

# Tips and tricks for the workshop

## Changing vehicle bulbs, relays and fuses on commercial vehicles

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Bosch Trucklight Maxlife bulbs for commercial vehicles

Anyone driving a commercial vehicle by profession, has the primary goal to complete the delivery order quickly and reliably. This is above all, because delays could cause unforeseen costs. And that's what every „commercial vehicle captain“ wants to avoid for his clients and himself.

Some minor malfunctions are easy to prepare for. These include failures of vehicle bulbs, relays and fuses. In all three cases, driving interruptions can occur. Be it that something ceases to work or the stop due to a traffic control hinders the continuation of the journey. Such delays cost time and are avoidable. **The most important tip is therefore: Always have a replacement ready!**

### Vehicle bulbs are wearing parts

Modern vehicle bulbs are designed for high light output, which they deliver excellently over a certain period of time. However, due to their design, no filament lasts forever. In continuous use, the filament wears out and the bulb naturally loses its luminosity. Should it fail, it is important to have the right bulb on hand as a replacement. It is therefore advisable to keep spare bulbs in the vehicle. This increases safety for the carrier, vehicle and load. At the same time it ensures compliance with legal regulations.

### Fast and easy bulb replacement

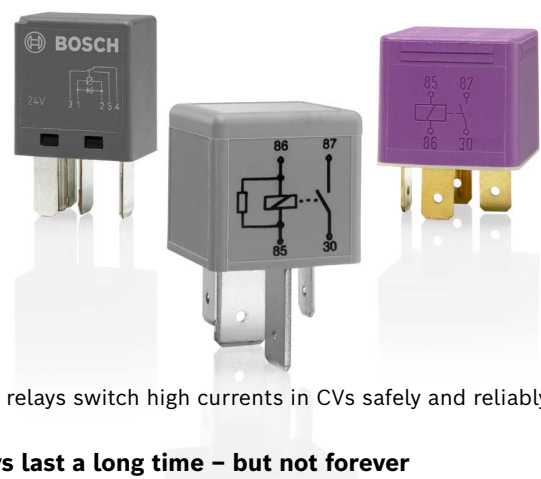
When changing vehicle bulbs, some basic precautions have to be observed: The method of bulb replacement varies by vehicle. The manufacturer's information on this is usually provided in the operating manual.

It is important to use gloves or a soft cloth when carrying out the work – for two reasons:

- A bulb that has just been switched off can be very hot and cause burns.
- If the glass of the bulb is touched with fingers, this may shorten its lifetime.

### Changing vehicle bulbs:

- Switch off ignition and light.
- Detach headlight and fold forward so that the rear is accessible – depending on vehicle type.
- Remove old bulb from mounting bracket.
- Install new bulb.



Bosch relays switch high currents in CVs safely and reliably

### Relays last a long time – but not forever

If an electrical consumer in the vehicle does not work, this may be due to a defective relay. To replace a relay, a screwdriver and a replacement relay are needed, depending on the installation method.

Relays are electromagnetic switches that convert low current into high working current in the vehicle, thus enabling the function of lamps and electrical components.

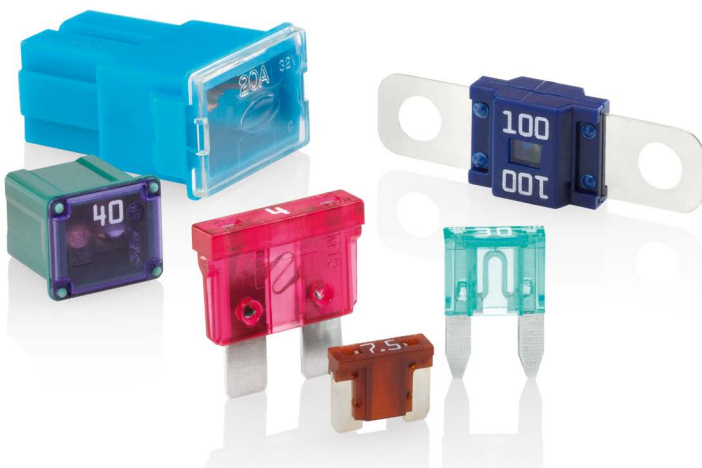
Before replacing the relay, always disconnect the battery to prevent it from discharging. The installation locations of the relays usually are specified in the operating manual. They are often located in a box in the engine compartment or on the left below the steering wheel.

Usually a wiring diagram on the panel shows the location of each relay. This helps identify the correct relay. In most cases, relays are plugged in. If they are firmly seated, take care to avoid damages. If a screwdriver can be inserted underneath without touching other relays, the relay is carefully lifted alternately on both sides and finally pulled out by hand.

### Check relay for function by replacement

For testing, the relay is replaced by an identical one from the relay box and the battery is briefly reconnected. If, after this test, the associated component is working again, the relay must be replaced. If the component does not function despite replacement, the old relays must be reinstalled at the original locations. Afterwards, the function of the relay used for testing must be checked to ensure that it has not been damaged.

After this procedure, the relay box can be closed and the battery can be reconnected.



Bosch fuses protect lines and devices from overload and short circuit

### Possible causes of blown fuses

Fuses work as circuit breakers for the electrical voltage in the vehicle. They interrupt the circuit in the event of an overvoltage or impending short circuit. A defective fuse can make itself felt in different ways. Fuses often blow without warning due to oxidation-related wear and tear.

wear and tear. They can then be replaced without any problems. If a part of the electronics, for example the windshield wiper, the windshield heater or the radio, suddenly stops working, the root cause is not necessarily a technical defect. A possible reason might be a blown fuse due to overheating. This has then to be replaced with a new one.

### Locate the fuse box in the vehicle

Depending on the vehicle model, the fuse box can be located in the engine compartment, on the side of the cockpit or in the instrument panel area behind a cover. Information on this can be found in the operating manual.

### Check fuses with the multimeter

A circuit diagram printed on the inside of the fuse box shows the assignment of the individual fuses. A defective fuse is usually visible to the naked eye, because the transparent plastic insulation or the flat plug is blackened or charred. The metal wire inside may also be cracked or burned through. If the condition is not clear, checking with a multimeter might help.

## Changing the fuse in just a few steps:

- Locate the fuse box using the operation manual. In most vehicles, this is located in the engine compartment, on the side of the cockpit or in the instrument panel area behind a cover.
- Disconnect the car battery to prevent electric shocks while working on the fuses.
- Use long flat-nose pliers or tweezers to avoid damaging other fuses.
- Pull out the blown fuse using flat-nose pliers or tweezers.
- Insert a new fuse of the same type (and color) between the spring terminals.
- Carefully tighten the terminals without bending them.

**Attention:** A defective fuse must always be replaced by a fuse of the same type. Wrong strength may cause short circuits or fire.