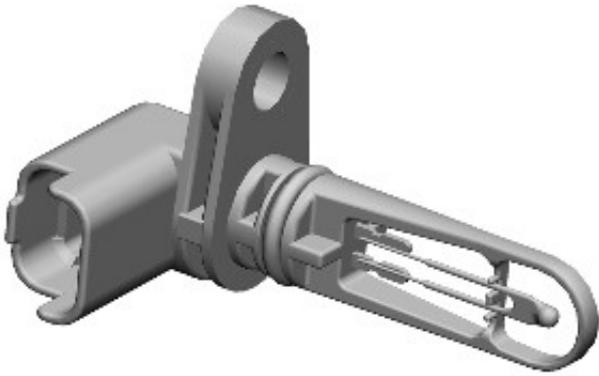


## CHARGE AIR TEMPERATURE SENSOR



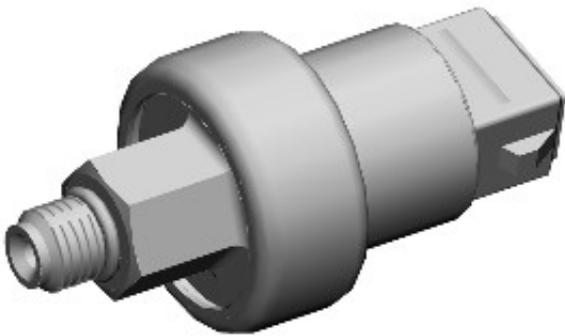
E 139406

The charge air temperature sensor is installed in the air duct between the charge air cooler and the electronic throttle.

The charge air temperature sensor is a **NTC (negative temperature coefficient)** thermistor that receives a 5V reference voltage from the ECM. The **ECM** uses the input from the sensor for fueling calculations.

If the charge air temperature sensor fails, the **ECM** uses a default charge air temperature of 20 °C (68 °F). In the event of a charge air temperature sensor failure, over fueling may occur, resulting in black smoke from the exhaust.

## CLUTCH PEDAL POSITION SWITCH



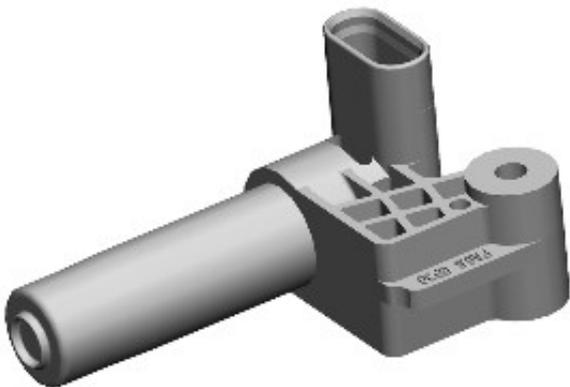
E 139407

The clutch pedal position switch is located on the clutch master cylinder.

The clutch pedal position switch is a pressure transducer type. When the clutch is pressed the switch disconnects a ground connection to the **ECM**, which reduces engine torque.

In the event of a clutch pedal switch failure, there may be some loss of driveability in the form of poor acceleration and reduced power.

## CRANKSHAFT POSITION SENSOR



E 139408

The CKP sensor is attached to a bracket on the rear of the cylinder block, in the joint between the cylinder block and the transmission clutch housing. The sensor tip is aligned with a magnetic trigger wheel attached to the crankshaft. The sensor produces a square wave signal, the frequency of which is proportional to engine speed.