

Tips & Technology

For Bosch Partners

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BOSCH

Invented for Life

Electrics/electronics

Headlamp adjustment

Causes of decreasing light output

Automotive manufacturers install dipped beam/high beam headlamps as standard, to ensure both maximum range of vision and minimum dazzle for oncoming traffic, and to provide good illumination at close range and on bends. The power of the lighting may diminish over time, and there can be various reasons for this:

- **Connectors:**
Dips in voltage can occur due to corroded connectors between the alternator and the headlamp.
- **Bulbs**
The light output of bulbs fades over time.
- **Lens or outer lens**
This can be dimmed by stone chippings or corrosion. Minute pitting breaks up the light and increases glare.
- **Headlamps:**
The light performance can decline - by up to 50% within 5 years in some models. This is caused by environmental influences and dirt from the road surface.
- **Headlamp adjustment**
Headlamps that are aimed too high or too low deliver a considerably smaller range of vision, or dazzle oncoming traffic.

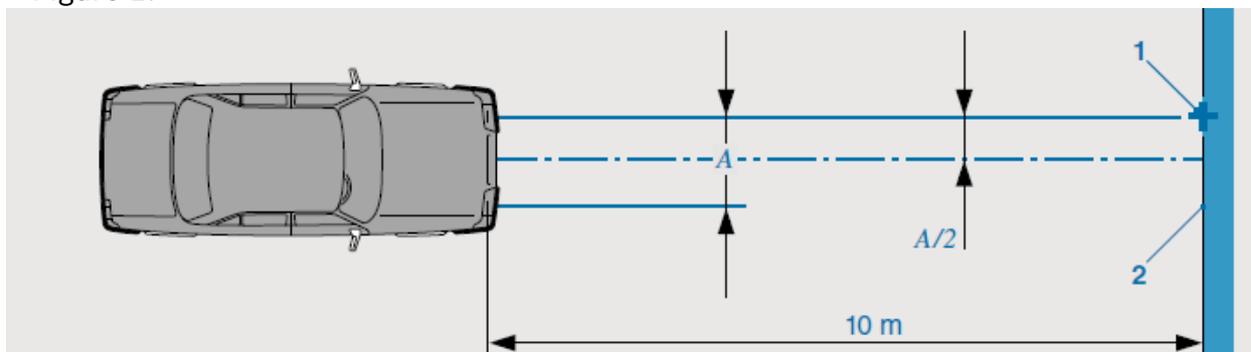


Preparations for headlamp adjustment

Before adjusting the headlamps, please perform the following steps:

- Examine the area surrounding the headlamp for damage or deformation
- Park the vehicle on a level surface
- Make sure the tire pressure is at the specified level
- Load the vehicle with a weight of 75 kg on the driver's seat, then roll the vehicle a few meters to allow the suspension to settle after loading
- If adjusting headlamps without an aim tester, arrange the test surface 10 m away from the vehicle such that the central mark in the direction of travel is in front of the headlamp being adjusted (see Figure 1)

Figure 1:



1 Central mark

2 Test surface

A Distance from headlamp center to headlamp center

Adjusting headlamps

Switch on the headlamps and set to dipped beam.

If the vehicle has manual headlamp range control, set it to the prescribed basic setting before adjustment. In older vehicles this is above the headlamp; more modern vehicles have a switch next to the light switch.

For vehicles with automatic headlamp range control, always follow the manufacturer's instructions.

Set the correct angle of inclination as per the manufacturer's instructions. This information is mostly near or directly on the headlamp. If the required angle of inclination is 1.2%, for example, the light at a distance of 10 meters must be lowered by 12 cm. Fog lamps should be set to 2%.

Adjust headlamps individually. Cover the other headlamp. First adjust the headlamp vertically, then horizontally. This is generally done via two adjusting screws, which are turned either by hand or using a hexagonal or Phillips screwdriver.

Xenon headlamps can only be tested and adjusted using a diagnostic tester.

Headlamp adjustment using a tester

Headlamp aim testers consist of a simple lens and an aiming screen rigidly connected to this lens, which bears the necessary marking for adjustment. The user can read this marking through a viewing window.

The light distribution of the headlamp is shown on the aiming screen. The illuminance is measured by means of a photo diode and a display instrument.

Move the device in front of the headlamp under test, and ensure it is parallel with the car. Its distance from the vehicle should be between 30 and 70 cm. It is vital to preset the correct angle of inclination on the tester in order to ensure correct adjustment of the vehicle headlamp. Set the prescribed setting dimension for the headlamps, i.e. the inclination relative to the headlamp's central axis, stated in cm at a distance of 10 m, by adjusting the aiming screen using a rotary knob. Align the center of the lens with the center of the headlamp. There is an upwards and lateral tolerance of 3 cm maximum.

Once the light-dark cutoff of the dipped beam has been set correctly, the center of the high beam (when the dipped and high beam are adjusted together) must lie within the corner limits on the aiming screen. Adjust the fog lamps.

A rail system ensures the most accurate testing, as it ensures the device is always parallel to the vehicle.