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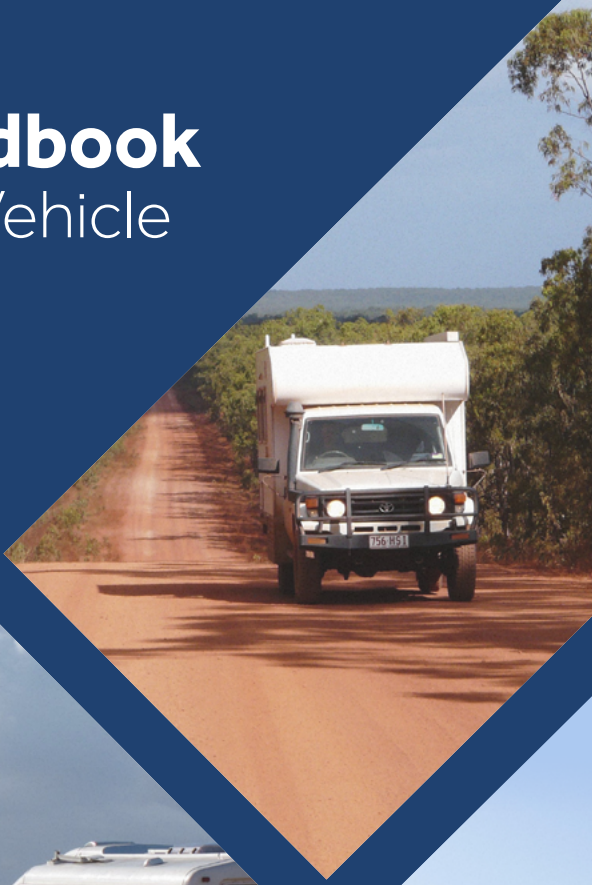
rvSafe Handbook

Recreational Vehicle Safety Guide

An initiative of CMCA



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Contents

Introduction

There are many types of RVs available on the market, including motorhomes, campervans, converted buses/coaches, side-ons, caravans, fifth-wheelers and camper trailers. As each vehicle type varies greatly, they all present their own challenges and safety risks.

rvSafe is a campaign designed to increase road safety awareness specific to the RV industry. The project is funded by the Federal Government's Road Safety Awareness and Enablers Fund and is proudly supported by the Campervan & Motorhome Club of Australia.

This guide will help you stay safe while exploring our great country.

Vehicles

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Recreational Vehicle Safety Guide

Types of RVs

There are over 840,000 recreational vehicles (RV) registered in Australia!

Types of RVs include motorhomes, campervans, converted buses/coaches, slide-ons, caravans, fifth-wheelers and camper trailers. There are numerous factors to consider when deciding which type of RV is right for you, and many RV enthusiasts find that they vary their choice of vehicle over their lifetime.

Motorhome

Campervan

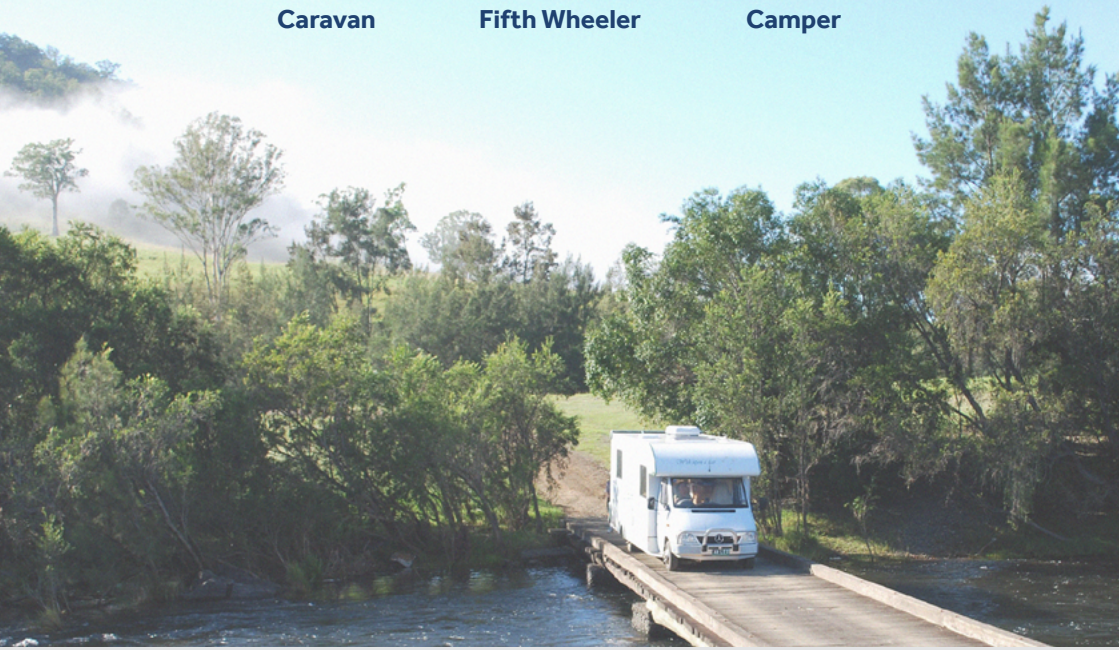
Bus

Slide On

Caravan

Fifth Wheeler

Camper



Vehicle Weights

It is estimated that over 50% of RVs are overweight. Overweight vehicles increase the risk of having an accident as the vehicle is more likely to become unstable or unable to stop. Additionally, you may also receive a fine and void your insurance.

To be compliant, you need to be within the gross vehicle mass (GVM) limit of your tow vehicle or motorhome, campervan, bus/coach or slide-on.

Gross Vehicle Mass (GVM)

Gross vehicle mass is specified by the manufacturer and is the maximum legal loaded mass of the vehicle. It includes the weight of the car, fuel, vehicle payload, all passengers, plus the tow ball weight if towing.

Tare Weight

Tare weight represents the unladen weight of the vehicle including all engine fluids and a 10L fuel reserve. It is important to note that this may not include dealer inclusions or optional fittings at the time of purchase.

Payload

Payload refers to the total weight you can add to your vehicle. This includes fresh and wastewater, gas bottles, personal items, clothes, bedding, food etc. It can also include optional extras and aftermarket modifications such as awnings and driving lights.

To calculate your payload:

GVM – Tare Weight = Payload

These weights will be stamped on your vehicle's compliance plate and listed in your owner's handbook.

Note, kerb weight is similar to tare weight but includes a full tank of fuel and no accessories.

It is very easy to exceed your vehicle's payload limit, but with careful planning when packing, you can stay within the threshold.

Note, if you are towing, your tow ball weight must be included in your vehicle's payload.

If you are planning on towing, you will also need to consider your gross combination mass.

You also need to know your vehicle's GVM to ensure you hold the correct licence (see Licensing).

Trailer Weights

If you are planning on towing a caravan or camper trailer, there are a few more weight compliances to be aware of. Here are some terms you should familiarise yourself with.

Tare Trailer Mass

Tare trailer mass represents the unladen weight of a trailer. Unlike a vehicle, it does not include any fluids.

Gross Trailer Mass (GTM)

Gross trailer mass is the tare weight on the axle(s) plus the proportion of the payload acting on the axle(s). This is specified by the manufacturer and is the total legal weight that can be supported by the wheels of a trailer.

Aggregate Trailer Mass (ATM)

Aggregate trailer mass is the maximum total weight of the caravan or camper trailer, unhitched from the tow vehicle. This is specified by the manufacturer and includes the tow ball weight.

Gross Combination Mass (GCM)

Gross combination mass is the total permissible weight of the loaded vehicle and caravan together and is specified by the manufacturer.

Braked Towing Capacity (BTC)

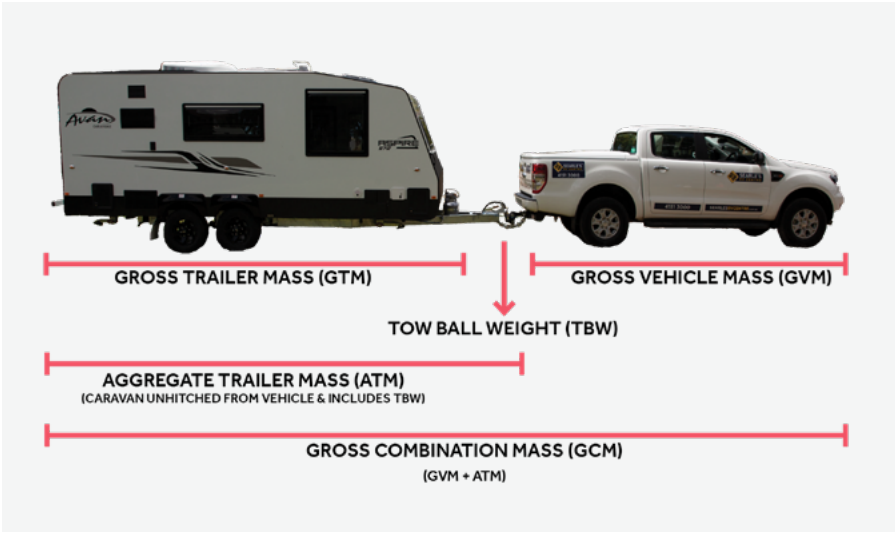
Braked towing capacity is the maximum allowable weight that can be legally towed by the vehicle.

Tow Ball Weight (TBW)

Tow ball weight, also referred to as tow ball mass, is the weight pushing down on the tow ball by the coupling of the RV being towed.

What do these mean for you?

Firstly, ensure that your **braked towing capacity** is greater than your **aggregate trailer mass**. You then need to get your vehicle weighed. You need to make sure that your actual weights are within the limits for gross vehicle mass (GVM), aggregate trailer mass (ATM), gross combination mass (GCM) and tow ball mass (TBM).



You can get your vehicle and trailer weighed at a public weigh bridge or mobile weighing station.

Note: if you wish to tow a trailer behind your motorhome or campervan, these weight limits apply as well.

Weight Distribution

Weight distribution greatly affects the handling of your RV.

If you are in a single vehicle RV, your front and rear axle loading and loading left to right will affect your handling. If you are towing, weight distribution in your trailer is extremely important for your handling and avoiding trailer sway.

Your tow ball mass maximum is stipulated by the manufacturer and is generally 10% of your aggregate trailer mass (ATM).

Tow ball mass too high

If your tow ball mass is too high, you will reduce your handling of your tow vehicle. You often see vehicles with a large gap between the tyre and wheel arch on the front axle, and a small gap on the rear axle and a dip in the middle between the tow vehicle and trailer. Adding toolboxes and storing items on the A-Frame of the trailer are common causes of this.

Tow ball mass too low

If your tow ball mass is too low, you will have too much weight at the rear of your trailer, which will make sway highly likely. This often occurs when bikes and toolboxes are added to the rear of the trailer.

The correct way to load your trailer is to have the heaviest weights low and central over the axles and to keep 10% of the trailer laden mass on the tow ball.

Keeping the RV community safe on our roads

Connecting and Disconnecting Your Trailer

Follow our step-by-step guide to connecting your caravan or trailer to your vehicle.

01. Check over the trailer ensuring tyre pressures are correct, gas cylinders are turned off and all water/electrical connections are disconnected.

02. Make sure you have attached your towing mirrors to your vehicle if required.

03. Ensure you have wound up your jockey wheel to a height that will allow the tow ball to clear under the coupling head.

04. Reverse your tow vehicle so the tow ball is positioned beneath the coupling head.

05. Pull the coupling latch up so you can lower onto the tow ball.

06. Lower the jockey wheel so the coupling hitch fits over the tow ball and takes the weight of the trailer.

07. Lower the coupling latch to secure the hitch over the tow ball ensuring it has connected properly and put the pin through the coupling latch to make sure it stays in place.

08. Put the jockey wheel into its travelling position or remove and stow as necessary.

09. Attach the safety chains below the hitch to your tow bar using D-shackles. If you have two chains, cross underneath the hitch. If the trailer was to become unhitched, it will fall and be held up by the chains.

10. Plug your trailer's electrical lead into the vehicle's socket.

11. For trailers over 2-tonne, connect the breakaway lanyard to the tow vehicle.

12. Disengage the trailer's handbrake.

13. Remove any chocks from the tyres.

14. Check that all the trailer lights are working.

When disconnecting your trailer:

01. Chock the wheels.

02. Fully apply the trailer's hand brake.

03. Unplug the trailer's electrics.

04. Put the jockey wheel into place.

05. Release the coupling latch and lower the jockey wheel to take the pressure off the tow ball.

06. Remove safety chains and breakaway brake cable.

Trailer Brakes

Trailer brakes might not be on the top of the list when thinking about your next adventure, but they are very important.

Trailers under 750kg do not require brakes; however, caravans and most camper trailers will weigh more than this.

Trailers weighing between 751kg and 2000kg require braking on both wheels on at least one axle. Override brakes are permitted when the gross trailer mass (GTM) is less than 2000kg and can be of the mechanical or hydraulic variety. Alternatively, electric brakes may be used.

Trailers weighing between 2001kg to 4500kg need to have braking on all wheels and electric brakes are required. An automatic breakaway system is also required for trailers over 2000kg in case the trailer becomes detached from the vehicle.

Electric brakes work by automatically applying the trailer brakes via the brake controller using electromagnetics and friction. Whilst they do work automatically when you press the brake pedal, they can also be manually operated via the controller installed within reach of the driver.

It is important to know how to use your electric brake controller. There are manual and proportional controllers. If you have older style manual electric brakes, you will need to adjust the level of braking to suit your trailer and driving conditions.

Modern advanced controllers have a proportional mode, so they automatically apply the trailer brakes in proportion to how you are braking on the tow vehicle. All brake controllers have the ability to apply just the trailer brakes. This is very important if you ever get trailer sway.

You can test your electric brakes are working by rolling along the flat slowly and then applying the trailer brake by pressing the manual control button. Your trailer brakes should apply and bring you to a stop.

If your trailer starts to sway, ease off your accelerator, and hold the steering wheel steady and apply the trailer brake button. This will bring the trailer back in line behind the car and slow the whole combination.

It is great to practise knowing where the electric brake button is in the case of an emergency. You need to be able to put your finger on the button without looking for it.

Breakaway Brakes

If your trailer is over 2000kg you are legally required to have breakaway brakes.

Breakaway brakes are a safety device that mounts to the trailer and in the event of the trailer becoming uncoupled from your tow vehicle, the device will activate the electric brakes and bring the trailer to a safe stop. Legally, the device must be capable of keeping the brakes engaged for a minimum of 15 minutes.

There are three main components of breakaway brakes; the battery, switch and cable connected to a pin. If the trailer breaks free, the pin will pull out from the switch and activate the brakes.

Tyres

Age

Tyres degrade with age. If your tyres are over five years old, they need to be checked for degradation by a reputable tyre business each year. Once they have reached 10 years old, they need to be replaced regardless of the tread left.

The age of your tyre is printed on the tyre wall. Find the code on the sidewall that starts with "DOT". The last four digits of the code represents the week and year the tyre was made. For example, 4922 is the 49th week of 2022.

Pressure

Keep tyres (including the spare) inflated to the recommended levels. Too much or too little air causes uneven wear, reduces handling and grip, and shortens the life of the tyres.

Tyre pressure can be too low, and you will not be able to notice with the naked eye – so get yourself a tyre pressure monitor or check at the service station next time you fill up.

Tyres on RVs typically carry more weight than standard vehicles, which makes it even more important to have the correct tyre pressure. The tyre placard will stipulate recommended tyre pressure for your rig, and we recommend checking your tyre pressure before heading off on your trip.

Tread

Inspect your tyres for uneven bulges, cuts and cracks. Remove any objects lodged in the tread and check for gouges or punctures.

Tyres must be replaced before the tread depth falls to 1.5mm; however, we recommend changing tyres at 3mm. Most tyres have tread depth indicators as a guide, or you can use a 20-cent coin. To measure your tyre's tread depth, place an Australian 20c coin into one of the central circumferential grooves of your tyre. If the tread doesn't reach the bill of the platypus, your tyre has less than 3mm of tread remaining. It's time to invest in some new tyres to make sure you stay safe while driving.

Unusual vibrations or uneven wear (bald) spots on tyres may suggest that a wheel balance is needed to avoid excessive loading to the vehicle's wheel bearings and suspension.

Final Tip!

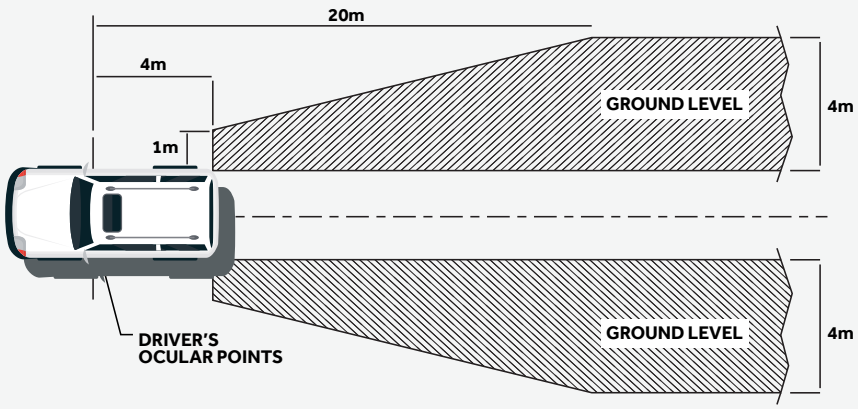
Don't forget your spare!
You need to ensure that it has pressure and is suitable for use in an emergency.

Mirrors

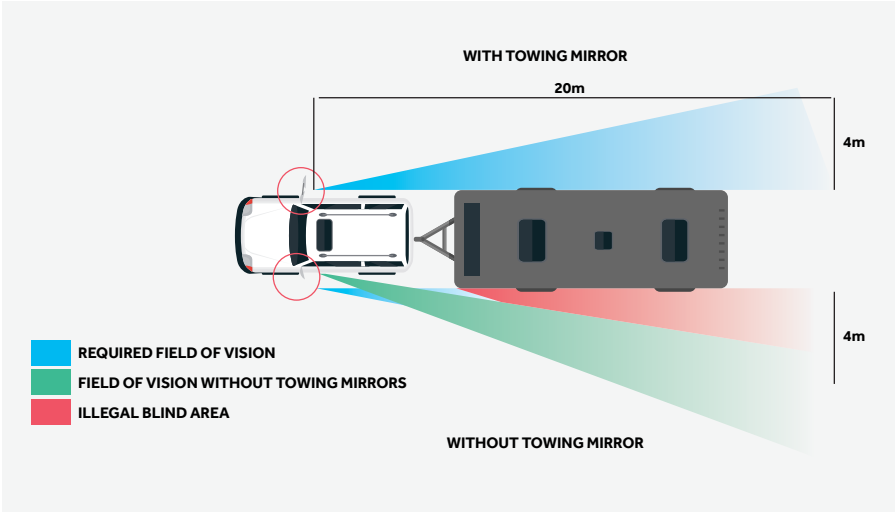
There is regular debate as to whether extended mirrors are required when towing. The field of vision required by a vehicle's external mirrors is set out in the Australian Design Rule 14/02 – Rear Vision Mirrors.

"The field of vision must be such that the driver can see at least a 4 m wide flat, horizontal portion of the road which is bounded by a plane parallel to the median longitudinal vertical plane passing through the outermost point of the vehicle on the passenger's side and which extends from 20 m behind the driver's ocular points to the horizon (see Figure 5). In addition, the road must be visible to the driver over a width of 1 m, which is bounded by a plane parallel to the median longitudinal vertical plane and passing through the outermost point of the vehicle starting from a point 4 m behind the vertical plane passing through the driver's ocular points."

Australian Design Rule 14/02 - Rear Vision Mirrors



You are required to see along the full length of your caravan or camper trailer at its widest point and a further 20m behind this. To further simplify this, your mirrors should be wider than what you are towing.



The above diagram shows the difference between using towing mirrors and standard mirrors. Without the towing mirrors there is a large blind area.

With most caravans, it is likely that you will require towing mirrors. You can purchase extendable mirrors to replace your vehicles existing mirrors or towing mirrors that will attach to your existing mirrors.

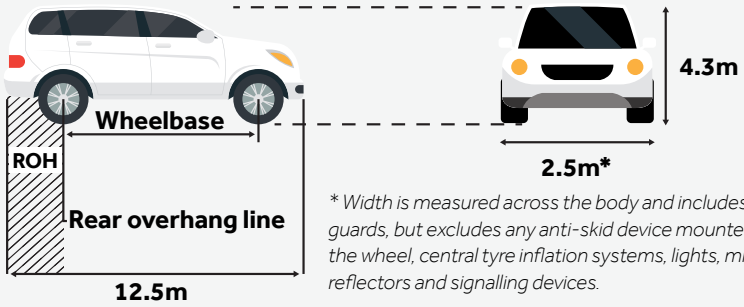
Finally, towing mirrors shouldn't be more than 150mm wider than the overall width of the vehicle or the trailer you're towing, whichever is more. Mirrors may be 230mm wider than the overall width, if they're capable of collapsing 150mm.

Vehicle Dimension and Rear Overhang

With many people wanting to add bike racks, toolboxes, and storage to the back of their motorhome or caravan, it's important to know your vehicle dimension and rear overhang rules.

Motor Vehicles

Light rigid motor vehicles include cars, utes, 4WDs, small buses and small trucks (e.g., motorhome). The following dimensions apply.



** Width is measured across the body and includes wheel guards, but excludes any anti-skid device mounted on the wheel, central tyre inflation systems, lights, mirrors, reflectors and signalling devices.*

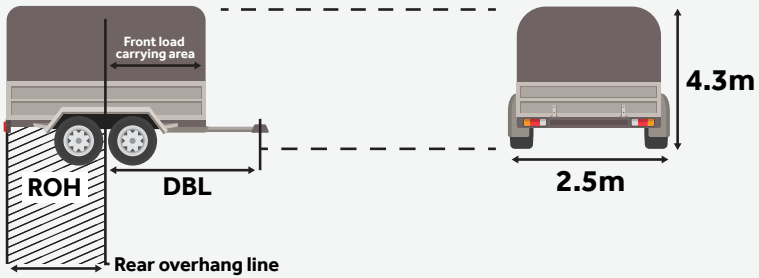
Rear overhang (ROH) is 60% of the wheelbase or 3.7 metres, whichever is the lesser, measured from the rear overhang line.

Any object permanently fitted to a vehicle (e.g., bullbar, winch, toolbox) is considered part of the vehicle and must be included within the applicable dimension limits.

Trailers

Dimension limits for trailers are divided into three categories: pig trailer, dog trailer and semi-trailer. Dog trailers aren't used as RVs.

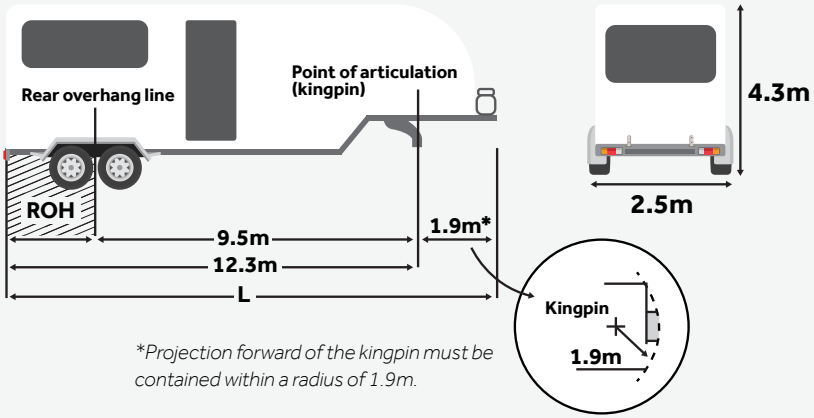
A ***pig trailer*** is a trailer that only has one axle group near the middle of the goods carrying surface. (e.g., caravan, camper trailer, box trailer).



Drawbar length (DBL) is measured from the centre of the axle group to the centre of the drawbar coupling pivot point with the drawbar level and must not be more than 8.5 metres.

Rear overhang (ROH) shall be no more than the length of the front load carrying area or body, ahead of the rear overhang line, or 3.7 metres, whichever is the lesser.

A ***semi-trailer*** is a trailer with a single axle or axle group towards the rear, with a means of attachment to a prime mover that would result in some of the load being imposed on the prime mover. (e.g., fifth- wheeler).



**Projection forward of the kingpin must be contained within a radius of 1.9m.*

Rear overhang (ROH) shall be no more than 60% of the distance between the centreline of the 'fifth- wheel' king pin and the line from which the rear overhang is measured, or 3.7 metres, whichever is the lesser.

Length (L): No specific limit, however, when combined with a prime mover, the overall combination length must not exceed 19 metres.