

Tips & Technology

For Bosch business partners

Current topics for successful workshops No. 01/2015

Diesel Injection



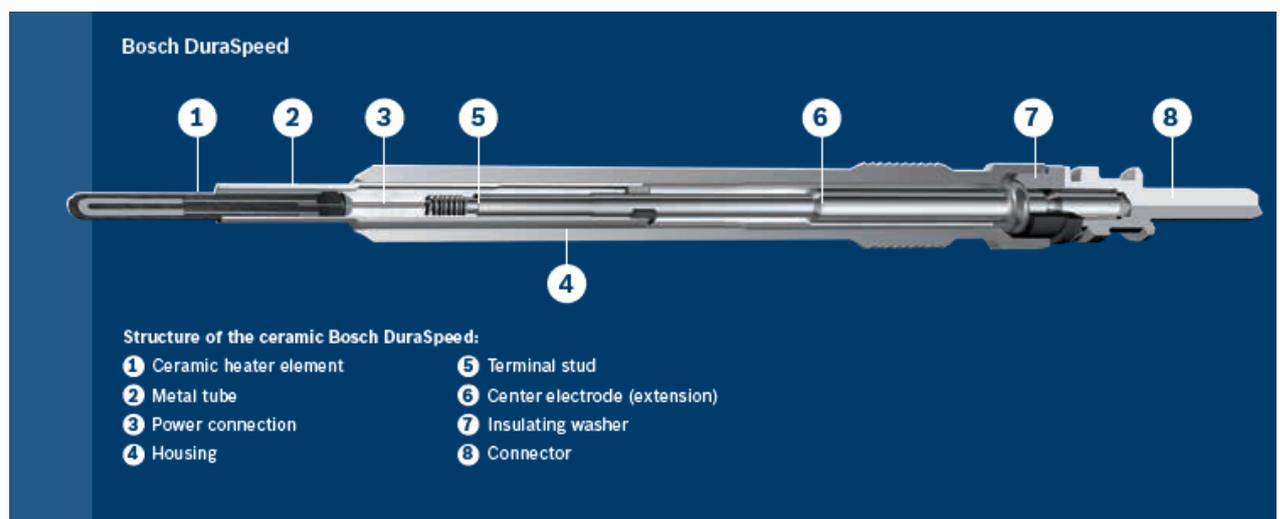
BOSCH

Invented for life

Glow Plugs

Despite the growing number of electric and hybrid vehicles, the diesel still represents the most environmentally friendly and attractive engine type. This will surely not change in the new few decades. Current sales figures confirm this trend. Even after the financial crisis, almost every second new vehicle registration in Europe has been for a car using economical diesel technology. This presents significant opportunities for sales in automotive workshops. An additional trend is becoming characteristic of modern engines: low compression in conjunction with higher specific output. In these systems, optimal integration of the glow plug system is especially important.

Glow plugs play a major role in modern diesel engines, since they work with such low compression that continued glow plug operation is necessary. Only in this way is smooth engine operation assured together with reduced fuel consumption and lower emissions. To ensure the above, Bosch offers a perfect system consisting of an electronic glow time control module in conjunction with Duraterm and DuraSpeed glow pin plugs. For almost all vehicles in Europe. Many automakers rely on innovative glow plug systems from Bosch for their original equipment.

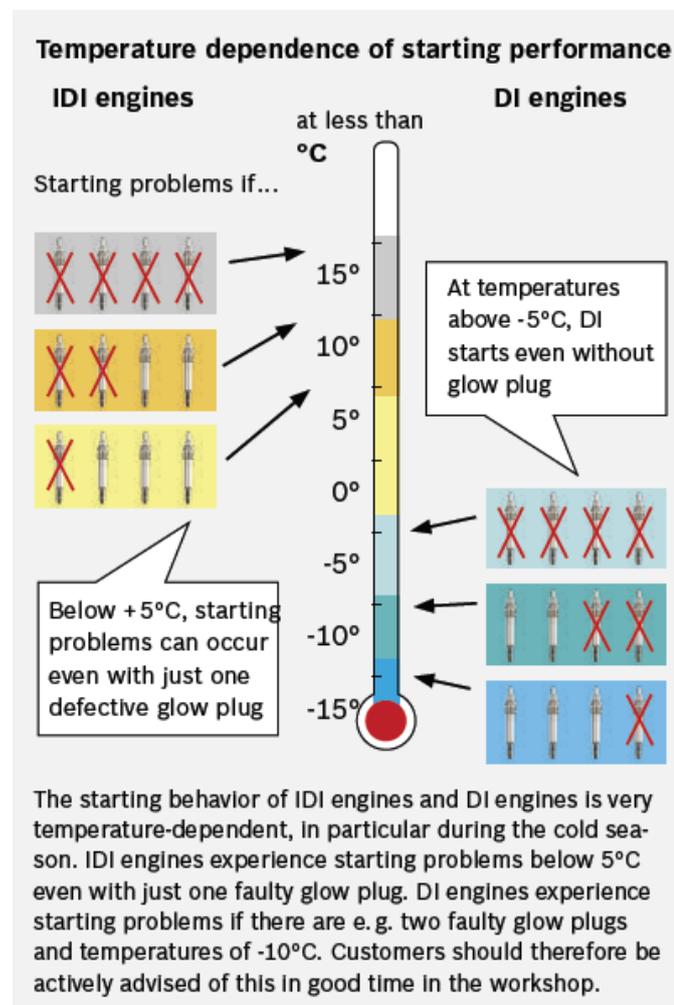


Glow plug service life and change intervals

The service life of glow plugs varies from type to type. In the experience of Bosch, the mean service life is 80,000 km for Duraterm® and the life of the engine in the case of ceramic plugs. This applies under normal conditions for both. Various factors have a great effect on the service life of glow plugs, for instance:

- Use in IDI engines or DI engines or DI low-compression engines
- Use in certain engines with a tendency to produce large amounts of soot
- Distance driven
- Maintenance by customer service
- Nozzle spray pattern adjustment

The customer notices immediately that one or more glow plugs need to be replaced. If the engine does not start immediately, the customer makes another attempt to start the engine. At the start of the cold months of the year it is already too late (see table).



For this reason, workshops should notify their customers, e.g. by means of an advertising brochure or letter, of the problems associated with cold weather. Bosch does not, however, recommend that the workshop replace the glow plugs as a matter of course, but rather that it use the following rule: if a Bosch glow plug becomes faulty within 50,000 km, only this individual plug should be changed. At an odometer reading is higher than 60,000 km, replace

all Bosch glow plugs, since the other, still-functioning plugs could fail shortly. The customer would then need to return to the workshop.

Faulty glow plugs can cause many problems. When the following symptoms appear, it makes sense to check the glow plugs.

- An increased amount of smoke is generated, especially after a cold start
- The sound of combustion is louder when the engine is cold
- The engine is rough despite being warm
- The engine develops less power or consumes more fuel

Functional test

During the functional test, the resistance of the glow plug should be measured only by means of an ohmmeter/multimeter. This protects the glow pin plug (especially Bosch GLP 0 250 403 XXX and 0 250 402 XXX with a rated voltage < 11 V) against overheating by the direct battery voltage. It also protects the workshop against possible consequences such as injuries or engine damage caused by melted metal parts.

- The resolution of the multimeter should be less than 100 mohm
- For a good measurement connection, remove all oil dirt and corrosion from contacts
- Determine the internal resistance (offset) of the multimeter: place the ends of the probes together and read the measured value
- Measuring points with plug installed (engine off): measuring instrument probes touching the glow pin plug connector and engine block (ground)
- The resistance value of the glow plug = measured value minus the internal resistance (offset)

Resistance values:

Resistance $\infty \Omega$: Malfunction: Glow plug faulty

Resistance < 0.2 Ω : Malfunction: Glow plug faulty

Resistance > 0.2 Ω and < 5 Ω : Glow plug OK

Installing glow plugs

1. Voltage check at the glow plug with multimeter (e.g. Bosch MMD 302 Digital Multimeter, item number 0684 500 302)
2. No continuity: glow plug must be replaced.
3. Select the right glow plug from the assortment
4. Ensure the threads are clean prior to installing
5. First, screw in the glow plug by hand – until the sealing seat touches the cylinder head. Then tighten to the correct torque (see table, p. 4).

Tips for the workshop:

- Never exceed the breaking torque when removing old glow plugs.
- It is easier to remove older glow plugs when the engine is warm. When the glow plugs are seated very tightly, loosen in increments and then tighten again. Keep the breaking torque in mind. If necessary, start the engine again and run it until warm.
- When installing new glow plugs, note the tightening torque (see car manufacturer's specifications).
- Prior to installing the glow plug, clean the glow plug seat and the glow plug hole.

Tightening torques for terminal nuts	
Thread	Tightening torque
4 mm (M4)	max. 2.5 Nm
5 mm (M5)	max. 5.0 Nm

Tightening torques for metal glow plugs or ceramic glow plugs like DuraSpeed®		
Thread	Breaking torque	Tightening torque
M 8	20 Nm	6 – 10 Nm
M 9	25 Nm	8 – 10 Nm
M 10	35 Nm	10 – 15 Nm
M 11	45 Nm	15 – 25 Nm



Protection against counterfeit products

Bosch Secure Label: Bosch has increased the level of protection against counterfeit products for glow pin plugs:

- Key Secure Label with difficult to copy hologram on every package
- 15-character Key Secure Code: The authenticity of the glow pin plug can be checked on the Internet at www.protect.bosch.com
- QR Code: Can be read with commercially available scanners or mobile phones. Immediate verification via e-mail or SMS



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