

DEFINITIVE GUIDE TO SAFE TOWING

by: **Weigh
Safe!**
MEASURES TONGUE WEIGHT



www.weigh-safe.com



There is a revolution taking place in the world of towing, and we want to help people understand just how important (and easy!) it is to have safe towing peace of mind by weighing your tongue weight before you tow.

Those who tow within their load's target tongue weight have a huge safety advantage that is hard to overstate, and we wanted to provide a complete guide for safe towing.

If towing safely is important to your business or lifestyle then this guide is for you. Let's begin.

What is Safe Towing?

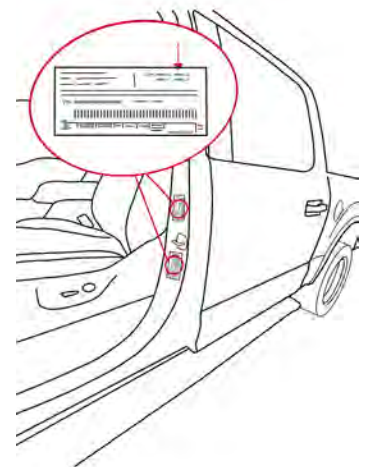
The capacities of your truck, trailer, and hitch each play an important role in how much you should be towing. Safe towing is understanding, calculating and staying within the specified weight limits of each part of your towing system.

What is the meaning of GVWR? Why is tongue weight so important? Do I need a weight distribution hitch? Let's start at the beginning...

#1 - Towing Within Your Truck's Tow Capacity

Towing capacity refers to how much weight you can safely pull behind your truck with a trailer. It will take a few minutes and some calculations to pin down your truck's exact towing capacity. Start by getting some information from your door sticker:

- GVWR** – Gross Vehicle Weight Rating (the maximum amount your truck can safely weigh when loaded. It also includes tongue weight, which is not the weight of the trailer and payload itself, but the downward force it exerts on the trailer hitch ball)
- GCWR** – Gross Combined Weight Rating (the maximum combined amount your truck and trailer can safely weigh when loaded)
- Payload Capacity** – the maximum cargo weight that you can safely add to your truck's curb weight (GVWR minus the truck's curb weight)
- Curb Weight** – this is how much your truck weighs empty (without anyone in it or any cargo)



Tow Capacity Formula

1. Find out curb weight.
2. Add the weight of the payload (passengers, cargo, tongue weight) to the curb weight.
3. Subtract this number from your truck's GCWR.
4. This is your max towing capacity.
5. Check to make sure your hitch and trailer can also handle this weight.

PRO TIP:

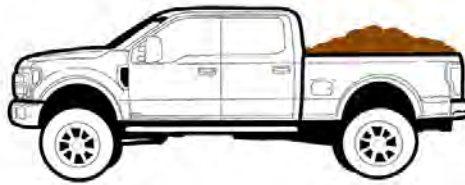
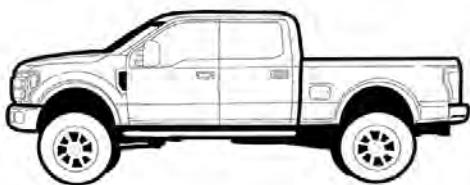
Weigh your truck with all your normal, everyday gear and equipment (i.e. custom tool box, spare tire, etc) at a weigh station to determine accurate curb weight.

Here's an example with numbers. Let's say your truck has a GCWR of 15,000 lbs. It weighs 5,000 lbs empty and you just loaded 4,000 lbs of dirt in the truck bed. Your towing capacity would be no more than 6,000 lbs.

GCWR: 15,000 lbs

5,000 lbs. **EMPTY**

9,000 lbs. **LOADED**



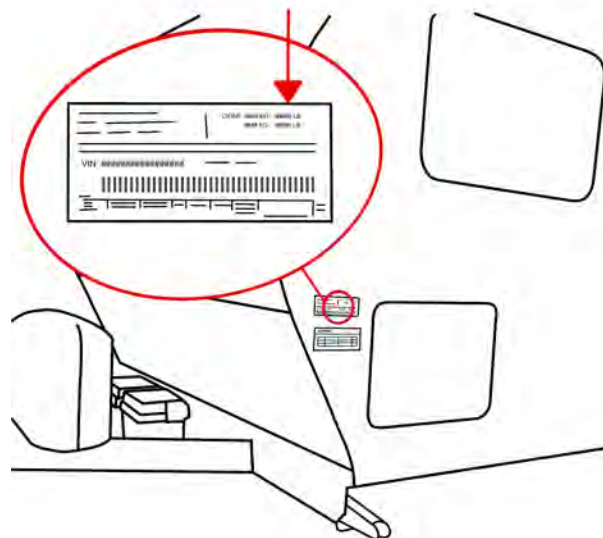
TOWING CAPACITY
=
6,000 LBS.

#2 - Towing Within Your Trailer's Load Limit

Towing within your trailer's load limit refers to the maximum amount of weight you can load onto it. To determine the safest load limit for your trailer, **start by locating the Federal Certification/VIN label on the front half of your trailer.** It should be located on the left side.

Specifications on the label should include:

- GVWR** – Gross Vehicle Weight Rating (the total maximum amount your trailer can safely weigh when loaded)
- GAWR** – Gross Axle Weight Rating (the maximum amount of weight that can be placed over each axle)
- Payload Capacity** – the maximum amount of cargo weight that you can safely load onto your trailer (your trailer's load limit)
- Trailer Weight** – this is how much your trailer weighs empty (you can weigh your empty trailer at a local weigh station)



Trailer Load Limit Formula

1. Find your trailer's GVWR.
2. Subtract your trailer weight.
3. This is your trailer load limit.
4. Check to make sure your truck is capable of pulling your trailer's GVWR, and that you're following tire, hitch, and loading specifications.

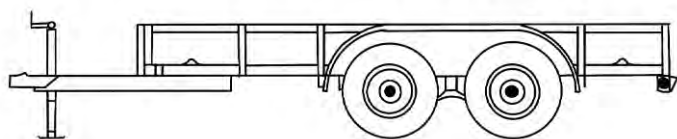
Let's go back to our example with numbers. You've calculated that your towing capacity is 6,000 lbs. Your utility trailer has a GVWR of 4,000 lbs and it weighs 1,000 lbs empty. Your trailer load limit is no more than 3,000 lbs.

In this case, even though your truck's tow capacity could handle another 2,000 lbs, your trailer can not. Cargo should only be added up to your trailer's listed GVWR on the placard.

TOWING CAPACITY = 6,000 lbs

GVWR: 4,000 LBS.
1,000 LBS. EMPTY

TRAILER LOAD LIMIT
=
3,000 LBS.



#3 - Towing Within Your Target Tongue Weight

Safe towing requires a certain amount of downward pressure on the hitch ball, called tongue weight, to ensure that the trailer will tow straight and remain stable. In all cases, it is not the weight itself that matters, it's what tongue weight represents: that the trailer's center of mass is situated ahead of its axle.

How Tongue Weight Affects Your Truck's Stability & Handling

CHECK OUT THIS VIDEO: <https://youtu.be/w9Dgxe584Ss>

This video demonstrates just how vital it is to keep within your target tongue weight. Yet, manually measuring tongue weight is an extensive process requiring several steps: pulling your trailer onto the scale, uncoupling it, leaving it on the scale to get your total trailer weight, then reconnecting and driving your truck wheels off the scale to measure your trailer's axle weight measurement, then subtracting the axle weight from the total trailer weight to determine your trailer's hitch weight....

Get where this is going??

Most people don't bother to weigh tongue weight at all. They just eyeball it and call it good. Which puts you at risk of losing control of your truck and trailer.

Not any more.

Introducing your secret weapon...a **Weigh Safe** hitch with a built-in scale to measure tongue weight.

A Weigh Safe hitch will accurately measure the tongue weight of your trailer.

For safe towing, the recommended amount of tongue weight is

10% - 15% of your loaded trailer's weight. Use this formula to calculate the recommended amount of tongue weight for your trailer.



Target Tongue Weight Formula

1. Find your GTW (Gross Trailer Weight. This is the weight of your trailer, plus the weight of the cargo you've loaded onto it. GTW can also be referred to as GVW, Gross Vehicle Weight).
2. Multiply GTW by (0.1).
3. This is the minimum of your target tongue weight.
4. Multiply GTW by (0.15).
5. This is the maximum of your target tongue weight.
6. When loading your trailer, aim to position your cargo so that your trailer's tongue weight is within this range. Also, check to make sure the tongue weight isn't putting your truck's payload capacity above its maximum.

Adjusting Tongue Weight

Adjusting your tongue weight involves putting heavier items ahead of the trailer axle, but not all the way towards the extreme forward edge. You'll also need to center heavy items left-to-right and position them as low to the trailer deck as practical. Be sure to secure loose items — particularly the heavier ones — so they can't move and alter the trailer's tongue weight underway. The goal is to have about 60% of your cargo's mass ahead of the trailer axle and 40% behind.

CHECK OUT THIS VIDEO:

<https://www.weigh-safe.com/>

Let's follow up on our example with numbers. You've calculated that it's safe to load 2,500 lbs of landscaping equipment onto your new trailer. This brings your GTW to 3,500 lbs. This means your target tongue weight is within 350 lbs – 525 lbs. Your truck is already loaded with 4,000 pounds of dirt. With this additional tongue weight, your truck's total payload will now be 4,350 lbs – 4,525 lbs.

This brings your combined weight – your truck's curb weight (5,000 lbs), plus your truck's payload (4,525 lbs), plus your loaded trailer weight (3,500 lbs) – to a total of 13,025 lbs.

This total combined weight is below your truck's GCWR of 15,000 lbs, so you're feeling confident that your truck (and your trailer) can handle this amount safely.

But, can your hitch??

TARGET TONGUE WEIGHT

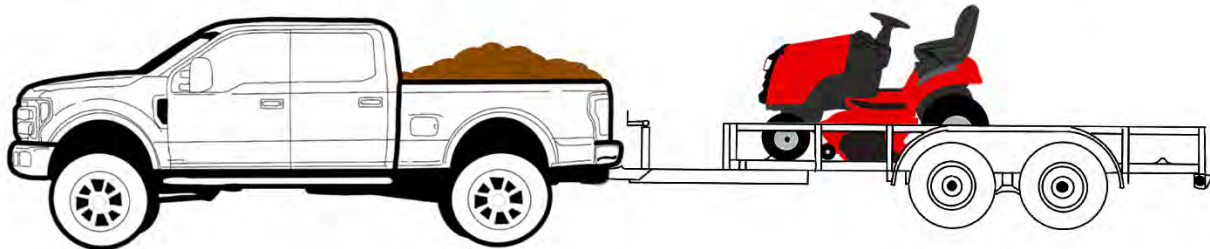
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350 LBS. - 525 LBS.

TOTAL PAYLOAD:

4,350 LBS. - 4,525 LBS.

GTW: 3,500 LBS.



$$\begin{array}{ccccccc} 5,000 \text{ LBS.} & + & 4,525 \text{ LBS.} & + & 3,500 \text{ LBS.} & = & 13,025 \text{ LBS.} < & 15,000 \text{ LBS.} \\ \text{CURB WEIGHT} & & \text{PAYLOAD WEIGHT} & & \text{LOADED TRAILER WEIGHT} & & \text{GCW} & & \text{GCWR} \end{array}$$

#3 - Towing Within Your Target Tongue Weight

Traditional hitches are composed of three main parts:

- Receiver** – the square receptacle that is mounted to your truck.
- Ball Mount** – the shaft that slides into the receiver and is securely pinned when it’s time to tow (should be removed, or stowed, when not in use).
- Trailer Ball** – the metal ball and connection point between your truck and trailer, allowing you to turn corners and travel over bumps and hills. (Trailer balls come in different diameters, and should be selected to match your trailer’s specific requirements).

All three of these components will be stamped or labeled with GTW (Gross Trailer Weight) ratings of their own, and all three ratings must meet or exceed your truck’s tow rating.

Hitch Capacity Formula

1. Find your receiver hitch GTW rating.
2. Find your ball mount GTW rating.
3. Find your tow ball GTW rating.
4. The lowest of these GTW ratings is the maximum capacity of your hitch.

PRO TIP:

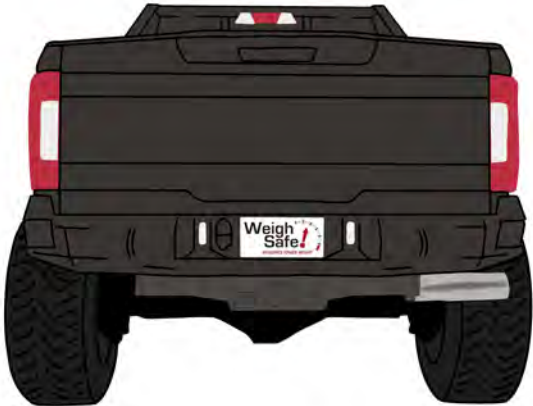
It’s important to note that using overrated components does not increase your truck’s towing capacity, but undersized ones represent the weakest link and must therefore lower it. You may not need the full capacity now, but when you need to pull a larger trailer in the future, it pays to have a hitch that is already equipped to handle the weight.

Receiver Hitch Ratings

Receiver hitch classes are separated by their maximum weight capacity rating and receiver opening size. Classes range from I to V, and each class has its own unique capacity and applications. You can start by using the chart below to determine which class of receiver hitch is required to pull your trailer:

Class	Basic Use	Size of Opening	Gross Trailer Weight (GTW)	Tongue Weight Capacity
I	Light-Duty	1.25”	2000 lbs	200 lbs
II	Moderate-Duty	1.25”	3,500 lbs	350 lbs
III	Versatile/Mix	2”	3,500-6,000 lbs	350-600 lbs
IV	Heavy-Duty	2”	10-12,000 lbs	1,000-1,200 lbs
V	Heaviest-Duty	2.5”	16-20,000 lbs	1,600-2,000 lbs

Continuing with our example: If your trailer has a GVWR of 4,000 lbs, your truck must feature, at least, a Class III receiver hitch to pull your fully-loaded trailer safely. And all of your ball mounts will need a 2” shaft that will fit into the 2” opening of your truck’s hitch receiver.



What size tow ball does my trailer hitch need?

The size of your hitch's tow ball must perfectly match the size of your trailer's coupler (the front part of your trailer, designed to latch onto the tow ball). Let's say your trailer comes with a 1-7/8" coupler. You'll need a 1-7/8" tow ball on your hitch's ball mount, in order for your trailer's coupler to latch onto the tow ball and operate correctly.

Tow Ball Ratings:

There is a comprehensive range of ball hitch sizes – and weight capacities range from 2,000 up to 30,000 pounds. When selecting a trailer ball (like any towing accessory), weight capacity must always be considered. You can start by using the chart below to determine which size and type is best for towing your trailer:

Type	Size of Tow Ball Diameter	Size of Shaft/Receiver	Gross Trailer Weight (GTW) Max
Weigh Safe	1-7/8"	–	Always rated at 7,500 lbs
Adjustable Drop Hitch	2"	–	Always rated at 8,000 lbs
	2-5/16"	2	12,500 lbs
		2.5	18,500 lbs
		3	21,000 lbs
Weigh Safe Fixed Height Ball Mount	2"	2"	10,000 lbs
Weigh Safe Universal Tow Ball	2"	–	10,000 lbs
Weigh Safe Universal Tow Ball with Clamshell	2-5/16"	–	10,000 lbs

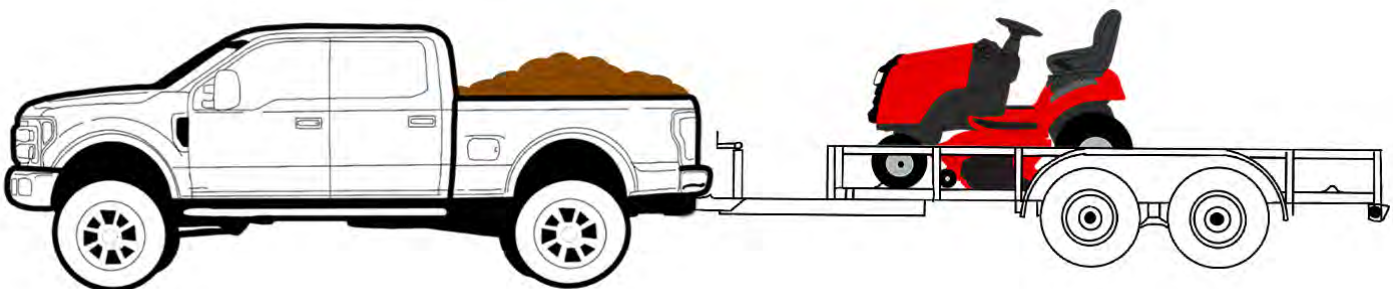
Continuing with our example: Let's say your truck features a Class IV receiver with a 2" opening, and your trailer features a 1-7/8" coupler. To hitch your trailer to your truck, you'll need a ball mount with a 2" shaft and a 1-7/8' tow ball.

Now, let's talk about the amount of drop or rise your ball mount must have to meet the height of your trailer.

#5 - Towing With The Correct Drop or Rise

If your trailer rides lower or higher than your truck, a specific ball mount can be used to make up the difference and ensure the trailer is level.

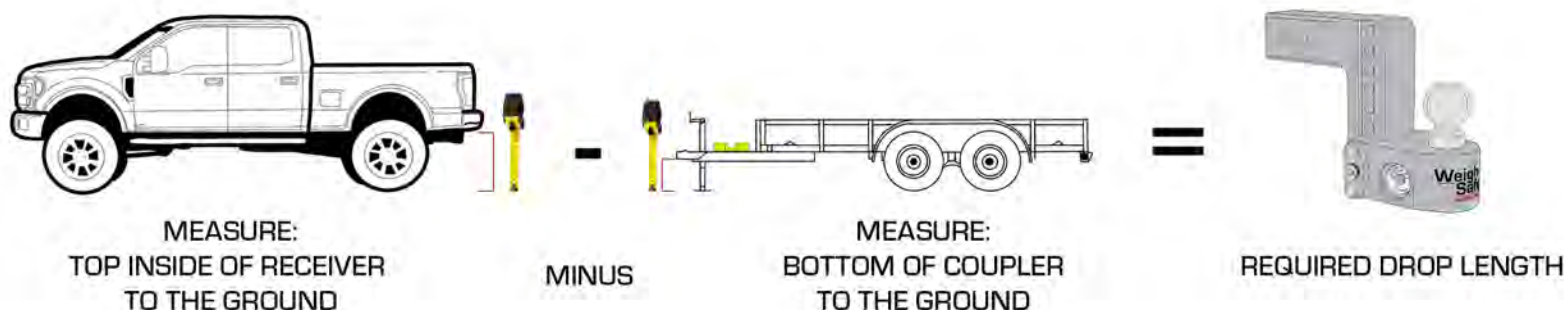
When loaded, both your truck and trailer must be level with the ground.



You'll need to make some further calculations to **determine how much of a drop, or rise, your ball mount requires to meet the height of your loaded trailer:**

Drop Length Formula (for trailers that ride lower than your truck)

1. Measure the distance from the bottom of your trailer's coupler to the ground (be sure your trailer is loaded and sitting level with the ground while you measure).
2. Subtract this number from the height of your hitch receiver (distance from the top of the inside of your truck's hitch receiver to the ground).
3. This is the required drop length of your ball mount.



Drop Length Formula (for trailers that ride higher than your truck)

1. Measure distance from the bottom of your trailer's coupler to the ground (be sure your trailer is loaded and sitting level with the ground while you measure).
2. From this number, subtract the height of your hitch receiver (distance from the top of the inside of your truck's hitch receiver to the ground).
3. This is the required drop length of your ball mount.

PRO TIP:

Be sure your trailer is exactly level with the ground by placing a level on the top of your trailer's coupler. Use the crank on your trailer jack to adjust the height, up or down, until the level is plumb, then take your measurement.

Redefining the Hitch

Adjustable trailer hitches are one of the many great solutions that make towing easier and safer. With so many different trucks and trailers out there, adjustable trailer hitches make it easy to tow numerous trailers on an array of different tow vehicles with one single hitch.

Meet the Weigh Safe Drop Hitch: An adjustable trailer hitch with a built-in scale.

The easiest solution for:

measuring tongue weight
making vertical height adjustments
switching between different tow ball sizes
towing a variety of trailer types

PRODUCT FEATURE:

Weigh Safe Adjustable Drop Hitches come in an array of different drop lengths ranging between 4 to 10 inches, each with 1" increments for adjustability. All of which can be used in both the drop and rise position.



#6 - Ensuring Adequate Hitch Clearance

To avoid that dreaded scraping sound and to avoid damage to your trailer, you'll need adequate clearance from the bottom of the hitch to the ground. It's important to note that the "drop length" of a hitch is not the same as its "total length".

When your trailer is fully loaded, there must be a minimum clearance of 11 inches from the bottom of the hitch to the ground.

All Weigh Safe Draw Bars are 3 inches longer than their listed drop length. **To ensure adequate clearance, start by using this formula to choose the right drawbar size for your adjustable trailer hitch:**

Hitch Clearance Formula

1. Find your required drop length (use drop length formula above).
2. Add 3 inches.
3. This is your total hitch length. Subtract this number from the height of your truck's hitch receiver (distance from the top of the inside of the hitch receiver to the ground).
4. This is your hitch's amount of clearance and **should be no less than 13 inches when the hitch is unloaded** (uncoupled from the trailer).
5. Your hitch's clearance **should be no less than 11 inches when the hitch is loaded** (coupled to the trailer and bearing tongue weight).

Here's another example with numbers. Let's say that you own a Ford F350 pickup truck. You've measured 24.5 inches from the top of your hitch receiver to the ground. You've considered purchasing a hitch with a 10-inch drop, for plenty of vertical height adjustment options. However, a Weigh Safe Hitch with a 8-inch drop, has a total length of 13 inches.

Using the hitch clearance formula, you calculate that 24.5 inches minus 13 inches would only leave you with 11.5 inches of clearance, unloaded. Ultimately, you decide to invest in a hitch with a drop length of no more than 8 inches, so that you'll have plenty of clearance, especially, when your hitch is fully loaded (carrying your trailer's tongue weight).

#7 - Towing With Weight Distribution & Sway Control

So far, we've discussed towing mid-range sized trailers. But, let's say you're ready to pull a trailer with a GTW of 6,000lbs. You might be thinking, "*but, my basic trailer hitch already has a max GTW of around 8,000 lbs, right?*" ... Yes, you're right, it does. But, that doesn't mean it will be able to deliver the kind of sway control and driving safety you'll need when towing at its maximum capacity.

This is where a weight distribution hitch comes in. Your truck's owner's manual should provide you with specifications regarding weight distribution use. For instance, the 2018 Chevy Traverse owner's manual states that weight distribution and sway control are required when towing a trailer over 5,000 lbs. You can also **use this checklist to determine if you'll need a weight distribution hitch:**

Indicators You Need a Weight Distribution Hitch

- Your trailer weight (GTW) is more than 50% of your truck's weight (GVWR)
- The rear of your truck sags when the trailer is hooked up
- You experience trailer sway
- Your truck's headlights point upward
- You find it difficult to steer or stop
- You want to tow to the highest capacity allowed by your trailer hitch

If you're ready to install a weight distribution hitch, you can begin by reading our *Definitive Towing Guide for Weight Distribution*.





#8 – Towing Heavy Duty Loads Securely

Towing heavy-duty-sized loads – such as horse trailers, industrial equipment, or RV's – comes with even more considerations. Only pick-up trucks equipped with a towing system for a gooseneck hitch can tow weight capacities of 30,000 lbs.

If you're ready to install a gooseneck hitch, you can read our *Definitive Guide to Heavy-duty Towing*.

#9 – Understanding Truck & Trailer Maintenance

Safe towing also means getting to know your equipment, learning how to install it, and understanding how to operate and maintain it. You'll get more comfortable with your equipment over time, but here's a **helpful checklist to go over each time you hit the road**:

Towing Trip Checklist:

- Go over your calculations and formulas one more time. In the event of an accident, or being inspected – if you have not adhered to the safety recommendations, specifications, and ratings of your truck, hitch, and trailer – it's a violation and a ticket.
- Check your truck and trailer tires.
- Your truck tires may require higher pressure for towing, as recommended in the owner's manual.
- Your trailer tires may have dry rot or cracking, especially, if your trailer has been stored outside and/or hasn't been used for a season.
- Don't forget to check the wheel lug nuts on your trailer and truck are tightened to the specified torque.
- Check your oil, fluids, and brakes. Towing puts additional stress on your truck. So before heading out on a towing road trip, be sure your truck has:
 - had a recent oil and filter change
 - brake pads with plenty of life remaining
 - its engine coolant filled to the proper level in the reservoir
 - plenty of transmission fluid

If your trailer has brakes, it's also a good idea to have those checked, as well, and to keep the wheel bearings greased.

- **Take a spare tire kit for your trailer.** Make sure you have at least one spare tire for your trailer. You'll also want a lug nut wrench specific to your trailer's wheels, as well as a jack that will work properly with your trailer.
- Cross your trailer's safety chains. Don't just run them straight. Crossed chains are meant to form a 'cradle'. If the hitch was ever to fail, the tongue of the trailer would fall down into the crossed chains, rather than digging into the pavement.
- The chains should have enough slack to permit sharp turns, but not drag on the road.
- Check trailer lights. Inspect the wires by hand; they should be loose enough to permit turns without getting disconnected, but tight enough that they won't touch the road. Be sure the trailer's running lights, brake lights, turn signals, and hazard lights are all working properly.
- Consider towing mirrors. If your trailer is wider than your truck, look into getting wide aftermarket tow mirrors to help you see your trailer's blind spots while driving and to aid rear visibility when backing up.
- Plan Ahead for Fuel Stops. You'll generally use more fuel while towing, and stopping at a small, remote gas station is not so easy with a large truck and trailer.
- Use wheel chocks. When unhooking the trailer from your truck, place wheel chocks (sturdy, wedge-shaped blocks) in front of and behind the trailer's tires to ensure the trailer doesn't roll away when you release the hitch.

#10 - Using Safe Driving Techniques

In many cases, your trailer will weigh more than your truck. All that extra weight behind the truck will have a huge impact on the truck's driving ability. **You'll need to learn new driving techniques to ensure safety on the road while towing:**

DOUBLE VEHICLE WEIGHT - **DOUBLE** YOUR STOPPING DISTANCE



DOUBLE VEHICLE SPEED - **QUADRUPLE** YOUR STOPPING DISTANCE



Safe Driving Techniques For Towing:

- Allow for longer stopping distances. Be more attentive to vehicles stopping suddenly ahead of you when towing, and begin braking sooner than if you weren't towing.
- Drive in the right lane on highways as much as possible. This will make it easier for you to get over to the shoulder if ever you need extra stopping room or happen to have a tire blowout.
- Don't ride your truck's brakes on long downhills. Shift the truck's transmission to a lower gear to help slow the vehicle and take some strain off of the brakes. Applying the brakes at intervals to keep the speed in check (as opposed to constant application of the brake pedal) will help keep the brakes from overheating.
- Adjust trailer brakes according to load. For example, if your trailer is equipped with brakes, you'll want them set to use a lot of force when towing a heavy load, but when the trailer is empty, the trailer's brakes need to be readjusted for that lighter weight, so the trailer's tires aren't locking up and skidding.

- Consider Height: Trailers can be much taller than the truck, so keep clearances in mind when pulling into gas stations or low bridge situations
- Take constant care to make wider turns at curves and corners. The trailer tires are more likely to hit or ride up over curbs.
- Use a spotter when backing up. Have someone outside at the rear of the trailer while backing up whenever possible.
- - Even wide tow mirrors can't provide all the visibility you may need, particularly in situations where there are other vehicles, objects, or people in close proximity.
- Check your route ahead of time. Some roads don't allow trailers on them, and certain roads also have weight, height, and width limits. Plan your route ahead of time to avoid the hassle of having to backtrack to find roads that allow your rig.

Conclusion

Towing can seem like a daunting task, but nail these guidelines we've outlined and you'll be well on your way to towing safely and confidently!

For more support and tips on towing, you can browse some of our how-to videos, or feel free to contact us with any of your questions. We're here to help!



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