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Multi-Combination - Heavy Vehicle Theory

Learner Guide

October 2023



Government of South Australia
Department for Infrastructure
and Transport

**Build.
Move.
Connect.**

Disclaimer

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We acknowledge the Traditional Custodians of the Country throughout South Australia and recognise their continuing connection to land and waters. We pay our respects to the diversity of cultures, significance of contributions and to Elders past, present and emerging.



Purpose

This document is for the express purpose of instruction for future drivers of *Multi Combination Heavy Vehicles*.

The information contained within this document may change without notice and it is advised that the user regularly check with SA Department of Infrastructure and Transport's website for currency of information.

The aim of this training is to build on your current road knowledge and refresh the information you have. We aim to ensure a future heavy vehicle driver who is calm, focused and therefore, safer on our roads.

This document does not represent the only source of information for your competency assessment. Please ensure you undertake all components of the relevant training including practical testing.

Refer to the South Australian licensing website for further information about your Heavy Vehicle licence by clicking [here](#) or via URL <https://mylicence.sa.gov.au/my-heavy-vehicle-licence> .

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Note: If you are progressing from Class HR, you must have completed the HC competencies prior to beginning any of the MC Training. These competencies demonstrate your skills operating a class HC prime mover or single semi-trailer.

Multi-Combination (MC) Theory

The heavy vehicles you currently drive are general access vehicles. These can use the road network with few restrictions. Vehicles classified as **MC class (B doubles, Road trains)** are referred to as '**restricted access vehicles.**' This means there are limitations to the roads they travel on and some of the turns they are required to make.

This resource provides key references, licensing requirements and knowledge required by heavy vehicle licence applicants prior to them undertaking further theory training with a Registered Training Organisation (RTO). It is an expectation that as preparation for the course, all applicants will thoroughly read and complete the questions in this booklet before they can attend training.

This theory course is designed as a Road Rule Refresher. To re-enforce existing driving concepts and introduce others related to MC vehicles. To ensure the applicant understands the information in the pre-course book, the answers to the quizzes will be reviewed.

The MC competency-based training and assessment program is designed to raise your awareness of the roles and responsibilities as a professional MC operator.

MC Program

Training and assessment program includes:

- Theory
- Vehicle inspections
- Coupling and uncoupling of the trailers and converter dolly
- Reversing the B-Double set for at least 70 metres in a straight line
- Three separate metropolitan drives, and
- A higher speed, open road drive

Following training, you will be assessed on your ability to operate the vehicle without assistance whilst interacting with traffic and obeying the Australian Road Rules. On successful completion your examiner will issue a certificate of competence which is presented to Service SA for conversion to a driver's licence.

Class MC Licence

Driving experience prior to obtaining an **MC licence** includes holding a **Class HC** or **HR** driver's licence for at least one year.

An MC Licence provides the driver with authority to drive any motor vehicle covered by an HC licence, B Doubles and Road Trains, however the driver is not licensed to ride a motor bike or motor trike. (Refer **Appendix C** for further information on licensing.)

Vehicle Check

Checking your vehicle for roadworthiness and safety are required to ensure you are safe, as the driver, and meet all compliance laws and National Heavy Vehicle licensing laws. A vehicle check needs to be completed prior to **every** trip.

Refer to [National Heavy Vehicle Inspection Manual](#) for more information.

Access the [Heavy Vehicle Inspection Checklist](#) and the [Heavy Trailer Inspection Checklist](#).

An example of a daily check sheet can be found on the NHVR website. To maintain compliance, all requirements must be followed, and this includes record storage.

Prior to starting a trip complete the following **checks**.

Area	Check
Pre-start under cab	Engine oil
	Engine coolant and hoses
	Power steering fluid
	Drive belts
	Windscreen washer reservoir
Pre-start outside cab	Registration
	Appropriate signage on truck and trailer
	Leaks under vehicle <ul style="list-style-type: none"> • Transmission • Differential • Engine • Radiator • Power steering • Wheel seals • Hub bearings • Fuel tanks • Fuel lines

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	Wheel bearings
	Tyres and wheel nuts
	Prop shaft and universal joints
	Turntable adjustment and coupling
	Air tanks
	Mirrors and windscreen clean, unbroken, and secure
	Load security
	Secure vehicle equipment (toolbox, steps, mud flaps, fuel caps etc)
	Load securing devices (Tarps, ropes, chains) are safely stored
	Suspension and vehicle posture
	Air lines and electrical lead
	Windscreen wipers, horns, lights, indicators, reflectors
	Battery security and fluid levels
	Previous damage recorded
Pre-start procedure	Check maxi brake applied
	Check transmission in neutral
	Adjust seating position
	Adjust mirrors
	Locate instruments and controls
	Fasten and adjust seat belt
Start-up procedure	Recheck maxi brake applied
	Depress clutch (except air assisted clutches when air is low)
	Select neutral
	Check air conditioner, radios and other accessories are switched off.
	Turn ignition to on position and check gauges (allow for engine check on computerised engines)
	Start up and allow motor to idle. (start up without throttle for computerised engines)
	Release clutch slowly
	Check all gauges

Pre-drive inspection	Check air tanks are drained of moisture
	Check air brake couplings and lines for leaks (this must be done when air system is fully charged)
	Ensure exit is clear
	Re-enter cab
	Check brake pedal and trailer brakes (Tug test)
	Move off slowly.

Coupling

Coupling is the function of connecting the trailer to the tractor or the power to the payload.

Before coupling the semi-trailer, the driver must make sure a complete check of the equipment has been conducted.

1. Inspect the surface of the turntable for proper greasing (or if the grease insert is in good condition)
2. Check the trailer spring brakes are on to avoid possibility of trailer moving.
3. If there is ANY doubt about the brakes on the trailer, CHOCK the rear wheels to prevent any movement.

The trailer is ready to be coupled.

Modern trailers are fitted with spring-brake actuators, so it is highly unlikely you will encounter this issue.

Note Chocking trailer wheels is compulsory on some work sites and may be required when rear-loading is performed off a dock.

This picture example is showing the two separate compartments with the compression spring on the right and the diaphragm service brake on the left.



(Courtesy: Fleet Watch- Spring-Brake)

4. Reverse prime mover:

- a. Use mirrors to line up outside edge of the mudguards with the sides of the semi-trailer.
- b. Stop when the tops of rear guards are in line with front of semi-trailer, so the turntable does not go too far back.
- c. Once in position apply Park Brake and lower the airbags.
- d. Exit the prime mover and check for alignment of turntable and king pin.
- e. Check jaws are open
- f. Check the clearance between bottom of semi-trailer and turntable.

Note NEVER step under a semi-trailer that does not have the safety of a prime mover ready to Support the trailer should the legs collapse or sink into the ground

5. Return to the prime mover:

- a. Disengage the park brake.
- b. Reverse so the top of the front mudguards are in line with the front of the semi-trailer.
- c. Apply park brake.
- d. Check the turntable is under the skid plate.
- e. Check kingpin is within the 'V' of the turntable.
- f. Return to prime mover.
- g. Adjust position as required.
- h. Raise airbags.
- i. Apply park brake and exit vehicle.

6. Once airbags are fully raised (with no gap between the skid plate and turntable):

- a. Wind the legs up approximately 1-2 cm so the weight of the semi-trailer is taken by the turntable.
- b. This will allow the prime mover to move if required during coupling.
- c. Return to the prime mover.
- d. **Disengage** park brake.
- e. Reverse **slowly** until turntable locks onto the kingpin.
- f. Engage 1st gear and attempt to move forward. This is called the **tug test** and checks the semi-trailer is hitched correctly and the trailer brakes work.
- g. Apply park brake.

7. Exit vehicle:

- a. Check locking lever is locked away.
- b. Check jaws are locked – use a torch if needed.
- c. Wind up legs until fully raised.
- d. Stow handle.
- e. Connect airlines, ensure they are open.
- f. Connect electrical lead.

8. Return to cab:

- a. Supply air to the semi-trailer – in new vehicles this is a red 8-sided dial.
- b. Turn on headlights.
- c. Check all lights are clean, clear, and functional.
- d. Perform general roadworthy check.

9. Return to prime mover:

- a. Engage 1st gear.
- b. Hold trailer brake handpiece on.
- c. Release park brake
- d. Perform a secondary **'tug test.'**
- e. Release trailer brake handpiece
- f. Move forward 1 metre then,
- g. Gently apply trailer brakes to stop.
- h. Apply park brake.

For prime movers fitted with **springs** rather than **air bags**, ensure there is **clearance** between the top of the turntable and the bottom of the semi-trailer.

Once the turntable is in position with the kingpin located within the 'V' of the turntable, the legs will need to be wound up until they are 1-2 cm off the ground. Then it will be safe to couple the two units.

Note The procedure could change depending on the vehicle equipment or the actual vehicle configuration. The main emphasis must be placed on **safety**.



(Courtesy: Toowoomba Chronicle)

Uncoupling

1. Check the trailer is positioned on firm and level ground.
 - ✓ To make uncoupling easier reverse park the trailer.
 - ✓ This releases pressure on the turntable jaws making them easier to open.
 - ✓ Apply the park brake.
 - ✓ Isolate the air supply to the trailer by the appropriate controls.
 - ✓ Exit vehicle.
 - ✓ Disconnect air lines.
 - ✓ Disconnect electrical lead.
 - ✓ Stow all lines securely.
 - ✓ Avoid contaminants entering the airlines by joining them together or connecting them to dummy fittings.
 - ✓ Wind down legs, checking they are moving at the same rate.
 - ✓ After legs have made contact with ground continue to wind until air is heard escaping from suspension.
 - ✓ Open turntable jaws by firmly pulling the handle then locking in place.
 - ✓ Return to prime mover.
 - ✓ Select first gear and release park brake.
 - ✓ Move forward slowly by no more than 30 cm.
 - ✓ Stop.
 - ✓ Apply park brake.
 - ✓ Select neutral then lower airbags.
 - ✓ Exit vehicle.
 - ✓ Check turntable is clear of skid plate and kingpin.
 - ✓ Ensure lines are not caught around any part of the semi-trailer.
 - ✓ Return to prime mover.
 - ✓ Select 1st gear.
 - ✓ Release park brake.
 - ✓ Drive forward until rear mudguards are in front of the semi-trailer.
 - ✓ Raise the airbags.
 - ✓ Once airbags are fully raised prepare to drive away.

If the prime mover is fitted with springs rather than air bags at the rear, the semi-trailer will need to be raised above the turntable by winding the legs down further until the gap can be seen between the bottom of the trailer and the top of the turntable.

Trailers with a block, mounted behind the kingpin, are suitable for coupling to a ball race turntable only.

Note If you are **distracted** at any time during the coupling or uncoupling process, systematically **double check** the steps to ensure you follow the procedure.

NEVER TAKE SHORT CUTS.

Fault diagnosis

Following are suggestions for problems you may encounter. If you encounter any issues with your vehicle report it promptly to your supervisor or company mechanic.

1. **Noise coming from transmission** check the following:

- Tail shaft/shafts bent or damaged.
- Universal joints worn.
- Gearbox bearings, pinion bearing (Front) or rear gearbox bearing.
- Low oil level.
- Gearbox bearings (there are many bearings in a gearbox, the main internal bearings are on the main shaft:
- Clutch bearing (thrust bearing)
- Always be aware of the correct airbag setting when travelling 'bobtail' (prime mover only without a trailer), as the incorrect setting will give you a phantom suspension fault.

Other noises could be mistaken for transmission noises could be the differential wheel bearings. The gearbox will make noises if it is misaligned, due to the gearbox mountings being worn and/or broken.

2. **Alternator not charging or light coming on:**

- Not charging is usually caused by one of the following:
 - Fan belt broken.
 - Fan belt slipping.
- Light coming on is usually caused by one of the following:
 - Internal failure of the alternator.
 - Fan belt broken.
 - Low fluid level in the battery.
 - Poor earth in electrical circuit.



(Courtesy Pinterest)

3. Severe engine noise could be:

- **Low oil in sump** (computerised engines will de-rate and then shut down when the level is too low)
- **High operating temperatures** have caused internal damage through heat stress of moving parts.
- **Low oil pressure** due to failure of oil pump or low oil level. (Computerised engines will de-rate and then shut down when the oil pressure is too low)
- **Other components** attached to the engine block have failed.

4. The list of components that **could fail** in the engine compartment is too large to mention. The following are **major components** that could be causing the noise:

- **Fan assembly** (some fan assemblies sound noisy on idle but could be serviceable, check with workshop)
- **Alternator** bearing failure.
- **Air compressor** failure (usually piston and / or bearing noise)
- **Loose or broken air cleaner** or bracket (diesel engines have a large intake of air and would be very noisy in this case)
- **Power steering pump** squeal (this would usually only occur when engine running and steering being operated)

Be aware the engine fan is often very noisy when it is operating. The engine fan robs the engine of a few horsepower when operating. This can be very useful when descending a steep hill because it will also lower the engine revs by a small amount, helping to prevent over-run.

Computerised engines have the ability to monitor many of the faults that may cause engine or engine component failure. You need to refer to the engine and vehicle manufacturers operating procedures to understand how these affect the driveability of that particular engine.

Give Way

To Give Way, for a driver or pedestrian means:

- If the driver or pedestrian is stopped – remain stationary until it is safe to proceed.
- In any other case, slow down and where necessary stop to avoid a collision.

The ‘Give Way Hierarchy’

When the driver of a vehicle approaches any intersection, the requirements for giving way should be considered in the following order:

Direction given by ...	Your actions....
Police	When police officers are directing traffic in any situation, obey all directions provided.
Traffic lights	Obey traffic light rules (Refer Pt 4 below)

When approaching traffic lights (especially when they have been green for a while)

- Check your mirrors for other traffic.
- Take your foot off the accelerator.
- Cover the brake pedal.
- Determine your decision points for stopping or going (Allow for the fact that more weight equals a longer stopping distance than what you may be familiar with).

If turning right and faced with a green light:

- Enter the intersection when safe to do so rather than staying behind the stop line.
- Ensure that you observe vehicles in all directions prior to entering the intersection.

Giving Way when traffic lights are not operating. (ARR 63)

The driver must give way to vehicles and pedestrians at or near the intersection in accordance with items provided in the ARR below, as if the intersection were an intersection without traffic lights, stop signs, stop lines, give way signs, or give way lines.

Signs or lines: stop at a :**Stop sign**, **Give Way** sign, **Roundabout** sign, or **Stop Line** at an intersection.



Stopping and giving way at an intersection without traffic lights (ARR69)

The driver must stop as near as practicable to, but before reaching:

- The stop line; or
- if there is no stop line—the intersection.

The driver must give way to a vehicle in, entering or approaching the intersection except:

- An oncoming vehicle turning right at the intersection if a stop sign, stop line, give way sign, or give way line applies to the driver of the oncoming vehicle; or
- A vehicle turning left at the intersection using a slip lane; or
- A vehicle making a U-turn.

Note After stopping, you can reposition the vehicle safely to gain a better view prior to moving off again.

Slip lane - an area of road for vehicles turning left that is separated, at some point, from other parts of the road by a painted island or traffic island, but not by a median strip (a dividing strip designed or developed to separate vehicles travelling in opposite directions).

Giving way at a Give-way sign or Give-way line at an intersection. (ARR69)

Give way at a give-way sign or give-way line at an intersection, unless the driver is turning left using a slip lane, the driver must give way to a vehicle in, entering or approaching the intersection except:

- An oncoming vehicle turning right at the intersection if a stop sign, stop line, give way sign, or give way line applies to the driver of the oncoming vehicle,
- A vehicle turning left at the intersection using a slip lane, or
- A vehicle making a U-turn.

If the driver is turning left using a slip lane, the driver must give way to:

- Any vehicle on the road the driver is entering, or turning right at the intersection into the road the driver is entering (except a vehicle making a U-turn at the intersection); and
- Any other vehicle or pedestrian in the slip lane.

Note For this rule, an oncoming vehicle travelling through a T-intersection on the continuing road is taken not to be turning.

Giving way at a roundabout (ARR114)

A driver entering a roundabout **must** give way to any vehicle in the roundabout. In this instance the driver must slow down or stop if necessary to avoid a collision

Intersection Rule (ARR 73)

At a T intersection there must be only **one** terminating road. In this instance the driver must slow down or stop if necessary to avoid a collision.

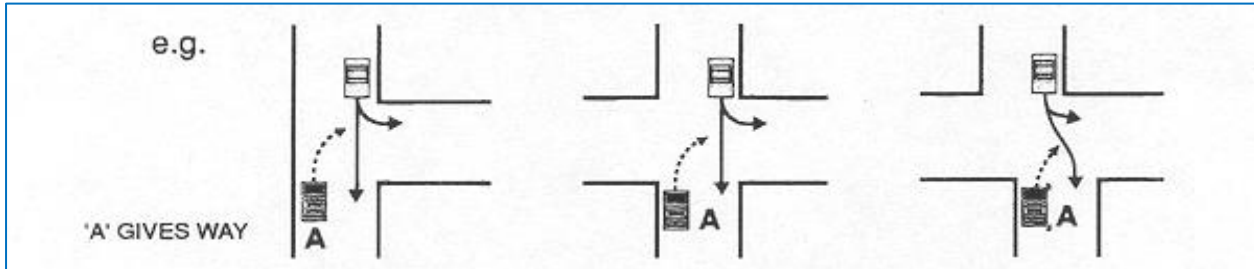
Giving way at a T-intersection

- If the driver is turning left (except when using a slip lane) or right from the terminating road into the continuing road, the driver must give way to any vehicle travelling on the continuing road. (Except a vehicle making a U-turn on the continuing road at the T-intersection)
- If the driver is turning left from the terminating road into the continuing road using a slip lane, the driver must give way to any vehicle travelling on the continuing road (Except a vehicle making a U-turn on the continuing road at the T-intersection)



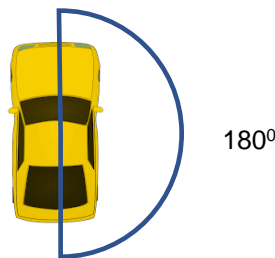
Giving way at uncontrolled intersections

- Vehicles turning to the right must give way to vehicles approaching from the opposite direction.
- If the driver is turning right, the driver must give way to any oncoming vehicle that is going straight ahead or turning left at the intersection, unless
- a stop sign, stop line, give way sign, or give way line applies to the driver of the oncoming vehicle, or
- the oncoming vehicle is turning left using a slip lane.



In all other cases

- **Give way to the right ('D' rule – refer diagram).** The driver makes an arc of 180 degrees from directly in front, through the right side of the vehicle and ending directly behind. (The shape of 'D') If any vehicle is in that arc, it is to the right and must be given way to.



- If the driver is **going straight ahead**, the driver must give way to any vehicle approaching from the right, unless a **stop sign, stop line, give way sign, or give way line** applies to the driver of the approaching vehicle.
- If the driver is **turning left** (except if the driver is using a slip lane), the driver must give way to any vehicle approaching from the right, unless a stop sign, stop line, give way sign, or give way line applies to the driver of the approaching vehicle.
- If the driver is **turning right**, the driver must give way to any vehicle approaching from the right, unless a stop sign, stop line, give way sign, or give way line applies to the driver of the approaching vehicle.

Note If you are in a turning vehicle at an intersection (both left and right) you must give way to pedestrians at or near the road you are about to enter.

Give-way situations

- Moving away from the kerb – give way to all other vehicles driving on the same road.
- Approaching a **level crossing** – give-way to all rolling stock (trams or trains)
- At **pedestrian crossings** – All pedestrians who are using the crossing, only while the lights are flashing or have been activated to allow pedestrians to cross.
- Give-way when **entering a road** from private land to all pedestrians and vehicles using the road.
- When attempting a **'U' turn** – give-way to all other vehicles and pedestrians.
- When **merging into traffic** (Zip Merge) – where road narrows, to any vehicle that is partly or wholly in front of your vehicle.
- **Emergency vehicles** – allow a free passage by moving to the left or right or slowing down.

Give Way S.T.O.D

A great way to remember when to give way is remembering STOD.

S.T.O.D. is an acronym for:

- **S**igns,
- **T**erminating road (T-intersection)
- **O**pposite direction and
- **D**-Rule give way.

When driving and approaching connecting roads or intersections consider the following:

- **S**igns – are there any signs which indicate you should stop or give way?
- **T**erminating road – is the road you are travelling on ending?
- **O**pposite direction – are there any vehicles coming toward you from the opposite direction?
- **D**-rule – if there are vehicles on your right, obey the 'give way to your right rule.'

In the following example you are in the yellow car (B).

- There are no signs
- You are not on a terminating road
- There is a vehicle coming from the **opposite direction** – car (A)
- You need to give way to the vehicle driving toward you, wait for a clear space, before making your right-hand turn.



Stopping enroute (ARR209)

Operators must not assemble or disassemble on a route or in a parking area. Drivers must stop in a parking area showing signs of 'Rest Area' or 'Truck Parking Area,' for rest purposes or vehicle checks. More information is available [here](#).

Reversing (ARR296)

Reversing manoeuvres must only be undertaken when the driver can do so safely. They should not reverse further than reasonable in the circumstances.

Please refer **Heavy Vehicle Driver's Handbook** p 55.

Giving way to buses (ARR77)

Driver driving on a length of road in a built-up area, in the left lane or left line of traffic, or in a bicycle lane on the far-left side of the road, must give way to a bus in front of the driver if:

- The bus has stopped, or is moving slowly, at the far-left side of the road, on a shoulder of the road, or in a bus-stop bay; and
- The bus displays a "give way to buses" sign and the right direction indicator lights of the bus are operating; and
- The bus is about to enter or proceed in the lane or line of traffic in which the driver is driving.

Note The driver of a bus must give the change of direction signal for at least 5 seconds, to give sufficient warning to other drivers and pedestrians before legally being allowed to enter traffic.

Keeping clear of police and emergency vehicles (ARR78)

A driver must not move into the path of an approaching police or emergency vehicle that is displaying a flashing blue or red light or sounding an alarm.

If a driver is in the path of such a vehicle the driver must move out of the path that vehicle as soon as it is safe to do so.

Stopping at children's crossing (ARR80)

A driver approaching a children's crossing must stop at the stop line at the crossing if a "handheld stop sign" is displayed or a pedestrian is on or entering the crossing. The driver **must not** proceed until the sign is no longer displayed or until there is no pedestrian on or entering the crossing.

Giving way at a pedestrian crossing (ARR81)

A driver approaching a pedestrian crossing must drive at a speed at which the driver can, if necessary, stop safely before the crossing. Drivers must give way to any pedestrian on the crossing.

Overtaking or passing a vehicle at a children's cross or pedestrian crossing (ARR82)

A driver approaching a children's crossing or pedestrian crossing **must not** overtake or pass a vehicle that is travelling in the same direction as the driver and is stopping, or has stopped, to give way to a pedestrian at the crossing.

Turn Signals (ARR46 – 48)

A driver who intends to turn or diverge, to the left or the right, must give a clear signal for a reasonable distance (or a minimum of 5 seconds) to allow sufficient warning to other drivers.

This also applies if the driver is about to change direction by moving from a stationary position at the side of the road or in a median strip parking area.

At the completion of the turn or change of direction the driver must stop the direction signal.

- At a modified T-intersection where the continuing road curves to the right, the driver must signal left when leaving the continuing road to proceed straight ahead onto the terminating road.
- At a modified T-intersection where the continuing road curves to the left, the driver must signal right when leaving the continuing road to proceed straight ahead onto the terminating road.

Note When changing lanes, it is recommended you check both side mirrors for traffic, signal in the appropriate direction, recheck mirrors on both sides again prior to (safely and legally) changing lanes. Turn off the signals once the vehicle has changed lanes and the vehicle is fully within the lanes.

Entering a roundabout and changing direction to the left (ARR112)

- This rule applies to a vehicle entering a roundabout if:
 - The driver is to leave the roundabout at the first exit after entering the roundabout
 - The exit is less than halfway round the roundabout.
- Before entering the roundabout, the driver must give a left change of direction signal to provide sufficient warning to other drivers and pedestrians.

Entering a roundabout and changing direction to the right (ARR113)

- This rule applies to a vehicle entering a roundabout if the driver is to leave the roundabout more than halfway round it.
- Before entering the roundabout the driver must give a right change of direction signal to give sufficient warning to other drivers and pedestrians
- The direction signal must continue whilst the vehicle is in the roundabout unless the driver is about to leave the roundabout.

Leaving a roundabout and giving a left change of direction signal (ARR118)

- If practical, a vehicle in a roundabout must give a left change of direction signal when leaving the roundabout.
- The driver must stop the direction signal as soon as the driver has left the roundabout.

Rail Crossings

A level crossing is an area where a road and **railway or tram tracks** meet at substantially the same level.

South Australian Crossing Rules (ARR120)

- A stop line across all or part of the road, a level crossing includes the whole or part of a road, that lies between the commencement of the stop line and the area referred to above
- A reference to a level crossing in this rule includes a reference to any area adjacent to the crossing that is denoted by painted cross hatched road markings.

Stopping and giving way at a level crossing stop sign

A vehicle at a level crossing with a Stop sign must:

- Stop as near as practical to, the stop line or if there is no stop line, as near as practical before reaching the stop sign.
- Give way to any train or tram on, approaching or entering the crossing.



Note Ensure ALL warning lights and bells have stopped before entering the level crossing and only do so if the crossing is clear.

Low loader suspension can be raised to negotiate level crossings if required.

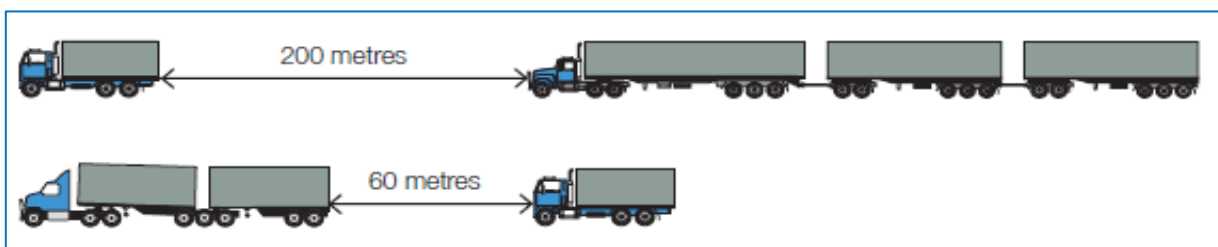
Minimum distance between long vehicles (ARR127)

The driver of a long vehicle must drive at least the required minimum distance behind another long vehicle travelling in front of the driver, unless the driver is:

- Driving on a multi-lane road or any length of road in a built-up area or
- Overtaking

Required minimum distances:

- For a road train behind a long vehicle – **200 metres**
- For any other long vehicle behind a long vehicle – **60 metres**



- A long vehicle is a vehicle (or combination) that is 7.5 metres long, or longer.
- A built-up area, in relation to the length of road is an area that has buildings or streetlights not over 100 metres apart for a distance of at least 500 metres.

Note At all times, a good following distance equals good braking distance.

At speed, recommended elapsed time following distances are:

- 5-7 seconds for B-double
- 11 seconds for a double road train (A-double)
- Up to 14 seconds for a triple road train (A-triple)

Bicycle lanes (ARR153)

A driver must not drive in a bicycle lane except for the reasons following:

- If stopping or parking is permitted at a place in a bicycle lane under another law of jurisdiction, a driver may drive up to 50 metres in the bicycle lane to stop or park at that place.

- A driver may drive for up to 50 metres in a bicycle lane:
 - To enter or leave road.
 - Enter a part of a one type of road to transfer to another type of road (example: moving to or from a service road, the shoulder of a road or an emergency stopping lane)
 - To overtake a vehicle that is turning right or making a U-turn from the centre of the road and giving right change of direction signal.
 - To enter a marked lane, or a line of traffic, from the side of a road.

Lanes (ARR154)

A driver **must not** drive in a Bus Lane except to:

- Turn left at or before the next road on the left.
- Enter or leave land adjacent to the road.
- Move from one line of traffic to another or go around an obstruction.
- Pass another vehicle on the left that is waiting to turn right.

In each case, the driver is **not permitted** to travel more than **100 metres** in the Bus Lane.

Stopping on a road (ARR200)

A heavy or long vehicle must **not be stopped** on a length of road that is in a built- up area, except on the **shoulder of the road**.

The driver of a long or heavy vehicle must not stop on a length of road in a built-up area for longer than an hour, unless the driver has been given permission via information on or with a traffic control device, or under another law of this jurisdiction.

Overtaking

Overtaking in a heavy vehicle has **inherent dangers** due to the **greater length, slower acceleration**, and the need for more road to affect the passing manoeuvre.

There is often less opportunity to pass which together with the need for greater clearances from other vehicles coupled with a lack of knowledge of some road users, can cause much frustration for the truck driver.

When overtaking a driver must assess hazards, available space, speed of vehicle being overtaken, oncoming vehicles, and the rate at which your vehicle can travel fitted with a speed limiting device.

When it is safe to overtake, use the following 'check system':

1. Mirrors
2. Signal right
3. Gears

4. Mirrors
5. Evasive action (if required)
6. Approach and position (clearance from vehicle being passed)
7. Clear the other vehicle
8. Mirrors
9. Signal left
10. Move back to correct position on road

In the diagram below:

- Vehicle **A** is travelling at 50km/h
- Vehicle **B** is travelling at 60km/h and intends to overtake vehicle **A**
- Vehicle **B** would take 17 seconds and cover 289m to close the 3 second gap
- The total passing manoeuvre (allowing 6m clearance after overtaking) would take
- 21 seconds and vehicle **B** would have covered 357m.



The recommended safe following distance in a heavy vehicle is at least **4 seconds** under good conditions.

To calculate your following distance: when the vehicle in front passes a fixed object

Count 1001, 1002, 1003, 1004. If you reach the same fixed object on or after this time, you are 4 seconds or more behind that vehicle.

You would need to add more time when driving in adverse conditions. (i.e. another 3 to 4 seconds)

Never overtake another vehicle that is stopped at a pedestrian crossing, railway or tram crossing and if any vehicle is coming from the opposite direction.

Night driving (ARR215)

When driving at night, **lights** must be switched on from **sunset to sunrise**, or during **periods of poor visibility**.

Lights include headlights, rear lights, number plate light and clearance lights, if appropriate.

It is an offence to drive a vehicle displaying parking lights only during the period of sunset to sunrise.



Blind spots

'**Blind spots**' can be created by the windscreen pillars inside a vehicle, other vehicles, or objects outside the vehicle, so although the eyes are 'looking' they will not see something that is hidden. You would be surprised at the size of blind spots created by the mirrors. To overcome these, you will need to move around, looking behind and in front of each mirror.

When a vehicle approaches from the opposite direction you must "**dip**" the headlights which further reduces our field of vision and as our eyes are attracted to the lights coming towards us there is a tendency to look at them, which can cause glare or 'temporary blindness' as the eyes take time to recover.

Note Headlights/ rear lights should be used during daytime periods of low visibility caused by low cloud, rain, dust, or heavily overcast conditions, to ensure your vehicle is seen by other road users.

Speed Limits

In Australia, the maximum default speed limit in a **built-up area** is **50km/h**.
The maximum default speed limit **outside a built-up area** is **100 km/h**.

Definition of a built-up area:

- Buildings on land next to land
- There is street lighting at intervals not over 100 metres for a minimum distance of 500 metres for the whole road.

Shared zones:

The speed limit for any length of road in a shared zone is the number of kilometres per hour indicated by the number on the shared zone sign and ends when the sign indicates the shared zone has ended.



Pedestrian crossings:

Throughout Australia there are 3 types of pedestrian crossings.

- **Emu crossing** – part-time children’s crossing within school zone when red ‘children crossing’ flags are displayed. (25km/h)



- **Koala crossing** - part time children’s crossing between the speed limit signs when lights are flashing (25 km/h)



- **Wombat crossing** – full time pedestrian crossing (40 km/h)



- **School zones** - generally have zigzag lines painted on the road on approach to the zone. The speed limit is (25 km/h) for school zones 24 hours/7 days per week but **only** when children are present.



OFFICIAL

- **School Bus** – when passing in either direction, a school bus that has stopped for the purpose of setting down or picking up children – **25 km/h**.



Driving **near** to school crossings, zones or buses the maximum speed limit is **25 km/h**.

Note In other jurisdictions the speed limit may be higher and may also be restricted at times on certain days. Be aware when travelling interstate.

- Road work speed limits are indicated by the speed restriction signs. There must be a speed restriction sign and not just notification of workers or roadwork ahead.

There must also be a return to speed limit sign, not only the notification of end of roadworks.



- When passing emergency vehicles, and they are displaying red or blue flashing lights and are stopped on a road your speed is **25km/h**.
Emergency services vehicles include ambulances, fire service, state emergency and police.
- Local traffic areas – some built up areas where the road is for local traffic only, may have speed restriction signs.



- The 'default' speed in built up areas where there is no other speed sign posted is **50 km/h**. Occasionally, there are warning signs on major roads to remind drivers.



Area	Speed Limit
Metropolitan roads	60 km/h
Learners or Provisional licences	< 100 km/h
State speed limit	100 km/h
Heavy vehicles = GVM > 12 tonnes	100 km/h
Buses = GVM > 5 tonnes	100 km/h

- Speed restrictions apply to certain vehicles that are wider, longer, and heavier than permitted. A lower maximum speed is a condition applied to the permit of travel.

Refer to:

- [Heavy Vehicle National Law \(South Australia\)](#)
 - [Heavy Vehicle \(Mass, Dimension and Loading\) National Regulation \(NSW\)](#)
- The State speed limit within South Australia is **100km/h** but some roads are signed **110km/h** for vehicles that are not governed to a lower limit.
 - A maximum **60km/h** speed limit applies to all trucks and buses from the Crafers interchange to the bottom of the South-Eastern Freeway. The speed limit for all other vehicles is **90km/h**.

(Refer **Heavy Vehicle Drivers Handbook** – pp 71-72)

Note: Remember, **always**, drive to the prevailing weather and road conditions. Consider your capabilities and the capabilities of the heavy vehicle you are driving to operate safely in any conditions. .

Accidents – Legal Obligations

Duties of driver involved in a crash (ARR287)

If you are involved in a crash with or without another vehicle you must follow the following tasks:

- Stop immediately.
- Give assistance to anyone who is injured.
- Give the following details:
 - Name of driver
 - Name of registered owner
 - Address
 - Include details of day, date, and time
 - Place of accident
 - Registration number of vehicle
 - Any information that could identify vehicles and people involved in the crash to their representatives.
- Report the crash to Police as soon as possible, when necessary, include details:
 - Day,
 - Time
 - Place of crash
 - Weather and road conditions
 - Positions and speed of vehicles before the time of collision

When to **report to police**:

Circumstances	Time frame
Where special circumstances exist	24 hours
Required details are not given to the other driver for any reason	24 hours
Vehicle is towed or carried away by another vehicle	24 hours
Fair estimate of the cost or repair is more than \$3000	24 hours
Where a person is injured or killed RTA s43-1-(b)	90 minutes
*Notify 3 rd party insurance company in writing if any person is injured or killed	



(Courtesy: Yahoo News)

Note: Use of mobile phone camera recordings or dash cam, following a crash, may provide additional information

Drugs and Alcohol

It is an offence to drive under the influence of any drug or alcohol in all States of Australia where your ability to drive is impaired.

The **drug** does not have to be illegal, it could be prescribed by a doctor however, if it affects your driving ability, it becomes an offence to be on it whilst driving.

The effects of drugs or alcohol depends on the amount and the following attributes of the person who has taken them or drunk them:

- Age
- Body size
- Gender
- Mood and emotional state
- How tired the person is

(RTA s47)-Driving with prescribed drug in oral fluid or blood. Road Traffic (Miscellaneous) Regulations 2014—R16—Prescribed drugs (section 47A of Act)

For the purposes of the definition of prescribed drug in *Section 47A (1) of the Act*, the following are declared to be prescribed drugs:

- (a) delta-9-tetrahydrocannabinol; (*marijuana or cannabis*)
- (b) methyl amphetamine; (*speed – 10-20% pure; or ice – 80% pure*), and
- (c) 3, 4-methylenedioxymethamphetamine (*MDMA*); (*ecstasy*).

(RTA s47) - Prescribed concentration of alcohol means:

- (a) A person who is not authorised under the *Motor Vehicles Act 1959* to drive the vehicle (e.g., a learner's permit holder)—any concentration of alcohol in the blood.
- (b) A person who is driving a prescribed vehicle—any concentration of alcohol in the blood.

Prescribed vehicles are:

- Vehicles with a gross vehicle mass exceeding 15 tonnes.
- Prime movers with an unladen mass exceeding 4 tonnes.
- Buses designed to carry more than 12 persons including driver.
- Mini-buses designed to carry 9 - 12 persons, including driver, which are used for hire, business, or community purposes.
- Taxis and hire cars while carrying passengers for hire.
- Vehicles used to transport dangerous substances within the meaning of the *Dangerous Substances Act 1979*.

Note: Vehicle insurance is void if you contravene any of these conditions.

Therefore, both the applicant and the Motor Driving Instructor (MDI) or Approved Examiner (AE) acting as the Qualified Supervising Driver (QSD) must have **zero** prescribed concentration of alcohol (PCA).

(Refer: *Appendix B – Mass Definitions*)

Impact of alcohol on driving skills

People suffer the following affects drinking alcohol, however, other factors including the size of the person and a person's metabolism of alcohol also affect the impact of having alcohol in the system.

Alcohol can:

- Act like an anaesthetic on the brain.
- Alter distance perception.
- Slow reaction times.
- Affect coordination.
- Causes fatigue.
- Reduces concentration.
- Failure to obey road rules and read signs.
- Overconfidence.

There are **four major offences** associated with driving under the influence:

1. Driving under the influence (DUI) – (*Section 47 (RTA)*)

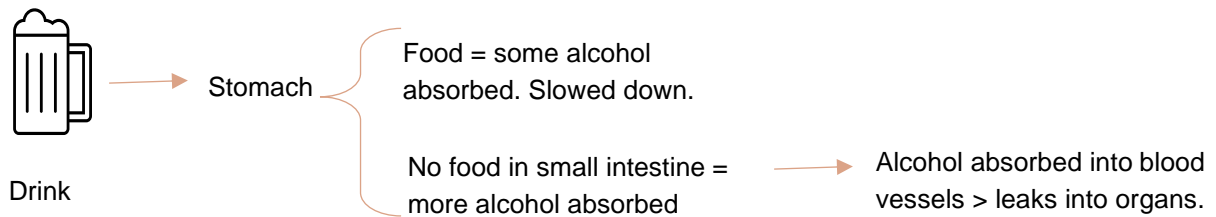
It is an offence in South Australia to drive or attempt to put a vehicle in motion while under the influence **of liquor** or **drugs**, as to be incapable of exercising effective control of the vehicle. It is not necessary for a person to exceed 0.05. If they are incapable of exercising effective control of a vehicle due to the influence of alcohol or drugs, the use of any mental or physical faculty of that person, is lost or impaired.

2. Prescribed concentration of alcohol (PCA)

When alcohol is consumed it enters the stomach, where it can be absorbed into the bloodstream. If no food present, alcohol moves down into the small intestine where the much larger surface area absorbs the alcohol in higher levels. Alcohol moves through the blood vessels (capillaries) and leaks into the cells of the various organs.

The construction of the **brain capillaries** generally does not allow most drugs to enter the brain itself, however alcohol can. In the brain, **alcohol interferes with the brain cell function** to cause intoxication.

Sobering up takes time! The liver gets rid of one standard drink in an hour.



Attempting to rid yourself of the alcohol in your body by:

- Sweating it out with exercise
- Cold showers,
- Coffee
- Fresh air
- Vomiting – will ease the symptoms BUT **will not** remove alcohol from your system.

This means it may **not be safe** to drive the following day.



3. Refusal to take a breath test – (*Section 47E (RTA)*)

Where a member of the police force believes, on reasonable grounds, a person should undertake an alcotest, be breathalysed or both, the person is required to agree to these tests.

This may be because of an accident, or another traffic offence has occurred, and the police believe the driver could be under the influence of a substance.

Refusing to have the breath test, is an offence in South Australia. (Re: *Road Traffic Act 1961, Road Traffic Regulations 2014*)

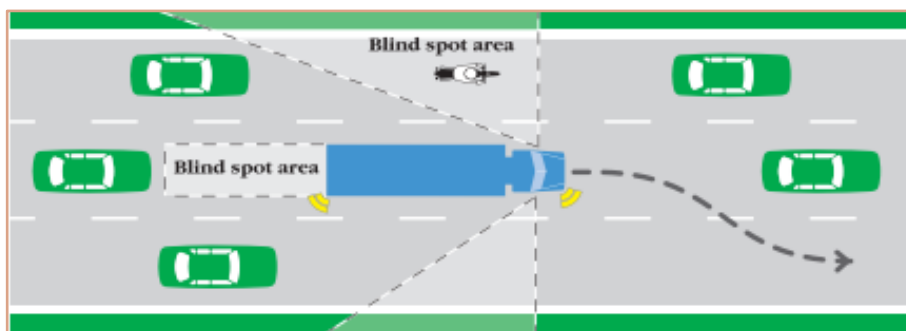
4. Refusal to give a blood sample (*Section 47F (RTA)*)

Where a person is unable to comply with the requirement of an alcotest or breath analysis test due to a physical or medical condition then that person is required to give a sample of their blood if requested by a member of the police force.

Observation

When driving one of the most important senses for driving **is vision/sight**.

Heavy vehicle drivers have several blind spots, those caused by the natural blind spot in our eyes and those caused by components of the vehicle, other traffic, or static environmental objects (i.e., trees, buildings).



Rules of observation

Following are some tips to keeping your eyes on the road and moving in a sensible and useful manner.

Aim high in steering:

- **Look well ahead when driving.** Steer the vehicle using your 'lower fringe vision.'
*FYI: **Fringe Vision** is used to judge depth and position. Use this to check reference points and detect changes in your side and rear mirrors.*
- Look in the **direction you want the vehicle to go**, especially on bends and corners.
- **React to gradient changes early**, especially if the road is about to go downhill.

Get the big picture:

- Move your eyes to **check far distance, middle distance and directly in front** of your vehicle for anything which may impact your line of travel.
- The **mirrors on both sides** should be checked on average at least once every 4 – 5 seconds.

This constant checking ensures you are fully aware of everything that is occurring around your vehicle.

Keep the eyes moving:

- **Do not fix your eyes** on any single object for more than 2 seconds.
- **Keep moving your eyes** from object to object, otherwise danger could threaten your vehicle from another source without you being aware.

Leave yourself an 'out':

- Always have a **plan of escape** should the traffic conditions change quickly. If a vehicle is tailgating, leave more space in front of your vehicle. This increases your safety margins when braking is required.
- **Offset your vehicle** where possible to the vehicle travelling alongside. This allows space for other vehicles to escape if they should swerve suddenly.
- When approaching oncoming traffic, **easing off the power** will allow for more potential to react if conditions change.

Make sure other road users see you:

- Look at the **faces of other drivers** to see if they are looking at you.
- **Use your signals** early ensuring they are clearly understood.
- Position your vehicle in such a way to **clearly show your intention**, especially when you are signalling for a turn and need more room.
- Where possible **do not travel in the blind spot areas of other vehicles**.



Rules of Braking

Note: Rarely do brakes fail on heavy vehicles going downhill, **unless** they are poorly maintained. Usually, it is the driver who is at fault for **not** selecting a sufficiently low enough gear to maintain a safe constant speed for the descent. This should require minimum, if any, use of the service brake.

Driving industry adage: "You can go down a hill too slowly a thousand times, but you only go downhill too fast once."

Braking distance

The braking distance is the distance it takes to stop the vehicle once brakes have been applied. This can be influenced by factors such as: downhill gradients, which may increase the braking distance or uphill gradients which can reduce the braking distance. Wet or slippery roads, uneven or unsealed roads and varying weight will affect the distances.

- Once the brakes have been applied the distance taken to stop increases at a proportionally greater rate as the speed increases.
- As the speed doubles (X2) the braking distance increases by four times (X4).
- The reason for this is that the distance taken to stop is proportionate to the square of the speed so if the distance taken to stop from 30km/h is 5 metres, the distance taken from 60 km/h is 20 metres (2x the speed, 4x the distance)
- Braking distance of commercial vehicle can vary depending on the weight that is being carried. A light load can sometimes take longer distance to stop as there is less weight to create a downward force on the tyres and create the friction needed between the tyre and road surface. Fully loaded vehicles may also take further to stop as the brake have to stop a heavier load.
- Remember the benefits of good maintenance!



(Courtesy: Bendix Brakes)

- Excessive use of the brakes can cause a build-up of heat leading to a loss of effectiveness and an increase in stopping distance. It is essential to use the supplementary braking systems, such as engine and exhaust brakes, when descending steep gradients.

Skidding

Definition: An involuntary movement of a vehicle due to the grip of the tyres on the road becoming less than the force or forces acting on the vehicle. A vehicle skids when one or more of the wheels slide instead of having pure rolling action.

Causes of skidding:

- Excessive speed for conditions
- Sudden or excessive braking
- Harsh or excessive acceleration
- A rapid change of direction
- A combination of all or any of the above

Factors that increase the risk of skidding

- Ice, snow, leaves, oil, or fuel on the road
- Water, loose surface, corrugations, or potholes
- Adverse camber, downhill slopes
- Bald or poorly inflated tyres
- Suspension faults, steering mechanism faults
- Painted lines and arrows, metal inspection plates, steel plates covering roadworks.
- Panic
- Poor load distribution – the weight must be over the drive tyres irrespective of the vehicle. With multiple trailers, having the **B trailer full** and the **A trailer empty** will lead to a loss of traction.
- Brake adjustment/truck-trailer bias especially with empty trailers. Load proportioning valves help to reduce rear wheel lock-up under braking.

Take care on wet roads as it is possible to Aquaplane or Hydroplane at speed.

Trucks and buses use low gear signs. (ARR108)

1. Where a road displays a **Trucks and Buses Use Low Gear** sign:
 - The truck or bus must be in a gear that is low enough to limit the speed.
 - Must not include the use of the primary brake.

Subrule (1) does not apply to the driver of a bus if information on the sign indicates it applies to **trucks only**.
2. The truck and bus low gear sign applies to the length of road beginning at the sign and ending at:
 - The sign indicates a distance when the rule ends. (e.g. for next 10 km)
 - Or a sign indicating an end to trucks and buses low gear requirements.
3. Primary brake means the footbrake, or other brake, fitted to a truck or bus that is normally used to slow the vehicle down. It does not include a supplementary brake such as an engine or exhaust brake.

Note: Severe penalties apply if drivers of heavy vehicles are detected driving unsafely on the down-track of the South-Eastern Freeway into Adelaide.

4. Signage is displayed on roads where there is:

- A short steep descent. 6% or greater for 600m to 1.5 km
- A steep descent. 6% or greater for 1.5 to 2.5 km.
- Long steep descent 5% or greater for 2.5 km or longer



Although some roads (For example the South-Eastern Freeway) have these signs, drivers of ALL heavy vehicles must exercise extreme caution when driving down hills no matter what signs are or are not displayed.

Note: The South-Eastern Freeway has a descent of approximately 7% for 7 km from Crafers to Glen Osmond.

Observe all signage. It is there for a reason!

- The driver must know the **effective gear** to use in all conditions.
- As a rule, if your vehicle is fitted with a good retarder, go down the hill one gear lower than you go up. If the retarder is not efficient, drive down the hill two gears lower than you drive up.
- In an **automatic vehicle select manual mode**, divide the gears by two then lose two more gears (i.e. 18=9=7) for safety.
- If unsure of the conditions, use the UHF radio and ask for information.
- Do **no gear work** on a **steep descent** – slow down and gear down before you drive down the hill.
- On a downhill gradient, change down at **200 RPM lower than normal**. (i.e. If you normally change down at 100 RPM for a single gear on level ground, reduce this to 800 RPM before changing.
- If you make a mistake **Stop** Immediately. Do not try to recover lost gears.
 - Put on your hazard lights.
 - If you have stopped in a dangerous position warn other drivers using the UHF radio.
 - If it is safe, move off in a gear that will retard your progress while allowing you to maintain control.
- Reduce speed to **60km/h** prior to going down a steep descent.
 - **Fully loaded trucks** will usually **descend at 20 – 30 km/h**. (Refer: *Department for Infrastructure and Transport website: Road Safety*)

Note: When all else fails, **use the safety ramps!** Removal is now paid for by the government.



South-Eastern Freeway: SLOW DOWN and CHANGE DOWN! Be safe!

Jack-knife and trailer swing

Jack-knifing can occur when there is a **loss of traction** in either the prime-mover or the trailer.

If the prime mover loses traction and the driver is unable to correct it in time, the trailer pushing from behind will continue to push the prime mover until it spins around.

Similarly, if the trailer loses traction under braking and the prime mover is doing all the braking, the uncontrolled momentum of the trailer can result in a jack-knife position (trailer jack-knife).

Another way you can jack-knife is if you enter a turn too fast, the momentum of a laden trailer can push the turning prime mover causing a jack-knife. Downhill turns are especially prone to this.

How to avoid a jack-knife

Steady braking over the longest distance possible will **avoid brake lock-up**.

If the brakes do lock and your vehicle starts to skid, take your foot off the brake immediately and correct by steering into the skid as you would with a rigid vehicle.

If a skid is not corrected, it can be aggravated by the trailer pushing from behind and the vehicle will jack-knife.

To avoid jack-knifing through corners or bends, **avoid braking in the bend**, particularly when coming down a hill. Make sure you are at the correct speed to take the corner or bend prior to changing direction.

If you ever need to take **preventative action, do not brake, and swerve at the same time:**

- **Brake first** to slow the vehicle down as much as possible,
- **Release the brakes** in order to swerve.

In this way, you have a better chance of remaining in control of the vehicle.

Once you are back in position, you can re-apply the brakes if necessary.

Keep both truck and trailer **properly maintained**. Uneven brakes, worn tyres and faulty suspension components increase the risk of an uncontrolled skid and loss of control.

Be wary of light loads. A properly driven, loaded, and maintained heavily laden vehicle is less likely to jack-knife.

Jack-knifing can occur **more frequently with empty trailers** or when the **weight of the load is badly distributed**, providing too little traction where it is needed.



Vehicle and trailer brakes are designed for a full load, and if incorrectly applied are **too powerful for an underweight trailer**. When the brakes are applied heavily, the trailer wheels could lock up, and cause skidding resulting in loss of control of the trailer.

Heavy vehicle dimensions

Within this guide we will include some basic heavy vehicle dimension information, however further information is available in the **Heavy Driver Handbook**.

Maximum **length** of heavy vehicles

Vehicle	Maximum length
Rigid vehicle (except an articulated or controlled access bus)	12.5 metres
Combination vehicle – e.g. prime mover, or semi-trailer	19.0 metres
B-Double	26.0 metres
B-Triple	36.5 metres
Type 1 Road Train	36.5 metres
Type 2 Road Train	53.5 metres



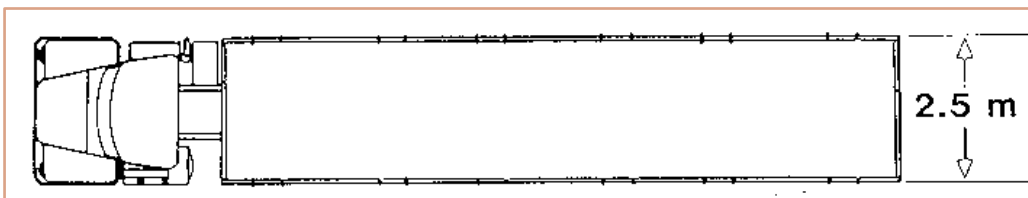
B-Double up to 25 metres is subject to:

- Distance between point of articulation at the front and the rear of the combination, is not over 20.6 metres.
- The prime mover is fitted with compliant Front Underrun Protection Device
- If prime mover was manufactured after 31 December 2005 it is fitted with a compliant protective cab
- The prime mover does not have a load carrying area.

Note: A bonus of the 26 metre B-Double, is that bonnet trucks can be used. Another is that, slightly longer 'A' trailers can be used with a cab-over prime mover. This will gain another pallet length of freight capacity.

Maximum width of vehicles

The maximum width of any vehicle is 2.5 metres (including any load)



The maximum side overhang of a load is 150mm providing the overall width does not exceed 2.5 metres.

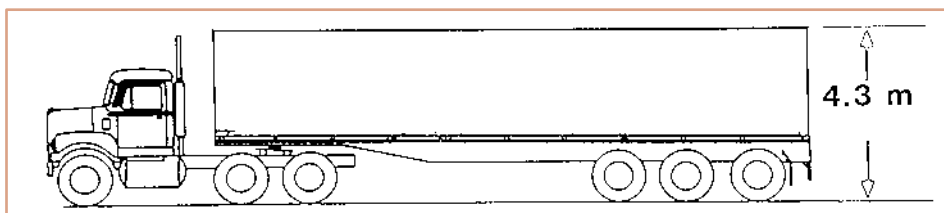
Rear vision mirrors

A rear vision mirror fitted to a motor vehicle with a GVM over 3.5 tonnes, must not project over 150 millimetres beyond the widest part (excluding lights, signalling devices and reflectors) of the vehicle or combination.

The rear vision mirror cannot project over 230 millimetres beyond the widest part of the vehicle or combination if it can fold to project not over 150 millimetres beyond the widest part.

Maximum height of vehicles

A vehicle must not exceed 4.3 metres in height.

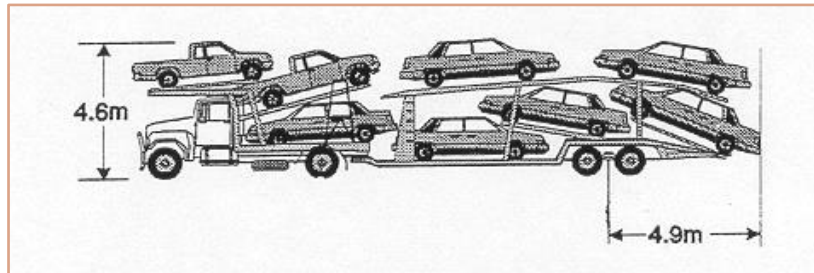


However:

- A vehicle built to carry cattle, sheep, pigs, or horses must not exceed 4.6 metres in height.
- A car carrier must not exceed 4.6 metres in height when loaded.
- A double-decker bus must not exceed 4.4 metres in height.

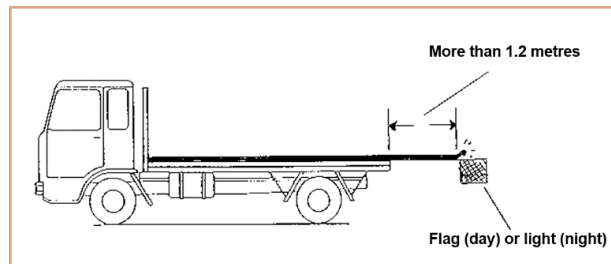
Rear overhang for a car carrier:

- Distance measured at right angles between rear overhang of a trailer carrying vehicles on more than one deck. The rear most vehicle on the trailer must not exceed 4.9 metres.



Load rear projection.

1. The rear of a load on a vehicle must carry a warning signal if the load:
 - Projects more than 1.2 metres behind the vehicle
 - Projects to the rear of the vehicle so that the end of the load cannot be seen easily from behind.
 - Is on a pole-type trailer.
2. In daytime, the warning signal must be a brightly coloured flag or a piece of material with each side at least 300 millimetres long.
3. At night, the warning signal must be a red light which can be seen for 200 metres.



Refer: Heavy Vehicle Handbook (pp93-94) for further information including axle weights and via Appendix D – Maximum Axle Weights at the end of this document.

Rear Marking Plates and Lights

Plates and lights need to be kept in a **clean and operable condition**. Ensure plates are easily visible and all lights are functioning.

Prime movers and semi-trailer combinations must display **rear marking plates** at the rear of the semi-trailer.

Do Not Overtake Turning Vehicle plates should be applied when a vehicle is 7.5 metres or longer in length. These plates must be either attached to the left rear of the vehicle or on both sides. Under 7.5 metres you are not permitted to display these signs.

Gear changing

For all types of vehicles, there are two main transmissions for **manual** gearboxes, synchromesh and non-synchromesh.

1. **Non – synchromesh truck gearbox** is not difficult to operate. In order to change gears the engine revs need to match the road speed for the gear change to happen successfully.
 - Depress the clutch and disengage the current gear
 - Let out the clutch to re-engage the neutral gear and then match the revs to the gear you want to engage.
 - Depress clutch and engage the next gear.
2. **Synchromesh truck gearbox** does not require the driver to **double clutch** as the truck gearbox has synchro rings which match the road speed and the engine revs which allows the gear to be selected. Many of the trucks doing local deliveries tend to use this type of gearbox as it is easier for the driver to operate and allows companies more choice when selecting drivers.
3. **Automatic truck gearbox** more trucks are being manufactured and purchased with automatic gearboxes due to technological improvements over the past decade. The automatic truck gearbox is slightly different to a car automatic gearbox in that they are, essentially, an automated manual transmission. This means that there is an automated shifter changing gears for the driver manual gearbox.

It is necessary to **warm up a cold gearbox** and reduce strain imposed by lugging and surging. Warming up the gearbox allows engine oil and transmission fluid to circulate and lubricate.

If the gear train is forced to start or stop turning suddenly, or when a heavy load is suddenly applied to a set of rotating gears, a '**shock load**' on gearing is imposed.

A good example of this, is when a driver of a car slams or bangs a car into gear without skilled use of the clutch which causes the car to lurch.



(Courtesy: Atlas Truck)

The gearbox transmits the drive from the engine to the wheels and to constantly use lower gears to slow down imposes extra strain on the gears. It is not fuel efficient.

The use of lower gears to slow down before commencing the descent on the South-Eastern Freeway, however, is recommended.

- Going down a **steep descent** select a **lower gear** to slow down the vehicle, **without** the constant use of brakes.
- If you miss a gear when trying to gear down, stop the vehicle with the brakes immediately, then select correct gear. It is **dangerous to coast** whilst struggling with the gears.
- Use auxiliary brakes to help control the vehicle speed.
- Reserve your primary brakes for coping with emergencies in traffic conditions or sharp corners.
- If you need to use your brakes, try to do this on straight sections of road as this reduces the chances of skidding.
- The selection of a lower gear prior to descending a steep hill is used to firstly slow the vehicle but then stop it from gaining speed.

Note: You must select a low gear BEFORE commencing steep descents. Truck and bus drivers must obey '**Trucks and buses use low gear**' signs by selecting a gear low enough to limit the speed of the vehicle without the need to use the primary brake (footbrake)

It is economical to:

- Progressive gear shift up through the gear box as this creates less fuel usage, less wear on components and less heat generated.
- Skip shifting up and down through the gear box. Correct gear for the occasion, fewer gear changes, less wear on the transmission.

Matching the engine speed to the road speed to the gear, using a non-synchromesh gear box requires you to double de-clutch. The process of double de-clutch is explained further on.

Precaution when starting the engine

We warm up our body before we play sport to prevent muscle or joint damage.

The truck needs to warm-up to **prevent damage** to the moving parts. The lifeblood of the vehicle is the **oil**. If it is not ready to lubricate the moving parts and you place heavy loads on these parts, you run the risk of component damage.

Before you start work, warm up the vehicle:

1. Press the **clutch pedal** to the floor to **disengage the clutch**, this breaks the connection between the engine and transmission, and reduces the load on the starter motor.

(If the vehicle is fitted with a clutch brake, depress the clutch pedal 6-8 centimetres only – about halfway down).

2. Ensure the **gear lever** is in the **neutral** position. This will stop any damage to the transmission.
3. If engine is computerised, turn the key to the first position and allow the engine to go through the normal checks.
4. If the engine is fitted with a **Jacobs Brake** or a similar retarding device, ensure that it is **turned off**.
5. If all warning lights for the engine checks have gone off, **start the engine** using **no throttle**. (This does not include the warning buzzer and lights for low air).
6. **Slowly** remove your foot from the clutch pedal.
7. If the engine is **not computerised raise revs** just above idle. If the engine is computerised this may happen automatically, if in doubt check the guide from the engine manufacturer.

Gearbox operation

Just like yourself when starting in the morning, give the gearbox time to warm up. This means not changing the gears rapidly up and down when the gearbox is cold. Slow deliberate changes with full gears for the first few occasions to gradually warm up the gearbox.

The oil in the gearbox will warm up in a relatively short space of time. You will notice that the gears will be easier to select when the gearbox is fully warmed up.

Gear changing

The engine in the vehicle will develop only a certain amount of **power** which can be **multiplied by the use of gears**.

Low gears give a **lot of power**, or torque, but not much speed whereas the **higher gears** will allow **more speed** but do not have the power. Having started in the lower gears and changed progressively through to the higher gears as the speed builds, it will be necessary to change down to the lower gears if the speed drops (for example, to turn a corner or climb up a gradient).

Gears, together with an **engine or exhaust brake**, can also be used to **help retard** or **restrain** the progress of a vehicle when **descending a hill**, especially when heavily loaded. This will **minimize the use of the brakes** allowing them to stay cool and not build up excessive heat through friction.

The **gears**, when driving the vehicle, **are under load**, or torque; so when making a gear change it is necessary to release this load or torque effect by **using the clutch** which “**breaks**” **the drive** and allows the gears to be moved. To attempt a gear change without using the clutch creates enormous stresses on the selector mechanism which over a period of time can wear and will eventually break.

If the gears are synchronized in a '**synchromesh**' type of gearbox it will be possible to disengage the clutch (pushing the pedal down) and move the gears into and out of engagement with relative ease; but if the gearbox is of the '**non synchromesh**' type it will be necessary to 'double clutch' which means using the clutch twice, once to take it out of gear, then engaging the clutch to match the road speed of the gears to the speed of the engine then clutching again to engage the next gear.

This technique requires a great deal of practice but once mastered can make for very smooth gear changes.

In **2021**, approximately **80%** of trucks in Australia had **automatic transmissions**.(Refer [Truck Sales](#))

This was up to 4,500kg GVM at that time, however, the trend continues to grow across the whole GVM range worldwide.

Clashing gears:

Clashing or crunching gears happens when a driver tries to mesh or engage two gears (or cogs) that are revolving at different speeds, that is, one turning at road speed and the other at engine speed.

Truck engines develop a great deal of power (torque) that is transmitted to the gearbox so if the gears are not turning at precisely the same speed at engagement, they will grind together which over a period of time will cause damage to the gears (cogs) and to the selector mechanism

Shock load on components:

Bad timing of gear changes and incorrect use of the clutch will result in damage to many parts of the drive train. If you clash the gears and force them to mesh at the incorrect speeds, abnormal stress will be placed on components that will not be able to sustain this stress.

Components of a heavy vehicle are built to take enormous stresses, but everything has its limitations, for example, downshifting followed by releasing the clutch when the road speed is too high will cause damage to the engine by over-revving as will engaging the clutch to go forwards while rolling backwards on a hill.

Other components that could be affected are clutch plates, drive axles, universal joints, tail-shaft, differentials, and a host of minor components.

Remember to remove your foot from the clutch pedal, except for when changing gears. Keeping your foot on the clutch, may cause the gear to be disconnected, clutch may slip and lead to overheating and it places unnecessary load on the drive train.

Think of the cost!

One bad gear change from a modern truck whose engine develops over 500 horsepower will generate twisting forces through the transmission and through to the axle and wheels which the vehicle was never designed to withstand.

Constant poor gear changing will lead to damage and breakages, which leads to vehicle downtime and unnecessary repairs and running costs. Costs which could be from \$15K to \$60K.

Up shifting and down shifting

There is a technique for changing gears smoothly and accurately. Firstly you need to understand the difference between a synchromesh gearbox and a non -synchromesh gearbox, commonly called a 'crash box.'

The synchromesh gearbox is popular with many European trucks, and there is no need to double clutch when changing gears.

In this type of gearbox there are components called 'cones' which are built onto the gears. They are designed to slow gears to similar speeds, so when engaging or meshing the gears they will slide on to the other with little or no resistance.

Due to this feature, the clutch is pushed down (disengaged) once while the gear lever is moved into the next gear. The clutch is then engaged slowly as it takes up the new gear to drive.

Method for an effective gear change:

1. Slow the vehicle to an appropriate speed (changing down only)
2. Disengage clutch (pushing the pedal down) while removing pressure from the accelerator.
3. Move the gear lever through the neutral position and into the next appropriate gear.
4. Engage the clutch, by releasing the clutch pedal smoothly
5. Apply the appropriate power, via the accelerator, to match the road speed.

Double clutching

In a vehicle fitted with a non-synchromesh or 'crash' gearbox it will be necessary to use the clutch twice for every gear change.

This is because there are no 'cones' to slow the gears to similar speeds so this has to be done by engaging the clutch while the gears are in neutral and matching the speed of the engine to the road speed of the vehicle.

Having done this, the clutch is disengaged, and the new gear engaged. The clutch pedal is allowed up gently to take up the new gear.

Changing up:

1. Press the clutch pedal down, just enough to disengage the drive while at the same time.
2. Removing pressure from the accelerator pedal so as to reduce the engine revs.
3. Move the gear lever through neutral to a position ready for the next higher gear.
4. Let the clutch pedal up until the transmission is re-engaged, then depress the clutch quickly.
5. Move the gear lever to the position for the next higher gear
6. Release the clutch pedal smoothly while simultaneously applying appropriate power to match the road speed

Changing down:

1. Release the accelerator and reduce speed by braking to the required speed
2. Disengage the clutch by pushing the pedal down
3. Move the gear level to neutral, positioning it for the next appropriate lower gear
4. Let the clutch pedal up to engage the clutch.
5. Apply sufficient power to increase the engine speed (revs) to match the gear to the road speed of the vehicle
6. Push the clutch pedal down sufficiently to disengage the transmission and then select the next lower gear
7. Apply appropriate power while releasing the clutch pedal smoothly being sure to 'balance' the power to match the new lower gear.

Note: Always be sure to maintain adequate engine revs when re-engaging the clutch.

Never attempt to change gear without using the clutch as damage can be done over a long period of time leading to premature wear of the gears and selector mechanisms.

Progressive shifting

Progressive gear shifting is a method where the first few gear changes are made without the need to drive the engine to its governed rev limit before shifting to the next higher gear. It will, in fact, make it easier and cleaner to change gears.

As an example, this would be a typical progressive shift pattern:

- In first gear accelerate to approximately 1000 rpm
- Make the first gear change at approximately 1100 rpm
- Make the next gear change at approximately 1200 rpm and so on

Progressively adding 100 rpm to each higher gear. In this way you will conserve fuel and, at the same time, pull the load reaching the required highest gear in the least amount of time.

This is also called the '**gear fast - run slow**' method. Minimum revs are required, and the highest usable gear is reached in shortest time.



(Progressive shift pattern)

To conserve fuel:

- Keep **engine revs down** in the **early stages** of moving the vehicle.
- **Start** in the **lowest gear** required and in the first few shifts,
- Develop **only the RPM** needed to **get rolling**.
- Then as you **up-shift**, **increase engine RPM** progressively.
- **Continue to accelerate** in this way until the desired **road speed is reached**.

With the development of variable (horsepower) rated engines if you use excessive engine revs you will actually lose power. This is because the computer that governs the amount of horsepower the engine develops is directly related to the engine manufacturer's specified RPM range.

Note: Heavy trucks take longer to get up to speed and to slow down safely. This takes quite a time to get used to, so resist the urge to move off and keep up with the cars.

Load placement and security

Basic principles:

Loading a heavy vehicle correctly is important, in order to **prevent damage to the load, the vehicle, the driver, and other road users.**

Factors that cause the load to move.

Under normal driving conditions a load is subjected to many forces that can cause the load to shift and include:

- Speed
- Change of direction
- Angle of the vehicle on the road e.g. camber of the road
- Braking
- Cornering
- Travelling in hills
- Airflow against the load
- Rough roads

Arranging the load

Incorrect positioning of the load on a vehicle will affect three main factors:

- Maintaining vehicle stability
- Steering and braking performance
- Overloading of tyres and axles

Load securing equipment

There are as many types of load securing devices The main types are:

- Ropes
- Chains
- Load binders
- Gates

Friction

It is important to understand that load restraints do not actually hold the load on the vehicle; they only increase the amount of friction between the load and the surface it is resting on. For this reason you should keep **friction** in mind.

When securing the load and ensure that contacting surfaces are:

- Clean and dry – dust and moisture can act as a lubricant
- Free from grease and any loose material

Consider using a **rubber load mat** or other high friction material between the load and the surface.

Factors that cause a load to move

- Speed
- Altitude e.g. camber of road
- Acceleration
- Travelling in hills
- Rough roads
- Change of direction
- Braking
- Cornering
- Airflow against the load



Load distribution

- Placement of load for weight distribution
- Arranging a mixed load for safety

When loading remember that friction will take place between items. Ensure surfaces that contact each other are clean, dry, and free from grease and loose material.

Load security equipment

Compliance and enforcement (also known as Chain of Responsibility) requires appropriate load restraint equipment and training is provided. Loads are required to be secured correctly and restrained to the “g forces” specified by law.

Even if you were not the person who secured the load. **Check it.**

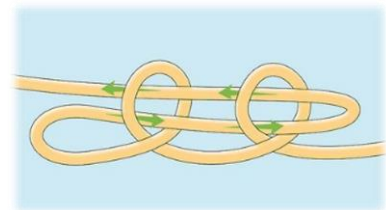
There are different types of load restraint depending on the load being carried:

Restraint	Load
Ropes	Used for restraining relatively light loads
Chains	Suitable for side gates or other containment methods
Binders	Used to tension a lashing.
Gates	Used at front, sides, and rear of a loading deck. Not for tall or small loose loads, can control loads when supported by diagonal lashings.
Headboards	Can reduce lashing numbers, used to attach chains and secure load.
Twist-locks	Used to attach a load to a vehicle.

Ropes

Ropes are best used when using tarpaulins to cover a load, to tie them down securely.

The “**Trucker’s Hitch**” is the go-to knot for securing loads of cargo on trucks or trailers. It can also be used on roof rack tie-downs for your outdoor adventure.



(Trucker’s Hitch Courtesy WikiHow)

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The knot is accomplished by tying one end of rope to a fixed object such as a roof rack, bumper, or tailgate.

1. About mid-way on the rope, you will tie a slippery half hitch to form a loop in the middle of the line.
2. You will want to make sure the loop part is formed with the **slack part of the rope**, or it will tighten down on itself under pressure.

Ratchet type load binders

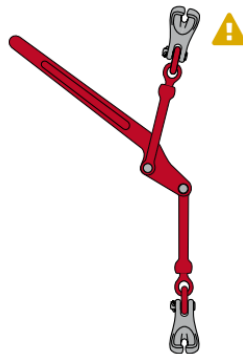
The ratchet secures to the rail under the train carriage. Spread the webbing across the load taking care to protect it from sharp edges, checking there are no twists, securing it and tightening it with a ratchet.



(Courtesy: Elphinstone Weighing) Load Binder

'Chain 'Dog'

- The use of over-centre tensioners (dogs) is **strongly discouraged**, and an alternative tensioner should be used where possible. There is a higher risk of injury using the load tensioning (dog) devices. Your local WH&S agency may be able to provide further information on the risks.



(Courtesy: NHVR Load Restraints) Restraint Guide

Chain and ratchet type chain tensioner

- **Chains** should be the **same length** and the **same angle** to be seen as working together.
- Chains are most effective for belly wrapping.
- It is possible to attach a ratchet to the chain for tensioning

Note: Do not mix and match chains and straps on the same load. They have different stretch factors and breaking points, which can cause lashings to fail.

Cover a load with tarpaulin

All loads must be secured to prevent any part of the load being dislodged and causing a hazard.




Loose loads such as **gravel** or **sand** can be covered with sheets or tarpaulins to help **prevent** them **from coming off the truck**. Tarpaulins are not strong enough for loads except **very light bulk loads**. Tarpaulins will only protect from the weather as they are waterproof.

Ropes should be used to tie down a tarpaulin using the rope hook attachments surrounding the loading deck.

Inspection, labelling and transport of loads.

From 1 August 2020, the requirement to undergo an annual inspection, or to be in the Maintenance Module of the National Heavy Vehicle Accreditation Scheme, was removed.

You will need to ensure any vehicle you operate is **roadworthy**. Inspections are still required when a heavy vehicle changes ownership.

<p>Motor Vehicles</p> 	<p>Load consists solely of motor vehicles</p> <p>Height of vehicle, including motor vehicles being carried does not exceed 4.6 metres</p> <p>The vehicle is constructed as a multiple deck vehicle transporter and does not exceed constructed height of 4.3 metres.</p> <p>No vehicles are loaded on the upper deck unless each deck below is fully loaded.</p>
<p>Livestock</p> 	<p>Height of the vehicle and load does not exceed 4.6 metres</p> <p>Load consists solely of livestock</p> <p>No animals are overloaded on the upper deck unless each lower deck is fully loaded</p> <p>If any deck is not fully loaded, the animals must be confined in a full width compartment which is fully loaded.</p>
<p>Baled hay and wool</p> 	<p>Baled wool shall not be loaded more than four layers high.</p> <p>Maximum overall vehicle height shall not exceed 4.6 metres.</p> <p>Vehicles more than 4.3 metres, the ground width must be greater than 2.1 metres.</p> <p>Load must be symmetrical as possible across the width of the vehicle.</p> <p>Baled wool carried on the vehicle shall be secured in accordance with guidelines detailed in the Load Restraint Guide</p>

Hauliers operating under the provisions of the NHVR notice (*Linked below*) should be aware that some bridges, signs, overhead wires, trees, and signals may not provide sufficient clearance for the passage of 4.6-metre-high vehicles.

NHVR Information sheet – [South Australia Class 3 Bailed Commodity Exemption Notice 2019](#)

Turning

Whilst following a straight road a driver needs to monitor road and traffic signs and conditions. This includes, checking the position of their vehicle on the road through constant mirror checks. (On the **(L)** side in particular.)

When you have experience of driving a cab-over truck and then change to a bonnet truck, you could tend to drive too far to the right of the lane. This is because the position feels comfortable but your position relative to your front wheels will have changed. In this instance constant mirror checking is essential.

When approaching a turn, **forward planning** is vital.

The driver needs to:

- Set-up the position early to negotiate the turn.
- Consider the amount of room needed to make the turn.
- Check all other hazards in the area.

* Most basic errors drivers make when driving a long vehicle, are **when turning**, they **do not allow for enough room** and begin the **turn too early**.

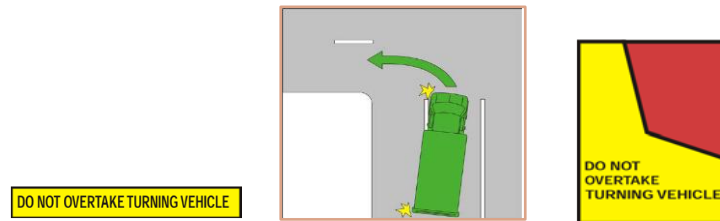
- ARR 28 – Starting a left turn from a multi-lane road.
- ARR 32 – Starting a right turn from a multi-lane road.

Please refer to the **Heavy Vehicle Handbook** for further information (**pp 54 - 56**)

A driver of a long vehicle may enter an intersection from the marked lane next to the turning lane as well as, or instead of the turning lane when:

- Vehicle displays a 'Do Not Overtake a Turning Vehicle' sign.
- Any part of the vehicle is within 50 metres of the nearest point of the intersection.
- It is not practical for the driver to turn the vehicle to the left or right from the appropriate lane.
- The vehicle can safely occupy the next marked lane and turn right or left at the intersection by straddling two lanes or occupying the next marked lane.

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Turn left while straddling two lanes if safe to do so.

- All heavy vehicles should **make turns as wide and gentle** as possible.
- Approaching a **multi-lane turn**, select **the outer (wider) lane** where possible, unless this will affect where you want to go.
- Ensure the **mirror on the inside of the turn is monitored** throughout the turn for accurate position of the trailer(s).
- **MC vehicles need a total of four lanes** (two lanes on one road and two lanes on the other). However, the ARR allows drivers of “long vehicles” to position their vehicles in what could be termed, an illegal position, by not obeying the lane markings on the approach to the turn.
- In the right turn example, lane straddling would be the only option in an MC vehicle due to the limited space through the turn and to keep other road users safe. More often than not, local knowledge is the only thing that will tell you this.
- If you are ever **unsure of the road network** you will be using, **ask someone with experience** to help you
- Drivers need to **signal long enough to inform other drivers** of your intentions. If you need to position your vehicle in the right lane before turning left, signal right for the reposition then signal for the left turn.
- For a single lane left turn the approach will need to be made from partially entering the lane to the right.

Note: Road camber, the proximity of stobie poles, and overhanging obstacles at the edge of the road must be considered when deciding to position your vehicle from the kerb.



Photo courtesy of Courier Mail. (2016)

Rear Marker Reflector Plates

All vehicles with a gross vehicle mass (GVM) exceeding 12 tonnes, and all trailers with a gross vehicle mass (GVM) exceeding 10 tonnes must be fitted with two retro-reflective rear marker plates.

Plate and sign selection requirements:

The types of vehicles on which rear marking plates must be placed is determined by their GVM or GTM. The types of vehicles or combinations on which they 'Do Not Overtake Turning Vehicle' message must be fitted is determined by the length of the vehicle or combinations and how the vehicle performs when turning at intersections. The vehicle must be 7.5 metres or longer to display these signs.

These plates must be kept clean and in good condition. Plates must not be covered or obscured by any vehicle equipment or load.

Various Reflector Types



Emergency - Portable warning triangles

Heavy vehicles are to be equipped with portable warning triangles (ARR226)

- A person must not drive a vehicle with a GVM over 12 tonnes unless the vehicle is equipped with at least **3 portable warning triangles**.
- The person must produce the portable warning triangles for inspection if directed to do so by a police officer or authorised person.

Using portable warning triangles (ARR227)

If the driver stops the vehicle on a road or if some or any load being carried by the vehicle falls on to a road, the driver must place the triangles behind and in front of their vehicle.

Note: Please refer to the **Heavy Vehicle Handbook** for further information (pp 77 – 78)

As the driver, you are legally responsible for the restraint of the load, so that:

- It does not come off your vehicle
- It does not negatively affect the stability of the vehicle
- It does not 'stick out' of the vehicle.

Any fallen load must be picked up if it is safe to do so, or you must arrange for someone to pick it up. It is an offence to leave load strewn near or on a road and fines may apply.

If the driver stops on a road or shoulder of a road, or if some or all of any load being carried by the vehicle falls on to a road, the driver must place the triangles as shown in *Diagram 1*.

- At a place where the **speed limit is 80 kilometres per hour or more** and the **vehicle is not visible for at least 300 metres** in all directions:
 - place 1 triangle at least 200 metres, but not over 250 metres, behind the vehicle or fallen load; and
 - place 1 triangle at least 200 metres, but not over 250 metres, in front of the vehicle or fallen load; and
 - place 1 triangle at the side of the vehicle, or fallen load, in a position that gives sufficient warning to other road users of the position of the vehicle or fallen load.
- At a place where the speed limit is **less than 80 kilometres per hour** and the **vehicle is not visible for at least 200 metres** in all directions:
 - place 1 triangle at least 50 metres, but not over 150 metres, behind the vehicle or fallen load; and
 - place 1 triangle at least 50 metres, but not over 150 metres, in front of the vehicle or fallen load; and
 - place 1 triangle at the side of the vehicle, or fallen load, in a position that gives sufficient warning to other road users of the position of the vehicle or fallen load.

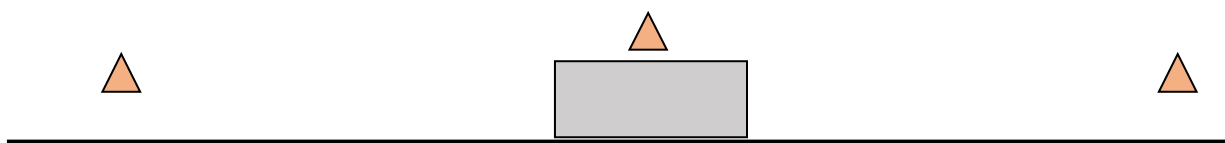


Diagram 1.

If the vehicle or fallen load is on a **one-way or divided road** (any length of a two-way road that has a median strip that is a structure), instead of placing one triangle to the front, place that triangle midway between the triangle at the rear and the vehicle or fallen load as shown in diagram 2

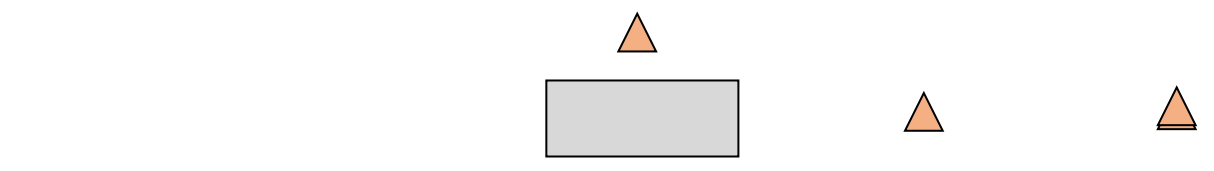


Diagram 2

Permits

The **Heavy Vehicle National Law** (HVNL) specifies maximum limits for height, width, length, and mass of vehicles permitted to drive on public roads. These limits promote the flow of traffic and prevent damage to Australia's substantial investment in the road system. It also ensures a level of safety for all road users. The *Road Traffic Act 1961* specifies maximum limits for the height, width, length, and mass of vehicles travelling on public roads in South Australia.

The HVNL law provides consistency across Australia for the regulation and operation of heavy vehicles. It controls heavy vehicle travel in all jurisdictions except the Northern Territory and Western Australia.

The HVNL allows heavy vehicles, which would otherwise be prevented from being used on roads, access to roads via exemptions or authorisations granted. This ensures the environment and road infrastructure will not be compromised.

In accordance with the *Road Traffic Act Amendment Act of 1986* and *Section 163aa of the Road Traffic Act*, the power to exempt vehicles from the requirements of the Road Traffic Act is vested in the Minister of Transport.

Exemptions take into consideration the following:

- the economic benefits of the permit operation
- the need to protect the state's road and bridge assets from structural damage
- the preservation of safety and convenience of all road users in the community
- the ability of the vehicle to carry the load

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- acceptable environmental impact
- equity to all sectors and individual operators of the transport industry.

There are 2 ways to issue an exemption:

1. **Permit** means a written authority is prepared and issued to exempt a specific vehicle to carry a specific load more than the normal statutory dimension and/or mass limits.
The permit will detail all terms and conditions under which the exemption will apply and must be carried in the vehicle at all times.
2. Exemption by **Government Gazette Notice** means that a general approval is granted for specific vehicle classes or specific commodities to be exempt from a clause or clauses of a statutory dimension and/or mass limits.

The notice details all the terms and conditions under which the exemption shall apply, i.e. some notices are required to be carried for the same reasons that the permit must be carried.








Permits can be applied for if the vehicle does not comply with mass, dimension or operating requirements set out in a gazette notice. Further information relating to the issue of permits and application process can be found on the [HNVR Website](https://www.nhvr.gov.au/road-access/access-management/applications) or via -

(<https://www.nhvr.gov.au/road-access/access-management/applications>)

The table of limited access locations in South Australia is detailed via

(https://www.sa.gov.au/data/assets/pdf_file/0013/501601/October-2022-Update-Consolidated-Table-of-Limited-Access-Locations-for-South-Australia.pdf)

Vehicles requiring a permit!

Vehicle Description	Configuration
• Prime Mover and Low Loader	
• Prime Mover and Semi-Trailer	
• Prime Mover and Flat Top Drop Deck Trailer	
• Prime Mover, Dolly and Low Loader	
• Prime Mover, Dolly and Jinker	
• Prime mover and Platform trailer	
• Prime mover, Dolly and Platform trailer	

(Graphic courtesy of NHVR)

Combinations over 22 metres long

Under the HVNL, certain longer combinations of vehicle are required to be fitted with either a 'Long Vehicle' or 'Road Train' warning sign.

This is to ensure other road users are aware the size of the vehicle is larger than normally met on public roads. Other drivers can amend their driving to consider the larger vehicle by allowing more time to overtake for example.

As per NHVR, signs must be used in pairs and fitted horizontally – one at the front and one at the rear of the combination vehicle.

- A long vehicle is considered 22–30 metres in length.
- A road train is a vehicle over 30 metres in length.



B-Double Vehicles

Under the Heavy Vehicle National Law, the authorisation for B-doubles to access the road network is made by Government Gazette titled: [National Class 2 B-double Authorisation Notice 2020 \(No.2\)](#).

Drivers of B-double vehicles **MUST** carry a copy of 'Operation of Medium Combination Vehicles in South Australia' when operating their vehicle under the terms and conditions of the gazette notice. This document must be produced when requested by authorities under the **Road Traffic Act**.

The following linked documents detail requirements for operating B-Doubles: (or enter the details in your search engine to locate documents)

- [National Class 2 B-double Authorisation Notice 2020 \(No.2\) \(B-double Gazette\)](#)
- [National Class 2 B-double Operator's Guide](#)
- [National Class 2 4.6m high and/or 25m Long Vehicle Carrier Authorisation Notice 2020 \(No.1\)](#)
- [National Class 2 4.6m High Livestock Carrier Authorisation Notice 2022 \(No.1\)](#)

Mass and dimension limits:

B-doubles must comply with the following requirements when operating at general mass limits:

Maximum width	2.5 metres
Maximum length	25 metres
	26 metres applies with specific design requirements
Maximum height	4.3 metres general freight
	4.6 metres for the transport of motor vehicles and livestock
Maximum weight	62.5 tonnes

Route Planning

A B-double may use **stated areas** or **routes** anytime **unless specified as a travel condition** on the relevant road network.

The **B-double networks** for each **state and territory** are provided in links below. If any part of your journey is **not on an approved network**, you will need to **apply for a permit from NHVR**.

For Northern Territory and Western Australia permits, apply to the relevant state or territory road transport authority.

- Australian Capital Territory
<https://cityservices.act.gov.au/roads-and-paths/restricted-access-vehicle-networks>
- Queensland
<https://www.tmr.qld.gov.au/business-industry/Heavy-vehicles/Heavy-vehicle-route-maps-and-restrictions>
- New South Wales
<https://roads-waterways.transport.nsw.gov.au/business-industry/heavy-vehicles/maps/restricted-access-vehicles-map/map/index.html>
- South Australia
<https://maps.sa.gov.au/ravnet/index.html>
- Tasmania
https://www.transport.tas.gov.au/vehicles_and_inspections/heavy_vehicles/Heavy_vehicle_access
- Victoria
<https://www.vicroads.vic.gov.au/business-industry/heavy-vehicle-industry/heavy-vehicle-map-networks-in-victoria>

Planning your trip

- ✓ **RAVnet**, is an interactive online map system that displays approved heavy vehicle routes, in South Australia. [CHANGE THIS LINK](#)
- ✓ Drivers or companies are able to obtain information from the National Heavy Vehicle Regulator (**NHVR**) website via the **Route Planner portal** to plan a trip Australia wide.
- ✓ You are able to enter a starting point and an end point of your trip, and the Route Planner will tell you which route you should take.
- ✓ There are **options** you can select including vehicle type, restrictions, type of road, avoidance of ferries or toll roads etc.
- ✓ NHVR Route Planner portal page can be found here: [Route Planner | NHVR](#)

Mudguards

A heavy vehicle must have mudguards firmly fitted for each wheel or for adjacent wheels.

Mudguards are not required in the following instances:

- The construction or use of the vehicle makes the fitting of mudguards unnecessary or impractical.
- The body or part of the body of the vehicle acts as a mudguard (e.g. pole-type trailers, road-making plant, some agricultural equipment)
- There is no longer a need to fit spray suppression devices to B-doubles.

Note: When updated, new information and regulations are published via the NHVR website.

Road train vehicles

Under the Heavy Vehicle National Law, the authorisation for road trains to access the road network is made by Government Gazette notice: [National Class 2 Road Train Authorisation Notice 2022 \(No2\)](#). In addition, the [National Class 2 Road Train Authorisation Notice 2022 Operators Guide](#) is published on the NHVR website.

These documents detail requirements to operate Road Trains. If any part of the journey is not an approved road train route, a permit can be applied for through NHVR.

- [National Class 2 4.6m High Livestock Carrier Authorisation Notice 2022 \(No.1\)](#)
- [National Class 3 heavy vehicle 4-6m high by construction – semitrailer dimension exemption notice 2022 \(No.1\)](#)

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Road train dimensions must comply with the following requirements when operating at general mass limits.

When descending the South-Eastern Freeway, from the Crafers interchange to the bottom, truck and bus drivers are limited to a maximum speed of **60 km/h**.

Speeds may be further reduced due to bad weather, reduced visibility, a crash, or roadworks.

Dimension limits	
Maximum width	2.5 metres
Maximum length	Type 1 (Double) Road train: 36.5 metres
	Type 2 (Triple) Road train: 53.5 metres
Maximum height	4.3 metres general freight
	4.6 metres for transport of motor vehicles and livestock
Semi-trailer internal dimensions	
≤ 12.3 metres	Distance from point of articulation (king pin) to rear of semi-trailer.
≤ 9.5 metres	Distance from point of articulation (king pin) to line from which rear overhang is measured (centre of axle group).
1.9 metres	Forward projection from the point of articulation (king pin) of the semi-trailer unit must be continued within a radius.
Length of draw bar	
Drawbar	Length must not be less than 3.0 metres and not more than 5 metres.
Location of towing point	
< 300 mm	Except on a rigid motor vehicle, the horizontal distance from the rearmost point of a vehicle, trailer, or semi-trailer to the towing pivot.
Vehicle Mass	
79.0 tonnes	Type 1 (double) road train with tandem axle dollies
82.5 tonnes	Type 1 (double) road train with tri-axle dollies
115.5 tonnes	Type 2 (triple) road train with tandem axle dollies
122.5 tonnes	Type 2 (triple) road train with tri-axle dollies
72.5 tonne	B-Double x1 quad axle:
77.00 tonne	B-Double x 2 quad axle:
Speed requirements of a road train	
100 km/h	Travelling on Eyre Highway West of Port Augusta or the Sturt Highway north of Port Augusta.

90 km/h	Speed limit for any other length of road in South Australia.
40 km/h in 50 / 60 zone	Within Port Augusta
40 km/h in 50 / 60 zone	Within Peterborough
40km/h in 50 / 60 zone	Within Whyalla
40 km/h in 50 / 60 zone	Within Orroroo
All speed restrictions are published on RAVnet under 'restrictions.'	

National Driver Work Diary

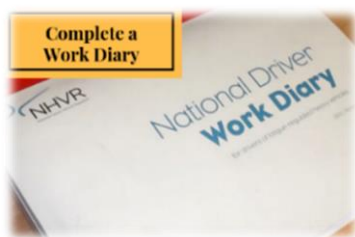
On **29 September 2008**, consistent laws were introduced into South Australia to regulate the hours that a driver of fatigue-related heavy vehicles can spend working and resting, and the records that must be kept.

These laws promote fatigue management systems to ensure the safety of drivers and other road users. They apply to everyone in the supply chain, not just drivers, to ensure safe driving practices.

It is an offence for an employer (consignor) to roster, a driver to carry out duties that could cause the driver to commit to more driving hours than allowed or to commit a speeding offence.

A [work diary](#) is required to be carried and completed by drivers of fatigue-regulated heavy vehicles if they are on a journey that will take them outside a radius of 100km from the driver's base.

Drivers who carry out primary production work are exempt from work diary requirements by an [Exemption Notice](#) within a 160km radius from their home base. An official information sheet for Primary Production work is available [here](#).



Work diary definitions

Driver's base.

The driver's base is a reference point for 100km radius from the place where the driver lives or receives instruction.

If the base changes, the new location, and the date of the change must be recorded. This information must be kept up to date.

Fatigue related heavy vehicle.

A fatigue related heavy vehicle is any of the following:

- Motor vehicle (except a bus or tram) with a GVM over 12 tonnes.
- Motor vehicle (except a bus or tram) forming part of a combination if the total GVM is over 12 tonnes.
- Bus with a GVM over 4.5 tonnes fitted to carry more than 12 adults including the driver.

Rest

Rest is a continuous period of time of at least 15 minutes where a driver is not working. Rest is always rounded down – example: a period less than 15 minutes does not count towards rest while a period of between 15-30 minutes is counted as 15 minutes.

- Rest periods of 5 hours or more must be taken away from the vehicle unless fitted with an approved sleeper berth.
- Stationary rest periods must be taken away from the vehicle or in an approved sleeper berth.
- Under standard hours solo driving, a 30-minute rest break can be taken as 2x 15- minute rest breaks.
- 7 Hour and 24-hour rest breaks must be taken as a continuous rest break.

Time Zone

Under **standard hours**, your driver base or registered address of the vehicle is the time zone in which you work under for the entire trip.

Two-up driving.

Two up driving is the arrangement under which 2 drivers share the driving of

- A heavy vehicle with a sleeper berth complying with ADR 42
- A commercial bus with an approved sleeper berth.

Working

Working is the time spent driving a commercial bus or heavy vehicle and is counted in 15-minute intervals from the time zone of the driver's base. Work is always rounded up – for example, a period less than 15 minutes is counted as 15 minutes, but if the period is between 15 and 30 minutes it is counted as 30 minutes.

This includes:

- Loading, unloading, or queuing in the vehicle
- Inspecting, servicing, or repairing the vehicle
- Inspecting or attending to the load
- Attending to passengers on a commercial bus

- Cleaning and refuelling a commercial bus or heavy vehicle.
- Performing marketing tasks in relation to the operation of a commercial bus or heavy vehicle
- Helping with, or supervising an activity as mentioned above.
- Recording information or completing a document in accordance with the regulations or in relation to the operation of a commercial bus or heavy vehicle.

Obtaining a Work Diary

Work diaries may be obtained from all **Service SA Customer Service Centres** and at some police stations.

- A driver needs his/her current driver's licence and payment for the appropriate fee.
- A driver is required to apply in person to be issued with a work diary (including a replacement)
- Drivers **must not** have in his/her possession more than one work diary.
- The work diary is the property of the person, it does not belong to the vehicle.
- It is an offence to have more than one Work Diary at a time.
- If requesting a replacement Work Diary, the driver must provide an outline of the circumstances of the destruction, loss, or theft in writing. The driver has a maximum of 7 days before he/she must get a new work diary.

Note: A Work Diary must **ONLY** be used by the person to whom it was issued and should not be lent to another person. A driver must not borrow a work diary issued to another person.

Keeping a Work Diary

When driving a regulated vehicle the driver must keep in the vehicle a Work Diary containing info for the last 28 days including:

- Record location
- Day of the week and date
- Name
- Licence number/jurisdiction; state of issue
- Type of hours – Standard, BFM or AFM
- Nature of rest/period/time/place of rest change; plus more.

The Work Diary must be used and carried at all times if the driver is working.

- Drivers must keep a work diary in their vehicle that contains current records of work and rest time within the last 28-day period.
- Drivers must continue to record the information until their next major rest break (5 hours continuous rest or more) not just from midnight to midnight.

- In the event, the work diary is full or destroyed, the driver must continue to keep records with the same information until a new Work Diary can be obtained.
- Employers are obliged to request and actively pursue the provision of copies of drivers' work diaries.
- Each page in the Work Diary has 3 copies: the first copy is given to the employer.
- False work records can lead to severe court-imposed penalties.

Work, rest, and record keeping.

Under the Standard hours option a driver must take 4 nights rest including one pair of consecutive nights rest in any 14-day period.

For example: in a 14-day period, a driver would work up to 6-night shifts (between midnight and 6am) in one week and 4 night shifts the following week.

In any period of....	Maximum Work	Minimum Rest
5 hours 30 minutes	5 hours 15 minutes	15 minutes
8 hours	7 hours 30 minutes	30 minutes
11 hours	10 hours	60 minutes
24 hours	12 hours	12 hours including 7 hours continuous
7 days (168 hours)	72 hours	96 hours including 24 hours continuous
14 days (336 hours)	144 hours	192 hrs, including 4-night rests (2 consecutive)

****Night rest is 7 hours continuous rest taken between 10.00 pm and 8.00 am.**



Non-local and Local area work

Records made by employed drivers.

Within 21 days of a workday, the driver must provide a copy of their Work Diary to the employer. If the driver has worked for several employers on the same day, then a copy must be given to each of them.

Non-local records that are required to be kept:

- An employer must keep the copy of a driver's driving records for the driver's non-local area work for a period of 3 years at the office or place where the employer manages the employment of the driver.

- A self-employed driver must keep the driver's driving records for non-local area work for each day's activity for 3 years after that day at the driver's base.
- Local area work records to be kept:
 - Employer must keep local area management records made in relation to the driver for each day's activity for 3 years, where the employer manages the employment records of the driver.
- A self-employed driver must keep their local area management records for each day's activity for 3 years after the date, at the driver's base.
- Solo drivers working under Standard Hours may use their heavy vehicle for up to one hour of additional work time to perform personal activities at certain times during the 24-hour rest break by way of an [Exemption Notice](#). Activities include personal shopping, cleaning, refuelling. Further information is detailed in the [Advisory Publication](#).

Defensive driving (Driver awareness)

What is defensive driving?

Defensive driving is, driving a motor vehicle with **emphasis on safety**, achieved through **superior observation** and **judgement** in order to **anticipate danger** and **avoid crashes**.

The best defence is to be aware of the risks and identify the best way to avoid them before they happen. This is **"driver awareness"** and is the foundation of being a **professional driver**.

What skills do you already have?

The skills you currently use are:

- Sight
- Hearing
- Reaction
- Perception
- Current knowledge of driving
- Current knowledge of road rules

Training and **on-road experience** will **build on skills** you currently have.

Looking at each skill in detail

Skill	Detail
Sight	<ul style="list-style-type: none"> • Peripheral vision is the ability of the eye to detect objects that are not in the direct line of sight (objects that are to the side of where you are looking). • Colour recognition is the ability of the eye to recognise and distinguish colours, e.g. traffic lights and road signs. • Accurate recognition is the ability of the brain to process the information from the eye quickly and accurately. • Blind spots are the areas that you do not see that may place you at risk of a collision. These blind spots may be within the eye (the optic nerve), within the vehicle such as screen pillars, mirrors or outside the vehicle such as roadside structures (signs or light poles).
Hearing	<ul style="list-style-type: none"> • Train yourself to become attuned to traffic sounds: e.g. an approaching ambulance or other emergency vehicles. • Driving with the radio too loud will impair your hearing and place you and others at risk.
Reaction	<ul style="list-style-type: none"> • Average reaction time is accepted as .75 sec. for the average alert driver. • At 60K/h this represents a reaction distance of 12 metres and a total stopping distance of approximately 80 metres in a heavy vehicle • Add to this worn or inadequate tyres, suspension, and brakes. • Add lack of defensive skills (anticipation). • Add wet or gravel road, rain, poor visibility, darkness. <p>You now have an estimated braking distance in excess of 100 metres, and that is after you have seen the obstruction. If you did not see the hazard and plan a suitable course of action, then at that distance the result is obvious!</p>
Perception	<ul style="list-style-type: none"> • The ability to read the possible outcome of an event before it happens, based on your previous experiences. • Do not commit yourself to a situation based on the assumption that the other driver is going to take the path that he/she has shown intentions of taking. • Use your skills of perception to read the situation and leave yourself an avenue of escape and/or the ability to control the situation by varying your intended path or speed.
Current driving knowledge	<ul style="list-style-type: none"> • Take nothing for granted. • Think of all the near misses you have had and use this knowledge to enhance your driver awareness skills.

Current knowledge of road rules	<ul style="list-style-type: none"> • Many drivers do not follow or understand the road rules completely. Do you understand the current Australian Road Rules (ARR)? These were introduced in 1999 and many older drivers are either not aware of them or have not updated their knowledge. • The requirement to give way is often ignored to force a way into traffic especially where a large vehicle can be used to intimidate other road users.
City driving	<ul style="list-style-type: none"> • Driving with other traffic can create many distractions. A driver must continuously scan for hazards and prepare to react accordingly, especially if there is the need to swerve or brake harshly. • With superior forward planning, a driver will often be able to maintain momentum and avoid many complete stops. • By planning the approach position, for turns and other manoeuvres, the available room will be used to the best advantage. • Blind spots are unavoidable. Constant looking around mirrors and pillars is essential to get the maximum view at all times. Never change direction or commit to a turn without being certain that there is nothing in your blind spots.
Country driving	<ul style="list-style-type: none"> • Plan country driving trips (allow for breaks, fuel, and possible hold ups etc.) • Allow sufficient time to reach the destination within hours of driving and allow for adequate meal breaks. • Knowledge of the route to be used (low bridges and other restrictions) • Comply with weight and height limits. • Keep safe and legal following distances at all times. • Be aware of noise levels and the use of exhaust/engine brake.

National Heavy Vehicle Accreditation Scheme (NHVAS)

The National Heavy Vehicle Accreditation Scheme (NHVAS) was first offered to industry in 1999, as an alternative compliance scheme to others such as Truck Safe.

It has since evolved as a formal process to recognise operators who have robust safety and other management systems in place.

It is also being used to show compliance with general duty requirements under road transport law.

Heavy vehicle operators can apply for accreditation under the following NHVAS modules:

- Mass management
- Maintenance management
- Fatigue management (Basic)
- Fatigue management (Advanced)

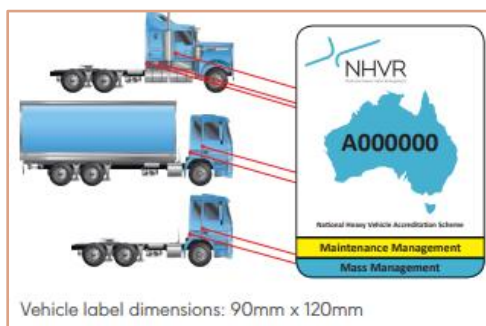
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Previously administered on a state and territory basis, the NHVAS is now managed on a national basis by the NHVR.

The NHVR is the administrator and single point of contact for all NHVAS business including all enquiries, applications and maintaining accreditation.

It is an offence to fail to display and maintain NHVAS labels on either, the Maintenance Management or Mass Management accreditation schemes.

Refer to [Accreditation labels, nominated vehicles and interception report books \(nhvr.gov.au\)](https://www.nhvr.gov.au)



Mass management accreditation.

Operators accredited in the Mass Management module can access additional mass concessions. These concessions allow vehicles to operate at [Concessional Mass Limits](#) for general access to the road network. Participation in this module is a pre-requisite for access to [Higher Mass Limits](#). All information may be found in the [Mass Management Accreditation Guide](#).

(*Refer **Appendix D** for **Maximum Axle Weight** information)

Higher mass limits for road friendly suspension.

Eligible vehicles are exempt from general mass limits and are able to operate at slightly higher mass limits when fitted with road friendly suspension.

For a suspension system to qualify as being '**road friendly**', it must have:

- Multiple axles to share the load.
- Dual tyres fitted and respond in certain ways to movements (e.g. rebound).
- Approved road friendly suspensions are fitted with either two or four airbags with two shock absorbers per axle.

The operation of vehicles under Higher Mass Limits is described in the following documents.

- [South Australian Class 3 Road Friendly Suspension Mass Exemption Notice 2022 \(No.1\)](#)
- [South Australian Class 3 Road Friendly Suspension Mass Exemption Notice 2022 Operator's Guide](#)

Maintenance management accreditation

Operators accredited in the Maintenance Management module must maintain their vehicles and comply with all relevant road transport legislation.

Some jurisdictions require annual inspections as part of the registration process but grant exemptions to vehicles with maintenance management.

The [Maintenance Management Accreditation Guide](#) summarises the requirements for entry to the scheme and how to remain compliant.

Basic Fatigue Management (BFM)

Operators with BFM accreditation can operate under more flexible work and rest hours, allowing for variations such as work of up to 14 hours in a 24-hour period.

To access BFM, operators will need to be accredited in the NHVAS, and comply with 6 BFM standards which have a direct impact on the fatigue experienced by drivers:

- Scheduling and rostering.
- Fitness for duty.
- Fatigue knowledge and awareness.
- Responsibilities.
- Internal review.
- Records and documentation.

BFM gives operators a greater say in when drivers can work and rest, providing the risks of driver fatigue from working long hours and night shifts are properly managed.

Both the driver and employer must be accredited within the BFM scheme

In any period of	Maximum work time	Minimum rest time
6 hours 15 mins	6 hrs	15 minutes
9 hours	8 hrs 30 mins	30 mins in 15 min blocks
12 hours	11 hrs	60 mins in 15 min blocks
24 hours	14 hrs	7 continuous hrs stationary
7 days	36 hrs long/night work time	No limit has been set
14 days	144 hrs	24 hrs continuous stationary rest time taken after no more than 84 hrs work time, and 24 continuous hrs stationary rest time and 2x night rest breaks, and 2x night rest breaks on consecutive days.

- **Stationary rest time:** the time a driver spends out of a regulated heavy vehicle or in an approved sleeper berth of a stationary heavy vehicle.
- **Long / night work time:** any work time outside of the period midnight to 6.00 am, in excess of 12 hours of work in a 24-hour period or any work time between midnight and 6.00 am (or the equivalent hours in the time zone of the driver's base)
- **Night rest breaks:** 7 consecutive hours stationary rest time taken between the hours of 10.00 pm on a day and 8.00am on the next day, (using the time zone of the base of the driver) or a 24 continuous hours stationary rest break.

Advanced Fatigue Management (AFM)

Advanced fatigue management (AFM) brings a 'risk management' approach to managing driver fatigue. It offers flexibility to roster drivers over longer periods or longer days.

Under AFM, drivers may be able to split their continuous rest break.

In return, they must demonstrate better accountability in managing fatigue risks. As a result, the AFM accreditation is more demanding.

States and territories have agreed to the **maximum** work time in a **24-hour period** being unified to **15.5 hours**. An operator can access this option by getting NHVAS AFM accredited and comply with AFM standards:

- Scheduling and rostering
- Readiness for duty
- Fatigue knowledge and awareness
- Responsibilities
- Internal review
- Records and documentation
- Health
- Workplace conditions
- Management practices
- Operating limits.

Fitness to drive a heavy vehicle.

To be eligible for **Basic and Advanced Fatigue Management** through NHVAS, drivers aged 49 years and under are required to have a medical assessment every 3 years.

Drivers aged 50 and over, are required to have a medical assessment every 12 months, regardless of any medical condition that may or may not affect their ability to drive.

The only time a truck driver needs to carry a medical certificate stating fitness to drive is when there is a pre-existing condition that has been noted on their driver's licence in the past or a medical condition that may impact their ability to drive under certain pressures. Carrying a medical certificate when driving is not required as it is not a valid road or travel condition under the HVNL.

Heavy vehicle checking stations.

Heavy vehicle checking stations are permanent Department of Infrastructure and Transport facilities.

Checking stations are located along major transport routes and are for heavy vehicles with GVM of > 4.5 tonne. These vehicles may be stopped and inspected to see if they meet safety and roadworthiness standards. The drivers are also checked to be complying with road transport laws.

Loads and the right vehicle.

When carrying a load you must ensure the size of the load space and the condition of the platform are suitable for the job you want to do.

- Long loads – should avoid excessive overhang and ensure good weight distribution.
- Liquids and loose material – vehicle must be designed to completely contain the load and minimise the effect of load movement.

Loads should be:

- Well positioned and the weight evenly distributed.
- Bulk liquids should be transported in tankers.
- Sheets or tarpaulins should be used to cover loose materials.
- Heavier loads need the correct vehicle and need to be distributed to ensure all wheels are creating contact with the road, if not, this can lead to steering difficulties.

Clearance signs (ARR102)

Ensure you know the height of your vehicle and its load before driving on a road. Obey clearance signs and low clearance signs that impose restrictions. Eg under a bridge, overpass or tunnel.



(Courtesy: Triple M publication)

Load limit signs (ARR103)

A driver must adhere to any load limit signs and must not drive past a bridge load limit (*gross mass*) sign or gross load limit sign if the total of the gross mass (*in tonnes*) of the driver's vehicle (and any vehicle connected to it) is more than the gross mass indicated by the sign.

A driver must not drive past a bridge load limit (*mass per axle group*) sign if the mass (*in tonnes*) carried by an axle group of the driver's vehicle, or any vehicle connected to it, is more than the mass indicated by the sign for the axle group.

Both of these instances of **disregarding signage** are an **offence**.



(Courtesy Truckers Report: 30-tonne truck on 3-tonne weight bearing bridge)

Chain of responsibility

The laws applied to Chain of Responsibility (CoR) were changed to align more closely with Workplace Health and Safety laws, in October 2018. ([Changes to the Chain of Responsibility laws](#))

The aim of CoR is to ensure everyone in the supply chain shares the responsibility for reducing any breaches of the **National Heavy Vehicle Laws (NHVL)**. You have a legal responsibility to ensure NHVL is complied with if you are named as a party in the CoR and you exercise control or influence over a transport task.

The **law recognises, multiple parties may be responsible for offences** committed by the drivers and operators of heavy vehicles. A person may be a party in the supply chain in more than one way. A person may have duties as the employer, the operator, and the consigner of goods. Legal liability applies to all parties for their actions or inactions, in each role.

Parties in the supply chain:

- **Employer** of a driver.
- Prime **contractor** for the driver (self-employed)

- **Operator** of vehicle.
- **Scheduler** for vehicle.
- **Loading manager** for goods in vehicle.
- **Personnel** who load or unload vehicle.
- **Consignor** (dispatcher, sender) of goods transported by vehicle.
- **Schedulers** who place unrealistic timeframes on drivers, causing breaches of work/rest options.
- **Loading managers** whose business practices, including loading/unloading times, cause the driver to exceed the speed limit.

Example breaches of Chain of Responsibility include:

- Fatigue management
- Mass
- Loading requirements
- Speed Limits
- Dimension

If **breaches of HVNL** are **taken to court**, each party in the chain will be required to demonstrate that they took, all reasonable steps, to prevent the contravention or show that there were no steps they could reasonably be expected to have taken to prevent the contravention.

Note: If breaches of HVNL are taken to court, each party in the chain will be required to demonstrate that they took, all reasonable steps, to prevent the contravention or show that there were no steps they could reasonably be expected to have taken to prevent the contravention.

Hazards

Road transport in Australia is a high-risk industry, according to SafeWork SA. Work related road crashes incur a greater time lost in worker absences than any other work injury claim.

Always monitor the traffic and road conditions for any hazards.

Employers and **workers** are required to **take responsibility** for the **safety of the driver, the truck, and the load**. Drivers of heavy vehicles and their employers are required to abide by the legislation, law, and code of practice that governs their roles.

A **hazard includes** anything which **will either cause you or has the potential to cause you to change speed or direction**.

Hazards include a series of features which need to be considered by a driver when approaching or negotiating the hazard.

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When negotiating intersections, roundabouts, and other potential hazards such as road works, railway crossings, and lane changes. It is important to **control the vehicle's speed** and **cornering forces** before entering the hazard.

Drivers following the system of vehicle control will be concentrating on potential trouble spots, not on the brakes and shift lever.

By considering the following steps you will take, your intentions will be clear to other road users.

Step	Function	Detail
1	Course	Determine the course to be taken to negotiate the hazard
2	Mirrors	Check behind the vehicle and along both sides
3	Signal	Signal your intentions to give sufficient warning prior to any move
4	Brake	Adjust your road speed early so you can downshift.
5	Gears	Change down, so that you are in the appropriate gear before the hazard.
6	Mirrors	Check mirrors again for safety
7	Manoeuvre	Negotiate hazard, monitoring the position of the rear wheels
8	Accelerate	To leave the hazard safely, having regard to the road surface and traffic conditions .

When performing a manoeuvre such as a lane change, you will not include steps 4 and 5. However, all other steps need to be done to ensure safety.

Long vehicles often need to use more space approaching a turn. Greater emphasis will need to be placed on road position and mirror checks through the turn.

Following the system of vehicle control produces a controlled, deliberate driving style that reduces risk. This is particularly so at roundabouts, where three directional changes can occur. Vehicles with a high centre of gravity or "live" loads can easily rollover and therefore a cautious approach is necessary.

Road transport in Australia is a high-risk industry, according to SafeWork SA. Work related road crashes incur a greater time lost in worker absences than any other work injury claim.

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Some of the hazards that can occur when heavy vehicles are on the road include:

1. **Environmental** factors (bad weather, poor road surface, limited visibility, sun position)
2. **Fatigue** (long hours, long distances)
 - Total awake time including travel to and from work.
 - Driver **distractions** (e.g. mobile phone)
 - **Time pressures** (work scheduling and demands)
 - **Drugs and alcohol** (including prescription and non-prescription medication)
 - **Vehicle maintenance** (or the right vehicle for the job)
 - Working around a vehicle with other vehicles in close proximity
 - Entering/exiting the cab (fall from height)
 - **Loading and unloading material** or stock (fall from height)
 - Other road users (unpredictability)

Employers and **workers** are required to **take responsibility** for the **safety of the driver, the truck, and the load**. Drivers of heavy vehicles and their employers are required to abide by the legislation, law, and code of practice that governs their roles.

When turning always set up your approach and position in plenty of time before reaching the actual turn. This includes the need to straddle lanes to ensure your truck makes the turn safely.

Never **change gears** when negotiating a turn, have this done **before** you commit to the turn.

Vehicle stability and the weight over the drive wheels are affected by rolling through the turn. All turns should be set up correctly on the approach and should, under normal circumstances, be taken at a constant speed on the accelerator pedal.



Stress

As a result of the pressures of driving other areas can impact your stress levels to a greater extent.

Common causes of **stress** include:

- Family and financial problems
- Social problems at work
- Media related problems (poor reputation)

Methods of managing your stress include:

- Relaxation
- Positive attitude
- Punctuality and time management
- Appropriate sleep.
- Healthy diet and exercise.



Truck driver considerations:

Do	Include
Check before starting out and during long trips.	<ul style="list-style-type: none"> • Brakes • Fuel • Water • Lights • Oil • Equipment
Personal problems	Leave your problems at the kerb when you start driving if you are able.
Keep up to date	Be aware of changes in road rules and observe them at all times. Respect laws of physics relating to forces, momentum, and centre of mass of your truck and load.
Watch out	For pedestrians – especially children!
Do not tailgate	<p>Keep enough distance between your vehicle and the one ahead to allow faster vehicles to pass.</p> <p>Let following traffic pass on long grades.</p>

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Be prepared	To give way rather than compete with other drivers.
Never	Drink alcohol or take drugs while on the road or before starting a trip.
Sleep	If drowsy, get off the road and take a short rest.
Reduce speed	Do not hesitate to reduce your speed and be ready to stop the instant potential danger appears.
Be considerate	Give other drivers the breaks you wish others would give you.



Appendix A – Glossary

B-Double	A B-double is defined in the Heavy Vehicle National Law (HVNL) as a “combination consisting of a prime mover towing two semitrailers, with the first semitrailer being attached directly to the prime mover by a fifth wheel coupling and the second semitrailer being mounted on the rear of the first semitrailer by a fifth wheel coupling on the first semitrailer.”
Built-up area	The Australian Road Rules define a built-up area as "an area in which there are buildings on the land next to the road, or there are streetlights, at intervals not over 100 metres for a distance of at least 500 metres or if the road is shorter than 500 metres for the whole road.
Converter dolly	Commonly used in road trains as part of a combination. It has a drawbar for its forward connection and pivots vertically. It allows multiple trailers to be attached forming the road train configuration.
Dog trailer	A trailer with axles at either end of the trailer, plus a drawbar to connect the trailer to a towing vehicle.
Turntable coupling	Allows quick coupling and uncoupling of semi-trailers, provide articulation for the combination, and provide stability and support to the semi-trailer. Referred to as a turntable or 5 th wheel.
Long vehicle	Any vehicle that together (any combination) with any load or projection is 7.5 metres long, or longer.
Semi-trailer	Has one axle group or a single axle towards the rear, a means of attachment to a prime mover that results in some of the mass of the trailer’s load being imposed on the prime mover.
Type 1 Road train	A road train up to 36.5 metres long consisting of: <ul style="list-style-type: none"> • A prime mover towing two trailers (A-double); and • A prime mover and semi-trailer combination connected by a converter dolly to two semi-trailers connected by a fifth wheel coupling (AB-triple); and • A prime mover towing three semi-trailers all connected by fifth wheel couplings (B-triple).
Type 2 Road train	A road train consisting of a prime mover towing three or four trailers, other than an AB-triple or B-triple, when the combination length is no longer than 53.5 metres.

*Refer to the NHVR [chart for further information](#).



Appendix B - Mass definitions

Unladen Mass (UL)	The weight of the vehicle without any cargo but does include your fuel, oil, and tools etc. In the case of a combination, it means the prime mover only.
Gross Vehicle Mass (GVM)	The maximum loaded mass of the vehicle, as set by the motor vehicle manufacturer or the registration authority.
Gross Combination Mass (GCM)	The greatest possible sum of the maximum loaded mass of a motor vehicle and of any vehicles that may lawfully be towed by it at one time, as specified by the motor vehicle manufacturer or the registration authority.
Gross Trailer Mass (GTM)	The mass transmitted to the ground by the axle or axles of the trailer when coupled to a drawing vehicle and carrying the maximum load recommended by the manufacturer uniformly distributed over the load bearing area.
Aggregate Trailer Mass (ATM)	The total mass through the axles and drawbar of the laden trailer when carrying the maximum load recommended by the manufacturer.

Registration Mass Check

When checking registration currency, ensure you check each trailer/converter dolly is registered too.










If the statutory axle mass limits are less than the registered mass, the lower figure is the maximum mass legally allowed on the road.

Download the EzyReg app onto your mobile device.

- Enter the registration number of the vehicle you will be driving.
- Check the GVM/GCM, Registration expiration date
- Remember to check the trailer registration if applicable.

Plate Type	HEAVY VEHICLE
Plate Number	XS13BA
Make	FREIGHTER
Body Type	PRIME MOVER
Primary Colour	WHITE
VIN	*****5197
Registered Configuration	MU3 - 3 axle P/Mover + 2 or more trailers (MU3)
Registered GVM/GCM	26000/106000
Manufacturer GVM/GCM	26000/106000
Vehicle Condition 1	MV2 NHVR NOTICE
CTP Insurer	AAMI
Expiry Date	02/06/2019

Appendix C - Licence classes

 Government of South Australia Department of Planning, Transport and Infrastructure		Licence classes		MR231A 2012
Class	Authorises the holder to drive:	Examples	Minimum age/ driving experience	
C	1. A motor vehicle with a gross vehicle mass (GVM) not greater than 4.5 tonne but not including – (a) a bus designed to carry more than 12 seated persons; or (b) a motor bike or motor trike. Examples of vehicles which may be driven: sedans, station wagons, panel vans, utilities, light delivery vans, small trucks, quad bikes, special purpose vehicles (e.g. farm machines, small tractors, forklifts, or other like machinery) 2. A motor vehicle included in 1 towing a single trailer, subject to the combination mass limits fixed under the Road Traffic Act 1961. For example, small truck towing a horse float, trailer, or caravan. MAY TOW: - trailer, horse float, caravan or farm implement.		Must be at least 17 years old. • if you are under the age of 25 you must have held your learner's permit for at least 12 months • if you are aged 25 or over you must have held your learner's permit for at least 6 months.	
LR	1. A motor vehicle authorised to be driven by a licence of the preceding class. 2. A motor vehicle with a GVM greater than 4.5 tonne but not greater than 8 tonne. (e.g. trucks, vans, tippers, special purpose vehicles, and buses designed to carry 13 or more seated persons); 3. A bus with a GVM not greater than 8 tonne. 4. A motor vehicle included in 2 or 3 towing a single trailer, subject to the combination mass limits fixed under the Road Traffic Act 1961 or the Heavy Vehicle National Law (South Australia). MAY TOW: - any farm implement. Any trailer provided the overall mass is within the gross combination mass (GCM) of the towing vehicle. DRIVER'S LICENCE MUST BE CARRIED IF DRIVING A VEHICLE OVER 4.5 TONNE GVM		Must have held a class C for at least one year.	
MR	1. A motor vehicle authorised to be driven by a licence of a preceding class. 2. A motor vehicle (other than a special purpose vehicle) with 2 axes and a GVM greater than 8 tonne. (e.g. two axle trucks, tippers and buses); 3. A motor vehicle included in 2 towing a single trailer (other than a semi-trailer) with a GVM not greater than 8 tonne, subject to the combination mass limits fixed under the Heavy Vehicle National Law (South Australia). 4. A special purpose vehicle with – (a) 2 axes and a GVM greater than 8 tonne; or (b) 3 or more axes and a GVM not greater than 15 tonne. MAY TOW: - any farm implement. Any trailer with a GVM not exceeding 9 tonne provided it is within the GCM of the towing vehicle. DRIVER'S LICENCE MUST BE CARRIED IF DRIVING A VEHICLE OVER 4.5 TONNE GVM		Must have held a class C for at least one year.	
HR	1. A motor vehicle authorised to be driven by a licence of a preceding class. 2. A motor vehicle (other than an articulated motor vehicle or a special purpose vehicle) with 3 or more axes and a GVM greater than 8 tonne. 3. A motor vehicle included in 2 towing a single trailer (other than a semi-trailer) with a GVM not greater than 8 tonne, subject to the combination mass limits fixed under the Heavy Vehicle National Law (South Australia). 4. An articulated bus with 3 or more axes and a GVM greater than 8 tonne. 5. A special purpose vehicle with 3 or more axes and a GVM greater than 15 tonne. MAY TOW: - any farm implement. Any trailer with a GVM not exceeding 9 tonne provided it is within the GCM of the towing vehicle. DRIVER'S LICENCE MUST BE CARRIED IF DRIVING A VEHICLE OVER 4.5 TONNE GVM		Must have held: (a) a class C for at least two years or (b) a class LR or MR for at least one year.	
HC	1. A motor vehicle authorised to be driven by a licence of a preceding class. 2. A prime mover to which is attached a single semi-trailer (whether or not any unladen converter dolly or low loader dolly is also attached). 3. A rigid motor vehicle to which is attached a single trailer with a GVM greater than 8 tonne (whether or not any unladen converter dolly or low loader dolly is also attached). DRIVER'S LICENCE MUST BE CARRIED IF DRIVING A VEHICLE OVER 4.5 TONNE GVM		Must have held a class MR or HR for at least one year.	
MC	1. Any motor vehicle or combination of motor vehicles except a motor bike or motor trike. (Includes B doubles; road trains.) DRIVER'S LICENCE MUST BE CARRIED IF DRIVING A VEHICLE OVER 4.5 TONNE GVM		Must have held a class HR or HC for at least one year.	
R-DATE*	1. A motor bike or motor trike that – (a) has an engine capacity not exceeding 660 mL and a power to weight ratio not exceeding 150 kW per tonne; and (b) is of a kind approved from time to time by the Registrar by notice in the Gazette. (*means the expiry date of the learner's permit or the date falling one year after class R-DATE was endorsed on the licence. It indicates the date on which the holder may apply for a class R licence.)		17 years, and if no other licence is held: • if you are under the age of 25 you must have held your learner's permit for at least 12 months • if you are aged 25 or over you must have held your learner's permit for at least 6 months.	
R	1. Any motor bike or motor trike.		Must have held a class R-DATE* for at least one year.	

*R-DATE means the expiry date of the learner's permit or the date falling one year after class R-DATE was endorsed on the licence. It indicates the date on which the holder may apply for a class R licence. The holder of a class R-DATE licence remains restricted to a motorcycle with an engine capacity of up to 660ml with a power-to-weight ratio of 150kw/t until granted a class R licence despite the fact that the date included in the classification has passed.







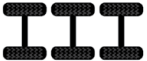

NOTE: The class of licence required to drive a commercial vehicle is determined by the number of axes and/or the vehicle's gross vehicle mass, not the load the vehicle is carrying.

Appendix D - Maximum Axle Weights

Front steering axles	
Any single axle fitted with two tyres	6.0 tonnes
A single axle fitted with two tyres on a Complying Bus	6.5 tonnes
Any single axle fitted with two 'wide' tyres	6.7 tonnes
Any twin steer (two axle) group without 'load sharing suspension'	10.0 tonnes
Any twin steer (two axle) group with a 'load sharing suspension'	11.0 tonnes
Other axles	
Any single axle fitted with four tyres	9.0 tonnes
Any single axle fitted with four tyres on a Complying Bus	10.0 tonnes
Any tandem axle group fitted with four tyres	11.0 tonnes
Any tandem axle group fitted with four 'wide' tyres	13.3 tonnes
Any tandem axle group fitted with eight tyres	16.5 tonnes
Any tandem axle group fitted with single tyres on one axle and dual tyres on the other axle	13.0 tonnes
On a complying Bus	14.0 tonnes
Any tri-axle group fitted with twelve tyres	20.0 tonnes
Any tri-axle group fitted with six 'wide' tyres	20.0 tonnes
Any variation to a tri axle	15.0 tonnes
Pig trailers	
Any tandem axle fitted with eight tyres	15.0 tonnes
Any tri axle fitted with twelve tyres	18.0 tonnes
Any tri axle fitted with six 'wide' tyres	18.0 tonnes



Axle configurations

Axle/s	Axle group/tyres	Axle/vehicle details	Mass limit (tonnes)
	Single axle Single tyres	<ul style="list-style-type: none"> Steer axle Non steer axle, tyres less than 375mm Non steer axle, tyres 375mm to 449mm Non steer axle, tyres at least 450mm 	6.0t 6.0t 6.7t 7.0t
	Single axle Dual tyres	<ul style="list-style-type: none"> Pig trailer Any other vehicle A complying bus, or a bus authorised to carry standing passengers under an Australian road law. An ultra-low floor bus with no axle groups, only 2 single axles 	8.5t 9.0t 10.0t 11.0t
	Twin-steer axle group Single tyres	<ul style="list-style-type: none"> Non-load-sharing suspension system Load-sharing suspension system 	10.0t 11.0t
	Tandem axle group Single tyres	<ul style="list-style-type: none"> Less than 375mm 375mm to 449mm At least 450mm 	11.0t 13.3t 14.0t
	Tandem axle group Dual/single tyres	<ul style="list-style-type: none"> Single tyres on one axle and dual tyres on the other axle A complying bus 	13.0t 14.0t
	Tandem axle group Dual tyres	<ul style="list-style-type: none"> Pig trailer Any other vehicle 	15.0t 16.5t
	Tri-axle group Single tyres	<ul style="list-style-type: none"> Single tyres on all axles: section width less than 375mm, or single tyres on one / two axles and dual tyres on the other axle or axles. Pig trailer with either single tyre with at least a 375mm section width, dual tyres on all axles or a combination of those tyres 	15.0t 18.0t
	Tri-axle group Dual tyres	<ul style="list-style-type: none"> Vehicle other than a pig trailer with either single tyre with at least a 375mm section width, dual tyres on all axles or a combination of those tyres 	20.0t

Resources and Contacts

Department	Phone / Email	Comment
Heavy Vehicle Confidential Reporting Line (HVCRL)	1800 931 785	Report safety issues
Road rule violations – SAPOL	Emer: 000 or 131 444	Speeding, intoxicated driver
Engine emissions (SAPOL Traffic)	131 444	Smoky vehicles
Noise emissions (SAPOL or EPA)	131 444 / (EPA) 82042004	
Industrial relations – Fair Work Ombudsman	1300 799 675	
Complaints about NHVR	13 64 87	
	privacyrti@nhvr.gov.au	
Department of Infrastructure and Transport (DIT SA)	1300 882 249	
	diti.roadmanager@sa.gov.au	
National Heavy Vehicle Regulations	13 64 87	
	info@nhvr.gov.au	
Austrroads	austroads@austrroads.com.au	
National Transport Commission	03 9236 500	
Australian Trucking Association	https://www.atatruck.net.au/	

The following links include legislation, regulations, and codes of practice for your reference.

- [Road Traffic Act and Regulations](#)
- [Work Health and Safety Act 2012 \(SA\)](#)
- [Work Health and Safety Regulations 2012 \(SA\)](#)
- [National Heavy Vehicle Law and Regulations](#)
- [Codes of Practice](#)
- [Load Restraint Guide SA](#)

