



**POLAR KING**  
INTERNATIONAL, INC.

## REFRIGERATED TRAILER OWNERS MANUAL



### **WARNING**

The contents of this Owner's Manual contains important information and instructions for your refrigerated trailer.

**ALL** material included in this manual **MUST** be read before loading or towing your refrigerated trailer.

**ALL** Safety Instructions and Precautions **MUST** be followed.

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# POLAR KING

INTERNATIONAL, INC.

To Our Customers:

Thank you for purchasing a Polar King® Refrigerated Trailer

*This Refrigerated Trailer has been designed and engineered to provide years of trouble-free service. All Polar King® Refrigerated Trailers are constructed of space-age materials and state-of-the-art manufacturing techniques. Every unit receives numerous quality inspections and is pre-tested prior to delivery. The finished product is the best and most efficient refrigerated trailer available on the market.*

*However, should you experience a service problem, please contact our customer service department. They will work with you on resolving the problem and insure your continued satisfaction.*

*Again, thank you for selecting Polar King®. Should you require future refrigerated storage, we would appreciate the opportunity to serve you.*

*Polar King® International, Inc.*

**Register your new Polar King® trailer  
online in our Resource Center at [www.polarking.com](http://www.polarking.com)**



This manual is also available  
online in our resource center.

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All diagrams are available in larger format online in our resource center at [www.polarking.com](http://www.polarking.com)

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A General Unit Information Sheet is included with this manual for your convenience. This sheet contains detailed information on your walk-in. Please have this information available when requesting service.

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## INTRODUCTION

The information contained in this manual covers a basic refrigerated trailer. **It is IMPORTANT you READ, FOLLOW and UNDERSTAND the instructions given by the trailer, tow vehicle and trailer hitch manufacturers.**

ALL manuals and materials provided with your trailer should be stored in a safe place.

Inserts with information on axles and tire warranty are provided with this manual. Please keep for future reference.

Consult Polar King if you have any questions regarding the information contained in this manual.

Please have your unit serial number available when contacting Polar King. Your unit serial number is normally located on the front left side of the trailer.

Please write your unit serial number in the space below for future use.

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# SAFETY PRECAUTIONS

## Safety

This Refrigerated Trailer Owner's Manual provides general information and cannot provide specifics for every situation. You must read, understand and follow all towing instructions for the vehicle used to pull the trailer and the Trailer hitch being used, as well as the instructions in this manual.

This trailer is constructed with components from various manufacturers. Refer to these separate instructions, when indicated. If you do not have access to those instructions, contact Polar King.

There is specific Safety Information given in this manual.



This symbol is used as an alert. It means **PAY ATTENTION! SAFETY INFORMATION!**

There are 4 levels of safety alerts used in this manual:

### **DANGER**

**DANGER** – This means there is a hazardous situation that **WILL** cause serious injury or death if not avoided.

### **WARNING**

**WARNING** – This means that a hazardous situation exists and **COULD** cause serious injury or death if not avoided.

### **CAUTION**

**CAUTION** – This means that a hazardous situation exists and **COULD** cause minor or moderate injury if not avoided.

### **NOTICE**

**NOTICE** – This means that a situation exists that could cause damage to the equipment or other property.

## Hazards

### **DANGER**

**Improper towing of this trailer may cause loss of control that can cause death or serious injury.**

The following is a list of common cause for the loss of control of the trailer and/or Tow vehicle.

- Traveling at excessive speed for road conditions
- Overloading and improper balancing
- Tow vehicle improperly sized for trailer
- Loose lug nuts on wheels
- Improper tire pressure
- Incorrect coupling of trailer to hitch
- Failure to adjust driving when towing, i.e. backing distance, lane changes, etc.
- Improper steering and/or braking when trailer is swaying

## Sizing the Tow Vehicle to the Trailer

### **DANGER**

**The incorrect tow vehicle will cause stability problems when towing the trailer and can result in serious or fatal accidents.**

### **NOTICE**

**Increased strain on the tow vehicles drive train and/or braking system can result in serious maintenance problems.**

Never exceed the maximum towing capacity of the tow vehicle being used. The information regarding the Gross Trailer Weight (GTW) and maximum Gross Combined Weight Rating (GCWR) is located in the tow vehicle's owner's manual.

### **DANGER**

**Danger – Never use and hitch, ball or tow vehicle that is under-rated for the trailer. This can lead to a loss of control while towing and cause death or serious injury.**

---

## Improper Speeds – Driving too Fast

The maximum recommended speed for safely towing a trailer is 55 MPH (≈90 KPH) under ideal road conditions. Driving at excessive speeds can cause the trailer to sway, which may cause loss of control. Excessive speeds may also cause tire to overheat. This increases the likelihood of a blowout.

### **WARNING**

**Do not drive too fast for the road conditions. This can cause loss of control which can lead to death or serious injury**

**Lower your speed when towing**

## Adjusting Your Driving Behavior When Towing a Trailer

Keep in mind that when towing a trailer your stopping distances increase dramatically. You will also have an increased turning radius, as well as decreased acceleration. Towing a trailer changes the way your tow vehicle handles and makes it more responsive to steering changes. A trailer is more likely to be affected by wind or when being overtaking by larger vehicles, such as semi-trucks. You will need greater distances to overtake other vehicles because of the decreased acceleration and increased overall length.

### Tips for Safe Towing

- Check your mirrors often to watch the trailer and surrounding vehicles
- If the trailer starts to sway, take your foot off the gas pedal and use small steering adjustments. (Just enough to stay in your lane of travel.) Do not make large steering adjustments,. This can increase the swaying. Do not apply the brakes of the tow vehicle. However, you may apply the trailer brakes alone (if so equipped), especially when going downhill. Allow the tow vehicle to pull the trailer straight until the swaying stops.
- Keep the trailer's height in mind when passing under roofed structures, tree limbs, low bridges and overpasses, especially if it is taller than the tow vehicle.
- Pay attention to the road surface conditions. Wet and/or icy conditions will adversely affect your ability to maintain control while towing.
- Use a lower gear when descending steep or long grades. The engine and transmission of the tow vehicle will create a braking action. Riding the brakes, while going down steep or long grade can cause them to overheat and lose their effectiveness.

## Trailer Coupling

It is critically important that the trailer is coupled to the hitch correctly and the safety chains and breakaway brake lanyard are attached properly. An uncoupling at highway speeds can lead to death or serious injury.

### **WARNING**

**The correct selection and condition of the coupler, hitch ball and receiver are critical to towing a trailer safely.**

**Uncoupling while towing can cause damage to property, serious bodily injury or death.**

**The hitches ball size must match that of the coupler. Never attempt to tow a trailer when the ball and coupler are mismatched.**

**Ensure that the load rating of the hitch is equal to or greater than that of the coupler.**

**Make sure the coupler is connected correctly and tightened to the hitch ball before attempting to moving the tow vehicle and trailer.**

**Inspect all hitch and coupler components before making the connection of coupler to hitch-ball. Replace worn, corroded or cracked components before coupling the trailer to the tow vehicle.**

## Coupling Check List

- Coupler is secured to hitch ball and locked in place
- Safety chains are connected to the tow vehicle and not dragging
- Breakaway brake lanyard is correctly connect to the tow vehicle
- The load is secured securely fastened to the trailer
- Check all tires and wheels on both tow vehicle and trailer
- Check the trailer brakes. Make sure they are working properly
- Retract the trailer jack(s)
- Connect trailer lights and make sure they work properly

### **WARNING**

**Before towing, make sure all tires are properly inflated to the correct pressure as stated in the Certification / VIN Label.**

**Make sure all wheel lug nuts are tight. Make sure the wheels are seated correctly on the hub. Normal use can cause the wheel rim to loosen over time. Inspect/tighten before towing.**

**Lug nuts tend to loosen after first being tightened (such as after a re-mounting). Inspect/tighten all lug nuts after the first few miles driven and before each tow after that.**

**A wheel that becomes loose can cause loss of control and can lead to death or serious injury.**

## Safety Chains

Safety chains are provided trailer control can be maintained in the event the trailer becomes loose from the hitch.

### **WARNING**

**Make sure to connect the trailer's safety chains to the tow vehicle's frame or hitch correctly. Improper rigging can cause the loss of control of the trailer and/or tow vehicle and, if the trailer becomes uncoupled while towing, lead to death or serious injury.**

**Chains should be crossed below the trailer's coupler and tow vehicle's hitch loosely enough to permit turning, but tight enough to hold the trailer tongue up should it uncouple while towing.**

**Do not attach safety chains to the tow vehicle's hitch unless loops or holes specifically designed for that purpose have been provided.**

## Breakaway Lanyard

### **WARNING**

**An inoperative trailer breakaway braking system and lead to a runaway trailer, which can result in death or serious injury.**

Trailer equipped with brakes will also be equipped with a breakaway brake system. This system will apply the trailers brakes in the event of a trailer uncoupling while towing. This system must be checked before towing. This system, including the battery, must be kept in working order and correct attached to the tow vehicle to be effective.

Connect the breakaway lanyard to the tow vehicle itself and not hitch.

Test the function of this system each time before towing the trailer.

## Trailer Coupling and Hitch Ball

### **WARNING**

**The Trailer is equipped with a (Size) Coupling. The Hitch Ball must be the same size. Improper sizing of the hitch ball can lead to uncoupling, leading to death or serious injury.**

**Make sure the tow vehicle and hitch are rated for the Gross Vehicle Weight Rating (GVWR) of the trailer. Using a hitch with a lower load rating than the trailer, can cause loss of control and may result in death or serious injury. Using a tow vehicle with a towing capacity lower than the load rating of the trailer, can cause loss of control and may result in death or serious injury.**

## Tires, Wheels & Lug Nuts

It's important to inspect the condition of the tire each time before towing. Excessive tire wear, as evidenced by bald spots or cords showing, or damage, such as cuts, cracks or bulging mean the tire is not safe and must be replaced before towing.

Too little tread will not provide the friction needed to maintain control of the trailer on wet roads.

Uneven tread wear may be caused by several factors, such as improper inflation, unbalanced tires or a axle damage or misalignment. Employ the assistance of a trailer service center to correct the problem.

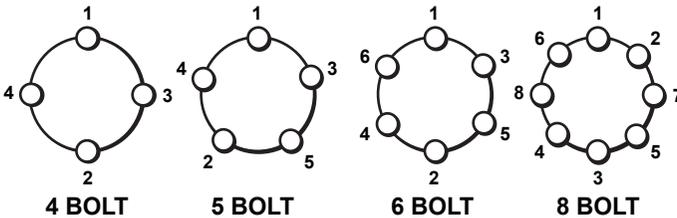
The correct tire pressure is given on the Certification / VIN label found at the front left side of the trailer. Tire pressures should be check and corrected before towing.

### **WARNING**

**Improper tire pressure can result in a tire blowout causing loss of control, which may lead to death or serious injury.**

**Make sure all wheel rims are undamaged and in good condition. A bent or otherwise damaged wheel can cause you to lose control and result in death or serious injury.**

Inspect and/or tighten all lug nuts before towing. Lug nut should be tightened to a torque in three stages. Using a Star-Pattern, as shown in this diagram, tighten each lug first to 20 to 25 ft/lbs. Then following the same pattern tighten each lug to 50 to 60 ft/lbs. Finally, tighten each lug to 90 to 120 ft/lbs.



### **WARNING**

**Wheel rims and lug nuts may loosen over time. This may cause a wheel to come off while towing and could result in death or serious injury. Tighten all lug nuts every time before towing.**

**Tighten all lug nuts after the first 10, 25 and 50 miles of towing after any wheel has been remounted.**

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## Loading the Trailer

The weight of the trailer plus the weight you load on it must not exceed the Gross Vehicle Weight Rating GVWR. A commercial scale can tell you the GVWR. You must also distribute the weight correctly so as not to exceed the weight of an axle. This called the Gross Axle Weight Rating (GAWR). The GVWR and GAWR are listed on the Certification / VIN Label located at the front left side of the trailer.

### **WARNING**

**Do Not Overload the trailer. Overloading can cause loss of control and can result in death or serious injury. Never exceed the weight for tire rating. Never exceed the Gross Vehicle Weight Rating GVWR or the Gross Axle Weight Rating (GAWR)**

**Never transport explosive, flammable, poisonous or other materials that may be dangerous in your trailed, with the exception of a fuel tank in a piece of equipment being hauled.**

## Load Distribution

The distribution of the load is very important to the stability of the trailer while towing. Having too much weight in front of the axel(s) will cause the tongue weight to be too great. Conversely, having too much weight behind the axle will cause tongue weights that are too low. Either condition will cause the trailer or tow vehicle to be unstable while towing.

The loaded trailer weight should be distributed correctly to achieve the correct tongue weight. As a "Rule of Thumb" the tongue weight should be 10 to 15% of the loaded weight of the trailer. So for a 5,000 pound loaded weight there should be 500 to 750 lbs. of tongue weight on the hitch.

This is just an example and the specific weights will depend on the loaded weight of your trailer.

Depending on the tow vehicle being used, a weight distribution system may be needed.

Be certain the trailer is evenly loaded left / right and the axles aren't overloaded. Uneven distribution may cause tire, wheel, axle or structural failure.

Specific questions regarding the actual percent of tongue weight for the trailer, contact the manufacturer.

### **WARNING**

**Make sure tongue weight is within the allowable range. Improper tongue weight (load distribution) can cause you to lose control of the trailer and result in death or serious injury.**

## Load Distribution Check List

- Check the following each time before towing:
- Even distribution left / right
- Keep the center of gravity low.
- Even front-to-rear load distribution providing proper tongue rate.

## Cargo

It's important to secure the cargo being transported while towing. Make sure that any cargo is not allowed to shift during braking, acceleration or turning.

### **WARNING**

**Load shifting can result in damage or loss of control. This can lead to death or serious injury. Any load must be secured properly.**

**Do not transport cargo that the trailer is not designed to haul. Never transport people, hazardous or flammable substances.**

**Transporting people in your trailer is dangerous and can cause death or serious injury. It is also illegal.**

**Never transport explosive, flammable, poisonous or other hazardous materials. The exception is the fuel in a fuel tank of a piece of equipment.**

## Brakes and Lights

If your trailer is equipped with electric brakes, your tow vehicle must have a brake controller that can operate those brakes. To verify that the brake system is connected and working correctly, you must test them before each tow.

To test the trailer brake system, with the trailer coupled to the tow vehicle and all connection made correctly and the trailer ready to be towed, begin pulling the trailer at a low speed (5 MPH recommended). Manually activate the trailer brake control in the tow vehicle. If the brakes are working properly you should feel a resistance from the trailer.

If the trailer is equipped with hydraulic surge brakes, test by pulling the emergency breakaway lanyard.

Before towing the trailer you must be certain that the brakes and all lights are properly connected via the multi-pin plug and working correctly.

### **WARNING**

**An incorrect connection of the brakes and/or lights between the trailer and the tow vehicle will not allow the brakes and/or lights to function. This can cause a collision, which can lead to death or serious injury. Verify that the trailer brakes are working by testing them before towing. Also check that all lights as well as turn indicators are functioning.**

## Mirrors

The tow vehicle must be equipped with mirrors that allow visibility to approaching traffic. A proper field of vision must be provided for the sides and rear of the trailer being towed.

## Modifications

Alterations to the trailer or trailer's structure can make the trailer unsafe and void your warranty. Before modifying the trailer, contact Polar King and discuss any alterations before making them.

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## Towing Guide

There is a big difference between how the tow vehicle handles with and without a trailer. Braking, maneuverability and acceleration are all reduced. You will need more time and distance to stop, more room to turn and overtake other vehicles, and more time to speed up.

You must adjust your driving behavior to tow a trailer safely. Driving risks and hazards are increased when towing. You are responsible for keeping the tow vehicle and trailer under control and any damage caused by the loss of control.

Practice towing in an open area with no traffic. Start by doing the pre-towing inspection and adjust the mirrors so you can see the sides of the trailer and the area behind. Begin towing at a very slow speed. Make turns to get used to how the tow vehicle and trailer reacts to the steering inputs. Apply the brakes a few times and note how the tow vehicle and trailer feel. Apply only the trailer brakes (if equipped with electric brakes) and see how the trailer responds.

Practice backing up with the trailer to learn how it reacts. Before backing up, exit the vehicle and check for obstacles or use another person as a spotter. Backing up with a trailer requires a lot of practice before one becomes proficient.

### Safe Towing Check List

Check the following each time before towing:

- Perform the coupling check list
- Inspect/Tighten all lug nuts
- Check that load is secured properly
- Check that the coupler is properly engaged on the hitch ball and tightened
- Test the trailer brakes
- Check that your mirrors are properly adjusted.

### While towing :

- Use your mirrors before changing lanes or merging into traffic.
- Use your turn indicators to indicate your intention to turn or change lanes.
- Allow adequate distance when stopping
- Downshift your tow vehicle to use lower gears when ascending or descending grades
- When descending grades, do not continually apply the brakes this will cause them to over-heat and become less effective. This could cause a loss of control.
- If the trailer begins to sway, apply only the trailer brakes lightly to correct. Do not apply only the tow vehicle brakes to correct trailer swaying.
- Slow down for bumps or uneven pavement.
- Avoid braking while in a curve if possible. Slow down before entering the curve instead.
- Do not drive at speeds which may cause the trailer to sway. Generally drive the posted speed limit or 55 MPH, whichever is less
- Allow adequate room of for overtaking another vehicle. Increase distance 4 times as compared to driving when not towing a trailer.

### At each stop:

- Inspect the coupler to ensure it is secured and locked to the hitch.
- Ensure the electrical connection is secured.
- Make sure there is adequate slack in the safety chains, that they are connected properly and not dragging.
- Check the breakaway brake system lanyard. Make sure it is connected to the tow vehicle and has adequate slack and is not dragging.
- Inspect the tires for signs of low tire pressure or damage.
- Make sure the cargo is secured.

## Safety Warning Labels

### **WARNING**

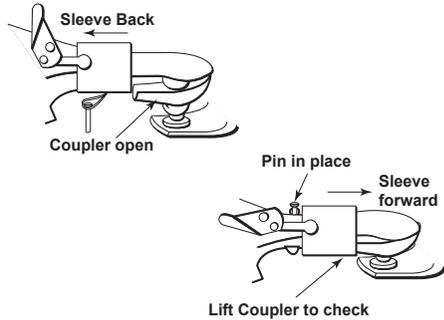
Make sure all warning labels are present and legible. This protects you and other against death or serious injury.

If any of the labels cannot be read or are missing, contact Polar King for replacements.

### **WARNING**

Uncoupling will cause trailer to come loose from tow vehicle. You must:

1. CHECK that ball LOAD RATING is same as or greater than coupler LOAD RATING.
2. CHECK that ball SIZE is same as coupler.
3. CLOSE COUPLER CLAMP on ball.
4. LIFT coupler upwards to test that it will not separate from ball.
5. LOCK sleeve with pin or padlock.



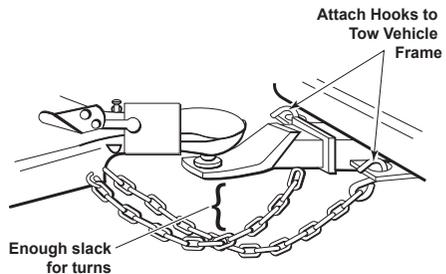
### **WARNING**

ALWAYS use safety chains.

Chains holds trailer if connection fails.

You must:

1. CROSS chains underneath coupler.
2. ALLOW slack for trailer to turn.
3. ATTACH chain hooks securely to tow vehicle frame.

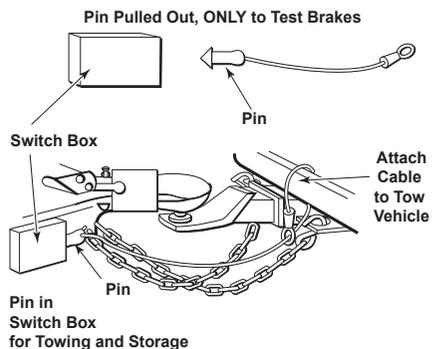


### **WARNING**

Trailer can roll if it comes loose.

Electric safety brake applies when cable pulls pin out of switch box.

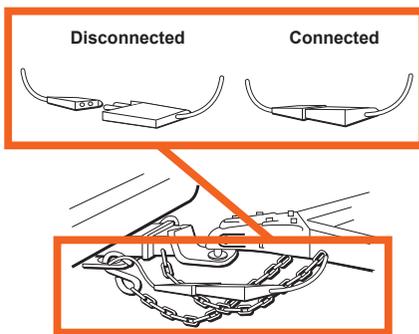
1. PULL hard to get pin out of switch box.
2. CHECK brake by PULLING TRAILER with tow vehicle.
3. ATTACH pin CABLE to tow vehicle so pin will be pulled out if trailer separates.
4. Promptly REPLACE pin in switch box.



## **WARNING**

Light can prevent trailer from being hit by other vehicles. You must:

1. **CONNECT** trailer and low vehicle electrical connectors.
2. **CHECK** all lights: tail lights, turn signal, and brake lights.
3. **DO NOT TOW** if lights are not working.

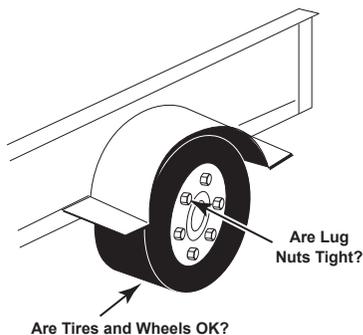


## **WARNING**

Tire, wheel or lug nut failure can cause loss of control. Before towing, you must **CHECK**:

1. Tire pressure and tread.
2. Tires and wheels for damage.
3. Lug nuts for tightness.

For new and remounted wheels, re-tighten lug nuts at the first 10, 25 and 50 miles of driving.



## **WARNING**

### OVERLOAD HAZARD

RISK OF DEATH DUE TO LOSS OF CONTROL  
NEVER EXCEED GROSS VEHICLE WEIGHT RATING (GVWR).

- **BEFORE LOADING THE TRAILER FOR THE FIRST TIME, YOU MUST VERIFY ITS CARGO CAPACITY.**
1. You **MUST WEIGH** the **EMPTY TRAILER**.
  2. Subtract the weight of the **EMPTY TRAILER** from the **MAXIMUM LOADED TRAILER WEIGHT (GVWR)**.
  3. **DO NOT LOAD TRAILER BEYOND VERIFIED CARGO CAPACITY.**

**MAXIMUM LOADED TRAILER WEIGHT (GVWR) = EQUALS**

**MAXIMUM CARGO WEIGHT**

**+ PLUS**

**WEIGHT OF EMPTY TRAILER**



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# TIRE SAFETY PRECAUTIONS

## Tire Safety

This manual contains information on tire safety as required by 49 CFR 575.6 from the National Highway Traffic Safety Administration (NHTSA), Department of Transportation.

This manual contains:

- Information on Trailer Tires
- Information on The Correct Load Limit for Trailers
- Information on the Correct Load Limit for Tow Vehicles
- A Glossary of Tire Terms
- A Section from the National Traffic Safety Administration's Brochure "Tire Safety – Everything Rides on It".

This brochure includes information on:

- Tire Size
- Tire Tread
- Tire Balance and Wheel Alignment
- Tire Repair
- Tire Fundamentals
- Information of Passenger Tires
- Tire Safety Tips

## Trailer Tires

Because they carry a lot of weight, even when not in use, trailer tires may be unsafe even if they still show plenty of tread depth.

In fact, a tire is designed to roll down the road not sit idle. Because of that, it's better for a tire to be used rather than to sit idle. While running a tire heats up and the rubber compounds release lubricants that are designed to increase tire life. Sitting idle creates flat spots and promotes dry rot.

The number one cause of tire failure is incorrect inflation. Check the trailer tires while cold weekly. The term "cold" means at the same temperature as the ambient air surrounding the tire. The trailer's Certification / VIN Label or tire placard will give the manufacturer's recommended tire pressure when the trailer is loaded to its gross vehicle weight rating (GVWR) in pounds per square inch (PSI).

Under-inflation or loading the trailer to weights exceeding the gross vehicle weight rating (GVWR) can dramatically reduce the load capacity of the tires. Over-inflation can adversely affect the handling characteristics of the tow vehicle and/or trailer. Refer to the tow vehicle's owner's manual or talk to Polar King if you have any questions about tire inflation.

Tire can lose pressure over time. In fact, 1 to 3 PSI per month is normal. A drop in tire pressure can result in heat build-up due to over-loading and suffer internal damage.

Towing in Hot Conditions at a high rate of speed will degrade tires greatly. When excessive heat builds up in a tire, its internal structure breaks down and the overall strength of the tire is compromised. Driving at moderate speeds may help preclude excessive heat build-up and extend the life of your tires.

National statistics show that the average life of a tire, that is properly inflated and maintained, is around 5 years. Replacement should be considered every 3 years, even if the tires show good tread. A tire that is 5 years old is considered worn out and should be replaced.

When storing a trailer for an extended time period, ensure the tires are inflated to the maximum rated pressure and store it away from direct sunlight, preferably in a cool dry place like a garage. If you must store your trailer outside, use covers to protect the tires from the effects of the sun.

### Correct Load Limit for Trailer

There is more to determining the load limits of a trailer than just those of the tires alone. Every trailer has a Certification / VIN label located at the front left side. This label contains information on the trailers Gross Vehicle Weight Rating (GVWR) as well as the Gross Axle Weight Rating (GAWR) for multi-axle trailers. For trailers with a Gross Vehicle Weight Rating (GVWR) equal to or less than 10,000 pounds, a vehicle placard will be located in the same place. This placard contains information on tires and trailer loading, as well as maximum cargo weight.

		<b>TIRE AND LOADING INFORMATION</b>	
		The weight of cargo should never exceed XXX kg. or XXX lbs.	
<b>TIRE</b>	<b>SIZE</b>	<b>COLD TIRE PRESSURE</b>	<b>SEE OWNER'S MANUAL FOR ADDITIONAL INFORMATION</b>
<b>FRONT</b>	20.5 × 8.0-1.00D	621 kPa, 90 PSI	
<b>REAR</b>			
<b>SPARE</b>	NONE		

The maximum cargo weight plus the weight of the trailer must not exceed the stated Gross Vehicle Weight Rating as shown on the Certification / VIN Label.

Weight distribution is also very important. Unbalanced loads, either front to back or side to side, can cause unstable towing and/or tire overloading.

Use a commercial scale to determine various weights that relate to your trailer.

For trailers rated over 10,000 pounds, no vehicle placard is required and may not be installed.

To determine the maximum cargo weight, use a commercial scale to determine the empty weight of your trailer. Subtract that amount from the Gross Vehicle Weight Rating (GVWR) on the trailers Certification / VIN Label. The resulting number is the maximum cargo weight.

### Tow Vehicle Load Limit

The choice of a tow vehicle is important in safely towing your trailer. The combined weight of the vehicle, all passengers and vehicle cargo (such as luggage) in addition to the loaded weight of the trailer, must be taken into consideration.

Consult your tow vehicle's owner's manual to determine if it is appropriate to tow your trailer.

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## **Tire Safety (NHTSA)**

The National Highway Traffic Safety Administration (NHTSA) has published a brochure on tire safety (DOT HS 809 361). It can be obtained, free of charge from their website:

[www.nhtsa.dot.gov/car/rules/TireSafety/ridesonit\\_index.html](http://www.nhtsa.dot.gov/car/rules/TireSafety/ridesonit_index.html)

Research has shown that taking care of your tires, including, maintaining proper tire pressures, not overloading the vehicle/trailer, avoiding road hazards, regular inspection for tire damage, will improve vehicle/trailer handling, reduce avoidable breakdowns and accidents, improve fuel mileage and increase tire life.

### **Basic Tire Maintenance**

Steering, stopping, traction and load-carrying capability will all be improved with properly maintained tires. The two main causes of tire failure are under-inflation and overloading. Paying attention to tire pressures and the weight limit of your trailer, as well as avoiding road hazards will greatly reduce the risk of tire failure.

Because most tires will lose pressure over time, it is important to check them regularly. Hitting road hazard, such as pot holes, debris, or striking a curb, can cause a tire to lose pressure suddenly. If your trailer has radial tires, it is difficult to determine under-inflation visually.

It is a good practice to keep a tire pressure gauge in your tow vehicle. These handy devices are inexpensive and can be purchased in many retail outlets.

Always take tire pressure readings when the tire is cold. You must wait at least 3 hours after driving for a tire to cool to ambient temperatures in order to get an accurate measurement. A warm tire will give a pressure measurement higher than a cold tire.

To safely inflate tires, first locate the recommended tire pressure on the tire information placard, certification label or owner's manual. Use your tire gauge to measure the pressures in all of the tires. If any of the pressures are too low, use an air compressor with the correct air chuck to fill the tire. Inflate in small increments so as not to over-fill the tire. Check the pressure after each time. Continue until the correct pressure is achieved. If you do not have access to an air compressor, you can use one found at many service stations.

If you find that the pressure in one or more of the tires is higher than recommended, press the valve stem to release some of the air. This can be done by hand or with a small tool. Release small amounts of air and measure the pressure each time until you reach the recommended pressure.

If you notice that a tire seems under inflated after you have been driving, verify that the pressure is low and fill it to the recommended pressure. Because the tire is hot it will be slightly under inflated, but it is better to run on a slightly lower pressure than a significantly lower pressure. Once the tire has been allowed to cool, fill it to the recommended pressure.

---

## **Tire Pressure and Load Limits for your trailer.**

Your trailer has information on a label, typically on the left front side, that will give recommendations on:

- Tire Size and inflation
- Vehicle Weight Capacity
- Axle Weight Capacity

Tire pressure is given in Pounds per square inch (PSI) and/or kilopascals (kPa). This number is determined by the vehicle manufacturer and is based on the design load limit or the greatest amount of weight a vehicle can carry with the recommended tire size. This measurement must be taken when the tire is the same temperature as the ambient air. Tires that are hot from travel will not give a correct measurement.

Because tires are designed to be used on many types of vehicles, the tire manufacture lists a Maximum permissible inflation pressure on the sidewall. This pressure must never be exceeded.

### **Tire Size**

The manufacture recommends replacing your trailer's tires with the same size as the original equipment. Refer to the tire placard or the sidewall of the tire being replaced.

### **Tire Tread**

The tire's gripping actions is provided by its tread. This traction helps prevents the trailer from sliding or slipping, especially in wet or icy road conditions. Tire should be replaced when the tread is worn to a depth of 2/32 of an inch. Most tires have wear indicators built into the tread design. Replace the tires when it appears.

### **Wheel Alignment and Tire Balance**

Proper wheel alignment will assure that the wheels are positioned correctly in relation to the trailer's frame. This prevents excessive tire wear and will allow your trailer to follow the tow vehicle correctly. Because these adjustments require specialized equipment, a qualified technician should be contacted to perform them.

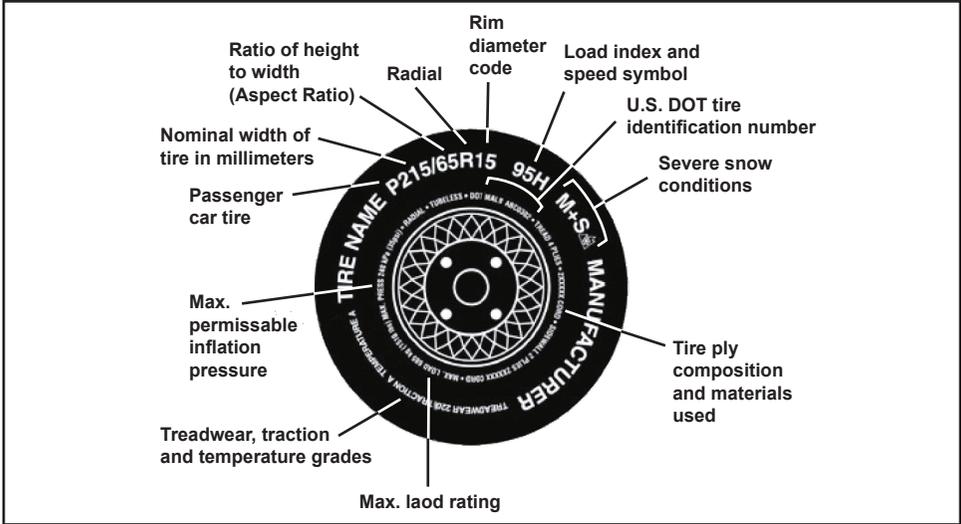
A tire should be properly balanced when installed on a wheel rim. This will allow for more even tire wear and avoid shaking and vibration. Your tire mounting mechanic will use weights attached to the wheel rim to achieve a rotating balance.

### **Repairing Tires**

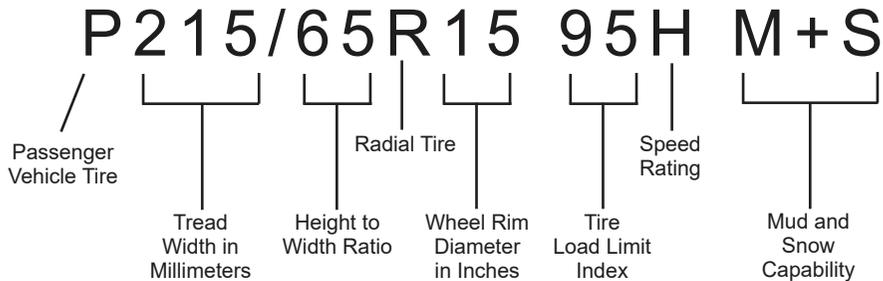
It is possible to repair a tire that has been punctured if they are small and through the tread but not the sidewall. A plug and patch should be used. The tire must be removed from the wheel rim in order to perform this repair properly, and is best left to a tire specialist.

### **Tire Information**

Tire Manufactures are required to mark their tires' side walls with standardized information.



In this example the passenger tire size is shown as:



Speed Ratings are as follows:

Rating	Speed	Rating	Speed
Q	99 mph	H	130 mph
R	106 mph	V	149 mph
S	112 mph	W	186 mph
T	118 mph	Y	186 mph
U	124 mph		

There is also a Department of Transportation (DOT) identification number which indicates that the tire meets federal US Standards.

There is a factory identification code that indicated where the tire was made.

A four-digit date code represents the week and year of manufacture. For example: 3914 means the tire was manufactured during the 39th week of the year 2014.

**Maximum Load Rating** indicates the maximum load that can be carried by this tire. This is expressed in both pounds and kilograms.

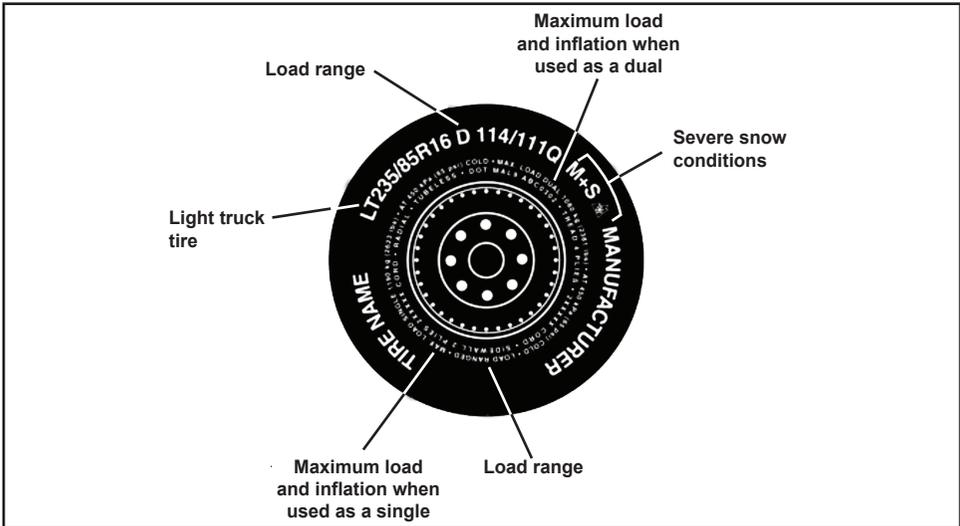
**Maximum Permissible Inflation Pressure** is the highest air pressure that should ever be used under normal driving conditions.

**Tread Wear** is an index to indicate the tire rate of wear. A higher number indicates longer wear.

**Traction Indicator** is a letter of letter that indicated the tires ability to stop on wet pavement. The traction is graded from high to lower with AA being the highest followed by A, B, and C.

**Temperature Indicator** is a letter that designates the tires resistance to heat. An “A” designation has a higher resistance than “B” or “C”.

### Additional Information on Light Truck (LT) Tires



Because light trucks can be designed with dual-mounted rear tires, special load ratings are marked on tire with the “LT” designation.

**ST** is an indication the tire is for trailer use only.

**Max. Load Dual kg (lbs) at kPa (psi) Cold** indicates the maximum load and tire pressure when the tire is used as a dual, that is, when four tires are put on each rear axle (a total of six or more tires on the vehicle).

**Max. Load Single kg (lbs) at kPa (psi) Cold** indicates the maximum load and tire pressure when the tire is used as a single.

**Load Range** identifies the tire’s load-carrying capabilities and its inflation limits.

### Tire Safety Check List

- Check pressures at least once a month including the spare.
- Clear road debris from tire tread
- Inspect for uneven wear, cracks or other damage
- Ensure valve stems have caps in place and tightened
- Do not overload tow vehicle or trailer

## COUPLING TRAILER TO TOW VEHICLE

### **DANGER**

**If the tow vehicle and hitch are not sufficiently rated for the trailer, loss of control may occur leading to an accident causing serious injury or death.**

Make sure the tow vehicle and hitch are rated for the Gross Vehicle Weight Rating (GVWR) of the trailer.

The trailer's information appears on the Certification / VIN label located at the front left side of the trailer. It contains information such as the manufacturer's name, date of manufacture, Gross Vehicle Weight Rating, Gross Axle Weight Rating, Tire Size, Wheel Rim Size, Tire Pressure, Vehicle Identification Number, Model or Style of Trailer, and Trailer Certification Statement.

The choice of tow vehicle is very important. Refer to the vehicle's owner's manual to find the maximum towing capacity, as well as the Gross Cargo Weight Rating. Even if the trailer will couple to the vehicle, that does not mean that the vehicle is capable of towing the trailer safely.

**Familiarize yourself with these parts, they couple the trailer to the tow vehicle.**

### **WARNING**

**Make sure the coupling is securely fastened to the tow vehicle's hitch. Accidental uncoupling while towing can result in serious injury or death.**

**Coupling:** The mechanism that connects to the trailer hitch. This includes the clamping/locking mechanism that captures the hitch ball.

**Hitch:** The assembly of parts affixed to the tow vehicle including the ball, draw bar, and receiver. For bumper hitches, this includes the bumper itself.

**Safety Chains:** These chains are affixed to the trailer permanently and, if properly connected can keep the trailer tongue from digging into the road surface should an uncoupling occur.

**Lightning and Braking Connector:** This is an electrical connection, typically a plug and receptacle, where the power and control to the lighting and electric brakes of the trailer are coupled to the tow vehicle.

**Breakaway System:** When the connecting lanyard is disconnected in an uncoupling event, this system will apply the trailer brakes. This system utilizes power from a battery on the trailer to apply the brakes should the trailer accidentally uncouple from the tow vehicle. The charge of this battery is important and should be checked regularly.

**Tongue Jack:** This is a lifting device mounted on the trailer's tongue used to raise or lower the tongue.

### **WARNING**

**A trailer that uncouples while towing can result in serious injury or death.**

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## Coupling Check List

- Coupler is secured to hitch ball and locked in place
- Safety chains are connected to the tow vehicle and not dragging
- Breakaway brake lanyard is correctly connect to the tow vehicle
- The load is secured on/in the trailer
- Check all tires and wheels on both tow vehicle and trailer
- Check the trailer brakes. Make sure they are working properly
- Retract the trailer jack(s)
- Connect trailer lights and make sure they work properly

**Ball Hitches:** A Ball Hitch coupler attached to a hitch ball mounted under or on the tow vehicle's rear bumper. The trailer is equipped with a coupler that is rated for the weight and size of the trailer. You must provide a ball; that is the same size as that coupler. A ball that is too small will not connect securely and may uncouple. Conversely, a ball that is too large will not allow the coupler to fit over the ball.

### **WARNING**

**An incorrectly sized ball can result in the trailer uncoupling and cause serious injury or death.**

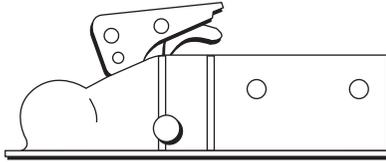
It is critical that the ball and coupling sizes match.

The Hitch and Ball must have a rated towing capacity that is greater than or equal to the trailer's Gross Vehicle Weight Rating (GVWR).

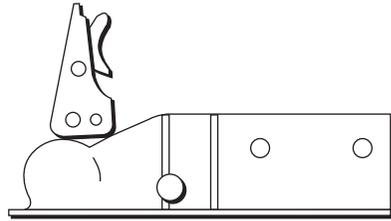
The required ball size and rated load capacity are marked on the hitch.

## Coupling the Trailer to the Tow Vehicle

- Verify that the size and rating of the ball and the size and rating of the coupler match.
- Remove any debris or residue from the ball.
- Inspect the ball for damage and wear.
- Make sure the ball is secured to the hitch.
- Clean the inside of the coupler.
- Inspect the coupler for wear and damage.
- Make sure the coupler is secured to the trailer tongue.
- Lubricate the ball and coupler with bearing grease.
- Raise the bottom of the coupler higher than the ball.
- Back the tow vehicle until the ball is directly below and aligned with the coupler.
- Open the coupler and lower the tongue so the coupler fully engages the ball.
- Close the latching mechanism of the coupler and insert the safety pin.



**Engaged**



**Released**

- Test the engagement by raising the jack to see if it will raise the rear of the tow vehicle.
- If the coupler cannot be made secure, do not attempt to tow the trailer. Contact Polar King for assistance.
- Lower the tongue jack until the trailer's tongue weight rests on the hitch.
- Retract the jack fully.

## **WARNING**

**Never attempt to tow your trailer using a worn, damaged or corroded hitch ball and/or coupler. Either may fail while towing and could cause serious injury or death.**

**Make sure the hitch ball is secure fastened to the hitch. A loose hitch ball can cause uncoupling and result in serious injury or death.**

## **NOTICE**

**When testing the coupling with the tongue jack, do not raise the rear of the tow vehicle more than 1 inch. It can be damaged by overloading.**

## Safety Chains

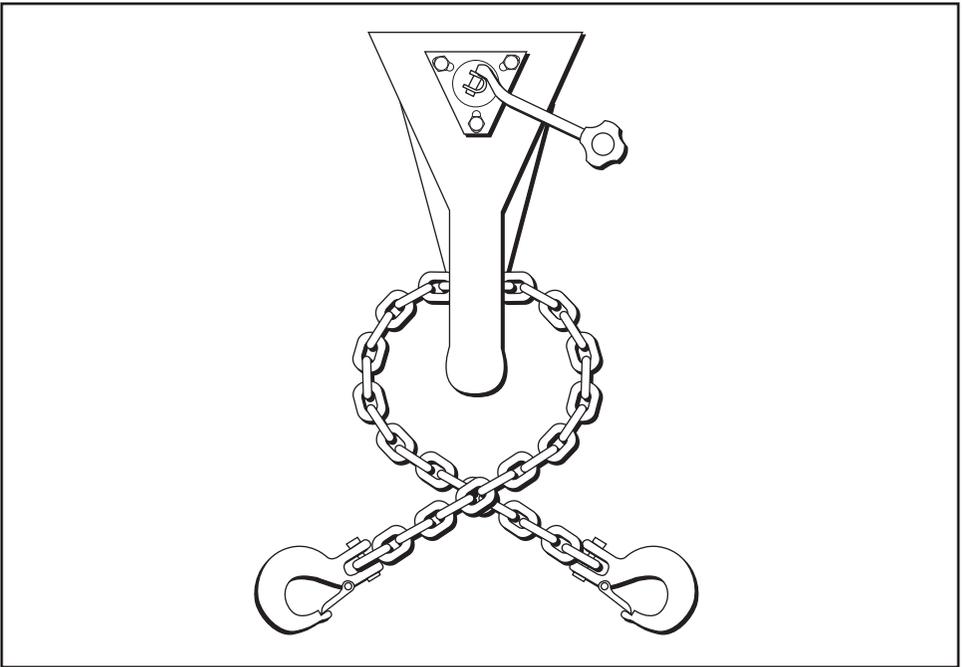
Before connecting the safety chains and hooks, visually inspect them for wear or damage. Replace them if worn or damaged.

In order to hold up the trailer's tongue in the event of an uncoupling, the chains must cross under the coupler.

Loop the chains around a frame member of the tow vehicle or attach them to holes or loops in the hitch, if specifically provided for that purpose. The chains must be attached to something secured to the tow vehicle and not a removable part such as a draw bar.

Attach the hooks from the underside of a hole or loop. **Do not** attach from the top.

Make sure there is enough slack to allow tight turns but not so much as to drag the pavement. They should be tight enough to hold up the trailer tongue in the event of an uncoupling.



### **WARNING**

**Make certain the safety chains are secured properly. Loss of control of the trailer and / or tow vehicle in the event of an uncoupling can result in serious injury or death.**

**Safety chains must cross under the hitch and coupler with enough slack to allow turning and to hold up the trailer tongue if the trailer uncouples.**

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## Electrical Connections

The trailer provides a cable with a plug to attach the lighting and braking system to the tow vehicle. The tow vehicle must have a corresponding receptacle or mating plug. Connect the cable.

Check all lights to make sure they are working properly. Do not tow when the trailer lights are not working. Repair/replace any lights that are not working.

Check the electric brakes using the tow vehicle's brake controller.



**Trailer lights that do not work can lead to a collision. Check all lights, including brake lights and turn indicators, before towing.**

## Breakaway Brake Lanyard

In the event of an uncoupling, a properly functioning breakaway break system will apply the trailer's brakes. The Safety chains will keep the trailer attached to the tow vehicle and the tow vehicle/trailer can come to a controlled stop.

The Breakaway Brake Lanyard must be attached to the tow vehicle so that it will be engaged before all to the safety chain slack is taken up.

Do not attach this lanyard to the draw bar, hitch ball or safety chains. Should these parts fail and cause the uncoupling the breakaway brake system would not activate.

## Testing the Electric Brake System

If your trailer is equipped with electric brakes, your tow vehicle must be equipped with a controller that sends electrical power to the trailer's brake system. You must test the brake each time the before towing the trailer.

To test, with a properly coupled and connected trailer, begin towing at a low rate of speed, about 5 MPH. Manually operate the tow vehicle's brake controller. When the trailer brakes are applied, you should feel a pull or resistance from the trailer. This means the trailer brakes are functioning properly. If the trailer brakes fail to operate, first check the electrical connection and test again. If they still fail to work you must determine the reason and correct it before towing. Contact a qualified trailer mechanic for assistance.

## Testing the Hydraulic Surge Brake System

The Hydraulic Surge Brake System will apply the trailer brakes by the motion of the tongue. A special controller is not required in the tow vehicle. It can be difficult to determine if the system is working properly. Follow these steps to test the Hydraulic Surge Brake System.

1. Move the trailer to a flat and level area.
2. Pull forward several feet. This will ensure trailers equipped with free backing brakes are in the normal operating position.
3. Uncouple the trailer and jack up the tongue until level.
4. Loop and connect the safety chains below the actuator cylinder.
5. Keep the breakaway lanyard connected to the tow vehicle.
6. Place wheel chock about 2 feet behind the trailer wheel to prevent a roll-away trailer.
7. With a board about 4 feet long (a 2 × 4 works well) place the end through the safety chain loop and against the actuator cylinder.
8. If the system is working correctly the trailer brakes will apply and prevent you from rolling the trailer.

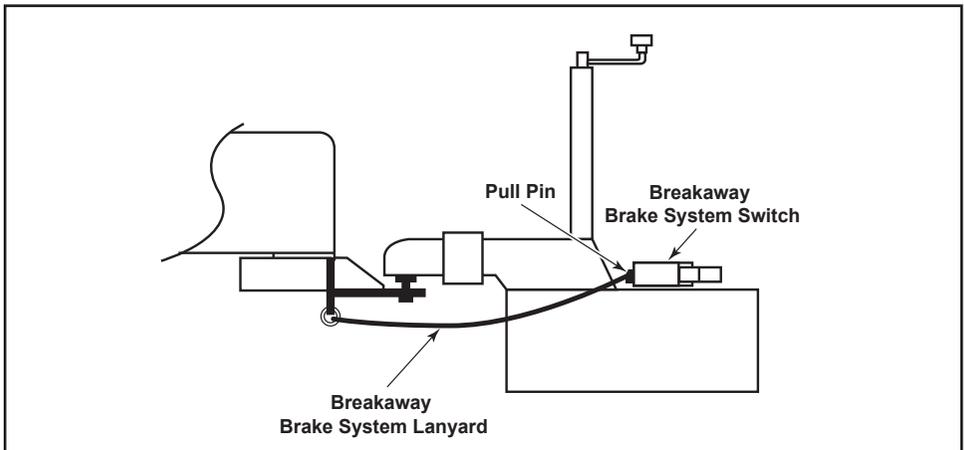
### CAUTION

**This test will only indicate if the trailer brakes are engaging, not how efficiently they operate. Regular inspection and maintenance are required to keep the hydraulic surge brakes system working properly.**

## Testing the Breakaway Brake System

This system includes a lanyard, pull pin, switch, battery and controller.

Most trailers are set up to charge the breakaway brake system battery when connected to the tow vehicle. However, some do not. If your vehicle does not provide charging power to this battery, you must charge it periodically with a separate battery charger.



## **CAUTION**

**Cold weather conditions can prevent the battery in this system from sending adequate voltage to the brakes system causing it not to function properly. Always check the battery's charge before towing.**

Never tow a trailer when the battery needs to be charged. This system requires adequate voltage to activate the braking system if the trailer uncouples from the tow vehicle.

To test, remove the pull pin from the switch. Attempt to tow the trailer. The trailer will resist being towed even if the trailer wheels are not locked. If the brakes fail to engage, do not tow the trailer until the brakes and/or battery are repaired.

Replace the pull pin when done testing; the battery will continue to discharge when the pull pin is removed from the switch.

Do not tow the trailer while the breakaway brakes are engaged. This will lead to overheating and eventual brake failure.

## **WARNING**

**Never tow a trailer with a malfunctioning breakaway brake system. This can lead to loss of control and may result in serious injury or death.**

**Connect the breakaway brake system lanyard to the tow vehicle and not the tow bar, hitch ball or safety chains.**

**Do not tow the trailer with the breakaway brakes system engaged. This can result in brake damage, which can lead to loss of control causing serious injury or death.**

When storing your trailer for more than 3 months, remove and store the battery indoors and charge it regularly. Replace the battery according to the manufacturer's recommendations.

### **Surge Brake Instructions**

#### **Tongue Weight**

A portion of the trailer's weight must be carried by the tow vehicle for proper control. Too much or too little tongue weight can cause loss of traction or steering control.

#### **Too little tongue weight can cause:**

- Loss of traction by the tow vehicle on rear wheel drive vehicles
- Trailer instability at towing speeds

#### **Too much tongue weight can cause:**

- Loss of steering control by the tow vehicle
- Loss of Loss of traction by the tow vehicle on front wheel drive vehicles

A percentage of 10 to 15% of tongue weight as compared to the loaded weight of the trailer is average. This is an example only. Contact Polar King for specific tongue weight to trailer weight percentages.

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## **WARNING**

**Too much or too little tongue weight can cause loss of control and result in death or serious injury.**

Make certain the cargo weight is distributed evenly left to right and that centers of gravity are kept as low as possible.

To determine the tongue weight, take your trailer to a commercial scale and weigh the uncoupled trailer by itself. Recouple the trailer to the tow vehicle and pull the trailer so only the trailer wheels are on the scale. Subtract the second number from the first and that is your tongue weight.

While doing this it is a good idea to get the combined weight of the tow vehicle and trailer. This weight should be lower than the Gross Combined Weight Rating of the tow vehicle.

### **HITCH HEIGHT**

It is important that the trailer rides level when coupled to the intended tow vehicle. Draw bars with different offset heights are available to adjust the ball height. Adjustable hitches are also available.

If using a bumper mounted ball, an offset coupler may be available.

## **WARNING**

**Overloaded tires, blowout and loss of control can be caused by improper hitch height. This can result in death or serious injury. Make sure the hitch height is correct so the loaded trailer will ride level.**

Park the tow vehicle and trailer on a level surface. Visually verify that the trailer is level. If the front of the trailer is lower than the rear, the hitch must be raised. If the front of the trailer is higher than the rear, the hitch must be lowered.

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## LOADING AND UNLOADING

Improper trailer loading causes many accidents and deaths. To safely load a trailer, you must consider:

- Overall load weight.
- Load weight distribution.
- Proper tongue weight.
- Securing the load properly.

Many accidents are caused by improper loading of trailers. The weight of the cargo plus the empty weight of the trailer must not exceed the Gross Vehicle Weight Rating (GVWR) as shown on the Certification / VIN Label at the front left side of the trailer.

The trailer's axles will carry the majority of the trailer's weight, with the remainder carried by the tow vehicle's hitch. The tongue and tow weights must be correctly balanced in order for the trailer to tow safely.

Keep the centers of gravity of all cargo as low as possible. A high center of gravity can cause instability in turns and curves.

Do not transport cargo that the trailer is not designed to haul. Never transport people, hazardous or flammable substances.

### **WARNING**

**Transporting people in your trailer is dangerous and can cause serious injury or death. It is also illegal.**

**Never transport explosive, flammable, poisonous or other hazardous materials. The exception is the fuel in a fuel tank of a piece of equipment.**

### LOADING THE TRAILER

Before loading the trailer, park the tow vehicle and trailer on a firm, level surface. Make sure the area around the trailer is clear. Inspect the floor for any damage. Verify that any tie downs or track systems are in good shape and undamaged.

### **WARNING**

**Never load a trailer unless it is coupled to a tow vehicle on a firm, level surface with wheels block and parking brake set. Shifting during loading can cause loads to move suddenly or topple causing serious injury or death.**

### **CAUTION**

**Use proper lifting techniques to avoid injury.**

Load the cargo with approximately 60% of the weight in front of the axle(s) and 40% behind the axle(s). Secure the load with tie-downs strap, chains and tensioning mechanisms.

Once the trailer is loaded and the load is secured, remove the wheel blocks.

---

## Securing Cargo



**Shifting cargo can result in loss of control of the trailer and can lead to serious injury or death.**

**Tie down all loads with proper sized fasteners, chains, straps, etc.**

Refer to [www.fmcsa.dot.gov](http://www.fmcsa.dot.gov) for regulations regarding cargo securement rules.

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# PRE-TOW CHECKLIST

## Pre-Tow Checklist

Before towing, double-check all of these items:

- Tires, wheels and lug nuts. See “Breaking In A New Trailer” section of this manual.
- Tire Pressure. Inflate tires on trailer and tow vehicle to the pressure stated on the Certification / VIN label.
- Coupler secured and locked. See “Coupling To Tow Vehicle” section of this manual.
- Safety chains properly rigged to tow vehicle, not to hitch or ball. See “Coupling To Tow Vehicle” section of this manual.
- Test Tail, Stop, and Turn Lights.
- Test trailer brakes.
- Safety breakaway lanyard fastened to tow vehicle, not to safety chains. See “Coupling To Tow Vehicle” section of this manual.
- Cargo properly loaded, balanced and tied down. See the appropriate “Loading And Unloading” section of this manual.
- Tongue weight and weight distribution set-up.
- Ramps secured for travel.
- Fire extinguisher.
- Flares and reflectors.

## Make Regular Stops

After each 50 miles, or one hour of towing, stop and check the following items:

- Coupler secured.
- Safety chains are fastened and not dragging.
- Cargo secured.

---

## BREAKING IN A NEW TRAILER

### Re-Tighten Lugs

Retighten the lugs after the first 10, 25 and 50 miles. Lugs can become loose after first being assembled. Use a torque wrench to insure correct torque on each lug.

### **WARNING**

**Lug nuts tend to loosen after first being tightened (such as after a re-mounting). Inspect/tighten all lug nuts after the first 10, 25 and 50 miles driven and before each tow after that.**

### Adjust Trailer Brakes

New brake shoes and drums will wear rapidly until they can seat properly. This is normal. However, that means you must adjust the brakes after the initial 200 miles of towing. Thereafter adjust the brakes every 3,000 miles.

Some axles are fitted with automatic adjusters. Follow the instructions in your axle and brake manual for adjustment instructions. If you do not have the axle and brake manual, contact Polar King.

### Pairing Brake Systems

It is important that the brakes of the trailer and tow vehicle work together. When the two systems are paired, or synchronized, they work with each other to slow both tow vehicle and trailer at the same time. If when braking, the tongue of the trailer rises or dives sharply, the systems are not paired and must be adjusted. Read and follow the instruction in your axle and brake manual and/or brake controller manual for instructions. If you do not have either of these manuals, contact Polar King.

### **WARNING**

**If the tow vehicle and trailer brakes do not work in unison, death or serious injury may result. Always test brakes in a safe area away from other traffic at low speeds (<30 MPH) before towing.**

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## ACCESSORIES

Basic information is provided in this section for the safe operation of accessories.

You must read and follow these instructions before using the accessory. If you are uncertain whether you have all of the instructions, contact Polar King before operating the accessory.

### Accessory Battery

Your trailer may be equipped with an accessory battery that operates the tilt deck.

The battery may be kept charged either by the tow vehicle, by an auxiliary charger or by using an on-board battery maintainer/charger (if equipped). If the trailer is used daily, it is recommended that the battery charger be plugged in after each days use. The battery may be located in a tongue mounted battery box or a side mounted box.

The accessory battery must be kept in a charged condition during storage. The battery could freeze and break if it becomes discharged.

If the battery is not fully charged, the hydraulic pump will lose pressure which may cause hydraulic fluid to flow back into the hydraulic reservoir, overfilling the reservoir and ejecting fluid into the battery box.

### **WARNING**

**Risk of battery exploding.**

**Battery box prop rod may contact battery terminals, which may result in the battery exploding, causing serious injury or death.**

**Place battery box lid prop rod in retaining clip.**

# INSPECTION & SERVICE SCHEDULE

## Insect and Service Before Each Tow

Item/System	Service/Inspect
Breakaway Brakes	Check operation
Breakaway Battery	Terminal clean, fully charged
Trailer Brakes	Check operation
Brake shoes/drums	Adjust after 200 miles/ then every 3,000 miles
Safety Chains/Hooks	Inspect for damage/wear
Coupler	Inspect for damage/wear
	Grease
	Inspect locking device for function/wear
Hitch Ball	Inspect for damage/wear
	Grease
Tires	Check cold pressures/inflate as needed
	Inspect for damage/wear
Wheels	Inspect for damage/wear
	Tighten all lugs.

## Insect and Service every 6 months

Item/System	Service/Inspect
Trailer Brakes	Check wear and current draw
	Check operation
	Adjust shoes
Brake Controller	Check voltage and current output (See Mfgr's Manual)
Tires	Inspect tread and sidewalls
	Rotate every 5,000 miles
Safety Chains/Hooks	Inspect for damage/wear
Coupler	Inspect for damage/wear
	Grease
	Inspect locking device for function/wear
Hitch Ball	Inspect for damage/wear
	Grease

## Insect and Service every 12 months or 12,000 miles

Item/System	Service/Inspect
Trailer Brakes	Remove drums, inspect for scoring/excessive wear. Replace per manufacturer's specifications
Tongue jack	Inspect for damage. Grease gears.
Frame	Inspect all frame members, bolts, nuts and rivets. Repair or replace as needed.
	Inspect all welds. Repair as needed
Wheels	Disassemble, inspect, repack bearings.
	Inspect rims for cracks and dents. Replace if needed.
Structure	Checked by Dealer.

### How To Inspect and Service Your Trailer

In order to inspect and/or service the trailer properly, it must be jacked up.

## **DANGER**

**Crushing hazard.**

**The tow vehicle engine must be off, ignition key removed and parking brakes set before performing any task in the area under the trailer. The tow vehicle and trailer could inadvertently move or drop causing severe injury or death.**

## **WARNING**

**Worn or broken suspension parts can cause loss of control of the trailer, serious injury or death.**

**Never enter the area under a trailer unless it is on firm, level ground and resting on properly placed and secured jack stand.**

**Never perform any tasks in the area under a trailer while it is coupled to a tow vehicle, unless the engine is off with the ignition key removed and the parking brakes set.**

You must use jack stands when jacking up a trailer for inspection/service. Jacks and jack stands must be placed so that they are clear of any electrical wires, brake lines and suspension parts (springs, torsion bars, etc.). Jacks and jack stands must be placed under the outer frame that the axle(s) is/are connected. Jack stands must be placed so that the trailer is stable and as level as possible.

Have trailer professionally inspected annually and after any impact.

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## Washing the Trailer

Use a power washer with detergent solution to wash the body and structural members of the trailer as needed.

## Screws, Bolts, Nuts & Rivets

Regularly inspect all fasteners and frame members for damage, corrosion, excessive wear or other failure. Replace any damaged fasteners, in kind. You may prefer to have this inspection/service performed by Polar King.

### **WARNING**

**Failure due to broken or damaged fasteners may result in personal injury and/or equipment damage.**

## Welds

Any weld can fail over time and when subjected to heavy stress such as heavy loads of cargo shifting. Inspect all welds anytime you believe the trailer has been subjected to these types of stresses. Failed weld can cause severe damage to the trailer and/or cargo.

Inspect all welds at least once each year. If you discovered a cracked or other weld failure, have it repaired by a qualified welder or contact Polar King for assistance.

### **WARNING**

**Cracked, broken or otherwise failed welds can cause death or serious injury. Inspect all weld at least once a year or if you suspect damage. Have all failed weld repaired by a qualified welder.**

**Never attempt to repair a failed weld unless you have the equipment and skill to do so properly. An improper weld repair will result in an early failure to the trailer's structure and can cause serious injury or death.**

## Trailer Brakes

### Shoes & Drums

Correctly functioning brakes are critical to the safe operation of your trailer. An inspection by Polar King or qualified trailer mechanic every 12,000 miles or over a year is very important.

Replacement of or adjustments to the brakes shoes is not covered under the trailer's axle warranty.

### Automatic Adjustment

Brakes must be adjusted after the first 200 miles of trailer use and every 3,000 afterward. For trailers with an automatic adjustment mechanism, hard braking in reverse will tighten the brakes shoes a notch at a time. These instructions will be in your brake and axle owner's manual. If you do not have this manual, contact Polar King.

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## Manual Adjustment

Some trailers are not equipped an automatic adjustment mechanism. For those trailers the brakes will need to be adjusted manually.

Before beginning a manual brake adjustment, read understand and follow the instructions in your brake and axle manual. If you do not have this manual, contact Polar King.

- Use a properly sized jack to raise the trailer high enough so the wheels turn freely.
- Secure the trailer on jack stands.
- On the inward side of the brake backing plate, remove the adjustment hole plug.
- With a brake spoon or large flat bit screwdriver, rotate the star wheel on the adjuster screw.
- Continue adjusting until the brakes shoes push against the brake drum and the wheel is difficult to turn.
- Back the star wheel off to loosen the brake shoes until the wheel turns with only a very slight drag.
- Replace the adjustment hole plug.
- Repeat for each wheel.
- Using safe jacking technique, remove the jack stands and lower the trailer to the ground.
- Test the brakes with the tow vehicle. An adjustment to the tow vehicle trailer brake controller may be necessary in order to synchronize the brakes with the trailer.

## Electric Brakes

There may be two brakes systems on trailer with electric brakes:

- Normal Brakes – which are engaged when the tow vehicle brakes are applied or when manually applied with the brake controller.
- Breakaway Brakes – which are applied when if the trailer uncouples and the breakaway pin is pulled and triggers the breakaway brake switch.



**Cold weather can adversely affect battery output and performance.  
Always check the battery's charge before towing.**

## Battery (Breakaway Brake System)

Trailers with electric brakes employ an on-board battery to supply power to operate the brakes should the trailer come uncoupled. This battery must be maintained to keep the critical safety system functioning properly. Some systems use the tow vehicle's power to keep this battery charged. Others systems require that the battery be charged by an external battery charger. Always follow the battery's manufacture instructions when charging this battery.

---

## Breakaway Switch

The breakaway switch will apply the trailer brakes if the trailer accidentally uncouples from the tow vehicle. This switch is activated when a pin is pulled by the lanyard attached to the tow vehicle. To test the Breakaway Brake System, pull the pin and try pulling the trailer. The trailer wheels may not lock but the tow vehicle will require greater force to move the trailer.

### **WARNING**

**The electric breakaway brakes system must function correctly. If the system cannot apply the trailer brakes if the trailer uncouples while towing, serious injury or death may result. Always inspect the breakaway brakes system before towing.**

## Hydraulic Surge Brakes

### Master Cylinder

Always check the brake fluid level in the Hydraulic brake system master cylinder before towing. The master cylinder is marked with a “FULL” line. Make sure the fluid level is at this mark.

Check for leaks and repair if found.

Check to make sure master Cylinder’s actuator is mounted securely.

### Wheel Cylinders

There is a hydraulic wheel cylinder on each wheel with brakes. Always inspect for leaks before towing.

### Brake Shoes or Pads

Brake Shoes and pads will wear over time. Inspect them regularly and adjust or replace when indicated.

### **NOTICE**

**Actuator travel greater than 1 inch indicate the brake shoes are out of adjustment or worn.**

## Tow Vehicle/Trailer Brake Pairing

It is important that the brakes of the trailer and tow vehicle work together. When the two systems are paired, or synchronized, they work with each other to slow both tow vehicle and trailer at the same time. For instructions in pairing the tow vehicle and trailer brake systems, refer to your brake and axle manual, as well as your tow vehicle brake controller manual. If you do not have these manuals, contact Polar King.

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## Hitch Ball And Coupler

Before connecting the trailer's coupler to the tow vehicle's hitch ball, coat the ball with a thin layer of automotive grease. This will decrease wear and ensure smooth operation. Check the locking mechanism on the coupler to make sure it is functioning correctly.

Inspect both the hitch ball and coupler for damage and wear. If you see flat spots, dents, pitting, corrosion or any deformation, contact Polar King for assistance. All damaged parts must be replaced before towing.

The latching mechanism on the coupler must operate easily and snap into the latched position. Lubricate all pivot points, spring ends and sliding surfaces with a good quality motor oil, such as SAE 30W. The hitch ball and coupler pocket must be kept clean. Dirt and debris may prevent the latching mechanism from working correctly.

## Tongue Jack

The jacking mechanism of the tongue jack should be lubricated regularly. If a grease fitting is present, use a grease gun to lubricate the gears and screws. If no grease fitting is present, the gears must be greased manually. At least once a year remove the top of the jack and pack the gears with a quality axle grease.

## Lights



**Make sure all lights and signals work correctly. Towing a trailer without lights and signals may result in a collision causing serious injury or death.**

Ensure that every light and signal is working properly before each tow.

## Wheel Rims

If you suspect a wheel has been damaged, inspect it thoroughly. Damage can be caused by collision at or near a wheel, striking a curb or pot hole, or having been stuck. Replace any wheel that has been damaged with the correct size replacement.

Inspect all wheels for any damage annually.

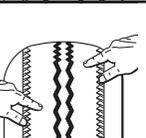
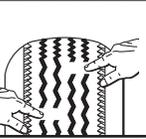
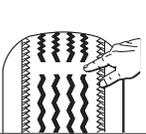
## Tires

Check the air pressure for each tire before every tow while the tires are cold. Make sure the pressure in each tire matches that listed on the Certification / VIN Label at the front left side of the trailer. Do not check the tire while hot (immediately after towing). Allow at least 3 hours for the tire to cool before checking the pressure.

When a tire has a tread depth of less than 2/32 of an inch, or if the wear bands are visible, it must be replaced. A bulge, cut or bubble in the tire's sidewall can cause a blowout. Inspect each tire for damage before each tow. Replace any damaged tire.

When storing a trailer for an extended time period, ensure the tires are inflated to the maximum rated pressure listed on the Certification / VIN Label or tire sidewall and store it away from direct sunlight, preferably in a cool dry place like a garage. If you must store your trailer outside, use covers to protect the tires from the effects of the sun.

## Tire Wear Inspection Chart

CONDITION	POSSIBLE CAUSE	REMEDY
	Even Center Wear	Over Inflation
	Inside and Outside Wear	Under Inflation
	Smooth, Side Wear - One Side	Loss of Chamber or Overloading
	"Feathering" Across the Face	Axle Not Square to Frame or Incorrect Toe In
	Cupping	Loose Bearings or Wheel Balance
	Flat Spots	Wheel Lockup

### **WARNING**

**Towing a trailer with under-inflated, over-inflated, worn or damaged tires can result in loss of control and may cause serious injury or death.**

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## Wheel Bearings

If the trailer brakes grab on one wheel, it's likely caused by a worn wheel bearing. To check for a worn wheel bearing, safely jack the trailer up and secure it with properly placed jack stands. Grasp the wheel on the right and left sides and rock back and forth. If a bearing is worn there will be side to side movement. Another indication of a worn bearing is a wheel that wobbles when spinning. A worn bearing must be serviced or replaced.

### **WARNING**

**Never enter the area under a trailer unless it is on firm, level ground and resting on properly placed and secured jack stand.**

**Never enter the area under a trailer while it is coupled to a tow vehicle, unless the engine is off with the ignition key removed and the parking brakes set.**

Wheel bearings must be greased every 6 months or 6,000 miles.

Some axles are equipped with a grease fitting at the wheel bearing. Remove the protective cover from the fitting. Connect a grease gun with a quality axle grease to the grease fitting. Pump the grease gun slowly until new grease appears. It is a good idea to alternate grease colors to make this easier. Wipe off any excess with a rag and replace the protective cover onto the grease fitting.

If your axle does not have a grease fitting, refer to the brake and axle manual for instructions. If you do not have this manual, contact Polar King.

## Lug Nuts

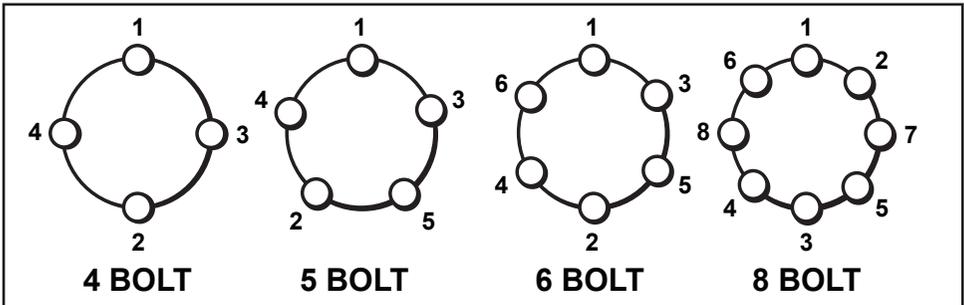
Lug nuts tend to loosen after a when has been remounted. It is important to check and retighten all lug nuts after the first 10, 25 and 50 miles of towing. Inspect and tighten all lug nuts before each tow after that.

### **WARNING**

**Make sure all wheel lug nuts are tight. Make sure the wheels are seated correctly on the hub. Normal use can cause the wheel rim to loosen over time. Inspect/tighten before towing.**

Inspect the wheel studs for corrosion, damage or wear. Never mount a wheel rim to a wheel with damaged studs. Contact Polar King or a qualified trailer mechanic for repairs.

Inspect and/or tighten all lug nuts before towing. Lug nut should be tightened to a torque in three stages. Using a Star-Pattern, as shown in this diagram, tighten each lug first to 20 to 25 ft/lbs. Then following the same pattern tighten each lug to 50 to 60 ft/lbs. Finally, tighten each lug to 90 to 120 ft/lbs. Use a calibrated torque wrench when tightening lug nuts. Do not over-tighten the lugs. This can damage the wheel studs or deform the holes in the brake drum.



Torque specifications can vary. Refer to your brake and axle manual for the specification for your trailer.

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## REFRIGERATION BASICS

Modern refrigeration has many applications. The first, and probably the most important, is the preservation of food because most foods kept at room temperature spoil rapidly. However, when kept cold most foods will keep much longer.

Before looking at the operation of mechanical refrigeration, it is important to understand the physical and thermal properties of the mechanisms and substances used to extract heat. Removing heat from the inside of the walk-in is somewhat like removing water from a leaking boat. A sponge may be used to soak up the water and then held over the side, squeezed, and the water released overboard. The operation may be repeated as often as necessary to transfer the water from the boat back into the lake.

In a walk-in, heat instead of water is transferred. Inside the walk-in heat is absorbed by the liquid refrigerant in the evaporator as the refrigerant changes from a liquid to a vapor. After the refrigerant has absorbed heat and turned it into a vapor, it is pumped into the condensing unit located outside the refrigerated space and then compressed. The heat is "squeezed" out by high temperature and then cooled in the condenser. This cycle repeats until the desired temperature is obtained.

Cold is a relative term used to describe low temperature, it is not something that is produced. Rather, the removal of heat results in a condition termed "cold". A refrigerator produces a condition called "cold" by removing heat from inside the refrigerator and the stored content within it. You have probably felt the heat on the floor as you walked by your refrigerator in your home. The principle of heat removal is the same for your walk-in cooler and/or freezer.

The fact that bacteria are present in most foods calls for it to be preserved in some fashion. Exposing the food to cold or low temperatures slows the growth of these bacteria preventing foods from spoiling as quickly. A cooler temperature slows the activity of all organisms, thus the growth of bacteria on refrigerated food slows dramatically.

The spoiling of food is actually the growth of bacteria. If the bacteria can be kept from increasing, the food will remain edible for a longer period of time. Since most foods contain a considerable amount of water, the food must be kept slightly above freezing temperatures.

If food is frozen slowly, at or near the freezing point of water, large ice crystals will form and break down the food tissues. When such food defrosts, it spoils rapidly and the taste and appearance of the food is greatly compromised. To prevent this problem fast freezing at temperatures between 0°F and -15°F is recommended. By using these low temperatures small crystals form which do not injure the food tissues.

It is always important to keep in mind the difference between refrigerating and freezing. Further, the standard walk-in cooler is designed to maintain the temperature of the product at 35°F, providing the temperature of the product is within 10°F of this temperature. If the product to be maintained is continually at a higher temperature, additional refrigeration system capacity will probably be required. The same parameters hold true for freezers.

To insure you have adequate refrigeration capacity, be sure to provide your sales consultant with as much information as possible about how you intend to use your cooler and/or freezer.

### Heat Load

As we mentioned earlier, the refrigeration system on your walk-in does not make things cold. The system instead removes heat from the walk-in structure. Where does the heat come from that must be removed by the refrigeration process? The two most common sources you can control are door openings and product load. Did you know that one 100-watt lamp left on in a walk-in would generate 8,208 BTU in a 24-hour period? Keep door openings and closings to a minimum to conserve energy. When working inside the walk-in, close the door behind you. No need to worry, as there is a door opener inside.

---

## Product Load

The main heat source in your walk-in is the amount of heat that must be removed from the stored product. For example, if you load your walk-in with 1,500 pounds of product at 0°F, very little heat will have to be removed to obtain a temperature of -10°F. If the same 1,500 pounds of product is delivered from your supplier at +25°F, you must pay to run the refrigeration system to remove this heat from each and every pound of product, until the satisfactory temperature of -10°F is reached. You will have smaller utility bills if you let your supplier remove heat from the product, rather than doing it yourself.

Remember, your unit is designed as either a holding unit (little or no product load) or has been designed to compensate for known product load. It is important to tell your sales consultant how you intend to use your unit. If significant product load occurs in a unit designed for holding, serious temperature problems may occur.

## Loading Your Walk-In

Always move product into your walk-in as soon as you receive it. The longer you wait the more heat it will absorb and the more you will pay to operate the walk-in. As you load your walk-in, be sure to allow plenty of airflow around the product because good airflow decreases the amount of time needed to remove heat. Be sure to allow adequate room around the evaporator. As well, never have a product closer than 12 to 16 inches from the evaporator. Remember, the evaporator is hot during defrost and can thaw a product that is too close.

## Basic Structure

The structure of your walk-in is manufactured at our factory in Fort Wayne, Indiana. Four-inch, five-inch, or six-inch, two-pound density foam insulation (the most efficient insulation available) is used in the walls, floor, and ceiling of the unit. The base of the unit has a built-in steel frame providing tremendous strength and allows for easy movement or total portability should your needs require this flexibility.

The unit is completely encased in fiberglass...one continuous surface...which means no seams, no rivet holes, and no air leaks. Unlike other outdoor units, you will never have to caulk splits or metal tears in your Polar King® walk-in. No protective roofs or enclosures are required. You won't pay to "cool the outside" with a Polar King® unit. All the cold air stays in the unit where it belongs. This equates to big dollar savings for you.

## Refrigeration

Polar King® selects the best refrigeration components available for each walk-in application.

Every system is engineered to provide maximum operating efficiency and years of trouble-free operation. All units are adjusted to the customer's temperature requirements. Trained technicians test and monitor the performance of each unit for 24 hours prior to it leaving our factory.

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## INSTALLATION INSTRUCTIONS

Polar King® walk-in coolers and/or freezers are delivered to our customers fully assembled and require only a few basic procedures prior to start-up.

### Do's

1. Trailer must be level for proper drainage of the evaporator coil.
2. Condensing unit on the top (or back) of the walk-in should be a minimum of 6 feet from any building intake or exhaust ventilation fans.
3. Keep an open area of at least 3 feet around condensing unit to assure that sufficient air ventilates across the compressor.
4. Make sure you have adequate electrical service for your particular unit.
5. Use proper electrical receptacle for the refrigeration amperage and voltage rating.
6. The unit is now ready for operation. (See sequence of operation.)
7. Units are preset at the factory to automatically include four defrost cycles with a maximum duration of 30 minutes each. Preset defrost cycles may be changed to accommodate different applications.

### Don'ts

1. Never use an extension cord rated for less amps than the supplied cord. Long distances may require a heavier gauge cord. **COMPRESSOR DAMAGE WILL OCCUR IF PROPER CORD IS NOT USED.**
2. Do not physically alter any controls, switches, wires or any device carrying an electrical current, without disconnecting power to the walk-in cooler and/or freezer.
3. The box temperature is preset at the factory to customer request. Temperature selection should not be adjusted up or down. If a different temperature is required, contact Polar King® for proper procedure on changing the preset temperature.
4. When cleaning the inside of the unit with any liquid substance, turn off electrical power. **IMPORTANT: DO NOT USE BLEACH OR AMMONIA TO CLEAN INSIDE OF UNIT AS IT MAY CAUSE DAMAGE TO THE EVAPORATOR COIL ALUMINUM FINNS.**
5. **IMPORTANT: DO NOT DISCONNECT MAIN POWER SUPPLY WHILE COMPRESSOR IS RUNNING. DAMAGE MAY OCCUR AT RESTART IF COMPRESSOR IS NOT ALLOWED TO PUMP DOWN.**

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# MAINTENANCE

## RECOMMENDED ANNUAL MAINTENANCE

As part of a comprehensive maintenance plan, Polar King® recommends that the following service functions be performed at least once a year. (Heavy dust areas may require more frequent attention). It is also recommended that a qualified refrigeration technician perform service.

1. Clean condenser coil.
2. Check unit for proper operation.
3. Check refrigerant charge.
4. Have condensate drain line checked and cleaned.
5. Have evaporator coil checked and cleaned with mild detergent.
6. Check cut-in and cut-out pressures.
7. Check for proper defrost cycle.

## CIRCUIT BREAKERS

All Polar King® coolers and freezers are equipped with circuit breakers. Circuit breakers must be in the “ON” position for the unit to operate.

**DO NOT USE THE CIRCUIT BREAKERS AS AN ON-OFF SWITCH.** Units must go through a “pump down” first or compressor damage may occur at start up.

Interior lights are pre-wired. No special connections are required; they are activated when system connections are made.

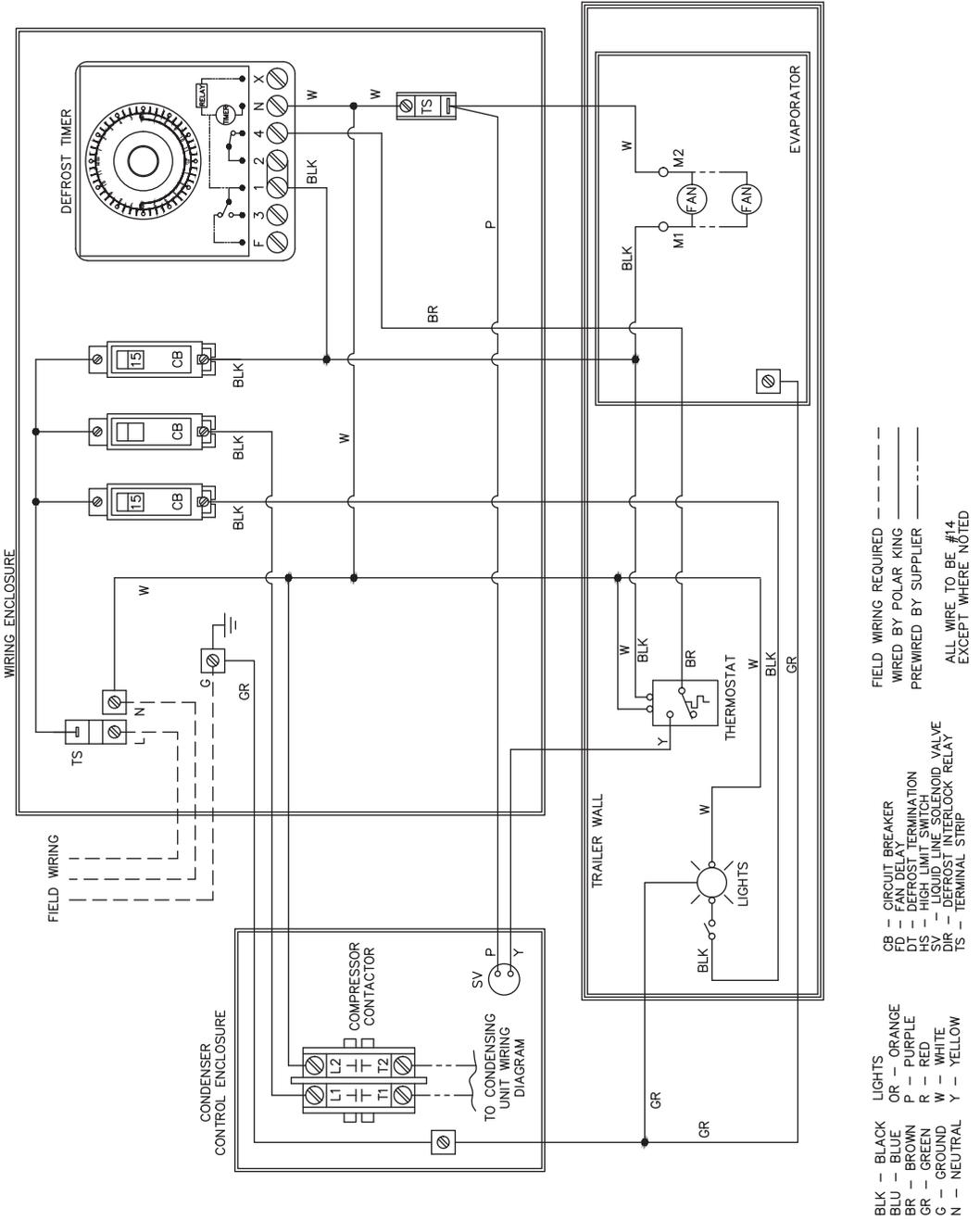
## ALLOWABLE VOLTAGES

### EXTREME ALLOWABLE VOLTAGE AT COMPRESSOR TERMINALS

	<b>Nominal Voltage Range</b>	<b>Extreme Voltage Range</b>
<b>Single Phase – 60 HZ</b>	115	108-130
	230	207-253
<b>Three Phase – 60 HZ</b>	208-230	200-253
	460	414-506
	575	517-632

# WIRING DIAGRAM

## 115V Trailer Cooler



FIELD WIRING REQUIRED  
 WIRING BY POLAR KING  
 PREWIRED BY SUPPLIER  
 ALL WIRE TO BE #14  
 EXCEPT WHERE NOTED

CIRCUIT BREAKER  
 FAN DELAY  
 DEFROST TERMINATION  
 HIGH LIMIT SWITCH  
 LIQUID LINE SOLENOID VALVE  
 DEFROST INTERLOCK RELAY  
 TERMINAL STRIP

BLACK  
 BLUE  
 BROWN  
 GREEN  
 GROUND  
 NEUTRAL  
 ORANGE  
 PURPLE  
 RED  
 WHITE  
 YELLOW



All diagrams are available in larger format online in our resource center at [www.polar-king.com](http://www.polar-king.com)







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# SEQUENCE OF OPERATION: COOLERS AND FREEZERS

## COOLERS

All standard units are equipped with an adjustable thermostat located on the lower right hand side of the evaporator coil, on the inside of the walk-in. All units are set at the factory to the temperature requested by the customer. Minor adjustments in operating temperature may be made to suit your needs. Polar King® recommends that you do not set the temperature colder than required, as this will cause unnecessary power consumption. Recommended temperature for a cooler ranges from +34°F to +37°F, unless specified otherwise, for special applications.

### Refrigeration - Initial Start-Up

When starting up the cooler refrigeration system for the first time, the following events occur.

The operating sequence is as follows:

1. Thermostat calls for refrigerant.
2. Liquid line solenoid valve opens, allowing refrigerant to flow.
3. Pressure control makes the control circuit and the condensing unit operates.
4. When the room thermostat is satisfied, the liquid line solenoid will close, and the compressor will pump down and turn off. (Fan on unit cooler will continue to run.)

These units are designed for application conditions 33°F and above.

**CAUTION: DO NOT SET A COOLER BELOW 32°F OR DAMAGE MAY OCCUR.**

### Defrost

Defrost is accomplished during refrigeration off cycle. Four defrost cycles per day are programmed at the factory (4 a.m., 10 a.m., 4 p.m., and 10:00 p.m.). It may be necessary to change the defrost cycle times to fit your work schedule.

The interior temperature may rise slightly during the defrost cycle. Do not be alarmed. Soon after the cycle is complete, the unit will return to operating temperature.

## FREEZERS

All standard units are equipped with an adjustable thermostat located on the lower right hand side of the evaporator coil, on the inside of the walk-in. All units are set at the factory to the temperature requested by the customer. Minor adjustments in operating temperature may be made to suit your needs. Polar King® recommends that you do not set the walk-in temperature colder than required, as this will cause unnecessary power consumption. Recommended temperature on a freezer ranges from 0°F to -10°F for frozen food, and -10°F to -15°F for ice cream.

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## Refrigeration - Initial Start-Up

When starting the system up for the first time, the fans will be delayed by the defrost termination thermostat and will not operate until the coil temperature is approximately +20°F.

The operating sequence is as follows:

1. Thermostat calls for refrigerant.
2. Liquid line solenoid valve opens, allowing refrigerant to flow.
3. Pressure control makes the control circuit and the condensing unit operates.
4. The coil temperature falls to approximately 20°F and the evaporator fans come on.

**NOTE:** The fans may cycle two or three times until the room temperature is stabilized.)

5. When the room thermostat is satisfied, the liquid line solenoid will close, and the compressor will pump down and turn off. (Fan on unit cooler will continue to run.)

## Defrost (Time Initiated - Temperature Terminated)

After a run period of approximately 6 hours, the evaporator coil will be frosted and require a defrost cycle. Four defrost cycles per day are programmed at the factory (4 a.m., 10 a.m., 4 p.m., and 10 p.m.). It may be necessary to change the defrost cycle times to fit your work schedule.

The interior temperature may rise 10°F to 20°F during the defrost cycle. Do not be alarmed. No thawing of the product will occur. Soon after the cycle is complete, the unit will return to operating temperature.

The defrost sequence is as follows:

1. Timer starts defrost cycle.
2. Liquid line solenoid valve closes, evaporator fans stop, and the defrost heaters are energized.
3. After pumping down, the compressor stops.
4. The heaters warm the coil, melt the frost, and trip the termination thermostat at the set temperature.
5. The defrost cycle is terminated, the liquid line solenoid opens, and defrost heaters are de-energized.
6. The pressure switch closes and the compressor starts the refrigeration cycle.
7. The evaporator fans will remain off until the coil temperature reaches approximately 20°F.

Should the termination thermostat fail to end the defrost cycle, the timer fail-safe time is designed to end after 30 minutes.

# DTAV40 TIMER PROGRAMMING - SYNCHRONOUS AND QUARTZ MODELS

Follow the instructions in the sections below to program the DTAV40 Timer.

## Setting the Time of Day:

### IMPORTANT: DO NOT ROTATE MINUTE HAND COUNTER-CLOCKWISE

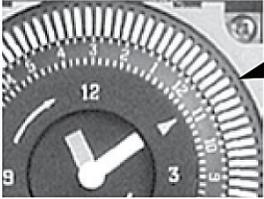
Rotate the timer dial clockwise to align the triangle on the inner dial with the desired time. The triangle represents the current time on the timer.

**NOTE:** The AM and PM locations on the wheel represent 6 AM and 6 PM. For example, if the triangle points to the 7 after PM, then the current time is 7 PM. If the triangle points to the 5 before PM, then the current time is 5 AM.

**DTAV40 TRIPPERS**  
**MODE A**  
**In Refrigeration Mode**  
Arrow on timer points to current time.

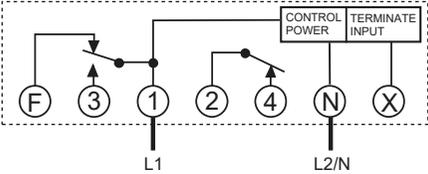
“Green” LED ON





Trippers are “IN”  
Indicates  
Refrigeration

“1 & F” Make  
“1 & 3” Break



“2 & 4” Make

## Setting Defrost Times:

Follow this procedure to configure defrost times.

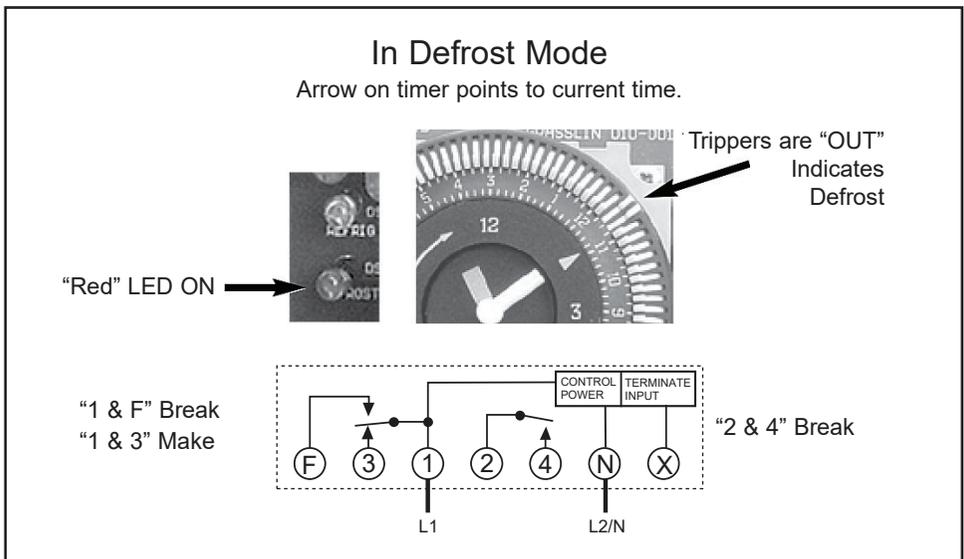
1. On the timer wheel, choose a defrost starting time.
2. Slide the tripper upward that is directly above the desired time. The timer will initiate a 15 minute defrost at the configured time.
3. To increase the duration of the defrost, slide up the trippers that are adjacent to the starting time.

**NOTE:** Each tripper on the time wheel represents 15 minutes. For example, to set a 45-minute defrost, slide the two trippers adjacent to the starting time.



**NOTE:** The AM and PM locations on the wheel represent 6 AM and 6 PM.

4. Repeat steps 1 through 3 as necessary to configure multiple defrost times for a given day.



**NOTE:** Changes to the number of defrost cycles per day and the time of day the defrost cycles occur can be made on the defrost timer located in the electrical panel.

## OPERATING TIPS

The operation of your Polar King® walk-in cooler and/or freezer has been engineered to be as simple and trouble free as possible. This manual provides you some helpful hints for everyday use of your equipment.

1. After unit has been delivered, we recommend that anyone who will work with your Polar King® unit take a minute and walk through it to familiarize themselves with the unit.

### THINGS TO LOOK FOR:

- A. Door Handle: Locking equipment and safety equipment.
  - B. Lighting: Location of switch, indicator light, and light bulb.
  - C. Thermometer: Proper operating temperature. If the temperature displayed on the thermometer is incorrect, the thermometer may be out of adjustment. Verify the walk-in temperature with another thermometer and follow the pointer-reset instructions.
  - D. Thermostat: Location on right side of evaporator coil in unit. Adjusting dial higher or lower can change the temperature. Polar King® recommends that you do not run your unit any cooler than required for economical operation. (Do not set a cooler below 32°F or damage may occur.)
2. Keep door opening and closing to a minimum to conserve energy.
  3. When working inside, close the door behind you. There is a door opener inside.
  4. When loading unit, be careful not to block the airflow from coil.
  5. Periodically check coil fan for proper operation. Check coil for ice. Faulty fan or iced coil will cost you unneeded power use.

### To Reset Dial Thermometer Pointer

#### For Lower Temperature

Place left index finger at wide end of pointer, but close to hub. Insert screwdriver in pointer slot and turn slowly clockwise. Adjust to proper setting (Figure 3).

#### For Higher Temperature

Place left index finger at wide end of pointer, but close to hub. Insert screwdriver in pointer slot and turn slowly counter-clockwise. Adjust to proper setting (Figure 4).

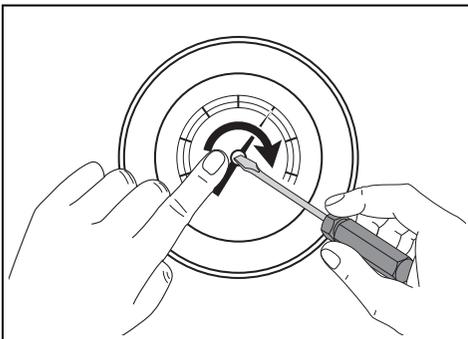


FIGURE 3: LOWER TEMP SETTING

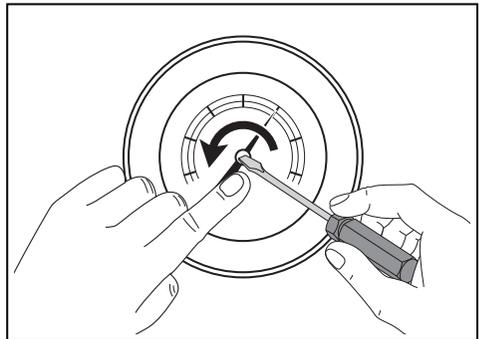


FIGURE 4: HIGHER TEMP SETTING

# TROUBLESHOOTING

## GENERAL REFRIGERATION SYSTEM SERVICE ANALYSIS

PROBLEM	POSSIBLE CAUSES	CORRECTIVE STEPS
Compressor will not run.	No supply at motor.	Check connections and controls.
	Main disconnects open	Close disconnect.
	Fuse blown	Repair electrical defect; replace fuse.
	Overload open circuit	Rectify overload condition; replace overload.
	Control open circuit.	Repair or replace.
	Burn out.	Check windings with meter.
Compressor hums but will not start.	Incorrectly wired.	Check against wiring diagram.
	Motor winding incorrectly connected.	Check winding resistance. The resistance of the start windings for single-phase motor should be higher than that of the run windings. The windings of three-phase motors should be equal.
	Low line voltage.	Check voltage at motor terminals.
	Start capacitor open circuit.	Replace start capacitor.
	Relay not operating.	Replace relay.
	Motor winding open circuit.	Check leads; if correct, replace compressor.
	Seized compressor.	Check oil level; rectify seize or replace compressor.
	Piston jammed or broken valve reed.	Rectify cause of liquid pumping; replace valve plate.
Compressor will not run up to speed.	Low line voltage.	Check voltage at motor terminals.
	Relay defective.	Replace relay.
	Start capacitor shorted.	Replace capacitor.
	High discharge pressure.	Ensure that discharge shut-off valve is open. Check condenser cooling.
	Incorrectly wired.	Check against wiring diagram.
	Motor winding incorrectly connected.	Check winding resistance. The resistance of the start windings for single-phase motors should be higher.
Compressor short cycles.	Control differential too small.	Readjust controls.
	Valve plate leaking.	Replace valve plate.
	Motor overloading.	Check condenser cooling, refrigerant charge, compressor lubrication, and load conditions.
	Shortage of refrigerant.	Repair leak and check for acidity.
	Expansion valve.	Adjust or replace.
	High-pressure switch operates.	Check condenser cooling, and refrigerant charge.

<b>PROBLEM</b>	<b>POSSIBLE CAUSES</b>	<b>CORRECTIVE STEPS</b>
Start relay burnt out.	Low voltage.	Check voltage at motor terminals.
	Run capacitor incorrect.	Fit correct valve capacitor.
	Short cycling.	Reduce number of starts per hour to 20 or less.
	Prolonged operations on start windings.	Reduce starting load, check for low voltage.
	Incorrect relay.	Fit correct relay.
High discharge pressure.	Refrigerant overcharge.	Remove refrigerant.
	Air in system.	Purge air.
	Dirty condenser.	Clean condenser.
Low discharge pressure.	Shortage of refrigerant.	Check for leaks and moisture; add refrigerant.
	Compressor inefficient.	Check and replace valve plate.
Compressor noisy.	Shortage of oil.	Check application for oil return; add oil.
	Pumping liquid.	Check application for oil return; ensure that liquid refrigerant does not return to compressor.
	Broken valve reed.	Check application for liquid pumping; replace valve plate.

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# APPROVALS & CODE COMPLIANCES

## EQUIPMENT APPROVALS / COMPLIANCES

National Sanitation Foundation (NSF)

National Electric Code (NEC)

U.L. Listed, Class I Foam Insulation

U.L. Listed Major Refrigeration Components

U.L. Listed Electrical Components

## BUILDING CODE GENERAL COMPLIANCES

International Building Code (IBC)

## CONDITIONS OF SALE

All sales of goods by Polar King® International, Inc., or through its designated representatives (hereinafter referred to as "The Seller") are made subject to the terms and conditions appearing herein.

### Conditions of Sale

Acceptances of orders from buyers are subject to acceptance by the Seller at its Ft. Wayne, Indiana plant. These conditions of sale shall govern and control all orders accepted by Polar King® or its representatives. No terms or conditions appearing in the buyer's order that are contrary to the Seller's terms and conditions shall be binding upon the Seller unless specifically agreed to in writing by an officer of Polar King®. No representative or agent shall have the authority to abrogate or change any part of these conditions of sale, nor to obligate the company for costs of any kind whatsoever, without permission from an officer of Polar King®.

### Prices and Terms of Payment

**Prices** - The manufacturer's suggested list price is subject to change without notice.

**Terms of Payment** - Unless other terms are specified, payment shall become due 30 days from date of invoice. If shipment is delayed by the buyer, date of readiness for shipment shall be determined by the purchase price and percentage of completion of the order; the balance shall be payable within 30 days from date of invoice or readiness for shipment, as the case may be. All accounts not paid when due are subject to a service charge of 1-1/2% per month. If, in the Seller's judgment, the buyer's financial condition at any time does not justify the terms specified, the Seller may require full or partial payment as a condition to commencing or continuing manufacture or advance of shipment, or if shipment has been made, recover equipment from the carrier.

**Taxes** - Any tax or other governmental charge now or hereafter levied upon the production, sale, use or shipment of goods ordered or sold will be charged to and paid for by the buyer. Such taxes are not covered in the Seller's price unless expressly so stated on the quotation form.

**Freight** - Prices are F.O.B. shipping point unless otherwise quoted in writing.

### Delivery

All delivery dates given by the Seller are approximate and are estimates only not promises and are contingent of fires, strikes, accidents, embargoes and other causes beyond the Seller's control. While every effort will be made to meet estimated delivery dates, the Seller accepts no liability for loss of profit, consequential, or other damages caused by delay in delivery or failure to deliver. The Seller has no obligation to deliver goods against any order unless and until it has accepted the order by issuance of

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its acknowledgment of order. The Seller assumes no responsibility beyond delivery to carrier in good order and is not responsible for loss, damage, goods in transit, or in aiding the purchaser in case of loss or damage. The consignee should make all claims for loss, damage, or delay against the carrier.

## **Cancellations**

The Seller subject to a cancellation charge will accept cancellation of an order for time, materials, and delivery.

## **Patents**

Goods manufactured and sold by the Seller may be used by the buyer pursuant to such patent rights as the Seller has, and such goods do not, in and of themselves, infringe any unexpired U.S. patent; but the Seller shall not be liable for any use to which any such goods may be put as part of any system, mechanism or process covered by patent rights of others.

## **POLAR KING® WARRANTY OVERVIEW**

At Polar King® International, Inc. we take great pride in the trailer cooler and freezer units that we manufacture. We also understand that our relationship with our clients isn't over after the sale. We want to ensure our clients are completely satisfied with their purchase and that our equipment operates, as intended, for years to come. This is why we include one of the most comprehensive manufacturer warranties in the industry. Our limited warranty covers nearly all aspects of the unit including, the refrigeration system, the compressor, the structural integrity of the unit, and nearly all of the miscellaneous parts and accessories included in your trailer unit. The obligation of Polar King® International, Inc., the manufacturer, under this warranty shall be limited to the conditions described below. This warranty is not assignable without the express consent of Polar King® and applies to the original purchaser of trailer units installed and operated within the contiguous United States. Below is a brief overview of the components, parts, and miscellaneous items covered under the Polar King® International, Inc. Limited Warranty.

## **Insulation**

Our manufacturer warranty covers the insulation on our trailer cooler and freeze unit for one (1) year. This ensures the internal foam insulation on your trailer unit will be free of defects from both the materials used and the workmanship in the manufacturing process.

## **Trailer Structure**

The structure of all Polar King® units is covered by the manufacturer warranty for one (1) year. This guarantees that your trailer unit has been built correctly and warrants any defects caused by the materials used and the workmanship in the manufacturing process.

- Structure
- Roof
- Doors
- Interior Surfaces
- Exterior Surfaces
- Frame

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## Refrigeration System and Components

The refrigeration system and several other components of Polar King® trailer units are all covered under the manufacturer warranty for one (1) year. This will make sure that if there are any issues or problems with your refrigeration system due to the materials used and the workmanship in the manufacturing process, you are covered.

- Refrigeration System
- Motors
- Compressors
- Condensers
- Evaporators
- Operational & Safety Controls
- Electrical Components
- Defrost System
- Refrigerant Specialties
- Piping

## Miscellaneous Parts and Accessories

The Polar King® manufacturer warranty covers a number of components and parts in addition to the structure and refrigeration system of the unit. This one (1) year coverage includes parts and accessories installed on the unit at a client's request that experience issues due to the materials used and the workmanship in the manufacturing process.

- Vinyl Strip Curtains
- HASP Lock
- Pallet Bumper Guard
- Shelving
- Remote Thermometers
- Awnings

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## **POLAR KING® INTERNATIONAL, INC. LIMITED TRAILER WARRANTY**

Polar King® International, Inc. hereinafter referred to as Polar King®, warrants that trailer refrigeration and freezer units manufactured by the company are free from any defect in both materials and workmanship under conditions of normal use and service. The obligation of the manufacturer under this warranty shall be limited to the conditions described below. This warranty is not assignable without the express consent of Polar King® and applies to the original purchaser of trailer units installed and operated within the contiguous United States.

### **A. One (1) Year Limited Insulation Material Warranty (Seamless Fiberglass Trailer Units)**

On trailer units originally purchased from Polar King, Polar King® warrants the internal foam insulation for trailer coolers and freezers to be free of defects in both the materials and workmanship for a period of one (1) year from the date of delivery of the unit. This warranty covers only the replacement materials and labor.

### **B. One (1) Year Limited Structural Warranty (Seamless Fiberglass Trailer Units)**

On trailer units originally purchased from Polar King®, Polar King® warrants the structural integrity for trailer coolers and freezers for a period of one (1) year from the date of delivery of the unit. This covers the structure, roof, doors, interior and exterior surfaces and frame to be free of both defects in material and workmanship. This warranty covers only the replacement materials and labor.

### **C. One (1) Year Limited Refrigeration System and Components Warranty (Seamless Fiberglass Trailer Units)**

On trailer units originally purchased from Polar King®, Polar King® warrants the refrigeration system and components for trailer coolers and freezers for the period of one (1) year from the date of delivery of the unit. This covers the refrigeration system, motors, compressors, condensers, evaporators, safety and operations controls, electrical components, defrost system, refrigerant specialties, and piping to be free of both defects in material and workmanship. This warranty covers only replacement materials and labor.

### **D. One (1) Year Limited Miscellaneous Parts and Accessory Items Warranty**

On trailer units originally purchased from Polar King®, Polar King® warrants all miscellaneous parts and accessory items for trailer coolers and freezers for the period of one (1) year from the date of delivery of the unit. This covers all miscellaneous parts and accessory items not manufactured by Polar King®, but which were attached or otherwise installed by Polar King® at the customer's request, to be free of defects in materials and workmanship. This warranty covers replacement materials and labor only.

**NOTE:** *This warranty is in lieu of all other warranties expressed or implied and does not apply to equipment, damage, or malfunctions attributed to normal wear and tear, accidents, improper installation, abuse, misuse, flood, fire, war, nuclear contamination, improper and/or unauthorized repairs, negligence, or any casualty unforeseen other than an operating defect or failure within the warranty period. Polar King's obligation hereunder shall be limited to the current Polar King® cost to repair or replace any item. In no event shall Polar King® be liable for any direct, indirect, or consequential damages for loss due to the defects warranted including, but not limited to, the loss of contents stored within the unit, or lost profits or revenues. This warranty is exclusively for trailer cooler and freezer units produced by Polar King® and does not apply to or cover walk-in cooler and freezer units. This warranty does not cover any products installed outside of the contiguous United States.*

All warranty service claims made must be made in accordance with the Polar King® "Warranty Work Policy" located on the following page.

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## WARRANTY WORK POLICY

In the event of a defective part or malfunction in operation of your Polar King® trailer cooler and/or freezer unit, the following steps must be taken to ensure successful warranty coverage.

### 1. Review Preliminary Checklist

**A. Check the power source to your trailer cooler and/or freezer unit.** Make certain that the unit is correctly powered on and the power source is on. Check any breaker box or the external power supply.

**B. Check the bottom of the evaporator coil.** Note if there is heat on the bottom of evaporator coil in the trailer. If this is the case, the unit may be in a defrost cycle. Wait for approximately 30 minutes. If the unit is in a defrost cycle, it should return to proper operation after cycle is completed.

**C. Check to see if the thermometer is working properly.** If possible, use a secondary thermometer to check the internal temperature of the unit.

**After this checklist has been reviewed and operation has not been restored, the following steps must be taken to initiate warranty service and to prevent product damage:**

**A.** Contact the licensed commercial refrigeration company of your choice or contact Polar King® for a recommendation on a local service company.

**B.** If your Polar King® unit is a cooler, standard ice should be packed around food or other products, in order to maintain proper temperature. Additionally, if possible, limit the number of times the doors are opened as well as the duration of time open.

**C.** If your Polar King® unit is a freezer, it is very important to limit the number of times the doors are opened as well as the duration of time open. Additionally, do not introduce heat into the freezer and contact a service provider as soon as possible.

**D.** After problem has been identified by your service provider, have them contact Polar King for warranty authorization and a work order number.

**E.** If a problem occurs outside of normal business hours (8 A.M. - 5 P.M. EST) have your service company correct problem and call Polar King® the following day to obtain a work order number.

**F.** All replaced parts and the repair bill must be sent to Polar King® International, Inc. (4424 New Haven Avenue, Fort Wayne, IN 46803) freight collect.

All steps and procedures stated in this "Warranty Work Policy" must be followed precisely. Failure to follow the "Warranty Work Policy" may make you responsible for all expenses incurred, since any service call not requiring warrantable item will not be paid for by Polar King® International, Inc. This warranty is exclusively for trailer cooler and freezer units produced by Polar King® and does not cover walk-in cooler and freezer units. This warranty is not assignable without the express consent of Polar King® and applies to the original purchaser of trailer units installed and operated within the contiguous United States.

**NO WARRANTY CLAIM WILL BE PAID WITHOUT A WORK ORDER NUMBER ON THE INVOICE AND THE REPLACED PARTS RETURNED TO POLAR KING® INTERNATIONAL, INC.**

**TO OBTAIN WARRANTY SERVICE AUTHORIZATION PLEASE CALL:**

**TOLL FREE 1-800-223-2017**

4424 New Haven Ave. Fort Wayne, IN 46803

Toll-Free: 800.752.7178 Fax: 260.428.2533

[www.polarking.com](http://www.polarking.com)

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## NOTES



**POLAR KING**  
INTERNATIONAL, INC.

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