



knowing
the vehicle

Heavy vehicles come in a variety of configurations.

It's your responsibility to know your vehicle. Regular checks should be carried out to minimise the risk of breakdown and ensure your vehicle is roadworthy.

Roadworthiness

The driver and the owner/operator are responsible for a vehicle's roadworthiness. A roadworthy vehicle is a safe one that offers advantages to both the driver and operator as well as other road users.

It is very important to check your vehicle is roadworthy. Pre-departure checks can save time and expense later on and reduce the chance of a crash resulting from mechanical failure.

To make sure that your vehicle remains roadworthy, you should carry out daily pre-departure checks and more 'in depth' weekly inspections.

All door latches or hinges must be secure and working well. The cabin must be sealed from the engine and fuel areas.

Brakes

Air brake operation

Most heavy vehicles have full air brakes. It is important that brakes are properly adjusted and well maintained.

When you apply the foot brake pedal you are opening a valve that allows pressurised air to flow to the brake chambers at each wheel, therefore braking effectiveness depends on how far you depress the pedal.

It is very important to check your brakes properly and regularly, and to refer to the manufacturer's manual. Use the following procedure as a guide only and get a professional to service your brakes often.

Inspection of hydraulic brakes

Step 1: external check

1. Check for line damage and leaks.
2. Check wheel backing plates and brake hoses for any signs of leaks or damage, such as chafed hoses or pipes.
3. Check around the master cylinder and hydraulic oil reservoir for leaks. Also check that the reservoir is full.

Step 2: system check

1. Check the feel of the brake pedal when you apply the foot brake.

If the pedal sinks down further than usual or if it feels spongy, there may be a leak or air in the system.
2. Keep full pressure on the pedal – it should continue to be hard. If the pedal starts to sink, there may be a leak in the system.
3. Vacuum brakes – check booster retention with full vacuum and the engine off. When you apply the pedal it should stay down without resistance.

The vacuum must be available soon after the engine is started with low vacuum available after 30 seconds and normal working vacuum after 60 seconds.

4. Check that the vehicle does not pull to one side when you brake while the vehicle is moving. Do this check in a low traffic environment where possible.

Inspection of air brakes

Step 1: secure the vehicle

1. Put on the parking brake.
2. Switch off the engine.
3. Where manual valves are fitted to air tanks, drain daily.
 - It is illegal to discharge fluid on the ground as it can be washed down drains and is an environmental hazard.

Step 2: drain all air tanks

On vehicles with a dual circuit braking system, drain one system first. Check to make sure that only one gauge indicates no pressure, then drain the other system. If both gauges show no pressure after draining one system, do not use the vehicle before your brakes have been checked by a professional.

Step 3: refill the system

1. Start engine and run at fast idle – do not race the engine.
2. Check that:
 - any low air pressure warning signals (if fitted) are operating as a result of having no air in the system
 - the low air pressure warning signals (if fitted) operate at about 410 kPa
 - the time it takes for air pressure to build up from 0 to 80% of maximum pressure limit (refer to manufacturer's specification) is not longer than five minutes.
3. Allow maximum pressure to build up and turn off engine.

Step 4: system check

1. Chock the wheels and release the park brake.
2. Stop the engine.
3. Apply the foot brake fully and check the drop in air pressure on the gauge. The drop in pressure per minute should not exceed 20 kPa. An additional drop of 5 kPa per trailer is allowed.
4. Apply the foot brake another four times, holding it down on the fourth application. The pressure should not have fallen by more than half normal system operating pressure.

If it has, do not use the vehicle before your brake system has been checked by a professional.

5. Start engine and recharge air system.

Step 5: trailer check

1. Turn the engine off.
2. Disconnect the air hoses between the hauling unit and trailer (articulated vehicles and truck/trailer combinations). The trailer brakes must automatically come on and remain on for at least 15 minutes. This is to check if the breakaway system is operational.
3. Re-connect air hoses.
4. Walk around the hauling unit and trailer and listen carefully for air leaks.
5. Apply the park brake.

These 'general checks' do not replace the need for thorough inspections of the systems by a professional.

Anti-lock braking systems (ABS)

Many trucks have ABS, which is designed to stop wheel lock-up and improve steering under heavy braking.

Maximum braking occurs when the wheels are just on the point of locking. However, if a wheel does lock and skidding occurs, braking is not effective and you may lose control of the vehicle.

For best results when using an ABS-equipped vehicle in an emergency situation, press the brake pedal down fully and allow the ABS to regulate braking for you. This allows you to have full steering control at the same time as maximum braking.

If the ABS fails, the system reverts to normal brake operation.

Parking brake

When applied a parking brake must be capable of holding the vehicle stationary on any slope up to a gradient of at least 15 degrees, or prevent it from moving under light throttle and must function by mechanical means such as springs.

Engine/exhaust brakes or speed retarders

These devices may be fitted to medium and large vehicles to supplement the vehicle's service brake system. They will not stop the vehicle completely but may help to slow it down. They are not considered service brakes as they act on the engine or drive train and are otherwise known as auxiliary brakes.

Three most common types are:

- Exhaust brake.
- Engine brake.
- Electric, magnetic or hydraulic retarder.

Applying these brakes may cause a lightly loaded vehicle to skid or jack-knife on slippery roads.

Auxiliary brakes are generally noisier than the service brake. Try to reduce brake noise in urban areas by limiting the use of auxiliary brakes.

Couplings

Prime mover/semi-trailers – Turntable mountings and other tow couplings must be secure and comply with Australian Standards for installation.

Other vehicles – All towbar, coupling and drawbar components must be in good working condition. Steps on performing uncoupling and coupling are covered at the end of this section.

Driving controls

All controls should function correctly and be regularly checked and maintained.

Electrical system

Electrical wiring and connections, both inside and outside the vehicle, must be secure, damage-free and not exposed to excessive heat.

Engine

When running above idle speed, the engine must not discharge excessive crankcase fumes.

Exhaust system

The exhaust system must not have leaks due to damage, loose connections and mountings or poor maintenance.

The exhaust system must not be too noisy.

Smoke from engines

Excessive smoke from vehicles is illegal, unpleasant and at times dangerous. It can also lead to expensive engine repairs and time off the road.

Blue smoke normally indicates engine wear or damage. Black and grey smoke results from incomplete combustion and may be caused by a number of factors. These examples can usually be fixed during routine maintenance:

- blocked air filter
- obstruction of fuel filters or water traps with dirt, grit or fuel wax
- incorrect fuel pumps timing
- engine speed too high
- incorrect valve or tappet adjustment
- poor cylinder compression indicating leakage past valves or piston rings
- excessive back-pressure in exhaust system
- injectors misfiring or leaking

- faulty turbo chargers where fitted
- poor driving techniques.

Noise pollution

Noise can affect your physical health, cause nervous stress and annoy others. It adds to fatigue, lowers productivity and can also increase the risk of heart disease.

Types of noise pollution

In heavy traffic flow each vehicle contributes to the general roar. Trucks contribute about half the noise energy from traffic even though they are less than 10% of vehicles on the road.

There is also noise pollution from excessively noisy individual vehicles - these contribute more than their fair share to general traffic noise.

Noisy vehicles

Excessive noise can come from:

- deterioration of the exhaust system from corrosion
- fitting an unsuitable muffler
- engine modifications such as raising the maximum governed speed
- removing sound absorbent materials
- using the exhaust brake or a noisy retarder unnecessarily in built up areas
- body noise on hitting bumps in the road.

What you can do to reduce noise

- Fit a good exhaust system.
- Beware of 'cheapies' - they can wear out faster and may not have a warranty. A noisy muffler does not mean higher performance or better fuel consumption. Tests conducted have shown that in many cases noisy systems were no better for backpressure or fuel consumption.
- Buy quality replacement mufflers. The manufacturer's recommended part is usually the best for all-round performance as well as noise control.

Get your truck or bus tested for noise

Ask the muffler fitter to check that your new muffler has a low noise level.

The legal noise limits vary according to GVM, manufacture date, type of engine and whether the exhaust pipe is vertical or horizontal.

Fuel system

The fuel tank and lines must be secure and not leak. The fuel tank cap must be properly fitted.

LPG fuelled vehicles must be fitted with an AUTOGAS plate near the LPG fuel tank and display the appropriate plates or stickers on the front and rear number plates. LPG cylinders need to be periodically inspected.

Compressed Natural Gas (CNG) is an alternative fuel and a CNG vehicle must display the appropriate plates or stickers, be fitted with a compliance plate and also be fitted with a refuelling information plate near the filler connection. CNG cylinders need to be periodically inspected.



LPG and CNG retroreflective identification labels must be in the shape of a square and mounted diamond-wise.

1 2 3 4 0	
GAS COMPLIANCE PLATE	
THIS GAS SYSTEM WAS INSTALLED TO COMPLY WITH THE DANGEROUS GOODS REGULATIONS BY THE HOLDER OF	
GASFITTING CERT. No. OR AUTOGAS CERT. No.	
DATE TESTED	
CHASSIS No.	
AUTOGAS SYSTEM COMPLIES WITH AS1425	

LIQUEFIED PETROLEUM GAS COMPLIANCE PLATE

The autogas installation to which this notice is affixed complies with the requirements of the Australian/New Zealand Standard AS/NZS 1425

INSTALLATION DATE STATE

COMPLIANCE No
 INSTALLED BY:

NAME LIC. No

WORKSHOP No (REP. No)

VIN No

CONTAINER SERIAL No

CONTAINER TEST STATION STAMP DATE

Examples of a LPG Compliance plate.

Gear boxes

Heavy vehicles must use low gear on roads where a sign displays TRUCKS & BUSES MUST USE LOW GEAR. The gear chosen by the driver must be able to control the speed of the vehicle without use of the brakes.



There are typically three types of gear boxes.

Non-synchromesh gear box (constant mesh)

In this type of gear box, the matching of engine and road speeds depends entirely on your judgement and skill as there are no synchronisers in the gear box to help you. Double-declutching is essential while you are learning to use this type of gear box. A non-synchromesh gear box may commonly be known as a crash box or constant mesh gear box.

Double-declutching means to change gear, by moving the gear lever first into neutral and then into the desired gear, releasing the clutch pedal between each movement. You should learn this technique from someone who is experienced with operating a non-synchromesh gear box.

Synchromesh gear box

This type of gear box works in much the same manner as those in most modern cars. They are easy to use, as the synchronising of the gears is done within the gear box. Be aware that damage can be caused by forcing gear changes before the engine and road speeds are matched.

Double-declutching is not recommended for synchromesh gear boxes as it may cause long term damage.

Automatic gear box

These work in much the same manner as in modern automatic cars where gear changes occur automatically.

Lights and indicators

All lights, and reflectors must work properly and their lenses must not be damaged. All rearward facing lights except reversing, numberplate and indicator lights must be red.

Warning lights

Parking brake and brake failure warning lights, where fitted, must work.

Flashing lights

A flashing light can be distracting to the driver so must not be directly visible from the normal driving position of the vehicle to which it is fitted.

The use of flashing warning lights is limited to particular types of vehicles and in particular circumstances. Flashing warning lights, where required, must be visible in normal daylight from a distance of 200 metres to drivers approaching from any direction.

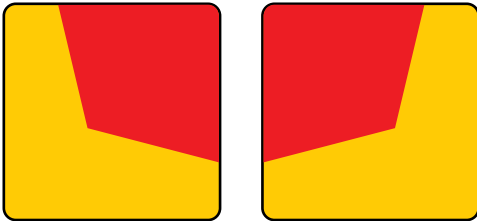
An amber/yellow flashing light warns road users of an obstruction to the free flow of traffic and is generally used by road maintenance vehicles, tow trucks and roadside assistance vehicles.

A red and blue flashing light warns road users of the presence of an emergency service vehicle associated with a risk-to-life situation. Red and blue flashing lights can only be fitted to police vehicles, fire and rescue service vehicles and ambulances.

Rear marking plates

All motor vehicles with a GVM exceeding 12 tonnes and trailers with a ATM over 10 tonnes must be fitted with retroreflective marking plates at the rear of the vehicle. Smaller trucks may have rear marking plates fitted too.

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



Rear marking plates may also display **DO NOT OVERTAKE TURNING VEHICLE** in black letters 50 millimetres high as shown if the vehicle exceeds 7.5 metres in length.

Only use plates with approved retroreflective material. Do not modify or use alternative plates except those described previously.



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

When a hauling unit vehicle is rated with a GCM exceeding 12 tonnes or the sum of the laden mass of the trailer and hauling unit exceeds 12 tonnes, rear marking plates must be fitted to the rearmost trailer being towed.

Rear marking plate rules do not apply to route buses used only in urban areas.

The marking plate shown below may be an acceptable alternative, if the first option is not practicable, provided it meets specific dimensions and locations. For further information refer to Standards Bulletin VSB12 – Rear Marking Plates



Rust and corrosion

Any structure, chassis, frame etc. must not have advanced rust – that is rust which could cause the metal to collapse in a crash. Any panel separating the driver or passenger from fuel or engine fumes must not have advanced rust.

Seats and seatbelts

Seats and mountings must be an approved restraint, structurally sound with no exposed parts that protrude due to damage.

All seatbelts must be undamaged and working properly.

Steering

The steering wheel must be undamaged and firmly attached to the steering column. All steering components must be secure, undamaged and not have excessive free play.

Structure

Any structure, chassis, frame etc. must not be distorted, cracked or damaged.

Suspension

Suspension springs must not sag or be modified and all suspension components must be aligned and undamaged.

Wheels and tyres

The correct number of wheels must be properly attached to the vehicle with the right type of nuts and studs. Wheel rims must not be cracked or bent.

All tyres fitted to a heavy vehicle must have at least 1.5 millimetres tread depth over 75% of tyre surfaces which normally contact the road. All tyres must have correct air pressure. Manufacturer's recommendations are a good guide.

Regrooved tyres are acceptable provided such tyres (or retreads) are marked by their manufacturers as being suitable for regrooving. This only applies to heavy vehicles.

Regrooved tyres must be regrooved to meet the requirements of the relevant Australian Standard.

Windscreen and windows

The windscreen directly in front of the driver or in the path of the windscreen wipers must not be cracked, scored or chipped.

Wiper blades, windscreen washers and demisters must be fitted and work well.

Pre-departure checks

All drivers are legally responsible for the safety and roadworthiness of the vehicles they drive. Before driving any vehicle you must ensure it is safe and roadworthy.

Pre-departure safety checks

It is very important to check your vehicle before you drive. These checks can save time and expense later on, reducing the chance of component failure and subsequent loss of vehicle control, which may result in an accident.

The areas you need to cover are listed in this section and can be checked off while completing the safety check.

Engine compartment

- Engine oil level
- Engine coolant level
- Clutch fluid level
- Brake fluid level
- Power steering fluid level
- Screen washer fluid level
- Ancillary drive belts

Electrical

- Headlights: high and low beam
- Driving and fog lights

- Park lights
- Indicators: left and right
- Clearance lights
- Tail lights and plate light
- Brake lights
- Hazard lights
- School warning lights

Vehicle posture, leaks and load

- Vehicle posture
- Fluid leaks
- Load properly secured (trucks)

Coupling

- Air hoses and cables
- Security

Vehicle body

- Body damage
- Mud flap(s) and guards – front and rear
- Cabin entry grab handles
- Door operation and locks
- Windows – operation and damage
- Bus rear window – Emergency Exit
- Cargo and luggage doors (if available)
- Mirror(s) – lens and security
- Plates and signs
- Fuel tanks
- Air tanks
- Toolbox(es)
- Other

Brakes

- Foot and hand controls correctly adjusted and not worn

Hydraulic brakes

- Brake fluid reservoirs must be full
- Hoses, pipes and cylinders leak free
- Rigid pipes bracketed, free of rust and have grommets when passing through chassis frames

Air brakes

- Compressors, drive belts, exhausters and reservoirs securely mounted and undamaged
- Brake air lines, hoses, valve drain cocks and plugs secure, functional and leak-free

Continued over the page

Wheels and tyres

- Rims (dents in flanges, loose lugs and nuts, rust trails, cracks in rim assembly)
- Tyres (tread minimum legal depth of 1.5 millimetres)
- Tyre inflation correct
- Tyre cuts, damage, dual tyres touching, rocks lodged between duals
- Spare wheel(s)/tyre(s)

Generally

- Registration current and in the correct configuration for intended use (use the NTREGO app)
- Warning triangles
- Fire extinguishers

Dealing with problems

If the vehicle you are driving has a maintenance or mechanical problem, you should attend to these immediately.

Keep a record of all repairs and check that the fault has been fixed. Take it back to the repairer if the problem persists.

Uncoupling and coupling

Uncoupling and coupling a prime mover and semi-trailer is a task which can lead to serious accidents, injury and vehicle damage. Follow these steps to perform the task correctly.

Uncoupling a semi-trailer

Before uncoupling:

- make sure your semi-trailer is parked on a level area
- ensure the vehicle is on a surface firm enough to support the trailer landing gear and its load
- make sure the prime mover and semi-trailer are in a straight line.

You will then need to:

1. Apply the parking brakes and tractor/trailer protection valve.
2. Chock the trailer wheels. Always use chocks when you have to park a semi-trailer on a grade. It is best to chock the semi-trailer's front axle in case the landing legs collapse and the rear axle(s) lifts.
3. Disconnect and secure all air hoses and cables.
4. Lower the landing gear ensuring firm and even contact with the ground.
5. Release turntable jaws from kingpin.

6. Raise the trailer until a gap is visible at the fifth wheel (turntable).
7. Secure the landing gear handle.
8. Move prime mover forward slowly until the fifth wheel is just clear of the skid plate.
9. Apply prime mover park brake.
10. Ensure semi-trailer supports its own weight.
11. Drive slowly away.
12. Ensure driver's door is closed whenever vehicle is moving.
13. Conduct all procedures safely and efficiently.

Coupling a semi-trailer

Position the vehicle

- Reverse the prime mover into position, lined up straight in front of the trailer, stopping the prime mover within 30 cm of the skid plate.
- Apply the parking brake.

Trailer check

- Check the trailer skid plate, kingpin, turntable jaws, airlines, leads and connections for damage.
- Make sure the turntable jaws are open and aligned with the kingpin.

Coupling the trailer

1. Return to the vehicle and reverse the prime mover slowly under the trailer until the turntable jaws lock around the kingpin.
You should hear the jaws close and lock into place.
2. Raise landing gear just clear of the ground (approximately 1 cm).
3. Perform a 'tug test' to check the trailer is locked on by trying to move off in first gear with the trailer brakes on. The prime mover should not move.

4. Repeat this check to be absolutely sure.
5. Check that the coupling release lever is in the locked position and there is no gap between the turntable and the trailer skid plate.

A visible gap between the turntable and the trailer skid plate may mean the trailer is set too high.

Try lowering the trailer on the landing gear slightly and the gap should close but if it does not check for any problems.

6. Check that the turntable jaws are closed correctly and have locked on to the kingpin.
Make sure that the head of the pin is not sitting on top of the jaws.
7. Connect air hoses and cables.
8. Fully raise the landing gear and stow the handle.
9. Remove wheel chocks (where applicable).
10. Check operation of all lights and indicators on trailer and prime mover.
11. Return to cab and charge trailer brake air system.
12. Apply trailer brakes, release parking brake and perform secondary tug test.

Uncoupling a truck and trailer

Secure the vehicle

- Make sure your truck and trailer are parked on a level area.
- Ensure they are on a surface firm enough to support the trailer drawbar support leg if fitted.
- Make sure the truck and trailer are in a straight line.

Uncoupling the trailer

1. Apply park brake.
2. Lower drawbar support leg.
3. Disconnect and secure all hoses and cables.
4. Release towing connection.
5. Drive slowly forward.
6. Check mirrors to confirm disconnection.

Coupling a truck and trailer

Note: These procedures may need to be varied.

1. Check coupling assembly including guide flange, towing and locking pins, and connections.
2. Check pin is in the coupling position.
 1. Reverse truck close to, but not touching, draw bar.
 2. Check height and alignment of eye ring to coupling assembly, adjusting if necessary.
 3. Reverse truck slowly until the towing system is locked or in position to be connected.
 4. Look to check the connection.
 5. Connect air hoses and cables.
 6. Raise drawbar support leg and stow (if fitted).
 7. Perform a 'tug test'.
 8. Check operation of all lights and indicators on trailer and prime mover.
 9. Switch off engine and inspect by listening for air leaks.