ATC

OWNER'S MANUAL

Dear ATC Customer,

Thank you for your purchase of an ATC Trailer. Accompanying this manual, you will have received information regarding your specific trailer's limited warranty policy. Our limited warranty policy provides excellent coverage.

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At ATC Trailers, we want our customers to be able to enjoy their new trailer to the fullest. In the pages that follow you will learn about safety information, towing and loading requirements before each trip and the maintenance responsibilities for the trailer.

Your trailer has been inspected by our manufacturing teams and another inspection by the dealership has also been performed. We recognize that sometimes things can go wrong on the road, therefore, please allow your dealership to assist you in correcting any warrantable issues. If you should need to contact our Nappanee, Indiana Parts, Service and Warranty teams, please call 1-877-441-2440. We wish you many satisfying years with your ATC Trailer.

Best Regards,

ATC Trailers
Customer Service Dept. Team

The following Owner's Manual will help you become better acquainted with your new ATC trailer and the safe operation of the trailer in conjunction with your tow vehicle.

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

- Read the entire manual and heed all caution and warning information, prior to operation of your trailer.

- The Owner should review the manufacturer's limited warranty and the limited warranty of all other component manufacturers.

If you have any questions regarding your new ATC trailer, please contact your dealer or ATC at 877-441-2440. Again, thank you for purchasing an ATC trailer.

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1. SAFETY INFORMATION

1.1 SAFETY ALERT SYMBOLS AND SIGNAL WORDS

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

- Driving too fast for the conditions
- Overloading the trailer or loading the trailer unevenly.
- Trailer improperly coupled to the hitch.
- Inadequate tow vehicle or towing hitch.
- No braking on the trailer.
- Not maintaining proper tire pressure.
- Not keeping lug nuts tight
- Not properly maintaining 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 the instructions in this manual.

Trailer Components

ATC 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 ATC at 877-441-2440, for a free copy.

Safety alert boxes denote the safety information in this manual.

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

DANGER

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

WARNING

WARNING – Hazards or unsafe practices, which COULD result in serious 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 60mph. If you drive too fast, the trailer tires will overheat and possibly blow out. As your speed increases, you are more likely to suddenly lose control. Never exceed 60mph while towing a trailer.

WARNING

Driving too fast for conditions can result in serious 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 roads 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 when around trees.

1.2.3 Trailer Not Properly Coupled to 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 the hitch.

The safety chains are secured to the tow vehicle

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 in the trailer

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 the chains to the frame of the tow vehicle. Do not fasten chains to any part of the hitch unless the hitch has holes or loops specifically designed for that purpose.

Cross the chains underneath the hitch and coupler with enough slack to permit turning and to hold the 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 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 or stopping 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 40mph 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 the rim to loosen and could result in the wheel coming off, leading to death or serious injury.

Tighten lug nuts before each tow.

The proper tightness (torque) for lug nuts is listed on page 66 of this manual. Use a torque wrench to tighten the lugnuts. 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.

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 the wheel(s) have been remounted after the first 50 miles and every 50 miles thereafter during the first 200 miles of travel.

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 load a trailer so that the weight on any tire exceeds its rating.

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

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.

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	20-25%

WARNING

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

Make certain that the 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.

Keep the center of gravity low.

Towing stability also depends on keeping the center of gravity as low as possible. Load the 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.

If the door latch is equipped with a catch that has a hole for a linchpin, use a linchpin to prevent the door latch from opening.

WARNING

If the door opens, your cargo may be ejected onto the road, resulting in death or serious injury to other drivers.

Always secure the door latch after closing. Place a linchpin or lock in the catch.

1.2.11 Inappropriate Cargo

Your trailer may be designed for specific cargo, for example motorcycles. If your trailer is designed for specific cargo, only carry that cargo in the trailer. Many models are not rated to transport automobiles (ie. a motorcycle ramp door or trailer frame cannot support the weight of an automobile). 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.

1.2.12 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 taillights 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 the 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 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 5mph, 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 of a towed trailer. You must provide mirrors that allow you to safely observe approaching traffic.

1.2.13 Hazards From Modifying Your Trailer

Altering your trailer can damage essential safety items. 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 ATC at 877-441-2440 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.

1.2.14 Hazards From Accessories

This chapter of the manual contains some information about certain optional accessories that may be on your trailer. Read and follow all of these instructions before operating the accessories. The major hazards from some of these accessories are:

1.2.14.1 *Generator*

If your trailer is equipped with a gasoline, LP or diesel generator, you must have and follow the generator manufacturer's instructions. You must also have one or more carbon monoxide detectors in the trailer's living quarters accommodation spaces.

Carbon Monoxide is an odorless gas that can cause death. Be certain exhaust from a running generator does not accumulate in or around your trailer, by situations such as:

- Being drawn in by fans or ventilators operated in a trailer.
- Prevailing wind
- Being trapped between your trailer and other trailers, vehicles or buildings
- Being trapped between your trailer and, or in a snow bank or other nearby objects

WARNING

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

Carbon Monoxide

Fire and Explosion

Electrocution

Not having a working carbon monoxide detector in the living quarters accommodation spaces before operating a generator.

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

1.2.14.2 *Shore Power*

"Shore Power" is the name given to connecting your trailer to a source of electrical power using an extension cord specifically designed for that purpose.

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 the correct rating.

1.2.14.3 *LP Gas Fuel System*

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 living quarters accommodations spaces of your trailer before operating any LP gas appliance.

Do not operate portable grills or stoves inside the trailer.

WARNING

Risk of death due to fire or explosion.

Do not store LP tanks inside the trailer.

Only fill a propane tank 80% full.

Only fill the tanks with liquefied petroleum gas. Never attempt to connect natural gas to this system.

Overfilled tanks can release gas and cause an explosion.

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.

Leave the area until the 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.

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.

1.2.15 Reporting Safety Defects

If you believe that your trailer has a defect that could a crash or could cause injury or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA) in addition to notifying ATC at 877-441-2440.

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

To contact NHTSA, you may either call the Vehicle Safety Hotline toll-free at 1-888-327-4236 (TTY: 1-800-424-9153), go to http://www.safercar.gov or write to:

Administrator
NHTSA
1200 New Jersey Avenue S.E.
Washington, DC 20590

You can also obtain other information about motor vehicle safety from http://www.nhtsa.gov/.

1.2.16 Trailer Towing Guide

Driving a vehicle with a trailer in tow is vastly different from driving the same vehicle without a trailer in tow. Acceleration, maneuverability and braking are all diminished with a trailer in tow. It takes longer to get up to speed; you need more room to turn and pass, and more distance to stop when towing a trailer. You will need to spend time adjusting to the different feel and maneuverability of the tow vehicle with a loaded trailer. Because of the significant differences in all aspects of maneuverability when towing a trailer, the hazards and risks of injury are also much greater then when driving without a trailer. You are responsible for keeping your vehicle and trailer in control, and for all the damage that is caused if you lose control of your vehicle and trailer.

As you did when learning to drive an automobile, find and open area with little or no traffic for your first practice trailering. Of course, before you start towing the trailer, you must follow all of the instructions for inspection, testing, loading and coupling. Also,

before you start towing, adjust the mirrors so you can see the trailer as well as the area to the rear of it.

Drive slowly at first, 5mph or so, and turn the wheel to the feel of how the tow vehicle and trailer combination responds. Next make some right and left hand turns. Watch in your side mirrors to see how the trailer follows the tow vehicle. Turning with a trailer attached requires more room.

Stop the tow vehicle and trailer a few times from speeds no greater than 10mph. If your trailer is equipped with brakes, try using different combinations of trailer/electric brake and tow vehicle brake. Note the effect that the trailer brakes have when they are the only brakes used. When properly adjusted, the trailer brakes will come on just before the tow vehicle brakes.

It will take practice to learn how to back up a tow vehicle with a trailer attached. Take it slow. Before backing up, get out of the vehicle and look behind the trailer to make sure that there are no obstacles. Some drivers place their hands at the bottom of the steering wheel, and while the tow vehicle is in reverse, "think" of the hands as being on top of the wheel. When the hands move to the right (counter-clockwise, as you would do to turn the two vehicle to the left when moving forward), the rear of the trailer moves to the right. Conversely, rotating the steering wheel clockwise with your hands at the bottom of the wheel will move the rear of the trailer to the left, while backing up. If you are towing a bumper pull hitch trailer, be careful not to allow the trailer to turn too much, because it will hit the rear of the tow vehicle. To straighten the rig, either pull forward, or turn the steering wheel in the opposite direction.

Safe Trailer Towing Guidelines

- Recheck the load tie downs to make sure the load will not shift during towing.
- Before towing, check coupling, safety chains, safety brake, tires, wheels and lights.
- Check the lug nuts or bolts for tightness.
- Check coupler tightness after towing 50 miles.
- Adjust the brake controller to engage the trailer brakes before the tow vehicle brakes. Your dealer or service center can assist you by making this adjustment.
- Use your mirrors to verify that you have room to change lanes or pull into traffic.
- Use your turn signals well in advance.
- Allow plenty of stopping space for your trailer and tow vehicle.
- Do not drive so fast that the trailer begins to sway due to speed. Never drive faster than 60mph.
- Allow plenty of room for passing. A rule of thumb is that passing distance with a trailer is four times the passing distance without a trailer.
- Shift your automatic transmission into lower gear for city driving.
- Use lower gears for climbing and descending grades.
- Do not ride the brakes while descending grades; they may get so hot that they will stop working. Then you will potentially have a runaway tow vehicle and trailer.

- To conserve fuel, don't use full throttle to climb a hill. Instead, build speed on the approach.
- Slow down for bumps in the road. Take your foot off the brake when crossing the bump.
- Do not brake while in a curve unless absolutely necessary. Instead, slow down before you enter the curve and power through the curve. Therefore, the towing vehicle remains "in charge."
- Do not apply the brakes to correct extreme trailer swaying. Continued pulling of the trailer, and even slight acceleration, will provide a stabilizing force.
- Make regular stops, about once each hour. Confirm that:
    - The coupler is secure to the hitch and is locked.
    - Electrical connectors are made.
    - There is appropriate slack in the safety chains.
    - There is appropriate slack in the breakaway switch pullpin cable.
    - The tires are not visibly low on pressure.
    - Your cargo is secure and in good condition.

2. COUPLING TO THE TOW VEHICLE

2.1 USE AN ADEQUATE TOW VEHICLE AND 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 your trailer rating is equal to or less than that of the tow vehicle. 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. If towing a gooseneck or fifth wheel trailer it is also very important to make certain the bed of your truck is long enough to clear the trailer during turning maneuvers.

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 of your trailer.

2.1.1 Trailer Information

The "Trailer VIN Tag" location on your trailer will be toward the front of the trailer on the tongue of a bumper pull trailer or on the bunk frame of a gooseneck or fifth wheel trailer.

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

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

2.1.1.2 *GVWR*: The maximum allowable gross weight of the trailer and its contents. The gross weight rating 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 the 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 on 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 the GAWR.

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

2.1.1.4 *VIN*: The Vehicle Identification Number.

2.1.2 Tow Vehicle

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.

2.1.2.1 *Overall Carrying and Towing Capacity of the Vehicle*

Vehicle manufacturers will provide you with the maximum capacities of their various models. No amount of reinforcement will give a 100 horsepower; 2500 pound truck the towing capacity that a 300 horsepower 5000-pound truck has.

2.1.2.2 *Towing Hitch*

The towing hitch attached to your tow vehicle must have a capacity equal to or greater than the load ratings of the trailer you intend to tow. The hitch capacity must also be matched to the tow vehicle capacity. Only your vehicle dealer or an authorized hitch service center can provide and install the proper hitch on your tow vehicle.

2.1.2.3 *Suspension System*

Sway bars, shock absorbers, heavy-duty springs, heavy-duty tires, and other suspension components must be able to sufficiently serve the size and weight of the trailer that is going to be towed.

2.1.2.4 *Brake Controller*

The brake controller is part of the tow vehicle and is essential in the operation of the electric brakes on the trailer. Your manufacturer provides electric brakes on trailers with a GVWR of 3,000 pounds or more. The brake controller is not the same as the safety breakaway brake system that may be equipped on the trailer.

2.1.2.5 *Side View Mirrors*

The size of the trailer that is being towed and your state law regulations determine the size of the mirrors. However, some states prohibit extended mirrors on a tow vehicle, except while a trailer is actually being towed. In this situation, detachable extended mirrors are necessary. Check with your dealer or appropriate state agency for mirror requirements.

2.1.2.6 *Heavy Duty Flasher*

A heavy-duty flasher is an electrical component that may be required when your trailer turn signal lights are attached to the tow vehicle flasher circuit.

2.1.2.7 *Electrical Connector*

An electrical connector connects the light and brake system on the trailer to the light and brake controls on the towing vehicle.

2.1.2.8 *Heavy Duty Engine Oil Cooling System*

The tow vehicle engine works harder when a trailer is being towed. Depending on the size of the trailer, you may need to install a separate engine oil cooler. Inadequate cooling may result in sudden engine failure. Ask the tow vehicle dealer if it is necessary to install a heavy-duty oil cooling system.

2.1.2.9 *Automatic Transmission Oil Cooler*

The automatic transmission of a towing vehicle handles more power when a trailer is being towed. Inadequate cooling will shorten the transmission life, and may result in sudden transmission failure. Ask the tow vehicle dealer if it is necessary to install a separate cooler for the automatic transmission.

2.1.2.10 *Fire Extinguisher*

It is sensible to have a fire extinguisher in the tow vehicle.

2.1.2.11 *Emergency Flares and Emergency Triangle Reflectors*

It is wise to carry these warning devices even if you are not towing a trailer. It is particularly important to have these when towing a trailer because the hazard flashers of your towing vehicle will not operate for as long a period of time when the battery is running both the trailer lights and tow vehicle lights.

2.1.2.12 *Lug Nut Wrench and Tire Changing Equipment*

Make certain that you have all the necessary equipment with you to change a tire on your trailer in the event of a flat tire. Your tow vehicle lug nut wrench may not necessarily be

the correct size to remove and reinstall the lugnuts on your trailer. You will also need a way to raise the trailer off of the ground (making certain that all the tires are blocked) and the jack in your tow vehicle may not be adequate.

2.2 COUPLING AND UNCOUPLING THE TRAILER

A secure coupling (fastening) of the trailer to the tow vehicle is essential. A loss of coupling may result in death or serious injury. Therefore, you must understand and follow all of the instructions for coupling.

The following parts are involved in making a secure coupling between the trailer and the tow vehicle:

Coupler
A device on the tongue of the trailer that connects to the hitch on the tow vehicle.

Hitch
A device on the tow vehicle that supports the weight of the trailer tongue and pulls the trailer. The coupler attaches to the hitch.

Safety Chains
If the coupler connection becomes loose, the safety chains can keep the trailer attached to the tow vehicle. With properly rigged safety chains, it is possible to keep the tongue of the trailer from digging into the road pavement, even if the coupler-to-hitch connection comes apart.

Trailer Lighting (and Braking) Connector
A device that connects electrical power from the tow vehicle to the trailer. Electricity is used to turn on brake lights, running lights, and turn signals as required. In addition, if your trailer has a separate braking system, the electrical connector will also supply power to the brakes from the tow vehicle.

Breakaway Switch
If the coupler connection comes loose, the breakaway switch can actuate emergency electrical brakes on the trailer. The breakaway switch must be rigged to the tow vehicle with appropriate slack that will activate the switch if the coupler connection comes loose.

Jack
A device on the trailer that is used to raise and lower the coupler. The jack is sometimes called the landing gear.

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 the hitch.

The safety chains are secured to the tow vehicle.

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.

The trailer lights are connected and checked.

Trailers are produced with a variety of coupler devices. One of the sections below will pertain to your trailer.

- Ball Hitch Coupler
- Gooseneck Hitch Coupler
- Fifth Wheel Coupler

2.2.1 Trailer with Ball Hitch Coupler

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

A ball hitch trailer may be fitted with a tongue jack that can raise and lower the coupler. The tongue jack is mounted to the A-frame (front, or tongue) part of the trailer. By rotating the jack handle clockwise, the jack will extend and raise the front 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 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 form 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 GVWR (Gross Vehicle Weight Rating).

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.

2.2.1.1 *Before Coupling the Trailer to the Tow Vehicle*

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

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

WARNING

A worn, cracked or corroded hitch ball can fail while towing, and 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 hitch ball 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.

2.2.1.2 *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.
- Slowly back the tow vehicle so that the ball is near or aligned under the coupler.

2.2.1.3 *Coupling the Trailer to the Tow Vehicle*

If your trailer does not have a jack, you will have to lift the coupler and place it over the ball.

- 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 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 hole in the locking mechanism.
- Be sure the coupler is all the way on the hitch ball and 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.

NOTICE

Overloading can damage the tongue jack. Do not use the tongue jack to raise the tow vehicle more than 1 inch. This is 1 inch of suspension travel on the tow vehicle, NOT the tires 1" off the ground.

If the coupler cannot be secured to the hitch ball, do not tow the trailer. Contact a service center to have the trailer inspected immediately.

- Lower the trailer so that its entire tongue weight is held by the hitch, and continue retracting the jack to its fully retracted position.

2.2.1.4 *Rigging the Safety Chains*

- Visually inspect the safety chains and hooks for wear 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 in the hitch system (but, do **not** attach them to an interchangeable part of the hitch assembly)
    - 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.

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 up tongue, if the trailer comes loose.

2.2.1.5 *Attach and Test Electrical 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 provided by the breakaway brake controller manufacturer. If you do not have these instructions call ATC at 877-441-2440 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 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. 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 5mph. You should feel the trailer resisting being towed, but the wheels will not necessarily be locked. If the brakes no not function do not tow the trailer until the brakes are repaired.
- Immediately replace the pullpin. The breakaway system battery discharges rapidly when the pullpin is removed.

  DO NOT use the breakaway battery as a parking brake. Use blocks in front and behind the wheels.

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 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 the 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 the winter months:

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

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

2.2.1.6 *Connecting 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 5mph, 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 properly.

Check that the electric brakes work by operating the brake controller inside the tow vehicle.

2.2.1.7 *Uncoupling the Ball Hitch Trailer With the Tongue Jack*

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 the 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.

2.2.2 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 sharper angles than are permitted by a bumper pull hitch system. A gooseneck coupler consists of a tube in an inverted "U" shape and a gooseneck ball receiver.

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 GVWR (gross vehicle weight 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

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.

The gooseneck height adjustment bolts, which have a "cup" that makes a gripping impression into the gooseneck tube, must be tight so that the trailer does not drop to a lower position. Do not over-tighten because the tube can be deformed. After tightening the bolts, tighten the jam nuts on the bolts.

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.

A trailer having a gooseneck hitch will have one or two drop leg jacks for raising and lowering the gooseneck ball receiver. Because we use several drop leg jack mechanisms, the general instructions that follow may very slightly from the jack manufacturer's instructions. If you have any questions operating your specific jack contact ATC at 877-441-2440.

Before attempting to tow:

- Be sure the size and rating of the gooseneck ball match the size and rating of the receiver. Gooseneck balls and receivers are marked with their size and ratings.
- Wipe the gooseneck ball clean and inspect it visually and feel for flat spots, cracks and pits.

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.

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

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.

- Wipe the inside and outside of the receiver clean and inspect it visually for cracks; and feel the inside of the receiver for worn spots and pits. If any of these conditions exist, have the receiver replaced before coupling the trailer.
- Lubricate the inside of the gooseneck ball receiver with automotive bearing grease.
- Be sure the receiver is tight to the trailer. All receiver fasteners must be visibly solid against the trailer frame.
- Release the jack handle or crank from its holder.
- Make certain the ground beneath the jack foot is firm enough to support the tongue weight.
- Rotate the handle/crank clockwise to raise the bottom surface of the gooseneck to be above the top of the gooseneck ball.

2.2.2.1 *Prepare the Ball Receiver and Gooseneck Ball*

- Release the lock plate on the gooseneck ball receiver. With the spring-loaded lock plate locking the pin in the OPEN position, rotate the lock plate to a position that allows the gooseneck ball to enter the receiver.
- Slowly back up the tow vehicle so that the gooseneck ball is aligned under the gooseneck ball receiver.

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.

2.2.2.2 *Coupling 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 locking 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.

NOTICE

Overloading can damage the drop leg jack. Do not use the drop leg jack to raise the tow vehicle more than 1 inch. This is 1 inch of suspension travel on the tow vehicle, NOT the tires 1" off the ground.

If the gooseneck ball cannot be secured to the receiver, do not tow the trailer. Contact a service center to have the trailer inspected immediately.

- After testing to see that the receiver is properly secured and locked to the ball, retract the jack to its fully retracted position.
- Return the drop legs to their upper positions. The drop legs are held in the lowered position with a plunger pin. Rotating the plunger pin while pulling it outward will cause it to come out of engagement with the drop leg and the leg will rapidly rise.

CAUTION

The drop legs are heavily spring loaded in the lowered position. They will rapidly return to the upper position when released and can inflict serious bruises, scrapes or pinching.

Keep your feet, shins and hands well clear of the drop legs and the drop leg bases when releasing the drop legs.

Always wear shoes or boots while performing this operation.

2.2.2.3 *Rigging 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 the ball

Have sufficient slack to permit turning and to keep gooseneck on bed of trailer, if the trailer comes loose.

2.2.2.4 *Attaching and Testing the 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 ATC Customer Service Dept. at 877-441-2440 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 does not provide power to the breakaway brake battery you must periodically charge the battery on the trailer to keep the breakaway brake system in working order.

- Visually inspect the breakaway system for broken parts.
- 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. Do **not** connect the pullpin cable to a safety chain or a safety chain receiver or to the gooseneck ball or its support. This would keep the breakaway brake system from operating when it is needed. Contact the hitch manufacturer or installer if you are not certain of the hitch provisions for the breakaway brake connection.
- Remove the pullpin from the switch and test tow the trailer at less than 5mph. You should feel the trailer resisting being towed, but the wheels will not necessarily be locked.
- Immediately replace the pullpin. The breakaway brake system battery discharges rapidly when the pullpin is removed.

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.

Connect the breakaway cable to the tow vehicle; and NOT to the safety chain, safety chain receiver, gooseneck ball or gooseneck ball support.

Test the function of the breakaway brake system before towing the trailer. Do not tow the trailer if the breakaway brake system is not working; 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 at intervals recommended by the battery manufacturers instructions.

2.2.2.5 Connecting the Electrical Cables

Connect the 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 two 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 5mph, 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.

2.2.2.6 Uncoupling the Gooseneck Trailer with Drop-Leg Jack

Follow these steps to uncouple your gooseneck 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 safety chains from the tow vehicle.
- Move the spring-loaded gooseneck receiver lock plate locking pin to the OPEN position.
- Rotate the lock plate to a position that permits the gooseneck ball to exit the receiver.
- Before releasing the drop leg jack, make certain ground surface below jack base will support the trailer tongue load.
- Rotate the drop leg plunger pin handle so that the plunger pin is released from the drop leg.
- Push down on the drop leg base with your foot to place a drop leg to the desired lowered position.
- Rotate the plunger pin handle so that the plunger pin is attempting to engage the drop leg.
- Slowly raise your foot, permitting the drop leg to rise. The plunger pin will engage a hole in the drop leg.

CAUTION

The drop legs are heavily spring loaded in the lowered position. They will rapidly return to the upper position when released and can inflict serious bruises, scrapes or pinching.

Keep your feet, shins and hands well clear of the drop legs and the drop leg bases when releasing the drop legs.

Always wear shoes or boots while performing this operation.

- Be sure the plunger pin is fully engaged. Push it by hand if necessary. The bent part of the plunger pin handle must be touching the plunger pin housing.
- If your trailer has two drop leg jacks, lower them both to the same level, following the above instructions.

NOTICE

If the drop legs are not set at the same level, one of the drop leg jacks can be overloaded and can be damaged.

- Release the handle (or crank) from its holder and engage it with the jackshaft.
- Rotate the handle (or crank) clockwise to slowly extend the jack and transfer the weight of the trailer tongue to the jack.
- On two speed jacks, pushing the handle shaft toward the gearbox can perform rapid extension. This shifts the gearbox into a high-speed mode.

- When the drop leg base contact the ground, shift the gearbox into low speed mode by pulling out on the handle shaft until it locks into low gear.

NOTICE

Do not use high speed to lift the trailer; the drop leg jack mechanism can be damaged.

High speed is used only to rapidly move the drop leg base into contact with the ground.

Continue to extend the jack(s), making sure that the ground is providing stable and level support for the trailer.

After the jack(s) are extended and the gooseneck ball receiver is well clear of the gooseneck ball, to permit driving the tow vehicle away, disengage the handle from its shaft and return to its holder.

2.2.3 Trailers with Fifth Wheel Coupler and Drop-Leg Jack

A fifth wheel coupler on the trailer 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.

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.

2.2.3.1 *Before Attempting to Tow*

- Be sure the size and rating of the fifth wheel and kingpin match.
- Wipe the kingpin clean and inspect it visually and 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.

- Be sure the brake line, electrical line, and any other lines are clear of the coupling area.
- Be sure the locks are open.
- If the tow vehicle is equipped with a tailgate, lower it.
- Block the trailer wheels, front and rear.
- Make certain that the trailer fifth wheel plate is slightly above the kingpin plate on the tow vehicle.
- Back the tow vehicle up close to the trailer, centering the kingpin in the slot of the fifth wheel.
- **STOP** before engaging the coupling.

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 procedure.

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

WARNING

An improperly coupled fifth wheel can come loose, resulting in death or serious injury.

Do not tow the trailer until all of the visual checks have been performed:

Adjustment nut against fifth wheel.

Secondary lock behind yoke.

Fifth wheel against kingpin plate.

A trailer having a fifth wheel coupler will be outfitted with one or two drop leg jacks for raising and lowering the fifth wheel coupler. Because we use several drop leg jack mechanisms, the general instructions below may very slightly from the jack manufacturer's instructions. If you have any questions operating your specific jack contact ATC at 877-441-2440.

- Rotate the jack handle counterclockwise. This will slowly retract the jack and transfer the weight of the trailer tongue to the towing vehicle. 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. Continue retracting the jack to its fully retracted position.
- Return the drop lefts to their upper positions. The drop legs are held in the lowered position with a plunger pin. Rotating the plunger pin while pulling it outward about ¾ inch will cause it to come out of the engagement with the drop leg and the leg will rapidly rise.
- Raise the tailgate of the tow vehicle.
- Pick up the trailer wheels blocks.

Because we use several drop leg jack mechanisms, the general instructions below may very slightly from the jack manufacturer's instructions. If you have any questions operating your specific jack contact ATC at 877-441-2440.

CAUTION

The drop legs are heavily spring loaded in the lowered position. They will rapidly return to the upper position when released and can inflict serious bruises, scrapes or pinching.

Keep your feet, shits and hands well clear of the drop legs and drop leg bases when releasing the drop legs.

Always wear shoes or boots while performing this operation.

2.2.3.2 *Attaching and Testing the Breakaway Brake System*

If the coupler fails, a properly connected and working breakaway brake system will apply electric brakes on the trailer.

The breakaway brake system includes a battery, a switch with a pullpin, and a breakaway brake controller. Read the following instructions here as well as the instructions that have been prepared by the breakaway brake controller manufacturer. If you do not have these instructions contact ATC at 877-441-2440 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 does not provide

power to the breakaway brake battery, you must periodically charge the battery to keep the breakaway brake system in working order.

- Visually inspect the breakaway brake system for broken parts.
- Connect the pullpin cable to the tow vehicle. Do **not** connect to kingpin or support.
- Remove the pullpin from the switch and test tow the trailer at less than 5mph. You should feel the trailer resisting being towed, but the wheels will not necessarily be locked.
- 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 fails.

Connect the breakaway cable to the tow vehicle, and NOT to the kingpin or its supports.

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 brake will overheat which can result in permanent brake failure.

WARNING

Failure to replace the pullpin will prevent the 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 at intervals recommended by the battery manufacturer.

2.2.3.3 *Connecting the Electrical Cables*

- Connect the trailer lights to the two vehicle's electrical connectors. Check all lights for proper operation:
  - Clearance and running lights (turn on tow vehicle headlights).
  - Brake lights (step on two vehicle brake pedal).
  - Turn signals (operate tow vehicle directional signal lever).
  - Backup lights (put tow vehicle gear shift into reverse).

- Check crakes for proper operation: While towing the trailer at less than 4mph, 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 you 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.

2.2.3.4 *Uncoupling the Fifth-Wheel Trailer with Drop-Leg Jack*

Follow these steps to uncouple your fifth wheel hitch trailer from your tow vehicle.

- Block the 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 pin in the switch.
- If the trailer has a tailgate, lower it.
- Make certain that the ground surface below the jack base will support the trailer tongue load.
- Rotate the drop leg plunger pin handle so that the plunger pin is released from the drop leg.
- Push down on the drop leg base with your foot to place the drop leg to the desired lowered position.

CAUTION

The drop legs are heavily spring loaded in the lowered position. They will rapidly return to the upper position when released and can inflict serious bruises, scrapes or pinching.

Keep your feet, shits and hands well clear of the drop legs and drop leg bases when releasing the drop legs.

Always wear shoes or boots while performing this operation.

- Rotate the plunger pin handle so that the plunger pin is attempting to engage the drop leg.

- Slowly raise your foot, permitting the drop leg to rise. The plunger pin will engage a hole in the drop leg.
- Be sure the plunger pin is fully engaged. Push it by hand if necessary. The bent part of the plunger pin handle must be touching the plunger pin housing.
- If your trailer has two drop leg jacks, lower them both to the same level, following the above instructions.

NOTICE

If the drop legs are not set at the same level, one of the drop leg jacks can be overloaded and can be damaged.

- Release the handle (or crank) from its holder and engage it with the jackshaft.
- Rotate the handle (or crank) clockwise to slowly extend the jack and transfer the weight of the trailer tongue to the jack.
- On two speed jacks, pushing the handle shaft toward the gearbox can perform rapid extension. This shifts the gearbox into a high-speed mode.
- When the drop leg base contacts the ground, shift the gearbox into low speed mode by pulling out on the handle shaft until it locks into low gear.

NOTICE

Do not use high speed to lift the trailer; the drop leg jack mechanism can be damaged.

High speed is used only to rapidly move the drop leg base into contact with the ground.

- Continue to extend the jack(s), making sure that the ground is providing stable and level support for the trailer.
- Turn the crank two or three turns to take some weight off of the coupling. Do **not** raise the fifth wheel off the kingpin plate.
- After the jack(s) are extended enough to permit driving the tow vehicle away, disengage the jack handle from its shaft and return it to its holder. Do NOT drive the tow vehicle yet!
- Open the fifth wheel locks by:
    - Pulling the release handle, or
    - Using a separate pipe release handle to engage the solid stud on the secondary lock.
- Slowly drive the tow vehicle away from the trailer.
- Raise the tow vehicle tailgate.

3. LOADING THE TRAILER

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

- Overall load weight

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

To determine that you have loaded the trailer within it's rating; you must consider the *distribution* of weight, as well as the total weight of the trailer and its contents. The trailer axles carry most of the total weight of the trailer and its contents (Gross Vehicle Weight, or "GVW"). The remainder of the total weight is carried by the tow vehicle hitch. It is essential for safe towing that the trailer tongue and tow vehicle hitch carry the proper amount of the loaded trailer weight, otherwise the trailer can suddenly sway wildly at towing speed. Read the "Tongue Weight" section below.

Towing stability also depends on keeping the center of gravity as low as possible. Load heavy items on the floor and over the axles. When loading additional items, be sure to maintain even side-to-side weight distribution and proper tongue weight. The total weight of the trailer and its contents must never exceed the total weight rating of the trailer (Gross Vehicle Weight Rating, or "GVWR").

WARNING

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

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

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

3.1 TONGUE WEIGHT

It is crucial to have a portion of the trailer load carried by the tow vehicle. That is, the trailer tongue must exert a downward force on the hitch. This is necessary for two reasons. First, the proper amount of tongue weight is necessary for the tow vehicle to be able to maintain control of the tow vehicle/trailer system. If, for example, the tongue exerts an upward pull on the hitch, instead of pushing down on it (because the trailer is overloaded behind the axle(s)), the rear wheel of the tow vehicle can lose traction or grip and cause loss of control. Also, even if there is some weight on the tongue, but not enough weight on the tongue, the trailer can suddenly, become unstable at high speeds.

If, on the other hand, there is too much tongue weight, the front wheels of the tow vehicle can be too lightly loaded and cause loss of steering control and traction, as well, if the front wheels are driving.

In addition to tow vehicle control, tongue weight is necessary to insure that the trailer axle(s) do not exceed their Gross Axle Weight Rating (GAWR).

The table below has "rules of thumb" for proper tongue weight.

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 a 20-25% of 12,000 pounds on the tongue. This 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	20-25%

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.

3.2 CHECKING THE TONGUE WEIGHT

To check the tongue weight, the tow vehicle and trailer must be on level ground, as they will be when the trailer is being towed.

If you know the weight of your tow vehicle axles when you are not towing a trailer, trailer tongue weight can be determined with the use of a truck axle scale.

The recommended method of checking tongue weight is to use an accessory called a "tongue weight scale." If don't have access to a tongue weight scale, call ATC at 877-441-2440 for assistance.

An alternate method of checking tongue weight involves the use of a bathroom scale. The loaded trailer must be on a smooth and level surface, and you must block the trailer wheels, front and rear.

WARNING

An unrestrained trailer can fall off its support, resulting in serious injury or death.

Before checking tongue weight, block trailer wheels, front and rear.

- Raise the tongue of the trailer with the jack
- Place the bathroom scale on the ground directly below the coupler.
- Place a strong support (such as a cement block) on the scale – note the scale reading for the weight of the block support.
- Lower the tongue until the coupler rests on the support and the jack is ½ inch above the ground.
- The scale reading, minus the weight of the block support is the tongue weight.
- If the tongue weight exceeds the capacity of a bathroom scale, you should have your tongue weight checked at an axle weighing scale.

3.3 SECURING THE CARGO

Since the trailer "ride" can be bumpy and rough, you must secure your cargo so that it does no 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.

3.3.1 Loading Cargo (Enclosed Trailer)

Couple the trailer to the tow vehicle before loading. The tongue of a bumper pull trailer can rise during loading before cargo is evenly 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. However, fuel in the tank of an off-road vehicle, or car or motorcycle, etc., may be carried inside of your enclosed cargo trailer.

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.

3.3.1.1 *Preparing the Trailer for Loading*

Before loading cargo into your enclosed trailer, inspect the interior of the trailer.

Enclosed trailers may be fitted with "D"-ring hold-downs, and/or a track system that can be used to secure the cargo. Inspect the "D"-ring and track system for looseness or signs of bending before loading the cargo onto the trailer.

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.

3.3.1.2 *Loading the Enclosed Trailer*

Enclosed trailers may be fitted with a drop ramp door. The weight of the drop ramp door is partially held by a spring and cable counterbalance assembly. If this assembly is out of adjustment or worn out, it will not provide the expected assistance for slow and careful lowering and raising of the ramp. Some smaller ramp doors (for example those on the front of some snowmobile trailers) are not assisted with a spring and cable counterbalance. Special attention and care should be taken in lowering and raising these ramp doors.

WARNING

A spring and cable counterbalance can inflict serious injury if it breaks, or if incorrectly adjusted.

Inspect the cable and cable ends each time the door is operated.

Do not attempt to service the counterbalance. Take the trailer to your dealer for service.

1. Carefully lower the drop ramp to the ground.
2. Load the cargo up the drop ramp and into the trailer. If the trailer has a living quarters, the cargo area of your trailer will have ventilation openings or windows. Do not block these ventilation openings or windows. These openings are provided to exhaust potentially deadly fumes.

WARNING

Accumulation of hazardous fumes can cause death or serious injury.

Do not block access to ventilation ports or windows.

3. Secure the cargo to the trailer using appropriate straps, chains and tensioning devices.
4. Close the drop ramp door and secure the door catch using a linchpin or other locking device, so that the catch and door cannot open while the trailer is being towed.

WARNING

If the door opens, your cargo may be ejected onto the road, resulting in death or serious injury to other drivers.

Always secure the door latch after closing. Place a linchpin or lock in the catch.

4. CHECKING THE TRAILER BEFORE AND DURING EACH TOW

4.1 PRE-TOW CHECKLIST

Before towing, double-check all of these items:

- ❑ Tires, wheels and lug nuts
- ❑ Coupler secured and locked
- ❑ Safety chains properly rigged to tow vehicle, not to hitch or ball
- ❑ Test of lights: Tail, Stop, Turn and Backup
- ❑ Safety breakaway switch cable fastened to tow vehicle, not to safety chains
- ❑ Cargo properly loaded, balanced and tied down
- ❑ Tongue weight
- ❑ Doors and gates latched and secured
- ❑ Fire Extinguisher
- ❑ Flares and reflectors
- ❑ Proper size lug nut wrench and jack

4.2 MAKE REGULAR STOPS

Stop and check the following items during normal stops or if something appears abnormal:

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

5. BREAKING IN A NEW TRAILER

5.1 RETIGHTEN LUG NUTS AT FIRST 50, 100, 150 AND 200 MILES

Wheel lugs can shift and settle quickly after being first assembled, and must be checked after the first 50, 100, 150 and 200 miles of driving. Failure to perform this check may resulting a wheel coming loose from the trailer, causing a crash and 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 50, 100, 150 and 200 miles of driving.

5.2 ADJUST BRAKE SHOES AT FIRST 200 MILES

Brake shoes and drums experience a rapid initial wear. The brakes must be adjusted after the first 200 miles of use, and every 3,000 miles thereafter. Some axles are fitted with a mechanism that will automatically adjust the brake shoes when the trailer "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 ATC at 877-441-2440, 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.
- To automatically adjust brakes on many braking systems.

If your trailer is not fitted with automatically adjusting brakes, the brakes will need to be manually adjusted. See your dealer or service center to have this performed.

5.3 SYNCHRONIZING THE BRAKE SYSTEM

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 30mph before each tow.

To insure safe brake performance and synchronization, read and follow the axle/brake and brake controller manufacturers' instructions. The brake controller manufacturers' instructions would have come with the brake controller you purchased. If you do not have the axle/brake manufacturers' instructions, call ATC at 877-441-2440 for a free copy.

6. ACCESSORIES

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 the instructions call, ATC at 877-441-2440 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 or replaced. Follow the fire extinguisher manufacturer's instructions for recharging the extinguisher after use.

6.1 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 or charcoal.

Carbon Monoxide is an odorless gas that can cause death. Be certain exhaust from any running engine or burning fuels cannot 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 fan or ventilators operated in a trailer
- Prevailing winds
- Being trapped between adjacent trailers, vehicles or buildings
- 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 living quarter accommodation spaces of your trailer

WARNING

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

Carbon Monoxide

Fire and Explosion

Electrocution

Not having a working carbon monoxide detector in the living quarter 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 a generator instruction manual, call ATC at 877-441-2440, for a free copy.

Never exceed the capacity of the generator.

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

6.2 ACCESSORY BATTERY

Your trailer may be outfitted with an accessory battery that operates lighting, electrical 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.

6.3 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.

6.4 LP GAS AND 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 living quarter 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 living quarters accommodations 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 device.

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 in the trailer.

Only fill an LP gas tank 80% full.

Only fill at 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 valve 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 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 case LP piping corrosion.

WARNING

Risk of fire or explosion

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

Do not touch the 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 the 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 outdoor temperature is below 32 degrees Fahrenheit.

NOTICE

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

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 with Department of Transportation (or with the AAA) for travel routes that do not have such restrictions.

6.4.1 LP Gas System Troubleshooting

- Having liquid "gas" at your appliance is an indication that the LP tank is overfilled, or that the temperature is too cold.
- If your LP 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 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

6.5 VENDING AND 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 the prop rods to hold vending or accessory doors open.

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

6.6 ELECTRIC-POWERED LANDING GEAR

The landing gear (also know 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.

Electric landing gear may or may not be equipped with an auxiliary 12-volt battery. If you do not have an auxiliary battery, the electric jack(s) may be wired through the trailer electrical plug, and run off of the tow vehicles battery source.

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.

7. INSPECTION AND SERVICE MAINTENANCE

7.1 INSPECTIOIN, 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 or qualified service facility perform the service. Note: In addition to this manual, also check the relevant component manufacturer's manual.

Inspection and Service Before Each Use

Item	Inspection / Service
Breakaway Brakes > Electric > Hydraulic	 Check operation Check fluid level
Breakaway Battery	Fully charged, connections clean
Brakes - All Types	Check operation
Shoes and Drums	Adjust
Brakes, Hydraulic - Vacuum Actuated	Check gauge for proper vacuum of 18In. Hg. (inches of mercury)
Coupler and Hitch Ball	Check for cracks, pits, and flats. Replace w/ball & coupler having trailer GVW Rating. Grease Check Locking device and & replace
Gooseneck Ball	Check for cracks, pits, and flats. Replace w/ball & coupler having trailer GVW Rating. Grease Check Locking device and & replace when worn

Fifth Wheel & Kingpin	Check for cracks, Grease Check Locking device and & replace when worn
Safety Chain(s) & Hooks	Check for wear and damage
Tires	Check tire pressure when cold Inflate as needed Inspect for visible defects
Wheels - Lug Nuts (Bolts) & Hub	Check for tightness Tighten. For new and remounted wheels, check torque after first 50, 100, 150 & 200 miles of driving and after any impact

Inspection and Service Each 3 Months or 3,000 Miles

Item	**Inspection / Service**
Structure	
> Flooring	Wash floor
> Hinges, Doors and Dividers	Inspect. Repair or replace damaged, worn or broken parts

Inspection and Service Each 6 Months or 6,000 Miles

Item	**Inspection / Service**
Tires	Rotate @ 5,000 miles Inspect tread and sidewalls thoroughly Replace tire when tread is worn, when sidewall has bulge, or sidewall is worn
Brakes, Electric	
> Magnets	Check wear and current draw
> Controller (in tow vehicle)	Check power output (amperage) and modulation
Structure	
> Roof Vents	Clean dirt buildup, lubricate hinges and slides
> Windows	Clean dirt buildup

Inspection and Service Each Year or 12,000 Miles

Item	Inspection / Service
Brakes, All Types	
> Shoes and Drums	Check for scoring and wear. Replace per manufacturer's specifications
Jack, Drop-Leg	Grease gears at top
Structure	
> Frame Members	Inspect all frame members, bolts & rivets. Repair or replace damaged, worn or broken parts
> Welds	Inspect all welds. Repair as needed
> Slide Out	Clean dirt build-up. Lubricate slides, shafts & gears
Wheels	
> Sealed Bearings (Hubs)	Check & confirm free running. Replace if not (sealed bearings are not serviceable)
> UNSEALED Bearings (Hubs)	Disassemble / inspect/ assemble and repack. Replace promptly if immersed in water
> Rims	Inspect for cracks & dents. Replace as needed
Structure	
> Axle attachment Bolts	Check BY DEALER

7.2 INSPECTIONS AND SERVICE INSTRUCTIONS

7.2.1 Axle Bolts, Frame, Suspension and 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 inspections and maintenance activities, you must jack up the trailer.

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 axle(s) are attached.

WARNING

Never crawl under your trailer unless it is on firm and level ground and resting on properly placed and secured jack stands.

7.2.2 Trailer Structure

Because the trailer floor receives the most abuse, it will most likely corrode before any other part of the structure. Make certain to perform a routine inspection of the floor before towing the trailer.

7.2.2.1 *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 any damaged 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.

The various fastener types used on your trailer are:

- Bolts, which are used mainly for attaching door and gate hinges to the trailer body
- Rivets, which are used to attach the side panels and extruded aluminum trim to the frame of the trailer
- Huck bolts may be at various locations on the frame (huck bolts are not serviceable). If you detect a loose huck bolt fastener, do not tow the trailer. Call your dealer for instructions.

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.

7.2.2.2 *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.

7.2.3 Drop Ramp Torsion Springs

If your trailer has a drop-ramp door, the weight of the door may be partially held by a torsion spring and a cable. Stand to the side when opening the drop ramp. You could be hurt if you are behind the drop ramp can the counterbalance does not work.

Inspect the cable and cable ends regularly for fraying and signs of loosening. If released, a torsion spring can inflict serious injury.

The torsion spring and cable is not user serviceable. A person who is trained in torsion spring safety must service the torsion spring.

7.2.4 Trailer Brakes

7.2.4.1 *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 12,000 miles.

The brake shoes must be adjusted after the first 200 miles of use, and each 3,000 miles 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 this manual, call ATC at 877-441-2440, for a free copy.

7.2.4.2 *Manually Adjusting Brake Shoes*

Some brake 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 ATC at 877-441-2440, for a free copy.

1. Block the front and rear of the tires of the trailer that you are not removing.
2. Jack up the trailer and secure it on adequate capacity jack stands.
3. Be sure the wheel and brake drum rotate freely.
4. Remove the adjusting-hole cover from the adjusting hole slot on the bottom of the brake backing plate.
5. With a screwdriver or standard adjusting tool, rotate the starwheel of the adjuster assembly to expand the brake shoes. Adjust the brake shoes until the pressure of

the linings against the drum makes the wheel very difficult to turn. Note: Your trailer may be equipped with drop spindle axles. See axle manual for your type of axle. You will need a modified adjusting tool for adjusting the brakes on this type of axle. With drop spindle axles, a modified tool with about an 80-degree angle should be used.

6. Rotate the starwheel in the opposite direction until the wheel turns freely with a slight drag.
7. Replace the adjusting-hole cover.
8. Repeat the above procedure on all brakes.
9. Lower the trailer to the ground.

7.2.4.3 *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.

7.2.4.3.1 *Breakaway Brake*

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's instructions.

7.2.4.3.2 *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 my not lock, but you will notice a greater force is needed to pull the trailer.

WARNING

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

DO NOT use the breakaway battery as a parking brake.

Check emergency breakaway brake system BEFORE each tow.

7.2.4.3.3 *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 ATC at 877-441-2440, for a free copy.

7.2.4.3.4 *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 12,000 miles. See the brake manual for ear and current inspection instructions.

7.2.4.4 *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 1,000 miles per month in a hot or 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.

7.2.4.4.1 *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 the 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.

7.2.4.4.2 *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 route the air to an air/hydraulic mechanism, which sends brake fluid to the wheel cylinders.

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

7.2.4.4.3 *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.

7.2.5 Trailer Connection to Tow Vehicle

7.2.5.1 *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 manufacturers' manual for other inspection and maintenance activities. If you do not have this manual, call ATC at 877-441-2440, 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 orientation of the latching mechanism.

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

7.2.5.2 *Gooseneck*

The gooseneck receiver on the trailer connects to a hitch-mounted ball on the towing vehicle. The receiver, ball and hitch transfer the forces down between the tow vehicle and the trailer. Before each tow, coat the ball with a thin layer of automotive 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 this manual, call ATC at 877-441-2440, for a free copy.

If you see or feel evidence of wear, such as flat spots, deformations, 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. All bent or broken receiver parts must be replaced before towing the trailer.

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

7.2.5.3 *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 inspections and maintenance activities. If you do not have this manual, call ATC at 877-441-2440, for a free copy.

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

7.2.6 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 the hand-cranked jacks once a year, by removing the top of the jack and pumping or hand packing grease into the gears.

7.2.7 Lights and Signals

Before each tow, check the trailer taillights, stoplights, turn signals, backup lights (if available) and any clearance lights for proper operation.

WARNING

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

Check all lights before each tow.

7.2.8 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 vehicles or by the generator or shore power. See 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 battery 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.

7.2.9 Tires

Before each tow, be sure the tire pressure is at the value indicated on the tire 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 tread has less than 1/16-inch depth or if the built-in wear indicator bars are visible and flush with the remainder of the tire tread.

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

For additional information regarding tire safety refer to Tire Safety brochure published by the National Highway Safety Administration (NHTSA). You can obtain a copy at: http://www.nhtsa.dot.gov.

WARNING

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

Inspect tires before each tow.

7.2.10 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 or bent or cracked); and replace any damaged wheel. Inspect the wheels for damage every year, even if no obvious impact has occurred.

7.2.11 Wheels, Bearing and Lug Nuts

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

To check your bearings, block the tires that you are not checking, jack the trailer up and check the 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.

7.2.11.1 *Unsealed Bearings (Hubs)*

If your trailer has unsealed axle bearings, they must be inspected and lubricated once a year or 12,000 miles 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.

Follow the steps below to disassemble and service the UNSEALED wheel bearings.

- After removing the grease cap, cotter pin, spindle nut and spindle washer, remove the hub and drum to inspect the bearings for wear and damage.
- Replace the bearings that have flat spots on the rollers, broken roller cages, rust or pitting. Always replace bearings and cups in sets. The inner and outer bearings are to be replaced at the same time.
- Replace the seals that have nicks, tears or wear.
- Lubricate the bearing with a high quality EP-2 automotive wheel bearing grease.

Every time the wheel hub is removed and the bearings are reassembled, follow the steps below to check the wheel bearings for free running and adjustment.

- Turn the hub slowly, by hand, while tightening the spindle nut, until you can no longer turn the hub hand.
- Loosen the spindle nut just until you are able to turn it (the spindle nut) by hand. Do not turn the hub while the spindle nut is loose.
- Put a new cotter pin through the spindle nut and axle.
- Check the adjustments. Both the hub and the spindle nut should be able to move freely (the spindle nut motion will be limited by the cotter pin)

7.2.12 Lug Nuts (Bolts)

Lug nuts are prone to loosen right after the wheel is mounted to the hub. When driving on a remounted wheel, check to see if the lug nuts are tight after the first 50,100, 150 an 200 miles of driving and before each tow thereafter.

WARNING

Lug nuts are print 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 50, 100 150 and 200 miles of driving.

WARNING

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

Tighten lug nuts before each tow.

Tighten 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 lug nuts. If you do not have a torque wrench, tight the lug nuts 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.

1. Start all bolts or nuts by hand to prevent cross threading.
2. Tighten the lugnuts in a star pattern.
3. The tightening of the lugnuts should be done in stages. Following the recommended sequence, tighten the lugnuts per the wheel torque chart below.
4. Wheel lugnuts should be torqued before your first road use and after any wheel removal. Check and re-torque the first 50, 100, 150 and 200 miles of driving. Check periodically thereafter or after the trailer has set unused for an extended time. Following excessive braking, inspect wheel lugnuts.

7.2.12.1 *Torque Stages*

Stage 1	**Stage 2**	**Stage 3**
20/25 ft-lb	50/85 ft-lb	Full Torque

7.2.12.2 *Wheel Torque Requirements*

Axle Size	**Wheel Size**	**Stud Size**	**Steel Wheel Torque**	**Aluminum Wheel Torque**
3500#	13”	½”	50-75#	N/A
3500#	15”	½”	90-120#	80-100#
5200#	15”	½”	90-120#	80-100#
6000#	16”	9/16”	90-120#	95-115#
7000#	16”	9/16”	90-120#	95-115#
8000#	17.5”	5/8”	90-120#	95-115#

Warranties on axles and trailers will not apply to damage or injuries caused by loose or improperly tightened lug nuts or broken studs. Inspect wheel stud holes for roundness. If oblong, this is a sure sign that the unit has been run with improperly tightened lug nuts. In these instances, the rim must be replaced immediately.

8. GENERAL MAINTENANCE

8.1 FLOOR MAINTENANCE

8.1.1 Advantech Flooring

To promote longevity and ease of clean up you can paint your Advantech floor with a quality oil-based porch and deck enamel. This will seal the floor and make spilled oil clean up easier. The painted floor or bare Advantech floor can be cleaned with a mild detergent or floor cleaner and scrub brush.

When parking your ATC trailer that is housing recently used (or snow covered) snowmobiles, tilt the trailer up in the front and open the rear door to allow melted snow to run out the rear. This will help the floor to dry more quickly and prevent damage from standing water.

8.1.2 Vinyl & Rubber Flooring

You can clean your vinyl and rubber flooring with a household vinyl floor cleaner and a mop. Make certain to follow the directions on the vinyl floor cleaner bottle. Please note that parking vehicles tires directly on your vinyl floor will result in the tires leaving permanent marks in the vinyl flooring.

8.1.3 Aluminum Tread Plate (ATP) and Extruded Aluminum Flooring

You can clean your ATP or Extruded Aluminum Floor with a scrub brush and mild detergent. Make certain to remove all residual detergent as this can result in slippery conditions later. Aluminum cleaners and polishes can also be used when needed. Both ATP and Extruded Aluminum flooring are susceptible to scratches by their very nature. This is a condition that is difficult if not impossible to avoid.

CAUTION!

All floor and ramp surfaces are slippery when wet or covered with ice or snow. Use extra caution in these conditions.

8.2 WHEEL MAINTENANCE

Your new wheels do require care to maintain their factory appearance. We strongly suggest you take a few reasonable steps to protect your investment. Typical road dirt traps moisture; which can cause corrosion over a period of time. Brake dust is also corrosive and can cause pitting of the wheels finish. This dirt must be removed regularly,

possibly weekly, depending on your driving habits. After cleaning, always apply a coat of soft non-abrasive cream wax to help prevent surface corrosion. Surface corrosion can be prevented with proper care and is not covered under warranty.

8.2.1 Gray Powdercoated Wheels

Wash with a quality RV or car wash. Protect with a quality RV or automotive wax.

8.2.2 Chrome Plated Wheels

Wash with a quality RV or car wash. Protect with a quality RV or automotive wax. To protect the chrome finish over winters you can apply a thin coat of a petroleum jelly product. In the spring you can use a pressure washer and mild detergent to remove the petroleum jelly. Wash thoroughly and apply a quality RV or automotive wax.

8.2.3 Aluminum Wheels

Aluminum wheels have a protective clear coat finish over the aluminum. Most household cleaning agents are too harsh for the finish on your wheels and must be avoided. Do not use any cleaning agent with a lye or acid base. You can clean this protective coating with any wheel cleaner specifically designed for clear-coated wheels. Always follow the manufacturer's recommendations on the bottle for safe and effective cleaning. You can also use a quality RV or car wash for general cleaning. In addition you can wax the wheels with a quality wax. Do not use any abrasives, aluminum cleaners or polishes to clean the aluminum wheels, as this will damage the protective clear coat finish.

8.3 DOORS, BARLOCKS AND RAMP HINGES

It is important to inspect your ramp door and man door hinges regularly. Lubricate all door and ramp hinges every 3 months with white Lithium grease. WD-40 and similar lubricants will free hinges, however, they will lose all lubricating qualities within a short period of time.

All ATC trailers have zerk fittings on the steel ramp door hinges, which will also require regular maintenance. You can use a manual grease gun, which is available at most RV or automotive parts stores to grease these fittings. Zerk fittings should be greased every three months or more often in dirty conditions or where road salt is prevalent.

Door holdbacks are designed to hold doors open when on uneven ground. They are not designed to hold doors open under windy conditions. Failure due to excessive wind conditions can result in damage to the door or personal injury. Please be aware of weather conditions when utilizing the door holdbacks.

The aluminum barlocks on your ATC trailer also require regular inspection and lubrication. The barlocks should be lubricated with white lithium grease every three months to help assure proper operation.

8.4 ROOF MAINTENANCE

Inspect your ATC roof at least once per year. During the inspection look for shrinking or cracked sealant that could lead to a roof leak. ATC uses a high quality self-leveling caulk that is available through ATC or at your local dealer. Do not allow excessive snow buildup onto the roof. Make certain to brush snow off of the roof after a heavy snowfall. The excessive weight may damage the trailer voiding the ATC warranty. Do not walk on your ATC trailer's roof unless the roof was specifically manufactured with a walk-on roof. The standard ATC trailer roof was not designed to support excessive weight. Walking on the roof of an ATC trailer that is not equipped with a walk-on roof option can result in serious injury.

8.5 ROOF VENTS

Roof vents on ATC trailers allow fresh air and light during the daytime into the trailer. Roof vents also allow warm air to escape when the vent is open. However, the roof vent is not intended to be open when traveling. It is important to make sure the vent is closed prior to towing the trailer.

If your ATC trailer is equipped with a MaxAire roof vent cover you can travel with your roof vent in the open position. The MaxAire roof vent cover protects the roof vent from wind damage during transportation and helps to keep rain and other weather from entering the roof vent when in the open position.

8.6 FRAME MAINTENANCE

Trailers take serious abuse during transportation underneath the trailer in the frame area. It is important to regularly inspect your frame for damage. It is equally important to keep your trailers underside frame clean and free of road dirt or road salt. After you have transported your ATC trailer on a long trip or in foul weather make certain to clean the underneath frame with a pressure washer to free the frame of road dirt and salt. This will greatly extend the life of your ATC trailer.

8.7 EXTERIOR MAINTENANCE

It is important to keep your ATC trailer clean and free of road dirt in order to maintain proper operation and protect your investment. Wash the exterior of your ATC trailer after each use or when dirt is present. Do not use a hard bristle brush on your ATC trailer; this can damage the exterior paints finish. Make certain the exterior of your trailer is wet before using anything to clean the surface. It is best to use a sponge or soft bristle brush to avoid scratching your trailers paint.

Black streaks on the side of your ATC trailer can be cleaned using a product called "Black Streak Remover" which is available at your local dealer. Make certain to follow

the instructions on the bottle prior to use. When washing your ATC trailer use a quality RV or car wash.

It is important to wax your trailer at least once a year to provide protection from the weather and sun. You can wax the painted surfaces, aluminum extrusions and even aluminum frame if desired. Make certain that the surfaces are clean before waxing. Use a quality wax that is available at an RV or automotive parts store.

Oxidation can form on the exposed aluminum over time. Keeping a protective coat of wax on the surface should help to eliminate the oxidation. If oxidation does occur you can use an aluminum cleaner or polish available at most RV or automotive stores. After cleaning or polishing the aluminum you should apply a coat of quality wax.

9.0 TIRE SAFETY INFORMATION

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

Section 9.1 contains "Steps for Determining Correct Load Limit - Trailer".

Section 9.2 contains "Steps for Determining Correct Load Limit – Tow Vehicle".

Section 9.3 contains a Glossary of Tire Terminology, including "cold inflation pressure", "maximum inflation pressure", "recommended inflation pressure", and other non-technical terms.

Section 9.4 contains information from the NHTSA brochure entitled "Tire Safety – Everything Rides On It".

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

• Tire labeling, including a description and explanation of each marking on the tires, and information about the DOT Tire Identification Number (TIN).
• Recommended tire inflation pressure, including a description and explanation of:
    A. Cold inflation pressure.
    B. Vehicle Placard and location on the vehicle.
    C. Adverse safety consequences of under inflation (including tire failure).
    D. Measuring and adjusting air pressure for proper inflation.
• Tire Care, including maintenance and safety practices.
• Vehicle load limits, including a description and explanation of the following items:
    A. Locating and understanding the load limit information, total load capacity, and cargo capacity.
    B. Calculating total and cargo capacities with varying seating configurations including quantitative examples showing / illustrating how the vehicles cargo and

luggage capacity decreases as combined number and size of occupants' increases. This item is also discussed in Section 3.
C. Determining compatibility of tire and vehicle load capabilities.
D. Adverse safety consequences of overloading on handling and stopping on tires.

9.1 Steps for Determining Correct Load Limit – Trailer

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

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

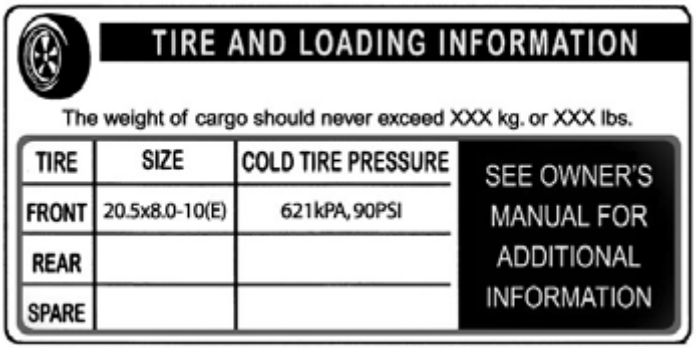
For trailers with living quarters installed, the weight of water and propane also need to be considered. The weight of fully filled propane containers is considered part of the weight of the trailer before it is loaded with cargo, and is not considered part of the disposable cargo load. Water however,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

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

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

maximum cold inflation pressure stamped on the tire.

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.

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.

9.2 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 #
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.

9.3 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 underside of the rim in a manner that encloses the rim flanges inside the air cavity of the tire.

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

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

Groove
The space between two adjacent tread ribs.

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

Gross Vehicle Weight Rating
The maximum weight of the fully loaded trailer, as published on the Certification / VIN label. Actual weight determined by weighing trailer on a public scale, without being attached to the towing vehicle.

Hitch Weight
The downward force exerted on the hitch ball by the trailer coupler.

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

Innerliner separation
The parting of the innerliner from cord material in the carcass.

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

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

Load rating
The maximum load that a tire is rated to carry for a given inflation pressure.

Maximum load rating
The load rating for a tire at the maximum permissible inflation pressure for that tire.

Maximum permissible inflation pressure
The maximum cold inflation pressure to which a tire may be inflated.

Maximum loaded vehicle weight
The sum of curb weight, accessory weight, vehicle capacity weight, and production options weight.

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

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

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.

9.4 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:

http://www.nhtsa.dot.gov/cars/rules/TireSafety/ridesonit/tires_index.html

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.

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.

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.

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.

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.

Steps for Maintaining Proper Tire Pressure

- Step 1: Locate the recommended tire pressure on the vehicle's tire information placard, certification label, or in the owner's manual.
- Step 2: Record the tire pressure of all tires.
- Step 3: If the tire pressure is too high in any of the tires, slowly release air by gently pressing on the tire valve stem with the edge of your tire gauge until you get to the correct pressure.
- Step 4: If the tire pressure is too low, note the difference between the measured tire pressure and the correct tire pressure. These "missing" pounds of pressure are what you will need to add.
- Step 5: At a service station, add the missing pounds of air pressure to each tire that is underinflated.
- Step 6: Check all the tires to make sure they have the same air pressure (except in cases in which the front and rear tires are supposed to have different amounts of pressure).

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

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.

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 builtin 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.

Tire Balance and Wheel Alignment

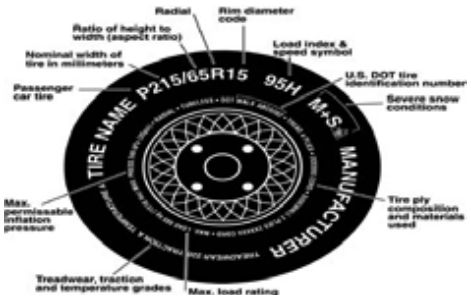
To avoid vibration or shaking of the vehicle when a tire rotates, the tire must be properly balanced. This balance is achieved by positioning weights on the wheel to counterbalance heavy spots on the wheel-and-tire assembly. A wheel alignment adjusts the angles of the wheels so that they are positioned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

Tire 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.

Tire Fundamentals

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



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

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

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

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

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

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

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

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

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

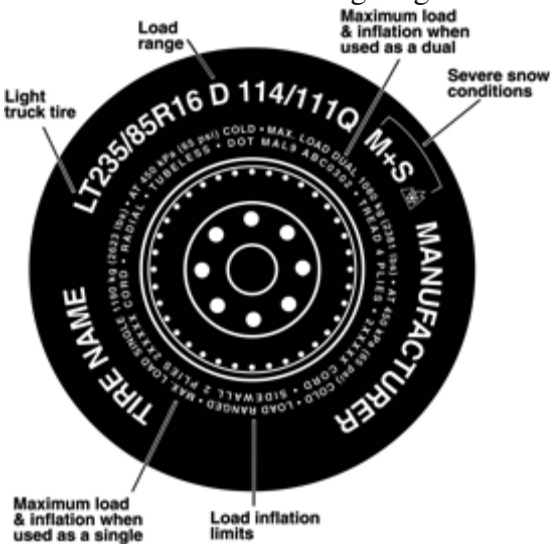
Maximum Permissible Inflation Pressure
This number is the greatest amount of air pressure that should ever be put in the tire under normal driving conditions. UTQGS Information

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". 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

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.

Notes

Notes

P.O. Box 396 | Nappanee, IN 46550-0396
Toll Free 1-877-441-2440
ATCtrailers.com