

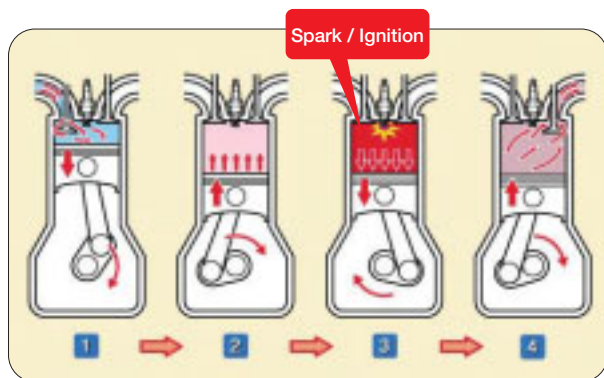
# BASIC INFORMATION FOR PLUG (1)



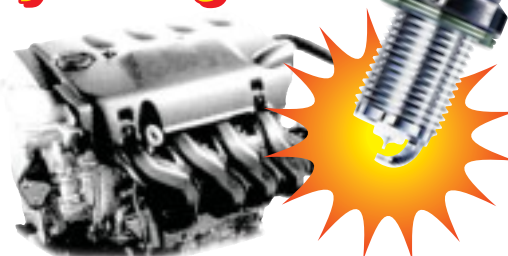
## 01 The role of spark plugs

### DENSO spark plugs ignite your engine.

Gasoline engines generate power from the precision-timing combustion of a fuel-air mixture of gasoline and oxygen. However, gasoline itself is relatively difficult to ignite with the precision timing required for combustion of the fuel-air mixture, even at high temperatures. The role of the spark plug is to create a spark which ignites the fuel. Since the spark plug ignites combustion, the performance of the entire engine. The engine is often likened to the "heart of a vehicle," and spark plugs have the significant role as the "heart of the engine."



**Spark plugs are the heart of your engine!**

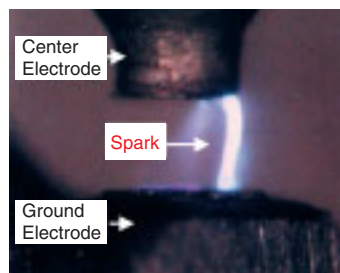


## 02 Spark and Ignition

### Generate a strong spark from an electrical discharge between electrodes

When high voltage produced by the ignition system is discharged between the center electrode and ground electrode of the spark plug, the natural insulation between the two electrodes breaks down, current flows as a result of the discharge phenomenon, and an electrical spark is generated.

The energy from this spark triggers the igniting and combustion of the compressed air-fuel mixture. The duration of this discharge is extremely brief (about 1/1,000 of a second) and is extraordinarily complex.

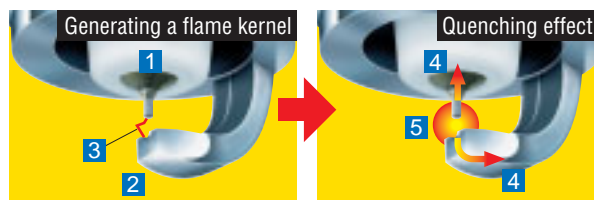


The role of the spark plug is to reliably generate a strong spark between electrodes precisely at each specific moment to create the trigger for combustion of the gaseous mixture.

### The spark plug generates a flame kernel from a spark which then ignites the fuel

Igniting the fuel with an electrical spark occurs because fuel particles situated between the electrodes are activated by the discharge spark to trigger a chemical reaction (oxidation), the reaction generates heat, and a flame kernel is formed. This heat ignites the surrounding air-fuel mixture until a flame core is formed that spreads combustion throughout the chamber. However, the electrodes themselves absorb heat which can extinguish the flame kernel, called the "quenching effect." If the quenching effect between the electrodes is greater than the heat generated by the flame kernel, the flame is extinguished and combustion stops.

If the plug gap is wide, the flame kernel will be larger and the quenching effect is reduced, so reliable ignition can be expected. But if the gap is too wide, a large discharge voltage becomes necessary, the limits of coil performance are exceeded, and discharge becomes impossible.



1 Center Electrode 2 Ground Electrode 3 Flame kernel  
4 Heat absorption 5 Flame propagation