



# Interpreting weight plates for light commercial vehicles

## Introduction

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### Are you aware that driving an overloaded vehicle is unsafe and could lead to a significant fine?

This guide to understanding the weight plates of light commercial vehicles (LCVs) will help vehicle drivers and fleet managers to accurately establish the maximum payload that their vehicle may carry legally and safely.

Read on to discover how to:

- ✔ Locate and read a weight plate.
- ✔ Establish a vehicle's maximum towing weight.
- ✔ Safely load items on the roof of a vehicle.
- ✔ Calculate maximum axle weights.

## Overloading prohibition rate

In certain circumstances, the only place to transport iThe LCV overloading prohibition rate found by traffic enforcers increased from 55.1% to 66.9% between 2007 and 2009<sup>1</sup>, making it the most frequent offence committed by drivers of LCVs in that period.

In many cases, drivers are simply unaware of the legal carrying capacity of their vehicles. Under the Road Traffic Act (1988), if a vehicle is found to be overloaded, both

the driver and operator could be prosecuted or cautioned, and fines of up to £5,000 can be imposed.

So how does a driver or vehicle manager know the weight that can be safely and legally carried on or in their LCV? Read on for guidance on how to read and interpret LCV weight plates.

## Weight Plates

It is a legal requirement that all LCVs are fitted with a manufacturer's plate.

Each manufacturer chooses where to fit these, typically in the engine bay or on the driver or passenger door. Though the location may vary, the plates adhere to a standardised format and must contain certain figures.

The diagram below shows a typical weight plate, annotated to indicate the relevant sections. The superscript numbers in the diagram are used in an example calculation later in this guide to help you locate the relevant information.

**Annotated diagram of a typical manufacturer's plate**

			Manufacturer's name
Whole vehicle EEC or National Type Approval number (if any)			
			Vehicle Identification number
Maximum gross weight in Great Britain			Maximum design gross weight
Maximum train weight in Great Britain (only for motor vehicles designed to tow a trailer)			Maximum design train weight
	1. kg		kg
Maximum axle weights in Great Britain. This example is for a three axle vehicle	2. kg		kg
	3. kg		kg
			Maximum design axle weights

The plate contains the Vehicle Identification Number (VIN), but more important to the driver are the two columns of figures underneath the VIN. These denote the design weights and the maximum legal weights for operation within Great

Britain. The design weights are set by the manufacturer as the greatest weights the vehicle is designed to carry safely, taking account of tyres, steering, suspension and so forth.

The **maximum legal weights** are the most important. The plate shows the maximum gross vehicle weight, the maximum gross train weight (the maximum permitted weight of the vehicle and any trailer being towed, plus any load carried in the vehicle and trailer), then each maximum axle weight from front axle backwards along the chassis. The plate above is from a vehicle with three axles; however the principle is the same for all vehicles. From this information, a driver or manager can establish the legal maximum weight for each axle on their vehicle.

In order to establish exactly what can be carried legally on their vehicle, the driver must subtract the **kerb weight** of each axle from the maximum legal weight figures on the plate. The kerb weight is the weight of the vehicle as it stands “at the kerb”, i.e. ready to drive with fuel and oil in the engine, but excluding the driver, additional equipment such as racking or a roof rack, and the load to be carried. The kerb weight of each axle can be found in the manufacturer’s brochure. Simply subtract the kerb weight of each axle from the maximum legal axle weight figure on the plate. The difference between the two figures is the maximum load that can be carried on each axle.

It is recommended that drivers have their vehicle weighed professionally at a **weighbridge** on a regular basis. For a modest sum, a weighbridge can determine precise weights for each axle, and for the vehicle’s kerb weight. The cost is minimal compared to the costs that could be incurred if you drive an overloaded vehicle. A fine can be issued for each axle overloaded, one for exceeding the **gross vehicle weight**, and your insurance may

also be invalidated. Having your vehicle weighed at a weighbridge gives you the comfort of knowing the exact weight of your van, subject to a very small tolerance, and the payload you are able to carry in it.

## Maximum towing weight

The maximum towing weight is the greatest weight of any trailer and its load which may be towed within the limit of the vehicle’s plated gross train weight (seen on the plate above). This weight is based upon the ability of the vehicle at full gross train weight to start from stationary on a 12% gradient. The driver also must ensure that the trailer noseweight (the imposed weight of the trailer upon the rear of the towing vehicle) does not cause the rear axle plated weight to be exceeded. If the combined weight of the vehicle and trailer (including any loads carried) exceeds 3,500 kg then, subject to exemptions, a tachograph will be required.

## On the roof

In certain circumstances, the only place to transport items is on a roof rack. In order to do so safely, it is important to check the vehicle handbook to find the maximum permitted roof load set by the manufacturer. Remember that this value includes the weight of the roof rack itself. When loading the vehicle, try to put light, bulky items on the roof, with the load spread evenly to keep the centre of gravity down and reduce any effect on the vehicle’s stability. It is important to note that roof racks and boxes have a significant impact on fuel economy and therefore transporting items inside the vehicle is preferred.

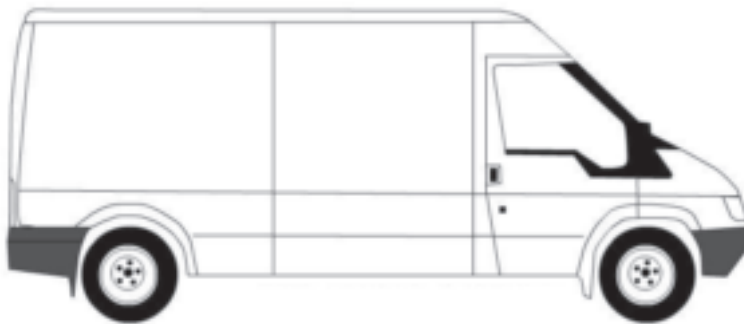


## Tips for safe loading

- ✔ Ensure that your vehicle is suitable for the load you want to carry.
- ✔ Use the correct equipment to secure the load.
- ✔ Make sure your load is stable before you tie it down.
- ✔ Don't load heavy items on a roof-rack.
- ✔ Put heavy items on the bottom of the load if it is going to be stacked. Make sure those heavy items are along the centre line of the vehicle, and within the wheelbase.
- ✔ Spread the load evenly to ensure you do not exceed the legal maximum weight for each axle.
- ✔ Changes in the load distribution will occur as you go along your delivery route. Be prepared to move the load around to maintain an equal weight distribution.
- ✔ Use the proper anchorage points on your vehicle.
- ✔ Check the load restraints at regular intervals.

## An example axle load calculation

Consider the vehicle below. How do we ensure that we do not overload it on either of the axles or exceed the gross vehicle weight?



**Assume it has the following weights and dimensions:**

- ✔ Wheelbase 3,098 mm.

### **Front axle (A1)**

- ✔ Kerb weight of 1,036 kg.
- ✔ Plated weight<sup>3</sup> of 1,450 kg.
- ✔ Hence the axle load tolerance (the payload that can be imposed on the axle) is the difference between the kerb weight and the plated weight, i.e. 414 kg.

### **Rear axle (A2)**

- ✔ Kerb weight of 635 kg.
- ✔ Plated weight<sup>3</sup> of 1,550 kg.
- ✔ Hence the axle load tolerance is 915 kg.

Assume that the gross vehicle weight is 2,700 kg. We know that the kerb weight of the vehicle is 1,036 kg + 635 kg, i.e. 1,671 kg. Therefore the maximum permitted payload of the vehicle is the difference between the kerb weight and

the gross vehicle weight, i.e. 1,029 kg. Supposing a 750 kg load is placed 2,000 mm behind the centre of the front axle. This weight is well within the payload. The effect of this weight on the axles can be calculated from the following:

$$\frac{\text{Distance of load from front axle}}{\text{Wheelbase}} \times \text{weight} = \text{effect on rear axle}$$

$$\frac{2,000 \text{ mm}}{3,098 \text{ mm}} \times 750 \text{ kg} = 484 \text{ kg effect on rear axle}$$

The effect on the front axle is the difference between the weight of the load and the effect on the rear axle, i.e. 266 kg.

The next step is to add these weights to the kerb weights for each axle. Doing so, we find that the total load on the front axle is 1,302 kg, and the total load on the rear axle is 1,120 kg. Both axles are therefore within the maximum weight limit and the load can be carried safely.

However, if the same 750 kg load is placed against the front bulkhead, 1,000 mm from the front axle, the axle loads are as follows:

- ✔ Total load on the front axle is 1,036 kg + 507 kg, i.e. 1,543 kg.
- ✔ Total load on the rear axle is 635 kg + 242 kg, i.e. 877 kg.

Comparing these figures to the plated weights of each axle shows that the front axle is now overloaded, even though the weight of the load is only three-quarters of the vehicle's total maximum payload.

Remember, although you can obtain the kerb weight of your van from the manufacturer's brochure, if you weigh your van at a public weighbridge, you will get a more precise value, because it will include personal belongings and other items in the vehicle.

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## Glossary of terms

**Gross train weight:** the maximum permitted weight of the vehicle and any trailer being towed, plus any load carried in the vehicle and trailer.

**Kerb weight:** the weight of the vehicle as it stands “at the kerb”, i.e. ready to drive with fuel and oil in the engine, but excluding the driver, additional equipment such as racking or a roof rack, and the load to be carried.

**Maximum towing weight:** the greatest weight of any trailer and its load which may be towed within the limit of the vehicle’s plated Gross Train Weight.

**Noseweight:** the imposed weight of the trailer upon the rear of the towing vehicle.

**Plated weight:** the maximum legal weight found on the vehicle plate.

## Resources and further information

[www.ntta.co.uk](http://www.ntta.co.uk) - National Trailer and Towing Association

[www.dft.gov.uk/vosa](http://www.dft.gov.uk/vosa) - Vehicle and Operator Services Agency

**Energy Saving Trust**  
21 Dartmouth Street  
London, SW1H 9BP  
Advice line: 0845 602 1425  
Email: [transportadvice@est.org.uk](mailto:transportadvice@est.org.uk)  
[energysavingtrust.org/fleet](http://energysavingtrust.org/fleet)  
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