

Control system/valve housing, removing

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! Read through the instructions before beginning work.

Information before removal

When replacing the valve housing, the distribution plate and all 6 balls (if undamaged) should be transferred to the new valve housing. There are many screws of different lengths. It is important that the different screws are not mixed up. Checks are carried out when replacing the valve housing.

The new valve housing does not have any solenoids installed. The solenoids are loose in the kit and must be installed separately.

Note! The three digit numbers in the text refer to Service Manual Hydra-Matic 4T65 E Technical Description.

Removing the side cover

Remove the side cover. See [Removing gearbox side cover](#).

Preparations for removing the valve housing

Remove the cable harness. See [Cable harness, control system, gearbox, replacing](#).

Remove the oil pump. See [Replacing the oil pump](#).

Air vent housing

The valve housing consists of:

- the valve housing (300)

Gaskets:

- 1 marked C (369)
- 1 marked V (371).
- distribution plate (370)
- guide sleeve (410).

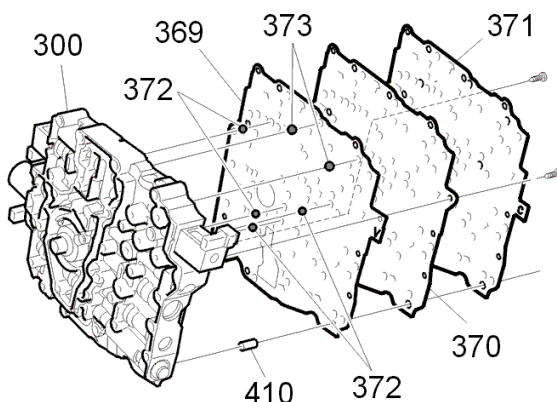
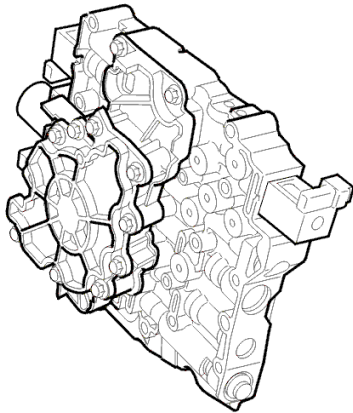
There are six balls in the valve housing. 4 small (372) and 2 larger (373).

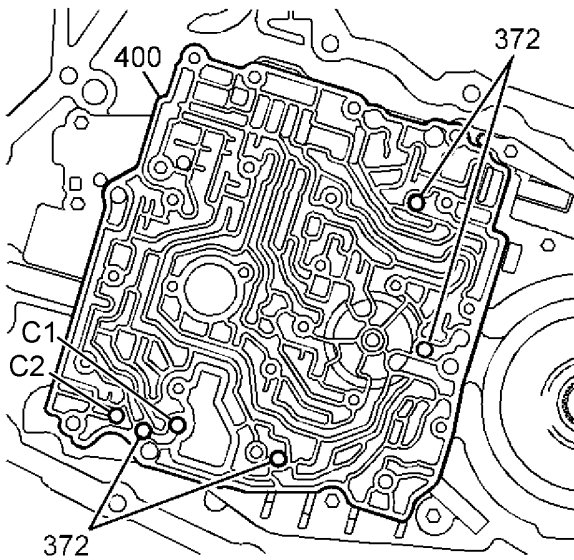
When separating the valve housing from the control system housing: The gaskets and plate must remain in the valve housing so that the balls do not fall out of their seats in the valve housing.

There are two small strainers (382) on the distribution plate.

2 plastic plugs (368) hold the gasket and plate in place.

Control system housing





There are 4 more balls in the control system housing. The balls will fall out when the valve housing is removed. Collect the balls in a clean container (the balls will be reinstalled later). There are 2 balls which do not fall out when the valve housing is removed (these are in the control system, C1 and C2).

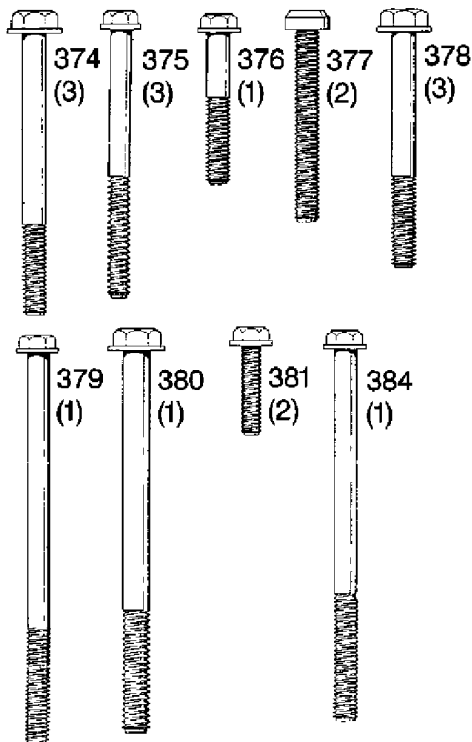
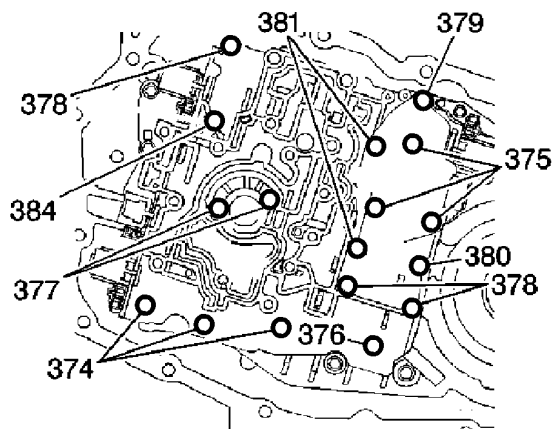
Removing the screws for the valve housing and pressure sensor

Caution! The screws are of different lengths. It is important that the screws are correctly installed.

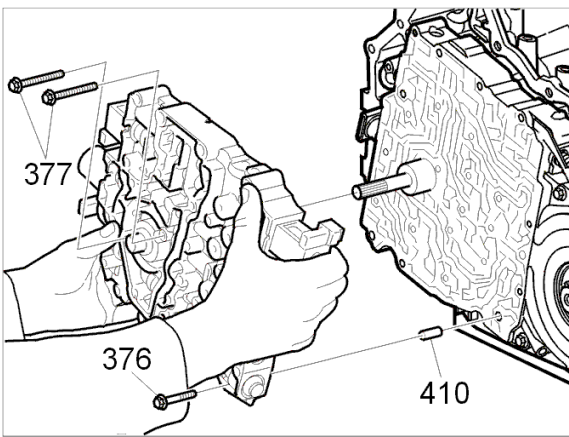
Remove the following screws:

- 3 screws numbered 374 (64 mm)
- 3 screws numbered 375 (60 mm)
- 1 screw numbered 376 (30 mm). Retain the guide sleeve on the screw or in the valve housing
- 3 screws numbered 378 (55 mm)
- 1 screws numbered 379 (15 mm)
- 1 screws numbered 380 (10 mm)
- 1 screw numbered 384 (85 mm).

Leave the screws numbered 377 (45 mm) in position for the time being.



Removing and separating the valve housing



Note! Do not damage the 2 small strainers on the distribution plate. The valve housing must not be twisted during removal.

Position a clean container underneath the gearbox. Slacken off the 2 Torx screws numbered 377. Press the valve housing against the control system housing.

Grip the valve housing (diagonally). Pull it straight out a little (ensure that the gaskets and distribution plate move with it). Continue to withdraw the valve housing so that fingers can be inserted to hold the gaskets and distribution plate in position in the valve housing.

Pull the valve housing out from the control system housing until 4 balls fall out.

Note! The oil pump shaft follows slightly.

Place the valve housing on a bench with the gaskets upwards.

Note! Do not damage the 2 small strainers on the distribution plate.

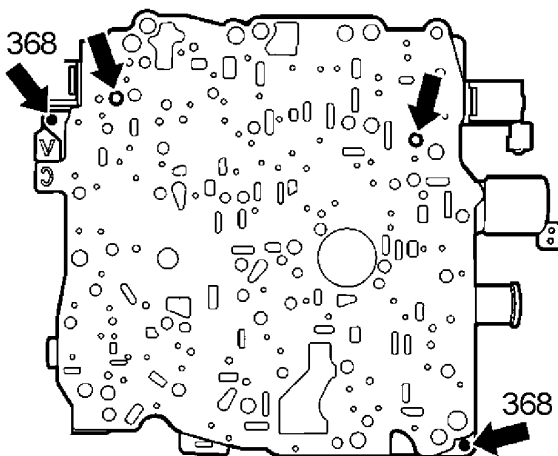
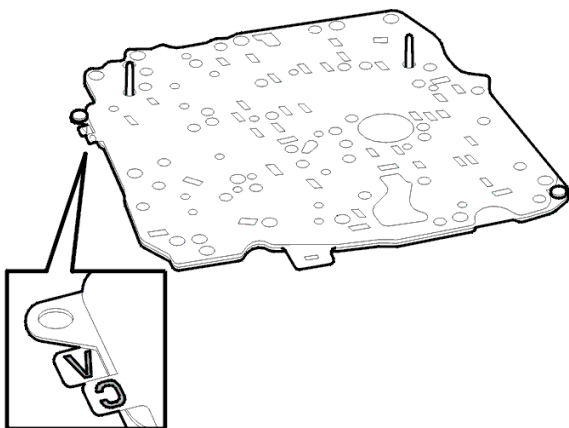
Take the balls out of the container. Wipe the balls dry. Check that the balls are round and smooth. Replace any defective balls.

Checking the markings and location of the gaskets

The gaskets are marked C and V.

Gasket C is against the control system housing.

Gasket V is against the valve housing.



Distribution plate

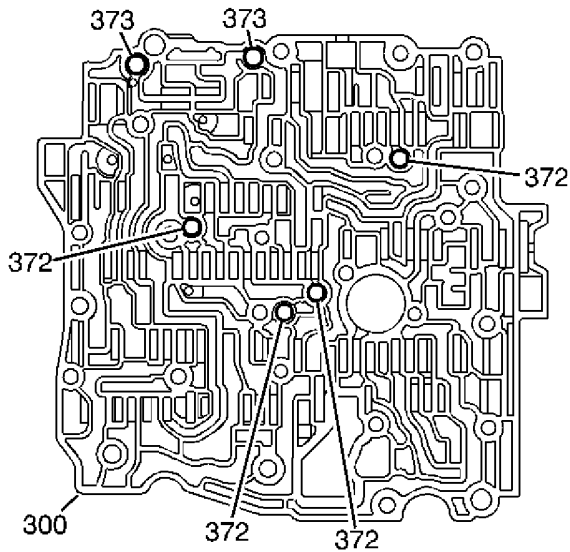
Remove the locking pin (368) (can be reused).

Lift up the distribution plate together with gasket C.

Note! Do not damage the 2 small strainers on the distribution plate.

Lift out gasket V.

Checking and reinstalling the balls in the valve housing



2 large balls (373).
4 smaller balls (372).

Inspect one ball at a time. Ensure that there is no dirt on the ball and that the surface are smooth and shiny. Check the four balls in the control system housing. Follow the same procedure as above.

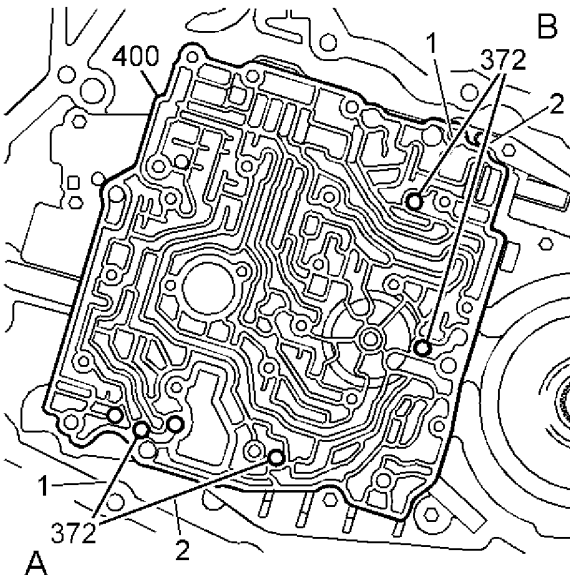
Location of the control system housing balls

Ball (372) A (1) is located between 2 existing balls in the housing (C1 and C2).

Ball (372) A (2) is located next to the hole.

Balls (372) B (1-2) are located in a seat with a holder to the right to prevent the ball moving to the side.

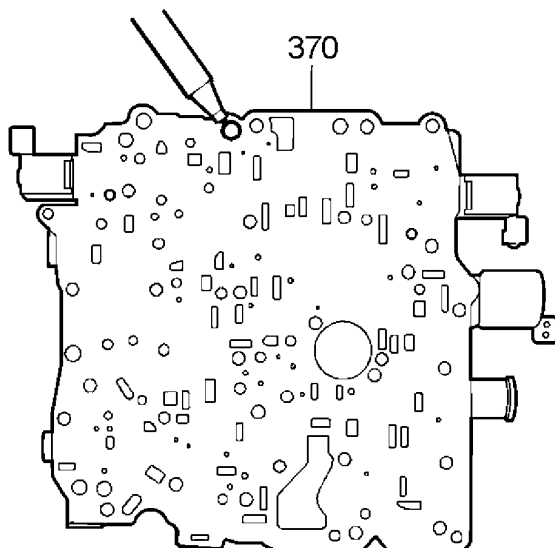
Installing the balls, see [Marking the location of the control system balls in relation to the distribution plate](#).



Marking the location of the balls in relation to the distribution plate

Position the distribution plate on the valve housing (strainers upwards) so that the balls can be seen. Mark the position of each ball beside the hole using a marker pen.

Turn the distribution plate and find each respective marking. Mark the hole. Check this side of the plate for leakage. See [Check the balls sealing against the distribution plate](#).

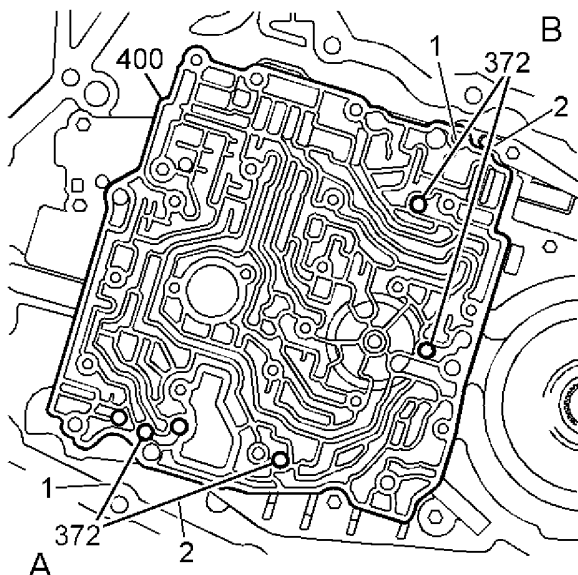


Marking the location of the control system balls in

relation to the distribution plate

Install the balls in the housing. Use Volvo Genuine parts petroleum jelly (P/N 116 1151-40).

Identify where the balls are to be located. Press petroleum jelly into the relevant holes and position the balls (the petroleum jelly ensures that the balls stay in the housing). To mark the position of the balls in relation to the distribution plate, see [Marking the location of the balls in relation to the distribution plate](#).



Check the balls sealing against the distribution plate

Note! Check that the balls are round and smooth. Replace any defective balls.

Feel the holes for the balls. Check that there is not a rough lip around the hole.

Turn each ball in turn in their hole (to remove dirt or burring).

Place the ball in the hole. Press the ball and turn the ball in the hole to see that the ball seals and that the holes in the plate are not oval.

Check the sealing of the balls against the control system housing

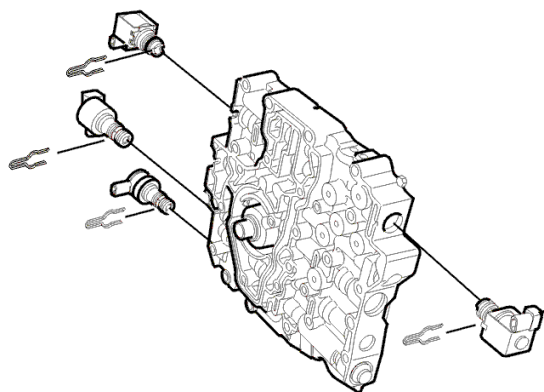
Carry out the same check as above for the 4 balls in the control system housing.

Remove the balls. Wipe off the petroleum jelly.

Installing new solenoids on the new valve housing

Install the solenoids in the relevant positions on the valve housing.

Note! Ensure that the solenoids are secure.



Installing the control system / valve housing

Note! The three digit numbers in the text refer to Service Manual Hydra-Matic 4T65 E Technical Description.

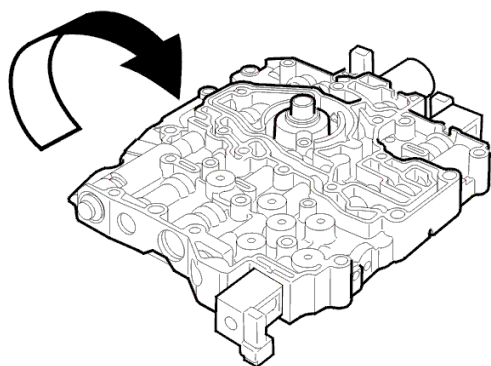
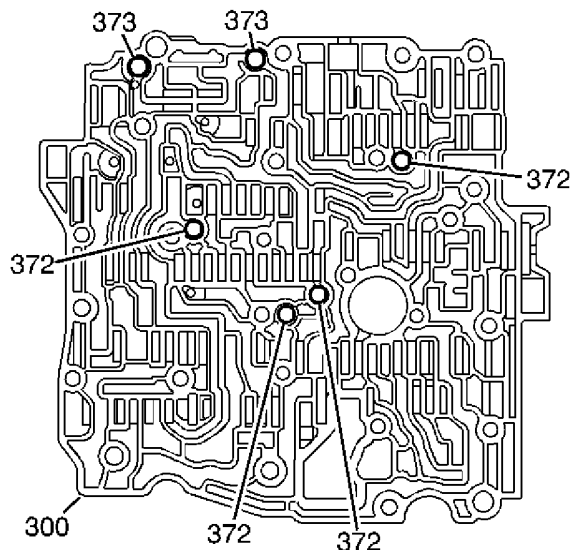
Transferring the balls to the new valve housing

Use Volvo Genuine parts petroleum jelly P/N 116 11 51-4 so that the balls remain in the relevant ducts during the installation of the valve housing.

Transferring

Balls 373 (2 x). Apply petroleum jelly to each duct. Install the balls (the petroleum jelly should cover the balls).

Balls 372 (4 x). Apply petroleum jelly to each duct. Install the balls.



Checking the balls in the valve housing

Turn the valve housing so that the balls are upside down.

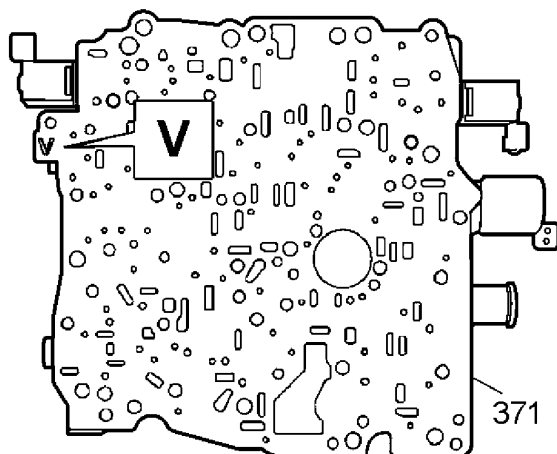
The balls should remain position. (If any of the balls fall out, use more petroleum jelly).

Turn the valve housing back again.

Installing new gaskets

Caution! Ensure that the gaskets are correctly positioned.

Install gasket 371 marked V on the valve housing.

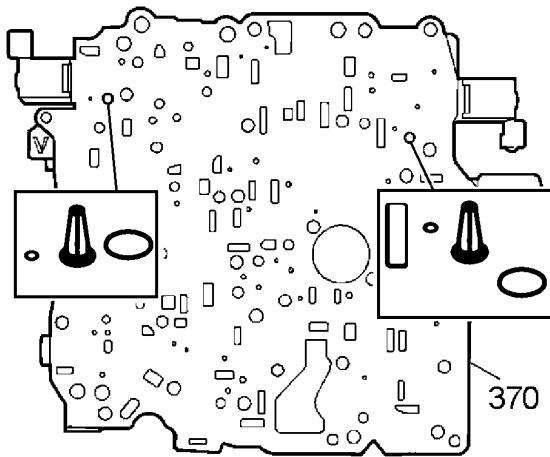


Install the distribution plate 370 on the gasket.

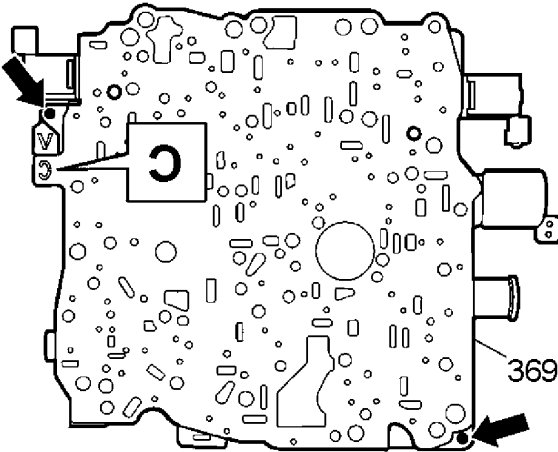
The strainers must be replaced if they are damaged. See the illustration for their positions.

Lock the gasket and the distribution plate in the valve housing using the two plastic plugs. Apply a little petroleum jelly to the outer ends of the distribution

plate so that the gasket C does not slide.

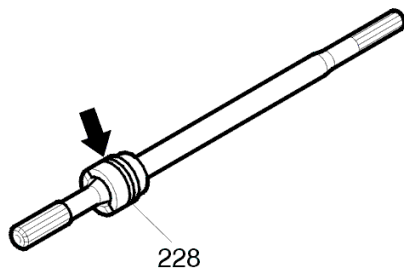


Install gasket 369 marked C on the distribution plate.



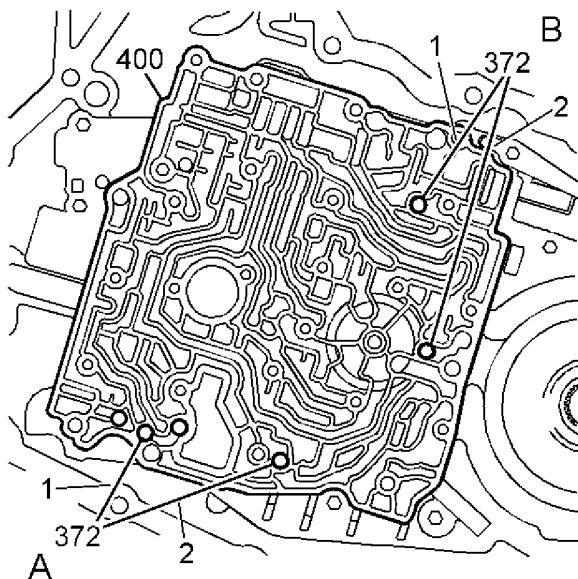
Replacing the seal on the pump shaft

Pull out the pump shaft.
Replace the seal around the shaft.
Reinstall the pump shaft.



Installing the balls for the control system housing

Apply petroleum jelly (P/N 116 11 51-4) to each duct (372) for the balls.
Reinstall the balls. Ensure that the petroleum jelly holds the balls in place in the housing.

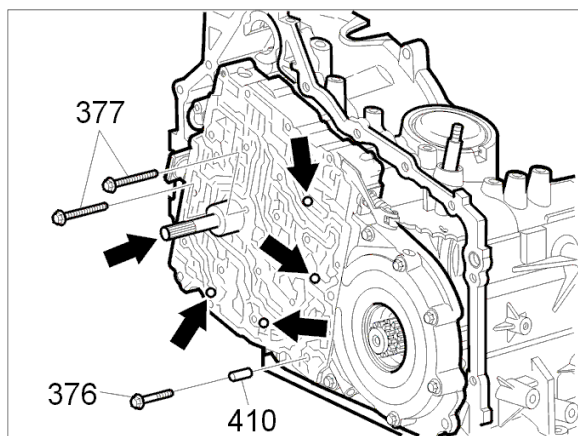


Installing the valve housing to the control system housing

Preparations

Check that:

- the surface of the valve housing is clean
- Note!** Use lint free paper.
- the balls remain in the petroleum jelly
- the pump shaft is in position
- the screws 377 to secure the valve housing are to hand
- the screw 376 and guide sleeve 410 are to hand.



Installing the valve housing

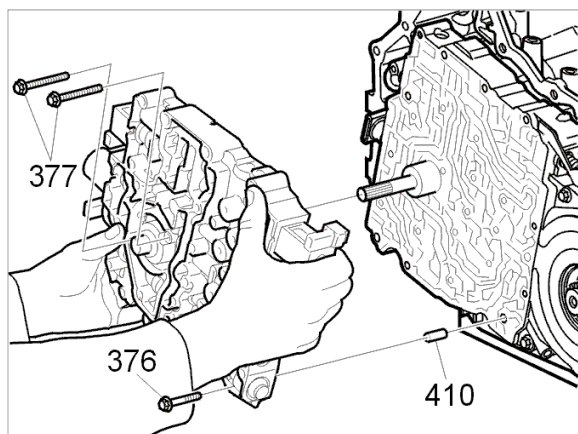
Carefully install the valve housing over the pump shaft (Be careful with the (2) strainers).

Caution! The valve housing must not be twisted.

Hold it in position against the housing and install the screws 377, lightly tightened.

Install **guide sleeve** 410 and the screw 376 on the valve housing tightened lightly.

Note! The guide sleeve ensures that the distribution plate and valve housing are positioned correctly.



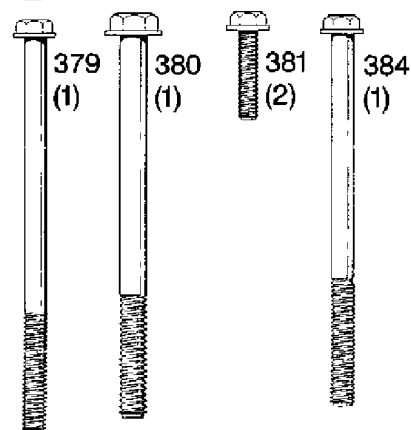
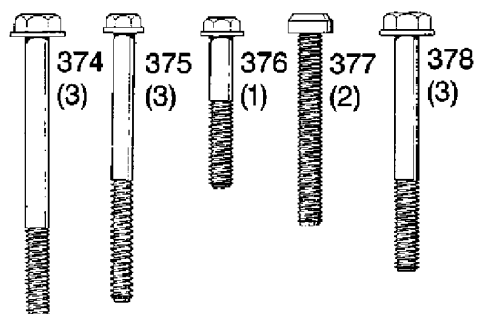
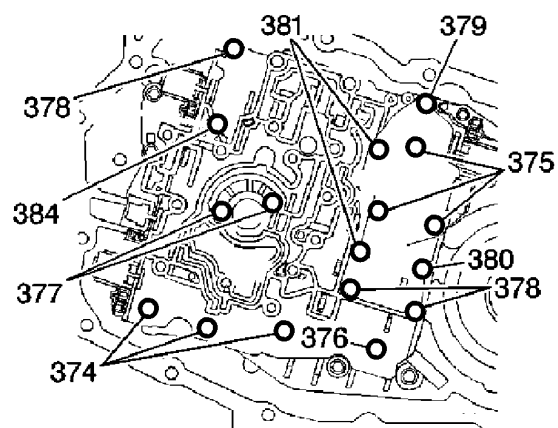
Transferring

Caution! Ensure that the screws are correctly positioned.

Transfer the pressure sensor to the new valve housing.

Note! Note the position of screws 381 in the illustration (the screws are self tapping).

Install the remaining screws for the valve housing.

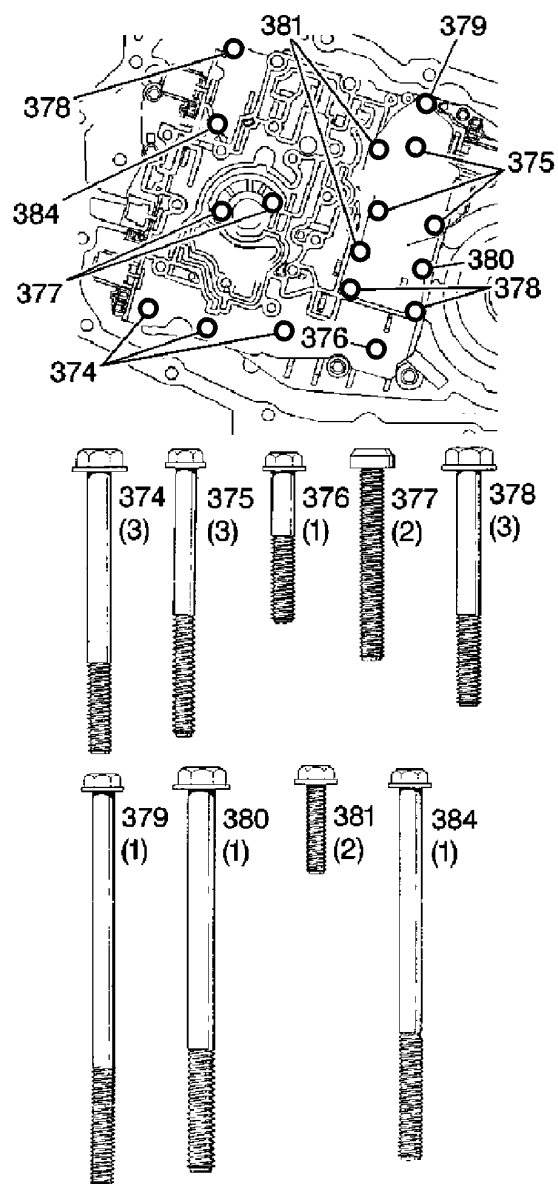


Tightening torques

Tighten the screws in the following order:

- 381 to **8 Nm**
- 376 to **12 Nm**
- 377 to **12 Nm**
- 374 to **12 Nm**
- 375 to **12 Nm**
- 378 to **12 Nm**
- 384 to **12 Nm**
- 379 to **12 Nm**
- 380 to **25 Nm**.

Check tighten all the screws.



Installing the oil pump

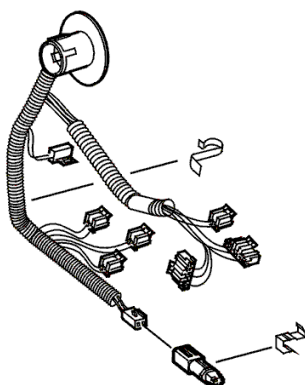
Install the oil pump according to [Replacing the oil pump](#) .

Installing the cable harness

Install:

- all the connectors on the solenoids
- the temperature sensor in the mounting
- the cable in the clamp.

Check that all components are installed correctly.



Installing the side cover

Install the side cover according to [Installing the gearbox](#)

[side cover](#) .

Filling with gearbox fluid

Fill with gearbox fluid according to [Gearbox oil / oil filter, replacing](#) .

Test drive the car.

Piston / cover, reverse (reverse) servo, replacing

Note! The reverse (reverse) servo is located up on the gearbox under the fuel rail and the coolant hose. The gearbox must be separated from the engine to access the reverse (reverse) servo.

Note! Read through the instructions before beginning work.

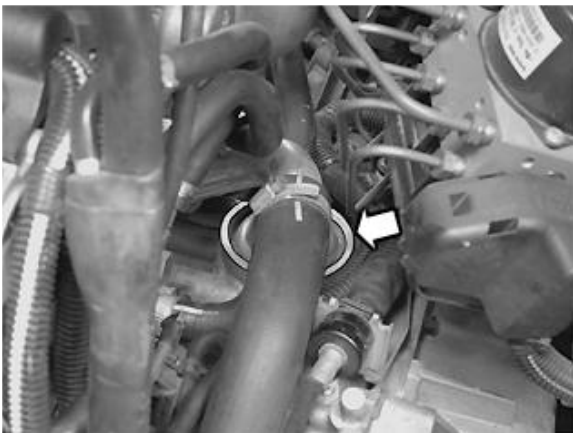
Caution! Cleanliness is extremely important when working on automatic transmissions. Use lint free paper or rags.

Removal

Removing the gearbox

Remove the gearbox. See [Gearbox, removing](#) .

Wipe and blow clean around the cover for the reverse servo.



Removing the reverse servo

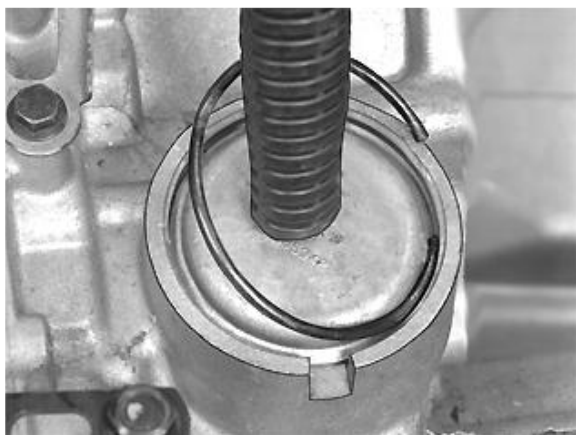
Push the spring clip (holding the cover) forward, so that the cut-out aligns with the cut-out in the gearbox housing.

Releasing the spring clip

Press the piston down a little using a jointed socket spanner.

Pry up the locking catch using a screwdriver.

Pick up the cover and the piston.



Replacing the cover

Replace the cover.
Install a new O-ring.



Installation

Installing the cover on the gearbox

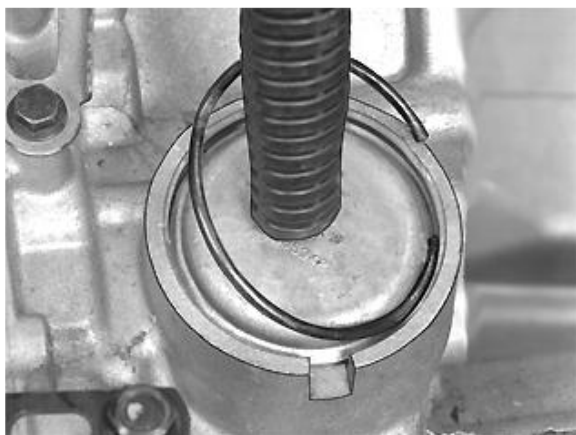
Hint: Two people are required to install the spring clip.
Apply a little petroleum jelly to the O-ring on the cover.
Use Volvo Genuine parts petroleum jelly (P/N 116 1151-4).

Install the cover (carefully) and press it down towards the piston, as far as it will go.



Installing the spring clip

Hold the cover depressed. Install the spring clip end in the groove a little way outside the cut out.
Then press down the spring clip, so that it locks the cover.



Installing the gearbox on the engine

Install the gearbox. See [Gearbox, removing](#)

Replacing differential housing cover

Preparations

Collect the gearbox fluid.

Remove the dipstick from the dip stick pipe.

Extract the oil (approximately 6 litres). Use an oil suction unit.



Raise the car. Remove the splash guard under the engine

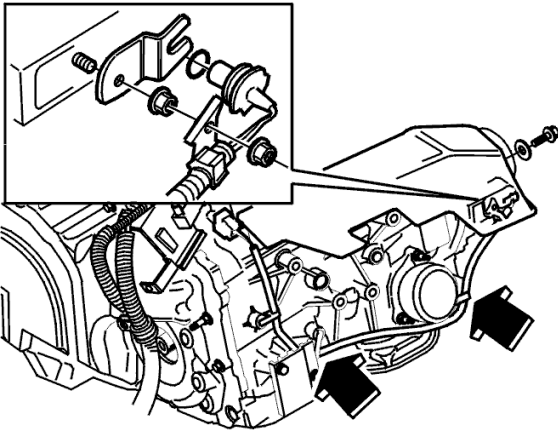


Remove the right-hand drive shaft

See [Half shaft, right, replacing](#) .

Remove the vehicle speed sensor (VSS) from the differential housing cover

Remove the screw for the splash guard. Press up the deflector plate slightly so that the sensor is accessible.



Place a container underneath the gearbox.

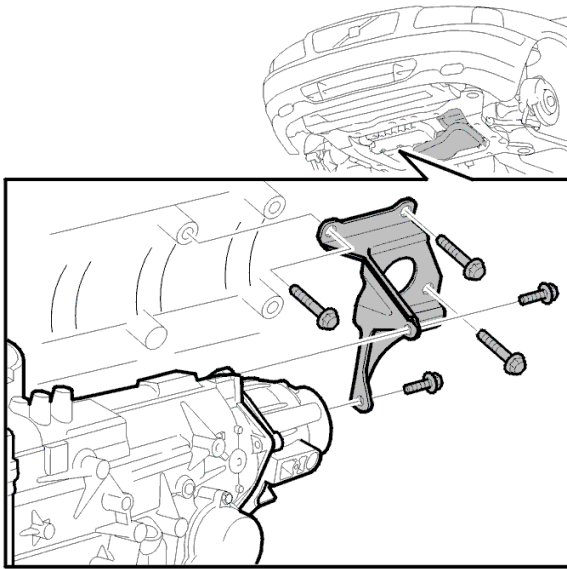
Remove:

- the screw holding the sensor
- the sensor.

Remove the bracket between the gearbox and the engine

Remove:

- the two screws in the differential housing cover
- the three screws for the bracket in the cylinder block
- the bracket.

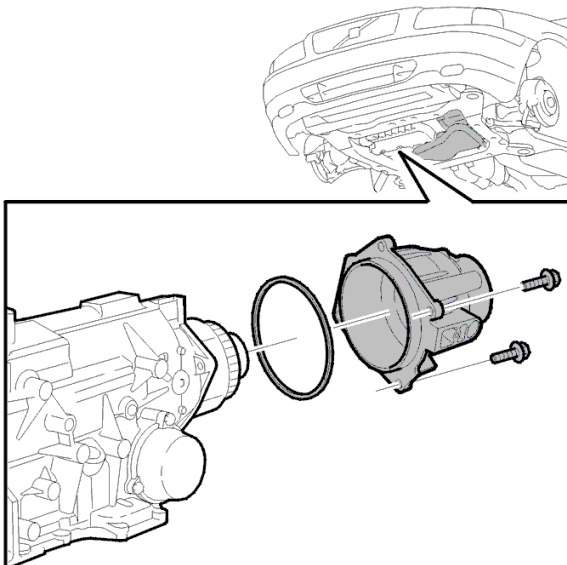


Remove the differential housing cover

Remove:

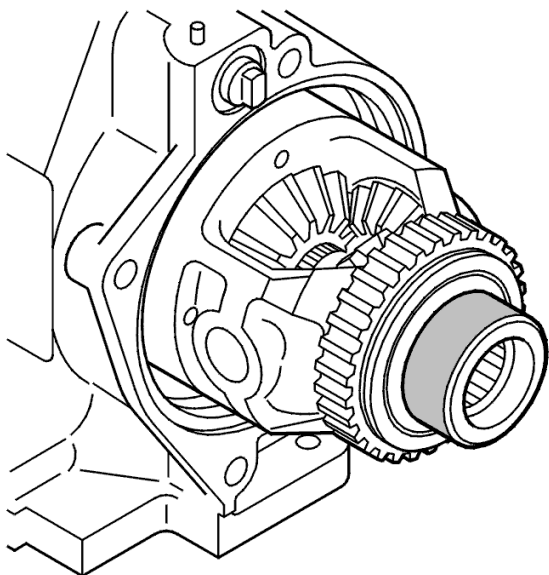
- the remaining two screws
- the cover.

Note! Remove the thrust bearing from the differential or the cover if it is still in place.



Check the bearing surface for the differential

There must not be any visible scratches or abnormal wear on the bearing surface.

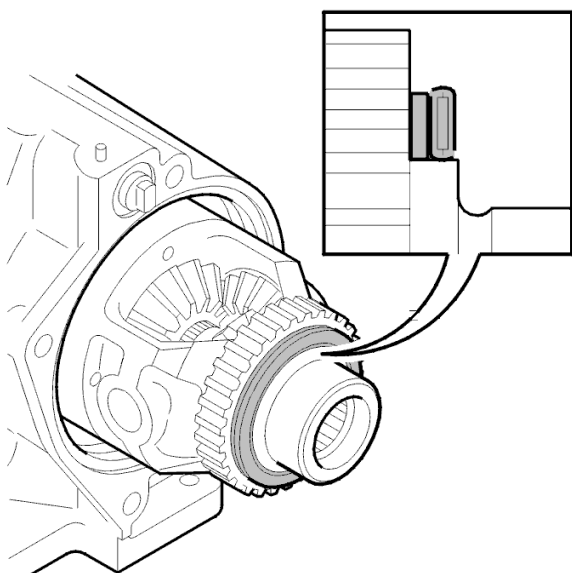


Install the spacer washer and the thrust bearing on the differential

Apply a little petroleum jelly on the thrust bearing so that it secures against the spacer washer.

Install:

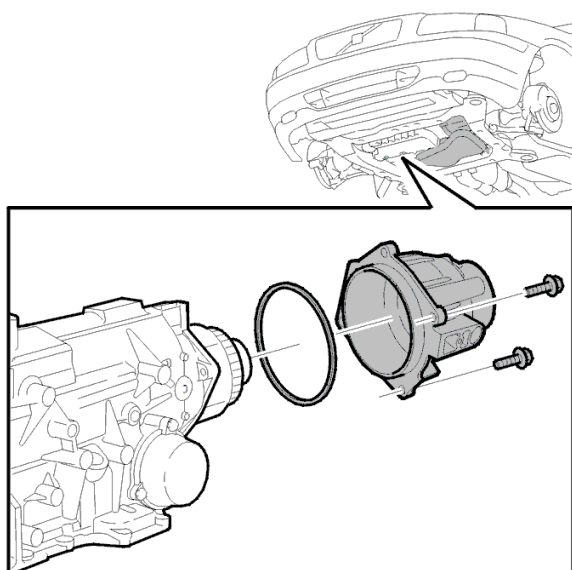
- the spacer washer against the gear wheel
- the thrust bearing, see the illustration.



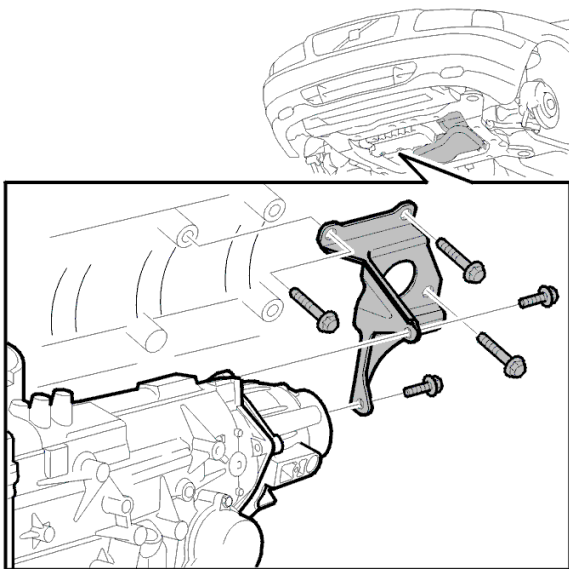
Install the differential housing cover

Use a new gasket.

Finger-tighten the screws.



Install the bracket on the cylinder block



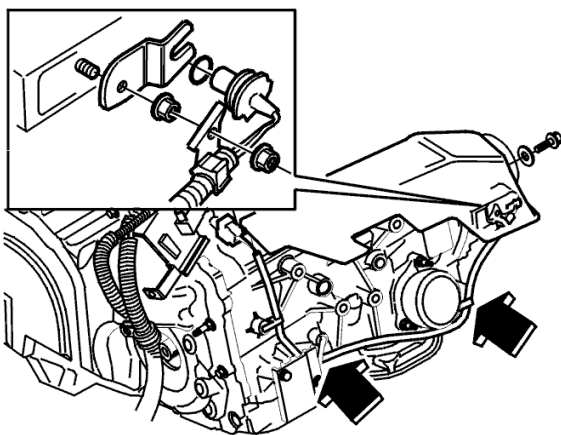
Install:

- the three screws for the bracket for the differential housing cover
- the two screws in the differential housing cover.

Tighten all the screws in the differential housing cover. Tighten to **50 Nm**.

Tighten the bracket screws. Tighten to **50 Nm**.

Note! There axial clearance must be **0.12 mm - 0.67 mm** between the differential and the differential housing cover.



Install the vehicle speed sensor (VSS)

Tighten the screw. Tighten to **10 Nm**.

Install the screw for the splash guard. Tighten the screw. Tighten to **25 Nm**.

Install the right drive shaft

See [Half shaft, right, replacing](#) .

Finishing work

Install the right wheel

See [installing wheels](#) .

Fill the gearbox with oil

Measure the amount of oil that was drained. Fill with the same amount of new oil.

Check the oil level

The oil level must be checked at a temperature of 80°C. This is to ensure that the read out is correct

Preparations:

- park the car on a level surface
- apply the handbrake
- let the engine idle
- move the gear selector lever to position P
- move the gear selector to each position. Stop for five seconds in each position
- move the gear selector lever to position P. Wait two minutes before checking the level.

Note! Wait two minutes before checking the level.

Note! Cars with Geartronic gear selector assemblies: P-R-N-D-Man. Do not shift up in the manual positions.
Cars with conventional gear selector assemblies: P-R-N-D-3-2-1, stop for five seconds in each position.

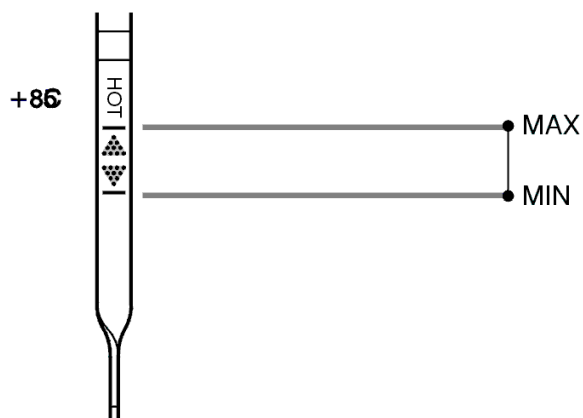
Oil level / temperature

Maximum level hot 80°C.
Maximum level cold 40°C.
Minimum level hot 80°C.
Minimum level cold 40°C.

Check that there is no oil leakage at the differential housing cover

Install the splashguard under the engine

Tighten the screws. Tighten to 25 Nm.



Replacing the seal for the torque converter

Special tools: [999 5762](#) , [999 5763](#)

Removal

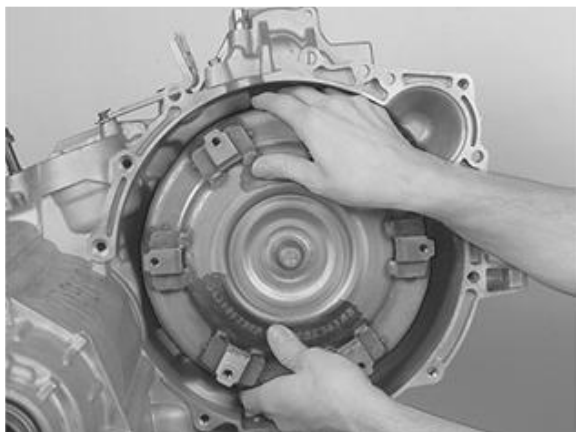
Removing the gearbox

See [Gearbox, removing](#) .

Removing the torque converter

Grasp the torque converter (it is heavy). Pull it straight out of the gearbox shaft.

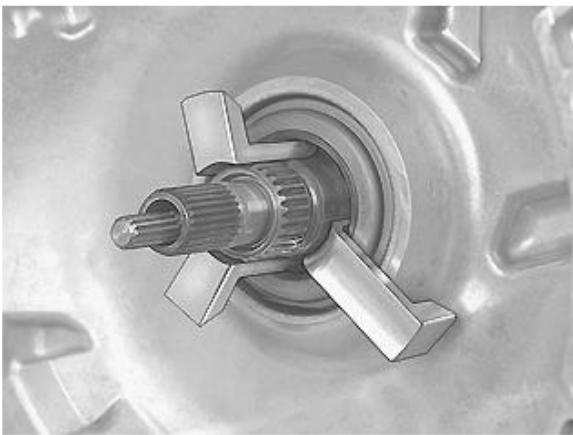
Note! Store it so that the oil does not run out.



Removing the sealing ring from the gearbox

Use puller [999 5762](#) .

Press the three hooks on puller 999-5762-1 into the sealing ring. Fold up the hooks in the sealing ring.

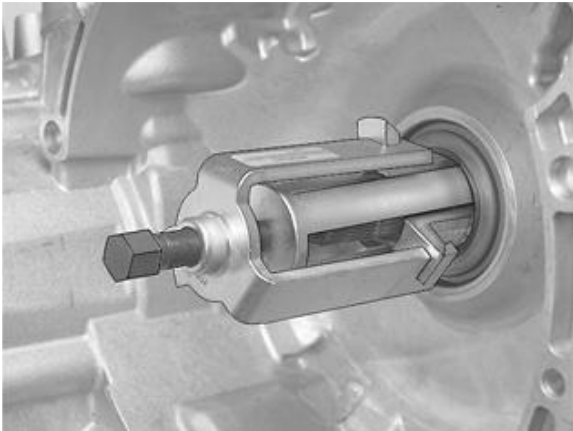


Extracting the sealing ring

Install:

- the counterhold on puller 999 5762-2 between the hooks and in the sealing ring
- puller [999 5762](#) on the hooks.

Extract the sealing ring. It may sit firmly.



Installation

Installing the sealing ring

Note! Blow clean before installation.

Use drift [999 5763](#) on the sealing ring.

Tap in the sealing ring to the bottom position.

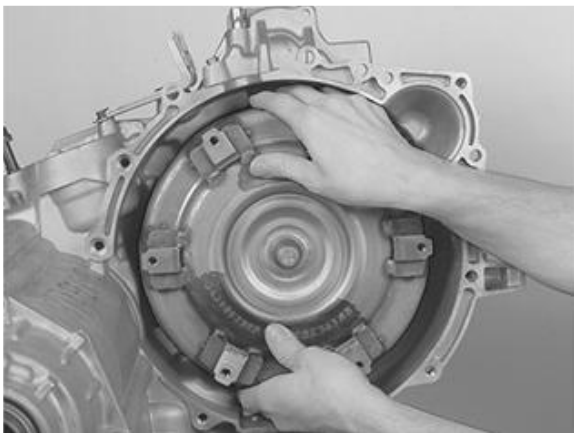
Check that the sealing ring is correctly positioned against the gearbox housing.



Installing the torque converter

Install the torque converter on the shaft

Lift and turn the torque converter slightly so that it positions correctly on the shaft and bottoms out in the gearbox.



Installing the gearbox

See [Transmission, installing](#) .

Gearbox oil / oil filter, replacing

Special tools: [999 4090](#)

Warning! Avoid skin contact with the gearbox fluid.

Note! Oil grade: Only ATF fluid Dexron III (with G-license).

Gearbox oil, Volvo P/N 116 1521-8 (1 litre container), 116 1621-6 (4 litre container).

Conditions

Always replace the oil in the following instances:

Where diagnostic trouble codes (DTCs) TCM 0042 and TCM 0046 are stored, in which case the diagnostic function activates the warning lamp in the following circumstances.

The gearbox control module (TCM) receives data about the operating temperature of the gearbox fluid while the car is being driven. TCM 0042 is stored after an accumulated amount of time.

Diagnostic trouble code (DTC) TCM 0046 is stored if the gearbox fluid temperature exceeds 150° C for more than 2 minutes.

On cars used in continuous taxi service and / or used for towing a trailer or caravan for most of its mileage, the oil must be replaced at a service interval of 75,000 km $\pm$ 5000 km. This is to conform to the regular service program.

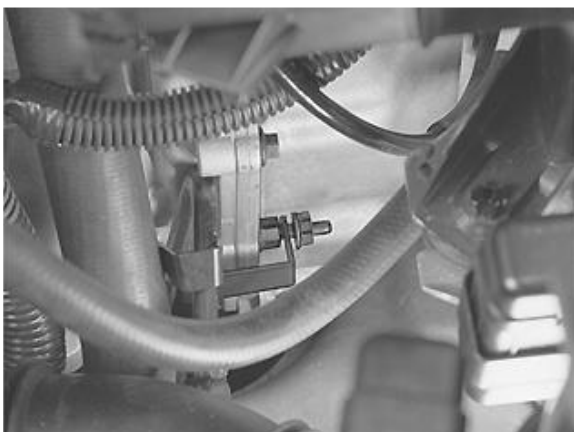
Warning! The oil may be very hot if the car has just been driven. Avoid skin contact.

Drain the oil

Suck up the oil through the dip stick pipe using an oil suction device. There is no drain plug.



Slacken off the nut on the return line for the oil pipe bracket a few turns



Remove the splash guard under the engine

Secured with 7 screws.



Remove the sump and the seal

Warning! Avoid skin contact with the oil. There is a risk of burns.

Allow the remaining oil to run out into a container.
Clean the sump.

Note! The gasket can be reused once.



Remove the oil filter



The filter is only secured to the gearbox by a plastic pipe and an O-ring.

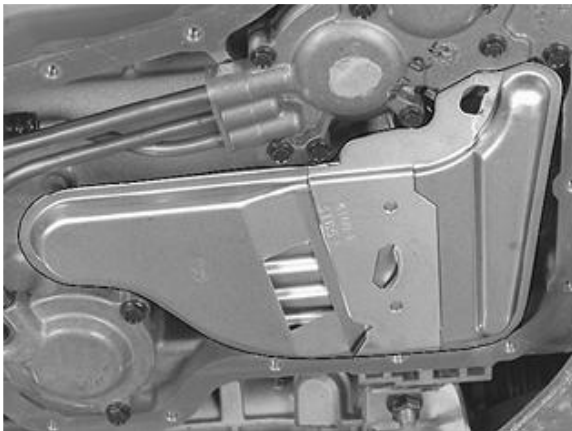
Use a jimmy bar.

Position the jimmy bar by the pipe connecting the oil filter to the gearbox.

Pry off the oil filter straight downward. Hold the filter.

Note! Use extractor **999 4090** if the plastic pipe comes off. Pull out the pipe and the O-ring.
Replace the O-ring.

Install the oil filter



Apply a little oil to the oil filter pipe before installing it.
Press the filter into place in the gearbox. **Check that it is secure.**

Install the sump

Install the screws. Tighten to **10 Nm**.

Note! The gasket can be reused once.

Drain off the remaining oil in the torque converter and the oil cooler

Note! Disconnect the oil return line at the gearbox and install a plastic hose. Drain off the old oil.

Remove the screw nipple on the oil return line from the connection. Counterhold in the gearbox



Pull out the oil pipe.

Install a plastic hose on the oil return line

Plug the connection in the gearbox.

Install a transparent plastic hose on the oil return line.
Clamp the hose into place in the sub-frame.

Place a container beneath the hose to catch the oil.



Fill the gearbox with oil. There are two different methods. Method 1

Fill the gearbox with oil

Use a funnel with a plastic hose. Fill through the dipstick pipe.

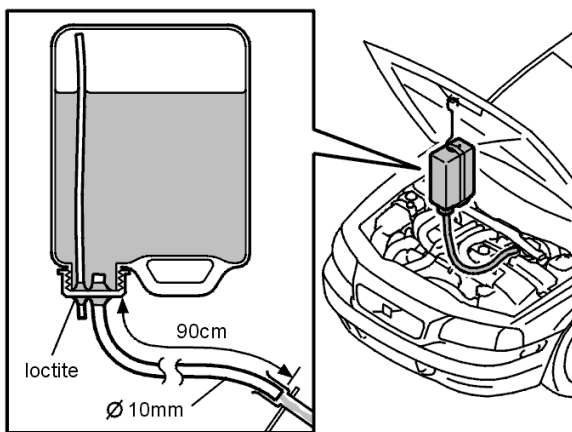
Clear up any oil spillage under the dip stick pipe.



Fill the gearbox with oil. Method 2

Use a converted five litre plastic can (see the illustration).

This method avoids oil spillage. It also provides a more regular flow when filling.



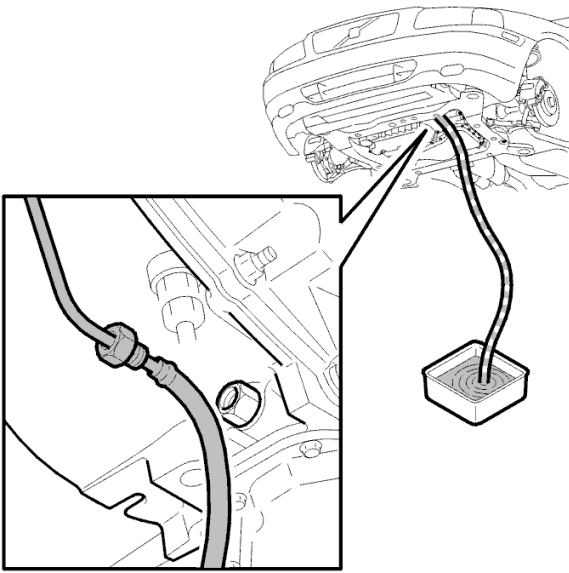
When filling (select method 1 or 2)

Apply the handbrake. Move the gear selector to position P. Add approximately 2 litres of oil. Start the engine. Let it idle for a maximum of 40 seconds. Turn the engine off when air bubbles start to become visible in the hose.

Refill with approximately 2 litres of oil.

Start the engine. Let it idle for a maximum of 40 seconds. Turn the engine off when air bubbles start to become visible in the hose.

Remove the plastic hose.



Install the oil return line on the gearbox

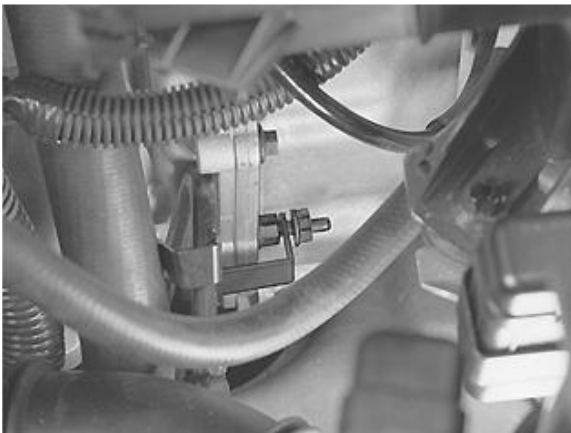
Install the oil pipe with the screw nipple on the connection.

Tighten to **30 Nm**.



Lower the car

Tighten the nut for the oil pipe bracket. Tighten to **25 Nm**.



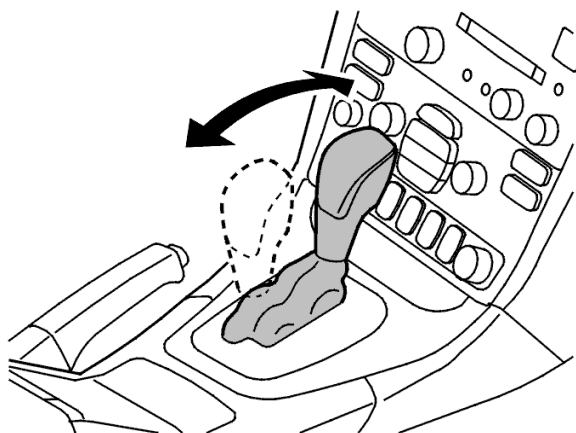
Finishing work

Pour the rest of the oil into the gearbox

Note! If the gearbox is over filled with oil, there may be operational problems. The oil must be filled to the correct level.

The total oil volume of the gearbox is 11.9 litres.

Measure the amount of oil that was drained. Refill with the same amount of new oil (approximately 11 litres).



Start the engine. Move the gear selector through all the gear positions. Then move the gear selector lever to position P.

Note! Carry out the following check at an oil temperature of $85^{\circ} \pm 5^{\circ}\text{C}$. Go to car communication function group 4. Select the digital display parameter. Select the parameter for the gearbox oil temperature.

Check the oil level

Check the oil level according to [Oil level, checking](#).

Check that there is no oil leakage at the pipe couplings or sump

Install the splashguard under the engine

Tighten the screws. Tighten to **25 Nm**.

Test driving the car.

Checking the oil level.

Note! After replacing the gearbox oil/filter, the "Gearbox oil change" counter must be reset. Use VIDA vehicle communication to reset the counter.

Replacing the oil pump

Note! The three digit numbers in the text refer to Service Manual Hydra-Matic 4T65 E Technical Description.

Removal

Removing the gearbox side cover

Remove the side cover. See [Removing gearbox side cover](#).

Removing oil pump

Note! In order to replace the lock-up solenoid, the oil pump must be removed from the control system. This is so that the spring clip holding the solenoid can be accessed.

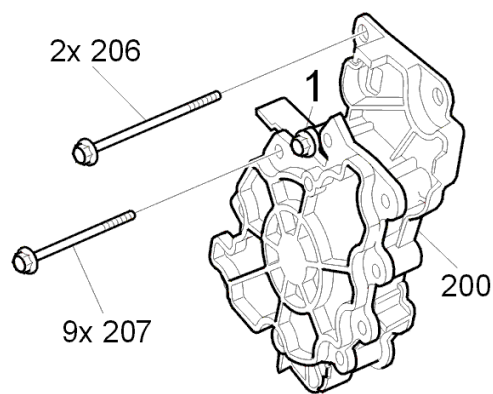
The shiny screw (1) must not be removed, it holds the oil pump together.

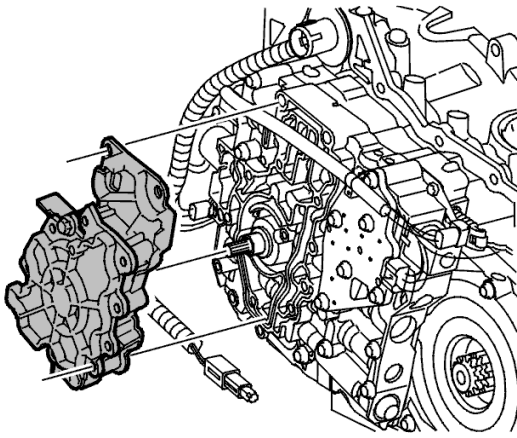
Remove:

- the temperature sensor with the cable harness from the clip
- the connector from the solenoid. Fold the cable harness out of the way
- the screws, **not** the shiny screws (1).

Note! The dimension of the upper screws.

Removing the oil pump from the pump shaft





Pull it straight out.
Place the pump on clean paper.

Installation

Installing the oil pump

Note! Ensure that mating surfaces are clean.

Note! Use lint free paper.

Lift and turn the pump slightly so that it is centred on the pump shaft.

Finger-tighten the screws. The two upper screw heads (206) are sized 10 mm. The other screw heads (207) are 8 mm.

First tighten the screws crosswise to light contact. Tighten the upper screws. Tighten to **16 Nm**. Tighten the other screws. Tighten to **12 Nm**.

Installing the side cover on the gearbox

Install the side cover. See [Installing the gearbox side cover](#).

Filling with gearbox fluid

Fill with gearbox fluid. See [Gearbox oil / oil filter, replacing](#).

Test drive the car.

Gasket / piston, accumulator, replacing

Note! The accumulator housing is located in the gearbox.

Caution! Cleanliness is extremely important when working on automatic transmissions. Use lint free paper or rags.

Caution! Read through the instructions before beginning work.

Removal

Preparations

Suck the oil from the gearbox. See [Gearbox, removing](#).

Take out a container for the oil.

Raise the car.



Remove:

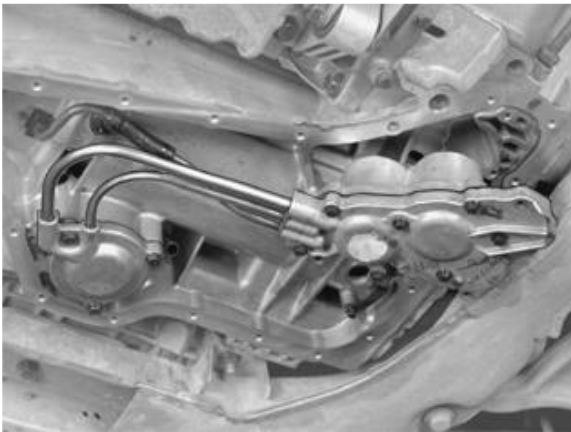
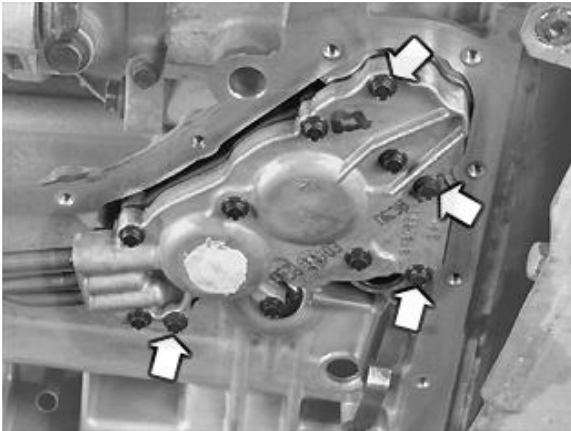
- the splash guard under the engine. Blow and wipe clean around the gearbox oil trough
- the gearbox oil trough. See [Gearbox oil / oil filter, replacing](#).

Removing the accumulator housing from the gearbox

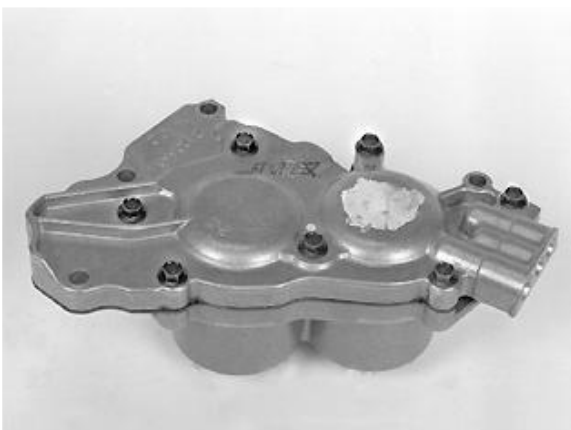
Note! Check the routing of the oil pipe in the accumulator housing.

Remove the oil filter. See [Gearbox oil / oil filter, replacing](#).

Remove the 4 screws holding the accumulator housing in the gearbox.



Fold down the housing with the oil pipes. Remove the oil pipes from the accumulator.



Disassembling the accumulator housing

Caution! Replace one piston at a time so that the springs are correctly installed during installation.

The thinnest spring should be against the terminal pipe.

Slacken off the remainder of the screws on the accumulator housing. Lift off the cover and the gasket.

Removing the pistons from the accumulator housing

Press the piston onto the spring so that the locating pin



can be gripped.

Pull up the locating pin a little so that it releases from the mounting in the housing.

Work the locating pin with the piston side to side while at the same time pulling the piston up from the housing.

Use the same method for the other piston. Remove the spring from the piston.

Check:

- for dirt or other particles in the housing
- that the springs are intact.

Blow the housing clean.

Installation

Installing new pistons on the accumulator housing

Install the locating pin and the spring in the housing. Apply petroleum jelly to the piston gasket. Use Volvo Genuine parts petroleum jelly (P/N 116 1151-4).

Install:

- the piston over the locating pin. Carefully press the piston down into the housing
- the spring on the piston
- the cover and the screws. Tighten the screws. Tighten to **12 Nm**.



Installing the accumulator housing on the gearbox

Install the oil pipes on the housing (start with the larger pipe).

Twist up the housing to the gearbox. Install the screws. Finger tighten the screws. Adjust the oil pipe using the hose in the housing if any of the screws are stiff.

Tighten the screws. Tighten to **12 Nm**.

Install the oil filter. See [Gearbox oil / oil filter, replacing](#) . Alternatively: Replace the oil filter (see the mileage)

Check:

- the oil pipes
- that the screws are tightened
- that the oil filter is installed.

Finishing

Install the oil trough. See [Gearbox oil / oil filter, replacing](#) .

Top up with oil. Check the oil level. See [Gearbox oil / oil filter, replacing](#) .

Test driving.

Replacing the gasket and O ring for the servo cylinder

Note! The servo cylinder is located in the gearbox.

Caution! Cleanliness is extremely important when working on automatic transmissions. Use lint free paper or rags.

Caution! Read through the instructions before beginning work.

Removal

Preparations

Suck the oil from the gearbox. See [Gearbox, removing](#).

Take out a container for the oil.

Raise the car.

Remove:

- the splash guard under the engine. Blow and wipe clean around the gearbox oil trough
- the gearbox oil trough. See [Gearbox oil / oil filter, replacing](#).



Removing the servo cylinder (2-1)

Remove the three screws.

Pull down the cover with the servo cylinder. Check the position of the small strainer on the cylinder.

Caution! Note the position of the strainer for reinstallation.

Lift the piston from the cover.



Disassembling servo cylinder

Open the catch on the push rod (press the piston towards the work surface).

Separate the cylinder.

Check:

- for dirt or other particles in the cylinder
- that both the springs are intact.

Blow the cylinder clean.



Replacing the gasket, O-ring and strainer

Replace the O-ring on the piston.

Replace the gasket on the inner piston.



Note! Check the position of the gasket on the piston.

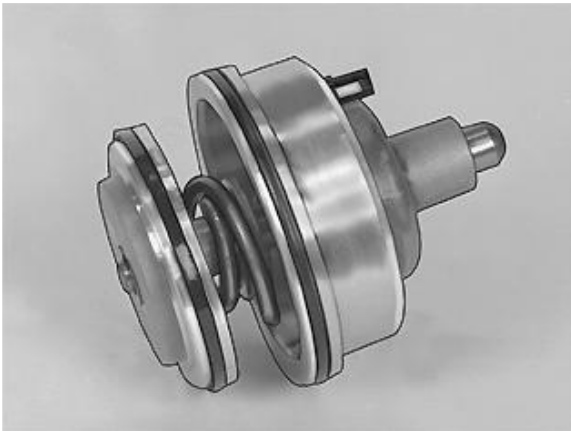
Remove the strainer by pulling it straight up. Replace the strainer.

Installation

Assembling the servo cylinder

Apply a little petroleum jelly to the inner piston gasket. Use Volvo Genuine parts petroleum jelly (P/N 116 1151-4).

Carefully press the piston up into the cylinder. Install the catch on the push rod.



Installing the servo cylinder on the gearbox

Note! The strainer on the piston must come into the opening on the left in the gearbox.

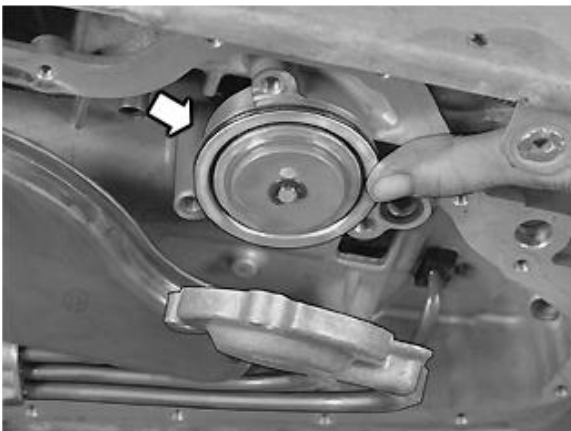
Apply petroleum jelly to the O-ring. Use Volvo Genuine parts petroleum jelly (P/N 116 1151-4).

Install the piston in the housing. Hold the piston in position by hand. Check that the strainer is opposite the opening on the left hand side.

Slide the cover up towards the piston. Lower the piston towards the cover. Press the piston down into the cover using your fingers so that the O-ring cannot be seen on the piston.

Install the screws. Hand tighten the screws (secure the cover so that all the screws are aligned).

Tighten the screws. Tighten to **25 Nm**.



Finishing

Install the oil trough. See [Gearbox oil / oil filter, replacing](#) .

Top up with oil. Check the oil level. See [Gearbox oil / oil filter, replacing](#) .

Test driving.

Removing gearbox side cover

Special tools: [998 5972](#) , [999 5460](#) , [999 5716](#) , [999 5736](#) , [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.

Disconnecting the battery lead

See [Note when disconnecting/connecting the battery lead](#) . It is essential that the instructions are followed.

Removing engine compartment components

Removing the air cleaner (ACL) housing

[Brake pipe master cylinder / ABS unit, replacing](#) .

Applies only to turbocharged cars

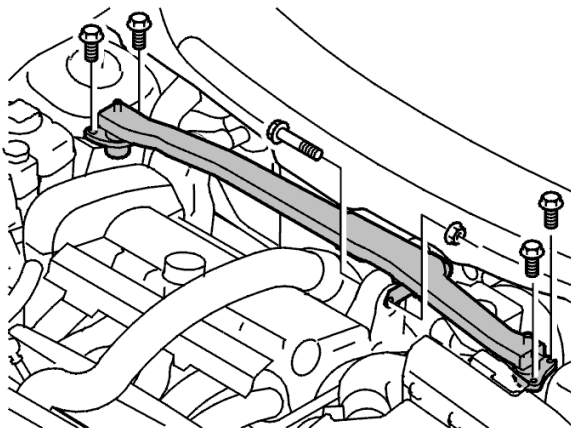
Carefully heat around the pipe at the charge air cooler (CAC). Use a hot air gun. Loosen and remove the pipe.



Removing the upper torque rod

Remove:

- the plastic covers over the spring strut mountings (applies only to early versions)
- the screws
- the screw and nut for the engine mounting.



Collecting gearbox fluid

Use an oil suction unit.

Remove the dip stick.

Extract all the fluid (6 litres). This is done to avoid oil spillage when the cover is removed.



Removing the charge air pipe and hose

Remove the charge air pipe and the cooler hoses according to [Gearbox, removing](#) .

Removing the spark plugs cover

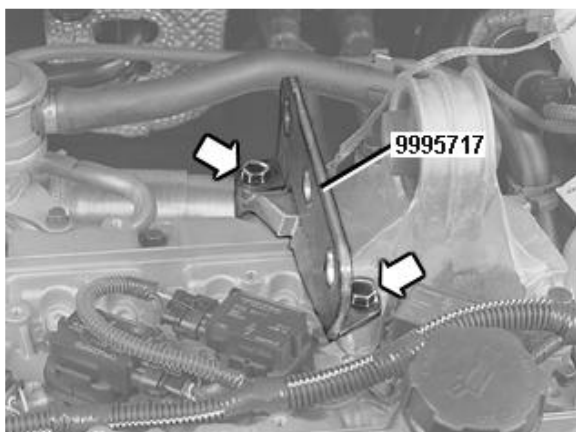
Remove the spark plug cover according to [Gearbox, removing](#) .

Installing lifting fixture

Remove the 2 screws at the engine mounting.

Install lifting lug [999 5717](#) .

Disconnect the ground strip.



Removing the connector from the gearbox

Remove:

- the screw for the clamp holding the positive cable on the engine
- the connector from the gearbox (press the connector together). Pull it from the gearbox.

Remove the cable from its clips on the side member.



Installing the lifting beam and lifting hook on the engine lifting eyelet

Install the lifting beam and the lifting hook on the engine lifting lugs. See [Gearbox, removing](#) .

Disconnecting the front suspension components

Remove the front end components according to

[Gearbox, removing](#) .

Removing the screws from the cable conduit and the parking heater. Removing the ground lead bracket from the sub-frame

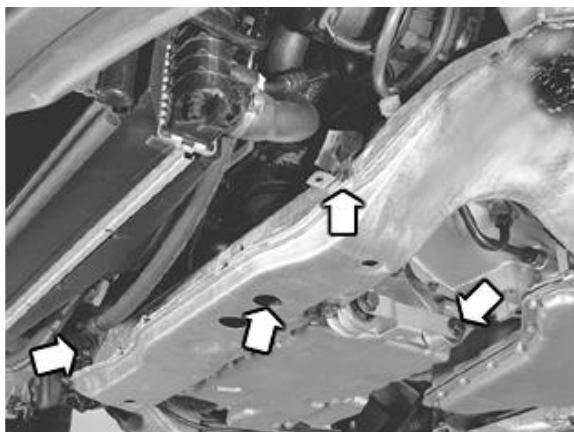
Remove:

- the screw for the front engine pad (see the arrow)
- the screws for the torque rod in the gearbox.

Applies only to cars with parking heaters:

Remove the fuel line from its clips on the sub-frame.

Hang up the parking heater in a tie strap.



Removing the ball joint nut (left hand side)

Remove the ball joint nut (left hand side) according to

[Gearbox, removing](#) .

Removing the control arms for the anti-roll bar, the track rod and the screw from the drive shaft on the left hand side

Only slacken off the brake pipe bracket on the left-hand side.

Remove the control arms for the anti-roll bar, the track rod and the screw from the drive shaft on both sides according to [Gearbox, removing](#) .

Removing the screws from the sub-frame support plates (both sides)

Remove the screws from the sub-frame support plates (both sides) according to [Gearbox, removing](#) .

Removing the pipe lines from the sub-frame

Unhook the servo pipe and the evaporator pipe from the holders on the right-hand side of the sub-frame.

Unhook the servo pipe from the clip on the sub-frame.



Removing the stub axle from the control arm

Remove the stub axle from the control arm according

to [Gearbox, removing](#) .

Pressing up the sub-frame on the right-hand side

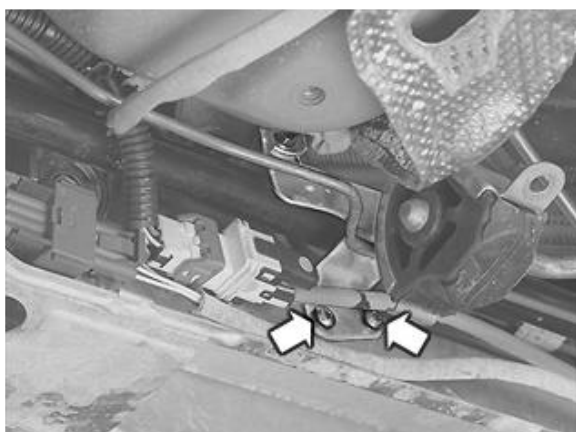
Press up the sub-frame on the right-hand side according to [Gearbox, removing](#) .

Removing the front cross member

Remove the front cross member according to [Gearbox, removing](#) .

Removing the bracket for the heated oxygen sensor (HO2S) wiring

Remove the screws for the bracket in the sub-frame holding the heated oxygen sensor (HO2S) cable. Push the bracket to one side.



Preparatory work for removing the stub axle on the left-hand side

Preparations, see [Gearbox, removing](#) .

Removing the drive shaft from the stub axle (left-hand side)

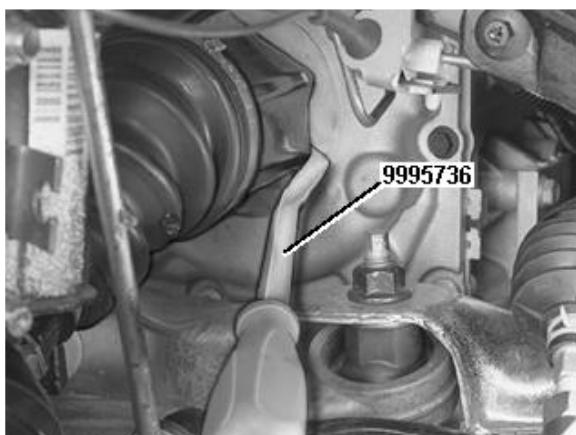
Remove the drive shaft from the stub axle. See [Gearbox, removing](#) .

Removing the left drive shaft from the gearbox

Use 2 gimmy bars [999 5736](#) .

Note! Do not damage the seal.

Note! Do not under any circumstances pull the drive shaft in such a way that could cause the joints to separate. The joints do not have axial pinions.



Removing the nuts and screws for the steering gear sub-frame

Remove the nuts and screws according to [Gearbox, removing](#) .

Removing the collision protection system over the

steering gear

Applies only to right-hand drive cars

Remove the collision protection system according to [Gearbox, removing](#).

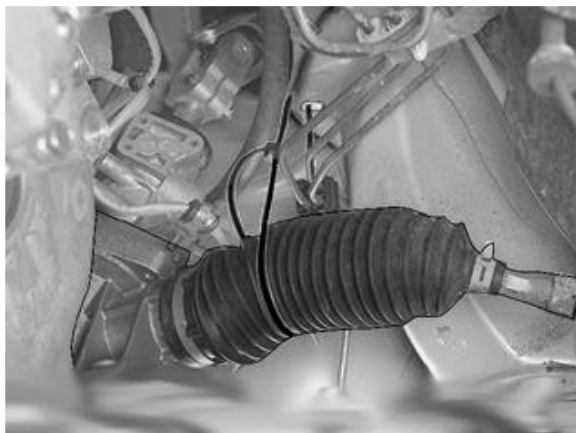
Lowering the sub-frame

Use the mobile jack. Lower the sub-frame approximately 5 cm.

Hang up the steering gear in a tie strap.

Carefully lower the sub-frame. Let it hang free.

Note! Ensure that the screws for the steering gear release from the frame.



Removing the screw for the rear engine mounting

Remove the screw for the rear engine pad according to [Gearbox, removing](#).

Removing the rear engine mounting

Remove the rear engine mounting according to [Gearbox, removing](#).

Preparations for removal of the gearbox side plate

Preparatory work can be carried out when the vehicle is lowered.

Remove the 2 nuts from the wing liner. Angle out and tie up the wing liner to the lifting beam. Use a retaining strap.

Note! Do not damage the front wing.



Removing the oil pipes from the gearbox

Remove the oil pipes according to [Gearbox, removing](#).

Lowering the engine and gearbox

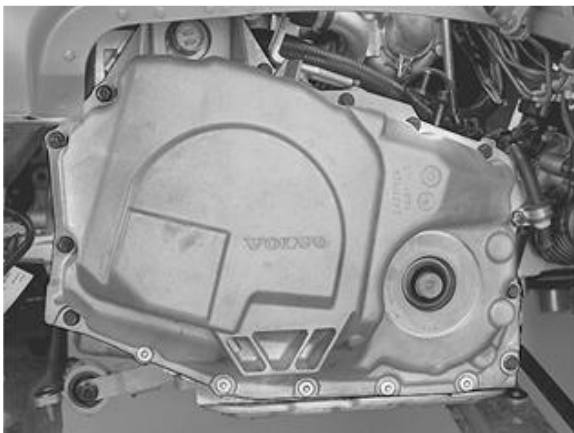
Caution! Do not damage the exhaust boots.

Lower the engine and gearbox according to [Gearbox, removing](#).

Preparations for removal of the gearbox side cover

Blow clean thoroughly around the gearbox.

Collect the oil spill when the side cover has been



removed.

Remove the nut for the clamp and the bracket holding the wiring.

Cut off the tie straps (2) holding cable harness above the bracket. Push the wiring to one side to access the screw.

Remove the screw and the bracket.

Remove all the screws from the side cover (the lower 5 screws are Torx screws).

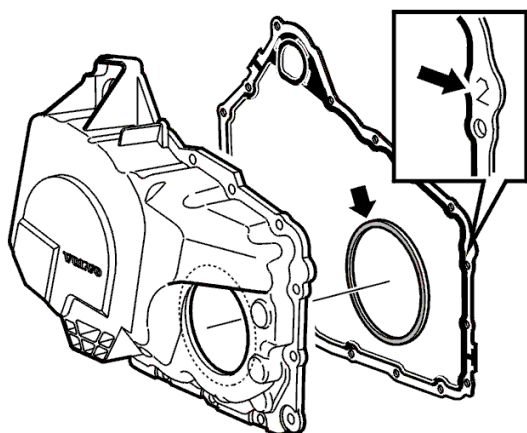
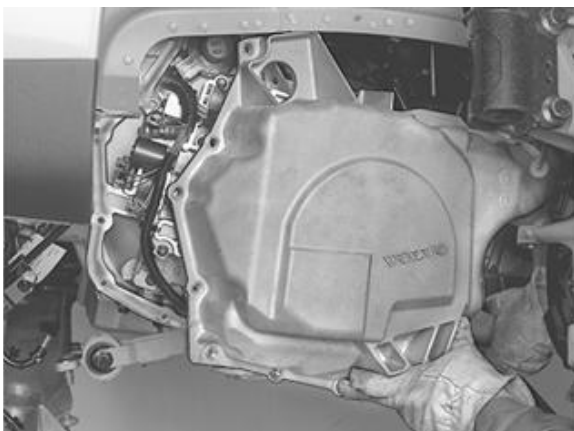
Caution! Ensure that the lower and outer screws align correctly during installation.

Removing the gearbox side cover

Pull out the side cover slightly from the gearbox.

Angle out the cover at the front on the left side quite a lot. Pull the cover backwards to the steering gear.

Pull out the cover at the bottom edge so that the upper section passes the side member.



Finishing work

Note! The gasket may only be re-used once. Check whether there is a 2 at the top of the right-hand corner of the gasket. The gasket must be replaced if there is a 2 on it. If there is no digit, stamp a 2. This indicates that the gasket has now been reused and must be replaced the next time the side cover is removed. Make this mark to assist other mechanics.

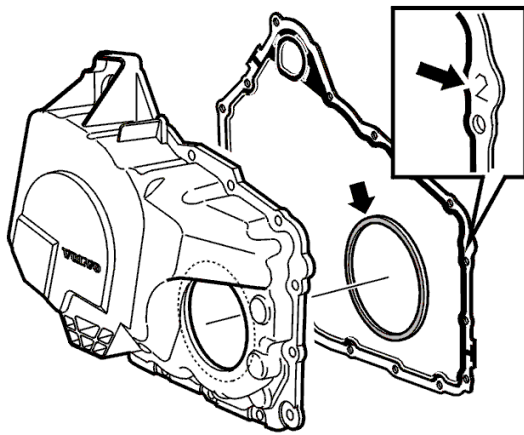
Replace the old rubber gasket which seals around the drive shaft.

Installing the gearbox side cover

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! Carefully clean the gearbox and side cover mating surfaces before installing the gasket. Paper must not be used for cleaning. Paper fragments can cause running problems. Check the marking on the side cover gasket. The gasket can be reused once.

Preparations



Note! The gasket may only be re-used once. Check whether there is a 2 at the top of the right-hand corner of the gasket. The gasket must be replaced if there is a 2 on it. If there is no digit, stamp a 2. This indicates that the gasket has now been reused and must be replaced the next time the side cover is removed. Make this mark to assist other mechanics.

Note! Apply a little petroleum jelly to the new rubber gasket which seals around the drive shaft outlet. This is so that it stays in place in the groove in the side cover on installation.

Installing cover

Note! The side cover has two different holes. The rear smaller hole and the front rectangular hole. These two holes are to guide the cover gasket during installation. Begin installing the cover by installing the two screws.

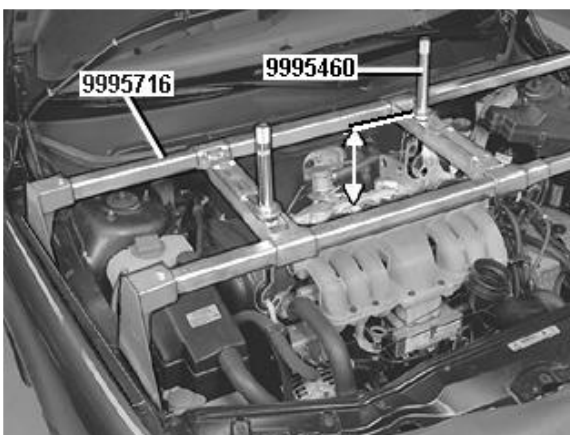
Apply a little petroleum jelly to the gearbox mating surface.

Install:

- the side cover gasket
- the side cover
- the screws. First tighten the screws crosswise to **10 Nm**. Then tighten the screws crosswise to **25 Nm**
- the lower three Torx screws. Tighten to **25 Nm**
- the bracket for the studs and the screw loosely on the bracket
- the clamp for the stud and the screw. Tighten to **25 Nm**. Tighten the screw for the bracket. Tighten to **25 Nm**.

Clamp the wiring up on the bracket. Use new tie straps.

Lifting the engine and gearbox to the horizontal position



Installing the oil pipes

Install:

- the oil pipe with the nipple to the terminal on the gearbox. Counterhold on the connection. Tighten to **30 Nm**



- the nut and washer for the oil pipe brackets. Tighten to **25 Nm**.

Installing the rear engine mounting

Install the rear engine mounting according to [Transmission, installing](#) .

Installing the screw for the rear engine pad through the steering gear

Install the screw for the rear engine pad according to [Transmission, installing](#) .

Installing the collision protection system over the steering gear

Applies only to right-hand drive cars

Install the collision protection on the steering gear according to [Transmission, installing](#) .

Installing the sub-frame on the bodywork

Install the sub-frame on the bodywork according to [Transmission, installing](#) .

Installing the left drive shaft on the gearbox, stub axle and control arm

Install the left drive shaft in the gearbox according to [Transmission, installing](#) .

Installing and tightening the sub-frame screws

Install and tighten the sub-frame screws according to [Transmission, installing](#) .

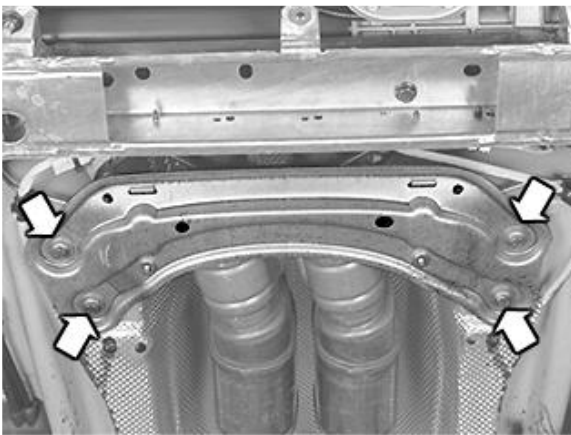
Installing the screws for the bracket for the heated oxygen sensor (HO2S) cable

Install the screws for the bracket for the heated oxygen sensor (HO2S) cable according to [Transmission, installing](#) .

Installing the front cross member

Install:

- the screws for the exhaust pipe mounting. Tighten to **10 Nm**
- the brake pipe in its holders



- the screws for the cross member. Tighten to **25 Nm**.
- Secure the heat deflector using rivets (early version).

Installing new lock nuts on the steering gear

Install new lock nuts on the steering gear according to [Transmission, installing](#) .

Installing the screw for the front engine pad and the torque rod mounting in the gearbox

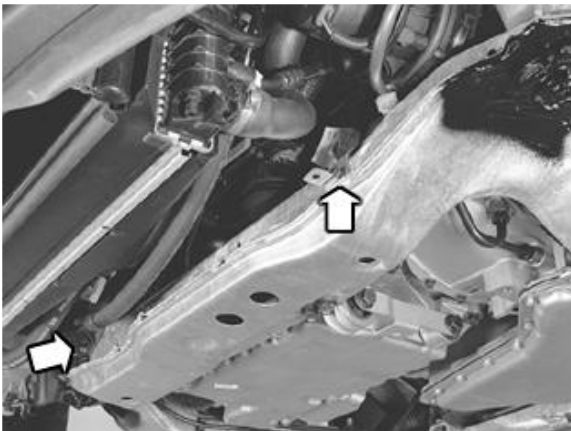
Install the screw for the front engine pad and the torque rod mounting in the gearbox. See [Transmission, installing](#) .

Installing the screws for the cable conduit and the ground lead bracket

Tighten to **10 Nm**.

Note! Cars with parking heaters: Install the heater in the bracket. Tighten the nuts. Tighten to **25 Nm**.

Reinstall the fuel line in the clips on the sub-frame.



Installing and tightening front end components (both sides)

Install and tighten the front end components according to [Transmission, installing](#) .

Tightening the ball joint pinion

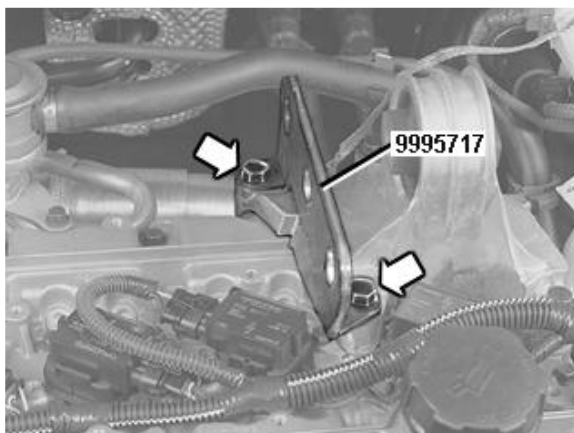
Tighten the ball joint pinion according to [Transmission, installing](#) .

Lower the car.

Remove the lifting beam and the lifting hook from the engine and the car

Remove the lifting fixture from the motor. Reinstall the screws. Tighten to **50 Nm**.

Reinstall the spark plug cover. Tighten the screws.



Tighten to 10 Nm.
Install the ground strip. Tighten to **10 Nm**.

Applies only to turbocharged cars

Lift up the delivery lines. Install the spark plug cover.
Tighten the screws.

Installing all the charge air pipes

Applies only to turbocharged cars

Connect all the charge air pipes to each other.
Tighten the hose clamps.

Install the screws for the charge air pipe in the intake manifold. Tighten to **10 Nm**.



Install the hose on the heater pipe in the bulkhead.
Press the radiator hose quick-release connector into place on the heater pipe.
Check: Pull the hose.

Installing the connector

Install:

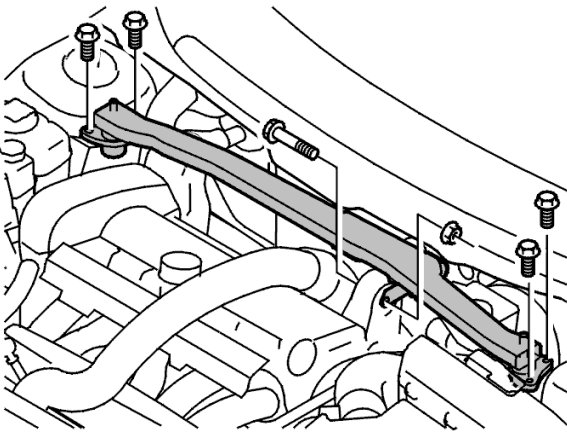
- the screw for the clamp for the positive cable
- the cable in the clips on the side member
- the connector for the gearbox. Press it into place properly.

Caution! It is important that the connector is pushed into place properly. If it is not correctly connected the gear shift function may stop.



Installing the upper torque rod

Install:



- the torque rod. Tighten the mounting screws.
Tighten to **50 Nm**
- the screw and a new nut for the engine mounting.
Tighten to **80 Nm**
- the plastic guard over the spring strut (if applicable).
Tighten the screws.

Installing the air cleaner (ACL) housing

Install the air cleaner (ACL) housing according to [Brake pipe master cylinder / ABS unit, replacing](#) .

Filling the gearbox with fluid

Note! Oil grade: Only automatic gearbox fluid (ATF). Dexron III (the fluid must have a G license)*.

*This is usually given as "Dexron III (G-xxxxx)" where xxxxx is a 5 digit serial number. "Dexron III-G" (without a number) may also occur.

Dexron II D and II E must not be used.

Note! Filling with oil: Start by filling with 5.5 litres of oil.

Refilling gearbox oil There are three different methods. Method 1



Note! Filling with oil: Start by filling with 5.5 litres of oil.

Fill the gearbox with oil. Use a funnel with a plastic hose. Fill through the dipstick pipe.

Clear up any oil spillage under the dip stick pipe.

Refilling gearbox oil Methods 2 and 3

Note! Filling with oil: Start by filling with 5.5 litres of oil.

Method 2

Use a converted five litre plastic can (see the illustration).

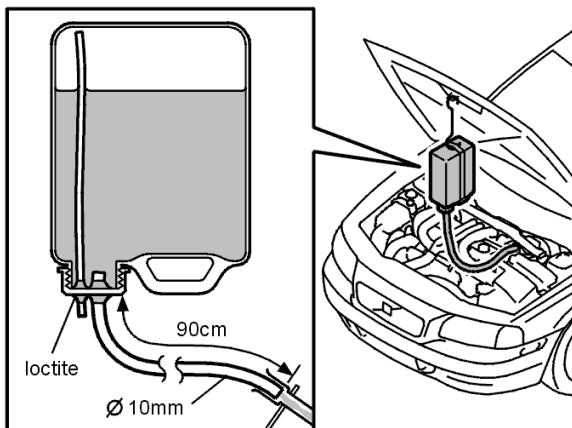
This method avoids oil spillage. It also provides a more regular flow when filling.

To check the oil level, see [Oil level, checking](#) .

Method 3

Push in the oil from the hydraulic pump.

Note! After changing the gearbox oil, the gearbox



adaptation and the "Gearbox oil change" counters must be reset. Use VIDA vehicle communication to set the adaptation and counters to zero.

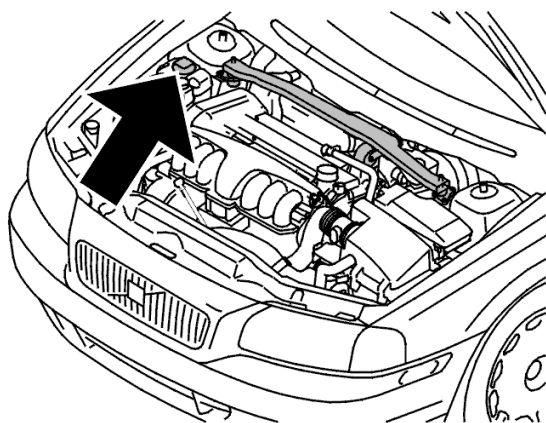
Check the coolant level in the expansion tank

Top up with water and coolant as necessary (when the engine is at operating temperature).

Raise the car.

Check that there is no oil leakage at:

- the connections for the oil pipes on the gearbox
- the side cover
- the side cover around the drive shaft.

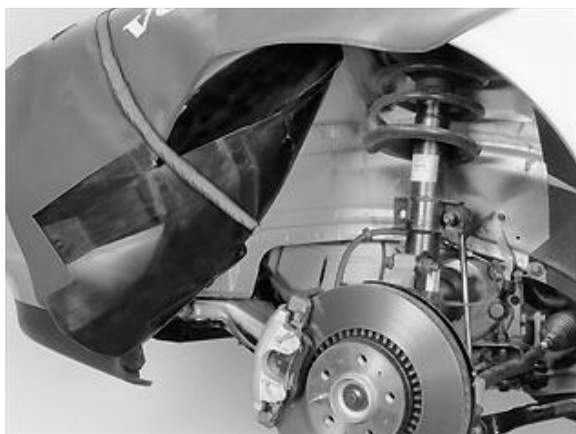


Installing the splash guards and the wing liner

Install:

- The ABS-cable on the mounting
- the splash guard under the engine
- the front splash guard
- the nut for the left wing liner
- the wheels. See [Installing wheels](#) .

Lower the car



Checking the steering gear bearing in the boot at the bulkhead

Check the steering gear bearing in the boot at the bulkhead according to [Transmission, installing](#) .

Installing the battery lead

See [Note when disconnecting/connecting the battery lead](#) . It is essential that the instructions are followed.

Test driving the car

Note! Test drive the car in the same way as before the repair. See [Gearbox checking/fault-tracing](#) .

In the event of faults other than vibrations (judder)

For information about test driving the car, see [Test Drive Form, description](#) .

Note! After changing the gearbox oil, the gearbox adaptation and the "Gearbox oil change" counters must be reset. Use VIDA vehicle communication to set the adaptation and counters to zero.

Solenoid lock-up function, replacing

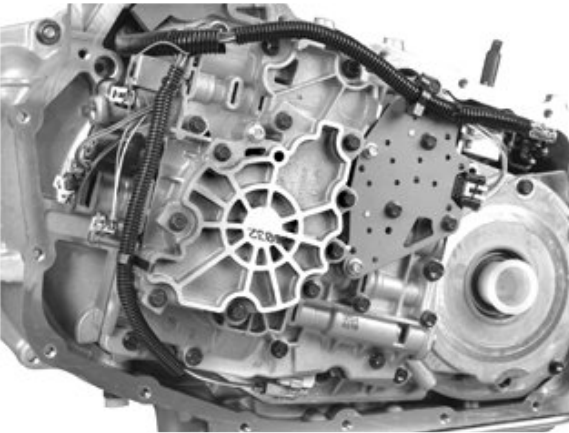
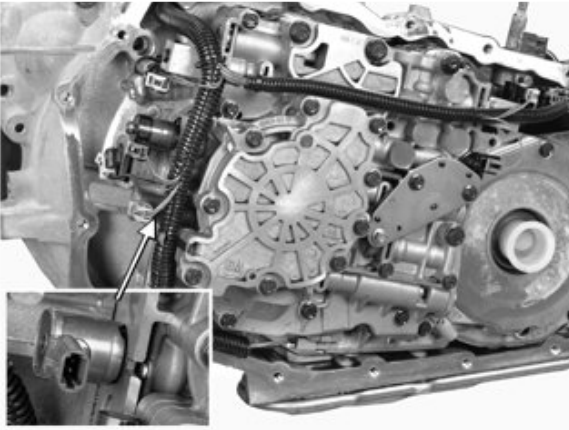
Note! As the illustrations in this service information are used for different model years and / or models, some variation may occur. However, the essential information is always correct.

Note! Later transmission versions, see: [Solenoid lock-up function, replacing](#)

Removing the transmission side cover

See [Removing gearbox side cover](#) .

Later oil pump version from and including model year 2003-.



When replacing the lock-up solenoid, the oil pump must be removed from vehicles up to and including model year 2002 as described in the method below.

Removing the oil pump

Note! In order to replace the lock-up solenoid, the oil pump must be removed from the control system. This is so that the spring clip holding the solenoid can be accessed.

The shiny screw (1) must not be removed, it holds the oil pump together.

Remove:

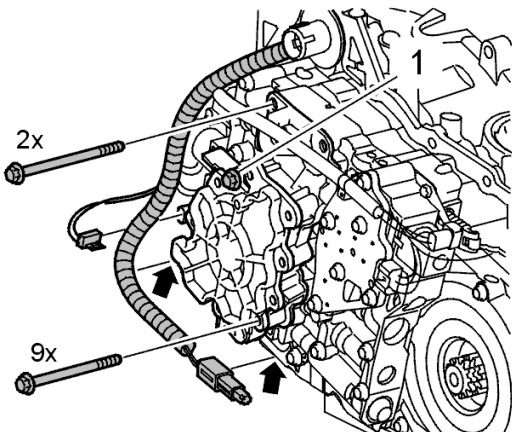
- the temperature sensor with the cable harness from the clip
- the connector from the solenoid. Fold the cable harness out of the way
- the screws, **not** the shiny screws (1).

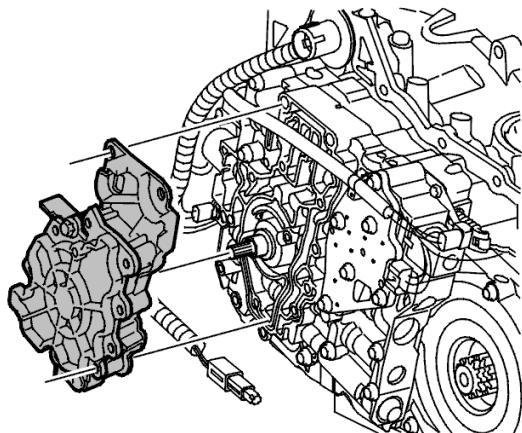
Note! The dimension of the upper screws.

Removing the oil pump from the pump shaft

Pull it straight out.

Place the pump on clean paper.

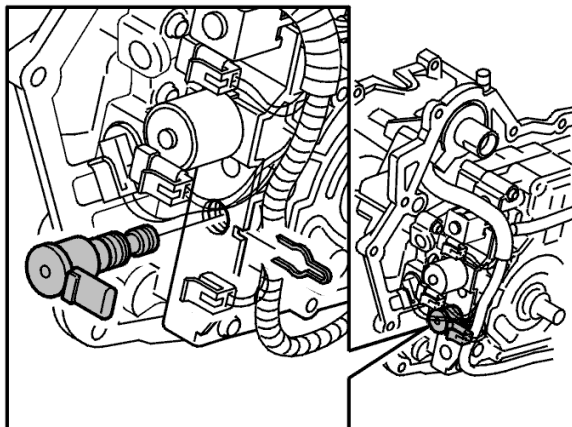




Removing the lock-up solenoid

Remove:

- the spring clamp. Pull it straight out. Use a small screwdriver
- the solenoid. Use a screwdriver between the solenoid and the housing. Check that the O-rings remain on the solenoid.

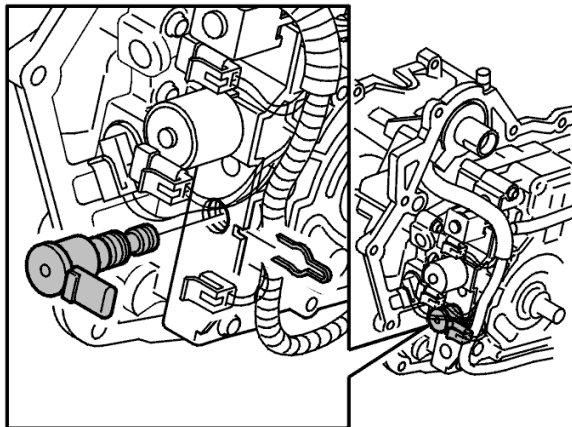


Installing the lock-up solenoid

Apply a little petroleum jelly to the O-rings.

Install:

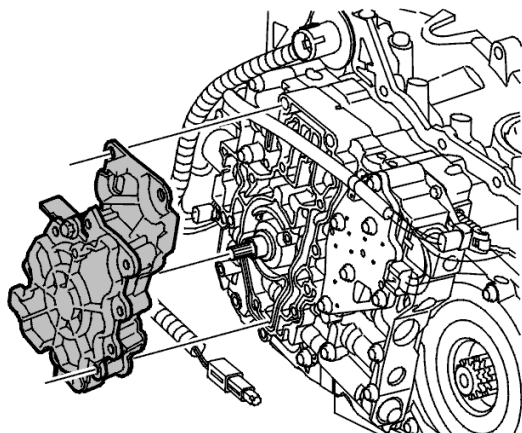
- the solenoid. Turn and press in the solenoid a little so that it bottoms against the control system
- the spring clamp. Check that the spring clamp is locked.



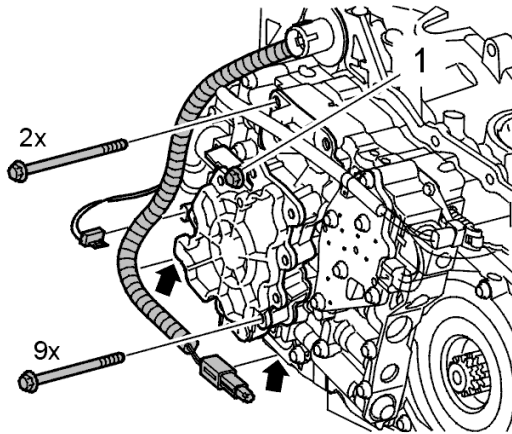
Installing the oil pump

Note! Ensure that mating surfaces are clean.

Lift and turn the pump slightly so that it is centered on the pump shaft.



Mounting the oil pump and connector



Finger-tighten the screws. The two upper screw heads are sized M10. The other screw heads are M8.

First tighten the screws crosswise to light contact. Then tighten **M10**. Tighten to **16 Nm**. Tighten **M8**. Tighten to **12 Nm**.

Install:

- the connector
- the cable harness and the temperature sensor in their respective clips.

Installing the side cover on the transmission

See [Installing the gearbox side cover](#) .

Solenoid, line pressure, replacing

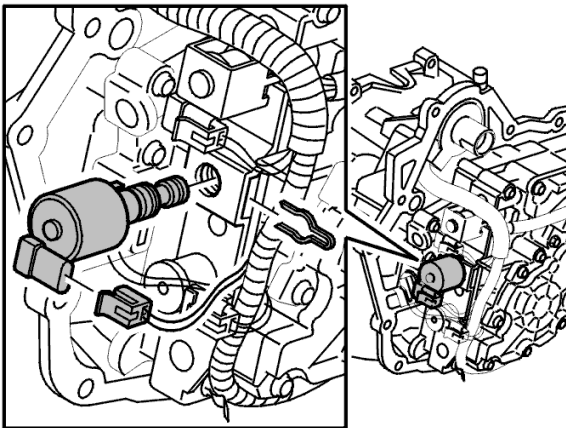
Side cover, gearbox, removing

See [Removing gearbox side cover](#)

Removing the line pressure solenoid

Remove:

- the connector
- the spring clamp. Pull it straight out. Use a small screwdriver to bend the clamp out slightly
- the solenoid from the control system. Use a screwdriver. Insert it between the solenoid and the control system. Carefully pry and pull on the solenoid at the same time. Check that the O-rings remain on the solenoid.



Installing the solenoid

Apply a little petroleum jelly to the sensor O-rings.

Install the solenoid.

Note! The small guide lug on the solenoid should be upwards on installation.

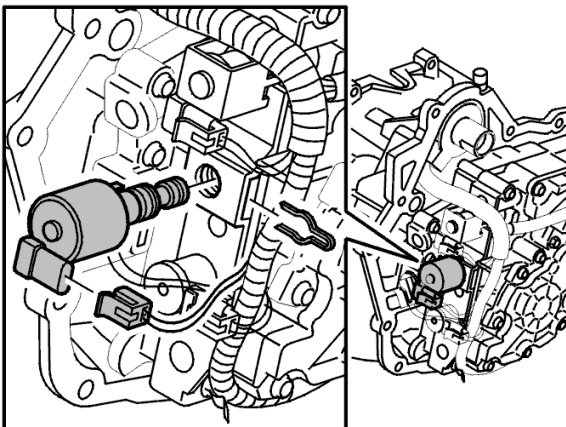
Twist and press in the solenoid so that it bottoms against the control system

Install:

- the spring clamp. Check that the spring clamp is locked
- the connector.

Installing the side cover on the gearbox

See [Installing the gearbox side cover](#)



Solenoid for shifting 1–2 and 3–4, replace

Side cover, gearbox, removing

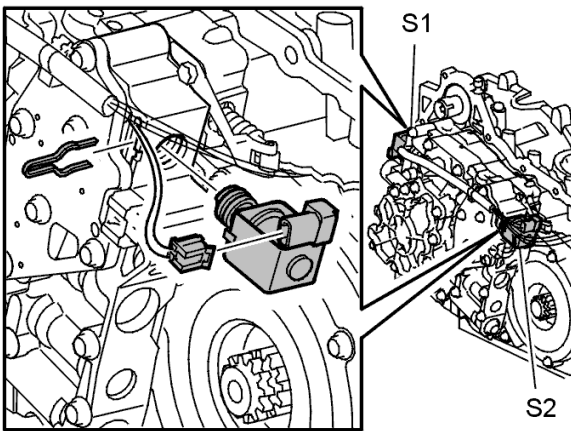
See [Removing gearbox side cover](#)

Removing solenoid S1

Remove:

- the connector
- the spring clamp. Pull it straight out. Use a small screwdriver
- the solenoid. Use a screwdriver. Insert it between the solenoid and the housing. Pry carefully. Pull the solenoid at the same time.

Check that the O-ring remains on the solenoid.

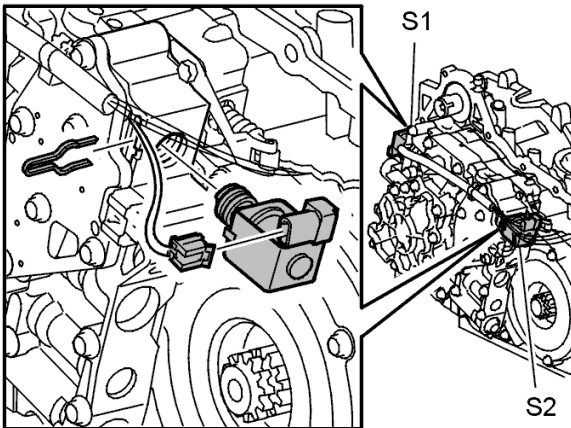


Installing solenoid S1

Apply a little petroleum jelly to the solenoid O-ring.

Install:

- the solenoid. Press the solenoid. Guide it in so that the locating pin on the side locates in the cut-out
- the spring clamp (check that it is locked)
- the connector.



Installing the side cover on the gearbox

See [Installing the gearbox side cover](#)

Solenoid for shifting 2–3, replace

Side cover, gearbox, removing

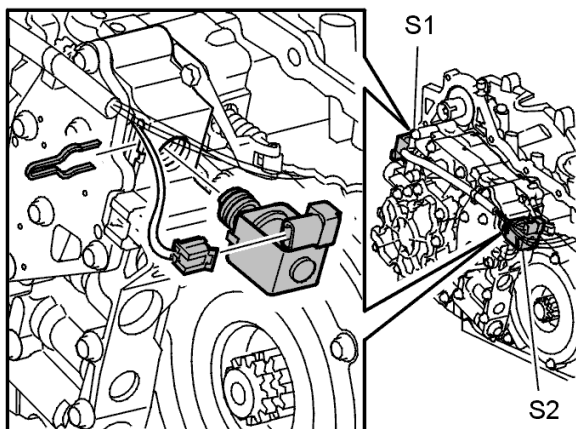
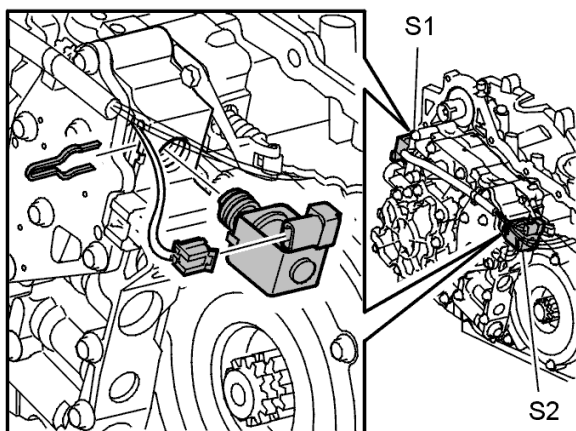
See [Removing gearbox side cover](#)

Removing solenoid S2

Remove:

- the connector
- the spring clamp. Pull it straight out. Use a small screwdriver
- the solenoid. Use a screwdriver. Insert it between the solenoid and the housing. Pry carefully. Pull the solenoid at the same time.

Check that the O-ring remains on the solenoid



Installing solenoid S2

Apply a little petroleum jelly to the solenoid O-ring.

Install:

- the solenoid. Press the solenoid. Guide it in so that the locating pin on the side locates in the cut-out
- the spring clamp (check that it is locked)
- the connector.

Installing the side cover on the gearbox

See [installing the gearbox side cover](#)

Gearbox control module (TCM), replacing

Points to observe when replacing the control module

Caution! The software can only be ordered when the control module is installed in the car. VIDA reads off the new control module identity. This is required so that the correct software can be ordered.

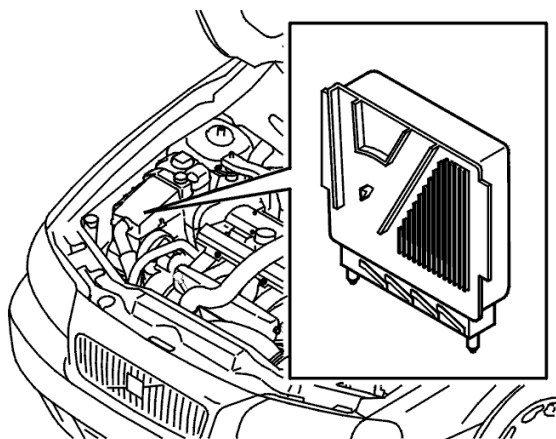
Caution! Wait two minutes after the ignition has been switched off. The main relay must be voltage free before the control module can be removed from the car. If the engine cooling fan (FC) runs on after the ignition has been switched off, wait until it stops. Then wait a further 2 minutes.

Caution! Always check that the control module and control module box connector pins and sleeves are not bent or damaged. This may have caused the fault.

Preparations for replacement

Remove:

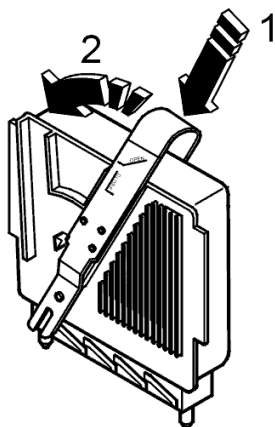
- the cable from the battery negative terminal. See [Note when disconnecting/connecting the battery lead](#)
- the cover over the control module.



Removing the control module

Note! Do not touch the control module terminal pins with your fingers. Static electricity may damage components in the control module.

Insert tool [999 5722](#) (1) in the car around the control module. Move the upper section of the tool backwards as far as it will go (2). Raise the tool. Carefully pull up the control module.

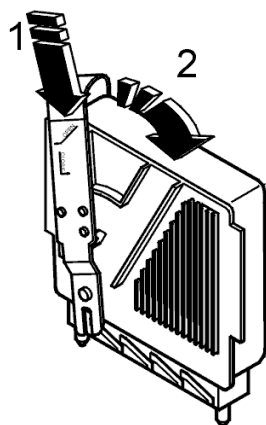


Installing the control module

Carefully press the control module down into the grooves on the inside of the control module box. Press down all the way.

Insert tool [999 5722](#) around the control module. Move the upper section of the tool forwards to stop and pull it up.

Press the cover into place over the control modules. Check that the air ducts are correctly positioned. Connect the battery negative lead. First read [Note when disconnecting/connecting the battery lead](#).



Ordering software

Order software according to the table below.

S60	Order SW
V70 2000-, V70 XC 2001-/XC70	Order SW
S80	Order SW
XC90	Order SW

Programming the control module

Program the new control module according to the table below.

--	--

S60	Load SW
V70 2000-, V70 XC 2001- /XC70	Load SW
S80	Load SW
XC90	Load SW

Finishing

Check that no diagnostic trouble codes have been stored during the repair.

Replacing pressure sensor

Removing the gearbox side cover

See [Removing gearbox side cover](#) .

Disconnecting the pressure sensor

Remove:

- the clip for the cable harness from the pressure sensor
- the connector
- the screws.

Note! The upper screw is M10. The two shiny screws are self tapping.

Disconnect the pressure sensor.

Check that all (6 x) O-rings remain in the pressure sensor.

Installing the pressure sensor

Apply a little automatic gearbox fluid on the sensor O-rings.

Install:

- the pressure sensor
- the screws loosely (finger tight).

Note! The upper screw is a M10 screw head. The three long screws are M8. The two shiny short screws are self tapping and should go into the same threads as before.

Tighten the screws lightly crosswise. The tighten to **the black screws** to 12 Nm.

Then tighten the two self tapping screws to **8 Nm**.

Install:

- the connector
- the clip for the cable harness for the pressure sensor.

Installing the gearbox side cover

See [Installing the gearbox side cover](#) .

Removing the sealing ring and piston with O-ring for the front servo

Special tools: [999 5717](#)

Note! Location: Opposite the steering gear on the gearbox.

Note! To access it the sub-frame must be lowered and the steering gear removed.

Removal

Preparations

Slacken off the 5 hose clamps for all the charge air pipes.

Remove the 2 screws from the charge air pipe on the intake manifold. Heat carefully with a hot air gun.

Separate all the air pipes. Leave the pipes lying on the spark plug cover.



Removing the spark plug cover

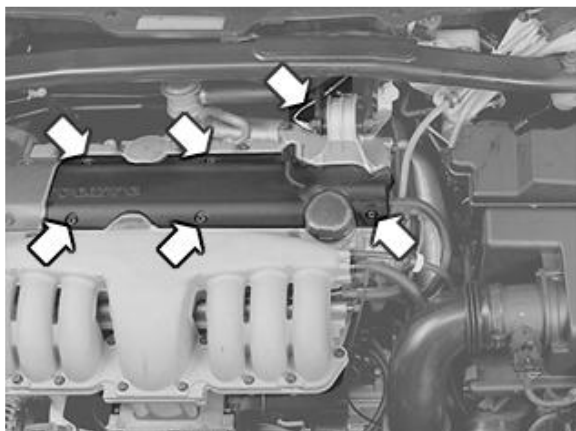
Remove:

- the screws for the spark plug cover
- the cover.

Applies only to turbocharged engines:

Remove the screws.

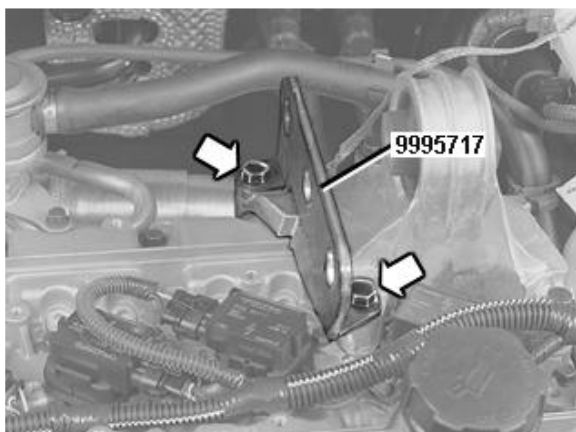
Lift up the delivery lines. Remove the spark plug cover.



Installing lifting fixture

Remove the 2 screws at the engine mounting.

Install fixture [999 5717](#).



Installing the lifting beam and lifting hook on the engine lifting eyelet

Install the lifting beam and the lifting hook according to [Gearbox, removing](#).

Disconnecting the front suspension components

Remove the front suspension components according to [Gearbox, removing](#) .

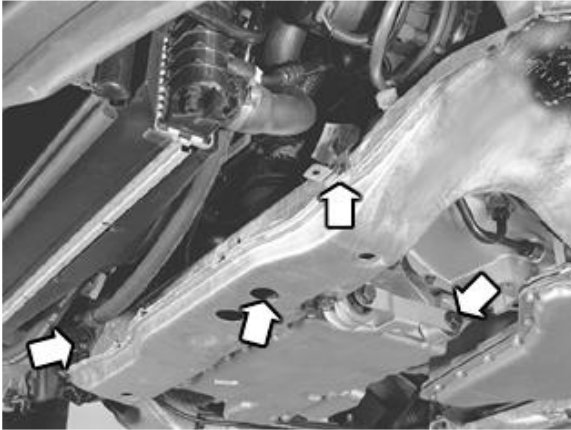
Removing the screws for the cable conduit and ground lead bracket on the sub-frame

Remove:

- the screw for the front engine pad (see the arrow)
- the screw for the torque rod in the gearbox.

Note! Cars with parking heaters: Remove the nuts for the heater from the sub-frame.

Hang the heater on the left front fender.



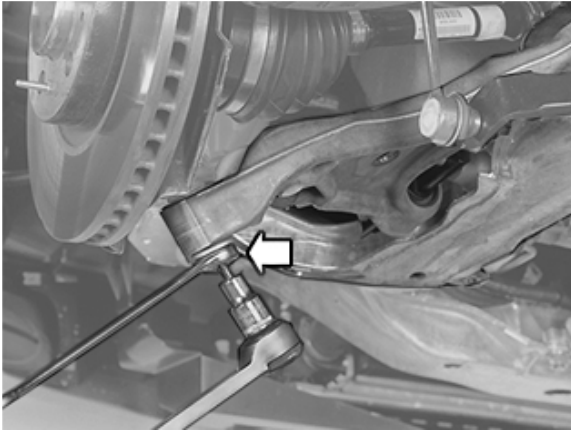
Removing the nut for the ball joint pinion (left hand side)

Remove:

- the nut for the ball joint pinion on the left-hand side of the control arm

Note! Counterhold the ball joint pinion so that the boot is not locked.

- the nut for the link to the anti-roll bar on the left-hand side.



Removing the screws from the sub-frame support plates (both sides)

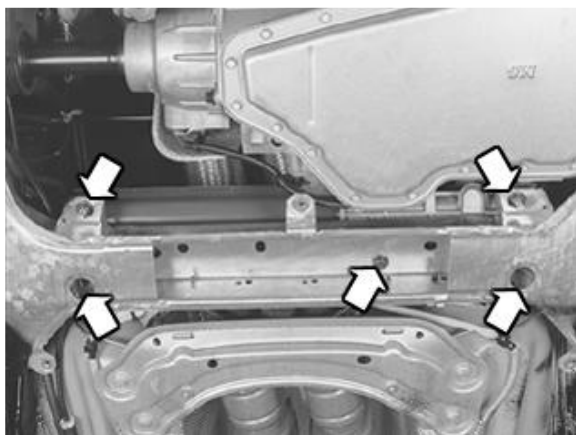
Remove the screws from the sub-frame support plates. See [Gearbox, removing](#) .

Pressing up the sub-frame on the right-hand side

Press up the rear edge of the sub-frame. See [Gearbox, removing](#) .

Removing the nuts and screws for the steering gear sub-frame

Remove the nuts and the screws from the steering gear sub-frame.



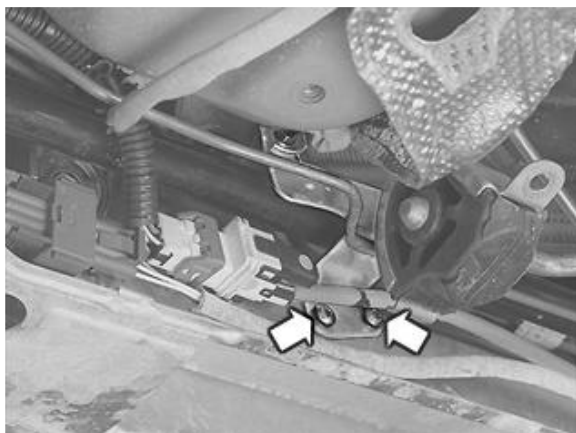
Removing the front cross member

Remove the front cross member according to [Gearbox, removing](#) .

Removing the bracket for the heated oxygen sensor (HO2S) wiring

Remove the screws for the bracket in the sub-frame holding the heated oxygen sensor (HO2S) cable. Push the bracket to one side.

Disconnect the connectors from the sub-frame.
Disconnect the heated oxygen sensor (HO2S) wiring from the sub-frame.



Removing the screw for the rear engine mounting

Remove the screw.



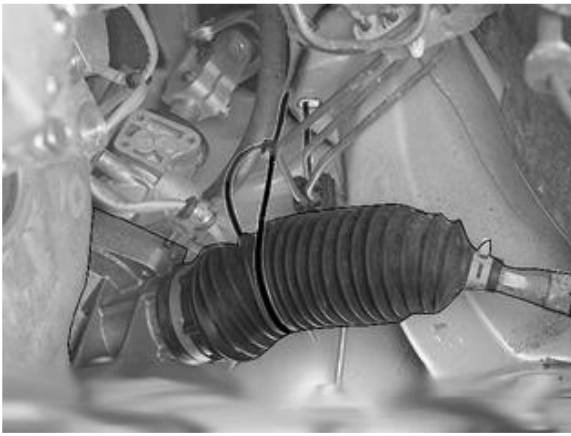
Preparatory work for removing the stub axle on the left-hand side

Prepare for removal according to [Gearbox, removing](#) .

Lowering the sub-frame

Use the mobile jack. Lower the sub-frame approximately 5 cm.

Hang the steering gear from a tie strap.



Carefully lower the sub-frame. Let it hang free.

Note! Ensure that the screws for the steering gear release from the frame.



Preparations for removing the servo cylinder

Press the steering gear backwards as far as possible.

Disconnect the wiring from the stud.

Wipe and blow the servo cylinder cover clean.

Take out a container for the oil.



Removing the cover

Place the container under the gearbox.

Remove the three studs.

Pull out the cover slightly, so that the oil runs out.

Fold down the and remove the cover.

Remove the piston from the gearbox. Pull it straight out.



Replacing the piston with O-ring and sealing ring

Hint: Press the piston against a bench so that the spring clip is easier to remove.

Replace the piston and the O-ring.

Replace the catch.

Replace the sealing ring for the cover.

Installing the sealing ring and piston with O-ring for the front servo

Installation

Installing the piston and cover

Apply a little petroleum jelly to the O-ring for the piston and the sealing ring for the cover.

Use Volvo Genuine parts petroleum jelly (P/N 116 51-4).

Reinstall the piston in the gearbox.



Angle the cover over the piston. Slide the cover towards the gearbox.

Tighten the screws alternately. Tighten to **10 Nm**.

Install the wiring on the stud.

Installing front suspension components

Install the sub-frame on the bodywork according to [Transmission, installing](#) .

Tighten the sub-frame screws. See [Transmission, installing](#) .

Installing the screw for the rear engine pad

Install the screw for the rear engine pad through the steering gear. Tighten to **50 Nm**.



Installing the screws for the bracket for the heated oxygen sensor (HO2S) cable

Install the screws. See [Transmission, installing](#) .

Installing the front cross member

Install the front cross member. See [Transmission, installing](#) .

Installing new lock nuts on the steering gear

Install new lock nuts. See [Transmission, installing](#) .

Installing the screw for the front engine pad and the torque rod mounting in the gearbox

Install the screw for the front engine pad and the torque rod mounting in the gearbox. See [Transmission, installing](#) .

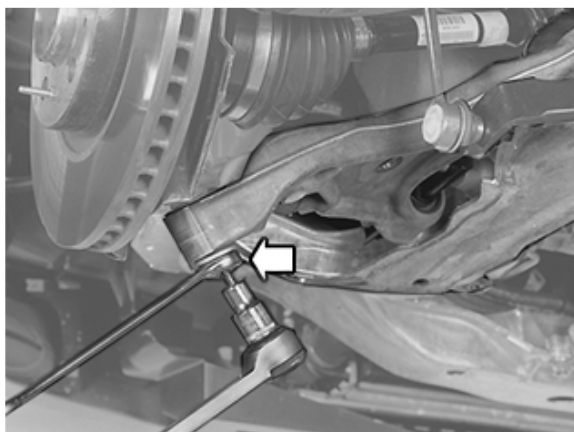
Tightening the ball joint pinion and the anti-roll bar link

Note! Counterhold the ball joint pinion while tightening so that the ball joint boot cannot turn. Tighten to 80 Nm.

Tightening the anti-roll bar link

Use a new lock nut.

Note! Counterhold the ball joint pinion while tightening so that the ball joint boot cannot turn. Tighten to 50 Nm.



Installing the screws for the cable conduit and the ground lead bracket

Install the screws for the cable conduit and the ground lead bracket. See [Transmission, installing](#) .

Install the screw for the torque rod in the gearbox. Tighten to **50 Nm**.

Install the front screw for the engine pad. Tighten to **50 Nm**.

Remove the lifting beam and the lifting hook from the engine and the car

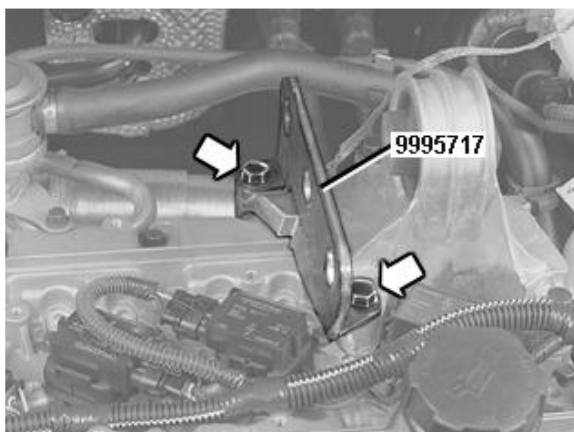
Remove the lifting fixture from the motor. Reinstall the screws. Tighten to **50 Nm**.

Reinstall the spark plug cover. Tighten the screws. Tighten to 10 Nm.

Applies only to turbocharged cars

Lift up the delivery lines. Install the spark plug cover.

Lower the car



Installing all the charge air pipes

Applies only to turbocharged cars



Connect all the charge air pipes to each other.
Tighten the hose clamps.

Install the screws for the charge air pipe in the intake manifold. Tighten to **10 Nm**.

Install the hose on the heater pipe in the firewall.

Press the radiator hose quick-release connector into place on the heater pipe.

Check: Pull the hose.

Check the engine coolant level. Top up if required.

Finishing work

Filling the gearbox with fluid

Fill the gearbox with oil. See [Transmission, installing](#).

Checking the steering gear bearing in the boot at the firewall

Check the bearing in the steering gear. See [Transmission, installing](#).

Test driving the car

For information about test driving the car, see [Test Drive Form, description](#)

Note! After changing the gearbox oil, the gearbox adaptation and the "Gearbox oil change" counters must be reset. Use VIDA vehicle communication to set the adaptation and counters to zero.

Gearbox, removing

Special tools: [998 5972](#) , [999 5045](#) , [999 5259](#) , [999 5395](#) , [999 5460](#) , [999 5463](#) , [999 5562](#) , [999 5716](#) , [999 7018](#) , [999 5734](#) , [999 5735](#) , [999 5736](#) , [999 5972](#) , [999 7077](#)

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.

Filling in Diagnostic and Check lists

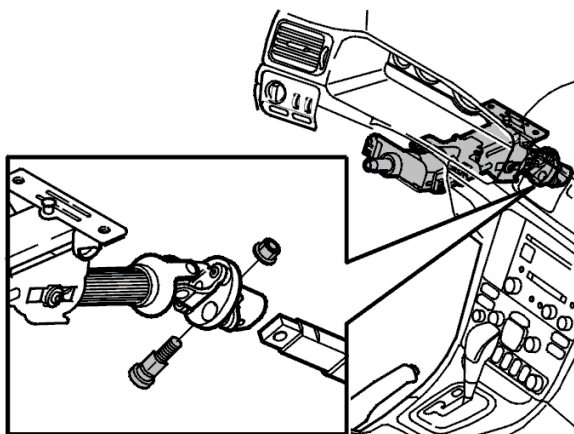
Note! Before replacing the gearbox, fill in [Diagnostic / check list](#) and enclose in the returns box.

Disconnecting the battery lead

See [Note when disconnecting/connecting the battery lead](#) . It is essential that the instructions are followed.

Exposing the lower steering shaft

Set the front wheels to the straight ahead position.
Lock the steering wheel.
Remove the upper screw on the lower steering shaft.
Expose the lower steering shaft from the upper steering shaft
Press up the upper steering shaft slightly for better access.



Removing engine compartment components

Remove the air cleaner (ACL) housing

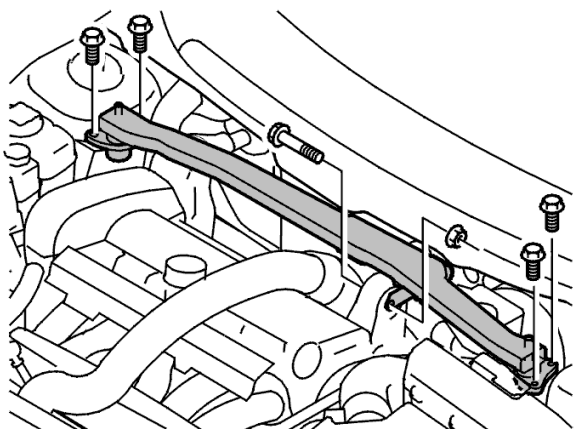
See [Brake pipe master cylinder / ABS unit, replacing](#) .

Applies only to turbo cars:

Carefully heat around the pipe at the charge air cooler (CAC). Use a hot air gun. Loosen and remove the pipe.

Remove the upper torque rod. Remove the screw for the oil hose clamp on the cross member mounting (right-hand side)

See [Brake fluid reservoir, replacing](#) .



Remove:

- * the plastic covers over the spring strut mountings (applies only to early versions)
- * the screws
- * the screw and nut for the engine mounting.

Removing the charge air hose and the hose clamp (turbocharged cars)

Undo the hose clamp at the twin pipe.
Remove the hose from the twin pipe.



Removing the gearbox cable from its mounting and the lever on the gearbox

Use jimmy bar **999 7077** to detach the ball joint for the gear selector cable from the lever.

Remove:

- * the gear selector cable from the bracket. Press the catch under the gear selector cable. Pull the gear selector cable out of the bracket
- * the connector from the gearbox (press the connector together). Pull it from the gearbox.

Hint: Hang the gear selector cable from a tie strap around the brake pipes.



Removing the hose for the heater pipe

Disconnect the hose from the heater pipes at the bulkhead so that the pipe in the heater unit is not damaged when lowering the engine (the rubber hose is short).

Twist the catch (see the arrow) on the hose connection. Pull the quick-release connector straight out. A small amount of water should run out (tie the hose up). Disconnect the ground strip (applies to older models).



Collecting gearbox fluid

Remove the dipstick from the dip stick pipe.

Suck up the oil using an oil suction device.

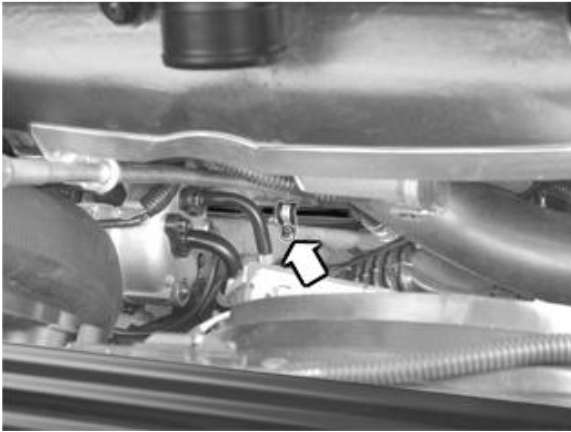
Note! The above must be carried out because when the oil pipe is removed the oil flows out of the gearbox.

Remove the screw for the dip stick pipe by the engine mounting.



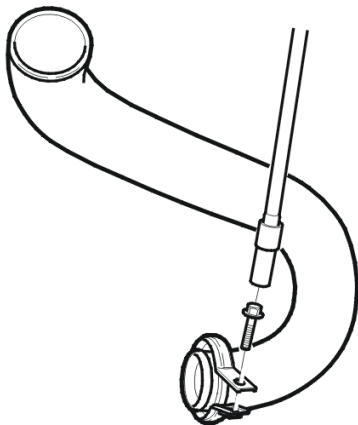
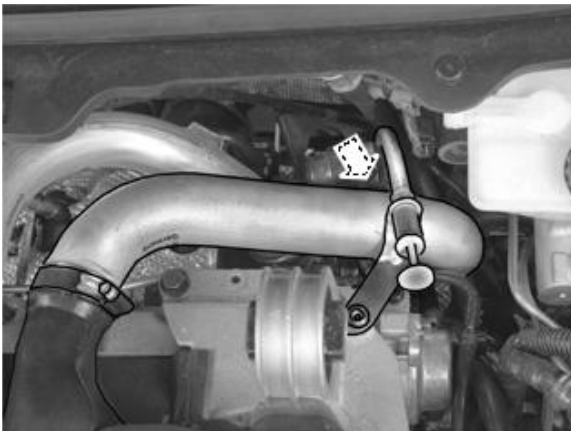
Removing the screw from the sub-frame

Slacken off the screw for the clamp holding the oil pipe to the power steering.



Removing the boost pressure pipe

Slacken off the upper screw for the dip stick pipe.



- * Slacken off the screw for the clamp around the turbocharger pipe
- * Open the clamp so that it is released from the turbocharger (TC)
- * Pull the turbocharger pipe from the turbocharger (TC) (push the pipe to one side).

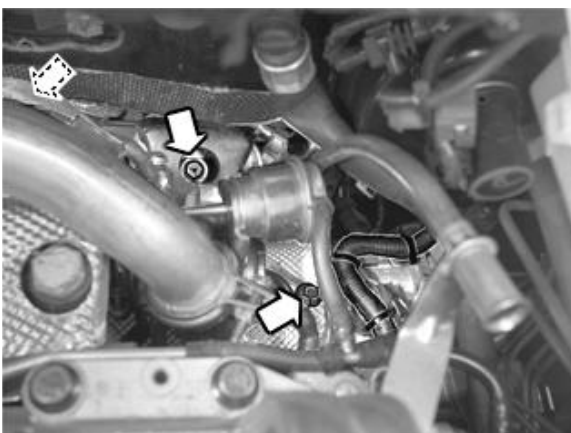
Removing engine compartment components

Remove:

- * the lower screw for the dip stick pipe
- * the nut for the engine pad (ensure the nut is close at hand when installing the engine pad)
- * the screw for the splash guard plate (by the engine mounting).

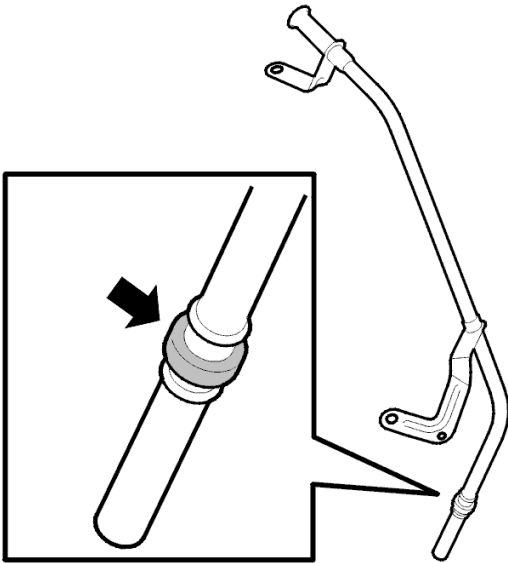
Cut off the 4 tie straps holding the cable harness on the bracket.

Disconnect the speed sensor connector.



Removing the dipstick

Pull the pipe straight upward out of the gearbox.
Ensure that the O-ring stays in place on the pipe.



Installing the lifting fixture

Install fixture [999 7018](#) on the left hand side of the engine at the 2 screws.
Lock the fixture using the catch.



Removing the screws for the gearbox and starter motor and the ground lead

Remove:

- * the 3 screws for the gearbox/engine
- * the screw for the ignition setting sender (lift up the ignition setting sender)
- * the 2 screws for the starter motor. Remove the starter motor
- * the ground lead screw under the starter motor
- * the screw for the clamp holding the positive cable on the engine.

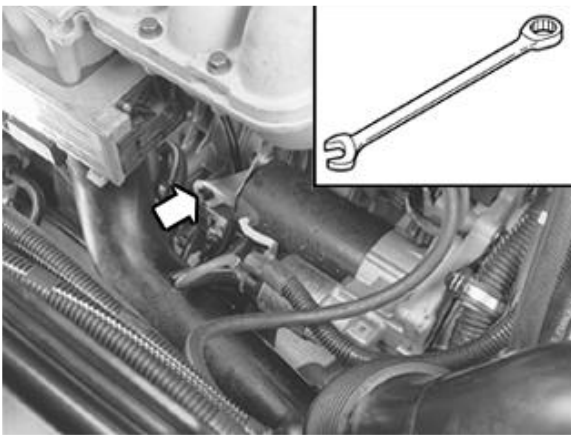
Tie the hoses and the cable harness to the intake manifold.

Removing components from the starter motor

Remove:

- * the nut for the positive cable and the switch on the starter motor
- * the screw at the bracket for the starter motor

Hint: Applies to turbocharged engines: Use a ratchet



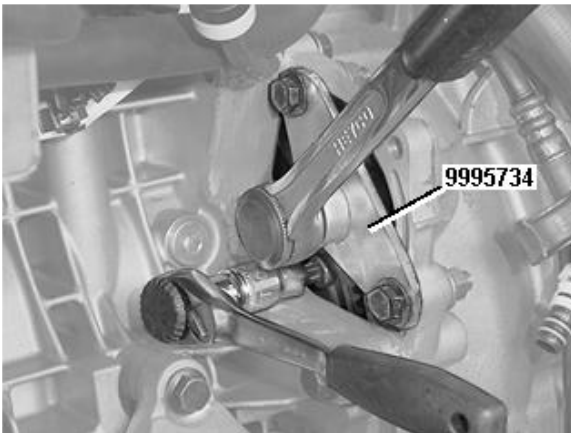
spanner when removing the screw at the bracket for the starter motor.

Removing the screws from the torque converter

Alternative 1

Installing twisting tool [999 5395](#) .

Turn the engine until the screws can be removed. Use a Torx tool (TX50).



Alternative 2

Slacken off and remove the screws in the cut-out between the engine and the gearbox from below. Turn the engine using a screwdriver in the cut-out under the gearbox.

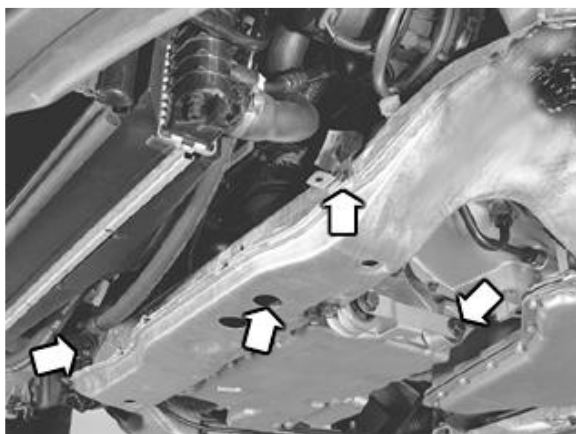


Installing the lifting beam and lifting hook on the engine lifting eyelet

Note! Position the stand for lifting beam [999 5716](#) on the upper wheel arch members.

Then position the lifting beam directly above the engine lifting eyes on both sides.

Connect lifting hook [999 5460](#) . Tighten to light contact.



Disconnecting the front suspension components

Raise the car

Note! Position the front lift arms so that they do not obstruct the sub-frame support plates.

Remove:

- * the front wheels
- * the splash guard under the engine
- * both the screws for the front splash guard. Remove the cover: Press in the catches at the front edge of the cover. Pull the cover backwards.

Removing the screws for the cable conduit and ground lead bracket on the sub-frame

Remove:

- * the screw for the front engine pad (see the arrow)
- * the screw for the torque rod in the gearbox.

Note! Cars with parking heaters: Remove the nuts for the heater from the sub-frame.

Hang the heater on the left front wing.

Removing the nut from the ball joint (both sides)

See [Gearbox, removing](#) .

Removing the control arms for the anti-roll bar, the track rod and the screw from the drive shaft on both sides

See [Gearbox, removing](#) .

Removing the screws from the sub-frame support plates (both sides)

See [Gearbox, removing](#) .

Removing the stub axle from the control arm

See [Gearbox, removing](#) .

Pressing up the sub-frame on the right-hand side

See [Gearbox, removing](#) .

Removing the drive shaft from the stub axle (right-hand side)

See [Gearbox, removing](#) .

Removing the cap for the drive shaft support bearing

Remove the screws for the bearing cap.

Unhook the servo pipe and the evaporator pipe from the holders on the right-hand side of the sub-frame.
Unhook the servo pipe from the clip on the sub-frame.



Removing the drive shaft

See [Gearbox, removing](#) .

Removing the drive shaft from the viscous coupling

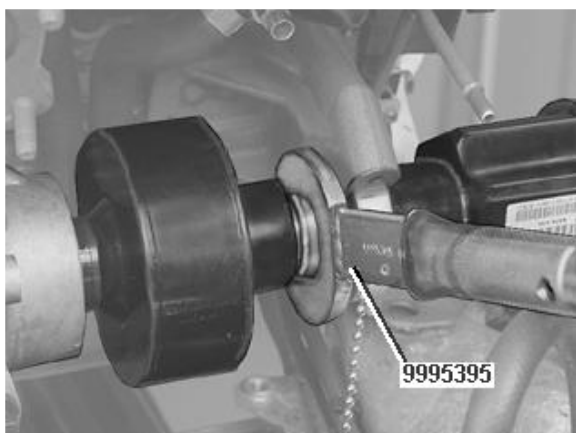
Use jimmy bar [999 5395](#) .

Position the tool between the drive shaft and the viscous coupling.
Gently tap the tool so that the drive shaft is released from the viscous coupling.

Note! Remove the drive shaft first.

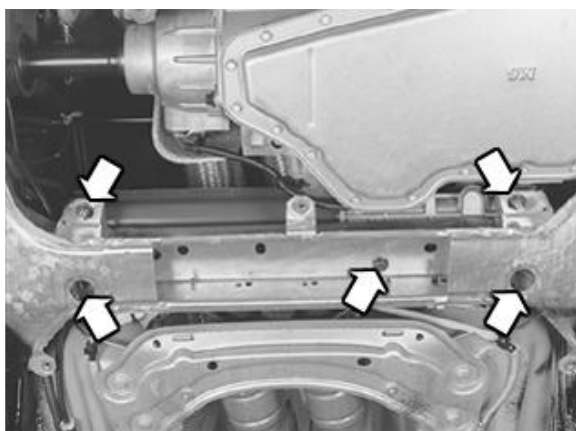
Remove the viscous coupling from the gearbox.

Note! There will be a little oil left in the viscous coupling.



Removing the nuts and screws for the steering gear sub-frame

Remove the nuts and the screws from the steering gear sub-frame.

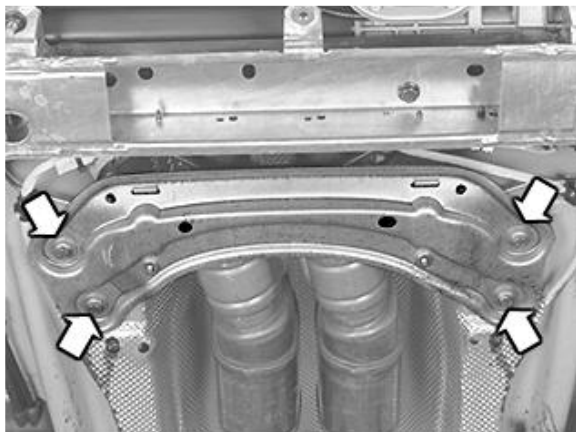


Removing the front cross member

Drill out the pop rivets for the heat deflector.

Remove:

- * the 4 screws by the front cross member
- * the screws for the exhaust pipe mounting in the front cross member
- * the brake pipe from its holder in the member.



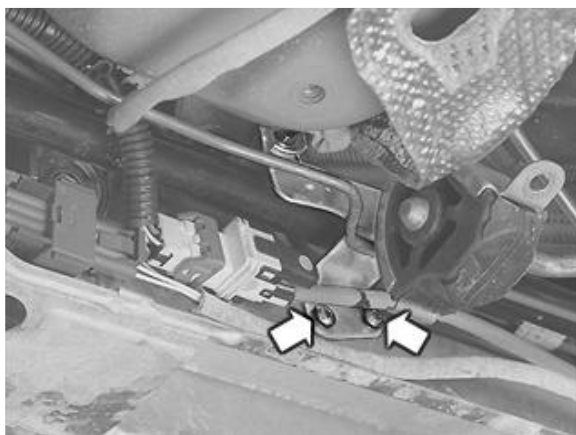
Removing the centre and rear cross members

Slacken off the screws for the cross members.
Remove the 2 screws for each member. Let them hang down.



Removing the bracket for the heated oxygen sensor (HO2S) wiring

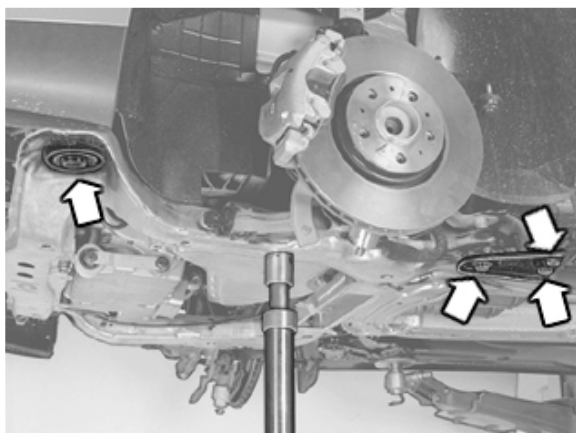
Remove the screws for the bracket in the sub-frame holding the heated oxygen sensor (HO2S) cable. Push the bracket to one side.
Disconnect the connectors from the sub-frame.
Disconnect the heated oxygen sensor (HO2S) wiring from the sub-frame.



Preparatory work for removing the stub axle on the left-hand side

Position fixture [998 5972](#) under the sub-frame.
Remove the sub-frame screws.
Lower the sub-frame so that the ball joint for the stub axle detaches.

Note! Install socket [999 5562](#) on the stub axle ball joint.
Do not damage the rubber bellow for the ball joint.

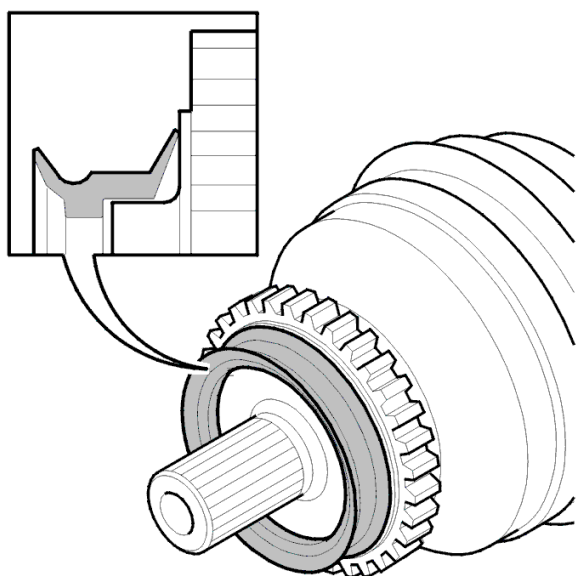
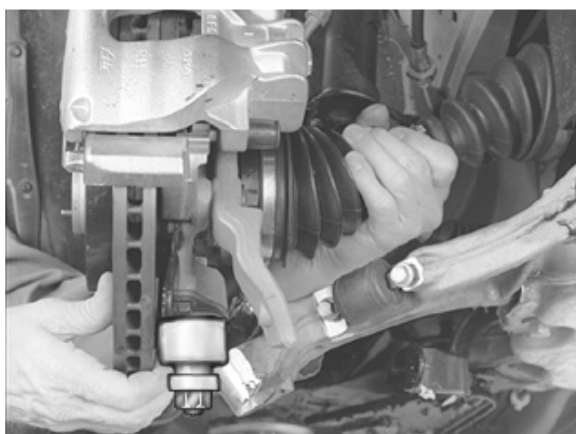


Removing the drive shaft from the stub axle (left-hand side)

Take hold of the drive shaft. Pull it down towards the control arm so that it does not tension.

Pull the brake disc outwards. At the same time, pull on the constant velocity joint towards the gearbox so that the drive shaft loosens.

Allow the drive shaft to lie on the control arm.



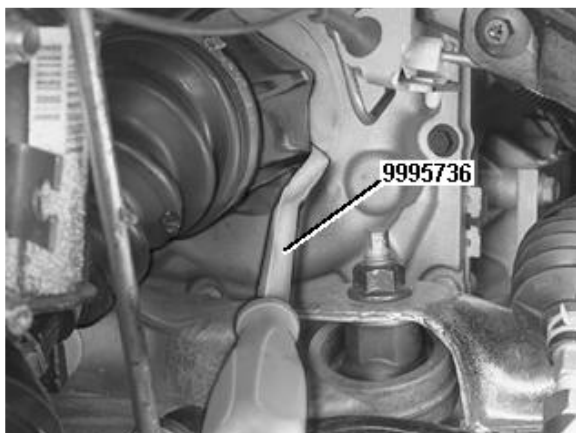
Caution! Later models have a rubber seal on the constant velocity joint. Do not damage the seal. It will be needed for installation.

Removing the left drive shaft from the gearbox

Use jimmy bar [999 5736](#) .

Note! Do not damage the seal.

Note! Do not under any circumstances pull the drive shaft in such a way that could cause the joints to separate. The joints do not have axial pinions.



Removing the collision protection system over the steering gear (right-hand drive cars)

Note! Applies only to right-hand drive cars.

Lower the sub-frame slightly. Use the mobile jack.
Remove a screw and a screw and nut.

Note! Carefully check that the collision protection system under the steering gear is free and not under stress.



Removing the screw for the rear engine mounting

Remove the screw.



Lowering the sub-frame

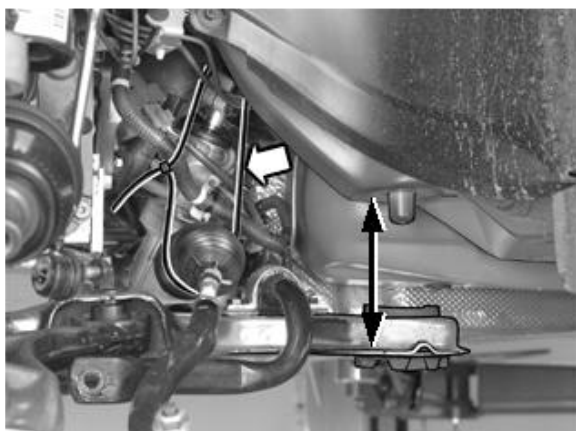
Use the mobile jack. Lower the sub-frame approximately 140 mm.

Hang the steering gear from a tie strap.

The steering shaft must not slide out of the rubber boot.

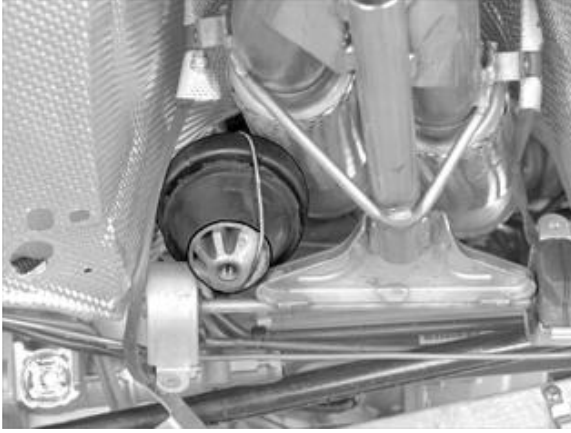
Carefully lower the sub-frame. Let it hang free.

Note! Ensure that the screws for the steering gear on the left side release from the frame.



Removing the rear engine pad

Remove the engine pad on the left side between the bodywork and the three-way catalytic converter (TWC).



Removing the rear engine mounting

Slacken off the 4 screws for the engine mounting. Twist out and remove the engine mounting.



Removing the oil pipe from the gearbox

Note! Plug the oil pipes so that no dirt gets in.

Remove the nuts from the brackets for the oil pipes. Remove the screw nipples (counterhold at the connections). Pull out the oil pipes. Move the oil pipes to one side. Lower the car.



Lowering the engine and gearbox

Lower the engine / gearbox on the left-hand side using the hook.

Lower the engine so that the distance between the upper edge of the mounting bracket and the spark plug cover is approximately **350 mm**. See arrow.

Caution! Ensure that the engine mounting is not against the exhaust boot and is not trapped. The exhaust boot must not be damaged.

Raise the car



Removing the heated oxygen sensor (HO2S) connectors from the bracket on the gearbox

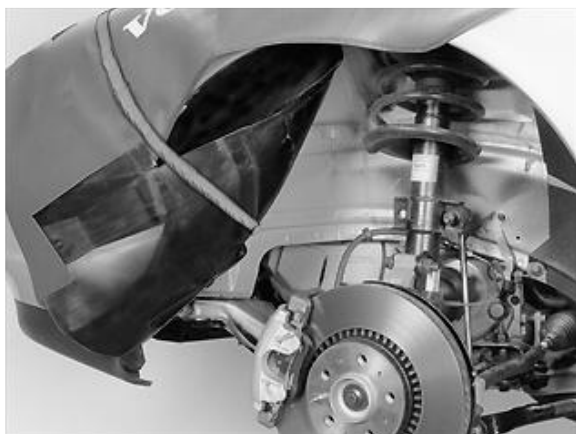
Disconnect the connectors from the bracket.
Remove the nut on the bracket and the clamp holding the wiring.



Preparations for removal of the gearbox

Remove:

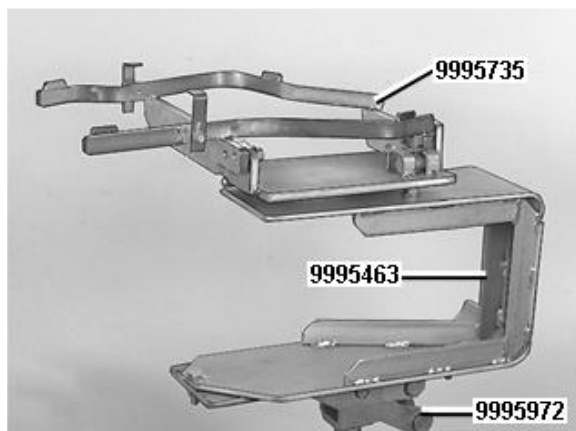
- * the 2 nuts for the wing liner. Angle out and tie up the wing liner to the lifting beam using a retaining strap
- * the ABS line from the spring strut.



Installing the fixture on the mobile jack

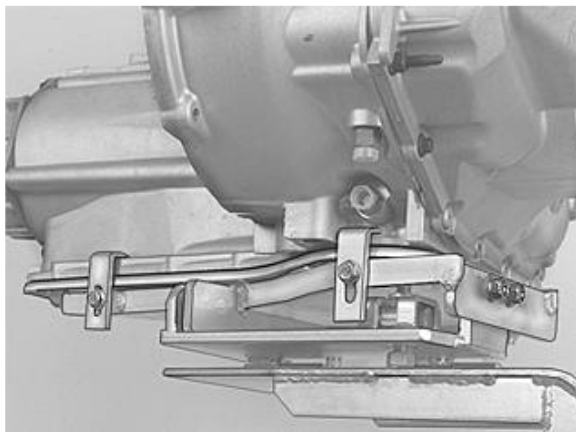
Install:

- * fixture [999 5463](#) on fixture [999 5972](#) . Use the fixture and plate together with mobile jack [998 5972](#)
- * fixture [999 5735](#) on fixture [999 5463](#) .



Aligning the fixture on the gearbox

Locate fixture [999 5735](#) against the gearbox.
Fold up the side mountings over the edge of the gearbox and secure.



Removing the gearbox

Remove:

- * the 2 screws (on the bracket) at the cover for the differential housing
- * the 2 screws positioned furthest in and highest up at the engine/gearbox
- * the remaining 4 screws for the engine/gearbox.

Pull the gearbox straight out in relation to the engine.

Note! Lower the gearbox slightly when it is being removed so that it will go past the side member.

Continue pulling the gearbox straight out.

Note! Ensure that the torque converter is also removed.

Flushing the oil cooler and oil hoses

The oil cooler and hoses must always be flushed if the following faults are found in the gearbox:

- Glycol in the gearbox fluid.
- Metal particles in the gearbox fluid.
- Burned or dirty oil.

Transmission, installing

Special tools: [951 2050](#) , [999 5395](#)

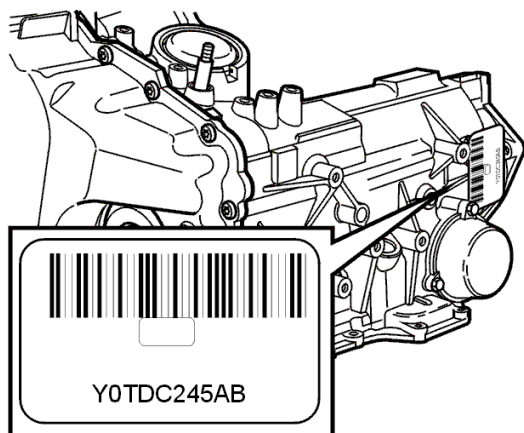
Note! As the illustrations in this service information are used for different model years and / or models, some variation may occur. However, the essential information is always correct.

When replacing with a new transmission

Note! Check the identification plate on the transmission to ensure that the correct transmission is selected for installation.

These screws and nuts must be replaced when replacing the transmission

P/N	Number	Designation



979 671	6	Screw (torque converter)
981 062	4	Sems screw (sub-frame)
971 098	4	Nut (steering gear)
863 4179	2	Sems nut (ball joints)
981 771	2	Sems screw (drive shaft)
980 985	1	Screw (steering shaft)
945 408	1	Nut (steering shaft)
971 099	1	Flange lock nut (tie rod)

Checking before installing

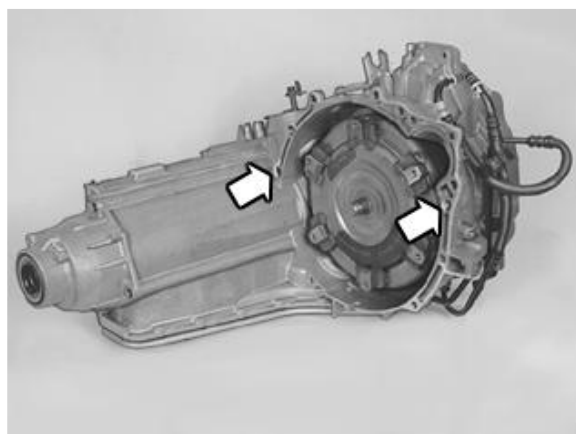
Flushing clean the oil cooler

When replacing the transmission, the oil cooler must always be flushed clean because there may be particles in the oil cooler. See [Oil cooler, flush cleaning](#).

Check that the transmission and engine mating surfaces are **absolutely** clean.

Also check that the guide sleeves towards the engine are in position and are free of faults.

Lubricate the holes in the transmission (for the guide pins). Use a little grease.



Adjusting the position of the transmission and engine

Adjust height and angle with the mobile jack and the transmission fixture.

Locate the transmission on the engine.

Ensure that the transmission goes straight in relation to the engine and that the torque converter is in the correct location.

Note! If necessary: Turn the engine so that the stator shaft is correctly aligned in the torque converter.



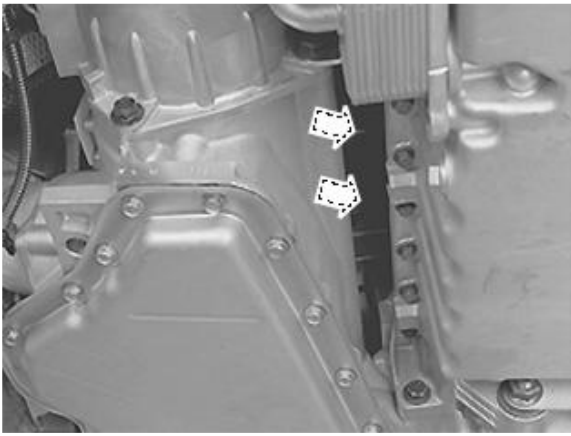
Installing and tightening the screws for the transmission

Install all 6 screws for the transmission and engine.

At the same time, check that the whole of the transmission is in contact with the engine.

Then tighten the transmission / engine screws crosswise. Tighten to **50 Nm**.

Remove the fixture from the transmission.



Install the 2 screws on the bracket at the cover for the differential housing.

Tighten the screws. Tighten to **50 Nm**.

Installing the splash guard above the transmission

Slide the splash guard up and secure it with a screw at the right drive shaft.

The illustration shows the splash guard when the three-way catalytic converter (TWC) is not in position.



Installing the heated oxygen sensor (HO2S) connectors on the bracket on the transmission

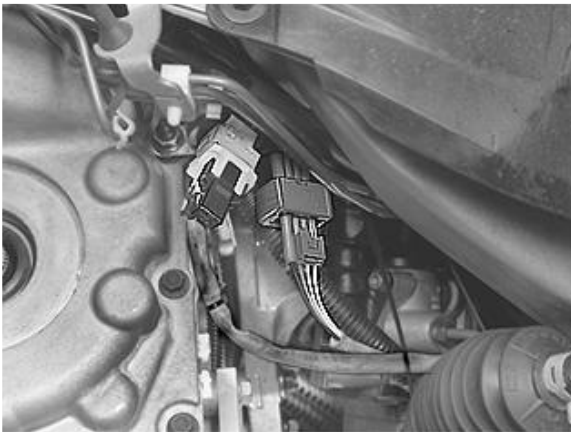
Connect the connectors.

Secure the connectors on the bracket.

Install the clamp with the wiring on the transmission.

Tighten the nut. Tighten to **25 Nm**.

Lower the vehicle.



Lifting the engine and transmission to the horizontal position

Lift up the engine and transmission to the horizontal position.



Installing the oil pipe at the transmission

Tighten the screw nipples. Tighten to **30 Nm**.
Counterhold on the connections.

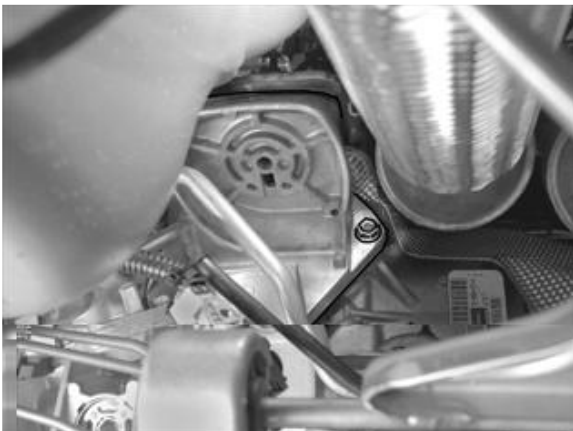
Tighten the nuts at the bracket. Tighten to **25 Nm**.



Installing the rear engine mounting

Install:

- the rear engine mounting on the transmission
- the 4 screws for the engine mounting. Tighten to **50 Nm**.

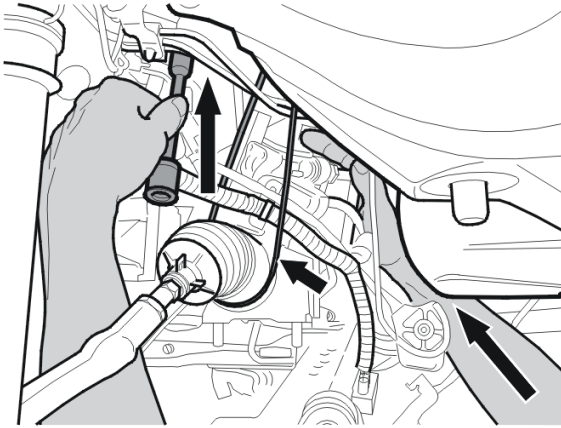


Installing the engine pad

Insert the engine pad between the bodywork and the three-way catalytic converter (TWC).

Secure the heat shield on the engine pad so that it is against the three-way catalytic converter (TWC).





Installing the engine pad on the engine mounting

Take out the nut, a short extension bar and a socket.

- Insert the nut into the socket so that it remains in place
- Insert the extension bar up to the collision protection system using your left hand
- Move up the engine pad to the engine mounting. Place the nut on the engine pad. Tighten the nut from above.

Installing the sub-frame on the bodywork

See [Transmission, installing](#) .

Installing the screw for the rear engine pad through the steering gear

Install the screw. Tighten to **50 Nm**.



Installing the collision protection system over the steering gear

Only applies to right-hand drive cars

See [Transmission, installing](#) .

Installing the left drive shaft on the transmission, wheel spindle and control arm

See [Transmission, installing](#) .

Installing the drive shaft and the viscous coupling

Right-hand side:

Carefully align the viscous coupling in the transmission. Ensure that the sealing ring is not damaged.

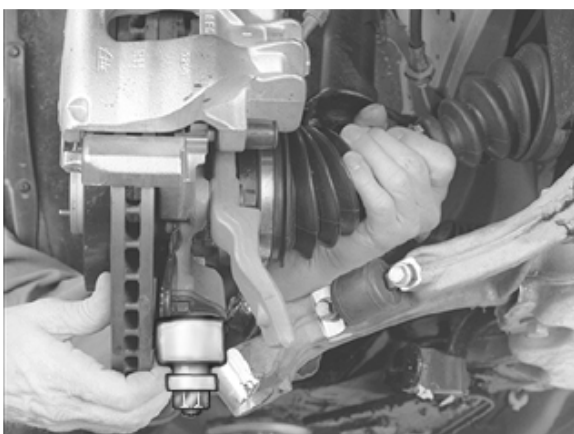
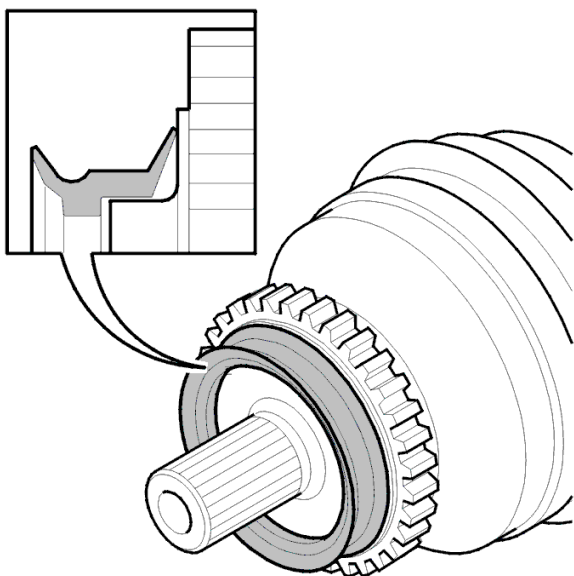
Install:

- the drive shaft to the viscous coupling. Press the drive shaft so that the locking in the viscous coupling secures the drive shaft
- the bearing cap. Tighten to **25 Nm**.



Installing the right-hand drive shaft on the transmission, wheel spindle and control arm

Ensure that the rubber seal is in position on the constant velocity joint.



Align the drive shaft in the wheel arch. Install the screw loosely in the drive shaft.

Install:

- the mobile jack under the sub-frame. Remove both the sub-frame screws. Lower the sub-frame approximately 10 cm
- the wheel spindle on the control arm
- the lock nut loosely.

Lift the sub-frame to the bodywork. Install the screws for the frame

Press the evaporator cable and the oil pipe into place in the sub-frame clips.

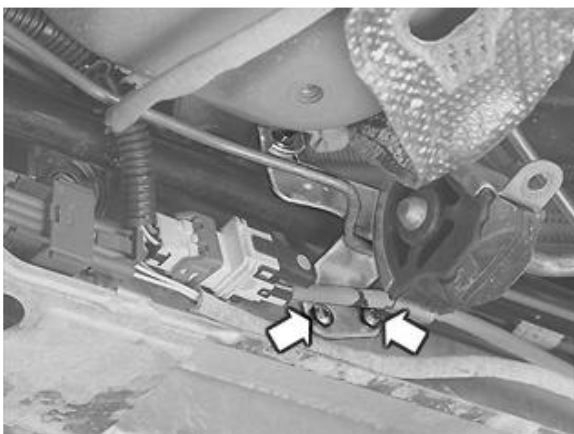
Installing and tightening the sub-frame screws

See [Transmission, installing](#) .

Installing the screws for the bracket for the heated oxygen sensor (HO2S) cable

Install:

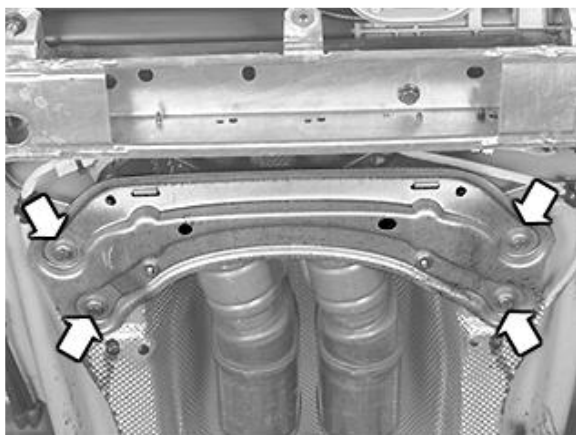
- the screws for the bracket
- the connectors in the sub-frame. Connect the connectors.



Installing the front cross member

Install:

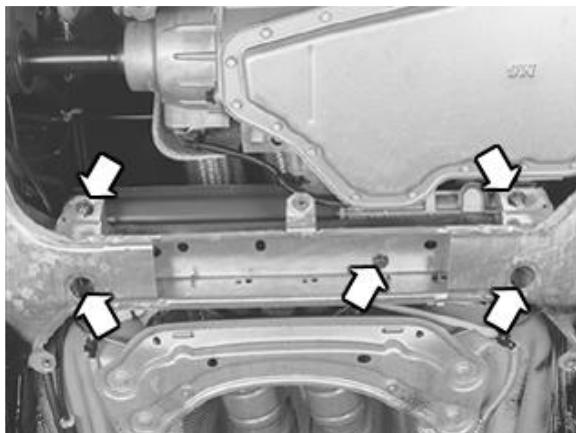
- the screws for the exhaust pipe mounting. Tighten



to **10 Nm**

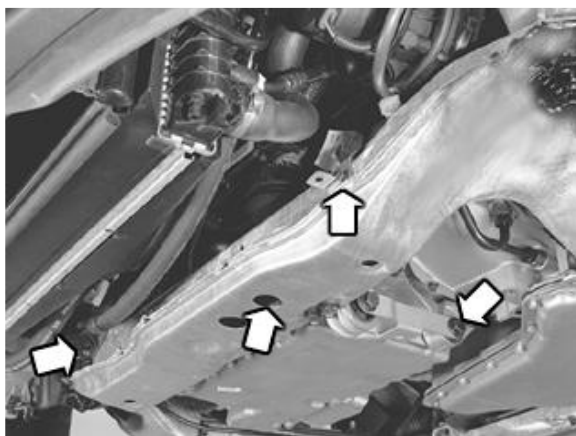
- the brake pipe in its holders
- the screws for the cross member. Tighten to **25 Nm**.

Secure the heat deflector using rivets (early version).



Installing new lock nuts on the steering gear

Tighten the nuts and screws. Tighten to **50 Nm**. Tighten the screw and the clamp for the oil pipe.



Installing the screw for the front engine pad and the torque rod mounting in the transmission

Install:

- the screw for the front engine pad. Tighten to **50 Nm**
- the torque rod mounting on the transmission.

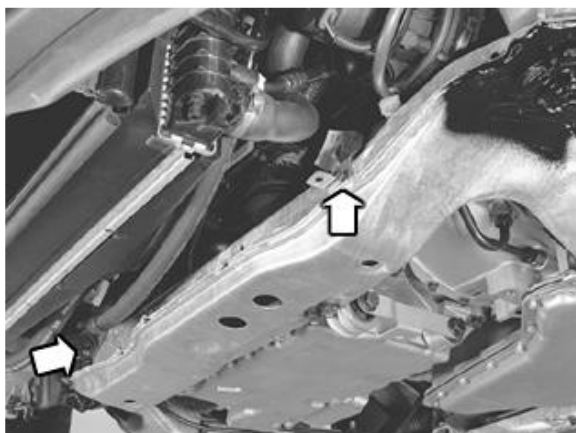
Note! Tighten to **50 Nm**.

Installing the screws for the cable ducts and ground lead bracket

Tighten to **10 Nm**.

Note! Vehicles with parking heaters: Install the heater in the bracket. Tighten the nuts. Tighten to **25 Nm**.

Reinstall the fuel line in the clips on the sub-frame.



Installing and tightening front end components (both sides)

See [Transmission, installing](#) .

Tightening the ball joint pinion

See [Transmission, installing](#) .

Remove the lifting beam and the lifting hook from the engine and the vehicle

Lower the vehicle.

Remove the lifting fixture from the motor.

Install the ground strip. Tighten to **10 Nm**.



Installing the torque converter screws

Note! Use new screws.

Install cranking tool [999 5395](#) to turn the engine.

Install all 6 screws loosely. Tighten the screws until the heads are in contact with the carrier plate. Then tighten to **35 Nm**. Use Torx socket TX50.

Tighten to the torque converter in one of two ways. From above next to the cranking tool. From under the car where the screws can also be accessed.

Raise the vehicle.

Insert a screw in the cut-out under the transmission and turn the engine.

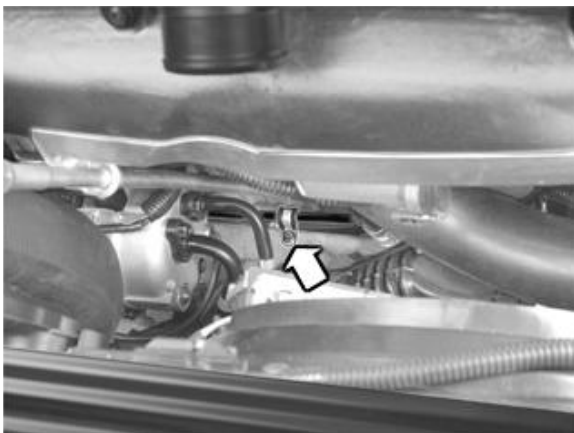
Tighten the 6 screws. Tighten to **35 Nm**. Use a Torx TX50 socket (see the illustration).





Installing the clamp for the oil pipe

Install the screw and clamp.
Tighten to **10 Nm**.



Installing the charge air hose

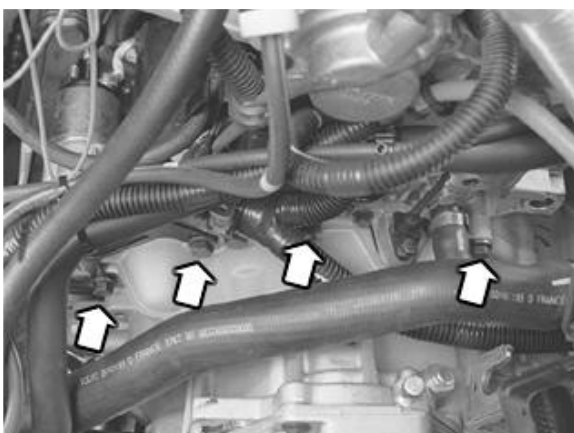
Reinstall the rubber hose for the delivery pipe. Tighten the hose clamp.



Installing the screws in the transmission and engine

Install:

- the 3 screws for the transmission and engine. Tighten to **50 Nm**
- the ignition setting sender and the screw. Tighten to **10 Nm**
- the screw for the clamp for the positive cable. Tighten to **10 Nm**.

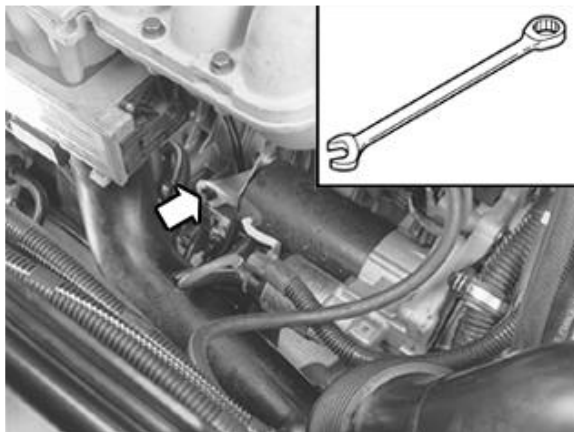


Installing the starter motor

Remove the cranking tool

Install:

- the starter motor. Tighten the screws. Tighten to **40 Nm**
- the positive cables and the connector
- the nut for the positive cables. Tighten to **25 Nm**
- the screw for the bracket. Tighten to **25 Nm**. Use a ratchet wrench.

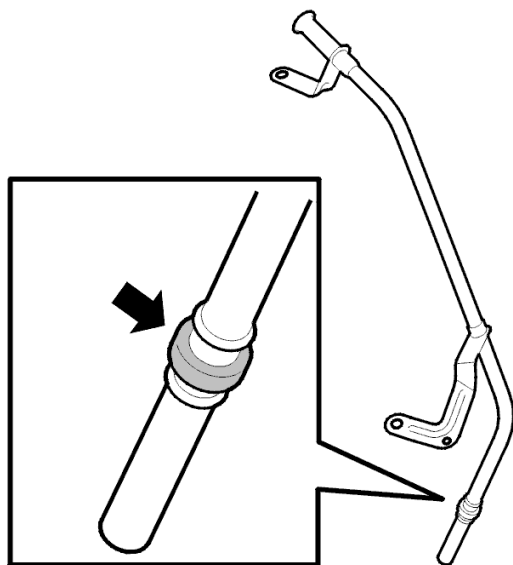


Installing the dip stick pipe in the transmission

Use a new rubber seal

Apply petroleum jelly on the rubber seal.

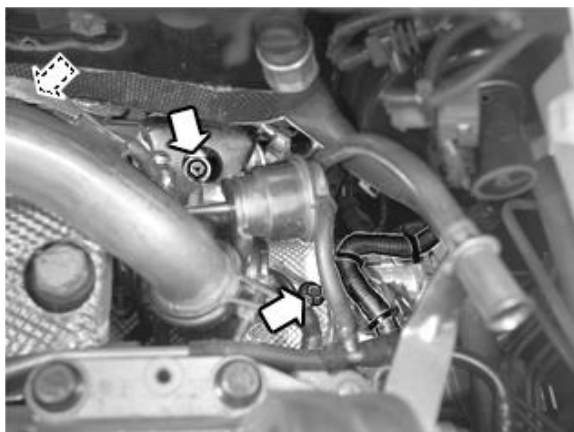
Note! Carefully check that the rubber seal is correctly positioned in the transmission. Failure to do so may result in leakage.



Installing engine compartment components

Install:

- the screw for the splash guard. Tighten to **25 Nm**
- the engine pad. Tighten to **50 Nm**
- the turbo pipe to the turbocharger (TC). Tighten the clamp
- the lower screw for the oil pipe. Tighten to **25 Nm**
- the upper screw for the oil pipe
- the connector
- the tie strap around the electrical wiring.



Installing the hose for the heater pipe

Install the hose on the heater pipe in the firewall.

Press the radiator hose quick-release connector into place on the heater pipe.

Check: Pull the hose.



Installing the gear selector cable on the transmission and lever

Install:

- the ball joint for the gear selector cable on the lever
- the gear selector cable in the bracket
- the connector for the transmission. Press the connector into place properly

Caution! It is important that the connector is pushed into place properly. If it is not correctly connected the gear shift function may stop.

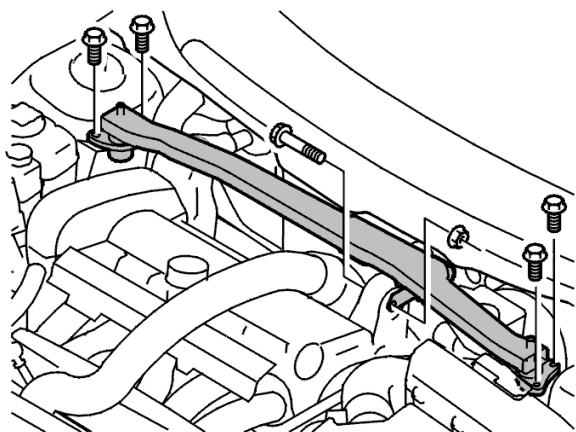
- the connector for the ABS unit.



Installing the upper torque rod

Install:

- the engine stabilizer brace. Tighten the mounting screws. Tighten to **50 Nm**
- the screw and a new nut for the engine mounting. Tighten to **80 Nm**
- the plastic guard over the spring strut (if applicable). Tighten the screws.



Installing engine compartment components

Install the integrated relay / fusebox. See [Brake pipe master cylinder / ABS unit, replacing](#) .

Installing the air cleaner (ACL) housing

Install the air cleaner (ACL) housing. See [Brake pipe master cylinder / ABS unit, replacing](#) .

Finishing work

Filling the transmission with fluid

Note! Oil grade: Only ATF fluid Dexron III (with G-license).

Transmission oil, Volvo P/N 116 1521-8 (1 liter container), 116 1621-6 (4 liter container).

Note! Filling with oil: Start by filling with 5.5 liters of oil.

Filling with transmission oil. There are 2 different methods. Method 1



Note! Filling with oil: Start by filling with 5.5 liters of oil.

Fill the transmission with oil. Use a funnel with a plastic hose. Fill through the dipstick pipe.

Clear up any oil spillage under the dip stick pipe.

Filling with transmission oil. Method 2

Note! Filling with oil: Start by filling with 5.5 liters of oil.

Use a converted five liter plastic can (see the illustration).

This method avoids oil spillage. It also provides a more regular flow when filling.

To check the oil level, see [Oil level, checking](#) .

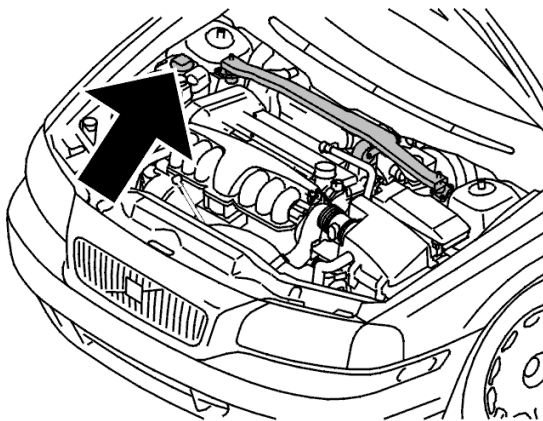
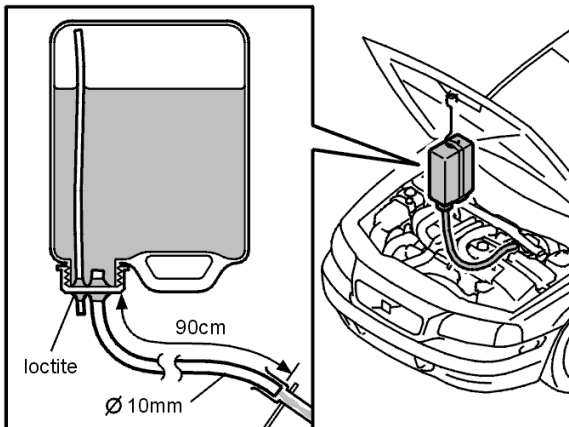
Note! After replacing the transmission, the transmission adaptation and the "Transmission oil change" counters must be reset. Use VIDA vehicle communication to set the adaptation and counters to zero.

Check the coolant level in the expansion tank

Top up with water and coolant as necessary (when the engine is at operating temperature).

Raise the vehicle.

Check that there is no oil leakage at the transmission or at the dip stick.



Installing the splash guards and the fender liner

Install:

- The ABS-cable on the mounting
- the splash guard under the engine
- the front splash guard
- the nut for the left fender liner
- the wheels. See [Installing wheels](#) .

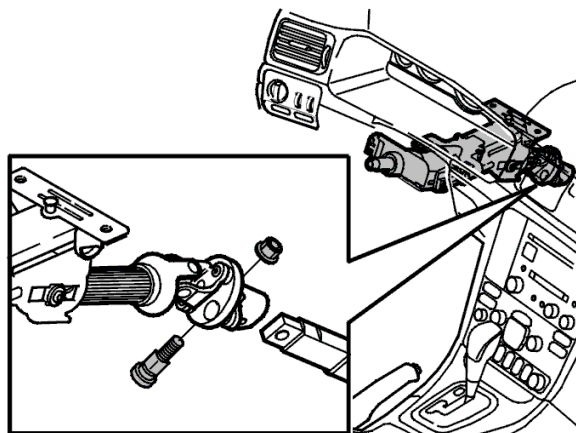


Lower the vehicle

Assembling the upper and lower steering shaft

- Pull the upper steering shaft down. Assemble the upper steering shaft with the lower steering shaft
- Install the screw and the nut. Tighten to **30 Nm**.

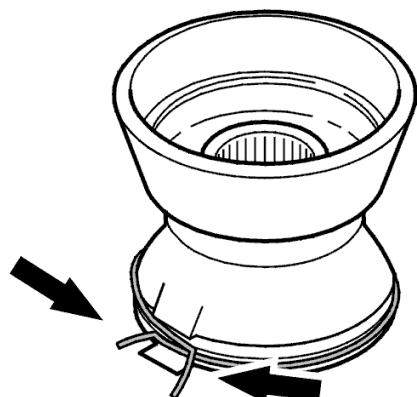
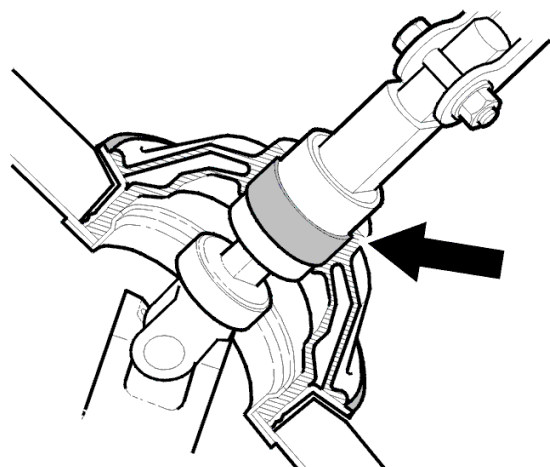
Note! Use a new screw and nut.



Checking the steering gear bearing in the boot at the firewall

Check that the steering gear bearing in the boot has not detached from the boot.

If it has become detached apply a little grease to the edge of the boot (around the hole). Press the bearing back down into the boot. See arrow in illustration.



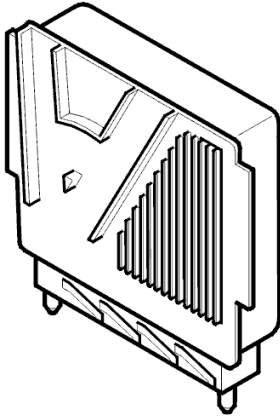
Note! Check that the rubber boot is positioned correctly in the bodywork (see the arrows). Adjust if necessary. Lift up the outer section of the rubber boot. There is a risk that noise from the transmission or engine and road noise may enter the passenger compartment.

Installing the battery lead

See [Note when disconnecting/connecting the battery lead](#) . It is essential that the instructions are followed.

Programming the transmission control module (TCM)

After replacing the transmission the latest software must be programmed into the control module. See the **technical journal** for information about the most recent software.



Test driving the vehicle

To test drive the vehicle, see [Test Drive Form, description](#) .

Note! When changing the transmission fluid, the “Transmission oil change” counter must be reset. Use VIDA vehicle communication to reset the counter.

Note! After replacing the transmission, the “Transmission oil change” adaptation must be reset. Use VIDA vehicle communication to reset the adaptation.