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*Dear Born Free Owner,*

*We are extremely happy that you have decided to purchase a new Born Free Motorcoach. We are confident you will have many years of enjoyable use with your new motorcoach.*

*This owner's manual has been prepared to help you enjoy using your Born Free to its fullest by understanding all of its features. We suggest you read the manual thoroughly and carry it in a convenient place in your coach, where you can refer to it if any questions should arise. The manufacturers and suppliers of the truck chassis, as well as those of the accessories and appliances used in the Born Free, have also included literature and information about their products. We recommend that you review this material carefully as it can be very helpful. Also, the manufacturers have included warranty registration cards that need to be filled out and mailed promptly (10-15 days) in order to properly register your purchase for warranty repairs.*

*At Born Free, we test and evaluate each motorcoach produced, continually looking for ways to make our product even better. Improvements, regardless of how large or small, are incorporated into the Born Free Motorcoach as they are produced. Consequently, this service manual may or may not reflect all of the current features and improvements. This service manual is intended to acquaint you with the proper servicing and repairing of your Born Free and is to be used as a guide only. Should you need assistance, please call our service department at 1-800-247-1835.*

*Thank you and happy motoring!*  
*The Born Free Motorcoach Staff*

*NOTE: Because it is impractical to make frequent literature changes, specifications and equipment described in this service manual must be subject to change without notice.*



**BORN FREE MOTORCOACH, INC.**

Hwy. 169 North, P.O. Box 39

Humboldt, IA 50548

(515) 332-3755 • 800-247-1835

**LIMITED WARRANTY**

Owner \_\_\_\_\_ Serial # \_\_\_\_\_

Address \_\_\_\_\_ Date \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Lienholder \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Year	Make	Model	Serial No.	Odometer	Code	Class	

As the manufacturer of this coach, Born Free Motorcoach issues this LIMITED WARRANTY to the original purchaser. THIS WARRANTY AND ALL IMPLIED WARRANTIES ARE LIMITED IN DURATION TO ONE (1) YEAR OR 12,000 MILES FROM THE DATE OF DELIVERY TO THE ORIGINAL RETAIL PURCHASER.

A warranty card is provided to the original purchaser of all "Born Free" coaches. This card must be filled out and returned to the factory within thirty (30) days of the purchase date or "NO WARRANTY WILL APPLY."

Born Free warrants to the original purchaser that all Born Free units will be free from defects in materials or workmanship for a period of one (1) year or 12,000 miles of use from date of purchase, whichever comes first. Any warranty, whether expressed or implied, rests solely with the seller. This Limited Warranty is expressly conditioned on the purchaser's use of the product in conformance with the instruction manual provided with the unit. The Limited Warranty, however, does not include: the chassis or truck upon which the unit is mounted, brake control and its component parts, battery isolator, jack systems, torsion axle and tires, battery, water heater, city water fill, furnace, water pump, generator, converter, air conditioner, curtains and cushions, refrigerator, bathroom module, stove, oven and power hood, LP tank, gauges and regulator, air ride system, or any other optional equipment or equipment specified by the purchaser. When furnished or attached, these items are covered solely by the warranty of the manufacturer of such product, commonly known as pass-through warranty. Names and addresses of pass-through warranted products is included with your warranty package. If you have further questions, contact Born Free Motorcoach, Inc.

During said one (1) year period, Born Free Motorcoach will, at its option, repair or replace any part manufactured by it, which upon examination by Born Free Motorcoach is found to be defective as to material or workmanship under normal use and service. Any unit which the consumer claims to be defective must be examined by Born Free's nearest authorized warranty service facility. All transportation cost under this warranty, including return to the factory, if necessary, are to be borne by the purchaser (and prepaid by him). This warranty does not include normal maintenance and service and does not apply to a unit or any part thereof which has been subject to misuse, negligence, accident, overloading, or improper maintenance, repair, or storage, so as in Born Free's judgment to affect adversely its performance.

There is no other express warranty. Born Free Motorcoach hereby disclaims any and all implied warranties including, but not limited to, those of merchantability and fitness for a particular purpose, to the extent permitted by law. The duration of any implied warranties which cannot be disclaimed is limited to the time period (one year or 12,000 miles) as specified in the express warranty. Liability for consequential, incidental, or special damages under any and all warranties is excluded to the extent permitted by law.

Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Born Free Motorcoach, Inc. reserves the right to make changes in design and changes or improvements upon its products without imposing any obligation upon itself to install the same upon any previously manufactured products.

**THIS WARRANTY DOES NOT COVER NOR APPLY TO LOSS OR EXPENSE:**

1. To any loss caused by negligence, misuse or failure to perform required servicing, or any mechanical failure caused by the lack of proper and necessary amount of coolants or lubricants.
2. To repairs and/or replacement not authorized by Born Free Motorcoach or to any mechanical alterations to the vehicle not recommended by the manufacturer of the vehicle.
3. To liability for damage to property or injury to or death of any person arising out of the operation, maintenance or use of the described vehicle in this warranty whether or not related to the parts covered within.
4. To loss caused by wear and tear, unless actual mechanical breakdown occurs.
5. To any loss caused by collision or upset, breakage of glass, missiles, falling objects, fire, theft or larceny, explosion, earthquake, windstorm, hail, water, flood, malicious mischief or vandalism, riot or civil commotion, lightning, nuclear contamination, freezing, smoke, or from any other cause whatsoever except as provided in this warranty.
6. For delays, however caused, shall the manufacturer be liable for the value of loss of use of the described vehicle.
7. If there has been any tampering or alteration to the odometer.
8. When the mechanical breakdown is the direct result of a mechanical or structural defect, wherein the manufacturer has publicly announced its responsibility by a recall for the purpose of correcting such defect.
9. For any loss, damage or injury to persons or property resulting from failure of any of the parts of the described vehicle, the repair or replacement of which are covered under the terms and conditions of this warranty.
10. To loss caused directly or indirectly by neglect of the Warranty Holder to cause to be performed all periodic maintenance services as are required and recommended by the manufacturer of the described vehicle, or while the described vehicle is out of the care, custody, or control of the Warranty Holder.
11. Generator, all electrical systems, electrical wiring, electrical appliances, television and television antenna.

**As the first retail owner and purchaser you must:**

1. Conduct the inspection and test outlined on this written warranty before you take possession of the vehicle, including the "test drive" required.
2. You must complete in legible detail the attached warranty registration on the date that you take delivery of the vehicle. The warranty registration must be returned to Born Free Motorcoach in order to comply with federal law; namely the Motor Vehicle Safety Act.
3. You must perform the care and maintenance steps and procedures set out in the Owners Manual, at your own cost, and use the vehicle for its intended purposes.
4. In the event that within the one year or 12,000 mile period after you take delivery of this vehicle a defect in parts or workmanship should develop which is attributable to the manufacturer's work, you must contact the Born Free Motorcoach Customer Service Dept. promptly and discuss the problem with the customer service representative. If a problem arises while you are traveling, you can reach our Customer Service Dept. by calling 1-800-247-1835.
5. If the defect is covered by the manufacturer's warranty, the correction of such defect attributable to the manufacturer will be performed at the manufacturer's expense. If the defect is not attributable to the manufacturer's work or covered by the warranty, you will be so advised.
6. In most instances the work to correct defects will be undertaken within a reasonable period of time. However, delays may result from unpredictable factors over which the manufacturer has no control. In these cases the appointed date for scheduling warranty work and the completion of the work thereof may necessarily be prolonged. If the time indicated is not in reason, you may contact the Born Free Customer Service Dept. to make other arrangements to expedite the correction.
7. In the event of a disagreement between you as the owner and the manufacturer as to whether a defect is attributable to the manufacturer's work, or covered by the warranty or corrected in a timely and prompt manner, the question and issue must be submitted to an impartial qualified arbitrator for decision before either you or the manufacturer may pursue any legal remedy in the courts. The fees or charges made by such independent arbitrator shall be paid by the party against whom the arbitrator rules.
8. In the event of a dispute in which the arbitrator rules against the manufacturer, if the manufacturer fails to correct the defect at its own expense, you, as the original retail purchaser of the vehicle, have the right to bring suit against the manufacturer for damages and other legal and equitable relief in any court of competent jurisdiction in any state or the District of Columbia or in a proper United States District Court, if jurisdiction is present.

Such rules and regulations as may be advised by the Federal Trade Commission under authority given it by the Magnuson-Moss Warranty-Federal Trade Commission Improvement Act (Act of Jan. 4, 1975, Public Law 93-367) as it relates to service contracts and/or warranties, are reference incorporated herein.



# NOTICE

## ***Warranty Information Ford Econoline***

If you have a Ford warranty problem with your unit, you must take it to an authorized Ford dealer first.

This must be done for any warranty coverage from Ford. If the Ford dealer can not fix your unit, he can authorize you to have it fixed at another service center. You must receive this authorization in writing.

Failure to comply with the above procedure will void your warranty coverage from Ford.

For "on-the-road" emergency service, call 1-800-241-FORD, in Georgia call 1-800-282-0959, for 24-hour-a-day service.

*Born Free Motorcoach, Inc.*



# Vendor Warranty and Service Phone Numbers

NAME OF COMPANY	WARRANTY PHONE #
A&E Awning .....	(800) 544-4881
Ahlrich Cabinets (1993 and older RV, all Show) .....	(712) 335-3949
Air Lift Company (Air Rides, 1993 and newer) .....	(800) 727-9009
Alumax Doors .....	(219)-295-6393
Atwood Water Heater (1994 and newer) .....	(815) 877-5700
Auto Climate Control (Show only) .....	(800) 937-9674 or (903) 677-3161
Autopage Burglar Alarm .....	(310) 618-2002
A&M Distributing (1989 and older Vet and Show) .....	(219) 294-2538
Barker TV Booster .....	(616) 965-2371
Best Plastics Storage Pods .....	(616) 641-5811
Delta Power Plus Booster Amplifier .....	(616) 965-2371 (same as Barker and Delta TV antenna)
Dicon Smoke Alarm .....	(708) 850-7255
Dicor Versa Liner .....	(219) 264-2699
Dometic Refrigerator .....	(519) 653-4390
Duo-Therm (heat strip and roof mount AC) .....	(800) 544-4881 <i>MODEL 600315, 421 S/N 52818838</i>
Elkhart Door and Shades .....	(800) 348-7559
Elixir Industries (windows and vents, early 80's) .....	(800) 421-1942
Emerson 9" Television and Video Cassette .....	(800) 388-8333
Fan-Tastic Vent .....	(800) 521-0298 or (810) 395-4045





## Phone Numbers Continued

### NAME OF COMPANY

### WARRANTY PHONE #

Firestone Air Ride (1993 and older) .....	(317) 773-0650
Fletcher Cabinets (1994 and newer RV's) .....	(515) 573-2021
Flexsteel .....	(319) 556-7730
Ford Roadside Assistance .....	(800) 241-3673
Ford Service Locator .....	(800) 444-3311
Ford Motorhome Warranty .....	(313) 323-7932
Generac Generators .....	(414) 544-4811
Heart Interface Inverter .....	(206) 872-7225 or (800) 446-6180
Hehr International Windows .....	(800) 835-2244
Hellwig (overload springs) .....	(209) 734-7451
Honda Generator .....	(213) 604-2400
Interstate Battery .....	(800) 747-2425
KEC TV (tri-star) .....	(800) 456-3340
Kwikkee Step .....	(800) 736-9961
Larson Monitor Panel (mid to late 80's) .....	(800) 456-4498
Magic Chef .....	(800) 688-1120
Magnatek Converter .....	(219) 356-7102
Magnavox Television .....	(813) 278-4242
Manchester LP Tank .....	(314) 221-8710
Marshall Brass LP Regulator .....	(616) 781-3901
Maxon CB .....	(319) 664-3768
Michelin Tire .....	(800) 847-3435

## Phone Numbers Continued



NAME OF COMPANY	WARRANTY PHONE #
Moen Sink .....	(501) 268-3521
Norcold Refrigerators .....	(800) 826-5045
Onan Generator and Remote Start.....	(800) 888-6626
Packmaster Storage Pods.....	(303) 469-3324
Panasonic Microwave .....	(219) 295-2441
Panasonic TV .....	(800) 447-4700
Prior Products (tag axles) .....	(800) 527-4848
RC Industries (fire extinguishers).....	(201) 937-5400
RV & Sea (sleeping bags) .....	(714) 830-1292
Sharp .....	(800) 798-8012
Shurflo Water Pump .....	(800) 762-8094 or (800) 854-3218 (Corp.)
Suburban Furnace .....	(615) 775-2131
Surepower Multi Battery Isolater .....	(503) 692-5360
Ten Tek Gas Alarm .....	(708) 850-7255
Thetford Toilet .....	(800) 521-3032
Thin Lite (fluorescent lights) .....	(805) 987-5021
Uniden CB.....	(317) 842-2483
Vollrath Faucet.....	(219) 294-5611
Vortec Throttle.....	(219) 482-4204
Walter Kidde Fire Extinguisher .....	(800) 654-9677
Wedgewood Oven Cooktop .....	(615) 643-4556
Westinghouse Ground Fault Circuit Breaker.....	(412) 244-2000
White-Rodgers Thermostat .....	(615) 775-2131



# Born Free Recreational Vehicle Specifications

(Cabover models only)

	21' Models	24' Models	26' Models	
BUMPER TO BUMPER OVERALL LENGTH	21' 11-1/2"	24' 7-1/2"	26' 4-1/2"	
FRONT OF FRONT BUMPER TO REAR OF CAB	88-1/2"	88-1/2"	88-1/2"	
CUT FLOOR LENGTH	164-3/8"	198"	219-3/8"	
HEIGHT AT TOP OF FRONT VENT	112"	114-1/2"	117"	10
REAR OF ROOF HEIGHT	107-1/2"	107-1/2"	108-1/2"	10
HEIGHT WITH ROOF AIR	(11") 118-1/2"	118-1/2"	119-1/2"	10
HEIGHT WITH ROOF POD	(15") 122-1/2"	122-1/2"	123-1/2"	10
BODY WIDTH	95-1/2"	95-1/2"	95-1/2"	8
BODY WIDTH WITH AWNING	98-1/2"	98-1/2"	98-1/2"	9
WIDTH ACROSS MIRRORS EXTENDED IN DRIVING POSITION	110"	110"	110"	10
WIDTH ACROSS MIRROR HDWE/MIRRORS FOLDED	98"	98"	98"	9
REAR BUMPER DEPTH	12"	12"	12"	1
INTERIOR FLOOR WIDTH	88-3/4"	88-3/4"	88-3/4"	8
INTERIOR HEIGHT	76-1/2"	76-1/2"	76-1/2"	7
CHASSIS WHEELBASE	158"	158"	176"	15
APPROXIMATE BASE WEIGHT**	9,800 LBS.	10,500 LBS.	11,200 LBS.	

ALL SPECS ARE SUBJECT TO CHANGE AND ARE APPROXIMATES ONLY.

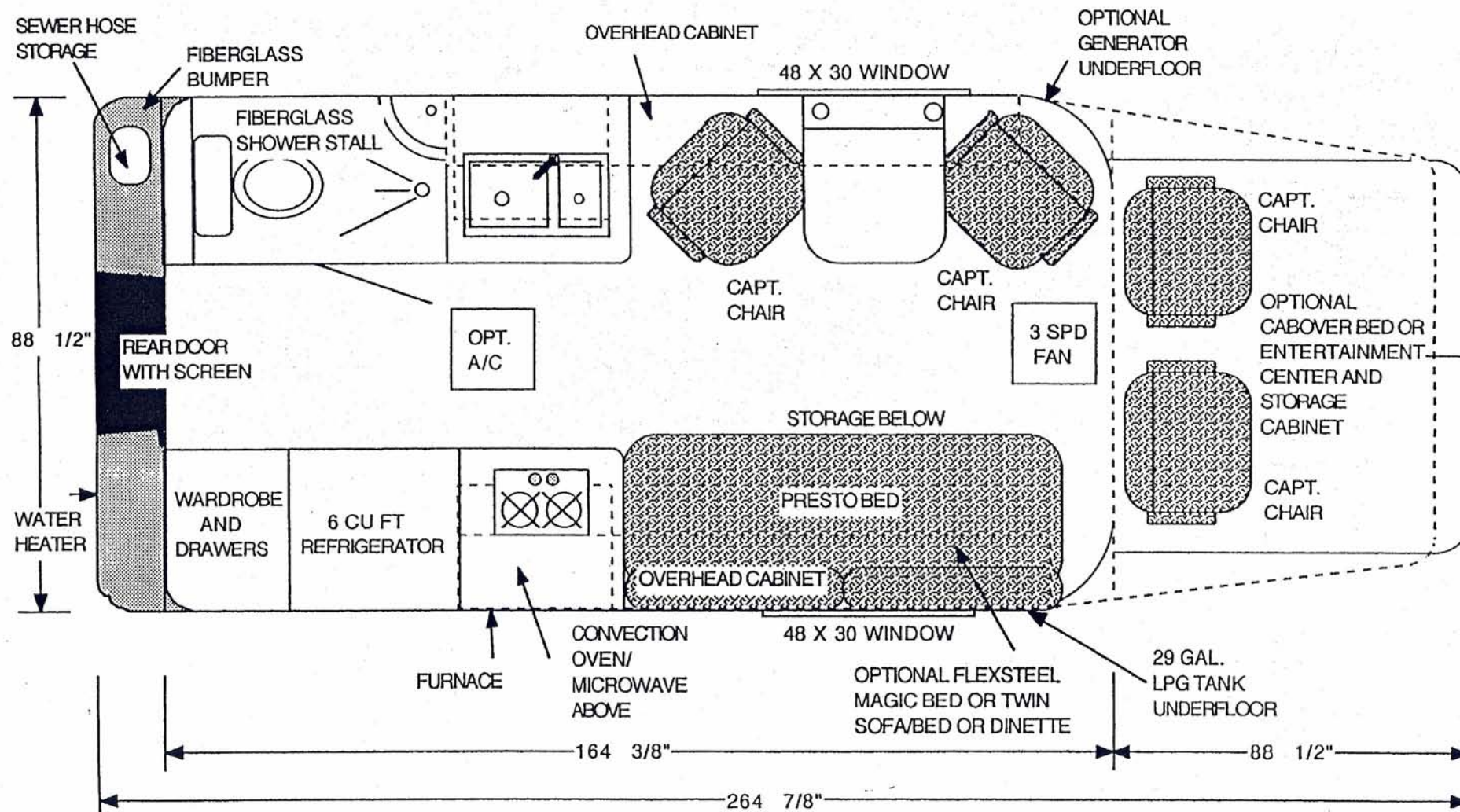
\*\*BASE WEIGHT IS LESS OPTIONS, PASSENGERS, AND CARGO.

## Tank Capacities

	21' RD & BFT	24' REAR BATH	24' REAR SIDE BED	26' REAR BATH	26' REAR SIDE BED
Fuel	35 gal.	35 gal.	35 gal.	35 gal.	35 gal.
LP	23 gal.	23 gal.	23 gal.	23 gal.	23 gal.
Fresh Water	35 gal.	35 gal.	35 gal.	35 gal.	35 gal.
Grey Water	13-1/2 gal.	20 gal.	25 gal.	20 gal.	25 gal.
Black Water	13 gal.	25 gal.	20 gal.	25 gal.	20 gal.
Water Heater	6 gal.	6 gal.	6 gal.	6 gal.	6 gal.

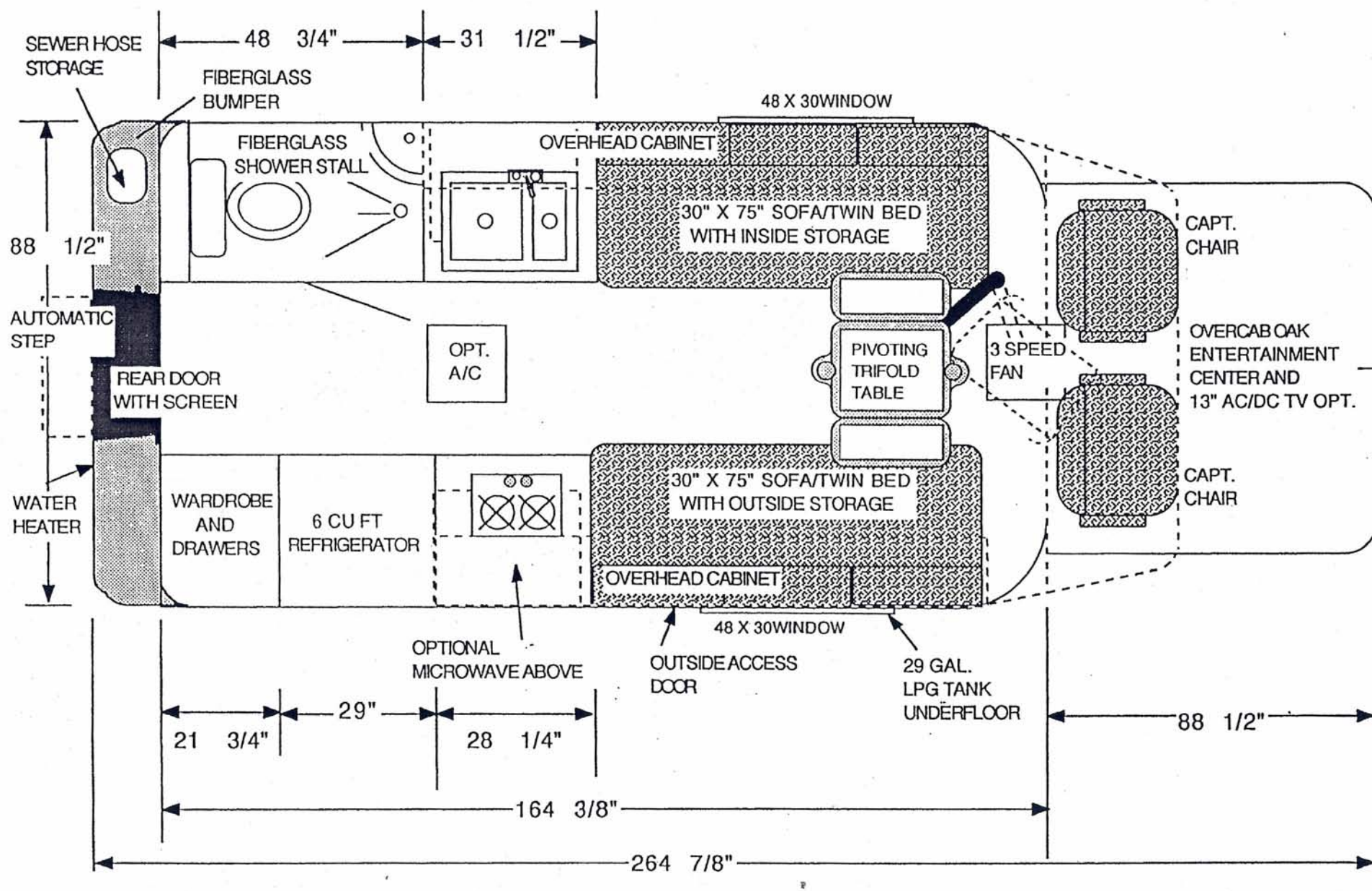


## BORN FREE 21' REAR DOOR



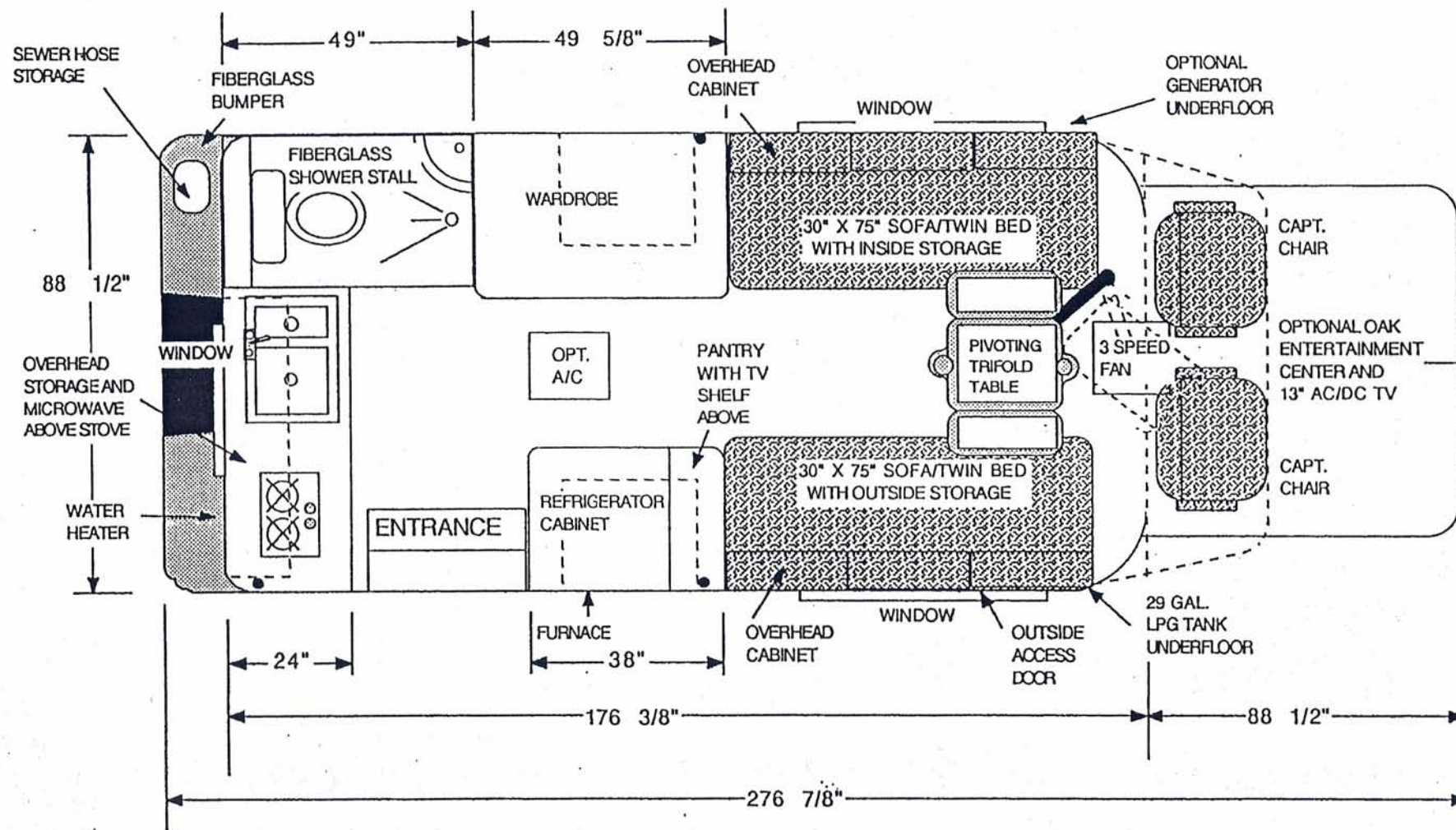
# BORN FREE 21' BFT

## A COMPLETE MOTOR HOME BUILT FOR TWO

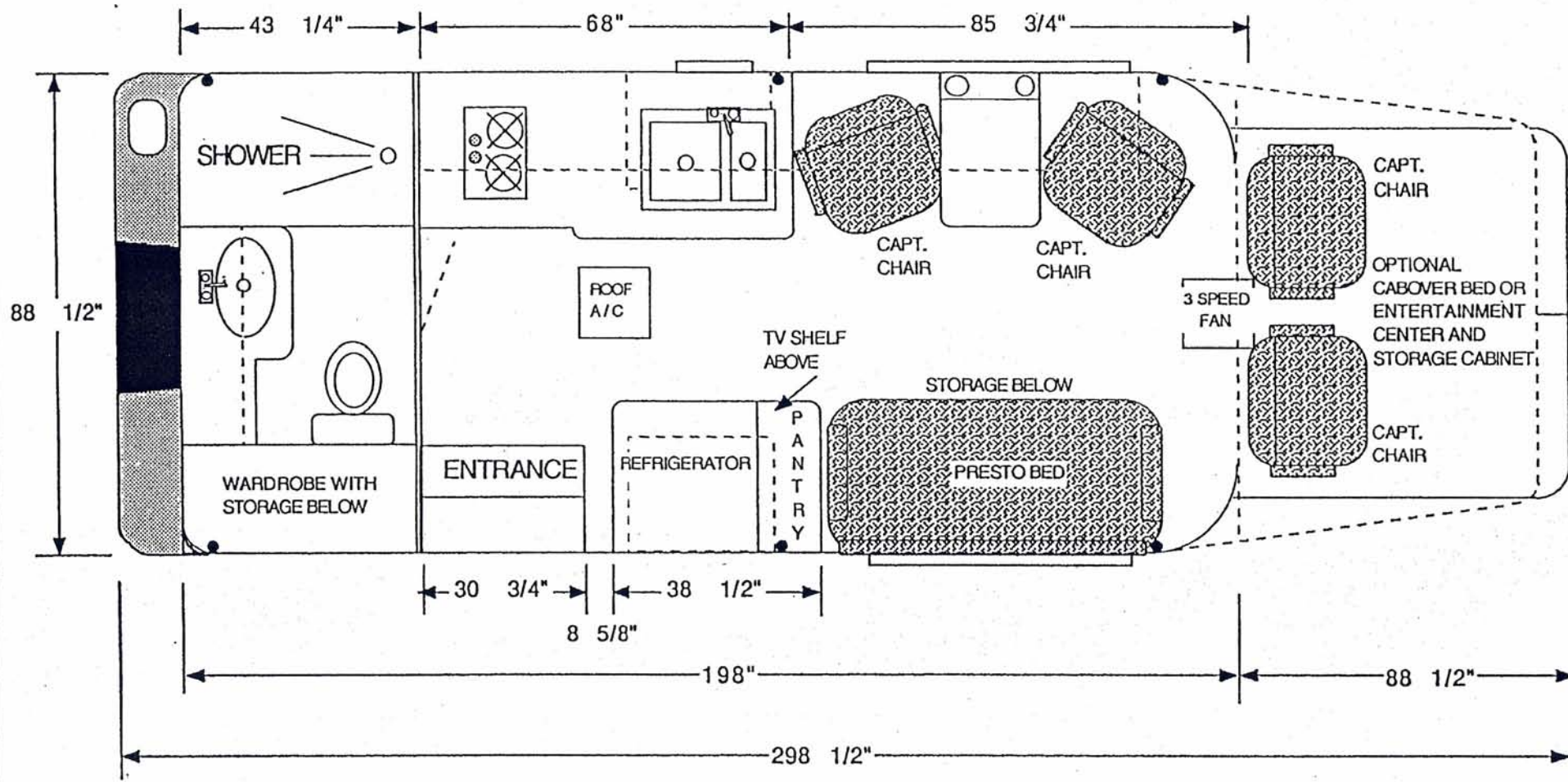




# BORN FREE 23' BFT REAR KITCHEN "BUILT FOR TWO"

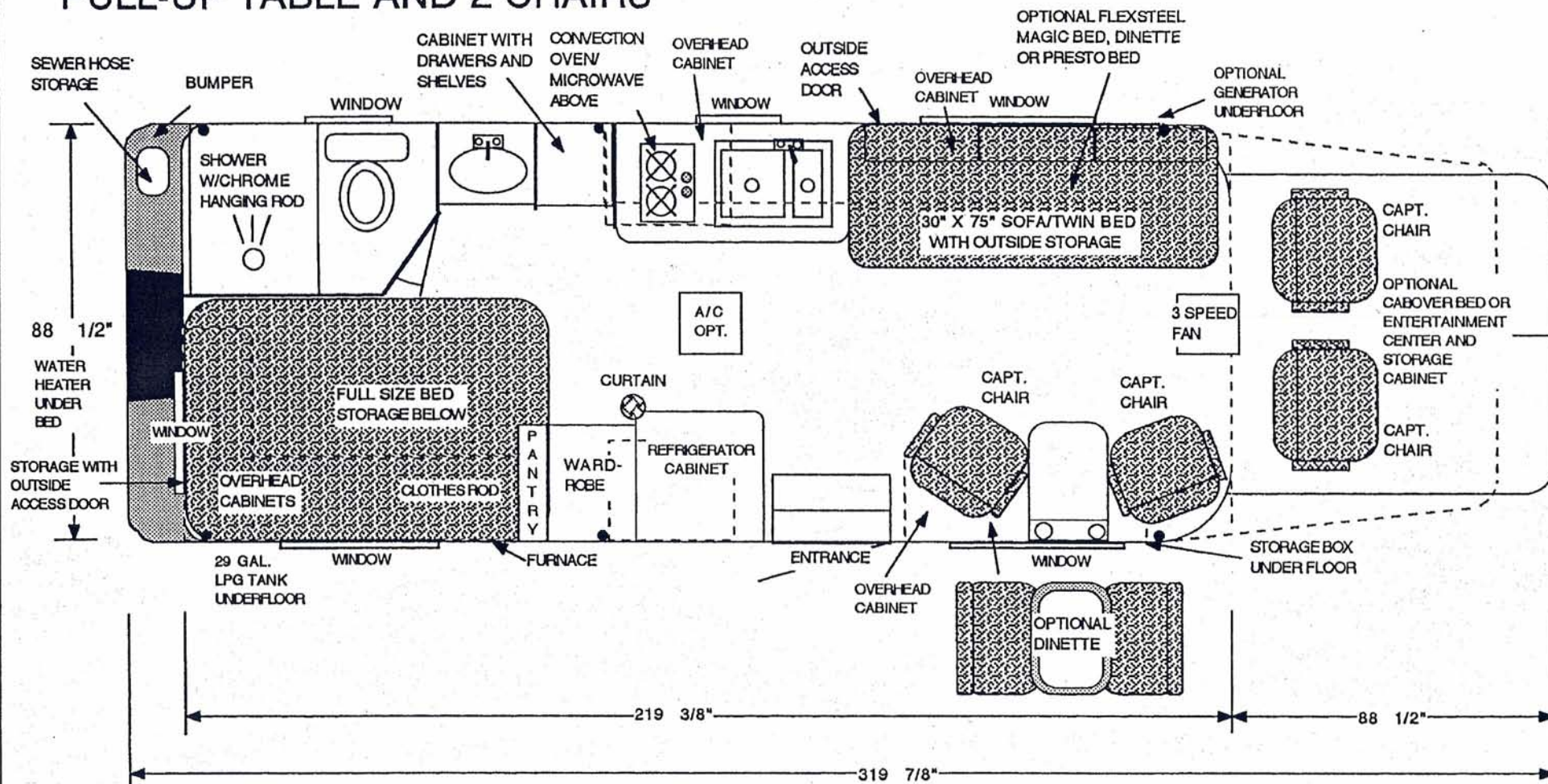


# BORN FREE 24' REAR BATH





# BORN FREE 26' REAR BED PULL-UP TABLE AND 2 CHAIRS





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## Tire Inflation and Vehicle Loading

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We have developed a guideline for tire and air suspension pressure that we would encourage you to follow so that you maintain the high level of satisfaction with your new Born Free Motorcoach.

Quite often we find that customers who report poor tire wear, handling, or excessive road vibration are driving with either the tires or air suspension system over-inflated. Many times service technicians over-inflate tires and air suspensions to a level equal to larger trucks. We advise you to routinely check these pressures to prevent unwarranted wear.

### Ford Recommended Pressures

	Front Tires	Rear Tires	Air Bags
RVs	65 PSI	60 PSI	55 PSI
Showmobiles	65 PSI	60 PSI	55 PSI
Vet Units	65 PSI	60 PSI	55 PSI

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## Driving Tips

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Your new Born Free Motorcoach will drive very much like your "family car." The biggest difference in handling will come from an increase in weight, width, height, and length. All of these differences will become second nature to you in just a few miles of driving. You will be able to drive your Born Free at interstate speeds, just like your car; but it will take a bit longer to achieve the maximum driving speed. The vehicle will slow down more when climbing an incline because of the added weight. When maneuvering a pass, allow yourself more time and room for overtaking and cutting back. Your Born Free is also wider and consideration should be taken when maneuvering in a tight place.

When maneuvering in a tight place, it is best if you have your co-pilot get out and walk with the coach as it moves. Station that person at the left rear of the coach where you can observe their signals.

As you become more familiar with your Born Free, you will become more aware of the additional weight, length, and width. However, height will have to be a constant thought when you approach low hanging branches or low building canopies. Allow 10-1/2 feet in most cases with a roof mounted air conditioner for proper clearance.

The experienced traveler learns to "walk his rig" at every stop. It takes but a minute to make a trip all the way around looking at the complete unit. Be sure that all caps are in place, access doors secure, and tires are well inflated. Be sure to check the rear inside duals either by kicking them or hit them with

a tire iron. An un-inflated tire will move on the rim causing heat build-up or possibly even a fire. "Once around before in" is a good practice.

The fuel efficiency of your Born Free depends on several factors: the load it's carrying, the size and weight of the body, driving habits and general condition and maintenance of the vehicle. Adding a trailer to your motorcoach will place an additional load on the engine and will reduce fuel economy. Here are some suggestions for increasing fuel economy:

1. Change oil and filter according to manufacturer's recommendations.
2. Manually shift the automatic transmission when appropriate.
3. Inspect air and fuel filters frequently when encountering excessive dust, bugs, and debris.
4. Keep cargo to a minimum.
5. Make sure tires and air bags are properly inflated.
6. Restrict dash air conditioner use when possible.

Ice, snow, and wet road surfaces present hazardous driving conditions. Stopping distance is unpredictable, and braking surfaces can cause skidding. Under such conditions, down-shifting the transmission helps reduce vehicle speed and provides more control. Pumping the brakes tends to prevent skidding. Lowering tire pressure helps considerably.

**CAUTION: To avoid skidding in slippery situations do not down-shift to 1st gear at speeds above 10 mph.**

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## Travel Tips

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Here are some traveling tips to keep in mind when you're on the road with your new Born Free.

1. Remember to "think high and wide." Save the top and sides of your motorcoach.
2. Keep an eye on service station attendants. They may accidentally fill your water tanks with gas or vice-versa. They may also get the wrong type of fuel in your unit.
3. Use manned tollgates - usually you will be charged one class more than a car. Some states may or may not require you to stop at weight stations.
4. Check the oil every time you stop for fuel.
5. Check wheel lug nuts every day before you start.
6. Do not leave food or odor causing materials in your vehicle for extensive periods of time.
7. Inspect your fire extinguisher for proper charge once a month. It's also a good idea if everyone using the coach knows where the extinguisher is located and how to use it in case of an emer-



gency.

8. Conduct a tour of your vehicle before departure to be sure that all compartment doors are closed and locked, cabinet doors closed, and the refrigerator doors are secured.
9. First-time motorcoach owners may have a tendency to crowd the center line of the highway. Check your mirrors frequently to prevent crowding the center line.
10. When fogging appears on windows, there is an excessive amount of humidity inside the vehicle. In extreme cold conditions the humidity can turn to frost or ice. To alleviate the excess moisture problem, open a roof vent slightly or open a window. Operating power vents will also help.
11. Taste the water before filling your fresh water tank.
12. 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 shower head. Turn the water on and rinse.
13. Dump sewage only at approved dumping stations.
14. During peak camping season, phone ahead for a camping spot.
15. You will find that sleeping bags save work. They take less space than blankets and are usually warmer.
16. 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.
17. Emergency items you should have along are:
  - a. Flashlight
  - b. First aid kit
  - c. Emergency flares
  - d. Tool box with tools
  - e. Plastic bucket
  - f. Tow chain or rope
  - g. Wheel blocks for leveling, or extra jacks
  - h. Water hose
  - i. 100-150 foot electrical cord with at least 50 amp rating
  - j. Fire extinguisher
  - k. Hydraulic jack and lug wrench

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## Check list for pre-departure inspection

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As a safety precaution get in the habit of: ONCE AROUND BEFORE IN - walk completely around your coach before departure. It could save leaving with a power cord or hose still connected.

- ☐ Inspect springs, shocks, and steering mechanism.

- ☐ Test auxiliary battery for charge condition, clean battery posts if necessary.
- ☐ Check all running lights, turn signals, and panel lights.
- ☐ Test horn.
- ☐ Examine tires for wear and test for proper inflation.
- ☐ Check fluid levels: radiator, brake fluid, and washer fluid.
- ☐ Check windshield wiper condition.
- ☐ Doors and windows closed.
- ☐ Roof vents closed.
- ☐ Compartment doors closed and locked.
- ☐ All cords and hoses unhooked and stored away.
- ☐ ONCE AROUND BEFORE IN.

---

## Trailer Towing

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Whenever a motorcoach is used for towing, the following limitations must be followed:

1. The towing hitch on the Born Free is NOT class rated.
2. The Gross Combination Weight (GCW) must not exceed the Gross Vehicle Weight Rating (GVWR) unless the trailer vehicle is equipped with adequate brakes.
3. Trailers weighing in excess of 1000 pounds require trailer brakes. Trailer brakes are also required whenever Gross Combination Weight (GCW) exceeds the Gross Vehicle Weight (GVW) of the motorcoach.

Gross Combination Weight (GCW) equals the total weight of fully equipped motorcoach and trailer with cargo, driver, passengers, fluids, etc.

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

An auxiliary transmission cooler must be installed if you are going to tow any vehicle. The additional heat created by towing will cause fluids to overheat resulting in transmission failure.

**CAUTION: Installation of a frame-type equalization hitch on a motorcoach is not recommended.**

## Additional Trailering Tips

1. Make extra wide turns to compensate the wider turning radius of the trailer.
2. When backing up, move trailer to the left by turning the front wheels of the motorcoach to the right. To turn the trailer to the right, do the opposite.
3. Place wheel blocks (chocks) under the trailer wheels before setting brakes and transmission of the tow vehicle. The blocks will absorb the stress and secure the trailer.



4. Frequently check operation of trailer brakes and trailer lights.
5. Decrease trailer load substantially for high-altitude driving.

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## Routine Operation

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As a guide we would suggest that the following guidelines be followed when operating your new Born Free:

1. Change engine oil and filter at 3000 mile intervals. See the Ford owners manual for oil specifications.
2. Rotate tires at 5000-7500 miles and again at 10,000-15,000 miles. Change the direction of rotation when rotating.
3. Wash regularly with mild soap. Do not use abrasive cleaners.
4. Wax the motorcoach twice a year using a good carnauba-based paste wax.
5. Check caulking twice a year and replace if needed. A silicone caulking is recommended.
6. Align the front end at approximately 2500-4000 miles. Contact a truck alignment shop. 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.
7. Service the auxiliary generator per manufacturer's guidelines.

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## Diesel Owners - Operating Tips

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Some special precautions need to be taken when dealing with diesel engines. Because it is not uncommon for diesel fuel to become contaminated with water, a water drain separator is located along with a bleeder valve on the bottom of the fuel filter. A warning light on the dash will indicate that there is a problem with water in the fuel. 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. In cold climates the 110-volt engine block heater should be used to assist in starting the engine.

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 second try.

## I. SUSPENSION

### A. Air Lifts

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

Proper inflation of the air lifts can result in the smoothest ride possible by reducing the choppy ride sometimes caused by truck tires and springs.

The system is made up of two air bags mounted to the rear axle and inflated by separate fill valves located by the driver's side wheel well. To operate, simply add air to each of the fill valves to achieve the proper leveling of the coach. Minimum air pressure is 20 PSI and maximum is 100 PSI. A general rule is that the air springs will support approximately 40 lbs. of load for every pound of inflation. For example: 50 PSI of inflation will support a load of 2000 lbs. per set. For the best ride use only enough air pressure to level the vehicle when viewed from the side.

*NOTE: 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 100 PSI.*

For service and warranty information see your manual pertaining to Air Lift Company.

### B. Hellwig Helper Springs

Hellwig Helper Springs are added to some Born Free Motorcoaches to help stabilize the unit for better handling. The Hellwig springs are simply a helper spring that is bolted to the factory rear leaf springs.

## II. FIBERGLASS SKIN

### A. Looking Like New

At Born Free Motorcoach, we constantly test and evaluate the latest in new fiberglass materials to offer you, the owner, the finest and the most long lasting products available. Even though we are constantly striving to use the best possible products in the construction of your unit, the fiberglass finish may become dull, faded, or chalk without proper care. The following is a brief explanation of what happens to dull or fade the fiberglass finish and what can be done to restore the finish.

Fiberglass consists of two basic polyester products: gel coat, which is the outer colored surface; and the structural reinforcement, which is a blend of polyester laminating resin mixed with strands of glass to create a structure that is strong, weather resistant, and long wearing.



Man-made and natural materials, when placed in the elements, slowly deteriorate. The material is exposed to the sun, water, wind, dust, and chemicals in the air. How much wear and tear depends on how you treat the product and maintain it. An automobile's exterior surface quickly deteriorates if you do not wash and wax the painted surface. Although the gel coated surface is approximately ten times thicker than the paint surface on your automobile, it reacts similarly when exposed to the elements.

## B. 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. Wax the unit once or twice a year using a paste wax containing a high percentage of carnauba. As a rule, only the hard paste waxes contain large amounts of carnauba. Liquid or soft waxes usually contain a large amount of silicone and solvents. The silicone is usually washed away after a few washings with a detergent.

## C. Chalking

Chalk is the outer surface of the gel coat being broken down into an extremely fine powder. The chalk that develops is strictly on the surface. This problem is caused by overexposure to the sun's ultraviolet rays, chemicals in the air, or improper care of the gel coat surface. To alleviate the chalk, wash the unit and try a paste wax to restore the luster. If this is not effective, apply a fine rubbing compound, either hand applied, or applied with a power buffer. Follow this procedure with a good paste wax. If this method is still ineffective, a light sanding using 600 grit or finer grit wet or dry sandpaper can be used followed by fine rubbing compound and a coat of wax.

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 a burn spot of softening of the gel coat surface.

## D. Fading

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

To determine how to remove a stain, pre-test the

stain in an inconspicuous area first, using mild detergent. A mild abrasive cleaner may be used if necessary. The abrasive cleaner may leave the finish dull and may need to be buffed to restore the luster. Always apply a coat of wax to the repair area when completed.

To remove a non-soluble stain, you may try removal using acetone, paint thinner, or alcohol. Prevent prolonged contact with the surface for fear of deterioration of the gel coat surface.

Scratches 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 larger repairs you may contact Born Free Customer Service and we will send you the desired amount of gel coat material. We would be happy to assist you with any and all repairs you may require.

# III. COACH

## A. Interior

1. **Seat Belts** - For seat belt requirements refer to RVIA and FMVSS (Federal Motor Vehicle Safety Standards). Most states, by law, are requiring the use of seat belts. In addition Born Free recommends the use of seat belts on all passengers while the vehicle is in motion.

According to Federal Regulations on 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. The safety of young passengers is not only your responsibility, but also the law.

All seats must be locked in the forward position when the vehicle is in motion.

2. **Smoke Alarm** - A smoke alarm is provided as protection in case of a fire. The alarm operates on a 9-volt battery. We suggest that you change the battery once a year for your protection.

**LIMITATION ON LIABILITY** - Remedy under this warranty is limited to repair or replacement of the detector only. We will not be liable for loss or damage due directly or indirectly to occurrences which the detector is designed to detect.

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

3. **Tables** - Some Born Free Motorcoaches are equipped with removable, pedestal-type tables and bases recessed into the floor.
4. **Cabinets and Doors** - Your Born Free is equipped with solid oak cabinet doors. It is not uncommon for the doors to become misaligned during travel. Because of normal movement of



the coach and cabinet loading, the doors on some cabinets may become misaligned. Normally, a simple adjustment of the door striker or hinge is all that is required.

5. **Beds** - Several types of beds are used in the Born Free Motorcoaches. They are designed for maximum comfort in seating and sleeping.
  - a. **42" x 76" Sofa Bed** - The sofa quickly converts from a sofa to a 42" x 76" bed by lifting up and pulling out of the seat cushion. The bed then can be made up for a comfortable night's sleep. To return it to a sofa simply lift the front and push in.
  - b. **Dinette/Sofa Bed** - The dinette sofa combines sleeping accommodations with dining-style seating. By removing the table and legs and removing the dinette front wood filler plates, the table can be inserted between the two dinette seat. Move the cushions into place using one of the back rest cushions to form a comfortable bed. Open storage is found under each seat base.
  - c. **Cabover Bed** - This uniquely shaped mattress fits the contour of our 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 coach and the outside. The mattress measures 66" x 82" x 4" thick.
6. **Interior Maintenance** - Curtains, shades, and upholstery ... vacuum the upholstery, curtains and shades as regularly as the carpet. Do not wash the curtains but rather have them dry cleaned. Carpet spot remover may be used to remove stains and soiled spots from furniture and carpet.
7. **Idle Control (Diesel Showmobiles)** - To get maximum efficiency from your auxiliary air conditioner and 12-volt lighting, a higher than normal idle speed is needed. The idler control, mounted at the bottom of dash, left of the steering column, will do this for you. Simply push the button on the control and the engine will accelerate to the required RPM. A light on the control will indicate that the device is engaged.

The idler control is engineered to work only when the transmission is in park or neutral. The device will automatically shut off when the transmission is shifted into gear, when the brake pedal is applied, or can be shut off manually by pushing the button on the control.
8. **Emergency Exits** - Three entry doors are designated as exits to your Born Free. The rear window on most recreational vehicles is also designated as an emergency exit. Familiarize all occupants with these exits in case of an emergency.
9. **Roof Vents** - To provide adequate ventilation

inside your coach, crank-out roof vents are installed in the ceiling. Some models are equipped with a "Fantastic Fan." This vent fan is a 3-speed exhaust fan that will do an excellent job of exhausting. The optional "Fantastic Fan" does not come equipped with a light.

We do not advise you to travel with the roof vents in the wide open position. Also, while using the roof-mounted air conditioner, be sure roof vents are closed to get maximum efficiency from the air conditioner.

10. **Roof Air Conditioner** - As an accessory, we install a 13,500 BTU Duo-Therm roof-mounted air conditioner.
  - a. **Operating Instructions** - The roof-mounted air conditioner operates on 110-volt power supplied either by shoreline or generator-produced 110-volt current..
  - b. **Controls** - The selector switch is the left-hand knob. It has eight positions and controls fan speeds, heating mode and cooling mode. The thermostat is located on the right side and controls the temperature range from 65° on the coldest side to 90° on the warmest side. The compressor ON/OFF is controlled by the thermostat setting in the cooling mode.
  - c. **Cooling Operation** -
    1. Select the fan speed that best satisfies your needs:

HI COOL: Selected when maximum cooling and dehumidification are required.

MED COOL: Selected when normal or average cooling is required.

LO COOL: Selected when room is at desired comfort level and needs to be maintained. Normally, this speed is used for night time operation.

NOTE: The blower runs continuously to circulate air and maintain an even temperature. The compressor will cycle on as cooling is required to maintain the selected temperature level.
    2. Set the thermostat at the desired temperature.
  - d. **Heating Operation** - Turn the selector switch to OPT HEAT. The fan and heater will run continuously on low speed.

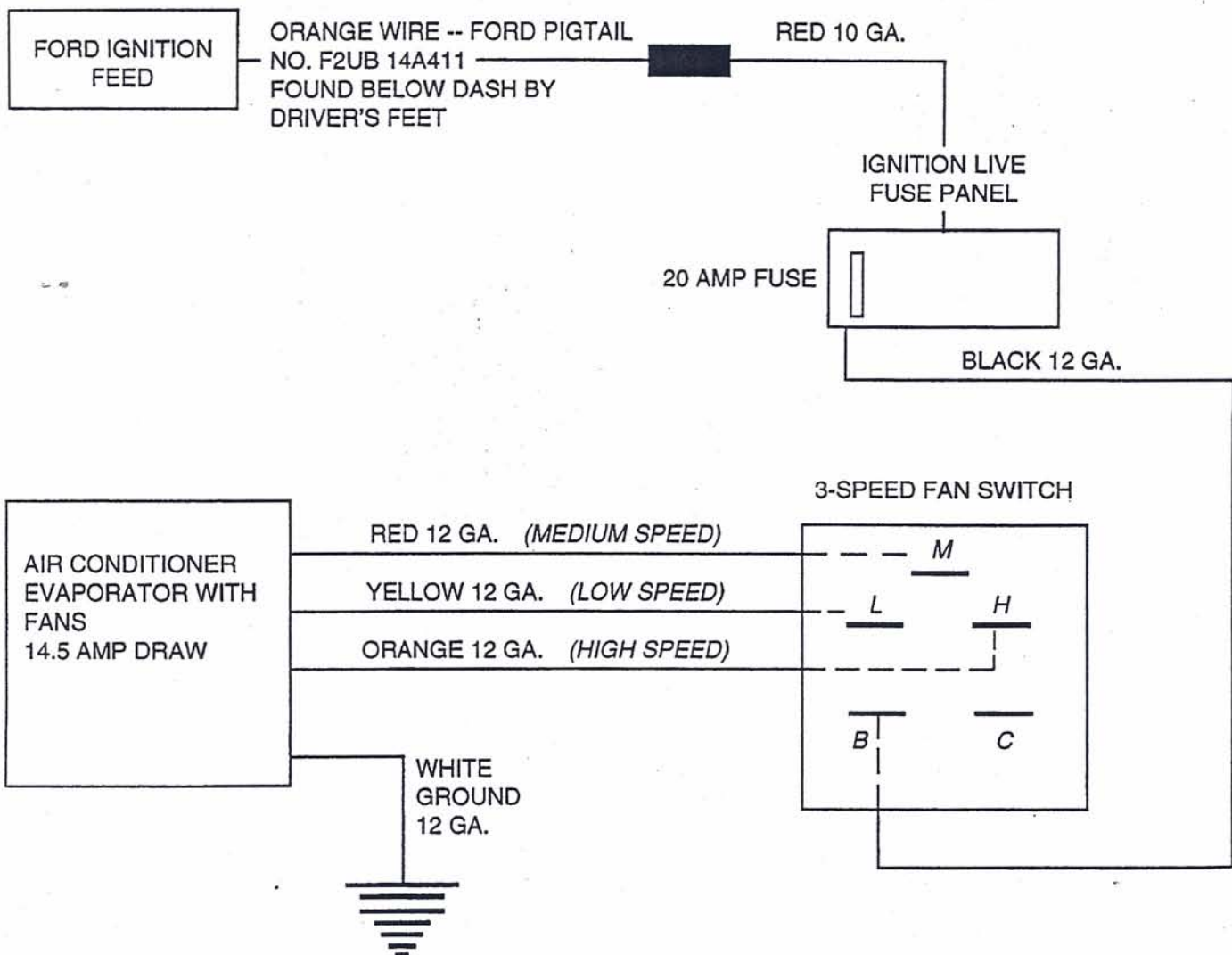
NOTE: The electric heater will not replace a furnace for heating your RV in cold weather. The intent is to remove the chill on cool days or mornings.
  - e. **Maintenance** - Periodically remove the filter/grille assemblies located in the air box and clean. Remove the assemblies by placing fingers on the long portion of latches and with an over-and-downward pressure, unlatch the catches. After assemblies are





# Evaporator Wiring Diagram

## Automotive Climate Control System on Born Free



removed, wash the filter/grille assemblies with soap and warm water. Let the assemblies dry and then reinstall.

- f. **Warranty Service** - In case of failure to operate, check power source first to make sure shore-line is carrying proper amount of current, check generator to see if it is producing power, or check the breaker at the power converter to see if it is tripped. Refer to the Duo-Therm Air Conditioner manual for warranty and service information.

11. **Auxiliary Air Conditioner/Heater** - Some Born Free Showmobiles are equipped with an auxiliary air conditioner/heater. The auxiliary unit runs independently from the chassis air. In other words, the dash air need not be running to run the auxiliary unit. The auxiliary air conditioner/heater is controlled with a switch mounted on the left side of the dash panel. The switch is a 3-position switch: "OFF" - "HEAT" - "A/C." The fan for the auxiliary unit is located on the cabinet next to the entry door. The switch controls the fan speed only.

**Maintenance** - As part of normal maintenance, the auxiliary air and heat unit should be run periodically, even in the winter, to lube fittings and seals. The compressor for this unit is a separate unit mounted on the engine. However, the drive belt or "serpentine belt" is incorporated into the Ford belt system to drive all of the accessories. This belt is available only through the manufacturer. For warranty service you may contact the manufacturer listed in the Auxiliary Air Conditioner/Heater manual or Born Free Customer Service.

## 12. **Range hood - Monitor Panel**

- a. **Range hood** - Your Born Free is equipped with a 12-volt range hood, vented to the outside. It also has a built-in monitor panel to accurately read the holding tanks, water tank, and battery level. The panel also has a water pump switch, hood light, and fan switch built-in.
- b. **Fan and light** - To operate the range hood fan you must first open the outside plastic vent by turning the two retaining turnbuckles on the vent. The door will now operate on its own, when the exhaust fan is in operation. A simple push of the fan button will now activate the exhaust fan. Also, a light can be activated by pushing the light switch. The third switch on the frontal panel is for the water pump. This switch may be left on while camping and the pump will automatically cycle when needed. We advise that you turn the water pump switch off and be sure to close the latch of the outside range vent when traveling.

- c. **Monitor Panel** - By pushing the "monitor" switch, the panel will light up, indicating the fluid levels in the black water holding tank, the gray water holding tank, the fresh water holding tank, and the charge condition of the auxiliary battery.

- d. **Maintenance** - The range vent may be cleaned with soap and water. Periodically, remove the aluminum filter and wash in soap and water. Allow to dry and reinstall. For warranty service, see your Jensen warranty manual.

13. **Microwave Oven** - Born Free offers an option on some vehicles - a microwave oven. Because we offer a variety of brands, we advise you to consult the manufacturer's owner's manual for proper operating instructions and warranty service.

14. **TV - VCR - VCP** - Again, Born Free offers as an option a variety of brands and we advise you to consult the manufacturer's owner's manual for proper operating instructions and warranty service.

## B. Exterior

1. **Doors and Locks** - Most Born Free Motorcoaches are equipped with the following locks and keys.

Identification	Replacement
a. Chassis door and ignition	See chassis dealer
b. Coach entrance door lock	Send number of lock to Born Free
c. Coach entrance dead bolt lock	Send number of lock to Born Free
d. Compartment door locks	One key fits all - order from Born Free

2. **Rack and Ladder** - Exterior roof mount rack and ladder is offered as an option to provide access to the roof area for storage purposes. 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 roof.
3. **Roof-mounted Storage Compartment** - This weatherproof storage pod is a very useful accessory for storing large items, like suitcases, sleeping bags, etc. Do not exceed 10 pounds per square foot, or 100 pounds total weight of storage in the compartment.
4. **Generator Storage Compartment** - The generator storage compartment is located under the floor on the driver's side of the vehicle. If an auxiliary generator is not installed in this area, it can be used as an outside storage compartment.
5. **Battery Storage Compartment** - The auxiliary battery storage compartment is located on the lower driver's side. The battery is mounted



on a sliding tray and can be slid out for servicing the auxiliary battery. This compartment is not weathertight to allow fumes and gasses to escape.

6. **Sewer Hose Compartment** - We have provided you with a storage compartment to house your sewer hose.
7. **Gas Fill Door** - Access to your fuel tank fill is obtained through this area. Pay particular attention to the warning labels affixed to the door. Diesel owners need to pay particular attention when filling the fuel tank that the service station attendant uses diesel fuel rather than gasoline.
8. **Power Cord Hatch** - Your 30-foot power cord is stored in this compartment. See section on "Power Cord" for proper use of the cord.
9. **Exterior Light** - We have installed a light in the area of the waste tank dump valve to aid you in evacuating the waste tanks at night.
10. **110-Volt Exterior Outlet** - A 110-volt weatherproof outlet is available on your coach to run any 110-volt accessories you may have. This outlet is controlled by a ground-fault 110-volt breaker to prevent electrical shock caused by wet conditions. Use only grounded plugs and do not exceed the amperage limit of the breaker.
11. **Potable and City Water Fills** - One door, located on the driver's side, access the potable water and city water fills.
12. **Furnace Outlet** - The exterior furnace outlet is a combination intake and exhaust system for the furnace. When furnace is operating, this vent may become hot and you should take precautions to not touch it or store flammables near it.
13. **Roof-mounted TV Antenna** - Models with TV's have an antenna mounted on the roof, with access to the inside of the coach for positioning the antenna. A simple turn of the inside knob will position the antenna to your desired location.
14. **Entry Door Light and Grab Handle** - The exterior porch light and the lighted grab handle are switched inside the entry door on the wall. On some models we also install a stepwell light, which is also switched on the wall.

## IV. ELECTRICAL SYSTEMS

Your Born Free Motorcoach is equipped with one or more electrical sources for electrical power for your coach.

1. 12-volt automatic electrical system
2. 12-volt motorcoach auxiliary battery
3. 110-volt external power supply
4. 110-volt auxiliary generator (optional)

### A. Automotive 12-volt System

The chassis battery is located under the chassis hood on the driver's side and operates 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. Radio and stereo

All of the above accessories are fused at the chassis fuse box. See your chassis owner's manual for proper replacement. NOTE - Never install a larger rated fuse as a replacement. Severe wire damage or possible fire may result.

### B. Auxiliary Coach 12-volt System

The coach is equipped with an auxiliary battery mounted on a slide-out tray beneath the coach floor. It operates the following:

1. Interior lights
2. Interior roof fans
3. Recirculating toilet
4. Range exhaust fan
5. Furnace fan and ignitor
6. Water pump
7. Monitor panel
8. Auxiliary generator starter
9. Safety detector
10. LP leak detector
11. Igniters for refrigerator and water heater

The auxiliary battery is separated from the truck battery anytime the chassis ignition is switched off by a battery isolator mounted near the auxiliary battery. The isolator separates the two systems so that the chassis battery won't run down during auxiliary use. When the chassis engine is running, the isolator allows the auxiliary battery to be charged by the alternator. The auxiliary battery can also be charged through the power converter when the vehicle is plugged into 110-volt shoreline power, or when the auxiliary generator is running. However, the rate of charge is a great deal less and will take a longer time to recharge.

Vehicles with diesel engines have two chassis batteries mounted under the chassis hood. Diesel engines require more cranking amperage and thus the two batteries.

### C. Care of Batteries

Check 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. If the motorcoach is stored for the



winter, remove the battery(ies) and store in a cool dry area, preferably off of a concrete floor. Even when idle, batteries will discharge due to chemical action, and should be charged periodically. Do not connect the battery to a charger and leave for the winter as the danger of overcharging is too great. Keeping the cells of the battery filled with water will keep the plates from buckling, causing an internal short.

#### **D. Switches and 12-volt Fusing**

All 12-volt powered equipment is fused inside the power-converter control center. Each fuse is labeled on the control center door. Do NOT install a larger replacement fuse, as each circuit is rated for the size of fuse installed.

A switch panel, mounted inside the door on some models, has control switches with a built-in circuit breaker to accommodate any overload situation. If a switch circuit becomes overloaded, the switch circuit breaker will trip and must be re-set. Re-setting the breaker involves switching the tripped switch from off to back on positions. Also located on the switch panel, in Showmobile models, is an hour meter hooked up to the diesel engine to record the running hours of the engine. Inside this compartment are two fuse bars with controlling fuses for other 12-volt accessories used in the motorcoach. Each fuse is identified, and again, a larger replacement fuse should never be installed to replace a blown fuse.

#### **E. 110-volt System**

The 110-volt system operates from a shore-line utility service, or an auxiliary generator source.

The following equipment operates entirely off of 110-volt power:

1. Roof air conditioner/heater
2. Refrigerator (except when operating on LP gas)
3. Electric appliances
4. Electrical outlets
5. Microwave
6. TV - VCR - etc.

1. **110-volt Utility Supply** - A 30-foot U.L. approved 30 amp heavy duty cable is provided for the connection to a utility supply. Also, a 15-amp adapter is provided to adapt to a standard three-prong outlet.

**WARNING - Never use an un-grounded plug adapter, as an electrical short may occur and cause serious electrical damage or personal injury.**

2. **Converter Control Center - Battery Charger** - When plugged into 110-volt shoreline, 110-volt current enters the motorcoach from the 30-amp cord directly into the converter control center. The converter converts the 110-volt power into 12-volt DC current, along with sup-

plying 110-volt power to wall outlets and all appliances requiring AC current. The converter also contains a battery charger that will charge the auxiliary battery at a rate of three amps per hour. The three amp charger is not intended to charge the auxiliary battery rapidly. The chassis alternator is intended to be the primary source of charge. When plugged into shoreline power, no DC power is removed from the auxiliary battery.

All cord electrical circuits are switched and fused inside the converter control center. Dropping the front panel of the converter will expose the circuit breakers that control the 110-volt power in the motorcoach and the automotive-type snap-in fuses that control 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 have to be manually reset. The automotive fuses must be replaced using the same amperage-rated fuse replacements. We recommend that you carry a supply of spare replacement fuses, in the various sizes required, along with you. Inside the converter face panel you will find that we have identified each circuit for you.

In the event that a circuit breaker trips or a fuse blows, reset the breaker or replace the fuse. If this happens again, we suggest that you locate the circuit and unplug the offending appliance before resetting the breaker or replacing another fuse. The cause may be in the appliance itself. Again, never replace a blown fuse or circuit breaker with a larger rated fuse or breaker.

#### **F. Ground Fault Circuit Breaker**

For your protection and safety, we have installed a Ground Fault Circuit Breaker (GFCB) to protect the outlets in your Born Free that are located in areas that are possibly wet. Bathroom and outside outlets are protected with this device and will sense and trip the "GFCB." We advise you to test the "GFCB" once a month to be sure the breaker is functioning properly. To test the device, simply push the "TEST" button. An electrical test will thoroughly test all groundfault features. The breaker handle will audibly move to center trip position indicating ground fault protection. Reset the breaker by moving the handle to "OFF" and then "ON." If the test fails to trip the breaker, you should have the breaker replaced.

#### **G. 110-volt Auxiliary Generator**

The auxiliary generator in your motorcoach allows you to use 110-volt appliances when utility power is not available. The generator operates on unleaded gasoline from the fuel tank of your



motorcoach or from LP-gas from the LP storage tank. We advise you to maintain at least one-fourth of a tank of gasoline and at least 15% full for the propane version to adequately supply fuel for the generator.

The propane generator runs on liquid LP-gas drawn from the bottom of the LP supply tank. This is unlike your LP appliances, which operate on LP-gas vapor.

**WARNING - The exhaust from the 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:**

1. Do not simultaneously operate your generator and a ventilator that could draw air containing exhaust gases into the vehicle.
2. Do not open windows or non-powered vents in the vicinity of the generator location.
3. Position the vehicle, when parking, so that the wind will carry exhaust fumes away from you. Note the position of other vehicles parked near you.
4. Do not position the motorcoach so that the generator exhaust is deflected off vegetation, snow, buildings, vehicles, or any other object that can deflect the exhaust under or into the vehicle.

#### **a. Generator Operation**

##### **Before starting the generator:**

1. Open access panel on generator and visually inspect exhaust system; look for loose or damaged components and fasteners.
2. Check the engine oil level. (Do not overfill.)
3. Make sure that you have an adequate supply of fuel.
4. Switch off all electrical appliances.

##### **Starting and stopping:**

The generator has two start-stop switches: one mounted on the generator, and one located inside the coach, mounted to a cabinet face. The inside switch panel also has an indicator light that tells you when the generator is running and an hour-meter to tell you how many hours the generator has run.

1. Push the "start" switch to start generator. Release the switch when the generator starts. A light will come on at the switch when the generator is running.
2. Allow the generator to warm up before switching on any appliances.
3. Switch on electrical appliances.
4. To stop generator, switch off all electrical appliances and allow generator to cool for three to five minutes. Then push "off" switch.

#### **b. Break-in Procedure**

After initial start-up; plug in enough appliances to equal half the generator's capacity. (Check the model and capacity in your owner's manual.) Run the generator with this load for two hours. Operate the generator for another two hours with a three-quarter's load.

Change the crank case oil after 50 hours and every 150 hours after that.

#### **c. Maintenance**

1. Because the generator is air-cooled, it is essential that the cooling fins be kept clean and nothing is allowed to obstruct air flow to and from the generator.
2. Keep the governor linkage clean and well lubricated. (Refer to the owner's manual for proper procedure.)
3. It's a good practice to "exercise" the generator in times when there is infrequent use of the motorcoach. Running the generator at one-half capacity approximately every four weeks for about two hours will rid the generator of damaging moisture condensation. Failure to follow this procedure could result in generator engine damage.
4. The generator should be cleaned every six months or sooner if severe road contamination or dusty conditions are encountered.
  1. Do not steam clean or power spray while the generator is running.
  2. Provide cover or protection so that spray is not directed into the generator air cleaner, control box, fuel solenoid, or electrical connectors. Do not use solvents.

# GENERATOR TROUBLESHOOTING GUIDE

The following is a simplified troubleshooting guide. If these recommendations fail to resolve the problem, contact your service organization generator set repair service.

Problem	Probable Cause	Solution
<b>FAILS TO CRANK</b>	<ol style="list-style-type: none"> <li>1. Low battery.</li> <li>2. Bad battery connection.</li> <li>3. Blown fuse.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check battery electrolyte level.</li> <li>2. Clean and tighten all battery and cable connections.</li> <li>3. Replace fuse on control box. See specifications for proper fuse rating.</li> </ol>
<b>CRANKS SLOWLY</b>	<ol style="list-style-type: none"> <li>1. Low battery.</li> <li>2. Bad battery connection.</li> <li>3. Oil is too heavy.</li> <li>4. Load connected.</li> </ol>	<ol style="list-style-type: none"> <li>1. See "Fails to Crank", #1.</li> <li>2. See "Fails to Crank", #2.</li> <li>3. Replace with lighter oil.</li> <li>4. Remove load.</li> </ol>
<b>CRANKS BUT WON'T START</b>	<ol style="list-style-type: none"> <li>1. Fuel below genset pick-up level in tank.</li> <li>2. Fuel supply shutoff valve closed.</li> <li>3. Carbon deposits on spark plugs.</li> </ol>	<ol style="list-style-type: none"> <li>1. Add fuel.</li> <li>2. Fully open fuel supply valve.</li> <li>3. Remove spark plugs and clean.</li> </ol>
<b>EXHAUSTING BLACK SMOKE</b>	<ol style="list-style-type: none"> <li>1. Rich fuel mixture.</li> <li>2. Dirty air filter.</li> <li>3. Excess oil.</li> </ol>	<ol style="list-style-type: none"> <li>1. Turn main fuel adjustment in 1/8 turn (location of adjustment is shown in Figure 3.)</li> <li>2. Replace air filter.</li> <li>3. Reduce engine oil level.</li> </ol>
<b>UNIT RUNS THEN STOPS</b>	<ol style="list-style-type: none"> <li>1. Out of fuel.</li> <li>2. Low oil level.</li> <li>3. Excess oil.</li> </ol>	<ol style="list-style-type: none"> <li>1. Refill fuel tank.</li> <li>2. Add oil if necessary.</li> <li>3. Reduce engine oil level.</li> </ol>
<b>UNIT RUNS BUT SURGES</b>	<ol style="list-style-type: none"> <li>1. Worn breaker points.</li> <li>2. Loose or worn spark plug leads.</li> <li>3. Ignition coil, wiring, or control components defective.</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust or replace breaker points.</li> <li>2. Check security of spark plug leads at spark plugs and ignition coil. Replace leads if worn.</li> <li>3. Contact a service representative</li> </ol>

## WARNING!!

**A HOT GENERATOR SET CAN CAUSE SEVERE BURNS.  
ALWAYS ALLOW THE GENERATOR SET TO COOL BEFORE  
PERFORMING ANY MAINTENANCE OR SERVICE.**



## Maintenance Schedule

Establish and adhere to a definite schedule for maintenance and service. If the generator set is subjected to extreme operating conditions, you should reduce the intervals accordingly.

Consult your dealer if the generator set will be subjected to any extreme operating conditions and determine a suitable maintenance schedule. Keep an accurate log of all service and maintenance performed for warranty support.

Perform all the maintenance at the time period indicated or after the number of operating hours indicated, whichever comes first. Use the schedule to determine the maintenance required, and then

refer to the sections that follow for the correct procedures.

If you have the under-floor mount generator set and it must be lowered for any maintenance procedure (that is, you cannot service it in its normal position), see the procedures "Lowering the Under-Floor Mount Generator Set" in this section before beginning the maintenance procedure.

### WARNING

**Accidental starting of the generator set during maintenance procedures can cause severe personal injury or death. Disconnect both generator set starting battery cables before performing maintenance; disconnect negative (-) cable first.**

PERIODIC MAINTENANCE SCHEDULE

Service these items	After each cycle of indicated hours				
	8	50	150	200	300
General inspection	x <sup>1</sup>				
Check oil level	x				
Check battery electrolyte level		x			
Clean out spark arrester		x			
Clean and lubricate governor linkage		x			
Change crankcase oil and oil filter			x <sup>2,7</sup>		
Change air filter			x <sup>2</sup>		
Clean fuel filter			x <sup>3</sup>		
Replace spark plugs			x <sup>4,9</sup>		
Check breaker points			x <sup>5</sup>		
Replace breaker points				x <sup>4,9</sup>	
Clean cooling fins				x <sup>6</sup>	
Clean carburetor and combustion chamber with Onan "4C" Cleaner			x		
Clean generator set			x		
Inspect and clean engine					x <sup>6</sup>
Adjust carburetor	as required <sup>6</sup>				
Check generator brushes	as required <sup>6</sup>				
Exercise generator set	as required <sup>8</sup>				

- 1 - With set running, visually and audibly check exhaust system for leaks.
- 2 - Every 150 operating hours or once a year, whichever is first. Perform more often in extremely dusty conditions (i.e., check monthly, and change if dirty).
- 3 - Equipped on BGEL and NHEL models. Customer option for BGE and NHE models.
- 4 - Or replace annually, or prior to storage, whichever is first.
- 5 - Replace if necessary.
- 6 - Have your Onan service center perform.
- 7 - First oil change during first year or 50 hours of operation, whichever is first.
- 8 - During periods of non-use, exercise for 2 hours every 4 weeks.
- 9 - Refer to Out-of-Service Protection if unit is to be stored.

# BORN FREE

## 26' REAR SIDE BED



IS FLUORESCENT 12VDC LIGHTING FIXTURES



IS INCANDESCENT 12VDC LIGHTING FIXTURE

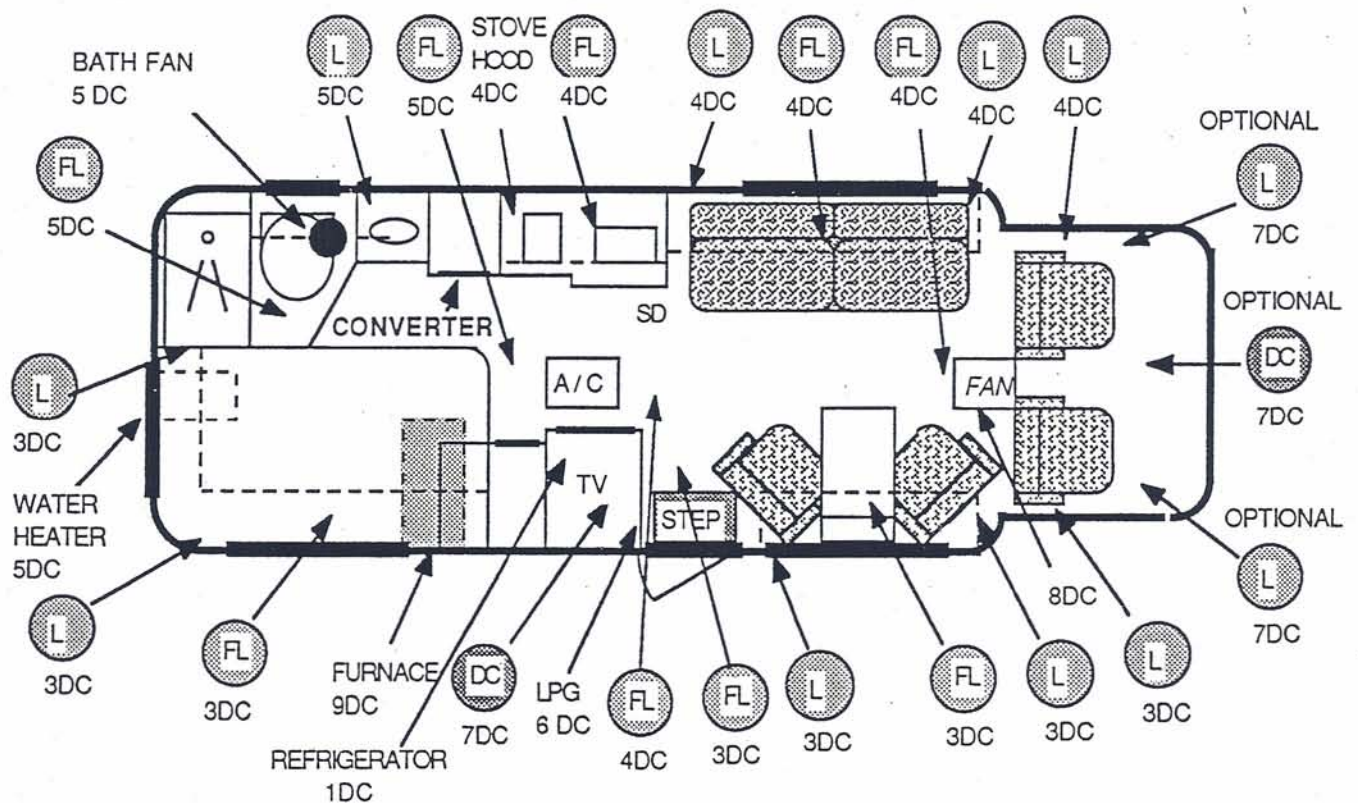


IS 12VDC OUTLET

SD IS SMOKE DETECTOR

LPG IS LP LEAK ALARM

THE NUMBER AND 2 LETTERS BELOW EACH SYMBOL REPRESENT THE CIRCUIT IN THE CONVERTER THAT THE ITEM IS ON.





# BORN FREE

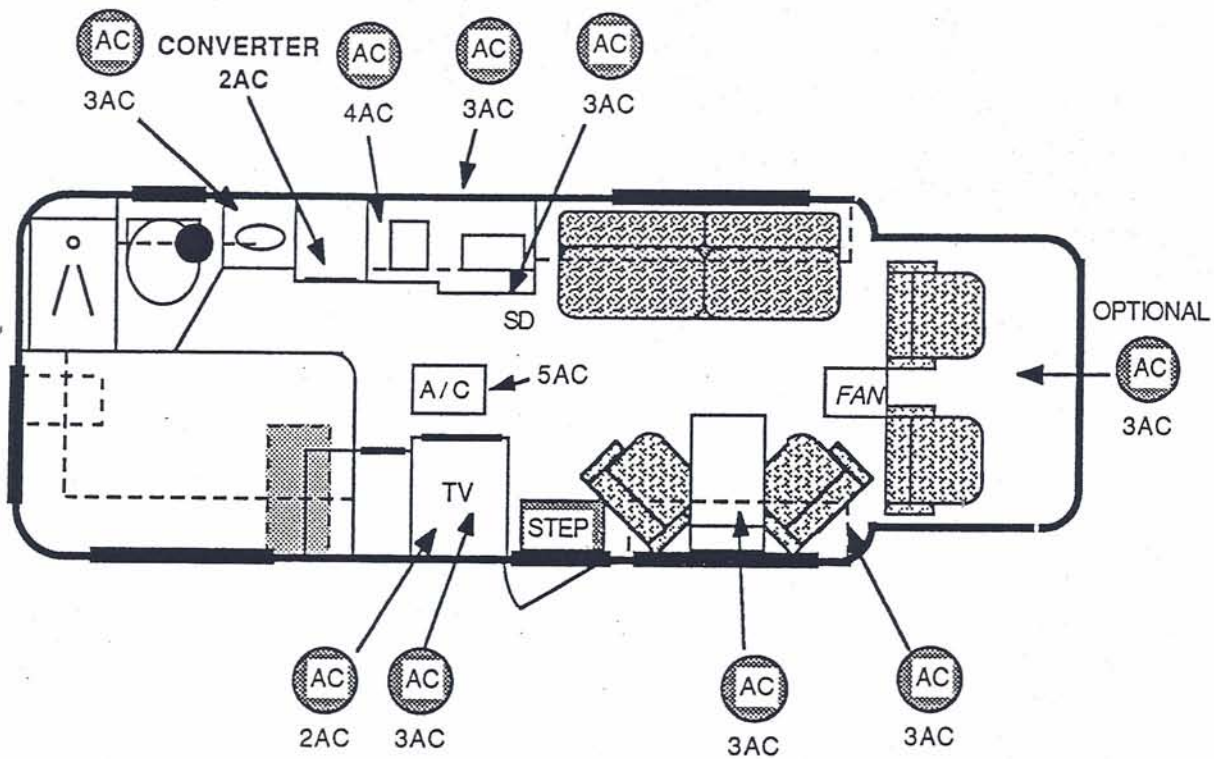
## 26' REAR SIDE BED



IS 120V / 60HZ OUTLET

SD IS SMOKE DETECTOR

THE NUMBER AND 2 LETTERS BELOW  
EACH SYMBOL REPRESENT THE  
CIRCUIT IN THE CONVERTER THAT  
THE ITEM IS ON.



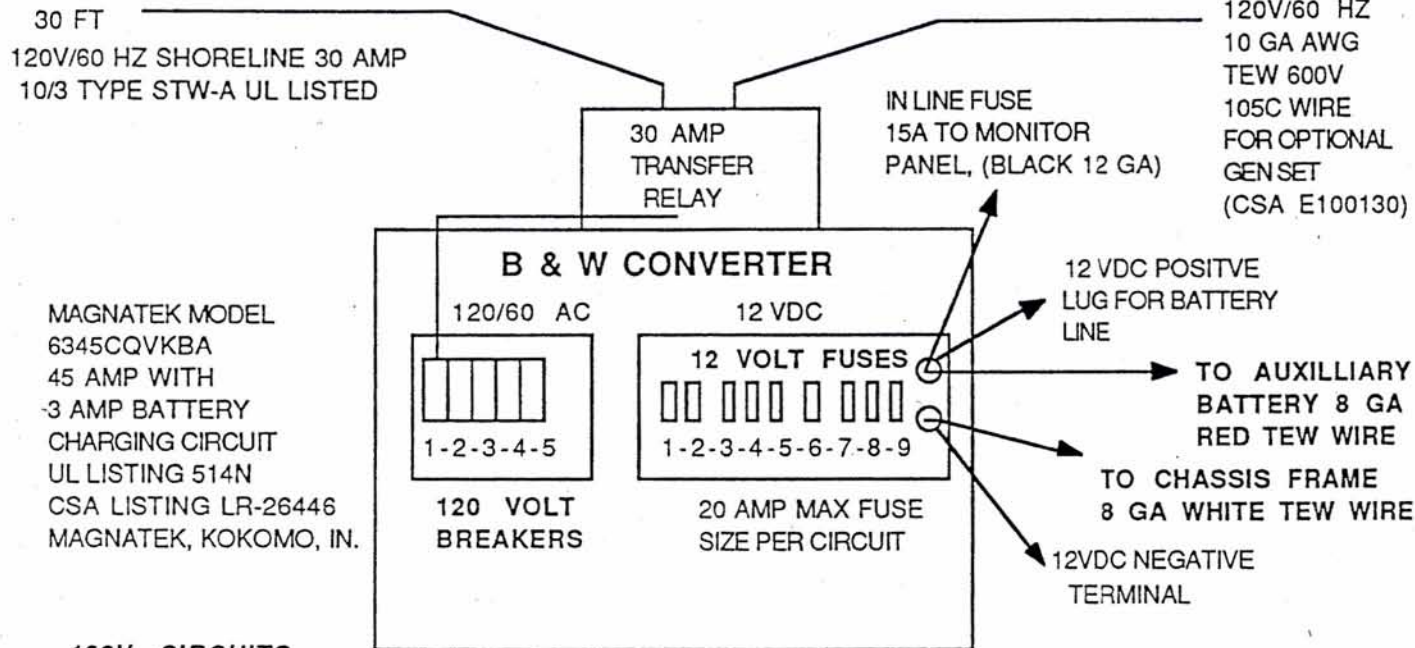


# ELECTRICAL CIRCUITS

## 26' REAR SIDE BED

DODGEN INDUSTRIES INC

HIWAY 169N HUMBOLDT, IA 50548



### 120V CIRCUITS

1. 30 AMP MAIN BREAKER
2. 20 AMP BREAKER: REFRIGERATOR OUTLET AND 12VDC CONVERTER
3. 20 AMP GFI BREAKER: BATH OUTLET, OUTSIDE OUTLET, TV OUTLET, KITCHEN OUTLETS (2), BUNK BED OUTLET  
OPTIONAL C/O OUTLET & TABLE OUTLET
4. 20 AMP BREAKER: MICROWAVE OUTLET
5. 20 AMP BREAKER: ROOF AIR CONDITIONER

ALL WIRE IS 12-2  
TYPE NM-B WITH  
GROUND 600 VOLT  
UL-E18679

### 12 VDC CIRCUITS

- |   |                           |
|---|---------------------------|
| 1. 15 AMP: REFRIGERATOR   | WHITE/BLACK 12 GAUGE WIRE |
| 2. 10 AMP: WATER PUMP CIRCUIT   | RED 12 GAUGE WIRE         |
| 3. 15 AMP: PASSENGER SIDE LIGHTS<br>(3 FLUORESCENTS AND 5 READING LIGHTS) | BLACK 12 GAUGE WIRE       |
| 4. 15 AMP: DRIVER'S SIDE LIGHTS<br>(4 FLUORESCENTS AND                    | BLUE 12 GAUGE WIRE        |
| 5. 3 READING LIGHT STOVE HOOD)  |                           |
| 15 AMP: WATER HEATER/VANITY LIGHT/BATH FAN/                               | ORANGE 12 GAUGE WIRE      |
| 6. BATHROOM FLUORESCENT LIGHT   |                           |



# BORN FREE 26' REAR SIDE BED

## TOTAL 12V ITEMS AVAILABLE ON CONVERTER CIRCUITS

2 PC OAK BED READING LIGHT

2.88

1PC THINLITE FLUORESCENT LIGHT 30 WATT

2.5

1PC THINLITE FLUORESCENT LIGHT 30 WATT

2.5

1PC THINLITE FLUORESCENT LIGHT 30 WATT

2.5

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2.5

1PC THINLITE FLUORESCENT LIGHT 30 WATT

2.5

1PC THINLITE FLUORESCENT LIGHT 30 WATT

2.5

1PC SHURFLO WATER PUMP

4.0

1PC B&W CONVERTER BATTERY CHARGE FUNCTION

3.0

1PC JENSEN 3 BULB DECORATIVE LIGHT

4.32

1PC BATHROOM BATH FAN

1.8

2PC OAK READING LIGHT (BEDROOM)

2.88

4PC OAK READING LIGHT (LOUNGE AREA)

5.76

1PC SUBURBAN FURNACE NT-30K

1.0

1PC ATWOOD WATER HEATER G6A-7E

1.0

1PC DOMETIC REFRIGERATOR LIGHT

1.25

1PC TEN TEK LPG ALARM

0.2

1PC 12 VOLT JACK FOR TV/VCP

3.33

(TV/VCP OPTIONAL)

1PC ANTENNA BOOSTER

0.1

(ANTENNA OTIONAL)

1PC FLOOR ENTRY LIGHT

0.19

(OPTIONAL 2.88  
ENTERTAINMENT LIGHTS)

1PC JENSEN ENTRY LIGHT

1.04

1PC BORN FREE LIGHTED ENTRY HANDLE

0.58

1PC EXTERIOR LIGHT ON DRIVER'S SIDE

1.04

(OPTIONAL)

1PC FANTASTIK VENT MODEL 1000R3 3 SPEED

3.00

62.75 AMPS TOTAL

### CALCULATION FORMULA:

FIRST 20 AMPS @ 100% = 20.0 AMPS

2nd 20 AMPS @ 50% = 10.0 AMPS

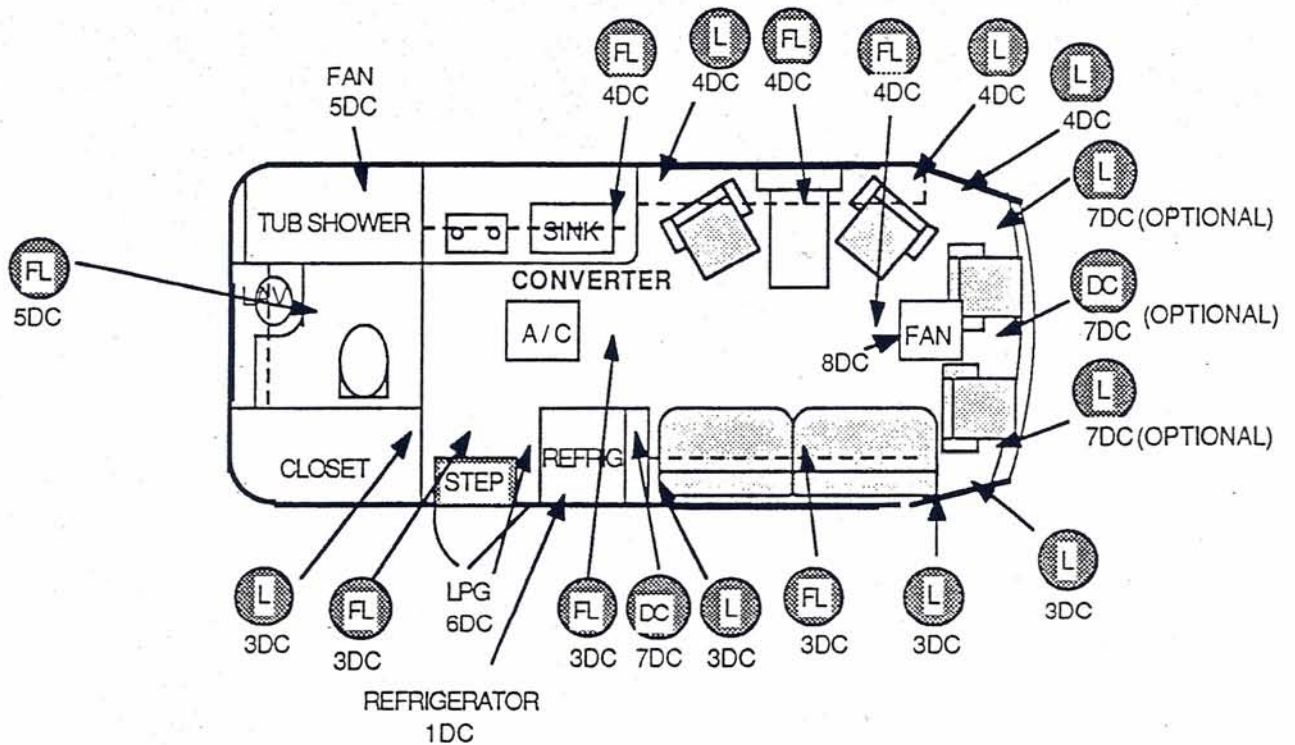
OVER 40 AMPS @ 25% = 5.69 AMPS

TOTAL = 35.69 AMPS

CONVERTER IS A 45 AMP  
MAGNATEK MODEL 6345CQVVKBA

# BORN FREE

## 24' REAR BATH



IS FLUORESCENT 12VDC LIGHTING



IS INCANDESCENT 12VDC LIGHTING



IS 12VDC OUTLETS

LPG IS LPG LEAK DETECTOR

THE NUMBER AND THE TWO LETTERS BELOW EACH SYMBOL REPRESENT THE CIRCUIT IN THE CONVERTER THAT THE ITEM IS ON.