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Technical tip: 02/2017

OPTIMAL's shock absorbers are of outstanding quality.

Indicators of safe, high-quality shock absorbers

Shock absorbers and suspension springs work in tandem with the wheel suspension and car body to ensure a vehicle remains safely and well-positioned on the road. The role of shock absorbers is to attenuate the energy generated by the vibrations of the springs. Strictly speaking, "shock absorbers" should therefore actually be called "vibration absorbers". Our technical tip explains everything you need to look out for.



Background:

Due to their higher engine power and speed, modern cars place increasing demands on the suspension system. This has resulted in the development of sophisticated suspension technology which is perfectly tailored to the vehicle in order to prevent powerful vibrations from the road surface from reaching the passenger compartment. A variety of parts are responsible for absorbing and reducing this kinetic energy. The most important of these are **suspension springs** and **shock absorbers**.

In principle, **suspension springs** are used to bear the weight of car bodies. These springs absorb the shock created by uneven road surfaces and ensure that vehicles maintain safe contact with the road. However, each spring has its own pattern of oscillations, which may build up very rapidly at certain frequency ranges.

This is where **shock absorbers** come in. This commonly used term is not strictly correct, however, because instead of absorbing shock, shock absorbers actually reduce the vibrations of suspension springs.

The development of electronic driver assistance systems has resulted in shock absorbers playing an increasingly important role in vehicle safety. Certain quality standards must therefore be fulfilled, not only to ensure greater passenger comfort, but also to improve vehicle road safety.

In particular, high-quality shock absorbers have the following safety features:

- Lower vehicle braking distance
- Greater stability on bends
- Better traction on uneven road surfaces
- ABS system remains fully functional
- Headlights do not turn up
- Wheel suspension, wheel bearings and suspension springs have longer service lives



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For maximum safety on the road, OPTIMAL's technical experts therefore recommend purchasing high-quality shock absorbers. These can be identified by the following characteristics:

Comments on the OPTIMAL product:	OPTIMAL's shock absorbers:	Examples of poor quality:	Comments:
The upper part of the shock absorber's piston rod should be coated, as is the case on OPTIMAL's shock absorbers (see photo to the right). Otherwise, the piston rod is much less resistant to corrosion.			The product shown here does not have a surface coating.
A rebound stop, which is fitted to the piston rod with six spot welds, acts as a non-detachable, high-quality and secure stop limiter.			A shrunk-on rebound stop is of lower quality and is less secure because it can become detached from the piston rod.
To ensure that its shock absorbers are as long-lasting as possible, OPTIMAL uses NOK double seals.			In contrast to OPTIMAL's parts, a single shock absorber seal is used here, which reduces the service life of the component.
The PTFE/Teflon seal on the shock absorber piston ensures a very low friction coefficient and therefore has a minimal initial breakaway torque, since the static friction is just as high as the kinetic friction. This means that there is no resistance during the transition from standstill to motion.			The sintered metal seal has a high friction coefficient, making it more susceptible to wear and tear. After some time, this may lead to greater oil flow in the worn part of the tube, weakening the damping forces and causing the part to completely stop working sooner.

Important information about replacing shock absorbers:

Make sure that you always replace shock absorbers in axle pairs. Since new shock absorbers have much greater damping forces than old shock absorbers, replacing them on just one side would result in vehicles becoming unstable on the road.

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