17-1

Lubrication system components, removing and installing

Notes:

- *If large quantities of metal particles or other deposits (caused, for example, by partial seizure of the crankshaft or connecting rod bearings) are found in the engine oil when performing repairs, clean the oil passages thoroughly and replace the oil cooler in order to prevent further damage from occurring later.*

- *Always replace O-rings, gaskets and oil seals when performing repairs.*

- *The oil level must not be above the max. mark - otherwise this can cause damage to the catalytic converter. Markings* ⇒ *Page 17-67*

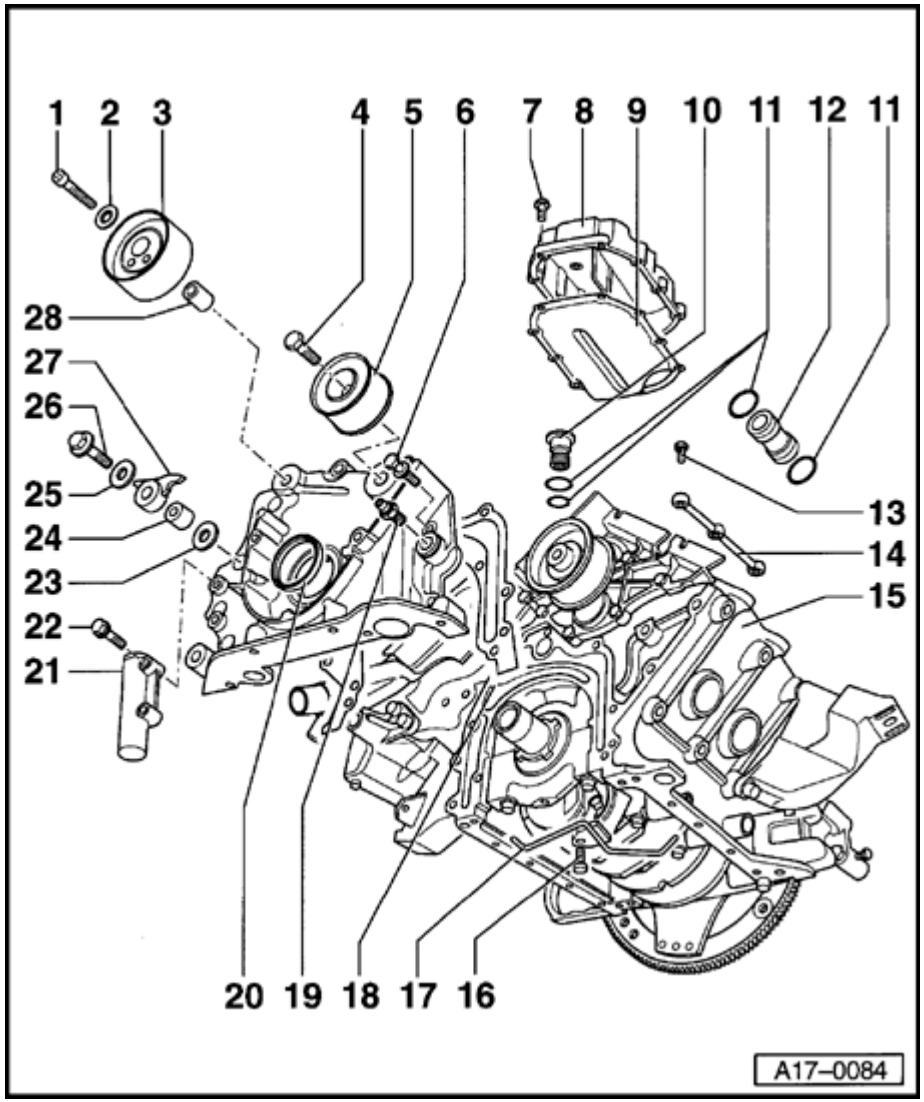
Viscosity grades and oil specifications

⇒ *Repair Manual, Maintenance*

Oil capacities

⇒ *Repair Manual, Maintenance*

Checking oil pressure ⇒ Page 17-65



Crankcase breather and oil spray jets, removing and installing

Removing and installing oil pump, oil pan, oil filter and oil cooler ⇒ Page 17-32

1 - Bolt, tightening torque: 20 Nm

2 - Washer

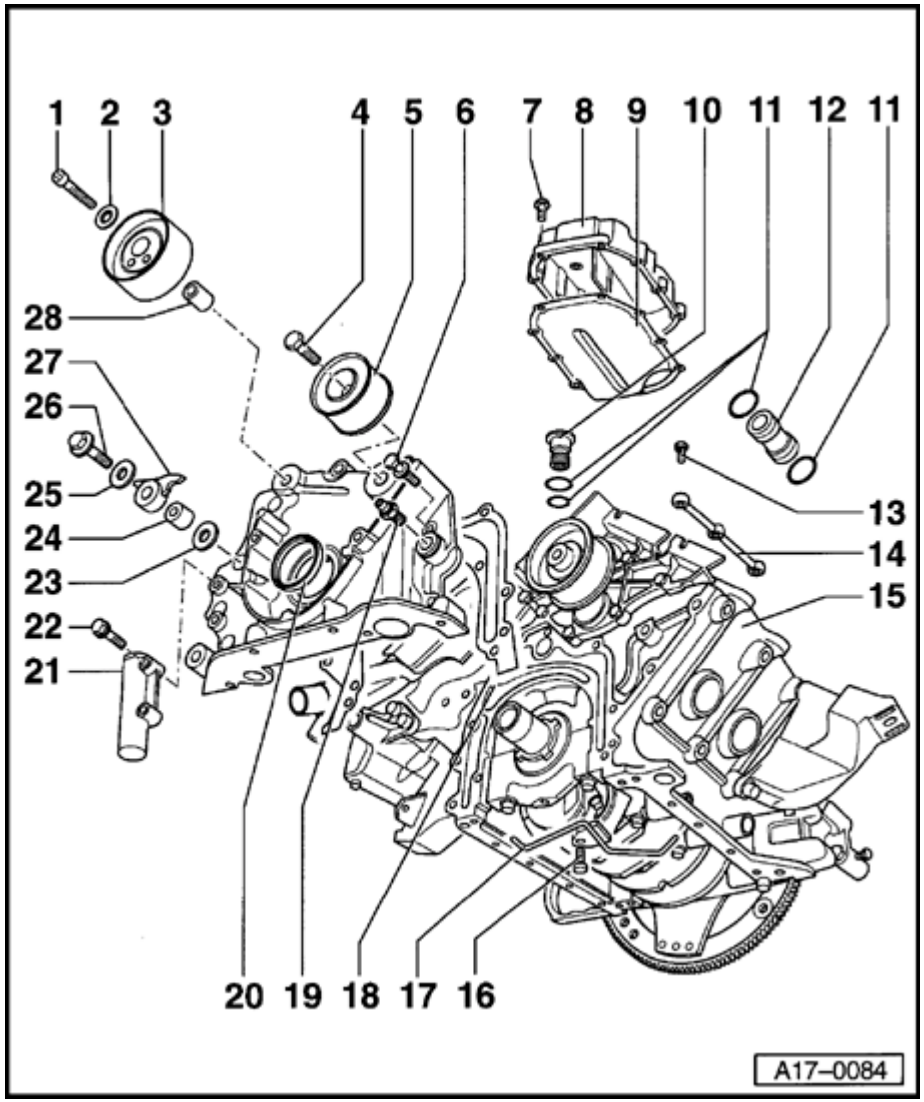
3 - Tensioning roller

4 - Bolt, tightening torque: 45 Nm

5 - Idler wheel

- For toothed belt

17-3



6 - Bolt

- M6 Tightening torque: 10 Nm
- M8 Tightening torque: 20 Nm

7 - Bolt, tightening torque 10 Nm

8 - Breather housing

9 - Gasket/breather plate

- Always replace

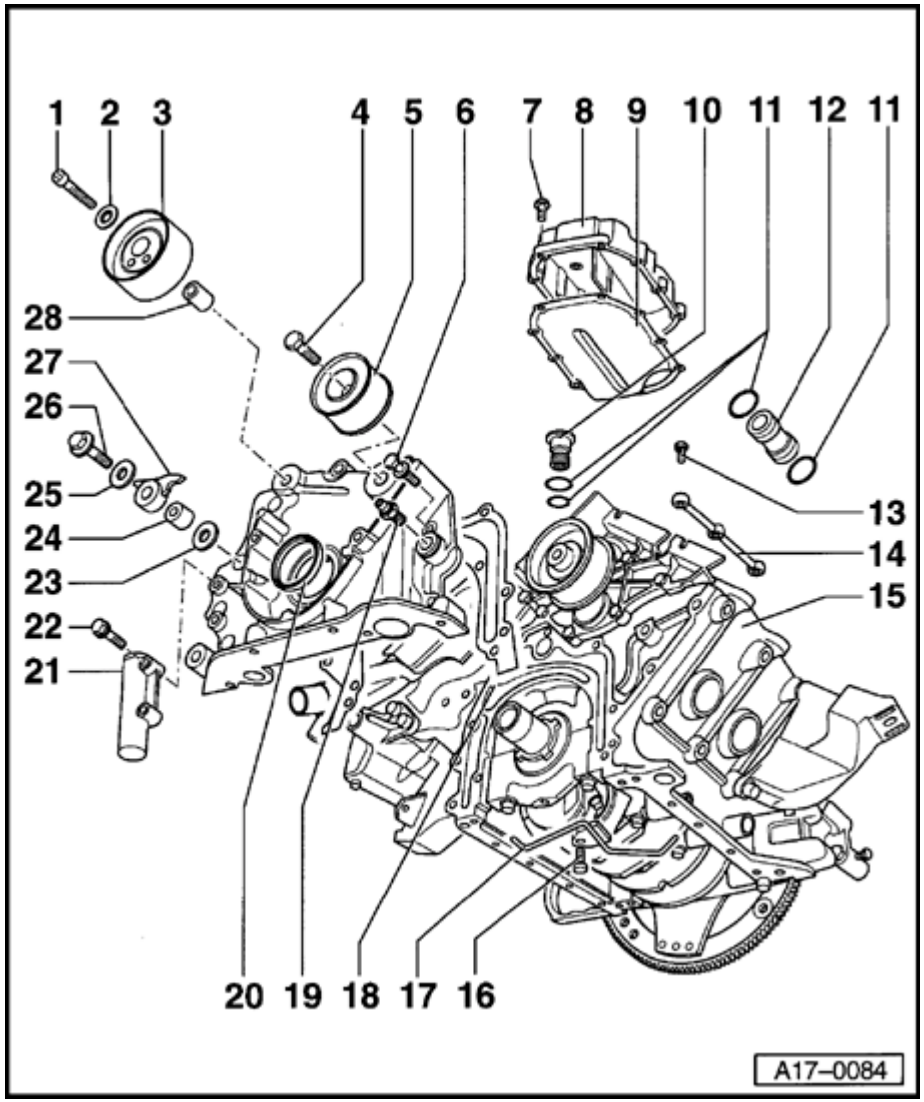
10 - Oil check valve

- Tightening torque: 25 Nm

11 - Oil seal

12 - Connector

17-4



13 - Banjo bolt

- Tightening torque: 15 Nm

14 - Oil distribution line

- For oil spray jets for piston cooling

15 - Cylinder block

16 - Bolt, tightening torque 10 Nm

- Apply locking fluid D6 when installing

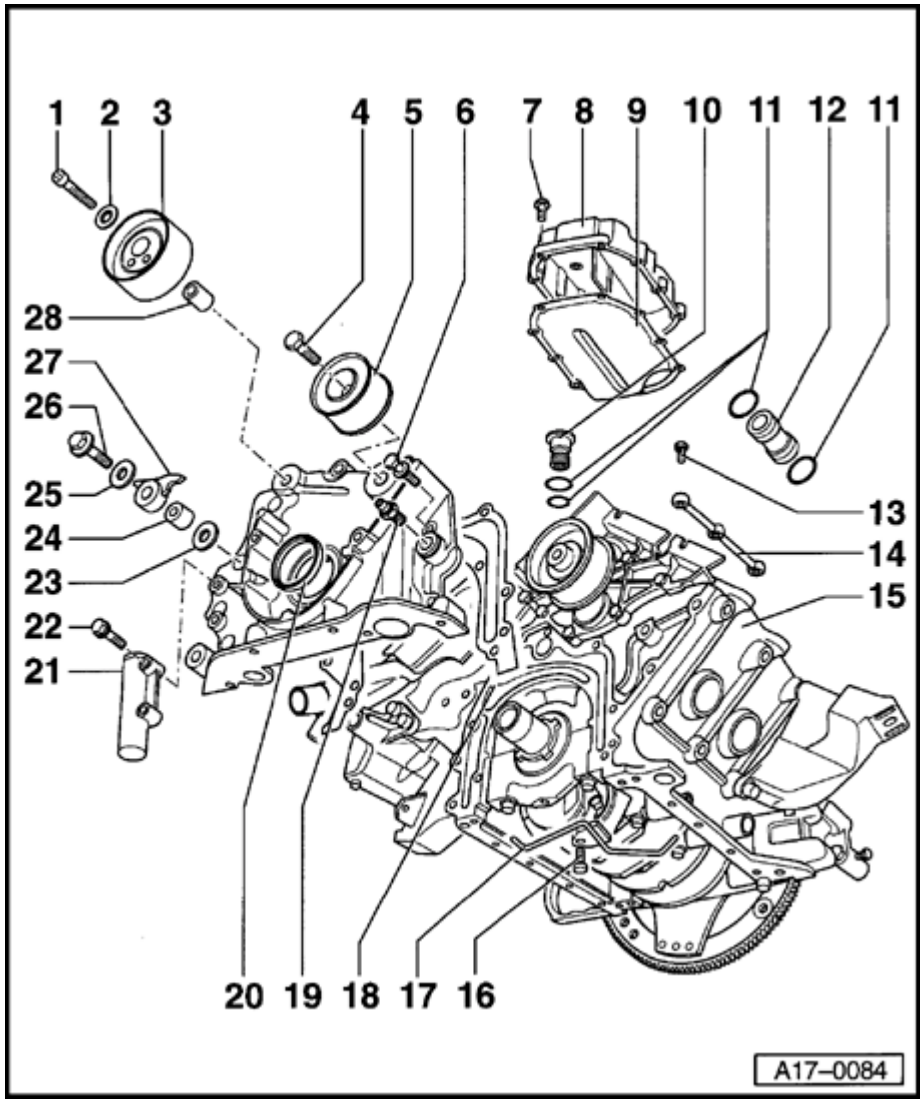
17 - Oil spray jet

- For piston cooling

18 - Gasket

- Metal gasket
- Always replace

17-5



19 - Oil temperature sender (-G8-), tightening torque 10 Nm

- For oil temperature gauge
- White
- If seal is leaking, cut open with pliers and replace.

20 - Oil seal

- Replacing ⇒ Page 15-10

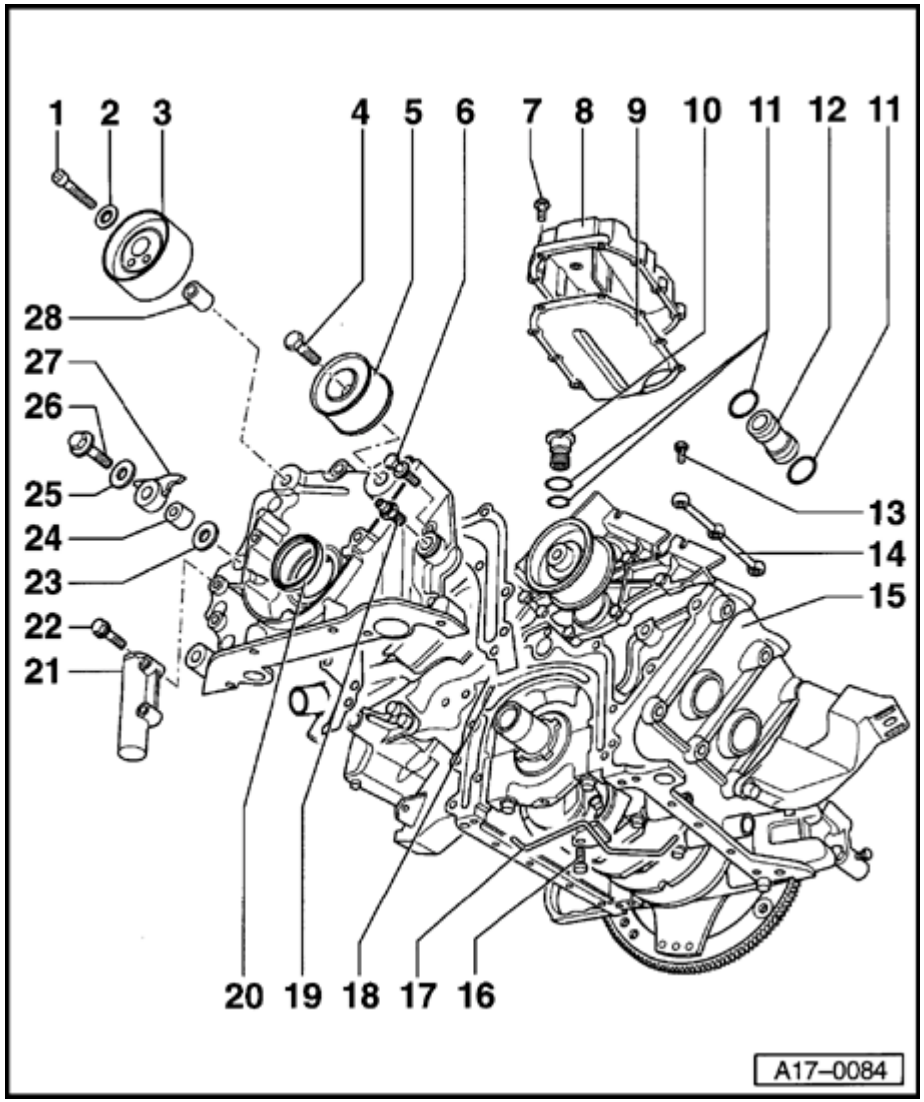
21 - Tensioner

- Secure in position before removing ⇒ Fig. ⇒ 1

22 - Bolt, tightening torque: 10 Nm

- Apply locking fluid D6 when installing

17-6



23 - Washer

24 - Bearing bush

- For tensioning lever

25 - Washer

26 - Bolt, tightening torque: 25 Nm

27 - Tensioning lever

28 - Bearing bush

- For tensioning roller

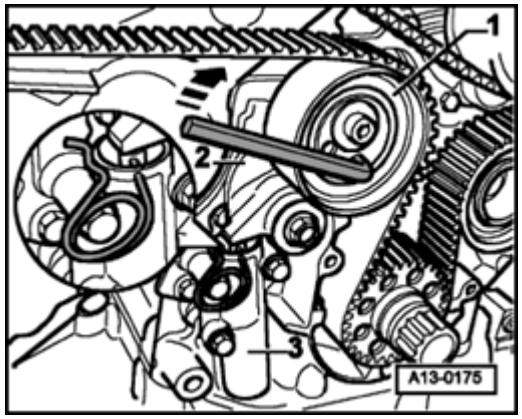


Fig. 1 Securing tensioner in position before removing

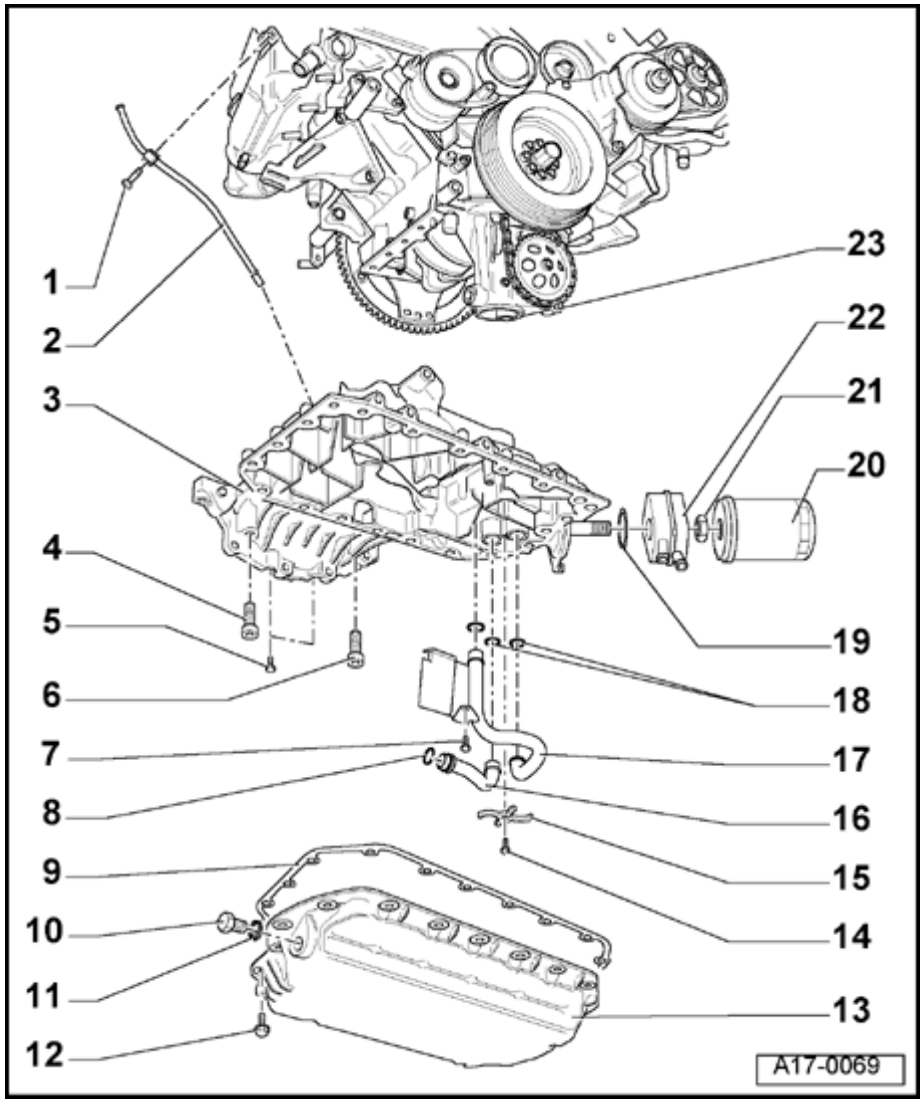
- Using a hex key, turn toothed belt tensioning roller -1- clockwise 8 mm in direction of arrow until tensioning lever -2- compresses tensioner -3- far enough to enable a 2 mm dia. spring pin to be inserted in drilling and in plunger.

Notes:

- *The toothed belt tensioner is oil-damped and can only be compressed slowly by applying gradual pressure.*
- *Use spring pin from 2024 A.*

- Insert spring pin and release toothed belt tensioning roller.

17-8



Oil pump, oil pan, oil filter and oil cooler, removing and installing

1 - Bolt for dipstick guide tube

- Tightening torque: 25 Nm

2 - Dipstick guide tube

- Replace O-ring

3 - Oil pan - upper section

- There is no gasket between engine block and upper section of pan. Only use silicone sealant D 454 300 A2.

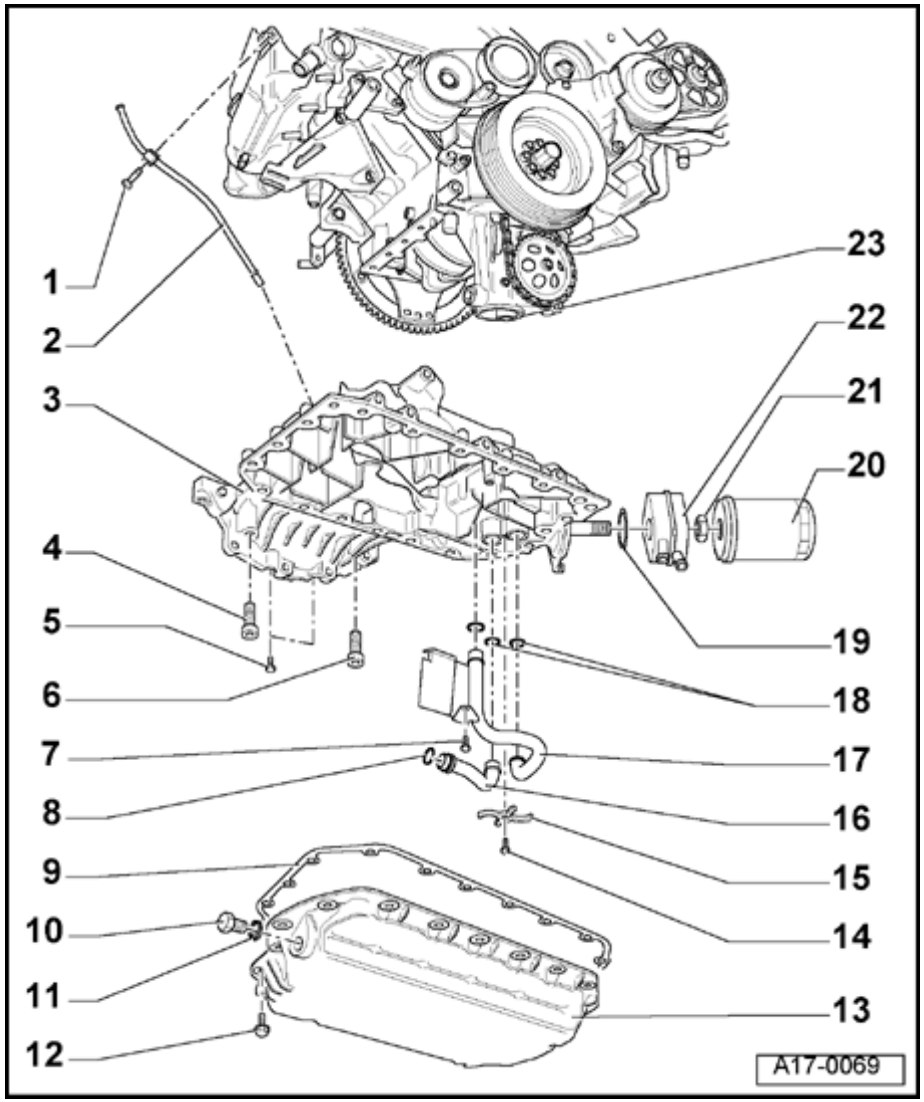
4 - Hex socket head bolt M8

- Tightening torque: 20 Nm

5 - Hex bolt M6

- Tightening torque: 15 Nm

17-9



6 - Hex socket head bolt M8

- Tightening torque: 20 Nm
- The coolant drain screw is next to this bolt

7 - Hex bolt M6

- Tightening torque: 10 Nm

8 - O-ring

- Always replace

9 - Gasket for lower section of pan

- Sealing surfaces should be clean and dry

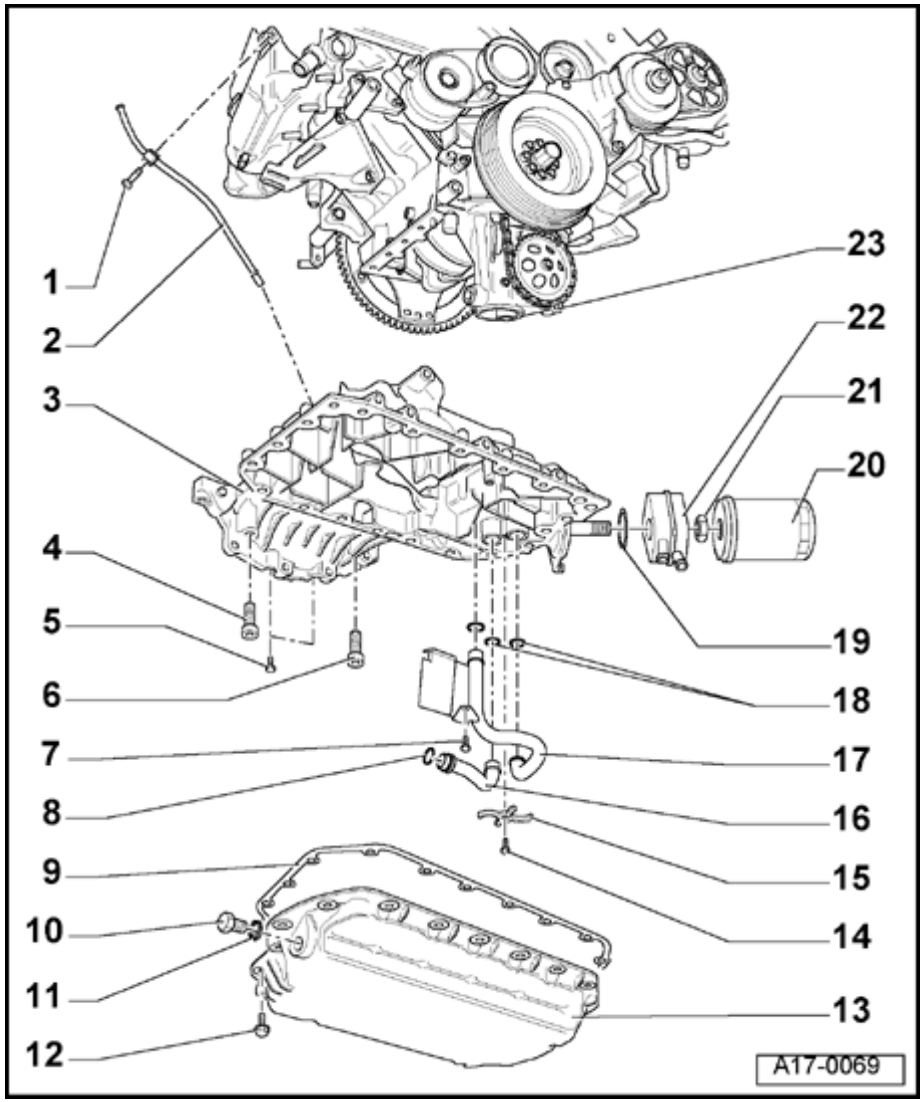
10 - Oil drain plug

- Tightening torque: 30 Nm

11 - Seal for oil drain plug

- Always replace

17-10



12 - Hex bolt M6

- Tightening torque: 10 Nm

13 - Oil pan - lower section

14 - Hex bolt M6

- Tightening torque: 10 Nm

15 - Retainer for oil lines

16 - Oil supply line

- From pump to oil filter

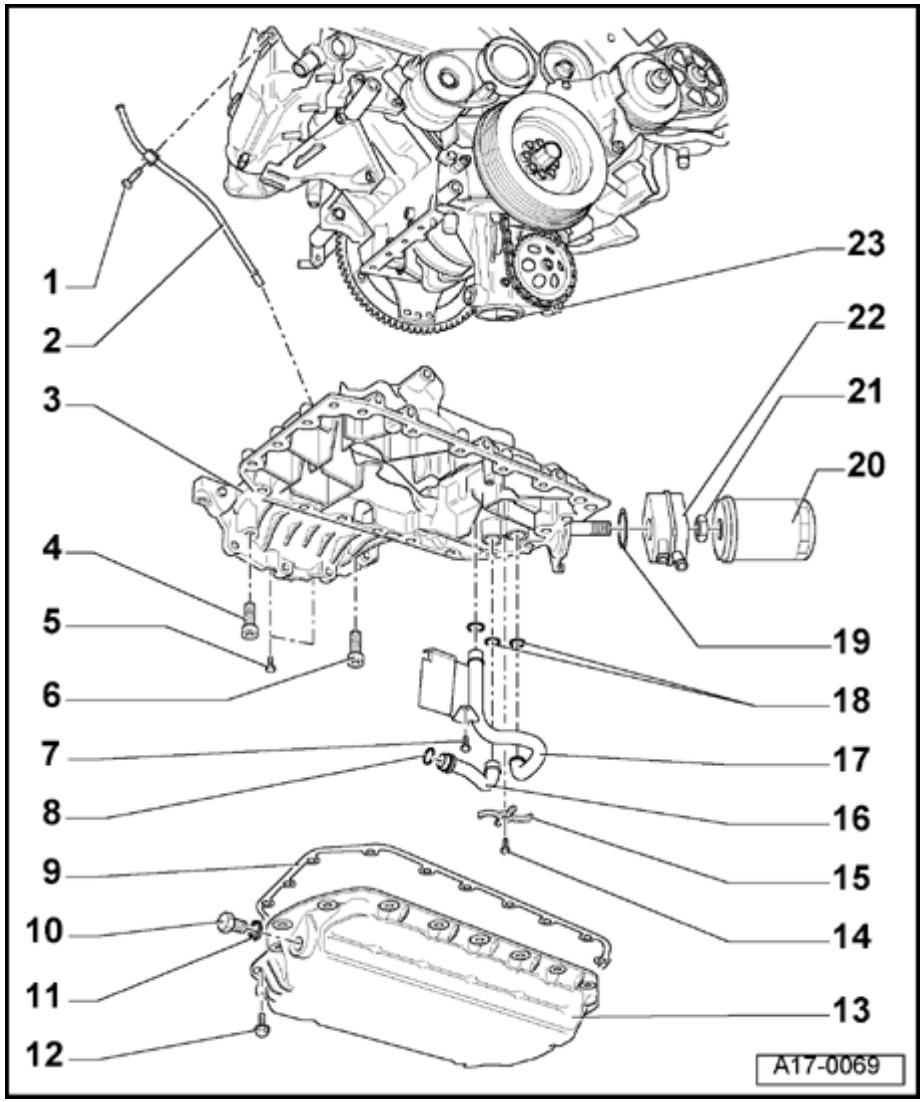
17 - Oil supply line

- From oil filter to engine oil system

18 - O-ring

- Always replace

17-11



19 - O-ring

- Always replace

20 - Oil filter

21 - Hex nut

- Tightening torque: 30 Nm
- Threaded line for oil cooler and oil filter is screwed into upper section of pan with 20 Nm tightening torque.

22 - Oil cooler

- Ensure O-ring is installed correctly when installing

23 - Oil pump

- Driven off crankshaft via chain
- Tightening torque of chain sprocket to oil pump: 25 Nm
- Tightening torque of oil pump to engine block: 25 Nm

17-12

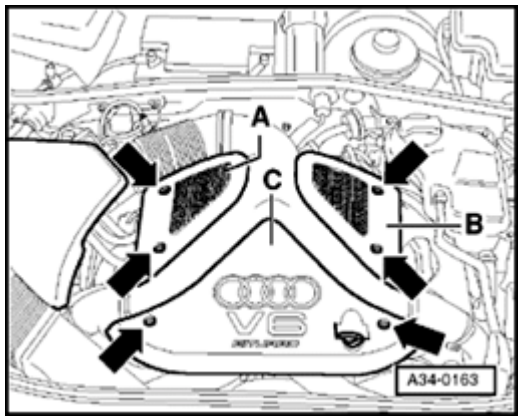
Oil check valves, replacing

Note:

If irregular valve noise occurs repeatedly during short journeys and disappears after extended driving, the oil check valves must be replaced.

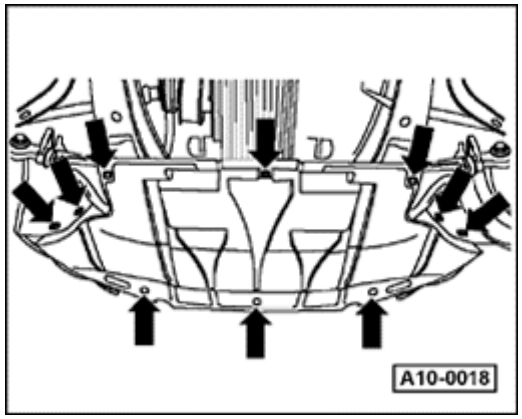
- *All cable ties which are released or cut open when removing the engine must be replaced in the same position when installing the engine.*
- *Catch drained-off coolant in a clean container for re-use or disposal.*
- *Replace all gaskets and seals.*

Removing



- Remove bolts -arrows- and remove engine cover panels -A...C-.
- Remove cover above air cleaner.

17-13

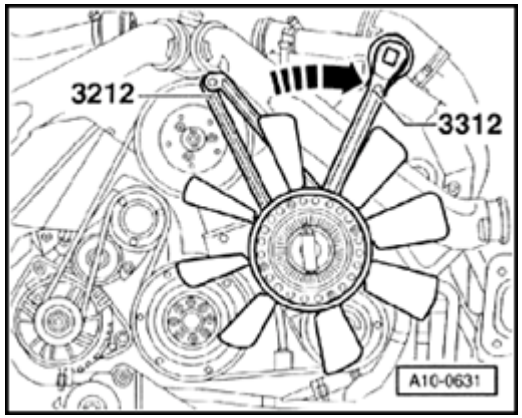


- Remove noise insulation -arrows-.
- Drain coolant ⇒ Page 19-19
- Remove bumper

⇒ *Repair Manual, Body Exterior, Repair Group 63*

- Move lock carrier to service position

⇒ *Repair Manual, Body Exterior, Repair Group 50*

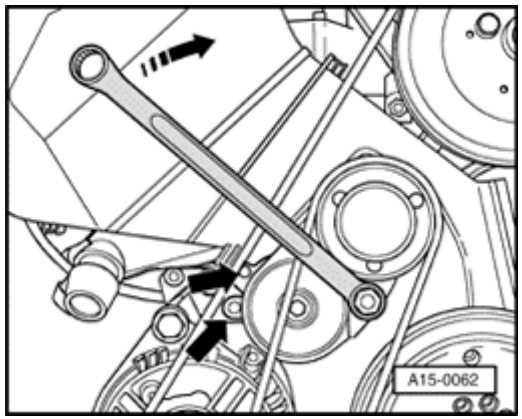


- Remove viscous fan (counter-hold with pin wrench 3212).

Note:

Viscous fan has left-hand thread.

- Mark direction of rotation of ribbed belt.

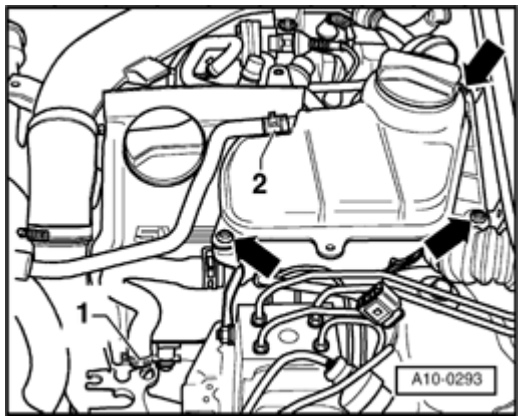


- To slacken ribbed belt, turn to the right using a 17 mm ring spanner until the two holes are aligned with each other -arrow- and hold in position with mandrel 3204.

Note:

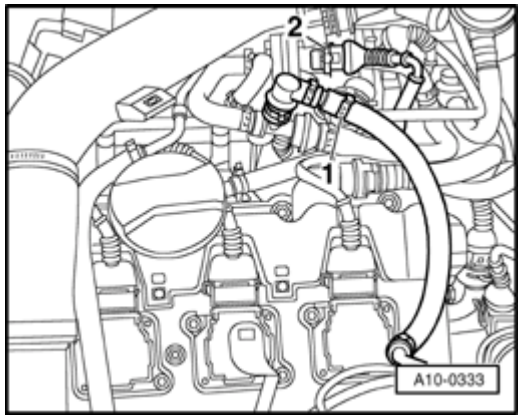
Mark direction of rotation of ribbed belt. The belt can break if it runs in the opposite direction when reinstalled.

- Take off ribbed belt.

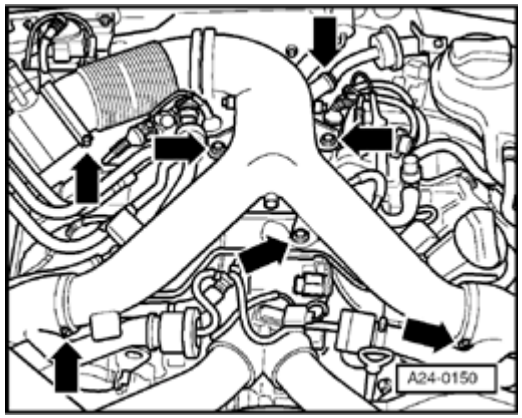


- Disconnect water hoses -1- and -2-.
- Remove coolant reservoir (arrows).
- Disconnect connector for coolant level monitor.
- Remove cover panel from cylinder head cover (cylinder bank 4-6).

17-15



- Pull off hose -1- going to vacuum reservoir.

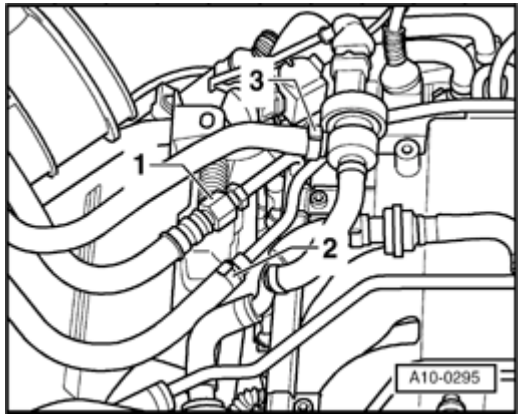


- Remove air duct -arrows-.

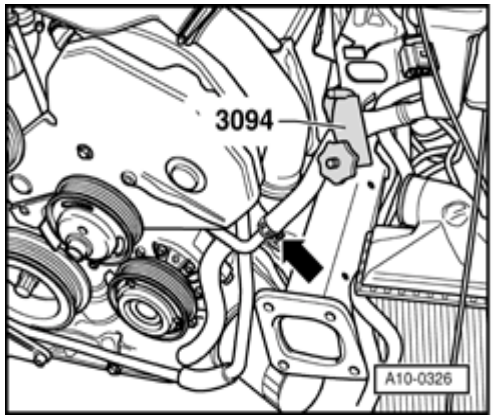
17-16

WARNING!

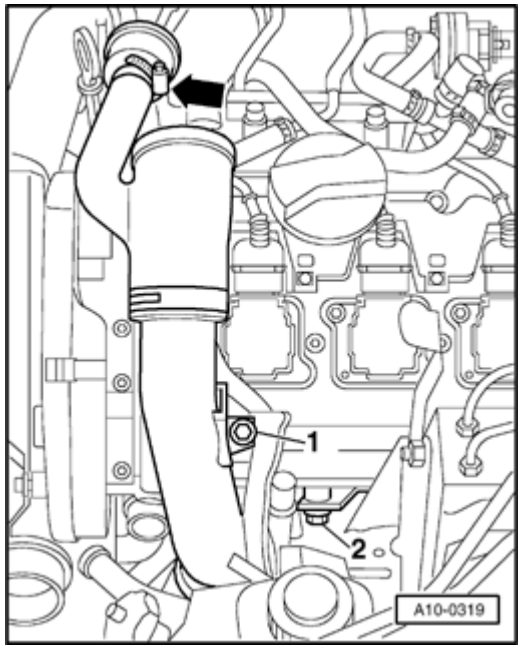
Fuel system is under pressure. Before opening the system, place a cloth around the connection. Then release pressure by carefully loosening the connection.



- Disconnect fuel supply line and fuel return line -1- and -2-, and move fuel lines clear.
- Pull hose off EVAP valve -3-.



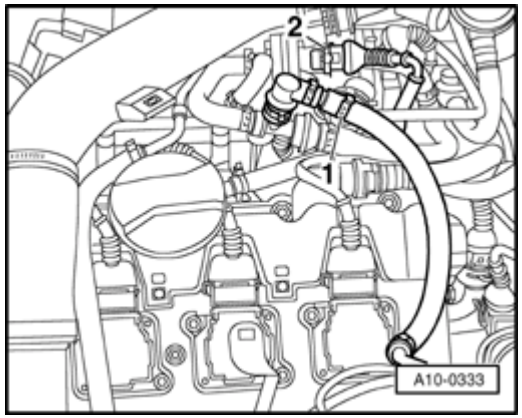
- install clamp (special tool 3094) on hose from power steering reservoir to power steering pump.
- Disconnect power steering hose -arrow-.



- Release hose clamp -arrow-.
- Remove intake line -1-.

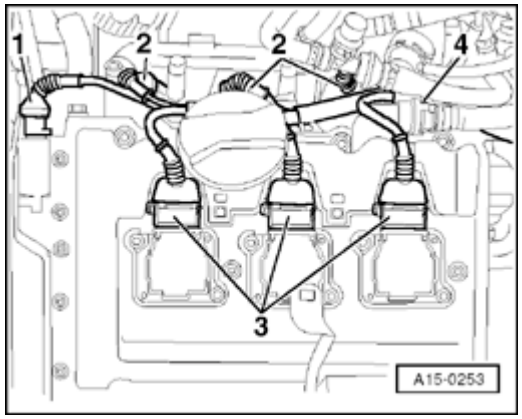
Notes:

- *All hose connections are secured with clips.*
- *Charge air system must be free of leaks.*
- *Replace all seals and gaskets.*

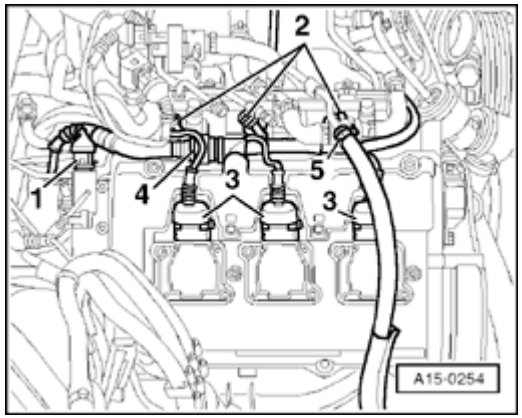


- Disconnect connector from air recirculation valve -2-.

17-18

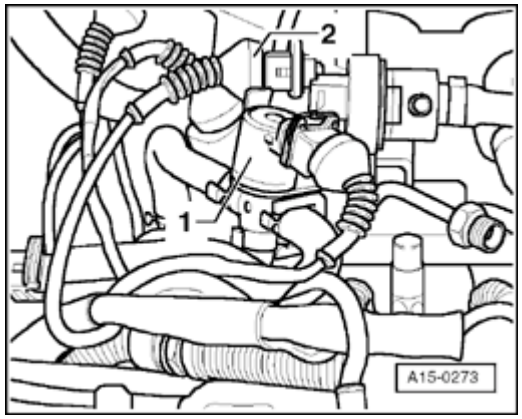


- Disconnect connector for camshaft timing control -1- (cylinder bank 4..6).
- Disconnect connectors from injectors -2- (cylinder bank 4..6).
- Pull crankcase breather -4- off cylinder head cover (cylinder bank 4..6).

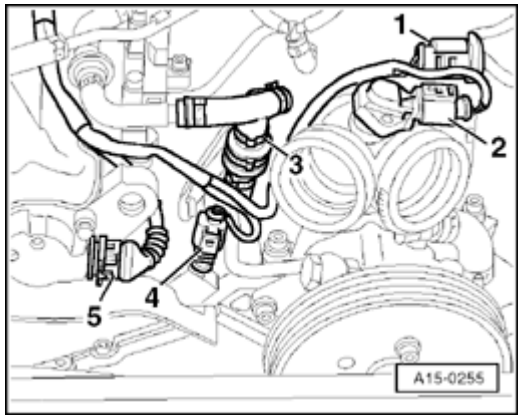


- Disconnect connectors from injectors -2- (cylinder bank 1..3).
- Pull off hose -5- going to turbocharger intake side.

17-19

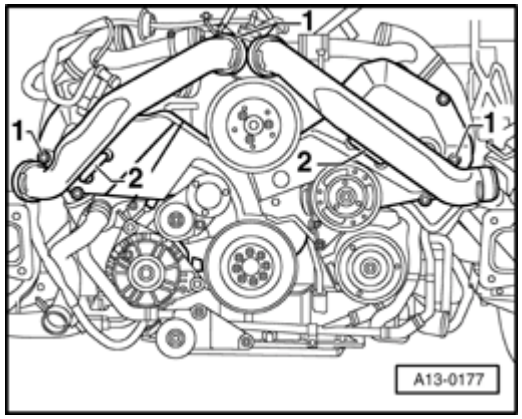


- Unclip solenoid valve for charge pressure control -1-.
- Pull connector off EVAP valve -2-.



- Pull connector off throttle unit -1-.
- Pull connector off charge air sensor -2-.
- Pull off crankcase breather -3-.
- Pull connector off intake air temperature sender -4-.

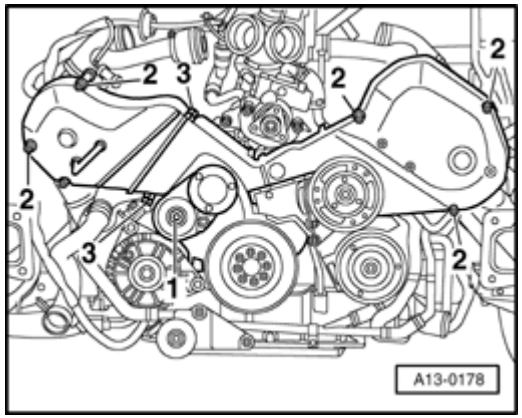
17-20



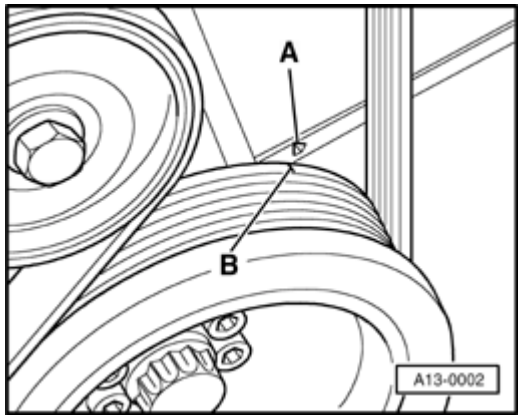
- Remove pressure lines -1-.

Note:

Watch position of retaining strips -2-.



- Remove tensioner -1- for ribbed belt.
- Remove toothed belt guards -2- (left and right).
- Remove toothed belt guard -3- (center).



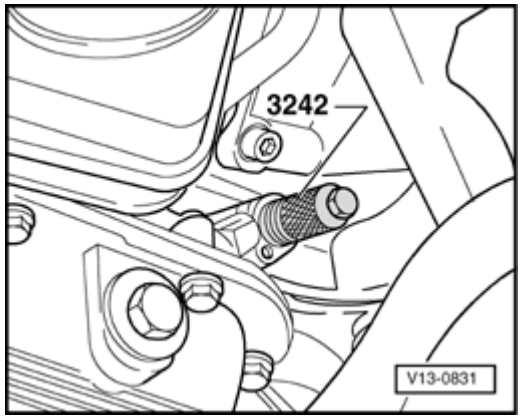
- Turn crankshaft to TDC by hand. Marks -A- and -B- must be aligned.

Note:

Turn over the engine at the central bolt on the crankshaft.

- Check position of camshafts: larger holes in securing plates on camshaft sprockets must align opposite one another on inside. If this is not the case, turn crankshaft one revolution further.
- Remove sealing plug from cylinder block, left.

  The TDC drilling in the crankshaft must be visible (or able to be felt) in line with the sealing plug hole.

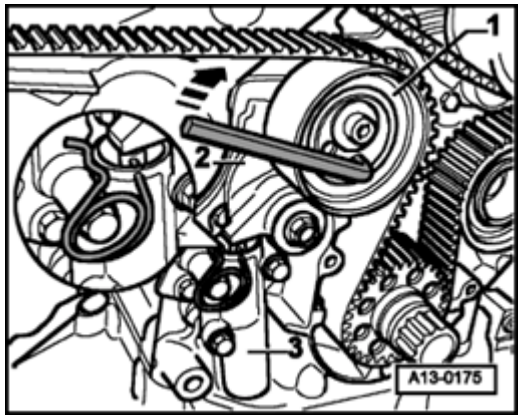


- Screw clamping bolt 3242 for crankshaft into sealing plug hole and tighten.

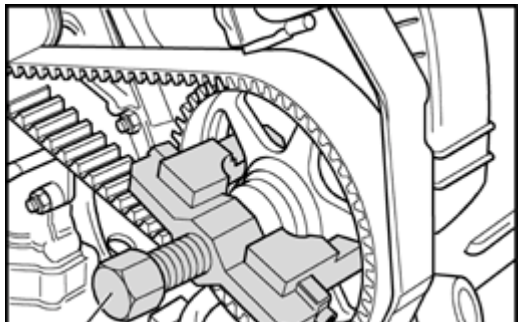
17-22

Notes:

- *Mark the direction of rotation of the toothed belt with chalk or felt pen before removing. A used belt can break if it rotates in the wrong direction when reinstalled.*
- *The toothed belt tensioning element is oil-damped and can therefore only be compressed slowly by applying constant pressure.*

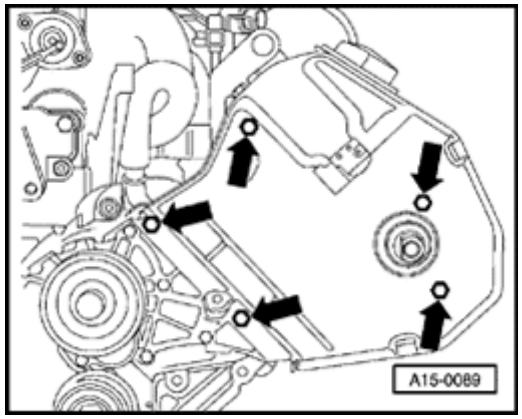


- Using a hex key, turn toothed belt tensioning roller -1- clockwise 8 mm in direction of arrow until tensioning lever -2- compresses tensioning element -3- sufficiently to enable special tool T 400 11 to be installed in drilling and in plunger.
- Insert special tool T 400 11 and release toothed belt tensioning roller.
- Insert camshaft clamp 3391 in the securing plates of the two camshafts.
- Loosen both camshaft bolts and remove approx. 5 turns.
- Take out camshaft clamp 3391.

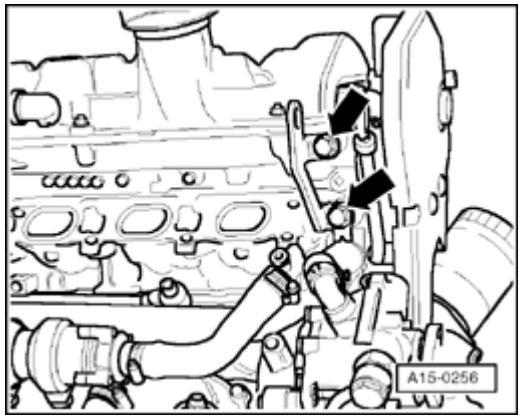


- Pull off both camshaft sprockets with special tool T40001.

17-23

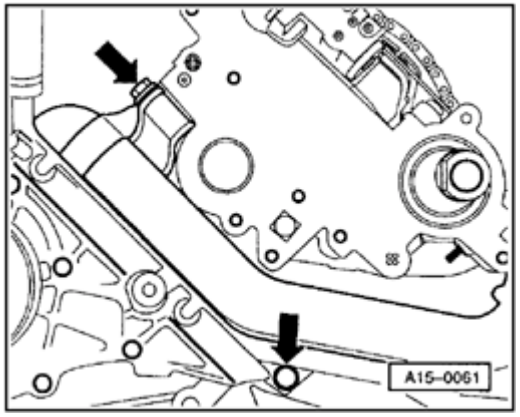


- Unbolt rear left toothed belt guard -arrows-.
- Detach intake manifold using special tool 3249.

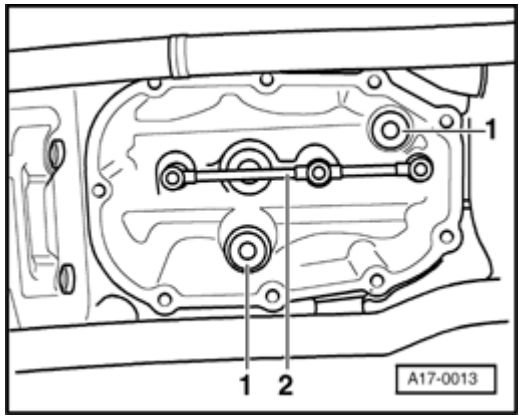


- Unbolt cylinder head lifting bracket with coolant line -arrows- from cylinder head.

17-24



- Unbolt coolant line at front of cylinder head -arrows- and remove.
- Remove water line and auxiliary water pump.
- Remove cover on oil check valves.



- Replace oil check valves -1- (25 Nm).

Note:

The oil distribution line -2- for the spray jets for piston cooling is also located in the opening.

17-25

Installing

Install in the opposite order to removing. When installing, note the following points:

- Install lock carrier

⇒ *Repair Manual, Body Exterior, Repair Group 50*

- Install bumper

⇒ *Repair Manual, Body Exterior, Repair Group 63*

- Fill with coolant ⇒ Page 19-19 .

Component		Nm
Bolts	M6	10
Bolts	M8	20
Toothed belt sprocket to camshaft		55
Intake manifold to cylinder head		10
Oil check valves		25

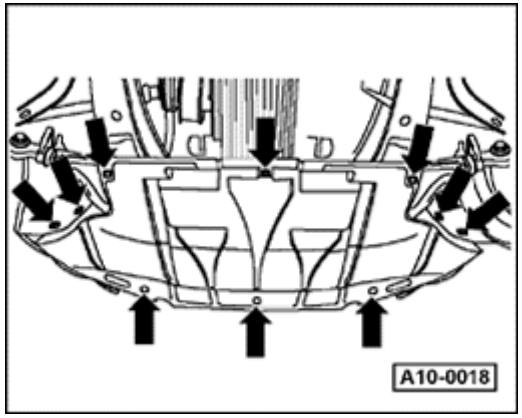
Cover for oil check valves	10

17-26

Lower section of oil pan, removing and installing

Special tools, testers and auxiliary items

- Drip tray VAG 1306



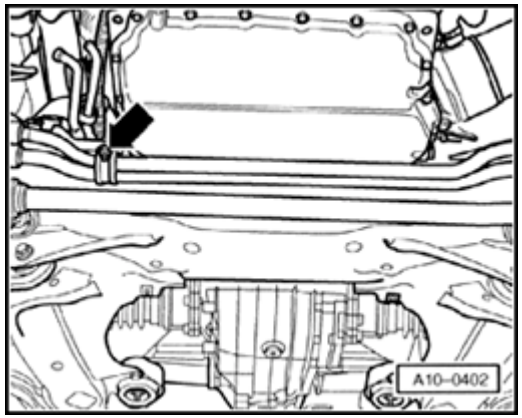
- Remove noise insulation panel -arrows-.
- Remove bumper.

⇒ *Repair Manual, Body Exterior, Repair Group 63*

- Move lock carrier to service position.

⇒ *Repair Manual, Body Exterior, Repair Group 50*

- Remove ribbed belt ⇒ Page 13-1 .

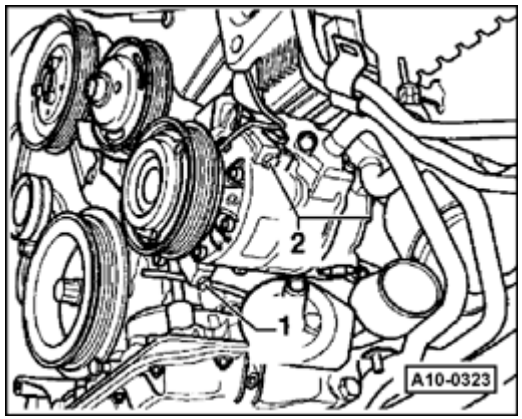


- Unbolt air conditioner lines from pan -arrow-.

17-27

WARNING!

Do not open air conditioner refrigerant circuit.



- Detach air conditioner compressor -1...2-.

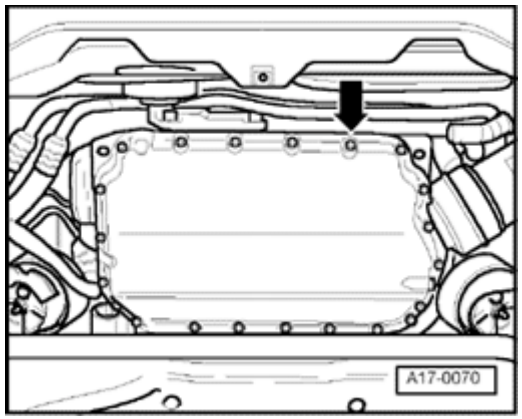
Notes:

- *Watch position of guide bushes when installing.*
- *When installing, insert bolt -1- in the compressor first.*
- *To prevent damage to the condenser and refrigerant lines/hoses, ensure that the lines and hoses are not stretched, kinked or bent.*

- Drain engine oil.

Note:

Use a separate container to collect the engine oil.



- Remove lower section of oil pan.

Installing

Install in the opposite order to removing. When installing, note the following points:

Note:

Do not use any adhesive or sealant.

- Clean sealing surfaces; ensure that they are free of oil and grease.

- Install new gasket on lower section of oil pan and install on upper section of oil pan with two diagonally opposite bolts.

- Tighten all securing bolts hand-tight.

- Tighten bolts to 10 Nm with torque wrench, working from center outward.

- install new seal on oil drain plug and tighten to 30 Nm.

17-29

- Fill engine with oil.

⇒ *Repair Manual, Maintenance*

- Install lock carrier in normal position.

⇒ *Repair Manual, Body Exterior, Repair Group 50*

- Install bumper.

⇒ *Repair Manual, Body Exterior, Repair Group 63*

17-30

Chain tensioner for oil pump, checking

The chain tensioner incorporates a leaf spring. To check the spring tension, the lower section of the oil pan must be removed.

- Remove bumper

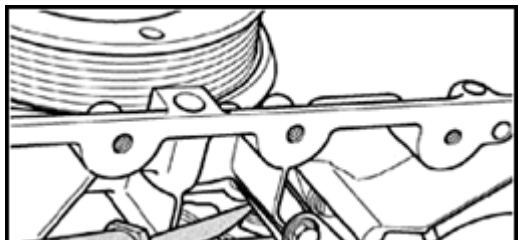
⇒ *Repair Manual, Body Exterior, Repair Group 63*

- Move lock carrier to service position.

⇒ *Repair Manual, Body Exterior, Repair Group 50*

- Remove ribbed belt ⇒ Page 13-1 .

- Remove lower section of oil pan ⇒ Page 17-26



- Insert a screwdriver between chain and chain tensioner and press screwdriver against chain tensioner.

If no spring tension can be felt and the chain is not being tensioned, this means the chain tensioner is malfunctioning and must be replaced.

To replace oil pump chain tensioner, remove front sealing flange ⇒ Page 17-55 .

17-31

Installing

Install in the opposite order to removing. When installing, note the following points:

- Fill up engine oil.

⇒ *Repair Manual, Maintenance*

- Install lock carrier in normal position.

⇒ *Repair Manual, Body Exterior, Repair Group 50*

- Install bumper.

⇒ *Repair Manual, Body Exterior, Repair Group 63*

17-32

Upper and lower sections of oil pan, removing and installing

Special tools, testers and equipment required

- Engine support bracket 10-222A with adapter 10-222A/3
- Drip tray VAG 1306
- Electric drill with plastic brush attachment
- Silicone sealant D 176 404 A2
- Torque wrench 10 Nm/ 45 Nm

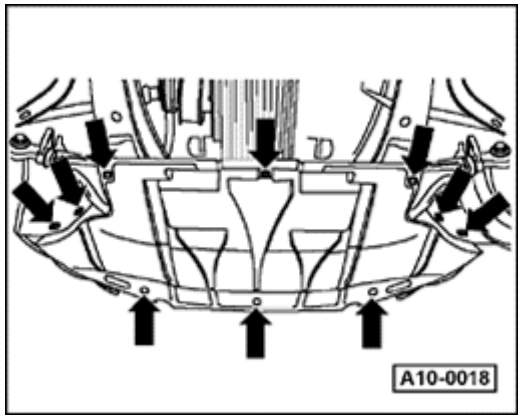
- Obtain radio theft code on vehicles with coded radio.

- With ignition switched off, disconnect battery Ground strap.

- Pull out dipstick.

17-33

- Unbolt dipstick guide tube at front of cylinder head (right side), and pull out of oil pan from the top.



- Remove noise insulation panel -arrows-.
- Remove bumper.

⇒ *Repair Manual, Body Exterior, Repair Group 63*

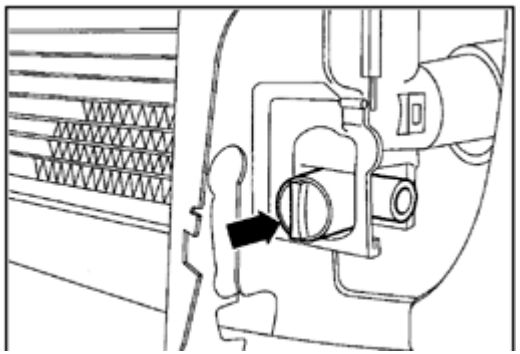
- Move lock carrier to service position.

⇒ *Repair Manual, Body Exterior, Repair Group 50*

WARNING!

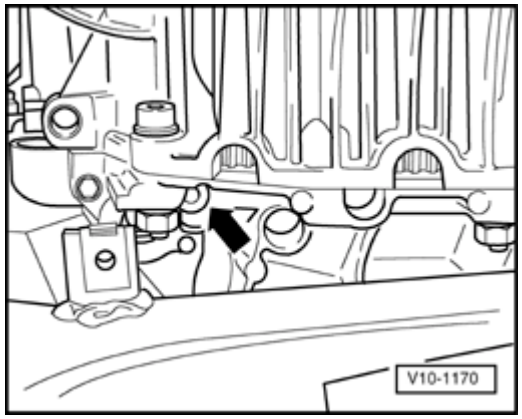
Hot steam can escape from the expansion tank when the filler cap is opened. Cover the filler cap with a cloth and remove it carefully.

- Remove cap on coolant expansion tank.
- Place drip tray VAG 1306 below engine.



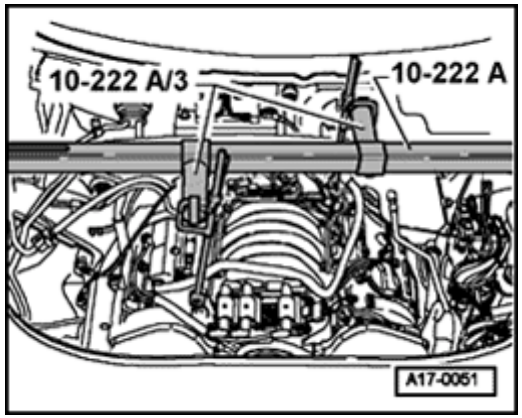
- Turn drain screw -arrow- on radiator anti-clockwise, if necessary install drain hose to connection.

17-34



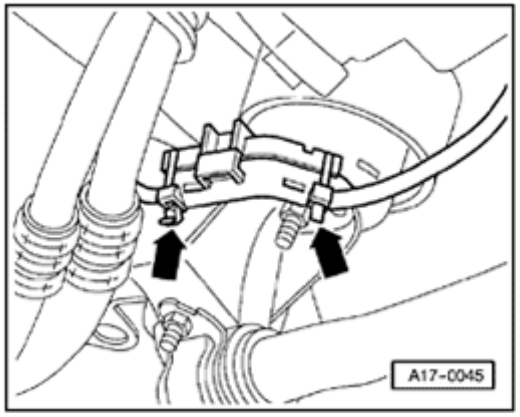
- Also open coolant drain screw -arrow- at rear right of oil pan.
- Draining off and filling up coolant ⇒ Page 19-19 .
- Drain off engine oil.

  Use a separate container to collect the engine oil.

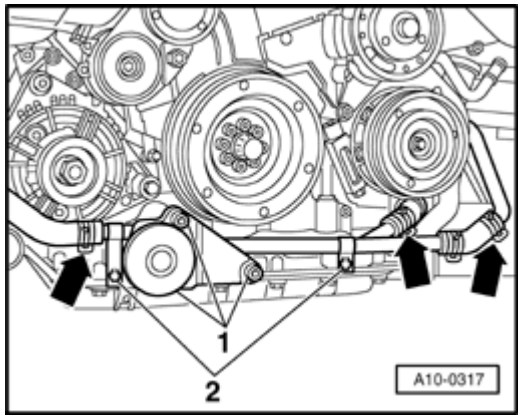


- Set up support bracket 10-222A with adapter 10-222A/3 on bolted flanges for wing panels.
- Attach support bracket to front and rear lifting eyes on engine.
- Raise engine as far as possible with spindles of support bracket.

17-35



- Cut open cable ties -arrows-, open retainer for starter cable and take out cable.
- Unbolt torque reaction support at front of oil pan.
- Unbolt coolant line from oil pan.
- Disconnect connector from oil pressure switch on left of oil pan.

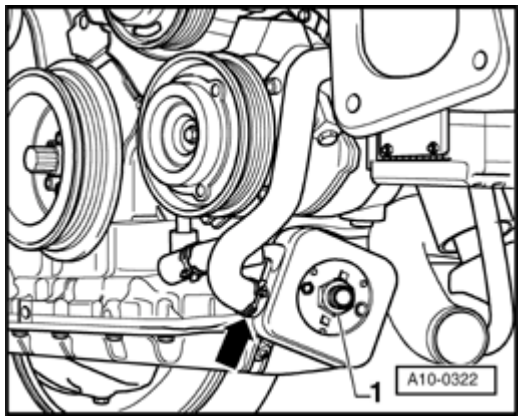


- Remove torque reaction support -1-.
- Release hose clamps -arrows-.
- Remove water line -2-.

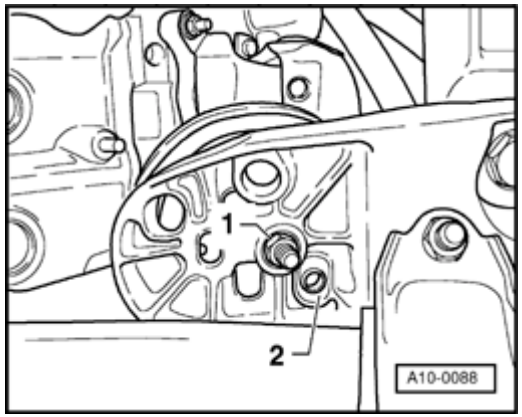
17-36

- Place drip tray VAG 1306 under engine.

- Remove oil filter.

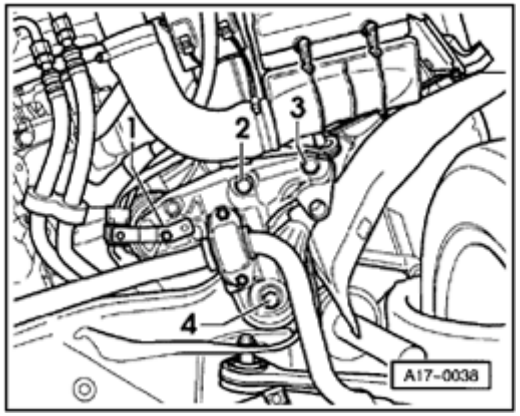


- Release hose clamps -arrows-.
- Remove oil cooler -1-.

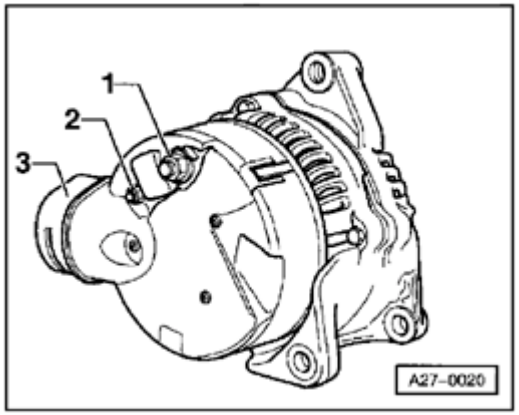


- Remove bottom nuts on engine mountings -1- (left and right sides).
- Mark positions of securing points -1- and locating sleeves -2- under engine mountings on left and right sides.

17-37

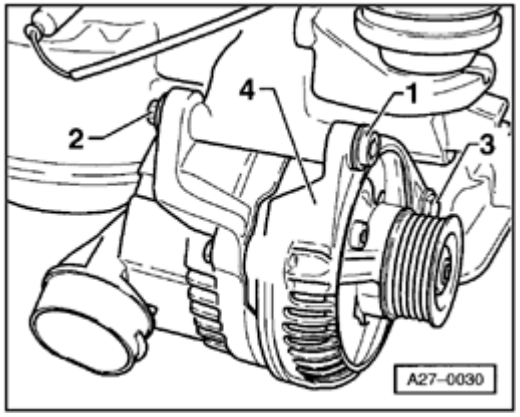


- First remove front subframe bolts -2- and -3- (left and right). Then remove bolts -4-.
- Move anti-roll bar downward.
- Remove charge air cooler -2- on right side (release hose connection at top, and 3 rubber mountings).

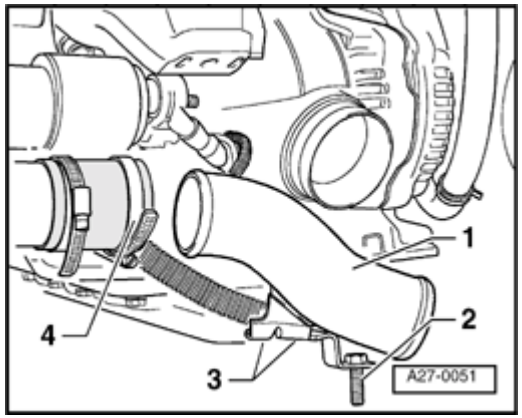


- Remove air duct from connector elbow on alternator -3-.
- Disconnect cable from terminal 30/B+ -1-. Tightening torque: 16 Nm
- Disconnect cable from terminal D+ -2-. Tightening torque: 4 Nm

17-38



- Remove hex socket head bolt -1- and securing nut -2-. Tightening torque: 45 Nm
- Loosen bolt -3-. Tightening torque: 22 Nm.
- Take out alternator -4- from below.



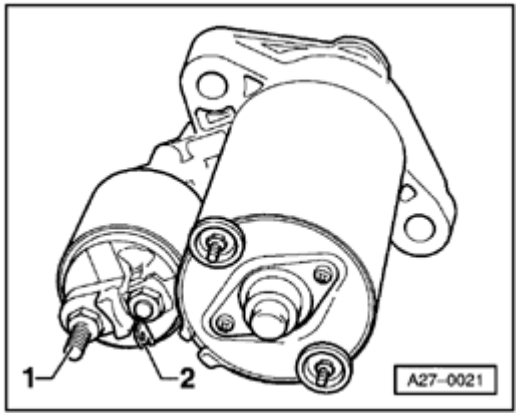
1 - Remove air line -1-.

2 - Mounting for oil line and air conditioner lines

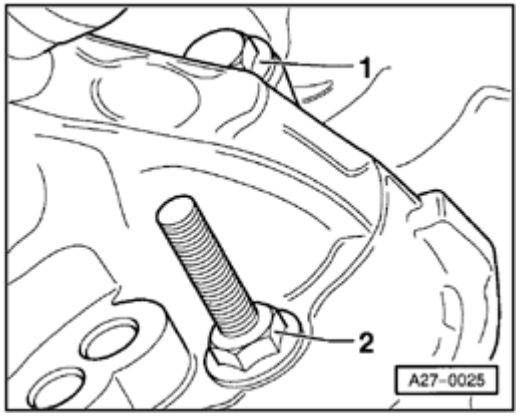
3 - Mounting on cylinder block

4 - Release hose clamp

17-39



- Disconnect cable from terminal 30/B+ -1-. Tightening torque: 16 Nm
- Disconnect connector for terminal 50 -2-.
- Remove right wheel

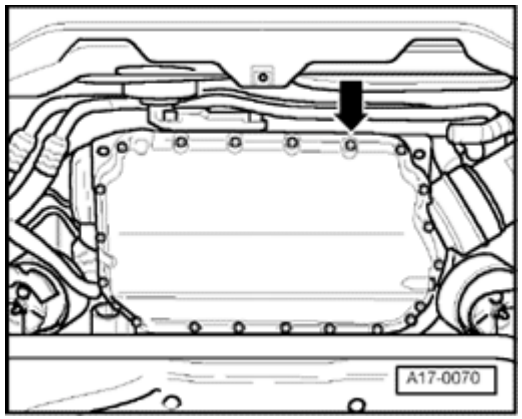


- remove top bolt -1- from right wheel housing. Tightening torque: 65 Nm
- Remove lower bolt (accessible from engine side). Tightening torque: 65 Nm
- Remove starter from front of vehicle.

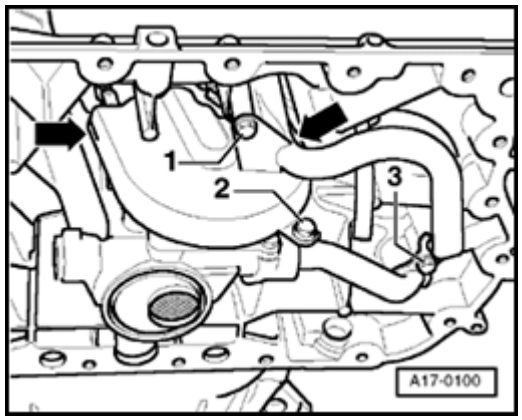
17-40

Note:

To avoid having to check and adjust wheel alignment, only loosen the front subframe mountings and lower the subframe at the front.



- Remove lower section of oil pan.
- Disconnect return lines for turbocharger from upper section of oil pan.

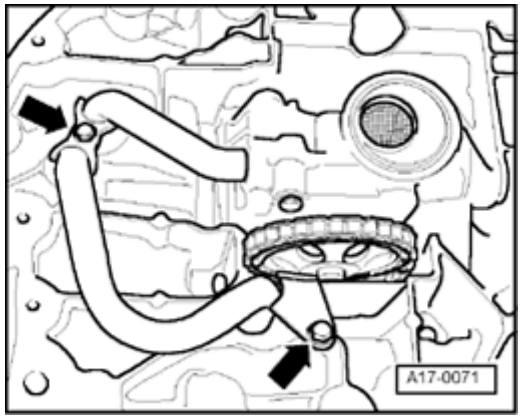


- Unbolt cover plate -2- for oil pump sprocket.

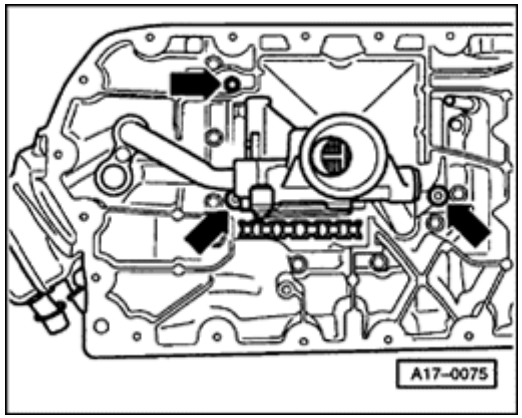
Notes:

- *When loosening bolt -2- securing cover plate, counter-hold at welded nut.*
- *When installing, make sure that the plate engages in position -arrows-.*

17-41



- Unbolt two oil supply lines, and pull longer of two lines downward to disconnect from upper section of oil pan.



- Unbolt oil pump from engine so that shorter oil supply line can be disconnected (do not remove oil pump).
- Remove bolts securing upper section of oil pan to transmission.
- Unbolt upper section of oil pan from engine.

Note:

Two M6 bolts and two M8 bolts are located vertically at rear of oil pan upper section (in front of joint between engine and transmission).

17-42

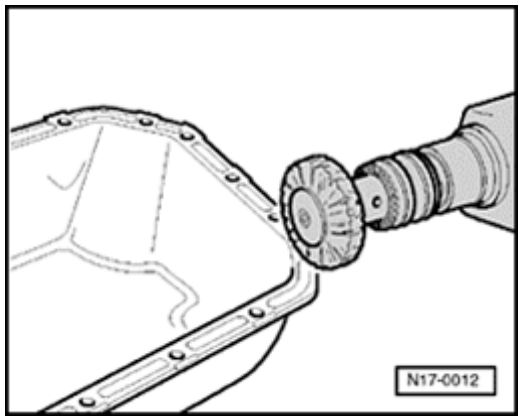
Installing:

Install in the opposite order to removing. When installing, note the following points:

- Clean sealing surfaces; ensure that they are free of oil and grease.

WARNING!

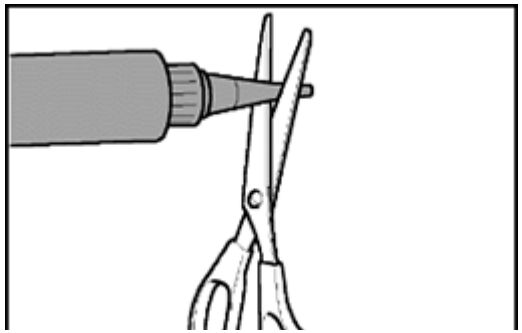
Wear protective goggles.



- Remove any residues of sealant on oil pan and engine block using plastic brush attachment, or similar.

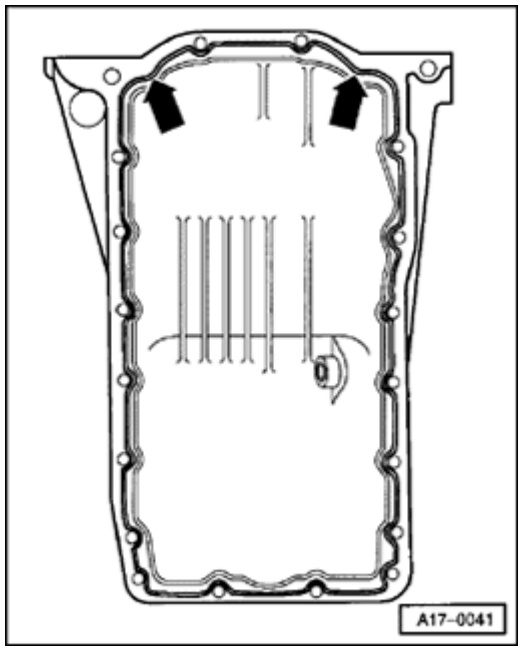
Note:

The oil pan must be installed within 5 minutes after applying silicone sealant D 454 300 A2.



- Cut off nozzle of tube at front marking (diameter of nozzle approx. 3 mm).
  - Thickness of sealant bead: 2 ... 3 mm

17-43



Note:

The bead of sealant must not be thicker than 3 mm, as otherwise excess sealant may enter the oil pan and block the strainer in the oil intake line.

- Make sure sealing surface is clean and then apply silicone sealant on sealing surface of oil pan, as shown in illustration. (Illustration shows position of sealant on cylinder block.)

Note:

Be particularly careful when applying the sealant around the rear sealing flange -arrows in illustration-.

- Locate oil pan in position immediately, and tighten all bolts securing oil pan to cylinder block to 5 Nm initially.
- Tighten bolts securing oil pan to transmission to 45 Nm.
- Tighten bolts securing oil pan to cylinder block in diagonal sequence in 2 stages; tighten to 10 Nm when tightening second time.
- Tighten M10 bolts securing oil pan to cylinder block to 45 Nm.

- Clean both sealing surfaces for lower section of oil pan; ensure that they are free of oil and grease.

Note:

Do not use any adhesive or sealant.

- Install new gasket on lower section of oil pan and install on upper section of oil pan with two diagonally opposite bolts.

- Tighten all securing bolts hand-tight.

- Tighten bolts to 10 Nm with torque wrench, working from center outward.

- Install new seal on oil drain plug and tighten to 30 Nm.

Notes:

- *When installing the upper section of the oil pan with the engine removed from the vehicle, ensure that the oil pan is positioned flush with the cylinder block at the flywheel end.*

- *The sealant must be left to dry for about 30 minutes after installing the oil pan before engine*

oil can be put in.

17-45

- Fill with coolant ⇒ Page 19-19 .

- Fill engine with oil.

⇒ *Repair Manual, Maintenance*

- Install subframe.

⇒ *Repair Manual, Suspension, Wheels, Steering, Repair Group 40*

- Install lock carrier in normal position.

⇒ *Repair Manual, Body Exterior, Repair Group 50*

- Install bumper.

⇒ *Repair Manual, Body Exterior, Repair Group 63*

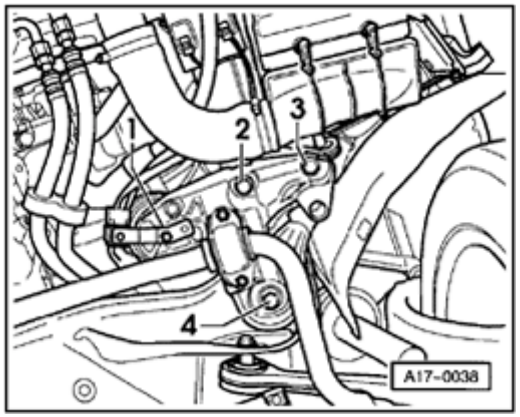
- Install noise insulation.

Tightening torques

Component		Nm
Upper section of oil pan to cylinder block	M6	10
	M8	20
Lower section of oil pan to upper section of oil pan		10
oil pan to transmission	M8	25
	M10	45
Coolant line to oil pan		10
Oil drain plug in lower section of oil pan		30
Dipstick guide tube to cylinder head		25
Oil pump to cylinder block		25
Oil pump supply lines to upper section of oil pan		10
Front sealing flange	M6	10
Collar bolt	M8	30
Bracket for coolant lines to oil pan		10
Coolant drain screw on engine		20

17-47

Component	Nm
Stop for torque reaction support to bracket on engine	25
Engine mounting to subframe	25
Torque reaction support to front of oil pan	25
Engine mounting to engine support	25
Chain sprocket to oil pump	25



Other tightening torques

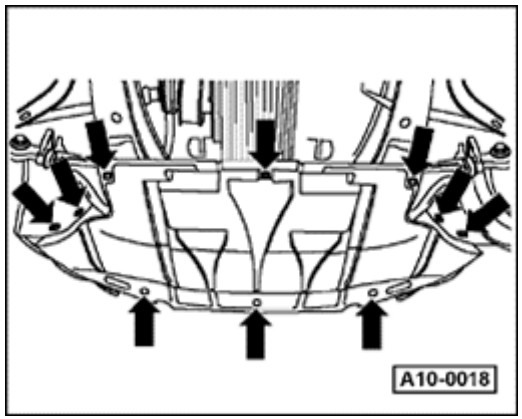
Nut for engine mounting -1-	25
Bolts -2- and -3-	60
Combi bolt -4- **	110 + 90°

** Combi bolt -4- must be replaced after removing.

17-48

Oil pump, removing and installing

Removing

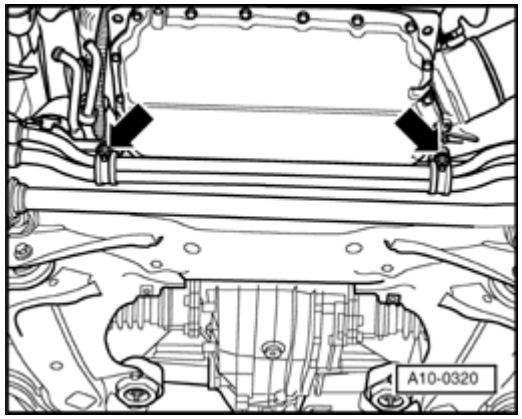


- Remove noise insulation panel -arrows-.
- Remove bumper.

⇒ *Repair Manual, Body Exterior, Repair Group 63*

- Move lock carrier to service position.

⇒ *Repair Manual, Body Exterior, Repair Group 50*

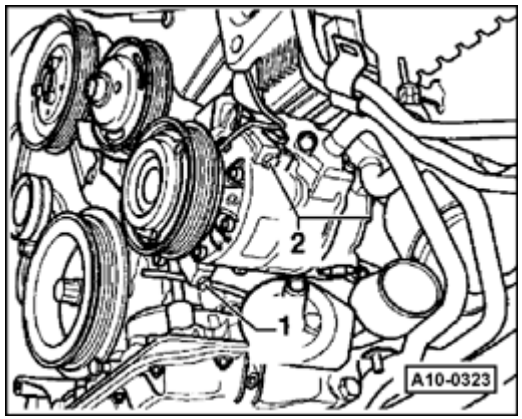


- Unbolt air conditioner lines from oil pan -arrows-.

17-49

WARNING!

Do not open air conditioner refrigerant circuit.



- Detach air conditioner compressor -1...3-.

Notes:

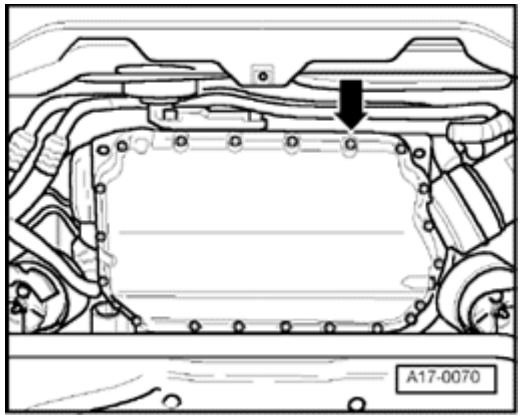
- *Watch position of guide bushes when installing.*
- *When installing, insert bolt -1- in the compressor first.*
- *To prevent damage to the condenser and refrigerant lines/hoses, ensure that the lines and hoses are not stretched, kinked or bent.*

- Drain engine oil.

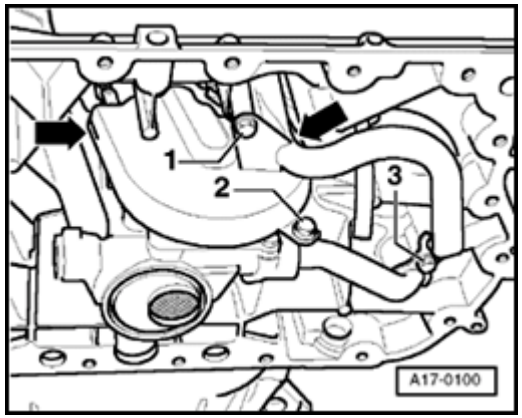
Note:

Use a separate container to collect the engine oil.

17-50



- Remove lower section of oil pan.

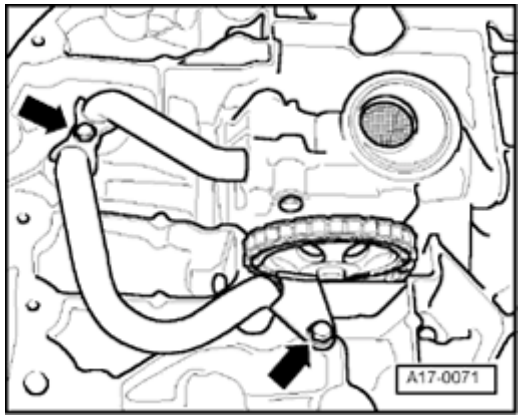


- Unbolt cover plate -2- for oil pump sprocket.

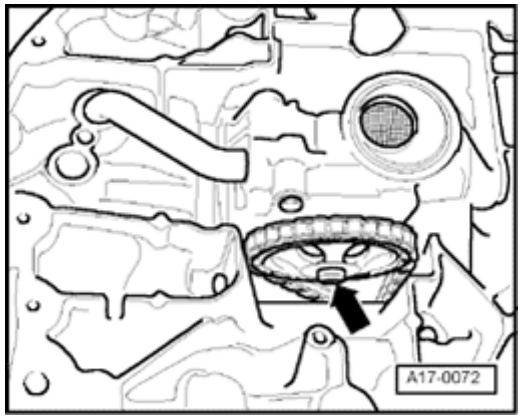
Notes:

- *When loosening bolt -2- securing cover plate, counter-hold at welded nut.*
- *When installing, make sure that the plate engages in position -arrows-.*

17-51

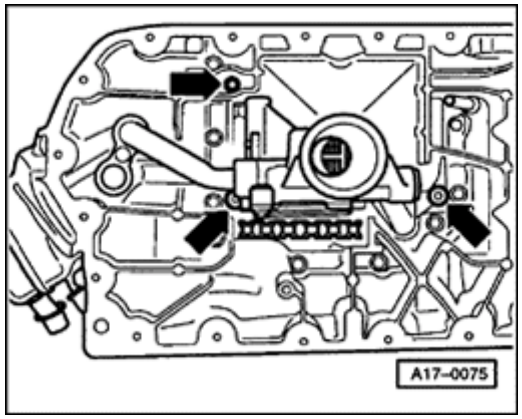


- Unbolt brackets for oil supply lines -arrows- and pull front (longer) oil supply line away downward.



- Remove bolt securing chain sprocket to oil pump using Torx T45, and pull sprocket off oil pump.

17-52

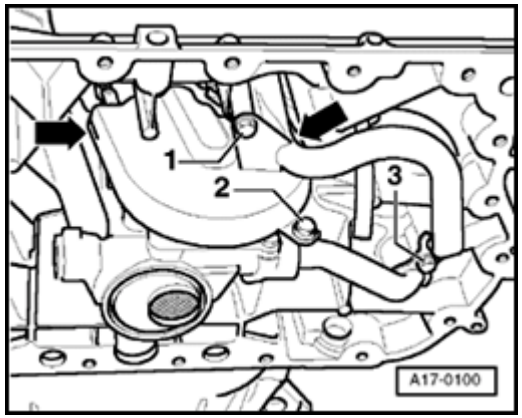


- Remove oil pump together with shorter oil supply line.

Installing

Install in the opposite order to removing. When installing, note the following points:

- Before bolting on oil pump, install short oil supply line into pump and upper section of oil pan with new O-rings.



- Bolt on cover plate -2- for oil pump sprocket.

Notes:

- *When installing, make sure that the plate engages in position -arrows-.*
- *When tightening bolt -2- securing cover plate, counter-hold at welded nut.*

- Clean both sealing surfaces for lower section of oil pan; ensure that they are free of oil and grease.

Note:

Do not use any adhesive or sealant.

- Install new gasket on lower section of oil pan and install on upper section of oil pan with two diagonally opposite bolts.

- Tighten all securing bolts hand-tight.

- Tighten bolts to 10 Nm with torque wrench, working from the center outwards.

- Install new seal on oil drain plug and tighten to 30 Nm.

- Fill up engine oil.

⇒ *Repair Manual, Maintenance*

- Install subframe.

⇒ *Repair Manual, Suspension, Wheels, Steering, Repair Group 40*

- Install lock carrier in normal position.

⇒ *Repair Manual, Body Exterior, Repair Group 50*

- Install bumper.

⇒ *Repair Manual, Body Exterior, Repair Group 63*

Tightening torques

Component	Nm
Chain sprocket to oil pump	25
Lower section of oil pan to upper section of oil pan	10
Oil drain plug in lower section of oil pan	30
Oil pump to cylinder block	25
A/C compressor to bracket	25
Oil pump supply lines to upper section of oil pan	10
Bracket for A/C lines to oil pan	10

17-55

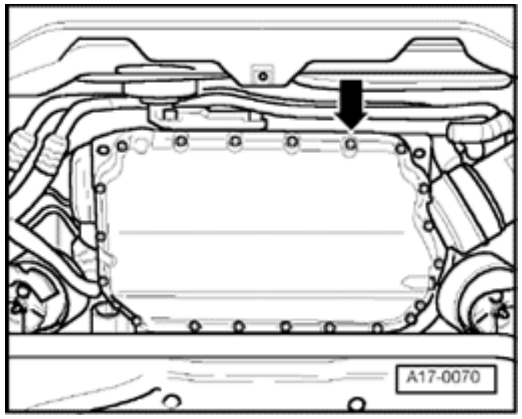
Front sealing flange and oil pump drive chain, removing and installing

Removing

- Remove ribbed belt ⇒ Page 13-1 .
- Remove toothed belt ⇒ Page 13-4 .
- Drain engine oil.

  Use a separate container to collect the engine oil.

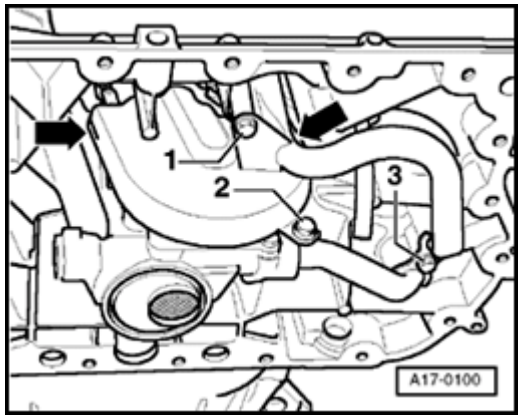
17-56



- Remove lower section of oil pan.
- Unbolt cover plate for oil pump sprocket (-2-).

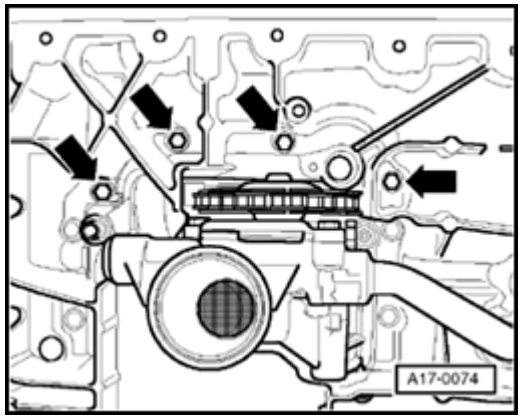
Notes:

- *When loosening bolt -2- securing cover plate, counter-hold at welded nut.*
- *When installing, make sure that the plate engages in position -arrows-.*

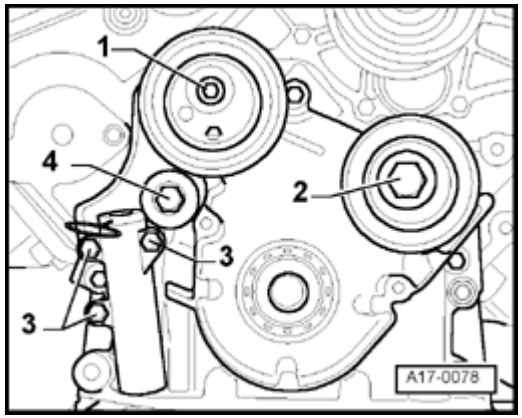


- Unbolt both oil supply lines -1- and -3- from upper section of oil pan and pull longer of two lines away downward.

17-57



- Remove 4 bolts from upper section of oil pan.



- Remove following components before unbolting front sealing flange:

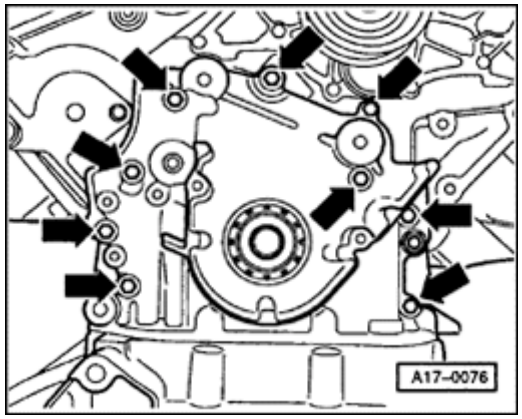
1 - Tensioning roller for toothed belt: 20 Nm

2 - Idler wheel: 45 Nm

3 - Toothed belt tensioner: 10 Nm

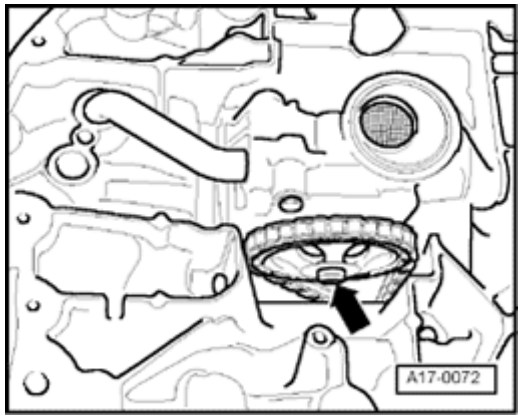
4 - Lever for toothed belt tensioner: 20 Nm

17-58



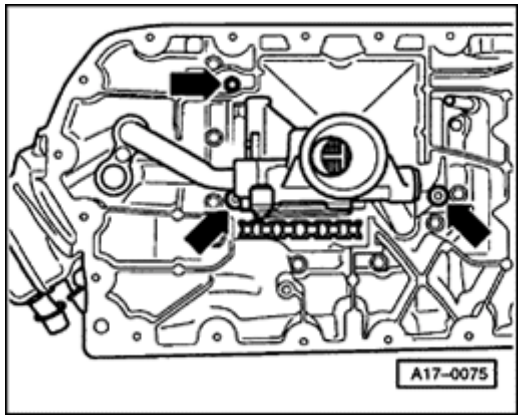
- Unbolt front sealing flange and take off gasket for front sealing flange M6 bolts: 10 Nm M8 collar bolt: 30 Nm

Replacing oil pump drive chain



- Remove bolt securing chain sprocket to oil pump using Torx T45, and pull sprocket off oil pump.

17-59



- Remove oil pump together with shorter oil supply line.
- Take out oil pump sprocket and remove drive chain from crankshaft.

Removing and installing chain sprocket on crankshaft ⇒ Page 17-62 .

Installing

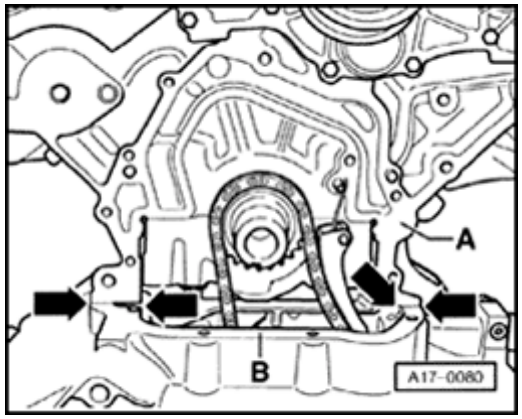
Install in the opposite order to removing. When installing, note the following points:

- Remove any residues of sealant on front of oil pan or engine block, if necessary.
- Clean sealing surfaces; ensure that they are free of oil and grease.

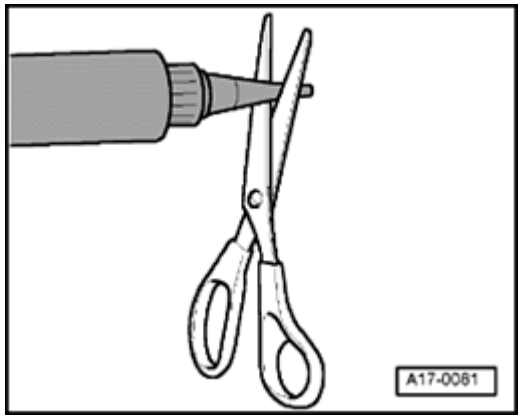
Note:

The front sealing flange must be installed within 5 minutes of applying silicone sealant D 454 300 A2.

17-60



- Do not apply any sealant on sealing surface -A- of the cylinder block.
- After installing gasket on sealing surface -A-, apply a small quantity of sealant to joints between two arrows -left and right-.

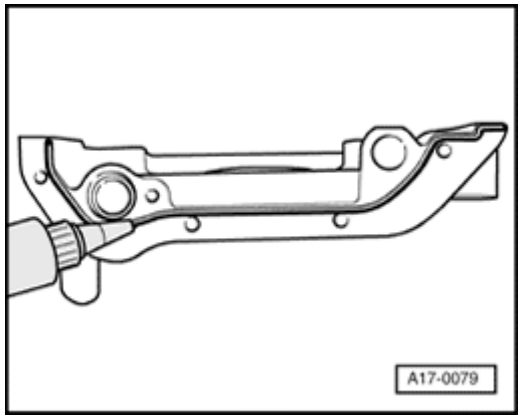


- Cut off nozzle of tube at front marking (diameter of nozzle approx. 3 mm).
  - Thickness of sealant bead: 2 ... 3 mm

Note:

The bead of sealant must not be thicker than 3 mm, as otherwise excess sealant may enter the oil pan and block the strainer in the oil intake line.

17-61



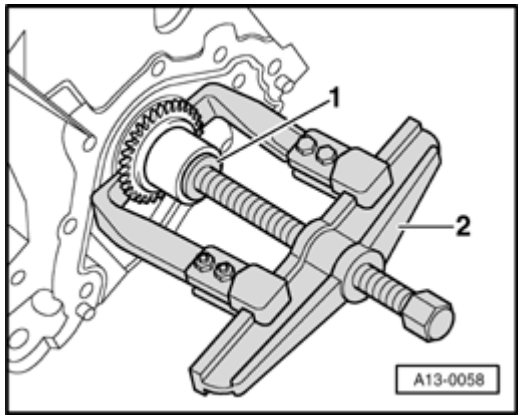
- Make sure sealing surface is clean and then apply silicone sealant on sealing surfaceof front sealing flange, as shown in illustration. (Illustration shows where bead of sealant is applied.)
- Use installing sleeve 3202/1 to install sealing flange. Locate sealing flange in position immediately and tighten all 4 bolts in oil pan hand-tight initially.
- Tighten bolts securing sealing flange Tightening torque: Front sealing flange: M6 10 Nm, M8 20 Nm 4 bolts in oil pan: 10 Nm

17-62

Chain sprocket for oil pump on crankshaft, removing and installing

Removing

Removing and installing front sealing flange and oil pump drive chain ⇒ Page 17-55 .



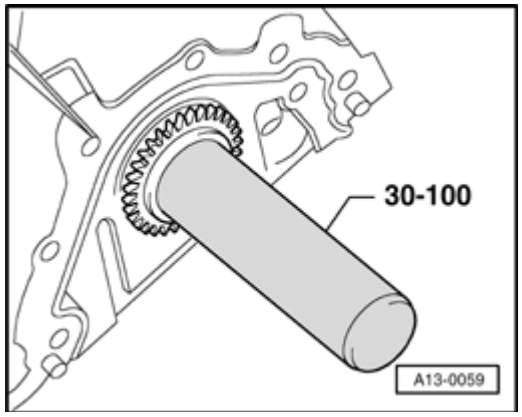
- Pull chain sprocket off crankshaft using a normal commercial-type puller -2-: use a suitable washer -1- to protect end of crankshaft.

Installing

- Heat chain sprocket in oven for about 15 minutes at 220 ° C.

Notes:

- *Wear protective gloves.*
- *Installation position: it should be possible to read the lettering on the chain sprocket.*



- Using pliers, install chain sprocket on end of crankshaft and push against stop on crankshaft with drift sleeve 30-100. If necessary knock on carefully using a plastic hammer.

Removing and installing front sealing flange and oil pump drive chain ⇒ Page 17-55 .

17-63

Crankshaft oil seal - pulley end, replacing

Removing

- Remove bumper.

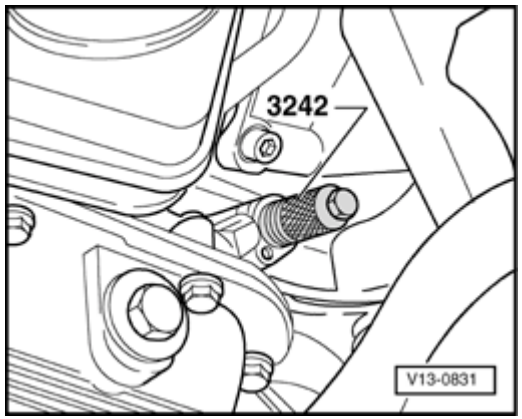
⇒ *Repair Manual, Body Exterior, Repair Group 63*

- Move lock carrier to service position

⇒ *Repair Manual, Body Exterior, Repair Group 50*

- Remove ribbed belt ⇒ Page 13-1 .
- Remove toothed belt ⇒ Page 13-4 .
- Remove sealing plug from hole in cylinder block (left side).
- Position crankshaft to TDC of No. 3 cylinder. Crankshaft TDC drilling should be visible (or it should be possible to feel the drilling) in sealing

plug hole.

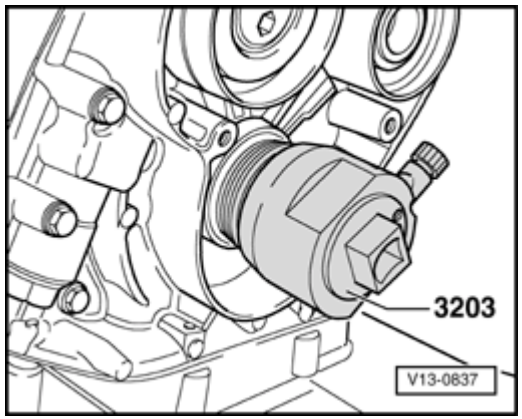


- Screw clamping bolt 3242 into hole so that crankshaft is secured against turning.

17-64

- Remove crankshaft toothed belt sprocket.

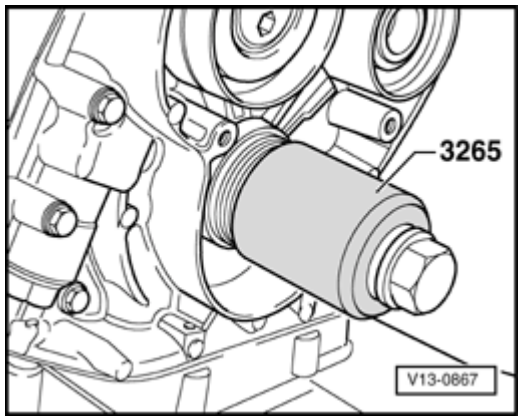
- Remove inner part of oil seal extractor 3203 two turns (approx. 3 mm) out of outer part and lock with knurled screw.



- Lubricate threaded head of oil seal extractor, place it in position and, exerting firm pressure, screw it in as far as possible into oil seal.
- Loosen knurled screw and turn inner part against crankshaft until oil seal is pulled out.

Installing

- Place guide sleeve 3202/1 onto crankshaft journal.
- Slide dry seal over guide sleeve.



- Press oil seal in flush with installing sleeve 3265.

Then proceed as for removing, performing steps in reverse order.

17-65

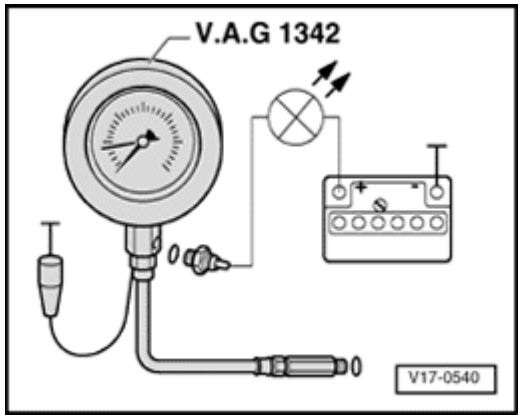
Oil pressure and oil pressure switch, checking

Note:

Servicing and checking function of oil pressure warning lamp and buzzer:

⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations*

Test procedure



- Remove oil pressure switch (F1) and screw oil pressure switch into tester.
- Screw tester into oil pan in place of oil pressure switch.
- Connect brown wire of tester to ground (GND) (-).
- Using test leads from VAG 1594, connect diode test lamp VAG 1527 between positive battery terminal (+) and oil pressure switch.
- Start engine and gradually increase engine speed.

  LED should light up at 1.2...1.6 bar, otherwise replace oil pressure switch.
- Increase engine speed further.

  At 2000 RPM and an oil temperature of 80 ° C oil pressure should be at least 2.0 bar.

17-66

Engine oil, specifications

A high-quality multigrade oil is put in at the factory: this can be used all year round, except in extremely cold climates.

Viscosity grades and oil specifications

Viscosity grades and oil specifications

⇒ *Repair Manual, Maintenance*

Oil level, checking

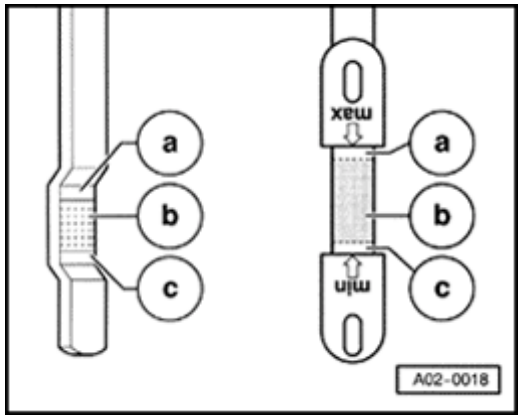
Test conditions

- Oil temperature above 60 ° C.
- Vehicle level.
- The vehicle must be standing on level ground when checking the oil level. Wait for a few minutes after switching off the engine to allow the oil to flow back into the oil pan.

Test sequence

- Pull out dipstick, wipe off with a clean cloth and insert it again as far as it will go.
- Pull out dipstick again and read oil level.

17-68



Markings on oil dipstick:

a - Do not top up oil.

b - Oil can be topped up. The oil level may rise as far as area -a- after topping up.

c - Oil must be topped up. It is sufficient if the oil level is somewhere in area -b- (grooved area on dipstick) after topping up.

Note:

The oil level must not be above marking -a- on the dipstick.

Oil capacities ⇒ *Repair Manual, Maintenance*