Electrode Gap Metric Conversion

inch	.020	.022	.024	.025	.028	.030	.032	.036	.040	.044	.048	.054	.060	.064	.080
mm	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.9	1.0	1.1	1.2	1.35	1.5	1.6	2.0

Gapping Specifications

Bosch Spark Plugs are pre-gapped at the factory. In most cases, that gap is indicated on the package. If the gap is adjustable and different from the gap specified by the engine manufacturer, it needs to be adjusted. For proper performance and exhaust emissions, the gap must be within ±0.004" of the specified value. For most applications, the pre-set gap is correct.
Note: Bosch OE Fine Wire Iridium, OE Fine Wire Double Platinum and OE Fine Wire Platinum are pre-gapped adjustment of gap could cause damage to the center electrode. See Spark Plug Gapping section.

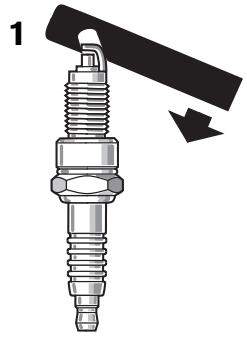
Spark Plug Gapping

(Bosch OE Fine Wire Iridium, OE Fine Wire Double Platinum, and OE Fine Wire Platinum Spark Plugs come with gaps pre-set at the factory. These gaps are never to be adjusted.)

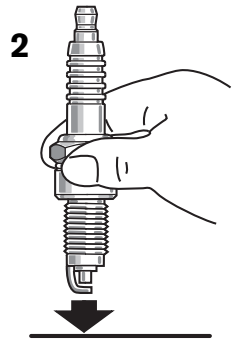
Bosch Super Plus Spark Plugs also have factory-set gaps. For most plugs, the setting is shown on the plug package. These gaps are correct for the most popular applications of these plugs. There are applications, however, for which the gap setting has to be adjusted according to the vehicle manufacturer's specifications.

To avoid damage to a spark plug in the process of adjusting the gap, it is important to follow these guidelines:

- To widen the electrode gap, use a tool that only pulls back the ground electrode, without applying pressure to the center electrode (see illustration 1). 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 illustration 2.

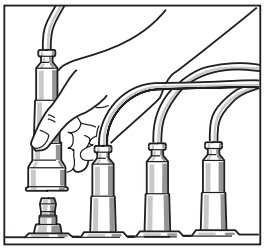


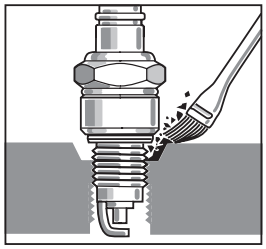
Widen electrode gap



Close electrode gap

Spark Plug Installation Procedure



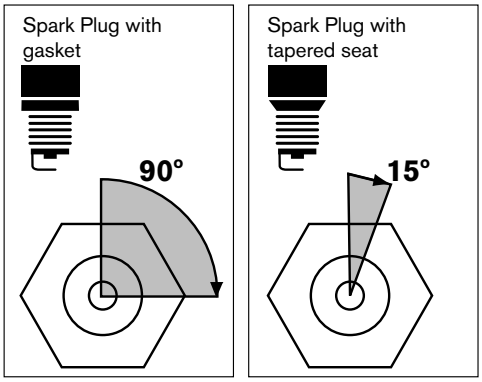


- Allow engine to cool.
- Disconnect cables or ignition coils. Mark spark plug cables/coils to ensure replacement in proper sequence.
- Loosen plugs one or two turns and clean surrounding area so that no dirt particles get into the threads or the combustion chamber.
- Remove worn spark plugs. If the spark plug is extremely tight, loosen only a little to allow penetrating oil to drip onto exposed thread, screw the plug in again and attempt to remove it after a few minutes.
- Check gap of new Bosch Spark Plugs and adjust if necessary. (**Note**: Bosch OE Fine Wire Iridium, OE Fine Wire Double Platinum, and OE Fine Wire Platinum are pre-gapped from the factory.)
- Thread in Bosch Spark Plug until hand tight. Using a torque wrench and suitable spark plug socket, tighten the spark plug to the manufacturers recommended torque. If torque wrench is not available, follow the procedure below (2).*
- Replace spark plug wires or coil boots if equipped.

Spark Plug Tightening Procedures

Bosch recommends when installing spark plugs to use a torque wrench and the correct torque in ft.-lbs. listed below. As a general guideline, 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 overtightening or undertightening as spark plug or engine damage may result. Always follow the manufacturer recommended torque specifications.



Tighten All Plugs With a Torque Wrench

Plugs should be tightened with a torque wrench to the manufacturers recommended torque specifications. Failure to sufficiently seat the plug in the engine spark plug seat, or over tightening the plug, will likely result in one or more of the following:

- Damaged spark plug (melting of electrodes, separation of the insulator from the shell, discoloration of shell and terminal nut)
- Burnt spark plug wire or coil boot
- Severe engine damage

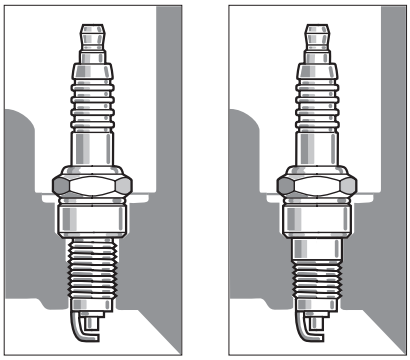
Recommended Torques For Spark Plug Installation

Thread size	10mm With Gasket	12mm With Gasket	14mm With Gasket	14mm With Tapered Seat	18mm With Gasket	18mm With Tapered Seat
Torque ft.-lbs.	8-11	12-15	19-22	12-15	20-23	14-17

Note: If anti-seize compound is used, reduce torque by 30% to avoid over-torquing.

Half-Thread vs. Full-Thread Spark Plugs

Some General Motors and Ford engines are equipped with original equipment spark plugs where the shell is partially threaded (examples: AC R43NTS8 or Motorcraft AWSF42C) to facilitate installation during engine assembly. The installation of full threaded plugs, in place of a partial threaded plug duplicates the original equipment plug reach (see illustration) and does not alter engine performance. Service Bulletins from Vehicle Manufacturers have approved of the use of full threaded spark plugs in place of partial. Do not install partial threaded plugs where the original equipment plug is full-threaded as severe engine damage is likely as a result of inadequate heat transfer.



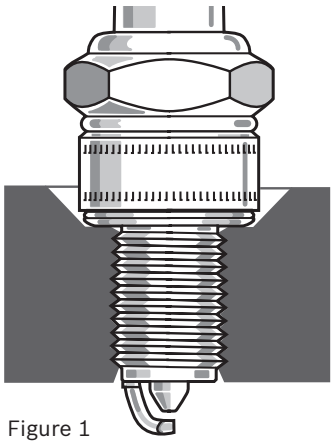


Figure 1

One gasket correct plug seat.

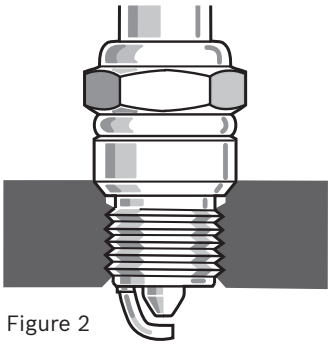


Figure 2

Conical plug installed correctly.

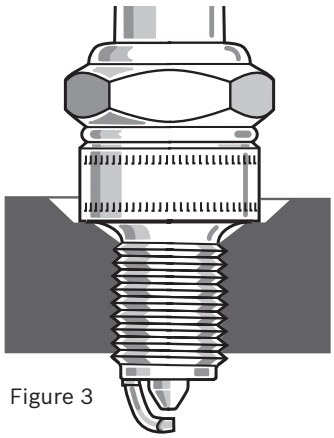


Figure 3

No gasket, danger of pre-ignition. Overheating of the ground electrode, difficulties in removal.

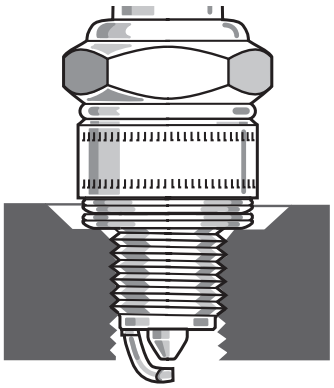


Figure 4

Two gaskets results in cylinder threads becoming filled with residue.

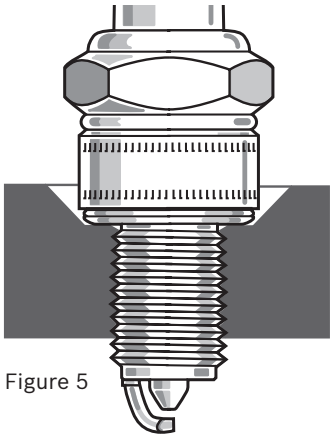


Figure 5

Spark plug with long reach in a cylinder head designed for shorter reach plug.

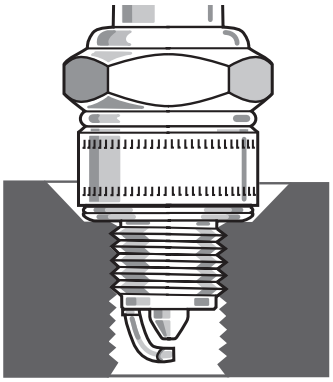


Figure 6

Spark plug with short reach in a cylinder head designed for longer reach plug.

Installation Tips:

To avoid problems later, it is always wise to check that the plug has the correct reach for the engine and that the gasket is in place during installation (see figure 1). Some plugs, however, do not require a gasket (see figure 2). These are usually plugs with a conical (or tapered) seat. When installing these plugs, it is important that the mating surfaces are clean and that you do not over-torque the plug. If a plug is installed without a gasket (see figure 3), excessive heating and pre-ignition may occur due to poor heat transfer and blow-by of combustion gases. Also, the threads will project in the combustion chamber and become filled with residue making removal difficult. On the other hand, if two gaskets are used (see figure 4), residue will collect in the exposed cylinder threads. This will make the next installation of the correct plug extremely difficult. The same conditions occur when installing a plug with incorrect reach, (see figures 5 & 6).

Important, please read!

Plugs must be tightened with a torque wrench. See page 309 for recommended values. Failure to sufficiently seat the plug in the engine spark plug seat will likely result in one or more of the following:

Damaged spark plug (melting of electrodes, separation of the insulator from the shell, discoloration of shell and terminal nut), burnt spark plug wire and severe engine damage.

Avoid overtorquing of the spark plug which will result in plugs damage (insulator becomes loose and center electrode melts). Bosch Spark Plug threads are rolled and nickelplated eliminating the need to use anti-seize compound (if anti-seize material is used, reduce the torque recommendations by 30%). Make sure cylinder head plug threads are free of carbon deposits — if necessary “chase” threads with a cleaning tool.

Automotive Spark Plug Type and Heat Range Chart

BOSCH
Spark Plugs

		Super Plus & Specialty Plugs		Silver Plugs		Platinum Plugs		Double Platinum Plugs		Iridium Plugs	
Thread Size & Hex	**Heat Range**	**Plug Number**	**Part Number**	**Plug Number**	**Part Number**	**Plug Number**	**Part Number**	**Plug Number**	**Part Number**	**Plug Number**	**Part Number**
12mm Thread 3/4" Reach 11/16" Hex	Hot ↕ Cold	X5DC XR5DC	7409	XR4CS XR2CS	7701 7700						
12mm Thread 3/4" Reach 5/8" Hex	Hot ↕ Cold	Y6DC	7416								
12mm Thread 1" Reach 5/8" Hex Extended Tip	Hot ↕ Cold									YR6SII330X	9619
12mm Thread 1" Reach 9/16" Hex Extended Tip	Hot ↕ Cold							VR8SPP33X	8121	VR8NII35U VR7NII33X	9620 9621
14mm Thread 3/8" Reach 13/16" Hex	Hot ↕ Cold	WR9EC+ WR8EC+ W7EC W5EC	7915 7908 7535 7534								
14mm Thread 3/8" Reach 13/16" Hex Extended Tip	Hot ↕ Cold	WR10FC+ WR10FCY+ WR10FCZ+ WR9FC+ WR9FCY	7919 7920 7921 7916 7517								
14mm Thread Tapered Seat .460" Reach 5/8" Hex	Hot ↕ Cold	HR10AC+ HR10ACY HR9AC+ HR9ACY+ HR8AC+	7983 7584 7972 7973 7968			HR9BPP30X HR9BPP30V HR7BPP30X	6712 6708 6722			HR9BII330V	9659
14mm Thread Tapered Seat .460" Reach 5/8" Hex Extended Tip	Hot ↕ Cold	HR10BC+ HR10BCX+ HR10BCY+ HR10BCZ+ HR9BC HR9BC+ HR9BCY+ HR9BCZ HR8BC+ HR6BC+	7985 7986 7987 7988 7975 7975 7976 7577 7969 7964								

NOTE: See Page 301 for part number interchange.

Automotive Spark Plug Type and Heat Range Chart

		Super Plus & Specialty Plugs		Silver Plugs		Platinum Plugs		Double Platinum Plugs		Iridium Plugs	
Thread Size & Hex	**Heat Range**	**Plug Number**	**Part Number**	**Plug Number**	**Part Number**	**Plug Number**	**Part Number**	**Plug Number**	**Part Number**	**Plug Number**	**Part Number**
14mm Thread 1/2" Reach 13/16" Hex	Hot ↑ ↓ Cold	W10AC WR8AC+ WR7AC+ WR5AC+ W4AC W3AC	 7902 7996 7932	 W5AS W4AS W3AS W2AS							
14mm Thread 1/2" Reach 13/16" Hex Extended Tip	Hot ↑ ↓ Cold	 WR8BC+ W7BC WR7BC+ W6BC W5BC WR5BC+	 7903 7997 7997 7993 7931 7931								
14mm Thread Tapered Seat 11/16" Reach 5/8" Hex Extended Tip	Hot ↑ ↓ Cold	HR10DCX+ H9DC HR9DC+ HR9DCX+ HR9DCY HR9LCX+ HR9LCY+ H8DC HR8DC+ HR8DCX+ H8DC0 HR7DC HR7DC+ H7DC0 H7LDCR HGR7KQC H6DC HR6DC H6DC0 H5DC	7989 7574 7978 7979 7980 7982 7974 7970 7970 7971 7918 7918 7411 7966 7966 	 HR6DS H4CS H3CS H2CS		 HR8JPP302V HR8DPP30Y HR8DPP30X HR8DPP30V HR7DPP30Y HR7DPP30V 	 6715 6706 6723 6709 6710 6701 	 HR8JPP33V HR8DPP33Y HR8DPP33X HR8DPP33V HR7DPP33Y HR7DPP33V HR6DPP33X 	 8120 8106 8119 8108 8111 8103 8113 	 HR8LII33U HR8JII33V HR8DII33X HR8KII33V HR8KII33Y HR7DII33V HR7KII33V HR7KII33Y HR6KII33X 	 9602 9660 9657 9655 9653 9606 9605 9623 9608

NOTE: See Page 301 for part number interchange.

Automotive Spark Plug Type and Heat Range Chart

BOSCH
Spark Plugs

		Super Plus & Specialty Plugs		Silver Plugs		Platinum Plugs		Double Platinum Plugs		Iridium Plugs	
Thread Size & Hex	Heat Range	Plug Number	Part Number	Plug Number	Part Number	Plug Number	Part Number	Plug Number	Part Number	Plug Number	Part Number
14mm Thread 3/4" Reach 5/8" Hex Extended Tip	Hot ▲	FR10DCX+	7963	FR8DS							
		FR9LCX+	7926	F6DSR							
		FR9LTE				HR9LPP30X	6718	HR9LPP33X	8117		
		FR8DC+	7927			HR9DPP30Y	6703	HR9DPP33Y	8102		
		F8DC4						HR8LPP33U	8104		
		FR8DC	7927			HR8LPP30U	6704				
		FR8DC+	7927								
		FR8DCX	7957								
		FR8DCX+	7957								
		FR8DCY+	7958								
		FR8LCX+	7962								
		F8LDCR									
		FR8LDC				FR8VPP30U	6717				
		FLR8LDCU+	7404			FR8LPP30X	6707				
		F8LCR	7959			FR8LPP302X	6725	FR8VPP33U	8115	FR8LII33X	9651
		F8KTCR				FR8HPP30X	6721	FR8VPP332V	8123	FR8KII33X	9600
		FR8KTC	7408			FR8DPP30X	6702	FR8LPP33X	8105	FR8KII332X	9664
		FGR8KQE	7405			FR8DPP30T	6726	FR8DPP33X	8100	FR8DII33X	9652
		F7DC	7955								
		FR7DC	7955								
		FR7DC+	7955								
		FR7DCX	7956								
		FR7DCX+	7956								
		F7LDCR									
		FR7LDC									
		FR7LDC+	7402								
		FR7LDC4									
		F7LTCR									
		F7LC0R2									
		F7KTCR	7407			FR7KPP30X	6705	FR7LPP33X	8112	FR7LII33X	9604
		FR7KTC	7406			FR7DPP30X	6724	FR7DPP33X	8101	FR7KII33X	9603
		FGR7KQE0	7401			FR7LPP30X	6719			FR7DII33X	9607
		FGR7DQE+	7524			FR7DPP30T	6730				
		FR6DC	7524							FR6LII330X	9614
		FR6DC+	7953			FR6LPP300X	6714	FR6LPP330X	8109	FR6KII33X	9610
		FR6DCX+									
		F6DTC									
		FR6DTC									
		FR6LDC	7410								
		F6DTC1									
		FGR6KQE	7413								
		F5DC	7928								
		FR5DC+	7928								
	Cold ▼	FR5DTC	7403								

Automotive Spark Plug Type and Heat Range Chart

		Super Plus & Specialty Plugs		Silver Plugs		Platinum Plugs		Double Platinum Plugs		Iridium Plugs	
Thread Size & Hex	**Heat Range**	**Plug Number**	**Part Number**	**Plug Number**	**Part Number**	**Plug Number**	**Part Number**	**Plug Number**	**Part Number**	**Plug Number**	**Part Number**
14mm Thread 3/4" Reach 13/16" Hex	Hot ↑ ↓ Cold	WR9CC WR8CC+ W7CC WR7CCX+ W7CC0 W5CC WR4CC WR3CC WR3CTC W3CC W2CC	7510 7904 7998 7999 7533 7530	W5CS W4CS WR3CS W2CS W08CS W07CS		WR8LPP30V	6729	WR8LPP33X	8118		
14mm Thread 3/4" Reach 13/16" Hex Extended Tip	Hot ↑ ↓ Cold	W9DC W9DC0 WR9DC+ WR9DC+ WR9DCX+ WR9DCY+ W8DC W8DC0 W8DTC WR8DC WR8DC+ WR8DCX WR8DCX+ WR8DCX+ W7DC WR7DC+ WR7DC+ W7DC0 W7DTC WR7DTC W6DC WR6DC W5DC WR5DC+	7511 7911 7911 7913 7914 7905 7905 7907 7907 7907 7900 7900 7900 7594 7995 7591 7992	WR9DS WR8DS WR7DS W7DSR WR6DS WR5DS							
14mm Thread 3/4" Reach 13/16" Hex Extended Tip	Hot ↑ ↓ Cold	 WR10LC+ WR10LCV+ W8LCR WR8LC+	 7922 7923 7909 7909	 WR9LS							
14mm Thread 3/4" Reach 13/16" Hex Extra Extended Tip	Hot ↑ ↓ Cold	FR9HC+	7961								

Automotive Spark Plug Type and Heat Range Chart

BOSCH
Spark Plugs

		Super Plus & Specialty Plugs		Silver Plugs		Platinum Plugs		Double Platinum Plugs		Iridium Plugs	
Thread Size & Hex	**Heat Range**	**Plug Number**	**Part Number**	**Plug Number**	**Part Number**	**Plug Number**	**Part Number**	**Plug Number**	**Part Number**	**Plug Number**	**Part Number**
14mm Thread Tapered Seat .840" Reach 5/8" Hex Special Extended Tip	Hot ↕ Cold	HR10HC+ HR9HC+	7990 7981								
14mm Thread .875" Reach 5/8" Hex Extended Tip	Hot ↕ Cold	FR8HC0X	7925								
14mm Thread Tapered Seat .98" Reach 5/8" Hex Extended Tip	Hot ↕ Cold					HR9SPP300X HR8TP-P3002V HR8SPP300V HR8NPP302X HR8MPP30X HR7MPP30X	6711 6720 6732 6727 6716 6728	HR8TP-P3302V HR8MPP33X HR7MPP33X	8116 8107 8114	HR9LII33X HR9SII330X HR8MII33X HR8NII332X HR8SII330V HR8TII3302V HR7NII33X	9612 9654 9611 9617 9667 9661 9616
14mm Thread 1" Reach 5/8" Hex Extended Tip	Hot ↕ Cold					FR8SPP30X FR8MPP30X FR7NPP30X	6734 6713 6731	FR8MPP33X FR7MPP33X	8110 8122	FR8MII33X FR8NII35U FR8SII33X FR8VII33U FR7NII33X FR7NII35U	9609 9622 9673 9656 9613 9615
18mm Thread Tapered Seat .460" Reach 13/16" Hex Extended Tip	Hot ↕ Cold	DR10BC+ DR10GC+ DR8BC+	7951 7952 7950								
18mm Thread 1/2" Reach 7/8" Hex	Hot ↕ Cold	M10AC0 M8AC0	7549								
18mm Thread 1/2" Reach 1" Hex	Hot ↕ Cold	M7AC M5AC M4AC									

What is a heat range?

Importance of a Spark Plug's Heat Range

A plug's heat range is its ability to transfer the excess heat from the insulator tip to the cylinder head. The speed of this transfer is commonly described by the term "hot plug" and "cold plug." A "hot plug" means that the heat transfer is slow, causing the plug to operate at a higher temperature. A "cold plug" has a faster rate of heat transfer, thus it operates at a cooler temperature. In other words, a "hot" plug has a low heat range, a "cold" plug has a high heat range.

Plugs are available in different heat ranges to accommodate the operating conditions of different engines and driving conditions. A plug must operate hot enough to stay clean (not foul) and cold enough to prevent pre-ignition (premature ignition of the fuel-air mixture). If pre-ignition were not controlled, engine performance would drop and the plug would eventually destroy itself by overheating.

The heat range is determined, for the most part, by the insulator material, the length of the insulator tip, and the alloy material of the center electrode. The amount of heat transfer is affected by the size and shape of the space between the insulator and plug shell and by the quality of insulator material. A positive contact between the insulator and shell must be provided. Figures 1 and 2 show these differences.

Why is Bosch Super Plus better?

Because of the yttrium enhanced copper core center electrode, Bosch Super Plus reaches its self-cleaning temperature earlier to resist fouling in city traffic. Heat dissipation is also accelerated during highway driving.

Why is Bosch Platinum Plus better?

With a platinum center electrode and a unique insulator design the Platinum Plus plug has a wider heat range than copper core plugs and reaches its self-cleaning temperature only seconds after the start.

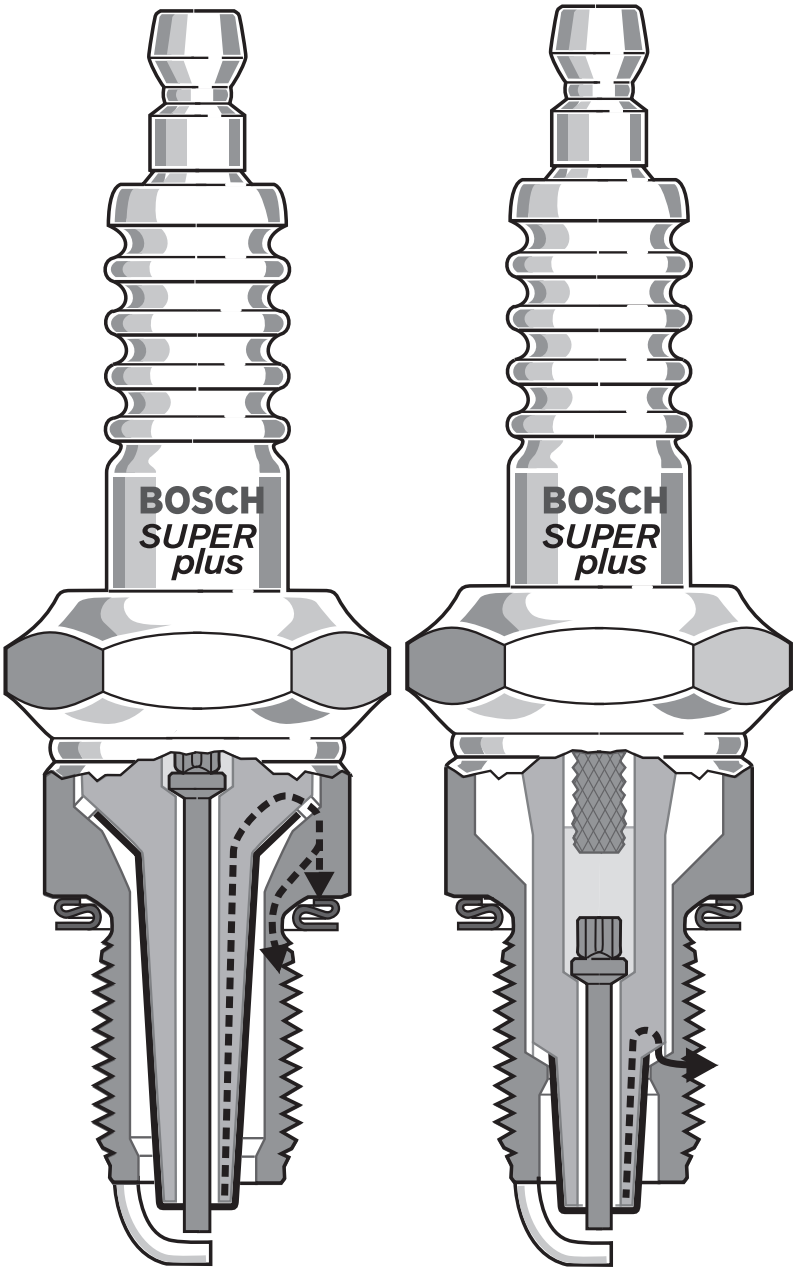


Figure 1

Figure 2

HOT PLUG
Figure 1
Spark plug with high heat range (hot plug), large insulator base area absorbs much heat.

COLD PLUG
Figure 2
Spark plug with low heat range (cold plug), small insulator base area absorbs little heat.

Selecting the Right Heat Range

A plug's heat range should be lower that the pre-ignition zone and higher than the cold fouling zone. In this lower temperature area, residues from fuel and oil additive are no longer burnt away and may cause the plug to misfire.

Generally, a colder plug is better suited for high speed highway traveling. A hotter plug is better for prolonged idling and city travel. The Heat Range Chart in our spark plug catalog will give you a listing of the various ranges available for different plugs.

Figure 1: The working temperature depends upon the heat absorption and heat dissipation of the spark plug. 20% of the heat absorbed by the spark plug is transferred to the passing mixture. The other 80% is dissipated through thermal conduction.

Figure 2: The curves below plot the temperature on the insulator tip of plugs with three different heat ranges. Plug "A" is too cold, and tends to foul during low speeds. Plug "C" is too hot, and will result in pre-ignition at higher speeds. The ideal heat range ("B") will always operate in the temperature zone between the fouling and pre-ignition areas. The results in an engine that operates more efficiently and economically, and produces fewer harmful emissions.

Figure 3 & 4: One way to minimize fouling is to use an extended tip electrode spark plug to help keep the plug clean at lower operating temperatures. The extended tip electrode reaches deeper into the combustion chamber than the regular tip plug. Residues are burned away more rapidly during firing, and the plug cools better during the intake stroke.

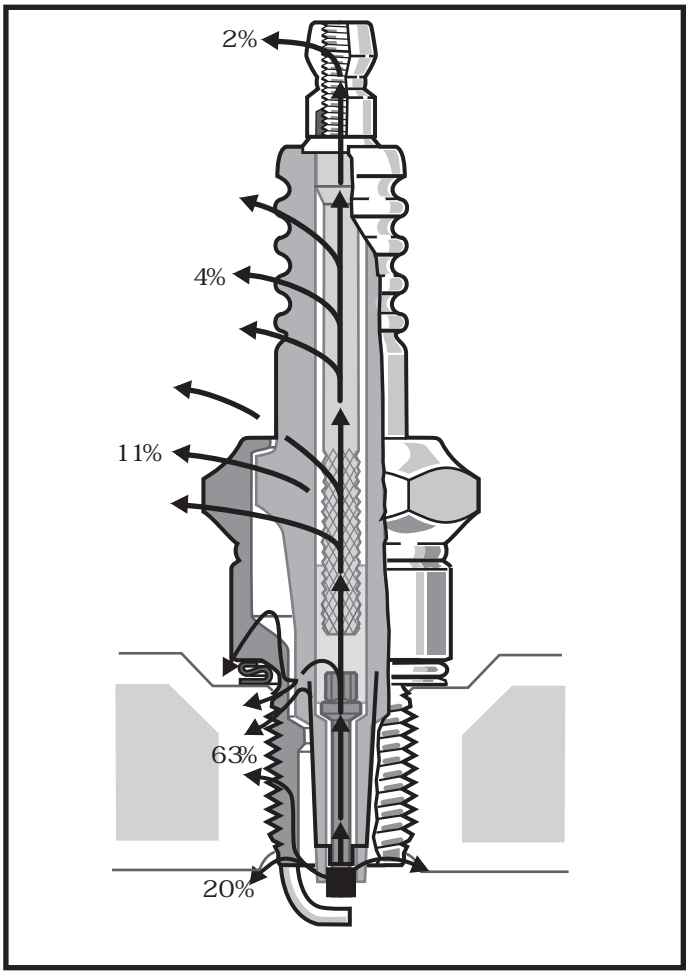


Figure 1

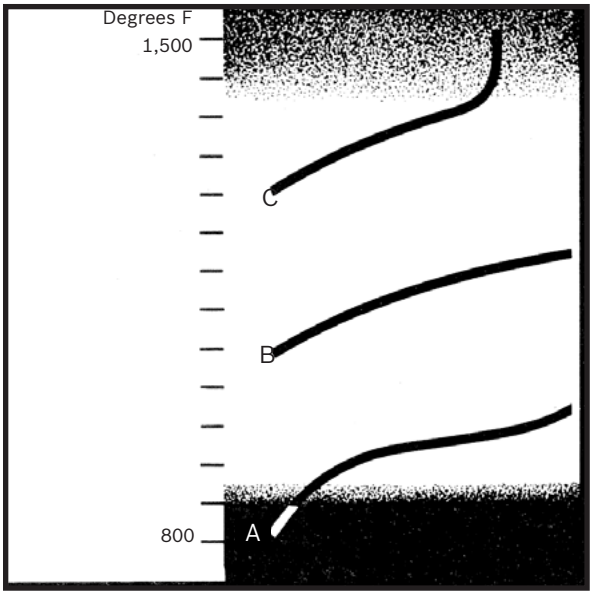
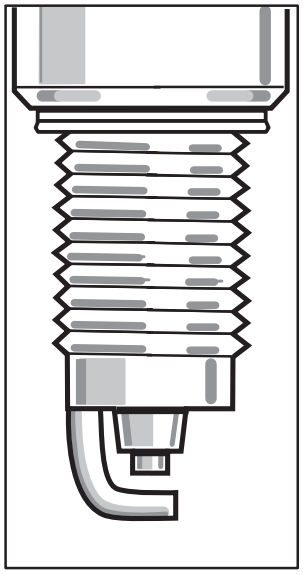
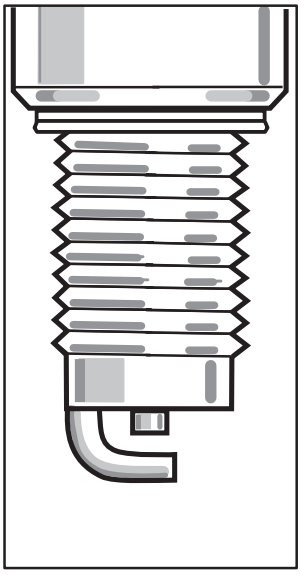


Figure 2



Extended Tip Electrode

Figure 3



Regular Tip Electrode

Figure 4

BOSCH
Spark Plugs

How Construction Affects Performance

Materials, shapes and assembly techniques are important to a plug's performance and life span. If any of these are varied, the operating characteristics are also varied. Critical parts of a spark plug and their purpose are detailed below.

1. Pyranit insulator. The most important part of a plug. It's made from aluminum oxide and glassy additives so it can hold up under 30,000 volts and an operating temperature up to 1550°F. The thermal conductivity of the insulator in this temperature range is crucial for establishing the plug's heat range and its performance under different driving conditions.

2. Current barrier. These ceramic ribs are more than just an identifying mark. They are designed to increase the path between the terminal stud and plug shell in order to reduce current leakage.

3. Shell. Steel is the most common material for most shells. The shell and insulator are mated together with an electro-heat-shrinking process. Some manufacturers use zinc plating, but Bosch shells are plated with nickel. The nickel plating prevents seizing in the cylinder heads. Zinc plating is more susceptible to seizing.

4. Electrode seal. A gas tight seal at this location prevents "blow-by" of hot combustion gases that rob engine power. Our seals are made of an exclusive mixture of graphitized-metal-glass to maintain constant conductivity at all operating temperatures.

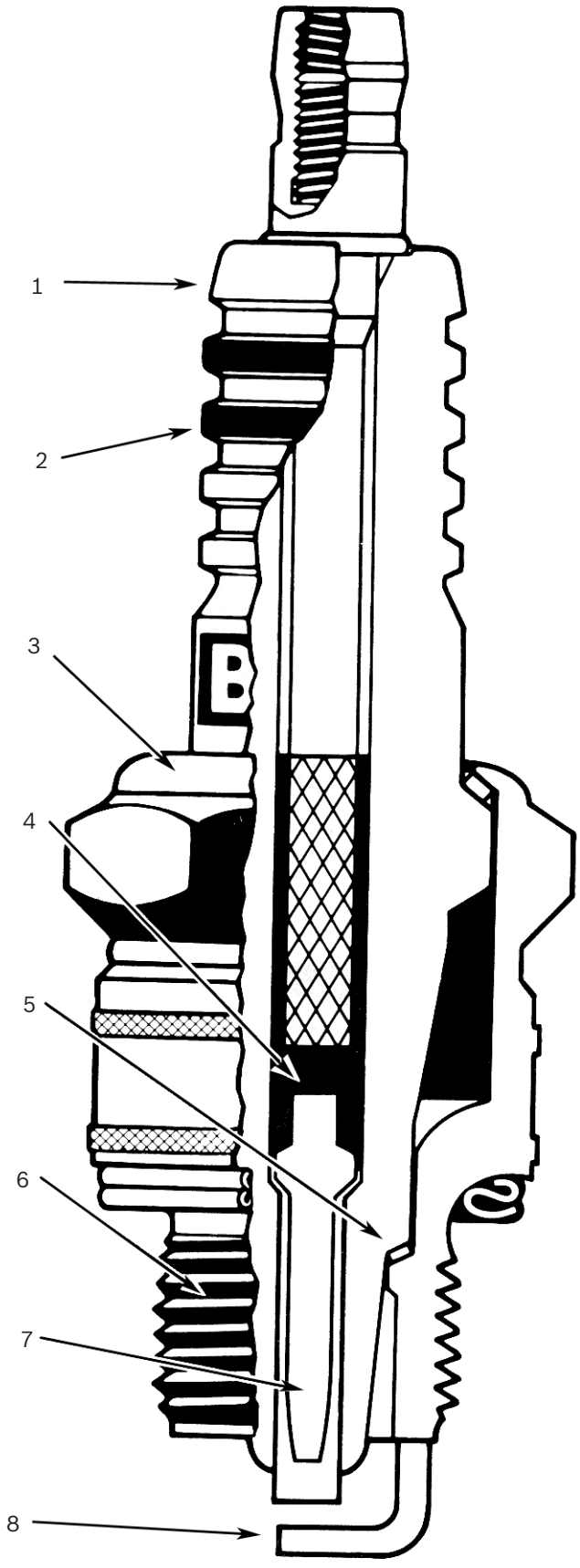
5. Insulator seal. This seal performs the same functions as the electrode seal; to prevent "blow-by" of combustion gases. Also it conducts heat from the insulator to the cylinder head. This assures a consistent heat range.

6. Threads. In order to prevent "cross-threading" in the cylinder head, plug threads should be completely rolled to eliminate sharp edges.

7. Center electrode. Bosch Super Plus Plugs have a heavy duty yttrium copper core center electrode. Therefore the plug reaches its self-cleaning temperature earlier to resist fouling in city traffic. Heat dissipation is also accelerated during highway driving. Heavy duty to prevent premature erosion and corrosion.

Bosch Platinum Plus Plugs have a thin platinum rod sintered into a unique insulator design. Platinum Plugs reach their self cleaning temperature even earlier than copper core plugs. This results in quicker starts and smoother acceleration.

8. Ground electrode. The center and ground electrodes combine to form the spark gap. Since the ground electrode is also exposed to high temperatures and voltage, its material and size are extremely important. All Bosch Spark Plugs use a heavy duty rated ground electrode.



Insulator Function

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Of all the parts in a spark plug, no part does more than the insulator. It not only has to efficiently perform a variety of functions, but it also has to have certain properties in order to do these jobs while withstanding the immense pressures, temperatures and vibrations of an engine. The insulator has two specific functions, as shown in figure 1.

1. Its name describes one function. It must insulate the ignition voltage from the engine block. The insulator accomplishes this by its material and shape. Aluminum oxide and glassy additives are combined and shaped to produce an insulator with high electrical resistance. The ribs on the top portion of the insulator are also important. These molded ribs increase the distance between the terminal stud and plug shell. Thus, the resistance to leakage current is considerably improved.
2. The insulator establishes the plug's heat range by the shape, length and thickness of its tip, as shown in figure 2. The smaller insulator of a "cold" plug absorbs less combustion heat, and is able to dissipate the heat quickly. The larger insulator of a "hot" plug absorbs more heat which it dissipates more slowly. Because it retains more heat, it is termed a hot plug.

Figure 1

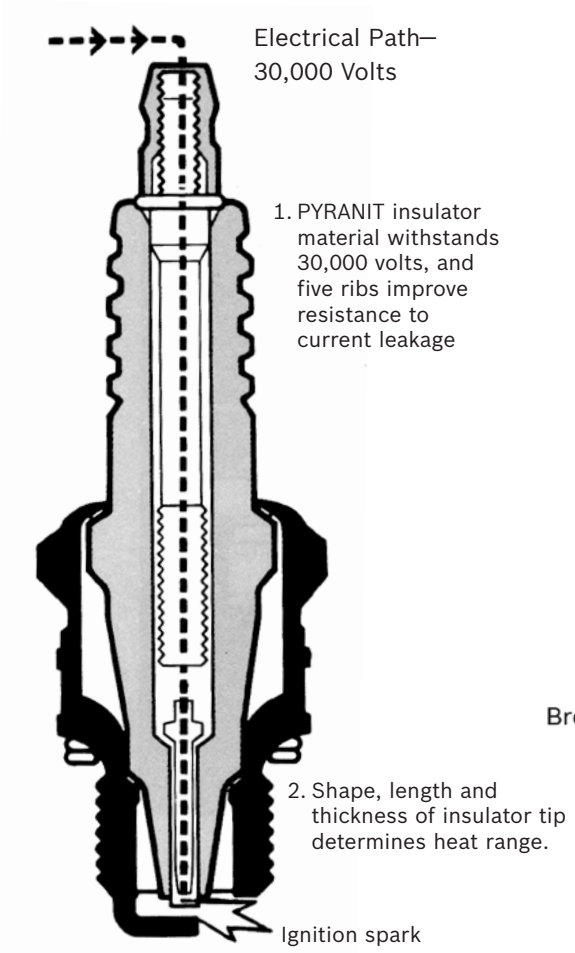
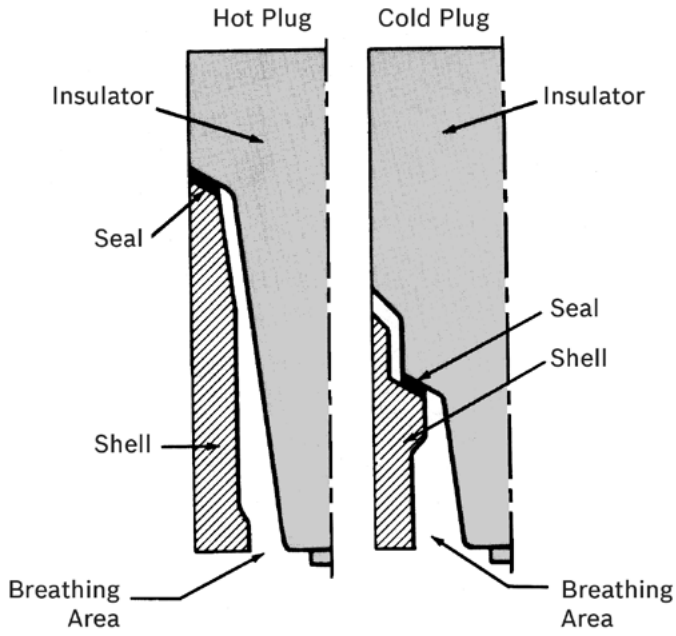


Figure 2



3. Cold plugs have a shorter insulator area exposed to combustion which dissipates heat faster.

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Reasons For Variations in Size

The most apparent difference in spark plug design is variations in thread size, reach and plug height. The plug an engine designer will select depends upon the engine size, performance and operating conditions.

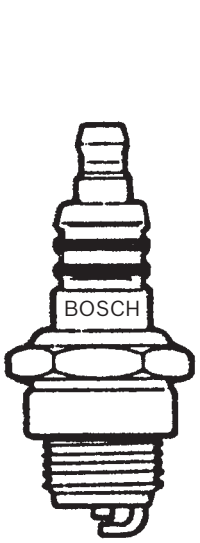
Thread sizes. Plugs subjected to high-abuse applications, normally associated with 2-cycle engines, require more breathing area. For this reason, sometimes the 18mm plug is used. This size also has higher physical strength and is used in snowmobiles, ATVs, tractors and commercial/industrial equipment.

The 14mm plug is standard for most 4-cycle American and imported engines. Most marine engines, lawnmowers, snowblowers, power saws and motorcycles also use 14mm plugs.

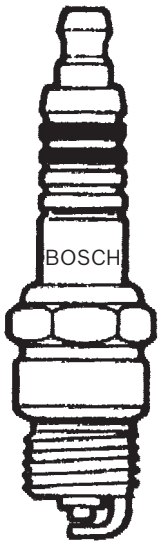
Reaches. The “reach” is the distance from the gasket seat (but not including the gasket), to the end of the threads. Different reaches are necessary because of the variations in cylinder head designs and thickness. In most American cars, the 3/8" and 3/4" reaches are the most popular, while the 1/2" and 3/4" are common in imported cars. Aluminum engines use longer reach plugs, 1/2", 3/4" and 1", to assure a better, stronger fit to the head.

It is extremely important to install the right reach specified by the engine manufacturer in order to prevent severe engine damage.

Length. For all practical purposes, most plugs have the same overall length. The one exception is the short, or mini-plug, developed for applications where space limitations prevent using the standard plug.



Length of mini-plug



Standard length plug