

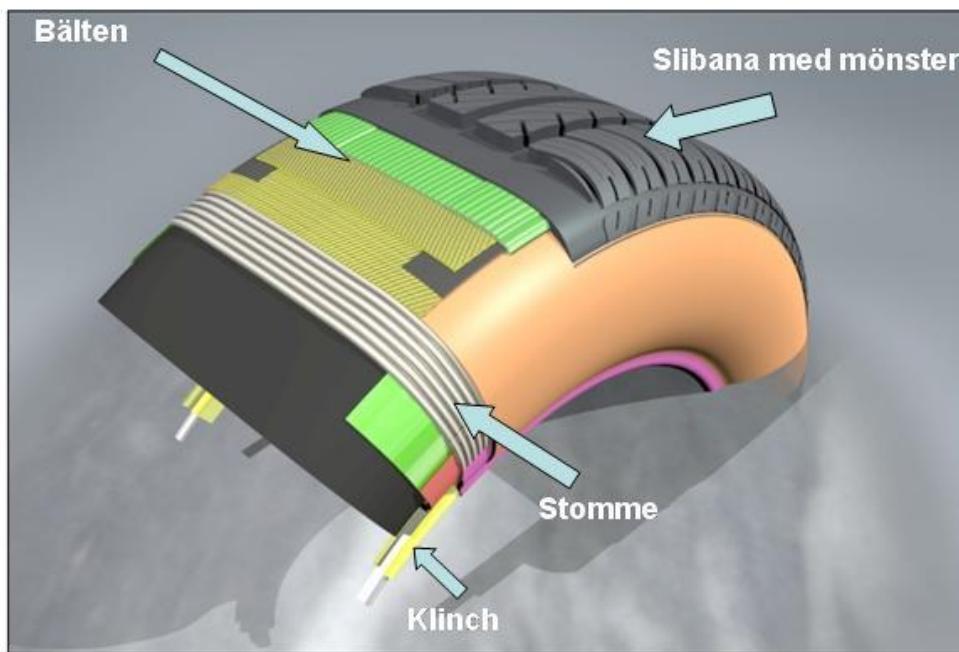
TIRE SCHOOL

Modern tyres provide comfortable cushioning compared with the old iron wheels. But the thing which makes movement more comfortable is not just the rubber material of the tyres but also the air they enclose. This pressurised air volume is also the reason why tyres are able to carry their load.

Construction

Modern passenger car tyres are constructed with textile cords arranged radially to the direction of travel, hence the name radial tyres. These so-called body plies are arranged in one or two layers and held together by several coatings of rubber. The radial tyre gives considerably better comfort than the old-fashioned cross-ply tyre, which has completely disappeared from the passenger car market. The soft carcass is stiffened by numerous belts lying diagonally and transversely to the body plies and which create stability in the tyre construction. These belts may be in steel (steel radial tyres) and/or textile material, e.g. polyester, rayon, nylon, Kevlar, etc.

The tread rubber consists of a combination of synthetic and natural rubber, depending on the properties required. Together with the pattern of the tread, the rubber ensures a safe grip on the road in all situations. The tread pattern is designed to give good water drainage and directional stability (longitudinal grooves), but also good driving and braking capacity (transverse grooves). Many modern tyres have far less rolling resistance than former models, as a result of special silica-based rubber mixtures and different belt structures



Tyre pressure

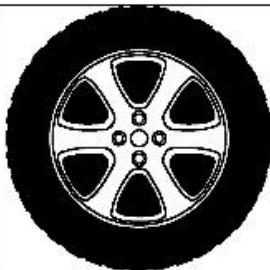
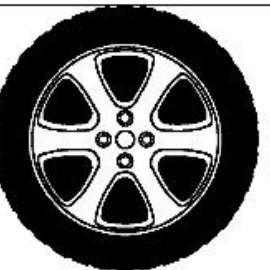
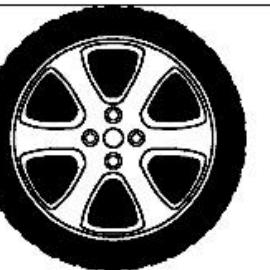
Modern-day tyres are exclusively supplied without inner tube. The inner rubber lining consists of an air-tight material which, in combination with the rim, keeps the air from escaping. The tyre's air pressure is responsible for maintaining the tyre's shape and helps to carry the load, so it is very important that it never falls too low.

You should take the manufacturer's recommended tyre pressure as the absolute minimum (rather like the lowest line on a dipstick). If you only check the air pressure now and again, or if you sometimes drive with a load, it is a good idea to fill the tyres with an extra 0.2-0.3 bar, as this will have a positive effect on lifespan.

Dimensions

Tyre size is expressed in mm, % and inches. Example: 195/65R15. This may seem illogical with today's mania for uniformity, but there are historical reasons. The width of the tyre at the widest point is given in millimetres, the height is expressed as a percentage of the width and the diameter of the rim is measured as a code which previously corresponded to a figure in inches. The R stands for Radial.

When changing a tyre and rim dimension, you must take account of the wheel's rolling circumference (RC) and not least the original loading index (LI). Tyres and rim dimensions may be changed if the wheel does not extend outside the original wheel arch after changing and it does not touch any part of the chassis under full deflection or full turning of the steering wheel. However, such changes are not allowed if this would result in a severe change to the car's driving performance, as this would be illegal. If you keep to the original tyre and rim dimensions or dimensions which are very close to these, changing the wheel should not be a problem.

195/65R15	205/55R16	225/45R17	225/40R18
Std	+ 1"	+ 2"	+ 3"
			
65	55	45	40

Loading and speed

The tyre's loading capacity is given by numbers directly following the dimensional designation.

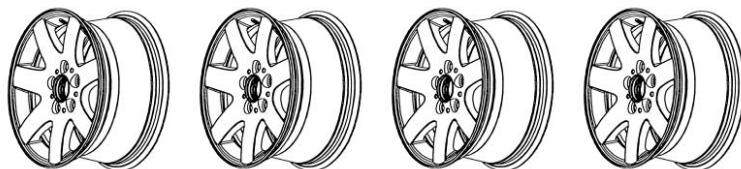
Example:

195/65R15 91H91 stands for the maximum load weight which the tyre can bear at reference pressure 250 kPa (290 kPa for Extra Load), and can be used directly for trailers vehicles, while for cars, the load of the original tyres here functions as a minimum.

The letter H in this case indicates the maximum long-term speed the tyre can tolerate ($H = 210 \text{ km/h}$). It also gives an impression of the tyre's other properties, such as grip, directional stability, rolling resistance, wet grip, aquaplaning properties, etc. See table below.

Speed rating	km/t	Load rating	Kg	Load rating	Kg
Q	160	79	437	91	615
R	170	80	450	92	630
S	180	81	462	93	650
T	190	82	475	94	670
H	210	83	487	95	690
V	240	84	500	96	710
W	270	85	515	97	730
Y	300	86	530	98	750
ZR	>240	87	545	99	775
ZR + Y	>300	88	560	100	800
		89	580	101	825
		90	600	102	850

Rims



The rims, or wheels to be precise, are available in many different models. The rim size is given as inches. Example: 6Jx15 (width, type of rim edge and diameter).

There are two main types of rim: steel and alloy. Steel rims are the commonest and mounted as standard on most vehicles. Alloy rims have become very common and are now fitted as the original wheel on many vehicles. They are often used to achieve special properties, as they are somewhat lighter, more durable and round. However, the normal reason is purely aesthetic.

Steel rims can be replaced by alloy rims without problem providing you take into account the rim's offset. Offset is the distance from the hub mounting surface to the centre line of the wheel and is usually marked on the rim.

Example: 6Jx15 ET45

This means that the mounting surface lies 45 mm outside the rim's centre line, and if you change to a rim with a lower offset figure, the rim will be correspondingly wider. A change in the offset may lead to a drastic change in the car's road-holding properties, often for the worse. Again, if you change the width, you must check that there is sufficient space for the wheel.

When mounting the rim on the vehicle, it is very important to ensure that the mounting surfaces on the wheel hub and the rim are perfectly clean. Only lubricate the mounting surface on the hub and use some type of heat-resistant grease (not copper paste). Screws and nuts should not be lubricated but be well cleaned. Screws must always be tightened to a particular torque. Nut tighteners must not be used under any circumstances, instead use a

torque wrench. More rims work loose through being tightened too much than tightened too little.



Standard rubber valves designed for passenger cars have a maximum pressure of 450 kPa with hot tyres. Vans, mobile homes and caravans with C-tyres must have a screw (metal) valve or a special high-pressure valve, if tyre pressure exceeds 450 kPa with a hot tyre. If ordinary car valves are used, there is a high risk of them starting to leak air at high pressures. It is a good rule never to use car valves on C-tyres.



Storage

Tyres will normally only age to a minimal extent before being taken into use. It is important to store tyres correctly to avoid the storage having a negative effect on the tyres. A tyre which is correctly stored will have fully satisfactory properties after 3-5 years, and may be regarded as new. The actual ageing process only starts when the tyre is taken into use.

Tyres are sensitive to high heat and sunlight (ozone). They must be stored in cool, dark and dry conditions. It is thus directly harmful to store them in boiler rooms, steel containers or

outdoors. Loose tyres must be stored vertically, while tyres mounted on rims may be stored horizontally. Avoid the use of strong solvents or so-called tyre paint for cleaning and maintaining the tyres, as these are directly damaging to the rubber. If you want a clean, black surface, any type of wax shampoo will do.

Sometimes you will see the wheels of caravans being protected by a covering disk. This naturally protects against sunlight and rain, but creates a kind of oven for the tyre, which can be almost as harmful. Make sure that the tyres are ventilated by drilling holes in the disk. Once a tyre has reached 5-6 years, you should examine it carefully and change it if you see cracks or damage, even if the tread is still OK. The age of the tyre is marked on one side of the tyre close to the rim. You will often see the designation DOT followed by numerous characters. The final digits denote the week and year of manufacture.

Example:

DOT XN MO XKNL 1118

The tyre was manufactured in Week 11 in 2018. If the tyre just has three digits, it was manufactured before 2000. The first two digits denote the week and the third the year. Often (not always), the digits are followed by a character for tyres manufactured in the 90's.
More information on tyres and rims is given on www.stro.se

Terminology picture text

Belts (Bälten)

Tread with pattern (Slitbana med mönster)

Carcass (Stomme)

Bead (Klinch)