

Tyres, wheels and hubs

10-1 Tyres and wheels

Summary of legislation

Applicable legislation

- Land Transport Rule: Tyres and Wheels 2001 (Rule 32013/1)

Mandatory equipment

Tyres

- Tyres must be compatible with the vehicle to which they are fitted.
- Tyres on the same axle must be of the same size designation and construction, and of the same tread pattern type.
- Asymmetric tyres must be fitted in axle sets in accordance with manufacturer's instructions.
- A unidirectional tyre must be fitted to a wheel position corresponding to its direction of rotation.
- The speed category of a tyre must be compatible with the maximum legal speed limit for the vehicle, or the vehicle's maximum speed (**Note 3**).
- A vehicle must not be fitted with a metal tyre or other non-pneumatic tyre, or with a tyre with studs, cleats, lugs or other gripping devices.

Wheels

- A wheel must:
 - be sufficiently strong for the type of vehicle to which it is fitted, and
 - be compatible with the vehicle to which it is fitted, and
 - be compatible with the tyre rim profile, flange height and valve fitment.
- There must be adequate clearance for the brake, hub, suspension and steering mechanism, and body parts.

Permitted equipment

- A vehicle may be fitted with retreaded tyres.

Condition

Tyres (excluding spare tyres and space-saver tyres)

- A tyre must be of good quality and construction, fit for its purpose, and maintained in a safe condition.
- A tyre must not have worn, damaged or visible cords apparent by external examination.
- A tyre must have a tread pattern depth of not less than 1.5 mm (excluding any tie-bar or tread-depth indicator strip) around the whole circumference of the tyre:
 - within all principal grooves that contain tread-depth indicators, or
 - if the tyre does not normally have tread-depth indicators, across at least three-quarters of the tyre tread width.

Reasons for rejection

Mandatory equipment

Tyres

- Tyres on the same axle are not of the same:
 - size designation, or
 - carcass type (ie mixed steel ply, fabric radial ply, bias/cross ply), or
 - tread pattern type (mixed asymmetric, directional, normal highway, traction).
- An asymmetric tyre is fitted to a vehicle with the 'inside' tyre wall facing outwards.
- A unidirectional tyre is fitted contrary to its correct direction of rotation.
- A tyre has a speed category that is less than the speed limit for the vehicle or less than the vehicle's maximum speed if this is less than the speed limit (**Note 3**).
- The vehicle has one or more of the following types of tyre fitted:
 - a space-saver tyre, or
 - a non-pneumatic tyre, or
 - a tyre with studs, cleats, lugs or other gripping devices, or
 - a tyre that is not compatible with the vehicle to which it is fitted, eg a tyre is marked with any of the following:
 - 'NOT FOR HIGHWAY USE'
 - 'NHS' (Not for Highway Service)
 - 'FOR TRAILER USE ONLY'
 - 'ADV' (Agricultural Drawn Vehicle)
 - 'RACING PURPOSES ONLY'.
 - a tyre that has had all its manufacturer/brand/model information removed so that the tyre can no longer be identified.

Wheels

- A wheel is not compatible with the tyre fitted to it for rim profile, flange height, or valve fitment.

Tyres, wheels and hubs

10-1 Tyres and wheels (cont.)

13. The regrooving of a tyre is permitted only if the tyre is identified as being specifically designed for regrooving after manufacture.
14. A tyre that is fitted to a vehicle must be maintained at a safe inflation pressure.

Spare tyre

15. If the vehicle carries a spare tyre, the tyre must be securely attached on or in the vehicle.

Space saver tyres

16. A space-saver tyre carried in a vehicle must have a safety warning label that:
 - a) has safety instructions that are printed clearly in English, and
 - b) identifies that the tyre is for temporary use only, and
 - c) specifies that the vehicle must not be operated with a space-saver tyre at a speed of more than 80 km/h or at a lesser speed specified by the tyre manufacturer, and
 - d) contains information on the recommended inflation pressure of the tyre when in use, and
 - e) is permanently attached to the outside of the wheel.

Reasons for rejection

7. A wheel is:
 - a) not compatible with the vehicle to which it is fitted.
or
 - b) not correctly attached to the vehicle.

Condition

Tyres (excluding spare tyres and space-saver tyres)

8. There are signs that a tyre is fouling on another part of the vehicle.
9. A tyre shows damage that it is likely to compromise its ability to operate in a safe manner or lead to premature tyre failure, such as:
 - a) a lump or bulge that is likely to be caused by separation or partial failure of the tyre structure, or
 - b) a cut in a sidewall or tread more than 25 mm long that reaches the cords, or
 - c) exposed or cut cords, or
 - d) the tread of a retreaded tyre shows signs of separation, or
 - e) nails or other sharp objects embedded in the tyre, or
 - f) significant perishing, eg due to age, moisture or exposure.
10. A tyre has a string type repair visible from the outside.
11. A tyre does not have a tread pattern depth (**Technical bulletin 7**) of at least 1.5 mm (excluding any tie-bar or tread depth indicator strip) around the whole circumference of the tyre:
 - a) within all the principal grooves that normally contain moulded tread depth indicators, or
 - b) if the tyre does not normally have moulded tread depth indicators (such as some retreaded or vintage tyres), across at least three-quarters of the tread width.
12. A tyre not identified as designed for regrooving has had its tread depth increased by regrooving.
13. A tyre is noticeably under- or over-inflated.

Spare tyres

14. A spare tyre, if carried is not:

Reasons for rejection

- a) securely attached by a device that is in good condition and correctly applied, or
- b) stowed in a closed compartment separate from the occupant space (eg if the manufacturer's attachment device is missing or faulty) .

Space-saver tyres

- 15. A space-saver tyre does not have a safety warning label permanently attached to the outside of the wheel.
- 16. A space-saver tyre warning label (see **Figure 10-1-2** for label examples) does not meet all of the following:
 - have safety instructions that are clearly printed in English
 - identify that the tyre is for temporary use only
 - specify that the vehicle must not be operated at a speed of more than 80 km/h or at a lesser speed specified by the tyre manufacturer
 - have information on the recommended inflation pressure of the tyre when in use.

Wheels

- 17. There are signs that a wheel is fouling on another part of the vehicle.
- 18. A wheel is:
 - a) cracked, or
 - b) significantly damaged, distorted or has deteriorated, or
 - c) not securely attached to the hub.
- 19. An alloy wheel has poor visible repairs.
- 20. A wheel or axle nut:
 - a) is missing, or
 - b) is loose, or
 - c) is deteriorated, or
 - d) is of the incorrect type, or
 - e) has insufficient thread engagement to the wheel stud.

Tyres, wheels and hubs

10-1 Tyres and wheels (cont.)

Reasons for rejection

Modifications

21. A modification affects the wheels or tyres, and:
- a) is not excluded from the requirements for LVV specialist certification (**Table 10-1-1**), 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 10-1-1. Modifications that do not require LVV certification

Fitting of or modification to:	LVV certification is not required provided that:
Aftermarket wheel fitments	<ul style="list-style-type: none"> • the wheels: <ul style="list-style-type: none"> - are a non-OE item of known and reputable brand, and - would be considered an appropriate fitment for the vehicle type by the wheel manufacturer, and - are not modified, and - do not have spacers or adaptors fitted. • the tyre tread: <ul style="list-style-type: none"> - does not protrude beyond the unmodified original body panels (including unmodified factory-fitted mudguard extensions), or - protrudes beyond the unmodified original body panels, but is covered by aftermarket or modified mudguard extensions or modified body panels, and the track width has increased by no more than 25 mm from OE.
Tyre size changes	<ul style="list-style-type: none"> • the tyres: <ul style="list-style-type: none"> - have an outer circumference that is no more than 5% greater than OE, and - are an appropriate selection for rim width, and - have tread that does not extend beyond the original or modified body panels or guard extension (see Figure 10-1-1).
Fitting of or modification to:	LVV certification is never required:
Any modification for the purposes of law enforcement or the provision of emergency services	<ul style="list-style-type: none"> • in-service requirements for condition and performance must be met.

Note 1 Tread pattern and tread depth requirements do not apply to vehicles that are not capable of exceeding 30 km/h.

Note 2 Definitions

Asymmetric tyre: tyre which, through tread pattern, is required to be fitted to a vehicle so that one particular side-wall faces outwards.

Construction in relation to a tyre:

- a) for a pneumatic tyre, the type of tyre carcass (including ply orientation and ply rating or load index), or
- b) for any other tyre, characteristics relating to size, shape and material.

Cross-ply: a pneumatic tyre structure in which the ply cords in the tyre carcass extend to the beads and are laid at alternate angles, which are substantially less than 90 degrees, to the centreline of the tread. This tyre structure is also referred to as 'bias ply' or 'diagonal ply'.

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.

Pneumatic tyre means a tyre that, when in use, is inflated by air or gas introduced from time to time under pressure so as to enclose under normal inflation, a cushion of air or gas forming altogether at least half of the total area of an average cross-section of a tyre so inflated.

Principal grooves means the wide grooves in the tyre tread which have the tread wear indicators located inside them. Any other grooves are secondary grooves which may wear out during the service life of the tyre.

Radial-ply means a pneumatic tyre structure in which the ply cords, which extend from bead to bead, are laid at approximately 90 degrees to the centreline of the tread, the carcass being stabilised by an essentially inextensible circumferential belt.

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.

Rim means that part of the wheel on which the tyre is mounted and supported.

Space saver tyre (temporary-use spare tyre) means a combination tyre and wheel designed and constructed solely for temporary use under restricted driving conditions, and not intended for use under normal driving conditions.

Speed category means a code allocated to a tyre by a tyre manufacturer that indicates the maximum vehicle speed for which the use of the tyre is rated.

Tread means that part of a pneumatic tyre which comes into contact with the ground.

Tread depth indicator (or tread wear indicator) means the projections within the principal grooves designed to give a visual indication of the degree of wear of the tread. To help locate these on a tyre, inspectors should look for a '△' or 'TWI' mark on the outer edge of the tyre side wall (most tyres have these marks).

Tube means an inflatable elastic liner, in the form of a hollow ring fitted with an inflation valve assembly, designed for insertion into certain tyre assemblies to provide a cushion of air or gas, that, when inflated, supports the wheel (also known as an 'inner tube').

Tyre carcass means that structural part of a pneumatic tyre other than the tread and outermost rubber of the side-walls that, when inflated, contains the gas that supports the load.

Tyre load rating means the maximum load a tyre can carry at the corresponding cold inflation pressure prescribed by the tyre manufacturer and the speed indicated by its speed category symbol.

Unidirectional tyre means a tyre with a tread pattern designed to operate in one direction only.

Wheel means a rotating load-carrying member between the tyre and the hub, which usually consists of two major parts, the rim and the wheel disc, and which may be manufactured as one part, or permanently attached to each other, or detachable from each other.

Wheel centre-disc means that part of the wheel that is the supporting member between the hub and the rim.

Wheel spacer means an additional component used for the purpose of positioning the wheel centre-disc relative to the hub or, in multiple wheel sets, for the purpose of positioning the wheel centre-disc relative to another wheel.

Note 3 The speed category is usually marked on the tyre. Where the tyre is not marked, the speed rating information must be obtained from the tyre manufacturer or a reference guide of tyre ratings before the tyre can be passed.

Tyres, wheels and hubs 10-1 Tyres and wheels (cont.)

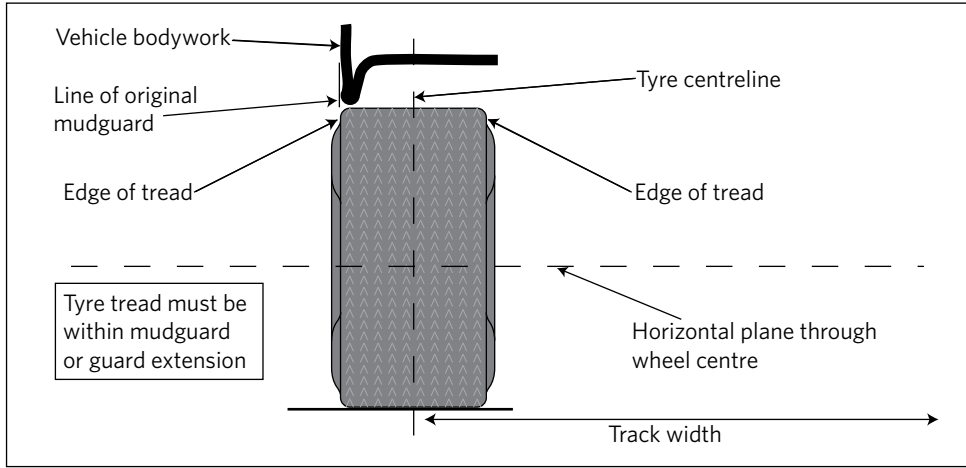


Figure 10-1-1. Tyre and body panel position



Figure 10-1-2. Common space-saver tyre labels

Note These are labels that were previously approved by the NZTA, see the NZTA website for colour versions. Labels no longer need NZTA approval, so other labels are acceptable provided they contain the required safety instructions printed clearly in English.

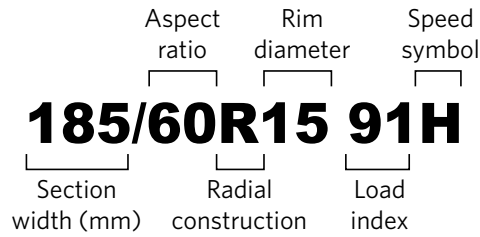


Figure 10-1-3. Tyre markings

Table 10-1-2. Tyre speed symbol categories

Speed symbol - speed category (km/h)							
A1 - 5	A5 - 25	B - 50	F - 80	L - 120	Q - 160	U - 200	Y - 300
A2 - 10	A6 - 30	C - 60	G - 90	M - 130	R - 170	H - 210	ZR - over 240
A3 - 15	A7 - 35	D - 65	J - 100	N - 140	S - 180	V - 240	
A4 - 20	A8 - 40	E - 70	K - 110	P - 150	T - 190	W - 270	

Table 10-1-3. Tyre interchangeability - imperial and metric

Imperial sizing	Metric sizing
10/70R22.5	255/70R22.5
11/70R22.5	275/70R22.5
12/70R22.5	305/70R22.5
15R22.5	385/65R22.5
16.5R22.5	425/65R22.5

Tyres, wheels and hubs

10-2 Hubs and axles

Summary of legislation

Applicable legislation

- Land Transport Rule: Tyres and Wheels 2001

Condition

1. The components of the assembly must be in good condition.
2. The hub and axle must be sufficiently strong for the type of vehicle to which they are fitted.
3. The hub and axle must have a suitable and correctly adjusted geometry.

Modification

4. A modification that affects the hubs or axles must be inspected and certified by a low volume vehicle specialist certifier, unless the vehicle is:
 - a) excluded from the requirement for LVV specialist certification (**Table 10-2-1**) and has been inspected in accordance with the requirements in this manual, including those for equipment, condition and performance, or
 - b) modified for the purposes of law enforcement or the provision of emergency services.

Reasons for rejection

Condition

1. A hub (**Note 1**):
 - a) is not securely attached to the vehicle, or
 - b) has a visible crack, or
 - c) is significantly damaged, distorted or has deteriorated, or
 - d) has a broken or missing wheel stud.
2. A wheel bearing:
 - a) has play beyond the manufacturer's specifications, or
 - b) is over-tight or sounds rough.
3. An axle:
 - a) is insecure, or
 - b) is visibly cracked, or
 - c) is significantly damaged, distorted or has deteriorated, or
 - d) shows signs of welding or heating after original manufacture, or
 - e) shows signs of fouling the vehicle structure or a brake, suspension or steering component.

Performance

4. The geometry of a hub or axle causes:
 - a) the vehicle to veer significantly to one side, or
 - b) the front wheel not to self-centre.

Modification

5. A modification (**Note 1**) affects the hubs or axles, and:
 - a) is not excluded from the requirements for LVV specialist certification (**Table 10-2-1**), and
 - b) is missing proof of LVV specialist certification, ie:
 - i. the vehicle is not fitted with a valid low volume vehicle certification plate, or
 - ii. the operator is not able to produce a valid modification declaration or authority card.

Table 10-2-1. Modifications that do not require LVV certification

Fitting of or modification to:	LVV certification is not required provided that:
Axle housing replacement	<ul style="list-style-type: none"> ▪ the axle housing fits the vehicle without adaptation, and ▪ no change to the OE suspension geometry occurs, and ▪ no changes are made to the OE brake system.
Fitting of or modification to:	LVV certification is never required:
Any modification for the purposes of law enforcement or the provision of emergency services	<ul style="list-style-type: none"> ▪ in-service requirements for condition and performance must be met.

Note 1 Definitions

Hub means that part of a vehicle that is attached to the axle and rotates on, or with, the axle, and to which the wheel is attached, and includes any bearings.

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.

Tyres, wheels and hubs

10-3 Mudguards

Summary of legislation

Applicable legislation

- Land Transport Rule: Vehicle Equipment 2004

Mandatory equipment

- A motorcycle must be fitted with a mudguard over each road wheel if it is reasonable and practicable to do so.
- A mudguard must cover no less than the width of the tyre tread on each road wheel.
- A motorcycle fitted with twin tyres or close-spaced multiple tyres must be fitted with a mudguard over each wheel on the rear axle that provides continuous protection from a horizontal line tangent to the top of the tyre tread to a line with a slope of 1 in 3 rising rearward from the tyre's contact point on the road.
- The following vehicles are not required to be fitted with mudguards:
 - a vehicle in an unfinished condition used under the authority of trade plates and operated in accordance with the Compliance Rule
 - a vehicle not capable of exceeding a speed of 30km/h.

Condition

- A mudguard must be securely fixed to the vehicle and must be constructed so that it does not present a hazard to road users.

Modification

- A modification that affects a mudguard must be inspected and certified by a low volume vehicle specialist certifier, unless the vehicle:
 - is excluded from the requirement for LVV certification (**Table 10-3-1**), and
 - has been inspected in accordance with the requirements in this manual, including those for equipment, condition and performance.

Reasons for rejection

Mandatory equipment

- A mudguard (**Note 1**) over a road wheel is missing where it is reasonable and practicable to fit a mudguard, unless the vehicle is:
 - in an unfinished condition legally used under the authority of trade plates, or
 - not capable of exceeding a speed of 30 km/h.
- A mudguard does not cover the full width of the tread of the tyre or tyres fitted to a road wheel (**Figure 10-3-1** and **Figure 10-3-2**).

Condition

- A mudguard is not securely fixed to the vehicle.
- A mudguard is so constructed or damaged that it is likely to present a hazard to road users.

Modification

- A modification affects a mudguard, and:
 - is not excluded from the requirements for LVV specialist certification (**Table 10-3-1**), and
 - is missing proof of LVV certification, ie:
 - the vehicle is not fitted with a valid low volume vehicle certification plate, or
 - the operator is not able to produce a valid modification declaration or authority card.

Table 10-3-1. Modifications that do not require LVV certification

Fitting of or modification to:	LVV certification is never required:
Modified mudguards, including flared wheel arches or the addition of mudguard extensions (Note 1)	<ul style="list-style-type: none"> in-service requirements for condition and performance must be met (see also Table 10-1-1).
Any modification for the purposes of law enforcement or the provision of emergency services	

Note 1 Some vehicles fitted with flared wheel arches or mudguard extensions will require LVV certification as a result of aftermarket wheel fitments and tyre size changes. See **Table 10-1-1**.

Tyres, wheels and hubs 10-3 Mudguards (cont.)

Note 1 Definitions

Mudguard means a fitting, inclusive of any portion of the vehicle and of any mudflaps attached, that serves to intercept material thrown up by a wheel more or less on the plane of the wheel.

Tyre tread means the portion of a tyre that contacts the road.

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.

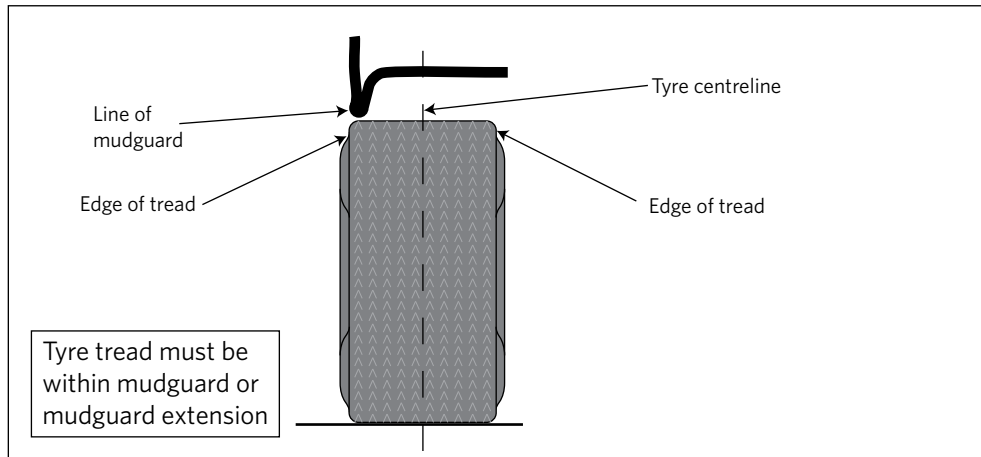


Figure 10-3-1. Size and position of mudguards which are incorporated into the body

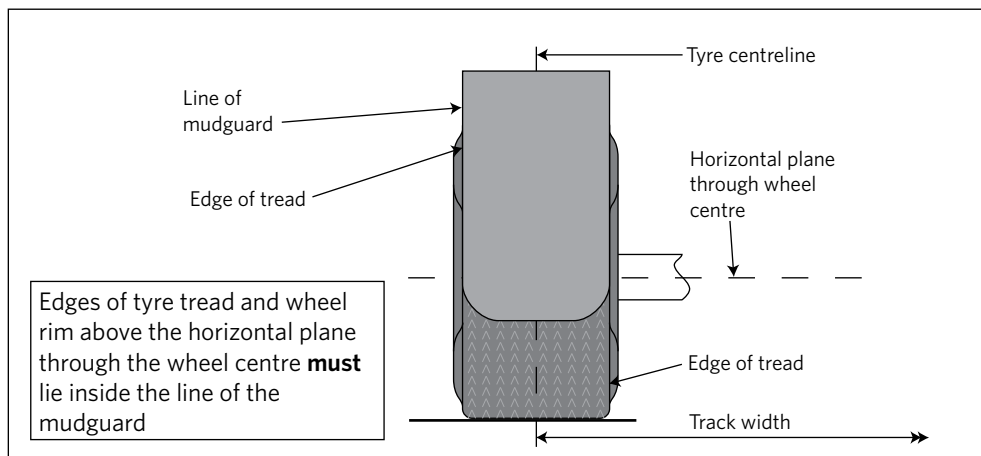


Figure 10-3-2. Size and position of individual mudguards