

OPERATOR & SAFETY MANUAL

Prospector & Trailtech
Product Information



Warranty Registration Card

Customer Name: _____

Dealer Name: _____

Address: _____

Town/City: _____

Town/City: _____

Province: _____

Province: _____

Trailer Model #: _____

Postal Code: _____

Serial Number: _____

Phone Number: _____

Date of Purchase: _____

Email: _____

I authorize Trailtech Inc. and its respective dealer _____ to give, receive and share and personal information provided on this Warranty Registration process regarding my purchase of a Trailtech trailer for purposes of providing information for company analysis, general mail outs or providing a reference to a prospective customer.

Signature of Purchaser: _____

Date: _____

CUSTOMER ACKNOWLEDGMENT

The Customer handbook describes important information about this Trailtech product and I understand that I should consult my Dealer representative regarding any questions no answered in this handbook.

I have received the handbook, and I understand that it is my responsibility (and I agree) to read and comply with all the information contained in the following:

- Owner's Information Form with the attachments
- Daily Safety Checklist
- Annual Trailer Maintenance list
- Recommended Torque Sequence
- Limited Warranty Certificate

Purchaser: _____

Date: _____

Serial Number: _____

Please Send Completed Warranty Card To:

**Trailtech Inc.
Box 988, Gravelbourg, Saskatchewan S0H 1X0**

Owner's Information

Date Purchased: _____

Model No: _____

Serial No: _____

Dealership Where Purchased: _____

*Please record this information, as it may be required when ordering parts.

Prospector One Year Limited Warranty

Trailtech Inc. (Trailtech) extends the following warranty to the original owner of its products including therein the Harvester, Sprayer and Transporter Series.

Within a period of one year (12 months) after the initial purchase, and when owned by the original purchaser, any Trailtech products, or part therefore, that upon inspection at Trailtech factory, is proved defective in material and workmanship, shall be repaired or replaced, at Trailtech's option, without charge to the owner. This warranty shall not apply with respect to any defect arising from a buyer's or users willful damage, negligence, abnormal working conditions, failure to follow Trailtech instruction (whether oral or in writing), misuse, or alteration or repair of the product without Trailtech's expressed written approval.

Trailtech does not warranty components not manufactured by Trailtech, such as but not limited to axles, suspensions, suspension parts, suspension hardware, brake linings, brake components, bearings, tires, wheels, center caps, lights, jacks, couplers, safety chains, breakaway kits or brake systems which are covered by their respective manufacturers warranties.

Within a period of One-year (12 month) warranty will apply to electrical wiring and paint. Warranty to paint does not include deterioration or damage from road elements, improper washing or use of solvents when washing, sand, salt, rocks or other weather conditions.

Normal wear on any items will not be subject to warranty. Normal wear items include, but are not limited to tires, bearings, brake linings, lights and hoses.

In all cases, Trailtech's liability is expressly limited to the repair or replacement of the defective parts, or defective product, or refund of the purchase price, at Trailtech's option. Trailtech shall have no liability for transportation, installation or removal costs. Trailtech products, or parts therefore cannot be returned without a Return Good Authorization number, which must be obtained by telephoning Trailtech at (306) 648-3158.

THE WARRANTIES SET FORTH HEREIN ARE EXCLUSIVE AND NO OTHER WARRANTIES, EXPRESSED, OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE MADE BY TRAILTECH OR ARE MADE AUTHORIZED TO BE MADE WITH RESPECT TO THE PRODUCT.

TRAILTECH'S SOLE OBLIGATION IN THE EVENT OF A DEFECTIVE PART OR PRODUCT SHALL BE TO REPAIR OR REPLACE, IN TRAILTECH'S SOLE DISCRETION, THE DEFECTIVE PRODUCT OR PART. IN NO EVENT SHALL TRAILTECH BE LIABLE FOR INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL LOSSES OR DAMAGES (INCLUDING BUT NOT LIMITED TO INTERRUPTION OR BUSINESS OR LOSS OF BUSINESS OR PROFIT) RESULTING FROM THE USE OR INABILITY TO USE THE PRODUCT, ANY BREACH OR WARRANTY OR DEFECT IN THE PRODUCT EVEN IF TRAILTECH SHALL HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH POTENTIAL LOSSES OR DAMAGES.

PROSPECTOR

 TRAILTECH

Operator And Safety Manual

WARNING

This User's Manual contains safety information and instructions for your trailer.

You must read this manual before loading or towing your trailer.

You must follow all safety precautions and instructions.

Table of Contents

1. SAFETY INFORMATION	1
1.1. SAFETY ALERT SYMBOLS AND SIGNAL WORDS.....	1
1.2. MAJOR HAZARDS.....	1
1.2.1. Driving Too Fast.....	1
1.2.2. Failure to Adjust Handling While Towing a Trailer.....	1
1.2.3. Trailer Not Properly Coupled to the Hitch.....	2
1.2.4. Incorrect Use of Safety Chains.....	2
1.2.5. Incorrect Use of Breakaway Brake.....	2
1.2.6. Mismatch of Trailer and Hitch.....	3
1.2.7. Unsafe Tires, Lug Nuts or Wheels.....	3
1.2.8. Overload.....	4
1.2.9. Unsafe Load Distribution.....	4
1.2.10. Shifting Cargo.....	4
1.2.11. Inoperable Brakes, Lights or Mirrors.....	5
1.2.12. Hazards From Modifying Your Trailer.....	5
1.3. TIRE SAFETY INFORMATION.....	6
1.3.1. Steps for Determining Correct Load Limit - Trailer.....	6
1.3.1.1. Trailers 10,000 Pounds GVWR or Less.....	6
1.3.1.2. Trailers Over 10,000 Pounds GVWR.....	6
1.3.2. Steps for Determining Correct Load Limit - Tow Vehicle.....	7
1.3.3. Glossery of Tire Terminology.....	7
1.3.4. Tire Safety - Everything Rides On It.....	9
1.3.4.1. Safety First - Basic Tire Maintenance.....	10
1.3.4.2. Finding Your Vehicle's Rec. Tire Pressure & Load Limits.....	10
1.3.4.3. Understanding Tire Pressure and Load Limits.....	10
1.3.4.4. Checking Tire Pressure.....	10
1.3.4.5. Checking Tire Pressure Steps.....	11
1.3.4.6. Tire Size.....	11
1.3.4.7. Tire Tread.....	11
1.3.4.8. Tire Balance and Wheel Alignment.....	11
1.3.4.9. Tire Repair.....	11
1.3.4.10. Tire Fundamentals.....	11
1.3.4.10.1. Information on Passenger Vehicle Tires.....	12
1.3.4.10.2. UTQGS Information.....	13
1.3.4.10.3. Additional Information on Light Truck Tires.....	13
1.3.4.11. Tire Safety Tips.....	13
2. COUPLING TO THE TOW VEHICLE	14
2.1. USE AN ADEQUATE TOW VEHICLE AND HITCH.....	14
2.1.1. Trailer Information.....	14
2.1.2. Trailer with Ball-Hitch Coupler.....	14
2.1.2.1. Before coupling the trailer to the tow vehicle.....	15
2.1.2.2. Prepare the coupler and hitch.....	15
2.1.2.3. Couple the trailer to the tow vehicle.....	16
2.1.2.4. Rig the safety chains.....	16
2.1.2.5. Attach and test electric breakaway brake system.....	16
2.1.2.6. Connect the electrical cables.....	17
2.1.3. Trailer with Gooseneck Coupler and Drop-leg Jack.....	17
2.1.3.1. Couple the trailer to the tow vehicle.....	18
2.1.3.2. Rig the safety chains.....	19
2.1.4. Trailer with Fifth-wheel Coupler and Drop-leg Jack.....	19
2.1.4.1. Before attempting to tow the trailer.....	19
3. LOADING THE TRAILER	21
3.1. Loading Cargo (Open Trailer).....	21
3.1.1. Preparing the Trailer for Loading.....	21
3.1.2. Loading a Rigid-deck Trailer.....	21
3.1.3. Loading a Pivoting-deck Trailer.....	22
4. CHECKING THE TRAILER BEFORE & DURING EACH TOW	23
4.1. PRE-TOW CHECKLIST.....	23
4.2. MAKE REGULAR STOPS.....	23
5. BREAKING-IN A NEW TRAILER	24
5.1. RETIGHTEN LUG NUTS AT FIRST 16, 40 & 80 KM.....	24
5.2. ADJUST BRAKE SHOES AT FIRST 320 KM.....	24
5.3. SYNCHRONIZING THE BRAKE SYSTEMS.....	24
5.4. GASOLINE-POWERED ELECTRIC GENERATORS.....	25
5.5. ACCESSORY BATTERY.....	25
5.6. SHORE POWER.....	25
5.7. LP GAS FUEL SYSTEM.....	26
5.7.1. LP Gas System Troubleshooting.....	27
5.8. VENDING & ACCESSORY DOORS.....	27
5.9. ELECTRIC-POWERED LANDING GEAR.....	27
6. INSPECTION SERVICE & MAINTENANCE	28
6.1. INSPECTION, SERVICE & MAINTENANCE SUMMARY CHARTS.....	28
6.2. INSPECTION AND SERVICE INSTRUCTIONS.....	30
6.2.1. Axle Bolts, Frame, Suspension, & Structure.....	30
6.2.1.1. Fasteners and Frame Members.....	30
6.2.1.2. Welds.....	30
6.2.2. Trailer Brakes.....	30
6.2.2.1. Brake Shoes and Drums.....	30
6.2.2.2. Manually Adjusting Brake Shoes.....	30
6.2.2.3. Brakes, Electric.....	31
6.2.2.4. Brakes, Hydraulic (vacuum, air or electric operated).....	31
6.2.3. Trailer Connection to Tow Vehicle.....	32
6.2.3.1. Coupler and Ball.....	32
6.2.3.2. Gooseneck.....	32
6.2.3.3. Fifth Wheel Kingpin.....	32
6.2.4. Landing Leg or Jack.....	32
6.2.5. Lights and Signals.....	32
6.2.6. Accessory Battery.....	33
6.2.7. Tires.....	33
6.2.8. Wheel Rims.....	33
6.2.9. Wheels, Bearings and Lug Nuts.....	33
6.2.9.1. Unsealed Bearings (Hubs).....	33
6.2.10. Lug Nuts (Bolts).....	33

Safety Information

1.1. SAFETY ALERT SYMBOLS & SIGNAL WORDS

Loss of control of the trailer or trailer/tow vehicle combination can result in death or serious injury. The most common causes for loss of control of the trailer are:

- Driving too fast for the conditions (maximum speed when towing a trailer is 100 kph.);
 - Overloading the trailer or loading the trailer unevenly;
 - Trailer improperly coupled to the hitch;
 - Inadequate tow vehicle or towing hitch;
- No braking on trailer;
- Not maintaining proper tire pressure;
- Not keeping lug nuts tight; and
- Not properly maintaining the trailer structure.

An owner's manual that provides general trailer information cannot cover all of the specific details necessary for the proper combination of every trailer, tow vehicle and hitch. Therefore, you must read, understand and follow the instructions given by the tow vehicle and trailer hitch manufacturers, as well as the instructions in this manual.

Trailer Components

Our trailers are built with components produced by various manufacturers. Some of these items have separate instruction manuals. Where this manual indicates that you should read another manual, and you do not have that manual, call Trailtech Inc. at (306) 648-3158 for a free copy.

The safety information in this manual is denoted by the safety alert symbol:

The level of risk is indicated by the following signal words.

DANGER

DANGER - Immediate hazards which WILL result in severe personal injury or death if the warning is ignored.

WARNING

WARNING - Hazards or unsafe practices which COULD result in severe personal injury or death if the warning is ignored.

CAUTION

CAUTION - Hazards or unsafe practices which could result in minor or moderate injury if the warning is ignored.

NOTICE

NOTICE - Practices that could result in damage to the trailer or other property.

1.2. MAJOR HAZARDS

1.2.1. Driving Too Fast

With ideal road conditions, the maximum speed when safely towing a trailer is 100 kph. If you drive too fast, the trailer tires will overheat and possibly blowout. As your speed increases, you are more likely to suddenly lose control. Never exceed 100 kph. while towing the trailer.

WARNING

Driving too fast for conditions can result in loss of control and cause death or serious injury.

Decrease your speed as road, weather and lighting conditions deteriorate.

1.2.2. Failure to Adjust Handling While Towing a Trailer

When towing a trailer, you will have decreased acceleration, increased stopping distance, and increased turning radius (which means you must make wider turns to keep from hitting curbs, vehicles, and anything else that is on the inside corner). In addition, you will need a longer distance to pass, due to slower acceleration and increased length.

- Be alert for slippery conditions. You are more likely to be affected by slippery road surfaces when driving a tow vehicle with a trailer, than driving a tow vehicle without a trailer.

- Anticipate the trailer "swaying." Swaying is the trailer reaction to the air pressure wave caused by passing trucks and busses. Continued pulling of the trailer provides a stabilizing force to correct swaying. Do not apply the brakes to correct trailer swaying.

- Check rearview mirrors frequently to observe the trailer and traffic.

- Use lower gear when driving down steep or long grades. Use the engine and transmission as a brake. Do not ride the brakes, as they can overheat and become ineffective.

- Be aware of your trailer height, especially when approaching roofed areas and around trees.

1.2.3. Trailer Not Properly Coupled to the Hitch

It is critical that the trailer be securely coupled to the hitch, and that the safety chains are correctly attached. Uncoupling may result in death or serious injury.

WARNING

Proper selection and condition of the coupler and hitch are essential to safely towing your trailer. A loss of coupling may result in death or serious injury.

- Be sure the hitch load rating is equal to or greater than the load rating of the coupler.
- Be sure the hitch size matches the coupler size.
- Observe the hitch for wear, corrosion and cracks before coupling. Replace worn, corroded or cracked hitch components before coupling the trailer to the tow vehicle.
- Be sure the hitch components are tight before coupling the trailer to the tow vehicle.

WARNING

An improperly coupled trailer can result in death or serious injury.

Do not move the trailer until:

- The coupler is secured and locked to hitch;
- The safety chains are secured to the tow vehicle; and
- The trailer jack(s) are fully retracted.

Do not tow the trailer on the road until;

- Tires and wheels are checked;
- The trailer brakes are checked;
- The breakaway switch is connected to the tow vehicle;
- The load is secured to the trailer; and
- The trailer lights are connected and checked.

1.2.4. Incorrect Use of Safety Chains

If your trailer comes loose from the hitch for any reason, we have provided safety chains so that control of the trailer can still be maintained.

WARNING

Improper rigging of the safety chains can result in loss of control of the trailer and tow vehicle, leading to death or serious injury, if the trailer uncouples from the tow vehicle.

- Fasten chains to frame of tow vehicle. Do not fasten chains to any part of the hitch unless the hitch has holes or loops specifically for that purpose.
- Cross chains underneath hitch and coupler with enough slack to permit turning and to hold tongue up, if the trailer comes loose.

1.2.5. Incorrect Use of Breakaway Brake

Your trailer may also be equipped with a breakaway brake system that can apply the brakes on your trailer, if your trailer comes loose from the hitch for any reason. You will have a separate set of instructions for the breakaway brake if your trailer is so equipped.

The safety chains and breakaway brake system must be in good condition and properly rigged to be effective.

WARNING

An ineffective or inoperative breakaway brake system can result in a runaway trailer, leading to death or serious injury if the coupler or hitch fails.

The breakaway cable must be connected to the tow vehicle, and NOT to any part of the hitch.

Before towing the trailer, test the function of the breakaway brake system. If the breakaway brake system is not working, do not tow the trailer. Have it serviced or repaired.

1.2.6. Mismatch of Trailer and Hitch

DANGER

Use of a hitch with a load rating less than the load rating of the trailer can result in loss of control and may lead to death or serious injury.

Use of a tow vehicle with a towing capacity less than the load rating of the trailer can result in loss of control, and may lead to death or serious injury.

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

1.2.7. Unsafe Tires, Lug Nuts or Wheels

Trailer tires and wheels are more likely to fail than car tires and wheels because they carry a heavier load. Therefore, it is essential to inspect the trailer tires before each tow.

If a tire has a bald spot, bulge, cuts, is showing any cords, or is cracked, replace the tire before towing. If a tire has uneven tread wear, take the trailer to a dealer service center for diagnosis. Uneven tread wear can be caused by tire imbalance, axle misalignment or incorrect inflation.

Tires with too little tread will not provide adequate tracking on wet roadways and can result in loss of control, leading to death or serious injury

Improper tire pressure causes an unstable trailer and can result in a tire blowout and loss of control. Therefore, before each tow you must also check the tire pressure. Tire pressure must be checked when tires are cold. Allow 3 hours cool-down after driving as much as 1 mile at 65 kph. before checking tire pressure.

NOTE: Trailer tires will be inflated to higher pressures than passenger vehicle tires.

WARNING

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

Be sure tires are inflated to pressure indicated on sidewall before towing trailer.

Since trailer wheels and lug nuts (or bolts) are subjected to greater side loads than automobile wheels, they are more prone to loosen. Before each tow, check to make sure they are tight.

WARNING

Metal creep between the wheel rim and lug nuts will cause rim to loosen and could result in a wheel coming off, leading to death or serious injury.

Tighten lug nuts before each tow.

The proper tightness (torque) for lug nuts is listed at page 27 in the "Inspection and Service Instructions" chapter of this manual. Use a torque wrench to tighten the lug nuts. If you do not have a torque wrench, use a lug wrench (from your tow vehicle) and tighten the nuts as much as you can. Then have a service garage or trailer dealer tighten the lug nuts to the proper torque.

Lug nuts are also prone to loosen after first being assembled. When driving a new trailer (or after wheels have been remounted), check to make sure they are tight after the first 16, 40 and 80 km of driving and before each tow thereafter.

Failure to perform this check can result in a wheel parting from the trailer and a crash, leading to death or serious injury.

WARNING

Lug nuts are prone to loosen after initial installation, which can lead to death or serious injury.

Check lug nuts for tightness on a new trailer or when wheel(s) have been remounted after the first 10, 25 and 50 miles of driving.

WARNING

Improper lug nut torque can cause a wheel parting from the trailer, leading to death or serious injury.

Be sure lug nuts are tight before each tow.

1.2.8. Overload

The total weight of the load you put in or on the trailer, plus the empty weight of the trailer itself, must not exceed the trailer's Gross Vehicle Weight Rating (GVWR). If you do not know the empty weight of the trailer, you must measure it at a commercial scale. In addition, you must distribute the load in the trailer such that the load on any tire or axle does not exceed the tire load rating or the Gross Axle Weight Rating (GAWR).

WARNING

An overloaded trailer can result in loss of control of the trailer, leading to death or serious injury.

Do not exceed the trailer Gross Vehicle Weight Rating (GVWR) or an axle Gross Axle Weight Rating (GAWR).

Do not load a trailer so that the weight on any tire exceeds its rating.

1.2.9. Unsafe Load Distribution

Uneven load distribution can cause tire, wheel, axle or structural failure. Be sure your trailer is properly loaded.

A proper weight distribution is equal, right to left; and creates a tongue weight that is in the proper range for stable trailer handling. For tandem and triple axle trailers, it is necessary to know or check that no axle is overloaded.

In the table below, the second column notes the rule of thumb percentage of total weight of the trailer plus its cargo (Gross Vehicle Weight, or "GVW") that should appear on the tongue of the trailer. For example, a trailer with a gooseneck hitch, with a loaded weight of 12,000 pounds, should have 20-25% of 12,000 pounds on the tongue. That is, the example trailer would have 2,400 to 3,000 pounds on its tongue.

Tongue Weight as a Percentage of Loaded Trailer Weight	
Type of Hitch	Percentage
Ball Hitch (Bumper Hitch)	10% - 15%
Gooseneck Hitch	20% - 25%
Fifth Wheel Hitch	

WARNING

Improper tongue weight (load distribution) can result in loss of control of the trailer, leading to death or serious injury.

Make certain that tongue weight is within the allowable range.

Be sure to:

- Distribute the load front-to-rear to provide proper tongue weight (see chart);
- Distribute the load evenly, right and left, to avoid tire overload; and
- Keep the center of gravity low.

Towing stability also depends on keeping the center of gravity as low as possible. Load heavy items on the floor, and over the axles, but do not exceed the axle load rating (GAWR). When loading additional items, be sure to maintain even side-to-side weight distribution and proper tongue weight.

1.2.10. Shifting Cargo

Since the trailer "ride" can be bumpy and rough, you must secure your cargo so that it does not shift while the trailer is being towed.

WARNING

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

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

Your trailer may be designed for specific cargo, for example, only for horses. If your trailer is designed for specific cargo, only carry that cargo in the trailer. A utility trailer must not be used to carry certain items, such as people, containers of hazardous substances or containers of flammable substances.

WARNING

Do not transport people inside the trailer, even if it has living quarters. The transport of people puts their lives at risk and may be illegal.

WARNING

Do not transport flammable, explosive, poisonous or other dangerous materials in your trailer.

Exceptions:

- Fuel in the tanks of vehicles that are being towed
- Fuel stored in proper containers used in trailer living quarters for cooking
- Fuel stored in the tank of an on-board generator

1.2.11. Inoperable Brakes, Lights or Mirrors

Be sure that the electric brakes and all of the lights on your trailer are functioning properly before towing your trailer. Electric brakes and lights on a trailer are controlled via a connection to the tow vehicle, generally a multi-pin electrical connector. Check the trailer tail lights by turning on your tow vehicle headlights. Check the trailer brake lights by having someone step on the tow vehicle brake pedal while you look at trailer lights. Do the same thing to check the turn signal lights.

If your trailer has electric brakes, your tow vehicle will have an electric brake controller that sends power to the trailer brakes. Before towing the trailer on the road, you must operate the brake controller while trying to pull the trailer in order to confirm that the electric brakes operate. While towing the trailer at less than 8 kph., manually operate the electric brake controller in the tow vehicle cab. You should feel the operation of the trailer brakes.

WARNING

Improper electrical connection between the tow vehicle and the trailer will result in inoperable lights and electric brakes, and can lead to collision.

Before each tow:

- Check that the taillights, brake lights and turn signals work
- Check that the electric brakes work by operating the brake controller inside the tow vehicle

Standard mirrors usually do not provide adequate visibility for viewing traffic to the sides and rear a towed trailer. You must provide mirrors that allow you to safely observe approaching traffic.

1.2.12. Hazards From Modifying Your Trailer

Essential safety items can be damaged by altering your trailer. Even simply driving a nail or screw to hang something can damage an electrical circuit, LP gas line or other feature of the trailer.

Before making any alteration to your trailer, contact your dealer or Trailtech Inc. at (306) 648-3158 and describe the alteration you are contemplating. Alteration of the trailer structure or modification of mechanical, electrical, plumbing, heating or other systems on your trailer must be performed only by qualified technicians who are familiar with the system as installed on your trailer.

1.3. Tire Safety Information

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

Section 1.3.1 contains "Steps for Determining Correct Load Limit - Trailer".

Section 1.3.2 contains "Steps for Determining Correct Load Limit – Tow Vehicle".

Section 1.3.3 contains a Glossary of Tire Terminology, including "cold inflation pressure", "maximum inflation pressure", "recommended inflation pressure", and other non-technical terms.

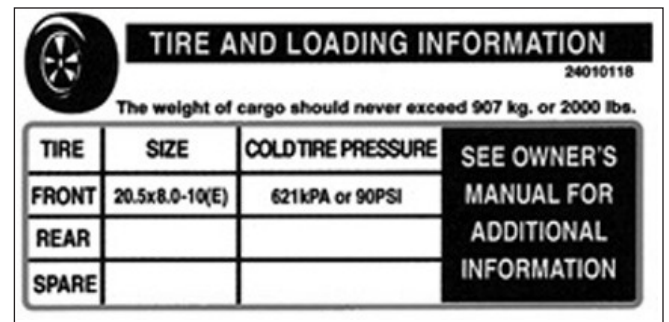
Section 1.3.4 contains information from the NHTSA brochure entitled "Tire Safety – Everything Rides On It".

This brochure 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.

1.3.1. Steps for Determining Correct Load Limit – Trailer

1.3.1.1. Trailers 10,000 Pounds GVWR or Less



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.

1.3.1.2. 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.

1.3.2. Steps for Determining Correct Load Limit – Tow Vehicle

1. Locate the statement, "The combined weight of occupants and cargo should never exceed XXX lbs.," on your 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.

1.3.3. 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.

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.

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.

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.

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.

1.3.4. 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:

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.

1.3.4.1. 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.

1.3.4.2. 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.

1.3.4.3. 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.

1.3.4.4. 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.

1.3.4.5. Checking 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.

1.3.4.6. 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.

1.3.4.7. 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.

1.3.4.8. 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.

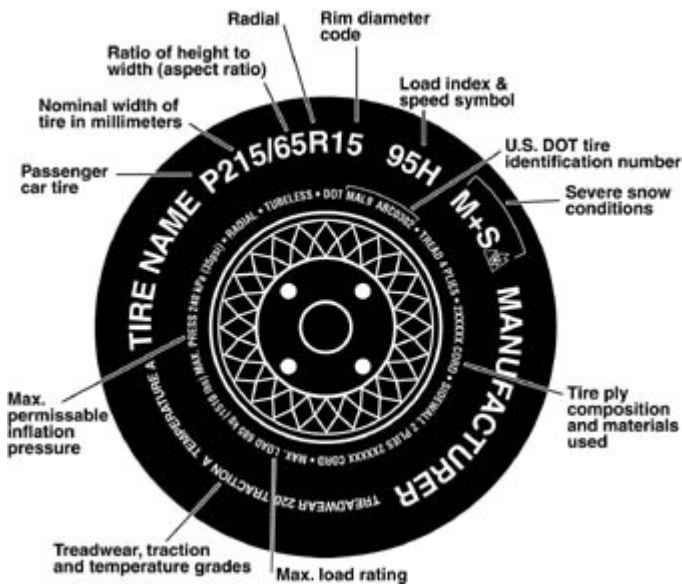
1.3.4.9. Tire Repair

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.

1.3.4.10. Tire Fundamentals

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.

1.3.4.10.1. Information on Passenger Vehicle Tires



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. For those with a maximum speed capability over 186 mph, tire manufacturers always 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.

1.3.4.10.2. 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

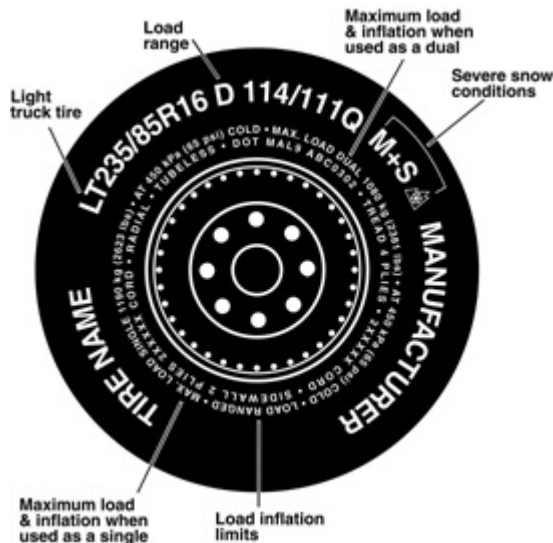
This letter indicates a tire's ability to stop on wet pavement. A higher graded tire should allow you to stop your car on wet roads in a shorter distance than a tire with a lower grade. Traction is graded from highest to lowest as "AA", "A", "B", and "C".

Temperature Letter

This letter indicates a tire's resistance to heat. The temperature grade is for a tire that is inflated properly and not 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".

1.3.4.10.3. 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.

1.3.4.11. 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.

2. Coupling To The Tow Vehicle

Follow all of the safety precautions and instructions in this manual to ensure safety of persons, cargo, and satisfactory life of the trailer.

2.1. USE AN ADEQUATE TOW VEHICLE & HITCH

If the vehicle or hitch is not properly selected and matched to the Gross Vehicle Weight Rating (GVWR) of your trailer, you can cause an accident that could lead to death or serious injury. If you already have a tow vehicle, know your vehicle tow rating and make certain the trailer's rated capacity is less than or equal to the tow vehicle's rated towing capacity. If you already have (or plan to buy) a trailer, make certain that the tow rating of the tow vehicle is equal to or greater than that of the trailer.

DANGER

Use of a hitch with a load rating less than the load rating of the trailer can result in loss of control and may lead to death or serious injury.

Use of a tow vehicle with a towing capacity less than the load rating of the trailer can result in loss of control, and may lead to death or serious injury.

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

2.1.1. Trailer Information

The trailer VIN tag contains the following critical safety information for the use of your trailer.

GAWR: The maximum gross weight that an axle can support. It is the lowest of axle, wheel, or tire rating. Usually, the tire or wheel rating is lower than the axle rating, and determines GAWR.

GVWR: The maximum allowable gross weight of the trailer and its contents. The gross weight of the trailer includes the weight of the trailer and all of the items within it (such as cargo, water, food and other supplies). GVWR is sometimes referred to as GTWR (Gross Trailer Weight Rating), or MGTW (Maximum Gross Trailer Weight). GVWR, GTWR and MGTW are all the same rating.

The sum total of the GAWR for all trailer axles may be

less than the GVWR for the trailer, because some of the trailer load is to be carried by the tow vehicle, rather than by the trailer axle(s). The total weight of the cargo and trailer must not exceed the GVWR, and the load on an axle must not exceed its GAWR.

PSIC: The tire pressure (Pounds per Square Inch) measured when Cold.

VIN: The Vehicle Identification Number.

EMPTY WEIGHT: Some information that comes with the trailer (such as the Manufacturer's Statement of Origin) is not a reliable source for "empty" or "net" weight. The shipping documents list average or standard weights and your trailer may be equipped with options. To determine the "empty" or "net" weight of your trailer, weigh it on an axle scale. To find the weight of the trailer using an axle scale, you must know the axle weights of your tow vehicle **without** the trailer coupled. Some of the trailer weight will be transferred from the trailer to the tow vehicle axles, and an axle scale weighs all axles, including the tow vehicle axles.

When equipping a new vehicle or an older vehicle to tow your trailer, ask the vehicle dealer for advice on how to outfit the towing vehicle. Discuss the following information and equipment with the vehicle dealer.

2.1.2. Trailer with Ball-Hitch Coupler

A ball hitch coupler connects to a ball that is located on or under the rear bumper of tow vehicle. This system of coupling a trailer to a tow vehicle is sometimes referred to as "bumper pull."

We have utilized a Ball Hitch coupler that is suitable for the size and weight of the trailer. The load rating of the coupler and the necessary ball size are listed on the trailer tongue. You must provide a hitch and ball for your tow vehicle, where the load rating of the hitch and ball is equal to or greater than that of your trailer. Also, the ball size must be the same as the coupler size. If the hitch ball is too small, too large, is underrated, is loose or is worn, the trailer can come loose from the tow vehicle, and may cause death or serious injury.

THE TOW VEHICLE, HITCH AND BALL MUST HAVE A RATED TOWING CAPACITY EQUAL TO OR GREATER THAN THE TRAILER Gross Vehicle Weight Rating (GVWR).

IT IS ESSENTIAL THAT THE HITCH BALL BE OF THE SAME SIZE AS THE COUPLER.

The ball size and load rating (capacity) are marked on the ball; hitch capacity is marked on the hitch.

2.1.2.1. Before coupling the trailer to the tow vehicle

Be sure the size and rating of hitch ball match the size and rating of the coupler. Hitch balls and couplers are marked with their size and rating.

WARNING

Coupler-to-hitch mismatch can result in uncoupling, leading to death or serious injury.

Be sure the **LOAD RATING** of the hitch ball is equal or greater than the load rating of the coupler.

Be sure the **SIZE** of the hitch ball matches the size of the coupler.

- Wipe the hitch ball clean and inspect it visually and by feel for flat spots, cracks and pits.

WARNING

A worn, cracked or corroded hitch ball can fail while towing, and may result in death or serious injury.

Before coupling trailer, inspect the hitch ball for wear, corrosion and cracks.

Replace worn or damaged hitch ball.

- Rock the ball to make sure it is tight to the hitch, and visually check that the hitch ball nut is solid against the lock washer and hitch frame.

- Wipe the inside and outside of the coupler clean and inspect it visually for cracks and deformations; feel the inside of the coupler for worn spots and pits.

- Be sure the coupler is tight to the tongue of the trailer. All coupler fasteners must be visibly solid against the trailer frame.

WARNING

A loose hitchball nut can result in uncoupling, leading to death or serious injury.

Be sure the hitch ball is tight to the hitch before coupling the trailer.

- Raise the bottom surface of the coupler to be above the top of the hitch ball. Use the jack if one is provided; otherwise, use wood or concrete blocks to support the trailer tongue.

2.1.2.2. Prepare the coupler and hitch

- Lubricate the hitch ball and the inside of the coupler with a thin layer of automotive bearing grease. If your trailer is equipped with a jack, raise the coupler above the ball height.

- Open the coupler locking mechanism. Ball couplers have a locking mechanism with an internal moving piece and an outside handle.

- In the open position, the coupler is able to drop fully onto the hitch ball.

- See the coupler instructions for details of placing the coupler in the "open" position.

2.1.2.3. Couple the trailer to the tow vehicle

- If you have a jack, lower the trailer until the coupler fully engages the hitch ball. If the coupler does not line up with the hitch ball, adjust the position of the tow vehicle.
- Engage the coupler locking mechanism. In the engaged position, the locking mechanism securely holds the coupler to the hitch ball.
- Insert a pin or lock through the hole in the locking mechanism.
- Be sure the coupler is all the way on the hitch ball and the locking mechanism is engaged. A properly engaged locking mechanism will allow the coupler to raise the rear of the tow vehicle. Using the trailer jack, test to see that you can raise the rear of the tow vehicle by 1 inch, after the coupler is locked to the hitch

If the coupler cannot be secured to the hitch ball, do not tow the trailer. Call Trailtech Inc. at (306) 648-3158 or your dealer for assistance.

2.1.2.4. Rig the safety chains

- Visually inspect the safety chains and hooks for wear or damage. Replace worn or damaged safety chains and hooks before towing.
- Rig the safety chains so that they:
 - cross underneath the coupler;
 - loop around a frame member of the tow vehicle or to holes provided in the hitch system (but, do not attach them to an interchangeable part of the hitch assembly); and
 - have enough slack to permit tight turns, but not be close to the road surface, so if the trailer uncouples, the safety chains can hold the tongue up above the road.

2.1.2.5. Attach and test electric breakaway brake system

If the coupler or hitch fails, a properly connected and working breakaway brake system will apply electric brakes on the trailer. The safety chains will keep the tow vehicle attached and as the brakes are applied at

the trailer's axles, the trailer/tow vehicle combination will come to a controlled stop.

The breakaway brake system includes a battery, a switch with a pullpin, and a breakaway brake controller. Read and follow the instructions here as well as the instructions that have been prepared by the breakaway brake controller manufacturer. If you do not have these instructions, call Trailtech Inc. at (306) 648-3158 for a free copy.

The breakaway brake system may be fitted with a charging facility that draws power from the tow vehicle. If the electrical system on your tow vehicle

WARNING

Improper rigging of the safety chains can result in loss of control of the trailer and tow vehicle, leading to death or serious injury, if the trailer uncouples from the tow vehicle.

- Fasten chains to frame of tow vehicle. Do not fasten chains to any part of the hitch unless the hitch has holes or loops specifically for that purpose.
- Cross chains underneath hitch and coupler with enough slack to permit turning and to hold tongue up, if the trailer comes loose.

does not provide power to the breakaway brake battery, you must periodically charge the battery to keep the breakaway brake system in working order.

- Connect the pullpin cable to the tow vehicle so that the pullpin will be pulled out before all of the slack in the safety chains is taken up (see Breakaway Brake System figure). Do not connect the pullpin cable to a safety chain or to the hitch ball or hitch ball assembly. This would keep the breakaway brake system from operating when it is needed.

- Remove the pullpin from the switch and test tow the trailer, at less than 5 m.p.h. You should feel the trailer resisting being towed, but the wheels will not necessarily be locked. If the brakes do not function, do not tow the trailer until brakes are repaired.

- Immediately replace the pullpin. The breakaway brake system battery discharges rapidly when the pullpin is removed.

WARNING

An ineffective breakaway brake system can result in a runaway trailer, leading to death or serious injury if the coupler or ball hitch fails.

Connect the breakaway cable to the tow vehicle; and NOT to the hitch, ball or support.

Before towing the trailer, test the function of the breakaway brake system. If the breakaway brake system is not working, do not tow the trailer. Have it serviced or repaired.

Do **not** tow the trailer with the breakaway brake system ON because the brakes will overheat which can result in permanent brake failure.

WARNING

Failure to replace the pullpin will prevent brakes from working, leading to loss of control, serious injury or death.

If you do not use your trailer for three or more months, or during winter months:

- Store the battery indoors; and
- Charge the battery every three months.

Replace the breakaway brake battery according to the battery at intervals specified by manufacturer.

2.1.2.6. Connect the electrical cables

Connect the trailer lights to the tow vehicle's electrical system using the electrical connectors.

- Check all lights for proper operation.
 - Clearance and Running Lights (Turn on tow vehicle headlights).
 - Brake Lights (Step on tow vehicle brake pedal).
 - Turn Signals (Operate tow vehicle directional signal lever).
 - Backup Lights (Put tow vehicle gear shift into reverse).
- Check electric brakes for proper operation

If your trailer has electric brakes, your tow vehicle will have an electric brake controller that sends

power to the trailer brakes. Before towing the trailer on the road, you must operate the brake controller while trying to pull the trailer in order to confirm that the electric brakes operate. While towing the trailer at less than 8 kph., manually operate the electric brake controller in the tow vehicle cab. You should feel the operation of the trailer brakes.

WARNING

Improper electrical connection between the tow vehicle and the trailer will result in inoperable lights and electric brakes, and can lead to collision.

Before each tow:

- Check that the taillights, brake lights and turn signals work
- Check that the electric brakes work by operating the brake controller inside the tow vehicle

Follow these steps to uncouple your ball hitch trailer from the tow vehicle:

- Block trailer tires to prevent the trailer from rolling, before jacking the trailer up.
- Disconnect the electrical connector.
- Disconnect the breakaway brake switch cable. Promptly replace the pullpin in the switchbox.
- Disconnect the safety chains from the tow vehicle.
- Unlock the coupler and open it.
- Before extending jack, make certain the ground surface below the jack pad will support the tongue load.
- Rotate the jack handle (or crank) clockwise. This will slowly extend the jack and transfer the weight of the trailer tongue to the jack.

2.1.3. Trailer with Gooseneck Coupler and Drop-leg Jack

A gooseneck coupler on the trailer connects to a gooseneck ball that you must have installed in the bed of the tow vehicle. This system of coupling a trailer to a tow vehicle permits the tow vehicle to turn to sharper angles than are permitted by a bumper hitch system.

A gooseneck coupler consists of a tube in an inverted "U" shape and a gooseneck ball receiver.

We have utilized a Gooseneck ball receiver that is suitable for the size and weight of the trailer. The load rating of the coupler and the necessary ball size are listed on the gooseneck.

You must provide a gooseneck ball and support structure that is marked with a rating that meets or exceeds the GVW Rating of your trailer and matches the size of the gooseneck ball receiver. If the gooseneck ball is too small, is underrated, is loose or is worn, the trailer can come loose from the tow vehicle, and may lead to death or serious injury.

THE TOW VEHICLE, SUPPORT STRUCTURE AND GOOSENECK BALL MUST HAVE A RATED TOWING CAPACITY EQUAL TO OR GREATER THAN THE TRAILER Gross Vehicle Weight Rating (GVWR).

IT IS ESSENTIAL THAT THE GOOSENECK BALL BE OF THE SAME SIZE AS THE GOOSENECK BALL RECEIVER.

The gooseneck ball size and load rating (capacity) are marked on the ball; hitch capacity is marked on the hitch.

WARNING

A worn, cracked or corroded gooseneck ball can fail while towing, and may result in death or serious injury.

Before coupling the trailer, inspect the gooseneck ball for wear, corrosion and cracks; and replace worn or damaged gooseneck ball.

WARNING

Coupler-to-hitch mismatch can result in uncoupling, leading to death or serious injury.

Be sure the **LOAD RATING** of the hitch ball is equal or greater than the load rating of the coupler.

Be sure the **SIZE** of the hitch ball matches the size of the coupler.

The height of the ball receiver on the trailer must be adjusted to match the height of the gooseneck ball on your tow vehicle, so that:

- There is clearance between the bottom of the trailer and the sides of the tow vehicle bed; and
- The trailer is level and allows equal weight distribution on tandem axles.

WARNING

Improper gooseneck height adjustment can result in overloaded tires, blowout and loss of control, leading to death or serious injury.

Adjust the gooseneck receiver so that the loaded trailer is level.

WARNING

A loose gooseneck ball can result in uncoupling, leading to death or serious injury.

Be sure the gooseneck ball nut is tight before coupling the trailer.

WARNING

If the trailer drops during coupling, death or serious injury may result.

There must be no one under the trailer or coupler before or during the coupling operation.

2.1.3.1. Couple the Trailer to the Tow Vehicle

- Rotate the jack handle counter-clockwise. This will retract the jack causing the gooseneck ball receiver to drop down so it can fully engage the gooseneck ball and transfer the weight of the trailer tongue to the towing vehicle hitch. If the receiver does not line up with the ball, raise the receiver again and adjust the position of the tow vehicle. Then lower the receiver over the ball. When the drop leg base is no longer resting on the ground, the towing vehicle hitch is holding all of the weight of the trailer tongue.

- Close the lock plate on the gooseneck ball receiver.
- Move the spring-loaded lock plate locking pin to the CLOSED position. Be sure the locking pin is holding the lock plate.
- Be sure the receiver is all the way on the gooseneck ball and the lock plate is engaged. A properly engaged locking mechanism will allow the coupler to raise the rear of the tow vehicle. Using the trailer jack, test to see that you can raise the rear of the tow vehicle by 1 inch.

If the gooseneck ball cannot be secured to the receiver, do not tow the trailer. Call Trailtech Inc. at (306) 648-3158 or your dealer for assistance.

2.1.3.2. Rig the Safety Chains

Visually inspect the safety chains and hooks for wear or damage. Replace worn or damaged safety chains and hooks before towing.

- Rig the safety chains so that they attach to the "safety chain receivers" on the hitch. If you are not certain of the hitch provisions for receiving safety chains, contact the hitch manufacturer or installer. Do NOT attach the safety chains to the gooseneck ball or its support; and
- Rig the safety chains so they have sufficient slack to permit turning, but not too much slack - the safety chains must keep the gooseneck on the tow vehicle bed if the trailer uncouples.

WARNING

Improper rigging of the safety chains can result in loss of control of the trailer and tow vehicle, leading to death or serious injury, if the trailer uncouples from the tow vehicle.

- Fasten chains to safety chain receivers on the hitch, not to ball.
- Have sufficient slack to permit turning and to keep gooseneck on bed of trailer, if the trailer comes loose.

2.1.4. Trailer with Fifth-wheel Coupler and Drop-leg Jack

A fifth wheel coupler on the trailer (see "Trailer with Fifth Wheel Coupler" and "Fifth Wheel Coupler" figures) connects to a kingpin that you must have installed in the bed of the tow vehicle. This system of coupling a trailer to a tow vehicle has a greater tongue weight capacity than a ball hitch or gooseneck coupling.

A fifth wheel coupler includes a flat load-bearing plate with a slot, and a mechanism inside the slot that "grips" the kingpin.

We have utilized a fifth wheel coupler that is suitable for the size and weight of the trailer. You must provide a kingpin and kingpin plate that match the fifth wheel, and that is rated for the Gross Vehicle Weight Rating (GVWR) of your trailer.

2.1.4.1. Before attempting to tow the trailer

- Be sure the size and rating of the fifth wheel and kingpin match.
- Wipe the kingpin clean and inspect it visually and by feel for flat spots, cracks and pits. Check the condition of the kingpin mounting in the bed of the tow vehicle.

WARNING

A worn, bent, cracked or corroded kingpin can fail while towing, and may result in death or serious injury.

Before coupling the trailer, inspect the kingpin and kingpin plate for wear, bending, cracks or corrosion; and replace worn or damaged kingpin.

- Be sure the fifth wheel mechanism operates freely.
- Lubricate the fifth wheel plate surface with a light coat of Lithium-base, waterproof grease.
- Be sure the fifth wheel and kingpin fasteners are tight and any welds are solid.

WARNING

A loose fifth wheel or kingpin can result in uncoupling, leading to death or serious injury.

Be sure the fifth wheel and kingpin are tight before coupling the trailer.

WARNING

If the trailer drops during coupling, death or serious injury may result.

There must be no one under the trailer or coupler before or during the coupling operation.

- Adjust the height of the trailer, using the jack, so that the fifth wheel plate just touches the kingpin plate.

- Slowly back up the tow vehicle, keeping the kingpin centered in the slot of the fifth wheel. Continue backing up until the fifth wheel locks firmly on the kingpin.

- Visually check to confirm that the fifth wheel locks are properly locked onto the kingpin by performing the three checks illustrated in the "Fifth Wheel Coupler Operation" figure.

- Attempt to pull forward as an initial test of the closing of the fifth wheel locks.

Figure 2-1 Fifth Wheel Coupler Operation

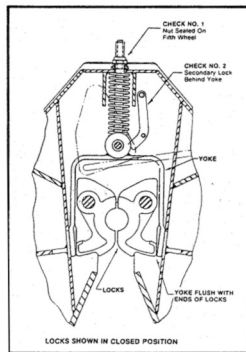


FIGURE 6A

- CHECK 1**
The adjustment nut must be seated against the fifth wheel (see Figure 6A).
- CHECK 2**
The secondary lock must be behind the yoke (see Figure 6A).
- CHECK 3**
The fifth wheel must be flush with the kingpin plate (see Figure 7A).

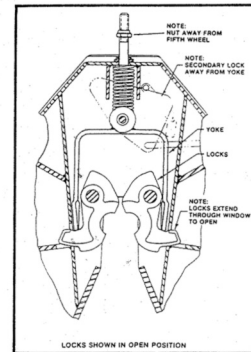


FIGURE 6B

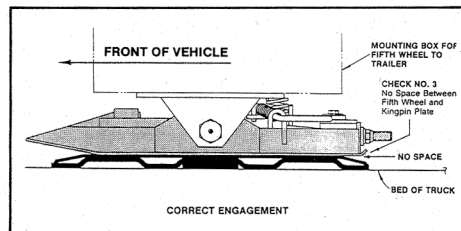


FIGURE 7A

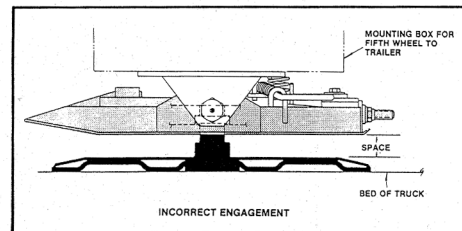


FIGURE 7B

3. Loading The Trailer

3.1. Loading Cargo (Open Trailer)

Couple the trailer to the tow vehicle before loading. This is essential for the bumper pull trailer because the tongue of a bumper pull trailer can rise during loading, before the cargo is properly distributed. To measure the tongue weight, you will have to uncouple the trailer after it is loaded.

Do not transport people, containers of hazardous substances, cans or containers of flammable substances, such as gasoline, kerosene, paint, etc. However, fuel in the tank of an off-road vehicle, or a car or motorcycle, etc. may be carried on your open trailer.

WARNING

Do not transport flammable, explosive, poisonous or other dangerous materials in your trailer.

Exceptions:

- Fuel in the tanks of vehicles that are being towed
- Fuel stored in proper containers used in trailer living quarters for cooking
- Fuel stored in the tank of an on-board generator

3.1.1. Preparing the Trailer for Loading

Before loading cargo onto the trailer:

- Inspect the deck of the trailer for corrosion or damage; and
- Inspect the hold down openings and/or "D"-rings. Hold down openings must be sturdy with no visible cracks or kinks. D-rings must be tight to the deck and must not be bent.

If the deck or any required hold-down is damaged, do not load the cargo. Bring the trailer to your dealer or a competent repair service before using it to carry cargo.

WARNING

Damaged or loose "D"-rings can break, allowing cargo to become loose inside the trailer. Loose cargo can shift the center of gravity, and result in loss of control of the trailer.

Inspect "D"-rings, and test them for looseness before loading cargo.

Do not use a damaged or loose "D"-ring to secure cargo.

3.1.2. Loading a Rigid-deck Trailer

Open trailers have either a rigid-deck or a pivoting deck, depending on the exact model. This subsection describes loading a rigid-deck trailer.

Before loading a rigid-deck trailer, couple the trailer to the tow vehicle and make sure the rigid-deck is level. Do not load or unload the trailer when the deck is not level.

Make sure the top of the ramp (or ramps) is secure to the trailer, and the bottom is resting on firm ground. Pockets may be provided to hold the ramp to the frame of the trailer.

WARNING

Load can suddenly move or topple, which can result in death or serious injury.

Do not load or unload your open trailer unless it is prevented from tipping and is on firm and level ground.

Load the cargo onto the trailer. Secure the cargo to the trailer using appropriate straps, chains and tensioning devices. Since the trailer "ride" can be bumpy and rough, you must secure your cargo so that it does not shift while the trailer is being towed.

WARNING

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

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

Return the ramp(s) to their stowed position(s), and secure them so that they will not move during transit.

3.1.3. Loading a Pivoting-deck Trailer

Some open trailers are equipped with a pivoting-deck instead of with ramps. The pivoting feature allows for easier loading and unloading.

The pivoting-deck trailer is fitted with a catch that keeps the trailer in the driving position. After the trailer is loaded and the cargo is secured with hold downs, be sure the spring-loaded catch has locked the trailer into "driving position."

Couple the trailer securely to the tow vehicle before attempting to unlock the deck and load the trailer. Unlock the deck and pivot it to the Loading position. Before loading the cargo, be certain the deck catch pin is retracted.

WARNING

Loading a pivoting-deck trailer before retracting the deck catch pin can crack the catch pin, which can cause loss of cargo or loss of control of the trailer. Death or serious injury may result.

Before loading the trailer, retract the deck catch pin.

If the deck catch pin becomes bent, do not straighten it. Replace the deck catch pin before towing the load.

Load the cargo onto the trailer. As the cargo is moved forward on the deck, the deck will pivot down into the driving position.

Extend the deck catch pin into the deck to lock the deck into the driving position. Ensure that the catch engages the hole in the pivoting deck.

WARNING

An unlocked pivoting deck can result in loss of cargo or loss of control of the trailer, which can result in death or serious injury.

Before towing the trailer:

- Lock the pivoting deck in the driving position.
- Double-check that the catch engages the hole in the pivoting deck.

Secure the cargo onto the trailer using appropriate straps and tensioning devices.

Since the trailer "ride" can be bumpy and rough, you must secure your cargo so that it does not shift while the trailer is being towed.

WARNING

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

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

4. Checking The Trailer Before & During Each Tow

4.1. PRE-TOW CHECKLIST

Before towing, double-check all of these items:

- Tires, wheels and lug nuts (see the "Major Hazards" section starting on page 1 of this manual)
- Coupler secured and locked section starting on page 7 of this manual) Safety chains properly rigged to tow vehicle, not to hitch or ball" chapter starting at Page 6 of this manual)
- Test of lights: Tail, Stop, Turn and Backup
- Safety breakaway switch cable fastened to tow vehicle, not to safety chains" chapter starting at Page 6 of this manual)
- Cargo properly loaded, balanced and tied down (see the "Loading the Trailer" chapter starting at page 13 of this manual)

- Tongue weight
- Doors and gates latched and secured
- Fire extinguisher
- Flares and reflectors

4.2. MAKE REGULAR STOPS

After each 80 km, or one hour of towing, stop and check the following items:

- Coupler secured
- Safety chains are fastened and not dragging
- Cargo secured
- Cargo door latched and secured

5. Breaking-In A New Trailer

5.1. RETIGHTEN LUG NUTS AT FIRST 16, 40 & 80 KM

Wheel lugs can shift and settle quickly after being first assembled, and must be checked after the first 16, 40 and 80 km of driving. Failure to perform this check may result in a wheel coming loose from the trailer, causing a crash leading to death or serious injury.

WARNING

Lug nuts are prone to loosen after initial installation, which can lead to death or serious injury.

Check lug nuts for tightness on a new trailer or when wheel(s) have been remounted after the first 10, 25 and 50 miles of driving.

5.2. ADJUST BRAKE SHOES AT FIRST 320 KM

Brake shoes and drums experience a rapid initial wear. The brakes must be adjusted after the first 320 km of use, and each 4,800 km thereafter. Some axles are fitted with a mechanism that will automatically adjust the brake shoes when the trailer is "hard braked" from a forward direction. Read your axle and brake manual to see if your brakes adjust automatically. If you do not have the axle and brake manual, call Trailtech Inc. at (306) 648-3158 for a free copy.

A hard stop is used to:

- confirm that the brakes work;
- confirm that the trailer brakes are properly synchronized with the tow vehicle brakes; and for many braking systems,
- automatically adjust the brake shoes.

If your trailer is not fitted with automatically adjusting brakes, the brakes will need to be manually adjusted. See section 6.2.2.2, "Manually Adjusting Brake Shoes," for instructions.

5.3. SYNCHRONIZING THE BRAKE SYSTEMS

Trailer brakes are designed to work in synchronization with the brakes on the tow vehicle. Do not use either brake system alone to stop the combined tow vehicle and trailer.

When the tow vehicle and trailer braking systems are synchronized, both braking systems contribute to slowing, and the tongue of the trailer will neither dive nor rise sharply.

WARNING

If trailer and tow vehicle brakes do not work properly together, death or serious injury can occur.

Road test the brakes in a safe area at no more than 30 m.p.h. before each tow

To insure safe brake performance and synchronization, read and follow the axle/brake and the brake controller manufacturers' instructions. If you do not have these instructions, call Trailtech Inc. at (306) 648-3158 for a free copy.

This chapter provides some basic information for the safe operation of several accessories. For many accessories, such as generators and LP appliances, the manufacturer of the accessory has also provided instructions. You must read and follow these instructions before using the accessory. If you are uncertain whether you have all of the instructions, call Trailtech Inc. at (306) 648-3158 before operating the accessory. The following accessories are described in this section:

- Gasoline (or LP) and Diesel Generators
- Accessory Battery
- "Shore Power" connections which provide power by "plugging the trailer in" to an external source of electrical power
- LP Gas Fuel System
- Vending or Accessory Doors
- Electric-powered Landing Gear

Many accessories introduce the risk of fire. If you have an accessory on your trailer, make sure you have a fire extinguisher charged and ready before operating the accessory. Check the fire extinguisher at least once a month. If the fire extinguisher is discharged even partially, it must be recharged. Follow the fire extinguisher manufacturer's instructions for recharging the extinguisher after use.

5.4. GASOLINE-POWERED ELECTRIC GENERATORS

If your trailer is equipped with a generator, you must have and follow the generator manufacturer's instructions. Carbon monoxide gas is present in the exhaust of all gasoline and diesel engines, as well as from other burning fuels such as LP gas and charcoal.

Carbon Monoxide is an odorless gas that can cause death. Be certain exhaust from any running engine or burning fuels can not accumulate in areas where people or animals are likely to be present. Conditions that can redirect exhaust fumes are, for example:

- Being drawn in by fans or ventilators operated in a trailer;
 - Prevailing wind;
 - Being trapped between adjacent trailers, vehicles or buildings; or
 - Being trapped between or in a snow bank or other materials that can redirect fumes.
- You must have an operating carbon monoxide detector inside the accommodation spaces of your trailer.

WARNING

Operating gasoline and diesel generators can lead to death or serious injury by:

- Carbon Monoxide
- Fire and Explosion
- Electrocutation

Have a working carbon monoxide detector in the accommodation spaces before operating a generator.

Do not refuel a running generator or refuel near ignition sources.

Before starting the generator, check fuels and oil levels. The generator may have to run for two or three minutes before it allows drawing electricity

from it. Read the generator instruction manual. If you do not have the generator instruction manual, call Trailtech Inc. at (306) 648-3158 for a free copy.

Never exceed the capacity of the generator.

Before turning off the generator, remove the electrical load and let the engine to run for two or three minutes to cool the generator.

5.5. ACCESSORY BATTERY

Your trailer may be outfitted with an accessory battery that operates lighting, electric landing gear, slide-outs or other accessories. An accessory battery may be kept charged either by the tow vehicle or by the generator or shore power.

A disconnect switch may be provided to disconnect the accessory battery when you do not plan to be using the trailer for an extended period, such as seasonal storage. If there is no disconnect switch, then remove the cables from the battery terminals.

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

5.6. SHORE POWER

Shore power is the delivery of electrical power from another source to a power inlet on your trailer. To connect your trailer to this source, you must have a "shore power" cord, specifically designed for this use. **DO NOT USE AN ORDINARY EXTENSION CORD.** The trailer end of this cord is connected to an electrical box on the trailer, sometimes referred to as a "motor base." This box contains circuit breakers and/or fuses and may include a power converter to change the shore power (usually 110 volts alternating current) into 12 volts direct current.

Do not assume that a shore power supply is correctly wired. Shore power may have incorrect polarity or not have the safety ground. Before connecting your trailer, test shore power by using a polarity and ground tester, which can be purchased at electronic stores.

If you have shore power, your trailer may be fitted with Ground-Fault Interrupting outlets (GFI). If you have GFI protection, you must periodically test the outlets by pressing the "TEST" button that is located on the GFI-equipped outlet.

WARNING

Shore power poses a risk of death due to electrocution or fire

- Always use an electrical cord specifically designed for shore power connection. Never use an ordinary extension cord.
- Always connect the electrical cord to a grounded source of shore power.
- Do not remove the "third prong" from the shore power plug.
- Connect only to source of proper voltage.
- Make certain polarity is correct.
- Do not overload electrical circuits.
- Always replace fuses or circuit breakers with correct rating.

Many accessories introduce the risk of fire. If you have an accessory on your trailer, make sure you have a fire extinguisher charged and ready before operating the accessory. Check the fire extinguisher at least once a month. If the fire extinguisher is discharged even partially, it must be recharged. Follow the fire extinguisher manufacturer's instructions for recharging the extinguisher after use.

5.7. LP GAS FUEL SYSTEM

LP gas systems are installed to operate a variety of appliances, such as stoves, refrigerators, heating units and electrical generators. The exhaust fumes from burning LP gas contain carbon monoxide. Carbon monoxide gas is odorless and can cause death or serious brain injury if inhaled. The exhaust from LP appliances must be directed to the outdoors. You must have an operating carbon monoxide detector in the accommodation space of your trailer.

DANGER

You can die or be brain damaged by Carbon Monoxide.

Make certain the exhaust from LP appliances is directed to the outdoors.

Have a working carbon monoxide detector in the accommodation spaces of your trailer before operating any LP gas appliance.

Do not operate portable grills or stoves inside the trailer.

When used for the first time, or after a period of storage, the LP gas lines will be full of air and must be purged of air, before the appliances will stay lit. Have the LP gas lines purged by your trailer dealer, or an LP gas dealer.

An LP gas system is designed to operate with a supply of LP gas only, NOT natural gas. A natural gas supply is unsafe for the system's pressure regulation devices.

WARNING

Risk of death due to fire or explosion.

Only connect an LP gas system to a supply of LP gas, NOT natural gas.

Do not store LP gas tanks inside the trailer.

Only fill an LP gas tank 80% full.

Only fill the tank with LP gas (butane or propane).

Overfilled tanks can release gas and cause an explosion.

Keep the shutoff valve on your LP gas tank closed at all times, except when you are operating an LP gas appliance. Before opening the LP shutoff valve, turn off all LP gas appliances. If an appliance is on when you open the shutoff valve, LP gas will accumulate in the trailer, which can result in an explosion.

Do not use a wrench to open or close the shutoff valve. If the shutoff does not completely stop the flow of LP gas when it is hand-tightened, replace the shutoff valve.

LP gas leaks can result in fire or explosion. If your trailer is equipped with an LP gas system, it must also be equipped with an LP gas detector. The LP gas detector will be located near the floor to detect the heavier-than-air LP gas. If a leak is suspected, use a soapy water solution to search for the leak. Do not use a solution that contains ammonia or chlorine (common in window and other household cleaning compounds), because those chemicals will cause LP piping corrosion.

WARNING

Risk of fire or explosion

If LP gas is detected (by smell or by the LP gas detector):

- Do not touch electrical switches
- Extinguish flames and pilot lights
- Open doors for ventilation
- Shut off LP gas supply at the LP tank
- Leave the area until odor clears

Correct the source of LP gas leakage before using LP appliances.

Do not use a flame to locate the source of an LP gas leak.

LP gas is either propane or butane that is compressed into liquid form. LP gas must be completely vaporized before being burned. Butane gas will not operate if the outside temperature is below 32 degrees Fahrenheit.

NOTICE

Use Butane only when the temperature is above freezing (32 degrees F).

Propane gas will operate at temperatures as low as minus 44 degrees Fahrenheit (-44 F).

Keep the regulator for the LP gas system (located near the LP gas tank) covered with a guard to protect it from road debris.

LP gas is prohibited on some roadways, bridges and tunnels. Check a map and with Departments of Transportation (or with the AAA) for travel routes that do not have such restrictions.

5.7.1. LP Gas System Troubleshooting

- Having liquid "gas" at your appliance is an indication that the LP gas tank is overfilled, or that the temperature is too cold.
- If your LP gas appliances do not stay lit, it might be because your LP gas system is contaminated with air or moisture. Many LP gas vendors have facilities to purge the air from an LP gas system.
- If your LP gas system is not providing gas, even when the shutoff valve is open, it might be because the LP gas regulator has frozen water in it.

WARNING

Risk of fire or explosion

Never use a flame, heat lamp or hair dryer to thaw an LP gas regulator. Use an incandescent light bulb.

Do not remove the regulator cover or attempt to service the LP gas regulator.

5.8. VENDING & ACCESSORY DOORS

A vending or accessory door opens vertically and has a hinge along its top edge. These heavy doors are equipped with spring-assisted lifting, usually with a device known as a "gas spring." The gas spring lifting device is not designed to hold a vending door up. You must use the provided solid "prop rods" to hold a vending door in the open position.

WARNING

Gas springs lose their lifting capability with age and cold weather; and can cause the door to fall, resulting in injury.

Always hold the door open until the prop rods are in place.

Always use prop rods to hold vending or accessory doors open.

Be prepared to hold the weight of the door when removing the prop rod.

5.9. ELECTRIC-POWERED LANDING GEAR

The landing gear (also known as the jack) on your trailer may be powered with an electric motor. The landing gear is operated up or down using controls located near the landing gear.

If the motor does not operate, such as when the battery is fully discharged, the landing gear can be operated manually with a socket wrench.

6. Inspection Service & Maintenance

6.1. INSPECTION, SERVICE & MAINTENANCE SUMMARY CHARTS

You must inspect, maintain and service your trailer regularly to insure safe and reliable operation. If you cannot or are unsure how to perform the items listed here, have your dealer do them. Note: In addition to this manual, also check the relevant component manufacturer's manual.

Inspection and Service before Each Use		
Item	Inspection / Service	Manual Section Reference
Breakaway Brakes • Electric • Hydraulic	Check operation Check fluid level	Sections 2.1.2.5 Section 6.2.2.4
Breakaway Battery	Fully charged, connections clean	Sections 2.1.2.5 Section 6.2.2.3.A.(i)
Brakes, all types	Check operation	Section 5.3
Shoes and Drums	Adjust	Section 5.2 6.2.2.2
Brakes, Hydraulic - Vacuum Actuated	Check gauge for proper vacuum of 18 In. Hg. (inches of mercury)	Section 6.2.2.4.A
Coupler and Hitch Ball	Check locking device & replace.	Section 6.2.3.1
Gooseneck Ball	Check locking device & replace when worn.	Section 6.2.3.2
Fifth Wheel & Kingpin	Check for cracks, Grease. Check locking device & replace when worn.	Section 2.1.4.1 Section 2.1.4.1 Section 2.1.4.1 & 6.2.3.3
Safety Chain(s) & Hooks	Check for wear and damage	Sections 2.1.2.4 & 2.1.3.2
Tires	Check tire pressure when cold. Inflate as needed.	Sections 1.1 & 6.2.7
Wheels - Lug Nuts (Bolts) & Hub	Check for tightnessTighten. For new and remounted wheels, check torque after first 10, 25 & 50 km of driving and after any impact.	Section 1.1 Sections 1.1 & 6.2.10

Inspection and Service Every 6 Months or 9,000 km

Item	Inspection / Service	Manual Section Reference
Tires	Rotate @ 8,000 km	Section 5.2 6.2.2.2
Brakes, electric <ul style="list-style-type: none"> • Magnets • Controller (in tow vehicle) 	Check wear and current draw Check power output (amperage) and modulation	Section 6.2.2.3.C Section 6.2.2.3.B See Controller Mfr's Manual
Tires	Inspect tread and sidewalls thoroughly.	Section 6.2.7
	Replace tire when treads are worn, when sidewall has a bulge, or sidewall is worn	Section 6.2.7

Inspection and Service Each Year or 18,000 km

Item	Inspection / Service	Manual Section Reference
Brakes, all types <ul style="list-style-type: none"> • Shoes and drums 	Check for scoring and wear. Replace per manufacturer's specifications	Section 6.2.2.1 See Brake Mfr's Manual
Jack, Drop-leg	Grease gears at top	See Jack Mfr's Manual
Structure <ul style="list-style-type: none"> • Frame members 	Inspect all frame members, bolts & rivets. Repair or replace damaged, worn or broken parts.	Section 6.2.1
<ul style="list-style-type: none"> • Welds 	Inspect all welds. Repair as needed	Section 6.2.1.2
Wheels <ul style="list-style-type: none"> • Sealed Bearings (Hubs) 	Check and confirm free running. Replace if not (sealed bearings are not serviceable)	Section 6.2.9
<ul style="list-style-type: none"> • UNSEALED Bearings (Hubs) 	Disassemble / inspect / assemble and repack. Replace promptly if immersed in water.	Section 6.2.9.1 See Axle Mfr's Manual
<ul style="list-style-type: none"> • Rims 	Inspect for cracks & dents. Replace as needed.	Section 6.2.8
Structure <ul style="list-style-type: none"> • Axle Attachment Bolts 	Check BY DEALER	Section 6.2.1

6.2. INSPECTION AND SERVICE INSTRUCTIONS

6.2.1. Axle Bolts, Frame, Suspension, & Structure

WARNING

Worn or broken suspension parts can cause loss of control and injury may result.

Have trailer professionally inspected annually and after any impact.

To perform many of the inspection and maintenance activities, you must jack up the trailer. "Jacking Points for All Trailers" figure indicates the general areas where jacks and jack stands may be applied.

When jacking and using jack stands, place them so as to clear wiring, brake lines, and suspension parts (springs, torsion bars, etc.). Place jacks and jack stands inside of the perimeter strip on the supporting structure to which the axles are attached.

6.2.1.1. Fasteners and Frame Members

Inspect all of the fasteners and structural frame members for bending and other damage, cracks, or failure. Repair or replace any damaged fastener and repair the frame member. If you have any questions about the condition or method of repair of fasteners or frame members, get the recommendation of, or have the repair done by, your dealer.

WARNING

Broken or damaged fasteners or welds can cause injury or damage to trailer and contents.

Inspect for, and repair all damaged parts at least once a year.

6.2.1.2. Welds

All welds can crack or fail when subjected to heavy loads or movement of cargo that was not properly tied to prevent movement. Any time that you know or suspect that the trailer has been subjected to heavy loads or movement of cargo, immediately inspect the welds and fasteners for damage. To prevent severe damage to your trailer, inspect all of the welds for cracks or failure at least once a year.

WARNING

Improper weld repair will lead to early failure of the trailer structure and can cause serious injury or death.

Do not repair cracked or broken welds unless you have the skills and equipment to make a proper repair. If not, have the welds repaired by your dealer.

6.2.2. Trailer Brakes

6.2.2.1. Brake Shoes and Drums

Properly functioning brake shoes and drums are essential to ensure safety. You must have your dealer inspect these components at least once per year, or each 19,200 km.

The brake shoes must be adjusted after the first 320 km of use, and each 4,800 km thereafter. Most axles are fitted with a brake mechanism that will adjust the brakes during a hard stop. Read your axle and brake manual to see how to adjust your brakes. If you do not have this manual, call Trailtech Inc. at (306) 648-3158 for a free copy.

6.2.2.2. Manually Adjusting Brake Shoes

Some braking systems are not automatically adjusted by hard stopping. These brakes require manual adjustment. The following steps apply to adjust most manually adjustable brakes. Read your axle and brake manual to see how to adjust your brakes. If you do not have this manual, call Trailtech Inc. at (306) 648-3158 for a free copy.

Jack up the trailer and secure it on adequate capacity jack stands. Be sure the wheel and brake drum rotate freely. Remove the adjusting-hole cover from the adjusting slot on the bottom of the brake backing plate. With a screwdriver or standard adjusting tool, rotate the starwheel of the adjuster assembly to expand the brake shoes. Adjust the brake shoes out until the pressure of the linings against the drum makes the wheel very difficult to turn.

Note: Your trailer maybe equipped with drop spindle axles. See axle manual for your axle type. You will need a modified adjusting tool for adjusting the brakes in these axles. With drop spindle axles, a modified adjusting tool with about an 80 degree angle should be used. Rotate the starwheel in the opposite direction until the wheel turns freely with a slight drag. Replace the adjusting-hole cover. Repeat the above procedure on all brakes. Lower the trailer to the ground.

6.2.2.3. Brakes, Electric

Two different types of electric brakes may be present on the trailer: an emergency electric breakaway system, which acts only if the trailer comes loose from the hitch and the breakaway pin is pulled. The other brake is an electric braking system that acts whenever the brakes of the tow vehicle are applied.

6.2.2.3.A. BREAKAWAY BRAKE

6.2.2.3.A.(i) BREAKAWAY BATTERY

This battery supplies the power to operate the trailer brakes if the trailer uncouples from the tow vehicle. Be sure to check, maintain and replace the battery according to the battery manufacturer' instructions.

6.2.2.3.A.(ii) BREAKAWAY SWITCH

This switch causes the breakaway battery to operate the electric brakes if the trailer uncouples from the tow vehicle.

The pull cable for the pull pin is connected to the tow vehicle, and the switch is connected to the trailer. To check for proper functioning of the switch, battery and brakes, you must pull the pin from the switch and confirm that the brakes apply to each wheel. You can do this by trying to pull the trailer with the tow vehicle, after pulling the pin. The trailer brakes may not lock, but you will notice that a greater force is needed to pull the trailer.

WARNING

If electric breakaway brakes do not operate when trailer is uncoupled from the tow vehicle, death or serious injury can occur.

Check emergency breakaway brake system BEFORE each tow.

6.2.2.3.B. TOW VEHICLE OPERATED ELECTRIC BRAKES

The electric brakes that operate in conjunction with the tow vehicle brakes must be "synchronized" so that braking is properly distributed to the tow vehicle brakes and the trailer brakes. For proper operation and synchronization, read and follow the axle/brake and the brake controller manufacturers' instructions. If you do not have these instructions, call Trailtech Inc. at (306) 648-3158 for a free copy.

6.2.2.3.C. MAGNETS FOR ALL ELECTRIC BRAKES

To make certain an electrically-operated braking system will function properly, you must have your dealer inspect the magnets at least once a year, or each 19,200 km. See the brake manual for wear and current inspection instructions.

6.2.2.4. Brakes, Hydraulic (vacuum, air or electric operated)

If your trailer has hydraulically-operated brakes, they function the same way the hydraulic brakes do on your tow vehicle. The hydraulic braking system must be inspected by a dealer, at least as often as the brakes on the tow vehicle, but no less than once per year. This inspection includes an assessment of the condition and proper operation of the wheel cylinders, brake shoes, brake drums and hubs.

You must check the fluid level in the master cylinder reservoir at least every three months. If you tow your trailer an average of 1,600 km per month in a hot and dry environment, you must check the brake fluid level once a month. The brake fluid reservoir is located on the tongue of the trailer or near the gooseneck. Fill with DOT 4 brake fluid.

6.2.2.4.A. VACUUM-OPERATED HYDRAULIC

When towing a trailer, the vacuum gauge, which is located inside the cab of the tow vehicle, must indicate 18 In. Hg. (inches of mercury) or more at all times.

WARNING

If the vacuum gauge in tow vehicle is not at or above 18 In. Hg. (inches of mercury), damage to the brake system will result and the brakes may become inoperable.

6.2.2.4.B. AIR PRESSURE-OPERATED HYDRAULIC

Air/hydraulic braking systems are typically used when the tow vehicle has a diesel engine. The tow vehicle has an air compressor that routes the air to an air/hydraulic mechanism, which sends brake fluid to the wheel cylinders.

The air pressure gauge in your tow vehicle indicates the current air pressure. See your tow vehicle manual for the proper air pressure.

6.2.2.4.C. ELECTRICAL-OPERATED HYDRAULIC

Electric/hydraulic braking systems, which are mounted on the trailer, use a small electrically-driven pump to generate hydraulic pressure, which operates the brake cylinders. Like electrical brakes, an electric/hydraulic braking system is operated by an electrical signal from the tow vehicle.

6.2.3. Trailer Connection to Tow Vehicle

6.2.3.1. Coupler and Ball

The coupler on the trailer connects to the ball attached to the hitch on the tow vehicle. The coupler, ball and hitch transfer the towing forces between the tow vehicle and the trailer. Before each tow, coat the ball with a thin layer of automotive bearing grease to reduce wear and ensure proper operation; and check the locking device that secures the coupler to the ball for proper operation.

See the coupler manufacturer's manual for other inspection and maintenance activities. If you do not have this manual, call Trailtech Inc. at (306) 648-3158 for a free copy.

If you see or feel evidence of wear, such as flat spots, deformations, pitting or corrosion, on the ball or coupler, immediately have your dealer inspect them to determine the proper action to prevent possible failure of the ball and coupler system. All bent or broken coupler parts must be replaced before towing the trailer.

The coupler handle lever must be able to rotate freely and automatically snap into the latched position. Oil the pivot points, sliding surfaces, and spring ends with SAE 30W motor oil. Keep the ball pocket and latch mechanism clean. Dirt or contamination can prevent proper operation of the latching mechanism.

When replacing a ball, the load rating must match or exceed the GVWR of the trailer.

6.2.3.2. Gooseneck

The gooseneck receiver on the trailer connects to a hitch-mounted ball on the towing vehicle. The receiver, ball and hitch transfer the towing forces between the tow vehicle and the trailer. Before each tow, coat the ball with a thin layer of automotive bearing grease to reduce wear and ensure proper operation; and check the locking device that secures the receiver to the ball for proper operation.

See the gooseneck ball receiver manufacturer's manual for other inspection and maintenance activities. If you do not have a manual for the receiver, call Trailtech Inc. at (306) 648-3158 for a free copy.

If you see or can feel evidence of wear, such as flat spots, pitting or corrosion, on the ball or receiver, immediately have your dealer inspect them to determine the proper action to prevent possible failure of the ball and receiver system.

When replacing a ball, the load rating must match or exceed the GVWR of the trailer.

6.2.3.3. Fifth Wheel Kingpin

Before each tow, inspect the fifth wheel and kingpin for wear, and coat the contact surface of the fifth wheel plate with water-resistant Lithium-base grease. If you see evidence of wear on the fifth wheel or kingpin, immediately have your dealer inspect them to determine the proper action to prevent failure of the fifth wheel and kingpin system.

See the manual prepared by the manufacturer of the fifth wheel and kingpin for other inspection and maintenance activities. If you do not have this manual, call Trailtech Inc. at (306) 648-3158 for a free copy.

6.2.4. Landing Leg or Jack

If a grease fitting is present, you must use a grease gun to lubricate the jack mechanism. Grease the gears in the top of hand-cranked jacks once a year, by removing the top of the jack and pumping or hand packing grease into the gears.

6.2.5. Lights and Signals

Before each tow, check the trailer taillights, stoplights, turn signals and any clearance lights for proper operation.

WARNING

Improper operating taillights, stoplights and turn signals can cause collisions.

Check all lights before each tow.

6.2.6. Accessory Battery

Your trailer may be outfitted with an accessory battery that operates lighting, electric landing gear, slide-outs or other accessories. An accessory battery may be kept charged either by the tow vehicle or by the generator or shore power. See the manual for the accessory battery.

A disconnect switch may be provided to disconnect the accessory battery when you do not plan to be using the trailer for an extended period, such as seasonal storage. If there is no disconnect switch, then remove the cables from the battery terminals.

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

6.2.7. Tires

Before each tow, be sure the tire pressure is at the value indicated on the sidewall. Tire pressure must be checked while the tire is cold. Do not check the tire pressure immediately after towing the trailer. Allow at least three hours for a tire to cool, if the trailer has been towed for as much as one mile. Replace the tire before towing the trailer if the tire treads have less than 1/16 inch depth or the telltale bands are visible.

A bubble, cut or bulge in a side wall can result in a tire blowout. Inspect both side walls of each tire for any bubble, cut or bulge; and replace a damaged tire before towing the trailer.

WARNING

Worn, damaged or under-inflated tires can cause loss of control, resulting in damage, serious injury and possibly death.

Inspect tires before each tow.

6.2.8. Wheel Rims

If the trailer has been struck, or impacted, on or near the wheels, or if the trailer has struck a curb, inspect the rims for damage (i.e. being out of round); and replace any damaged wheel. Inspect the wheels for damage every year, even if no obvious impact has occurred.

6.2.9. Wheels, Bearings and Lug Nuts

A loose, worn or damaged wheel bearing is the most common cause of brakes that grab.

To check your bearings, jack trailer and check wheels for side-to-side looseness. If the wheels are loose, or spin with a wobble, the bearings must be serviced or replaced.

Most trailer axles are built with sealed bearings that are not serviceable. Sealed bearings must be replaced as complete units.

6.2.9.1. Unsealed Bearings (Hubs)

If your trailer has unsealed axle bearings, they must be inspected and lubricated once a year or 19,200 km to insure safe operation of your trailer.

If a trailer wheel bearing is immersed in water, it must be replaced.

If your trailer has not been used for an extended amount of time, have the bearings inspected and packed more frequently, at least every six months and prior to use.

6.2.10. Lug Nuts (Bolts)

Lug nuts are prone to loosen right after a wheel is mounted to a hub. When driving on a remounted wheel, check to see if the lug nuts are tight after the first 16, 40 and 80 km of driving and before each tow thereafter.

WARNING

Lug nuts are prone to loosen after initial installation, which can lead to death or serious injury.

Check lug nuts for tightness on a new trailer or when wheel(s) have been remounted after the first 10, 25 and 50 miles of driving..

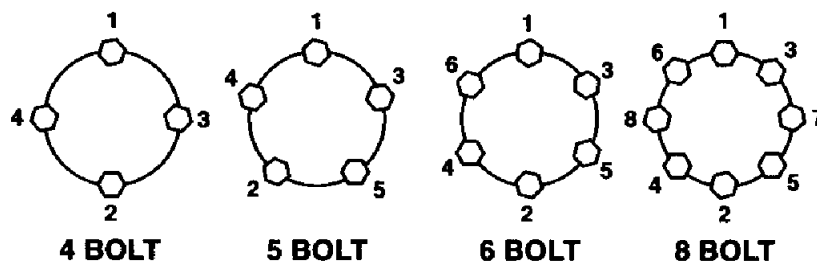
WARNING

Metal creep between the wheel rim and lug nuts will cause rim to loosen and could result in a wheel coming off, leading to death or serious injury.

Tighten lug nuts before each tow.

Tighten the lug nuts to the proper torque for the axle size on your trailer, to prevent wheels from coming loose. Use a torque wrench to tighten the fasteners. If you do not have a torque wrench, tighten the fasteners with a lug wrench as much as you can, then have a service garage or dealer tighten the lug nuts to the proper torque. Over-tightening will result in breaking the studs or permanently deforming the mounting stud holes in the wheels.

Figure 6-1 Lug Nut Sequence of Tightening



Lug Nut Torque - Steel Wheels

Axle Rating Pounds	Stud Size	Torque Foot-Pounds
3,500 to 7,000	1/2 inch	80 to 95
8,000	9/16 inch	120 to 140
9,000	5/8 inch	175 to 225
10,000	5/8 inch flanged	275 to 325
12,000	3/4 inch flanged	375 to 425

Lug Nut Torque - Aluminum Wheels

Rim Size	Stud Size	Torque Foot-Pounds
15 inch (5 or 6 hole)	1/2 inch	65 to 75
16 inch (8 hole)	1/2 inch	65 to 75

Dedicated To Excellence



Box 988, Gravelbourg, SK
Canada S0H 1X0

Phone: (306) 648-3158
Fax: (306) 648-3305

www.trailtech.com