

Steering

9-1 Steering and suspension systems



Summary of legislation

Applicable legislation

- Land Transport Rule: Steering Systems 2001
- Traffic Regulations 1976, Reg 70
- NZ Gazette 19/3/98, Issue 42, page 978, notice 1851 and amendment
- NZ Gazette, 25/2/99, Issue 23, page 575, notice 1478

Mandatory equipment

1. The steering column of a motor vehicle shall be to the right of the longitudinal centre-line of the body of the vehicle except as permitted below.
2. A motor vehicle capable of a speed more than 30 km/h and equipped with a steering system with no direct mechanical connection between the driver's means of control and the wheels or other means of changing the vehicle's direction must have at least one additional means of steering.

Permitted equipment

3. A registered vehicle may be in left-hand drive or dual steer configuration. Such a vehicle is not required to carry a Left-Hand Drive Permit, as the LHD requirements are enforced at the time of first registration in NZ.

Condition

4. The steering system and associated systems and components that directly or indirectly affect the directional control of the vehicle must be:
 - a) sound and in good condition, and
 - b) strong, durable, and fit for their purpose, taking into account whether adverse effects have resulted from a loss of integrity of any protective system used by a relevant component.

Performance

5. The steering system and associated systems and components that directly or indirectly affect the directional control of the vehicle must provide the vehicle with safe, efficient, convenient and sensitive control.

Modifications

6. A modification that affects the steering system must be inspected and certified by an LVV specialist certifier, unless the vehicle:
 - a) is excluded from the requirement for LVV specialist certification (**Table 9-1-1**), and
 - b) has been inspected in accordance with the requirements in this manual, including those for equipment, condition and performance

Reasons for rejection

Mandatory equipment

1. A vehicle capable of exceeding a speed of 30 km/h equipped with a steering system (**Note 1**) with no direct mechanical connection between the driver's means of control and the wheels, or other means of changing the vehicle's direction, does not have at least one additional means of steering.

Condition

2. The **steering wheel**:
 - a) is insecurely attached to the steering shaft, or
 - b) shows excessive movement indicating unacceptable wear or looseness in the steering box or rack or steering column bearings, or
 - c) rim covering is insecure so that the directional control of the vehicle is affected.
3. The **steering column** is insecure.
4. The **power steering**:
 - a) has been disconnected, or
 - b) system does not operate correctly, requiring unreasonable force to steer the vehicle, or
 - c) has a hose, pump drive, drive belt or pump mounting that is insecure, damaged, significantly deteriorated, or
 - d) has a significant fluid leak.
5. A **linkage or joint between the steering column shaft and steering box or rack**:
 - a) is insecure, or
 - b) is damaged, significantly corroded, distorted or cracked, or
 - c) shows signs of welding or heating after original manufacture, or
 - d) has play beyond manufacturer's specifications, or
 - e) does not operate smoothly without roughness or stiffness, or
 - f) is fouling on the vehicle structure, wheel tyre or brake system component.

Reasons for rejection

6. The **steering box or rack**:
 - a) is insecure, or
 - b) is damaged, significantly corroded, distorted or cracked, or
 - c) shows signs of welding or heating after original manufacture, or
 - d) has play beyond manufacturer's specifications, or
 - e) does not operate smoothly without roughness or stiffness, or
 - f) has an excessive fluid leak.
7. A **steering rack gaiter** is missing, insecure or split.
8. A **steering linkage or joint (Note 2)**:
 - a) is insecure, or
 - b) is damaged, significantly corroded, distorted or cracked, or
 - c) shows signs of welding or heating after original manufacture, or
 - d) has play beyond manufacturer's specifications, or
 - e) does not operate smoothly without roughness or stiffness, or
 - f) is fouling on the vehicle structure, wheel tyre or brake system component, or
 - g) shows signs of plastic injection.
9. A **steering arm or associated component**:
 - a) is insecure, or
 - b) is damaged, significantly corroded, distorted or cracked, or
 - c) shows signs of welding or heating after original manufacture.
10. A **king pin or suspension joint (Note 3)**:
 - a) is insecure, or
 - b) is damaged, significantly corroded, distorted or cracked, or
 - c) shows signs of welding or heating after original manufacture, or
 - d) has play beyond the manufacturer's specifications, or
 - e) does not operate smoothly without roughness or stiffness, or

Reasons for rejection

- f) shows signs of plastic injection.
- 11. A **lock-stop** is loose or damaged.
- 12. A **steering component mounting point**:
 - a) is insecure, or
 - b) has corrosion damage, buckling or fractures within 150 mm of a mounting point (**Figure 9-1-1**).
- 13. **Any other suspension component**:
 - a) is insecure, or
 - b) is damaged, significantly corroded, distorted or cracked, or
 - c) shows signs of welding or heating after original manufacture, or
 - d) has play beyond manufacturer's specifications, or
 - e) does not operate smoothly without roughness or stiffness, or
 - f) has excessive leakage of damping fluid, or
 - g) shows excessive play, roughness or stiffness in a strut upper support bearing, or
 - h) is a replacement urethane suspension bush that is not voided or shaped to allow for similar movement to an OE bush.
- 14. There is corrosion damage (**Note 4**) within 150 mm of a **suspension component mounting point**.

Performance

- 15. During operation:
 - a) the vehicle veers significantly to one side, or
 - b) the vehicle requires unreasonable force to steer, or
 - c) the steering is unreasonably stiff, rough or light.

Modifications

- 16. A modification affects a component or system that directly or indirectly affects the directional control of the vehicle, and:
 - a) is not excluded from the requirements for LVV specialist certification (**Table 9-1-1**), and
 - b) is missing proof of LVV specialist certification, ie:
 - i. the vehicle is not fitted with a valid LVV certification plate, or
 - ii. the operator is not able to produce a valid modification declaration or authority card.

Table 9-1-1. Modifications that do not require LVV certification

Fitting of or modification to:	LVV certification is not required provided that:
Right-hand drive steering conversions	<ul style="list-style-type: none"> the conversion can be proven via documented evidence to have been carried out prior to 1 January 1998, and an approved conversion agent's individually numbered plate is attached to the vehicle structure.
Steering wheels	<ul style="list-style-type: none"> the vehicle does not have an airbag installed as OE, and the steering wheel is a direct substitute without shaft modification, and the steering wheel is a reputable brand non-OE item, and The vehicle is not required to comply with a frontal impact occupant protection standard². The following vehicles are required to comply with such a standard: <ul style="list-style-type: none"> class MA motor vehicles manufactured from 1/3/1999, and class MA motor vehicles that were first registered in New Zealand from 1/4/2002, except one that was more than 20 years old on 1/4/2002, and class MB or MC motor vehicles manufactured from 1/10/2003.
Springs and shock absorbers	<ul style="list-style-type: none"> the springs or shock absorbers are direct replacements, and replacement springs fit and maintain contact with un-modified OE seats throughout full suspension travel, and replacement springs are self-retaining in their seats at full extension, without the use of non-standard devices such as wire-ties, straps, or external spring locators, and replacement springs have not been heated or cut, and springs and spring seats are not height adjustable (unless OE), and replacement shock absorbers fit un-modified OE mountings, and suspension maintains sufficient travel for safe operation when fully laden, and suspension components maintain sufficient clearance from unmodified bumpstops when fully laden, and a minimum of 100 mm ground clearance exists below any part of the vehicle structure, or any steering, braking, or suspension component¹, and the normal relationship between front and rear suspension height is not unduly affected.
Blocks for leaf springs to adjust their ride height	<ul style="list-style-type: none"> the blocks are: <ul style="list-style-type: none"> securely fitted, and constructed from metal, and designed for the purpose, and firmly seated over not less than the OE seat area, and not more than 50 mm in height.
Larger diameter anti-sway bar	<ul style="list-style-type: none"> the bar is attached to unmodified OE mounting points.
Addition of anti-sway bar	<ul style="list-style-type: none"> no cutting, heating, or welding to the vehicle structure or suspension components is involved in attachment of the bar.
Suspension braces (strut tower braces)	<ul style="list-style-type: none"> there are no structural changes to the body or suspension mounting points.

¹ does not include such items as exhaust pipes and exterior body panels that do not contribute to the structural strength of the vehicle

² a vehicle that cannot comply with this clause cannot be LVV certified unless it has been issued with an LVV authority card.

Fitting of or modification to:	LVV certification is never required:
Steering wheel spinner	<ul style="list-style-type: none"> in-service requirements for condition and performance must be met.
Urethane suspension bushes	
Any modification for the purposes of law enforcement or the provision of emergency services	

Note 1 Definitions

Modify means to change a vehicle from its original state by altering, substituting, adding or removing a structure, system, component, or equipment, but does not include repair.

Repair means to restore a damaged or worn vehicle, its structure, systems, components or equipment to within safe tolerance of its condition when manufactured, including replacement with undamaged or new structures, systems, components or equipment.

Steering system means those components, parts and systems that connect the driver's controls to the vehicle's wheels or tracks by means of which the direction of motion of a vehicle is controlled.

Note 2 A damaged boot on a steering joint is not grounds for rejection; however, the vehicle's owner should be advised.

Note 3 A damaged boot on a suspension joint is not grounds for rejection; however, the vehicle's owner should be advised.

Note 4 Corrosion damage is where the metal has been eaten away, which is evident by pitting. The outward signs of such corrosion damage is typically displayed by the lifting or bubbling of paint. In extreme cases, the area affected by the corrosion damage will fall out and leave a hole.

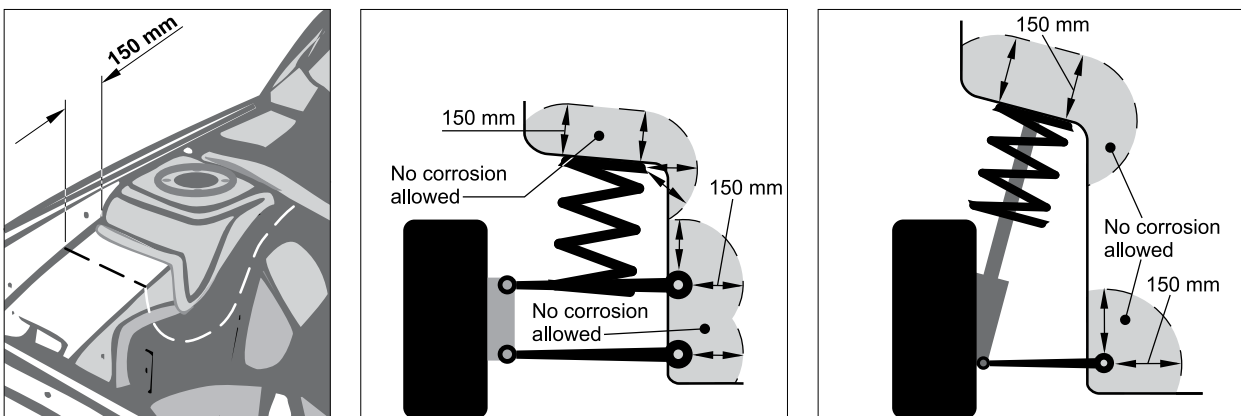


Figure 9-1-1. Corrosion limits around front or rear suspension anchorages.

See also figures for corrosion limits to structure (section 3-1), hinge and latch anchorages (section 6-1), and seatbelt anchorages (section 7-5).

Summary of legislation

Applicable legislation

- Land Transport Rule: Vehicle Dimensions and Mass 2002
- Land Transport Rule: Heavy Vehicles 2004

Mandatory equipment

1. General vehicle pages.

Permitted equipment

2. General vehicle pages.
3. A vehicle may be fitted with an axle-stop device.
4. A vehicle may be fitted with a ballrace turntable.

Condition

5. General vehicle pages.
6. The suspension system must have adequate strength for all conditions of loading and operation for which the vehicle was constructed.
7. An axle-stop device fitted to a vehicle must be within safe tolerance of its original condition.

Performance

8. General vehicle pages.
9. The suspension system must have performance characteristics for all conditions of loading and operation for which the vehicle was constructed.

Modification and repair

10. A modification or repair that affects the steering or suspension system must be inspected and certified by a HVS certifier of category HVEC, HVMC or HVIC, unless the vehicle:
 - a) excluded from the requirement for HVS certification (Table 9-1-2), and
 - b) has been inspected in accordance with the requirements in this manual, including those for equipment, condition and performance.

Reasons for rejection

Mandatory equipment

1. General vehicle pages.

Condition

2. General vehicle pages.
3. An axle-stop device fitted to a vehicle has deteriorated so that it is not effective.

Performance

4. General vehicle pages.

Modification and repair

5. A modification or repair affects the steering and suspension system and:
 - a) is not excluded from the requirements for HVS certification (Table 9-1-2), or
 - b) the modification is not for the purpose of law enforcement or the provision of emergency services, or
 - c) is missing proof of HVS certification, ie:
 - i. the vehicle was modified or repaired before the last CoF inspection and no LANDATA record has been entered, or
 - ii. the vehicle was modified or repaired since the last CoF inspection and no valid LT400 form from a HVS certifier of category HVEC, HVMC or HVIC has been presented.

Table 9-1-2. Requirements for HVS certification

HVS certification is required	HVS certification is not required
<ol style="list-style-type: none"> 1. Left- to right-hand drive or dual steering conversion 2. A steering or suspension system that is modified, including a replacement system that is not identical to the system fitted by the vehicle manufacturer. 3. The steering system of a vehicle to which a second steering axle is fitted to form a twin-steer axle set 4. Any components showing successive repairs 	<ol style="list-style-type: none"> 1. Any modification or repair likely to have been carried out before 1/1/1997. (Modifications and repairs before this date generally required certification but for inspection purposes no evidence of this is required.) 2. Any repair or modification not listed in the left-hand column unless the VI considers that certification is required because the modification or repair has affected the vehicle's safety performance (a second opinion from an expert may be needed, eg the manufacturer's representative, reputable workshop).

Note 1: Definitions

Axle-stop device means a device to control the movement of the axle in the event of suspension failure.

Summary of legislation

Applicable legislation

- Land Transport Rule: Passenger Service Vehicles 1999.

Condition and Performance

1. Refer to general vehicle pages.
2. A PSV must be maintained so that no excessive body sway will occur which is likely to adversely affect the steering stability.
3. Axle-stops, shackles, or similar devices must be maintained within safe tolerance of their original condition.

Modification

4. Refer to general vehicle pages.

Reasons for rejection

Condition and Performance

1. Refer to general vehicle pages.
2. The condition of the PSV is such that excessive body sway is likely to adversely affect the steering stability.
3. An axle stop, shackle or other suspension safeguard is:
 - a) missing (where originally fitted)
 - b) insecure, or
 - c) bent, or
 - d) cracked, or
 - e) excessively corroded or otherwise weakened.

Modification

4. Refer to general vehicle pages.

Summary of legislation

Applicable legislation

- Land Transport Rule: Passenger Service Vehicles 1999.
- PSV (Constructional) Regulations 1978

Mandatory equipment

1. A heavy PSV first registered on or after 1/9/1966 and before 1/9/1999 must be fitted with axle stops, shackle stops or other devices to prevent the front axle from moving backwards to such an extent that the driver is likely to lose directional control should a suspension component fail in service.

Permitted equipment

2. Heavy vehicle pages.

Condition and Performance

3. Refer to heavy vehicle pages.
4. A PSV must be maintained so that no excessive body sway will occur which is likely to adversely affect the steering stability.
5. Axle-stops, shackles, or similar devices must be maintained within safe tolerance of their original condition.

Modification and repair

6. Refer to heavy vehicle pages.

Reasons for rejection

Mandatory equipment

1. A heavy PSV first registered on or after 1/9/1966 and before 1/9/1999 is not fitted with an axle stop, shackle stop or similar device to prevent the front axle from moving backwards to such an extent that the driver is likely to lose directional control should a suspension component fail in service.

Condition and Performance

2. Refer to heavy vehicle pages.
3. The condition of the PSV is such that excessive body sway is likely to adversely affect the steering stability.
4. An axle stop, shackle or other suspension safeguard is:
 - a) missing (where originally fitted), or
 - b) insecure, or
 - c) bent, or
 - d) cracked, or
 - e) excessively corroded or otherwise weakened.

Modification and repair

5. Refer to heavy vehicle pages.