

Installing the cylinder head

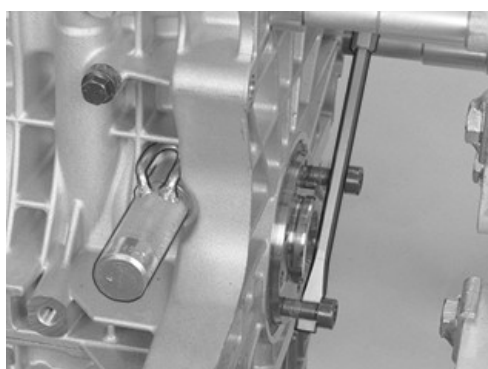
Special tools: [951 2050](#) , [951 2767](#) , [999 5450](#) , [999 5451](#) , [999 5452](#) , [999 5454](#) , [999 5718](#) , [999 5719](#)

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

Tightening torques

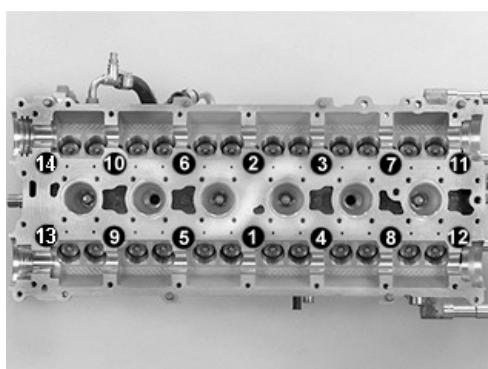
For tightening torques not in the text, see [Tightening torque](#) .

Aligning the crankshaft



Turn the crankshaft **counter-clockwise** (viewed from the rear of the engine) until the piston in cylinder 1 reaches top dead centre (TDC). Install the crankshaft stop [999 5451](#) Ensure that it bottoms out against the cylinder block. Now turn the crankshaft **clockwise** (viewed from the rear of the engine) until the crankshaft counter-weight is in contact with the crankshaft stop

Installing the cylinder head



Install a **new cylinder head gasket**.

Install the cylinder head.

Use **new screws**.

Lubricate and install all the screws.

Tighten the screws as illustrated. Tighten the screws in the following order.

1. 20 Nm
2. 60 Nm
3. Angle-tighten **130°**. Use protractor [951 2050](#) .

Installing tappets and camshafts

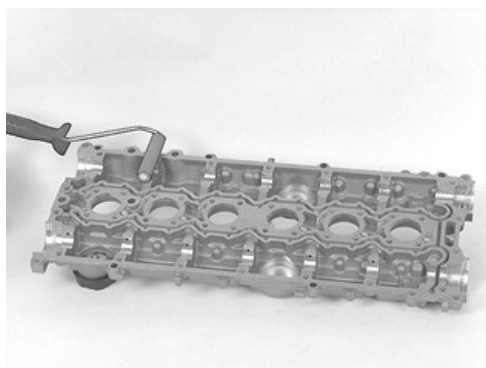
See [Valve clearance, setting / adjusting](#) .

Applying liquid gasket

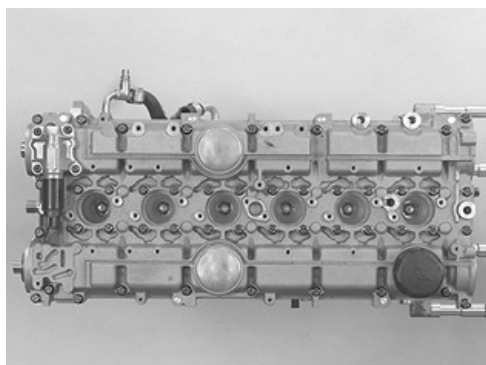
Wipe the oil film off the mating surfaces on the camshaft cover and cylinder head.

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

Apply liquid gasket 11 61 059 to the camshaft cover. **The surface must be completely covered without any excess.** Use roller [951 2767](#)



Note! Ensure that no liquid gasket gets in to the oil ducts.



Installing the camshaft covers

Lubricate the camshaft lobes, the camshaft bearing surfaces and the tappets.

Install the camshaft cover.

Install 2 press tools [999 5454](#) .

Pull the camshaft cover alternately down, keeping it parallel to the cylinder head with the press tools

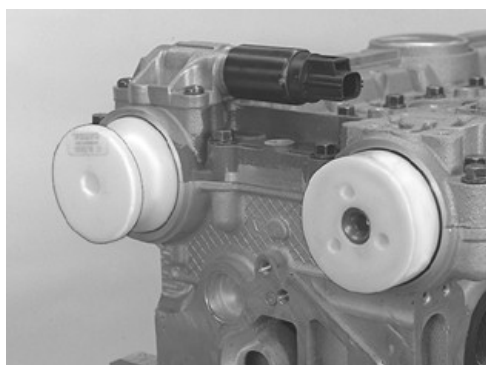
Install all the screws and tighten.

Remove the press tools.

Install the spark plugs. Tighten to **30 Nm**.

Install the control valve for the variable valve timing unit with a new gasket. Tighten.

Installing the front camshaft seal

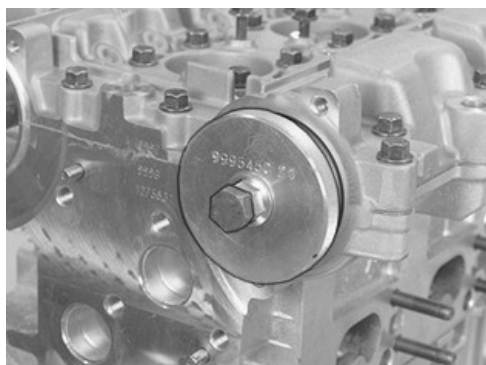


Use drift [999 5718](#) on camshafts with variable valve timing units. Use drift [999 5719](#) on camshafts without variable valve timing.

Lubricate the surface of the seal that the camshaft rotates against.

Carefully tap in the seal until the drift bottoms against the end of the camshaft.

Installing the rear camshaft seal



Turbocharged engines = seal at the exhaust camshaft.

Naturally aspirated engines = seal at the intake camshaft.

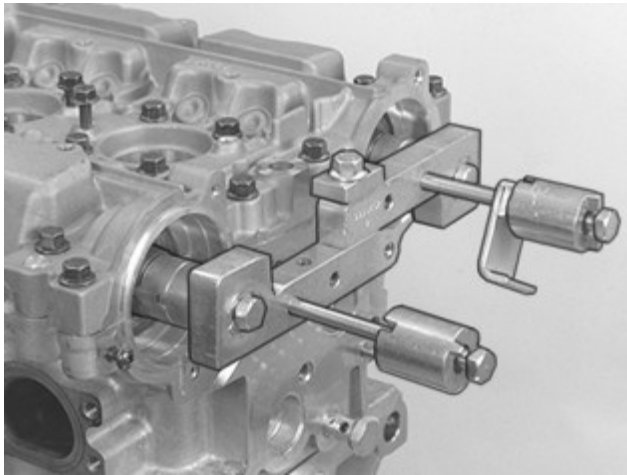
Use drift [999 5450](#) .

Lubricate the surface of the seal that the camshaft rotates against.

Press in the seal until the drift bottoms out.

Note! If there are grooves on the camshaft, the seal can be pressed in a further 2 mm by reversing the sleeve.

Securing the camshafts



Use camshaft adjustment tool **999 5452** .

Caution! The camshafts must not be turned more than is absolutely necessary to install the adjustment tools. The valves may be damaged!

Screw the adjustment tool sections together into one. Check that the screws retaining the adjustment tool to the camshafts and the screws holding the tool together are well tightened.