

Engine/transmission, removing

Special tools: [999 5474](#) , [999 5722](#)

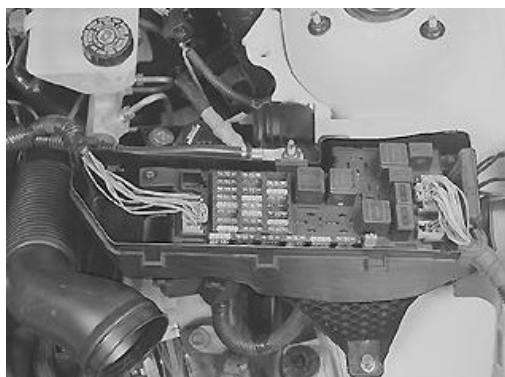
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Preparation



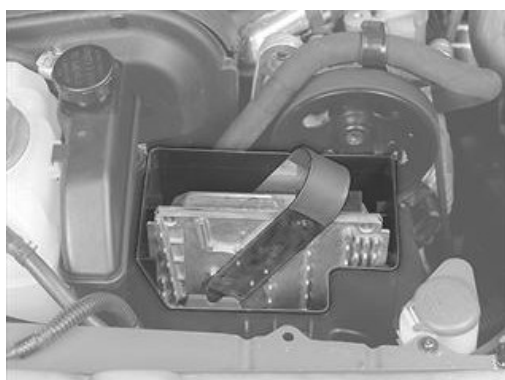
Remove

- the battery negative lead. First read [Note when disconnecting/connecting the battery lead](#)
- the cross stay between the suspension turrets
- the air cleaner (ACL) assembly. Seal the opening in the plastic pipe for the turbocharger (TC)
- the plastic charge air pipe above the engine. Seal the openings
- both the ground strips at the top of the cylinder head.



Remove

- the cover over the central electrical unit
- the connector for the engine wiring from the central electrical unit
- the positive lead for the starter motor from the terminal block.



Remove

- control module unit cover
- the control modules. Use tool [999 5722](#) . Also see [Engine control module \(ECM\), replacing](#) .

Separate the control module box. Disconnect the engine wiring. Also see [Central electrical unit, engine compartment, replacing](#) . Remove the ground terminal for the engine wiring at the right wheel arch.

Removing the engine cooling fan (FC)

Remove

- the brake vacuum hose from the ejector valve



- The canister purge (CP) valve from the mounting on the fan shroud. Disconnect the connector.

Expose the wiring and the breather tube for the radiator.

Disconnect the connectors for the engine cooling fan (FC).

Remove

- the screws securing the fan shroud to the front panel
- the dip stick
- the upper oil hose for the transmission at the connection to the radiator (automatic transmissions only). Seal the openings.

Lift up and remove the engine cooling fan (FC).

Remove

- the connectors for the pressure sensor and temperature sensor in the plastic charge air pipe between the charge air cooler (CAC) and the throttle body (TB)
- the rubber hose at the intake for the charge air cooler (CAC)
- the brake vacuum hose at the intake manifold
- the plastic pipe between the throttle body (TB) and the charge air cooler (CAC)
- the lower oil hose for the transmission at the connection to the radiator (automatic transmissions only). Seal the openings.

Install radiator protection [999 5474](#) .

Removing the transmission cable

Automatic transmissions: Remove the screws for the transmission cable bracket at the transmission.

Manual transmissions: Separate the clutch cable and remove the transmission cables. See

[Gearbox, removing](#) .

Tie up the cable(s) to the central electrical unit.

Draining the fuel line

Drain the fuel line. See [Draining the fuel system](#) .

See also: [Fuel system, quick-release connectors](#) .

Remove the cover from the expansion tank.

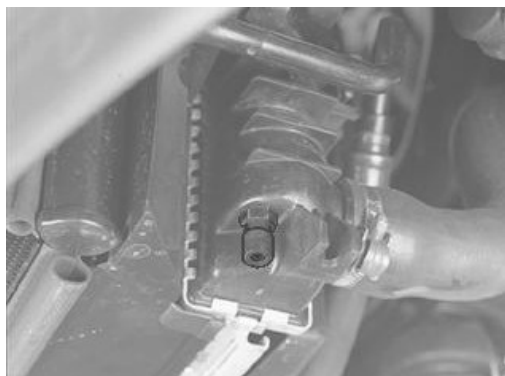


Removing components

Raise the car.

Remove

- the left and right front wheels
- the splash guard under the radiator
- the splash guard under the engine.



Draining coolant

Position a container under the radiator drain cock.

Drain the coolant.

Warning! Avoid skin contact with the coolant.

Close the cock.



Cars with engine block heaters (option)

Drill out the first three blind rivets at the right mounting for the fender lining to the fender edge, seen from the front edge and upwards.

Bend the fender liner out of the way.

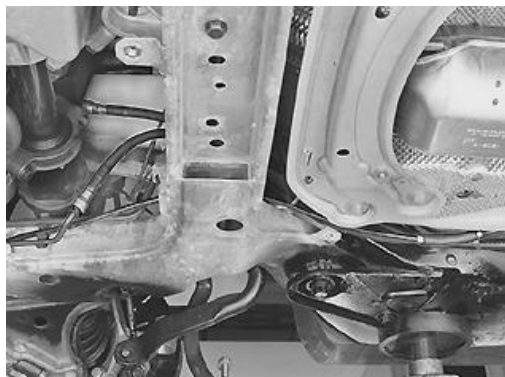
Disconnect the connector from the engine block heater.



Preparations for removal of the drive shafts

Remove on the left and right-hand sides

- the tie rod from the wheel spindle
- the link rod from the anti-roll bar
- the screw that holds the brake pipe bracket to the bodywork
- the nut holding the control arm to the ball joint
- the center screw from the end of the drive shaft.



Separating the fuel line

Note! If an engine block heater is installed, mark the position of the fuel lines.

Separate the quick-release connectors for the fuel pressure line and engine block heater (option). See also: [Fuel system, quick-release connectors](#) .

Hint: Use tool [999 5666](#) .

Pull apart the EVAP line at the rubber joint behind the rear right mounting for the sub-frame.

Separating the front exhaust pipe

Remove the screw from the wiring clamp that holds the wiring for the heated oxygen sensor (HO2S) at the right side of the steering gear. Remove the wiring from the clips at the power steering line on the steering gear.

Remove

- the screw for the wiring clamp at the bracket at the rear edge of the sub-frame
- the lower screw that holds the heat deflector plate over the turbocharger (TC)
- the three nuts that hold the front exhaust pipe to the turbocharger (TC).

Tie up the front exhaust pipe at the right suspension turret (cars without All-wheel drive (AWD)).

Removing the air conditioning aggregate

Disconnect the connector from the pressostat in the air conditioning (A/C) receiver drier. Slacken off the lower right screw for the cooling unit.

Pull the cooling unit down. Carefully pull the wiring for the pressostat through the cavity at the mounting for the cooling unit.

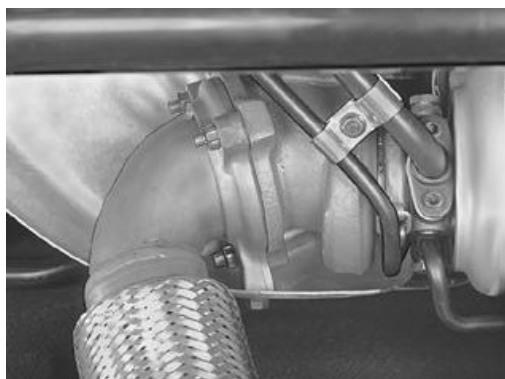
Release the lower ventilation pipe for the control module box from the sub-frame.

Exposing the air conditioning (A/C) compressor

Remove the upper radiator hose.

Remove the auxiliaries belt.

Disconnect the one-pin connector for the





compressor magnetic clutch.

Remove the four screws holding the air conditioning (A/C) compressor to the engine. Tie up the compressor in the front cover plate.

Note! Handle the compressor carefully. Ensure that there are no kinks in the air conditioning (A/C) pipes.

Removing components

Expose the wiring for the front heated oxygen sensor (HO2S).

Disconnect the connector for the level sensor in the expansion tank.

Remove

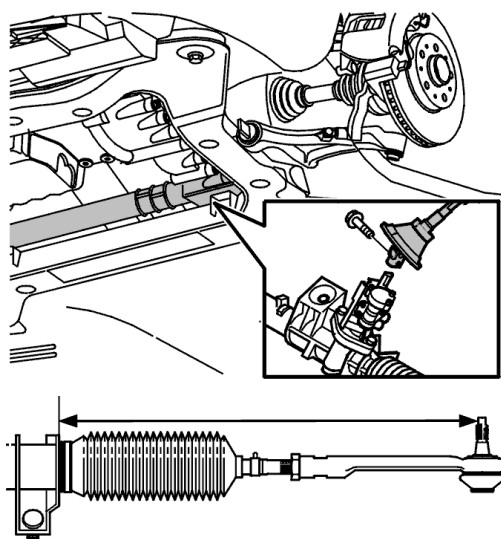
- the heat deflector plate above the turbocharger (TC)
- the hoses for the heater unit at the terminal in the firewall
- the bleed hose for the radiator at the expansion tank
- the ABS line and clips and the power steering hose.

Lift up the power steering fluid reservoir and the expansion tank. Place them on top of engine.

Separating the steering shaft

Remove the ignition key.

Remove the screw from the joint between the steering gear and the steering shaft.



On one side, measure the length of the tie rod in relation to the steering gear housing. Note the measurement.

Press up the joint from the steering gear.

Caution! The steering shaft must not be turned. The contact reel in the SRS system could be damaged.

Removing the three-way catalytic converter (TWC) (all-wheel drive (AWD) only)

Remove

- the nuts where the exhaust pipe divides downstream of the three-way catalytic converter (TWC)
- the screws securing the SIPS member to the bodywork.

Remove the brake pipe from the holders on the SIPS member.

Lift off the front exhaust pipe from the turbocharger (TC) and the rear system.

Lower and pull back the three-way catalytic converter (TWC) with the SIPS member.

Note! The routing of the heated oxygen sensor (HO2S) wiring over the brake pipe.

Removing the propeller shaft from the transmission and drive distribution box (all-wheel drive (AWD) only)

remove the propeller shaft from the transmission and drive distribution box (all-wheel drive (AWD) only). See [Pinion seal bevel gear, replacing](#) .

Lowering the engine and transmission

Use a post hoist with a lifting table and stud guides.

Position the lifting table against the sub-frame.

Note! Ensure that the lifting table is centered under the sub-frame for optimal weight distribution. Check that the lifting table is correctly applied against the sub-frame.

Remove

- the sub-frame brackets screws
- the screws for the sub-frame.

Lower the engine and transmission approximately 15 cm so that the drive shafts describe a horizontal line between the hub and transmission.

Caution! Ensure that no hoses, wiring or anything else catch in the engine and transmission unit when it is lowered.



Unhook the control arms from the ball joint pinion.
Hold the constant velocity joint. Pull the drive shaft off the hub. Let the drive shafts rest against the control arms.
Turn the engine block heater out of its position.
Check that the air conditioning (A/C) compressor is hanging free.
Continue lowering the engine and transmission unit.

Engine/transmission, installing

Special tools: [951 2050](#) , [999 5972](#)

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 is always correct.

Note! For tightening torques, see: [Tightening torque](#)

Note! To ensure that there is no exhaust leakage, see: [Flanged joint, assembling](#) .

Installing the engine and transmission unit

Raise the engine and the transmission unit. Use a lifting table with locating pins.

Stop when the sub-frame is approximately 15 cm below the frame members.



Install (left and right-hand sides)

- the drive shaft to the hub. Install the center screws. Do not tighten yet!
- the ball joint to the control arm. Install the nuts. Do not tighten yet!

Note! Ensure that the mating surfaces on the ball joints and control arms are clean.

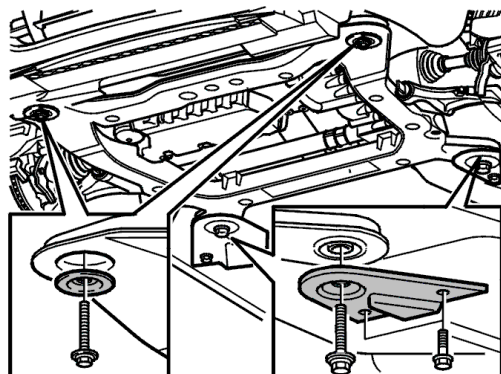
Twist the engine block heater (option) into position. Check that the air conditioning (A/C) compressor is correctly positioned.

Check that the tie rod is in the correct position.

Check that the transmission cable is routed between the steering shaft and the firewall. Align the steering shaft joint on the steering gear.

Lift the engine and transmission unit up to the frame members.

Note! Ensure that no hoses, wiring or anything else catches.



Install

- a new screw in the lower steering shaft joint. Tighten to 20 Nm
- new screw in the sub-frame. Lubricate the screws
- the washes at the front edge and the support plates at the rear edge of the sub-frame.

Tighten the screws for the sub-frame. Tighten to 105 Nm. Angle-tighten 120°. Use bevel protractor [951 2050](#) . Start on the left hand side of the sub-frame. Continue with the right hand side.

Tighten the screws for the brackets at the rear of the sub-frame. Tighten to 50 Nm.

Remove the lifting table.

Installing the propeller shaft (all-wheel drive (AWD) only)

Install the propeller shaft (all-wheel drive (AWD) only). See [Pinion seal bevel gear, replacing](#) .

Installing the three-way catalytic converter (TWC) (all-wheel drive (AWD) only)

Lubricate the studs where the exhaust system separates downstream of the three-way catalytic converter (TWC). Use paste 116 1408.

Warning! Avoid skin contact with the paste.

Lift up the exhaust system and connect it to the rear system. Use a new gasket and new nuts.

Hint: Use a mobile jack with universal plate [999 5972](#) as a support.

Note! The routing of the heated oxygen sensor (HO2S) wiring over the brake pipe.

Install the screws holding the SIPS member to the bodywork. Tighten the screws.

Press the brake pipe into place in the holders on

the SIPS member.

Installing the front exhaust pipe

Lubricate the studs on the turbocharger (TC).
Use paste 116 1408.

Warning! Avoid skin contact with the paste.

Install the front exhaust pipe on the turbocharger (TC). Use new nuts. Tighten to 30 Nm.

Clamp the wiring for the rear heated oxygen sensor (HO2S) into place at

- the bracket at the rear of the sub-frame
- the clips on the power steering pipe at the steering gear
- the clamp at the right-hand side of the steering gear.

Connecting fuel lines

When assembling the fuel lines, see also: [Fuel system, quick-release connectors](#).

Connect the quick-release connector and the fuel line to:

- the motor
- the engine block heater (option).

Press the EVAP line together at the rubber joint.



Assembling the spring strut

Install

- the tie rods. Use new nuts. Tighten to 70 Nm
- the link rod to the anti-roll bar. Use new nuts. Tighten to 50 Nm. Counterhold with Tx27
- the bracket for the brake pipe to the body.

Tighten

- the nut for the ball joint and control arm. Tighten to 80 Nm. Counterhold using Tx40
- the center screw in the drive shaft. Tighten to 50 Nm.



Cars with engine block heaters (option)

Connect the heater connector at the vehicle wiring.

Ensure that the connector and wiring are



secured at the body.

Rivet the fender liner to the fender edge.

Check that the quick-release fuel line connector is secure at the engine block heater.



Installing the air conditioning (A/C) compressor

Install the 4 screws whilst the compressor is loose.

Raise the compressor and screw it into place.

Note! Handle the compressor carefully. Ensure that there are no kinks in the air conditioning (A/C) pipes.

Connect the one-pin connector to the compressor magnetic clutch.



Installing components

Connect the engine wiring to the control module box. See [Central electrical unit, engine compartment, replacing](#) .

Install

- the ground lead to the ground terminal at the right fender edge in the engine compartment
- the auxiliaries belt
- the intermediate piece for the control module box
- the control modules. See [Engine control module \(ECM\), replacing](#)
- the cover for the control module box
- expansion tank. Connect the radiator breather tube to the expansion tank. Tighten the clamp. Connect the connector for the level sensor in the expansion tank
- servo oil reservoir. Check that the hoses are correctly positioned.

Clamp the ABS cable to the power steering hose.

Install

- the heat deflector plate above the

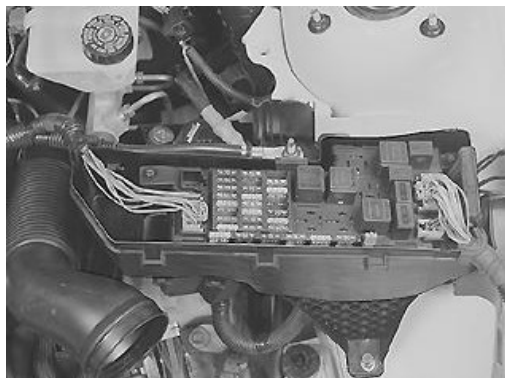


turbocharger (TC)

- the 2 ground strips on the top of the cylinder head.

Clamp the wiring for the front heated oxygen sensor (HO2S) to

- the coolant pipe
- the heat deflector plate above the manifold
- the turbo control hose at the plastic intake pipe for the turbocharger (TC).



Install

- the positive lead for the starter motor
- the connector for the engine wiring
- the cover over the central electrical unit.

Installing the transmission cable

Automatic transmissions: Install the screws holding the bracket and transmission cable to the transmission.

Manual transmissions: Install the transmission cable. Assemble the clutch cable. See [Transmission, installing](#) .

Installing the engine coolant fan (FC)

Install

- the lower engine coolant hose to the radiator. Tighten the clamp
- the lower oil cooler hose for the transmission to the radiator (automatic transmissions only). Use new O-rings
- the plastic charge air pipe between the throttle body (TB) and the charge air cooler (CAC). Only connect the plastic pipe at the throttle body (TB). Do not tighten the clamp.

Remove radiator protection 999 5474

Install

- the engine cooling fan (FC). Tighten the screws securing the fan shroud to the front panel
- the plastic charge air pipe to the connection



at the charge air cooler (CAC). Tighten both the clamps. Connect the connectors for the temperature and pressure sensors in the plastic pipe

- the canister purge (CP) valve to the bracket at the fan shroud. Secure the EVAP hose to the clip at the lower section of the fan shroud
- the brake vacuum hoses
- the upper oil cooler hose for the transmission to the radiator (automatic transmissions only). Use new O-rings.



Press down the right side of the cooler unit. Pull the wiring for the pressure switch (Pressostat) into the drier bottle.

Connect the connectors to

- the engine cooling fan (FC) (x2)
- the canister purge (CP) valve.

Secure

- the breather tube for the radiator at the top of the fan shroud
- the wiring at the lower right corner and at the top of the fan shroud.

Install

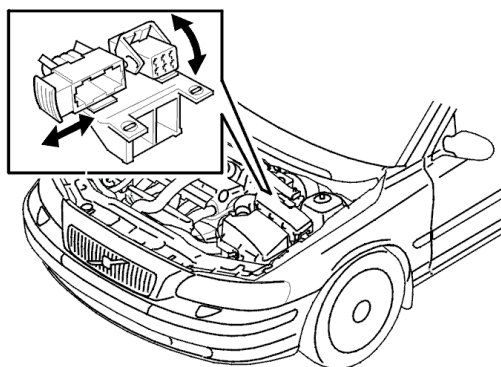
- the rubber hose to the inlet side of the charge air cooler (CAC)
- the plastic charge air pipe above the engine. Tighten all clamps. Secure the pipe on the engine
- the upper coolant hose. Tighten the clamp
- the ventilation pipe between the control module box and fan shroud
- the air cleaner (ACL) assembly. Connect the plastic hose to the mass air flow (MAF) sensor. Tighten the clamp
- the air cleaner (ACL) intake pipe.

Connect the connector to the mass air flow (MAF) sensor. Secure the wiring at the front of the air cleaner (ACL) housing.

Install the support brace between the suspension turrets. Secure the servo hose to the right mounting on the support brace.

Finishing

Connect the connector to the pressure switch (Pressostat) in the drier bottle. Secure the



wiring.

Tighten the lower screw on the cooler unit.
Connect the connectors to both the heated oxygen sensors (HO2S).

Install

- the splash guard under the radiator
- the splash guard under the engine
- the front wheels. See [Installing wheels](#)
- the battery negative lead. Also read [Note when disconnecting/connecting the battery lead](#).

Final check

Top up

- coolant
- engine oil
- power steering fluid.

Start the engine.

Warm up the engine until the thermostat opens.

Check for leakage.

Check the oil and coolant levels. Adjust if necessary.

Check the transmission oil level (automatic transmissions only). Top up if necessary.