

Lubrication system components, removing and installing

Note:

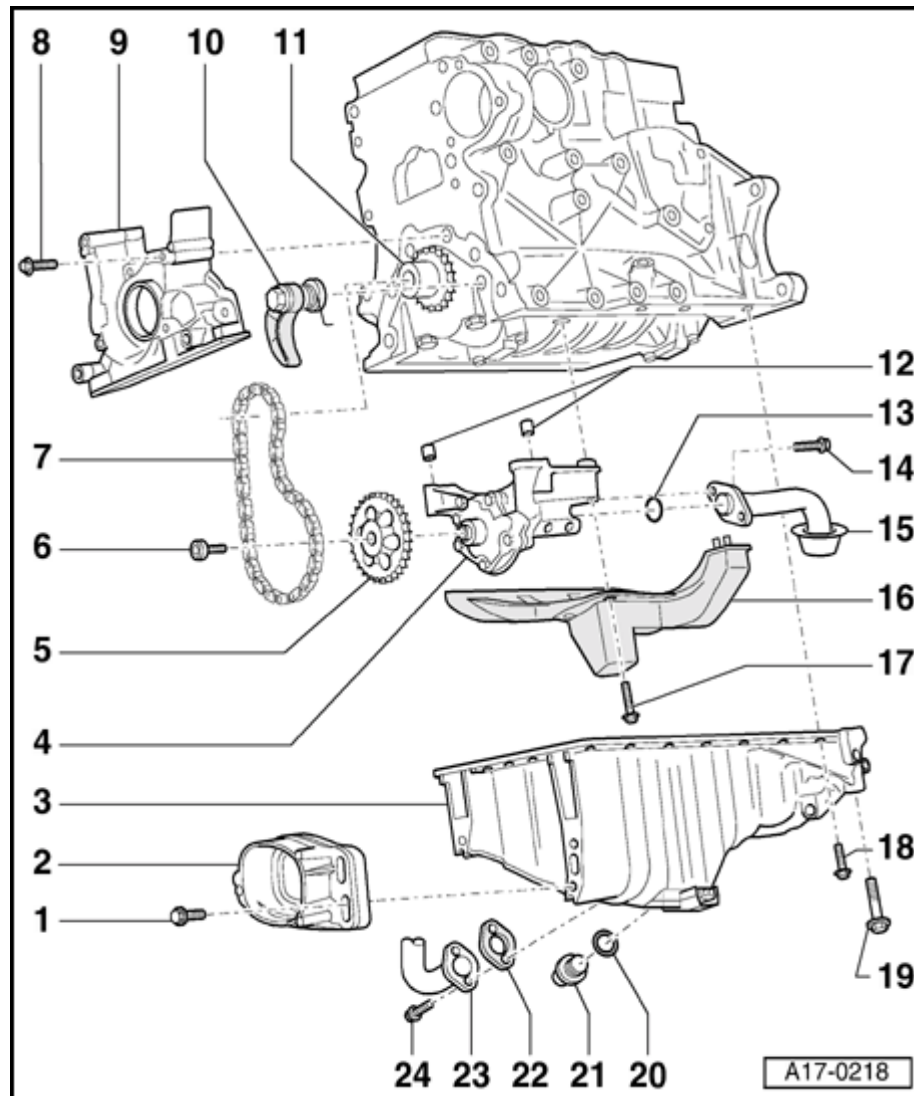
- ◆ *If large quantities of metal shavings or particles are found in the engine oil when repairing the engine, all oil passages must be cleaned carefully, and the oil cooler replaced in order to prevent further damage occurring later.*
- ◆ *The oil level must not be above max. mark on dipstick - danger of damage to catalytic converter!*
- ◆ *Oil spray jet and pressure relief valve ⇒ Fig. ⇒ [1](#), ⇒ [Page 17-6](#)*

Viscosity grades and oil specifications:

⇒ [Repair Manual, Maintenance](#)

Oil system capacity:

⇒ [Repair Manual, Maintenance](#)



Part I - Oil pump/oil pan components

1 - 28 Nm

2 - Limit stop for torque reaction support

3 - Oil pan

- ◆ Apply silicone sealant D 176 404 A2 before installing

- ◆ Removing and installing ⇒ [Page 17-11](#)

4 - Oil pan

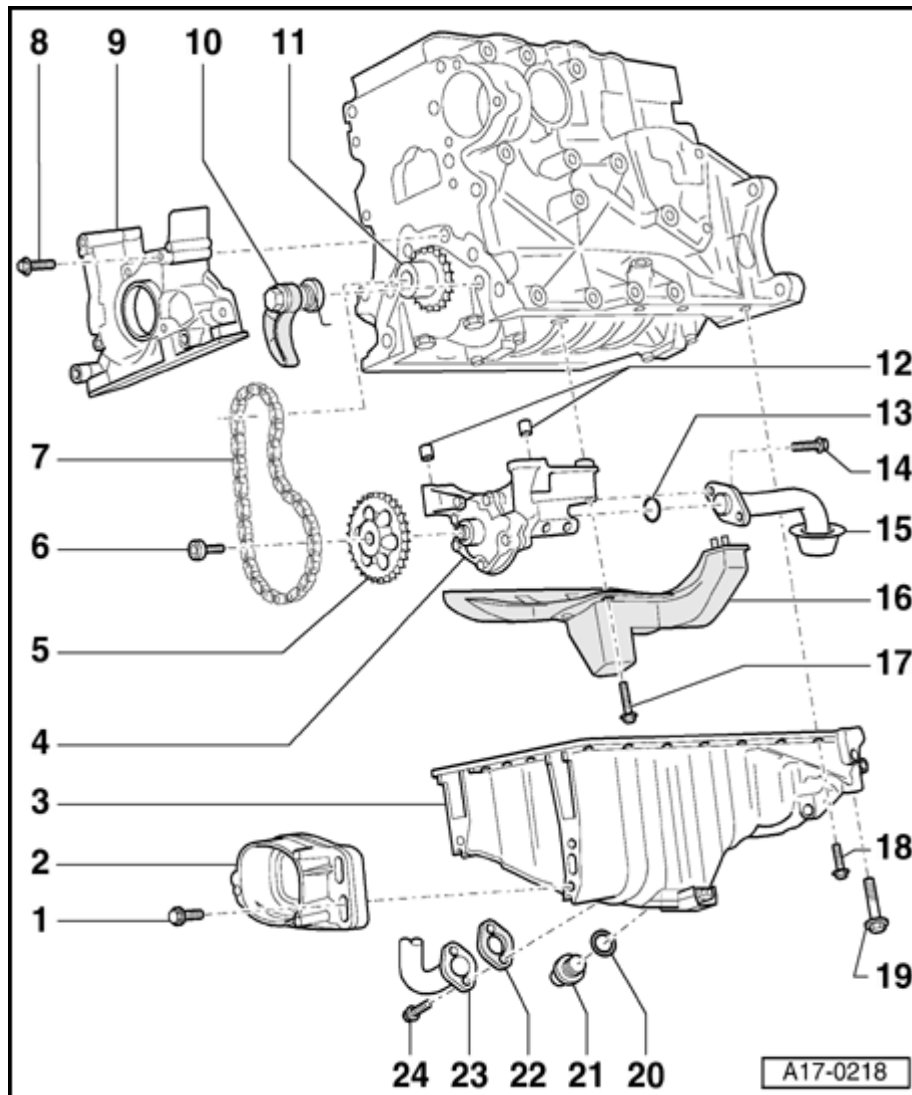
- ◆ With pressure relief valve (12 bar)

- ◆ Removing and installing ⇒ [Page 17-28](#)

- ◆ Before installation check whether the two dowel sleeves -Pos. 12 - for the centralizing of the oil pump/cylinder block are present

- ◆ Replace pump if there is scoring on moving surfaces and gear teeth

- ◆ Tightening torque for oil pump cover to oil pump housing: 10 Nm



5 - Chain sprocket for oil pump

- ◆ Sprocket can only be installed on oil pump shaft in one position

6 - 22 Nm

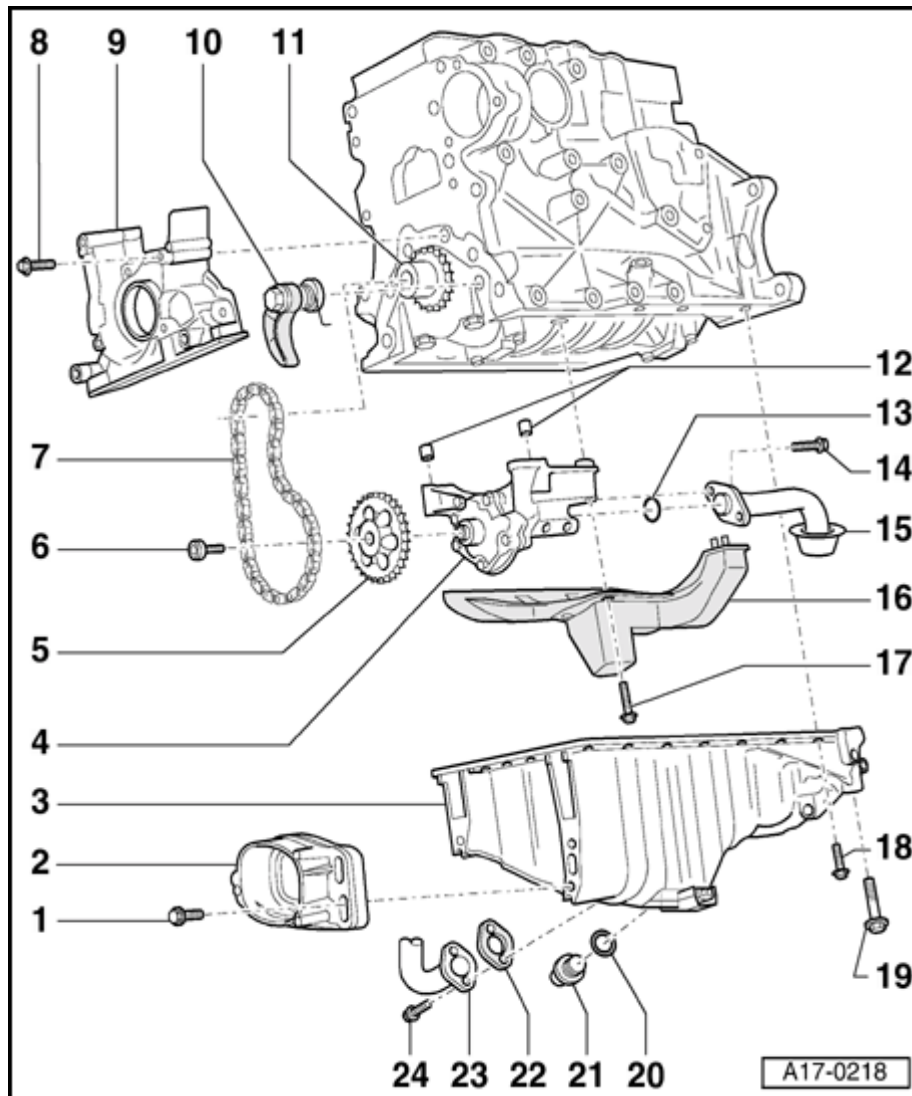
7 - Drive chain for oil pump

- ◆ Mark direction of rotation before removing
- ◆ Check for wear

8 - 15 Nm

9 - Sealing flange - front

- ◆ Apply silicone sealant D 176 404 A2 ⇒ [Page 13-56](#)
- ◆ Replacing crankshaft oil seal on pulley end ⇒ [Page 13-51](#)

**10 - Chain tensioner**

- ◆ Tighten to 16 Nm
- ◆ Do not disassemble
- ◆ Note installation position
- ◆ Pre tension spring and engage before installing
- ◆ If spring is broken replace chain tensioner complete

11 - Chain sprocket for oil pump

- ◆ Removing and installing ⇒ [Page 13-77](#)

12 - Dowel sleeves

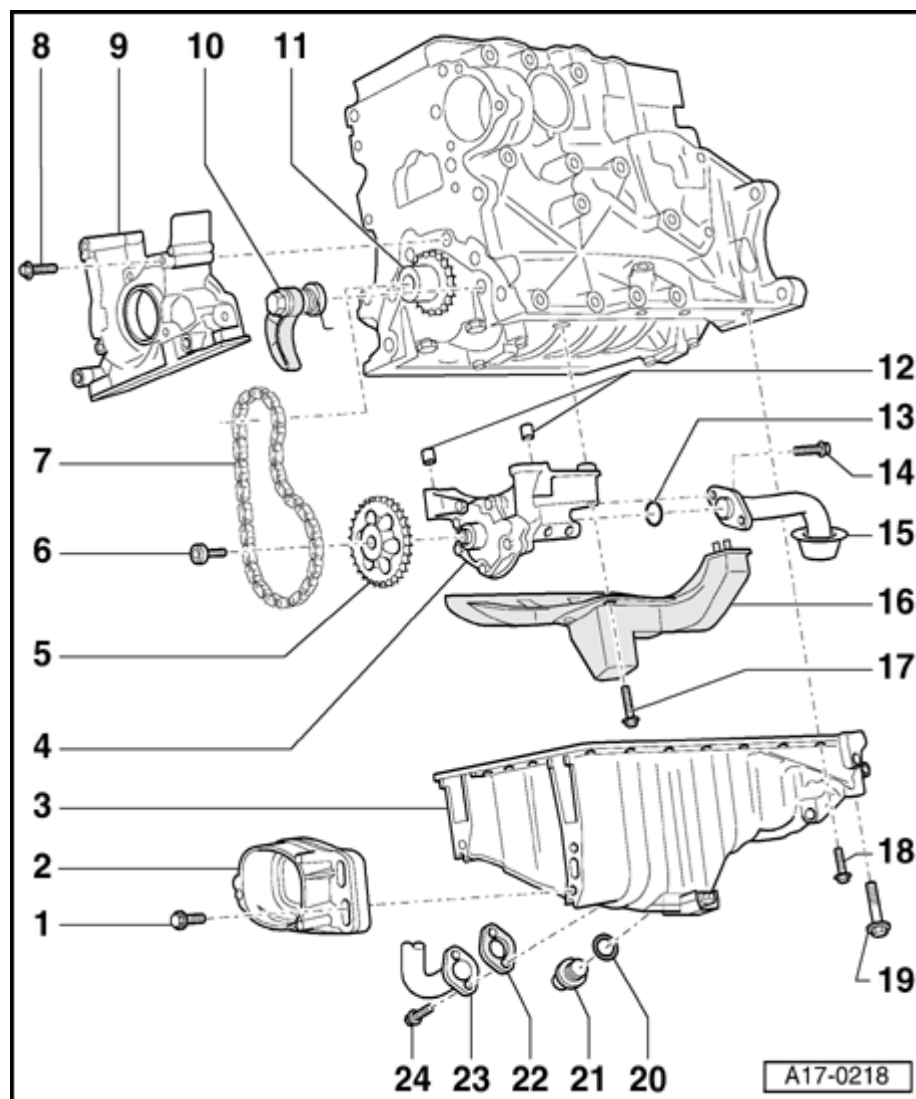
- ◆ 2 pieces

13 - O-ring

- ◆ Always replace

14 - 16 Nm**15 - Suction pipe**

- ◆ Clean strainer if soiled



16 - Baffle plate

17 - 16 Nm

18 - 15 Nm

- ◆ Tighten in stages and in diagonal sequence

- ◆ Observe tightening sequence ⇒ [Page 17-25](#)

19 - 40 Nm

20 - Sealing ring

- ◆ Always replace

21 - Oil drain plug, 30 Nm

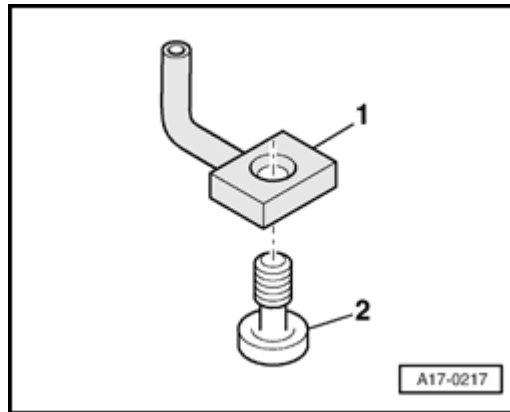
22 - Gasket

- ◆ Always replace

23 - 10 Nm

24 - Oil return pipe

- ◆ From exhaust turbocharger



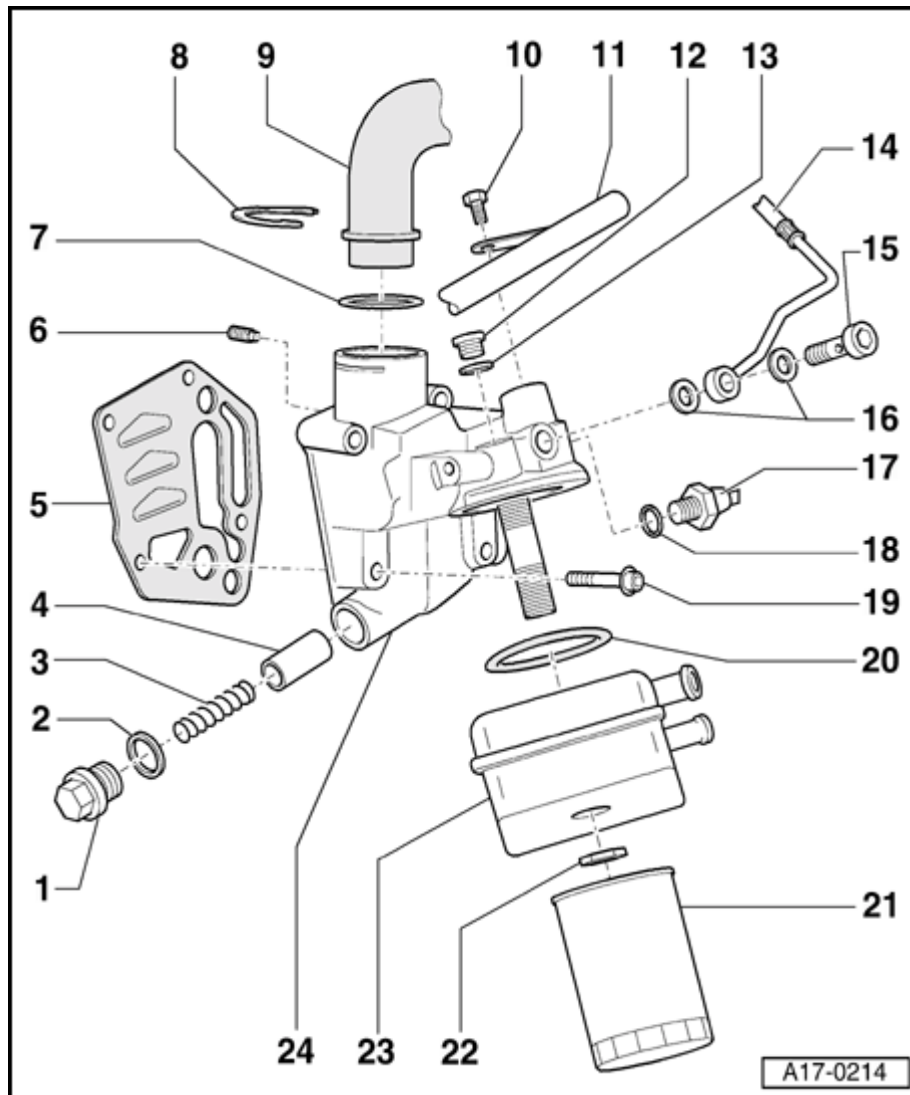
A

Fig. 1 Oil spray jet and pressure relief valve

1 - Oil spray jet (for piston cooling)

2 - Bolt with pressure relief valve - 27 Nm

◆ Opening pressure 1.3 to 1.6 bar



Part II - Oil filter bracket components

1 - Screw plug - 40 Nm

2 - Sealing ring

◆ Always replace

3 - Spring

◆ For pressure relief valve, approx. 4 bar

4 - Piston

◆ For pressure relief valve, approx. 4 bar

5 - Gasket

◆ Always replace

6 - Oil retention valve

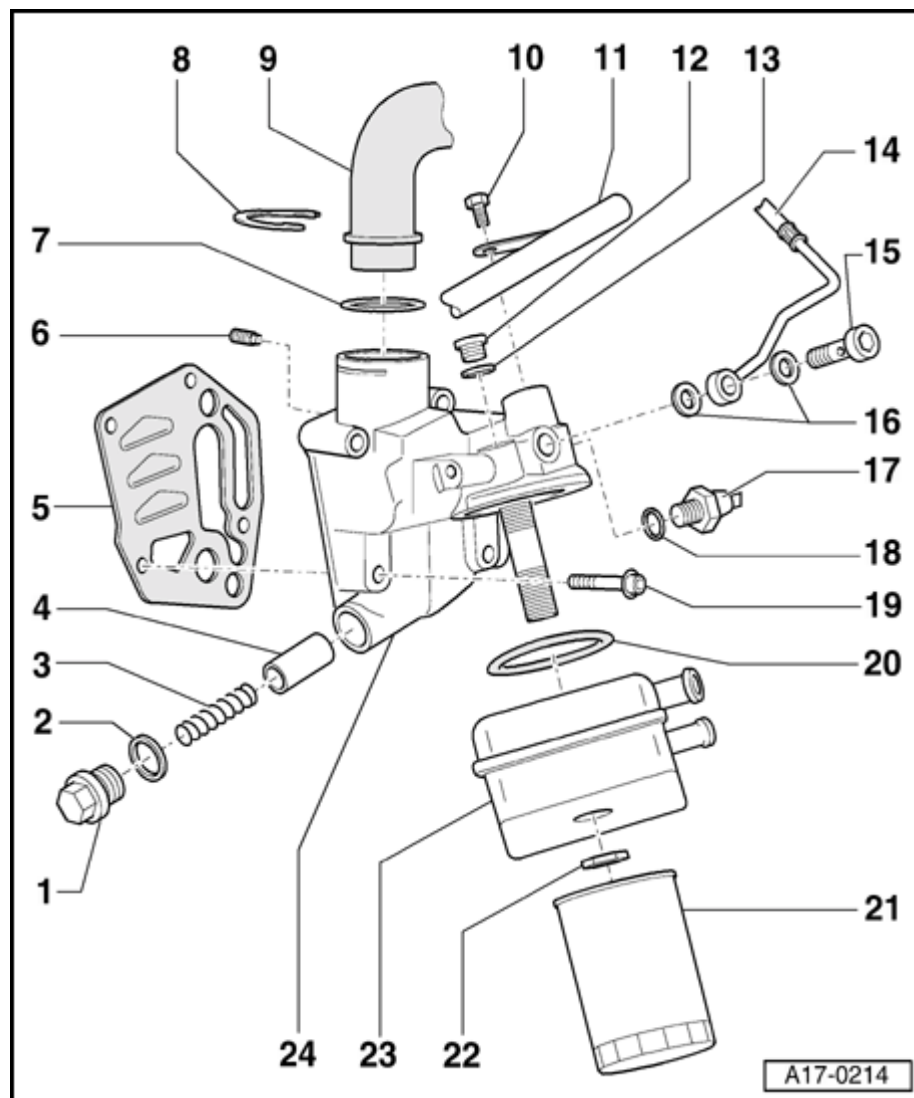
◆ Tighten to 8 Nm

◆ Built into oil filter bracket

7 - O-ring

◆ Always replace

◆ Slide on until flush with collar on pipe -Item 9 -



8 - Locking clip

9 - Pipe

◆ For crankcase breather

10 - 20 Nm

◆ Install with locking fluid D 000 600 A2

11 - Bottom coolant pipe

12 - Screw plug - 15 Nm

13 - Sealing ring

◆ If seal is leaking, cut open and replace

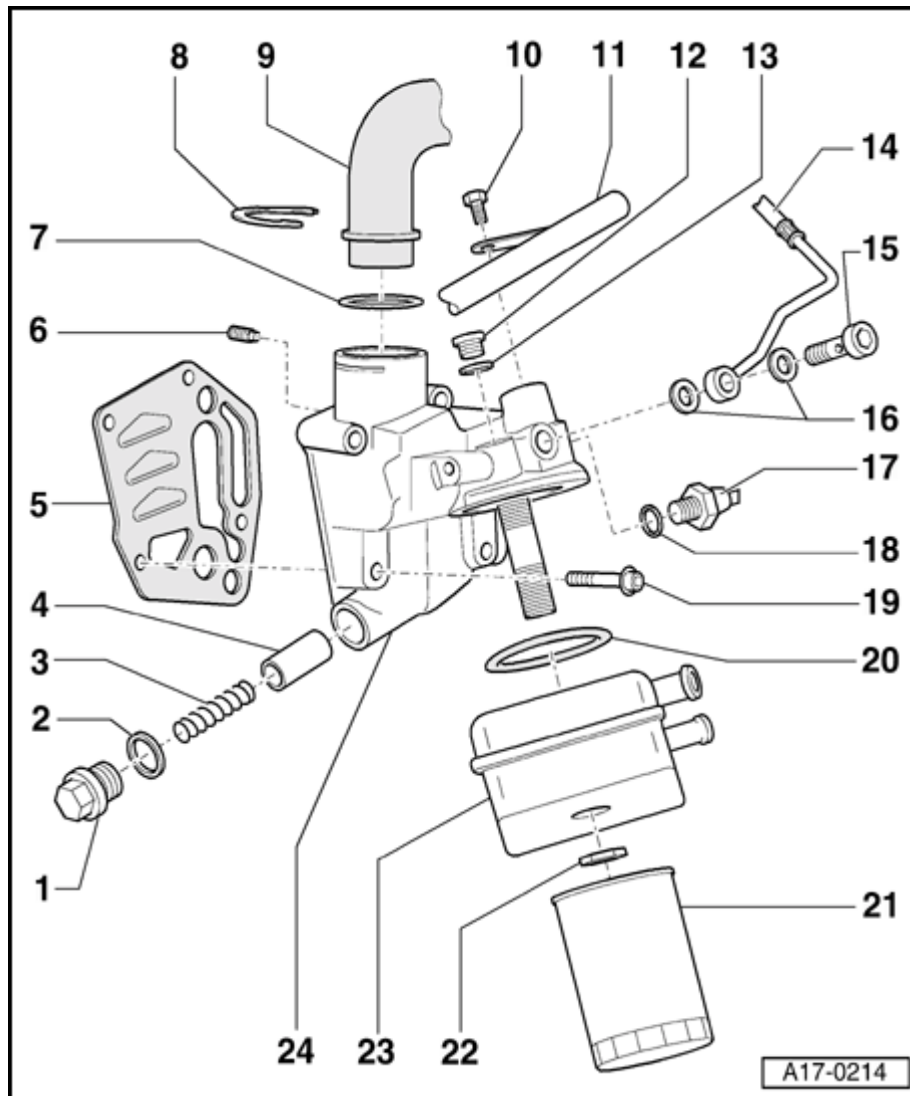
14 - Oil supply pipe

◆ To turbocharger

15 - Banjo bolt - 30 Nm

16 - Seals

◆ Always replace



17 - Oil pressure switch -F1-, 1.4 bar - 25 Nm

- ◆ Black insulation
- ◆ Checking ⇒ [Page 17-30](#)

18 - Sealing ring

- ◆ If seal is leaking, cut open and replace

19 - 15 Nm + 1/4 turn (90°) further

- ◆ Always replace

20 - Gasket

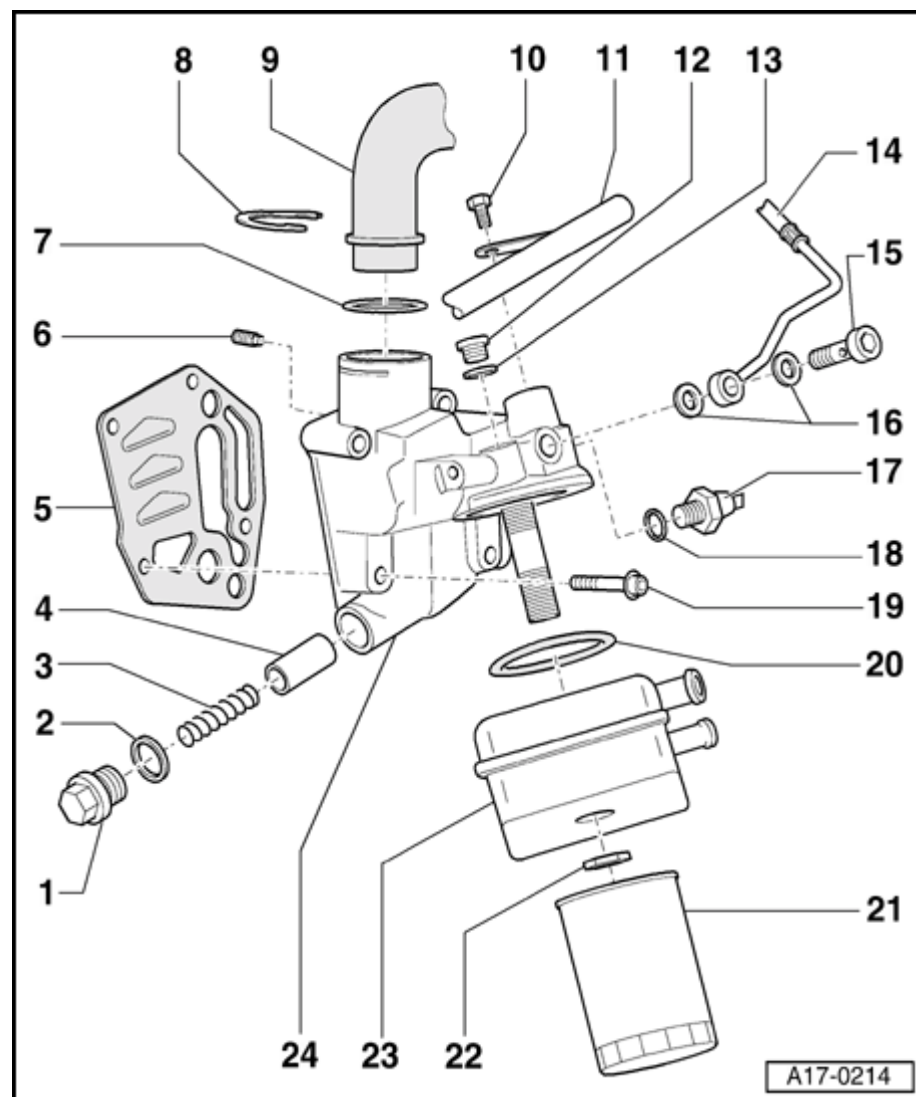
- ◆ Always replace
- ◆ Engage in projections on oil cooler

21 - Oil filter

- ◆ Observe change intervals

⇒ [Repair Manual, Maintenance](#)

- ◆ Observe installation instructions on oil filter
- ◆ Tighten to 20 Nm



22 - 25 Nm

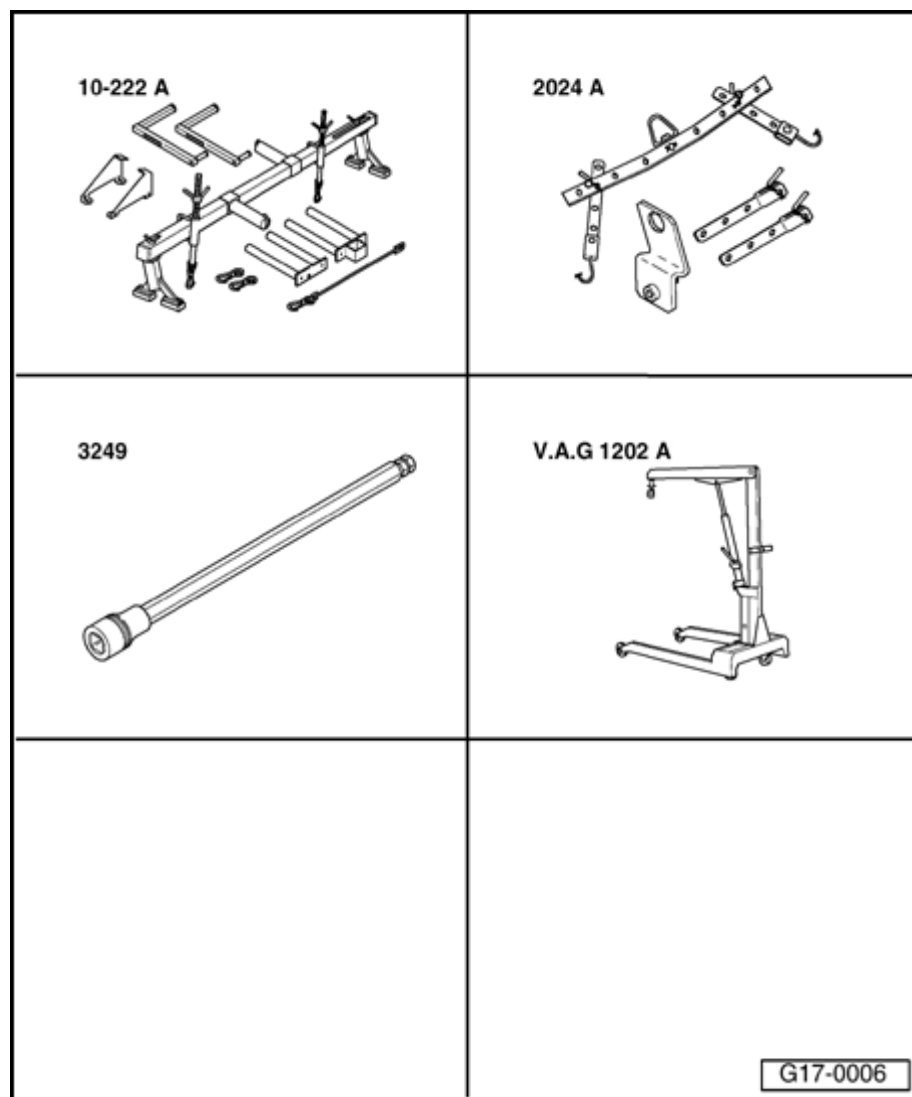
23 - Oil cooler

- ◆ See note ⇒ [Page 17-1](#)
- ◆ Ensure clearance to adjacent components
- ◆ Coolant hose connection diagram ⇒ [Page 19-2](#)

24 - Oil filter bracket

- ◆ With pressure relief valve, approx. 4 bar

17-11



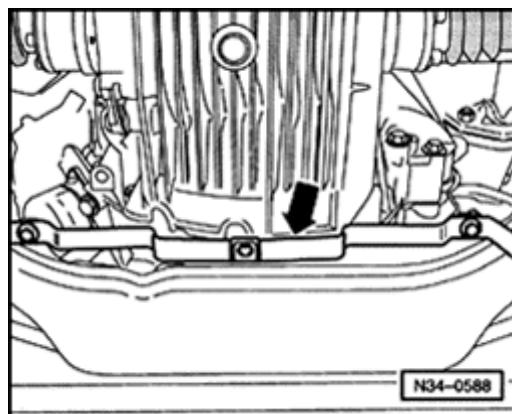
Oil pan, removing and installing

Special tools and equipment

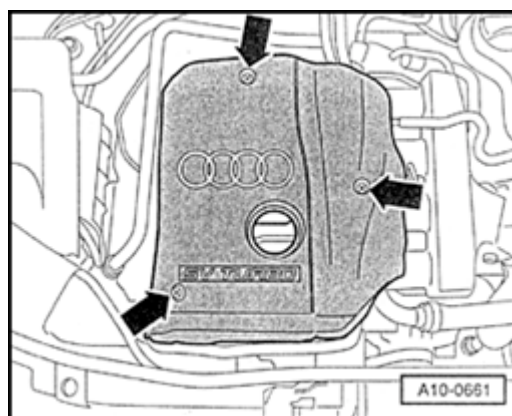
- ◆ Support bar 10-222A
- ◆ Lifting tackle 2024 A
- ◆ Socket 3249
- ◆ Workshop crane VAG 1202 A
- ◆ Electric drill with plastic brush attachment
- ◆ Protective goggles

Removing

- Engine in vehicle
- Lock carrier must be in service position ⇒ [Page 13-1](#) .

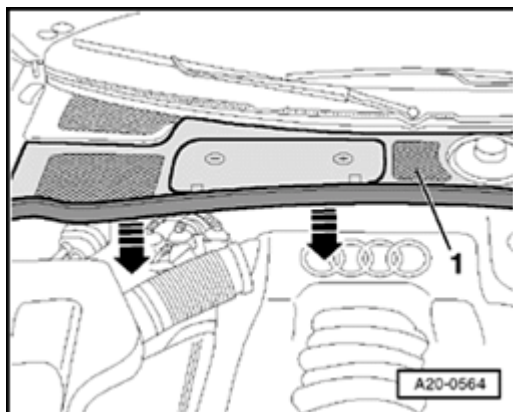


- A - Unbolt bracket for sound insulation -arrow-.
- Remove air duct hose on bottom left on charge air cooler.

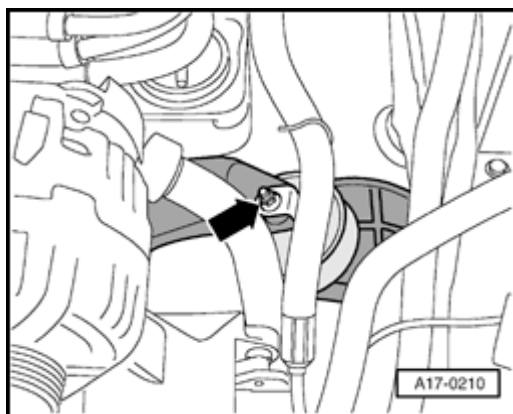


- A - Remove engine cover -arrows-.

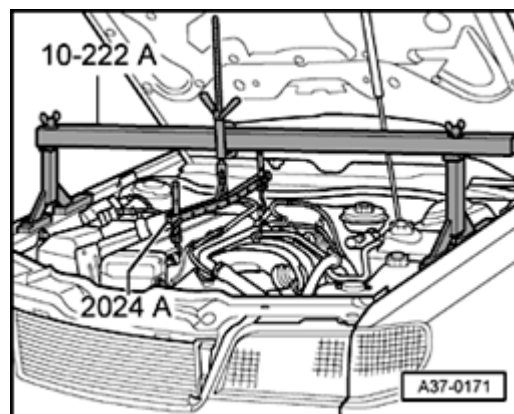
17-13



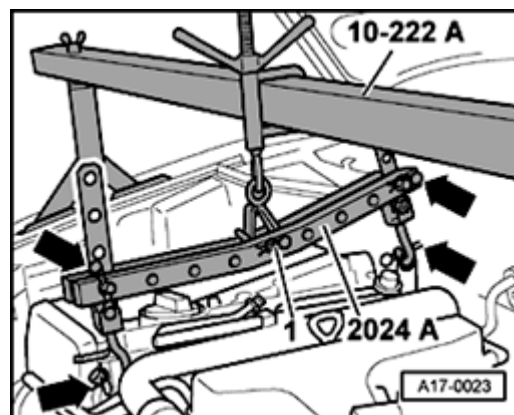
- A**
- Remove seal from plenum chamber cover in direction of arrow.
 - Remove plenum chamber cover -1- from front.



- A**
- Remove nut -arrow- from top of left engine mounting.

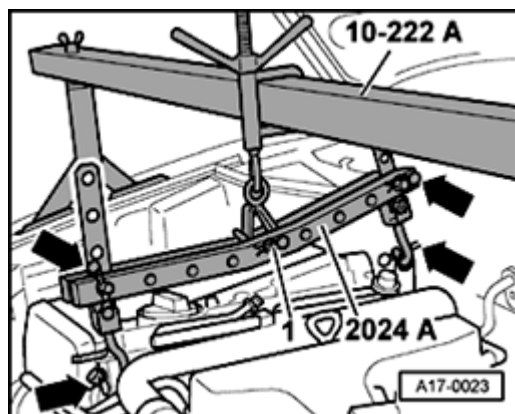


- A**
- Set up support bar 10-222 A on fender panel flanges.



- A**
- Remove lifting eye from lifting tackle 2024 A.
 - Replace pin -1- in center hole on lifting tackle and secure with locking pin.
 - Engage pin on lifting tackle 2024 A on spindle of support bar 10-222 A.

17-15

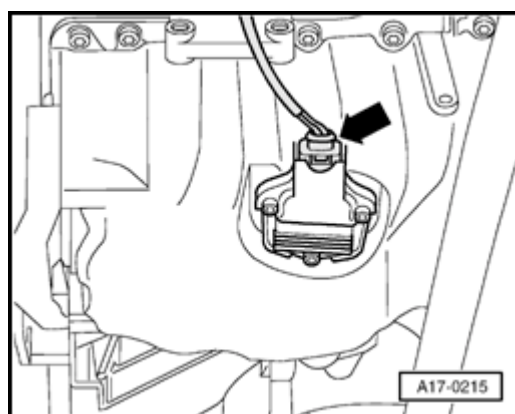


- A
- Engage lifting tackle 2024 A in front and rear lifting eyes on engine.

CAUTION!

The hooks and locating pins of the lifting tackle must be secured with locking pins -arrows in illustration-.

- Pretension engine with spindle of support bar, do not lift.
- Drain engine oil.
- Remove oil return line of exhaust turbocharger from oil pan.

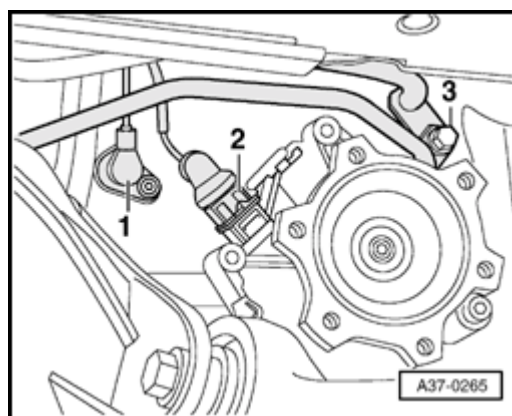


- A
- Disconnect electrical connector -arrow- from oil level sender.

Vehicles with automatic transmission:**Note:**

Observe cleanliness rules when working on the automatic transmission:

⇒ [Repair Manual, 5 Spd. Automatic Transmission 01V, Repair Group 37](#)



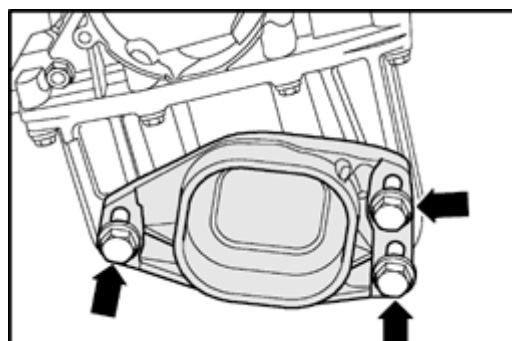
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- Remove bolt -3- and disconnect ATF lines from transmission.

Note:

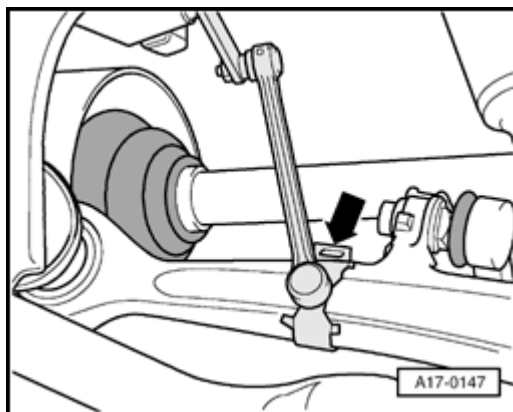
Ignore positions -1- and -2-.

- Remove bracket for ATF lines from engine.
- Move ATF lines aside.

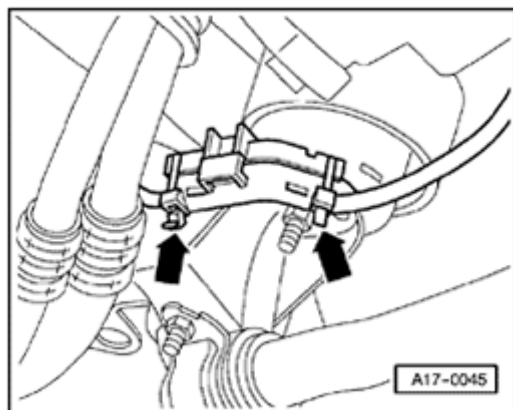
All models:

A

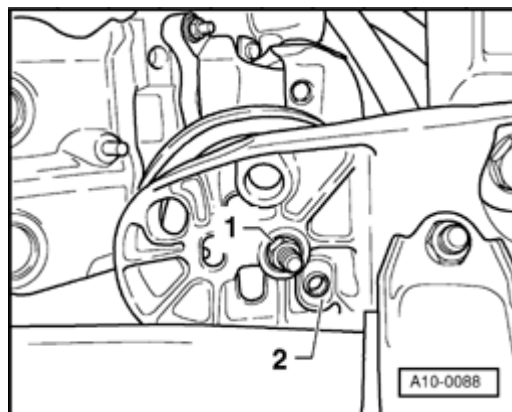
- Remove stop for torque reaction support -arrows-.



- A** - Where present unclip operating rod of vehicle level sender from lower transverse link -arrow-.



- A** - Cut through cable ties -arrows-. Open retainer for starter cable and take out electrical wiring.

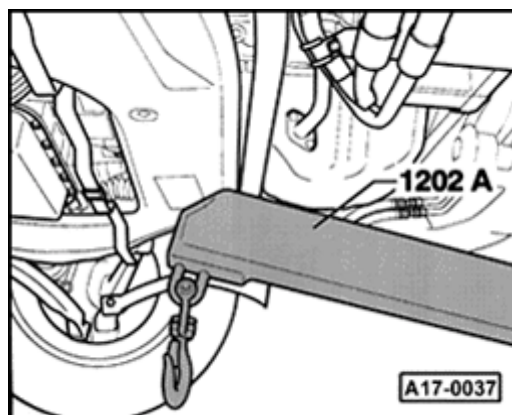


- A**
- Mark positions of mountings -1- and locating sleeves -2- on left and right engine mountings (lower).

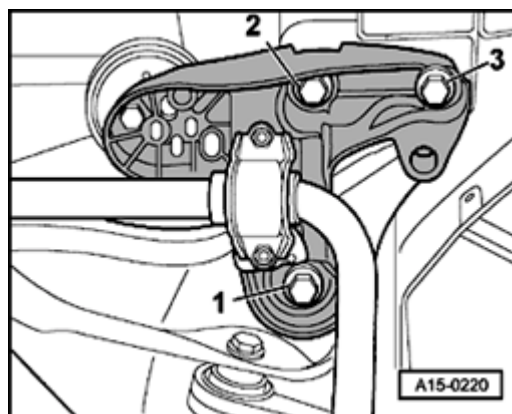
Note:

Different mounting holes are provided for the different engine versions.

- Remove nut -1- from lower right of engine mounting.
- Completely remove left engine mounting.



- A**
- Support subframe with workshop crane VAG 1202 A.

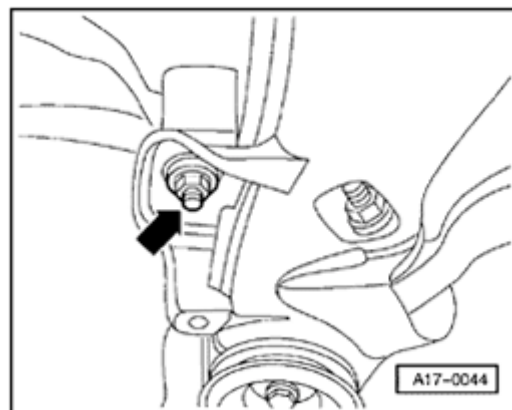


- A**
- Remove front subframe bolts -2- and -3- (left and right) and loosen bolts -1-.

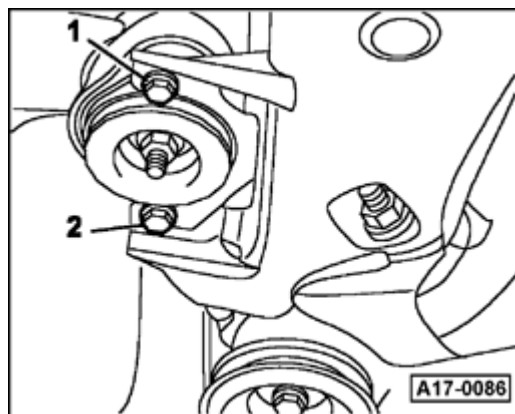
Note:

The subframe should be disconnected and lowered at the front only, otherwise it will be necessary to check the wheel alignment.

Vehicles with manual transmission

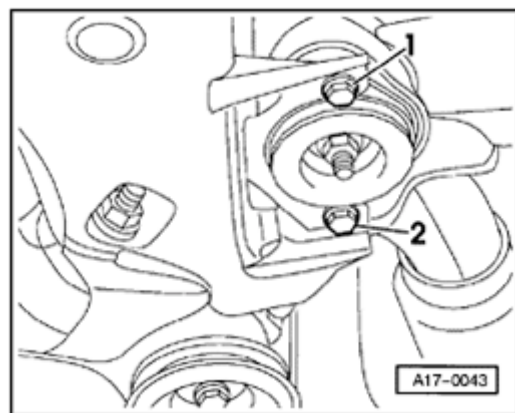


- A**
- Loosen nut -arrow- on left transmission mounting until it is flush with end of bolt (approx. four turns on the thread).

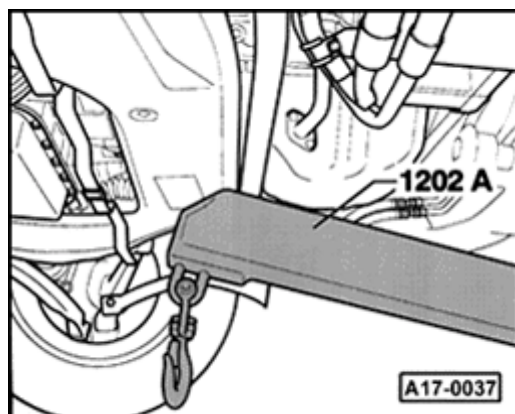


- A**
- Loosen rear bolt -2- on left transmission mounting a few turns; remove front bolt -1- on left transmission mounting.

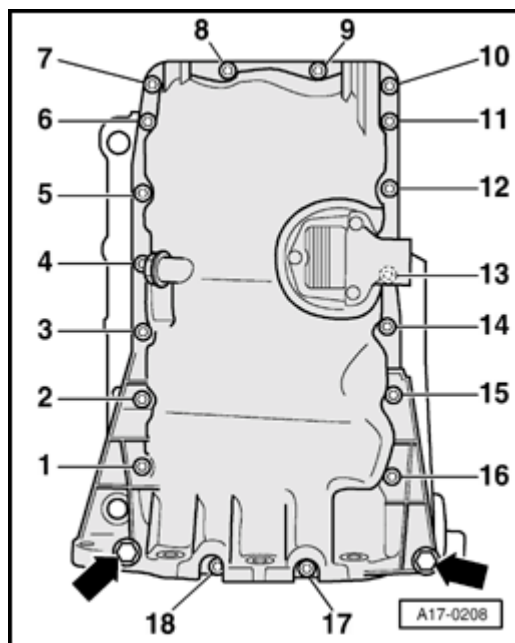
All models:



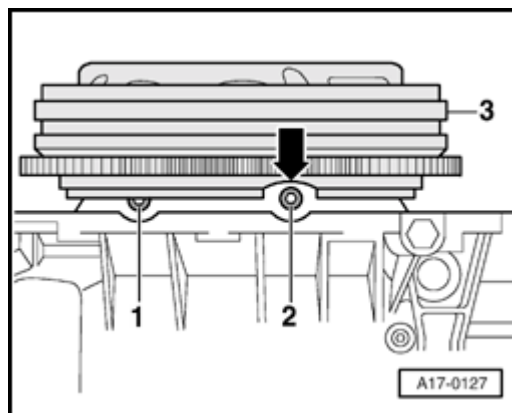
- A**
- Loosen rear bolt -2- on right transmission mounting a few turns; remove front bolt -1- on right transmission mounting.



- A**
- Lower subframe slowly using workshop crane 1202 A.
 - Take out workshop crane VAG 1202 A.
 - Remove bolts for oil pan/transmission:

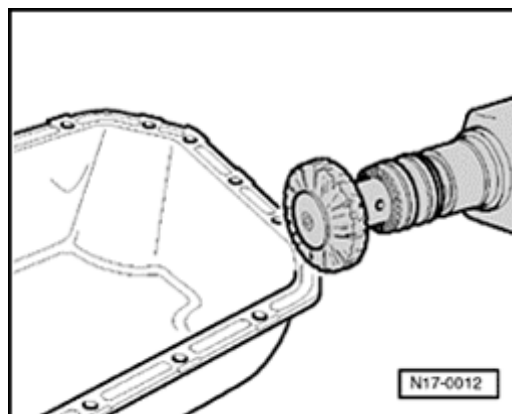


- A**
- Remove M10 bolts -arrows-.
 - Loosen bolts -1 to 18- diagonally.

**Note:**

A *Unscrew both rear oil pan bolts -1- and -2- with attachment 3249. Turn the flywheel on vehicles with a manual transmission -3- until the notch -arrow- is aligned with the bolt.*

- Take off oil pan. If necessary loosen it by striking lightly with a rubber hammer.
- Carefully remove sealant residues from cylinder block (remove baffle plate).



A - Remove remaining sealant from oil pan, e.g. with a rotating plastic brush.

WARNING!

Wear protective glasses.

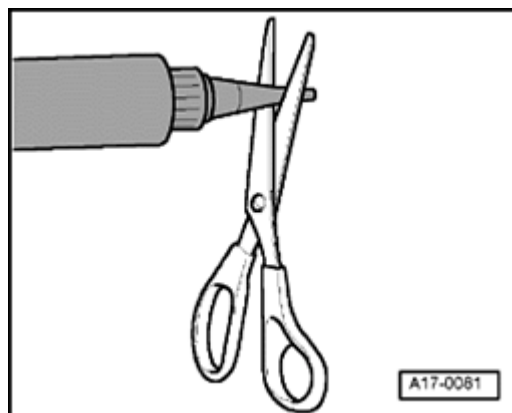
- Clean sealing surfaces: they must be free of oil and grease.

Installing

Installation is carried out in the reverse order of removal; note the following:

Note:

The oil pan must be installed within 5 minutes after applying the silicone sealant.

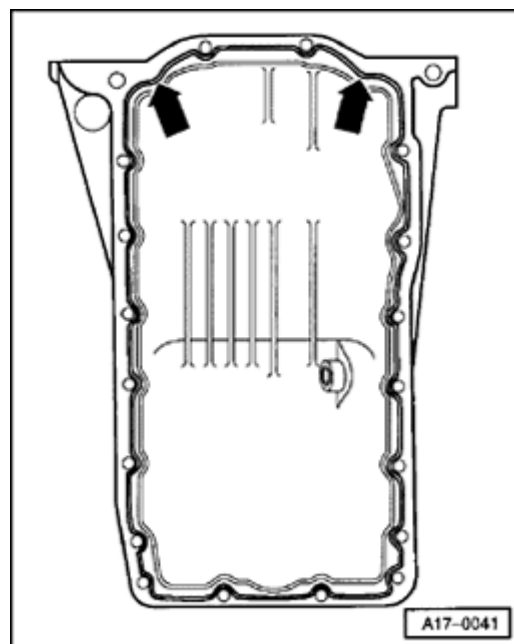


A

- Cut off nozzle of tube at front marking (diameter of nozzle approx. 3 mm).
 - ◆ Silicone sealant D 176 404 A2
 - ◆ Thickness of sealant bead: 2 to 3 mm

Note:

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

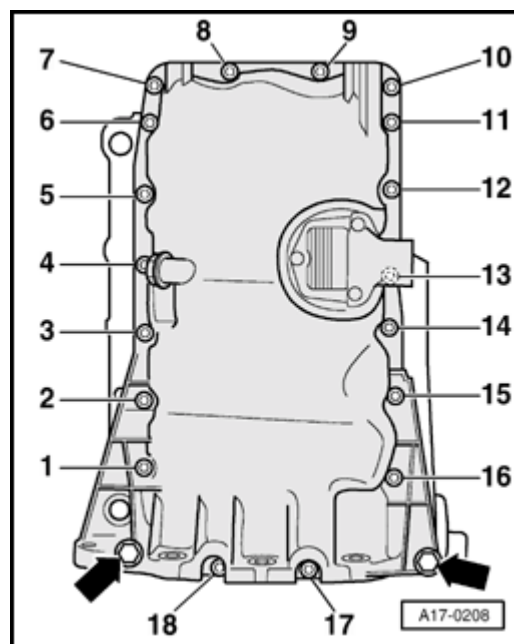
**A**

- Apply bead of silicone sealant onto clean sealing surface of oil pan, as illustrated. (Illustration shows position of sealant bead on cylinder block).

Note:

Be particularly careful when applying the bead of sealant around the rear sealing flange (arrows in illustration).

- Immediately attach oil pan and tighten bolts in described sequence:

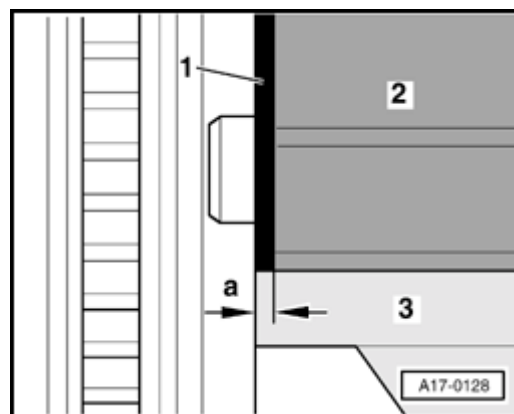


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- Tighten bolts -1 to 18- diagonally to 5 Nm.
- Tighten bolts securing oil pan to transmission to 45 Nm.
- Tighten bolts M10 -arrows- to 40 Nm.
- Tighten bolts -1 to 18- tighten diagonally to 15 Nm.

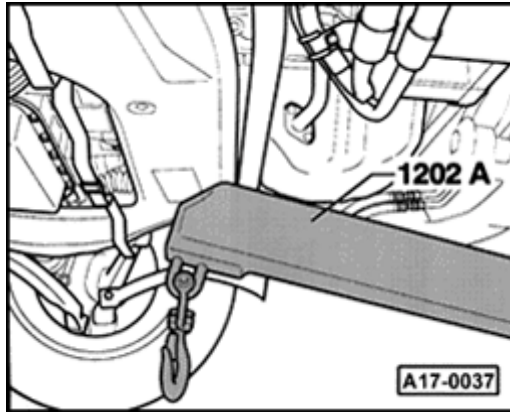
Note:

- ◆ Replace seals and gaskets.



A

- ◆ When installing the oil pan with the engine removed from the vehicle, ensure that the oil pan -3- is positioned flush with the intermediate plate -1- at the flywheel end (i.e. oil pan should protrude dimension "a" = 0.8 mm from cylinder block with respect to the cylinder block -2-).
- ◆ After installing oil pan assembly, the sealant must dry for approx. 30 minutes. Only then may the engine be filled with oil.



A

- Support subframe with workshop crane VAG 1202 A.
- Installing subframe:

⇒ [Repair Manual, Suspension, Wheels, Steering, Repair Group 40](#)

Vehicles with automatic transmission:

- Secure ATF lines.

⇒ [Repair Manual, 5 Spd. Automatic Transmission 01V, Repair Group 37](#)

All models:

- Install lock carrier ⇒ [Page 13-1](#) .
- Fill engine with oil and check oil level.

Vehicles with automatic transmission:

- Check ATF level:

⇒ [Repair Manual, 5 Spd. Automatic Transmission 01V, Repair Group 37](#)

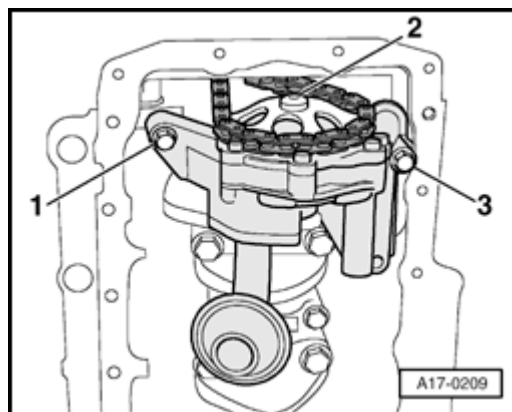
Tightening torques

| Component | Nm |
|---|-----------|
| Oil pan to cylinder block | M7 15 |
| | M10 40 |
| Oil pan to transmission | 45 |
| Limit stop for torque reaction support on oil pan | 28 |
| Engine mounting to subframe | 25 |
| Engine mounting to engine support | 25 |
| Transmission support to transmission support | M10 40 |
| Transmission mounting to subframe | M8 25 |
| | |
| Oil return pipe to oil pan | 10 |
| Oil drain plug | 30 |
| Hose clamps for air duct hoses | 3.5 |

Oil pump, removing and installing

Removing

- Remove oil pan and baffle plate ⇒ [Page 17-11](#).



A

- Remove bolt -2-.
- Remove sprocket wheel from oil pump shaft.
- Remove bolts -1- and -3- and remove oil pump.

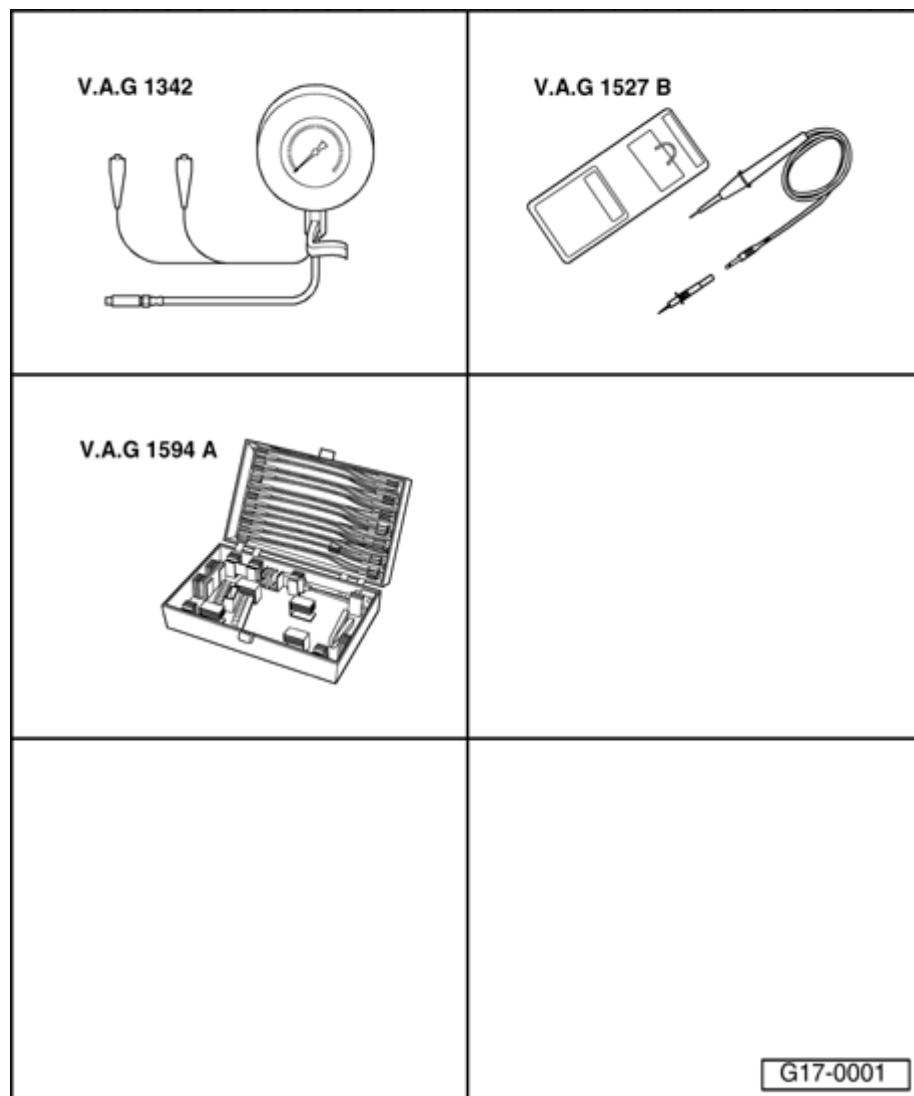
Installing

Installation is carried out in the reverse order of removal; note the following:

- Insert dowel sleeves -Item 12 -, ⇒ [Page 17-4](#) on top of oil pump.
 - ◆ Oil pump shaft/sprocket wheel location: Can only be installed in one position.
- Installing oil pan ⇒ [Page 17-23](#)

Tightening torques

| Component | Nm |
|----------------------------------|----|
| Chain sprocket to oil pump shaft | 22 |
| Oil pump to cylinder block | 16 |



Oil pressure and oil pressure switch, checking

Special tools and equipment

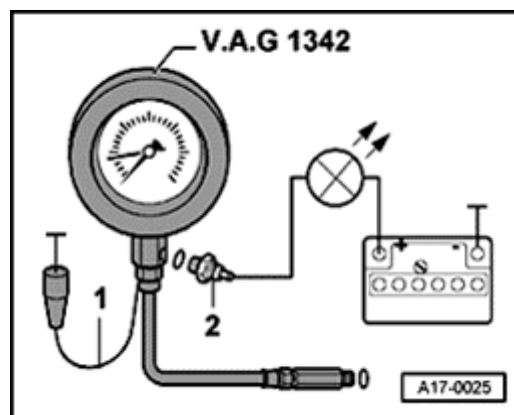
- ◆ VAG 1342
- ◆ VAG 1527 B
- ◆ VAG 1594 A

Test requirements:

- Oil level OK.
- Engine oil temperature approx. 80° C.
- Oil pressure warning lamp -K3- must come on when ignition is switched on.
- In vehicles with auto check system the "OK" display must appear (call up symbol).

Testing oil pressure switch

- Disconnect wire from oil pressure switch.
- Remove oil pressure switch and screw in oil pressure tester VAG 1342.
- Thread oil pressure switch -2- into VAG 1342.
- Connect brown wire -1- of tester to Ground (-).



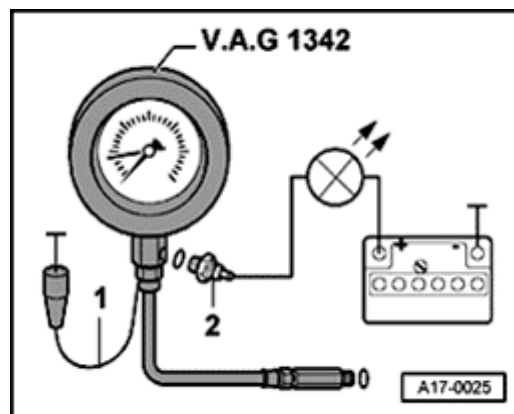
- Connect voltage tester VAG 1527 B to oil pressure switch and positive side of battery (+) using test leads from VAG 1594 A.
- Test lamp should not light up.
- If test lamp lights up, install new oil pressure switch.
- Start engine.

Note:

The switching point of the oil pressure switch can be reached when the engine is cranked on the starter motor, so watch the tester and the test lamp while starting the engine.

Black oil pressure switch:

- LED must light up at 1.2 to 1.6 bar.
- If test lamp does not light up, install new oil pressure switch.



Check oil pressure

- Disconnect wire from oil pressure switch.
- Remove oil pressure switch and screw in oil pressure tester VAG 1342.
- Thread oil pressure switch -2- into VAG 1342.
- Start engine (engine oil temperature approx. 80 ° C).
 - Oil pressure at idling speed: at least 1.3 bar
 - Oil pressure at 2000 rpm: 3.5 to 4.5 bar

If specified values are not attained:

- Pressure relief valve or oil pump faulty, replace oil pump ⇒ [Page 17-28](#).

Engine oil

The engine is filled with a high quality multigrade oil at the factory. This oil may be used all year round, except in extremely cold climates.

Viscosity grades and oil specifications

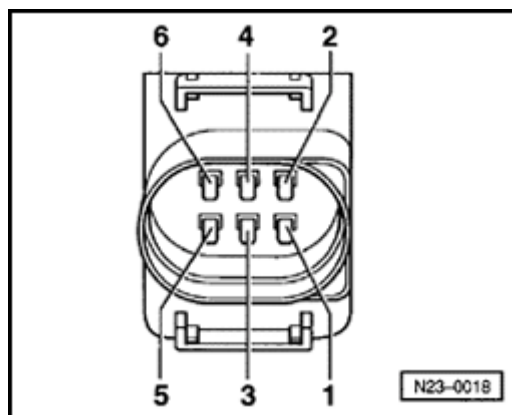
Viscosity grades and oil specifications:

⇒ [Repair Manual, Maintenance](#)

Engine oil level, checking

Test requirements:

- Engine oil temperature at least 60 ° C
 - Vehicle must be level (horizontal)
 - Wait a few minutes after switching off engine to allow oil to flow back into oil pan.
- Pull out dipstick, wipe with a clean cloth and insert again to stop.
- Pull out dipstick again and read oil level.



Markings on oil dipstick:

- a - Oil must not be topped up.
- b - Oil may be topped up. The oil level may rise as far as area -a- after topping up.
- c - Oil must be topped up. The oil level is sufficient if somewhere in area - b- (grooved area) after topping up.

Note:

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