Check or replacing cooling system

Special tools: 998 5496

Note! Replacing the radiator Check cooling system for leaks

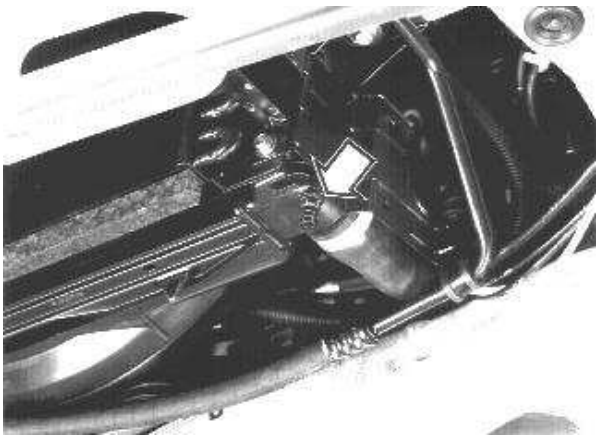
Replacing the engine coolant temperature sensor Coolant-temperature sensor location

Check cooling system for leaks

Cooling system test pressurisation

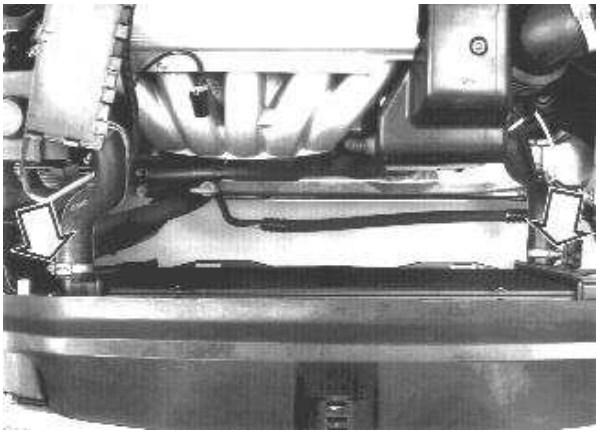
Test pressurise the cooling system. See Test pressurisation .

Drain the coolant



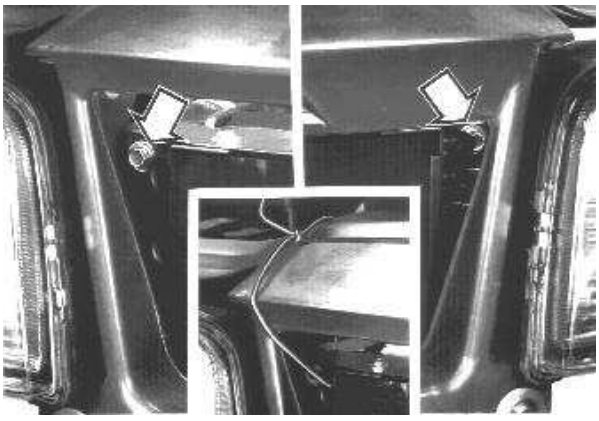
Remove the expansion tank cap.
Remove the splashguard under the radiator.
Open the stopcock on the radiator. Thread a hose onto the stopcock to collect the coolant.
Close the cock.

Disconnect the upper and lower radiator hoses



Remove the engine coolant fan (FC).
Disconnect the upper and lower radiator hoses from the radiator.
Turbocharged engines: *Detach the oil cooler hoses from the right side of the oil cooler.*
Automatic transmissions: *Detach the oil cooler hoses from the left side of the oil cooler.*

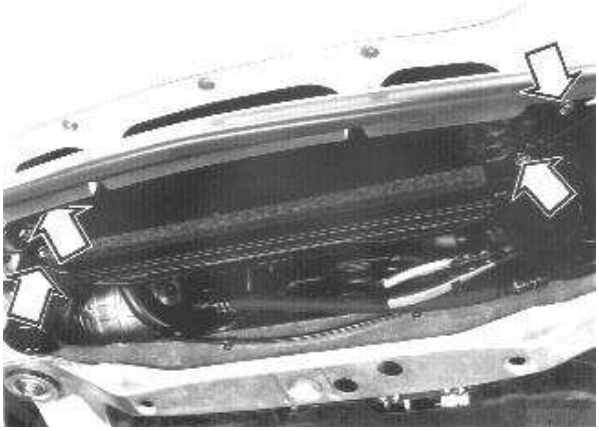
Remove the upper AC-condenser screws



Note! Applies to cars with air conditioning (A/C):
Remove the two upper screws holding the condenser to the radiator.
Hang the radiator, using string or similar, as illustrated.

Remove the lower AC-condenser screws

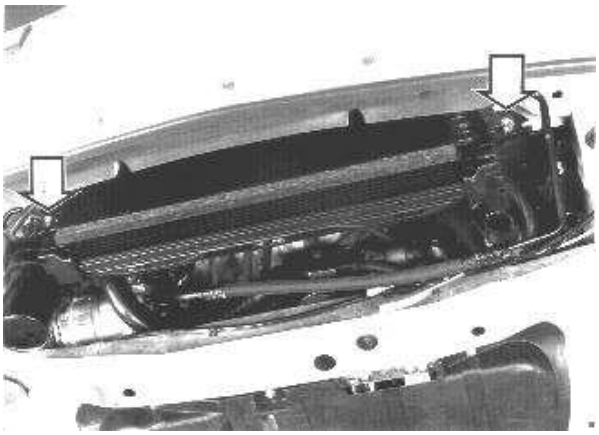
Remove the two lower screws holding the condenser to the radiator.



Remove the radiator

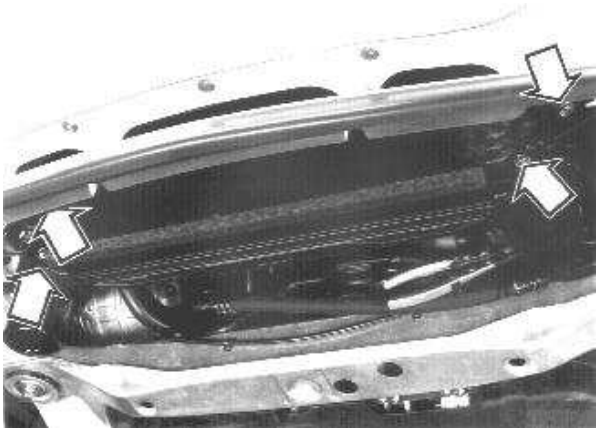
Remove two radiator retaining screws.

Caution! Hold the radiator so it is not damaged.



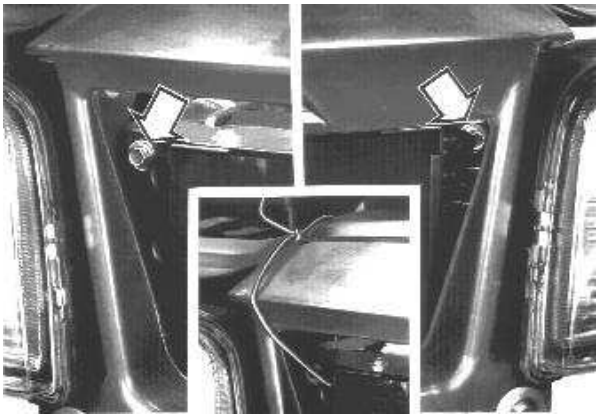
Install the radiator

Tighten the radiator. Tighten to **30 Nm**.
Loosely install the two lower screws holding the AC condenser.



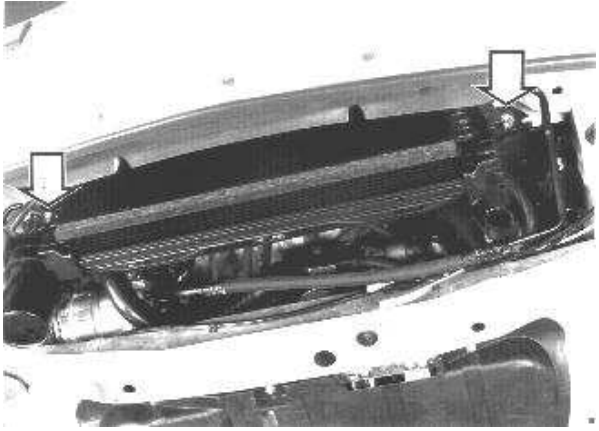
Tighten the radiator / air conditioning (A/C) condenser

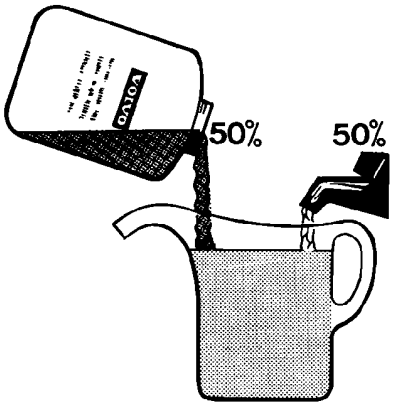
Install the two upper screws for radiator and condenser.



Install the radiator hoses and engine cooling fan (FC)

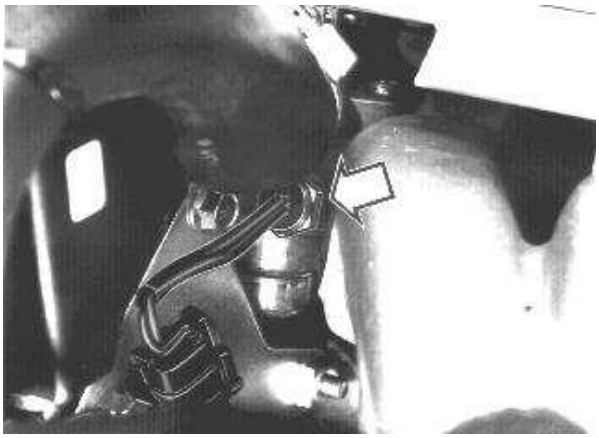
Install the upper and lower radiator hoses.
Install the engine cooling fan (FC).
Raise the car. **Tighten the lower screws** holding the AC condenser to the radiator.
Reinstall the splash guards.





Top up coolant

Fill the cooling system through the expansion tank.
The total coolant capacity is approximately **7.2 litres**.
Run the engine to operating temperature and top up the coolant if necessary.
Check for leaks.

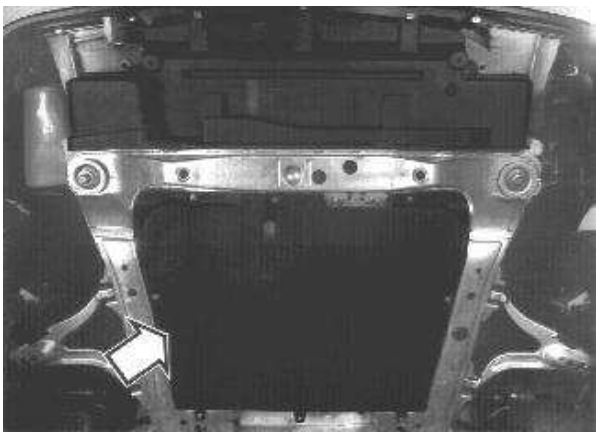


Coolant-temperature sensor location

The sensor is located in the thermostat housing.
The sensor gives a signal to both the engine management system and to the temperature gauge in the combined instrument panel.

Replacing coolant pump

Special tools: 999 5456

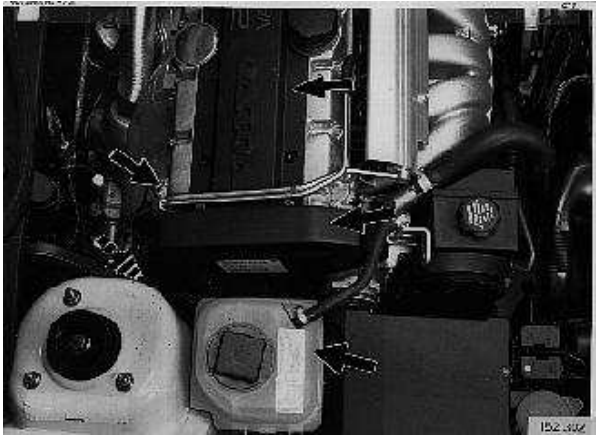


Drain coolant

Remove expansion tank cap.
Raise the car.
Remove the splash guard under the engine.
Open the engine and radiator nipples. Thread hoses onto the relevant nipple to collect the coolant.
Close the nipples.

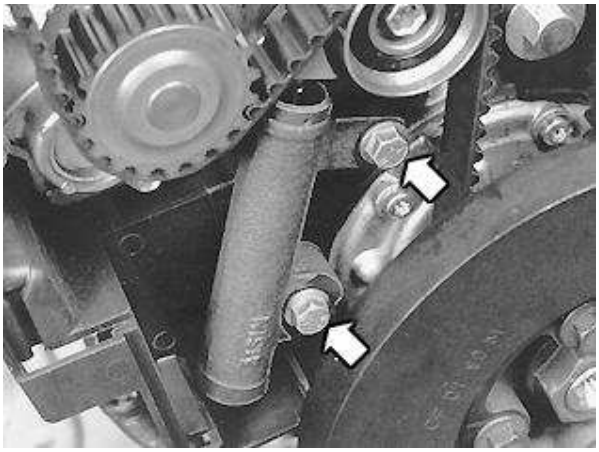
Remove:

- spark plugs cover



- two fuel lines clamps
- lift up expansion tank and place over engine to one side
- front timing cover
- right front wheel

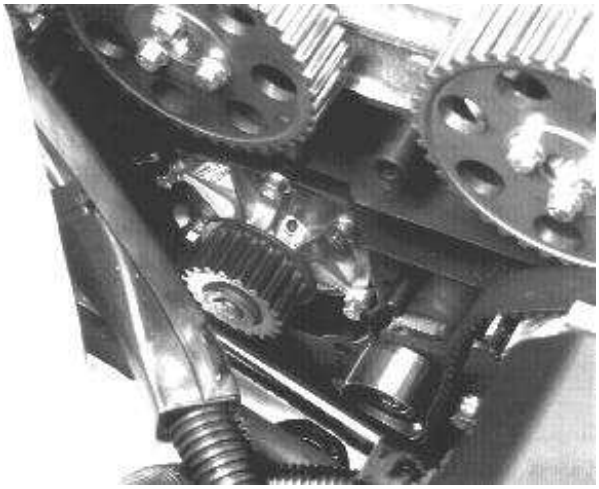
Remove fender liner fender liner to expose the vibration damper.
Turn the crankshaft so that all the markings correspond.



Remove:

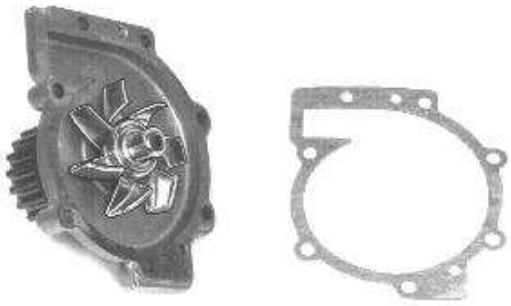
- upper timing cover
- tensioner damping unit

Remove timing belt and put it to one side.
Compress the tensioner damping unit with tool 999 5456 .



Remove the coolant pump and clean the gasket face and mating surfaces

Clean and scrape off all gasket residue from the cylinder block.

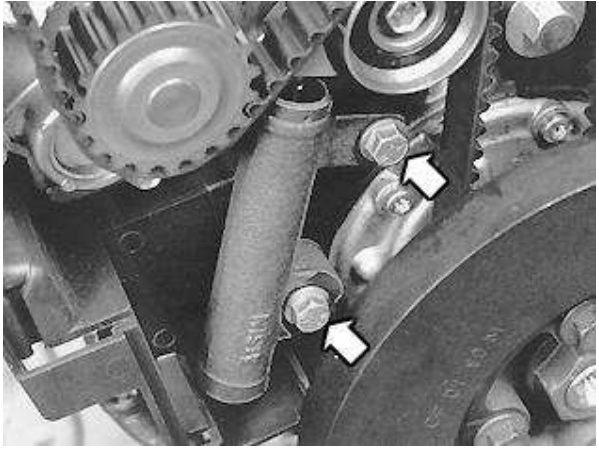


Install coolant pump

Use a **new** gasket.
Tighten the screws to **20 Nm**.

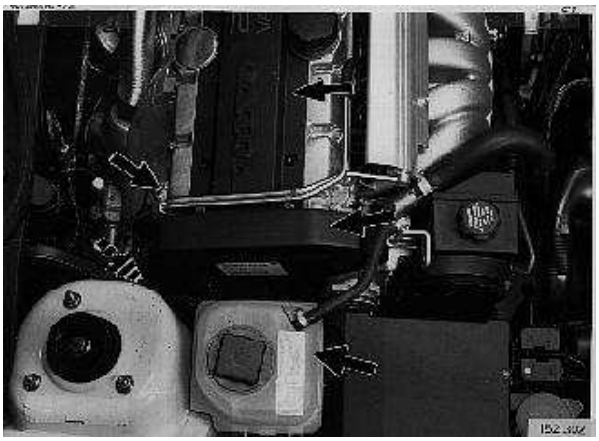
Install:

- tensioner damping unit
- timing belt



- upper timing cover

Remove lock pin from tensioner damping unit.
Turn the crankshaft two revolutions until all the markings correspond again.



Install:

- front timing cover
- expansion tank
- two fuel line brackets
- spark plugs cover
- splashguard under engine

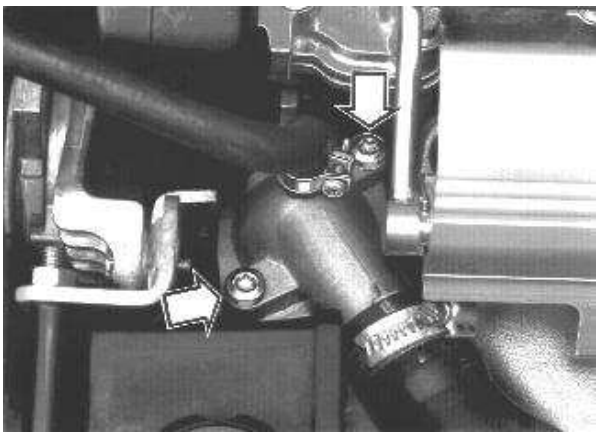
Top up coolant.
Run the engine to operating temperature and top up coolant if necessary.
Check for leaks.

Check/replacing thermostat

Note! Drain approximately. 2 liters of coolant. Remove expansion tank cap. Open nipples on the left side of underside of the radiator, use a hose to lead off coolant. Close the nipple.

Replacing thermostat

Removing/installing thermostat



Remove the hose on the thermostat housing cover and remove the thermostat and gasket (Torx 40).
Clean the mating surface of the thermostat housing.
Install a **new** seal on the thermostat.
Install the thermostat in the housing, install and tighten the cover and hose.
Fill with coolant and run engine until the thermostat opens and top up as necessary.
Check for leaks.

Check thermostat

Checking opening function

The thermostat can be tested in warm water.
Maximum opening should take place within **2 minutes** in water at opening temperature.
Marking:**87**
Begins to open at:**87°C**
Fully open at:**102°C**

Marking:**90**
Begins to open at: **90°C**

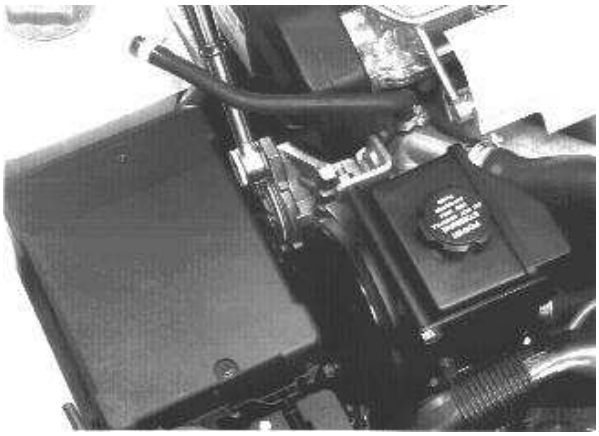
Fully open at: **105°C**

Replacing drive belts/belt tensioner auxiliary equipment

See also Greasing auxiliaries belt tensioner

See also New routing of auxiliaries belt

Remove auxiliaries belts



Use jointed socket wrench with 3/8-inch mounting on the belt tensioner and remove load from belt. Later version has a 3/4-inch mounting.
Remove drive belt.

Replacing belt tensioner

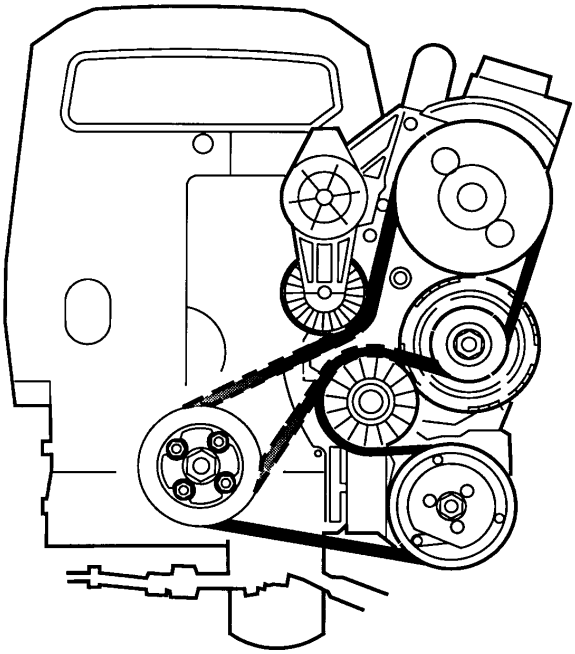
Slacken off two belt tensioner screws and remove the belt tensioner.
Install the new belt tensioner. Torque to **20 Nm**.

Hint: If noise is the reason for the change greasing the tensioner can be sufficient to correct the noise.

Greasing the tensioner
Remove the tensioner center screw and disassemble as illustrated
Apply grease P/N 1161246-2 (50 gr) or 1161247-0 (500 gr) as indicated by the arrows.
Tighten center screw to **20 Nm**.

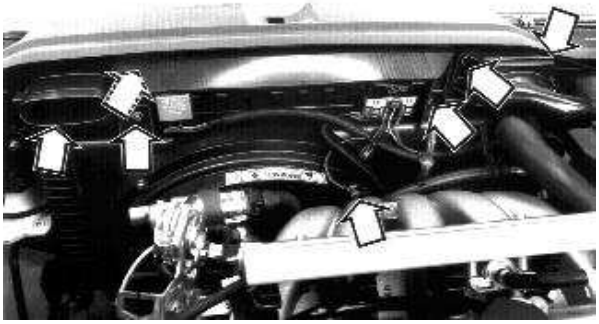
Install auxiliaries belt

Place belt around crankshaft.
Then around air conditioning (A/C) compressor, idler pulley, generator (GEN) and power steering pump.
Turn up belt tensioner and apply belt.
(Scored line displays belt routing **without air conditioning (A/C)**.)
Test function



Cooling fan replacement

Remove the cooling fan



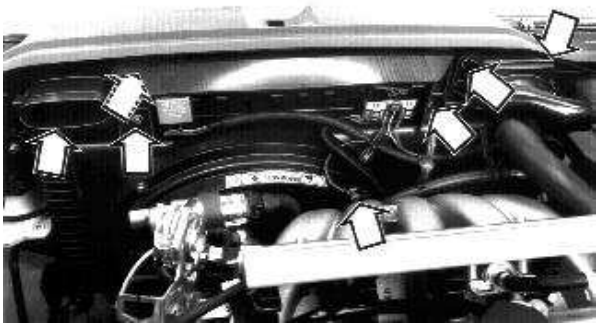
Disconnect the negative battery lead.
Remove the four screws attaching the cooling fan shroud.
Fold the shroud aside a little, pull the relay holder up and disconnect the fan connector.
Remove the air ducts for the control unit box and air filter housing.
Remove fan with the shroud.

Removing the old cooling fan and installing the new fan

Loosen the four screws and remove the cooling fan from the shroud.
Install and tighten the **new** cooling fan.

Lifting in the cooling fan with the fan shroud

Install the relay holder with relays and connect the connectors.
Install the air intake.
Tighten the fan shroud in the cooler.
Install the air ducts for the control unit box and air filter housing.
Connect the negative battery lead.



Replacing the charge air cooler (CAC)

Removal

Remove

- the radiator with the charge air cooler (CAC) according to Check or replacing cooling system
- the four screws securing the charge air cooler (CAC) to the radiator.

Replace the charge air cooler (CAC).

Installation

Install

- the four screws securing the charge air cooler (CAC) to the radiator
- the radiator with the charge air cooler (CAC) according to Check or replacing cooling system .