How to weight

This process is a relatively easy one, but can get a little complicated depending on how many wheels or axles you want to weight, and by how many individual scales are available.

First, let's set some terminology for the purpose of this document. A "scale" is the device that tells how much something weighs, like a bathroom scale. A "weigh station" is where the scales are located, like at a truck stop.

Okay now, let's start weighing!

Our tow vehicle could be anything, but I'll call it a truck, and our trailer has two axles. If you are doing this at a truck stop, you may need to pay a small fee for each weighing you do. It might be best to check first to see what the best process will be for what you are trying to do and how much it will cost. You will probably get a slip of paper that shows each weighing that you do, so you won't need to write anything down right away.

If you use a weigh station along the highway, you may be able to do this for free! Try to pick a time that the commercial traffic is low or not using them. That way you won't have to be in a hurry. Many weigh stations, when they are closed, will turn the scale read-out machine around so that you can see it from a window. You will need to write the weights down as you do them.

Alright, we are after 4 weights:

1. Front truck axle weight (A or D below).
2. Rear truck axle weight (B or E below).
3. Trailer hitch (or pin) weight (H below).
4. Trailer weight (J below).

First we'll start with just one scale at the weigh station.

Put each truck axle on the scale one at a time. Then put the trailer axles on the scale. Write the weights down here.

A. Front axle: _____
B. Rear axle: _____
C. Trailer axles: _____

Pull off the scale and find a place that you can park the trailer and unhitch it. Go back and weigh the front and rear truck axles again. Write down the weights here.

D. Front axle: _____
E. Rear axle: _____

We'll deal with the math shortly.

If there are 2 scales at the weigh station.

Put each truck axle on a separate scale. Write the weights down here.

A. Front axle: _____
B. Rear axle: _____

Pull forward and put the trailer axles on one of the scales, it doesn't matter which one. Write down the weight here.

C. Trailer axles: _____

Pull off the scale and find a place that you can park the trailer and unhitch it. Go back and weigh the front and rear truck axles again. Write down the weights here.

D. Front axle: _____
E. Rear axle: _____

Hold on, we're getting to math.

Now if the weigh station has 3 scales, this is easy! Pull your entire rig onto the scales so that the front truck tires are on one scale, the rear truck tires are on another scale, and the trailer tires are on another scale. Write down the weights here.

A. Front axle: _____
B. Rear axle: _____
C. Trailer axles: _____

Pull off the scale and find a place that you can park the trailer and unhitch it. Go back and weigh the front and rear truck axles again. Write down the weights here.

D. Front axle: _____
E. Rear axle: _____

Now it's time to do the math.

D – A = F, or the weight added to the front axle from the trailer tongue (or pin) weight (via the weight distribution hitch, if equipped).

E – B = G, or the weight added to the rear axle from the trailer tongue (or pin) weight (via the weight distribution hitch, if equipped).

F + G = H, or the total trailer tongue weight from the trailer tongue (or pin) weight (via the weight distribution hitch, if equipped). Add this number to C to get the total trailer weight.

C + H = J, or the total trailer weight. This number should be less than or equal to the trailer's GVWR. If not, you have overloaded your trailer!

It is important that D and E do not exceed the tow vehicle's front or rear gross axle weight ratings (GAWR). If they do, you may experience premature wear of several components in your suspension and/or drive train.

If you want to see how much each trailer axle weighs, that's simple. Just put each axle on a scale one at a time. It would help if you have someone to tell you when to stop as you pull the trailer forward onto the scale. Otherwise, you may need to pull forward or back up a few times to get just the one axle on the scale.

You can also see if the tow vehicle and/or trailer are loaded evenly side-to-side by doing any of the above steps with the tires of just one side on the scales at a time. Again, it might help if you have someone to tell you when to stop.

Another set of weights that was mentioned earlier were the front and rear axle weight ratings (or GAWR), which you can also find on the same sticker on the inside frame of the driver's door or in the engine compartment.

For fifth wheel's, almost all of the pin weight will be placed directly on the rear axle, while a small amount will go up front. Is the rear GAWR enough to handle the load?

For other trailers that do not use a weight-distributing hitch (usually when the TW is less than 500 pounds), all of the TW will be placed on the rear axle. Is the rear GAWR enough to handle the load?

For other trailers that do use a weight distributing hitch (TW over 500 pounds), some of the TW will be placed on the front and rear axles of the tow vehicle as well as some moved back to the trailer axle(s). Are the GAWR's enough to handle the load? Just for argument sake, lets assume the worst situation (this would not be an ideal situation, but it could happen) where the weight-distributing hitch is not set up properly and the TW is places entirely on the rear axle. Is it strong enough?

If you could answer yes to these GAWR questions, then you have selected a tow vehicle capable of towing the desired trailer.

Hopefully, you can see the importance of understanding how all of the different weights interact with each other. And now you can see why those "tow rating" or "towing capacity" numbers are so inflated!

It is strongly recommended to stay under the GAWR's, GVWR, GCWR and TGVWR. The manufacturer's came up with these numbers for a reason, and there is plenty of debate as to the validity of these numbers. Performance from the tow vehicle will begin to suffer the closer you

get to the GCWR. When possible, get more tow vehicle than you think you will need to give you that extra margin of performance. You may be sorry if you don't!

Many people try to factor gas mileage into the equation in selecting a tow vehicle. Keep in mind what you are trying to do with the tow vehicle, TOW!!! Gas engines may get less gas mileage and have less power than a similar size diesel engine, but diesel engines cost more initially. You would need to factor in the additional cost of the diesel engine compared to a gas engine, what the difference is in fuel mileage and the cost of fuel to determine how many miles you would have to drive the diesel engine to break even on the additional expense. The break-even point could be well over 75,000 miles depending on how much you tow. Also, some diesel engines may be more costly to maintain than a gas engine.

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