

Fault Diagnosis of Spark Plug Problems



Normal

Symptoms: Brown to greyish-tan colour and slight electrode wear. Correct heat range for engine and operating conditions.
Recommendations: When new spark plugs are installed, replace with plugs of the same heat range.



Worn

Symptoms: Rounded electrodes with a small amount of deposits of the firing end. Normal colour. Causes hard starting in damp or cold weather and poor fuel economy.
Recommendations: Plugs have been left in the engine too long. Replace with new plugs of the same heat range. Follow the recommended maintenance schedule.



Carbon Deposits

Symptoms: Dry sooty deposits indicate a rich mixture or weak ignition. Causes misfiring and hard starting.
Recommendations: Make sure the plug has the correct heat range. Check for a clogged air filter or problem in the fuel system or engine management system. Also check for ignition system problems



Ash Deposits

Symptoms: Light brown deposits encrusted on the side or centre electrodes or both. Derived from oil and/or fuel additives. Excessive amounts may mask the spark, causing misfiring and hesitation during acceleration.
Recommendations: If excessive deposits accumulate over a short time or low mileage, install new valve guide seals to prevent seepage of oil into the combustion chambers. Also try changing petrol brands.



Oil Deposits

Symptoms: Oily coating caused by poor oil control. Oil is leaking past worn valve guides or piston rings into the combustion chamber. Causes hard starting and misfiring.

Recommendations: Correct the mechanical condition with necessary repairs and install new plugs.



Gap Bridging

Symptoms: Combustion deposits lodge between the electrodes. Heavy deposits accumulate and bridge the electrode gap. The plug ceases to fire, resulting in a dead cylinder.

Recommendations: Locate the faulty plug and remove the deposits from between the two electrodes.



Too Hot

Symptoms: Blistered, white insulator, eroded electrode and absence of deposits. results in shortened plug life.

Recommendations: Check for the correct plug heat range, over advanced ignition timing, lean fuel mixture, intake manifold, vacuum leaks, sticking valves and insufficient engine cooling.



Pre-ignition

Symptoms: Melted electrodes. Insulators are white but may be dirty due to misfiring or flying debris in the combustion chamber. Can lead to engine damage.

Recommendations: Check for the correct plug heat range, over advanced ignition timing, lean fuel mixture, insufficient engine cooling and lack of lubrication.



High Speed Glazing

Symptoms: Insulator has yellowish glazed appearance. Indicates that combustion chamber temperatures have risen suddenly during hard acceleration. Normal deposits melt to form a conductive coating. Causes misfiring at high speeds.

Recommendations: Install new plugs. Consider using a colder plug if driving habits warrant.



Detonation

Symptoms: insulators may be cracked or chipped, improper gap setting techniques can also result in a fractured insulator tip. Can lead to piston damage.

Recommendations: Make sure the fuel anti-knock valves meet engine requirements. Use care when setting the gaps on new plug.



Mechanical Damage

Symptoms: Maybe caused by a foreign object in the combustion chamber or the piston striking an incorrect reach (too long) plug. Causes a dead cylinder and could result in piston damage.

Recommendations: Repair the mechanical damage. Remove the foreign object from the engine and/or install the correct reach plug.