

The National
Caravan
and Recreational Vehicle
Towing Guide



Published by the caravan and camping industry

The National Caravan & Recreational Vehicle Towing Guide

The National Caravan & Recreational Vehicle Towing Guide has been produced in response to overwhelming public demand. In the Guide you will find a wealth of technical information, handy hints and advice, which, when put into practice, will help you to tow your caravan or other recreational vehicle with a greater degree of confidence and safety.

There are currently over 330,000 registered recreational vehicles – including caravans, camper trailers and tent trailers – in Australia. The popularity of these vehicles is growing

rapidly, with new registrations of around 18,000 units every year.

Of course, there are also innumerable other types of trailers such as boat trailers, horse floats and the humble box trailer, which are used for both private and commercial purposes. But no matter what vehicle you tow and what your level of experience (from first-timer to old hand) you will find the Guide is an invaluable reference tool.

Refereed by nine technical experts with many years of collective towing experience, the information in the Guide is

both practical and, at the time of publication, consistent with the applicable national road and towing regulations. For additional towing information or advice, please contact one of the organisations listed on the last page of this Guide.

The Caravan and Camping Industry Associations throughout Australia are pleased to make The National Caravan & Recreational Vehicle Towing Guide available to you free of charge. We hope you find the publication useful and we wish you many hours of happy, safe towing.

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Introduction

Touring and towing a caravan or other recreational vehicle is one of the most exciting ways to see Australia. Not only is it an affordable holiday, it also gives you the freedom to travel to the destinations of your choice.



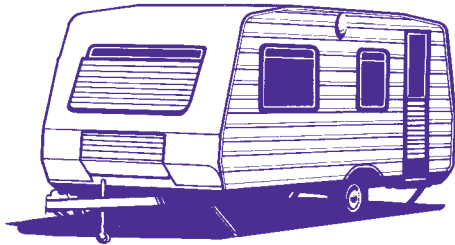
Australian caravans are among the best in the world. They are aerodynamically designed and can be towed easily and safely. However, towing any type of trailer involves more than attaching a towbar to your vehicle and hitching up.

It adds another dimension to your driving and there are a number of considerations you should take into account. These include:

- the towing capacity of your vehicle;
- the type of tow bar you should fit to your vehicle and the maximum load capacity of the coupling;
- the type of trailer you are towing and whether it complies with all the regulations governing trailers in Australia;
- the type of equipment you may need to fit to increase the trailer's stability when being towed;
- whether your trailer is correctly loaded;
- the ways in which towing can affect your driving;
- the safety checks you should make prior to and during your trip; and
- the type of insurance most suitable for your caravan or trailer.

This guide will help to answer your questions regarding these issues.

Definitions



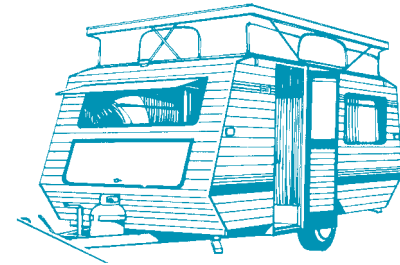
Please Note: In this Towing Guide, the word 'trailer' refers to caravans, camper trailers, tent trailers, horse floats, boat trailers and box trailers.

Caravan

Modern caravans are built using either a timber, aluminium frame, or sandwich panel and can vary in length from 3 - 12.5 metres. They can be up to 2.5 metres wide (including any fittings). They require very little time to set up on site but can have a higher wind resistance when towing than a pop top caravan or a camper trailer.

Pop Top Caravan

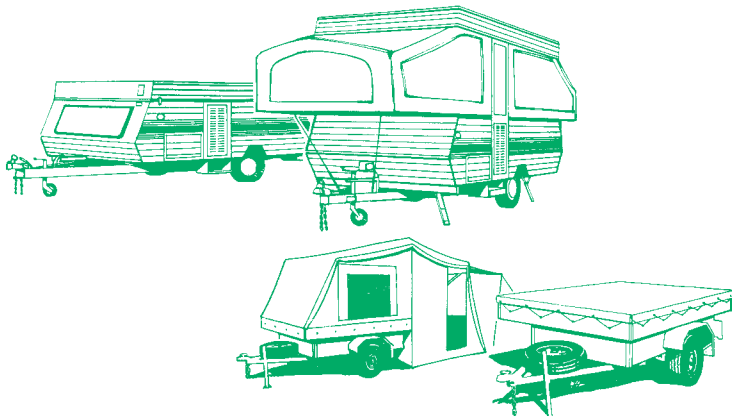
Pop tops feature a canvas, vinyl or fabric insert that connects the roof to the sides of the caravan. This insert allows the roof to be lowered for travelling. With the roof lowered, the vehicle's height, and therefore wind resistance, is reduced and its centre of gravity is lowered.



5th Wheel Caravan

5th Wheelers have all the features of a standard caravan but are designed to be towed by utilities or trucks. The towing connection is mounted on the tray of the tow vehicle, as close as possible to the rear axle. The 5th Wheeler's suspension carries the majority of its gross weight, with the balance distributed forward of the rear suspension over the differential rather than the extreme rear of the tow vehicle.





Motorhome

A self-powered, self-contained unit driven from a cabin that allows easy access to the rest of the vehicle.



Campervan

A motorised van equipped with sleeping, refrigeration, washing, cooking and dining facilities designed for recreational travel.

Camper Trailer and Tent Trailer

Tent trailers, a cross between a caravan and a luxury tent, are compact and popular for off-road use. The camper trailer is a low profile caravan with a wind-up roof and usually push-out bed sections at either end of the trailer. With their light mass and low wind resistance, camper trailers and tent trailers are easy to tow and are suitable for smaller tow vehicles.



Slide-on Camper

A caravan body which slides on and is secured to the bed of a utility.

ATM (Aggregate Trailer Mass)

The total laden weight of a trailer, which includes the tow ball mass and whatever you add as payload (eg. water, gas, luggage). The ATM is specified by the trailer manufacturer and must not be exceeded.

GCM (Gross Combination Mass)

The maximum laden mass of a motor vehicle plus the maximum laden weight of any trailer(s) it can tow. The GCM is specified by the vehicle manufacturer.

GTM (Gross Trailer Mass)

The total permissible mass which includes whatever you add as payload (eg. water, gas and luggage) that can be supported by the wheels of a trailer. This does not include the mass supported by the tow ball. The GTM is specified by the manufacturer and must not be exceeded.

Tare Mass

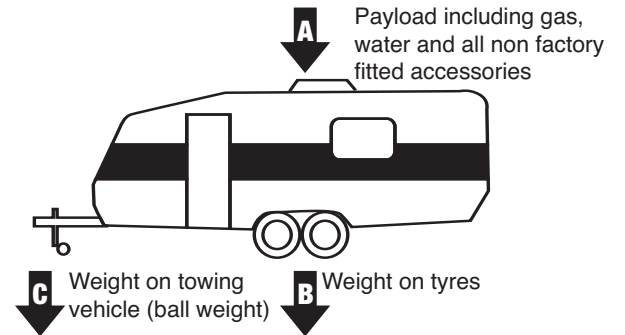
The unladen weight of the trailer.

Tow Ball Mass

The weight imposed on the rear of the tow vehicle's tow ball from the coupling of a trailer or caravan.

Payload

Payload is specified by the manufacturer. **It must not be exceeded** under any circumstances. Safety, insurance & warranty may be affected if the specified payload is exceeded.



ATM = A plus B plus C
 GTM = A plus B

Tare Mass = B plus C

Information required for Trailer Plate (VIN Plate) to determine Ball Weight:
 Ballweight = ATM – GTM

Legal Requirements

All vehicles on Australian roads are subject to rules and regulations designed to promote safe road use. However, regulations applying to vehicles towing trailers have sometimes varied between the States and Territories, making life for interstate travellers somewhat confusing.

In an attempt to remedy this situation, new regulations were introduced in December 1998 that nationalised the speed limits applicable to vehicles towing trailers and to the maximum ATM.

Speed Limits

For a motor vehicle and trailer combination that has a GCM of less than 4.5 tonnes, the posted speed limits apply - unless the manufacturer of the towing vehicle has stipulated a lower towing speed limit. The only exception to this is in Western Australia where the maximum speed limit is 100km/h for vehicles towing a trailer with an ATM of over 750kgs.

However, if you are a Provisional license holder, you should check with the individual States or Territories to ascertain what towing laws apply to you.

Maximum Trailer Mass

Throughout Australia, the allowable maximum mass for the trailer is either the capacity of the tow vehicle's towing attachment or the

towing limit specified by the vehicle manufacturer for the towing vehicle, whichever is the least.



If the vehicle's manufacturer has not made a recommendation as to the towing mass, then the following rules apply. A vehicle may tow a laden trailer of up to one and a half times the unladen mass of the tow vehicle, provided that the towbar is rated accordingly and the trailer is fitted with brakes that comply with the requirements stipulated in the Australian Design Rule ADR38. If the trailer is not fitted with brakes, then the maximum mass must not exceed the unladen mass of the motor vehicle. The unladen mass of the vehicle can be found in the vehicles handbook, or check with your dealer. All trailers with a GTM exceeding 750kgs must have brakes.

Tow Vehicle

In December 1998, a national regulation came into effect that limits the mass a vehicle can tow. So if you are going to purchase a trailer or caravan, it is critical that you give careful consideration to your vehicle's towing mass and construction prior to making your purchase.

You will find the towing mass (or towing rating) under the towing section in the vehicle manufacturer's handbook. The rating will include a trailer weight capacity and a trailer ball weight capacity, both of which must be adhered to.

As previously mentioned, if the manufacturer has not stipulated a recommended tow mass, then the vehicle may tow one and a half times its unladen mass if the trailer has brakes. If no brakes are fitted, then the one to one ratio applies.

With regards to the construction of the tow vehicle, its body must be sturdy enough to attach a towbar of suitable capacity for the trailer you intend to tow. Some vehicles may require structural reinforcement and/or special suspension and load distribution devices before they can satisfactorily tow heavier trailers. You may also need to make other modifications to your vehicle, which could include:

- Fitting levelling equipment (frequently called weight distributing sets or level rides).





- Fitting electrical sockets for lighting: a seven pin electrical connector (which is compulsory in Australia) provides the electrical power to operate the trailer lights as well as the electrical brakes that are fitted to all later model caravans.

- Fitting a suitable brake controller and connection: all trailers of 750kgs GTM or more must be fitted with brakes. Electrical brakes are the most commonly used and require a brake controller, with appropriate connections to the trailer, to be fitted in the tow vehicle.
- Extra mirrors may need to be added to the tow vehicle when towing large trailers. It is a legal requirement that the driver has a clear and unobstructed view of the road at all times.
- Fitting an extra transmission oil cooler for vehicles with automatic transmission. (these are standard on some late model vehicles).
- As some motor vehicle manufacturers limit the speed at which you can tow a trailer always refer to the vehicle handbook.

Remember that towing a trailer or caravan will decrease your vehicle's acceleration and braking performance. It will also reduce vehicle control and manoeuvrability, while increasing fuel consumption.

Your vehicle's towing capacity is a factor of its engine size, brakes, weight, transmission, tyres, chassis etc. After taking these variables into account, the vehicle's manufacturer establishes a recommended towing capacity, which must be adhered to.

Couplings

The coupling must be strong enough to take the weight of a fully loaded trailer. There are five main parts involved in a trailer coupling: the towbar, the ball mount or tongue and the tow ball are all attached to the tow vehicle, while the coupling body and the trailer draw bar or 'A' Frame form the attachment points on the trailer.

The Towbar

The towbar is the framework attached to the back of the tow vehicle. For safe towing, a properly designed and fitted towbar with an adequate weight rating is essential. Further, the load capacity of the towbar and the trailer coupling must be equal to or exceed the loaded mass of the trailer.

Note: Towbars should not protrude dangerously when your trailer is not connected.

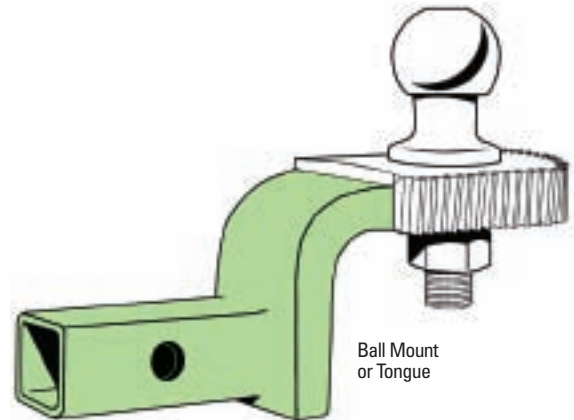
If you bought a second hand vehicle with a towbar already attached, be especially careful. You need to make sure that the towbar is appropriate for whatever you intend towing. For example, although ideal for the previous owner's box trailer, the towbar might be totally unsuitable for your caravan.

Unless a permanent part of the vehicle, it is compulsory for all towbars manufactured after 1 July 1988 to clearly and permanently display the maximum load rated capacity plus the make and model

of vehicle for which they are intended, or alternatively, the manufacturer's name, trade mark and part number. Check for this information to help you ascertain whether the towbar suits your needs.

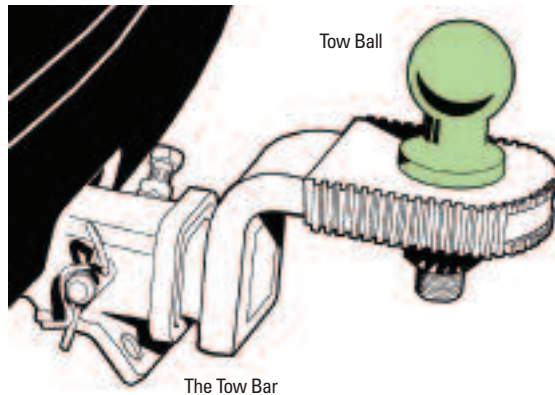
The Ball Mount or Tongue

The ball mount, also known as the tongue, is the section of the towbar to which the towball is attached. It is usually a flat 75mm wide, 16 to 20mm thick steel bar, which may be either straight or curved to achieve the correct coupling height. If the ball mount or tongue obscures the number plate it must be removed from the towbar when the trailer is not attached.



The Tow Ball

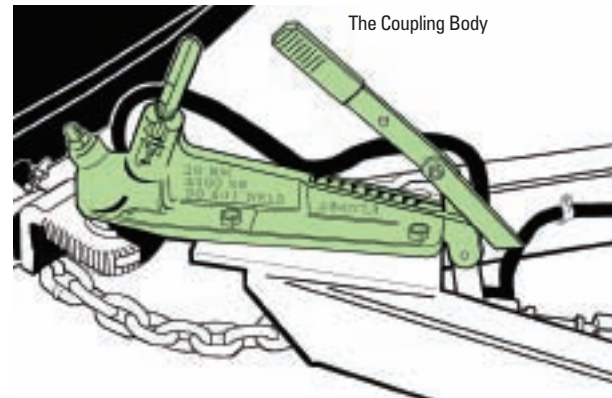
Tow balls suitable for weights of up to 3,500kgs must be 50mm in diameter and should comply with Australian Standard 4177-2. The tow ball must be a one-piece element, the shank of which should be 22.2mm in diameter. The top face of the sphere should be clearly stamped with the capacity (3.5 t) and tow ball diameter (50). The tow ball unit must be fitted to the vehicle with a locking washer and an appropriately sized nut. According to the Australian Standard 4177.2 the manufacturer's name or trademark must also be stamped on the flange of the tow ball.



The Coupling Body

The coupling body is the section that is attached to the 'A' frame of the trailer. It forms a socket for the tow ball and provides the necessary pivot point between the trailer and the towing vehicle. Coupling bodies commonly in use can range in capacity from 750kgs to 3,500kgs. They must be marked with their capacity, as well as the manufacturer's name and the size of the tow ball for which they are suitable.

It is important to ensure that the coupling body's capacity exceeds or is at least equal to the fully laden weight of the trailer.



Coupling Height - 50mm Ball Couplings

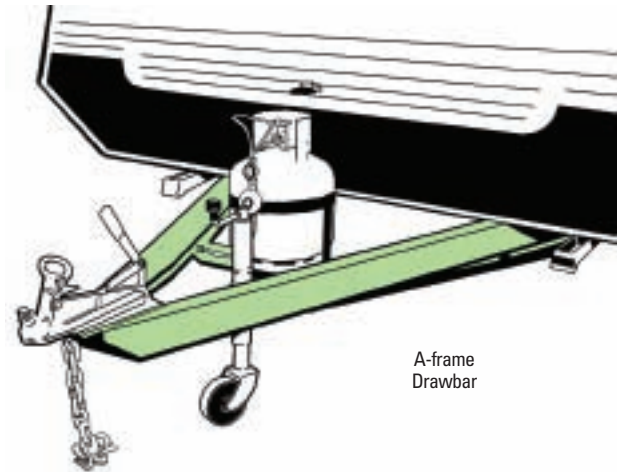
Ball couplings used on trailers with an ATM of up to 3.5 tonnes must comply with Australian Standards and be installed so that the height of the centre of the body of the ball couplings is between 350mm and 460mm from the ground when laden.

The Trailer's 'A' Frame (Drawbar)

This is the front section of the trailer or caravan chassis to which the coupling body is attached with bolts, nuts and locking washers. Welding the coupling body is also permitted on trailers under 1000 kgs provided the manufacturer has specified that this approach is suitable and has provided welding instructions, which must be followed.

The "A" frame or drawbar is required under the Australian Design Rules to be of sufficient strength for the specified trailer ATM, and must be able to be proven to do so by engineering calculation. It is therefore foolish to add to the drawbar additional items (such as spare wheels, outboard motors, metal carry bins etc.) that will increase the load on the drawbar, without the specific approval of the trailer and towbar manufacturers. Increasing the downward load on the trailer drawbar will also increase the tow-ball weight on the towbar.

Excessive overloading of towbar ball weight will affect its performance and may void manufacturer's warranty.



A-frame
Drawbar

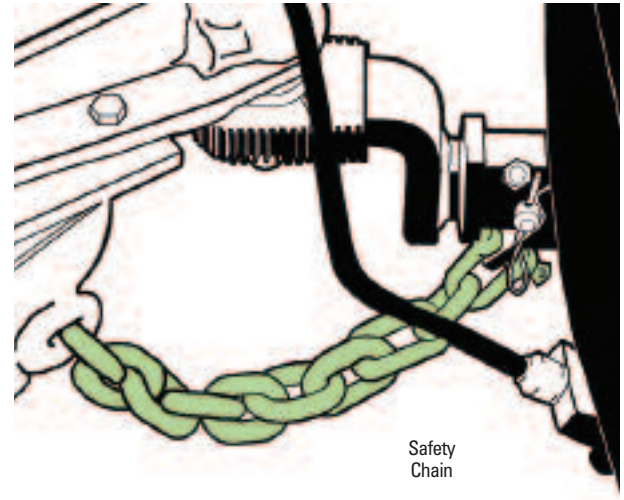
Safety Chains

Safety chains are compulsory in all States and Territories of Australia. They must be strong enough to hold the trailer and prevent the drawbar from touching the ground, should the coupling fail or be accidentally disconnected from the ball.

Trailers less than 2,500kgs ATM must be fitted with at least one safety chain of at least 9.5mm in diameter. Trailers over 2,500kgs ATM and up to 3,500kgs must have two safety chains. Chains must comply with AS4177-4 and have a size designation at least equal to the trailer ATM.

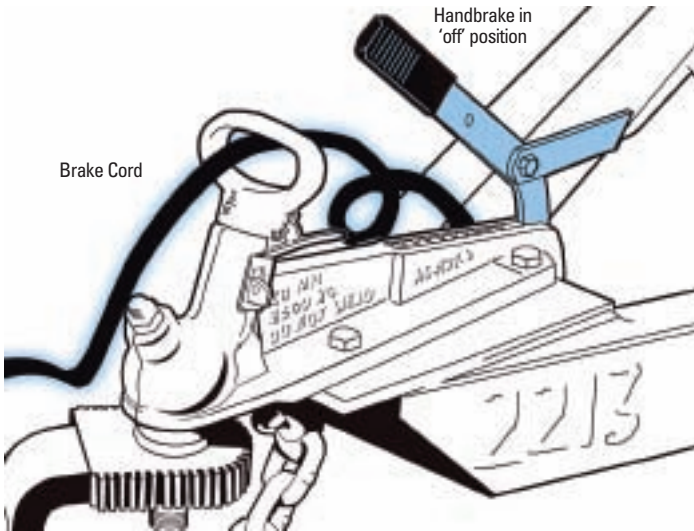
The chains attach the 'A' frame or draw bar of the trailer to the main towbar framework on the vehicle. The attachment must be made with 'D' shackles of equivalent strength to the chains. It is vital that the chains are attached to the main towbar framework and not to a detachable ball mount or tongue. Safety chains must be stamped with the chain's capacity, the manufacturer's identification and the digits 4177.

The chains should be as short as possible, leaving only enough slack to permit tight turns. If two are required they should be crisscrossed under the trailer tongue to prevent the forward end of the drawbar from hitting the ground if the coupling becomes disconnected.



Braking Systems

According to the Australian Design Rules, all trailers over 750kgs GTM (irrespective of the towing capacity or unladen mass of the tow vehicle) must have an effective brake system fitted. All brakes must be operable from the driver's seat of the tow vehicle except for over-ride brakes.



The minimum braking system required for a trailer or caravan depends on its type and weight, as well as the weight of the tow vehicle:

- Up to 750kgs GTM: No brakes are required.
- 751-2,000kgs GTM: There must be a braking system on the wheels of at least one axle and over-ride brakes are permitted. However, for caravans exceeding 1000kgs, independent brakes (electric brakes are the most common form) are strongly recommended.
- Over 2,000kgs GTM: A brake system operating on all wheels is required. The system must be capable of automatically activating should the trailer become detached from the tow vehicle. Under these circumstances the brakes must remain applied for at least 15 minutes. These 'break away' systems are compulsory on all trailers over 2,000kgs GTM.

Tyres

It is vital that your tyres are in good condition. Tyres can deteriorate just as much when a vehicle stands for long periods, as when it is being used. As tyres age, the surface rubber can crack and rubber compounds can deteriorate. Manufacturers recommend that tyres are replaced after six years, even if the tread has more than the legal minimum groove depth remaining. If tyres are worn to the legal minimum tread depth, they must be replaced regardless of age. Remember to keep a spare that is the same, and gets replaced with the others.

Tyres must have a sufficient load-rating and speed-rating for towing, and must have the correct tyre pressure to suit the load being carried. Tyre pressure maintenance is important, as properly inflated tyres will give you the best economy, safety and performance from your towing vehicle and caravan. Under inflated tyres can lead to the tyre walls becoming overheated and blowing out. Over inflation can cause sever vibration and stress to your caravan.

One way to decide on the correct tyre pressure is to check the tyre placards on the vehicle and the caravan. For the towing vehicle, the placard specifies the recommended pressures for both normal

and maximum load conditions when the vehicle is operated for sustained periods at high speed. For safety and optimum tyre life, inflation pressures should be adjusted in accordance with the placard recommendations.

In addition to the vehicle placard, a metal information plate fastened to the caravan provides important details in relation to mass and tyre pressure.

The tyre pressure must be adjusted according to the load, and the best way to determine the optimum tyre pressure is to know the fully laden weight of the van. A trip to a weighbridge will establish this. Tables providing the correlation between load and pressure are available from your local tyre dealer.

If in doubt, contact a tyre retailer. Correct tyre pressure will provide safe operation, maximum tyre life, the best ride, handling, and fuel economy.

Towing Your Caravan



The loaded mass of your trailer must not exceed:

- the capacity of the towbar; or
- the maximum towing mass specified by the tow vehicle's manufacturer; or
- the maximum ball weight specified by the tow vehicle's manufacturer.

The Driver

Apart from adding to the driver's legal responsibilities, towing requires a greater degree of knowledge and skill than normal driving. When towing, you should:

- allow for the extra length and width of the trailer when entering traffic;
- apply the accelerator, brakes and steering smoothly and gently to avoid sway, especially in wet or slippery conditions;
- avoid applying the towing vehicle's brakes if the trailer begins to sway or snake. If the trailer is fitted with brakes that can be operated independently, apply the manual control firmly. Otherwise continue at a steady speed or accelerate slightly until the sway stops;

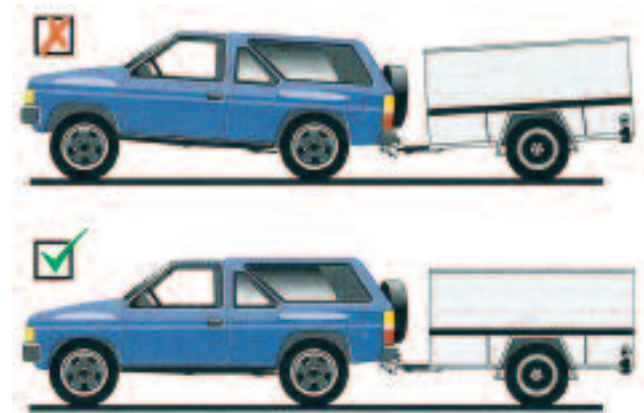
- maintain a space of at least 60 metres between you and the vehicle in front to allow for a longer stopping distance;
- engage a lower gear in both manual and automatic vehicles to increase vehicle control and reduce brake strain when travelling downhill;
- allow more time and a greater distance in which to overtake. When towing, your vehicle's capacity to accelerate is reduced;
- if possible, reverse with a person watching the rear of the trailer;
- where areas are provided, pull off the road to allow traffic building up behind you to overtake;
- be aware that towing is more stressful than normal driving and is more likely to cause fatigue. Therefore, more rest stops should be planned.

Loading Trailers

It is important not to overload your trailer. You should not exceed the maximum load specified or recommended by the trailer manufacturer, nor should you exceed the tyre or coupling capacity.

Trailers now have attached to their drawbars a plate displaying the ATM which is the maximum allowable weight.

As a general rule, the ball mass (the mass towards the front of the trailer carried by the tow ball of the towing vehicle) should be about 10 % of the total laden trailer weight. The ball mass can be measured either at a weighbridge by resting only the jockey wheel on the scale, or by placing a ball mass scale under the coupling then taking the weight off the jockey wheel.



Control of Sway

Weight Distribution Hitches

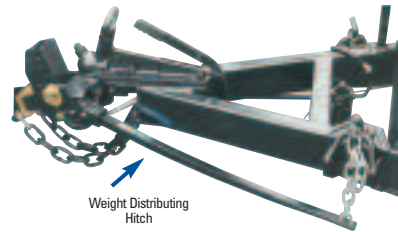
The trailer's drawbar should preferably be level when being towed. Towing applies a downward force on the rear of your vehicle which is referred to as 'ball weight'. This weight will be carried by the rear suspension, which can cause the back of the tow vehicle to sag. In response, the front of the vehicle will rise and the steering will feel light, due to the lower weight on the front wheels. This can cause loss of steering and braking performance (increased wear and tear on the rear suspension and tyres will also result).

Weight distribution hitches will help return your vehicle close to the original dynamics by re-distributing the effects of this ball weight to the original balance between front and rear suspensions, thus levelling out the vehicle/trailer combination.

Some vehicle manufacturers require the use of a Weight Distribution Hitch to be able to tow to their stated maximum capacity. You are legally obliged to use them in such situations.

Remember Weight Distribution Hitches are not a means lowering the ball weight, and you still can not tow more than the maximum ball weight as set out by the vehicle/towbar manufacturer. You should always consult your vehicle owner's manual for the true towing capacity of your vehicle and match that with the correct towbar.

Fitting of weight distributing hitches is not recommended with old style over ride-brakes, as the hitch interferes with the application and release of the brakes, and may cause brake malfunction.



Sway Control

When the weight of a loaded caravan or trailer is transferred via the towball connection to the tow vehicle suspension, a Weight Distribution kit, matched to the towball weight is the first essential sway control. This restores the tow vehicle front wheel traction and tow vehicle stability.

External factors such as cross winds and overtaking trucks and buses create significant side thrust forces that increase in intensity with increasing caravan/trailer size and load. If these forces are noticeable after fitting an appropriate weight distributing kit, an added sway control unit should be fitted.

Below are three examples of Sway Control devices that are commercially available:

Friction Sway Control

This is a device of universal application to all caravan/trailer combinations regardless of towball weight or coupling height. It is adjustable to accommodate small to large rigs and normal to severe highway conditions.

AKS 3004 Stabiliser

With this device, friction pads apply a high level of pressure on the towball. Their high damping force resists sudden movements, either horizontally or vertically to stabilise the caravan when being towed.

Dual Cam Sway Control

This is applicable only to caravan/trailers having heavy towball weights (exceeding 180kg), and with a coupling to ground clearance of 450mm. Whereas the Friction Sway Control is adjustable, the Dual Cam has a fixed setting.

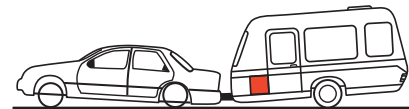
The guidance of an experienced installer is advisable with any of this equipment.



Sensible Loading: How to Apportion it



Incorrect Loading



Preparation



Maintenance

Regular maintenance of your vehicle and trailer is essential for safe towing. Have them checked regularly to ensure they are in a safe and roadworthy condition.

The trailer's wheel-bearings, suspension and brakes must all be in good working order and tyres must be properly inflated. It is a good idea to take some of the mass off your trailer's springs and tyres if it is going to be stationary for an extended period of time. The best way to do this is by placing blocks under the chassis behind the wheels and under the point where the A-frame attaches to the chassis. By using a properly secured jockey wheel to raise and lower the trailer, this can be achieved quite easily.

Gas cylinders and LPG regulators should also be checked regularly by a qualified person. For example, if left out in the open, your regulator may have been affected by water. If this is the case, it needs to be drained and cleaned thoroughly to prevent corrosion, which will prevent it from working properly. Check that all hoses and pipes are securely connected and also check the date stamp on your cylinders, which must be checked for continued service life once every 10 years at a certified gas cylinder testing station.

Checks before the trip

- Check oil, water, brake fluid, the battery etc.
- Inspect all tyres carefully. If your trailer has not been used for a long time, the tyres may be soft. And remember, when towing heavily loaded trailers your vehicle's tyre pressures should be increased to the level recommended in the owner's handbook or on the tyre placard. If in doubt, contact your local tyre dealer.
- Check that your vehicle and trailer's wheel nuts have been tightened to the manufacturer's specifications. To tighten the nuts, use a torque wrench to the torque recommended by the manufacturer (around 90ft lb or 125Nm). Wheel nuts should then be re-tightened after each 100 kms for the first 400 kms and checked every 1,000 kms or at six month intervals thereafter.
- Ensure the coupling socket and ball match in size.
- Check that the coupling is correctly and securely fastened.
- Check that the safety chains are correctly connected.
- Check to ensure that the trailer brake and light connections are secure and that all lights work.
- Check that the towing lights, number plates and registration labels of your caravan are clearly visible.
- Disengage any reversing catch fitted to the trailer coupling (as used with over-run brakes).
- Make one or two test stops to check that the brakes are working properly.
- Ensure that your load is properly secured.
- Limit the amount of load in the boot of the tow vehicle.
- Ensure that the rear vision mirrors on the tow vehicle are properly adjusted.
- Ensure that the gas cylinders are properly secured.
- While you are travelling ensure that the gas cylinders are turned off and that the refrigerator door is closed.
- Check that the roll-out awning is stored away and locked in the travel position.



- Remove the jockey wheel from its clamp and store it in the boot of the car or RV, or if it is of the swivel mount variety, lock it in the travelling position.
- Check that the front and rear corner stabilisers are in the up position.
- Ensure that the hand brake of the trailer has been correctly released.
- Check that the roof hatches, windows and stone shields are secure.
- Check that the electrical cord has been disconnected and stored away.
- Check that the TV antenna is in the travel position.

Checks during the trip

- Check that the couplings and chains are still securely fastened.
- Check that the brakes and wheel bearings are not overheating, by comparing to your carbrakes.
- Check that light connections are still secure and that the lights are working.
- Check that the tyres are still sufficiently inflated.
- Check that the load is still secure.
- Check that the roll out awning is properly locked in the travel position.

Facts About Caravan Insurance



Your recreational vehicle needs to be insured, but choose your policy wisely. You should also bear in mind that your trailer may not be covered by comprehensive insurance if it fails to comply with legislation, or if its ATM exceeds your vehicle's towing capacity, or if it is unroadworthy or overloaded.

When shopping around for a policy, consider the following:

- Is the policy premium competitive?
- Is the policy an Agreed Value or a Market Value policy?
- Does the policy include the annex and accessories such as air conditioners?
- Does the policy cover personal contents?
- Does the policy cover emergency accommodation and urgent repairs to the vehicle?
- Is comprehensive flood cover included?

Organisations for Further Information

Caravan and Camping Industry Association of NSW

Ph 02 9615 9999
Fax 02 9615 9998
Email admin@cciansw.com.au
Web Site www.cciansw.com.au

Caravan Industry Australia (QLD Trades Division)

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Caravan Industry Australia (Victorian Trades Division)

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NT Caravan Parks Association

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Fax 08 8952 5236
Email macrange@macrange.com.au
Web site www.ntcaravanpark.com.au

Caravan Industry Australia (Tasmania)

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Recreational Vehicle Manufacturers Association of Australia

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Web Site www.rvmaa.com.au

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