



America's Easiest Towing
Travel Trailer

OWNER'S MANUAL



THE TRAVEL TRAILER THAT TOWS LIKE A POP-UP

SINCE 1983

P.O. Box 130, Lake City, TN 37769

865-426-7426

www.trailmanor.com



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CHAPTER I

INTRODUCTION TO R.V. OWNERSHIP

WELCOME

Welcome to the world of recreation vehicle travel. Your purchase of a TrailManor allows you to enter this unique world of camping in the world's easiest towing travel trailer. Now you can visit those places you've always dreamed about and enjoy the comforts of home along the way.

This owner's manual was prepared to assist you in understanding the proper use and operation of various systems, to provide recommendations for servicing and maintaining component parts, and to explain your warranty protection.

We have made every effort to make this manual as accurate as possible to reflect information available at the time of publication. Components are constantly being improved and we endeavor to upgrade our installations accordingly. You should carefully read and understand this owner's manual and the various other instructions supplied by the manufacturers of separately warranted products. Each contains important operating, safety, and maintenance instructions. Keep this owner's manual in your recreational vehicle for handy reference.

Every effort has been made to provide you with a safe, dependable product. Your vehicle complies with applicable requirements of Federal Motor Vehicle Safety Standards, State Regulations, and complies with requirements of ANSI Standard A119.2, the nationally recognized *Standard for Recreational Vehicles - Installation of Plumbing, Heating, and Electrical Systems*. The Recreational Vehicle Industry Association (RVIA) periodically inspects our production line and assists us in maintaining strict compliance with installation and safety standards for those systems. Your follow-up with periodic safety inspections and a program of preventative maintenance is important for the continuation of safe and trouble-free operation.

SAFETY

SAFETY IN USING LP GAS

You should check for leaks at the connections on the LP Gas system soon after purchase and initial filling of the LP tanks. Continued periodic checks of the system are recommended. The manufacturer and dealer have already checked for leaks, but the vibration encountered during travel can loosen connections or cause cracks. Your vehicle was manufactured to provide you with full access to all gas line connections. Leaks can be found easily with a soapy water solution applied to the outside of the gas piping connections: the soap will bubble at the leak.

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 Trailer Weight and Towing Guidelines
 Limited Warranty

Do NOT use flame or lighted matches to test for leaks. Usually tightening the connections will close leaks. If not, ask your authorized dealer service department to make the necessary repairs.

LP gas is heavier than air. Leaking gas tends to flow to low places. It will sometimes pocket in a low area. LP gas can usually be detected by an identifiable odor similar to onions or garlic. Never light a match or allow any open flame in the presence of leaking gas.

It is very important to have the main LP gas valve shut off during refueling of tow vehicles.

Never allow gas containers to be filled above the liquid capacity indicated on the container. If a container is overfilled, liquid gas may flow through the regulator causing it to freeze and/or introduce a dangerous excessive gas pressure into the lines. In addition, an overfilled container placed in hot sunlight may expel excess gas through the relief valve and be susceptible to ignition by any nearby open flame.

CAUTION: TURN GAS BOTTLES OFF WHEN LOWERING TRAILER. The refrigerator should be switched to 12-volt operation while towing. Operation of gas appliances in the lowered trailer can cause fire or other serious damage.

ELECTRICAL SYSTEM SAFETY

Circuit breakers and fuses are installed to protect electrical circuits from overloading. Do not make unauthorized changes to circuitry or add fixed appliances yourself. Before you make any changes, consult your dealer.

An approved power supply cord has been supplied with the trailer. Always use this for hook-up to the 120-volt source. Note that the cord has a three-pin plug, which provides proper grounding through the third (round) pin. Grounding is your personal protection from electrical shock. Do not use any adapter, cheater, or extension cord that will break the continuity of the grounding circuit connected to that third pin. NEVER remove the grounding pin for the convenience of being able to connect to non-grounded (only 2-prong) receptacle. Use a grounding adapter with two prongs plus a "pig-tail" conductor, which should be externally grounded.

NEVER operate your RV with a "hot skin". If you can feel even a small shock from the RV while standing on the ground, you should immediately disconnect the RV from the power source and locate the trouble. The fault is usually from a break in the grounding circuit, which should be continuous from the skin or frame to the distribution panel board to the third pin on the power supply cord and then back to the park receptacle and earth ground.

EMERGENCY STOPPING SAFETY

Always carry road flares and/or reflective triangular highway warning devices to be displayed when necessary. Pull off the roadway as far as possible when changing a flat tire or for other emergency situations. Turn on your vehicular hazard warning flashers when parked alongside a roadway, even if parked for only few minutes.

ADDITIONAL SAFETY CONSIDERATIONS

The operator is ultimately responsible for the safe operation of the vehicle. Improper operating procedures can jeopardize the safety of the occupants and others. The following suggests some procedures to help the operator enjoy safe, trouble-free use.

- Sanitize the fresh water supply system periodically (see sanitizing instructions). Keep fresh water in the potable water supply tank. Make sure that only sanitary water suitable for drinking is used to fill tank. Do not contaminate tank with water of questionable quality.
- To reduce the chance of contamination, keep water connection fittings from coming in contact with the ground or drain hose.
- Latch bolts fastening beds to wall sections before getting on the bed.
- Never attempt to fix gas or electrical appliances yourself. Enlist services of a qualified technician.
- Observe the warning labels attached to your trailer concerning LP gas, water, electricity, and loading.
- Make sure the fire extinguisher provided with your trailer is in place and charged properly.
- Never store gasoline or diesel fuel in an area where fuel or fuel vapor may accumulate or may travel to an open spark.
- Disconnect television power cord and antenna lead-in during local thunderstorms and lightning activity.
- Don't overload your vehicle. Be careful not to cause an improper load distribution, which can adversely affect roadability and/or towing safety. Heaviest loads should be placed from the axle forward, if possible.

- Ensure that tires are in good condition and are properly inflated. Watch inflation especially closely: underinflated tires will overheat. Overheated tires are a potential hazard as they may throw rubber and cause a blowout.
- Check and tighten wheel lugs regularly (every 50 miles when new until 200 miles are reached and then check lugs every 500 miles).
- Check brakes in a safe area - not while traveling a busy highway.
- Always solidly block trailer wheels before unhitching.
- Before leaving a camp area with a trailer in tow, ensure that the locking lever is seated, break-away wire is attached to tow vehicle, the jacks are raised so that they cannot touch the ground, the dolly wheel removed, 120-volt electric cord properly stored, and safety chains and power cord to your tow vehicle are connected.
- Ensure that all hold-down latches are securely fastened before travel.
- Always test running lights, brake lights, and trailer brakes before travel.
- Tow vehicle brake controller should be set such that the trailer brakes provide nearly all of the stopping effort for the trailer.
- Obey speed limit restrictions when towing a trailer. Some states post speed limits specific to towing trailers.

INSURANCE

As with your automobile, it is important that you protect yourself and others with insurance coverage for personal liability, theft, collision, property damage, etc. Your dealer will assist you in obtaining appropriate insurance for your protection or you may check with the company that provides your automobile insurance.

CHAPTER II

WARRANTY & SERVICE

BASIC SERVICE

We are very interested in maintaining good customer relations. Only by having your complete confidence and satisfaction with our product and its service can we assure our continued success as a manufacturer of recreational vehicles. We have found that continuing a pleasant and effective relationship through our dealers is equally as important as maintaining the technical excellence of our product. Your authorized dealer will cordially assist you in providing service, maintenance, selection of options, and instructions concerning the operation of your vehicle.

Should you have a problem, contact your local dealer's service department for an appointment.

FACTORY

A factory service department is operated at our Lake City, Tennessee, manufacturing facility. If your TrailManor requires repairs that your dealer feels could be best accomplished at the factory, you may bring it to our plant for repairs with the following stipulations:

- You must make an appointment prior to returning it to the factory.
- Freight costs are the responsibility of the owner.

OUT OF TOWN SERVICE

If you should need service while you are vacationing, contact your RV dealer for assistance or call the factory, Monday through Friday, at 865-426-7426 or 1-800-707-7061. We will recommend a local service department and instruct them on correct service procedures.

CHAPTER III

USAGE OF YOUR R.V.

HITCHES

We recommend that you install a class III hitch on your tow vehicle for use with all TrailManor models. We also recommend load-equalizing hitches for front-wheel drive vehicles. See your authorized TrailManor dealer or hitch specialist for specific installation instructions. Also, refer to your tow vehicle owner's manual for specific towing recommendations and load ratings.

LOADING

A properly loaded vehicle will perform better and handle more safely. Store heavy gear first, keeping it on or as close to the floor as possible. Heavy items should be stored directly over or slightly ahead of the axle(s). Distribute weight to obtain even side-to-side balance of the loaded vehicle. Lighter items may be stored in cabinets, wardrobes, and drawers. Luggage, televisions, or similar cargo transported inside your RV should be secured to prevent damage in case of a sudden stop. The Federal Certification Sticker is located on the off-door side of the trailer, near the front. The sticker gives the maximum weight carrying capacity of the trailer and each axle.

The Gross Vehicle Weight Rating (GVWR) is the maximum the trailer should weigh with water and LP gas tanks full and with food, clothing, and all other supplies aboard. Each axle has a maximum load bearing capacity referred to as the Gross Axle Weight Rating (GAWR). Load equalizing hitch systems may increase the load at the trailer axle. Refer to the hitch installation instructions to ensure proper weight distribution.

SAFETY CHAINS

Several states have specific safety chain requirements. Please contact your state's Department of Transportation to ensure compliance. As delivered by your dealer, your vehicle is equipped with chains to meet SAE standard requirements for maximum gross trailer weight. Always have the safety chains attached when towing. Install the safety chains so that they do not restrict sharp turns of the tow vehicle-trailer combination, but tightly enough so they do not drag the road.

"PINCH POINTS"

When setting up or closing your TrailManor, there are a few places to watch to avoid pinching your fingers. Stay clear of the door when closing the trailer. Also, keep hands away from the lift arms, lift arm pockets, and the bed supports when opening or closing the trailer. Before lowering the trailer, always check both sides of the trailer to ensure that no one else is near any pinch points.

CAUTION: DO NOT ATTEMPT TO RAISE ROOF SECTIONS FROM SIDE OF TRAILER, FINGERS MAY GET CAUGHT IN LIFT ARM POCKETS CAUSING SERIOUS INJURY.

WHEEL LUGS

Because of the possibility that wheel lugs could work loose, it is important that you check your wheel lugs every 50 miles when new until 200 miles are reached and then check lugs every 500 miles. The wheel lugs should also be checked after winter storage, before starting a trip, or following extensive braking. Also check wheel lugs after changing a tire. Over-tightening can distort the wheel.

WHEEL BEARINGS

Proper maintenance is an important step in achieving maximum bearing life and reducing the risk of failure.

Please refer to *Dexter Axle: Operation Maintenance Service Manual* for instructions.

TIRES

The tires on TrailManor trailers are high-pressure steel belted radials. Air pressure should be kept at 50 p.s.i. for 14" tires and at 65 p.s.i. For 15" tires. Always check the tires when they are cold, such as before traveling at the beginning of the day. Underinflated tires may cause slight swaying during towing. Also, underinflated tires will overheat, which may cause a blowout.

Tires tend to deteriorate with age. Tires should be inspected and replaced when the tread or sidewall is cracked. This may occur before the tread shows excessive wear. Tire warranty is covered by the manufacturer of the tires.

CHANGING A FLAT TIRE

Before you change a flat tire, pull well off the road, turn on your vehicular hazard warning flashers, and place a reflective triangular highway warning device a car's length behind your trailer for safety. Follow these steps to change the flat tire:

1. Open both tops and secure open with the corner latches.
2. Remove fender skirt by removing screws fastening skirt and raise the skirt several inches vertically.
3. Place a bottle jack just behind the wheel, under the frame member.
4. Jack the tire off the ground. Trailer stabilizer jacks should be lowered for additional safety. **CAUTION: Improper placement of jack may allow trailer to fall.**
5. Remove all lug nuts from the wheel.
6. Remove flat tire.
7. Replace with new tire.
8. Tighten each nut by hand until the wheel is against the hub. Tighten wheel lug nuts firmly in a crisscross sequence. Be sure to tighten nuts evenly and to proper torque specifications (90 to 95 foot pounds).

BRAKES

The brakes on your new TrailManor are electric and are integrated into the brake system of your truck or car in such a way that equal braking power may be distributed to both trailer and towing vehicle. Explained below are several components that make up the brake system.

The battery of your tow vehicle is used as the primary source of power. No additional source of power is required. From the battery, the power is taken to the controller, which will be installed in your tow vehicle. With your tow vehicle brakes off, the controller opens the electrical circuit so no current reaches the trailer's brakes. When the controller is actuated (manually or automatically by your tow vehicle's braking system), the controller varies the amount of current through the circuit, which in turn varies the braking of your trailer. Refer to your brake controller manufacturer's instruction.

ENSURE YOUR TRAILER BRAKES ARE WORKING CORRECTLY. Pulling a TrailManor trailer should not significantly increase your car's stopping distance if the trailer's braking system is working properly.

CAUTION: TEST THE TRAILER BRAKES BEFORE EACH TRIP. Brakes should be tested before entering a main highway.

LEVELING YOUR TRAILER

The simplest way to level your TrailManor is using the two-point method. After opening your trailer, place a bubble level on the refrigerator. Using the tongue jack, level the trailer front-to-back. Use the rear scissor jack on the low side of the trailer to level the trailer side-to-side. To lower the scissor jacks, crank clockwise with the jack handle provided in the trunk. Once the trailer is level, you can mount a bubble level permanently on the tongue of your TrailManor to aid in future leveling. Then your trailer can be easily leveled before opening.

SET UP

After parking your TrailManor, level the trailer using the previously described procedure. Then lower the scissor jacks to stabilize your unit. Because of certain terrain conditions, you may need to place flat blocks of wood or flat rocks under the base plates of the corner jacks.

TO OPEN YOUR TRAILMANOR:

1. Release the four white draw latches located on each corner.(See Figure 1.)
2. Release the four black hold down latches located in the middle of your trailer, two on each side at the lower edge near the wheels. (See Figure 1.)
3. Standing near the tongue, grasp the lower edge of the front roof section. Lift the front roof up and out in a circular motion beginning with a straight-up motion and finishing with a pull. **Do not lift the roof by the front window stoneguard.** Slide the front bed out by grasping the bed strap, located on the center edge of the bed, and pull toward you.
4. Engage the two top corner latches (square aluminum tubes, Figure 1). **NOTE:** For front slide models, after lifting the roof section and securing in place with the corner latches; grasp handle above gas bottles and pull living room section out toward you.
5. Lift rear roof at center of rear wall. Slide rear bed out and latch rear top corner latches.
6. Unhook and open lower door. Swing out the left door jamb and press pin at top of door facing into spring clip located on upper left wall. Repeat on door hinged facing, pressing pin into spring clip located on right wall. Secure top of door to lower door with white turn button (door sections usually fit best when in fully opened position). Raise vinyl flaps and velcro in place. Slide entrance step out and lower second step, then enter unit.
7. Raise wardrobe to vertical position and slide it left onto the counter top. Swing front bathroom wall up and slide it back toward wall (about 3-4 inches). Latch walls together and latch the door together. Grasp the rear and side bathroom walls in the middle of the top edges and lift together toward rear of

trailer. Swing side bath wall open and latch into place. (See Figure 2.) Raising the rear bath wall closes a switch that energizes the rear roof lights and LP detector. **IMPORTANT: To lock tops open and prevent beds from tipping out, bolt rear bed to bathroom wall. Do NOT climb on bed before bed is securely latched in place.**

8. **IMPORTANT: Bolt front bed to side walls. Do NOT climb on bed until latched.** Lower flap seals and secure.
9. On slide-out models, secure the two bolts on the slide-out sofa section at the floor.

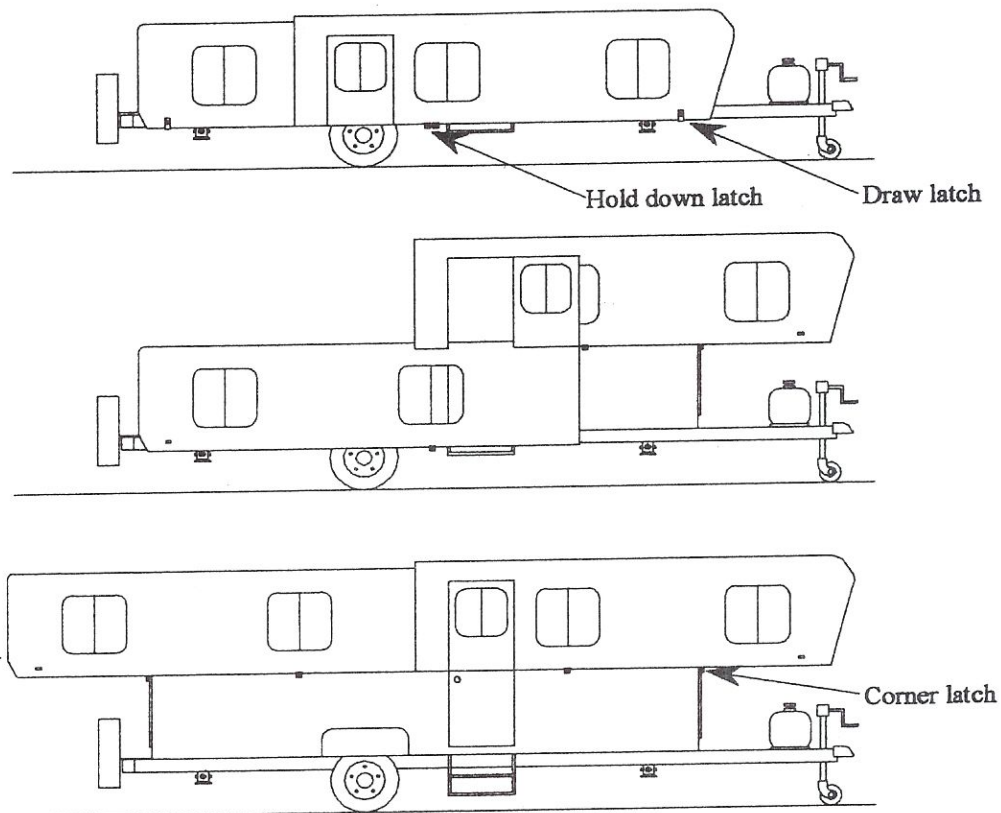
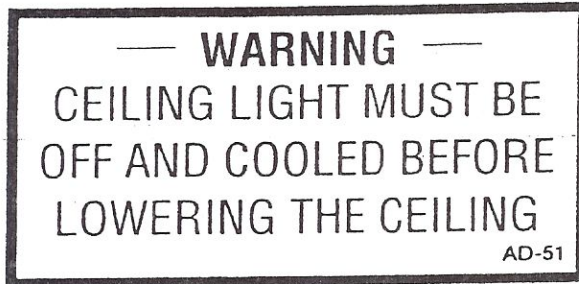


Figure 1. Trailer Operation

CLOSING YOUR TRAILMANOR

All lights must be switched off and cooled before closing your TrailManor. Stow 120-volt power cord before closing; power cord hatch can catch on roof sidewall if not properly secured.



1. Switch refrigerator to 12 volt and latch refrigerator door closed. Switch on refrigerator vent fan.
2. Turn off water heater, furnace, and gas stove.
3. Close valves on gas bottles mounted on tongue of trailer.
4. Empty grey water and toilet holding tank. (See instructions in Toilet section of manual)
5. Remove hanging wall cabinet from wall and place on floor. Protect cabinets by padding large items on floor with bed pillows or blankets during travel.
6. Remove all items from counter tops and leave no item in the sink higher than the kitchen splash board.
7. Close windows, close roof vents, and lower TV antenna.
8. Raise flap seals and secure. Check that counter tops are clear and sofa backs are lowered.
9. Unbolt front bed (or slideout) from side walls. Slide bed into trailer. (Beds may be pushed in from outside if you prefer. Push slideout into the trailer from outside.)
10. Unplug roof air conditioner(models with rear roof A/C only)

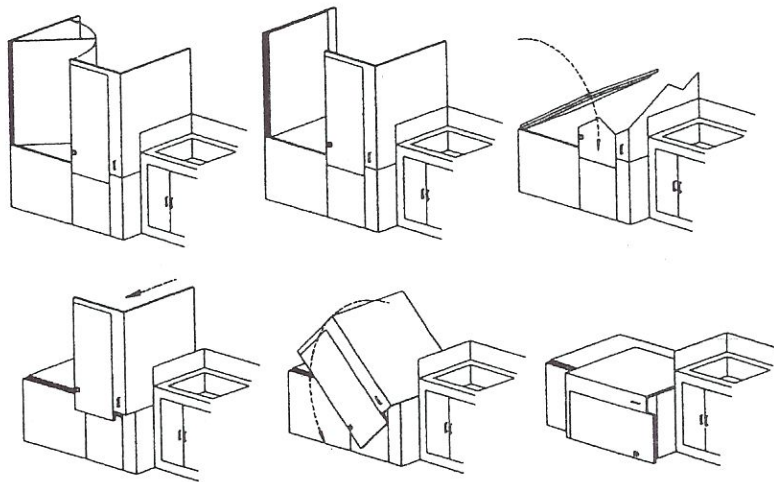
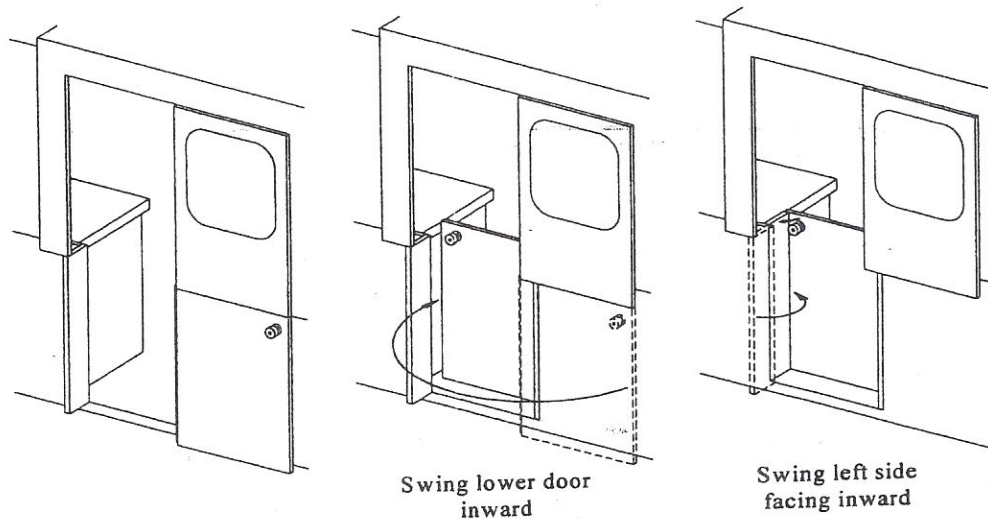


Figure 2. Bathroom Fold Down

11. Unbolt rear bed from bathroom wall. Unlatch bathroom wall and fold side wall against rear wall. (Illustrated in Figure 2) Grasp the top middle edges of both walls and slowly lower them **together** forward over the bathtub. Be sure to leave the lower door in closed position before lowering the front wall. Unlatch front bathroom latches, slide wall toward you, then slowly lower the wall section over rear half. Slightly lift and slide wardrobe to the right and slowly lower into aisle. Slide back bed into trailer over wardrobe.

12. Unfasten door latch to separate upper door from lower door. Release velcro flap covering left door facing. Dislodge pin from clip on right door wall and push door hinge into trailer. Swing lower door into trailer. Dislodge pin from left door facing and swing facing into trailer. Hook to secure lower door to facing. Flip lower step over top step and slide step assembly under the



trailer.

Figure 3. Entrance Door Operation

13. Unlatch the two rear top corner latches (square aluminum tubes, see Figure 1). Be sure to slide rear bed in completely. Ensure that all draw latches are oriented with the hook facing outward (to prevent latches from being captured between the lift arm and the wall during closing). Close rear roof by pushing at the center of the rear wall. If necessary, pull down on the roof until the rear wall contacts both of the rubber bumpers on the frame. (The roof may spring back up slightly. This should not affect latching.) During latching, you may need to push the walls in for proper latch alignment. **Note:** Your trailer should always be latched first on the door side and then the off-door side. Reach through open upper door and push down on roof until it latches. The U-bolt foot stirrups may be used to assist in latching the tops down. Close upper door and secure with turn button. Latch other side of rear roof by pushing down on off-door side until it latches, using foot stirrup as needed.

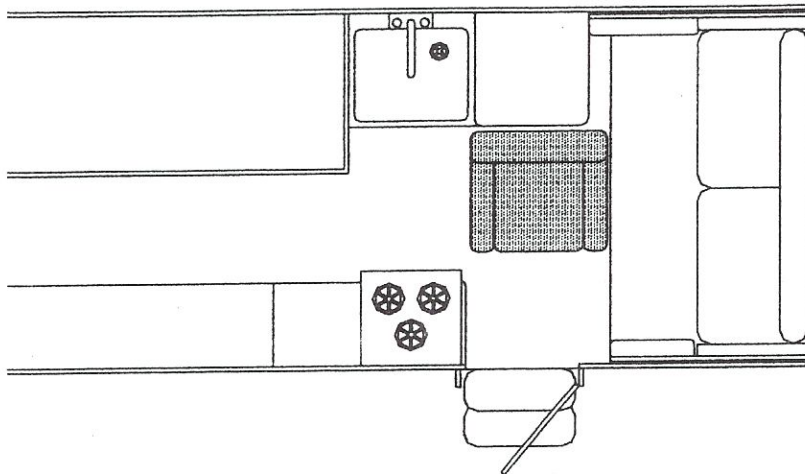
Important: Before proceeding with the next steps of the close down, stand inside the front section for a final inspection to ensure all items have been removed from the counter tops. Tops will not close down if items are above cabinet level.

14. Unlatch the two front corner latches. Make sure the front bed or front living room section is slid completely into the trailer, then close front top by pushing at the center of the front wall. (Do not push against the stone guard.) Pull down on roof until the front wall contacts both of the rubber bumpers on the frame. (Again, the roof may spring up slightly.) Standing behind the axle on

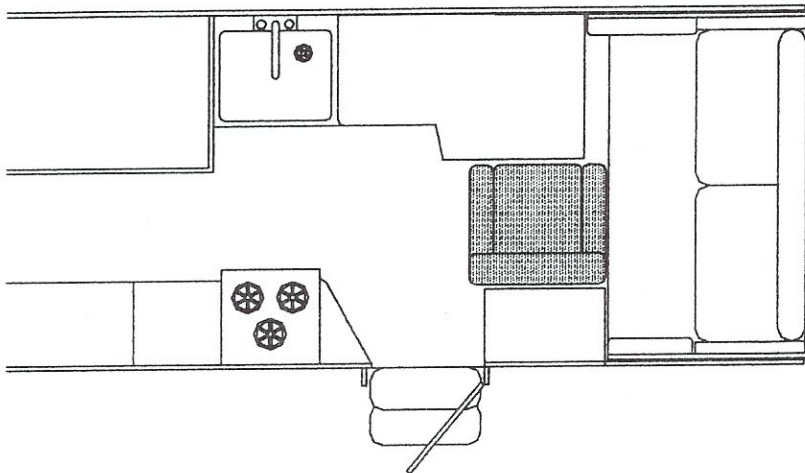
the door side, push down on roof until it latches, using the foot stirrup as needed. Repeat on other side of trailer to latch.

15. Secure the four draw latches located at each corner. The draw latches are equipped with loops through which padlocks may be placed to secure the trailer. (Only one lock is necessary.)
16. To stow corner jacks, crank handle counter-clockwise until jacks are raised completely.
17. Raise tongue jack by turning handle counter-clockwise and stow tongue jack wheel. Position tongue coupler onto car hitch ball and latch into place. Never use an equalizing hitch to raise the rear of your tow vehicle above its normal ride height. This will add stress to your trailer's axle and tires.
18. If using a load equalizing hitch system, install spring bars of equalizing hitch into place according to manufacturer's instructions.
19. Attach safety chains and the electrical connector to your tow vehicle.
20. Check to see that all outside marker lights, brake lights, and turn signals on the trailer are functioning properly. Test the trailer brakes as you pull away.

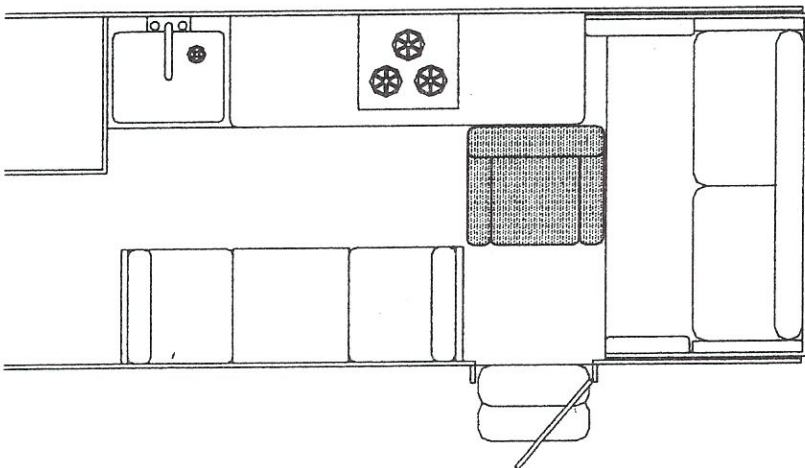
Chair Placement for Slideout Models



2720SL



3124KS



3326

To best secure the chair for travel and to avoid interference with the slideout and other components of the trailer, position the chair as shown.

CHAPTER IV

THE SYSTEMS

PLUMBING SANITIZING WATER SYSTEM

We recommend that you completely sanitize the water system after delivery, after long periods of nonuse, and after any suspected contamination. Various commercial solutions approved for RV use are available to assist you in sanitizing the system or you can use the following:

Prepare a chlorine solution using one gallon of water and 1/4 cup of household bleach (5% sodium hypochlorite solution). With water tank empty, pour one gallon of solution into tank for each 15 gallons of tank capacity. Complete filling of tank with fresh water. Open faucets to release air. Pressurize system with pump until water flows, then turn off pump and faucets. Allow to stand for three hours. Drain and flush with potable fresh water.

To remove excessive chlorine taste or odor that may remain, prepare a solution of one quart of vinegar to five gallons of water and allow solution to agitate in water tank by vehicle motion (several days if possible). Drain tank and again flush with potable fresh water.

FRESH WATER SYSTEM

Fresh water may be supplied to trailer by two different methods:

1. A 20 gallon fresh water tank is located under the sofa, dinette seat, or in a cabinet.
2. A "city water" or direct hook-up from external water supply may be attached to the pressure water inlet located on the off-door side of the trailer.

You may wish to add a water regulator to the line systems, as some campgrounds may have water pressure in excess of 100 psi. A regulator rated at 35 psi is suggested. (Removable type regulators are available.) If a water hose taste is encountered, flush the hose by running water through the hose for a few minutes, then fill the 20-gallon tank as needed.

WATER PUMP

When using the onboard water supply, the water pump must be activated. A switch located on the cabinet below the kitchen sink activates the pump. This will maintain water pressure while using the water from the fresh water tank. See water pump manufacturer owner's manual for more information.

TOILET

Your TrailManor has a recirculating Thetford Electra Magic toilet. It is a 100% self contained sanitation system which requires no pressure water connection or separate holding tank. An indicator gauge, located on the top back of the toilet, shows the charge level and when to empty the toilet. To prepare initial flush charge, using the bathtub hand shower, pour approximately three gallons of water into the bowl (until water reaches the charge level (C) on indicator lens). Add toilet chemicals according to manufacturer's instruction.

To empty, attach discharge hose to outside outlet located under rear corner of the trailer below toilet. Close grey water tank valve and open toilet valve below trailer. From inside the trailer, open termination valve on the bottom of the toilet. On your final day of vacation, you may want to rinse the toilet before returning home. To rinse, refill water in toilet and release termination valve again. If you use a dump station to empty your toilet, you can do this without opening your TrailManor at the station by doing the following: Close grey water tank valve below trailer. Open termination valve on the bottom of toilet. Close trailer and once at dump station, connect sewer hose and open toilet valve below trailer.

For additional information, see toilet manufacturer's manual.

DRAINAGE SYSTEM

The grey water (sink and shower water) tank drains through the 1 1/2" drain line to the small dump valve to the sewer outlet. To dump, connect sewer hose and pull the small valve. The toilet dumps through the larger 3" valve and out the sewer outlet.

A 10 gallon portable tank with wheels, such as a Blue Boy, may be used to transport grey water to a dump station if sewer hook-ups are not available at your camp site.

WINTERIZING

Following is a list of steps to winterize your trailer.

1. Open the tub and all sink faucets.
2. Drain the freshwater tank (low point valve under trailer near tank).
3. Open the high pressure cold water drain valve (low point valve under trailer near freshwater tank), to drain the hot water tank.

4. Open the low point drain valves located underneath the trailer, aft of the bathtub (hot and cold high-pressure lines).
5. If trailer is equipped with exterior shower, remove and store shower head and drain as much water as possible from hose.
6. Drain the toilet (pull inside valve at lower front of toilet and valve outside at left side of sewer hose connection).
7. Drain grey water tank (valve outside at right side of sewer hose connection).
8. Disconnect battery. Freezing temperatures may damage your battery if charge is low. If the trailer is stored open, the LP gas monitor will continue to draw current while battery is connected. (Periodically recharge the battery while in storage.)
9. Antifreeze may be added to the sink and tub drains to keep the drains in working condition, but freezing will not damage the traps.

LP GAS SYSTEM

The liquid propane (LP) gas tanks mounted on your vehicle contains LP fuel under pressure. As fuel is used, vapor (propane gas) passes from the top of the tank through a dual-stage regulator which reduces the pressure to about 6 1/2 ounces per square inch. Vapor at the low pressure is then transferred through the gas distribution lines for appliance use. You must keep the regulator clean and dry. Its cover should remain in place and its vent placed according to the regulator manufacturer's instructions (diaphragm vent facing downward).

WARNING: LP gas containers should never be placed or stored inside the vehicle. LP gas containers are equipped with safety devices which relieve excessive pressure by discharging gas to the atmosphere.

⚠ WARNING

IT IS NOT SAFE TO USE COOKING APPLIANCES FOR COMFORT HEATING.
Cooking appliances need fresh air for safe operation.

Before operation:

1. Open overhead vent or turn on exhaust fan.
2. Open window.

FAILURE TO COMPLY COULD RESULT IN DEATH OR SERIOUS INJURY.

LD-101

The warning label located in the cooking area is intended to remind you to provide an adequate supply of fresh air. Unlike homes, the amount of oxygen supply is limited due to the size of the recreational vehicle, and proper ventilation when using the cooking appliance(s) will avoid dangers of asphyxiation. It is especially important that cooking appliances not be used for comfort heating as the danger of asphyxiation is greater when the appliance is used for long periods of time. A warning label located near the LP gas containers reads:

DO NOT FILL CONTAINERS TO MORE THAN 80 PERCENT OF CAPACITY.

Overfilling the LP gas container can result in uncontrolled gas flow that can cause a fire or explosion. A properly filled container will contain approximately 80 percent of its volume as liquid LP-Gas.

Portable fuel-burning equipment, including wood and charcoal grills and stoves, should never be used inside the recreational vehicle. The use of this equipment inside the trailer may cause fires or asphyxiation.

DO NOT bring or store LP gas containers, gasoline, or other flammable liquids inside the vehicle because a fire or explosion may result.

The following label is located in the trailer near the range area:

⚠ DANGER

IF YOU SMELL PROPANE

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

**FAILURE TO COMPLY COULD
RESULT IN EXPLOSION RESULTING
IN DEATH OR SERIOUS INJURY. LD-101**

SERVICING AND FILLING LP CONTAINERS

WARNING: Your vehicle has exterior combustion air inlets. Appliance pilot lights should be turned off during gasoline or LP gas refueling.

Local regulations sometimes require cylinders be removed from the RV for refilling. A relief valve is incorporated on all tanks for safety. This valve is normally opened during fillings and will indicate when the tank is filled to the proper limit by appearance of liquid replacing vapor. At all other times, the overfill valve should be tightly closed by hand only.

The main valve on the LP gas container should be tightened by hand only, using caution not to over-tighten. The valve is designed to satisfactorily close with only

a reasonable amount of tightening. Continual over-tightening will eventually damage the valve and will require its replacement.

A safety check valve is built into the tank to prevent sudden release of large quantities of gas. The gas valve should be turned on slowly to avoid activating the safety valve. If gas flow to the trailer is less than normal, it may be necessary to turn off the gas bottle valve. Turn off all gas appliances in the trailer. Then wait for a minute and turn on gas bottle valve slowly.

When LP gas containers are filled to the proper level, sufficient space remains for safe expansion of the vaporized liquid. If your tank becomes overfilled and is not allowed to "bleed off" before installation with the RV system, it may release pressure from the relief valve. This can be detected by the strong odor around tanks. Keep open flames away from this area. It is best to remove the bottle, take it to a safe area, and "bleed off" the excess pressure by opening the valve and closing it when discharge has been sufficient.

Handle your LP tanks with care. Vertical tanks must be filled and used in an upright position. Horizontal tanks must be used only in a horizontal position. Always fill a horizontal LP gas tank in the vertical position, using the least amount of pressure possible. Sometimes while filling, the Overfill Prevention Device (OPD) valve will close. If this occurs, gently tap the cylinder on the ground to knock the float arm back down. Lowering the fill pressure will help prevent the OPD valve from closing prematurely.

If you travel alternately on wet roads and in freezing weather, be sure your LP gas regulator is protected from road spray. If water enters the vent in the regulator, it may freeze the pressure controlling diaphragm in the open position so that the container pressure is applied to the appliances - a hazardous condition. Follow the instructions given by the regulator manufacturer.

CAUTION: Never smoke while filling LP tanks. Keep the RV away from immediate filling area when possible or extinguish all gas pilot lights. When an LP tank gets low, sometimes there is a concentration of garlic-like odor which may be mistaken for a gas leak. After changeover to a full tank, the odor usually will soon disappear.

CHECKING FOR LEAKS

Upon delivery and periodically thereafter, check your gas system for possible leaks. The entire distribution system and its attached appliances have undergone factory testing for leaks. However, because trailers are subject to road vibrations, connections and fittings can develop leaks. If you do encounter a gas-leak odor, turn off all open flames immediately and begin a systematic search for leaks throughout the gas system. Use a bubble solution of soapy water to check for leaks on connections and fittings. Bubbles will appear at the

leaky points. **Never use a match to check for leaks.** When tightening connections, use two wrenches with opposing torque to prevent twisting of copper tubing. If the leak doesn't show up in the manifold or copper tubing distribution systems, then check the appliances. See appliance manufacturer's instruction.

LP GAS REGULATOR SETTING

Never attempt to reset the gas regulator yourself. Have an authorized service agency make any regulator adjustments. Even a little amount of pressure over the recommended setting can cause damage to appliances and regulators.

Your trailer is equipped with an "excess flow" valve that is intended to restrict the flow of escaping gas in the event of a break in the gas supply line. The "Dual-stage" regulator reduces the gas pressure to eleven inches of water column. It is important to turn your gas bottle valve slowly to eliminate a chance of a fast rush of gas from the tank. This would possibly "freeze" the excess flow valve and shut off your gas supply. Should this happen, turn off your gas valve at the tank. Wait about 15 minutes and try again.

USING THE AUTOMATIC CHANGEOVER REGULATOR

All TrailManor trailers are equipped with an automatic changeover regulator. This accessory allows both gas bottles to be turned on simultaneously. The arrow on the regulator handle indicates which bottle is in service. When the indicated bottle is emptied, the regulator automatically begins drawing fuel from the other bottle. At this point, the plastic window will display a red signal or flag to indicate the condition. You should then flip the lever over to indicate service on the other bottle. The first depleted bottle can then be turned off, uncoupled, and refilled without disturbing the RV gas supply. After refilling, it should be remounted and again turned to the "On" position. This allows both bottles to be utilized once more.

PROPANE GAS LEAK DETECTOR

Your TrailManor is equipped with a gas leak detector for safety. The gas leak detector is located near floor level beside the sink cabinet door. When the detector is powered, the green operating LED will light. If a gas leak occurs that results in significant vapor concentration, your detector will produce a pulsating alarm sound and the red LED will light. The alarm sound will continue until you press the mute button. **When the alarm sounds, immediately extinguish ignition sources and open the door and windows to air out your trailer. If the alarm sounds a second time after the gas is turned back on, shut off the gas supply and have a qualified gas dealer or RV service center make the necessary repairs to the source of the gas leak.**

If the battery in the gas detector is weak, the gas detector will beep about once per minute. Replace the battery as necessary. (Refer to your Propane Gas Leak Detector Manual for complete operating and safety instructions.)

ELECTRICAL SYSTEM & OPERATION

Your electrical system of 120 volts AC and 12 volts DC has been designed and installed in accordance with the safety requirements of ANSI Standard A119.2 and The National Electrical Code.

Your new TrailManor is equipped with a 30-amp heavy duty power cord to connect from the campground outlet to your camper. The power cord is prewired into the distribution panel with a 30-amp overcurrent protection breaker that supplies 120 volt AC to the 12 volt DC power converter.

To prevent accidental electrical shock, ensure that the ground pin on the attachment plug cap is in good contact with the RV park receptacle. When plugged into a receptacle with no provision for the third pin, use an adapter with a pigtail that can be connected from the plug's third pin to the RV park receptacle box. To avoid the risk of electrical shock or damage to appliances, you should be certain that the polarity of the RV Park power supply is not reversed. Polarity indicators may be purchased in many electrical and hardware stores.

CHANGES, MODIFICATIONS, AND ADDITIONS

Any electrical system modification made after delivery may pose a hazard. Be sure to consult your local authorized dealer. Only qualified electrical technicians should attempt to make changes or additions to your electrical system.

Extension cords should always be a heavy gauge of wire equal to the power cord. Air conditioned models require extra heavy duty (10 gauge) extension cords. Use of too small a cord will result in the cord overheating and possibly burning.

Wall receptacles are powered by 120-volt electrical current, and are rated at 15 amps, maximum.

CONVERTER AND G.F.C.I. BREAKERS

A converter uses 120-volt power and transforms this energy into 12-volt DC power. Your TrailManor has a 30-amp converter. This converter automatically switches from 120-volt source to battery when the power cord to the external

source is disconnected. It automatically charges your trailer battery while connected to 120-volt power.

WARNING: Do not replace circuit breakers or fuses with those of a higher current rating than those supplied with the new trailer. Over-fusing can cause a fire hazard by overheating electrical wires above temperature ratings.

All trailer receptacles are protected by a G.F.C.I.(Ground Fault Current Interrupter) to reduce the risk of injury caused by an electrical shock. An example of ground fault current is the current which would flow through a person who is using or touching an appliance with faulty insulation and, at the same time, is in contact with an electrical ground such as a plumbing fixture, wet floor, or earth. The G.F.C.I. should be tested periodically to ensure that it continues to provide protection from ground fault conditions.

12 VOLT DC SYSTEM

EXTERIOR

All exterior vehicle lights are 12 volt and wired in accordance with the standard accepted color code:

- White---Ground
- Green---Running lights
- Red-----Left turn, stop
- Brown---Right turn, stop
- Yellow--Back-up lights

The connector between tow vehicle and trailer may build up corrosion over a period of time caused by weather elements, and should be cleaned occasionally to ensure good electrical contact.

INTERIOR

The small switch located in the overhead vent controls the brass wall lamps, positioned on the end wall of the front top, and any ceiling lamps forward of the overhead vent.

CAUTION: Be sure to turn off all interior lights before folding the camper for transit as the bulbs may cause a fire hazard in the folded position.

BATTERY

All TrailManor travel trailers are engineered to accept an auxiliary battery. Batteries mounted within the trailer must be sealed to the interior and vented to the exterior. The battery must be hooked up directly to black (positive) and white and bare copper ground (negative) on converter using nothing less than 14 gauge wire. The black wire should be protected with a 30-amp in-line fuse. The 30-amp converter has an automatic transfer switch, which designates the energy source. When connected to a 120-volt power supply, the converter will charge the battery. The trailer's battery will be charged also by your tow vehicle's battery/charging system when connected.

CAUTION: When drawing current from the tow vehicle battery, be sure to avoid draining battery to such a low point that the tow vehicle will not start.

BATTERY ISOLATOR (Optional)

Since the converter draws energy from the strongest source, you may want a battery isolator installed in your car. It protects the car's battery from draining while the tow vehicle is not running. Contact your dealer for more information.

CHAPTER V

APPLIANCES

STOVE AND/OR OVEN

The TrailManor Stove has a 3 burner with either an oven or microwave.

To operate top burners:

1. Push knob inward and turn to "on" position.
2. Hold gas match beside burner until burner lights.
3. After burner is lit, extinguish match and adjust burner to position desired.

To operate oven:

1. Push oven control knob inward and rotate counterclockwise to "pilot on".
2. Light oven pilot, located at back of oven under the burner cover, with a gas match.
3. Turn oven control knob to desired setting.
4. To extinguish oven pilot, push oven control knob inward and turn clockwise to "off".

See stove/oven manufacturer owner's manual for additional information.

FURNACE

The furnace features a sealed combustion system. The combustion chamber is completely sealed from the inner atmosphere of the RV. Combustion air is drawn in from the outside and combustion products are expelled outside through the vent. The system is very stable and even under the most severe wind conditions, it is almost impossible for the flame to blow out. All models come equipped with an automatic ignition gas furnace with blower.

USING THE FURNACE

The furnace is equipped with an ignition device that automatically lights the burner. Do not try to light the burner by hand. **See furnace manual for precautions and detailed lighting procedures.**

1. Set the thermostat to lowest setting.
2. Turn the switch on the bottom of the thermostat to "off" and wait five minutes (to allow accumulated gas to escape).
3. Turn on all electric power to the furnace.
4. Set thermostat to desired temperature.

To turn off gas to furnace, set the thermostat to lowest setting.

For further information, see furnace manufacturer's manual.

WATER HEATER

Before lighting the water heater, make certain that the fresh water system is filled with water and the air is purged from the water heater by opening all faucets until water flows steadily from each.

CAUTION: Damage may result from operating water heater when system is not filled with water.

Read the safety information provided by the water heater manufacturer in the installation and operation manual.

This water heater may be operated by propane gas or electrical power. It is equipped with an ignition device that automatically lights the burner and does not have a pilot.

To operate electrically, you must go outside the trailer to change power supply. Inside the water heater storage compartment is an on/off switch. Pull the cotter pin out of the switch and press the "on" switch. To revert to gas, return switch to "off" position and replace cotter pin.

To operate by gas, turn off all electric power to the water heater at the switch located under the sink. The red light on the switch will light briefly. Turn off gas supply. Wait five minutes to allow gas, which may have accumulated in the burner compartment to escape. **If you smell gas, STOP and follow instructions in safety information in water heater manual.** Turn on gas supply. Turn on electrical power to the water heater. Turn switch to "on" position. If burner does not light on first three tries, the system will lockout. If lockout occurs before main burner lights, turn switch to "off", and wait five seconds before turning switch to "on" position. The first start-up of the heater may require several ignition cycles before all air is purged from the gas lines.

To Turn Water Heater Off

Turn switch to "off" position. Turn off electrical power to the water heater. Turn off gas supply. If trailer is to be stored while subject to freezing temperature, drain water heater.

See water heater manufacturer owner's manual for more information.

REFRIGERATOR:

The refrigerator is a 3-way design, which uses LP gas, 120 volt AC, or 12-volt DC electricity for power. The control panel is located at the top front of the refrigerator.

Following are the instructions for LP gas operation.

1. Open the valve at the gas storage tank.
2. Turn the thermostat to the 5 position.
3. Turn the selector switch to the propane gas position.
4. Push and hold in the safety valve and push in the igniter several times in rapid succession, for about five seconds.

WARNING: Do not hold in the safety valve for more than 30 seconds. If there is no flame in this time, wait at least five minutes before you try ignition again.

5. When a flame is present and the flame meter moves into the green area, release the safety valve. If the flame meter does not move into the green area, do this step again.
6. Turn the thermostat to the temperature setting that you wish.

Start up: AC operation:

Make sure that 120 volts AC is available.

Turn the selector switch to the AC position.

Turn the thermostat to the temperature setting desired.

Start up: DC operation:

Make sure that 12 volts DC is available.

Turn the selector switch to the DC position.

This refrigerator is made to operate on DC power while your vehicle is "in transit" and AC power or propane gas sources are not available. Operate the refrigerator on DC power only when the vehicle engine is running.

For the refrigerator to operate correctly on DC power, the battery must be maintained in a fully charged condition.

Additional information will be found in the refrigerator manufacturer owner's manual.

REFRIGERATOR FAN

Your TrailManor is equipped with a 12-volt exhaust fan to remove excess heat from the back of the refrigerator when operating with the trailer closed down. This permits proper operation of the refrigerator, on 12 volts, while towing. The switch is located to the left of the refrigerator below the kitchen sink. The fan may also be used to improve the refrigerator performance during very hot weather even when the trailer is set up.

For proper operation, the fan should be wired to force air down through the exhaust tube. Air flow upward through the tube would indicate reversed polarity of the power leads to the fan motor.

Excessive noise from the fan may result from improper positioning of the fan in the vent tube. Access to the fan is through the lower refrigerator vent outside the trailer.

Bathroom Exhaust Fan

The bathroom 12-volt exhaust fan is mounted beneath the bathtub. The fan switch is located on the bathroom sink cabinet.

CHAPTER VI

CARE OF BODY COMPONENTS

EXTERIOR, INTERIOR, SEALS

The "Krystal Kote" aluminum exterior of your new TrailManor can be easily cleaned with a mild abrasive detergent such as Soft Scrub with bleach. Also, the interior aluminum and the seals can be cleaned the same way. You may spray the seals with a lubricant such as silicone if they appear to provide excessive drag during opening or closing.

WINDOWS AND VENTS

Inspect annually all caulking around window, vents, clearance lights, and TV antenna base. Recaulk as needed to prevent leaks.

BED SUPPORT TRACKS

To keep your beds sliding easily, spray tracks with a lubricant such as WD-40 periodically.

DRAPES

For best results, drapes should be dry cleaned. If you clean them yourself, use cold water and hang damp to dry to avoid shrinking.

CUSHIONS

If the mattresses are dry cleaned, the vinyl on the reverse side will shrink, become hard, and crack. If covers are removed from cushions, it may be difficult to reinstall due to possible shrinking.

To clean your cushions and bed mattress covers, we recommend that you frequently vacuum or lightly brush to remove dust and grime.

Spot clean using the foam only from a water based cleaning agent such as a mild detergent. Apply foam with a soft brush in a circular motion. Vacuum when dry. Pretest a small area for color fastness before proceeding.

Vehicle Safety

If you believe that your vehicle has a defect, which could cause a crash or could cause injury or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA) in addition to notifying TrailManor, Inc.

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

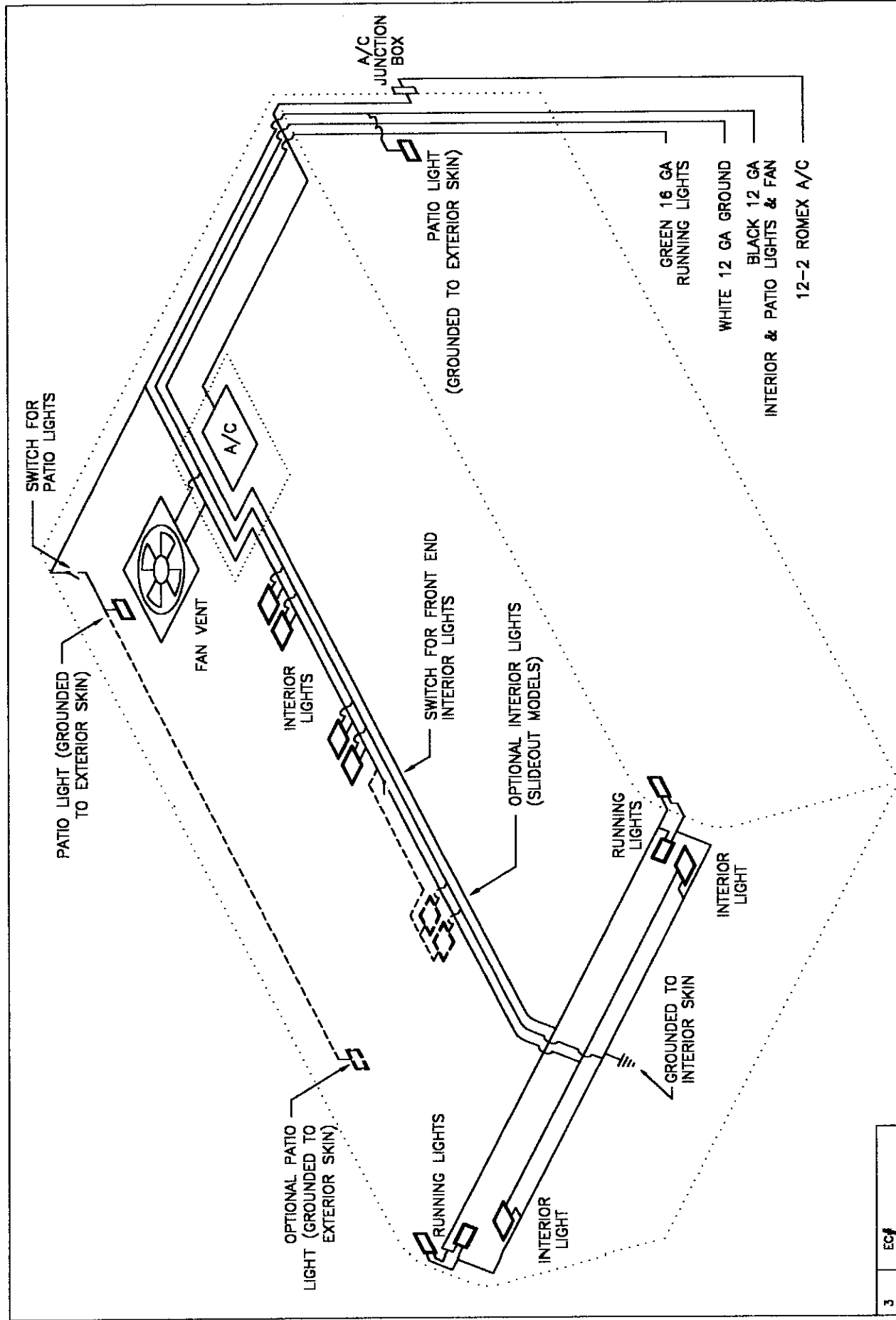
To contact NHTSA, you may either call the Auto Safety Hotline toll-free at 1-800-424-9393 (or 366-0123 in Washington, DC, area) or write to: NHTSA, US Department of Transportation, Washington, DC 20590. You can also obtain other information about motor vehicle safety from the Hotline.

PRECAUTION FOR STORING: If you store your trailer in open sunlight in hot climates, slightly open the trailer roof vents when the unit is folded down. Extreme heat may warp plastic components within the vents.

Raise front end of trailer to ensure best possible protection against water during storage.

Excessive snow loads can damage the roof of your TrailManor. If you suspect snow is coming, you should place the trailer under shelter or close the unit down to allow access to the roof for snow clearing. One foot of snow (or one inch of ice) should be ok. If the snow accumulation approaches two feet, or if the snow is excessively wet and heavy at one foot, you should remove the snow from the roof.

CAUTION: Do not attempt to close the trailer with snow accumulation on the roof. One inch of dry snow adds 40-60 pounds to the weight of the top. The added weight could cause the top to fall suddenly while being closed, causing personal injury or trailer damage.



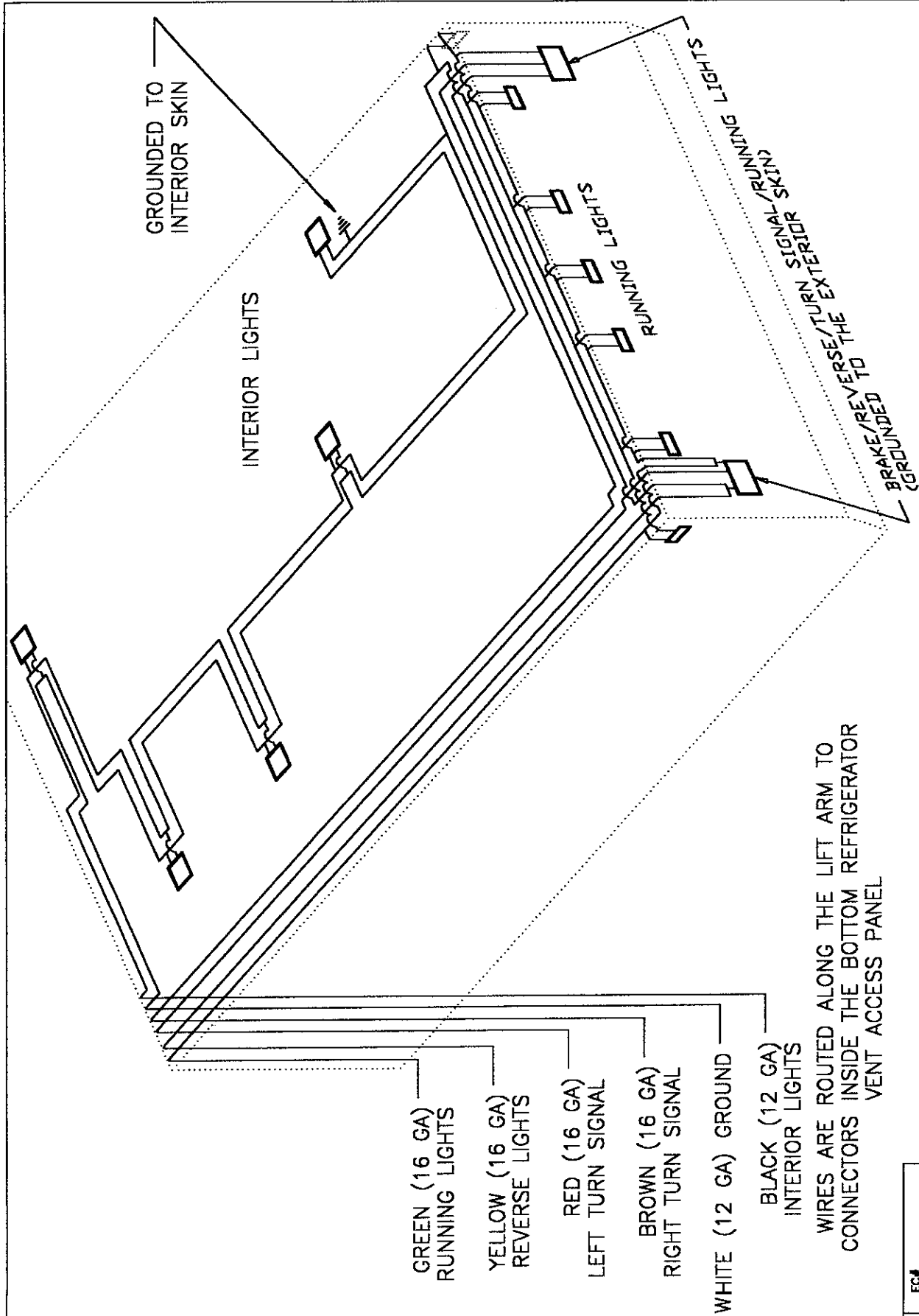
REVISION HISTORY	
3	EC#
2	EC#
1	EC#

TrailManor

REV: 0
DATE: SEPTEMBER 13, 2002

NOT TO SCALE
MODELS: ALL

FRONT ROOF WIRING SCHEMATIC
DWG #: EY-ROOF WIRING FRONT



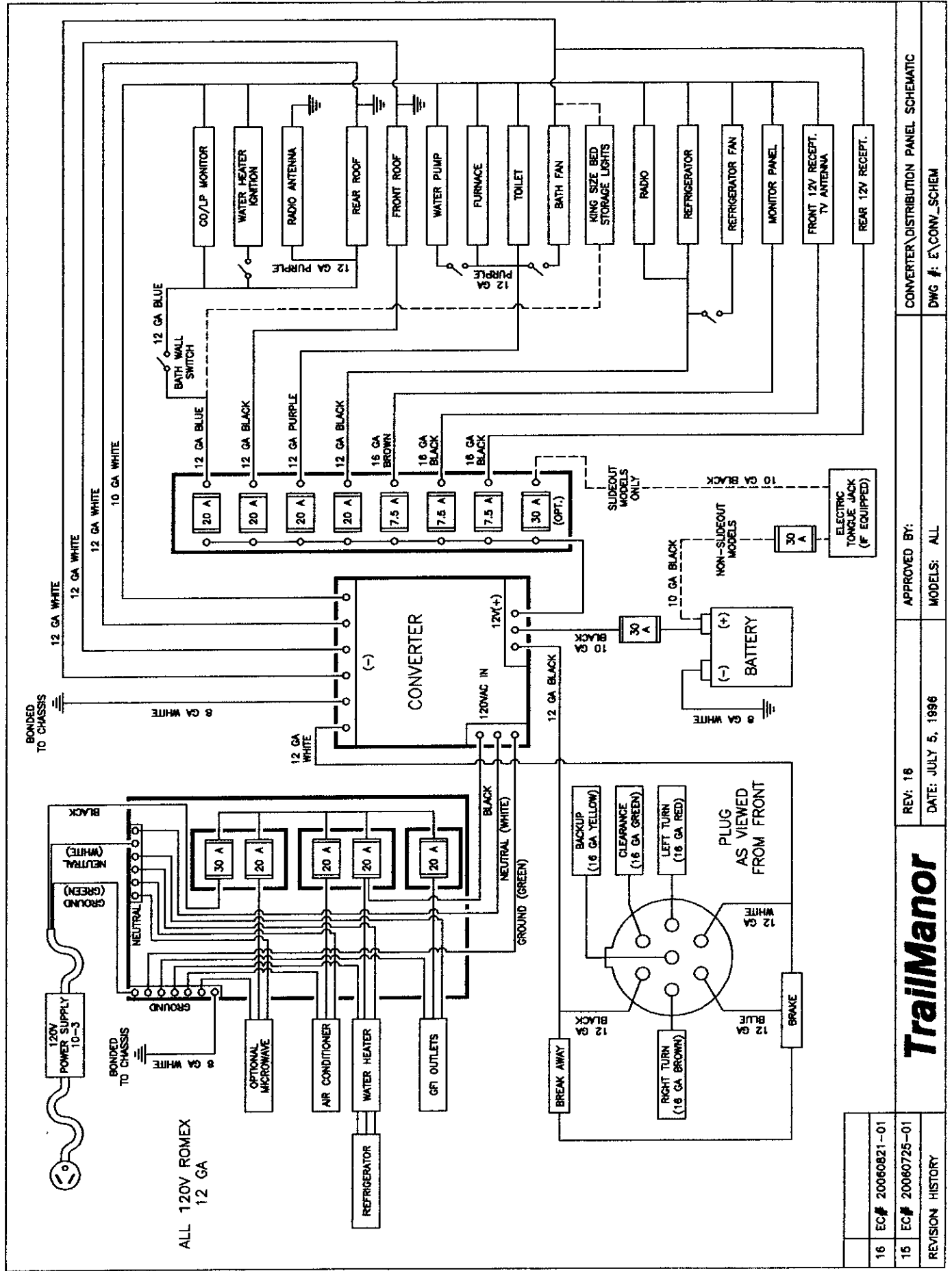
3	EC#
2	EC#
1	EC#
REVISION HISTORY	

TrailManor

REV: 0
DATE: SEPTEMBER 11, 2002

NOT TO SCALE
MODELS: ALL

REAR ROOF WIRING SCHEMATIC
DWG #: E\ROOF WIRING REAR



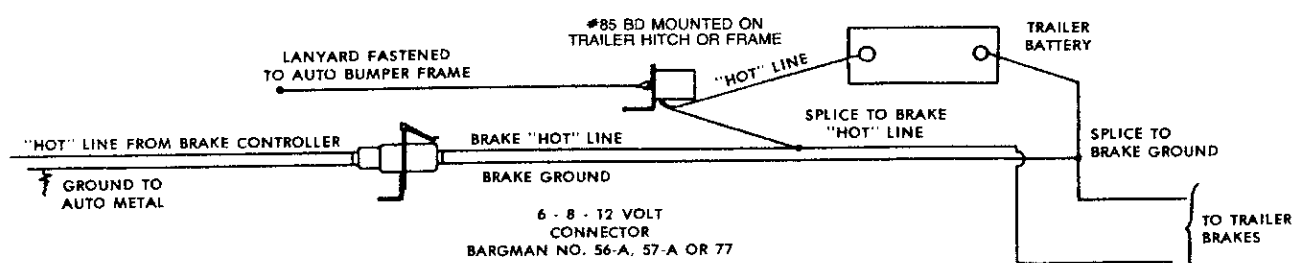
IMPORTANT!

FILE WITH YOUR VEHICLE'S OWNER'S MANUAL

Your recreational vehicle is equipped with a #85 BD breakaway device. It is intended for emergency use ONLY! The only time you need a breakaway device is if the towed vehicle separates from the towing vehicle. In such a case, the breakaway device will complete the circuit and put on the brakes.

To insure proper function of this device, you must comply with the following INSTALLATION INSTRUCTIONS:

Mount #85 BD on hitch of trailer with one screw in mounting bracket. Position bracket so there is no strain on lanyard between trailer and tow car. Device must be mounted on horizontal plane as close as possible to center line of hitch. Connect wires as shown in schematic wiring diagram.



Keep trailer battery charged at all times to insure safe operation.

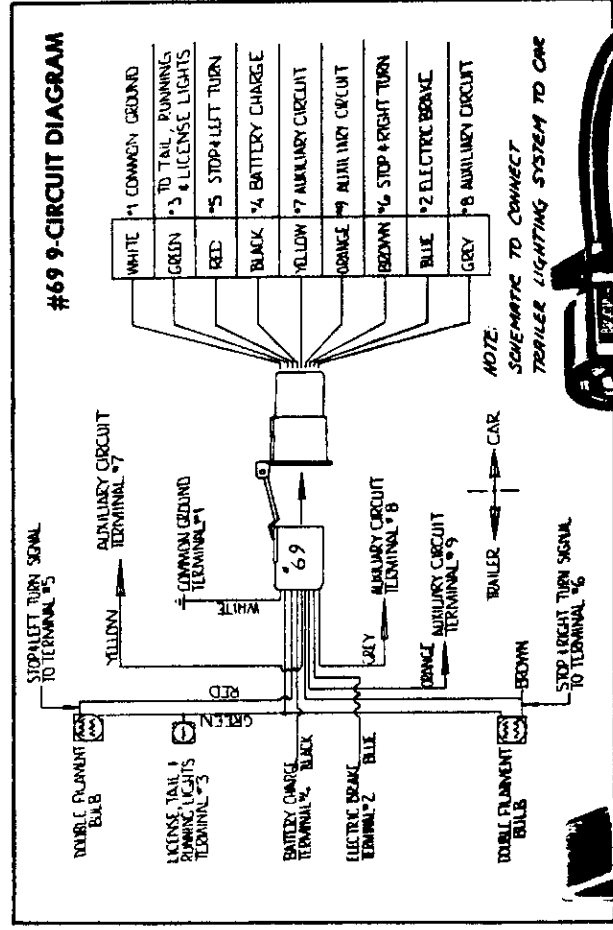
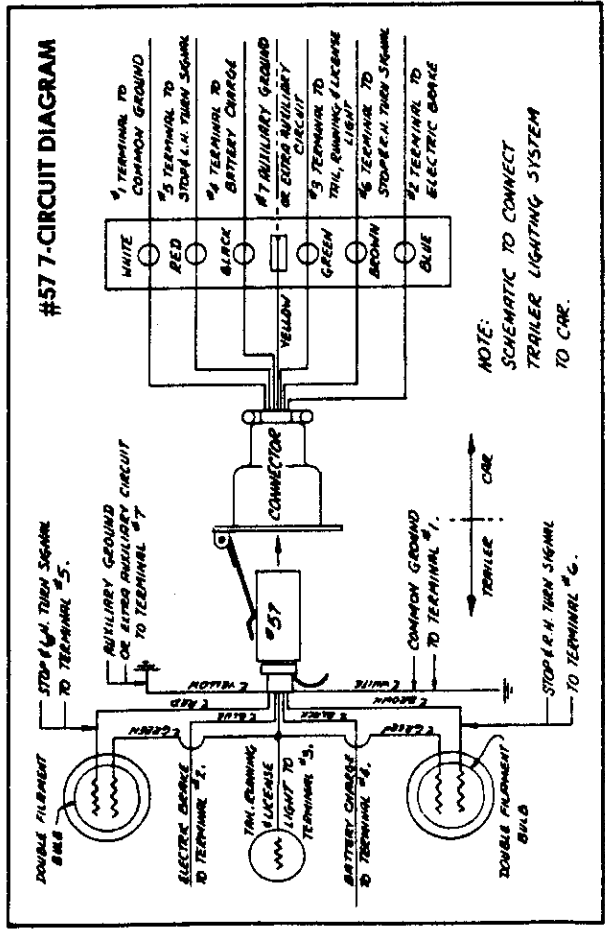
NOTE: Make sure pin is securely in place each time before using trailer.

THEODORE BARGMAN CO. COLDWATER, MICH. 49036



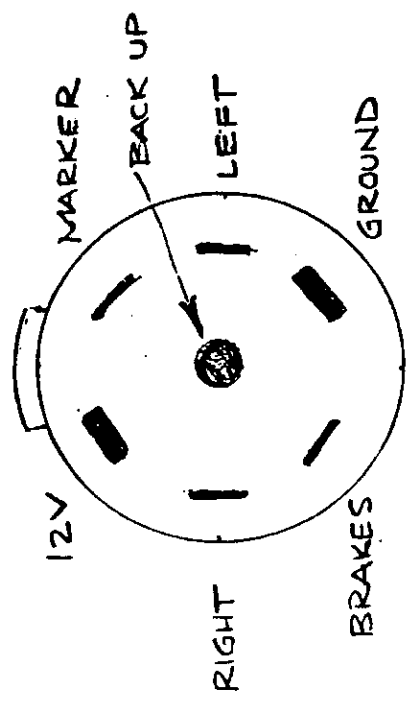
50-64-012

Wiring Diagrams for BARGMAN 7 and 9 Circuit 12V Electrical Connectors



BARGMAN 7-CIRCUIT TRAILER END

LOOKING AT TRAILER PLUG:



HELPFUL HINTS

ABOUT LP-GAS (PROPANE) AND LP-GAS (PROPANE) CONTAINERS



**SO YOU MAY ENJOY USING THE WORLD'S
MOST VERSATILE FUEL - ALWAYS FOLLOW
ALL SAFETY WARNINGS AND PRODUCT
INSTRUCTIONS.**

*LP-gas is a highly flammable fuel contained
under pressure and may cause fires and/or
explosions if improperly used.*

LP-gas (liquid petroleum gas) is a true gas compressed into liquid form for easy transportation and storage. It is also known as propane or bottled gas. It is safe and economical and, because of its portability, it provides modern living convenience no matter where you travel.

LP-gas is flammable, is always contained under pressure and the liquid can freeze skin. Therefore, in the interest of safety, it is important to understand the basic facts about LP-gas and LP-gas containers.

Federal DOT regulations require periodic inspections and requalifications of cylinders (see NPGA Pamphlet 118). **DO NOT USE** damaged or rusted tanks.

MANCHESTER TANK & EQUIPMENT CO.

2880 Norton Ave., Lynwood, CA 90262
2738 Lithonia Industrial Blvd., Lithonia, GA 30058
1201 No. Gary Ave., Lubbock, TX 79415
29389 Lexington Park Dr., Elkhart, IN 46514
P.O. Box 511, Tillsonburg, Ont., N4G4J1, Canada
P.O. Box 953, Hannibal, MO 63401
23209 Airpark Dr., Petersburg, VA 23803

CAUTION USE LP-GAS TANKS AND CYLINDERS IN PROPER POSITION

Use vapor only. All LP-gas appliances for cooking, heating, lighting, water heating and refrigeration are designed to operate on LP-gas vapor only. Therefore, all LP-gas tanks and cylinders designed for vapor service must be transported, installed and used in the proper position. Do not transport, install or use a vertical cylinder (see Fig. No. 3) in a horizontal or upside down position. Never use a horizontal cylinder or tank (see Fig. No. 4) on its improper side. Liquid LP-gas could enter the system designed for vapor only, creating a hazardous condition.

Always use a POL plug when transporting or storing disconnected cylinders or tanks (full or empty).

Manchester LP-gas containers are permanently marked with "top" stamped on a tab welded to the tank or "arrows must point up" stamped in the guard or bracket to identify the proper position.

All LP-gas tanks and cylinders must be securely attached in the proper position for intended use. Use all brackets provided to ensure proper support and positioning.

FILLING YOUR LP-GAS CONTAINER

Caution! **Overfilling is hazardous!** Do not overfill your LP-gas container. Stop filling when liquid appears at the fixed liquid level gauge. Most LP-gas containers are equipped with a fixed liquid level gauge which contacts the liquid level at 80% of container capacity allowing 20% for expansion. LP-gas containers not equipped with a fixed liquid level gauge can only be filled by weight.

LP-gas containers must not be filled over 80% of total capacity. Propane expands approximately 1.5% for each 10° F temperature rise. Only qualified personnel should fill your container. Pumps do not stop filling "automatically." Pumps "by-pass" when tanks are dangerously filled to total capacity. If overfilled, excessive pressure could develop within the container causing the relief valve to open, relieving pressure to a safe level at which time it will automatically close. However, LP-gas released through the safety relief valve is flammable; thus it could cause a fire.

The fixed liquid level gauge is used only to determine safe fill levels and does not indicate lower levels. LP-gas containers are available with visible gauges that monitor the amount of gas in the container at all times, reading from full to empty. If your container is not equipped with a gauge, replacement cylinders with sight gauges are available from your dealer for an additional cost. Do not use visible gauges for filling.

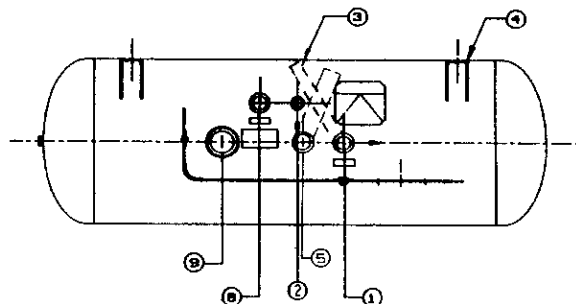


FIG. NO. 1
ASME Horizontal Motor home tank

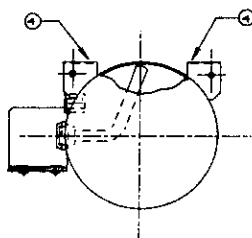


FIG. NO. 2
Side View FIG. NO. 1

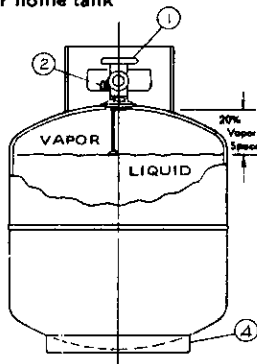


FIG. NO. 3 Standard vertical
20 lb. DOT cylinder.

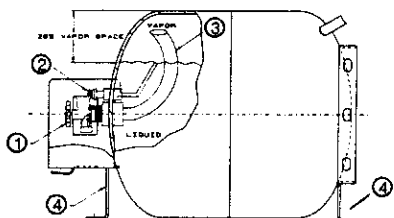


FIG. NO. 4 DOT 20 lb. cylinder
designed for horizontal use.

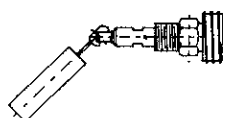


FIG. NO. 5 Automatic
stop fill valves required
on any permanently
mounted tanks.

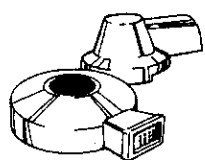


FIG. NO. 6 Regulator
covers required on all
exposed regulators.

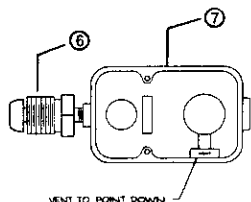


FIG. NO. 8
Two-stage regulator
required on all RV's.

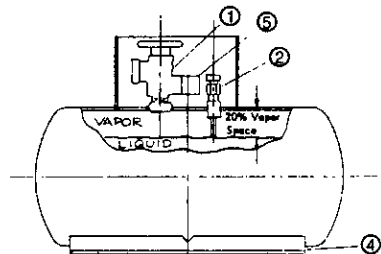


FIG. NO. 7
ASME standard
horizontal tank.

PURGING OF AIR FROM LP-GAS CONTAINERS

Air in LP-gas containers must be removed during the initial filling with LP-gas. If the container is not properly purged, air in the container dilutes the LP-gas vapor. Failure to purge may cause excessive tank pressure, slow filling and poor operation of Automatic Stop Fill valve. Appliances then require constant adjustment and pilot lights won't stay lit. This condition would exist until all air is depleted, leaving pure LP-gas vapor.

Have your LP-gas container purged, using LP-gas vapor to ensure satisfactory appliance performance. It only takes a few minutes and your LP-gas dealer is equipped to perform this service.

COMMON TERMS OF LP-GAS TANKS

1. POL-Vapor withdrawal service valve.
2. 20% Fixed Liquid Level Gauge. (Sometimes inaccurately called a 10% valve).
3. Vapor withdrawal tube. (Used on tanks where POL Valve is not located on top of tank.)
4. Bottom ring, stand legs, or mounting brackets.
5. Safety relief valve. Do not tamper.
6. Spud & nut with excess flow required on all RV's.
7. Two-stage pressure regulator.
8. Automatic Stop Fill Valve with 1-3/4" ACME.
9. Visible sight gauge. Available with remote sender.

DOT AND ASME TANKS

- Generally speaking, LP-gas tanks are built to the specifications of either the ASME or DOT pressure safety codes which are used extensively. Basically, the difference between the two codes is that valves, fittings and brackets may be located on the ends only on DOT cylinders, while on the ASME tanks they may be located on ends as well as sides. These tanks are required to be rated in gallons (ASME) or pounds (DOT) water capacity. Manchester production and testing methods are the most modern available to assure top quality.
- All valves and fittings on Manchester cylinders are listed by UL.

LP-GAS REGULATORS

LP-gas regulators reduce the pressure of LP-gas vapor from tank pressure to 6 1/4 oz. or 11" W.C. for use at the appliances. The regulator is the heart of the LP-gas system and although it seldom requires service, care should be taken to protect it from the elements which could cause it to malfunction. In addition, your LP-gas system should be kept free of moisture which could cause regulator freeze-up. Installation of a good regulator enclosure will protect your regulator and anhydrous methanol injected into your LP-gas container will help to prevent freeze-ups (1 pint per 100 gallons capacity).

CAUTION - ALWAYS BE SURE THAT THE REGULATOR VENT IS POINTING DOWN WITHIN 45°.

ADVANTAGES OF TWO-STAGE REGULATION

Reduced Freeze-Up Problems - A two-stage regulator must be used on RV's. A two-stage regulator greatly reduces the possibility of freeze-ups because (1) larger orifice sizes can be used in the regulators and (2) heat can be transferred through the walls of two regulators instead of just one.

Improved Regulation - The second stage regulator receives a relatively uniform pressure from the first stage regulator. This helps the second stage regulator to maintain appliance pressure at a nearly constant 11" W.C. because it does not have to adjust to varying inlet pressures.

*BASIC FACTS ABOUT LP-GAS

PROPANE

Pounds per gallon	4.20
Specific gravity of gas	1.50
Specific gravity of liquid	0.51
Cu. ft. gas per gallon liquid	36.38
Cu. ft. gas per pound	8.66
BTU per gallon	91,502
BTU per pound	21,548
Dew point in degrees F	-44
Vapor pressure at 0° F	31
Vapor pressure at 70° F	127
Vapor pressure at 100° F	196
Vapor pressure at 110° F	230

Butane is not readily available in the U.S. or Canada. Low pressures in cold climates are more likely to cause vaporization problems. Keep fuel levels above 50%.

Average LP-gas capacities (PROPANE)
(allow 20% for vapor space)

	Lbs. of gas	BTU's
1 - 1.0 gal. DOT cylinder	5	107,740
1 - 2.5 gal. DOT cylinder	11	237,028
1 - 4.8 gal. DOT cylinder	20	430,960
1 - 7.2 gal. DOT cylinder	30	646,440
1 - 9.2 gal. DOT cylinder	40	861,920

Conversions:

Gallons to Liters (1 gallon = 3.785 liters)

F° to C° (F° = 9/5 C° + 32°)

11" Water Column = 6¼ ozs. per sq. in. pressure

27.7" Water Column = 1 pound per sq. in. pressure

To find out how long your LP-gas supply will last, simply total the BTU demand of all your gas appliances and the BTU capacity of your containers at 80% full. Divide container BTU capacity by total appliance demand.

*Data From NFPA Pamphlet #58-1989

NOTE: This pamphlet is not meant to be a complete guide to the use of propane cylinders and appliances.

Part #S 33108
Rev. 10/90

SOME BASIC PRACTICES TO ENSURE SAFETY AND TROUBLE-FREE USE

1. **Never** allow your LP-gas tank or cylinder to be filled above the maximum safe level as indicated by the fixed liquid level gauge (outage). Do not use the visible gauge for filling.
2. Do not use a wrench or pliers to close the POL service valve or fixed liquid level gauge on your tank. These valves are designed to be closed leak-tight by hand or screwdriver as appropriate. If wrenches are necessary to stop a leak, the valve needs repair or replacement.
3. When tightening the POL Nut (lefthand thread) on the service valve, draw it up snug with a proper wrench — don't jam it. This is a machined male brass fitting which seats securely against a female seat in the POL valve — no pipe dope is necessary. Check for leaks after connecting. Apply soapy water to connection, turn off all burners and pilots and open service valve. Leaks will be detected by the appearance of bubbles. If bubbles appear, tighten POL connector and repeat leak test.
4. When using tank, slowly open POL service valve all the way. Listen to the regulator. A hiss means a leak.
5. Check all tank and line connections periodically to be sure they are tight. When testing for leaks use soapy water — not matches.
6. Make certain your cylinder is properly fastened in place.
7. On dual tank installation, turn tanks with open part of tank guard towards trailer (travel trailer installation). This protects valves and regulator against flying rocks and mud which may be thrown to the rear on gravel or dirt roads.
8. If you take your LP-gas tank to an LP-gas dealer for filling, transport it in the proper position in which it is used, with the valves closed and **POL plug inserted**. Secure the tank against falling or rolling.
9. Since LP-gas is non-corrosive, you need not worry about the inside of your tank. However, the outside should be kept from rusting by a periodic coat of paint in a light reflective color.
10. Practice safety at all times. If you have questions about the operation of your appliance or LP-gas systems, contact your local LP-gas dealer.
11. Do not store LP-gas tanks or cylinders indoors or in enclosed areas. Do not expose LP-gas container to heat. Always store with service valve closed and plugged.
12. Do not attempt to repair LP-gas containers, valves or regulators.
13. Valve information supplied by appropriate manufacturer.

**ADDITIONAL COPIES OF HELPFUL HINTS
AVAILABLE AT NO CHARGE.**



Trailer Running Gear

DEXTER AXLES are available nationwide from the following plant locations:

Philips Industries
Western
Wilco Road
Stayton, Oregon 97383
(503) 769-6321
FAX: (503) 769-3528

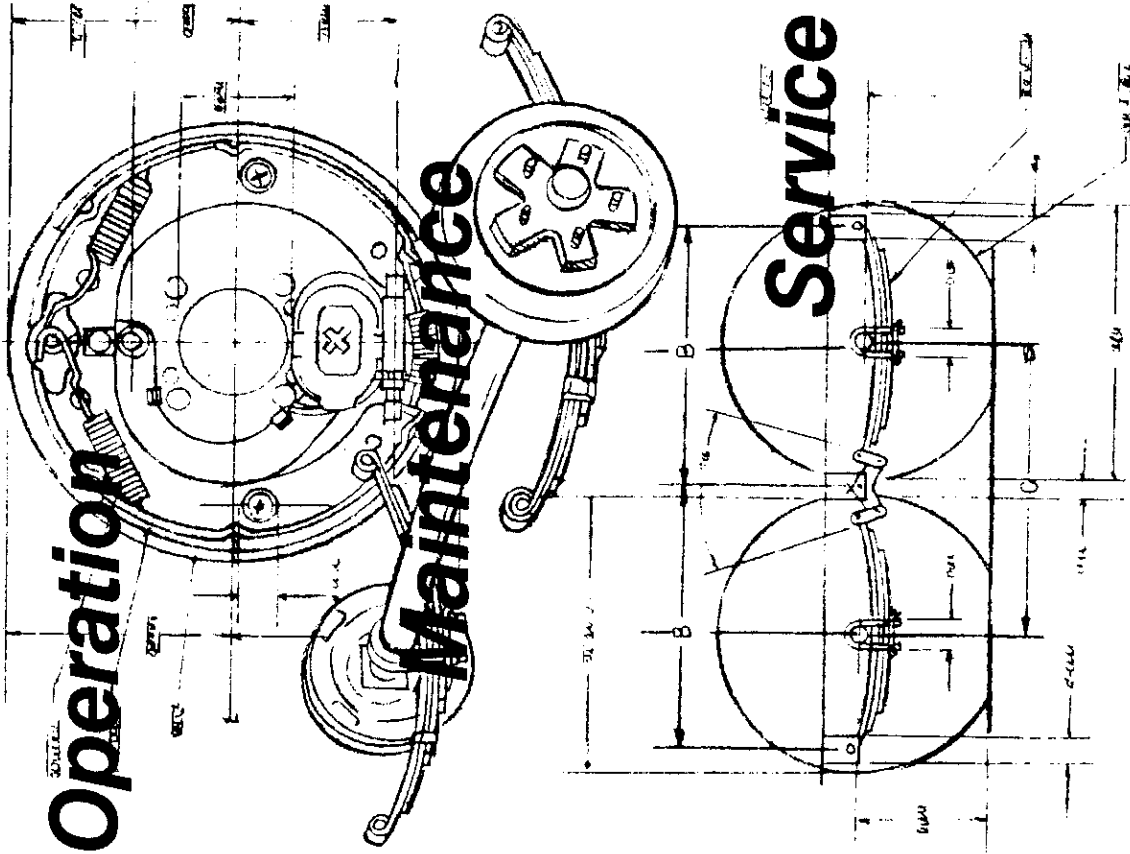
Dexter Axle
222 Collins Road
Elkhart, Indiana 46516
(219) 295-1900
FAX: (219) 295-8094

Dexter Axle
West Pearl Street
Fremont, Indiana 46737
(219) 495-5100
FAX: (219) 495-1701

K-B Axle Company
2700 S. Yates Ave.
Los Angeles, CA 90040
(213) 726-3157
FAX: (213) 724-8193

Dexter Axle
500 S.E. 27th Street
El Reno, Oklahoma 73036
(405) 262-6700
FAX: (405) 262-9089

Dexter Axle
Industrial Park
Monticello, Georgia 31064
(404) 468-6487
FAX: (404) 468-2966



Electric Brakes • Wheels, Tires • Suspensions • Hubs, Bearings

INTRODUCTION

This manual is designed to provide information for you to understand, use, maintain and service your trailer running gear system. Your axles are manufactured by Dexter Axle, the largest producer of trailer axles in the world. The Dexter product line, the most complete in the industry, is the result of over 30 years of experience in the design, testing and manufacture of trailer axles. The Dexter running gear system consists of axles, spindles, hubs, drums, brakes, springs and wheels which are engineered to provide you the finest towing and stopping performance currently available in the industry today.

Two Dexter philosophies are at work to provide you the best product available and have enabled us to maintain our position of leadership. First, we operate on the theory that "there is always a better way" - for a product to operate, to be manufactured, to be serviced; and we are constantly striving to find that better way. Second, we maintain wall-to-wall production control so that all the major components of your running gear system are manufactured in Dexter facilities under our strict quality control standards. These manufactured components include our axle beams, hubs, drums, spindles, brakes, magnets, rims, wheels and most of the steel stampings used in the attachment of your axle to your trailer. Dexter has the most complete, state-of-the-art manufacturing facilities which enables us to provide you, the trailer owner, with the finest product possible.

FOR ALL YOUR RUNNING GEAR NEEDS...

Look First to Dexter

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HOW ELECTRIC BRAKES WORK

The electric brakes on your trailer are similar to the drum brakes on your automobile. The basic difference is that your automotive brakes are actuated by hydraulic pressure while your electric trailer brakes are actuated by an electromagnet. With all of the brake components connected into the system, the brakes will operate as follows: (See Figure A).

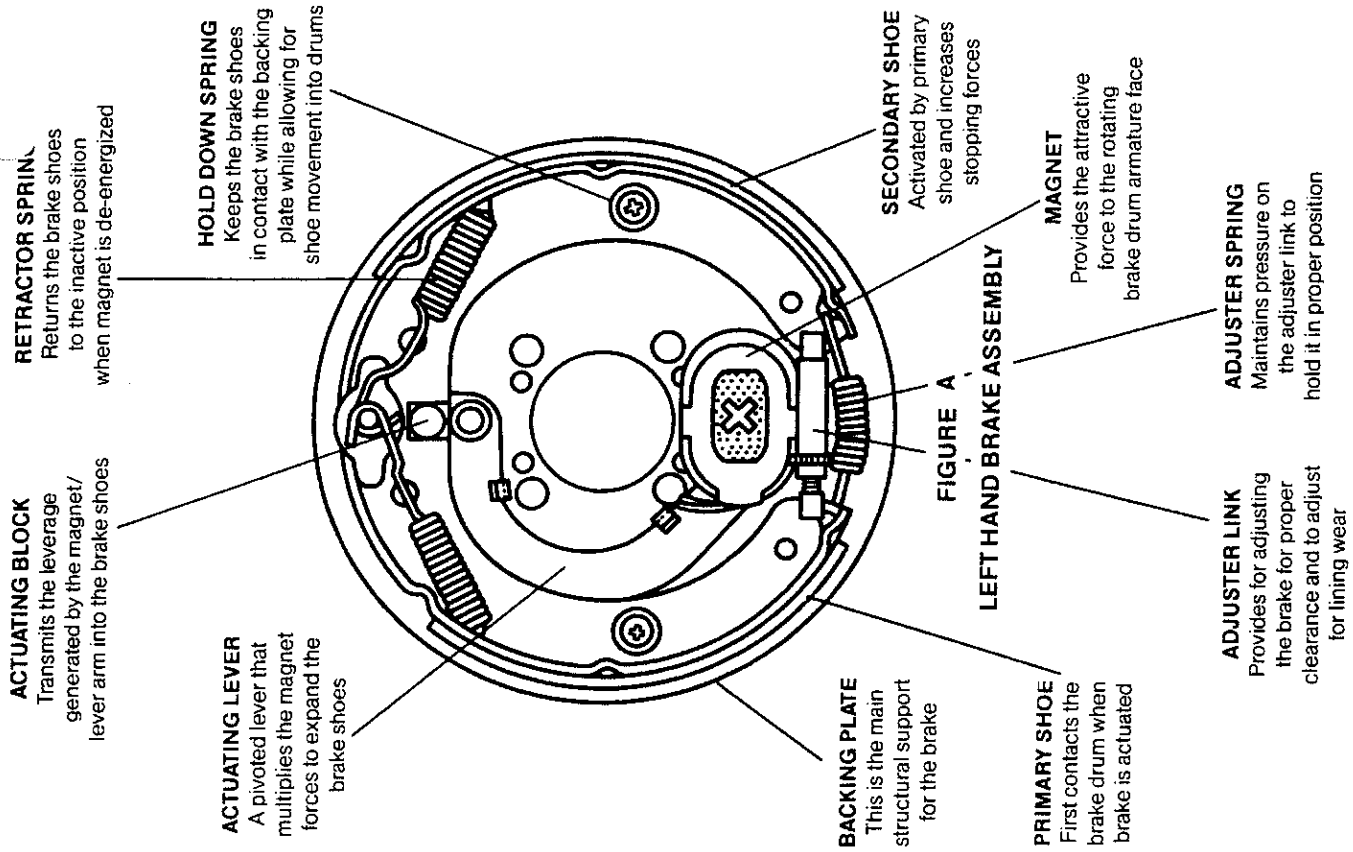
When electrical current is fed into the system by the controller, it flows through the electromagnets in the brakes. The high capacity electromagnets are energized and are attracted to the rotating armature surface of the drums which moves the actuating levers in the direction that the drums are turning. The resulting force causes the actuating cam block at the shoe end of the lever to push the primary shoe out against the inside surface of the brake drum. The force generated by the primary shoe acting through the adjuster link then moves the secondary shoe out into contact with the brake drum.

Increasing the current flow to the electromagnet causes the magnet to grip the armature surface of the brake drum more firmly. This results in increasing the pressure against the shoes and brake drums until the desired stop is accomplished.

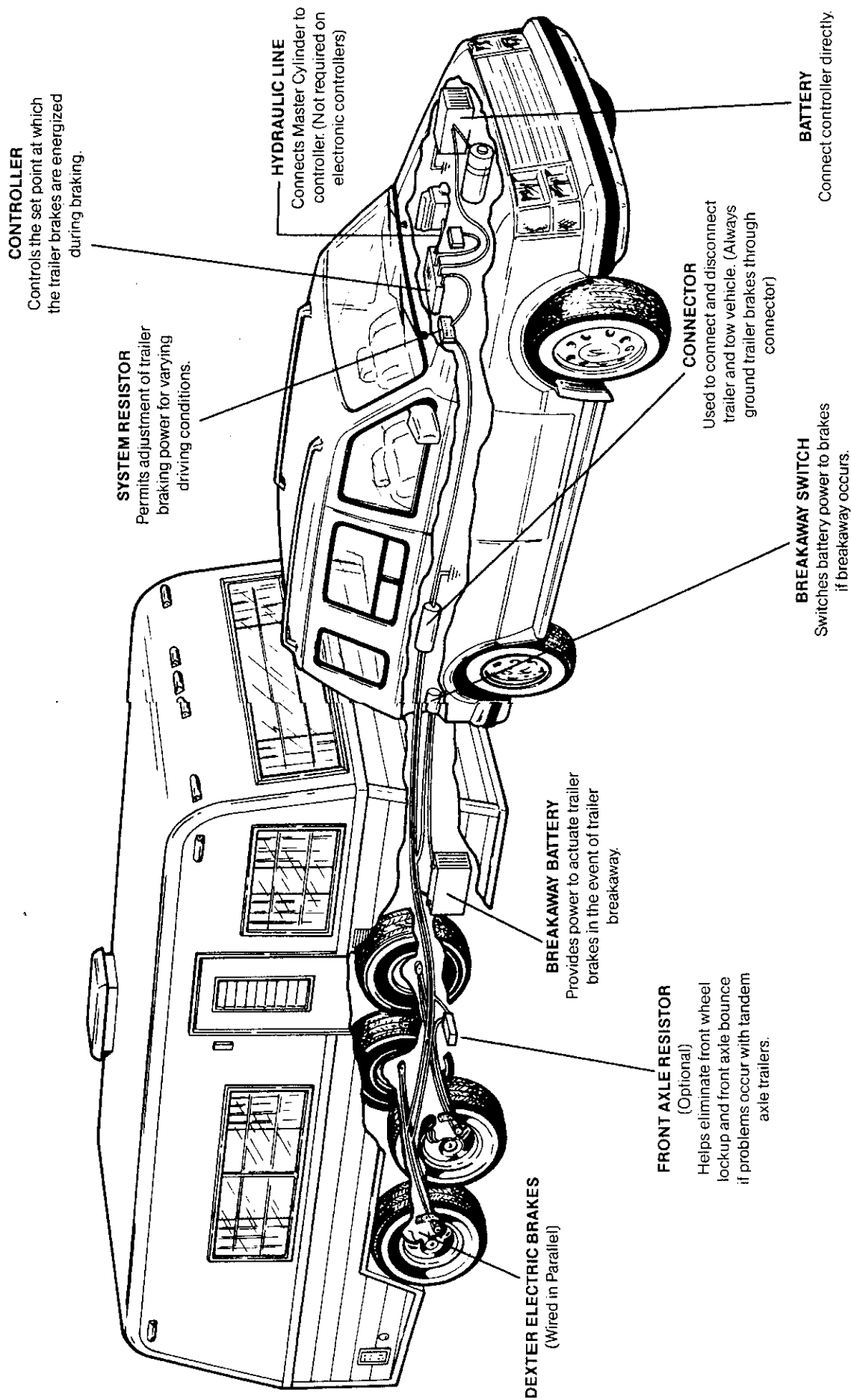
HOW ELECTRIC BRAKES HELP

Electrically actuated brakes have several advantageous features over other brake actuation systems.

1. They can be electrically adjusted to provide the correct braking capability for varying road and load conditions.
2. They can be modulated to provide more or less braking force, thus easing the brake load on the towing vehicle.
3. They have relatively no lag time from the moment the tow vehicle's brakes are actuated until the trailer brakes are actuated.
4. They provide a separate braking system to that of the tow vehicle which can be of benefit in the event of tow vehicle brake failure.

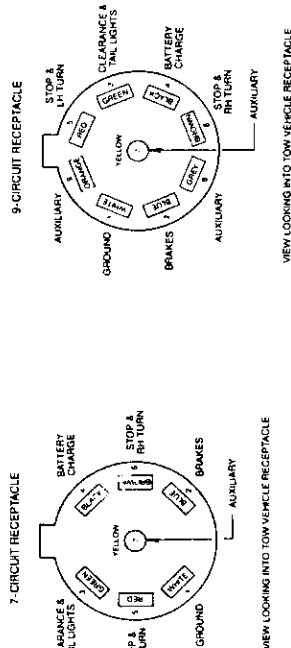
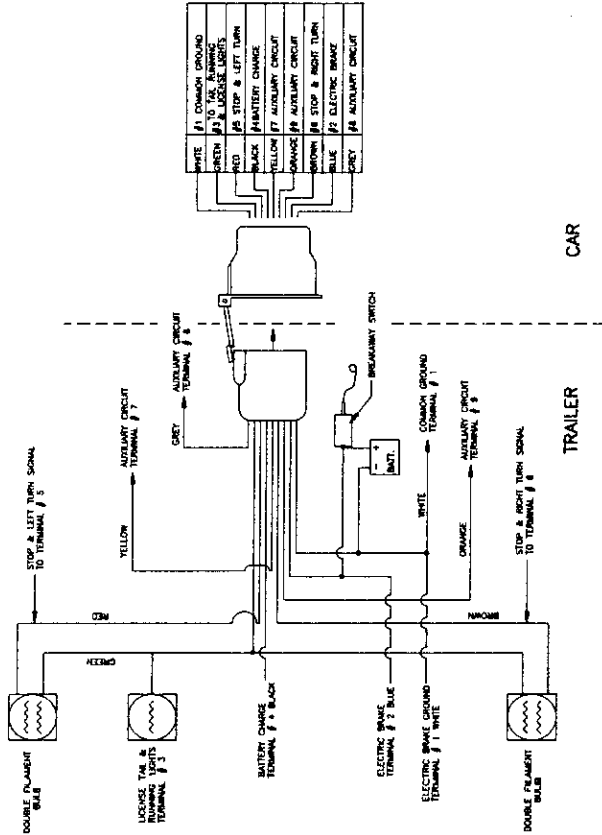


ELECTRIC BRAKE SYSTEM COMPONENTS



TYPICAL CONNECTOR WIRING

TYPICAL TRAILER WIRING DIAGRAM



TRAILER WIRE SIZE CHART		
NUMBER OF BRAKES	HITCH-TO-AXLE DISTANCE IN FEET	RECOMMENDED MINIMUM HOOKUP WIRE SIZE (COPPER)
2	UNDER 30	12 AWG
4	30-50	12 AWG
4	UNDER 30	10 AWG
6	30-50	10 AWG
6	UNDER 30	8 AWG

HOW TO USE YOUR ELECTRIC BRAKES PROPERLY

Your trailer brakes are designed to work in synchronization with your tow vehicle brakes. Never use your tow vehicle or trailer brakes alone to stop the combined load.

Your trailer and tow vehicle will seldom have the right amperage flow to the brake magnets to give you comfortable, safe braking unless you make proper brake system adjustments. Changing trailer load and driving conditions as well as uneven alternator and battery output can mean unstable current flow to your brake magnets. It is therefore imperative that you maintain and adjust your brakes as set forth in this manual, use a properly modulated brake controller, and perform the synchronization procedure noted below.

In addition to the synchronization adjustment detailed below, electric brake controllers provide a modulation function that varies the current to the electric brakes with the pressure on the brake pedal. It is important that your brake controller provide approximately 2 volts to the braking system when the brake pedal is first depressed and gradually increase the voltage to 12 volts as brake pedal pressure is increased. If the controller "jumps" immediately to a high voltage output, even during a gradual stop, then the electric brakes will always be fully energized and will result in harsh brakes and potential brake lockup.

Proper synchronization of tow vehicle to trailer braking can only be accomplished by road testing. Brake "lockup, grabbiness, or harshness" is quite often lack of synchronization between the tow vehicle and the trailer being towed, too high of a threshold voltage (over 2 volts), or underadjusted brakes.

There are two synchronization adjustments available:

1. **System Resistor** - regulates the maximum braking power of the trailer brakes.
2. **Brake Controller** - controls the tow vehicle brake line pressure at which the controller will begin to pass current to the trailer brakes.

Before any synchronization adjustments are made, your trailer brakes should be burnished-in by making 10-12 full stops from approximately 20 mph. This allows the brake shoes and magnets to slightly "wear-in" to the drum surfaces.

TO SYNCHRONIZE:

Start by making sure the trailer brakes are properly adjusted (See page 9) Set the System Resistor in the middle of the coil and the Controller adjustment near the center of its setting.

CAUTION: BEFORE MAKING ROAD TESTS, MAKE SURE THE AREA IS CLEAR OF VEHICULAR AND PEDESTRIAN TRAFFIC.

Make hard stops from 20 mph on a dry paved road free of sand and gravel. If the trailer brakes lock and slide, add more resistance to the circuit with the System Resistor. If they do not slide, take resistance out of the circuit. Adjust the resistor just to the point of brake lockup and wheel skid.

Make a number of 30 mph hard stops to check braking at this speed. If the trailer brakes lag behind the tow vehicle, turn the Controller adjustment in the direction for more braking. If the trailer brakes come in ahead of the tow vehicle brakes, turn the Controller adjustment in the opposite direction. For best braking performance, it is recommended that the Controller be adjusted to allow the trailer brakes to come in just slightly ahead of the tow vehicle brakes. When proper synchronization is achieved there will be no sensation of the trailer "jerking" or "pushing" the tow vehicle during braking.

When this adjustment is complete, make a hard stop or two from 20 mph to check for wheel lockup and whether further fine tuning of the System Resistor is required.

GENERAL MAINTENANCE

BRAKE ADJUSTMENT

Brakes should be adjusted (1) after the first 200 miles of operation when the brake shoes and drums have "seated", (2) at 3000 mile intervals, (3) or as use and performance requires. The brakes should be adjusted in the following manner:

1. Jack up trailer and secure on adequate capacity jack stands. Follow trailer manufacturer's recommendations for lifting and supporting the unit. Check that the wheel and drum rotates freely.
2. Remove the adjusting hole cover from the adjusting slot on the bottom of the brake backing plate.
3. With a screwdriver or standard adjusting tool rotate the starwheel of the adjuster assembly to expand the brake shoes. (NOTE: With drop spindle axles a modified adjusting tool with about an 80 degree angle should be used. Sears Craftsman #4736 or K-D #295 are recommended.) Adjust the brake shoes out until the pressure of the linings against the drum makes the wheel very difficult to turn.
4. Then rotate the starwheel in the opposite direction until the wheel turns freely with a slight lining drag.
5. Replace the adjusting hole cover and lower the wheel to the ground.
6. Repeat the above procedure on all brakes.

CAUTION: NEVER CRAWL UNDER YOUR TRAILER UNLESS IT IS RESTING ON PROPERLY PLACED JACK STANDS.

FOLLOW THE TRAILER MANUFACTURERS RECOMMENDATIONS FOR LIFTING AND SUPPORTING THE UNIT. DO NOT LIFT OR PLACE SUPPORTS ON ANY PART OF THE SUSPENSION SYSTEM.

BRAKE CLEANING, INSPECTION AND LUBRICATION

Your trailer brakes must be inspected and serviced at yearly intervals or more often as use and performance requires. Magnets and shoes must be changed when they become worn or scored thereby preventing adequate vehicle braking.

Cleaning and inspection

Clean the backing plate, magnet arm, magnet, and brake shoes. Make certain that all the parts removed are replaced in the same brake and drum assembly. Inspect the magnet arm for any loose or worn parts. Check shoe return springs, hold down springs, and adjuster springs for stretch or deformation and replace if required.

CAUTION: ASBESTOS DUST HAZARD
SINCE MOST BRAKE SHOE FRICTION MATERIALS NORMALLY CONTAIN ASBESTOS, CERTAIN PRECAUTIONS NEED TO BE TAKEN WHEN SERVICING BRAKES.

1. AVOID CREATING OR BREATHING DUST.
2. AVOID MACHINING, FILING, OR GRINDING THE BRAKE LININGS.
3. DO NOT USE COMPRESSED AIR OR DRY BRUSHING FOR CLEANING. (DUST CAN BE REMOVED WITH A DAMP BRUSH.)

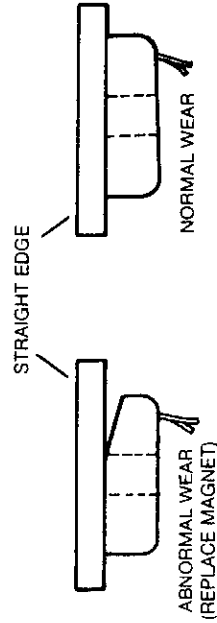
Brake Lubrication

Before reassembling apply a light film of Lubriplate or similar grease on the brake anchor pin, the actuating arm bushing and pin, and the areas on the backing plate that are in contact with the brake shoes and magnet lever arm. Apply a light film of oil on the actuating block mounted on the actuating arm.

CAUTION: DO NOT GET GREASE OR OIL ON THE BRAKE LININGS OR DRUMS.

MAGNETS:

Your electric brakes are equipped with high quality electromagnets that are designed to provide the proper input force and friction characteristics. Your magnets should be inspected and replaced if worn unevenly or abnormally. As indicated below a straightedge should be used to check wear.



Even if wear is normal as indicated by your straightedge the magnet should be replaced if any part of the magnet coil has become visible through the friction material facing of the magnet. It is also recommended that the drum armature surface be re-faced when replacing magnets. (See Brake Drum Section on page 16.) Magnets should also be replaced in pairs (both sides of an axle). Use only genuine Dexter replacement parts when replacing your magnets. Noted below are the magnet replacement kits which will include the necessary specific instructions for replacement.

Brake Size	Magnet Kit Part No. (One Magnet/Kit)
7 x 1 1/4	71-51 (Since 4-90)
7 x 1 1/4	71-56 (Prior to 4-90)
10 x 1 1/2	71-57 (Prior to 9-88)
10 x 1 1/2	071-177-00 (Since 9-88)
10 x 2 1/4	71-104
12 x 2	71-105

SHOES AND LININGS

A simple visual inspection of your brake linings will tell if they are usable. Replacement is necessary if the lining is worn thin (1/16" or less), contaminated with grease or oil, or abnormally scored or gouged. It is important to replace both shoes on each brake and both brakes of the same axle. This is necessary to retain the "balance" of your brakes. Noted below are the Dexter replacement shoe and lining kits which will contain the specific instructions necessary for proper replacement.

Brake Size	Shoe and Lining Replacement Kit No. (one brake)
7 x 1 1/4	71-45
10 x 1 1/2	71-46
10 x 2 1/4	71-47
12 x 2	71-48

TROUBLE SHOOTING

Most brake malfunctions that cannot be corrected by either brake adjustment or synchronization adjustments can generally be traced to electrical system failures. Mechanical causes are ordinarily obvious, i.e. bent or broken parts, worn out linings or magnets, seized lever arms or shoes, scored drums, loose parts, etc. Electrically, a voltmeter and ammeter are essential for proper troubleshooting.

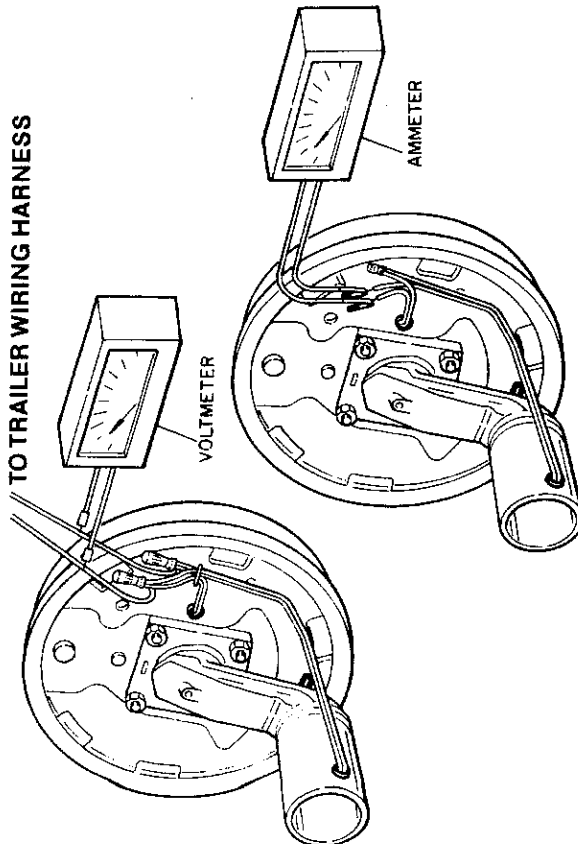
HOW TO MEASURE VOLTAGE

System voltage is measured at the magnets by connecting the voltmeter to the two magnet lead wires at any brake. This may be accomplished by using a pin probe inserted through the insulation of the wires dropping down from the chassis or by cutting the wires. The engine of the towing vehicle should be running when checking the voltage so that a low battery will not affect the readings.

Voltage in the system should begin at 0 volts and, as the controller bar is slowly actuated, should gradually increase to about 12 volts. This is referred to as modulation. No modulation means that when the controller begins to apply voltage to the brakes it applies an immediate high voltage which causes the brakes to apply instantaneous maximum power.

The threshold voltage of a controller is the voltage applied to the brakes when the controller first turns on. The lower the threshold voltage the smoother the brakes will operate. Too high of a threshold voltage (in excess of 2 volts as quite often found in heavy duty controllers) can cause grabby, harsh brakes.

TO TRAILER WIRING HARNESS



HOW TO MEASURE AMPERAGE

System amperage is the amperage being drawn by all brakes on the trailer. The engine of the towing vehicle should be running when checking amperage. One place to measure system amperage is at the BLUE wire of the controller which is the output to the brakes. The BLUE wire must be disconnected and the ammeter put into the line. System amperage draw should be as noted in the tables following. Make sure your ammeter has sufficient capacity and note polarity to prevent damaging your ammeter. If a resistor is used in the brake system, it must be set at zero or by-passed completely to obtain the maximum amperage reading.

Individual amperage draw can be measured by inserting the ammeter in the line at the magnet you want to check. Disconnect one of the magnet lead wire connectors and attach the ammeter between the two wires. Make sure that the wires are properly reconnected and sealed after testing is completed.

By far, the most common electrical problem is low or no voltage and amperage at the brakes. Common causes of this condition are:

1. Poor electrical connections
2. Open circuits
3. Insufficient wire size
4. Broken wires
5. Blown fuses (Fusing of brakes is not recommended.)
6. Improperly functioning controllers or resistors

Another common electrical problem is shorted or partially shorted circuits (indicated by abnormally high system amperage). These are occasionally the most difficult to find. Possible causes are:

1. Shorted magnet coils
2. Defective controllers
3. Bare wires contacting a grounded object

Finding the system short is a matter of isolation. If the high amperage reading drops to zero by unplugging the trailer, then the short is in the trailer. If the amperage reading remains high with all the brake magnets disconnected, the short is in the trailer wiring.

All electrical troubleshooting procedures should start at the controller. Most complaints regarding brake harshness or malfunction are traceable to improperly adjusted or functioning controllers. See your controller manufacturer's data for proper adjustment and testing procedures. If the voltage and amperage is not satisfactory, proceed on to the connector and then to the individual magnets to isolate the problem source. 12 volts output at the controller should equate to 10.5 volts minimum at each magnet. Nominal system amperage at 12 volts with cold magnets, system resistor at zero and controller at maximum gain should be as detailed in the following chart:

BRAKE SIZE	AMPS/ MAGNET	TWO BRAKES	FOUR BRAKES	SIX BRAKES
7 x 1 1/4	2.5	5.0	10.0	15.0
10 x 1 1/2	2.5 (3.0)	5.0 (6.0)	10.0 (12.0)	15.0 (18.0)
10 x 2 1/4	3.0	6.0	12.0	18.0
12 x 2	3.0	6.0	12.0	18.0

NOTE: THESE AMPERAGE LEVELS WILL DROP AS THE MAGNETS HEAT UP

(xx) 10 x 1 1/2 Brakes with Oval Magnets

TRUBLE SHOOTING GUIDE

SYMPTOM	CAUSES	REMEDIES
NO BRAKES	OPEN CIRCUITS	FIND & CORRECT
	SEVERE UNDERADJUSTMENT	ADJUST BRAKES
	FAULTY CONTROLLER	TEST & CORRECT
	SHORT CIRCUITS	FIND & CORRECT
WEAK BRAKES	GREASE OR OIL ON MAGNETS OR LININGS	CLEAN OR REPLACE
	CORRODED CONNECTIONS	CLEAN AND CORRECT CAUSE OF CORROSION
	WORN LININGS OR MAGNETS	REPLACE
	SCORED OR GROOVED BRAKE DRUMS	MACHINE OR REPLACE
	IMPROPER SYNCHRONIZATION	CORRECT
	UNDERADJUSTMENT	ADJUST BRAKES
	GLAZED LININGS	REBURNISH OR REPLACE
LOCKING BRAKES	OVERLOADED TRAILER	CORRECT
	UNDERADJUSTMENT	ADJUST
	IMPROPER SYNCHRONIZATION	CORRECT
	FAULTY CONTROLLER	TEST & CORRECT
	LOOSE, BENT OR BROKEN BRAKE COMPONENTS	REPLACE COMPONENTS
INTERMITTENT BRAKES	OUT OF ROUND BRAKE DRUMS	MACHINE OR REPLACE
	INSUFFICIENT WHEEL LOAD	ADJUST SYSTEM RESISTOR AND SYNCHRONIZE
	FAULTY CONTROLLER	TEST & CORRECT
	BROKEN WIRES	REPAIR OR REPLACE
	LOOSE CONNECTIONS	FIND & REPAIR
BRAKES PULL TO ONE SIDE	INCORRECT ADJUSTMENT	ADJUST
	GREASE OR OIL ON LININGS OR MAGNET	CLEAN OR REPLACE
	BROKEN WIRES	FIND & REPAIR
	BAD CONNECTIONS	FIND & REPAIR
HARSH BRAKES	UNDERADJUSTMENT	ADJUST
	IMPROPER SYNCHRONIZATION	CORRECT
	IMPROPER CONTROLLER	CHANGE
	FAULTY CONTROLLER	TEST & CORRECT
NOISY BRAKES	UNDERADJUSTMENT	ADJUST BRAKES
	LACK OF LUBRICATION	LUBRICATE
	BROKEN BRAKE COMPONENTS	REPLACE COMPONENT
	INCORRECT BRAKE COMPONENTS	CORRECT
SURGING BRAKES	GREASE OR OIL ON LININGS OR MAGNET	CLEAN OR REPLACE
	OUT OF ROUND OR CRACKED BRAKE DRUMS	MACHINE OR REPLACE
	FAULTY CONTROLLER	TEST & CORRECT
DRAGGING BRAKES	OVERADJUSTMENT	READJUST
	OUT OF ROUND BRAKE DRUMS	MACHINE OR REPLACE
	INCORRECT BRAKE COMPONENTS	REPLACE
	LOOSE, BENT OR BROKEN BRAKE COMPONENTS	REPLACE
	FAULTY BREAKAWAY SWITCH	REPAIR OR REPLACE
	LOOSE WHEEL BEARING ADJUSTMENT	ADJUST
	BENT SPINDLE	REPLACE AXLE

HUB REMOVAL

Whenever the hub equipment on your axle must be removed for inspection or maintenance the following procedure should be utilized.

1. Elevate and support the trailer unit per manufacturers' instructions.
2. Remove the wheel.
3. Remove the grease cap by carefully prying progressively around the flange of the cap. If the hub is an oil lube type then the cap can be removed by unscrewing it counter-clockwise while holding the hub stationary.
4. Remove the cotter pin from the spindle nut or, in the case of E-Z Lube versions, bend the locking tang to the free position.
5. Unscrew the spindle nut (counter-clockwise) and remove the spindle washer.
6. Remove the hub from the spindle, being careful not to allow the outer bearing cone to fall out. The inner bearing cone will be retained by the seal.

BRAKE DRUM INSPECTION

There are two areas of the brake drum that are subject to wear and require periodic inspection. These two areas are the drum surface where the brake shoes make contact during stopping and the armature surface where the magnet contacts.

The drum surface should be inspected for excessive wear or heavy scoring. If worn more than .020" oversized, or the drum has worn out of round by more than .015", then the drum surface should be turned. If scoring or other wear is greater than .090", the drum must be replaced. When turning the drum surface the maximum re bore diameter is as follows:

7" Brake Drum	-	7.090"
10" Brake Drum	-	10.090"
12" Brake Drum	-	12.090"

The machined inner surface of the brake drum that contacts the brake magnet is called the armature surface. If the armature surface is scored or worn unevenly, it should be refaced to a 120 microinch finish by removing not more than .030" of material. To insure proper contact between the armature face and the magnet face, the magnets should be replaced whenever the armature surface is refaced and the armature surface should be refaced whenever the magnets are replaced.

NOTE: IT IS IMPORTANT TO PROTECT THE WHEEL BEARING BORES FROM METALLIC CHIPS AND CONTAMINATION WHICH RESULT FROM DRUM TURNING OR ARMATURE REFACING OPERATIONS. MAKE CERTAIN THAT THE WHEEL BEARING CAVITIES ARE CLEAN AND FREE OF CONTAMINATION BEFORE RE-INSTALLING BEARINGS AND SEALS. THE PRESENCE OF THESE CONTAMINANTS WILL CAUSE PREMATURE WHEEL BEARING FAILURE.

BEARING INSPECTION

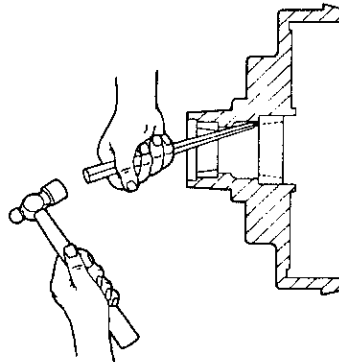
Wash all grease and oil from the bearing cone using a suitable solvent. Dry the bearing with a clean, lint-free cloth and inspect each roller completely. If any pitting, spalling, or corrosion is present then the bearing should be replaced. The bearing cup inside the hub should likewise be inspected.

IMPORTANT: BEARINGS MUST ALWAYS BE REPLACED IN SETS OF A CONE AND A CUP

When replacing the bearing cup proceed as follows.

1. Place the hub on a flat work surface with the cup to be replaced on the bottom side.
2. Using a brass drift punch, carefully tap around the small diameter end of the cup to drive out.
3. After cleaning the hub bore area, replace the cup by tapping in with the brass drift punch. **BE SURE THE CUP IS SEATED ALL THE WAY UP AGAINST THE RETAINING SHOULDER IN THE HUB.**

Replace only with bearings as specified in the accompanying Bearing Replacement Chart.



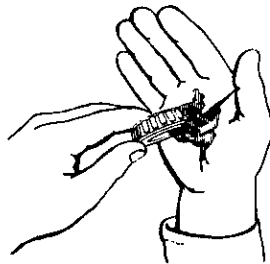
CAUTION: BE SURE TO WEAR SAFETY GLASSES WHEN REMOVING OR INSTALLING FORCE FITTED PARTS. FAILURE TO COMPLY MAY RESULT IN SERIOUS EYE INJURY.

BEARING REPLACEMENT CHART									
BRAKE SIZE	HUB	INNER BEARINGS				OUTER BEARINGS			
		CUP	CONE		PART NO.	CUP	CONE		PART NO.
		BEARING NO.	BEARING NO.	NO.		BEARING NO.	BEARING NO.	NO.	
7 x 1 1/2	4 or 5 Bolt	31-31-1	L44610	31-31-2	L44649	31-31-1	L44610	31-31-2	L44649
10 x 1 1/2	4 or 5 Bolt	31-32-1	LM67010	31-32-2	LM67048	31-31-1	L44610	31-31-2	L44649
10 x 2 1/2	4 or 5 Bolt	31-33-1	L68111	31-33-2	L68149	31-31-1	L44610	31-31-2	L44649
12 x 2	4 or 6 Bolt	31-30-1	25520	31-30-2	25580	31-32-1	LM67010	31-32-2	LM67048
12 x 2	5 Bolt	31-30-1	25520	31-30-2	25580	31-29-1	15245	31-29-2	15123
12 x 2	8 Bolt	31-30-1	25520	31-30-2	25580	31-17-1	14276	31-17-2	14125A
12 x 2 1/2	6 Bolt*	31-30-1	25520	31-30-2	25580	31-29-1	15245	31-29-2	15123

*Special Application with 2.25 diameter seal journal

BEARING LUBRICATION

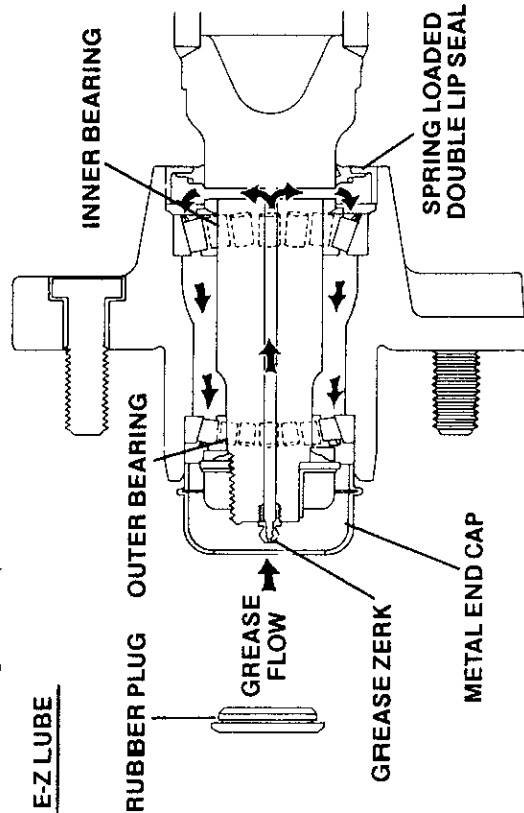
Along with bearing adjustment, proper lubrication is essential to the proper functioning and reliability of your trailer axle. Bearings should be lubricated every 12 months or 12,000 miles. The method to repack bearing cones is as follows:



1. Place a quantity of grease into the palm of your hand.
2. Press a section of the widest end of the bearing into the outer edge of the grease pile closest to the thumb forcing grease into the interior of the bearing.
3. Repeat this while rotating the bearing from roller to roller.
4. Continue this process until you have the entire bearing completely filled with grease.
5. Before re-installing, apply a light coat of grease on the bearing cup.

If your axle is equipped with the Dexter E-Z Lube feature, the bearings can be periodically lubricated without removing the hubs from the axle. This feature consists of axle spindles that have been specially drilled and fitted with a grease zerk in their ends. When grease is pumped into the zerk, it is channeled to the inner bearing and then flows back to the outer bearing and eventually back out the grease cap hole.

E-Z LUBE



The procedure is as follows:

1. Remove the rubber plug from the end of the grease cap.
2. Place a standard grease gun onto the grease zerk located in the end of the spindle. Make sure the grease gun nozzle is fully engaged on the fitting.
3. Pump grease into the zerk. The old, displaced grease will begin to flow back out the cap around the grease gun nozzle.
4. When the new, clean grease is observed, remove the grease gun, wipe off any excess, and replace the rubber plug in the cap.

NOTE: THE E-Z LUBE FEATURE IS DESIGNED TO ALLOW IMMERSION. AXLES NOT EQUIPPED WITH E-Z LUBE ARE NOT DESIGNED FOR IMMERSION AND BEARING SHOULD BE REPACKED AFTER EACH IMMERSION.

If your axles are equipped with oil lubricated hubs then your lubrication procedure is to periodically fill the hub with a high quality hypoid gear oil to the level indicated on the clear plastic oil cap. The oil can be filled from either the oil fill hole in the hub or through the rubber plug hole in the cap itself.

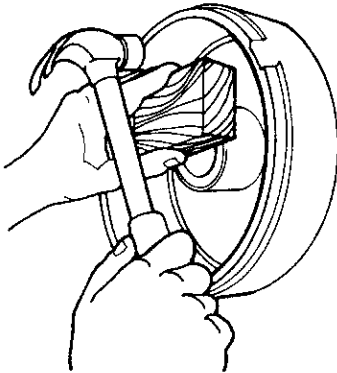
RECOMMENDED WHEEL BEARING LUBRICATION SPECIFICATIONS		APPROVED SOURCES
GREASE: THICKENER TYPE ----- Lithium Complex DROPPING POINT ----- 230°C (446°F) Minimum CONSISTENCY ----- NLGI No. 2 ADDITIVES ----- EP, Corrosion and Oxidation Inhibitors BASE OIL ----- Solvent Refined Petroleum Oil BASE OIL VISCOSITY ----- @ 40°C (104°F) 150 cSt (695 SUS) Min. VISCOSITY INDEX ----- 80 Minimum POUR POINT ----- -10°C (14°F) Minimum		MOBIL OIL Mobilgrease HP EXXON/STANDARD Ronex MP KENDALL REFINING CO. Kendall L-427 ASHLAND OIL CO. Valvoline Val-plex EP Grease PENNZOIL PROD. CO. Premium Wheel Bearing Grease 707L
OIL: SAE 90 Hypoid Gear (Hypoid Rear Axle Oil) (Use only with hubs equipped with oil option)		UNION OIL CO. Union MP Gearlube - LS EXXON COMPANY, USA Gear Oil GX 80W-90 MOBIL OIL CORP. Mobilube SHC 75W-90 PENNZOIL PROD. CO. Multi-Purpose Gear Lubricant 4092 Multi-Purpose Gear Lubricant 4096

NOTE: THE CONVENIENT LUBRICATION PROVISIONS OF THE E-Z LUBE AND THE OIL LUBRICATION OPTIONS MUST NOT REPLACE PERIODIC INSPECTION OF THE BEARINGS.

SEAL INSPECTION AND REPLACEMENT

Whenever the hub is removed, inspect the seal to assure that it is not nicked or torn and is still capable of properly sealing the bearing cavity. If there is any question of condition, **replace the seal**. Use only the seals specified in the Seal Replacement Chart. To replace the seal follow the procedure on page 20.

1. Pry the seal out of the hub with a screwdriver. Never drive the seal out with the inner bearing as you may damage the bearing.
2. Apply a PERMATEX™ sealant to the outside of the seal.
3. Tap the new seal into place using a clean wood block.



SEAL REPLACEMENT CHART			
BRAKE SIZE	HUB	SEAL PART NO.	
		STD	E-Z
7 x 1 1/2	4 or 5 Bolt	10-9	10-60
10 x 1 1/2	4 or 5 Bolt	10-42	NA
10 x 2 1/2	4 or 5 Bolt	10-4	10-19
12 x 2	4 or 6 Bolt	10-1	10-10
12 x 2	5 Bolt Demount	10-1	10-10
12 x 2	8 Bolt	10-1	10-10
12 x 2*	6 Bolt*	10-54	NA

*Special Application with 2.25 diameter seal journal

BEARING ADJUSTMENT AND HUB REPLACEMENT

If the hub has been removed or bearing adjustment is required, the following adjustment procedure must be followed:

1. After placing the hub, bearings, washers, and spindle nut back on the axle spindle in reverse order as detailed in the previous section on hub removal, rotate the hub assembly slowly while tightening the spindle nut to approximately 50 lb-ft. (12" wrench or pliers with full hand force)
2. Then loosen the spindle nut to remove the torque. **DO NOT ROTATE THE HUB.**
3. Finger tighten the spindle nut until just snug.
4. Back the spindle nut out slightly until the first castellation lines up with the cotter key hole and insert the cotter pin. (Or locking tang in the case of E-Z Lube.)
5. Bend over the cotter pin legs to secure the nut. (or locking tang in the case of E-Z Lube)
6. Nut should be free to move with only restraint being the cotter pin or locking tang.

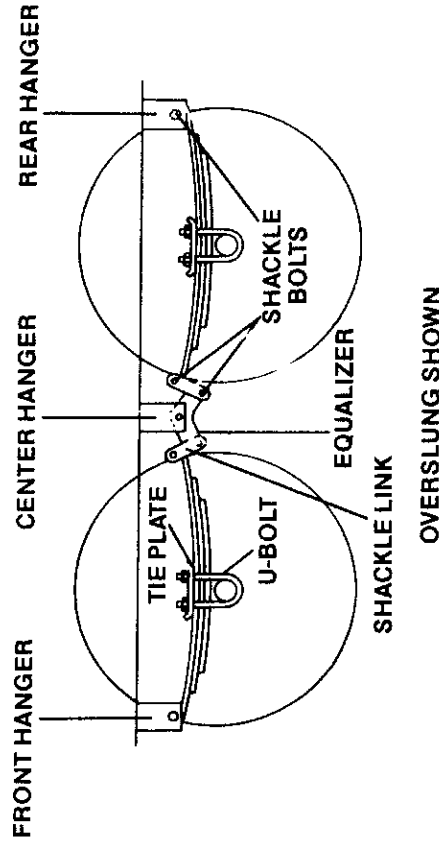
SUSPENSION TYPES

The suspension system incorporated into Dexter axles are designed to provide the trailer owner three basic functions:

1. Attach the axle to the trailer
2. Dampen the effects of road shock
3. Provide stability to the trailer

All Dexter suspension systems are available in single and multiple axle configurations. These suspension systems are available in three types which are discussed below.

DOUBLE EYE LEAF SPRINGS

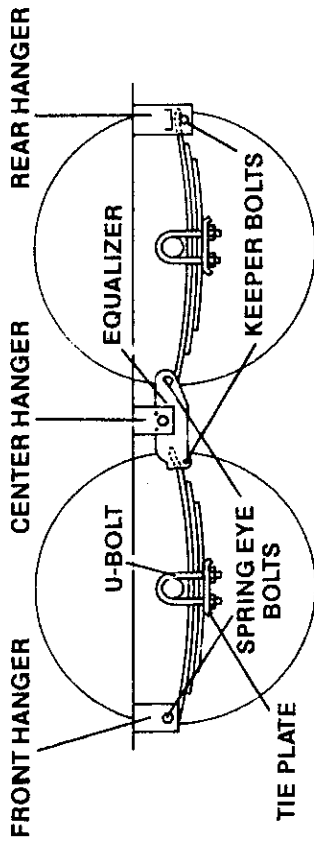


Double eye springs have eyes formed in each end of the spring and are attached to the trailer as follows:

1. The front spring eye is attached directly to the front hanger with a bolt and nut.
2. The rear spring eye is attached to a pair of shackle links which are attached to either a rear hanger (in the case of single axle installation) or into an equalizer (in the case of a multiple axle installation).

The articulation of this suspension occurs when the spring becomes loaded and consequently lengthens. The double pivot action of the shackle links accommodates this articulation and allows the system to move freely. In multiple axle installations the action is the same but with the additional movement of the equalizer assembly which serves to transfer instantaneous loads from one axle to another in an effort to "equalize" the load between the axles.

SLIPPER LEAF SPRINGS



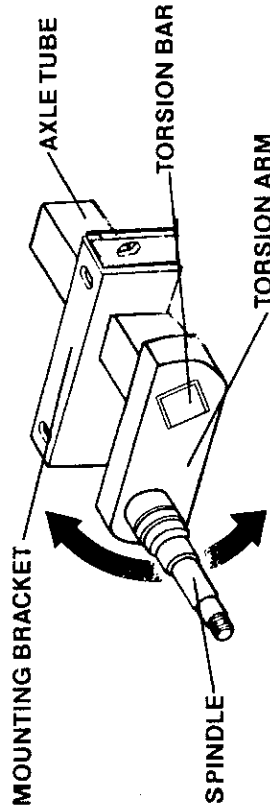
UNDERSLUNG SHOWN

Slipper springs have an eye formed in one end only with the other end formed into a reverse curve. The attachment of these springs is as follows:

1. The front eye is attached directly into the front hanger with a bolt and nut.
2. The rear end of the spring is captured in the rear hanger or equalizer with a "keeper bolt" that prevents the spring from coming out when the trailer is jacked up for service.

The articulation of this suspension occurs when the rear end of each slipper spring slides against the wear surfaces provided in the rear hangers or equalizers. This suspension is also available in single and multiple axle configurations.

TORFLEX SUSPENSION



The TORFLEX suspension system is a torsion arm type suspension which is completely self contained within the axle tube. It attaches directly to the trailer frame using brackets which are an integral part of the axle assembly. The TORFLEX axle provides improved suspension characteristics relative to leaf spring axles through the unique arrangement of a steel torsion bar surrounded by four natural rubber cords encased in the main structural member of the axle beam. The wheel/hub spindle is attached to a lever, called the torsion arm, which is fastened to the rubber encased bar. As load is applied, the bar rotates causing a rolling/compressive resistance in the rubber cords. This action provides the same functions as conventional sprung axles with several operating advantages including independent suspension.

INSPECTION AND REPLACEMENT

All the components of your suspension system should be visually inspected at least every 6,000 miles for signs of exercise wear, elongation of bolt holes, and loosening of fasteners. Whenever loose or replaced, the fasteners in your suspension system should be torqued as detailed in the charts below.

ITEM	Torque (lb-ft)	
	Minimum	Maximum
3/8" U-Bolt	30	35
7/16" U-Bolt	45	60
1/2" U-Bolt	45	60
Shackle Bolt Spring Eye Bolt Equalizer Bolt	Snug fit only. Parts must rotate freely. Locking nuts or cotter pins are provided to retain nut-bolt assembly.	
Shoulder Type Shackle Bolt	30	50

Worn spring eye bushings, sagging springs, or broken springs should be replaced using the following method.

1. Support the trailer with the wheels just off the ground. FOLLOW THE TRAILER MANUFACTURERS RECOMMENDATIONS FOR LIFTING AND SUPPORTING THE UNIT. DO NOT LIFT OR PLACE SUPPORTS ON ANY PART OF THE SUSPENSION SYSTEM.
2. After the unit is properly supported place a suitable block under the axle tube near the end to be repaired. This block is to support the weight of the axle only so that suspension components can be removed.
3. Disassemble the U-bolts, nuts, and tie plates.
4. Remove the spring eye bolts and remove the spring and place on a suitable work surface.
5. If the spring eye bushings are to be replaced, drive out the old bushing using a suitable drift punch. **CAUTION: BE SURE TO WEAR SAFETY GLASSES WHEN REMOVING OR INSTALLING FORCE FITTED PARTS. FAILURE TO COMPLY MAY RESULT IN SERIOUS EYE INJURY.**
6. Drive the new bushing into the spring eye using a piloted drift punch or a close fitting bolt inserted through the bushing.
7. Re-install repaired or replaced components in reverse order.

Note: For multiple axle units, the weight of each axle must be supported as outlined in Step 2 before disassembly of any component of the suspension system.

If the equalizer or equalizer bushings must be replaced, follow the instructions above for lifting and supporting the trailer unit and then proceed as follows:

1. With both axles blocked up, remove the spring eye bolt, shackle bolt, and equalizer bolt from the equalizer to be repaired or replaced.
2. Take the equalizer to a suitable work surface and remove the worn bushings using a suitable drift punch.
3. Drive the new bushings into place using a piloted drift punch or a close fitting bolt through the bushing. **CAUTION: BE SURE TO WEAR SAFETY GLASSES WHEN REMOVING OR INSTALLING FORCE FITTED PARTS. FAILURE TO COMPLY MAY RESULT IN SERIOUS EYE INJURY.**
4. Reassemble in reverse order.

All of the pivot points of your suspension system have been fitted with anti-friction bearing materials which do not require routine lubrication. However, when otherwise servicing the unit, these pivot points may be lubricated if you so desire.

Except for periodic inspection of the fasteners used to attach the TORFLEX axle to the vehicle frame, no other suspension maintenance is required on TORFLEX axles. They are, of course, subject to the maintenance and inspection procedures regarding brakes, hubs, bearings, seals, wheels, and tires as outlined in this manual.

WHEEL SELECTION

Wheels are a very important and critical component of your running gear system. When specifying or replacing your trailer wheels it is important that the wheels, tires, and axle are properly matched. The following characteristics are extremely important and should be thoroughly checked when replacement wheels are considered.

1. **Bolt Circle.** Many bolt circle dimensions are available and some vary by so little that it might be possible to attach an improper wheel that does not match the axle hub. Be sure to match your wheel to the axle hub.
2. **Capacity.** Make sure that the wheels have enough load carrying capacity and pressure rating to match the maximum load of the tire and trailer.
3. **Offset.** This refers to the relationship of the center line of the tire to the hub face of the axle. Care should be taken to match any replacement wheel with the same offset wheel as originally equipped. Failure to match offset can result in reducing the load carrying capacity of your axle.
4. **Rim Contour.** **WARNING: Use only the approved rim contours as shown in the Tire and Rim Yearbook or the tire manufacturers catalog. The use of other rim contours is dangerous. Failure to use the proper rim contour can result in explosive separation of the tire and wheel and could cause a serious accident.**

WARNING: DO NOT ATTEMPT TO REPAIR OR MODIFY A WHEEL. EVEN MINOR MODIFICATIONS CAN HAVE A GREAT EFFECT. DO NOT INSTALL A TUBE TO CORRECT A LEAK THROUGH THE RIM. IF THE RIM IS CRACKED, THE AIR PRESSURE IN THE TUBE MAY CAUSE THE PIECES OF THE RIM TO EXPLODE WITH GREAT FORCE AND CAN CAUSE SERIOUS INJURY OR DEATH.

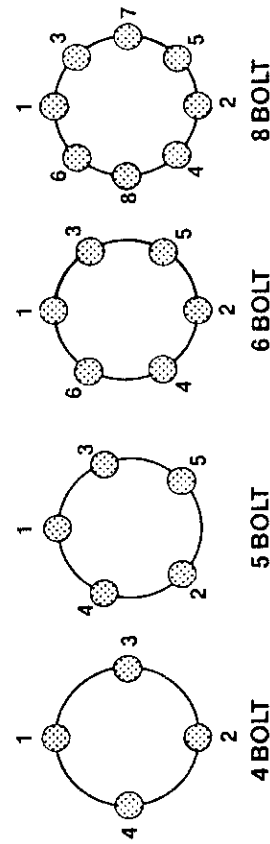
TORQUE REQUIREMENTS

It is extremely important to apply and maintain proper wheel mounting torque on your trailer axle. Torque is a measure of the amount of tightening applied to a fastener (nut or bolt) and is expressed as length times force. A force of 90 pounds applied at the end of wrench one foot long will yield 90 lb-ft of torque. Torque wrenches are the best method to assure that the proper amount of torque is being applied to a fastener. **NOTE: Wheel nuts or bolts must be applied and maintained at the proper torque levels to prevent loose wheels, broken studs, and possible dangerous separation of wheels from your axle.** Be sure to use only the fasteners matched to the cone angle of your wheel. (usually 60 or 90 degrees)

The proper procedure for attaching your wheels is as follows:

1. Start all bolts or nuts by hand to prevent cross threading.
2. Tighten bolts or nuts in the sequence detailed below.
3. The tightening of the fasteners should be done in stages. Following the recommended sequence, first tighten all the fasteners to 20-25 lb-ft, then to 50-60 lb-ft, and finally to 85-95 lb-ft.
4. Wheel nuts/bolts should be torqued before first road use and after each wheel removal. Check and retorqued after the first 25 miles and again at 50 miles. Check periodically thereafter.

TORQUE SEQUENCE



TIRES


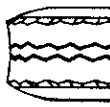
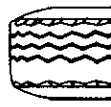
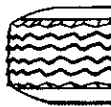
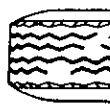
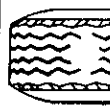
Before mounting tires onto wheels make certain that the rim size and contour is approved for the tire as shown in the Tire and Rim Association Yearbook or the tire manufacturers catalog. Also make sure the tire will carry the rated load.

If the tires are not equal on all tires due to trailer weight distribution, use the tire rated for the heaviest wheel position. **Note:** The capacity rating molded into the sidewall of the tire is not always the proper rating for the tire if used in a trailer application. Use the following guideline:

1. LT and ST tires. Use the capacity rating molded into the tire.
2. Passenger Car tires. Use the capacity rating molded into the tire sidewall **divided by 1.10**.

Use tire mounting procedures as outlined by the Rubber Manufacturers Association or the tire manufacturers.

Tire inflation pressure is the most important factor in tire life. Inflation pressure should be as recommended for the load but in no case should exceed the tire or rim maximum pressure rating. Inflation pressure should be checked cold before operation. Do not bleed air from tires when they are hot. Check inflation pressure weekly during use to insure the maximum tire life and tread wear. The following tire wear diagnostic chart will help you pinpoint the causes and solutions of tire wear problems. **Note:** Tire wear should be checked frequently because once a wear pattern becomes firmly established in a tire it is difficult to stop, even if the underlying cause is corrected.

TIRE WEAR DIAGNOSTIC CHART			
WEAR PATTERN		CAUSE	ACTION
	CENTER WEAR	Over inflation	Adjust pressure to particular load per tire catalog
	EDGE WEAR	Under inflation	Adjust pressure to particular load per tire catalog
	SIDE WEAR	Loss of camber or overloading	Make sure load does not exceed axle rating. Align at alignment shop
	TOE WEAR	Incorrect toe-in	Align at alignment shop.
	CUPPING	Out-of-balance	Check bearing adjustment and balance tires
	FLAT SPOTS	Wheel lockup and tire skidding	Avoid sudden stops when possible and adjust brakes

STORAGE PREPARATION

If your trailer is to be stored for an extended period of time or over the winter, it is important that the trailer be prepared properly.

1. Remove the emergency breakaway battery and store inside, out of the weather. Charge the battery at least every 90 days.
 2. Jack up the trailer and place jack stands under the trailer frame so that the weight will be off the tires. Follow trailer manufacturers guidelines to lift and support the unit.
- Never jack up or place jack stands on the axle tube or on the equalizers.**

3. Lubricate mechanical moving parts such as the hitch, and suspension parts, that are exposed to the weather.
4. Boat trailer axles are subject to repeated immersion. Before storing, remove brake drums; clean, dry, and relubricate moving brake components; inspect bearings - clean and relubricate.

Note: On oil lubricated hubs the upper part of the roller bearings are not immersed in oil and are subject to potential corrosion. For maximum bearing life it is recommended that you revolve your wheels periodically (every 2-3 weeks) during periods of prolonged storage.

AFTER PROLONGED STORAGE-INSPECTION PROCEDURES

Before removing trailer from jack stands:

1. Remove all wheels and hubs or brake drums. Note which spindle and brake that the drum was removed from so that it can be reinstalled in the same location.
2. Inspect suspension for wear.
3. Check tightness of hanger bolt, shackle bolt, and U-bolt nuts per recommended torque values.
4. Check brake linings, brake drums and armature faces for excessive wear or scoring.
5. Check brake magnets with an ohmmeter. The magnets should check 3.2 ohms. If shorted or worn excessively, replace.
6. Lubricate all brake moving parts using a high temperature brakelubricant (LUBRIPLATE or Equivalent). **CAUTION:** Do not get grease or oil on brake linings or magnet face.
7. Remove any rust from braking surface and armature surface of drums with a fine emery paper or crocus cloth. Protect bearings from contamination while so doing.
8. Inspect oil or grease seals for wear or nicks. Replace if necessary.
9. Lubricate hub bearings. Refer to procedure in manual.
10. Reinstall hubs and adjust bearings per instructions in manual.
11. Mount wheels per instructions in manual.

TRIP PREPARATION CHECKLIST

There are a number of simple rules to follow in caring for your trailer axle assembly that can add to its life -- and in the case of some of these rules, you may be protecting your own life as well. Using the following checklist before starting a trip with your trailer is highly recommended. Some of these items should be checked 2-3 weeks prior to planned trip to allow sufficient time to perform maintenance.

1. Check your maintenance schedule and be sure you are up-to-date.
2. Check hitch. Is it showing wear? Is it properly lubricated?
3. Fasten safety chains and breakaway switch actuating chain securely. Make certain the breakaway battery is fully charged.
4. Inspect towing hookup for secure attachment.
5. Load your trailer so that approximately 10% of the trailers total weight is on the hitch. For light trailers this should be increased to 15%.
6. **DO NOT OVERLOAD**. Stay within your gross vehicle rated capacity. (Consult your trailers identification plate)
7. Inflate tires according to manufacturers specifications; inspect tires for cuts, excessive wear, etc.
8. Check wheel mounting nuts/bolts with a torque wrench. Torque, in proper sequence, to the levels specified in this manual.
9. Make certain brakes are synchronized and functioning properly
10. Check tightness of hanger bolt, shackle bolt, and U-bolt nuts per torque values specified in manual.
11. Check operation of all lights.
12. Check that your trailer is towing in a level position and adjust hitch height if required.

MAINTENANCE SCHEDULE

Item	Function Required	Weekly	3 Months or 3000 Miles	6 Months or 6000 Miles	12 Months or 12000 Miles	Refer to
Brakes	Test That They Are Operational		At Every Use			
Brake Adjustment	Adjust to Proper Operating Clearance		●			9
Brake Magnets	Inspect for Wear and Current Draw			●		10,13
Brake Linings	Inspect for Wear or Contamination				●	11
Brake Controller	Check for Correct Amperage & Modulation			●		7
Trailer Brake Wiring	Inspect Wiring for Bare Spots, Fraying, Etc.				●	13
Breakaway System	Check Battery Charge and Switch Operation		At Every Use			
Hub/Drum	Inspect for Abnormal Wear or Scoring				●	16
Wheel Bearings and Cups	Inspect for Corrosion or Wear. Clean & Repack				●	17,18
Seals	Inspect for Leakage. Replace if Removed				●	19,20
Springs	Inspect for Breakage, Wear, Loss of Arch				●	23,24
Suspension Parts	Inspect for Bending, Loose Fasteners, Wear			●		23
Hangers	Inspect Welds				●	
Wheel Nuts and Bolts	Tighten to Specified Torque Values		●			25
Wheels	Inspect for Cracks, Dents, or Distortion			●		25
Tire Inflation Pressure	Inflate Tires to Mfg's Specifications	●				26
Tire Condition	Inspect for Cuts, Wear, Bulging, Etc.		●			26

With this information, you can determine if any single component (e.g., tire or axle) is overloaded. If you find an overload condition, you should redistribute or eliminate cargo to help ensure safe travel.

Towing Guidelines

TrailManor developed a system, unique in the industry, to evaluate weight distribution and position the trailer's axles to eliminate sway and ensure excellent tracking. Loading heavy cargo too far to the rear of your trailer could offset this balance and cause sway conditions. We recommend that you load the heaviest cargo over the axle or forward of the axle to minimize the effects on your trailer's handling. If you experience sway, gently apply your trailer's brakes and, if possible, slightly accelerate to straighten the trailer. Slowing down suddenly by using your tow vehicle's brakes could make the problem worse. Drivers overcompensating their steering can also magnify sway. If you experience sway, evaluate the cargo placement and redistribute it as necessary.

Excessive load behind a tow vehicle's rear wheels, caused by the weight of the trailer's tongue or cargo in the tow vehicle, may make the tow vehicle unstable and cause sway. A load-equalizing hitch may be used to distribute the trailer's tongue weight more evenly on the tow vehicle. Particularly with front-wheel-drive tow vehicles, traction and handling characteristics may also be improved through use of a load-equalizing hitch. An improperly adjusted load-equalizing hitch may put undue stress on your trailer and tow vehicle and may worsen handling, so please refer to hitch manufacturer's instructions when adjusting such a system.

Always consider the effects of extra cargo weight when adjusting your brake controller (if adjustable) and leave extra following distance to ensure safe stopping.

TrailManor trailers have a low profile, which minimizes aerodynamic effects during travel and helps make TrailManor trailers the safest travel trailers available. However, be aware of the added surface area your trailer presents to strong winds and turbulence from large trucks.

TrailManor trailers are light weight and have a low center of gravity. However, when towing any trailer, you should reduce cornering speeds and minimize abrupt maneuvers. We recommend that you practice maneuvering your trailer in an unpopulated area to get a feel for its handling characteristics before venturing into highly trafficked areas.

Please discuss with your dealer and research other towing considerations such as brake controller operation and adjustment, tire care (particularly inflation), hitch operation, safety chain use, and trailer maintenance before towing your trailer.

Trailer Weight and Towing Guidelines

Following are definitions of weight terms used in the RV industry, a sample weight sticker, instructions for weighing your trailer, and guidelines for safe towing.

Gross Vehicle Weight Rating (GVWR) is the maximum permissible weight of the trailer when fully loaded. It includes all weight at the trailer axle(s) and tongue.

Unloaded Vehicle Weight (UVW) is the approximate weight of the trailer as manufactured at the factory. It includes all weight at the trailer axle (s) and tongue.

Cargo Carrying Capacity (CCC) is equal to the GVWR minus each of the following: UVW, full fresh (potable) water weight (including water heater), and full LP-gas weight.

Gross Axle Weight Rating (GAWR) is the maximum permissible weight on the trailer axle(s). This includes the weight of the axle, wheels, tires, and associated hardware and assumes that the axle is loaded equally on both sides.

VIN OR SERIAL NUMBER 5

GVWR (GROSS VEHICLE WEIGHT RATING) IS THE MAXIMUM PERMISSIBLE WEIGHT OF THIS TRAILER WHEN FULLY LOADED. IT INCLUDES ALL WEIGHT AT THE TRAILER AXLE(S) AND TONGUE OR PIN.

UVW (UNLOADED VEHICLE WEIGHT) IS THE WEIGHT OF THIS TRAILER AS MANUFACTURED AT THE FACTORY. IT INCLUDES ALL WEIGHT AT THE TRAILER AXLE(S) AND TONGUE OR PIN. IF APPLICABLE, IT ALSO INCLUDES FULL GENERATOR FLUIDS, INCLUDING FUEL, ENGINE OIL AND COOLANTS.

CCC (CARGO CARRYING CAPACITY) IS EQUAL TO GVWR MINUS EACH OF THE FOLLOWING: UVW, FULL FRESH (POTABLE) WATER WEIGHT (INCLUDING WATER HEATER), FULL LP-GAS WEIGHT.

CARGO CARRYING CAPACITY (CCC) COMPUTATION		POUNDS	KILOGRAMS
GVWR		4166	1894
MINUS UVW		3095	1407
MINUS FRESH WATER WEIGHT OF	GALLONS @ 8.3 LB/GAL	382	174
MINUS LP-GAS WEIGHT OF	GALLONS @ 4.5 LB/GAL	40	18
= CCC FOR THIS TRAILER*		649	295

*DEALER INSTALLED EQUIPMENT WILL REDUCE CCC

CONSULT OWNER MANUAL(S) FOR SPECIFIC WEIGHING INSTRUCTIONS AND TOWING GUIDELINES. CD-132

Weighing Your Trailer

Studies have shown that RV owners quite often load their RVs beyond allowable limits. To ensure that your trailer is not overloaded, we strongly recommend that you periodically weigh your trailer at a truck weigh station that will allow you to weigh your trailer one wheel at a time.

TECHNICAL BULLETIN

RELEASED BY: ITC INCORPORATED

DATE: June 20, 2001

Cleaning The Fontana® Exterior Shower

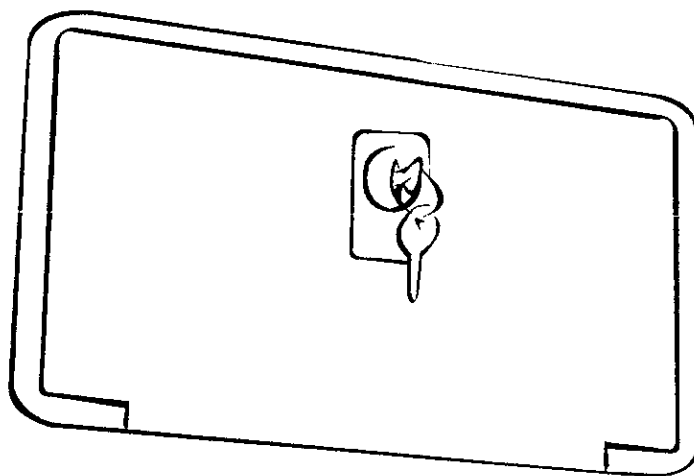
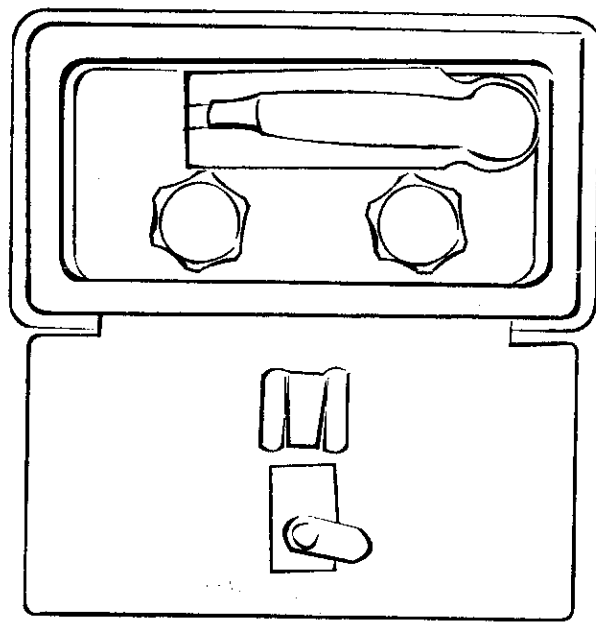
To Clean Your Fontana® Exterior Shower, Use Mild Soap & Water Only:

In direct response to customer concerns that competitive shower doors fade and discolor due to exposure, our Fontana® showers have been manufactured using a UV Inhibitor spray so they maintain their true color without yellowing due to weather / sun exposure.

We've added this feature at no cost to the consumer in an effort to maintain customer satisfaction and differentiate ourselves further from the other manufacturers in the marketplace who may not be so responsive.

Due to the properties of the UV Inhibiting spray that your shower was treated with during the manufacturing process, use of an alcohol-based product may break down the properties of the spray. The effectiveness of the inhibitor may be reduced. It may also develop a gooey residue on the surface of the door. For the integrity of the product, please use only mild soap & water to clean your shower.

Thank you for your continued faith in the products ITC delivers. We look forward to serving you again in the future.



CORPORATE: 230 E. Lakewood Blvd., PO Box 8338, Holland, MI 49422-8338
Phone: 616-396-1355 ~ Fax: 616-396-1152 ~ E-Mail: itc-inc@egl.net

ELKHART: 2421 S. Nappanee Street, Elkhart, IN 46517
Phone: 219-389-8986 ~ Fax: 219-389-8687 ~ E-Mail: tfitcinc@earthlink.net



THE TRAVEL TRAILER THAT TOWS LIKE A POP-UP

POST OFFICE BOX 130
LAKE CITY, TENNESSEE 37769
865/426-7426

issues this

LIMITED WARRANTY

to the original consumer purchaser of the vehicle

This warranty is not enforceable by anyone other than the original consumer purchaser. THIS WARRANTY AND ALL IMPLIED WARRANTIES ARE LIMITED IN DURATION TO ONE (1) YEAR FROM THE DATE OF DELIVERY TO THE ORIGINAL CONSUMER PURCHASER. (Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.)

TrailManor, Inc. warrants to the first person who purchases and uses this family camping vehicle for its intended purpose, which is recreational travel and family camping, that, to the best of the knowledge of TrailManor, Inc., this vehicle was designed, built and equipped to conform, at the time it left the Manufacturer's control, with all applicable federal, state and industry regulations, standards and codes; that it is reasonably fit for the normal limited uses for which such vehicles are designed and intended; and that except for variations and imperfections which do not affect the suitability for the limited uses and/or are acceptable in this type of product, that it was, at the time it left TrailManor, Inc.'s control, free of defects in materials and workmanship.

In the event that a defect in parts or workmanship, attributable to the original manufacture or installation is found to exist, TrailManor, Inc. will bear the cost of the repair or replacement of such defective part or workmanship, provided that the consumer:

- A) notifies the TrailManor dealer of the defect within ten (10) days discovery of it;
- B) returns the vehicle to the dealer promptly, as scheduled; and
- C) pays any freight costs, or import duties or fees involved.

TrailManor, Inc. does not control the scheduling of service work at the dealers, and you may encounter some delay in scheduling or completion of work.

If you need assistance in obtaining the benefit of this Limited Warranty, please contact TrailManor, Inc. at the above telephone number between 8:00 a.m. and 4:30 p.m. EST on regular business days.

AS THE WARRANTOR, TRAILMANOR, INC. SPECIFICALLY EXCLUDES ANY OBLIGATION FOR CONSEQUENTIAL DAMAGES OR INCIDENTAL EXPENSES FOR THE BREACH OF THIS WARRANTY OR ANY IMPLIED WARRANTY. Consequential damages or incidental expenses include, but are not limited to, such items as loss of use of the vehicle, loss of time, inconvenience, expense for transporting the vehicle, telephone, travel, lodging, or commercial losses. (Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.)

Failure to return warranty card does not diminish your warranty rights during the warranty period. Returning the warranty card enables TrailManor to notify owners of modification updates or possible recall notices.

Limited lifetime warranty on torsion bars under the same terms and conditions as listed above.

(Continued On Back)

THIS WARRANTY DOES NOT APPLY TO:

- A) Items which are added or changed after the vehicle left the possession of TrailManor, Inc.
- B) Any vehicle which is used for rental or other commercial purposes.
- C) Normal wear and usage, such as fading or discoloration of fabrics, or the effects of moisture condensation inside the vehicle.
- D) Minor imperfections which do not affect the suitability of the vehicle for its intended use.
- E) Damage resulting from tire failure.
- F) Costs incurred for transportation of the vehicle to a dealer, or costs incurred as the result of consumer's request to have repairs performed at other than a dealership.
- G) This Limited Warranty does not apply to or cover:

Refrigerator

Propane furnace

or any other component which is warranted separately by its manufacturer, if the vehicle is equipped with these components. The written warranty provided by the Manufacturer of those components is a direct responsibility of that Manufacturer to you as the consumer. TrailManor, Inc. makes no warranty as to those components. Please refer to the written warranties issued by each such component manufacturer for the terms and provisions of their written warranty undertakings.

NOTE: This vehicle, like your car or your boat, requires proper care and maintenance by the owner. The accessories and appliances must be properly used. Failure to provide the proper care and maintenance, or to observe the proper handling and use of accessories and appliances will result in damage to the vehicle or its components. Instructions regarding care and maintenance, and proper usage of appliances and accessories are contained in the Owner's Manual and the Appliance Manuals which accompany this vehicle. TrailManor, Inc. will not pay for the cost of repairing or replacing items or components which are damaged as a result of lack of care or proper use, nor for damage to other parts of the vehicle which result from such lack of care and proper use.

IT IS IMPORTANT that when a defect is noted, the dealer be promptly notified, and that you comply with his instructions and scheduling regarding corrections. Further damage to the vehicle resulting from the failure or refusal of the consumer to give prompt notification and comply with schedules and instructions regarding the correction of defects WILL NOT BE PAID for by TrailManor, Inc.

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS. AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.

POTABLE WATER PUMP

Installation and Operation Manual

SHURflo has supplied pumps to the manufacturers of RV's for over 30 years. Our patented Tri-a-fram® line of potable water pumps deliver smooth, consistent flow at all ranges of operation, while drawing low current. The balanced diaphragm design incorporates two precision ball bearings for long life. SHURflo pumps are 100% tested for proper operation before they leave the factory. When installed correctly, SHURflo water pumps will provide years of quiet operation.

A SHURflo pump in combination with a low back pressure water system can exceed all expectations. For unmatched reliability and trouble-free performance request SHURflo's complete line of water system products.

GENERAL INFORMATION

SHURflo realizes that in many instances our pump is being installed as a replacement pump within an existing system.

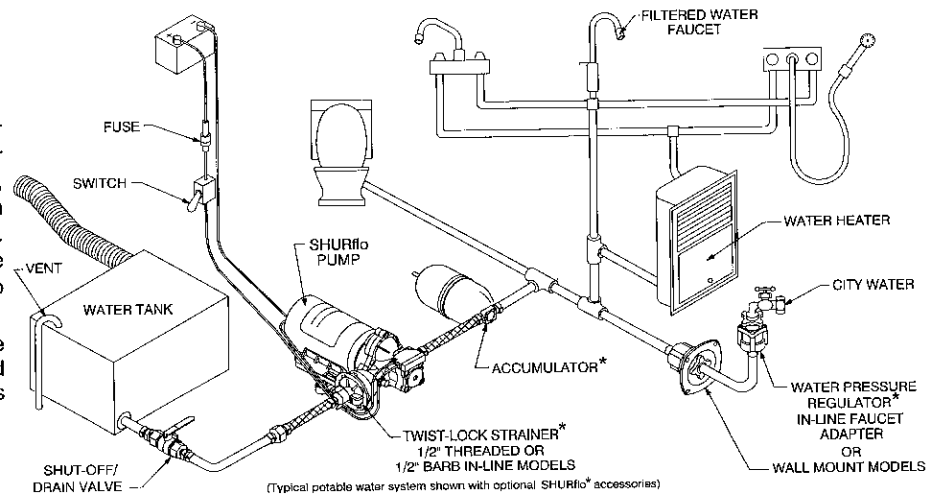
The following guidelines should be considered to achieve optimum pump operation

MOUNTING

- The pump can be at the same level or below the water tank. It may be positioned above the water tank if needed, as it is capable of a 6 ft. [1.8M] vertical prime. Horizontal inlet tubing will allow priming to 30 ft. [9M].
- Consider a location that allows easy access if maintenance is required. The pump should not be located in an area less than one cubic foot unless adequate ventilation is provided. Excessive heat may trigger the integral thermal breaker and interrupt operation. When the temperature drops the breaker will automatically reset and start operation.
- The pump may be mounted in any position. If mounting the pump vertically, the pump head should be in the down position so that in the unlikely event of a leak, water will not enter the motor.
- Use #8 hardware to fasten the pump. Choose a **solid** surface (thick plywood) that will not amplify pump operation. The mounting feet are intended to isolate the pump from the mounting surface; over-tightening, flattening, or use of oversized screws will reduce the ability to isolate vibration/noise.

ELECTRICAL

- The pump should be on a dedicated (individual) circuit, protected by the specified fuse indicated on the motor label.
- A switch rated at or above 15 amps is recommended, and must interrupt current flow on the positive (+ red) lead. Marine applications should use U/L approved marine duty (ignition protected) switches and pumps.
- Wire size (gauge/mm²) is based on the distance from the power source to the pump. Recommended size wire is #14 gauge [2.5mm²]. For lengths of 20-50ft. [6-15M] use #12 gauge [4 mm²].
- The pump must be grounded to a "known ground" (frame). The ground wire must be the same size (gauge/mm²) as the positive wire.
- The total current draw on the circuit **must not** exceed 15 amps. If the pump is used in conjunction with other components, overload current protection (fuse or circuit breaker) and wire size must be for the total amp requirement of all devices on the circuit.



(Typical potable water system shown with optional SHURflo® accessories)

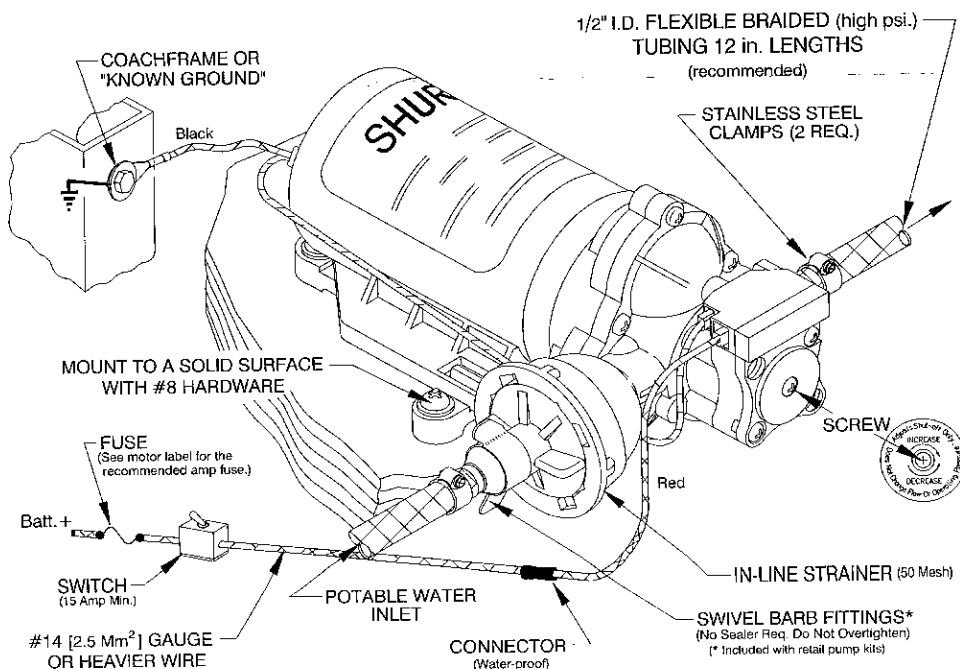
PLUMBING

- SHURflo recommends at least 1ft. [.3 M] of 1/2" [13mm] I.D. flexible high pressure tubing to both ports. Ideally the pumps ports/strainer **should not** be connected to plastic or rigid pipe. The pump's normal oscillation may transmit through rigid plumbing causing noise, and possibly loosen or crack components.
- Installation of a 50 mesh strainer (SHURflo P/N 170) is recommended to prevent foreign debris from entering the pump.
- SHURflo swivel barb fittings provide easy removal if maintenance or access is required. The fittings are designed with a "taper-seal", creating a water tight connection when **hand-tightened**. **Never** use Teflon tape or sealing compounds on threads. Sealer may enter the pump causing a failure. **Failure due to foreign debris is not covered under warranty.** Always secure barb tubing connections with properly sized stainless steel clamps to prevent leaks.
- Rapid cycling may be caused by excessive back pressure created by one or more of the following within a plumbing system:
 - ▶ Water filters not on separate feed lines.
 - ▶ Flow restrictors in faucets and shower heads.
 - ▶ Small I.D. lines. Pipe/tubing should be at least 1/2" [13mm] I.D. for main lines.
 - ▶ Restrictive fittings and connections (elbows, "T's", feeder lines to faucets, etc.)

SWITCH SHUT-OFF

Restrictions in a plumbing system may cause the pump to rapid cycle (ON/OFF within 2 sec.) during low flow demands. Cycling should be minimized to prevent pulsating flow, and to achieve maximum pump life.

To determine if adjustment is necessary, turn a faucet ON to lower than average flow of water. The pump should cycle, but its "OFF time" must be 2 sec. or longer. If the cycling is correct, leave well enough alone. If the pump is cycling rapidly increase the setting by turning the screw clockwise (1 1/2 turn MAX.) until the pump operates for 1 sec. with at least 2 sec. "OFF time". If cycling cannot be minimized consider removing plumbing restrictions or simply install a SHURflo Accumulator.



SANITIZING

Potable water systems require periodic maintenance to deliver a consistent flow of fresh water. Depending on use and the environment the system is subject to, sanitizing is recommended prior to storing and before using the water system after a period of storage. Systems with new components, or ones that have been subjected to contamination, should also be disinfected as follows:

NOTE: The sanitizing procedure is in conformance with the approved procedures of RVIA ANSI A119.2 and the U.S. Public Health Service.

1. Use one of the following methods to determine the amount of common household bleach needed to sanitize the tank.
 - A) Multiply "gallons of tank capacity" by 0.13; the result is the ounces of bleach needed to sanitize the tank.
 - B) Multiply "Liters of tank capacity" by 1.0; the result is the milliliters of bleach needed to sanitize the tank.
2. Mix into solution the proper amount of bleach within a container of water.
3. Pour the solution (water/bleach) into the tank and fill the tank with potable water.
4. Open **all** faucets (Hot&Cold) allowing the water to run until the distinct odor of chlorine is detected.
5. The standard solution must have four (4) hours of contact time to disinfect completely. Doubling the solution concentration allows for contact time of one (1) hour.
6. When the contact time is completed, drain the tank. Refill with potable water and purge the plumbing of all sanitizing solution.

TROUBLESHOOTING

Vibration induced by road condition can cause plumbing or pump hardware to loosen. Check for system components that are loose. Many symptoms can be resolved by simply tightening the hardware. Check the following items along with other particulars of your system.

PUMP WILL NOT START/ BLOWS CIRCUIT:

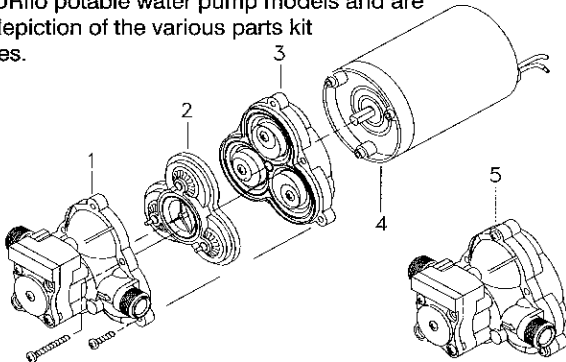
- ✓ Electrical connections, fuse or breaker, main switch, and ground connection.
- ✓ Is the motor hot? Thermal breaker may have triggered; it will reset when cool.
- ✓ Is the voltage present at the switch? Bypass the pressure switch. Does the pump operate?
- ✓ Charging System for correct voltage ($\pm 10\%$) and good ground.
- ✓ For an open or grounded circuit, or motor; or improperly sized wire.
- ✓ For seized or locked diaphragm assembly (water frozen?).

WILL NOT PRIME/SPUTTERS: (No discharge/Motor runs)

- ✓ Is the strainer clogged with debris?
- ✓ Is there water in the tank, or has air collected in the hot water heater?
- ✓ Is the inlet tubing/plumbing sucking in air at plumbing connections (vacuum leak)?
- ✓ Is inlet/outlet plumbing severely restricted or kinked?
- ✓ Proper voltage with the pump operating ($\pm 10\%$).
- ✓ For debris in pump inlet/outlet valves or swollen/dry valves.
- ✓ Pump housing for cracks or loose drive assembly screws.

SERVICE KITS

To insure the correct service kit, order by the complete model number, date of manufacture and other name plate data. Part kits come with complete repair instructions. Pump illustrations may not be representative of all SHURflo potable water pump models and are only for depiction of the various parts kit assemblies.



1	Switch / Check valve and Upper Housing Kit (Replaces all previous switch designs)
2	Valve plate assembly
3	Diaphragm / Drive assembly
4	Motor
5	Complete Pump Head assembly (includes parts #1, 2, 3) (Replaces all previous switch designs)

WINTERIZING

If water is allowed to freeze in the system, serious damage to the plumbing and the pump may occur. Failures of this type will void the warranty. The best guarantee against damage is to completely drain the water system.

NOTE: When used per the manufacturers recommendations **non-toxic antifreeze for potable water** is safe for use with SHURflo pumps.

Refer to the coach manufacturer and other equipment manufactures for their specific winterizing & drainage instructions.

CAUTION: Do not use Automotive Antifreeze to winterize potable water systems. Such solutions are highly toxic. Ingestion may cause serious injury or death.

To properly drain the system perform the following:

1. Drain the water tank. If the tank doesn't have a drain valve, open all faucets allowing the pump to operate (15 min. ON / 15 min. OFF) until the tank is empty.
2. Open all the faucets (including the lowest valve or drain in the plumbing) and allow the pump to purge the water from the plumbing, then turn the pump OFF.
3. Using a pan to catch the remaining water, remove the plumbing at the pump's inlet/outlet ports. Turn the pump ON, allowing it to operate until the water is expelled. Turn OFF power to the pump once the plumbing is emptied. Do not reconnect pump plumbing. Make a note at tank filler as a reminder: "Plumbing is Disconnected".
4. All faucets must be left open to guard against any damage.

PUMP WILL NOT SHUT-OFF / RUNS WHEN FAUCET IS CLOSED:

- ✓ Output side (pressure) plumbing for leaks, and inspect for leaky valves or toilet.
- ✓ For air trapped in outlet side (water heater) or pump head.
- ✓ For correct voltage to pump ($\pm 10\%$).
- ✓ For loose drive assembly or pump head screws.
- ✓ Are the valves or internal check valve held open by debris or is rubber swollen?
- ✓ Pressure switch operation/adjustment, refer to shut-off adjustment for switch.

NOISY OR ROUGH OPERATION:

- ✓ For plumbing which may have vibrated loose.
- ✓ Is the pump plumbed with rigid pipe causing noise to transmit?
- ✓ Does the mounting surface multiply noise (flexible)?
- ✓ For mounting feet that are loose or are compressed too tight.
- ✓ For loose pump head to motor screws. (3 long screws)
- ✓ The motor with pump head removed. Is noise from motor or pump head?

RAPID CYCLING:

- ✓ For restrictive plumbing, flow restrictors in faucets/shower heads.
- ✓ Water filter/purifier should be on separate feed line.
- ✓ Pressure switch shut-off adjustment.

LEAKS FROM PUMP HEAD OR SWITCH:

- ✓ For loose screws at switch or pump head.
- ✓ Switch diaphragm ruptured or pinched.
- ✓ For punctured diaphragm if water is present in the drive assembly.

LIMITED WARRANTY

SHURflo warrants its Potable Water pumps to be free from material and workmanship defects under normal use and service for a period of two (2) years from the date of manufacture indicated on the motor name plate.

The limited warranty will not apply to pumps that were improperly installed, misapplied, or are incompatible with components not manufactured by SHURflo. Pump failure due to foreign debris is not covered under the terms of this limited warranty. SHURflo will not warrant any pump that is physically damaged, or altered outside the SHURflo factory.

Warranty claims may be resolved by an authorized dealer service center, or by a SHURflo service center. Returns are to be shipped with charges pre-paid. Package all returns carefully. SHURflo will not be responsible for freight damage incurred during shipping to a service center.

For complete Limited Warranty details consult Service Bulletin #1050



SHURflo reserves the right to update specifications, prices, or make substitutions.

SHURflo *
5900 Katella Ave.
Cypress, CA 90630
(562) 795-5200 (800) 854-3218
FAX (562) 795-7564
Shipping: 5900C Katella Ave.
Cypress, CA. 90630

SHURflo®
First in Fluid Innovation™

SHURflo East
52748 Park Six Court
Elkhart, IN 46514-5427
(800) 762-8094 (574) 262-0478
FAX (574) 264-2169
<http://www.shurflo.com>
© 1999 Printed in USA

SHURflo Ltd. *
Unit 5 Starling Park
Gatwick Road, Crawley
West Sussex, RH10 2QT
United Kingdom
+44 1293 424000
FAX +44 1293 421880