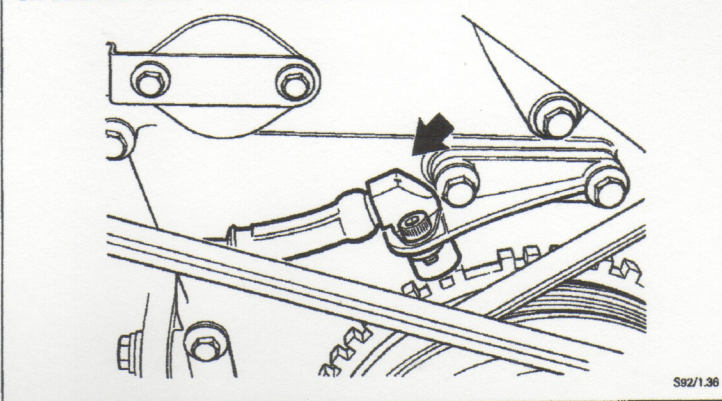## Engine Speed and Crankshaft Position

Crankshaft position sensor (CKPS)

The sensor portion of the crankshaft position sensor is identical to the AJ6 sensor with a revised electrical lead and bracket.

The CKPS provides the primary input to the ECM for engine speed and engine position. The sensor is a variable reluctance device, consisting of a bobbin coil with a magnetic core. The steel teeth on the crankshaft timing ring form a rotor. As the rotor teeth pass by the crankshaft position sensor, pulses are generated.

The rotor has 60 tooth positions set at 6° intervals with one tooth missing. The gap identifies the TDC position of cylinders 1 and 6. The rotor thus provides both engine speed and crankshaft position information to the ECM. Each tooth pulse represents 6° of crankshaft rotation. Thus the frequency of the toothed pulses are a measure of engine speed. The sensor is mounted to the timing cover on the front of the engine. The air gap between the sensor and the rotor should be 0.020 – 0.040 in.
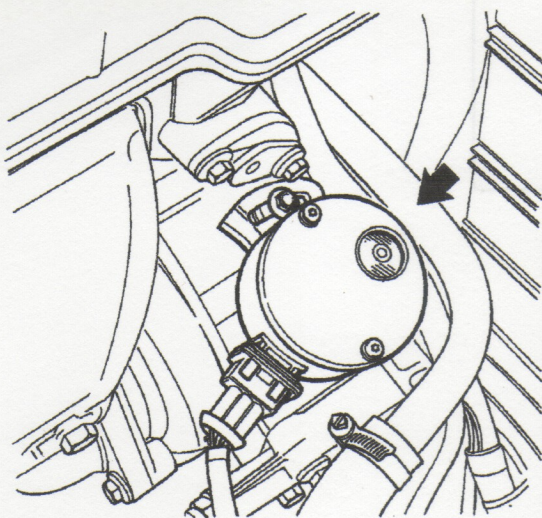

CRANKSHAFT POSITION SENSOR LOCATION
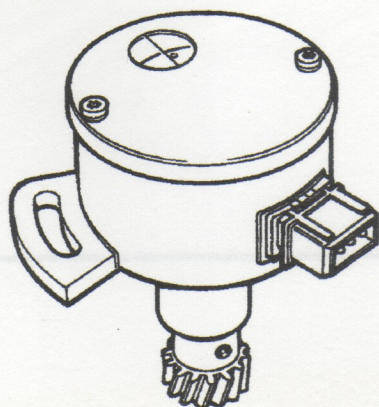
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CRANKSHAFT POSITION SENSOR
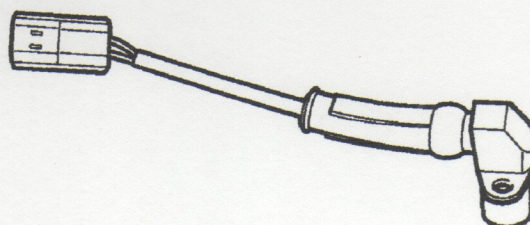
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CAMSHAFT POSITION SENSOR LOCATION

CAMSHAFT POSITION SENSOR

Initial Cylinder Synchronization for Engine Starting

Camshaft position sensor (CMPS)

The camshaft position sensor is a Hall-effect sensor which provides the ECM with a sequencing input so that correct ignition and fuel injection will begin with two-thirds of an engine revolution at engine start. The CMPS rotor has six "windows" of different width to positively identify each cylinder. As a window passes the sensor, the ECM is able to identify the cylinder (1 through 6).

The CMPS is necessary because the crankshaft position sensor (CKPS) gap identifies TDC position for *both* cylinders 1 and 6. Without the CMPS sequencing input, the ECM would attempt engine start by trial and error, firing each cylinder in sequence; several engine revolutions might be required for successful engine start. CMPS input is not required by the ECM once the engine is started.

CMPS installation procedure

With the engine at cylinder 1 compression TDC, the dot on the CMPS rotor should align with the circle in the inspection window.

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O- Ring   15/16 × 1 1/16 × 1/16 (Size 21)