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The design attitude describes the distance from the vehicle body to the ground when the suspension is compressed by a load situation defined by the vehicle maker. The correct installation position will prevent premature wear due to excessive, one-sided friction on the piston rod/sealant pairing. But what happens if the vehicle's design attitude is changed by a lowering procedure for sporting purposes, for example? Service engineer Peter Orosz recommends that “in such

Figure 1: Severe joint wear following four weeks of driving with an incorrectly fixed link.

Figure 2: Precise measurement of the design position is essential.

Figure 3: Checking once again that the vehicle has been lowered to 33 centimeters.

It's good to relax

Stress – in people or in cars – is a widespread scourge of our times. Experienced mechanics know that shock absorbers have to be installed in vehicles without trapped stresses, i.e. in the design attitude.

cases, you should first bring the vehicle to its changed design attitude before tightening the shock absorber attachments.” But this precaution alone is not enough. Modern vehicles in particular are equipped with a large number of axle links, many of which are attached with elastic bearings to enhance vehicle safety and comfort. These bearings and attachment points are also designed for the specified design attitude.

If the vehicle is lowered, the design attitude is shifted downward. If the mechanic fails to temporarily loosen the corresponding links so they can adjust to the new position, the elasticity of the attachment bearings will already be maximally utilized before the dampers are compressed. When the dampers later have to compress during a driving maneuver, these elasto-kinetic bearings will be strained and permanently damaged. Fatigue cracks will form (Figure 1). If these bearings can no longer perform their precision guide functions, they will be a safety hazard. Moreover, noise levels will increase.

That is why Peter Orosz recommends

loosening all link attachments on both the wheel side and the vehicle-body side when doing suspension work. After the new suspension components are installed, the wheels should first be mounted provisionally without tightening the attachments on the wheel-guiding elements. The vehicle should then be placed on its wheels with the specified empty weight for the design attitude. By measuring the distance from the center of the wheel hub to the wheel cutout on the fender (Figure 2) – this example shows 33 cm now and 37 cm before – you can find the new design attitude. To complete the installation, the link attachments can then be tightened for this design attitude.

If this is not practical for reasons of space, the vehicle can be raised without its wheels. But here you should be careful to position the wheel carrier to the body in such a way that the new design attitude – i.e. 33 cm – is achieved once again (Figure 3). Now all the links guiding the wheel can be fixed with the specified tightening torques, and nothing will stand in the way of sports-oriented driving pleasure.



Figure 1



Figure 2



Figure 3