

Tips & Technology

For Bosch business partners

Current topics for successful workshops No. 12/2014

Gasoline Injection



BOSCH

Invented for life

Fuel Injection Components

Fuel injection has a long history. The Deutz gas engine factory was manufacturing small quantities of plunger pumps for gasoline injection as early as 1898. After today's carburetor principle was invented shortly thereafter, fuel injection was no longer competitive given the level of technology at that time. At Bosch, the first experiments with gasoline fuel injection pumps were already being conducted in 1912. In 1937, the first airplane engine with Bosch gasoline fuel injection, delivering an output of 1200 HP, went into production. The uncertainty of carburetor technology in the event of icing and the risk of fires accelerated the development of gasoline fuel injection in this field in particular. The actual era of Bosch gasoline fuel injection had begun, but the use of gasoline fuel injection in a passenger car was still a long way off.

Today, Bosch is in demand as a development partner among automakers around the world. In close cooperation with manufacturers, Bosch develops solutions that set standards and advance the automotive industry. This is documented by exceptional innovations such as gasoline direct injection, which is facilitating current trends such as downsizing and contributing to the fuel savings and reduced emissions of today's engines.



Whether port fuel injection or direct fuel injection – Bosch offers an extensive product line for both systems. This includes the components that ensure a reliable supply of fuel, safe ignition, intelligent engine management and optimal exhaust treatment.

Gasoline Injection

Gasoline direct injection facilitates the downsizing trend and provides the basis for even more economical and cleaner engine generations. The market for such systems is growing continuously. Experts project that the percentage of vehicles with gasoline direct injection will more than double worldwide in the coming years.



Bosch offers components for both today's and earlier system generations:

- High-pressure pumps
- Injectors for gasoline direct injection
- Injectors for gas-operated vehicles
- Injectors for port injection
- Fuel rails

Workshop tip:

The Bosch ESI[tronic] diagnostic software recognizes Bosch components in the fuel injection system – in almost every vehicle. It gives your workshop recommendations about the actions to take, together with detailed removal and installation information.

Fuel Supply

The electronic fuel pump must supply the engine with sufficient fuel at the required pressure under all operating conditions. Increasingly, it also functions as a pre-supply pump for modern direct injection systems on both gasoline and diesel engines. Bosch fuel supply components are designed for delivery rates between 60 and 200 liters/h and fuel system pressures between 300 and 450 kPa (3–4.5 bar). The new brushless pump generation (BLDC) ensures need-based control to achieve CO₂ emission goals.



Workshop tip:

Repair kit solutions make it possible for your workshop to make fuel supply module repairs at a reasonable price – all wear parts in one kit.



Ignition Components

Bosch invented the first high-voltage magneto ignition over 100 years ago. Since then, we have focused on all components that play a role in ignition in internal-combustion engines and can offer a complete product line of carefully matched ignition components.



Components:

- Ignition cables
- Ignition coils
- Ignition modules

Workshop tip:

Watch for counterfeit parts: Only Bosch OEM parts ensure optimal performance and guarantee optimal power output from the engine and low exhaust emission values. Subsequent damage, e.g. to the catalytic converter, the oxygen sensor or control module is ruled out.

Oxygen Sensors

Oxygen sensors are subjected to extreme conditions. This is why the oxygen sensor on a vehicle should be checked regularly every 30,000 km – at best, whenever service is performed. If ageing is detected, the oxygen sensor should be replaced. This prevents expensive catalytic converter damage. assures better drivability and provides up to 15% fuel savings.



Workshop tip:

Poor cold starting? Check the oxygen sensor!

Hot-Film Air-Mass Meters

Hot-film air-mass meters sense the actual air mass flow quickly and very precisely, and are thus able to control a specified air/fuel ratio. This assures that optimal combustion takes place in the engine, resulting in low pollutant emissions in conjunction with high efficiency. Hot-film air-mass meters are used in both gasoline and diesel engines.



Bosch currently offers 3 basic types of hot-film air-mass meters:

- HFM5: analog with plastic housing
- HFM6: digital with plastic housing
- HFM7: analog or digital with especially rugged wire-reinforced plastic housing

The spare parts line also includes other components installed in older vehicles for air measurement:

- Air-flow sensors
- Hot-wire air-mass meters

Workshop tip:

Use only an OEM part as a replacement part! If an OEM part is not installed, approval to operate the vehicle is revoked. Furthermore, the output of the engine can be reduced significantly and fuel consumption increased.

Sensors

Vehicles are being equipped with more and more electronic components. In turn, the number of sensors that act as the "sensory organs" of the vehicle to capture various parameters is increasing as well. Sensors are wear parts that represent potential for greater sales for your workshop.



The sensor assortment from Bosch includes::

- Low-pressure sensors
- High-pressure sensors
- Differential-pressure sensors
- Peripheral pressure sensors
- Speed sensors for the crankshaft, camshaft (phase sensor) transmission and wheels
- Temperature sensors
- Steering angle sensors
- Pedal position sensors
- Torque sensors
- Rotation-rate sensors, acceleration sensors
- Rain sensors
- Climate sensors

Workshop tip:

Faulty sensors usually require specific measurements to be localized. These are carried out quite easily with a KTS diagnostic tool from Bosch and an FSA measurement module as an add-on.