

Spark Plug **FAQs**

Answers to Frequently Asked Questions



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Q: What is the function of a spark plug and why is it a vital engine component?

A: The function of the spark plug is to introduce the ignition energy into the combustion chamber and to initiate combustion of the compressed air-fuel mixture. It accomplishes this task by generating a spark between its electrodes, which then generates the required heat to ignite a smooth burn of the air/fuel mixture. The spark plug is an important factor in determining optimal performance and reliable functioning of an engine. It must permit reliable cold starting, it must guarantee that there is no misfiring during acceleration, and it must withstand the engine being operated for hours on end at maximum power. These requirements apply throughout the entire service life of the spark plug. For over 100 years, Bosch Spark Plugs have been designed for optimal performance and reliable functioning to withstand extreme operating conditions. Today, the continuously developing spark plug is a key engine system component. It plays a major role in clean and efficient combustion and the reliable operation of engines and catalytic converters.

Q: What are the different types of spark plugs?

A: There is a large variety of different spark plug designs with more than 1,400 variations. Design variants and special materials such as iridium, platinum, silver, or yttrium allow Bosch spark plugs to be used in a wide variety of applications today. In all, Bosch has developed more than 20,000 different types of spark plugs over the last 100+ years.

Q: Why do we need to change spark plugs?

A: The spark plug should be replaced at regular intervals. In the course of its service life, the spark plug undergoes changes that increase the required ignition voltage. When the required voltage reaches a level that can no longer be compensated for by the voltage reserve, the result is misfiring. These changes can be caused by electrode wear (both erosion and corrosion effects), engine wear, abnormal operating conditions (pre-ignition, detonation, high oil consumption).

Q: How often do I need to change my plugs?

A: As a rule, Bosch recommends that you follow the replacement interval listed in your vehicle owner's manual. However, we highly recommend that you inspect (read) your spark plugs annually and replace as required, to insure optimum engine performance. For more information on "reading" spark plugs, download the Spark Plug Faces document at <http://www.boschautoparts.com/TechnicalResources/Pages/TechnicalResources.aspx>

Q: How should spark plugs be tightened for best performance?

A: Bosch recommends using a torque wrench and the correct torque in ft.-lbs. as listed below:

| | 10mm with Gasket | 12mm with Gasket | 14mm with Gasket | 14mm Tapered Seat | 18mm with Gasket | 18mm Tapered Seat |
|-----------------|------------------|------------------|------------------|-------------------|------------------|-------------------|
| Torque Ft.-Lbs. | 8 - 11 | 12 - 15 | 19 - 22 | 12 - 15 | 20 - 23 | 14 - 17 |

If a torque wrench is not available, hand-tighten the plug until it is seated in the cylinder head. Spark plugs with gaskets should be tightened an additional 90°. Spark plugs with tapered seats should be tightened an additional 15°.

NOTE: AVOID OVER-TIGHTENING OR UNDER-TIGHTENING AS SPARK PLUG OR ENGINE DAMAGE MAY RESULT.

Q: Are Bosch Spark Plugs pre-gapped at the factory?

A: Most Bosch Spark Plugs are factory pre-gapped for popular vehicle applications. The gap measurements are indicated either on the box, or by the part number located on the spark plug shell.

Gaps should never be adjusted on Ir Fusion, Platinum+4 or Platinum+2. They have factory pre-set gaps, and should never be gapped by the installer.

Bosch Iridium, Platinum Plus and Super Plus Spark Plugs also have factory-set gaps. For most plugs, the setting is shown on the plug package. These gaps are correct for the most popular applications of these spark plugs. If the vehicle manufacturer's specifications require adjustment of the gap, it is important to follow these guidelines:

- To measure spark plug gaps, use pin gauges, not wedge type gap tools. Incorrectly measured gaps can lead to spark plug damage.

- To widen the electrode gap, use a tool that only pulls back the ground electrode, without applying pressure to the center electrode. The tool must not be wedged between the electrodes as that may cause damage to the insulator nose.
- To close the electrode gap, carefully tap the plug, electrode first, on a hard surface, as shown in the illustration.

Q: What is detonation?

A: Detonation or “knocking” is uncontrolled combustion with a very steep rise in pressure. It is caused by spontaneous ignition of the fuel mixture, which has not yet been reached by the ignition spark. As the high-pressure waves hit the walls of the combustion chamber, their impact produces a metallic knocking sound. Failure to recognize and deal with knocking will inevitably lead to serious engine damage.

Q: What is heat range?

A: A spark plug’s heat range is an index of its capacity to dissipate thermal energy. The different characteristics of automotive engines regarding operating load; compression, engine speed, cooling and fuel make it impossible to run all engines with a standard spark plug.

The same spark plug may get very hot in one engine type, but may reach only a relatively low temperature in another.

In the first case, the air-fuel mixture would ignite on the hottest parts of the spark plug projecting into the combustion chamber (pre-ignition) and, in the second case, the insulator tip would soon become so badly fouled by combustion deposits that misfiring would occur.

To ensure that the plug runs between the desired temperatures, plugs with different heat capacities were developed. The so-called “heat range,” which is assigned to each spark plug, is used to characterize these heat dissipation capacities. A plug with a lower heat range number indicates a cold plug that quickly dissipates heat to the engine block and cooling system, while a higher code indicates a hot plug that retains heat.

Properly selecting the heat range of the plug ensures that the plug will operate between its designed operating ranges of 500-900 degrees Celsius. In this range, the spark plug will be self-cleaning, yet will not be hot enough to pre-ignite the air/fuel mixture.

Q: How does Bosch test engines to determine heat range, and what heat range should I use?

A: To ensure optimal performance in your car, Bosch has tested each vehicle model and the various engines available for that model listed in the Spark Plug catalog or our Webpage. Using a special spark plug with a thermocouple built in, Bosch engineers find the hottest cylinder in an engine and then test various spark plugs in that cylinder until the ideal plug is found. This ensures that you will always get the best performance possible.

Q: I want to use Bosch Spark Plugs, but have modified my engine by adding a performance system. Can I still use the plug listed in the catalog for my vehicle?

A: If you have modified your engine with a performance system such as a turbocharger, supercharger or nitrous, the recommended spark plug may not be correct. You may need to use a plug with a colder heat range to compensate for the additional heat generated by the engine. Bosch recommends that in these situations, you consult a qualified engine builder for assistance in determining the appropriate heat range.

Q: How does iridium improve a spark plug?

A: Iridium provides improved corrosion and erosion resistance that imparts a longer performance life than a standard Platinum Plug. These iridium properties also allow engineers to reduce center electrode diameter, which increases ignitability and decreases ignition system demand voltage while increasing spark plug life.