



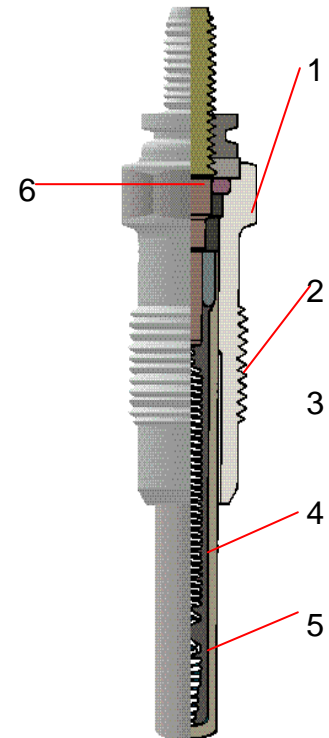
Glow plugs

General

Diesel engines require an extra heat source to reach the necessary ignition temperature of the diesel fuel/air mixture when lower outside temperatures exist. This is the function of the pre-heater system and the use of Glow plugs as the heat source.

Function

By applying a voltage to the glow plug, the heater coil is heated up. The temperature at the glow plug point reaches up to 850 °C. With the rising temperature the regulator coil is also heated up. The regulator coil is in series with the heater coil and works as a PTC resistor. With rising temperature the resistance is also increasing and the current reduces. This causes the temperature of the heater coil be constant (prevailing temperature) and damage through overheating can be avoided. Glow plugs using this principle are called a Self Regulating sheathed glow plug.



1. Housing
2. Thread
3. Isolation
4. Filament
5. Glow tube
6. Seal

Effects of failure

Faulty glow plugs can cause the following:

- difficult or no engine start when the temperature is low
- excessive smoke after starting
- rough idling when the engine is cold

Causes of failure:

- coil open circuit
- overheating of the heating rod
- no or not enough supply voltage





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Diagnostics

For fault recognition consider the following system checks:

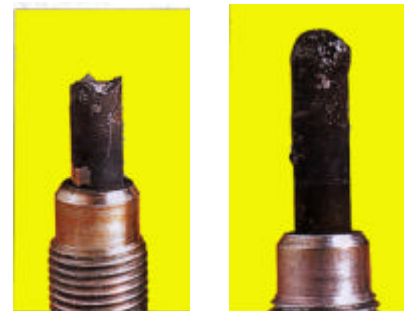
1. At first check the supply voltage at the glow plugs to exclude other faulty parts.
2. Measurement of the current strength, the initial current from cold, at all glow plugs together, is about 60 amps (4cyl. engine, all required data can be found in the Hella glow plug spare parts catalogue).
3. The current should decrease steadily. If not then a timer fault should be assured.
4. If the current is a lot less then one or more glow plugs may be faulty.
5. Remove the glow plugs and examine them.
Sometimes it is possible to recognise from the heating rod causes of failure or faults with the injection system.



measurement of the initial current

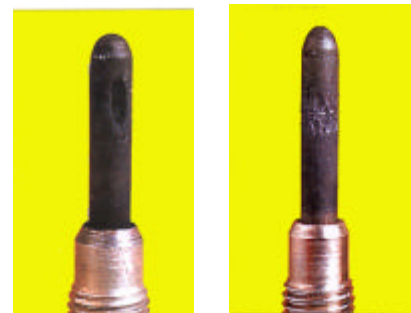
Broken or fused-on heating rod.

- The cause of overheating of the heating rod can be as a result of an early injection time, a fault dripping injector. In this case the injection time should be checked and adjusted. The spray pattern of the injectors should also be checked.



Dents and creases in the heating rod

- Dents and crease are caused by a open circuit coil. This is due to, too high an operation voltage (start assist), caused by a sticking relay (extended power supply) or through mistaken post-heating. In this case the pre-heater system should be checked and if necessary replace the glow time relay. With a pre-heater system incorporating post-heating, it is



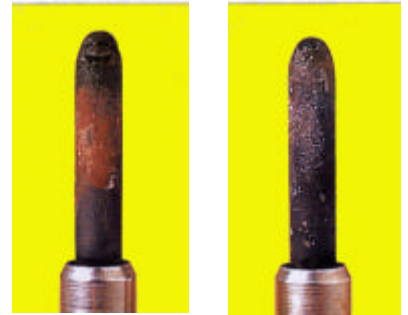


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important that post heating type glow plugs are fitted.

Damaged heating rod

- This fault is caused by overheating as a result of early injection, due to this, the heating coil gets brittle and breaks. A closed annular gap, due to over-tightening, causes too much warmth to pass to the glow plug casing the regulator coil stays cooler and does not limit the current flow and therefore the heating coil overheats.



Directions for fitting

Please note the stipulated tightness do not over tighten. Don't grease or oil a nickel-plated thread. Consider if it is necessary to fit post-heating glow plugs.

All required data can be found in our new glow plug parts catalogue.