

Tips & Technology

For Bosch business partners

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Diesel / Gasoline Injection



BOSCH

Invented for life

EVOII Mechanical Vacuum Pump

On diesel and modern gasoline engines with a low intake manifold vacuum, the mechanical vacuum pump ensures generation of vacuum for pneumatic operation of the brake booster and other components such as the exhaust gas recirculation valve, wastegate valve on the exhaust-gas turbocharger and the central locking system.

The EVOII mechanical vacuum pump

The EVOII mechanical vacuum pump demonstrates that there is still considerable development potential in conventional components. Bosch has made the inexpensive mechanical pump lighter and considerably more efficient. As a result, it can hold its own against supposedly more efficient and considerably more expensive electric vacuum pumps. The Bosch EVOII offers the best price-performance ratio on the market for supplying vacuum and reliably generates vacuum for the brake booster. At up to a 75 percent lower cost than for a comparable electric vacuum pump, the new generation is the ideal solution for modern gasoline and diesel engines. The CO₂ impact is less than 0.4 grams of CO₂ per kilometer and thus at the reference level of the electric competitors. Furthermore, the component is especially rugged, operates in the engine compartment and is thus noiseless for the driver.



To achieve this advance, Bosch completely redesigned this time-tested component, which has been produced 45 million times to date: the new generation is 300 grams lighter than other mechanical vacuum pumps and even more than one kilogram lighter than electric vacuum pumps. A thermoplastic rotor makes the difference. Its dimensionally stable vanes generate the needed vacuum, but the rotor weighs considerably less.

The operating principle of mechanical vacuum pumps has been well-established for many years on diesel engines. At the same time, the need for vacuum on modern gasoline engines has been increasing as well in recent years. The reason is increasing use of gasoline direct injection, which in combination with downsizing yields fuel savings of up to 15%. Around 40 percent of all new cars were already equipped with gasoline direct injection by 2013. Modern direct injection engines need an additional pump, since the vacuum can no longer be controlled by the throttle flap.

The EVOII vacuum pump shows that Bosch places great value also on improvements to individual components where major trends are concerned. "With the EVOII, we once again put an established product under the magnifying glass and refined every detail", stated Alessandro Fauda, Development Manager for the mechanical vacuum pump. The result: the redesigned product not only generates the required vacuum level, but also has the lowest friction on the market. This efficient design of housing and rotating components is the result of intensive simulation and calculation. In this way, the best solution for every engine application is obtained by changing a few parameters.

In addition, the new vacuum pump generation is adaptable, depending on the OEM customer and engine application. To meet customer requirements, the mechanical Bosch vacuum pump can be driven by the engine's camshaft, the crankshaft, or via rollers, gears or chains. It can also be coupled to an oil or fuel pump.