



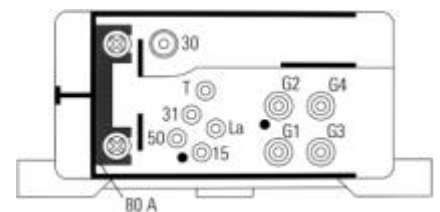
## Preheating relays

### General

Preheating relays provide switching and control of glow plugs. Activation and operation duration are mostly influenced by the position of the ignition switch or activity of the door lock and a temperature sensor.

### Function

Through the engine temperature sensor the relay recognizes whether and how long a glow operation should last. Preheating time and/or start readiness are signalled from one or more control lamps which are controlled by the preheating relay. With modern systems the supervision of the parallel connected glow plugs is carried out via reed-contacts which remain open with faulty plugs, due to the spool current not generating a magnetic field. It is also possible to show the failure visually. The preheating relay makes it possible for glow to continue during the start phase and beyond. The consequence of this operation is a quieter engine idle and lower pollution.



### Effects of failure

A faulty preheating relay can have the following effects:

- Preheating control lamp doesn't light or remains on longer than normal
- Engine starts badly or not at all
- Excessive smoke when starting
- Fault code present

Possible causes of failure :

- Switch contacts worn out
- Internal short circuit
- Missing voltage/ground (earth)
- Plug connection contact fault



- Open circuit
- Short circuit

## Diagnostics

1. Check electrical connection and wires to the relay for correct fitting, open circuit, short circuit and corrosion
2. Check supply voltage and ground (earth) connection
3. Read out the fault memory (if possible)
4. Test the temperature sensor
5. Check preheating control lamp
6. Check ignition starter switch
7. Test output signal/voltage

### Note:

The picture shows a standard connection and a standard wiring diagram. These can vary depending on vehicle manufacturer, type and added features (cold start valve, air-conditioning, full throttle switch). When testing, the manufacturer and vehicle specific wiring diagrams have to be taken into account.

