

The Basics of Recreational Towing

We have all seen vehicles with trailers attached going down the highway. Some appear level, some have the front end riding high and the rear of the tow vehicle squatting down, others the opposite. Is one hookup safer than another? Is one dangerous? What causes these differences in vehicle attitude? What else needs to be addressed to ensure a vehicle and trailer are attached safely and properly?

Rear End Squat of the tow vehicle is a typical sign of too much tongue load. This is dangerous because the front axle weight will be light, resulting in altered steering response. This condition may also cause the rear tires and/or the rear axle to fail due to overloading.

Rear End Lift is a typical sign of too little or negative tongue load. This is dangerous as it causes the trailer to sway.

Optimal - Most trailers and tow vehicles should be level (parallel to the ground) during travel. Some vehicle manufacturers may call for a slight squat.

Safe Towing Requires Planning

Vehicle & Trailer Selection - Safe towing begins with the selection of a tow vehicle and trailer. It is important to compare the manufacturer's vehicle ratings with trailer requirements that can accommodate the size and weight of what will be towed. Failure at the selection phase can lead to an overloaded tow vehicle and/or trailer, which can often cause reliability and handling issues, such as failed hitches, suspension components, tires, and even structural components of the tow vehicle. It may also reduce the longevity of the power train.

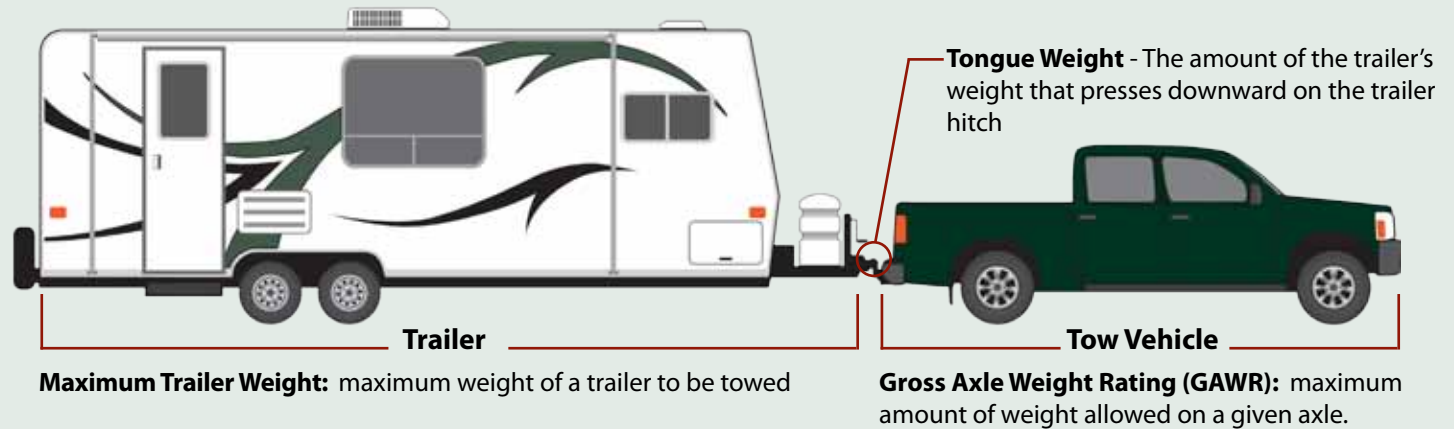
The Maiden Voyage - The first trip with a new trailer/tow vehicle combination should be to the scales. Best practice involves loading the trailer and vehicle in a manner that is similar to typical usage and re-weighing the combined vehicle. Comparing the front and rear axle weights of

the tow vehicle before and after the trailer and cargo are loaded allows for comparison of axle, tongue, and combined weights against manufacturer's guidelines. Adjustments should be made to the distribution of cargo in the vehicle and trailer to ensure compliance. If the trailer tongue weight cannot be brought within specification, a weight distributing hitch may remedy the situation.

Failure to comply with manufacturer ratings may compromise safe vehicle handling and braking, reliability, and durability.

Braking Systems - For a trailer with a loaded weight of more than 1,500 pounds, many states require a separate trailer braking system and a breakaway switch, located on the tongue of the trailer, to activate the trailer brakes in the event the trailer

Gross Combined Weight Rating (GCWR): maximum weight of the vehicle, occupants, cargo, and trailer.



separates from the tow vehicle. There are several styles of brakes. Surge brakes are commonly hydraulic and are self contained on the trailer tongue; they use the trailer weight to build pressure in the system as the tow vehicle slows down. Electric brakes are the most popular on recreational travel trailers. Electric brakes require a trailer brake controller, which allows the driver to adjust trailer brake response. Excessive trailer sway may be the result of a maladjusted brake controller.

Safety Chains - Safety chains are required by most states. When connected, safety chains should have some slack to permit sharp turns but should not drag on the road. In addition, they should cross under the trailer tongue to help prevent the tongue from dropping to the road in the event that the trailer separates from the tow vehicle.

Tires - All tires on a trailer should be the same type, size, and construction. Tires have a load rating that indicates the amount of weight they can safely carry. Tow vehicle tires commonly require a higher tire pressure for towing.

Peter J. Leiss - Automotive Engineer
pleiss@robsonforensic.com

Mr. Leiss worked as an automotive engineer with General Motors and Dodge. His expertise includes powertrains, suspensions, structures and safety equipment; this includes ABS, Traction Control, and Electronic Stability Control systems. At Dodge, Peter was responsible for testing Dodge Ram and Durango vehicle systems performance under real world towing situations.