Hitch Systems, Towing Packages and Trailer Permits

TOWING A TRAILER IN OREGON

Being Equipped For Safety

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Introduction

Hitch systems, towing packages, and tongue weight—there's a lot more to towing a trailer than just hitching up and taking off down the road. This brochure provides general information and tips that can help you make safe decisions when purchasing and driving a tow vehicle and trailer for use in Oregon. It covers the following topics:

- How the size and weight of a trailer affect the selection of a tow vehicle
- Things to consider if you already have a tow vehicle
- The importance of trailer manufacturers' tow ratings
- How to measure the weight of a trailer
- The hitching, braking, and wiring systems that connect tow vehicles with trailers
- Tire safety
- Proper loading and weight distribution of cargo and equipment
- Oregon requirements for towing a trailer
- A pre-departure checklist
- Safety tips for driving with a trailer
- Safety tips for maintaining a tow vehicle and trailer

This brochure is not a substitute for the technical information found in manufacturers' towing guides and vehicle owner's manuals. It is important that you read and refer to them. If you've never towed a vehicle before get help from a trailer, RV dealer or experienced friend.

Selecting a Tow Vehicle

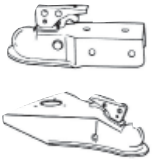
Most SUVs, pickup trucks, vans, minivans, and passenger cars can be equipped to tow a trailer. However, the selection of an appropriate tow vehicle and the proper equipment to tow a trailer depends on the type of trailer, its size and weight, and the amount of weight being towed. There are numerous types of trailers, but in general they fall into four categories: flatbed or open trailers, boat trailers, enclosed trailers, and recreational vehicle trailers (including travel trailers, fifth-wheel trailers, and folding camping trailers).

Check the owner's manual and review the manufacturer's guide to see if the vehicle you plan to buy can tow a trailer. After you have reviewed the vehicle capabilities, you also must investigate the capabilities of compatible hitch systems for the vehicle. This is especially important if you plan to purchase a hitch from a source other than the vehicle manufacturer.

You may find that vehicle manufacturers offer specially designed towing packages that identify the equipment necessary to tow different types of trailers depending on their fully loaded weight and size. A towing package may include a heavy-duty radiator, battery, flasher system, alternator, suspension, and brakes, as well as an engine-oil cooler, transmission-oil cooler, wiring harness, specific axle ratio, and special wheels and tires.

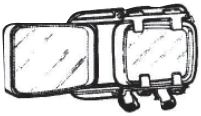
Towing packages also may include the **trailer hitch receiver,** which is mounted to the tow vehicle. If the vehicle being towed has a gross weight of

more than 5,000 pounds, the coupling device (trailer hitch receiver) on the tow vehicle must be firmly attached to the frame of the towing vehicle (not just the bumper). Towing packages rarely include the draw bar, or **ball mount**, and hitch ball.



The draw bar is a separate assembly on which the hitch ball is mounted. The draw bar then slides into the hitch receiver on the tow vehicle and is secured with a locking pin. The front part of the trailer that hitches to the tow vehicle is referred to as the tongue. At the end of the tongue is a **coupler** into which the **hitch ball** or loop is inserted and secured. The ball **must be** the correct size for the coupler.

A manufacturer may offer different towing packages to safely tow various sizes and types of trailers. Towing packages indicate both equipment that must be installed on your tow vehicle and equipment that is optional or recommended. For example, not all trailers require the tow vehicle to be equipped with extended side-view mirrors. But if you are towing a trailer that is wider than your tow vehicle, you will need **extended side-view mirrors** to see rear- and side-approaching traffic. Oregon law requires you to be able to see 200' behind you at all times.



If You Already Have a Tow Vehicle

If you already have a tow vehicle, look up its tow rating—size, maximum loaded weight, and maximum tongue weight of a trailer that the tow vehicle is capable of towing. The vehicle owner's manual contains these specifications. Most automotive manufacturers and dealerships have towing specification guides with tow ratings and detailed information if extra equipment is needed to tow a trailer. While your vehicle may have certain tow ratings, remember you must have a matching hitch system that can handle the same specifications. To ensure safety, you may have to install extra towing equipment.

Manufacturers' Tow Vehicle Ratings

Manufacturers' tow vehicle ratings address tongue weight as well as the individual, combined, and fully loaded weights at which a tow vehicle can safely tow a trailer. They also can be used to guide the selection of brake and hitching systems as well as tow vehicle tires. Together with the hitch system specifications, these weight considerations will help you purchase a safe tow vehicle. In general, manufacturers provide tow ratings for the *maximum:*

- Amount the tow vehicle may weigh when fully loaded, or **gross vehicle weight rating (GVWR)**.

- Weight a vehicle can tow. This figure may vary depending on the vehicle's equipment, such as a manual or automatic transmission and whether it is equipped with four-wheel drive.

- Permissible combined weight of the tow vehicle, trailer, passengers, equipment, fuel, etc., that the vehicle can handle, or **gross combination weight rating (GCWR)**.

- Weight a single axle can carry, or **gross axle weight rating (GAWR)**.

Measuring the Weight of a Trailer

Some manufacturers provide a "dry" or empty weight for trailers; however, to select a proper tow vehicle and hitching system, you must know how much your trailer weighs fully loaded. For example, if you are towing an open trailer that carries a boat or motorcycle, the fully loaded weight includes the weight of the trailer with the boat or motorcycle and any additional items being towed, such as fuel tanks, motors, and safety equipment.

Develop a realistic estimate of the total weight of your trailer. The time you spend doing this and getting properly equipped will save you time and money in preventing unexpected repairs to your tow vehicle and unanticipated breakdowns while on the road. In addition to speaking with dealers and other individuals who sell and use trailers, the best way to know the actual weight of your trailer is to weigh it at a public scale. Oregon has many public weigh stations on most major highways.

Major points of entry can be very busy with semi-trucks. Try to find a scale that is not backed up or is closed. Most closed scales have a reader board that is left on.

Manufacturers consider the loaded weight of a trailer when specifying **tongue weight**—the amount of the trailer's weight that presses down on the trailer hitch. Too little tongue weight can cause the trailer to sway. Too much tongue weight can cause many problems, including not enough weight on the front wheels of the tow vehicle. When this occurs, the tow vehicle will be less responsive to steering. A weight-distributing hitch can remedy this problem by transferring weight to the front axle of the tow vehicle.

Manufacturers also establish the gross axle weight and provide a rating that denotes the maximum weight a single axle can carry. Knowing these weights will help you when it is time to load your trailer. Remember that the gross axle weight rating listed on the tow vehicle's certification label must not be exceeded.

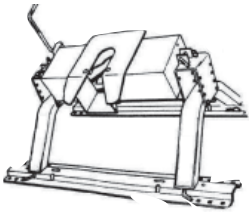
Connecting Your Trailer to Your Tow Vehicle

Tow vehicles and trailers must be compatible with hitching, braking, and wiring systems to ensure safety.

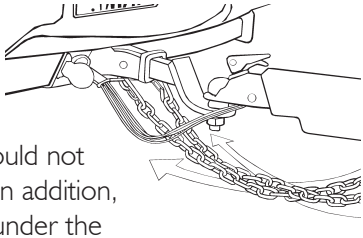
Hitching Systems

The trailer towing industry has developed a classification system that differentiates hitches according to the amount of weight they can tow. This system addresses tongue weight and total weight. Keep in mind that within each classification are numerous hitches made by a variety of manufacturers.

The three most common types of hitches are the weight-carrying hitch, the weight-distributing (or load equalizer) hitch, and the fifth-wheel hitch, or gooseneck. Weight-carrying hitches are designed to carry all of the trailer's tongue weight. Weight-distributing hitches are used with a receiver hitch and special parts that distribute the tongue weight among all tow vehicle and trailer axles. **Fifth-wheel hitches** are designed to mount the trailer connection in the middle of the truck bed right over the rear wheels.



When purchasing a hitch, use the recommendations of the manufacturer of the tow vehicle and trailer based on the type and weight of the trailer. Make sure the hitch has provisions for the connection of **safety chains,** which are required in Oregon.



When connected, safety chains should have some slack to permit sharp turns but should not drag on the road. In addition, they should cross under the trailer tongue to help prevent the tongue from dropping to the road in the event the trailer separates from the tow vehicle.

Braking Systems

Oregon ***recommends*** a braking system for safety reasons. Page 15 explains more.

The selection of a brake system will depend on your tow vehicle and the type and fully loaded weight of your trailer. For a trailer with a loaded weight of more than 1,500 pounds, some other states may require a separate braking system and a breakaway switch, located on the tongue of the trailer, to activate the trailer brakes in the event the trailer separates from the tow vehicle. There are two basic types of brake systems designed to activate the brakes on a trailer:

- Electronically controlled brakes usually provide automatic and manual control for trailer brakes. They require that the tow vehicle be equipped with a controlling device and additional wiring for electrical power. These brakes typically have a control box installed within reach of the driver and can be

manually or automatically applied. The control box may require adjustment or "tuning in" for variations in trailer load.

- Surge brakes are independent hydraulic brakes activated by a master cylinder at the junction of the hitch and trailer tongue. Surge brakes are not allowed in some other states. These brakes are not controlled by the hydraulic fluid in the brake system of the tow vehicle. **Note:** The hydraulic system of the tow vehicle should never be directly connected to the hydraulic system of the trailer. These systems are self-compensating and do not require adjustment for variation in trailer load.

Follow the tow vehicle manufacturer's recommendations for brake selection. If you will be traveling outside of Oregon you should know that some states require braking systems on all axles of the trailer. So, check the requirements by contacting the motor vehicle administration for the state(s) you will be visiting.

Wiring Systems

The law requires **all** trailers to have taillights, brake lights, side marker lights, turn signals, and side and rear reflectors regardless of size. Some trailers also have backup lights. To provide power to these lights, a four-way (or more) **connector** is hooked into the tow vehicle's electrical system.

Many tow vehicle manufacturers offer a 7-way connector that may include an electric brake signal, power supply, and backup lights, in addition to the typical four functions. **Note:** You must ensure that the signals on the electrical connector of the tow vehicle match the electrical connector of the trailer.

Because the wiring systems of many tow vehicles use separate wires for turn signals and stop lights, you may need to purchase a tail-light converter. This converter will combine these wires so that they can be connected to the trailer lighting system. Most factory-installed towing packages include a trailer wire harness that will perform this function if required. If you tow more than one type of trailer, you also may need to purchase an adapter to accommodate differences in the wiring systems.

It is best to equip your trailer and tow vehicle with high quality connectors and lighting to avoid trouble with corrosion and other connections.

Tire Safety

All your trailer tires should be the same type, size, and construction—do not mix bias-belted and radial tires. In selecting tires for your trailer, buy the size, type, and load range found on the trailer's certification label or in the owner's manual. Keep in mind that tires have a load rating that indicates the amount of weight they can carry safely. As with your tow vehicle, always maintain proper tire pressure and replace worn tires. Remember—your tow vehicle tires may require a higher tire pressure for towing, especially heavy loads.

Trailer tires can, and do, age. Be sure to inspect trailer tires for cracking and unusual bulges before every trip, but especially if it has been a long time since the trailer was last used.

Loading and Weight Distribution

Your ability to handle and control your tow vehicle and trailer is greatly improved when the cargo is properly loaded and distributed. Refer to your tow vehicle and trailer owner's manuals to find out how to:

- Balance weight from side to side. If you're hauling a single horse in a straight load trailer, put the horse on the left side.
- Distribute cargo weight evenly along the length of the trailer.
- Secure and brace all items to prevent them from moving during travel.
- Adjust the height of the tow vehicle/trailer interface.
- Apply load leveling (weight distributing hitch bars).

Most trailers and tow vehicles should be level (parallel to the ground) during travel. Check the instructions from your trailer manufacturer to make sure this is correct for your combination of vehicles.

Oregon's Towing Requirements

Oregon law defines trailers as "vehicles without motive power designed to be drawn by another vehicle."

Equipment Requirements

If you own or are thinking about buying, building or rebuilding a trailer you need to know what safety equipment is required in Oregon.

Lights and Reflectors

All lighting equipment must meet the federal DOT lighting standards.

All trailers in Oregon are required to have a full compliment of lighting equipment, regardless of size.

- All trailers must have the following lighting equipment:

  On the rear:
  - two red tail lights:
  - two red tail reflectors;
  - two red stop lights;
  - two red or amber turn signals; and
  - one white registration (license) plate light.

Wider trailers need additional lighting equipment.

- Trailers over 80 inches in width and less than 30 feet long, must have additional lighting equipment.
  on the rear:
  Three red identification lights in the center rear of the trailer.
  on each side:
  At the rear, a red reflector and red side marker light;
  at the front, an amber reflector and amber side marker light;

Large trailers need additional lighting equipment.

- Tall trailers, trailers over 8,000 pounds GVWR, trailers over 30 feet long regardless of width, must have this additional lighting equipment:
  On the rear:
  Two rear red clearance lights on the upper outer corners.
  On the front:
  Two front amber clearance lights on the upper outer corners and three amber identification lights in the center front of the trailer.
  On the side:
  Intermediate amber side marker lights and intermediate amber side reflectors.

For the proper location of lighting equipment, the National Highway Traffic Safety Administration publishes the federal lighting chart for trailers at:
www.nhtsa.gov/Vehicle+Safety/Other+Equipment/Trailers:+Federal+Lighting+Equipment+Location+requirements

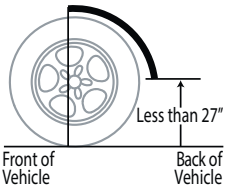
Brakes: Any combination of vehicles must be equipped with brakes that are adequate to stop within a certain distance. While traveling at a speed of 20 miles per hour without leaving a 12-foot wide lane the combination of vehicles must be able to stop:

Within 25 feet for those vehicle combinations under 8,000 pounds.

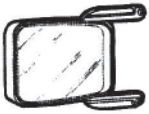
Within 35 feet for those vehicle combinations over 8,000 pounds.

Oregon law does not require trailer brakes, but their use is strongly encouraged as an additional safety measure. Oregon law requires that all safety equipment that came from the manufacturer on your vehicle, including brakes, be kept in good working order. So if your trailer is equipped with brakes, they must be kept in good working order. You must follow both the tow vehicle and trailer manufacturer's recommendations for all aspects of towing, including the use of trailer brakes.

Fenders and mudguards: Trailers must be equipped with fenders or mudguards which extend over and to the rear of the wheels and within 10 inches of the road surface. The fenders or mudguards must extend at least to each side of the tread of the tire or multiple tires. This includes above or over the tires also. Cars, pickups, SUVs, and vans have the same rules, except the fenders or mudguards must be within 27 inches of the ground behind tall tires.



Outside Rearview Mirrors: Drivers must have a clear and unobstructed view to the rear for at least 200 feet at all times. ODOT recommends that a towing vehicle have an outside rearview mirror on each side of the tow vehicle.



Other Towing Information:

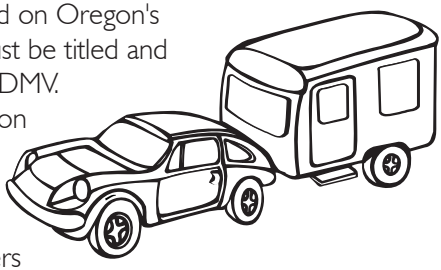
Size limits without special permits:
Width: 8 feet 6 inches
Height: 14 feet
Length: 40 feet (RVs may be 45 feet)

Recreation Vehicle (RV) combinations: An RV combination may be no longer than 65 feet. Some Oregon roads have length limits where this 65 foot combination or even shorter vehicles are not allowed. Several highways have a 50 foot limit and Hwy 242, the scenic McKenzie Pass, has a 35 foot limit.

Number of Vehicles in combination without special permits:

A vehicle may tow only one vehicle or trailer in Oregon (a two-vehicle combination ORS 818.110). Some states allow towing more than one trailer or vehicle by non-commercial vehicles. Permits are not allowed in Oregon for towing more than one trailer or vehicle except for commercially titled and registered vehicles.

DMV Title and Registration Requirements:

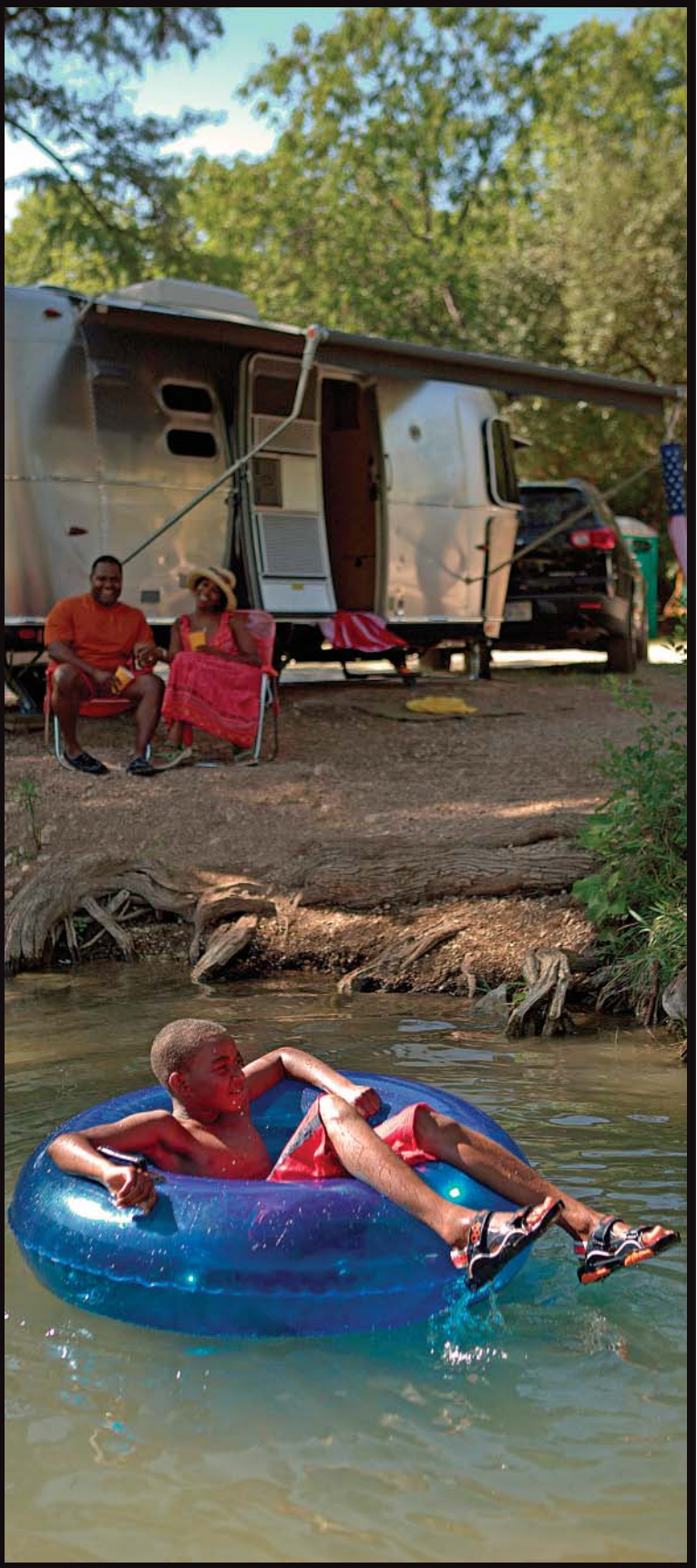


Trailers operated on Oregon's public roads must be titled and registered with DMV. Fees are based on the loaded weight of the trailer. Light trailers are trailers with a loaded weight of 8,000 pounds or less, heavy trailers are trailers with a loaded weight over 8,000 pounds. Trailers with a loaded weight of 1,800 pounds or less are exempt from title and registration requirements.

Travel trailer registration fees are based on the length of the trailer rather than loaded weight.

Travel Outside of Oregon:

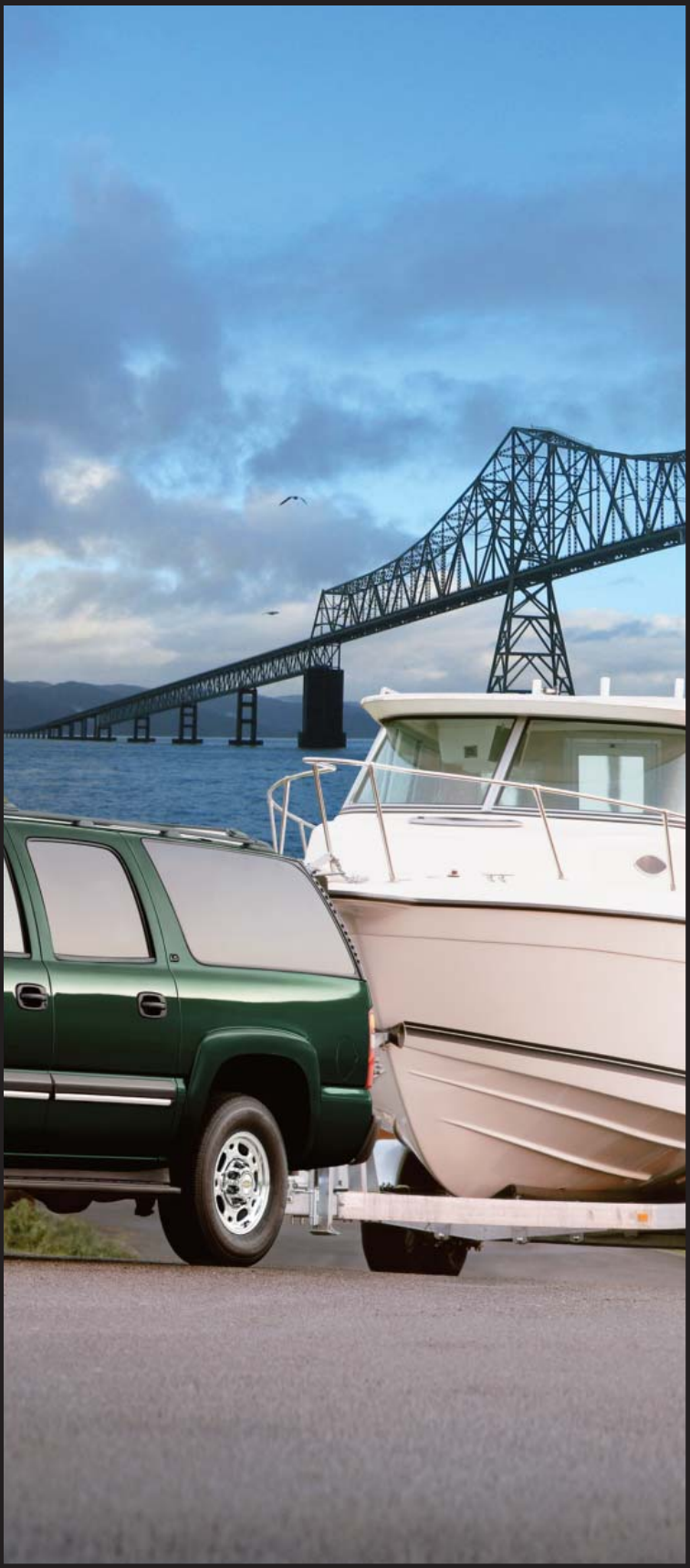
If you plan to travel in another state, don't forget to check its requirements also. For example, surge brakes may not be legal in some jurisdictions. In addition to licenses and permits, there may be weight, height, and width limits for using certain roads, bridges, and tunnels. Also, be aware of restrictions regarding the transport of propane gas and other volatile gases or fuels in tunnels. And don't forget to contact your insurance company to make sure you have the proper coverage.



PRE-DEPARTURE SAFETY CHECKLIST

Before driving, make sure your vehicle maintenance and trailer maintenance are current. This is very important because towing puts additional stress on the tow vehicle. (Review the next section of the brochure for an overview of maintenance requirements.)

- ❑ Check and correct tire pressure on the tow vehicle and trailer.
- ❑ Make sure the wheel lug nuts/bolts on the tow vehicle and trailer are tightened to the correct torque.
- ❑ Be sure the hitch, coupler, draw bar, and other equipment that connect the trailer and the tow vehicle are properly secured and adjusted.
- ❑ Check that the wiring is properly connected—not touching the road, but loose enough to make turns without disconnecting or damaging the wires.
- ❑ Make sure all running lights, brake lights, turn signals, and hazard lights are working.
- ❑ Verify that the brakes on the tow vehicle and trailer are operating correctly.
- ❑ Check that all items are securely fastened on and in the trailer. Check awning, antennae, steps, doors, etc.
- ❑ Be sure the trailer jack, tongue support, and any attached stabilizers are raised and locked in place.
- ❑ Check load distribution to make sure the tow vehicle and trailer are properly balanced front to back and side to side.
- ❑ Check side- and rear-view mirrors to make sure you have good visibility.
- ❑ Check routes and restrictions on bridges and tunnels.
- ❑ Make sure you have wheel chocks and jack stands.



SAFETY TIPS FOR DRIVING WITH A TRAILER

Take time to practice before driving on main roads. Before you leave, remember to check routes and restrictions on bridges and tunnels. Consider the following safety tips each time you drive with a trailer.

General Handling

- Use the driving gear that the manufacturer recommends for towing.
- Drive at moderate speeds. This will place less strain on your tow vehicle and trailer. Trailer instability (sway) is more likely to occur as speed increases.
- Avoid sudden stops and starts that can cause skidding, sliding, or jackknifing.
- Avoid sudden steering maneuvers that might create sway or undue side force on the trailer.
- Slow down when traveling over bumpy roads, railroad crossings, and ditches.
- When approaching a corner reduce your speed early. Make sure you are traveling at or below the posted speed (yellow and black signs).
- Make wider turns at curves and corners. Because your trailer's wheels are closer to the inside of a turn than the wheels of your tow vehicle, they are more likely to hit or ride up over curbs.
- To control swaying caused by air pressure changes and wind buffeting when larger vehicles pass from either direction, release the accelerator pedal to slow down and keep a firm grip on the steering wheel.

Passengers

Oregon law allows passengers to ride in a fifth-wheel type trailer but they need to have an auditory or visual signaling device between passenger and driver, at least one unobstructed exit and safety glass wherever there are windows or doors. Passengers are not allowed to ride in or on non fifth-wheel type trailers.

Braking

- Allow considerably more distance for stopping.
- If you have an electric trailer brake controller and excessive sway occurs, activate the trailer brake controller by hand. Do not attempt to control trailer sway by applying the tow vehicle brakes; this will generally make the sway worse.
- Always anticipate the need to slow down. To reduce speed, shift to a lower gear and press the brakes lightly.

Acceleration and Passing

- When passing a slower vehicle or changing lanes, signal well in advance and make sure you allow extra distance to clear the vehicle before you pull back into the lane.
- Pass on level terrain with plenty of clearance. Avoid passing on steep upgrades or downgrades.
- If necessary, downshift for improved acceleration or speed maintenance.
- When passing on narrow roads, be careful not to go onto a soft shoulder. This could cause your trailer to jackknife or go out of control.

Downgrades and Upgrades

- Downshift to assist with braking on downgrades and to add power for climbing hills.
- On long downgrades, apply brakes at intervals to keep speed in check. Never leave brakes on for extended periods of time or they may overheat.
- Some tow vehicles have specifically calibrated transmission tow-modes. Be sure to use the tow-mode recommended by the manufacturer.

Backing Up

- Put your hand at the bottom of the steering wheel. To turn left, move your hand left. To turn right, move your hand right. Back up slowly. Because mirrors cannot provide all of the visibility you may need when backing up, have someone outside at the rear of the trailer to guide you whenever possible.
- Use slight movements of the steering wheel to adjust direction. Exaggerated movements will cause greater movement of the trailer. If you have difficulty, pull forward and realign the tow vehicle and trailer and start again.

Parking

- Try to avoid parking on grades. If possible, have someone outside to guide you as you park. Once stopped, but before shifting into Park, have someone place blocks on the downhill side of the trailer wheels. Apply the parking brake, shift into Park, and then remove your foot from the brake pedal. Following this parking sequence is important to make sure your vehicle does not become locked in Park because of extra load on the transmission. For manual transmissions, apply the parking brake and then turn the vehicle off in either first or reverse gear.
- When uncoupling a trailer, place blocks at the front and rear of the trailer tires to ensure that the trailer does not roll away when the coupling is released.
- An unbalanced load may cause the tongue to suddenly rotate upward. Before un-coupling, place jack stands under the rear of the trailer to prevent injury.

ENGINE OIL

MAINTENANCE

Tow vehicles often have more frequent maintenance requirements, including changes of engine and transmission oils and filters, lubrication of components, and cooling system checks. Check your owner's manual for information on scheduled maintenance of your tow vehicle and trailer. Here are some additional maintenance suggestions.

Tires

Periodic inspection and maintenance of tow vehicle and trailer tires and wheels are essential to towing safety, including spare tires. Proper tire pressure affects vehicle handling and the safety of your tires. You can find the correct tire pressure for your tow vehicle in the owner's manual or on the tire information placard.

- Underinflation reduces the load-carrying capacity of your tow vehicle or trailer, may cause sway and control problems, and may result in overheating, causing blowouts or other tire failure.
- Overinflation causes premature tire wear and affects the handling characteristics of the tow vehicle or trailer.

Brakes

On a regular basis, have the brakes on both vehicles inspected. Be sure that necessary adjustments are made and any damaged or worn parts are replaced.

Hitch

Check the nuts, bolts, and other fasteners to ensure that the hitch remains secured to the tow vehicle and the coupler remains secured to the trailer. The connection point may require periodic lubrication to permit free movement of the coupler to the hitch ball.

Wiring

Make sure connector-plug prongs and receptacles, light bulb sockets, wire splices, and ground connections are clean and shielded from moisture. Lightly coat all electrical terminal connections with nonconducting (dielectric), light waterproof grease.

Clean the prongs with very fine sandpaper, being careful not to damage the contact area.

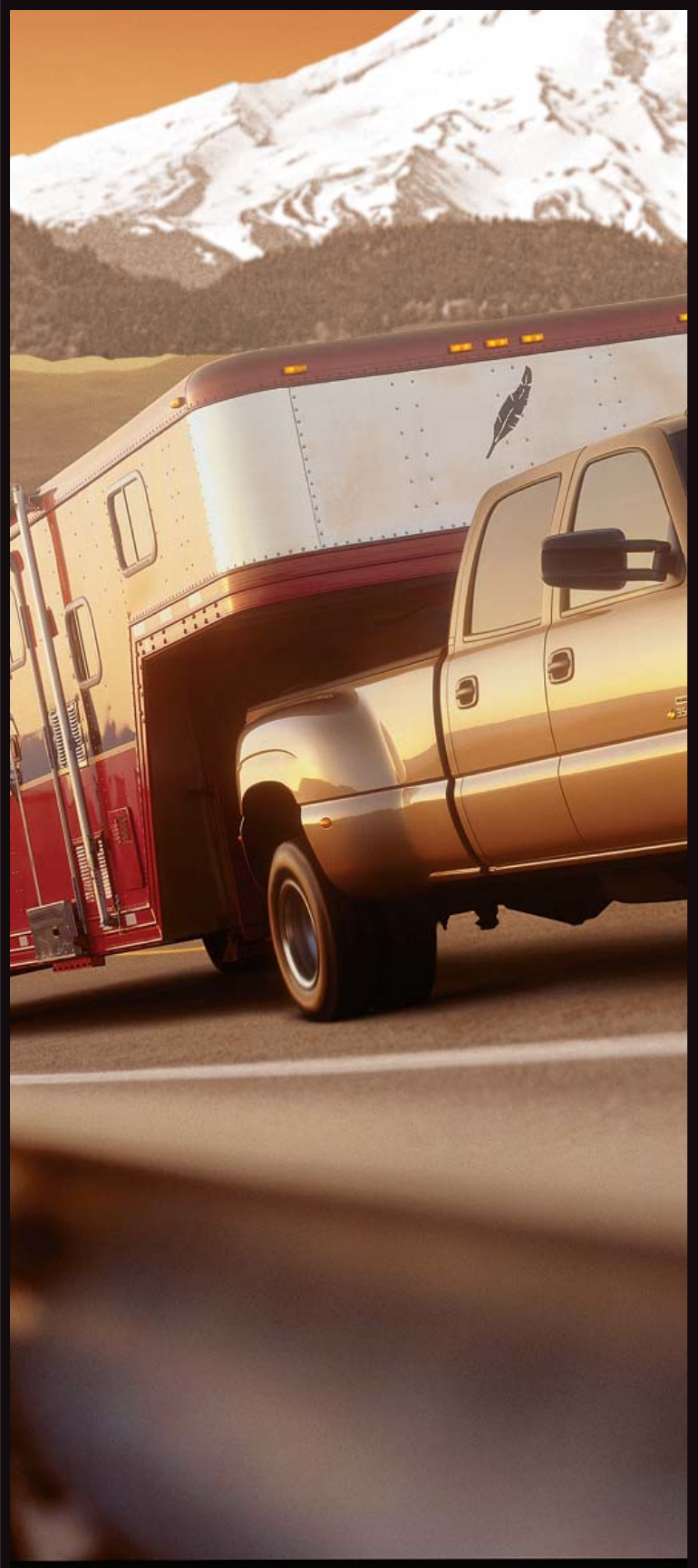
Clean the surface deposits in the connector holes. (Make sure the lights are off to prevent blowing a fuse.) Try to clean off only the deposits and lubricate lightly with dielectric, light waterproof grease.

Fluids

At the start of every trip and each time you fuel up, check the engine oil, coolant and transmission fluid. Follow the instructions in your owners manual. Avoid trouble while on the road by checking these before you leave.

Trailers that have been stored

Tow vehicles and trailers that have been stored for extended periods of time require special care before use. Wheel bearings can develop grease “bare spots” that can cause unexpected failure on the road. Also, tires that have been in one position for an extended period of time can develop hidden flaws. If in doubt, contact your trailer or tire service provider for further advice.



RESOURCES

To Report Safety Problems and Obtain More Information

If you have a safety problem with your vehicle, or if information is missing from your trailer certification label, call the DOT Auto Safety Hotline at 888-327-4236/TDD 800-424-9153.

For Additional Information

National Association of Trailer Manufacturers (NATM)
2945 SW. Wanamaker Drive, Suite A
Topeka, KS 66614-5321
785-271-0208
785-271-0166 Fax
www.natm.com

National Marine Manufacturers Association (NMMA)
200 East Randolph Drive, Suite 5100
Chicago, IL 60601-6528
312-946-6200
312-946-0388 Fax
www.nmma.org

Recreation Vehicle Industry Association (RVIA)
1896 Preston White Drive
P.O. Box 2999
Reston, VA 20195-0999
703-620-6003
703-620-5071 Fax
www.rvia.org

For questions regarding your tow vehicle, please contact your automobile dealer or manufacturer.

THREE EASY WAYS TO AVOID DELAYS

Learn more about Oregon roadway conditions with these helpful trip-planning resources.

TripCheck www.tripcheck.com

www.TripCheck.com

Visit the site for current travel information, highway conditions and road work projects, as well as winter traction tire and chain requirements.

511 Travel Info

Dial 511 or 1-800-977-6368

Call for the latest on traffic, weather and highway conditions by route, major city or mountain pass. Simply speak or press the keys on your touch-tone phone and get the answers you need.

TripCheck Mobile

www.TripCheck.com/mobile

If your mobile phone is web-enabled, traveler information can be formatted for your device.

Sites of Interest:

http://www.oregon.gov/ODOT/TS/Veh_Equipment.shtml

www.oregon.gov/ODOT/TS/roadwaysafety.shtml

www.fhwa.dot.gov

www.nhtsa.gov

Parts of this publication were developed by the National Highway Traffic Safety Administration (NHTSA). Permission has been given to revise and reproduce for the State of Oregon. The information is not intended to be a comprehensive document for safe trailer operation. As a helpful guide it contains information that, if used, can reduce risk. Good judgement should be used to adapt this information to different equipment, driving situations and conditions.

Transportation Safety
Oregon Department of Transportation

Photos courtesy of
BMW, Da'Lan Hitch,
EZ Loader Boat Trailers,
GM, and Recreation Vehicle
Industry Association.

Form 737-3503 (6-12)
STK #330032