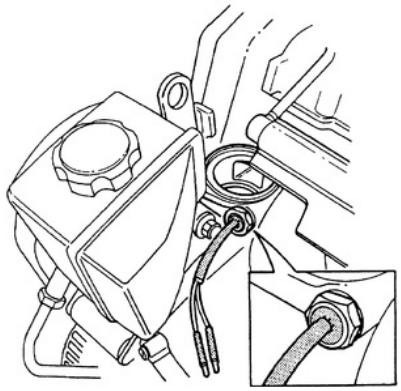
1992 Volvo 940

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

The Engine Coolant Temperature (ECT) sensor is used as the sending unit on Volvos. Please refer to Section 4 of this manual for information.

Fig. 1: Location of the ECT sensor/temperature sending unit



1992 Volvo 940

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

The thermal switch is located on the top of the radiator, usually on the passenger side.

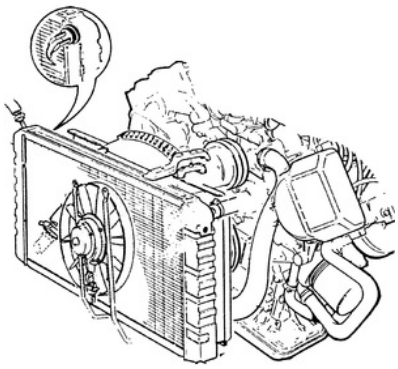
1. Disconnect the negative battery cable.
2. Drain and recycle the engine coolant.

   CAUTION
   Never open, service or drain the radiator or cooling system when hot; serious burns can occur from the steam and hot coolant. Also, when draining engine coolant, keep in mind that cats and dogs are attracted to ethylene glycol antifreeze and could drink any that is left in an uncovered container or in puddles on the ground. This will prove fatal in sufficient quantities. Always drain coolant into a sealable container. Coolant should be reused unless it is contaminated or is several years old.
3. Unplug the electrical connector from the switch.
4. Using a suitable size socket or wrench, loosen the switch.
5. Remove the switch by hand.

   To install:
6. Install the switch into the radiator, and start the threads by hand.
7. Tighten the switch into the radiator, but take care not to overtighten or you will break the switch or radiator.
8. Plug the electrical connector in.
9. Connect the negative battery cable.
10. Refill the coolant and start the engine.
11. Let the vehicle warm up and check the operation of the fan switch.
12. Check the level of the coolant.

    CAUTION
    Never open, service or drain the radiator or cooling system when hot; serious burns can occur from the steam and hot coolant.

Fig. 1: The cooling fan switch is located at the upper corner of the radiator



Troubleshooting Basic Starting System Problems

Problem	Cause	Solution
Starter motor rotates engine slowly	• Battery charge low or battery defective	• Charge or replace battery
	• Defective circuit between battery and starter motor	• Clean and tighten, or replace cables
	• Low load current	• Bench-test starter motor. Inspect for worn brushes and weak brush springs.
	• High load current	• Bench-test starter motor. Check engine for friction, drag or coolant in cylinders. Check ring gear-to-pinion gear clearance.
Starter motor will not rotate engine	• Battery charge low or battery defective	• Charge or replace battery
	• Faulty solenoid	• Check solenoid ground. Repair or replace as necessary.
	• Damaged drive pinion gear or ring gear	• Replace damaged gear(s)
	• Starter motor engagement weak	• Bench-test starter motor
	• Starter motor rotates slowly with high load current	• Inspect drive yoke pull-down and point gap, check for worn end bushings, check ring gear clearance
	• Engine seized	• Repair engine
Starter motor drive will not engage (solenoid known to be good)	• Defective contact point assembly	• Repair or replace contact point assembly
	• Inadequate contact point assembly ground	• Repair connection at ground screw
	• Defective hold-in coil	• Replace field winding assembly
Starter motor drive will not disengage	• Starter motor loose on flywheel housing	• Tighten mounting bolts
	• Worn drive end busing	• Replace bushing
	• Damaged ring gear teeth	• Replace ring gear or driveplate
	• Drive yoke return spring broken or missing	• Replace spring
Starter motor drive disengages prematurely	• Weak drive assembly thrust spring	• Replace drive mechanism
	• Hold-in coil defective	• Replace field winding assembly
Low load current	• Worn brushes	• Replace brushes
	• Weak brush springs	• Replace springs

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The electric fan switch, or thermal switch, can be checked by placing the element in a bucket of water using an ohmmeter. Heat the water to approximately 207°–216°F (97°–102°C) and connect the switch leads to an ohmmeter. The switch should have no continuity until the temperature reaches this level. Let the water cool off below 207°F (97°C) and the switch should lose continuity. If the switch has no continuity at any temperature, replace it.

1992 Volvo 940

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On the Coupe, 240, 700 Series, and 940 models, the sending unit is attached to the fuel pump. See Section 5 for service information.

On the 850/C70/S70/V70 and 960/S90/V90 models, the sending unit has an access panel located in the trunk/hatch area. The procedure is as follows:

1. Relieve the fuel system pressure.
2. Disconnect the negative battery cable.
3. Tilt the rear seat forward and remove or fold back the trunk compartment carpet over the right-hand wheelwell panel. Remove any access panels or covers as necessary.
4. Disconnect the sending unit electrical wiring.
5. Remove the sending unit's plastic retaining nut using a socket wrench and tool 999-5486 or equivalent.
6. Lift the sending unit out carefully and remove the rubber seal.

WARNING

Install the retaining nut while the sending unit is removed, otherwise the tank connection may swell and the nut will be difficult to install.

To install:

7. Install a new dry seal, making sure that it is seated properly. Lubricate the top and outer side of the seal with petroleum jelly.
8. Install the sending unit with the wiring harness facing towards the passenger side of the vehicle.
9. Remove the retaining nut from the tank and install the retaining nut on the sending unit. Tighten it to 30 ft. lbs. (40 Nm) using tool 999-5486 or equivalent.
10. Connect the wiring, then install the panels, covers and carpet.
11. Connect the negative battery cable.
12. Run the engine and check for leaks.

Fig. 1: Remove the trunk/hatch trim

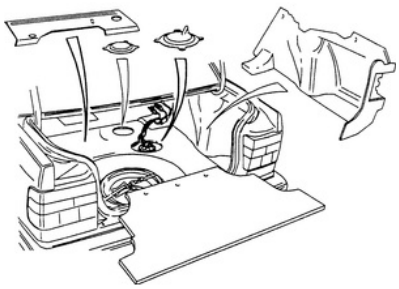


Fig. 2: Fuel level sending unit location — do not confuse it with the fuel pump

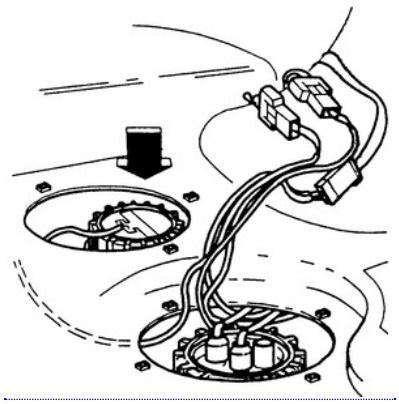


Fig. 3: Unfasten the fuel level sending unit's connector

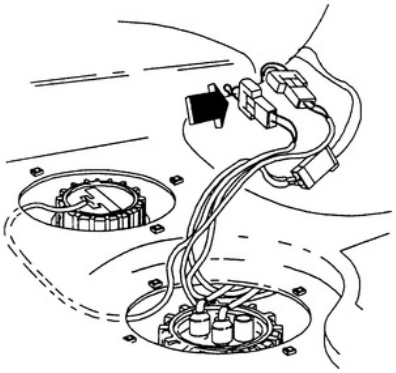
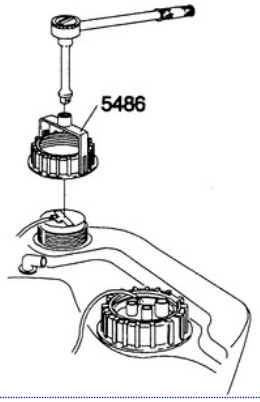


Fig. 4: Using a socket wrench and tool 999-5486 or equivalent, remove the retaining ring and lift the sending unit out of the tank



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The easiest way to test the fuel level sender is to use an assistant and remove the sending unit from the fuel tank. Turn the ignition **ON**, but leave the engine **OFF**. While your assistant watches the fuel gauge, slowly move the sending unit arm upward and have your assistant check if the fuel gauge responds accordingly. If the gauge does not move, check the circuit to the gauge, and check the gauge; if both are OK, replace the sending unit.

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Submodel: | **Engine Type:** L4 | **Liters:** 2.3
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1. Raise and safely support the vehicle.
2. Unplug the connector from the sensor.
3. Unfasten the sensor mounting bolts and remove the sensor from the oil pan.

To install:

4. Install the sensor into the oil pan.
5. Tighten the sensor mounting bolts.
6. Plug in the sensor connector.
7. Lower the vehicle.

Fig. 1: The oil pressure sensor is mounted to the side of the oil pan — 850 model shown

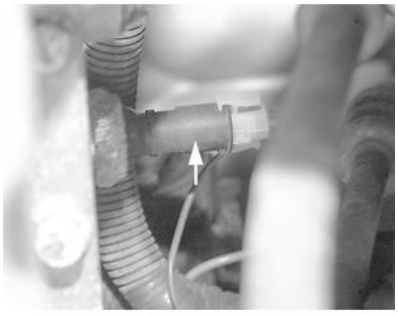


Fig. 2: Unplug the connector from the oil pressure sensor

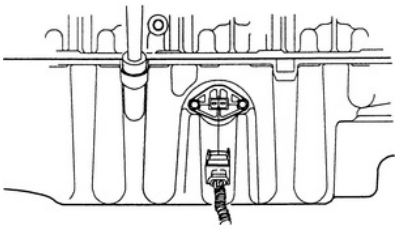
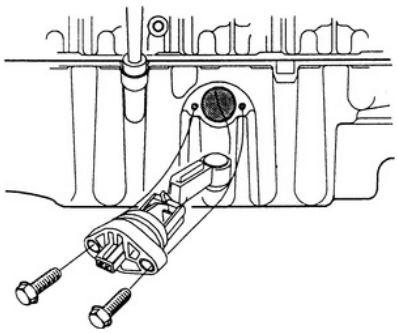


Fig. 3: Unfasten the retaining bolts and remove the sensor

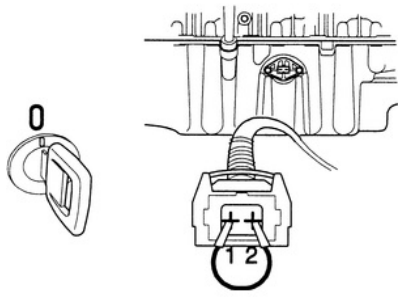


1992 Volvo 940

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

1. Unplug sensor connector and insert a jumper wire between terminals 1 and 2.
2. Start the vehicle.
3. If the light is on, check the harness and dashboard light.
4. If the light is off, replace the sensor and recheck the light operation.

Fig. 1: Connect a jumper wire between terminals 1 and 2



1992 Volvo 940

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

NOTE: This section describes the operating principles of sending units, warning lights and gauges. Sensors which provide information to the Electronic Control Module (ECM) are covered in Section 4 of this manual.

Instrument panels contain a number of indicating devices (gauges and warning lights). These devices are composed of two separate components. One is the sending unit, mounted on the engine or other remote part of the vehicle, and the other is the actual gauge or light in the instrument panel.

Several types of sending units exist, however most can be characterized as being either a pressure type or a resistance type. Pressure type sending units convert liquid pressure into an electrical signal which is sent to the gauge. Resistance type sending units are most often used to measure temperature and use variable resistance to control the current flow back to the indicating device. Both types of sending units are connected in series by a wire to the battery (through the ignition switch). When the ignition is turned **ON**, current flows from the battery through the indicating device and on to the sending unit.

Troubleshooting Basic Starting System Problems

Problem	Cause	Solution
r rotates engine slowly	• Battery charge low or battery defective	• Charge or replace batte
	• Defective circuit between battery and starter motor	• Clean and tighten, or re cables
	• Low load current	• Bench-test starter moto for worn brushes and brush springs.
	• High load current	• Bench-test starter moto engine for friction, drag in cylinders. Check rin pinion gear clearance.
r will not rotate engine	• Battery charge low or battery defective	• Charge or replace batt
	• Faulty solenoid	• Check solenoid ground replace as necessar
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	• Engine seized	• Repair engine
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	• Inadequate contact point assembly ground	• Repair connection at g
	• Defective hold-in coil	• Replace field winding a
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