

Knock Sensor (Flat Type)

- When the conventional resonance type knock sensor receives vibrations from the cylinder block, a diaphragm on a piezoelectric ceramic element flexes along the area where it is mounted to the cylinder block acting as the fulcrum. This causes a pressure to act on the piezoelectric ceramic element, which generates a voltage. In contrast, when the flat (non-resonance type) knock sensor receives vibrations from the cylinder block, a delayed movement of the weight occurs in the sensor due to the inertial force of the weight. This causes a pressure to be applied to a piezoelectric ceramic element, which is provided between the cylinder block and the weight, thus generating a voltage.

Knock Sensor Operation

- In the conventional resonance type knock sensor, the diaphragm resonates at a certain frequency at which the engine knocks. Therefore, when the knock sensor generates an output, the engine ECU determines that knocking has occurred. In contrast, the flat (non-resonance type) knock sensor has practically constant output characteristics in all frequency ranges. Therefore, the engine ECU can detect a target frequency at which knocking occurs, enabling a more accurate knocking detection.

