

Analysis of Automotive Sensor for Engine Knock System

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Abstract : This paper deals with the phenomenon of the undesirable detonation combustion in internal combustion engines. A control unit of the engine monitors these detonations using piezoelectric knock sensors. With the control of these sensors the detonations can be objectively measured just outside the car. If this component provides small amplitude of the output voltage it could happen that there would have been in the areas of the engine ignition combustion. The paper deals with the design of a simple device for the detection of this disorder. A construction of the testing device for the knock sensor suitable for diagnostics of knock combustion in internal combustion engines will be presented. The output signal of presented sensor will be described by Bessel functions. Using the first voltage extremes on the characteristics it is possible to create a reference for the evaluation of the polynomial residue. It should be taken into account that the velocity of sound in air is 330 m/s. This sound impinges on the walls of the combustion chamber and is detected by the sensor. The resonant frequency of the clicking of the motor is usually in the range from 5 kHz to 15 kHz. The sensor worked in the field to 37 kHz, which shall be taken into account on an own sensor resonance.

Keywords : diagnostics, knock sensor, measurement, testing device

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