

2-8 ENGINE ELECTRICAL

3. Detach the electrical connector at the module by pushing in on the connector finger ends while grasping the connector body and pulling away from the module.

To install:

4. Attach the electrical connector to the module by pushing until the connector fingers are

locked over the locking wedge feature on the module.

5. Install the module and the retaining screws. Tighten the screws to 24–35 inch lbs. (3–4 Nm).

➔ **Locking the connector is important to ensure sealing of the connector/module interface.**

6. Connect the negative battery cable.

Crankshaft and Camshaft Position Sensors

For procedures on the position sensors, please refer to Section 4 in this manual.

FIRING ORDERS

▶ See Figures 34, 35 and 36

➔ **To avoid confusion, remove, and tag the spark plug wires one at a time, for replacement.**

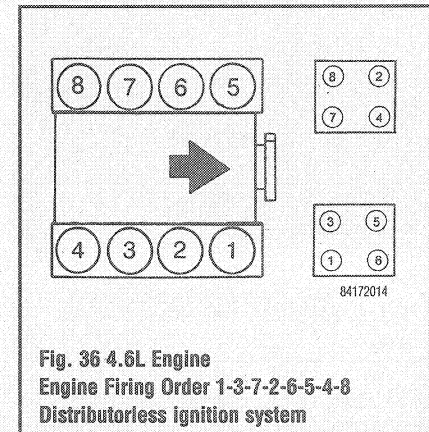
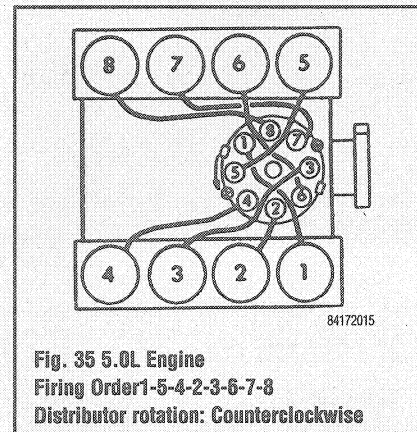
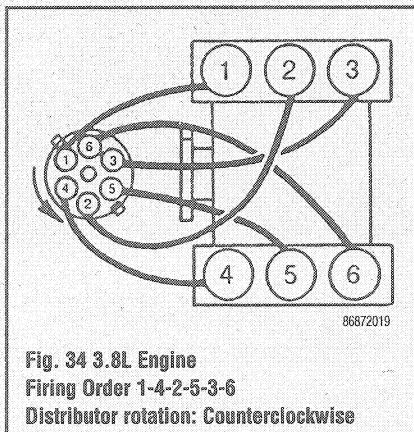
If a distributor is not keyed for installation with only one orientation, it could have been removed previously and rewired. The resultant wiring would hold the correct firing order, but could change the

relative placement of the plug towers in relation to the engine. For this reason, it is imperative that you label all wires before disconnecting any of them. Also, before removal, compare the current wiring with the accompanying illustrations. If the current wiring does not match, make notes in your book to reflect how your engine is wired.

On the 3.8L and 5.0L engine's ignition system, the distributor is driven off the camshaft and uses no centrifugal or vacuum advance. The distributor

operates by using a Hall effect vane switch assembly, causing the ignition coil to be switched on and off by the EEC-IV and TFI-IV modules.

The 4.6L Engine uses no distributor. The ignition system is the EDIS system, which consists of a crankshaft sensor, ignition module ignition coil pack, the spark angle portion of the Powertrain Control Module (PCM), and the related wiring. The EDIS eliminates the need for a distributor by using multiple ignition coils.



CHARGING SYSTEM

Alternator Precautions

Several precautions must be observed when performing work on alternator equipment.

- If the battery is removed for any reason, make sure that it is reconnected with the correct polarity. Reversing the battery connections may result in damage to the one-way rectifiers.
- Never operate the alternator with the main circuit broken. Make sure that the battery, alternator, and regulator leads are not disconnected while the engine is running.
- Never attempt to polarize an alternator.
- When charging a battery that is installed in the vehicle, disconnect the negative battery cable.
- When utilizing a booster battery as a starting aid, always connect it in parallel; negative to negative, and positive to positive.
- When arc (electric) welding is to be performed on any part of the vehicle, disconnect the negative battery cable and alternator leads.
- Never unplug the PCM while the engine is running or with the ignition in the ON position. Severe and expensive damage may result within the solid state equipment.

Alternator

TESTING

Voltage Test

1. Make sure the engine is **OFF**, and turn the headlights on for 15–20 seconds to remove any surface charge from the battery.
2. Using a DVOM set to volts DC, probe across the battery terminals.
3. Measure the battery voltage.
4. Write down the voltage reading and proceed to the next test.

No-Load Test

1. Connect a tachometer to the engine.

CAUTION

Ensure that the transmission is in PARK and the emergency brake is set. Blocking a wheel is optional and an added safety measure.

2. Turn off all electrical loads (radio, blower motor, wipers, etc.)
3. Start the engine and increase engine speed to approximately 1500 rpm.
4. Measure the voltage reading at the battery with the engine holding a steady 1500 rpm. Voltage should have raised at least 0.5 volts, but no more than 2.5 volts.
5. If the voltage does not go up more than 0.5 volts, the alternator is not charging. If the voltage goes up more than 2.5 volts, the alternator is overcharging.

➔ **Usually under and overcharging is caused by a defective alternator, or its related parts (regulator), and replacement will fix the problem; however, faulty wiring and other problems can cause the charging system to malfunction. Further testing, which is not covered by this book, will reveal the exact component failure. Many automotive parts stores have alternator bench testers available for use by customers. An alternator bench test is the most definitive way to determine the condition of your alternator.**

6. If the voltage is within specifications, proceed to the next test.