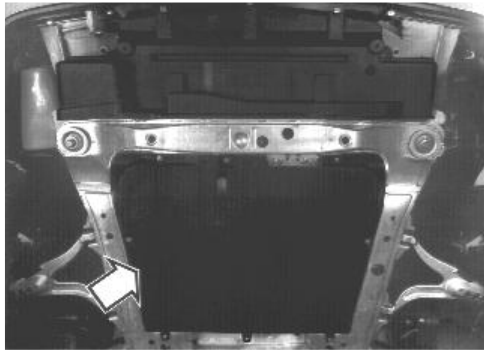


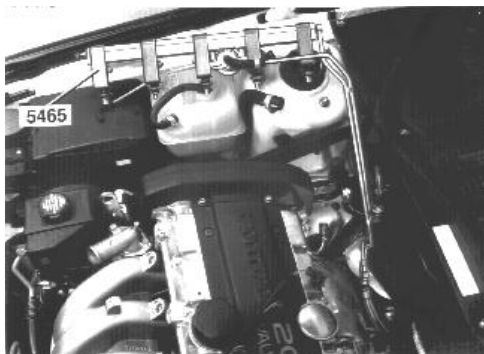
Replacing cylinder head gasket

Special tools: [951 2050](#) , [999 5199](#) , [999 5449](#) , [999 5451](#) , [999 5452](#) , [999 5453](#) , [999 5454](#) , [999 5509](#) , [999 5533](#) , [999 5670](#)



Drain off the coolant and remove the front exhaust pipe

Disconnect battery negative lead.
Remove the expansion tank cap.
Remove the engine splash guard.
Open the nipples on the engine and radiator.
Use hoses to lead off coolant.
Close the nipples.
Remove manifold/front exhaust pipe nuts.



Remove the exhaust manifold and the fuel rail

Remove

- the exhaust manifold, according to operation [Check/replacing exhaust system](#) .
- the belt transmission, according to operation [Replacing timing belt](#) .

Lift up and put the fuel rail with injectors to one side. Use protractor [999 5533](#) , for injectors.

Remove the two ground strips from the engine.

Caution! Take care not to damage injector nozzles and fuel needles.

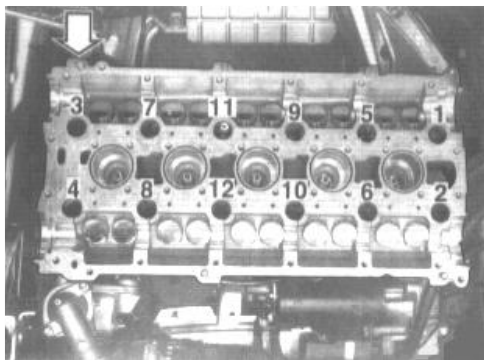
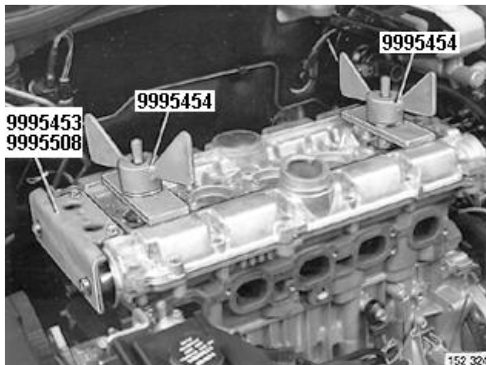
Remove:

- the engine cooling fan (FC) and the intake manifold.
- the upper radiator hose from the thermostat housing
- the camshaft pulleys, use counterhold [999 5199](#) , mark up the pulleys (intake/exhaust)
- the inner timing cover screw



Remove rear components:

- the air cleaner (ACL) housing with hoses
- the camshaft position (CMP) sensor with trigger wheel
- the distributor cap with wiring and rotor
- the torque control arm with brackets



Remove the upper half of the cylinder head

Install tool [999 5453](#) (4 valve engine) or [999 5508](#) (2-valve engine) to secure the front edge of the camshafts.

Install tool [999 5454](#) to the camshaft housing cover allowing a few mm play.

Slacken off the screws (from outside and in) from the upper half, remove all screws.

Disconnect the camshaft cover at the stop lugs with tool [999 5670](#). Start with cylinder 1 and work alternately backward.

Open and remove tools [999 5454](#) step for step so that parallel movement is ensured when removing the camshaft housing cover. Mark up and remove the camshafts.

Remove the cylinder head

Remove the two coolant pipe screws.

Slacken off the cylinder head screws (work from the outside in).

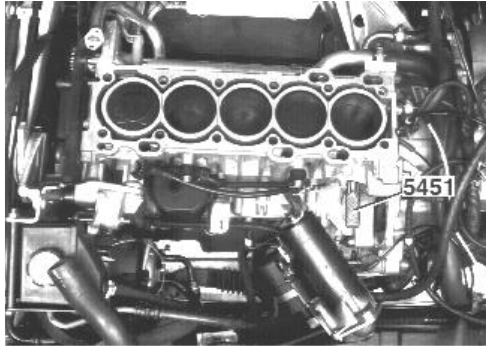
Remove cylinder head.

Remove cylinder head gasket.

Clean:

- the exhaust joints exhaust manifold/cylinder head
- the cylinder block gasket face
- the coolant pipe gasket face
- the gasket face between the upper and lower cylinder head halves

Caution! Do not use a metal scraper. Use a soft putty knife and if necessary gasket solvent, P/N 1 161 340-3. The surfaces must be completely clean for them to seal. When using gasket solvent a fume hood or extractor must be used.



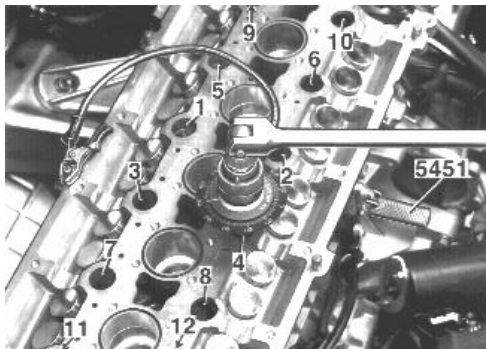
Align the crankshaft as marked

Remove the starter motor.

Remove the blind cover plug.

Install camshaft adjustment tool [999 5451](#) .

Turn the crankshaft **counter-clockwise** until it stops.



Install the lower cylinder head half

Install the new cylinder head gasket

Lubricate the screws.

Tighten the screws in three stages from the middle and working out according to:

1. **20 Nm**

2. **60 Nm**

3. **130°**, use bevel protractor [951 2050](#)

Install the coolant pipe with a **new** gasket.

Install **new** O-rings around the spark plug wells.

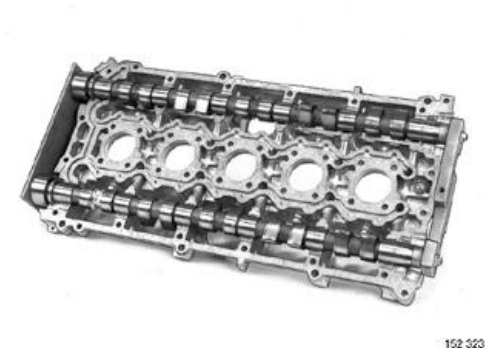
Remove spark plugs 1 and 5.

Apply liquid gasket

Apply liquid gasket P/N 1 161 059-9 to the upper half of the cylinder head using a short-bristle roller.

Caution! Ensure that no gasket compound falls into the oilways. A thin layer is enough to form a seal.

Install the camshafts. Secure the front of the camshafts using holder [999 5453](#) and the rear using camshaft adjustment tool [999 5452](#) (without extensions).



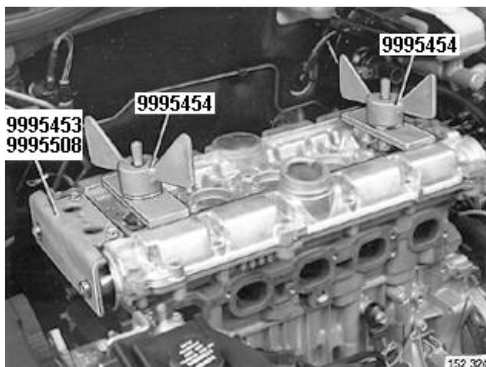
Install the upper half of the cylinder head

Position the upper half.

Pull down onto cylinder head using press tool [999 5454](#) (two).

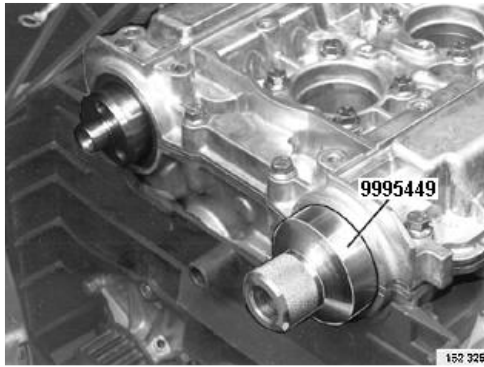
Install the upper section from the inside and outside. Tighten to **17 Nm**.

Remove camshaft adjustment tool ([999 5453](#)) and tool ([999 5454](#))



Install the front camshaft seals

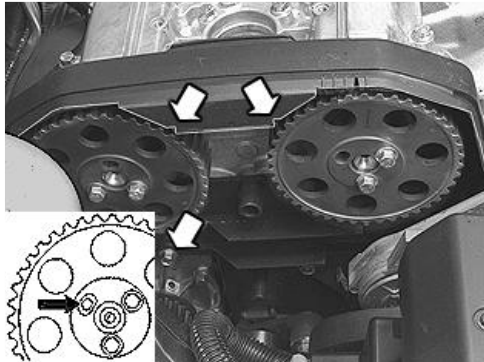
Use drift [999 5449](#) .



Grease the seal.

Tap in the seal.

The later version of drift 999 5449 is made of plastic.



Install the camshaft pulleys

Position the upper timing cover

Install the camshaft pulleys, align according to marking.

Tighten the two screws until they **just come into contact** with the camshaft pulleys.

Lift out the upper timing cover.

Note! Check that the camshaft screw holes are centered, see illustration.

Adjusting the mechanical belt tensioner

If a mechanical belt tensioner is being used, adjust according to [Adjusting the mechanical belt tensioner](#).

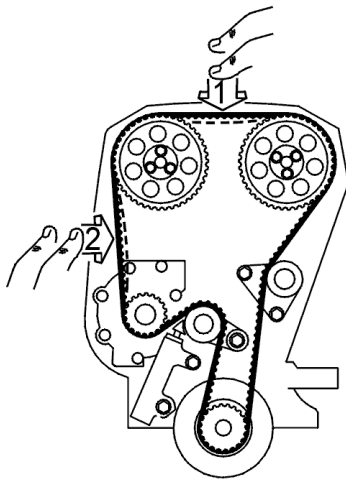
Install the camshaft belt

Install the tensioner damping unit. Tighten to **25 Nm**.

Place the belt over the camshaft pulley, around the coolant pump and press the belt over the tensioner pulley.

Slacken off the two camshaft pulley screws. Pull the lock pin out of the tensioner/damping unit.

Press **hard** or knock the belt **twice** in the direction of arrow (1) and **twice** in the direction of arrow (2) using a plastic mallet.

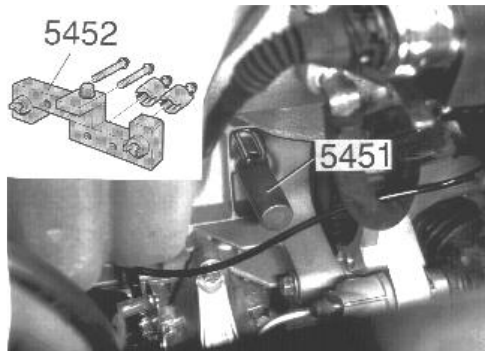


Tighten the camshaft pulleys

Install the third screw and tighten the screws to **20 Nm**.

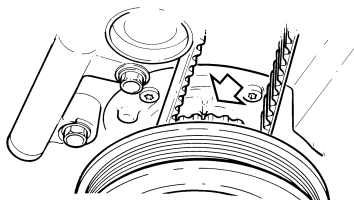
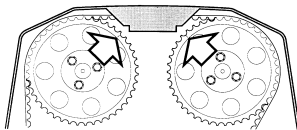
Install the inner timing cover screw.

Install the timing cover.



Remove the holding tools

Remove camshaft adjustment tool ([999 5451](#)) and install blind cover plug.
Install the starter motor.
Remove the camshaft adjustment tool ([999 5452](#)).



Check the markings

Turn the engine crankshaft two turns.
Check that markings on the crankshaft and the timing gear pulley correspond.
Install the outer timing cover.



Install the rear camshaft seal

4- valve engines:

Use drift [999 5450](#).

2- valve engines:

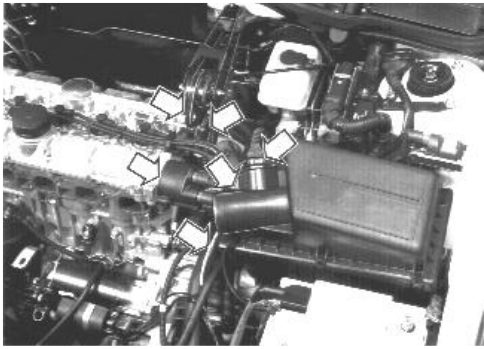
Use drift [999 5509](#).

Grease the seal.
Press in the seal.

Hint: Normally the seal is positioned flush with the internal bevel edge. If there are grooves on the shaft journal the seal can be pressed in a further **2 mm** by reversing the sleeve.

Install:

- the torque control arm, with the brackets
- the rotor with holder
- the camshaft position (CMP) sensor with



trigger wheel

- the spark plugs
- the distributor cap and ignition cables
- the air cleaner (ACL) housing with all hoses and connectors

Install:

- the exhaust manifold according to operation [Check/replacing exhaust system](#)
- the intake manifold and engine cooling fan (FC) according to operation [Replacing intake manifold](#)
- the fuel rail
- the ground strip on the engine
- the exhaust pipe
- the splashguard under the engine

Top up coolant/Change oil and oil filter

Install battery negative lead

Top up with oil.

Oil capacity

including filter	4.75 liters
excluding filter	4.25 liters

Fill the cooling system.

Run the engine until the thermostat opens and top up if necessary.

Check for leaks.

