

What is all this confusing talk about weights? The weight issue is probably the most critical and least understood issue you will confront when purchasing a towable RV. It is critical because a mismatched tow vehicle and trailer can put you and your loved ones safety in jeopardy. It can also result in expensive repair bills for damage and premature wear to major components on your tow vehicle. It is the least understood issue because the buyer is not educated on weight concerns until it is too late.

Trying to cover everything involved on this subject in a short article is like trying to find the needle in a haystack. For a more in depth look at these topics check out our newest video production “Trailer Towing, Weights Hitch Work & Backing” at >> <http://rveducation101.com/trainingvideos.htm?siteID=0>

Let’s start with the tow vehicle. The vehicle manufacturer determines tow vehicle ratings. Extensive testing is done and many factors are considered such as; engine size, transmission, axle ratio, chassis, suspension, brakes, tires, cooling system, and tow packages. Any time a vehicle or trailer is given a rating it is based on the weakest link in the chain. For example, the axle on a trailer may be capable of supporting 5,000 pounds, but if the tires on the axle can only support 3,000 pounds the axle is rated for 3,000 pounds. This is why it is crucial that you never exceed a manufacturers rating.

You can take five ½ ton trucks with the same engine, and tow ratings can vary by 4,000 pounds. One of the major factors affecting tow ratings is the rear axle ratio. Very basically, the axle ratio is a comparison of how many times the drive shaft rotates versus the wheels. If you have a 3.73:1 axle ratio it means the drive shaft rotates 3.73 times for each rotation of the wheels. The higher the numeric value of the rear axle the better it tows, but you compromise gas mileage. The key to selecting the tow vehicle is to figure out what your requirements are and to know exactly how it is equipped so you can determine the correct tow rating. Tow ratings are extremely important, but there are other weight issues concerning the tow vehicle that are often overlooked.

There’s a very simple formula we can use to determine how much we can safely tow, but first there are a couple of weight ratings you need to understand:

Gross Vehicle Weight Rating (GVWR): is the maximum permissible weight of the vehicle or trailer when fully loaded for travel. This includes the unloaded vehicle weight, all fluids, cargo, optional equipment and accessories. The tow vehicle and trailer each have a GVWR.

Gross Combined Weight Rating (GCWR): is the maximum permissible combined weight of the **tow vehicle and the trailer together** when they are fully loaded for travel.

Unloaded Vehicle Weight or Dry Weight (UVW) or (DW): is the actual weight of the tow vehicle or trailer as built at the factory. The UVW does not include passengers, cargo, dealer installed options, personal belongings, water, or LP gas.

Gross Vehicle Weight (GVW): is not a rating, it is the actual weight of the tow vehicle when it is fully loaded including passengers, cargo, a full fuel tank and accessories like the hitch.

Gross Trailer Weight (GTW): is not a rating, it is the actual weight of the fully loaded trailer including all options, cargo, personal belongings, food, water and LP gas.

Armed with this information, let's look at a typical buying scenario. We know for a fact that our tow vehicle is rated to tow 8,800 pounds and it has a GCWR of 15,000 pounds. When I account for the cargo in the truck, three additional passengers, and after market accessories my actual tow rating is 8,040 pounds. Keep in mind that any weight you load in or on the truck reduces the tow rating by that amount.

Tow rating for the vehicle	8,800 lbs.
Cargo in the tow vehicle	- 150 lbs.
Three passengers	- 450 lbs.
Dealer installed options	- 160 lbs
Actual tow rating	8,040 lbs.

Now let's look at our towing formula: **Tow Vehicle GCWR – Tow Vehicle GVW = the Maximum GVWR for a trailer we can purchase.**

The GCWR for my truck is 15,000 pounds. Now I subtract the GVW of my truck when it's fully loaded for travel and this equals the maximum GVWR of a trailer I can consider purchasing. The only way to determine the actual GVW of the tow vehicle is to take the fully loaded vehicle to a set of scales and have it weighed. The GVWR can be found on the Safety Compliance Certification label, located on the exterior left front of the trailer.

Tow vehicle GCWR	15,000 lbs.
Tow Vehicle GVW	- 6,832 lbs.
Maximum GVWR of Trailer =	8,168 lbs.

So let's say we found a trailer with a floor plan we like that has a GVWR of 8,000 lbs. The UVW or Dry Weight of the trailer is 6,350 pounds. Keep in mind we have to add any dealer installed options, cargo loaded in the trailer, any water we add to the fresh water holding tank and LP gas. This gives us a gross trailer weight of 7,075 pounds. Ask the RV dealer to show you the weight label that is inside the trailer for accurate trailer weights. Unloaded Vehicle Weights found in a manufacturer's brochure are normally for the base model of the trailer and do not include options the dealer may have ordered on the unit. In the majority of cases there is a significant difference between the GVWR and the UVW of the trailer.

UVW or DW of trailer	6,350 lbs.
Dealer installed options	+ 100 lbs.
Cargo in the trailer	+ 300 lbs.
Water 8.3 X 32 gallons	+ 266 lbs.
LP gas 4.23 X 14 gallons	+ 59 lbs.
Gross Trailer Weight	7,075 lbs.

Let's see if this will work: Remember our GCWR is 15,000 pounds. When we subtract the weight of our **fully loaded tow vehicle** and our **fully loaded trailer** we still have 1,093 pounds to spare before we exceed our GCWR.

Tow Vehicle GCWR	15,000 lbs.
Combined Weight of (fully loaded)	
Tow Vehicle & Trailer	- 13,907 lbs
	= 1,093 lbs. to spare

This method will almost always works, unless you have the tow vehicle and the trailer loaded to their maximum GVWR, which when added together can exceed the GCWR. This is more likely to happen when the tow vehicle is a light duty vehicle like a mini van, small SUV or light duty truck. In this situation you simply add the GVWR of the tow vehicle to the GVWR of the trailer then select a tow vehicle that is rated for the combined weight.

If your original calculations are based on estimates you need to verify all weights by going to a set of scales and properly weighing the vehicle and trailer. Keep in mind this is a crash course and there are many more weight factors and considerations we did not even touch on. Gross Axle Weight Ratings (GAWR), tires, tire inflation, proper hitch work, trailer brakes and much more need to be addressed. I cover a lot of this information in my "Trailer Towing, Weights, Hitch Work & Backing" DVD. I hope this helped to clear up some of the issues concerning matching your tow vehicle and trailer to ensure a safe towing system.

Happy Camping,

Mark

Mark Polk is the owner of RV Education 101. RV Education 101 is a North Carolina based company that produces professional training videos, DVDs and e-books on how to use and maintain your RV. Our goal is to make all of your RVing experiences safe, fun and stress free. www.rveducation101.com