



# **WELCOME TO THE WORLD OF HI-LO**

**"The worlds most fuel efficient travel trailer."**

## **Hi-Lo LIMITED VEHICLE WARRANTY\***

Hi-Lo Trailer Co., hereinafter called Hi-Lo, 100 Elm Street, Butler, Ohio 44822, constantly strives by manufacturing procedures and inspections before shipment, to insure high standard of quality, workmanship and materials and therefore issue the following limited warranty subject to the limitations and conditions hereinafter provided.

Hi-Lo warrants the trailer to which this warranty applies:

A. To be merchantable and fit for the ordinary purposes for which such trailers are ordinarily used; and

B. Hi-Lo or its dealer will repair or replace, at Hi-Lo's option, any part which has never been subject to another warranty which is found to be defective.

(Note: The component parts of the trailer which are manufactured by others such as tires, running gear, battery, plumbing and electrical fixtures, compressors, pumps, air conditioners, furnaces, stereos, appliances and bedding are covered by the separate warranty, if any, and service policy of the manufacturer of such components. Service on these components will be covered by such manufacturer's warranty and service policy as delivered to the consumer-user at the time of the original purchase of the trailer.)

The warranties expressed in A and B above are in lieu of all other warranties, expressed or implied.

The said warranties contained in A and B above are subject to the following conditions and limitations:

1. All Hi-Lo warranties, express or implied, shall expire twelve (12) months from the date of purchase by the consumer-user; proof of purchase date will be required with all warranty claims. (Note: Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.)

2. The Hi-Lo Trailer must have been used, operated and maintained in accordance with the printed instructions provided to the original consumer-user in the Care and Use Manual.

3. The warranties A and B above, are limited to and extend only to the first purchasing consumer-user.

4. These warranties, A and B above, shall not extend to any trailer or part thereof that has been subjected to abuse, misuse, accident or use or operation contrary to the Care and Use Manual.

5. These warranties, A and B above, shall not extend to a trailer or any part thereof which has been loaned, leased or rented.

6. These warranties, A and B, shall not extend to labor costs or repair costs other than costs of parts found to be defective.

7. Except where required by applicable law, Hi-Lo shall in no event be liable for special or consequential damages. Hi-Lo does not assume responsibility for loss or use of the trailer, loss of time, inconvenience, expense of gasoline, telephone, travel, lodging, loss or damage to personal property or loss of revenues; Hi-Lo does not undertake responsibility to any purchaser of its product for any undertaking, representation or warranty made by dealers or representatives selling its product beyond those representations and warranties herein expressed. (Note: 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.)

8. Hi-Lo may make changes in design and improvements in subsequent vehicles and models without incurring any obligations to make such changes or improvements to units previously manufactured.

### **WARRANTY PROCEDURES**

To obtain warranty repairs, the trailer should be taken to the authorized franchised dealer who sold you the Hi-Lo. This warranty work is to be rendered in accordance with the dealer's franchise service agreement. If the franchised dealer from whom the trailer was purchased is not available, contact Hi-Lo Trailer Co., 100 Elm Street, Butler, Ohio 44822, for instructions as to the nearest franchise dealer or arrangements to bring the trailer to the factory in Butler, Ohio for repairs.

All warranty work shall be performed by an authorized franchise dealer during the time specified in the public day and hours of such dealer. Within reasonable limits, preference will be given to warranty work in accordance with the dealer's franchise agreement.

Warranty work at the factory in Butler, Ohio can only be handled Monday thru Friday between 8:00 a.m. and 2:30 p.m., legal holidays excluded.

The procedures herein outlined and the remedies hereinabove outlined, shall be exclusive remedy for any alleged defect or breach of any warranty.

\*(This warranty gives you specific legal rights, and you may also have other rights which may vary from state to state. You also have implied warranty rights. In the event of a problem with warranty service or performance, you may be able to go to a Small Claims Court, a State Court, or a Federal District Court.)

## INTRODUCTION

Congratulations you have joined a growing group of satisfied travelers, who own a trailer carrying the Hi-Lo mark of quality and distinction. Being a Hi-Lo owner sets you apart as an individual who demands safe trailering comforts.

Hi-Lo designs its telescoping travel trailer to fit the needs of the traveler. For over 25 years, our aerodynamically efficient low travel profile has provided safety, towability, and up to 64% savings in fuel consumption, while our well-planned interiors provide all the roominess, beauty and comforts of home.

It is important that you read this owners manual carefully. This manual is designed to provide you operating instructions, maintenance information, and use tips that make your travel and camping care-free and trouble-free. We also recommend you keep this manual at hand during your trips for easy reference.

Hi-Lo Trailer Co. prides itself in the quality of each trailer's construction and excellent workmanship. Your dealer will fill out a certified customer care registration card and mail it to Hi-Lo Trailer Co., where it is kept on file.

All the employees at Hi-Lo thank you for choosing Hi-Lo as your recreational vehicle.

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# 1. BEFORE YOU LEAVE YOUR DEALER

## 1.1 Check Off List

Before leaving your dealer "be" sure you understand how to:

- ☐ Raise and lower your Hi-Lo properly
- ☐ Operate LP-gas system
  - Light pilots
  - Shut off LP-gas system
- ☐ Operate electrical system
  - Change fuses
  - Reset circuit breakers
  - Change bulbs
  - Check all vehicular lighting
  - Understand usage of power cords (including optional A/C unit)
- ☐ Operate water system
  - Attach hose to city water
  - Fill potable water supply
  - Drain locations
  - Pump switch location
- ☐ Operate drainage system
  - Toilet operation
  - Holding tank chemical addition
  - Sewer hose connection and storage
  - Holding tank evacuation procedures
- ☐ Connect your unit to tow vehicle
  - Hitch ball, coupler, and coupler latch
  - Equalizer bars
  - Safety chains
  - Automotive electrical connector (12 volts)
  - Break-away switch
  - Mirror adjustment
- ☐ Stabilize your unit
  - Leveling procedures
- ☐ Convert into sleeping quarters
  - Dinette
  - Twin beds
  - Sofa bed
  - Swing away bunk

Be sure to fill out registration card and leave with your dealer

## 2. PREPARING FOR TRAVEL

### 2.1 Hitching Up

Note: The hitch ball diameter must be the correct size to mate with the coupler on the trailer. All models require "2" size except 25 ft. and larger models which require "2 5/16" ball size.

1. Move tow vehicle into place so ball on hitch is directly below the ball lock coupler on trailer.
2. Hook up breakaway switch cable. Be sure it is properly attached to tow vehicle.
3. Lower ball lock coupler over hitch ball and secure.
4. Install the stabilizer bars, completely retract jack and remove dolly wheel.
5. Plug in electrical connections and check to see that the turn signals, brake, and trailer marker lights are working properly (may be necessary to equip heavy duty flashers on tow vehicle.)
6. Hook up safety chains.
7. Pull out the breakaway switch actuating pin. Test brakes by attempting to drive away. The breakaway switch is functioning properly if the trailer brakes are activated. Replace breakaway pin.
8. Put step in travel position.

Note: Before you go check inside to make sure all materials are stored securely. Then check to make sure the trailer is in the fully lowered position. We recommend you not tow the trailer in the upright position for any distance. When all is ready, close the doors firmly and lock the outer door. Be sure LP-gas system is turned off, check both bottles.

### 2.2 Load Capacity

Located on the left exterior wall of your trailer, near the front, is the Federal Certification Label which gives the maximum weight-carrying capacities of your trailer and each axle, designated by the letters 'GVWR' and 'GAWR', respectively.

The Gross Vehicle Weight Rating (GVWR) is the maximum your trailer should weigh with water and LP-gas tanks full, and with food, clothing and all other supplies aboard.

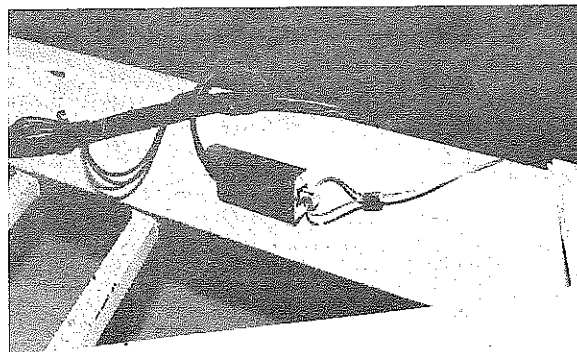
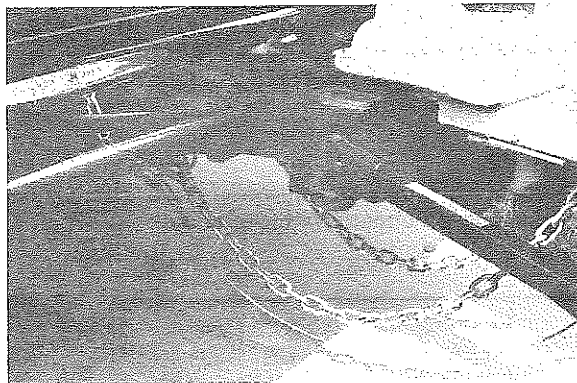
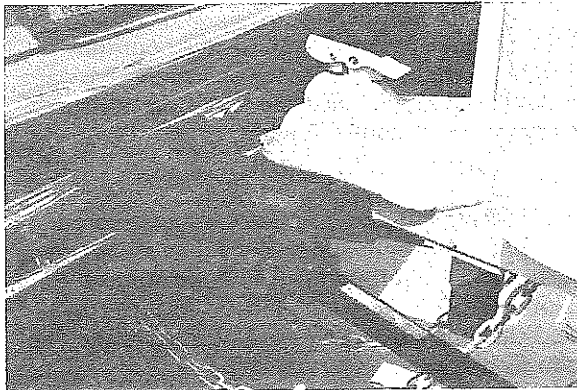
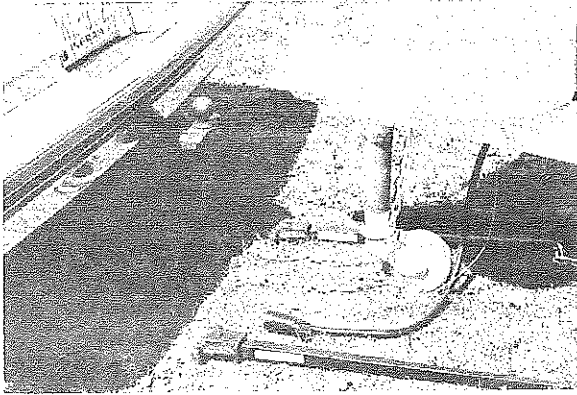
Each axle also has a maximum load bearing capacity referred to as the Gross Axle Weight Rating (GAWR).

Your Hi-Lo is rated as follows:

### 2.3 Weight Distribution

When loading your trailer, 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 axles. Store only light objects on high shelves. Distribute weight to obtain even side to side balance of the loaded vehicle. Secure loose items to prevent weight shifts that could affect the balance of the trailer.

With the trailer fully loaded, drive to a scale, unhitch the trailer from the tow vehicle, and weigh separately the load on the hitch coupler and the load on the axles. The load on each axle should not exceed its GAWR. The total of the axle loads and hitch load should not exceed the GVWR. For best towing stability the load at the hitch coupler should be between 12% and 15% of the fully loaded trailer weight. If a weight-distributing hitch is employed, the load on the axles should also be weighed with the trailer hitched to the tow vehicle to



### 2.3 Weight Distribution (continued)

make certain the load on the axle does not exceed its GAWR. If weight ratings are exceeded, move or remove items to bring all weights below the ratings.

#### Weight of optional equipment

Swing away bed - 80 lbs.

Roof air conditioner - 130 lbs.

Spare tire and mount - 55 lbs.

14 ft. awning - 93 lbs.

### 2.4 Packing and Inspecting Trailer

Part of the fun of trailer travel and camping is the ability to take along recreational equipment such as a boat, motor, fishing gear, and sports equipment. Comfort items such as awnings, folding tables, and chairs add to your camping pleasure. And, you will certainly want to include some of the food stuffs from your own kitchen. Also, be sure to fill your water tank.

Although your Hi-Lo trailer is sturdily built with margins of safety, too much extra weight can damage the under carriage and cause excessive tire wear. Check label GW on left front corner for maximum Gross Vehicle Weight.

Your Hi-Lo trailer is designed and balanced for easier and safer towing so that just the right tongue weight rests on the car hitch. In packing extra equipment, it is important to maintain that balance as near as possible fore and aft. It is also recommended that the heaviest item to be positioned as near as possible to directly over the wheels.

In stowing loose equipment, pack it in such a way as to avoid shifting during acceleration or braking. Pad heavy and sharp items to avoid damaging interiors and equipment. A little extra care and few minutes spent in getting your trailer ready for travel assures a pleasant trip.

### 2.5 Vehicle Inspection

Your vehicle should be in good running order. Also tires, lights, and brakes should be checked before travel.

MODEL* <sup>1</sup>	FACTORY WEIGHT	HITCH WT.	G.A.W.R.	G.V.W.R.	MAX. CARGO WT.	RECOM MENDED HITCH WT.** <sup>2</sup>
20 L	3190	370	<sup>1</sup> 2100-2100	4570	1380	12-15%
22 L&D	3590	420	<sup>2</sup> 2630-2630	5000	1410	12-15%
25 L&B	4175	640	<sup>3</sup> 2720-2720	6000	1825	12-15%
25 RD	4175	510	<sup>3</sup> 2720-2720	6000	1825	12-15%
27 F	4750	690	<sup>4</sup> 2940-2940	6570	1820	12-15%
27 RT&RL	4750	500	<sup>4</sup> 2940-2940	6570	1820	12-15%
33 B	6280	750	<sup>3</sup> 2720-2720	8280	2000	12-15%
32 FB&FL (Fifth Wheel)	7000	1700	<sup>5</sup> 3680-3680	9000	2000	20-25%

<sup>1</sup> - P175/80B13 - 4 Ply Rated    <sup>3</sup> - P205/75B14 - 4 Ply Rated    <sup>5</sup> - P235/75B15 - 6 Ply Rated  
<sup>2</sup> - B78-13 ST - 6 Ply Rated    <sup>4</sup> - P215/75B14 - 4 Ply Rated

<sup>1</sup>\* Standard Equipment  
<sup>2</sup>\*\* % of loaded weight (Factory Wt. + Cargo Wt.) 2000 lbs. max. w/2 5/16" coupler



## 3. TRAVEL

### 3.1 Towing Speed

Probably the greatest factor in safe, pleasant towing is maintaining reasonable vehicle speed. Lowering of speed increases trailer towing stability and reduces emergency stopping distances. If you are new to travel trailering, reduce your driving speed while towing. As you gain experience, you will be able to determine the maximum safe driving speeds for all towing conditions. Slower speeds will also decrease fuel consumption.

### 3.2 Towing Stability

The three main principal factors affecting trailer towing stability are traveling speed, wind conditions, and weight distribution. Poor trailer towing stability can be recognized by the trailer having the tendency to sway from side to side after quick course changes, while being passed by large trucks or buses, or in cross winds.

If the trailer begins to sway strongly from side to side, make as little steering corrections as possible. Using the hand lever on the brake controller, firmly apply the trailer brakes to pull the trailer straight behind the tow vehicle, and reduce speed. (Note: Electronic and brake pedal mounted controls may not allow for independent operation.) Do not attempt to stop the trailer swaying by making quick steering changes or by forcefully applying the tow vehicle brakes.

Since cargo weight in the rear of the trailer can reduce towing stability, avoid storing heavy objects in the rear of the trailer or on the rear bumper. Empty waste holding tanks before traveling whenever possible.

Equalizing hitches improves towing stability and should be used on all Hi-Lo trailer models. In addition, sway control devices are offered by most hitch manufacturers that will help reduce swaying, and will improve trailer handling during emergencies or in crosswinds. Be sure to follow the hitch and sway control manufacturer's instructions. Correct use of these devices will increase stability, but should not be considered a substitute for prudent speed, proper cargo loading, safe weather conditions, and towing experience.

Small but sudden course changes can occur when a vehicle towing a travel trailer is passed from the rear by a large flat-fronted vehicle such as a truck or bus. These course changes happen when the side wind from the flat front blows against the side of the trailer. As the truck front passes the rear of the trailer, the tow vehicle will tend to turn away from the truck, and as the truck front passes trailer wheels, the tow vehicle will turn back toward the truck.

If a large flat-fronted vehicle passes from behind causing your vehicle to change course, make as little steering correction as possible, remembering that the tow vehicle will be turned back toward its original course as soon as the truck front passes the trailer wheels. Avoid quick steering corrections that can inadvertently magnify these course changes and start trailer swaying.

### 3.3 Passing

When passing another vehicle, remember that your tow vehicle will accelerate more slowly than usual because of the added weight of the trailer. Allow ample passing time and distance. Once past the other vehicle, allow for clearance of the trailer before returning to the original lane. Use your outside rear view mirrors and proper turn signals to assure safe maneuvering.

### 3.4 Stopping

The increased weight of the car-trailer combination requires greater stopping distances. Maintain at least twice the normal stopping distance while towing your trailer.

### 3.5 Backing Up

Here is an easy way for new trailerists to remember the way to turn the steering wheel when backing a trailer. Place your hand at the bottom of the steering wheel. To turn the trailer to the left, move your hand to the left (turn steering wheel clockwise). To turn the trailer to the right, move your hand to the right (turn the steering wheel counter clockwise). Your car should go the opposite way that you want the trailer to turn. In time, and with a little practice, backing will be accomplished with little effort. Always be aware that you have poor visibility to the rear. Someone standing outside at the rear of the trailer guiding your actions will assure safe backing.

### 3.6 Mirrors

There are many types of outside mirrors that can be used on your tow vehicle. Some may prefer a non-permanent installation that can be removed between trips. Most states require mirrors extending on both the right and left sides of the towing vehicle to provide the driver a clear view when passing or being passed.

Install mirrors as close to the driver as possible to provide the maximum field of view.

Check for specific requirements in the states where you will travel.

## 4. PARKING & SETUP

### 4.1 Selecting Campsite

Many commercial parks and campsites are available for the modern traveler and camper. It is recommended for reasons of convenience and security that you take advantage of these facilities when parking. However, in the case no facilities are available, school, church parking, motel or other parking lots are sometimes used with consent of the caretakers. In such event it is wise to notify local police of your location.

### 4.2 Leveling Trailer

Once the site is selected several factors need be considered as the site is approached. Location of utility outlets if any and the levelness of the parking area will determine your position. If it is a pull thru site, it is best to approach from the 'high' end and stop to a point where electric, water and sewer connections can be made. Once this position is reached level your wheels from side to side. Small pieces of planking and boards may be carried for this purpose. Once leveled from side to side, block wheels to stop trailer from rolling, then adjust leveling jack on your trailer hitch to level front to back. Having parked with hitch on low end allows you to easily disconnect tow vehicle or leave attached as you so desire. It is especially important that your trailer be level for most efficient operation of your refrigerator.

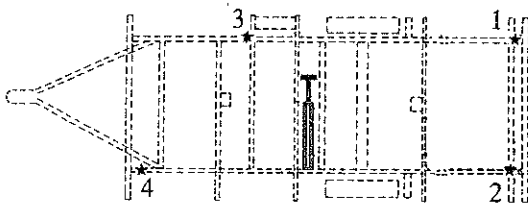


Figure 1

To provide a good solid base for trailer stability, it is recommended that you use four leveling jacks with your Hi-Lo trailer. Position these jacks according to the diagram in Figure 1 as follows unless your Hi-Lo is already equipped with stabilizer jacks.

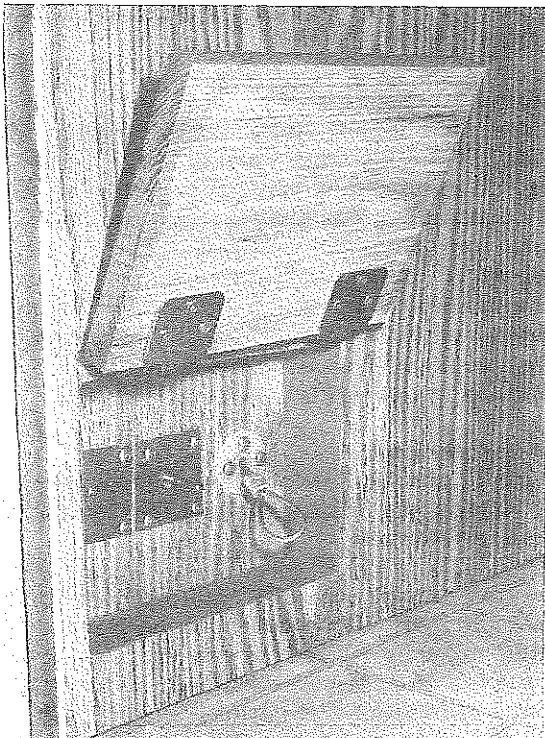
1. Under main frame between spring hanger and rear bumper on doorside.
2. Under main frame between spring hanger and rear bumper on roadside.
3. Under the cross frame member at the front of the side door on front door models (rear door models reverse steps (1) and (3) (locate jack at door area in a position that will not hinder door operation).
4. Under the cross frame member at the left front of the trailer.

Adjust these jacks up to a point where they make a tight fit between the frame and the ground. While you may use them to make minor adjustments, do not raise them to the point where they take the weight off the wheels.

### 4.3 Raising Your Hi-Lo

With your Hi-Lo positioned on your campsite and leveled, you are ready to raise it from the low traveling profile to the normal living position.

1. Open top door and fasten to door holder.
2. Hold bottom door at an angle of 90 degrees, so it will NOT interfere with top door while raising.
3. Lift the telescoping switch and hold in this position until the trailer's top section has reached its full height at which time you should hear a 'squeal' and the safety lock engages automatically. To make sure safety bar is locked depress switch to down position, if the top section does not lower this indicates that safety bar is in locked position. Once you have ascertained that the safety bar is



## 4.3.3 (continued)

locked, lift telescoping switch to pressurize hydraulic cylinder. If the safety bar does not lock refer to section (7.9.3).

Your trailer now is ready for entry and connecting up your utilities, electric, water and sewer when available. Turn on LP gas valve at tank. Before lighting water heater be sure water system and water heater tank are filled with water. Also light oven pilot if so equipped (See section 10.2). The refrigerator may be switched to 110v electric or LP gas. Note: Instruction booklets are enclosed for further details on hot water heater, refrigerator, furnace and other components included in your trailer. To get the most from your trailer it is best to read and study each manual.

## 4.4 Outside Utility Hook Ups

**1. Electric Supply** - The 110v supply cord is located in a compartment on the lower left side of the trailer. Your trailer is equipped with a 25' heavy duty power cord designed to carry 110-125v AC, 60 hz, 30 amp electric service. Pull out cord and take one complete wrap around electric supply post, then up to receptacle. Be sure power source is 110-125 volt with standard 3 wire connector, positive, neutral and ground. (See section 6.13).

**2. Sewer Hook up** - Remove sewer hose from capped bumper storage tube. Place container under capped drain outlet located under left side of trailer to catch any water in the drain, then remove protective cap by turning counter clockwise. Connect sewer hose to terminal fitting. Place opposite end of the sewer hose into a ground sewer or dump station inlet.

The use of a tapered collar or adapter, available from your dealer or trailer supply stores, to put around hose before placing it into the sewer outlet, is recommended. This will help prevent the escape of unpleasant odors about your campsite. Arrange hose so it slopes as evenly as possible from terminal to outlet. Always ensure that tank is emptied into an acceptable sewer outlet or dump station.

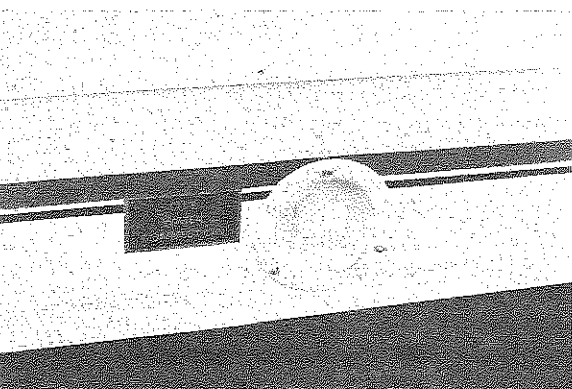
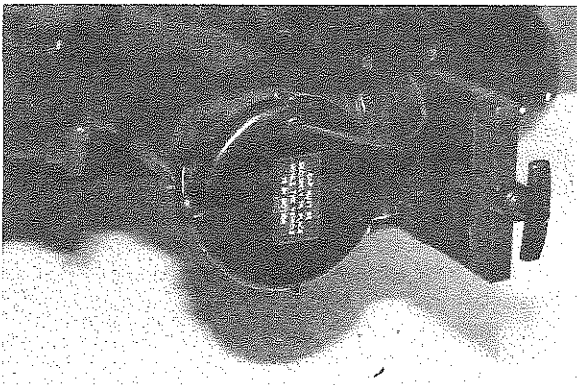
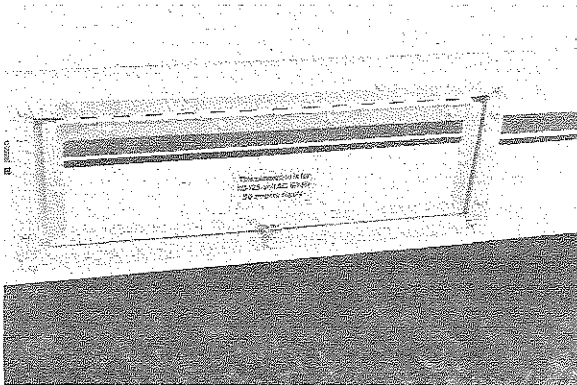
**3. Draining Holding Tanks.**

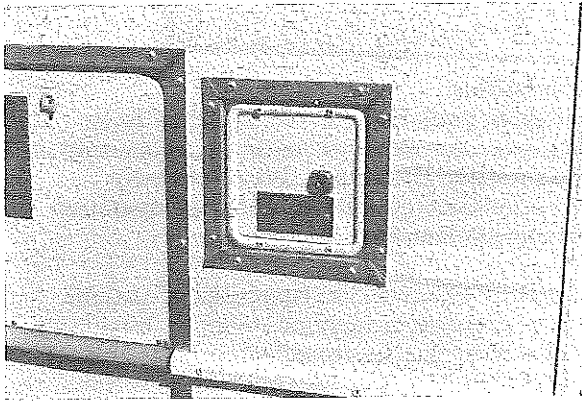
All Hi-Lo trailers have dual holding tanks, one for sewage and the other grey water. To dump sewage open the large knife valve by unlocking valve and sliding valve open with a quick steady pull. After completely drained, rinse and flush tank. When tank is empty close and relock valve. If trailer is equipped with grey water holding tank, repeat same procedure using the smaller of the two knife valves. If staying at campsite keep hose connected and both knife valves closed, draining and flushing periodically as needed. **Towing your trailer with the holding tanks full is not recommended.**

**4. Fresh Water Connection**

**Caution** - Check supply pressures before connecting - your system is tested at 100 lbs. psi. Pressures above this should be controlled by an in line regulator.

Connection for city water supply is located on lower left front portion of the trailer and marked 'water city connection.' Connection should be made by water hose directly from the supply hydrant to the trailer connection. Note: It is important to use the proper type of hose for this purpose as some will give an offensive taste and odor to your water supply. Flush hose before connecting to trailer. Once connection is made the





water pressure may be turned on and different spigots within trailer opened slightly to release trapped air.

The on board water tank is protected from city water pressure by a check valve in the line. To fill this tank unlock the water fill door marked 'potable water.' The water storage tank then may be filled with a container or with an approved water supply hose. The water is pumped from the tank by a 12 volt demand pump. A switch for this pump will be found within the trailer marked 'shur flo water.' **Caution** - This switch should be 'off' when tank is empty or when traveling.

Never put contaminated water into your system. Procedures for sanitizing your system may be found under the plumbing section (8.4). Sanitizing is recommended even for a new trailer.

This completes your outside utility hook ups and ready for normal use providing all interior connections are in order.

#### 4.5 Awning and Windows

Awnings may be extended if trailer is equipped, being sure they are securely fastened in case of wind or storms. Pockets for collecting water should be avoided. Upon leaving trailer for long periods, awnings and roof vents should be returned to normal position. When trailer is in use windows or the roof vent should be opened at least a small amount for ventilation and an aid to prevent condensation.

#### 4.6 Preparing To Leave Camp and Lowering Your Hi-Lo

1. Drain and flush holding tanks. Close knife valves.
2. Fill water tank if supply desired for travel.
3. Remove, flush and replace sewer hose into storage.
4. Remove water line and electric cord and store.
5. Replace caps on sewer and water lines on trailer and site.
6. Shut off LP gas at tank and oven pilot to 'oven off' position.
7. Shut off shur flo water pump switch.
8. Change refrigerator to 12v while trailer is in transit (see section 10.1)
9. Close all windows, awnings, vents, access doors, exterior utility doors and front sun shade.
10. Secure all loose items in trailer.
11. Be sure there is nothing on counters and other areas that will interfere with the trailers telescoping operation.
12. Place swing away bunk into stored position and close all cabinet doors.
13. Turn off all heat producing appliances.
14. Set entrance doors in operational position for raising (see section 4.3)
15. Check for obstruction both inside and out. Make sure no one is inside or close to the trailer before lowering.
16. Release safety bar by pulling release cable located near the telescoping switch. (If safety bar will not release raise top section enough to accomplish this.) Then depress telescoping switch to down position.
17. Depress telescoping switch until the top section lowers to travel position.
18. Remove and store leveling jacks.
19. Close and lock doors securely.
20. Put slideout step in 'stow away' position.
21. Remove wheel blocking materials.
22. Trailer is now ready to hitch to tow vehicle (see section 2.1)
23. Never tow your Hi-Lo in a raised position.

## 5. LP-GAS SYSTEM

### 5.1 General Information

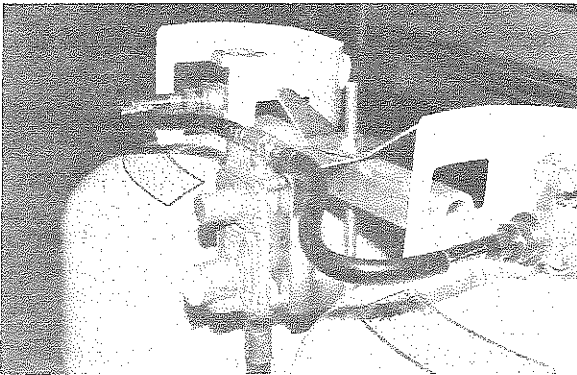
As with other systems in your Hi-Lo all components have been tested and approved for use in recreational vehicles by a nationally recognized testing laboratory. When properly handled, LP-gas will provide you with trouble-free operation of your heat producing appliances.

LP-gas (liquid petroleum) is a material composed of various hydrocarbons such as propane, propylene, butanes, butylenes, or a mixture of them. In its gaseous form (vaporized), it is colorless and carries an added garlic-like odor for detection. Besides being flammable, it is potentially lethal to inhale. LP-gas is compressed into liquid form for storage and transportation. It is also known as bottle gas. Propane gas will vaporize during extreme cold (above 44° F. below zero), while butane will not vaporize below 30° F. Most LP-gas fueling stations sell only propane for recreational vehicle use.

The LP-gas tank mounted on your vehicle contains LP-fuel in liquid form under high pressure. As fuel is used, vapor (LP-gas) passes from the top of the tank through a regulator which reduces the pressure to about 6½ ounces per square inch. Vapor at the low pressure is then transferred through the gas distribution line for appliance use.

### 5.2 Checking For Leaks

Upon delivery and periodically thereafter, check your gas system for possible leaks. Although the entire distribution system and its attached appliances have undergone extensive factory testing for leaks, with normal use being subject to road vibration, connections, and fitting can develop leaks. Usually you can detect these leaks by the strong odor of garlic or onions. If you encounter this odor, turn off all open flames immediately and commence a systematic search for leaks throughout the gas system. Use a bubble solution of non ammoniated soapy water - **NEVER A MATCH** - on connections and fittings. Bubbles will appear at the leaky points. 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 system, then check the appliances.



### 5.3 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 6½ ounce per square inch can cause damage to appliance regulators.

### 5.4 Using The Automatic Changeover Regulator (Optional)

Your Hi-Lo may incorporate an automatic changeover regulator. This apparatus 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 in service becomes empty, changeover is automatically accomplished to commence draining fuel from the other bottle. At this point, the plastic window will display a red signal or flag to indicate the condition, whereupon first notice you should then flip the lever over to indicate service on the other bottle. The first bottle which was depleted can then be **turned off**, uncoupled and taken to be refilled without

#### 5.4 Using the Automatic Changeover Regulator (continued)

disturbing the LP-gas supply. After refilling, it can be remounted and again to the 'on' position. When the other bottle is depleted, the LP-gas supply will again be automatically changed over.

#### 5.5 Gas Containers - Using Alcohol

When gas containers are not in use for sometime, or are empty, it is advisable to keep the service outlet valve closed to minimize entry of moisture inside containers or the regulator. Moisture can cause freeze-up damage to regulators. To minimize chance of freeze-up, have your dealer add a half cup of dry methyl alcohol into each container.

#### 5.6 Filling LP-Gas Containers

**Warning - Your vehicle has exterior combustion air inlets. Appliance pilot lights should be turned off during gasoline or LP-gas refueling on the unit. (Required by law in some states.)**

LP-gas is available throughout the country. When one bottle is depleted, it is best to have it filled without delay. Most camp ground directories have listings of LP-gas stations. Many travel parks have LP-gas available.

Local regulations sometimes require that I.C.C. removable cylinders be removed from the RV for filling. Caution the supplier not to overfill your tank. A 20% or 10% relief valve is incorporated on some tanks for safety. This valve is normally opened during filling and will indicate when the tank is filled to proper limit by appearance of liquid replacing vapor. At all times, the overfill valve should be tightly closed by hand only.

The main valve on LP-gas containers 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. If a valve is replaced, always replace it with the RV type that incorporates a check valve as some local regulations prohibit filling tanks that don't have one.

When LP-gas containers are filled to the proper level there is available space for safe expansion of the vaporized liquid. If your tank becomes over-filled and is not allowed to 'bleed off' before installation with the RV system, it may gain pressure due to exposure to hot sun rays and will begin 'blowing off' pressure from the relief valve. This can be detected by strong odor around tanks and can be heard close up. Keep all open flames away from this area. It is best to remove the bottle, take it to a safe area, and bleed off the excessive pressure by opening the valve and closing it when discharge has been sufficient.

Handle your LP-tanks with care, note that when disconnecting, you must turn the wrench in a clockwise direction because the connection utilizes left hand threads. Similarly, when reconnecting, turn wrench counter clockwise. When tightening, only 'snug up'. Avoid over tightening.

### 5.7 LP-Gas Consumption

Most gas appliances are only intermittently operated. Unless there is heavy use of hot water, water heater consumption is not too great. Operating under wintery conditions, requiring heavy use of the furnace, or doing a lot of oven baking for hours at a time is what really consumes the gas rapidly. During freezing weather and high wind conditions, furnace consumption can be extremely heavy.

LP-gas consumption depends upon individual use of appliances and the length of time operated. Each gallon of LP-gas produces about 91,500 BTU's of heat energy. A typical seven gallon container will provide about 640,500 BTU's of heat energy.

### 5.8 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 LP-gas tanks, and continued periodic checks of the system are recommended. Even though the manufacturer and dealer have already made tests for leakage, this check is advisable because of the vibration encountered during travel. 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. Usually tightening of connections will close leaks. If not ask your authorized dealer service to make the necessary repairs.

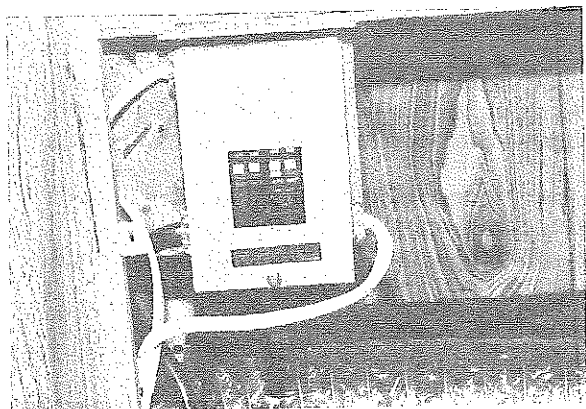
LP-gas is heavier than air. Leaking gas tends to flow to low places, much as will water. It will sometimes pocket in a low area. LP-gas can usually be detected by an identifiable odor similar to onions or garlic. **NEVER LIGHT A MATCH OR ALLOW ANY OPEN FLAME IN THE PRESENCE OF LEAKING GAS.**

Be sure to shut off main LP-gas supply valve when the vehicle is not in use. This rule should also apply while the vehicle is moving to prevent any accidental ignition of gasoline fumes while refueling by the pilot lights in the water heater, furnace or refrigerator.

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



**This connection is for  
110-125-volt AC, 60-Hz  
30 ampere supply**



## 6. ELECTRICAL SYSTEM

### 6.1 General Information

Your Hi-Lo trailer is equipped with a combination 110/125 volt AC and 12 volt DC electrical system. This is provided so you may use outside 110 volt service where available or when this is not the case, you may be self contained and operate off your car and trailer batteries for limited periods. This versatility is a big advantage when traveling as situations may arise where utilities are not available. Many state and federal parks, primitive camps, overflow areas, etc., provide only the camp site itself with few or no facilities. You are prepared for most any eventuality.

### 6.2 110-125 Volt AC

Commonly referred to as the 115 volt AC system with 30 amp capacity at 60 hz cycles. It is recommended that you always check outside power sources to make certain they are within the compatible voltage rating of your trailer. As a reminder of this circuit capacity, an instruction plate similar to Figure 2 is attached to your trailer near your 115 volt entrance.

Your Hi-Lo is equipped with a heavy duty 30 amp power cord stored in the electric power cord compartment located on the lower left front side of your trailer. The cord's weatherproof construction permits it to be extended to the power source. The cable assembly should not be cut or altered in any manner so as to safeguard it's water tightness.

Duplex receptacles are located and wired within the trailer to furnish convenient outlets for AC power. Circuit breakers have been installed to protect electrical circuits from overloading. Do not make unauthorized changes to circuitry or add on fixed appliances. Should you wish to make such changes, consult your dealer who will assist you in obtaining a safe installation.

### Circuit Breakers

The circuit breaker box is located in the lower left inside cabinets of your trailer as pictured. Location will vary slightly with trailer models. If a circuit breaker trips, locate and remove the cause of the overload before resetting the circuit breaker.

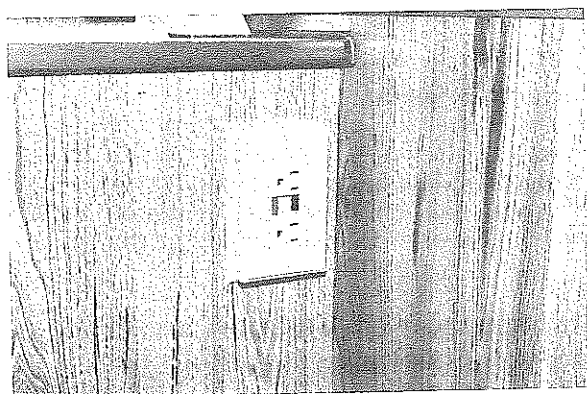
### 6.3 Ground Fault Interrupter

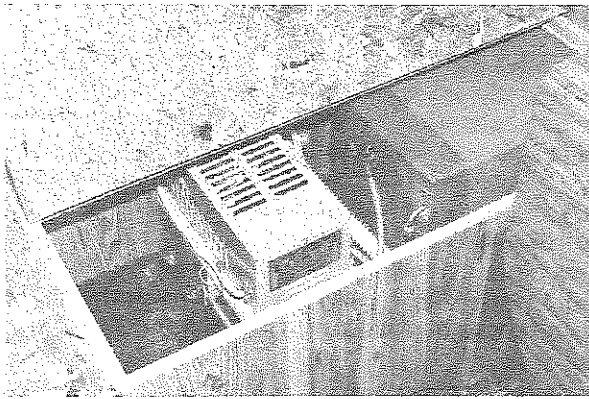
The bathroom and outside outlets are protected by a ground fault interrupter (G.F.I.). This device is provided in compliance with ANSI A119.2/NFPA 501C requirements, and is intended to protect you against electrical shock possible when using electrical appliances in the bathroom or damp areas. Should an appliance develop a shock hazard or your trailer grounding is faulty, the G.F.I. device will disconnect the outlet, protecting you from serious shock.

Your owners information kit contains instructional material about the G.F.I. These should be read and the test procedures carefully followed.

### 6.4 12 Volt DC

The second electrical system in your trailer is the 12 volt DC system. A 12 volt battery, located just behind your LP-gas tanks, provides power for lighting and other living needs for limited periods of time. Used mainly when you are on the road or parked where 110 volt AC is not available.



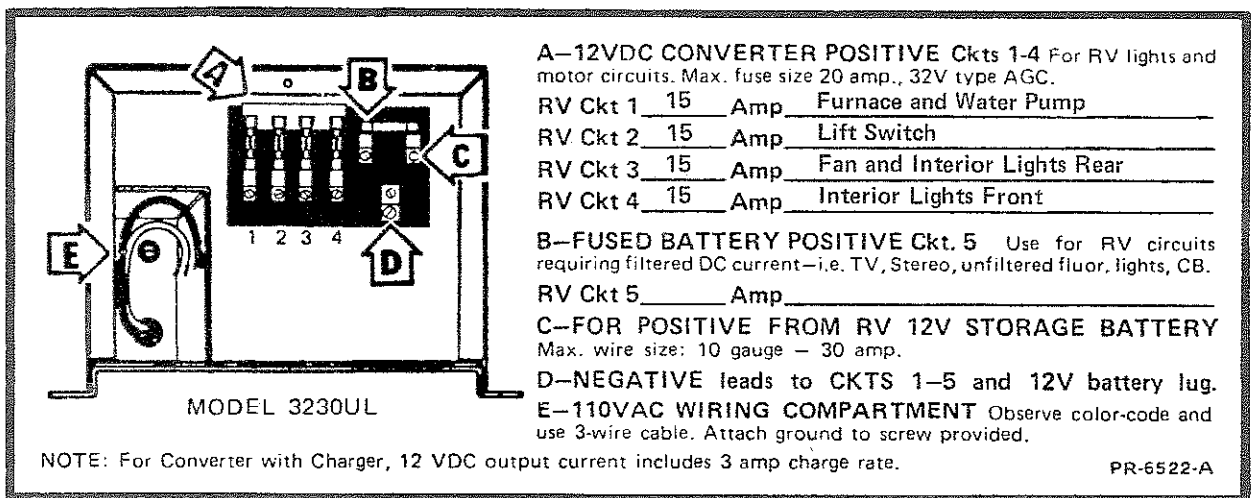


### 6.5 115 Volt to 12 Volt DC Converter

The converter will supply 12 volt requirements when your trailer is connected to a 115 volt supply source. This not only saves the power in on-board battery, but the converter will automatically sense the condition of the RV battery. If it is below full charge, the charger section of the converter will start charging the battery. The battery will automatically be charged at a high or low amperage rate, depending on the need. The rate of charge will decline as the battery reaches 'full charge' and the charger will drop back to 'maintenance' level. Anytime a storage battery cannot be charged as described, it is possible the battery is defective.

When the 115 volt AC is disconnected from the trailer, the converter, - via its automatic relay - will switch RV battery into the circuit for power to operate 12 volt lights and motors.

Battery usage without 115 volt supply should be very limited, for furnaces, motors, refrigerators on DC can run down a battery in a matter of a few hours. Careful usage of lights and limited use on appliances can extend the time between charges.



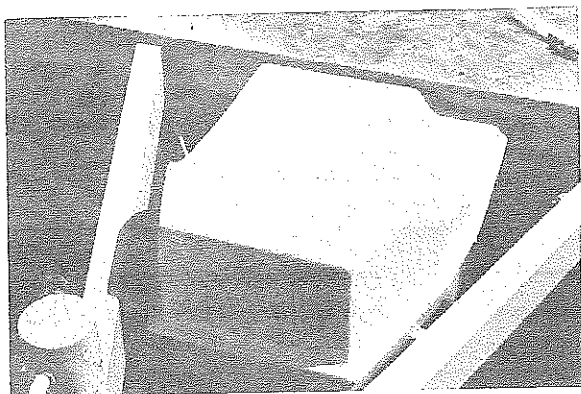
### 6.6 DC Distribution Panel (12 Volt Fuses)

A DC distribution panel is located in the front compartment of the converter. This panel contains circuits with replaceable fuses for protection of RV 12 volt light and motor lines. Do not put in larger fuse than indicated. Clearance lights, turn signals, stop lights and electric brakes are controlled and fused by the tow vehicle.

### 6.7 Automatic Thermal Breaker

A protective thermal breaker will 'break' if converter becomes over heated. The thermal breaker will reset itself after a short period of time and lights and motors will resume operation. Should the 'break' repeat, shut off at least part of connections to reduce load. Inspect converter to make certain ventilation is not obstructed.

**Warning: Disconnect the 115 volt cord and the positive battery terminal before working on either electrical system.**



**6.8 12 Volt to Electric/Hydraulic Power Lifting Unit**  
The power for your lift unit motor is supplied by a heavy duty battery cable that runs directly from the battery to the motor.

Instruction pamphlets covering the converter, ground fault interrupter and other components of your trailer are enclosed with your manual or available at your Hi-Lo dealer.

### 6.9 Electric Brakes

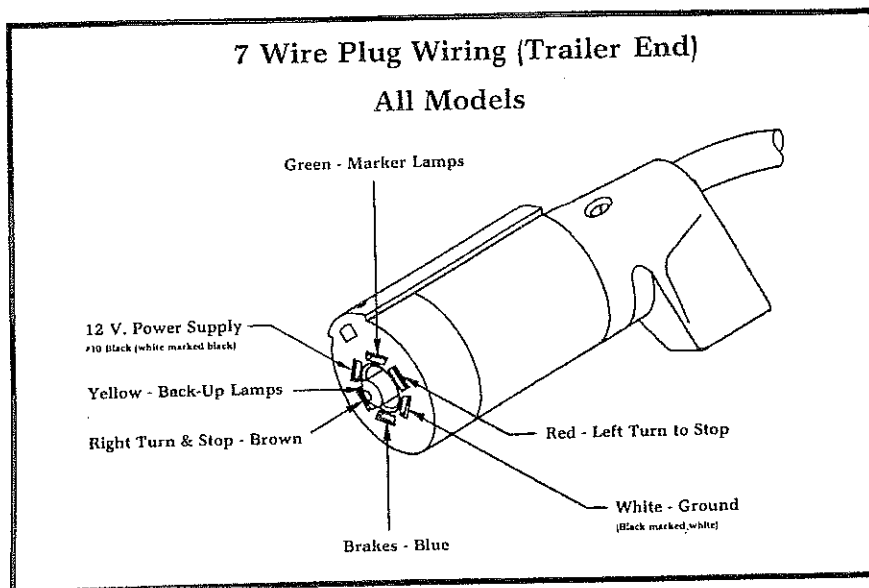
Electric brakes require little or no special care or service other than keeping connections and wiring free of dirt and other foreign matter. Brake adjustment, relining and repair are similar to those of your car and can be serviced by any qualified service station.

### 6.10 Break Away Switch

Your trailer is equipped with an emergency break away switch. In the event you would come unhitched on the road, the break away pin will be pulled setting your trailer brakes. This device should be checked periodically by pulling pin and attempting to pull forward. If the brakes 'lock up' the system is in good order. Never leave pin out or attempt to use for parking brake as this will run battery down. Loss of emergency braking is usually due to defective wiring, defective break away switch, or low battery.

### 6.11 7 Wire Plug

A chart of the 7 wire plug is shown in Figure 6.11. This will assist you in matching up the tow vehicle wiring to that of the trailer. It is very important to keep plug terminals clean and free from corrosion at all times.



6.11

### 6.12 Schematics of Electrical Systems

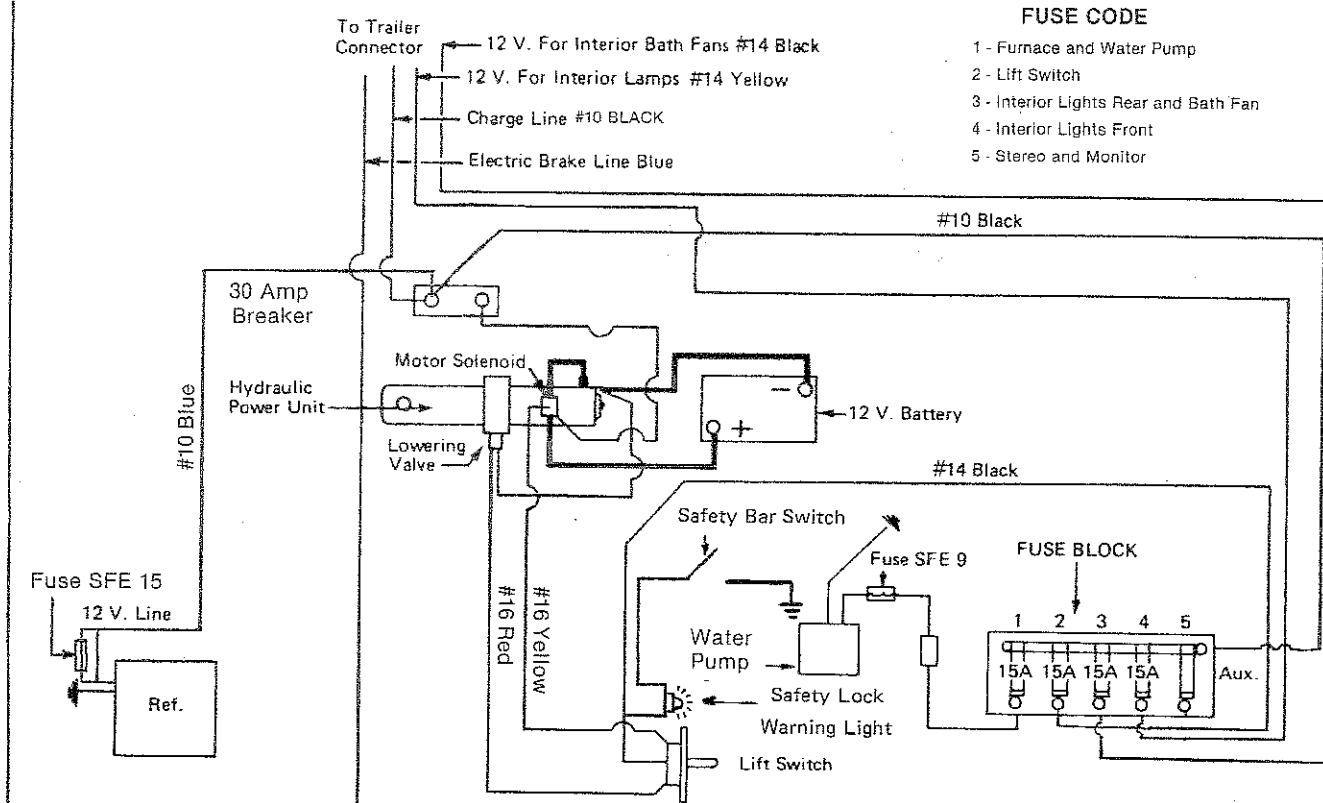
Schematics for the 12 volt lower section is shown on Page 18 (Hi-Lo Manual). Also the 12V schematic car-trailer connection showing various hook ups on the tow vehicle and trailer.

### 6.13 Understand the use of power cord (including air conditioner circuit cord).

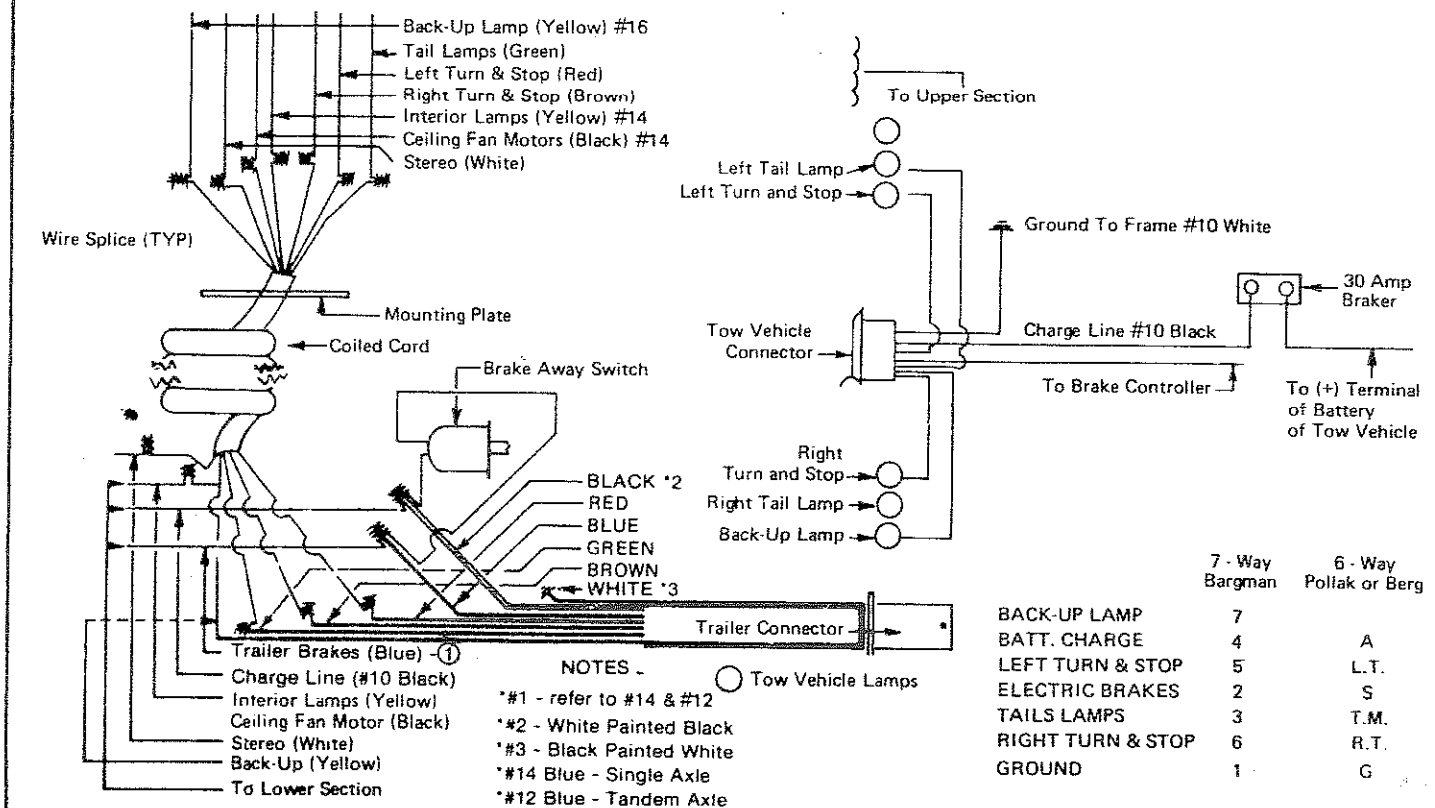
The long cord with the three prongs is used to supply 110/115 volts to your trailer from the campsite power supply outlet.

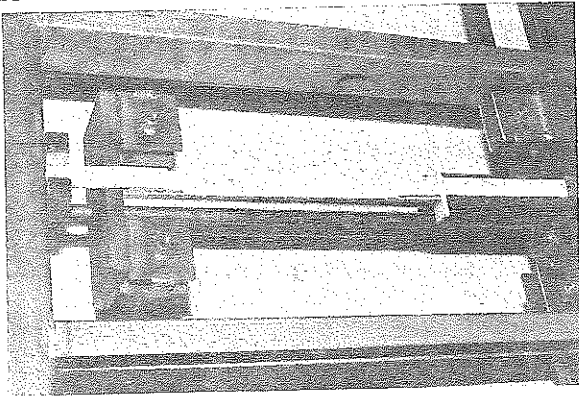
The short cord with female outlet is used to supply power to the topside outlet to run your air conditioner if so equipped.

# DRAWING A 12 VOLT SCHEMATIC LOWER SECTION



# DRAWING B 12 V. SCHEMATIC CAR - TRAILER CONNECTION





### 7.5 Lowering Solenoid

It is engaged by depressing control switch level to activate bleed-off valve and lower top section.

### 7.6 Safety Bar

When raising top section to the raised position, make sure safety bar engages. This can be accomplished by moving telescoping switch to the down position. If the top section does not lower, then the safety bar is latched. Lift telescoping switch to pressurize hydraulic cylinder. Red warning light will indicate when safety bar is not properly engaged.

### 7.7 Hydraulic Cylinder

The cylinder that raises your Hi-Lo is located in a transverse position and mounted in the center of the frame assembly. The unit is readily accessible from the trailer underside. As with the pump and other elements of the lifting system, it is rated well beyond maximum requirements to insure dependable performance.

### 7.8 Cable Lifting Assembly

Aircraft-type cables operate from the hydraulic cylinder and perform the actual raising of the upper section.

The upper section of your Hi-Lo is also equipped with nylon glide assemblies and the bottom section with matching trunnion guides to keep the upper and lower sections in proper alignment at all times.

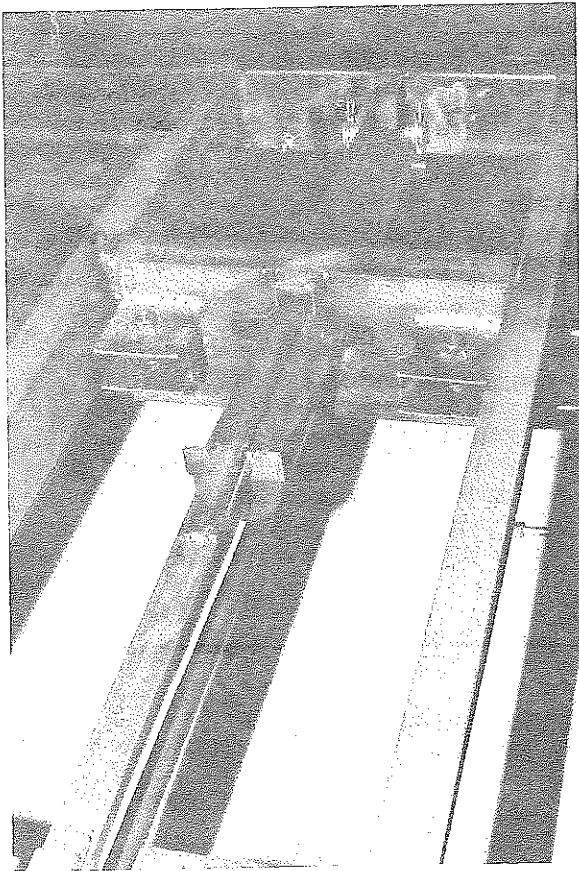
### 7.9 Trouble Shooting Hi-Lo Lift Mechanism

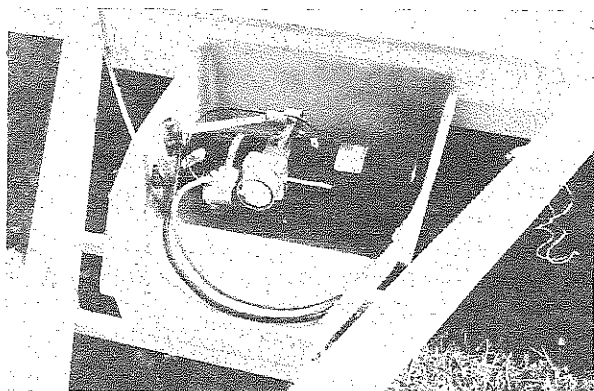
#### 1. Top Will Not Raise - Lift Motor Will Not Run

- A. **Low or Dead Battery** - Attach jumper cable from a charged battery to the trailer battery. (Positive post to positive post - Negative post to chassis ground). If the motor now runs check to be sure you are getting ample charge from the connector system and to the tow vehicle charge line.
- B. **Blown Fuse** - Replace blown fuse located in the circuit panel of the convertor system. Check for short in wire between fuse and motor solenoid.
- C. **Loose Wire Connection** - Tighten all connections at the battery and motor terminals. Check to be sure that the wire and the terminal connection is crimped properly.
- D. **Defective Toggle Switch** - Remove the panel housing of the toggle switch, lift the toggle switch to the raising position and with a 12 volt test lamp test for 12 volt current supply between the yellow wire and ground. If the light does not light and you have voltage at the black wire, replace the toggle switch.
- E. **Defective Motor Solenoid** - Using a jumper wire, jump between the battery terminal of the solenoid and the switch control terminal. The solenoid should click indicating a response from the magnet. If it does not click be sure that the solenoid is properly grounded to the motor chassis. Next with a heavier jumper wire jump between the two larger terminals of the solenoid. If the motor runs the solenoid is defective, replace it.
- F. **Worn Motor Brushes** - Remove end cap from motor and inspect the brush assemblies. Clean and lubricate brushes and if necessary replace brushes.

#### 2. Top Will Not Raise - Lift Motor Runs

- A. **Low On ATF Fluid** - Check to be sure fluid level is within one inch from the top of the reservoir with the trailer in the lowered position.





## 7. HYDRAULIC LIFTING SYSTEM

### 7.1 Electric/Hydraulic Power Lifting Unit

This unit is located on the "A" frame at the front of the chassis and consists of the following elements: 1. Electric motor; 2. Solenoid start switch; 3. Filler breather port; 4. Reservoir; 5. Relief valve; 6. Manual release lever; 7. 3/8 NPTF pressure port; 8. Electric release valve. This complete unit is factory adjusted and pre-set for smooth and efficient operation. It should require no further adjustment. However, for your information, here are some facts about the unit which may prove useful in the future.

### 7.2 Electric Motor

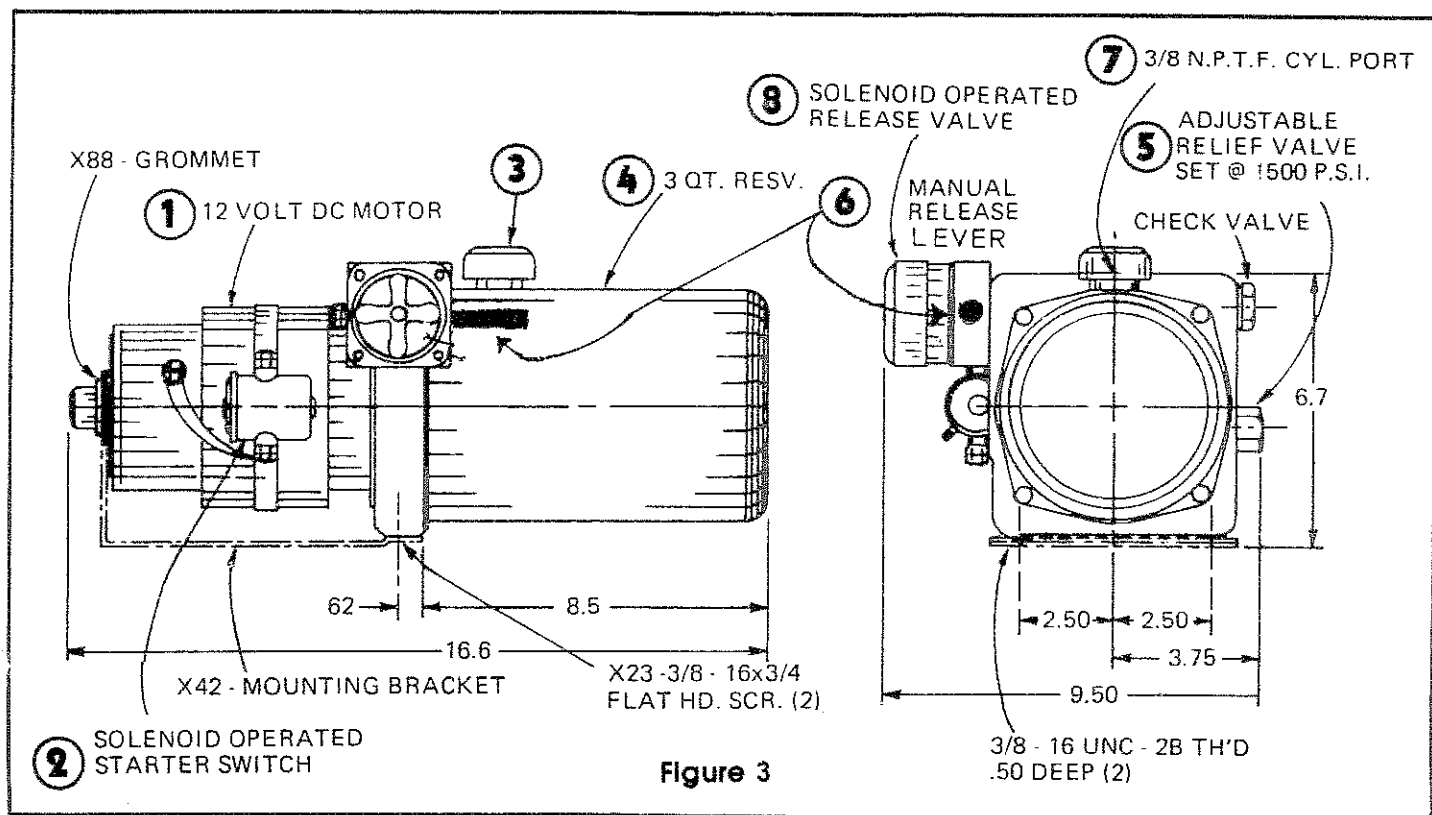
A standard D-C Prestolite starter motor operates the hydraulic pump. While it should seldom need servicing or replacement, an automotive supply house can supply a replacement in an emergency.

### 7.3 Raising Solenoid

Engaged by raising control switch, the solenoid completes the circuit to supply power to the pump.

### 7.4 Hydraulic Pump

The hydraulic pump is close-coupled to the electric motor. It is capable of producing pressure up to 3,000 PSI; however, the raising mechanism of your Hi-Lo trailer requires much less for efficient operation. This unit includes a by-pass valve that operates when the hydraulic lifting cylinder has reached its maximum thrust. The by-pass is a built-in safety device to prevent damage. A harmless "squeal" will be detected when it is activated to indicate the top section is fully raised into position.



- B. **Lowering Valve Stuck In Open Position** - Check to be sure that the manual lowering valve lever is in neutral position and is not in a partially open position. Lift the toggle switch to run the motor and simultaneously pull on the lowering valve lever in an attempt to raise and lower the trailer at the same time. This will force the fluid through the lowering valve at high pressure and clean out any debris that may have lodged in the valve.
  - C. **Air In Pump Chamber** - Air in the pump chamber will result when running the pump when the fluid level is not at its filled position as the trailer is lowered. This will result in a gravelly sound when the pump is running. Lower the trailer and keep the switch in the lowering position for 60 seconds so that the air can bubble out of the pump into the reservoir, then add fluid to the proper level.
  - D. **Too Low of Pressure Relief Settings** - To adjust pressure, a pressure gauge with a reading of 0 to 3000 lbs. should be used. Remove 1/4" pipe plug from tee on top of pump and install gauge. Proper setting should be approx. 1500 lbs. maximum. To adjust pressure remove 1" cap on lower rear of pump. To increase pressure turn screw 1/4 turn clockwise for each 200 lbs.
3. **Safety Bar Will Not Release**
- A. **Locked in Safety Position** - To remove pressure off of safety bar, lift toggle switch to raise the top section. Pull on safety release cable and depress lift switch. If trailer top does not raise to release safety bar, then follow steps under trouble shooting "Top Will Not Raise."
  - B. **Dirt on Top of Safety Bar** - From the underside of the trailer, inspect the safety release bar which lies on top of the cylinder rod assembly. Remove any dirt which may have been lodged on top of the safety bar.
  - C. **Broken Release Cable** - A replacement cable will have to be strung through the safety release housing and attached to the safety release bar.
4. **Lowering Valve Inoperative**
- A. **Low or Dead Battery** - Follow instructions for item 1.A
  - B. **Blown Fuse** - Follow instructions for item 1.B
  - C. **Loose Wire Connection** - Follow instructions for item 1.C
  - D. **Defective Toggle Switch** - Follow instructions for item 1.D except test the red wire to ground.
  - E. **Dirt in Lowering Valve** - Follow instructions for item 2.B
  - F. **Lowering Valve Adjustment** - To adjust lowering valve remove two screws on the plate on top of the valve. Remove the plate using two 5/16 open end wrenches, hold the valve stem with one wrench and turn the cap screw in the end of the valve stem counter clockwise to increase the lowering speed of the top section. Turn cap screw clockwise to reduce the speed.

#### 7.10 Servicing Hydraulic Lifting System

The hydraulic lifting system has been fully tested by Hi-Lo and proven in over 20 years of actual use. Here are a few helpful hints in the unlikely event you encounter a problem with your Hi-Lo trailer:

1. If top section will not raise, first check the steps in raising procedure.
2. If the pump motor will not run, check the battery connections for tightness. (Be sure there is a good ground to motor mechanism.) Turn on trailer lights to see if you have power. If lights go out when you operate the toggle

switch for the motor, the battery is low and in need of charge. Also check to be sure the raising solenoid is operating properly.

3. If motor runs, but pump does not raise trailer, check the fluid level in the pump reservoir. Fluid level should be approximately 3 inches from the top when trailer is in the "down" position. If low, add necessary amount. Use only type A or DEXRON II automatic transmission fluid. Be sure it is clean and avoid over filling. If fluid level is extremely low, check for leaks around the pump, at lifting cylinder, and the connecting hose.
4. If top section appears to be out of level when raised, check by measuring from the bottom edge of the trailer body. Distance should be the same on all four corners. If it is uneven, it is probably due to normal stretch of the cables and should be corrected as follows:

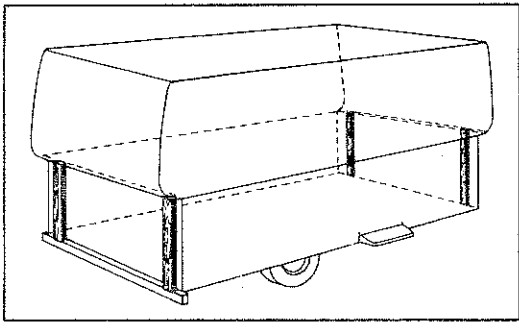


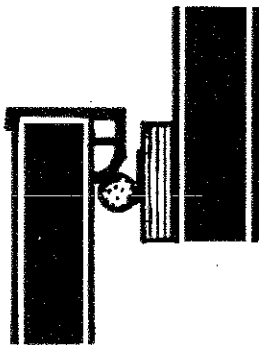
Figure 4

Check the leveling adjustment points for simple front and back realignment, adjust the proper adjusting nut located on the underside of trailer. All front to back adjustments should be made with the trailer upper section supported so that tension is removed from cables - accomplished by lowering the upper section onto four 2" x 4" boards of the same length to brace between the section and frame member.

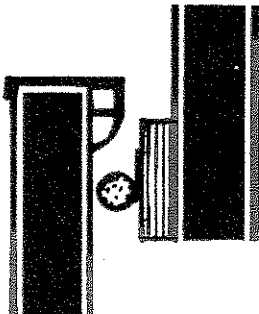
For example, if the front section is lower than the rear, you will correct this condition as follows:

- A. Lower the top section onto 2" x 4" boards. Refer to Fig. 4
- B. Loosen the locking nut.
- C. Turn the front adjusting nut until all slack in cable is taken up.
- D. Tighten the locking nut.
- E. Raise trailer; remove 2" x 4" boards, and check for proper alignment.

Proper Seal



Improper Seal



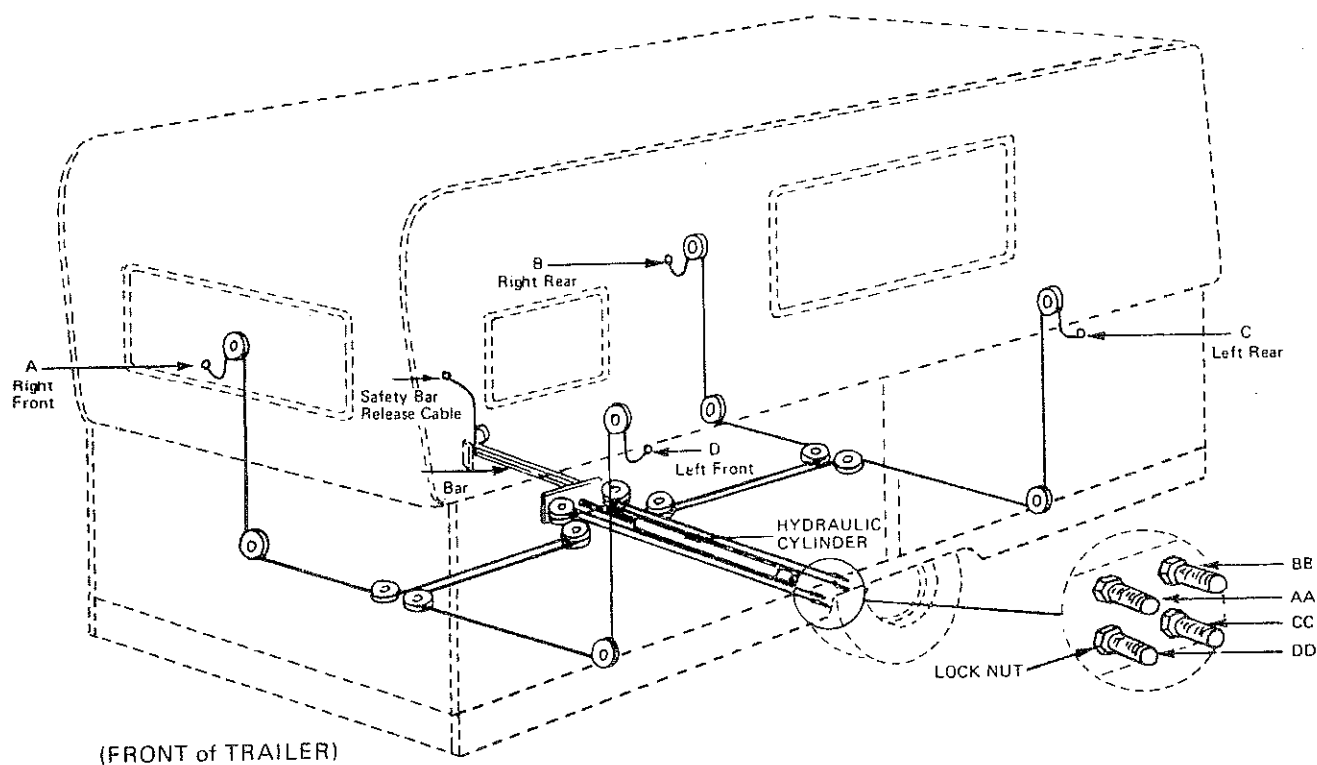
If one corner of the trailer is low, it may be corrected as follows:

- A. Lower the top section onto 2" x 4" boards.
- B. Loosen the locking nut on appropriate cable.
- C. Adjust nut to take up slack in cable.
- D. Tighten locking nut on cable.
- E. Raise trailer; remove 2" x 4" boards, and check for proper alignment.
5. If upper section will not lower, release safety bar. (Follow lowering procedure). If safety bar does not release and lift motor runs and makes a squeal, the unit may be low on hydraulic fluid.
6. If the safety bar does not release and lift motor runs and does not make a squeal, the lowering valve is blocked in open position.
  - A. Dirt in Valve: Run lift motor for 10 sec. (At 1 min. intervals) 4 times to dislodge any dirt that may be in the lowering valve.
  - B. Manual Release Valve Open: Be sure manual release lever is in neutral and not in partially opened positions.
  - C. Check Toggle Switch: With switch in center (off) position or in raising (up) position there should be no 12 volt supplied to the terminal to which the yellow wire is attached. Twelve volt should be supplied to this terminal only when switch is in lowering (down) position. (Drawing "A" 12 volt schematic lower section 6.12). If toggle switch does not follow this pattern - replace switch. For temporary operation: To raise trailer off of safety release, use a screw driver to short between black and white wire. To lower, short between black and yellow wire.



7. If safety bar releases and trailer will not lower:
- Check all cables to be sure that the cable is in the pulley grooves.
  - Lower trailer with manual valve. Pull manual release valve lever until trailer lowers. Then release lever to original position. Then raise trailer half way and try toggle switch. This releases high pressure that may have generated in lowering valve.
  - Check ground wire from lowering valve to motor bracket. Be sure terminals are tight.
  - With 12 volt test light, check center terminal (Black wire) of toggle switch to ground. If no light, check fuse 3 or check for broken wire between toggle switch and fuse block.
  - Using screwdriver, short between black and yellow wire of toggle switch. If valve operates-replace toggle switch.
  - Check connection at black lead wire of lowering valve to red wire of toggle switch for broken wire or loose terminal.
  - Replace lowering valve.

DRAWING C



BB - Right Rear Adjusting Nut  
 AA - Right Front Adjusting Nut  
 CC - Left Rear Adjusting Nut  
 DD - Left Front Adjusting Nut

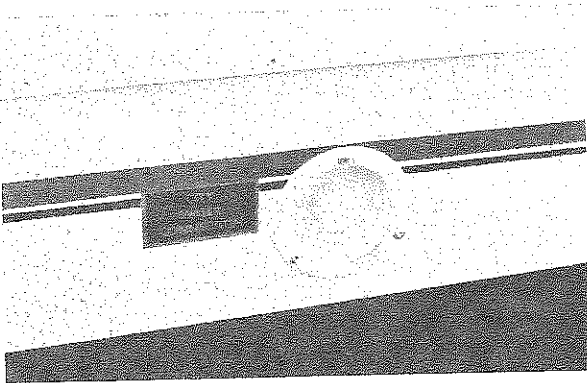
## 8. PLUMBING

### 8.1 Fresh Water Tank

Fresh water is provided from one of two sources:

1. City water, provided under pressure when the trailer is hooked up to a park or city water supply.
2. Water stored in an on-board water tank supplied by a pump operating automatically from your 12-volt electrical system.

A tank for your water supply is standard equipment. This tank is located at the front end and is filled through a fitting on the outside wall of the trailer.



### 8.2 External Water Supply

When camped in a park or near a city water supply, connect to your trailer as follows:

1. Turn water pump off.
2. Remove protective cap over city water inlet.
3. Connect water hose to your trailer inlet and to the city water supply line.
4. Turn city water supply valve on.
5. Let the water run a few minutes with your supply line attached to clean the lines.

Note: Both the on-board pump and on-board fresh water tank are now isolated from the water pressure in the system. Do not turn pump on until line is disconnected to avoid damaging the water pump.

Use the following procedure to disconnect the city water supply:

1. Turn city water supply valve to off.
2. Disconnect the water supply hose from your trailer inlet connection and replace inlet protective cap. If the on board tank is to be filled, go to step (3). If not, store the supply hose.
3. Fill the fresh water on-board tank from the city water source, then remove and store the hose.

### 8.3 Filling Fresh Water Supply

The on-board fresh water supply in your trailer provides fresh water automatically to all systems whenever a faucet is opened. Water is provided by a 12-volt automatic self priming water pump which functions any time power is available and the pump switch is on.

Fill the water tank by inserting a standard hose in to exterior water fill. After fresh water tank is filled remove hose and close water fill door. Turn the water pump on to supply system.

Avoid leaving water in tank when it is not in use. Turn the water pump off before draining water tank. For prolonged storage and during the winter months, this tank should be drained completely by opening valves at tank.

Note: The water system should be sanitized, flushed and drained before using.

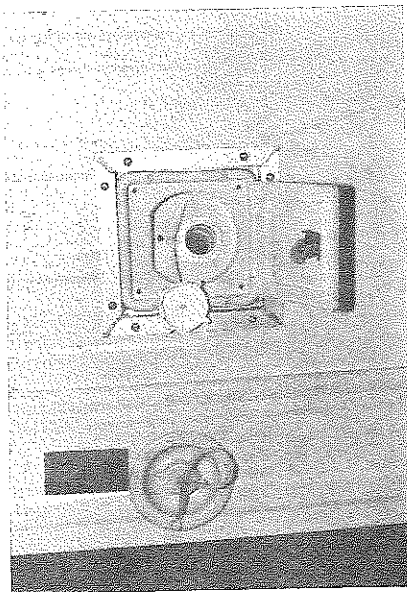


Figure A

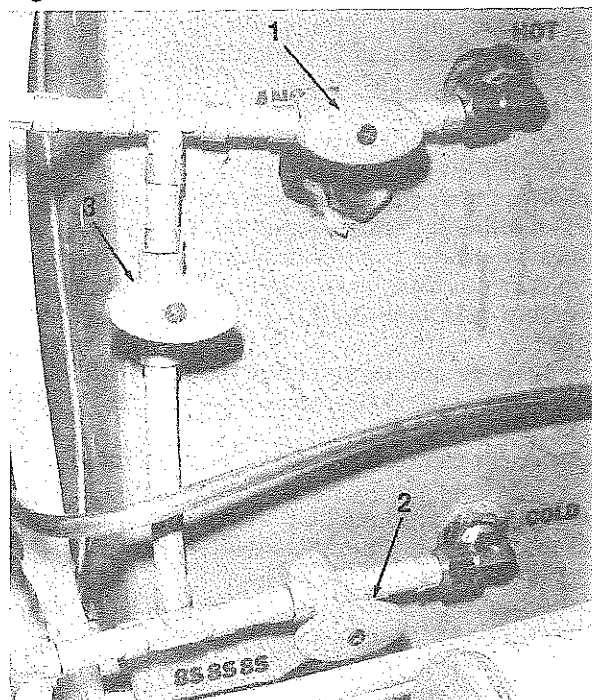
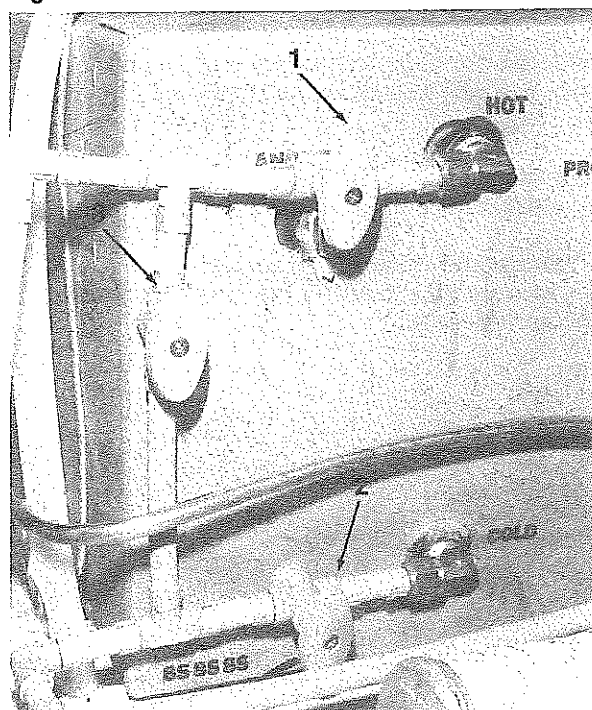


Figure B



#### 8.4 Sanitizing Potable Water System

To assure complete sanitation of your potable water system, it is recommended that the following procedures be followed on a new system, one that has not been used for a period of time, or one that may have become contaminated:

1. Prepare a chlorine solution using one gallon of water and 1/4 cup of Clorox or Purex household bleach (5% sodium hypochlorite solution). Pour one gallon of solution into tank for each 15 gallon of tank capacity.
2. Complete filling of tank with fresh water. Open each faucet and drain cock until all air has been released from the pipes and entire system is filled.
3. Allow to stand for three hours.
4. Drain and flush with potable fresh water.
5. To remove any excessive chlorine taste or odor which might remain, prepare a solution of one quart vinegar to five gallons water and allow this solution to agitate in tank for several days by vehicle motion.
6. Drain tank and again flush with potable water.

#### 8.5 Heat Tape

Travelers who like to camp in cold climate. A heat tape should be installed to your fresh water tank to keep it from freezing. Heat tape is operated by 110 V.

#### 8.6 Winterizing Water System

1. Open all interior valves, sink, shower, etc.
2. Drain supply tank by opening valve at front of tank.
3. Lower front of trailer by cranking down with jack.
4. If equipped with hot water tank, open drain valve and pressure relief valve at front of tank. This is located back of cover at front of trailer under pilot light. Open valve in hot and cold water supply line.
5. Your Hi-Lo is equipped with a manual by-pass system shown at left.
6. Figure A for normal operation. Valves 1 and 2 open; valve 3 closed.
7. Figure B for winterizing. Valves 1 and 2 closed; valve 3 open.
8. To winterize be sure valves are in the Figure B position. Pour about two gallons of RV antifreeze in the fresh water tank. Using your 12 V. pump, draw the antifreeze through the entire water system.

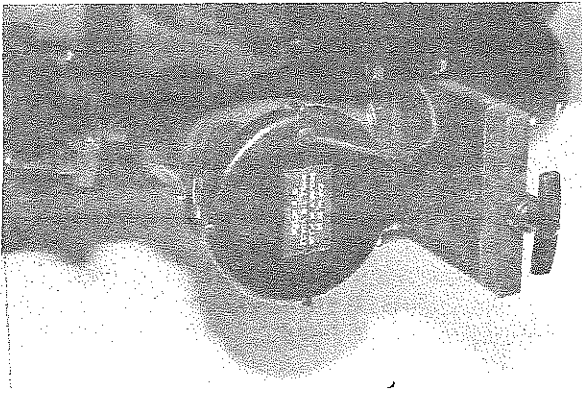
#### 8.7 Waste Water System

Your Hi-Lo trailer has a self-contained drainage system in which waste water and sewage go directly to separate holding and sewage tanks. All of the plumbing fixtures in the trailer are usable even when the drain is capped.

Waste water and sewage enter the holding tanks to be retained until the tanks can be emptied into a disposal area.

#### 8.8 Toilet

Your Hi-Lo is equipped with a mechanical seal type toilet. The instruction booklet accompanying these units should be reviewed carefully before use.



### 8.9 Waste Water Draining

If your campsite is equipped with drain facilities or dumping station, drain your body waste holding tank and waste water tank as follows:

1. Pull the flexible hose from its storage place in the rear bumper.
2. Remove the termination cap.
3. Install the drain hose on the termination fitting and place the other end well into dumping station fitting.
4. Pull out the large slide-ez valve lever.
5. Allow body waste tank sufficient time to completely drain.
6. Pull out the small slide-ez valve lever.
7. Allow waste water tank sufficient time to completely drain, also this will help rinse sewage that might collect to flexible hose when the body waste tank was drained.
8. Flush both tanks with clean water and allow to drain.
9. Push in both large and small slide-ez valve levers to closed position.
10. Remove flexible hose from termination fitting and rinse out hose with fresh water, then remove hose from dumping station.
11. Replace termination cap to trailer and dumping station cover.
12. Stow sewer flexible hose to rear bumper storage.

Note: All drain caps must be in place while in transit.

Note: Do not pull either slide-ez valve levers open when the termination cap is in the secured position.

### 8.10 Deodorizing Waste Tank

Keep your holding tanks clean using any cleaner approved for recreational vehicle sanitation systems.

Add a special deodorizer or chemical additive approved for recreational vehicle systems to sanitize and improve the tank action.

### 8.11 Winterizing Waste Water System

**Toilet** - Drain, and depress pedal until antifreeze appears in bowl.

**Holding Tanks** - Drain and rinse. Close valves.

**Slide-Ez Valves** - Examine the shaft on the slide-ez valve and apply metal lubricant if needed.

## 9. INTERIOR FURNISHINGS

### 9.1 Storage

Storage facilities in your Hi-Lo trailer has been especially designed to remain secure while the vehicle is in motion. Exterior access compartments have key-operated locks. Drawers rest in small notches or detents, when closed. To open drawers lift up slightly to clear the detent, then pull open. All cabinet doors have special latches to keep them closed securely while in transit. For best results, follow a few simple rules when stowing articles in the trailer.

1. Always keep tools and equipment stored in areas where they will not shift while traveling.
2. Wherever possible, place heavy articles in storage compartments which are low and between the axles for better weight distribution.
3. Use a "packing" technique of the articles in a compartment to prevent shifting. If necessary, secure articles with straps to prevent movement.
4. Be sure that containers holding liquids are capped and can't tip or spill. When glass containers (or dishes) are transported, secure them well to protect against accidental breakage.
5. Exterior storage compartments may not be watertight in all climate conditions. Any articles which could be damaged by water should be stored inside of trailer.

### 9.2 Dinette Conversion

To convert the "D" dinette into bed:

1. Pull back of each sofa forward and push braces down. Figure 1.
2. Using strap provided on seat, pull each seat toward the center of the trailer.

To convert the side dinette into bed:

1. Reach under table, release long leg latch and fold back. Pull short leg forward until latched.
2. Raise front portion of table several inches until table inserts are disengaged from wall brackets.
3. Pull out hinged side supports.
4. Lower table top into position to complete bed base.
5. Slide seat and back cushion into place over bed.

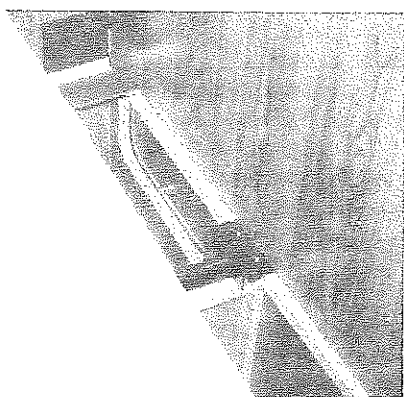
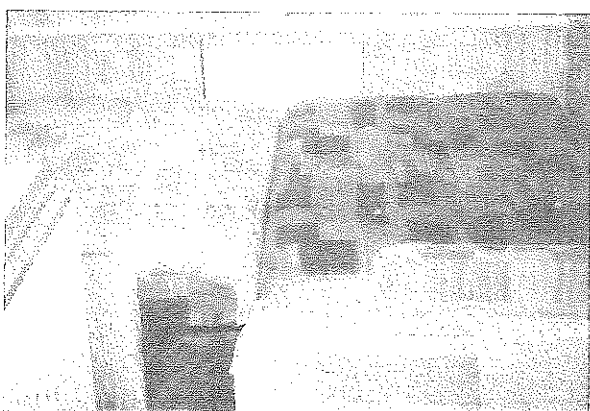
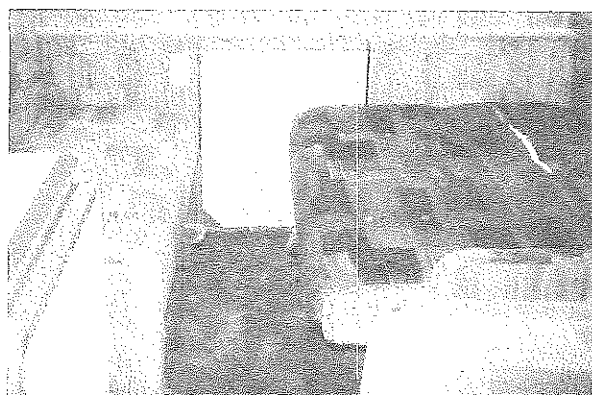
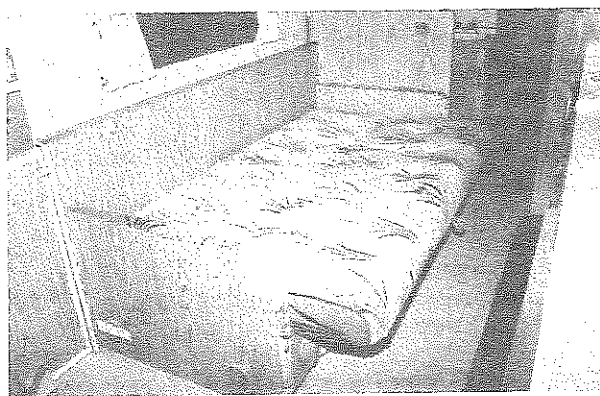
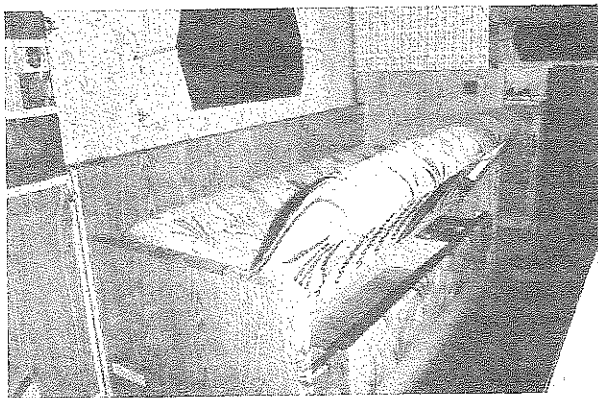
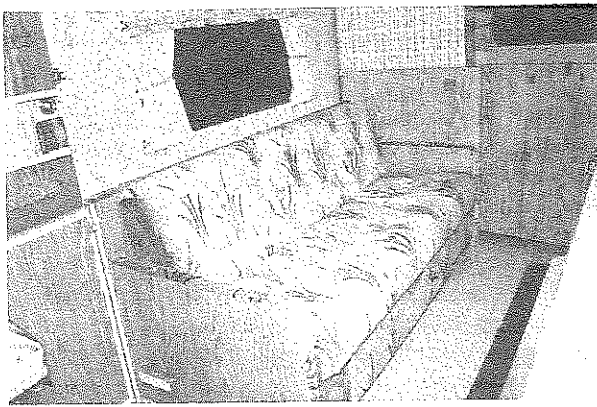


Figure 1





### 9.3 Sofa Bed Conversion

To convert sofa bed into bed:

1. Lift front edge of the seat cushion and push forward until it clicks and release, it should lay flat.
2. To convert back to original state, lift front edge of the seat cushion and push forward until it clicks and releases. It should return to upright position.

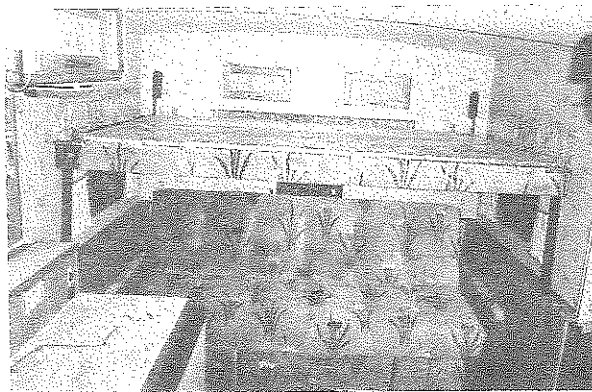
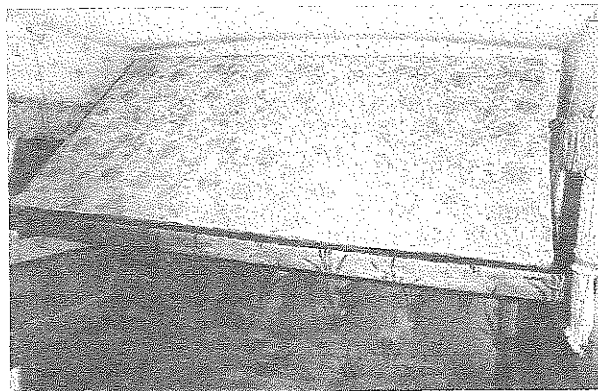
### 9.4 Swing Away Bunk

To convert swing away bunk into bed:

1. Remove safety hooks from ceiling brackets.
2. Release ceiling bracket latches while holding bunk.
3. While holding bunk let the side facing you drop straight down pivoting at the wall, then pull towards you and let bunk rest on its cables. The opposite side of the bunk will swing back to rest against wall.
4. Pull bunk legs down on each side of bunk and insert pins on ends of legs into holes on the top sides of the bottom section.

Note: Do not attempt to use bunk without legs in bed position.

5. To convert bunk into original state, reset bunk legs, let bunk rest on its own cables.
6. Pull bunk back and at the same time push bunk down, this should let the rear of bunk rest on top of wall brackets.
7. Push up bunk into ceiling bracket until latched. Reinsert safety hooks.







### 9.5 Twin Bed Conversion

To convert twin bed on door side of trailer:

1. Pull on bottom of cushion towards center of trailer, this will let back cushion drop down flat.
2. To convert to upright position, pull back cushion up and push bottom cushion toward wall.

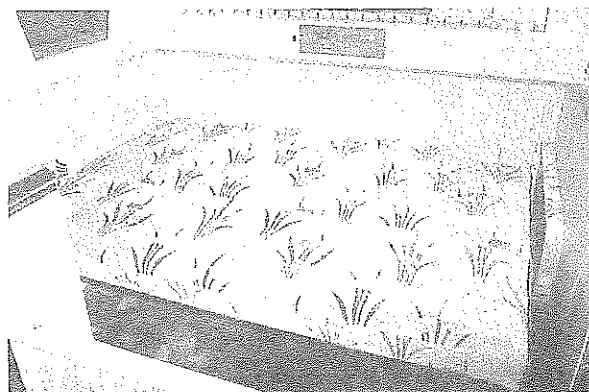
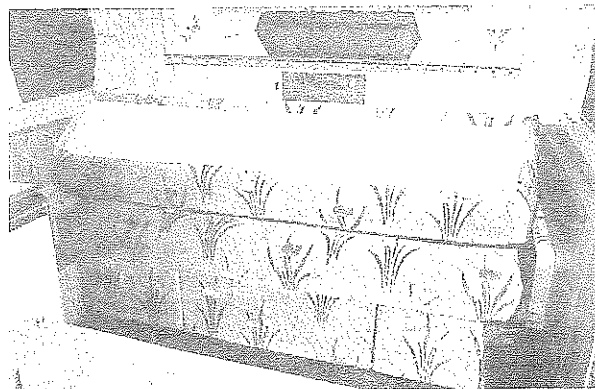
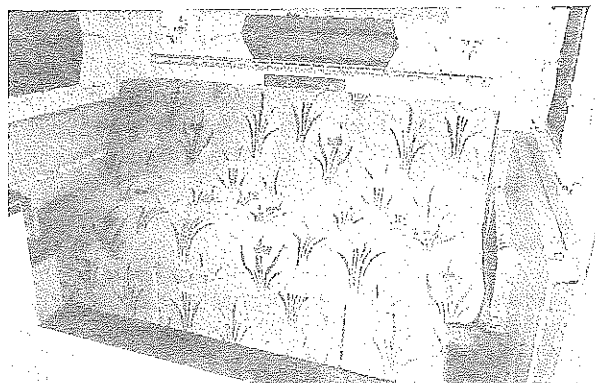
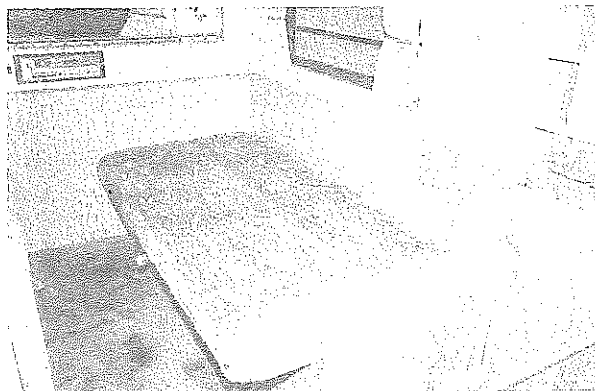
To convert twin bed on road side of trailer:

1. Same as door side twin bed.

### 9.6 "L" Sofa Conversion

To convert "L" sofa to bed:

1. Roll back of sofa towards rear of trailer.
2. Match back of sofa to the front and push down flat.



## 10. APPLIANCE OPERATION AND CARE

### 10.1 3-Way/Electric Refrigerator

Your Hi-Lo is equipped with a 3-way refrigerator and there is an instruction booklet inside trailer. We recommend you read and follow the instructions for most efficient operation of this unit.

Before starting on a trip, plug in your coach utility cord at your home about six hours before leaving. Switch the refrigerator to 110V. This will insure that the refrigerator is cold before you start your journey. Be sure the trailer is in the raised position. **Do not operate refrigerator over one hour while trailer is in lowered position unless the vehicle is in motion.** On the highway switch to low volts until you get to your destination. When you arrive, switch to LP Gas or 110V.

Note: If the refrigerator voltage selector is accidentally left on 12V. it will result in a discharged battery.

### 10.2 Oven/Range Combination

If your Hi-Lo includes an oven/range unit, you will find an operating guide book in your owner's kit. Be sure to read it carefully and follow directions step by step.

Note: Be sure the pilot is off during transit.

### 10.3 Range Exhaust Hood

If your Hi-Lo is equipped with a range exhaust hood it is operated by a simple on and off switch. The hood has a grease filter screen protecting the fan which will require periodic cleaning. To clean, remove the screen and wash in soapy water. Rinse with water and let the screen drain dry. Replace the clean filter in the exhaust hood. To operate exhaust fan unlatch exterior vent cover.

### 10.4 Automatic Gas Hot Water Heater

Units equipped with a LP-Gas fueled hot water heater will include an instruction manual in the owner's kit. This unit should also be turned off while in transit or whenever the trailer is in the lowered position.

Note: An additional plate concerning the Hi-Lo unit's gas piping is located on the front of the trailer adjacent to the mounting for the gas bottles. For your reference it is reproduced here.

**THIS GAS PIPING SYSTEM IS DESIGNED  
FOR USE OF  
LIQUEFIED PETROLEUM GAS ONLY.  
DO NOT CONNECT NATURAL GAS  
TO THIS SYSTEM.**

Securely cap inlet(s) when not connected for use. After turning on gas, except after normal container replacement, test gas piping and connections to appliances for leakage with soapy water or bubble solution. Do not use products that contain ammonia or chlorine.

### 10.5 Furnace

Your Hi-Lo is equipped with forced air furnace which operates on LP-Gas. It is equipped with a sealed combustion chamber and has an automatic ignition system that is designed for safety and efficiency. You will find an operating manual in your owner's kit. Be sure to read it carefully and follow its instructions. Also be sure the gas is shut off during transit. The furnace requires 12 volt DC current to operate blower and automatic ignition. If the furnace is operating in absence of 115 volt power source it will discharge 12 volt storage battery.

Note: To operate furnace the on/off switch under the thermostat should be on. Switch should be in the off position when furnace is not in use.



## 11. MAINTENANCE

### 11.1 Electric Brakes

Electric brakes need no special care or service other than keeping connections and wiring free of dirt and other foreign matter. Brake adjustment, relining, and repair are similar to those on your car. Any qualified service station can do the job. Caution: Do not pull breakaway pin for parking brake, as this will result in a constant drain on the battery and run it down.

### 11.2 Wheel Bearing Lubrication

Repack the wheel bearings with a good grade of grease every 6,000 miles or before any major trip. Check tightness of wheel lugs every 1,000 miles.

### 11.3 Tires Inspection

Your Hi-Lo trailer is equipped with first line quality tires which are designed to provide many miles of service.

Inspect all tires for wear and damage. If general tread wear indicates 1/16" (1.6mm) between any two adjacent tread ribs, the tires should be replaced. Look for abnormal wear patterns such as cupping or feathering of the tread or rapid wear on either the inside or outside of the tread surface. Replace the tire if cuts, bulges, peeling tread or other signs of damage or failure are evident. Remove stones and other objects lodged in tread.

Maintain proper pressure. The most common cause of tire failure is improper inflation. Keep an accurate tire gauge in your tool kit. Check tire pressure cold. A cold tire is one that has been run less than 1 mile (1.6km).

Note: Do not bleed air out of warm tires.

### 11.4 Changing Tires

1. Remove fender skirt.
2. Place jack under main frame near tire being changed.
3. Remove tire.
4. Reverse procedure above.

### 11.5 Exterior Care

Almost the entire outside surface of your Hi-Lo consists of prefinished aluminum and fiberglass that will keep its finish indefinitely, if given the proper care. Mild soap and water will help retain the natural gloss. Clean top section first in lowered position, then raise and clean the bottom section.

Abrasive cleaners should not be used on the fiberglass.

The warranty requires that the owner perform minimum maintenance which includes washing and waxing the R.V. siding at least 3 times a year at regular intervals.

### 11.6 Interior Care

Counter top and tables — The hard finish surfaces of your counter tops and tables are the same as those in your kitchen at home. While being highly resistant to heat, staining, and abrasion, the same good care will keep them like new for years to come. Simply wipe clean with warm soap and water. Wall paneling — The paneling and ceiling of your Hi-Lo trailer may be of several finishes and textures. Never use detergents or abrasive cleaners on walls or ceilings. Most surfaces will

clean with a soft cloth which has been dampened with furniture polish or wax; avoid the use of large amount of water.

Drapes — Washable.

Floors — Same as your kitchen floor at home. Waxing before extended trip will make floor care easier enroute. A rubber or fiber mat placed outside the door will do wonders in keeping sand and dirt outside. For units equipped with carpet, use mild soap and water to clean soiled spots and a regular vacuum cleaner to pick up sand and dirt.

Appliances — Same as your appliances at home.

#### **11.7 Hitch Inspection and Lubrication**

Periodically inspect your ball and hitch assembly for cracked welds and metal fitting. Also check for loose nuts and bolts.

Occasionally lubricate the hitch ball with universal bearing grease, or hitch ball lubricant.

#### **11.8 Battery**

Add water and recharge if needed. Disconnect cables, remove battery and store in a cool, dry place. Check monthly and recharge as needed.

#### **11.9 Hydraulic Cylinder**

Periodically check your hydraulic cylinder for leaks. If **EXCESSIVE** leaking occurs take your trailer to your dealer for repairs.

## 12. SAFETY CONSIDERATIONS

### 12.1 Additional Safety Considerations

1. Sanitize the fresh water system periodically (see sanitizing instructions).
2. Prevent water connection fittings from coming in contact with the ground or drain hose to reduce chance of contamination.
3. Never attempt to repair gas or electrical appliances. Enlist services of a qualified technician.
4. Always have a serviceable fire extinguisher located in an easily accessible location. This extinguisher should have a rating of at least 2 BC units.
5. Never overload your vehicle (See limits 2.3).
6. Avoid improper load distribution which can adversely affect roadability and towing safety (2.3).
7. Insure that tires are in good condition and properly inflated. Watch inflation especially close for tandem wheel models - under-inflated tires get hot. Hot tires are more apt to blow out.
8. Check and tighten wheel lugs regularly. (Torque to 85 lbs.)
9. Test brakes in a safe area, not while traveling a busy highway.
10. Disconnect television power cord and antenna lead-in during local thunderstorm and lightening activity.
11. Always solidly block trailer wheels before unhitching.
12. Before leaving a camp area with a trailer in tow, insure that the safety pin or locking lever is seated, break away wire is attached to tow vehicle, and the electrical cord and safety chains are connected.
13. Have wheel bearings cleaned and packed at regular intervals.
14. Check condition of trailer brake magnets and linings periodically.
15. Observe warning labels attached to your vehicle concerning LP-Gas, water, electricity, and loading.
16. All heat producing appliances should be turned off before trailer is lowered. Also turn off valve at LP-Gas cylinder.
17. Read appliance manufacturer's instructions before attempting to light or operate appliances.
18. Normally store trailer in the lowered position. If stored in the raised position, (for an extended period of time) grease the exposed thrust rod of the hydraulic cylinder.
19. This warning label has been located in the cooking area to remind you to provide an adequate supply of fresh air for combustion. 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 for asphyxiation is greater when the appliance is used for long periods of time:

## **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 and;
2. Open Window.

20. The following label has been placed in the vehicle near the range area:

## IF YOU SMELL GAS:

1. Extinguish any open flames, pilot lights and all smoking materials.
  2. Do not touch electrical switches.
  3. Shut off the gas supply at the tank valve(s) or gas supply connection.
  4. Open doors and other ventilating openings.
  5. Leave the area until odor clears.
  6. Have the gas system checked and leakage source corrected before using again.
- 
21. Warning: Portable fuel burning equipment including wood and charcoal grills and stoves shall not be used inside recreational vehicles.
  22. Warning: Do not bring or store LP gas containers, gasoline or other flammable liquids inside the vehicle because a fire or explosion may result.
  23. Warning: LP-gas containers shall not 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.
  24. A warning label has been located near LP gas container. This label reads:  
Do not fill container(s) to more than 80 percent of capacity.
  25. LP-gas regulators must always be installed with the diaphragm vent facing downward. Regulators that are not in compartments have been equipped with a protective cover. Make sure that regulator vent faces downward and that cover is kept in place to minimize vent blockage which could result in excessive gas pressure causing fire or explosion.

### 12.2 Safety When Emergency Stopping

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 flats or for emergency situations. Turn on your vehicular hazard warning flashers when parked alongside a roadway, if only for a few minutes. Get members of your family out of the RV and have them stand clear of the vehicle area when parked on the edge of a highway.



## **6-YEAR LIMITED WARRANTY ON HYDRAULIC LIFTING SYSTEM**

HI-LO Trailer Co., 100 Elm Street, Butler, Ohio 44822, warrants that it will replace any part of your HI-LO hydraulic lifting system (excluding the battery) which becomes broken or inoperative due to defect in material or workmanship within 6 years from date of purchase. Adjustment of the cables and power units are not included.

This warranty is extended only to the original purchaser of the HI-LO trailer in which the hydraulic lifting system is installed.

Damage while in the possession of the consumer resulting from lack of proper care, negligence, use other than as recommended by the "Care & Use Manual," or from the involvement of the HI-LO trailer in a collision or other accident is not covered by this warranty. The warranty does not cover any trailer which has been leased, loaned or rented.

The HI-LO trailer must be returned to the HI-LO dealer for routine inspection and where applicable, service during the 24 months immediately following date of sale.

Implied warranties on your HI-LO hydraulic lifting system shall be in effect only for the duration of the express warranties and upon conclusion of the express warranties, there shall be no warranties express or implied (including merchantability and fitness for purpose) on your HI-LO hydraulic lifting system.

Some states do not allow limitation on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages so the above limitation may not apply to you.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

### **HOW TO OBTAIN SERVICE**

To obtain service under this warranty, return your HI-LO trailer to the HI-LO dealer who sold you the trailer. The dealer will provide a free replacement part for any of the hydraulic lifting system found to be defective. There will be no charge for labor or removal and replacement during the first 12 months from date of purchase of the trailer. Labor for removal and replacement will be available at your expense after 12 months from date of purchase of the trailer. You are responsible for the costs incurred by your dealer in shipping a defective part to HI-LO Trailer Co. for replacement and for the costs of shipping your free replacement part from HI-LO Trailer Co. to your HI-LO dealer.

The HI-LO Certified Customer Care registration card must be returned to HI-LO within 5 days from date of purchase for the warranty to be effective.



1990 25ft+ classic.



# A Family of Low Profile Travel Trailers

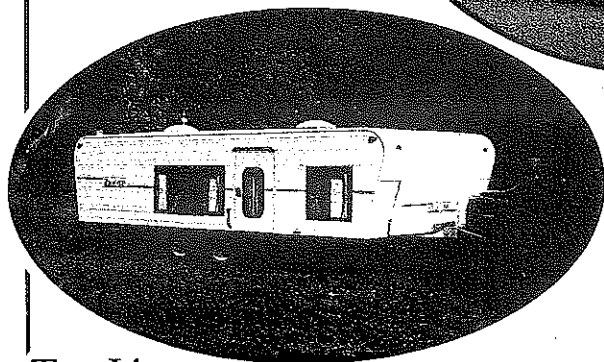
Up to 64% gas savings

26

Up for  
spacious living. →



Down for  
safe & easy travel.  
↓



**HI-LO**  
PRESTIGIOUS  
LINE



## TowLite

LOW PRICED,  
LIGHTWEIGHT

## FunLite

MEDIUM PRICED,  
MEDIUM WEIGHT

- Aerodynamic styling
- Safe and easy to tow
- No buffeting by passing trucks
- Beautiful, spacious interiors
- Raises and lowers in just seconds
- Automatic lifting system (Warranted 6 years)
  - Can be stored in your garage
- Fiberglass exterior skin (Warranted 7 years) - most models
- Strength - Durability - Quality
  - Owner proven over 30 years
- Value now and when you trade - one of the highest resale values in the RV Industry

*Luxurious,  
Well - Planned Interiors*

Please send me more information on: **HI-LO**

Name \_\_\_\_\_

Address \_\_\_\_\_

Phone # \_\_\_\_\_

☐ Prestigious

☐ Tow Lite

☐ Fun Lite

MANTELLI TRAILER SALES, INC.

(716) 625-8877





## ICP Global Technologies

### 7Amp Charge Controller (# 10014) Instructions

The ICP 7amp controller is designed to protect your 12 Volt batteries from being overcharging by the Solar Systems. It includes a built-in diode for reverse current protection, which prevents discharge of the battery. The ICP 7amp controller reduces overall system maintenance and helps extend the life of the battery.

#### INSTALLATION

*The charge controller should not be exposed to direct sunlight or to temperatures exceeding 170°F (77°C). It should be installed within 5 feet (1.5m) of the battery in a cool, dry and well ventilated area.*

**DO NOT USE MORE THAN SEVEN (7) ICP 15 Watt PANELS WITH THIS 7Amp CONTROLLER**

There is no need for any extra fuse protection if using the kit as per its instructions.

**ALL connections should be in PARALLEL**

**(Positive to Positive, Negative to Negative)**

Insure that connections are clean and solid.

Soldering the contacts guarantees the best connection between wires. For all installations or additions, use 16 or 14 AWG (gauge) wires.

**Always CONNECT the BATTERY FIRST, AND DISCONNECT the BATTERY LAST.**

#### STEPS:

1. **CONNECT PANELS :**  
If you have more than one solar panel, simply connect them all in parallel (positive to positive and negative to negative) then connect the remaining leads to the controller as described in step 3.
2. **CONTROLLER TO BATTERY CONNECTION:**  
Connect the controller's "battery side" positive (red) wire to the positive side of the battery. Next, connect the negative (black) wire of the controller to the negative side of the battery.
3. **CONTROLLER TO PANEL CONNECTION:**  
Connect the controller's "panel side" positive (red) wire to the positive (white) wire of the solar (PV) panel(s) and the negative (black) wire of the controller to the negative (black) wire of the solar panel(s).

#### OPERATION

##### YELLOW LIGHT ON:

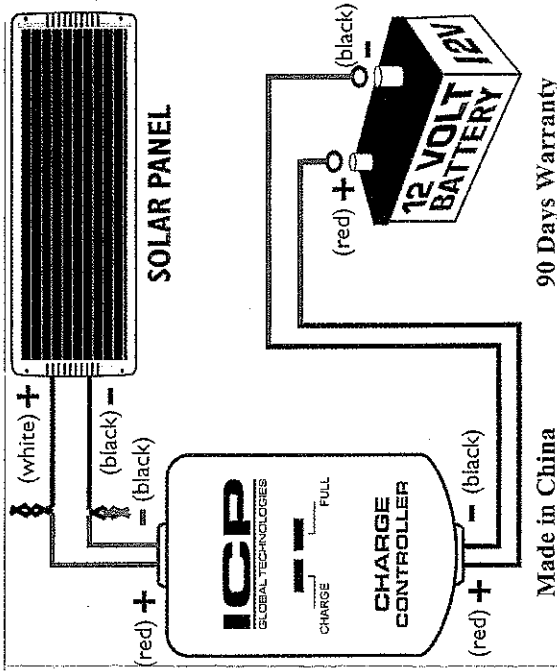
- Solar panel is charging the battery.
- When battery voltage is below 13Volts the charger cuts in and begins the charging operation.

##### GREEN LIGHT ON:

- Battery is fully charged.
- When battery voltage reaches 14.2Volts the Controller cuts out and will minimize voltage while monitoring battery.

This will protect battery from damaging overcharge.

**During normal operations the yellow and green lights may blink alternately with varying intensities.**



#### OPÉRATION :

##### LUMIÈRE JAUNE ALLUMÉE :

- Panneau Solaire charge la batterie
- Le Contrôleur de charge commence à charger (cut-in) quand le voltage de la batterie tombe sous 13Volt

##### LUMIÈRE VERTE ALLUMÉE :

- La batterie a atteint sa pleine charge
- Quand le voltage atteint 14.2Volt, le contrôleur de charge minimise (cut-out) le voltage à la batterie tout en vérifiant la condition de la batterie. Cela protégera votre batterie. Pendant l'opération, les lumières jaune et verte peuvent s'allumer/es alternativement avec des intensités variables.

Made in China / Fabriqué en Chine

Rev. 05-02-01  
702-000118

## ICP Global Technologies

### Instruction pour contrôleur 7Amp (# 10014)

Le contrôleur 7amp d'ICP est conçu pour régulariser le voltage du panneau solaire afin d'assurer que la batterie ne soit pas surchargée. L'unité inclus une diode qui protégé contre tout renversement de courant. Le contrôleur d'ICP aide à réduire le temps d'entretien général de la batterie.

#### INSTALLATION.

*Le contrôleur de charge ICP ne devrait pas être exposé directement au soleil ni à des températures excédant 170°F (77°C). Il devrait être installé au plus à 5 pied (1.5m) de la batterie dans un endroit sec, frais et bien ventilé.*

**NE PAS UTILISER PLUS DE (7) SEPT PANNEAUX ICP 15Watt AVEC LE CONTRÔLEUR DE 7Amp**

**TOUTES les connexions devraient-être en PARALLÈLE (Positif à Positif, Négatif à Négatif)**

Assurez-vous que les contacts sont propres et solides.

La soudure des contacts garantira une meilleure connection entre les fils. Pour toutes installations ou additions, utilisez des fils de type 16 ou 14 AWG

**Toujours Brancher la BATTERIE en PREMIER. et la DÉBRANCHER en DERNIER.**

#### ÉTAPES:

##### 1. BRANCHEZ LES PANNEAUX:

Si vous avez plusieurs panneaux, branchez les simplement en parallèle, (positif à positif, et négatif à négatif), ensuite branchez les deux derniers fils au contrôleur tel que décrit dans l'étape 3.

##### 2. BRANCHEMENT DE LA BATTERIE:

Branchez-le fil (rouge) positif ( du côté "batterie" du contrôleur) au côté positif de la batterie et le fil (noir) négatif du contrôleur au côté négatif de la batterie.

##### 3. BRANCHEMENT PANNEAU(X) SOLAIRES:

Branchez le fil (rouge) positif (côté Panneau du contrôleur) au fil (blanc) positif du ou des panneau(x) et le fil (noir) négatif du contrôleur au fil (noir) du ou des panneau(x).

QUESTIONS : customers@icpglobal.com

