



Oil Condition and Oil Level Sensor SGM110

Introduction

Bosch is developing a multifunctional oil sensor (SGM110) determining oil level and oil condition. The oil level information allows the omission of the oil dipstick and ensures that the engine can never run low on oil unnoticed. The oil condition information allows extended oil change intervals adapted to the actual state of the engine oil.

Function

The oil change will only be performed when required by the condition of the oil, yielding both economic and ecological benefits. Furthermore the information provides an insight into the actual state of the engine and thus supports the early detection of threatening engine failures.

The deterioration of the oil can be affected differently by various factors such as

- individual driving behaviour,
- the frequency of cold starts,
- the quality of the fuel or
- the surrounding environmental conditions.

The SGM110 constantly measures the temperature and oil level as well as the viscosity and permittivity of the oil. In conjunction with an engine oil management system, the optimal time for an oil change has never before been determined so precisely.



Figure 1: SGM110

Customer Benefit

- Maximise intervals between oil drain
- Environmentally friendly system due to extended oil use and reduced filter and oil consumption
- Protection of engine – potential of early detection of threatening engine failures
- Reliable oil level sensor - the oil dipstick becomes obsolete

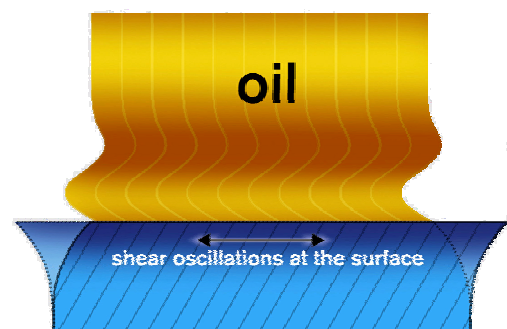


Figure 2: Measuring Principle



Application

The SGM110 is integrated into the oil pan. The housing can be designed according to customer specifications.

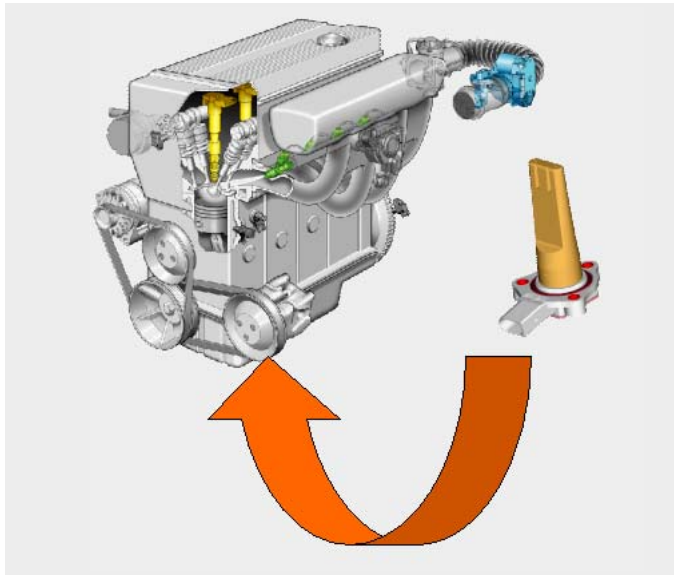


Figure 3: Sensor integration in the oil pan

Technical Data - preliminary

Supply Voltage	9V to 16V
Nominal Current	10mA to 20mA
Digital serial output	BSS, PWM
Ambient Air Temperature	- 40°C to 150°C
Level Range	20mm to 100mm
Viscosity Range (in terms of cinematic viscosity)	3 to 300 mm ² /s
Permittivity (ϵ_r) Range	1 to 6

Sensor Output Data

- Oil level
- Viscosity
- Permittivity
- Temperature

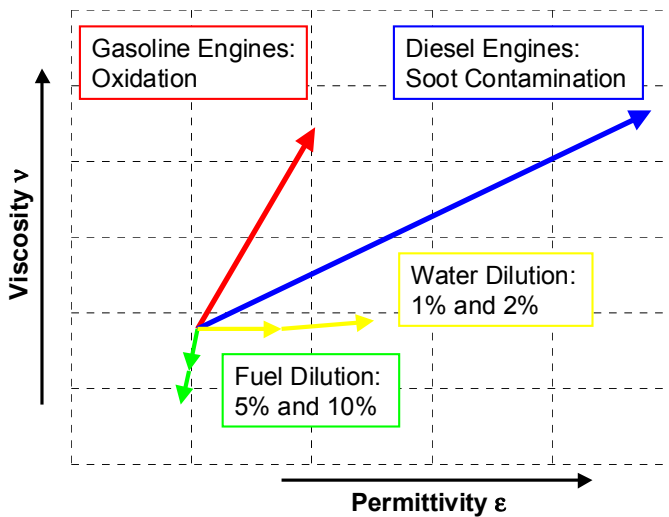


Figure 4: Correlation of oil condition with sensor measurements

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