Tips & Technology
For Bosch Partners

Current topics for successful workshops No. 41/2012

Diesel injection

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Invented for life

Glow plugs and possible damage

Power for diesel engines

Modern diesel engines achieve high power with ever lower emissions. They start as soon as the ignition is turned – whatever the temperature. The glow plugs have an important part to play in this success.

DuraSpeed glow plugs from Bosch

DuraSpeed glow plugs feature sheathed elements of high-temperature resistant ceramic material. This enables immediate starting in all weathers, maximum preheating temperatures of 1,400°C and post and intermediate glowing for as much as a minute at 1,300°C. Cold starting behavior is similar to gasoline engines down to -28°C, and cold running is becomingly increasingly smooth. Optimum combustion in the engine's warm-up phase prevents the generation of smoke even during load changes, and protects the environment.

Causes of glow plug failure

As long as it is warm and dry outside, diesel engines often start even if the glow plug is already faulty. However, as soon as the weather becomes colder and damper, and night frosts begin, faulty glow plugs mean the engine has difficulty starting, or does not start at all.

Problem:
Starting problems due to an overheated or corroded heating element tip

Possible cause:
- Start of injection too early

Solution:
- Check injection system, set injection point exactly

Problem:
Starting difficulties due to a dented and folded heating element, break in the heating filament

Possible cause:
- Operation at excessive voltage (e.g. jump starting)
- Current applied for too long
- Increased alternator voltage
- Unwanted post-glowing with the engine running
- Glow plug without post-glow capability fitted

Solution:
- Jump start using 12-volt vehicle electrical system
- Check glow plug system, replace glow control relay
- Use a glow plug with post-glow capability

Problem:
Poor engine performance due to melted or broken heating element

Possible cause:
- Start of injection too early
- Dripping injection nozzle
- Coked/worn injection nozzle
- Seized piston rings
- Engine damage (following valve breakage, piston seizure, etc.)

Solution:
- Set injection point exactly
- Check injection system (e.g. nozzle-and-holder assembly)

Problem:
The engine starts with difficulty or not at all due to a lack of glow plug continuity

Possible cause:
- Closed-up/coked annular orifice between plug shell and heating element
- Heating element discharging too much heat
- As a result, the control filament remains cold and allows too much current to the heating filament

Solution:
- Check injection system
- Set injection point exactly
- Adhere to specified tightening torque

Problem:
Short circuit on starting due to overheating, pipe may burst/explode

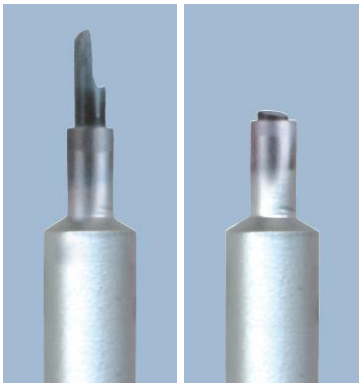
Possible cause:
- Use of low-quality glow plugs

Solution:
- Use high-quality glow plugs such as Bosch Duraterm

Problem:
Engine does not start as terminal stud has broken off or hex nut is damaged

Possible cause:
- Terminal nut tightened excessively
- Damage during installation due to use of the wrong tool

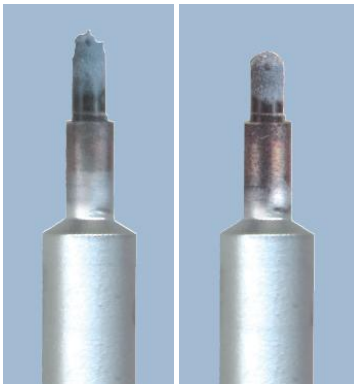
Solution:
- Use a torque wrench and pay attention to the tightening torque specified by the manufacturer



Problem:
Starting difficulties due to an overheated or broken heating element

Possible cause:
- Incorrect injection point
- Incorrect injection pattern
- Overvoltage
- Glow plug was fitted askew on installation

Solution:
- Check the engine for oil loss due to leaks
- Check that the control unit functions correctly
- Install plug correctly



Problem:
Starting problems due to melted ceramic heating element

Possible cause:
- Wrong glow plug installed (e.g. 12V instead of 24V)
- Faulty control unit which generates too much voltage or cuts off the current too late.

Solution:
- Check the alternator
- Check that the control unit functions correctly
- Use designated glow plugs for the vehicle in question