



Weigh master, George Wickholm #13110, weighs Mark and Emily Fagan's RV.



## Maintain Personal Safety and RV Longevity by **MAKING WEIGHT**

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One of the least glamorous, but most important, aspects of RVing is ensuring your rig makes weight. Even though your RV may not be "making weight" for a wrestling match any time soon, your personal safety while driving and the longevity of the rig itself are on the line.

For many of us, once we've established that our RV can make it across the various mountains and valleys we typically tackle, we stop thinking about whether our truck can handle our trailer or whether we've positioned everything in the motorhome so it isn't listing to one side. Over time, however, we end up moving things around in our rolling homes; we buy more stuff and pack it away into the depths of our closets, and pretty soon our sleek, new-to-us rig is bloated and overweight.

Measuring the weight of an RV and punching the numbers to figure out whether it's overloaded is not a trivial matter. Fortunately, there are RV-specific weigh stations that cater to RVers' needs and give us the critical data that can't be found at the average truck scale. On our recent visit to the Escapees' Smart Weigh station in Congress, Arizona, we learned a lot about our rig and discovered that, like many full-time RVers, we'd let our beloved buggy get a little plump.

### **Preliminaries First—Homework**

The first step in our weighing was to take some paperwork home and fill it out. We needed to find all the specs on our Hitchhiker II LS fifth-wheel and Dodge RAM 3500 truck, from the GVWR of the trailer to the GCWR of the truck. Yikes! Besides the head-spinning alphabet soup of these ratings (see the glossary in the sidebar for the definitions), we also needed the make, model and tire pressure ratings of each tire on both the truck and trailer. That's a lot of work, but the weighing is meaningless if you don't have all the specs in which to compare your weights.

### **Tire Inflation**

Although much of the importance of weighing a rig is ensuring the frame and axles aren't overloaded (risking possible cracking or other failures), it is the tires where the rubber meets the road. Blowouts from overloaded tires are an all too common failure in RVs.



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Measuring your tires' pressure on a regular basis is critical. However, small, hand-held tire gauges are often inaccurate. When we arrived at the Escapees SmartWeigh station in our truck (without the trailer attached), the first thing our weigh master, George Wickholm, did was to calibrate our new digital tire gauge so we knew we could trust it in the future when we measured the tire pressure ourselves.

Then he proceeded to use a high-end tire gauge to determine the current tire pressure of each tire on the truck. We arrived first thing in the morning to ensure the tires were still cold. The Escapees park at North Ranch is at around 1,500-foot elevation, and George reminded us to check our tire pressure when we criss-cross the mountain ranges of the West because tire pressure changes with elevation.

### **Weighing Individual Wheels**

One of the reasons a truck scale (or grain elevator or other large scale) doesn't give RVers the kind of detail we need about our rigs is that they don't weigh the wheels individually. Those scales are great in a pinch, but they won't tell you that one corner of the RV is much heavier than the others. If the weight isn't distributed evenly, the rig may wander as you drive, the tires won't wear evenly and

you won't be able to inflate the tires to suit their exact load.

Also, RV-specific weigh stations are perfectly level, which means the wheel weights are correct even though some wheels are on scales and others are not. Trying to weigh the wheels independently at a truck scale may not be possible or may require putting one or two wheels off the pavement, rendering the weights meaningless.

Our weigh master, George, began by weighing the truck in a “not towing” state, that is, without the trailer attached. The truck was set up as it usually is when we drive, with both of us in it, our spare water jugs full and our leveling boards and portable generator in their normal positions in the bed. He asked us to drive the front tires onto two portable Loadometer scales so he could obtain the individual wheel weights of the two front tires. Then he had us pull forward so he could weigh the two back tires in the same fashion. These numbers would later give us the truck's “not towing” weight.

Once the four tires of the truck had been weighed without the trailer, we drove off and hitched up our fifth-wheel and returned to the scales. The trailer was set up the way we travel, with full water tanks, empty waste tanks (we boondock all the time, so we

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manage our holding tanks accordingly), full refrigerator and pantry, bikes on the bike rack and both of us in the truck. Now each of the wheels of the truck and then the trailer was weighed individually as we slowly inched forward and carefully placed each pair of wheels on the two scales. These numbers would later give us the “towing weights” for both the truck and trailer.

### How Tall Is This Beast Anyway?

Before the calculators came out for the vital calculations, George held an enormously long yardstick with a cross-bar at the top next to the highest point of the trailer (the air conditioning vent), and measured the height of the rig. It was 12 feet, 6 inches, but he suggested we always allow at least six inches more than that. Sure enough, a month later, at an RV car wash, when I crouched on the roof to eyeball the clearance, I discovered the RV bay was about six inches lower than its posted height!

### Axle and Pin Weights

Now that we had all the wheel weights on our worksheet, the calculations began. The SmartWeigh program leaves these calculations to the customer to ensure we understand our rig’s weight thoroughly and to avoid legal responsibility for miscalculations. The math isn’t bad, however.

The axle weights are simply the sum of each pair of wheels on each axle, and the worksheet makes it obvious how to add those up.

More difficult is calculating the pin weight of the trailer. This is the weight of the trailer at the hitch, whether it is a bumper-pull travel trailer or a fifth-wheel trailer. Big motorhomes pulling small cars don’t need to worry about this calculation, but smaller motorhomes pulling large utility trailers do.

The pin weight (or “tongue weight”) is calculated by comparing the weight of the truck when it is towing the trailer (towing weight) to its weight when it doesn’t have the trailer attached (not towing weight).



The “towing weight” is determined by adding up the truck’s four wheel weights when it is towing the trailer. The “not towing weight” is determined by adding up the truck’s four wheel weights when it doesn’t have the trailer attached. Subtracting the “not towing weight” of the truck from its “towing weight” gives you the weight of the portion of the trailer that is being held up by the truck, known as the “pin weight.”

If this is confusing, imagine you get on a bathroom scale and find you weigh 150 pounds. This may be a pleasant surprise or a discouraging shock. Either way, when your 16-year-old son puts his hands on your shoulder and hangs on you,

telling you he doesn’t want to go to school, you look down and see the weight on the scale has increased to 180 lbs. You can feel his weight on your shoulder, but he’s also standing on his own two feet next to you. By hanging on you, he’s putting 30 pounds of his weight on your shoulders (180 - 150). However, the bulk of his weight (no matter what it actually is) is on his own feet.

It is exactly the same with a tow vehicle and a trailer. Fortunately, the worksheets make it easy to add up the total weight of the four wheels of the truck both when it is loaded and when it is unloaded and to do this subtraction to get the pin weight.

## Comparisons and Conclusions

Once we completed all our calculations, we compared our weights to the specs for our truck and trailer. Our wheel and axle weights were all within spec, the wheel weights were similar all around, and our pin weight was okay so we didn't need to move anything to redistribute our weight. However, our trailer was overweight by 105 pounds, or 0.07% (the GVW of the trailer exceeded its GVWR). Luckily, this was easy to rectify.

More startling was the discovery that when our trailer was hitched to our truck, it overloaded the truck by 750 pounds, or 7.4% (the GVW of the truck when towing exceeded the GVWR of the truck). That's a lot, and it is something we are still working on fixing (it's hard to get rid of stuff!). Determining the manufacturers' GCWR of older trucks like ours is difficult, even if you contact them with your VIN number; however, we know we need to lighten our load, and that is our focus.

If you haven't weighed your rig lately, it is well worth a little extra effort to locate an RV-specific weigh station and find out if your RV is truly fight ready and makes weight. 🚚

Emily and Mark Fagan have been traveling full-time since 2007. Until recently, they split their time between their fifth-wheel trailer and their sailboat, but now they are back on the road full-time. They chronicle their journey with beautiful photos and fun stories at [www.roadslsstraveled.us](http://www.roadslsstraveled.us), and their site also includes many pages of tips about the RVing lifestyle.



**SmartWeigh**  
ESCAPEES RV Club™

Escapes SmartWeight weighing locations and weigh schedule can be found on [page 32](#), or visit SmartWeight online: [www.escapes.com/smartweigh](http://www.escapes.com/smartweigh). You can also have your RV weighed at Escapes RVers' Boot Camp. See page 18, or visit [www.escapes.com/bootcamp](http://www.escapes.com/bootcamp).

## GLOSSARY

### • GVWR—Gross Vehicle Weight Rating

The maximum weight that can be supported by a fully loaded vehicle. This includes passengers, clothes, kitchen contents, fuel(s), fresh and waste water and the tongue weight of any vehicle towed behind. (GVW = Gross Vehicle Weight)

### • GAWR—Gross Axle Weight Rating

The maximum weight that can be supported by each axle on a vehicle, measured at the tires.

### • GCWR—Gross Combined Weight Rating

The maximum combined weight of the tow vehicle and the vehicle(s) towed behind. (GCW = Gross Combined Weight)

### • TWR—Tongue Weight Rating or Pin Weight

The weight of the trailer at the hitch pin or king pin where it connects to the tow vehicle.

### • UVW - Unloaded Vehicle Weight

The weight of a vehicle coming out of the factory, including fuel and liquid for the engine and/or onboard generator. It does not include clothes, kitchen contents, food, water, fresh and waste water, propane, passengers or dealer-installed accessories.

## LIQUID WEIGHTS

- **Water:** 8.3 lbs/gal
- **Diesel Fuel:** 6.8 lbs/gal
- **Gasoline:** 5.6 lbs/gal
- **Propane:** 4.2 lbs/gal

## RESOURCES

- **Smart Weigh:** [www.escapes.com/smartweigh](http://www.escapes.com/smartweigh)
- **RV Weighing and Safety Information:** [www.rvsafety.com](http://www.rvsafety.com)
- **Scales used by Smart Weigh:** [www.loadometer.com/wl101.htm](http://www.loadometer.com/wl101.htm)
- **CAT Scale locator:** [www.catscale.com/cat-scale-locator](http://www.catscale.com/cat-scale-locator)
- **Penske certified truck scale locator:** [www.publicscaleslocator.com](http://www.publicscaleslocator.com)



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