1992 Volvo 940

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

Ignition system functions are controlled by the control module, 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
Fuel Delivery: FI | **Fuel:** GAS

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

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

Fig. 1: Take care in working around the ignition system; high voltage is present and electrical shock can occur

- 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.
- Before detaching the control unit connector, remove fuse 1 (740/940 models) or fuse 31 (760 models) to deactivate the ignition system.
- 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.
- A spare location in the fuse panel is used as a test terminal for SRS diagnostics. Never install a fuse in this position or connect accessories to this terminal.

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

1992 Volvo 940

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

The only function of the distributor is to distribute voltage to the spark plugs. There are no advance functions built into the distributor. It is no longer possible to adjust ignition timing through the distributor.

1992 Volvo 940

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

NOTE: For information on understanding electricity and troubleshooting electrical circuits, please refer to Section 6 of this manual.

The EZ115K, EZ116K, EZ129K, and REX-1 ignition systems, used on Coupe, 240, 700 series, 1993–94 850, and 940 models are like most engine management systems currently in use, in that ignition functions are closely integrated with the fuel system. Various sensors feed information to an on-board computer which makes necessary adjustments.

The EZK ignition systems are used on vehicles utilizing Bosch LH-Jetronic electronic engine controls. The REX-1 system is used on vehicles with the Bendix Regina electronic engine control system. Both systems have separate control modules for the ignition and engine controls. The inputs are similar on both; knock sensor, crankshaft position sensor, engine coolant temperature sensor, throttle position sensor or switch, and inputs from the electronic engine control module.

Fig. 1: REX-1 ignition system

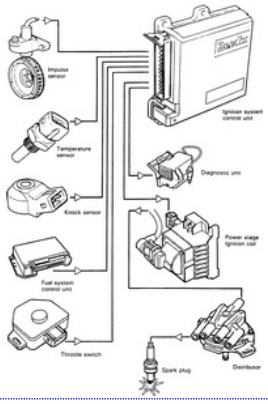
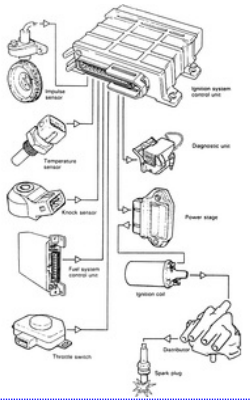


Fig. 2: Typical EZK series ignition system



1992 Volvo 940

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

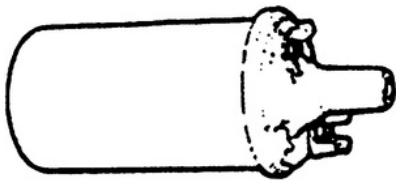
EZ115K and EZ116K Systems

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

To install:

6. Install the coil and tighten the bracket retaining bolts.
7. Install the coil wire on the coil tower.
8. Connect the coil primary leads.
9. Install the air cleaner assembly.
10. Connect the negative battery cable.

Fig. 1: EZ115K and EZ116K systems' ignition coil



EZ129K System

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

To install:

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

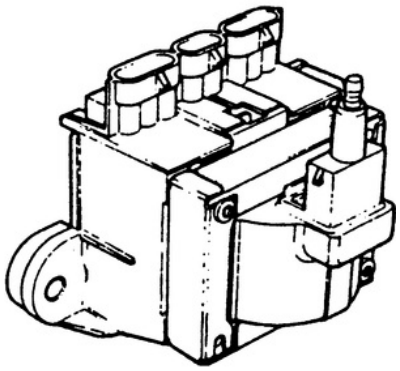
REX-1 System

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

To install:

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

Fig. 2: REX-1 coil/power stage assembly



1992 Volvo 940

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

EZ115K and EZ116K Systems

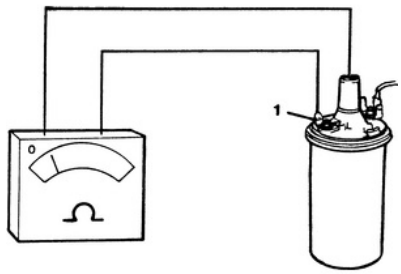
PRIMARY WINDING TEST

1. Disconnect the negative battery cable.
2. Remove fuse No. 1 (740 and 940 models) or fuse No. 31 (model 760) from the fuse box. Note that these fuses must be removed whenever any connector to or from the ECU is removed or installed.
3. Remove the air cleaner assembly.
4. Remove the connector from the power stage.
5. Remove the rubber cover from the connector to expose the terminals. Never test the terminals from the front. This could result in damage to the terminals and make any faults worse.
6. Connect an ohmmeter between the power stage amplifier connector terminal 1 and terminal 15 of the ignition coil. Resistance should be 0.6–1.0 ohms.
7. If resistance is low, replace the ignition coil.
8. If resistance is too high, connect an ohmmeter directly to terminals 1 and 15 of the ignition coil. If resistance is still too high, replace the ignition coil.
9. If resistance is correct (0.6–1.0 ohm), check the wire between the ignition coil and power stage amplifier connector terminal 1. Replace/repair the wire as needed.
10. Install the air cleaner assembly.
11. Connect the negative battery cable.

SECONDARY WINDING TEST

1. Disconnect the negative battery cable.
2. Remove the air cleaner assembly.
3. Remove the connector from the power stage.
4. Remove the rubber cover from the connector to expose the terminals. Never test the terminals from the front. This could result in damage to the terminals and make any faults worse.
5. Connect an ohmmeter between the power stage amplifier connector terminal 1 and the ignition coil high tension terminal (coil tower). Resistance should be 6.5–9.0 kilohms.
6. If resistance is higher or lower, replace the ignition coil.
7. Install the air cleaner assembly.
8. Connect the negative battery cable.

Fig. 1: Testing the coil secondary windings



EZ129K System

PRIMARY WINDING TEST

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

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 windings connectors on the outside of the coil and the coil wire tower on the coil.

5. Resistance should be 8–9 kilohms.
6. Install the air cleaner assembly.
7. Connect the negative battery cable.

REX-1 System

NOTE: To check the ignition coil/power stage unit on REX-1 systems, make sure the ignition switch is OFF.

1. Remove the air cleaner assembly.
2. Unplug the connectors from the coil/power stage unit.
3. Remove the ignition coil from the power stage by removing the 2 Torx® head screws and lifting off the ignition coil.
4. Measure the resistance between the terminals of the ignition coil by connecting an ohmmeter between the low voltage terminals (**+**) and (**-**). Resistance should be 0.5 ohms.
5. Connect an ohmmeter between the high tension terminal and a low voltage terminal. Resistance should be approximately 5000 ohms.
6. Check that voltage is present at the ignition coil/power stage unit by first turning the ignition **ON**. Connect a voltmeter between ground and terminal A in the 3-way connector. There should be 12 volts. If the voltage is low, or none at all, check the point where the feed wire branches to the ECU and ignition coil/power stage unit.
7. Check that the voltage does not fall below 10.5 volts when the starter motor is operated.
8. Turn the ignition key **OFF**.
9. Check the ground connections of the ignition coil/power stage unit by connecting an ohmmeter between ground and terminal B of the 3-way connector. The resistance should not exceed 0.1 ohm. If the resistance is too high, check for bad ground connection.
10. Connect an ohmmeter between ground and terminal A of the 2-way connector. If resistance is more than 0.1 ohm, check for a bad ground connection.
11. Check the signal line between the ignition coil/power stage unit and ECU. Check for power on this circuit. Connecting a shop-made buzzer between terminal B of the 2-way connector and terminal 16 of the ECU may be helpful. If the line is problem-free, the buzzer should sound.
12. Install the air cleaner assembly.

1992 Volvo 940

Submodel: | **Engine Type:** L4 | **Liters:** 2.3
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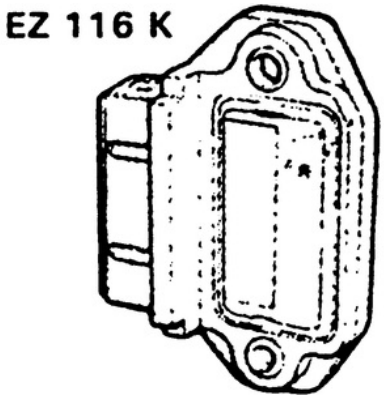
The power stage on the REX-1 and EZ129K systems is combined with the ignition coil into a single unit (Power Stage/Ignition Coil). Refer to the ignition coil removal and installation procedure earlier in this section.

1992 Volvo 940

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

EZ115K and EZ116K Systems

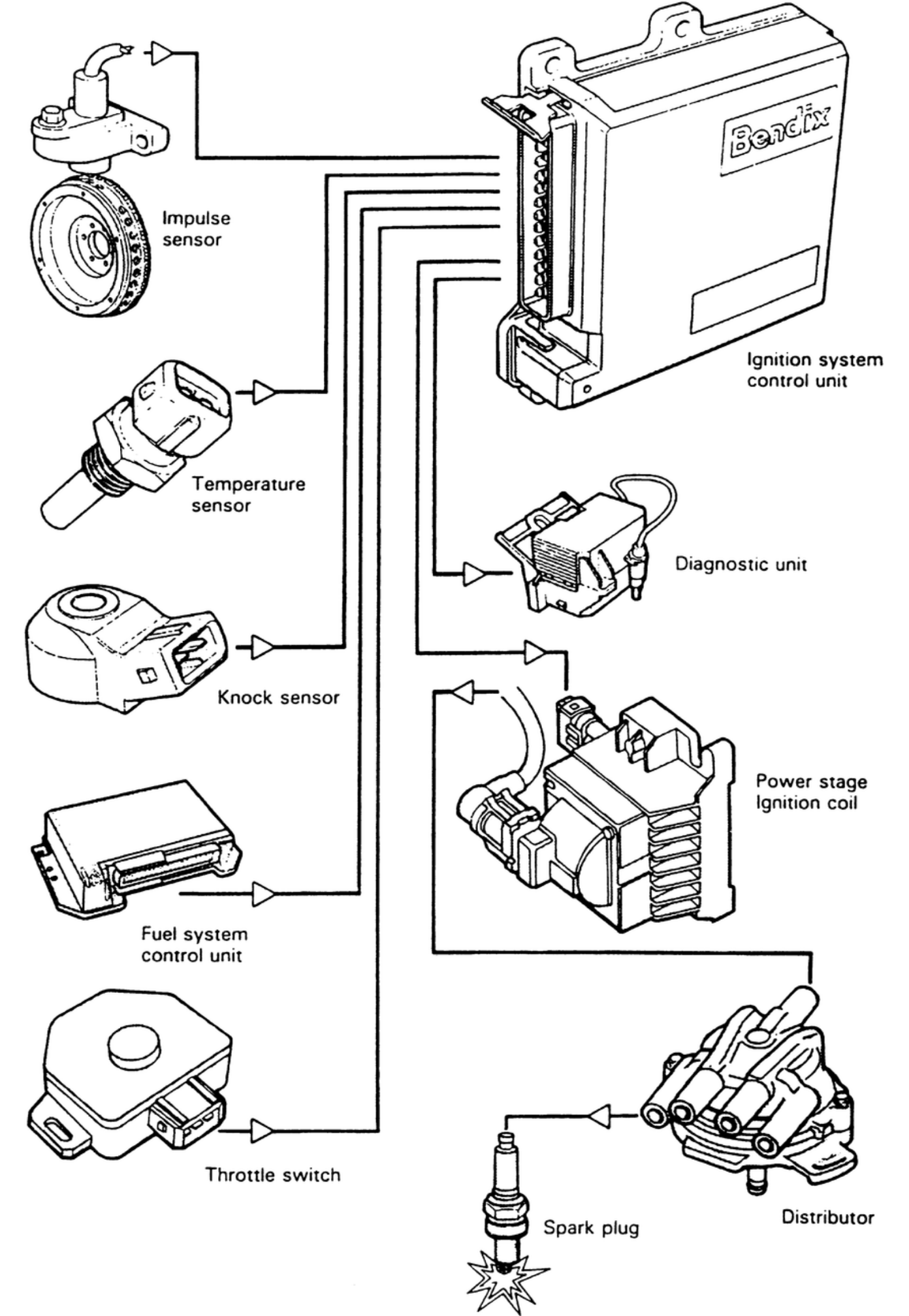
Fig. 1: Power stage — EZ116K ignition system

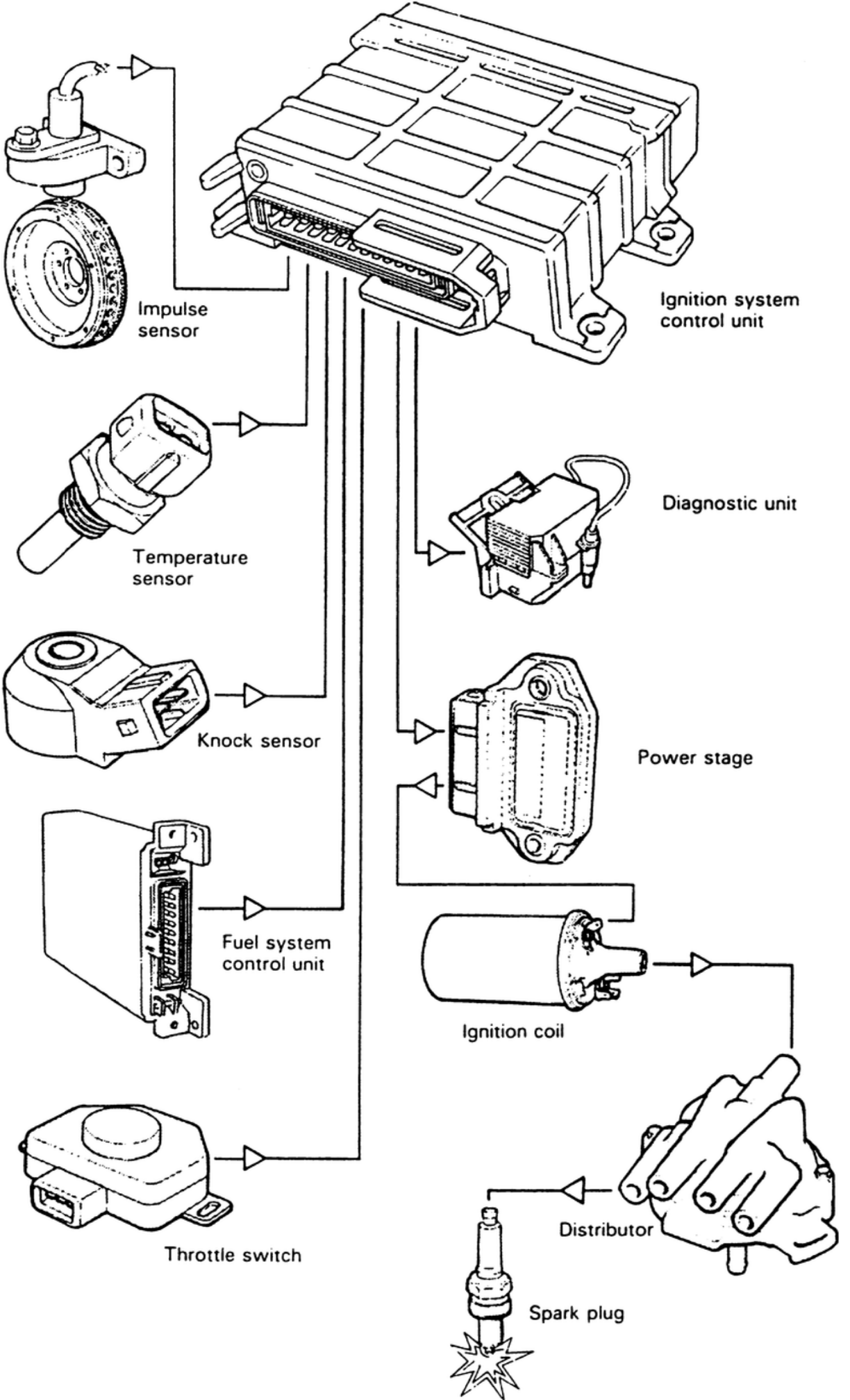


1. Disconnect the negative battery cable.
2. Unplug the power stage connector.
3. Unfasten the mounting bolt(s) from the retaining bracket, then remove the ignition coil and power stage.

To install:

4. Install the coil and power stage and tighten the retaining bolts.
5. Plug in the power stage connector.
6. Connect the negative battery cable.


Bendix
Impulse sensor
Ignition system control unit
Temperature sensor
Diagnostic unit
Knock sensor
Power stage Ignition coil
Fuel system control unit
Throttle switch
Distributor
Spark plug


Impulse sensor
Ignition system control unit
Temperature sensor
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Power stage
Fuel system control unit
Ignition coil
Distributor
Throttle switch
Spark plug