17 - ENGINE - LUBRICATION

OIL PUMP AND LOWER PART OF OIL PAN

Oil pump and lower part of oil pan

NOTE:

- **If large quantities of metal particles or abraded material are detected during engine repairs, it may be an indication for a damaged crankshaft or rod bearings. To prevent subsequent damage, the following work must be performed after the repair: Oil channels must be cleaned carefully; replace oil spray jets, oil cooler and oil filter.**
- **Viscosity classes, oil specifications, oil capacities Maintenance tables.**

CAUTION: Danger of catalytic converter damage.

- **Oil level must not exceed "max" marking.**

Oil pump and lower part of oil pan, assembly overview

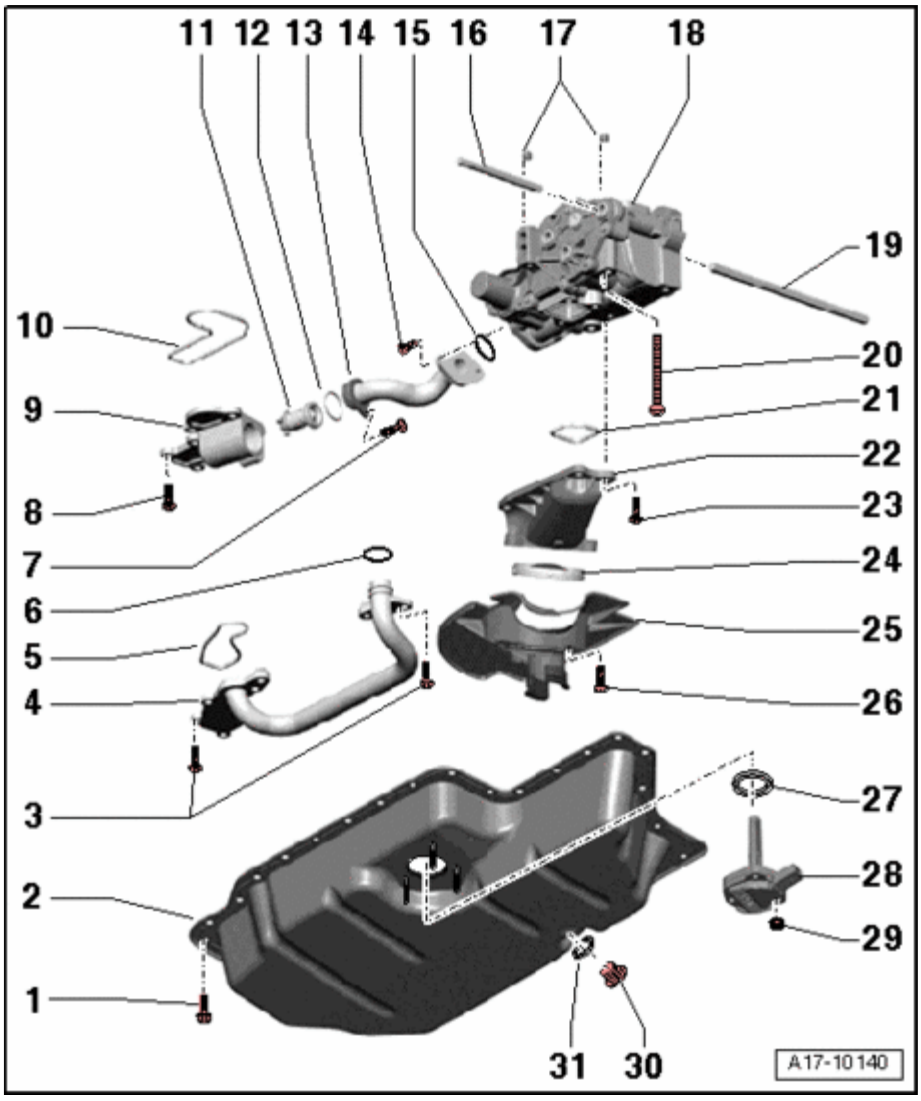

Fig. 391: Oil Pump And Lower Part Of Oil Pan, Assembly Overview
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Bolt

- 9 Nm

2 - Oil pan (lower section)

- Removing and installing --> **Lower part of oil pan, removing and installing**

3 - Bolt

- 9 Nm

4 - Oil pipe

5 - Gasket

- Replace

6 - O-ring

- Replace

7 - Bolt

- 9 Nm

8 - Bolt

- 9 Nm

9 - Oil check valve housing

10 - Gasket

- Replace

11 - Oil check valve

12 - O-ring

- Replace

13 - Oil pipe

14 - Bolt

- 9 Nm

15 - O-ring

- Replace

16 - Drive shaft for coolant pump

17 - Fitting sleeves

- 2 pieces

18 - Oil pump

- Do not disassemble
- With relief valve approx. 5.5 bar
- Removing and installing --> **Oil pump, removing and installing**

19 - Drive shaft for oil pump

20 - Bolt

- Replace
- 8 Nm plus an additional 90° ($^{1}/_{4}$ turn).

21 - Gasket

- Replace

22 - Intake tube

- For oil pump

23 - Bolt

- 9 Nm

24 - Oil strainer

- Clean

25 - Oil baffle

26 - Bolt

- 9 Nm

27 - Seal

- Replace

28 - Oil Level Thermal Sensor G266

29 - Bolt

- 9 Nm

30 - Oil drain plug

- 25 Nm

31 - Seal

- Replace

Lower part of oil pan, tightening sequence

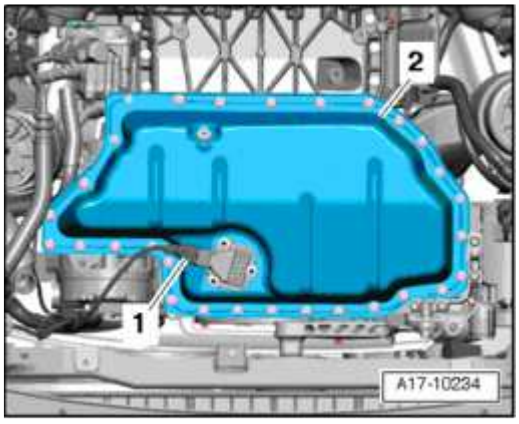

Fig. 392: Identifying Oil Level Thermal Sensor G266 Electrical Connector & Oil Pan (Lower Part)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Tighten bolts in 3 stages as follows:
- Tight bolts by hand in a diagonal sequence.
- Pre-tighten all bolts in a diagonal sequence to 5 Nm.
- Tighten bolts diagonally to 9 Nm.

Lower part of oil pan, removing and installing

Special tools, testers and auxiliary items required

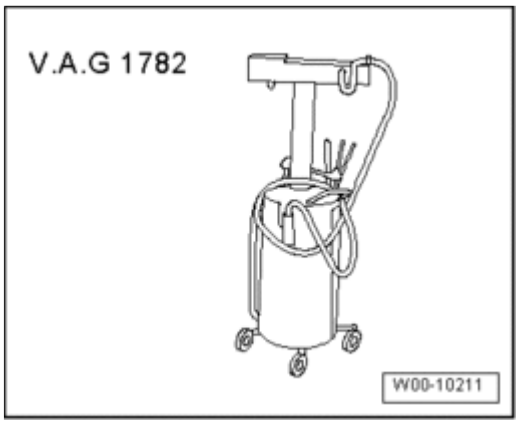

Fig. 393: Identifying Old Oil Collecting And Extracting Device V.A.G 1782
Courtesy of VOLKSWAGEN UNITED STATES, INC.

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

Removing

- Drain coolant --> **Cooling system, draining and filling**.
- Remove front coolant pipe --> **Front coolant line, removing and installing**.

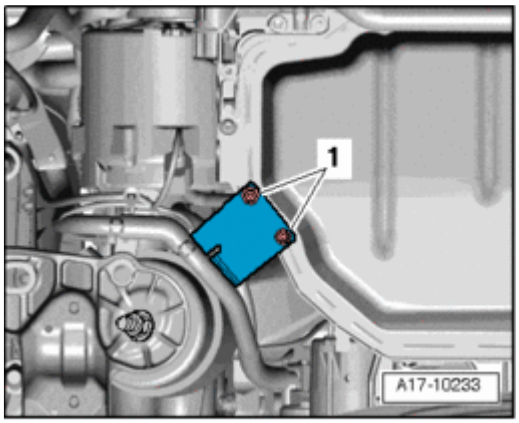

Fig. 394: Removing Nuts And Laying Aside Bracket With Electrical Wiring
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove nuts - **1** - and lay aside bracket with electrical wiring.

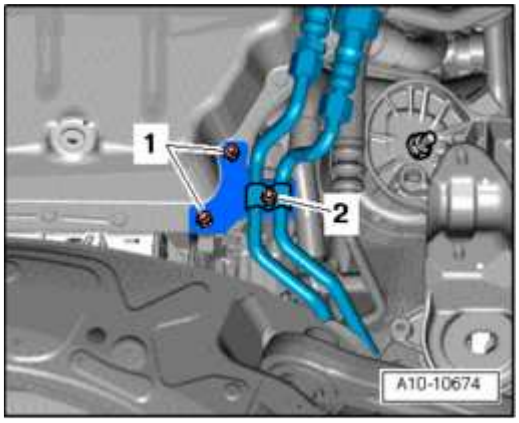

Fig. 395: Removing Nuts & ATF Line Bracket
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove nuts - **1 and 2** -.
- Remove ATF line bracket.

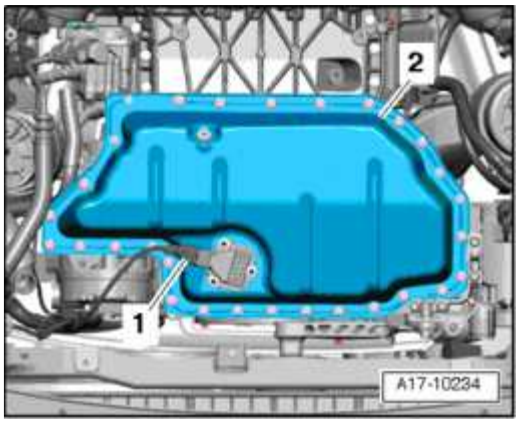

Fig. 396: Identifying Oil Level Thermal Sensor G266 Electrical Connector & Oil Pan (Lower Part)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect electrical connector - **1** - at Oil Level Thermal Sensor G266.
- Place old oil collecting and extracting device V.A.G 1782 under engine and drain engine oil.
- Remove oil pan (lower part) - **2** - and pry out carefully.

NOTE:

- **There is still a residual amount of oil in lower section of oil pan.**

Installing

- Tightening torque **Lower part of oil pan, tightening sequence**

NOTE:

- **Replace sealing rings.**

CAUTION: Risk of eye injury.

- **Wear safety glasses.**

CAUTION: Risk of contaminating lubricating system and bearing.

- **Cover open parts of engine.**

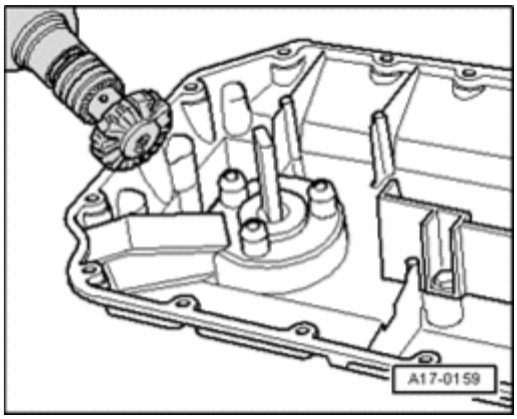

Fig. 397: Using Rotating Plastic Brush To Remove Any Remaining Sealant From Oil Pan (Lower Part) And At Upper Part
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove sealant residue lower part and upper part of oil pan, e.g. with rotating plastic brush.
- Clean sealing surfaces so they are completely free of any oil or grease.

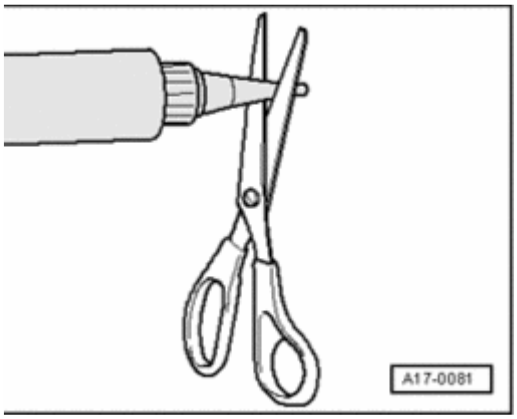

Fig. 398: Cutting Tube Nozzle At Front Marking
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Cut off nozzle on tube of sealant at front mark (dia. of nozzle approx. 2 mm).

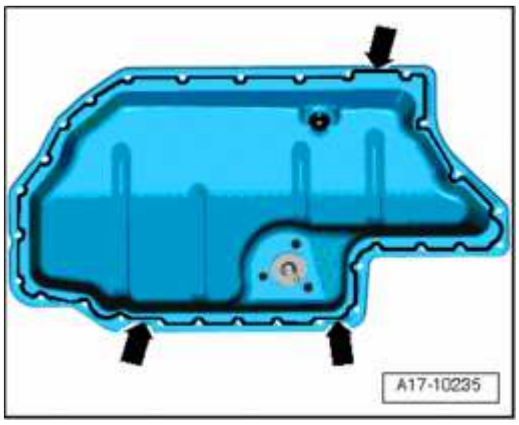

Fig. 399: Applying Sealant Bead On Clean Sealing Surface Of Lower Part Of Oil Pan
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Apply sealant bead - **arrow** - on clean sealing surface of lower part of oil pan as shown in illustration.
- Thickness of sealant bead: 2.5 mm.

CAUTION: Risk of plugging oil pump strainer with excess sealant.

- **Do not apply sealant bead thicker than specified.**

NOTE:

- **The oil pan (lower part) must be installed within 5 minutes after application of sealant.**

- Position lower part of oil pan and tighten bolts **Lower part of oil pan, tightening sequence**

The rest of installation is in reverse order of removal, note the following:

- Install front coolant pipe --> **Front coolant line, removing and installing**.
- Add engine oil and check oil level --> **Oil level, checking**.
- Fill with coolant **Filling**.

Oil pump, removing and installing

Special tools, testers and auxiliary items required

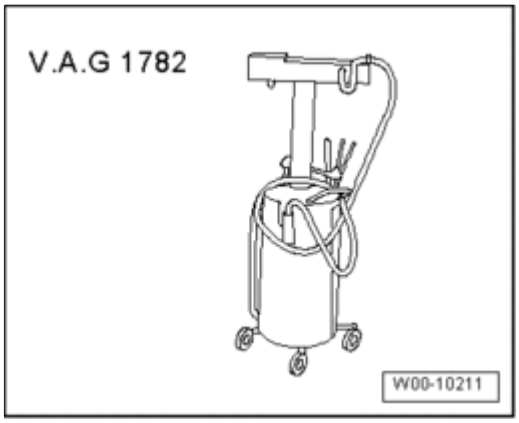

Fig. 400: Identifying Old Oil Collecting And Extracting Device V.A.G 1782
Courtesy of VOLKSWAGEN UNITED STATES, INC.

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

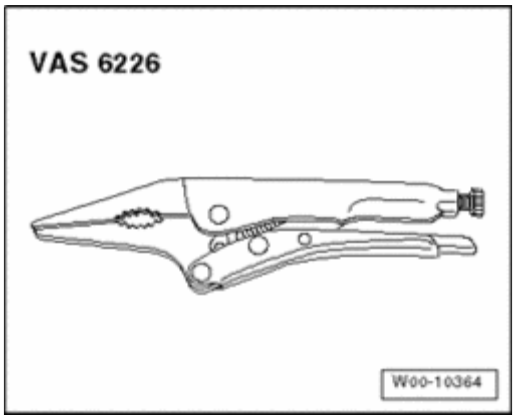

Fig. 401: Long-Nose Gripping Pliers VAS 6226
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Long-nose gripping pliers VAS 6226

Removing

- Drain coolant --> **Cooling system, draining and filling**.
- Remove front coolant pipe --> **Front coolant line, removing and installing**.
- Remove coolant pump --> **Coolant pump, removing and installing**.
- Remove lower section of oil pan --> **Lower part of oil pan, removing and installing**.

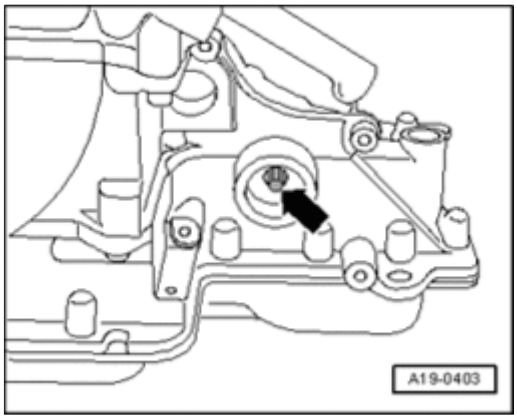

Fig. 402: Removing/Installing Drive Shaft For Coolant Pump From Oil Pump
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove drive shaft - **arrow** - for coolant pump from oil pump.
- Place old oil collecting and extracting device V.A.G 1782 under engine.

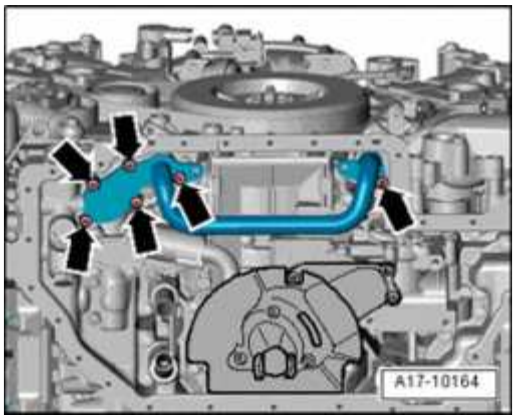

Fig. 403: Removing Bolts And Oil Pipe
Courtesy of VOLKSWAGEN UNITED STATES, INC.

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

NOTE:

- **Oil escapes when removing oil pipes.**

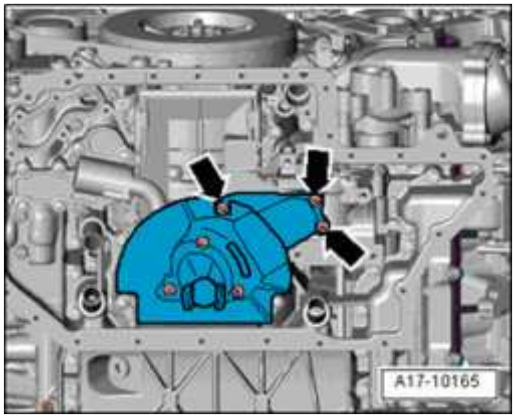

Fig. 404: Removing Bolts And Intake Tube
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove bolts - **arrows** - and remove intake tube.

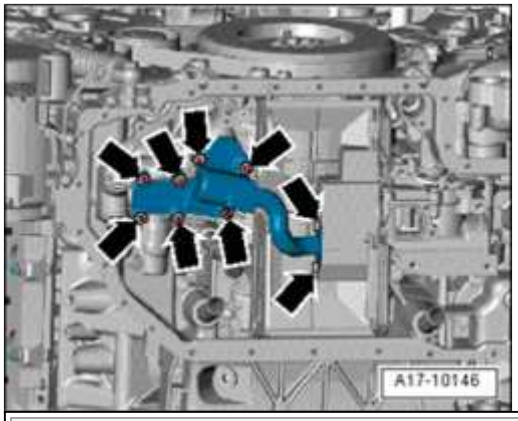

Fig. 405: Removing Oil Pipe Together With Oil Check Valve Housing
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove oil pipe together with oil check valve housing.

NOTE:

- **Oil escapes when removing oil pipes.**

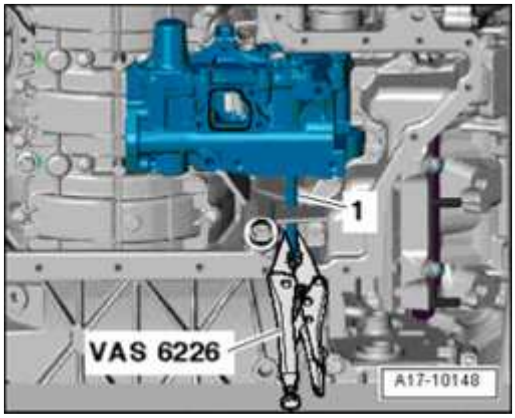

Fig. 406: Pressing Back Drive Shaft For Oil Pump Against Spring Force And Clamping Tightly Using Long-Nose Gripping Pliers VAS 6226
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Press back drive shaft - **1** - for oil pump against spring force and clamp tightly using Long-nose gripping pliers VAS 6226.

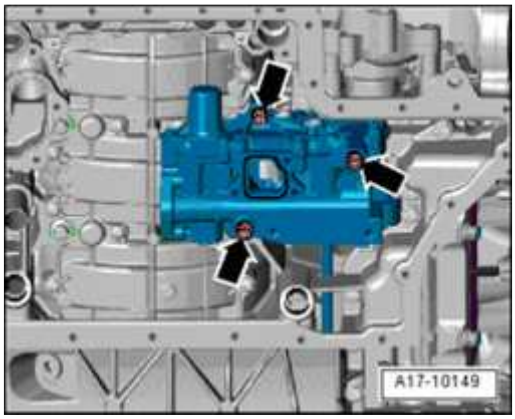

Fig. 407: Removing Bolts And Oil Pump
Courtesy of VOLKSWAGEN UNITED STATES, INC.

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

Installing

- Tightening torques --> **Oil pump and lower part of oil pan, assembly overview**.

NOTE:

- **Replace sealing rings and O-rings.**

- Check whether 2 alignment bushings are present in cylinder block, install if necessary.
- Tighten oil pump - **arrows** -.

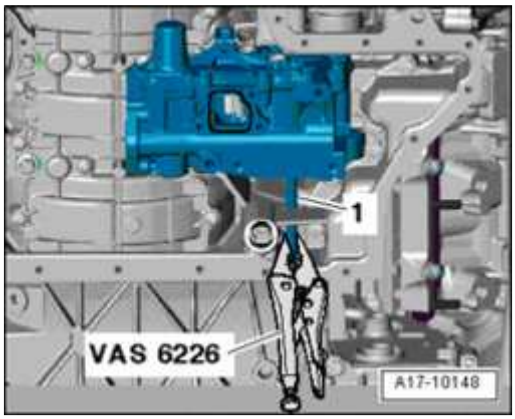

Fig. 408: Pressing Back Drive Shaft For Oil Pump Against Spring Force And Clamping Tightly Using Long-Nose Gripping Pliers VAS 6226
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Unlock Long-nose gripping pliers VAS 6226 and let drive shaft - **1** - glide into oil pump.

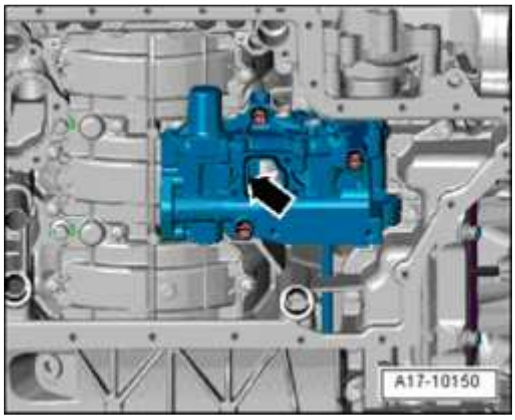

Fig. 409: Checking Whether Drive Shaft Is Friction Locked To Oil Pump
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Check whether drive shaft is friction locked to oil pump. To do so, reach into intake opening - **arrow** - of oil pump and try to rotate oil pump gears.

- Toothed gears must not be able to be rotated.

The rest of installation is in reverse order of removal, note the following:

- Install coolant pump --> **Coolant pump, removing and installing**.
- Install lower section of oil pan **Installing**.

- Install front coolant pipe --> **Front coolant line, removing and installing**.
- Add engine oil and check oil level --> **Oil level, checking**.
- Fill with coolant **Filling**.

OIL PAN (UPPER SECTION)

Upper part of oil pan, assembly overview

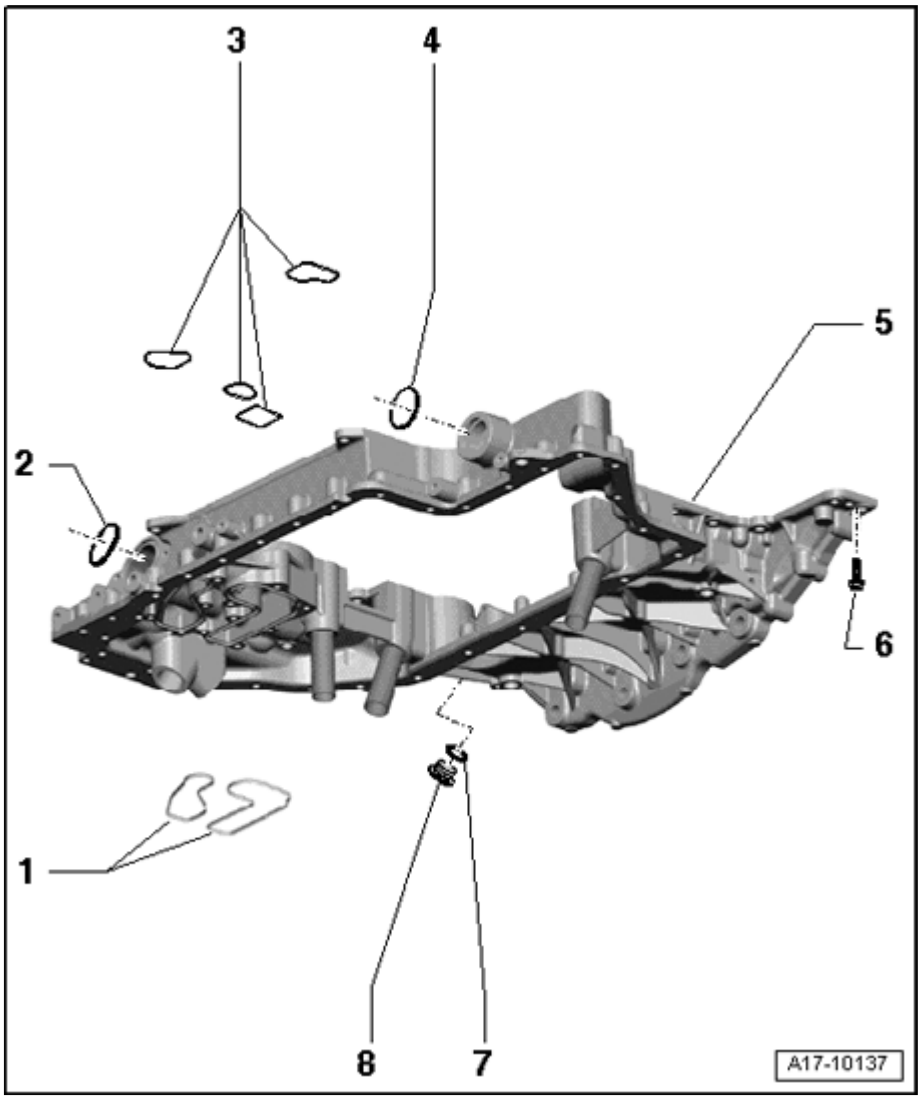

Fig. 410: Upper Part Of Oil Pan, Assembly Overview
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Seals

- Replace

2 - O-ring

- Replace

3 - Seals

- Replace

4 - O-ring

- Replace

5 - Oil pan (upper section)

- Removing and installing --> **Upper part of oil pan, removing and installing**

6 - Bolt

- Tightening order **Upper part of oil pan, tightening sequence**

7 - Seal

- Replace

8 - Locking bolt

- 35 Nm

Upper part of oil pan, tightening sequence

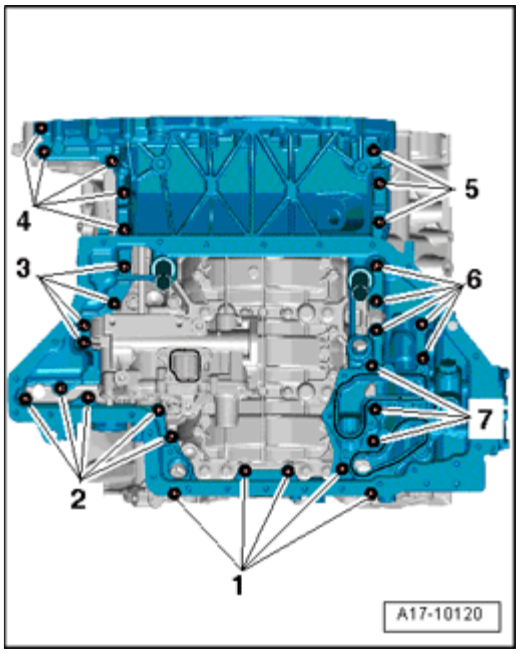

Fig. 411: Removing/Installing Bolts For/To Upper Section Of Oil Pan
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Tighten bolts - **1 through 7** - in 2 stages as follows:
- Pre-tighten all bolts in a diagonal sequence to 5 Nm.
- Tighten bolts diagonally to 14 Nm.

Upper part of oil pan, removing and installing

Special tools, testers and auxiliary items required

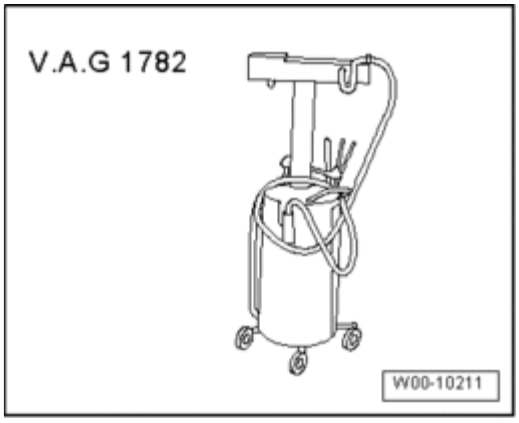

Fig. 412: Identifying Old Oil Collecting And Extracting Device V.A.G 1782
Courtesy of VOLKSWAGEN UNITED STATES, INC.

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

- Hand drill with plastic brush attachment
- Sealant

Removing

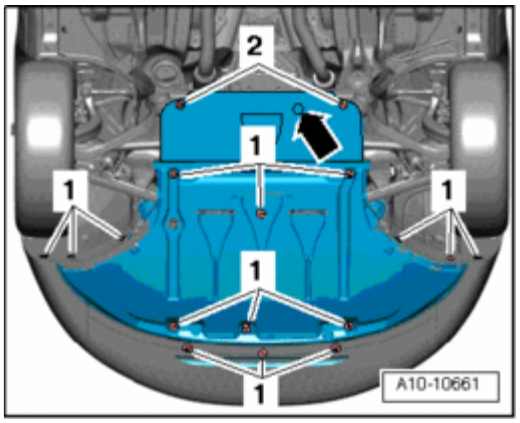

Fig. 413: Identifying Noise Insulation And Mountings
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove sound insulation by loosening securing pieces - **1, 2 and arrow** -.
- Place old oil collecting and extracting device V.A.G 1782 under engine and drain engine oil.
- Remove engine --> **Engine, removing**.
- Separate engine and transmission --> **Engine and transmission, separating**.

- Secure engine to assembly stand --> **Engine, securing to assembly stand**.
- Remove drive plate --> **Drive plate, removing and installing**.
- Remove left and right timing chain covers --> **Left and right timing chain covers, removing and installing**.
- Remove intake manifold --> **24 - MULTIPORT FUEL INJECTION (MFI)** .

- Remove oil filter housing --> **Oil filter housing, removing and installing**.
- Remove lower timing chain cover --> **Timing chain lower cover, removing and installing**.
- Remove ribbed belt tensioner --> **Ribbed belt tensioner, removing and installing**.
- Remove front coolant pipe --> **Front coolant line, removing and installing**.

- Remove generator --> **27 - STARTER, GENERATOR, CRUISE CONTROL** .

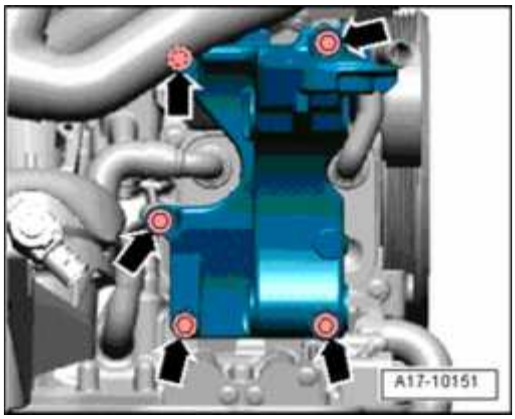

Fig. 414: Removing Bolts And Air Generator Bracket
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove bolts - **arrows** - and remove air generator bracket.

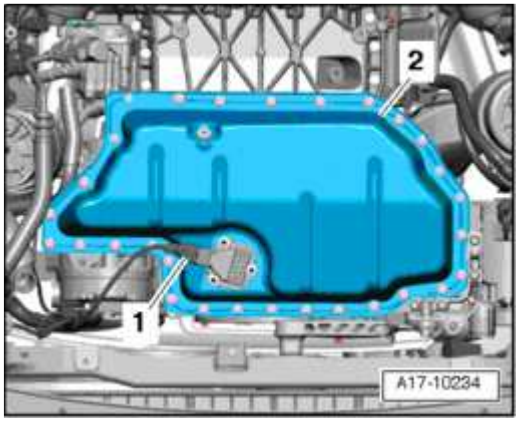

Fig. 415: Identifying Oil Level Thermal Sensor G266 Electrical Connector & Oil Pan (Lower Part)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect electrical connector - **1** - at Oil Level Thermal Sensor G266.
- Place old oil collecting and extracting device V.A.G 1782 under engine.

NOTE:

- **There is still a residual amount of oil in lower section of oil pan.**

- Remove oil pan (lower part) - **2** - and pry out carefully.

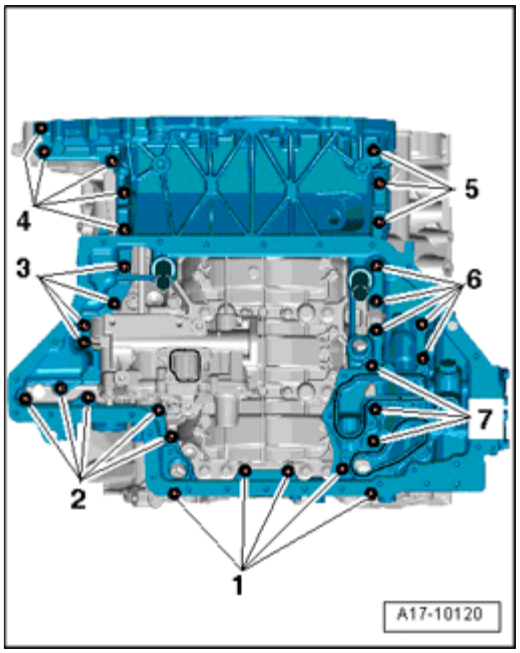

Fig. 416: Removing/Installing Bolts For/To Upper Section Of Oil Pan
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove oil pump --> **Oil pump, removing and installing**.
- Remove bolts - **1 to 7** - for upper section of oil pan.
- Press upper part of oil pan from alignment pins of cylinder block.

Installing

- Tightening torques --> **Ribbed belt drive, assembly overview** , **Upper part of oil pan, tightening sequence**

NOTE:

- **Replace sealing rings and O-rings.**

CAUTION: Risk of eye injury.

- **Wear safety glasses.**

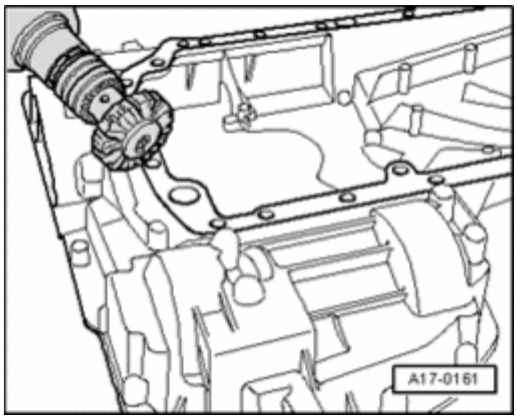

Fig. 417: Using Rotating Plastic Brush To Remove Remaining Sealant From Oil Pan (Upper Part) And At Cylinder Block
Courtesy of VOLKSWAGEN UNITED STATES, INC.

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

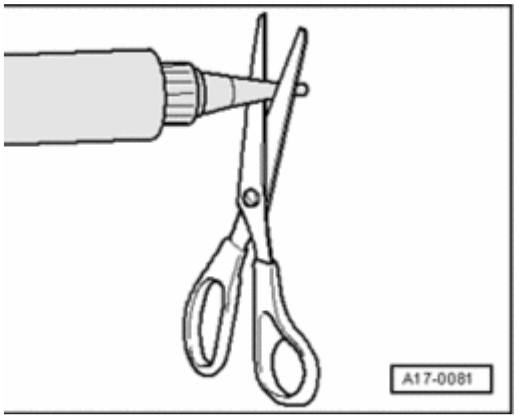

Fig. 418: Cutting Tube Nozzle At Front Marking
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Cut off nozzle on tube of sealant at front mark (dia. of nozzle approx. 1 mm).

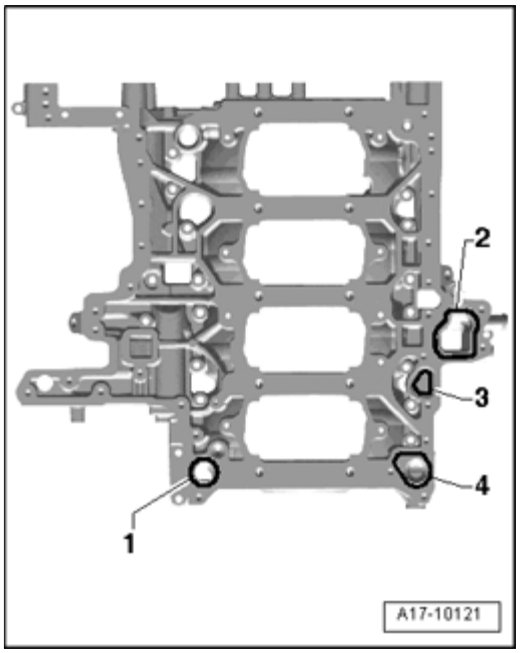

Fig. 419: Inserting New Seals Into Grooves On Cylinder Block
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Insert new seals - **1 to 4** - into grooves on cylinder block.

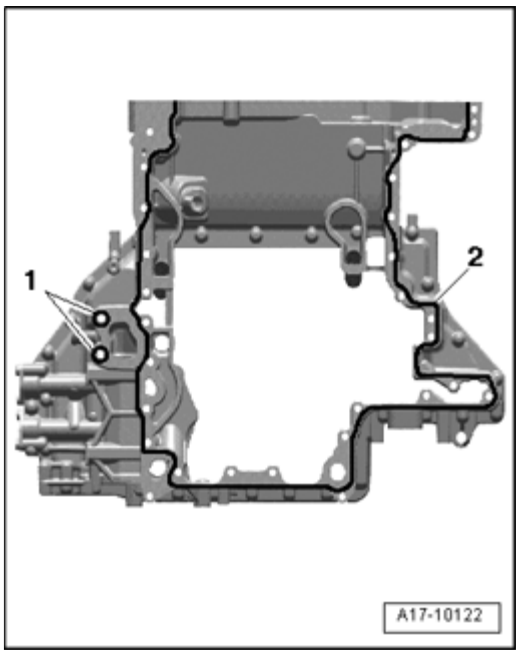

Fig. 420: Applying Sealant Beads On Clean Sealing Surfaces Of Upper Part Of Oil Pan
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Apply sealant beads - **1 and 2** - on clean sealing surfaces of upper part of oil pan, as shown in illustration.

- Thickness of sealant beads: 2.5 mm.

CAUTION: Risk of plugging oil pump strainer with excess sealant.

- **Do not apply sealant bead thicker than specified.**

NOTE:

- **The oil pan (upper part) must be installed within 5 minutes after application of sealant.**

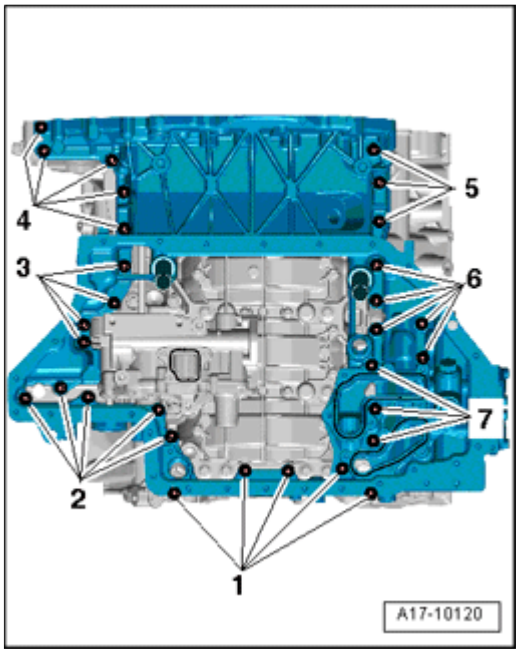

Fig. 421: Removing/Installing Bolts For/To Upper Section Of Oil Pan
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Position lower part of oil pan and tighten bolts **Upper part of oil pan, tightening sequence**

The rest of installation is in reverse order of removal, note the following:

- Install oil pump --> **Oil pump, removing and installing**.
- Install coolant pump --> **Coolant pump, removing and installing**.
- Install lower section of oil pan **Installing**.
- Install front coolant pipe --> **Front coolant line, removing and installing**.

- Install ribbed belt tensioner --> **Ribbed belt tensioner, removing and installing**.
- Install generator --> **27 - STARTER, GENERATOR, CRUISE CONTROL** .
- Install lower timing chain cover --> **Timing chain lower cover, removing and installing**.
- Install crankshaft seal, transmission side --> **Transmission-side crankshaft sealing ring, replacing**.

- Install oil filter housing --> **Oil filter housing, removing and installing**.
- Install intake manifold --> **24 - MULTIPORT FUEL INJECTION (MFI)** .

- Install left and right timing chain covers --> **Left and right timing chain covers, removing and installing**.
- Install drive plate --> **Drive plate, removing and installing**.

- Install engine --> **Engine, installing**.
- Add engine oil and check oil level --> **Oil level, checking**.

OIL CHECK VALVE, SPRAY NOZZLE VALVE, OIL FILTER HOUSING, OIL COOLER, OIL PRESSURE SWITCH

Oil check valve and spray nozzle valve, assembly overview

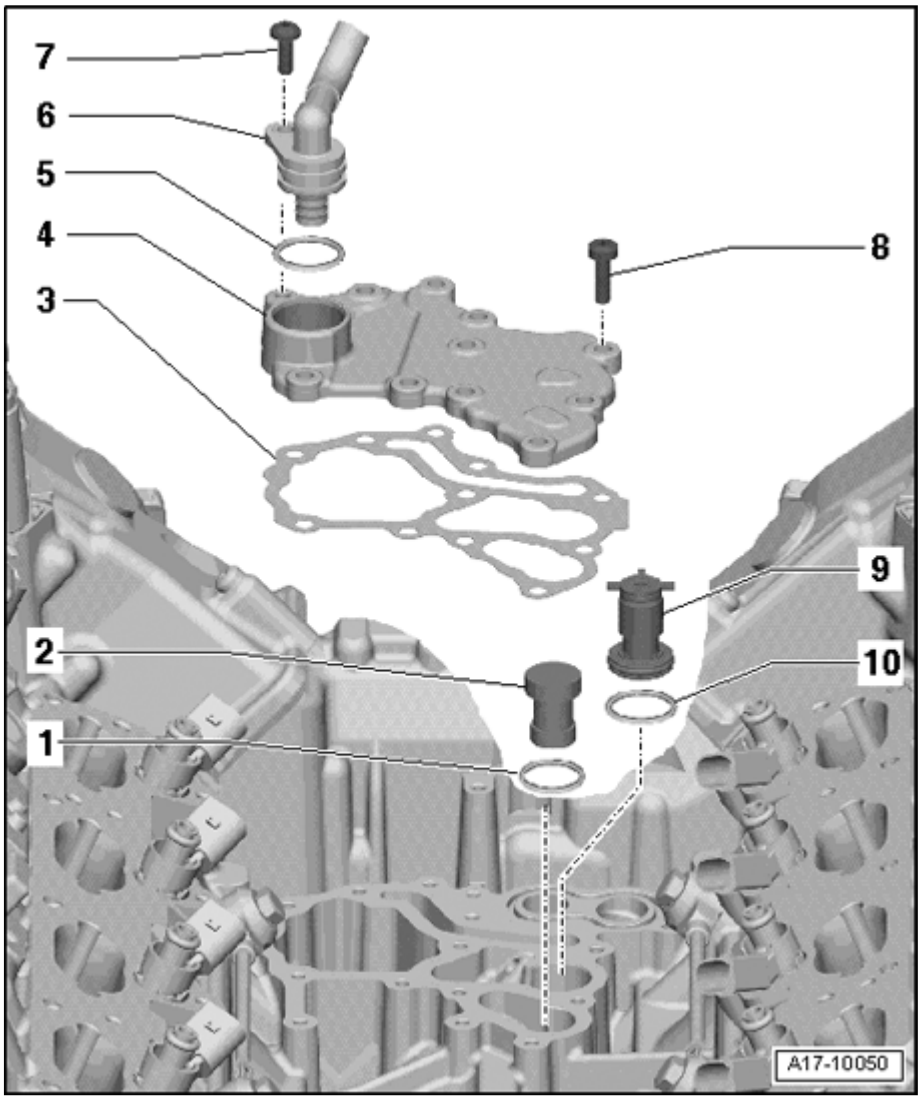

Fig. 422: Oil Check Valve And Spray Nozzle Valve, Assembly Overview
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - O-ring

- Replace

2 - Spray nozzle valve

- Removing and installing --> **Oil check valve and spray nozzle valve, removing and installing**

3 - Gasket

- Replace

4 - Cover

5 - O-ring

- Replace

6 - Hose

- For crankcase ventilation

7 - Bolt

- 9 Nm

8 - Bolt

- 9 Nm

9 - Oil check valve

- Removing and installing --> **Oil check valve and spray nozzle valve, removing and installing**

10 - O-ring

- Replace

Oil check valve and spray nozzle valve, removing and installing

NOTE:

- **If irregular valve noises disappear after a long drive but always return on short drives, oil check valve must be replaced.**

Removing

- Remove intake manifold --> **24 - MULTIPORT FUEL INJECTION (MFI)** .

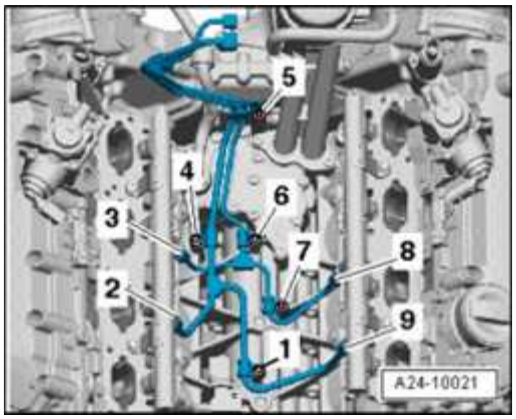

Fig. 423: Identifying Bolts On High Pressure Line Retaining Clamps, Fuel Injectors Electrical Harness Connectors & High Pressure Lines
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove bolts - **1, 4, 5, 6, 7** - on high pressure line retaining clamps.
- Disconnect electrical harness connectors at fuel injectors.
- Remove high pressure lines - **2 and 9** - from connections on fuel rail.
- Remove high pressure lines - **3 and 8** - from connections on fuel rail. To do this, counter-hold at hex head with and open-end wrench and loosen union nut.

- Remove high pressure lines.

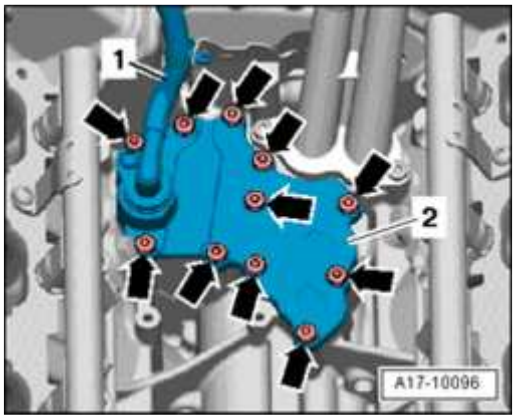

Fig. 424: Removing Bolts & Cover With Crankcase Ventilation Hose
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove bolts - **arrows** -.
- Remove cover - **2** - with crankcase ventilation hose - **1** -.
- Remove seal.

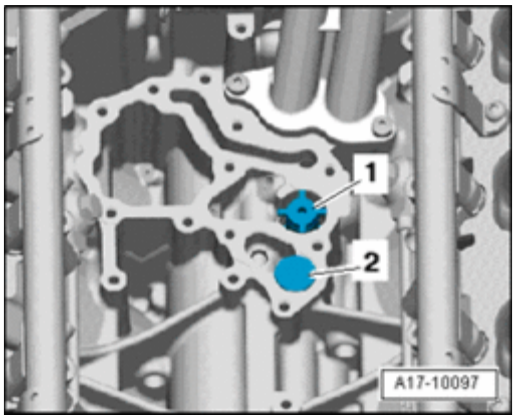

Fig. 425: Removing Oil Check Valve And Spraying Nozzle Valve
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove oil check valve - **1** - and spray nozzle valve - **2** -.

Installing

- Tightening torques --> **Oil check valve and spray nozzle valve, assembly overview**.

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

NOTE:

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

- Install high pressure lines --> **24 - MULTIPORT FUEL INJECTION (MFI)** as described under "Fuel injectors, removing and installing".
- Install intake manifold --> **24 - MULTIPORT FUEL INJECTION (MFI)** .

Crankcase ventilation hose, removing and installing

Removing

- Remove intake manifold --> **24 - MULTIPORT FUEL INJECTION (MFI)** .

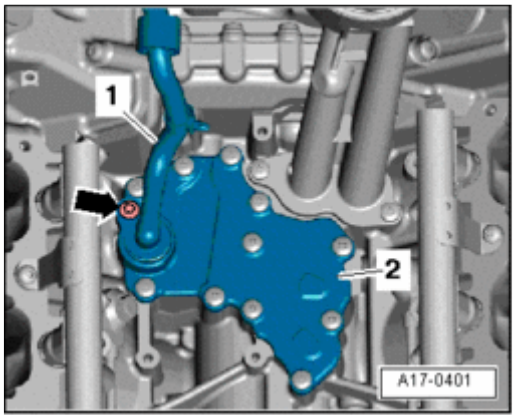

Fig. 426: Removing Bolt And Crankcase Ventilation Hose From Cover
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove bolt - **arrow** - and remove crankcase ventilation hose - **1** - from cover - **2** -.

Installing

- Tightening torque --> **Oil check valve and spray nozzle valve, assembly overview**.

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

NOTE:

- **Replace O-ring.**

- Install intake manifold --> **24 - MULTIPORT FUEL INJECTION (MFI)** .

Oil filter housing, assembly overview

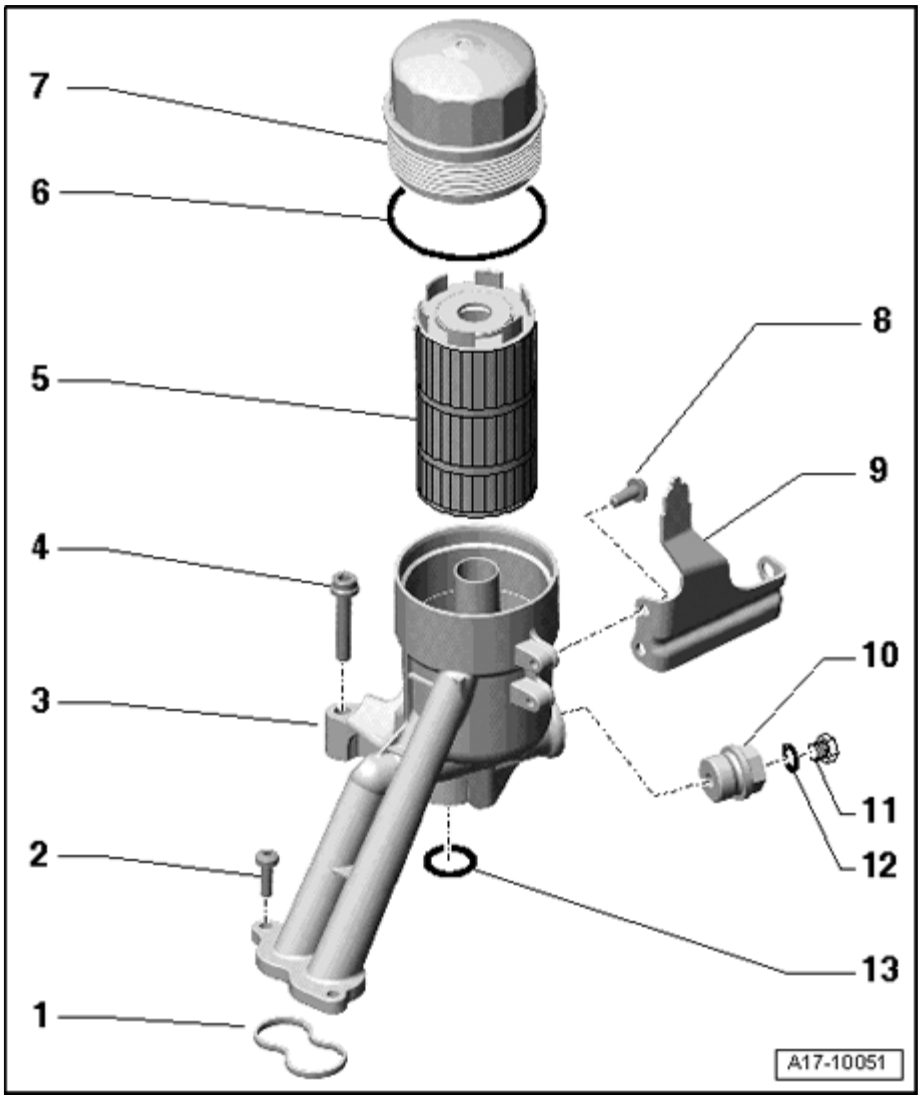

Fig. 427: Oil Filter Housing, Assembly Overview
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Gasket

- Replace

2 - Bolt

- 9 Nm

3 - Oil filter housing

- With oil filter by-pass valve 1.3 bar

4 - Bolt

- 22 Nm

5 - Oil filter element

- Replace O-ring - **6** - when filter is changed
- Observe change intervals 405

6 - O-ring

- Replace

7 - Cap

- 25 Nm

8 - Bolt

- 9 Nm

9 - Bracket

- For evaporative emission (EVAP) canister purge regulator valve N80

10 - Locking bolt

- 50 Nm

11 - Locking bolt

- 9 Nm

12 - Seal

- Replace

13 - O-ring

- Replace

Oil cooler

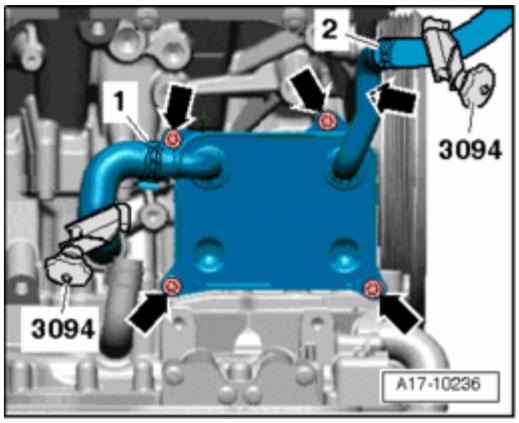

Fig. 428: Identifying Oil Cooler
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Bolts - **arrows** -

- 9 Nm

Oil pressure switch F1

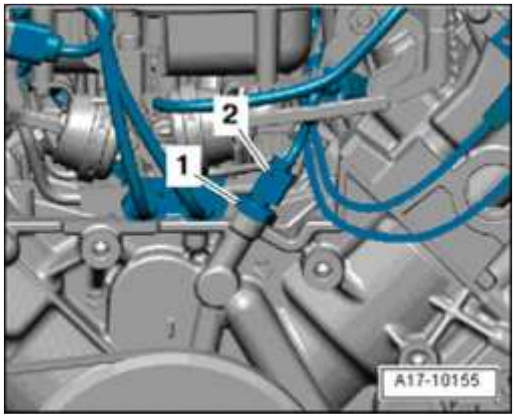

Fig. 429: Oil Pressure Switch F1
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Oil Pressure Switch F1 - **1** -

- 20 Nm
- Replace seal

Oil filter housing, removing and installing

Removing

- Remove intake manifold --> **24 - MULTIPORT FUEL INJECTION (MFI)** .

NOTE:

- **To collect escaping engine oil, place a clean cloth around oil filter housing.**

- Remove cover and remove oil filter insert.

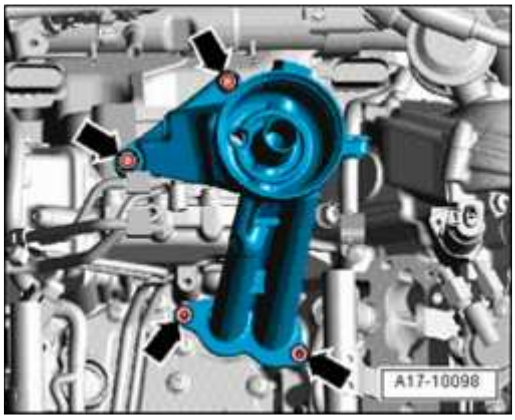

Fig. 430: Removing Bolts And Oil Filter Housing
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove bolts - **arrows** - and remove oil filter housing.

Installing

- Tightening torques --> **Oil filter housing, assembly overview**.

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

NOTE:

- **Replace sealing rings and O-rings.**

- Install intake manifold --> **24 - MULTIPORT FUEL INJECTION (MFI)** .
- Check oil level --> **Oil level, checking**.

Oil cooler, removing and installing

Special tools, testers and auxiliary items required

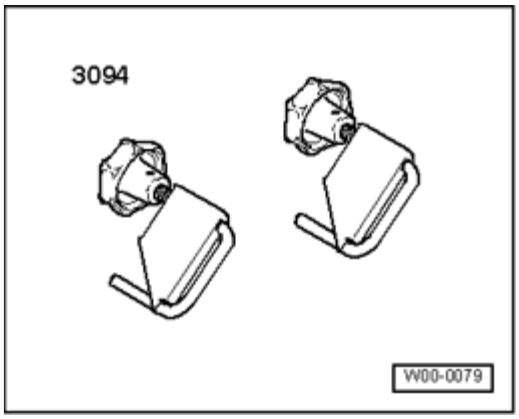

Fig. 431: Identifying Hose Clamps 3094
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Hose clamps up to 25 mm dia. 3094

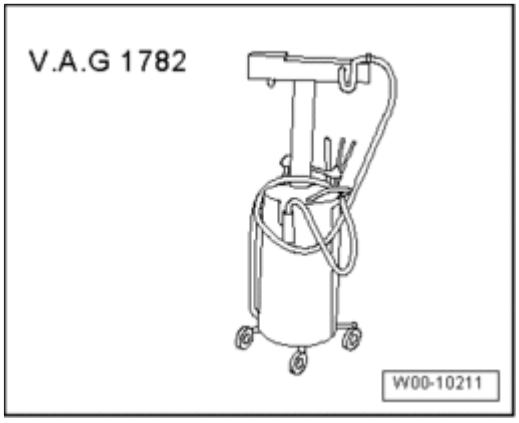

Fig. 432: Identifying Old Oil Collecting And Extracting Device V.A.G 1782
Courtesy of VOLKSWAGEN UNITED STATES, INC.

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

Removing

- Remove generator --> **27 - STARTER, GENERATOR, CRUISE CONTROL** .

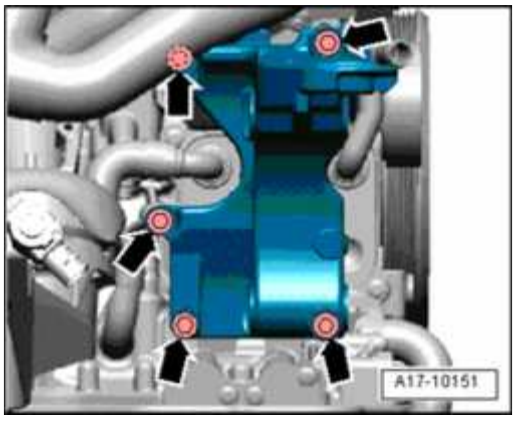

Fig. 433: Removing Bolts And Air Generator Bracket
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove bolts - **arrows** - and remove air generator bracket.

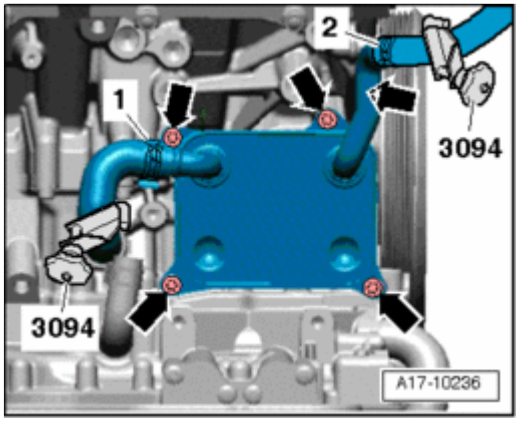

Fig. 434: Clamping Off Coolant Hoses With Hose Clamps Hose Clamps Up To 25 mm Dia. 3094
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Clamp off coolant hoses with hose clamps Hose clamps up to 25 mm dia. 3094 as shown in illustration.

NOTE:

- **Lay a cloth below to catch escaping coolant.**

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

Installing

- Tightening torques --> **Ribbed belt drive, assembly overview** , --> **Oil filter housing, assembly overview**.

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

NOTE:

- **Replace O-rings.**
- **Secure all hose connections using hose clamps appropriate for the model type .**

- Install generator --> **27 - STARTER, GENERATOR, CRUISE CONTROL** .
- Check coolant level **Filling**.

Oil Pressure Switch F1 , removing and installing

Removing

- Bring lock carrier into service position --> **50 - BODY - FRONT** .

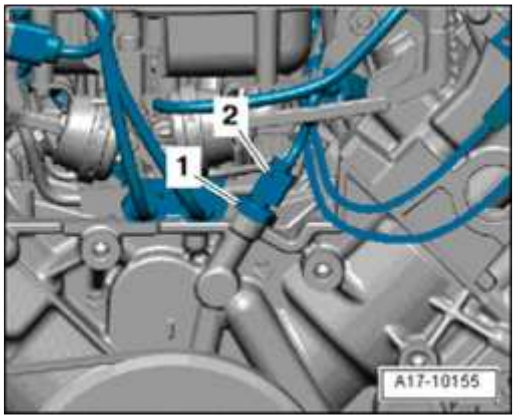

Fig. 435: Oil Pressure Switch F1
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect electrical connector - **2** - on Oil Pressure Switch F1 - **1** -.
- Remove Oil Pressure Switch F1.

Installing

- Tightening torque --> **Oil filter housing, assembly overview**.

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

NOTE:

- **Replace sealing ring.**
- **Secure all hose connections using hose clamps appropriate for the model type .**

- Install lock carrier with attachments --> **50 - BODY - FRONT** .

Oil pressure and oil pressure switch F1 , checking

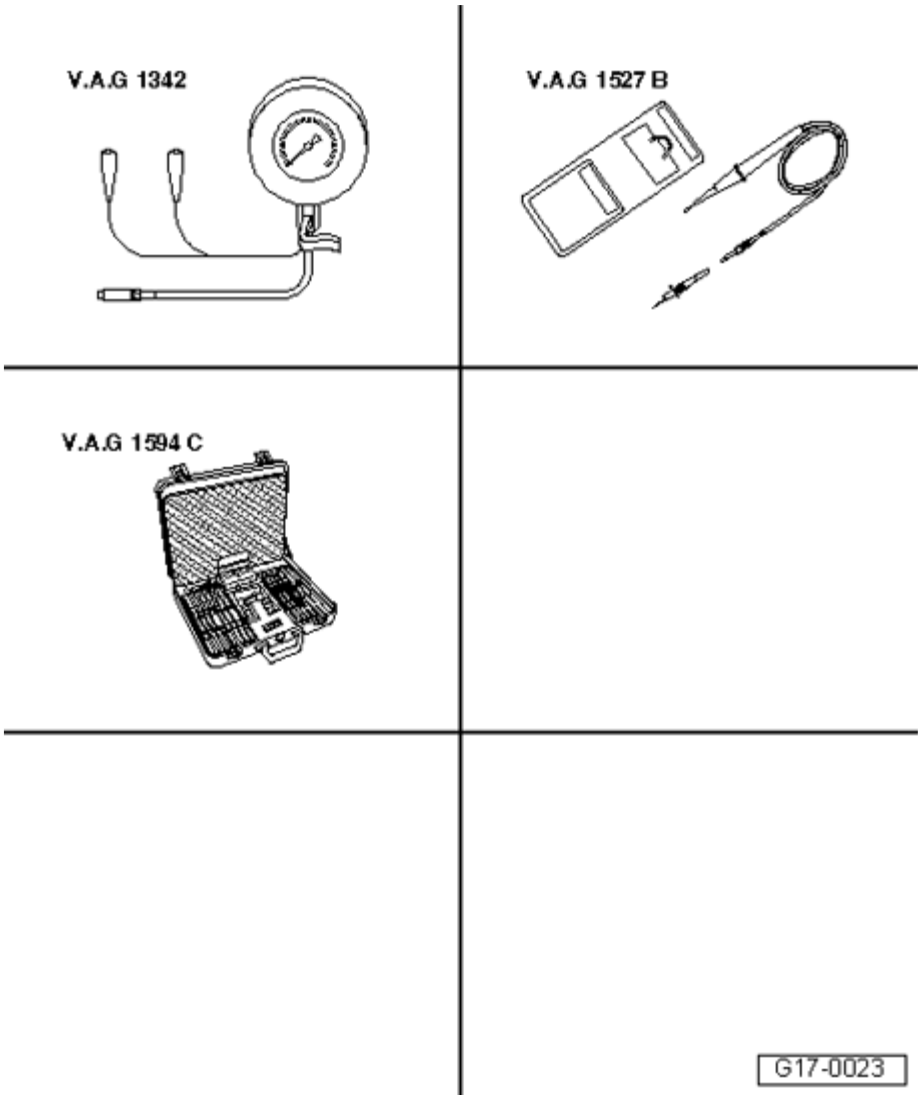

Fig. 436: Identifying Special Tools - Oil Pressure And Oil Pressure Switch F1 , Checking
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools, testers and auxiliary items required

- Oil pressure gauge V.A.G 1342 with adapter V.A.G 1342/14
- Voltage tester V.A.G 1527B
- Connector test set V.A.G 1594C

Work procedure

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

- Remove Oil Pressure Switch F1 --> **Oil Pressure Switch F1 , removing and installing**.

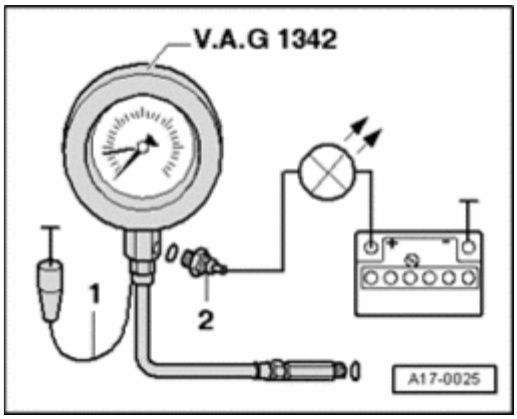

Fig. 437: Connecting Oil Pressure Gauge V.A.G 1342 With Adapter V.A.G 1342/14 To Hole For Oil Pressure Switch
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect oil pressure gauge V.A.G 1342 with adapter V.A.G 1342/14 to hole for oil pressure switch.
- Install oil pressure switch - **2** - into oil pressure gauge V.A.G 1342.
- Place brown wire of oil pressure gauge on Ground (GND) ("").

Oil pressure switch, checking

- Connect voltage tester V.A.G 1527B using adapter cables from connector test kit V.A.G 1594C 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, LED must light up.**

If LED does not light up:

- Replace Oil Pressure Switch.

Oil pressure, checking

- Start engine.

- Oil pressure at idle: at least 1.5 bar.

- Oil pressure at 2000 RPM: at least 3.5 bar.

If specifications are not obtained: Check-valve or oil pump malfunctioning.

- Replace oil pump --> **Oil pump, removing and installing**.

Assembling

- Install Oil Pressure Switch F1 --> **Oil Pressure Switch F1 , removing and installing**.

Engine oil

Viscosity classes, oil specifications, oil capacities Maintenance tables.

Oil level, checking

NOTE:

- **Oil level must not exceed "max" marking danger of catalytic converter damage!**

Work procedure

- Engine oil temperature at least 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.

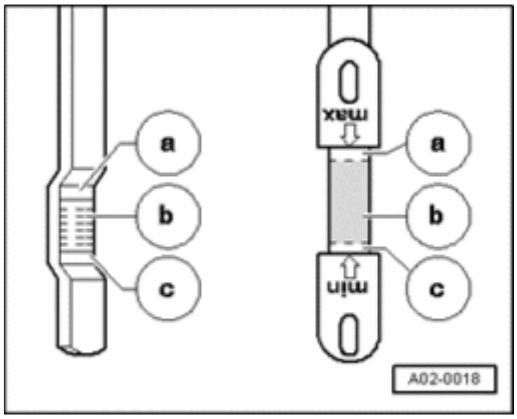

Fig. 438: Range Of Markings On Dipstick:
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Range of markings on dipstick:

a - Oil must not be added.

b - Oil may be topped off.

c - Oil must be added.

NOTE:

- **The oil level may not exceed the "max" marking - a - or fall below the "min" marking - c -.**