

Wheels

The wheel is part of the wheel and tyre system and its primary job is to support and transmit the forces between the hub and the tyres.

Function

The wheel and tyre system - i.e. the combination of wheels and tyres - is the only link between the road and the vehicle chassis. The system has to transmit the braking force and the acceleration force, as well as cornering forces and lifting force via the tyres' tread contact area.

For cars alloy wheels made of aluminium, or more rarely magnesium, are widely used. More economical steel wheels are also still being used.

Colloquially, the wheel is often referred to as the rim but this is actually only one part of the wheel. The wheel actually consists of the rim and the wheel disc, which form a single unit. The rim is made up of the bead seat, hump, flange, well and valve hole. It must be shaped in such a way that the tyre beads are always retained on the bead seats: outward curved "flanges" enable the tyre to cling securely to the rim under its internal pressure.

Rim designations are standardised. For example, 8J× 17 H2 ET15, LK 5×120 MZ57 would be the designation for a rim with the following properties:

- 8: Width in inches
- J: Flange contour (other contours: H, P, K, JK etc.)
- x: One-piece wheel
- 17: Rim diameter in inches
- H2: In this case, hump on both sides
- ET15: Wheel offset (+)15 mm
- LK: Bolt circle of wheel
- 5x: 5 bolt holes
- 120: Diameter of bolt circles in mm
- MZ: Central hole centring in mm, here: 57 mm

The wheel is secured on the flange of the rotating wheel hub using wheel nuts or wheel bolts. For modern vehicle designs, the wheel offset (ET) is an important figure. The offset describes the distance from the centre of the rim of the disc wheel to the inner mounting surface of the wheel disc on the hub flange, and can be positive or negative. It may only be changed slightly due to changes in the axle geometry.

When fitting tyres on the rim, the following must be observed:

- To prevent contact corrosion between steel wheel hubs and alloy wheels, the wheel hub flange should be coated with a special wheel hub paste before fitting the alloy wheel.
- The tyres and rim must have the same diameter and must be approved as a combination for the relevant vehicle type.

Safety

Like the tyres, the wheel is a safety critical part which is subject to mandatory type approval. Vehicle manufacturers must ensure that the wheel and tyre combinations fitted and approved are optimally adapted for the relevant vehicles. All permitted wheel and tyre combinations are listed on the CoC document. CoC stands for “Certificate of Conformity”, also known as the EC Conformity Certificate. The wheel manufacturer must confirm that the wheel has sufficient strength for the specific application.

Aluminium wheels can only be repaired if the degree of damage allows it. One-piece wheels can only be treated superficially by polishing up the surface of the wheel. More significant damage can only be repaired on two or three-piece wheels, by replacing the defective part. As a general rule: Severe damage or cracks mean that the wheel has to be replaced.

Value retention

Stubborn dirt can clog the wheel and accumulate if it is not carefully removed on a regular basis. Acid-free special cleaners are particularly good for people, the material and the environment. Aggressive cleaners can cause corrosion to the wheel bolts and other metallic surfaces of the wheel.



Continental

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