NATIONAL HEAVY VEHICLE INSPECTION MANUAL

EXPLANATORY NOTES

Introduction

The National Heavy Vehicle Inspection Manual (NHVIM) applies to all vehicles that have a GVM greater than 4.5 tonnes. The manual has been prepared by the National Transport Commission\(^1\) (NTC) as part of its task to develop uniform or consistent principles and practices for the safe and efficient operation of road transport in Australia.

The aim of the National Heavy Vehicle Inspection Manual (NHVIM) is to provide consistent procedures for heavy vehicle inspections that are in line with National Transport Reform. The inspection manual details practical information about wear, damage or change to important systems of vehicle in-service inspections for owners, operators and administrators in each State and Territory of Australia.

Generally, to be considered roadworthy, a vehicle must comply with the Road Transport Reform (Vehicle Standards) Regulations\(^2\), the Australian Vehicle Standards Rules (the “Vehicle Standards”\(^3\)) 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 these requirements.

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

\(^1\) The NTC acknowledges the previous work done by the Roads and Traffic Authority New South Wales and the Department of Urban Services, Australian Capital Territory on this manual.

\(^2\) The complementary State or Territory regulations based on the National Reform Regulations may be known by different titles in each jurisdiction.

\(^3\) The complementary State or Territory Vehicle Standards may be known by different titles in each jurisdiction.
Some inspection processes and standards apply only to certain vehicles. Similarly, a vehicle may have been exempted from a Vehicle Standard or ADR. 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 HVIM 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.

The Australian Vehicle Standards Rules have not been listed as the rule numbering maybe different from state to state. All relevant documents should be consulted for a complete list of the requirements.

**Purpose**

The principle purpose of the National Heavy Vehicle Inspection Manual is to provide owners, vehicle inspectors and other customers of jurisdictions with consistent practical test fail criteria to be applied during an inspection in order to establish a national consistent process to heavy vehicle roadworthiness in each State or Territory of Australia.

**Scope**

The NHVIM will provide information for Authorized Inspection Stations (AIS), On-Road Inspectors, enforcement agencies, Industry and Vehicle Certification providers on the national approach to inspections for heavy vehicles.

The NHVIM is intended to serve two principal functions:

1. It will be a national source of information to apply acceptable inspection practices involving heavy vehicle inspections.

2. It will provide the basis for all authorised inspection processes to apply consistent standards to heavy vehicles.

As a general rule the application of consistent standards will prevent duplication of effort within and between jurisdictions and lead to a more efficient transfer of heavy vehicles operating between states and territories.

This manual is intended to apply to standard vehicles. Where vehicles have been modified examiners will need to assess the vehicle against whatever approvals have been issued for the vehicle in question. These may be in the form of an engineers report, a modification permit, second stage manufacturer compliance plate or an authorized modifiers plate which signifies that the modifications have been carried out to an accepted standard.

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4 Check local jurisdiction for exemptions as applicable. An ADR or AVSR developed after publication of the NHVIM may also allow a variation or exemption.
Administrative Arrangements

The NHVIM will be as free as possible of administrative arrangements. Jurisdictions may need to adjust their current arrangements to allow for the most efficient use of the NHVIM.

It is expected that each jurisdiction will supplement the manual with specific local jurisdictional administrative processes and procedures. However, the core essentials of inspection from the NHVIM remain as a consistent application.

Approval Processes

The NHVIM is not expected to significantly change methods or processes of assessment for the conduct of heavy vehicle inspections currently being utilized by individual jurisdictions. Rather the NHVIM when integrated into existing inspection procedures should be an enhancement to current State and Territory processes.

Objectives

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

Identification of Alternatives

At a national level it was identified that each State/Territory was capable of producing its own inspection manual. However in the interest of national uniformity it was generally agreed by jurisdiction vehicle safety staff that a significant increase to productivity and efficiency within the vehicle inspection process could be achieved by the development of a common inspection manual to implement consistent vehicle inspection assessment criteria.

Consultation With Affected Parties

The procedures set out in this manual reflect current consultation with road user groups, road authorities and manufacturers and suppliers.

Impact

Road transport operators have made frequent representations to the National Transport Commission 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 authorized vehicle inspectors in relation to the assessment of vehicles. In turn, this process will deliver more consistent vehicle inspection outcomes for vehicle operators throughout Australia.

5 Individual jurisdictions will need to assess the impact on their current processes including training aspects.
Acknowledgements

The consultant (Estill & Associates, Perth) would like to thank all those who assisted the development of the manual by returning comments and ideas. Further acknowledgement is given to the previous work on the manual by the Roads and Traffic Authority New South Wales and the Department of Urban Services, ACT. Thanks are also given to the Project Review Group and especially John Dombrose from the Department for Planning and Infrastructure, WA and Barry Hendry from the National Transport Commission.
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Section 1 : Brakes

The following Australian Design Rules are relevant to this section:

ADR 7        Hydraulic Brake Hoses
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 & B-Doubles

1.1 Check brake components

Reasons for rejection
Any condition exists that will, or is likely to, interfere with the effective operation of the braking system including:

a) Brake pedals do not have an anti-slip surface across the complete surface;
b) Brake pedals or handles are broken or missing;
c) Brake control mountings, pivots, cables or links are kinked, loose, broken, excessively worn or binding;
d) A ratchet or locking device on a parking brake control does not hold the parking brake in the applied position;
e) Park brake control can be released with only one action;
f) Abrasions or cuts on brake hoses penetrate the outer protective covering;
g) Brake pipes, hoses and connections are cracked, broken, kinked, cramped, damaged by heat or have visible signs of leakage, swelling or bulging;
h) Brake drums or discs are not fitted or have missing pieces, or cracks other than short and shallow heat cracks inside the drums;
i) Drums or discs are distorted or worn beyond manufacturers specifications;
j) Any calliper, wheel cylinder or master cylinder leaks;
k) Linings or pads are contaminated;
l) The thickness of the linings or pads is less than the manufacturer’s recommended minimum. Where the manufacturer does not provide specifications or they are no longer appropriate, the thickness of the linings or pads is less than:

- 0.8 mm above the fastener; or
- on bonded linings or pads, 1.5 mm above the shoe or pad backing plate.

m) Brake chamber (including chamber clamps) or camshaft support brackets are loose, bent, cracked or missing;

n) 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, misaligned or broken;

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

o) 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 it leaks;

*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 1.2.*

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

1.2 Check brake adjustment

Reasons for rejection
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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) The park brake and/or emergency brake is not capable of being fully applied without the control running out of available travel;

d) The brake adjusters are bent, damaged or excessively worn, or are not properly adjusted.

1.3 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 misaligned cracked, broken or loose;

c) Drive belts are loose, cracked through to reinforcing plies, extensively frayed or missing drive sections.

1.4 Check air filters

Reasons for rejection

a) Filter units for air compressors or vacuum pumps are missing, loose, blocked or damaged.

1.5 Check braking system operation

Reasons for rejection

a) Any brake failure indicators do not operate;

b) Any compulsory pressure, vacuum or low level warning devices or gauges do not operate;

c) The brake controls do not cause the corresponding brake to apply when they are operated (with the engine running if necessary).
1.6 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) If the vehicle is fitted with a low vacuum indicator, the indicator does not activate at a vacuum level of 25 kPa or more;

c) With the engine stopped, one application of the service brake with a moderate pedal force results in the low vacuum indicator coming on;

d) If a trailer is connected to the motor vehicle, the trailer vacuum brakes cannot be applied from the normal driving position;

e) A brake pedal that is held depressed while the engine is running, tends to rise when the engine is stopped;

f) Vehicle is not fitted with at least one vacuum storage reservoir or tank;

g) The reservoir or tank for vacuum is not protected by a check valve;

h) 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;

i) Time taken for vacuum to reach normal working level when the vacuum reserve is fully depleted is longer than 60 seconds;

j) The vacuum warning device (if fitted) does not deactivate when the low mark is reached;

k) The loss of vacuum from its maximum indicated level exceeds 125mm (5 inches) Hg in 10 minutes when the engine is stopped;

l) 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;

m) With the engine stopped, there is insufficient level of vacuum to allow at least two assisted service brake applications.
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1.7  Check air brake system integrity (including air over hydraulic)

NOTES:

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).

Checks and 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
   a) 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 and releasing 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 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.
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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.

1.8 Check hydraulic brake system integrity

Reasons for rejection

a) When a constant light force is applied to the brake pedal for 10 seconds:

- after the initial travel, the service brake pedal continues to travel 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.

1.9 Service brake test with a decelerometer

*NOTE 1:* 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 30 km/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 without locking the wheels and 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 1.

c) Individual wheel locking cannot be controlled.

Note: A decelerometer reading that meets the requirements of the table may still indicate a
braking problem if it is significantly below the average for that model of vehicle. The
values in Table 1 are the minimum acceptable brake performance requirements.

Note: When brake testing is carried out, that the vehicle or combination should be on a
dry, smooth, level road service and free from loose material.

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<td>GVM exceeding 4.5 tonnes</td>
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1.10  **Emergency brake test with a decelerometer for vehicles not designed to ADR 35 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 15 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 without locking the wheels and in a safe manner with one sustained and smooth application of the emergency brake.

**Reasons for rejection**

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

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<td></td>
<td>m/s²</td>
<td>%g</td>
</tr>
<tr>
<td>GVM exceeding 4.5 tonnes</td>
<td>1.5</td>
<td>16</td>
</tr>
</tbody>
</table>

1.11  **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. The parking brake of vehicles with a transmission hand brake must hold be able to hold the vehicle stationary on a 12% gradient.

**Reason for rejection**

a)  The parking brake does not hold the vehicle in the stationary position.

1.12  **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 1;

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 2;

d) Where ADR 35 applies, or vehicles fitted with a tandem master cylinder/dual circuit brakes, the parking brake does not hold the vehicle in a stationary position.

### 1.13 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 brake efficiency is less than the requirements specified in Table 3;

c) With all brakes released, the brake drag at any axle exceeds the performance requirement specified in Table 4;

d) The parking brake does not give an adequate reading, or the vehicle does not lift out of the rollers.
### TABLE 3  Minimum Brake Force

<table>
<thead>
<tr>
<th>Type of vehicle</th>
<th>kN/tonne (minimum)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GVM exceeding 4.5 tonnes</td>
<td>3.0</td>
</tr>
</tbody>
</table>

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

1. adding the brake force for each axle
2. dividing Step 1 by the vehicle mass

### TABLE 4  Maximum Brake Drag

<table>
<thead>
<tr>
<th>Type of Vehicle</th>
<th>kN (maximum)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GVM exceeding 4.5 tonnes</td>
<td>1.0 drive axle</td>
</tr>
<tr>
<td></td>
<td>0.5 other axle</td>
</tr>
</tbody>
</table>

#### 1.14 Check of 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 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.
Section 2 : Couplings

The following Australian Design Rules are relevant to this section:

<table>
<thead>
<tr>
<th>ADR 62</th>
<th>Mechanical Connections Between Vehicles</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADR 63</td>
<td>Trailers Designed for Use in Road Trains</td>
</tr>
</tbody>
</table>

2.1 Check fifth wheels/turntables

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

Reasons for rejection

a) Where ADR 62 applies, the fifth wheel/turntable does not display the manufacturer’s name/trademark, nominal size (eg 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 (eg quick release turntable fitted to a ballrace turntable);

c) The top and bottom mounting flanges have insufficient effective fasteners (eg ballrace);

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 5 mm 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.

2.2 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) Pin couplings or pintle hooks have any missing, loose, broken, deformed or cracked fasteners including welds. (See Figure 2.2);
c) Any mounting bolts, fasteners or weld beads have advanced corrosion;
d) 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;
e) The pin coupling or pintle hook welds have cracks;
f) 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.
## 2.3 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 maximum rated capacity and the make and model of the vehicle/s for which it is designed or the manufacturers part number;

d) Where ADR 62 applies, the tow bar does not have two safety chain attachments, mounted one on either side of, and adjacent to the towbar.

e) 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.
2.4 Check towing attachments

Reasons for rejection

a) Any towing attachment (such as a towball 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).
Section 3: Steering and Suspension

The following Australian Design Rules are relevant to this section:

<table>
<thead>
<tr>
<th>ADR 10</th>
<th>Steering Column</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADR 42</td>
<td>General Safety Requirements</td>
</tr>
<tr>
<td>ADR 43</td>
<td>Vehicle Configuration &amp; Dimensions</td>
</tr>
</tbody>
</table>

NOTE: To be registered in Australia, a motor vehicle with a GVM over 4.5 tonnes must have a steering control to the right of, or in line with, the centreline of the vehicle. Jurisdictions have various ways of registering certain categories of left hand drive vehicles. These can include special purpose vehicles, which may be conditionally registered or allowed to operate under a permit. Examiners should be aware of the requirements for their jurisdiction.

3.1 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 specifically authorised in writing by the State or Territory licensing authority;

b) The steering wheel is loose on the shaft;

c) The steering column is insecure or has excess movement;

d) The steering wheel structure is fractured or the hub, rim or spokes are loose.

3.2 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>
<thead>
<tr>
<th>Steering wheel diameter (mm)</th>
<th>Movement (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to 450</td>
<td>75</td>
</tr>
<tr>
<td>over 450</td>
<td>100</td>
</tr>
</tbody>
</table>
3.3 Check steering components under the bonnet and under the vehicle

Reasons for rejection

a) Any steering component is missing, cracked, distorted or broken;

b) Any threaded or tapered joint is loose;

c) Any freeplay due to wear in a balljoint exceeds manufacturer’s specifications. Where these are not known or are no longer appropriate, the freeplay 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 misaligned, cracked, broken or loose;

j) Power steering pump belts are loose, cracked through to reinforcing plies, extensively frayed or missing drive sections;

k) Integral power steering assemblies or power assist cylinders leak more than one (1) drop every 30 seconds;

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;

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>
<thead>
<tr>
<th>Rim Diameter (mm)</th>
<th>Free play (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to 405</td>
<td>7.0</td>
</tr>
<tr>
<td>over 405 to 455</td>
<td>10.0</td>
</tr>
<tr>
<td>over 455</td>
<td>13.0</td>
</tr>
</tbody>
</table>

q) Any noticeable movement due to wear in any component exceeds manufacturer’s specification, or 3 mm where this is unknown.
3.4 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, 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, distorted or missing;

d) Air bags leak or sag;

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.

NOTE: Superficial crazing is acceptable on rubber bushes. This is often present on rubber suspension components even when new.
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 4: Wheels Tyres and Hubs

The following Australian Design Rules are relevant to this section:

<table>
<thead>
<tr>
<th>ADR 20</th>
<th>Safety Rims*</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADR 24</td>
<td>Tyre &amp; Rim Selection</td>
</tr>
</tbody>
</table>

* Repealed 2003

4.1 Check wheels and rims

Reasons for rejection

a) Any wheel or rim:
   - is loose or shows signs of movement;
   - is cracked;
   - is buckled;
   - has pieces of casting missing;
   - has elongated stud holes;
   - has weld repairs not in accordance with sound industry practice.

b) Any wheel contacts unrelated vehicle components at any point through its full range of travel;

c) Spiders have cracks;

d) Wheels are not compatible with hubs;

e) Valve protection lugs are missing.

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

4.3 Check retaining rings

Reasons for rejection
a) Lock or side rings are incorrectly seated, sprung, mismatched, bent, broken, cracked or ends meet when fitted to the rim.

4.4 Check tyres

Reasons for rejection
a) A tyre does not have at least 1.5 mm tread depth in a band which runs continuously around the whole circumference of the tyre and extends across at least 75% of the width of the tyre that normally comes in contact with the road;

NOTES:

1. 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.

2. 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 25 mm;

c) A tyre (including sidewalls) has deep cuts, chunking, bumps, bulges, exposed cords or other signs of carcass failure or could make the operation of the vehicle unsafe;

d) A tyre has been regrooved (except where indicated on the side wall that the tyres are suitable for regrooving);
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 – except for retread tyres;

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 max speed i.e. 125km/h);

h) A tyre fitted to a heavy vehicle is not suitable for road use at:
   - a speed of at least 100 kilometres an hour; or
   - if the vehicle cannot travel at a speed of 100 kilometres an hour, its top speed;
   - the wheels and tyres fitted to an axle of a vehicle are not of sufficient size and capacity to carry that portion of the vehicles gross mass transmitted to the ground through the axle.

i) The tyres on an axle are not of the same carcass construction (eg cross ply, radial ply or bias belted);

j) Dual tyres contact each other;

k) Any tyre on a vehicle contacts the body, chassis, frame or braking, steering or suspension components at any point through its full range of travel;

l) A tyre has cleats or other gripping devices that could damage road surfaces.
Section 5: Structure and Body Condition

The following Australian Design Rules are relevant to this section:

ADR 2 Side Door Latches and Hinges
ADR 10 Steering Column
ADR 15 Demisting of Windscreen
ADR 16 Windscreen Wipers & Washers
ADR 18 Instrumentation
ADR 21 Instrument Panel
ADR 42 General Safety Requirements
ADR 43 Vehicle Configuration & Dimensions
ADR 44 Specific Purpose Vehicle Requirements
ADR 58 Requirements for Omnibuses Designed for Hire and Reward
ADR 59 Omnibus Rollover Strength
ADR 63 Trailers Designed for Use in Road Trains
ADR 64 Heavy Goods Vehicles Designed for Use in Road Trains & B-Doubles

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

5.1 Check exterior body panels and fittings

Reasons for rejection

a) Exterior body work including mudguards, bullbars, 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 230 mm from the ground or in the case of a vehicle built to be used off-road, 300 mm from the ground.
Section 5
STRUCTURE and BODY CONDITION

d) Spray suppression devices are not fitted to ‘B’ Double combinations in accordance with Rule 33 Australian Vehicle Standard Rules. Does not apply in those states that have granted exemption (eg: WA);

e) Any motor vehicle which is 2.2 m or more in width and fitted with a body which is less than 300 mm 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;

f) The rear coaming of any vehicle described in 5.1(e) above is not silver or white in colour for a depth of 75 mm or more;

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

g) Any aftermarket fitting attached to the exterior of the vehicle that could cause injury to a person coming into contact with that part of the vehicle.

5.2 Check Rear Marker Plates

Reasons for rejection

a) Rear marker plates not fitted to a heavy vehicle that has a GVM greater than 12 tonnes;

b) Rear marker plates not fitted to a bus that has no provision for standing passengers;

c) Rear marker plates do not comply with AS 4001.1-1992 or State or Territory instructions;

d) Rear marker plates are faded, damaged or incorrectly fitted.
5.3 Check cabin and body condition

Reasons for rejection

a) Any structural member of a body or cabin such as a crossmember, 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, affects the attachment of any vehicle controls (pedals, steering columns etc) or allows the entry of engine fumes into an occupant space;

b) Any cabin, body, sleeper compartment, load carrying area or compartment is not securely attached or 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 tilting cabin or tray does not have a positive latching device that secures it in its normal travelling position;

e) Any door, gate, hatch, bonnet or compartment latch, latch control, or hinge is damaged, excessively worn, insecure or inoperative in any latching position.

5.4 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 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;

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6 Number plate condition is not necessarily a roadworthiness item. Check local jurisdiction requirements
Section 5  
STRUCTURE and BODY CONDITION

d) The number plates are not substantially parallel to the vehicles axles;

e) Any part of the number plate is more than 1300mm from the ground (ADR 43).

5.5 Check electrical equipment

Reasons for rejection

a) Electrical wiring or connectors are corroded, damaged, bare live wires (except earth wire) or hanging loose in a way that could allow it to be damaged;

b) Electrical wiring is located where it can:
   • become exposed to excessive heat;
   • come into contact with moving parts;
   • come near a fuel system to cause a fire hazard.

c) Batteries are not securely mounted, leak or are situated in an occupant space without adequate protection from spillage and fumes.

5.6 Check chassis

Reasons for rejection

a) Any part of the chassis or subframe is:
   • cracked;
   • 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) 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.
5.7 Check operation of the horn

Reasons for rejection

a) The horn is inoperative or is not fitted;

b) The horn makes a sound like a siren, exhaust whistle or compression whistle;

c) The horn makes a repeating sound.
Section 6 : Seats and Seatbelts

The following Australian Design Rules are relevant to this section:
ADR 4   Seatbelts
ADR 5   Anchorages for 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

6.1  Check seats

Reasons for rejection

a)  Seat frames or attaching points are loose, cracked, broken, damaged or have fasteners missing or have advanced corrosion;
b)  Adjustment mechanisms do not work properly or any securing device does not hold the seat in the selected position;
c)  Any seat has an exposed sharp edge or other parts that protrude due to damage or wear.

6.2  Check seat belts

Reasons for rejection

a)  Any seat belt or attaching point (component) is loose, cracked or has missing fasteners;
b)  Any retractor, buckle or adjustment device is faulty or inoperative;
c)  Webbing is cut, burnt, tied in a knot, frayed, stretched, severely deteriorated or has broken stitching;
d)  Seatbelt missing or incorrect type fitted.

NOTE: Discolouration alone is not reason for rejection however if there is texture change as well it should be rejected.
Section 7: Lights and Reflectors

The following Australian Design Rules are relevant to this section:

- ADR 1  Reversing Lamps
- ADR 6  Direction Indicator Lamps
- ADR 13 Installation of Lighting & Light-signalling Devices on other than L-group Vehicles
- ADR 44  Specific Purpose Vehicle Requirements
- ADR 45  Lighting & Light-signalling Devices not covered by ECE Regulations
- ADR 46  Headlamps
- ADR 47  Reflex Reflectors
- ADR 48  Rear Registration Plate Illuminating 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 76  Daytime Running Lamps

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.

7.1 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 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);
- turn signal indicator lights (yellow);
Section 7
LIGHTS and REFLECTORS

- clearance/end outline marker lights (white/yellow to front, red to rear);
- number plate light (white);
- side marker lights (yellow);
- compulsory tell-tale 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 amber 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) There is any other type of opaque cover over a headlight which cannot be readily removed;

i) Any light or reflector is mounted on a flexible component (e.g. mudflap) that could cause the light to appear to flash or flicker;

j) Any light does not comply with the requirements as specified in the Department of Transport and Regional Services Vehicle Standards Bulletin No.9 (VSB 9).

7.2 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 show white light;

e) Headlight lens or reflector is internally contaminated by dirt or moisture.
7.3 Check headlight aim using a headlight tester

(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 8m, 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 8m, any part of the top edge of the high intensity portion of the low beam pattern is above and to the right of the centreline of the headlight;

NOTES:

1) in the region above and to the right of the centreline of the headlight the luminous intensity must not exceed 437cd.

2) the portion of the beam to the left of the centreline of the light may extend above the height of the centreline of the headlight.

3) the "centreline of the headlight" passes through the centre of the globe filament, or equivalent

   c) the headlight high beam indicator light is not operating
Section 8 : Mirrors

The following Australian Design Rules are relevant to this section:

<table>
<thead>
<tr>
<th>ADR 14</th>
<th>Rear Vision Mirrors</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADR 58</td>
<td>Requirements for Omnibuses Designed for Hire and Reward</td>
</tr>
</tbody>
</table>

8.1 Check mirrors

Reasons for rejection:

a) Any reflective surface of a compulsory rear view mirror:
   - has a missing section;
   - is cracked or insecure;
   - is deteriorated;
   - is obscured;
   - where fitted to the right side, does not have a flat surface;
   - where fitted to the right side, does not have a surface of at least 150cm².

b) Mirrors are not securely mounted or missing;

c) Any compulsory left side mirror does not have a reflecting surface of at least 150 cm²;

d) Any compulsory mirror does not provide a clear view of the road to the rear of the vehicle.
Section 9 – Windscreen and Windows

The following Australian Design Rules are relevant to this section:

<table>
<thead>
<tr>
<th>ADR</th>
<th>Rule</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Safety Glazing Material</td>
</tr>
<tr>
<td>12</td>
<td>Glare Reduction in Field of View*</td>
</tr>
<tr>
<td>15</td>
<td>Demisting of Windscreen</td>
</tr>
<tr>
<td>16</td>
<td>Windscreen Wipers &amp; Washers</td>
</tr>
<tr>
<td>42</td>
<td>General Safety Requirements</td>
</tr>
</tbody>
</table>

ADR 12: Repealed in 2003

9.1 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 16 mm in diameter, or any two (2) of the following:
     - hairline crack up to 30 mm long;
     - a crack from the edge of the windscreen up to 75 mm 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.

b) Any cracks in a laminated windscreen penetrate more than one layer of glass or are more than 150 mm long;

c) Any glazing used in any motor vehicle is not safety glass (except a caravan) and where ADR 8 applies, the glass does not display an identification mark or symbol;

d) Glazing is loose in its frame or cracked to the extent that sharp edges are exposed;
Section 9
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e) 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;

f) Items that obscure the driver’s view are placed in Area A or the corresponding area on the other side of the windscreen.

NOTE: Diagrams show Area A for a right hand drive vehicle. The reverse applies for left hand drive vehicles.
9.2 Test the light transmittance level of the windscreen and front side windows

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

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.

The light transmission requirements do not apply to a tinted or opaque band at the top of the windscreen, provided they are above the arc swept by the windscreen wipers, or 10% of the depth of the windscreen whichever is the greater.

**Reasons for rejection**

a) The visible light transmittance of any glazing (including any applied film) is less than that detailed below:

<table>
<thead>
<tr>
<th>Glazing</th>
<th>Minimum Light Transmittance</th>
<th>Vehicles NOT TO BE REJECTED until meter readings are LESS than</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windscreen</td>
<td>75%</td>
<td>70%</td>
</tr>
<tr>
<td>All other windows</td>
<td>35%</td>
<td>30%</td>
</tr>
<tr>
<td>Rearward of the driver</td>
<td></td>
<td>No limit for windows to the rear of the driver if the vehicle is a light truck or commercial, or other goods carrying vehicles, including the following categories: NA, NB, NC, MD, ME.</td>
</tr>
</tbody>
</table>

**NOTE:** South Australia requires front side windows to have a minimum light transmittance of at least 70%.

b) Glazing that has been coated to reduce the luminous transmittance has a reflectance over 10%.

9.3 Check windscreen wipers, demisters and washers

**Reasons for rejection**

a) The windscreen wipers are inoperative on any speed setting;

b) Wiper blade rubbers are cracked, hardened, frayed, curled, torn or missing or otherwise ineffective;

c) Windscreen washers are inoperative or incorrectly aimed (where applicable);
Section 9  
WINDSCREEN and WINDOWS

d) Windscreen demister is inoperative or does not blow air onto the windscreen (where applicable);
e) The windscreen washer is not able to be operated from a normal driving position.

9.4  
Check operation of the horn

Reasons for rejection

a) The horn is inoperative or is not fitted;
b) The horn makes a sound like a siren, exhaust whistle or compression whistle;
c) The horn makes a repeating sound.
Section 10: Engine, Driveline & Exhaust

The following Australian Design Rules are relevant to this section:

<table>
<thead>
<tr>
<th>ADR</th>
<th>Rule Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>Fuel System</td>
</tr>
<tr>
<td>28</td>
<td>External Noise of Motor Vehicles</td>
</tr>
<tr>
<td>30</td>
<td>Diesel Engine Exhaust Smoke Emission</td>
</tr>
<tr>
<td>36</td>
<td>Exhaust Emission Control for Heavy Duty Vehicles</td>
</tr>
<tr>
<td>42</td>
<td>General Safety Requirements</td>
</tr>
<tr>
<td>44</td>
<td>Specific Purpose Vehicle Requirements</td>
</tr>
<tr>
<td>58</td>
<td>Requirements for Omnibuses Designed for Hire and Reward</td>
</tr>
<tr>
<td>65</td>
<td>Maximum Speed Limiting for Heavy Goods Vehicles and Heavy Omnibuses</td>
</tr>
<tr>
<td>70</td>
<td>Exhaust Emission Control for Diesel Engined Vehicles</td>
</tr>
<tr>
<td>80</td>
<td>Emission Control for Heavy Vehicles</td>
</tr>
<tr>
<td>83</td>
<td>External Noise</td>
</tr>
</tbody>
</table>

10.1 Check exhaust system

Reasons for rejection

a) Any component of the exhaust system is not securely mounted;

b) The exhaust system contacts any unrelated part of the vehicle;

c) Exhaust pipe outlet is not rearward of all rear passenger doors or sleeper compartment;

d) There is any leak in the exhaust system (excluding manufacturers’ drain holes in the mufflers);

e) Vehicle with internal combustion engine emits visible emission for at least 10 seconds continually at or near the discharge end of the exhaust pipe; (Check local jurisdiction legislation for diesel powered vehicles)

f) A catalytic converter is missing, bypassed or has a missing heat shield.

g) Any part of the exhaust liable to be contacted by a person touching or leaning on the vehicle is not shielded.

**NOTE:** Some vehicles are not built with catalytic converters or heat shields.
10.2 Check noise emissions

 NOTE: This section must be read in conjunction with Appendix B.

 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.

 b) The noise level from the vehicle exceeds the figure in the following Table 1 for vehicles not certified to ADR 83;

 c) The stationary noise level of a motor vehicle that is certified to ADR 83/00 must not exceed, by more than 5 dB(A), the noise level that is established for the motor vehicle when it is certified.

 TABLE 1: Stationary Noise Levels for Diesel Powered Vehicles

<table>
<thead>
<tr>
<th>Gross Vehicle Mass (kg)</th>
<th>Height above ground of end of exhaust pipe (mm)</th>
<th>Manufacture period</th>
<th>Noise level dB(A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>more than 3 500, but not more than 12 000</td>
<td>1 500 or more</td>
<td>Before 1/7/80</td>
<td>103</td>
</tr>
<tr>
<td></td>
<td></td>
<td>On or after 1/7/80 and before 1/7/83</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>On or after 1/7/83</td>
<td>97</td>
</tr>
<tr>
<td>more than 3 500, but not more than 12 000</td>
<td>less than 1500</td>
<td>Before 1/7/80</td>
<td>107</td>
</tr>
<tr>
<td></td>
<td></td>
<td>On or after 1/7/80 and before 1/7/83</td>
<td>104</td>
</tr>
<tr>
<td></td>
<td></td>
<td>On or after 1/7/83</td>
<td>101</td>
</tr>
<tr>
<td>more than 12 000</td>
<td>1 500 or more</td>
<td>Before 1/7/80</td>
<td>105</td>
</tr>
<tr>
<td></td>
<td></td>
<td>On or after 1/7/80 and before 1/7/83</td>
<td>102</td>
</tr>
<tr>
<td></td>
<td></td>
<td>On or after 1/7/83</td>
<td>99</td>
</tr>
</tbody>
</table>
Section 10

ENGINE, DRIVELINE and EXHAUST

<table>
<thead>
<tr>
<th>more than 12 000</th>
<th>less than 1500</th>
<th>Before 1/7/80</th>
<th>On or after 1/7/80 and before 1/7/83</th>
<th>On or after 1/7/83</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>109</td>
<td>106</td>
<td>103</td>
</tr>
</tbody>
</table>

Note: Appropriate tolerances on noise values should be applied.

10.3 Check engine and driveline

Reasons for rejection

a) Engine and driveline mounts or driveline components are loose, cracked, broken, otherwise deteriorated or are missing components or fasteners;

b) Any universal joint has excessive movement or securing bolts are loose or missing;

c) Engine and transmission controls are inoperative;

d) A vehicle fitted with automatic transmission is capable of being started when the transmission control is in a position to drive the vehicle;

e) A vehicle fitted with automatic transmission does not have, in the driver’s compartment, an indicator showing the transmission control position (where applicable);

f) 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;

g) Emission control equipment is missing or inoperative;

NOTE: Modifications to emission equipment can effect smoke emission or emission of non-visible pollutants

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

i) The engine lets out sparks, flames, oil or fuel residue;

j) A diesel engine is not fitted with a device that prevents the engine from being started accidentally or inadvertently;

k) Fuel injection equipment, engine speed governor or any other part of an engine is adjusted so that it increases smoke;
Section 10
ENGINE, DRIVELINE and EXHAUST

1) Maximum road speed limiting is greater than 100km/h (or 90km/h for Road Train prime mover in some jurisdictions).

**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.

### 10.4 Check oil leaks

**Reasons for rejection**

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

### 10.5 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;
f) Incorrect type of fuel tank fitted.

### 10.6 Visually inspect Fire Extinguisher (where required).

**Reasons for rejection**

a) Fire extinguisher is not filled or charged;
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.
Section 11 : LPG /CNG Vehicles

<table>
<thead>
<tr>
<th>The following Australian Design Rules are relevant to this section:</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADR 44 Specific Purpose Vehicle Requirements</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>The following Australian Standards are relevant to this section:</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS 1425 for LPG</td>
</tr>
<tr>
<td>AS 2739 for CNG/NGV</td>
</tr>
</tbody>
</table>

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

Vehicles with Autogas systems installed within this State

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

Vehicles with Autogas 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 unique identification number of the installed vehicle;
   - 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 Autogas vehicles.
Reasons for rejection

a) vehicle does not have an approved LPG/NGV/CNG modification 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.

b) 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:

White lettering on red background. Note: NGV labels are acceptable on CNG system installed before 1st October 1999. CNG label may be a circle.
c) On systems installed since 1st October 1999, these labels are not affixed to a metal plate (fitted on the front and rear number plates) that is:

For LPG systems, a 25mm square at least 1mm thick and mounted as a diamond on the number plate.

For CNG systems, a 35mm disc at least 1mm thick.

11.2 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:
   i) fork lift trucks;
   ii) vehicles which do not use LPG/NGV or CNG as a means of propulsion;
   iii) diesel engine enhancement systems;

b) The container has:
   i) advanced corrosion or fire damage;
   ii) cuts or dents which penetrate the surface of the container;
   iii) 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;
   iv) 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
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years

d) the boot lid torsion bars, coil springs or hinges 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 ullage valve or 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:

i) the container is mounted externally;

ii) the container is not installed within a protective compartment;

iii) the container is located less than 75mm from the side panels of the vehicle;

iv) the container is not marked "This vessel shall be installed within a compartment inside the vehicle".

k) Any CNG container is located less than 100mm inboard from the front, rear or side outer body panels of the vehicle.

11.3 Visually inspect the container anchorages and straps.

Reasons for rejection

a) any anchorage straps allow the container to move;
Table 5 Dimensions of Container Attachment Devices

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

- 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 5;
- e) the anchorage bolts or studs are smaller than the sizes shown in Table 5;
- 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 1:** Reinforcement plates attached to sheet metal panels must be at least 75mm square and 3mm thick.

**NOTE 2:** 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.
11.4 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 automatic fuel shut off device (AFSOD) or the wiring connecting the contents gauge;

b) wiring is not insulated or secured at interval 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.

11.5 Visually inspect direct filled internally mounted containers.

Reasons for rejection

a) the passenger compartment of the vehicle is not sealed from the container space;

b) the container space vent(s) is obstructed;

c) the container space vent outlet is less than 250mm from the exhaust system;

d) wiring is not insulated or secured at intervals of not more than 600mm.
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11.6 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 centreline of the vehicle); 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.

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

d) the tank, or any tank component has less than 300mm ground clearance;

e) 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;

f) 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;

g) 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 body work.
11.7 Visually inspect ullage and 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 an ullage valve is fitted, the outlet does not have a cap or plug;

NOTE: An ullage valve is not required if the vehicle is fitted with an AFL.

c) where a container is not fitted with an AFL, there is no label warning the driver to "Stop filling when liquid appears";

d) 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.

11.8 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.

11.9 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;
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b) 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.

11.10 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 Autogas operating pressure using an approved gas detecting device or foaming agent solution. The solution must be applied to the component having the suspected leak.
11.11 Test the operation of the fuel containment system.

(i) 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 State or Territory authorised/licensed gas fitter/installer certifying that the excess flow valve is operating satisfactorily.

**NOTE 1:** 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.

**NOTE 2:** This test can only be conducted by State or Territory authorised examiner, accredited for this purpose.

**NOTE 3:** If an automatic fuel shut off device is fitted at the container there is no requirement to test the excess flow valve.

(ii) 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.

**NOTE 1:** Alternatively the owner is to produce a certificate from an Autogas Installer certifying that the excess flow valve is operating satisfactorily.

**NOTE 2:** 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.
NOTE 3: This test can only be conducted by State or Territory authorised examiner, accredited for this purpose.

11.12 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 12 : Buses

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.

The following Australian Design Rules are relevant to this section:
- ADR 24 Tyre & Rim Selection
- ADR 42 General Safety Requirements
- ADR 44 Specific Purpose Vehicle Requirements
- ADR 58 Requirements for Omnibuses Designed for Hire and Reward
- ADR 59 Omnibus Rollover Strength
- ADR 66 Seat Strength, Seat Anchorage Strength and Padding in Omnibuses
- ADR 68 Occupant Protection in Buses

12.1 Check safety equipment and interior fittings

Reasons for rejection

a) Any emergency exits do not have clear access, or identification signs inside and outside the bus displaying the words “Emergency Exit” 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 handstrap 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) Any fire extinguisher is:
   • not securely restrained;
   • not maintained in a fully charged and useable condition;
   • not correct type for application.

n) Buses (those first registered after 1/1/1984 in ACT) do not have a fire extinguisher fitted which complies with the selection and location requirements of Australian Standard AS2444-1995 Portable Fire Extinguishers and Fire Blankets Selection and Location;
o) 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;
p) Buses operating outside urban areas on long trips, when fitted with an integral luggage compartment do not have an additional fire extinguisher of the above specifications mounted in a bin or boot near the underfloor or engine.

12.2 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 eg. NSW.
Reasons for rejection

Signs

a) A sign with the words "SCHOOL BUS", in capital letters at least 100m high, is not displayed on the bus’s standard destination sign at the front of the bus, or;

b) if there is no destination sign present, then a suitable high mounted "SCHOOL BUS" sign is not displayed at the front of the bus (see following diagram). (This sign must be mounted no lower than 1800 mm above the ground when the bus is loaded and must not interfere with the driver's vision);

NOTE: 1. If fitted after 1 July 1999, the front sign can be as per following sections c), d) and e).

2. Buses are exempt from this requirement if engaged in regular timetabled route service.

c) A sign depicting "Children in area" as displayed on the standard international warning road sign is not mounted high on the rear of the bus (see following diagram);

d) The rear sign is not a rectangle with dimensions of at least 400 mm wide by 250 mm high or does not display an image of children in black on a retro-reflective yellow background - (If fitted after 1 July 1999, and the warning lights are on the sign, is not a rectangle with dimensions of at least 550 mm wide by 400 mm high);

NOTE: The standard international diamond shape warning sign (in its standard size i.e. 600 mm x 600 mm, 750 mm x 750 mm or 900 mm x 900 mm) may be used.

e) The image of the children on the rear sign is not in the same proportion as the standard sign or the figure of the taller child is smaller than 230 mm;

NOTE: Depending on local jurisdiction legislation, a bus may have a “40” speed limit sign as an alternative to the “Children in area sign”.

Flashing warning lights

Where the warning lights are fitted to a bus prior to 1 July 1999:
(unless complying fully with the requirements applying to lights fitted on or after 1 July 1999 - see (s) onwards)

f) A pair of flashing lights is not installed with the sign closely between them on the front and rear of the bus;

g) The position for the lights is not along the horizontal axis of the sign;

NOTE: Where not practical, they may be located immediately above or below the sign, provided that both lights are mounted at the same level and not closer together than 600 mm.

h) The lights are not mounted symmetrically about the centreline of the bus;

i) The colour of any light is not amber;

j) The lens area of any light is smaller than $7800 \text{ mm}^2$ (this equates to a minimum nominal size of 100 mm diameter or 100 mm square lens);

k) The warning lights at the rear of the bus are installed lower than 150 mm below the top of the window;

l) The warning lights in each pair do not flash alternately with a frequency of 60 to 120 cycles per minute;

m) The lights are not of a type that complies with Australian Design Rule 6/00 "Direction Indicator Lamps";

n) The lights do not activate automatically by the opening of any passenger door;

o) All lights do not flash while any passenger door remains open, and do not continue operating for at least 20 and not more than 30 seconds after the door/s close;

p) The headlights are not wired to operate on low beam only when they flash;

q) An isolating switch does not control the operation of the lights;

r) Location of the sign or lights interferes with the operation of any passenger emergency exit.
Preferred location of lights fitted prior to July 1999

Where the warning lights are fitted to a bus on or after 1 July 1999:

s) A pair of flashing lights is not installed on the front and rear of the bus;

t) The lights are not mounted on either side of, and equidistant from, the warning sign (they need not be symmetrical on the vehicle);

u) The lights are closer together than 300mm or are more than 100mm from edge of the sign, measured from the innermost point of each lens;

v) The colour of any light is not yellow;

w) The axis of maximum intensity of a light is not horizontal and parallel to the vehicle centreline;

x) When viewed along the axis of maximum intensity, the lights are not noticeably brighter than normal turn signal lights;
Section 12
BUSES

Note: for optimum signal range in bright daylight the on-axis intensity is required to be no less than 1500cd. This is about six times brighter than typical turn signals.

y) The warning lights are not mounted at the same height and as high as practicable on the bus;

Note: in any case the lights must not be lower than mid-height and, if they are lower than 1.8m from the ground, they must be located wholly on the right side of the vehicle.

z) The warning lights in each pair do not flash alternately (“wig wag”) with a frequency of 90 to 180 flashes per minute;

aa) An isolating switch does not control the operation of the lights and there is no visible or audible signal to tell the driver that the lights are operating;

bb) When the isolating switch is “on”, the lights do not activate automatically by the opening of any passenger door;

cc) Any light does not flash while any passenger door remains open, and does not continue operating for at least 10 and not more than 20 seconds after the door/s close;

dd) The location of the sign or lights interferes with the operation of any passenger emergency exit.
Section 13: Trailers

The following Australian Design Rules are relevant to this section:

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<thead>
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<th>ADR  1</th>
<th>Reversing Lamps</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADR  6</td>
<td>Direction Indicator Lamps</td>
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<tr>
<td>ADR 13</td>
<td>Installation of Lighting &amp; Light-signalling Devices on other than L-Group Vehicles</td>
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<td>ADR 24</td>
<td>Tyre and Rim Selection</td>
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<td>ADR 38</td>
<td>Trailer Brake Systems</td>
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<td>Lighting &amp; Light-signalling devices not covered by ECE Regulations</td>
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<td>ADR 47</td>
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<td>ADR 63</td>
<td>Trailers Designed for Use in Road Trains</td>
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<tr>
<td>ADR 76</td>
<td>Daytime Running Lamps</td>
</tr>
</tbody>
</table>

13.1 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 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 caliper, 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:
   • 0.8 mm above the fastener; or
   • on bonded linings or pads, 1.5 mm 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 do not cause the corresponding 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 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.
13.2 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 1;

c) With the brakes released, the average brake drag is more than the performance requirement specified in Table 2;

d) The parking brake does not give a reading or the vehicle does not lift out of the roller.

<table>
<thead>
<tr>
<th>TABLE 1 Minimum Brake Force</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of vehicle</td>
</tr>
<tr>
<td>-----------------</td>
</tr>
<tr>
<td>All trailers</td>
</tr>
</tbody>
</table>

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

Step 1 adding the brake force for each axle

Step 2 dividing Step 1 by the vehicle mass

<table>
<thead>
<tr>
<th>TABLE 2 Maximum Brake Drag</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of Vehicle</td>
</tr>
<tr>
<td>-----------------</td>
</tr>
<tr>
<td>GTM over 4.5 tonnes</td>
</tr>
</tbody>
</table>

NOTE: On some trailers the brake force limit might not be reached as the vehicle will be lifted out of the rollers. 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.

13.3 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.
For trailers fitted with electrically activated systems refer to State or Territory instructions.

Reasons for rejection
a) For trailers with a gross trailer mass (GTM) in excess of 2 tonnes, 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 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)
13.4 Check drawbar

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

Reasons for rejection

a) Drawbar is extensively corroded, cracked, misaligned, distorted, 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 6 mm of movement between the subframe and hinged drawbar at the attachment point;

d) Drawbar eye is elongated by wear, cracked or worn more than 5% of the original diameter or manufacturers specifications;

e) Drawbar eye bush is worn through, or beyond manufacturers specifications, is insecure or is attached by welding (unless manufacturer specifies welding);

f) Where ADR 62 applies the drawbar eye does not display the manufacturer’s name/trademark and the ‘D’ value rating;

g) Any mounting bolts, fasteners or weld beads have advanced corrosion;

h) Any sliding drawbar latching mechanism is faulty or inoperative;

i) One or more stops on a sliding drawbar are missing or are inoperative;

j) A sliding drawbar has more than 6 mm of movement between the slider and the housing;

k) Air or hydraulic cylinders, hoses or chambers on sliders leak (other than normal weeping of hydraulic seals).

13.5 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.
13.6 Check skid plates (including king pin)

Reasons for rejection

a) Where ADR 62 applies the kingpin does not display the manufacturer’s name/trademark, nominal size (eg 50mm) and the ‘D’ or ‘M’ value rating;

b) The vertical or horizontal movement between the upper and lower fifth wheel halves of coupled vehicles exceeds 13 mm;

c) The king pin is excessively 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.

13.7 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 or have insecure attachment points, clamps or fasteners;

b) 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 is not fitted with two safety chains complying with Table 3.

<table>
<thead>
<tr>
<th>Aggregate Trailer Mass (tonnes)</th>
<th>Chain size (mm)</th>
<th>Minimum chain breaking load (tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5 - 4.3</td>
<td>7.1</td>
<td>6.4</td>
</tr>
<tr>
<td>4.3 - 7.5</td>
<td>9.5</td>
<td>11.6</td>
</tr>
<tr>
<td>7.5 - 13.5</td>
<td>12.7</td>
<td>20.4</td>
</tr>
<tr>
<td>13.5 - 21.5</td>
<td>15.9</td>
<td>32.0</td>
</tr>
<tr>
<td>21.5 - 30.0</td>
<td>19.0</td>
<td>46.4</td>
</tr>
<tr>
<td>&gt; 30.0</td>
<td>22.0</td>
<td>63.2</td>
</tr>
</tbody>
</table>
NOTE: Safety chains should be inspected in accordance with: Australian Standards; AS 1872.1976; AS 2312.1979; AS 4177.4-1994

c) 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.;

NOTE: 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 4.

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

### TABLE 4 Typical Bracket Dimensions

<table>
<thead>
<tr>
<th>Chain (mm)</th>
<th>Minimum length of fillet weld</th>
<th>Bracket dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Size</td>
<td>Length</td>
</tr>
<tr>
<td>7.1</td>
<td>6 x</td>
<td>150</td>
</tr>
<tr>
<td>9.5</td>
<td>6 x</td>
<td>200</td>
</tr>
<tr>
<td>12.7</td>
<td>6 x</td>
<td>360</td>
</tr>
<tr>
<td>15.9</td>
<td>8 x</td>
<td>420</td>
</tr>
<tr>
<td>19.0</td>
<td>10 x</td>
<td>480</td>
</tr>
</tbody>
</table>

* Dimension “D” to suit coupling link plus minimum clearance to prevent binding
A typical attachment of chains

A. To the trailer
Pin welded to prevent chain loss

B. to the towing vehicle
13.8 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) Any suspension component is not correctly aligned or is damaged, loose or broken;

c) Any nut, bolt or locking mechanism is insecure or missing;

d) Springs are cracked, missing or broken;

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

e) Air bags leak or sag;

f) Leaves in a leaf spring are displaced sideways more than 10% of their width or so that they contact wheels, brakes or the frame;

g) Any “walking beam” type heavy vehicle suspension has signs of damage to beam;

h) Shock absorbers, if original fitted, are missing, loose, inoperative or leak;

*NOTE:* Shock absorber sweating is acceptable.

i) 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.
13.9  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.

13.10  Check wheels/ rims

Reasons for rejection
a)  Any wheel or rim:
   •  is loose or shows sign of movement;
• is cracked;
• is buckled;
• has pieces of casting missing;
• has elongated stud holes;
• has weld repairs not in accordance with relevant industry practice.

b) Any wheel contacts unrelated vehicle components;

c) Spiders have cracks across a spoke, hub or web area;

d) Wheels are not compatible with hubs;

e) Valve protection lugs are missing.

13.11 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.

13.12 Check retaining rings

Reasons for rejection

a) Lock or side rings are incorrectly seated, sprung, mismatched, bent, broken, cracked or ends meet when fitted to the rim.

13.13 Check tyres

Reasons for rejection

a) A tyre does not have at least 1.5 mm 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.
NOTES:

1. 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.

2. 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 25 mm;

c) A tyre (including sidewalls) has deep cuts, chunking, bumps, bulges, exposed cords or other signs of carcass failure;

d) A tyre has been regrooved (except where indicated on the side wall that the tyre are suitable for regrooving);

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 except for retreaded tyres;

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.. 125km/h);

h) A tyre fitted to a vehicle is not suitable for road use at:

• a speed of at least 100 kilometres an hour;

• if the vehicle cannot travel at a speed of 100 kilometres an hour, its top speed;

• the wheels and tyres fitted to an axle of a vehicle are not of a sufficient size and capacity to carry that portion of the vehicle’s gross mass transmitted to the ground through the axle.

i) The tyres on an axle are not of the same carcass construction (eg cross ply, radial ply or bias belted);

j) Dual tyres contact each other;
k) The tyres or wheels on a vehicle contact the body, chassis, frame or braking or suspension components;

l) A tyre on a trailer has cleats or other gripping devices that could damage road surfaces.

### 13.14 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 that 1/3 of the horizontal distance between the centre of the axle and the mudguard;

**NOTE:** This height must not be more than 230 mm from the ground or in the case of a vehicle built to be used off-road, 300 mm from the ground.

d) Any trailer which is 2.2 m or more in width and fitted with a body which is less than 300 mm 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 13.14 (d) above is not silver or white in colour for a depth of 75 mm or more;

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

g) Any aftermarket fittings attached to the exterior of the trailer that could cause injury to a person coming into contact with that part of the trailer.
13.15 Check Rear Marker Plates

Reasons for rejection

a) Rear marker plates not fitted to a trailer with a GTM greater than 10 tonnes;
b) Rear marker plates do not comply with AS 4001.1-1992 or the requirements as specified in the State or Territory instructions.

13.16 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 20 metres at any point within an arc of 45 degrees from the surface of the number plate above or either side of the vehicle;
e) The number plates are not substantially parallel to the vehicle’s axles.

13.17 Check electrical equipment

Reasons for rejection

a) Any electrical wiring or connector is corroded damaged or hanging loose in a way that could allow it to be damaged;
b) Electrical wiring is located where it can:
   • become exposed to excessive heat;
   • come into contact with moving parts.
c) Batteries are not securely mounted or leak

---

7 Number plate condition is not necessarily a roadworthiness item. Check local jurisdiction requirements
13.18 Check chassis

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

Reasons for rejection

a) Any part of the chassis or subframe is:
   - Cracked;
   - Sagging;
   - Broken;
   - affected by extensive or advanced rust (see Appendix A)

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.

13.19 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;
Section 13
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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 does not comply with the requirements as specified in the State or Territory vehicle standards instructions.
APPENDIX A

CHECKING FOR RUST
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.

Classification of Vehicle Structures

Vehicle structural components can be categorised according to their importance to safety. For instance, subframes 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 subframes 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. Luggage bin compartment floors (buses and coaches);
10. Bulkheads;
11. Cabin mounts;

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. 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.

<table>
<thead>
<tr>
<th>Type of corrosion</th>
<th>Category of structure</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Primary</td>
<td>Secondary</td>
</tr>
<tr>
<td>Surface Rust</td>
<td>Acceptable</td>
<td>Acceptable</td>
</tr>
</tbody>
</table>
Appendix A
CHECK FOR RUST

<table>
<thead>
<tr>
<th>Advanced Rust</th>
<th>Not Acceptable</th>
<th>Acceptable (See Note A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extensive Rust</td>
<td>Not Acceptable</td>
<td>Not Acceptable (See Note B.)</td>
</tr>
</tbody>
</table>

**NOTE A:** Areas within 100mm of hinges and locks (e.g. 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.

**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 underbody 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.
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 rustproofing coating or oil as is appropriate (body panels should be repainted using a good quality refinishing 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 B

STATIONARY NOISE TEST
National Stationary Exhaust Noise Test Procedures for In-Service Motor Vehicles
National Road Transport Commission

National Stationary Exhaust Noise Test Procedures for In-Service Motor Vehicles – April 2000


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FOREWORD

Vehicle noise is a major community concern. While Australian Design Rules set limits on exhaust noise for new vehicles and describe a standard test to determine compliance, there has been no nationally standard test available to determine whether vehicles comply with specified standards when they are in-service. In the absence of a national approach to testing in-service vehicles, some jurisdictions have developed their own approaches. There are variations in these approaches that could lead to inconsistencies in test results.

The National Stationary Exhaust Noise Test Procedures for In-Service Motor Vehicles was prepared by the Motor Vehicle Environment Committee to introduce a national approach to measuring exhaust noise. A nationally uniform approach ensures that vehicle owners will get an accurate assessment of whether their vehicle complies with national noise standards.

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.
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STATIONARY NOISE TEST

1. DEFINITIONS

1.1 "Diesel Engine" means an internal combustion engine which operates on the compression-ignition principle.

1.2 "Engine Speed at Maximum Power" ("ESMP") means the speed at which the engine develops maximum power (r/min).

1.3 "Spark Ignition" means positive ignition.

1.4 “Motor Cycle” means motorcycle or moped

2. MEASURING INSTRUMENTS

2.1 A sound level meter of high precision complying at least with the specifications of Publication No. 651 (1979) - "Precision sound level meters" of the International Electrotechnical Commission (IEC), or Type 1 of Australian Standard 1259.1-1990 - "Sound Level Meters", concerning the characteristics of sound level meters, shall be used. Measurements shall be carried out using frequency weighting "A" and time weighting “F”.

2.2 The sound level meter shall be calibrated against an acoustic calibrator immediately before and after each series of test runs. If the meter readings obtained from these calibrations differ by more than 1dB(A) the test shall be considered invalid.

2.3 The rotational speed of the engine shall be measured by an external tachometer whose accuracy is within 3 percent or, where an external tachometer cannot reasonably be used, the vehicle’s tachometer.

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. Any sound peak which 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, in the case of a motor cycle, the rider, shall be within 1 m of the microphone in use. No person or object other than the person conducting the test and an observer or the objects necessary for the performance of the test shall be within 3m of the microphone in use.

3.4 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. TEST METHOD FOR PASSENGER CARS AND DERIVATIVES

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 Figure 1.

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 ±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 ±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 525mm ±25mm.

4.1.6 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 within the configuration shown on Figure 1.

4.1.7 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 which results in the greatest possible distance from the vehicle.
4.1.8 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.

4.1.9 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 4.1.2 and 4.1.3 may be varied.

4.1.10 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 The engine of the vehicle under test shall be operated in accordance with one of the following procedures:

4.2.2.1 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

4.2.2.2 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:

If the engine has:

i) 5 cylinders or less 4000 rpm.
ii) 6 cylinders 3200 rpm.
iii) 8 cylinders 3300 rpm.
iv) more than 8 cylinders 4300 rpm.
v) If the engine is a rotary engine 4500 rpm.

OR

4.2.2.3 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.

4.2.3 A single noise level measurement shall then be made.
4.2.4 The specified procedure shall be repeated until such number of readings, each within a range of 1dB(A), as the person making the tests considers appropriate have been made. For the purposes of this sub-paragraph 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.

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

4.3.2 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. The noise level of the vehicle shall be the higher or highest noise level so calculated.

4.3.3 If the microphone position is less than 1m from the engine compartment of the vehicle the calculated noise level shall be reduced by 2dB(A) unless the provisions of paragraph 4.3.4 have been invoked.

4.3.4 Where the mechanical noise of the 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. Where such shielding is used the provisions of paragraph 4.2.4 shall not apply.

5. TEST METHOD FOR 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 Figure 1.

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 ±25mm 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 1050mm ±50mm.
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5.1.5 For vehicles fitted with one exhaust outlet which 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.

5.1.5.1 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 which 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.

5.1.6.1 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 which 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 In the case of Goods Vehicles and Omnibuses powered by a Diesel Engine the engine shall be operated in accordance with the following procedure.
5.2.2.1 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.

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

5.2.3 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.

5.2.3.1 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 to 3/4 ESMP as the testing officer can achieve; or

5.2.3.2 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:

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

OR

5.2.3.3 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.

5.2.3.4 A single noise level measurement shall then be made.

5.2.4 The specified procedure shall be repeated until such number of readings, each within a range of 1dB(A), as the testing officer considers appropriate have been made. For the purposes of this paragraph noninteger decibel readings are to be rounded downwards to the nearest whole decibel.

5.3 Interpretation of results

5.3.1 Where one microphone position is used the noise level of the vehicle shall be the arithmetic mean of the readings specified in paragraph 5.2.4.
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5.3.2 When the noise level of the vehicle has been calculated, non-integer results shall be rounded down to the nearest whole decibel.

5.3.3 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. The noise level of the vehicle shall be the higher or highest noise level so calculated.

6. TEST METHOD FOR IN-SERVICE MOTOR CYCLES

6.1 Microphone position

6.1.1 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 Figure 2.

6.1.2 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 ±10 degrees with the principal direction of gas flow from the exhaust.

6.1.3 In selecting the 45 degree alignment from the outlet of a motor cycle fitted with two or more outlets, only the angle resulting in the microphone being farthest from any other outlet must be used.

6.1.4 The height of the microphone above the test site surface shall be equal to that of the orifice of the exhaust outlet ±25mm but shall not be less than 200mm above the test site surface.

6.1.5 The distance of the microphone from the exhaust outlet orifice shall be 525mm ±25mm.

6.1.6 For motor cycle fitted with one exhaust outlet the microphone shall be placed so that the greatest possible distance is achieved between it and the contour of the motor cycle.

6.1.7 For motor cycles fitted with two or more exhaust outlets spaced less than 500mm apart only one microphone position shall be used. The microphone position selected shall be in relation to the outlet nearest to the external side of the motor cycle, or when such an outlet does not exist, to the outlet which is the highest above the ground.

6.1.8 For motor cycles having exhaust outlets spaced more than 500mm apart, each exhaust outlet shall be treated separately as if it were the only one.
6.2 Vehicle operation and noise measurement

6.2.1 The motor cycle shall be stationary and held in a substantially vertical position.

6.2.2 The engine of the motor cycle under test shall be operated in accordance with one of the following procedures:

6.2.2.1 Where the ESMP for that engine has been determined by the testing authority, the engine shall be held steady at a speed as close to 50 per cent of ESMP as the testing officer can achieve and then the throttle shall be returned swiftly to the idle position;

OR

6.2.2.1 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:

   i) for a two-stroke engine  3750 rpm
   ii) for a four-stroke engine:
       • of Japanese origin  3000 rpm
       • from Harley Davidson  2500 rpm
       • of other origin   3000 rpm

OR

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

and then the throttle shall be returned swiftly to the idle position.

6.2.2.3 A single noise measurement shall then be made by noting the maximum noise level indicated during this procedure.

6.2.3 The specified procedure shall be repeated until such number of readings, each within a range of 1dB(A), as the testing officer considers appropriate have been made. For the purposes of this sub-paragraph non-integer decibel readings are to be rounded downwards to the nearest whole decibel.

6.3 Interpretation of Results

6.3.1 Where one microphone position is used the noise level of the motor cycle shall be the arithmetic mean of the readings specified in paragraph 6.2.3.

6.3.2 When the noise level of the motor cycle has been calculated, non-integer results shall be rounded down to the nearest whole decibel.

6.3.3 Where more than one microphone position is used the noise level at each microphone shall be determined as if it were the only one. The noise level of the motor cycle shall be the higher or highest noise level so calculated.
Figure 1

TYPICAL TEST SITE LAYOUT AND MICROPHONE LOCATIONS

Cars

Goods Vehicles and Omnibuses
TYPICAL TEST SITE LAYOUT AND MICROPHONE LOCATIONS

Motor Cycles (Includes Mopeds)