

S80 (-06), 2000, B6294S, M65, L.H.D, YV1TS94K2Y1079445, 079445



9/5/2013

PRINT

Cylinder head/gasket, replacing

Special tools:

951 2666
951 2767
999 5450
999 5452
999 5454
999 5670
999 5718
999 5719
999 5750
999 5972

Removing the cylinder head gasket

Note! Since the illustrations in the information are used for different model years and/or models, there may be some deviations. However, the essential information in the illustrations is always correct.

Preparation

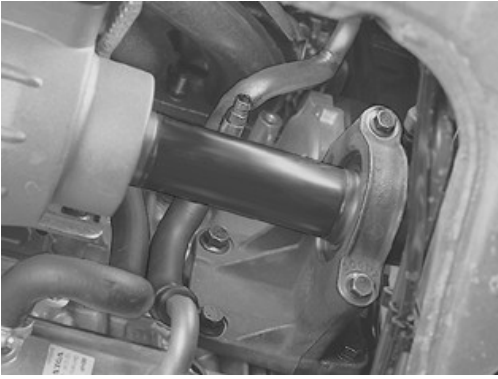
Remove

- the radiator breather tube from the expansion tank. Install lock grip pliers
- the negative battery cable. First read Battery, disconnecting .
- the right front wheel.



Draining coolant

Raise the car. Remove the splash guard from under the engine.
Open the engine nipple.



Drain the coolant into a container.
Close the nipple.

Separating the exhaust system



Remove

- the nuts where the manifold and front exhaust system separate.
- the first mounting bracket for the exhaust system downstream of the three-way catalytic converter (TWC) from the car body.
- the front SIPS member from the car body
- the brake pipe from the holders on the SIPS member.

Press the exhaust system backward so that there is a 60-70 mm gap at the joint after the manifold.

Hint:

Use a mobile jack with universal plate 999 5972 as a support.

Remove the gaskets.
Seal the openings at the exhaust system.

Removing components



Remove

- the engine stabilizer brace between the suspension turrets
- the air cleaner (ACL) intake from the connection on the front cover plate.

Undo the clamp holding the plastic intake pipe to the electronic throttle module. Press out the pipe. Leave the pipe in place.

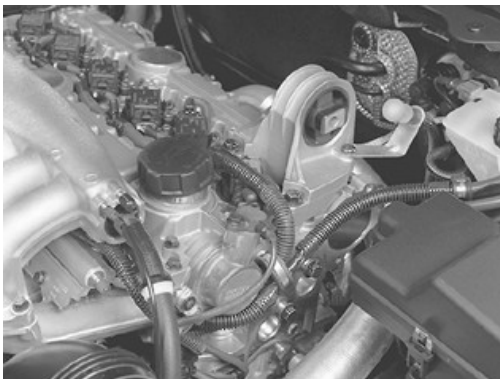
Remove

- the connector for the mass air flow (MAF) sensor. Disconnect the wiring from the air cleaner (ACL)
- the control hose for the air preheating damper at the intake manifold
- the air cleaner (ACL) assembly.

Relieve the load from the belt tensioner. Remove the auxiliaries belt.

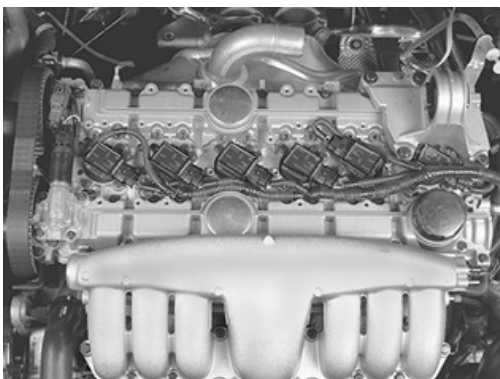
First remove the upper timing cover then the front timing cover.

Remove the cover over the ignition coils.



Remove

- the clamps that hold the wiring to the rear of the cylinder head
- the camshaft position (CMP) sensor housing and trigger wheel.
- the cover at the rear of the intake camshaft
- the brake vacuum hose from the intake manifold
- the air pre-heating hose
- the rear screw in the lower row from the connection between the intake manifold and the cylinder head.



Remove

- the upper section of the intake manifold.

Install protective plate 999 5723 .

- the screws holding the ignition coils and the two ground terminals between the ignition coils.

Disconnect the connectors for the variable valve timing solenoid and the engine coolant temperature (ECT) sensor. Lift up and put the ignition coils and wiring to one side.

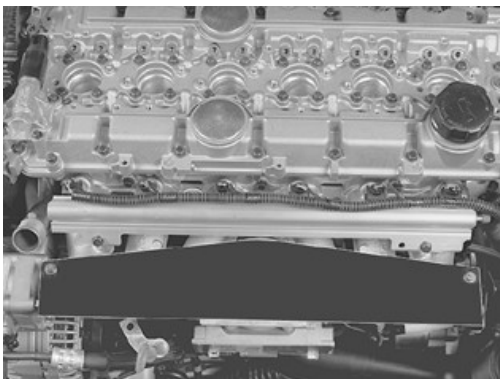
Note! Mark up the ignition coils before removal.

- the upper screw for the transmission dipstick pipe
- the ground strips between the engine and the firewall
- the torque rod bracket
- the upper engine coolant hose for the engine and radiator
- the dipstick pipe from the intake manifold
- disconnect the connector for the electronic throttle module.

Draining the fuel line

Drain the fuel line. See Fuel system pressure release .

Removing the fuel rail



Remove the mounting screws from the fuel rail.
 Spray universal oil or similar around the injector connectors on the intake manifold.
 Gently work the fuel rail and injectors loose.
 Separate the fuel line quick-release connector under the intake manifold. Use tool 951 2666 .
 Carefully put the fuel rail to one side.

Remove

- the EVAP hose from the intake manifold
- the crankcase ventilation vacuum hose.

Removing the manifold

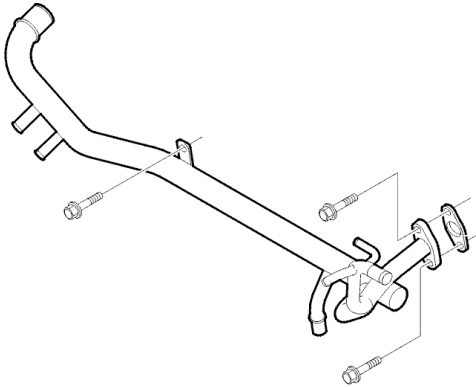


Remove

- the heat deflector plate above the manifold
- the nuts and washers holding the manifold to the cylinder head
- the manifold and gaskets.

Releasing the inlet

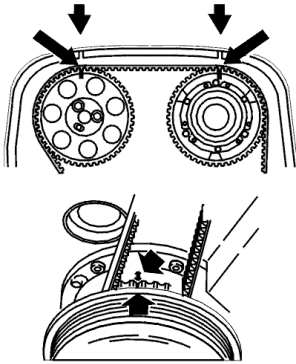
pipe for the coolant pump



Remove

- the screw that holds the inlet pipe for the coolant pump on the cylinder block
- the two screws for the connector between the coolant pipe and the bypass channel. Carefully turn the pipe to remove it from the cylinder block.

Setting up the engine



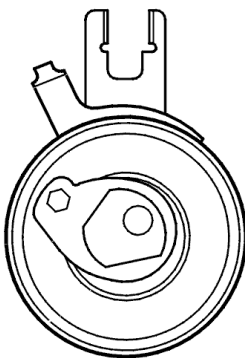
Remove the nuts from the cover on the fender liner.

Position the upper timing cover.

Turn the crankshaft clockwise until the markings on the crankshaft and camshafts correspond.

Remove the upper timing cover.

Removing the timing belt



Slacken off the center screw for the belt tensioner slightly.

Hold the center screw still. Turn the tensioner eccentric counter-clockwise to 10 o'clock. Use a 6 mm Allen key.

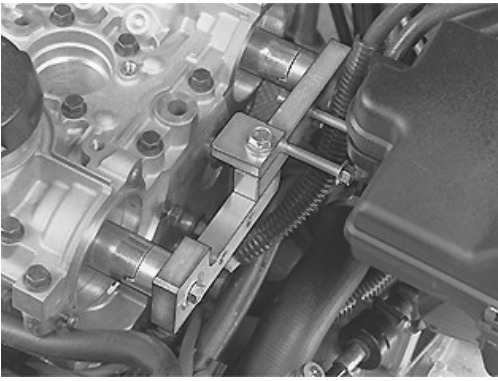
Remove the timing belt.

Removing the timing gear pulley

Install tool 999 5452 at the rear of the camshafts.

Remove

- the center plug for the variable



- valve timing unit
- variable valve timing unit center screw.
Pull / pry off the variable valve timing unit and timing gear pulley
- screws holding the timing belt (without the variable valve timing unit) to the camshaft
- the timing gear pulley
- tool 999 5452.

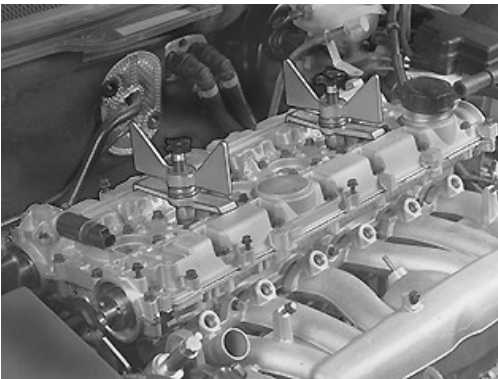
Removing the thermostat housing



Remove

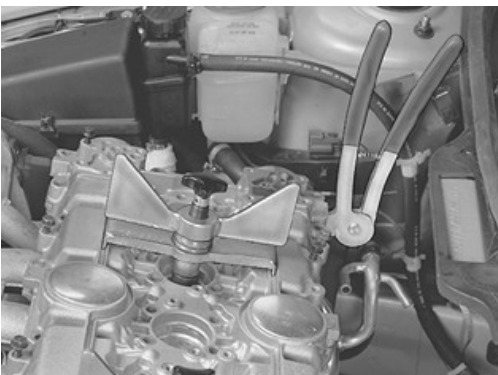
- the screw for the thermostat housing cable duct
- screws holding the thermostat housing to the cylinder head.
Lift out the thermostat housing, gasket and cable duct
- screw holding the inner timing cover to the cylinder head.

Removing the camshaft cover and cylinder head

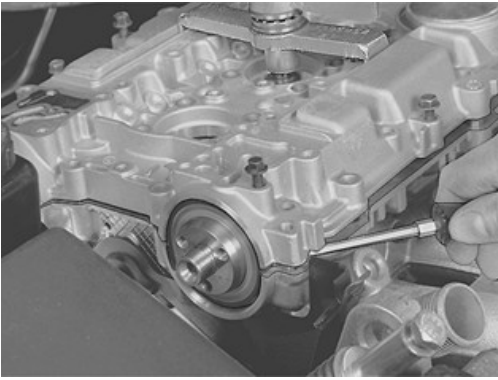


Remove

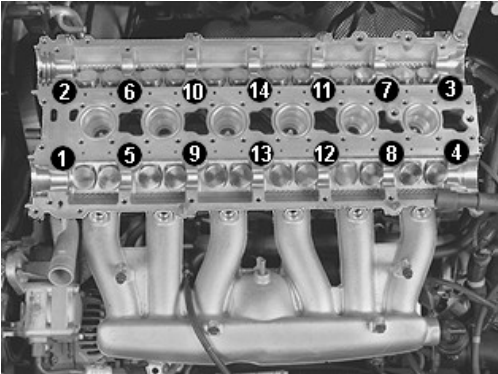
- spark plugs for cylinders 2 and 5.
Install tool 999 5454 (x2).
Leave a **2-3 mm** gap to the camshaft cover. Ensure that the screw in the spark plug well is fully tightened.
- Variable valve timing solenoid
- screws holding the camshaft cover to the cylinder head.



Use pliers 999 5670 to lift the cover from the cylinder head.
Install the pliers at the stop lugs.
Start with cylinder 1 and work alternately backward.
Slacken off the wing nuts approximately 2 turns.
Repeat the procedure with the pliers.



Carefully press out the front and rear camshaft seals.
Remove the seals.



Remove

- tools 999 5454.
- the camshaft cover
- the camshafts.

Lift out the valve lifters. Use a suction cup.

Caution! Mark up and position the lifters so that their original positions can be established.

Remove the screws holding the cylinder head on the cylinder block. Start at the sides and work alternately towards the center (see illustration).
Get help to lift off the cylinder head.

Caution! Work very carefully to avoid damaging the contact faces.

When replacing or working on the cylinder head

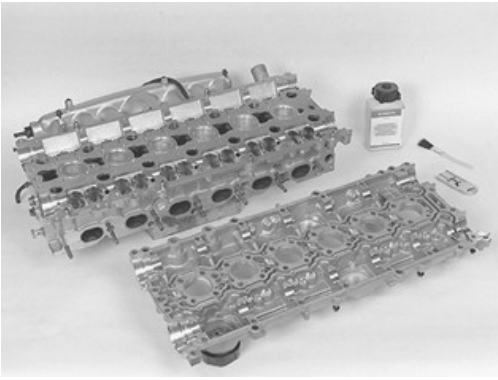
Remove

- the intake manifold and gasket
- the coolant outlet pipe.

Caution! Work very carefully to avoid damaging the contact faces.

Cleaning

Cleaning the gasket faces



Clean the gasket faces for:

- the manifold. Check that the studs are tightened
- the coolant bypass channel
- the coolant outlet pipe.
- the intake manifold
- the cylinder block
- camshaft cover.

Blow the oil ducts clean.

Note! Use a razor blade or a gasket scraper and gasket solvent 1161 440. Use a fume hood or extractor when using gasket solvent!

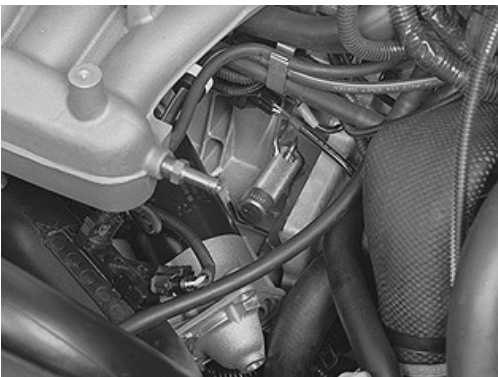
Installing the cylinder head gasket

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Tightening

For tightening torques not in the text see Tightening torque .

Aligning the crankshaft



Remove

- the mounting screws for the starter motor. Pull out the starter motor and place to one side
- the blind cover plug.

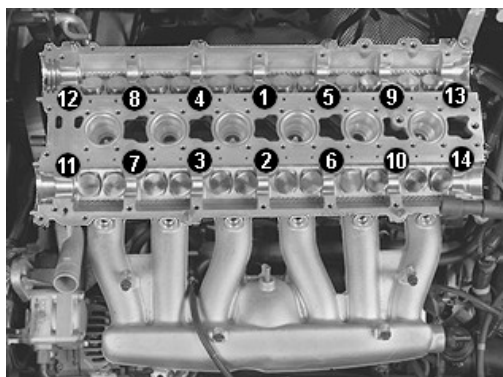
Turn the crankshaft slightly **clockwise**.

Install the crankshaft stop 999 5451 . Ensure that it bottoms out against the engine block.

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

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

Installing the cylinder head



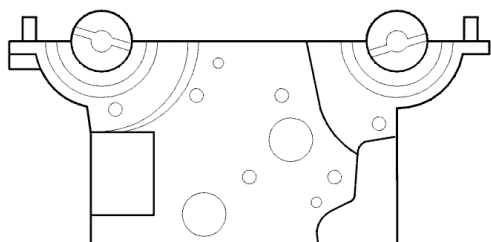
Install a new cylinder head gasket.
Install the cylinder head. Use new screws.

Lubricate and install all the screws.
Tighten the screws in the order illustrated.

Tighten the screws in the following order:

1. **20 Nm.**
2. **60 Nm.**
3. Angle tighten **130°**. Use a bevel protractor 951 2050 .

Installing valve lifters and camshafts



When installing a new cylinder head, the valve clearance must be set. See Valve clearance, setting / adjusting .

Lubricate the valve guide wells.
Install all valve lifters

Caution! Make sure that the lifters end up in the same position as before.

Lubricate the camshaft bearing seats.

Install the intake camshaft. Ensure that the groove at the back of the camshaft is **above** an imaginary center line

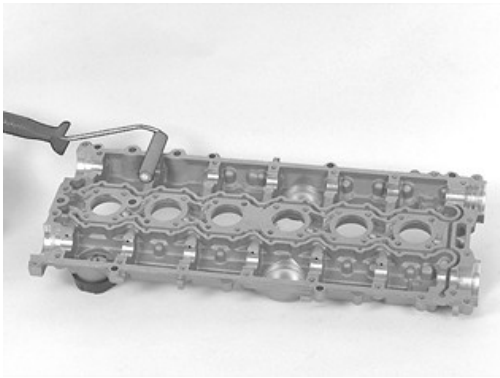
Position the exhaust camshaft.

Ensure that the groove at the back of the camshaft is **below** an imaginary center line.

Applying liquid gasket

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

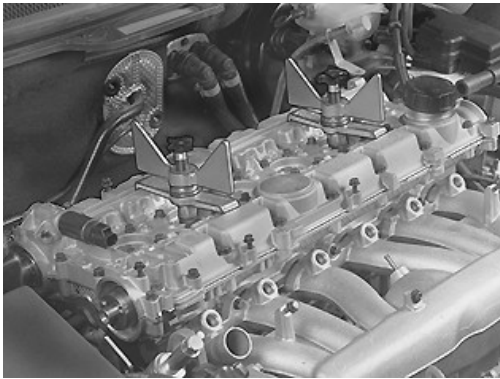
Apply liquid gasket 11 61 059 to the camshaft cover. Use roller 951 2767 . The surface must be completely covered without any



excess.

Caution! Make sure that no liquid gasket gets into the oil channels.

Installing the camshaft covers



Lubricate the camshaft lobes, the camshaft bearing surfaces and the valve lifters.

Install the camshaft cover.

Install press tool 999 5454 (2x).

Tighten the camshaft cover screws alternately, keeping it parallel to the cylinder head with the press tools.

Install all the screws and tighten.

Install the variable valve timing solenoid with a new gasket.

Remove the press tools.

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

Installing the rear camshaft seal



Use drift 999 5450 .

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

Press in the seal until the drift bottoms out.

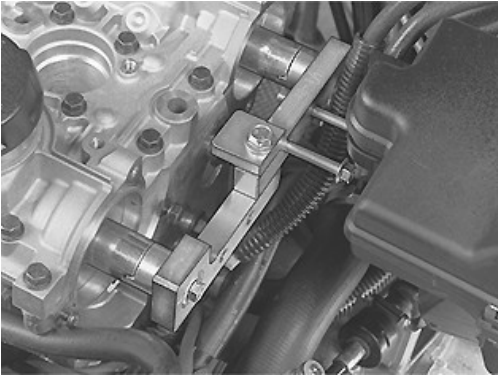
Note! If there are wear grooves on the camshaft the seal can be pressed in another 2 mm, by turning around the tool's sleeve.

Securing the camshafts

Use camshaft tool 999 5452 .

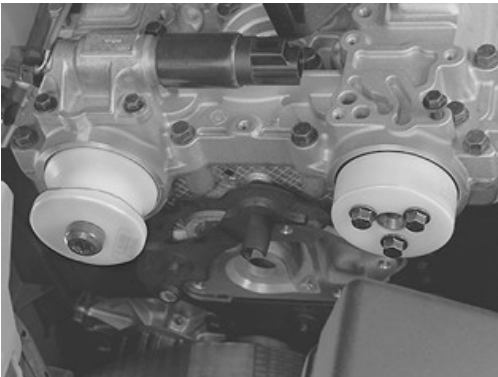
Separate the camshaft adjustment tool into two units.

Note! The camshafts must not be turned more than indicated in the text below, the valves may be damaged!



Install the exhaust camshaft section of the adjustment tool. Screw into the rear edge of the camshaft. Carefully turn the camshaft adjustment tool clockwise (as viewed from the back of the engine) until the camshaft adjustment tool is parallel with the join between the cylinder head and camshaft cover. Install the intake camshaft section of the adjustment tool. Screw into the rear edge of the camshaft. Carefully turn the camshaft adjustment tool counter-clockwise until it is in contact with the exhaust camshaft section of the camshaft adjustment tool. 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.

Installing the front camshaft seal



Use drift 999 5718 for camshaft with variable valve timing unit and drift 999 5719 for camshaft without variable valve timing unit. Lubricate the surface of the seal that the camshaft rotates against. Use the variable valve timing unit / timing belt pulley mounting screws. Tighten the screws until the drift bottoms out.

Installing the thermostat housing



Install

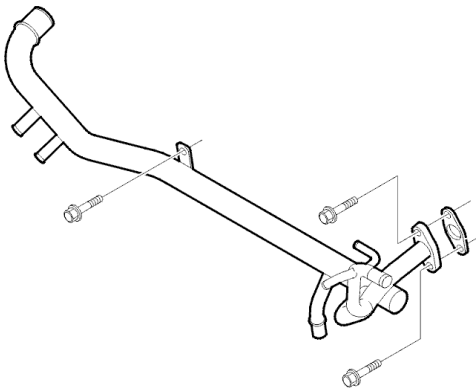
- the screw holding the inner timing cover to the cylinder head
- the thermostat housing and cable duct. Use a new gasket.
- the screw for the thermostat housing cable duct.

Checking the variable valve timing (VVT)

unit

Check the variable valve timing (VVT) unit. See: Variable valve timing unit, checking and adjusting

Installing the intake pipe for the coolant pump



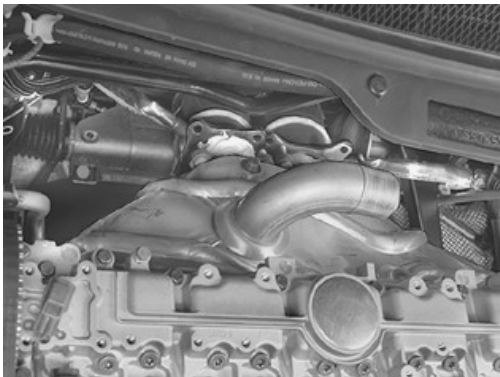
Install

- the inlet pipe for the coolant pump to the cylinder head. Use a new gasket.

Note! Apply thread sealant, P/N 1161 056, to the screw threads.

- the screw for mounting the coolant pump inlet pipe to the cylinder block.

Installing the manifold



Install

- new gaskets.

Lubricate the studs at the exhaust ports and the flanges on the manifold using paste P/N 116 1408.

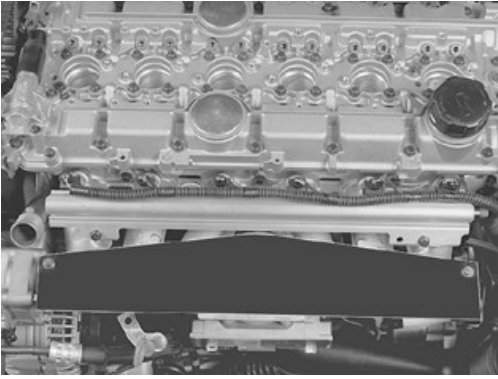
Install

- the manifold
- the washers and new nuts that hold the manifold onto the cylinder head
- the heat deflector plate above the manifold

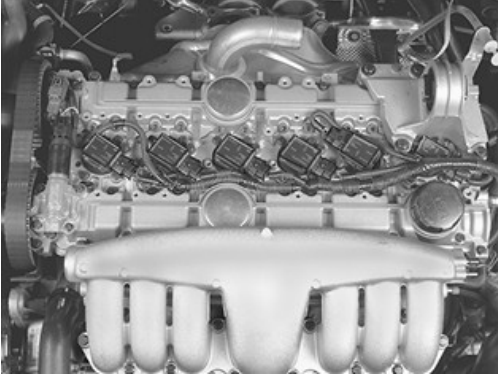
Installing components

Install

- the EVAP hose to the intake manifold. Use a new clamp.
- the crankcase ventilation vacuum hose.

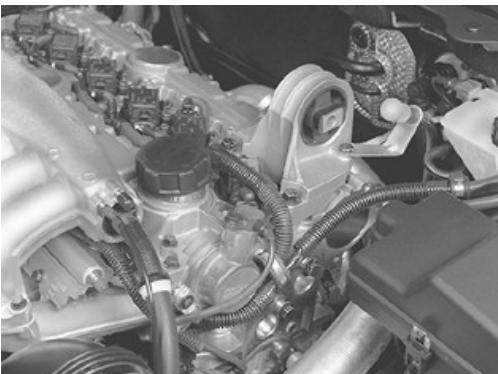


- the fuel rail. Use new screws.



Install

- the screw holding the dipstick pipe to the intake manifold
- the upper engine coolant hose for the engine and radiator. Tighten the clamp
- the ignition coils according to the earlier markings
- the screws for the two ground terminals between ignition coils 1 and 2 and 5 and 6
- the connector for the coolant temperature sensor
- the connector for the variable valve timing solenoid
- the torque rod bracket
- the ground strips between the engine and the firewall
- the upper screw for the transmission dipstick pipe
- the upper section of the intake manifold. Use a new gasket. Tighten to **19 Nm**.



Install

- the bracket and screw to the lower row of screws at the mounting for the intake manifold on the cylinder head
- the air pre-heating hose
- the brake vacuum hose to the intake manifold
- the cover at the rear of the exhaust camshaft
- the camshaft position sensor (CMP) housing and trigger wheel.
- the clamps that hold the wiring to the rear of the cylinder head

Assembling the

exhaust system



Raise the car.
Remove the seals from the exhaust system flanges.
Install new gaskets.
Lift up and push the exhaust system onto the connector at the manifold.

Note! Use a mobile jack with universal plate 999 5972 as a support.

Install the screws holding the front SIPS member and rear mounting on the body. **Do not tighten!**
Remove the mobile jack.
Install new nuts at the connection between the exhaust system and manifold.
Tighten the nuts at the exhaust system join. Tighten the screws on the front and rear SIPS members.

Installing components



Install

- the cover over the ignition coils
- the front timing cover
- the upper timing cover
- expansion tank. Connect the connector to the engine coolant level sensor
- the hose to the expansion tank from the radiator. Tighten the clamp.

Connect the connector to the ABS sensor.

Install

- the servo oil reservoir. Ensure that the hoses are correctly positioned
- the air cleaner (ACL) housing assembly.
- the control hose for the air preheating shutter to the intake manifold
- the connector to the mass air flow (MAF) sensor. Secure the wiring at the front edge of the air cleaner (ACL) housing.

Connect the throttle body (TB) connector to the engine wiring.

Install

- the plastic intake pipe between the air cleaner (ACL) housing and the throttle body (TB). Tighten the clamps. Check that the crankcase ventilation hoses are secure
- the intake pipe for the air cleaner (ACL) housing to the sleeve connector on the front cover plate
- the engine stabilizer brace between the suspension turrets. Clamp the servo hose to the right mounting on the engine stabilizer brace
- the plastic nuts for the hatch in the right fender liner
- the right front wheel. See [Installing wheels](#) .
- the battery negative lead. Also read [Battery, disconnecting](#) .

Checking and filling media

Replace the oil and oil filter if necessary.

Check

- the engine oil level
- the servo oil level
- the coolant level.

Warm up the engine until the thermostat opens.

Check

- the engine for leaks
- the oil level in the transmission
- the coolant level.

Top up if necessary.

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