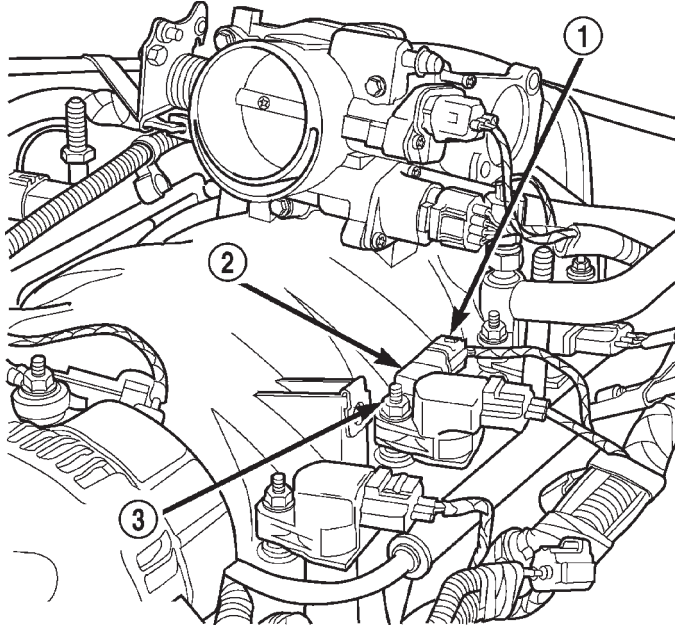


## IGNITION COIL CAPACITOR

### DESCRIPTION

Two coil capacitors are used. One of them is located near the center of, and on the left side of the intake manifold (Fig. 20). The other capacitor is located near the center of, and on the right side of the intake manifold.



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**Fig. 20 Coil Capacitor (Left Side Shown)**

- 1 - ELECTRICAL CONNECTOR
- 2 - COIL CAPACITOR
- 3 - MOUNTING NUT

### OPERATION

The 2 coil capacitors are used to prevent high-voltage spikes from interfering with the operation of certain powertrain sensors. They are also used to help prevent radio interference.

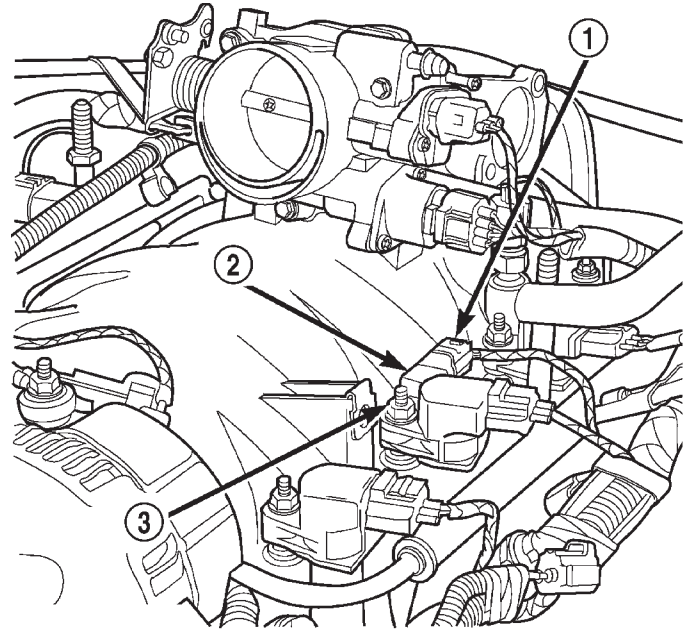
### REMOVAL

Two coil capacitors are used. One of them is located near the center of, and on the left side of the intake manifold (Fig. 21). The other capacitor is located near the center of, and on the right side of the intake manifold.

- (1) Disconnect electrical connector at coil capacitor (Fig. 21).
- (2) Remove mounting nut.
- (3) Remove capacitor from mounting stud.

### INSTALLATION

- (1) Position capacitor to manifold mounting stud.



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**Fig. 21 Coil Capacitor (Left Side Shown)**

- 1 - ELECTRICAL CONNECTOR
- 2 - COIL CAPACITOR
- 3 - MOUNTING NUT

- (2) Install nut and tighten to 8 N·m (70 in. lbs.) torque.
- (3) Connect electrical connector to capacitor (Fig. 21).

## KNOCK SENSOR

### DESCRIPTION

#### 4.7L High-Output Engine

The 2 knock sensors are bolted into the cylinder block under the intake manifold.

### OPERATION

#### 4.7L High-Output Engine

Two knock sensors are used on the 4.7L V-8 engine if equipped with the high-output package; one for each cylinder bank. When the knock sensor detects a knock in one of the cylinders on the corresponding bank, it sends an input signal to the Powertrain Control Module (PCM). In response, the PCM retards ignition timing for all cylinders by a scheduled amount.

Knock sensors contain a piezoelectric material which constantly vibrates and sends an input voltage (signal) to the PCM while the engine operates. As the intensity of the crystal's vibration increases, the knock sensor output voltage also increases.

## KNOCK SENSOR (Continued)

The voltage signal produced by the knock sensor increases with the amplitude of vibration. The PCM receives the knock sensor voltage signal as an input. If the signal rises above a predetermined level, the PCM will store that value in memory and retard ignition timing to reduce engine knock. If the knock sensor voltage exceeds a preset value, the PCM retards ignition timing for all cylinders. It is not a selective cylinder retard.

The PCM ignores knock sensor input during engine idle conditions. Once the engine speed exceeds a specified value, knock retard is allowed.

Knock retard uses its own short term and long term memory program.

Long term memory stores previous detonation information in its battery-backed RAM. The maximum authority that long term memory has over timing retard can be calibrated.

Short term memory is allowed to retard timing up to a preset amount under all operating conditions (as long as rpm is above the minimum rpm) except at Wide Open Throttle (WOT). The PCM, using short term memory, can respond quickly to retard timing when engine knock is detected. Short term memory is lost any time the ignition key is turned off.

**NOTE: Over or under tightening the sensor mounting bolts will affect knock sensor performance, possibly causing improper spark control. Always use the specified torque when installing the knock sensors.**

## REMOVAL

## 4.7L High-Output Engine Only

The 2 knock sensors are bolted into the cylinder block under the intake manifold (Fig. 22).

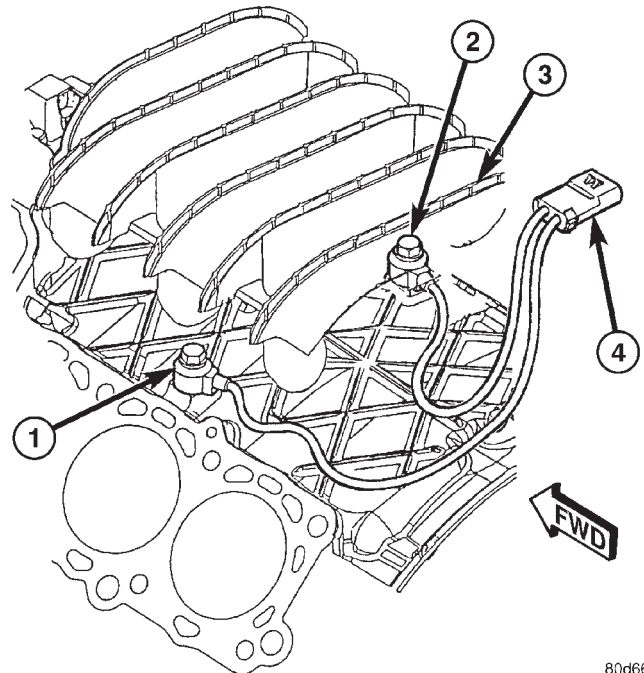
**NOTE: The left sensor is identified by an identification tag (LEFT). It is also identified by a larger bolt head. The Powertrain Control Module (PCM) must have and know the correct sensor left/right positions. Do not mix the sensor locations.**

(1) Disconnect knock sensor dual pigtail harness connector from engine wiring harness connector. This connection is made near the right/rear of intake manifold (Fig. 23).

(2) Remove intake manifold. Refer to Engine section.

(3) Remove sensor mounting bolts (Fig. 22). Note foam strip on bolt threads. This foam is used only to retain the bolts to sensors for plant assembly. It is not used as a sealant. Do not apply any adhesive, sealant or thread locking compound to these bolts.

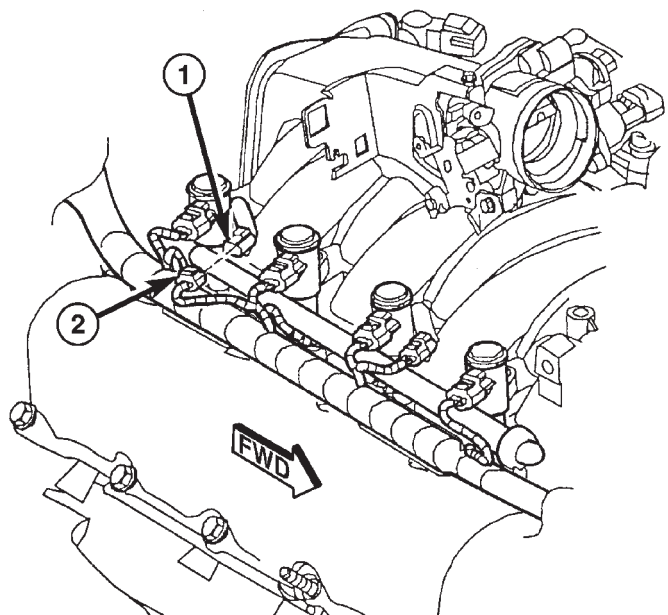
(4) Remove sensors from engine.



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**Fig. 22 KNOCK SENSOR LOCATION - 4.7L H.O.**

- 1 - KNOCK SENSORS (2)
- 2 - MOUNTING BOLTS
- 3 - INTAKE MANIFOLD (CUTAWAY)
- 4 - PIGTAIL CONNECTOR



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**Fig. 23 KNOCK SENSOR ELEC. CONNECTOR - 4.7L H.O.**

- 1 - KNOCK SENSOR PIGTAIL HARNESS CONNECTOR
- 2 - ENGINE WIRING HARNESS