



# “A”- Frame Towing

Requirements for the Towing of Vehicles  
with Simple (Un-braked) “A”-Frames



### Introduction

This bulletin is intended to assist persons that wish to undertake “A”-frame towing of a motor vehicle in a manner that satisfies the Australian Road Rules.

“A”-frame towing is the term used to refer to towing a motor vehicle, which has its front wheels on the road and is connected to the towbar of the towing vehicle by a triangular shaped frame commonly known as an “A”-frame.

### The Australian Road Rules state:-

294(1) *The driver of a motor vehicle must not tow another motor vehicle unless:*

(a) *either:*

(i) *the driver can control the movement of the towed vehicle; or*

(ii) *the brakes and steering of the towed vehicle are in working order and a person who is licensed to drive the towed vehicle is sitting in the driver's seat of the towed vehicle, and is in control of its brakes and steering; and*

(b) *it is safe to tow the vehicle.*

You will need to check with the Road Transport Authority in which your vehicle is registered to determine whether you need to make application and, if so, what evidence you will need to supply for approval to be considered.

Persons who tow vehicles in accordance with this bulletin will be able to tow legally in all States and Territories. However, in order to ensure that potential problems with enforcement officers are minimised, it is recommended that a copy of this bulletin, together with any reports, approvals or other documentation, is carried in the vehicle at all times.

This bulletin provides a guide for the individual seeking approval for the simple (un-braked) “A”-frame towing of a small motor vehicle. Persons who wish to tow vehicles equipped with proprietary or individually constructed systems incorporating braking of the towed vehicle will need to seek advice from their respective Road Transport Authority.

Persons wishing to undertake “A”-frame towing may need to seek advice from a recognised engineering signatory or a professional chartered engineer to ensure that the “A-frame” device that they intend to use meets the technical requirements of this bulletin.

## Coupling Design

### The “A”-frame coupling must;

- be designed and constructed with sufficient strength to hold the vehicles together in tow and must comply with the requirements of Australian Design Rule 62 “Mechanical connections between vehicles” relevant to the Gross Vehicle Mass (GVM) of the towed vehicle.
- permit an adequate amount of angular movement between the towing and towed vehicles, to cater for road undulations.
- be secured to a substantial body member of the towed vehicle, such as a sub-frame or chassis member. Connection to the towed vehicle’s bumper, suspension or steering components is not permitted, unless approved by the manufacturer of the towed vehicle.



- be marked with the manufacturer’s name or trademark and the rated capacity. The “manufacturer” may include the owner in the case of a privately constructed device.
- Be marked with the VIN/chassis numbers of both the towing vehicle and the towed vehicle.
- maintain a space between the combination not exceeding 2 metres.



**Chain Design**



**Towed vehicles with a GVM of up to 3500 kg.**

Towed Vehicles with a GVM of up to 3500 kg must be equipped with safety chains/cables complying with AS 4177.4-1994 and of the appropriate size for the towed vehicle GVM as detailed in Table I below:-

**Table I**

Towed Vehicle GVM in kg	Nominal material size in mm	Applicable Australian Standard
0 to 1000	6.3	AS 4177.4-1994
Up to 1600	8.0	AS 4177.4-1994
Up to 2500	10.0	AS 4177.4-1994
Up to 3500	13.0	AS 4177.4-1994

The number of chains required depends on the towed vehicle's GVM as described below.

- Towed vehicles with a GVM up to 2500 kg shall be equipped with at least one safety chain
- Towed vehicles with a GVM over 2500 kg shall be equipped with two safety chains

For towed vehicles with a GVM up to 3500 kg safety chains may be replaced by safety cables with a certified load capacity not less than that of chains complying with Australian Standard 4177.4 – 1994 “Safety Chains up to 3500 kg”.



## Chain Design (Continued)

### Towed vehicles with a GVM over 3500 kg.

Towed Vehicles with a GVM over 3500 kg must have two chains made from steel of a minimum 800 Mpa breaking stress and conforming to the mechanical properties of Grade T chain as specified in AS 2321-1979 'Short-Link chain for Lifting purposes (non-calibrated)'. (Refer Table 2).

The size of chain must be as follows:

- Towed vehicles with a GVM over 3500 and up to 4300 kg shall have chains of at least 7.1mm in size.
- Towed vehicles with a GVM over 4300 and up to 7500 kg shall have chains of at least 9.5mm in size.

Safety cables (fitted in lieu of safety chains) must comply with and be certified to AS 3569-1989 'Steel wire ropes'. The cable fitted with attachments (ie. snap hooks and quick link) must be equal to or larger than that specified in Table 2.

**Table 2**

Towed Vehicle GVM in kg	Nominal material size in mm	Applicable Australian Standard
0 to 4300	7.1	AS 2321-1979
Over 4300 & up to 7500	9.5	AS 2321-1979

### Towed Mass Ratio

The tare mass of the towing vehicle divided by the mass of the towed vehicle (including the “A”-frame) determines the combination’s towed mass ratio (TMR).

$$\text{TMR} = \frac{\text{Tare Mass of towing vehicle}}{\text{Laden Mass of towed vehicle}}$$

## Towing Capacity of Towing Vehicle

Where the vehicle used for towing has a gross vehicle mass (GVM) not exceeding 4500 kg, the towing limits specified by the vehicle manufacturer must not be exceeded. (Most manufacturers specify towing limits for their vehicles in the vehicle handbook.)

The loaded mass of the towed vehicle must not exceed the towing capacity of any component in the combination, including the “A”-frame, towbar and towball.

As a safety precaution, the combination shall have **a towed mass ratio of at least 1 : 3.5** to provide for safe handling and braking.

### Braking Requirements (Applicable to All Towed Mass Ratios)

The requirement for a 1 : 3.5 towed mass ratio is designed to give a combination adequate braking without the need for the brakes of the towed vehicle to be operated by the driver of the towing vehicle.

The vehicles in combination must have a braking performance of at least that detailed in Table 3.

Table 3

	Stopping distance when brakes applied at 35 km/h	Average deceleration rate from any legal speed	Peak deceleration rate from any legal speed
Vehicle combination gross mass under 2.5 tonnes	12.5m	3.8ms <sup>-2</sup>	5.8ms <sup>-2</sup>
Vehicle combination gross mass 2.5 tonnes or over	16.5m	2.8ms <sup>-2</sup>	4.4ms <sup>-2</sup>

The parking brake of the towing vehicle must be able to hold the vehicle combination stationary on a 12% gradient.

### Lighting

The following lights must be fitted to the rear of the towed vehicle and must be operational whilst under tow;

- two turn signal lamps showing amber light to the rear.
- two stop lamps showing red light to the rear.
- two reverse lamps showing white light to the rear.
- one registration plate lamp at the rear of the towed vehicle to illuminate the registration plate.
- two tail lamps showing red light to the rear.

These lamps may be arranged on a portable light bar providing it is securely fastened to the rear of the towed vehicle.

### Steering

The “A”-frame towing system shall provide safe and adequate steering control for both vehicles whilst being towed in combination. The stability of the vehicle combination, the steer-ability of the towed vehicle and the tracking of the vehicle combination must be satisfactorily addressed.

- The vehicle combination must be capable of turning within a 25 m diameter circle, measured at the outer wheel track.
- When travelling in a straight line on a level, smooth surface the towed vehicle must track (follow) in the path of the towing vehicle without deviating off-line by more than 100mm.

## Vehicle and Towing Componentry Manufacturer’s Requirements

The vehicle manufacturer’s recommendations must be complied with whilst carrying out “A”-frame towing. This applies equally to both the towing and towed vehicle.

Vehicle owners are advised to check with their manufacturer/dealer to determine whether their towed vehicle is suitable for “A”-frame towing. Advice given in the “Owner’s Manual” for the towing of the vehicle should always be followed.

## Loads in Towed Vehicle

Carrying a load in the towed vehicle is not forbidden. However, when carrying such a load it is important to consider the following points:

- The loaded mass of the towed vehicle must not exceed the capacity of any component in the combination.
- The Towed Mass Ratio of the combination must not be less than 1:3.5 when the towed vehicle is loaded.
- Any load carried in the towed vehicle should be placed as low and as centrally as possible. Large, heavy items (eg outboard motors) carried high up and behind the rear axle of the towed vehicle will adversely affect the handling of the combination and may render towing unsafe.

## Other Requirements

- The overall length of the vehicle combination must not exceed 19.0 metres.
- The “A”-frame, and any attachment which could constitute a dangerous projection, must be removed from the towed vehicle before it is driven on public roads.
- In most jurisdictions both the towing and the towed vehicle must be legally registered. Owners are advised to check with their Road Transport Authority to confirm this requirement.

Obtaining the assistance of an Engineering Signatory to confirm that an “A”-frame towing vehicle combination and “A”-frame coupling apparatus meet the requirements of this Information Bulletin is recommended. A list of recognised consulting engineering signatories is available from the appropriate agency in each jurisdiction.



# APPENDIX I

## LEGAL REQUIREMENTS

- Both vehicles constituting the combination must meet registration requirements and be roadworthy.
- The coupling and towbar must not obscure the number plate or lights on the rear of the towing vehicle when the towed vehicle is not attached.
- Regulations prohibit towing more than one vehicle or trailer at once.
- Nobody is allowed to ride in the towed vehicle.
- When towing, the maximum speed at which you may tow is 100 Kilometres per hour or the posted speed limit whichever is the lesser.
- Following distances outside built-up areas - On roads outside a built up area that do not have more than one lane in the direction you are driving, there are specific minimum following distances for long vehicles. If your vehicle is 7.5 metres long or longer (including any load), you may not follow closer than 200 metres to a similar vehicle in front of you. The exception is when you are overtaking.
- Stopping on carriageways - If your vehicle including trailers and load is longer than 7.5 metres or has a total mass of more than 4.5 tonnes you may not:
  - Stop on a carriageway in a built - up area for longer than one hour unless engaged in picking up or setting down goods; or
  - Stop on a carriageway outside a built up area except on a hard shoulder or in a truck bay or other area set aside for parking of goods vehicles.

## “Do Not Overtake Turning Vehicle” Signs

If your combination (the towing vehicle together with the towed vehicle) is 7.5 metres long or longer, you may display the sign “DO NOT OVERTAKE TURNING VEHICLE” at the rear. This can be either a separate sign or incorporated on one of a pair of rear marking plates.

If this sign is attached to the rear of your combination, other vehicles must give way whilst your combination uses part or all of an adjacent second lane for turning. You will have the right of way to complete such turns.

It is an offence not to display this sign on a vehicle (meaning the towing vehicle together with the towed vehicle) with a combined length of more than 7.5 metres long if lanes need to be straddled when turning.

It is an offence to display this sign on a combination (meaning the towing vehicle together with the towed vehicle) with a combined length less than 7.5 metres long. However, it is not illegal to use standard rear marking plates without the words 'DO NOT OVERTAKE A TURNING VEHICLE' on such a vehicle.

## APPENDIX 2

### EQUIPMENT

#### Towing Vehicle

Your vehicle must be suitable and properly equipped for towing, with towbars and couplings properly designed and fitted.

- Electrical sockets for trailer lights must be fitted to the towing vehicle, and where necessary, suitable brake connections.
- Vehicles with automatic transmission may require extra transmission oil cooling.
- Some vehicles may need strengthening, and/or special transmission and suspension options. A load distributing device may also be required. You should check the vehicle handbook or consult the manufacturer or the vehicle distributor regarding these requirements.

#### Towbar

Your towbar must comply with Australian Design Rules, Standards and Regulations.

- The capacity of your towbar and coupling must be at least equal to the total mass of the towed vehicle and the “A-frame” coupling. A towbar fitted to a vehicle built after January 1992 must be marked with its load capacity and either the vehicle model for which it is designed or the towbar manufacturer’s part number.
- The towbar must not protrude dangerously, or have sharp corners that could be a safety hazard when no trailer is fitted to your towing vehicle.
- The towbar must be fitted with two attachments for connecting safety chains, one on either side of the coupling.
- Towbar chain attachments must be able to withstand the rated load capacity of the towbar.
- The safety chain attachments must be mounted adjacent to the tow coupling and arranged so as to maintain the direction of a trailer in the event of coupling failure or disconnection.
- In the event of coupling failure or disconnection, the safety chain(s) should support the drawbar and prevent it dropping to the ground.
- Towbars with a removable towing lug should be fitted with safety chain connections on the non-removable part of the towbar. If the chain connections are on the removable lug then the lug must be restrained by an additional chain to prevent disconnection from the towbar if the lug attachment fails.

### APPENDIX 3

#### DRIVING TIPS

Towing requires additional knowledge and skill than normal driving and can be stressful and more likely to cause fatigue. The following procedures will help reduce risks and improve towing safety.

- Remember to allow for the extra length of the towed vehicle, and its tendency to “cut in” on corners and curves.
- The extra weight of your combination requires greater stopping distance when braking. Always allow for this when towing.
- Brakes should not be applied more than very lightly when cornering or travelling around a curve, particularly when the road is wet or slippery.
- Reversing an “A-frame” coupled combination is not recommended due to lack of directional control over the towed vehicle.
- A towing vehicle’s performance will be reduced by the mass of the towed vehicle. Therefore greater care is needed when overtaking.
- Accelerator, brake and steering must be operated smoothly when towing. Unnecessary steering wheel movement should be avoided because sway or “snaking” of the combination can result. If sway occurs, a steady speed or slight acceleration should be maintained if possible, until the sway ceases. The towing vehicle’s brakes should only be applied as a last resort.
- Ensure your mirrors on both sides of your towing vehicle are properly adjusted to give clear view of vehicles approaching from the rear.
- To avoid a build-up of following traffic that is unable to overtake, consider pulling off the road where suitable to allow the faster traffic to clear.
- When travelling downhill with a trailer, a lower gear should be engaged. This gives you greater vehicle control and reduces the load on your brakes.
- A strong wind will affect towing, so reduce your speed accordingly.

#### Towing Is Different From Everyday Driving

Towing requires more knowledge and skill than normal driving and is more stressful and more likely to cause fatigue. Be sure to plan your trip, get plenty of rest before it and take regular breaks to avoid fatigue.

Remember the correct matching of the towing vehicle and the towed vehicle is essential for safe towing. Check your vehicle handbook and consult your vehicle, dealers on all towing performance and safety aspects.

## APPENDIX 4

### SAFETY CHECKS

## INSPECT THE COMBINATION BEFORE EACH TRIP:

Towing places extra demands on a vehicle. Carry out the normal service checks on the towing vehicle and ensure that both vehicles are roadworthy.

- Check the vehicles', suspension, brakes, lights and tyre inflation.
- Check the vehicles' handbooks or the tyre placards for recommended tyre pressures when towing. If these figures are not available, the towing vehicle's tyres should be inflated to about 15 kPa. above normal.
- Check that the coupling and safety chains are securely fastened. If two safety chains are fitted, they should be crossed to help prevent the drawbar from contacting the road if the coupling becomes disconnected.
- Ensure that no heavy loads are carried in the towed vehicle. It is very important that heavy or dense loads are not attached to the rear of the towed vehicle. eg heavy outboard motors.

### Safety Checks during A Trip

- Inspect the combination soon after commencing a journey, and during rest stops.
- Check that the brakes and wheel bearings of the towed vehicle are not overheating.
- Check that the coupling and safety chains are secured.
- Check that tyres are still correctly inflated and lights are functional.
- Check the combination regularly when travelling on gravel or rough roads.

### Dealing with Trucks

Encounters with road trains and other large trucks are inevitable for anyone driving in the country. To ensure these encounters are as safe as possible you should:

- Only overtake if the road is clear and visible a long way ahead (at least 1 km - even more if towing). Once you have made the decision to pass, do so quickly and positively.
- Be ready for the effect of wind buffeting as you pass a truck
- Remember that the stopping ability of a heavy vehicle is not the same as a standard car.
- Do not attempt to overtake a large truck near an intersection - they often require two lanes to turn a corner.
- When meeting a road train or other heavy vehicle on a narrow bitumen road, your best option is to slow down and move as far left as practical. This will help to prevent flying debris and dust from the oncoming truck, which can impair vision and possibly cause windscreen damage.



## ENQUIRIES



Department for Planning and Infrastructure  
Government of Western Australia

### Vehicle Safety

21 Murray Road South,  
(corner of Welshpool Road)  
Welshpool WA 6106

Phone: (08) 9351 1696 • Fax: (08) 9351 1699