The CKP sensor is a Hall effect sensor that receives a 5V supply from the ECM and produces a square wave signal, the frequency of which is proportional to engine speed. The trigger wheel has two missing teeth to provide a reference point for the angular position of the crankshaft.

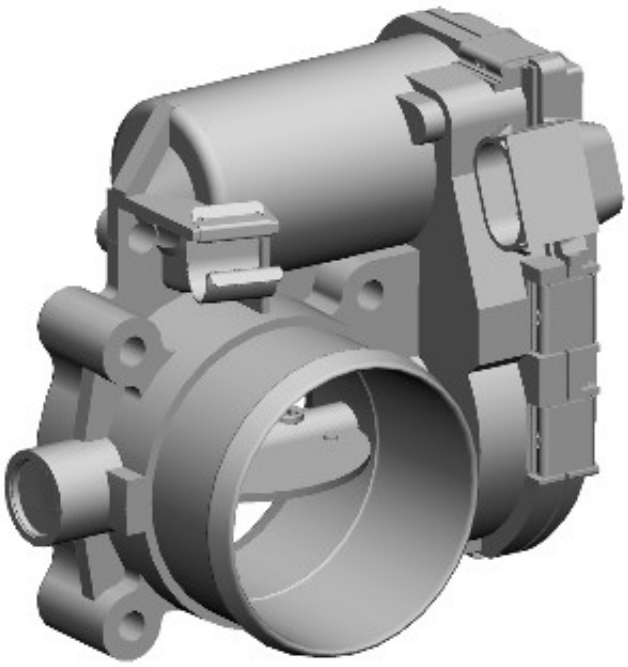
The ECM uses the signal from the CKP sensor for the following functions:

- Synchronization
- Determining fuel injection timing
- Producing an engine speed signal which is broadcast on the high speed controller area network (CAN) bus for use by other systems.

If there is a fault with the CKP (crankshaft position) sensor, the following symptoms may be observed:

- Engine will not start
- Rough idle, EGR (exhaust gas recirculation) disabled, poor acceleration and lack of power.

ELECTRONIC THROTTLE



E139429

The electronic throttle is installed between the duct from the charge air cooler and the intake manifold, and is used by the ECM for EGR to control emissions, to make engine shutdown smoother, and to provide a second means of stopping the engine if other items fail.

The throttle plate is operated by an electric DC (direct current) motor, attached to the throttle body, which is controlled by the ECM. A position sensor in the DC motor supplies a feedback signal of throttle plate position to the ECM.

In there is a fault with the DC motor or the position sensor, the ECM will:

- Signal the instrument cluster, on the high speed CAN bus, to illuminate the MIL
- Disable EGR and DPF regeneration (where fitted), which results in increased emissions
- Reduce engine power output.

ENGINE COOLANT TEMPERATURE SENSOR