



National Heavy Vehicle Regulator

National Heavy Vehicle Inspection Manual

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Please note: While every attempt has been made to ensure the accuracy of the content of this *National Heavy Vehicle Inspection Manual*, it should not be relied upon as legal advice.

Preamble

Introduction

The National Heavy Vehicle Inspection Manual (NHVIM) applies to all vehicles that have a Gross Vehicle Mass (GVM) greater than 4.5 tonnes. The manual has been updated by the National Heavy Vehicle Regulator (NHVR) as part of its task to develop consistent principles and practices for the safe and efficient operation of road transport in Australia.

The aim of the manual is to provide a consistent test/fail guideline for heavy vehicle inspections that are in line with National Transport Reform. The manual details practical information about wear, damage or change to important systems regarding vehicle in-service inspections for owners, operators and administrators in each state and territory of Australia.

Jurisdictions have successfully managed the risks associated with the inspection of heavy vehicles through the utilisation of well trained and experienced staff and the application of risk based discretion and knowledge when conducting inspections. The manual is a test/fail guideline that supplements this knowledge and experience of the inspection process and is not intended to be a prescriptive method by which to conduct heavy vehicle inspections or when to inspect specific components of a heavy vehicle.

For a vehicle to be considered roadworthy it must comply with the *Heavy Vehicle (Vehicle Standards) National Regulations*, and the relevant *Australian Design Rules* ('ADRs'). These contain mandatory requirements for the safe design, construction and maintenance of vehicles and for the control of emissions and noise. Relevant legislation as applicable in each jurisdiction should also be checked for requirements e.g. those in relation to passenger transport vehicles.

When using the manual, the following principles are relevant:

- equipment required by the Vehicle Standards or ADRs to be part of a vehicle must be present and work properly;
- equipment which is essential for compulsory equipment to function, for the safe operation of a vehicle and for the control of its emissions, must be kept in good condition;
- equipment that is not required by the Vehicle Standards and has no direct effect on the vehicle's safe operation or the control of its emissions does not have to function, as long as it does not interfere with compulsory equipment that is required;
- manufacturers' recommendations relevant to the safety of particular vehicle parts or to the control of emissions must be considered; and
- test methods or other conditions have not been specified except where they are necessary to determine whether criteria are met.

Some inspection processes and standards apply only to certain heavy vehicles. Similarly, a heavy vehicle may have been exempted from a Vehicle Standard or ADR¹.

Relevant ADRs are noted at the beginning of each section of the manual. Some of the ADRs may have been repealed since publication of the manual or included in ADR 42/04 General Safety Requirements. However, depending on the age of the vehicle being inspected, the ADR or aspects of the ADR may still be applicable. All relevant documents should be consulted for a complete list of the requirements.

The manual has been adapted from the National Transport Commission (NTC) *National Heavy Vehicle Inspection Manual December 2004* as part of its task to develop uniform principles and practices for the safe and efficient operation of road transport in Australia.

Purpose

The purpose of the manual is to provide owners, vehicle inspectors and other customers of jurisdictions with consistent practical steps that when applied during a heavy vehicle inspection (at the discretion of the inspector) establish a nationally consistent test/ fail criteria for heavy vehicle roadworthiness in Australia.

Scope

The manual will provide information for Authorised Inspection Stations (AIS), On-Road Inspectors, enforcement agencies, Industry and Vehicle Certification providers on the national test/fail criteria for heavy vehicle roadworthiness in Australia.

As a general rule the application of consistent test/fail criteria will prevent duplication of effort within and between jurisdictions and through mutual recognition lead to a more efficient transfer of heavy vehicles between states and territories.

The manual is intended to apply to in-service heavy vehicles. Where heavy vehicles have been modified inspectors will need to assess the vehicle against whatever approvals have been issued for the heavy vehicle in question. These may be in the form of an engineer's report, a Vehicle Standards exemption, a second stage manufacturer compliance plate or an authorised modifiers plate which signifies that the modifications have been carried out to an accepted standard.

The manual will be supplemented by each Jurisdictions administrative processes and procedures.

The manual at present does not cater for some vehicle considerations such as smart braking and these types of considerations have been included into a forward work program list to be included in future updates to the manual. For the present, inspectors

¹ An ADR or Heavy Vehicle (Vehicle Standards) National Regulation developed after publication of the NHVIM may allow a variation or exemption.

will be requested to refer to manufacturer specifications in the absence of a test/fail reason for rejection.

Objectives

The use of the same test/fail criteria in all jurisdictions for heavy vehicle inspections will ensure a more consistent approach to the management and detection of vehicles which are unsafe.

Consultation

The procedures set out in this manual reflect current consultation with road user groups, road authorities and manufacturers and suppliers. The NHVR seeks to continually update and improve this manual. Contributions and feedback may be made by sending an e-mail to vehiclestandards@nhvr.gov.au.

Impact

Road transport operators have made frequent representations to the government on the importance to industry of consistency in on-road and workshop vehicle inspection practices.

Use of this manual will improve the consistency of decision making by all authorised vehicle inspectors in relation to the test/fail assessment of heavy vehicles. In turn, this process will deliver more consistent vehicle inspection outcomes for vehicle operators throughout Australia.

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Amendments

Ver #	Section	Page	Date	Who	Summary of changes

Heavy Vehicle Inspection Checklist

Preliminary

- Reason for Inspection

Identity

- Compliance Plate/ Date of Manufacture
- Seating Capacity
- Make/ Model/ Series
- Colour
- Body Type
- VIN/Chassis No
- Engine No.
- Cylinders/ Rotors
- Registration number
- Odometer reading

Compliance

- | | |
|--|--|
| <input type="checkbox"/> Headlights/ Park Lights | <input type="checkbox"/> Auto Gear Selector |
| <input type="checkbox"/> Indicators/ Brake Lights | <input type="checkbox"/> Seats |
| <input type="checkbox"/> Reflectors | <input type="checkbox"/> Seat Belts |
| <input type="checkbox"/> Windscreen Wipers/ Washers | <input type="checkbox"/> Wheels |
| <input type="checkbox"/> Windows | <input type="checkbox"/> Tyres |
| <input type="checkbox"/> Horn | <input type="checkbox"/> Suspension |
| <input type="checkbox"/> Body | <input type="checkbox"/> Brakes |
| <input type="checkbox"/> Mudguards | <input type="checkbox"/> Air Lines & Couplings |
| <input type="checkbox"/> Marker Plates (if required) | <input type="checkbox"/> Oil/ Fluid Leaks |
| <input type="checkbox"/> Doors | <input type="checkbox"/> Drive Train |
| <input type="checkbox"/> Mirrors | <input type="checkbox"/> Exhaust System |
| <input type="checkbox"/> Steering Wheel/ Steering | <input type="checkbox"/> Floor Panels |
| <input type="checkbox"/> Park Brake | <input type="checkbox"/> Turntable/ Trailer Coupling |
| <input type="checkbox"/> Service Brake | <input type="checkbox"/> LPG/ CNG Fuel Systems |
| <input type="checkbox"/> Clutch | <input type="checkbox"/> Engine |

Heavy Trailer Inspection Checklist

Preliminary

- Reason for Inspection

Identity

- Compliance Plate Affixed
- Make
- Model
- Main Body Colour
- Vehicle Type
- VIN/ Chassis No.
- ATM
- Registration number

Compliance

- Axles
- Wheels
- Wheel Bearings
- Tow Coupling
- Safety Chain
- Draw Bar
- King Pin/ Skid Plate
- Tray Condition
- Service Brake
- Park Brake
- Air Lines & Couplings
- Tyres
- Suspension
- Mudguards
- Marker Plates (if required)
- Stop Lights
- Park Lights
- Reflectors
- Indicators
- Clearance Lamps (if required)
- Rear end visibility
- Rear end over hang

Section 1 : Vehicle Identification

Australian Design Rules relevant to this section:
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ADR 61 Vehicle markings

OBJECTIVE: To ensure that vehicle being inspected is authentic and correctly identified.

1.1 Check the identity of the vehicle

Reasons for Rejection

- a) No VIN/ Chassis number present;
- b) VIN on vehicle plate differs from that stamped into body or chassis;
- c) VIN/ Chassis number has been altered or tampered with;
- d) Engine number has been altered or tampered with (except trailers);
- e) No engine number present;
- f) A trailer manufactured after July 1984 that is not fitted with an Australian compliance plate and has not been previously registered in Australia;
- g) Motor vehicle manufactured prior to August 1972 that has not been previously registered in Australia;
- h) For a vehicle that is used in a Road Train or B-Double combination, the vehicle plate does not include the words "ROAD TRAIN" and/ or "B-DOUBLE"; and for a trailer designed for use in a Road Train, the words "ROAD TRAIN TRAILER".

NOTE: *Where a vehicle fails the above identity inspection the Tiered Identity Inspection Regime of the jurisdiction should be applied or the matter referred to the Police.*

Section 2 : Brakes

Australian Design Rules are relevant to this section:

ADR 35	Commercial vehicle brake systems
ADR 38	Trailer brake systems
ADR 42	General safety requirements
ADR 63	Trailers designed for use in Road Trains
ADR 64	Heavy goods vehicles designed for use in Road Trains and B-Doubles

OBJECTIVE: To ensure that the brakes operate effectively and are correctly adjusted.

2.1 Check brake components

Reasons for rejection

- a) Brake pedals do not have an anti-slip surface across the complete surface;
- b) Brake pedals or handles are broken or missing or are outside the scope of manufacturer's original design;
- c) Brake control mountings, pivots, cables or links are kinked, missing, loose, broken, excessively worn or binding;
- d) Vehicle is not equipped with an effective mechanical park brake;
- e) Any handle or control lever on a parking brake is not fitted with a locking device capable of holding in any position;
- f) Park brake control can be released with only one action;
- g) Abrasions or cuts on brake hoses penetrate further than the outer protective covering;
- h) Brake pipes, hoses and connections are not securely mounted, cracked, broken, kinked, crimped, damaged by heat or have visible signs of leakage, swelling or bulging;
- i) Brake drums or discs are not fitted or have missing pieces, or cracks other than short heat cracks inside the drums or in the disc;
- j) Drums or discs are worn beyond manufacturers specifications;

- k) Any calliper, wheel cylinder or master cylinder leaks;
- l) Linings or pads are contaminated with oil, grease or brake fluid;
- m) The thickness of the linings or pads is less than the manufacturer's recommended minimum. If this is not known or is no longer appropriate, the thickness of the linings or pads is less than the following:
 - the rivet or bolt head on riveted or bolted linings; or
 - within 3mm of the pad mounting surface on bonded pads; or
 - within the following height from the shoe mounting surface on bonded linings:

Table 1: Shoe Lining Height

Nominal lining thickness	≤ 5mm	>5mm <u><10mm</u>	>10mm <u><13mm</u>	>13mm <u><19mm</u>	>19mm
Minimum lining thickness	0.8mm	3mm	5 mm	6 mm	7mm

- n) Brake chambers (including chamber clamps) or camshaft support brackets are loose, bent, cracked or missing;
- o) Brake linings or pads are missing, broken or loose on their shoes or plates, springs, anchor pins, cam rollers or bushes, pull or push rods, clevis pins, retainers or brake chamber mounting bolts are missing, loose, damaged or broken;

NOTE: *It is acceptable to have small cracks that do not affect the way the friction materials are attached.*

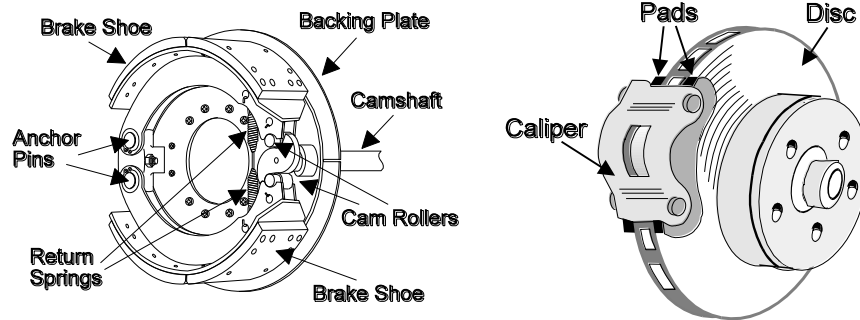
- p) In the case of hydraulic, or air over hydraulic brakes, the reservoirs, master cylinders or servo units are loose, cracked, broken, or excessively worn or are damaged so that leaks are likely;
- q) Vehicles equipped with Antilock Systems (ABS) where the antilock system warning light is inoperative or indicates a system fault or is missing;

NOTE: *Some servo units have a stroke indicator to indicate excessive stroke. This may need to be observed when the brakes are applied - see Section 2.2*

- r) In the case of hydraulic, or air over hydraulic brakes, the fluid level in a master cylinder reservoir is below the minimum level.

Figure 1: Drum Brake Components

Disc Brake Components



2.2 Check brake adjustment

Reasons for rejection

- a) With any brake fully applied, a brake adjustment indicator runs out of travel or indicates that adjustment is necessary;
- b) Brake chamber push or pull rods move more than 80% of their max stroke or travel over centre with the brakes fully applied;
- c) With any brake fully applied any stroke indicator displays evidence of excessive stroke;
- d) The park brake and/ or emergency brake is not capable of being fully applied without the control running out of available travel;
- e) The brake adjusters are bent, damaged or excessively worn, or are not properly adjusted.

2.3 Check air compressor/ vacuum pump

Reasons for rejection

- a) The air compressor or vacuum pump has loose mounting bolts, or cracked or broken mounting brackets, braces or adaptors, or is inoperative;
- b) Drive pulleys are cracked, broken or loose;
- c) Drive belts are loose, cracked through to reinforcing plies, extensively frayed or missing drive sections.

2.4 Check air filters

Reasons for rejection

- a) Filter units for air compressors or vacuum pumps are not fitted, loose, blocked or damaged.

2.5 Check braking system operation

Reasons for rejection

- a) Any brake failure indicators do not operate;
- b) Any brake air or vacuum storage system is not fitted with a visual or audible warning device to warn the driver whilst seated in the normal driving position of a lack of air or vacuum;
- c) Any compulsory pressure, vacuum or low level warning devices or gauges do not operate;
- d) The brake controls do not cause the corresponding brake to apply when they are operated (with the engine running if necessary).

2.6 Check vacuum assisted brake system integrity

Reasons for rejection

- a) With vacuum depleted from the system and with moderate steady force applied, the brake pedal does not travel towards the floor when the engine is started;
- b) With the engine stopped, one application of the service brake with a moderate pedal force results in the low vacuum indicator coming on;
- c) If a trailer is connected to the motor vehicle, the trailer vacuum brakes cannot be applied from the normal driving position;
- d) A brake pedal that is held depressed while the engine is running, tends to rise when the engine is stopped;
- e) Vehicle is not fitted with at least one vacuum storage reservoir or tank;
- f) The reservoir or tank for vacuum is not protected by a check valve;

- g) Vacuum is not available as soon as the engine starts, or build up time to reach the low vacuum mark (to deactivate the warning device) is longer than 30 seconds;
- h) Time taken for vacuum to reach normal working level when the vacuum reserve is fully depleted is longer than 60 seconds;
- i) The vacuum warning device (if fitted) does not deactivate when the low mark is reached;
- j) The loss of vacuum from its maximum indicated level exceeds 125mm Hg in 10 minutes when the engine is stopped;
- k) With the engine stopped and vacuum at its maximum indicated level, the vacuum gauge reading does not fall progressively with every application of the service brake;
- l) With the engine stopped, there is insufficient level of vacuum to allow at least two-assisted service brake applications.

2.7 Check air brake system integrity (including air over hydraulic)

NOTE: *These checks require the assistance of a person to operate the vehicle controls.*

Use chocks to prevent accidental movement of the vehicle.

Observe manufacturer's shut-down instructions before switching off the engine (e.g. to avoid turbo-charger damage).

Reasons for rejection

- Step 1:** Start the engine and charge up the braking system until the low-pressure warning device turns off. Apply the brake several times until the low-pressure warning device activates.
- a) A visual or audible warning device connected to the brake system does not provide a warning to the driver when the air pressure is lowered to less than the following levels, unless the manufacturer specifies a different level:
 - 420 kPa (60psi) for ADR 35 vehicles, or
 - 350 kPa (50psi) for pre-ADR 35 vehicles.

- Step 2:** Build the pressure up to its maximum level and note this pressure.
- a) The cut-out pressure is more than 1120 kPa (160psi), or less than 720kPa (100psi) unless other values are recommended by the manufacturer.
- Step 3:** With the engine running, apply the service brakes several times until the governor "cuts in".
- a) The governor cut-in pressure is less than 550kPa (80psi), unless another value is recommended by the manufacturer.
- Step 4:** Recharge the system to maximum pressure. *Stop the engine.* Have the assistant apply and hold the service brake. Check around the vehicle for audible air leaks.
- a) Any air leak;
 - b) With the brake system fully charged, the engine stopped and the service brake applied, the air brake pressure drops more than 20 kPa (3psi) per minute. An additional drop per minute of 5 kPa is allowed for each trailer that may be attached.
- Step 5:** Release the service brake. With the engine stopped and the service brake released, the air brake pressure drops more than 15 kPa per minute. An additional drop per minute of 5 kPa is allowed for each trailer that may be attached.
- Step 6:** Fully apply and release the service brake four more times.
- a) After four more full applications of the service brakes the reservoir pressure drops to less than 50% of the maximum value observed in Step 2.
- Step 7:** Fully deplete the braking system by repeatedly applying the service brake. Observe the operation of the low pressure warning device (see "reason for rejection" (a)). Observe operation of spring brakes, if fitted.
- a) Spring brakes activate before the low pressure warning device activates.
- Step 8:** Apply and release the parking brake.
- a) The parking brake is inoperative or on a vehicle with a reserve air tank is unable to be released at least once.
- Step 9:** Charge up the braking system by operating the engine at manufacturer's recommended

speed, if necessary. Note the time it takes for the system to charge from zero to 80% of the maximum pressure (as noted in Step 2).

- a) Time taken to charge from zero to 80% of maximum pressure exceeds 5 minutes.

Step 10: One at a time, open the drain valve of each reservoir for a sufficient time to notice a pressure drop on the pressure gauge(s).

- a) Air reservoir drain valves are inoperative;
- b) Excessive oil drains from the reservoir (this usually indicates a faulty compressor);
- c) Where ADR 35 applies, the pressure in both sub-circuits falls when the reservoir of one of the sub-circuits is drained.

NOTE: *Although it is usually a sign of neglected brake maintenance, excessive water in a reservoir is not a reason for rejection, provided that it is fully drained during the check.*

When performing a dynamic emergency brake test, care is to be taken not to damage components (e.g. tail shaft mounted emergency brakes).

Step 11: Where ADR35 applies one sub-circuit should be fully drained and a check made that the brakes on the remaining sub-circuit operate when the service brake is applied (observe actuators or feel for pressure in flexible brake lines). The brake pressure should then be recharged and the test repeated for the other sub-circuit.

- a) When the air-pressure in one (and only one) sub-circuit is fully drained any brake connected to the other sub-circuit fails to operate when the service brake is applied;
- b) Where fitted, spring brakes apply when one sub-circuit is fully drained.

NOTE: *ADR 35 and ECE R13 both require brake tests to be conducted with the engine running.*

For certain vehicles spring brakes may apply if the engine is not running and the service brake circuit has been fully deplete of air.

In a single circuit service brake system, energy to hold off spring brakes is supplied by a separate dedicated reservoir.

In a dual circuit service brake system, spring brakes are normally held off by residual line pressure. Repeated applications of the service brake will cause the spring brakes to apply, which is acceptable.

2.8 Check hydraulic brake system integrity

Reasons for rejection

- a) When a constant force is applied to the brake pedal for 10 seconds:
 - after the initial travel, the service brake pedal travels to the floor; or
 - the brake system failure indicator comes on.
- b) When the service brakes are firmly applied, less than 20% of the pedal travel remains (unless the brake system is designed for greater travel);
- c) When soft pumping makes the brake pedal travel to the floor.

2.9 Service brake test with a decelerometer

NOTE: *Decelerometer standards should be read in conjunction with the equipment manufacturer's specification.*

On some vehicles with light axle loads, or when testing in wet weather, it might be difficult to obtain a brake test result because of wheel lockup. In these cases the pedal pressure should be reduced to a point where only the minimum specified deceleration rates are achieved.

Set up a suitable decelerometer in the vehicle cabin. Drive the vehicle to a speed of at least 35km/h. If the vehicle has a manual transmission, put the transmission into neutral, automatic transmission vehicles may remain in gear. With hands on the steering wheel, bring the vehicle to a halt as rapidly as possible in a safe manner with one sustained and smooth application of the service brakes.

Reasons for rejection

- a) The application of the brakes causes the vehicle to swerve from a straight line path;
- b) The service braking system decelerates the vehicle at less than the performance requirement specified in Table 2;
- c) Individual wheel locking cannot be controlled.

Table 2: Service Brake Performance

Type of vehicle	Average		Peak	
	m/ s ²	%g	m/ s ²	%g
GVM exceeding 4.5 tonnes	2.8	29	4.4	45

2.10 Emergency brake test with a decelerometer

Emergency brake test with a decelerometer for vehicles not designed to ADR35 or vehicles not fitted with a tandem master cylinder/ dual circuit brakes.

After installing a decelerometer, drive the vehicle to at least a speed of 35 km/h. If the vehicle has a manual transmission, put the transmission into neutral, automatic transmission vehicles may remain in gear. Bring the vehicle to a halt as rapidly as possible in a safe manner with one sustained and smooth application of the emergency brake.

NOTE: *Hand brakes fitted to drive shaft or gear box are not tested to this method. When performing a dynamic emergency brake test, care is to be taken not to damage components (e.g. Tail shaft mounted emergency brakes).*

Reasons for rejection

- a) The emergency brake decelerates the vehicle at less than the performance requirement specified in Table 2.

Table 3: Emergency Brake Performance

Type of Vehicle	Average		Peak	
	m/ s ²	%g	m/ s ²	%g
GVM exceeding 4.5 tonnes	1.1	12	1.5	16

NOTE: *When performing a dynamic emergency brake test, care is to be taken not to damage components (e.g. Tail shaft mounted emergency brakes).*

2.11 Parking brake test for vehicles designed to ADR 35

Parking brake test for vehicles designed to ADR 35 or vehicles fitted with a tandem master cylinder/ dual circuit brakes.

Apply the park brake and attempt to drive forward using a light throttle.

Reason for rejection

- a) The parking brake does not provide any retardation.

2.12 Brake testing with a skid-plate tester

NOTE: *This section should be read in conjunction with the equipment manufacturer's instructions.*

Using a skid-plate tester, check the deceleration rates and retardation forces on each axle in accordance with the manufacturer's test procedure.

Reasons for rejection

- a) There is more than 30% difference in the brake force between the wheels on any same axle;
- b) The service braking system decelerates the vehicle at less than the performance requirements specified in Table 2;
- c) In other than ADR 35 vehicles, or vehicles fitted with a tandem master cylinder/dual circuit brakes, the emergency brake decelerates the vehicle at less than the performance requirements specified in Table 3;
- d) Where ADR 35 applies, or vehicles fitted with a tandem master cylinder/dual circuit brakes, the parking brake does not provide any retardation.

2.13 Brake testing with a roller brake tester

NOTE: *This section should be read in conjunction with the equipment manufacturer's instructions.*

Using a roller brake tester, check the retardation forces on each wheel.

Release all brakes, place transmission in neutral (not "park" for automatic transmission) and slowly apply the service brake until maximum force is attained, or wheel slip occurs.

Reasons for rejection

- a) There is more than 30% difference in the brake force between the wheels on any same axle;
- b) The minimum service brake efficiency is less than the requirements specified in Table 4;
- c) With all brakes released, the brake drag at any axle exceeds the performance requirement specified in Table 5;
- d) Any parking brake assembly that when applied does not give a reading, or the vehicle does not lift out of the rollers.

Table 4: Minimum Brake Force

Type of vehicle	kN/ tonne (minimum)
GVM exceeding 4.5 tonnes	4.5

NOTE: *The minimum brake efficiency (kN/tonne) is determined by:
Step 1. adding the brake force for each axle;*

Step 2.dividing the vehicle mass by Step 1.

Table 5: Maximum Brake Drag

Type of Vehicle	kN (maximum)
GVM exceeding 4.5 tonnes	1.0 drive axle 0.5 other axle

2.14 Check trailer brakes and breakaway protection

NOTE: *The examiner should seek the assistance of another person in order to make a thorough check of the breakaway protection.*

Reasons for rejection

- a) In an air or vacuum assisted brake system when any trailer hose coupling or connection is disconnected to simulate a breakaway situation the trailer service brakes do not operate immediately the trailer service hose coupling or connection is disconnected from the towing vehicle and do not remain fully applied for at least 15 minutes;
- b) A truck trailer interconnecting flexible hose and coupling is not properly mated or secured;
- c) The trailer brakes are not capable of being applied and released from the normal driving position;
- d) Any trailer having brakes which are air or vacuum assisted is not fitted with a reservoir that is protected by a check valve;
- e) Any trailer having brakes, which are air or vacuum assisted, is not built to provide a visible or audible warning to the driver of the towing vehicle, while the driver is in a normal driving position, of a lack of air or vacuum.

NOTE: *For more information on braking systems, refer to Appendix A 'Brake Drums and Discs'.*

2.15 Road testing of service brakes

Using a suitable area with a hard level surface and be free from gravel or loose material, which must be at least 350 metres in length for testing of heavy vehicles. Drive the vehicle to 35 km/h then put the transmission into neutral, automatic transmission vehicles may remain in gear. With both hands on the steering wheel bring the vehicle to a halt as rapidly as

possible in a safe manner with one sustained and smooth application of the service brakes.

Reasons for rejection

- a) The application of the brakes causes the vehicle to swerve from a straight line path;
- b) For vehicles built after 1930, the service braking system fails to bring the vehicle to a stop within the distance specified in Table 6.

Table 6: Service Brake Performance

Type of Vehicle	Distance
GVM exceeding 4.5 tonnes	16.5 metres

NOTE:

1). The maximum stopping distance in this table are intended to cover a wide range of vehicles including some older vehicles with older braking systems. If a modern vehicle is found to only just comply with the prescribed values then the owner should be informed that the brakes are likely to be in need of maintenance.

2). For vehicles built before 1930 no service brake performance requirements apply but the on-road brake test should be conducted to assist in determining whether a brake maintenance problem exists - such problems should be followed up by visual inspection of the brake components.

Section 3 : Couplings

Australian Design Rules are relevant to this section:

ADR 62 Mechanical connections between vehicles

ADR 63 Trailers designed for use in Road Trains

OBJECTIVE: To ensure that all tow couplings and associated components are in a serviceable condition and that they provide the necessary load carrying capacity.

NOTE: *This section should be read in conjunction with ADR 62 and manufacturer's specifications for minimum requirements.*

3.1 Check fifth wheels/ turntables

Reasons for rejection

- a) Where ADR 62 applies, the fifth wheel/ turntable does not display the manufacturer's name/ trademark, nominal size (e.g. 50mm) and the 'D-value' rating;
- b) The mating parts of a coupling used to connect a semi-trailer to a towing vehicle allow the semi-trailer to roll to an extent that makes the towing vehicle unstable;
- c) The top and bottom mounting flanges have insufficient effective fasteners;
- d) Fasteners either side of the mounting frame, plate or pivot brackets are insufficient or ineffective;
- e) Fifth wheel/ turntable mounting plate or sub frame assembly securing bolts are missing, broken or loose, or the fasteners are "U" bolts;
- f) There is movement between the fixed mounting components;
- g) There is more than 5mm horizontal movement between:
 - the pivot bracket pin and bracket, or
 - a slider bracket and slide base.
- h) There are cracks in mounting angles or plates, pivot brackets, slider components or coupler plates except for casting shrinkage cracks;

- i) The fifth wheel pivot bracket pin/s or bushes are missing, insecure or excessively worn;
- j) The locking mechanism on either side of a sliding coupling is missing, inoperative or excessively worn;
- k) End stops on slides are missing or insecure;
- l) King pin locking mechanism parts are missing, or damaged to the extent that the king pin is not securely held;
- m) The top and bottom plates, flanges and welds are loose, cracked, missing or broken;
- n) Ball bearing type turntables are worn beyond the manufacturer's specifications, or to the extent that the upper and lower flanges or bearing halves touch each other or the ball bearings seize.

NOTE: *The fifth wheel feet shall be secured to the base plate either using bolts or by welding. Bolting is preferred - welding is only permitted if the turntable manufacturer recommends this method.*

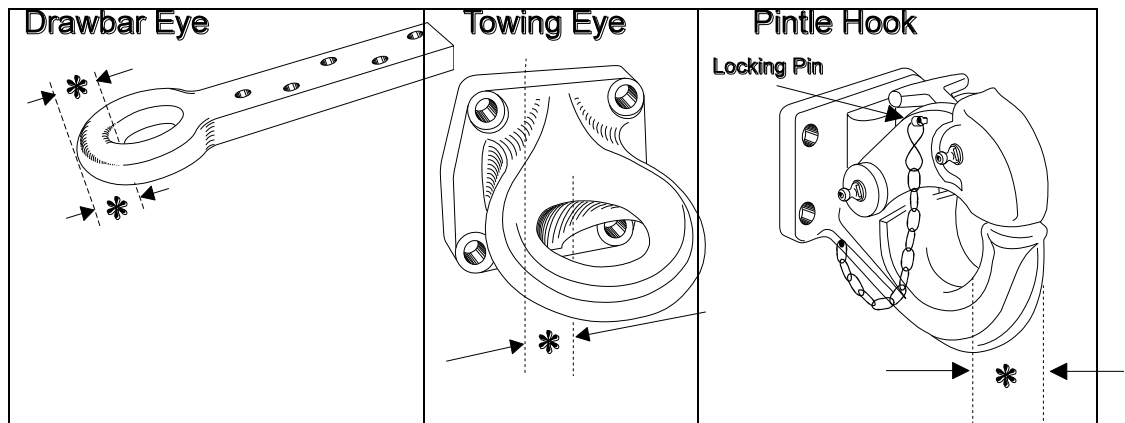
Trailer kingpins and skid plates are covered in section 14.6 of this manual.

3.2 Check pin couplings and pintle hooks

Reasons for rejection

- a) Where ADR 62 applies a 50mm pin type coupling does not display the manufacturer's name/ trademark, rated vertical load and the 'D-value rating';
- b) The tow ball or hook assembly (127mm or hook type) is not legibly and indelibly marked with the manufacturer's name or trademark and the rated 'D-value';
- c) Deformed or cracked fasteners including welds. (See Figure 2)

Figure 2: Typical tow devices



***Typical wear surfaces**

- d) Any mounting bolts, fasteners or weld beads have advanced corrosion;
- e) The area that the pin coupling or pintle hook is mounted on is loose or cracked or any locking mechanism is not fitted or is inoperative;
- f) The pin coupling or pintle hook welds have cracks;
- g) Pin couplings or pintle hooks are worn beyond the manufacturer's limits. If the manufacturer's limits are not known, any dimension on a wear surface of the horn of a pintle hook or pin coupling is worn more than 5% of the original diameter;
- h) Any wear on the diameters of each of the coupling pin and the drawbar eye bush greater than 1.5mm;
- i) Any transverse or circumferential welds on the draw bar eye block.

NOTE: *Wear should be checked by direct measurement, or by the use of a gauge. Allowable dimensions for worn components are given in Table 7.*

Table 7: Allowable Dimensions in Millimetres for Worn Components

Component	Standard Dimension	Allowable Wear Limit*	Gauge Sizes
Coupling pin	48.7 OD	47.2 min	47.1
Drawbar eye bush	50.0 ID	51.5 max	51.6

** When the wear of components is checked by direct measurement, it should be noted that an elliptical wear pattern is generated on the bore of the drawbar eye bush, and on the outside of the pin.*

3.3 Check tow bar

Reasons for rejection

- a) The towbar is not securely mounted or is bent or cracked;
- b) Any mounting bolts, fasteners or weld beads have advanced corrosion or cracks;
- c) Where ADR 62 applies the tow bar and towing ring does not display the manufacturer's name/ trademark, the rating and the make and model of the vehicle/s for which it is designed;
- d) Where any part of the tow bar is removable, the bolts, studs, nuts etc fastening those parts do not have a locking device such as a U-clip, split pin, spring washer or nylon lock nut;
- e) Tow bar assembly used to tow rigid draw bar trailers is not fitted with two safety chain attachments mounted one on either side of and adjacent to the tow coupling;
- f) Safety chain attachments are not affixed to part of the tow assembly that is permanently attached to the vehicle.

NOTE: *Always check the underside of drawbar and drawbar eye for excessive wear and cracks.*

3.4 Check towing attachments

Reasons for rejection

- a) Any towing attachment (such as a tow-ball or pintle hook), any mounting bolts, fasteners or weld beads are loose, cracked, broken or extensively corroded;
- b) Safety chain/s or cables (if required) are not able to be connected or affixed in such a way that the safety chain/s or cables are liable to accidental disconnection and are not readily detachable from the towing vehicle;
- c) Safety chain or cable retaining brackets are cracked, deformed or insecure;
- d) Safety chain or cable retaining brackets do not meet required standards;

- e) The tow coupling capacity does not equal or exceed the Aggregate Trailer Mass (ATM) of any trailer being towed (if applicable).

NOTE: *For information on safety chains, refer to Appendix B 'Safety Chains for Trailers 3.5 Tonnes ATM and above'.*

Required number and size of chains

Two separate chains must be used.

The size of each chain used on the trailer must correspond with the maximum gross mass of the trailer as indicated in Table 8 below. The use of chains larger than specified should be avoided to minimise the shock loading on attachment fittings in the event of coupling failure.

Table 8: Size and Number of Chains Required

Gross Trailer Mass (tonnes)	Chain Nominal Size (mm)	Minimum Chain Braking Load (tonnes)
2.5 – 4.27	7.1	6.4
4.27 – 7.75	9.5	11.6
7.75 – 13.5	12.7	20.4
13.5 – 21.5	15.9	32.0

Section 4 : Steering and Suspension

Australian Design Rules are relevant to this section:

ADR 42 General safety requirements
ADR 43 Vehicle configuration and dimensions

OBJECTIVE: To ensure that the steering and suspension is in good working order and allows the driver effective control of the vehicle.

4.1 Check steering components inside cabin

Reasons for rejection

- a) Steering wheel is not located in the centre or to the right hand side of the vehicle unless the vehicle is built and used for a purpose other than the transportation of goods or people;
- b) The steering wheel is loose on the shaft;
- c) The steering column is insecure;
- d) The steering wheel structure is fractured or the hub, rim or spokes are loose;
- e) Any steering component that has been removed, heated, bent, welded, damaged or inoperative.

4.2 Check steering free play

Reasons for rejection

- a) With the road wheels in the straight ahead position and the engine running (if the vehicle has power steering), rotational free play measured at a point on the steering wheel exceeds:

Table 9: Steering Wheel Diameter and Free Play

Steering wheel diameter (mm)	Movement (mm)
up to 450	75
over 450	100

4.3 Check steering components under the bonnet and under the vehicle

Reasons for rejection

- a) Any steering component is missing, cracked or broken;
- b) Any threaded or tapered joint is loose;
- c) Any free-play due to wear in a ball-joint exceeds manufacturer's specifications. Where these are not known or are no longer appropriate, the free-play exceeds 3mm;

NOTE: Some ball type steering joints are spring loaded or are designed to have a certain amount of play.

- d) Any steering component can be seen to have been repaired or modified by heating or welding;

NOTE: Except where an original component has been fitted by the manufacturer or repairs have been conducted to manufacturer's specifications.

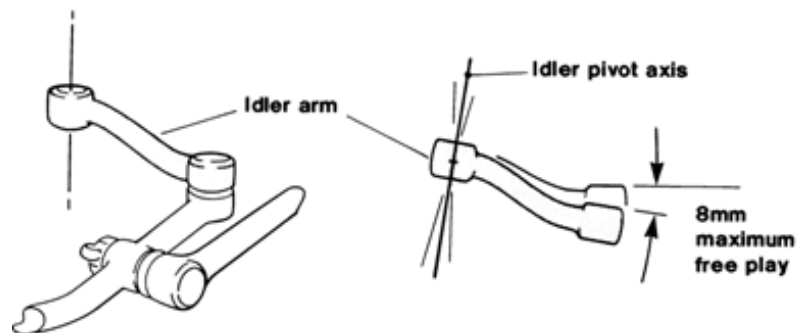
- e) Any nut, bolt or locking device is missing or insecure;
- f) The pitman arm is loose on the steering output shaft;
- g) The steering system is not designed to transmit energy by mechanical means only. (Power assisted steering systems are acceptable);
- h) The power steering pump has loose mounting bolts or cracked or broken mounting brackets, braces or adaptors, or is inoperative;
- i) Power steering pump pulleys are cracked, broken or loose;
- j) Power steering pump belts are loose, cracked through to reinforcing plies, extensively frayed or missing drive sections;
- k) Evidence of oil or fluid leaking from any power steering components;

NOTE: Dampness or staining around seals is acceptable.

- l) With the wheels off the ground, the steered road wheels do not turn freely to the left and right through their normal range of travel;

- m) Steering shaft is not securely connected to the steering box or rack, or is incorrectly aligned or adjusted;
- n) Steering box, rack and pinion assembly, mounting brackets, bolts or couplings are cracked or not securely fixed to the vehicle;
- o) Play at the end of the idler arm exceeds 8 mm;

Figure 3: Idler Arm Free Play

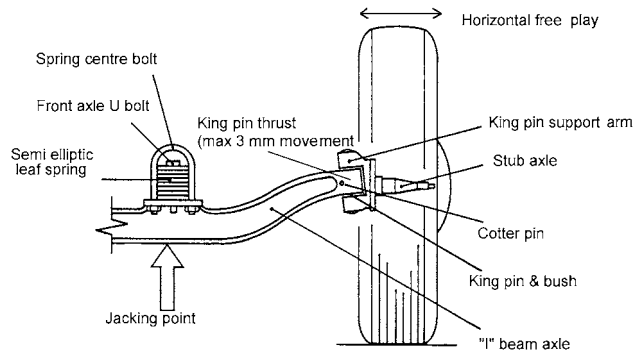


- p) Free play at the steered road wheel rim in a horizontal or vertical plane (excluding any necessary wheel bearing play) exceeds manufacturer's specifications. Where these specifications are not known or are no longer appropriate, free play exceeds the amount in the following table:

Table 9: Rim Diameter and Free Play

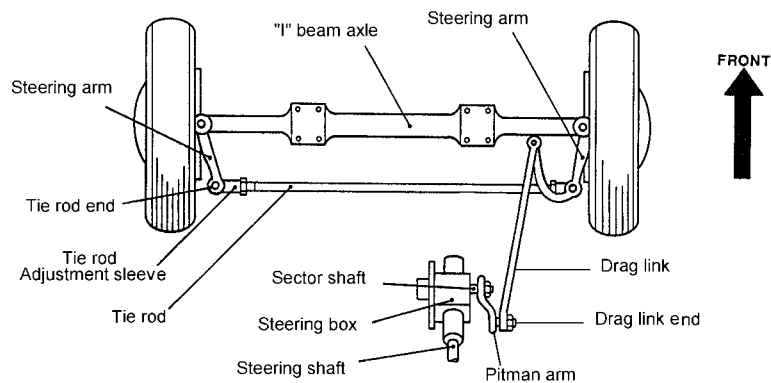
Rim Diameter (mm)	Free play (mm)
up to 405	7.0
over 405 to 455	10.0
over 455	13.0

Figure 4: 'I' Beam axle typical of most heavy vehicles



- q) Any noticeable movement due to wear in any component exceeds manufacturer's specification, or 3mm where this is unknown.

Figure 5: Steering linkage typical of most heavy vehicles



4.4 Check suspension components

Reasons for rejection

- a) U-bolts or other spring to axle or spring pack clamp bolts, centre bolts, spring eyes or hangers, torque, radius or tracking component assemblies, control arms, sway bars, bushes or any parts used to attach them to the vehicle frame or axle are cracked, loose, broken, missing or worn beyond manufacturers' limits;

- b) Any “walking beam” type heavy vehicle suspension has signs of damage to beam;
- c) Springs are cracked, broken or missing;
- d) Springs (including air bags) are sagged or air bag/ components leak;
- e) Leaves in a leaf spring are displaced sideways more than 10% of their width or so that they contact wheels, brakes or the frame;
- f) Shock absorbers, if originally fitted, are missing, loose, inoperative or leak;
- g) Any suspension component is not correctly aligned or is damaged, loose or broken;
- h) Any nut, bolt or locking mechanism is insecure or missing;
- i) Suspension components are missing, or repaired or modified by heating or welding unless specifically approved by an approved vehicle examiner.

NOTE: *Superficial crazing is acceptable on rubber bushes. This is often present on rubber suspension components even when new.*

Later model vehicle suspensions are designed to move within their rubber bushing considerably.

Figure 6: Typical air bag suspension

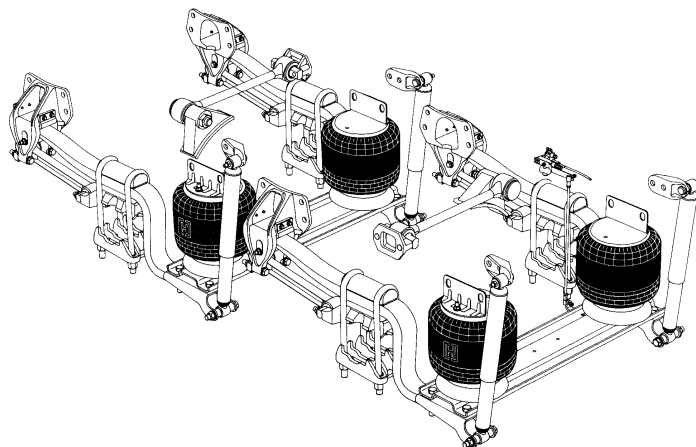
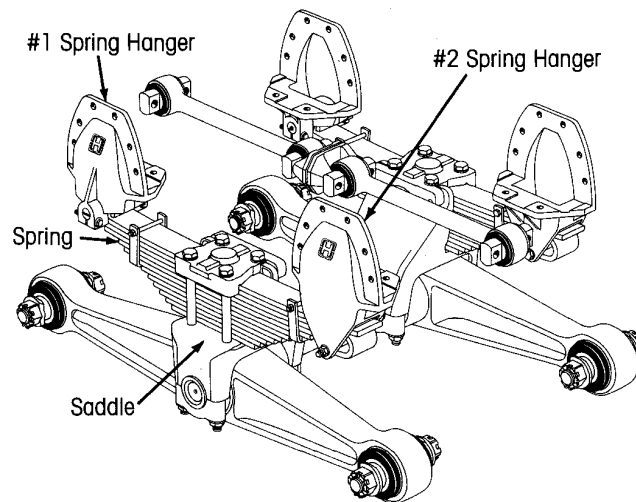


Figure 7: Walking beam suspension - rigid beam



NOTE: *Repairs using either heating or welding may adversely affect the strength of suspension components. Any such repairs should only be affected in consultation with the vehicle or component manufacturer.*

Section 5 : Wheels Tyres and Hubs

Australian Design Rules are relevant to this section:
ADR 42/04 General safety requirements (Tyre and rim selection)

OBJECTIVE: To ensure that road wheels and tyres are of a suitable type and condition and that they provide the necessary load carrying capacity, speed rating and control of the vehicle.

5.1 Check wheels and rims

Reasons for rejection

Any wheel or rim:

- a) is loose;
- b) is cracked;
- c) is buckled;
- d) has pieces of casting missing;
- e) has elongated stud holes;
- f) has weld repairs not in accordance with relevant industry practice;
- g) Any wheel contacts unrelated vehicle components at any point through its full range of travel;
- h) Spiders have cracks across a spoke, hub or web area;
- i) Wheels are not compatible with hubs;
- j) Required valve protection lugs are missing.

5.2 Check wheel/ rim fasteners

Reasons for rejection

- a) The wheel nut does not fully engage the thread of the wheel stud or the fitting of the wheel nut does not match the taper of the wheel stud hole;
- b) Any hub has missing, cracked, stripped or broken wheel mounting nuts, studs or bolts;
- c) Spacer plates are used between hub and wheels, except where fitted by the vehicle manufacturer;

- d) Fasteners are not of the correct type for the wheel being used or allow a rim to slip on its spider.

5.3 Check retaining rings

Reasons for rejection

- a) Lock or side rings are incorrectly seated, sprung, mismatched, bent, broken or cracked.

5.4 Check tyres

Reasons for rejection

- a) A tyre does not have at least 1.5mm tread depth in a continuous band which runs around the whole circumference of the tyre and extends across at least 75% of the width of the tyre;

NOTE: Tread wear indicators are built into most tyres to indicate when tread depth reaches about 1.5mm. The depth of the tyre tread above these indicators is not included in the assessment of tread depth around the circumference of a tyre.

In effect, these requirements allow a tyre to be worn to less than 1.5mm tread depth on its edges, provided that at least 75% of the remaining width of the tyre has a minimum tread depth of 1.5mm around the whole circumference.

- b) The overall diameter of dual tyres on the same side of an axle is not matched within 25mm;
- c) A tyre (including sidewalls) has deep cuts, chunking, bumps, bulges, exposed cords or other signs of carcass failure;
- d) A tyre has been re-grooved (except where indicated on the side wall that the tyres are suitable for re-grooving);
- e) When in the straight ahead position, the wheels and tyres and fittings (wheel nuts, grease caps etc) of any vehicle project beyond the extreme width of the mudguards;
- f) A tyre that exceeds the maximum width of the vehicle;

NOTE: The width of a vehicle is to be measured without taking into account any of the following:

- anti-skid devices mounted on wheels;
- central tyre inflation systems;
- lights;

- *mirrors;*
 - *reflectors;*
 - *signalling devices;*
 - *tyre pressure gauges.*
- g) Any tyre is not of a type constructed for unrestricted road use;
 - h) Any retreaded or remoulded tyre is not marked with the words “**RETREAD**” or “**REMOULD**”, and where speed limited the words “**MAX. SPEED XX KM/H**” or “**SPEED LIMITED TO XX KM/H**”. (XX means the max speed i.e. 125km/h);
 - i) The speed rating of all tyres is not of at least 100 km/h or the vehicle’s top speed, whichever is the lesser, unless a lower rating has been specified by the manufacturer;
 - j) A tyre fitted to a vehicle with a GVM of more than 4.5 tonnes is not suitable for road use if:
 - The tyre load ratings are less than the minimum ratings specified originally by the vehicle manufacturer.
 - k) The tyres on an axle are not of the same carcass construction (e.g. cross ply, radial ply or bias belted);
 - l) Dual tyres contact each other;
 - m) Any tyre on a vehicle contacts the body, chassis, frame, braking, steering or suspension components at any point through its full range of travel;
 - n) A tyre has cleats or other gripping devices that could damage road surfaces;
 - o) Tyres are not compatible with the rim to which they are fitted.

NOTE: *For more information on retreaded tyres, refer to Appendix C ‘Retreaded Tyres’.*

Section 6 : Structure and Body Condition

Australian Design Rules are relevant to this section:

ADR 18	Instrumentation
ADR 42	General safety requirements
ADR 43	Vehicle configuration and dimensions
ADR 44	Specific purpose vehicle requirements
ADR 58	Requirements for omnibuses designed for hire and reward
ADR 59	Omnibus roll-over strength
ADR 63	Trailers designed for use in Road Trains
ADR 64	Heavy goods vehicles designed for use in Road Trains and B-Doubles

OBJECTIVE: To ensure the vehicle body is free of protrusions, structurally sound and free from any defects or additional fittings that are likely to increase the risk of bodily injury to any occupant and other road users.

NOTE: Refer to Appendix J for a detailed explanation of checking for rust.

6.1 Check exterior body panels and fittings

Reasons for rejection

- a) Exterior body work including mudguards, bull-bars, roof racks etc on a vehicle have exposed sharp edges (including corrosion or accident damage) that could injure a person who comes into contact with that part of the vehicle;
- b) Mudguards are not properly fitted to provide protection over the full width of the wheels and tyres and any mudguard does not extend inboard over the full width of the tyre/s (except where part of the body of the vehicle acts as a mudguard);
- c) The bottom edge of mudguard and/or mudflap at the rear of any vehicle is higher off the ground that 1/3 of the horizontal distance between the centre of the axle and the mudguard;

NOTE: This height must not be more than 230mm or 300mm for a vehicle to be used off-road.

- d) Any motor vehicle which is 2.2 metres or more in width and fitted with a body which is less than 300mm in height at the rear, measured from the lowest point of the body above the ground to the highest point, does not have the rear face of any rear mudguards silver or white in colour;

- e) The rear coaming of any vehicle described in 6.1(d) above is not silver or white in colour for a depth of 75mm or more;

NOTE: *Rules (d) and (e) do not apply when a vehicle is correctly fitted with rear marking plates.*

- f) Any after-market fitting attached to the exterior of the vehicle that could cause injury to a person coming into contact with that part of the vehicle.

NOTE: *For further information on Mudguard requirements, refer to Appendix D 'Mudguard and Mudflap Requirements'*

6.2 Check Rear Marker Plates

Reasons for rejection

- a) Retroreflective rear marker plates not fitted to a motor vehicle with a GVM over 12 tonnes, except a bus fitted with hand grips or similar equipment for standing passengers to hold;
- b) Rear marker plates are not fitted in locations specified by the required standards;
- c) Rear marker plates are faded, damaged or incorrectly fitted.

NOTE: *For more detailed information on Rear Marker Plates refer to VSB12 and Appendix E 'Rear Marking Plates'.*

6.3 Check cabin and body condition

Reasons for rejection

- a) Any structural member of a body, cabin or chassis such as a cross-member, door sill, pillar, seat or seat belt anchorage, roof rail and floor panel is cracked, broken or corroded to an extent that weakens the strength of the vehicle or any safety system, or allows the entry of engine fumes into an occupant space;
- b) Any cabin, body, sleeper compartment, load carrying area or compartment is loose on the chassis or has missing fasteners;
- c) Any load carrying area or compartment is damaged, deteriorated, corroded or distorted so that any part of the load is not retained;

- d) Any door, gate, hatch, bonnet or compartment latch, latch control, or hinge is damaged, excessively worn, insecure or inoperative in any latching position;
- e) Any body repairs on the vehicle have not been carried out in accordance with recognised industry repair methods and standards;
- f) Any object or fitting, not technically essential to the vehicle, which protrudes from any part of the vehicle so that it is likely to increase the risk of bodily injury to any person;
- g) Any component that adversely affects the safety of the vehicle, and in particular, obscures the drivers view.

NOTE: *For further information on rust and body condition, refer to Appendix J 'Rust and Corrosion'*

6.4 Check number plates

Reasons for rejection

- a) Any number plate is obscured, for example, by a towing attachment, goose neck or tow ball;
- b) Any number plate cover is tinted, reflective, rounded or bubble like;
- c) Any number plate is not issued or approved by the State or Territory Road Transport authority, is damaged or faded to the extent that the registration number is not legible from a distance of twenty metres;
- d) The number plates are not substantially parallel to the vehicles axles;
- e) The number plate is fitted to a hinged plate that enables the plate to hinge whilst the vehicle is in motion;
- f) The number plate is mounted more than 1300mm from the ground;
- g) Characters on the number plate are not clearly visible from a distance of 20 metres at any point within an arc of 45 degrees from the surface of the number plate above or to either side of the vehicle;

- h) A rear number plate is positioned so that it is not illuminated by at least one number plate light.

6.5 Check electrical equipment

Reasons for rejection

- a) A warning device (horn) that is capable of providing sufficient audible warning to other road users is not fitted or is not operational or the tone is not of a single pitch;
- b) A warning device (horn) is not clearly audible and the actuating mechanism is not located within the reach of the driver in the normal seated position;
- c) Electrical wiring or connectors are corroded, damaged, not insulated or are not securely fastened at least every 600mm and are located in such a way that would cause danger to the operation of the vehicle;
- c) Electrical wiring is located where it can:
- become exposed to excessive heat;
 - hinders driver or passenger movement;
 - come into contact with moving parts;
 - cause a fire hazard; batteries are not securely mounted, leak or are situated in an occupant space without adequate protection from spillage and fumes.

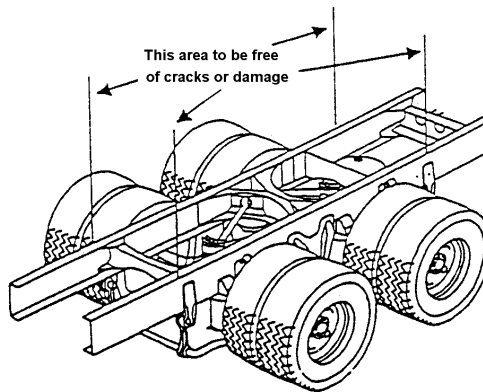
6.6 Check chassis

Reasons for rejection

- a) Any part of the chassis or sub-frame that is:
- cracked;
 - distorted
 - sagging;
 - loose;
 - broken; or
 - affected by extensive or advanced rust.
- b) Any fastenings between frame members, including welds, are missing, loose, distorted or cracked;

- c) Any chassis or subframe repairs on the vehicle that have not been carried out in accordance with recognised industry repair methods and standard;
- d) Frame members in load areas are missing or damaged to an extent that the load area is not properly supported or the members are likely to fall out or contact moving parts;

Figure 8: Example of critical structural components



- e) Any vehicle wheelbase that has been lengthened or shortened without certification of compliance with section H and C of VSB-6 in the form of a modification plate and Compliance Certificate from a Registering Authority or the NHVR.

Section 7 : Seats and Seatbelts

Australian Design Rules are relevant to this section:

ADR 3	Seat and seat anchorages
ADR 4	Seat belts
ADR 58	Requirements for omnibuses designed for hire and reward
ADR 66	Seat strength, seat anchorage strength and padding in omnibuses
ADR 68	Occupant protection in buses

OBJECTIVE: To ensure that all seating and restraints fitted to the vehicle provide a safe, comfortable and secure position for the driver to control the vehicle and control the deceleration of all vehicle occupants.

7.1 Check seats

Reasons for rejection

- a) Seat frames or attaching points are loose, cracked, broken or have fasteners missing;
- b) Seat cushions and backrests are not fitted;
- c) A seat slide or other seat control used for adjustment of a seating position is not operational and does not hold any selected position allowed for in the mechanism's design;
- d) Any seat has an exposed sharp edge or other parts that protrude due to damage;
- e) Any reduction or increase in seating capacity is not approved, where the reduction or increase in seating capacity changes the vehicle's Australian Design Rule (ADR) category or affects compliance with the applicable vehicle standards.

NOTE: For more detailed information refer to VSB5.

7.2 Check seat belts

Reasons for rejection

- a) Seat belt assemblies are not securely attached to the respective anchorage point or show signs of distortion, cracks, fractures, or other damage likely to cause failure;
- b) Any retractor, locking mechanism, buckle, tongue or adjustment device is inoperative;

- c) Seat belt webbing that is:
 - damaged;
 - frayed;
 - stretched;
 - tied in a knot;
 - twisted;
 - split;
 - torn;
 - altered or modified;
 - severely deteriorated;
 - burnt;
 - not correctly and firmly secured to each end fitting;
 - not the appropriate seat belt for the type of seat mechanism fitted;
- d) Seat belts are not fitted in accordance with the table below.

NOTE: *Discolouration alone is not reason for rejection, however if there is a texture change as well it should be rejected.*

Table 10: Seat Belt Requirements

MINIMUM SEAT BELT REQUIREMENTS FOR GOODS VEHICLES	
Goods Vehicles with a GVM exceeding 4.5 tonnes and up to 12 tonnes GVM	
1 July 1977 ⇒ 30 June 1992	Lap belts in front outboard seating positions
1 July 1992 ⇒	Lap sash belts with safety locking retractors in all front outboard seating positions and lap belts in all other positions.
Goods Vehicles with a GVM exceeding 12.0 tonnes	
1 July 1977 ⇒ 30 June 1992	Lap belts in front outboard seating positions
1 July 1992 ⇒	Lap belts with safety locking retractors in front outboard seating positions and lap belts in all other positions.

NOTE: *For further information on seat belts, refer to Appendix 'F' 'Seat belts'.*

7.3 Child Restraints and their anchorages

Each child restraint anchorage point must be readily accessible and have sufficient clear space to allow the child restraint to be attached.

Each anchorage point in these vehicles shall have a (1) 5/16" UNC-2A hexagon headed bolt and an appropriate spacer.

A least one anchorage point in these vehicles shall have a child restraint fitting clip.

MD4 and ME category vehicles must have at least 6 child restraint anchorage points. Child Restraint Anchorages fitted to any other heavy vehicle must also comply with these requirements.

Reasons for rejection

- a) The vehicle structure within 100mm of a CRA point is cracked or has advanced rust;
- b) A 5/16" 18 UNC bolt and suitable spacer installed is not fitted to each CRA point;
- c) A CRA fitting is not readily accessible or cannot be attached or unclipped by hand;
- d) A CRA fitting is missing, loose or damaged;
- e) For an MD4 or ME category vehicle built from 1 July 1995, at least six rear seating positions are not equipped with a Child Restraint Anchorage (CRA) point.

Section 8 : Lights and Reflectors

Australian Design Rules are relevant to this section:

ADR 1	Reversing lamps
ADR 6	Direction indicator lamps
ADR 44	Specific purpose vehicle requirements
ADR 45	Lighting and light signalling devices not covered by ECE regulations
ADR 46	Head lamps
ADR 47	Reflex reflectors
ADR 48	Rear registration plate eliminating devices
ADR 49	Front and rear position (side) lamps, stop lamps and end outline marker lamps
ADR 51	Filament globes
ADR 58	Requirements for omnibuses designed for hire and reward
ADR 75	Headlamp cleaners
ADR 76	Daytime running lamps
ADR 77	Gas-discharge headlamps
ADR 78	Gas-discharge light sources

OBJECTIVE: To ensure that all compulsory lights, reflectors and other electrical lighting components as required by prescribed standards are operational.

NOTE: *In this section description “yellow” is used as a more modern term instead of the description “Amber” which is used in earlier legislation and some ADRs.*

In this section description “parking lights” is used as a more modern term instead of the description “front position lamps” which is used in earlier legislation and some ADRs.

8.1 Check lights and reflectors

Reasons for rejection

- a) Compulsory reflectors are damaged, obscured, deteriorated, not installed in the correct location or are not fitted;
- b) Any of the following lights are inoperative, obscured, deteriorated insecure or not fitted where required, or are an incorrect colour:
 - headlight (high/low beam) (white);
 - front park or side lights (white);
 - tail lights (red);
 - brake lights (red);
 - reversing lights (where fitted, mandatory after 30/06/1975)(white);
 - turn signal indicator lights (yellow);
 - clearance/ end outline marker lights (white/ yellow to front, red to rear);

- number plate light (white);
 - side marker lights;
 - compulsory tell-tale lights;
 - step lights (for buses), except in the case of an external access step to a single row of seats for a small bus having a seating capacity of not more than 15 adults, including the driver;
 - interior bus lights.
- c) Any rear light other than a reversing light is installed or damaged to the extent that white light shows to the front or rear of the vehicle;
 - d) Any yellow clearance light or front turn signal is damaged so that it shows white light (except vehicles prior 7/73);
 - e) The number plate light is not directing light onto the surface of the rear number plate;
 - f) Any optional light or reflector interferes with the effective operation of any compulsory light or reflector;
 - g) Any light has a tinted cover over it that affects its intended operation;
 - h) Any light that is not clearly visible under all normal conditions and of a consistent intensity, and are affected by dirty or damaged lenses or poor electrical contact;
 - i) Lenses and light reflectors are not securely mounted, are faded or discoloured and are not free from cracks, holes, or other damage which would allow the entry of moisture or dirt to impair the efficiency of the light or reflector;
 - j) There is any other type of opaque cover over a headlight which cannot be readily removed;
 - k) Lighting does not comply with the NHVR Heavy Vehicle (Vehicle Standards) Regulation.

8.2 Check headlights

Reasons for rejection

- a) Headlight reflector is tarnished or peeling to the extent that headlight performance is impaired;
- b) Headlight lens is cracked or broken;
- c) Headlight assembly is not secured or is out of position;

- d) Headlight does not project white light;
- e) Headlight lens or reflector is internally contaminated by dirt or moisture;
- f) A device to indicate to the driver that the headlights are in the high beam position is not fitted and operational;
- g) A dipping device to change the headlights from the high beam position to the low beam position and operated from the normal driving position is not fitted and operational;
- h) Headlights do not comply with the NHVR Heavy Vehicle (Vehicle Standards) Regulation.

8.3 Check headlight aim using a headlight tester or testing screen (Includes driving lights and alternative headlights)

NOTE: This section should be read in conjunction with the equipment manufacturer's instructions.

Reasons for rejection

- a) The aim of the headlight is adjusted such that, when on high beam and measured at an effective distance of 9m the projected centre of the beam is to the right of the headlight centre and/ or is above the headlight centre;
- b) When measured at an effective distance of 9m, any part of the top edge of the high intensity portion of the **low beam pattern** is above, **and to the right** of the centre-line of the headlight.

NOTE: In the region above and to the right of the centre-line of the headlight the luminous intensity must not exceed 437cd.

The portion of the beam to the left of the centre-line of the light may extend above the height of the centre-line of the headlight.

The "centre-line of the headlight" passes through the centre of the globe filament, or equivalent.

For information regarding headlight adjustment, Refer to Appendix H 'Headlamp Testing Screens'.

Section 9 : Mirrors

Australian Design Rules are relevant to this section:

ADR 14 Rear vision mirrors

ADR 58 Requirements for omnibuses designed for hire and reward

OBJECTIVE: To ensure that the mirrors and associated components are in such a condition that the driver has a clear field of vision at all times under the normal range of climatic conditions.

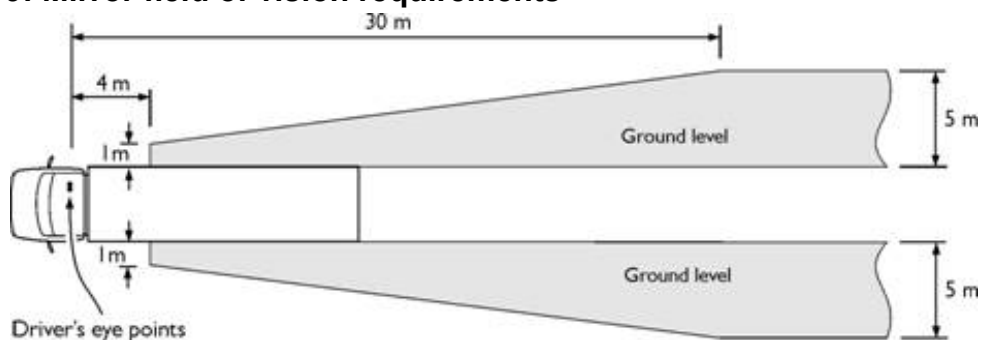
9.1 Check mirrors

Reasons for rejection:

- a) Any reflective surface of a compulsory rear view mirror:
 - has a missing section;
 - is cracked;
 - is deteriorated, blemished or tarnished which would reduce the view to the rear of the vehicle;
 - is obscured;
 - side mirrors do not have a surface of at least 150cm² (e.g. 100mm by 50 mm).
- b) Mirrors are not securely mounted or missing;
- c) Mirrors are not fitted to both sides of the motor vehicle;
- d) Any compulsory mirror does not provide a clear view of the road to the rear of the vehicle;
- e) Mirrors protrude beyond 230mm past the widest part of the vehicle.

NOTE: *ECE Regulations allow external rear vision mirrors to exceed 230mm, however no more than necessary to achieve the field of view as shown below.*

Figure 9: Mirror field of vision requirements



Section 10 : Windscreen and Windows

Australian Design Rules are relevant to this section:

ADR 8	Safety glazing material
ADR 15	Demisting of windscreen
ADR 16	Windscreen wipers and washers
ADR 42	General safety requirements

OBJECTIVE: To ensure that the windscreen, windows and associated components are in such a condition that the driver has a clear field of vision at all times under the normal range of climatic conditions.

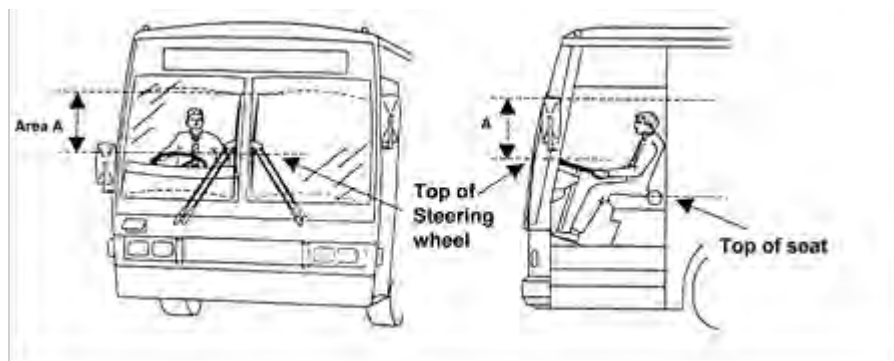
10.1 Check windscreen and windows

Reasons for rejection

- a) The wiped area of the windscreen in front of and on the same side of the vehicle as the driver, (shown in the following diagram as Area A), has:
- damage (such as scoring, sandblasting or severe discolouration) that interferes with the driver's view;
 - any bulls-eye or star fracture that exceeds 16mm in diameter, or any two (2) of the following;
 - hairline crack up to 30mm long;
 - a crack from the edge of the windscreen up to 75mm long.

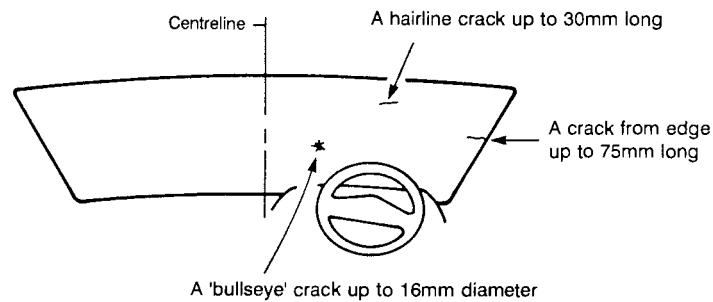
NOTE: Grooves in windscreens that are designed specifically to clean the wiper blades are not regarded as damage unless they affect the driver's view. Approved grooving is usually identified by the installer.

Figure 10: Drivers field of vision



- b) Any cracks in a laminated windscreen penetrate more than one layer of glass or are more than 150mm long;
- c) Any glazing used in any motor vehicle is not safety glass and where ADR 8 applies, the glass does not display an identification mark or symbol;
- e) Glazing is loose in its frame or cracked to the extent that sharp edges are exposed;
- f) Glazing, other than the windscreen, that is necessary for the driver to see the road is discoloured, obscured, badly scratched, sandblasted or fractured to the extent that it interferes with the driver's view;
- g) Items that obscure the driver's view are placed in Area A of the diagram above or the corresponding area on the other side of the windscreen with the exception of a drivers aid;
- h) At least half the number of windows must be capable of being opened or the vehicle must be provided with an alternative method of ventilation;
- i) Windscreens are removed and not replaced;
- j) If a window on a bus is:
 - cracked (in excess of specifications shown in diagram below), broken or incorrectly fitted;
 - is not fitted with a suitable device for opening and closing, if moveable.
- k) Part of the glass in at least half of its window frame is not capable of being opened. (unless a bus is adequately ventilated by means of a fan forced "jet air" or fan forced air-conditioning system);
- l) If a bus does not have ventilation additional to that provided by its windows.

Figure 11: Cracks in field of vision



NOTE: For further information on windscreens, refer to Appendix I 'Replacing or Repairing Windscreens'

10.2 Test the light transmittance level of the windscreen, side and rear windows

NOTE: (i) This section should be read in conjunction with the light meter manufacturers' instructions.

(ii) The light meter may have up to a 5% measuring inaccuracy. A vehicle may be accepted if the readings are up to 5% lower than the minimum light transmittance.

Reasons for rejection

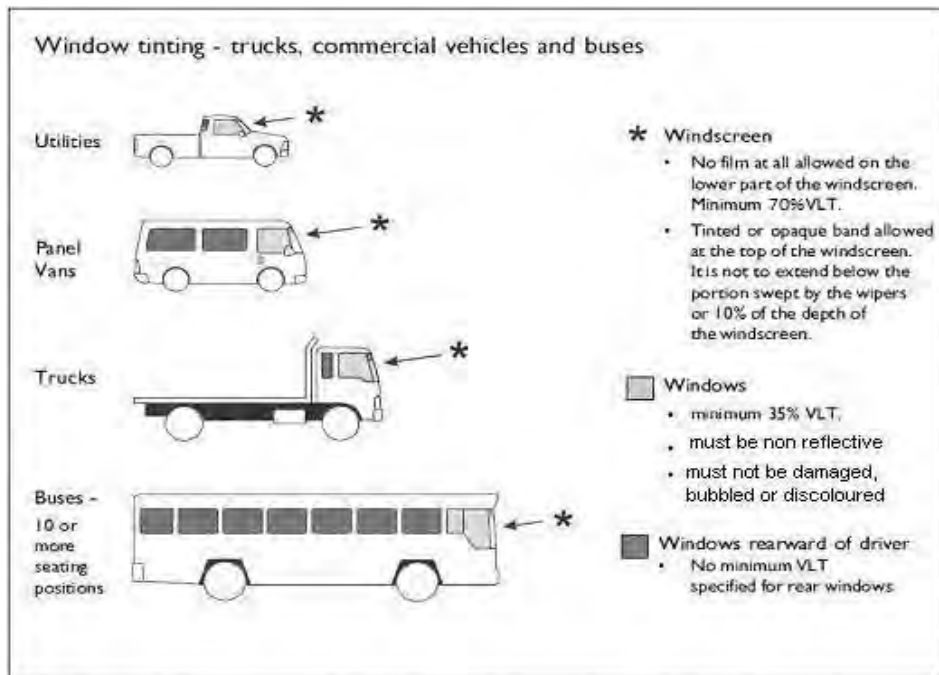
- a) Any windscreen glazing has any coating which reduces its light transmittance;
- b) The visible light transmittance of any glazing (including any applied film) is less than that detailed below;
- c) Tint films are not free of bubbles, scratches or other defects that significantly affect the driver's vision;
- d) Tint films have a reflectance in excess of 10% (e.g. mirror tints).
- e) Not fitted with both side exterior rear view mirrors.

Table 11: Tint Transmittance Requirements

Glazing	Minimum Light Transmittance	Vehicles NOT TO BE REJECTED until meter readings are LESS than
Windscreen	70%	70%
All other windows	35%	30%

- No limit for windows to the rear of the driver if the vehicle is a bus, stretch limousine, ambulance or hearse.
- No limit for windows with glazing or coating fitted before 1 October 1996 behind the rear of the driver's seat of the vehicle.
- No limit for windows with glazing or coating adjacent to the rear of an area of a motor vehicle designed and built to carry goods.
- No limit for a tinted or opaque band at the top of the windscreen, provided it is above the arc swept by the windscreen wipers, or the upper 10% of the windscreen, whichever is the greater.

Figure 12: Window Tinting



10.3 Check windscreen wipers, demisters and washers

Reasons for rejection

- The windscreen wipers are not operational at all speeds and do not return to their normal parked position;
- Wiper blade rubbers are cracked, hardened, frayed, curled, torn or missing;
- Windscreen washers are inoperative or incorrectly aimed (where applicable);
- Windscreen demister is inoperative or does not blow air onto the windscreen (where applicable);
- The windscreen washer is not able to be operated from a normal driving position.

Section 11 : Engine, Drive-line & Exhaust

Australian Design Rules are relevant to this section:

ADR 42	General safety requirements
ADR 44	Specific purpose vehicle requirements
ADR 58	Requirements for omnibuses designed for hire and reward
ADR 65	Maximum speed limiting for heavy goods vehicles and heavy Omnibuses
ADR 80	Emission control for heavy vehicles
ADR 83	External noise

OBJECTIVE: To ensure the engine, drive line and associated components provide a controlled transmission of power to the driving wheels.

11.1 Check exhaust system

Reasons for rejection

- a) Any component of the exhaust system is not securely mounted;
- b) The exhaust system does not incorporate an effective silencing device that all exhaust gases pass through;
- c) The exhaust system contacts any unrelated part of the vehicle;
- d) Exhaust pipe outlet is not rearward of all rear passenger doors or sleeper compartment that may allow the ready entrance of exhaust gases;
- e) There is any leak in the exhaust system (excluding manufacturers' drain holes in the mufflers);
- f) A catalytic converter is missing, bypassed or has a missing heat shield;

NOTE: *Most heavy vehicles are not built with catalytic converters or heat shields.*

- g) Any exhaust component that fouls any part of the steering, suspension, brake or fuel system;
- h) Any part of the exhaust system liable to be contacted by a person touching or leaning on vehicle that is not protected by a suitable guarding.

11.2 Check noise emissions

Where it is evident that a vehicle is emitting significantly higher noise than normal, the vehicle must not be passed as fit for registration. The customer

must be referred to a facility where a stationary noise test must be conducted in accordance with Table 12 below.

NOTE: *This section must be read in conjunction with Appendix L – Stationary Noise Testing Procedure.*

Reasons for rejection

- a) Any noise reducing or absorbing equipment is missing;

NOTE: *Changes to the original design of the engine, fuel system, air inlet system, or exhaust system all have the potential to affect compliance of the vehicle with noise standards. Where any such modifications have been carried out a noise test may be necessary to ensure that the vehicle complies with the exhaust noise limits.*

Such modifications could also affect compliance with exhaust emission requirements and the operator may be directed to have the vehicle tested.

- b) The noise level from the vehicle exceeds the figure in the following table:

Table 12: Noise Limits for Diesel Powered Heavy Vehicles

Gross Vehicle Mass (kg)	Height above ground of end of exhaust pipe (mm)	Manufacture period	Noise level dB(A)
more than 3 500, but not more than 12 000	1 500 or more	Before 1/7/80	103
		On or after 1/7/80 and before 1/7/83	100
		On or after 1/7/83	97
more than 3 500, but not more than 12 000	less than 1500	Before 1/7/80	107
		On or after 1/7/80 and before 1/7/83	104
		On or after 1/7/83	101
more than 12 000	1 500 or more	Before 1/7/80	105
		On or after 1/7/80 and before 1/7/83	102
		On or after 1/7/83	99
more than 12 000	less than 1500	Before 1/7/80	109
		On or after 1/7/80 and before 1/7/83	106
		On or after 1/7/83	103

Note: Appropriate tolerances on noise values should be applied.

11.3 Check engine and drive-line

Reasons for rejection

- a) Engine and drive line mounts or drive line components are loose, cracked, broken or are missing components or fasteners;
 - a bus fitted with a transmission incorporating any longitudinal drive shafts is not fitted with a device that prevents the front of the drive shaft from contacting the road in the event of becoming detached from its normal position.
- b) Any universal joint or securing bolts are loose or missing;
- c) Constant velocity joints, universal joints, support bearings, splines, and other drive line components are not secure, free of excessive wear, back lash or seizure which could cause component failure;
- d) Engine and transmission controls are inoperative;
- e) A vehicle fitted with an automatic transmission is capable of being started when the transmission control is in a position to drive the vehicle;
- f) A vehicle fitted with a compression ignition engine (Diesel) that is not fitted with a device that prevents the engine from inadvertently being started;
- g) Seals on covers between the engine and the passenger compartment are missing, distorted or damaged in a way that allows fumes to enter the passenger compartment;
- h) Engine emits excessive smoke for at least 10 seconds continually at or near the discharge end of the exhaust pipe;
- i) Vehicles manufactured with emission devices do not have all emission control equipment properly located, connected or are damaged, deteriorated or altered in any way to reduce effectiveness;

NOTE: *Modifications to emission equipment can effect smoke emission.*

- j) Crankcase gases escape into the atmosphere (applies to petrol engines fitted with positive crankcase ventilation only);

- k) The engine lets out sparks, flames, oil or fuel residue;
- l) Air cleaners are not fitted;
- m) Fuel injection equipment, engine speed governor or any other part of an engine is adjusted so that it increases smoke;
- n) For a vehicle that is covered under ADR 65, the maximum road speed limiting is greater than 100km/h or there is evidence of tampering or modification of road speed limiting device;
 - a bus with a GVM over 14.5 tonnes that was built after 1987 must comply with third edition ADR 65;
 - a prime mover with a GVM over 15 tonnes that was built after 1987 must comply with third edition ADR 65.

NOTE: o) *does not apply to;*

- an ambulance, police vehicle or Australian Defence Force vehicle; or
- a vehicle built or permanently modified for fire fighting or emergency rescue purposes; or
- a bus fitted with hand grips or similar equipment for standing passengers to hold; or
- a 2 axle prime mover if:
 - 1) it was built after 1987 but before July 1991; and
 - 2) its operator is a person who uses it for agriculture, horticulture or other primary production activities, except forestry, fishing and mining.
- o) If a vehicle manufactured after 1 July 1988 is not fitted with an operational speedometer, which indicates vehicle speed only in kilometres per hour;
- p) If a vehicle manufactured after 1 July 1988 is not fitted with an operational odometer, which indicates distance travelled in one kilometre units (or less) from 1 to 999,999 kilometres.

NOTE: *Adjustments or modifications to components of the fuel system have the potential to affect compliance of a vehicle with emission standards. The manufacturer's advice should be sought to ensure the vehicle is kept within prescribed limits. A test to determine compliance with National Diesel Emission Standards may be undertaken in jurisdictions that have the necessary test equipment.*

11.4 Check oil leaks

Reasons for rejection

- a) Oil leaks from the engine, gearbox, differential, power steering or any joint or seal:
 - on to brake friction surfaces, or
 - on to the exhaust system; or
 - on to the road surface at a rate of more than one drop every 30 seconds from any joint or seal;
 - evidence of oil or fluid leaking from any brake or power steering components.

11.5 Check fuel tanks and system for leaks (non LPG/ CNG)

Reasons for rejection

- a) Any leakage from the fuel system;
- b) Fuel lines are in contact with moving parts or a heat source, are kinked, cracked or not secure;
- c) Fuel tanks are not securely mounted, straps, supports, mounting brackets or fasteners are missing, cracked, broken or loose;
- d) Fuel filler cap is missing or not suitable for the type of tank;
- e) Fuel filler cap seal is damaged or missing.

11.6 Visually inspect Fire Extinguisher (where required).

Reasons for rejection

- a) Fire extinguisher is not filled, charged or under current inspection, if required;
- b) Handles, nozzles or hoses of fire extinguisher is missing or damaged;
- c) The extinguisher is not securely mounted in the vehicle.

NOTE: *Fire extinguishers can become ineffective even though they appear properly charged. For example powder type extinguishers subject to vibration can fail due to compacting of the powder.*

Australian Standards AS 1851.1-1995 Portable Fire Extinguishers, contains suitable procedures for inspecting and testing fire extinguishers.

Australian Standards AS 2444 Portable Fire Extinguishers- Selection and Location outlines the appropriate type, size and location of fire extinguishers for vehicles.

Table 13: Fire Extinguisher requirements in accordance with AS2444

TABLE 5.1
MINIMUM RATING, CLASSIFICATION AND NUMBER OF EXTINGUISHERS FOR VEHICLES

Type of vehicle	Minimum rating and classification of extinguishers	Minimum number of extinguishers
Sedan, station wagon, panel van or utility	1A:5B	1
Caravan/campervan – Single compartment	1A:5B	1
Multi-compartment	1A:5B	2
Outboard-powered boat – Small fuel tank (< 25 L)	5B	1
Large fuel tank (> 25 L)	20B	1
Houseboat and motor cruising yacht	2A:10B	2
Passenger-carrying vehicle In urban areas or on short trips outside urban areas	2A:20B (fitted with hose)	1
Outside urban areas or when fitted with integral luggage compartment	2A:20B (fitted with hose)	2 (one to be mounted near the under-floor area or engine)
Cargo-carrying vehicle	1A:10B (fitted with hose)	1 (in cabin) (Additional extinguishers appropriate to the cargo carried and in accordance with the relevant regulations)

NOTES:

- 1 In caravans and boats where cooking appliance (using cooking oils and fats) are installed, a fire blanket is recommended, additional to the above.
- 2 Consideration should be given to all extinguishers having an E rating where electrical hazards may be found in vehicles if capable of being connected to 240 V a.c., e.g. caravans, campervans, houseboats and the like.

Section 12 : LPG/ CNG Vehicles

Australian Design Rules are relevant to this section:

ADR 42	General safety requirements
ADR 44	Specific purpose vehicle requirements
ADR 80	Emission control for heavy vehicles

OBJECTIVE: To ensure that LPG/ LNG vehicles and associated components are fitted in accordance with regulation and operate in a safe manner.

NOTE: *ADR 80 applies to vehicles operating on LPG/CNG with a GVM in excess of 3500kg as of 1st January 2004. Compressed Natural Gas (CNG) is also known as Natural Gas for Vehicles (NGV).*

12.1 Visually inspect for the presence of an approved LPG/ NGV/ CNG

Visually inspect for the presence of an approved LPG/ NGV/ CNG modification plate and number plate labels.

Vehicles with Auto-gas systems installed within this state:

Installation of LPG/ NGV/ CNG must be done in accordance with State or Territory regulations and licensing requirements. A LPG installation plate from a licensed gas fitter/installer must be fitted to the vehicle, as part of installation.

Vehicles with Auto-gas systems installed in another Australian State or Territory:

A vehicle which has an LPG/ NGV/ CNG fuel system fitted and which is registered in another State or Territory may be accepted if:

1. A metal plate is fitted in a prominent position near the installation, showing:
 - a statement that the installation complies with the Standards Australia code for the fuel type (AS1425 for LPG and AS2739 for CNG/ NGV);
 - the date the installation was commissioned;
 - the State or Territory where installation was made;
 - the identification number of the suitably qualified installer.

AND

2. The installation passes a safety check inspection conducted by an examiner who is authorised to examine Auto-gas vehicles.

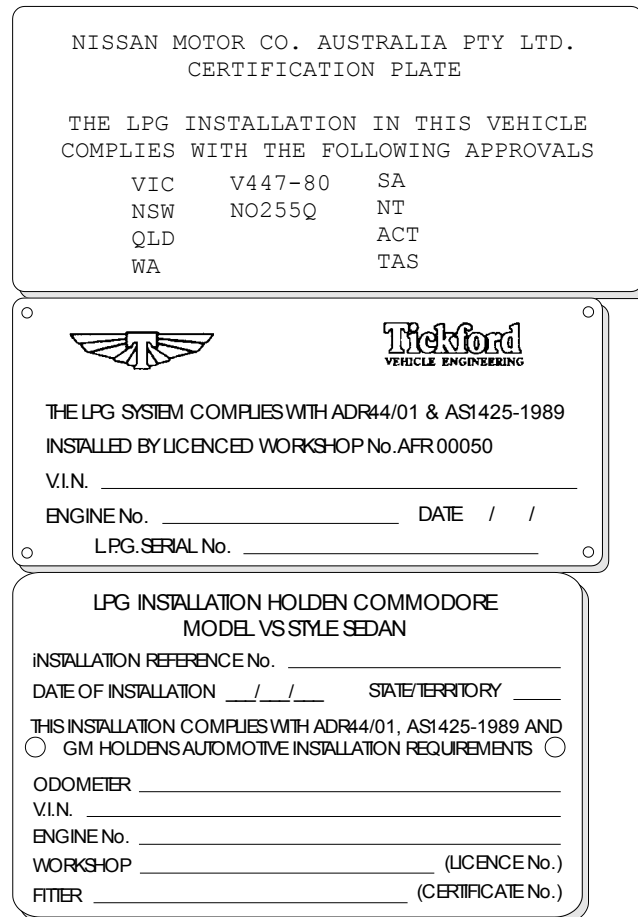
Reasons for rejection

- a) Vehicle does not have an approved LPG/ NGV/ CNG installation plate. Acceptable plates are either:

1. A plate fitted by a State or Territory authorised/ licensed gas fitter/ installer; or
2. A plate fitted by the vehicle manufacturer, where the LPG/ NGV or CNG system was installed by the original vehicle manufacturer.

The following are examples of acceptable plates that have been fitted by vehicle manufacturers.

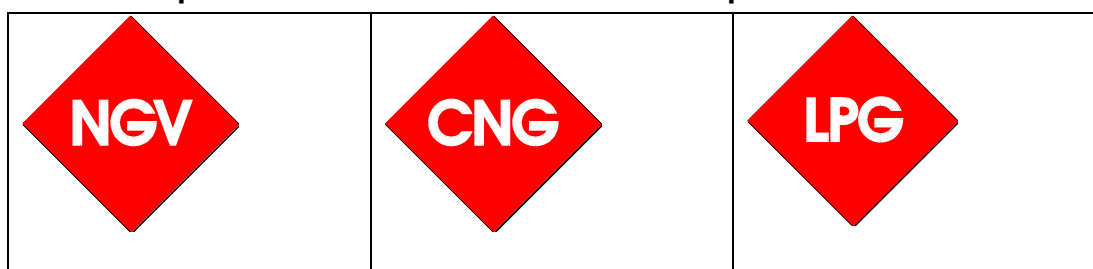
Figure 12: Acceptable LPG/ NGV or CNG plate examples



- b) Durable and reflective number plate labels are not fitted to the front and rear of the vehicle indicating it is LPG, NGV or CNG fuelled;

Acceptable number plate labels are shown below:

Figure 14: Acceptable LPG/ NGV or CNG label examples



White lettering on red background. Labels are to be a minimum of 25mm x 25 mm in size. Letters must be capitals and of a minimum of 6mm in height.

- c) Number plate labels are not made of 1mm thick metal, retro reflective with letters at least 10mm high.

NOTE: This is only for installations post 1999.

12.2 Visually inspect the LPG/ NGV or CNG container

Reasons for rejection

- a) The container is removable without the use of tools from any vehicle other than those specified below:
 - fork lift trucks;
 - vehicles which do not use LPG/ NGV or CNG as a means of propulsion;
 - diesel engine enhancement systems.
- b) The container has:
 - advanced corrosion or fire damage;
 - cuts or dents which penetrate the surface of the container;
 - any dent on the container which is deeper than 10% of the width of the dent, or which is located on a weld and exceeds 6.5mm in depth;
 - any dent or crease on the container which is longer than 75mm.
- c) The statutory life of the container has expired.

NOTE: It is a statutory requirement for an LPG/ NGV/ CNG container to be checked for continued service life:

- LPG every ten years;
- NGV steel containers every five years;
- CNG steel containers every five years;
- Fibreglass reinforced plastic (frp) containers every three years.
- d) Any metal parts contact the container;
- e) The container and its surface mounted fittings are not protected from damage by vehicle component (e.g. tail shaft) failure;
- f) Where mounted within a cargo space the container is not protected from impact from cargo or other objects carried in that area, i.e. it is not installed within an enclosed protective compartment;

- g) The container or its gas carrying components are located within 150mm of a heat source and there is no heat shield;

NOTE: *This may be reduced to 40mm if the shield is more than 15mm from a gas carrying component.*

- h) The container is incorrectly aligned so that it impedes access to the container service valve;
- i) The container is incorrectly aligned so that it impairs the operation of the automatic fill limiter (AFL);
- j) Where containers installed on or after 1 July 1988 have a wall thickness marked to be less than 2.2mm;
- k) The container is mounted externally;
 - the container is not installed within a protective compartment;
 - the container is located less than 75mm from the side panels of the vehicle;
 - the container is not marked "This vessel shall be installed within a compartment inside the vehicle".

12.3 Visually inspect the container anchorages and straps

Reasons for rejection

- a) Any anchorage straps allow the container to move;
- b) There is only one anchorage strap used to secure the container;
- c) The anchorage straps are cut, have advanced rust or are otherwise deteriorated;
- d) The anchorage straps are smaller than the sizes shown in Table 14;

Table 14: Dimensions of Container Attachment Devices

LPG/ NGV/ CNG container size (litres)			Minimum anchorage strap dimensions (mm)	Bolt or stud diameter for anchorage strap mountings (mm)
Over	-	Up to		
0	-	100	30 x 3	10
100	-	150	50 x 6	12
150	-	Approval limit	Approval required from state licensing department	

- e) The anchorage bolts or studs are smaller than the sizes shown in Table 14.
- f) The anchorage bolts or studs do not have locking devices (such as spring washers, split pins or lock nuts) fitted;
- g) Reinforcement plates are missing or not shaped to the contours of the panel on which the container is mounted;

NOTE: *Reinforcement plates attached to sheet metal panels must be at least 75mm square and 3mm thick.*

Where a compliance plate is fitted, the vehicle should not be rejected if reinforcement plates of mounting points are smaller than typical dimensions in the Standards Australia code, as compliance covers the whole installation.

- h) There are less than four (4) points of attachment to the vehicle structure.

12.4 Visually inspect remote filled internally mounted containers

Reasons for rejection

- a) The compartment housing the container and its fittings, or the sub-compartment has electrical equipment other than the wiring connecting the contents gauge;
- b) Wiring is not insulated or secured at intervals of not more than 600mm;
- c) Any conduit containing the piping and hoses which pass through an enclosed area of the vehicle is missing or damaged so that it allows venting to the inside of the vehicle;
- d) The clamps for the conduit connections are missing or loose;
- e) There are holes in the conduit through which wiring can be passed;

NOTE: *Adhesives or sealing compounds are not acceptable as alternatives to mechanical clamps.*

- f) The container service valve is inoperable;
- g) The seals for any sub-compartment do not provide a gas-tight seal;

- h) The container space vent outlet is less than 250mm from the exhaust system.

12.5 Visually inspect externally mounted containers

Reasons for rejection

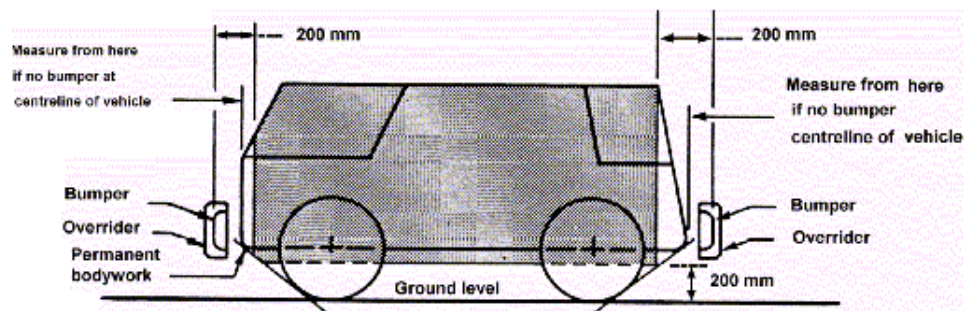
On vehicles less than 4.5 tonnes tare mass or where the chassis has 600mm ground clearance or less:

- a) The tank, or any tank component, has less than 200mm ground clearance;
- b) The tank, or any tank component, is not a minimum 200mm inboard of the original equipment bumper bars (measured on the centre-line of the vehicle);

NOTE: *If a bumper bar is not fitted, the measurement should be taken from the extremity of the permanent body work.*

- c) The tank, or any tank component, is not above a line which is tangent to the front or rear wheels and slopes upward and outward to the extremities of the vehicle's permanent body work.

Figure 15: Illustration showing mounting location for LPG containers for vehicles less than 4.5 tonne tare mass or less than 600mm ground clearance.

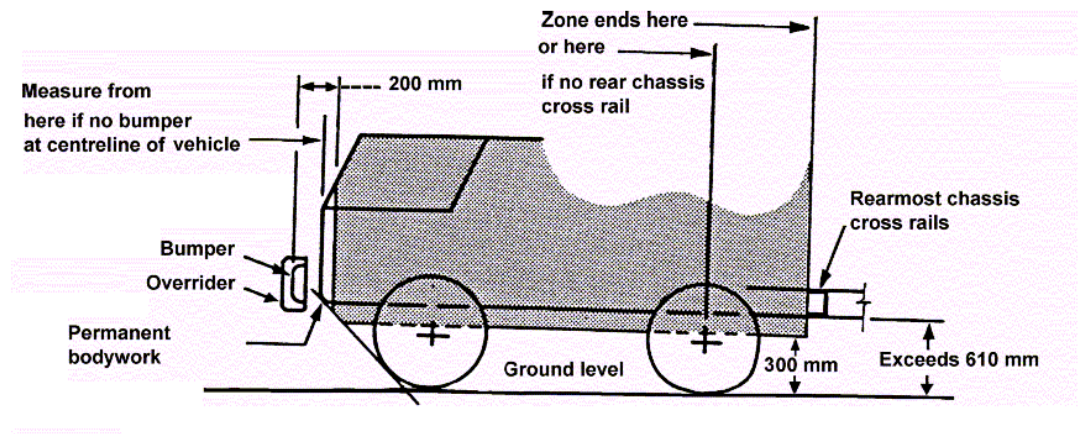


On vehicles with 4.5 tonnes or more tare mass, or where the chassis has more than 600mm ground clearance at the rear:

- a) The tank or any tank component has less than 300mm ground clearance;
- b) The tank or any tank compartment is not a minimum of 200mm inboard of the original equipment bumper bars (measures on the centreline of the vehicle) at the front. If a bumper bar is not fitted, the measurement should be taken from the extremity of the permanent body work;

- c) The tank, or any tank component, is not in front of the rearmost chassis cross member if provided, otherwise, the centreline of the rearmost wheels;
- d) The tank, or any tank component, is not above a line which is tangent to the front or rear wheels and slopes upward and outward to the extremities of the vehicle's original equipment bumper bars. If a bumper bar is not fitted, the measurement should be taken from the extremity of the permanent bodywork.

Figure 16: Illustration showing mounting location for LPG containers for vehicles 4.5 tonne or more tare mass or where the vehicle has a chassis ground clearance more than 600mm.



12.6 Visually inspect safety valves

Reasons for rejection

- a) Where a container is fitted with an automatic fill limiter (AFL), there is no label at the filling point warning the driver "AFL fitted - bleeding during filling not required";
- b) Where a container is not fitted with an AFL, there is no label warning the driver to "Stop filling when liquid appears";
- c) The safety valve has any damage in the system or blockage to the discharge pipe, if fitted, or allows the discharge to strike the exhaust system, container or a bystander, or the protective cap is not functioning or is missing.

12.7 Visually inspect hydrostatic relief valves

Reason for rejection

- a) The hydrostatic relief valve on multiple containers is damaged, missing, not fitted with a self-closing device which prevents the entry of dirt or water into the outlet or its discharge would strike the exhaust system, a bystander or the container.

12.8 Visually inspect fuel lines, joints and connections

Reasons for rejection

- a) Where the vehicle body or chassis members do not provide protection for fuel lines under the vehicle, the piping is not shielded or encased in a protective sleeve;
- b) If fitted the sleeving of any fuel line routed under the vehicle is damaged such that the fuel line is exposed;
- c) Any supporting clips (required to be spaced at intervals of 600mm) are missing or do not provide effective support to the fuel line;
- d) Any provision has been made to allow use of the gas fuel for purposes other than as automotive fuel.

12.9 Visually inspect fuel shut off devices

Visually inspect fuel shut off devices (filter locks), converters (vaporiser regulators), fuel selectors and air/ gas mixers.

Reasons for rejection

- a) The fuel shut off device is not securely mounted;
- b) The fuel shut off device allows the fuel to flow to the converter while the ignition and the engine are off;
- c) The converter is not securely mounted;
- d) Where the converter uses water circulation to assist in vaporisation, the water hoses leak or are disconnected, or deteriorated;
- e) Air/ gas mixers are not securely mounted or vapour lines and connections have leaks;

- f) The filling connection does not have a captive cap or the seal is deteriorated or missing;
- g) The high tension ignition wiring or electrical contacts in the engine compartment are exposed.

NOTE: *Where there are any signs of leakage from any component, the system must be thoroughly leak tested under normal Auto-gas operating pressure using an approved gas detecting device or foaming agent solution. The solution must be applied to the component having the suspected leak.*

12.10 Test the operation of the fuel containment system

Excess flow valve

Close the service valve and run the engine until the fuel line is empty. With the ignition turned OFF, quickly open the service valve.

Reason for rejection

- a) The excess flow valve does not produce a click or thud sound; or
- b) The owner is not able to produce a certificate from a State or Territory authorised/ licensed gas fitter/ installer certifying that the excess flow valve is operating satisfactorily.

NOTE: *The certification is valid for 1 calendar month from the date of issue. The certificate number and licence number of the State or Territory authorised/ licensed gas fitter/ installer are to be recorded in the inspection report.*

This test can only be conducted by State or Territory authorised examiner, accredited for this purpose.

If an automatic fuel shut off device is fitted at the container there is no requirement to test the excess flow valve.

Automatic fuel shut off device (AFSOD)

Deactivate the AFSOD and run the engine until the service line is empty and the engine stalls.

Reasons for rejection

- a) The engine fails to stall or the engine stalls but then re-starts after a short period; or
- b) For automated change over systems, the driver is not given an indication that the service line is depleted and that the vehicle is running on the alternate fuel.

NOTE: *Alternatively the owner is to produce a certificate from an Auto-gas Installer certifying that the excess flow valve is operating satisfactorily.*

The certification is valid for 1 calendar month from the date of issue. The certificate number and licence number of the State or Territory authorised/ licensed gas fitter/ installer are to be recorded in the inspection report.

This test can only be conducted by State or Territory authorised examiner, accredited for this purpose.

12.11 Test the fuel lines, joints, connections and gas carrying components for leaks

Apply a foaming agent solution or use a combustible gas detector around all components or areas that may develop a gas leak.

Reasons for rejection

- a) Any fuel lines, joints, connections or gas carrying components leak.

Section 13 : Buses

Australian Design Rules are relevant to this section:

ADR 42	General safety requirements
ADR 44	Specific purpose vehicle requirements
ADR 58	Requirements for omnibuses designed for hire and reward
ADR 59	Omnibus roll-over strength
ADR 66	Seat strength, seat anchorage strength and padding in omnibuses
ADR 68	Occupant protection in buses

OBJECTIVE: To ensure that buses and associated components are fitted in accordance with regulation and operate in a safe manner.

NOTE: *The general roadworthiness of buses has been included within the standard vehicle inspection process outlined in each section.*
This section deals only with those items that apply exclusively to buses.

13.1 Check safety equipment and interior fittings

Reasons for rejection

- a) Any emergency exits do not have clear access, or identification signs and operating instructions, where required, are not clearly visible;
- b) Equipment necessary to operate an exit is not present;
- c) The exit is broken, distorted or damaged in a way that stops it working properly;

NOTE: *Some emergency exits are designed to be used only once. Do not operate them for testing purposes.*

- d) Any controls for passenger access doors that do not work properly;
- e) Any warning device to indicate the operation or condition of the exit is not in working order;
- f) Any interior body panel or fitting in a bus is not securely mounted or has exposed sharp edges due to damage including corrosion or separated joints that could injure a person who comes into contact with them;
- g) Any floor covering is torn, worn or loose to an extent that it could trip passengers;
- h) Any handgrip, handrail or hand-strap is loose or damaged;

- i) Any passenger stop signal is inoperative;
- j) Any step is damaged to an extent that it could trip or injure a person;
- k) Seat belts are not fitted (where applicable);
- l) There is no fire extinguisher in the vehicle located in a readily accessible position;
- m) Fire extinguisher is not filled, charged or under current inspection, if required;
- n) Handles, nozzles or hoses of fire extinguisher is missing or damaged;
- o) The extinguisher is not securely mounted in the vehicle.

NOTE: *Fire extinguishers can become ineffective even though they appear properly charged. For example powder type extinguishers subject to vibration can fail due to compacting of the powder.*

Australian Standards AS 1851.1-1995 Portable Fire Extinguishers, contains suitable procedures for inspecting and testing fire extinguishers.

Australian Standards AS 2444 Portable Fire Extinguishers- Selection and Location outlines the appropriate type, size and location of fire extinguishers for vehicles.

Table 15: Fire Extinguisher requirements in accordance with AS2444

**TABLE 5.1
MINIMUM RATING, CLASSIFICATION AND NUMBER OF EXTINGUISHERS
FOR VEHICLES**

Type of vehicle	Minimum rating and classification of extinguishers	Minimum number of extinguishers
Sedan, station wagon, panel van or utility	1A:5B	1
Caravan/campervan – Single compartment	1A:5B	1
Multi-compartment	1A:5B	2
Outboard-powered boat – Small fuel tank (< 25 L)	5B	1
Large fuel tank (> 25 L)	20B	1
Houseboat and motor cruising yacht	2A:10B	2
Passenger-carrying vehicle In urban areas or on short trips outside urban areas	2A:20B (fitted with hose)	1
Outside urban areas or when fitted with integral luggage compartment	2A:20B (fitted with hose)	2 (one to be mounted near the under-floor area or engine)
Cargo-carrying vehicle	1A:10B (fitted with hose)	1 (in cabin) (Additional extinguishers appropriate to the cargo carried and in accordance with the relevant regulations)

NOTES:

- 1 In caravans and boats where cooking appliance (using cooking oils and fats) are installed, a fire blanket is recommended, additional to the above.
- 2 Consideration should be given to all extinguishers having an E rating where electrical hazards may be found in vehicles if capable of being connected to 240 V a.c., e.g. caravans, campervans, houseboats and the like.

- p) Portable Halon Fire Extinguishers are installed;
- q) The extinguisher does not have the Standards Australia (SA) approval marking, having a fire test rating (as defined in the standard) of at least 20B and fitted with a hose;
- r) The operational capacity is not displayed in accordance with local jurisdictional requirements.

13.2 Check School Bus Warning System

NOTE:

A school bus is a bus used solely or principally for the conveyance of children to or from school. Where a bus is fitted with lights and signs indicating that it is a school bus the following Reasons for Rejection apply.

Not all jurisdictions apply the national requirements. Apply local requirement if different to national approach (e.g. NSW).

SCHOOL BUS WARNING SIGNS

Reasons for rejection (Does not apply in NSW, VIC or TAS - see local inspection manual for rejection reasons)

Applies to buses fitted with warning lights after July 1999.

- a) A rectangular sign bearing either the words 'SCHOOL BUS' in black capital letters at least 100mm high or an image of 2 children in the same proportions as the children in AS 1743 'Road Signs—Specifications', image W6-3, with the image of the taller child at least 230mm high is not displayed at the front and rear of the bus;
- b) Either sign is not at least 550mm long and 400mm high if the warning lights are on the sign or 400mm long and 250mm high if the warning lights are not on the sign;
- c) There are not two lights at each end;
- d) If the lights are on the warning sign and obscure the words or image on the signs;
- e) The signs do not have a black border and graphics or have a yellow surface complying with class 1 or 2 of AS 1906 *Retroreflective Materials and Devices for Road Traffic Control Purposes*;
- f) The lights are not at least 300mm apart;
- g) The lights are more than 100mm from the edge of the warning sign;
- h) The lights are not on each side of, and the same from, the centre of the warning sign;
- i) The lights are not at the same height and mounted as high as practicable;
- j) The lights are mounted with the lowest point on the lens of each light at least midway between the highest and lowest points on the bus body;
- k) Each light does not have an effective lit lens area of at least 60cm²;
- l) If the centres of the warning lights are less than 1.8m above ground level no part of the warning lights or warning sign is to be on the left side of the bus;

- m) If the warning lights, when switched on, do not emit a flashing yellow-coloured light and flash between 90 and 180 times per minute;
- n) If the warning lights, when switched on, do not flash alternately at the same end of the bus;
- o) If the warning lights, unless turned off, do not operate automatically when a door on the bus opens and for at least 10 seconds, and not more than 20 seconds, after all the doors on the bus have closed;
- p) The bus does not have an audible or visible signal that tells the driver of the bus in the normal driving position when the warning lights are flashing;
- q) The bus is not fitted with a switch that allows the driver of the bus to turn the warning lights off from the normal driving position;
- r) Each light does not have a luminous intensity (in candela) of at least the values mentioned in the following table when measured at the angles mentioned in the table.

Table 16: Luminous Intensity Values

Horizontal angle from centre of light									
	-30°	-20°	-10°	-5°	0°	5°	10°	20°	30°
10°				50	80	50			
50°		180	320	350	450	350	320	180	
0°	75	450	1000	1250	1500	1250	1000	450	75
-5°	40	270	450	570	600	570	450	270	40
-10°				75	75	75			

NOTE: *Special purpose bus warning lights manufactured by the firm "Hazard" have been shown to meet the luminous intensity requirements above and are therefore approved for use.*

Lights from other manufactures can only be fitted if an acceptable certificate of compliance is presented prior to inspection.

13.3 Check Ordinary Entrances and Exits

Reason for rejection

- a) No ordinary entrance door fitted on the left hand side;
- b) Must not have an entrance or exit on the right side of the bus other than:
 - a mandatory emergency exit; or
 - the driver's door.
- c) The height of the entrance is less than the interior height of the bus;
- d) The entrance is less than 550mm wide.

13.4 Check Emergency Exits

Reason for rejection

- a) If an emergency exit is not fitted at the extreme rear of a bus or in the rear half of the roof of the passenger compartment.
- b) Has an area less than 5200 square centimetres in the case of a small bus or 7000 square centimetres in the case of a large bus;
- c) If any dimension is less than 500mm;
- d) If an emergency exit is fitted in the rear half of the roof of the passenger compartment:
 - there is no additional exit provided on the right side of the vehicle in the rear half of the passenger compartment and;
 - that exit has an area less than 3200 square centimetres and;
 - if any dimension is less than 500mm.
- e) If there is no suitable means of opening the exit at all times;
- f) Except in the case of a "push out type" there is no suitable opening and closing device on both the inside and outside of the emergency exit;
- g) Emergency hammers are not fitted as required by manufacturer;
- h) There is no **"EMERGENCY EXIT"** sign displayed on the exit both inside and outside the bus.

However, a bus is not required to be fitted with an emergency exit if it:

- is designed and constructed to seat not more than 12 adults including the driver; and
- is fitted with one or more doors on each side; and
- has an overall width of not more than 2 metres;
- a hinged and latched door fitted to a small bus with a seating capacity of not more than 15 adults, including the driver, may be regarded as an emergency exit if it is capable of being opened outwards from inside the bus.

13.5 Check Doors

Reason for rejection

If a bus is fitted with:

- a) An interior door that separates the space normally used by passengers from the access doors or emergency exits; or
- b) An inward opening door other than a “jack-knife” or “glide-away” door which is so constructed that no part of it extends beyond the back of the lowest step of the entrance or exit where it is located;
- c) A forward opening (suicide) door.

13.6 Check Steps

Reason for rejection

- a) If the entrance is not securely fitted;
- b) If the height of the tread of the lowest step from the ground is over 410mm or under 250mm;
- c) The height of any step in relation to an adjacent step is over 300mm;
- d) The transverse depth of the tread of each step in a small bus is less than 180mm;
- e) The transverse depth of the tread of each step in a large bus is less than 225mm;
- f) The width of the tread of the lowest step is less than the width of the entrance;
- g) The width of each step, other than the lowest step, is less than 450mm;

- h) If each step is not fitted with skid-resistant tread;
- i) If step treads and risers are not directly illuminated, except in the case of an external access step to a single row of seats for a small bus having a seating capacity of not more than 15 adults, including the driver.

13.7 Check Interior Height

Reason for rejection

If the distance from the floor of a bus to the centre line of its roof is less than:

- a) 1.2 metres in the case of a small bus with an aisle length not over 2 metres; or
- b) 1.35 metres in the case of any other small bus; or
- c) 1.65 metres in the case of-
 - each deck of a double-deck bus; or
 - a large bus that is not involved in frequent stops for the purpose of picking up or setting down passengers; or
 - 1.8 metres in the case of a large bus that is involved in frequent stops for the purpose of picking up or setting down passengers.

13.8 Check Aisle Width

Reason for rejection

- a) If the width of an aisle is less than 300mm on a small bus;
- b) If the width an aisle is less than 300mm on a large bus that is used to only carry seated passengers and less than 380mm wide in the case of any other large bus.

13.9 Check Passenger Seating

Reason for rejection

- a) Any passenger seating position does not have a dimension of at least 400mm when measured along the front of the seat cushion;
- b) The distance from the foremost point of each seat squab to the foremost point of its corresponding seat cushion is less than 350mm;

- c) There is any obstruction horizontally forward of the seat squab for a distance, when measured on the centreline of the seating position and between the top of the seat cushion and any point up to 610mm above the floor, within:
 - i) 1200mm in the case of opposite facing seating positions; or
 - ii) 660mm in the case of other seating positions.
- d) There is any obstruction in front of each seating position for a space 200mm horizontally forward of the seat cushion, and 300mm in width but not extending beyond the nominal seat width, and between the floor and the level of the seat cushion.

Note: The spaces described by this requirement shall not intersect each other or any other spaces designated for standing passengers or required minimum aisle width.

- e) The average height of each unloaded seat cushion relative to the floor exceeds 500mm or less than:
 - i) 400mm in the case of a large omnibus;
 - ii) 380mm in the case of other omnibuses; or
 - iii) 300mm when the floor level is interrupted by a wheel housing and/ or engine housing or similar structure.
- f) Any seat interrupts the minimum access and clearance dimensions;
- g) Any seat is not securely attached to the vehicle;
- h) The minimum concave radius of any seat squab is less than 450mm for a Route Service Omnibus or 300mm for any other omnibus, when measured in any horizontal plane between the top of the seat cushion and 610mm above the floor and within 150mm on either side of the centreline of the seating position.

13.10 Check Driver Seating

Reasons for rejection

- a) If the driver's seat on a bus is not:
 - securely attached to the bus; and

- is not designed and fitted in such a way that the driver can be comfortable and have control of the bus.

13.11 Safety and Guard Rails

Reasons for rejection

- a) A bus is not fitted with a suitable rail or partition in front of any seat located on the left side of the bus immediately behind a step so as to prevent persons from falling into a step well;
- b) The driving position on a large bus is not otherwise separated from the passenger compartment and is not fitted with a suitable guard rail or other structure so as to prevent passengers from-
 - coming into contact with the driver or the controls; or
 - obstructing the drivers view.

Section 14 : Trailers

Australian Design Rules are relevant to this section:

ADR 1	Reversing lamps
ADR 6	Direction indication lamps
ADR 38	Trailer brake systems
ADR 42	General safety requirements
ADR 43	Vehicle configuration and dimensions
ADR 44	Specific purpose vehicle requirements
ADR 45	Lighting and light-signalling devices not covered by ECE regulations
ADR 47	Reflex reflectors
ADR 48	Rear registration plate illuminating devices
ADR 49	Front and rear position (side) lamps, stop lamps and end-outlined marker lamps
ADR 62	Mechanical connections between vehicles
ADR 63	Trailers designed for use in road trains

OBJECTIVE: To ensure that all components and associated systems are in a serviceable condition and meet all legislative requirements.

14.1 Check brake components

Reasons for rejection

- a) Abrasions or cuts on brake hoses penetrate further than the outer protective covering;
- b) Brake pipes, hoses and connections are not securely mounted, are cracked, broken, kinked, crimped, damaged by heat or have visible signs of leakage, swelling or bulging;
- c) Brake control mountings, pivots, cables or links are missing, frayed, kinked, loose, broken, excessively worn or binding;
- d) Brake drums or discs are not fitted, or have missing pieces, or cracks other than short heat cracks inside the drums;
- e) Drums or discs are worn beyond the manufacturers specification;
- f) Any calliper, wheel cylinder or master cylinder leaks;
- g) Linings or pads are contaminated with oil, grease or brake fluid;

- h) The thickness of the linings or pads is less than the manufacturer's recommended minimum. If this is not known or is no longer appropriate, the thickness of the linings or pads is less than:
 - 0.8mm above the fastener; or
 - on bonded linings or pads, 1.5mm above the shoe or pad backing plate.
- i) Brake chambers (including chamber clamps) or camshaft support brackets are loose, bent, cracked or missing;
- j) Brake shoes, springs, anchor pins, cam rollers or bushes, pull or push rods, clevis pins, retainers or brake chamber mounting bolts are missing, loose, damaged or broken;
- k) The brake controls of the towing unit, when operated do not cause the corresponding trailer brake to work when they are operated;
- l) Operating the service brake of the motor vehicle does not cause the trailer brakes to come on (where applicable);
- m) There are any air/vacuum or hydraulic leaks;
- n) Where the trailer is fitted with air/vacuum brakes it does not have at least one reservoir;
- o) Any reservoir or tank for vacuum or air storage is not protected by a check valve;
- p) Reservoirs are not secured or their mountings are deteriorated;
- q) Air reservoir drain valves on reservoirs do not work properly or cannot be readily operated by the driver/operator;
- r) With any brake fully applied, any stroke indicator runs out of travel or indicates that adjustment is necessary;
- s) Brake chamber push rods move more than 80% of their maximum stroke or travel over centre with the brakes fully applied;
- t) Brake adjusters are not properly adjusted, are bent, damaged or excessively worn;
- u) The truck/ trailer interconnecting flexible hose and coupling is not properly mated or secured;

- v) Any wiring for electric brakes is frayed, bared or not secure;
- w) Any handle of a parking/ hand brake fitted to a trailer that is not fitted with a locking device capable of holding in any position.

14.2 Brake testing with a roller brake tester

NOTE: *This section should be read in conjunction with the equipment manufacturers' instructions.*

Using a roller brake tester, check the retardation forces on each wheel. Release all brakes then slowly apply a braking force until a maximum force is attained or wheel slip occurs.

Reasons for rejection

- a) There is more than 30% difference in the brake force between the wheels on any same axle;
- b) The minimum brake force on any wheel is less than the performance requirement specified in Table 17;
- c) With the brakes released, the average brake drag is more than the performance requirement specified in Table 18;
- d) The parking brake does not give a reading at each wheel assembly where fitted or the vehicle does not lift out of the roller.

Table 17: Minimum Brake Force

Type of vehicle	kN/tonne (minimum)
All trailers	4.5

NOTE: *The minimum brake efficiency (kN/tonne) is determined by:*

Step 1 adding the brake force for each axle.

Step 2 dividing the vehicle mass by the force calculated from Step 1.

Table 18: Maximum Brake Drag

Type of Vehicle	kN (maximum)
GTM over 4.5 tonnes	0.5 per axle

NOTE: *On some trailers the brake force limit might not be reached as the vehicle will be lifted out of the rollers or lock the wheels. Similarly, it might not be reached if a load proportioning valve is fitted to the rear axle. In both cases it is considered a pass if the brake balance is within the specified limit.*

14.3 Check trailer brakes and breakaway protection

NOTE: *The examiner should seek the assistance of another person in order to make a thorough check of the breakaway protection systems.*

Reasons for rejection

- a) For trailers with a gross trailer mass (GTM) in excess of 2 tonnes, the trailer brakes do not operate immediately the trailer is disconnected from the towing vehicle and do not remain fully applied for at least 15 minutes;
- b) A towing vehicle's service brakes apply automatically when any trailer service hose coupling or connection is disconnected or the operating pressure falls below the recommended operating level;
- c) A truck trailer interconnecting flexible hose and coupling is not properly mated or secured;
- d) A towing vehicle's brakes are not functional both with or without a trailer connected;
- e) For trailers with a GTM in excess of 2 tonnes the trailer brakes are not capable of being applied and released from the normal driving position;
- f) Any trailer having brakes which are air or vacuum assisted is not fitted with a reservoir that is protected by a check valve;
- g) Any trailer having brakes which are air or vacuum assisted is not built to provide a visible or audible warning to the driver of the towing vehicle, while the driver is in a normal driving position, of a lack of air or vacuum;
- h) In an air operated brake system when any trailer hose coupling or connection is disconnected to simulate a breakaway situation, the rate of loss in air pressure in the towing vehicle's service brake system is more than 15 kPa per minute after stabilisation.

14.4 Check drawbar

Reasons for rejection

- a) Drawbar is extensively corroded, cracked, bent or insecurely mounted;
- b) Where any part of the drawbar is removable the bolts, studs, nuts etc fastening those parts do not have a locking device such as a U-clip, split pin, spring washer or nylon lock nut;
- c) There is more than 6mm of movement between the sub-frame and hinged drawbar at the attachment point;
- d) Drawbar eye is elongated by wear, cracked or worn more than 5% of the original diameter;
- e) Drawbar eye bush is worn through, insecure or is attached by welding (unless manufacturer specifies welding);
- f) Drawbar eye/ block has transverse or circumferential welds evident;
- g) Where ADR 62 applies the drawbar eye does not display the manufacturer's name/ trademark and the rating. A "D" value" is also a requirement for the drawbar;
- h) Any mounting bolts, fasteners or weld beads have advanced corrosion;
- i) Any sliding drawbar latching mechanism is inoperative;
- j) One or more stops on a sliding drawbar are missing or are inoperative;
- k) A sliding drawbar has more than 6mm of movement between the slider and the housing;
- l) Air or hydraulic cylinders, hoses or chambers on sliders leak (other than normal weeping of hydraulic seals).

14.5 Check towing attachments

Reasons for rejection

- a) Any towing attachment, any mounting bolts, fasteners or weld beads are loose, cracked, broken or extensively corroded;

- b) Any ball coupling locking device is broken or inoperative.

14.6 Check skid plates (including kingpin)

Reasons for rejection

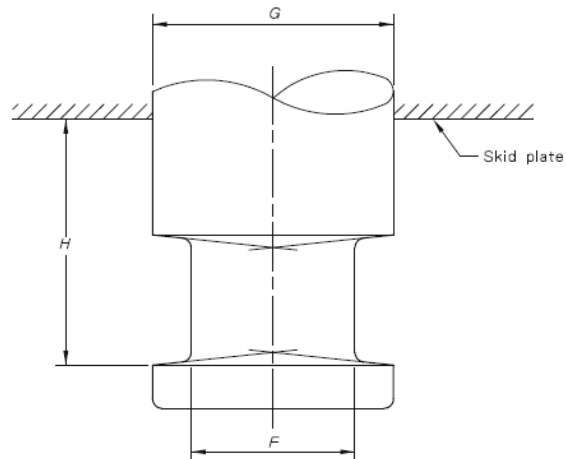
- a) Where ADR 62 applies the kingpin does not display the manufacturer's name/ trademark, nominal size (e.g. 50mm) and the rating;
- b) The vertical or horizontal movement between the upper and lower fifth wheel halves of coupled vehicles exceeds 13mm;
- c) The king pin is worn or loose;
- d) Any mounting bolts, fasteners or weld beads have advanced corrosion;
- e) An adaptor is used to fit a kingpin to a fifth wheel coupling;
- f) Skid plate or king pin has missing or loose bolts;
- g) Skid plate is cracked or warped;
- h) Any welding performed to the king pin not carried out in accordance with the requirements of Australian Standard 2175.
- i) A trailer skid plate is worn more than 20% or 2mm whichever is the greater;
- j) The maximum wear limits for kingpins is exceeded.

Table 19: Kingpin Maximum Wear Limits

Size (mm)	<i>F</i> (mm)	<i>G</i> (mm)	<i>H</i> (mm)
50	49	71	73
75	73	100	73.3
90	86	112	62

Note: Dimensions *F*, *G* and *H* are illustrated in Figure 17.

Figure 17: Kingpin Wear Dimensions



NOTE: The above table and diagram has been extracted from AS/ NZS 4968.3:2011.

14.7 Check safety chains and cables

Reasons for rejection

- a) Safety chains as required by ADR 62 or cables are stretched, nicked, frayed, worn or cracked, extensively corroded;
- b) Any safety chain that has insecure attachment points, clamps or fasteners, and are not liable for accidental disconnection and are not readily detachable from the towing vehicle;
- c) Safety chains attachment on a trailer exceeding 3500kg involves welding or deformation of the chain welding;

Table 20: Safety chains

Aggregate Trailer Mass (tonnes)	Minimum Chain size (mm)	Minimum chain breaking load (tonnes)
4.3 - 7.5	9.5	11.6
7.5 - 13.5	12.7	20.4
13.5 - 21.5	15.9	32.0
21.5 - 30.0	19.0	46.4
> 30.0	22.0	63.2

NOTE: Safety chains should be inspected in accordance with: Australian Standards; AS 1872; AS 2321; AS 4177.4 and as amended, whichever is applicable at the time of the manufacture of the vehicle. Breakaway brakes on any rigid drawbar pig type trailer with an aggregate trailer mass of 2.5 tonnes or more and manufactured on or after 1 July 1988 are not capable of activating before the safety chains have broken.

To comply with this requirement the brake connections (hoses) must be short enough to cause disconnection before full extension of the safety chains.

- d) Safety chain retaining brackets are cracked, deformed or not secure;
- e) Safety chain retaining brackets do not meet the requirements of ADR 62 (where applicable) or Table 20.

NOTE: The dimensions and configurations of typical chain retention brackets are shown in following diagrams.

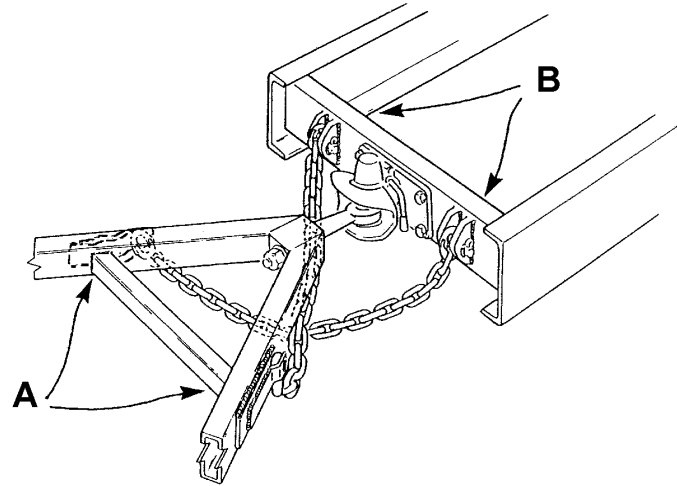
Table 21: Typical Bracket Dimensions

Minimum Chain (mm)	Minimum length of fillet weld	Bracket dimensions				
		(T1)	(T2)	(B)	(C)	(D)
	Size length					
9.5	6 x 200	16	16	4 x M12	19	*
12.7	6 x 360	20	20	4 x M16	25	*
15.9	8 x 420	25	20	4 x M20	32	*
19.0	10 x 480	25	25	4 x M20	38	*

* Dimension "D" to suit coupling link plus minimum clearance to prevent binding.

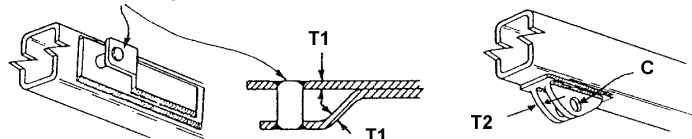
Figure 18: Typical Bracket Dimensions

A typical attachment of chains

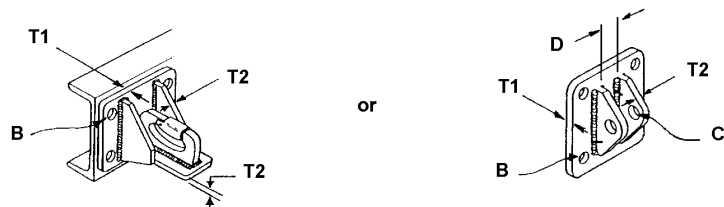


A. To the trailer

Pin welded to prevent chain loss



B. to the towing vehicle



14.8 Check suspension components

Reasons for rejection

- a) U-bolts or other spring to axle or spring pack clamp bolts, centre bolts, spring eyes or hangers, torque, radius or tracking component assemblies, control arms, bushes or any parts used to attach them to the vehicle frame or axle are cracked, loose, broken, missing or worn beyond manufacturer's limits;
- b) Nuts do not fully engage 'U' Bolts;
- c) Any suspension component is not correctly aligned or is damaged, loose or broken;
- d) Any nut, bolt or locking mechanism is insecure or missing;
- e) Springs are cracked, missing or broken;

NOTE: *Superficial crazing is acceptable. This is often present on rubber suspension components even when new.*

- f) Air bags leak or sag;
- g) Leaves in a leaf spring are displaced sideways more than 10% of their width or so that they contact wheels, brakes or the frame;
- h) Any "walking beam" type heavy vehicle suspension has signs of damage to beam;
- i) Shock absorbers, if originally fitted, are missing, loose, inoperative or leak;
- j) Shock absorber mountings or bushes are not secure or damaged.

NOTE: *Repairs using either heating or welding may adversely affect the strength of suspension components. Any such repairs should only be affected in consultation with the vehicle or component manufacturer.*

Figure 19: Four spring suspension

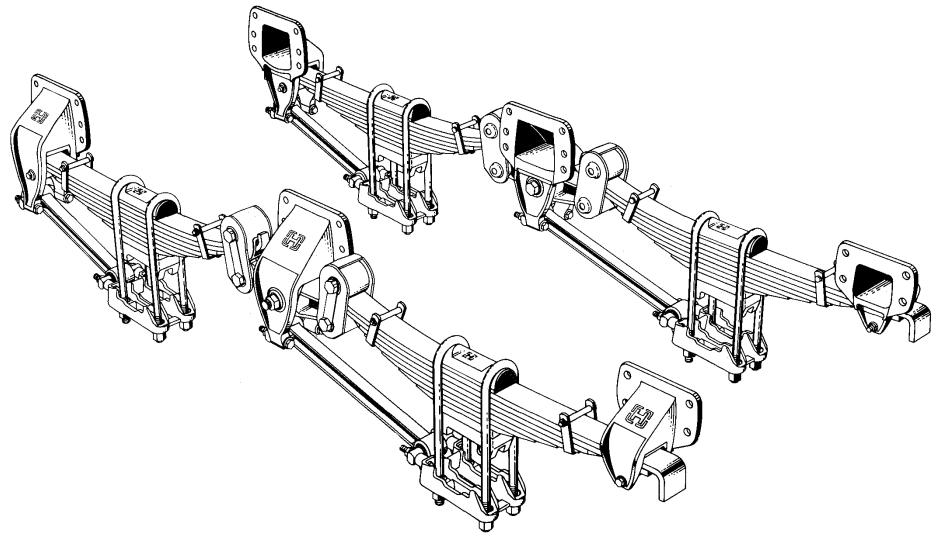
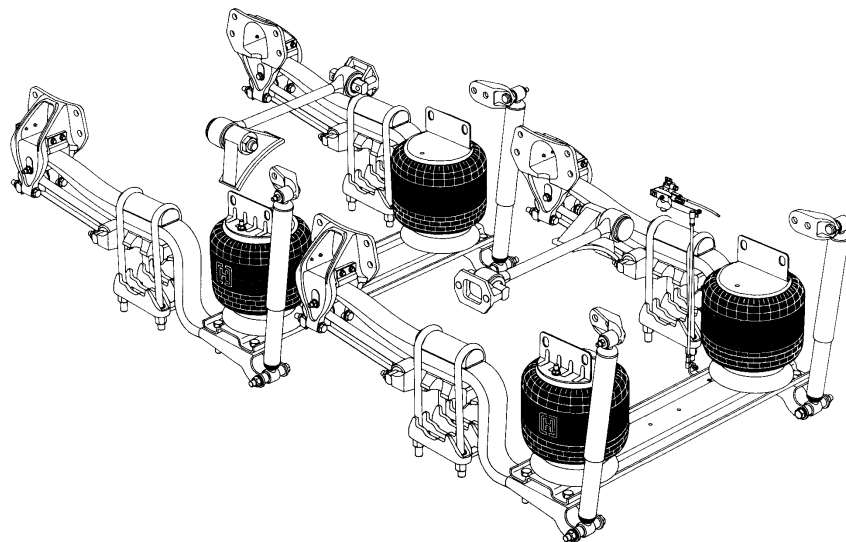


Figure 20: Typical air bag suspension



14.9 Check sliding axles

Reasons for rejection

- a) Sliding axles do not lock securely in position or have lock pins missing or not engaging;
- b) Secondary securing devices and locking indicators do not work properly;
- c) Lock pins are excessively worn, cracked or damaged.

14.10 Check wheels/ rims

Reasons for rejection

- a) Any wheel or rim:
- b) is loose;
- c) is cracked;
- d) is buckled;
- e) has pieces of casting missing;
- f) has elongated stud holes;
- g) has weld repairs not in accordance with relevant industry practice;
- h) Any wheel contacts unrelated vehicle components;
- i) Spiders have cracks across a spoke, hub or web area;
- j) Wheels are not compatible with hubs;
- k) Valve protection lugs are missing.

14.11 Check wheel fasteners

Reasons for rejection

- a) The wheel nut does not fully engage the thread of the wheel stud or the fitting of the wheel nut does not match the taper of the wheel stud hole;
- b) Any hub has missing, cracked, stripped or broken wheel mounting nuts, studs or bolts;
- c) Fasteners are not the correct type for the wheel being used or allow a rim to slip on its spider;
- d) Spacer plates are used between hub and wheels, except where fitted by the vehicle manufacturer.

14.12 Check retaining rings

Reasons for rejection

- a) Lock or side rings are incorrectly seated, sprung, mismatched, bent, broken or cracked.

14.13 Check tyres

Reasons for rejection

- a) A tyre does not have at least 1.5mm tread depth in a continuous band which runs around the whole circumference of the tyre and extends across at least 75% of the width of the tyre;

NOTE: *Tread wear indicators are built into most tyres to indicate when tread depth reaches about 1.5mm. The depth of the tyre tread above these indicators is not included in the assessment of tread depth around the circumference of a tyre.*

In effect, these requirements allow a tyre to be worn to less than 1.5mm tread depth on its edges, provided that at least 75% of the remaining width of the tyre has a minimum tread depth of 1.5mm around the whole circumference.

- b) The overall diameter of dual tyres on the same side of an axle is not matched within 25mm;
- c) A tyre (including sidewalls) has deep cuts, chunking, bumps, bulges, exposed cords or other signs of carcass failure;
- d) A tyre has been re-grooved (except where indicated on the side wall that the tyre is suitable for re-grooving);
- e) When in the straight ahead position, the wheels and tyres and fittings (wheel nuts, grease caps etc) of any vehicle project beyond the extreme width of the mudguards or exceed the maximum width of a vehicle;
- f) Any tyre is not of a type constructed for unrestricted road use;
- g) Any retreaded or remoulded tyre is not marked with the words "**RETREAD**" or "**REMOULD**" and where speed limited the words "**MAX. SPEED XX KM/H**" or "**SPEED LIMITED TO XX KM/H**". ("XX" means the maximum speed i.e. 125kph);
- h) The speed rating of all tyres is not of at least 100 km/h or the vehicle's top speed, whichever is the lesser, unless a lower rating has been specified by the manufacturer;
- i) A tyre fitted to a vehicle with a GVM of more than 4.5 tonnes is not suitable for road use if:

- the tyre load ratings are less than the minimum ratings specified originally by the vehicle manufacturer;
- tyres are not compatible with the rim to which they are fitted;
- the tyres on an axle are not of the same carcass construction (e.g. cross ply, radial ply or bias belted);
- dual tyres contact each other;
- the tyres or wheels on a vehicle contact the body, chassis, frame or braking or suspension components;
- a tyre on a motor vehicle has cleats or other gripping devices that could damage road surfaces.

14.14 Check exterior body panels and fittings

Reasons for rejection

- a) Exterior body work including mudguards on a vehicle have exposed sharp edges (including corrosion or accident damage) that could injure a person who comes into contact with the vehicle;
- b) Mudguards are not properly fitted to provide protection over the full width of the wheels and tyre(s) and any mudguard does not extend inboard over the full width of the tyre/s (except where part of the body of the vehicle acts as a mudguard);
- c) The bottom edge of the mudguard and/ or mudflap at the rear of any vehicle is higher off the ground than $\frac{1}{3}$ of the horizontal distance between the centre of the axle and the mudguard;

NOTE: *This height must not be more than 230mm, or 300mm for a vehicle built to be used off-road.*

- d) Any motor vehicle which is 2.2 metres or more in width and fitted with a body which is less than 300mm in height at the rear, measured from the lowest point of the body above the ground to the highest point, does not have the rear face of any rear mudguards silver or white in colour;
- e) The rear coaming of any vehicle described in 14.14 (d) above is not silver or white in colour for a depth of 75mm or more;

NOTE: Rule (d) and (e) does not apply when a vehicle is correctly fitted with rear marking plates.

- f) Any after-market fittings attached to the exterior of the trailer that could cause injury to a person coming into contact with that part of the trailer.

14.15 Check rear marker plates

Reasons for rejection

- a) Retroreflective rear marker plates not fitted to a trailer with a GTM greater than 10 tonnes;
- b) Rear marker plates are not fitted in locations specified by the required standards;
- c) Rear marker plates are faded, damaged or incorrectly fitted.

NOTE: For more detailed information refer to VSB12 and Appendix E - Rear Marker Plates.

14.16 Check number plate

Reasons for rejection

- a) Any number plate is obscured, for example by a towing attachment, goose neck or tow ball);
- b) Number plates covers are tinted, reflective, rounded or bubble like;
- c) Number plate is not issued or approved by the State or Territory Road Transport authority;
- d) Number plate is damaged or faded to the extent that the registration number is not legible from a distance of twenty metres;

- e) The number plates are not substantially parallel to the vehicle's axles;
- f) The number plate is mounted more than 1300 mm from the ground;
- g) Characters on the number plate are not clearly visible from a distance of 20 metres at any point within an arc of 45 degrees from the surface of the number plate above or to either side of the vehicle.

14.17 Check electrical equipment

Reasons for rejection

- a) Any electrical wiring or connector that is corroded damaged, not insulated or securely fastened so that it could be damaged;
- b) Electrical wiring is located where it can:
 - come into contact with combustible substances;
 - become exposed to excessive heat;
 - come into contact with moving parts.

14.18 Check chassis

NOTE: Refer to Appendix J for detailed explanation of checking for rust.

Reasons for rejection

- a) Any part of the chassis or sub-frame is weakened or failure of a component is likely to occur from being:
 - cracked;
 - distorted;
 - sagging;
 - broken;
 - loose; or
 - affected by extensive or advanced rust (see Appendix J).
- b) Any fastenings between frame members, including welds, are loose, distorted or cracked;

- c) Frame members in load areas are missing or damaged to an extent that the load area is not properly supported or the members are likely to fall out or contact moving parts;
- d) Trailer chassis has been altered without certification of compliance with section H of VSB6 in the form of a Modification Plate from a Registering Authority or the NHVR.

14.19 Check lights and reflectors

Reasons for rejection

- a) Compulsory reflectors are damaged, obscured, deteriorated or are not fitted;
- b) Any of the following lights are inoperative, obscured, deteriorated, insecure or not fitted where required or is an incorrect colour:
 - tail lights (red);
 - brake lights (red);
 - turn signal indicator lights (yellow);
 - clearance/end outline marker lights (white/yellow to front, red to rear);
 - number plate light (white);
 - side marker lights (yellow);
- c) Any rear light other than a reversing light is damaged to the extent that white light shows to the rear of the vehicle;
- d) Any yellow clearance light or turn signal indicator is damaged so that it shows white light;
- e) The number plate light is not directing light onto the surface of the rear number plate;
- f) Any light has a tinted cover over it that affects its intended operation;
- g) Any light not clearly visible under normal conditions and of a consistent intensity, or affected by dirty lenses or poor electrical contact;
- h) Any light does not comply with the requirements as specified in the national vehicle standards instructions.

Section 15 : Motor homes, caravans and campervans

Australian Design Rules are relevant to this section:

ADR 42	General safety requirements
ADR 44	Special purpose vehicle requirements

OBJECTIVE: To ensure that motor homes/ caravans and campervans and associated components are fitted correctly and operate in a safe manner.

15.1 Visually inspect the living quarters

Reasons for rejection

- a) There is no permanently affixed sleeping berths;
- b) There is no permanently affixed cooking facilities;
- c) A motor home or caravan manufactured after 1 July 1988 fitted with a fuel burning cooking facility or living, or sleeping accommodation that do not have at least one outward opening or sliding door on the left hand side or rear (bi-fold doors are not acceptable);
- d) There is no fire extinguisher fitted with a minimum rating of 5B and complies with AS 2444 Portable Fire Extinguishers;
- e) The fire extinguisher is not securely mounted in the living quarters;
- f) A motor home does not have at least one designated seating for each sleeping berth;
- g) A designated seating position in a motor home is not fitted with a seatbelt in accordance with ADRs;
- h) A designated seating position that swivels in a motor home is not capable of being securely locked into position for travelling;
- i) Where gas appliances are fitted if there is no installation compliance certification for the vehicle supplied by a licensed household gas plumber;
- j) Where mains wiring is fitted an electrical safety certificate showing compliance with AS 3000 and AS 3001;
- k) Where the vehicle has a load/ goods carrying capacity this capacity must not exceed 30% of the living/ cabin area of the vehicle;

- I) Where a toilet or urinal is present a catchment tank (black water tank) must be fitted and the toilet vented directly to the atmosphere.

Appendix A : Brake Drums and Discs

BRAKE DRUMS AND DISCS

The purpose of this information sheet is to provide additional guidance where an invasive inspection is deemed necessary for the purpose of assisting determine a pass/fail for brake components. It discusses the terms for the acceptability of brake drums and disc dimensions and the criteria for the replacement of worn or damaged brake drums or discs used in the automotive industry.

This procedure is in accordance with Australian Standard 3617 (Parameters for the machining and reconditioning of brake drums and discs). When the braking system of a motor vehicle is inspected, serviced, overhauled, repaired, reconditioned or rebuilt, the condition of each brake drum or brake disc fitted to the vehicle shall be inspected in accordance with the following standards:

Brake drums

After removal of the brake drum from the vehicle, the brake drum should be inspected for:

- **Cracking:** If the drum is cracked, **replace the brake drum**. No repair shall be made to the component. (See comment at end of this information Sheet).
- **Glazing and excessive scoring:** If the brake drum is glazed or excessively scored, place it on a suitable fixture and measure it in accordance with the section titled 'Measurement Parameters'.
- **Heated or hardened hotspots:** If the brake drum has heated or hardened hotspots, place it on a suitable fixture and measure it in accordance with the section titled 'Measurement Parameters'.

After inspection and assessment, the following should be taken into account:

1. If the drum is cracked, **replace the brake drum**. No repair shall be made to the component. (See comment at end of this Information Sheet).
2. If it is considered that there is insufficient material available to successfully machine the brake drum in accordance with the vehicle manufacturer's requirements, **replace** the brake drum.
3. Where a vehicle manufacturer specifies that a brake drum may not be machined, replace the brake drum.
4. If, after machining, the brake drum measures on or above the maximum diameter specified by the vehicle manufacturer, **replace the brake drum**.

5. Where after machining the brake drum, and re-measuring in accordance with the section titled 'Measurement Parameters', any of the parameters are outside the vehicle manufacturer's recommendations, **replace the brake drum**.
6. After machining, inspect the drum for any flaws or defects, including excessive scoring or undercutting. If any flaws are present, **replace the brake drum**.
7. If after machining the brake drum, heated or hardened hotspots are still present, replace the brake drum.

Brake discs

1. If any cracking is evident, **replace the brake disc**. No repair shall be made to the component. (See comment at end of this Information Sheet).
2. If it is considered that there is insufficient material available to successfully remachine the brake disc in accordance with the vehicle manufacturer's requirements, **replace** the brake disc.
3. Where the manufacturer specifies that a disc rotor may not be machined, **replace the brake disc**.
4. If, after machining, the brake disc measures on or below the minimum thickness specified by the vehicle manufacturer, **replace the brake disc**.
5. Where after machining the brake disc, and remeasuring in accordance with the section titled 'Measurement Parameters', any of the parameters are outside the vehicle manufacturer's recommendations, **replace the brake disc**.
6. After machining, inspect for any flaws or defects, including excessive scoring or undercutting. If any flaws are present, **replace the brake disc**.
7. After machining the brake disc, heated or hardened hotspots are still present, **replace** the brake disc.

Measurement Parameters

The following dimensions shall be measured and recorded to ascertain the suitability for reuse or machining:

a. For brake drums, the following shall be observed:

1. *Diameter*: The diameter of the brake drum shall be measured in at least 6 equispaced positions across the area of lining contact. The largest measured diameter shall be deemed to be the diameter.
2. *Radial runout*: When rotating the drum on a suitable fixture, a dial gauge shall be used to record the runout of the drum.

a. For brake discs, the following shall be observed:

1. *Thickness:* Using suitable measuring equipment, the disc thickness shall be measured in at least 6 equispaced positions around and across the pad contact area. The smallest dimension measured shall be deemed to be the thickness of the disc.
2. *Lateral runout* A dial gauge should be used to measure the brake disc lateral runout.

Definitions

Brake drum: A hollow, machined, round drum that rotates with the wheel axle/hub and against which brake linings are forced into contact when the brakes are applied.

Brake disc: A flat, machined, round disc that rotates with the wheel axle/hub and against which the brake pads clamp when the brakes are applied.

Lateral (axial) runout: A measurement of the lateral or sideways change in the position of the disc rotor-wearing surface during one revolution.

Radial runout: A measurement of the radial change in the position of the brake drum wearing surface during one revolution excluding any bearing movement or other clearances.

Machining: The process of turning or grinding a brake drum or disc to remove surface imperfections such as scoring and glazing, and to eliminate lateral disc runout and other dimensional problems.

Maximum diameter: The largest diameter specified by the vehicle manufacturer at which a brake drum can remain in service.

Minimum thickness: The smallest thickness specified by the vehicle manufacturer at which a brake disc can remain in service.

Shall: Indicates that a statement is mandatory.

Should: Indicates that a statement is advisory.

Please Note:

Linings or disc pads must *not* be worn below wear indicators. If no indicators are provided, the thinnest part of the lining or disc pad must *not* be worn below manufacturer's specifications.

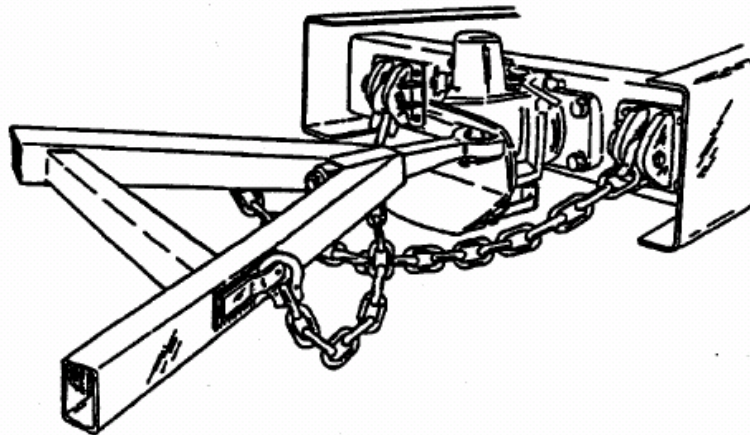
Comment:

Cracking of brake drums and disc rotors, other than minor surface heat cracks, MUST result in the drum or rotor being replaced.

Appendix B : Safety Chains

SAFETY CHAINS FOR:

- **TRAILERS IN EXCESS OF 3.5 TONNES ATM**
- **TRAILERS IN EXCESS OF 2.5 TONNES GTM WITH FIXED OR RIGID DRAWBARS AND AUTOMATIC PIN TYPE COUPLINGS**



All fixed or rigid pig trailers with a GTM greater than 2.5 tonnes and fitted with automatic pin couplings, all medium and heavy category pig trailers with rigid drawbars and any other trailers without breakaway brakes require safety chains.

It is strongly recommended that all other trailers be fitted with safety chains, especially vehicles used in severe conditions, e.g. quarry vehicles which are jackknifed regularly for unloading.

Safety chains complement the safety features of the trailer's "breakaway" braking system, allowing the driver to maintain control of the truck and trailer combination following a coupling failure or disconnection.

Safety chains **MUST** be supplied and fitted to comply with the following requirements:

Type of Chain

Chains must be manufactured from alloy steel of 800 MPa minimum breaking stress to conform with the mechanical properties of Grade T chain as specified in Australian Standard 2321 [Short Link Chain for Lifting Purposes (non-calibrated)], commonly referred to as "Herc-Alloy" chain.

Required number and size of chains

Two separate chains must be used.

The size of each chain used on the trailer must correspond with the maximum gross mass of the trailer as indicated in the table on the following page. The use of chains larger than specified should be avoided to minimize the shock loading on attachment fittings in the event of coupling failure.

Gross Trailer Mass (tonnes)	Chain Nominal Size (mm)	Minimum Chain Braking Load (tonnes)
2.5 - 4.27	7.1	6.4
4.27 - 7.75	9.5	11.6
7.75 - 13.5	12.7	20.4
13.5 - 21.5	15.9	32.0

Arrangement of chains

Safety chains must be arranged so that:

- the chains are permanently attached to the trailer;
- the chains are crossed to support the draw bar and prevent it from dropping to the ground in the event of coupling failure or disconnection;
- the points of attachment to both the towing vehicle and the trailer must be as near as practicable to the coupling and arranged so as to maintain direction of the trailer in the event of coupling failure or disconnection.

Ensure that the attachment fittings do not foul on the rear of the towing vehicle or trailer drawbar under and possible operating conditions;

- the chains are as short as possible but long enough to permit proper turning of the vehicle;
- the brake hoses are of sufficient length to prevent them breaking in the event of a coupling failure or disconnection.

Attachment of chains

Safety chains must be attached so that:

- the attachments to the towing vehicle and the trailer are capable of withstanding the specified breaking load of each chain;
- the attachments of the towing vehicle and the trailer are separate from the coupling and its fasteners;
- chain coupling links ("Berglok" type BL Grade 8 or similar) are used to connect the

chains to the trailer and towing vehicle.

Shackles are not permitted.

- The chain and coupling links are **NOT WELDED, DEFORMED OR ELECTROPLATED** subsequent to its manufacture.



"Berglok" coupling link

"Berglok" coupling link

Note: The chain coupling attachment brackets and dimensional requirements appear on the last page of this attachment.

Chain attachment brackets

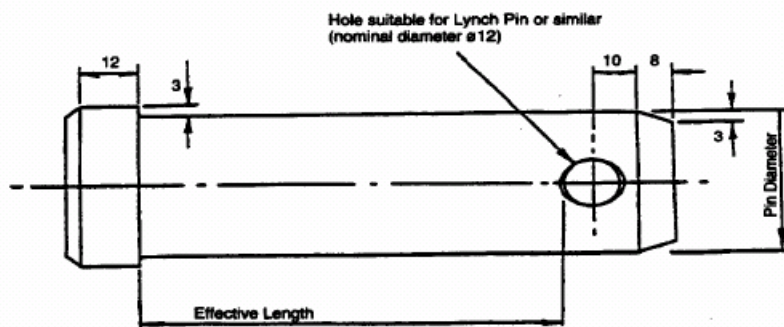
Preferred designs for safety chain attachment brackets and dimensional requirements appear on the last page of this information sheet.

'RAMSHORN' TYPE HOOKS ARE NOT PERMITTED.

Attachment pins

All pins used to connect safety chains to trailers and towing vehicles must be manufactured from steel bar with a minimum specification of 4140 or 4150 grade (Ultimate tensile strength – 1040 MPA) unless otherwise approved.

TYPICAL PIN DESIGN



Material - Steel 4140 (Alternative 4150)
(Metric Grade 10.9) - Ultimate Tensile Strength 1040 MPA)

Note: Standard agricultural 3-point linkage pins are **NOT** suitable because they are manufactured from a lower grade of steel and will not meet the load requirements. It is acceptable to use a metric grade 10/9 bolt of the correct diameter providing that the threaded portion of the bolt is clear of the brackets.

Appendix C : Retreaded Tyres

The use of retreaded tyres retreaded must be in accordance with Australian Standard (AS) 1973 (Pneumatic tyres – Passenger car, light truck, and truck/bus - Retreading and repair process). The details listed below advise of the requirements listed in AS 1973 to ensure compliance.

Marking of Retreaded Tyres

Marking on one side: Each retreaded tyre shall bear on at least one side wall or shoulder the following marking:

- a. The nominal size of the tyre.
- b. The word 'RADIAL' or 'R' in the size designation, for a radial ply tyre.
- c. The word 'TUBELESS' if applicable.
- d. The maximum load rating, ply rating, or service description of the tyre.

Note In the case of a remould, the service description is to be clearly identified as the original service description applicable to the tyre when new.

Marking on both sides: Each retreaded tyre shall bear on both side walls or shoulders the following marking:

- a. The word 'RETREAD' or 'REMOULD' if applicable.

Note: The maximum speed rating shall be placed adjacent to 'Retread' or 'Remould', as applicable.

- b. For light truck tyres, the maximum speed rating, expressed as follows:

- i) For tyres having an original speed category when new of 'L' (120 km/h) or higher, 'MAX SPEED 120 km/h', or 'MAXIMUM SPEED 120 km/h', or 'SPEED LIMITED 120 km/h'.
- ii) For tyres having an original speed category when new of less than 'L' (120 km/h), the original speed category.

Note: The maximum speed rating shall be placed adjacent to 'Retread' or 'Remould', as applicable.

- c. For truck/bus tyres:

- i) The speed equivalent to the original speed category.

Note: Retention of the original speed category on both side walls is sufficient to satisfy this requirement.

- ii) If structural belts have been replaced, the word 'REBELTED', and
- iii) The word 'REGROOVABLE' if the retread is specifically designed for regrooving. Only tyres marked regroovable are permitted to be regrooved.

Note: After major repairs have been carried out in the crown area, regrooving may be performed to reinstate tread grooves.

d. For speed limited truck/bus tyres:

- i) The original speed symbol shall be removed from the tyre.
- ii) Each speed limited tyre shall bear on both side walls or shoulder of the retreaded tyre the following marking, max. speed 80 km/h or speed limited to 80km/h.

Method and position of marking: All new marking (except for date code) on a retreaded tyre shall be in letters not less than 4mm high, be permanently and legibly marked in the shoulder or upper side wall of the tyre, and be durable for the life of the retread. Date coding shall be a digit week/year code. Branding with a hot iron is not permitted on passenger car or light truck tyres.

Removal of marking: The following information shall be removed from the tyre during retreading:

- a. The word 'TUBELESS' if a tyre originally designated as tubeless has been converted to tube type.
- b. The word 'REGROOVABLE' if the retread is not designed for regrooving.
- c. Any previous retreader's name or registered trademark.
- d. Any marks of approval.

Removal or mutilation of any original tyre speed category symbol is not required on passenger car and light truck tyres.

Any original speed category for truck/bus tyres must not be removed.

Marking on Repaired Tyres

Repaired tyres shall be marked as follows:

- a. All major repairs shall be marked, in a legible and permanent manner, with the identification of the repairer and the date on which the repair was carried out.

Note: Marking is not required for unreinforced repairs.

- b. The word 'TUBELESS' shall be removed if the tyre, originally designed as tubeless, has been converted to tube type.

Branding with a hot iron is not permitted on passenger car or light truck tyres.

Definitions

Shall indicates that a statement is mandatory.

Retreading is the process of reconditioning a worn tyre by topcapping, fullcapping, remoulding, or the application of a pre-cured tread.

Remoulding is a retreading process in which new rubber is applied to the casing extending from bead area to bead area.

Topcapping is a retreading process in which tread rubber is applied only to the tread area of the buffed casing.

Fullcapping is a retreading process in which new tread rubber is applied to the area of the casing normally in contact with the road and extending over the shoulder area.

Shoulder is the transitional area of a tyre between the side wall and the crown.

Precured retreading is the process by which a previously cured and patterned tread is cured to the casing.

Appendix D : Mudguard and Mudflap Requirements

MUDGUARD AND MUDFLAP REQUIREMENTS

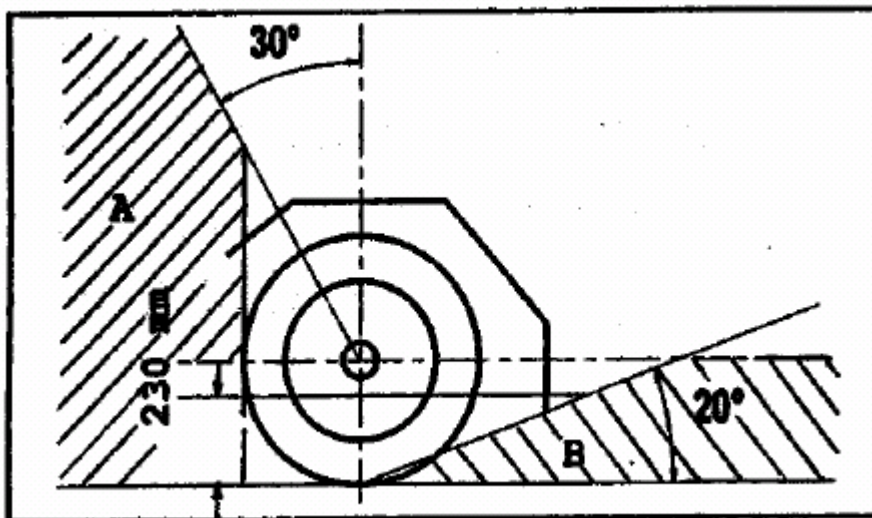
Effective mudguards must be fitted for all wheels on all vehicles. However, this does not apply to a vehicle if the construction or use of the vehicle makes the fitting of mudguards unnecessary or impractical. Examples are:

- most road making plant
- some agricultural equipment.

Mudguards may include parts of bodywork, etc. and must cover the full width of the wheels and tyres in the case of rear wheels on trucks, buses and trailers.

Mudguards and mudflaps must be capable of deflecting downwards any mud, water, stones or any other substance thrown upward by the rotation of the wheels. Mudguards must be fitted to the vehicle in such a manner that, when the vehicle is unladen, the height of the lowest edge of the mudguard, when measured from the ground, does not exceed:

- 230mm from the ground; or
- in the case of a vehicle built to be used off road, 100mm from the ground and cover the area of the wheel as shown below.



The mudguards on a single axle trailer must provide continuous protection, for the overall width of the tyres, between a point in area A and a point in area B as shown.

Appendix E : Rear Marking Plates

VSB 12 Rear Marking Plates for all motor vehicles over 12 tonnes GVM and for all trailers over 10 tonnes GTM

General Requirements

All vehicles with a gross vehicle mass (GVM) over 12 tonnes and trailers with a gross trailer mass (GTM) over 10 tonnes must be fitted with retroreflective rear marking plates. Buses with a gross vehicle mass over 12 tonnes must also be fitted with rear marking plates but buses fitted with hand grips or similar equipment for standing passengers to hold are exempt from these requirements.

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

Rear marking plates may also be fitted to any motor vehicle with less than 12 tonnes gross vehicle mass or to any trailer with less than 10 tonnes gross trailer mass. If your vehicle (meaning the towing vehicle together with the trailer and projecting load) is 7.5 metres long or longer, you may then also have the sign *"DO NOT OVERTAKE TURNING VEHICLE"* displayed at the rear.

Rear marking plates may also be fitted to light vehicles. However, in certain jurisdictions if the vehicle is less than 7.5 metres long, the plates must **not** have the words *"DO NOT OVERTAKE TURNING VEHICLE"*.

Australian Standards AS 4001 – 2003 Motor Vehicles – Rear Marker Plates Parts 1 and 3 (Manufacturing requirements) and Part 2 (Fitting requirements) provides for plates made from Class 1, Class 1A and Class 2 retroreflective material. Class 1 retroreflective material is more durable and because of its improved retroreflective performance, when compared to the older Class 2 plates, the plates can be smaller and yet reflect more light. Class 1A pressure sensitive plates have been developed so that these plates can be affixed directly to the vehicle without a metal backing plate.

You may use either style provided that both plates on any one vehicle are of the same size and material. Plates complying with AS 4001 are available in either rectangular or strip configuration as illustrated in the Figures 1 and 2 respectively.

Class 1 plates are preferred because they outperform and outlast Class 2 plates.

Types of Class 1 retroreflective material marking plates

Dimensions and graphics of the Class 1 rear marking plates are shown in the following diagrams. Class 1 rear marking plates are referred to by a code based on the overall width and height of the plate (eg. 31 for a 300mm wide x 100mm high plate). Where applicable, this number is followed by a letter, L to indicate a legend only plate (eg. *"DO NOT OVERTAKE TURNING VEHICLE"*) or a letter A, B or C to indicate the inclination of the colour bands on a "strip" plate.

The size of approved Class 1 rear marking plates are listed in Table 1.

When installed on a vehicle, rear marker plates shall be at a height above the road surface and at a distance in from the outer edge of the vehicle, as specified in Table 2.

TABLE 1 OVERALL SIZE OF PLATE

Category	Dimensions width x height (mm)
31 L	300 x 100
33, 33 L	300 x 300
34A, 34B	300 x 400
161	1,600 x 100
81	800 x 100
41	400 x 100
615	600 x 150

NOTES FOR TABLE 2:

- 'Side of vehicle' corresponds with the maximum-width-of-vehicle plane, excluding rear vision mirrors, side lights, and other projections.
- Height of plate to be determined when the vehicle is unladen and parked on a flat horizontal surface.

TABLE 2 INSTALLATION SPECIFICATIONS

Category	Position description	Dimensions (mm)
33 33L 34A, 34B 31L	Side of vehicle to outer edge of mounted plate (see Note 1)	500 max.
81A 81C 41A 41B	Height from road surface to underside edge of mounted plate (see Note 2)	400 min. 2000 max.
161 81B	Side of vehicle to outer edge of mounted plate (see Note 1)	On vehicle centreline
	Height from road surface to underside edge of mounted plate (see Note 2)	400 min. 2000 max.
615A 615B	Side of vehicle to outer edge of mounted plate (see Note 1)	200 max.
	Height from road surface to underside edge of mounted plate (see Note 2)	300 min.

Note: Australian Standard AS4001.2-2003 "Motor vehicles – Rear marker plates Part 2", contains additional information about fitting requirements of Class 1, Class 1A and Class 2 marking plates.

Figure 1 – Rectangular Class 1 and Class 1A rear marking plates

(all dimensions in millimetres)

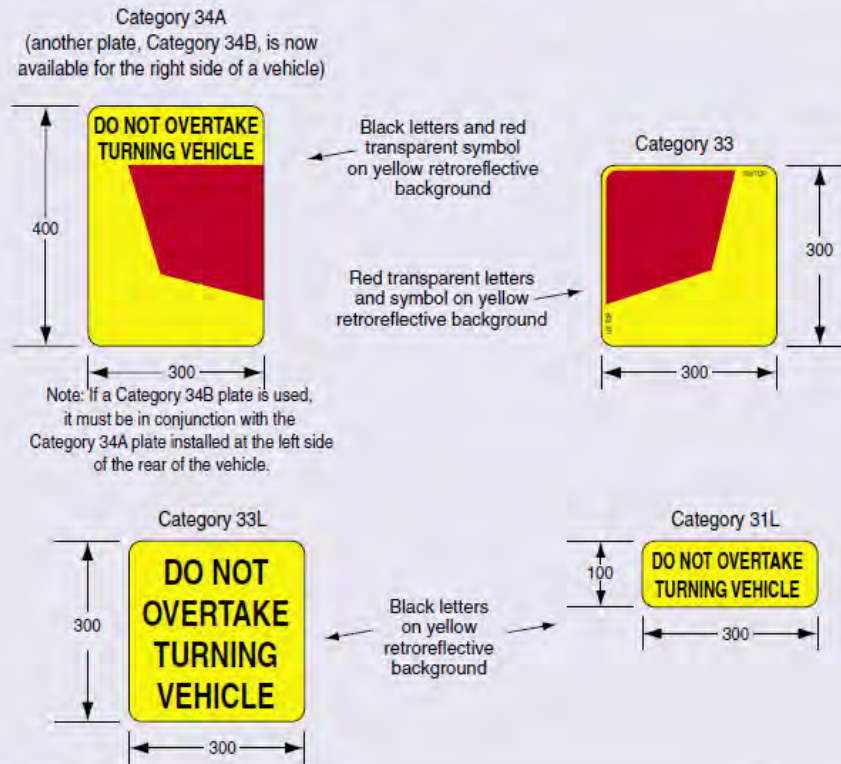
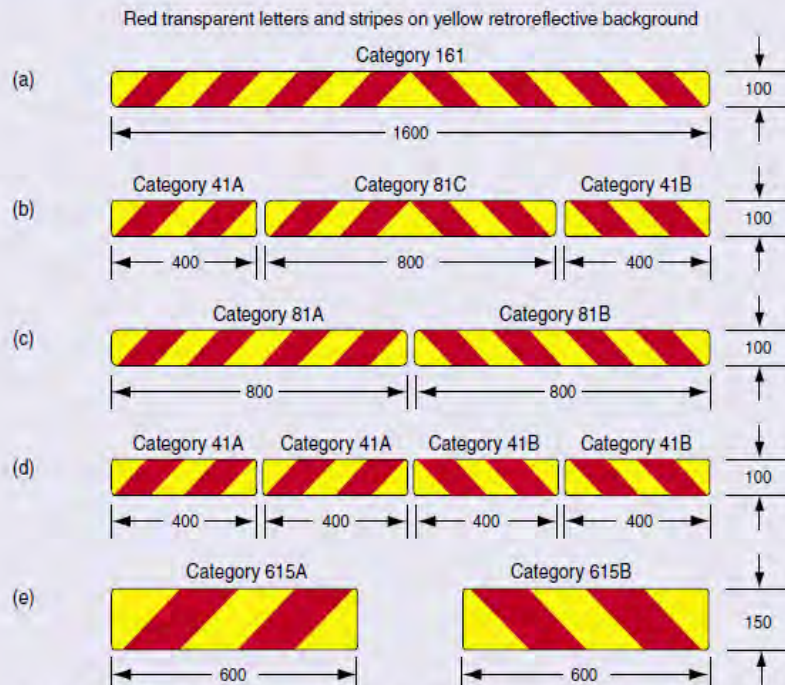


Figure 2 – Class 1 strip type rear marking plates

(all dimensions in millimetres)



Note: Category 615 plates are intended only for horizontal installation on the rear of prime movers.

Types of Class 2 retroreflective material marking plates

Figure 3 – Preferred style plates

(all dimensions in millimetres)

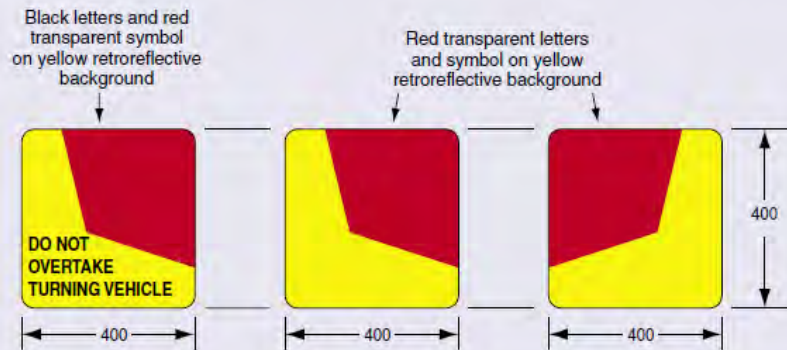
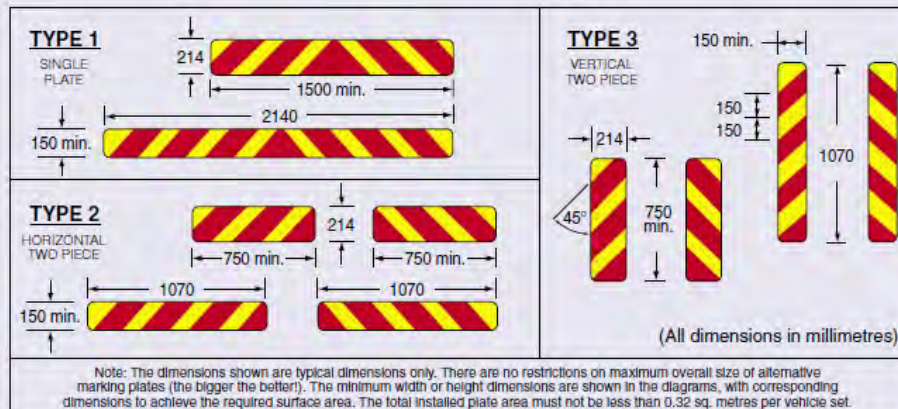


Figure 4 – Alternative styles of class 2 plates

(for use where it is not possible to fit preferred plates)



Apart from the dimensions and design, alternative style marking plates must meet all of the requirements for the preferred square plates, including the use of approved retroreflective material and words.

Use of an alternative style plate is not permitted unless the standard plate (see Figure 3) cannot be fitted.



Difficult installations

On vehicles with skeleton structures, such as carriers or trailers, plates can be attached to fabricated supports well clear of the load or to moveable panels which can be swung aside for loading (similar systems are used on vehicles such as boat trailers to mount registration plates and rear lamps). Car carriers with tip-up loading ramps can have the marking plates attached to the underside of the ramps.

Where it is necessary to mount plates across the edges of moveable or opening panels, the plates may be cut in two and attached to adjacent panels, provided the gaps between the portions are not wider than 10mm. It will be acceptable, when cutting plates to remove a strip of material (not wider than 10mm) along the line of the cut, so that the overall dimensions of the plates can be maintained. Alternatively, the sections can be moved apart.

Markings

The front reflective surface of the plate must bear the name of the manufacturer or agent. In addition, Class 2 marking plates must also be marked with the words "AS1906 Class 2" or "AS4001.2 Class 2". "Class 1" plates also display letters indicating the correct orientation on the vehicle.

When buying plates, make sure that this information is provided on each of them. Plates without this identification will not be accepted.

NOTE: Rear marking plates do not qualify as reflectors.

Installation requirements - Class 1, Class 1A and Class 2 marking plates

- A vehicle must not be fitted with a mixture of Class 1 and Class 2 retroreflective marking plates.
- Rear marking plates are to be located on a rear, near-vertical surface.
- Pairs of marking plates should be positioned symmetrically about the centreline of the vehicle and at the same height from the ground.
- It is recommended that for vehicles over 7.5 metres long, the "DO NOT OVERTAKE TURNING VEHICLE" sign be fitted, either as a separate sign located on the left hand side or incorporated in the left hand side marking plate. If such a vehicle (meaning the towing vehicle together with the trailer and load) will need to straddle lanes when turning, then it **must** be fitted.
- It is not permitted to fit categories of rear marker plates containing the text "DO NOT OVERTAKE TURNING VEHICLE" (i.e. 'Legend' plates 34, 31L and 33L) to vehicles with an overall length less than 7.5m, other than to the trailer or semitrailer of an articulated combination, where the total articulated vehicle length will exceed 7.5m when coupled.
- The colour bands of all "strip" type rear marking plates shall be oriented to slope down and outwards (away from the centre of the vehicle).
- Rear marking plates should not be bent to suit the contour of a non-flat mounting surface.
- Cutting of the marking plate to suit a restricted space or to span fixed and moveable sections of the vehicle should be avoided and alternative styles of marking plates should be considered. Where cutting is unavoidable, any resulting gap between the sections of the plate should not exceed 10mm after installation.
- Category 615A and 615B Class 1 material rear marking plates are intended only for horizontal installation on the rear of a prime mover. (See figure 10)
- Class 1 retroreflective material must be applied to the required backing material made of aluminium and complying with AS1734. Application directly to the vehicle is also permitted. Class 1A plates have been developed for these situations and are permitted in the 2003 Australian Standard.
- Australian Standard AS4001.2 – 2003 contains additional information about the installation of retroreflective rear marking plates.

Installation of rear marking plates made from Class 1 and Class 1A material

Figure 5 (Class 1)

(all dimensions in millimetres)

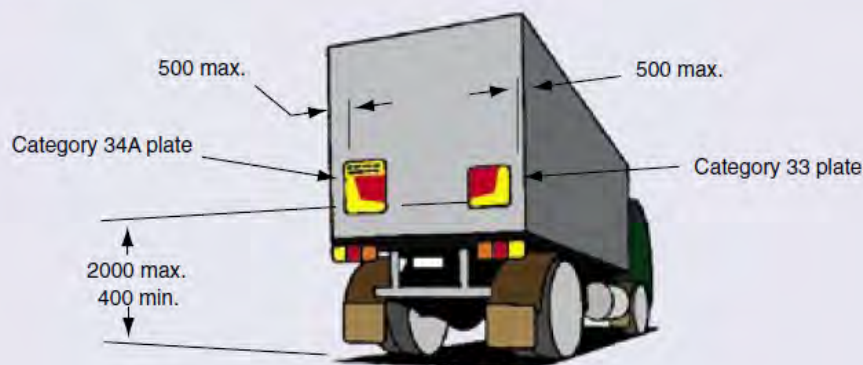


Figure 6 (Class 1)

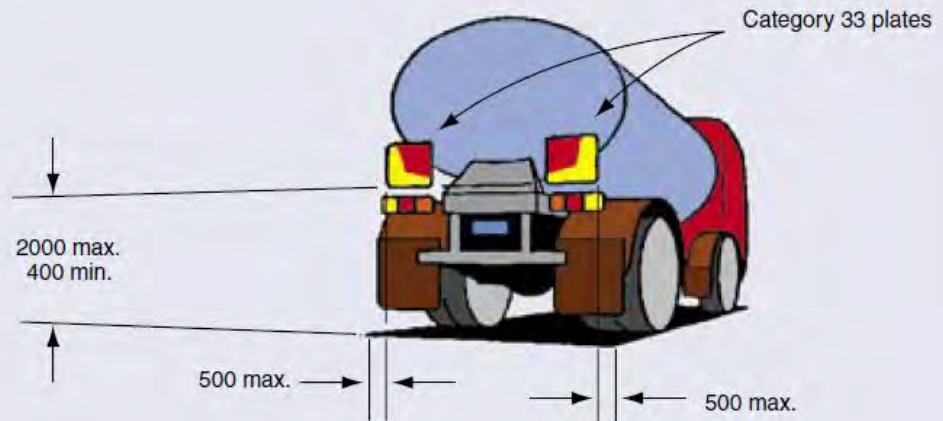


Figure 7 (Class 1)

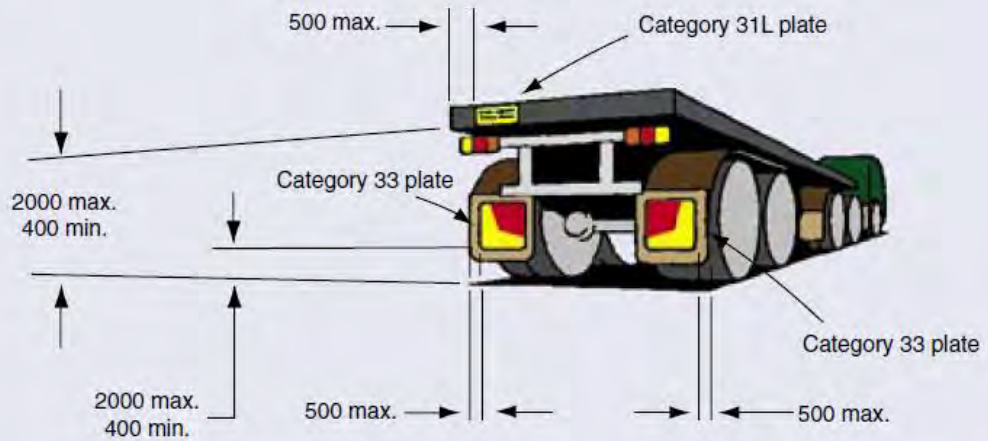


Figure 8 (Class 1)

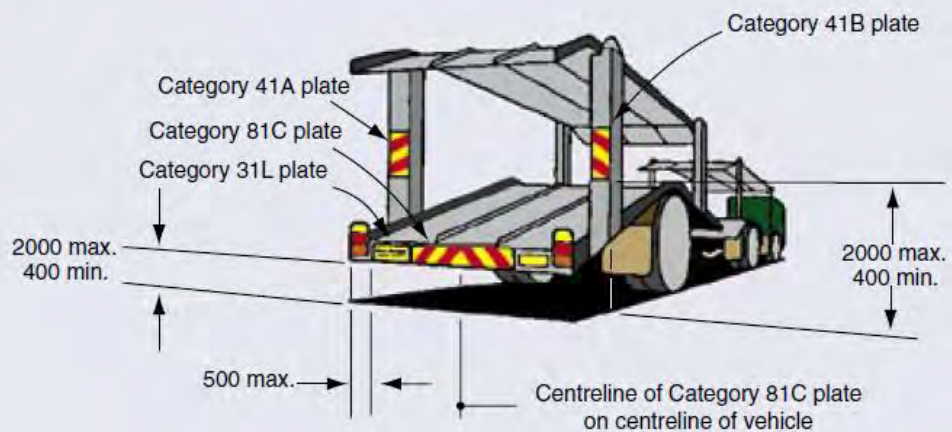


Figure 9 (Class 1)

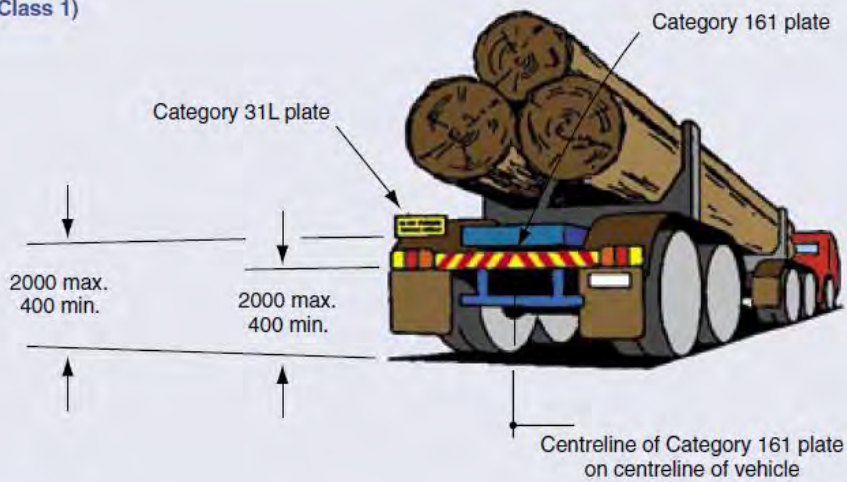
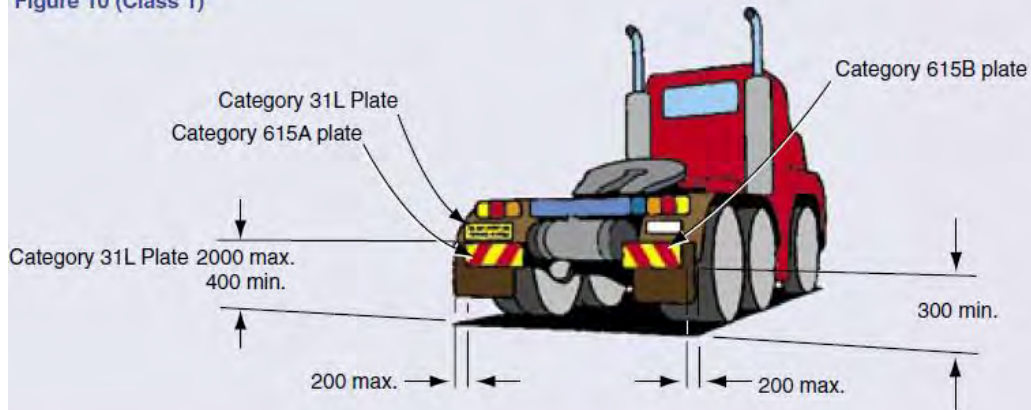


Figure 10 (Class 1)



Installation of rear marking plates made from Class 2 material

Figure 11 (Class 2)

(all dimensions in millimetres)

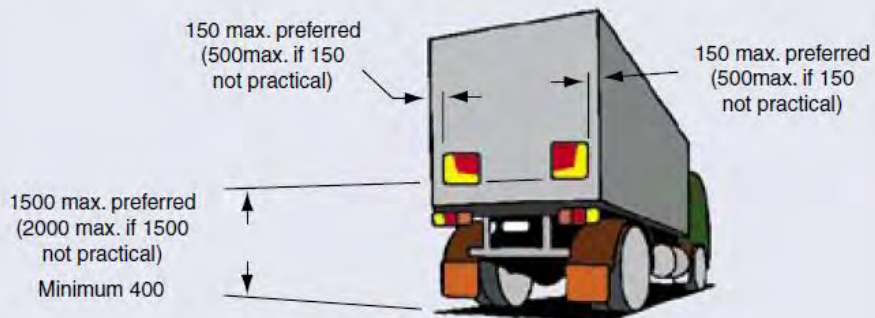


Figure 12 (Class 2)

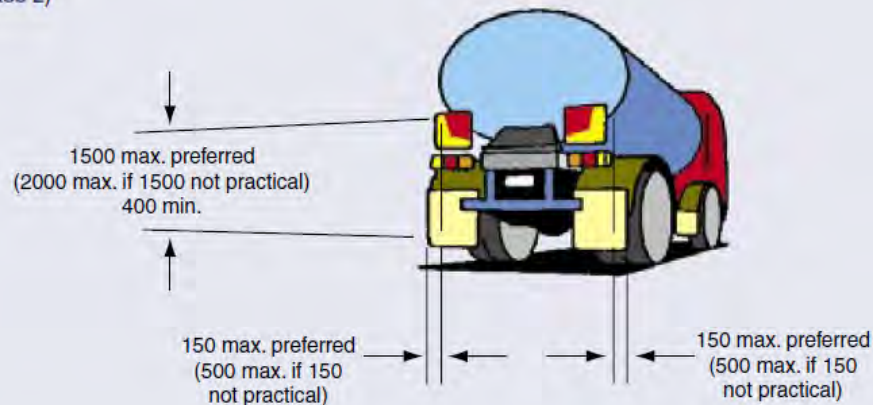


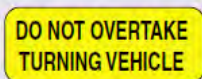
Figure 13 (Class 2)



Showing typical fitting of alternative style class 2 plate (type 1)

REMEMBER

- ✓ Only use rear marking plates made with approved retroreflective material.
- ✓ Keep the plates clean and in good condition.
- ✓ Plates must not be obscured by other parts of the vehicle, load or tarpaulins.



Turning Vehicle Sign

If your vehicle (meaning the towing vehicle together with the trailer and projecting load) is 7.5 metres long or longer, you may have the sign "Do not overtake turning vehicle" displayed at the rear of the rearmost vehicle. This can be either a separate sign or the words can be incorporated on either the left hand marking plate only, or both left and right plates. By having this sign attached to the rear of your vehicle, other following vehicles must give way to you.

Please note that if your vehicle (meaning the towing vehicle together with the trailer and projecting load) needs to straddle lanes or turn from an adjacent lane in order to turn left or right at intersections, and it is 7.5 metres long or longer, you must have the sign "DO NOT OVERTAKE TURNING VEHICLE". Not having "DO NOT OVERTAKE TURNING VEHICLE" sign on these vehicles is illegal.

The "DO NOT OVERTAKE TURNING VEHICLE" sign must not be displayed in certain jurisdictions where a vehicle (or combination) is less than 7.5m long.

Appendix F : ADR – Occupant Restraint requirements

This appendix provides a guide to the requirements for seatbelts, child restraint and their respective anchorages.

The precise requirements are made under the applicable Australian Design Rules (ADRs).

The requirements are determined by the vehicle type and its date of manufacture and outlined in the following tables. Vehicles within each category, manufactured on or after the date shown must be fitted with the correct type of seat belt and child restraint anchorage point.

Table 1 below outlines the vehicle categories in accordance with the ADRs. In most cases vehicles manufactured after June 1988 will have the appropriate vehicle category code marked on the compliance plate.

3rd Edition ADR vehicle categories for heavy vehicles

Vehicle Category Code	Vehicle Category
MD	Omnibus
MD4	Omnibus, GVM exceeding 4.5 tonnes but not 5.0 tonnes
ME	Heavy Omnibus (GVM exceeds 5.0 tonnes)
NB	Medium Goods Vehicle
NB2	Medium Goods Vehicle, GVM exceeding 4.5 tonnes but not 12.0 tonnes
NC	Heavy Goods Vehicle (GVM exceeds 12.0 tonnes)

APPLICATION TABLE

Each vehicle category manufactured on or after the date shown in this table must be fitted with seatbelts and Child Restraint Anchorages as indicated.

GENERAL NOTES:

- (i) See ADRs 4/-- & 5/-- for seatbelt and seatbelt anchorage requirements.
- (ii) See ADR.68/-- for child restraint and child restraint anchorage (CRA) requirements.
- (iii) Lap-type seatbelts are acceptable if there is no suitable permanent structure above and to the rear of the seating positions of some vehicles.

(iv) Lap-type seatbelts are acceptable for the third and further rows of seats of some vehicles if the seat is adjustable for conversion to luggage or goods space. See ADRs 4/-- & 5/-- for more information.

(v) Side facing seats may only be fitted with a Lap-type seatbelt.

Passenger vehicles

Vehicle Category MD4 (Bus with GVM exceeding 4.5 t but not exceeding 5.0 t)

Seating Position		Occupant Restraint Requirement			
		Lap	Lap/sash	Lap/sash & retractor	CRA point
Front Row	Outer	1/7/87		1/7/92 ^b	
	Centre	1/7/92 ^a		1/7/95	
Second Row	Outer	1/7/92 ^a		1/7/95	
	Centre	1/7/92 ^a		1/7/95	
Other Rows	Outer	1/7/92 ^a		1/7/95	1/7/95 ^d
	Centre	1/7/92 ^a		1/7/95	1/7/95 ^d

Vehicle Category ME (Heavy Bus with GVM exceeding 5.0 t)

Seating Position		Occupant Restraint Requirement			
		Lap	Lap/sash	Lap/sash & retractor	CRA point
Front Row	Outer	1/7/87 ^c		1/7/94	
	Centre	1/7/92 ^a		1/7/94	
Second Row	Outer	1/7/92		1/7/94	
	Centre	1/7/92		1/7/94	
Other Rows	Outer	1/7/92		1/7/94	1/7/95 ^d
	Centre	1/7/92		1/7/94	1/7/95 ^d

Goods Carrying Vehicles

Vehicle Category NB2 (Light goods Vehicle over 4.5t and up to 12t)

Seating Position		Occupant Restraint Requirement			
		Lap	Lap/sash	Lap/sash & retractor	CRA point
Front Row	Outer	1/7/77		1/7/92	
	Centre	1/7/92			
Second Row	Outer	1/7/92			
	Centre	1/7/92			
Other Rows	Outer	1/7/92			
	Centre	1/7/92			

Vehicle Category NC (Heavy Goods Vehicle over 12t)

Seating Position		Occupant Restraint Requirement			
		Lap	Lap/sash	Lap/sash & retractor	CRA point
Front Row	Outer	1/7/77 ^c			
	Centre	1/7/92			
Second Row	Outer	1/7/92			
	Centre	1/7/92			
Other Rows	Outer	1/7/92			
	Centre	1/7/92			

SUPERSCRIPT NOTES:

- (a) Except for Route Service Buses, seatbelts are required for all non protected seats
- (b) A lap-type seatbelt with a retractor mechanism is acceptable on a protected seat if the vehicle was built between 1/7/92 and 1/7/95. See ADR 68 for vehicles built on or after 1/7/95.
- (c) A lap-type seatbelt with a retractor mechanism is required if the vehicle's date of manufacture is on or after 1/7/92.
- (d) See ADR.68/.. for more information.

Appendix G : ADR Applicability Tables

The Australian Design Rules (ADRs) set out the minimum safety and environmental standards that heavy vehicles operating on public roads are required to comply with at the date of manufacture and during on road operation. The ADRs have been developed for the purpose of:

- reducing the possibility of accidents occurring through such measures as improving lights and signals, drivers visibility and braking standards etc
- mitigating the effects of those accidents that do occur, through such measures as seat belts, energy absorbing steering columns, head restraints and occupant protection measures.
- reducing the effects of motor vehicles on the environment by limiting the noise and pollutants emitted.

Many of the features associated with the ADRs are not readily apparent by visual inspection and evidence of a vehicles compliance with these requirements is demonstrated by the fitment of a compliance plate to the vehicle.

The ADRs are set out in two editions being the 2nd and 3rd editions. The 2nd edition ADRs cover vehicles manufactured between 01 January 1969 and the 30th of June 1988. The 3rd edition ADRs cover vehicles manufactured on or after 1 July 1988.

For the purpose of the ADRs vehicles are classified into various categories dependant on the type of vehicle. Each category is identified by a two letters (e.g. NB - medium goods vehicle) and in some cases each category is further broken down using a number system following the letters (e.g. NB2 – over 4.5 tonnes GVM and up to 12 tonnes GVM). The vehicle categories are as follows:

The Australian Design Rules can be accessed online at:
www.infrastructure.gov.au/roads/safety/bulletin/index.aspx

VEHICLE CATEGORY CODES

2nd Edition ADR Vehicle Categories

VEHICLE CODE	VEHICLE CATEGORY
OM	Omnibus
OM4	GVM over 4.5 tonnes
LG	Light Goods Vehicle, up to and including 4.5 tonne
HG	Heavy Goods Vehicle, over 4.5 tonne GVM

3rd Edition ADR Vehicle Categories

MB	Forward Control Passenger Vehicle (up to 9 seats)
MC	Off Road Passenger Vehicle (up to 9 seats with off road capabilities)
MD	Light Omnibus (more than 9 seats)
MD1	up to 3.5 tonnes GVM and up to 12 seats
MD2	up to 3.5 tonnes GVM and over 12 seats
MD3	over 3.5 tonnes GVM and up to 4.5 tonnes GVM
MD4	over 4.5 tonnes GVM and up to 5.0 tonnes GVM
ME	Heavy Omnibus exceeding 5.0 tonnes GVM
NB	Medium Goods Vehicle
NB2	over 4.5 tonnes GVM and up to 12 tonnes GVM
NC	Heavy Goods Vehicle (exceeding 12 tonnes GVM)
TC	Medium Trailer, GTM greater than 3.5 tonne up to 10 tonne
TD	Heavy Trailer, GTM exceeding 10 tonnes

Definitions

GVM – Gross Vehicle Mass – the maximum laden mass of a motor vehicle as specified by the manufacturer.

GTM – Gross Trailer Mass – the maximum mass transmitted to the ground through the axle/s of the trailer when coupled to a tow vehicle. Specified by the vehicle manufacturer.

AUSTRALIAN DESIGN RULES FOR MOTOR VEHICLE SAFETY 2ND EDITION

CONTENTS

Title	Number	Release Date
<u>Reversing Signal Lamps</u>	1	1 Jan 1972
<u>Door Latches And Hinges</u>	2	1 Jan 1971
<u>Seat Anchorages For Motor Vehicles</u>	3	1 Jan 1971
<u>Seat Anchorages For Motor Vehicles</u>	3a	1 Jan 1977
<u>Seat Belts</u>	4	1 Jan 1969
<u>Seat Belts</u>	4a	1 Jan 1974
<u>Seat Belts</u>	4b	1 Jan 1975
<u>Seat Belts</u>	4c	1 Jan 1976
<u>Seat Belts</u>	4d	1 Jan 1984
<u>Seat Belt Anchorage Points</u>	5a	1 Jan 1969
<u>Seat Belt Anchorages</u>	5	1 Jan 1975
<u>Direction Turn Signal Lamps</u>	6	1 Jan 1973
<u>Direction Turn Signal Lamps</u>	6a	1 July 1981
<u>Hydraulic Brake Hoses</u>	7	1 Jan 1970
<u>Safety Glass</u>	8	1 July 1971
<u>Standard Controls For Automatic Transmissions</u>	9	1 Jan 1972
<u>Steering Columns</u>	10a	1 Jan 1971
<u>Steering Columns</u>	10b	1 Jan 1973
<u>Internal Sun Visors</u>	11	1 Jan 1972
<u>Glare Reduction In Field Of View</u>	12	1 Jan 1973
<u>Rear Vision Mirrors</u>	14	1 Jan 1972
<u>Demisting Of Windscreens</u>	15	1 Jan 1971
<u>Windscreen Wipers And Washers</u>	16	1 Jan 1973
<u>Fuel Systems For Goods Vehicles</u>	17	1 July 1975
<u>Location And Visibility Of Instruments</u>	18	1 Jan 1973

<u>Location And Visibility Of Instruments</u>	18a	1 Jan 1981
<u>Safety Rims</u>	20	1 July 1970
<u>Instrument Panels</u>	21	1 Jan 1973
<u>Head Restraints</u>	22	1 Jan 1972
<u>Head Restraints</u>	22a	1 Jan 1975
<u>New Pneumatic Passenger Car Tyres</u>	23	1 Jan 1974
<u>New Pneumatic Passenger Car Tyres</u>	23a	1 Jan 1984
<u>New Pneumatic Passenger Car Tyres</u>	23b	1 Jan 1986
<u>Tyre Selection</u>	24	1 Jan 1973
<u>Tyre Selection</u>	24a	1 Jan 1986
<u>Anti-Theft Locks</u>	25	1 Jan 1972
<u>Anti-Theft Locks</u>	25a	1 Jan 1978
<u>Vehicle Engine Emission</u>	26	1 Jan 1972
<u>Vehicle Engine Emission Control</u>	27	1 Jan 1974
<u>Vehicle Emission Control</u>	27a	1 Jmy 1976
<u>Vehicle Emission Control</u>	27b	1 Jan 1982
<u>Vehicle Emission Control</u>	27c	1 Jan 1983
<u>Motor Vehicle Noise</u>	28	1 Jan 1974
<u>Motor Vehicle Noise</u>	28a	1 July 1980
<u>Side Door Strength</u>	29	1 Jan 1977
<u>Diesel Engine Exhaust Smoke Emissions</u>	30	1 July 1976
<u>Hydraulic Braking Systems</u>	31	1 Jan 1977
<u>Seat Belts For Heavy Vehicles</u>	32	1 July 1977
<u>Seat Belts For Heavy Vehicles</u>	32a	1 July 1980
<u>Motorcycle And Moped Braking Systems</u>	33	1 March 1976
<u>Motorcycle And Moped Braking System</u>	33a	1 1988
<u>Child Restraint Anchorages</u>	34	1 July 1976
<u>Child Restraint Anchorages</u>	34a	1 Jan 1985
<u>Commercial Vehicle Braking System</u>	35	1 Jan 1979
<u>Commercial Vehicle Braking Systems</u>	35a	1 July 1980
<u>Exhaust Emission Control For Heavy Duty Vehicles</u>	36	1 July 1978
<u>Exhaust Emission Control For Heavy Duty Vehicles</u>	36a	1 Jan 1988

<u>Vehicle Emission Control</u>	37	1 Jan 1986
<u>Heavy Trailer Braking System</u>	38	1 July 1984
<u>Motorcycle And Moped Noise</u>	39	1 March 1985
<u>Motorcycle Noise</u>	39a	1 March 1988
<u>Light Duty Vehicle Emission Control</u>	40	1 Jan 1988
<u>Mandatory Operation On Unleaded Petrol</u>	41	1 Jan 1988

SECOND EDITION ADRS APPLICABLE TO VEHICLE CATEGORIES

The application date (year/month) is shown for each category (eg. 01-07-1972 is shown as 7/72)

ADR	PC	PD	FC1	FC2	PM	OM1	OM2	OM3	OM4	CY	MOPED	LG	HG	
1	Reversing signal lamps	1/72	1/85	1/85	1/73	7/73	7/73	7/73	7/75	-	-	7/73	7/75	
2	Door latches and hinges	1/71	1/85	1/85	1/73	7/83	7/83	-	-	-	-	7/74	7/75	
3	Seat anchorages	1/71	1/85	1/85	1/73	7/83	7/83	-	-	-	-	7/74	-	
3A	Seat anchorages	1/77	1/86	1/86	-	1/87	-	-	-	-	-	-	-	
4	Seat belts - front seats	1/69	-	-	1/70	-	-	-	-	-	-	1/70	-	
	Seat belts - front and rear seats	1/71	-	-	1/71	-	-	-	-	-	-	1/71	-	
4A	Seat belts	1/74	-	-	1/74	-	-	-	-	-	-	7/74	-	
4B	Seat belts	1/75	-	-	1/75	-	-	-	-	-	-	7/75	-	
4C	Seat belts	1/76	1/85	1/85	1/76	7/83	7/83	-	-	-	-	7/76	-	
4D	Seat belts	1/84	1/86	1/86	-	1/87	-	-	-	-	-	-	-	
5A	Seat belt anchorages - front	1/69	-	-	1/69	-	-	-	-	-	-	1/71	-	
	Seat belt anchorages - front and rear	1/71	-	-	1/71	-	-	-	-	-	-	1/71	-	
5B	Seat belt anchorages	1/75	1/85	1/85	1/75	7/83	7/83	-	-	-	-	7/75	-	
6	Direction turn signal	1/73	1/85	1/85	1/73	7/73	7/73	7/73	7/73	-	-	7/73	7/73	
6A	Direction turn signal	-	-	-	-	-	-	-	7/81	-	-	-	7/81	
7	Hydraulic brake hoses	1/70	1/85	1/85	1/70	1/70	1/70	1/70	1/70	7/75	7/75	1/70	1/70	
8	Safety glass	7/71	1/85	1/85	7/71	7/71	7/71	7/71	7/71	-	-	7/71	7/71	
9	Automatic transmissions	Applies between 1/72 and 1/76 for all vehicles except motorcycles, mopeds and forward control passenger vehicles.												
10A	Steering columns	1/71	1/71	-	-	-	-	-	-	-	-	-	-	
10B	Steering columns	1/73	1/73	-	-	-	-	-	-	-	-	-	-	
11	Internal sunvisors	1/72	1/85	1/85	1/73	7/73	7/73	7/73	-	-	-	7/73	-	
12	Glare reduction	1/73	1/85	1/85	1/73	7/73	7/73	7/73	7/73	-	-	7/73	7/73	
14	Rear view mirrors	1/72	1/85	1/86	1/73	1/87	-	-	-	-	-	-	-	
15	Demisting of windcreens	1/71	1/85	1/85	1/73	7/83	7/83	-	-	-	-	7/73	7/76	
16	Windscreen wipers and washers	1/73	1/85	1/86	1/74	1/87	-	-	-	-	-	-	-	
17	Fuel systems - goods vehicles	-	-	-	-	-	-	-	-	-	-	-	7/75	
18	Location and visibility of instruments	1/73	1/73	-	-	-	-	-	-	-	-	-	-	
18A	Location and visibility of instruments	1/81	1/81	-	-	-	-	-	-	-	-	-	-	
20	Safety rims	7/70	1/85	1/86	1/73	1/87	-	-	-	-	-	-	-	
21	Instrument panel	1/73	1/73	-	-	-	-	-	-	-	-	-	-	
22	Head restraints	1/72	1/72	-	1/74	-	-	-	-	-	-	-	-	
22A	Head restraints	1/75	1/85	1/86	1/75	1/87	-	-	-	-	-	-	-	

ADR	PC	PD	FC1	FC2	PM	OM1	OM2	OM3	OM4	CY	MOPED	LG	HG
23	1/74	1/74	-	-	1/74	-	-	-	-	-	-	-	-
23A	1/84	1/84	1/85	-	1/84	-	-	-	-	-	-	-	-
23B	1/86	1/86	1/86	1/86	1/86	1/87	-	-	-	-	-	-	-
24	1/73	1/73	1/85	-	1/73	-	-	-	-	-	-	-	-
24A	1/86	1/86	1/86	1/86	1/86	1/87	-	-	-	-	-	-	-
25	1/72	1/72	-	-	1/73	-	-	-	-	-	-	-	-
25A	1/78	1/78	1/85	1/86	1/78	1/87	-	-	-	-	-	-	-
26	1/72	-	-	-	-	-	-	-	-	-	-	-	-
27	1/74	-	-	-	-	-	-	-	-	-	-	-	-
27A	7/76	7/76	-	-	-	-	-	-	-	-	-	-	-
27B	1/82	1/82	-	-	-	-	-	-	-	-	-	-	-
27C	1/83	1/83	-	-	-	-	-	-	-	-	-	-	-
28	1/74	1/74	-	-	1/74	7/74	7/74	7/74	7/74	7/75	7/75	7/74	7/74
28A	1/74	1/74	-	-	1/74	7/75	7/75	7/75	7/75	7/75	7/75	7/75	7/75
28B	1/81	1/81	1/85	1/85	1/81	7/80	7/80	7/80	7/80	-	-	7/80	7/80
29	1/77	-	-	-	-	-	-	-	-	-	-	-	-
29A	7/76	7/76	1/85	1/85	7/76	7/76	7/76	7/76	7/76	7/76	7/76	7/76	7/76
31	1/77	-	-	-	-	-	-	-	-	-	-	-	-
32	-	-	-	-	-	-	-	-	-	-	-	-	7/77
32A	-	-	-	-	-	-	-	7/87	7/87	-	-	-	7/80
33	-	-	-	-	-	-	-	-	-	3/76	3/76	-	-
34	7/76	-	-	-	-	-	-	-	-	-	-	-	-
35	-	1/79	-	-	7/79	7/79	7/79	7/79	-	-	-	7/79	-
35A	-	1/81	1/85	1/85	7/80	7/80	7/80	7/80	7/80	-	-	7/80	7/80
36	-	-	1/85	1/85	1/79	7/78	7/78	7/78	7/79	-	-	7/78	7/79
37	1/86	1/86	-	-	-	-	-	-	-	-	-	-	-
38	Applies to heavy trailers only.												
39	-	-	-	-	-	-	-	-	-	3/85	3/85	-	-
39A	-	-	-	-	-	-	-	-	-	3/88	3/88	-	-
40	-	-	1/88	-	1/88	7/88	-	-	-	-	-	7/88	-
41	-	-	-	1/88	1/88	-	-	7/88	7/88	3/88	3/88	-	7/88

Applicability of 3rd Edition ADRs

APPLICABILITY SUMMARY

1. This table seeks to show:
 - (a) the national standards in force for new vehicles as at July 1998 and the vehicle categories to which those standards are applicable; and
 - (b) the dates on which standards not yet in force will come into force, and the vehicles to which they will then be applicable.
2. For an explanation of the symbols used, see the annotations following this summary.
3. The table is for guidance only. Users must refer to the standards in question for definitive information on particular points.

CODE ADR	LA	LB	LC	LD	LEM	LE	LEP	LEG	MA	MB	MC	MD1	MD2	MD3	MD4	ME	NA	NB1	NB2	NC	TA	TB	TC	TD
1/00		X(I)	O	X(I)	X(I)	X(I)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	O	O	O	O
2/00							X	X	X	X	X	X	X	X	X	X	X	X	X	X				
3/01							X	X	X	X	X	X	X	X	X	X	X	X	X	X				
3/02							X	X	X	X	X	X	X	X	X	X	X	X	X	X				
4/01							X	X	X	X	X	X	X	X	X	X	X	X	X	X				
4/02							X	X	X	X	X	X	X	X	X	X	X	X	X	X				
4/03							X	X	X	X	X	X	X	X	X	X	X	X	X	X				
5/02							X	X	X	X	X	X	X	X	X	X	X	X	X	X				
5/03							X	X	X	X	X	X	X	X	X	X	X	X	X	X				
5/04							X	X	X	X	X	X	X	X	X	X	X	X	X	X				
6/00	O	O	O	O	O	O	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
X							X	X	X	X	X	X	X	X	X	X	X	X	X	X				
7/00							X	X	X	X	X	X	X	X	X	X	X	X	X	X				
8/00	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
8/01	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
10/01							X	X	X	X	X	X	X	X	X	X	X	X	X	X				
11/00							X	X	X	X	X	X	X	X	X	X	X	X	X	X				
12/00							X	X	X	X	X	X	X	X	X	X	X	X	X	X				
13/00							X	X	X	X	X	X	X	X	X	X	X	X	X	X				
14/02	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
15/01							X	X	X	X	X	X	X	X	X	X	X	X	X	X				
16/01							X	X	X	X	X	X	X	X	X	X	X	X	X	X				
17/00							X	X	X	X	X	X	X	X	X	X	X	X	X	X				
18/01							X	X	X	X	X	X	X	X	X	X	X	X	X	X				
18/02*							X	X	X	X	X	X	X	X	X	X	X	X	X	X				
19/01	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
19/02	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
20/00							X	X	X	X	X	X	X	X	X	X	X	X	X	X				
21/00*							X	X	X	X	X	X	X	X	X	X	X	X	X	X				
22/00							X	X	X	X	X	X	X	X	X	X	X	X	X	X				
23/01							X	X	X	X	X	X	X	X	X	X	X	X	X	X				
24/02	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				

ADR 7/00 will cease to have effect from 1 January 2005.

ADR 15/01 will cease to have effect from 1 January 2005.

ADR 16/01 will cease to have effect from 1 January 2005.

See Rule for Applicability and Exemptions

Repeated

Repeated

APPLICABILITY SUMMARY

CODE ADR	LA	LB	LC	LD	LEM	LE	LEP	LEG	MA	MB	MC	MD1	MD2	MD3	MD4	ME	NA	NB1	NB2	NC	TA	TB	TC	TD
ADR 24/02 will cease to have effect from 1 January 2005.																								
25/02							X	X	X	X	X	X	X				X							
28/01							X	X	X	X	X	X	X				X	X	X					
29/00*							1 Jul 92		X	X	X						X							
30/00	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
31/00							X	X	X	X	X	X	X	X	X	X	X	X	X	X				
31/01							1 Jan 2004		1/1/0 4	1/1/02	1/1/02													
33/00*	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
34/00*							X	X	X	X	X	X	X	X	X	X	X	X	X	X				
34/01*							X	X	X	X	X	X	X	X	X	X	X	X	X	X				
35/00*							X	X	X	X	X	X	X	X	X	X	X	X	X	X				
35/01							X	X	X	X	X	X	X	X	X	X	X	X	X	X				
36/00*							X	X	X	X	X	X	X	X	X	X	X	X	X	X				
37/00*							X	X	X	X	X	X	X	X	X	X	X	X	X	X				
37/01																								
38/00																								
38/01																								
38/02																								
39/00																								
41/00*																								
See Rule for applicability																								
39/00																								
38/01																								
38/02																								
39/00																								
41/00*																								
Repealed																								
42/02*	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
42/03	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
42/04	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
43/02	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
43/03	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
43/04	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
44/02*	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
45/01	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
46/00							X	X	X	X	X	X	X	X	X	X	X	X	X	X				
47/00	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
48/00							X	X	X	X	X	X	X	X	X	X	X	X	X	X				
49/00*							O	X	X	X	X	X	X	X	X	X	X	X	X	X				
50/00	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O				
51/00	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
52/00	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O				
53/00	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
54/00	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
55/00	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
56/00	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				

APPLICABILITY SUMMARY

CODE ADR	LA	LB	LC	LD	LEM	LE	LEP	LEG	MA	MB	MC	MD1	MD2	MD3	MD4	ME	NA	NB1	NB2	NC	TA	TB	TC	TD	
57/00	X		X									X	X	X	X	X									
58/00																									
59/00*					X		X		X	X															
60/00																									
61/01	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X
61/02	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X
62/00	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X
62/01	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X
63/00																									
64/00																									
65/00																									
66/00																									
67/00		X			X	X	X	X																	
68/00																									
69/00									X#	X	X	X#	X#	X#	X#	X#	X#	X#	X#	X#	X#	X#	X#	X#	X#
70/00									X#	X#	X#	X#	X#	X#	X#	X#	X#	X#	X#	X#	X#	X#	X#	X#	X#
71/00																									
72/00									X*	X*	X*														
73/00									X*																
74/00																									
75/00																									
76/00																									
77/00																									
78/00																									
79/01																									
80/00																									
80/01																									
81/00									X	MB1	MC1														
81/01																									
82/00									X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
83/00	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

NOTES:

X = Applicable.

O = Optional (not mandatory to fit, but if fitted must comply with requirements).

* = Conditions apply for some or all classes of vehicles. See Rule for details.

= Staggered implementation as between new models and all models. See Rule for details.

@ = N/A1 vehicles only.

(1) Only if fitted with reverse gear.

(2) Except for 'Chassis-cab' vehicles.

Repeated

The circumstances under which side marker lamps are mandatory, optional, or prohibited are set out in either ADRs 13/..., 19/..., or 67/....

The circumstances under which daytime running lamps are mandatory, optional, or prohibited are set out in either ADRs 13/..., 19/..., or 67/....

The circumstances under which gas discharge light sources are mandatory, optional, or prohibited are set out in either ADRs 13/..., 19/..., or 67/....

The circumstances under which gas discharge light sources are mandatory, optional, or prohibited are set out in either ADRs 13/..., 19/..., or 67/....

Applicable to all M and N category vehicles with a GVM less than or equal to 3.5 tonnes

Applicable to all M and N category vehicles with a GVM greater than 3.5 tonnes

Applicable to all M and N category vehicles with a GVM less than or equal to 3.5 tonnes

Applicable to all M and N category vehicles with a GVM greater than 3.5 tonnes

Applicable to all M and N category vehicles with a GVM not exceeding 3.5 tonnes

Appendix H : Headlamp Testing Screens

1) Scope

1.1 This specification describes requirements for the headlight testing screen and the layout of the headlight testing space.

2) The Headlight Testing Screen

2.1 The surface of the screen should be 'flat' white (gloss finish should be avoided). The screen shall be at least 1300mm in height and 2400mm in width and shall be marked with horizontal and vertical lines. Horizontal lines shall be spaced 75mm apart and vertical lines shall be spaced 300mm apart. Horizontal lines shall be labeled with their height starting from the bottom of the screen.

1275							
1200							
1125							
1050							
975							
900							
825							
750							
675							
600							
525							
450							
375							
300							
225							
150							
75							

FRONT ELEVATION OF SCREEN

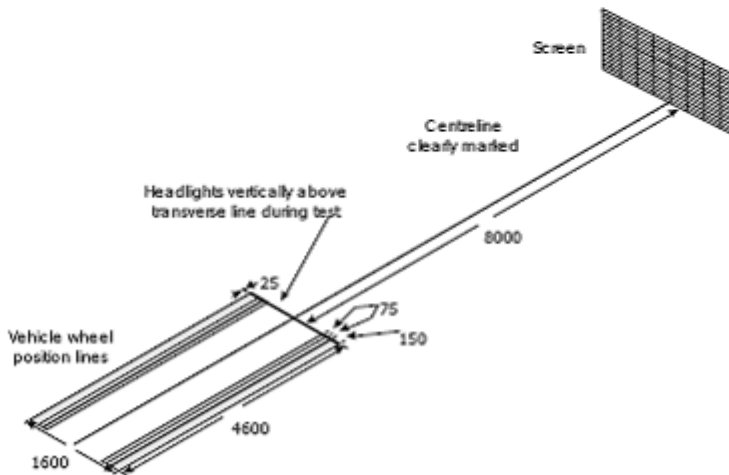
Level of surface upon which the vehicle is standing during test.

NOTE: All lines to be black except centre vertical which is to be red. The thickness of all lines is to be as small as possible and consistent with good visibility for an observer at a distance of 9 metres from the screen during test of headlights. The heights of the horizontal lines above the level of surface upon which vehicle is standing during test are to be clearly marked with black figures, as shown, of a size to ensure good visibility for an observer at a distance of 9 metres from the screen during test of headlights.

3 Layout of The Testing Space

- 3.1 The ground on which the vehicle stands shall be marked with a centreline which passes through the centreline of the screen and a transverse line which intersects the centreline and is 8000mm from the screen (the headlights of the tested vehicle are positioned directly over this line). Additional longitudinal lines in the region where the vehicle standing would assist alignment and their use is recommended.
- 3.2 The bottom of the screen is at the same level as the surface on which the vehicle stands.
- 3.3 The screen and testing space must be adequately shielded from extraneous light.
- 3.4 The testing space must be clear of obstruction.

General Arrangement Of The Headlight Testing Space



NOTE: All dimensions in the diagrams are in millimetres.

4) Headlight Aim Tester

Scope

The approved use of headlight aim testers for checking the aim of vehicle headlights.

Headlight aim testers complying with the requirements of this specification are acceptable for the testing of the aim of vehicle headlights in accordance with the National Regulations.

This specification is restricted to headlight aim testers that employ a collimating lens. It does not apply to testers which use other methods of testing headlight aim.

Definitions

Unless otherwise stipulated, angles given in this specification refer to the included angle between the line drawn from the headlight centre to the intersection of the X calibration screen axes and the line drawn from the headlight centre to the point of intersection of either the horizontal or vertical axis of the screen with the required respective vertical or horizontal line.

Headlight: a lighting source mounted on a vehicle to provide illumination of the road and objects ahead of a vehicle.

Hot Spot: the zone of the headlight beam which is of highest intensity as it appears to an observer viewing the beam on an image screen. For headlights with European beams or where the beam has a sharp angular cut-off, the top of the hot spot shall be taken as the “elbow point” or intersection of the horizontal and inclined cut-off zones.

HV Point: the intersection of the Central horizontal axis (H) and the Central vertical axis (5J) of the image screen.

Vertical Median Plane: the plane passing through the longitudinal centre line of the vehicle, perpendicular to the plane on which the vehicle is standing.

The vertical height of the centre of the headlight above the plane supporting the vehicle (in millimetres).

1. General requirements

1.1 The headlight aim tester shall consist of a lens which focuses the light beam onto a screen within the tester.

1.2 The screen shall be located in a position that will allow the operator of the tester to readily and conveniently see the image of the headlight’s light beam.

1.3 Provision shall be made for immediate adjustment to allow for different headlight heights and vehicle orientations.

1.4 The tester shall be mounted on at least one securely mounted locating guide rail which traverses the inspection lane and shall be easily movable to any point along this rail. The track followed by the tester (whether consisting of two rails, or one rail and a prepared surface) shall be such that the tester is always correctly aligned in the vertical plane.

1.5 Aiming of the tester shall be accomplished by either an electrical or mechanical device. If an electrical aiming device is provided, a back-up mechanical aiming device shall also be provided.

2. Design requirements

2.1 Optical Characteristics

2.1.1 Headlight aim testers shall enable the headlight beam pattern to be examined on an image screen within the device. The resulting image must be equivalent to that which would be projected onto a flat screen placed in front of the headlight lens at a horizontal distance nominated by the manufacturer (D metres).

2.1.2 The focused beam on the image screen shall be accurate to within 0.25 degrees in the vertical direction at all declinations from horizontal to 3.25 degrees below horizontal.

2.2 Image Screen

The image screen shall have grid lines provided to assist aiming of headlights, comprising:

2.2.1 A central horizontal and a central vertical axis which intersect on the optical axis of the collimating lens, at the HV point.

2.2.2 A series of evenly spaced horizontal lines which allows estimation of angular declination below the HV point in the range 0 to 3.25 degrees with a spacing not more than 0.25 degrees. They must be labelled in degrees, or mm declination as measured on an equivalent flat screen as specified in Section 2.1.1.

2.2.3 A straight line inclined at 15 degrees to the horizontal axes for testing the aim of asymmetric European or Z-beam type headlights. The line shall originate at the intersection of the vertical axis and the horizontal line 0.5 degrees below the horizontal axis and shall project upwards and to the left of the point of origin.

2.2.4 The requirements of 4.2.2 may be met by movement of the horizontal axis by an external calibrated mechanism which indicates the equivalent angles of declination.

3. Device Alignment

3.1 The device shall be provided with an indicator or other means to enable an operator to locate rapidly the approximate Centre of the headlight lens.

3.2 The following adjustments shall be provided to allow for different headlight positions:

- height adjustments allowing the testing of headlights with centres located at or between 600 mm and 1400 mm above the surface supporting the vehicle. The device shall incorporate a means of determining the height (h) with a scale graduated in at least 5 mm increments.

- lateral horizontal adjustment on guide rails (or one rail and prepared surface) to allow for the checking of headlights up to at least 2500 mm apart.

3.3 The following provisions shall be made for-aligning the device with the longitudinal axis of the vehicle:

- the optical axis must be able to be set parallel to the vertical median plane. The adjustment mechanism must provide a range of rotational alignment about a vertical axis over a range of not less than 20 degrees in either direction. The adjustment must be able to be made without the use of tools.

The adjustment mechanism must permit alignment to an accuracy of 0.25 degrees.

- the optical axis must be able to be set parallel with the plane supporting the vehicle. The adjustment mechanism must provide a range of rotational alignment about a horizontal axis over a range of not less than 5 degrees in either direction.

The adjustment must be able to be made without the use of tools. The adjustment mechanism must permit alignment to an accuracy of 0.25 degrees.

4 Operating Instructions

4.1 The device shall be provided with a table or graph clearly informing the user of the acceptable declination of the headlight as required under the National Regulations. This shall indicate the location of the top of the hot spot as a function of the vehicle's headlight height,

4.2 The acceptable range of declination below the optical axis of the top of the hot spot can be determined from the directions provided in **5 -Location of the Hot Spot band**. An example is given below for a device graduated to a reading accuracy of 0.25 degrees.

Range of Headlight Height (h) Range of Angular Declination

600 to 709 mm	0.25 - 1.59 degrees
710 to 819 mm	0.25 - 1.75 degrees
820 to 929 mm	0.25 - 2.00 degrees
930 to 1039 mm	0.25 - 2.25 degrees
1040 to 1149 mm	0.25 - 2.50 degrees
1150 to 1249 mm	0.50 - 2.75 degrees
1250 to 1359 mm	0.75 - 3.00 degrees
1360 to 1400 mm	1.00 - 3.25 degrees

4.3 The device shall be provided with a label showing the distance the tester should be positioned from the headlight.

5 Location of the hot-spot band

5.1 To satisfy the requirements of the National Regulations, each headlight must be adjusted so that the top of its hot spot lies within a specified band of angle of declination. This band is a function of the headlight height (h).

5.2 To determine this band, the distance from the headlight (D) to the test screen must be known.

5.3 Application of the following formulae, with D fixed, defines the headlight dipping characteristics required under the National Regulations.

5.4 For a linear scale (with h in millimetres and D in metres):

- the top of the band is $D \times (h-1000) / 22$ millimetres below the horizontal, and
- the bottom of the band is $D \times h / 25$ millimetres below the horizontal.

5.5 For an angular scale (with h in millimetres):

- the top of the band is $\text{INV TAN } (h-1000) / 22000$ degrees below the horizontal, and
- the bottom of the band is $\text{INV TAN } (h / 25000)$ degrees below the horizontal.

5.6 The above formulae may be approximated for tabulation purposes by using a step function such that the tabulated values do not deviate from the exact value by more than 0.25 degrees.

Appendix I : Replacing or Repairing Windcreens

Introduction

Windscreen damage or defects may impair a driver's forward vision, create a potential safety hazard and affect road safety. However, windcreens will be subject to some damage such as sandblasting, cracks, and stone chips during normal operation, therefore some deterioration from new condition is allowable.

A windscreen should be clean and free of damage that might impair the driver's view to the front of the vehicle.

Things which might impair a driver's vision are:

- the location of the damage;
- the size of the damage;
- effect on the mechanical strength of the windscreen.

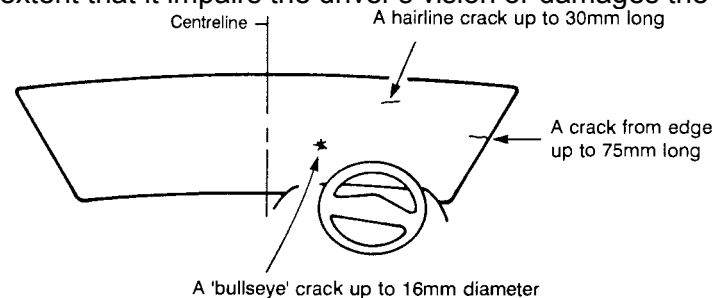
Is a damaged windscreen safe?

When a damaged windscreen is examined the following factors should be considered:

- the location of the damage;
- the size of the damage;
- effect on the mechanical strength of the windscreen.

To determine if a windscreen should be replaced or repaired, the area of windscreen swept by the wipers may have bull's-eyes and star fractures up to 16 mm in diameter and cracks up to 150mm long which do not penetrate more than one (1) layer of the glass in a laminated windscreen, provided they do not interfere with the driver's vision.

In addition, the "primary vision area" (the area of the windscreen which is swept by the windscreen wipers) must not be cracked, scored, chipped, sandblasted or otherwise damaged to the extent that it impairs the driver's vision or damages the wiper blades.



It is recommended that all defects be repaired as soon as possible.

Repairing windscreen damage

Repairing a damaged windscreen, if undertaken correctly, is an acceptable means of reinstating a windscreen to a safe condition.

Repaired windscreens must comply with the following requirements:

- when inspected from the inside of the vehicle, the repair should not exhibit any significant optical defects which would distort or distract the vision of the driver and should restore clarity to the damaged area. (Acceptable limits of repairs are outlined in Note 1);
- any repair to the windscreen should not reduce the effectiveness of the windscreen wipers;
- windscreen repair material must be used in accordance with the manufacturer's instructions.

If a repair has been unsuccessful or is unlikely to be effective, the vehicle owner is responsible for replacing the windscreen in order to meet the necessary safety requirements.

NOTE 1

In a repaired windscreen, a faint outline of the repair, or in some cases, a slight dull spot may be visible where the repair has been performed. A repaired crack may also be detectable by a fine hairline surface mark. These are acceptable and should not cause a vehicle to fail a safety inspection provided the damaged windscreen has been repaired to a standard which complies with the requirements outlined in this document.

To date, the extent of windscreen damage considered to be repairable has not been defined. Improved technology has increased the scope of repairable damage and acceptability can only be determined (in accord with the above standards) after the repair has been completed.

It is recommended that repairs of cracks longer than 350mm be avoided.

NOTE 2

The Australian Standard AS 2366-1990 (*Repair of Laminated Glass Windscreens Fitted to Road Vehicles*) is a voluntary code of practice for the repair of automotive windscreens that gives recommended practices regarding the repair of laminated windscreens. The use of the Australian Standard is not mandatory.

Replacement windscreens

To ensure the safety of all motor vehicle occupants, replacement windscreens must be of an approved safety glass.



The glass must always bear an identification mark indicating the standard to which the glass has been manufactured (e.g. AS2080, BSAU178, JISR3211, ECER-43/00, ANSI-Z26.1) and have a standards mark etched or indelibly printed on the glass.

Windscreens which do not comply with these recognised standards may shatter easily and unexpectedly, creating areas of distorted vision.

Windscreens that do not have a standards mark are illegal.

Windscreens fitted to motor vehicles manufactured on or after 1 July 1971, are required by law to be made from glass which has a light transmittance of no less 75 percent. Aftermarket tint film may be applied to the upper portion of the windscreen. The tinting must not extend lower than a horizontal line contacting the uppermost point of the arcs swept by the vehicle manufacturer's original wiper blades. The tinting may be of any shade but must not have a reflectance of more than 10 percent.

Types of windscreens available

There are two types of replacement windscreens available for motor vehicles, laminated or tempered.

Laminated glass windscreens are manufactured like a "sandwich" with glass on the outside and inside surfaces and a clear plastic film between. A laminated screen is more resistant to breakage than tempered glass and even when fractured it remains almost transparent.

Tempered glass is specially treated so that, when broken, it shatters into tiny fragments instead of jagged splinters. Unfortunately, when the windscreen shatters, it is difficult to see through.

Vehicles manufactured on or after 1 January 1994 must be fitted with laminated glass windscreens. Whilst vehicles built before 1 January 1994 do not have to meet this requirement, it is strongly recommended that when a replacement windscreen is needed, laminated glass be used.

Remember

Windscreen damage or defects could seriously impair a driver's ability to see clearly, thereby presenting a safety hazard.

Appendix J : Rust and Corrosion

1 Classification of Rust

The extent of corrosion in a vehicle can range from light surface rust to the total breakdown of parent metal.

Depending on the individual vehicle's design, there are many different ways in which corrosion can begin and the degree to which a material or structure is attacked can vary widely. In general, though, the formation of rust and resultant loss of metal occurs in areas which retain moisture because (for example) of a build-up of road dirt and mud.

In order to simplify identification and classification when carrying out a motor vehicle inspection, this publication classifies the extent of corrosion in three different stages.

Stage 1 - Surface Rust:

Light, powdery corrosion on the surface of a section of metal is termed surface rust and is sometimes the first indication of corrosion that can be observed; it should warn the owner of the vehicle to take steps for preventing the rust from spreading. Surface rust can occur on or behind any body panel of a vehicle particularly if the protective coating is scratched or damaged.

Stage 2 - Advanced Rust:

Surface rust, if left unattended, will develop into an advanced form of corrosion which can usually be seen as an eruption of oxidised metal, either on bare metal or under paint. This eruption occurs because the rust reaction involves an increase in volume so that pitting or bubbling of paint is the usual indication of penetration.

Stage 3 - Extensive Rust:

The final stage of the corrosion process is the formation of heavy encrustation of oxidised metal which completely replace the parent metal. This results in a hole or series of holes in the body panel or structural member of the vehicle when the rust is removed. This category of rust can usually only be rectified by replacement of the affected body panels and parts.

2 Classification of Vehicle Structures

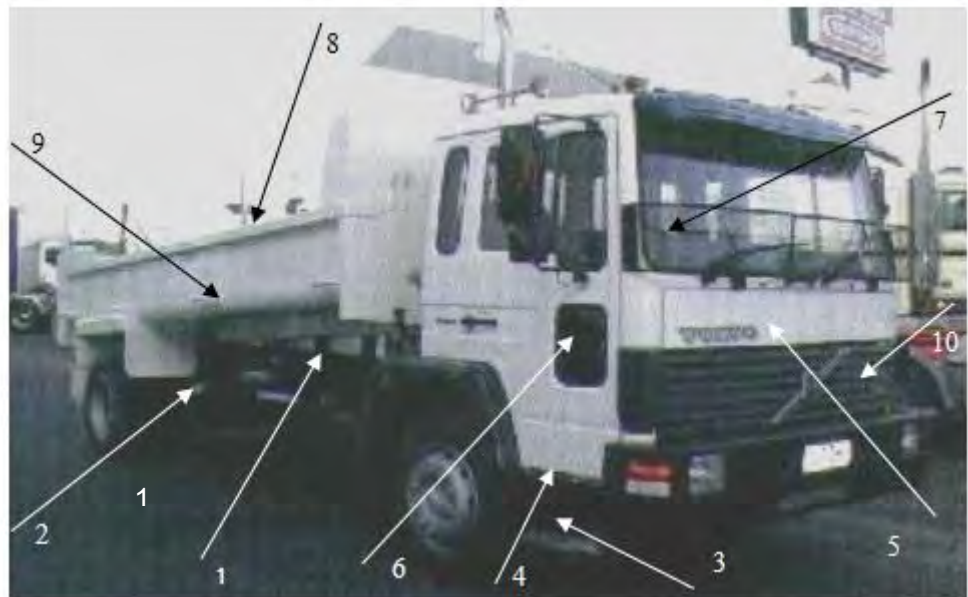
Vehicle structural components can be categorised according to their importance to safety. For instance, sub-frames and other basic structural sections have to be absolutely free of rust because their failure could make a vehicle difficult to control and might cause it to crash. As already mentioned, such failures will also probably reduce the chances of survival in a crash.

Primary Structure

This category includes any structure or component which, if it collapsed, would make the vehicle uncontrollable or would considerably reduce occupant safety in a crash. Examples of components in this category are illustrated below.

Typical primary structure components

1. Main structural members such as sub-frames and chassis rails
2. Suspension mountings and parts
3. Steering component mounting points
4. Door sills and pillars
5. Door hinges and latch mounting points
6. Seat anchorage points
7. Seat belt anchorage points
8. All floor panels
9. Boot floor
10. Bulkheads.

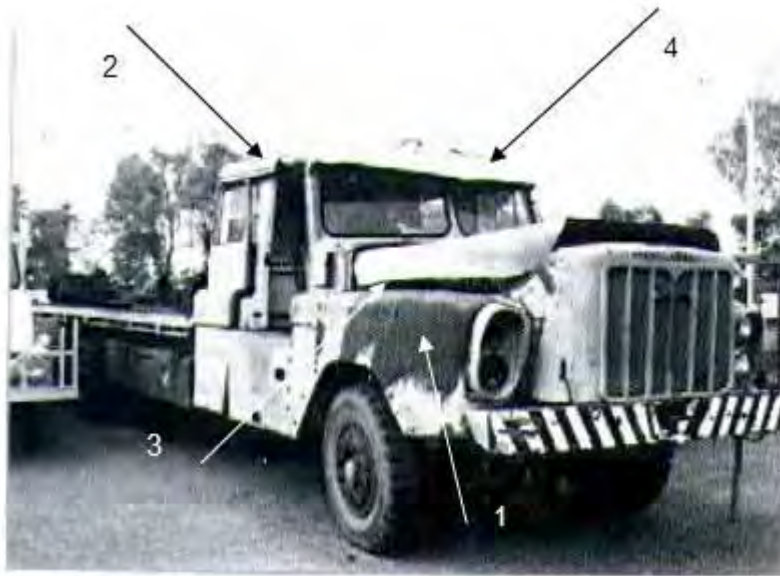


Secondary Structure

The second category includes any structure or component which, if it collapsed, would not immediately affect a vehicle's controllability or the protection provided by its built-in safety systems. Normally, surface rust or advanced rust would not be a cause for rejection in these components but extensive rust is usually either hazardous to persons in or near the vehicle because of its sharp edges or because exhaust fumes can get into the vehicle. In such cases, extensive rust must therefore be rejected. The illustration below shows examples covered by this category.

Typical secondary components

1. Mudguards or fenders
2. Roof
3. Boot-lid, bonnet and doors (areas within 100mm of mounting and locking points are primary structures and must be free of advanced or extensive rust)
4. Exhaust system.



NOTE: *Because of differing structural designs, it might be difficult to categorise some vehicle components as primary or secondary structure. Where such difficulties are encountered, advice should be sought through the Authority's Technical Enquiries Officers to clarify any uncertainties that might be encountered.*

Reasons for Rejection

The following table summarises the acceptability of rusted components in terms of the categories of rust and structures described so far. Remember that it is a general guide only and that in some cases it might be necessary to depart from the table

Type of corrosion	Category of structure	
	Primary	Secondary
Surface Rust	Acceptable	Acceptable
Advanced Rust	Not Acceptable	Acceptable (See Note A)
Extensive Rust	Not Acceptable	Not Acceptable (See Note B.)

NOTE A: *Areas within 100mm of hinges and locks (e.g. boot lid, bonnet and doors), are considered primary structures and must be free of advanced and extensive rust.*

NOTE B.: *Extensive rust is not acceptable in secondary components, if it has resulted in hazardous conditions to persons in or near the vehicle e.g. sharp edges, loose panels or, in the case of exhaust system, gas leaks.*

3 Inspection Method

Visual inspection is usually adequate since advanced corrosion is almost always associated with an eruption of oxidised metal and pitting or bubbling of paint. However, this method may not be adequate in all cases. In under body areas prone to rust such as steering and suspension mounting points and major structural components which include chassis, floor; structural sills and sub-frames presence of rust should be checked by probing with a rod. This method should also be used to check for presence of rust in other areas where cosmetic damage is not a problem, such as inside wheel arches.

In using this technique, great care must be taken to ensure that sound panels or paint work are not scratched or damaged in any way. It should be remembered that the purpose of such checks is to find out whether rust is present, not to determine its extent.

When checking for advanced rust, you should pay particular attention to seam welds and spot welds: these frequently corrode through from the interior and can result in the eventual detachment of panels. Any panel which is made insecure by such corrosion must be repaired even if it is an area of the component where rust holes are not an immediate danger.

4 Repairs

Surface rust on a component or structure is not immediately dangerous and is not a reason for rejection of a vehicle for the purpose of registration. However, if it is observed, the owner should be advised to have it rectified before it becomes serious. Rectification is simply a matter of completely removing the deposit and applying a rust-proofing coating or oil as is appropriate (body panels should be repainted using a good quality re-finishing system).

It should be noted that repairs made to primary structure components solely by using body filling compounds are not acceptable. However, plastic filler or fibreglass can be used to smooth a non-structural component. A vehicle must not be passed for registration if it is found that a repair to a primary component is carried out by methods which do not restore the original strength of the component or part. (A good way to check for continuity of structure, if a fibreglass repair is suspected, is to run a magnet over the surface.)

Extensive rust in structural members can only be repaired by replacing the affected member or by completely removing all rusted material and reinforcing it so that the original strength of the affected structural member is re-established. Where a primary structure is found to be in need of repair and the repaired component would normally be coated with a bituminous coating or covered by another vehicle component such as a seat or a floor mat, it is quite in order to ask the owner to resubmit the repaired vehicle before the repairs are obscured so that the adequacy of the repairs can be assessed. A note to this effect should be made on the inspection report if this is required.

Appendix K : VEHICLE MODIFICATIONS

Heavy Vehicle Modification

The National Code of Practice for Heavy Vehicle Modifications, which is also known as VSB-6 provides a nationally consistent set of technical specifications relating to modifications to heavy vehicles that are intended for road use. The codes aim is to ensure that modified heavy vehicles remain compliant with the relevant Australian Design Rules, the Heavy Vehicle (Vehicle Standards) National Regulation and that the modifications are carried out to the appropriate engineering standards.

Heavy vehicle modifications fall into two distinct categories:

1. owner certified modifications i.e., minor modifications not requiring an engineering certificate.
2. engineering signatory certified modifications.

Owner certified modifications cover modifications that do not affect the level of safety, reliability or strength of vital vehicle systems and have no impact upon the vehicles compliance with the Australian Design Rules or the requirements of VSB-6.

Examples of owner certified modifications are:

Components	Modifications including	ADRs
Bodywork & Structures	Replacement Mudguards	
Lighting	Installation of additional lighting Installation of School Bus Flashing Lights	1, 13, 44, 45, 46, 47, 48, 49, 51, 74
Mirrors	Replacement of mirrors	14
Windscreen & Glazing	Fitment of tinting	8
Seating	Replacement of seats with options available from the manufacturer for the make or model	3, 4, 5

An engineer's certificate must be provided for any modifications beyond owner certified level and for any modifications affecting the vehicles compliance with the ADRs. On receiving of an appropriate engineer certificate a Modification Plate must be fitted to the vehicle.

Modified heavy vehicles that have been approved, as being compliant with the requirements of VSB-6 must be fitted with a Modification Plate from the NHVR that stipulates what modifications have been approved in the form of modification codes.

The table below outlines what each modification code refers to.

Code	Modification
A1	Engine Substitution
A2	Air Cleaner Substitution
A3	Turbocharger Installation
A4	Exhaust System Alteration
A5	Road Speed Limiter
B1	Transmission Substitutions
C1	Tail Shaft Modification
D1	Rear Axle Installation
D2	Differential Substitution
E1	Front Axle Installation
E2	Steering Alterations
E3	Fitting of Non-standard Rim & Tyre Components
F1	Suspension Substitute
F2	Trailer Suspension Modification
G1	Relocation of Air Brake Component
G2	Installation of Trailer Brake Controls
G3	Trailer Brake System Upgrade
G4	Brake System Certification
G5	Fitting of Auxiliary Brake
G6	Air Operated Accessories
G7	Brake System Substitution or Wheel Base Extension
G8	Approved Design Certification Non-standard Trailer Brake System
H1	Wheel Base Extension
H2	Wheel Base Reduction
H3	Wheel Base Alteration within Manufacturers Options
H4	Chassis Frame Alteration
H5	Trailer Chassis Frame Modification

Code	Modification
J1	Body Mountings
K1	Seat Capacity Alteration
K2	Seat Anchorage & Seat Belt Anchorage Certification
K3	Cabin Conversions
K5	Wheel Chair Occupant Restraint System Installation
M1	Fuel System Alterations
P1	Tow Coupling Installations
P2	Fifth Wheel & Kin Pin Installations
Q1	Installation of Truck Mounted Lifting System
R1	Goods Loading Device Installation
R2	Wheel Chair Loading Installation
S1	GVM/ GCM rating
S2	GVM Rating for Non-standard Vehicles & Special Vehicles
S3	GCM Rating for Non-standard Vehicles
S7	ATM Rating for Trailers
S8	Road Train Prime Mover Rating
S9	B-Double Rating
S11	Road Train Trailer Rating
S12	ATM Approved Design for a Non-standard Trailer
T1	Construction of Tow Truck
T2	Design of Tow Truck

Appendix L : Stationary Noise Test Procedure

National Stationary Exhaust

Noise Test Procedures

for

In-Service Motor Vehicles



National Transport Commission

**National Stationary Exhaust Noise Test Procedures for In-Service Motor Vehicles –
September 2006**

Report Prepared by: *National Transport Commission on behalf of the Land Transport Environment Committee.*

ISBN: 1 921168 50 1

FOREWORD

The National Transport Commission (NTC) and the National Environment Protection Council (NEPC) are jointly responsible, through statutory obligations, to develop policy relating to land transport emissions and noise in consultation with each other. This consultation takes place through the Land Transport Environment Committee (LTEC) and this committee includes transport and environmental agencies.

The National Stationary Exhaust Noise Test Procedures (NSENTP) for In-Service Motor Vehicles was first prepared by the Motor Vehicle Environment Committee (MVEC, the precursor to LTEC) in 1999 to introduce a national approach to measuring exhaust noise. Previous to this, some jurisdictions had developed their own approaches and the differences in these approaches could have led to inconsistencies in test results. A nationally uniform approach ensures that vehicle owners will get an accurate assessment of whether their vehicle complies with national noise standards.

The Australian Design Rule (ADR) 83/00 for the external noise of motor vehicles was approved by Ministers in 2003. This new noise emission standard for motor vehicles adopts the UN Economic Commission for Europe (UNECE) Regulations for motor vehicle noise. The UNECE regulations refer to ISO 5130 “Acoustics – Measurement of Sound Pressure Levels Emitted by Stationary Road Vehicles” which provide the noise testing procedures for in-service vehicles. The NSENTP needed to be updated to incorporate elements of ISO 5130.

These test procedures have been approved by the Australian Transport Council and the National Environment Protection Council. They are referred to in the Roadworthiness Guidelines issued under the Australian Vehicle Standard Rules 1999 (Rule 153).

The test procedures should be used by all environment and transport agencies when testing for compliance with Australian Vehicle Standard Rules.

LTEC would like to acknowledge the Environment Protection Authority Victoria for the work in developing this revised draft NSENTP.

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3 TEST SITE AMBIENT REQUIREMENTS

- 3.1 The measurements shall be made in the open air where both the ambient and wind noise levels are at least 10dB(A) below the noise level being measured.

The site may take the form of an open space or beneath a canopy if no part of the canopy or its supports is within 3 metres of the microphone being used in the test.

The test site within 3 metres of the microphone(s) must be substantially flat and may include kerbs, channels, gutter, poles or other objects not providing excessive acoustic reflection provided that no such object is within 1 metre of the microphone.

- 3.2 Measurements shall not be made under adverse weather conditions unless the test site is located beneath a canopy meeting the requirements of 3.1 above. Any sound peak that appears to be unrelated to the characteristics of the vehicle shall be ignored in taking the readings. If a windscreen is used, its influence on the sensitivity and the directional characteristics of the microphone shall be taken into account.
- 3.3 Whilst testing is in progress no person other than any occupants of the vehicle or shall be within 1 metre of the microphone in use. No person or object other than the testing officer and an observer or the objects necessary for the performance of the test shall be within 3 metres of the microphone in use.

4 TEST METHOD FOR ALL VEHICLES EXCEPT PRE ADR83 IN-SERVICE GOODS VEHICLES AND OMNIBUSES

4.1 Microphone position

- 4.1.1 The microphone shall be directed towards the orifice of the exhaust outlet and shall be supported by a tripod or similar device not providing excessive acoustic reflection. The general requirements for positioning microphones are shown in the Appendix.
- 4.1.2 The nominal axis of maximum sensitivity of the microphone shall be substantially parallel to the test site surface and shall make an angle of 45 degrees \pm 10 degrees with the principal direction of gas flow from the exhaust.
- 4.1.3 In selecting the 45 degree alignment from the outlet of a motor vehicle fitted with two or more outlets, only the angle resulting in the microphone being farthest from any other outlet must be used.
- 4.1.4 The height of the microphone above the test site surface shall be equal to that of the orifice of the exhaust outlet \pm 25mm but shall not be less than 200mm above the test site surface.
- 4.1.5 The distance of the microphone from the exhaust outlet orifice shall be 500mm \pm 25mm.

- 4.1.6 In the case of a vehicle fitted with a vertical exhaust, the microphone shall be placed at the height of the exhaust outlet, oriented upwards with its axis vertical. It shall be placed at a distance of 500mm \pm 25mm from the side of the vehicle nearer to the outlet.
- 4.1.7 For vehicles fitted with one exhaust outlet the microphone shall be placed so that the greatest possible distance is achieved between it and the vehicle.
- 4.1.8 For vehicles fitted with two or more exhaust outlets spaced less than 300mm apart only one microphone position shall be used. That position shall be selected in accordance with the procedure described in the preceding paragraphs in respect of an exhaust outlet that results in the greatest possible distance from the vehicle or where this does not exist, to the outlet that is highest above the ground.
- 4.1.9 For vehicles fitted with two or more exhaust outlets spaced more than 300mm apart, each exhaust outlet shall be treated separately as if it were the only one.
- 4.1.10 Notwithstanding anything to the contrary in the preceding paragraphs if the microphone positioning procedures result in no suitable position due to an obstruction being part of the vehicle or in an obstruction being directly between the microphone and the exhaust outlet, the requirements of paragraphs 4.1.2, 4.1.3 and 4.1.5 may be varied provided the distance from the outlet to the microphone is not less than 500mm \pm 25mm.
- 4.1.11 Despite the preceding paragraphs if the microphone is to be placed so that it is less than 500mm from the engine then the angle between the direction of gas flow and the angle of the nominal maximum sensitivity of the microphone may be altered so that the microphone is more than 500mm from the engine.

4.2 Vehicle operation and noise measurement

- 4.2.1 The vehicle shall be stationary with the transmission in "neutral" or, in the case of a vehicle with automatic transmission, with the gear selector in the "park" position if such a position is provided.
- 4.2.2 Before the measurements are begun, the testing officer shall ensure that the engine of the vehicle under test is sufficiently warm to allow the noise testing to be carried out.
- 4.2.3 The engine of the vehicle under test shall be operated in accordance with one of the following procedures:
- 4.2.3.1 Where the ESMP for that engine has been determined by the testing authority the engine shall be brought to and stabilised at a speed as close as the testing officer can achieve to:
- (i) $\frac{3}{4}$ ESMP.

4.2.3.2 Where the engine speed has been governed by the manufacturer and $\frac{3}{4}$ ESMP cannot be achieved, the test speed shall be 5% below the maximum governed speed.

4.2.3.3 Where the ESMP for that engine has not been determined by the testing authority then the engine shall be brought to and stabilised at a speed as close as the testing officer can achieve to one of the following speeds:

In the case of a goods vehicle or bus, if the engine has:

- (i) 6 cylinders or more 3000rpm
- (ii) 4 cylinders and is manufactured before 1970 2500rpm
manufactured in 1970 or later 3500rpm

4.2.3.4 Where, in the opinion of the testing officer, the test speed determined by reference to the above is not attainable by the engine then at the maximum speed that the testing officer believes that the engine can be safely tested.

4.2.4 A noise level measurement shall then be made. The noise level shall be the maximum level measured between the stabilised test speed and when the throttle is swiftly returned to idle position.

4.2.5 The specified procedure shall be repeated until a least three consecutive readings are obtained, each within a range of 1dB (A). For the purposes of this subparagraph only, non-integer decibel readings are to be rounded downwards to the nearest whole decibel.

4.3 Interpretation of results

4.3.1 Where one microphone position is used the noise level of the vehicle shall be the arithmetic mean of the readings specified in paragraph 4.2.4 prior to any rounding process.

4.3.2 When the noise level of the vehicle has been calculated, non-integer results shall be conventionally rounded to the nearest whole decibel.

4.3.3 Where more than one microphone position is used the noise level at each microphone position shall be determined as if it were the only one as described in 4.3.1. The noise level of the vehicle shall be the higher or highest noise level so calculated.

4.3.4 In the case of a pre ADR83 vehicle, if the microphone position is less than 1 metre from the engine compartment of the vehicle the calculated noise level shall be reduced by 2dB(A). Alternately if the mechanical noise of a pre ADR83 vehicle (for example engine or transmission noise) can be shown to increase the measured noise level by 2dB(A) or more, special acoustic shielding may be fitted to mask this source so that the test is carried out on the exhaust noise alone.

5 TEST METHOD FOR PRE ADR83 IN-SERVICE GOODS VEHICLES AND OMNIBUSES

5.1 Microphone position

- 5.1.1 The microphone shall be directed towards the orifice of the exhaust outlet and shall be supported by a tripod or similar device not providing excessive acoustic reflection. The general requirements for positioning microphones are shown in the Appendix.
- 5.1.2 The nominal axis of maximum sensitivity of the microphone shall be substantially parallel to the test site surface.
- 5.1.3 The height of the microphone above the test site surface shall be equal to that of the orifice of the exhaust outlet $\pm 25\text{mm}$ but shall not be less than 200mm above the test site surface.
- 5.1.4 The distance of the microphone from the orifice of the exhaust outlet shall be $1050\text{mm} \pm 50\text{mm}$.
- 5.1.5 For vehicles fitted with one exhaust outlet that is at a height above the test site surface of less than 1500mm, the nominal axis of maximum sensitivity of the microphone shall make an angle of 45 degrees ± 10 degrees with the principal direction of the gas flow from the exhaust outlet. In selecting this microphone position the microphone shall be placed so that the greatest possible distance is achieved between it and the vehicle.
- 5.1.6 For vehicles fitted with one exhaust outlet that is at a height above the test site surface of at least 1500mm, the nominal axis of maximum sensitivity of the microphone shall make an angle of 90 degrees ± 10 degrees with the longitudinal centreline of the vehicle. However, if positioning the microphone according to the preceding requirement would result in the microphone being placed in the gas flow from the exhaust outlet then the microphone location may be rotated, in a horizontal plane, no greater than 45 degrees. In selecting this microphone position the microphone shall be placed so that the greatest possible distance is achieved between it and the vehicle.
- 5.1.7 For vehicles fitted with two or more exhaust outlets spaced less than 500mm apart and connected to a single silencer only one microphone position shall be used. That position shall be selected in accordance with the procedure described in the preceding paragraphs in respect of an exhaust outlet that results in the microphone being at the greatest possible distance from the vehicle.
- 5.1.8 For vehicles fitted with two or more exhaust outlets connected to separate silencers or spaced more than 500mm apart, each exhaust outlet shall be treated separately as if it were the only one.
- 5.1.9 Notwithstanding anything to the contrary in the preceding paragraphs if the

microphone positioning procedures result in no suitable position due to an obstruction being part of the vehicle or in an obstruction being directly between the microphone and the exhaust outlet, the requirements of paragraphs 5.1.2 and 5.1.3 may be varied.

5.2 Vehicle operation and noise measurement

5.2.1 The vehicle shall be stationary with the transmission in "neutral" or, in the case of a vehicle with automatic transmission, with the gear selector in the "park" position if such a position is provided.

5.2.2 Before the measurements are begun, the testing officer shall ensure that the engine of the vehicle under test is sufficiently warm to allow the noise testing to be carried out.

5.2.3 In the case of goods vehicles and omnibuses powered by a diesel engine the engine shall be operated in accordance with the following procedure.

5.2.3.1 With the engine at idling speed the accelerator pedal of the vehicle shall be depressed as rapidly as possible and kept fully depressed until the speed of the engine is substantially stable at maximum (or governed) speed. The accelerator pedal shall then be permitted to return to its original position as rapidly as possible and left in that position until the engine has returned to idling speed.

5.2.3.2 A noise level measurement shall be made for each microphone position in use by noting the maximum noise level indicated during this procedure.

5.2.4 In the case of goods vehicles and omnibuses powered by a spark ignition engine the engine shall be operated in accordance with one of the following procedures.

5.2.4.1 Where the ESMP for that engine has been determined by the testing authority, the engine shall be brought to and stabilised at a speed as close to $\frac{3}{4}$ ESMP as the testing officer can achieve; or

5.2.4.2 Where the ESMP has not been determined for that engine by the testing authority, then the engine shall be brought to and stabilised at as close as the testing officer can achieve to one of the following speeds:

If the engine has:

- | | | |
|-------|---|---------|
| (i) | 6 cylinders or more | 3000rpm |
| (ii) | 4 cylinders and is manufactured before 1970 | 2500rpm |
| (iii) | manufactured in 1970 or later | 3500rpm |

OR

5.2.4.3 Where, in the opinion of the testing officer, the speed determined by reference to the above is not attainable by the engine then at the maximum speed that the testing officer believes that the engine can be safely tested.

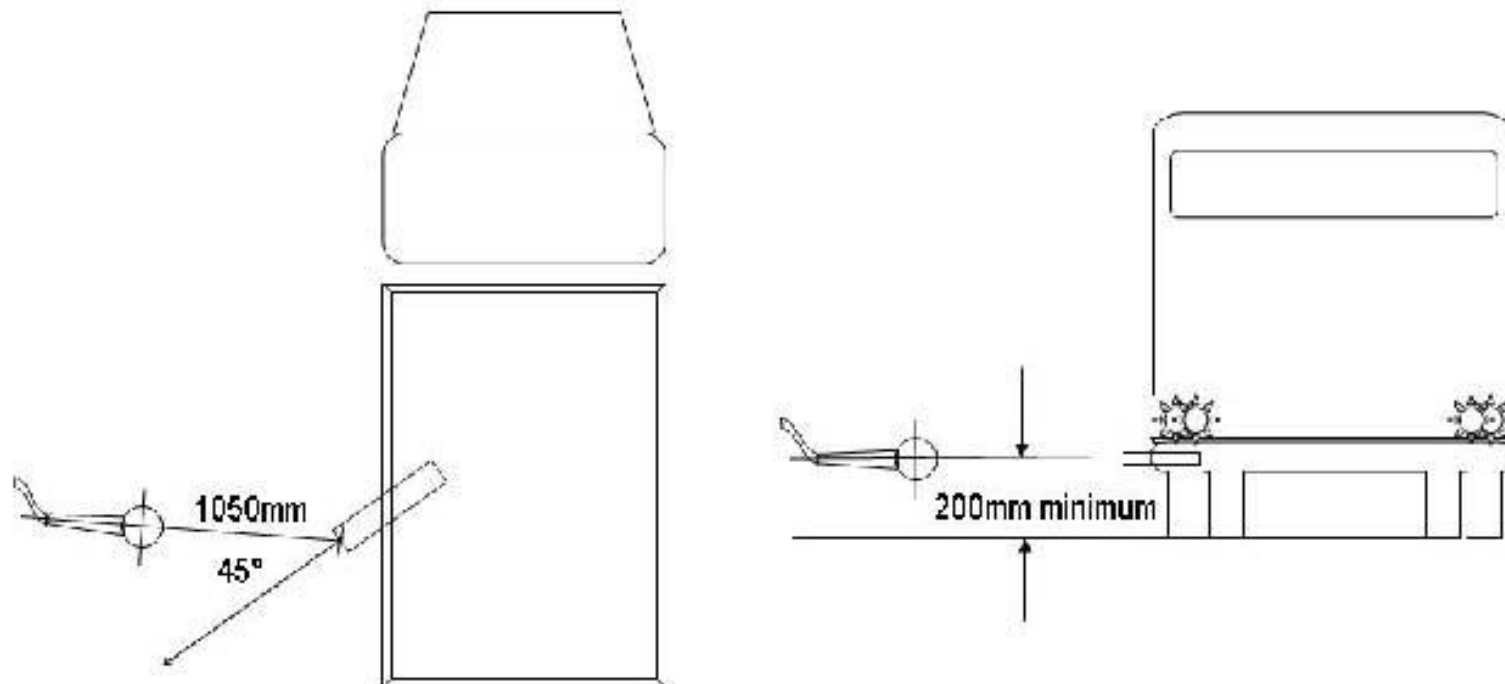
5.2.4.4 A noise level measurement shall then be made.

5.2.5 The specified procedure shall be repeated until a least three consecutive readings are obtained, each within a range of 1dB (A). For the purposes of this subparagraph only, non-integer decibel readings are to be rounded downwards to the nearest whole decibel.

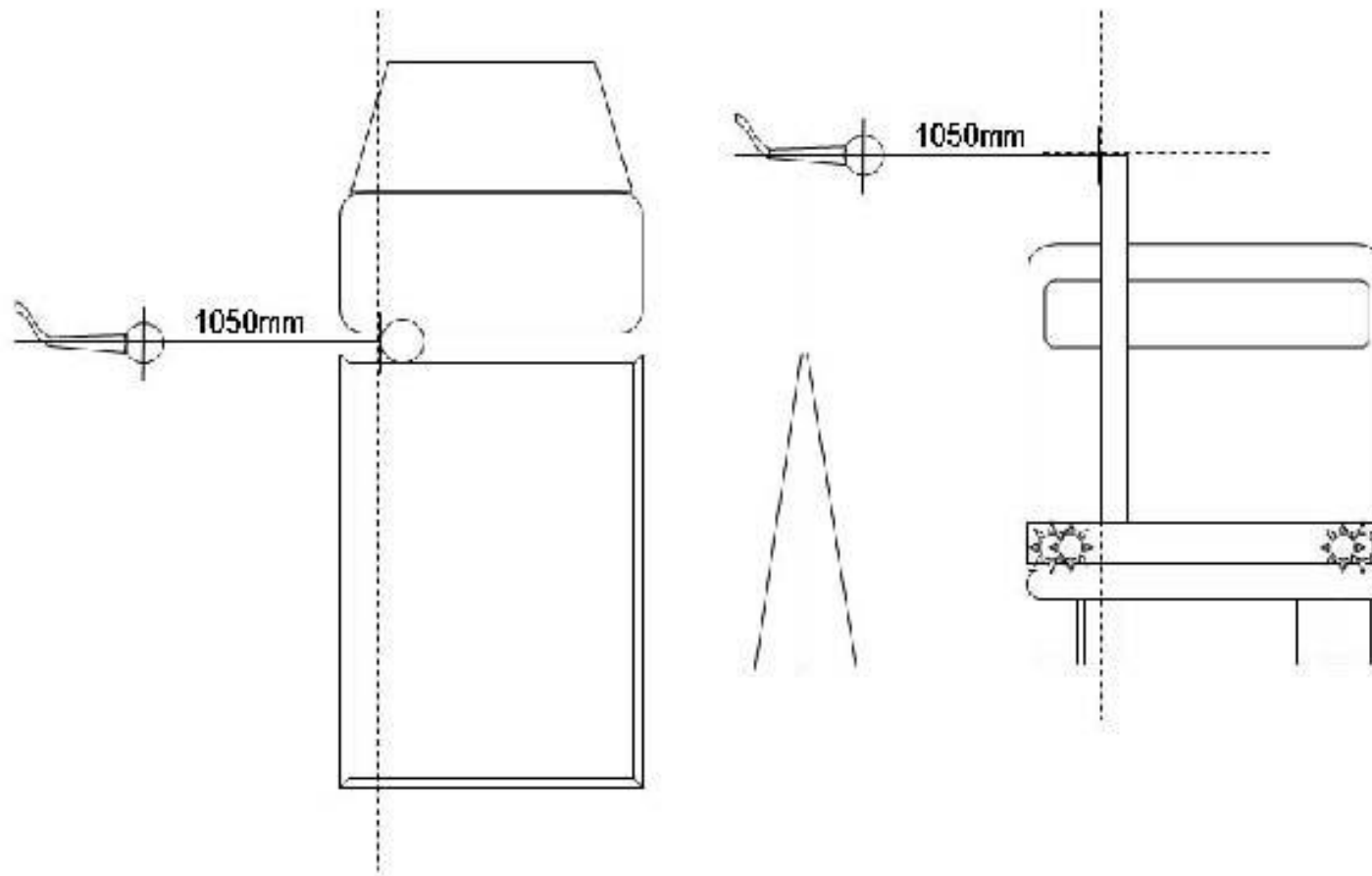
5.3 Interpretation of results

Results shall be interpreted as in section 4.3.

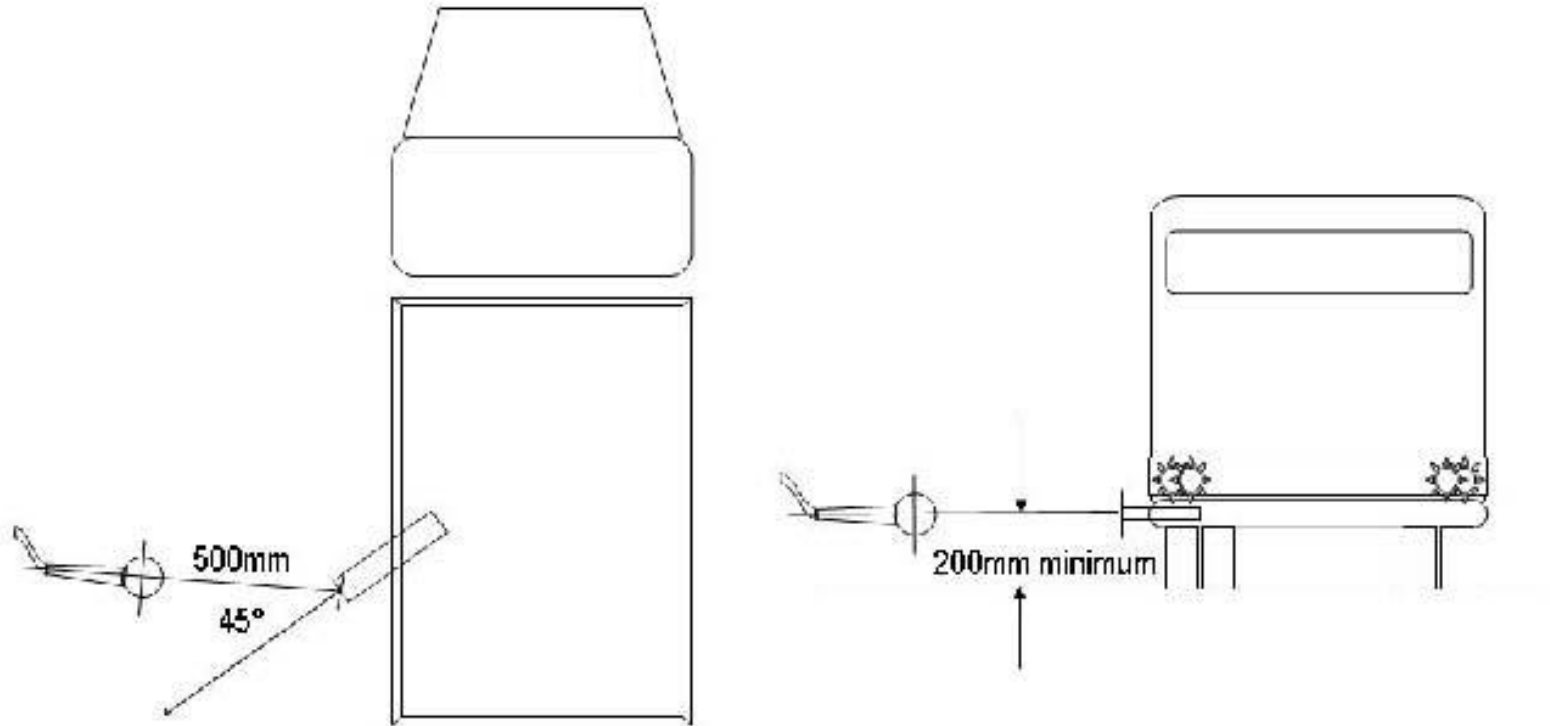
TYPICAL TRUCK MICROPHONE LOCATIONS PRE ADR83 VEHICLES
Exhaust height less than 1500mm above surface



TYPICAL TRUCK MICROPHONE LOCATIONS PRE ADR83 VEHICLES
Exhaust height 1500mm or more above surface

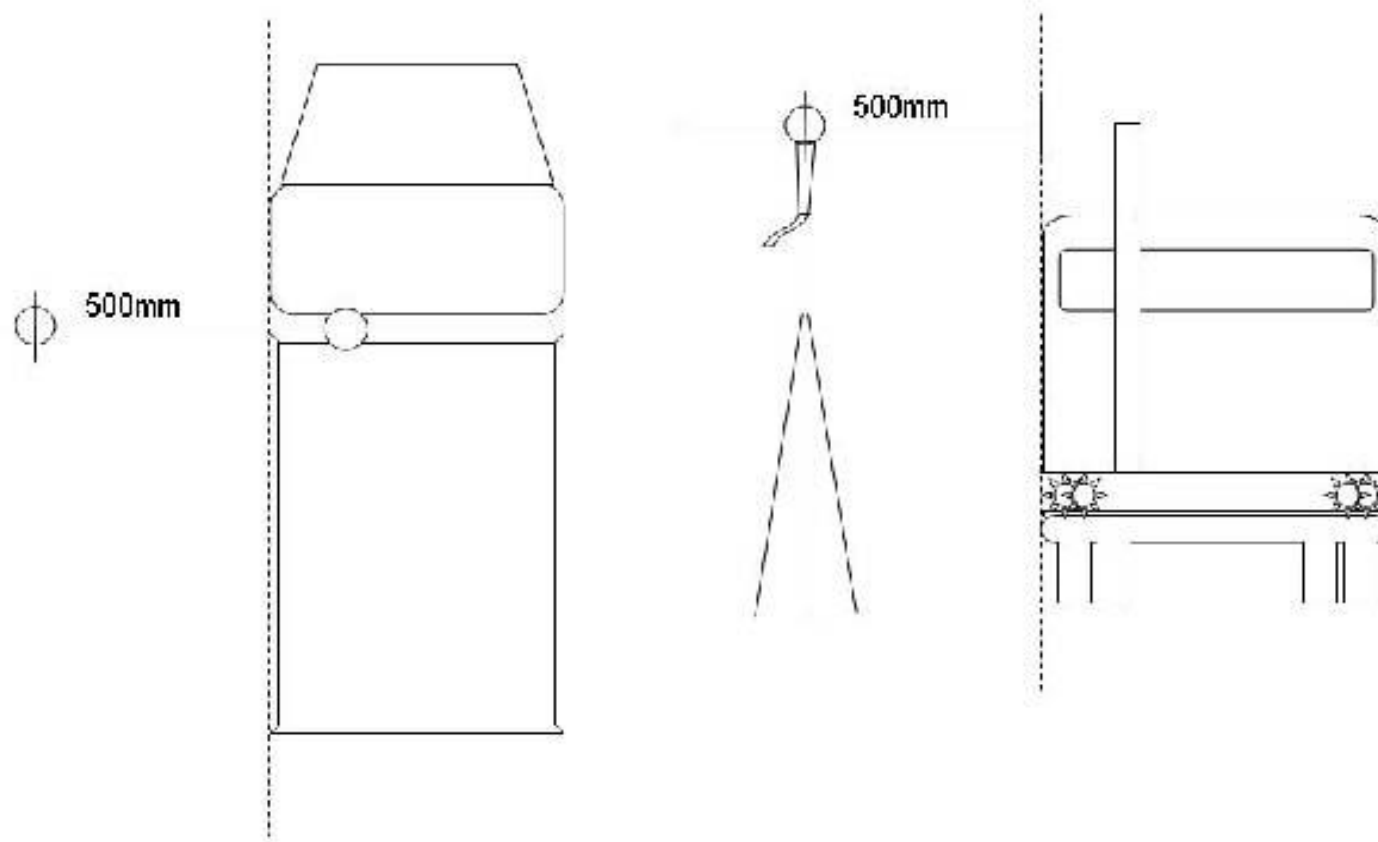


TYPICAL TRUCK MICROPHONE LOCATIONS ADR83 VEHICLES Side Exiting Exhaust



TYPICAL TRUCK MICROPHONE LOCATIONS ADR83 VEHICLES

Vertical Exhaust



Appendix M : Suggested Equipment List for Heavy Vehicle Inspections

1. Roller brake testing machine, able to provide a printout of the brake performance readings;
2. Vehicle inspection pit;
3. Suspension detection equipment, shaker plates;
4. Pit mounted vehicle jacking system;
5. Pit mounted lighting and handheld inspection light;
6. In pit portable steps;
7. Inspector to driver communication system;
8. Crow (pinch) bar/ various lengths;
9. Kingpin gauges;
10. Turntable jaw checker;
11. Tractor protection adaptors;
12. Wheel chocks/ various sizes;
13. Light Transmittance Meter;
14. Portable Brake testing decelerometer or Skid plate brake testing machine;
15. Headlight aim tester or Headlight testing screen;
16. Sound level meter;
17. Facsimile machine or equivalent (AUVIS);
18. Computer and printer (computer must be connected to the internet),
19. Station stamp suitable for Inspection Reports and Defect Notices (stamp must display the following details of the AIS, trading name, address and ABN);
20. Approved station signs.