

RACK TECH EXPLAINED

Load Ratings

Load Ratings

Confused by how much weight you can actually carry on top of your vehicle? Don't worry, so are most of us, but this helpful guide should help you calculate this.

If still in doubt, please drop us a line at info@prorack.com.au and we will walk you through this.

When trying to calculate how much weight you can carry on top of your vehicle there are few key factors to take into consideration:

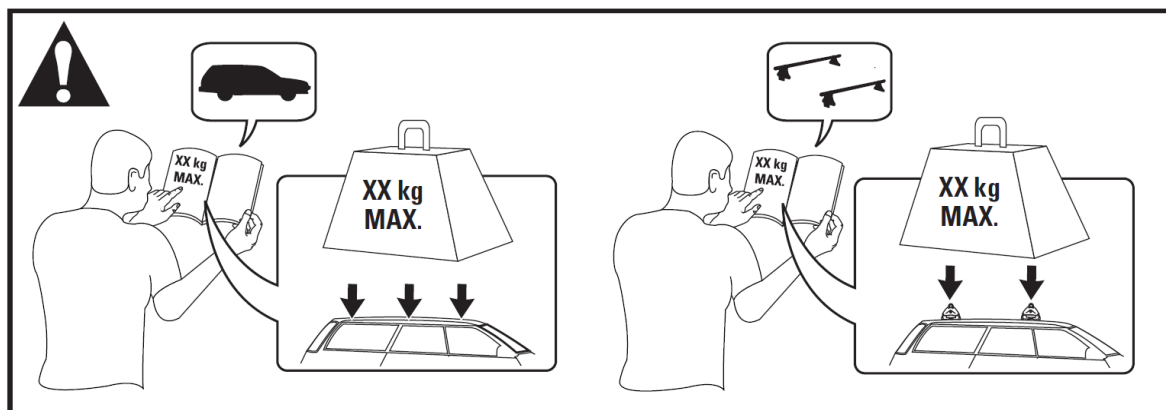
- Load ratings
- Static vs dynamic forces
- On road vs off road usage

Calculating Load Ratings

To calculate the load rating of your vehicle's roof, you first need to understand that this needs to be derived from the ratings of various components.

A typical Prorack or Whipbar roof carrying solution consists of:

- A vehicle roof (obvious, right?)
- A 'kit' that attaches a roof rack, platform, etc. to the vehicle roof. Think of this as the interface between the vehicle roof and the roof rack system. For Whipbar and Prorack products, this is the part starting with the letter K.
- A roof rack or platform that is attached to the roof via the kit, and on which you intend to carry your stuff.
- Possibly a further carrying apparatus like a roof box, boat holder, etc.



Each of the items listed above has an independent maximum load rating. **The maximum amount you can carry on top of your vehicle is the lowest maximum value of all of the components.**

For example, if your vehicle roof has a manufacturer's maximum load rating of 80 kg, your 'kit' is rated to 80 kg, your roof racks are rated to 75 kg and your roof box says it can carry 120 kg, **the maximum you can carry on your roof racks is 75 kg.** Just think of this as the weakest link in the chain concept.

If the lowest number derived relates to the vehicle roof, remember that the **derived load rating includes the roof rack weight.**

Note that the component parts can vary, sometimes the kit will already be on the roof racks, sometimes there will be additional spacers or height adjusters required. Once you identify the components, the same principle always applies.

To find the load ratings of the various components you'll need to consult the manufacturer's instructions (owner's manual for the vehicle roof rating) and/or website. If in any doubt, call rather than guess.

Always remember that load ratings for a system assume that any load is evenly spread over the system. As far as is possible, please try to apply this when loading your vehicle. Excessive loading on a point can cause damage and also vehicle instability.

With regards to the vehicle roof load rating, remember that (no matter what anyone tries to tell you) adding a roof rack system will not lead to an increase in the amount you can carry. The only way this is possible is if the roof is reinforced through significant modification.

Static vs Dynamic Loads

What's the difference? Put simply, dynamic is when you are driving your vehicle and there is motion, and static is when your vehicle is stationary.

The load ratings applied to products by roof rack manufacturers are for when you are driving the vehicle, i.e. they are dynamic load ratings. Static load ratings are generally higher.

Why does this matter? Well, generally it doesn't, as you don't add more luggage when you reach your destination and stop driving.

Where it does come into play though is with roof top tents (RTTs). In the example above, we determined that you can carry 75 kg on your vehicle. If your RTT weighs 55 kg, you are within your limits by 20 kg (75 kg – 55 kg = 20 kg).

So, what happens when you climb into your RTT? If you weigh 80 kg, using the dynamic load rating, you would be now over the limit by 60 kg. Don't worry though – unless you plan on being in your tent while driving! This is when the static load rating applies.

As a general rule, in a static environment, the load rating can be increased by a multiple of three (3). So, in this case, you can load 225 kg onto your roof and you will be ok and actually have 90 kg to spare. (225 kg – 55 kg – 80 kg = 90 kg)

There are exceptions to this though, which all responsible roof rack manufacturers should make you aware of. **For Prorack and Whispbar, we have a blanket exclusion of all clamp mount systems for use with RTTs.**

Note that the 3x multiple applies to roof rack components. As a general rule, it should be applicable to most vehicle roofs but we always recommend you consult with your vehicle manufacturer before assuming any increase from dynamic to static load rating in the vehicle roof.

Off Road Use

All load ratings are applicable for driving on well-formed sealed roads with a smooth surface.

Once you move to gravel roads or further off the beaten track, your stated load ratings have to be reduced. This is because the extra bumpiness of these environments gets transmitted through the vehicle and anything attached to it – including your roof racks.

The rule of thumb is that you need to reduce the load rating by 50% for all clamp mount fits and 30% for fixed point, track and other mounts. So, if you deduced you could carry 75 kg, once you go off road this is reduced to 37.5 kg for clamp mounts and 52.5 kg for fixed point, track and other mounts.

In the example used with the RTT which weighs 55 kg on your vehicle, you would now be overloaded – which at best voids your warranty, at worst creates a safety risk.

If your vehicle roof rating is 80 kg, your fitting kit's rating is 65 kg and your roof racks rating is 100 kg, your maximum load rating would be 65 kg. If you were to leave sealed roads the maximum load would come down to 32.5 kg ($65 \text{ kg} - 50\% = 32.5 \text{ kg}$) for clamp mounts and 45.5 kg ($65 \text{ kg} - 30\% = 45.5 \text{ kg}$) for fixed point, track and other mounts.

You see, the 30% reduction always comes off the weakest link in the chain of components.

Key Takeaways

- Load rating is the lowest maximum rating of the various components (generally vehicle roof, kit and roof rack).
- Static loads can increase by up to a multiple of three (subject to confirmation by your vehicle manufacturer).
- Once you go off a sealed road, your load rating reduces by 30%.