

Volume

1

NORFOLK ISLAND ADMINISTRATION

ROAD TRAFFIC ACT 1982

INSPECTION MANUAL
FOR HEAVY VEHICLES

NORFOLK ISLAND ADMINISTRATION

HEAVY VEHICLE INSPECTION MANUAL

**This manual is applicable to all vehicles with a GVM of 8 tonnes
or greater**

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Table of Contents

Brakes	1
Couplings	10
Steering & Suspension	13
Wheels, Tyres & Hubs	18
Structure & Body Condition	21
Lights & Reflectors	26
Mirrors	28
Windscreen & Windows	29
Engine Driveline & exhaust	32
LPG / CNG Vehicles	36
Buses	45
Trailers	49
Checking for Rust	61
(Appendix A)	

Brakes

1. CHECK BRAKE COMPONENTS
2. CHECK BRAKE ADJUSTMENT
3. CHECK AIR COMPRESSOR/VACUUM PUMP
4. CHECK AIR FILTERS
5. CHECK BRAKING SYSTEM OPERATION
6. CHECK VACUUM ASSISTED BRAKE SYSTEM INTEGRITY
7. CHECK AIR BRAKE SYSTEM INTEGRITY (INCLUDING AIR OVER HYDRAULIC)
8. CHECK HYDRAULIC BRAKE SYSTEM INTEGRITY
9. 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
10. PARKING BRAKE TEST FOR VEHICLES DESIGNED TO ADR 35 OR VEHICLES FITTED WITH A TANDEM MASTER CYLINDER/DUAL CIRCUIT BRAKES
11. BRAKE TESTING WITH A SKID-PLATE TESTER
12. BRAKE TESTING WITH A ROLLER BRAKE TESTER
13. CHECK OF BREAKAWAY PROTECTION

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:

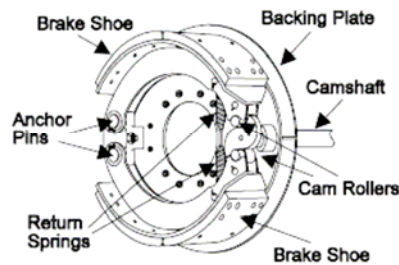
- a) Brake pedals do not have an anti-slip surface across the complete surface;
- b) Brake pedals or handles are broken or missing;
- c) Brake control mountings, pivots, cables or links are kinked, loose, broken, excessively worn or binding;
- d) A ratchet or locking device on a parking brake control 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, crimped, 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

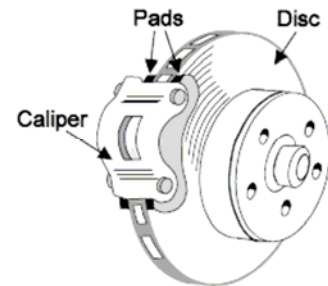
- o) In the case of hydraulic, or air over hydraulic brakes, the reservoirs, master cylinders or servo units are loose, cracked, broken, or excessively worn or are damaged so that it leaks;

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.
- q) Hand brake must hold on moderate slope
- r) When brakes applied to moving vehicle it does not deviate or pull to one side



Drum Brake Components



Disc Brake Components

2. CHECK BRAKE ADJUSTMENT

Reason for rejection

- a) With any brake fully applied, a brake adjustment indicator runs out of travel or indicates that adjustment is necessary;
- b) Brake chamber push or pull rods move more than 80% of their max stroke or travel over centre with the brakes fully applied;
- c) 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.

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.

4. CHECK AIR FILTERS

Reasons for rejection

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

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).

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.

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:
- 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) 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.

Step 11. 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.

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.

9. Emergency brake test with a decelerometer for vehicles 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.

TABLE 2 Emergency brake performance

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

10: Parking brake test for 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.

Reasons for rejection

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

11. 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.

Couplings

1. Check fifth wheels/turntables

Reasons for Rejection

- a) 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. Check pin couplings and pintle hooks

Reasons for rejection

- a) 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.

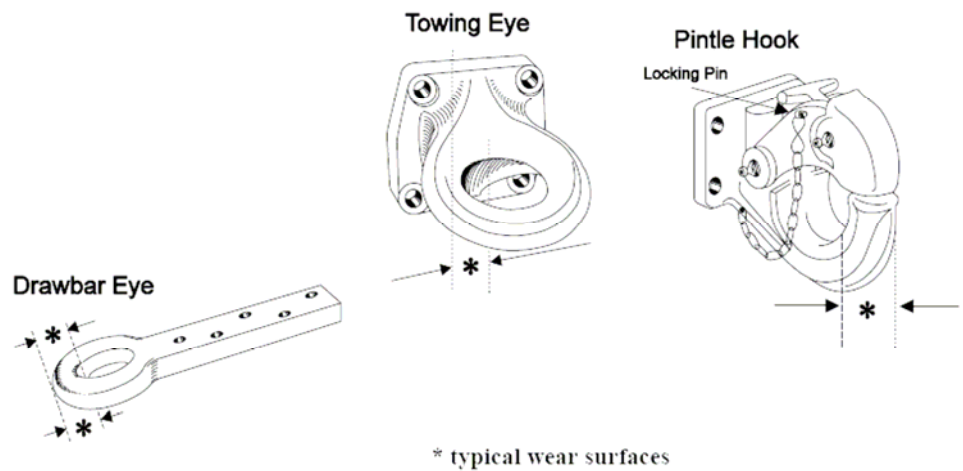


Figure 2.2 Illustration showing typical tow coupling devices

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 Uclip, split pin, spring washer or nylon lock nut.

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).

Steering & Suspension

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.

2. Check steering free play

Reasons for rejection

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

b)

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

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;

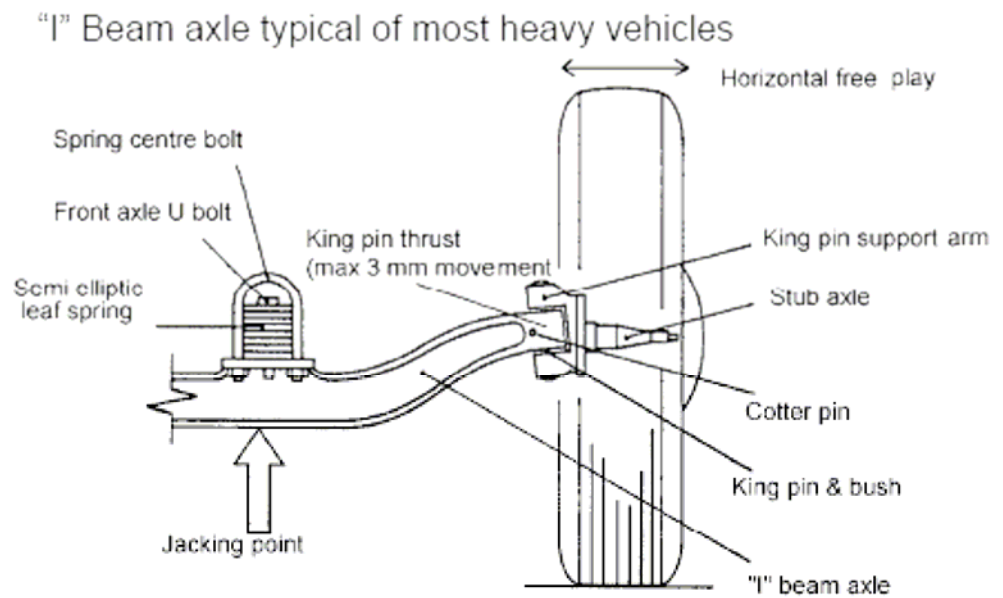
NOTE: Except where an original component has been fitted by the manufacturer or repairs have been conducted to manufacturer's specifications.

- 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;

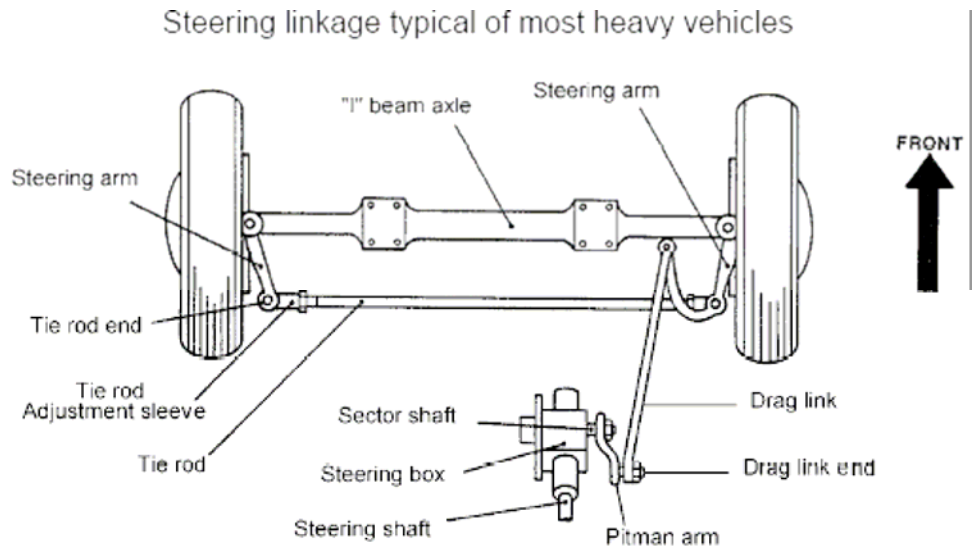
NOTE: Dampness or staining around seals is acceptable.

- 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:

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



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



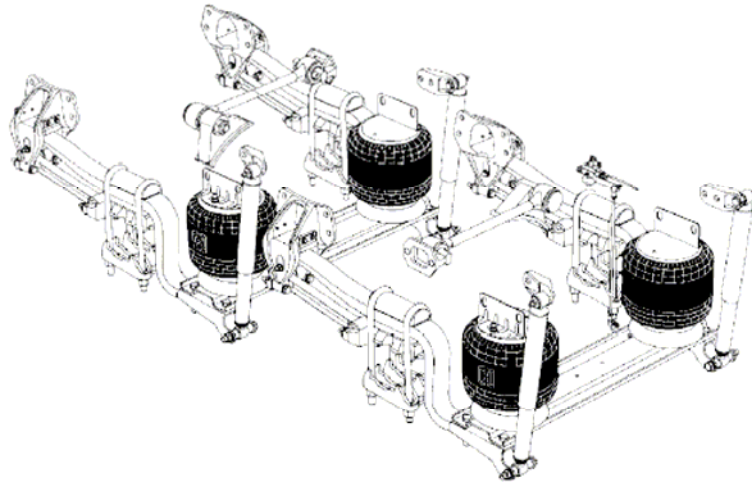
4. Check suspension components

Reasons for rejection

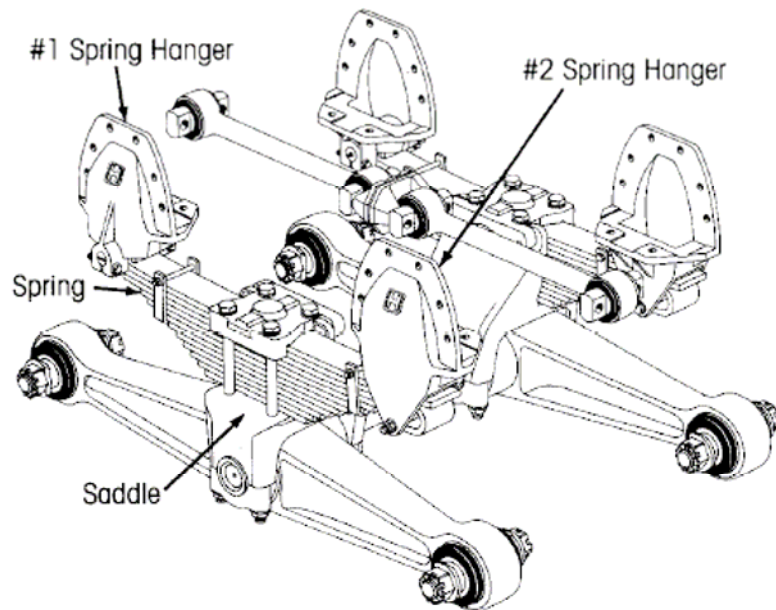
- a) U-bolts or other spring to axle or spring pack clamp bolts, center bolts, spring eyes or hangers, torque, radius or tracking component assemblies, control arms, bushes or any parts used to attach them to the vehicle frame or axle are cracked, loose, broken, missing or worn beyond manufacturers'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

Typical air bag suspension



Walking beam suspension - rigid beam



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

Wheels Tyres and Hubs

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.

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.

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. 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.
- m) Tyres to be the same size on the same axle

Structure and Body Condition

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.

- d) 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;
- e) 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.

- f) 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.

2. Check rear marker plates

(for articulated vehicles only – not to apply to other trucks)

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 o
- d) Rear marker plates are faded, damaged or incorrectly fitted.

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.

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;
- 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

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.

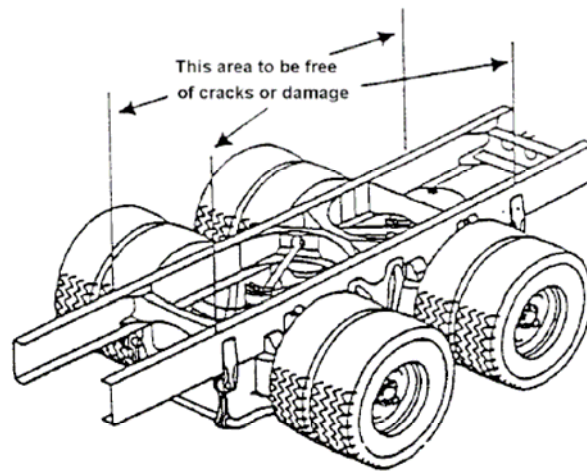
6. Chassis

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.

Example of critical structural components



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.

8. 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.

Lights and reflectors

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);
 - 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 (eg mudflap) that could cause the light to appear to flash or flicker;

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.

3. Check headlight aim using a headlight tester (Includes driving lights and alternative headlights)

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

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.
- e) Mirrors to be mounted on both sides

Windscreen & windows

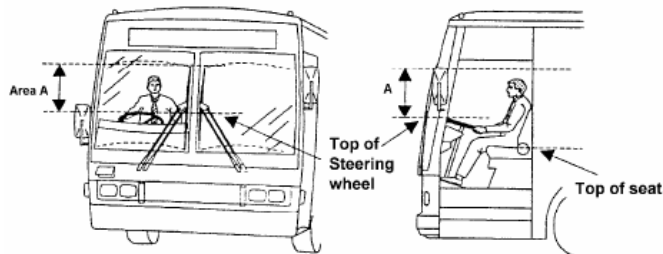
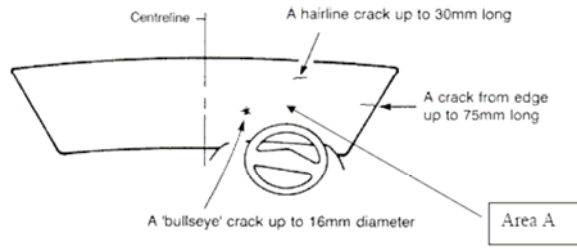
1. Check windscreen & Windows

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)
- d) Glazing is loose in its frame or cracked to the extent that sharp edges are exposed;
- 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.

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:

Glazing	Minimum Light Transmittance	Vehicles NOT TO BE REJECTED until meter readings are LESS than
Windscreen	75%	70%
All other windows	35%	30%
Rearward of the driver	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.	

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

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);
- 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.

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.

Engine, Driveline & Exhaust

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.

2. Check noise emissions

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

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

Note: Appropriate tolerances on noise values should be applied.

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;

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

5. Check fuel tanks and system for leaks (not 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.

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.

LPG / CNG Vehicles

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

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

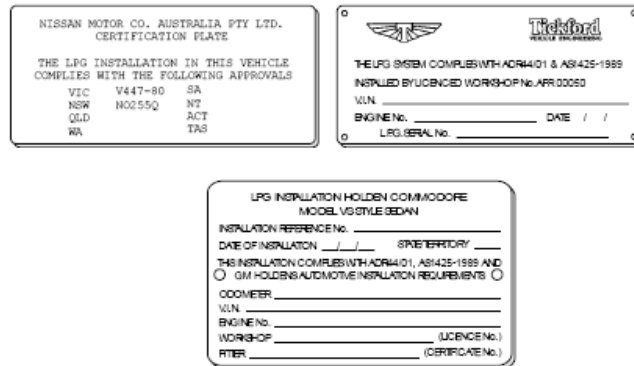
2. the installation passes a safety check inspection conducted by an examiner who is authorised to examine Autogas vehicles.

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 diamond on the number plate.

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

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 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.

3. Visually inspect the container anchorages and straps.

Reasons for rejection

- a) any anchorage straps allow the container to move;
- b) there is only one anchorage strap used to secure the container;
- c) the anchorage straps are cut, have advanced rust or are otherwise deteriorated;
- d) the anchorage straps are smaller than the sizes shown in Table 5;

TABLE 5 Dimensions Of Container Attachment Devices

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

- e) the anchorage bolts or studs are smaller than the sizes shown in Table 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.

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.

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.

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.

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.

8. Visually inspect hydrostatic relief valves.

Reasons 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.

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;
- 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.

10. Visually inspect fuel shut off devices (filter locks) converters (vapouriser 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. 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.

Reasons 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.

NOTE1: 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.

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.

Buses

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 step is damaged to an extent that it could trip or injure a person;
- j) Seat belts are not fitted (where applicable);
- k) There is no fire extinguisher in the vehicle located in a readily accessible position;
- l) Any fire extinguisher is:
 - not securely restrained;
 - not maintained in a fully charged and useable condition;
 - not correct type for application.
- m) 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;
- n) 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;
- o) 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.

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.

Reasons for rejection

Signs

- a) A sign with the words "**SCHOOL BUS**", in capital letters at least 100mm 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);

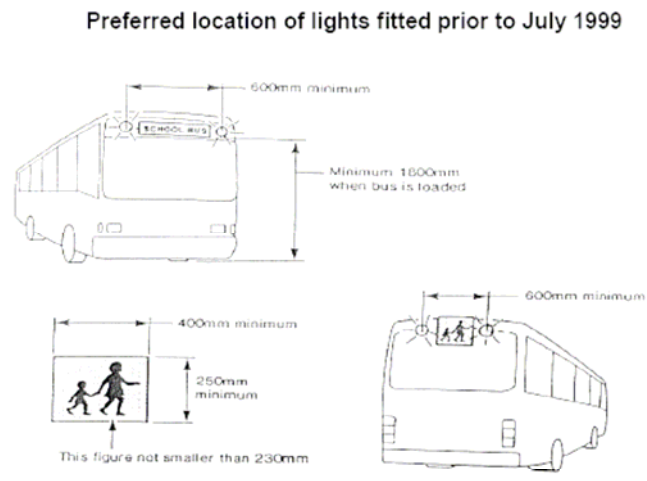
NOTE: 1. If fitted after 1 July 1999, the front sign can be as per following sections c), d) and e)

- 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;



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;

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.

Trailers

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.

2. Check trailer brakes and breakaway protection

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;

3. 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 Uclip, 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) Any mounting bolts, fasteners or weld beads have advanced corrosion;
- g) Any sliding drawbar latching mechanism is faulty or inoperative;
- h) One or more stops on a sliding drawbar are missing or are inoperative;
- i) A sliding drawbar has more than 6 mm of movement between the slider and the housing;
- j) Air or hydraulic cylinders, hoses or chambers on sliders leak (other than normal weeping of hydraulic seals).

4. 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.

5. Check skid plates (including king pin)

Reasons for rejection

- a) The vertical or horizontal movement between the upper and lower fifth wheel halves of coupled vehicles exceeds 13 mm;
- b) The king pin is excessively worn or loose;
- c) Any mounting bolts, fasteners or weld beads have advanced corrosion;
- d) An adaptor is used to fit a kingpin to a fifth wheel coupling;
- e) Skid plate or king pin has missing or loose bolts;
- f) Skid plate is cracked or warped.

6. Check safety chains and cables

Reasons for rejection

- a) Safety chains 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 3 Safety chains

Aggregate Trailer Mass (tonnes)	Chain size (mm)	Minimum chain breaking load (tonnes)
2.5 - 4.3	7.1	6.4
4.3 - 7.5	9.5	11.6
7.5 - 13.5	12.7	20.4
13.5 - 21.5	15.9	32.0
21.5 - 30.0	19.0	46.4
> 30.0	22.0	63.2

- 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;

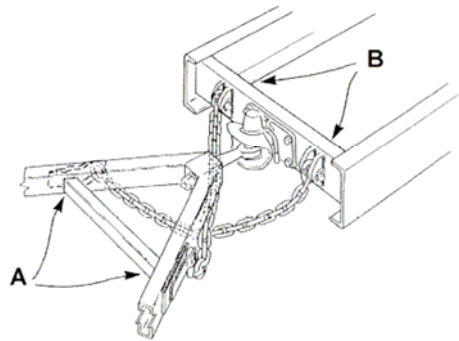
NOTE: The dimensions and configurations of typical chain retention brackets are shown in following diagrams.

TABLE 4 Typical Bracket Dimensions

Chain (mm)	Minimum length of fillet weld		Bracket dimensions				
	Size	length	(T1)	(T2)	(B)	(C)	(D)
7.1	6 x	150	12	12	4 x M12	16	*
9.5	6 x	200	16	16	4 x M12	19	*
12.7	6 x	360	20	20	4 x M16	25	*
15.9	8 x	420	25	20	4 x M20	32	*
19.0	10 x	480	25	25	4 x M20	38	*

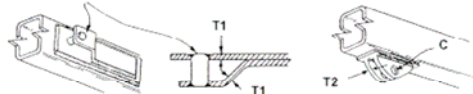
* Dimension "D" to suit coupling link plus minimum clearance to prevent binding

A typical attachment of chains

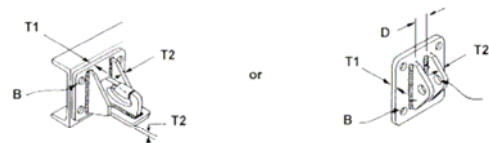


A. To the trailer

Pin welded to prevent chain loss



B. to the towing vehicle



7. Check Suspensions components

Reasons for rejection

- a) U-bolts or other spring to axle or spring pack clamp bolts, center 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;

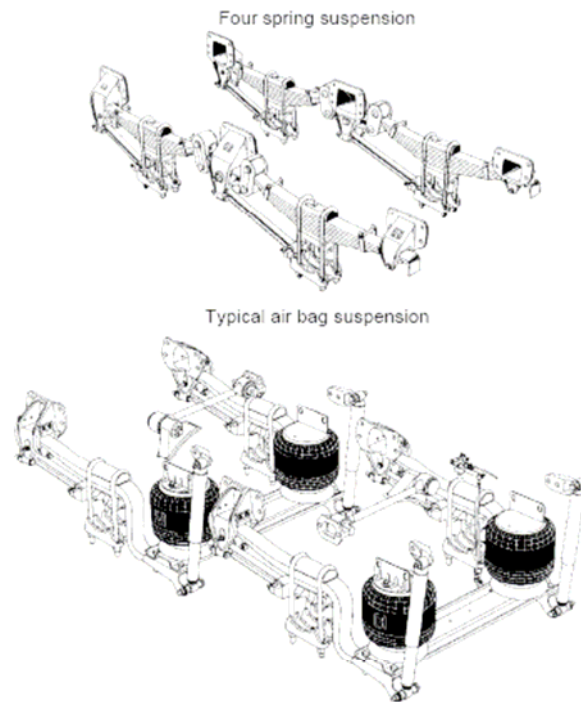
NOTE: Superficial crazing is acceptable. This is often present on rubber suspension components even when new.

- 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.



8. 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.

9. 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.

10. 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.

11. 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.

12. 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:
 - 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. Check exterior body panels and fittings

Reasons for rejection

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

14. 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.

15. 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.

16. 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

17. Check chassis

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.

18. Check lights & reflectors

Reasons for rejection

- a) Compulsory reflectors are damaged, obscured, deteriorated or are not fitted;
- b) Any of the following lights are inoperative, obscured, deteriorated, insecure or not fitted where required or is an incorrect colour:
 - tail lights (red);
 - brake lights (red);
 - turn signal indicator lights (yellow);
 - clearance/end outline marker lights (white/yellow to front, red to rear);
 - number plate light (white);
 - side marker lights (yellow).
- c) Any rear light other than a reversing light is damaged to the extent that white light shows to the rear of the vehicle;
- d) Any yellow clearance light or turn signal indicator is damaged so that it shows white light;
- e) The number plate light is not directing light onto the surface of the rear number plate;
- f) Any light has a tinted cover over it that affects its intended operation;

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;
12. Body mountings.

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.

Reasons for rejection

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

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

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