

Troubleshooting guide spark plugs



Alan Povey, Technical Services Manager for DENSO

Spark plugs may be a familiar engine component, but their improved performance and longer life, means you are probably fitting fewer replacements than ever before. Alan Povey, Technical Service Manager for DENSO, offers some help in identifying common spark plug faults.

Spark plugs perform a pivotal role in petrol engine response and represent an increasingly complex electrical set-up, so make time to remind yourself of some of the visual signals of spark plug problems, as well as their wider symptoms and likely causes.

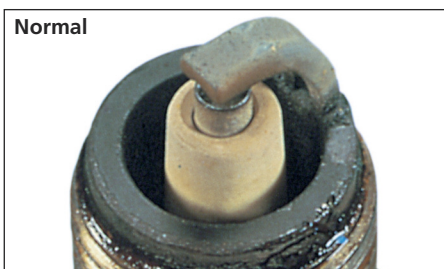
A plug's life can be affected by many factors. Dirt and fouled plugs (caused by carbon build-up), breakage and wear can all play a part and the portions of the spark plug that wear over time are the centre and side electrodes. The two main types

of wear are:

- Oxidised wear - oxidised scale build-up that drops off in places, only to be replaced by further irregular build-up
- Spark wear - melting / rounded edges / increased plug gaps caused by discharge energy and wear between the two electrodes

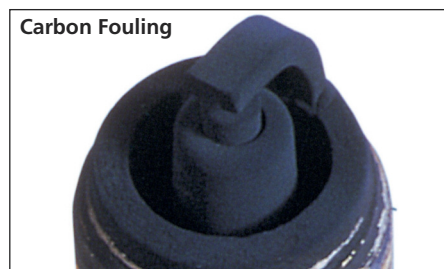
Other main causes of spark plug failure are shown on this page.

Also remember that failure to correctly install, inspect, clean and re-gap Spark Plugs can also result in problems, especially as 70% of a plug's wear is on the firing electrode. A bigger gap will stress the coil pack causing premature failure, causing potentially long term and costly faults. Modified engines also need to be considered to ensure that the correct application is used. If in doubt please consult DENSO.



Normal

Appearance: Light grey or tan deposits and slight electrode erosion

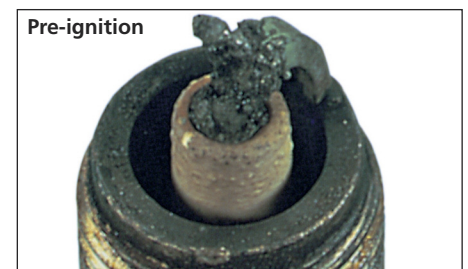


Carbon Fouling

Appearance: Dry, soft black carbon on the insulator and electrodes

Symptoms: Poor starting, misfiring, faulty acceleration

Possible causes: Faulty choke, over-rich air-fuel mixture, delayed ignition timing, bad ignition leads, plug heat range too cold

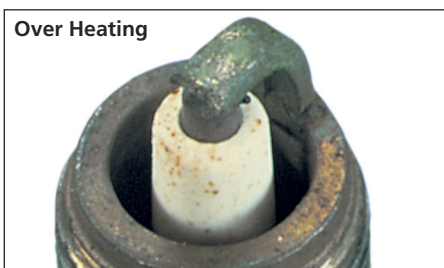


Pre-ignition

Appearance: A melted or burned centre and/or ground electrode, blistered insulator and aluminium or metallic deposits on the insulator

Symptoms: Loss of power, will cause engine damage

Possible causes: Much the same as over-heating. Pre-ignition takes place when combustion begins before the timed spark occurs

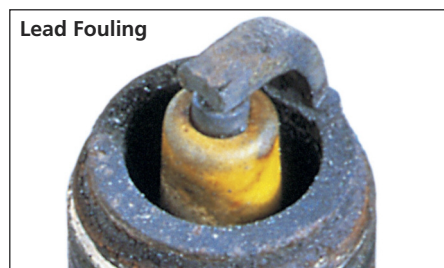


Over Heating

Appearance: Extremely white insulator with small black deposits & premature electrode erosion

Symptoms: Loss of power at high speed or with a heavy load

Possible causes: Plug insufficiently tightened, engine insufficiently cooled, ignition timing too advanced, plug heat range too hot, severe detonation

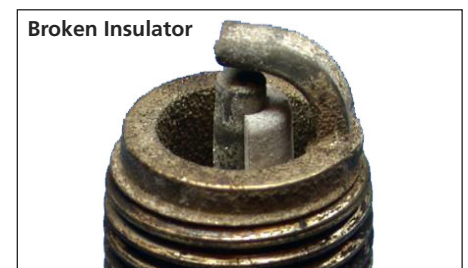


Lead Fouling

Appearance: Yellow or tan cinder-like deposits or a shiny glaze coating on the insulator

Symptoms: Misfiring under sudden acceleration or heavy load conditions but no adverse effect under normal operating conditions

Possible causes: Use of petrol with high-lead content



Broken Insulator

Appearance: The insulator leg section is cracked or broken

Symptoms: Misfiring

Possible causes: Severely abnormal combustion, lack of attention to gap adjustment