

# Technical and Sales Information

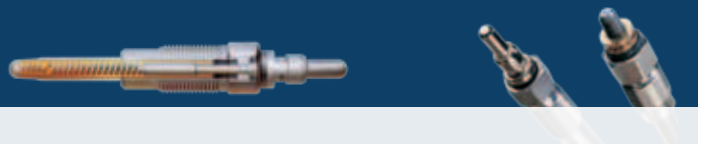


## Diesel Glow Plugs



**BOSCH**  
Invented for life





**This booklet is intended for your use as a sales and technical training reference. It answers the questions most commonly asked by:**

- Automotive parts sales professionals
- Automotive parts service professionals
- DIY (do-it-yourself) customers
- DIFM (do-it-for-me) customers

Please review the questions and answers on the pages that follow to familiarize yourself with the features and benefits of Bosch Glow Plugs. Your customers depend on you to provide complete and accurate product information so they can make an informed choice. Armed with the answers to these questions, you can easily convey to your customers the many benefits of stocking or purchasing Bosch. Once they have all the facts, it will be clear that for premium quality glow plugs, built to deliver superior cold-start performance, Bosch is the best choice.

<b>Question</b>	<b>Answer</b>
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### Question 1

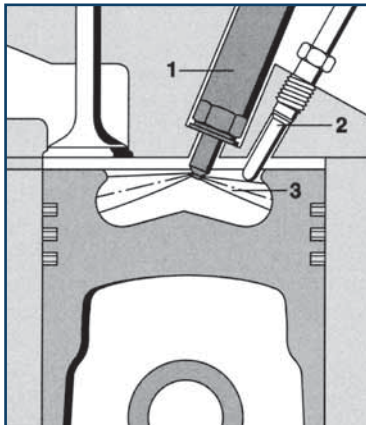
Why do diesel engines require glow plugs and what function do they perform?

### Answer

Unlike gasoline engines which use a spark plug to ignite an air/fuel mixture, diesel engines rely on the heat of highly-compressed air to ignite a precise amount of fuel to initiate combustion. Heating the air to a minimum starting temperature of 850°C is critical for diesel engine start-up.

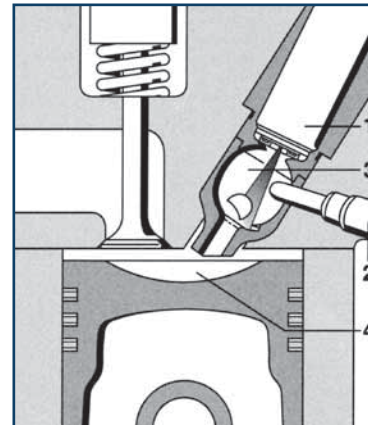
In low temperatures, factors such as cold intake air and cold cylinder walls hinder the attainment of the necessary starting temperature. In these situations, glow plugs function as an additional heat source to bring the intake air up to the temperature necessary to initiate the combustion cycle.

There are two basic types of diesel combustion cycles:



#### Direct-injection engine

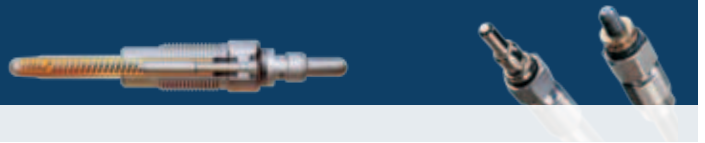
- 1 Nozzle holder with injection nozzle
- 2 Sheathed-element glow plug
- 3 Combustion chamber



#### Pre-chamber engine

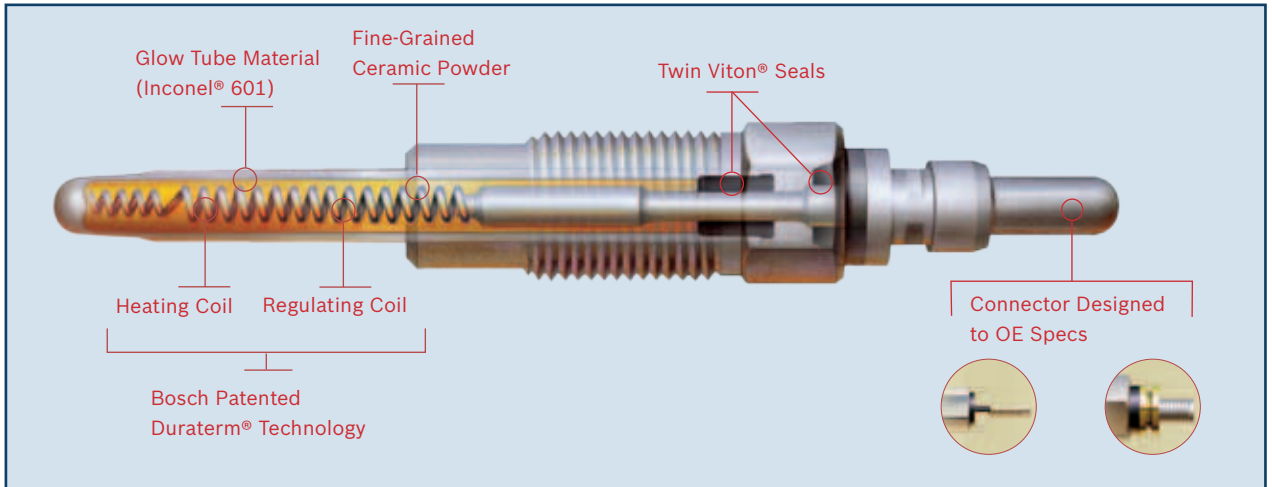
- 1 Nozzle holder with injection nozzle
- 2 Sheathed-element glow plug
- 3 Pre-chamber
- 4 Combustion chamber

No matter which type of diesel engine a vehicle has, Bosch supplies just the right glow plug to give your customers dependable cold-start performance.



## Question 2

What sets Bosch Glow Plugs apart from other brands?



## Answer

Bosch, a worldwide leader in diesel fuel injection innovation engineers and manufactures glow plugs to withstand the rigorous demands of today's diesel engines.

Feature	Benefit
Bosch patented Duraterm® technology*	Reaches higher temperature more quickly for fast engine start-up
Inconel® 601 glow tube material	Resists corrosion and vibration for long service life
Fine-grained ceramic insulating powder	Provides superior electrical insulation and high thermal conductivity
Twin Viton® seals	Protect coils from exhaust gas damage for long life
Connectors designed to OE specifications	Deliver precise fit and easy installation

Viton® is a registered trademark of DuPont Dow Elastomers LLC. Inconel® is a registered trademark of Inco Alloys International, Inc.

\*Available for the majority of diesel car and light truck applications. Other applications employ standard glow plug technology per OE specifications.

†The post-glow feature allows the glow plug to remain active for up to three minutes after the vehicle has started.

**Question 3**

What is Bosch Duraterm® technology and how is it different from other glow plug technologies?

**Answer**

Bosch’s revolutionary Duraterm® glow plug technology utilizes a self-regulating control system that reduces glow wait time by more than 50%. The patented dual-control regulating and heating coil effectively directs current draw, enabling the glow plug to reach higher temperatures more quickly for faster engine start-up. The regulating coil keeps the heating element within the 1000° – 1100°C optimal temperature range, preventing engine damage due to over voltage/overheating (see Question 4).

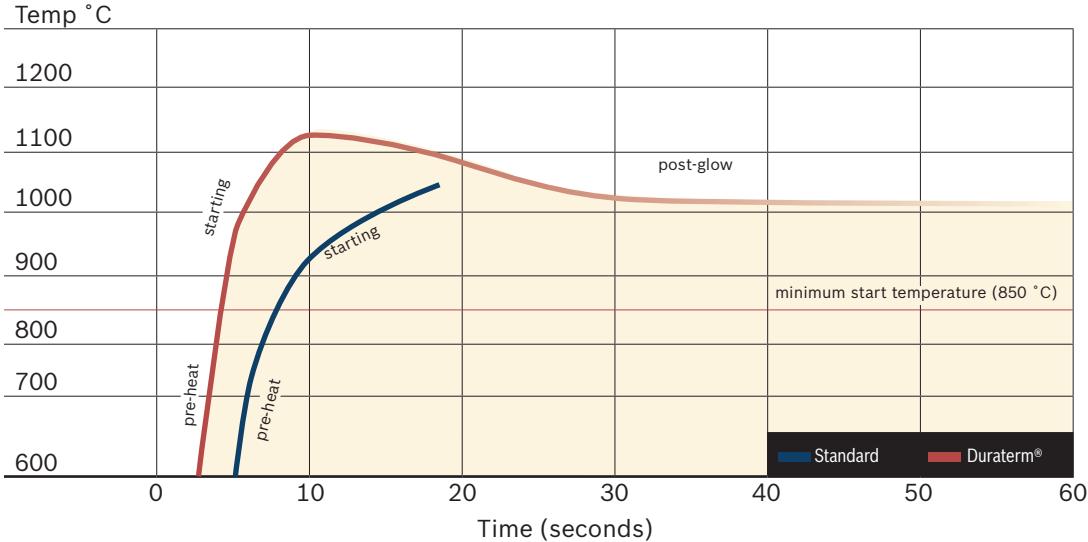
For vehicles with a post-glow<sup>†</sup> control system, this advanced technology offers a post-glow heating phase. During the post-glow phase, glow plugs continue to operate for up to three minutes after the engine has started, improving overall engine performance and reducing smoke emissions and combustion noise.

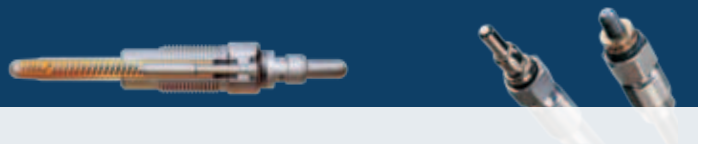
Bosch Duraterm® technology is available for the majority of diesel car and light truck applications. Other applications employ standard glow plug technology per OE specifications.

**Heating phase comparison**

**Standard glow plug technology vs. Bosch Duraterm®**

(Standard represents average of Bosch and leading competitors.)





### Question 4

What causes glow plug failure and what are the results?

### Answer

**Excessive voltage is the leading cause of glow plug failure.**

Glow plugs are designed to operate within a temperature range of 850° – 1100°C. During operation, the glow plug controller switches current to the glow plug for a specific period of time to allow for proper heating. However, when the controller fails, current could be applied for a longer than specified time causing the temperature of the glow plug to exceed the 1100°C upper limit. Under these conditions, the glow plug overheats causing the casing to swell, split or burst which allows air to enter the coil area causing immediate failure.

**Other causes of glow plug failure include:**

- Improper testing procedure (applying 12 volts directly to a glow plug designed to operate on 6 volts)
- Incorrect engine timing
- Improper fuel injector spray pattern
- Continual cycling of the glow plugs



Glow Plugs damaged due to over voltage



Glow Plug damaged by incorrect engine timing

Damage like this will most likely result in engine failure. Removing a glow plug with a distended or broken tip may require engine head removal – a time-consuming and costly repair.

Heed the warning signs of worn glow plugs (see Question 5) and replace them with a brand new set of Bosch Glow Plugs!

### Question 5

What conditions indicate that it's time to replace the glow plugs?

#### Answer

The following signs most likely indicate that it's time to change a vehicle's glow plugs. If any of these conditions exist, be sure to check the vehicle's glow plugs and if necessary, replace them with a new set of Bosch Glow Plugs.

- Vehicle won't start
- Vehicle starts only after excessive cranking  
Excessive cranking can cause the engine oil to be diluted with fuel, which could adversely effect the life of the engine.
- Vehicle idles roughly after initial start-up
- Excessive exhaust emissions after initial start-up

### Question 6

Can only the worn or failed glow plug(s) be replaced, or should all glow plugs be replaced at the same time?

#### Answer

If one glow plug fails, chances are the others won't be far behind. To minimize vehicle down-time and save on labor costs, Bosch recommends changing all glow plugs at the same time.

### Question 7

Bosch is not the OE glow plug on this vehicle. Is Bosch comparable to the OE brand?

#### Answer

You can replace OE glow plugs with Bosch with complete confidence. Bosch is currently the OE glow plug on most European diesel vehicle applications. And for Domestic and Japanese vehicle applications, Bosch Glow Plugs are designed to meet and/or exceed the OE glow plug specifications.



## Bosch Diesel Glow Plugs

### **Make Bosch Glow Plugs a part of every diesel tune-up.**

Regular preventive maintenance keeps a diesel vehicle running right and can save the owner the cost and inconvenience of unexpected repairs down the road. When you're selling a tune-up, be sure to suggest a new set of Bosch Glow Plugs for both import and domestic diesel cars and light trucks.

Since 1927, Bosch has been recognized as a worldwide leader in diesel innovation. All Bosch Glow Plugs are designed and manufactured to meet or exceed OE manufacturer specifications. Bosch experience and high quality standards are your assurance of premium performance and customer satisfaction.

Don't leave your customers out in the cold. Sell Bosch Glow Plugs.



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