17 - ENGINE LUBRICATION

LUBRICATION SYSTEM COMPONENTS, REMOVING AND INSTALLING

Lubrication System Components, Removing and Installing

--> **Oil Pan Sections, Oil Pump and Oil Cooler, Component Overview**

--> **Oil Cooler, Removing and Installing**

--> **Oil Pan Lower Section, Removing and Installing**

--> **Oil Pump, Removing and Installing**

--> **Oil Pan Upper Section, Removing and Installing**

--> **Oil Filter Housing, Component Overview**

--> **Oil Filter Housing, Removing and Installing**

--> **Oil Check Valves, Oil Separator, Component Overview**

--> **Oil Pressure Switch, Removing and Installing**

--> **Oil Pressure, Checking**

--> **Engine Oil Specifications**

--> **Oil Level, Checking**

NOTE:

- **If large quantities of metal shavings or abraded material are found in the engine oil while servicing the engine, the oil passages must be carefully cleaned to prevent resulting damage and the oil cooler must be replaced.**
- **The oil level must not be above the max. mark - danger of damage to catalytic converter!**
- **Oil capacities, specifications and viscosity classes --> Fluid Capacity Chart located in ServiceNet.**

OIL PAN SECTIONS, OIL PUMP AND OIL COOLER, COMPONENT OVERVIEW

Oil Pan Sections, Oil Pump and Oil Cooler, Component Overview

NOTE:

- **Oil injector jet for piston cooling --> Oil spray jet for piston cooling**

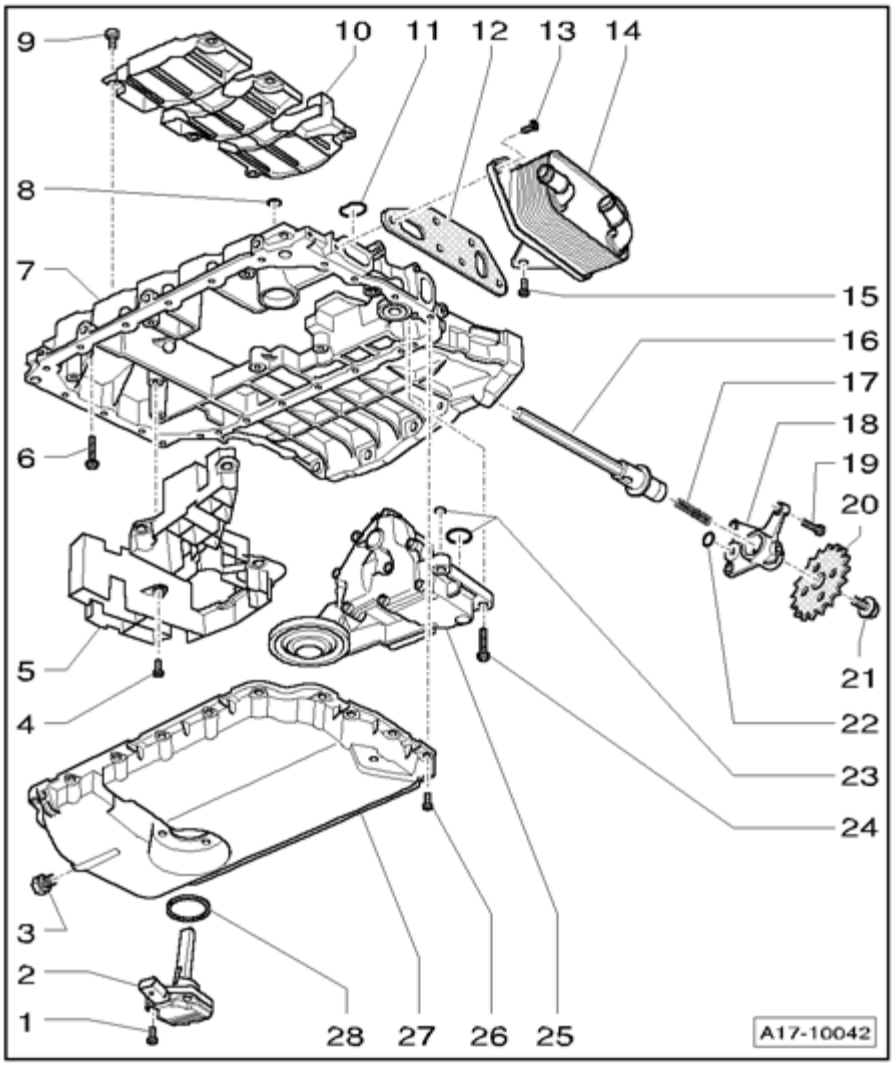

Fig. 457: Oil Pan Sections, Oil Pump And Oil Cooler, Component Overview
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - 9 Nm

- Depending on the version, bolt or nut
- Insert with locking compound; Locking compound .

2 - Oil Level Thermal Sensor G266

3 - Oil drain plug - 30 Nm

4 - 9 Nm

5 - Lower oil baffle

6 - 16 Nm

- Fasten in diagonal sequence in steps

7 - Oil pan (upper section)

- Removing and installing --> **Oil Pan Upper Section, Removing and Installing**

8 - O-ring

- Replace

9 - 9 Nm

- Insert with locking compound; Locking compound .

10 - Upper oil baffle

11 - Gasket

- Replace

12 - Gasket

- Replace

13 - 9 Nm

14 - Oil cooler

- See note
- Removing and installing --> **Oil Cooler, Removing and Installing**
- With oil cooler by-pass valve

15 - 9 Nm

16 - Drive shaft for oil pump

17 - Spring

18 - Bracket

19 - 9 Nm

20 - Chain sprocket for oil pump

- Can only be placed onto drive shaft in one position

21 - 30 Nm plus an additional 90 ($^1/_4$ turn)

- Replace
- To loosen, counterhold on sprocket with Spanner Wrench 3212

22 - O-ring

- Replace

23 - O-rings

- Replace

24 - 20 Nm

25 - Oil pump

- Do not disassemble
- With cold pressure relief valve 11 bar and pressure regulator valve 4.3 bar
- Removing and Installing

26 - Bolt

Aluminum oil pan lower part:

- 9 Nm
- Fasten in diagonal sequence in steps

Metal oil pan lower part:

- Replace
- 5 Nm plus an additional 90 ($^1/_4$ turn)
- Fasten in diagonal sequence in steps

27 - Oil pan (lower section)

- Different versions
- Removing and installing --> **Oil Pan Lower Section, Removing and Installing**

28 - Seal

- Replace

Oil spray jet for piston cooling

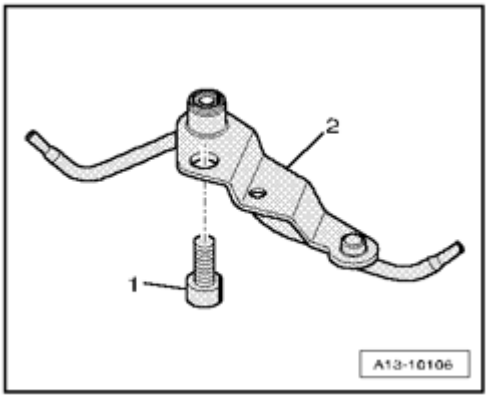

Fig. 458: Oil Spray Jet For Piston Cooling
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1. Install bolt - 9 Nm - using a locking compound
2. Oil spray jet with spray nozzle valve

OIL COOLER, REMOVING AND INSTALLING

Oil Cooler, Removing and Installing

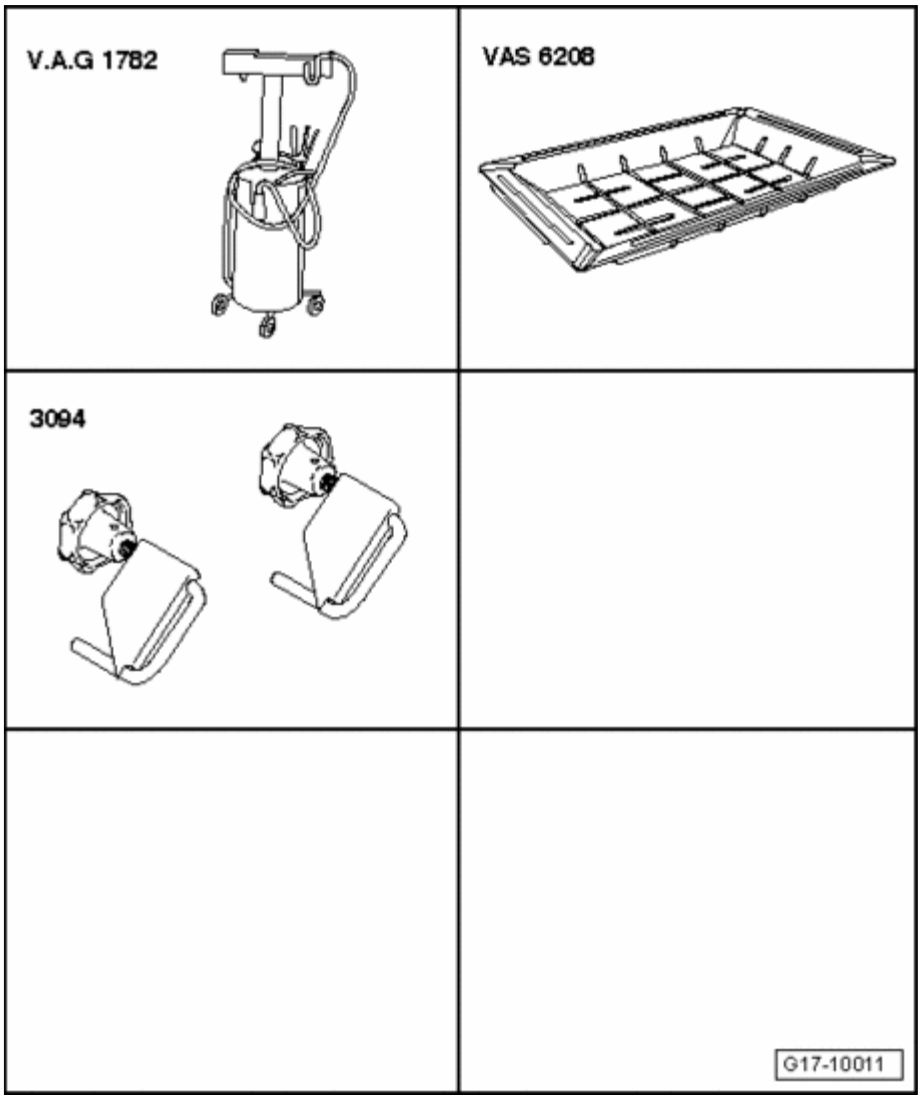

Fig. 459: Identifying Special Tools - Oil Cooler, Removing And Installing
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools, testers and auxiliary items required

- Old oil collecting and extracting device V.A.G 1782
- Drip tray for workshop crane VAS 6208
- Hose Clamps Up to 25 mm dia. 3094

Removing

CAUTION: Cover cap of expansion tank with rag and open carefully, as hot steam i.e. hot coolant may escape when opening.

- Open cap of coolant expansion tank.

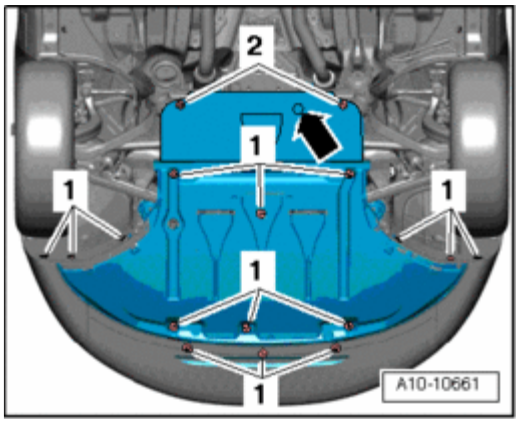

Fig. 460: Identifying Noise Insulation And Mountings
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove noise insulation and the mountings - **1, 2** - - **arrow** - where present.
- Place old oil collecting and extracting device V.A.G 1782 under engine.
- Drain engine oil.

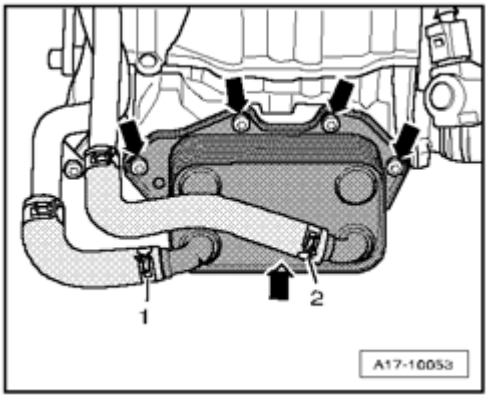

Fig. 461: Connecting/Removing Coolant Hoses With Hose Clamps
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Place drip tray for workshop crane VAS 6208 under engine.
- Connect coolant hoses - **21** - and - **2** - with Hose Clamps Up to 25 mm dia. 3094.
- Remove coolant hoses on oil cooler and drain coolant.
- Place old oil collecting and extracting device V.A.G 1782 under engine.

- Remove bolts - **arrows** - and remove oil cooler.

Installing

Installation is in reverse order of removal, noting the following:

NOTE:

- **Always replace gaskets and seals.**
- **Secure all hose connections with hose clamps appropriate for the model .**

- Add engine oil and check oil level --> **Oil Level, Checking** .
- Fill with coolant -->**Cooling System, Draining and Filling** .

Tightening Specifications

Component	Nm
Oil cooler to oil pan (upper part)	9
Oil drain plug	30

OIL PAN LOWER SECTION, REMOVING AND INSTALLING

Oil Pan Lower Section, Removing and Installing

Special tools, testers and auxiliary items required

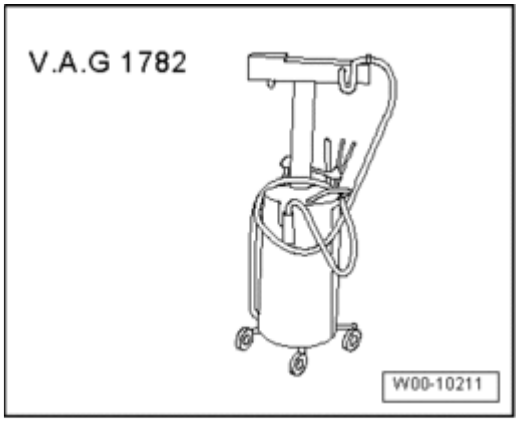

Fig. 462: Identifying Old Oil Collecting And Extracting Device V.A.G 1782
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Old oil collecting and extracting device V.A.G 1782
- Hand drill with plastic brush attachment
- Protective glasses
- Sealant

Removing

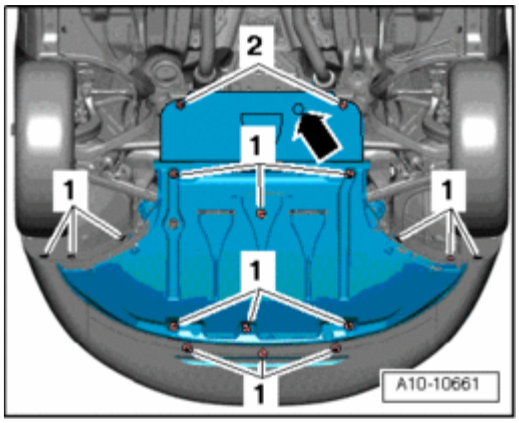

Fig. 463: Identifying Noise Insulation And Mountings
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove noise insulation and the mountings - **1, 2** - - **arrow** - where present.

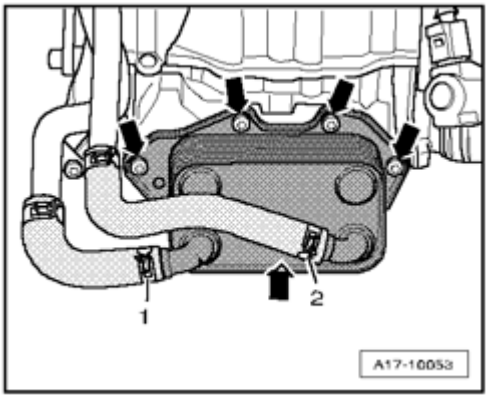

Fig. 464: Connecting/Removing Coolant Hoses With Hose Clamps
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Place old oil collecting and extracting device V.A.G 1782 under engine.
- Drain engine oil.
- Remove bolts - **arrows** - and remove oil cooler with coolant hoses - **1** - and - **2** - connected.

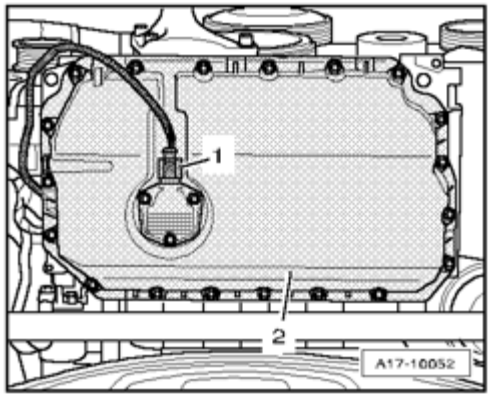

Fig. 465: Disconnecting Electrical Connector To Oil Level Thermal Sensor G266 And Free Up Lines
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect electrical connector - **1** - to Oil Level Thermal Sensor G266 - **arrow** - and free up lines.
- Carefully loosen the metal lower section of the oil pan from the bond without bending it.

Installing

NOTE:

- **Always replace gaskets and seal.**
- **Replace the metal lower section of the oil pan if the coating on it is damaged or if it is bent.**

CAUTION: Wear safety glasses.

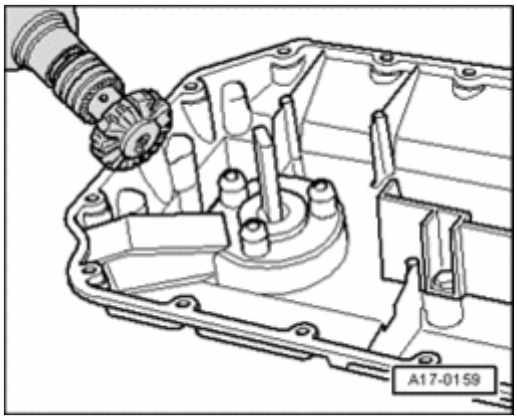

Fig. 466: Using Rotating Plastic Brush To Remove Any Remaining Sealant From Oil Pan (Lower Part) And At Upper Part
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Using rotating plastic brush, remove any remaining sealant from lower part of oil pan and upper part.

NOTE:

- **Make sure the coating on the metal lower section of the oil pan is not damaged.**

  - Clean sealing surfaces so they are completely free of any oil or grease.

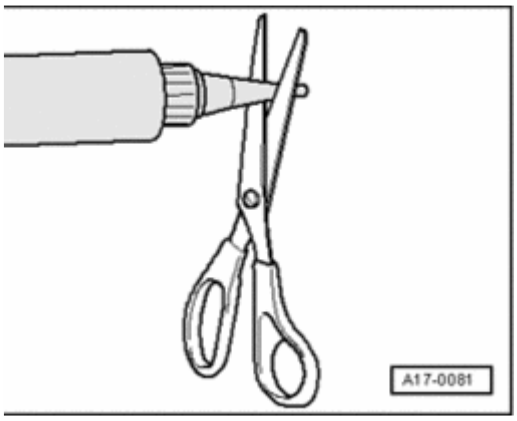

Fig. 467: Cutting Tube Nozzle At Front Marking
Courtesy of VOLKSWAGEN UNITED STATES, INC.

  - Cut tube nozzle at front marking (dia. of nozzle approximately 1 mm).

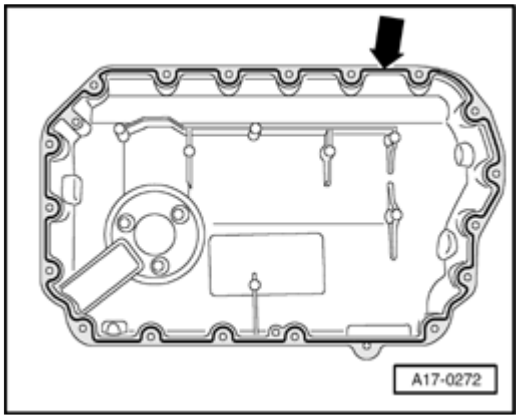

Fig. 468: Applying Sealant Bead To Clean Sealing Surfaces Of Oil Pan (Lower Part)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

  - Apply sealant bead - **arrow** - to clean sealing surfaces of oil pan (lower part) as shown in illustration.

- Thickness of sealant bead: approximately 1.5 mm.

NOTE:

- **Sealant bead must not be thicker than specified, otherwise excess sealant may get into lower section of oil pan and clog strainer in intake tube.**
- **The oil pan (lower part) must be installed within 5 minutes after application of sealant.**

- Position the oil pan lower section and tighten all the bolts in a diagonal sequence to 5 Nm.
- Fasten bolts for lower part of oil pan in a diagonal sequence.
- Install oil cooler --> **Oil Cooler, Removing and Installing**.
- Add engine oil and check oil level --> **Oil Level, Checking** .

Tightening Specifications

Component	Nm
Oil cooler to oil pan (upper part)	9
Aluminum oil pan lower part to oil pan upper part	9 1)
Metal oil pan lower part to oil pan upper part	5 + 90° 1)2)3)
Oil drain plug	30
1) Tighten diagonally. 2) Replace bolts. 3) 90° corresponds to a quarter turn.	

OIL PUMP, REMOVING AND INSTALLING

Oil Pump, Removing and Installing

Removing

- Remove lower section of oil pan --> **Oil Pan Lower Section, Removing and Installing**.

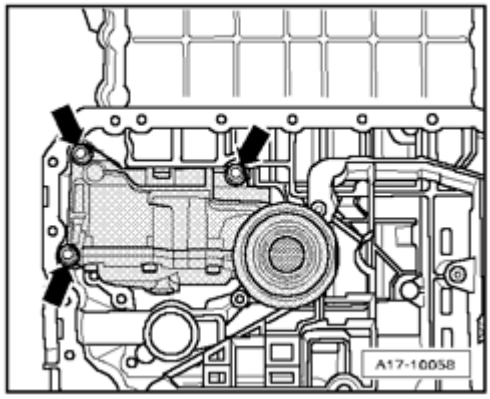

Fig. 469: Removing Oil Pump Bolts
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove bolts - **arrows** -.
- Pull oil pump forward from the drive shaft; if necessary, push the drive shaft slightly to the rear.

Installing

Installation is in reverse order of removal, noting the following:

NOTE:

- **Replace O-rings.**

- Install oil pump onto the drive shaft and fasten.
- Install lower section of oil pan --> **Oil Pan Lower Section, Removing and Installing**.
- Add engine oil and check oil level --> **Oil Level, Checking** .

Tightening specifications

Component	Nm
Oil pump to upper part of oil pan	20

OIL PAN UPPER SECTION, REMOVING AND INSTALLING

Oil Pan Upper Section, Removing and Installing

Special tools, testers and auxiliary items required

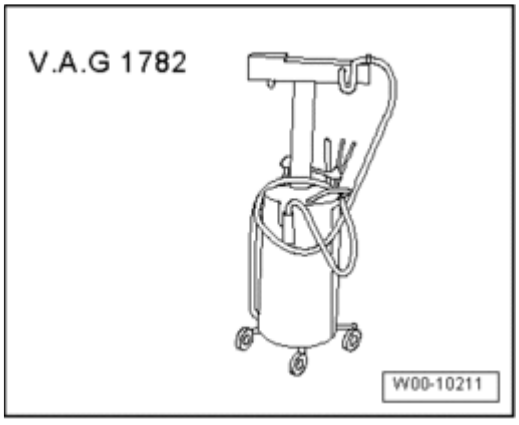

Fig. 470: Identifying Old Oil Collecting And Extracting Device V.A.G 1782
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Old oil collecting and extracting device V.A.G 1782
- Protective glasses
- Hand drill with plastic brush attachment
- Sealant

Removing

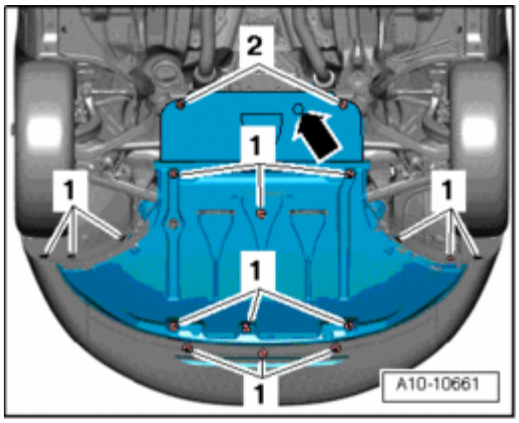

Fig. 471: Identifying Noise Insulation And Mountings
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove noise insulation and mountings - **1, 2** - - **arrow** - where present.
- Place old oil collecting and extracting device V.A.G 1782 under engine.
- Drain engine oil.
- Remove engine:

- Vehicles with multitronic transmission --> **Engine, with Multitronic Transmission, Removing and Installing**.
- Vehicles with automatic transmission 09L --> **Engine, Removing**.

- Separate engine/transmission assembly:

- Vehicles with multitronic transmission --> **Engine and Transmission, Separating**.
- Vehicles with automatic transmission 09L --> **Engine and Automatic Transmission 09L, Separating**.

- Secure engine to assembly stand:

- Vehicles with multitronic transmission --> **Engine, Securing to Engine and Transmission Holder**.
- Vehicles with automatic transmission 09L --> **Engine, Securing to Engine and Transmission Holder**.

- Vehicles with multitronic transmission: Remove damper unit --> **Damper Unit, Removing and Installing** and flywheel --> **Flywheel, Multitronic Transmission, Removing and Installing**.
- Vehicles with automatic transmission 09L: Remove drive plate --> **Drive Plate, Automatic Transmission 09L, Removing and Installing**.
- Remove lower timing chain cover --> **Lower Timing Chain Cover, Removing and Installing** .
- Remove lower section of oil pan --> **Oil Pan Lower Section, Removing and Installing**.

- Remove oil pump --> **Oil Pump, Removing and Installing**.

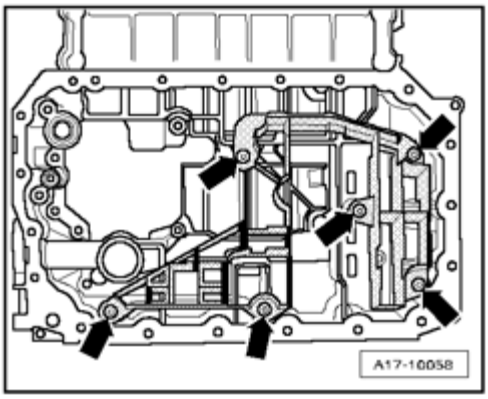

Fig. 472: Removing Bolts And Lower Oil Baffle
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove bolts - **arrows** - and remove lower oil baffle.

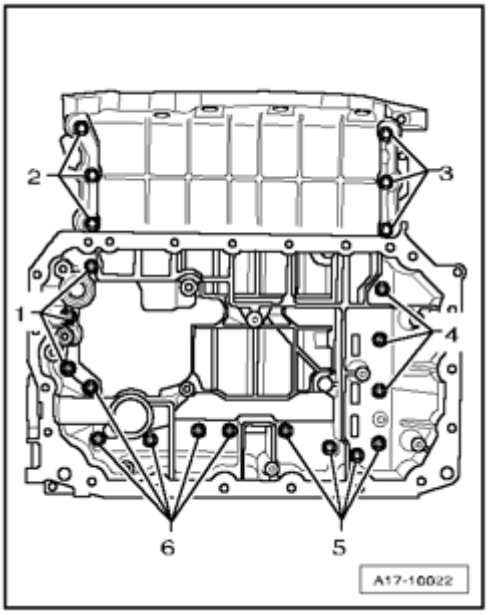

Fig. 473: Removing/Installing Bolts For Upper Section Of Oil Pan
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove bolts - **1 to 6** - for upper section of oil pan.
- Press upper part of oil pan from alignment pins of cylinder block.

Installing

NOTE:

- **Replace gaskets, seals and O-rings.**

- Remove sealant from grooves of upper part of oil pan and from sealing surfaces.

CAUTION: Wear safety glasses.

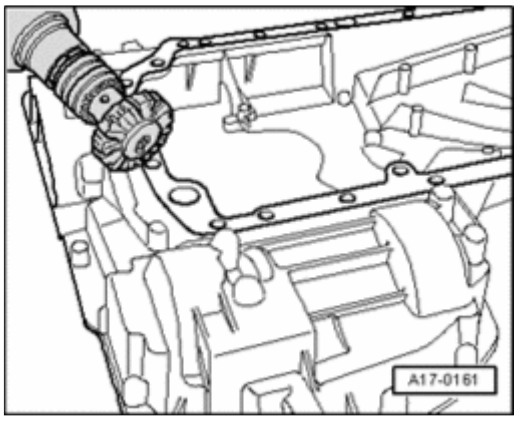

Fig. 474: Using Rotating Plastic Brush To Remove Remaining Sealant From Oil Pan (Upper Part) And At Cylinder Block
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Using rotating plastic brush, remove any remaining sealant from upper part of oil pan and cylinder block.
- Clean sealing surfaces so they are completely free of any oil or grease.

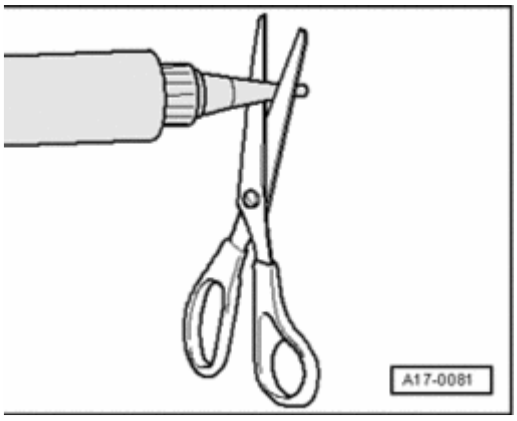

Fig. 475: Cutting Tube Nozzle At Front Marking
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Cut tube nozzle at front marking (dia. of nozzle approximately 2 mm).

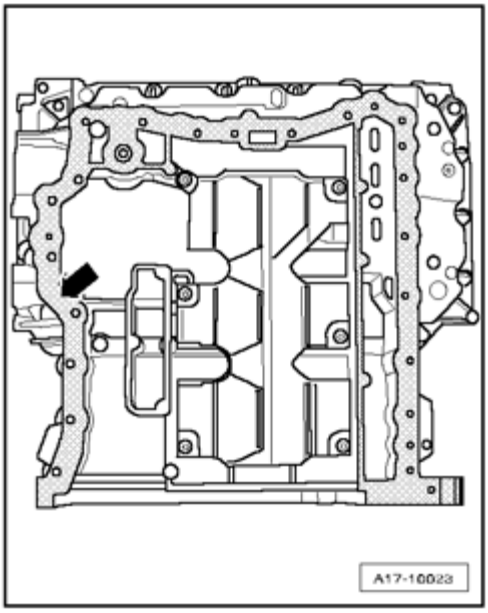

Fig. 476: Applying Sealant Bead On Clean Sealing Surface Of Upper Section Of Oil Pan
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Apply sealant bead - **arrows** - on clean sealing surface of upper section of oil pan as shown in illustration.

- The grooves - **arrows** - of sealing surfaces must be completely filled with sealant.
- The sealant bead must be 1.5 to 2.0 mm above the sealing surface.

NOTE:

- **Sealant bead must not be thicker than specified, otherwise sealant could get into oil pan and clog the oil pump strainer.**
- **The oil pan (upper part) must be installed within 5 minutes after application of sealant.**

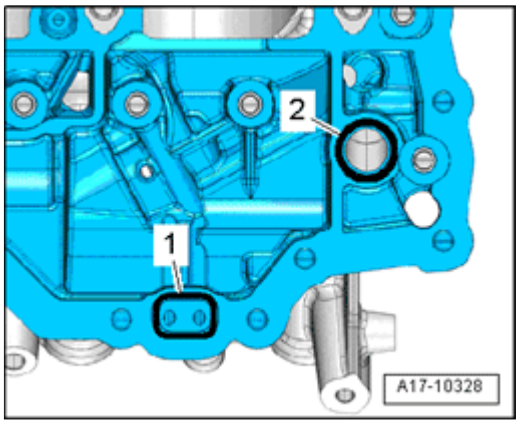

Fig. 477: Inserting Seal And O-Ring In Guide Frame
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Insert seal - **1** - and O-ring - **2** - in the guide frame.

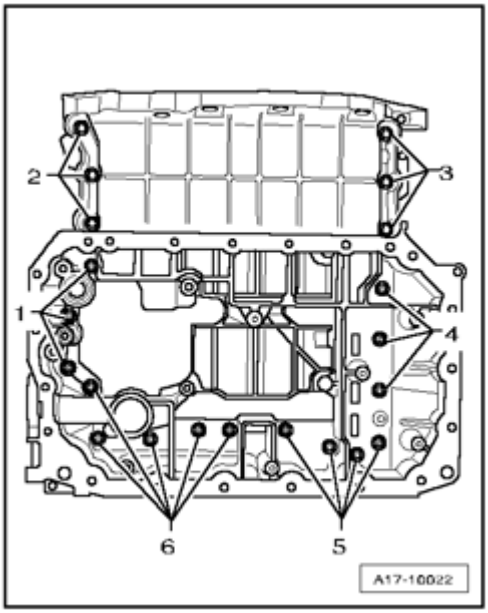

Fig. 478: Removing/Installing Bolts For Upper Section Of Oil Pan
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Position upper part of oil pan in place and tighten bolts - **1 through 6** - to 5 Nm in diagonal sequence.
- Tighten bolts - **1 to 6** - in a diagonal sequence.

Further installation is in reverse order of removal, noting the following:

- Install oil pump --> **Oil Pump, Removing and Installing**.
- Install lower section of oil pan --> **Oil Pan Lower Section, Removing and Installing**.
- Install lower timing chain cover --> **Lower Timing Chain Cover, Removing and Installing** .
- Vehicles with multitronic transmission: Install flywheel --> **Flywheel, Multitronic Transmission, Removing and Installing** and damper unit --> **Damper Unit, Removing and Installing**.
- Vehicles with automatic transmission 09L: Install drive plate --> **Drive Plate, Automatic Transmission 09L, Removing and Installing**.
- Attach transmission to engine and install engine/transmission assembly:

- Vehicles with multitronic transmission --> **Engine, Installing**
- Vehicles with automatic transmission 09L --> **Engine, Installing**

- Add engine oil and check oil level --> **Oil Level, Checking** .

Tightening Specifications

Component	Nm
Upper part of oil pan to cylinder block	16 1)
Upper oil baffle to upper part of oil pan	9 2)
Lower oil baffle to upper part of oil pan	9
1) Tighten diagonally. 2) Insert with locking compound; locking compound .	

OIL FILTER HOUSING, COMPONENT OVERVIEW

Oil Filter Housing, Component Overview

Vehicles through 04.2005

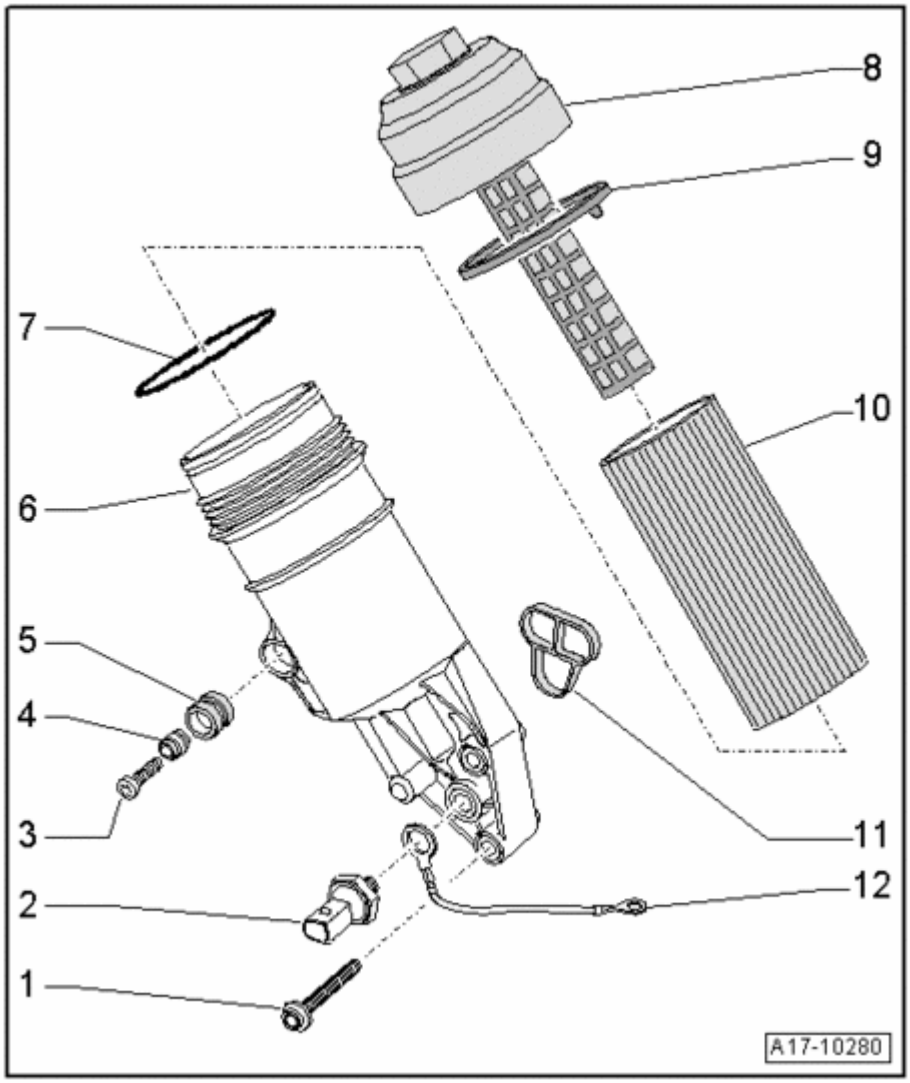

Fig. 479: Oil Filter Housing, Component Overview (Vehicles Through 04.2005)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - 13 Nm

2 - Oil pressure switch F1

- Black insulation
- Checking --> **Oil Pressure, Checking**
- Removing and installing --> **Oil Pressure Switch, Removing and Installing**
- Tighten to 20 Nm.

3 - 13 Nm

4 - Sleeve

5 - Rubber grommet

6 - Oil filter housing

- With filter by-pass valve 3.0 bar
- With oil check valve
- Oil check valve cannot be replaced
- Removing and installing --> **Oil Filter Housing, Removing and Installing**

7 - O-ring

- Replace
- Inserting --> **O-ring, inserting on oil filter housing**

8 - Cover - 25 Nm

9 - Seal

- Replace
- Removing and installing --> **Sealing ring on cap, replacing**

10 - Oil filter element

- Removing and installing --> **01 - MAINTENANCE**

11 - Gasket

- Replace

12 - Seal with Ground (GND) wire

- Replace

Vehicles from 05.2005

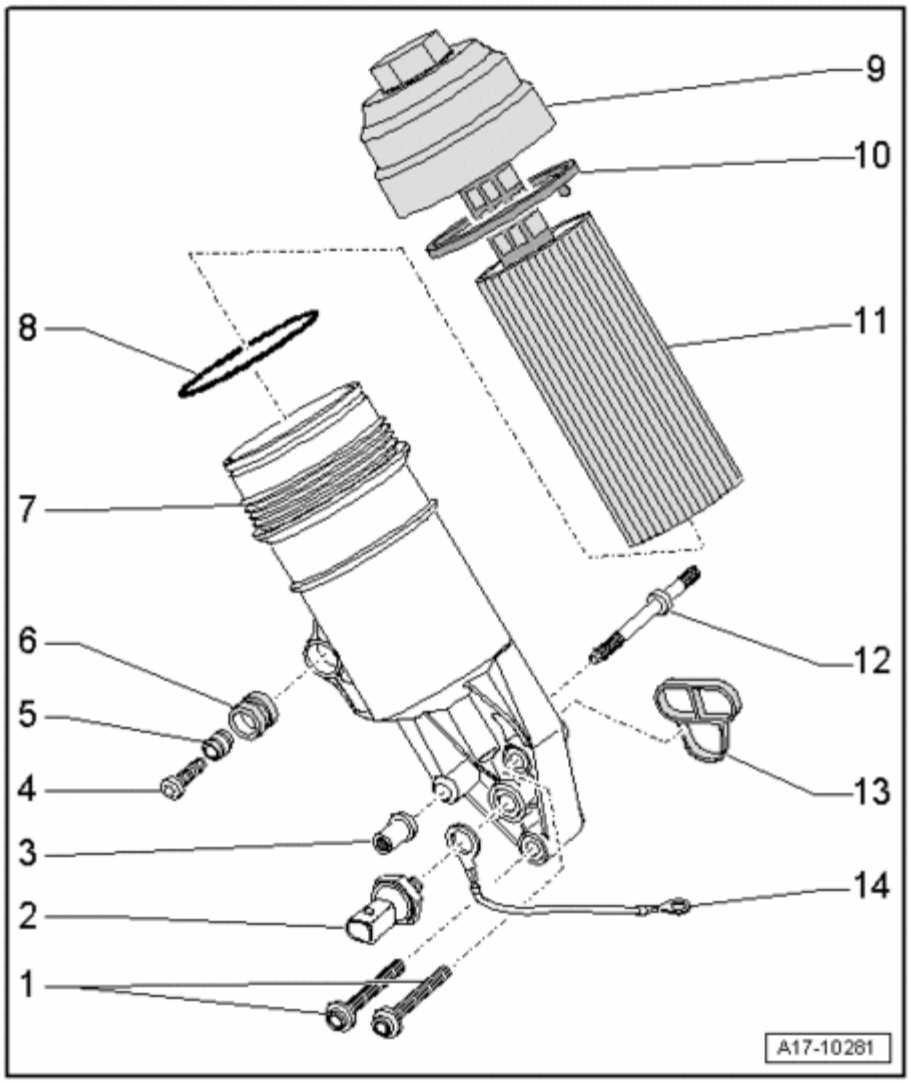

Fig. 480: Oil Filter Housing, Component Overview (Vehicles From 05.2005)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - 13 Nm

2 - Oil pressure switch F1

- Tighten to 20 Nm.
- Black insulation
- Removing and installing --> **Oil Pressure Switch, Removing and Installing**
- Checking --> **Oil Pressure, Checking**

3 - Multi-point socket head union nut - 13 Nm

4 - 13 Nm

5 - Sleeve

6 - Rubber grommet

7 - Oil filter housing

- With filter by-pass valve 3.0 bar
- With oil check valve
- Oil check valve cannot be replaced

8 - O-ring

- Replace
- Inserting --> **O-ring, inserting on oil filter housing**

9 - Cover - 25 Nm

10 - Seal

- Replace
- Removing and installing --> **Sealing ring on cap, replacing**

11 - Oil filter element

- Removing and installing --> **01 - MAINTENANCE**

12 - Stud bolt - 16 Nm

13 - Gasket

- Replace

14 - Seal with Ground (GND) wire

- Replace

Sealing ring on cap, replacing

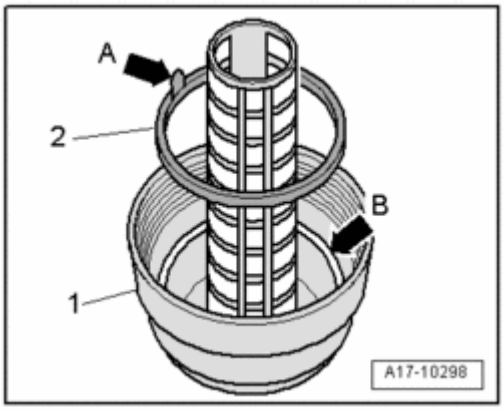

Fig. 481: Identifying Sealing Ring On Cap
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove sealing ring - **2** - at pull tab - **arrow A** - from cap - **1** -.
- Insert new sealing ring with semicircular profile in groove - **arrow B** - on cap.

- The pull tab - **arrow A** - must face up.

O-ring, inserting on oil filter housing

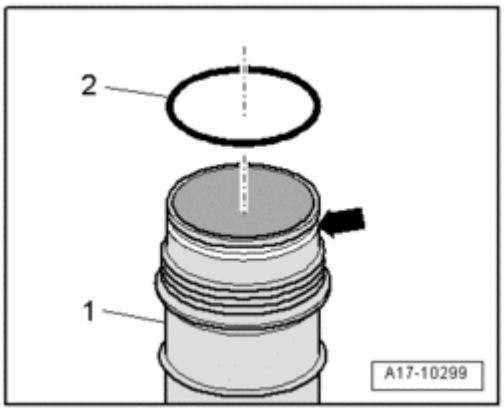

Fig. 482: Identifying Oil Filter Housing O-Ring
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Insert O-ring - **2** - in groove - **arrow** - on oil filter housing - **1** -.

OIL FILTER HOUSING, REMOVING AND INSTALLING

Oil Filter Housing, Removing and Installing

Special tools, testers and auxiliary items required

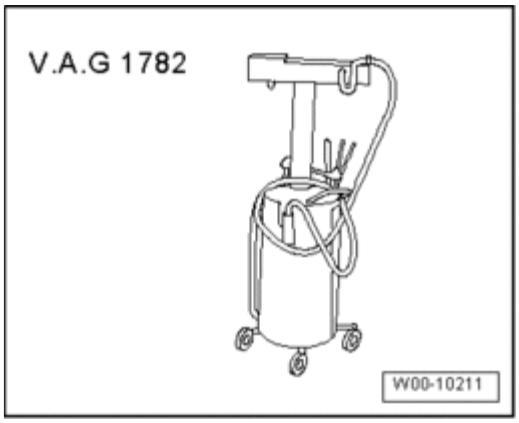

Fig. 483: Identifying Old Oil Collecting And Extracting Device V.A.G 1782
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Old oil collecting and extracting device V.A.G 1782

Removing

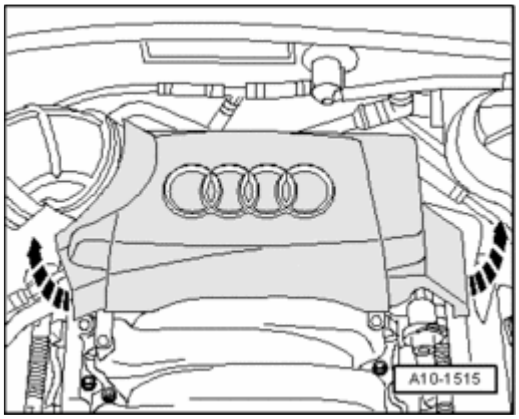

Fig. 484: Removing Rear Engine Cover
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Pull rear engine cover off - **arrows** -.

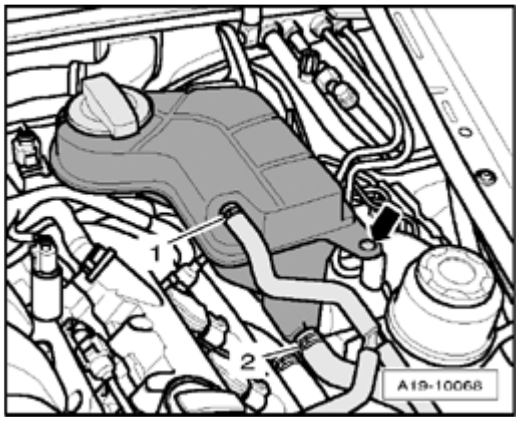

Fig. 485: Removing Coolant Hoses At Coolant Expansion Tank
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove coolant expansion tank - **arrow** -.
- Disconnect electrical connection from Engine Coolant Level (ECL) Warning Switch F66 at bottom of coolant reservoir and set aside coolant reservoir with coolant hoses - **1** - and - **2** - connected.

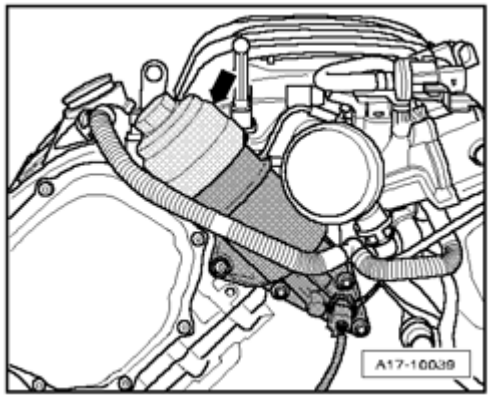

Fig. 486: Removing Cap For Oil Filter Housing
Courtesy of VOLKSWAGEN UNITED STATES, INC.

NOTE:

- **To improve clarity, the work procedures in the following illustrations are shown with the engine removed and viewed from the rear.**

- Remove cap - **arrow** - for oil filter housing.
- Remove oil filter element.
- Extract engine oil using old oil collecting and extracting device V.A.G 1782 from oil filter housing.

NOTE:

- **Place a rag under oil filter housing to catch escaping engine oil.**

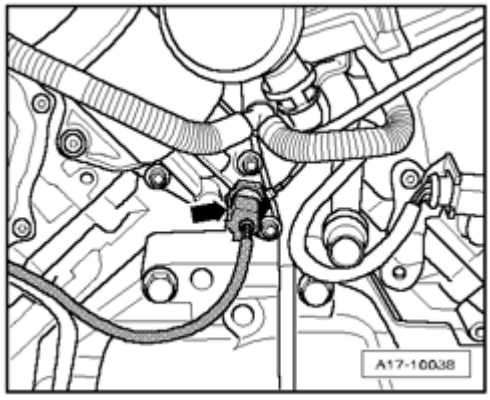

Fig. 487: Disconnecting Electrical Harness Connector From Oil Pressure Switch F1
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect electrical harness connector from Oil Pressure Switch F1 - **arrow** -.
- Remove oil pressure switch.

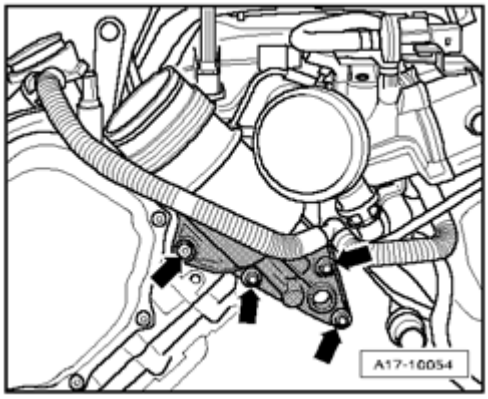

Fig. 488: Removing Oil Filter Housing Bolts
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove bolts - **arrows** -.
- On engines from 05.2005, also remove multi-point socket head union nut.
- Remove oil filter housing.

Installing

Installation is in reverse order of removal, noting the following:

NOTE:

- **Replace gaskets, seals and O-rings.**

- Add engine oil and check oil level --> **Oil Level, Checking** .

Tightening Specifications

Component	Nm
Oil filter housing to engine	13
Oil pressure switch to oil filter housing	20
Cap to oil filter housing	25

OIL CHECK VALVES, OIL SEPARATOR, COMPONENT OVERVIEW

Oil Check Valves, Oil Separator, Component Overview

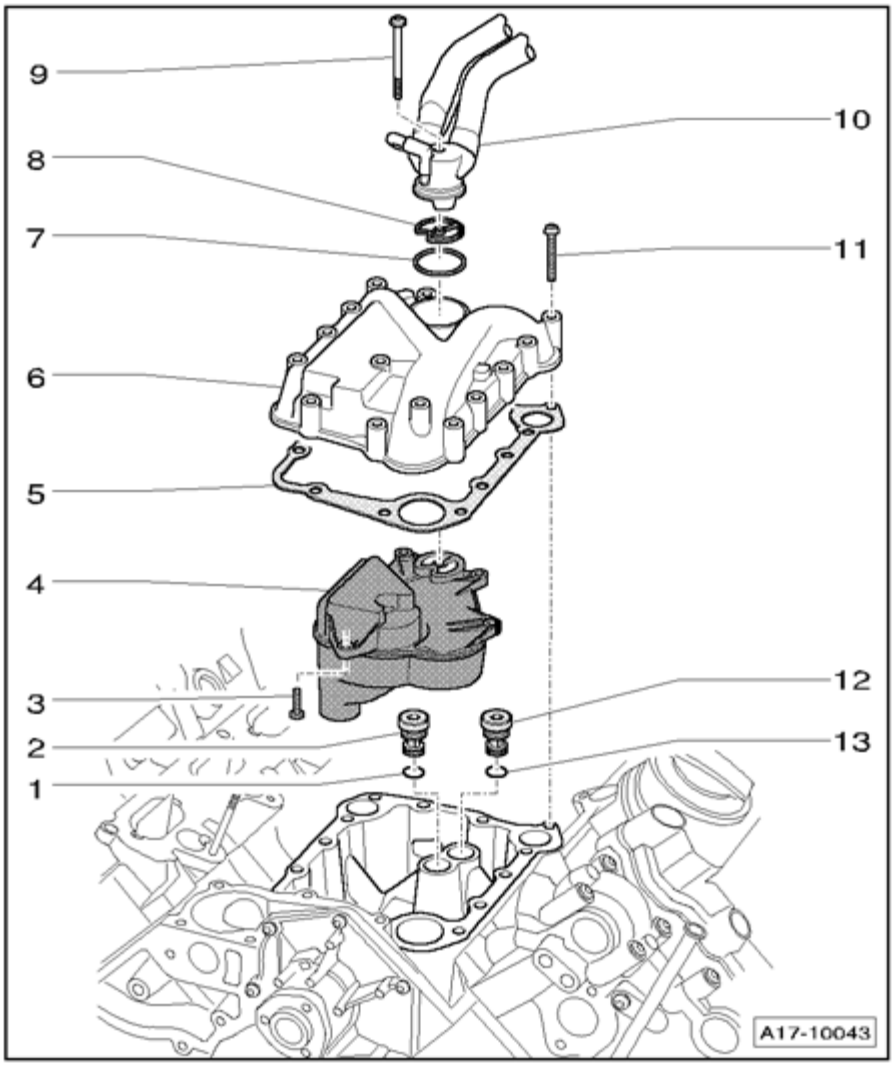

Fig. 489: Oil Check Valves, Oil Separator, Component Overview
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - O-ring

- Replace

2 - Oil check valve - 20 Nm

- For oil supply to right cylinder head

3 - 9 Nm

4 - Oil separator

5 - Gasket

- Replace

6 - Cover

- With connection for crankshaft housing ventilation
- To remove, remove upper part of intake manifold and lower parts of left and right intake manifold --> **24 - FUEL INJECTION SYSTEM**

7 - O-ring

- Replace

8 - Gasket

- Replace

9 - 6 Nm

10 - Crankcase ventilation hoses

- Removing and installing

CAUTION: Crankcase ventilation must not be removed.

11 - 9 Nm

12 - Oil check valve - 20 Nm

- For oil supply to left cylinder head

13 - O-ring

- Replace

OIL PRESSURE SWITCH, REMOVING AND INSTALLING

Oil Pressure Switch, Removing and Installing

Removing

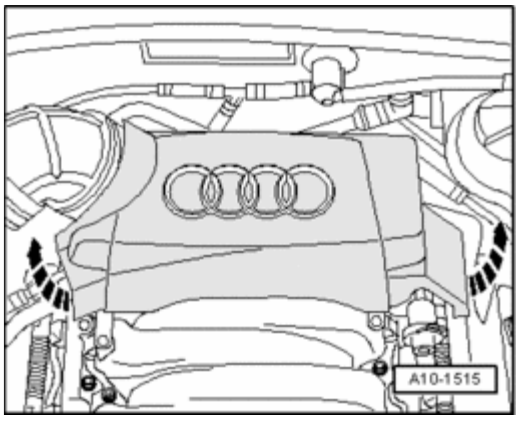

Fig. 490: Removing Rear Engine Cover
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove rear engine cover - **arrows** -.

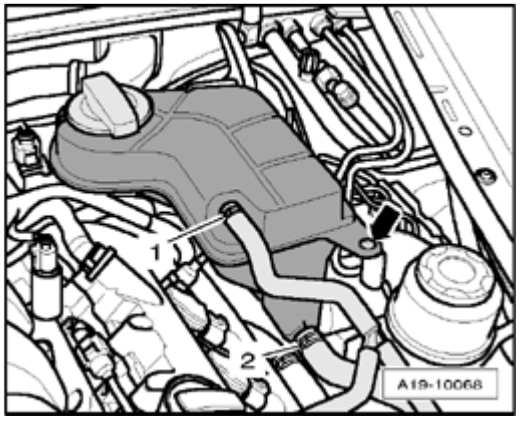

Fig. 491: Removing Coolant Hoses At Coolant Expansion Tank
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove coolant expansion tank - **arrow** -.
- Disconnect electrical connection from Engine Coolant Level (ECL) Warning Switch F66 at bottom of coolant reservoir and set aside coolant reservoir with coolant hoses - **1** - and - **2** - connected.

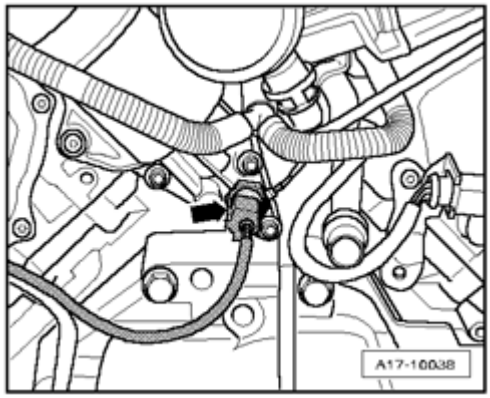

Fig. 492: Disconnecting Electrical Harness Connector From Oil Pressure Switch F1
Courtesy of VOLKSWAGEN UNITED STATES, INC.

NOTE:

- **Place a rag under oil filter housing to catch escaping engine oil.**

- Disconnect electrical harness connector from Oil Pressure Switch F1 - **arrow** -.
- Remove oil pressure switch.

Installing

Installation is in reverse order of removal, noting the following:

NOTE:

- **Replace seal.**

- Check oil level --> **Oil Level, Checking** .

Tightening specifications

Component	Nm
Oil pressure switch to oil filter housing	20

OIL PRESSURE, CHECKING

Oil Pressure, Checking

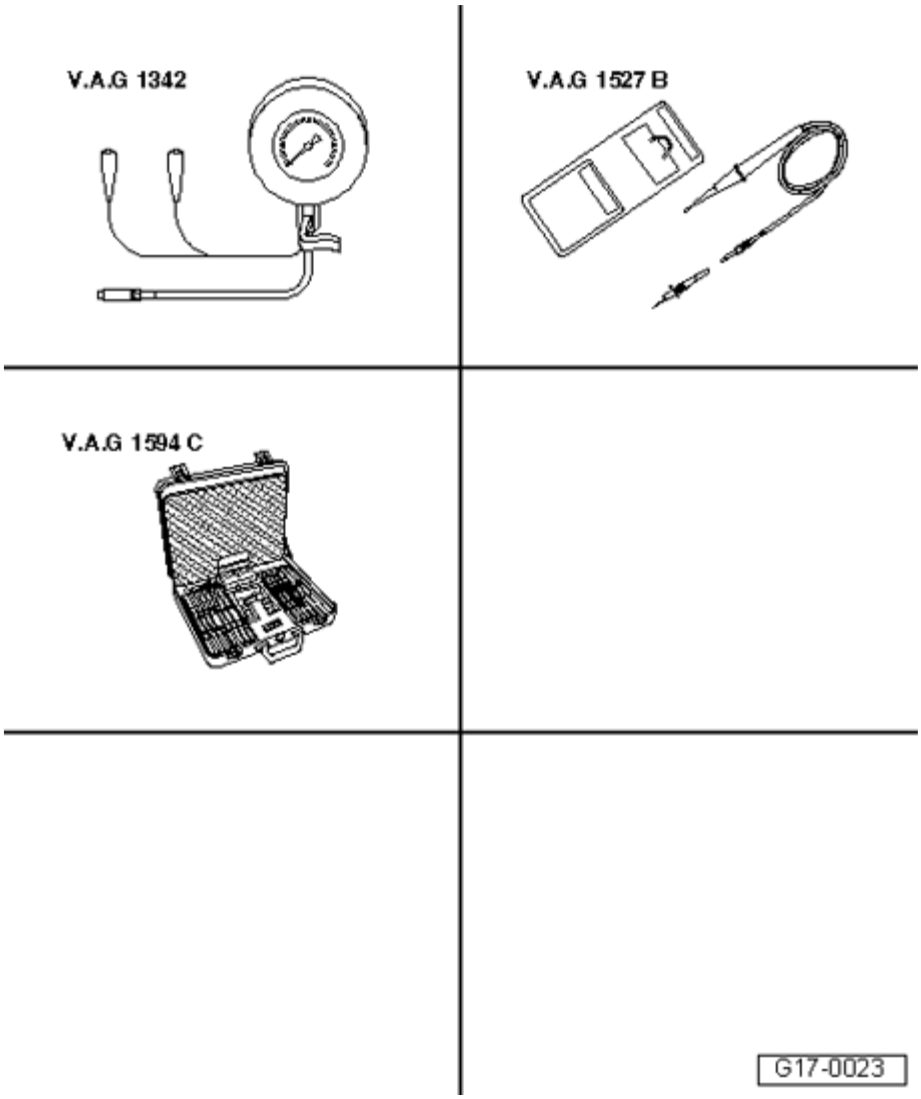

Fig. 493: Identifying Special Tools - Oil Pressure, Checking
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools, testers and auxiliary items required

- Oil pressure gauge V.A.G 1342
- Voltage tester V.A.G 1527 B
- Connector test set V.A.G 1594 C

Procedure

- Oil level OK
- Engine oil temperature approximately 80 C.

- Remove oil pressure switch --> **Oil Pressure Switch, Removing and Installing**.

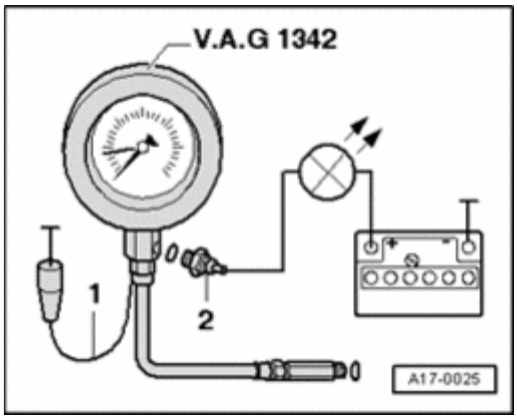

Fig. 494: Connecting Oil Pressure Tester V.A.G 1342 To Hole For Oil Pressure Switch
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect oil pressure tester V.A.G 1342 to hole for oil pressure switch.
- Install oil pressure switch - **2** - into oil pressure gauge V.A.G 1342.

Oil Pressure Switch, Checking

- Connect brown wire - **1** - of oil pressure gauge to Ground (GND).
- Connect voltage tester V.A.G 1527 B using adapter cables from connector test kit V.A.G 1594 C to oil pressure switch and battery plus (+).

- LED must not light up.

If LED lights up:

- Replace Oil Pressure Switch.
- Start engine.

NOTE:

- **While starting engine, watch Pressure Tester and LED as oil pressure switch may open during start.**
- **At 1.2 to 1.6 bar pressure, the LED must light up.**

If LED does not light up:

- Replace Oil Pressure Switch.

Oil Pressure, Checking

- Start engine.

- Oil pressure at idle: min. 1.2 bar positive pressure.
- Oil pressure at 2000 RPM: min. 3.4 bar positive pressure.

Assembling

- Install oil pressure switch --> **Oil Pressure Switch, Removing and Installing**.

ENGINE OIL SPECIFICATIONS

Engine Oil Specifications

Viscosity classes, oil specifications, oil capacities --> Fluid Capacity Chart located in ServiceNet.

OIL LEVEL, CHECKING

Oil Level, Checking

Procedure

- Engine oil temperature min. 60 C.
- Vehicle in level position.
- After stopping engine, wait a few minutes to allow oil to flow back into oil pan.

- Pull out oil dipstick, wipe off with a clean cloth and re-insert dipstick again up to stop.
- Withdraw dipstick again and read oil level.

Range of markings on dipstick:

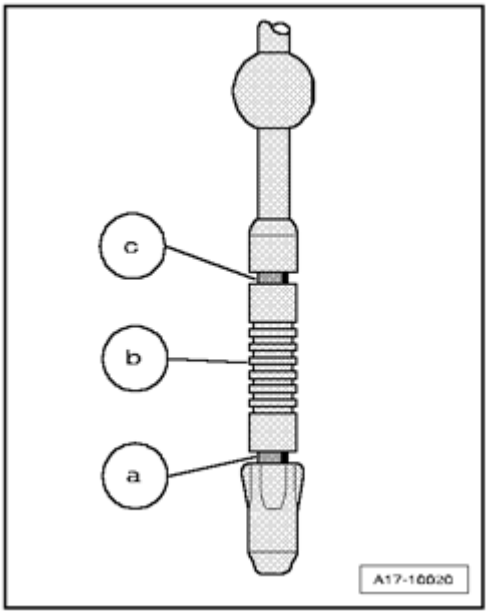

Fig. 495: Range Of Markings On Dipstick
Courtesy of VOLKSWAGEN UNITED STATES, INC.

a - Oil must be added.

b - Oil may be topped off.

c - Oil must not be added.

NOTE:

- **The oil level may not exceed the "max" marking - c - or fall below the "min" marking - a -.**
- **If the oil level exceeds the "max" marking, the catalytic converter could be damaged.**