OWNER SAFETY MANUAL

BUILDING QUALITY TRAILERS SINCE 1953

MAGICTILT

TABLE OF CONTENTS

IMPORTANT

Read this manual carefully with special attention directed towards all WARNINGS, CAUTIONS, IMPORTANT, & NOTE information specially marked.

Because of the continual improvements being made in our line, Magic Tilt Trailers, Inc. reserves the right to add or discontinue models at any time or to change design and specifications without notice and incurring obligations.

All information contained herein was in effect at the time this manual was printed.

Trailer laws covering such things as brakes, licenses, etc., will vary from state to state. Be sure that your trailer is in full compliance with your state laws. Your trailer dealer can usually help you in this regard. If not, contact your nearest state motor vehicle department office for full information.

The key to carefree trailering is a proper matching of the trailer to your needs. A proper match is one in which the total weight and size of the load you intend to haul falls under the capabilities that your trailer was designed and built to handle.

Information subject to change. Consult your local dealer for any questions you may have.

CONGRATULATIONS ON YOUR NEW MAGIC TILT TRAILER!

You've entered the incredible world of recreational boating, and you've chosen Magic Tilt to be a part of that journey. A wise choice, indeed, as we are the leader in trailer transportation. Our trailer will help provide you access to countless waterways so you can enjoy cruising, exploring, fishing, waterskiing, or any watersports activity.

We are confident that you will be completely satisfied for years to come with the quality and versatility of your Magic Tilt Trailer. We have paid special attention to all the details that make your investment choice a step above the others, to ensure your ultimate satisfaction.

This guide will help ensure for appropriate care and maintenance of your trailer so that you can thoroughly enjoy it safely and effectively for years to come. Enclosed are operator's instructions and warranty information for your new Magic Tilt Trailer. Please read them carefully before operating.

Welcome to the Magic Tilt family!

Craig Clawson,
Owner
Magic Tilt Trailers, Inc.

Product and Specifications subject to change without notice.

OUR QUALITY POLICY

We have communicated our quality policy throughout our organization using our three C's:

CUSTOMER SATISFACTION – We recognize that we are here because of our customers and we will strive to meet their expectations.

CONTINUOUS IMPROVEMENT – This is a way of life at our facility. We use this element to drive our quality system, making us a world-class designer, manufacturer, and innovator.

COST – We challenge our supply chain vendors to be highly competitive in their market so we can deliver the best cost-effective product to our customers.

TRAILER REGISTRATION

Please register your trailer within thirty (30) days of purchase.

You may print, fill out, and mail the warranty form below, or register online at www.magictilt.com.
For a printed copy of the Maintenance and Warranty Guidelines, check the box on the warranty form, or call us toll-free at 800-998-8458.

Date:	Dealer Name:
Owner Name:	Dealer Address:
Address:	City, State, Zip:
City, State, Zip:	Trailer Serial #:

Mail To: **Magic Tilt Trailers – Warranty Department**
2161 Lions Club Rd., Clearwater, FL 33764

MAGIC TILT WARRANTY

LIMITED BOAT TRAILER WARRANTY

I. Duration
Magic Tilt Trailers, Inc. (Magic Tilt) warrants each new Magic Tilt aluminum trailer to be free from defects in materials and workmanship for a period of two (2) years from date of purchase or three (3) years from the date of manufacturer.

Magic Tilt warrants each new Magic Tilt galvanized steel trailer to be free from defects in materials and workmanship for a period of one (1) year from date of purchase or two (2) years from the date of manufacturer.

II. Coverage
Magic Tilt shall repair or replace, without charge, any parts found to be defective because of imperfect workmanship or materials, within a reasonable time after the trailer is returned at purchaser's expense to any Magic Tilt authorized distributor or dealer.

This warranty is extended to the original boat manufacturer, boat dealer, and original retail trailer consumer only and does not extend to any other persons to whom the trailer may be transferred. Warranty on tires shall be made through the nearest representative for the tires.

Magic Tilt warranties do not cover the costs of damage caused by normal wear and tear or caused by environmental factors (including, but not limited to chemicals, salt, or contact with hazardous materials). Purchased parts such as winches, lights, couplers, brakes, tongue jacks, actuators, and springs are exempt from Magic Tilt limited warranty.

Galvanizing and/or other finishes are exempt from warranty.

Any items found to be modified or altered in any way shall be exempt from warranty; nor shall the warranty apply to any defect or malfunction which was caused by damage, unreasonable use, or failure to provide reasonable and necessary maintenance.

The warranty will not cover damage caused by overloading the trailer beyond stated capacities or the use of improperly installed weight distribution hitches in conjunction with hydraulic surge brakes.

Due to the highly corrosive conditions a trailer is exposed to, rust formation / corrosion is not covered.

III. Limitations
On galvanized trailers, races, bearings, and seals are covered for 180 days from date of purchase.

On aluminum trailers, races, bearings, and seals are covered for 1 year from the date purchase, but only if maintained properly.

MAGIC TILT WARRANTY CONT...

Any implied warranties, obligations, or liabilities, including but not limited to, any implied warranty of merchantability, shall be limited in duration to the time frames clearly outlined in this warranty document. Some states do not allow limitation on how long an implied warranty lasts, so the above limitation may not apply to you. The use of any unit as part of a rental fleet or use for commercial purposes voids this warranty.

IV. Exclusions
The following are exclusions of Magic Tilt's Warranty:

- Lack of maintenance or negligence (including improperly tightening lug nuts and bolts, or improperly adjusted trailer coupling)
- Abuse
- Overloading
- Unauthorized repairs
- Improper storage accidents
- Loss of time
- Inconvenience
- Towing charges
- Travel expenses
- Lodging expenses
- Fuel expenses
- Loss or damage to personal property or loss of wages
- Gelcoat damage or hull damage

Any warranty credit from Magic Tilt for either tires or brake system components will be pro-rated over time throughout the 2-year warranty period.

V. Warranty Claim Procedures
Upon discovery of a defect, the owner is to contact a Magic Tilt dealer within fifteen (15) days after discovery, and said dealer will affect any corrective action required under this Warranty after prior written authorization from Magic Tilt. If there is no Magic Tilt dealer within the practical vicinity, the owner must contact Magic Tilt, 2161 Lions Club Road, Clearwater, FL 33764, telephone number 727-535-5561 to obtain prior written authorization for any corrective action required under this Warranty.

VI. Laws Governing
In addition to the provisions of this Warranty, the owner has available the legal remedies provided by the Magnuson-Moss Warranty Act, 15 U.S.C. 2301 et seq. This Warranty is designed and intended to fully comply with the requirements of the Magnuson-Moss Warranty Act. should any provision of this Warranty be held not to comply, however, the remaining provisions of this Warranty shall remain in full force and effect.

Some states do not allow limitations on how long an implied warranty lasts or the exclusion or limitations of "incidental or consequential" Damages, so the applicable limitations or exclusions herein may not apply to you. This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

TRAILER CHECKLIST

IMPORTANT

Before towing, be sure to read through this entire guide, familiarizing yourself with all instructions and safety information. Whether you're a first-timer or a long-time boater, it's always a great idea to study and review best trailering practices and safety procedures.

Follow the checklist below and be sure that your tow vehicle is rated to accommodate the weight of the boat or personal watercraft and trailer combination.

Before you tow the trailer, check to ensure that:

- ☐ Coupler and hitch ball are the correct rating and size
- ☐ Coupler and safety chains are safely and correctly secured to hitch or tow vehicle
- ☐ All fasteners are properly tightened
- ☐ Winch line is properly secured
- ☐ Boat is securely tied down to trailer (winch line is not a tie-down)
- ☐ Wheel lug nuts are properly tightened to wheel manufacturer's specifications
- ☐ Wheel bearings are properly adjusted and maintained
- ☐ Load is within maximum load-carrying capacity
- ☐ Tires are properly inflated to tire manufacturer's specifications denoted on tire
- ☐ All trailer lights and turn signals are working properly
- ☐ Trailer brakes are properly adjusted and working (if trailer is equipped)
- ☐ Trailer jack is locked in the travel position
- ☐ All gear is stowed, and no persons are in the boat while towing
- ☐ Clean, drain, and dry the boat and trailer, removing any attached plant material or debris

By law, all trailers are equipped to meet applicable federal safety standards.
Check state and local requirements regarding brakes and any additional equipment that may be required.

THE RIGHT TRAILER FOR YOU

WARNING

The total weight of your trailer, boat, engine, fuel, batteries, water, and gear must not exceed the trailer's Gross Vehicle Weight Rating (GVWR). Overloading can cause serious injury or property damage.

NOTE

Maximum load-carrying capacity of the trailer is the Gross Vehicle Weight Rating (GVWR) less the weight of the empty trailer.

The key to trouble-free trailering is properly matching the boat and trailer. A proper match is one in which the trailer is designed and built to carry the full weight of the boat, engine, and gear, and which provides proper support for the boat hull. A high capacity trailer built for heavier loads can damage light boats, aluminum in particular.

Trailer & Tire Registration

Federal law requires the completion of trailer and tire registration information. Forms are provided to you by us and/or the dealer to complete and send in to comply with these requirements.

The primary purpose of these forms is to make it possible for us to contact first purchasers of our products if it becomes necessary to issue a defect notification concerning the tires and/or trailer. Be sure to complete these registration forms and mail them/submit them in accordance with instructions. Doing so ensures you will be notified in the unlikely event that a recall of your tires or trailer becomes necessary.

NOTE

Trailer laws covering such items as brakes, license plates, etc., will vary from state to state. Be sure that your trailer is in full compliance with your state laws, as well as in states you plan to travel. Your local dealer can assist with this information. If not, contact your nearest state motor vehicle department.

GVWR & LOAD CAPACITY

Check the VIN certification label attached to the left forward side of your trailer. It shows the maximum load-carrying capacity of the trailer. This label is required to show the Gross Vehicle Weight Rating (GVWR), which is the load-carrying capacity PLUS the weight of the trailer itself. Be sure that the total weight of your trailer, boat, engine, fuel, and all gear does not exceed the GVWR.

If you don't know the correct weight of your boat and engine, have it weighed. This can usually be done at a local lumber yard, feed and fertilizer store, truck weight station, etc.

Be especially careful not to overload your trailer by putting heavy or large amounts of gear that would combine to be heavy in the boat. If you must transport this additional heavy gear in your boat while trailering, be safe and go to the next larger capacity trailer.

NOTE

Be aware that some boats have water ballast systems. These must be drained before the boat can be loaded onto the trailer.

WEIGHT DISTRIBUTION

WARNING

Fishtailing caused from improper tongue weight (not enough) on the tow vehicle hitch ball can cause loss of control of the tow vehicle and result in serious, potentially deadly injury and / or property damage.

Improper weight distribution can cause a boat trailer to "fishtail" (sway from side to side) as it moves down the highway, putting excessive strain on both trailer and towing equipment, increasing gas consumption, and possibly causing an accident. The most effective way to guard against fishtailing is to make sure the weight load on your trailer is properly distributed.

It is extremely important that 7-10% of the total weight of your loaded trailer is felt at the trailer-coupling ball when the tongue is parallel to the ground. A bathroom scale may be used for the determination. For example, if the loaded weight of a trailer, boat, and gear is 2,000 pounds, the weight on the tongue should not be more than 200 pounds and not less than 140 pounds.

NOTE

The 7-10% guideline will hold true until you get into larger-sized boats (9,000 pounds and heavier). It may become necessary to strike a balance between sufficient tongue weight to properly tow and not too much tongue weight to create undue stress on the tow vehicle. When in doubt, consult your local dealer. Also, check your tow vehicle owner's manual for the vehicle's towing information.

If the weight on the coupling ball does not fall within the proper range, you should take immediate steps to achieve it. If only a small adjustment is required, you may be able to solve the problem simply by shifting some of the gear in your boat (gas tank, anchor, fishing tackle) from back to front or vice versa. If this is not adequate, the undercarriage of some trailers (axle or axles) can be moved backward or forward, as required.

NOTE

The importance of adequate tongue weight on the hitch ball cannot be overemphasized.

BOAT SUPPORTS

CAUTION

Improper adjustment of boat supports or improper boat positioning on the trailer may cause damage to your boat hull.

Most of the weight of your boat and engine rests on the transom (stern) supports. These supports must be positioned so that the boat's transom rests directly on them. If the boat overhangs these supports the hull can potentially become deformed and damaged.

It is best if your boat does not overhang on your trailer. However, with larger boats, this may not be feasible. Consult your local dealer for any questions regarding your boat and trailer length dimensions.

An aluminum boat should have long, straight, longitudinal bunks or a long series of closely spaced rollers. This will spread the support across the boat hull. Single rollers should be avoided. Roller heights must be adjusted so that the boat weight is evenly distributed on them. If one roller is set higher than the rest, it can cause damage to the boat bottom.

Side guides or guide poles are used to guide the boat during loading.

NOTE

If your boat and trailer exceed 102", you are required to have a permit to drive on a federal highway in the U.S. Consult your local dealer with any questions.

TRAILER HITCH

WARNING

Do not exceed the maximum trailer weight rating or the maximum tongue rating of your hitch. This can cause a failure of the hitch and can lead to an accident, causing serious injury.

Types of Trailer Hitches

There are two basic types of trailer hitches: a weight-carrying hitch and weight-distributing hitch. Generally, for towing lighter rigs with a passenger car, a weight-carrying hitch is adequate. A weight-distributing hitch may be recommended for heavier rigs. Before deciding which type of hitch to use, consult the manufacturer's recommendation for your car or truck.

Be sure that the total weight of your boat and trailer combination does not exceed the hitch's load capacity; the maximum weight it can handle is stamped on the hitch. Also, be sure the hitch ball is the size to match the coupler on your trailer. The correct ball diameter is marked on the trailer coupler.

The hitch should also provide a place for attaching the trailer's safety chains, two rings or holes on either side of the hitch ball. A truck or van using a "step bumper" as the hitch platform will need to have chain attachments such as eye bolts, as well as a hitch ball installed according to the Society of Automotive Engineers SAE J684 Standard. Installing a light or heavy-duty hitch can be a major undertaking. The hitch and its installation should meet the SAE J684 Standard. It is recommended that the installation be completed by a professional. Consult your tow vehicle dealer.

To ensure that the boat is riding properly on the trailer supports, the trailer should be in a level position when hitched to the tow vehicle and parallel to the ground. More importantly, if the coupler is much lower than the rear end of the trailer, it may prematurely activate the surge brakes. This can be corrected in a number of different ways. For example, you may install air-pressure shock absorbers on the tow vehicle, or switch from a weight-carrying hitch to a weight-distributing hitch. For questions regarding this, consult your tow vehicle dealer.

TRAILER COUPLING

WARNING

Failure to properly engage the hitch ball in the coupler ball socket, securely close and lock the coupler latch mechanism, and secure with the latch pin can cause the trailer to detach from the tow vehicle. This may cause serious injury or property damage. Failure to replace the coupler or latch assembly if either shows any evidence of wear or damage can result in serious injury or property damage.

The trailer coupling is designed to have the required strength when a hitch ball is properly in its socket. It is necessary to exercise care when connecting or disconnecting the trailer and the hitch ball. Care should also be taken not to damage the coupling when it is detached from the tow vehicle. For example, dropping it on the ground or backing the tow vehicle into the trailer.

The coupler socket should not be allowed to lay on the ground where debris can enter the socket and cause excessive wear when the trailer is not hitched up or cause the locking mechanism to jam.

If the coupler becomes damaged it must be repaired or replaced before towing. When the coupler is placed on the ball, the latch should close firmly. Keep the latch mechanism clean and lightly oiled.

Periodically check the attachment of the coupler to the trailer. This attachment is important and often overlooked.

WARNING

Check the actuator and / or coupler for damage, bent parts, and excessive wear. Replace parts if needed. Contact the manufacturer for replacement parts. Check that the bolts that attach the actuator (if equipped) to the trailer are tight.

WARNING

Check that the coupler (latch) handle closes (down) completely when the hitch ball is in the coupler. To make sure the coupler is secured to the hitch ball, look under the coupler and check. Also, while the coupler is attached, raise the front of the trailer 2" to 4" with the tongue jack. If the coupler stays connected, it is secure. If coupler does not stay attached, try the attachment and check again. **If the coupler will not stay attached to hitch ball, or the latch opens inadvertently, DO NOT TOW TRAILER. REMEMBER TO LOWER TRAILER / RAISE JACK BEFORE TOWING.**

NOTE

At times the coupler can push on the hitch ball when parked. Check to make sure the tongue jack is raised or that you are not parked downhill. Correct these conditions, then try to open the handle.

SAFETY CHAINS

WARNING

Failure to properly attach safety chains between your trailer and tow vehicle can result in a run-away trailer should the trailer coupler become detached from the hitch, causing serious injury or property damage.

Safety chains are required on your boat trailer and provide added insurance that your boat trailer will not become totally detached from the tow vehicle. Make sure that the safety chains are correctly attached between the towing vehicle and trailer before each trip.

Your trailer hitch provides a place for attaching safety chains on both sides of the hitch ball. You should crisscross the chains under the trailer tongue – the chain on the left side of the trailer attached to the hole or ring on the right side of the hitch ball; the right chain attached to the hole or ring on the left side of the hitch ball. This will prevent the trailer tongue from dropping to the road if the trailer coupler separates from the hitch ball. The chains should be rigged with just enough slack to permit tight turns. If for any reason you find it necessary to replace a safety chain, ensure that it is correctly rated for your trailer. Do not use or substitute any lighter weight chain.

The Society of Automotive Engineers uses the following as its standard for safety chains:

Trailer Class	Trailer Weight	Minimum Breaking Strength
Class 1	up to 2,000 lbs GVWR	2,000 lbs
Class 2	2,000 to 3,500 lbs GVWR	3,500 lbs
Class 3	3,500 to 5,000 lbs GVWR	5,000 lbs
Class 4	5,000 to 10,000 lbs GVWR	The GVWR of the trailer

Most hardware stores carry a type of chain commonly known as “Proof Coil.” A 3/16-inch, trade size proof coil chain satisfies the requirement for a Class 1 trailer; 1/4-inch trade size proof coil satisfies the requirement for Class 2 and Class 3 trailers. For Class 4 trailers, the breaking strength of a chain must equal the GVWR of the trailer. All chain attachments, including hooks, must be at least as strong as the chains. Harness snaps and small “S” hooks, which don’t have the necessary strength, should not be used. No welding operation should be performed on the chain after its manufacture.

Trailers with brakes have a third chain or cable called the breakaway chain / cable. This chain automatically activates the trailer brakes if the coupler detaches from the tow vehicle. Attach this cable or chain with enough slack to permit tight turns.

NOTE

Safety cables may be substituted for safety chains provided each cable and attaching hardware have a minimum breaking strength equal to or greater than the trailer’s Gross Vehicle Weight Rating (GVWR).

WARNING

If your trailer is equipped with a breakaway cable, check it each time before you tow, get gas at the gas station, and while stopped at rest stops to make sure it has not been damaged. Check the location of the indicator bead and clip. The clip should be in place and the bead should not be outside the actuator. Accidental application will cause brakes to drag and heat up.

TRAILER LIGHTS

United States and Canadian federal safety regulations spell out lighting requirements for trailers used on public roads. Compliance with applicable federal regulations is the trailer manufacturer's responsibility, but it is the trailer owner's responsibility to maintain these lamps and reflectors to ensure they are in proper operating condition.

WARNING

Make certain that all trailer lights are in proper working order to reduce the risk of serious injury or property damage.

Keeping your trailer's lighting system in good operating condition requires basic maintenance:

- ☐ Check each light for burned out bulbs, broken lenses, and loose connections. Replace if needed.
- ☐ Check the tow vehicle electrical wiring, as well as the trailer electrical harness for frayed wires and/or loose connections.
- ☐ Check that all ground connections are clean and tight; lubricate with a silicone spray.
- ☐ Check operation of all lighting and signaling functions – tail, stop, turn, etc.
- ☐ After each use, particularly in saltwater, wash down all lamps to remove dirt, grime, or corrosive elements that may cause premature failure.

If your tow vehicle has a separate turn signal from its stoplight, you will need an electronic tail lamp converter for your trailer lamps to operate properly. These are available at most marine and automotive stores as well as hitch installation locations.

NOTE

Please ensure you have the appropriate adaptor for trailers with and without brakes. You may require a 4-way pin flat, 5-way pin, or 7-way round adaptor, depending on your tow vehicle.

TRAILER JACKS

WARNING

A wheel-equipped jack is intended for lifting and minimal positioning of the trailer coupler over the hitch ball. The jack is not intended to be wheeled excessively. Never roll over bumps or through other obstructions. In the case of a swing-up style jack, failure to properly secure the plunger pin in the proper position may result in serious injury or property damage.

With the exception of trailers carrying lightweight boats, it is generally necessary to use a jack to lift the coupling of a loaded trailer from the hitch ball and to move the trailer about when it is disconnected from the towing vehicle. The trailer tongue should be lowered to a minimum height before moving the trailer around on the jack wheel.

Like any mechanical assembly, a jack requires maintenance to function properly over an extended duration of time. Follow the manufacturer's recommendations for lubricating drive gear, rack and pinion, casters, and jack wheel bearing.

If your trailer jack is designed to swing up out of the way when the trailer is hooked up to your tow vehicle, be certain it is in its fully locked position before attempting to move the trailer tongue.

Be sure to block the trailer wheels before the trailer is detached from the tow vehicle to eliminate dangerous trailer movement.

TRAILER WINCH

WARNING

Be cautious of your trailer winch. High forces are created when using a winch, creating potential safety hazards. It should be operated and maintained properly. Failure to properly operate the winch may result in serious injury.

- Check for proper ratchet operation on each use of the winch. Do not use if damaged; seek immediate repairs.
- Maintain a firm grip on the winch handle at all times. Never release the handle when ratchet lever is in the unlocked position with a load on the winch or handle will spin violently, which could cause personal injury.
- Never use the winch handle as a handle for pulling or maneuvering the trailer or other equipment. Never pull on the winch handle against a locked ratchet.
- Never exceed rated capacity of the winch. Excess loads may cause premature failure and result in serious personal injury.
- Never apply a load on the winch with the line or strap fully extended. Keep at least three full turns of line on the reel.
- Secure the boat properly. When winching operation is complete, do not depend on the winch to support load. Use tie-downs to accomplish this.
- Using a winch line or line hook which is damaged or worn can result in serious personal injury or damage to the boat.
- Never allow children or anyone who is not familiar with the operation of the winch to use it.

All but the smallest trailers are normally equipped with a winch assembly to aid in loading your boat on the trailer. (Electric winches are available for use with larger boats). Industry standards require that the minimum breaking strength of the winch rope or cable must be at least 150% of the winch capacity and the winch hook must have at least 150% of the minimum breaking strength of the winch rope, or 125% of the minimum breaking strength of a steel cable.

Ideally, your winch assembly should be located so that it will pull the boat on a straight line onto the trailer and draw the bow firmly against the bow stop on the winch stand. Boat trailer winches are designed to load and unload boats. It is also designed to hold the bow in place in addition to the system of tie-downs on the trailer (see section on “Tie-Downs”). Your trailer dealer should ensure that your winch assembly is properly positioned, but it’s a good idea to check frequently to be sure nothing has shifted. The bow of your boat should be held firmly in place, and the stern or transom of the boat should rest directly over the transom supports of the trailer.

The bow stop of the winch stand must be adjusted so it is located directly above the boat bow eye and the winch strap must attach to the boat bow eye below the bow stop to secure the boat from moving forward in the event of a sudden stop.

Check the winch line frequently. Its strength can deteriorate significantly from exposure to weather, ozone, and ultraviolet light. If it becomes frayed, “whiskered”, or worn, replace it immediately with a new cable or strap that properly matches the winch and hook. Attach it to the winch as the winch manufacturer recommends and keep at least three turns of line on the winch drum at all times. To avoid fraying or wear, be sure the line does not rub against edges of the winch stand or trailer when winching your boat onto the trailer.

Most knots are not adequate to fasten synthetic rope to winch hooks.

A winch is a simple mechanism but requires maintenance if it is to function properly. Bearings should be oiled regularly. A heavy grease should be applied to the gears to give it a free-running drive and to minimize the effort for cranking the boat onto the trailer.

TIE-DOWNS

WARNING

Failure to tie down the bow independently from the winch line could allow your boat to shift while traveling, causing loss of control of the tow vehicle and resulting in serious injury or property damage.

Ensuring that your boat is held securely in place on the trailer's hull supports, especially when underway, is extremely important. If it is not properly secured, your boat can be damaged as it bounces against the hull supports – or it may slide or fall off the trailer while being towed. Depending upon the boat and trailer you purchased, all the necessary tie-downs for holding the boat on the trailer may not be provided to you by your dealer.

Regardless of your trailer's make or model, there are two key areas to consider:

1. Bow Tie-Downs: A bow stop to hold the front of the boat in place is located on the winch stand. It should be positioned so that the winch line pulls the boat bow forward against the bow stop. A separate tie-down should then be attached to hold the boat down to the trailer. Do not rely on just the winch strap to hold the boat in place. Besides keeping your boat from sliding if the winch releases, bow tie-downs keep the boat on the trailer during quick stops. Be certain that lines do not pass over any edge that will cause chafing.

2. Rear Tie-Downs: As noted previously, it is very important to be sure that the transom of the boat is resting securely on the supports provided at the rear end of the trailer, and that it remains in place when parked or underway. Special rear tie-downs are available for this purpose. Check often to be sure the rear tie-downs are securely locked in place and that they are tight enough to prevent any movement of the boat. Check by rocking the boat on the trailer. If it does not seem to remain firmly in place on the supports, the tie-downs should be tightened or re-rigged.

TIRES

WARNING

Keep tires properly inflated. Failure to maintain correct tire pressure may cause tire failure and loss of control resulting in serious injury or property damage.

Burdened by the weight of their loads, infrequent use, potholes, the sun's blistering UV rays, winter's freezing temperatures, and submersion in water, boat trailer tires do not have an easy life.

The most common cause of trailer tire trouble is underinflation. It is important, therefore, that you always maintain correct air pressure as indicated by the tire manufacturer's certification label or the tire inflation pressure label (see example).

Always check air pressure when the tires are cold, before you've moved the trailer. Tires heat up and the air pressure increases after traveling only a short distance.

When your trailer tires become worn or damaged, replace them promptly with the same type, size, and capacity (not necessarily the same brand) as the original tires.

For safety and convenience, it is recommended that you always carry a spare wheel and tire.

NOTE

Underinflating tires may result in a lower carrying capacity.

TIRE SAFETY INFORMATION

This portion of the Safety Manual contains tire safety information as required by 49 CFR 575.6.

SECTION 2.1 "Steps for Determining Correct Load Limit - Trailer".

SECTION 2.2 "Steps for Determining Correct Load Limit - Tow Vehicle".

SECTION 2.3 Glossary of Tire Terminology, including "cold inflation pressure", "maximum inflation pressure", "recommended inflation pressure", and other non-technical terms.

SECTION 2.4 contains information from the NHTSA brochure entitled "Tire Safety - Everything Rides On It".

This brochure, as well as the preceding subsections, describes the following items;

- Tire labeling, including a description and explanation of each marking on the tires, and information about the DOT Tire Identification Number (TIN).
- Recommended tire inflation pressure, including a description and explanation of:
  A. Cold inflation pressure.
  B. Vehicle Placard and location on the vehicle.
  C. Adverse safety consequences of under inflation (including tire failure).
  D. Measuring and adjusting air pressure for proper inflation.
- Tire Care, including maintenance and safety practices.
- Vehicle load limits, including a description and explanation of the following items:
  A. Locating and understanding the load limit information, total load capacity, and cargo capacity.
  B. Calculating total and cargo capacities with varying seating configurations including quantitative examples showing / illustrating how the vehicles cargo and luggage capacity decreases as combined number and size of occupants' increases. This item is also discussed in Section 3.
  C. Determining compatibility of tire and vehicle load capabilities.
  D. Adverse safety consequences of overloading on handling and stopping on tires.

1.1. STEPS FOR DETERMINING CORRECT LOAD LIMIT – TRAILER

Determining the load limits of a trailer includes more than understanding the load limits of the tires alone. On all trailers there is a Federal certification/VIN label that is located on the forward half of the left (road) side of the unit. This certification/VIN label will indicate the trailer's Gross Vehicle Weight Rating (GVWR). This is the most weight the fully loaded trailer can weigh. It will also provide the Gross Axle Weight Rating (GAWR). This is the most a particular axle can weigh. If there are multiple axles, the GAWR of each axle will be provided.

If your trailer has a GVWR of 10,000 pounds or less, there is a vehicle placard located in the same location as the certification label described above. This placard provides tire and loading information. In addition, this placard will show a statement regarding maximum cargo capacity. Cargo can be added to the trailer, up to the maximum weight specified on the placard. The combined weight of the cargo is provided as a single number. In any case, remember: the total weight of a fully loaded trailer can not exceed the stated GVWR.

For trailers with living quarters installed, the weight of water and propane also need to be considered. The weight of fully filled propane containers is considered part of the weight of the trailer before it is loaded with cargo, and is not considered part of the disposable cargo load. Water however, is a disposable cargo weight and is treated as such. If there is a fresh water storage tank of 100 gallons, this tank when filled would weigh about 800 pounds. If more cargo is being transported, water can be off-loaded to keep the total amount of cargo added to the vehicle within the limits of the GVWR so as not to overload the vehicle. Understanding this flexibility will allow you, the owner, to make choices that fit your travel needs.

When loading your cargo, be sure it is distributed evenly to prevent overloading front to back and side to side. Heavy items should be placed low and as close to the axle positions as reasonable. Too many items on one side may overload a tire. The best way to know the actual weight of the vehicle is to weigh it at a public scale. Talk to your dealer to discuss the weighing methods needed to capture the various weights related to the trailer. This would include the weight empty or unloaded, weights per axle, wheel, hitch or king-pin, and total weight.

Excessive loads and/or underinflation cause tire overloading and, as a result, abnormal tire flexing occurs. This situation can generate an excessive amount of heat within the tire. Excessive heat may lead to tire failure. It is the air pressure that enables a tire to support the load, so proper inflation is critical. The proper air pressure may be found on the certification/VIN label and/or on the Tire Placard. This value should never exceed the maximum cold inflation pressure stamped on the tire.

TIRE SAFETY INFORMATION CONT...

1.1.1. TRAILERS 10,000 POUNDS GVWR OR LESS

TIRE AND LOADING INFORMATION

The weight of cargo should never exceed XXXkg, or XXX lbs.

TIRE	SIZE	COLD TIRE PRESSURE	SEE OWNER'S MANUAL FOR ADDITIONAL INFORMATION
FRONT	20.5x8.0-10(E)	621kPA,90PSI	
REAR			
SPARE			

Tire and Loading Information Placard – Figure 1-1

1. Locate the statement, "The weight of cargo should never exceed XXX kg or XXX lbs.," on your vehicle's placard. See figure 1-1.
2. This figure equals the available amount of cargo and luggage load capacity.
3. Determine the combined weight of luggage and cargo being loaded on the vehicle. That weight may not safely exceed the available cargo and luggage load capacity.

The trailer's placard refers to the Tire Information Placard attached adjacent to or near the trailer's VIN (Certification) label at the left front of the trailer.

1.1.2. TRAILERS OVER 10,000 POUNDS GVWR

(Note: These trailers are not required to have a tire information placard on the vehicle)

1. Determine the empty weight of your trailer by weighing the trailer using a public scale or other means. This step does not have to be repeated.
2. Locate the GVWR (Gross Vehicle Weight Rating) of the trailer on your trailer's VIN (Certification) label.
3. Subtract the empty weight of your trailer from the GVWR stated on the VIN label. That weight is the maximum available cargo capacity of the trailer and may not be safely exceeded.

1.2. STEPS FOR DETERMINING CORRECT LOAD LIMIT – TOW VEHICLE

1. Locate the statement, "The combined weight of occupants and cargo should never exceed XXX lbs.," onyour vehicle's placard.
2. Determine the combined weight of the driver and passengers who will be riding in your vehicle.
3. Subtract the combined weight of the driver and passengers from XXX kilograms or XXX pounds.
4. The resulting figure equals the available amount of cargo and luggage capacity. For example, if the "XXX" amount equals 1400 lbs. and there will be five 150 lb. passengers in your vehicle, the amount of available cargo and luggage capacity is 650 lbs. (1400-750 (5 x 150) = 650 lbs.).
5. Determine the combined weight of luggage and cargo being loaded on the vehicle. That weight may not safely exceed the available cargo and luggage capacity calculated in Step # 4.
6. If your vehicle will be towing a trailer, load from your trailer will be transferred to your vehicle. Consult the tow vehicle's manual to determine how this weight transfer reduces the available cargo and luggage capacity of your vehicle.

TIRE SAFETY INFORMATION CONT...

1.3. GLOSSARY OF TIRE TERMINOLOGY

ACCESSORY WEIGHT
The combined weight (in excess of those standard items which may be replaced) of automatic transmission, power steering, power brakes, power windows, power seats, radio and heater, to the extent that these items are available as factory-installed equipment (whether installed or not).

BEAD
The part of the tire that is made of steel wires, wrapped or reinforced by ply cords and that is shaped to fit the rim.

BEAD SEPARATION
This is the breakdown of the bond between components in the bead.

BIAS PLY TIRE
A pneumatic tire in which the ply cords that extend to the beads are laid at alternate angles substantially less than 90 degrees to the centerline of the tread.

CARCASS
The tire structure, except tread and sidewall rubber which, when inflated, bears the load.

CHUNKING
The breaking away of pieces of the tread or sidewall.

COLD INFLATION PRESSURE
The pressure in the tire before you drive.

CORD
The strands forming the plies in the tire.

CORD SEPARATION
The parting of cords from adjacent rubber compounds

CRACKING
Any parting within the tread, sidewall, or inner liner of the tire extending to cord material.

CT
A pneumatic tire with an inverted flange tire and rim system in which the rim is designed with rim flanges pointed radially inward and the tire is designed to fit on the underside of the rim in a manner that encloses the rim flanges inside the air cavity of the tire.

CURB WEIGHT
The weight of a motor vehicle with standard equipment including the maximum capacity of fuel, oil, and coolant, and, if so equipped, air conditioning and additional weight optional engine.

EXTRA LOAD TIRE
A tire designed to operate at higher loads and at higher inflation pressures than the corresponding standard tire.

GROOVE
The space between two adjacent tread ribs.

GROSS AXLE WEIGHT RATING
The maximum weight that any axle can support, as published on the Certification / VIN label on the front left side of the trailer. Actual weight determined by weighing each axle on a public scale, with the trailer attached to the towing vehicle.

GROSS VEHICLE WEIGHT RATING
The maximum weight of the fully loaded trailer, as published on the Certification / VIN label. Actual weight determined by weighing trailer on a public scale, without being attached to the towing vehicle.

HITCH WEIGHT
The downward force exerted on the hitch ball by the trailer coupler.

INNERLINER
The layer(s) forming the inside surface of a tubeless tire that contains the inflating medium within the tire.

INNERLINER SEPARATION
The parting of the innerliner from cord material in the carcass.

INTENDED OUTBOARD SIDEWALL
The sidewall that contains a white-wall, bears white lettering or bears manufacturer, brand, and/or model name molding that is higher or deeper than the same molding on the other sidewall of the tire or the outward facing sidewall of an asymmetrical tire that has a particular side that must always face outward when mounted on a vehicle.

LIGHT TRUCK (LT) TIRE
A tire designated by its manufacturer as primarily intended for use on lightweight trucks or multipurpose passenger vehicles.

LOAD RATING
The maximum load that a tire is rated to carry for a given inflation pressure.

MAXIMUM LOAD RATING
The load rating for a tire at the maximum permissible inflation pressure for that tire.

MAXIMUM PERMISSIBLE INFLATION PRESSURE
The maximum cold inflation pressure to which a tire may be inflated

MAXIMUM LOADED VEHICLE WEIGHT
The sum of curb weight, accessory weight, vehicle capacity weight, and production options weight.

MEASURING RIM
The rim on which a tire is fitted for physical dimension requirements.

NON-PNEUMATIC RIM
A mechanical device which, when a non-pneumatic tire assembly incorporates a wheel, supports the tire, and attaches, either integrally or separably, to the wheel center member and upon which the tire is attached.

NON-PNEUMATIC SPARE TIRE ASSEMBLY
A non-pneumatic tire assembly intended for temporary use in place of one of the pneumatic tires and rims that are fitted to a passenger car in compliance with the requirements of this standard.

TIRE SAFETY INFORMATION CONT...

NON-PNEUMATIC TIRE
A mechanical device which transmits, either directly or through a wheel or wheel center member, the vertical load and tractive forces from the roadway to the vehicle, generates the tractive forces that provide the directional control of the vehicle and does not rely on the containment of any gas or fluid for providing those functions.

NON-PNEUMATIC TIRE ASSEMBLY
A non-pneumatic tire, alone or in combination with a wheel or wheel center member, which can be mounted on a vehicle.

NORMAL OCCUPANT WEIGHT
This means 68 kilograms (150 lbs.) times the number of occupants specified in the second column of Table I of 49 CFR 571.110.

OCCUPANT DISTRIBUTION
The distribution of occupants in a vehicle as specified in the third column of Table I of 49 CFR 571.110.

OPEN SPLICE
Any parting at any junction of tread, sidewall, or innerliner that extends to cord material.

OUTER DIAMETER
The overall diameter of an inflated new tire.

OVERALL WIDTH
The linear distance between the exteriors of the sidewalls of an inflated tire, including elevations due to labeling, decorations, or protective bands or ribs.

PIN WEIGHT
The downward force applied to the 5th wheel or gooseneck ball, by the trailer kingpin or gooseneck coupler.

PLY
A layer of rubber-coated parallel cords.

PLY SEPARATION
A parting of rubber compound between adjacent plies.

PNEUMATIC TIRE
A mechanical device made of rubber, chemicals, fabric and steel or other materials, that, when mounted on an automotive wheel, provides the traction and contains the gas or fluid that sustains the load.

PRODUCTION OPTIONS WEIGHT
The combined weight of those installed regular production options weighing over 2.3 kilograms (5 lbs.) in excess of those standard items which they replace, not previously considered in curb weight or accessory weight, including heavy duty brakes, ride levelers, roof rack, heavy duty battery, and special trim.

RADIAL PLY TIRE
A pneumatic tire in which the ply cords that extend to the beads are laid at substantially 90 degrees to the centerline of the tread.

RECOMMENDED INFLATION PRESSURE
This is the inflation pressure provided by the vehicle manufacturer on the Tire Information label and on the Certification / VIN tag.

REINFORCED TIRE
A tire designed to operate at higher loads and at higher inflation pressures than the corresponding standard tire.

RIM
A metal support for a tire or a tire and tube assembly upon which the tire beads are seated.

RIM DIAMETER
This means the nominal diameter of the bead seat.

RIM SIZE DESIGNATION
This means the rim diameter and width.

RIM TYPE DESIGNATION
This means the industry of manufacturer's designation for a rim by style or code.

RIM WIDTH
This means the nominal distance between rim flanges.

SECTION WIDTH
The linear distance between the exteriors of the sidewalls of an inflated tire, excluding elevations due to labeling, decoration, or protective bands.

SIDEWALL
That portion of a tire between the tread and bead.

SIDEWALL SEPARATION
The parting of the rubber compound from the cord material in the sidewall.

SPECIAL TRAILER (ST) TIRE
The "ST" is an indication the tire is for trailer use only.

TEST RIM
The rim on which a tire is fitted for testing, and may be any rim listed as appropriate for use with that tire.

TREAD
That portion of a tire that comes into contact with the road.

TREAD RIB
A tread section running circumferentially around a tire.

TREAD SEPARATION
Pulling away of the tread from the tire carcass.

TREADWEAR INDICATORS (TWI)
The projections within the principal grooves designed to give a visual indication of the degrees of wear of the tread.

VEHICLE CAPACITY WEIGHT
The rated cargo and luggage load plus 68 kilograms (150 lbs.) times the vehicle's designated seating capacity.

VEHICLE MAXIMUM LOAD ON THE TIRE
The load on an individual tire that is determined by distributing to each axle its share of the maximum loaded vehicle weight and dividing by two.

TIRE SAFETY INFORMATION CONT...

VEHICLE NORMAL LOAD ON THE TIRE
The load on an individual tire that is determined by distributing to each axle its share of the curb weight, accessory weight, and normal occupant weight (distributed in accordance with Table I of CRF 49 571.110) and dividing by 2.

WEATHER SIDE
The surface area of the rim not covered by the inflated tire.

WHEEL CENTER MEMBER
In the case of a non-pneumatic tire assembly incorporating a wheel, a mechanical device which attaches, either integrally or separably, to the non-pneumatic rim and provides the connection between the non-pneumatic rim and the vehicle; or, in the case of a non-pneumatic tire assembly not incorporating a wheel, a mechanical device which attaches, either integrally or separably, to the non-pneumatic tire and provides the connection between tire and the vehicle.

WHEEL-HOLDING FIXTURE
The fixture used to hold the wheel and tire assembly securely during testing.

1.4. TIRE SAFETY - EVERYTHING RIDES ON IT

The National Traffic Safety Administration (NHTSA) has published a brochure (DOT HS 809 361) that discusses all aspects of Tire Safety, as required by CFR 575.6. This brochure is reproduced in part below. It can be obtained and downloaded from NHTSA, free of charge, from the following web site:

https://www.nhtsa.gov/equipment/tires

Studies of tire safety show that maintaining proper tire pressure, observing tire and vehicle load limits (not carrying more weight in your vehicle than your tires or vehicle can safely handle), avoiding road hazards, and inspecting tires for cuts, slashes, and other irregularities are the most important things you can do to avoid tire failure, such as tread separation or blowout and flat tires. These actions, along with other care and maintenance activities, can also:

- Improve vehicle handling
- Help protect you and others from avoidable breakdowns and accidents
- Improve fuel economy
- Increase the life of your tires.

This booklet presents a comprehensive overview of tire safety, including information on the following topics:

- Basic tire maintenance
- Uniform Tire Quality Grading System
- Fundamental characteristics of tires
- Tire safety tips

Use this information to make tire safety a regular part of your vehicle maintenance routine. Recognize that the time you spend is minimal compared with the inconvenience and safety consequences of a flat tire or other tire failure.

1.5. SAFETY FIRST–BASIC TIRE MAINTENANCE

Properly maintained tires improve the steering, stopping, traction, and load-carrying capability of your vehicle. Underinflated tires and overloaded vehicles are a major cause of tire failure. Therefore, as mentioned above, to avoid flat tires and other types of tire failure, you should maintain proper tire pressure, observe tire and vehicle load limits, avoid road hazards, and regularly inspect your tires.

1.5.1. Finding Your Vehicle's Recommended Tire Pressure and Load Limits

Tire information placards and vehicle certification labels contain information on tires and load limits. These labels indicate the vehicle manufacturer's information including:

- Recommended tire size
- Recommended tire inflation pressure
- Vehicle capacity weight (VCW–the maximum occupant and cargo weight a vehicle is designed to carry)
- Front and rear gross axle weight ratings (GAWR– the maximum weight the axle systems are designed to carry).

Both placards and certification labels are permanently attached to the trailer near the left front.

1.5.2. Understanding Tire Pressure and Load Limits

Tire inflation pressure is the level of air in the tire that provides it with load-carrying capacity and affects the overall performance of the vehicle. The tire inflation pressure is a number that indicates the amount of air pressure– measured in pounds per square inch (psi)–a tire requires to be properly inflated. (You will also find this number on the vehicle information placard expressed in kilopascals (kpa), which is the metric measure used internationally.)

Manufacturers of passenger vehicles and light trucks determine this number based on the vehicle's design load limit, that is, the greatest amount of weight a vehicle can safely carry and the vehicle's tire size. The proper tire pressure for your vehicle is referred to as the "recommended cold inflation pressure." (As you will read below, it is difficult to obtain the recommended tire pressure if your tires are not cold.) Because tires are designed to be used on more than one type of vehicle, tire manufacturers list the "maximum permissible inflation pressure" on the tire sidewall. This number is the greatest amount of air pressure that should ever be put in the tire under normal driving conditions.

1.5.3. Checking Tire Pressure

It is important to check your vehicle's tire pressure at least once a month for the following reasons:

- Most tires may naturally lose air over time.
- Tires can lose air suddenly if you drive over a pothole or other object or if you strike the curb when parking.
- With radial tires, it is usually not possible to determine underinflation by visual inspection.

For convenience, purchase a tire pressure gauge to keep in your vehicle. Gauges can be purchased at tire dealerships, auto supply stores, and other retail outlets. The recommended tire inflation pressure that vehicle manufacturers provide reflects the proper psi when a tire is cold. The term cold does not relate to the outside temperature. Rather, a cold tire is one that has not been driven on for at least three hours. When you drive, your tires get warmer, causing the air pressure within them to increase. Therefore, to get an accurate tire pressure reading, you must measure tire pressure when the tires are cold or compensate for the extra pressure in warm tires.

1.5.4. Steps For Maintaining Proper Tire Pressure

Step 1: Locate the recommended tire pressure on the vehicle's tire information placard, certification label, or in the owner's manual.

Step 2: Record the tire pressure of all tires.

Step 3: If the tire pressure is too high in any of the tires, slowly release air by gently pressing on the tire valve stem with the edge of your tire gauge until you get to the correct pressure.

Step 4: If the tire pressure is too low, note the difference between the measured tire pressure and the correct tire pressure. These "missing" pounds of pressure are what you will need to add.

Step 5: At a service station, add the missing pounds of air pressure to each tire that is underinflated.

Step 6: Check all the tires to make sure they have the same air pressure (Except in cases in which the front and rear tires are supposed to have different amounts of pressure).

If you have been driving your vehicle and think that a tire is underinflated, fill it to the recommended cold inflation pressure indicated on your vehicle's tire information placard or certification label. While your tire may still be slightly underinflated due to the extra pounds of pressure in the warm tire, it is safer to drive with air pressure that is slightly lower than the vehicle manufacturer's recommended cold inflation pressure than to drive with a significantly underinflated tire. Since this is a temporary fix, don't forget to recheck and adjust the tire's pressure when you can obtain a cold reading.

1.5.5. Tire Size

To maintain tire safety, purchase new tires that are the same size as the vehicle's original tires or another size recommended by the manufacturer. Look at the tire information placard, the owner's manual, or the sidewall of the tire you are replacing to find this information. If you have any doubt about the correct size to choose, consult with the tire dealer.

1.5.6. Tire Tread

The tire tread provides the gripping action and traction that prevent your vehicle from slipping or sliding, especially when the road is wet or icy. In general, tires are not safe and should be replaced when the tread is worn down to 1/16 of an inch. Tires have built-in treadwear indicators that let you know when it is time to replace your tires. These indicators are raised sections spaced intermittently in the bottom of the tread grooves. When they appear "even" with the outside of the tread, it is time to replace your tires. Another method for checking tread depth is to place a penny in the tread with Lincoln's head upside down and facing you. If you can see the top of Lincoln's head, you are ready for new tires.

1.5.7. Tire Balance and Wheel Alignment

To avoid vibration or shaking of the vehicle when a tire rotates, the tire must be properly balanced. This balance is achieved by positioning weights on the wheel to counterbalance heavy spots on the wheel-and-tire assembly. A wheel alignment adjusts the angles of the wheels so that they are positioned correctly relative to the vehicle's frame. This adjustment maximizes the life of your tires. These adjustments require special equipment and should be performed by a qualified technician.

TIRE SAFETY INFORMATION CONT...

1.5.8. Tire Repair

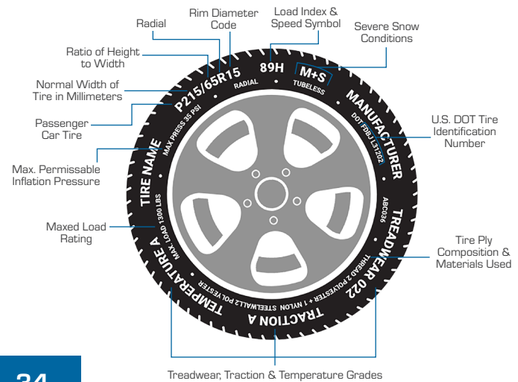
The proper repair of a punctured tire requires a plug for the hole and a patch for the area inside the tire that surrounds the puncture hole. Punctures through the tread can be repaired if they are not too large, but punctures to the sidewall should not be repaired. Tires must be removed from the rim to be properly inspected before being plugged and patched.

1.5.9. Tire Fundamentals

Federal law requires tire manufacturers to place standardized information on the sidewall of all tires. This information identifies and describes the fundamental characteristics of the tire and also provides a tire identification number for safety standard certification and in case of a recall.

1.5.9.1. Information on Passenger Vehicle Tires

Please refer to the diagram below.



P
The "P" indicates the tire is for passenger vehicles.

Next number
This three-digit number gives the width in millimeters of the tire from sidewall edge to sidewall edge. In general, the larger the number, the wider the tire.

Next number
This two-digit number, known as the aspect ratio, gives the tire's ratio of height to width. Numbers of 70 or lower indicate a short sidewall for improved steering response and better overall handling on dry pavement.

R
The "R" stands for radial. Radial ply construction of tires has been the industry standard for the past 20 years.

Next number
This two-digit number is the wheel or rim diameter in inches. If you change your wheel size, you will have to purchase new tires to match the new wheel diameter.

Next number
This two- or three-digit number is the tire's load index. It is a measurement of how much weight each tire can support. You may find this information in your owner's manual. If not, contact a local tire dealer. Note: You may not find this information on all tires because it is not required by law.

M+S
The "M+S" or "M/S" indicates that the tire has some mud and snow capability. Most radial tires have these markings; hence, they have some mud and snow capability.

Speed Rating
The speed rating denotes the speed at which a tire is designed to be driven for extended periods of time. The ratings range from 99 miles per hour (mph) to 186 mph. These ratings are listed below. Note: You may not find this information on all tires because it is not required by law.

Letter Rating	Speed Rating
Q	99 mph
R	106 mph
S	112 mph
T	118 mph
U	124 mph
H	130 mph
V	149 mph
W	168* mph
Y	186* mph

*For tires with a maximum speed capability over 149 mph, tire manufacturers sometimes use the letters ZR.

U.S. DOT Tire Identification Number
This begins with the letters "DOT" and indicates that the tire meets all federal standards. The next two numbers or letters are the plant code where it was manufactured, and the last four numbers represent the week and year the tire was built. For example, the numbers 3197 means the 31st week of 1997. The other numbers are marketing codes used at the manufacturer's discretion. This information is used to contact consumers if a tire defect requires a recall.

Tire Ply Composition and Materials Used
The number of plies indicates the number of layers of rubber-coated fabric in the tire. In general, the greater the number of plies, the more weight a tire can support. Tire manufacturers also must indicate the materials in the tire, which include steel, nylon, polyester, and others.

Maximum Load Rating
This number indicates the maximum load in kilograms and pounds that can be carried by the tire.

Maximum Permissible Inflation Pressure
This number is the greatest amount of air pressure that should ever be put in the tire under normal driving conditions.

1.5.9.2. UTQGS Information

Treadwear Number
This number indicates the tire's wear rate. The higher the treadwear number is, the longer it should take for the tread to wear down. For example, a tire graded 400 should last twice as long as a tire graded 200.

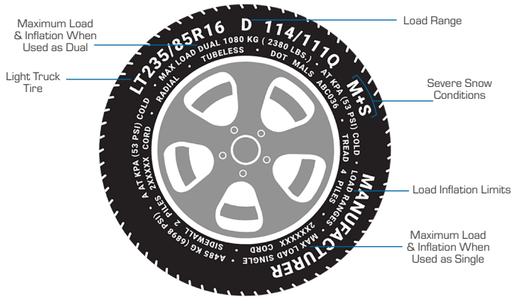
Traction Letter
This letter indicates a tire's ability to stop on wet pavement. A higher graded tire should allow you to stop your car on wet roads in a shorter distance than a tire with a lower grade. Traction is graded from highest to lowest as "AA","A", "B", and "C".

Temperature Letter
This letter indicates a tire's resistance to heat. The temperature grade is for a tire that is inflated properly andnot overloaded. Excessive speed, underinflation or excessive loading, either separately or in combination, can cause heat build-up and possible tire failure. From highest to lowest, a tire's resistance to heat is graded as "A", "B", or "C".

TIRE SAFETY INFORMATION CONT...

1.5.9.3. Additional Information on Light Truck Tires

Please refer to the following diagram.



Tires for light trucks have other markings besides those found on the sidewalls of passenger tires.

LT

The "LT" indicates the tire is for light trucks or trailers.

ST

An "ST" is an indication the tire is for trailer use only.

Max. Load Dual kg (lbs) at kPa (psi) Cold

This information 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

This information indicates the maximum load and tire pressure when the tire is used as a single.

Load Range

This information identifies the tire's load-carrying capabilities and its inflation limits.

1.6. TIRE SAFETY TIPS

Preventing Tire Damage

- Slow down if you have to go over a pothole or other object in the road.
- Do not run over curbs or other foreign objects in the roadway, and try not to strike the curb when parking.

Tire Safety Checklist

- Check tire pressure regularly (at least once a month), including the spare.
- Inspect tires for uneven wear patterns on the tread, cracks, foreign objects, or other signs of wear or trauma.
- Remove bits of glass and foreign objects wedged in the tread.
- Make sure your tire valves have valve caps.
- Check tire pressure before going on a long trip.
- Do not overload your vehicle. Check the Tire Information and Loading Placard or User's Manual for the maximum recommended load for the vehicle.

WHEELS & HUBS

WARNING

Maintain proper torque on lug nuts or wheel bolts. Failure to do so may result in serious injury or property damage.

WARNING

Keep wheel bearings lubricated. Failure to properly lubricate may cause bearing failure and possible wheel loss resulting in serious injury or property damage.

Because they are often exposed to water, trailer wheels and tires require more attention than the wheels and tires on your tow vehicle. The three major items to check are lug nuts, lubrication, and tire pressure.

Lug Nuts / Wheel Bolts

Loose lug nuts can lead to the loss of a wheel! Before each trip, check for loose or missing lug nuts. When tightening lug nuts, use a wrench of the right size, and torque the nut to the manufacturer's specifications. Be certain a replacement nut is an exact match for the original. While the threads of the lug nut may match, the nut may be a size that does not hold the wheel securely against the hub, even when fully tightened. Also, ensure that the wheel bolts and nuts are clean and grease-free.

Lubrication

Your best protection against wheel bearing damage is to always keep your hub assembly fully lubricated. If your trailer uses conventional wheel bearing grease, remove all old grease and water from the hub and bearings, then repack the bearings with a quality wheel bearing grease and fill the hub cavity with grease to allow as little room as possible for air or water.

Bearings should be inspected after long periods of non-use and before long trips.

When on a trip, make it a habit to check the wheel hubs periodically and each time you stop for fuel. If the hub feels abnormally hot, visit or call the nearest service station for advice.

Recommended Torque (ftlbs)

Size	Bolt Circle	Off Set	Steel	Aluminum
12"	4-4 or 5-4.5	0.00	50-75	95-105
13"	4-4 or 5-4.5	0.00	50-75	95-105
14"	5-4.5	0.00	90-120	110-120
15"	5-4.5	0.00	90-120	110-120
15"	6-5.5	0.00	90-120	110-120
16" (1/2" Stud)	6-5.5	0.00	90-120	110-120
16" (9/16" Stud)	8-6.5	0.00	90-120	125-130
17.5" (9/16" Stud)	8-6.5	0.00	N/A	125-130
17.5" (5/8" Stud)	8-6.5	0.00	275-325 (Flange Nut)	150

**Always verify installation recommendations, procedures, and tolerances with all other running gear component(s).*

Lug Nut Installation Sequence(s)

WHEEL MOUNTING PROCEDURES

WARNING

Improper wheel fastening can result in wheel separation from the vehicle causing serious injury and/or death.

Proper mounting practice is as easy as 1,2,3,4...

1. **Fit**
   - Wheel should fit flat against the hub
   - All surfaces should be clean and free of contamination or foreign material
   - There should be no fit interference at the hub face or hub diameter
2. **Fasten**
   - Avoid cross-threading by starting each lug nut by hand
3. **Tighten***
   - Apply torque to the lug nuts in a star pattern as shown on previous page
   - Gradually increase torque on the lug nuts until each lug nut has achieved the specified torque
4. **Confirm**
   - A second check verifying the torque should be performed using a dial or digital torque gauge

*Do not use an impact wrench without proper torque attachment

BRAKES

WARNING

Trailer brakes must be maintained in good working condition. Loss of adequate braking could result in serious injury or property damage.

In most states, trailers with a Gross Vehicle Weight Rating (GVWR) over 3,000 pounds are required by law to have brakes. (Auto manufacturers generally recommend brakes even with light trailers).

NOTE

Check your state trailer brake requirements and other states that you plan to travel in to ensure your trailer complies with these laws. Many states require brakes on all axles.

Most trailer brakes are designed to operate automatically when the tow vehicle's brakes are applied. These are known as "surge brakes." When the tow vehicle slows down or stops, the forward momentum (surge) of the trailer against the hitch ball applies pressure to the master cylinder in the trailer coupler. This pressure activates the trailer brakes through a hydraulic system, much like the brakes on your automobile.

Trailer disc brakes are self-adjusting and do not need to be periodically adjusted. Using pads or shoes without enough brake lining material can result in brake damage, create excessive heat, and potentially cause the loss of braking capability.

NOTE

In saltwater applications, the brake system components must be thoroughly washed as soon as possible once the trailer is out of the water. Proper brake maintenance is essential to the life of your trailer. Check with your local dealer about the use of recommended over-the-counter products that could assist your efforts.

BRAKES CONT...

Try out your brakes before each trip and after each time your trailer wheels are pulled for lubrication. On a regular basis, have your brake linings inspected, necessary adjustments made, and any damaged or worn parts replaced. Wet brakes usually do not operate very well. If your wheels have been in water, several brake applications at slow speeds will dry them out.

If your trailer is not equipped with self-adjusting brakes, the brakes will require regular adjustment from time to time to ensure that they are working properly.

Automatic Brake Lockout (if equipped)

To check: Have someone listen for the sound while the driver is in the tow vehicle. Keep the emergency brake on and one foot on the brake pedal to avoid accidentally backing up.

WARNING
The electrical lead from the solenoid valve must be connected to the tow vehicle backup lights. A "click" should be heard when the tow vehicle is shifted into reverse and the backup lights come on.

WARNING
Check the fluid in the master cylinder reservoir each time before you tow or if you see brake fluid leakage. Refill as required.

ATTACHING YOUR TRAILER TO THE TOW VEHICLE

When hitching your trailer, you should always observe each item of the **"Trailer Checklist"** printed on page 7 of this booklet.
Hitching your trailer to your tow vehicle can be a one-person job, but it is easier if you have a second person to help you.

Here are the basic steps:

1. Raise the front end of the trailer so the coupler is higher than the hitch ball. Make sure the coupler latch is open.
2. Back your tow vehicle as close as possible to the trailer. Do not pull the trailer to the tow vehicle. The trailer will not brake even if the trailer has brakes.
3. Place the coupler over the hitch ball and lower the coupler until it is around the ball and not riding on top of the ball.
4. Lock the coupler over the hitch ball. To be sure it is in the locked position and securely in place, raise up on the trailer tongue. If it comes loose from the ball, unlock and go back to step 3.
5. Be certain the jack is fully raised and locked in the travel position (and castor wheel removed, if necessary).
6. If you have a weight-distributing hitch with spring bars, follow the above procedures, and attached spring bar chain or cable to the trailer and tighten until the tow vehicle is in a normal level position.
7. If your trailer has a surge brake break-away cable or chain, attach it to the tow vehicle, making sure there is enough slack for tight turns.
8. Attach the safety chains (see "Safety Chains" section).
9. Connect trailer wiring harness to lighting system connection of tow vehicle and check for proper operation of the lights (see "Trailer Lights" section).

WARNING
Make sure a hitch ball of proper size and correct load rating is used. A film of clean grease on the ball will extend coupler and ball life and stop squeaking. Wipe ball clean and renew the film periodically.

WARNING
The hitch on the tow vehicle must be of the proper load rating and in good condition. If the hitch is of the receiver type, make sure the receiver pull pin is in place and the safety pin is installed.

TRAILERING TACTICS

With a boat and trailer in tow you are operating a vehicle combination that is longer, heavier, and sometimes wider and taller than your tow vehicle. This means you will have to make a few adjustments in your normal driving practices to compensate for the differences. Here are a few tips to follow when trailering.

Take a "Shakedown Cruise": Before you make your first trip with your trailer, make at least one short trial run to familiarize yourself with its handling characteristics and to be sure everything is working properly – lights, brakes, hitch, etc.

Slow Down: Going fast is a major cause of vehicle / trailer combination accidents. Slower speeds are not as hard on the vehicle, trailer, and boat. Slow down for curves, inclement weather, bad roads, and highway exits. Also, many states have lower speed limits for vehicles towing trailers.

Pass and Stop with Extra Care: You'll need more time and space when passing and stopping, especially if your trailer is not equipped with brakes. Pass with care and return to the right lane.

Check Rear View Mirrors: You may need to install extended outside rear view mirrors on both sides of the tow vehicle. Make it a habit to check the mirrors at frequent intervals to be sure your trailer and boat are riding properly.

Swing Wider When Turning: Trailer wheels swing closer to the inside of turns than the wheels on your tow vehicle when turning. This means you should swing wider around curves and corners.

Going Downhill: Swaying happens more often going downhill. Slow down before starting down a hill. Shift into a lower gear and let the engine help control your speed. Going too fast can make the trailer sway and can lead to loss of control.

Watch the Wind: Be prepared for wind buffering when larger vehicles pass you from either direction. Slow down a little and keep a firm hold on the steering wheel.

Conserve Fuel: Wind resistance against the boat and trailer can reduce your gas mileage significantly, especially at higher speeds. "Streamline" your rig with a boat cover, and make sure any doors, hatches or windows (portholes) are closed securely.

Avoid Sudden Stops and Starts: Even if your trailer has brakes a sudden stop could cause it to skid, slide, or even jackknife. (Be especially careful to avoid the necessity for quick stops while turning). Smooth, gradual starts and stops will improve your gas mileage and put less strain on your tie-downs.

Signal Your Intentions: Well before you stop, turn, change lanes, or pass, use your signal lights to let other vehicles know what you intend to do.

Shift to Lower Gear: If your tow vehicle has a manual transmission, traveling in lower gears when going up steep hills or over sand, gravel, or dirt roads will ease the load on your engine and transmission.

Always Be Courteous: Make is as easy as possible for faster moving vehicles to pass you. Keep to the right side of the road and be prepared to slow down if they need extra time to return to their proper lane.

Don't Tailgate: Allow extra distance between you and the vehicle ahead. Coming to a stop or slowing requires more time and distance while trailering.

If a Problem Occurs: The general rule is to stay cool. Don't panic and don't do anything anymore suddenly or violently than you have to. A sudden bumping or "fishtailing" may be due to a flat tire. Do not panic-brake or accelerate to attempt to "drive out of it". Stop slowly and in a straight line. If conditions permit, allow your vehicle to coast to a very slow speed and try to avoid braking when the towing vehicle and trailer are not in line.

If your trailer begins to "fishtail" as you accelerate to highway speed, back off a little and it should cease. If it begins again as you accelerate, stop and check your load. If probably is not evenly distributed side to side or it is too far back so the hitch load is low. Redistribute your load before continuing.

LAUNCHING YOUR BOAT

WARNING
To reduce the risk of serious injury, do not step inside or on the trailer frame during the launching or loading procedures.

WARNING
To reduce the risk of serious injury if the winch line or hook breaks, stand to one side when winching the boat onto your trailer.

Until you develop your own boat launching techniques, here are a few helpful tips:

1. **Check the Ramp First.** Whether you're launching from an unimproved or a surfaced ramp, check the grade, width, surface condition, and water depth before starting your launching procedure.

NOTE
Some surfaced ramps become very slippery when wet. Make sure your tow vehicle is powerful and heavy enough to pull your boat out of the water.

2. **Prepare for Launching.** Attach a bowline to your boat and detach trailer tie-downs. If your boat is an outboard or stern drive, tilt up the lower unit. To avoid flooding and swamping your boat, be sure the hull drain plug is in place and tight.
3. **Back Trailer to the Ramp.** Have someone stand to one side of the ramp to direct you. Backing up a trailer can be tricky. A good way to simplify the procedure is to grasp the steering wheel with one hand at its lowest point (at 6 o'clock). When you want the trailer to go right, move your hand on the wheel to the right; to make the trailer go left, move your hand to the left.
4. **Launching.** Back trailer into the water. Set parking brake on and gear shift in park. Be sure to have a firm hold on the bowline. Unlock the winch and push your boat slowly off the trailer into the water.
5. **Final Step.** Detach winch hook and line from the boat, crank it back up and lock it in place. Using the bowline from the boat, walk the boat to the loading site, away from the ramp. Park your car and trailer where they will not obstruct access to the ramp.

To re-load the boat on the trailer, simply reverse the procedures. Before loading, clean any dirt or sand off the rollers or bunks. Sand on bunks or rollers can abrade the boat's bottom while trailering.

Be certain all boat tie-downs are properly fastened before departing from the launching ramp area.

NOTE
Wet brakes may not function. A few brakings at slow speed will help to dry them out.

TRAILERING TIPS

1. Before your trip, do a final "walk-around" inspection to verify the security of the boat to the trailer, as well as the trailer to the tow vehicle, and that all lights are working properly.
2. The jack and lug wrench that came with your tow vehicle may also work on your trailer, but don't count on it! Check to be sure.
3. Your trailer will look better and last longer if you wash it with mild detergent several times a year. If you boat in saltwater, the trailer should be rinsed off with fresh water after every trip. An annual waxing with an auto wax will also help to keep your trailer bright and clean.
4. Invest in a spare tire and wheel that can be mounted to your trailer's frame by using a spare tire carrier.
5. Carry a Trailer Travel Kit which should include a lug wrench, wheel chocks, bearing grease, extra line (for tie-downs), extra light bulbs, and road flares.
6. Some insurance policies do not provide coverage when towing a trailer. Check your policy or call your insurance agent to be sure you are fully covered.
7. Take time to practice turning and backing up before you head to the ramp. Shopping mall parking lots (after hours) make for safe practice areas.

AQUATIC INVASIVE SPECIES

Aquatic Invasive Species (AIS) are plants and animals that occur in waters in which they are not native and whose introduction causes or is likely to cause economic or environmental damage or harm to human health.
AIS negatively impact the waterway, its native species, and recreational and commercial uses of the waterway.

As responsible boaters and citizens, each boat owner should do their part to prevent the spread of these aquatic hitchhikers. In many cases, it is also required by law. Check local regulations for any water where you will boat.

After each boating trip, follow these three simple steps before you leave the water access to stop the spread of AIS: Clean, Drain, and Dry. This is a boater's way to help protect the environment from the damage that AIS can cause.

Clean. Inspect and remove all the aquatic plants, animals, mud, and debris from the boat, engine, trailer, anchor and any water sports equipment. Rinse, scrub or wash, as appropriate, away from storm drains, ditches, or waterways. Rinse watercraft, trailer, and equipment with hot water, when possible. Flush motor according to owner's manual.

Drain. Completely drain all water from the boat and its compartments, including but not limited to the bilge, wells, lockers, ballast tanks or bags, bait containers, engines, and outdrives.

Dry. Allow the boat to completely dry before visiting any other bodies of water.

NOTE

Some localities may require inspection or decontamination before and/or after launching.
Check state and local laws and regulations for requirements prior to traveling to go boating.

Additional Boat Specific Recommendations

Non-motorized Watercraft

Canoes, rafts, kayaks, rowboats, inflatables, sculls, and other non-motorized recreational watercraft also require proper treatment.

- Clean straps, gear, paddles, floats, ropes, anchors, dip nets, and trailer before leaving the body of water
- Dry everything completely between each use and before storing
- Wear quick-dry footwear or bring a second pair of footwear with you when portaging between bodies of water

Sailboats

- Clean centerboard, bilge board, wells, rudder-post, trailer ,and other equipment before leaving the body of water
- Drain water from boat, motor, bilge, ballast, wells, and portable bait containers before leaving the body of water

Motorized Watercraft

- Inspect and clean motor and engine, including the gimbal area; trailer, including axles, bunkers, and rollers; anchors; dock lines; and equipment before leaving the body of water
- Drain livewells, bait connectors, ballast and bilge tanks, and engine cooling systems

Jet Boats and Personal Watercraft (PWC)

- Inspect and clean hull, trailer, intake grate, and steering nozzle, etc.
- Clean hull, trailer, intake grate, and steering nozzle, etc. before leaving the water access
- Run engine 5-10 seconds to blow out excess water and vegetation from the internal drive before leaving the body of water

TRAILER & BOAT STORAGE

When your trailer will not be in use for several months, you can ensure it will continue to give you good performance by taking the following steps:

1. If at all possible, park your trailerable boat in a protected area, such as a garage, carport, etc.
2. If you must park the trailer outdoors, install a boat cover that is tight enough for adequate protection but not air-tight; if parking on grass or dirt, place boards beneath the tires.
3. Service or repack wheel bearings according to manufacturer's instructions.
4. For prolonged storage, jack up the trailer and place blocks under the trailer frame to take most of the weight off trailer springs and tires.
5. Loosen tie-downs and winch line but be sure the boat is resting properly on hull supports.
6. If the boat has a drain plug, remove it and elevate the trailer tongue slightly (just an inch or two) to allow water to drain out and keep the boat dry. Tie the plug to something obvious, so you will remember to replace the drain plug before you take your next trip!
7. While your boat is in storage, it is a good time to touch up rust spots, nicks, and chips on the trailer.
8. Lubricate moving parts – rollers, winch, wheel hubs, etc.
9. Tighten any loose nuts and bolts, including lug nuts on wheels according to manufacturer's specifications.

REPORTING SAFETY DEFECTS

If you experience issues with your trailer, please contact us: **customerservice@magictilt.com**

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

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

To contact NHTSA, you may call the Vehicle Safety Hotline toll-free at 800-327-4236 (TTY: 800-424-9153) or write to:
Administrator
NHTSA
1200 New Jersey Avenue S.E.
Washington D.C. 20590

You can also obtain more information about motor vehicle safety at SaferCar.gov

MAGICTILT