

The Airstream Tech Help Group has been established to provide assistance to the membership experiencing technical problems. We will respond directly to you in response to your email describing a problem. Examples of questions, modifications or upgrades that might be of interest to members will be published in the Blue Beret. We hope you will find this service of value in the care and feeding of your Airstream.

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## Controlling Trailer Sway Part 1

The travel trailer's Achilles' heel is the way it is hitched to the tow vehicle – at a point often four or five feet behind the axle. Thus, the trailer has the leverage to move the tow vehicle's rear to one side or the other, which has the effect of steering the tow vehicle. This steering effect can go into oscillations, known as fishtailing – a name for excessive sway. Sway can be controlled in most cases.

The information described here is intended to help you have safe, enjoyable towing. Whether you are new to trailering or a practiced "old hand", we hope you will find this informative and helpful. Please feel free to send us comments that may improve this information and help others down the road. [techhelp@wbcci.org](mailto:techhelp@wbcci.org)

**Weight and Balance.** All conventionally hitched travel trailers will sway slightly in response to crosswinds or the "bow wave" (air pressure) of an 18-wheeler overtaking from the rear. The good hitches, set up properly, will need little correction by the driver and will quickly re-stabilize. Poorly set up trailers will continue to sway after the force that caused the instability has ceased. In poorly balanced trailers, the sway motion may increase until control is lost. Most evaluations of sway problems focus on the hitch or the tow vehicle, but the trailer's weight distribution is often the primary cause. Following are points on how to tell a well-behaved trailer from a poorly behaved one, and how to correct problems with your trailer.

**Trailer Checkup.** A trailer's inherent stability is part of its design, based on the amount of weight in front of the axles vs. the amount of weight behind the axles. The difference between these two weight masses is the amount of weight on the trailer's hitch, which is called the *hitch weight* or *tongue*

*weight*. Trailers with insufficient hitch weight have two deficiencies: The percentage of weight (mass) behind the axle(s) is too high, so when set in motion it acts as a pendulum. Trailers with a high proportion of hitch weight to gross weight usually have more of their length ahead of the axles and handle better. The generally accepted industry standard is that the hitch weight should be approximately 10 percent of gross weight. This is a minimum, and some trailers with 10 percent hitch weight may still not handle well. Hitch weights of 12 percent or higher (up to the weight limits of the hitch and the vehicle being used) help to assure proper handling. In marginal situations, the owner's ability to handle an unstable trailer will depend on the inherent stability of the tow vehicle, which is yet another variable. A truck or van with a long wheelbase, a relatively short rear overhang and stiff springs often will partially make up for a trailer's lack of inherent stability, whereas if the trailer is towed by a softly sprung vehicle with a long overhang, the trailer's shortcomings will be more obvious.

**How a Trailer Should Handle.** Properly designed, well-matched, tow vehicles and trailers have positive control and good road handling and are easy to drive. Strong crosswinds may push the tow vehicle/trailer combination laterally, and the tow vehicle/trailer may end up wandering out of the traffic lane if the driver isn't paying close attention. Steering should be predictable, and the driver should be able to use corrective steering measures without fear of sway. Speeding 18-wheelers present hazards to conventionally hitched trailers that don't handle well, particularly while descending mountain grades. A tow vehicle/trailer rig is most susceptible to destabilizing forces while descending a grade at highway speeds, and such conditions are the true test of inherent stability.

The "bow wave" of a speeding 18-wheeler may affect a tow vehicle and trailer – an effect that requires steering correction. But the effect should not be destabilization that makes the tow vehicle feel like steering control is minimal and unpredictable. It is always necessary to monitor one's rearview mirror and anticipate the effects of an 18-wheeler overtaking from the rear.

The four important keys to good road performance while towing a travel trailer are:

1. Proper trailer-weight distribution
2. Proper hitch adjustment
3. Use of effective sway-control equipment
4. Anticipation of adverse driving conditions

**Weight Evaluation.** If you notice significant trailer sway during normal driving and an occasional uncomfortable situation, your rig is not set up properly and should be corrected. The first step in evaluating a trailer for correction of stability is a trip to the scales. Commercial scales are accessible in most communities at rental yards, waste management sites, moving and storage firms, and grain elevators. Gross weight and hitch weight should be recorded with the trailer loaded for travel. Gross weight is recorded with the trailer unhitched on the scale. Hitch weight is determined by subtracting two trailer weights. For the first, weigh the trailer, unhitched, on the scale. For the second, position the tongue jack off the scale (trailer unhitched and tongue height same as when towing) to weigh only the trailer wheels. Subtract the two figures for hitch weight. Weighing the trailer wheels with the trailer hitched and spring bars in use will give a false hitch weight reading. If hitch-weight percentage is down around 10 percent or less, unstable trailer behavior may result. If hitch weight is 10 to 12 percent, towing stability still could be a problem if the tow vehicle is marginally stable. If hitch weight is 12 to 15 percent, the trailer should handle well and should not be a contributor to any instability issue. It is important that the measured hitch weight not exceed the

rating of the weight distribution hitch. Ratings of conventional hitches typically range between 800 and 1,000 pounds of tongue weight, although they are available up to 20,00 pounds. Ratings are stamped on hitch components.

Let's examine a couple of trailers that have different weight distribution:

	Example 1	Example 2
Total trailer weight	5,400#	6200#
Hitch weight	650#	560#
Hitch/Trailer %	12%	9%
Result	Good	Insufficient
	Handles well	Likely handling problem

Example two (2) involves a trailer that clearly has insufficient hitch weight and is prone to sway. The only solution is to move weight forward. This may be accomplished by moving some supplies or moving a rear-mounted spare tire. The worst place for a tire, or anything else that is relatively heavy, is on the back of a travel trailer that has marginal hitch weight. Carry it in the tow vehicle unless it can be mounted on the trailer in front. Another possibility is the battery; if carried in the rear, it could be relocated forward to the trailer A-frame. The freshwater tank should not be located behind the trailer axles. If a rear water tank can be replaced by one of a different shape that will fit under a sofa in the forward section of the trailer, for example, the positive effect on stability could be dramatic. Ideally, the water tank should be located over the axles, so its varying content weight does not affect hitch weight significantly. It is wise to empty holding tanks before traveling to minimize weight in the rear. A trailer with insufficient hitch weight can be towed successfully by combining a very stable tow vehicle with very conservative driving habits, but such a rig can still get out of control in an emergency.

Happy trails to you, see you, safely, down the road.

*To be continued.*