

Volkswagen New Beetle
1.8 Liter 4-Cyl. 5V Turbo OBD II Engine Mechanical
17 Engine-Lubrication system (Page GR-17)

- [Lubrication system components, removing and installing](#)
- [Oil pressure and oil pressure switch, checking](#)
- [Sump, removing and installing](#)

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1.8 Liter 4-Cyl. 5V Turbo OBD II Engine Mechanical

Valve gear, servicing (Page 17-1)

Notes:

- ♦ *If large quantities of metal particles or other deposits (caused, for example, by partial seizure of the crankshaft or conrod 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.*
- ♦ *The oil level must not be above the max. mark , or there is danger of damage to the catalyst! Marking ⇒ [Page 17-9](#) , [Fig. 1](#) .*

Checking oil pressure ⇒ [Page 17-14](#)

Oil system capacity:

- ♦ without oil filter: 4.0 ltrs
- ♦ with oil filter: 4.5 ltrs

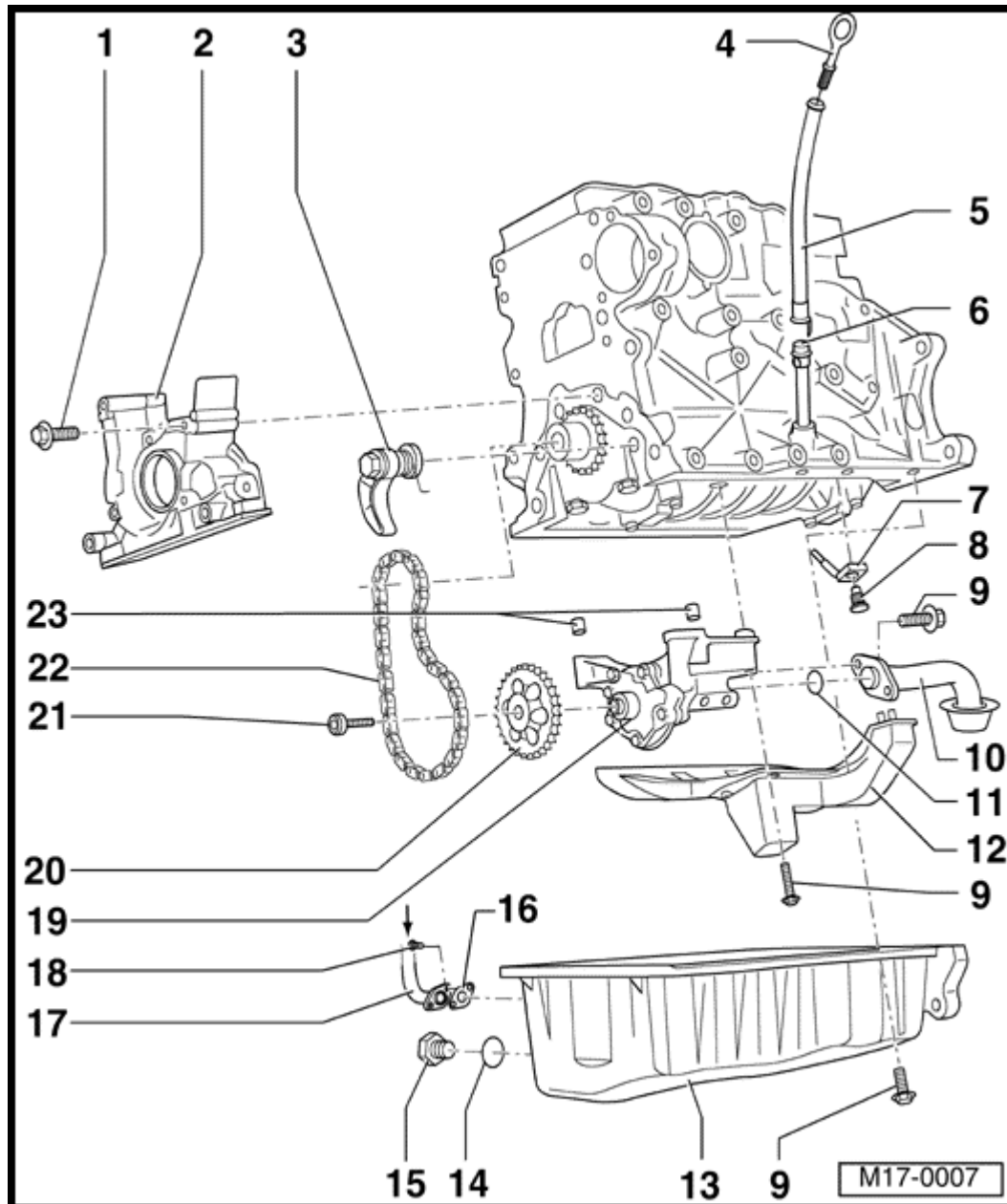
Engine oil specifications:

Use engine oil to VW standard 500 00, 50101 or 502 00. Only in exceptional cases: Multi - grade oils corresponding to API - SF or SG.

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1.8 Liter 4-Cyl. 5V Turbo OBD II Engine Mechanical
Lubrication system components, removing and installing (Page 17-2)

Part I

Part II, disassembly oil filter bracket ⇒ [Page 17-6](#) .



1 - 15 Nm

2 - Sealing flange

- ◆ Removing and installing ⇒ [Page 13-27](#)
- ◆ Insert with silicone sealant D 176 404 A2 ⇒ [Page 13-27](#)
- ◆ Replacing crankshaft oil seal (pulley end) ⇒ [Page 13-23](#)

3 - Chain tensioner with tensioning rail, 15 Nm

- ◆ When installing, pretension spring and fit

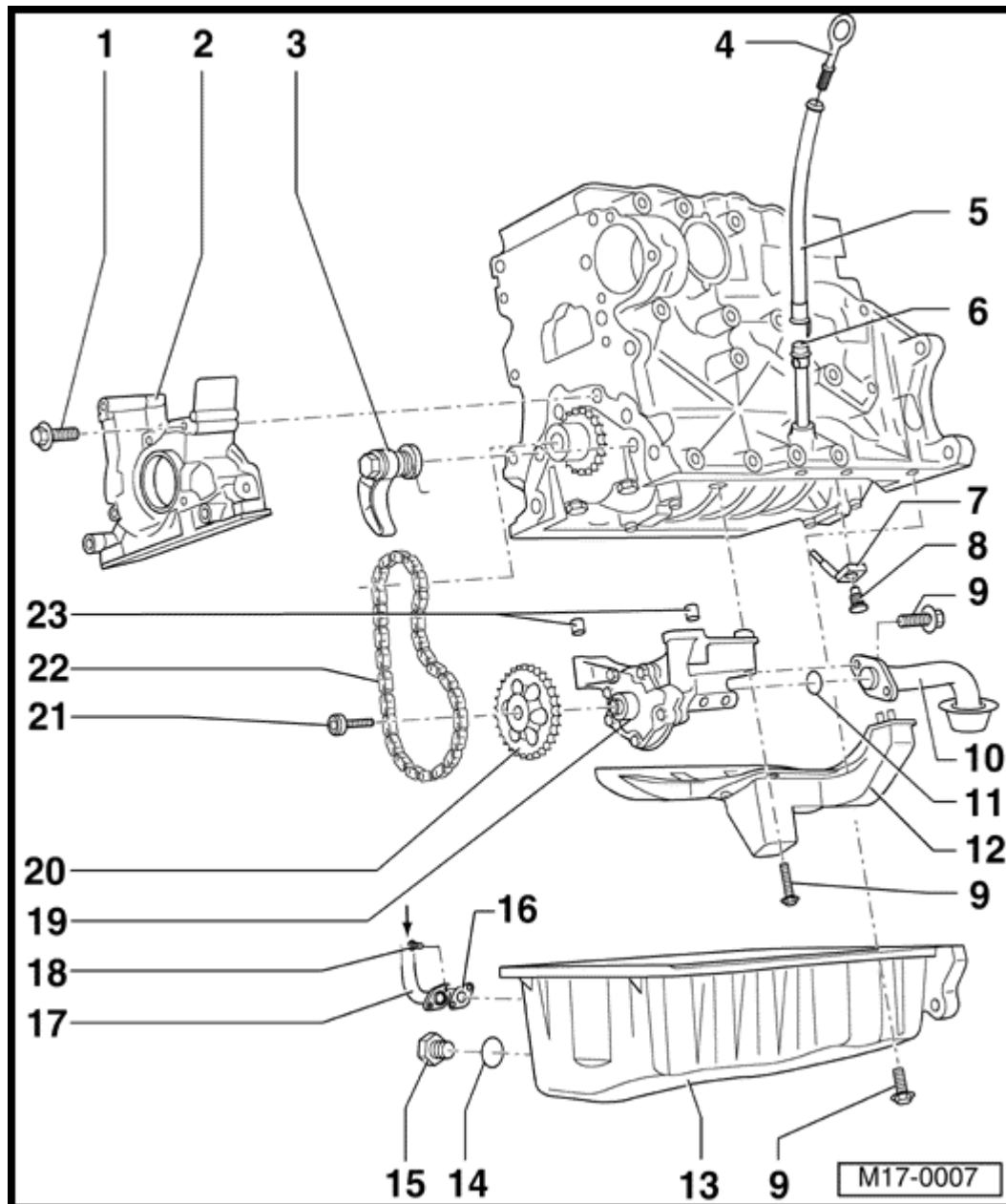
4 - Dipstick

- ◆ Oil level must not be above the max. mark!
- ◆ Markings ⇒ [Page 17-9](#) , [Fig. 1](#)

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Lubrication system components, removing and installing (Page 17-3)



5 - Guide

- ◆ Pull off to extract oil

6 - Guide tube

7 - Oil spray jet

- ◆ For piston cooling

8 - Pressure relieve valve, 27 Nm

- ◆ Opening pressure: 2.5-3.2 bar

9 - 15 Nm

10 - Suction pipe

- ◆ Clean strainer if soiled

11 - O ring

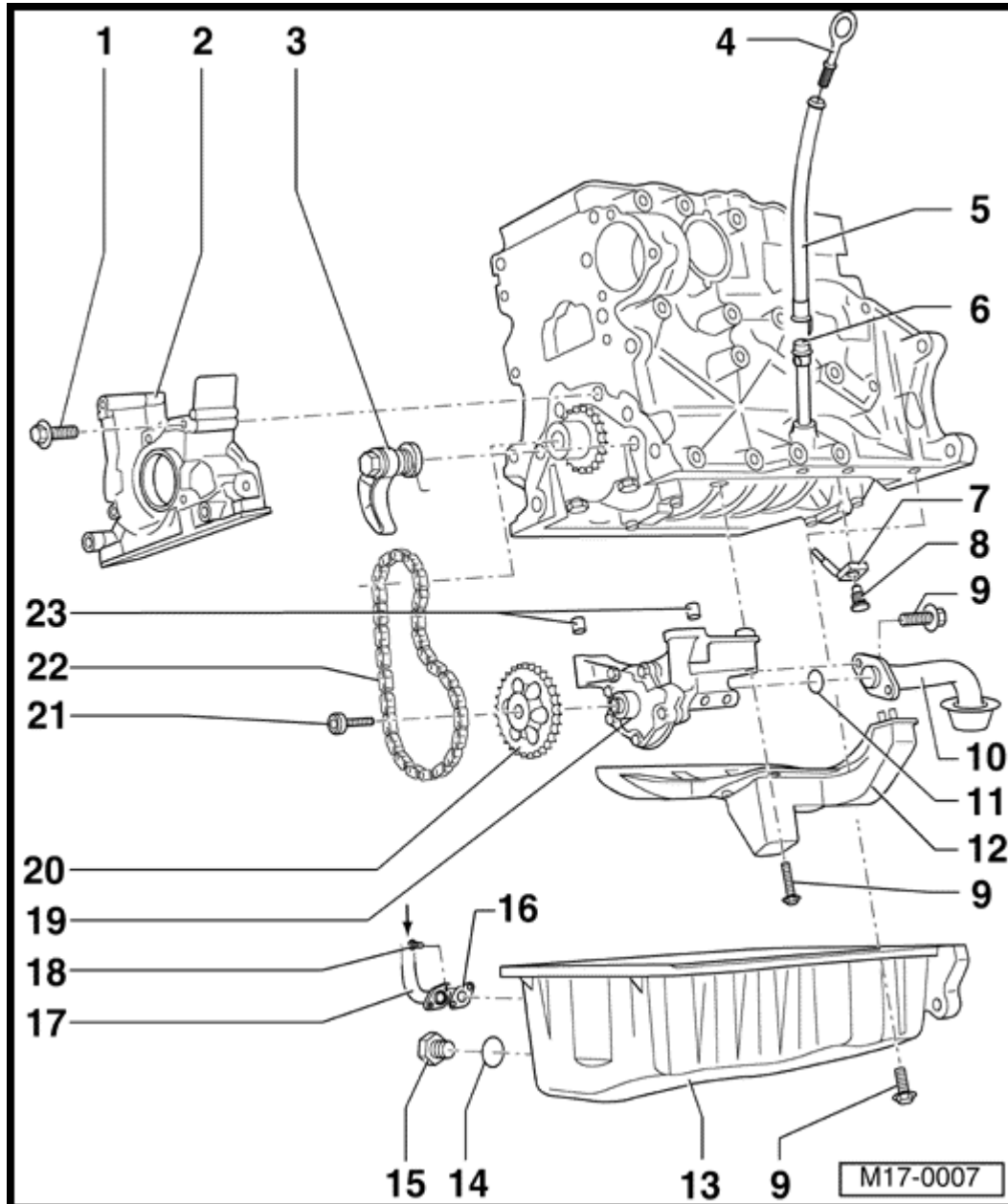
- ◆ Replace

12 - Baffle plate

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Lubrication system components, removing and installing (Page 17-4)



13 - Sump

- ◆ Clean sealing surface before installing
- ◆ Install with silicone sealant D 176 404 A2 ⇒ [Page 17-10](#)

14 - Seal

- ◆ Replace

15 - Oil drain plug, 30 Nm

16 - Gasket

- ◆ Replace

17 - Oil return pipe

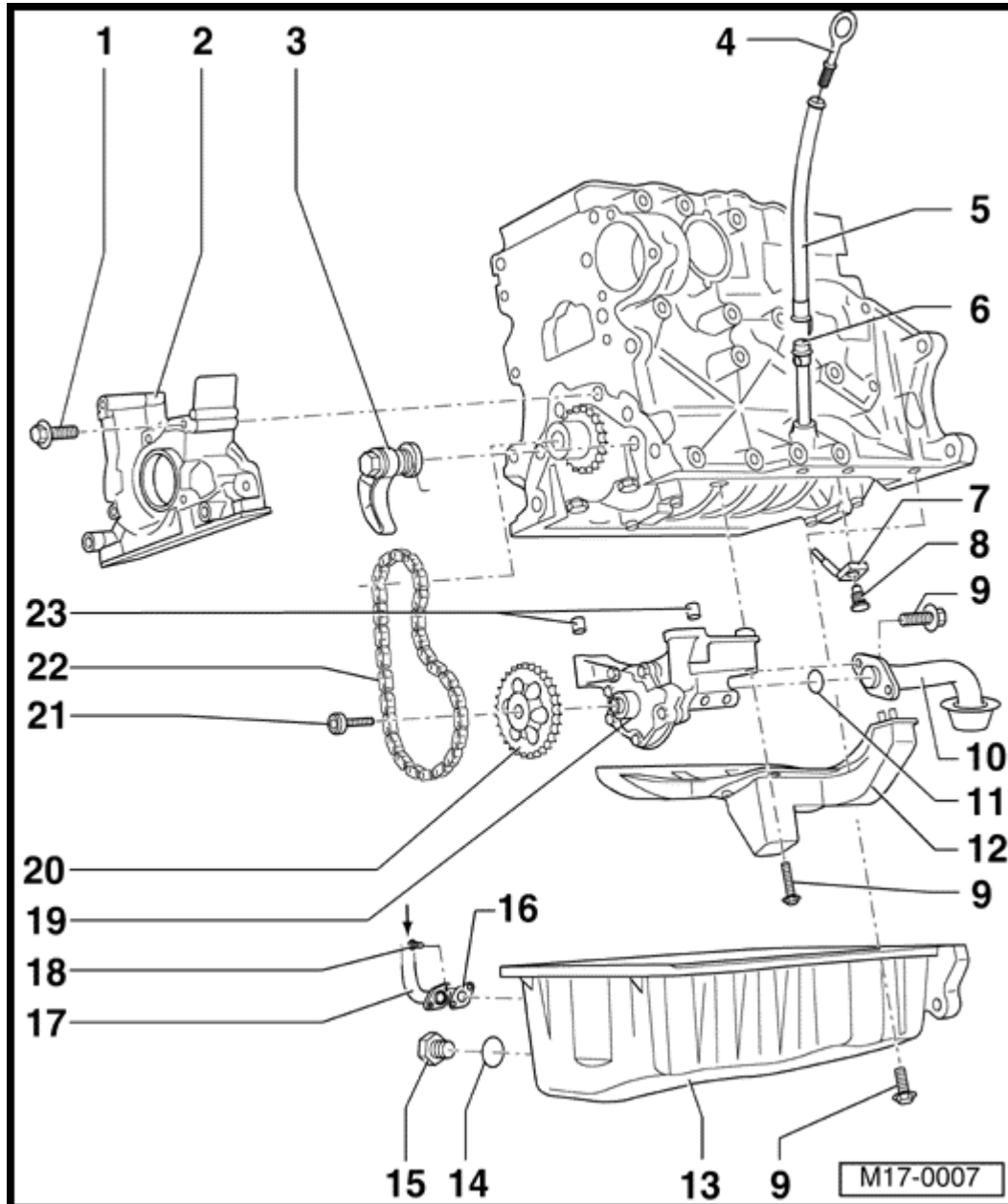
- ◆ From turbocharger

18 - 10 Nm

19 - Oil pump

- ◆ With with positive pressure valve 12 bar
- ◆ Before installing, check that both dowel sleeves for centralizing oil pump/cylinder head are fitted
- ◆ Replace if running surfaces and gears are scored

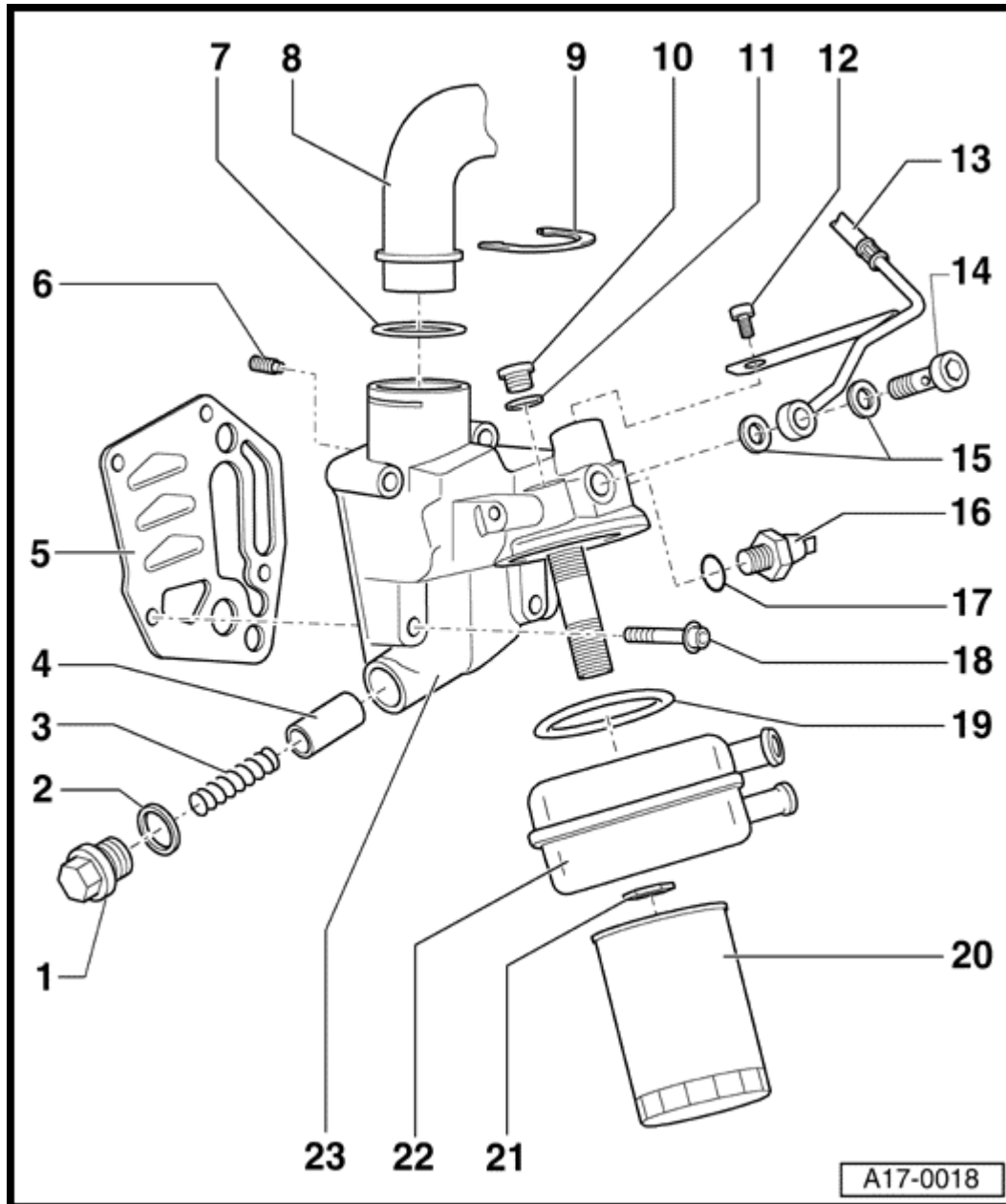
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Lubrication system components, removing and installing (Page 17-5)



- 20 - Chain sprocket**
- 21 - 25 Nm**
- 22 - Chain**
 - ♦ Mark direction of rotation before removing
 - ♦ Check for wear
- 23 - Dowel sleeves**

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Lubrication system components, removing and installing (Page 17-6)

Part II



- 1 - Sealing plug, 40 Nm**
- 2 - Seal**
 - ♦ If sealing ring is leaking nip open and replace.
- 3 - Spring**
 - ♦ For pressure relief valve, approx. 4 bar
- 4 - Piston**
 - ♦ For pressure relief valve, approx. 4 bar
- 5 - Gasket**

- ◆ Replace

6 - Non-return valve, 8 Nm

7 - O ring

- ◆ Replace

- ◆ Fit onto shoulder of pipe - 8 -

8 - Pipe

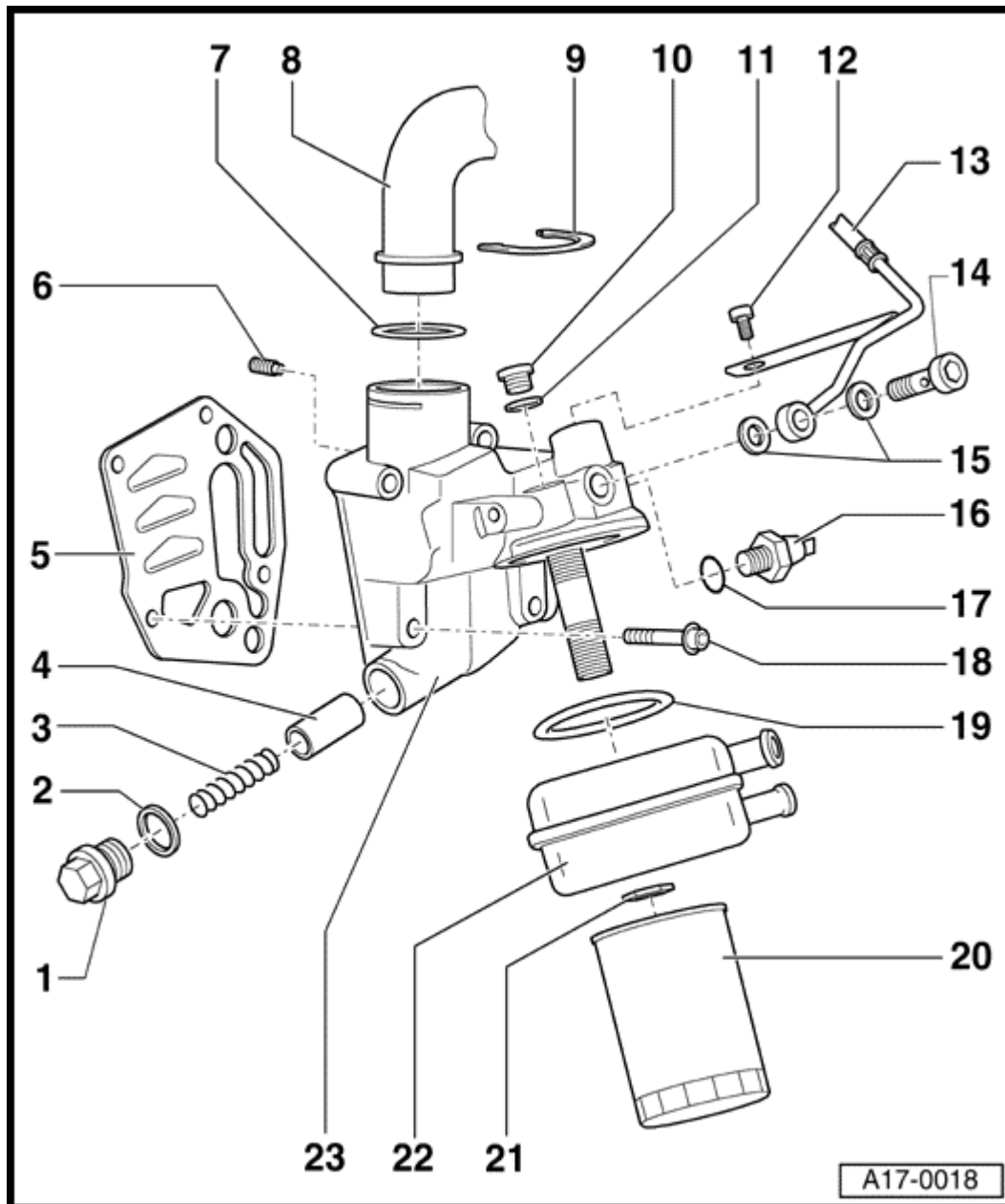
9 - Retaining clip

- ◆ Check for tight fit

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Lubrication system components, removing and installing (Page 17-7)



10 - Sealing plug, 15 Nm

11 - Seal

- ◆ If sealing ring is leaking nip open and replace

12 - 20 Nm

13 - Oil supply pipe

- ◆ To turbocharger

14 - Banjo bolt, 30 Nm

15 - Gasket

- ◆ Replace

16 - 1.4 bar oil pressure switch (F1), 25 Nm

- ◆ Black
- ◆ Checking ⇒ [Page 17-14](#)

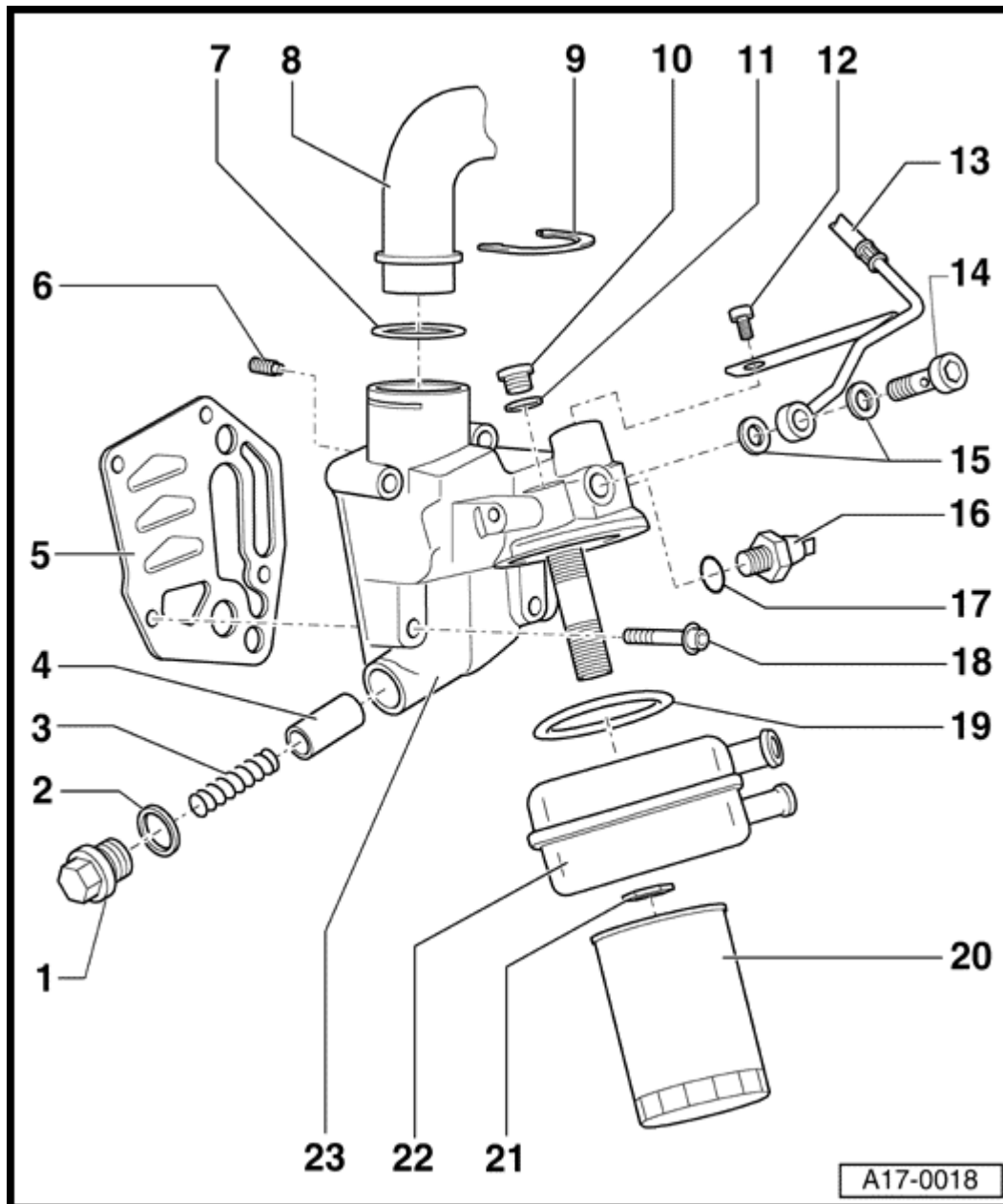
17 - Seal

- ◆ If sealing ring is leaking nip open and replace

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Lubrication system components, removing and installing (Page 17-8)



18 - 15 Nm + 1/4 turn (90°) further

- ◆ Replace

19 - Gasket

- ◆ Replace
- ◆ Fit into groove on oil cooler

20 - Oil filter

- ◆ Loosen with strap wrench
- ◆ Tighten by hand
- ◆ Observe installation instructions on oil filter

21 - 25 Nm

22 - Oil cooler

- ◆ Ensure clearance to adjacent components
- ◆ See note ⇒ [Page 17-1](#)
- ◆ Coat contact area to flange, outside the seal, with AMV 188 100 02

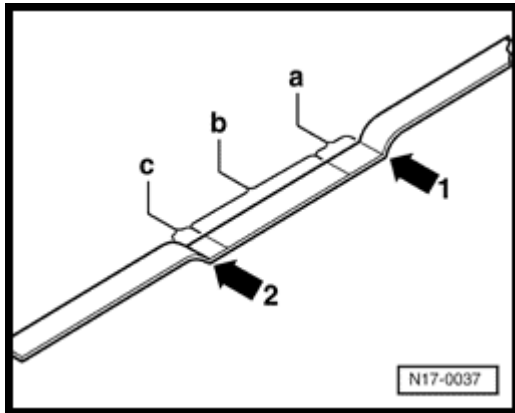
23 - Oil filter bracket

- ◆ With pressure relief valve approx. 4 bar

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Lubrication system components, removing and installing (Page 17-9)



A

Fig. 1 Markings on oil dipstick

1- max. mark

2- min. mark

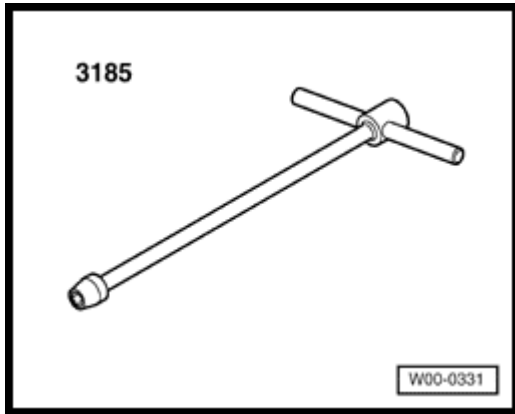
a- Area above hatched field up to max. mark: Do not top - up with engine oil!

b- Oil level within hatched field: can be topped - up with engine oil

c- Area from min. mark up to hatched field: fill with max. 0.5 ltr. of engine oil!

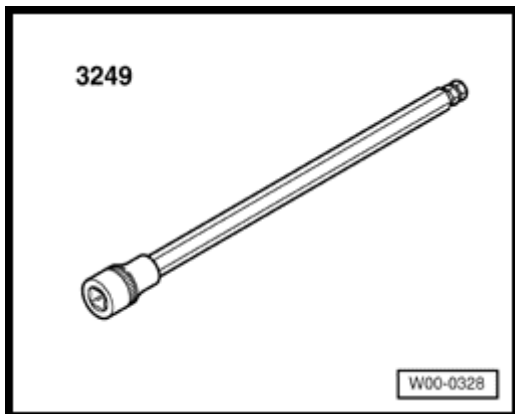
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Lubrication system components, removing and installing (Page 17-10)

Sump, removing and installing
Special tools and equipment



A

- ◆ 3185 Extension socket wrench



A

- ◆ 3249 Socket
- ◆ Hand drill with plastic brush
- ◆ Silicone sealant D 176 404 A2

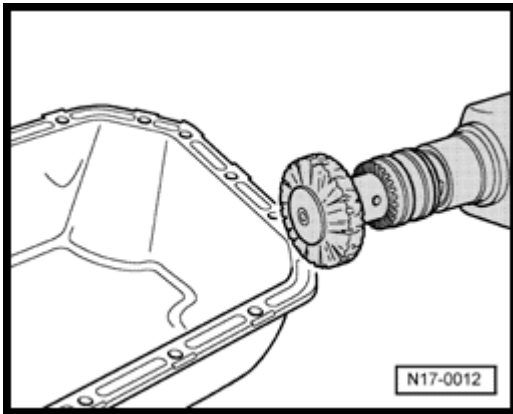
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Lubrication system components, removing and installing (Page 17-11)

Removing

- Removing center and right insulation tray:
⇒ [Repair Manual, Body-Exterior, Repair Group 50](#)
- Drain engine oil.
- Loosen and tighten oil sump bolts using extension socket wrench 3185. Unscrew with socket 3249.
- Remove sump; it may be necessary to release sump by tapping lightly with a rubber head hammer.
- Remove sealant residue on cylinder block with a flat scraper.



A

- Remove sealant residue on the sump with a rotating brush, e.g. a hand drill with a plastic brush (wear protective glasses).
- Clean sealing surface, must be free of oil and grease.

Installing

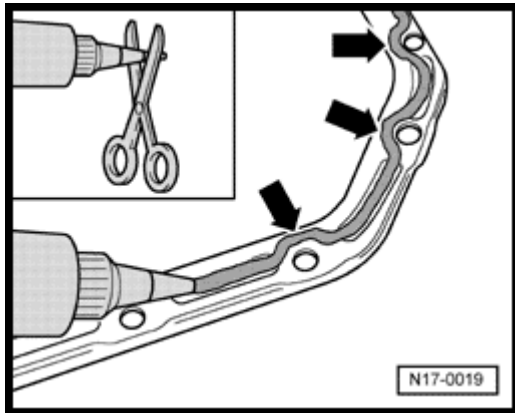
Notes:

- ◆ *Note the use by date of the sealant.*
- ◆ *Sump must be installed within 5 minutes of applying silicone sealing compound.*

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Lubrication system components, removing and installing (Page 17-12)



A

- Cut - off tube nozzle at forward marking (nozzle approx. 3 mm \varnothing).
- Apply silicone sealing compound, as shown, to clean sump sealing surface.
- Sealing compound bead must be:
 - ♦ 2-3 mm thick.
 - ♦ and run on inside of bolt holes - arrows - .

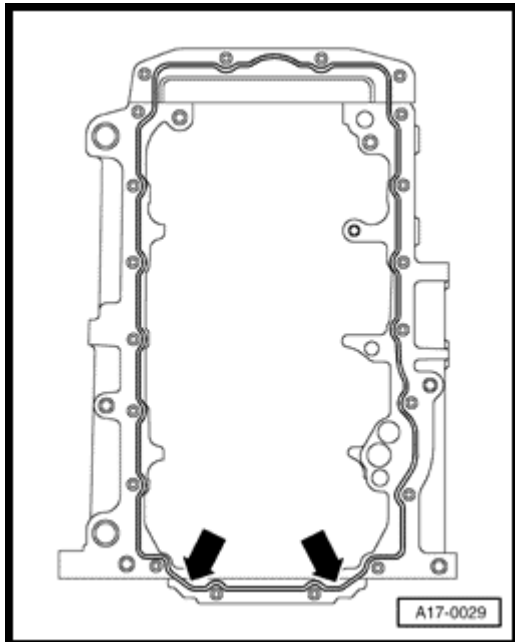
Notes:

The sealing compound bead must not be thicker, otherwise excess sealing compound will enter the sump and may block the oil suction pipe strainer.

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Lubrication system components, removing and installing (Page 17-13)



- Apply silicone sealing bead as shown to the clean sealing surface of the sump (illustration shows the position of the sealant bead on the cylinder block).
- Install sump immediately and tighten bolts as follows:
 - 1- Tighten all bolts sump/cylinder block very lightly and diagonally.
 - 2- Lightly tighten three bolts sump/gearbox.
 - 3- Lightly tighten all bolts sump/cylinder block diagonally.
 - 4- Tighten three bolts sump/gearbox to 45 Nm.
 - 5- Tighten all bolts sump/cylinder block diagonally to 15 Nm.

Notes:

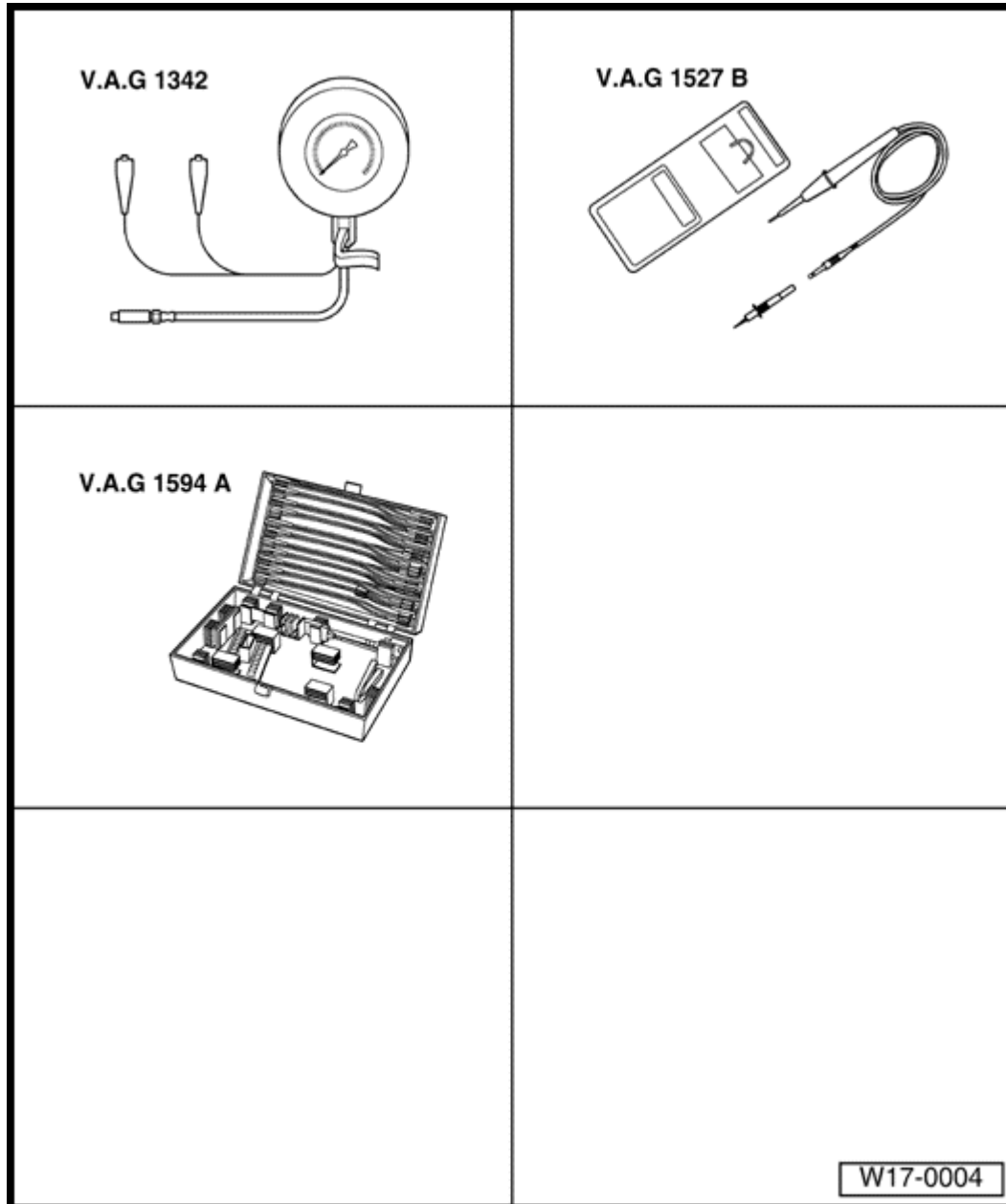
- ◆ *When installing the sump on an engine which is out of vehicle, ensure that the sump is flush with cylinder block on flywheel end.*
- ◆ *The sealant must be allowed to drive approx. 30 minutes after fitting the sump. Only then can the engine be filled with engine oil.*

The rest of the assembly is basically a reverse of the disassembly sequence.

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Lubrication system components, removing and installing (Page 17-14)



Oil pressure and oil pressure switch, checking

Special tools and equipment

- ◆ V.A.G 1342 Oil pressure tester
- ◆ V.A.G 1527 B Diode test lamp
- ◆ V.A.G 1594 A Adapter set

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Lubrication system components, removing and installing (Page 17-15)

Function of the dynamic oil pressure warning indicator

- ◆ When not under pressure, the oil pressure switch is open and will close when the operating pressure is attained.
- ◆ The oil pressure warning will be activated approx. 10 seconds after switching the ignition on.
- ◆ Switch - in delay of oil pressure warning: approx. 3 seconds.
- ◆ Switch - off delay of oil pressure warning: approx. 5 seconds.

Notes:

Functional check and servicing the optical and acoustic oil pressure warning:

⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations binder*

Checking warning lamp

After switching on the ignition without engine started, the oil pressure warning lamp in dash panel insert must light for approx. 3 seconds and then go out. The test will be terminated if the engine is running.

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Lubrication system components, removing and installing (Page 17-16)

Criteria for warning

Switching on the optical oil pressure warning (the oil pressure warning lamp flashes) and the buzzer sounding three times for the acoustical warning will occur under one of the following conditions:

- "Ignition on," engine stationary, oil pressure switch closed
- Engine speed above 1500 rpm, oil pressure switch open

Notes:

- ♦ *If the oil pressure switch is closed, the warning lamp will remain switched on if the engine speed is above 5000 rpm. The warning lamp will be switched off again if the engine speed is below 5000 rpm.*
- ♦ *If the oil pressure switch is open for 0.3 - 3.0 seconds when the engine speed is above 1500 rpm, it will be stored in the combi - processor in the dash panel insert. If this condition occurs three times when the engine is running, the oil pressure warning will be activated and will not be cancelled even below 1500 rpm. The oil pressure warning will be cancelled when the oil pressure switch is closed for longer than 5 seconds at an engine speed above 1500 rpm, or when the ignition is switched off.*

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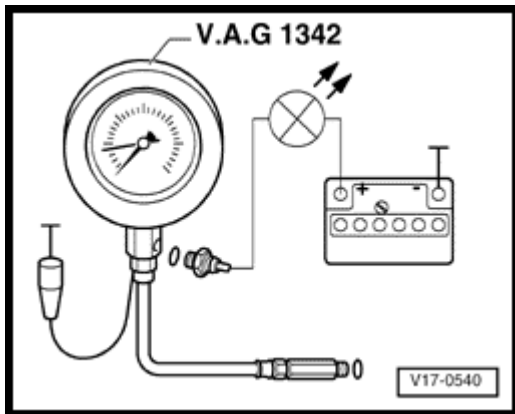
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Lubrication system components, removing and installing (Page 17-17)

Test conditions

- Engine oil level OK ⇒ [Page 17-9](#)
- Oil pressure warning lamp (K3) must light up for approx. 3 seconds when ignition is switched on
- Engine oil temperature at least 80° C (radiator fan must have run once)

Test sequence



A

- Remove oil pressure switch (F1) and screw into tester.
- Screw tester into the oil filter bracket in place of the oil pressure switch.
- Connect brown wire of tester to Ground (-).
- Connect diode test lamp V.A.G 1527 B using aux. cables from V.A.G 1594 A to battery positive (+) and oil pressure switch.
- LED must not light up.
- If the LED lights up, replace 1.4 bar oil pressure switch (F1).

When the LED does not light up:

- Start engine and run at idling speed:
- At 1.2-1.6 bar the LED must light up, otherwise replace oil pressure switch.

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Lubrication system components, removing and installing (Page 17-18)

- Check oil pressure at different RPMs:
 - ◆ Idle: at least 2.0 bar
 - ◆ 2000/min: 3.0-4.5 bar
 - ◆ Above 2000/min: maximum 7.0 bar

If the specifications are not obtained:

- Repair mechanical damage (e.g. bearing damage).
- Replace oil filter bracket with pressure relief valve ⇒ [Page 17-8](#) , item 23 or replace oil pump ⇒ [Page 17-4](#) , item 19.

At higher engine speeds the oil pressure must not exceed 7.0 bar.

If the specification is exceeded:

- Check oil galleries.
- If necessary, replace oil filter bracket with pressure relief valve ⇒ [Page 17-8](#) , item 23.