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Pierburg Pump Technology GmbH

## **New electric transmission oil pump supports modern drive concepts**

**In the last several years, the publicly held discussions about worldwide climate problems and the demand for more environmental protection have especially influenced the more recent developments in the automotive industry. Since that time, necessary fuel savings and related reductions in the discharge of CO<sub>2</sub> emissions have been taking an increasingly central role. New drive train concepts have also been developed: today hybrid vehicles and engines with start-stop systems are no longer rarities.**

**However, in order to function perfectly, these hybrids also need new concepts relating to ancillary engine units. The use of electric transmission oil pumps is therefore indispensable for various hybrid vehicle concepts as well as for conventionally powered vehicles with start-stop systems if hydraulic pressure in the systems shall be maintained after switching off the combustion engine. For this reason, Pierburg Pump Technology GmbH (PPT) has developed its new generation of electric oil pumps, which are currently about to enter series production.**

The manufacturer has over a decade of experience with electric pumps and the X20R transmission oil pump with a 200 watt engine has been in series production at an American OEM since 2007. Experiences with the X20R as well as the many years of expertise in electric coolant pumps were utilized in the development of this new generation of pumps. Costs and development times could thereby be reduced while simultaneously increasing quality and reliability.

From a technical standpoint, an electric oil pump consists of three main modules: the pump itself, an electric BLDC motor and the electronic control. Both the installation size and weight have been reduced in the new pump generation by integrating the electric motor and hydraulics.

Depending on requirements, the electronics – which mainly ensure the sensorless commutation of the brushless DC motor – can be separately placed in a control device or integrated into the pump casing.

The sensorless rotor position detection, as well as the generation of the motor control signals, is performed by the software in the ASIC (user-specific IC) developed in-house.

Because the nominal engine currents can total as much as 40 amps, the design of semiconductor output levels requires special attention with regard to their electromagnetic tolerability and cooling. This requires a timely forecast of the thermal behaviour of the pump as well as interdisciplinary expert knowledge.