Vehicle Standards Information

9

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VSI 9 Rev 3 Oct 03

Guidelines for alternative wheels and tyres

Introduction

Changes to your car's wheels and tyres can alter its behaviour on the road. Because of this, there are limits to the changes that are permitted. These guidelines specify those limits. It is still the responsibility of the vehicle owner to ensure the vehicle remains safe even if modified within the limits. If you are unsure you should consult a signatory [see Vehicle Standards Information (VSI) No. 15 for a list of signatories].

Except in the case where the alternative wheels and tyres need to be certified by a signatory, there is no obligation to notify the Roads and Traffic Authority (RTA) when you fit alternative wheels or tyres. You should remember however, that it is your responsibility to ensure your car is safe at all times. If your alterations go beyond these guidelines, there is always the chance that you could be stopped by a police officer and issued with a fine and a defect notice for your vehicle. Unsafe modifications can also be detected at the annual inspection and the inspection station might then refer your vehicle to the RTA.

You should also be aware that modifications to your car could make the insurance cover void. Always check with your insurance company before you make any alteration to your car.

Tyre placard

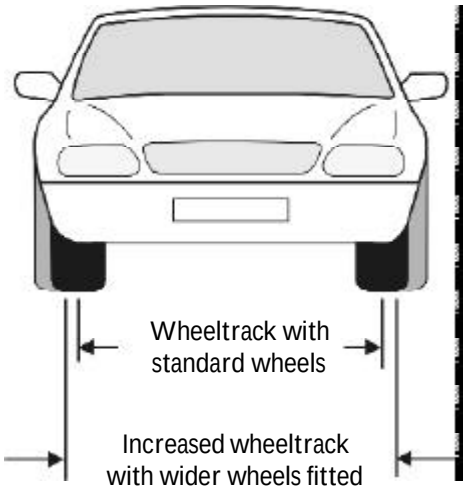
Road wheels and tyres are vital to your car's safety. Since 1971, strict design standards have been progressively introduced to specify wheel rims that will stop a deflated tyre from coming off the wheel, to specify strength, air pressures, speed ratings and allowable combinations of wheel and tyre sizes.

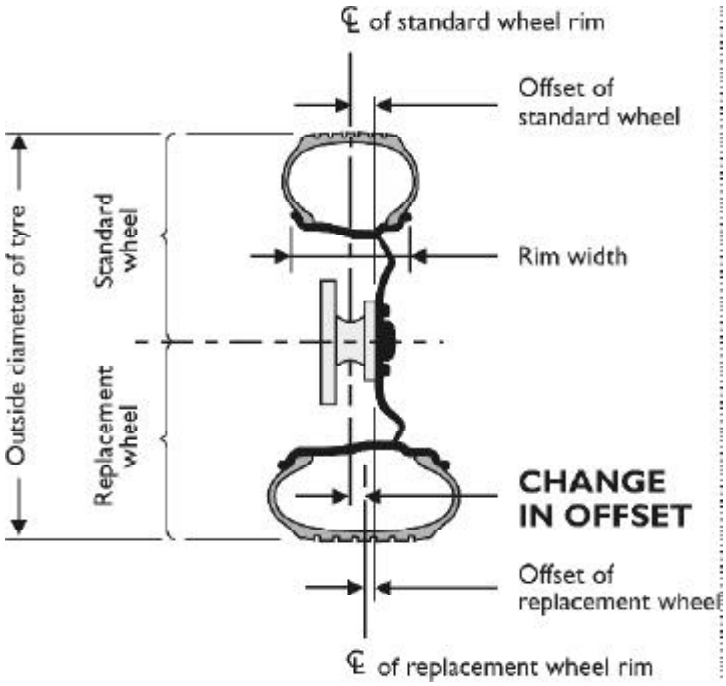
From 1973 all cars are fitted with a tyre placard (usually located in the glove box, the engine bay or on a door pillar) which specifies the wheel and tyre combinations recommended by the vehicle manufacturer. The placard also specifies load capacity, speed rating and the recommended air pressure of tyres.

Wheeltrack and wheel offset

Wheeltrack is the distance between your car's wheels; it is measured between the rim centrelines.

If you fit wider wheels you will probably increase wheeltrack and this is usually associated with a change in *wheel offset* increasing the loads on bearings, axles, suspension joints and steering tie rods.





Wheels

As a general rule, it is recommended you only fit wheels and tyres that are listed on the tyre placard or in the owner's handbook. These have been tested and proved for your car.

Sometimes the range of wheels listed by the manufacturer may appear to be limited. While it is recommended that you only fit these wheels, the RTA does not oppose the fitting of wheels outside the range providing they are safe for the vehicle.

An important requirement for all replacement wheels is that the wheel track must not be increased by more than 25mm beyond the maximum specified by the vehicle manufacturer for that vehicle.
Where non original axle or suspension components are fitted, the offset of the wheel in relation to the axle or stub axle assembly used shall not be increased by more than 12.5mm each side of the vehicle based on the specifications of the axle components used. If an axle assembly is shortened then the track width limit is taken as the axle manufacturers original track dimension, less the amount the assembly has been narrowed, plus 25mm.

If you are contemplating fitting non original axle or suspension components you should seek the guidance of a signatory as engineering certification will be required (see page 3).

Minor changes to wheels

Wheels up to 26mm wider than the largest optional wheel recommended by the vehicle manufacturer for the vehicle can be fitted without the need to notify the RTA.

The outside diameter of the wheel and tyre combination must be no more than 15mm over the largest diameter wheel and tyre combination specified for the vehicle and not more than 15mm below the smallest diameter wheel and tyre combination specified for the vehicle.

Replacement wheels requiring an engineering certificate

Wheels that exceed the diameter and width limits for minor wheel changes must be assessed by a signatory. If the signatory finds that the wheels are safe for your vehicle, you will be issued with an engineering certificate.

The vehicle owner must notify the RTA so that registration records can be updated. This is done by obtaining an "Adjustment of Records" and a "blue slip" from an Authorised Unregistered Vehicle Inspection Station (AUVIS). (contact the RTA Customer Service Centre on 13 22 13 for details of your nearest AUVIS).

The Adjustment of Records, blue slip and engineering certificate are then presented at a Motor Registry.

The owners copy of the engineering certificate is stamped and endorsed by the RTA and must be kept in the vehicle. This certificate must be presented to an authorised officer of the RTA or the Police when requested.

There are limits on the size of wheels that can be certified by a signatory. These limits are as follows:

Rear wheels

The maximum permitted rear rim width for a particular vehicle is determined by its unladen weight (10 litres of fuel, no occupants or luggage) in accordance with the following tables:

Vehicles built to comply with ADR 24 (after 1/1/1973 for passenger cars)

Unladen weight	Allowable rim width increase above the widest optional wheel available for the axle assembly used
Up to 800kg	26mm (1inch)
801 - 1200kg	39mm (1.5 inches)
1201kg & over	51mm (2 inches)

Note: 25mm increase in wheel track limit also applies

Vehicles that were not built to comply with ADR 24 (prior to 1973 for passenger cars)

Unladen weight	Maximum rim width
Up to 800kg	153mm (6 inches)
801 - 1000kg	178mm (7 inches)
1001 - 1200kg	204mm (8 inches)
1201 - 1400kg	229mm (9 inches)
1401kg & over	254mm (10 inches)

Note: 25mm increase in wheel track limit also applies

Front wheels

Front wheels shall be:

- No wider than the maximum permitted for rear wheels on your vehicle or 204mm (8 inches).
- No narrower than 70% of that fitted to the rear wheels.
- No narrower than a standard wheel fitted to the your vehicle as original equipment.

Front wheel drive vehicles

Except where the original manufacturer provides to the contrary, front wheel widths shall be no more than 26mm greater than the widest optional wheel offered by the vehicle manufacturer. This requirement also applies to four-wheel drive vehicles with constant front wheel drive.

Four wheel drive vehicles

Except where the original manufacturer provides to the contrary, the maximum width of front wheels is the lesser of the maximum width for rear wheels or 204mm (8 inches), the front and rear wheel widths must be the same.

Vehicles with diagonally split brake systems

Except where the original manufacturer provides to the contrary, the front and rear wheel widths must be the same. The front wheel offset (and front wheeltrack) must remain as original.

Additional requirements for replacement wheels

When wheels and tyres outside the manufacturers recommended range are fitted to a vehicle the following requirements must be met:

- The wheel rim width must not be less than the minimum width fitted by the vehicle manufacturer for the particular model.
- The wheel and tyre must be contained within the body work or mudguards (including any flares) when the wheels are in the straight ahead position.
- The wheel and tyre must not foul any part of the body or suspension under all operating conditions.
- All wheels and tyres fitted to an axle must be of the same carcass construction, diameter, offset, width and mounting configuration (except for spare wheels used in an emergency situation).
- The wheel must not prevent the wheel nuts from fully engaging their studs.
- The wheel rim must not have a circumferential weld other than that which attaches the rim to the wheel centre.
- The wheel must be one designed for the particular hub/axle in respect to bolt pitch circle diameter and wheel nut tapers. Wheels with slotted stud holes are not permitted.
- Speedometer accuracy must be maintained for the selected tyre and rim combination.
- The fitment of wheel spacers (or adaptors for dual wheel conversions) between the wheel mounting face and the road wheel is not permitted unless fitted as original equipment by the vehicle manufacturer.

Tyres

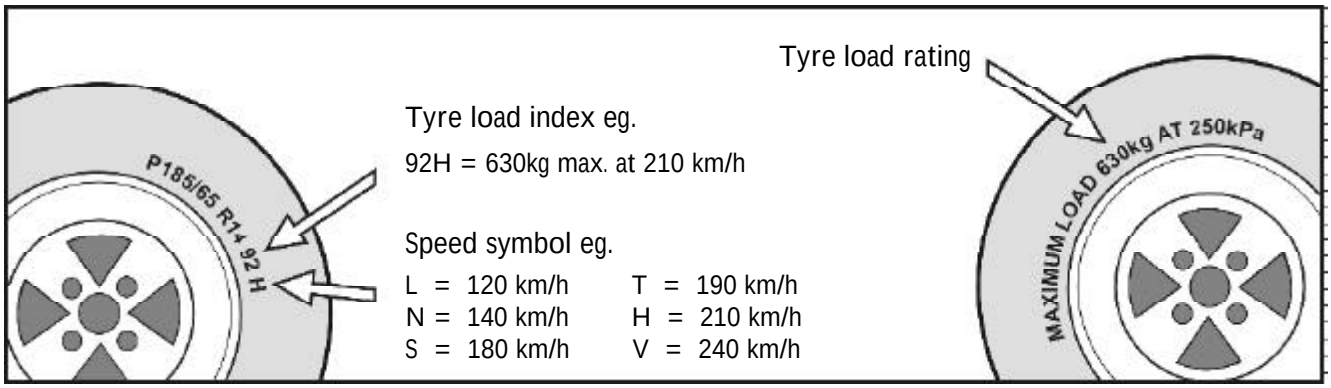
The tyre and rim industry sets standards for the correct combinations of wheels and tyres. If you are in doubt as to which tyres are acceptable alternatives for your car, ask your tyre dealer to check for you. The tyres you fit must correctly match your car's wheels.

If the wheels are listed on your car's tyre placard or in the owners handbook then the tyres you fit must be those listed on the placard or in the handbook for these wheels.

Don't mix tyre types or sizes if you can possibly avoid this. Never mix radials with cross-ply tyres on one axle. If you have only two radials, they must be on the rear wheels. Always make sure that both front tyres and both back tyres are the same.

Tyre load rating

Any replacement tyre must have a load rating equal to or better than the rating of the original tyres fitted by the vehicle manufacturer. This information is available from the tyre placard or the vehicle manufacturer.



Tyre speed rating

If the speed rating of the tyres specified for your vehicle is less than 140km/h you must not fit tyres with a lower speed rating.

It is strongly recommended that the speed rating of the tyres fitted should be equal to or better than the rating of the original tyres fitted by the vehicle manufacturer, however:

- If the speed rating of the tyres specified for your vehicle is higher than 140km/h, you may fit tyres with a lower speed rating but not lower than 140km/h.
- If the replacement tyres fitted, including winter tread tyres (commonly called "mud and snow" tyres) and retreaded tyres, have a speed rating less than that shown on the vehicle's tyre placard, a warning label must be affixed to the vehicle (usually by the tyre dealer) which states:

WARNING

This vehicle is fitted with tyres which have a lower speed rating than that specified on the tyre placard.

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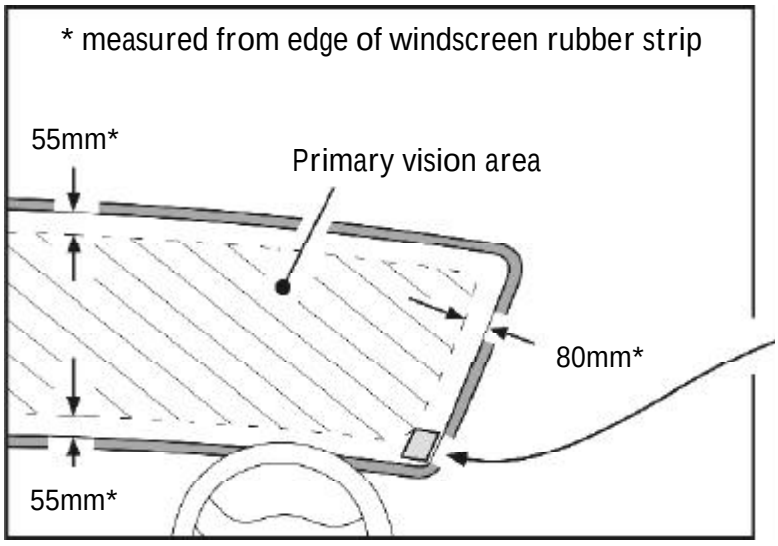
The label must be at least 40mm x 40mm in size, made of durable material, with not less than 2mm high black lettering on an orange coloured background.



The label must be located in an area conspicuous to the driver, usually on the inside of the windscreen, outside of the primary vision area, which is the area the driver normally looks through when driving the vehicle.

Check with your tyre dealer what the speed rating is for the tyre fitted to your vehicle and don't drive the vehicle in excess of this speed.

Retreaded tyres

NSW legislation requires that all retreaded tyres fitted to vehicles must comply with the provisions of Australian Standard AS 1973 (1976, 1985 or 1993). Tyres retreaded after November 1999 must comply with the provisions of Australian Standard AS 1973 (1993).

The standard requires among other things that the identity of the retreader, the words "RETREAD/REMOULD", "MAX. SPEED/SPEED LIMITED" and the tyres speed limit are permanently and legibly moulded on retreaded passenger car tyres. The retreader identity may be provided either by the name, registered trademark or other means, such as a code number assigned by the Motor Traders Association of NSW.

Speed limits for retreaded passenger car tyres are:
- 110 km/h for winter tread tyres
- 120 km/h for cross ply tyres
- 140 km/h for radial ply tyres

Space saver spare wheels and tyres

The design of some vehicles is such that there is insufficient space available to carry a conventional spare wheel and tyre. In order to avoid the possibility of a tyre puncture or failure rendering such a vehicle immobile, the manufacturer usually provides a temporary-use, space saver spare wheel.

There are two types of space saver wheels. The more common of these is a wheel and tyre combination with a narrower width. The second type is one incorporating a special tyre which, when not in use, is carried deflated on the rim and thus occupies much less space than a conventional tyre.

The durability, strength and traction of narrow space saver spare tyres are inferior to conventional tyres. With dissimilar tyres fitted, the handling and controllability of your vehicle can become unpredictable. Vehicle manufacturers design their space saver wheels and tyres to compensate for any imbalance so you should only use space savers that are supplied or recommended by the manufacturer of your vehicle.

Space saver wheels and tyres should only be used in emergency situations and for as short a distance as possible. When your damaged wheel or tyre is repaired, you should put it back on the vehicle immediately.

Regrooved tyres

Regrooved tyres must not be fitted to cars, panel vans, utilities or station wagons. Generally, regrooved tyres are acceptable on other types of vehicles providing that it is indicated on the sidewall that the tyres are suitable for regrooving.

Condition of tyres

- For vehicles with a GVM 4.5 tonnes or less, a tyre must have a tread pattern around its circumference that is at least 1.5mm deep across the entire surface which contacts the road.

- For all other vehicles, a tyre must have a tread pattern around its circumference that is at least 1.5mm deep across at least 75% of the tyre surface that contacts the road.

Tyres must not be used if there are any apparent defects that could make the vehicle unsafe (eg deep cuts, bulges, exposed cords or other signs of carcass failure).

Further information:

Tel: 1300 137 302 Fax: (02) 9843 3821

www.rta.nsw.gov.au Email: tech-enq@rta.nsw.gov.au

RTA Technical Enquiries PO Box 1120 PARRAMATTA NSW 2124