



TECHNICAL INFORMATION

KNOCK SENSORS

Knock sensors prevents from a harmful spontaneous ignition resulting in the knocking effect.

The acyclic uncontrolled combustions results in a high temperature inside the cylinder. This phenomenon causes that, engine parts like pistons, valves or the cylinder head, are subjected to high stress.

The knock sensor is located on the engine block so that records the pinging caused by the knocking effect and transforms it into an electrical signal. The control unit checks the signal with the values stored specification and intervene to control the engine, the fuel injection and the ignition to the extent necessary, before the fuel reaches the knock limit.

Thanks to the presence of these sensors the engines can work closer to the limits of controlled burning, obtaining better performance of the mix. Depending on the application they may have the built-in connector or be connected by a cable. The connectors may have 2 or 3 terminals, if they have cable and the shielding antiparasite is grounded.

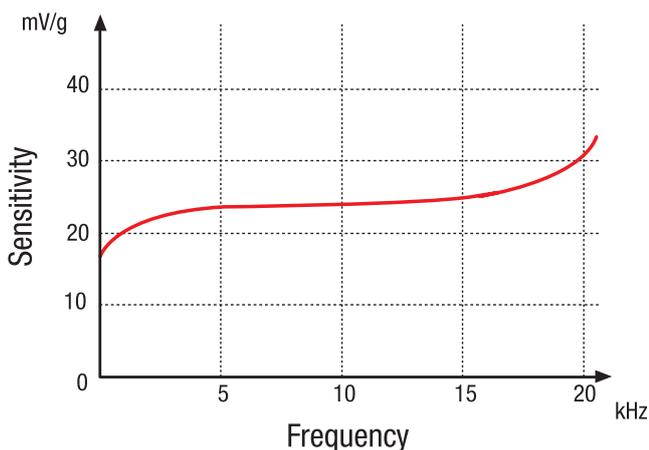
Depending on the engine or the vehicle control unit, it will have one or more sensors measuring simultaneously. In the particular case of carrying multiple sensors, we can find them with an individual connector or with a common connector.



FEATURES

Knock sensors are differentiated by their sensitivity (S). Sensitivity is the ratio between the tension generated on the sensor terminals and the acceleration to which it is subjected. It is expressed in mVolts/g.

Knock sensors of non-resonant type have the property to maintain its sensitivity almost constant throughout its whole range of reading.



$$S = \frac{\text{voltage}}{\text{acceleration}} \left(\frac{\text{mVolt}}{g} \right)$$

(1g = 9,81 m/s²)

· Within the wide range available can be found with or without discharge resistor.

TECHNICAL DATA

All knock sensors are subjected to rigorous tests and tested in response to 100%.

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|-------------------------|-------------------------|
| • Working range: | 1 ... 20 kHz. |
| • Sensitivity at 5 kHz: | Feature of each sensor. |
| • Working temperature: | -40 ° C ... 140 ° C. |
| • Range of capacity: | 800 1400 pF. |
| • Main resonance: | > 25 kHz. |

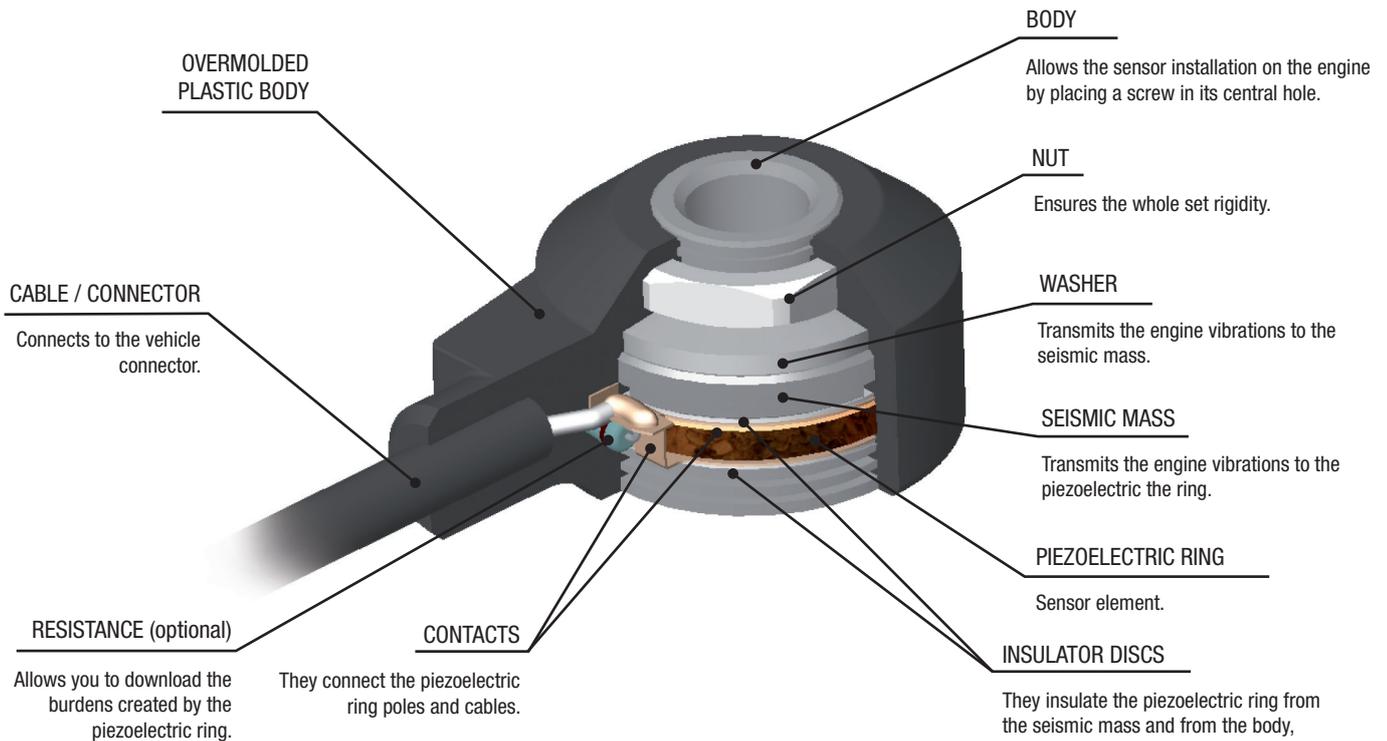


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OPERATION

Inside the knock sensor there is a piezoelectric ring with a metal contact in each of their faces and perfectly isolated from the body and the seismic mass. The piezoelectric sensor is a ceramic ring which polarizes when exposed to an external electric field, so that, when subjected to compressive forces can generate a potential difference. The seismic mass is a metal ring perfectly calibrated to achieve the required sensitivity, so that when placed next to the sensor and compressed by a spring washer and a threaded nut (due to the inertial force) transmits the vibrations to the sensor element.

The sensor metal part (body) is responsible for transmitting the vibrations from the engine block, before fitting it, we need to ensure that the area is clean and in a good condition, otherwise it would not be possible to guarantee the proper operation of the sensor.



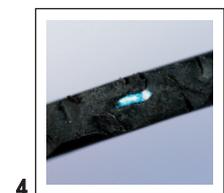
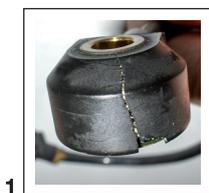
INSTALLATION INSTRUCTIONS

- To ensure a proper torque reading the tightening torque should be 20 ± 5 Nm.
- The sensor metal part must be in direct contact with the motor unit (without washers).
- In order to improve the vibrations transmission it is recommended to apply a thin silicone layer in the sensor base.

VISUAL INSPECTION / CAUSES OF FAILURE

The body sensor, the connector and the cable should be checked, ensuring their good condition. Also check if the knock sensor body shows any crack, dents or impact that may have deteriorated it.

Take into account that, as a general rule, visual inspection is not sufficient to ensure the sensor smooth or malfunction, but it helps to make an initial diagnosis.



1- CRACKING AND BREAKING. Tensions caused by mechanical stress.

2- DEFORMATIONS AND DENTS. Sensor overheated.

3- METAL BODY CORROSION. Wrong anchor to the block engine.

4- NO SIGNAL. Cable breakage due to friction or excessive vibration; and internal sensor breakage due to mechanical or thermal stress.