

## MOTOR HOME WEIGHT

A common topic of discussion is the payload and towing capacity of a vehicle. Winnebago Industries currently provides a weight information sheet with each coach to help define what the specific capacities are. With this information, you can make better decisions concerning loading the coach and towing. The following is a summary of the weight information sheet and general comments concerning towing with your motor home.

A comprehensive weight information sheet is now being included in the InfoCase of each new Winnebago Industries motor home. The weight sheet is also posted at eye-level in the rear most interior wardrobe or shirt closet. It gives an expanded listing of weights specific to the subject motor home for the dealer and customer's better understanding. Of great importance to the customer is the NCC—the net carrying capacity of the motor home. This is the weight allowance available to carry driver, passengers, water, LP gas, cargo and hitch tongue load. Many competitors have very small NCC on their units with the result that the owner can easily overload the unit above the chassis manufacturer's ratings. The six weight figures listed on the weight information sheet are as follows:

**GAWR** (Gross Axle Weight Rating) means the maximum load carried by an axle. The axle ratings are divided into the front and rear capacities.

**GVWR** (Gross Vehicle Weight Rating) is the maximum permissible weight of this motor home. The GVWR is equal to or greater than the sum of the unloaded vehicle plus the net carrying capacity.

**UVW** (Unloaded Vehicle Weight) means the weight of this motor home as built at the factory with a full fuel tank, engine and coolants. The UVW does not include cargo, fresh water, LP gas, occupants or dealer installed accessories.

**NCC** (Net Carrying Capacity) means the maximum weight of all

occupants including the driver, personal belongings, food, fresh water, LP gas, tools, tongue weight of the towed vehicle, dealer installed accessories and other items that can be carried by this motor home. This capacity could also be referred to as the payload capacity of the motor home.

**GCWR** (Gross Combination Weight Rating) means the value specified by the motor home manufacturer as the maximum allowable loaded weight of this motor home plus its towed trailer or towed vehicle. If the "trailer" is not equipped with brakes that are activated when the motor home brakes are applied, the GCWR equals the GVWR plus 1,000 pounds. For purposes of this definition, the "trailer" can be a trailer, a vehicle towed on a dolly or a vehicle towed by means of a tow bar.

**FACTORY INSTALLED OPTIONS** – The total weight of the options ordered on this vehicle and installed at the Winnebago Industries factory in Forest City, IA. This weight does not include customizing or dealer installed options.

**CAPACITIES** – This information shows the fluid capacities for this vehicle and the weight per gallon of each fluid. The weight of fresh water is 8.33 pounds per gallon, LP gas is 4.5 pounds per gallon, and engine fuel (diesel) is 7.0 pounds per gallon.

Winnebago Industries adds this caveat at the bottom of the weight information sheet. "Consult owner's manual for specific weighing instructions and towing guidelines. Remember, motor homes should be operated within recommended GVWR ratings. For safer operating and handling conditions, you must distribute allowable payload properly."

### Towing Capabilities of a Motor Home

Key factors in determining the towing capability of a motor home/trailer combination are:

**GVWR** – The gross vehicle weight rating specified by the

chassis manufacturers as the maximum loaded weight of the vehicle (motor home) including fuel, water, passengers, cargo and optional equipment installed by the motor home manufacturer, dealer and/or owner.

**GCWR** – The gross combination weight rating specified by the chassis manufacturer as the maximum loaded weight of the towing vehicle (motor home) plus towed vehicle or trailer including all items noted in the GVWR above.

For the purpose of this definition, the "trailer" can be a trailer, a vehicle towed on a dolly, or a vehicle towed by means of a tow bar. In establishing the GCWR, the chassis manufacturer has considered the capacity of the engine, drivetrain and rear axle to power this amount of weight. Durability and reliability of these components are part of this consideration.

**BASE WEIGHT** – This is the weight of the vehicle without any options and with all tanks and storage areas empty.

**UNLOADED VEHICLE WEIGHT** – The base weight of the vehicle plus all the installed options and fuel. The unloaded vehicle weight listing is posted in every Winnebago Industries motor home on the Vehicle Weight Specifications Sheet. This sheet is posted on one of the wardrobe walls of every motor home built by Winnebago Industries.

The weight sheet (estimated) is customized for the specific motor home in which it is posted and accounts for factory-installed optional equipment.

**GAWR** – Gross axle weight rating. Each axle has a separate weight rating specified by the chassis manufacturer which is listed on Winnebago Industries' weight sheet. When preparing to tow a trailer or vehicle behind a motor home, care should be exercised not to put too much weight on the motor home's rear axle. **DO NOT OVERLOAD THE REAR AXLE!**

**HITCH RATING** – The Society of Automotive Engineers (SAE)

standard for hitches specifies a rating classification without any references to the towing capacity of the towing vehicle (motor home). The rating for a given hitch and the rating for a given tow vehicle are established independently. The lowest rating will apply for a given combination of hitch and tow vehicle.

SAE Standard J684 defines a Class III trailer as more than 3,500 pounds but not to exceed 5,000 pounds. Traditionally, the vertical tongue load to be imposed on the hitch is 10-15 percent of the drawn value, but is not specified by the SAE standard. Some models equipped with a Class III hitch will have a lesser vertical load rating.

Although the hitch is rated at a maximum weight, the owner must take into consideration the GCWR

and GAWR of the specific motor home to determine its towing capacity.

If a car or truck is towed by means of a tow bar, the vertical hitch load is small. The limiting factor in this case is the towed vehicle weight including the weight of the towed vehicle and any cargo carried in the towed vehicle.

Care must be taken to stay within the Gross Combination Weight Rating (GCWR). Individual axle weight ratings must not be exceeded. These ratings can be found on the vehicle certification label, which is included in the owner's InfoCase. This certification label is also located near the driver's position.

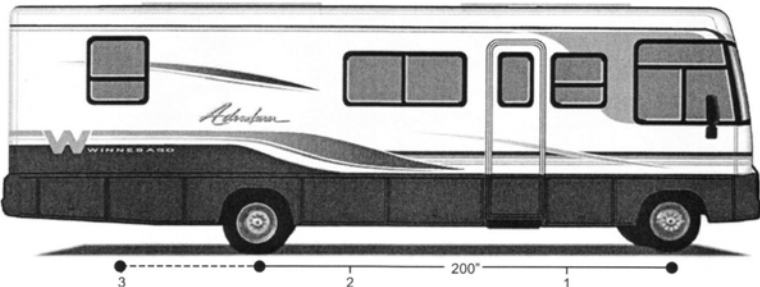
**TOWED VEHICLE BRAKES –**

Many states have laws requiring brakes on a trailer if it weighs more

than a stated amount, typically 1,000 to 1,500 pounds. The chassis manufacturers also have specific towing guidelines and limitations. See your chassis operator's manual for their recommendations and to determine if auxiliary braking system is needed.

It is always a good idea to carefully weigh both your motor home and towed vehicle or trailer to ensure that you do not exceed weight ratings. If you are uncomfortable about any aspects of loading your coach, seek the assistance of your dealer or other qualified professionals.

$$\frac{\text{Weight of item} \times \text{distance to front axle}}{\text{Wheelbase}} = \text{Weight transfer to rear axle}$$



**Example 1 – Moving 500 lb 50" rear of front axle**

$$\frac{500 \times 50}{200} = 125 \text{ pounds to rear axle (375 on front)}$$

**Example 2 – Moving 500 lb 150" rear of front axle**

$$\frac{500 \times 150}{200} = 375 \text{ pounds to rear axle (125 on front)}$$

**Example 3 – Moving 500 lb 250" rear of front axle**

$$\frac{500 \times 250}{200} = 625 \text{ pounds to rear axle (-125 on front)}$$

This chart illustrates the net effect on axle load achieved by moving weight rearward from the front axle of a vehicle. In the extreme you can transfer more than the object weighs to the rear axle, while "removing" weight from the front.