

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

ENGINE

1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

00 - GENERAL, TECHNICAL DATA

TECHNICAL

Engine number

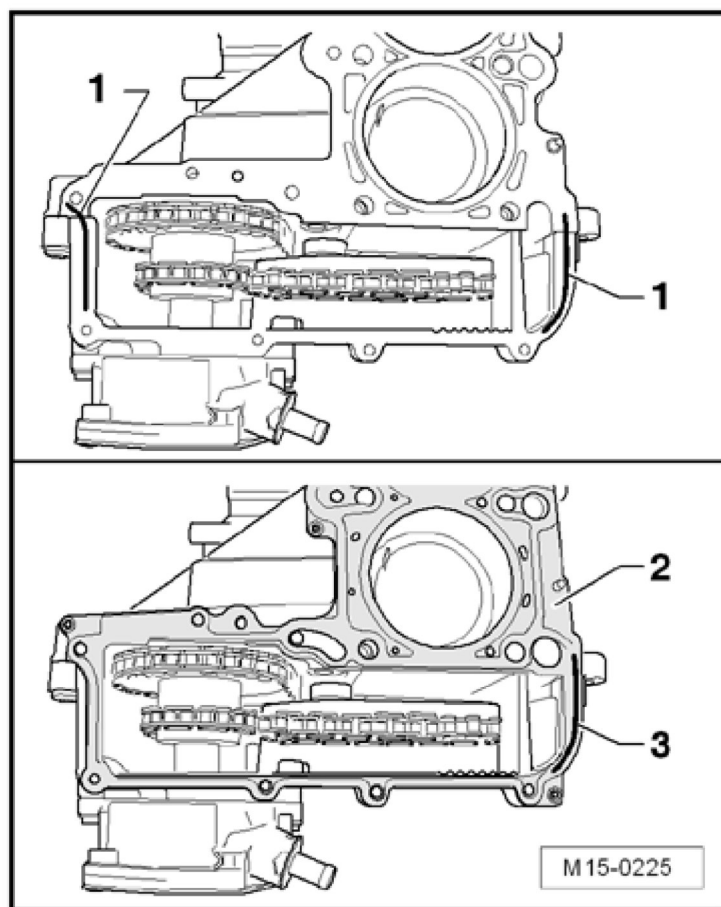


Fig. 1: Locating Engine Number

Courtesy of VOLKSWAGEN UNITED STATES, INC.

The engine number ("Code letters" and "Serial number") can be found on the joint between engine/gearbox.

Additionally there is a sticker on the toothed belt guard with "Engine code" and "Serial number".

The engine code is also included on the vehicle data plate.

The engine number consists of up to nine characters (alphanumeric). The first part (maximum 3 characters)

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

makes up the "engine code" , and the second part (6 characters), the "serial number". If more than 999,999 engines with the same engine code are produced, the first of the six characters is replaced with a letter.

Engine data

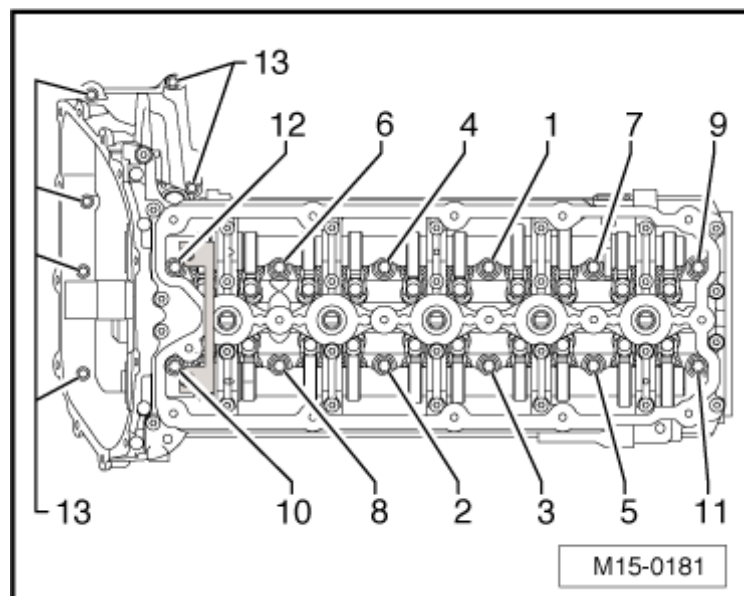
Engine code	BEW	
Manufactured	06.03 -->	
Displacement	l	1.9
Output	kW at rpm	74/4000
Torque	Nm at rpm	240/ 1800 to 2400
Bore	dia. mm	79.5
Stroke	mm	95.5
Compression ratio	17.5	
CN	min.	48
Firing order	1-3-4-2	
Catalytic converter	yes	
Exhaust gas recirculation	yes	
Charging	yes	
Charge air cooler	yes	

10 - ENGINE - ASSEMBLY

ENGINE, REMOVING AND INSTALLING

Engine, removing and installing

Special tools, testers and auxiliary items required



2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

Fig. 2: Identifying Special Tools - Engine, Removing And Installing (1 Of 2)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Lifting tackle 2024 A
- Engine bracket T10012
- Support clamp VW 313
- Engine and transmission stand VW 540
- Workshop crane V.A.G 1202 A
- Drip tray V.A.G 1306

Special tools, testers and auxiliary items required

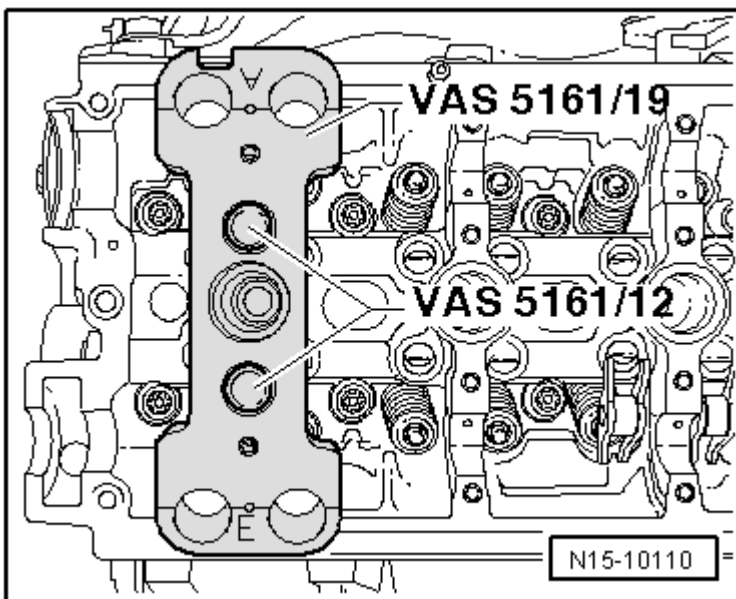


Fig. 3: Identifying Special Tools - Engine, Removing And Installing (2 Of 2)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Torque wrench (5...50 Nm) V.A.G 1331
- Torque wrench (40...200 Nm) V.A.G 1332
- Engine/transmission jack V.A.G 1383 A
- Spring-type clip pliers VAS 5024
- Ladder V.A.S 5085
- Grease G 000 100 (models with a manual transmission)
- Bolt M10x25/8.8
- Cable ties

Engine, removing

Work sequence

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

The engine is removed downward together with the transmission.

CAUTION: When doing any repair work, especially in the engine compartment, pay attention to the following due to the cramped conditions:

- Route all the various lines (e.g. for fuel, hydraulics, EVAP system, coolant, refrigerant, brake fluid and vacuum) and electrical wiring in their original positions.
- Ensure that there is sufficient clearance to all moving or hot components.

NOTE:

- All cable ties which are opened or cut through when engine is removed must be replaced in the same position when the engine is installed.

- Check whether a coded radio is installed. If so, obtain anti-theft coding.
- With ignition switched off disconnect battery Ground (GND) strap.
- Remove engine cover.
- Remove battery and battery retainer.
- Remove air cleaner.
- Disconnect pipe between charge air cooler and intake connecting flange at intake connecting flange.
- Disconnect fuel supply and return lines at fuel filter.

CAUTION:

- The fuel and the fuel lines in the fuel system can become very hot (danger of scalding)!
- The fuel system is also under pressure! Before opening the system, place cloths around the connections. Then carefully loosen the connection to release the pressure!
- Wear eye and hand protection when performing any type of repair work on the fuel system!

Vehicles with manual transmission 02J

- Remove hydraulic clutch slave cylinder: Refer to **30 CLUTCH**
- Disconnect shift mechanism from transmission: Refer to **34 MANUAL TRANSMISSION - CONTROLS, HOUSING**

Vehicles with automatic transmission

- Remove selector lever cable from transmission: refer to **37 - AUTOMATIC TRANSMISSION - CONTROLS, HOUSING**

Continuation for all vehicles

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Remove center, left and right sound insulation trays: Refer to **50 BODY, FRONT**
- Drain coolant, refer to **Coolant, draining and filling** .
- Disconnect connector from thermal switch and coolant fan.
- Pull coolant hoses off radiator.
- Disconnect all electrical wiring from transmission, Generator and starter and move clear.

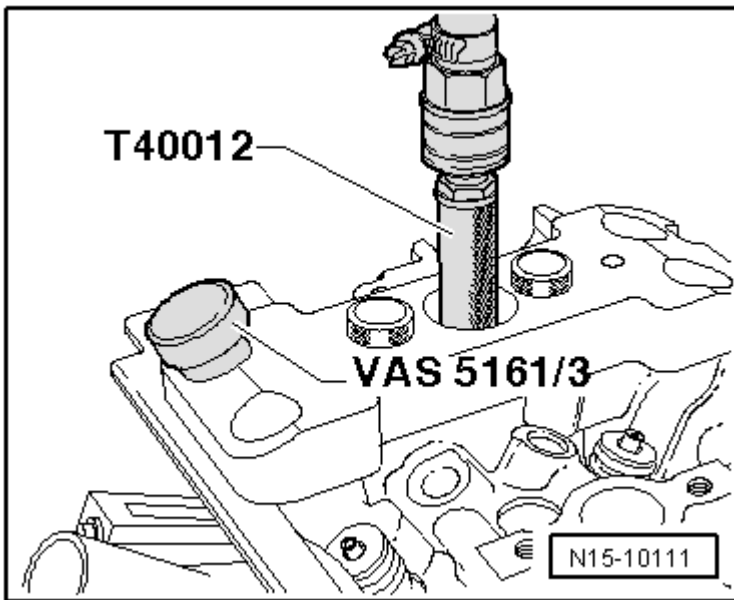


Fig. 4: Locating Pendulum Support Bolts

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Unbolt pendulum support in order shown - **arrows** -.
- Remove front exhaust pipe refer to **Exhaust system components, removing and installing**.
- Remove poly V-belt refer to **Poly V-belt, removing and installing** .
- Unbolt power steering pump from bracket and move aside. Hoses remain connected: Refer to **48 STEERING**
- Separate all connections from engine for coolant, vacuum and intake hoses.
- Pull off/disconnect all other electrical connections as necessary from engine and lay to one side.
- Remove right side axle shaft and disconnect left side axle shaft at transmission: Refer to **40 FRONT SUSPENSION**
- Remove securing clamps for power steering pressure line.

Vehicles with air conditioning

- Observe additional information and removal work refer to **Additional information and removal work on vehicles with air conditioning** .

Continuation for all vehicles

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Insert engine bracket T10012 in engine/transmission jack V.A.G 1383 A.

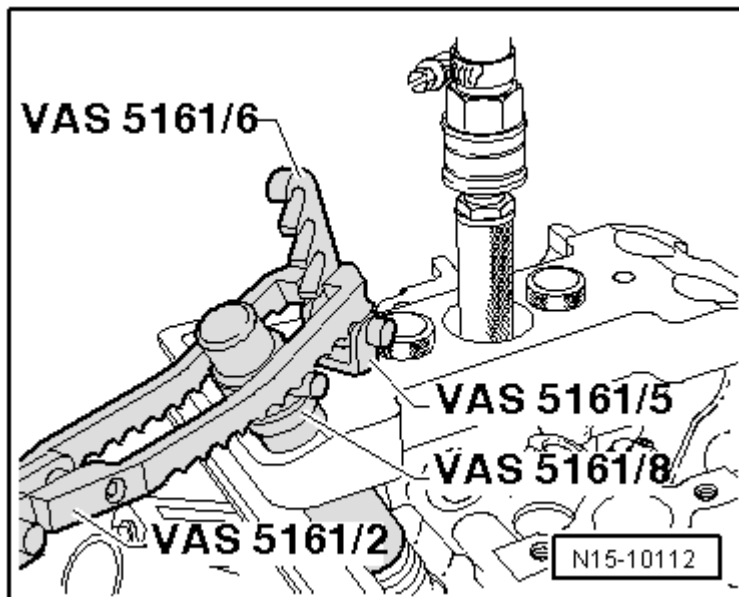


Fig. 5: Installing Engine Bracket T10012 Onto Cylinder Block With A Securing Nut
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Install engine bracket T10012 onto cylinder block with a securing nut and M10x25/ 8.8 bolt and tighten to approx. 40 Nm.
- Lift engine and transmission lightly using engine/transmission jack V.A.G 1383 A.

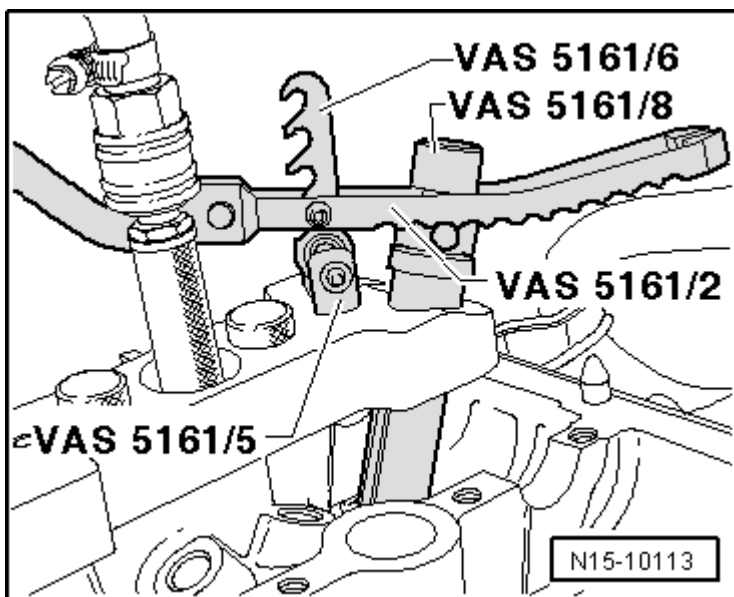


Fig. 6: Locating Engine Carrier Bolts (Engine Side)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Unbolt engine side of assembly mounting from engine carrier at top - **arrows** -.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

NOTE:

- To remove securing bolts use step ladder VAS 5085.

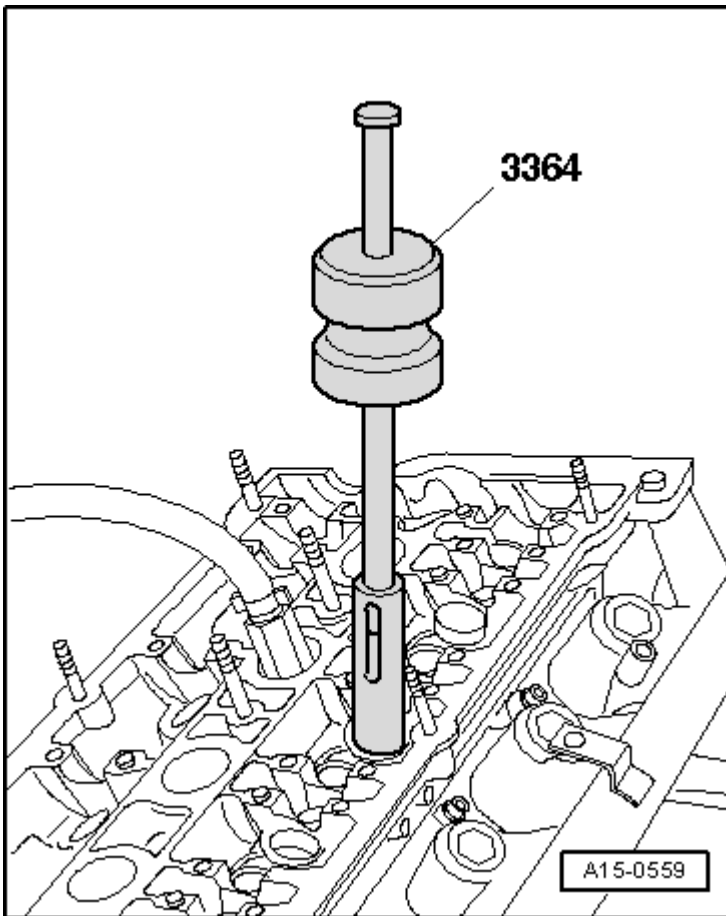


Fig. 7: Locating Engine Carrier Bolts (Transmission Side)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Unbolt transmission side of assembly mounting from transmission carrier at top - **arrows** -.
- Carefully lower engine with transmission.

NOTE:

- The engine and transmission must be guided carefully when lowering to prevent damage to the bodywork.

Engine, securing to assembly stand

When working on the engine, it must be secured to support clamp VW 313 using engine and transmission bracket VW 540.

Work sequence

- Remove transmission.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

Vehicles with automatic transmission

- Secure torque converter to prevent it from falling out after separating engine from transmission.

Continuation for all vehicles

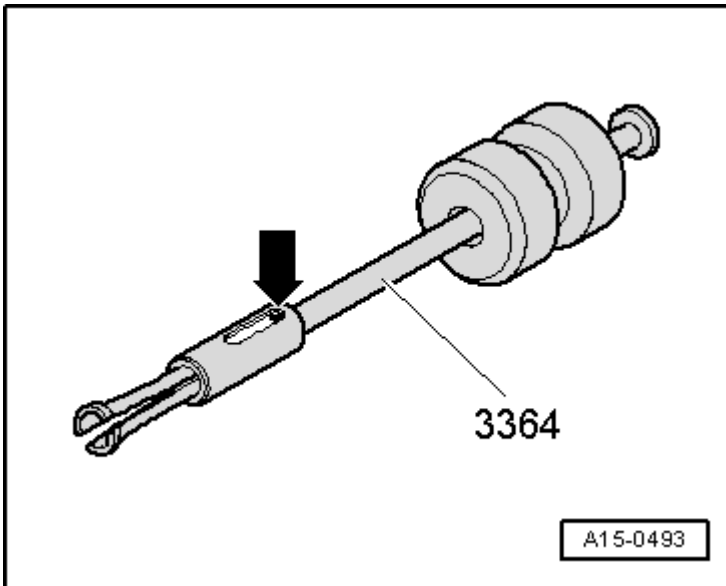


Fig. 8: Attaching Lifting Tackle 2024 A

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Attach lifting tackle 2024 A as follows and lift off engine/transmission jack V.A.G 1383 A with workshop crane.

Belt pulley end: 2nd hole on support bar in position 1

Flywheel end: 4th hole on support bar in position 8

CAUTION: The hooks and locating pins must be secured with locking pins.

NOTE:

- The positions marked 1 to 4 on the bar must be toward the belt pulley end.
- The holes in the hook rails are counted up from the hook.

- Secure engine to support clamp VW 313 using engine and transmission bracket VW 540.

NOTE:

- First loosen coolant pipe at flywheel end.

Engine, installing

Installation is performed in reverse order. Note the following:

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Check clutch release bearing for wear, replace if necessary.
- Lightly grease clutch release bearing, release bearing guide sleeve and splines on input shaft with *grease G 000 100*.
- Check whether dowel sleeves for centering engine/transmission are in cylinder block and install if necessary.
- When installing assembly, ensure sufficient clearance to axle shafts.
- Align engine and transmission mountings refer to **Engine and transmission mountings, aligning**.

Tightening torques, refer to **Assembly mountings**.

- Install axle shafts: Refer to **40 FRONT SUSPENSION**
- Install front exhaust pipe, refer to **Exhaust system components, removing and installing**.

Vehicles with manual transmission 02J

- Install hydraulic clutch slave cylinder: Refer to **30 CLUTCH**
- Install shift mechanism and adjust cable mechanism if necessary: Refer to **34 MANUAL TRANSMISSION - CONTROLS, HOUSING**

Vehicles with automatic transmission

- Install selector cable on transmission, adjust if necessary: Refer to **37 - AUTOMATIC TRANSMISSION - CONTROLS, HOUSING**

Continuation for all vehicles

- Install power steering pump: Refer to **48 STEERING**
- Reconnect pipe between charge air cooler and intake connecting flange at intake connecting flange.
- Reconnect electrical connections and check routing: Refer to **97 WIRING**

Vehicles with air conditioning

- Install air conditioning compressor: Refer to **87 - AIR CONDITIONING**

Continuation for all vehicles

- Install poly V-belt. Refer to **Poly V-belt, removing and installing**.
- Install center, left and right insulation trays: Refer to **50 BODY, FRONT**
- Fill with coolant. Refer to **Coolant, draining and filling**.
- Road test vehicle and read fault memory. Refer to **Engine control module fault memory, reading and erasing**; Reading and erasing fault memory of engine control module.

Tightening torques

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

Threaded connection		Torque
Bolts, nuts	M6	10 Nm
-	M8	20 Nm
-	M6	45 Nm
-	M6	60 Nm
Deviations		
Front exhaust pipe to exhaust turbocharger		25 Nm

Engine and transmission mountings, aligning

CAUTION: The assembly must be supported with the support device 10-222A before loosening the bolts.

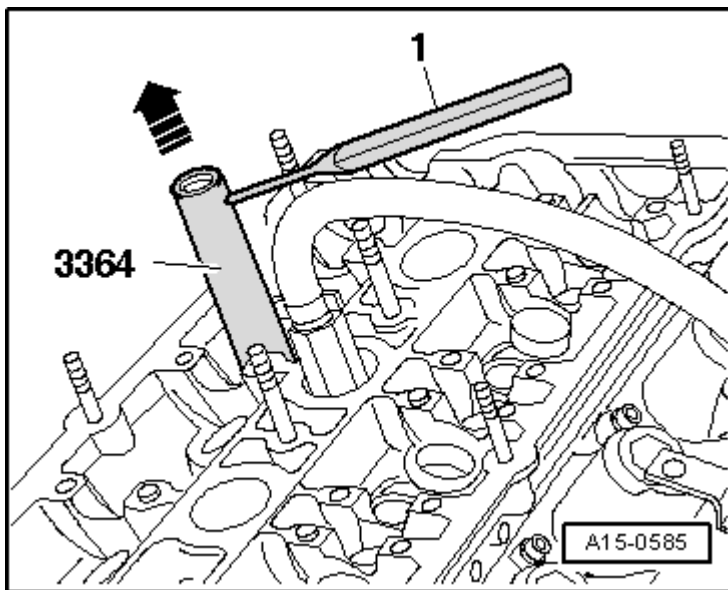


Fig. 9: Measuring Engine Mounting

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Engine assembly mounting

a = 14.0 mm

b = At least 10.0 mm

Both bolt heads - **1** - must be in flush with edge - **c** -.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

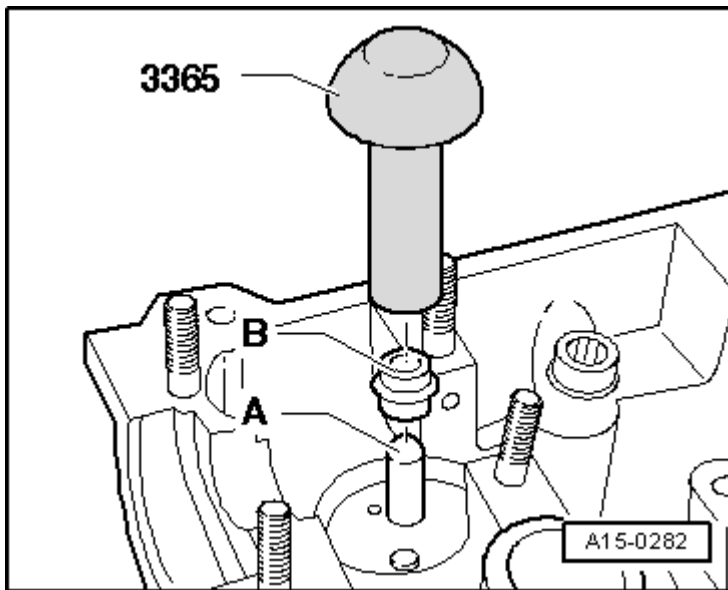


Fig. 10: Measuring Transmission Mounting

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Transmission assembly mounting

The edges - a - and - b - must be parallel with one another.

c = 18 to 20 mm

Assembly mountings

Tightening torques

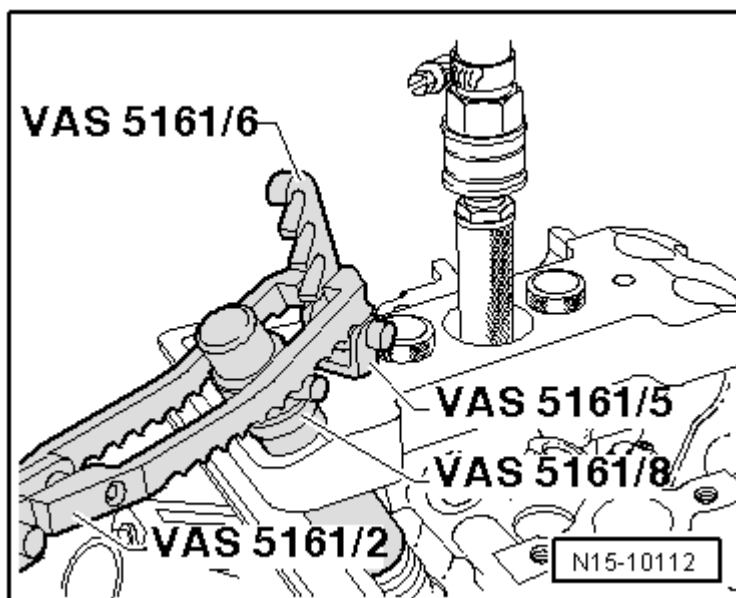


Fig. 11: Identifying Engine Mounting Bracket & Bolts

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Assembly mounting, right:

1 -	Mounting to body * See note	40 Nm + 90 ° (14 turn) further
2 -	Mounting/bracket to body	25 Nm
3 -	Mounting to engine bracket	100 Nm

* Replace bolts

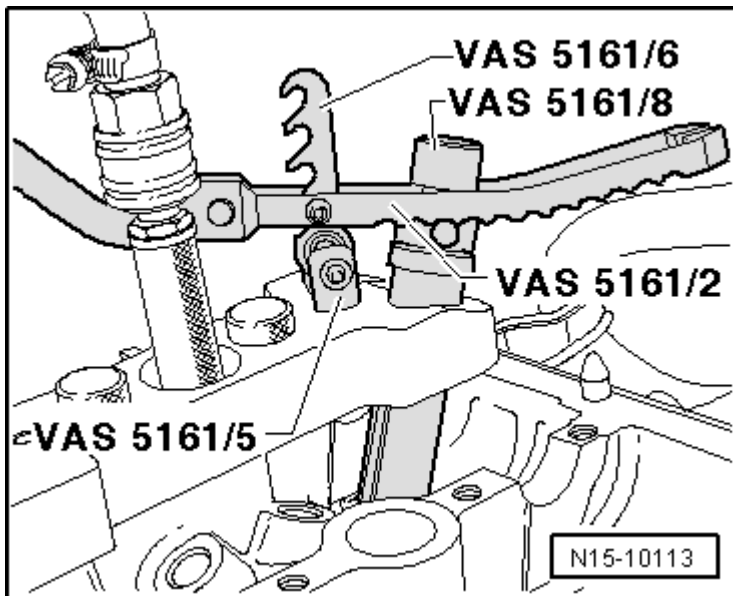


Fig. 12: Identifying Transmission Mounting Bracket & Bolts
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Assembly mounting, left, on vehicles with manual transmission:

1 -	Mounting to body * See note	40 Nm + 90 ° (14 turn) further
2 -	Mounting to body	25 Nm
3 -	Mounting to transmission console	100 Nm

* Replace bolts

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

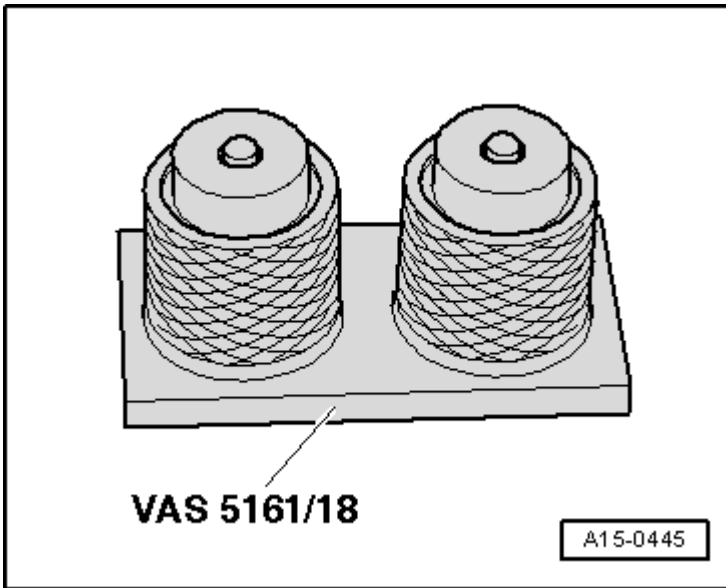


Fig. 13: Identifying Transmission Mounting Bracket & Bolts
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Assembly mounting, left, on vehicles with automatic transmission:

1 -	Mounting to body * See note	40 Nm + 90 ° (14 turn) further
2 -	Mounting to body	25 Nm
3 -	Mounting to transmission console	100 Nm

* Replace bolts

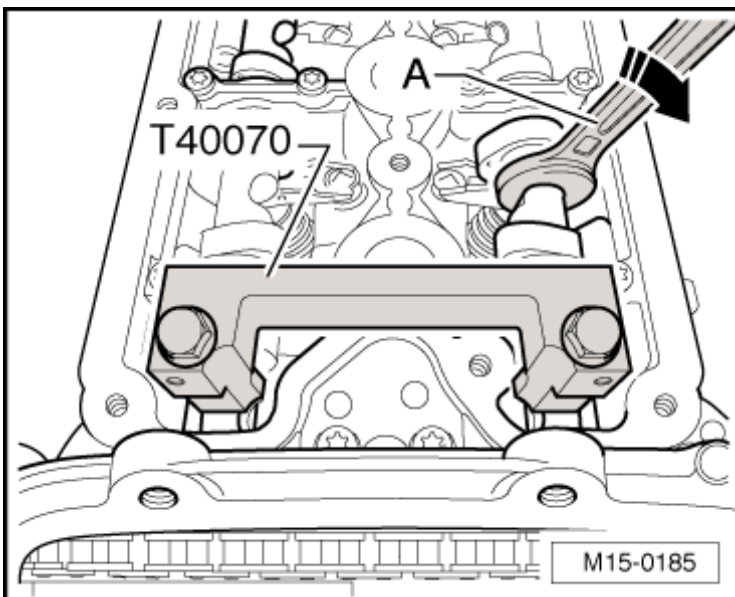


Fig. 14: Identifying Pendulum Support
Courtesy of VOLKSWAGEN UNITED STATES, INC.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

Pendulum support

Assembly order:

1 -	Pendulum support to subframe * See note	20 Nm + 90 ° (14 turn) further
2 -	Pendulum support to transmission * See note	40 Nm +45 ° (18 turn) further
3 -	Pendulum support to transmission * See note	40 Nm +45 ° (18 turn) further

* Replace bolts

Additional information and removal work on vehicles with air conditioning

CAUTION: The air conditioning system refrigerant circuit must not be opened.

NOTE:

- To prevent damage to the condenser and to the refrigerant lines, ensure that the lines and hoses are not stretched, kinked or bent.

To facilitate removing and installing the engine without opening refrigerant circuit:

- Remove retaining clamp(s) from refrigerant lines.
- Remove poly V-belt. Refer to **Poly V-belt, removing and installing** .
- Remove air conditioning compressor: Refer to **87 - AIR CONDITIONING**

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

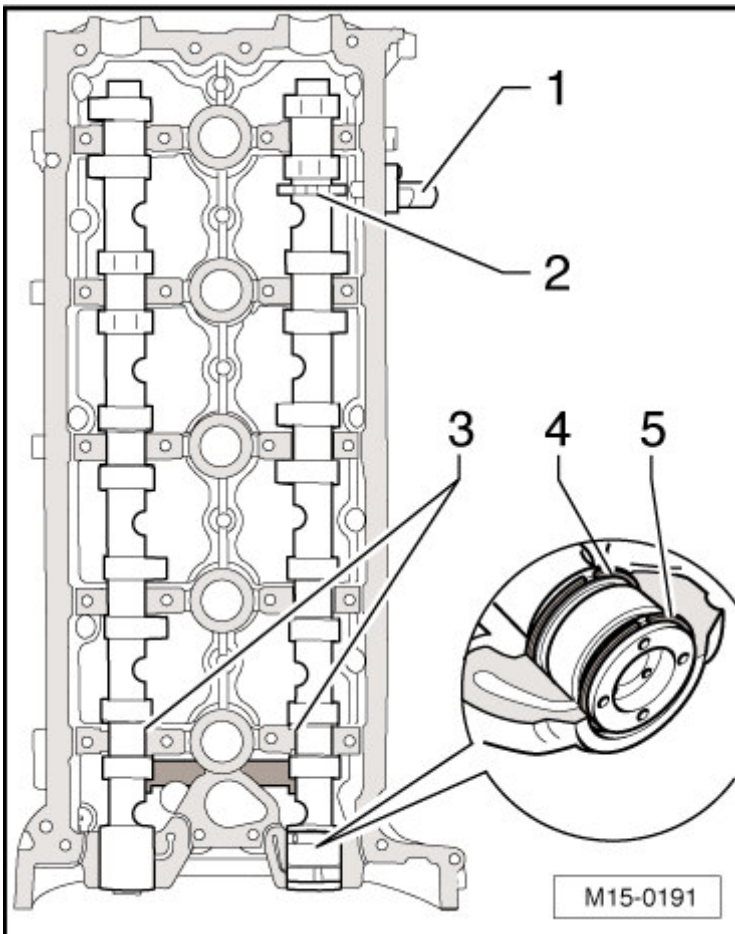


Fig. 15: Identifying Air Conditioning Compressor Secured To Towing Eye
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Secure air conditioning compressor to towing eye so that refrigerant lines are not under tension.

NOTE:

- Prevent damage to the bumper by protecting it with tape.

13 - ENGINE - CRANKSHAFT, CYLINDER BLOCK

ENGINE, DISASSEMBLING AND ASSEMBLING

Engine, disassembling and assembling

NOTE:

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

Engine, assembly overview

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

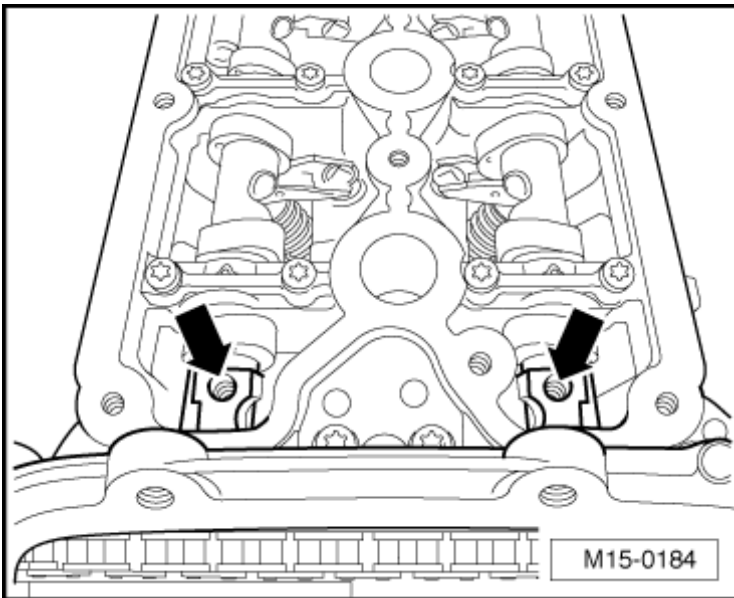


Fig. 16: Exploded View - Engine Assembly
Courtesy of VOLKSWAGEN UNITED STATES, INC.

I -

II -

III -

Part I

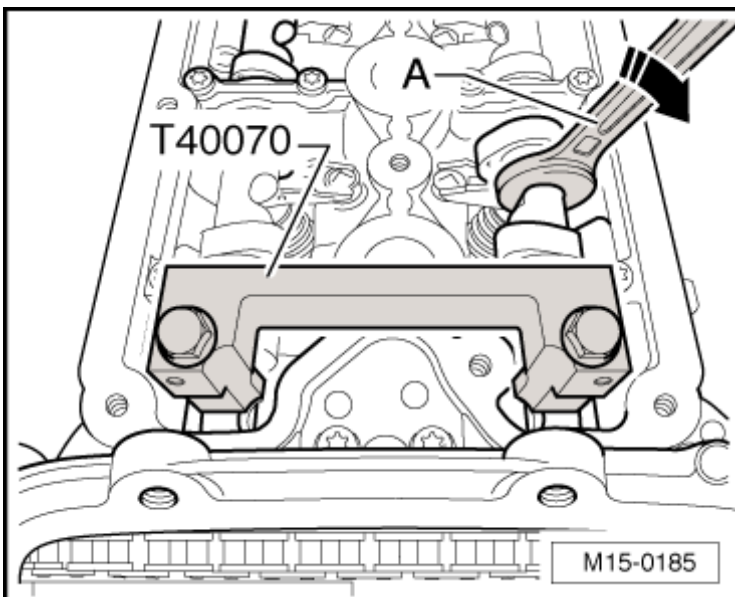


Fig. 17: Exploded View - Engine Assembly
Courtesy of VOLKSWAGEN UNITED STATES, INC.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

1 - Toothed belt guard - upper part

2 - Toothed belt

- Mark direction of rotation before removing
- Check for wear
- Do not kink
- Removing, installing and tensioning. Refer to **Toothed belts, removing, installing and tensioning**

3 - 20 Nm + 18 turn (45 °) further

4 - Tensioning roller

5 - 100 Nm

6 - 25 Nm

7 - Camshaft pulley

8 - Hub

- With sender wheel
- Use counterhold T10051 to loosen and tighten
- To remove, use puller T10052
- Removing and installing. Refer to **Camshaft, removing and installing**

9 - 10 Nm

- Replace

10 - Rear toothed belt guard

11 - Sealing grommet

- Replace if damaged

12 - Idler roller

13 - Coolant pump

- Removing and installing. Refer to **Coolant pump, removing and installing.**

14 - Crankshaft toothed belt pulley

15 - 120 Nm plus 14 turn (90 °) further

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Replace
- Use counterhold 3099 to loosen and tighten
- Do not additionally oil or grease threads and shoulder
- Turning further can be done in several stages.

16 - 15 Nm

17 - 20 Nm

18 - Toothed belt guard, lower part

19 - Belt pulley/vibration damper

- Can only be installed in one position. Holes are off-set.

20 - 10 Nm plus an additional 14 turn (90 °)

21 - Toothed belt guard, center part

Part II

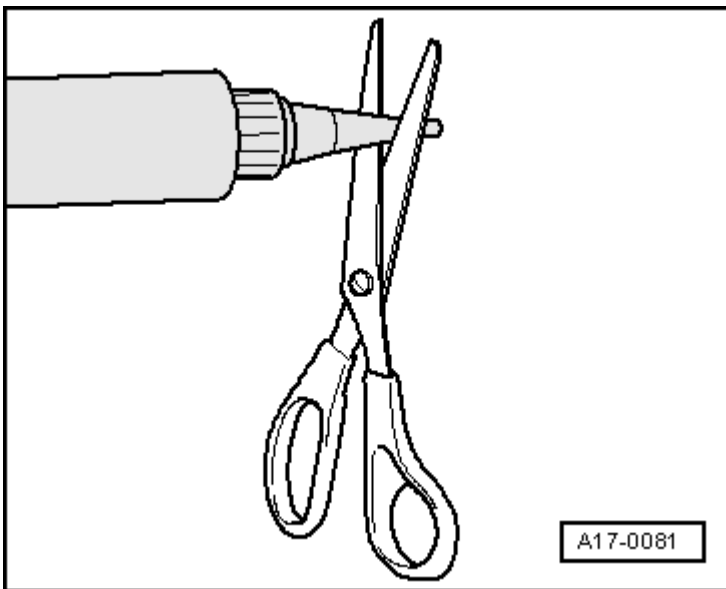


Fig. 18: Exploded View Of Engine Assembly - Part II
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Poly V-belt

- Mark direction of rotation before removing
- Check for wear
- Do not kink

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Removing and installing. Refer to **Poly V-belt, removing and installing**

2 - 10 Nm plus an additional 14 turn (90 °)

3 - Belt pulley/vibration damper

- Can only be installed in one position. Holes are off-set.

4 - 25 Nm

5 - Tensioning element for poly V-belt

- Turn with open end wrench to relieve tension on poly V-belt. Refer to **Poly V-belt, removing and installing**

6 - Generator

7 - Compact bracket

- For Generator, power steering pump and air conditioning compressor

8 - 45 Nm

9 - Banjo bolt, 30 Nm

10 - Seal

- Replace

11 - Pressure line

12 - Power steering pump

- Removing and installing: Refer to **48 STEERING** .

13 - Belt pulley

- For power steering pump

Tightening sequence for compact bracket to cylinder block

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

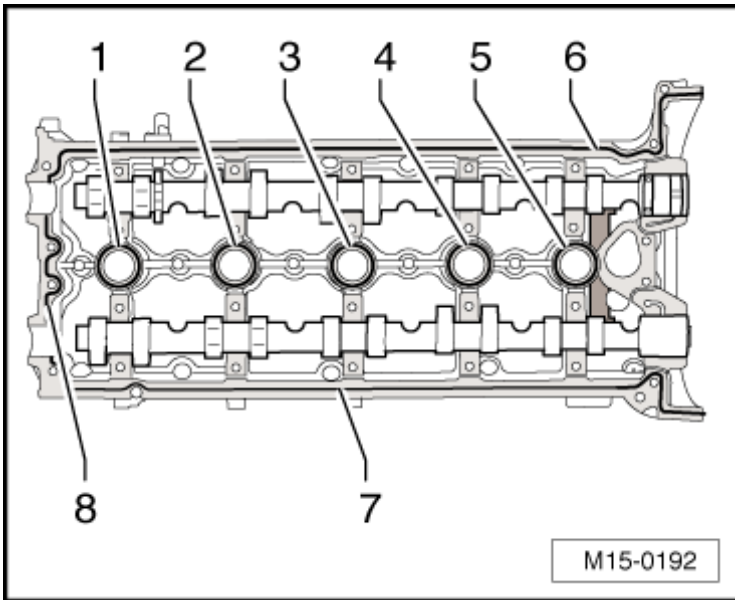


Fig. 19: Tightening Sequence For Compact Bracket To Cylinder Block
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Tightening sequence for compact bracket to cylinder block

Work sequence

- Position compact bracket on cylinder block (observe dowel sleeve between compact bracket and cylinder block).
- Tighten compact bracket as shown in following tightening sequence:

1. Tighten bolt A , 45 Nm
2. Tighten bolt B , 45 Nm
3. Tighten bolt C , 45 Nm
4. Tighten bolt D , 45 Nm
5. Tighten bolt E , 45 Nm
6. Tighten bolt F , 45 Nm

Part III

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

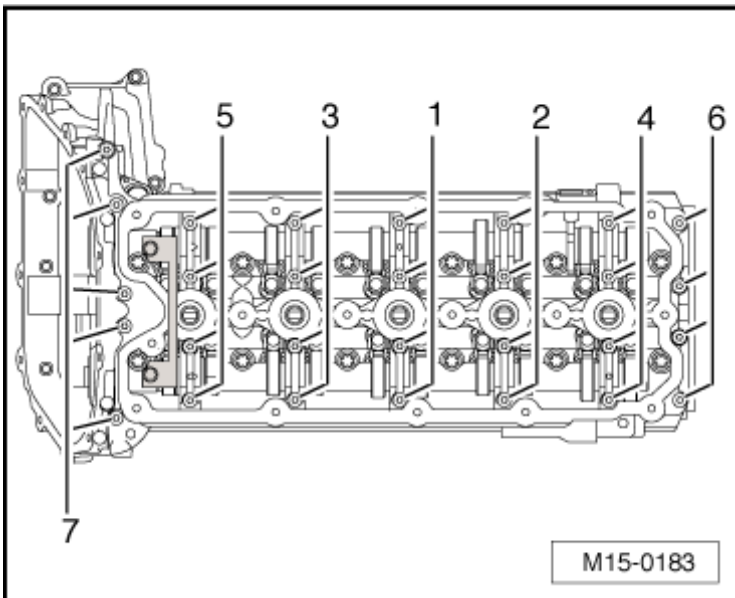


Fig. 20: Exploded View Of Engine Assembly - Part III
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - 45 Nm

2 - Trim

3 - Cylinder block

- Removing and installing sealing flange and flywheel. Refer to **Sealing flanges and flywheel/drive plate, removing and installing**
- Removing and installing crankshaft. Refer to **Crankshaft, removing and installing**
- Disassembling and assembling pistons and connecting rods. Refer to **Piston and connecting rod, disassembling and assembling**

4 - 10 Nm

5 - Bracket

- For vacuum reservoir

6 - Vacuum reservoir

7 - 15 Nm

8 - Seal

- Replace

9 - Oil filter bracket

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Disassembling and assembling

10 - 15 Nm plus an additional 14 turn (90 °)

- Replace
- First install upper left and lower right bolts, then tighten four bolts diagonally and alternately

11 - Engine speed (RPM) sensor -G28-

12 - Union

- For thermostat

13 - 15 Nm

14 - O-ring

- Replace

15 - Thermostat

- Removing and installing. Refer to **Thermostat, removing and installing**
- Observe installed position. Refer to **Thermostat, removing and installing**
- Checking: heat-up thermostat in water
- Opening begins: approx. 85 ° C
- Opening ends: approx. 105 ° C
- Opening lift: min. 7 mm

16 - 45 Nm

- Note tightening sequence, see **Tightening sequence for compact bracket to cylinder block**

17 - Compact bracket

- For Generator, power steering pump and air conditioning compressor

18 - Oil sump

- Clean sealing surface before installing
- Insert with *silicone sealant D 176 404 A2* . Refer to **Oil pan, removing and installing**

19 - 15 Nm

Poly V-belt, removing and installing

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

CAUTION: Observe safety notes.

Special tools, testers and auxiliary items required

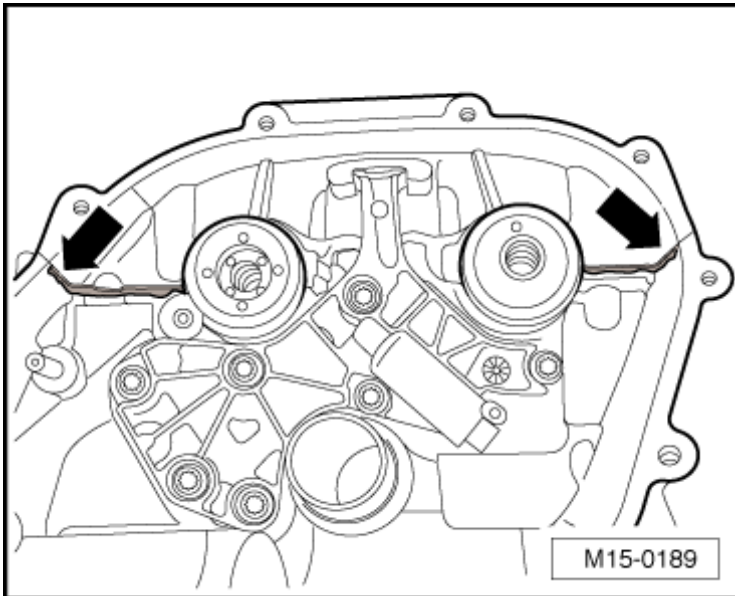


Fig. 21: Special Tool - T10060

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Pin T10060

Removing

- Remove right side sound insulation tray: Refer to **50 BODY, FRONT**
- Mark direction of rotation of poly V-belt.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

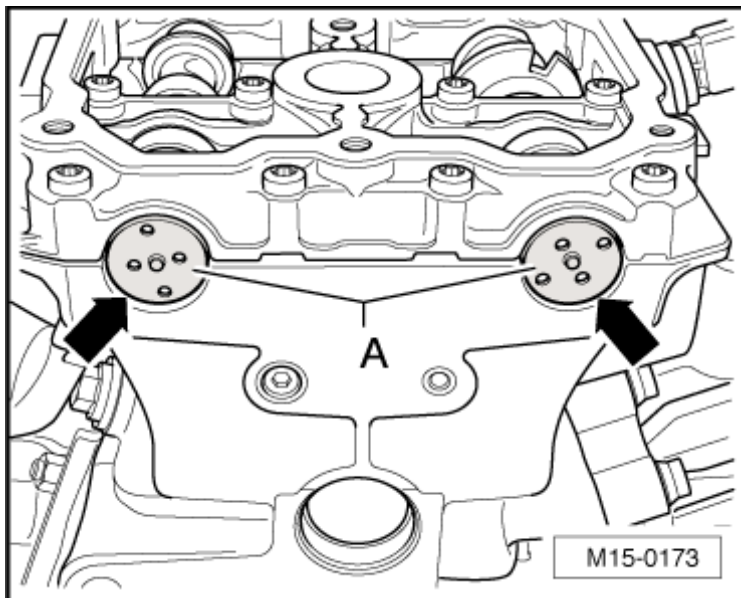


Fig. 22: Turning Tensioning Device In Direction Of Arrow
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Turn tensioning device in direction of arrow to relieve tension on poly V-belt.

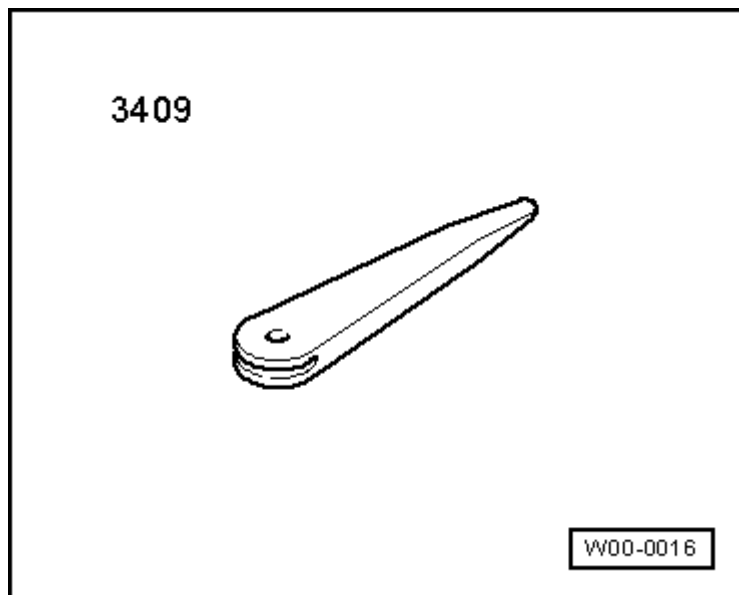


Fig. 23: Identifying Retaining Pin T10060
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Lock tensioning element with retaining pin T10060.
- Remove poly V-belt.

Installing

- Installation is performed in reverse order of removal.

2006 Volkswagen Golf GL

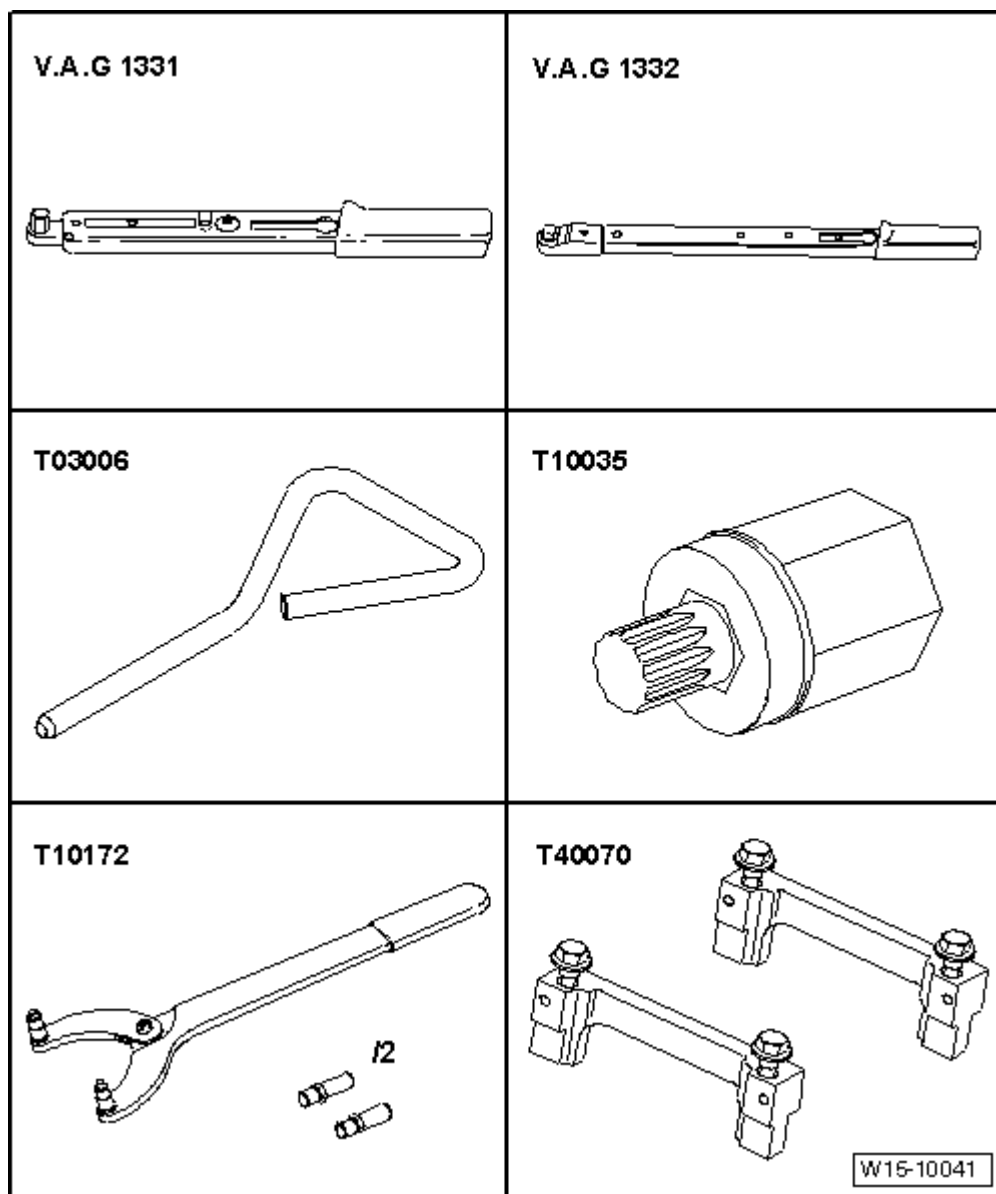
ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

NOTE:

- Before installing the poly V-belt, ensure that all ancillaries (Generator, air conditioning compressor, power steering pump) are secured tightly.
- When installing the poly V-belt, check the direction of belt rotation and for proper seating of the belt in the pulleys.
- For vehicles without air conditioning, put the poly V-belt over the Generator pulley last.
- For vehicles with air conditioning, put the poly V-belt over the air conditioning compressor pulley last.

After completing repairs always:

- Start engine and check belt running.



2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

Fig. 24: Identifying Belt Drive For Vehicles Without Air Conditioning
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Belt drive for vehicles without air conditioning

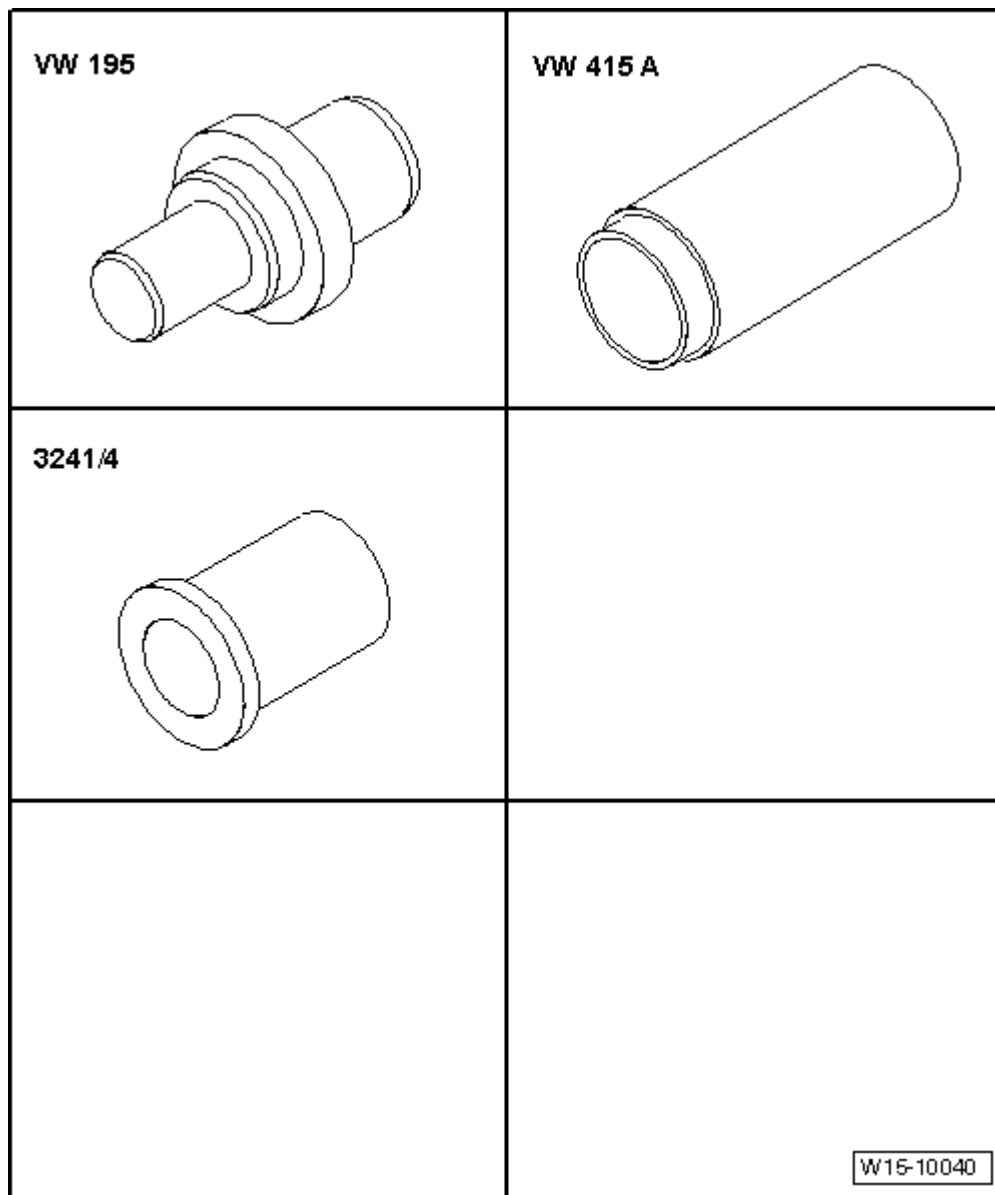


Fig. 25: Identifying Belt Drive For Vehicles With Air Conditioning
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Belt drive for vehicles with air conditioning

SEALING FLANGES AND FLYWHEEL/DRIVE PLATE, REMOVING AND INSTALLING

Sealing flanges and flywheel/drive plate, removing and installing

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

NOTE:

- Servicing the clutch: Refer to **30 CLUTCH**.

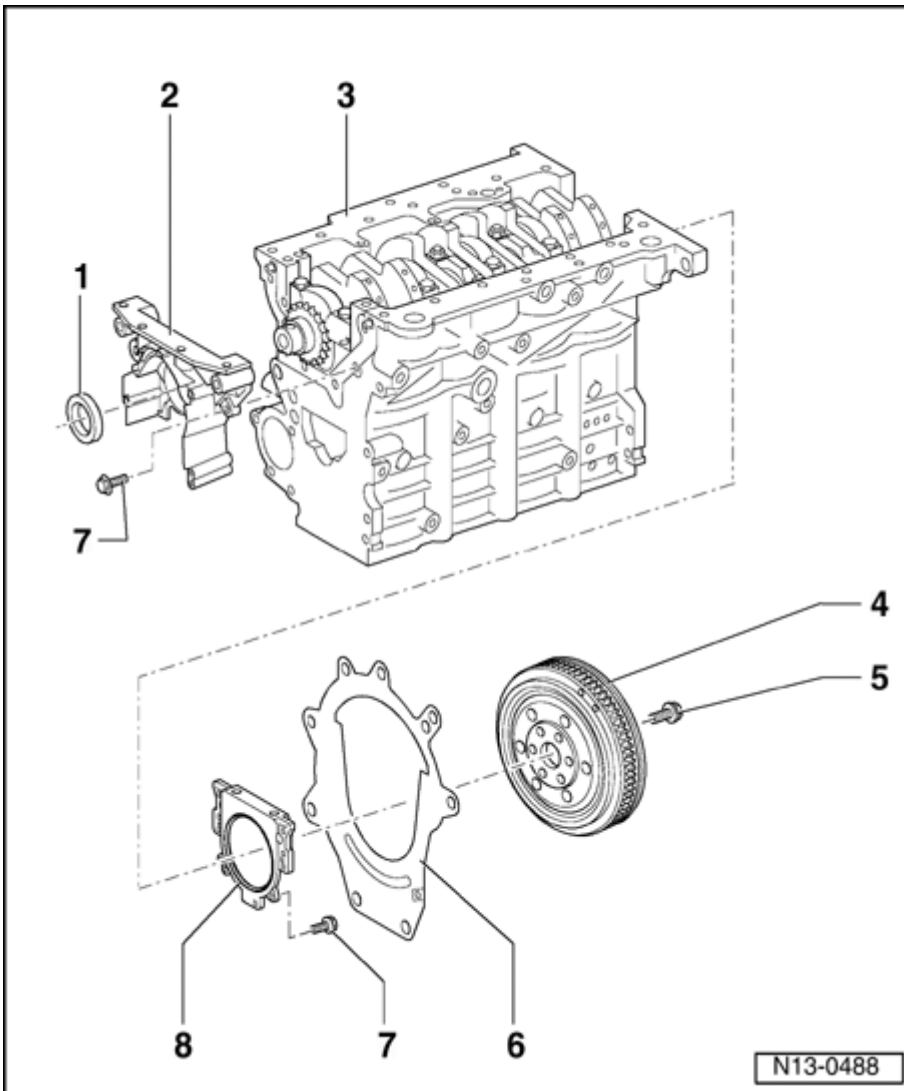


Fig. 26: Identifying Crankshaft Oil Seal

Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Seal

- Do not additionally oil or grease oil seal sealing lip
- Before installing, remove oil residue from crankshaft journal using a clean cloth.
- Replacing crankshaft oil seal - belt pulley end. Refer to **Crankshaft oil seal - belt pulley end, replacing**

2 - Sealing flange

- Must be located on dowel sleeves.
- Removing and installing. Refer to **Sealing flange - belt pulley end, removing and installing**

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Insert with *silicone sealant D 176 404 A2* . Refer to **Sealing flange - belt pulley end, removing and installing**

3 - Cylinder block

- Removing and installing crankshaft. Refer to **Crankshaft, removing and installing**
- Disassembling and assembling pistons and connecting rods. Refer to **Piston and connecting rod, disassembling and assembling**

4 - Flywheel/drive plate

- To remove and install flywheel counterhold with 3067
- Removing and installing drive plate. Refer to **Drive plate, removing and installing**

5 - 60 Nm plus an additional 14 turn (90 °)

- Replace

6 - Intermediate plate

- Must be located on dowel sleeves
- Do not damage/bend when assembling

7 - 15 Nm

8 - Sealing flange with oil seal

- Replace complete only
- Do not additionally oil or grease oil seal sealing lip
- Before installing, remove oil residue from crankshaft journal using a clean cloth
- Use protective sleeve supplied when installing
- Remove protective sleeve first after sliding sealing flange onto crankshaft journal

Crankshaft oil seal - belt pulley end, replacing

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

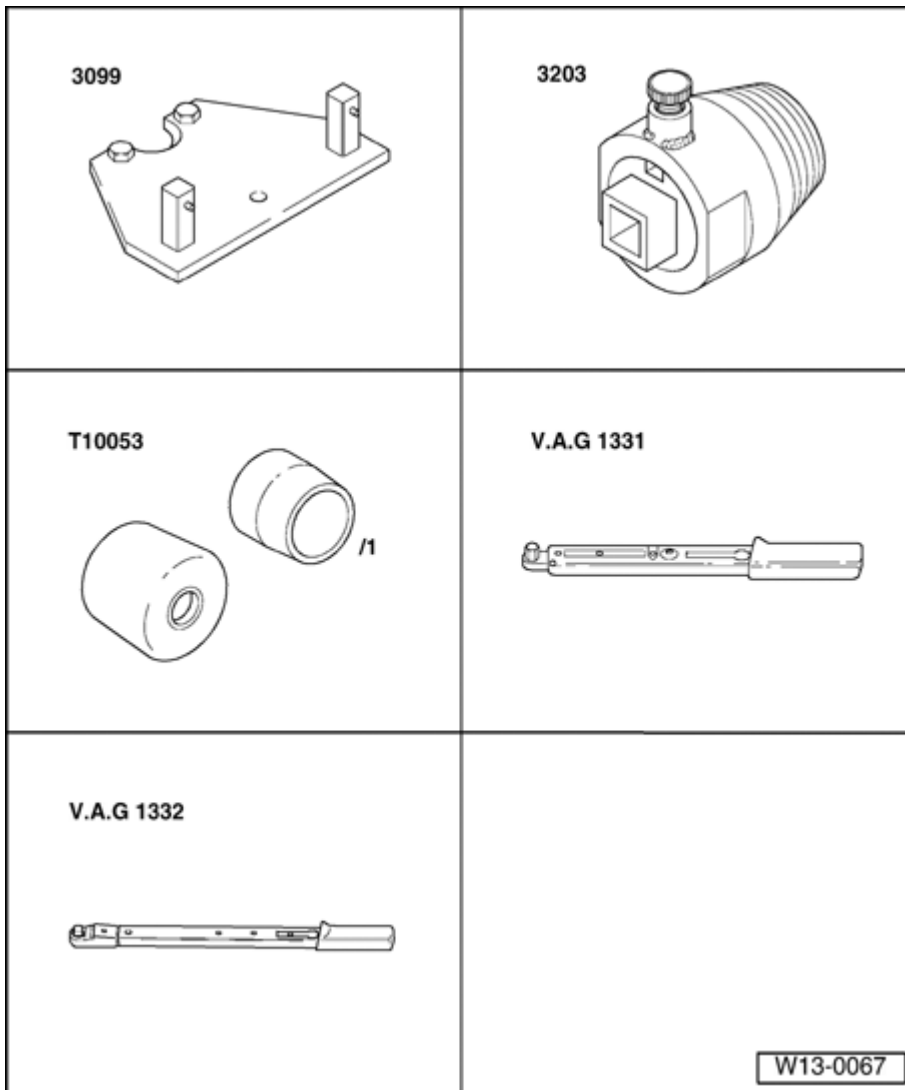


Fig. 27: Special Tools - Crankshaft Oil Seal - Belt Pulley End, Replacing
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools, testers and auxiliary items required

- Counterhold 3099
- Oil seal extractor 3203
- Assembly tool T10053
- Torque wrench (5...50 Nm) V.A.G 1331
- Torque wrench (40...200 Nm) V.A.G 1332

Removing

- Remove toothed belt. Refer to **Toothed belts, removing, installing and tensioning** .

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

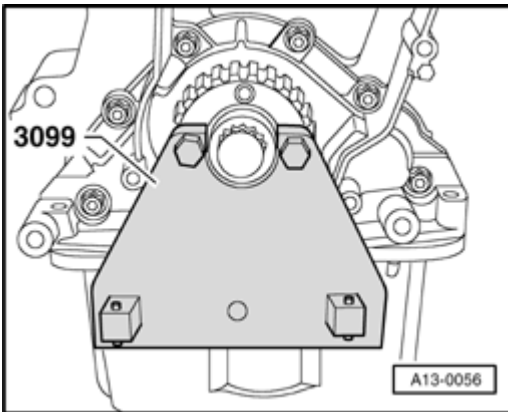


Fig. 28: Identifying Counterhold 3099

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove crankshaft toothed belt pulley by counterholding toothed belt pulley with counterhold 3099.

NOTE:

- **When bolting on the counterhold place two washers between the toothed belt pulley and the counterhold.**

- To guide seal extractor, screw center bolt into crankshaft onto stop by hand.
- Unscrew inner part of oil seal extractor 3203 two turns (approx. 3 mm) out of outer part and lock with knurled screw.

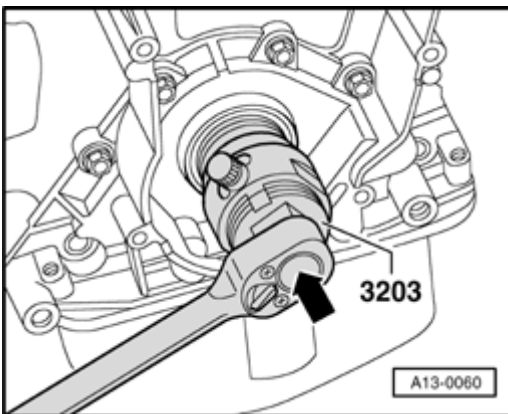


Fig. 29: Identifying Special Tool - 3203

Courtesy of VOLKSWAGEN UNITED STATES, INC.

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

Installing

NOTE:

- **The oil seal sealing lip must not be additionally oiled or greased.**

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Remove oil residue from crankshaft journal using clean cloth.

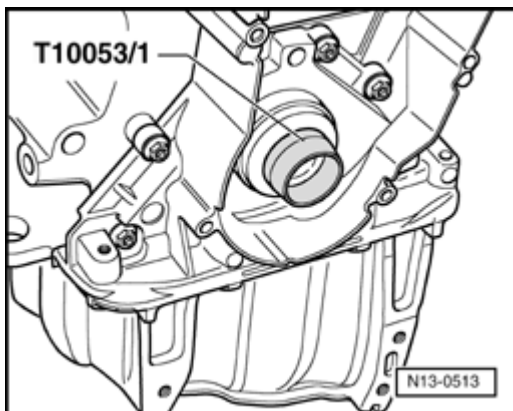


Fig. 30: Identifying Guide Sleeve T10053/1

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Mount guide sleeve T10053/1 onto crankshaft journal.
- Slide oil seal over guide sleeve onto crankshaft journal.

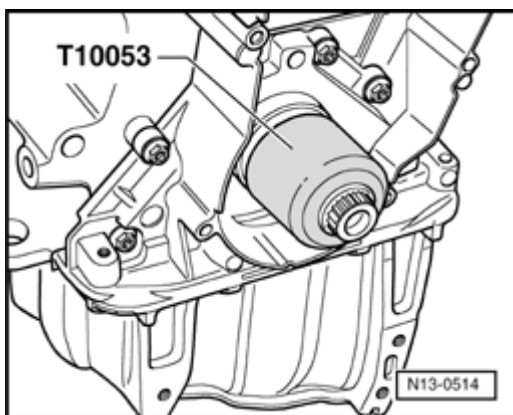


Fig. 31: Identifying Press Sleeve T10053

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Using press sleeve T10053, press oil seal onto stop with center bolt.
- Install toothed belt and tension. Refer to **Toothed belts, removing, installing and tensioning**.

Drive plate, removing and installing

Special tools, testers and auxiliary items required

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

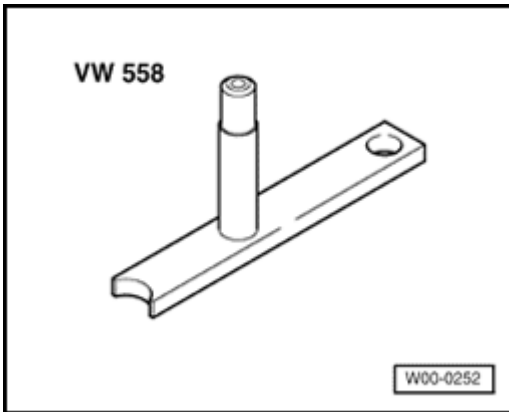


Fig. 32: Identifying Counterhold VW 558

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Counterhold VW 558
- Hex bolt M8x45 and two M10 hex nuts
- Depth gauge

Removing

- Secure counterhold VW 558 to drive plate with M8x45 hex bolt. Place two M10 hex nuts between counterhold tool and drive plate.

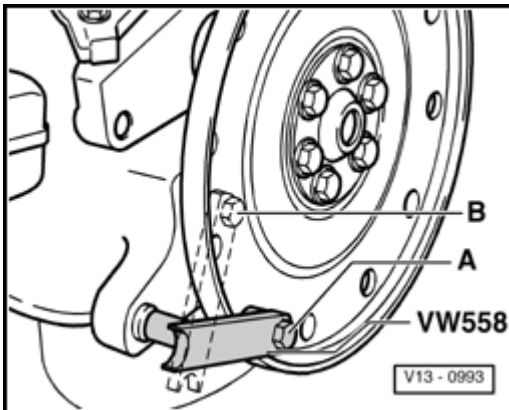


Fig. 33: Identifying Counterhold VW 558

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Installed position of counterhold: A - To loosen

- Loosen drive plate bolts.
- Remove counterhold tool, remove bolts and drive plate

Installing

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

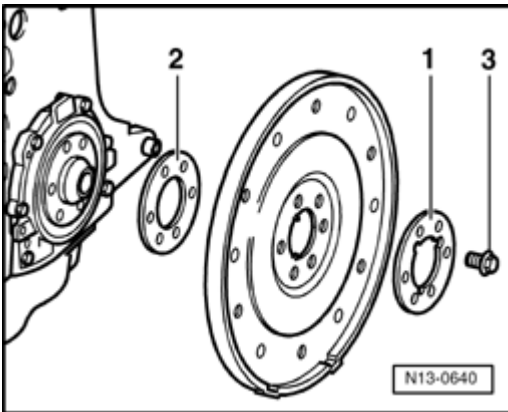


Fig. 34: Identifying Drive Plate And Packing Plate

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Position drive plate and packing plate - **1** - with recesses aligned. (Shim - **2** - added later).
- Secure counterhold VW 558 to drive plate with M8x45 hex bolt. Place two M10 hex nuts between counterhold tool and drive plate.

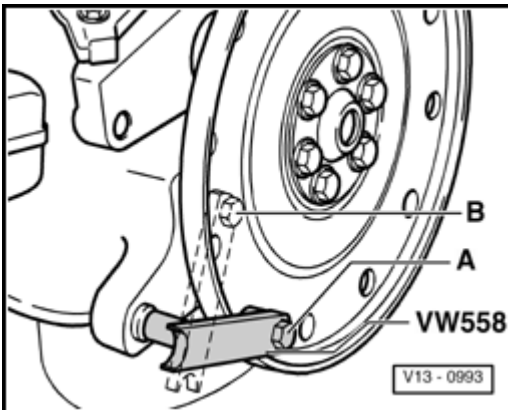


Fig. 35: Identifying Position Of Counterhold VW 558

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Installed position of counterhold: B - To tighten

- Install new bolts - **3** - and tighten to 30 Nm.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

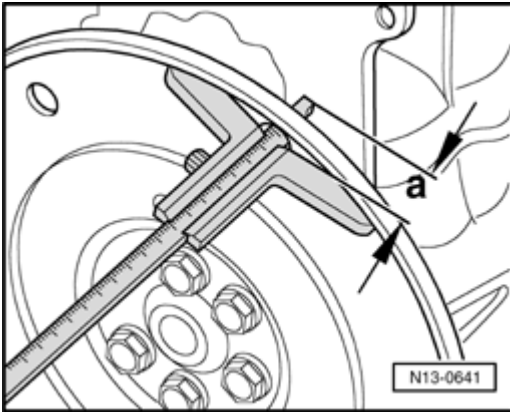


Fig. 36: Measuring Through Hole In Drive Plate To The Milled Surface Of The Cylinder Block
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Check dimension - **a** - at three points and calculate average. Specification: 19.5 to 21.1 mm

NOTE:

- Dimension - **a** - is measured through hole in drive plate to the milled surface of the cylinder block.

If specification is not attained:

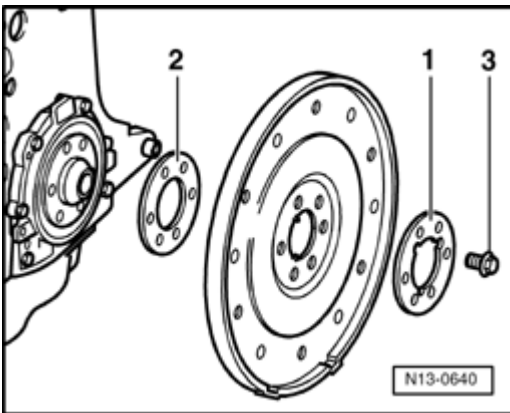


Fig. 37: Identifying Drive Plate And Appropriate Shims
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove drive plate again and install appropriate shim - **2** -. Retighten bolts - **3** - again to 30 Nm.
- Tighten bolts - **3** - to 60 Nm and turn 90 ° (14) further (turning further can be done in several stages).

Sealing flange - belt pulley end, removing and installing

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

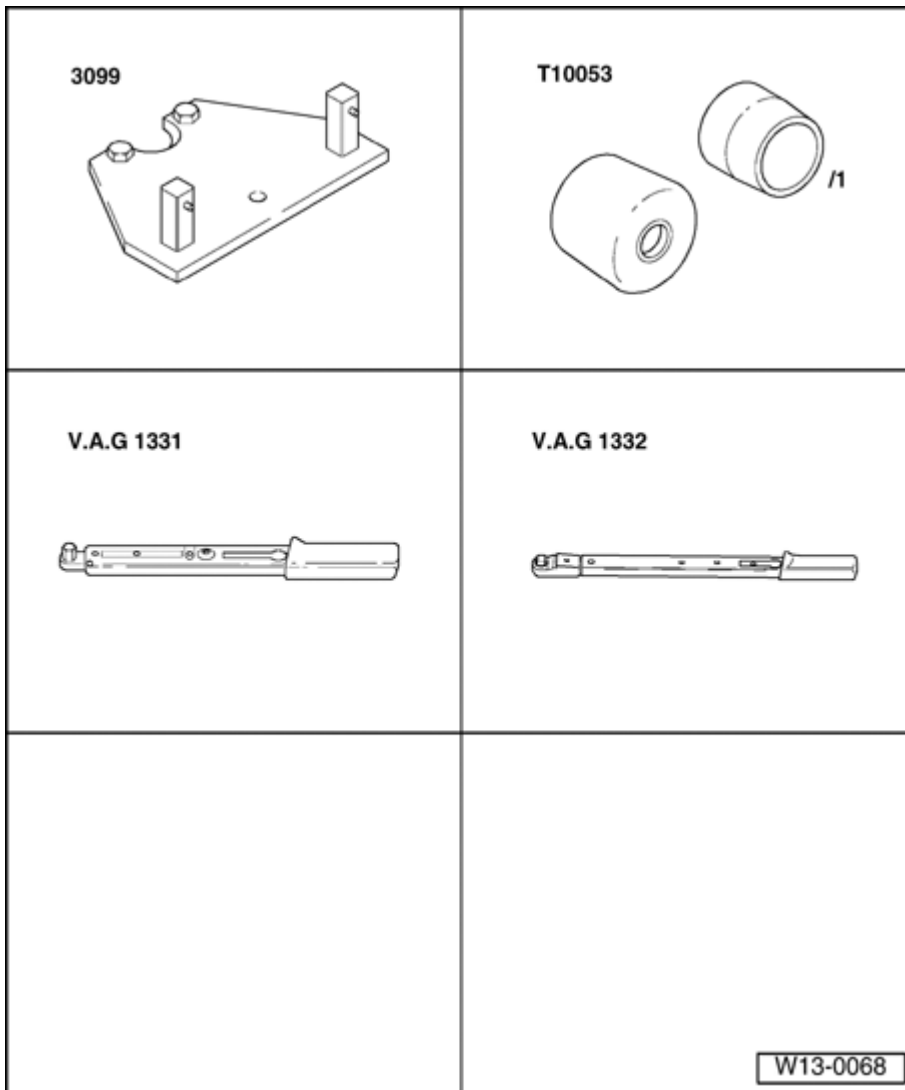


Fig. 38: Special Tools - Sealing Flange - Belt Pulley End, Removing And Installing
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools, testers and auxiliary items required

- Counterhold 3099
- Assembly tool T10053
- Torque wrench (5...50 Nm) V.A.G 1331
- Torque wrench (40...200 Nm) V.A.G 1332
- Drill motor with plastic brush
- *Silicone sealant D176404 A2*
- Flat scraper

Removing

- Remove toothed belt. Refer to **Toothed belts, removing, installing and tensioning** .

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

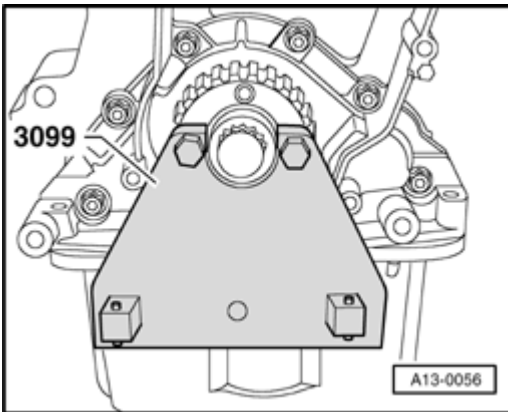


Fig. 39: Identifying Counterhold 3099

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove crankshaft toothed belt pulley by counterholding toothed belt pulley with counterhold 3099.

NOTE:

- When bolting on the counterhold place two washers between the toothed belt pulley and the counterhold.

- Drain engine oil.
- Remove oil pan. Refer to **Oil pan, removing and installing** .
- Unbolt front sealing flange.
- Remove sealing flange. Release flange using light blows with a rubber-headed hammer if necessary.
- Remove sealant residue on cylinder block with a flat scraper.

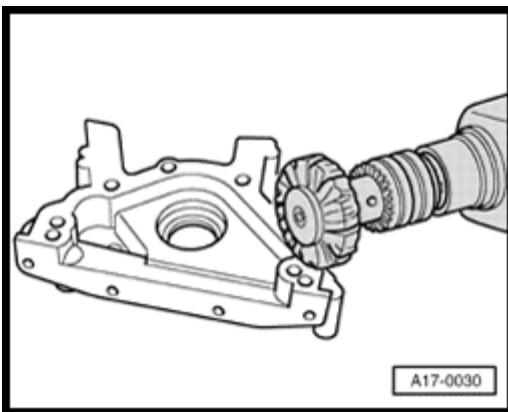


Fig. 40: Identifying Rotating Plastic Brush

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove sealant remains on sealing flange with a rotating plastic brush (wear eye protection).
- Clean sealing surfaces. They must be free of oil and grease.

Installing

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

NOTE:

- Observe the use by date of the sealing compound.
- The sealing flange must be installed within 5 minutes of applying the silicone sealant.

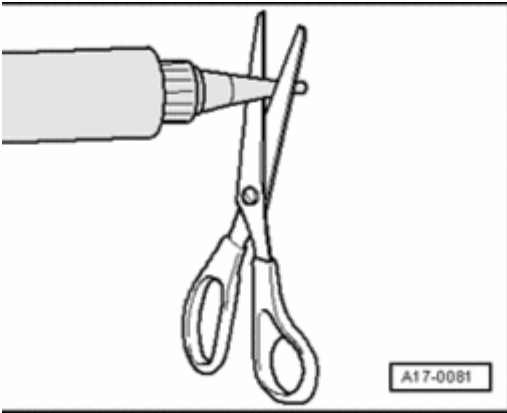


Fig. 41: Cutting Off Tube Nozzle

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Cut off tube nozzle at forward marking (nozzle diameter approx. 3 mm).

NOTE:

- The sealant bead must not be thicker than 2 to 3 mm, otherwise excess sealant can enter the oil pan and clog the strainer in the oil pump suction pipe, as well as drip onto the crankshaft oil seal.
- Before applying the sealant bead, cover the sealing surface of the oil seal with a clean rag.

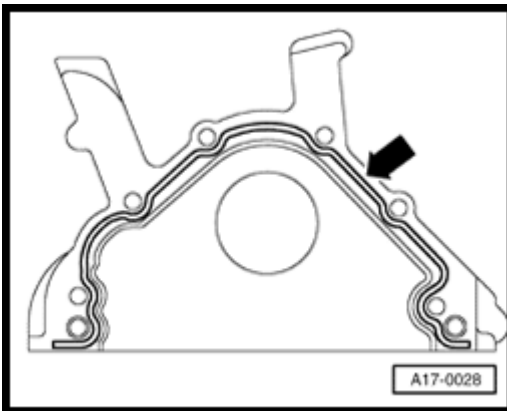


Fig. 42: Identifying Silicone Sealant Bead

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Apply silicone sealant bead as shown - **arrow** - to clean sealing surface of sealing flange.
- Install sealing flange immediately and lightly tighten all bolts.

NOTE:

- Use guide sleeve T10053/1 to install sealing flange with the oil seal already

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

installed.

- Tighten sealing flange securing bolts using diagonal and alternating sequence. Tightening torque: 15 Nm
- Install oil pan. Refer to **Oil pan, removing and installing**.

NOTE:

- Allow the sealing compound dry for approx. 30 minutes after installing the oil pan. Only then fill the engine with oil.

Installing toothed belt and adjusting valve timing. Refer to **Toothed belts, removing, installing and tensioning**.

CRANKSHAFT, REMOVING AND INSTALLING

Crankshaft, removing and installing

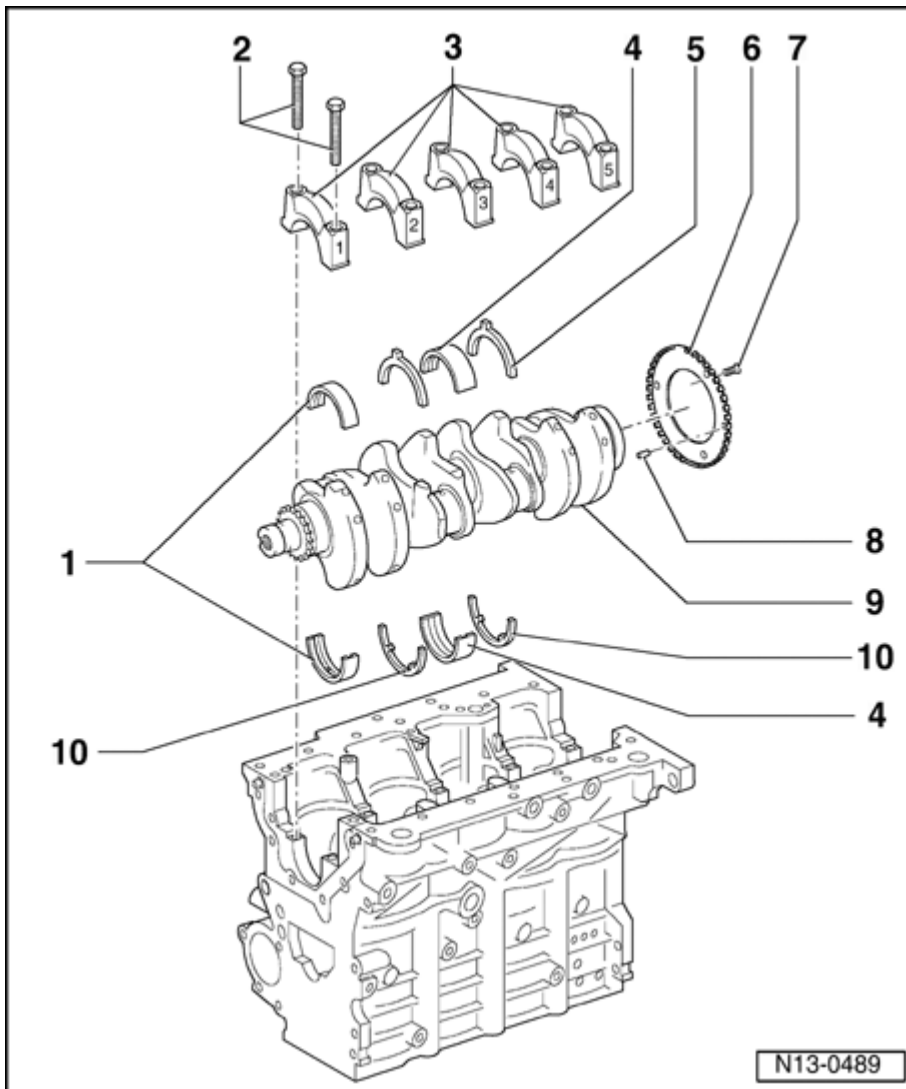


Fig. 43: Exploded View - Crankshaft

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Bearing shells 1, 2, 4 and 5

- For bearing cap without oil groove
- For cylinder block with oil groove
- Do not interchange used bearing shells (mark)

2 - 65 Nm plus an additional 14 turn (90 °)

- Replace
- To measure radial clearance, tighten to 65 Nm but not further

3 - Bearing cap

- Bearing cap 1: Belt pulley end
- Bearing cap 3 with recesses for thrust washers
- Bearing shell retaining lugs in cylinder block and bearing caps must align

4 - Bearing shell 3

- For bearing cap without oil groove.
- For cylinder block with oil groove.

5 - Thrust washer

- For bearing cap 3
- Note securing arrangement

6 - Sender wheel

- For Engine speed (RPM) sensor -G28-.
- Replace if damaged
- Always replace sender wheel if securing bolts have been loosened
- Removing and installing. Refer to **Removing and installing sender wheel**

7 - 10 Nm plus an additional 14 turn (90 °)

- Replace

8 - Dowel pin

- Checking projection from crankshaft. Refer to **Crankshaft, removing and installing**

9 - Crankshaft

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Axial clearance, new: 0.07 to 0.17 mm; wear limit: 0.37 mm
- Check radial clearance with Plastigage, new: 0.03 to 0.08 mm; wear limit: 0.17 mm
- Do not rotate crankshaft when checking radial clearance
- Crankshaft dimensions. Refer to **Crankshaft dimensions** .

10 - Thrust washer

- For cylinder block, bearing 3

Identifying Dowel Pin

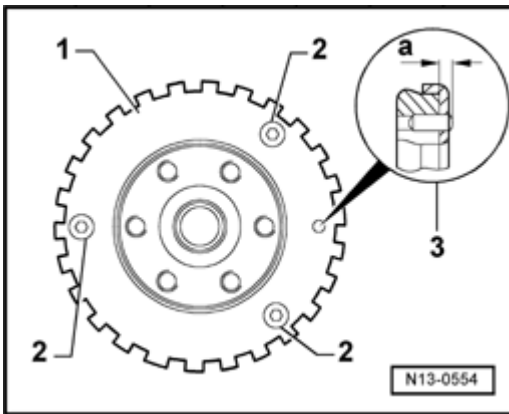


Fig. 44: Identifying Dowel Pin

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Checking dowel pin projection out of crankshaft

Special tools, testers and auxiliary items required

- Depth gauge

Work sequence

- Use depth gauge to check projection - **a** - of dowel pin with sender wheel - **1** - removed.
- Sender wheel
- Securing bolt
- Projection of dowel pin 3 out of crankshaft $a = \sim 2.5$ to 3.0 mm

Removing and installing sender wheel

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

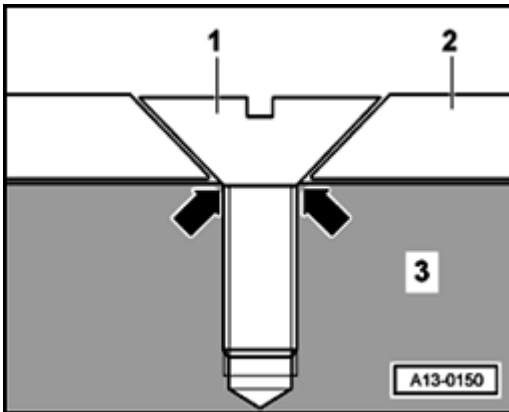


Fig. 45: Removing And Installing Sender Wheel

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Removing and installing sender wheel

- Replace sensor wheel - 2 - each time bolts - 1 - are loosened. Tightening torque: 10 Nm plus an additional 90 ° (14 turn)

NOTE:

- The second time the bolts are tightened, the contact point of the countersunk head, in the sender wheel, is deformed sufficiently to allow the bolt head to seat - arrows - on the crankshaft - 3 - , thus allowing the sender wheel to remain loose under the bolts.

Crankshaft dimensions

Honing dimension in mm	Crankshaft main journal diameter	Connecting rod journal diameter
Basic dimension	-0.022 54.00 -0.042	-0.022 47.80 -0.042
1st undersize	-0,022 53,75 -0,042	-0.022 47.55 -0.042
2nd undersize	-0,022 53,50 -0,042	-0.022 47.30 -0.042
3rd undersize	-0.022 53.25 -0.042	-0.022 47.05 -0.042

PISTON AND CONNECTING RODS, SERVICING

Pistons and connecting rods, disassembling and assembling

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

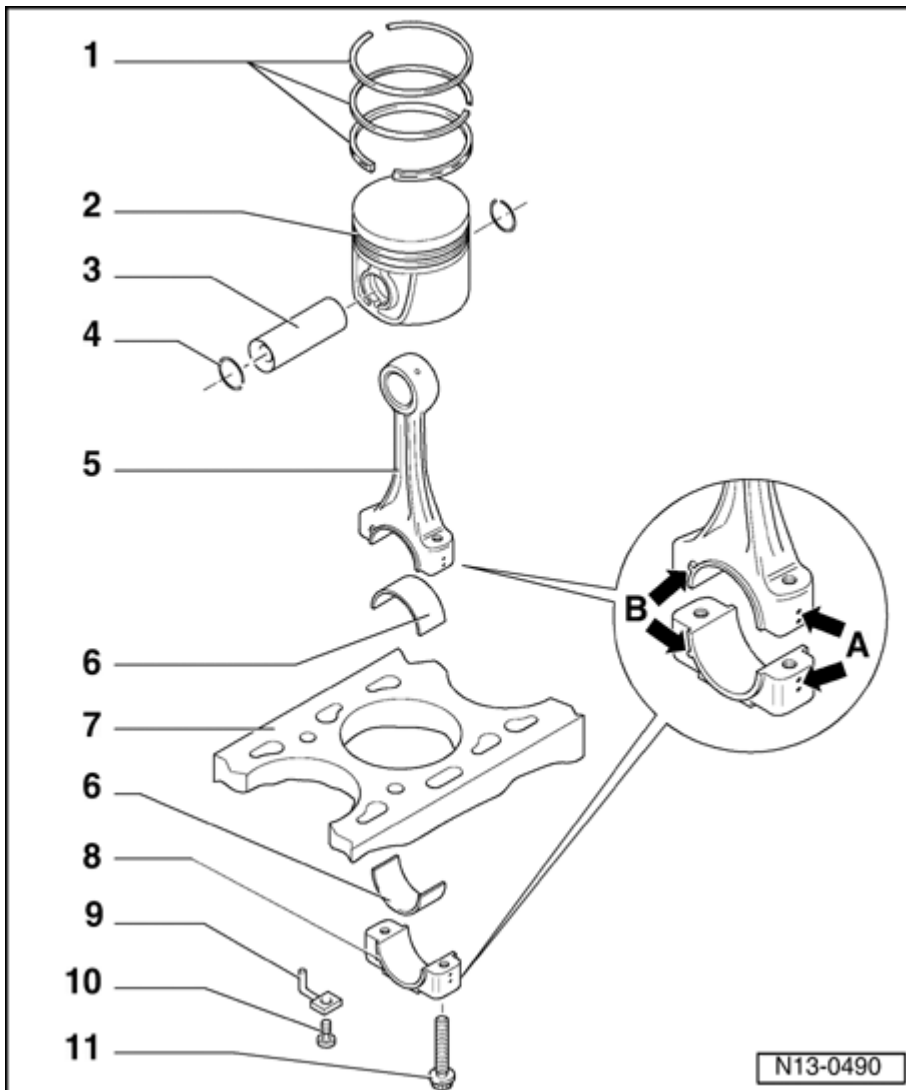


Fig. 46: Exploded View - Piston And Connecting Rod
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Piston rings

- Offset gaps by 120 °
- Remove and install using piston ring pliers
- "TOP" faces piston crown
- Checking ring gap
- Checking ring-to-groove clearance

2 - Piston

- With combustion chamber
- Mark with installed position and cylinder number

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Installed position and allocation of piston/cylinder
- Arrow on piston crown points to belt pulley end
- Install using piston ring clamp
- If cracks are observed on piston skirt, replace piston
- Checking piston projection at TDC. Refer to **Piston projection at TDC, checking**

3 - Piston pin

- If difficult to remove, heat piston to 60 ° C
- Remove and install with drift VW 222 a.

4 - Circlip

5 - Connecting rod

- Mark cylinder allocation - **A** - with colored felt tip pen
- Installed position: Marking - **B** - faces belt pulley end
- With industrially cracked bearing caps

6 - Bearing shell

- Note installed position
- Note version: Upper bearing shell (toward piston) made of a more wear resistant material; Identification: Black line on bearing surface in area of joint
- Do not interchange used bearing shells
- Insert bearing shells centrally
- Check for secure seating
- Axial clearance, wear limit: 0.37 mm
- Check radial clearance with Plastigage: Wear limit: 0.08 mm. Do not rotate crankshaft when checking radial clearance.

7 - Cylinder block

- Checking cylinder bores.
- Piston and cylinder dimensions. Refer to **Piston and cylinder dimensions** .

8 - Connecting rod bearing cap

- Note installed position
- Caps only fit in one position and only on appropriate connecting rod due to breaking procedure (cracking) separating cap from connecting rod

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

9 - Oil spray jet

- For piston cooling

10 - 25 Nm

- Insert without sealant

11 - Connecting rod bolt, 30 Nm plus an additional $\frac{1}{4}$ turn (90 °)

- Replace
- Oil threads and contact surface
- Use old bolts to measure radial clearance

Piston rings, checking

Checking ring gap

Special tools, testers and auxiliary items required

- Feeler gauges

Work sequence

- Push ring squarely from above down to approx. 15 mm from bottom end of cylinder.

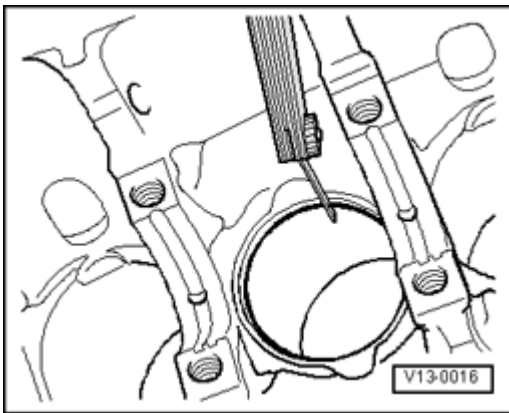


Fig. 47: Identifying Ring Gap Using Feeler Gauge
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Determine ring gap using feeler gauges.

Piston ring Dimensions in mm	new	Wear limit
1. compression ring	0.20 to 0.40	1.0
2. compression ring	0.20 to 0.40	1.0

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

Oil scraper ring	0.25 to 0.50	1.0
------------------	--------------	-----

Checking ring-to-groove clearance

Special tools, testers and auxiliary items required

- Feeler gauges

Work sequence

- Clean ring groove before checking.

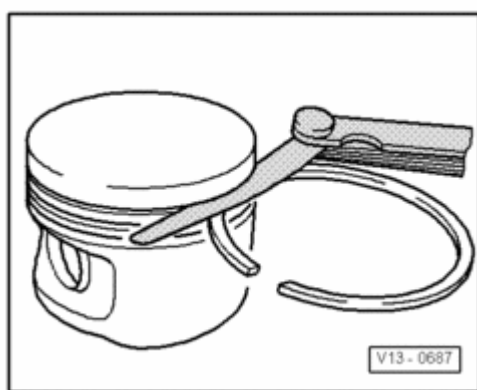


Fig. 48: Identifying Ring Gap Using Feeler Gauge
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Determine ring gap using feeler gauges.

Piston ring Dimensions in mm	new	Wear limit
1. Compression ring	0.06 to 0.09	0.25
2. Compression ring	0.05 to 0.08	0.25
Oil scraper ring	0.03 to 0.06	0.15

Checking cylinder bores

Special tools, testers and auxiliary items required

- Internal dial gauge 50 to 100 mm

Work sequence

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

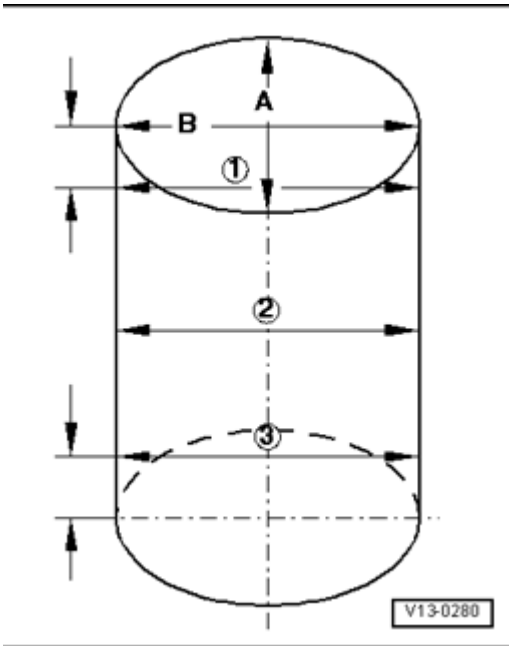


Fig. 49: Identifying Measurements

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Take measurements at 3 positions in both lateral - **A** - and longitudinal - **B** - directions, as illustrated.

Difference between actual and nominal diameter: not more than 0.10 mm.

NOTE:

- **Measuring the cylinder bores must not be done when the cylinder block is mounted on a repair stand with engine bracket VW 540 as the resulting measurements would likely be incorrect.**

Piston installation position and piston/cylinder allocation

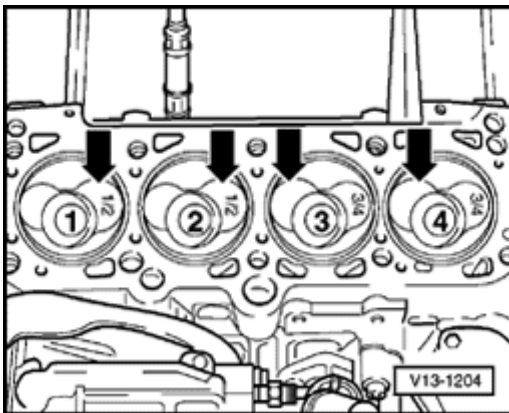


Fig. 50: Identifying Valve Position

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Piston in cylinders 1 and 2:

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

Larger intake valve chamber toward flywheel end - **arrows** -.

Piston in cylinders 3 and 4:

Larger intake valve chamber toward belt pulley end - **arrows** -.

NOTE:

- New piston allocation to cylinders is shown by a colored marking on piston crown.
- Piston for cylinders 1 and 2: marked 1/2.
- Piston for cylinders 3 and 4: marked 3/4.

Piston projection at TDC, checking

Special tools, testers and auxiliary items required

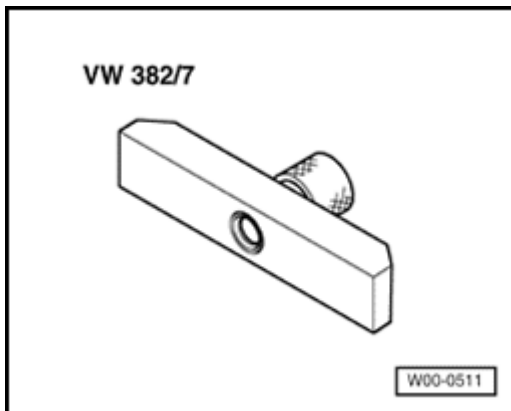


Fig. 51: Special Tool - VW 382/7

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Measuring bridge VW 382/7

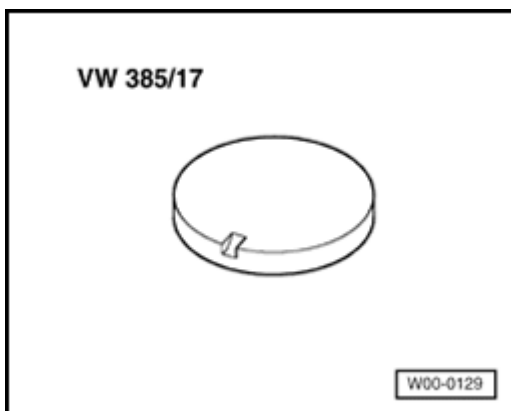


Fig. 52: Special Tool - VW 385/17

Courtesy of VOLKSWAGEN UNITED STATES, INC.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Adjustment plate VW 385/17
- Dial gauge

Work sequence

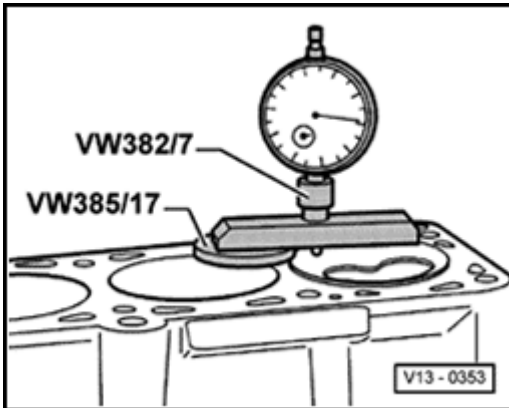


Fig. 53: Measuring Piston Projection At TDC
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Piston projection of all pistons at TDC must be measured when installing new pistons or a short engine. Depending upon piston projection, install the corresponding cylinder head gasket according to the following table:

NOTE: • Turn engine clockwise to measure piston projection at TDC.

Piston projection	Gasket Identification Holes/notches
0.91 mm to 1.00 mm	1
1.01 mm to 1.10 mm	2
1.11 mm to 1.20 mm	3

Cylinder head gasket identification

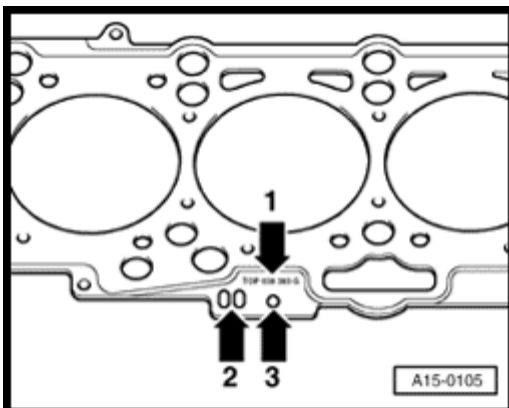


Fig. 54: Identifying Cylinder Head Gasket
Courtesy of VOLKSWAGEN UNITED STATES, INC.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Part No. = - **arrow 1** -
- Production control code = - **arrow 2** - (can be disregarded)
- Holes = - **arrow 3** -

NOTE:

- If different values are measured during the projection measurement, use the largest dimension for determining the gasket.

Piston and cylinder dimensions

Honing dimension		Piston diameter	Cylinder bore diameter
Basic dimension	mm	79.47	79.51
1st oversize	mm	79.72	79.76
2nd oversize	mm	79.97	80.01

15 - ENGINE - CYLINDER HEAD, VALVETRAIN

CYLINDER HEAD, SERVICING

Cylinder head, servicing

NOTE:

- When installing an exchange cylinder head with an installed camshaft, the contact surfaces between the bucket tappets and the cam must be oiled before installing the cylinder head cover.
- The plastic packing pieces for protecting the open valves must not be removed until immediately before installing the cylinder head.
- If the cylinder head is replaced, all the coolant in the system must also be replaced.

Checking compression. Refer to Compression, checking .

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

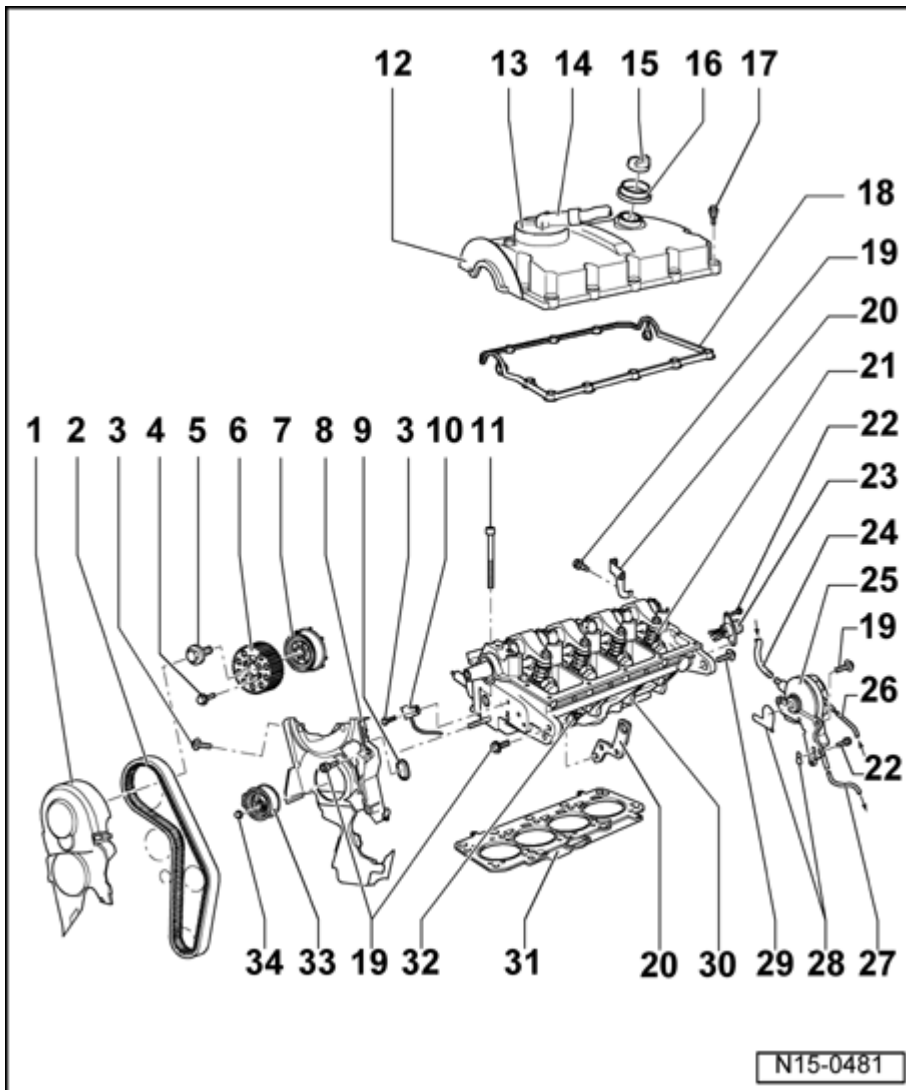


Fig. 55: Exploded View - Cylinder Head

Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Toothed belt guard - upper part

2 - Toothed belt

- Mark direction of rotation before removing
- Check for wear
- Do not kink
- Removing, installing and tensioning. Refer to **Toothed belts, removing, installing and tensioning**

3 - 10 Nm

- Replace

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

4 - 25 Nm

5 - 100 Nm

6 - Camshaft pulley

7 - Hub

- With sender wheel
- Use counterhold T10051 to loosen and tighten
- To remove, use puller T10052
- Removing and installing. Refer to **Camshaft, removing and installing**

8 - Rear toothed belt guard

9 - Sealing grommet

- Replace if damaged

10 - Camshaft Position (CMP) sensor -G40-

11 - Cylinder head bolt

- Note sequence when loosening and tightening. Refer to **Cylinder head, removing and installing**

12 - Cylinder head cover

- Before installing, thoroughly clean sealing surface of cylinder head with a clean cloth

13 - Pressure regulating valve

- For crankcase breather

14 - To exhaust turbocharger

15 - Sealing cap

- Replace seal if damaged

16 - Boot

- Replace if damaged

17 - 10 Nm

- Observe tightening sequence. Refer to **Cylinder head cover, removing and installing** , Removing and

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

installing cylinder head

18 - Cylinder head cover gasket

- Replace if damaged.
- Before installing, seal transition points with "AMV 174 004 01". Refer to **Cylinder head cover, removing and installing** , Removing and installing cylinder head cover

19 - 20 Nm

20 - Lifting eye

21 - Unit injector

- Removing and installing. Refer to **Unit injector, removing and installing**

22 - 10 Nm

23 - Central connector

- For unit injector

24 - From brake servo

25 - Tandem pump

- For fuel and vacuum supply
- Checking, refer to **Tandem pump, checking**
- Removing and installing. Refer to **Tandem pump, removing and installing**

26 - Supply hose

- White or with white marking
- Check for secure seating
- Secure with spring-type clips

27 - Return hose

- Blue or with blue marking
- Check for secure seating
- Secure with spring-type clips

28 - Seal

- Replace

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

29 - Bolt

30 - Cylinder head

- Removing and installing. Refer to **Cylinder head, removing and installing**
- After replacing, replace entire amount of coolant

31 - Cylinder head gasket

- Replace
- Note marking
- After replacing, replace entire amount of coolant

32 - Glow plug

- 15 Nm
- Checking, refer to **Glow plugs, checking**

33 - Tensioning roller

34 - 20 Nm plus an additional 18 turn (45 °)

Cylinder head cover, removing and installing

Special tools, testers and auxiliary items required

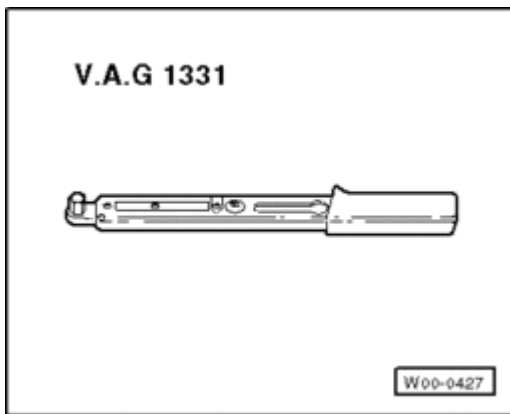


Fig. 56: Special Tool - Torque Wrench V.A.G 1331
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Torque wrench (5 to 50 Nm) V.A.G 1331
- *Sealant AMV 174 004 01*

Removing

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

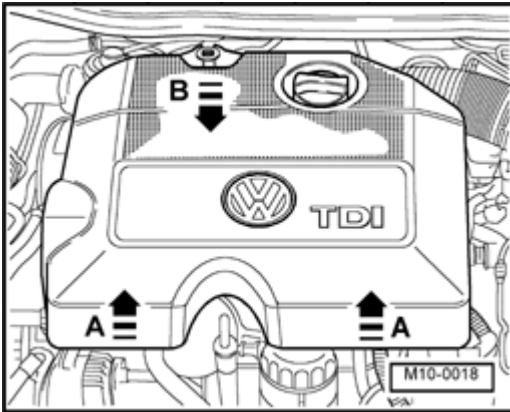


Fig. 57: Identifying Engine Cover

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove engine cover by pulling forward edge of engine cover abruptly upward - **arrow A** - and pulling forward out of rear securing clips - **arrow B** -.
- Remove EGR valve.
- Remove toothed belt guard - upper part.
- Disconnect crankcase breather hose at union of charge air pipe at rear.
- Remove cylinder head cover.

Installing

NOTE: • **Replace cylinder head cover gasket and seal for bolts if damaged.**

Installation is performed in reverse order of removal. Note the following:

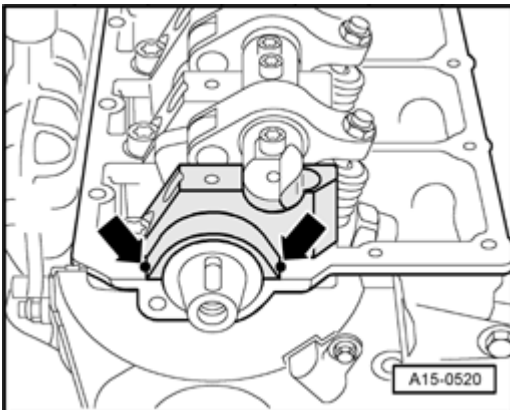


Fig. 58: Identifying Drop Of Sealant On Both Side Edges Of Front Bearing Cap/Cylinder Head Sealing Surfaces

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Apply a drop of *sealant AMV 174 004 01* (approx. 5 mm diameter) - **arrows** - to both side edges of front bearing cap/cylinder head sealing surfaces.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

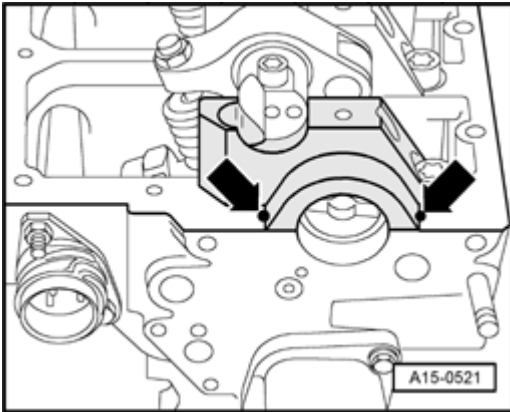


Fig. 59: Identifying Drop Of Sealant To Both Side Edges Of Rear Bearing Cap/Cylinder Head Sealing Surfaces

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Apply a drop of sealant AMV 174 004 01 (approx. 5 mm diameter) - **arrows** - to both side edges of rear bearing cap/cylinder head sealing surfaces.

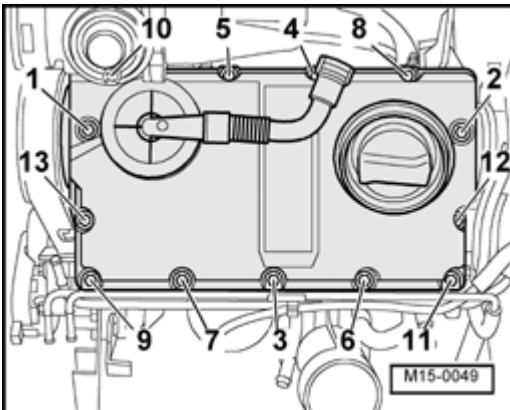


Fig. 60: Identifying Cylinder Head Cover Tightening Sequence
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Tighten cylinder head cover hand tight in sequence -1 to 13-.
- Tighten bolts to 10 Nm in sequence -1 to 13-.

Toothed belts, removing, installing and tensioning

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

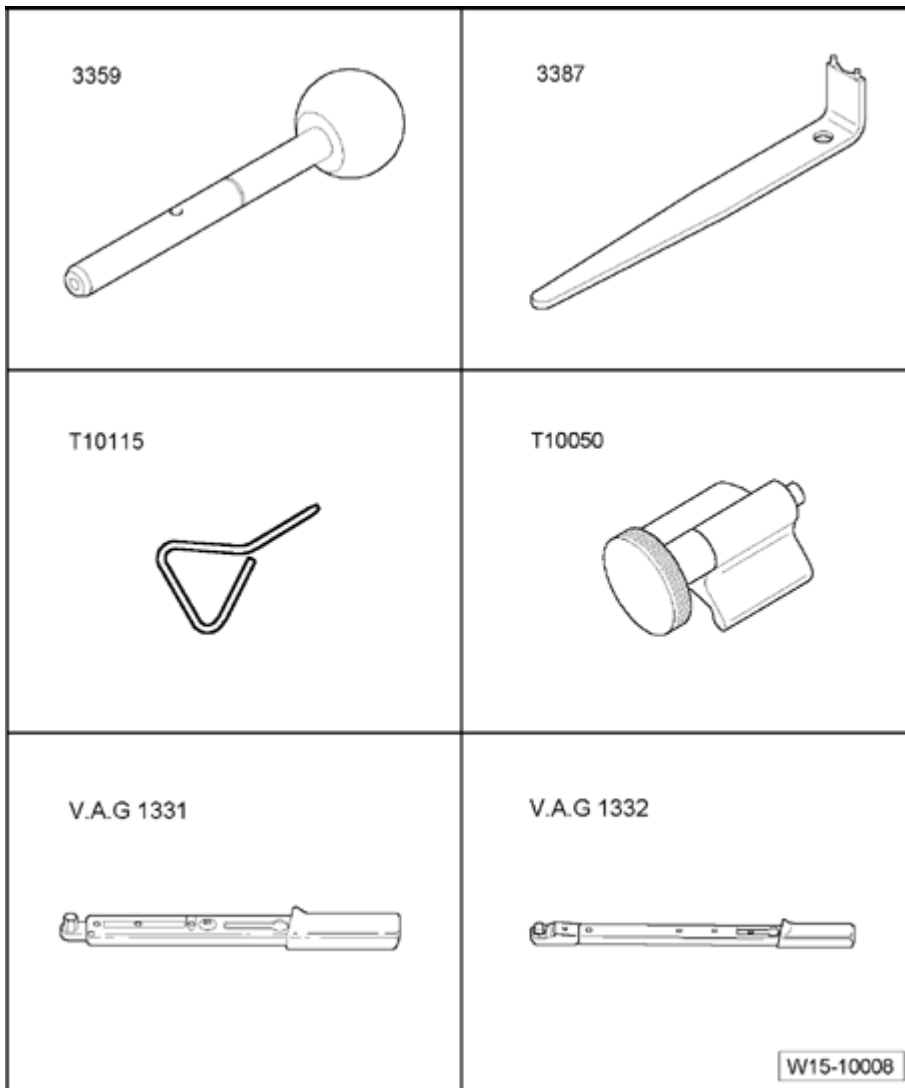


Fig. 61: Special Tools - Toothed Belts, Removing, Installing And Tensioning
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools, testers and auxiliary items required

- Locking pin 3359
- Pin wrench 3387
- Locking pin T10115
- Crankshaft stop T10050
- Torque wrench (5...50 Nm) V.A.G 1331
- Torque wrench (40...200 Nm) V.A.G 1332

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

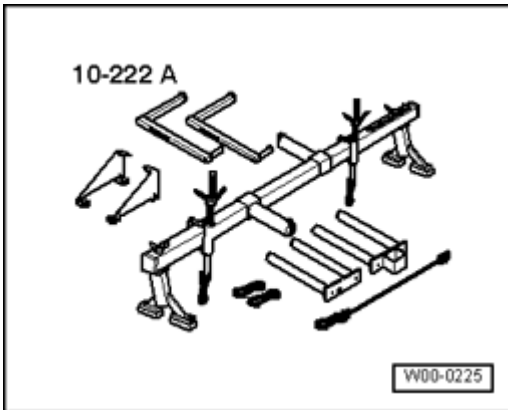


Fig. 62: Identifying Support Assembly 10-222 A With Legs 10-222 A/1
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Support device 10-222A with legs 10-222A/1

Removing

NOTE:

- Perform adjustment work on toothed belts on cold engines only.

- Remove poly V-belt. Refer to **Poly V-belt, removing and installing** .
- Remove tensioning element for poly V-belt.
- Remove right headlight: Refer to **94 LIGHTS, SWITCHES - EXTERIOR** .
- Remove charge air pipe between charge air cooler and exhaust turbocharger. Refer to **Charge air cooling components, removing and installing** .
- Remove coolant expansion tank (coolant hoses remain connected).
- Unbolt power steering reservoir and fuel filter and set aside (hoses remain connected).
- Disconnect fuel lines from cylinder head cover.

CAUTION:

- The fuel and the fuel lines in the fuel system can become very hot (danger of scalding)!
- The fuel system is also under pressure! Before opening the system, place cloths around the connections. Then carefully loosen the connection to release the pressure!
- Wear eye and hand protection when performing any type of repair work on the fuel system!

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

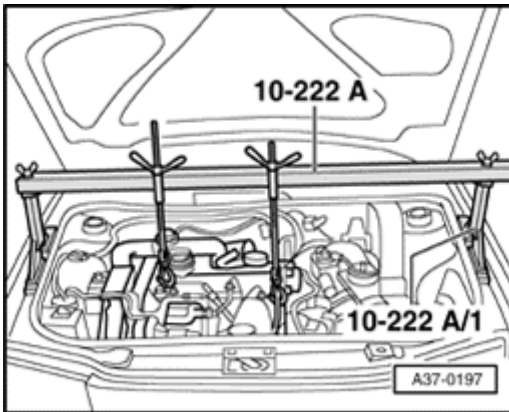


Fig. 63: Identifying Support Bracket 10-222A

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Mount engine support bracket 10-222A and take up weight of engine in its installed position.

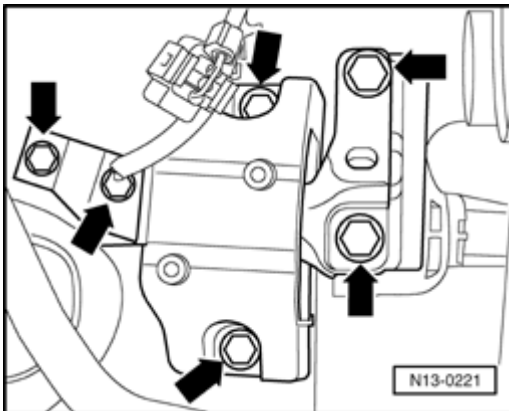


Fig. 64: Identifying Securing Bolts

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove securing bolts from assembly mounting/engine mounting, assembly mounting/body and assembly mounting/body mounting - **arrows** - and remove assembly mounting complete.

NOTE:

- The assembly mounting may only be removed, if the engine is supported with support device 10-222A !
- The engine mounting may only be loosened if the assembly mounting has been removed.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

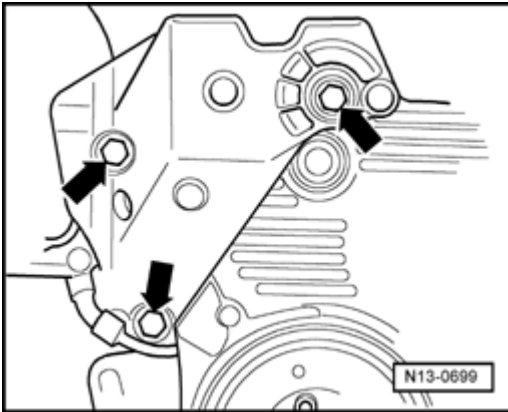


Fig. 65: Identifying Engine Mounting Bolts

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Unbolt engine mounting on cylinder block - **arrows** - and remove.

NOTE:

- When loosening both upper engine mounting bolts the engine must be raised slightly with the support device.
- When loosening the lower engine mounting bolt the engine must be lowered slightly with the support device.

- Remove vibration damper/belt pulley.
- Remove center and lower toothed belt guard.
- Turn crankshaft to TDC No. 1 cylinder.

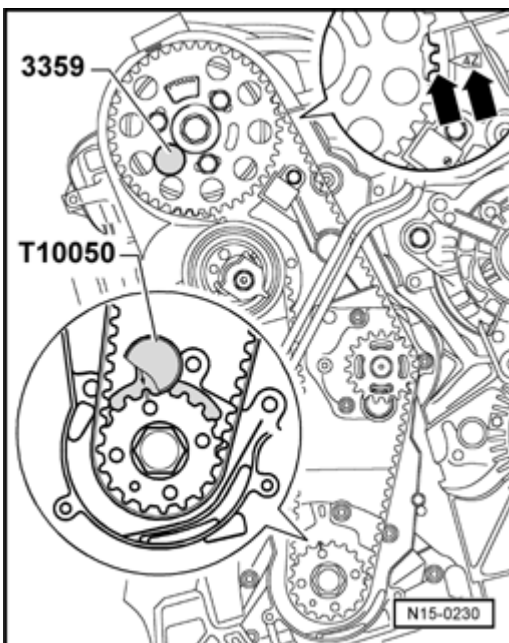


Fig. 66: Identifying Locking Pin 3359 And Crankshaft Stop T10050

Courtesy of VOLKSWAGEN UNITED STATES, INC.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

NOTE:

- Turn the crankshaft so far that the marking on the crankshaft sprocket is at the top and the arrow on the rear toothed belt guard aligns with the lugs on the sender wheel of the hub - arrows -.

- Lock hub with locking pin 3359. To do this, slide locking pin through free elongated hole on left side of cylinder head.
- Lock crankshaft pulley with crankshaft stop T10050. To do this, push crankshaft stop from face side of toothed belt pulley into pulley teeth.

NOTE:

- The marks on the crankshaft pulley and the crankshaft stop must align. At the same time, the pin of the crankshaft stop must engage in the hole in the sealing flange.

- Mark direction of rotation of toothed belt.
- Loosen tensioning roller securing nut.

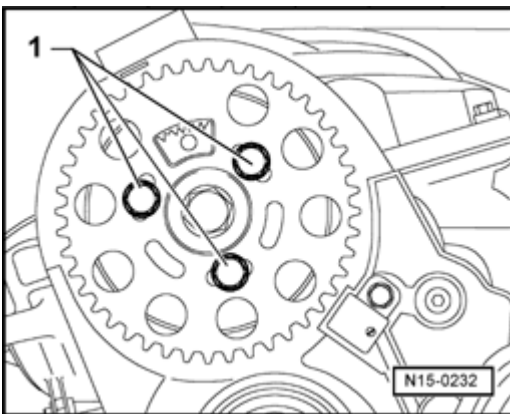


Fig. 67: Identifying Camshaft Pulley Securing Bolts
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Loosen camshaft pulley securing bolts - 1 - until camshaft pulley can be moved within elongated holes.

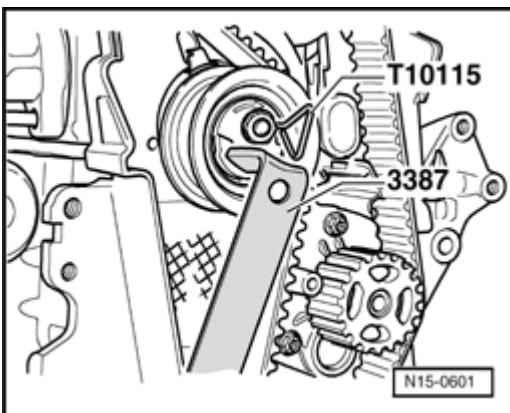


Fig. 68: Identifying Pin Wrench 3387 And Locking Pin T10115
Courtesy of VOLKSWAGEN UNITED STATES, INC.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Turn pin wrench 3387 counter-clockwise (opposite direction of arrow on tensioner) until toothed belt tensioner can be locked in position using locking pin T10115.
- Turn pin wrench clockwise (in direction of - **arrow** - on tensioner) until stop and tighten securing nut hand-tight.
- Remove toothed belt first from coolant pump and then from remaining pulleys.

Installing

NOTE:

- **Adjustment work on toothed belts must only be performed on cold engines as the indicator on the tensioning element alters depending on the engine temperature.**
- **The tensioning roller must be locked with locking pin T10115 and secured to the right limit stop.**

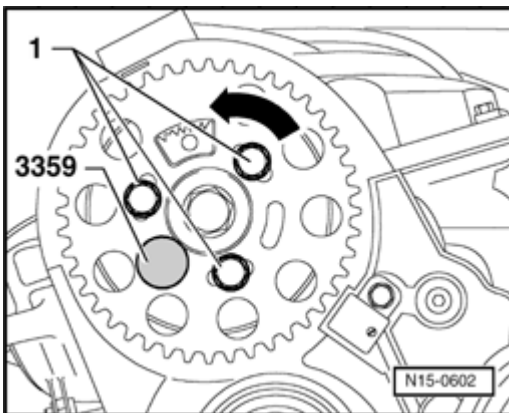


Fig. 69: Turning Camshaft Pulley

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Turn camshaft pulley in elongated holes counter-clockwise - **in direction of arrow** - onto limit stop.
- Install toothed belt to crankshaft pulley, belt tensioner and camshaft pulley.
- Install toothed belt onto coolant pump toothed belt pulley.

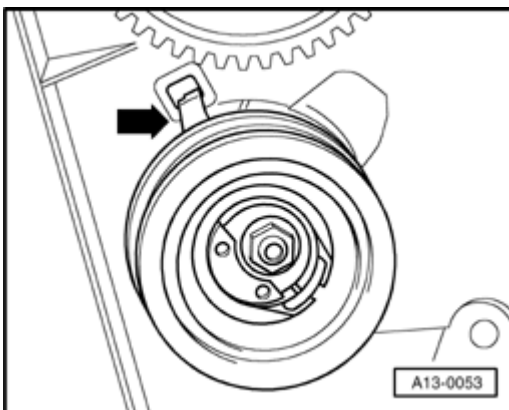


Fig. 70: Identifying Tensioning Roller

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

NOTE:

- **Ensure that tensioning roller seats correctly in rear toothed belt guard - arrow -.**

- Loosen tensioning roller securing nut.
- Relieve tension on tensioning roller by turning pin wrench in opposite direction of - **arrow** - and remove locking pin from tensioning roller.

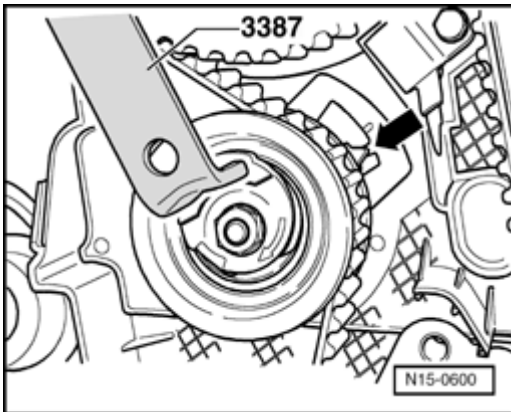


Fig. 71: Identifying Pin Wrench 3387

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Carefully turn tensioning roller with pin wrench 3387 in direction of arrow until indicator is in middle of gap in base plate - **arrow** -.
- Hold tensioning roller in this position and tighten tensioning roller securing nut as follows: 20 Nm and 45 ° (18 turn) further.
- Tighten camshaft pulley securing bolts to 25 Nm.
- Remove locking pin 3359 and crankshaft stop T10050.
- Turn crankshaft two rotations in direction of engine rotation and set again to TDC No. 1 cylinder.

NOTE:

- **As this is done, the shaft of the crankshaft stop must be able to engage in the sealing flange from direction of engine rotation.**
- **If the crankshaft is turned past TDC No. 1 Cyl. and the crankshaft stop could not engage in the sealing flange, turn the crankshaft back 14 turn to be able to turn the crankshaft in the direction of engine rotation again to set it to TDC No. 1 cyl. It is not permitted to turn the engine opposite to the normal direction of rotation when turning to ensure the crankshaft stop will engage.**

- Once crankshaft stop T10050 has engaged, check whether hub can be fixed in place using locking pin 3359.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

If the hub cannot be locked:

- Pull crankshaft stop pin out of hole in sealing flange and turn crankshaft until hub can be locked with locking pin.

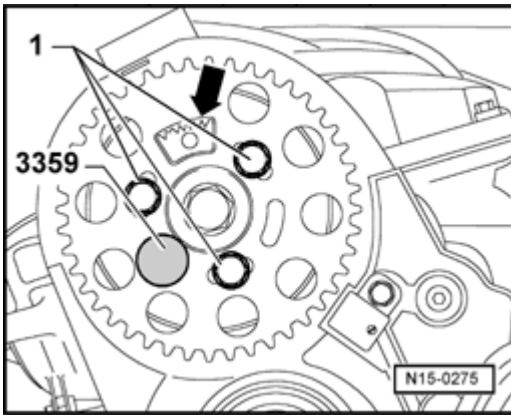


Fig. 72: Identifying Camshaft Pulley Securing Bolts
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Loosen camshaft pulley securing bolts - 1 -.

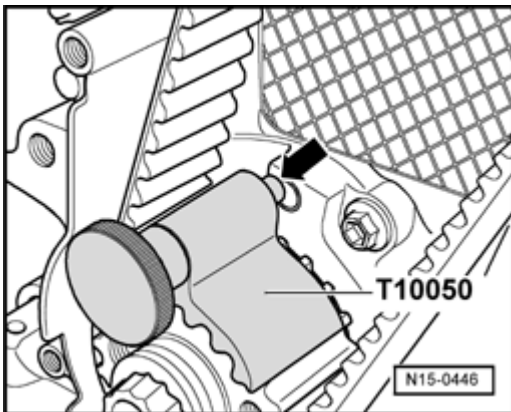


Fig. 73: Identifying Crankshaft Stop T10050
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Turn crankshaft slightly against direction of engine rotation until crankshaft stop pin is positioned just before hole in sealing flange - **arrow** -.
- Turn crankshaft in engine direction of rotation until crankshaft stop pin engages in sealing flange while turning.
- Tighten camshaft pulley securing bolts to 25 Nm.
- Remove locking pin 3359 and crankshaft stop T10050.
- Turn crankshaft two rotations in engine direction of rotation until crankshaft is set to TDC No. 1 cylinder again.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

NOTE:

- As this is done, the shaft of the crankshaft stop must be able to engage in the sealing flange from direction of engine rotation.
- If the crankshaft is turned past TDC No. 1 Cyl. and the crankshaft stop could not engage in the sealing flange, turn the crankshaft back 14 turn to be able to turn the crankshaft in direction of engine rotation again to set it to TDC No. 1 cyl. It is not permitted to turn the engine opposite to the normal direction of rotation when turning to ensure the crankshaft stop will engage.

- Repeat check.
- Install lower toothed belt guard and vibration damper/belt pulley.
- Install center toothed belt guard.

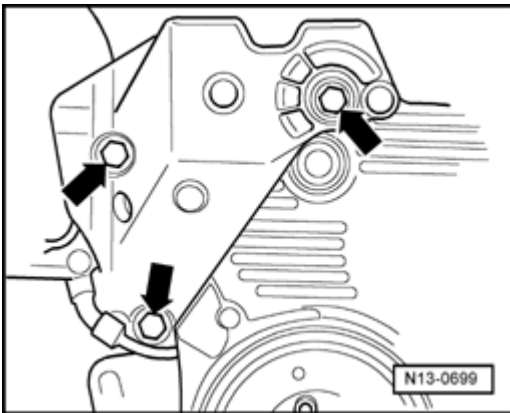


Fig. 74: Identifying Engine Mounting Bolts

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Install engine mounting to cylinder block and tighten - **arrows** -. Tightening torque: 45 Nm
- Install top toothed belt guard.

NOTE:

- Before installing the assembly mounting, all engine mounting bolts must be tightened to prescribed torque.

- Install engine/body assembly mounting (replace securing bolts). Tightening torque: 40 Nm plus an additional 90 ° (14 turn).
- Align engine and transmission mountings. Refer to **Engine and transmission mountings, aligning** .
- Tighten engine assembly mounting to engine bracket. Use support device 10-222 A to bring contact surfaces into position. Tightening torque: 100 Nm
- Install bracket for body assembly mounting. Tightening torque: 25 Nm
- Install coolant expansion tank.
- Install power steering reservoir and fuel filter.
- Install charge air pipe between charge air cooler and intake connecting flange. Refer to **Charge air cooling components, removing and installing** .

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Install poly V-belt tensioning element. Tightening torque: 25 Nm
- Install poly V-belt. Refer to **Poly V-belt, removing and installing** .
- Install right side insulation tray: Refer to **94 LIGHTS, SWITCHES - EXTERIOR**
- Install sound insulation tray.

Cylinder head, removing and installing

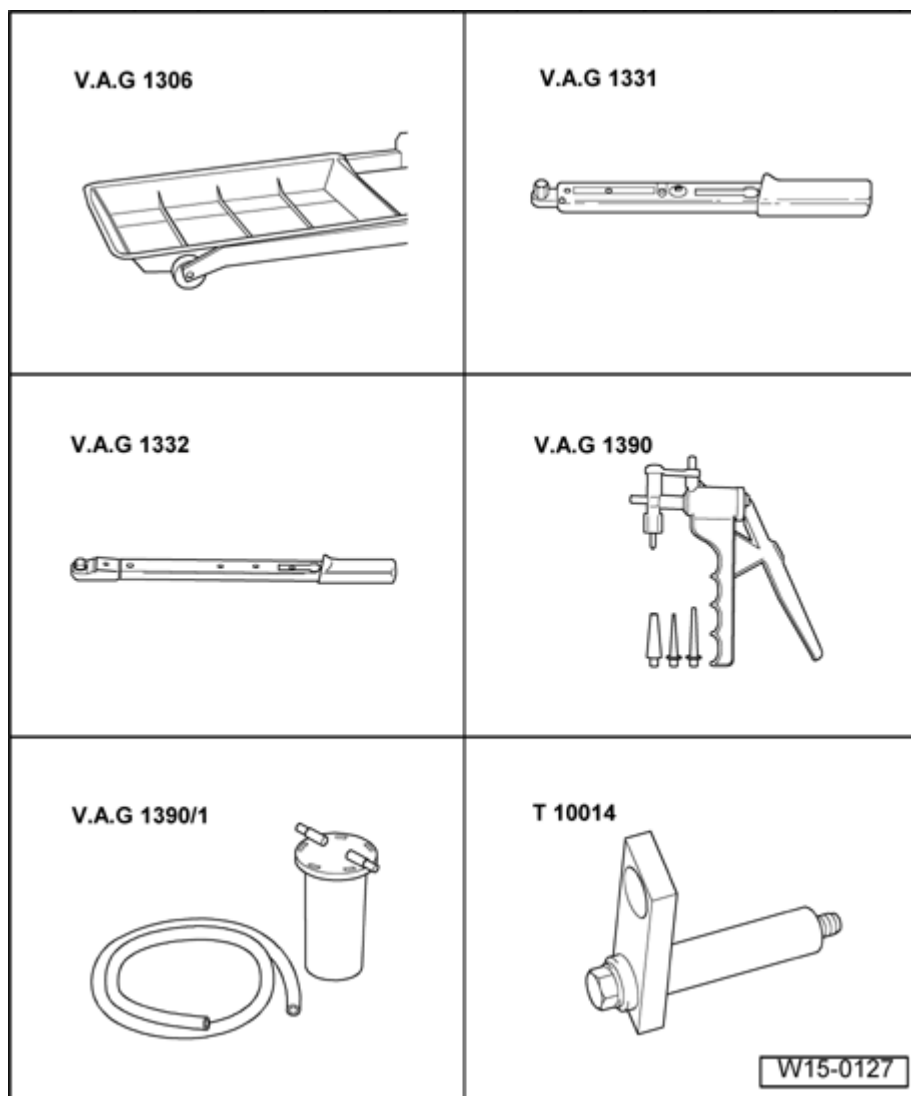


Fig. 75: Special Tools - Cylinder Head, Removing And Installing
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools, testers and auxiliary items required

- Drip tray V.A.G 1306
- Torque wrench (5 to 50 Nm) V.A.G 1331
- Torque wrench (40 to 200 Nm) V.A.G 1332

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Hand vacuum pump V.A.G 1390
- Bleed container V.A.G 1390/1
- Bracket T10014

Special tools, testers and auxiliary items required

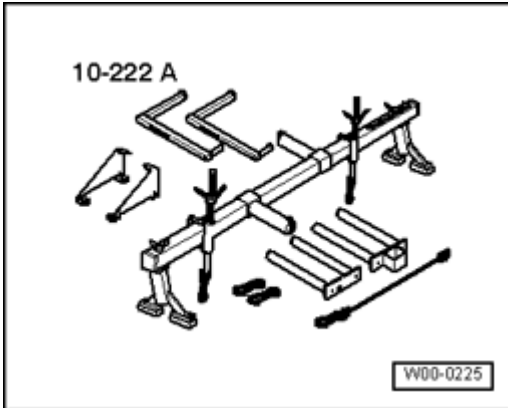


Fig. 76: Identifying Support Assembly 10-222 A With Legs 10-222 A/1
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Support device 10-222A with legs 10-222A/13

NOTE:

- All cable ties which are opened or cut through when the cylinder head is removed must be replaced in the same position when the cylinder head is installed.

CAUTION: When doing any repair work, especially in the engine compartment, pay attention to the following due to the cramped conditions:

- Route all the various lines (e.g. for fuel, hydraulics, EVAP system, coolant, refrigerant, brake fluid and vacuum) and electrical wiring in their original positions.
- Ensure that there is sufficient clearance to all moving or hot components.

Removing

NOTE:

- Before removing the toothed belt from the camshaft pulley, lock the toothed belt tensioner. Refer to Toothed belts, removing, installing and tensioning .
- Both lifting eyes for the support are located on the cylinder head, so an additional bracket for supporting the engine must be secured on the cylinder block.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Drain coolant. Refer to **Coolant, draining and filling** .
- Unbolt exhaust pipe on turbocharger.
- Disconnect connector on Turbocharger (TC) vane position sensor -G500-.
- Remove cylinder head cover. Refer to **Cylinder head cover, removing and installing** .
- Remove toothed belt from camshaft. Refer to **Toothed belts, removing, installing and tensioning** .

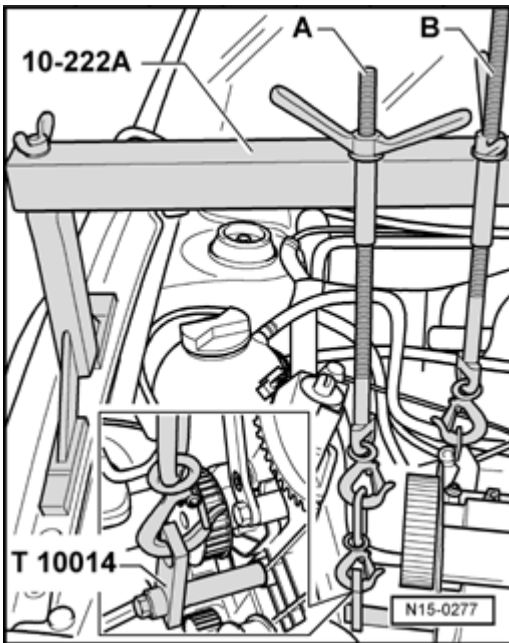


Fig. 77: Identifying Bracket T10014

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Install bracket T10014 to cylinder block using tapped hole in vicinity of water pump as shown.
Tightening torque: 20 Nm
- Lift engine slightly using spindle - **A** - until spindle - **B** - is relieved.
- Remove spindle - **B** -.
- Before removing cylinder head, extract fuel at tandem pump using hand vacuum pump V.A.G 1390 with bleed receptacle V.A.G 1390/1 , refer to **Tandem pump, removing and installing** .
- Remove camshaft pulley hub. Refer to **Camshaft, removing and installing** .
- Pull off/disconnect all other electrical connections/wiring as necessary from cylinder head and lay aside.
- Separate all connections from cylinder head for coolant, vacuum and intake hoses.

NOTE:

- **Maintain sequence when loosening and tightening cylinder head bolts.**

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

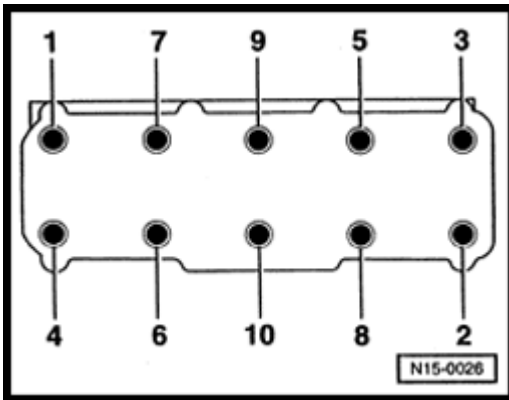


Fig. 78: Identifying Cylinder Head Loosening Sequence
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Loosen and remove cylinder head bolts in sequence.
- Remove cylinder head.
- Check cylinder head distortion once cylinder head sealing surfaces have been cleaned.

Installing

NOTE:

- **Always replace cylinder head bolts.**
 - **For repairs, carefully remove gasket remains from the cylinder head and cylinder block. Make sure that no long scores or scratches are made on the surfaces. When using abrasive paper do not use a grade less than 100.**
 - **Carefully remove emery and abrasive remains.**
 - **Thoroughly blow out threaded holes for cylinder head bolts. Place a cloth over the respective hole as a protection against oil etc which may be sprayed out of the hole.**
 - **Remove the new cylinder head gasket from the packaging just before installation.**
 - **Handle the gasket extremely carefully. Damaging the silicone layer or the indented area will lead to leaks.**
-
- Check before installing the cylinder head that new cylinder head gasket is identical to old cylinder head gasket (3 possible thicknesses)
 - Turn crankshaft to TDC marking before installing cylinder head.
 - Turn crankshaft against engine direction of rotation until all pistons are approximately equally placed below TDC.
 - Position cylinder head gasket.
 - Install cylinder head and hand tighten all 10 new cylinder head bolts.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

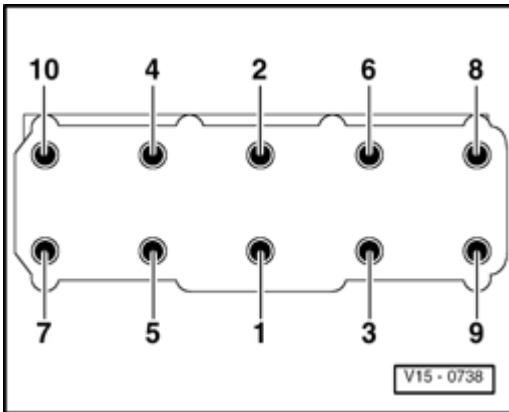


Fig. 79: Identifying Cylinder Head Tightening Sequence
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Tighten cylinder head in four stages in sequence shown as follows:

Stage I = 40 Nm

Stage II = 60 Nm

Stage III = 14 turn (90 °)

Stage IV = 14 turn (90 °)

NOTE:

- Re-torquing the cylinder head after repairs is no longer necessary.

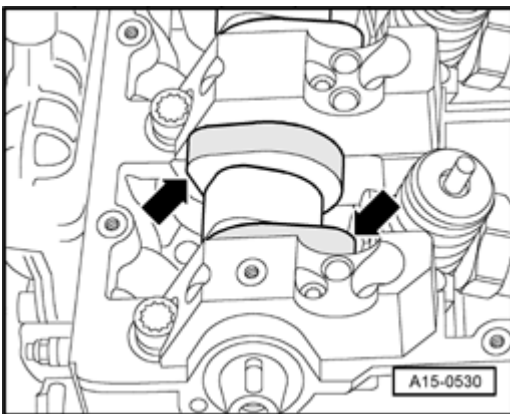


Fig. 80: Identifying Cam Lobes Pointing Equally Upward
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- After tightening cylinder head, turn camshaft so that cam lobes for No. 1 cylinder point equally upward. Before installing toothed belt, turn crankshaft in direction of engine rotation to TDC. Refer to **Toothed belts, removing, installing and tensioning** .
- Install camshaft pulley hub. Refer to **Camshaft, removing and installing** .

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

The remainder of the installation is performed in the reverse sequence of removal.

- Road test vehicle and read fault memory. Refer to **Engine control module fault memory, reading and erasing**.

Checking for distortion

NOTE:

- Before installing a cylinder head which has previously been installed, check it for distortion.

Special tools, testers and auxiliary items required

- Straight edge
- Feeler gauges

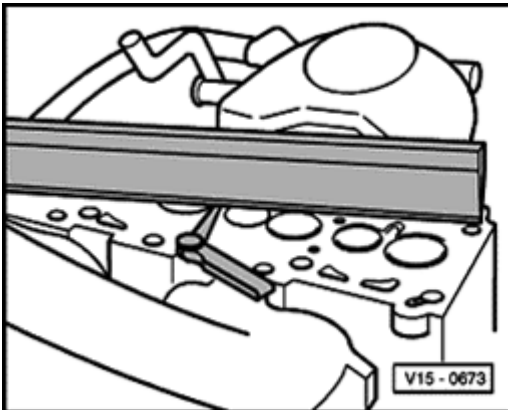


Fig. 81: Measuring Distortion Of Sealing Surface With Feeler Gauges
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Position straight edge diagonally over sealing surface (a check in opposite direction must also be made) and determine distortion with feeler gauges.

Max. permissible distortion: 0.1 mm

NOTE:

- Reworking diesel cylinder heads is not permissible.

Cylinder head gasket identification

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

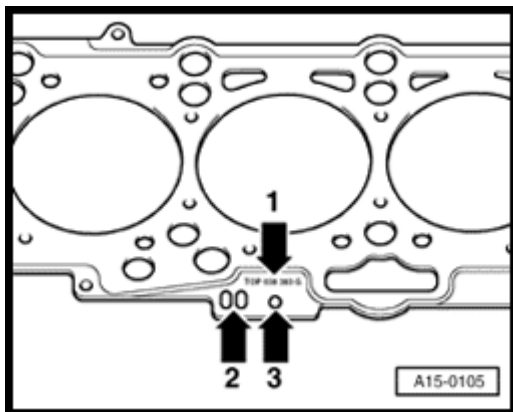


Fig. 82: Identifying Cylinder Head Gasket

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Part No. = - **arrow 1** -
- Production control code = - **arrow 2** - (can be disregarded)
- Holes = - **arrow 3** -

NOTE:

- Different thicknesses of cylinder head gasket are installed depending on the piston projection. When replacing the cylinder head gasket, install a new gasket with the same identification.

Compression, checking

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

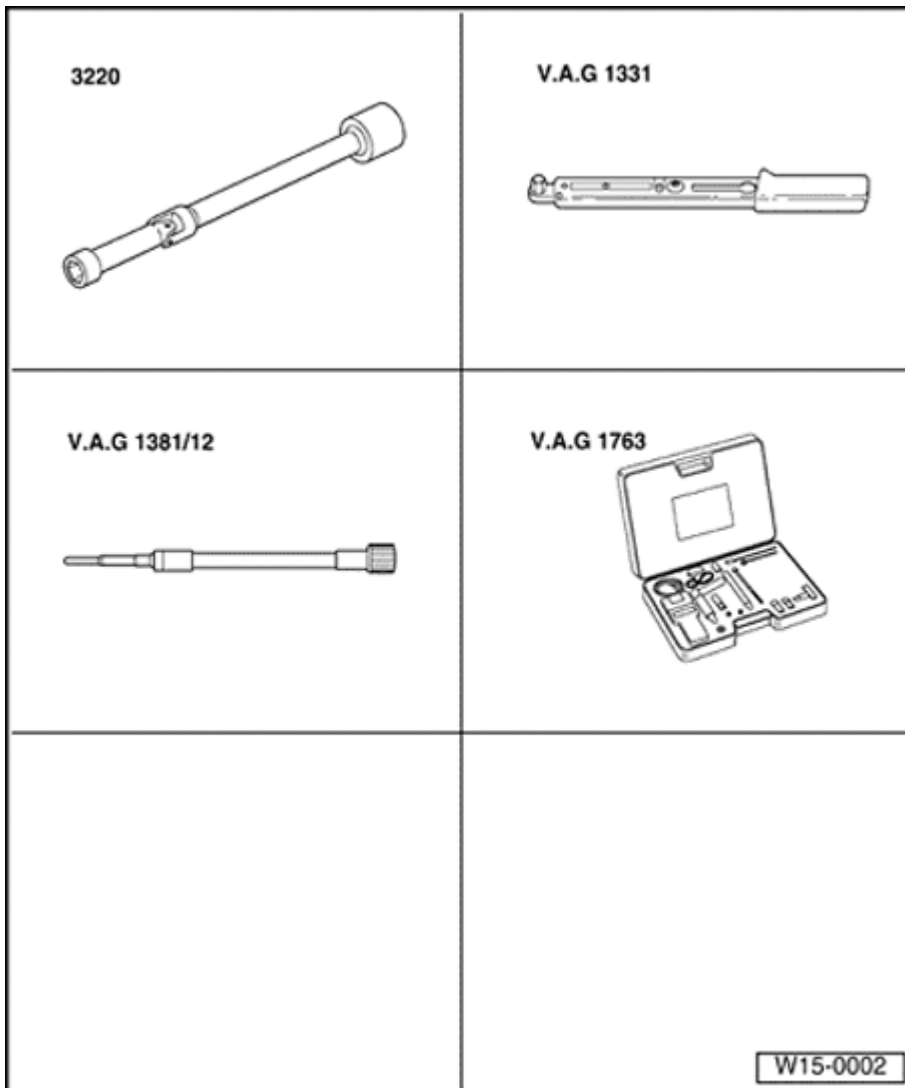


Fig. 83: Special Tools - Compression, Checking
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools, testers and auxiliary items required

- Jointed wrench 3220
- Torque wrench (5...50 Nm) V.A.G 1331
- Adapter V.A.G 1381/12
- Compression tester V.A.G 1763

Requirements

- Engine oil temperature at least. 30 ° C

Work sequence

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Remove engine cover.

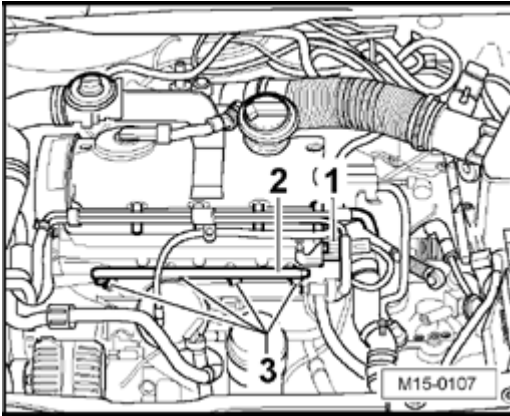


Fig. 84: Identifying Connector Strip And Glow Plugs
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect central connector for unit injectors - 1 -.
- Pull connector strip - 2 - off glow plugs.
- Remove all glow plugs - 3 - using jointed wrench 3220.

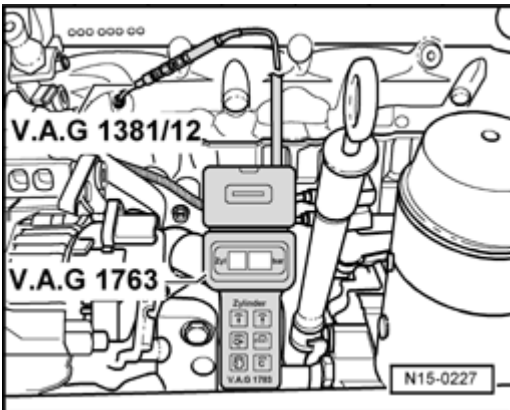


Fig. 85: Identifying V.A.G 1381/12 And V.A.G 1763
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Screw in adapter V.A.G 1381/12 in place of glow plugs.
- Check compression using compression tester V.A.G 1763.

NOTE: • **Using compression tester. Refer to Tester operating instructions.**

- Operate starter until tester shows no further pressure increase.

Compression pressures

- New: 25 to 31 bar

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Wear limit: 19 bar
- Permissible difference between all cylinders: 5 bar
- Install glow plugs with jointed wrench 3220. Tightening torque: 15 Nm
- Read fault memory. Refer to **Engine control module fault memory, reading and erasing**.

NOTE:

- **Disconnecting the central connector for unit injectors causes faults to be stored. Therefore read and erase fault memory.**

VALVE GEAR, SERVICING

Valve gear, assembly overview

NOTE:

- **Cylinder heads with cracks between the valve seats may be used without reducing engine life, provided the cracks are short and not more than 0.5 mm wide.**

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

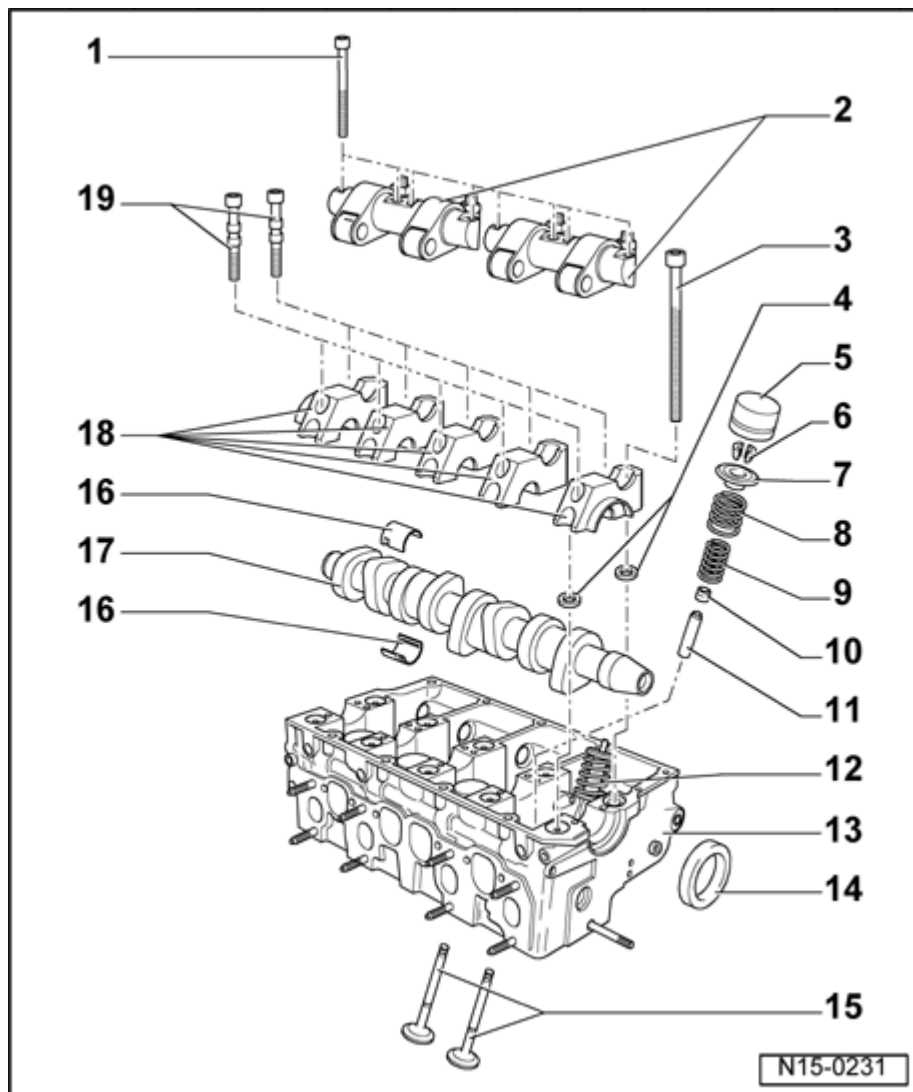


Fig. 86: Exploded View - Valve Gear

Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - 20 Nm plus an additional 14 turn (90 °)

- Replace
- Note sequence when loosening and tightening. Refer to Camshaft, removing and installing

2 - Rocker arm shaft

- Do not interchange

3 - Cylinder head bolt

- Note sequence when loosening and tightening. Refer to Cylinder head, removing and installing

4 - Washer

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- For cylinder head bolts
- Position in cylinder head before installing bearing caps.

5 - Hydraulic lifter

- Do not interchange
- With hydraulic valve clearance compensation
- Store with cam contact surface downward
- Before installing check camshaft axial clearance
- Oil contact surfaces
- Before removing, remove camshaft bearing caps

6 - Keepers

7 - Valve spring plate

8 - Outer valve spring

- Removing and installing: Cylinder head removed: with 2037; Cylinder head installed: Refer to **Valve stem seals, replacing**

9 - Inner valve spring

- Removing and installing: Cylinder head removed: with 2037; installed: Refer to **Valve stem seals, replacing**

10 - Valve stem seal

- Replacing, refer to **Valve stem seals, replacing**

11 - Valve guide

- Checking, refer to **Valve guides, checking**

12 - Unit injector

- Removing and installing. Refer to **Unit injector, removing and installing**

13 - Cylinder head

- See note, refer to **Valvetrain, assembly overview**

14 - Seal

- Do not additionally oil or grease oil seal sealing lip

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Before installing, remove oil remains from camshaft journals with a clean cloth
- To install, tape over (e.g. with cellophane tape) groove in taper of camshaft
- Removing and installing. Refer to **Camshaft oil seal, removing and installing**

15 - Valves

- Valve dimensions

16 - Bearing shell

- Do not interchange used bearing shells (mark)
- Ensure proper seating of retaining lugs in bearing caps and cylinder head

17 - Camshaft

- Checking axial clearance
- Removing and installing. Refer to **Camshaft, removing and installing**
- Check radial clearance with Plastigage, wear limit: 0.11 mm
- Run-out: max. 0.01 mm
- Identification and valve timing

18 - Bearing cap

- Installation sequence. Refer to **Camshaft, removing and installing**
- To install, seal parting surfaces of bearing caps 1 and 5 with *AMV 174 004 01*

19 - 8 Nm plus an additional 14 turn (90 °)

- Replace

Identifying Camshaft Clearance

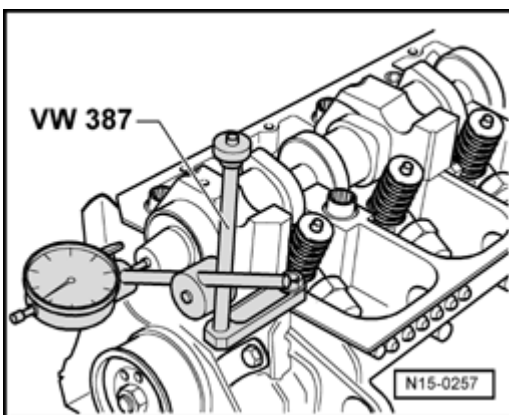


Fig. 87: Identifying Camshaft Clearance

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Checking camshaft axial clearance

Special tools, testers and auxiliary items required

- Universal dial gauge bracket VW 387
- Dial gauge

Work sequence

Check with lifters removed and with first, third and last bearing caps installed.

Wear limit: max. 0.15 mm

Identifying Sealant

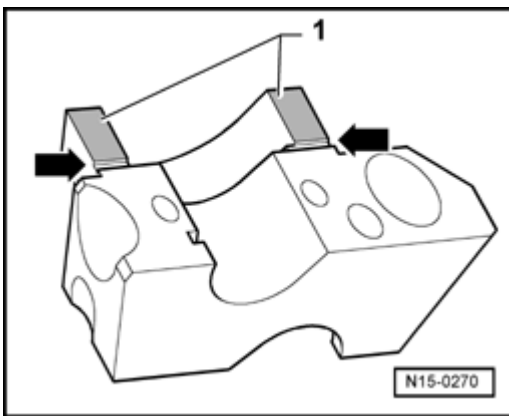


Fig. 88: Identifying Sealant

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Sealing parting surfaces of bearing caps 1 and 5

- Apply sealant AMV 74 04 1 thinly and evenly onto surfaces - 1 -.

NOTE:

- Ensure that no sealant gets into the grooves - arrows -.

Identifying Valve Dimensions

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

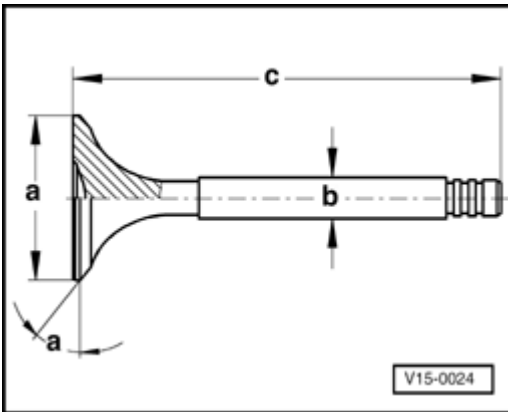


Fig. 89: Identifying Valve Dimensions

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Valve dimensions

NOTE:

- Valves must not be reworked. Only lapping is permitted.

Dimension		Intake valve	Exhaust valve
diameter a	mm	35.95	31.45
diameter b	mm	6.980	6.956
c	mm	89.95	89.95
a	Angle °	45	45

Identifying Cam Base Diameter - A

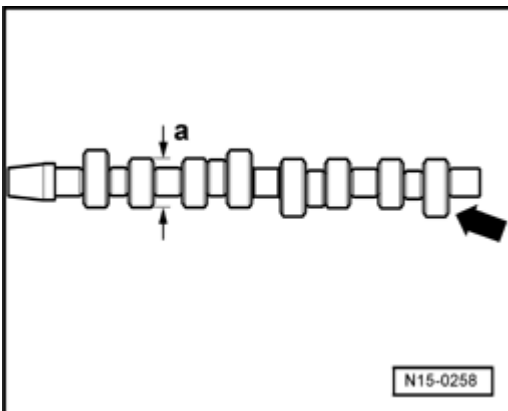


Fig. 90: Identifying Cam Base Diameter - A

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Camshaft identification, valve timing

Identification

- Cam base diameter: a = 52.8 mm

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Identification by stamped numbers and letters on face of No. 4 cylinder exhaust cam:

No. 4 cylinder - **arrow** -

038 R or 858 R

Valve timing at 1 mm valve lift

Intake opens after TDC	15.8 °
Intake closes after BDC	25.3 °
Exhaust opens BDC	28.2 °
Exhaust closes before TDC	18.7 °

Valve guides, checking

Special tools, testers and auxiliary items required

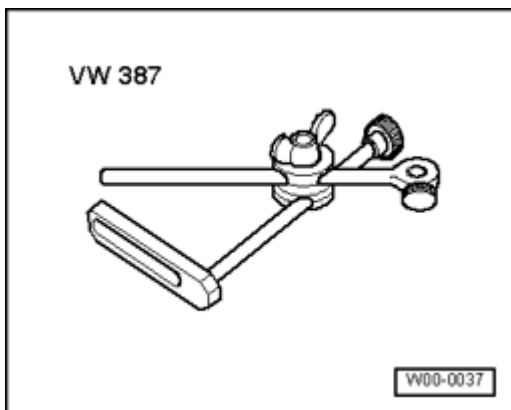
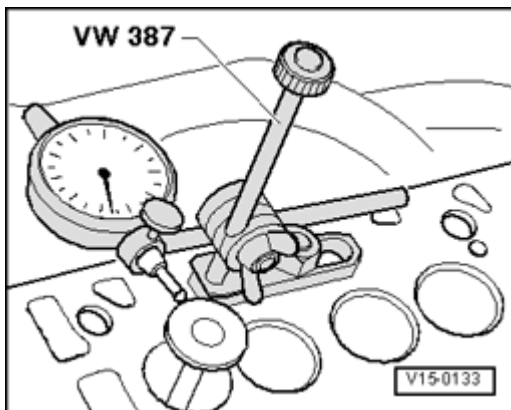


Fig. 91: Identifying VW 387 Universal Dial Gauge Bracket
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Universal dial gauge bracket VW 387
- Dial gauge

Work sequence



2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

Fig. 92: Identifying Special Tool - VW 387

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Insert new valve into guide. End of valve stem must be flush with guide. Due to slight differences in stem diameters, use only an intake valve in intake guide and an exhaust valve in exhaust guide.
- Determine rock. Wear limit: max. 1.3 mm

NOTE:

- Replace the cylinder head if the valve rock is greater than the wear limit.

Valve stem seals, replacing

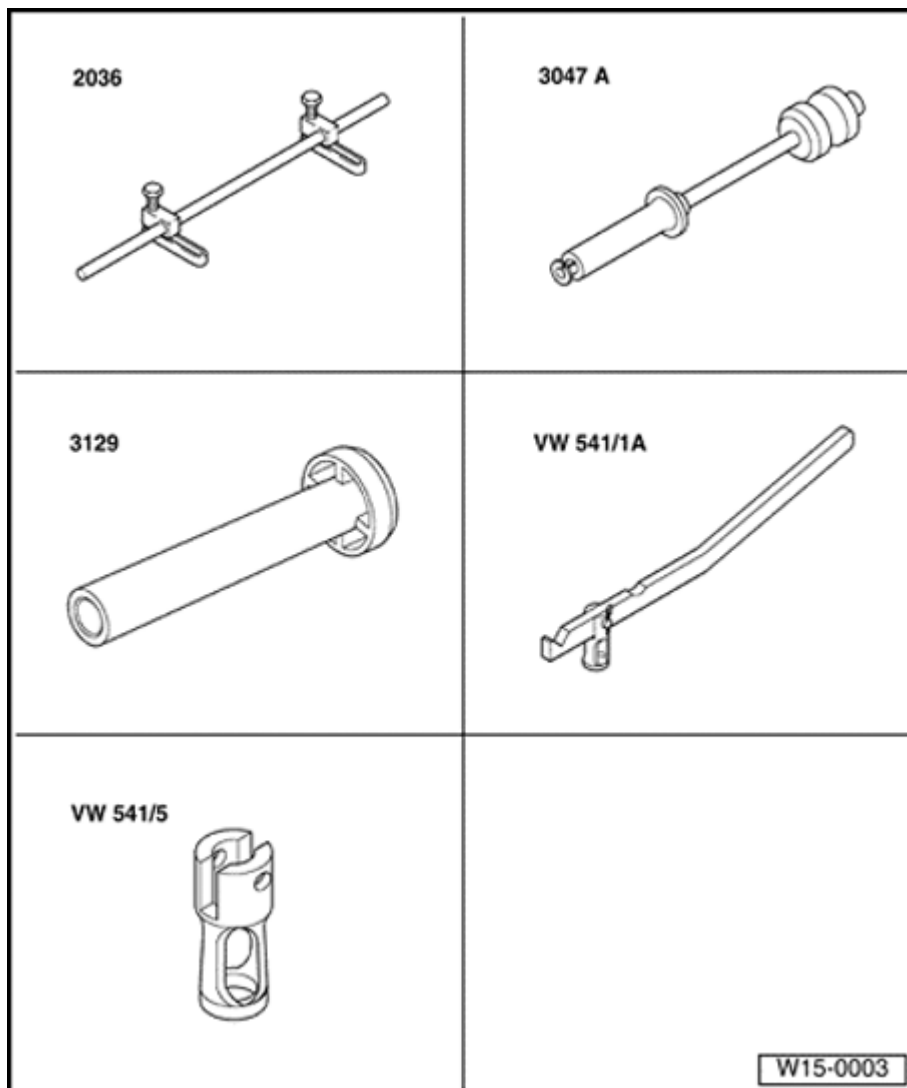


Fig. 93: Special Tools - Valve Stem Seals

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools, testers and auxiliary items required

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Assembly tool 2036
- Puller 3047 A
- Assembly tool 3129
- Valve lever VW 541/1A
- Thrust piece VW 541/5

Removing

(with cylinder head installed)

- Remove camshaft. Refer to **Camshaft, removing and installing** .
- Remove hydraulic lifters and place them with contact surface downward. Ensure that lifters will not be interchanged.
- Set piston of respective cylinder to top dead center (TDC).

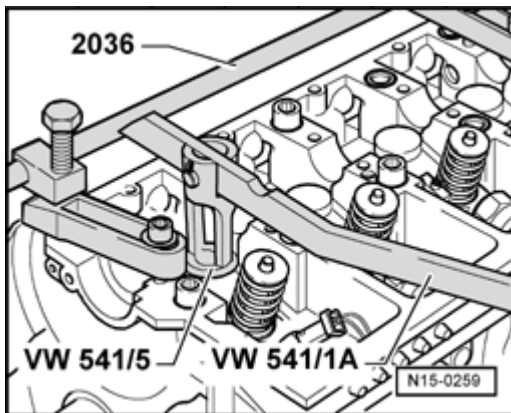


Fig. 94: Identifying Valve Springs Using Valve Lever VW 541/1A And Press Tool VW 541/5
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Mount assembly tool 2036 and adjust mountings to height of studs.
- Remove valve springs using valve lever VW 541/1A and press tool VW 541/5.

NOTE:

- The valves are supported by the piston crown.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

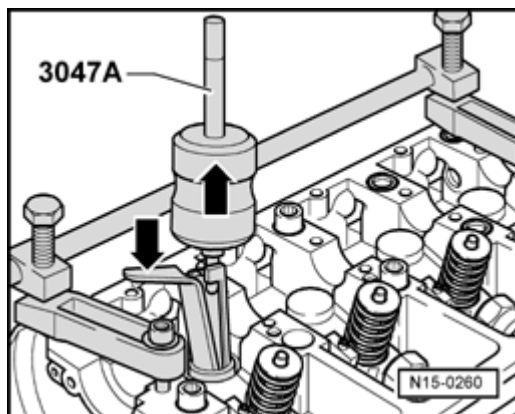


Fig. 95: Identifying Special Tool - 3047 A

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Pull off valve stem seals with 3047 A.

Installing

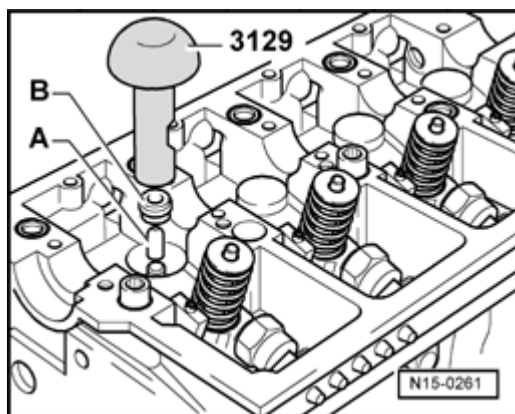


Fig. 96: Identifying Special Tool - 3129

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Place plastic sleeve - A - supplied on respective valve stem. This will prevent new *valve stem seal* - B - from being damaged.
- Place new valve stem seal in assembly tool 3129.
- Oil valve stem seal sealing lip and press carefully onto valve guide.

Camshaft, removing and installing

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

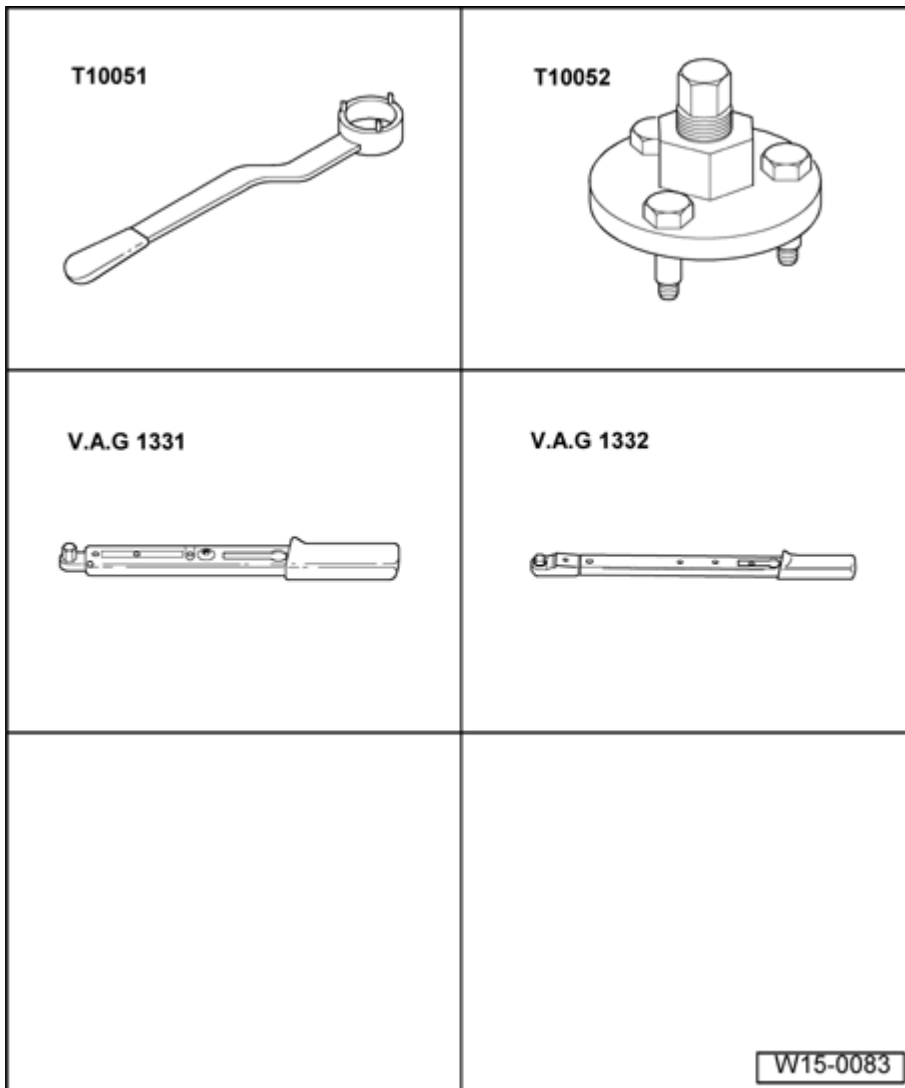


Fig. 97: Special Tools - Camshaft, Removing And Installing
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools, testers and auxiliary items required

- Counterhold T10051
- Puller T10052
- Torque wrench (5 to 50 Nm) V.A.G 1331
- Torque wrench (40 to 200 Nm) V.A.G 1332
- *Sealant AMV 174 004 01*

Removing

- Remove toothed belt. Refer to **Toothed belts, removing, installing and tensioning** .

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

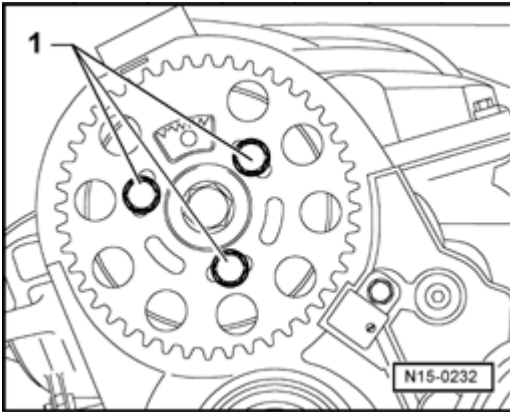


Fig. 98: Identifying Camshaft Pulley Securing Bolts
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove camshaft pulley securing bolts - 1 -.
- Pull camshaft pulley off hub.

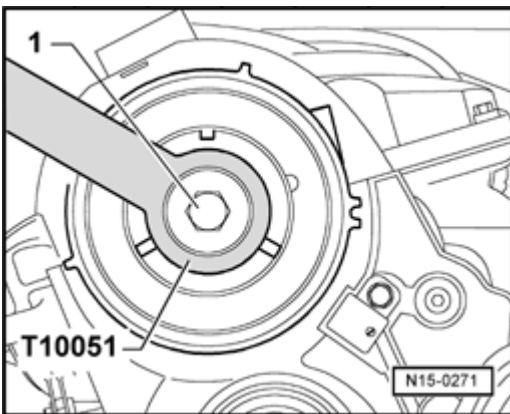


Fig. 99: Identifying Counterhold T10051
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Use counterhold T10051 and loosen hub securing bolt - 1 -.
- Loosen hub securing bolt about 2 turns.

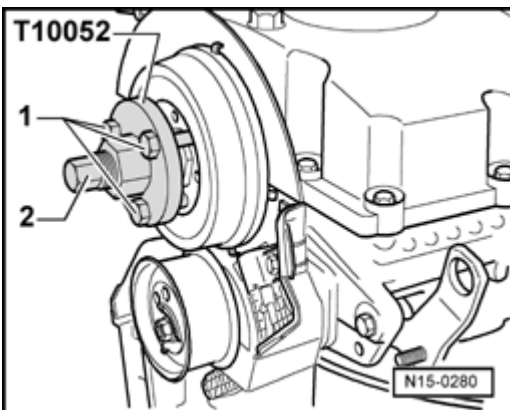


Fig. 100: Identifying Puller T10052

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Set up puller T10052 and align it with holes in hub.
- Apply tension to hub by evenly tightening puller until hub separates from taper of camshaft.

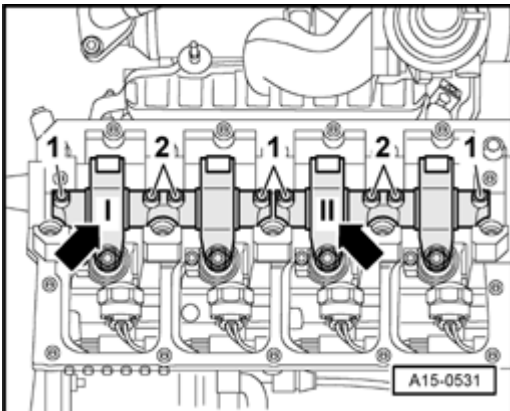
NOTE:

- **Hold puller with a 30 mm wrench while doing this.**

- Remove hub from taper of camshaft.
- Remove cylinder head cover. Refer to Cylinder head cover, removing and installing.
- Remove rocker arm shafts.

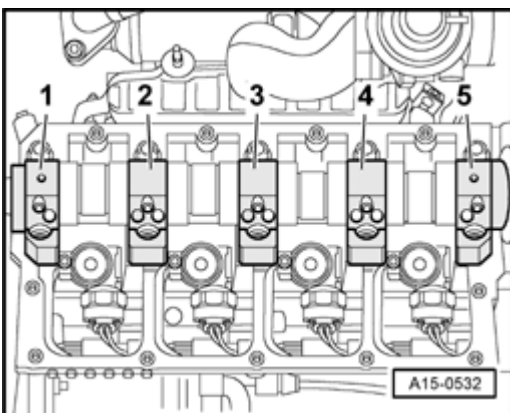
NOTE:

- **First loosen both the outer and then the inner securing bolts respectively.**

**Fig. 101: Identifying Mark On Rocker Arm Shafts**

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Mark rocker arm shafts - **arrows** - using a permanent felt tip marker to prevent interchanging, thus preventing requirement for basic (default) settings of unit injectors.
- Remove tandem pump. Refer to Tandem pump, removing and installing.

**Fig. 102: Identifying Bearing Caps**

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove bearing caps 5, 1 and 3. Loosen bearing caps 2 and 4 alternately and diagonally.
- Remove camshaft.

Installing

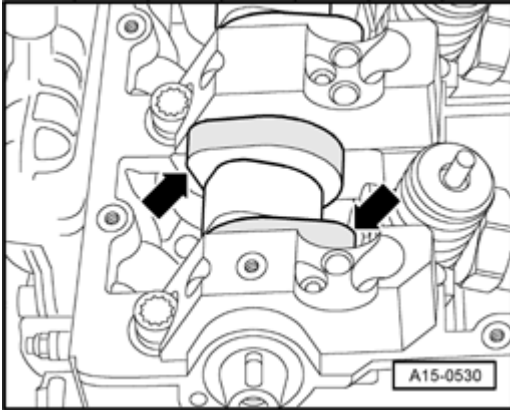


Fig. 103: Identifying Correct Position Of Camshaft

Courtesy of VOLKSWAGEN UNITED STATES, INC.

NOTE:

- When installing the camshaft the No. 1 cylinder cam lobes must point equally upward.
- Do not interchange used bearing shells (mark).
- When installing the camshaft, ensure proper seating of retaining lugs in bearing caps and cylinder head.
- Before installing bearing caps, ensure that cylinder head bolt washers are inserted in the cylinder head.

- Oil running surfaces of bearing shells.
- Tighten bearing caps 2 and 4 alternately and diagonally to 8 Nm plus an additional 14 turn (90 °).
- Install bearing caps 5, 1 and 3 and also tighten to 8 Nm plus an additional 14 turn (90 °).

NOTE:

- Seal parting surfaces of bearing caps 1 and 5 with **AMV 174 004 01**.
- Bearing cap 5 must align flush with outer edge of cylinder head, otherwise leaks can develop at the tandem pump.

- Install camshaft oil seal. Refer to **Camshaft oil seal, removing and installing**.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

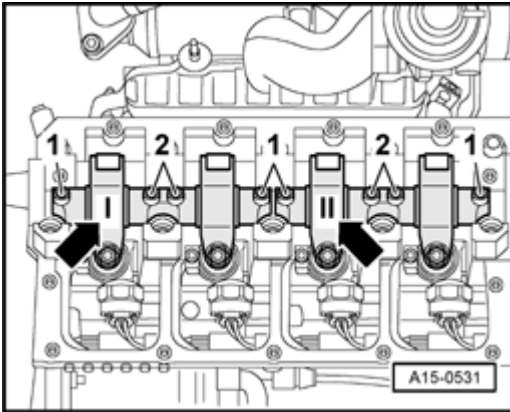


Fig. 104: Identifying Bolts

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Install rocker arm shafts and tighten securing bolts, first inner - **2** - and then outer - **1** - , evenly and in diagonal sequence. Tightening torque: 20 Nm plus an additional 14 turn (90 °).
- Position hub on camshaft.

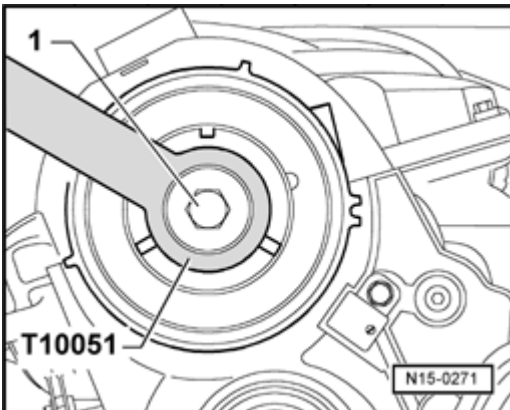


Fig. 105: Identifying Hub Securing Bolt - 1

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Use counterhold T10051 and tighten hub securing bolt - **1** -. Tightening torque: 100 Nm.

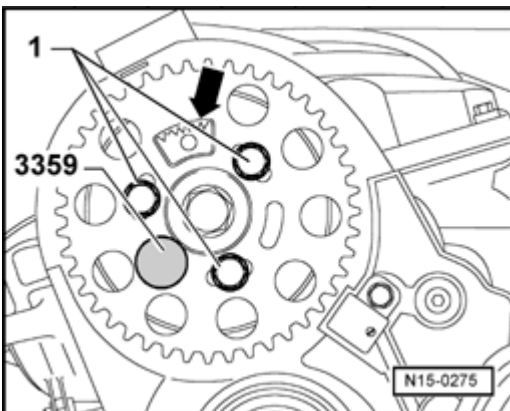


Fig. 106: Identifying Camshaft Pulley Bolts

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Push camshaft pulley onto hub.

NOTE:

- **The toothed segment - arrow - of the camshaft pulley must be on top.**

- Align camshaft pulley to central position in elongated holes.
- Hand tighten securing bolts - **1** - to camshaft pulley so that there is no play.
- Lock hub with locking pin 3359.
- Install toothed belt and tension. Refer to **Toothed belts, removing, installing and tensioning** .
- Install tandem pump. Refer to **Tandem pump, removing and installing** .

NOTE:

- **After installing new hydraulic lifters the engine must not be started for approx. 30 minutes. The hydraulic compensation elements must settle (otherwise valves will strike pistons).**

Camshaft oil seal, removing and installing

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

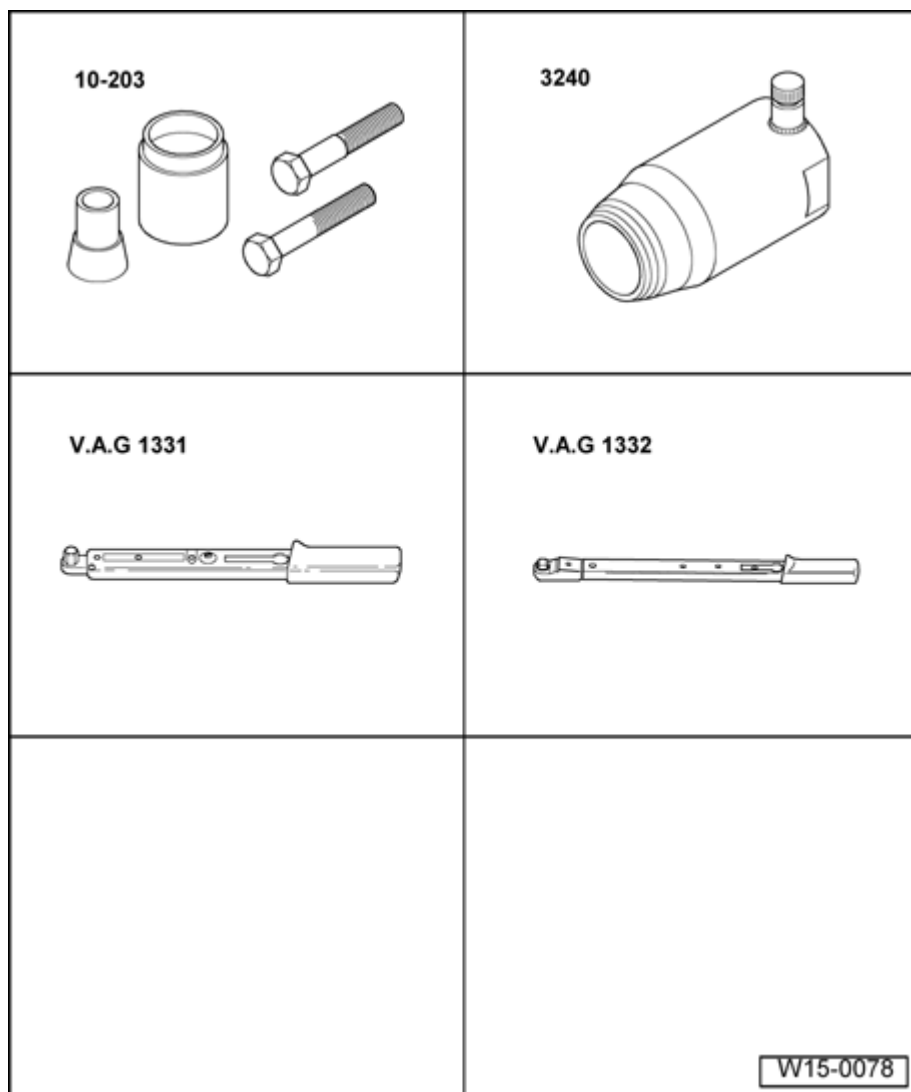


Fig. 107: Special Tools - Camshaft Oil Seal, Removing And Installing
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools, testers and auxiliary items required

- Assembly sleeve 10-203
- Oil seal extractor 3240
- Torque wrench (5 to 50 Nm) V.A.G 1331
- Torque wrench (40 to 200 Nm) V.A.G 1332
- Bolt M12 x 1.5 x 65

Removing

- Remove toothed belt. Refer to **Toothed belts, removing, installing and tensioning** .
- Remove camshaft pulley and hub. Refer to **Camshaft, removing and installing** .
- Unscrew inner part of oil seal extractor 3240 two turns (approx. 3 mm) out of outer part and lock with

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

knurled screw.

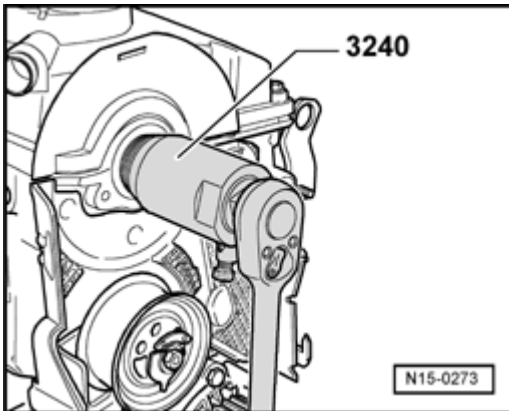


Fig. 108: Identifying Special Tool - 3240

Courtesy of VOLKSWAGEN UNITED STATES, INC.

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

Installing

NOTE:

- **The oil seal sealing lip must not be additionally oiled or greased.**

- Remove oil residue from camshaft journal with a clean cloth.
- Tape over (e.g. with cellophane tape) groove in taper of camshaft.
- Position oil seal carefully on camshaft.

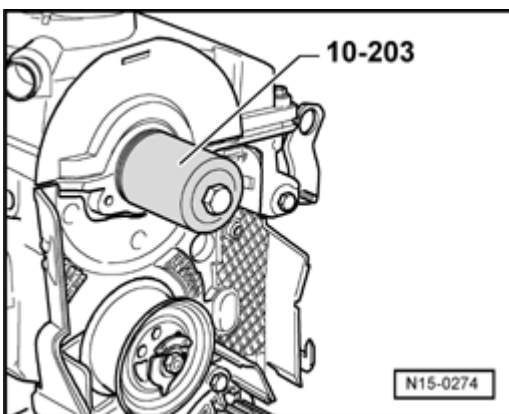


Fig. 109: Identifying Special Tool - 3240

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Press in oil seal with press piece of puller 10-203 and bolt M12 x 65 onto limit stop.
- Install toothed belt and tension. Refer to **Toothed belts, removing, installing and tensioning** .

17 - ENGINE - LUBRICATION

LUBRICATION SYSTEM, SERVICING

Lubrication system, servicing

NOTE:

- If large quantities of metal particles or other deposits (caused, for example, by partial seizure of the crankshaft or connecting rod bearings) are found in the engine oil when performing repairs, clean the oil passages thoroughly and replace the oil cooler to prevent further damage from occurring later.
- The oil level must not be above the max. mark - danger of damage to catalytic converter!

Checking oil pressure and oil pressure switch. Refer to Oil pressure and oil pressure switch, checking .

Engine oil

Oil capacities

With oil filter 4.3 liters * See note

* Up-to-date figures: ; Additional Information, Fluid Capacity Chart

Engine oil specifications

Only use engine oil conforming to VW standard 505 01.

Markings on oil dipstick

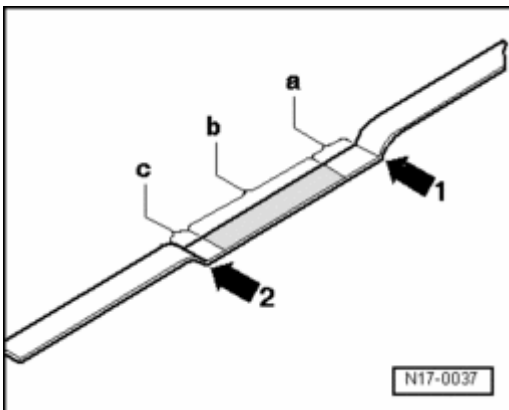


Fig. 110: Identifying Dipstick Markings

Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Max. mark

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

2 - Min. mark

a - Area above hatched field up to Max. mark: Do not add engine oil!

b - Oil level within hatched field: Engine oil may be added.

c - Area from Min. mark up to hatched field: Add max. 0.5 liter of engine oil!

Lubrication system components, assembly overview

Part I

Part II - Disassembling oil filter bracket

Part III - Removing and installing oil supply lines.

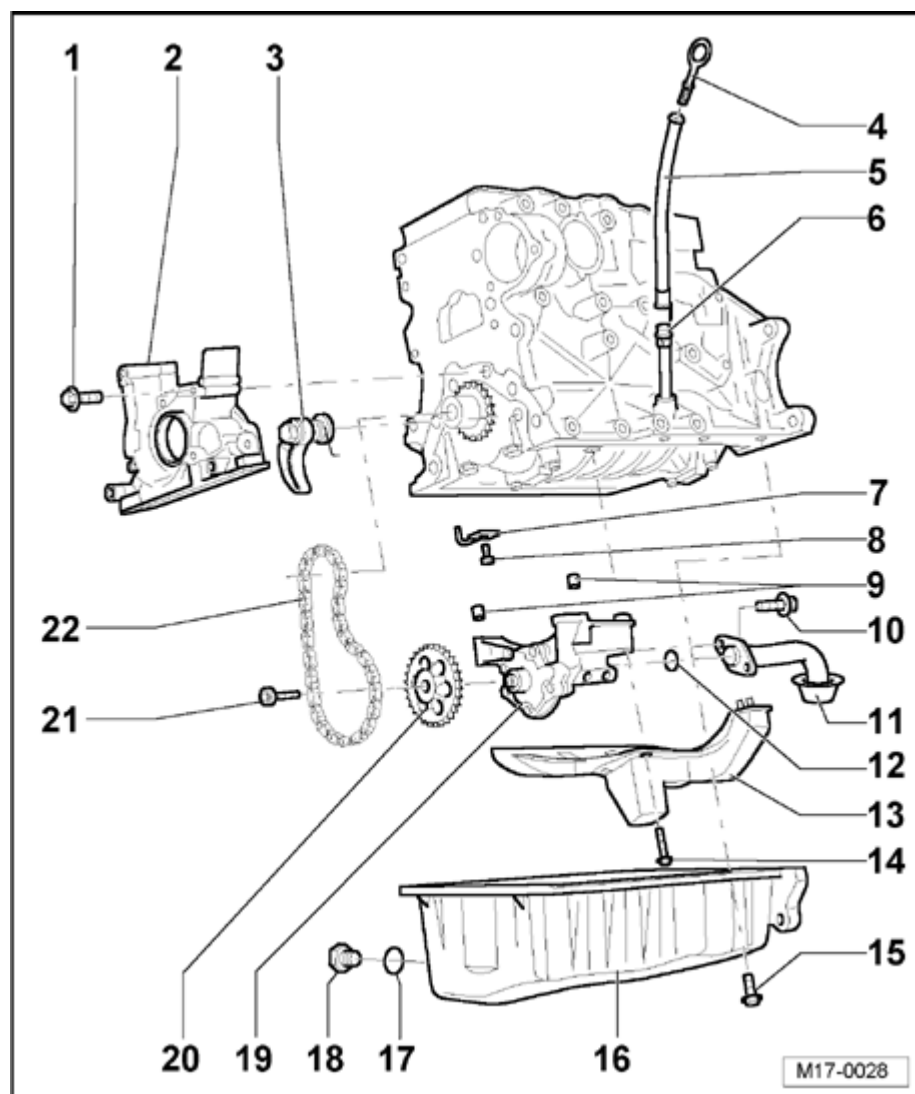


Fig. 111: Exploded View - Lubrication System

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - 15 Nm

2 - Sealing flange

- With seal
- Must be located on dowel sleeves
- Removing and installing. Refer to Sealing flange - belt pulley end, removing and installing
- Insert with *silicone sealant D 176 404 A2* . Refer to Sealing flange - belt pulley end, removing and installing
- Do not additionally oil or grease oil seal sealing lip
- Before installing, remove oil residue from crankshaft journal using a clean cloth
- Replacing crankshaft oil seal - belt pulley end. Refer to Crankshaft oil seal - belt pulley end, replacing

3 - Chain tensioner with tensioning rail, 15 Nm

- When installing, pretension spring

4 - Dipstick

- Oil level must not be above Max. mark!
- Marking

5 - Guide

- Pull off to extract oil

6 - Guide tube

7 - Oil spray jet

- For piston cooling

8 - 25 Nm

- Insert without sealant

9 - Dowel sleeves

10 - 15 Nm

11 - Suction line

- Clean strainer if soiled

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

12 - O-ring

- Replace

13 - Baffle plate

14 - 15 Nm

15 - 15 Nm

16 - Oil pan

- Clean sealing surface before installing
- Install with *silicone sealant D 176 404 A2* . Refer to **Oil pan, removing and installing**

17 - Seal

- Replace

18 - Oil drain plug, 30 Nm

- Replace plug with permanently attached seal

19 - Oil pump

- With pressure relief valve of 12 bar
- Before installing, check that both dowel sleeves are installed for centralizing oil pump/cylinder block
- Replace if running surfaces and gears are scored

20 - Chain sprocket for oil pump

21 - 25 Nm

22 - Chain

Part II

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

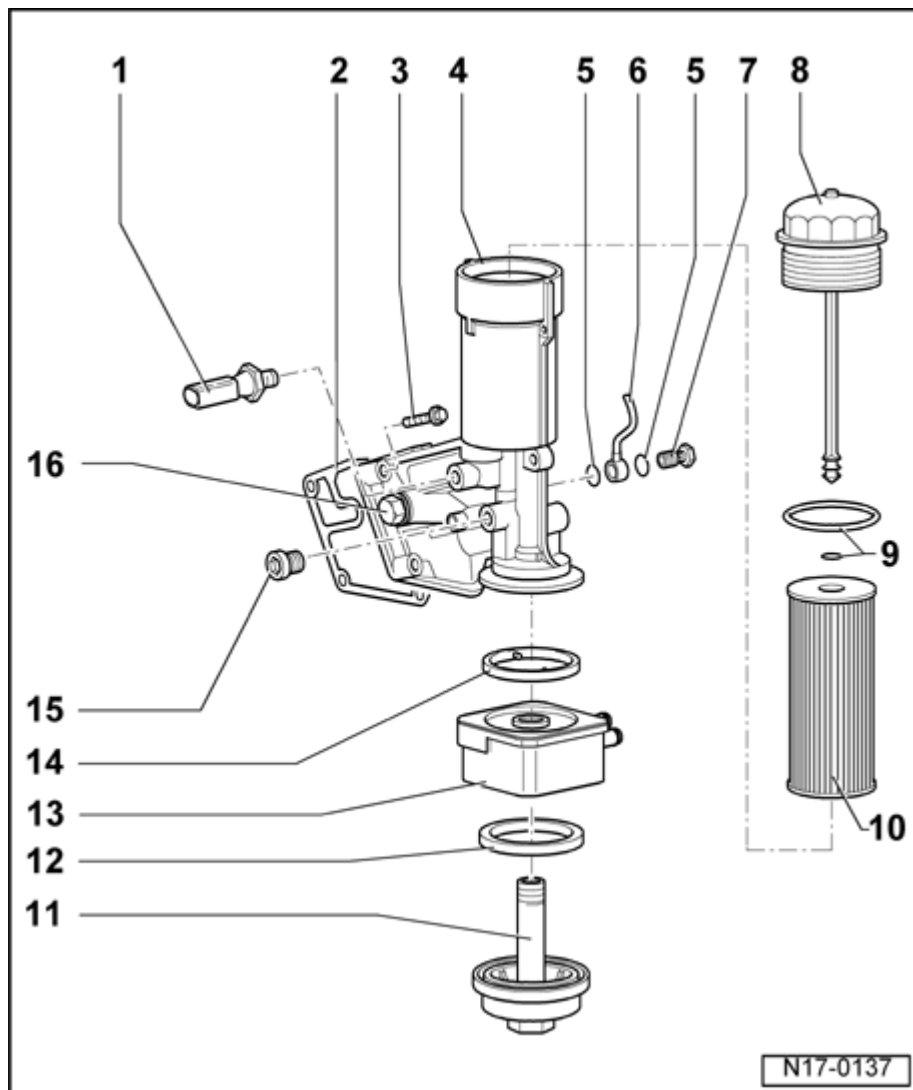


Fig. 112: Exploded View - Oil Filter System

Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Oil pressure switch -F1- , 20 Nm

- 0.7 bar switch: Brown or 0.9 bar switch: Gray
- If sealing ring is leaking, cut open and replace
- Checking. Refer to **Oil pressure and oil pressure switch, checking** .

2 - Seal

- Replace

3 - 15 Nm plus an additional 14 turn (90 °)

- Replace

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- First install upper left and lower right bolts, then tighten four bolts diagonally and alternately

4 - Oil filter bracket

5 - Seal

- Replace

6 - Oil supply line

- To exhaust turbocharger
- Removing and installing

7 - Banjo bolt

8 - Sealing cap, 25 Nm

- Loosen and tighten with oil filter wrench 3417

9 - O-ring

- Replace

10 - Oil filter element

- Note correct installed position: top

11 - Sealing plug, 25 Nm

12 - Seal

- Replace

13 - Oil cooler

- Ensure clearance to adjacent components
- See note, refer to **Lubrication system, servicing**

14 - Seal

- Replace
- Install into groove on oil cooler

15 - Sealing plug, 10 Nm

- If sealing ring is leaking, cut open and replace

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

16 - Sealing plug

- For pressure relieve valve
- Do not loosen

Part III

Assembly overview - oil pressure line

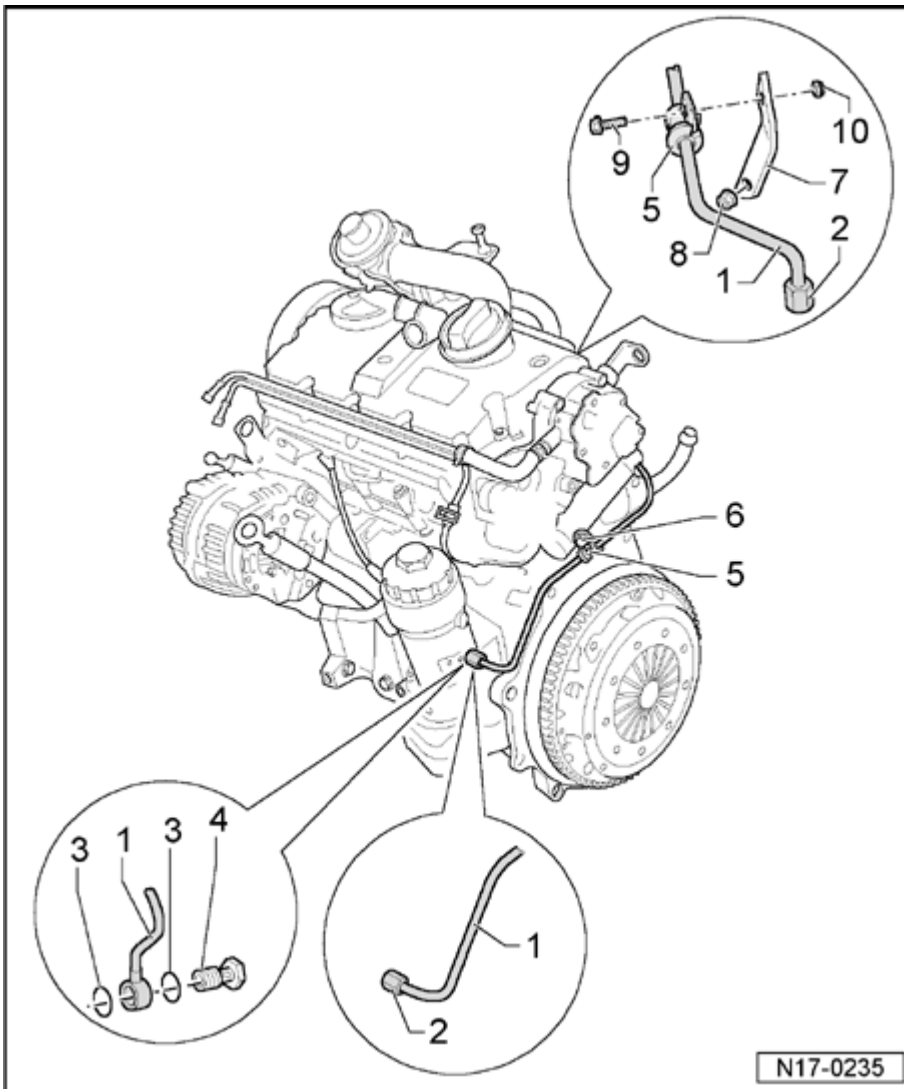


Fig. 113: View Of Oil Lines

Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Oil supply line

- To turbocharger

2 - Union nut, 22 Nm

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- When loosening and tightening counterhold union

3 - Seal

- Replace

4 - Banjo bolt, 25 Nm

5 - Clip

6 - 10 Nm

7 - Bracket

8 - 25 Nm

- Replace

9 - 10 Nm

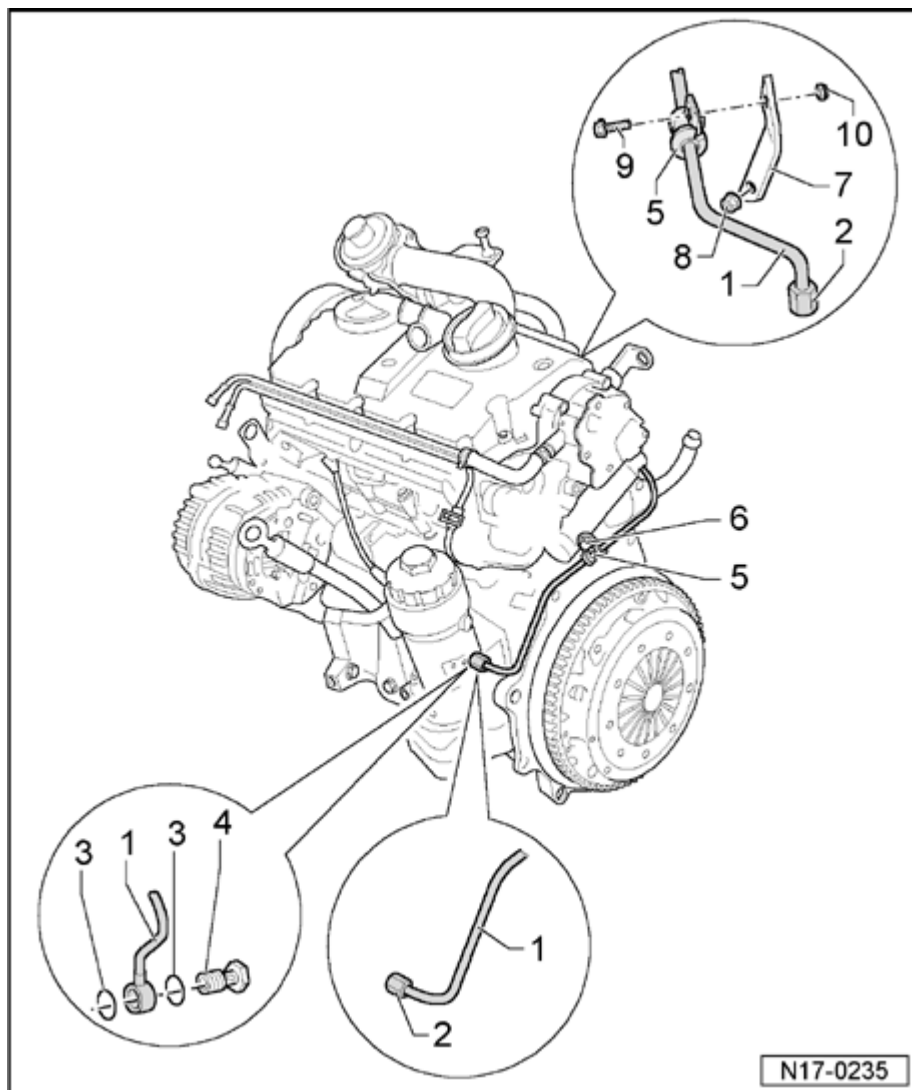
10 - 10 Nm

Installation sequence

Removing

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)



N17-0235

Fig. 114: View Of Oil Lines

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove sound insulation.
- Position drip tray V.A.G 1306 underneath.
- Remove air cleaner housing.
- Remove union nut - 2 - or banjo bolt - 4 - from oil filter bracket.
- Remove bolt - 6 -.
- Remove union nut - 2 - on turbocharger.
- Remove bolt - 9 - from bracket - 7 -.
- Remove nut - 8 - and take off bracket - 7 -.
- Remove oil supply line - 1 -.

Installing

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

Installation is performed in reverse order of removal. Note the following:

CAUTION: The installation of the oil supply line must be as described below.

- Screw bracket - **7** - with nut - **8** - loosely to exhaust manifold.
- Install union nut - **2** - or banjo bolt - **4** - on oil filter bracket.
- Install union nut - **2** - on turbocharger.
- Tighten union nut - **2** - or banjo bolt - **4** - on oil filter bracket to specified torque.
- Tighten union nut - **2** - on turbocharger to specified torque.
- Position clips - **5** - on oil supply line.
- Tighten bolts - **6** - and - **9** - to specified torque.
- Tighten nut - **8** - to specified torque.

Oil pan, removing and installing

Special tools, testers and auxiliary items required

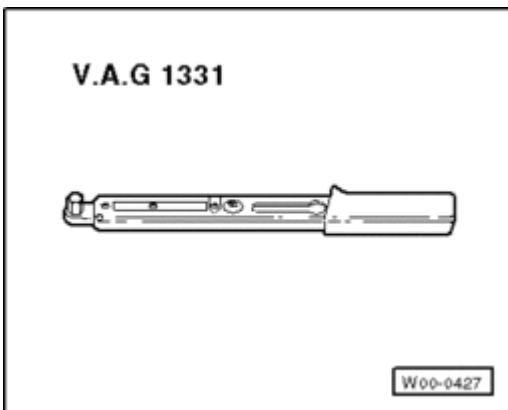


Fig. 115: Special Tool - Torque Wrench V.A.G 1331
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Torque wrench (5...50 Nm) V.A.G 1331
- Drill motor with plastic brush
- Protective glasses
- Flat scraper
- *Silicone sealant D 176 404 A2*

Removing

- Remove center, left and right sound insulation trays: --> Body Exterior - Repair Group 50
- Drain engine oil.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

NOTE:

- **Observe disposal regulations!**

- Remove securing bolts for oil pan.
- Loosen oil pan with light blows of a rubber-headed hammer, if necessary.
- Remove oil pan.
- Remove sealant residue on cylinder block with a flat scraper.

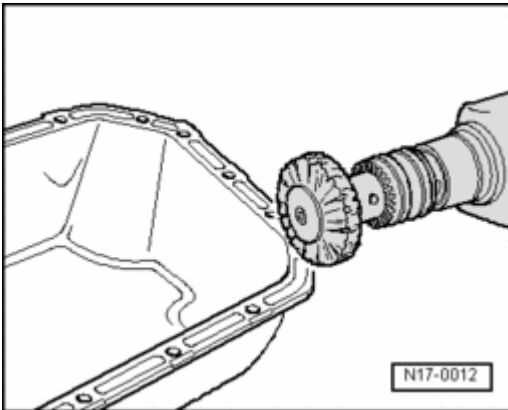


Fig. 116: Removing Sealant Residue From Oil Pan With A Rotating Brush
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove sealant residue on oil pan with a rotating brush, e.g. a drill motor with a plastic brush (wear eye protection).
- Clean sealing surfaces. Surfaces must be free of oil and grease.

Installing

- NOTE:**
- **Observe the use-by date of the sealing compound.**
 - **The oil pan must be installed within 5 minutes of applying the silicone sealing compound.**

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

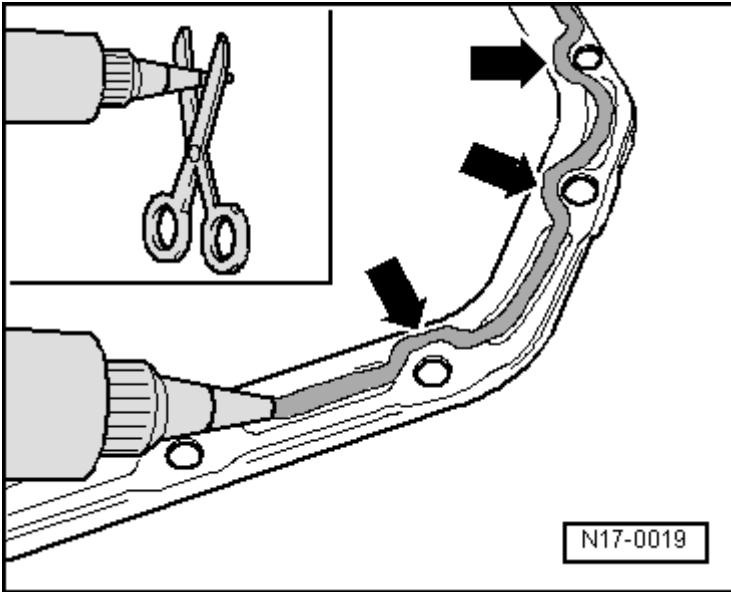


Fig. 117: Cutting Off Tube Nozzle & Applying Silicone Sealing Compound To Oil Pan Sealing Surface
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Cut off tube nozzle at forward marking (approx. nozzle diameter: 3 mm).
- Apply silicone sealing compound, as shown, to clean oil pan sealing surface. Sealant bead must be:
 - 2 to 3 mm thick
 - Run along inner side of bolt holes - **arrows** -.

NOTE:

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

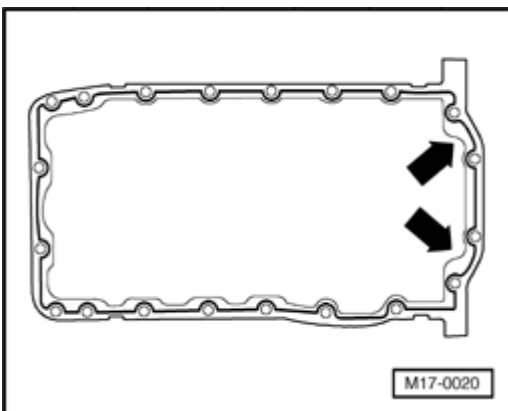


Fig. 118: Applying Sealant To Inside Path Of Bolt Holes
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Apply silicone sealant bead carefully as shown to areas marked by arrows. (Illustration shows position of sealant bead on cylinder block).

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Install oil pan immediately and tighten all oil pan bolts lightly.

NOTE:

- **The oil pan must be flush with the cylinder block.**

- Tighten oil pan bolts to 15 Nm.
- Tighten oil pan/transmission bolts to 45 Nm.

NOTE:

- **Let the sealing compound dry for approx. 30 minutes after installing the oil pan. Only then fill the engine with oil.**

Further assembly is basically the reverse of the disassembly procedure.

Oil pressure and oil pressure switch, checking

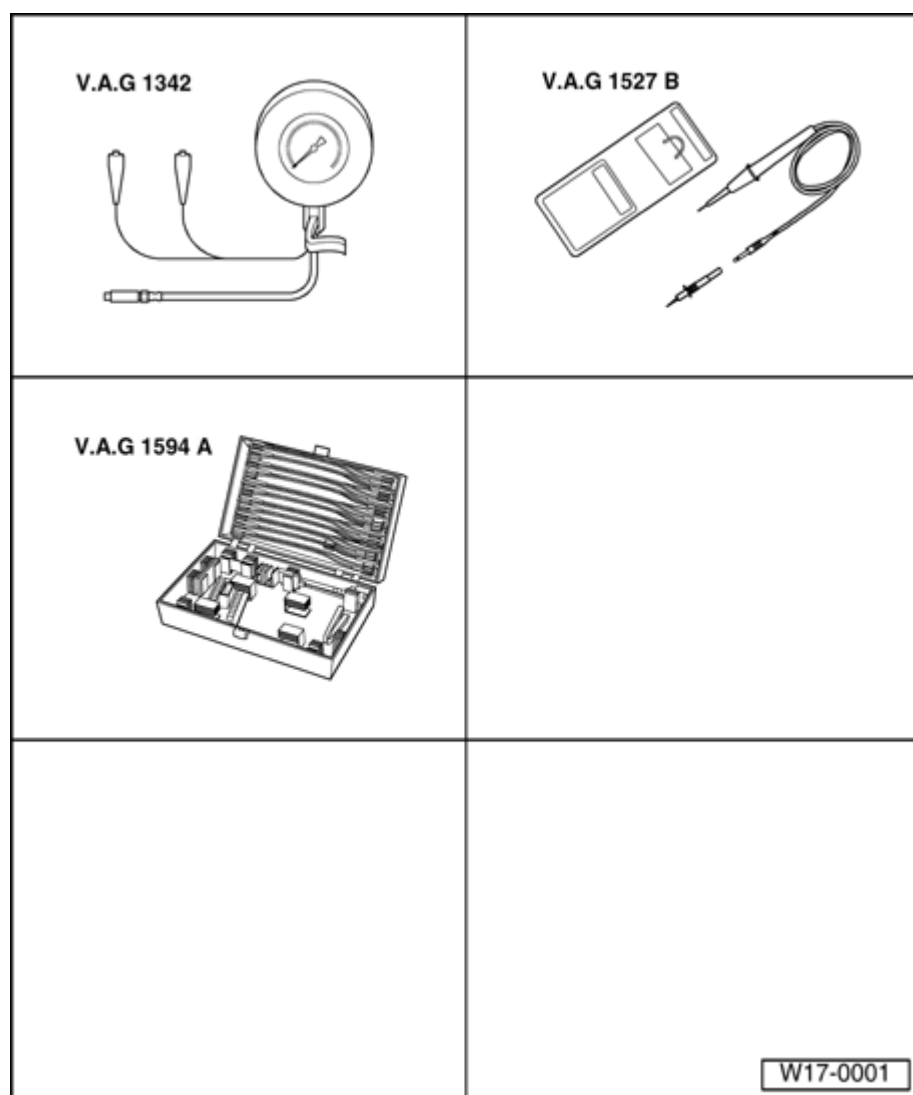


Fig. 119: Identifying Special Tools -- Oil Pressure And Oil Pressure Switch, Checking

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools, testers and auxiliary items required

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

NOTE:

- **Functional check and servicing the optical and acoustic oil pressure warning: Electrical Wiring Diagrams, Troubleshooting Component Locations, Vehicle diagnosis, testing and information system VAS 5051**

Work sequence

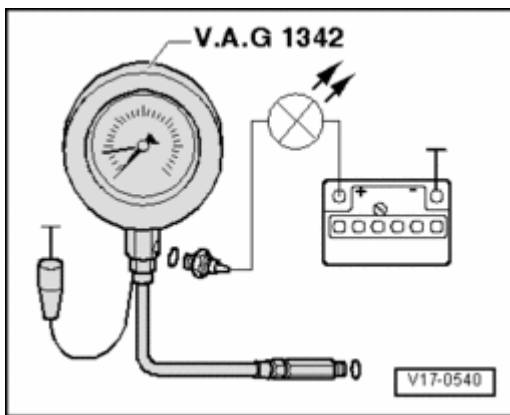


Fig. 120: Identifying V.A.G 1342 Oil Pressure Tester

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove Oil pressure switch -F1- and screw into tester.
- Screw tester into oil filter bracket in place of oil pressure switch.
- Connect brown wire of tester to ground (-).
- Connect diode test lamp V.A.G 1527 B using auxiliary cables V.A.G 1594 A to battery positive (+) and oil pressure switch. LED must not light up.
- Start engine and increase speed slowly.

Oil pressure switch, brown:

- At 0.55 to 0.85 bar LED must light up; otherwise replace oil pressure switch.
- Increase engine speed further. At 2000 rpm and an oil temperature of 80 ° C oil pressure should be at least 2.0 bar.

For higher engine speeds the oil pressure must not exceed 7.0 bar. If necessary replace the oil filter bracket.

Oil pressure switch, gray:

- At 0.75 to 1.05 bar LED must light up; otherwise replace oil pressure switch.
- Increase engine speed further. At 2000 rpm and an oil temperature of 80 ° C oil pressure should be at least 2.0 bar.

For higher engine speeds the oil pressure must not exceed 7.0 bar. If necessary replace oil filter bracket.

19 - ENGINE - COOLING SYSTEM

COOLING SYSTEM COMPONENTS, REMOVING AND INSTALLING

Cooling system components, removing and installing

CAUTION: When doing any repair work, especially in the engine compartment, pay attention to the following due to the cramped conditions:

- Route all the various lines (e.g. for fuel, hydraulics, EVAP system, coolant, refrigerant, brake fluid and vacuum) and electrical wiring in their original positions.
- Ensure that there is sufficient clearance to all moving or hot components.

NOTE:

- When the engine is warm, the cooling system is under pressure. If necessary, release the pressure before beginning repair work.
- Hoses are secured with spring-type clips. In case of repair, only use spring-type clips.
- Assembly tool VAS 5024 or hose clip pliers V.A.G 1921 are recommended for installing spring-type clips.
- When installing coolant hoses, route the hoses stress-free so that they do not come into contact with other components (observe markings on coolant connection and hose).

Check for leaks in cooling system using cooling system tester V.A.G 1274 and adapters V.A.G 1274/8 and V.A.G 1274/9.

Parts of cooling system - body side. Refer to Cooling system components, body side .

Parts of cooling system - engine side. Refer to Cooling system components - engine side .

Coolant hose connection diagram. Refer to Coolant hose connection diagram .

Draining and filling with coolant. Refer to Coolant, draining and filling .

Coolant mixture ratios. Refer to Coolant, draining and filling .

Cooling system components, body side

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

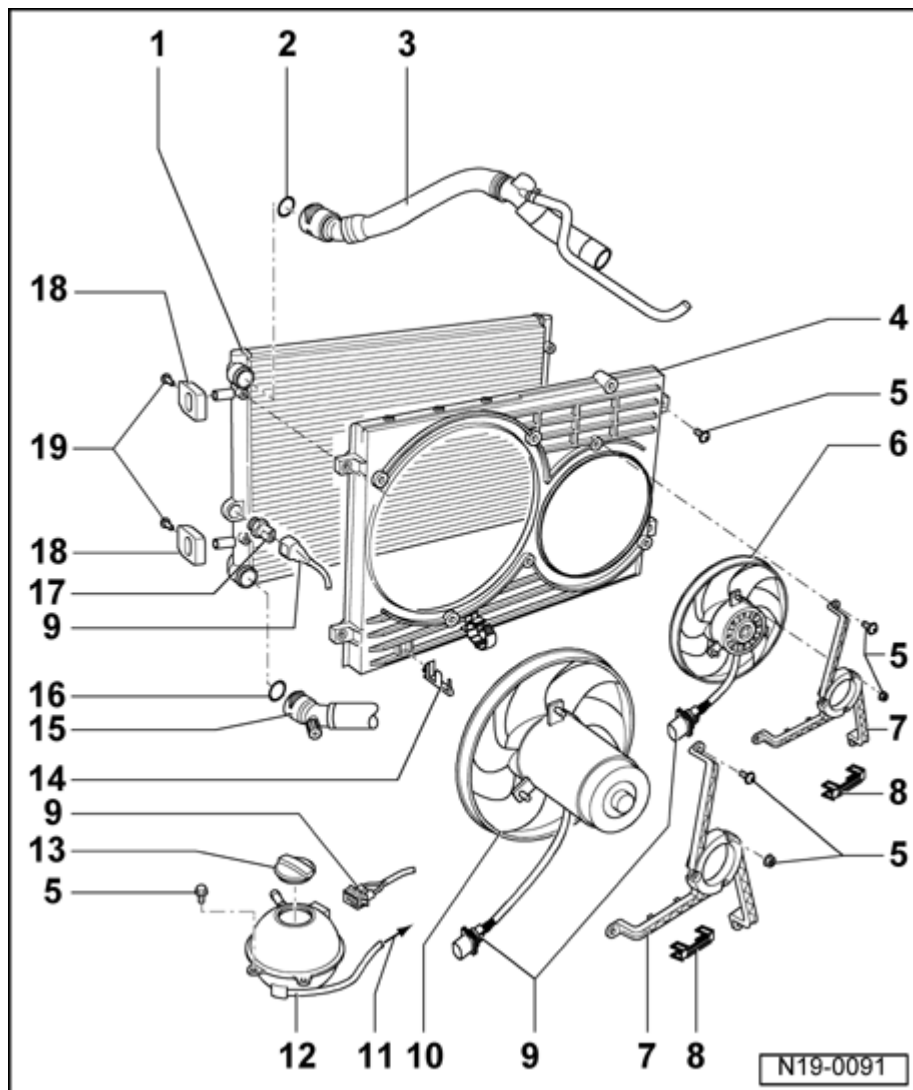


Fig. 121: Exploded View - Cooling System

Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Radiator

- Removing and installing. Refer to **Radiator, removing and installing**
- After replacing, replace entire quantity of coolant

2 - O-ring

- Replace

3 - Upper coolant hose

- Secured to radiator with retaining clip
- Coolant hose connection diagram. Refer to **Coolant hose connection diagram** .

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

4 - Air ducting

5 - 5 Nm

6 - Auxiliary coolant fan

- Only on models with optional equipment

7 - Fan ring

8 - Securing clip

- Check for secure seating

9 - Connector

10 - Coolant fan

11 - To coolant pipe

- Coolant hose connection diagram. Refer to **Coolant hose connection diagram** .

12 - Expansion tank

- Perform leak test of cooling system with cooling system tester V.A.G 1274 and adapter V.A.G 1274/8
- Test pressure: 1.4 to 1.6 bar
- Note markings. Refer to **Coolant, draining and filling** .

13 - Sealing cap

- Check with cooling system tester V.A.G 1274 and adapter V.A.G 1274/9
- Pressure relief valve must open at a pressure of 1.4 to 1.6 bar

14 - Bracket

- For coolant fan connector

15 - Lower coolant hose

- Secured to radiator with retaining clip
- Coolant hose connection diagram. Refer to **Coolant hose connection diagram** .

16 - O-ring

- Replace

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

17 - Coolant Fan Control (FC) thermal switch -F18- , 35 Nm

- For coolant fan
- Switching temperatures:
- 1st speed on: 92 to 97 ° C, off: 84 to 91 ° C
- 2nd speed on: 99 to 105 ° C, off: 91 to 98 ° C

18 - Bracket

- For radiator
- Note installed position
- Note various versions

19 - 5 Nm

Cooling system components - engine side

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

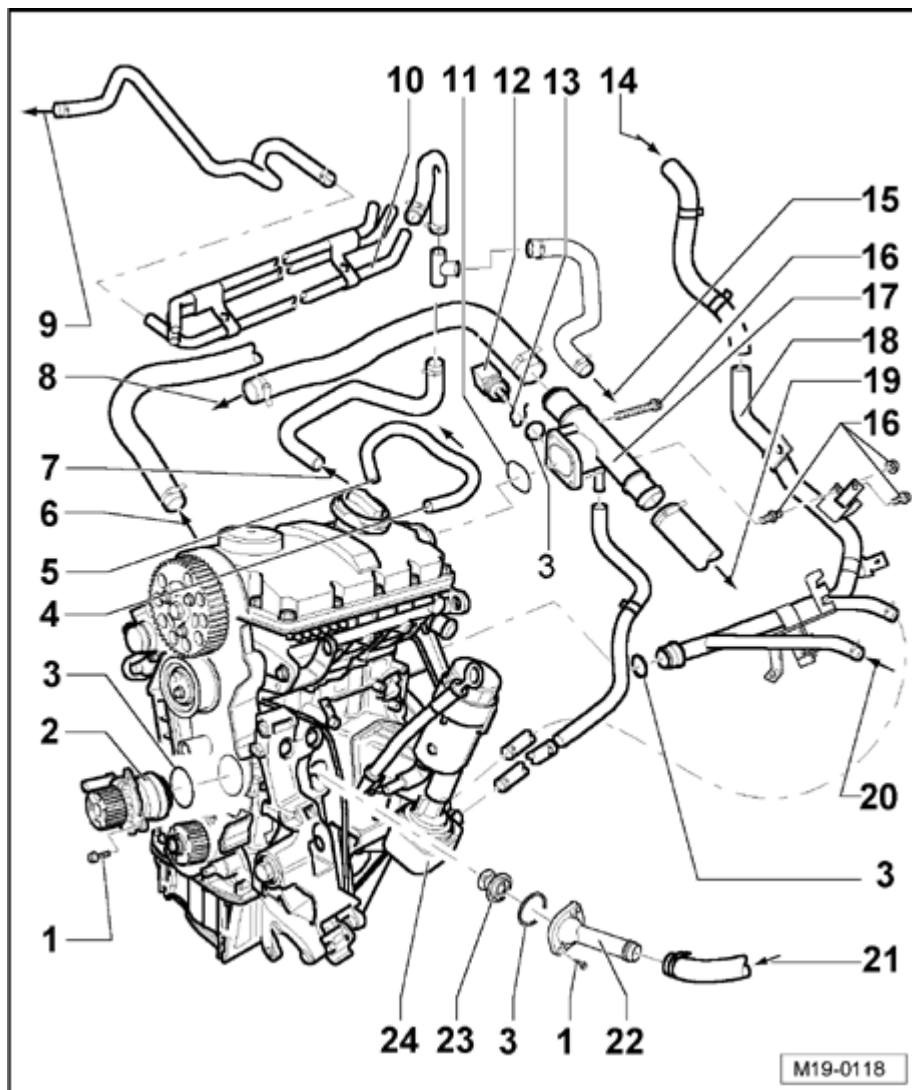


Fig. 122: Exploded View Of Cooling System - Engine Side
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - 15 Nm

2 - Coolant pump

- Check for ease of movement.
- Note installation position.
- Removing and installing. Refer to **Coolant pump, removing and installing**.

3 - O-ring

- Replace

4 - From cylinder head

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

5 - To bypass flap

6 - From Exhaust Gas Recirculation (EGR) cooler

- To heat exchanger

7 - From bypass flap

- To Exhaust Gas Recirculation (EGR) cooler

8 - To Exhaust Gas Recirculation (EGR) cooler

9 - To top of expansion tank

- Coolant hose connection diagram. Refer to **Coolant hose connection diagram** .

10 - Upper coolant pipe

- Bolted to cylinder head cover
- As a unit with fuel lines
- Coolant hose connection diagram. Refer to **Coolant hose connection diagram** .

11 - O-ring

- Replace

12 - Engine Coolant Temperature (ECT) sensor -G62-

- With Engine Coolant Temperature (ECT) sensor -G2-.

13 - Securing clip

- Check for secure seating

14 - From heat exchanger

- Coolant hose connection diagram. Refer to **Coolant hose connection diagram** .

15 - To top of radiator

- Coolant hose connection diagram. Refer to **Coolant hose connection diagram** .

16 - 10 Nm

17 - Connection union

18 - Coolant pipe

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Coolant hose connection diagram. Refer to **Coolant hose connection diagram** .

19 - To top of radiator

- Coolant hose connection diagram. Refer to **Coolant hose connection diagram** .

20 - From bottom of expansion tank

- Coolant hose connection diagram. Refer to **Coolant hose connection diagram** .

21 - From bottom of radiator

- Coolant hose connection diagram. Refer to **Coolant hose connection diagram** .

22 - Connection union

- For thermostat

23 - Thermostat

- Removing and installing. Refer to **Thermostat, removing and installing**
- Observe installation position. Refer to **Thermostat, removing and installing**
- Checking: heat-up thermostat in water.
- Opening begins: approx. 85 ° C
- Ends: approx. 105 ° C
- Opening lift: min. 7 mm

24 - Oil cooler

Coolant hose connection diagram

Vehicles with manual transmission

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

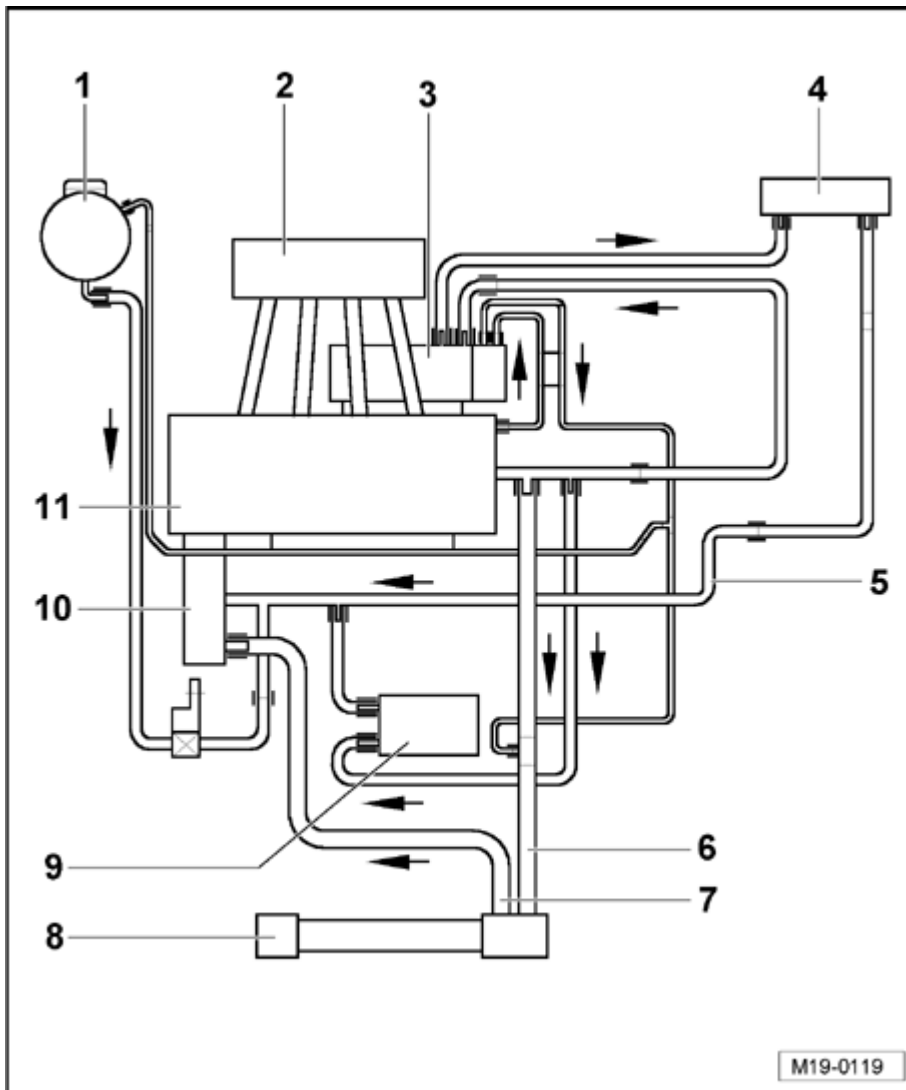


Fig. 123: Coolant Hose Connection Diagram - Manual Transmission
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- 1 - Expansion tank
- 2 - Intake manifold
- 3 - Radiator
 - For exhaust gas recirculation
- 4 - Heater unit heat exchanger
- 5 - Coolant pipe
- 6 - Lower coolant hose

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

7 - Upper coolant hose

8 - Radiator

9 - Oil cooler

10 - Coolant pump/thermostat

11 - Cylinder head/cylinder block

Vehicles with automatic transmission

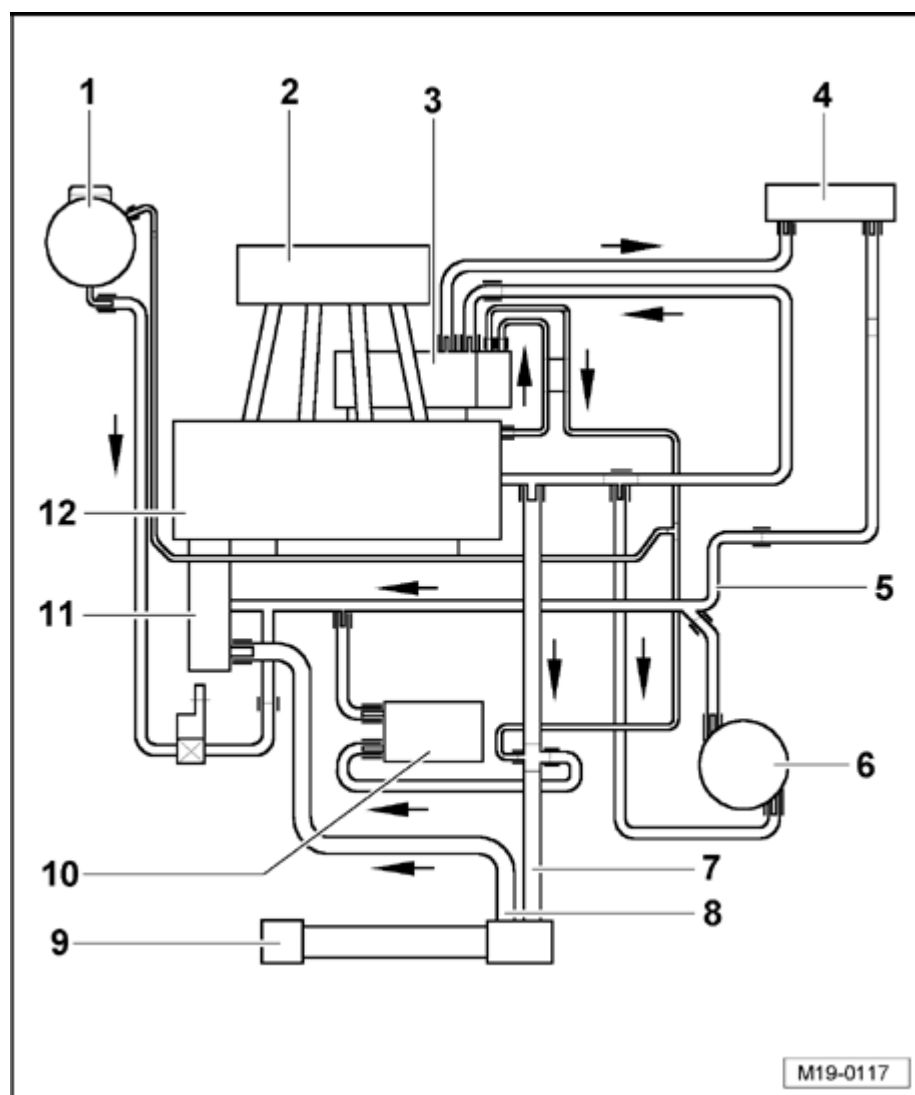


Fig. 124: Coolant Hose Connection Diagram - Automatic Transmission
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Expansion tank

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

2 - Intake manifold

3 - Radiator

- For exhaust gas recirculation

4 - Heater unit heat exchanger

5 - Coolant pipe

6 - Transmission oil cooler

7 - Upper coolant hose

8 - Lower coolant hose

9 - Radiator

10 - Oil cooler

11 - Coolant pump/thermostat

12 - Cylinder head/cylinder block

Coolant, draining and filling

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

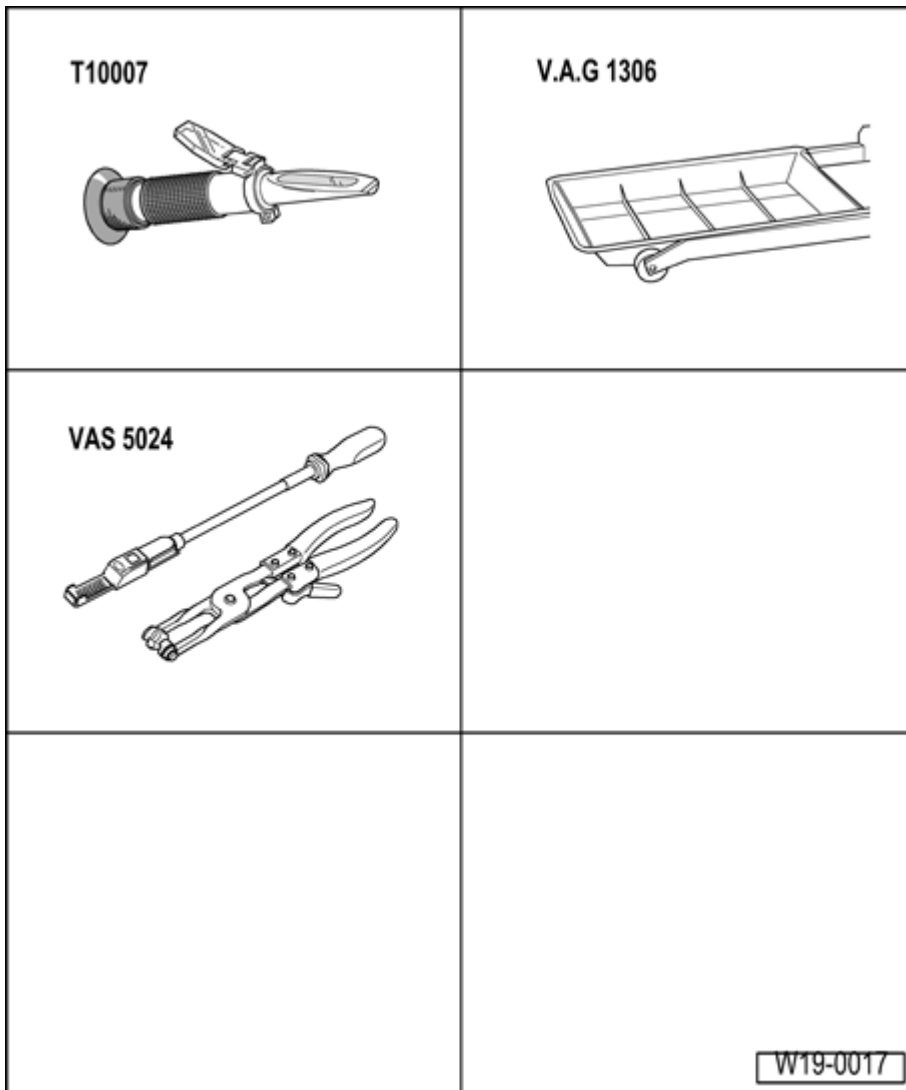


Fig. 125: Special Tools - Coolant, Draining And Filling
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools, testers and auxiliary items required

- Refractometer T10007
- Drip tray V.A.G 1306
- Spring-type clip pliers VAS 5024
- Cooling system charging unit VAS 6096

Draining

- Remove cap from coolant expansion tank.

CAUTION: Hot steam may escape when the expansion tank is opened. Place a cloth over the cap and open with caution.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Remove sound insulation: Refer to **50 BODY, FRONT** .

Vehicles with a radiator drain plug

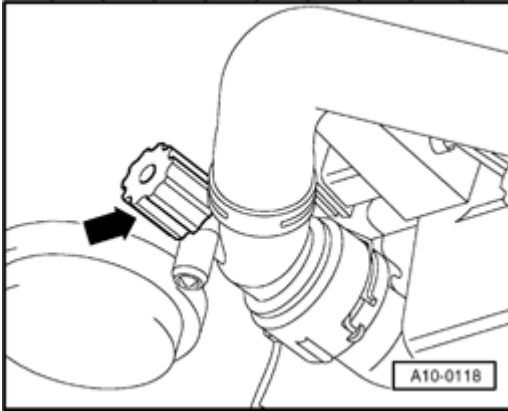


Fig. 126: Identifying Radiator Drain Plug
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove radiator drain plug to drain coolant - **arrow** -.

Vehicles without a radiator drain plug

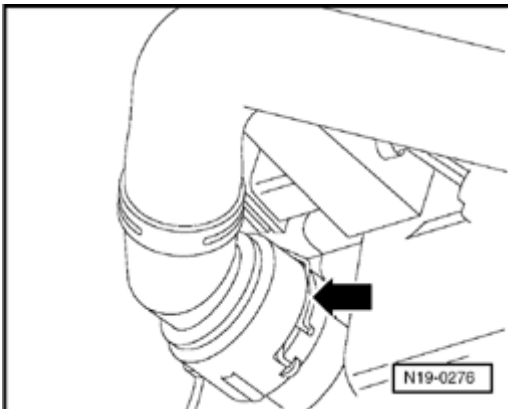


Fig. 127: Identifying Bottom Coolant Hose Retaining Clip
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Pull off bottom coolant hose retaining clip - **arrow** - and remove coolant hose from radiator quick release coupling to drain coolant.

Continuation for all vehicles

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

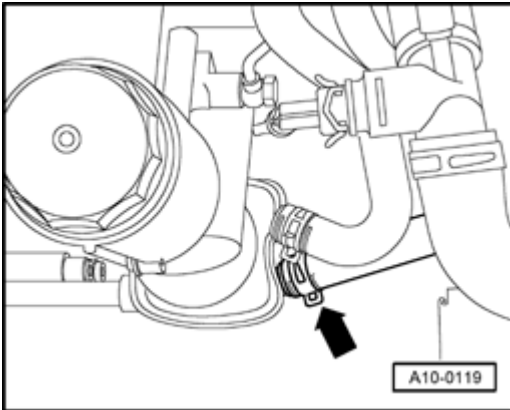


Fig. 128: Identifying Coolant Hose At Oil Cooler

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- To drain coolant from engine also remove coolant hose at oil cooler - **arrow** -.

NOTE:

- **Observe disposal regulations!**

Filling

NOTE:

- Only use coolant additive **G 12** in accordance with TL VW 774 F. Identification characteristic: lilac color.
- **G 12 lilac** (in accordance with TL VW 774 F) can be mixed with the previous coolant additive **G 12 red**.
- **G 12** and coolant additives marked "In accordance with TL VW 774 F" prevent frost and corrosion damage, scaling and also raise the boiling point of the coolant. Therefore, the system must be filled all-year-round with frost and corrosion protection additives.
- Because of its high boiling point, the coolant improves engine reliability under heavy loads, particularly in countries with tropical climates.
- Frost protection is required down to about -25 ° C (in countries with arctic climates: down to about -35 ° C).
- The coolant concentration must not be reduced by adding water even in warmer seasons and in warmer countries. The anti-freeze must be at least 40 % of the mixture.
- Use only clean drinking water for mixing.
- If for climatic reasons greater frost protection is required, the amount of **G 12** can be increased, but only up to 60 % (frost protection to about -40 ° C). Otherwise frost protection and cooling effectiveness are reduced again.

- If radiator, heat exchanger, cylinder head or cylinder head gasket is replaced, do not reuse old coolant.

Recommended mixture proportions:

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

The quantity of coolant can vary according to the vehicle equipment.

Frost protection to	Anti-freeze quantity	G 12	Clean water
-25 ° C -35 ° C	40% 50%	2.4l 3.0l	3.6l 3.0l

Vehicles with a radiator drain plug

- Screw drain plug into radiator.

Vehicles without a radiator drain plug

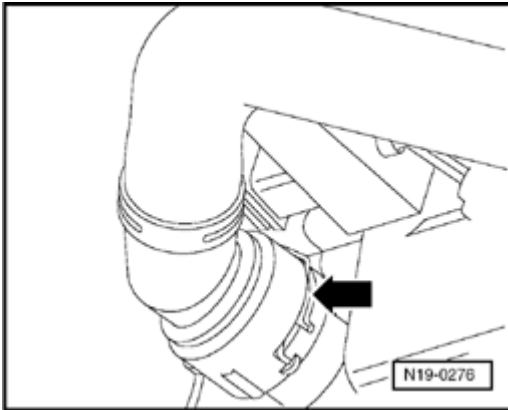


Fig. 129: Identifying Retaining Clip

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Install lower coolant hose and secure with retaining clip - **arrow** -.

Continuation for all vehicles

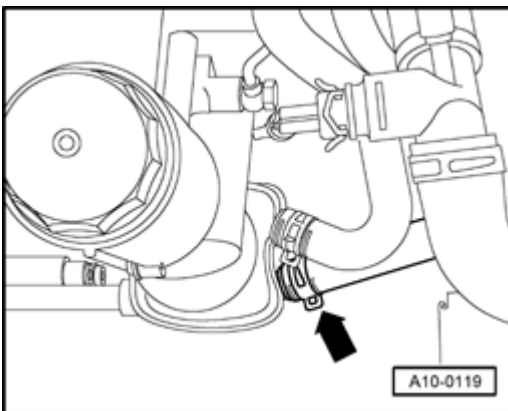


Fig. 130: Identifying Coolant Hose

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Push coolant hose onto oil cooler connection and secure with a spring-type clip.

Filling with charging unit VAS 6096 :

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Fill cooling system using cooling system charging unit VAS 6096. Operating instructions for cooling system charging unit VAS 6096.

Filling without charging unit VAS 6096 :

Vehicles with a Max. mark on expansion tank

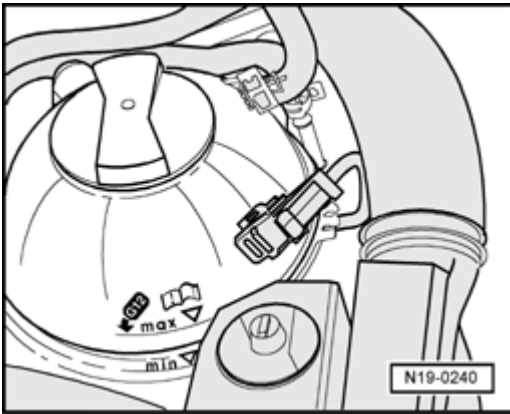


Fig. 131: Identifying Coolant Max. Mark

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Fill with coolant up to Max. mark on expansion tank.
- Install expansion tank cap.
- Run engine until coolant fan starts.
- Check coolant level and add if necessary. When engine is at normal operating temperature, coolant level must be on Max. mark, when engine is cold, between Min. and Max. marks.

Vehicles without a Max. mark on expansion tank

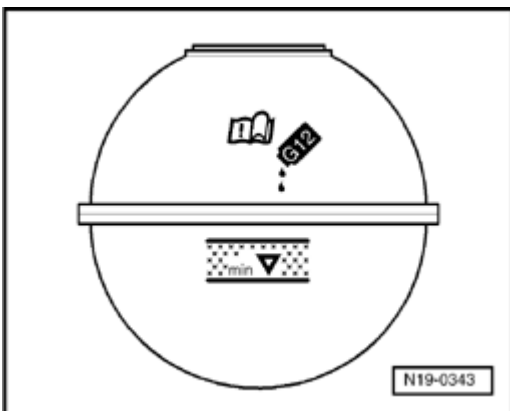


Fig. 132: Identifying Expansion Tank

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Fill with coolant slowly up to upper edge of hatched field on expansion tank.
- Install expansion tank cap.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Run engine until radiator fan cuts in.
- Check coolant level and add if necessary.

When engine is at normal operating temperature the coolant level must lie on upper marking of the hatched field.

When engine is cold the coolant level must lie approx. in middle of hatched field.

Radiator, removing and installing

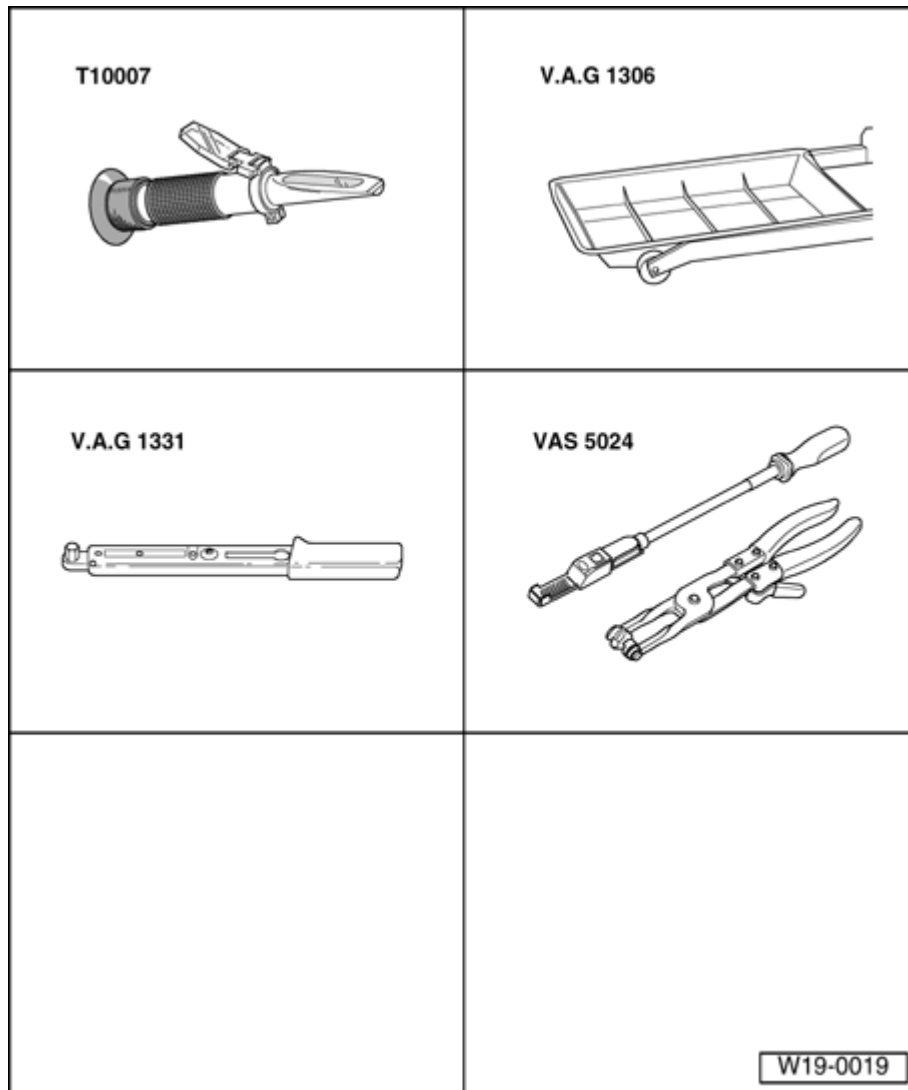


Fig. 133: Special Tools - Radiator, Removing And Installing
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools, testers and auxiliary items required

- Refractometer T10007

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Drip tray V.A.G 1306
- Torque wrench (5...50 Nm) V.A.G 1331
- Spring-type clip pliers VAS 5024

Removing

- Drain coolant. Refer to **Coolant, draining and filling** .
- Disconnect coolant hoses from radiator.
- Disconnect connectors from thermal switch and coolant fan.
- Remove front bumper: Refer to **63 BUMPER** .
- Bring lock carrier into service position: Refer to **50 BODY, FRONT** .
- Remove radiator securing bolts and take radiator and fan out downward.

Vehicles with air conditioning

CAUTION: The air conditioning system refrigerant circuit must not be opened.

NOTE:

- To prevent damage to condenser and to the refrigerant lines, ensure that the lines and hoses are not stretched, kinked or bent.
- Remove retaining clamp(s) from refrigerant lines.
 - Unbolt condenser from radiator and secure to lock carrier.

Installing

Installation is performed in the reverse order.

Coolant pump, removing and installing

(with engine installed)

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

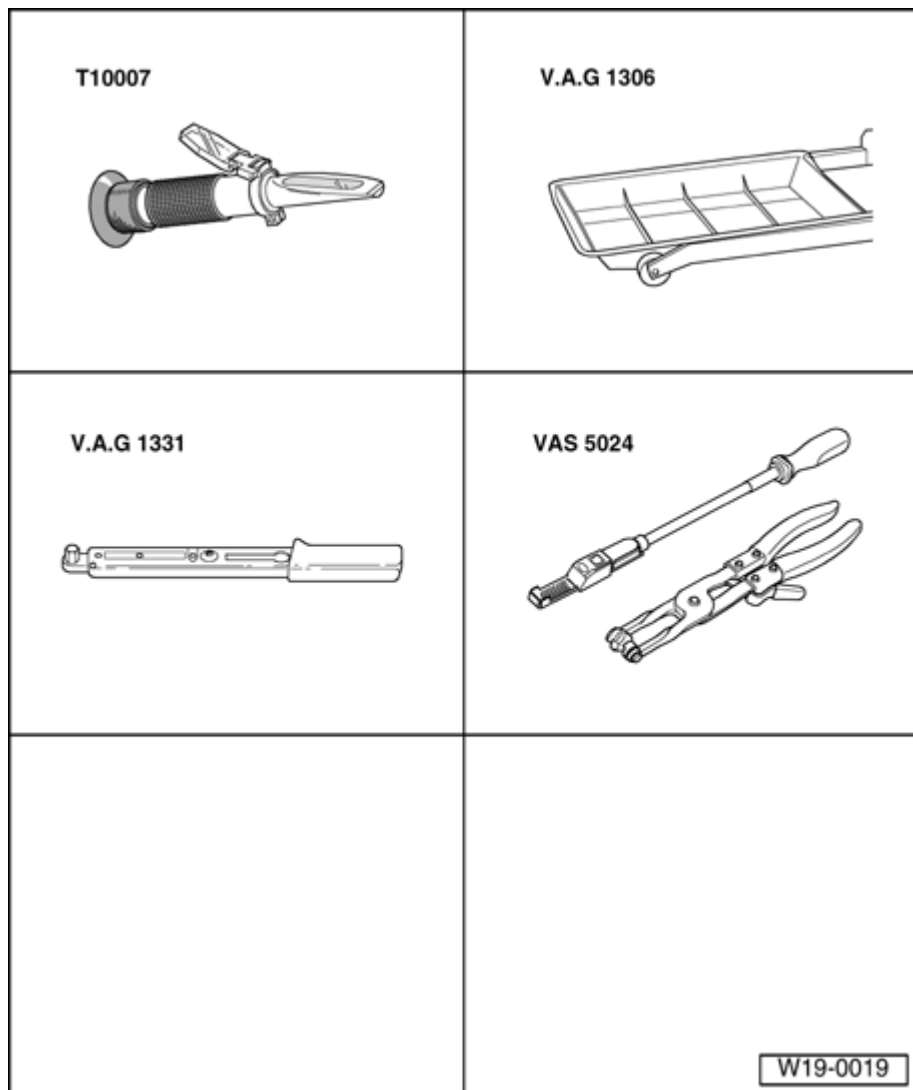


Fig. 134: Special Tools - Coolant Pump, Removing And Installing
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools, testers and auxiliary items required

- Refractometer T10007
- Drip tray V.A.G 1306
- Torque wrench (5 to 50 Nm) V.A.G 1331
- Spring-type clip pliers VAS 5024

Removing

NOTE:

- **Always replace seals and gaskets.**
- **Cover toothed belt with a cloth to protect it from coolant before removing coolant pump.**

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Remove toothed belt. Refer to **Toothed belts, removing, installing and tensioning** .
- Drain coolant. Refer to **Coolant, draining and filling** .

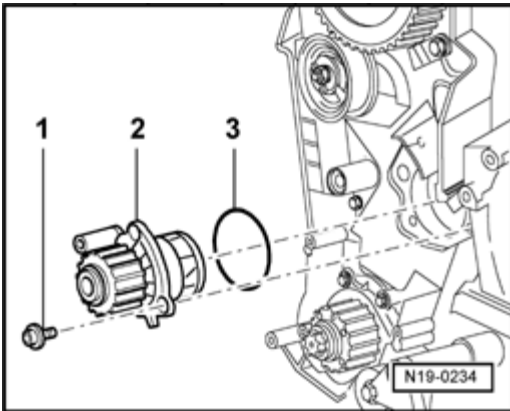


Fig. 135: View Of Coolant Pump And Securing Bolts
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Unscrew coolant pump - 2 - securing bolts - 1 - and carefully remove coolant pump.

Installing

Installation is performed in reverse order. Note the following:

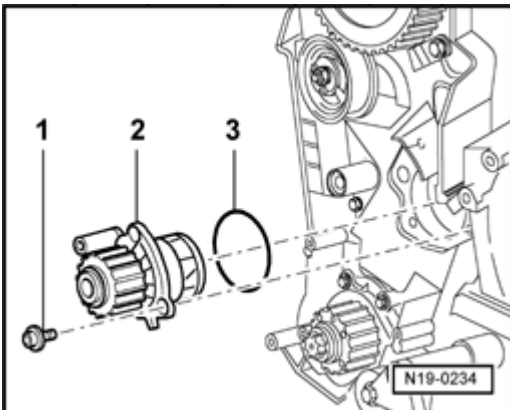


Fig. 136: View Of Coolant Pump And Securing Bolts
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Moisten new O-ring - 3 - with coolant.
- Insert coolant pump - 2 - into cylinder block and tighten securing bolts - 1 -. Tightening torque: 15 Nm

NOTE:

- The coolant pump sealing plug faces downward.

- Install toothed belt and tension. Refer to **Toothed belts, removing, installing and tensioning** .
- Fill with coolant. Refer to **Coolant, draining and filling** .

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

Thermostat, removing and installing

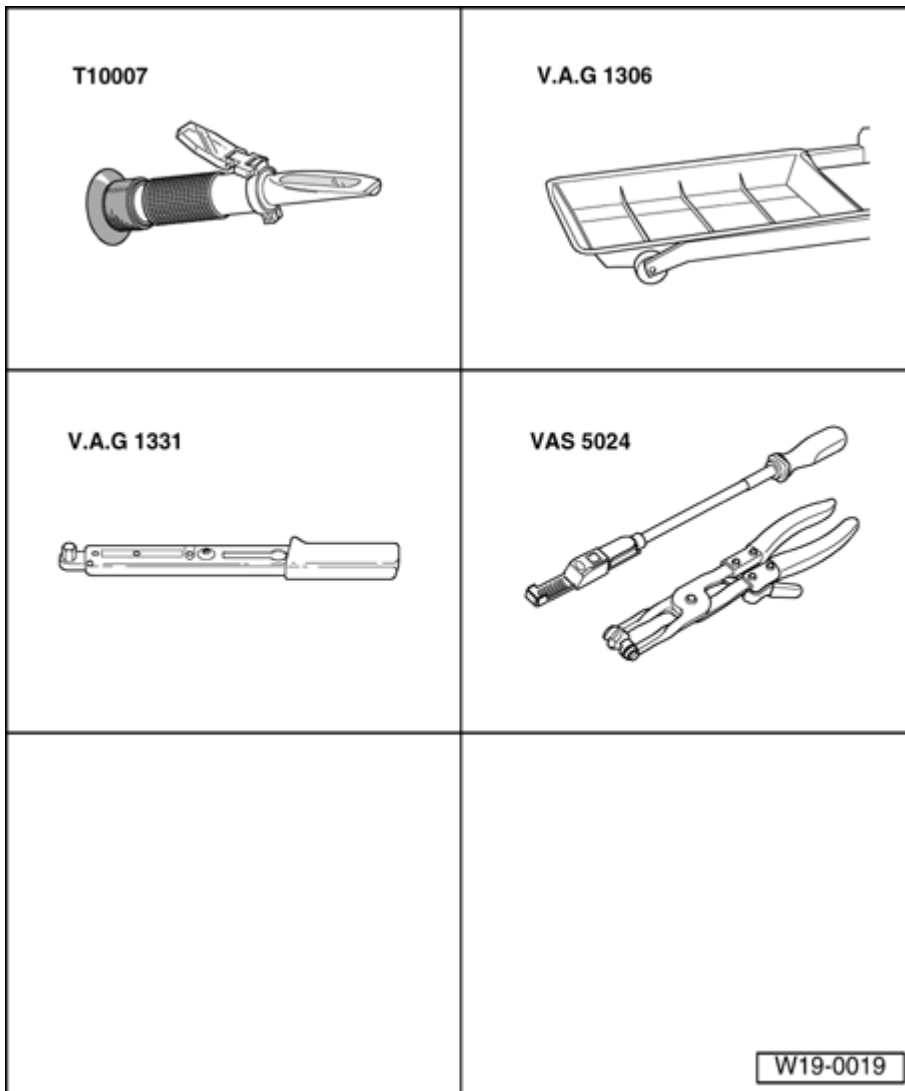


Fig. 137: Special Tools - Thermostat, Removing And Installing
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools, testers and auxiliary items required

- Refractometer T10007
- Drip tray V.A.G 1306
- Torque wrench (5 to 50 Nm) V.A.G 1331
- Spring-type clip pliers VAS 5024

Removing

NOTE: • Always replace seals and gaskets.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Drain coolant. Refer to **Coolant, draining and filling** .
- Pull coolant hose off connecting flange.

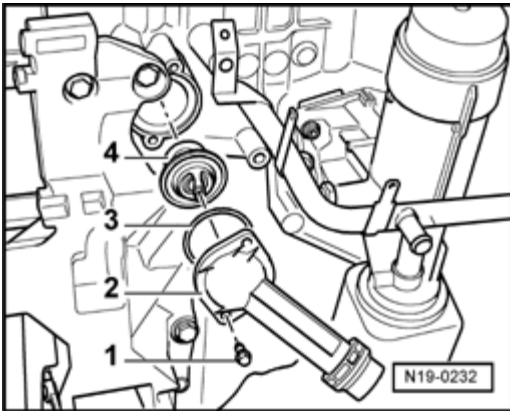


Fig. 138: Identifying Thermostat Housing

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove securing bolts - 1 - of connecting union - 2 - and remove connecting union - 2 - with thermostat - 4 -.
- Turn thermostat - 4 - 14 turn (90 °) to left and take out of connecting union - 2 -.

Installing

Installation is performed in the reverse order. When installing, note the following:

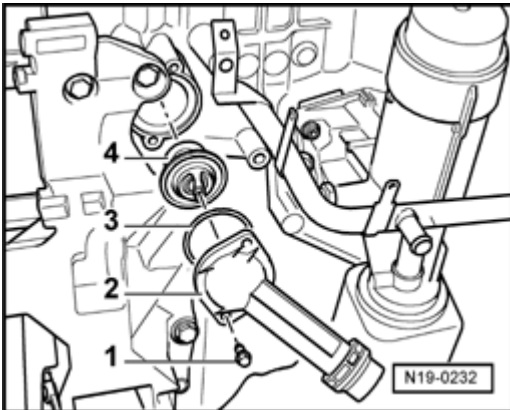


Fig. 139: Identifying Thermostat Housing

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Moisten new O-ring - 3 - with coolant.
- Insert thermostat - 4 - into connecting union - 2 - and turn 14 turn (90 °) to right.

NOTE:

- The brace on the thermostat must be almost vertical.

- Fit connecting union - 2 - with thermostat - 4 - into engine block.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Tighten securing bolts - **1** -. Tightening torque: 15 Nm
- Fill with coolant. Refer to Coolant, draining and filling .

20 - FUEL SUPPLY

COMPONENTS OF FUEL SUPPLY SYSTEM, REMOVING AND INSTALLING

Components of fuel supply system, removing and installing

NOTE:

- Hose connections are secured with either spring-type or clamp-type clips.
- Always replace clamp-type clips with spring-type clips.
- Fuel hoses in engine compartment must be secured only with spring-type clips. The use of clamp or screw-type clips is not permissible.
- Assembly tool VAS 5024 or hose clip pliers V.A.G 1921 are recommended for installing spring-type clips.

Repairing fuel filter. Refer to Fuel filter, servicing .

Observe safety precautions. Refer to Safety precautions when working on fuel supply system .

Observe rules for cleanliness. Refer to Rules for cleanliness .

Repairing accelerator mechanism. Refer to Accelerator mechanism, servicing .

Safety precautions when working on fuel supply system

CAUTION:

- The fuel and the fuel lines in the fuel system can become very hot (danger of scalding)!
- The fuel system is also under pressure! Before opening the system, place cloths around the connection. Then carefully loosen the connection to release the pressure.
- Wear eye and hand protection when performing any type of repair work on the fuel system!

CAUTION: When doing any repair work, especially in the engine compartment, pay attention to the following due to the cramped conditions:

- Route all the various lines (e.g. for fuel, hydraulics, EVAP system, coolant, refrigerant, brake fluid and vacuum) and electrical wiring in their original positions.
- Ensure that there is sufficient clearance to all moving or hot components.

When removing and installing fuel gauge sender or fuel pump (fuel delivery unit) from a full or partly full fuel

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

tank, observe the following:

- Before beginning work, an extraction hose must be placed close to the sender opening in the fuel tank to extract escaping fuel fumes. Switch on an exhaust extraction system. If no exhaust extraction system is available, a radial fan with a displacement greater than 15 m³ /h can be used providing that the motor is not in the air flow.
- Prevent skin contact with fuel! Wear fuel-resistant gloves!

Rules for cleanliness

When working on the fuel supply/injection system, pay careful attention to the following "6 rules" :

- Thoroughly clean all unions and adjacent areas before disconnecting.
- Place removed parts on a clean surface and cover. Do not use fluffy cloths!
- Carefully cover opened components or seal if repairs cannot be performed immediately.
- Only install clean components: Only unpack replacement parts immediately prior to installation. Do not use parts that have not been stored in their packing (e.g. in tool boxes etc.).
- When the system is open: Do not work with compressed air if this can be avoided. Do not move vehicle unless absolutely necessary.
- Also ensure that no diesel fuel contacts the coolant hoses. If necessary hoses must be cleaned immediately. Affected hoses must be replaced.

Fuel tank with attachments

NOTE:

- **After completing repairs on the fuel delivery unit and/or the fuel gauge, ensure that the fuel supply and fuel return lines do not touch the fuel tank (transfer of pump noises).**

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

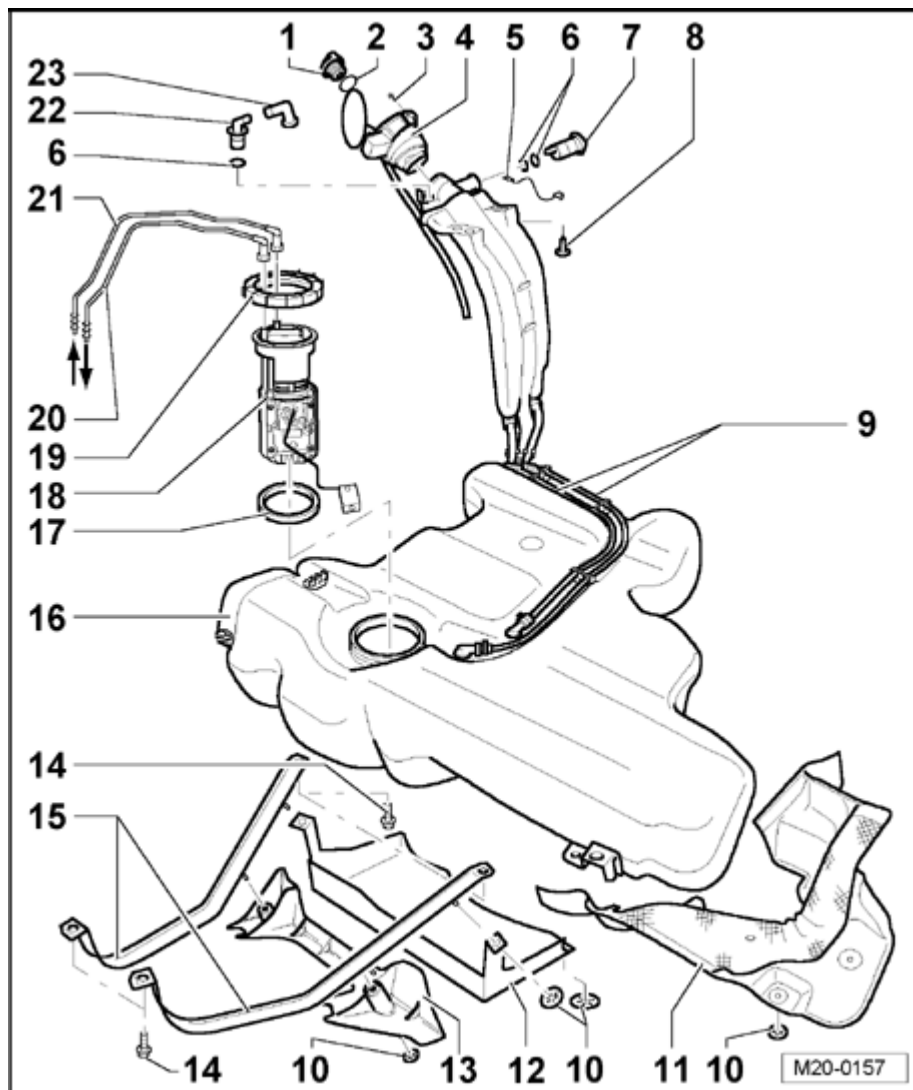


Fig. 140: Exploded View - Gas Tank

Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Sealing cap

- With securing clip

2 - Seal

- Replace if damaged

3 - Securing bolt

4 - Tank flap unit

- With rubber cup and overflow hose
- When installing: Push overflow hose behind filler neck and ensure it is not kinked

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

5 - Ground connection

- Check for secure seating

6 - O-ring

- Replace if damaged.

7 - Breather valve

- To remove valve unclip sideways out of support
- Before installing remove sealing cap
- Checking

8 - 10 Nm

9 - Breather line

- Clipped onto top of fuel tank
- Check for secure seating
- Secure with spring-type clips

10 - Clamping washer

11 - Heat shield

- For fuel tank

12 - Fuel tank cover

- Not installed on Jetta Wagon

13 - Fuel tank cover

14 - 25 Nm

15 - Securing strap

- Note differing lengths

16 - Fuel tank

- Support with engine/transmission jack V.A.G 1383 A when removing
- Removing and installing. Refer to **Fuel tank, removing and installing**

17 - Seal

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Replace if damaged
- When installing, insert seal "dry" into fuel tank opening
- Moisten with fuel only when installing flange

18 - Fuel delivery unit

- Note installed position of flange on fuel tank
- Removing and installing. Refer to **Fuel delivery unit, removing and installing**
- Checking fuel pump. Refer to **Fuel pump, checking**
- With fuel gauge sender - **G** -
- Removing and installing fuel gauge sender. Refer to **Fuel gauge sender, removing and installing**
- Clean strainer if soiled

19 - Union nut

- Remove and install using wrench 3217

20 - Supply line

- Black
- Clipped onto fuel tank
- Check for secure seating
- Press release button on connecting piece to pull off flange

21 - Return hose

- From fuel cooler
- To connection "R"
- Blue or with blue marking
- Clipped onto fuel tank
- Check for secure seating
- Press release button on connecting piece to pull off flange

22 - Gravity/overflow valve

- To remove valve unclip upward out of support
- Check valve for through-flow, valve vertical: open, valve tilted 45 ° : closed

23 - Angle piece

Installed position of fuel delivery unit flange

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

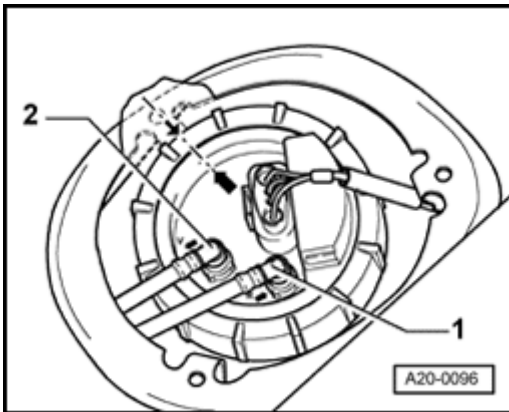


Fig. 141: Installed Position Of Flange Of Fuel Delivery Unit
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Installed position of fuel delivery unit flange

Mark on flange must align with mark on fuel tank - **arrows** -.

Return line "1" (blue or with blue marking) to connection marked "R".

Black supply pipe "2" to connection marked "V".

NOTE:

- After installing fuel delivery unit flange, check that the supply, return and breather lines are still clipped onto the fuel tank.

Checking breather valve

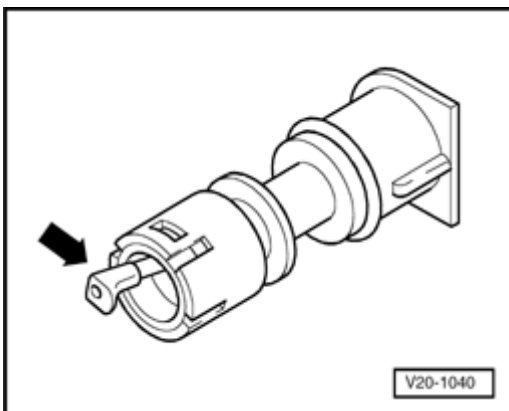


Fig. 142: Checking Breather Valve
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Checking breather valve

Lever in rest position: Closed

Lever pushed in direction of arrow: Open

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

NOTE: • Before installing breather valve, unscrew filler cap from fuel tank.

Fuel filter, servicing

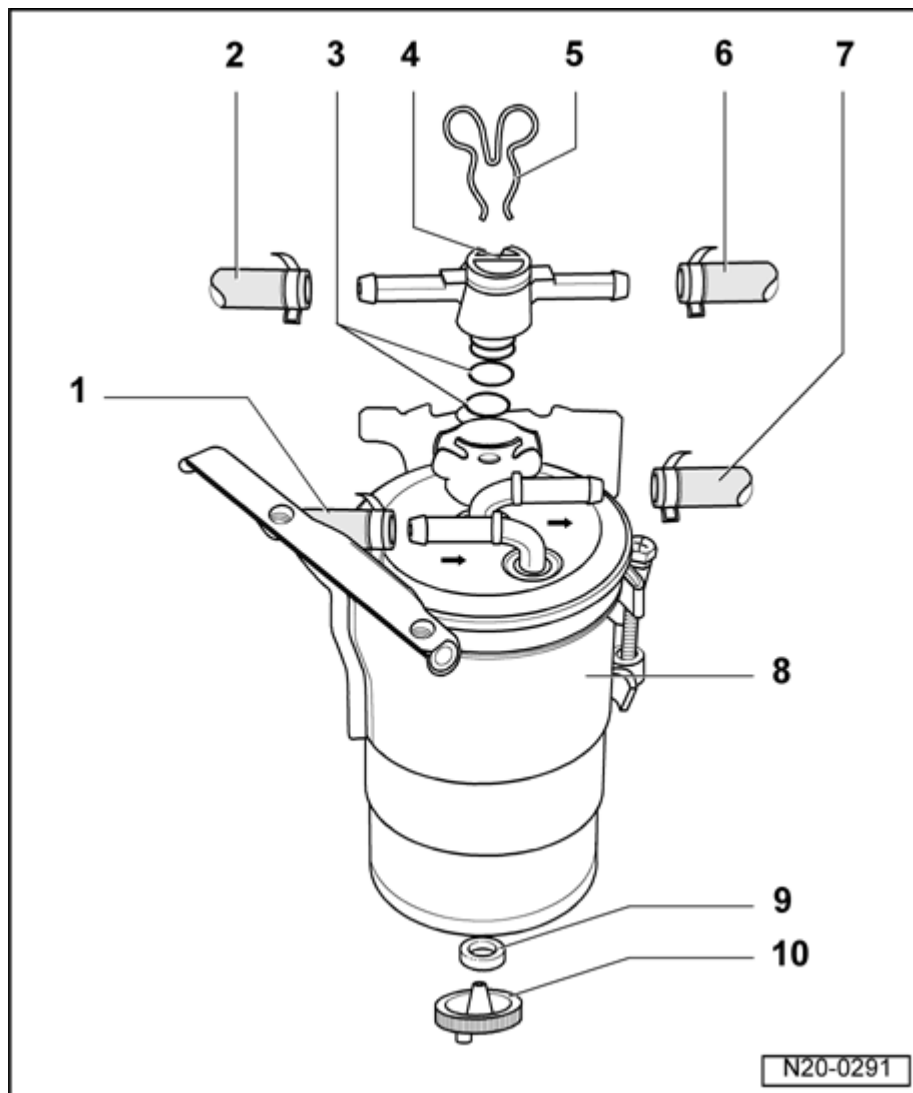


Fig. 143: Exploded View - Fuel Filter

Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Supply line

- From fuel tank
- White or with white marking
- Check for secure seating

2 - Return hose

- To fuel cooler

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Blue or with blue marking
- Check for secure seating

3 - O-ring

- Replace

4 - Regulating valve

- Installed position: Arrow points toward fuel tank
- When changing filter, remove securing clip and take regulating valve off with fuel lines still connected
- Below +15 ° C: Flow to filter open
- Over +31 ° C: Flow to filter closed

5 - Securing clip

- Check for secure seating

6 - Return hose

- Check for secure seating

7 - Supply line

- Check for secure seating

8 - Fuel filter

- Fill with diesel fuel before installing
- Flow direction is marked by arrows
- Do not interchange connections
- Replace if damaged

9 - Seal

- Replace if damaged

10 - Water drain plug

- To bleed, remove securing clip and take regulating valve off complete with fuel lines still connected
- Loosen and allow approx. 100 cm³ fluid to drain

Fuel cooler, removing and installing

Special tools, testers and auxiliary items required

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

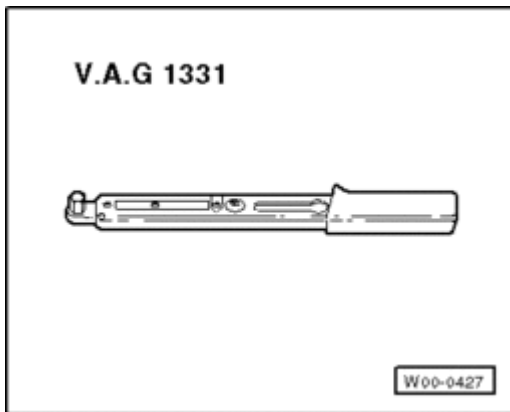


Fig. 144: Special Tool - Torque Wrench V.A.G 1331
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Torque wrench (5...50 Nm) V.A.G 1331

Removing

Observe safety precautions. Refer to Safety precautions when working on fuel supply system .

Observe rules for cleanliness. Refer to Rules for cleanliness .

NOTE:

- The fuel cooler is located in the return line to the fuel tank. It is located on the vehicle underbody.

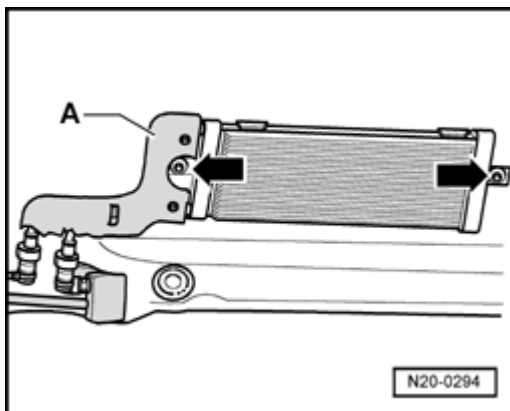


Fig. 145: Identifying Cover
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove cover - **A** -.
- Separate fuel lines at fuel cooler.
- Remove securing nuts - **arrows** -.

Installing

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

Installation is performed in reverse order of removal. Note the following:

- Tighten fuel cooler securing nuts to 20 Nm.

Fuel tank, removing and installing

Special tools, testers and auxiliary items required

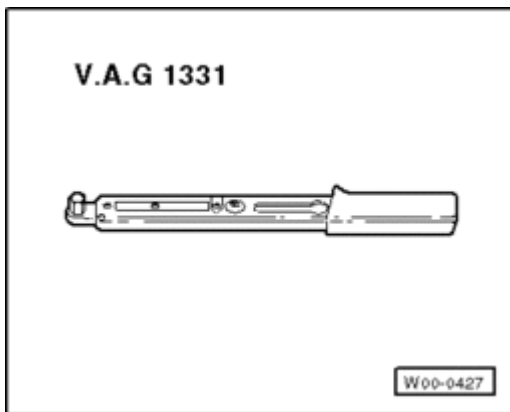


Fig. 146: Special Tool - Torque Wrench V.A.G 1331
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Torque wrench (5...50 Nm) V.A.G 1331

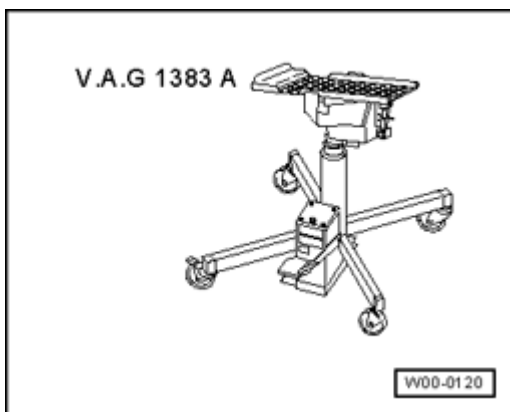


Fig. 147: Engine & Transmission Jack VAG 1383 A
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Engine/transmission jack V.A.G 1383 A

Removing

Observe safety precautions. Refer to **Safety precautions when working on fuel supply system** .

Observe rules for cleanliness. Refer to **Rules for cleanliness** .

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Check whether a coded radio is installed. If so, obtain anti-theft coding.
- Open fuel flap.
- With ignition switched off disconnect battery ground strap.
- Remove rear axle: Refer to **42 REAR SUSPENSION** .
- Remove right rear wheelhousing liner: Refer to **66 EXTERIOR EQUIPMENT** .

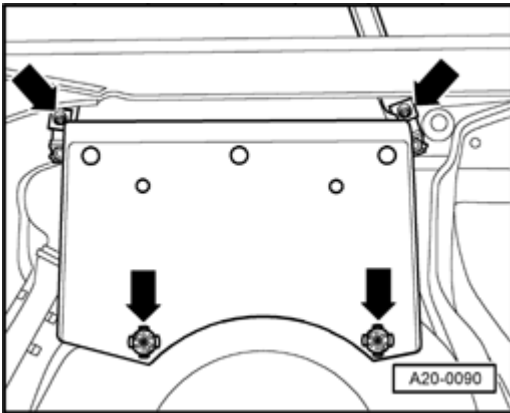


Fig. 148: Identifying Fuel Tank Securing Bolts
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove fuel tank cover.
- Drain fuel tank and clean fuel filler neck and surrounding area.
- Unscrew securing bolt and remove tank flap unit with rubber cup.
- Remove securing bolts on filler neck.
- Fold rear seat bench forward.
- Remove cover plate from fuel gauge sender and disconnect connector from flange.

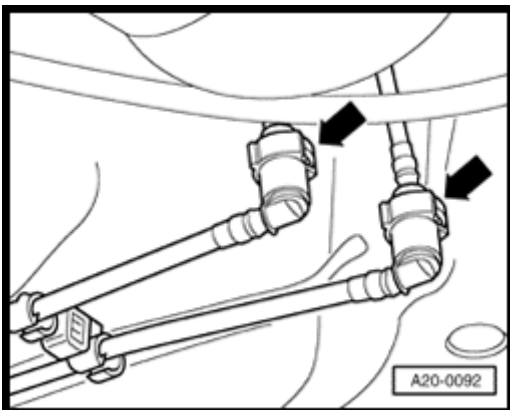


Fig. 149: Identifying Supply And Return Lines
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect supply and return lines on right front of fuel tank.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

CAUTION:

- The fuel and the fuel lines in the fuel system can become very hot (danger of scalding)!
- The fuel system is also under pressure! Before opening the system, place cloths around the connection. Then carefully loosen the connection to release the pressure.
- Wear eye and hand protection when performing any type of repair work on the fuel system!

NOTE:

- Press buttons on hose couplings - arrows - to disconnect fuel line connections.

- Remove tensioning strap. When doing this support fuel tank with engine/transmission jack V.A.G 1383 A.
- Lower fuel tank.

Installing

Installation is performed in reverse order of removal. Note the following:

- Install breather and fuel hoses free of kinks.
- Ensure fuel hoses are tight.
- Do not interchange supply and return lines (return line = blue or blue markings, supply line = black).
- Clip supply and return line onto fuel tank.

NOTE:

- After installing fuel gauge sender, check that the supply, return and breather lines are still clipped onto the fuel tank.

Fuel delivery unit, removing and installing

Special tools, testers and auxiliary items required

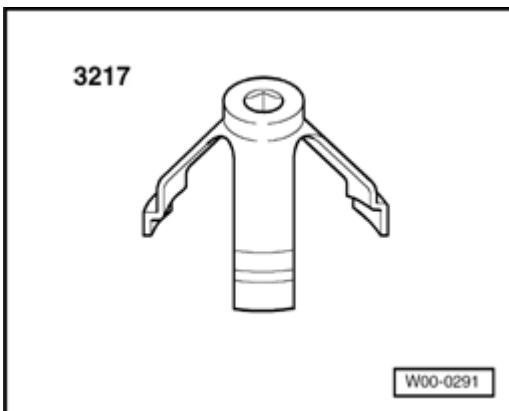


Fig. 150: 3217 Ring Nut Spanner

Courtesy of VOLKSWAGEN UNITED STATES, INC.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Spanner for union nut 3217

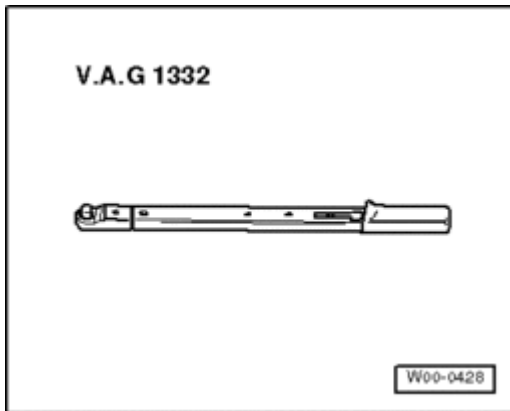


Fig. 151: Torque Wrench V.A.G. 1332 (40 To 200 Nm)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Torque wrench (40...200 Nm) V.A.G 1332

Removing

Observe safety precautions. Refer to **Safety precautions when working on fuel supply system** .

Observe rules for cleanliness. Refer to **Rules for cleanliness** .

- Check whether a coded radio is installed. If so, obtain anti-theft coding.
- With ignition switched off disconnect battery ground strap.
- Fold rear seat bench forward.
- Remove cover from fuel delivery unit.
- Pull 4-pin connector as well as supply and return lines off flange.

CAUTION:

- The fuel and the fuel lines in the fuel system can become very hot (danger of scalding)!
- The fuel system is also under pressure! Before opening the system, place cloths around the connection. Then carefully loosen the connection to release the pressure!
- Wear eye and hand protection when performing any type of repair work on the fuel system!

NOTE:

- Press buttons on hose couplings to disconnect fuel line connections.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

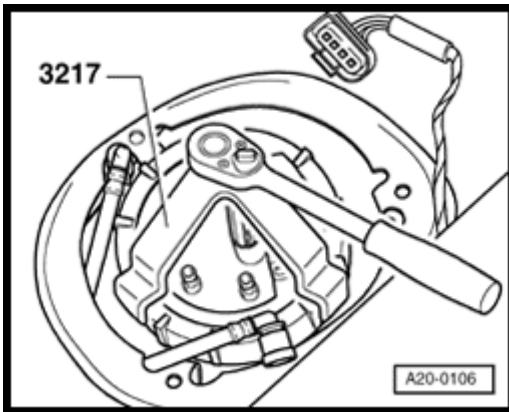


Fig. 152: Removing/Installing Union Nut With Wrench 3217
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove union nut with spanner 3217.
- Pull fuel delivery unit and seal out of opening in fuel tank.

NOTE:

- If the delivery unit is to be replaced then drain old delivery unit before disposal.

Installing

Installation of the fuel delivery unit is performed in the reverse order.

NOTE:

- Do not bend the fuel sender when installing.
- Insert seal for flange or fuel delivery unit dry into opening of fuel tank.
- Moisten seal with fuel only when installing flange or fuel delivery unit.
- Ensure fuel hoses are tight.
- After installing fuel delivery unit, check that the supply, return and breather lines are still clipped onto the fuel tank.

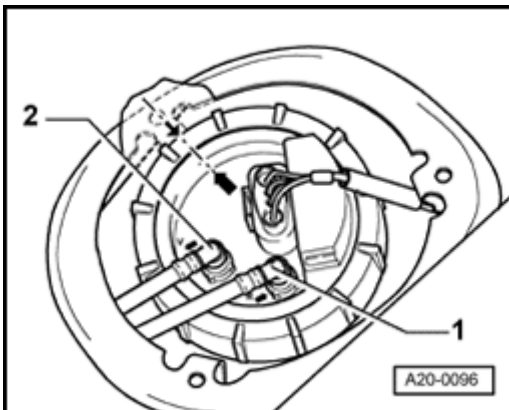


Fig. 153: Installed Position Of Flange Of Fuel Delivery Unit
Courtesy of VOLKSWAGEN UNITED STATES, INC.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

NOTE:

- Note installed position of fuel delivery unit flange: Marking on flange must align with the marking on fuel tank - arrows -.

Fuel gauge sender, removing and installing

Removing

- Remove fuel delivery unit. Refer to **Fuel delivery unit, removing and installing**.

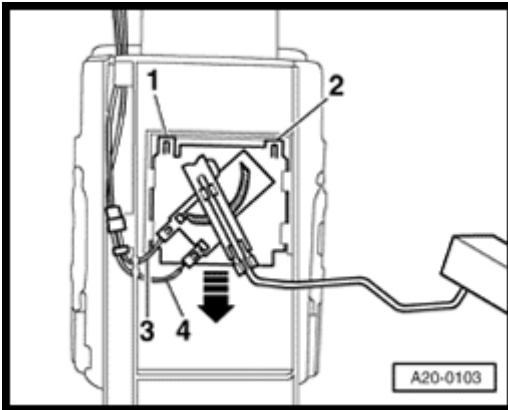


Fig. 154: Fuel Gauge Sender Connectors & Retaining Tabs (Engine Codes AEG, AVH, AZG, BEV)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Release line connector lugs - 3 - and - 4 - and pull off.
- Lift up retaining tabs - 1 - and - 2 - using a screwdriver and pull fuel sender off downward - **arrows** -.

Installing

- Insert fuel gauge sender in guides on fuel delivery unit and push up until it engages.

Fuel pump, checking

Special tools, testers and auxiliary items required

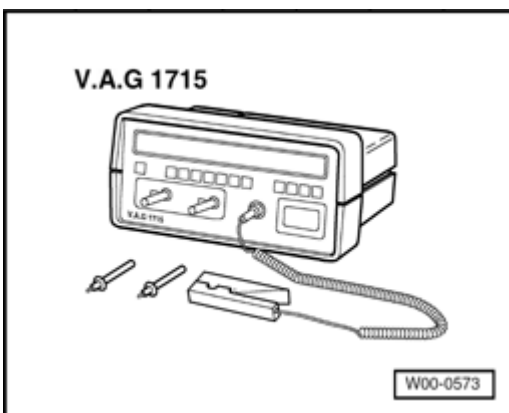


Fig. 155: Special Tool - Multimeter V.A.G 1715

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Multimeter V.A.G 1526 or Multimeter V.A.G 1715
- Adapter set V.A.G 1594 A
- Diode test lamp V.A.G 1527

Requirements

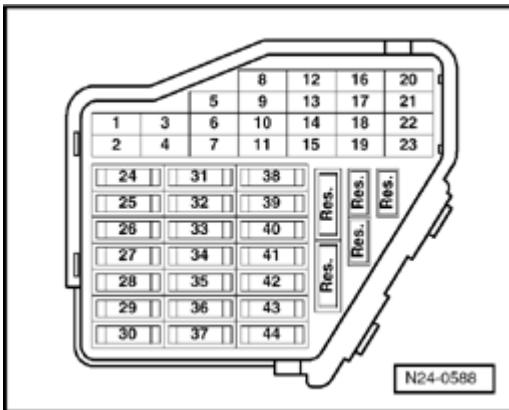


Fig. 156: Identifying Main Fuse Panel

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Fuses must be OK.
- Battery voltage must be at least 11.5 V.
- All electrical consumers, e.g. lights and rear window defogger, must be switched off.

Checking function and voltage supply

- Fold rear seat bench forward.
- Remove cover under bench seat.
- Briefly operate starter. Fuel pump must be heard to run.
- Switch off ignition.

If the fuel pump does not run:

- Disconnect 4-pin connector from fuel delivery unit flange.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

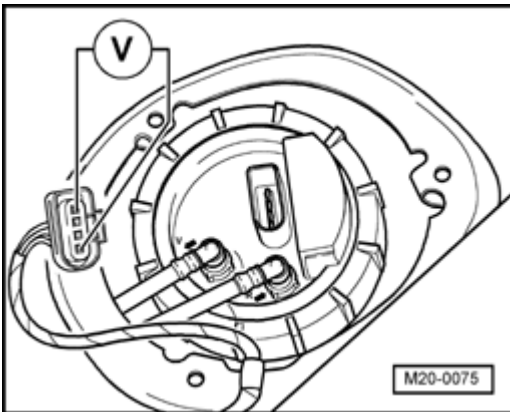


Fig. 157: Identifying Voltage

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect diode test lamp V.A.G 1527 with adapter cables from V.A.G 1594 to outer contacts of connector. LED must light up for approx. 2 seconds.

LED does not light up:

- Check activation of fuel pump relay and wiring for an open or short circuit. Electrical Wiring Diagrams, Troubleshooting Component Locations

LED lights up (voltage supply OK):

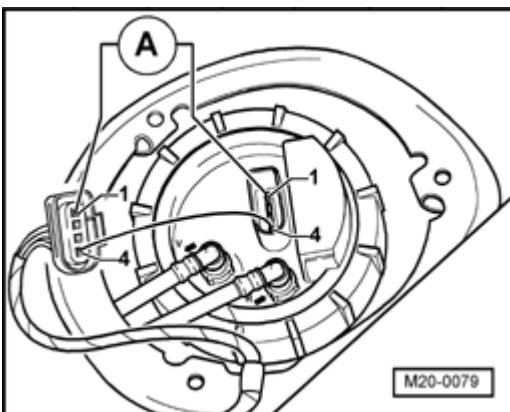
- Remove fuel delivery unit. Refer to **Fuel delivery unit, removing and installing** .
- Check that electrical wiring between flange and fuel pump is connected and has continuity.

If no open circuit can be found:

- Replace fuel delivery unit. Refer to **Fuel delivery unit, removing and installing** .

Checking current consumption of fuel pump

- Disconnect 4-pin connector from fuel delivery unit flange.



2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

Fig. 158: Checking Current Consumption Of Fuel Pump

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Set multimeter measuring range to 20 A and connect multimeter in series between contacts - **1** - of connector and fuel pump using adapter cables from V.A.G 1594 A.

NOTE:

- **The current pick-up clamp from multimeter V.A.G 1715 can also be connected to an adapter cable connected between connector contacts - 1 - and fuel pump.**

- Connect contacts - **4** - of connector and fuel pump using adapter cables from V.A.G 1594 A.
- Start engine and run at idling speed.
- Measure current draw at fuel pump: Specification: 3.5...4.5 amps.

If values measured lie outside specifications:

- Replace fuel delivery unit. Refer to **Fuel delivery unit, removing and installing** .

Accelerator mechanism, servicing

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

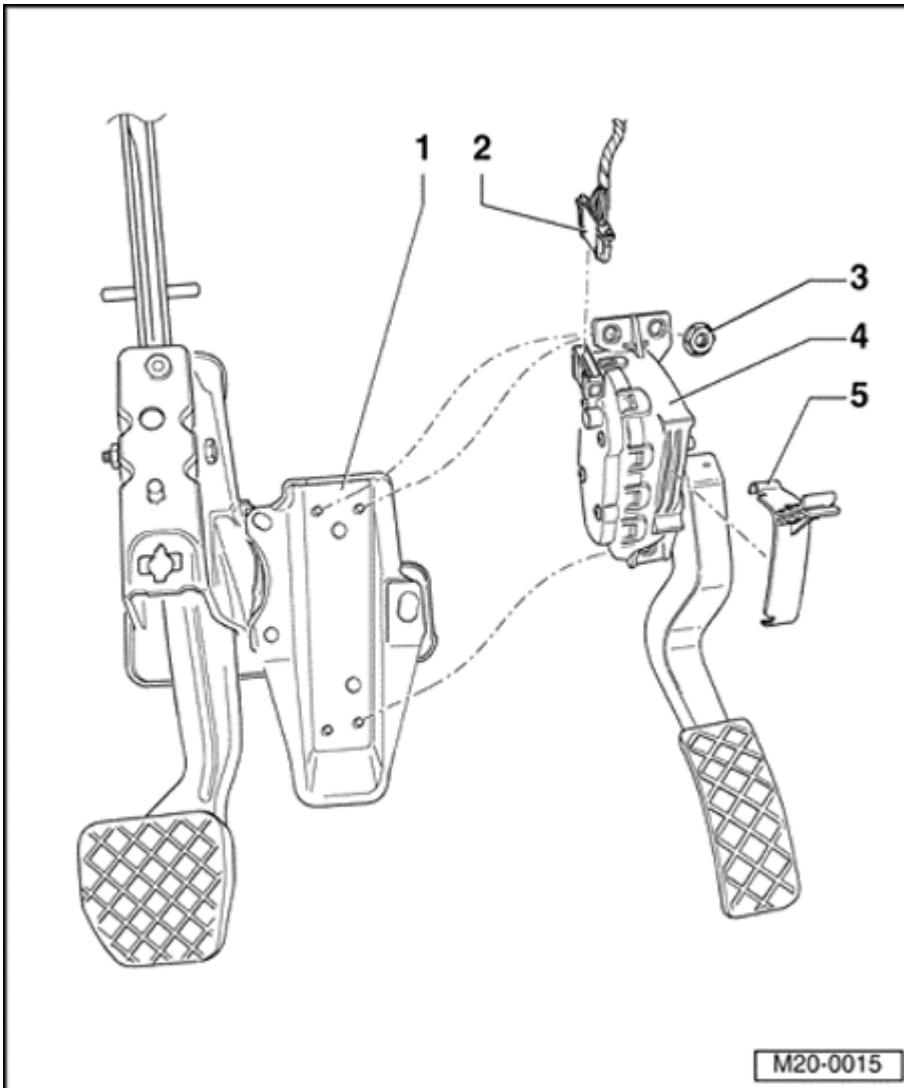


Fig. 159: Exploded View - Accelerator Mechanism
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Mounting bracket

2 - Connector

- Black, 6-pin

3 - 10 Nm

4 - Throttle Position (TP) sensor -G79-

- Cannot be adjusted
- TP sensor passes position of pedal on to engine control module
- Remove footwell cover to remove sensor

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

5 - Bracket

- For footwell cover
- Clipped firmly onto throttle position sensor.

Tandem pump, checking

Special tools, testers and auxiliary items required

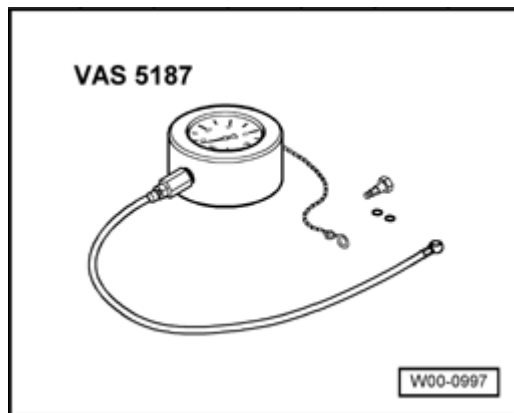


Fig. 160: Special Tool - Pressure Tester VAS 5187
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Pressure tester VAS 5187

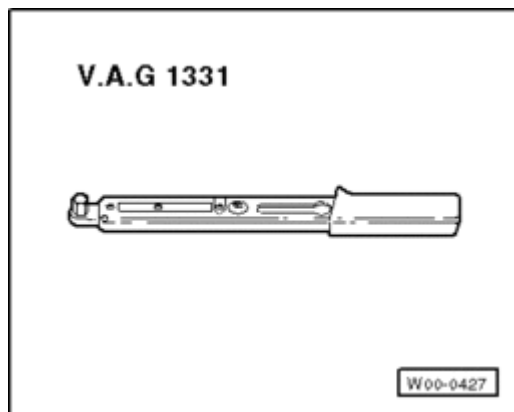


Fig. 161: Special Tool - Torque Wrench V.A.G 1331
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Torque wrench (5...50 Nm) V.A.G 1331
- Vehicle diagnosis, Testing and Information System VAS 5051

Requirements

- Coolant temperature must be at least 85 ° C.
- Unit injectors OK.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

Work sequence

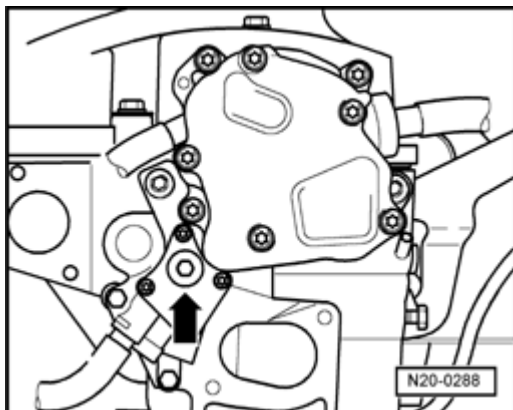


Fig. 162: Identifying Plug

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove plug - arrow -.

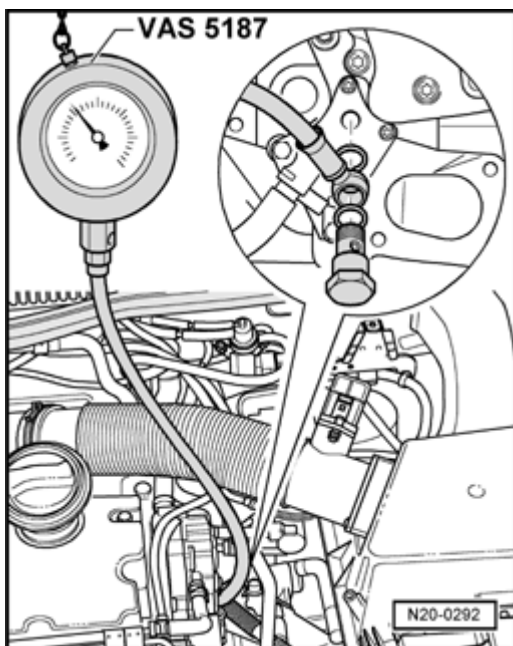


Fig. 163: Identifying - Connect pressure tester VAS 5187

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect pressure tester VAS 5187 as shown.
- Start engine and run at idling speed.
- Connect Vehicle diagnosis, Testing and Information System VAS 5051 and select operating mode "Vehicle self-diagnosis". Then select engine control module with Address word "01".
- Press diagnosis function "08-Read measured value block".
- Enter display group "2" using number block and confirm entry with Q key.
- Read engine idling speed in display zone 1.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Increase engine speed to 1500 rpm.
- Observe pressure indicated on pressure gauge. Specification: min. 3.5 bar
- Press <-- key.
- Press function "06-End output".
- Switch off ignition.

If the specification is not obtained:

- Replace tandem pump. Refer to **Tandem pump, removing and installing**

NOTE:

- **After removing pressure tester, tighten plug to 25 Nm. Always replace seal.**

Tandem pump, removing and installing

CAUTION:

- **The fuel and the fuel lines in the fuel system can become very hot (danger of scalding)!**
- **The fuel system is also under pressure! Before opening the system, place cloths around the connection. Then carefully loosen the connection to release the pressure.**
- **Wear eye and hand protection when performing any type of repair work on the fuel system!**

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

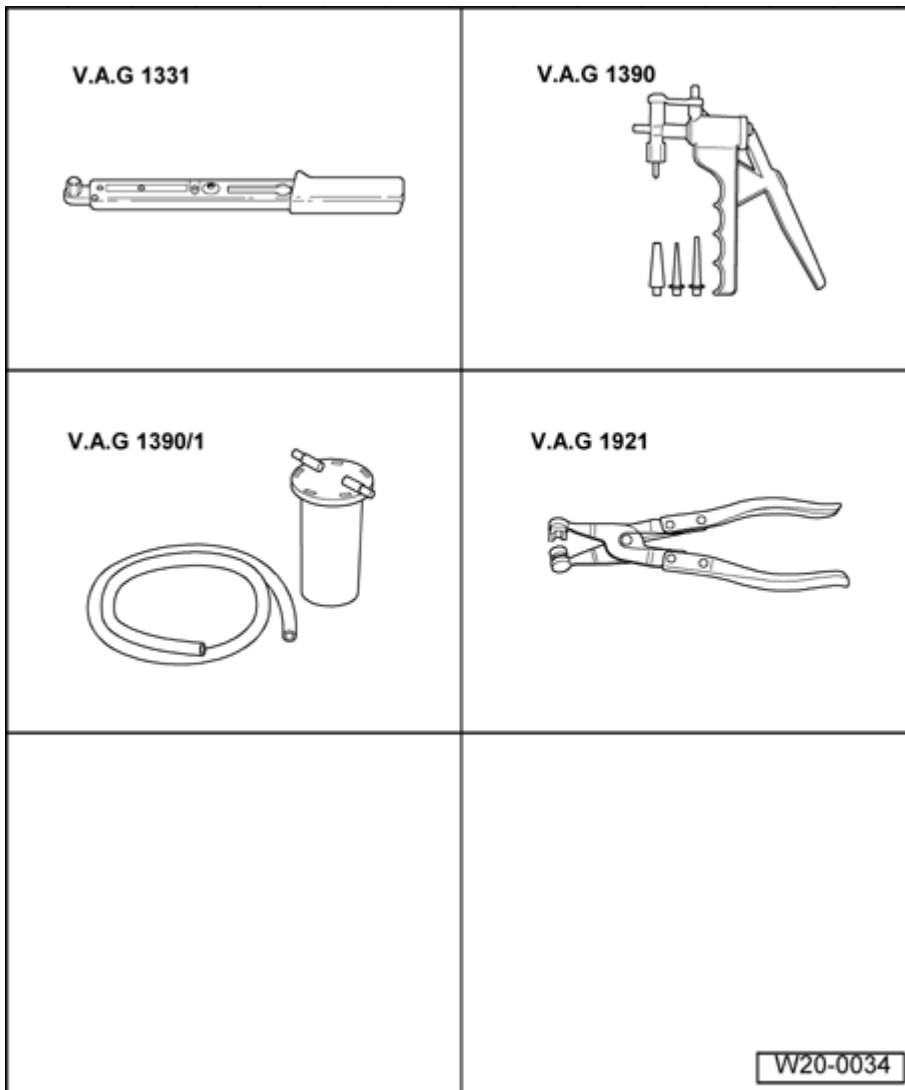


Fig. 164: Special Tools - Tandem Pump, Removing And Installing
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools, testers and auxiliary items required

- Torque wrench (5...50 Nm) V.A.G 1331
- Hand vacuum pump V.A.G 1390
- Bleed container V.A.G 1390/1
- Spring-type clip pliers V.A.G 1921

Removing

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

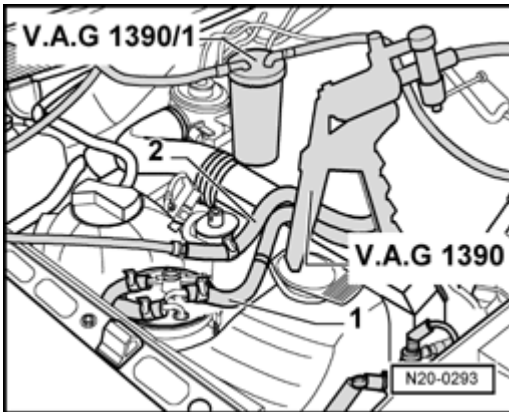


Fig. 165: Identifying V.A.G 1390 And V.A.G 1390/1
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Pull off supply hose - 1 - (white marking) and return hose - 2 - (blue marking) from fuel filter.
- Connect hand vacuum pump V.A.G 1390 with bleed container V.A.G 1390/1 to return hose.
- Operate hand vacuum pump until no more fuel comes out of return hose. Ensure that no fuel is drawn into hand vacuum pump.

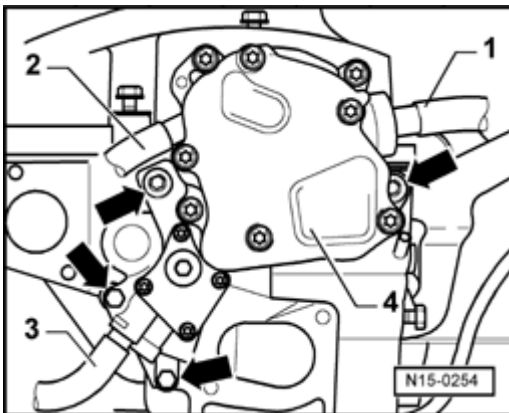


Fig. 166: Identifying Vacuum Hose, Supply Hose, And Return Hose
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Pull vacuum hose - 1 - from brake servo off tandem pump - 4 -.
- Pull supply hose - 2 - (white marking) off tandem pump - 4 -.
- Remove securing bolts - **arrows** -.
- Remove tandem pump - 4 - from cylinder head.
- Pull tandem pump - 4 - slightly upward, pull off return hose - 3 - (blue marking) and remove tandem pump - 4 -.

Installing

Installation is performed in the reverse order. When installing, note the following:

NOTE:

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Ensure proper seating of tandem pump coupling in camshaft.
- Always replace tandem pump seals.

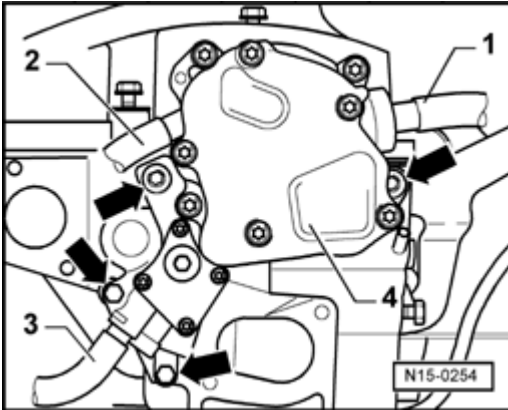


Fig. 167: Identifying Vacuum Hose, Supply Hose, And Return Hose
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect return hose - 3 - (blue marking) to return connection of tandem pump.
- Install tandem pump and tighten upper securing bolts to 20 Nm.
- Tighten lower securing bolts to 10 Nm.
- Connect supply hose - 2 - (white marking) to supply connection of tandem pump and vacuum hose - 1 - from brake servo to tandem pump - 4 -.

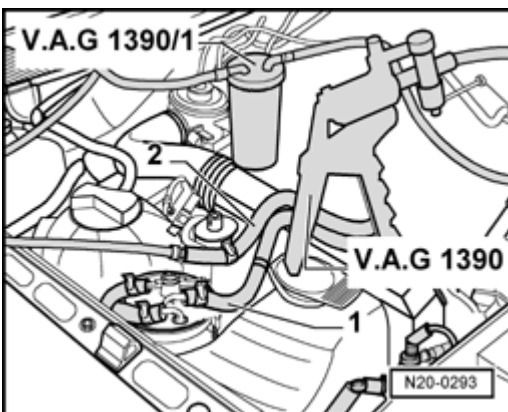


Fig. 168: Identifying V.A.G 1390 And V.A.G 1390/1
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect supply hose - 1 - (white marking) to fuel filter.
- Connect hand vacuum pump V.A.G 1390 with bleed container V.A.G 1390/1 to return hose - 2 - (blue marking) of fuel filter.
- Operate hand vacuum pump until fuel comes out of return hose. Ensure that no fuel is drawn into hand vacuum pump.
- Connect return hose - 2 - (blue marking) to fuel filter.

21 - TURBOCHARGER, G-CHARGER

CHARGE AIR SYSTEM WITH TURBOCHARGER

Safety precautions

CAUTION: When doing any repair work, especially in the engine compartment, pay attention to the following due to the cramped conditions:

- **Route all the various lines (e.g. for fuel, hydraulics, EVAP system, coolant, refrigerant, brake fluid and vacuum) and electrical wiring in their original positions.**
- **Ensure that there is sufficient clearance to all moving or hot components.**

Observe following if test and measuring instruments are required during a test drive:

- Test and measuring instruments must be secured to rear seat and operated by a second person from this location.

If test and measuring instruments are operated from the front passengers seat and the vehicle is involved in an accident, there is a possibility that the person sitting in this seat may receive serious injuries when the airbag is triggered.

Rules for cleanliness

When working on the exhaust gas turbocharger, pay careful attention to the following rules of cleanliness:

- Thoroughly clean all unions and adjacent areas before disconnecting.
- Place removed parts on a clean surface and cover. Do not use fluffy cloths!
- Carefully cover opened components or seal if repairs cannot be carried out immediately.
- Only install clean components: Only unpack replacement parts immediately prior to installation. Do not use parts that have not been stored in their packing (e.g. in tool boxes etc.).
- Existing transport and protective packaging and sealing caps must only be removed immediately prior to installation.
- When repairing remove oil from connections and hose ends.
- When the system is open: Do not work with compressed air if this can be avoided. Do not move the vehicle unless absolutely necessary.

Hose connections with connector couplings

NOTE:

- **All hose connections of the charge air system are secured by spring-type clips or by connector couplings. Always check the following points with connector couplings:**

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

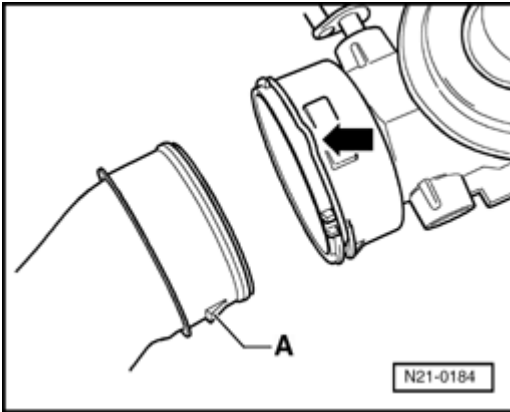


Fig. 169: Identifying Locking Clip

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Release connection by pulling locking clip - **arrow** -.
- Separate hose/line without auxiliary tools.
- When assembling ensure that retaining tabs - **A** - are engaged securely.

Turbocharger with attachments, removing and installing

Installation notes

Observe safety precautions. Refer to **Safety precautions** .

Observe rules for cleanliness. Refer to **Rules for cleanliness** .

NOTE:

- All hose connections secured by clips.
- The charge air system must be free of leaks.
- Do not install hose connections with lubricant containing oil.
- For assembly use lubricating agent (water without additive) if necessary. Do not use lubricating agents containing oil.
- When repairing remove oil from connections and hose ends.
- Before connecting oil supply line fill turbocharger at connection with engine oil.
- After installing turbocharger run engine for approx. 1 minute at idling speed, do not rev engine. This ensures that the turbocharger is adequately lubricated.
- Replace self-locking nuts.

Turbocharger components, assembly overview

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

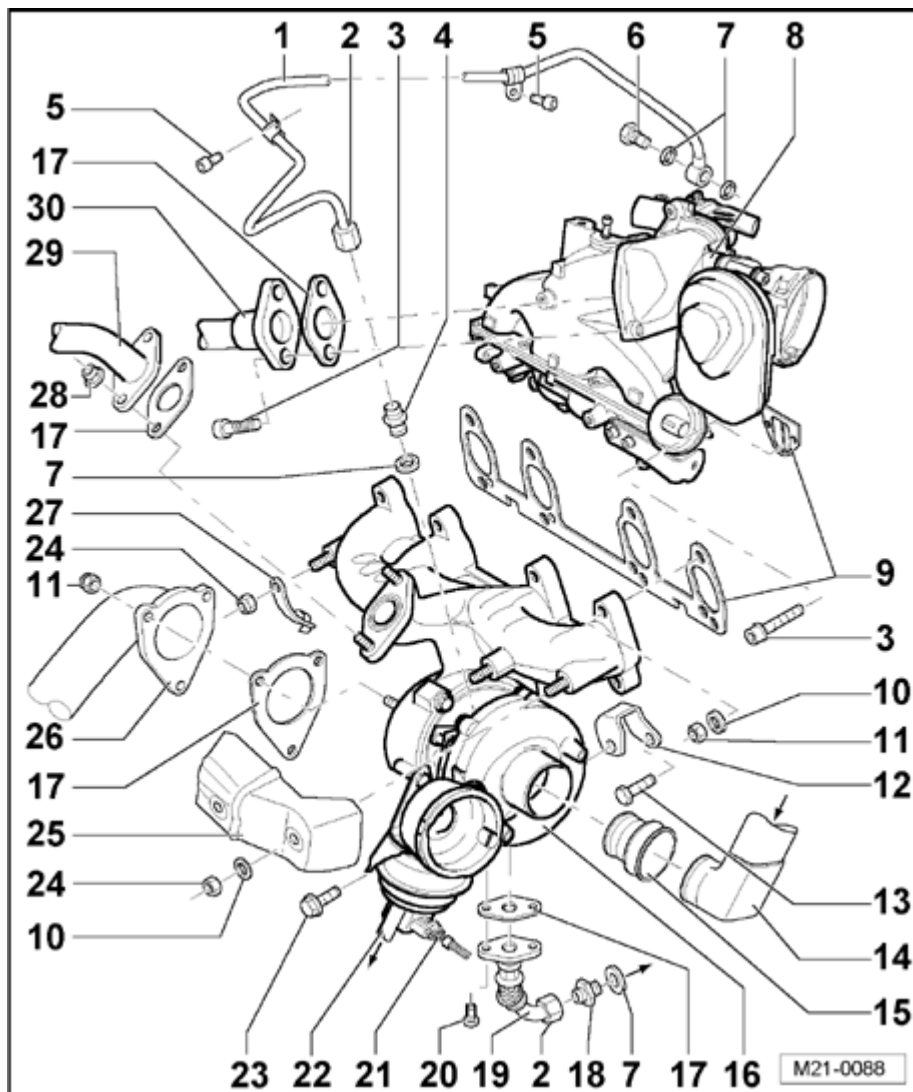


Fig. 170: Exploded View - Turbocharger Components

Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Oil supply line

- Fill connection with engine oil before connecting oil supply line
- Removing and installing

2 - Union nut

3 - 22 Nm

4 - Union 30 Nm

- Replace
- Coat threads and bolt head seating surface with *G 052 112 A3*

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Fill connection with engine oil before connecting oil supply line

5 - Bolt

6 - Banjo bolt

7 - Seal

- Replace

8 - Intake manifold

9 - Seal

- Replace
- Note installed position

10 - Washer

11 - 25 Nm

- Replace

12 - Support

- Between turbocharger and cylinder block

13 - 40 Nm

- First hand-tighten all bolts

14 - Connecting pipe

- Air cleaner/exhaust turbocharger.

15 - Transition piece

16 - Turbocharger

- Can only be replaced with exhaust manifold
- To remove exhaust turbocharger disconnect right axle shaft at transmission: Refer to **40 FRONT SUSPENSION**.

17 - Seal

- Replace

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

18 - Union 40 Nm

19 - Oil return line

- To cylinder block

20 - 17 Nm

21 - Connector

- Turbocharger (TC) vane position sensor -G500-

22 - Vacuum hose

- To Wastegate bypass regulator valve -N75-.
- Vacuum hose connection diagram. Refer to **Vacuum hose connection diagram**

23 - 20 Nm

- First hand-tighten all bolts

24 - 20 Nm

- Replace

25 - Heat shield

26 - Front exhaust pipe

27 - Bracket

- Before installing secure oil supply line

28 - 22 Nm

- Replace

29 - Connecting pipe

- To exhaust gas recirculation cooler

30 - Connecting pipe

- From exhaust gas recirculation cooler

Charge air cooling components, removing and installing

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

Observe safety precautions. Refer to Safety precautions .

Observe rules for cleanliness. Refer to Rules for cleanliness .

NOTE:

- All hose connections secured by clips.
- The charge air system must be free of leaks.
- Do not install hose connections with lubricant containing oil.
- For assembly use lubricating agent (water without additive) if necessary. Do not use lubricating agents containing oil.
- When repairing remove oil from connections and hose ends.

Charge air cooling components, assembly overview

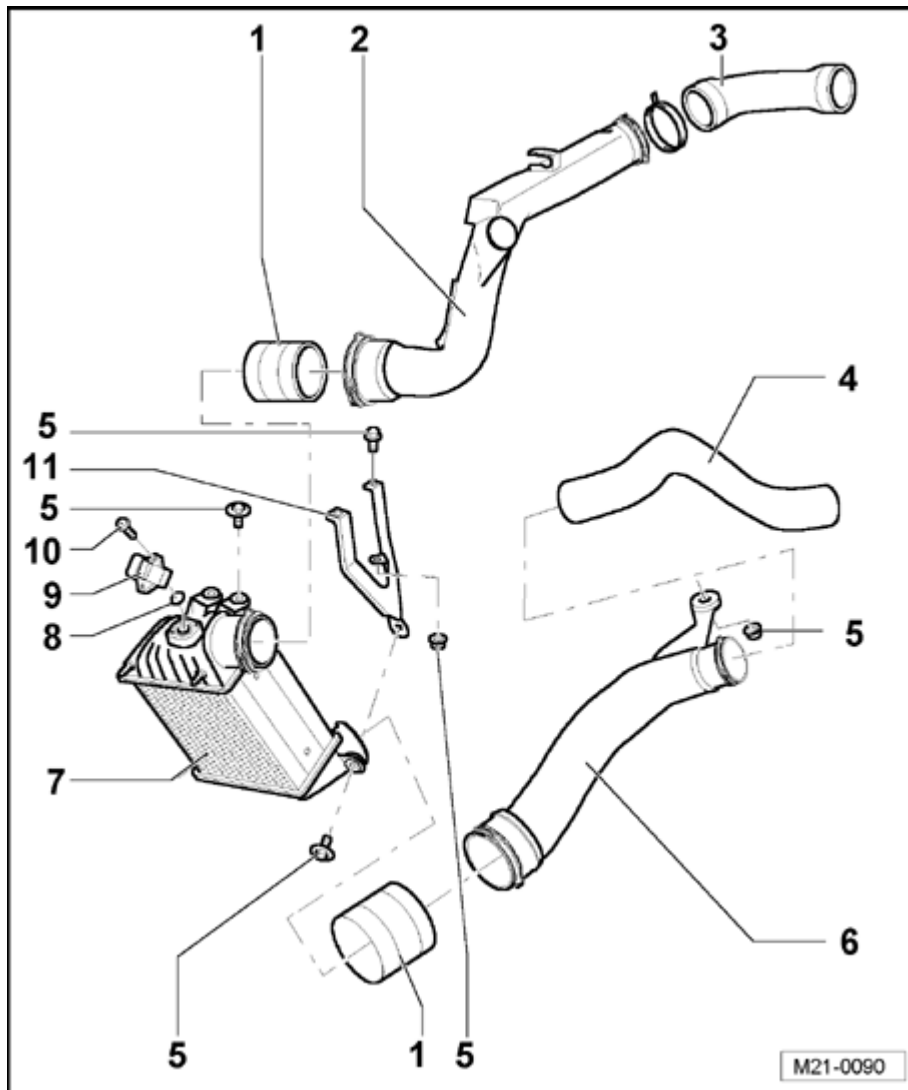


Fig. 171: Exploded View - Charge Air Cooling Components
Courtesy of VOLKSWAGEN UNITED STATES, INC.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

1 - Connecting hose

2 - Connecting pipe

3 - Connecting hose

- Connecting pipe/intake connecting union

4 - Connecting hose

- Charge air pipe/exhaust turbocharger

5 - 10 Nm

6 - Charge air pipe

7 - Charge air cooler

8 - O-ring

- Replace if damaged

9 - Manifold Absolute Pressure (MAP) sensor -G71- with Intake Air Temperature (IAT) sensor -G72-

10 - 5 Nm

11 - Bracket

Vacuum hose connection diagram

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

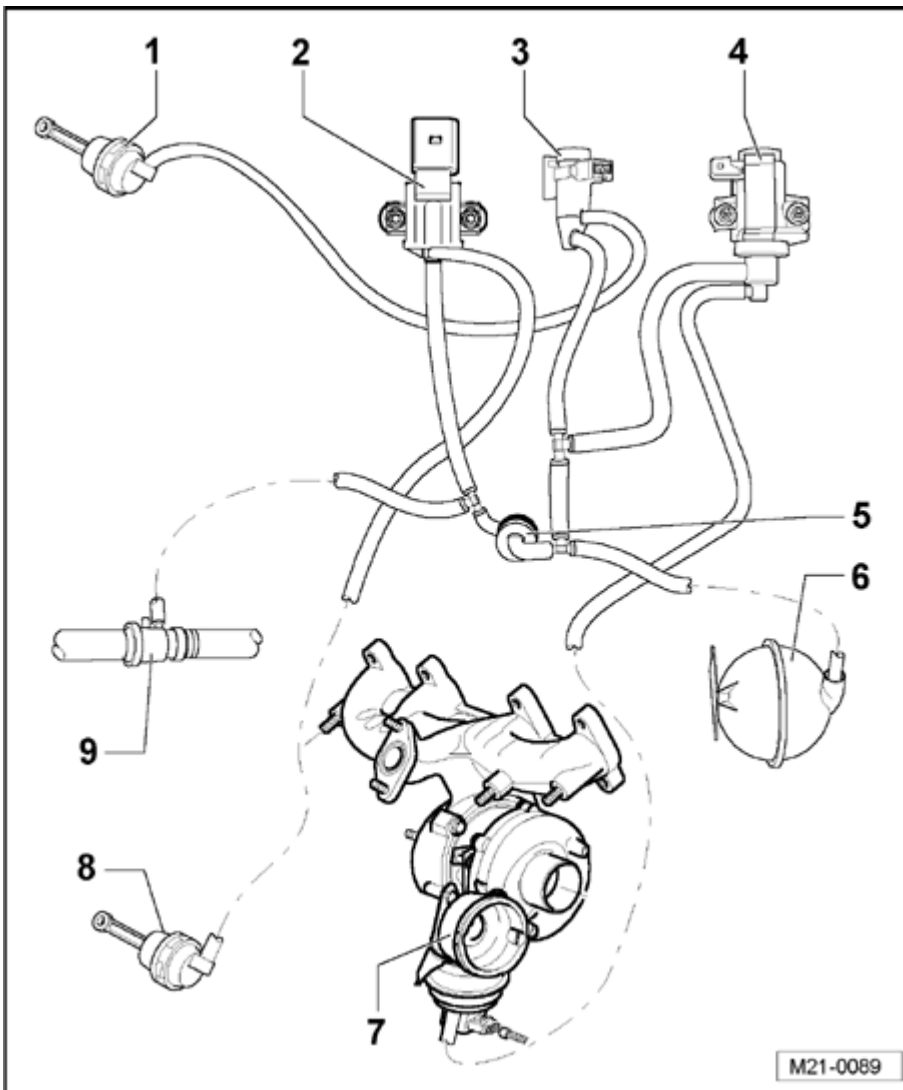


Fig. 172: Vacuum Hose Connection Diagram

Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Vacuum unit

- For exhaust gas recirculation change-over

2 - Intake Manifold Runner Control (IMRC) valve -N316-

- For variable intake manifold

3 - Exhaust Gas Recirculation (EGR) cooler switch-over valve -N345-

4 - Wastegate bypass regulator valve -N75-

5 - Non-return valve

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

6 - Vacuum reservoir

7 - Vacuum unit

- With Turbocharger (TC) vane position sensor -G500-.
- For charge pressure control
- Integral part of turbocharger - cannot be replaced

8 - Vacuum unit

- For intake manifold runner control valve

9 - Vacuum connection

- Between tandem pump and brake servo

23 - DIESEL FUEL INJECTION

DIESEL DIRECT INJECTION SYSTEM, SERVICING

Diesel direct injection system, servicing

The diesel direct injection system control module is equipped with a fault memory. The fault memory must be read before and after repairs or adjustments. Refer to **Engine control module fault memory, reading and erasing**

Safety precautions. Refer to **Safety precautions** .

Rules for cleanliness. Refer to **Rules for cleanliness** .

Safety precautions

CAUTION: When doing any repair work, especially in the engine compartment, pay attention to the following due to the cramped conditions:

- Route all the various lines (e.g. for fuel, hydraulics, EVAP system, coolant, refrigerant, brake fluid and vacuum) and electrical wiring in their original positions.
- Ensure that there is sufficient clearance to all moving or hot components.

To prevent injuries to persons and/or damage to the injection and glow plug system, note the following:

- The ignition must be switched off before connecting or disconnecting injection or glow plug system wiring or tester cables.
- If the engine is to be turned at starter speed, without starting, e.g. when checking compression, disconnect

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

unit injector connector on cylinder head.

- Before disconnecting the battery, obtain the radio code for radios with an anti-theft coding.
- Only disconnect and connect the battery when the ignition is switched off, otherwise the diesel direct injection system control module may be damaged.

Observe following if test and measuring instruments are required during a test drive:

- Test and measuring instruments must be secured to the rear seat and operated by a second person from this location.

If test and measuring instruments are operated from the front passengers seat and the vehicle is involved in an accident, there is a possibility that the person sitting in this seat may receive serious injuries when the airbag is triggered.

Rules for cleanliness

When working on the fuel supply/injection system, pay careful attention to the following "6 rules" :

- Thoroughly clean all unions and adjacent areas before disconnecting.
- Place removed parts on a clean surface and cover. Do not use fluffy cloths!
- Carefully cover opened components or seal if repairs cannot be performed immediately.
- Only install clean components: Only unpack replacement parts immediately prior to installation. Do not use parts that have not been stored in their packing (e.g. in tool boxes etc.).
- When the system is open: Do not work with compressed air if this can be avoided. Do not move the vehicle unless absolutely necessary.
- Also ensure that no diesel fuel contacts the coolant hoses. If necessary, hoses must be cleaned immediately. Affected hoses must be replaced.

Diesel direct injection system, component locations overview

Components A to D are not shown on the illustration.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

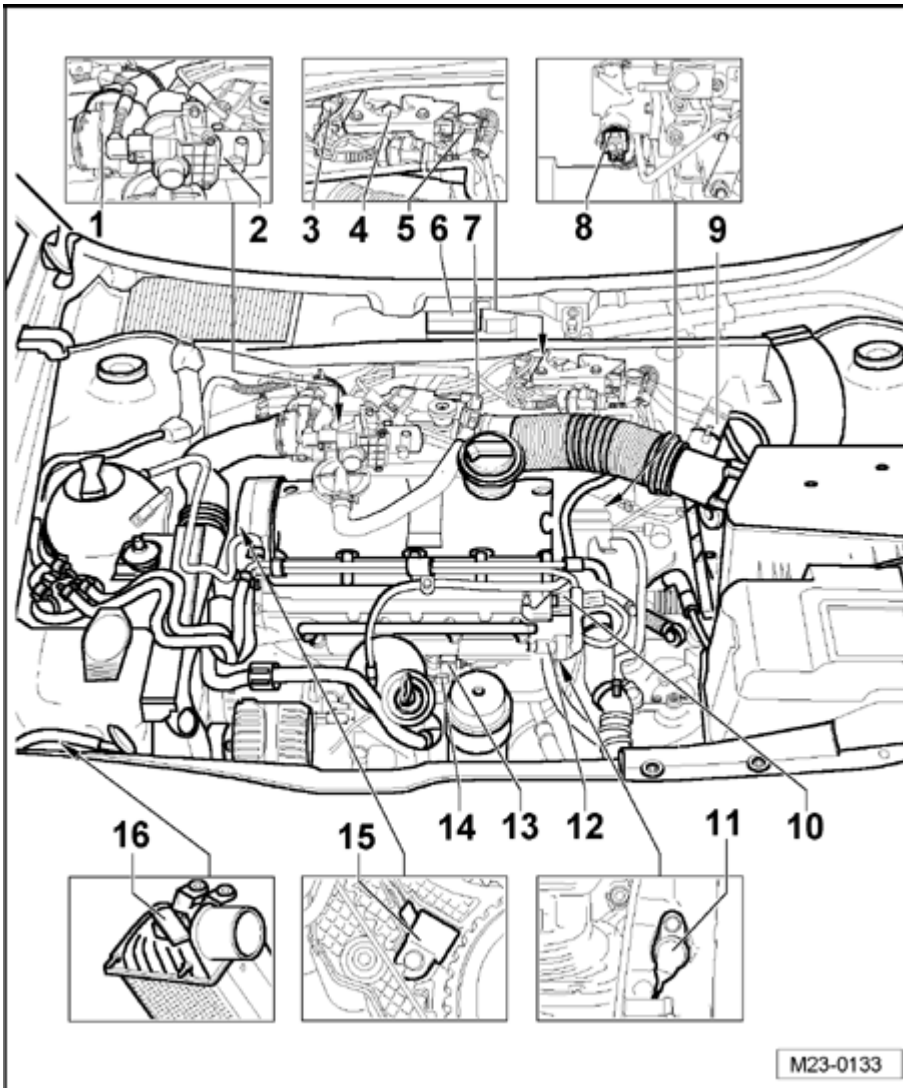


Fig. 173: Component Locations - Diesel Direct Injection System
Courtesy of VOLKSWAGEN UNITED STATES, INC.

A - Brake pedal switch -F47-

- In footwell on brake pedal

B - Brake light switch -F-

- In footwell on brake pedal

C - Throttle Position (TP) sensor -G79-

- In footwell on accelerator

D - Clutch vacuum vent valve switch -F36-

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- In footwell on clutch pedal

1 - Variable intake manifold flap

- With Motor for intake flap -V157-

2 - EGR vacuum regulator solenoid valve -N18-

3 - Intake Manifold Runner Control (IMRC) valve -N316-

4 - Exhaust gas recirculation (EGR) cooler switch-over valve -N345-

-

5 - Wastegate bypass regulator valve -N75-

6 - Diesel Direct Fuel Injection (DFI) Engine Control Module (ECM) -J248-

- With Barometric pressure (BARO) sensor -F96-
- Replacing, refer to **Engine control module**

7 - Positive Crankcase Ventilation (PCV) heating element -N79-

8 - Engine Coolant Temperature (ECT) sensor -G62-

- For engine control module
- With Engine Coolant Temperature (ECT) sensor -G2-
- If necessary, release pressure in cooling system before removing

9 - Mass Air Flow (MAF) sensor -G70-

10 - Connector

- For unit injector (-N240-...-N243-)

11 - Engine speed (RPM) sensor -G28-

12 - Fuel temperature sensor -G81-

13 - Connector

- For Camshaft Position (CMP) sensor -G40-

14 - Connector

- For Engine speed (RPM) sensor -G28-

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

15 - Camshaft Position (CMP) sensor -G40-

16 - Manifold Absolute Pressure (MAP) sensor -G71- with Intake Air Temperature (IAT) sensor -G72-

Intake manifold, servicing

The variable intake manifold is switched dependent on engine revolutions and position of accelerator.

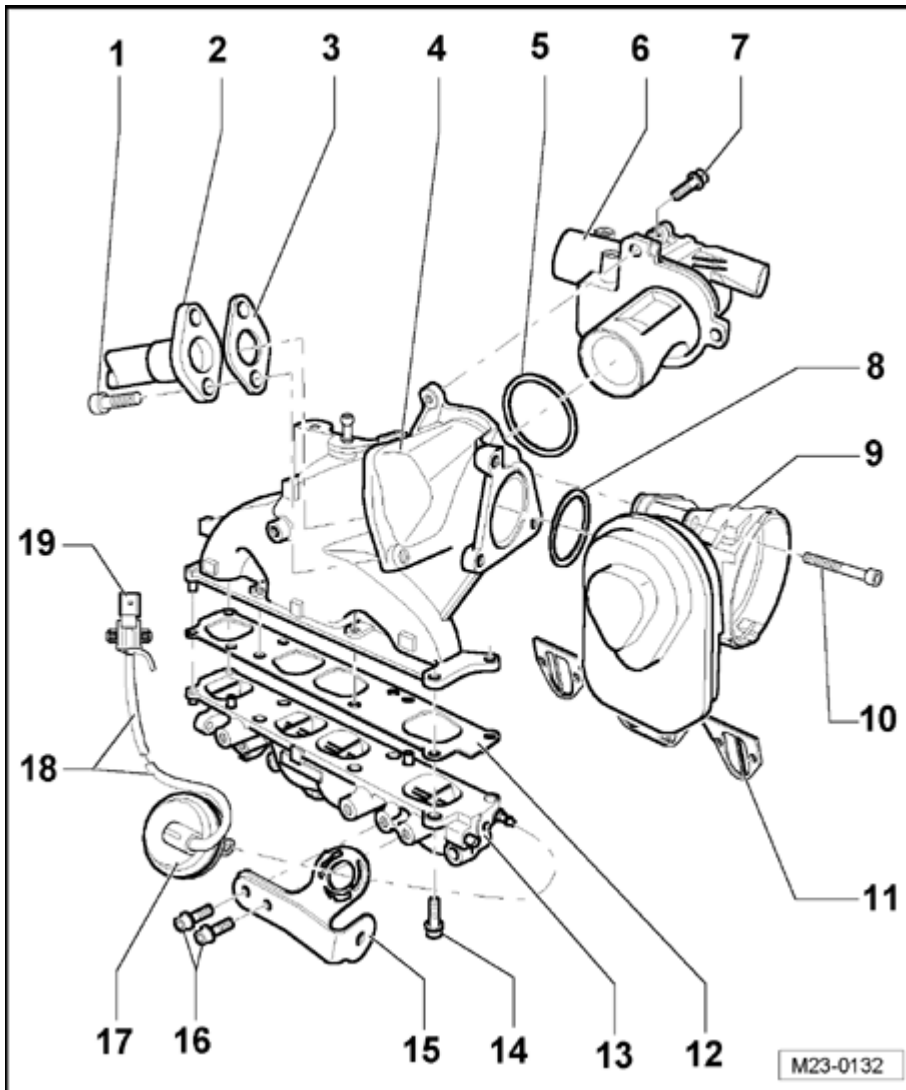


Fig. 174: Exploded View - Intake Manifold
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - 22 Nm

2 - Connecting pipe

- From exhaust gas recirculation cooler. Refer to **Exhaust gas recirculation system components, assembly overview**

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

3 - Seal

- Replace

4 - Intake manifold - upper part

5 - O-ring

- Replace

6 - EGR vacuum regulator valve -N121-

7 - 10 Nm

8 - O-ring

- Replace

9 - Variable intake manifold flap

- With Motor for intake flap -V157-.

10 - 10 Nm

11 - Seal

- Replace

12 - Seal

- Replace

13 - Intake manifold - lower part

- With change-over shaft

14 - 10 Nm

15 - Bracket

16 - 10 Nm

17 - Vacuum unit control element

18 - Vacuum hose

19 - Intake Manifold Runner Control (IMRC) valve -N316-

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Vacuum hose connection diagram. Refer to [Vacuum hose connection diagram](#)

Unit injector, servicing

- Observe rules for cleanliness. Refer to [Rules for cleanliness](#)
- Always replace seals and O-rings

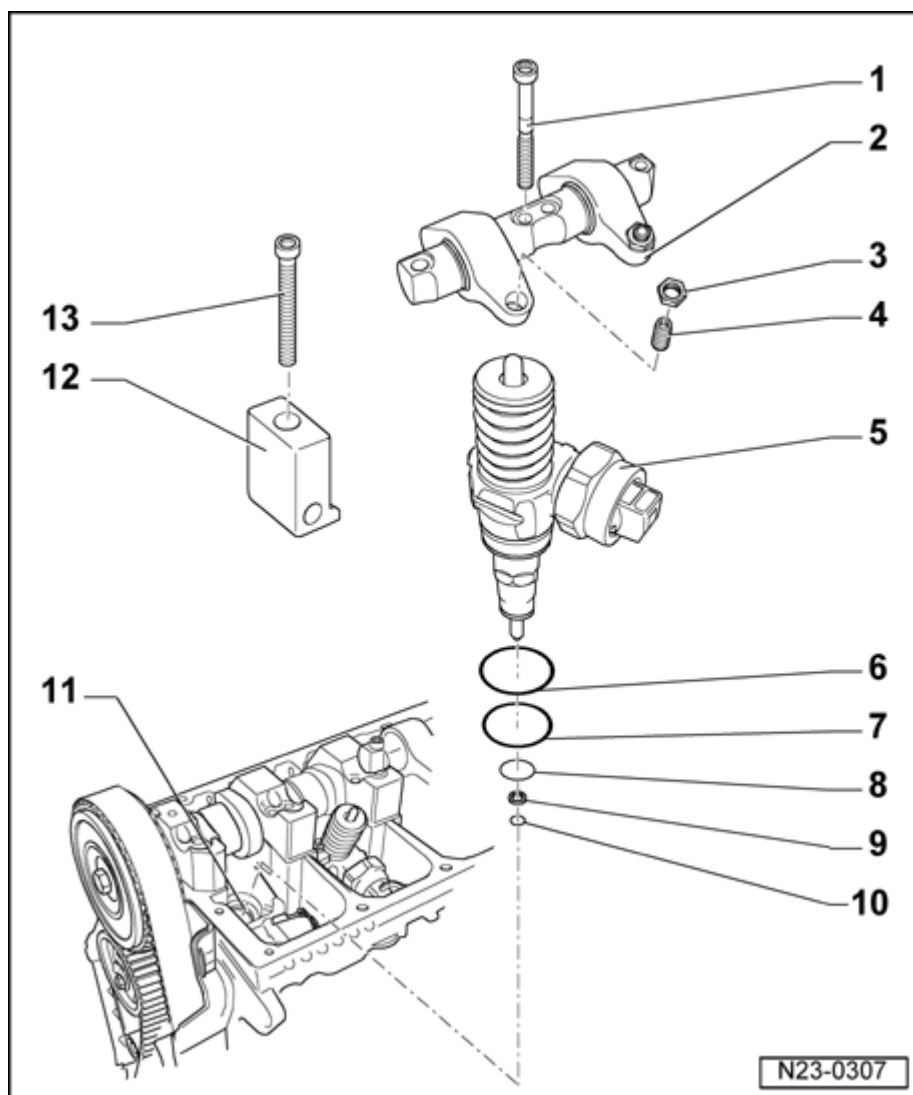


Fig. 175: Exploded View - Unit Injector

Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - 20 Nm plus an additional 14 turn (90 °)

- Replace
- Note sequence when loosening and tightening. Refer to [Unit injector, removing and installing](#) , Unit injector, removing and installing

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

2 - Rocker arm shaft

- With rocker arm
- Removing and installing. Refer to **Unit injector, removing and installing** , Unit injector, removing and installing

3 - Lock nut, 30 Nm

4 - Adjustment screw

- Replace if there are signs of wear when installing a new unit injector
- Adjusting, refer to **Unit injector, removing and installing** , Unit injector, removing and installing

5 - Unit injector

- Check ball pin for signs of wear, replace if necessary
- Removing and installing. Refer to **Unit injector, removing and installing**

6 - O-ring

- Replacing, refer to **O-rings for unit injector, removing and installing**

7 - O-ring

- Replacing, refer to **O-rings for unit injector, removing and installing**

8 - O-ring

- Replacing, refer to **O-rings for unit injector, removing and installing**

9 - Heat insulation seal

- Replace

10 - Circlip

11 - Cylinder head

12 - Tensioning block

13 - 12 Nm plus an additional 34 turn (270 °)

- Replace

O-rings for unit injector, removing and installing

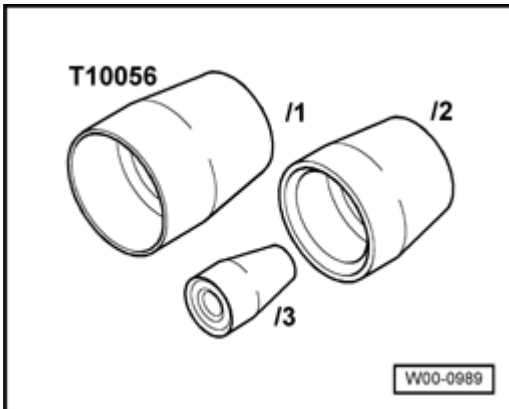
Special tools, testers and auxiliary items required

Fig. 176: Special Tool - Assembly Sleeves T10056
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Assembly sleeves T10056

Removing

- Remove unit injector. Refer to **Unit injector, removing and installing**.
- Pry old O-rings very carefully off unit injector.

NOTE:

- Ensure that the seat for the O-rings does not contain burrs.

Installing**NOTE:**

- Always use the assembly sleeves to install the O-rings. There is a danger of damaging the O-rings if the sleeves are not used.
 - There has been a gradual introduction of O-rings with no colored markings. Ensure that the O-rings are allocated correctly to their respective grooves: Ring size decreases towards nozzle.
 - Prevent the O-rings from rolling when sliding them on. The O-rings must not be twisted when seated in the unit injector.
- Pull heat shield seat off together with securing clip.
 - Clean O-ring seating surfaces on unit injector very carefully.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

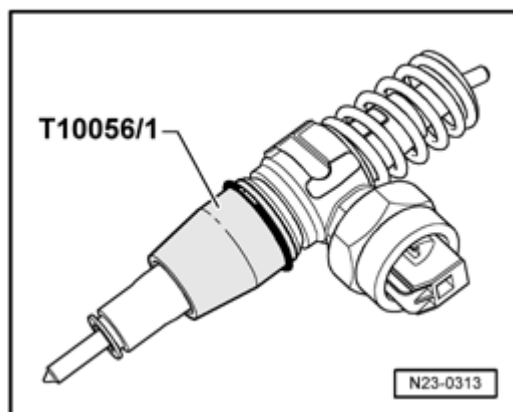


Fig. 177: Identifying Assembly Sleeve T10056/1
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Slide assembly sleeve T10056/1 onto stop on unit injector.
- Slide upper, thicker O-ring carefully on to assembly sleeve and into seat on unit injector.
- Remove assembly sleeve.

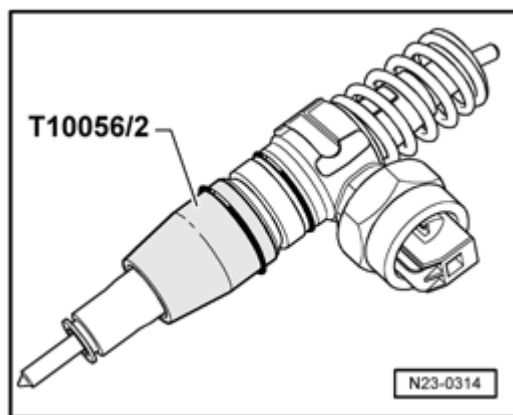


Fig. 178: Identifying Assembly Sleeve T10056/2
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Slide assembly sleeve T10056/2 onto stop on unit injector.
- Slide middle, thinner O-ring carefully on to assembly sleeve and into seat on unit injector.
- Remove assembly sleeve.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

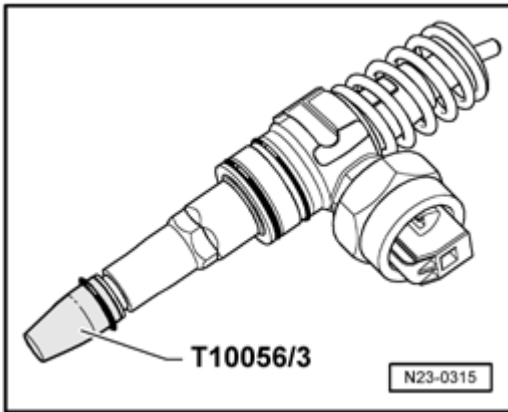


Fig. 179: Identifying Assembly Sleeve T10056/3

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Slide assembly sleeve T10056/3 onto stop on unit injector.
- Slide lower O-ring carefully on to assembly sleeve and into seat on unit injector.
- Remove assembly sleeve.
- Install new heat shield seal together with circlip.
- Install unit injector. Refer to **Unit injector, removing and installing** .

Unit injector, removing and installing

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

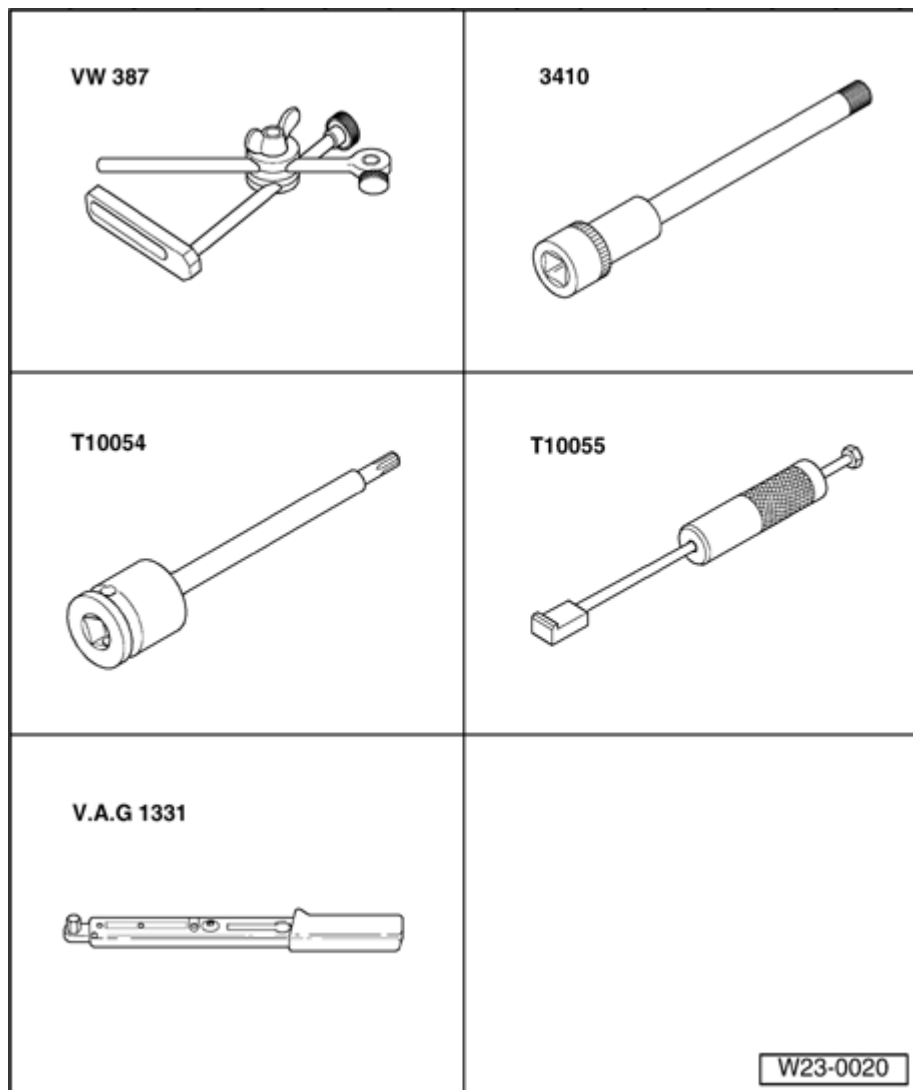


Fig. 180: Special Tools - Unit Injector, Removing And Installing
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools, testers and auxiliary items required

- Universal dial gauge bracket VW 387
- Socket 3410
- Socket T10054
- Puller T10055
- Torque wrench (5...50 Nm) V.A.G 1331
- Dial gauge
- Grease G 000 100

Removing

- Remove upper toothed belt guard. Refer to **Toothed belts, removing, installing and tensioning** and

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

cylinder head cover, refer to **Cylinder head cover, removing and installing**.

- Turn crankshaft until cam lobe pair point upward for unit injector which is to be removed.

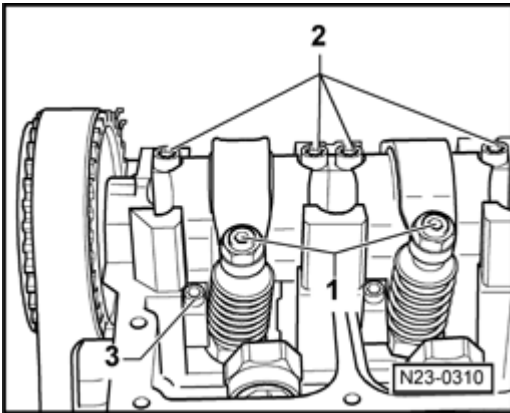


Fig. 181: Identifying Lock Nuts And Securing Bolts
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Loosen lock nut of adjustment screw - **1** - and unscrew until relevant rocker arm lies against plunger spring of unit injector.
- Remove rocker arm securing bolts - **2** - (outward to inward) with socket 3410 and take rocker arm shaft off.
- Remove tensioning block securing bolts - **3** - with socket T10054 and remove tensioning block.
- Pry connector off unit injector with a screwdriver. Support opposite side of connector using light finger pressure to prevent canting.

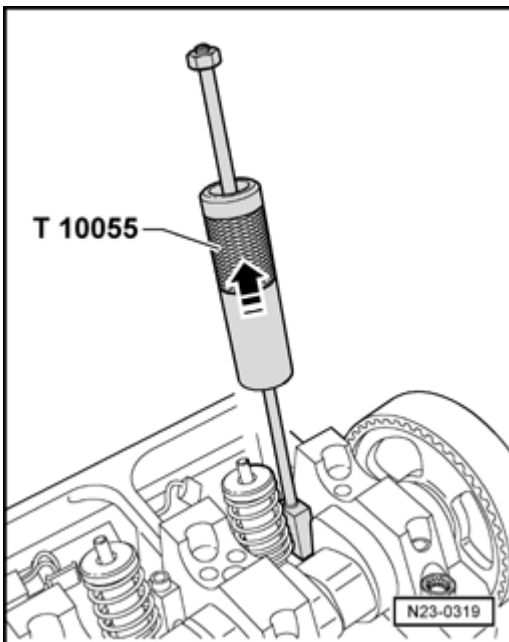


Fig. 182: Identifying Seat Puller T10055
Courtesy of VOLKSWAGEN UNITED STATES, INC.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Seat puller into slot on side of unit injector instead of tensioning block.
- Pull unit injector out of cylinder head seat with gentle taps.

Installing

NOTE:

- If a new unit injector is installed, the appropriate adjustment screw in the rocker arm must also be replaced.
 - Each time work is performed which requires the unit injector to be adjusted, the adjustment screw in the rocker arm and also the unit injector ball pin must be cleaned and checked for signs of wear. If wear is evident the ball pin and the adjustment screw must be replaced.
 - New unit injectors are supplied with O-rings and heat shield seal.
- Replace heat shield seal and O-rings if old unit injector is reused. Refer to **O-rings for unit injector, removing and installing**.
 - Check that three O-rings, heat shield seal and circlip are seating correctly before installing unit injector.

NOTE:

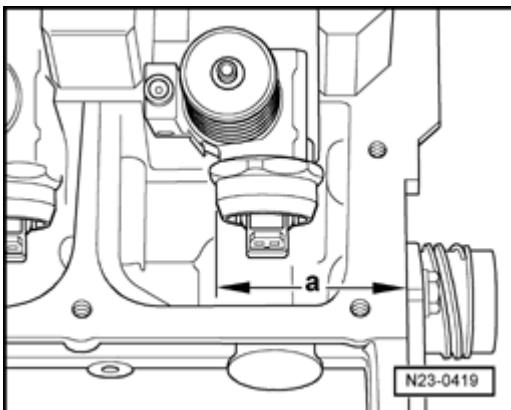
- The seals must not be twisted.
- Oil seals and install unit injector into cylinder head with great care.
 - Push unit injector evenly into cylinder head onto its limit stop.
 - Install tensioning block into slot on side of unit injector.

NOTE:

- If the unit injector is not at right angles to the tensioning block the securing bolt may loosen and this can damage the unit injector or the cylinder head.

Align the unit injector as follows:

- Screw new securing bolt into tensioning block until unit injector can still just be turned easily.
- Align unit injector at right angles with camshaft bearing caps.



2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

Fig. 183: Identifying Dimension "a"

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Check dimension "a" from outer edge of cylinder head to rounded edge of unit injector with a vernier gauge (measuring range: min. 400 mm).

Cylinder	"a"
1	333.0 ± 0.8 mm
2	245.0 ± 0.8 mm
3	153.6 ± 0.8 mm
4	65.6 ± 0.8 mm

- If necessary realign unit injector.

Tighten securing bolts as follows:

- Tighten bolts to 12 Nm and turn $270^\circ \pm 34$ further (turning further can be done in several stages).

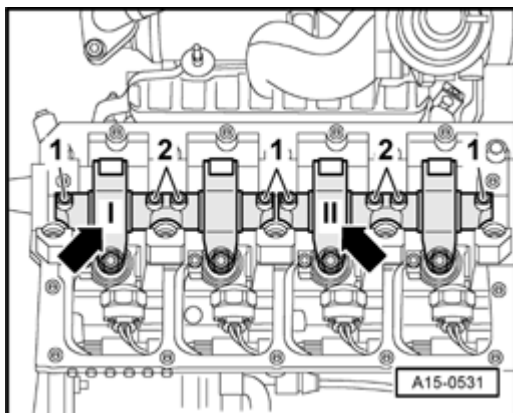


Fig. 184: Identifying Mark On Rocker Arm Shafts

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Install rocker arm shaft and tighten new securing bolts as follows:
- First tighten inner bolts - 2 - and then outer bolts - 1 - hand tight. Then, using same sequence, tighten to 20 Nm and turn 90° (14) further.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

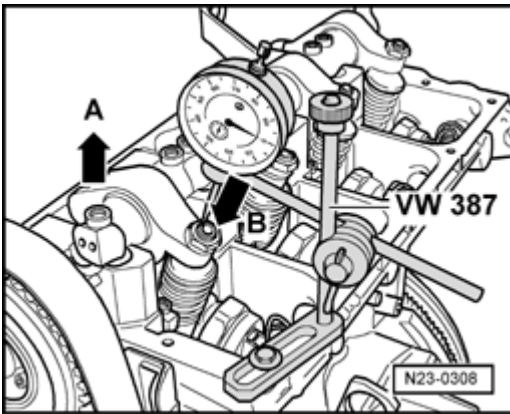


Fig. 185: Identifying Special Tool VW 387

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Mount dial gauge onto adjustment screw of unit injector as shown.
- Turn crankshaft in engine direction of rotation until roller of rocker arm is positioned on peak of drive cam lobe, roller side - **arrow A** - is positioned at highest point and dial gauge - **arrow B** - positioned at lowest point.
- Remove dial gauge.
- Turn adjustment screw inward into rocker arm until a firm resistance is felt (unit injector positioned at limit stop).

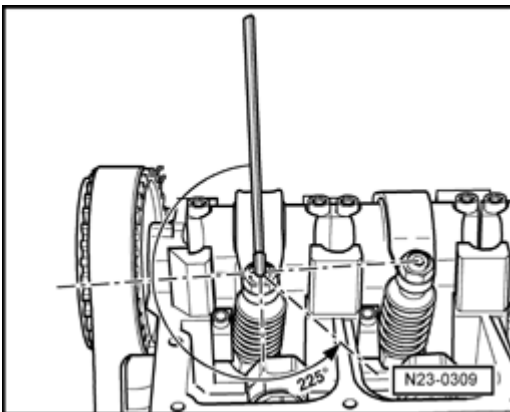


Fig. 186: Adjusting Screw 225°

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Turn adjustment screw 225 ° back off limit stop.
- Hold adjustment screw in this position and tighten lock nut to 30 Nm.
- Connect unit injector connector and install cylinder head cover. Refer to **Cylinder head cover, removing and installing** and toothed belt guard, refer to **Toothed belts, removing, installing and tensioning** .

ADDITIONAL SIGNALS, CHECKING

RPM signal, checking

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

Function

The engine speed (RPM) signal is output via contact 27 on the engine control module. The signal is required, among others, by the automatic transmission control module to calculate the gear change points and for rev counter in the instrument cluster.

Special tools, testers and auxiliary items required

- Test box V.A.G 1598/31
- Adapter set V.A.G 1594
- Multimeter V.A.G 1526 or Multimeter V.A.G 1715
- Wiring diagram

Work sequence

- Switch off ignition.
- Remove windshield wiper arms and cover for plenum chamber: --> Electrical Equipment - Repair Group 92.
- Unlock and separate connector on engine control module.

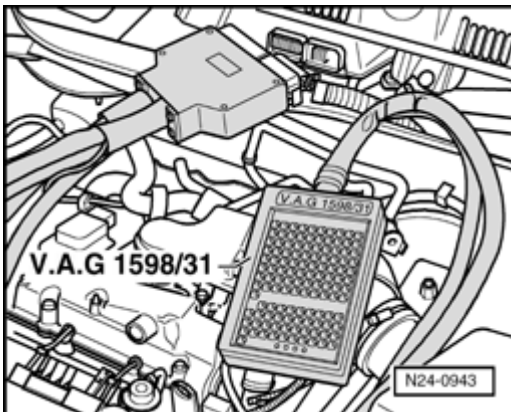


Fig. 187: Identifying Special Tool V.A.G 1598/31
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect test box V.A.G 1598/31 to control module wiring harness.
- Check wiring for open circuit between test box socket 27 and instrument cluster for open or short circuit referring to wiring diagram. Wire resistance: max. 1.5 ohms Electrical Wiring Diagrams, Troubleshooting Component Locations

ENGINE CONTROL MODULE

Engine control module, removing and installing

- First read control module identification and thereby coding of installed control module before removing it. Refer to **Engine control module fault memory, reading and erasing** ; Engine control module, reading and erasing fault memory.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

Removing

- Switch off ignition.
- Remove windshield wiper arms and cover for plenum chamber: Refer to **92 WINDSHIELD WIPER & WASHER SYSTEM** .
- Unlock and separate connector of engine control module.

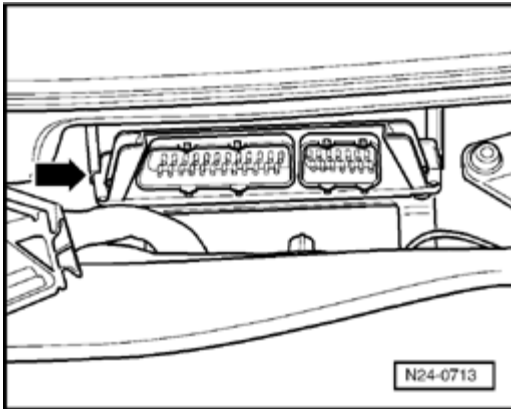


Fig. 188: Identifying Control Module

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Press control module to right and pull out.

Installing

- Insert new control module and press to left.
- Connect control module connector and lock in position.
- Check previous coding and coding of new control module. Refer to **Components, checking** .

Engine control module fault memory, reading and erasing

Special tools, testers and auxiliary items required

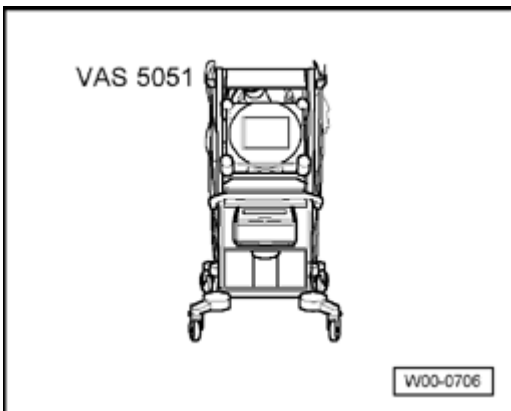


Fig. 189: Special Tool - Testing And Information System VAS 5051

Courtesy of VOLKSWAGEN UNITED STATES, INC.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Vehicle Diagnosis, Testing and Information System VAS 5051
- Diagnosis cable VAS 5051/1 or VAS 5051/3

Work sequence

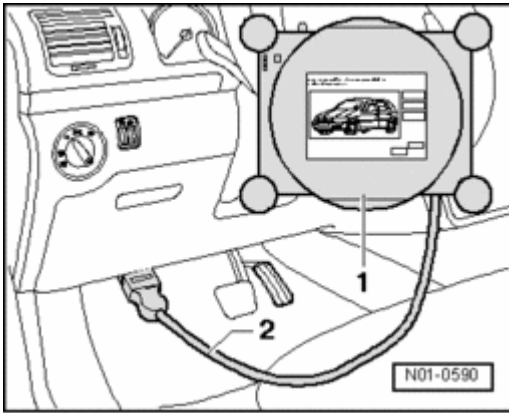


Fig. 190: Identifying VAS 5051 And VAS 5051/1
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect vehicle diagnosis, testing and information system VAS 5051 - **1** - as follows:
- Connect diagnosis cable VAS 5051/1 or VAS 5051/3 - **2** - to diagnosis connection.
- Start engine and run at idling speed.

Only when engine does not start:

- Switch on ignition.

Selecting operating mode

- Press button on display for "Vehicle self-diagnosis".

Selecting vehicle system

- Press button "01 - Engine electronics" on display.

The control module identification and coding are indicated on the display.

Selecting diagnostic function

- Press button "02 - Read fault memory" on display.

If no fault is stored in the engine control module "0 fault(s) detected" is displayed.

If faults are stored in the engine control module, these are shown one below the other on the display.

- Press <-- key.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Press button "05 - Erase fault memory" on display.
- Press function "06-End output".

Components, checking

Special tools, testers and auxiliary items required

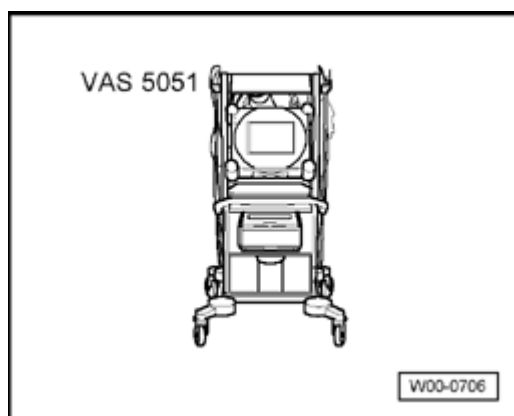


Fig. 191: Special Tool - Testing And Information System VAS 5051
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Vehicle Diagnosis, Testing and Information System VAS 5051
- Diagnosis cable VAS 5051/1 or VAS 5051/3

Work sequence

Select "Guided fault finding" on diagnosis tester VAS 5051.

After all control modules have been read:

- Press key "Go to".
- Select "Function/component selection".
- "Select drive train."
- Select "Engine code".
- Select "01-Systems capable of self-diagnosis".
- Select "Engine management".
- Select "Functions".
- Select "Function or component".

26 - EXHAUST SYSTEM, EMISSION CONTROLS

EXHAUST SYSTEM COMPONENTS, REMOVING AND INSTALLING

Exhaust system components, removing and installing

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

NOTE:

- Removing and installing exhaust manifold. Refer to Turbocharger with attachments, removing and installing , Removing and installing turbocharger with attachments.
- After working on the exhaust system ensure that the system is not under stress and that it has sufficient clearance from the bodywork. If necessary, loosen double clamps and align muffler and exhaust pipe so that sufficient clearance is maintained to the bodywork and the support rings are evenly loaded.
- Replace self-locking nuts.

Front exhaust pipe and catalytic converter with attachments, assembly overview

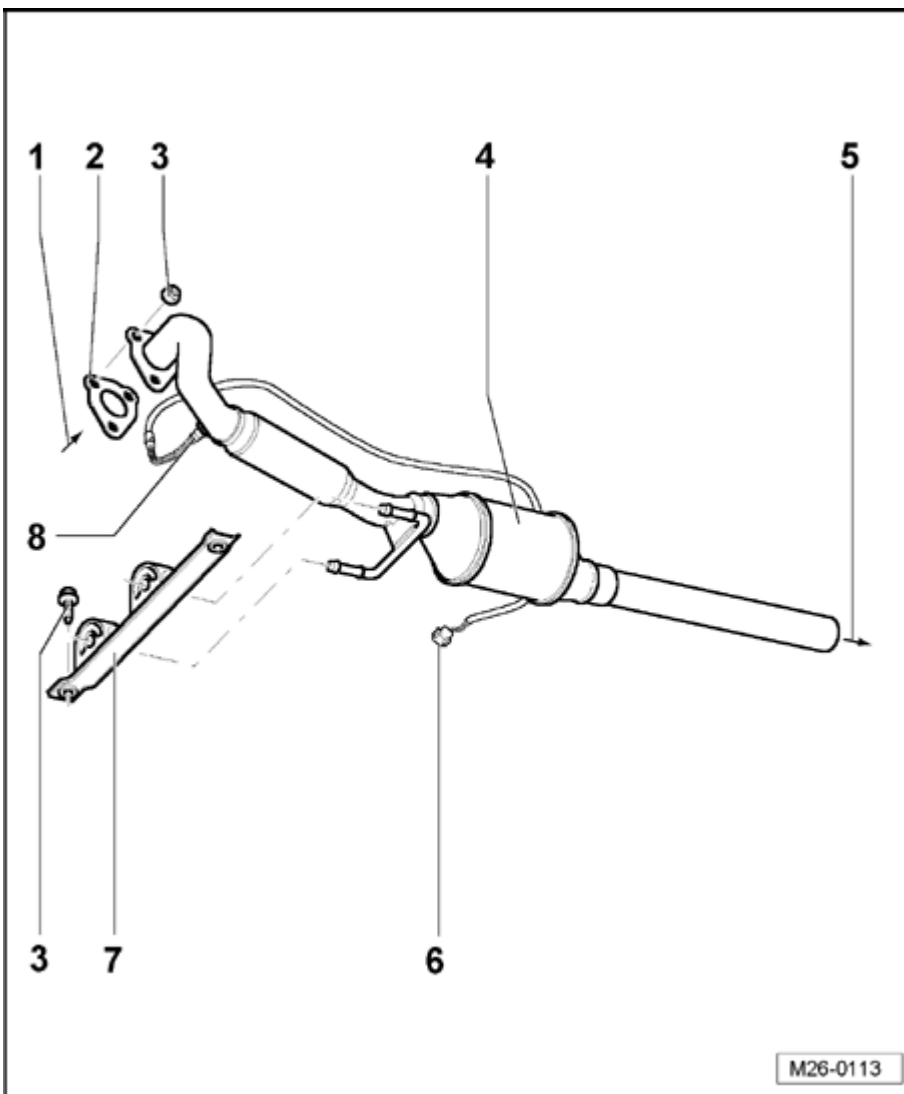


Fig. 192: View Of Front Exhaust Components

Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - From turbocharger

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

2 - Seal

- Replace

3 - 25 Nm

- Replace

4 - Front exhaust pipe with catalytic converter

5 - To muffler

6 - Connector for mass air flow sensor -T6c-

7 - Mounting

8 - Heated Oxygen Sensor (HO2S) -G39-

Muffler with mountings

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

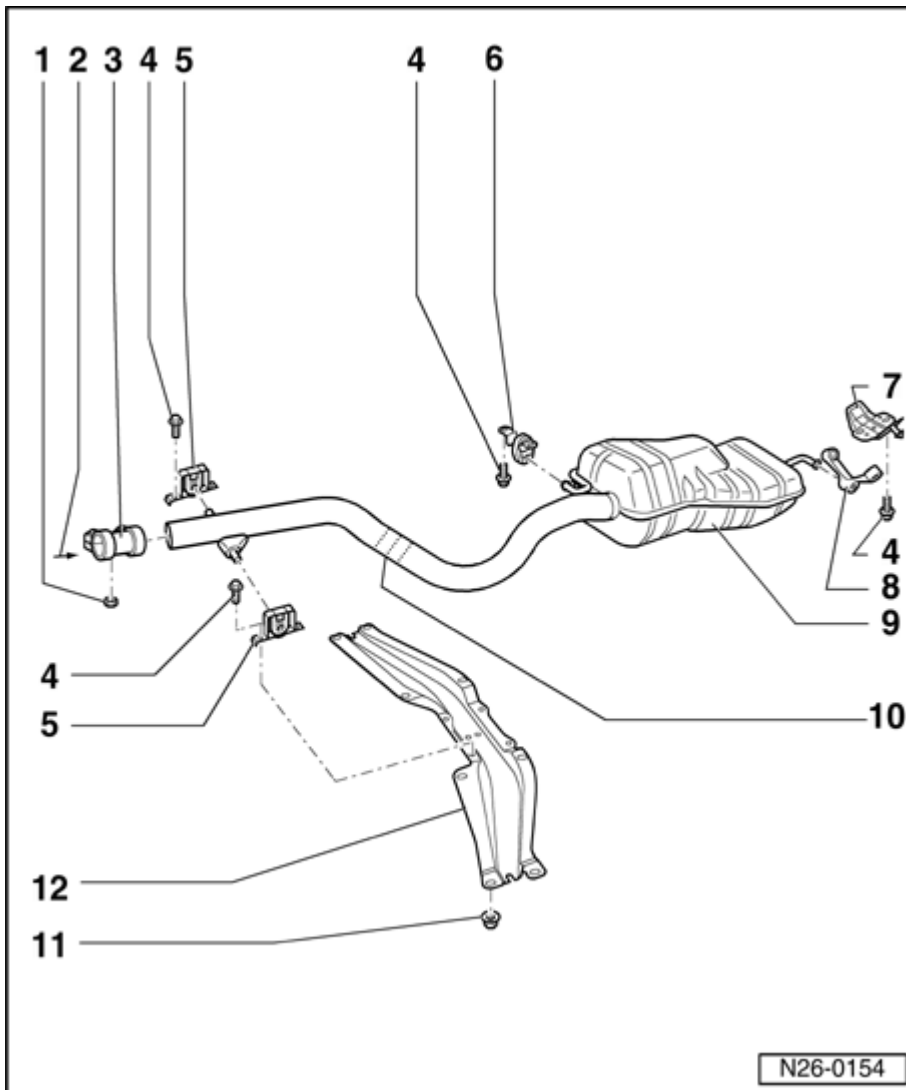


Fig. 193: View Of Rear Exhaust Components

Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - 40 Nm

2 - From catalytic converter

3 - Double clamp

- Note installed position, refer to **Checking installation position of double clamp**

4 - 25 Nm

5 - Mounting

- Note installed position. Refer to **Installed position of mounting**

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

6 - Mounting

- With retaining ring

7 - Bracket

8 - Mounting

9 - Muffler

- Aligning muffler free of stress. Refer to Work sequence and Aligning rear muffler free of stress .

10 - Separating point

- For repair cases
- Marked by three impressions on circumference of exhaust pipe
- As standard, exhaust pipe and rear mufflers are installed as a single component. For repairs, exhaust pipe and muffler are supplied individually with a double clamp for connecting together.
- Cut through connecting pipe with body saw e.g. V.A.G 1523 at right angles at separating point. Refer to Separating point on exhaust pipe

11 - 20 Nm

12 - Tunnel bridge

Checking installation position of double clamp

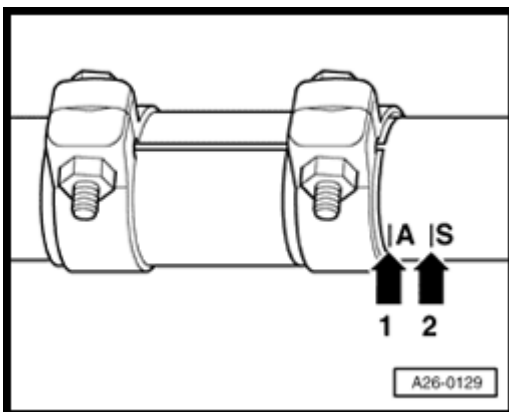


Fig. 194: Installation Position Of Double Clamp
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Checking installation position of double clamp

- Position double clamp approx. 5 mm away from mark - A - - arrow 1 -.

NOTE:

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- **Mark - A - is valid for vehicles with manual and automatic transmissions.**

Installed position of mounting

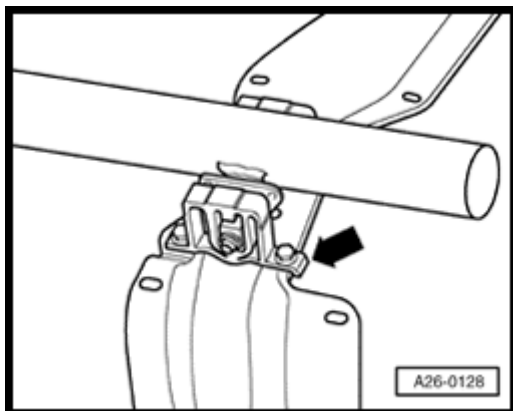


Fig. 195: Installation Position Of Mounting

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Installed position of mounting

Angled side on foot of mounting - **arrow** - points forward.

Separating point on exhaust pipe

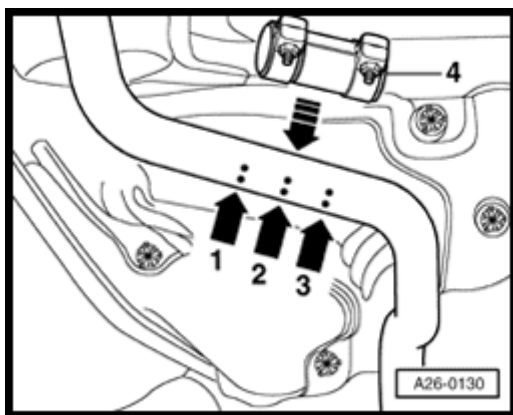


Fig. 196: Separating Point On Exhaust Pipe

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Separating point on exhaust pipe

Special tools, testers and auxiliary items required

- Body repair saw e.g. V.A.G 1523

Work sequence

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Separate exhaust pipe at right angles at separating point - **arrow 2** -.
- Use repair type double clamp - **4** - at side markings - **arrows 1 and 3** - when installing. Tightening torque: 40 Nm

Aligning rear muffler free of stress

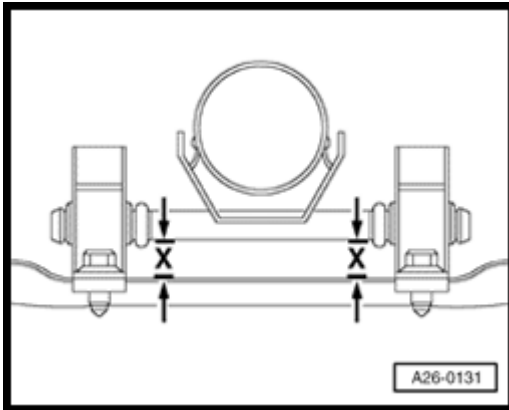


Fig. 197: Installing Muffler Free Of Tension
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Aligning rear muffler free of stress

The mounting pins on the exhaust pipe must run parallel with the tunnel bridge (dimension - x - is the same on left and right).

EXHAUST GAS RECIRCULATION SYSTEM

Exhaust gas recirculation system

NOTE:

- The function and control of the exhaust gas recirculation system is undertaken by the Diesel direct fuel injection (DFI) Engine Control Module (ECM) -J248- to the EGR vacuum regulator valve -N121-.
- Pulsed control makes every conceivable valve position possible.
- Replace self-locking nuts.
- Vacuum hose connection diagram. Refer to Vacuum hose connection diagram .

Exhaust gas recirculation system components, assembly overview

2006 Volkswagen Golf GL
ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

2006 Volkswagen Golf GL
ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

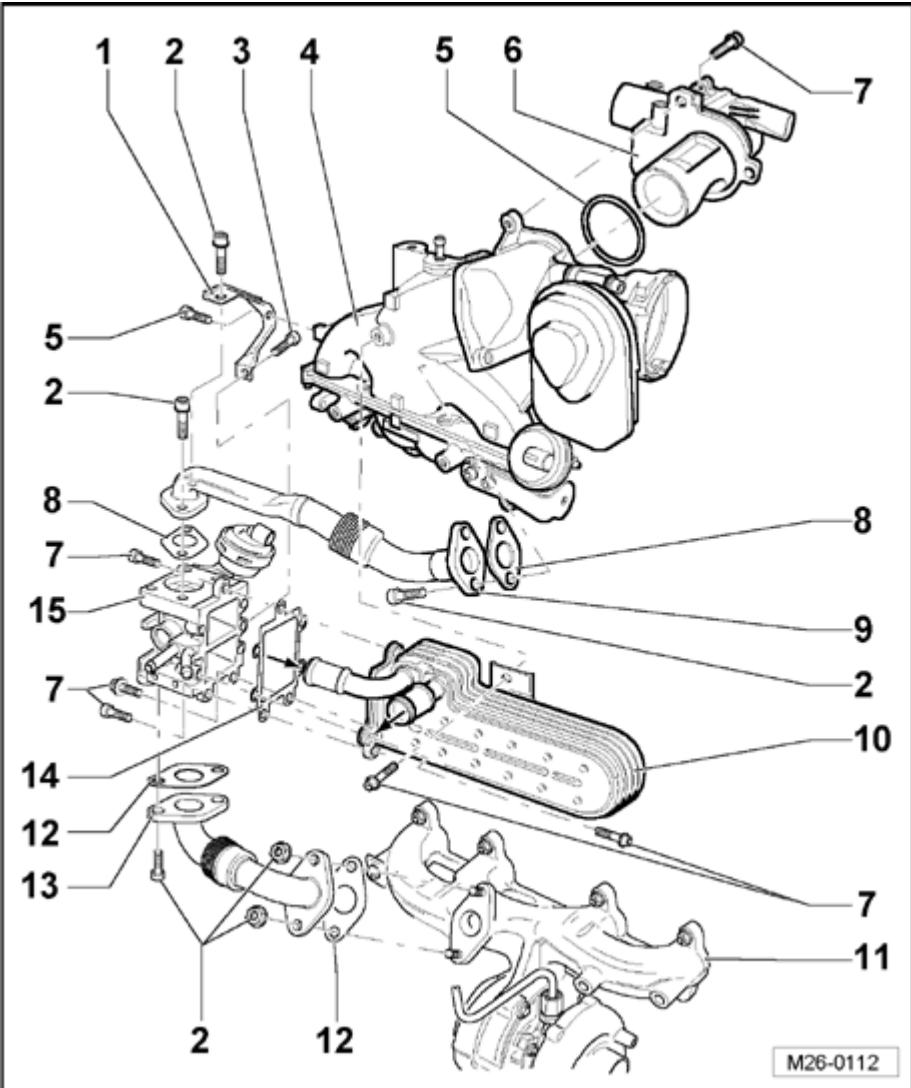


Fig. 198: Exploded View - Exhaust Gas Recirculation System
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- 1 - Bracket
 - For bypass flap
- 2 - 22 Nm
- 3 - 5 Nm
- 4 - Intake manifold
 - With EGR vacuum regulator valve -N121- and Motor for intake flap -V157-
- 5 - O-ring

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Replace

6 - EGR vacuum regulator valve -N121-

7 - 10 Nm

8 - Seal

- Replace

9 - Connecting pipe

10 - Cooler

- For exhaust gas recirculation
- Removing and installing. Refer to **Exhaust gas recirculation cooler, installing**

11 - Exhaust manifold

12 - Seal

- Replace

13 - Connecting pipe

14 - Seal

- Replace

15 - Bypass flap

- Vacuum hose connection diagram. Refer to **Vacuum hose connection diagram**
- Removing and installing. Refer to **Exhaust gas recirculation cooler, installing**

Exhaust gas recirculation cooler, installing

Special tools, testers and auxiliary items required

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

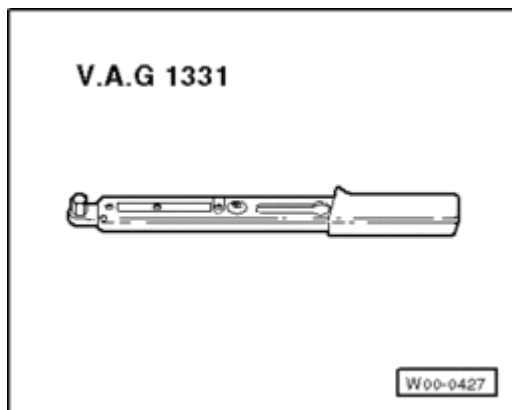


Fig. 199: Special Tool - Torque Wrench V.A.G 1331
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Torque wrench V.A.G 1331

NOTE:

- Adhere to the procedure described to prevent damage due to component stress.

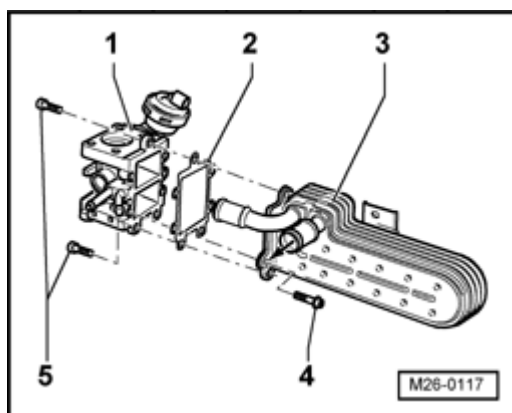


Fig. 200: Identifying Bypass Flap And EGR Cooler
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Assemble bypass flap - 1 - with seal - 2 - and two bolts - 5 - with EGR cooler - 3 - and tighten by hand.
- Insert four bolts - 4 - and tighten all bolts to 10 Nm.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

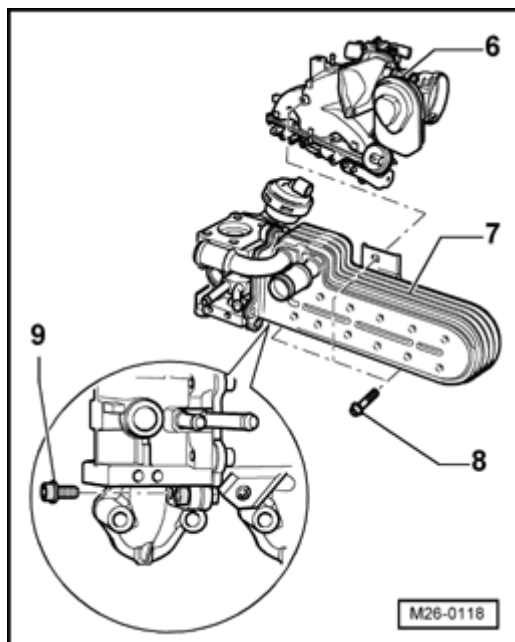


Fig. 201: Identifying EGR Cooler And Intake Manifold
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Mount EGR cooler - 7 - to intake manifold - 6 - with 3 bolts - 8 - tightened by hand (EGR cooler must make contact and must be able to move within bolt holes).
- Insert bolt - 9 - and tighten it to 10 Nm.
- Tighten bolts - 8 - to 10 Nm.

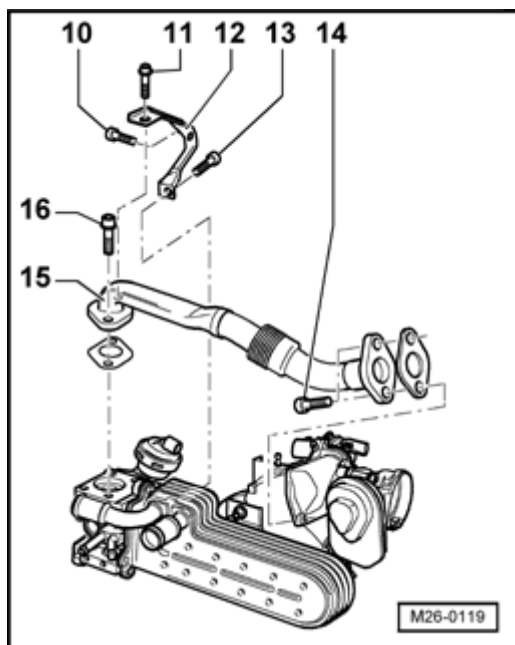


Fig. 202: Identifying Connecting Pipe And Mounting Hardware
Courtesy of VOLKSWAGEN UNITED STATES, INC.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Install connecting pipe - **15** - with seal, two bolts - **14** - and bolt - **16** - hand tight.
- Install bracket - **12** - with bolt - **11** - and bolt - **13** - to bypass flap.
- Bolt bracket - **12** - with bolt - **10** - to intake manifold and tighten it to 10 Nm.
- Tighten bolt - **11** - to 22 Nm.
- Tighten bolt - **13** - to 5 Nm.
- Tighten bolt - **14** - and - **16** - to 22 Nm.

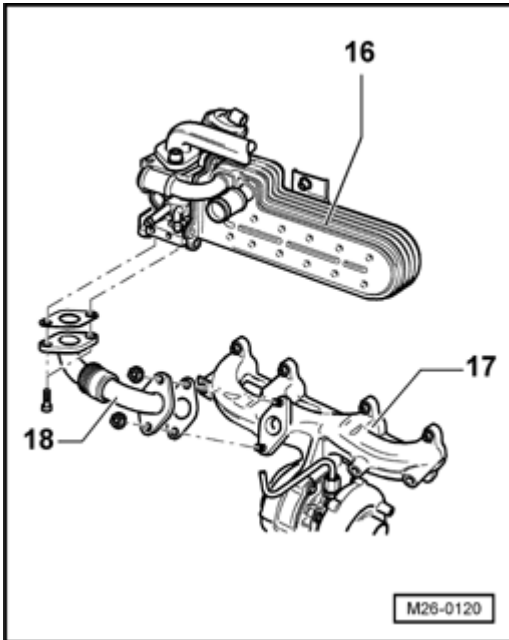


Fig. 203: Identifying Connecting Pipe From EGR Cooler To Exhaust Manifold
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Install connecting pipe - **18** - from EGR cooler - **16** - to exhaust manifold - **17** -.
- Tighten nuts and bolts to 22 Nm.

28 - IGNITION/GLOW PLUG SYSTEM

GLOW PLUG SYSTEM, CHECKING

Glow plug system, checking

CAUTION: The ceramic glow plugs are very sensitive to impacts and bending. For this reason, any glow plugs that have been dropped (even from a short distance of approx. 2 cm) must not be used under any circumstances, even if there appears to be no external damage. The installation instructions must be followed exactly, otherwise there is a dangerous risk that the plug may break and thereby cause engine damage.

Special tools, testers and auxiliary items required

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

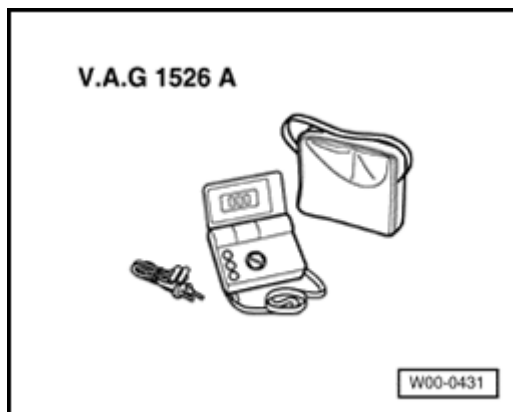


Fig. 204: Special Tool - Multimeter V.A.G 1526 A
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Multimeter V.A.G 1526 A

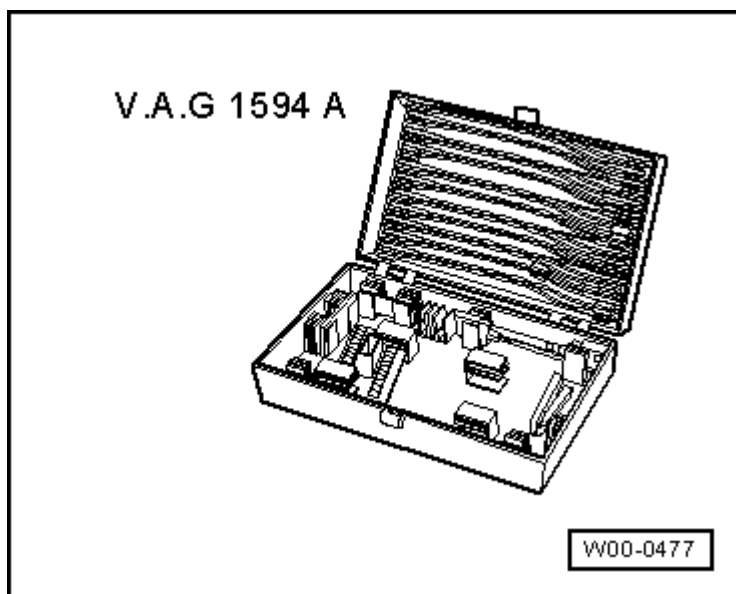


Fig. 205: Special Tool - Adapter Set V.A.G 1594 A
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Adapter set V.A.G 1594 A

Requirements

- Glow plug strip fuse in battery fuse holder OK.
- Battery voltage must be at least 11.5 V.
- All electrical consumers, e.g. lights and rear window defogger, must be switched off.
- Diesel Direct Fuel Injection (DFI) Engine Control Module (ECM) -J248- OK.

Work sequence

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Disconnect connector on Engine Coolant Temperature (ECT) sensor -G62-.

NOTE:

- **Disconnecting the sensor simulates the engine condition "cold" and when switching the ignition on the relevant glow period is initiated.**

- Disconnect glow plug connector.
- Connect multimeter to measure voltage between a glow plug connector and vehicle ground.
- Switch on ignition for approx. 20 seconds. Approx. battery voltage must be displayed.
- If no voltage is present: Electrical Wiring Diagrams, Troubleshooting Component Locations.

Glow plugs, checking

Special tools, testers and auxiliary items required

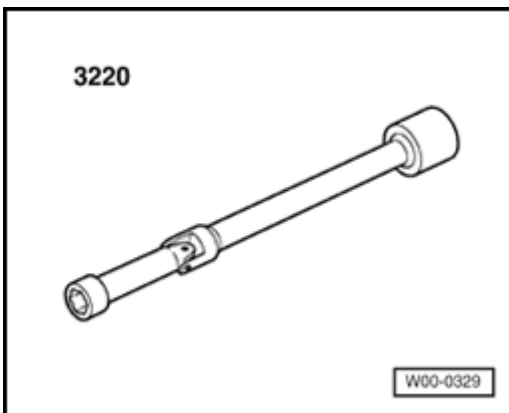


Fig. 206: Special Tool - Jointed Wrench 3220

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Jointed wrench 3220

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

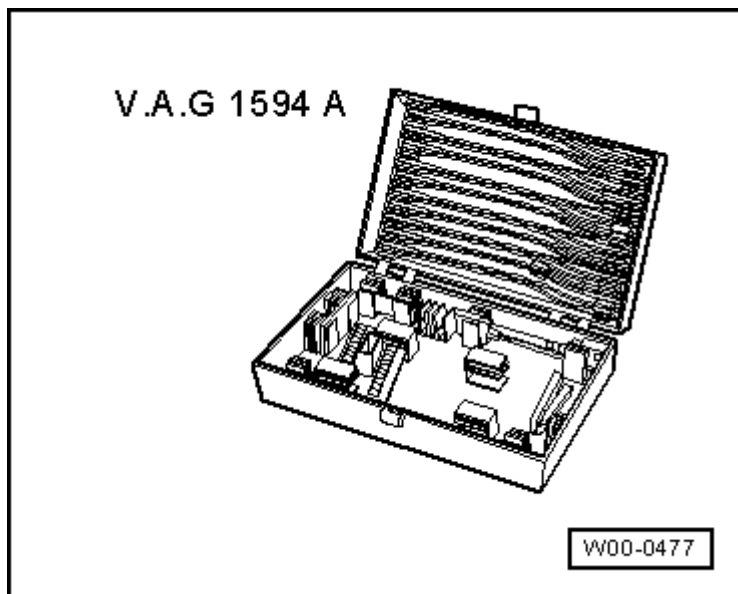


Fig. 207: Identifying V.A.G 1594 A Adapter Set
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Adapter set V.A.G 1594 A
- Diode test lamp V.A.G 1527

Requirements

- Glow plug strip fuse in battery fuse holder OK.
- Battery voltage must be at least 11.5 V.
- All electrical consumers, e.g. lights and rear window defogger, must be switched off.

Work sequence

- Disconnect glow plug connector.

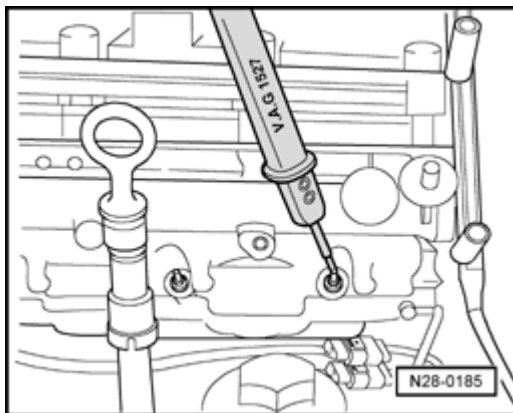


Fig. 208: Identifying Diode Test Lamp
Courtesy of VOLKSWAGEN UNITED STATES, INC.

2006 Volkswagen Golf GL

ENGINE 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BEW - Golf, Jetta & GTI (A4 Platform)

- Connect diode test lamp wire using clips from auxiliary cable set to battery positive (+).
- Place diode test lamp test probe on each glow plug one after another. Diode lights up: glow plug OK; diode does not light up: Replace glow plug.
- Remove and install glow plugs with jointed wrench 3220. Tightening torque: 15 Nm