1992 Volvo 940

Submodel: | **Engine Type:** L4 | **Liters:** 2.3
Fuel Delivery: FI | **Fuel:** GAS

Ignition system functions are controlled by the ECM, so no adjustment is necessary. To check or adjust the ignition timing, refer to Section 1 of this manual.

1992 Volvo 940

Submodel: | **Engine Type:** L4 | **Liters:** 2.3
Fuel Delivery: FI | **Fuel:** GAS

The Camshaft position sensor is covered in Section 4, under Electronic Engine Controls.

1992 Volvo 940

Submodel: | **Engine Type:** L4 | **Liters:** 2.3
Fuel Delivery: FI | **Fuel:** GAS

The Crankshaft position sensor is covered in Section 4, under Electronic Engine Controls.

1992 Volvo 940

Submodel: | **Engine Type:** L4 | **Liters:** 2.3
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The best way to perform this procedure is to use a spark tester (available at most automotive parts stores). Two types of spark testers are commonly available. The Neon Bulb type is connected to the spark plug wire and flashes with each ignition pulse. The Air Gap type must be adjusted to the individual spark plug gap specified for the engine. This type of tester allows the user to not only detect the presence of spark, but also the intensity (orange/yellow is weak, blue is strong).

1. Disconnect a spark plug wire at the spark plug end.
2. Connect the plug wire to the spark tester and ground the tester to an appropriate location on the engine.
3. Crank the engine and check for spark at the tester.
4. If spark exists at the tester, the ignition system is functioning properly.
5. If spark does not exist at the spark plug wire, remove the distributor cap and ensure that the rotor is turning when the engine is cranked.
6. If the rotor is turning, perform the spark test again using the ignition coil wire.
7. If spark does not exist at the ignition coil wire, test the ignition coil, and other distributor related components or wiring. Repair or replace components as necessary.

1992 Volvo 940

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- The ignition system operates with a very high output and there are hazardous voltages in the low and high voltage circuits.
- Always turn the ignition **OFF**, before separating connectors.
- Never disconnect the battery while the engine is running.
- Always disconnect the battery when quick charging the battery.
- Never use a boost charger or voltage higher than 16 volts to start the engine.
- Always remove the control unit if the vehicle is to be stove or if welding is to be carried out. The control unit must not be exposed to temperatures above 176°F (80°C).
- Do not replace a control unit without first correcting the original fault, or the same fault may damage the new control unit.
- Do not be hasty in condemning the ECM. This system uses voltages and resistances that are very small. Examine the sensors, wiring and connectors carefully. The sensors operate in more harsh conditions than the ECM which is generally in a more protected location.
- Check all ground connections before condemning the ECM.
- Use care when working around vehicles equipped with Supplementary Restraint System (SRS), often known as "air bags." Vehicles equipped with SRS are generally recognized by the letters **SRS** molded into the steering wheel cover. Follow all precautions to avoid personal injury.

Before performing any component testing, check for and, if necessary, repair the following:

- Damaged, corroded, contaminated, carbon tracked or worn distributor cap and rotor
- Damaged, fouled, improperly seated or gapped spark plug(s)
- Damaged or improperly engaged electrical connections, spark plug wires, etc.
- Discharged battery
- Blown fuses

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On these Motronic systems, the distributor is essentially a rotor bolted onto the end of the intake camshaft. There is no distributor housing to remove. Once the distributor cap is removed, the rotor can be removed from the camshaft. See Section 1 for Distributor Cap and Rotor removal and installation.

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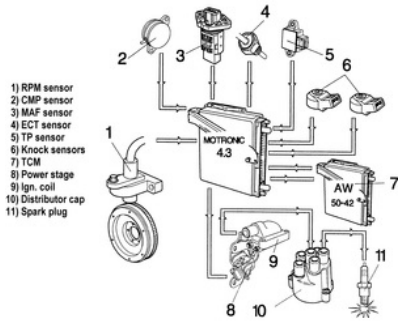
The Motronic 4.3 and 4.4 system on 850/C70/S70/V70 models is a total control system. Both engine and ignition controls are incorporated into one system with one control module. The control module receives the inputs from various sensors and controls all the outputs together.

The inputs that directly affect ignition include the RPM sensor (crankshaft position sensor), Camshaft Position (CMP) sensor, knock sensors, Engine Coolant Temperature (ECT) sensor, Mass Air Flow (MAF) sensor, acceleration sensor, Throttle Position (TP) sensor and, on vehicles equipped with an automatic transaxle, a Transmission Control Module (TCM). The RPM and CMP sensors determine engine speed and directly affect ignition timing control. The TP and MAF sensors, as well as the TCM, determine engine load. The knock sensor determines if the ignition timing is correct by detecting engine knocks or "pre-ignition," and the acceleration sensor determines if the vehicle is being driven on a bumpy or uneven surface, possibly causing faulty knock sensor readings.

The system has a fail safe or "limp home mode" where it defaults to a predetermined timing and voltage level if an input device fails. The Malfunction Indicator Lamp (MIL) will illuminate and the vehicle may exhibit more driveability problems; it should be diagnosed as soon as possible.

Fig. 1: Motronic 4.3 distributor ignition system



1992 Volvo 940

Submodel: | **Engine Type:** L4 | **Liters:** 2.3
Fuel Delivery: FI | **Fuel:** GAS

The ignition coil and power stage are an assembly.

1. Disconnect the negative battery cable.
2. Remove the air cleaner assembly.
3. Carefully remove the coil wire from the coil tower.
4. Remove the mounting bolt(s) from the retaining bracket and remove the ignition coil and power stage.
5. Unplug the power stage connector.

To install:

6. Install the coil and power stage and tighten the retaining bolts.
7. Plug the power stage connector in.
8. Install the coil wire on the coil tower.
9. Install the air cleaner assembly.
10. Connect the negative battery cable.

Fig. 1: Remove the coil wire from the coil

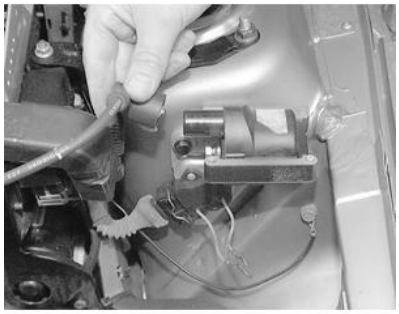


Fig. 2: Unfasten the mounting bolts . . .

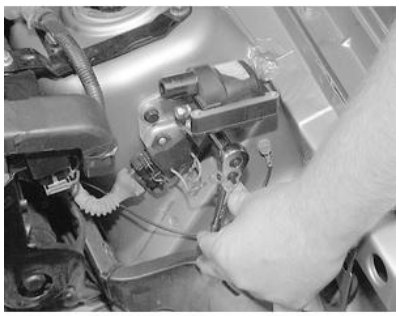


Fig. 3: . . . then remove the assembly from the strut tower

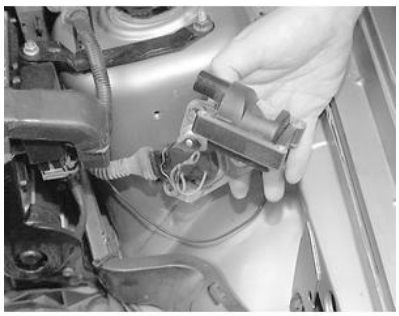
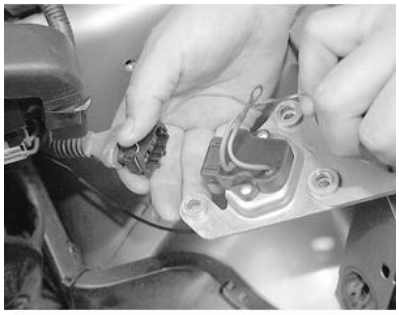


Fig. 4: Unplug the power stage connector and remove the assembly from the vehicle



1992 Volvo 940

Submodel: | **Engine Type:** L4 | **Liters:** 2.3
Fuel Delivery: FI | **Fuel:** GAS

Primary Winding Test

1. Disconnect the negative battery cable.
2. Remove the air cleaner assembly.
3. Remove the coil primary leads.
4. Connect an ohmmeter between the primary windings connectors on the outside of the coil.
5. Resistance should be 0.5–1.5 ohms.

Fig. 1: Remove the coil primary leads

Fig. 2: Attach the ohmmeter probes to the studs after removing the primary leads

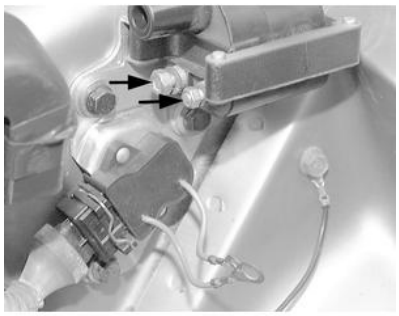
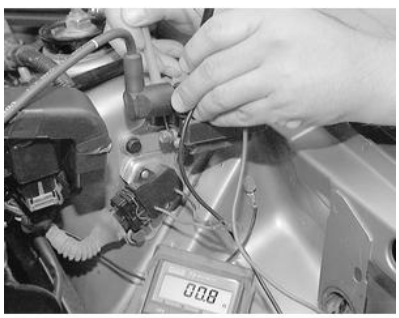


Fig. 3: Testing the primary windings of the ignition coil

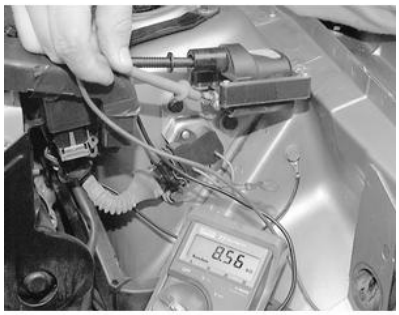


Secondary Winding Test

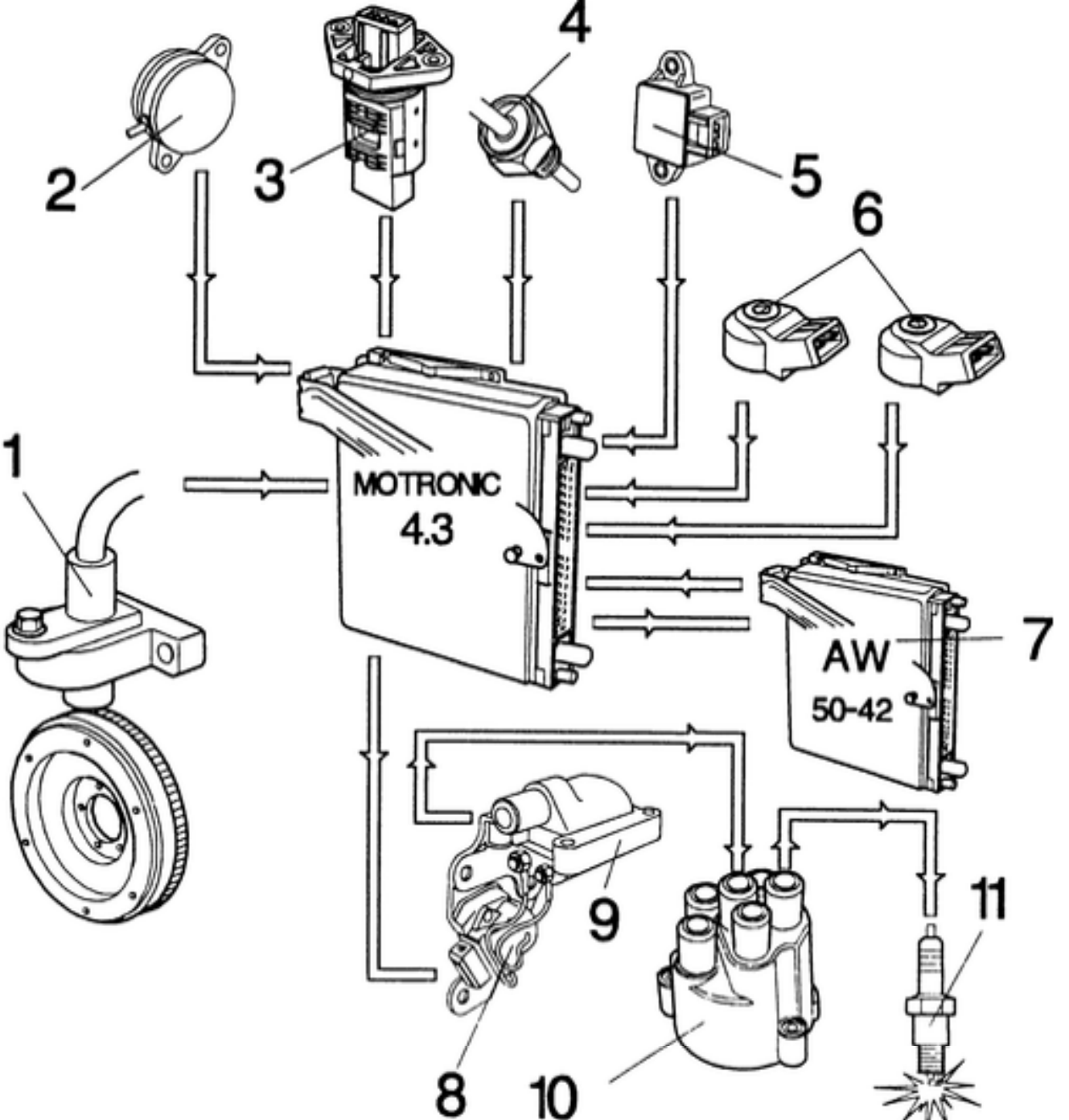
1. Disconnect the negative battery cable.
2. Remove the air cleaner assembly.
3. Remove the coil wire from the coil.
4. Connect an ohmmeter between one of the primary winding connectors on the outside of the coil and the coil wire tower on the coil.

5. Resistance should be 8–9 kilohms.

Fig. 4: Testing the secondary windings of the ignition coil



1) RPM sensor
2) CMP sensor
3) MAF sensor
4) ECT sensor
5) TP sensor
6) Knock sensors
7) TCM
8) Power stage
9) Ign. coil
10) Distributor cap
11) Spark plug



1992 Volvo 940

Submodel: | **Engine Type:** L4 | **Liters:** 2.3
Fuel Delivery: FI | **Fuel:** GAS

The ignition coil and power stage are an assembly. Refer to the Ignition Coil removal and installation procedure in this section.