SNS COLLEGE OF TECHNOLOGY

COIMBATORE-35

DEPARTMENT OF MECHATRONICS ENGINEERING

19MCT402-APPLIED MECHATRONICS ENGG.
UNIT-2 AUTOTRONICS

Knock sensor

Knock sensor is an essential component and it is used in automobiles. This sensor is located in the minor engine block, head of the cylinder. This sensor is mainly designed to generate the voltage signal depending upon the vibrations which are occurred due to the explosion. When we observe or hear a knock or ping sound along with the noise of an engine in cars is pre-ignition. This ignition can be occurred due to the air mixture or pocket of fuel ignited in front of the flame from the flash plug. So there will be a small shock wave can be occurred around the ignition, which can increase the pressure within the cylinder. In some cases, this can damage the engine.

The knock sensor is one kind of sensor used to detect the flash knock. This flash is the state within the engine of the automobile where the fuel starts burning because of the pre-ignition, detonation, otherwise pinging.
The main function of this sensor is to monitor the ignition process inside the engine. Its indication assists the engine control to stop knocking ignition and thus guard the motor or engine control.

Working Principle

The arrangement of this sensor can be done outside of the engine block in the automobile. The main function of this is to record knocking noise within all engine operating conditions to stop engine injure.
The sensor used in the car listens to the sensations which are occurred from the engine block in the car & changes them into electrical voltage signals, which are filtered & estimated inside the control unit.

The knocking signal can be allocated to a particular cylinder in the car. If knocking occurs, the explosion signal for the particular cylinder can be changed within the late direction until knocking ignition no longer takes place.

Symptoms of Faulty Knock Sensor

A faulty sensor can visible itself in different ways during fault discovery through the control unit which includes the following,

- An error code can be stored
- Engine power can be reduced
- Fuel consumption can be increased
- Warning light of the engine will be ON

- Slow acceleration

Causes

A faulty sensor can be occurred due to the following reasons

- Rust
- The short circuit inside the engine
- Damage of wiring
- Wiring short circuit
- Mechanical injury
- Wrong mounting

Troubleshooting the Sensor

- Verify the sensor wiring connections and the plug whether these are connected in an exact place or not
- Read out the fault code which is stored
- Check the explosion end

Applications

The applications of knock sensor include the following.

- These sensors are used in automotive industries
- These sensors are used to control the internal ignition of engines in cars
- These sensors are used to protect the machine tools
- These sensors are used to detect the cavitations
- Monitoring spin bearings

Crash sensors

Crash sensors need to detect a collision and convert it to usable signals within milliseconds. The accelerating forces acting on the sensors after a collision can be as high as 100g (100 times the earth's gravitational force). When a car is stopped abruptly by an impact, all bodies or objects that are not firmly fixed to the car will continue to move at the impact speed. The sensors measure this acceleration and relay it to the control unit as usable data.

Many of our cars are fitted with ultra-fast pressure sensors in the front doors. These sensors detect a side collision that pushes the outer door panel inwards, creating excess pressure. Acceleration sensors are also fitted near the C-pillars so that collisions from the side, which don't cause deformation of the front doors, can also be detected in time.