Press Release

Lighting in Vehicles

An important topic for 100 years: Seeing and being seen in road traffic

- As early as 1928, DEKRA pointed out the importance of vehicle lighting
- Many fatal crashes happen in the dark
- Retrofitting is possible within the limits of specific regulations

Frequent drivers know that nothing is more tiring than long night drives. And if the headlights aren't working properly, it can quickly become dangerous – especially for pedestrians, who are often spotted too late on country roads or in towns. One thing is clear: driving with defective or incorrectly adjusted lights endangers yourself and others. A glance at the "DEKRA Magazine" from the 1920s shows that this is not a new issue.

At dusk, in fog or rain, it becomes clear how well the headlights work and whether they illuminate the road sufficiently without dazzling oncoming traffic. Many drivers take this issue too lightly and drive with defective or incorrectly adjusted lights. Many vehicles have defects in the lighting system – particularly in the low beams, which play the most important role in seeing and being seen.

As early as 1928 and 1929, the "DEKRA Magazine" wrote:

> *"Motorists don't just need bright lights; they also need reliable lights that will never let them down. Their lives depend on it. Today, headlights are also subject to very high standards. They should not only provide high light output, but also be durable and nice to look at."*

> *"Every vehicle must be equipped with at least two brightly burning lanterns of the same height, indicating the lateral limits of the vehicle, with colorless or slightly yellow glass, which project the light onto the road in such a way that the driver can see the road at least 20 meters [~22 yards] in front of the vehicle."*

Low beam is the most important light on a car in darkness and poor weather conditions. It illuminates the road without dazzling oncoming traffic. In cloudy weather, rain or fog, it is advisable to switch on the low beam even during the day –

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this significantly improves visibility. Daytime running lights or parking lights alone are not sufficient for this purpose.

In 1928, DEKRA explained the German legal situation at the time regarding when lights should be switched on:

> *"In the past, there were conflicting views on the interpretation of the term 'darkness'. These have been clearly resolved by the new regulation; now it is not the actual conditions that are decisive, but the calendar. Whether darkness actually sets in earlier or lasts longer is irrelevant."*

That was the regulation at the time. As a guide, DEKRA published an annual calendar with sunrise and sunset times that drivers should follow. However, there is no question that it makes more sense to switch the lights on or off based on the actual conditions.

In modern vehicles, this is much more convenient thanks to automatic lighting. However, even this does not always work perfectly. In diffuse light, when driving through tunnels or in fog, it sometimes reacts too late or not at all. In such situations, the driver should therefore switch on the lights manually.

Using high beams, fog lights, and other lights correctly

High beams shine much farther than low beams but should only be used when there is no oncoming traffic. In fog or heavy snowfall, they are actually counterproductive: the fine water crystals in the air or the snowflakes scatter and reflect the light, which impairs visibility.

In such situations, it is better to switch on the fog lights. They shine diagonally onto the road directly in front of the car. The very bright rear fog light should only be used in very bad visibility – in some countries it is only allowed to be used when visibility is less than 50 meters (55 yards). As soon as visibility improves, it should be switched off again so as not to dazzle following motorists.

Not all light is the same

Lighting technology in vehicles has advanced dramatically in every respect over the past 20 years: from cornering and turning lights to sophisticated LED matrix lights that detect oncoming vehicles and pointedly avoid glare while illuminating the area around. This system latter consist of many LEDs that are controlled individually. Put simply, the headlight switches individual LEDs on and off up to 100 times per second, depending on where light is needed and where it is not. This ensures that the car always illuminates the road optimally without dazzling oncoming vehicles or

pedestrians – even in curves. The advantage for the driver: They don't have to manually switch the high beams on and off, always have optimal lighting conditions, and reduce fatigue.

Retrofitting modern bulbs

In many older vehicles, standard halogen bulbs can be retrofitted with brighter lights. Often, H4 or H7 bulbs can even be replaced with LEDs, if the replacement complies with the applicable regulations. These vary slightly from country to country. If LED lights can be used, they are usually far superior to older halogen lights. They provide significantly better and more even illumination of the road – a clear advantage when it comes to noticing pedestrians or cyclists, for example.

About DEKRA

For 100 years, DEKRA has been a trusted name in safety. Founded in 1925 with the original goal of improving road safety through vehicle inspections, DEKRA has grown to become the world's largest independent, non-listed expert organization in the field of testing, inspection, and certification. Today, as a global partner, the company supports its customers with comprehensive services and solutions to drive safety and sustainability forward—fully aligned with DEKRA's anniversary motto, "Securing the Future." In 2024, DEKRA generated revenue of 4.3 billion euros. Around 48,000 employees are providing qualified and independent expert services in approximately 60 countries across five continents. DEKRA holds a Platinum rating from EcoVadis, placing it among the top 1% of the world's most sustainable companies.