

Replacing the camshaft seals

Special tools: [999 5006](#) , [999 5383](#) , [999 5460](#) , [999 5452](#) , [999 5651](#) , [999 5451](#) , [999 5199](#) , [999 5718](#) , [999 5719](#)

Note! As the illustrations in this service information are used for different model years and / or models, some variation may occur. However, the essential information in the illustrations is always correct.

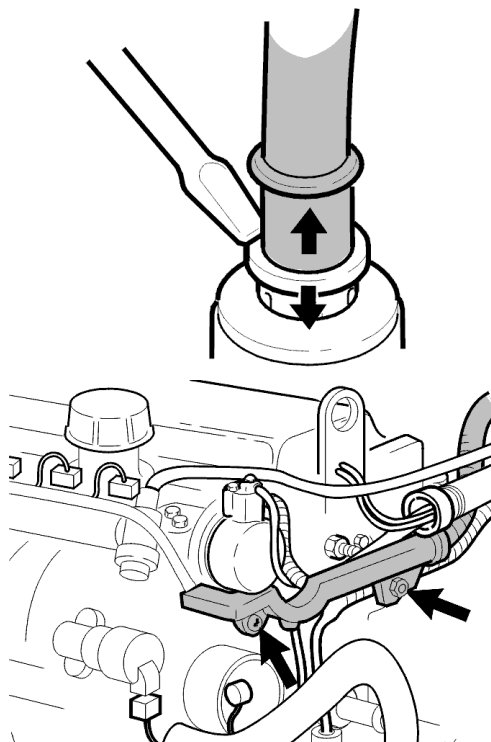
Note! The crankshaft and camshafts must not be turned more than is stated in the method description!

If the shafts are turned in any other way the valves may be damaged.

Preparations

Remove:

- the cable from the battery negative terminal. First read [Note when disconnecting and connecting the battery lead](#)
- the inlet hose between the air cleaner (ACL) and throttle body (TB). Place it to one side.



Remove:

- the brake servo vacuum hose from the terminal in the throttle body (TB). Disconnect the hose by pressing the plastic ring down. At the same time pull the hose upwards. Move the hose to one side
- the fuel line and wiring from the clips at the rear edge of the cylinder head.

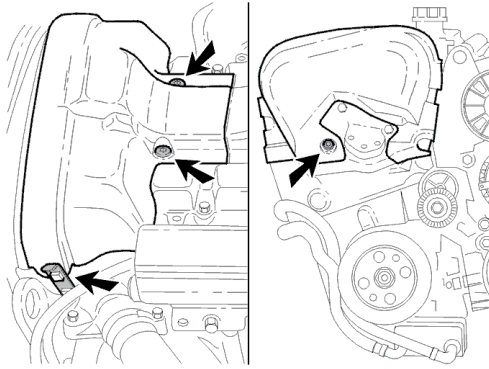
Remove:

- the screws for the cable duct
- the rear cover for the camshaft
- the camshaft position (CMP) sensor housing
- the trigger wheel
- the right-hand engine cover (turbocharged models only)
- the auxiliaries belt.

Removing timing covers

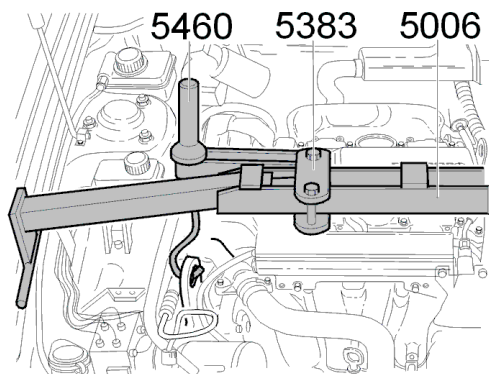
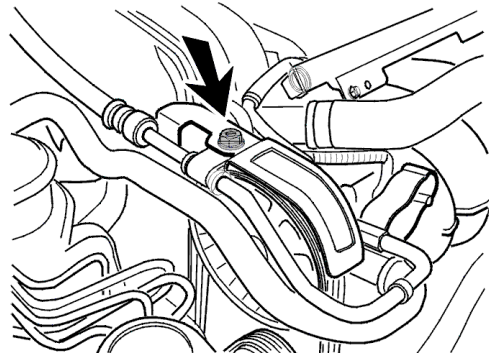
Remove:

- the upper timing cover
- the front timing cover.



Installing the lifting beam and the lifting hook

Remove the metal bracket for the servo hose from the rotation protection for the auxiliaries belt.

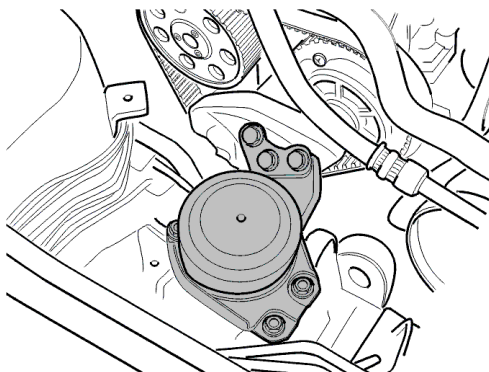


Position lifting beam **999 5006** slightly in front of the front lifting eyelet for the engine. Use lifting arm **999 5383** and lifting hook **999 5460** to lift the engine a few mm at the front edge.

Removing the right-hand engine mounting

Remove:

- the screws for the servo holder
- the engine mounting screws
- the engine mounting
- the lower timing cover.

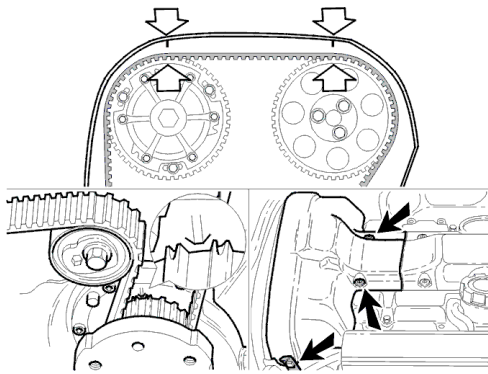


Position the engine according to the marking

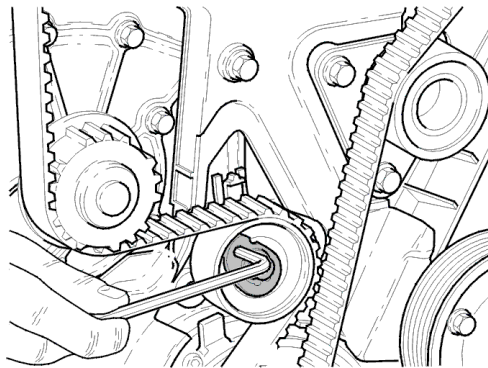
Remove the right front wheel.

Position the upper timing cover.

Turn the crankshaft until the markings on the crankshaft and camshaft pulley correspond.



Turn the crankshaft a further ¼ turn clockwise and then back again until the markings correspond. The markings are illustrated. Remove the upper timing cover.

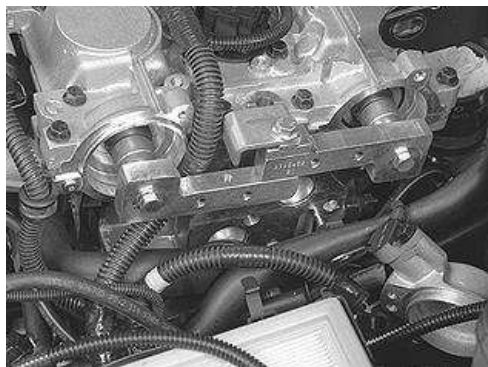


Removing the timing belt

Slacken off the centre screw for the belt tensioner slightly.

Hold the centre screw still. Turn the tensioner eccentric clockwise using a 6 mm Allen key to 10 o'clock.

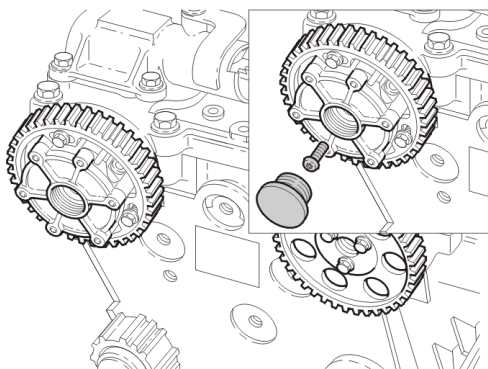
Remove the timing belt from the camshaft pulleys.



Removing the timing gear pulley

Timing gear pulleys with variable valve timing unit

- Install camshaft adjustment tool **999 5452** at the rear of the camshafts.



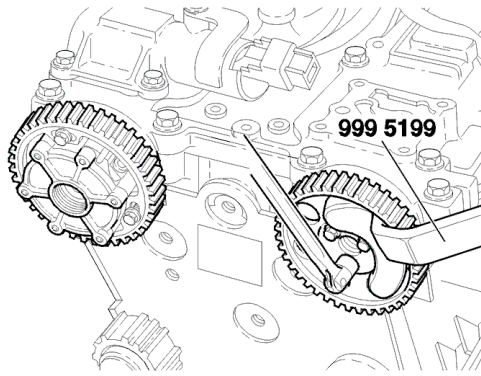
Timing gear pulleys with variable valve timing units:

- Remove the plug at the front edge of the variable valve timing unit (TORX 55)
- Remove the centre screw from the VVT unit (TORX 55).

Carefully pull out the timing gear pulley with the variable valve timing (VVT) unit. A small amount of oil may run out. Place paper underneath.

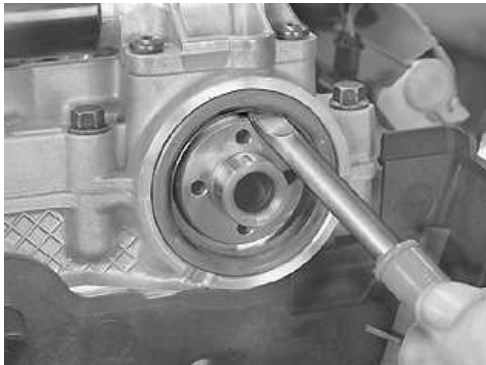
Timing gear pulleys without variable valve timing units:

- Remove the screws for the timing gear pulley. Use counterhold **999 5199**
- Remove the timing gear pulley
- Remove tool **999 5452**
- Remove the screw holding the inner timing



cover to the cylinder head.

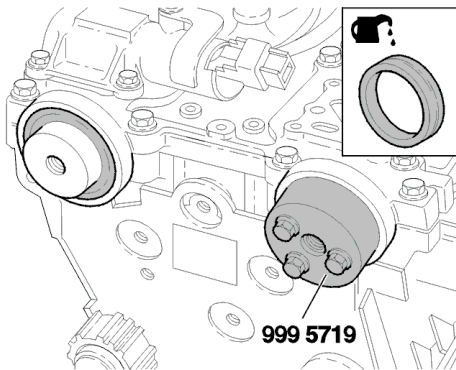
Replacing the camshaft seal



Carefully press in tool [999 5651](#) between the sealing ring and the camshaft.

Carefully pry out the seal.

Oil the new seal.



Install the new seal for the camshaft with variable valve timing. Use drift [999 5718](#) .

Install the new seal for the camshaft without variable valve timing. Use drift [999 5719](#) .

Install the screw holding the inner timing cover to the cylinder head.

Secure the crankshaft position

Install the adjustment tool.

Remove:

- the front air baffle
- the support between the cylinder block and the intake manifold
- the mounting screws for the starter motor.

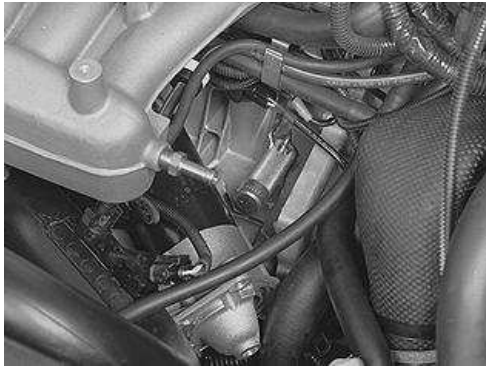
Place the starter motor to one side.

Remove the blind cover plug and cover washer.

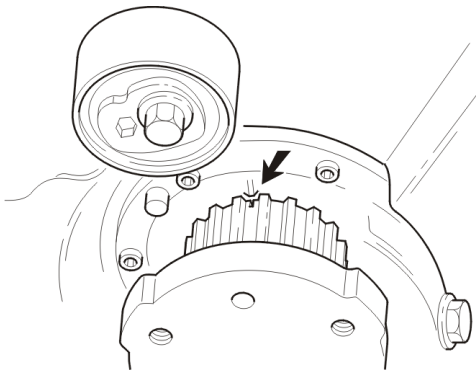
Turn the crankshaft clockwise slightly to avoid the adjustment tool being in the wrong position.

Install adjustment tool [999 5451](#) . Ensure that the adjustment tool bottoms out against the cylinder block.

Turn the crankshaft back counter-clockwise



until it stops against the drift.

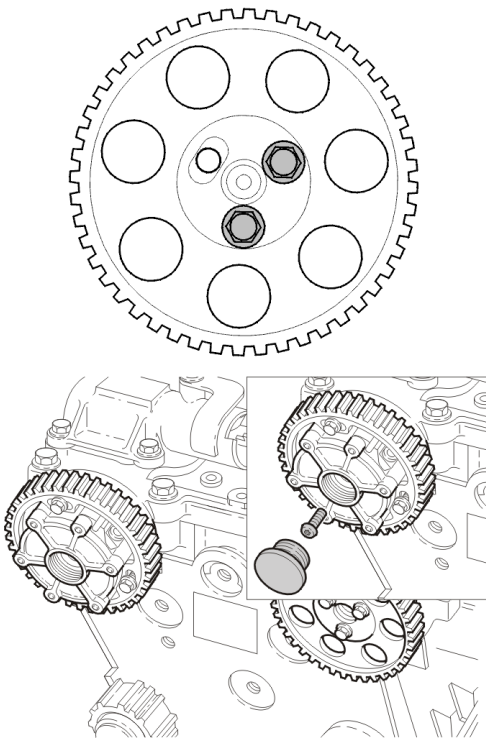


Check that the marking on the crankshaft timing gear pulley corresponds with the marking on the oil pump.

Installing the timing gear pulley for the camshafts

Timing gear pulleys without variable valve timing (VVT):

- install the upper timing cover
- install the timing gear pulley without variable valve timing on the camshaft. Use the two screws positioned so that the markings on the timing gear pulleys and upper timing cover correspond. **Donottighten.**



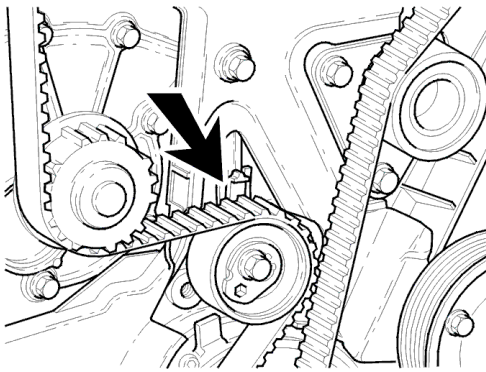
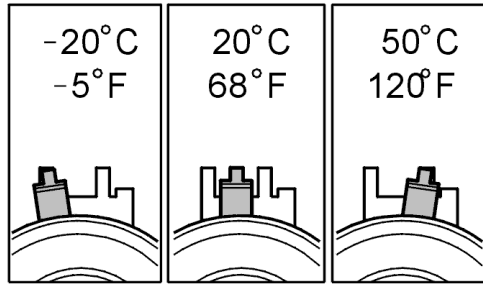
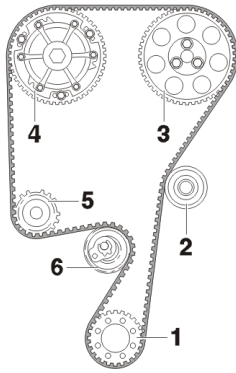
Timing gear pulleys with variable valve timing (VVT):

- Install the timing gear pulley using the centre screw on the camshaft. Ensure that the markings on the timing gear pulleys/upper timing cover correspond. **Donottighten.**

Installing the timing belt

Install the timing belt on the timing gear pulleys.

Note! Adjust so that the screws in the timing gear pulley without variable valve timing do not reach the limit position in the oval holes.



Tension the timing belt

Note! This adjustment is to be made with a cold engine. Suitable temperature is approximately 20°C/67°F.

At higher temperatures (with the engine at operating temperature or a high outside temperature for example) the indicator is further to the right.

The illustration shows the position of the indicator at different engine temperatures.

- The belt must be tensioned between the intake camshaft pulley, the idler pulley and the crankshaft
- Hold the belt tensioner centre screw secure. Turn the belt tensioner eccentric counter-clockwise until the tensioner indicator passes the marked position. Then turn the eccentric back so that the indicator reaches the marked position in the centre of the window
- Hold the eccentric securely. Tighten the centre screw. Tighten to **20 Nm**.

Tightening the timing gear pulley

Tighten the centre screw on the timing belt tensioner with variable valve timing. Tighten to **90 Nm**.

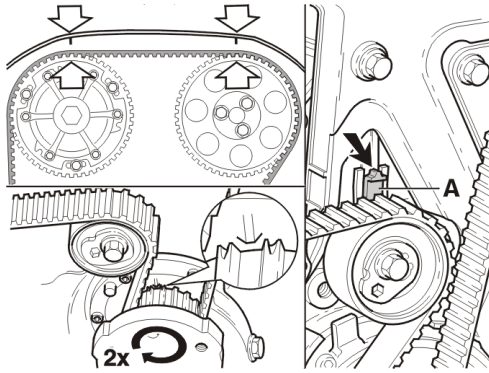
Install the plug. Tighten to **35 Nm**.

Install the third screw on the camshaft without variable valve timing. Tighten to **20 Nm**.

Remove the adjustment tools.

Check

- Press the belt to check that the indicator on the tensioner moves easily
- Install the upper timing cover
- Turn the crankshaft two turns. Check that the markings on the crankshaft and camshaft pulley correspond.



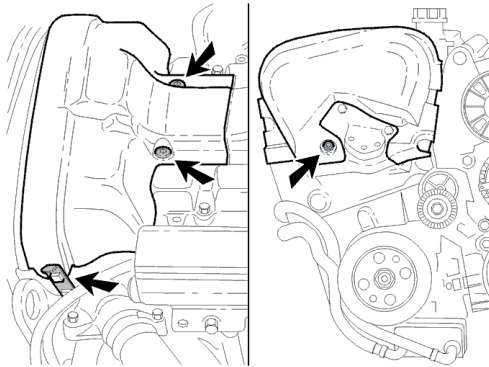
Note! Check that the indicator on the belt tensioner is within the marked area.

- Remove the upper timing cover.

Installing the timing covers

Install:

- the lower timing cover
- the front timing cover. Tighten to **12 Nm**
- the upper timing cover.

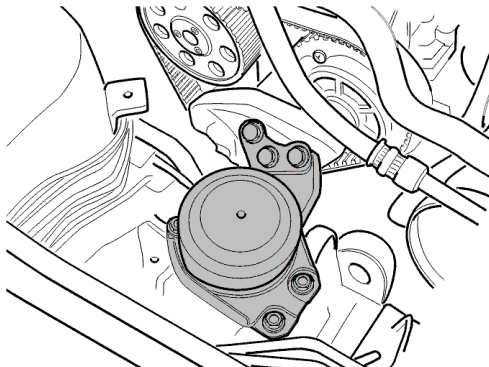


Installing the right-hand engine mounting

Screw the engine mounting into place on the engine. Tighten to **67 Nm**.

Install:

- the screws on the bracket for the bodywork. Tighten to **50 Nm**.

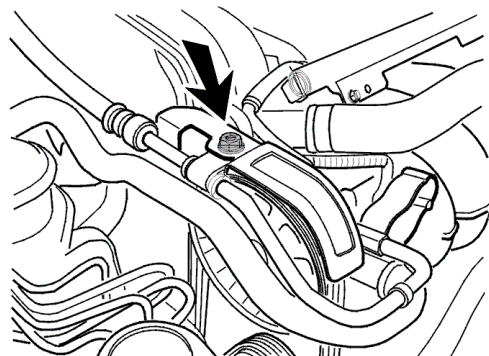


Finishing

Remove the lifting beam and lifting hook.

Install:

- the power steering reservoir
- the metal bracket for the power steering hose on the rotation protection for the auxiliaries belt
- the auxiliaries belt
- turbocharged engines: the right engine cover and the cover over the right headlamp unit
- the rear camshaft cover
- the trigger wheel. Tighten to **17 Nm**
- the camshaft position (CMP) sensor housing. Tighten to **5 Nm**
- the cable duct



- the brake servo vacuum hose
 - the hose between the intake manifold and air cleaner (ACL) housing
 - the blind cover plug
 - the mounting screws for the starter motor
 - the support between the cylinder block and the intake manifold
 - the front air baffle
 - the cable from the battery negative terminal.
- First read Note when disconnecting and connecting the battery lead .

Checking work

Function test:

- Test drive the car.