Technical Bulletin

October 2021,TSB-VSA-EMS-102021-01

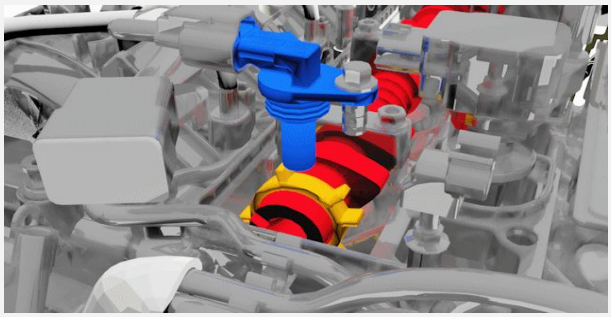
TIPS AND TRICKS

Camshaft sensor

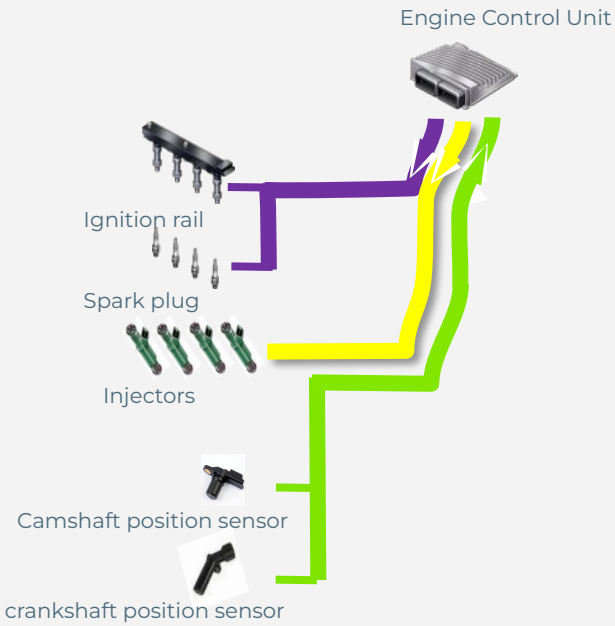
Application for

All engines

Camshaft sensor, how does it work?

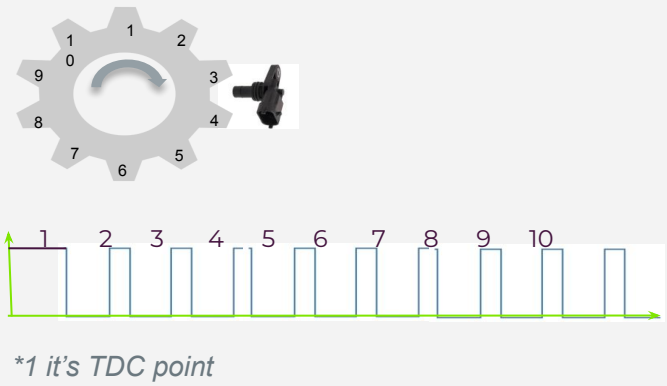
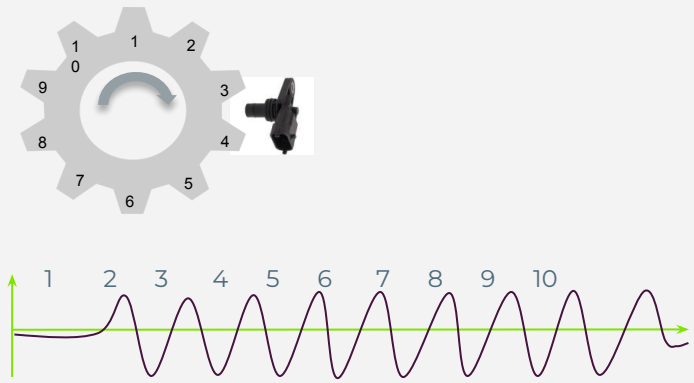


Source: Peugeot camshaft sensor

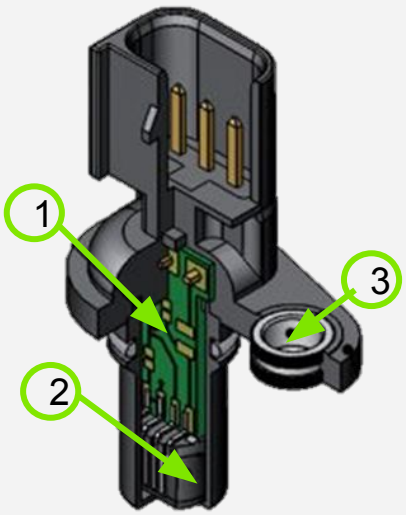


- The **Camshaft** & **Crankshaft** or Angular sensors determine the position of each camshaft and crankshaft.
- **Synchronization** of **CAM** & **CRK** sensors are very important and some systems will even determine if **injection** takes place. The **ECM** simply **cuts** the injection if it finds there is **no** synchronization between them in order to protect the engine.
- The **camshaft** shaft sensor **registers** the **speed** and the **position** of the camshaft.
- The **engine control unit** makes use of this information to **regulate ignition** & **fuel injection**.
- The **camshaft sensor** provides the data that is used to **compute** the **engine's RPM** which is essential for **proper** transmission **gear selection** in relationship to **vehicle speed.**

Types of camshaft

Hall effect sensor	Variable reluctance sensor
• **3 wire** sensor, creates **square** wave **output.** • **Requires power** to function. • **Edge** of the trigger tooth corresponds to a **rising** or **falling** signal voltage.	• **2 wire** sensor, creates **sine** wave **output**. • **Center** of the tooth corresponds to "**zero crossing**". • The **zero-crossing** is what the **ECU** uses to **indicate position.**
 *1 it's TDC point	

Camshaft structure & information (hall effect)

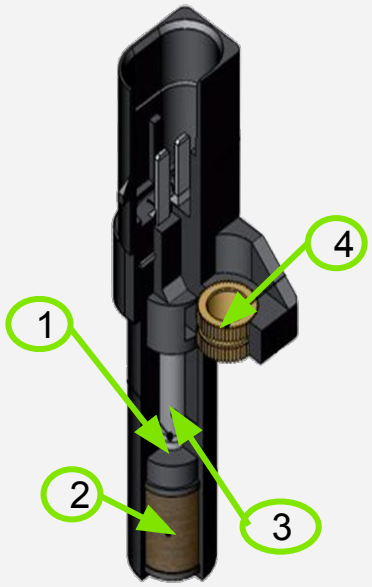


Note:
Standard Hall effect sensor

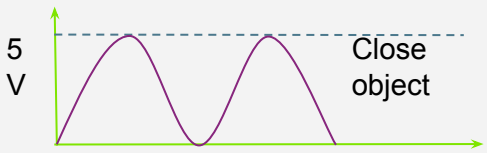
S	Item name
1	Electronic circuit (this electronic circuit protects the sensor from possible voltage peaks)
2	Hall element
3	Metallic fixation

Sensor information	
Power supply	From ECU, 5V and ground
Signal type	Frequency varying
Signal level	Switching between 0V to 5V

Camshaft structure & information (Variable reluctance)



Note:
Standard Variable reluctance sensor



S	Item name
1	Magnetic core
2	Coil
3	Permanent magnet
4	Metallic fixation

Sensor information	
Power supply	The **amplitude** and **frequency** of the induced **voltage** is **proportional** to the **speed** of the target feature.
Signal type	
Signal level	

Characteristics of each sensor type

S	Advantage (Hall effect)	Disadvantage (Hall effect)
1	Contactless operation	Temperature sensibility
2	Unaffected by temperature fluctuations	
3	Unaffected by vibration	

S	Advantage (variable reluctance)	Disadvantage (variable reluctance)
1	Self-generating electrical signal requires no external power supply	As low rotation speed the signal strength decreases
2	Fewer wiring connections contribute to excellent reliability	
3	Meets a wide range of output, resistance, and inductance requirements	