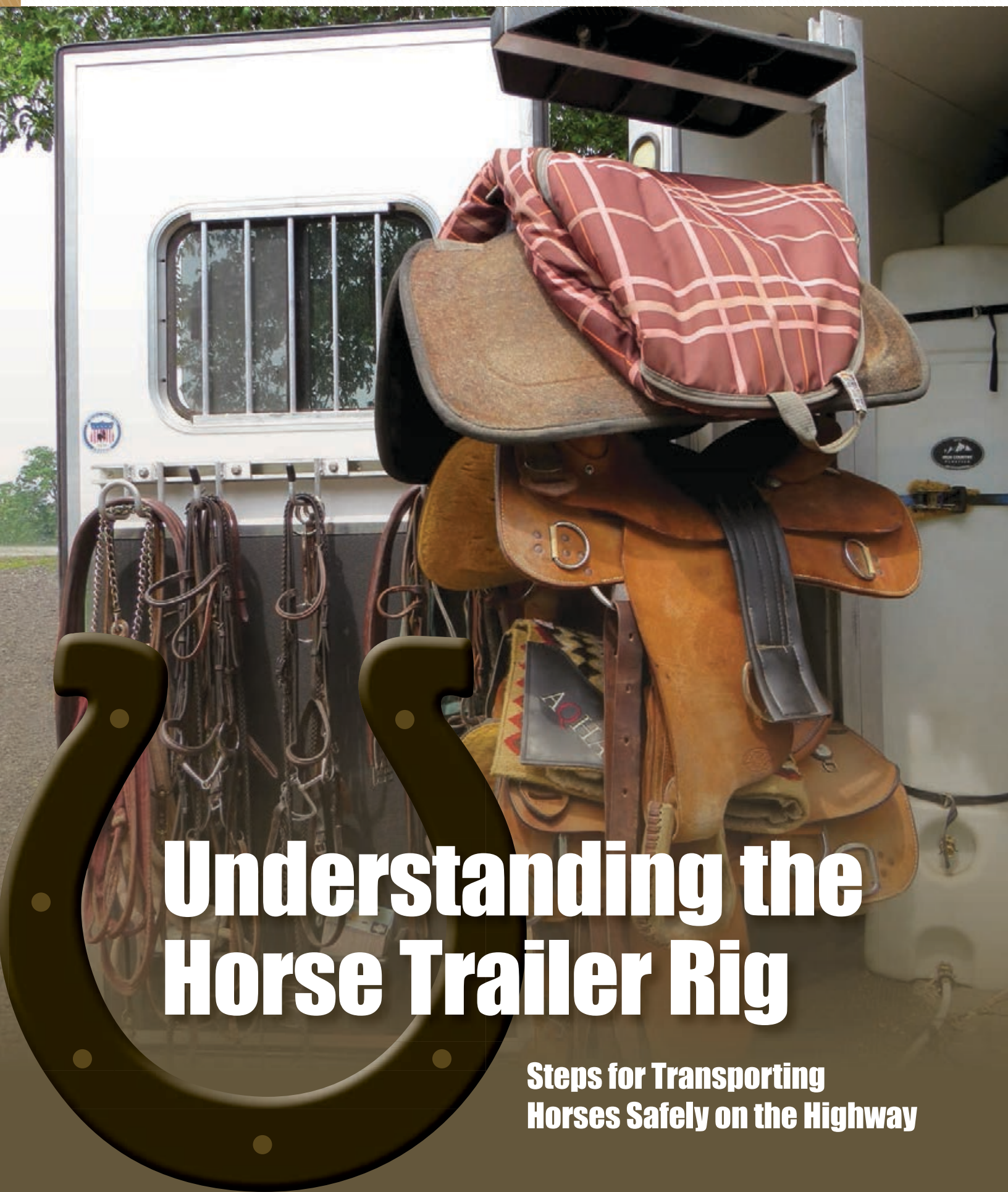
PURDUE EXTENSION

PPP-114



# Understanding the Horse Trailer Rig

## Steps for Transporting Horses Safely on the Highway

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# Introduction

Horses are an icon of early American history. Farmers once hitched horses to wagons to haul their commodities to town and pick up farm supplies or to pull their farm plows. The Pony Express used horses to deliver the mail. Paul Revere famously rode a horse through the streets of Lexington to alert the minutemen that the British were coming. Horses pulled army caissons and they made cavalry possible. Even today there are those (like the Amish) who continue use the larger breeds (like Belgians and Percherons) as work horses.

*Taking care of one of your best friends means transporting them just like you would your children.*


*A highway crash is enough to give any horse owner anxiety.*

While tractors, cars, and trucks have largely replaced horses for work, horses have not disappeared from the American landscape. So, it's ironic that horses now ride in trailers more than they pull them.

It's common to see dozens of horses grazing on summer pastures as you drive along rural roads. These horses are more like companion animals than livestock. Horse owners enjoy owning these majestic animals, whether it's walking to the barn to feed them, or riding them across pastures and through the woods. There are always horse shows, including the annual county fair where 4-H members showcase their horses and riding skills while competing for awards, cash, and trophies.

# Losing a Horse From Injury Can Be Catastrophic

Transporting horses involves placing them in an enclosed trailer, sometimes for hundreds of miles and several hours. While most owners seriously try to keep their horses healthy and safe, they often overlook how dangerous it is to move large animals on busy and congested highways. Sadly, there are plenty of examples of horse trailers detaching from trucks, killing the horses and endangering other motorists.

## SAFETY CHAINS SAVED MY HORSES

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Following trailer safety isn't just about obeying the law — it can save lives. Consider this real story of how safety chains saved a trailer from going over the edge of an embankment with two horses inside. Austen Gage had a terrible crash on the icy roads of Indiana. It could have been much worse if she did not have the proper safety chains on her trailer.

Here's how Gage describes what happened.

*"Driving down the highway, we hit a patch of black ice. The horses in the back (two of them), must have shifted in the trailer because it started to fishtail. The icy roads caused the whole situation to escalate quickly. Truck and trailer fishtailed all over the highway for approximately 600 yards.*

*"Several times I thought I had us straightened out, only to lose the trailer again. The roads had no traction to speak of. Finally, the trailer jack-knifed hard into the truck bumper, popped off the hitch, and flipped onto its side. Until I heard the loud boom of the trailer flipping behind me, everything was in slow motion. After the bang, my mind was a complete blank.*

*"Somehow the truck stopped, and my traveling companion and I got out. The truck and trailer were sideways, blocking the entire highway.*

*"I wish I had the words to express what I felt when I looked into the back of that trailer. I think 'hopelessness' is as close as I can get. After asking my companion to call 911, I remember saying out loud, 'I can't do this. I don't know how to do this.'*

*"The inside of the trailer was just a jumble of bodies and legs. The way the trailer had fallen, my companion's horse was on the bottom, but propped up halfway by the roof of the trailer. His legs were mostly free, but one was in between the slats of my trailer. I was afraid to open the trailer doors, in case he decided to back out and twist it. My horse was on his side completely, his halter and break-away lead still attached to the trailer. His head was twisted up, and his neck was at a 30-degree angle against the front of the trailer. Both horses were breathing heavily, and their eyes were wide. Neither was panicking or moving, which was a miracle."*

In an incredible story of bravery and level thinking, Gage worked with emergency response personnel to remove her horses safely from the flipped trailer. The photograph shows the trailer after responders removed the safety chains from the truck.

It is easy to see that if Gage did not have stout safety chains, the trailer probably would have flipped, and it could have gone off the road and over the embankment, making the conclusion of the story much less favorable.

There are numerous newspaper and personal accounts of instances when overloaded trailers push light-duty tow vehicles forward through stop signs only to be broadsided by oncoming traffic. We invest a lot of money and emotion in our horses, so losing a horse in a crash can be catastrophic for individuals and families.

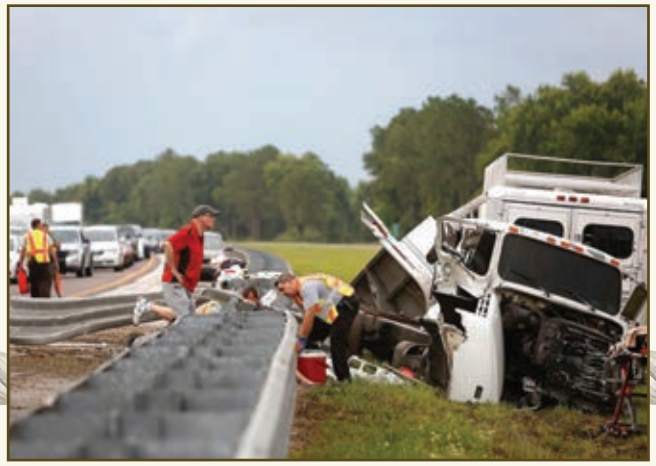
Knowing how to safely operate a truck and loaded horse trailer is just as critical as properly feeding, sheltering, and providing veterinary care for your horse. Whether the destination is 500 miles away or just around the corner, it should be a top priority to safely transport the horses that trust you enough to go into a trailer.

Horrific things can happen to horses when you overlook or ignore maintaining the trailer floor, hitch, coupler, or other structural components that could cause the trailer system to fail. It puts your equine friends and people at risk.

It's true that even the most safety-conscious drivers can be involved in highway crashes. But many crashes that involve trailers loaded with horses might have been prevented if the owners had taken a few minutes to bring their equipment up to highway standards.

After a crash, it's common to hear drivers remark, "If I had only known about that, I could have repaired it." But after the fact, it's too late.

This publication provides information about what it takes to safely attach a livestock trailer to a truck. We also will discuss examples of maintenance issues you need address as part of "the rig." While we emphasize safely transporting horses in trailers, the same principles hold true for transporting other livestock.



*Some horses survive the trauma of a trailer crash; others are less fortunate.*

# Consider the Horse Transportation Rig as a System

It's common for us to view the truck and trailer separately. Each has its own driving characteristics, braking patterns, load capacities, and tire sizes. When we join them, however, they become one unit. Each component (truck and trailer) depends on and influences the other while they move on the highway. When your tow vehicle-trailer system is not operating in unison or your equipment is mismatched, crashes do occur.

Because of this interdependence, it is useful to think of the towing vehicle and the trailer as a single system.

*A safe journey is the goal for you, your passengers, and your horses.*

Here are some common examples of transportation rig system problems and what can happen:

- **A loaded trailer that is too heavy for a lightweight tow vehicle** — the trailer can push the tow vehicle forward when an emergency stop is required.
- **A trailer that is loaded unevenly with too much weight on the back** — this can pull up on the coupling attached to the ball. Under these conditions, the trailer could uncouple and disconnect from the tow vehicle, or the vehicle could handle erratically at highway speeds. Not enough weight on the ball also makes it more likely that the trailer will sway at highway speeds. With a tagalong hitch (a.k.a. weight-carrying) trailer always place about 10 percent of its total weight down on the coupler. For example, if you have trailer with gross vehicle weight rating (GVWR) of 7,000 pounds fully loaded to 7,000 pounds, then 700 pounds of must be on the ball.

- **An undersized truck, hitch, insert, or ball** — such components can break if the load you're pulling exceeds the capacity of any component.
- **An unbalanced trailer** — this can make the trailer sway and cause the driver to lose control. Bad weather or other poor driving conditions can exacerbate this problem.

# The Anatomy of a Trailer 'Rig'

Hauling horses and other livestock isn't the same as moving inanimate payloads like mowers, furniture, boats, or campers. Before transporting nonliving loads, most drivers firmly secure all cargo with chains and straps to keep the load from falling off or moving around. You can't tie down a horse. And because horses have high centers of gravity and will move in the trailer, this creates a "shifting" or "live" load.

A live load can directly influence the tow vehicle during normal driving, but the real problem occurs if you have to engage the truck in evasive maneuvering — like stopping suddenly or swerving to miss another vehicle. Such moves cause the horse's weight to shift, which makes it challenging for any driver to regain control.

The good news is that there are things you can do to make your equipment and your horses as safe as possible. You can be safer if you better understand how to properly attach a truck and trailer, learn to identify where problems can arise, and know what maintenance issues need closer inspection.

At first glance, the major components of a horse transport tagalong hitch and a gooseneck rig look very different (see Know Your Hitch, page 12). But it may surprise you to learn that they are more similar than dissimilar. The major difference between these two hitch types is the location of the hitch ball. In a tagalong rig, the trailer's coupler mechanism is attached to the ball at the rear of the towing vehicle. In a gooseneck rig, the ball is above the rear axle of the truck (inside the truck bed).

*A horse trailer with a tagalong (weight-carrying) rig couples to a ball mounted at the rear of the truck.*

*A horse trailer with a gooseneck rig couples to a ball above the rear axle of the truck (inside the truck bed). Note that a gooseneck rig is different than a fifth wheel. A gooseneck uses a ball, a fifth wheel uses a flat "kingpin" receiver similar to a semi.*

# Know the Weights, Unlock the Mystery

Many people wrongly believe that as a truck's size increases (half-ton, to three-quarter-ton, to one-ton) that its towing capability automatically increases, too. That's not necessarily true.

Each vehicle has a specific tow rating based on its design. Tow ratings (as defined by the manufacturer) can vary significantly among the same models of a single truck. For example, a three-quarter-ton Ford F-250 may actually have a lower tow rating than its half-ton F-150 cousin — it all depends on how the trucks were built.

Trucks that have higher tow ratings are equipped with higher performance features such as heavy-duty engines, springs, transmissions, frames, U-joints, rear axles, and brakes. These features have nothing to do with whether a truck is called a three-quarter-ton or half-ton.


Look in the owner's manual for your truck to get the specific tow rating. To work properly, your truck should lead the trailer and control its movement. A "light" truck pulling a heavier trailer will instead react to what the trailer is doing. If a car suddenly stops in front of a truck that is pulling a trailer that exceeds the truck's towing capacity (even if the truck driver slams on the brakes), the weight of the loaded trailer will push the truck forward into the stopped car. When a truck tows more weight than it is designed to pull, the driver is more likely to lose control of the towing combination.


Each horse trailer should have a placard that provides more information about the trailer. Look for the trailer's gross vehicle weight rating (GVWR). For example, if a trailer has a GVWR of 9,760 (as in the photo below), then the trailer is designed to carry this amount — which includes the weight of the trailer itself plus the cargo.


If you don't know the general weight of your trailer and its load, you will be unprepared to manage the trailer in unforeseen situations. A horse trailer's loaded weight includes the trailer, horses, and equipment being carried.

Let's say you have a trailer that weighs 3,500 pounds empty, two horses that weigh 1,250 pounds each (a total of 2,500), and 500 pounds of show gear, water, and feed (see Table 1). Simple math puts the total weight of the loaded trailer at 6,500 pounds.

To be safe, your truck must have a minimum towing capacity of 6,500 pounds — it is always preferable to have a truck that can exceed the minimum capacity. In addition, the trailer should have a GVWR greater than the load it will carry (that is, greater than 6,500 pounds). You need to consider everything when calculating total weight.

**Table 1.** An example of calculating trailer weights.

| Rig Component | Weight (pounds) |
|---|---|
| Trailer | 3,500 |
| Horses (2) | 2,500 |
| Gear/feed | 500 |
| **Loaded Trailer Weight** | **6,500** |

There is one more set of numbers you must evaluate: the gross combined weight rating (GCWR). You should be able to find your truck's GCWR on a tag located in the doorjamb or behind the seat. The GCWR should also be in the owner's manual.

*A truck's GCWR is the maximum weight it can haul and tow.*

The GCWR includes:

1. The weight of the truck
2. The weight of the trailer it is towing
3. The total weight of the passengers, full fuel load, and cargo being carried in both the truck and the trailer

If you exceed the truck's GCWR, it will be similar to towing more than what the truck is designed to pull. That not only shortens the useful life of your vehicle, it could have dangerous consequences if you need to stop or maneuver in an emergency.

*No matter how new or fancy the trailer is, it needs proper care (just like your horses).*

## FIND OUT MORE

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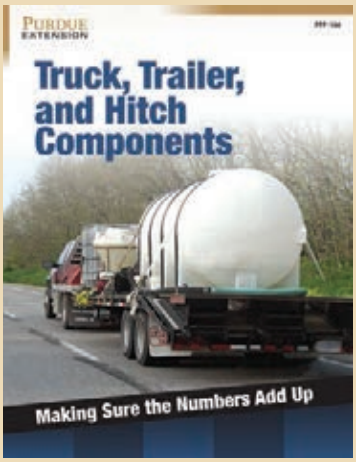
Learn more about pulling trailers from two Purdue Pesticide Programs publications:

- *Keep the Trailer Connected to the Truck: Understanding the Hitch System* (PPP-92)
- *Truck, Trailer, and Hitch Components: Making Sure the Numbers Add Up* (PPP-106)

Both are available from the Purdue Extension Education Store, **www.edustore.purdue.edu**.

# Let's Get Hitched

Look at the anatomy of a "bumper hitch" (no trailer should ever be placed on the actual bumper even if there are holes there for a ball). More precisely a bumper hitch is, called a tagalong, or weight-carrying hitch. Modern truck bumpers are more cosmetic than the custom-ordered bumpers of the past. Most bumpers can be pulled off or bent when a trailer's weight exceeds the bumper's rated capacity.

Typically, you can find a bumper's towing capacity written directly on the bumper. You might be shocked at first that the bumper is only rated from 2,000 to 5,000 pounds. A frame-mounted receiver hitch is vastly superior to a ball mounted on the bumper.


## Know Your Hitch

There are two main types of frame-mounted hitches: tagalong (weight-carrying) hitches and gooseneck hitches.

- **A tagalong hitch** carries the trailer's tongue weight on a ball at the rear of the truck.

- **A gooseneck hitch** is mounted in the center of truck bed, which allows the truck's frame, springs, and axles, to support the trailer's tongue weight directly over or slightly ahead of the truck's rear axle. A gooseneck hitch allows a tow vehicle (with properly rated axles and tires) to pull more weight, because the coupler or "pin" of the gooseneck exerts a vertical force on the axle rather than the lever action of a rear-mounted weight-carrying hitch.

## ACCESSORIZE ★ ★ ★

You can purchase weight-distributing (load-leveling) devices for towing extremely heavy trailers on weight-carrying hitches. These accessories use springs, levers, bars, or chains to distribute the vertical load from the rear of the truck to the front of the truck and to the rear of the trailer.

When a driver adjusts and tightens the support bars on the hitch, that action lifts up the back of the truck by creating a stiffer connection between the trailer tongue and the ball, thereby reducing the down force of the trailer on the ball. It will transfer some weight to the trailer's axles.

## Hitch Component Ratings Matter

In practice, a truck's tow rating is just one factor to consider when determining whether you can safely pull a trailer. Just as important, is the maximum towing capacity of the entire hitch assembly, which consists of the receiver, insert, and ball. These three devices together will determine how much of your truck's towing capacity you can use and the weight it can pull.

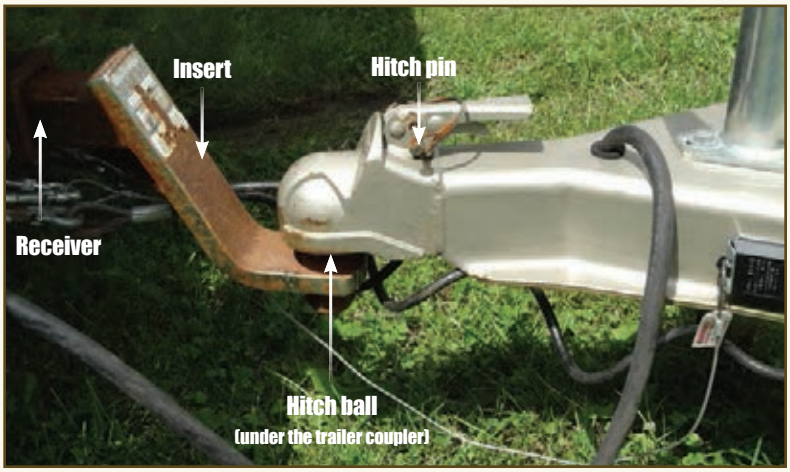
The entire hitch assembly is only as strong as its weakest component — analogous to the weakest link in a chain. Never let the weight of a trailer and its load exceed the rating of any one of the three hitch assembly components. If you do, the metal can bend or break, because the load exceeds the manufacturer's design specifications.

## Know Your Hitch Assembly Components

Each component of a hitch assembly is individually rated for the maximum load it can tow. Operating safely means you must work within maximum load limit for each component of the hitch assembly.

The components of a hitch assembly are:

- Receiver
- Insert
- Hitch pin
- Hitch ball




*This tagalong hitch shows its connection components.*

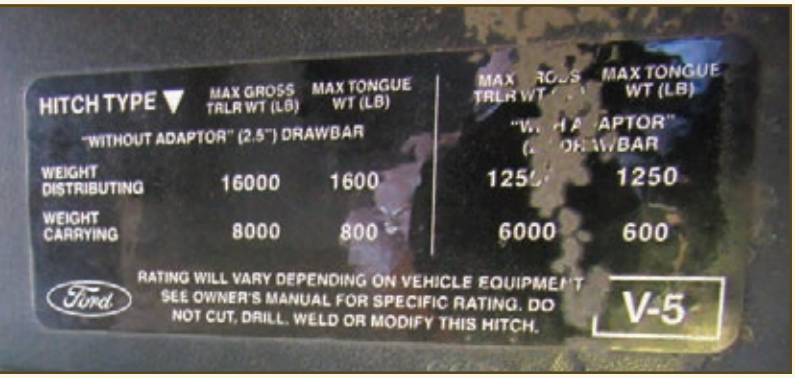
## Hitch Component: RECEIVER

A truck or large SUV with a "towing package" commonly has a factory-installed receiver bolted to the frame. This receiver forms the support base of the hitch system. Convenience, flexibility, cost, and durability have made these hitches very popular.

A factory-installed receiver usually has a label that lists the maximum weight it can tow. Often, the receiver's towing limit is less (sometimes significantly) than what the truck itself is equipped to pull.

*When that's the case, the receiver's towing weight replaces or downgrades the truck's towing capacity.*


*When you purchase a new towing vehicle, know what towing activities you'll be performing. When considering which vehicle to purchase, you can add the proper receiver capacity to the list of things you need. Always ask to install a receiver that is at least equal to what the truck can tow.*

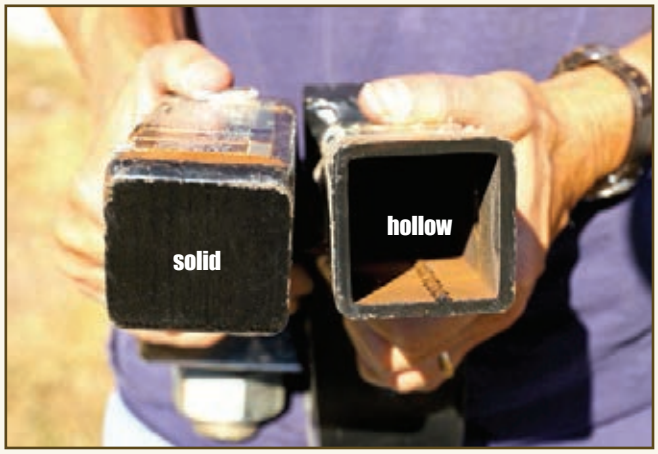



*Stickers tend to wear over time. Take a photograph before the information is lost forever and place the photo in the glove box or owner's manual.*

## Hitch Component: INSERT

Inserts (also known as "draw bars" or "ball mounts") can be hollow in the center or have solid cores. Like receivers, each insert has a rating stamped into the metal that states its maximum tow capacity and weight and the tongue weight it can support.

If this tag is missing or unreadable, you will not be able to tell the insert's rating. If you have an unreadable insert, play it safe: Replace the insert instead of taking chances.




*This photo shows the differences between solid and hollow mounts.*


*This insert is rated for pulling 10,000 pounds and a tongue weight of 1,000 pounds.*

Some companies make inserts that have the same rating whether you mount them in a rise or drop position. The instructions that accompany an insert should state how to use these types of inserts.

Remember that all receivers are subject to corrosion. When you're not using a receiver, remove it to keep it from rusting in place. Removing the receiver also prevents it from being stolen, lost, or accidentally falling out.

*This ball mount disconnected from a receiver and hit the windshield of a car that was following the tow vehicle.*

### Hitch Component: HITCH PIN

Manufacturers design different types of hitch pins that keep the insert locked to the receiver. Hitch pins are often made of solid steel with a hole to insert the keeper. Some designs include a lock that prevents the trailer from being disconnected and stolen. Hitch pins are generally not rated like the other components.

However, hitch pins wear down over time as the insert moves forward and backward when you tow the trailer. Pins can bend and break. Always replace any pin that is bent, worn, or rusted. So before you connect any trailer, be sure to inspect the hitch pin.

### Hitch Component: HITCH BALL

Common hitch ball diameters for towing horse trailers with trucks are 2 inches or 2 5⁄16 inches. Very light utility trailers only need hitch balls with a diameter of 1 7⁄8 inches, which is generally too small and lightweight for most horse trailers. The hitch ball's size is engraved on the top of the ball along with its towing weight rating.

Don't assume that balls with the same diameter have the same towing ratings (page 16). Regardless of diameter, each ball has its own rating, which is based on the material it was made from and on the diameter of the ball's shank.

Again, if you don't know the ball's rating, don't take chances: Replace it. Even if you do know the rating, replace a ball when the ratings have faded, become corroded, or every 10 years. Keep the ball lubricated to decrease wear from friction under the trailer coupler. If your ball shows any signs of wear, replace it immediately, because a worn ball will distort how the coupler and the ball attach.


*This insert is too small for the receiver and the ball is worn.*

*Examples of two sizes of hitch balls (1⅞ inches and 2 5⁄16 inches) that show different towing ratings.*


*A 2,000-pound, 1⅞-inch ball is usually not suited for horse trailers.*


*A 5,000-pound, 2-inch ball.*


*A 7,500-pound, 2-inch ball.*


*A 6,000-pound, 2 5⁄16-inch ball.*


*A 12,000-pound, 2 5⁄16-inch ball on a weight-distributing mount.*


*A 14,000-pound, 2 5⁄16-inch ball.*

# Balanced Halts and Stopping a Runaway

In Indiana and many other states, trailers that have a gross weight of 3,000 pounds or more must be equipped with a braking system between the truck and the trailer. Normally, these braking systems are electric, and you can adjust them with a brake controller in the cab of the tow vehicle. You can purchase these braking systems from the vehicle dealer or an after-market retailer.

There are two types of electric brake controllers: timed systems and inertia systems.

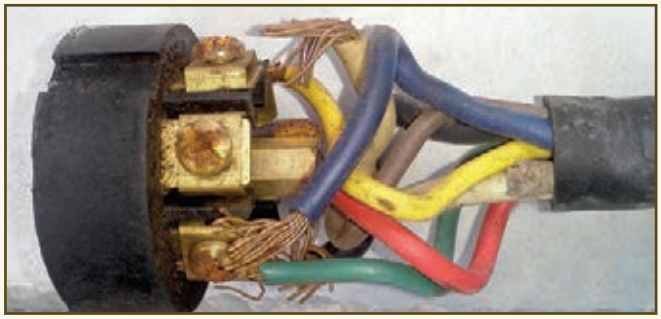
With a timed system, drivers can adjust the delay between the time the tow vehicle brakes are applied and the time the electric trailer brakes are applied.

Inertia systems apply the trailer brakes based on how hard the tow vehicle's brakes are being applied. They also adjust for the incline of the road surface.

To work correctly, you must adjust both systems according to the manufacturer's directions. Each braking system also includes a manual override that allows the driver to apply just the trailer brakes in situations where slowing or stopping the trailer is advantageous.

Although uncommon on horse trailers in the United States, some trailers use a style known as a surge brake. A surge brake has no connection to the tow vehicle other than the coupler. When the tow vehicle stops, momentum carries the trailer forward, which compresses a hydraulic cylinder in the trailer's coupler, subsequently applying the trailer brakes hydraulically.

*Keep the trailer connection socket and plug clean and corrosion–free to maintain reliable operating lights and brakes.*



*"A friend brought me her horse trailer on Monday to see if I could figure out why the brakes didn't work. I took the cover off the trailer end plug and found this mess. I can't believe anything worked."*

# Emergency Trailer Brakes Are the Last Backup System

Emergency trailer brakes are also required in case the trailer pulls free from the truck and the trailer no longer responds to the truck's braking system. Emergency trailer brake systems (commonly called "breakaway brakes") have batteries and switches mounted on the trailer's tongue or gooseneck. In Indiana, these systems are required for trailers with more than 3,000 pounds of gross weight.

The systems connect to the truck by a cable. If the trailer ever becomes detached from the towing vehicle, the cable removes an insert that is connected to the breakaway box and the battery engages the emergency brakes to stop the trailer independently.

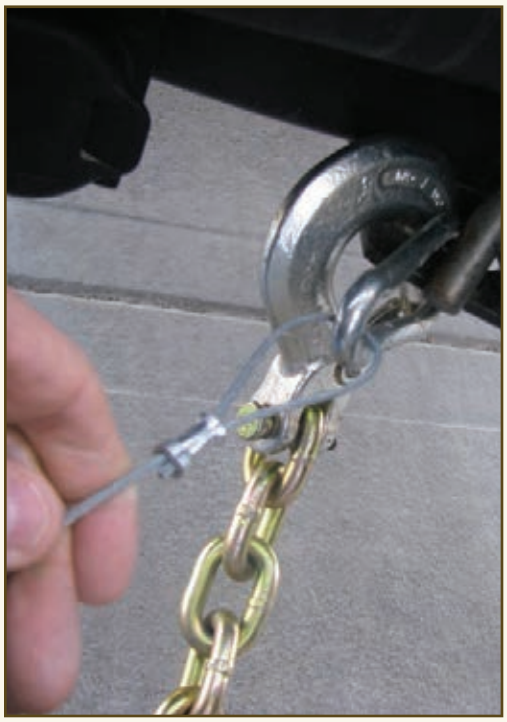
Regularly check the breakaway switch to be certain it is working. To do this, attach the trailer to the truck. Pull the cable so you remove the insert — if the unit is working this should set the trailer brakes. You can check this by driving forward a bit. If the tires roll, the brake did not engage; if the tires drag, the brake did engage. Often, you will hear a humming sound at each wheel when you activate the electric brakes. Most often, the reason why an emergency braking system fails to work is that the battery is not charged.

*Pulling out the insert or pin of an emergency system will set the trailer brakes.*

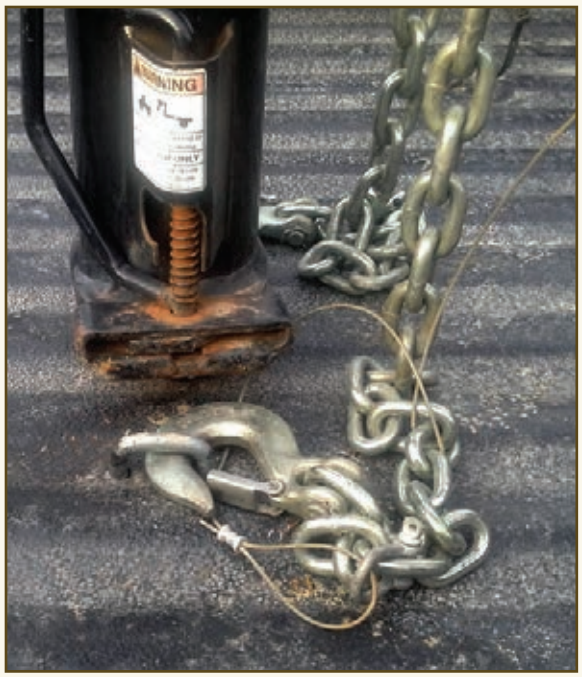
You also need to make sure the emergency brake cable is in good condition if you expect it to do its job. If a cable is rusted or frayed, it can snap before it can pull out the insert, never engaging the brakes.

Because many people do not understand how breakaway brake systems work, improperly connected systems are common. Remember, the cable has to pull out the insert to activate the trailer brakes. Always attach the breakaway switch cable to the towing vehicle's frame (not to the safety chains or the trailer).

If it isn't possible to attach the cable from the trailer to the vehicle frame, the best attachment point might be the slot where the chain hooks are put in on the receiver.



*The cables for these breakaway brake systems are correctly hooked to the frame of the towing vehicle's receiver.*



*This breakaway brake system cable is improperly attached to the safety chains. It should be attached to the chain anchor point in the truck bed.*

*This damaged breakaway brake system cable might snap before it is able to pull out the pin.*

*This breakaway brake system's battery is wired to be charged while the tow vehicle is running and is connected to the trailer.*

*This brake system's battery has loose connections.*

How long should the breakaway cable be? There are two schools of thought.

Some argue that the cable needs to be longer than the length of the safety chains. At this length the breakaway cable will not engage the brakes as long as the safety chains stay attached to the tow vehicle. In this scenario, so the argument goes, the driver controls the trailer's brake system from the controller. Although the trailer may slam into the back of the truck, the driver can bring the truck and trailer to a controlled stop.

As one trailer sales technician said, "If the chains do not hold, setting the brakes is a last resort. You do not want the trailer brakes coming on at full force at 60 miles per hour."

Others argue that the breakaway brake cable should be shorter than the length of the chains. At this length, the breakaway cable will engage the brakes while the trailer is still tethered to the truck by chains. In this scenario (with the brake on and the trailer still attached), the driver has control.

Those who argue for shorter emergency brake cables say, "I would rather keep the trailer attached to the towing vehicle."

This difference of opinion means that there is no one-size-fits-all answer. These are personal choices that you must make. No matter what option you follow, make sure the emergency brake system functions as it was intended.

The emergency brake system should be:

- Attached to the truck frame or hitch
- Not twisted into the chain or knotted
- Have a fully charged battery that can activate the electric trailer brakes
- Have a cable that will remove the switch insert when you pull it

*This trailer's coupler came undone, but the safety chains kept the trailer connected. When this happens, the trailer often damages the back of the truck, but that is obviously better than letting the trailer run into nearby vehicles.*

# Use Chains as the Lead Rope

With weight-carrying hitches, crisscross the safety chains whenever possible to form an X pattern. The X pattern forms a cradle. If the trailer detaches, the chains will pull tight, forming a cradle that catches the tongue of the trailer. This minimizes the trailer's side-to-side movement, and keeps the tongue of the trailer from planting into the pavement, and flipping.

The most common chains are grade 30, grade 43, grade 70, or unmarked (which are grade 30). Within each grade, the larger the diameter of the chain, the more strength it has.

Make sure each chain has a weight rating that exceeds the weight of the trailer and its load. We recommend you use the working load limit for each chain instead of its breaking strength. This builds in a safety margin in the event the trailer becomes uncoupled from the towing vehicle.

For a thorough discussion of safety chains, see *Keep the Trailer Connected to the Truck: Understanding the 'Hitch' System* (Purdue Extension publication PPP-92), available from the Education Store, **www.edustore.purdue.edu**.

**- Chains -**

| Chain Link Diameter (inches) | Working Load Limit (pounds) | | | | |
|---|---|---|---|---|---|
| | Unmarked or Grade 30 | Grade 40 | Grade 70 | Grade 80 | Grade 100 |
| 1/4 | 1,300 | 2,600 | 3,150 | 3,500 | 4,300 |
| 5/16 | 1,900 | 3,900 | 4,700 | 4,500 | 5,700 |
| 3/8 | 2,650 | 5,400 | 6,600 | 7,100 | 8,800 |
| 7/16 | 3,700 | 7,200 | 8,750 | .....not available..... | |
| 1/2 | 4,500 | 9,200 | 11,300 | 12,000 | 15,000 |
| 5/8 | 6,900 | 13,000 | 15,800 | 18,100 | 22,600 |

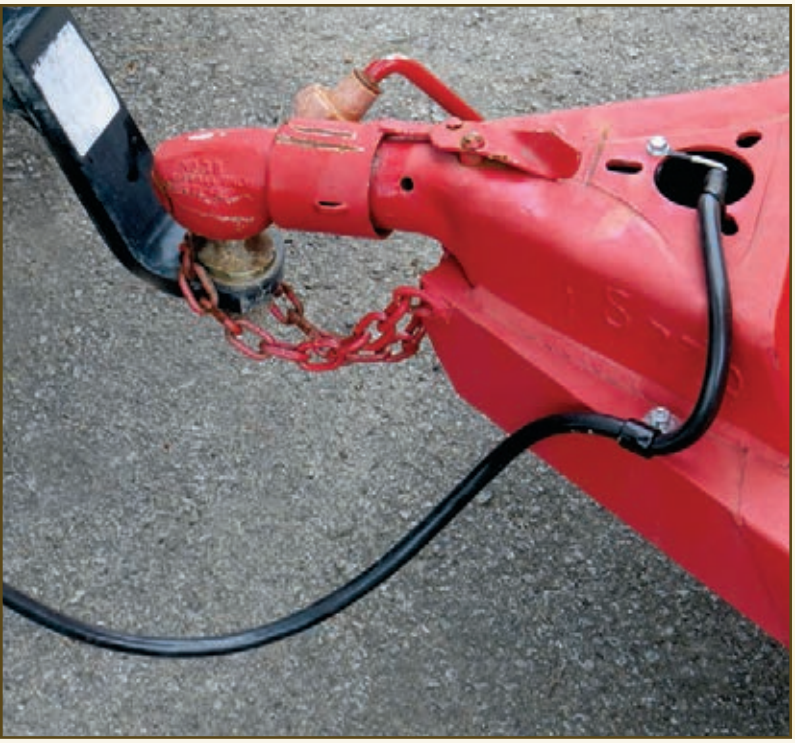
*This photo shows a grade 30 chain. Unmarked chains are also grade 30.*


*The L4 on this chain stands for grade 40.*


*The L7 on this chain represents a grade 70.*

*These chains are stretched and worn and should be replaced.*

*Never cobble together poor chains like this — it's a disaster waiting to happen.*



*Looping a small chain around the ball like this is useless. Notice too that the pin that locks the coupler closed is missing.*

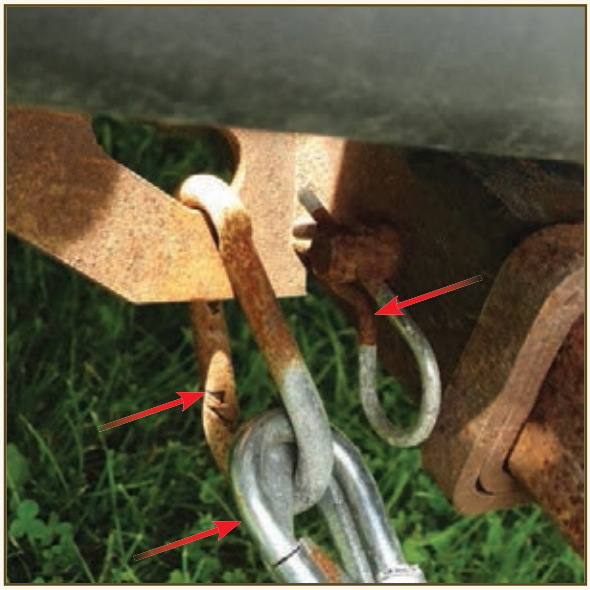
Always be sure safety chains are in good condition. Chains that are in "bad shape" (stretched, severely rusted) could fail if the trailer reaches the end of the chain and a sudden jerk is placed on the chain.

Be certain to attach safety chains to the proper location.

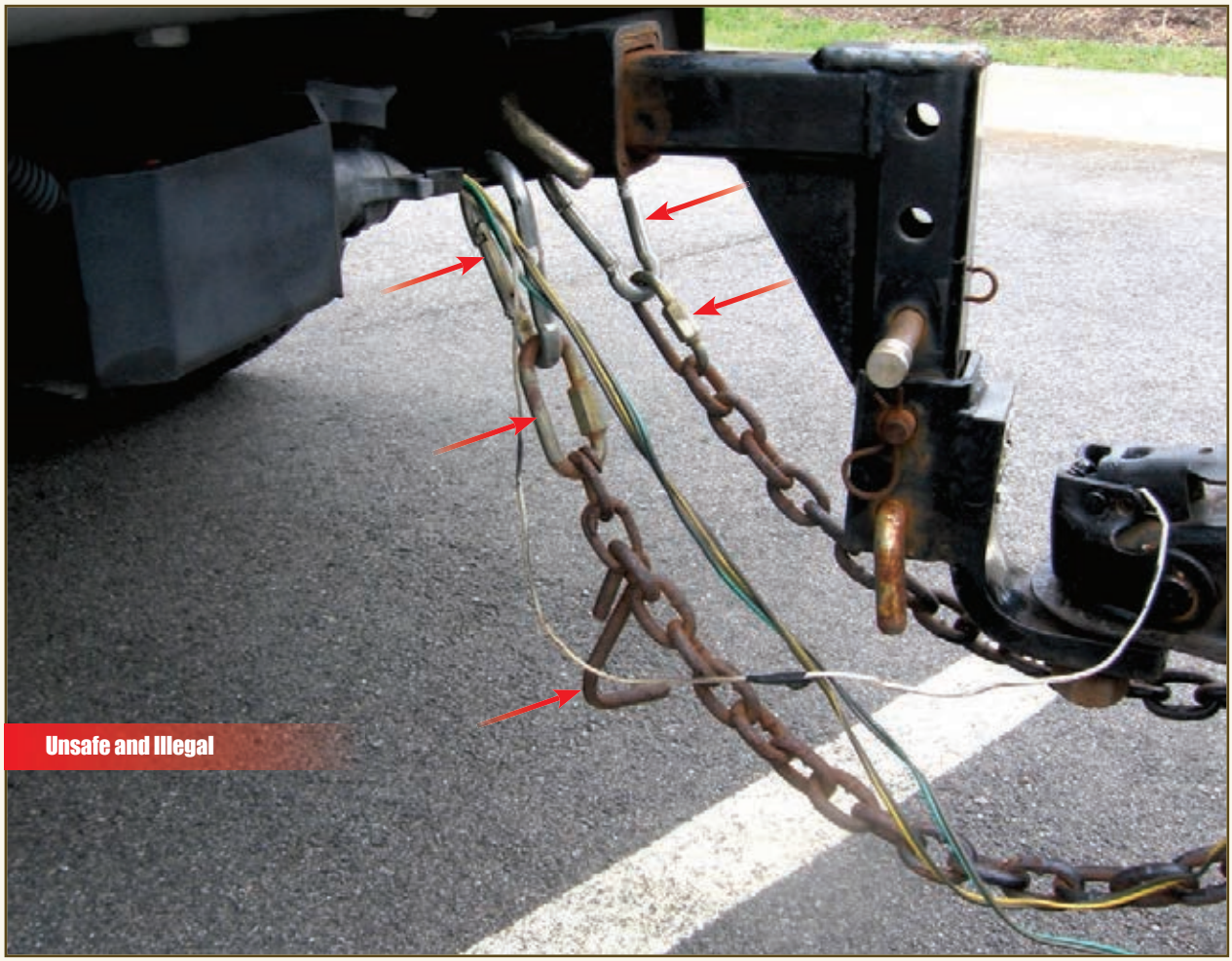
If you have a frame-mounted receiver, attach the safety chains to the loops ("ears") that were designed to hold the hooks. If you hook safety chains to a bumper or worse, around the hitch ball they will do no good — today's bumpers are more cosmetic than functional. Attaching safety chains with larger hooks to some receivers can be difficult if the connections are underneath the truck, difficult to get to, or are not large enough to hold bigger hooks.

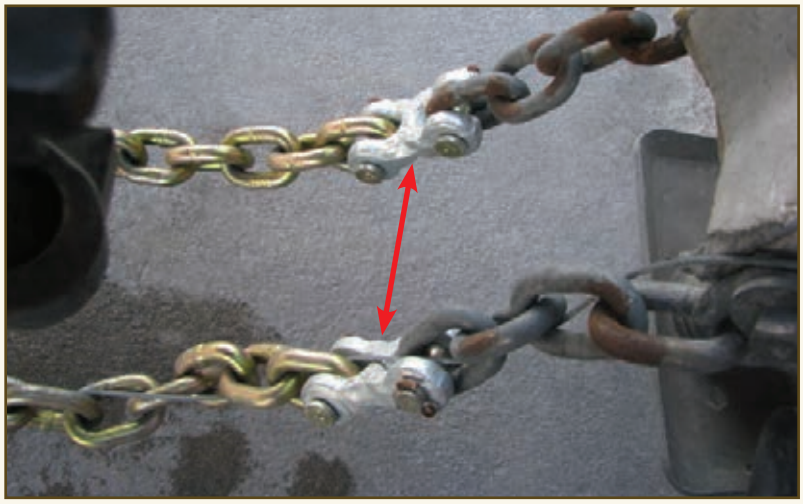
Although tempting, do not install a hook via a "quick link" to the hitch unless it is your only option and only if you can find a link that has a capacity that is greater than or equal to the safety chains. While the new link makes it easier to hook the safety chain, this type of connection is not nearly as strong and secure as it would be if the chain were attached directly to the connection point on the receiver. Be aware that connectors of various types are often not rated for transportation use, and in many cases, specifically indicate they are not to be used for transportation.


*Only one safety chain is connected and it's only connected to a piece of wire, which would never hold the weight of an uncoupled trailer.*




*Good looks will not stop a runaway trailer. Use connectors, hooks, and repair links that are rated equal to or greater than the necessary rating of the safety chains. If you use unrated or underrated components they will not hold up if the safety chains are put under loads from unhitched trailers.*

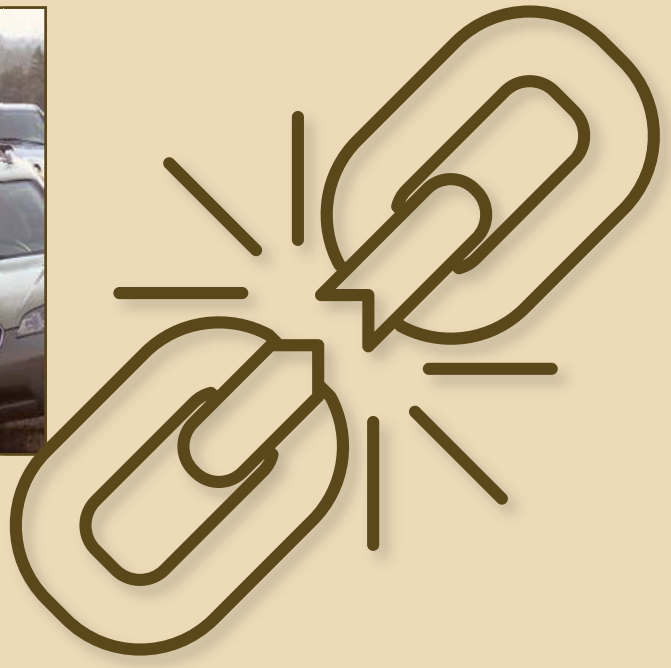




*An approved, capacity-rated repair link for a chain.*

## WHEN SAFETY CHAINS SNAP, BAD THINGS HAPPEN!

★ ★ ★



This photo shows the results of what can happen when safety chains snap. Always make sure your safety chains are properly rated, not stretched, and properly connected.

# Hitch Up the Wagon

There is as much to know about the trailer as there is about the truck and the connectors. Choose the combinations that will offer the best control and braking abilities you can get. Consult your tow vehicle's owner's manual for specific recommendations about towing and hitching a trailer to the vehicle.

In addition to being familiar with the components of a horse transporting rig, you need to be able to balance the rig so that the trailer and the truck are aligned at the same height. When your rig is properly aligned, it is much easier to handle the truck and trailer, it is less stressful on the hitch components, it reduces axle overloading, and it keeps the tires from wearing out prematurely.

The first test for your rig is the "eyeball" test. Park the rig on flat and level pavement, and then stand back some distance to see if the truck and trailer appear level with one another.

If you load too much weight on the front of the trailer, then you are putting too much weight (called tongue weight) on the ball. This will cause the front end of the truck to rise, and when this happens it is harder to steer the truck, the headlights will be improperly aimed at night, and the back tires will wear unevenly. In some cases, the tongue weight may exceed what the hitch can carry, which can cause the receiver to be pulled off the truck.

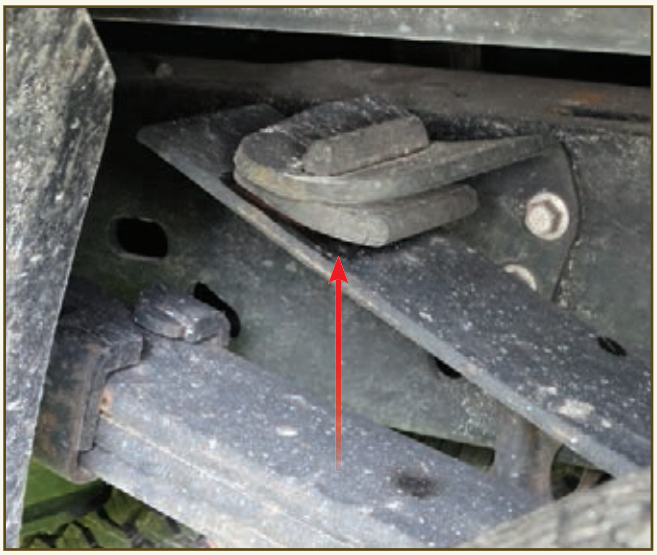
If you load too much weight on the back of the trailer, it causes the opposite effect: The tongue of the trailer is forced up, which stresses the trailer coupler and the ball on the insert. When the trailer pulls up on the ball, it can dislodge the trailer's coupler. The added weight on the trailer's rear axles will make it more difficult to control.

*You can have an unbalanced rig when your tow vehicle and trailer are mismatched like this. This older gooseneck trailer (built when trucks were lower than they are now) is hitched to a new truck. The height of the gooseneck part of the trailer from the ground is not high enough to make the trailer level when it is hitched to a new truck.*

*Note how the heavy tongue weight of the trailer forces up the front of the towing vehicle.*

Sometimes a truck and trailer are not level because the physical height of the truck hitch doesn't line up with the physical height of the trailer coupler. This is common when drivers hitch an older trailer to a newer (and taller) tow vehicle.

*A quick way to determine if you have too much tongue weight on the tow vehicle, is to check on the helper (or overload) springs in the rear suspension of the truck. (Top) When the bumper stops sit off of the helper spring, then the back end of the truck is not overloaded. (Bottom) When the bumper spring is touching the bumper stop, you are approaching the maximum designed load.*



## Weight Distribution

If you look at the receiver of a weight-carrying system, you will notice two sets of numbers. One provides the maximum weight that can be placed on the ball.

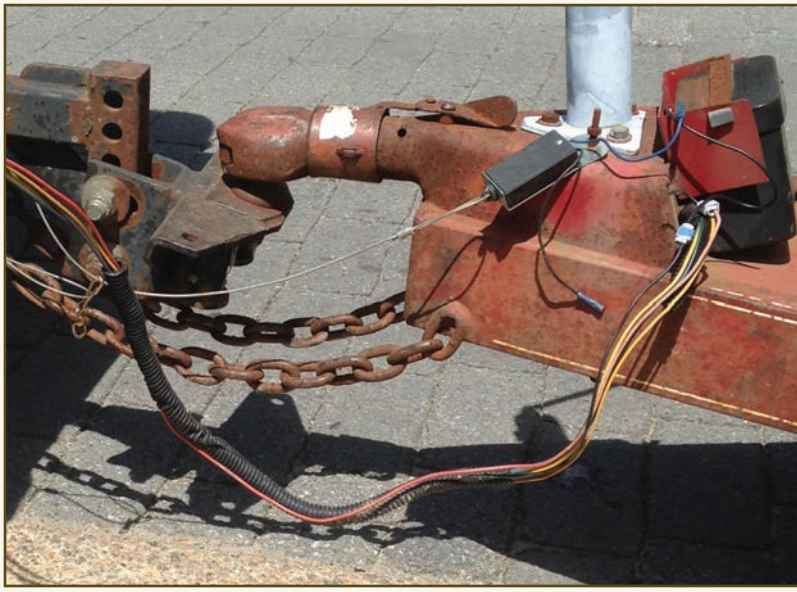
The second set of numbers provides a rating for the receiver based on the use of weight-distributing and load-leveling systems. Weight-distributing bars transfer the tongue weight on the ball, redistributing it forward and behind the coupler.

| Hitch Ratings | V-5 TALON | | Capacités de remorquage | |
|---|---|---|---|---|
| Hitch Type<br>Type d'attelage | Maximum Trailer Weight<br>Poids maximal de remorque | | Maximum Tongue Weight<br>Poids maximal au timon | |
| Weight Carrying<br>Porteur de charge | 5 000 lb | (2 268 kg) | 600 lb | (272 kg) |
| Weight Distributing<br>Répartiteur de charge | 12 000 lb | (5 443 kg) | 1 500 lb | (680 kg) |

Tow vehicle maximum trailer rating may be less.

La capacité de remorquage maximale du véhicule remorqueur peut être inférieure.

*This hitch tag shows the towing potential when you use a weight-distributing device.*



*The coupler on the trailer and ball must fit together like a ball and socket. The ball and the coupler shown here are not seated well together — this is a poor connection.*

*Always check and recheck couplers. You also need a retainer pin or bolt to keep the coupler closed — otherwise, one bump or sudden stop will open the coupler and allow it to come off the ball.*

*This hitch was damaged by too much tongue weight.*

# Do Your Best to Avoid Surprises

Horse trailers are of little value if the towing vehicle breaks down on the road. You can avoid most truck problems with routine maintenance, timely repairs, and pre-trip inspection protocols. For example, make it a priority to check fluid levels before hauling your horse rig anywhere. And follow the recommendations in your truck's owner's manual — this can go a long way toward avoiding issues such as an overheated vehicle or seized engine.

If you don't know what to check or how to check them, find a skilled person who can show you. You can easily check your vehicle's fluid levels, belts, tire pressure, transmission, brakes, lights, and windshield wipers in a matter of minutes. Anyone can learn the basics — even those who are uncomfortable using a wrench. These checks can save you literally hours on the road waiting to get a truck repaired — not to mention avoid the problem of what to do with your horses while the truck gets repaired.

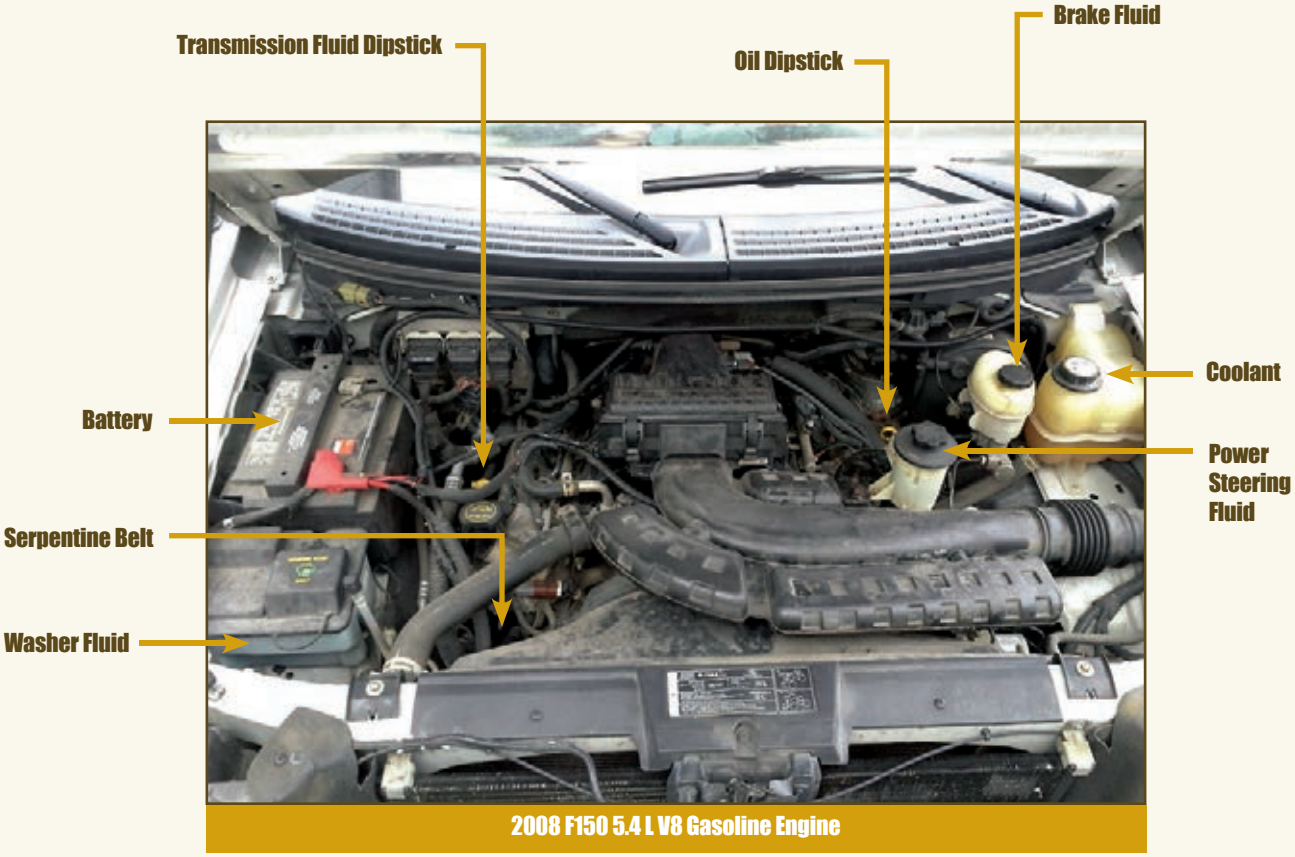
# What's Under the Hood, Anyway?

Pop the hood, pull out the owner's manual, and look around. Manuals often provide photographs and illustrations that tell you where to find the various dipsticks that measure vehicle fluids. A truck's anatomy varies by its make and model. However, knowing where to check and add engine oil, transmission fluid, washer fluid, power steering fluid, coolant, and brake fluid is a must.

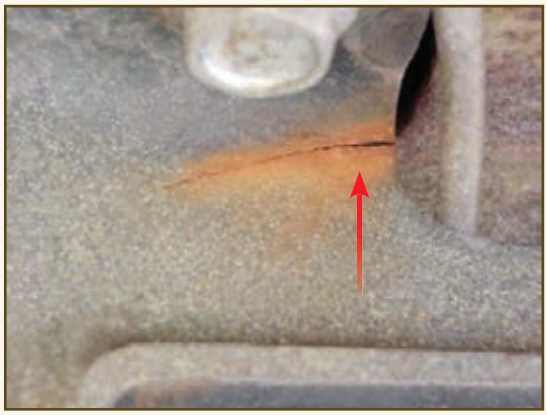
And if you ever have to jump-start a dead battery, you should know where the battery is, be able to find the positive (red) and negative (black) poles or cable attachment points, and you should have cables long enough (and of a heavy enough gauge) to reach from your truck to the one that is recharging your battery.

The owner's manual also has a wealth of information about how to handle emergencies or how to respond to indicator lights (such as a "check engine" light or a "service engine soon" light). Knowing what the alerts mean can give you time to make a decision to pull the truck and trailer to a safe area for further evaluation, rather than feeling like you must stop immediately on a possibly dangerous highway.

*The anatomy of a 2008 Ford F-150, which shows the locations of fluids and belts that you need to check before you pull a horse trailer on the highway.*



# Don't Neglect the Trailer



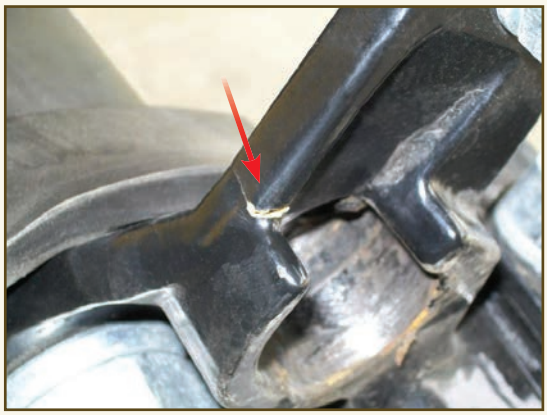
*Thoroughly inspect each component — you may not see flaws during a casual walkaround. Whether you inspect the components or have someone else do it, it is important to check the receiver and other hitch components to ensure the metal is not cracked. Thorough inspections are no different than routine trips to the veterinarian or farrier to care for the health and well-being of your horses.*

Trailers, like trucks, also require routine maintenance.

An often overlooked responsibility of owning a horse is maintaining the truck and horse trailer. While you may routinely schedule truck maintenance, you may overlook your horse trailer.

People often assume the trailer is in good working condition — just like it was the last time it was used. Trailer owners often wait until the last minute to press trailers into service when the horse needs to be transported to a show on short notice or to a veterinary clinic in an emergency. This last-minute decision leaves little time to carefully inspect the tow vehicle and trailer.

Rotten floor boards, lights or brakes that don't work, unrepaired latches, and worn tires that are no longer roadworthy to carry heavier loads or stop on a dime can cause crashes that lead to serious injuries to your horses, and to potential damage to other vehicles and drivers sharing the road. Preventative maintenance can help keep horses (and drivers and vehicles) safe.



## KEEP A TRAILER MAINTENANCE LOG

★ ★ ★

Few people keep mileage and maintenance logs for their trailers, but it makes sense to do so. Consider that trailers often sit idle for months in the winter and summer when it is too nasty to ride. That time sitting doesn't make the trailer safer. A maintenance log will help you track your equipment and keep it safe.

When you have a breakdown on the highway from improper maintenance (improper tire inflation, low fluid levels, or repairs that were put off for another day) it creates serious safety hazards for the driver and horses. Imagine needing a repair along a busy highway in the summer — your horses can suffer from the heat and feel the stress of being cooped up in a trailer. Take a few minutes to inspect your truck and trailer and make repairs before leaving on a trip to get to your destination safely.

*Always check and adjust tire pressure (including the spare tires).*

*Never unload horses on the side of the road unless an emergency forces you to. Unloading on the side of the road is dangerous.*

Although we tend to think of a trailer as a rolling enclosed box, horses call it home for the hours they are stalled within. So, it is critical that the floor is structurally sound. Floors need to be in good condition so the horse can stand (such as a solid floor with a nonslip surface), and not fall through.

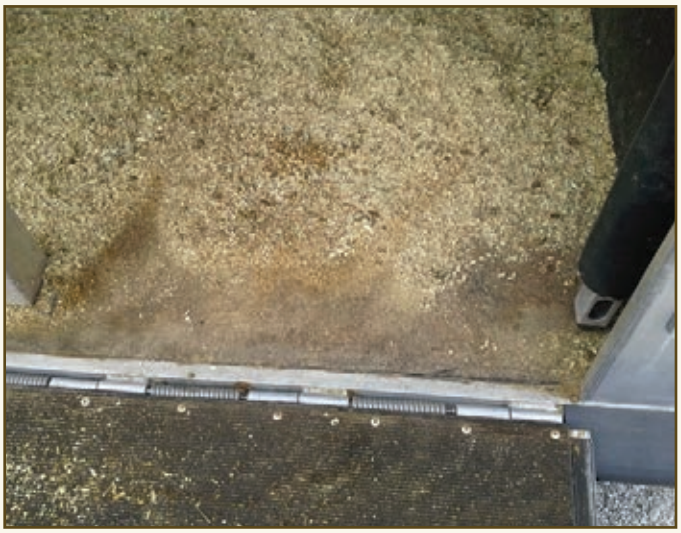
Make sure that all metal parts are solid and the hinges are lubricated and working — this can make loading and unloading the horses quicker and safer. Sand down or completely remove rusty or sharp edges so the horses do not cut themselves or get their halters caught. If you have a manger-style trailer, make sure the manger is solid enough that it doesn't break in case a horse jumps up into the manger due to a sudden stop or if the horse panics.

*Get down! Crawl underneath trailers to look for cracks and corrosion. Note the loose wiring. (Top) This photograph shows what is left of a ramp that broke off the back of a trailer. Had the owner inspected the trailer, he or she would have noticed that the metal was probably cracked before it failed.*

An important inspection step people tend to skip is to crawl under their trailer to look at the floor from underneath. Trailer floors usually ride lower to the highway than most trucks, which means the floor could have damage from running over something on the road. Look underneath the trailer for loose wires, corroded or loose axle shackles, corroded cross-member supports, bent or broken supports or axles, lost nuts, or broken leaf springs.

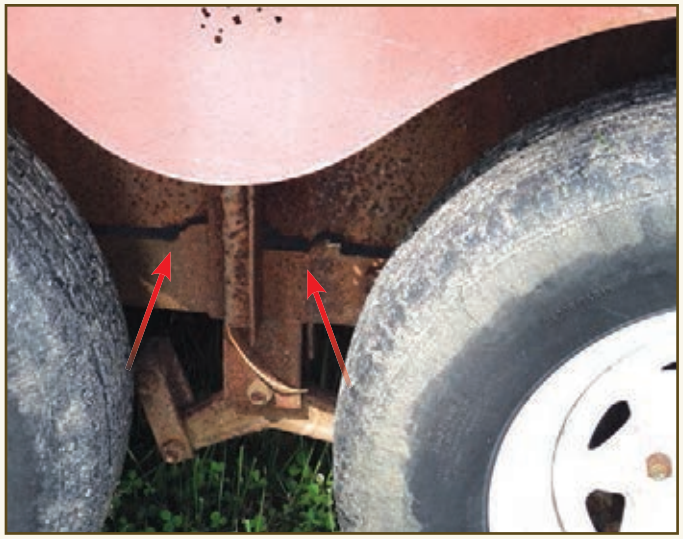
*Get dirty — get under, over, and into this home on wheels. Look for rust and corrosion under bedding and floor mats. Some trailers have solid aluminum floors. Although aluminum does not rot like wood, it does corrode when exposed to urine and manure. Weak spots can form from "rusting" through. Aluminum-, steel-, and wood-floor trailers need to be carefully inspected (on the top and the bottom) on a routine basis and washed out regularly.*

*These photos show aluminum floors that are corroding and pitting from oxidation. These need to be repaired.*



*Some trailer floors are now made from synthetic materials such as "rumber." No material is completely maintenance free, so it is important to know the requirements of the materials in each trailer.*

*Many trailers have wood floors. This trailer shows a solid, well-maintained original floor.*



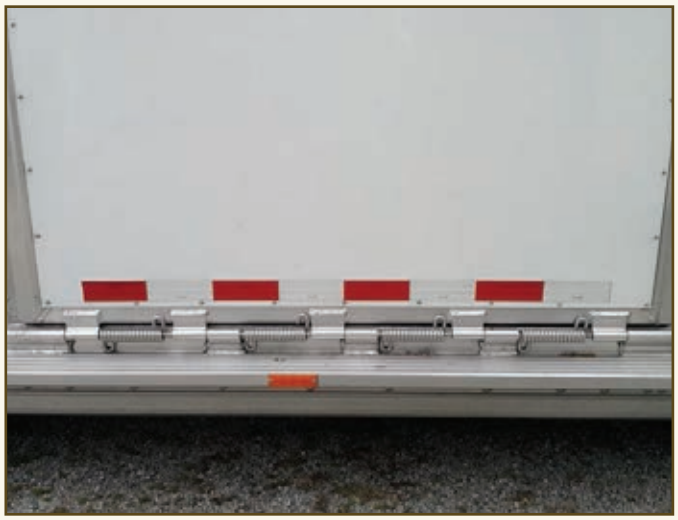
*Carefully inspect and maintain trailer suspension pieces. Leaf spring suspensions have shackles and bushings that can wear; rubber torsion axles have less maintenance but still need regular inspections.*

*(Left) Rust can reduce the strength of any metal. Inspect the shackle bolts and bushings. These do wear out and can be easily replaced.*

*(Right) The worn bushing and bolt on this leaf spring equalizer is probably cutting into the spring eye.*

Ramps on a horse trailer can be very heavy. For that reason, ramps are often equipped with an "assist" mechanism to make it easier for one person to lift up and pull down. You need to lubricate and clean the metal ramp springs in such mechanisms to keep the mechanism working properly. If you have trouble lifting the ramp, find out what is wrong.

*The ramp fell off this trailer, exposing the springs.*



*This ramp hinge has springs integrated into the hinge assembly. Over time, the springs can break and "unload," making the ramp difficult to lift.*

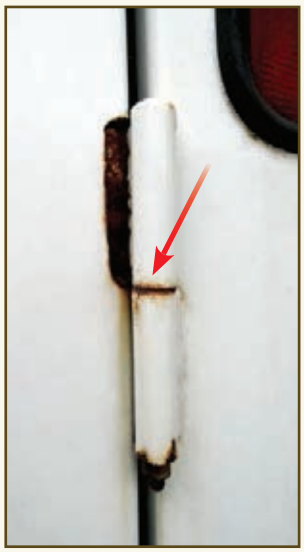
*This ramp has a spring assist as a separate leaf spring attachment. Such designs are often found on older trailers.*

*This ramp load trailer with a broken spring assist requires the handler to lift the ramp from the middle. If a horse tries to escape, a person could be crushed underneath the ramp. Make sure ramps are in good working condition to avoid these situations.*

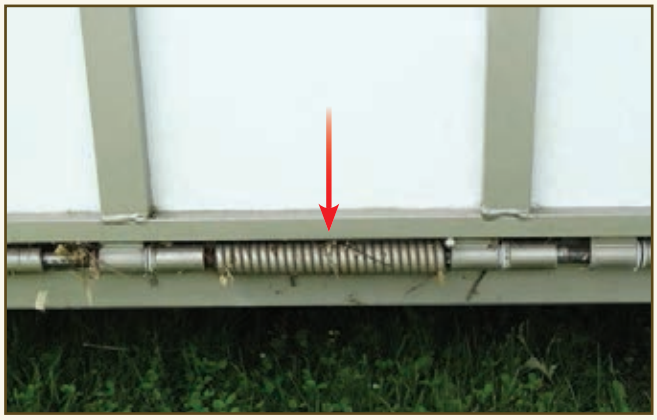
*This ramp load trailer with a functional spring allows the handler to easily lift the ramp while remaining at the side well out of the kicking zone. Make sure ramps are in good working condition so you can stay safe.*

*It might not look serious from a distance, but a closer look shows a problem. The hinge section has cracked away from the rear gate. After some new steel, welding, and a bit of grinding the trailer will be structurally sound again and ready for paint. Left unrepaired, it could fail. Always inspect your trailer's functional components, including the latches, gates, and hinges. Most of these items can be repaired and made safe and functional by someone with the proper skills.*

*Make sure all parts of the trailer are solid, including this manger. Panicked horses could jump up on the manger, so you want it to be solid enough to withstand the impact of a hoof and the horse's weight.*



*When you inspect trailers for safety and structural soundness, remember to examine the other components. Make sure the doors, ramps, and other accessories are in good working order.*



*Regularly lubricate springs and hinges to help mechanical parts work better and to extend their working life. When possible, insert fittings that make it easier to access the inside when you apply the grease.*

*Properly maintain all latches on your trailer. You should add additional locking pins to ensure latches do not come free during transport.*

*Cheap aluminum carabineers are better than nothing — but that's about all you can say about them.*

*Trailer ventilation is notoriously bad — more vents are always better. Make sure trailer vents and windows operate properly so your horses can get adequate fresh air during transport.*

## PAY ATTENTION TO TRAILER DESIGNS ★ ★ ★

There are many different horse trailer designs. While your main focus is to purchase one that can carry a certain number of horses, it also is important to look for additional safety features inherent in the design. One frequently overlooked consideration is where the latches are located.

Look where the chest and butt bars/gate latches are located. You should be able to operate the latches from a safe location without the risk of getting pinned, kicked, or crushed by a horse. Horse trailers should have two methods for keeping a horse in the trailer (for example, a ramp and butt bars, or butt bars and a door, etc.).

Think about a trailer that has a butt bar that requires you to latch the bars in the middle on the divider. If there is one horse in the trailer, this is not a problem, because you would stand to the side when latching the bar. But if there are two horses in the trailer, standing to the side puts you in one of the horse's kicking zones when latching or unlatching a butt bar that locks in the center post.

*Some trailer designs* require *a person stand at the middle of the ramp to latch it. Be aware of designs that may not be safe for your use with horses.*

From a human safety perspective, it is better to have a design in which the butt bar is attached on the side of the trailer rather than in the middle. Such a design allows you to stand outside of the horse's kicking zone.

## Get Seen!

Driving a trailer at night is difficult. To be safe, it is essential that other drivers on the highway see you and your equine companions. Motorists often cannot judge how far the trailer extends beyond the truck. Besides tail lights on the rear of the trailer and marker lights on the sides, consider using reflective tape on the sides and back of the trailer so drivers can spot it when they approach your rig.

*Be seen and identified at night. We recommended you place reflective tape at the top, middle, and bottom of each trailer. Without tape, all you have is the trailer lights on the lower corners.*

# Trailer Tires — 'Hoof' Care

Trailer tires carry the full load of the trailer, horses, and tack. It's important that you have tires that are designed for a trailer and rated to carry the trailer's loaded weight.

It's important to remember that trailer tires are not designed to steer like truck tires. Rather, trailer tires are designed and reinforced when loaded to carry heavier loads in a straight line.


*Your horse gets foot care.*
*Shouldn't your trailer get the same attention?*

The sidewalls of most trailer tires provide a number of important facts: size, weight, carrying capacity, proper inflation. If you don't know how to interpret the information, then ask a tire professional.

Tires wear out from *both* use and age. It's easy to see how the depth of a tire's treads get smaller as you put on the miles. The treads are grooves in tires that allow water on the road surface to enter into them and be thrown out. Since water cannot be compressed, allowing that water to find a place inside the tread keeps the tire next to the road instead of hydroplaning above it and losing control.

A brand new tire will have a tread depth between 11/32 inch and 14/32 inch. Replace tires when the tread depth is 2/32 inch or less. You can use a special tool (a tire tread depth gauge) to measure the tread depth. You can also look at a tire's wear bar. The wear bars are in the treads and indicate a depth of 2/32 inch. When the tread depth is even with or lower than the wear bar, it is dangerous (and illegal) to continue to use the tires.

*This brand new tire has a tread depth of 13/32 inch. You can buy an inexpensive tire tread gauge and put it in your toolbox.*

*New tires have wear bars. Once the tire has worn to the depth of the bar, it is time to replace the tire.*

Horse trailer tires usually rot out before they wear out. That's because they degrade over time. Your old trailer tires may have sufficient tread, but the rubber may be so old that it is cracking — both from exposure to sunlight and drying out from not being used. Often, surface cracks allow water and salt to enter into tires and corrode the reinforcement wires.

Consider the stress that a tire on a horse trailer undergoes when fully loaded — especially a tire that has passed its useful life. Manufacturers recommend that you replace tires every five to eight years.

*Cracks do not always appear in the tire wall. These cracks formed in the tread groove of a 10-year old tire with plenty of tread left. As the integrity of the tire decreases, the odds of a failure increase.*

*This trailer tire is in poor condition because it is old. Whether the tire has any tread is irrelevant; this tire should not be in service.*



*You can tell how old a tire is by looking at the DOT identification on the tire. The first two numbers are the week (1-52) and the last two numbers are the year. (Top) This tire was manufactured in the sixth week of 2003. (Right) This tire was manufactured in the eighth week of 2005.*

When you purchase new tires, upgrade to trailer tires that are designed to carry heavier loads than you expect to carry. Look at the load range to determine if the tire is strong enough for the loads you will place over them. Out of the factory, some manufacturers only put LT (light truck) tires on their trailers. When you can, ask to install ST (special trailer) tires on the trailer. Never use P tires (car tires) on trailers, because they are not designed nor reinforced to carry the heavier loads.



*ST refers to "special trailer" tires.*



*Trailer tires indicate the maximum pressures and weights they are designed to carry. (Top) This tire can carry up to 6,175 pounds when inflated at 110 psi. Note that it can carry less when used in combination with another tire. (Bottom) This tire can carry up to 1,820 pounds when inflated at 50 psi.*

If you haven't noticed, the message of this publication is that routine, preventative maintenance and awareness are essential for trailer safety.

All tires can (and do) lose a few pounds of air pressure (expressed as psi) each month. As the tire loses air pressure, it flattens, which will cause the tires to wear on their outer edges. Low pressures can also cause tires to overheat, which can lead to a burst tire.

*A tire blowout can destroy the wheel, damage the trailer, or cause the driver to lose control.*


Don't think over-inflating a tire will help either — over-inflated tires will raise the tire's profile and wear out the middle of the tire first.

In short, always locate on a tire its recommended or maximum pressure and how much it can carry at this pressure. This is why you should know the weight of your fully loaded horse trailer first — if you know the weight, it will steer you to the correct tires to purchase.

The same is true for tires on the towing vehicle. The more you drive the truck, the more heat will build in the tire. And just as ambient air temperatures cause tire pressures to fluctuate, heated air expands and cooler air contracts.

When you think about your tires, don't forget the unseen tires: the spare tires and inside duals on a truck. A good spare tire is critical when you have to replace a flat on the side of the road. Unfortunately, people often find out too late that they never checked the pressure of the spare before the trip, and found out it was too flat when they needed it.

Even if you have a mobile phone, you're still going to have to wait for assistance. The challenge becomes what you should do with your horses while you wait for help. If the spare tire is in good shape, then it can be a quick change and you're back on the road. But in many cases, spare tires are "bald" with no tread or are so old that once you drop the trailer off the jack, the spare blows, too. Don't neglect spare tires; they could save you time and inconvenience in the future.

*(Right) What's a little dirt (or water, or salt) going to hurt? The dust cap on this axle bearing has fallen off, which means water and dirt can quickly contaminate the bearings and cause it the wheel to fail prematurely. (Left) Pay attention to properly maintaining wheel bearings. Neglecting them can ruin the wheel or lead to real problems on the road.*

# Help! My Trailer Sprung a Shoe!

Do you know how to change a flat tire on your trailer?

It's easier to learn how to change a tire at home, than it is on the side of a road, which is the most dangerous place you could be. Changing a trailer tire isn't that difficult after you've done it a couple of times, and it is sure easier to learn how when it's not an emergency.

Learn more about tires in *Tires for the Road and Field: A Guide to the Best Value and Performance* (Purdue Extension publication PPP-99), available from the Education Store, **www.edustore.purdue.edu**


If you do encounter a flat tire with your trailer, the most important thing to do is to pull as far over on the shoulder as possible. Remember, experienced construction workers and emergency responders have been killed while working on the sides of roads because they either forgot and stepped into oncoming traffic, or a car drove onto the shoulder.

When you have a flat tire, always place three safety triangles or flares 100 feet behind your trailer and one in front of your vehicle to warn other drivers. The triangles or flares will give drivers enough time to switch to the other lane or to take notice that they are entering a "work zone."

Even if you know how to change a flat tire, you still have to figure out what to do with the horses.

The question of whether to unload horses while you repair a trailer is complicated. If at all possible, it is always safest (for both the horses and other drivers) to leave the horses in the trailer. If you unload horses alongside the road, there is always a chance that one will get loose, possibly injuring itself or worse, getting killed.

A trailer does not need to be jacked up very high to change a tire. But if you must unload your horses, then it is preferable to have a second trailer ready so you can quickly unload and then load them again, or to construct a corral made of gate panels. You should always involve law enforcement personnel before you unload animals so the police can properly control traffic.

## DRIVE ON OR PULL OVER? ★ ★ ★

People have many opinions about what to do when your tire goes flat. If it happens in a dangerous location, some actually recommend that you drive to a safe spot before you stop — even if you have to destroy the wheel.

Next, be sure you packed the necessary tools to lift the trailer and change the tire. For example, it's not uncommon for the truck's lug wrench to be metric and the trailer's lug nuts to be English or standard. So always make sure you have a lug wrench that will work specifically on your trailer. Consult the owner's manual for the towing vehicle (or if one was provided, the manual for the trailer) to learn the recommended procedures for safely changing tires.

Will the jack provided with your truck actually fit under the trailer? And if it can, will it be stable? If the jack provided with the truck is too tall to fit under a trailer axle, consider using a drive up chock or packing a suitable low-profile jack.

Finally, always be sure you have a strong flashlight.

Just as there are emergency kits for travelers, so there are for horse rigs. Consider keeping several emergency items to keep in your towing vehicle or with the trailer.

An emergency kit for a horse rig might include:

- **A sledgehammer** for beating out a bent fender in case a tire blowout damages the fender
- **A floor jack or scissor jack**, which will be easier to use than a bottle jack
- **Ratchet straps** (big and small) for keeping compartment doors closed if a latch fails
- **Duct tape** (for covering sharp edges)
- **A pry bar**
- **A 4-way tire iron** (lug wrench)
- **A towel**
- **A rubber mallet** for putting the wheel cover back on


*This photo shows a chock placed behind the right front tire to make it easier to change the rear tire. To use this device, you pull the trailer forward onto the ramp until the good tire sits in the cup. This lifts the rear wheel slightly off the ground, which helps with the tire change.*

*When changing a trailer tire, follow these steps: 1. Loosen the lug nuts. 2. Drive the trailer on the trailer aid (or jack up the trailer). 3. Install spare tire and wheel. 4. Tighten lug nuts (in the pattern recommended by the trailer manufacturer). 5. Torque the lug nuts. 6. Stop and check the lug nuts after 50 miles.*

*This trailer requires a special tool to remove the hubcap.*

*This photograph shows a hubcap with the locking nut removed. Now the hubcap can be removed to access the lug nuts and wheel studs to change a flat tire.*

*A special tool is required to take off the long pieces (arrows) that hold the cover to the wheel.*

# Getting Kicked in the Head

If you were the driver of a car unlucky enough to be hit by a runaway trailer, how would you react (if you were lucky enough to survive)? What would your family do if you didn't survive?

The answer for most people would be to work through the insurance claims process to cover medical expenses, to make up for lost wages, and to replace damaged vehicles. Families often turn to lawyers to represent them in court.

Lawyers hire expert consultants to examine the crash and see what the evidence from the police reports indicate. If your trailer came unhitched from your truck, how do you imagine the lawyers would argue the following evidence? The towing ball on your truck was damaged and the chains were stretched. That resulted in the trailer unhooking and the chains giving way.

Your lawyer would have very little to work with and would always be on the defensive. The plaintiff's lawyers would argue that you were negligent because you didn't maintain your equipment properly. Could you disagree with them after seeing the damage? Could you live with yourself knowing that your negligence killed a person or your horse?

This is why it is important to always check your equipment before you leave and to hire a professional to inspect the truck and trailer at least once a year. It's the best money you will ever spend.

## REVIEW YOUR INSURANCE

★ ★ ★

Did you know that if your horse trailer comes unhitched from the truck it may not be insured?

As long as a trailer remains hooked to the towing vehicle, most insurance policies will represent your liability. If the trailer unhitches, most insurance policies state that they will not cover the damage or represent you in court.

Ask your insurance agent to remove the exclusion by adding an endorsement that will cover your trailer in the event it becomes disconnected from the truck. Don't believe that is true? Call you insurance agent to find out.

*Lawsuits and settlements are often won or lost based on the condition of the equipment. (Left) A chain that is stretched. (Right) A ball that is worn. Driving with badly worn equipment makes it difficult to defend your claim.*

*(Left) Always be certain that your horse trailer is road worthy and safe.*
*(Right) You don't ever want to endanger your horses because you couldn't be bothered to make sure the trailer was safe.*

# Pre-trip Inspection Checklist

To keep your horses and fellow drivers safe, you need to do as much as possible to avoid incidents — and preventing problems is always better than reacting to them. Before you tow a trailer, inspect your rig using a checklist like the one shown below. Spending a few minutes to inspect your rig may save you countless hours and thousands of dollars in the event of an incident. Be sure to correct any problems before you drive off.


*Operators are responsible for what takes place with their trailers, not friends, spouses, or children.*

## Before You Hitch

- Check the hitch ball on the towing vehicle and ensure it is the proper size for the horse trailer hitch.
- Check the drawbar (ball mount), pin, and hitch ball and make sure all items are present and in good working order.
- Visually inspect the undercarriage of the hitch and wiring and ensure everything is in good working order.

## Tow Vehicle

- Check tires for proper air pressure and sufficient tread.
- Check for leaks and other signs of potential mechanical failure.
- Check mirrors and make sure they are clean and properly adjusted.
- Check windshield wipers for excessive wear and fill washer fluid.

## Trailer

- Visually inspect for loose components. Make sure all equipment is properly secured.
- Inspect the interior for sharp or loose objects, floor, sides, gates, and doors and their latches.
- Check tires for proper air pressure and sufficient tread.
- Look for loose wiring, particularly on electric brakes, tail lamps, and stop/turn signals.
- Make sure you have an appropriate jack and lug wrench for the trailer.
- Make sure dropdown windows have screens so debris will not hit horses in the face.
- Use wood shavings inside the trailer to help footing while hauling. Proper surface footing helps horses to stay relaxed during trailering.

## After Hitching Up

- Make sure you are using the appropriate drawbar so that the combination is level.
- Verify that the hitch is properly attached and locked to the drawbar ball.
- Inspect the safety chains and verify that they are properly crossed and attached.
- Inspect the break-away "rip cord" and verify that it will engage properly.
- Inspect the drawbar hitch pin and make sure it is properly locked.
- Inspect the trailer electrical plug and make sure it is locked properly into the receptacle.

## Starting the Tow Vehicle

- Check the trailer brake controller for a "connected" indication (this may not apply to older controllers).
- Check the fuel gauge to make sure you are not rolling out on an empty tank.
- Pull forward slowly, manually actuate the brake controller, and feel for the brakes to apply.
- Make sure the vehicle's headlights and 4-way emergency flashers function properly.
- Walk around the rig to verify that all lamps on the tow vehicle and trailer are operating properly.
- Double-check that all gates and doors are secured and that the trailer hitch is still properly latched.
- When starting out, apply the service brakes a couple of times on hard pavement and adjust the brake controller as necessary to provide the appropriate amount of "drag" from the trailer brakes.

# Practice Safe Driving Habits

Now that you are on your way, continue to focus on safe driving habits. Remember, hauling a trailer creates many more hazards than just driving a vehicle.

Before you start to drive (and whenever you need to stop for a break or fuel), always be sure to:

- **Double-check attachment points.** Even if you have someone else to hook the trailer to the truck, walk around to make sure it was done properly and everything is secured.
- **Check all doors and latches to make sure they are locked.**

As you drive, keep these thoughts in mind:

- **Don't be distracted by your phone.** It's hard enough to handle a truck and loaded horse trailer with two hands. Taking your focus away from the road is trouble waiting to happen.
- **Stay centered in your lane.** This will give you a little room on each side to maneuver. When a trailer tire runs off the shoulder, it can create havoc for the driver.
- **Never exceed speed limits.** A truck and trailer require more distance to stop than a truck alone. Use the 4 second rule between you and other vehicles.
- **Drive based on road conditions, not speed limits.**
- **Drive at posted speed limits when it is safe to do so**. Driving too slow can also cause trouble if other drivers tailgate you, waiting for the slightest opening to pass. When they do pass, other cars will often quickly cut in front of you, requiring you to apply the brakes and further cause traffic issues.
- **Slow down over railroad crossings and bumpy roads.** Not only will your horses appreciate it, but this will help keep the coupler and ball connected and reduce wear-and-tear.
- **Slow down in construction zones.** Driving a truck and trailer though a construction zone can be hazardous. Often, the lanes are restricted or narrower, which makes going through the zone difficult. Slow down, and as they say, "Give them a brake."
- **Maintain a safe stopping distance behind other vehicles.** Give yourself plenty of distance to stop, especially when you are handling heavier trailer loads. Anticipate, anticipate, and anticipate.

*Put that mobile phone down. It is critical to stay focused on your driving to keep you, your horses, and other drivers safe.*

- **Avoid sudden maneuvers.** Making a sudden turn often means the driver will overcompensate, which creates its own set of problems when you're hauling a trailer.
- **Be especially careful making right turns.** The trailer will go slightly inside of the right side of the truck, which can help reduce wear on tires.
- **Use your mirrors.** Pay attention to where you are going and what is behind you at all times through your mirrors.
- **Signal well in advance before passing another vehicle, changing lanes, or turning onto a side road.** This gives those around you an opportunity to plan their move with yours.
- **Don't forget about blind spots.** When you adjust your truck mirrors to haul a trailer it can create a blind spot that makes small cars between the trailer and truck difficult to see. Use both direct sight and mirrors as you begin your moves.

- **Allow extra distance after passing a vehicle before pulling back into the driving lane.** When you think you have enough distance between the trailer and the car you passed, put on your turn signal and slowly move back into the lane.
- **Keep lights on at all times.**
- **Learn to back a trailer with mirrors.** Get out of the truck and look around the load first before backing a covered trailer. Use a buddy system when possible to watch as you back up.

# Annual Inspection Checklist

With so much at risk, we recommend that you have a competent mechanic inspect your trailer each year. There is nothing wrong with you inspecting the equipment yourself if you are qualified and you can perform a thorough and complete inspection.

The goal of an annual inspection is to perform routine maintenance and spot critical issues before they pose a threat. The checklist below is a model for an annual trailer inspection.

## Body (walkaround)

Walk around the trailer body, and make sure:

- There are no loose or broken screws, bolts, rivets, welds.
- There are no ragged or sharp edges.
- There is no hazardous road damage.
- All latches work and are lubricated.
- There are no rust problems.
- The welds holding the body to the frame are sufficient.

## Lamps and Reflectors

Check the trailer's lamps and reflectors, and make sure:

- It has the proper number of reflectors (but more of them is always better).
- The reflectors are in good condition.
- It has the proper number of marker lamps.
- The clearance and marker lamps are in good condition.
- The tail lamps are in good condition.
- The turn signals are working properly (LEDs are brighter).
- The brake lamps are working properly.
- The license plate lamp is working properly.
- It has DOT reflective striping.

## Interior

Check the trailer's interior, and make sure:

- There are no broken bolts or rivets on the roof.
- There are no sharp edges.
- The hay mangers are in good condition.
- The side pads are intact and in good condition.
- The trailer mats are intact and lying flat.
- There are no rotten spots in the floor.
- The interior walls are intact.
- The tack compartment is intact.
- The doors and gates swing and latch.

## Brakes and Wiring

Check the trailer's brakes and wiring, and make sure:

- The breakaway cable is the proper length.
- The breakaway cable is in good condition and its battery is working.
- The breakaway brakes engage properly.
- There are no cracks or excessive rust on the undercarriage.
- Any exposed wiring is in good condition.
- The springs are in good condition and properly aligned.
- The wheels and tires are in good condition.
- There are no loose or missing lug nuts.
- The tires are at the proper pressure.
- The wheel bearings are free and at the proper tension.

*The protective coverings on the safety cable (top) and electrical cable (bottom) have failed, which will allow moisture and road salt into the cables. The safety cable is more prone to corrision and the electrical cable more prone to shorting.*

*Although towing components look tough and robust, routine inspection will uncover aging, corroded components. Moisture and road salt can affect receiver hitch platforms attached to the towing vehicle frame. Over time, hidden corrosion can lead to failure. Get under your truck and look.*

## Tow Vehicle

Check the tow vehicle, and make sure:

- The truck-trailer combination stands level.
- The hitch is free of obstructions (for turns).
- It has the proper mirrors for hauling a trailer.
- The trailer brakes work properly.

*These safety chains have stretched and have cut links from being caught under the hitch.*

## Hitch and Undercarriage

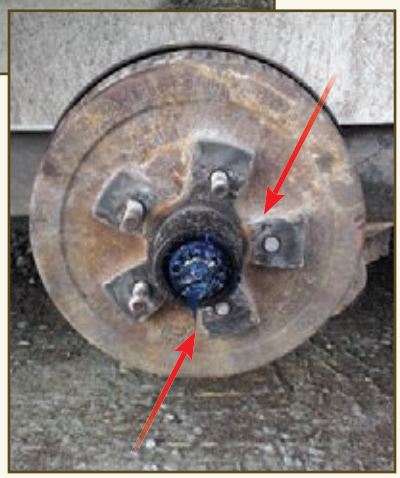
Check the trailer's hitch and undercarriage, and make sure:

- The pickup hitch is solid and in good condition.
- The receiver locking pin is in good condition.
- The hitch ball is clean and tight.
- The trailer nosepiece is solidly bolted or welded.
- The cable, plug, and receptacle are in good condition.
- The safety chains are in good condition.
- The safety chains are long enough to cross.
- The trailer nose jack works properly.

## Supplies

Check the trailer's supplies, and make sure:

- There is a fire extinguisher.
- There is a first aid kit.
- There are emergency reflector stands, triangles, or flares.
- There is an appropriate trailer jack.
- There is a correct lug wrench.
- It has snow chains (for winter operation).
- There are spare fuses and bulbs that will work with this trailer.
- There is an aerosol tire filler.
- There is a strong flashlight.
- There is a reflective jacket for you to wear when out of the truck.



*Be sure lug nuts are properly secured or they could cause the wheel to wobble. Eventually, the studs could sheer off and the trailer could lose the wheel.*

# Happy Trails!

The vast majority of horse owners use trailers to take their horses to shows or training, to pick up newly purchased horses, or to take horses to the veterinarian. A horse may be transported hundreds of times over its working life. So it is clear that transporting horses safely is as necessary and important as proper feeding, housing, and medical care.

To use a trailer properly, you must invest in a safe and capable rig operated by a knowledgeable driver. Shortcuts invite disaster. In a single moment, a crash can turn the fun and excitement of going to a horse show or trail ride at the park into a tragic memory.

Every person who transports horses — whether around the block or across the country — should be acquainted with the truck and trailer. You can have peace-of-mind when you understand that you are operating safely. Safe operation means that you operate the truck and trailer as they were designed and routinely inspect and maintain all components.

*The right light is out.*

This does not mean that everyone has to be a certified mechanic. You can perform most truck and trailer inspections before a trip — even if you think you are mechanically challenged.

What it does mean is that you need to invest a little time before the trip to ensure that people and animals arrive at their destination without any surprises. When a truck and trailer are properly matched, held together with a hitch system that is properly rated, and the equipment is well maintained, it significantly reduces the likelihood of something bad happening on the highway. This means you will arrive safely and enjoy that long horse ride or competition.

*Get back and forth from home safely. Happy trails!*

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