

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

ENGINE

2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

00 GENERAL, TECHNICAL DATA

TECHNICAL DATA

Engine number

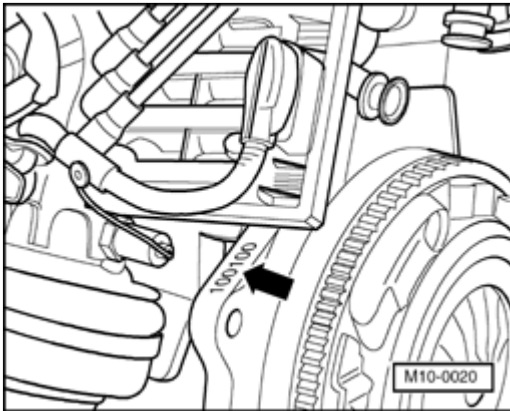


Fig. 1: Locating Engine Number

Courtesy of VOLKSWAGEN UNITED STATES, INC.

The engine number (Code letters and Serial number) can be found on the flange between engine/transmission.

The engine number consists of up to nine characters (alphanumeric). The first part (maximal 3 characters) makes up the engine code, and the second part (6 letters/numbers), 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 by a letter.

Additionally there is a sticker on the toothed belt guard containing the engine code and serial number.

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

Engine data

Code		AEG	AVH
Manufactured		from 02.98	from 08.00
Exhaust emissions		LEV	SULEV
Displacement	liters	2.0	2.0
Output	kW at rpm	85/5200	85/5200
Torque	Nm at rpm	165/2600	165/2600
Bore	diameter mm	82.5	82.5
Stroke	mm	92.8	92.8

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Compression ratio		10.0	10.0
RON	min.	91 unleaded	91 unleaded
Fuel injection system		Motronic 5.9.2	Motronic ME 7.5
Ignition system		Motronic 5.9.2	Motronic ME 7.5
Knock control		yes	yes
On Board Diagnostic version		OBD II	OBD II
Oxygen sensor regulation		yes	yes
Catalytic converter		yes	yes
Charging		no	no
Secondary air system		yes	yes

Code	AEG	AVH
Variable intake manifold	no	no
Variable valve timing	no	no
Electronic Power Control (EPC)	no	yes

Code	AZG	BBW
Manufactured	from 10.00	from 02.02
Exhaust emissions	LEV	SULEV
Displacement	liters	2.0
Output	kW at rpm	85/5200
Torque	Nm at rpm	165/2600
Bore	diameter mm	82.5
Stroke	mm	92.8
Compression ratio	10.0	10.0
RON	min.	91 unleaded
Fuel injection system	Motronic ME 7.5	Motronic M7.1.1
Ignition system	Motronic ME 7.5	Motronic M7.1.1
Knock control	2 knock sensors	2 knock sensors
On Board Diagnostic version	OBD II	OBD II
Oxygen sensor regulation	2 sensors	3 sensors
Catalytic converter	yes	yes

Code	AZG	BBW
Charging:	no	no
Secondary air system	yes	no

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Variable intake manifold	no	no
Variable valve timing	no	no
Electronic Power Control (EPC)	yes	yes

Code		BEV
Manufactured		from 06.03
Exhaust emissions		LEV 2
Displacement	liters	2.0
Output	kW at rpm	85/5200
Torque	Nm at rpm	165/2600
Bore	diameter mm	82.5
Stroke	mm	92.8
Compression ratio		10.0
RON	min.	91 unleaded
Fuel injection system		Motronic ME 7.5
Ignition system		Motronic ME 7.5
Knock control		2 knock sensors
On Board Diagnostic version		OBD II
Oxygen sensor regulation		2 sensors
Catalytic converter		yes
Charging		no

Code		BEV
Secondary air system		yes
Variable intake manifold		no
Variable valve timing		no
Electronic Power Control (EPC)		yes

10 ENGINE - ASSEMBLY

ENGINE, REMOVING AND INSTALLING

Engine, removing and installing

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

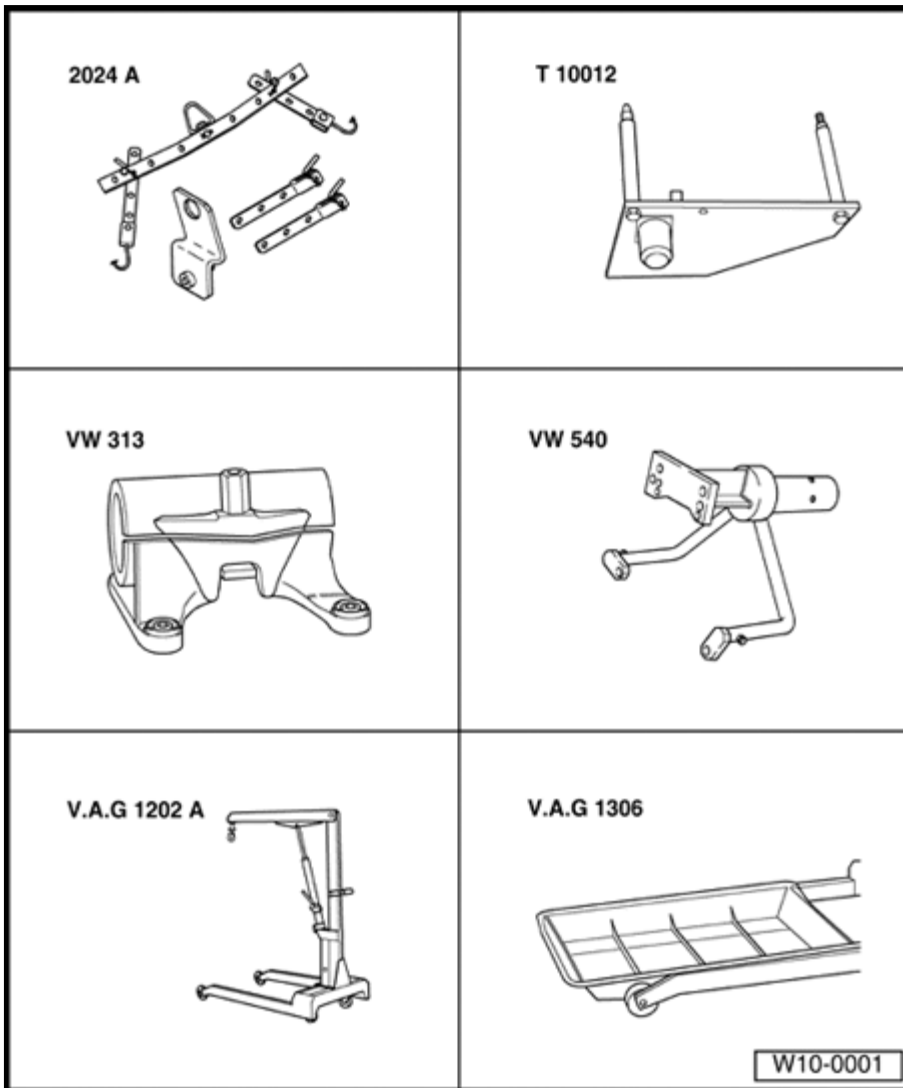


Fig. 2: Identifying Special Tools - Engine, Removing And Installing (1 Of 2)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools equipment

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

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

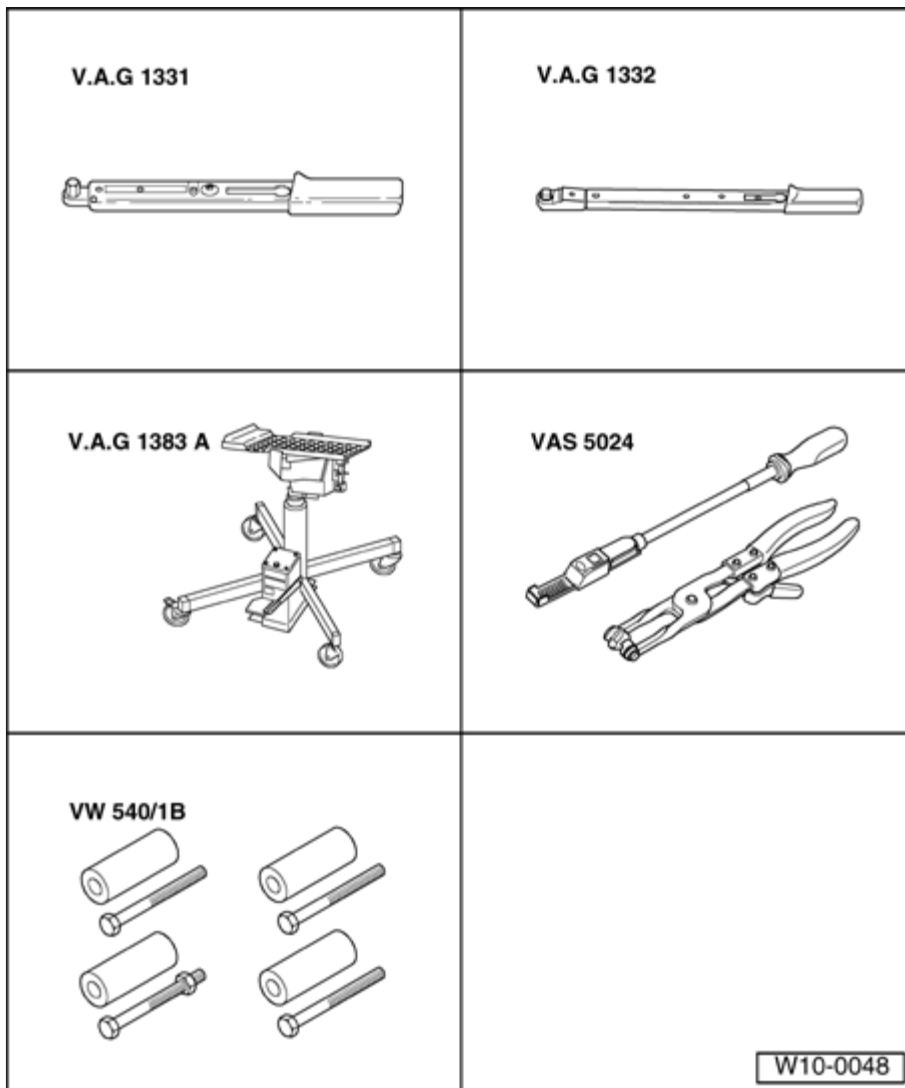


Fig. 3: Identifying Special Tools - Engine, Removing And Installing (2 Of 2)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- V.A.G 1331 Torque wrench (5 to 50 Nm)
- V.A.G 1332 Torque wrench (40 to 200 Nm)
- V.A.G 1383 A Engine/transmission jack
- VAS 5024 Assembly tool for spring-type clips
- VW 540/1 B Supplementary set
- VAS 5085 Step ladder
- G 000 100 Grease (models with manual transmission)
- Bolt M10 x 25 / 8.8
- Cable tie

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Engine, removing

NOTE: During the following procedure the battery Ground strap must be disconnected. Check whether a coded radio is installed. Obtain the radio code first, if necessary.

The engine is removed in a downward direction together with the transmission.

CAUTION: When performing repair work, especially due to the confined conditions in the engine compartment, pay attention to the following:

- Route all types of lines (e.g. for fuel, hydraulics, EVAP system, coolant, refrigerant, brake fluid and vacuum) as well as electrical wiring so that the original positions are restored.
- Ensure sufficient clearance to all moving or hot components.

NOTE: All cable ties which are opened or cut open when removing the engine must be replaced in the same position when installing the engine.

- With ignition switched off disconnect battery Ground strap.
- Remove engine cover.
- Remove left and right sound insulation:

Refer to **NOISE INSULATION (GASOLINE ENGINES), ASSEMBLY OVERVIEW**

- Drain coolant. Refer to **Cooling system, draining and filling** .
- Remove battery and battery retainer.

Refer to **BATTERY, REMOVING AND INSTALLING**

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

CAUTION:

- Fire Hazard! Do NOT have anything in the area that can ignite fuel!
- The fuel system is under pressure! Before opening the system place a cloth around the connection. Then release the pressure by carefully loosening the connection.

Engine codes AEG, AVH, AZG

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

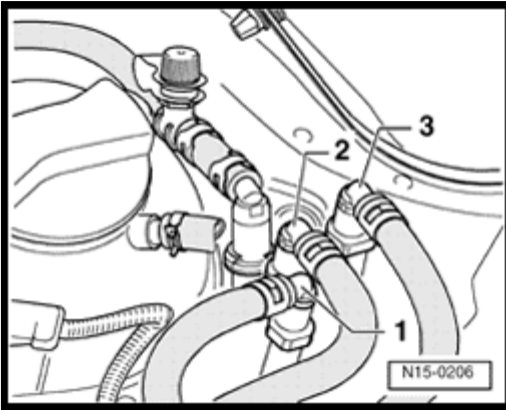


Fig. 4: Identifying Vacuum Hose To Throttle Valve Control Module, Fuel Return Hose & Fuel Supply Hose (AEG, AVH, AZG)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect following hose connections and collect fuel that leaks out with a cloth.

1 - Vacuum hose to Throttle valve control module -J338-

2 - Fuel return hose (with blue markings)

3 - Fuel supply hose (with white markings)

Engine codes BBW, BEV

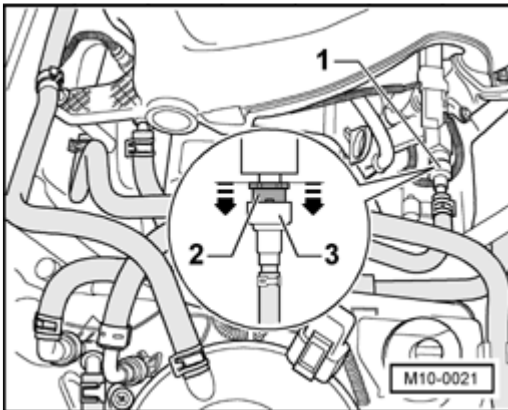


Fig. 5: Disconnecting Fuel Supply Line Off Union By Pressing Locking Ring Into Union

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect fuel supply line -1- off union by pressing locking ring -2- into union -3-.

Continued for all vehicles

- Seal lines to avoid contamination of fuel system.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

NOTE: Seal the intake ports in the intake manifold lower section with clean cloths.

- In preparation for further disassembly work disconnect connectors from following components (Refer to Component Locations):

Camshaft Position (CMP) sensor -G40-

Fuel Injectors -N30- to -N33-, unclip cable guide

Engine Coolant Temperature (ECT) sensor -G62-

Engine speed (RPM) sensor -G28-

Knock Sensor (KS) 1 -G61-

Knock Sensor (KS) 2 -G66-

Oil pressure switch -F1-

Mass Air Flow (MAF) sensor -G70-

Throttle valve control module -J338-

A/C cut-out thermal switch -F163-

Engine code BBW

Valve -1- for camshaft adjustment -N205-

Ignition coils with power output stages -N70-, -N127-, -N291-, -N292-

Secondary Air Injection (AIR) pump motor -V101-

Engine code AEG, AVH, AZG

Ignition coils (-N- and -N128-) with power output stage -N122-

Secondary Air Injection (AIR) pump motor -V101-

Engine code BEV

Ignition coils with power output stages -N70-, -N127-, -N291-, -N292-

Secondary Air Injection (AIR) pump motor -V101-

Continued for all vehicles

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Remove air cleaner. Refer to **Air cleaner, disassembling and assembling** .
- Remove interconnecting, coolant, vacuum and intake hoses on engine.
- Remove intake manifold upper part. Refer to **Intake manifold upper part, removing and installing** .

NOTE: **Seal the intake ports in the intake manifold lower part with a clean cloth.**

Vehicles with manual transmission

- Disconnect shift mechanism from transmission.

Refer to **GEAR SELECTOR MECHANISM UP TO 05.99, SERVICING** or **GEAR SELECTOR MECHANISM FROM 05.99, SERVICING**

- Remove hydraulic clutch slave cylinder:

Refer to **34 MANUAL TRANSMISSION - CONTROLS, HOUSING**

NOTE: **The clutch pedal must not be operated.**

Vehicles with automatic transmission

- Disconnect selector lever cable from transmission:

Refer to **SELECTOR CABLES, REMOVING AND INSTALLING**

Continued for all vehicles

- Remove poly V-belt. Refer to **Poly V-belt, removing and installing** .
- Remove securing clamps for power steering pressure line.
- Remove power steering pump from bracket and lay to side; hoses remain connected:

Refer to **POWER STEERING PUMP WITH HYDRAULIC LINES/HOSES, OVERVIEW**

Vehicles with air conditioning

- Remove air conditioning compressor.
- Note additional information and removal work. Refer to **Additional information and assembly work on models with an air conditioning system** .

Continued for all vehicles

- Disconnect hoses from engine.
- Vehicles with secondary air pump: remove secondary air pump motor and bracket.
- Disconnect all electrical wiring from transmission, Generator and starter and move clear.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Disconnect all other electrical connections from engine and lay to one side as necessary.

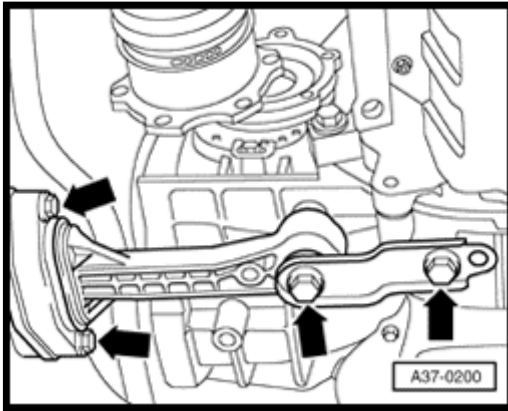


Fig. 6: Identifying Pendulum Support & Bolts

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Unbolt pendulum support (arrows).
- Remove protective cover for right side inner constant velocity joint from engine.
- Remove right axle shaft and disconnect left axle shaft at transmission:

Refer to **FRONT DRIVE SHAFTS, SERVICING**

- Remove front exhaust pipe. Refer to **Exhaust system components, removing and installing** .
- Disconnect connector for oxygen sensor before catalytic converter and move wiring clear. Refer to **Exhaust system components, removing and installing** .
- Depending on version, remove oil pan protection. Refer to **Oil pan, removing and installing** , and remove rubber bushings. Refer to **Engine code BBW, assembly overview** , Fig.13 .
- Insert engine bracket T10012 in engine/transmission jack V.A.G 1383 A.

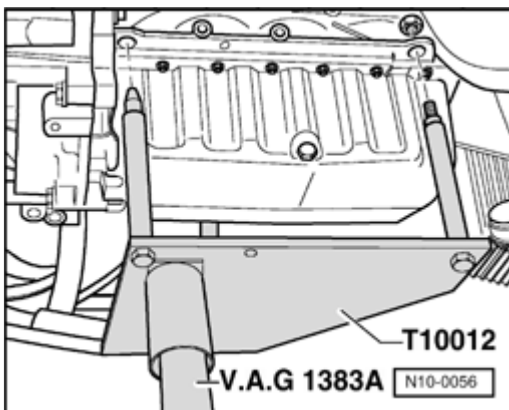


Fig. 7: Identifying Engine Bracket T10012 & Engine/Transmission Jack V.A.G. 1383A

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Secure engine bracket T10012 to front of cylinder block with securing bolt M10 x 25(8.8) to 40 Nm.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Tighten securing nut on exhaust side hand tight.
- Lift engine and transmission lightly using engine/transmission jack V.A.G 1383 A.

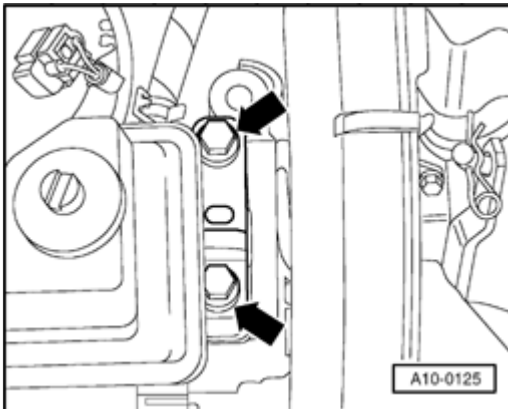


Fig. 8: Locating Engine Carrier Bolts (Engine Side)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Unbolt engine side of assembly mounting from top of engine carrier (arrows).

NOTE: Use step ladder VAS 5085 or equivalent to remove securing bolts.

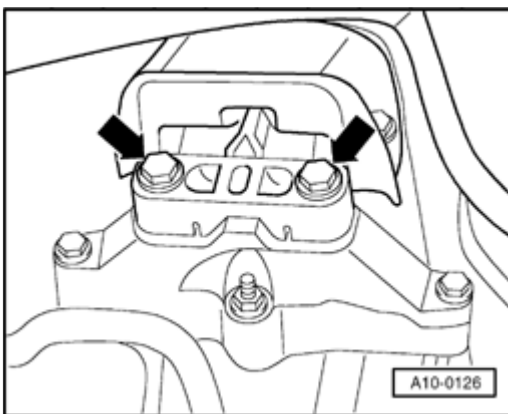


Fig. 9: Locating Engine Carrier Bolts (Transmission Side)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

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

NOTE: Engine and transmission must be guided carefully when lowering to prevent damage to the bodywork, hoses and lines/wiring.

Engine, attaching to assembly stand

When working on the engine, it should be secured to the assembly stand support clamp VW 313 using the

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

engine and transmission bracket VW 540 and supplementary set VW 540/1B.

Work sequence

- Remove transmission.

Vehicles with automatic transmission

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

Continued for all vehicles

CAUTION: Hooks and locating pins must be secured with locking pins.

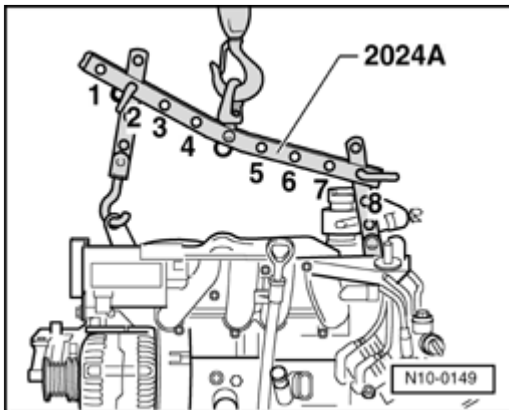


Fig. 10: Identifying Lifting Tackle 2024A & Crane Attached to Engine
Courtesy of VOLKSWAGEN UNITED STATES, INC.

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

Belt pulley end: 3rd hole of lifting rail in position 2

Flywheel end: 3rd hole of lifting rail in position 8

NOTE:

- Positions marked 1 to 4 on the bar must face toward 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 and supplementary set VW 540/1B.
- Remove dowel sleeves.

Engine, installing

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Installation is performed in reverse sequence. Note the following:

CAUTION: When performing repair work, especially due to the confined conditions in the engine compartment, pay attention to the following:

- Route all types of lines (e.g. for fuel, hydraulics, EVAP system, coolant, refrigerant, brake fluid and vacuum) as well as electrical wiring so that the original positions are restored.
 - Ensure sufficient clearance to all moving or hot components.
- Insert new dowel sleeves in cylinder block for centralizing engine and transmission.

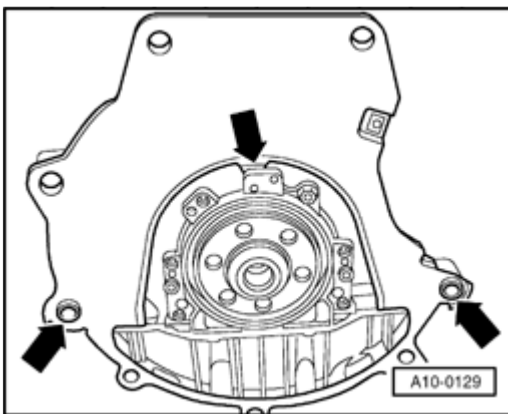


Fig. 11: Identifying Intermediate Plate, Sealing Flange And Dowel Sleeves
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Install intermediate plate onto sealing flange and slide onto dowel sleeves (arrows).

Vehicles with manual transmission

- Lightly grease input shaft splines with G 000 100 grease.
- Install hydraulic clutch slave cylinder:

Refer to **CLUTCH CONTROL, SERVICING**

- Check clutch and clutch operating mechanism, then install.

Refer to **CLUTCH CONTROL, SERVICING**

- Install gear shift mechanism, adjust gear shift cables if necessary:

Refer to **GEAR SELECTOR MECHANISM UP TO 05.99, SERVICING** or **GEAR SELECTOR MECHANISM FROM 05.99, SERVICING**

Vehicles with automatic transmission

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Install selector cable on transmission, adjust if necessary:

Refer to **SELECTOR LEVER CABLE, REMOVING AND INSTALLING**

NOTE: Always replace selector cable circlip

Vehicles with air conditioning

- Install air conditioner compressor:

Refer to **A/C COMPRESSOR AND BRACKET**

- Observe additional information and installation instructions. Refer to **Additional information and assembly work on models with an air conditioning system** .

Continued for all vehicles

- When installing engine/transmission assembly, ensure sufficient clearance to engine and transmission mountings and radiator.
- Align assembly mountings for engine and transmission. Refer to **Engine and transmission mountings, aligning** .

NOTE: Assembly mounting tightening torques. Refer to **Assembly mounting** .

- Install right axle shaft and attach left axle shaft to transmission:

Refer to **FRONT DRIVE SHAFTS, SERVICING**

- Install front exhaust pipe. Refer to **Exhaust system components, removing and installing** , Exhaust system components, removing and installing.
- Install power steering pump:

Refer to **POWER STEERING PUMP WITH HYDRAULIC LINES/HOSES, OVERVIEW**

- Route wiring harness and connect all electrical connections to engine

Refer to **97 WIRING**

- Install poly V-belt. Refer to **Poly V-belt, removing and installing** .
- Install sound insulation at left and right sides:

BODY, FRONT

- Refill with coolant. Refer to **Cooling system, draining and filling** .
- Vehicles with secondary air injection pump, install pump with bracket.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Adapt (match) engine control module to throttle valve control module. Refer to **Adapting components and functions** , Adapting components and functions.

Vehicles without Electronic Power Control (EPC)

- Adjust throttle cable. Refer to **Accelerator mechanism, servicing** .

Continued for all vehicles

- Test drive vehicle and check Diagnostic Trouble Code (DTC) memory.
- Generate readiness code again if DTC memory has been erased or engine control module was disconnected from permanent positive. Refer to **Adapting components and functions** , Adapting components and functions.

Engine and transmission mountings, aligning

Special tools and equipment

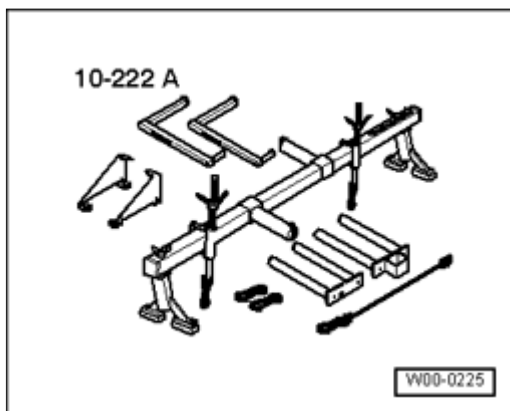


Fig. 12: Identifying Support Assembly 10-222 A With Legs 10-222 A/1
Courtesy of VOLKSWAGEN UNITED STATES, INC.

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

CAUTION: Before loosening bolts secure assembly using support device 10-222A.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

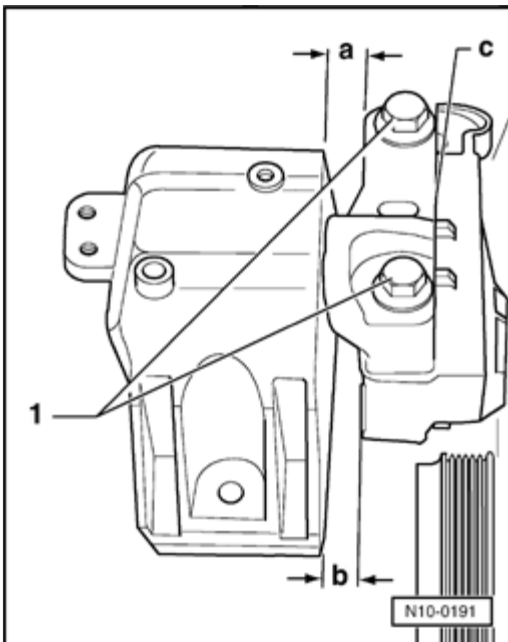


Fig. 13: Measuring Engine Mounting
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Engine mounting

-a- = 14.0 mm

-b- = at least 10.0 mm

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

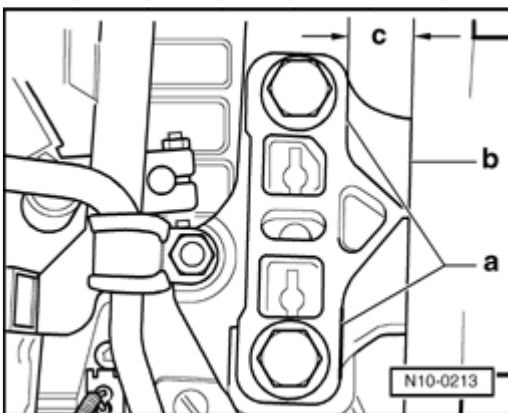


Fig. 14: Measuring Transmission Mounting
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Transmission mounting

Edges -a- and -b- must be parallel with one another

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

-c- = 18 to 20 mm

NOTE: Tightening torques for assembly mounting. Refer to Assembly mounting .

Tightening torques

Bolted connections		Specified torque
Nuts, bolts/screws	M 6	10 Nm
	M7	15 Nm
	M8	25 Nm
	M10	40 Nm
	M12	60 Nm
Deviations from above		
Engine to transmission connecting bolts: Refer to <u>TRANSMISSION, REMOVING AND INSTALLING</u> . Refer to <u>TRANSMISSION, REMOVING AND INSTALLING</u>		
Torque converter to drive plate: Refer to <u>TRANSMISSION, REMOVING AND INSTALLING</u>		
Install axle shaft: Refer to <u>FRONT DRIVE SHAFTS, SERVICING</u>		

NOTE: Tightening torques for assembly mounting. Refer to Assembly mounting .

Assembly mounting

Tightening torques

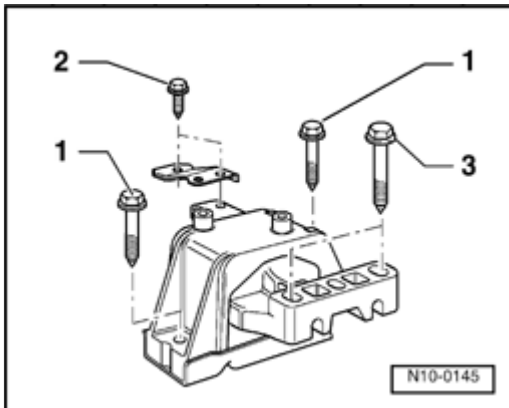


Fig. 15: Identifying Engine Mounting Bracket & Bolts
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Engine mounting

1 -	Bracket to body 1)	40 Nm plus 90 ° (1/4 turn)
2 -	Mounting/bracket to body	25 Nm
3 -	Mounting to body	100 Nm

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

1) Replace bolts

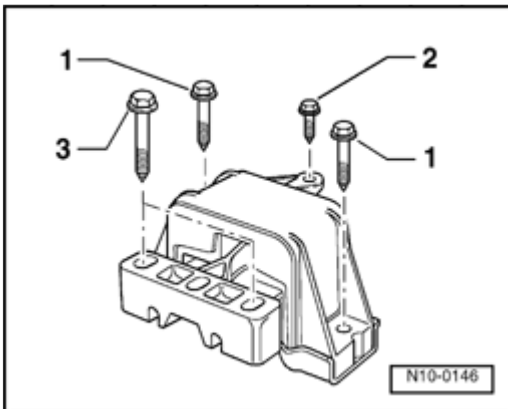


Fig. 16: Identifying Transmission Mounting Bracket & Bolts
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Transmission mounting

1 -	Mounting to body 1)	40 Nm plus 90 ° (1/4 turn)
2 -	Mounting to body	25 Nm
3 -	Mounting to transmission bracket	100Nm

1) Replace bolts

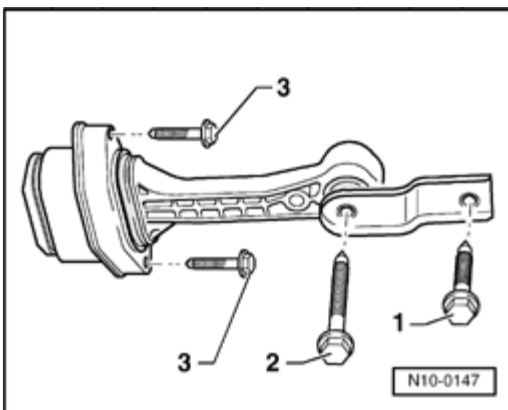


Fig. 17: Identifying Pendulum Support & Bolts
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Pendulum support

1 -	Pendulum support to transmission	40 Nm plus 90 ° (1/4 turn)
2 -	Pendulum support to transmission	40 Nm plus 90 ° (1/4 turn)
3 -	Pendulum support to subframe	20 Nm plus 90 ° (1/4 turn)

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Additional information and assembly work on models with an air conditioning system

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

NOTE: To prevent damage to the condenser as well as to the refrigerant lines/hoses, ensure that lines and hoses are not stretched, kinked or bent.

To facilitate removal and installation of the engine without having to open the refrigerant circuit:

- Remove sound insulation.

Refer to **BODY, FRONT**

- Remove retaining clamp(s) from refrigerant lines.
- Remove air conditioning compressor:

Refer to **A/C COMPRESSOR AND BRACKET**

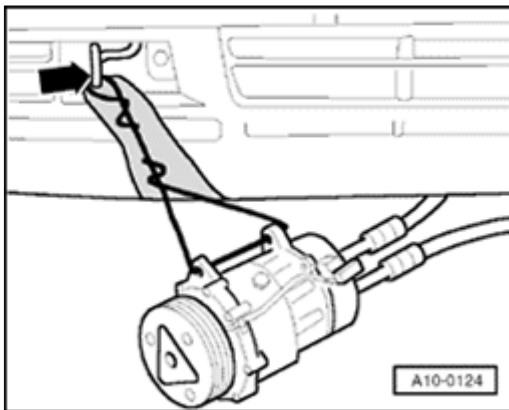


Fig. 18: Identifying Air Conditioning Compressor Secured To Towing Eye
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Secure air conditioning compressor to towing eye (arrow) so that refrigerant lines/hoses are not under tension.

NOTE: Protect bumper with tape to prevent damage.

13 ENGINE - CRANKSHAFT, CYLINDER BLOCK

ENGINE, DISASSEMBLING AND ASSEMBLING

Assembly overview

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

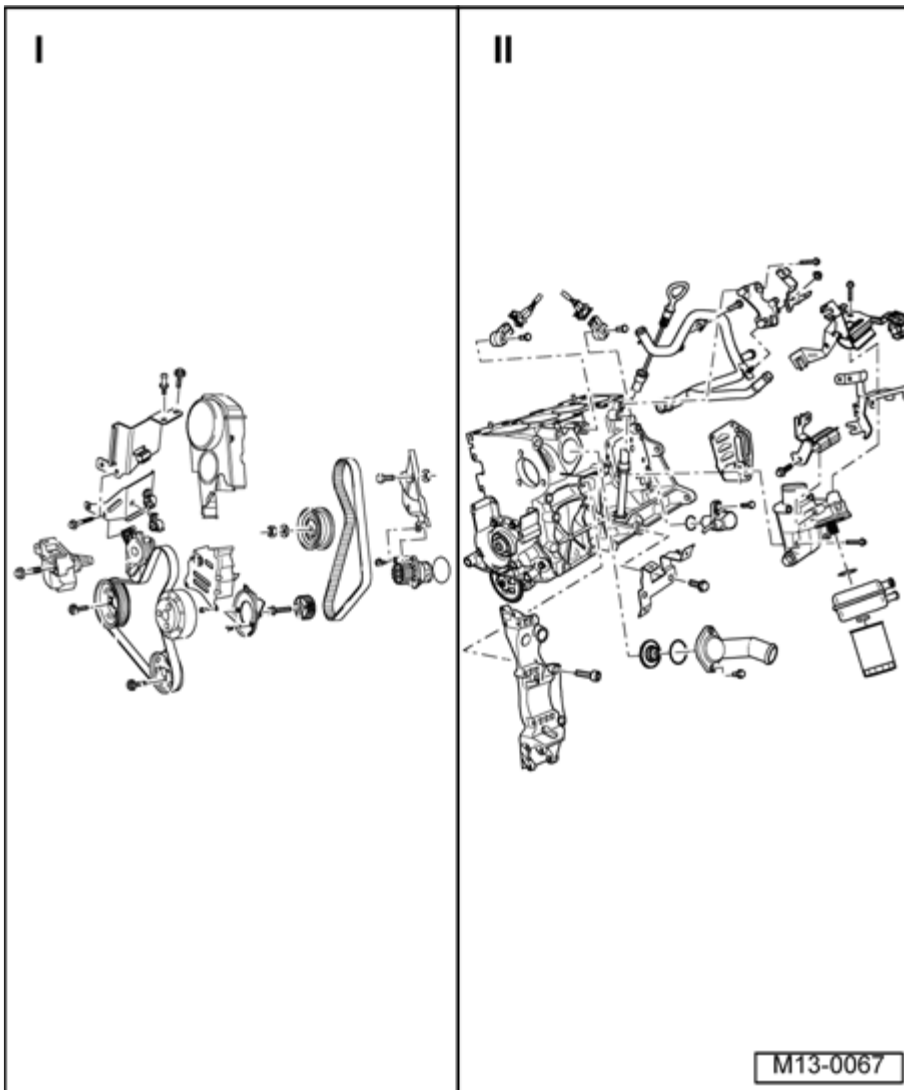


Fig. 19: Exploded View Of Engine Assembly

Courtesy of VOLKSWAGEN UNITED STATES, INC.

NOTE: If, when repairing an engine, metal shavings or large amounts of small metal particles are found in the engine oil, caused for example by partial seizure of crankshaft or connecting rod bearings, perform the following work sequences to prevent consequential damage once repairs are complete:

- Thoroughly clean oil passages
- Replace oil spray jets
- Replace oil cooler
- Replace oil filter

I. Refer to **Part I**

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

II. Refer to **Part II**

Part I

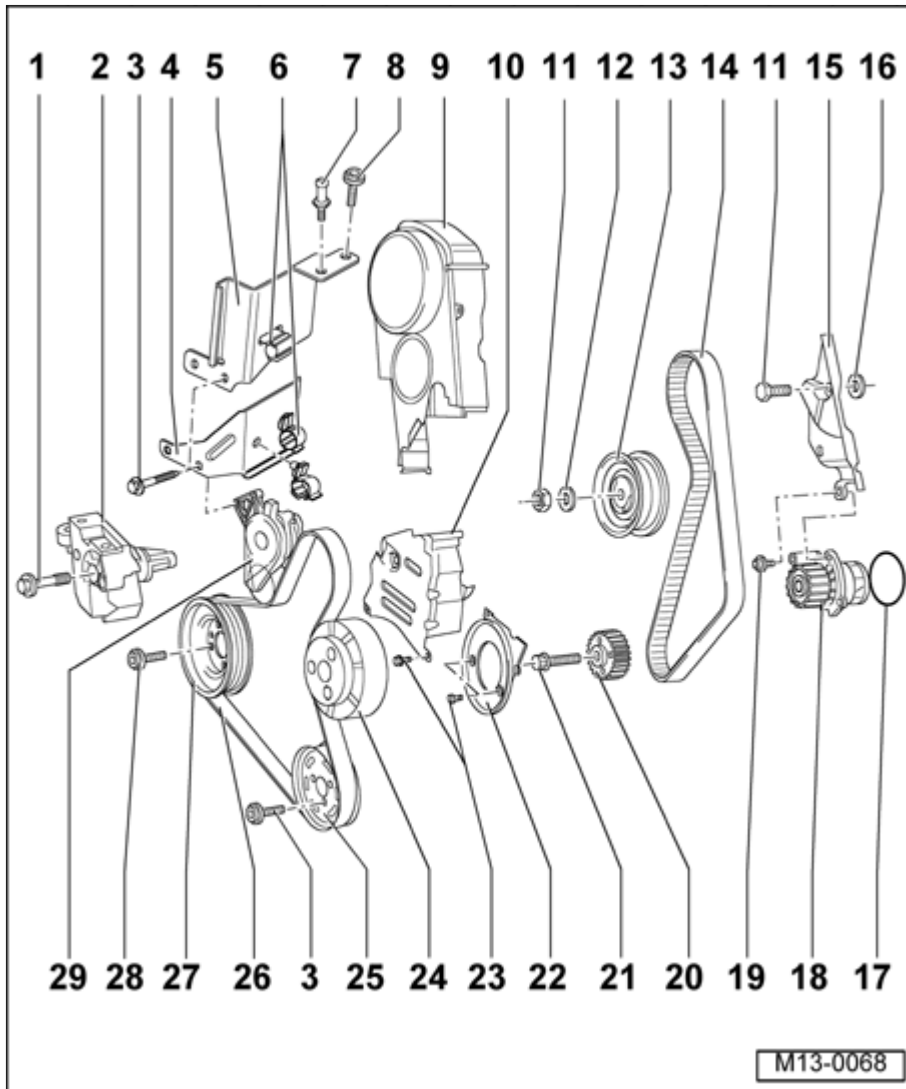


Fig. 20: Exploded View Of Engine - Part I

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Part I

1 - 45 Nm

2 - Engine bracket

3 - 25 Nm

4 - Bracket

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Depending on version

5 - Bracket

6 - Hose clip

7 - 10 Nm

- For engine cover
- Depending on version

8 - 20 Nm

- Depending on version

9 - Toothed belt guard, upper part

10 - Toothed belt guard, center section

11 - 20 Nm

12 - Washer

13 - Tensioning roller

- Checking semi-automatic toothed belt tensioning roller. Refer to Semi-automatic toothed belt tensioning roller, checking

14 - Toothed belt

- Mark direction of rotation before removing
- Check for wear
- Do not kink
- Removing and installing, tensioning. Refer to Engine codes AEG, AVH, AZG, BEV .

15 - Rear toothed belt guard

16 - Washer

- Note Part No.

17 - O-ring

- Always replace

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

18 - Coolant pump

- Check for ease of movement
- If damaged or leaking replace complete
- Removing and installing. Refer to **Coolant pump, removing and installing**

19 - 15 Nm

20 - Crankshaft toothed belt sprocket

21 - 90 Nm plus 1/4 turn (90 °)

- Always replace
- Threads and shoulder must be free of oil and grease
- Use counterhold tool 3415 to loosen and tighten

22 - Toothed belt guard, lower part

23 - 10 Nm

- Always replace

24 - Electro-magnetic coupling

- Air conditioning compressor

25 - Belt pulley

- For power steering pump

26 - Poly V-belt

- Mark direction of rotation before removing
- Check for wear
- Do not kink
- Removing and installing. Refer to **Poly V-belt, removing and installing**

27 - Belt pulley/vibration damper

- Can only be installed in one position; holes are offset
- Note position when installing toothed belt. Refer to **Engine codes AEG, AVH, AZG, BEV**

28 - 25 Nm

29 - Tensioning element for poly V- belt

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Turn with open end wrench to loosen ribbed poly V-belt. Refer to **Poly V-belt, removing and installing**

Part II

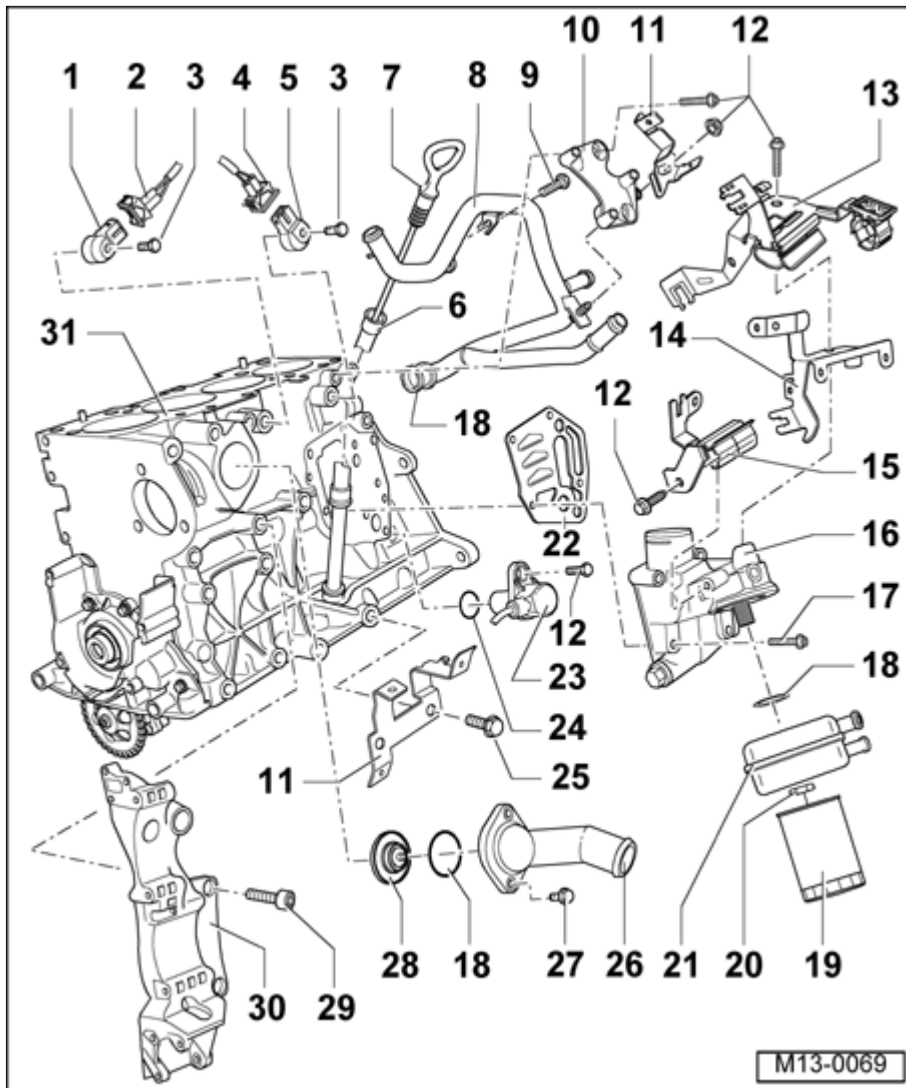


Fig. 21: Exploded View Of Engine - Part II

Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Knock sensor (KS) 1 -G61-

- Gold plated contacts

2 - Connector

- For Knock Sensor (KS) 1 -G61-
- Gold plated contacts

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

3 - 20 Nm

- Torque setting influences function of knock sensor

4 - Connector

- For Knock Sensor (KS) 2 -G66-
- Gold plated contacts

5 - Knock Sensor (KS) 2 -G66-

- Gold plated contacts

6 - Dipstick guide

7 - Dipstick

- Oil level must not exceed Max. mark!
- Markings. See **Fig. 160** .

8 - Coolant pipe

- Depending on version
- Coolant hose connection diagram. Refer to **Coolant hose connection diagram**

9 - 25 Nm

10 - Bracket

- For ignition coil

11 - Bracket

- Depending on version

12 - 10 Nm

13 - Bracket

- Depending on version

14 - Bracket

- Depending on version

15 - Bracket

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Depending on version

16 - Oil filter bracket

- Disassembling and assembling. Refer to [Oil filter housing, disassembling and assembling](#)

17 - 15 Nm plus 1/4 turn (90 °)

- Always replace

18 - O-ring

- Always replace

19 - Oil filter

- Loosen with strap wrench
- Tighten by hand
- Note instructions on filter when installing

20 - 25 Nm

21 - Oil cooler

- Coat contact surfaces to oil filter bracket outside the seal with AMV 188 100 02
- Ensure clearance to adjacent components
- See notes. Refer to [Assembly overview](#)

22 - O-ring

- Always replace

23 - Engine speed sender

24 - O-ring

- Replace if damaged

25 - 40 Nm

26 - Union

27 - 15 Nm

28 - Thermostat

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Checking: Heat up thermostat in water
- Starts to open at approx. 86 ° C
- Opening stroke min. 7 mm
- Removing and installing. Refer to **Thermostat, removing and installing**

29 - Hex socket head bolt, 45 Nm

30 - Compact bracket

- For V-belt tensioning roller, Generator, power steering pump and air conditioning compressor

Refer to **A/C COMPRESSOR AND BRACKET**

31 - Cylinder block

- Removing and installing sealing flange and flywheel/drive plate. Refer to **Sealing flanges and flywheel/drive plate, removing and installing**
- Removing and installing crankshaft. Refer to **Crankshaft, removing and installing**
- Disassembling and assembling piston and connecting rod. Refer to **Assembly overview**

Poly V-belt, removing and installing

Special tools and equipment

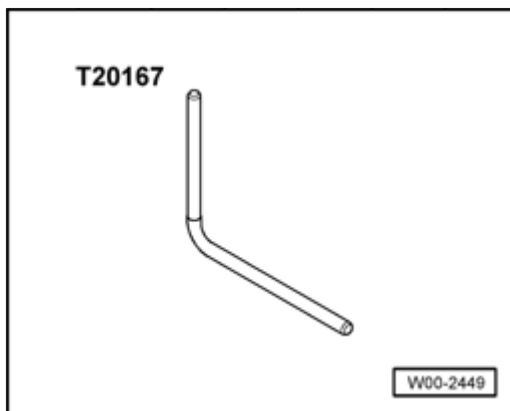


Fig. 22: Identifying T20167 Clamp

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- T20167 Clamp

Removing

- Remove right side sound insulation:

Refer to **50 BODY, FRONT**

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Remove engine cover.
- Mark direction of rotation of poly V-belt.

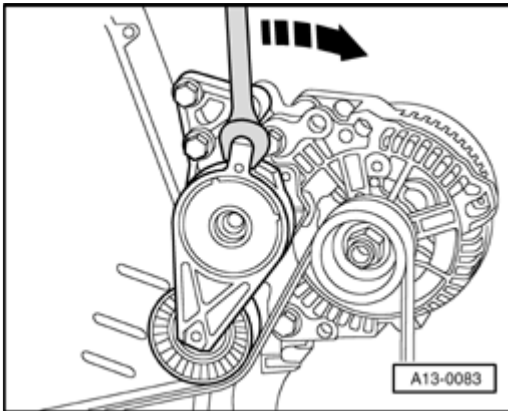


Fig. 23: Relieving Tension On Poly V-Belt

Courtesy of VOLKSWAGEN UNITED STATES, INC.

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

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

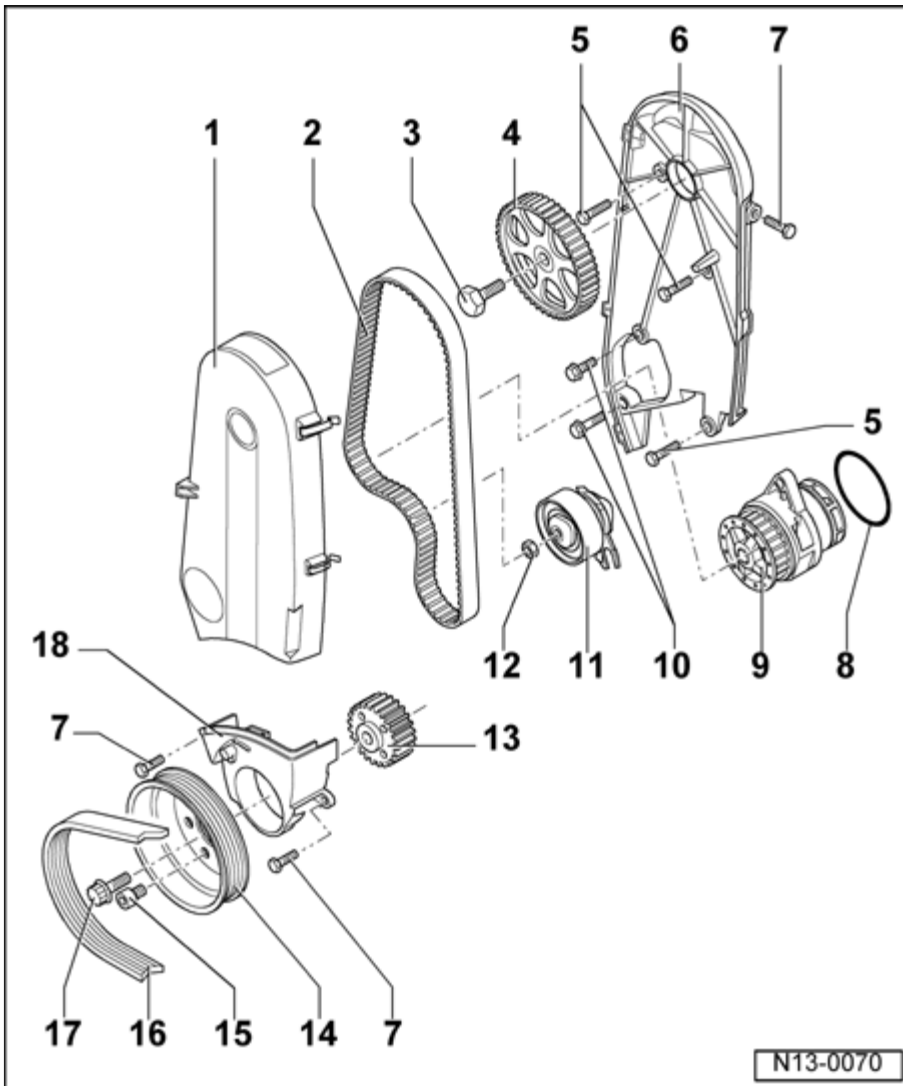


Fig. 24: Exploded View Of Poly V-belt Components
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Lock tensioning element using locking pin T20167.
- Remove poly V-belt.

Installing

Install in reverse order and note the following:

NOTE:

- Ensure, before installing poly V-belt, that all ancillaries (Generator, air conditioning compressor, power steering pump) are secured tightly.
- When installing the poly V-belt observe belt direction of rotation and ensure that the belt is seated correctly in the belt pulleys.
- On vehicles which do not have an air conditioning system, place the

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

ribbed belt over the Generator pulley last.

- **For models with an air conditioning, place the poly V-belt over the air conditioning compressor last.**

After completing repairs always:

- Start engine and check belt running.

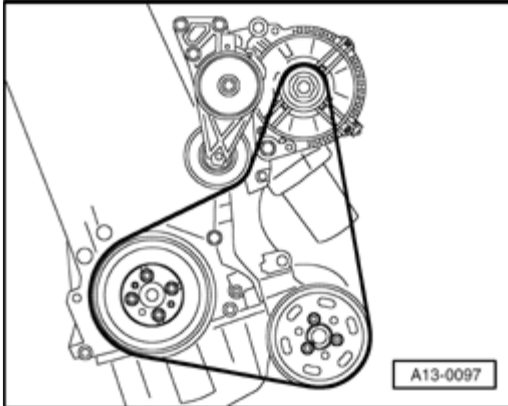


Fig. 25: Identifying Belt Drive With No Air Conditioning Compressor
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Belt drive with no air conditioning compressor

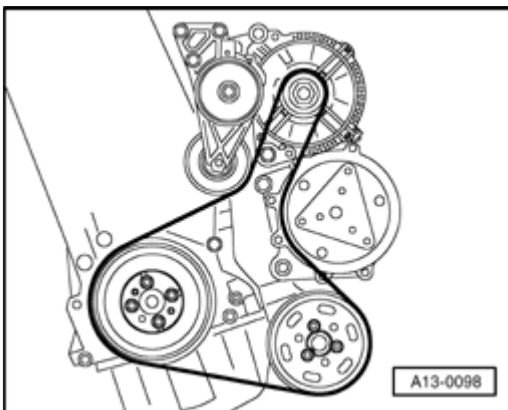


Fig. 26: Identifying Belt Drive With Air Conditioning Compressor
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Belt drive with air conditioning compressor

SEALING FLANGES AND FLYWHEEL/DRIVE PLATE, REMOVING AND INSTALLING

Sealing flanges and flywheel/drive plate, removing and installing

NOTE: Servicing clutch:

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Refer to **CLUTCH, SERVICING** for 5 spd. manual transmission 02J or **CLUTCH, SERVICING** for 6 spd. manual transmission 02Y all wheel drive

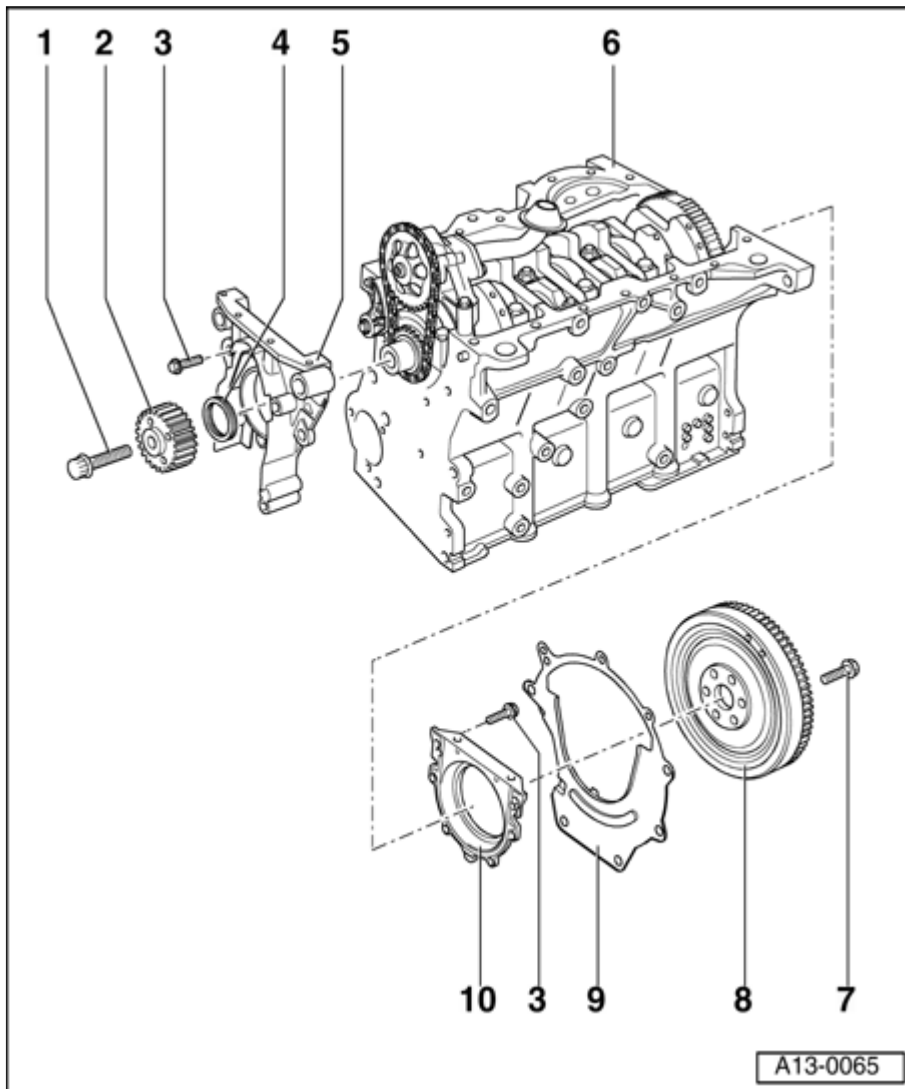


Fig. 27: Identifying Sealing Flanges And Flywheel/Drive Plate
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - 90 Nm plus 1/4 turn (90 °)

- Always replace
- Threads and shoulder must be free of oil and grease
- Use counterhold tool 3415 to loosen and tighten

2 - Crankshaft toothed belt sprocket

3 - 15 Nm

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

4 - Seal

PTFE seals:

- Do not add oil or grease to the oil seal sealing lip.

Coil spring seals:

- Lightly oil or grease the oil seal sealing lip.

Differences between PTFE seals and coil spring seals. Refer to Crankshaft oil seal - belt pulley end, replacing , Fig. 10

- Replace. Refer to Crankshaft oil seal - belt pulley end, replacing

5 - Sealing flange

- Remove oil pan to remove and install
- Must be located on dowel sleeves
- Insert with silicone sealant D 176 404 A2
- Removing and installing. Refer to Front sealing flange, removing and installing

6 - Cylinder block

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

7 - 60 Nm plus 1/4 turn (90 °)

- Always replace

8 - Flywheel/drive plate

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

9 - Intermediate plate

- Must be located on dowel sleeves, refer to Crankshaft oil seal - belt pulley end, replacing
- Do not damage/bend when assembling

10 - Sealing flange with oil seal

- Only replace complete

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Use protective sleeve supplied when installing
- Remove oil pan to remove and install
- Before installing, remove oil remains from crankshaft journal with a clean cloth.
- Do not add oil or grease to the oil seal sealing lip
- Remove protective sleeve first after sealing flange has been slid onto crankshaft journal

PTFE seals:

- Do not add oil or grease to the oil seal sealing lip.

Coil spring seals:

- Lightly oil or grease the oil seal sealing lip.

Differences between PTFE seals and coil spring seals. Refer to **Crankshaft oil seal - belt pulley end, replacing**, Fig. 10

Difference between PTFE and coil spring oil seals

NOTE:

- The oils seals for the sealing flange are shown individually for a clearer illustration. Replace all sealing flange seals when replacing sealing flange.

Identifying PTFE Seals - Teflon & Coil Spring Type

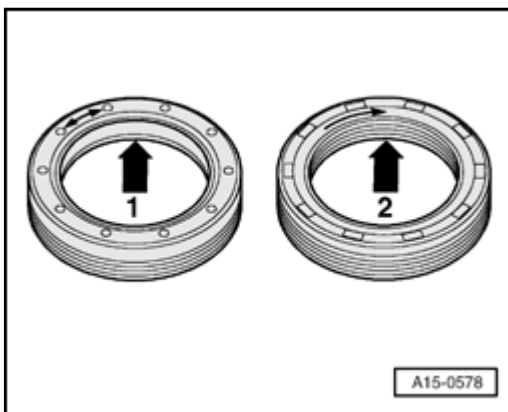


Fig. 28: Identifying PTFE Seals - Teflon & Coil Spring Type
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- PTFE seals (Teflon) -2- have been introduced gradually to replace the coil spring type seals -1-. These seals have wider sealing lip.
- PTFE oil seals are installed free of oil and grease.
- If PTFE seals are installed then only these seals may be used as replacement parts.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Identifying Intermediate Plate, Sealing Flange And Dowel Sleeves

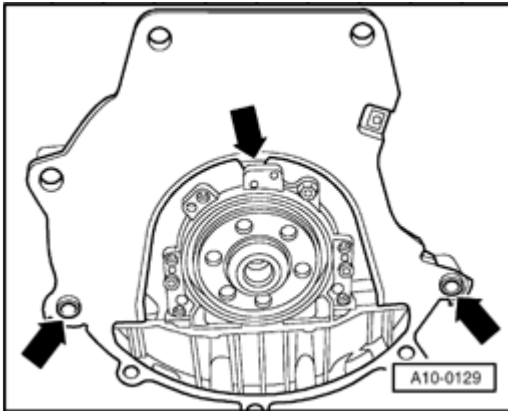


Fig. 29: Identifying Intermediate Plate, Sealing Flange And Dowel Sleeves
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Install intermediate plate onto sealing flange and slide onto dowel sleeves (arrows).

Crankshaft oil seal - belt pulley end, replacing

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

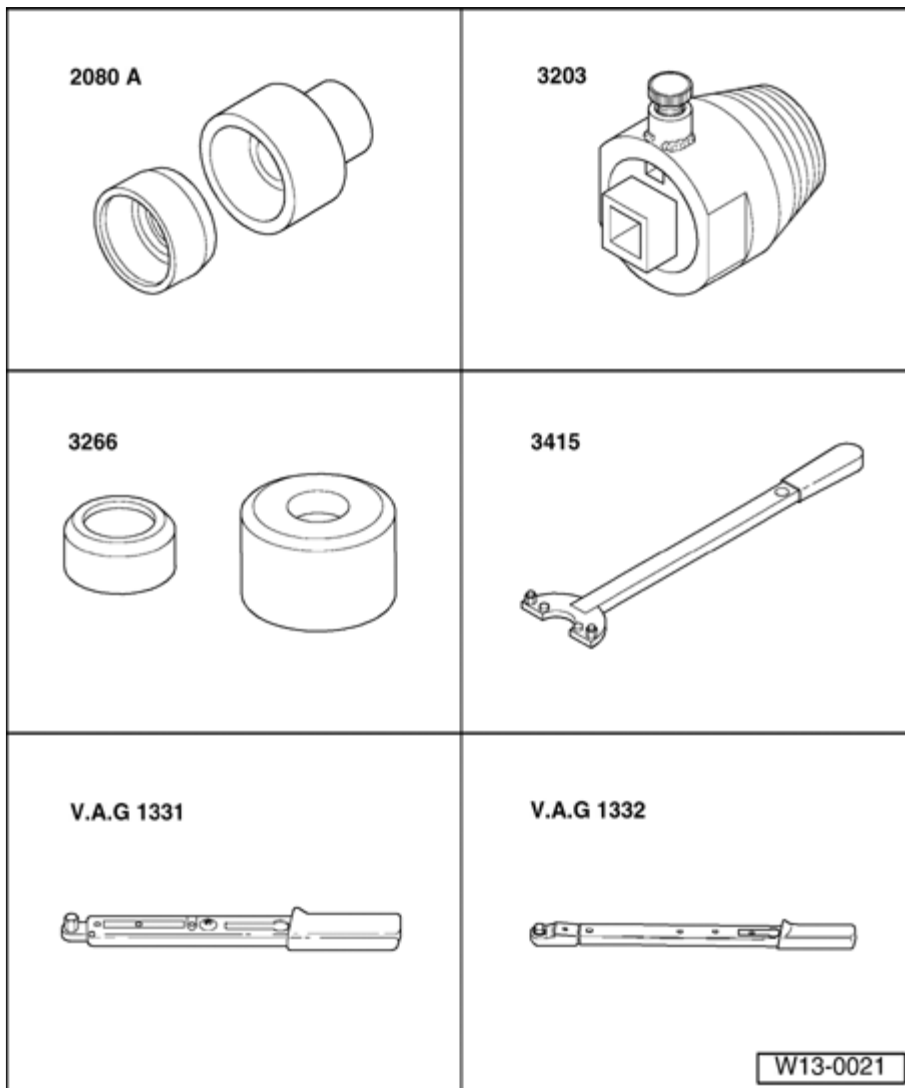


Fig. 30: Identifying Special Tools - Crankshaft Oil Seal - Belt Pulley End, Replacing (For Coil Spring Seals)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

For coil spring seals:

Special tools and equipment

- 2080 A Guide sleeve
- 3203 Oil seal extractor
- 3266 Seal installer
- 3415 Counterhold
- V.A.G 1331 Torque wrench (5 to 50 Nm)
- V.A.G 1332 Torque wrench (40 to 200 Nm)

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

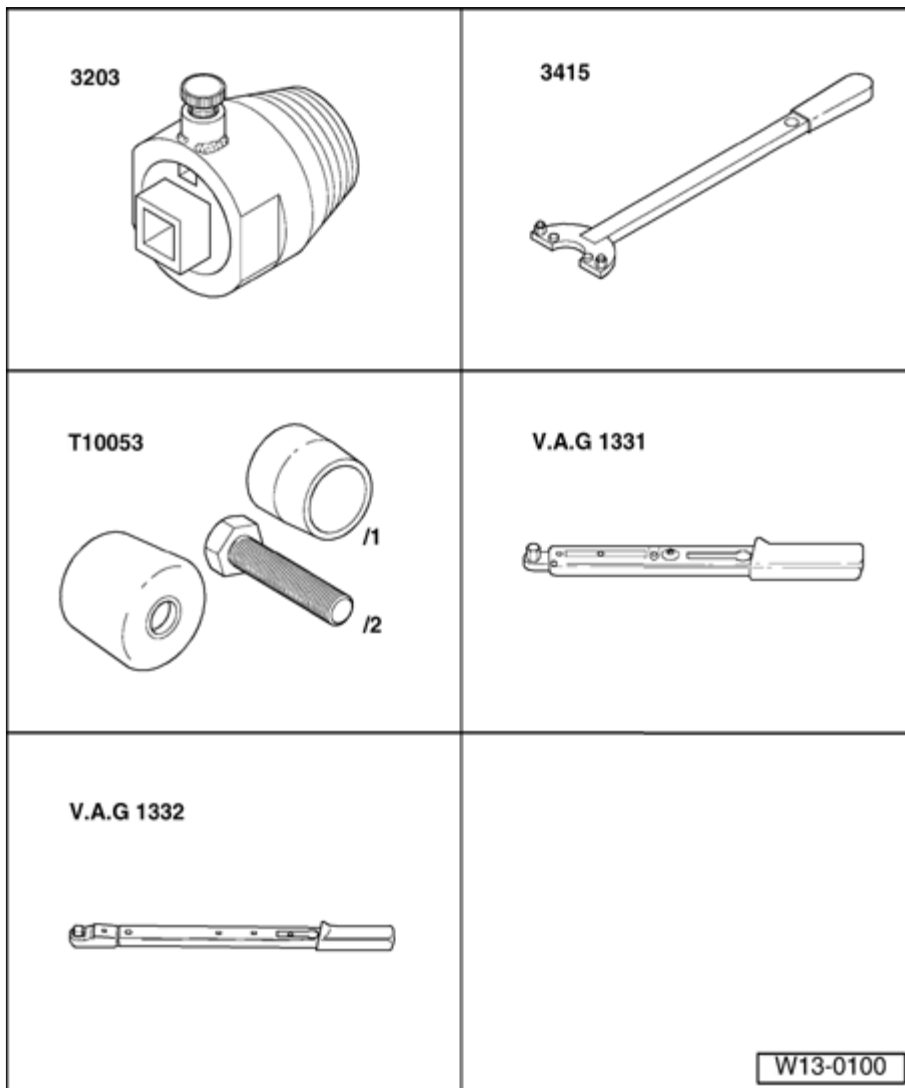


Fig. 31: Identifying Special Tools - Crankshaft Oil Seal - Belt Pulley End, Replacing (For PTFE Seals)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

For PTFE seals:

- 3203 Oil seal extractor
- 3415 Counterhold
- T10053 Assembly device
- V.A.G 1331 Torque wrench (5 to 50 Nm)
- V.A.G 1332 Torque wrench (40 to 200 Nm)

Removing

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

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Remove toothed belt. Refer to **Engine codes AEG, AVH, AZG, BEV** .

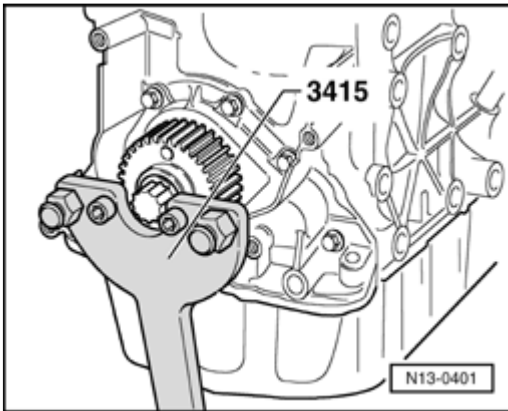


Fig. 32: Counter-Holding Crankshaft Toothed Belt Sprocket With 3415
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove crankshaft toothed belt sprocket by counter-holding sprocket with 3415.

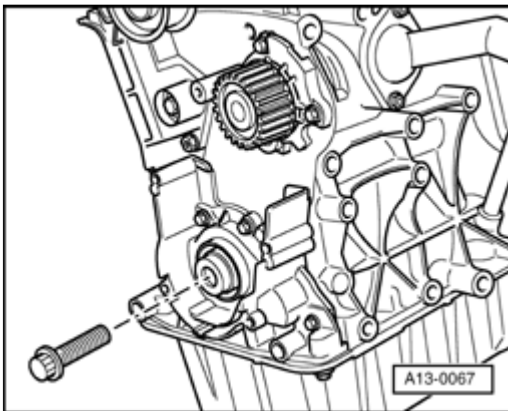


Fig. 33: Identifying Center Bolt & Crankshaft
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- To guide seal extractor, screw center bolt into crankshaft onto limit stop by hand.
- Unscrew inner part of oil seal extractor 3203 nine turns (approx. 20 mm) out of outer part and lock with knurled screw.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

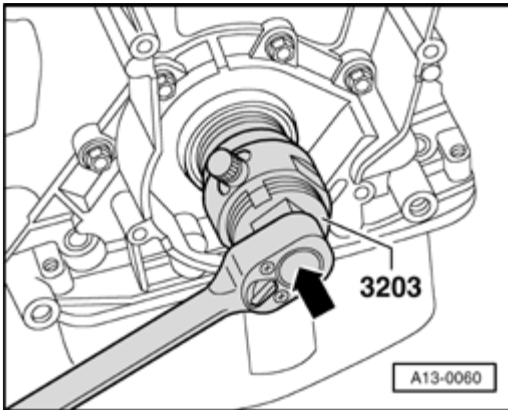


Fig. 34: Exerting Firm Pressure To Oil Seal Extractor 3203 Into Oil Seal
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Lubricate threaded head of oil seal extractor 3203, 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 crankshaft until oil seal is pulled out.

Installing

NOTE:

- A PTFE seal (Teflon) -2- is being introduced instead of the inner coil spring seal -1-. This seal has a wider sealing lip.
- PTFE oil seals are installed free of oil and grease.

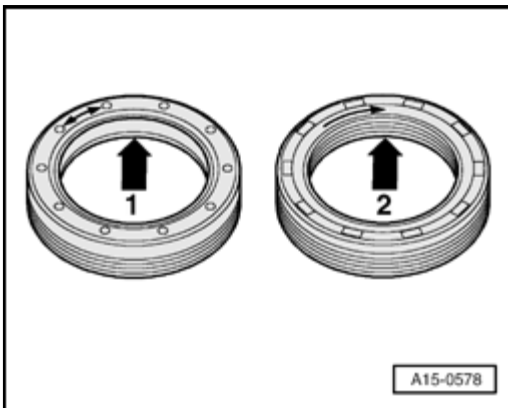


Fig. 35: Identifying PTFE Seals - Teflon & Coil Spring Type
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove oil remains from crankshaft journal with a clean cloth.

PTFE seals

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

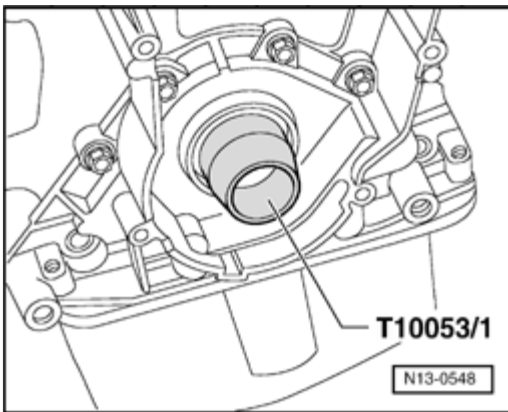


Fig. 36: Identifying Guide Sleeve T10053/1 Mounted Onto Crankshaft Journal
Courtesy of VOLKSWAGEN UNITED STATES, INC.

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

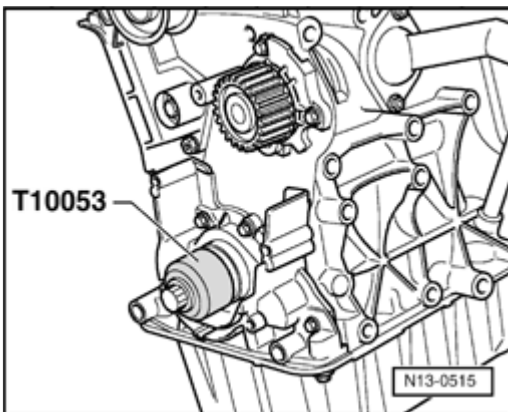


Fig. 37: Identifying Press Sleeve T10053 & Bolt Mounted
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Press in oil seal onto limit stop using press sleeve T10053 and bolt T10053/2 (M16 x 1.5 x 60).

Coil spring seals

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

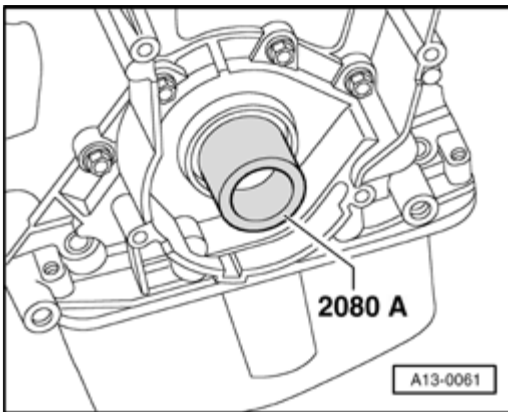


Fig. 38: Identifying Guide Sleeve 2080 A Mount Onto Crankshaft Journal
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Lightly oil sealing lip of oil seal
- Mount guide sleeve 2080 A onto crankshaft journal.
- Slide oil seal over guide sleeve

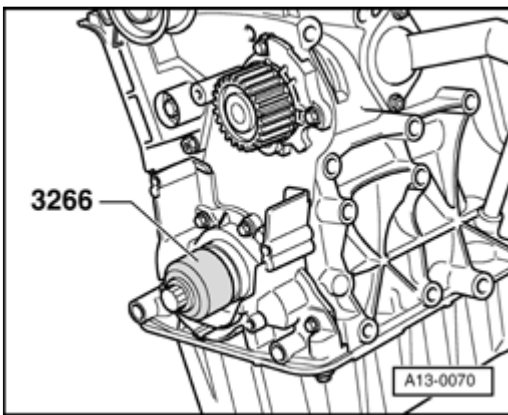


Fig. 39: Identifying Press Piece 3266 & Bolt Mounted
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Press in oil with press piece 3266. To do this use old center bolt for crankshaft toothed belt sprocket
- Press sleeve in onto limit stop.

Continued for all oil seals

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

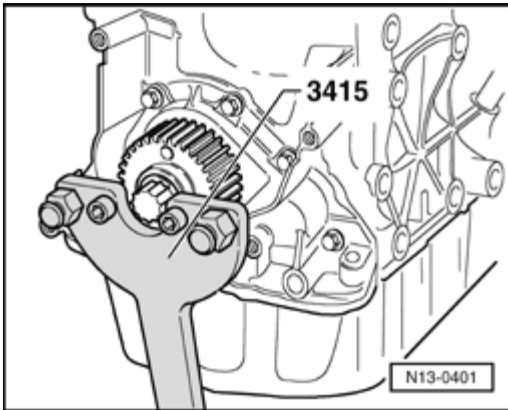


Fig. 40: Counter-Holding Crankshaft Toothed Belt Sprocket With 3415
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Install crankshaft toothed belt pulley sprocket and lock with counterhold 3415.
- Tighten new center bolt to 90 Nm plus 90 ° (1/4 turn) (turning further can be done in several stages).

NOTE: Thread and shoulder must be free of oil and grease.

- Install toothed belt and adjust timing. Refer to Engine codes AEG, AVH, AZG, BEV .
- Install poly V-belt. Refer to Poly V-belt, removing and installing .

Front sealing flange, removing and installing

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

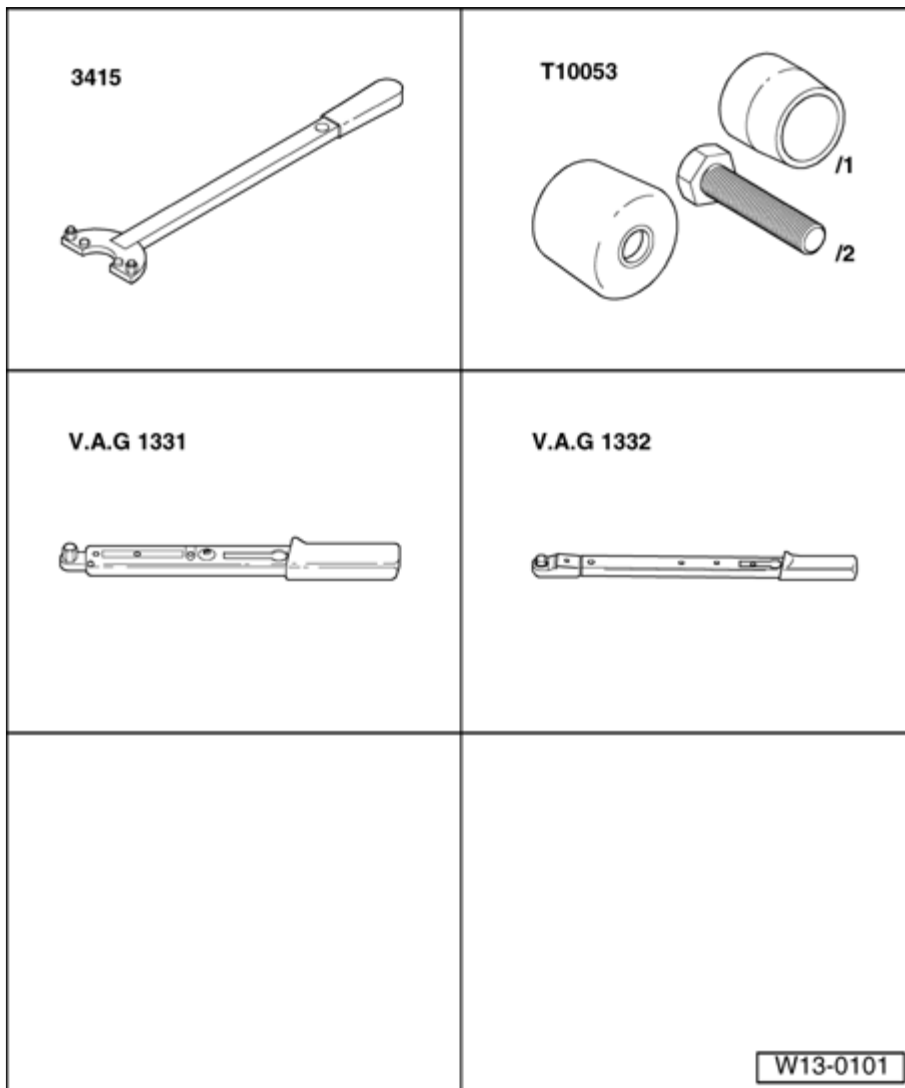


Fig. 41: Identifying Special Tools - Front Sealing Flange, Removing And Installing (For PTFE Seals)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

For PTFE seals:

Special tools and equipment

- 3415 Counterhold
- T10053 Assembly device
- V.A.G 1331 Torque wrench (5 to 50 Nm)
- V.A.G 1332 Torque wrench (40 to 200 Nm)
- Hand drill with plastic brush attachment
- D 176 404 A2 Silicone sealant
- Flat scraper

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

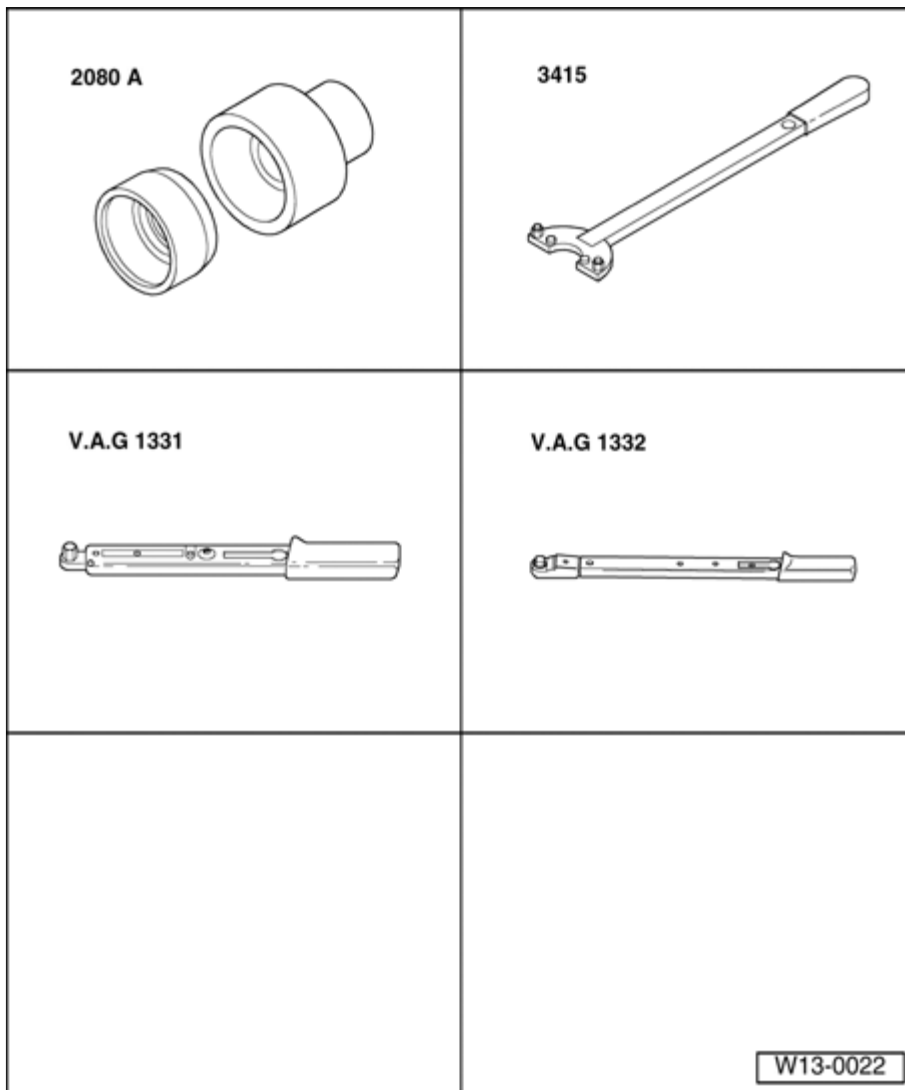


Fig. 42: Identifying Special Tools - Front Sealing Flange, Removing And Installing (For Coil Spring Seals)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

For coil spring seals:

- 2080 A Guide sleeve
- 3415 Counterhold
- V.A.G 1331 Torque wrench (5 to 50 Nm)
- V.A.G 1332 Torque wrench (40 to 200 Nm)
- Hand drill with plastic brush attachment
- D 176 404 A2 Silicone sealant
- Flat scraper

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Removing

- Remove poly V-belt. Refer to **Poly V-belt, removing and installing** .
- Remove tensioning element for poly V-belt.
- Remove toothed belt. Refer to **Engine codes AEG, AVH, AZG, BEV** .

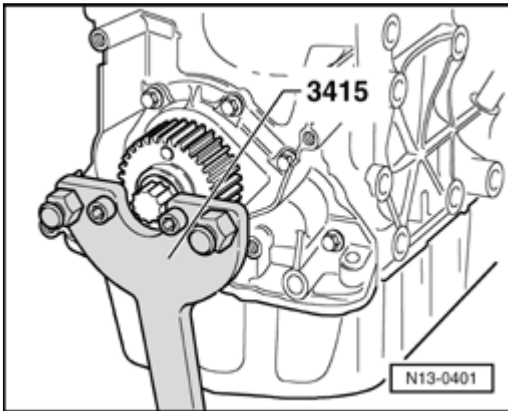


Fig. 43: Counter-Holding Crankshaft Toothed Belt Sprocket With 3415
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove crankshaft toothed belt sprocket by counterholding sprocket with 3415.
- Drain engine oil.
- Remove oil pan. Refer to **Oil pan, removing and installing** .
- Unbolt front sealing flange.
- Take off sealing flange. Use light blows with a rubber headed hammer to release flange if necessary.
- Remove sealant residue from cylinder block with a flat scraper.
- Cover oil seal with a clean cloth.

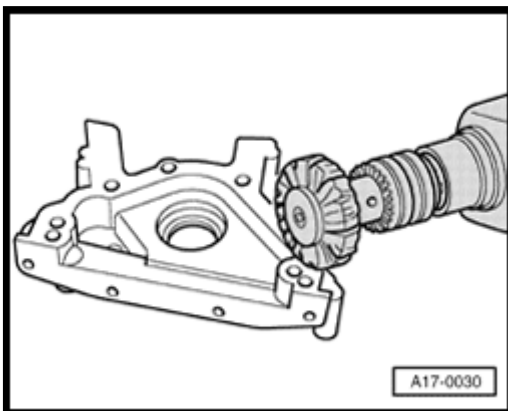


Fig. 44: Removing Sealant Remains On Sealing Flange With A Rotating Plastic Brush
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove sealant remains on sealing flange with a rotating plastic brush (wear eye protection).

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

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

Installing

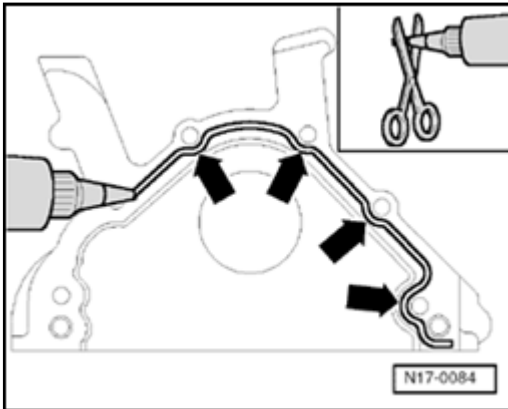


Fig. 45: Cutting Off Tube Nozzle At Front Marking & Applying Silicone Sealing Compound To Clean Sealing Surface Of Sealing Flange

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Cut off tube nozzle at front marking (nozzle approx. 3 mm diameter).
- Apply silicone sealing compound, as shown, to clean sealing surface of sealing flange.

Thickness of sealant bead (arrows): 2 to 3 mm

NOTE:

- Before applying sealing bead, cover the oil seal with a clean cloth.
- The sealing compound bead must not be thicker, otherwise excessive sealing compound will enter the oil pan and may block the oil suction pipe strainer.
- Observe the use-by date of the sealant.
- The sealing flange must be installed within 5 minutes of applying the silicone sealing compound.

For PTFE seals

NOTE:

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

For coil spring seals

NOTE:

Use guide sleeve 2080 A to install sealing flange with the oil seal already installed.

Continued for all oil seals

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

The sealant must be allowed to cure for approx. 30 minutes after installing the oil pan. After this time the engine may be filled with engine oil.

- Install sealing flange immediately and lightly tighten all bolts.
- Tighten sealing flange securing bolts using alternating sequence.

Tightening torque: 15 Nm

- Remove excess sealing compound.
- Install oil pan. Refer to **Oil pan, removing and installing** .

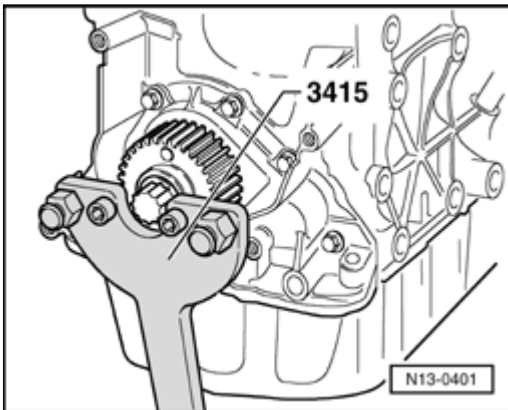


Fig. 46: Counter-Holding Crankshaft Toothed Belt Sprocket With 3415
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Install crankshaft toothed belt pulley sprocket and lock with counterhold 3415.

Tightening torque: 90 Nm plus 1/4 turn (90 °)

NOTE: Thread and shoulder must be free of oil and grease.

- Install toothed belt and adjust timing. Refer to **Engine codes AEG, AVH, AZG, BEV** .
- Install tensioning element for poly V- belt.
- Install poly V-belt. Refer to **Poly V-belt, removing and installing** .

Drive plate, removing and installing

Special tools and equipment

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

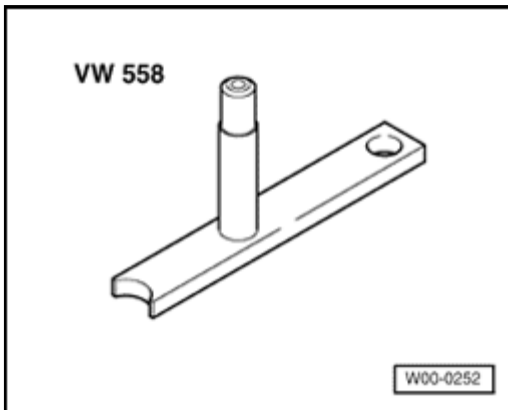


Fig. 47: Identifying VW 558 Counterhold Tool
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- VW 558 Counterhold tool
- Hex bolt M8 x 45 and two M10 hex nuts
- Depth gauge

Loosening and tightening drive plate

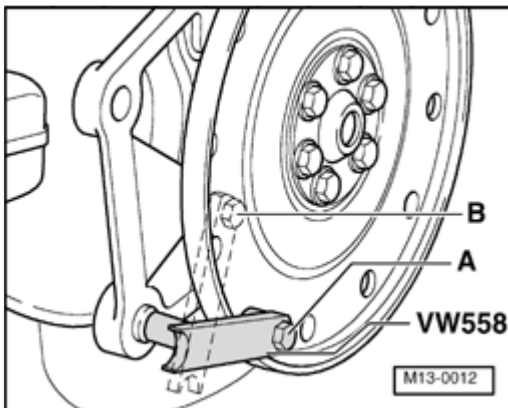


Fig. 48: Securing Counterhold Tool VW 558 To Drive Plate (Loosening & Tightening Positions Of Tool)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Secure counterhold tool VW 558 to drive plate with hex bolt M8 x 45. Place two M10 hex nuts between counterhold tool and drive plate.

Position of counterhold tool:

A - To loosen

B - To tighten

Installing drive plate

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

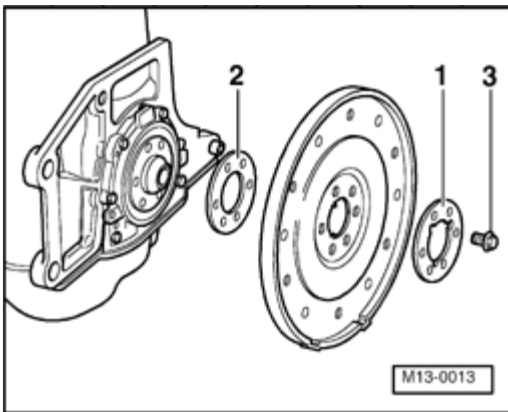


Fig. 49: Identifying Washer With Recesses, New Bolts & Shim
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Locate drive plate using washer with recesses -1-.
- Install new bolts -3- and tighten to 30 Nm.

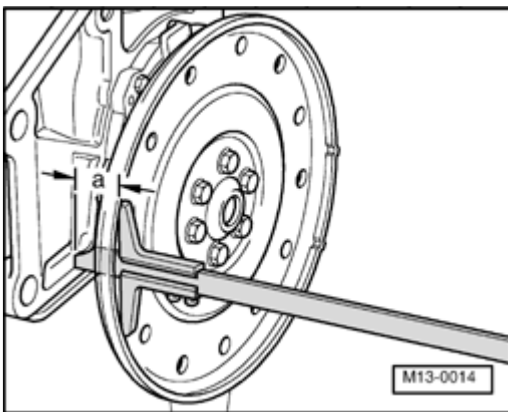


Fig. 50: Measuring Drive Plate Distance
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Measure dimension -a- at three different outer holes of drive plate (120 ° offset) and calculate average.

Specification: 19.5 to 21.1 mm

NOTE: Measure through hole in drive plate to milled surface of cylinder block. To do this unhook intermediate plate (Refer to Identifying Intermediate Plate, Sealing Flange And Dowel Sleeves , Fig. 1).

If the specification is not attained:

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

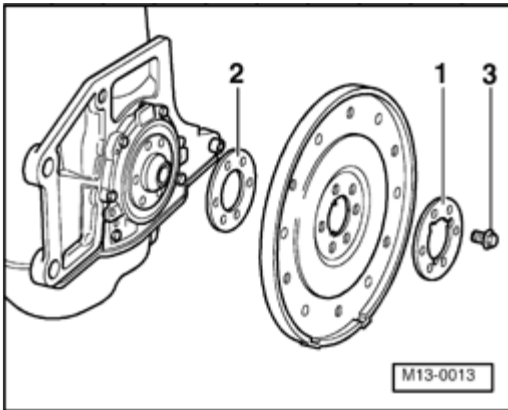


Fig. 51: Identifying Washer With Recesses, New Bolts & Shim
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove drive plate again and install shim -2-. Again tighten bolts -3- to 30 Nm.
- Tighten bolts to 60 Nm plus 90 ° (1/4 turn) (turning further can be done in several stages).

CRANKSHAFT, REMOVING AND INSTALLING

Crankshaft, removing and installing

NOTE:

- Before removing the crankshaft, prepare a suitable place to set it which will ensure that the sender wheel (Refer to Crankshaft, removing and installing , item -8-) is free and does not get damaged.
- Before starting repair work the engine should be secured with engine and transmission bracket VW 540 and supplementary set VW 540/1B.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

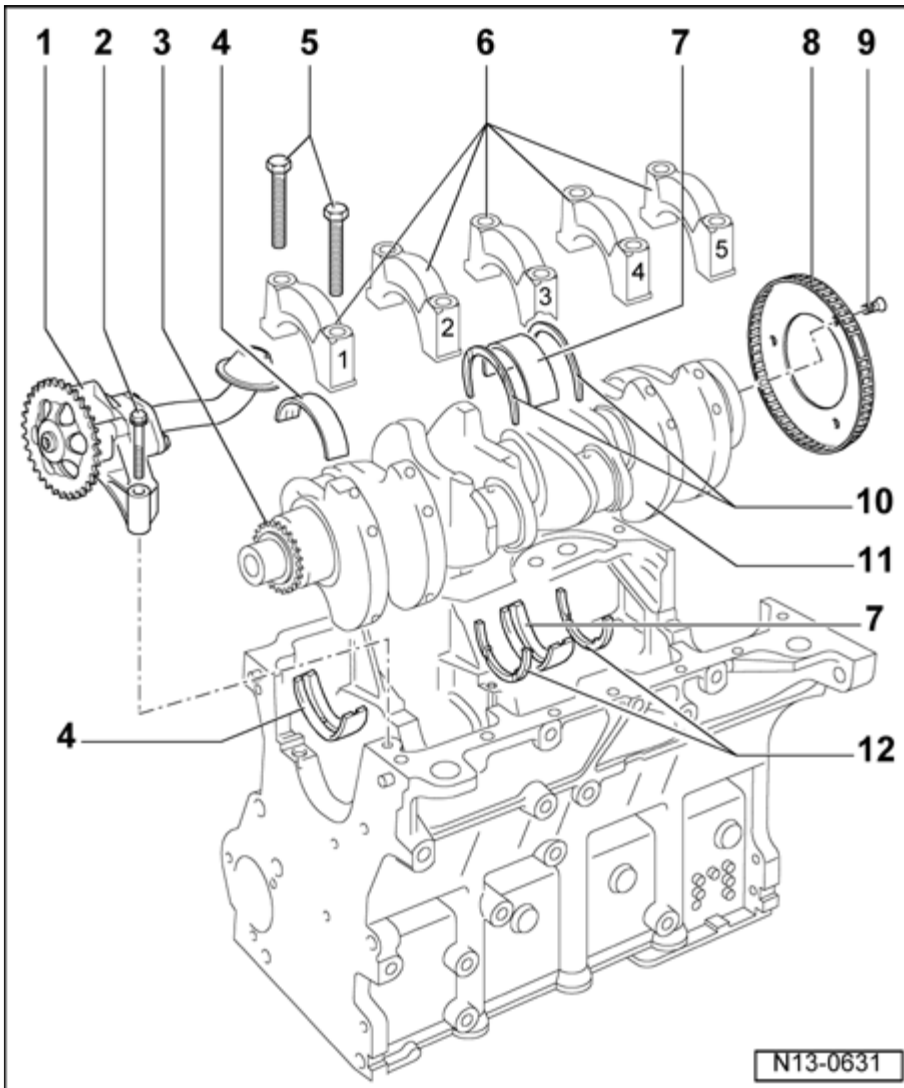


Fig. 52: Exploded View Of Crankshaft & Components
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Oil pump

- With pressure relief valve of 12 bar
- Before installing, check that both dowel sleeves for centralizing oil pump/cylinder block are installed
- Removing and installing. Refer to **Oil pump, removing and installing**

2 - 15 Nm

3 - Chain sprocket

- For oil pump drive

4 - Bearing shells 1, 2, 3, 4 and 5

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Classification for ordering spare parts. See **Upper crankshaft bearing identification (gradual introduction)** .
- For bearing cap without oil groove
- For cylinder block with oil groove
- Do not interchange used bearing shells (mark)

5 - 65 Nm plus 90 ° (1/4 turn)

- Always replace
- Threaded along complete length (screw)
- Tighten to 65 Nm when measuring crankshaft radial clearance

6 - Bearing cap

- Bearing cap 1: Poly V-belt pulley end
- Bearing cap 3 with recesses for thrust washers
- Bearing shell retaining tabs (cylinder block/bearing cap) must be on same side

7 - Bearing shell 3

- Refer to **Crankshaft, removing and installing** , item -4-
- Do not interchange used bearing shells (mark)

8 - Sender wheel

- Replace
- For Engine speed (RPM) sensor -G28-
- Can only be installed in one position. Holes are offset

9 - 10 Nm plus 90 ° (1/4 turn)

- Always replace

10 - Thrust washer

- For bearing 3 bearing cap
- Not fixing arrangement
- Lettering faces mounting bracket

11 - Crankshaft

- Axial clearance, New: 0.07 to 0.23 mm; Wear limit: 0.30 mm
- Check radial clearance with Plastigage, New: 0.01 to 0.04 mm; Wear limit: 0.15 mm

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Do not rotate crankshaft when checking radial clearance
- Crankshaft dimensions. Refer to **Crankshaft dimensions**

12 - Thrust washer

- For cylinder block, bearing 3
- Lettering faces mounting bracket

Upper crankshaft bearing identification (gradual introduction)

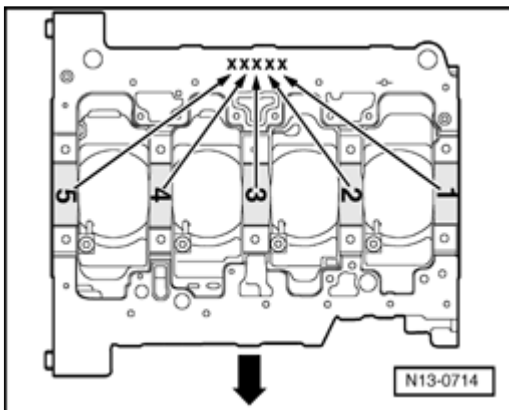


Fig. 53: Upper Crankshaft Bearing Identification
Courtesy of VOLKSWAGEN UNITED STATES, INC.

In the factory the upper bearing caps are determined with the correct thickness for the cylinder block. Colored marks are used to identify the thickness of the bearing shells. Refer to **Color markings**.

Which thickness of shell should be installed to which location is marked by a letter on the lower sealing surface of the cylinder block -x-.

Arrow indicates direction of travel (forward).

Color markings

Letter on cylinder block		Color of bearing
S	=	black
R	=	red
G	=	yellow

NOTE:

- If the colored marks have not been stamped or are no longer legible, use the average bearing shell (red).
- The lower crankshaft bearing shells are always supplied as a spare part with the color marking "yellow".

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Crankshaft dimensions

(dimensions in mm)

Grinding dimension	Crankshaft main journal diameter	Connecting rod journal diameter
Basic dimension	-0.017 54.00 -0.037	-0.022 47.80 -0.042
1st undersize	-0.017 53.75 -0.037	-0.022 47.55 -0.042
2nd undersize	-0.017 53.50 -0.037	-0.022 47.30 -0.042
3rd undersize	-0.017 53.25 -0.037	-0.022 47.05 -0.042

PISTON AND CONNECTING ROD, DISASSEMBLING AND ASSEMBLING

Piston and connecting rod, disassembling and assembling

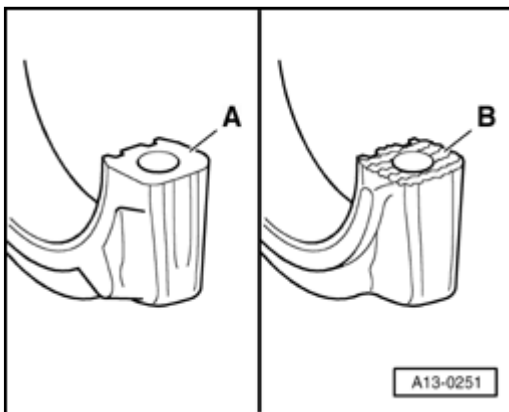


Fig. 54: Identifying Conventional Connecting Rods (Polished Parting Surfaces) & Industrially Cracked Connecting Rods (Rough Parting Surfaces)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Gradual introduction of industrially cracked connecting rods

Identification characteristics:

A - Conventional connecting rods (polished parting surfaces).

B - Industrially cracked connecting rods (rough parting surfaces).

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Disassembling and assembling pistons and conventional connecting rods. Refer to **Conventional connecting rod**

Disassembling and assembling pistons and industrially cracked connecting rods. Refer to **Industrially cracked connecting rod**

Assembly overview

Conventional connecting rod

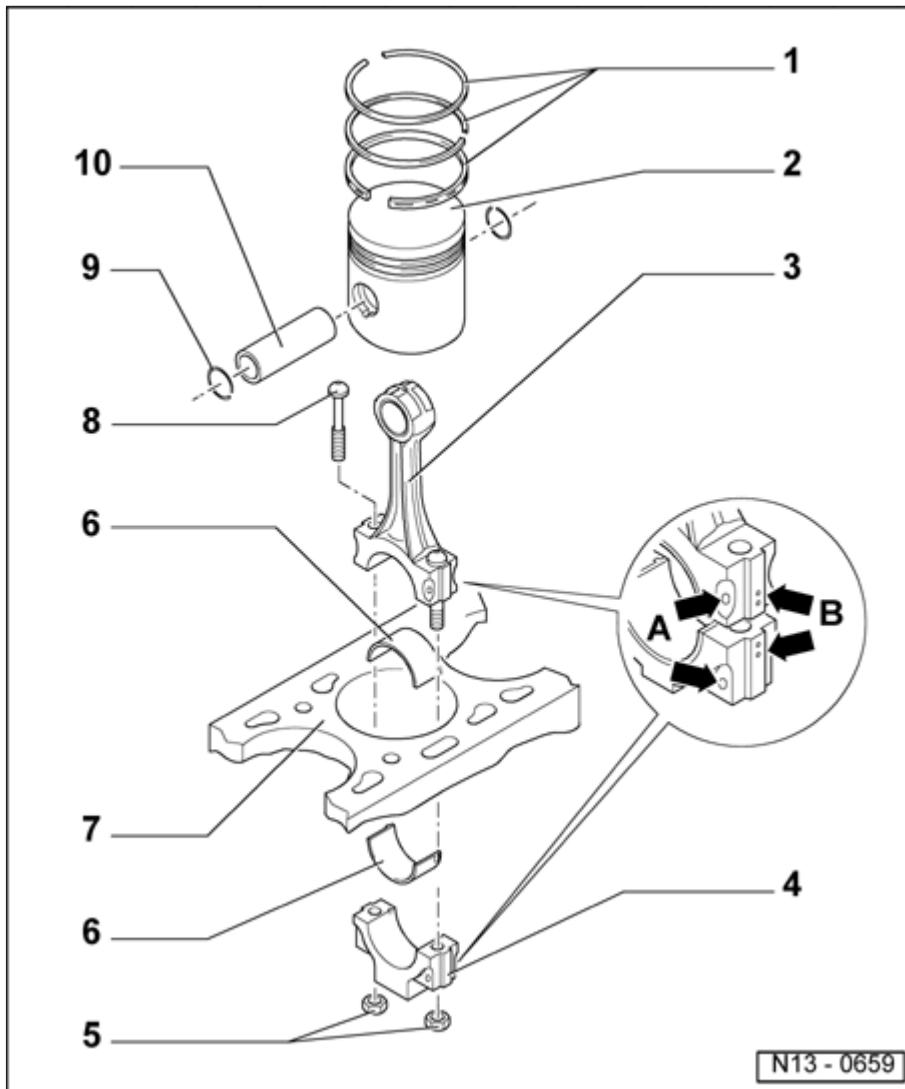


Fig. 55: Exploded View Of Conventional Connecting Rod
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Piston rings

- Offset gaps by 120 °

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Use piston ring pliers to remove and install
- "TOP" faces towards piston crown
- Checking ring gap. See **Checking piston ring gap** .

2 - Piston

- Checking. See **Checking piston** .
- Mark installation position and cylinder number
- Arrow on piston crown points to belt pulley end
- 2-part oil scraper ring
- Checking piston ring-to-groove clearance. See **Checking ring to groove clearance** .
- Install using piston ring clamp

3 - Connecting rod

- Only replace as a set
- Mark relation to cylinder -B-
- Installation position: Marking -A- faces belt pulley end

4 - Connecting rod bearing cap

- Mark relation to cylinder -B-
- Installation position: Marking -A- faces belt pulley end

5 - 30 Nm plus 1/4 turn (90 °)

- Always replace
- Oil thread and contact surfaces
- To measure radial clearance tighten to 30 Nm, but do not turn further

6 - Bearing shell

- Observe installation position
- Do not interchange used bearing shells
- Ensure retaining lugs fit tightly in recesses.
- Upper bearing shell with oil drilling for piston pin lubrication.
- Axial clearance, New: 0.10 to 0.31 mm; Wear limit: 0.37 mm
- Check radial clearance with Plastigage: New: 0.01 to 0.06 mm; Wear limit: 0.12 mm
- Do not rotate crankshaft when checking radial clearance

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

7 - Cylinder block

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

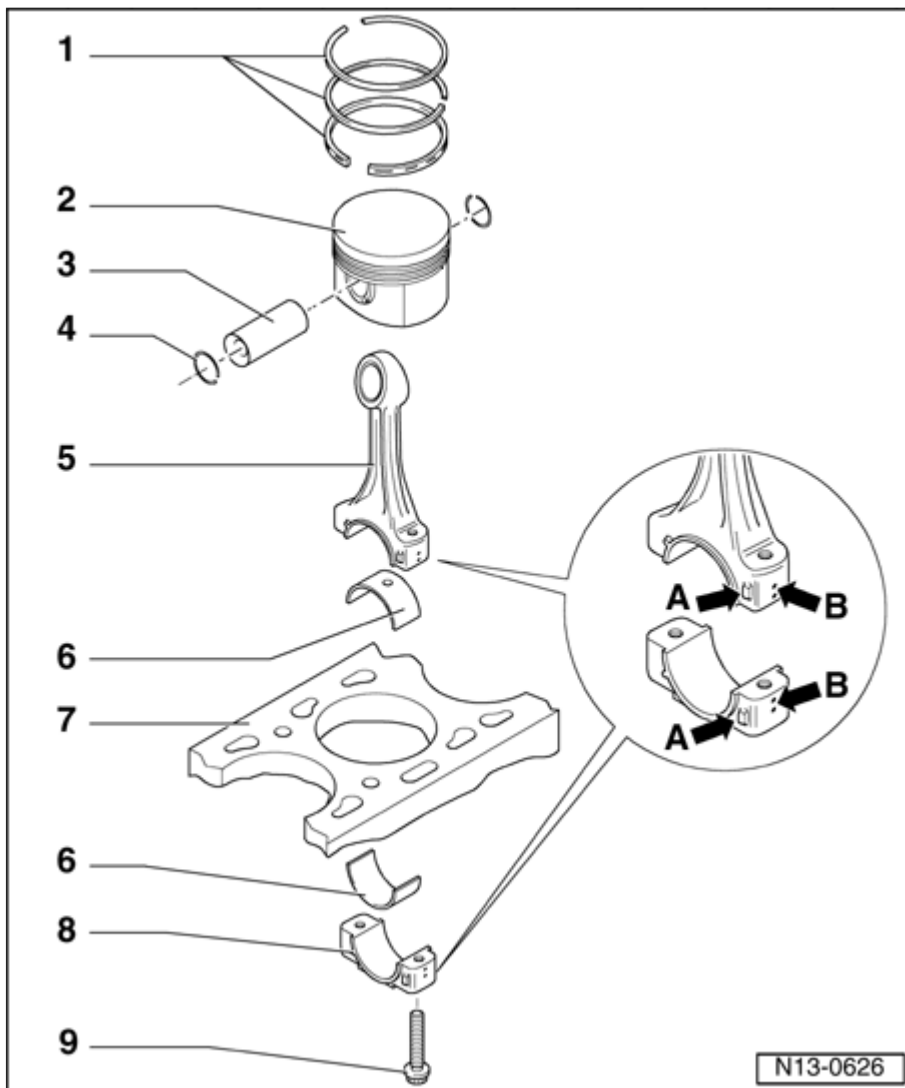
8 - Connecting rod bolt

9 - Circlip

10 - Piston pin

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

Industrially cracked connecting rod



2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Fig. 56: Exploded View Of Industrially Cracked Connecting Rod
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Piston rings

- Offset gaps by 120 °
- Use piston ring pliers to remove and install
- Manufacturer's mark faces piston crown
- Checking ring gap. See Checking piston ring gap .
- Checking ring to groove clearance. See Checking ring to groove clearance .

2 - Piston

- Checking. See Checking piston .
- Mark installation position and cylinder number
- Arrow on piston crown points to belt pulley end
- Install using piston ring clamp

3 - Piston pin

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

4 - Circlip

5 - Connecting rod

- With split bearing cap
- Only replace as a set
- Mark relation to cylinder -B-
- Installation position: Marking -A- faces belt pulley end

6 - Bearing shell

- Observe installation position. See Checking piston .
- Insert bearing shells centrally
- Do not interchange used bearing shells
- Check seated securely
- Axial clearance, New: 0.10... 0.35 mm; Wear limit: 0.4 mm
- Check radial clearance with Plastigage: New: 0.01... 0.05 mm; Wear limit: 0.09 mm (Do not rotate crankshaft when checking radial clearance)

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

7 - Cylinder block

- Checking cylinder bores. Refer to **Piston and cylinder dimensions** , Fig. 5
- Piston and cylinder dimensions. Refer to **Piston and cylinder dimensions**

8 - Connecting rod bearing cap

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

9 - 30 Nm plus 1/4 turn (90 °)

- Torx E10
- Replace
- Oil thread and contact surface
- To measure radial clearance tighten to 30 Nm, but do not turn further

Checking piston ring gap

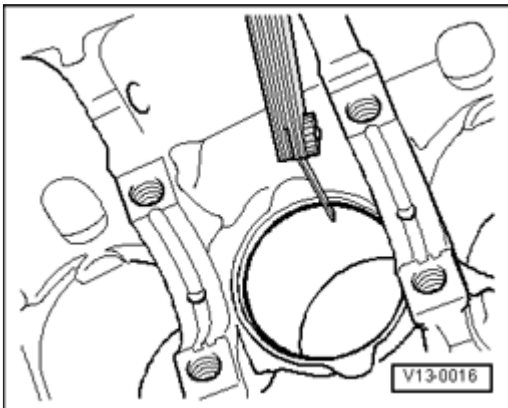


Fig. 57: Checking Piston Ring Gap

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools and equipment

- Feeler gauge

Work sequence

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

Piston ring		Gap	
		New	Wear limit

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Compression rings	mm	0.20 to 0.40	0.8
Oil scraper ring	mm	0.25 to 0.50	0.8

Checking ring to groove clearance

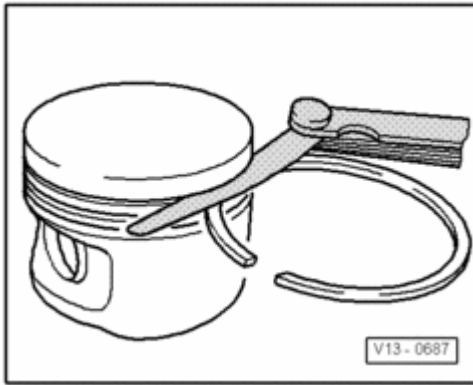


Fig. 58: Checking Ring To Groove Clearance
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools and equipment

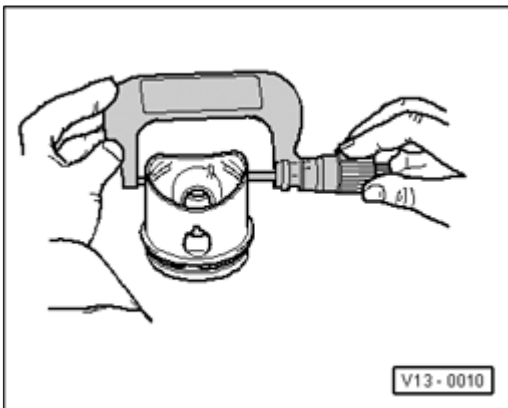
- Feeler gauge

Work sequence

- Clean groove before checking.

Piston ring		Ring to groove clearance	
		New	Wear limit
Compression rings	mm	0.06 to 0.09	0.20
Oil scraper ring	mm	0.03 to 0.06	0.15

Checking piston



2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Fig. 59: Checking Piston

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools and equipment

- External micrometer 75 to 100 mm

Work sequence

- Measure pistons approx. 10 mm from lower edge of skirt, 90 ° offset to axis of piston pin.

Deviation from nominal dimension: max. 0.04 mm

Installation position of bearing shells

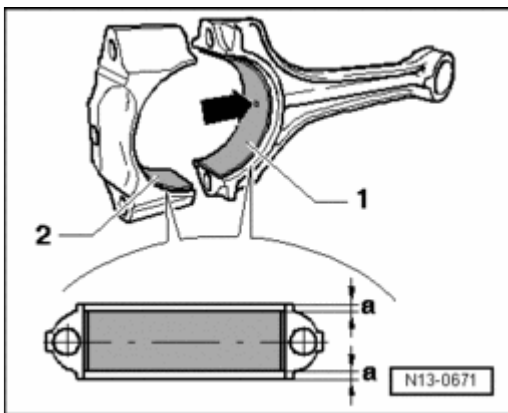


Fig. 60: Installation Position Of Bearing Shells

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Bearing shell -1- with oil channel (arrow) for connecting rod.

Bearing shell -2- without oil channel connecting rod bearing cap.

- Insert bearing shells and connecting rod bearing cap centrally.

Dimension -a- must be same on both left and right side. Deviation: 0.2 mm.

Checking cylinder bores

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

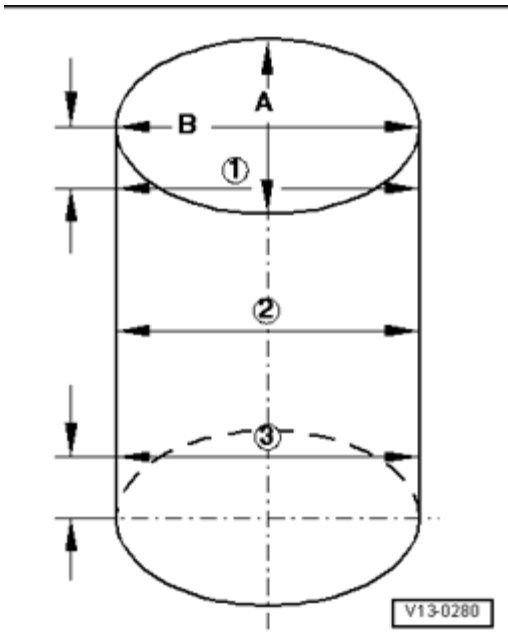


Fig. 61: Checking Cylinder Bores

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools and equipment

- Internal dial gauge 50... 100 mm
 - Measure bores at 3 locations in both directions -A- across engine and -B- in line with crankshaft.

Deviation from nominal dimension: max. 0.08 mm

NOTE: Measuring of the cylinder bores must not be done when the cylinder block is mounted on a repair stand with adapter bracket VW 540, as incorrect measurements would then be possible.

Piston and cylinder dimensions

Grinding dimension		Piston diameter	Cylinder bore diameter
Basic dimension	mm	82.4651)	82.51
1st oversize	mm	82.9651)	83.01

1) Dimensions are without graphite coating (thickness 0.02 mm). The graphite coating wears away.

15 ENGINE - CYLINDER HEAD, VALVETRAIN

CYLINDER HEAD, REMOVING AND INSTALLING

Cylinder head, removing and installing

Afinacion de Motor y Diagnostico, OBDII,VW ,Audi	044 664 252 34 69		
Wednesday, July 06, 2016 9:38:39 AM	Page 61	© 2011 Mitchell Repair Information Company, LLC.	

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Checking compression. Refer to **Compression pressures, checking**

NOTE:

- When installing an exchange cylinder head with camshaft, lubricate running contact surfaces between hydraulic lifters and camshaft cam surfaces before installing 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.
- Removing and installing intake manifold. Refer to **Intake manifold upper part, removing and installing**

Assembly overview

- Engine codes AEG, AVH, AZG with aluminum plate cylinder head gasket. Refer to **Engine codes AEG, AVH, AZG with aluminum plate cylinder head gasket**
- Engine Code: BBW. Refer to **Engine code BBW**
- Engine code: BEV. Refer to **Engine code BEV**

Engine codes AEG, AVH, AZG

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

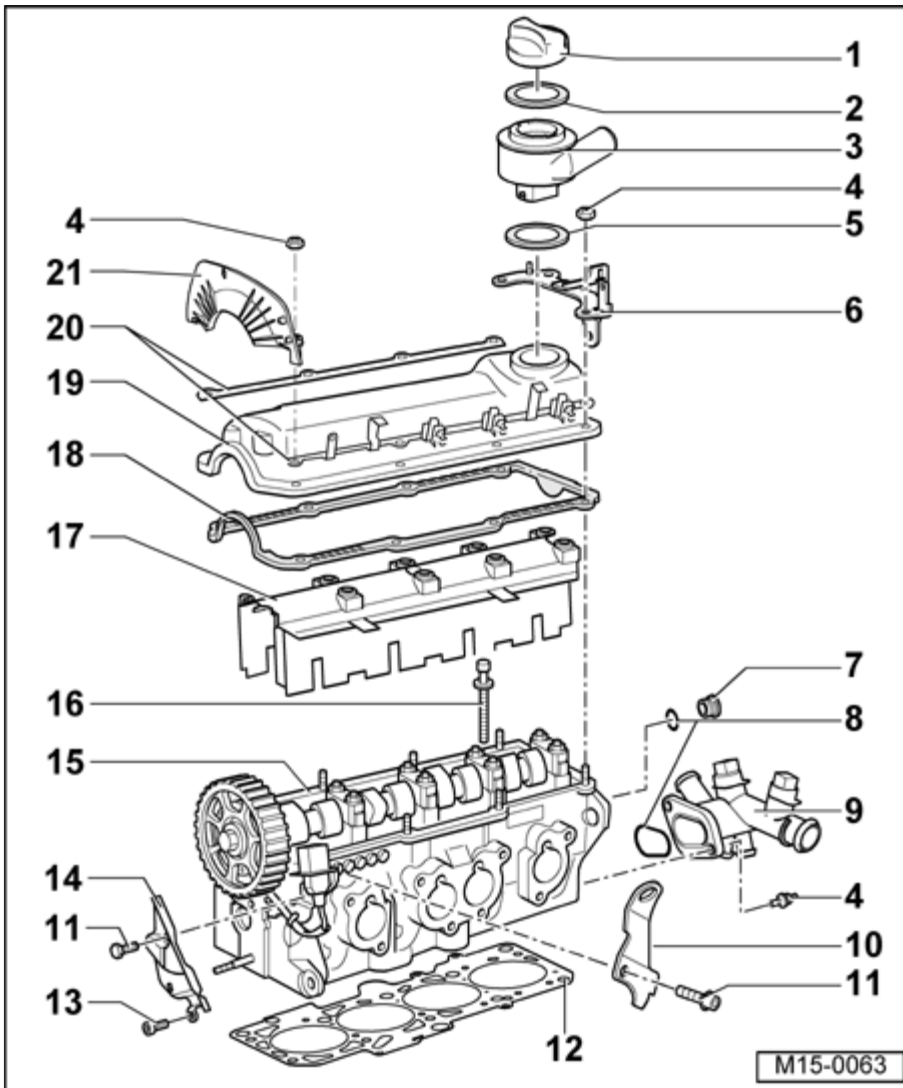


Fig. 62: Exploded View Of Cylinder Head Components - Engine Codes AEG, AVH, AZG
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Engine codes AEG, AVH, AZG with steel plate cylinder head gasket

1 - Plug

2 - Seal

3 - Breather housing

- Turn to right to remove

4 - 10 Nm

5 - Seal

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Replace if damaged

6 - Bracket

7 - Sealing plug, 15 Nm

- Always replace

8 - O-ring

- Always replace

9 - Union

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

10 - Lifting eye

11 - 20 Nm

12 - Cylinder head gasket

- Always replace
- After replacement replace complete amount of coolant in system

13 - 15 Nm

14 - Rear toothed belt guard

15 - Cylinder head

- Check for distortion. See Fig. 66 .
- Reworking sealing surface. See Fig. 125 .
- Removing and installing. Refer to Cylinder head, removing and installing
- After replacement replace complete amount of coolant in system

16 - Cylinder head bolt

- Always replace
- Removing and installing "Polydrive" cylinder head bolt with 3452
- Sequence when loosening and tightening. Refer to Cylinder head, removing and installing , Removing and installing cylinder head

17 - Oil deflector

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Replace if damaged
- Before installing gasket, coat transition between bearing cap and cylinder head with D 454 300 A2.

18 - Cylinder head cover gasket

19 - Cylinder head cover

20 - Reinforcing strip

21 - Rear upper toothed belt guard

Engine codes AEG, AVH, AZG with aluminum plate cylinder head gasket

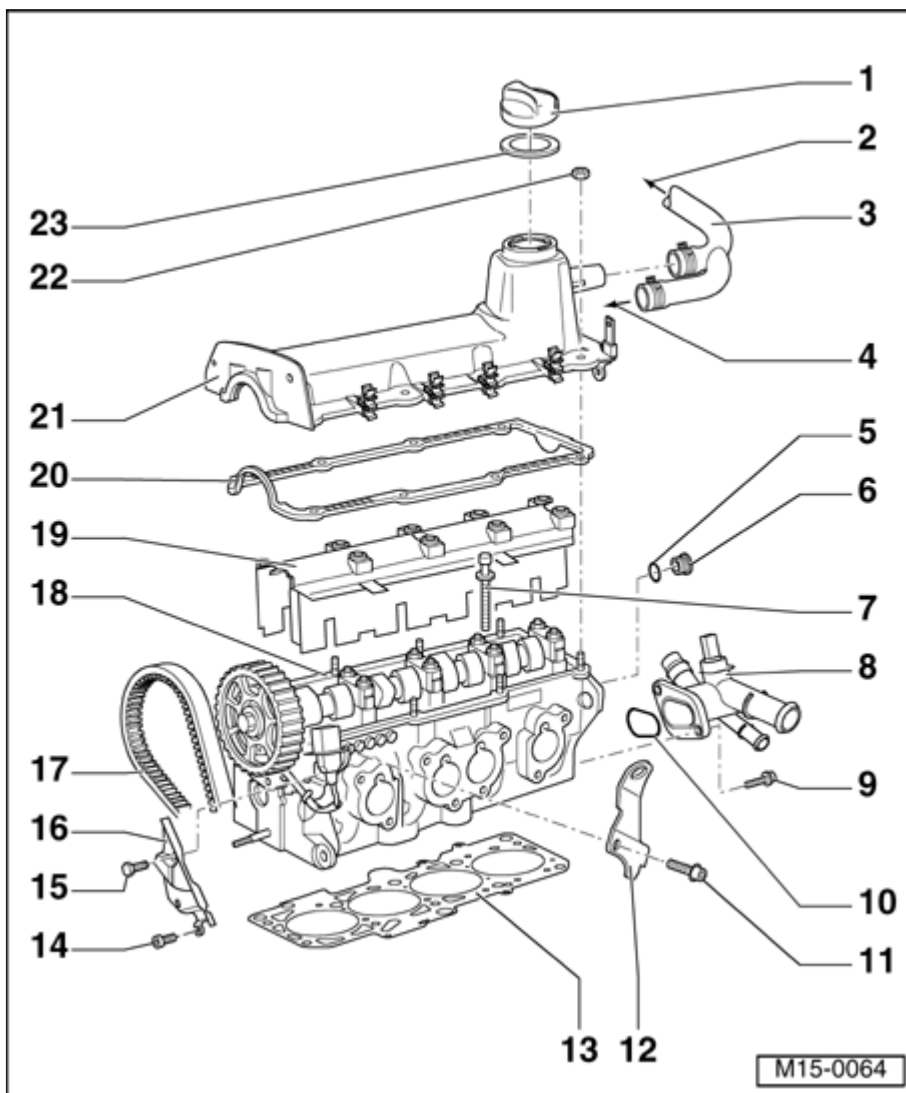


Fig. 63: Exploded View Of Cylinder Head Components - Engine Codes AEG, AVH, AZG With Aluminum Plate Cylinder Head Gasket

Courtesy of VOLKSWAGEN UNITED STATES, INC.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Engine codes AEG, AVH, AZG with steel plate cylinder head gasket. Refer to **Engine codes AEG, AVH, AZG**

1 - Plug

2 - To intake manifold

3 - Shaped hose

4 - To intake manifold

- Only from model year 2002

5 - O-ring

- Always replace

6 - Sealing plug

7 - Cylinder head bolt

- Always replace
- Removal and install "Ploydrive" cylinder head bolt with 3452
- Sequence when loosening and tightening. Refer to **Cylinder head, removing and installing** , Cylinder head, removing and installing

8 - Union

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

9 - 10 Nm

10 - O-ring

- Always replace

11 - 20 Nm

12 - Lifting eye

13 - Cylinder head gasket

- Always replace
- After replacement replace complete amount of coolant in system

14 - 15 Nm

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

15 - 20 Nm

16 - Rear toothed belt guard

17 - Tooth belt

- Mark direction of rotation before removing
- Check for wear
- Do not kink
- Removing, installing and tensioning. Refer to **Fig. 66**

18 - Cylinder head

- Check for distortion. See **Fig. 66** .
- Reworking sealing surface. See **Fig. 125** .
- Removing and installing. Refer to **Cylinder head, removing and installing**
- After replacement replace complete amount of coolant in system

19 - Oil deflector

20 - Cylinder head cover gasket

- Replace if damaged
- Before installing gasket, coat transition between bearing cap and cylinder head with D 454 300 A2.

21 - Cylinder head cover

22 - 10 Nm

23 - Seal

Engine code BBW

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

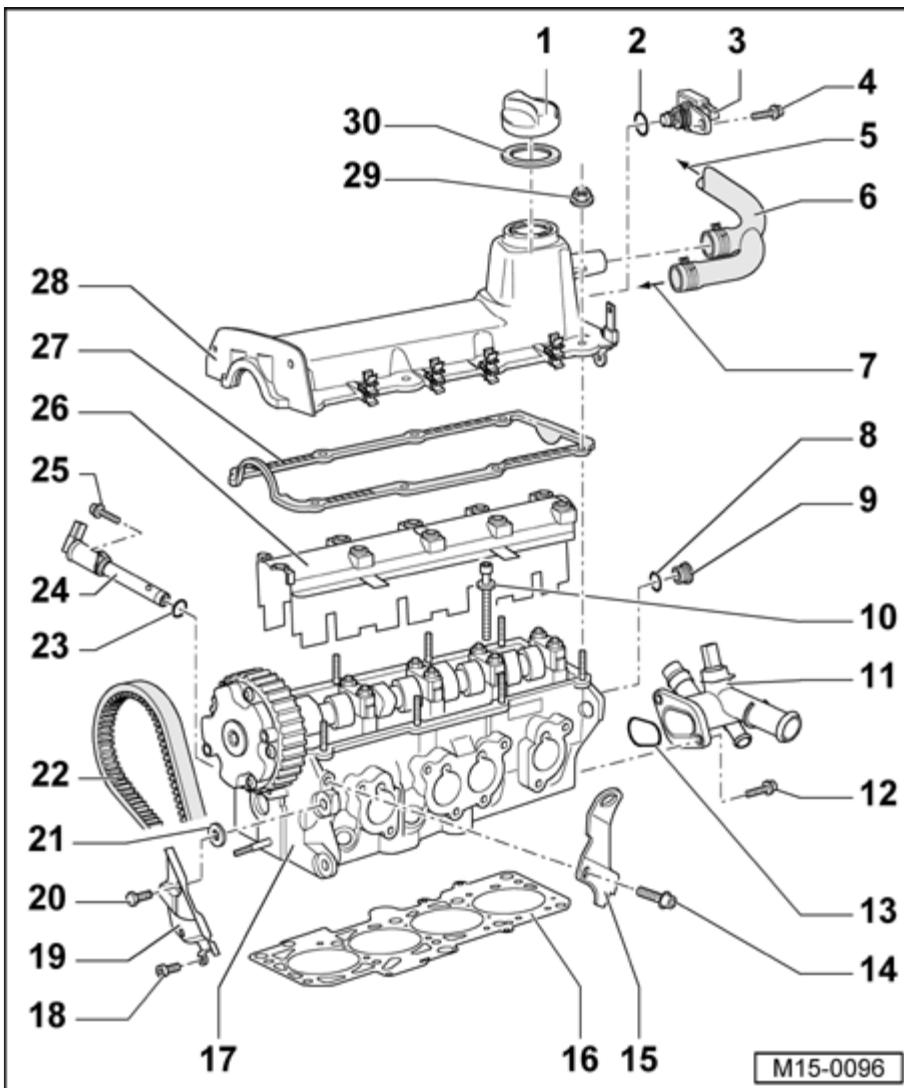


Fig. 64: Exploded View Of Cylinder Head Components - Engine Code BBW
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Cover

2 - O-ring

- Always replace

3 - Camshaft Position (CMP) sensor -G40-

4 - 9 Nm

5 - To intake hose

6 - Shape hose

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Do not separate shape hose/intake hose

7 - To intake manifold

8 - Seal

- Installed firmly onto. Refer to item - 9

9 - Sealing plug-15 Nm

- Always replace

10 - Cylinder head bolt

- Replace
- Removing and installing Polydrive cylinder head bolt with 3452
- Sequence when loosening and tightening. Refer to Cylinder head, removing and installing , Removing and installing cylinder head

11 - Union

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

12 - 10 Nm

13 - Seal

- Always replace

14 - 20 Nm

15 - Lifting eye

16 - Cylinder head gasket

- Replace
- After replacement replace complete amount of coolant in system

17 - Cylinder head

- Check for distortion. See Fig. 66 .
- Reworking sealing surface. See Fig. 125 .
- Removing and installing. Refer to Cylinder head, removing and installing
- After replacement replace complete amount of coolant in system

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

18 - 15 Nm

19 - Rear toothed belt guard

20 - 20 Nm

21 - Washer

- Note Part No.

22 - Toothed belt

- Mark direction of rotation before removing
- Check for wear
- Do not kink
- Removing, installing and tensioning. Refer to **Fig. 66**

23 - O-ring

- Always replace

24 - Valve -1- for camshaft adjustment -N205-

- Controlled by engine control module

25 - 9 Nm

26 - Oil deflector

27 - Cylinder head gasket

- Replace if damaged
- Coat cylinder head/bearing cap transition points with D 454 300 A2 before installing

28 - Cylinder head cover

- With cable guide

29 - 10 Nm

30 - Seal

Engine code BEV

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

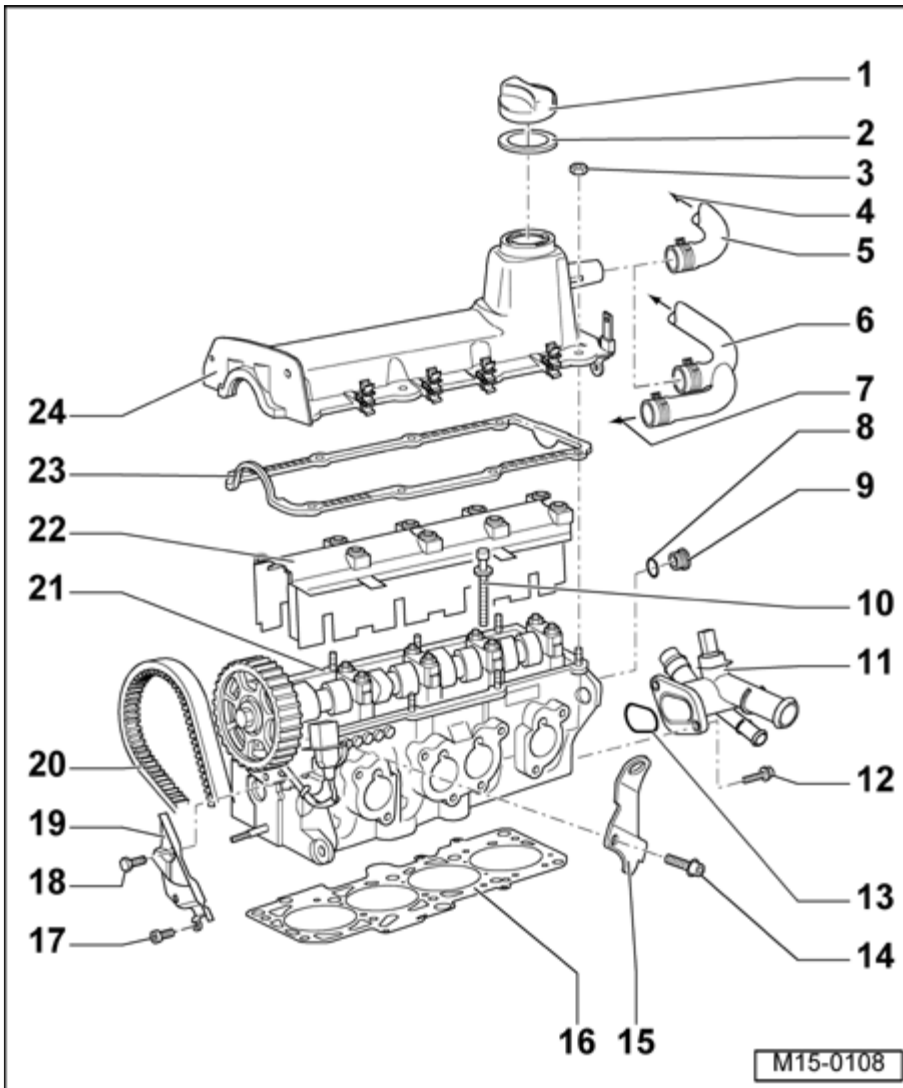


Fig. 65: Exploded View Of Cylinder Head Components - Engine Code BEV
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Cover

2 - Seal

3 - 10 Nm

4 - To intake manifold

5 - Shape hose

- Not for engine code BEV

6 - Shape hose

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Do not separate shape hose/intake hose

7 - To intake manifold

8 - O-ring

- Always replace

9 - Sealing plug-15 Nm

- Always replace

10 - Cylinder head bolt

- Always replace
- Removing and installing Polydrive cylinder head bolt with 3452
- Sequence when loosening and tightening. Refer to Cylinder head, removing and installing , Removing and installing cylinder head

11 - Union

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

12 - 10 Nm

13 - Seal

- Always replace

14 - 20 Nm

15 - Lifting eye

16 - Cylinder head gasket

- Always replace
- After replacement replace complete amount of coolant in system

17 - 15 Nm

18 - 20 Nm

19 - Rear toothed belt guard

20 - Toothed belt

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Mark direction of rotation before removing
- Check for wear
- Do not kink
- Removing, installing and tensioning. Refer to **Fig. 66**

21 - Cylinder head

- Check for distortion
- Reworking sealing surface. See **Fig. 125**.
- Removing and installing. Refer to **Cylinder head, removing and installing**
- After replacement replace complete amount of coolant in system

22 - Oil deflector

23 - Cylinder head cover gasket

- Replace if damaged
- Coat cylinder head/bearing cap transition points with D 454 300 A2 before installing

24 - Cylinder head cover

- With cable guide

Checking cylinder head for distortion

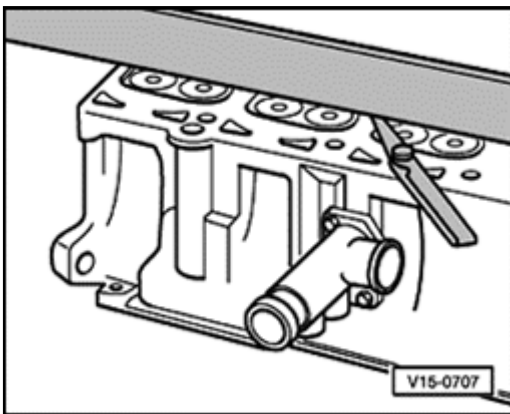


Fig. 66: Checking cylinder head for distortion

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Max. permissible distortion: 0.1 mm (minimum distance between linear measurements: 100 mm)

Toothed belts, removing, installing and tensioning

Engine codes AEG, AVH, AZG, BEV

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Engine code BBW. Refer to **Engine code BBW**

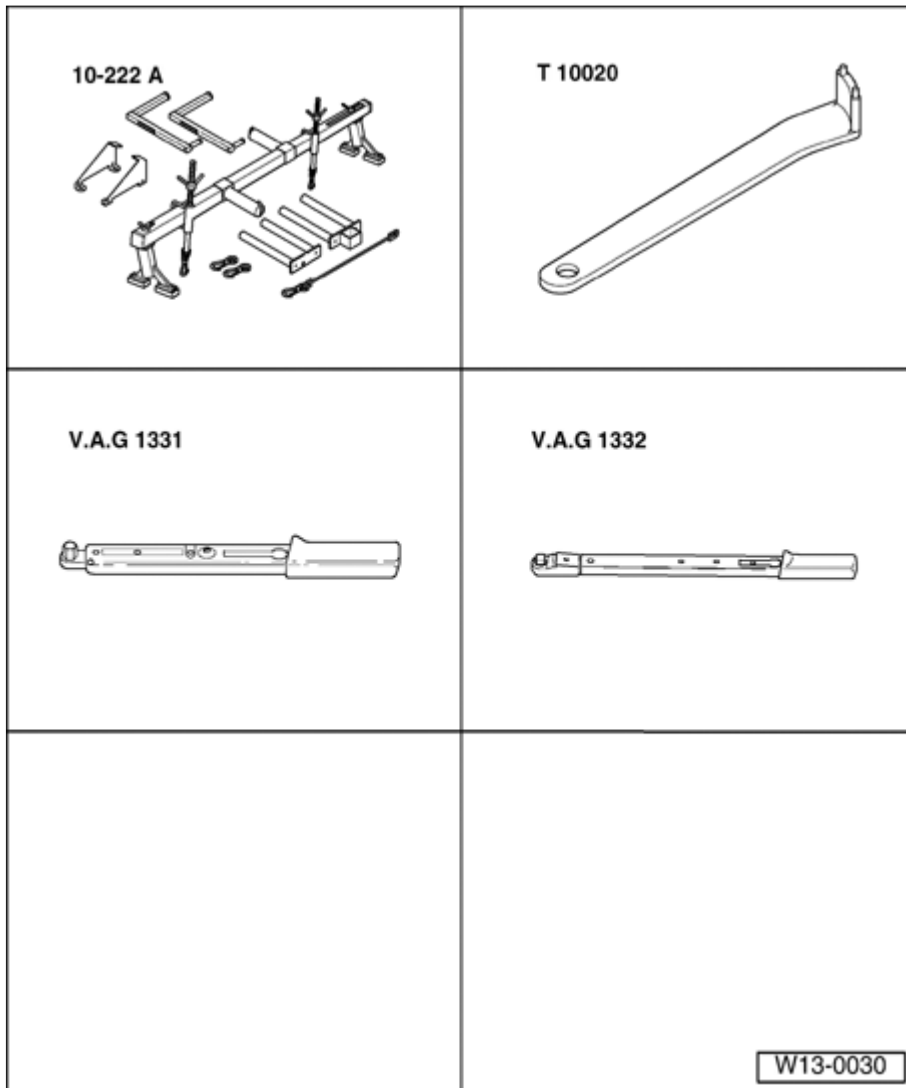


Fig. 67: Identifying Special Tools - Toothed Belts (Engine Codes AEG, AVH, AZG, BEV)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

(Adjusting valve timing)

Special tools and equipment

- 10-222A Engine support bracket with legs 10-222A/1
- T10004 Two hole pin wrench
- V.A.G 1331 Torque wrench (5 to 50 Nm)
- V.A.G 1332 Torque wrench (40 to 200 Nm)

Removing

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Remove engine cover.
- Remove right side sound insulation.

Refer to **BODY, FRONT**

- Remove poly V-belt. Refer to **Poly V-belt, removing and installing** .
- Remove tensioning element for poly V-belt.
- Remove coolant expansion tank (supply hose remains connected, close union for return supply hose).
- Remove power steering reservoir (hoses remain connected).
- Remove toothed belt guard upper part.

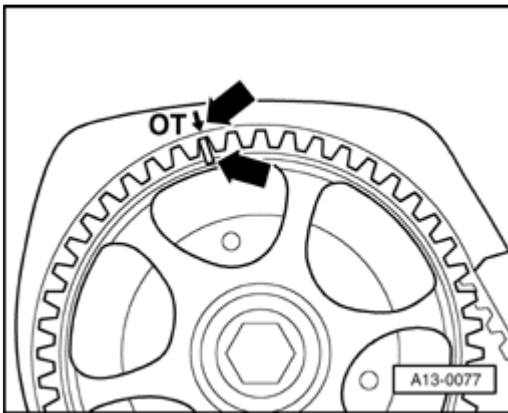


Fig. 68: Aligning Mark On Camshaft With Mark On Toothed Belt Cover
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Set camshaft pulley to TDC No. 1 cylinder by turning crankshaft. Mark on camshaft pulley must align with (arrow) on toothed belt guard.

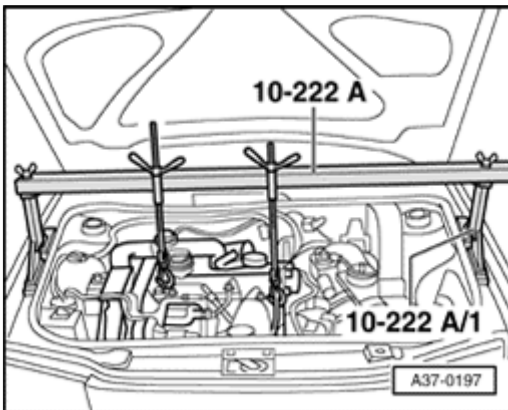


Fig. 69: Mounting Support 10-222A With Legs 10-222A/1
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Mount support 10-222A with legs 10-222A/1 as shown.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

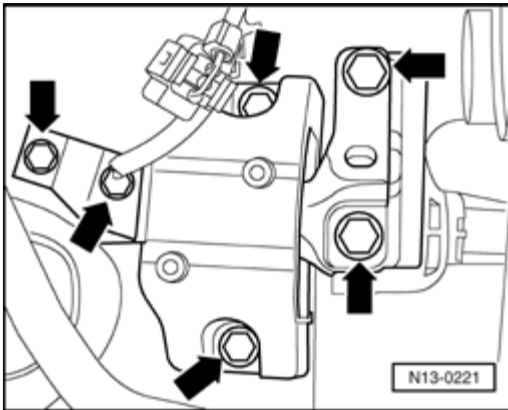


Fig. 70: Locating Securing Bolts From Assembly Mounting/Engine Bracket, Assembly Mounting/Body And Assembly Mounting Bracket/Body

Courtesy of VOLKSWAGEN UNITED STATES, INC.

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

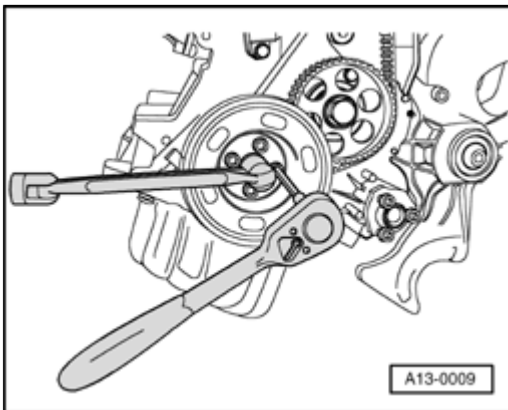
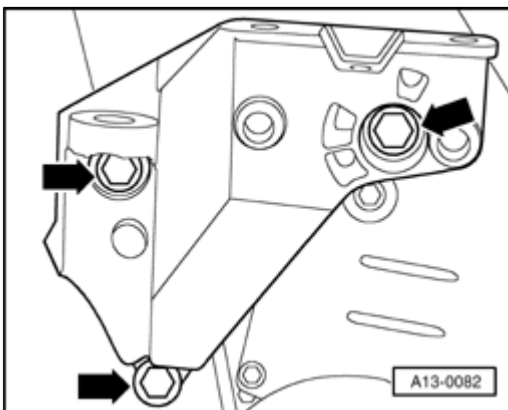


Fig. 71: Removing/Installing Vibration Damper/Belt Pulley

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove vibration damper/belt pulley.



2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Fig. 72: Identifying Engine Bracket-To-Cylinder Head Bolts

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove engine bracket from cylinder head.

NOTE: When loosening the front engine mounting bolt the engine must be raised slightly with the support device.

- Remove toothed belt guard center and lower parts.
- Mark direction of rotation of toothed belt.
- Release tensioner and take off toothed belt.
- Turn crankshaft back slightly.

Installing

Requirements

- Pistons must not be positioned at TDC.

Work sequence

- Place toothed belt on crankshaft pulley and coolant pump pulley (observe direction of rotation).

NOTE:

- **With engine removed:**
- **Install lower toothed belt guard and vibration damper/belt pulley.**

Adjusting valve timing

NOTE: When turning the camshaft the crankshaft must not be at TDC. Danger of damage to valves/piston crown.

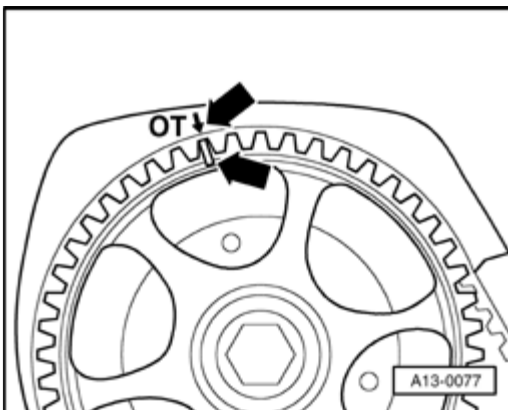


Fig. 73: Aligning Mark On Camshaft With Mark On Toothed Belt Cover

Courtesy of VOLKSWAGEN UNITED STATES, INC.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Align mark on camshaft with mark on toothed belt cover.

Engine installed:

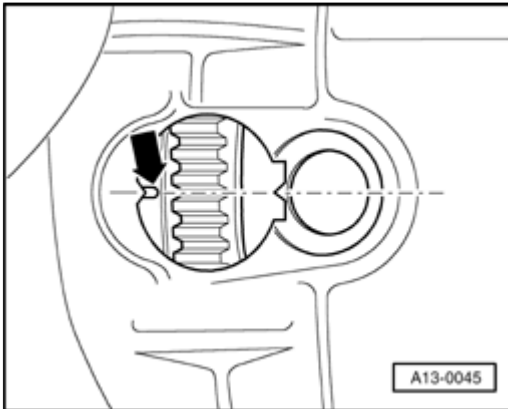


Fig. 74: Identifying Crankshaft At TDC No. 1 Cylinder (Vehicles With A Manual Transmission)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Turn crankshaft to TDC No. 1 cylinder (vehicles with a manual transmission).

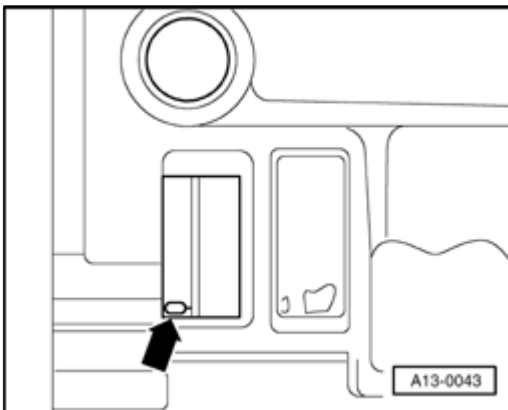


Fig. 75: Identifying Crankshaft At TDC No. 1 Cylinder (Vehicles With A Automatic Transmission)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Turn crankshaft to TDC No. 1 cylinder (vehicles with an automatic transmission).

With engine removed:

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

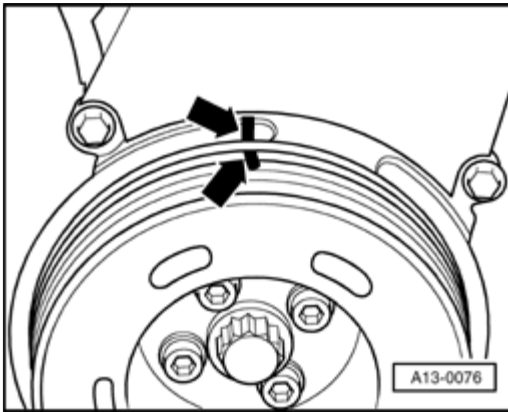


Fig. 76: Identifying Vibration Damper At TDC No. 1 Cylinder
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Position vibration damper at TDC No. 1 cylinder (arrows).
- Installed toothed belt on tensioning roller and camshaft pulley.

Tensioning toothed belt

Requirements

- Engine must be no more than warm to the touch.
- Camshaft pulley positioned at TDC for cylinder 1.
- Before tensioning toothed belt, turn tensioning roller 5 times on to limit stop (in both directions) at eccentric using pin wrench T10020.

Work sequence

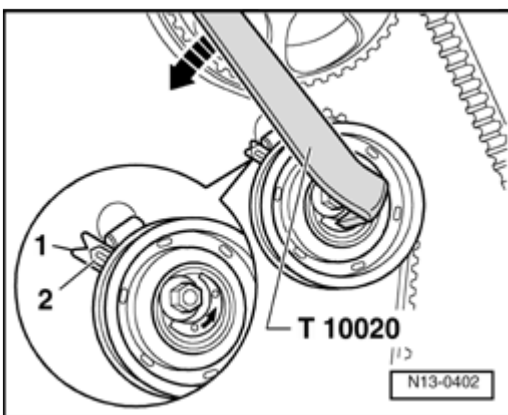


Fig. 77: Releasing Tension On Toothed Belt Until Notch And Indicator Align (Engine codes AEG, AVH, AZG, BEV)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Tension toothed belt by turning eccentric to left (direction of arrow) with two hole pin wrench (T10020) onto limit stop.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Release tension on toothed belt until notch -1- and indicator -2- align (use mirror).
- Tighten securing nut to 20 Nm.
- Turn crankshaft two rotations in engine direction of rotation and set again to DTC No. 1 cylinder. When doing this it is important that last 45 ° (1/8 turn) is completed without interruptions.
- Check tension of toothed belt again.

Specification: Indicator and notch align

Continued for completing installation of toothed belt

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

Tightening torque: 25 Nm

- Install engine mounting to cylinder block.

Tightening torque: 45 Nm

- Install engine assembly mounting complete.

NOTE: Insert bolts into engine bracket before installing bracket

- Align assembly mountings for engine and transmission. Refer to **Engine and transmission mountings, aligning**.
- Assembly mounting torque settings. Refer to **Assembly mounting**
- Remove engine support device 10-222 A.
- Install toothed belt guard upper part.
- Install poly V-belt tensioning element.

Tightening torque: 25 Nm

- Install poly V-belt. Refer to **Poly V-belt, removing and installing**.
- Install coolant expansion tank.
- Install power steering reservoir.
- Install right side sound insulation:

Refer to **BODY, FRONT**

- Check engine oil level and top up, if necessary.
- Install engine cover.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Engine code BBW

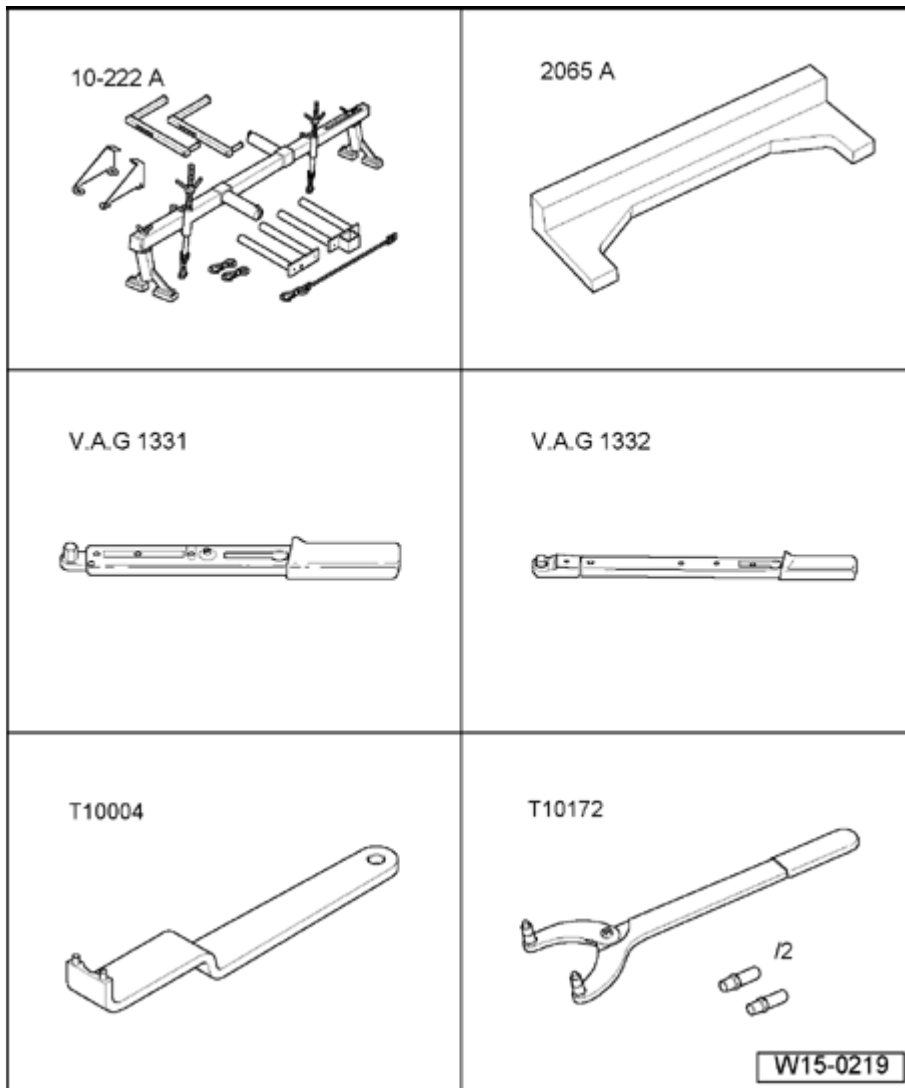


Fig. 78: Identifying Special Tools - Toothed Belts (Engine Code BBW)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

(Adjusting valve timing)

Special tools and equipment

- 10-222A Engine support bracket with legs 10-222A/1
- 2065 A Adjustment bar
- V.A.G 1331 Torque wrench (5 to 50 Nm)
- V.A.G 1332 Torque wrench (40 to 200 Nm)
- T10004 Two hole pin wrench
- T10172 Counterhold tool

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Special tools and equipment

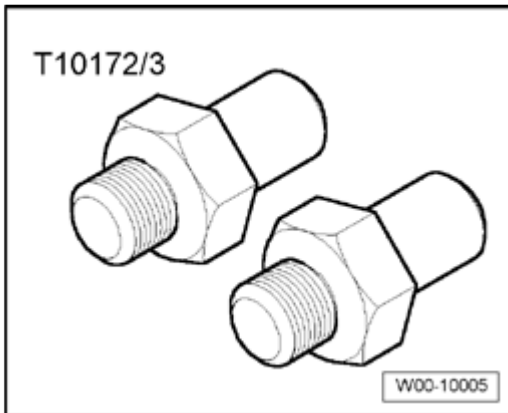


Fig. 79: T10172/3 Pin

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- T10172/3 Pin

NOTE:

- If the toothed belt is to be taken off the camshaft sprocket, e.g. when removing the camshaft or the cylinder head, the following must be considered:
- Engine bracket, tensioning element for ribbed belt, vibration damper/belt pulley and toothed belt guard (except for upper part) can remain installed.
- To remove the toothed belt from the camshaft sprocket, unscrew the tensioning roller and slide up to the engine bracket.

Counterhold tool T10172

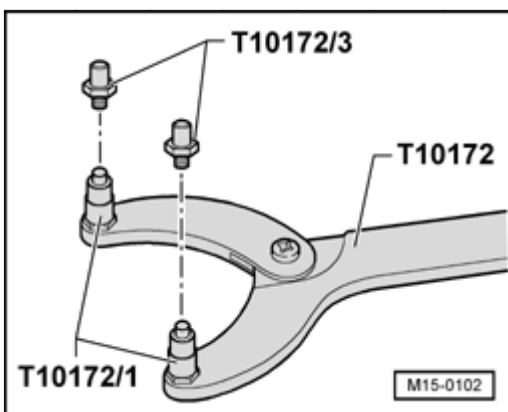


Fig. 80: Identifying Counterhold Tool T10172, Pins T10172/1 & Pins T10172/3

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Unscrew pins T10172/1.
- Screw pins T10172/3 in and tighten.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Removing

- Remove engine cover.
- Remove right side sound insulation.

Refer to **BODY, FRONT**

- Remove poly V-belt. Refer to **Poly V-belt, removing and installing** .
- Remove tensioning element for poly V-belt.
- Remove intake manifold upper part. Refer to **Intake manifold upper part, removing and installing** .
- Remove toothed belt guard upper part.
- Remove coolant expansion tank (supply hose remains connected, close union for return supply hose).
- Remove power steering reservoir (hoses remain connected).
- Disconnect connector of camshaft timing adjustment valve.
- Remove cylinder head cover.

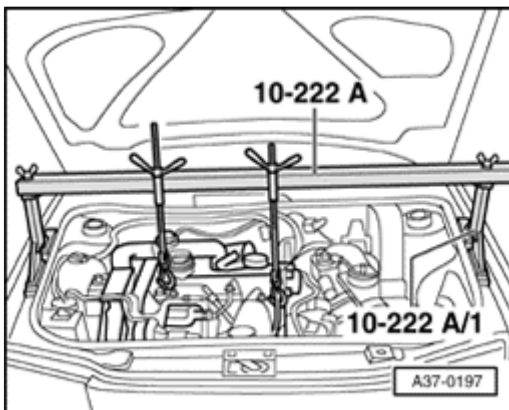
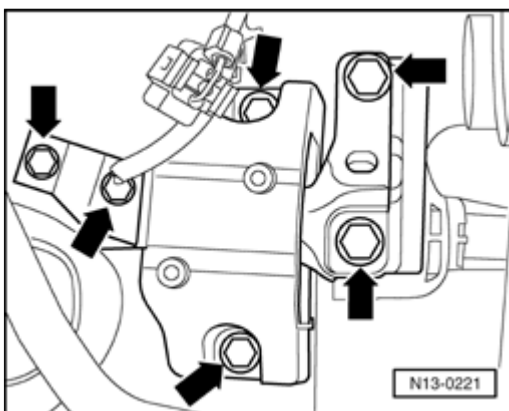


Fig. 81: Mounting Support 10-222A With Legs 10-222A/1
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Mount support 10-222A with legs 10-222A/1 as shown.



2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Fig. 82: Locating Securing Bolts From Assembly Mounting/Engine Bracket, Assembly Mounting/Body And Assembly Mounting Bracket/Body

Courtesy of VOLKSWAGEN UNITED STATES, INC.

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

NOTE:

- Only remove the engine mounting when the engine is secured with the support bracket 10-222A.
- The engine bracket must be only released when the engine mounting is removed.

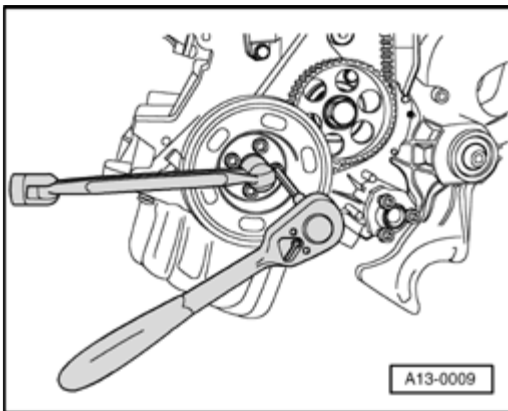


Fig. 83: Removing/Installing Vibration Damper/Belt Pulley

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove vibration damper/belt pulley.

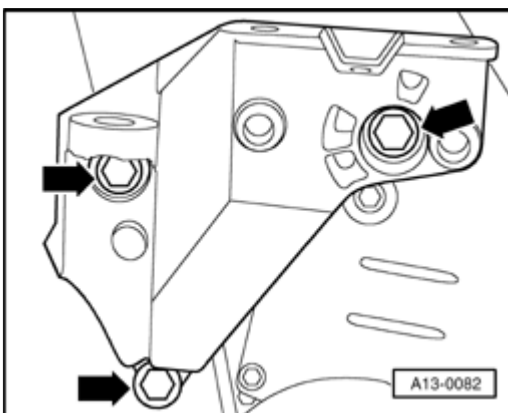


Fig. 84: Identifying Engine Bracket-To-Cylinder Head Bolts

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove engine bracket from cylinder block.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

NOTE: When loosening the front engine mounting bolt the engine must be raised slightly with the support device.

- Remove toothed belt guard center and lower parts.
- Mark direction of rotation of toothed belt.

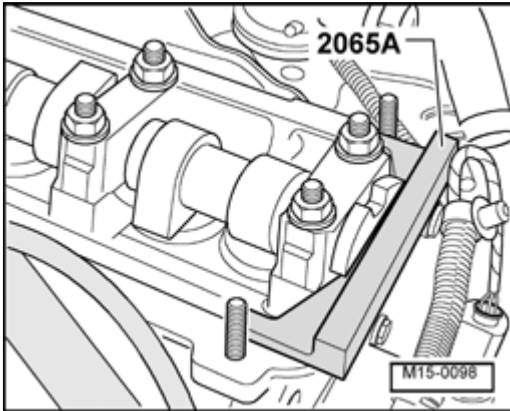


Fig. 85: Identifying Adjustment Bar 2065 A
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Turn crankshaft until camshaft is set to TDC No. 1 cylinder. Adjustment bar 2065 A must be pushed into slot of camshaft.
- Remove tool.
- Release tensioner and take off toothed belt.
- Turn crankshaft against engine direction of rotation 45 °.

Installing

Requirements

- Pistons must not be positioned at TDC.
- Engine must only be hand touch warm.

Tensioning toothed belt and adjusting valve timing

- NOTE:**
- When the camshaft is turned, the crankshaft must not be at TDC. Danger of damage to valves or piston crowns.
 - Never use the adjustment bar 2065 A as counter-hold when loosening and tightening the camshaft sprocket! Use counterhold tool T10172 with pin T10172/3.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

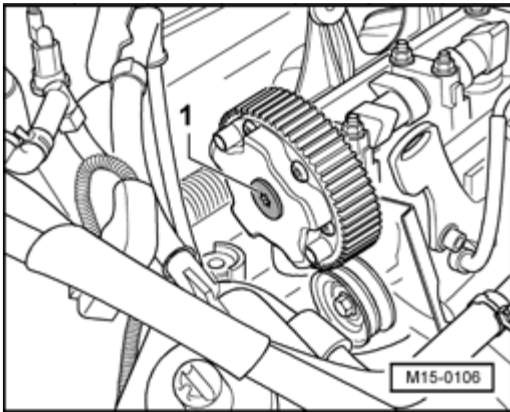


Fig. 86: Locating Camshaft Sealing Plug

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Place a flat container under camshaft sprocket to collect oil leaking out when sealing plug -1- is loosened.
- Unscrew sealing plug -1- carefully and collect leaking oil. Do not rotate crankshaft, if possible.

NOTE: To loosen the sealing plug use counterhold tool T10172 with pin T10172/3, if necessary.

- Clean oil from camshaft sprocket with a cloth.
- Remove camshaft pulley bolt. Do not rotate crankshaft, if possible.

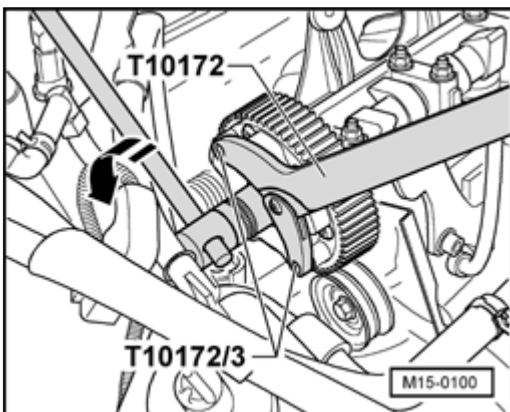


Fig. 87: Loosening Camshaft Bolt Using Counterhold Tool T10172 With Pin T10172/3

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Use counterhold tool T10172 with pin T10172/3 to loosen camshaft bolt.
- Take camshaft sprocket off camshaft and clean it.

NOTE:

- The teeth of the camshaft sprocket and the running surface of the camshaft must be free of oil.
- In this condition, replacement of the camshaft seal is recommended as a preventative and inexpensive measure, refer to Camshaft oil seal.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

replacing .

- Install camshaft sprocket again and camshaft bolt.

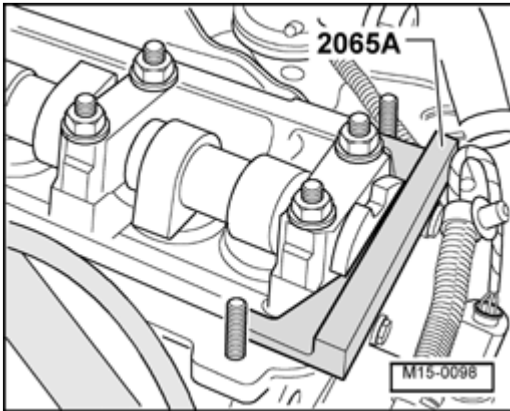


Fig. 88: Identifying Adjustment Bar 2065 A

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Set camshaft to TDC No. 1. Cyl. and insert adjustment bar 2065 A.
- Loosen camshaft bolt until camshaft sprocket can be turned by hand. Use counterhold tool T10172 with pin T10172/3.
- Place toothed belt on crankshaft pulley and coolant pump (observe direction of rotation).
- Install toothed belt guard center and lower parts and belt pulley/vibration damper.

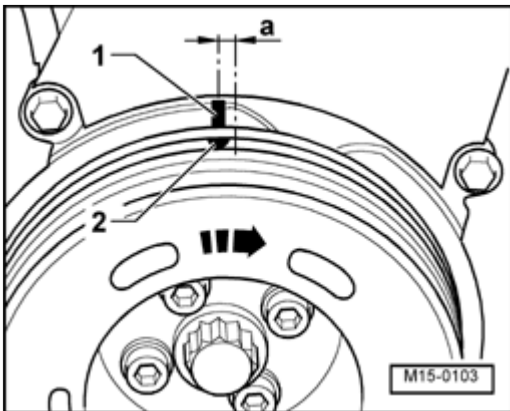


Fig. 89: Aligning Notch On Belt Pulley/Vibration Damper With Notch On Toothed Belt Guard, Upper Part

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Turn crankshaft in engine direction of rotation again at TDC No. 1 Cyl. Notch -2- on belt pulley/vibration damper must align with notch -1- on toothed belt guard, upper part.
- Turn camshaft sprocket so that counterhold tool T10172 with pin T10172/3 can be inserted.
- Place toothed belt on tensioning roller and camshaft sprocket.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

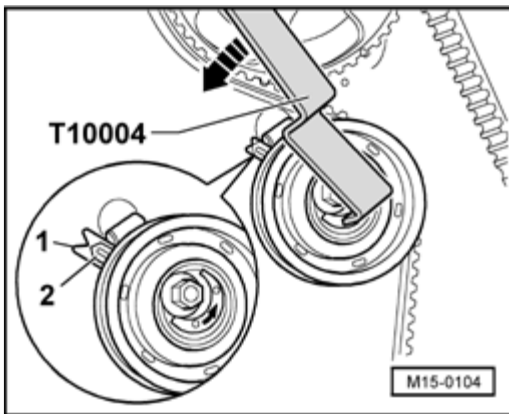


Fig. 90: Releasing Tension On Toothed Belt Until Notch And Indicator Align (Engine code BBW)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Turn tensioning roller on eccentric with two hole pin wrench (T10004) five times onto limit stop in both directions.
- Tension toothed belt by turning eccentric to left (direction of arrow) with two hole pin wrench (T10004) onto limit stop.
- Release tension on toothed belt until notch -1- and indicator -2- align (use mirror).
- Tighten securing nut to 20 Nm.
- Check TDC of crankshaft again, correct if necessary.

NOTE: If the crankshaft is positioned after TDC No. 1 cylinder turn the crankshaft again a bit against the engine direction of rotation and set to TDC No. 1 cylinder.

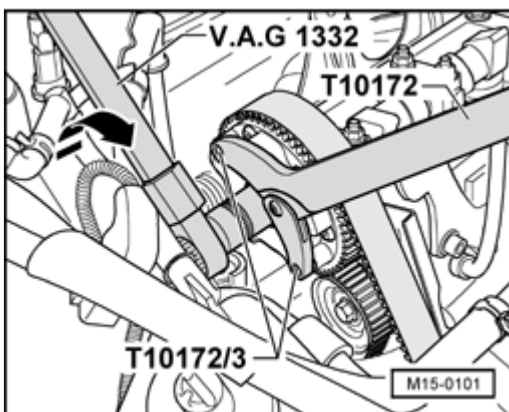


Fig. 91: Tightening Camshaft Bolt While Holding Crankshaft Sprocket With Counterhold T10172 (Pin T10172/3)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Hold crankshaft sprocket with counterhold T10172 (pin T10172/3) and tighten camshaft bolt to 40 Nm.
- Remove setting bar 2065 A.
- Counter-hold camshaft sprocket and tighten camshaft bolt to 130 Nm.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

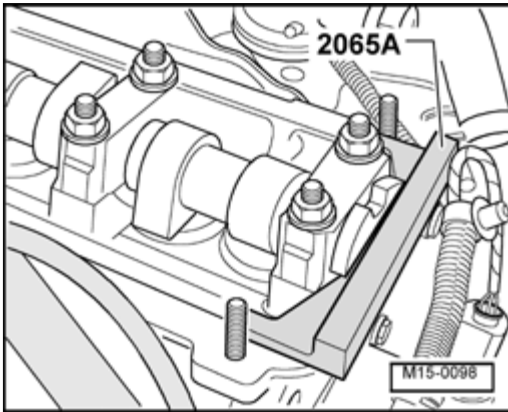


Fig. 92: Identifying Adjustment Bar 2065 A

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Turn crankshaft two rotations in engine direction of rotation until setting bar 2065 A can be inserted.

NOTE:

- It is essential that the last 45 ° (1/8 turn) is performed without stopping.
- If the crankshaft has been turned to far, turn the crankshaft 1/4 turn back and set the camshaft to TDC No. 1 cylinder again (insert the setting bar 2065 A).

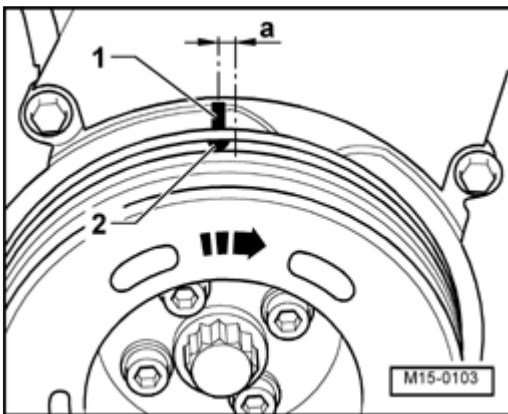


Fig. 93: Aligning Notch On Belt Pulley/Vibration Damper With Notch On Toothed Belt Guard, Upper Part

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Check TDC of crankshaft.

Notch -2- on vibration damper/belt pulley must be positioned -a- (max. 5 mm) after TDC marking -1- on toothed belt guard lower part.

If the crankshaft is not in this area:

- Repeat adjustment.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

If the crankshaft is in this area:

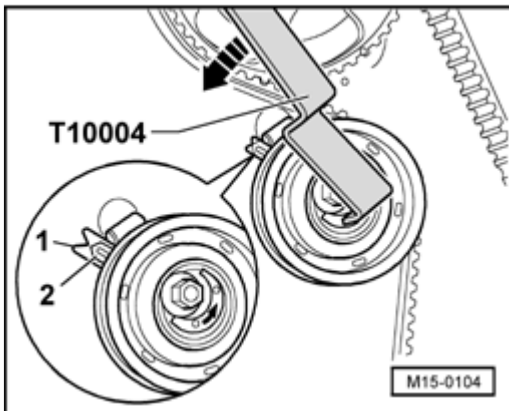


Fig. 94: Releasing Tension On Toothed Belt Until Notch And Indicator Align (Engine code BBW)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Check toothed belt tension again and adjust if necessary.

Specification: Indicator and notch align

Continuation, completing installation of toothed belt

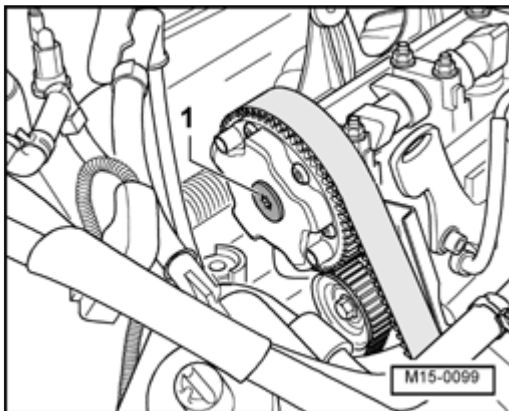


Fig. 95: Identifying Crankshaft Sealing Plug
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Install sealing plug -1- (replace O-ring).

Tightening torque: 25 Nm

- Install engine mounting to cylinder block.

Tightening torque: 45 Nm

NOTE:

- Insert bolts into engine bracket before installing engine bracket.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- **Tighten all bolts of the engine bracket, with the tightening torque mentioned, before installing the engine mounting.**

- Install engine assembly mountings complete.
- Align assembly mountings for engine and transmission. Refer to **Engine and transmission mountings, aligning**.

Tightening torques for assembly mounting. Refer to **Assembly mounting**.

- Remove engine support device 10-222 A.
- Install toothed belt guard upper part.
- Install poly V-belt tensioning element.

Tightening torque: 25 Nm

- Install poly V-belt. Refer to **Poly V-belt, removing and installing**.
- Install coolant expansion tank.
- Install power steering reservoir.
- Install cylinder head cover.
- Connect connector of camshaft timing adjustment valve.
- Install intake manifold upper part. Refer to **Intake manifold upper part, removing and installing**.
- Start engine and run briefly at idling speed (oil pressure increase in camshaft adjustment).
- Install right side sound insulation:

Refer to **BODY, FRONT**

- Check engine oil level and top off, if necessary.
- Install engine cover.

Semi-automatic toothed belt tensioning roller, checking

Engine codes AEG, AVH, AZG, BEV

Special tools and equipment

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

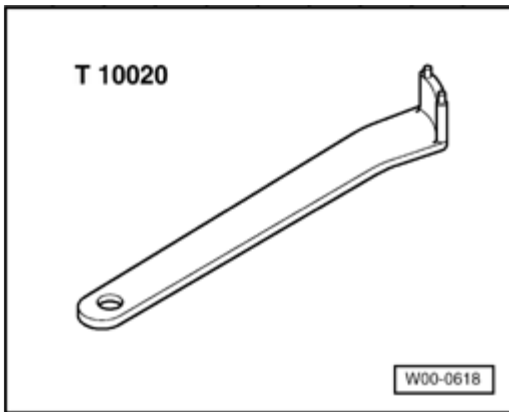


Fig. 96: Identifying Special Tool T10020 Two Hole Pin Wrench
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- T10020 Two hole pin wrench

Engine code BBW

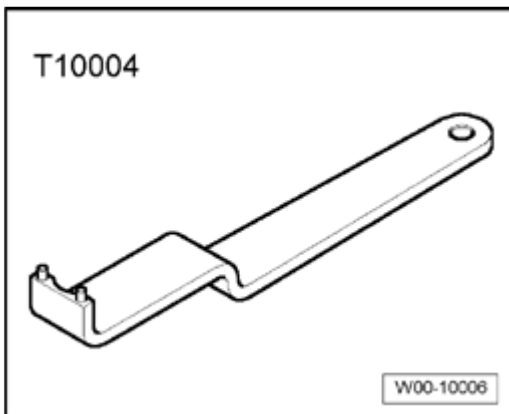
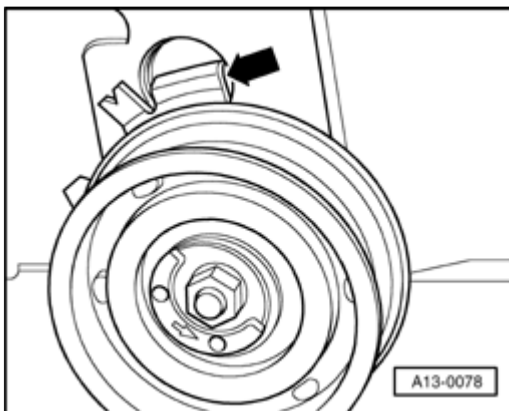


Fig. 97: Identifying T10004 Two Hole Pin Wrench
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- T10004 Two hole pin wrench



2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Fig. 98: Locating Angled Retainer & Cut-Out On Cylinder Head
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Angled retainer (arrow) must locate in cut-out on cylinder head.

Requirements

- Engine must only be hand touch warm.

Work sequence

- Position engine at TDC for cylinder No. 1

Engine codes AEG, AVH, AZG, BEV

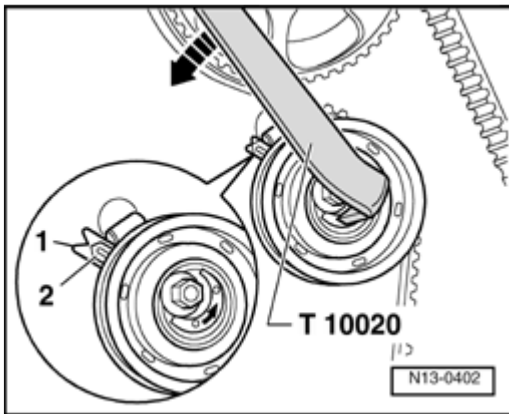
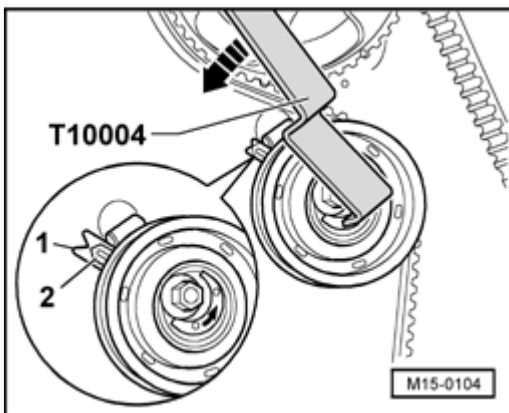


Fig. 99: Releasing Tension On Toothed Belt Until Notch And Indicator Align (Engine codes AEG, AVH, AZG, BEV)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- With forceful thumb pressure, depress toothed belt. Indicator -2- must move.

Engine code BBW



2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Fig. 100: Releasing Tension On Toothed Belt Until Notch And Indicator Align (Engine code BBW)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- With forceful thumb pressure, depress toothed belt. Indicator -2- must move.

Continued for all engines

- Release thumb pressure on toothed belt and turn crankshaft two turns in engine direction of rotation until engine is again at TDC No.1 cylinder. It is essential that last 45 ° (1/8 turn) is performed without stopping.

Tensioning roller must return to its original position. (Notch -1- and indicator -2- are again aligned).

NOTE: Use a mirror when checking.

Cylinder head, removing and installing

Engine codes AEG, AVH, AZG, BEV

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

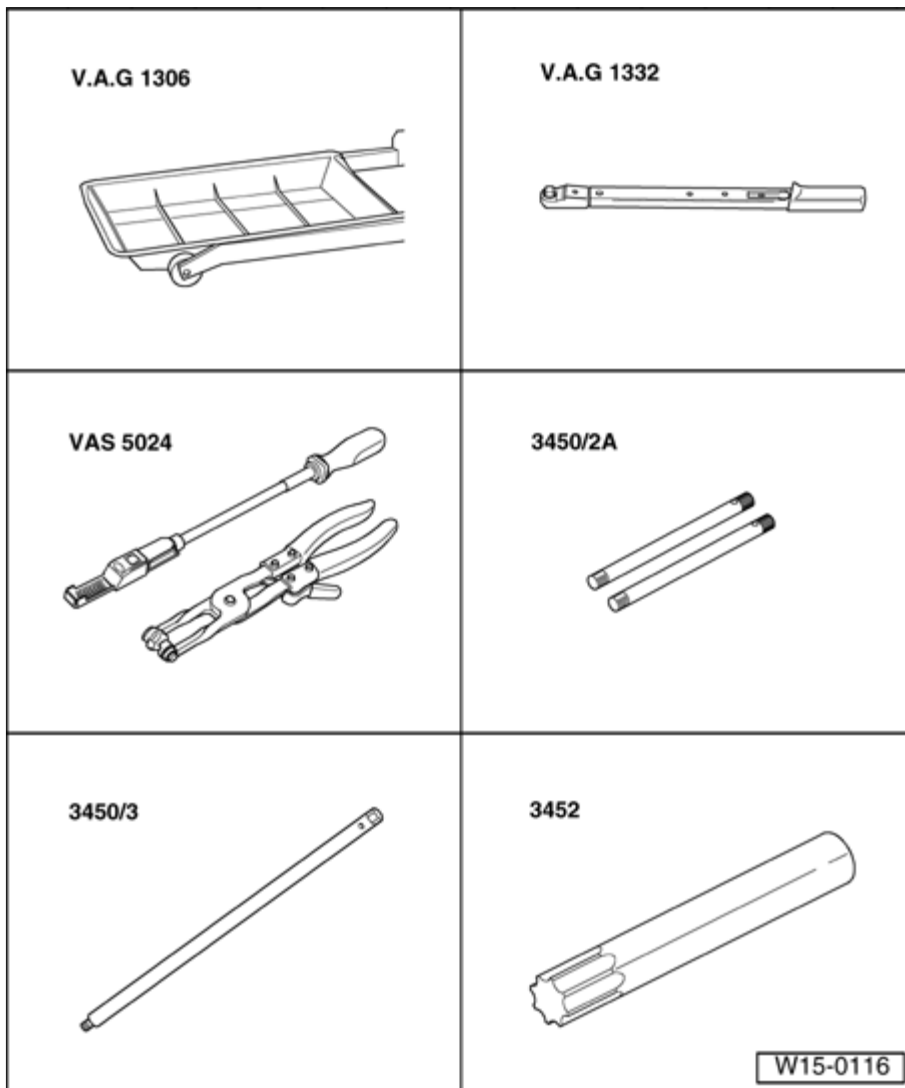


Fig. 101: Identifying Special Tools - Cylinder Head, Removing And Installing (engine Codes AEG, AVH, AZG, BEV)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Engine code BBW. Refer to **Engine code BBW**

Special tools and equipment

- V.A.G 1306 Drip tray
- V.A.G 1332 Torque wrench (40 to 200 Nm)
- VAS 5024 Assembly tool for spring-type clips
- 3450/2A Guide pins
- 3450/3 Removal tool
- 3452 Key (for Polydrive cylinder head bolts)

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

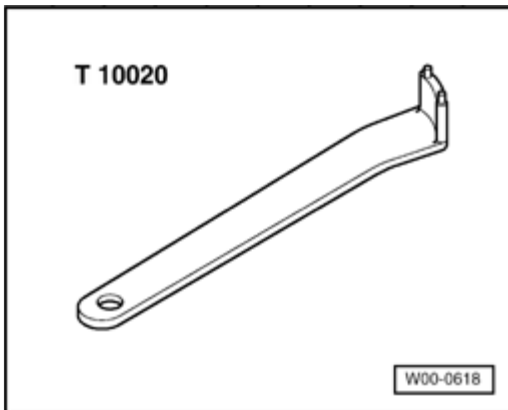


Fig. 102: Identifying T10020 Two Hole Pin Wrench
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- T10020 Two hole pin wrench

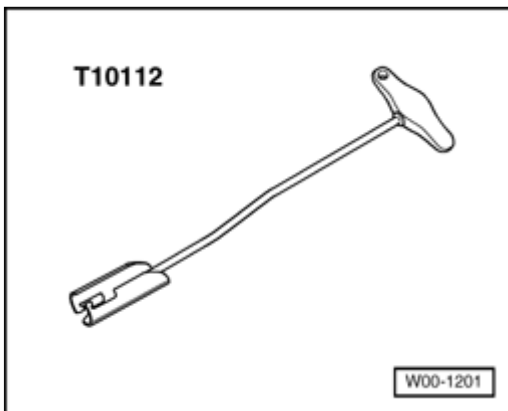


Fig. 103: Identifying T10112 Fitting Tool
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- T10112 Fitting tool

Requirements

- Engine must only be hand touch warm.

Removing

CAUTION: When performing repair work, especially due to the confined conditions in the engine compartment, pay attention to the following:

- Route all types of lines (e.g. for fuel, hydraulics, EVAP system, coolant, refrigerant, brake fluid and vacuum) as well as electrical wiring so that the original positions are restored.
- Ensure sufficient clearance to all moving or hot components.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

NOTE: During this procedure the battery Ground strap must be disconnected. Therefore, please check first whether a coded radio is installed. Obtain the radio code first if necessary.

- With ignition switched off disconnect battery Ground (GND) strap.
- Remove engine cover.
- Drain coolant. Refer to Cooling system, draining and filling .

WARNING: The fuel system is under pressure! Before opening the system place a cloth around the connection. Then release the pressure by carefully loosening the connection.

Engine codes AEG, AVH, AZG, BEV

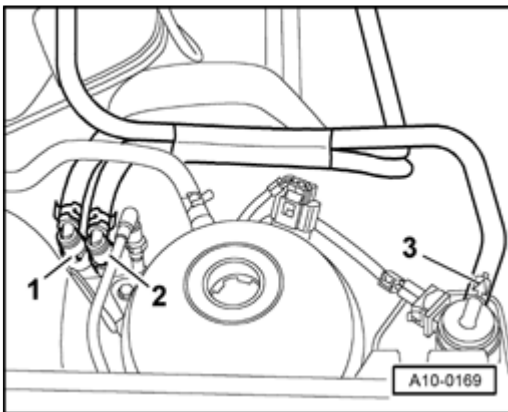


Fig. 104: Locating Fuel Supply & Return Lines & EVAP Canister Purge Regulator Valve
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Pull fuel supply line -1- and fuel return line -2- off connections
- Disconnect hose -3- from solenoid valve for Evaporative Emission (EVAP) Canister Purge Regulator Valve

Engine code BEV

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

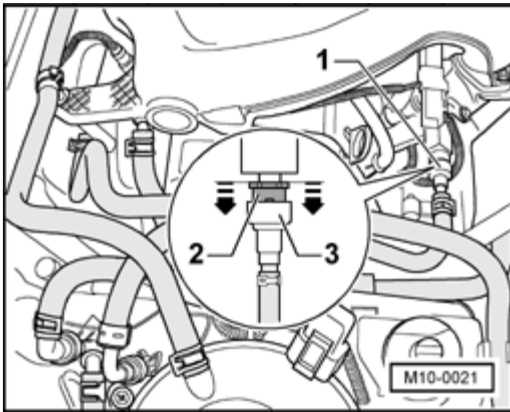


Fig. 105: Disconnecting Fuel Supply Line Off Union By Pressing Locking Ring Into Union
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Pull fuel supply line -1- off union by pressing locking ring -2- into union -3-.

Continued for all engines

- Seal lines to avoid contamination of fuel system. Refer to **Air cleaner, disassembling and assembling**.
- Remove air cleaner with intake hose and secondary air line.
- Remove intake manifold upper part. Refer to **Intake manifold upper part, removing and installing**.
- Disconnect all necessary coolant, vacuum and intake hoses from intake manifold upper part/cylinder head.
- Pull off/disconnect all electrical connections/wiring as necessary from cylinder head and lay aside.

NOTE: **Seal the intake ports in the intake manifold lower section with clean cloths.**

- Remove connections with coolant hoses.
- Remove suction and pressure lines from secondary air pump motor.
- Remove pressure line retainer.
- Unbolt secondary air pump motor bracket and remove.
- Disconnect following connections:

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

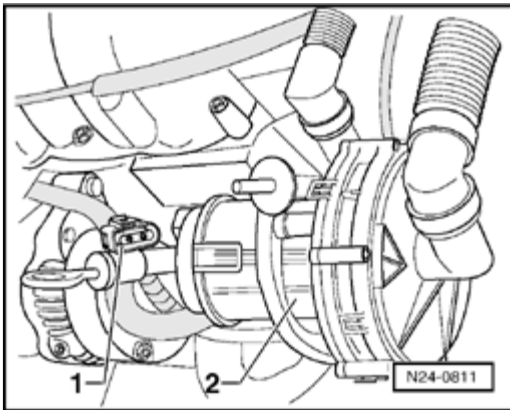


Fig. 106: Identifying Secondary Air Injection Pump Motor -V101- & Harness Connector
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- -1- for Secondary Air Injection (AIR) Pump Motor -V101- -2-.
- Camshaft position (CMP) sensor -G40-
- Knock Sensor (KS) 1 -G61-
- For injectors -N30-, -N31-, -N32-, -N33-, (unclip cable guide).

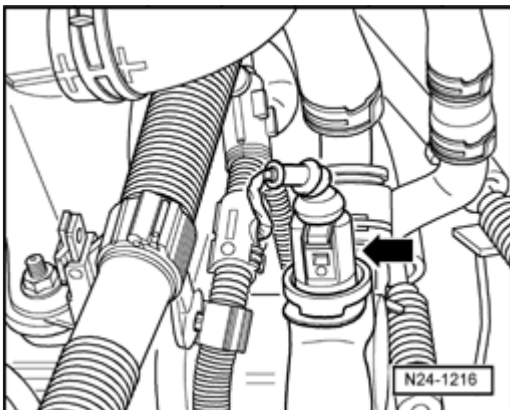


Fig. 107: Engine Coolant Temperature Sensor -G62-
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Engine Coolant Temperature (ECT) sensor -G62- (arrow).
- Knock Sensor (KS) 1 -G61- from clip on generator bracket.
- Remove wiring harness from fuel rail and lay to one side.
- Unclip wiring harness on left next to cylinder head.
- Disconnect wiring from spark plus using tool T10112.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

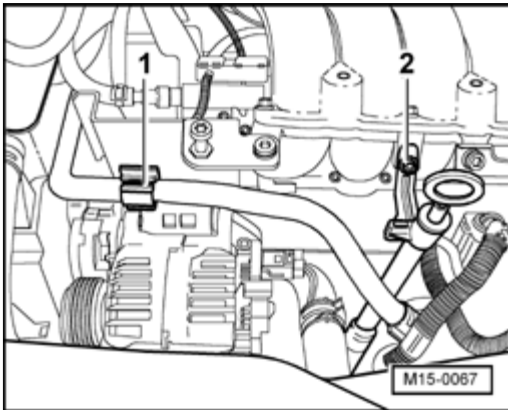


Fig. 108: Return Line Clip & Oil Dipstick Retainer Bolt
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Unclip return line from clip -1-.
- Remove bolt -2- from oil dipstick retainer.
- Remove cover for Heated Oxygen Sensor (HO2S) connector.
- Disconnect Heated Oxygen Sensor (HO2S) -G39- connector and take wiring harness off heat shield.
- Disconnect front exhaust pipe with catalytic converter,
- Take off poly V-belt. Refer to **Poly V-belt, removing and installing** .
- Remove bracket (Refer to **Part I** , item 2) from poly V-belt tensioning element.
- Remove toothed belt guard upper part.

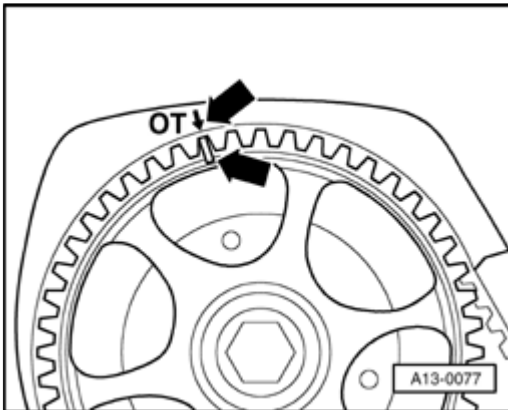


Fig. 109: Aligning Mark On Camshaft With Mark On Toothed Belt Cover
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Set camshaft pulley to TDC No. 1 cylinder by turning crankshaft 1. Mark on camshaft pulley must align with (arrow) on toothed belt guard.
- Loosen tensioning roller and remove toothed belt from camshaft pulley.
- Turn crankshaft back slightly.
- Remove cylinder head cover.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Remove upper bolt from rear toothed belt guard.

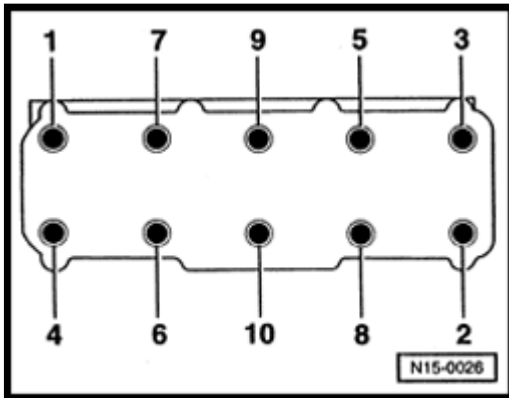


Fig. 110: Identifying Cylinder Head Bolts Loosening Sequence
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Loosen socket head bolts in sequence given and then remove.

NOTE: Use key 3452 for polydrive cylinder head bolts.

- Carefully lift cylinder head off.

NOTE:

- Always replace bolts.
- There must be no oil or coolant in the cylinder head bolt pockets in the cylinder head.
- Do not remove new cylinder head gasket from its packing until immediately before installing.
- Handle new gasket with extreme care. Damage will cause leakage.
- Place clean cloths in cylinders so that no dirt or emery cloth particles can get in between cylinder wall and piston.
- Also prevent dirt and emery cloth particles from getting into coolant.
- Carefully clean sealing surfaces of cylinder head and cylinder block. Ensure thereby that surfaces are not scored or scratched (if abrasive paper is used, grade must not be less than 100)
- Carefully remove metal particles, emery residue and cloths.
- If crankshaft has been turned: Set No. 1 cylinder piston to top dead center and then return crankshaft back slightly.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

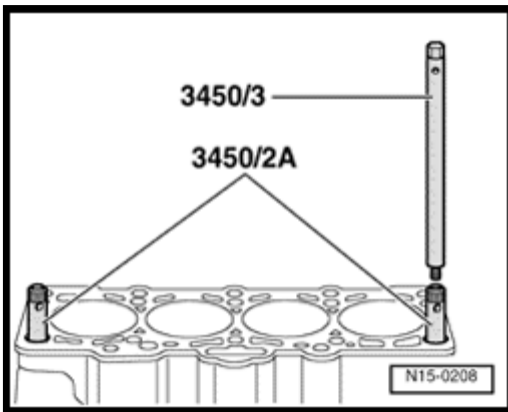


Fig. 111: Identifying Guide Pins From 3450/2 A & 3450/3 Inserted Into Front Outer Threaded Holes For Cylinder Head Bolts

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- To centralize, screw guide pins from 3450/2 A into front outer threaded holes for cylinder head bolts.

NOTE: Part number must be visible.

- Install new cylinder head gasket.
- Install cylinder head, screw in 8 remaining cylinder head bolts and tighten by hand.
- Remove guide pins through bolt holes with removal from 3450/3. To do this turn removal tool counter-clockwise, until pins are free.
- Install remaining cylinder head bolts and tighten hand-tight.

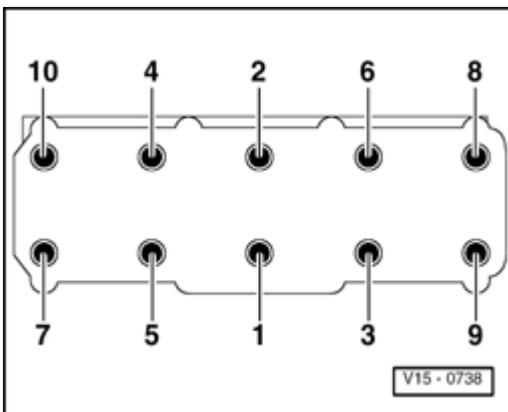


Fig. 112: Identifying Cylinder Head Bolt Tightening Sequence

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Tighten cylinder head in tightening sequence as follow:
- Pretighten all bolts to 40 Nm.
- Then tighten all bolts 1/4 turn (90 °) using a rigid wrench.
- Then tighten all bolts again another 1/4 turn (90 °).

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Further assembly is the reverse of the disassembling procedure.

NOTE: When turning the camshaft the crankshaft must not be at TDC. Danger of damage to valves/piston crown.

- Install cylinder head cover.

Tightening torque: 10 Nm

- Install toothed belt and set timing. Refer to Engine codes AEG, AVH, AZG, BEV
- Install poly V-belt tensioning element.

Tightening torque: 25 Nm

- Install poly V-belt. Refer to Poly V-belt, removing and installing .
- Installing front exhaust pipe with catalyst to exhaust manifold. Refer to Exhaust system components, removing and installing .

NOTE: Reinstall wiring/lines to their original positions.

- Fill with new coolant. Refer to Cooling system, draining and filling .
- Connect battery Ground (GND) strap.

Vehicles with throttle (accelerator) cable

- Adjusting throttle cable. Refer to Accelerator mechanism, servicing .

Continued for all models

- Adapt engine control module to throttle valve control module. Refer to Adapting components and functions , Adapting functions and components.
- Test drive vehicle and read Diagnostic Trouble Code (DTC) memory.
- If DTC memory was erased or engine control module has been disconnected from permanent positive supply, regenerate readiness code. Refer to Adapting components and functions , Adapting functions and components.

Engine code BBW

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

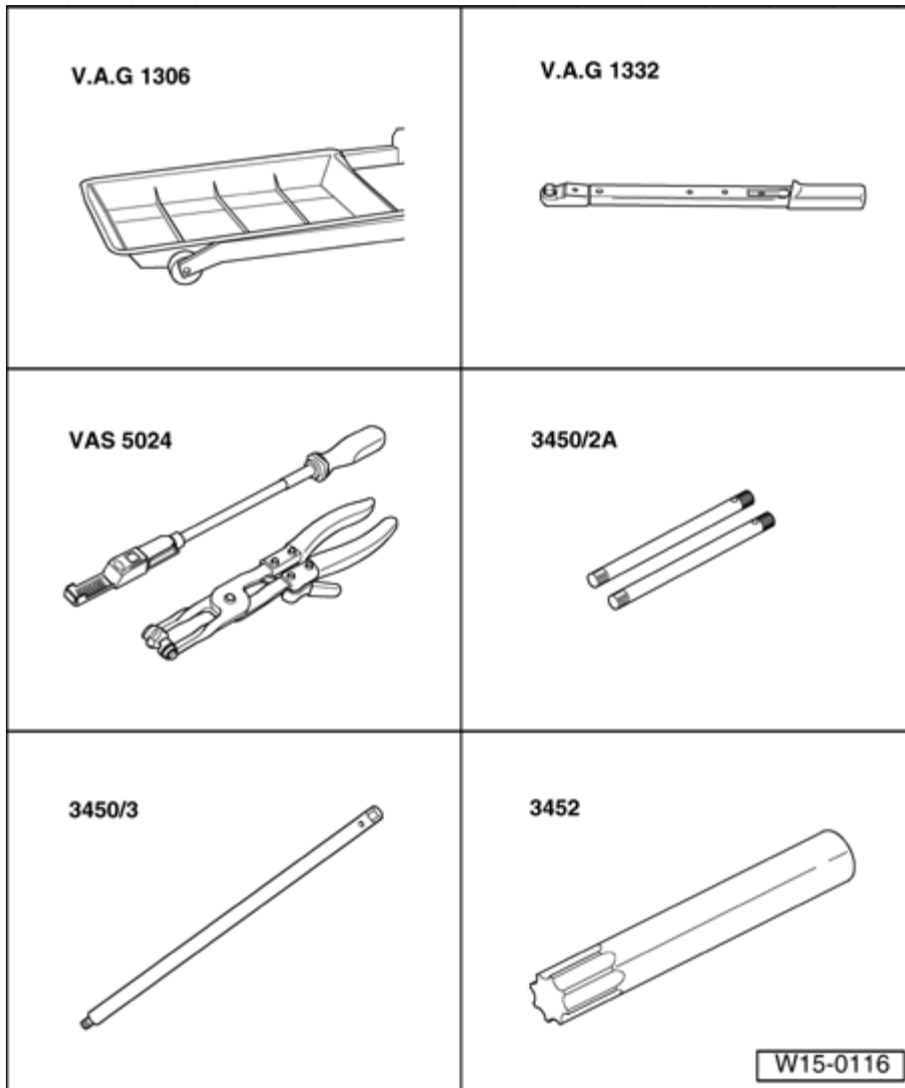


Fig. 113: Identifying Special Tools - Cylinder Head, Removing And Installing (engine Code BBW)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools and equipment

- V.A.G 1306 Drip tray
- V.A.G 1332 Torque wrench (40 to 200 Nm)
- VAS 5024 Spring-type clip pliers
- 3450/2A Guide pins
- 3450/3 Puller
- 3452 Key (for polydrive cylinder head bolts)

Removing

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

CAUTION: When performing repair work, especially due to the confined conditions in the engine compartment, pay attention to the following:

- Route all types of lines (e.g. for fuel, hydraulics, EVAP system, coolant, refrigerant, brake fluid and vacuum) as well as electrical wiring so that the original positions are restored.
- Ensure sufficient clearance to all moving or hot components.

NOTE: During this procedure the battery Ground strap must be disconnected. Therefore, please check whether a coded radio is installed. Obtain the radio code first if necessary.

- With ignition switched off disconnect battery Ground (GND) strap.
- Remove engine cover.
- Drain coolant. Refer to Cooling system, draining and filling .
- Remove right side sound insulation.

Refer to NOISE INSULATION (GASOLINE ENGINES), ASSEMBLY OVERVIEW

WARNING: The fuel system is under pressure! Before opening the system place a cloth around the connection. Then release the pressure by carefully loosening the connection.

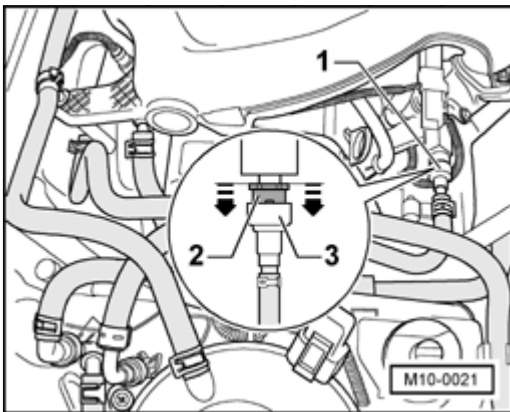


Fig. 114: Disconnecting Fuel Supply Line Off Union By Pressing Locking Ring Into Union
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect fuel supply line (at connection -1-. To do this slide securing ring -2- in union -3-.
- Seal lines to avoid contamination of fuel system.
- Remove intake manifold upper part. Refer to Intake manifold upper part, removing and installing .

NOTE: Seal the intake ports in the intake manifold lower part with a clean cloth.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Remove connections with coolant hoses.
- Disconnect coolant hose from cylinder head.
- Remove intake and pressure lines for secondary air pump motor.
- Disconnect following connections:
 - Camshaft variable timing adjustment valve.
 - For Secondary Air Injection (AIR) Pump Motor -V101-.
 - For injectors -N30-, -N31-, -N32-, -N33-, (unclip cable guide).
 - Camshaft position (CMP) sensor -G40-
 - Knock Sensor (KS) 1 -G61-
 - for Spark plugs (using T10112)
- Remove bracket with secondary air pump motor.
- Disconnect all necessary electrical wiring of cylinder head and move aside.
- Disconnect front exhaust pipe with catalytic converter. Refer to **Engine code BBW**
- Disconnect connector for Heated Oxygen Sensor (H2OS). Refer to **Fig. 363** .
- Take off poly V-belt. Refer to **Poly V-belt, removing and installing** .
- Remove poly V-belt tensioning element.
- Remove bracket (Refer to **Part I** , item 2) from poly V-belt tensioning element.
- Remove toothed belt guard upper part.
- Remove cylinder head cover.

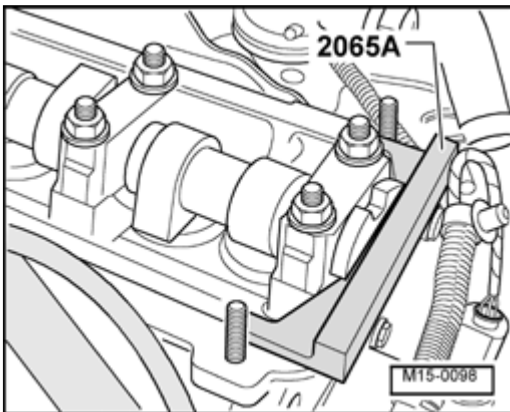


Fig. 115: Identifying Adjustment Bar 2065 A
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Turn crankshaft until camshaft is positioned at TDC No. 1 cylinder.

It should be possible to move setting bar 2065 A in camshaft groove.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Remove tool.
- Loosen tensioning roller and remove toothed belt from camshaft pulley.
- Turn crankshaft back slightly.
- Remove upper bolt from rear toothed belt guard.

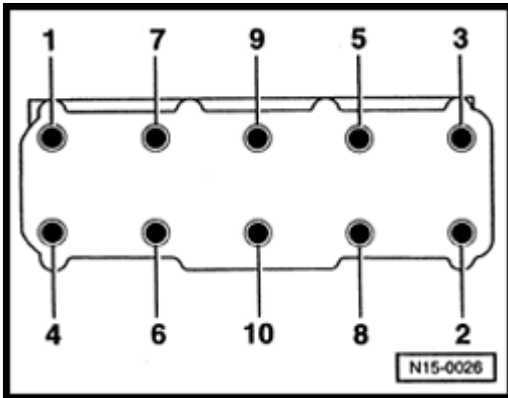


Fig. 116: Identifying Cylinder Head Bolts Loosening Sequence
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Loosen socket head bolts in sequence given and then remove.

NOTE: Use key 3452 for polydrive cylinder head bolts.

- Carefully lift cylinder head off.

Installing

NOTE:

- There must be no oil or coolant in the cylinder head bolt pockets in the cylinder head.
- Do not remove new cylinder head gasket from its packing until immediately before installing.
- Handle new gasket with extreme care. Damage will cause leakage.

- Place clean cloths in cylinders so that no dirt or emery cloth particles can get in between cylinder wall and piston.
- Also prevent dirt and emery cloth particles from getting into coolant.
- Carefully clean sealing surfaces of cylinder head and cylinder block. Ensure thereby that surfaces are not scored or scratched (if abrasive paper is used, grade must not be less than 100)
- Carefully remove metal particles, emery residue and cloths.
- If crankshaft has been turned: Set No. 1 cylinder piston to top dead center and then return crankshaft back slightly.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

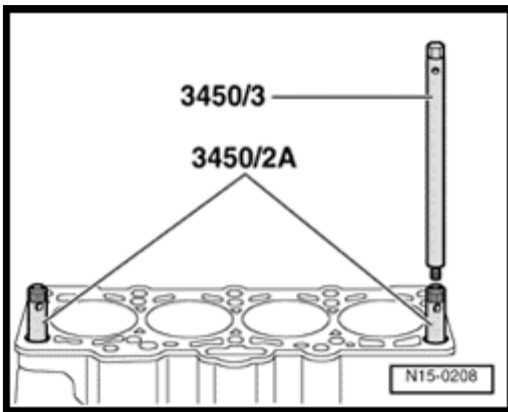


Fig. 117: Identifying Guide Pins From 3450/2 A & 3450/3 Inserted Into Front Outer Threaded Holes For Cylinder Head Bolts

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- To centralize, screw guide pins from 3450/2 A into front outer threaded holes for cylinder head bolts.
- Install new cylinder head gasket.
- Install cylinder head, screw in 8 remaining cylinder head bolts and tighten by hand.
- Remove guide pins through bolt holes with removal from 3450/3. To do this turn removal tool counter-clockwise, until pins are free.
- Install remaining cylinder head bolts and tighten hand-tight.

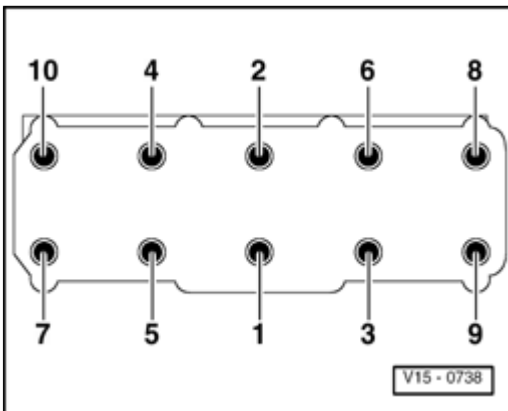


Fig. 118: Identifying Cylinder Head Bolt Tightening Sequence

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Tighten cylinder head in tightening sequence as follow:
- Pretighten all bolts to 40 Nm.
- Then tighten all bolts 1/4 turn (90 °) using a wrench.
- Then tighten all bolts again another 1/4 turn (90 °).

Further assembly is reverse of the disassembling procedure.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

NOTE: When turning the camshaft the crankshaft must not be at TDC. Danger of damage to valves/piston crown.

- Install toothed belt and set timing. Refer to the Engine codes AEG, AVH, AZG, BEV
- Install poly V-belt tensioning element.

Tightening torque: 25 Nm

- Install poly V-belt. Refer to Poly V-belt, removing and installing .
- Fill with new coolant. Refer to the Cooling system, draining and filling .
- Connect battery Ground (GND) strap.
- Adapt engine control module to throttle valve control module. Refer to Exhaust system components, removing and installing , Adapting functions and components.
- Test drive vehicle and read Diagnostic Trouble Code (DTC) memory.
- If DTC memory was erased or engine control module has been disconnected from permanent positive supply, regenerate readiness code. Refer to Adapting components and functions , Adapting functions and components.

Compression pressures, checking

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

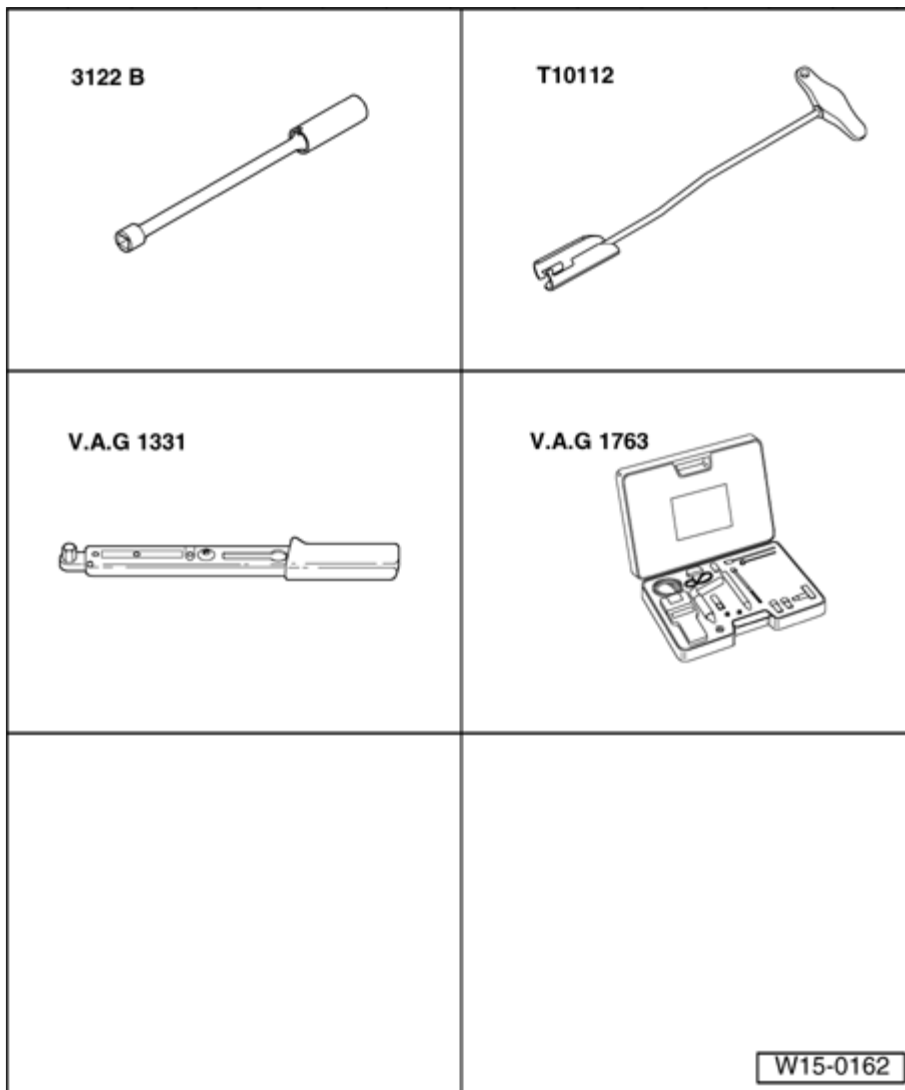


Fig. 119: Identifying Special Tools - Compression Pressures, Checking
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools equipment

- 3122 B Spark plug wrench
- T10112 Removal tool
- V.A.G 1331 Torque wrench (5 to 50 Nm)
- V.A.G 1763 Compression tester

Requirements

- Engine oil temperature must be at least 30 ° C.
- Voltage supply OK.
- All electrical consumers, e.g. lights and rear window defroster, must be switched off.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- If the vehicle is equipped with air conditioning, this must be switched off.
- On models with an automatic transmission, selector lever in position "P" or "N"

Work sequence

- Remove engine cover.

Engine code AEG

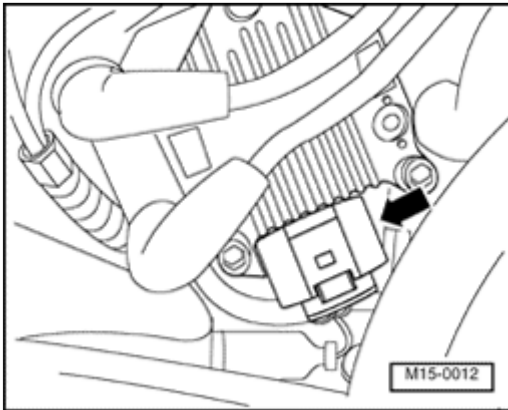


Fig. 120: Identifying Ignition Coil With Final Output Stage Black 6-Pin Connector
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect black 6-pin connector from ignition coil with final output stage (arrow).

Engine codes AVH, AZG, BBW, BEV

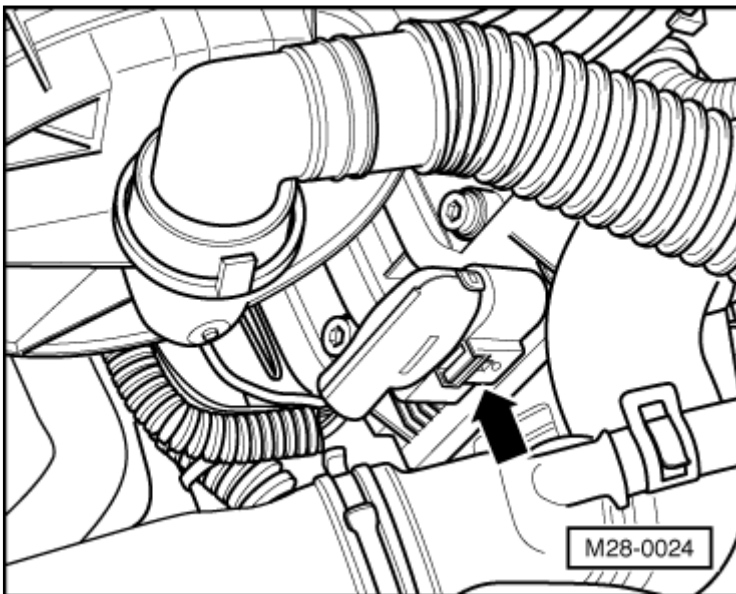


Fig. 121: Identifying Ignition Coil With Final Output Stage Black 6-Pin Connector

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect black 6-pin connector from ignition coil with final output stage (arrow).

Continued for all engines

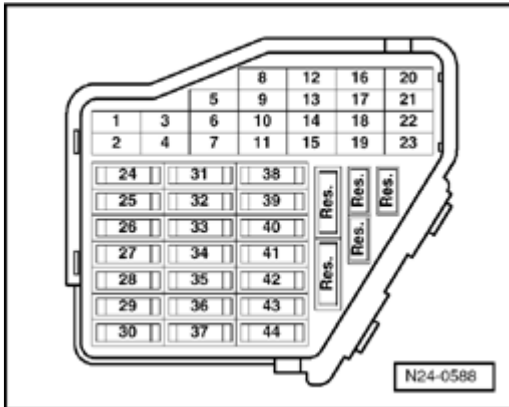


Fig. 122: Identifying Main Fuse Panel

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Pull fuse No 32 out of fuse holder.

NOTE: Removing the fuse 32 interrupts the voltage supply to the injectors.

- Disconnect connectors from outer injectors.
- Pull spark plug connectors off with tool T10112
- Remove spark plugs with spark plug socket 3122B.
- Check compression pressures using compression tester V.A.G 1763 and adapter V.A.G 1763/6.

NOTE: • Using the compression tester. Refer to Operating instructions.

Vehicles with throttle (accelerator) cable

- Have a second technician fully depress accelerator pedal.

Continuation for all engines

- Have a second technician operate starter motor.
- Operate starter until tester shows no further pressure increase.

Compression pressure values

New: 10 to 13 bar

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Wear limit: 7.5 bar

Permissible difference between all cylinders: 3 bar

- Adapt engine control module to throttle valve control module. Refer to **Engine control module Diagnostic Trouble Code (DTC) memory, interrogating and erasing** , Adapting functions and components.
- Generate readiness code again if DTC memory has been erased or engine control module was disconnected from permanent positive. Refer to **Adapting components and functions** ; Adapting components and functions.

VALVE GEAR, SERVICING

Valve gear, servicing

NOTE:

- Cylinder heads which have cracks between the valve seats or between valve seat inserts and the spark plug thread can be used further without reducing service life, provided the cracks do not exceed a maximum of 0.3 mm in width, or when no more than the first four spark plug threads are cracked.
- When new lifters have been installed the engine must not be started for about 30 minutes. (Otherwise valves will contact pistons) First, rotate crankshaft two complete revolutions.

Assembly overview

Engine code BBW. Refer to **Engine code BBW**

Engine codes AEG, AVH, AZG, BEV

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

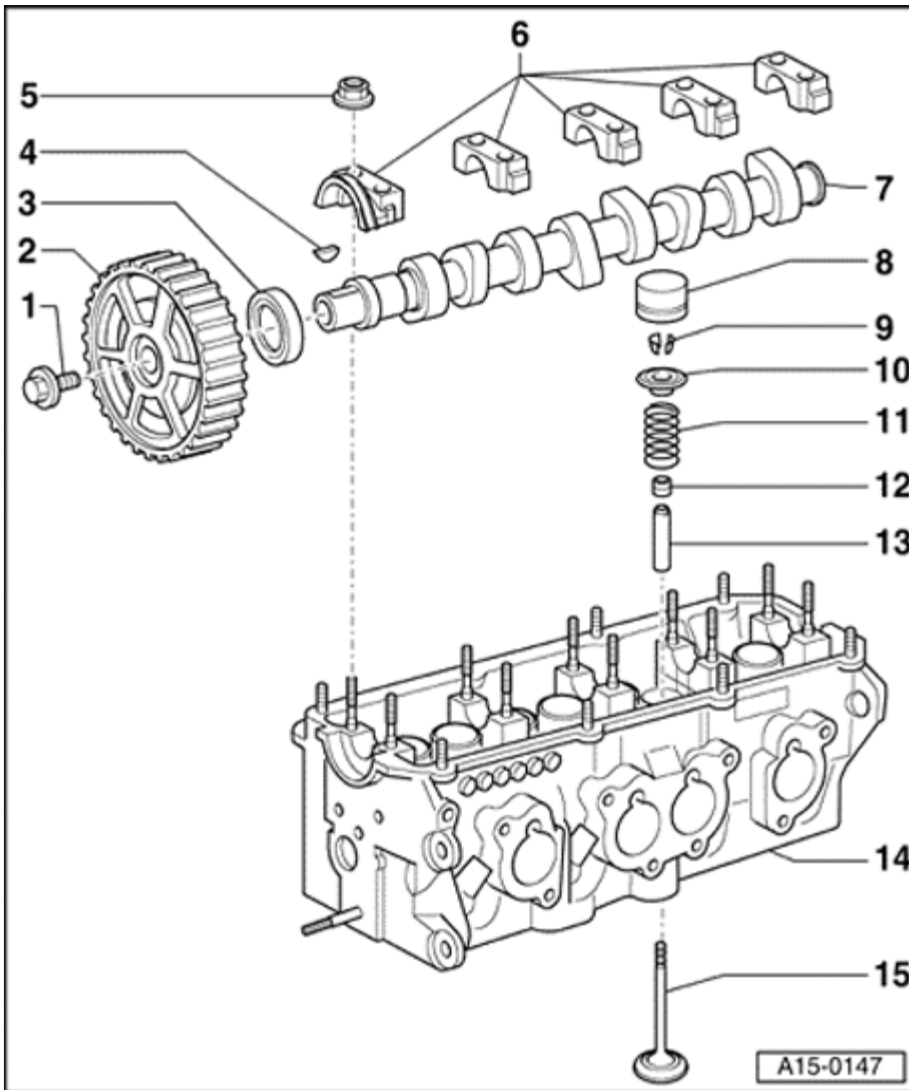


Fig. 123: Identifying Valve Gear Components (Engine Codes AEG, AVH, AZG, BEV)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - 100 Nm

- Use counterhold 3415 to loosen and tighten

2 - Camshaft sprocket

3 - Seal

- Replacing. Refer to **Camshaft oil seal, replacing**

4 - Woodruff key

- Check for secure seating

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

5 - 20 Nm

6 - Bearing cap

- Installation position. Refer to **Valve seats, reworking** and **Fig. 127**
- Installation sequence. Refer to **Engine code BBW** , removing and installing camshaft
- Coat contact surfaces of bearing cap 1 lightly with sealing compound AMV 174 004 01.

7 - Camshaft

- Checking axial clearance. See **Fig. 126** .
- Removing and installing. Refer to **Engine code BBW**
- Check radial clearance with Plastigage, Wear limit: 0.1 mm
- Run-out: max. 0.05 mm

8 - Hydraulic lifter

- Do not interchange
- With hydraulic valve clearance compensation
- Checking. Refer to **Hydraulic lifters, checking**
- Store with cam contact surface downward
- Before installing check camshaft axial clearance. Refer to **Valve seats, reworking** and **Fig. 126**
- Oil contact surface

9 - Keepers

10 - Valve spring upper plate

11 - Valve spring

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

12 - Valve stem seal

- Replace. Refer to **Valve stem seals, replacing**

13 - Valve guide

- Checking. Refer to **Valve guides, checking**
- Replace. Refer to **Valve guides, replacing**
- Repair version with shoulder

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

14 - Cylinder head

- Reworking sealing surface. See **Fig. 126** .
- Reworking valve seats. Refer to **Valve seats, reworking**

15 - Valves

- Do not rework, only lapping is permitted
- Valve dimensions. Refer to **Valve seats, reworking**

Engine code BBW

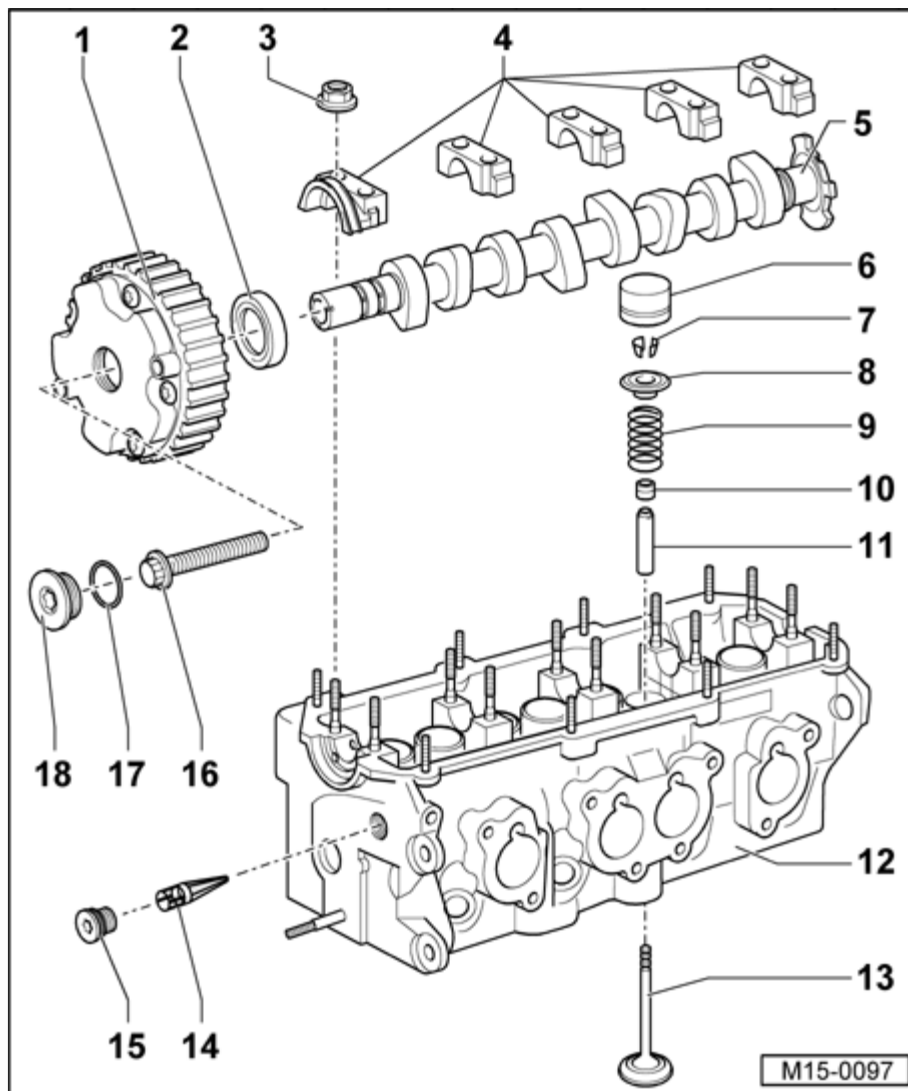


Fig. 124: Identifying Valve Gear Components (Engine Codes BBW)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Camshaft sprocket

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- With camshaft timing adjustment
- Under no circumstances should bolts be loosened.
- Replace complete

2 - Seal

- Replacing. Refer to **Camshaft oil seal, replacing**
- To remove and install, remove bearing cap
- Do not oil sealing lips of sealing ring.
- Removing and installing toothed belt from camshaft sprocket. Refer to **Engine code BBW**

3 - 20 Nm

4 - Bearing cap

- Installation position. See **Fig. 127** .
- Installation sequence. Refer to **Engine code BBW** , removing and installing camshaft
- Coat contact surfaces of bearing cap 1 lightly with sealing compound AMV 174 004 01.

5 - Camshaft

- With sender wheel for camshaft position sensor
- Checking axial clearance. See **Fig. 125** .
- Removing and installing. Refer to **Engine code BBW**
- Check radial clearance with Plastigage, Wear limit: 0.1 mm
- Run-out: max. 0.05 mm

6 - Hydraulic lifter

- Do not interchange
- With hydraulic valve clearance compensation
- Checking. Refer to **Hydraulic lifters, checking**
- Store with cam contact surface downward
- Before installing check camshaft axial clearance. See **Fig. 125** .
- Oil contact surface

7 - Keepers

8 - Valve spring upper plate

9 - Valve spring

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

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

10 - Valve stem seal

- Replace. Refer to **Valve stem seals, replacing**

11 - Valve guide

- Checking. Refer to **Valve guides, checking**
- Replace. Refer to **Valve guides, replacing**
- Repair version with shoulder

12 - Cylinder head

- Reworking sealing surface. Refer to **Fig. 125** Fig. 1
- Reworking valve seats. Refer to **Valve seats, reworking**

13 - Valves

- Do not rework, only lapping is permitted
- Valve dimensions. Refer to **Valve seats, reworking** , Fig. 4

14 - Filter element

- Pull off with hooks
- Clean if soiled

15 - Sealing plug, 12 Nm

- Always replace

16 - 130 Nm

- To loosen and tighten use counter-bracket T10172 with pin T10172/3.

17 - O-ring

- Always replace

18 - Sealing plug, 25 Nm

Reworking cylinder head sealing surface

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

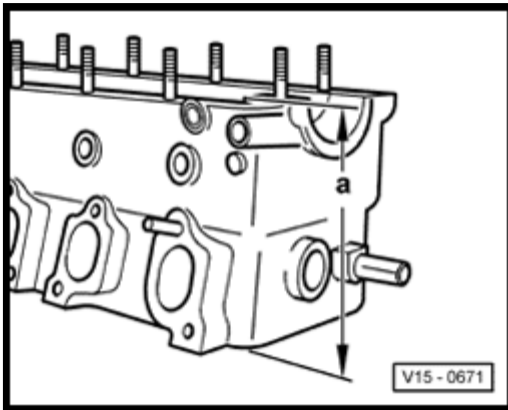


Fig. 125: Reworking cylinder head sealing surface
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Cylinder head reworking dimension:

a = At least 132.6 mm

NOTE: When the sealing surface has been reworked, the valves must be set deeper by the same amount.

Checking camshaft axial clearance

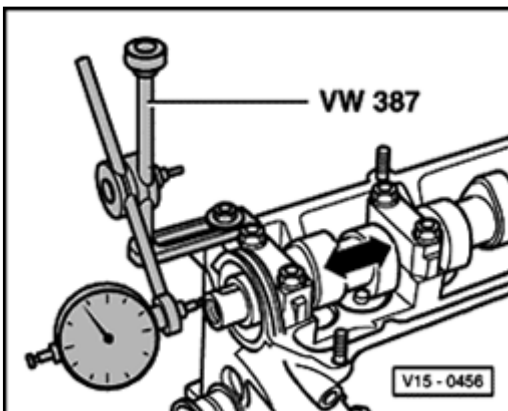


Fig. 126: Checking camshaft axial clearance
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools, testers, measuring instruments and auxiliary items required

- Universal dial gauge bracket VW 387
- Dial gauge

Check with hydraulic lifters removed and with first and last bearing caps installed.

Wear limit: max. 0.15 mm

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Installed position of camshaft bearing caps

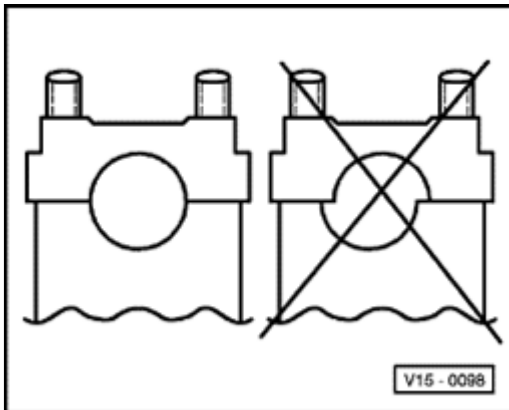


Fig. 127: Installed position of camshaft bearing caps
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Note offset. Before installing camshaft determine position.

Valve dimensions

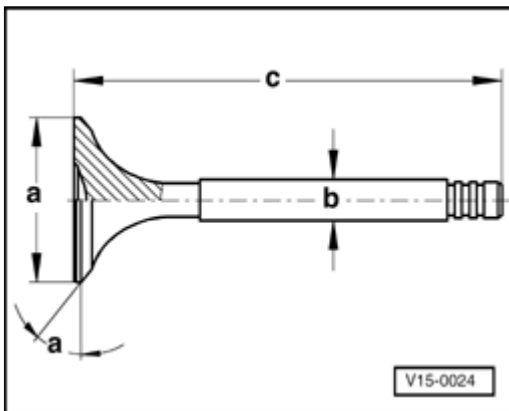


Fig. 128: Valve dimensions
Courtesy of VOLKSWAGEN UNITED STATES, INC.

NOTE: Valves must not be reworked. Only lapping is permitted.

Dimension		Intake valve	Exhaust valve
dia. a	mm	39.5 ± 0.15	32.9 ± 0.15
dia. b	mm	6.92 ± 0.002	6.92 ± 0.002
Engine: AEG			
dia. b	mm	6.98 ± 0.007	6.96 ± 0.007
c	mm	91.85	91.15
a	Angle °	45	45

Valve seats, reworking

Afinacion de Motor y Diagnostico, OBDII,VW ,Audi

044 664 252 34 69

Wednesday, July 06, 2016 9:38:42 AM

Page 120

© 2011 Mitchell Repair Information Company, LLC.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Special tools and equipment

- Depth gauge
- Valve seat re-facing tool

NOTE:

- When repairing engines with leaking valves, it is not sufficient to rework or replace valve seats and valves. It is also necessary to check the valve guides for wear. This particularly important on high mileage engines.
- The valve seats should only be reworked just enough to produce a perfect seating pattern. The maximum permissible reworking dimension must be calculated before reworking begins. If the reworking dimension is exceeded, the function of the hydraulic lifters can no longer be guaranteed and the cylinder head should be replaced.

The maximum permissible reworking dimension is calculated as follows:

- Insert valve and press firmly against seat.

NOTE:

If the valve is to be replaced as part of a repair, use a new valve for the measuring.

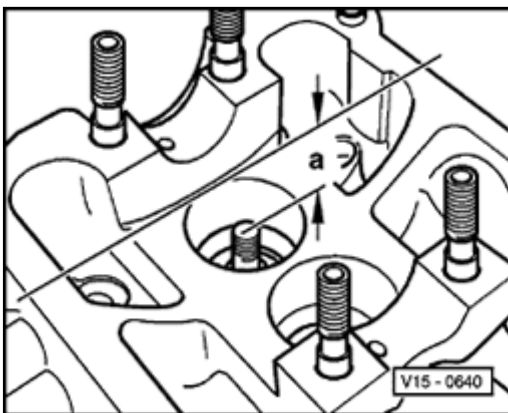


Fig. 129: Measuring Distance Between End Of Valve Stem And Upper Edge Of Cylinder Head
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Measure distance -a- between end of valve stem and upper edge of cylinder head.
- Calculate max. permissible reworking dimension from measured distance -a- and minimum dimension.

Minimum dimensions:

- Intake valve 33.8 mm
- Exhaust valve 34.1 mm

Measured distance -a- minus minimum dimension = max. permissible reworking dimension.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Example:

-	Measured distance -a-	35.1	mm
	Minimum dimension	34.1	mm
=	max. perm. rework dimension*	1.0	mm

*) Max. permissible reworking dimension is shown as dimension "b" in illustrations for reworking of valve seats.

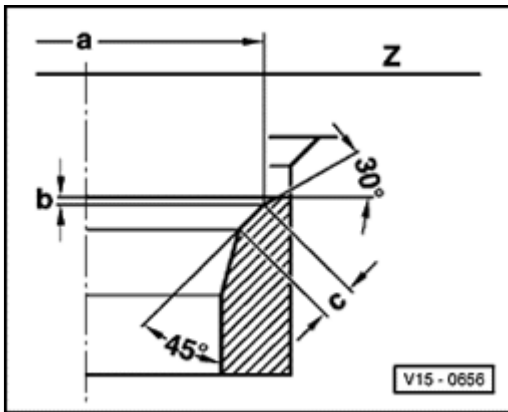


Fig. 130: Identifying Intake Valve Seat Measurements
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Reworking intake valve seat

Dimension		Intake valve seat
diameter a	mm	39.2
b	mm	max. permissible reworking dimension
c	mm	1.8 to 2.2
Z		Cylinder head lower edge
45 °		Valve seat angle
30 °		Upper correction angle

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

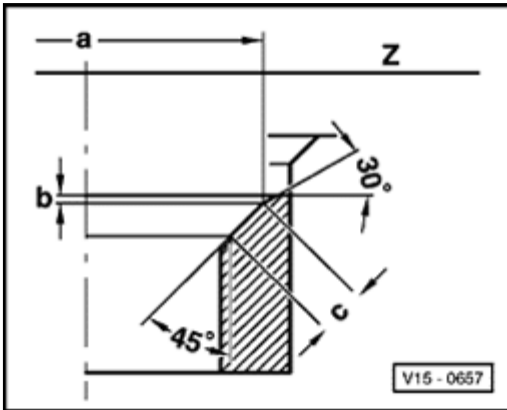


Fig. 131: Identifying Exhaust Valve Seat Measurements
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Reworking exhaust valve seat

Dimension		Exhaust valve seat
diameter a	mm	32.4
diameter b	mm	max. permissible reworking dimension
c	mm	2.2 to 2.6
Z		Cylinder head lower edge
45 °		Valve seat angle
30 °		Upper correction angle

Camshaft oil seal, replacing

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

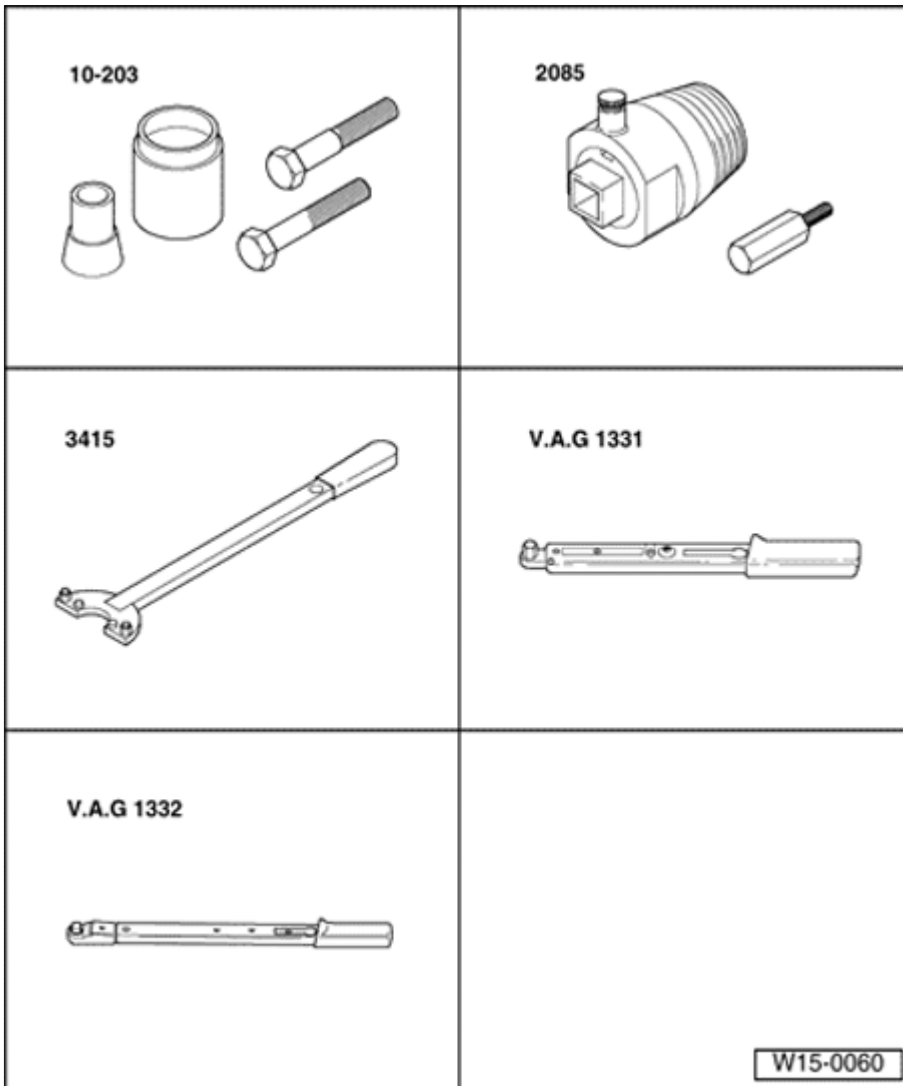


Fig. 132: Identifying Special Tools - Camshaft Oil Seal, Replacing (Coil Spring Seals)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Coil spring seals:

Special tools and equipment

- 10-203 Oil seal driver
- 2085 Seal puller
- 3415 Counter support
- V.A.G 1331 Torque wrench (5 to 50 Nm)
- V.A.G 1332 Torque wrench (40 to 200 Nm)

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

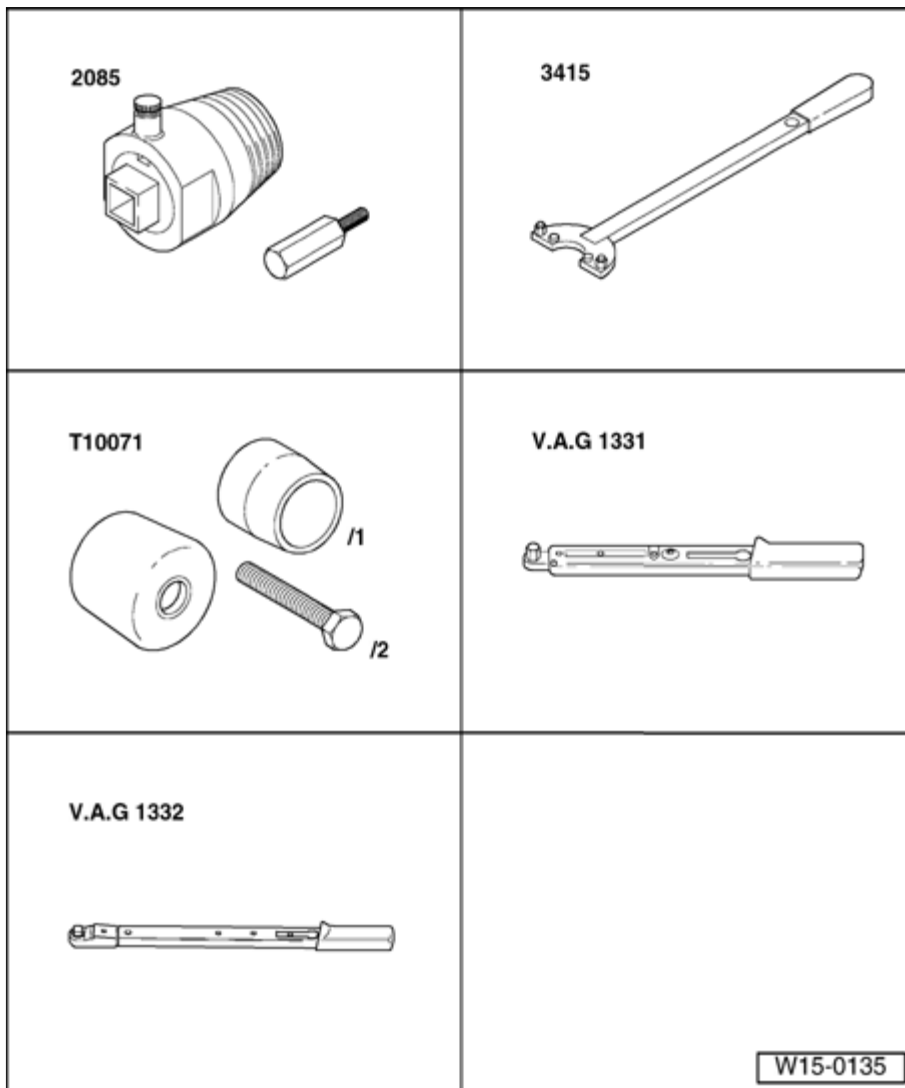


Fig. 133: Identifying Special Tools - Camshaft Oil Seal, Replacing (PTFE Seals)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

PTFE seals:

Special tools and equipment

- 2085 Seal puller
- 3415 Counter support
- T10071 Assembly tool
- V.A.G 1331 Torque wrench (5 to 50 Nm)
- V.A.G 1332 Torque wrench (40 to 200 Nm)

Removing

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Remove toothed belt guard upper part.

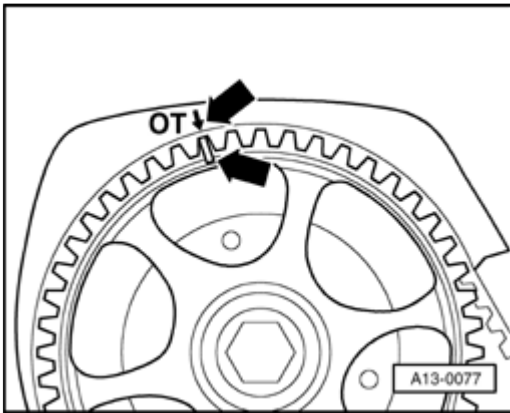


Fig. 134: Aligning Mark On Camshaft With Mark On Toothed Belt Cover
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Set camshaft pulley to TDC No. 1 cylinder by turning crankshaft. Mark on camshaft pulley must align with (arrow) on toothed belt guard.
- Loosen tensioning roller and remove toothed belt from camshaft pulley.
- Turn crankshaft back slightly.

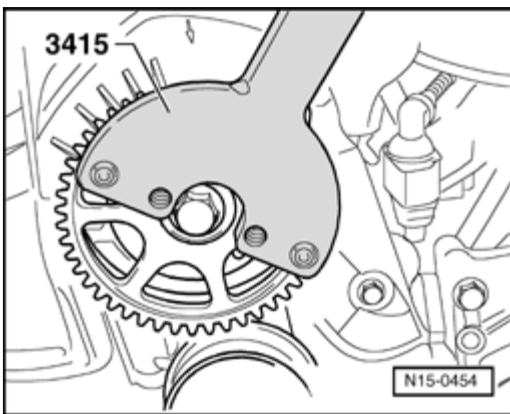


Fig. 135: Identifying Counterholding 3415 & Camshaft Pulley Bolt
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Take camshaft pulley off. When loosening bolt hold camshaft pulley with counterhold 3415.
- Remove woodruff key from camshaft.
- Screw camshaft pulley bolt into camshaft onto limit stop.
- Unscrew inner part of oil seal extractor 2085 two turns (approx. 3 mm) out of outer part and lock with knurled screw.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

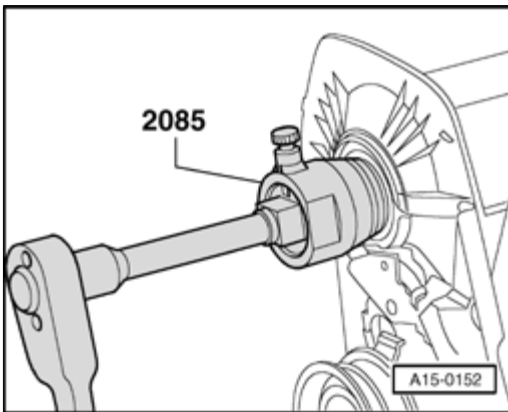


Fig. 136: Identifying Seal Puller 2085

Courtesy of VOLKSWAGEN UNITED STATES, INC.

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

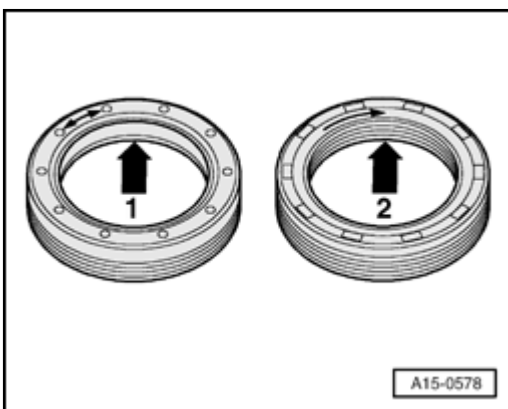
Installing

Requirements

- Pistons must not be positioned at TDC.

NOTE:

- PTFE seals (Teflon) -2- have been introduced gradually to replace the coil spring type seals -1-. PTFE seals have a wider sealing lip.
- PTFE oil seals are installed free of oil and grease.
- An old type radial shaft seal (with coil spring) may be replaced by a PTFE seal (but a PTFE seal may not be replaced by a coil spring type).
- If PTFE seals are installed then only these seals may be used as replacement parts.



2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Fig. 137: Identifying PTFE Seals - Teflon & Coil Spring Type
Courtesy of VOLKSWAGEN UNITED STATES, INC.

PTFE seals

NOTE: Do not add oil or grease to the oil seal sealing lip.

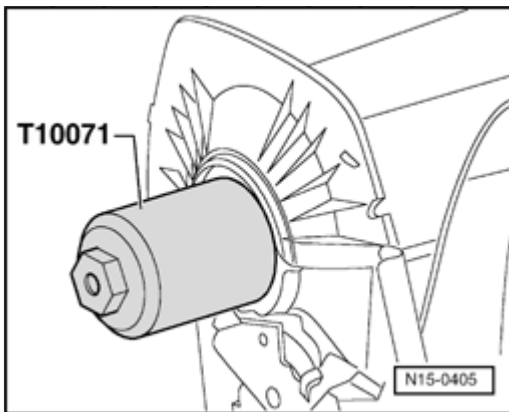


Fig. 138: Identifying Assembly Tool T10071
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Position seal with assembly tool T10071 and press in onto limit stop with press sleeve T10071/1 and bolt T10071/2.

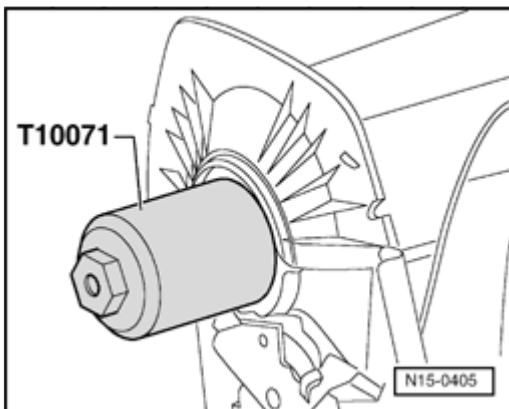
Coil spring seals

NOTE: Lightly oil or grease the oil seal sealing lip.

- Position seal with fitting sleeve 10-203 and press into limit stop with press sleeve and bolt 10-203.

Continued for all oil seals

- Install woodruff key in camshaft.



2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Fig. 139: Identifying Assembly Tool T10071

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Install camshaft pulley. When tightening camshaft pulley bolt counterhold with 3415.
- Tightening torque: 100 Nm

NOTE: When turning the camshaft the crankshaft must not be at TDC. Danger of damage to valves/piston crown.

Further installation is the reverse of removal.

Installing toothed belt and adjusting timing. Refer to **Fig. 66**

Camshaft, removing and installing

- Engine code BBW. Refer to **Engine code BBW**

Engine codes AEG, AVH AZG, BEV

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

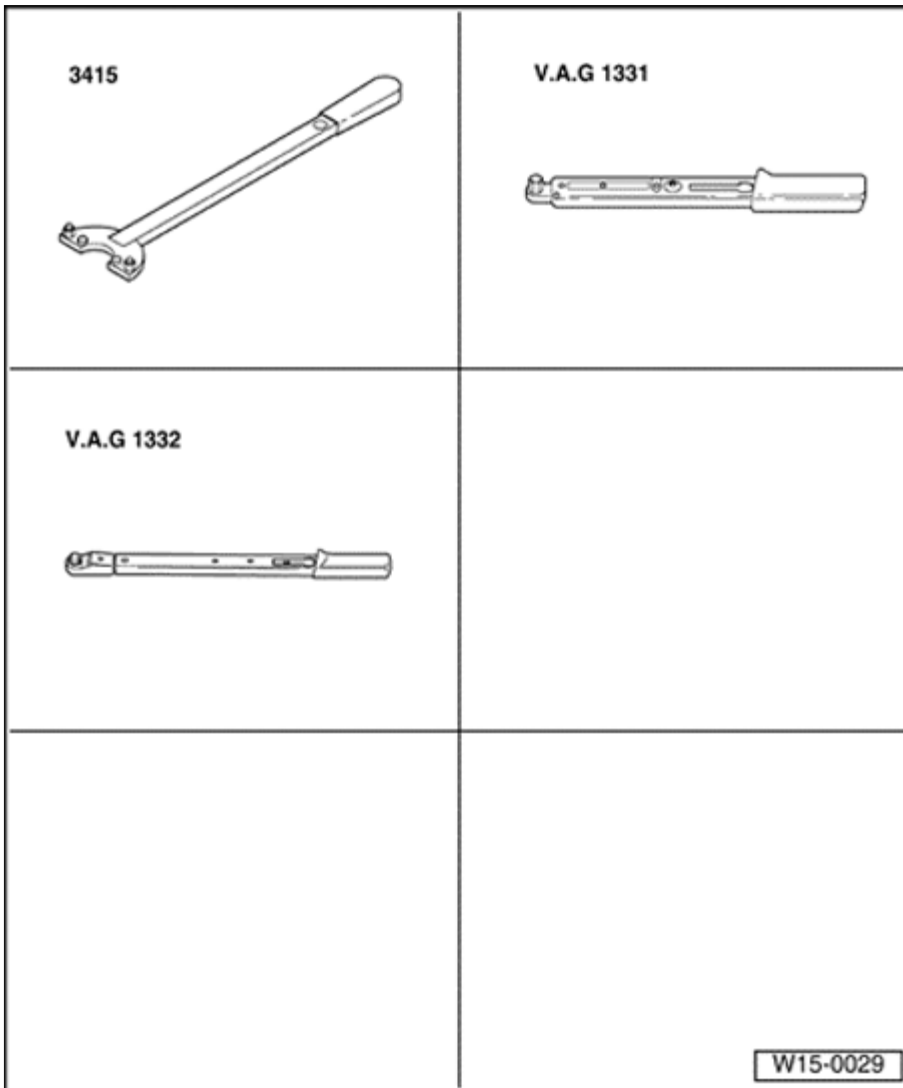


Fig. 140: Identifying Special Tools - Camshaft, Removing And Installing (Engine Codes AEG, AVH AZG, BEV)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools and equipment

- 3415 Counter support
- V.A.G 1331 Torque wrench (5 to 50 Nm)
- V.A.G 1332 Torque wrench (40 to 200 Nm)
- AM 174 004 01 Sealing compound

Removing

- Remove engine cover.
- Remove intake manifold upper part. Refer to **Intake manifold upper part, removing and installing** .

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

NOTE: Seal the intake ports in the intake manifold lower part with a clean cloth.

- Remove toothed belt guard upper part.

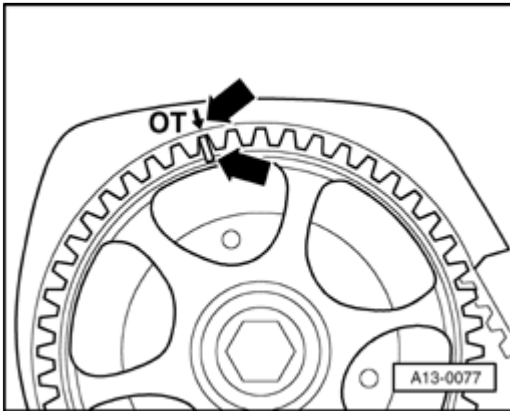


Fig. 141: Aligning Mark On Camshaft With Mark On Toothed Belt Cover
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Set camshaft pulley to TDC No. 1 cylinder by turning crankshaft. Mark on camshaft pulley must align with (arrow) on toothed belt guard.
- Loosen tensioning roller and remove toothed belt from camshaft pulley.
- Turn crankshaft back slightly.

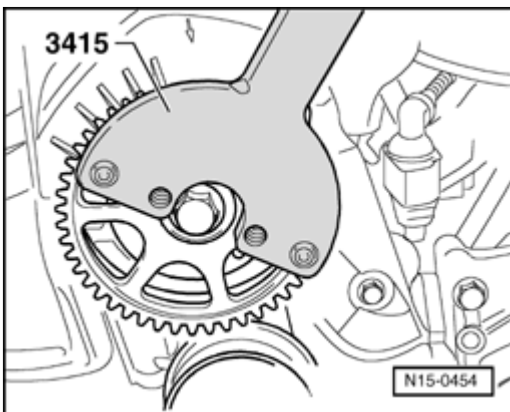


Fig. 142: Identifying Counterholding 3415 & Camshaft Pulley Bolt
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Take camshaft pulley off. When loosening bolt hold camshaft pulley with counterhold 3415.
- Remove woodruff key from camshaft.
- Remove cylinder head cover.
- First remove bearing caps 5, 1 and 3. Tighten bearing caps 2 and 4 alternate and diagonally.

Installing

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Requirements

- Pistons must not be positioned at TDC.

NOTE:

- When installing the camshaft, the cam lobes for cylinder 1 must be facing up.

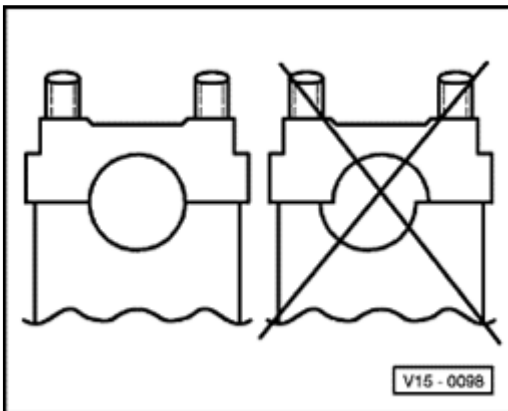
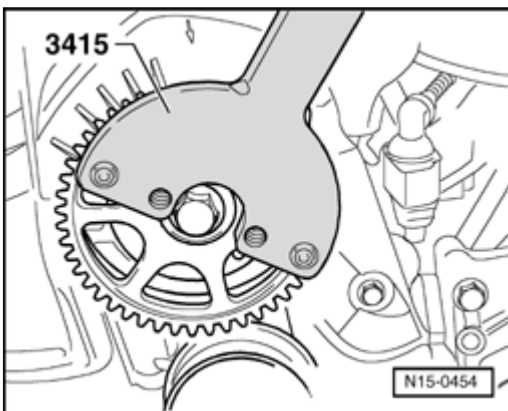


Fig. 143: Identifying Correct & Incorrect Bearing Cap Position
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- When installing the bearing cap note offset. Before installing camshaft determine installed position.

Work sequence

- Oil contact surfaces on camshaft.
- Install camshaft.
- Tighten bearing caps 2 and 4 alternately and diagonally to 20 Nm.
- Coat contact surfaces of bearing cap 1 lightly with sealing compound AMV 174 004 01.
- Install bearing caps 3, 1 and 5 and also tighten to 20 Nm.
- Install woodruff key in camshaft.



2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Fig. 144: Identifying Counterholding 3415 & Camshaft Pulley Bolt

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Take camshaft pulley off. When loosening bolt hold camshaft pulley with counterhold 3415.
- Tightening torque: 100 Nm

NOTE: When turning the camshaft the crankshaft must not be at TDC. Danger of damage to valves/piston crown.

Further installation is the reverse of removal.

Installing toothed belt and adjusting timing. Refer to Engine code BBW

NOTE: When new hydraulic lifters have been installed the engine must not be started for about 30 minutes. The hydraulic compensation elements must settle or the valves will strike the pistons.

Engine code BBW

Special tools and equipment

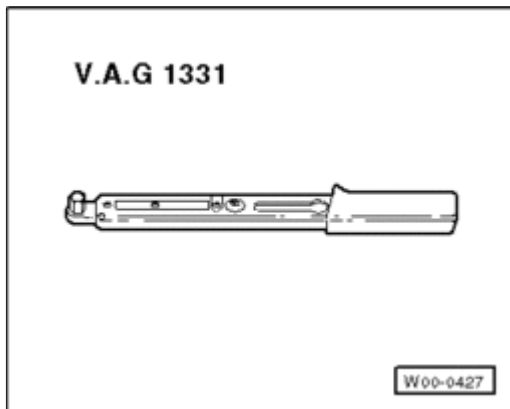


Fig. 145: Torque Wrench V.A.G. 1331 (5 To 50 Nm)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

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

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

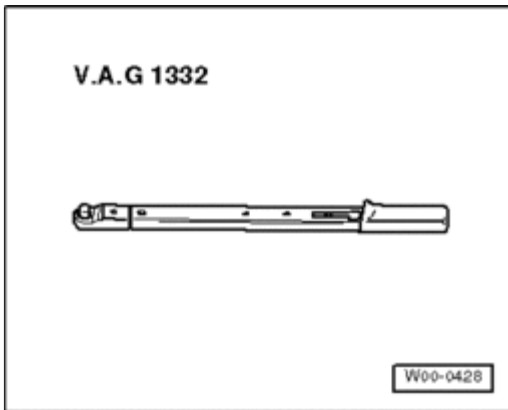


Fig. 146: Torque Wrench V.A.G. 1332 (40 To 200 Nm)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- V.A.G 1332 Torque wrench (40 to 200 Nm)
- AMV 174 004 01 Sealant

Removing

- Remove camshaft sprocket. Refer to **Engine code BBW** .

NOTE: **Remove toothed belt only from camshaft sprocket.**

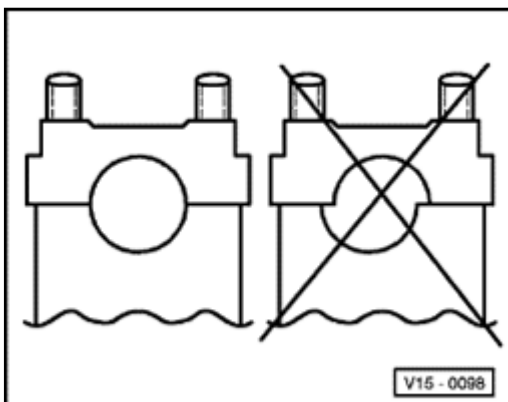
- First remove bearing caps 5, 1 and 3. Loosen bearing caps 2 and 4 alternately and diagonally.

Installing

Requirements

- Pistons must not be positioned at TDC.

NOTE: • **When installing the camshaft, the cam lobes for cylinder 1 must be facing up.**



2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Fig. 147: Identifying Correct & Incorrect Bearing Cap Position
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- When installing the bearing cap note offset. Before installing camshaft determine installed position.

Work sequence

- Oil running surfaces on camshaft.
- Install camshaft.
- Tighten bearing caps 2 and 4 alternately and diagonally to 20 Nm.
- Coat contact surfaces of bearing cap 1 lightly with sealing compound AMV 174 004 01.
- Install bearing caps 3, 1 and 5 and also tighten to 20 Nm.
- Install toothed belt. Refer to **Engine code BBW** .

NOTE: When new hydraulic lifters have been installed the engine must not be started for about 30 minutes. The hydraulic compensation elements must settle or the valves will strike the pistons.

Hydraulic lifters, checking

Special tools and equipment

- Feeler gauge
- Wood or plastic wedge

NOTE:

- Replace each faulty hydraulic lifter complete only (cannot be adjusted or serviced).
- Irregular valve noises when starting engine are normal.

Work sequence

- Start engine and run until coolant fan has switched on once.
- Increase engine speed to about 2500 rpm and hold for approx. 2 minutes.

If the hydraulic lifters are still noisy, locate faulty lifters as follows:

- Remove intake manifold upper part. Refer to **Intake manifold upper part, removing and installing** .

NOTE: Seal the intake ports in the intake manifold lower section with clean cloths.

- Remove cylinder head cover.
- Rotate crankshaft clockwise, until cam of lifter to be checked is pointing up.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Determine clearance between cam lobe and hydraulic lifter.

If the clearance is greater than 0.2 mm:

- Replace hydraulic lifter.

If clearance is less than 0.1 mm or no clearance exists, proceed with check as follows:

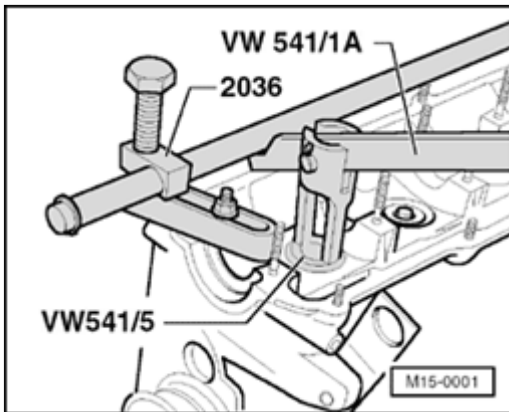


Fig. 148: Identifying Assembly Appliance 2036, Assembly Lever VW 541/1A & Thrust Piece VW 541/5
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Push hydraulic lifter down lightly with a wooden or plastic wedge. If when lifter is pushed down a 0.2 mm thick feeler gauge can be pushed between camshaft and lifter, lifter must be replaced.

NOTE: When new lifters have been installed the engine must not be started for about 30 minutes. The hydraulic compensation elements must settle or the valves will strike the pistons.

Valve guides, checking

Special tools and equipment

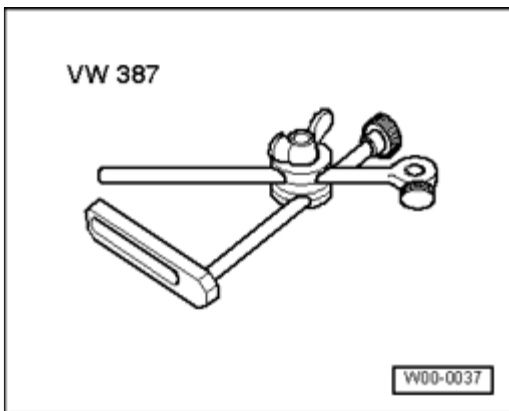


Fig. 149: Identifying VW 387 Universal Dial Gauge Bracket

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- VW 387 Universal dial gauge bracket
- Dial gauge

Work sequence

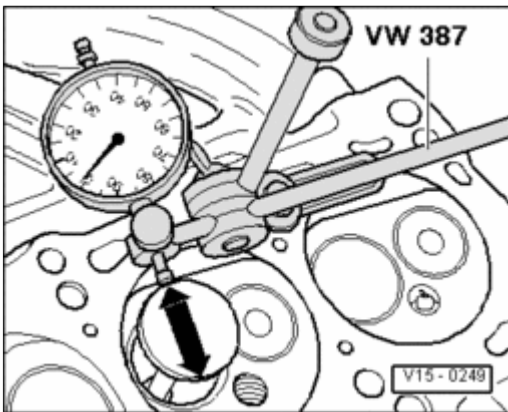


Fig. 150: Identifying VW 387

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Insert a new valve into guide. End of valve stem must be flush with guide.

NOTE: Due to the slight difference in stem diameters, only use an intake valve in the intake guide and an exhaust valve in the exhaust guide.

- Determine rock.

Wear limit:

Intake valve guide = 1.0 mm

Exhaust valve guide = 1.3 mm

Valve guides, replacing

Special tools and equipment

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

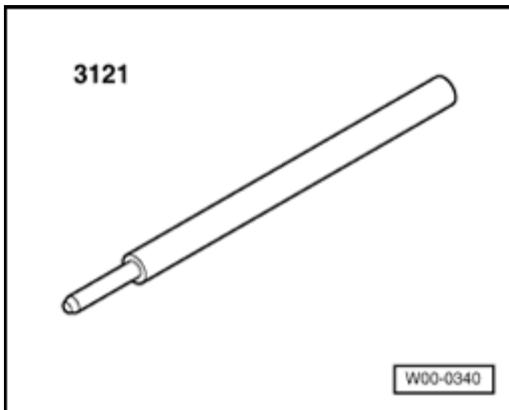


Fig. 151: Identifying 3121 Drift

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- 3121 Drift

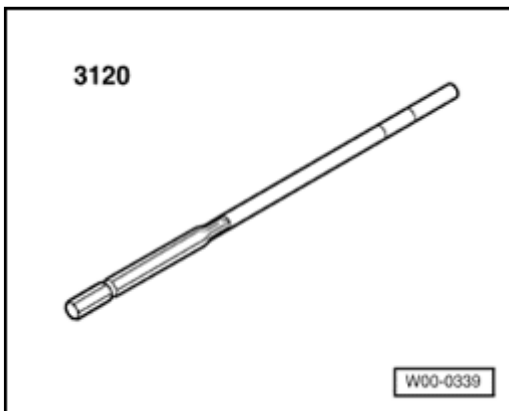


Fig. 152: Identifying 3120 Reamer And Cutting Fluid

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- 3120 Reamer and cutting fluid

Removing

- Clean and check cylinder head.

NOTE: Cylinder heads in which the valve seats can no longer be reworked (note minimum dimension. Refer to Valve seats, reworking), or cylinder heads which have already been machined to the minimum dimension (Refer to Fig. 125 , Fig.1), should not have the valve guides replaced.

- Press out worn valve guides with drift 3121 from camshaft side (repair versions with shoulder, from combustion chamber side).

Installing

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Press in new guides, moistened with oil, from camshaft side onto shoulder in cold cylinder head using drift 3121.

NOTE: When the shoulder on guide makes contact the pressure must not exceed 10 kN (approx. 1.0 t) or the shoulder may break off.

- Ream valve guide using hand reamer 3120. Always use cutting fluid when reaming.
- Rework valve seats. Refer to Valve seats, reworking.

Valve stem seals, replacing

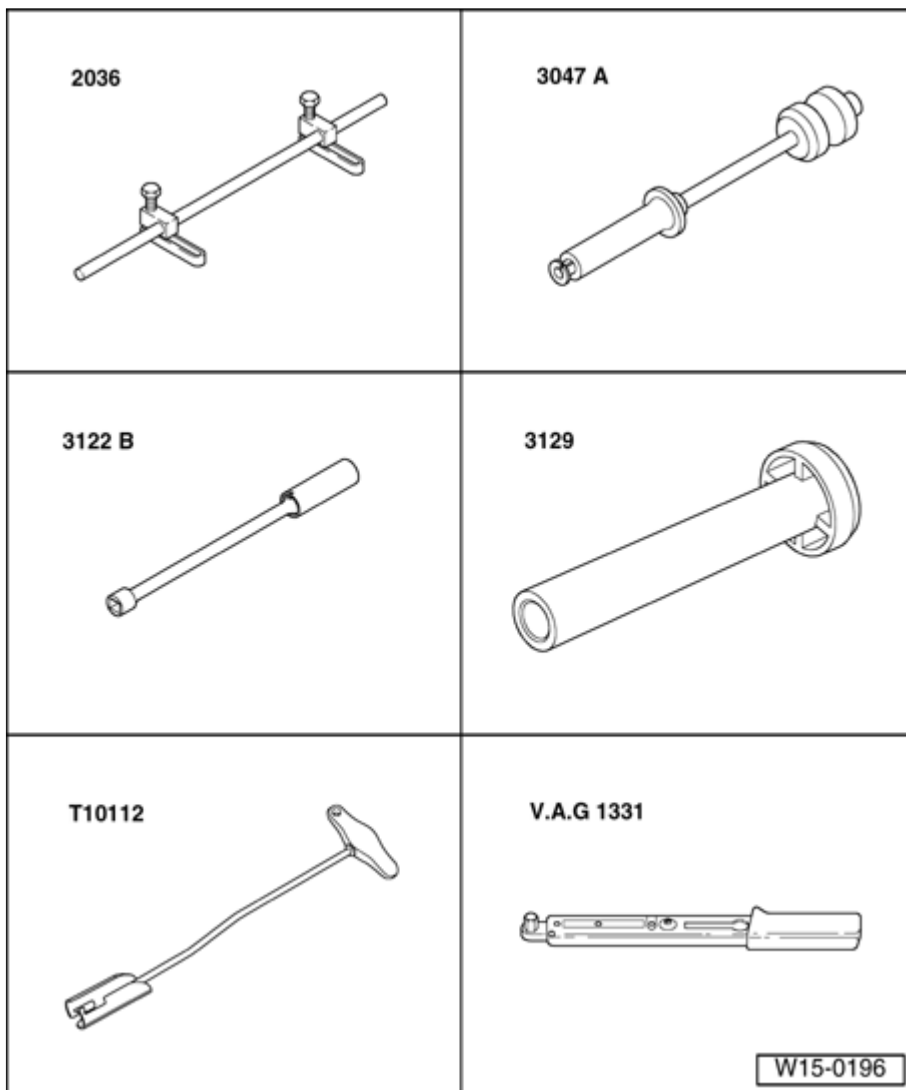


Fig. 153: Identifying Special Tools - Valve Stem Seals, Replacing (1 Of 2)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

(with cylinder head installed)

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Special tools and equipment

- 2036 Adjustable rod
- 3047A Slide hammer
- 3122B Spark plug removal tool
- 3129 Seal driver
- T10112 Installation tool
- V.A.G 1331 Torque wrench (5 to 50 Nm)

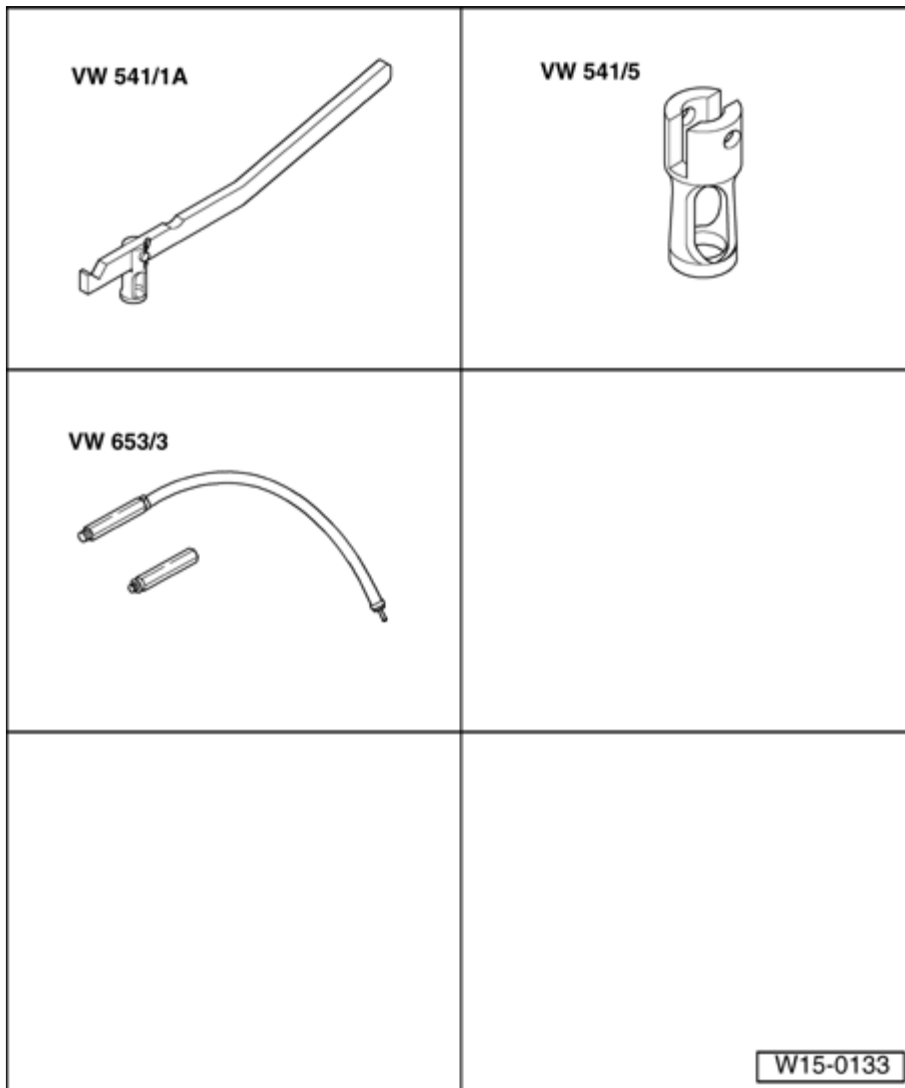


Fig. 154: Identifying Special Tools - Valve Stem Seals, Replacing (2 Of 2)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools and equipment

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- VW 541/1A Assembly lever
- VW 541/5 Thrust piece
- VW 653/3 Pressure hose

Removing

- Remove camshaft. Refer to **Engine code BBW**.
- Take out hydraulic lifters and place with running surface downward. Ensure lifters are not interchanged.
- Disconnect spark plug connectors with tool T10112
- Remove spark plugs with spark plug removal tool 3122B.
- Set piston of appropriate cylinder to "Top Dead Center".

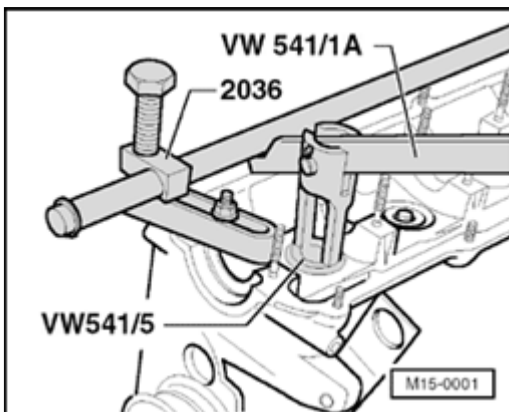


Fig. 155: Identifying Assembly Appliance 2036, Assembly Lever VW 541/1A & Thrust Piece VW 541/5
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Mount assembly appliance 2036 and adjust mountings to height of studs.
- Screw pressure hose VW 653/3 into spark plug thread.
- Connect pressure hose to compressed air supply of at least 6 bar.
- Remove valve springs with assembly lever VW 541/1A and thrust piece VW 541/5.

NOTE: **Tight valve keepers can be loosened by tapping lightly on the lever.**

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

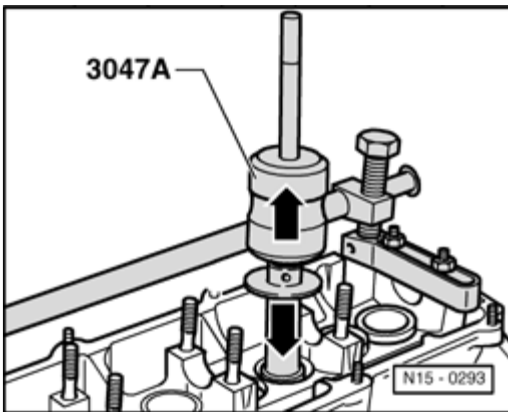


Fig. 156: Pulling Off Valve Stem Seals With 3047A
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Pull off valve stem seals with 3047A.

Installing

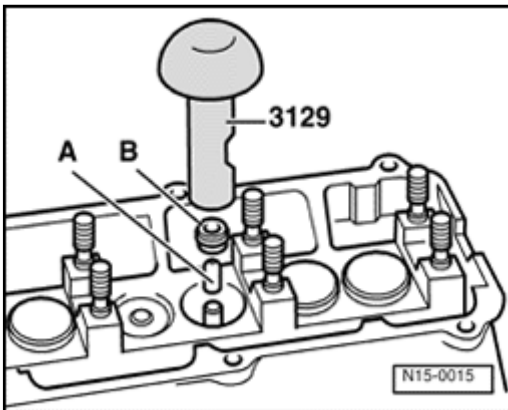


Fig. 157: Identifying Plastic Sleeve, Valve Stem Seal & Seal Driver Tool 3129
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Place plastic sleeve -A- supplied on appropriate valve stem. This will prevent new valve stem seal -B- being damaged.
- Place new valve stem seal into seal driver tool 3129.
- Oil valve stem seal sealing lip and press carefully onto valve guide.

17 ENGINE - LUBRICATION

LUBRICATION SYSTEM COMPONENTS, REMOVING AND INSTALLING

Lubrication system components, removing and installing

NOTE:

- If when repairing an engine, metal shavings or large amounts of small

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

metal particles are found in the engine oil, caused for example by partial seizure of crankshaft or connecting rod bearings, perform the following work sequences to prevent consequential damage once repairs are complete:

- Thoroughly clean oil passages
- Replace oil spray jets
- Replace oil cooler
- Replace oil filter
- The oil level must not be above the Max. mark or there is a danger of damage to the catalytic converter!
- Markings. See **Fig. 160** .

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

Oil system capacity

Refer to Additional Information, Fluid Capacity Chart

Engine oil specifications

Use engine oils according to VW standard 500 00, 501 01 or 502 00. Multigrade and single grade oils conforming with API-SF and SG or ACEA A2/A3 may also be used if oil to VW standard is not available.

NOTE:

- **In the factory the engine is filled with engine oil conforming to VW standard 503 00. This engine oil is designed for long service intervals.**
- **Engine oils according to VW standard 500 00, 501 01 or 502 00 can be used.**

Engine codes AEG, AVH, AZG, BEV, assembly overview

- Engine code BBW. Refer to **Engine code BBW, assembly overview**

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

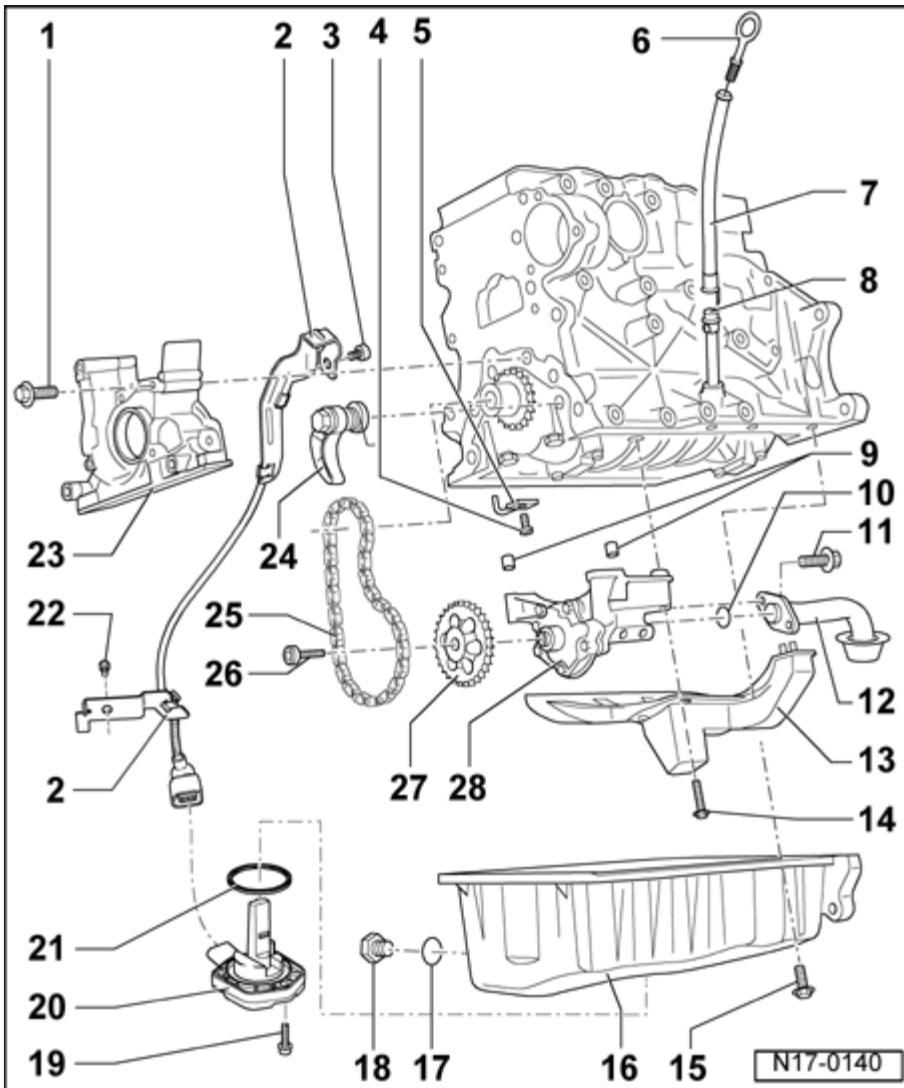


Fig. 158: Exploded View Of Engine Assembly (Engine Codes AEG, AVH, AZG, BEV)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - 15 Nm

2 - Bracket

- Not applicable for engine codes in this repair manual
- For oil level/oil temperature sensor wiring harness

3 - 25 Nm

4 - Pressure relief valve, 27 Nm

5 - Oil spray jet

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- For piston cooling

6 - Dipstick

- Oil level must not exceed Max. mark!
- Markings. See **Fig. 160** .

7 - Dipstick guide

- Fastened to intake manifold
- Pull off to extract oil

8 - Guide tube

9 - Adjustment bushings

10 - O-ring

- Always replace

11 - 15 Nm

12 - Suction line

- See Parts catalog
- Clean strainer if soiled

13 - Baffle plate

14 - 15 Nm

15 - 15 Nm

16 - Oil pan

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

17 - Seal

- Always replace

18 - Oil drain plug, 30 Nm

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

19 - 10 Nm

20 - Oil level thermal sensor -G266-

- Not applicable for engine codes in this repair manual

21 - Seal

22 - 25 Nm

23 - Sealing flange

- Must be located on dowel sleeves
- Insert with silicone sealant D 176 404 A2. Refer to **Front sealing flange, removing and installing**
- Removing and installing. Refer to **Front sealing flange, removing and installing**
- Replacing crankshaft oil seal, poly V-belt pulley end. Refer to **Crankshaft oil seal - belt pulley end, replacing**

24 - Chain tensioner with tensioning rail, 15 Nm

- When installing, first pretension spring

25 - Chain

26 - 20 Nm

- Use counter support T10051 to loosen and tighten

27 - Chain sprocket for oil pump

- Observe installed position

28 - Oil pump

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

Engine code BBW, assembly overview

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

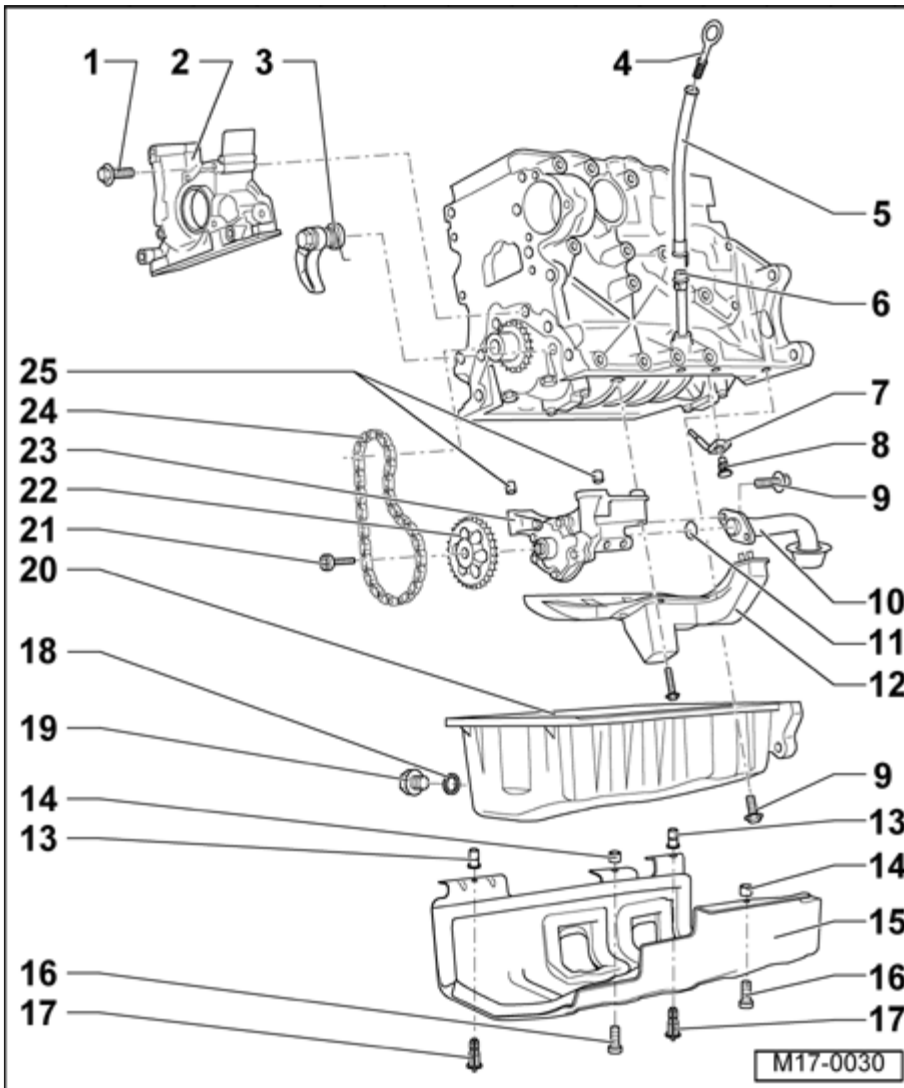


Fig. 159: Exploded View Of Engine Assembly (Engine Codes BBW)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - 15 Nm

2 - Sealing flange

- Must be located on dowel sleeves
- Insert with silicone sealant D 176 404 A2. Refer to **Front sealing flange, removing and installing**
- Removing and installing. Refer to **Front sealing flange, removing and installing**
- Replacing crankshaft oil seal, poly V-belt pulley end. Refer to **Crankshaft oil seal - belt pulley end, replacing**

3 - Chain tensioner with tensioning rail, 15 Nm

- When installing, pretension spring first

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

4 - Dipstick

- Oil level must not exceed Max. mark!
- Markings. See **Fig. 160** .

5 - Dipstick guide

- Fastened to intake manifold
- Pull off to extract oil

6 - Guide tube

7 - Oil spray jet

- For piston cooling

8 - Pressure relief valve, 27 Nm

9 - 15 Nm

10 - Suction line

- See Parts catalog
- Clean strainer if dirty

11 - O-ring

- Always replace

12 - Baffle plate

13 - Rubber bushing

- On cylinder block
- Replace if damaged

14 - Sleeves

15 - Oil pan guard

16 - 37 Nm

17 - Rivet spreader

- With spreader pin

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

18 - Seal

- Always replace

19 - Oil drain plug, 30 Nm

20 - Oil pan

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

21 - 20 Nm

- Use counter support T10051 to loosen and tighten

22 - Chain sprocket for oil pump

- Observe installation position

23 - Oil pump

- With pressure relief valve of 12 bar
- Before installing, check that both dowel sleeves for centralizing oil pump/cylinder block are installed
- Replace if contact surfaces and gears are scored
- Removing and installing. Refer to **Oil pump, removing and installing**

24 - Chain

25 - Adjustment bushings

Dipstick marks

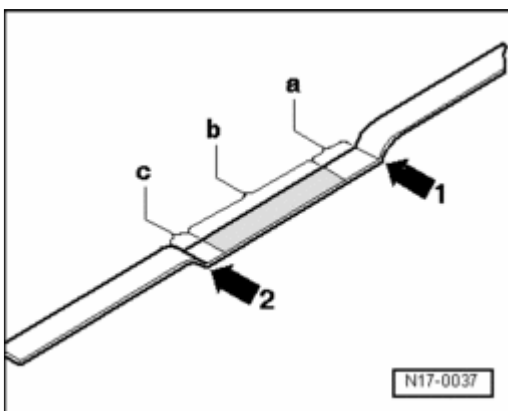


Fig. 160: Dipstick Marks

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Max. mark

2 - Min. mark

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

b - Oil level within hatched field: May add engine oil

c - Area from min. mark up to hatched field: Add max. 0.5 liters of engine oil

Oil filter housing, disassembling and assembling

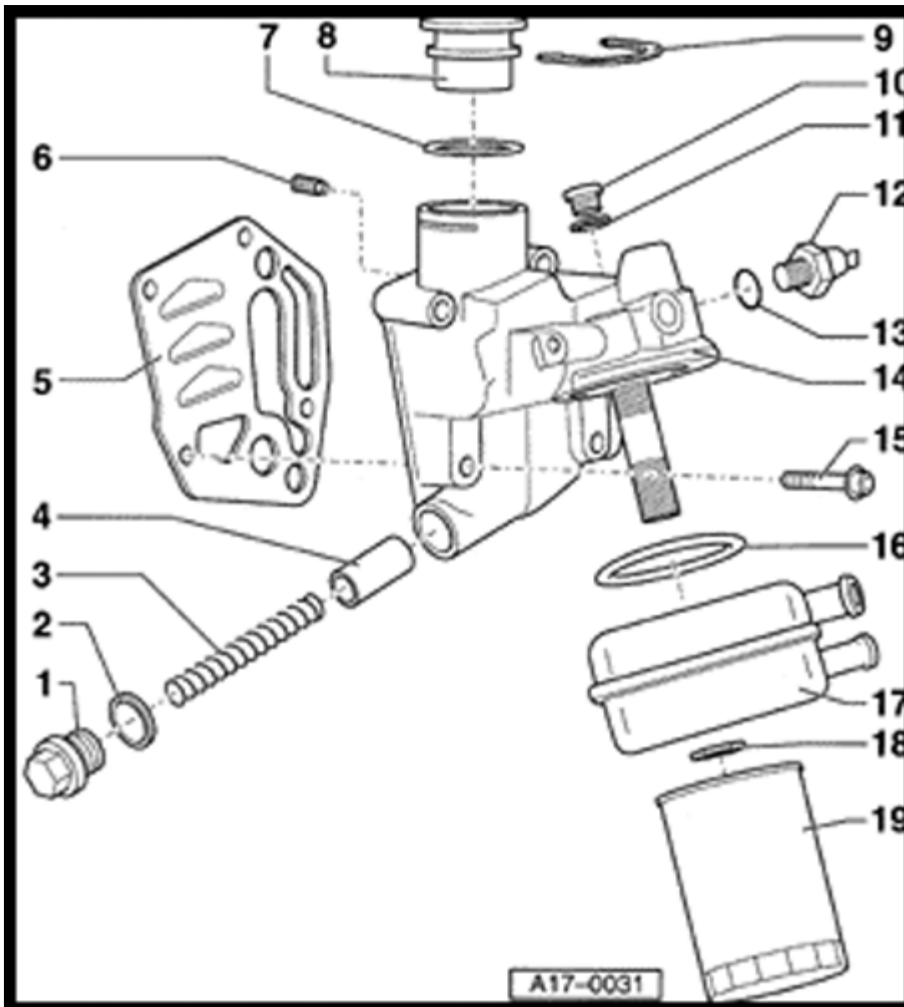


Fig. 161: Exploded View Of Oil Filter Housing

Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Sealing plug, 40 Nm

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Always replace

2 - Seal

- Installed firmly onto item -**Oil filter housing, disassembling and assembling**

3 - Spring

- For pressure relief valve, approx. 4 bar

4 - Piston

- For pressure relief valve, approx. 4 bar

5 - Seal

- Always replace

6 - Non-return valve, 8 Nm

- Dependent on version: Screwed or clipped.
- Press fit valves are not available as replacement parts.

7 - Seal

- Slide on to shoulder of sealing cover item -8- Cover
- Replace if damaged

8 - Cover

9 - Retaining clip

10 - Sealing plug, 15 Nm

11 - Seal

- If sealing ring is leaking cut open and replace.

12 - 1.4 bar Oil pressure switch -F1-, 25 Nm

- Black
- Checking. Refer to **Oil pressure and oil pressure switch, checking**

13 - Seal

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- If sealing ring is leaking cut open and replace.

14 - Oil filter bracket

15 - 15 Nm plus 1/4 turn (90 °)

- Always replace

16 - Seal

- Always replace
- Install into groove on oil cooler

17 - Oil cooler

- Coat contact surfaces to oil filter bracket outside the seal with AMV 188 100 02
- Ensure clearance to adjacent components
- Note. Refer to **Lubrication system components, removing and installing**

18 - 25 Nm

19 - Oil filter

- Loosen with filter strap or oil filter key 3417
- Tighten by hand
- Note instructions on filter when installing

Oil pan, removing and installing

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

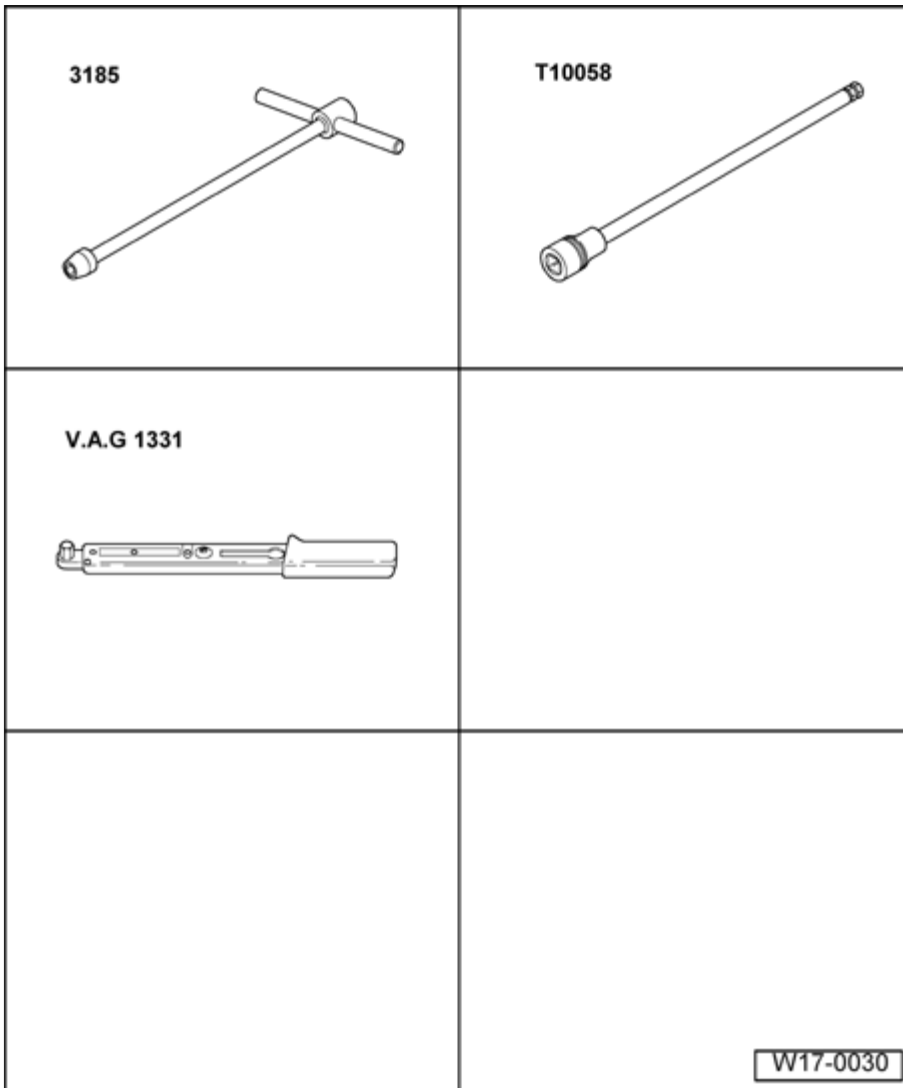


Fig. 162: Identifying Special Tools - Oil Pan, Removing And Installing
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools and equipment

- 3185 Jointed wrench
- T10058 Hex ball socket
- V.A.G 1331 Torque wrench (5 to 50 Nm)
- Hand drill with plastic brush attachment
- Silicone sealing compound D 176 404 A2

Removing

- Remove center and right side sound insulation:

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Refer to **BODY, FRONT**

Engines with oil pan guard

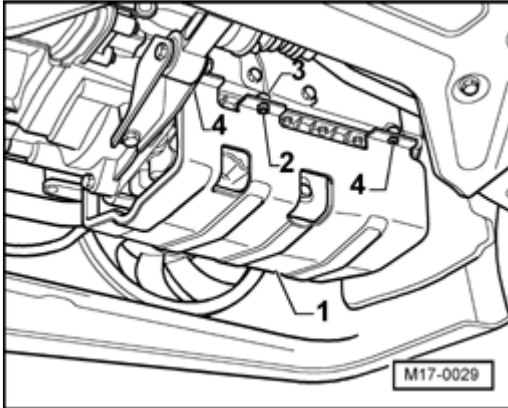


Fig. 163: Identifying Oil Pan Cover, Bolts, Sleeves & Spreader Rivet
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove bolts -2- and take sleeves -3- off front and rear parts of oil pan cover.
- Press spreader pin out upward and remove spreader rivet -4-.
- Remove oil pan cover -1-.

Continued for all engines

- Drain engine oil.

NOTE: **Observe waste disposal regulations!**

- Remove bolts from oil pan.

NOTE: **Loosen bolts on flywheel end of oil pan with jointed wrench 3185 and remove with socket T10058.**

- Remove oil pan.

NOTE: **It may be necessary to release the pan with light blows from a rubber headed hammer.**

- Remove sealant residue from cylinder block with a flat scraper.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

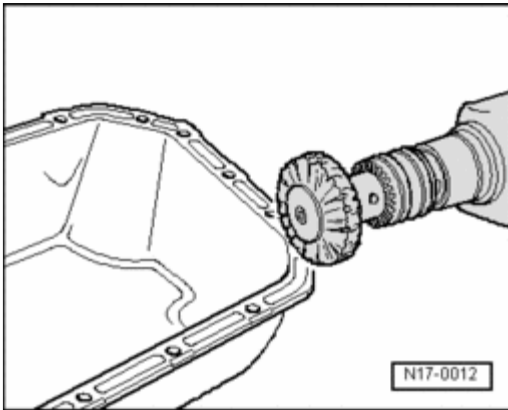


Fig. 164: Removing Sealant Residue From Oil Pan With A Rotating Brush
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove sealant residue from oil pan with a rotating brush, e.g. a hand drill with a plastic brush attachment (wear protective goggles).
- Clean sealing surfaces. They must be free of oil and grease.

Installing

NOTE:

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

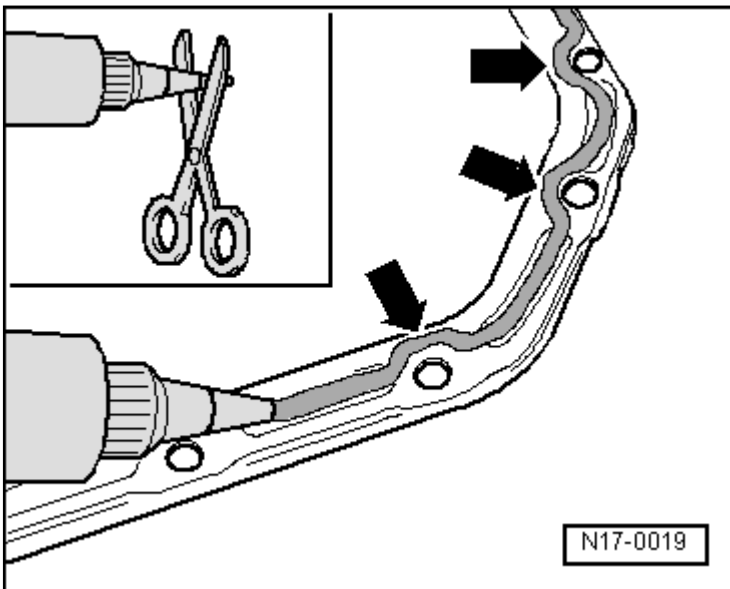


Fig. 165: Cutting Off Tube Nozzle & Applying Silicone Sealing Compound To Oil Pan Sealing Surface
Courtesy of VOLKSWAGEN UNITED STATES, INC.

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

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Apply silicone sealing compound, as shown, to clean oil pan sealing surface. Sealing compound bead must be:

2 to 3 mm thick

and run on inside 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.

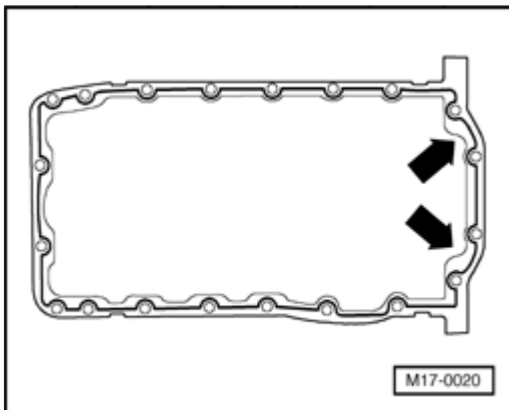


Fig. 166: Applying Sealant To Inside Path Of Bolt Holes
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Apply sealing compound bead carefully to areas marked by (arrows).
- Install oil pan immediately and tighten bolts as follows:

NOTE:

- When installing the oil pan on an engine which is removed from the vehicle, ensure that the oil pan is flush with the cylinder block on the flywheel end.
- The sealant must be allowed to cure for approx. 30 minutes after installing the pan. After this time the engine may be filled with engine oil.

- 1 - Tighten all oil pan/cylinder block bolts lightly using a diagonal sequence.
- 2 - Tighten three oil pan/transmission bolts lightly.
- 3 - Tighten all oil pan/cylinder block bolts lightly using a diagonal sequence again.
- 4 - Tighten oil pan/transmission bolts to 45 Nm.
- 5 - Tighten all oil pan/cylinder block bolts to 15 Nm using a diagonal sequence.

Oil pan, lower part

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

NOTE:

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

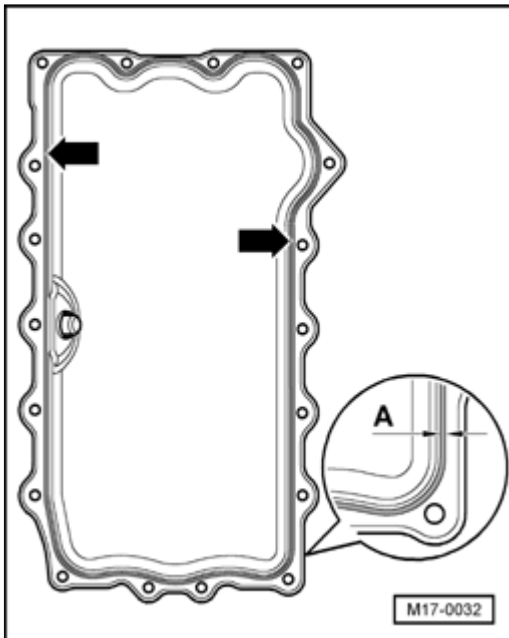


Fig. 167: Identifying Silicone Path And Dimensions On Lower Part Of Oil Pan
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Apply silicone sealing compound AMV 176 501 as shown, to clean sealing surface of lower part of oil pan.

- Sealing compound bead must be: A = 2 to 3 mm thick
- Run sealing compound bead 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.

Engines with oil pan guard

NOTE:

- Check condition of rubber bushings in cylinder block (for mounting spreader rivets) before installing oil pan cover.
- Before bolts are reinstalled, clean threads and apply sealant D 000 600 A2.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

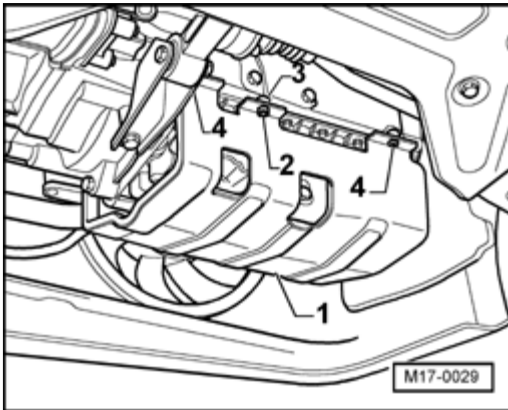


Fig. 168: Identifying Oil Pan Cover, Bolts, Sleeves & Spreader Rivet
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Insert spreader pin flush with spreader rivet -4- and install in oil pan cover -1-.
- Tighten bolts -2- in front and rear ends of oil pan to 37 Nm.

Continued for all engines

The rest of the assembly is basically in reverse order to the removal sequence.

Oil pump, removing and installing

Removing

- Remove oil pan and baffle plate. Refer to **Oil pan, removing and installing** .

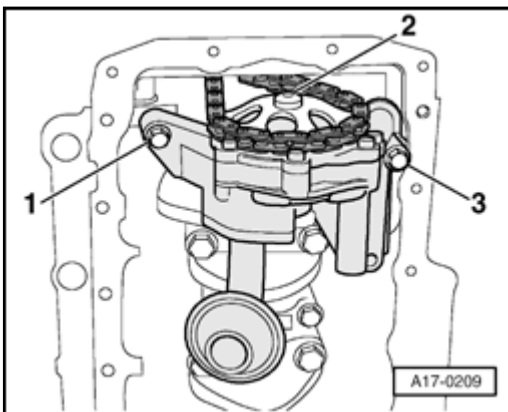


Fig. 169: Identifying Oil Pump & Bolts
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove bolt -2-.
- Pull off chain sprocket from oil pump shaft.
- Remove bolts -1- and -3- and remove oil pump.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Installing

Install in reverse order and note the following:

- Install dowel sleeves into upper part of oil pump.

Installed position of oil pump shaft/chain sprocket: Can only be installed in one position

- Install oil pan and baffle plate. Refer to **Oil pan, removing and installing** .

Oil pressure and oil pressure switch, checking

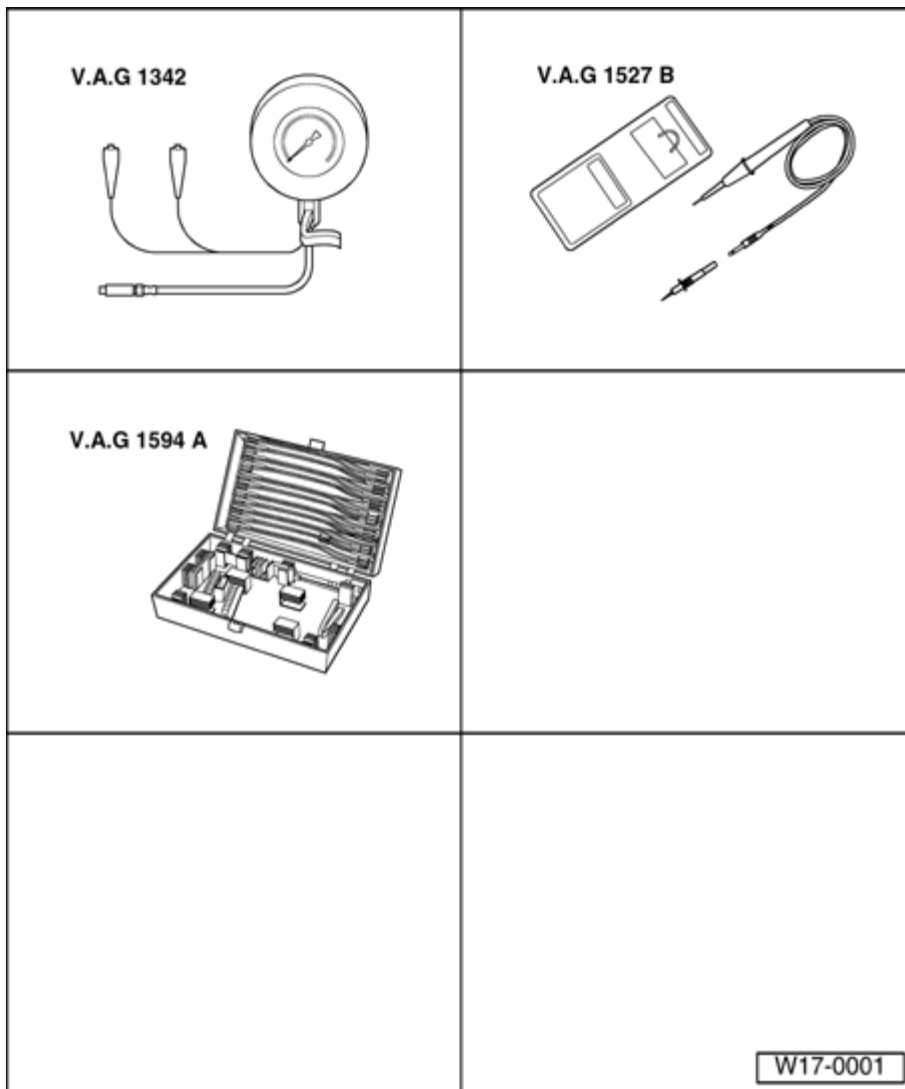


Fig. 170: Identifying Special Tools - Oil Pressure And Oil Pressure Switch, Checking
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools and equipment

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

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

Function of the dynamic oil pressure warning system

The oil pressure switch is open when there is no pressure and closes when the specified switch pressure is reached.

The oil pressure warning is activated approx. 10 seconds after switching the ignition on (terminal 15 on).

Switch on delay for oil pressure warning: approx. 3 seconds

Switch off delay for oil pressure warning: approx. 5 seconds

Checking warning lamp

After switching on the ignition when the engine is not running, the oil pressure warning lamp in the instrument cluster must light up for approx. 3 seconds and go out again afterward. The check is terminated if the engine is running.

Criteria for warning

The optical oil pressure warning switches on (the oil pressure warning lamp flashes) and the buzzer sounds three times for audible warning under one of the following conditions.

- Ignition on, engine at rest, oil pressure switch closed
- Engine speed higher than 1500 rpm, oil pressure switch open
- At an engine speed greater than 5000 rpm the oil pressure warning is not erased; even when the oil pressure switch is closed. Oil pressure warning goes out below 5000 rpm.
- If the oil pressure switch is open (engine revs greater than 1500) for 0.5 to 3 seconds, this is stored in the combi-processor of the instrument cluster. If this condition happens three times while the engine is running, the oil pressure warning is immediately triggered and remains on, even below 1500 rpm. The oil pressure warning goes out when the oil pressure switch is closed for longer than 5 seconds when the engine revolutions are greater than 1500 rpm or ignition is "switched off".

Requirements

- Engine oil level OK, checking. See **Fig. 160** .

Engine code BBW

- Oil pressure warning light -K3- must light up for approx. 3 seconds when ignition is switched on

Continued for all engines

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Coolant temperature minimum 80 ° C (coolant fan must run once)

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

Refer to Electrical Wiring Diagrams, Troubleshooting & Component Locations

Work sequence

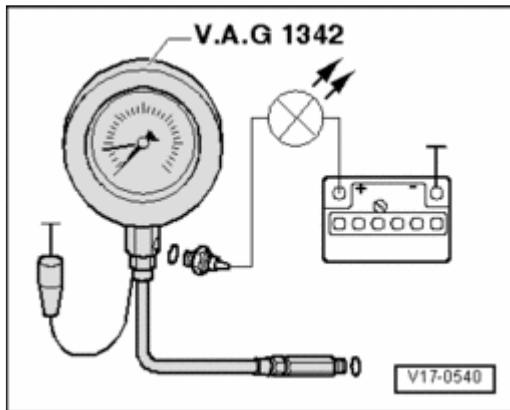


Fig. 171: Identifying V.A.G 1342 Oil Pressure Tester
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- 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 from V.A.G 1594 A to battery positive (+) and oil pressure switch.

LED must not light up.

If the LED lights up:

- Replace 1.4 bar oil pressure switch -F1-.

If the LED does not light up:

- Start engine and increase revolutions slowly.

At 1.2 to 1.6 bar pressure LED must light up

If the LED does not light up:

- Replace oil pressure switch.
- Increase engine speed further.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

At 2000 rpm and an oil temperature of 80 ° C oil pressure should be between 2.7 to 4.5 bar

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

If the specifications are not attained:

- Correct mechanical damage, e.g. bearing damage.
- Replace oil filter bracket with pressure relief valve. Refer to **Oil filter housing, disassembling and assembling**, item -15- or oil pump.

If the specification is exceeded:

- Check oil galleries.
- If necessary, replace oil filter bracket with pressure relief valve. Refer to **Oil filter housing, disassembling and assembling**, item -15-.

19 ENGINE - COOLING SYSTEM

COOLING SYSTEM COMPONENTS, REMOVING AND INSTALLING

Cooling system components, removing and installing

CAUTION: When performing repair work, especially due to the confined conditions in the engine compartment, pay attention to the following:

- Route all types of lines (e.g. for fuel, hydraulics, EVAP system, coolant, refrigerant, brake fluid and vacuum) as well as electrical wiring so that the original positions are restored.
- Ensure 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 cases of repair only use spring-type clips.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

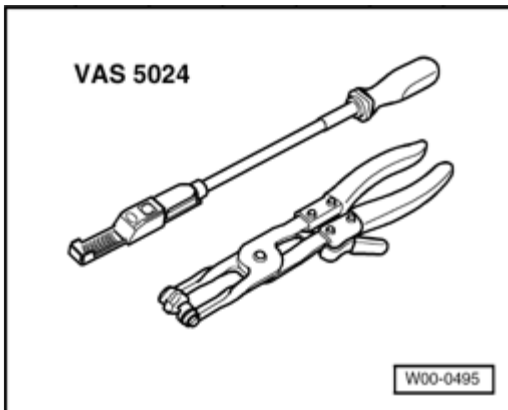


Fig. 172: Identifying Assembly Tool VAS 5024

Courtesy of VOLKSWAGEN UNITED STATES, INC.

NOTE:

- **Assembly tool VAS 5024 or hose clip pliers V.A.G 1921 are recommended for installing spring-type clips.**
- **When installing coolant hoses route them stress-free so that they do not come into contact with other components (observe markings on coolant connection and hose).**

Perform cooling system leakage test with cooling system tester V.A.G 1274 and adapters V.A.G 1274/8 and V.A.G 1274/9.

Cooling system components, body side

Engine codes: AEG, AVH, AZG, BBW and BEV. Refer to Cooling system components, body side

Cooling system components, engine side:

Engine code: AEG (up to model year 1999). Refer to Cooling system components, engine side

Engine codes: AEG, AVH and AZG (from model year 1999). Refer to Engine codes AEG, AVH and AZG (from model year 1999)

Engine codes: BBW and BEV. Refer to Engine codes AEG, AVH and AZG (from model year 1999)

Coolant hose connection diagram. Refer to Coolant hose connection diagram

Engine code: AEG. Refer to Engine code AEG

Engine codes: AVH, AZG, BBW and BEV. Refer to Engine codes AVH, AZG, BBW, BEV

Draining and filling with coolant. Refer to Cooling system, draining and filling

Coolant mixing ratios. Refer to Filling , Draining and filling with coolant

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Cooling system components, body side

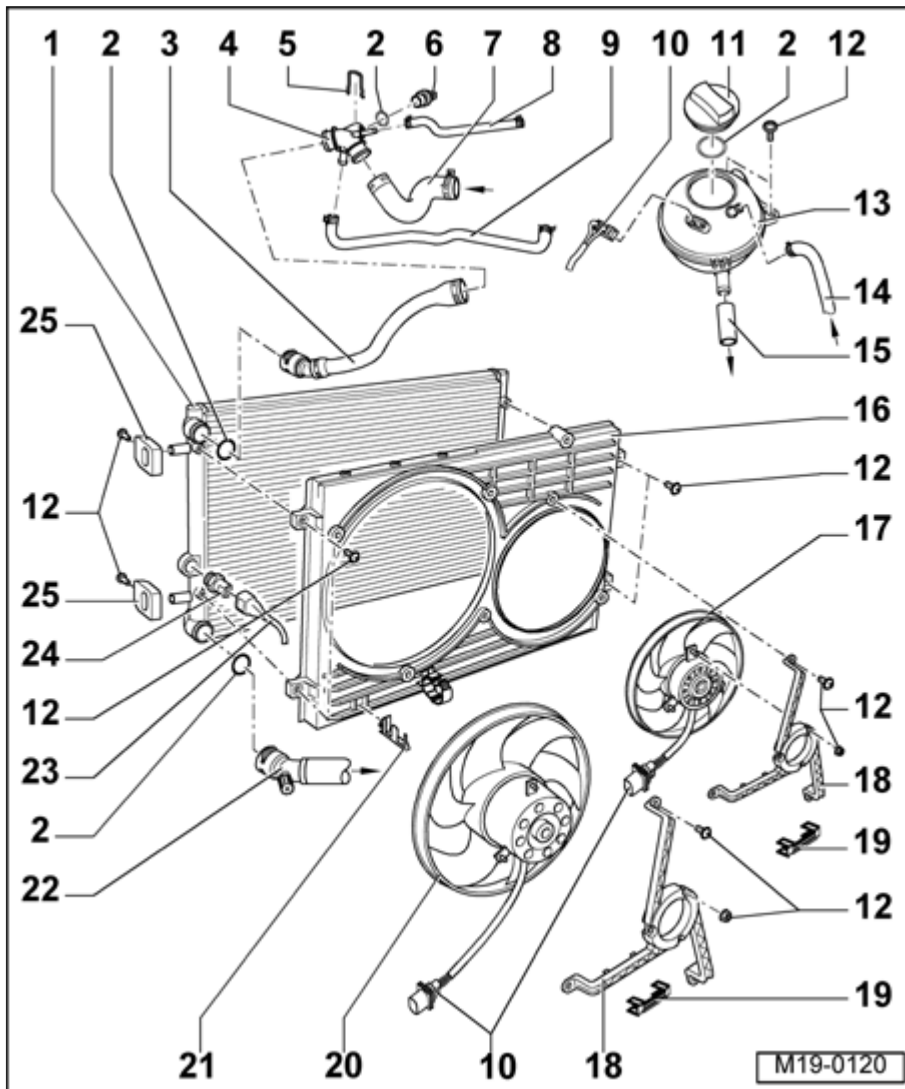


Fig. 173: Exploded View Of Cooling System (Engine codes AEG, AVH, AZG, BBW, BEV)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Engine codes AEG, AVH, AZG, BBW, BEV

NOTE:

- Coolant hose connection diagram, Engine code AEG. Refer to Engine code AEG
- Coolant hose connection diagram, Engine codes AVH, AZG, BBW, BEV. Refer to Engine codes AVH, AZG, BBW, BEV

1 - Radiator

- Removing and installing. Refer to Radiator, removing and installing

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- After replacement replace entire amount of coolant

2 - O-ring

- Always replace

3 - Upper coolant hose

4 - Distributor connection piece

- Secured to radiator with quick release coupling
- Check for secure seating

5 - Clip

- Check for secure seating

6 - A/C Cut-Out Thermal Switch -F163-

- Only applies to models with air conditioning system up to build date 05.99, depending on version.

7 - Coolant hose

- From cylinder head union

8 - Coolant hose

9 - Coolant hose

- To coolant pipe on cylinder block, AEG engine.
- To oil cooler on engines: AVH, AZG, BBW, BEV

10 - Connector

11 - Cover

- Check with coolant 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

12 - 10 Nm

13 - Expansion tank

- Perform leak test on coolant system with coolant system tester V.A.G 1274 and adapter V.A.G1274/8
- Test pressure 1.4 to 1.6 bar

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

14 - Coolant hose

- From throttle valve control module

15 - Coolant hose

- To coolant pipe

16 - Air ducting

17 - Right coolant fan -V35-

- Only models with optional equipment
- Checking, Engines: AEG, AVH and AZG. Refer to **Radiator coolant fan (vehicles with engine codes AEG, AVH and AZG), checking**
- Removing and installing. Refer to **Radiator, removing and installing**

18 - Fan ring

19 - Retaining clip

- Check seated securely

20 - Coolant fan -V7-

- Checking. Refer to **Radiator coolant fan (vehicles with engine codes AEG, AVH and AZG), checking**
- Removing and installing. Refer to **Radiator, removing and installing**

21 - Bracket

- For coolant fan connector

22 - Lower coolant hose

- Secured to radiator by quick release coupling
- Check seated securely

23 - Connector

- For Coolant Fan Control (FC) thermal switch -F18-

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

- For Coolant fan -V7- and Right coolant fan -V35-
- Switching temperatures:

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

1st Speed

- on: 92...97 ° C
- off: 84...91 ° C

2nd Speed

- on: 99...105 ° C
- off: 91...98 ° C

25 - Bracket

- For radiator
- Observe installed position
- Different versions

Cooling system components, engine side

- Engine codes AEG, AVH and AZG (from model year 1999). Refer to **Engine codes AEG, AVH and AZG (from model year 1999)**
- Engine codes BBW, BEV. Refer to **Engine codes BBW, BEV**

Engine code AEG (up to model year 1999)

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

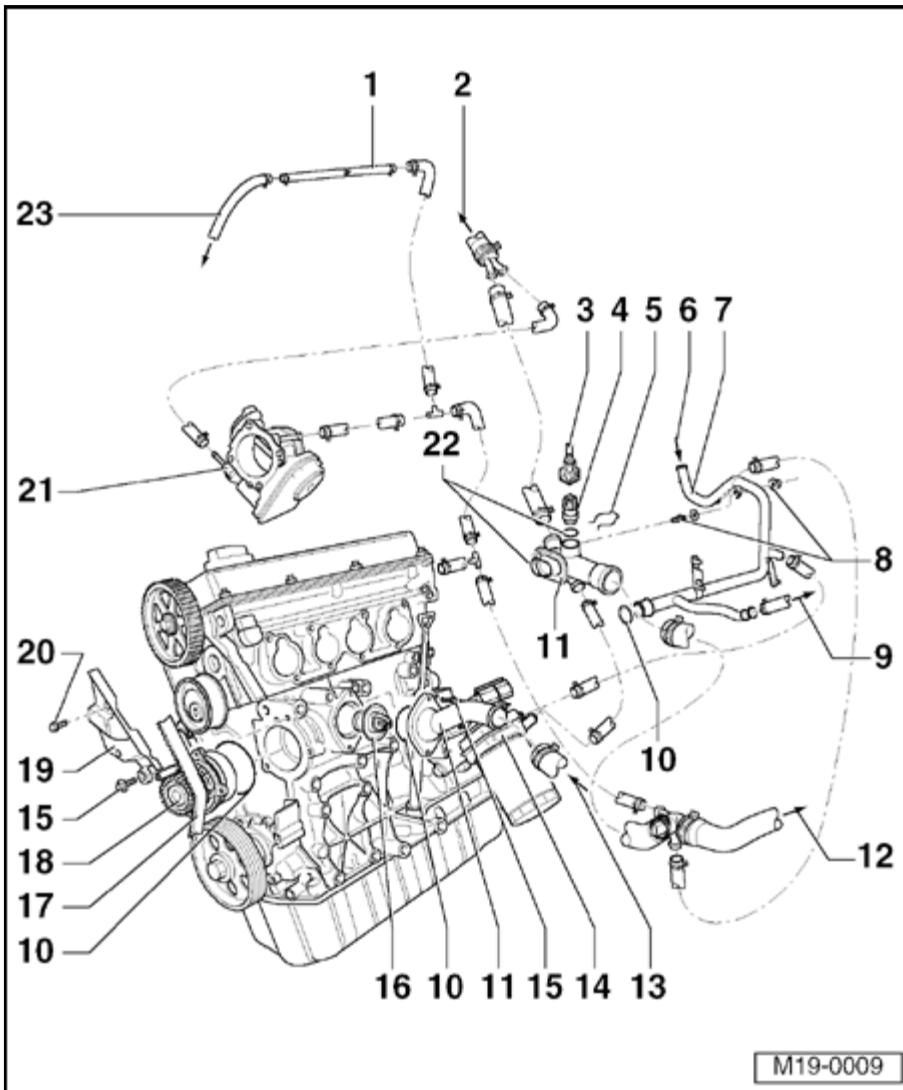


Fig. 174: Exploded View Of Cooling System (Engine code AEG up to model year 1999)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

NOTE: Coolant hose connection diagram for engine code AEG. Refer to Engine code AEG

1 - Upper coolant pipe

- Clipped onto bulkhead

2 - To heat exchanger

3 - Connector

- 4-pin
- Wiring chamber 3 and wiring chamber 4 for Engine Coolant Temperature (ECT) sensor -G62-

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Gold plated contacts for Engine Coolant Temperature (ECT) sensor -G62-

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

- For engine control module
- With Engine Coolant Temperature (ECT) Sensor -G2-
- Gold plated contacts for Engine Coolant Temperature (ECT) Sensor -G62-
- Release pressure in coolant system if necessary before removing components

5 - Retaining clip

- Check seated securely

6 - From heat exchanger

7 - Coolant pipe

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

8 - 10 Nm

9 - To bottom of expansion tank

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

10 - O-ring

- Always replace

11 - Union

12 - To top of radiator

13 - From bottom of radiator

14 - Oil cooler

- Ensure clearance to adjacent components
- Note. Refer to Lubrication system components, removing and installing

15 - 15 Nm

16 - Coolant thermostat

- Checking: Heat up thermostat in water

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Starts to open at approx. 86 ° C
- Opening stroke: min. 7 mm
- Removing and installing. Refer to **Thermostat, removing and installing**

17 - Toothed belt

- Mark direction of rotation before removing
- Check for wear
- Do not kink
- Removing, installing and tensioning. Refer to **Engine codes AEG, AVH, AZG, BEV**

18 - Coolant pump

- Check for ease of movement
- If damaged or leaking replace complete
- Removing and installing. Refer to **Coolant pump, removing and installing**

19 - Rear toothed belt guard

20 - 20 Nm

21 - Throttle valve control module

- Heated by coolant

22 - O-ring

- Replace if damaged

23 - To top of expansion tank

Engine codes AEG, AVH and AZG (from model year 1999)

NOTE:

- Coolant hose connection diagram, AEG engine. Refer to **Engine code AEG**
- Coolant hose connection diagram for engines AVH and AZG. Refer to **Engine codes AVH, AZG, BBW, BEV**

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

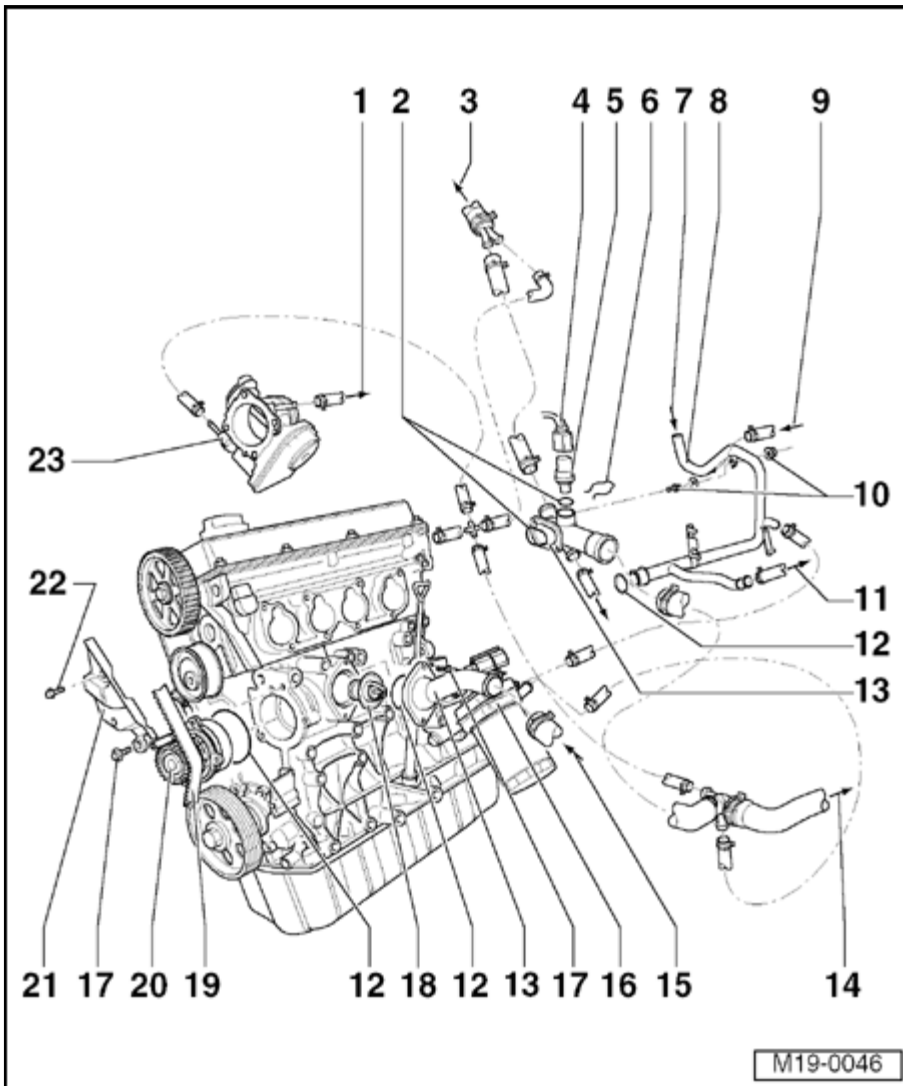


Fig. 175: Exploded View Of Cooling System (Engine Codes AEG, AVH & AZG From Model Year 1999)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - To top of expansion tank

2 - O-ring

- Replace if damaged

3 - Connection heater heat exchanger

4 - Connector

- 4-pin
- Wiring chamber 3 and wiring chamber 4 for Engine Coolant Temperature (ECT) sensor -G62-
- Gold plated contacts for ECT -G62-

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

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

- For engine control module
- With Engine Coolant Temperature (ECT) Sensor -G2-
- Gold plated contacts for Engine Coolant Temperature (ECT) Sensor -G62-
- Release pressure in coolant system if necessary, before removing components

6 - Retaining clip

- Check seated securely

7 - From heat exchanger

- Coolant hose connection diagram, AEG engine. Refer to Engine code AEG
- Coolant hose connection diagram for engines AVH and AZG. Refer to Engine codes AVH, AZG, BBW, BEV

8 - Coolant pipe

9 - From ATF radiator (automatic transmission) or shape hose

10 - 10 Nm

11 - To bottom of expansion tank

12 - O-ring

- Always replace

13 - Union

14 - To top of radiator

15 - From bottom of radiator

16 - Oil cooler

- Ensure clearance to adjacent components
- Note. Refer to Lubrication system components, removing and installing

17 - 15 Nm

18 - Coolant thermostat

- Checking: Heat up thermostat in water

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Starts to open at approx. 86 ° C
- Opening stroke: min. 7 mm
- Removing and installing. Refer to **Thermostat, removing and installing**

19 - Toothed belt

- Mark direction of rotation before removing
- Check for wear
- Do not kink
- Removing, installing and tensioning. Refer to **Engine codes AEG, AVH, AZG, BEV**

20 - Coolant pump

- Check for ease of movement
- If damaged or leaking replace complete
- Removing and installing. Refer to **Coolant pump, removing and installing**

21 - Rear toothed belt guard

22 - 20 Nm

23 - Throttle valve control module

- Heated by coolant

Engine codes BBW, BEV

NOTE: **Coolant hose connection diagram for engine codes BBW, BEV. Refer to Engine codes AVH, AZG, BBW, BEV**

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

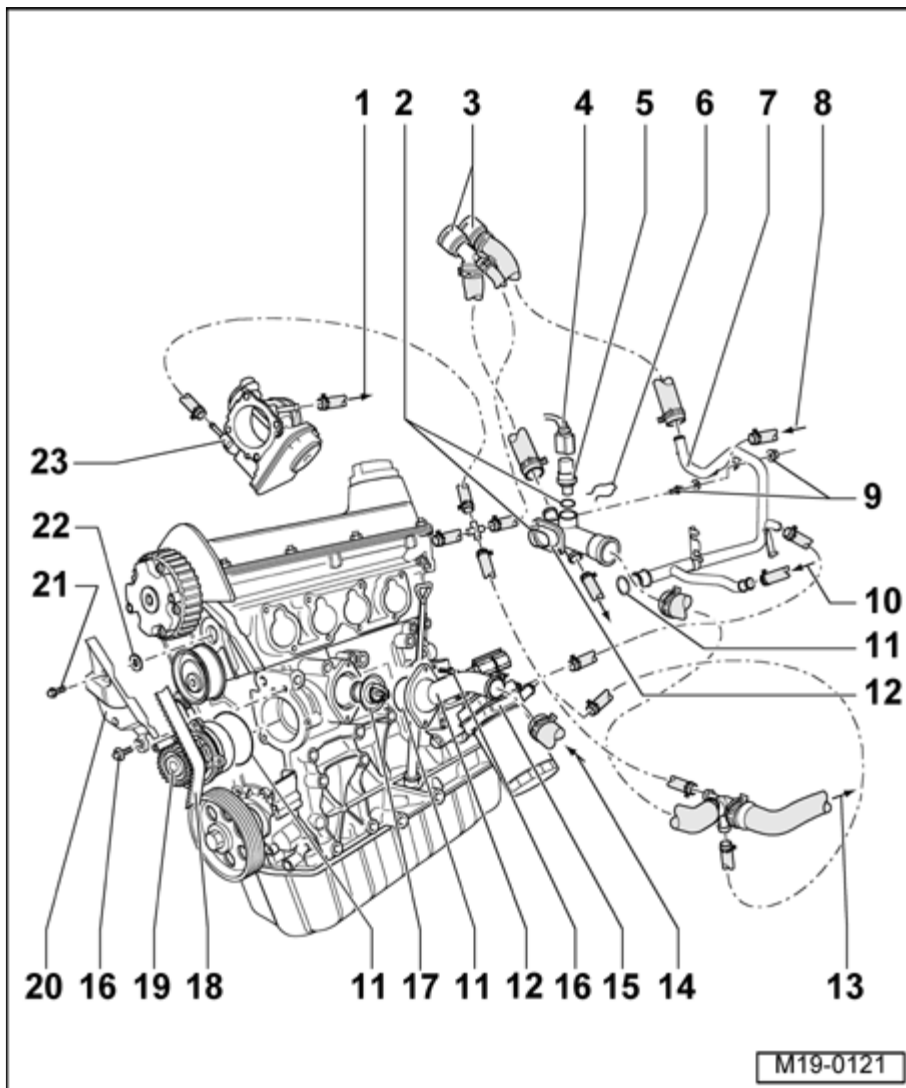


Fig. 176: Exploded View Of Cooling System (Engine Codes BBW, BEV)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - To top of expansion tank

- Coolant hose connection diagram for engines BBW, BEV. Refer to **Engine codes AVH, AZG, BBW, BEV**

2 - O-ring

- Replace if damaged

3 - Quick release coupling

- Connection heater heat exchanger

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

4 - Connector

- 4-pin
- Wiring chamber 3 and wiring chamber 4 for Engine Coolant Temperature (ECT) sensor -G62-
- Gold plated contacts for ECT -G62-

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

- For engine control module
- With Engine Coolant Temperature (ECT) Sensor -G2-
- Gold plated contacts for Engine Coolant Temperature (ECT) Sensor -G62-
- Release pressure in coolant system if necessary, before removing components

6 - Retaining clip

- Check seated securely

7 - Coolant pipe

8 - From ATF radiator (automatic transmission) or shape hose

- Coolant hose connection diagram for engines BBW, BEV. Refer to **Engine codes AVH, AZG, BBW, BEV**

9 - 10 Nm

10 - To bottom of expansion tank

- Coolant hose connection diagram for engine codes BBW, BEV. Refer to **Engine codes AVH, AZG, BBW, BEV**

11 - O-ring

- Always replace

12 - Union

13 - To top of radiator

14 - From bottom of radiator

15 - Oil cooler

- Ensure clearance to adjacent components
- Note. Refer to **Lubrication system components, removing and installing**

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

16 - 15 Nm

17 - Coolant thermostat

- Checking: Heat up thermostat in water
- Starts to open at approx. 86 ° C
- Opening stroke: min. 7 mm
- Removing and installing. Refer to **Thermostat, removing and installing**

18 - Toothed belt

- Mark direction of rotation before removing
- Check for wear
- Do not kink
- Removing, installing and tensioning. Refer to **Engine codes AEG, AVH, AZG, BEV**

19 - Coolant pump

- Check for ease of movement
- If damaged or leaking replace complete
- Removing and installing. Refer to **Coolant pump, removing and installing**

20 - Rear toothed belt guard

21 - 20 Nm

22 - Washer

- Note part number

23 - Throttle valve control module

- Heated by coolant

Coolant hose connection diagram

- Engine codes AVH, AZG, BBW, BEV. Refer to **Engine codes AVH, AZG, BBW, BEV**

Engine code AEG

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

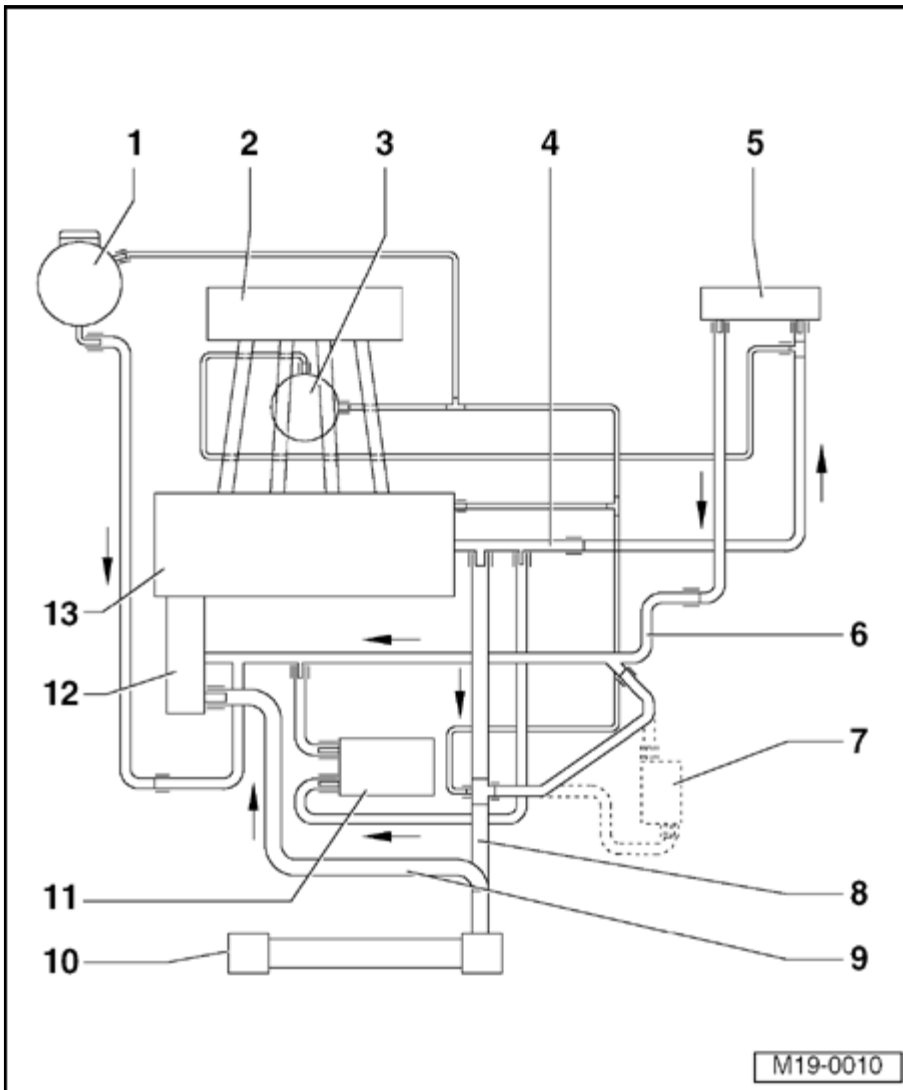


Fig. 177: Coolant Hose Connection Diagram (Engine Code AEG)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- 1 - Expansion tank
- 2 - Intake manifold
- 3 - Throttle valve control module
- 4 - Union
- 5 - Heating system heat exchanger
- 6 - Coolant pipe
- 7 - ATF cooler

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Only on vehicles with automatic transmission

8 - Upper coolant hose

9 - Lower coolant hose

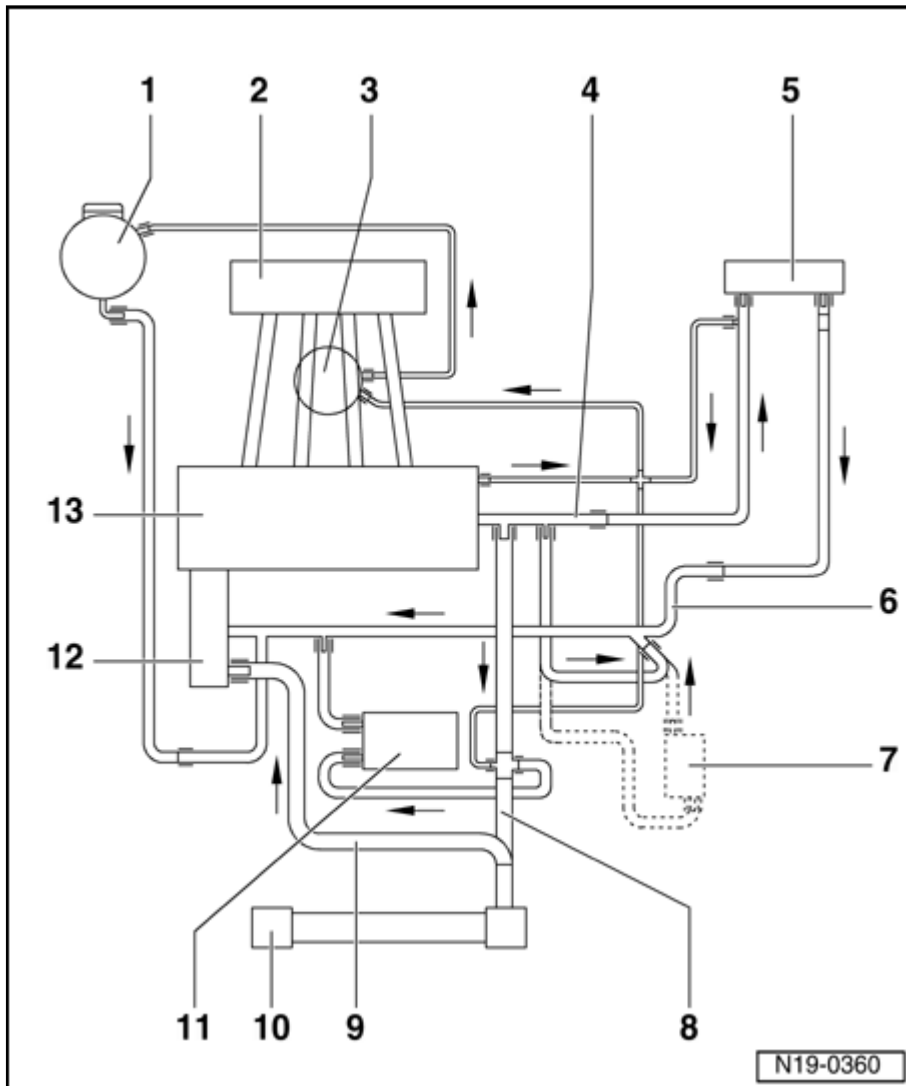
10 - Radiator

11 - Oil cooler

12 - Coolant pump/coolant thermostat

13 - Cylinder head/cylinder block

Engine codes AVH, AZG, BBW, BEV



2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Fig. 178: Coolant Hose Connection Diagram (Engine Codes AVH, AZG, BBW, BEV)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Expansion tank

2 - Intake manifold

3 - Throttle valve control module

4 - Union

5 - Heating system heat exchanger

6 - Coolant pipe

7 - ATF cooler

- Only on vehicles with automatic transmission

8 - Upper coolant hose

9 - Lower coolant hose

10 - Radiator

11 - Oil cooler

12 - Coolant pump/coolant thermostat

13 - Cylinder head/cylinder block

Cooling system, draining and filling

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

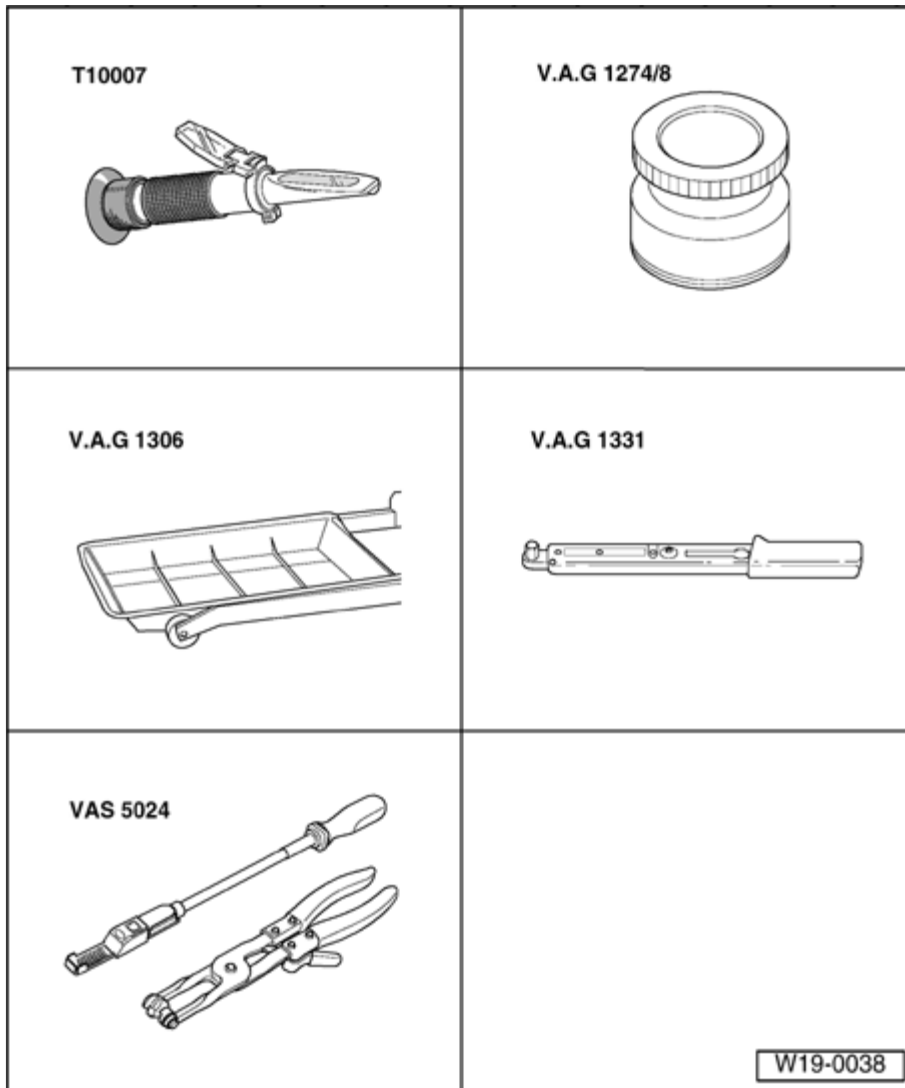


Fig. 179: Identifying Special Tools - Cooling System, Draining And Filling
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools and equipment

- T10007 Refractometer
- V.A.G1274/8 Adapter
- V.A.G 1306 Drip tray
- VAS 5024 Assembly tool for spring-type clips

Not illustrated:

- VAS 6096 Coolant system charging unit

Draining

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

WARNING: Steam can be released when removing the cap from the expansion tank. Always cover the cap with a cloth and open it carefully.

- Open cap on coolant expansion tank.
- Remove sound insulation:

Refer to **50 BODY, FRONT**

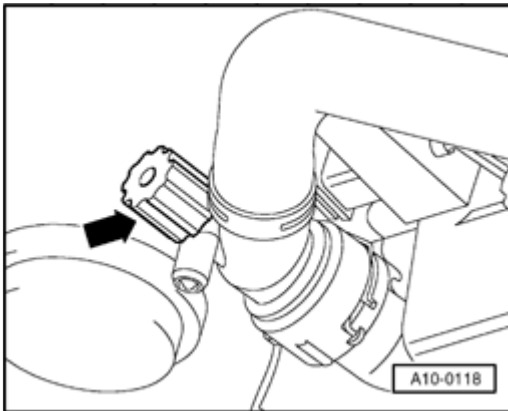


Fig. 180: Locating Radiator Drain Plug
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove drain plug (arrow) and drain coolant from radiator.

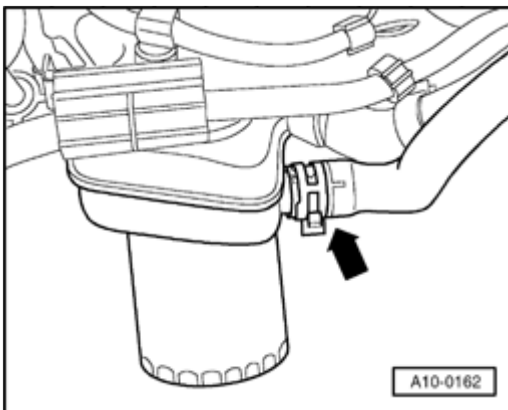


Fig. 181: Locating Oil Cooler Coolant Hose
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove coolant hose for oil cooler (arrow) and drain coolant from engine.

Filling

NOTE: Observe waste disposal regulations!

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Engine codes AEG, AVH, AZG

NOTE:

- **Only use coolant additive G12 in accordance with TL VW 774 D.**
 - **Distinguishing color: red**
 - **Do not mix G12 with other coolant additives!**
 - **If the fluid in the expansion tank is brown, G12 has been mixed with another coolant additive. In this case the coolant must be changed/**
-
- G12 and coolant additives marked "In accordance with TL VW 774 F" prevent frost and corrosion damage, scaling and also raise boiling point of coolant. For this reason the system must be filled the entire year with frost and corrosion protection additives.

Engine codes BBW, BEV

NOTE:

- **Only use coolant additive G12 in accordance with TL VW 774 F.**
- **Distinguishing color: violet**
- **G12 and coolant additives marked "In accordance with TL VW 774 F" prevent frost and corrosion damage, scaling and also raise boiling point of coolant. For this reason the system must be filled the entire year with frost and corrosion protection additives.**
- **G12 violet (according to TL VW 774 F) can be mixed with coolant additive G12 red.**

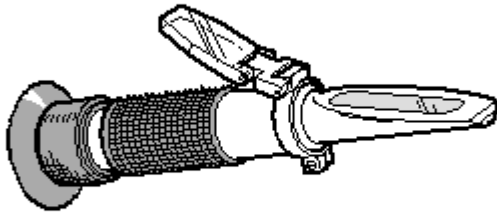
Continued for all engines

- Because of its high boiling point, the coolant improves engine reliability under heavy loads, particularly in countries with tropical climates.
- Protection against frost must be assured to about -25 ° C (in arctic climatic countries 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 ratio must be at least 40%.
- If for climatic reasons a higher frost protection is required, the amount of G12 can be increased, but only up to 60% (frost protection to about -40 ° C), as otherwise frost protection is reduced again and cooling effectiveness is also reduced.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

T1 0007



W00-0689

Fig. 182: Refractometer T10007

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Refractometer T10007 is recommended to determine coolant freezing temperature.
- If the radiator, heat exchanger, cylinder head or cylinder head gasket is replaced, do not reuse old coolant.

Recommended mixture ratios

Anti-freeze ¹	Anti-freeze proportion	G12 ¹	Water ²
-25 ° C	40 %	2.0 ltr.	3.0 ltr.
-35 ° C	50 %	2.5 ltr.	2.5 ltr.

- 1) The quantity of coolant can vary in dependence on the vehicle equipment.
- 2) Use only clean drinking water.

Work sequence

- Screw drain plug into radiator and secure coolant hose on oil cooler connection.

Without coolant system charging unit VAS 6096

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

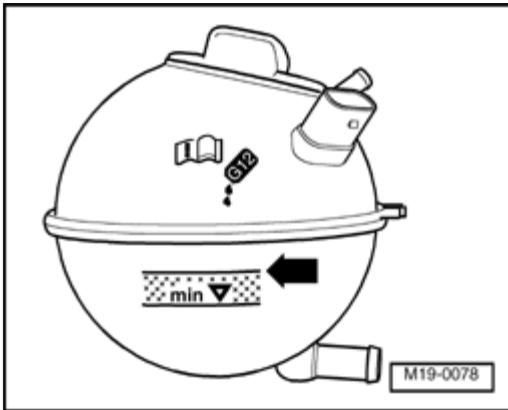


Fig. 183: Identifying Expansion Tank Upper Hatched Field Mark
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Fill coolant slowly up to upper hatched field mark (arrow) on expansion tank.

With coolant system charging unit VAS 6096

- Screw adapter V.A.G1274/8 onto expansion tank.
- Fill cooling system using coolant system charging unit VAS 6096:

Refer to Instruction manual for coolant system charging unit VAS 6096

With and without coolant system charging unit VAS 6096

- Seal expansion tank.
- Switch off heater and air conditioner.
- Start engine and maintain an engine speed of about 2000 rpm for approx. 3 minutes.
- Run engine until coolant fan starts.
- Switch off ignition.

WARNING: Steam can be released when removing the cap from the expansion tank.
Always cover the cap with a cloth and open it carefully.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

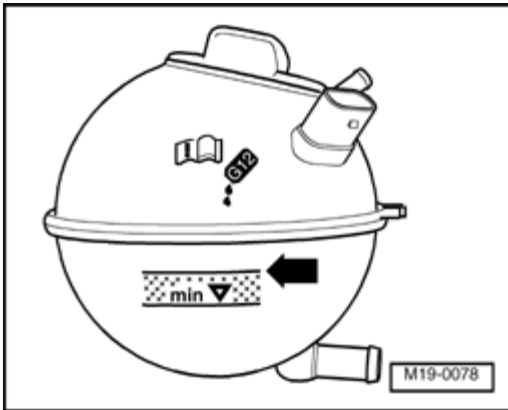


Fig. 184: Identifying Expansion Tank Upper Hatched Field Mark
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Check coolant level and top off coolant level if necessary:

Coolant level must be at upper hatched field mark when engine is at operating temperature (arrow).

When engine is cold coolant level should be near middle of hatched field.

Radiator, removing and installing

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

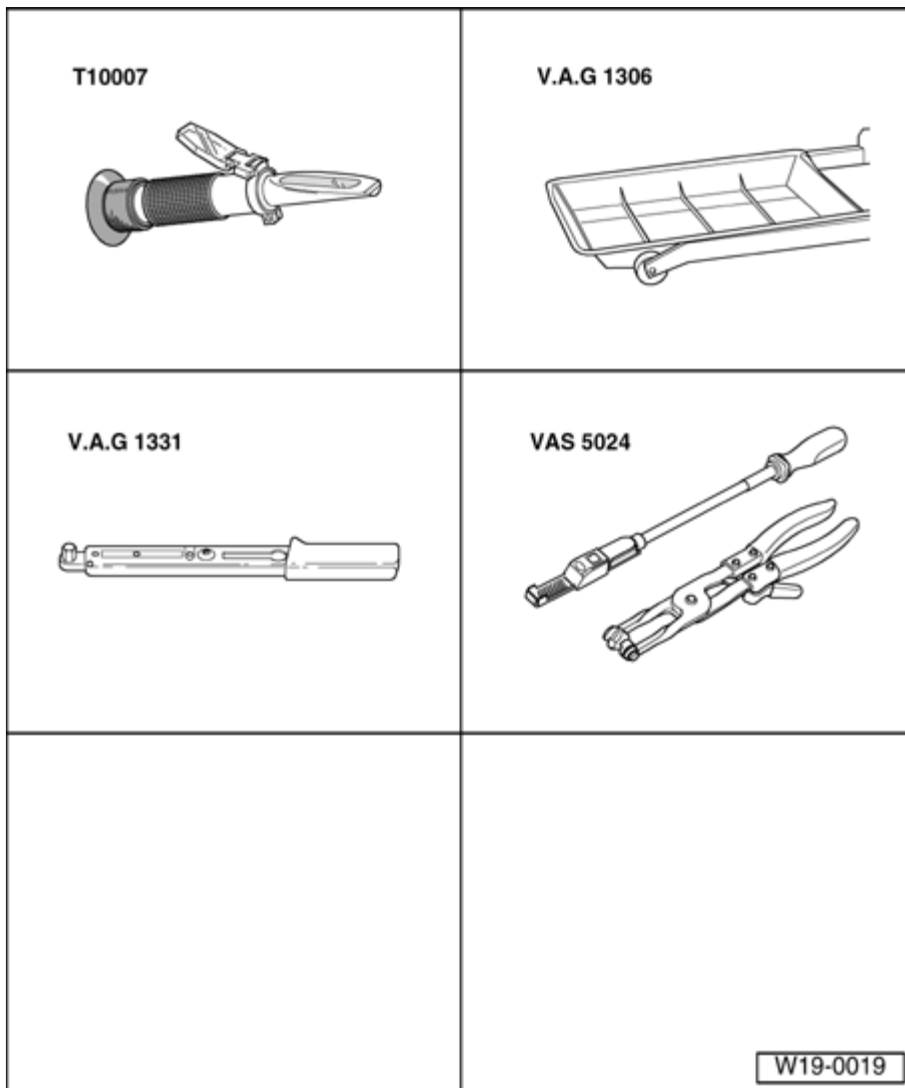


Fig. 185: Identifying Special Tools - T10007, V.A.G 1306, V.A.G 1331, VAS 5024
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools equipment

- T10007 Refractometer
- V.A.G 1306 Drip tray
- V.A.G 1331 Torque wrench (5 to 50 Nm)
- VAS 5024 Assembly tool for spring-type clips

Removing

- Drain coolant. Refer to **Draining** .

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

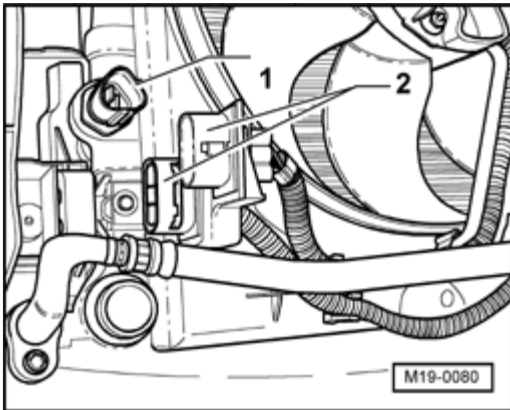


Fig. 186: Locating Thermal Switch Connectors

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect connectors from thermal switch -1- and coolant fan -2-.
- Remove front bumper:

Refer to removing and installing in **FRONT BUMPER**

- Bring lock carrier into service position:

Refer to **LOCK CARRIER SERVICE POSITION**

- Pull coolant hoses quick release couplings off radiator.
- Remove securing screws for headlight and disconnect connections

Refer to **HEADLIGHTS - GOLF** or **HEADLIGHTS - JETTA**

Vehicles with air conditioning

- Observe additional information and removal work. Refer to **Additional information and assembly work on models with air conditioning** .

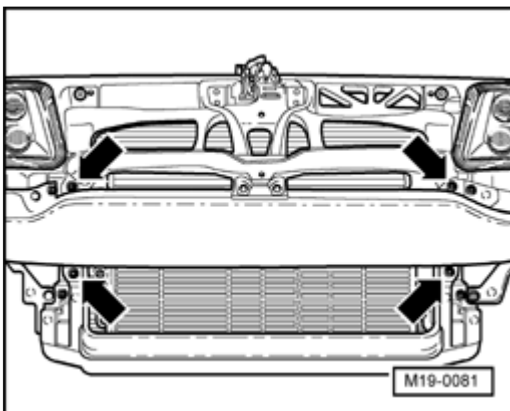


Fig. 187: Locating Air Conditioning Condenser Bolts

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove four bolts for air conditioning condenser.

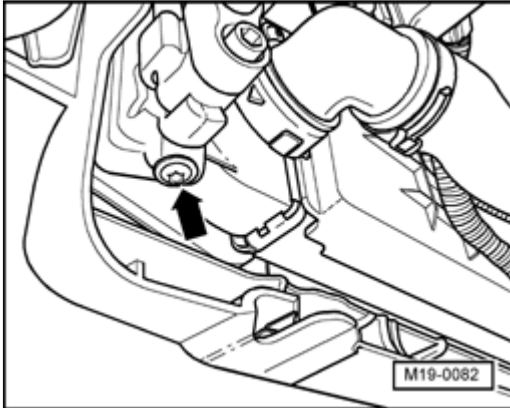


Fig. 188: Locating Air Conditioning Condenser Bracket Bolts
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove bolt (arrow) on left of radiator for condenser bracket.

Continued for all models

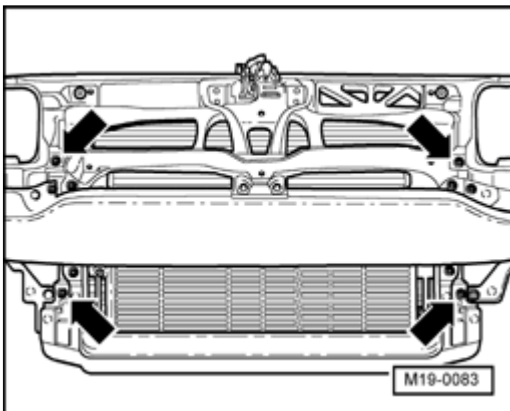


Fig. 189: Locating Radiator Bolts
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove radiator securing bolts and take radiator with fan out downward.

Installing

Installation is performed in reverse order to removal, considering the following:

Electrical connections and routing:

Refer to Electrical Wiring Diagrams, Troubleshooting & Component Locations

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Fill with coolant. Refer to **Filling** .

Additional information and assembly work on models with air conditioning

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

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

- Remove retaining clamp(s) from refrigerant lines.
- Remove radiator securing bolts from side of radiator.
- Remove condenser from radiator.
- Secure condenser to body, so that refrigerant lines/hoses are not under stress.
- Swing radiator out downward.

Coolant pump, removing and installing

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

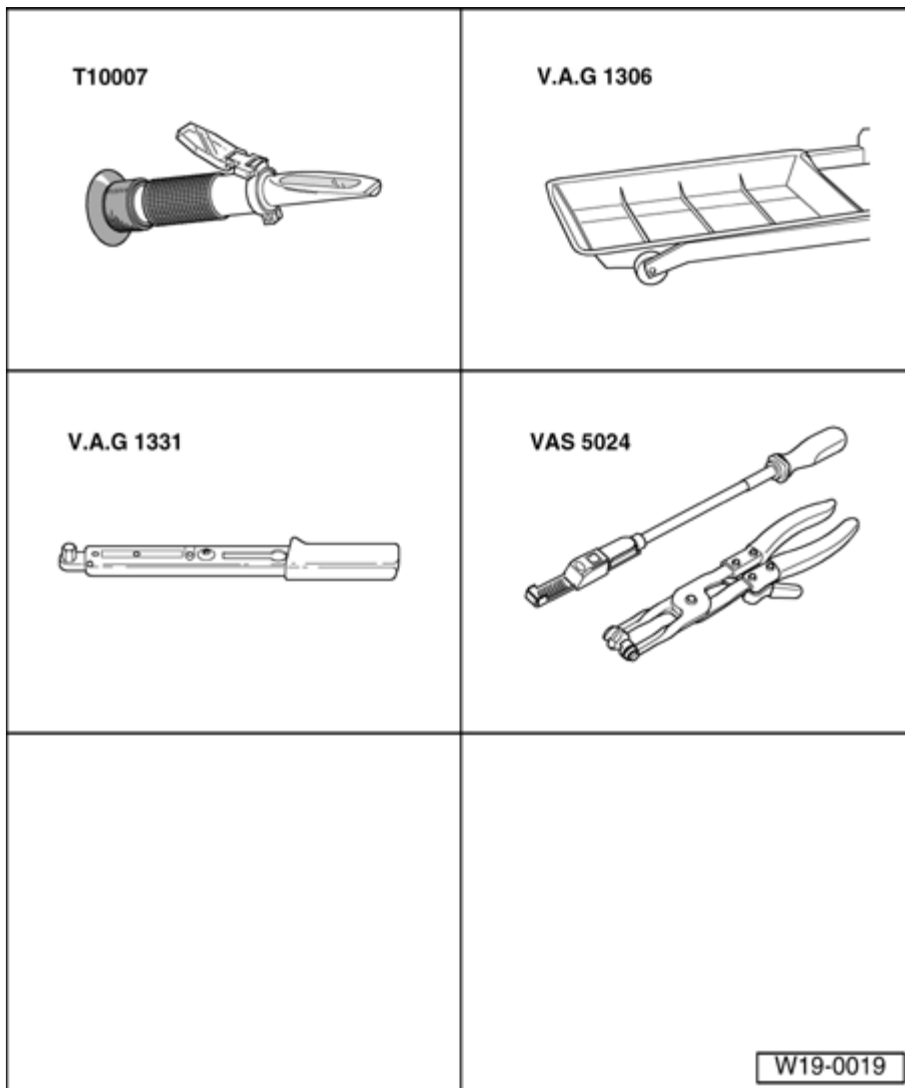


Fig. 190: Identifying Special Tools - T10007, V.A.G 1306, V.A.G 1331, VAS 5024
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools and equipment

- T10007 Refractometer
- V.A.G 1306 Drip tray
- V.A.G 1331 Torque wrench (5 to 50 Nm)
- VAS 5024 Assembly tool for spring-type clips

Removing

NOTE:

- Always replace seals and gaskets.
- The lower section of the toothed belt guard need not be removed.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- The toothed belt should be left in position on the crankshaft sprocket.
- Cover the toothed belt with a cloth to protect it from coolant before removing the coolant pump.

- Drain coolant. Refer to **Cooling system, draining and filling**.
- Remove poly V-belt. Refer to **Poly V-belt, removing and installing**.
- Remove tensioning element for poly V-belt.
- Remove upper and center sections of toothed belt guard.
- Take toothed belt off coolant pump toothed belt sprocket. Refer to **Engine codes AEG, AVH, AZG, BEV**.

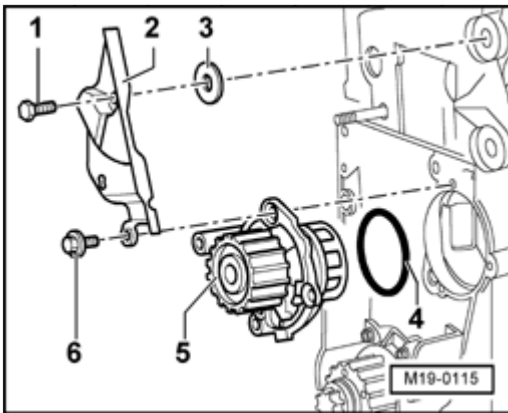


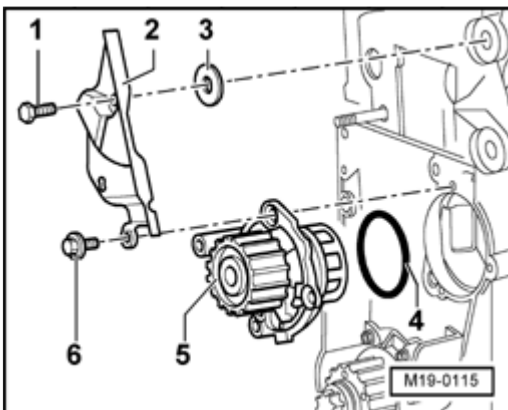
Fig. 191: Identifying Coolant Pump & Components

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Unscrew securing bolt -1- for rear toothed belt guard -2-.
- Unscrew securing bolts -6- for coolant pump and remove coolant pump -5-.

Installing

Installation is performed in the reverse sequence. Note the following:



2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Fig. 192: Identifying Coolant Pump & Components

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Moisten new O-ring -4- with coolant.
- Install coolant pump -5-. Installed position: Coolant pump sealing plug faces down.
- Tighten securing bolts -6-. Tightening torque: 15 Nm
- Tighten securing bolt -1- for rear toothed belt guard -2- on cylinder head (place washer -3- underneath). Tightening torque: 20 Nm
- Install toothed belt and adjust timing. Refer to **Engine codes AEG, AVH, AZG, BEV** .
- Install poly V-belt tensioning element. Tightening torque: 25 Nm
- Install poly V-belt. Refer to **Poly V-belt, removing and installing** .
- Fill with coolant. Refer to **Cooling system, draining and filling** .

Thermostat, removing and installing

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

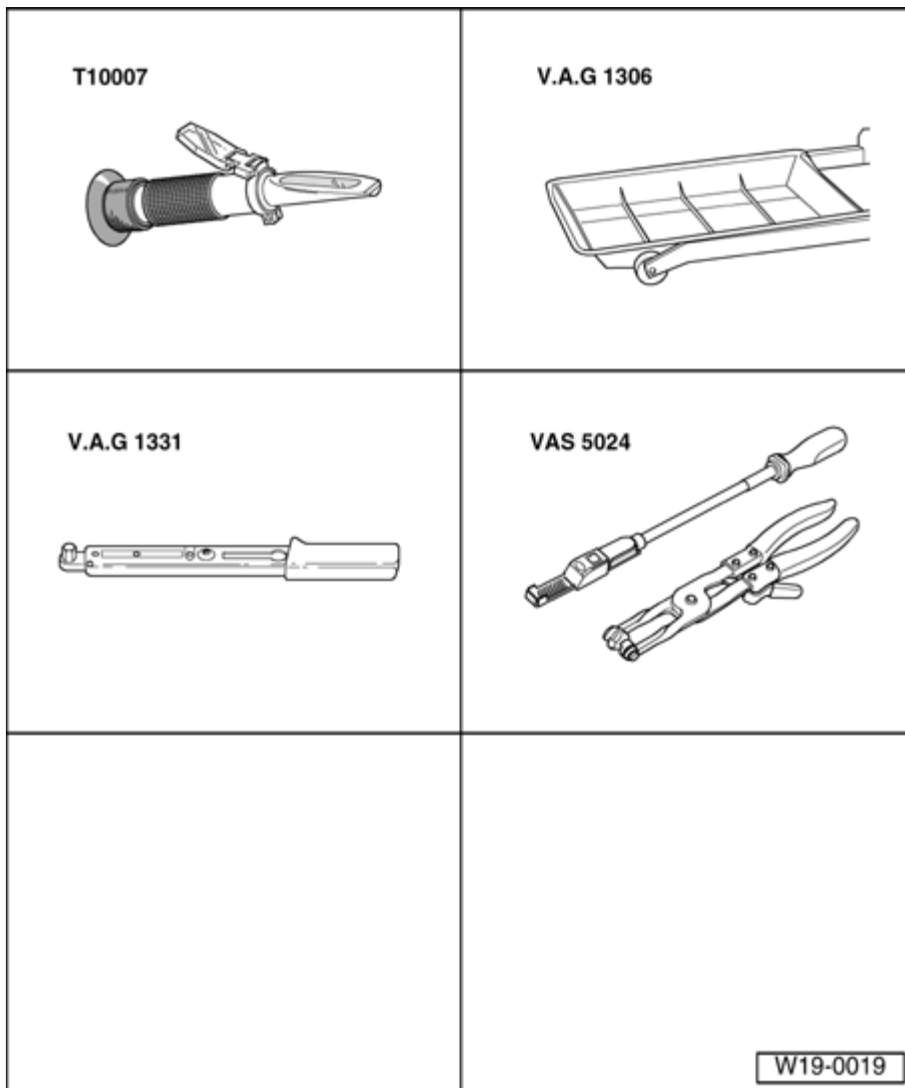


Fig. 193: Identifying Special Tools - T10007, V.A.G 1306, V.A.G 1331, VAS 5024
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools and equipment

- T10007 Refractometer
- V.A.G 1306 Drip tray
- V.A.G 1331 Torque wrench (5 to 50 Nm)
- VAS 5024 Assembly tool for spring-type clips

Removing

NOTE: Always replace seals and gaskets.

- Drain coolant. Refer to Cooling system, draining and filling .

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

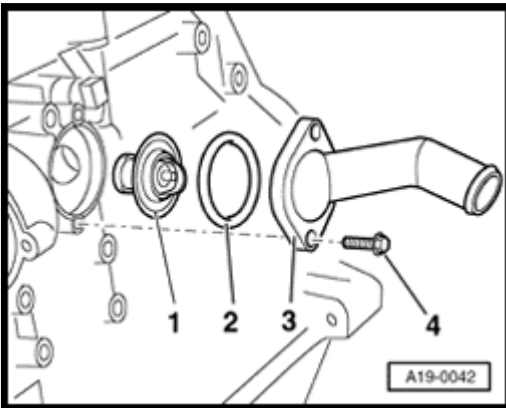


Fig. 194: Identifying Thermostat & Fasteners

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Pull coolant hose off union -3-.
- Unbolt securing bolts -4- of union -3- and remove union -3- together with thermostat -1-.

Installing

Installation is performed in the reverse sequence. Note the following:

- Moisten new O-ring -2- with coolant.
- Install union -3- with thermostat -1- into engine block.

NOTE: The brace on the thermostat must be almost vertical.

- Tighten securing bolts -4-. Tightening torque: 15 Nm
- Fill with coolant. Refer to **Filling**.

Radiator coolant fan (vehicles with engine codes AEG, AVH and AZG), checking

Special tools and equipment

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

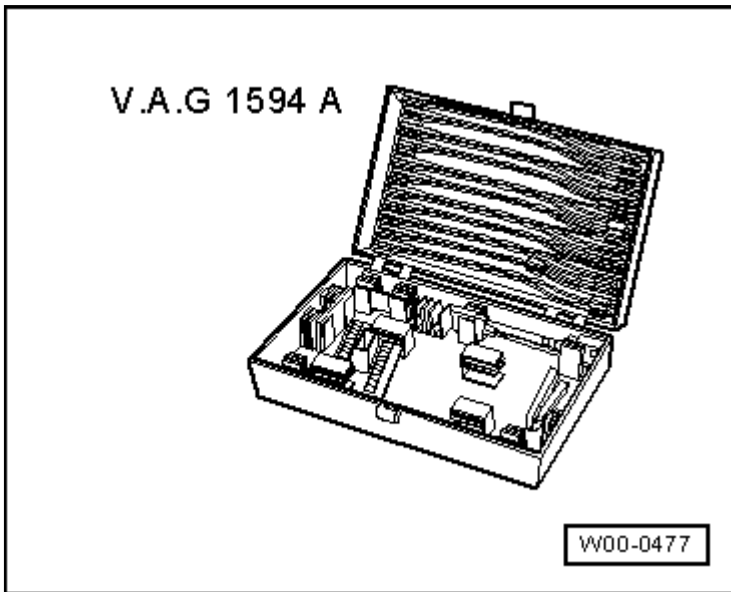


Fig. 195: Identifying V.A.G 1594 A Adapter Set
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- V.A.G 1594 A Adapter set
- Wiring diagram

Requirements

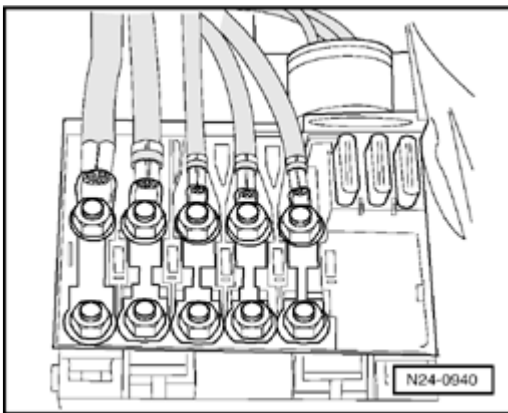


Fig. 196: Locating Coolant Fan Control Thermal Switch
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Main fuses must be OK
- Coolant Fan Control (FC) Thermal Switch -F18- OK

Work sequence

- Remove left sound insulation tray

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Refer to **NOISE INSULATION (GASOLINE ENGINES), ASSEMBLY OVERVIEW** or **NOISE INSULATION (DIESEL ENGINES), ASSEMBLY OVERVIEW**

- Disconnect 3-pin connector from Coolant Fan Control (FC) thermal switch -F18-
- Bridge contact -1- and contact -2- of connector with auxiliary cables from V.A.G 1594 A

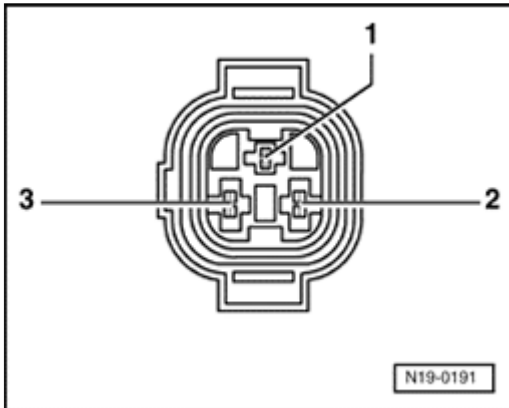


Fig. 197: Coolant Fan Control Thermal Switch 3-Pin Connector - Connector Type A
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Connector type A

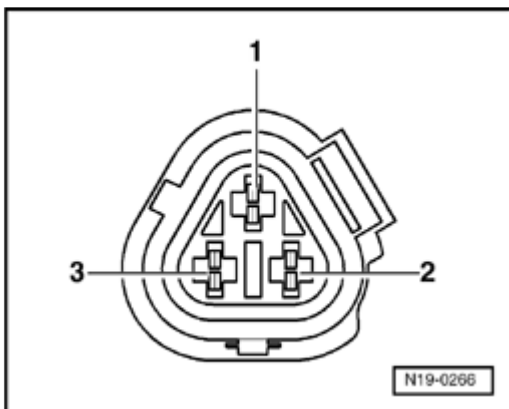


Fig. 198: Coolant Fan Control Thermal Switch 3-Pin Connector - Connector Type B
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Connector type B

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

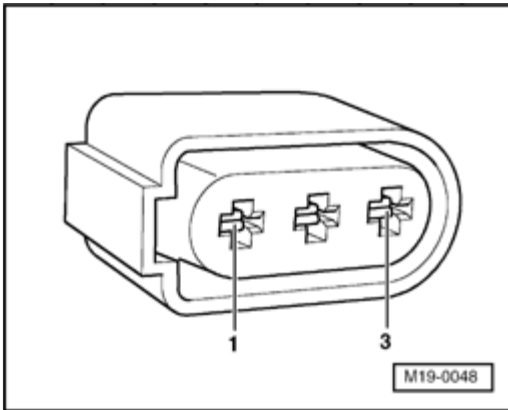


Fig. 199: Coolant Fan Control Thermal Switch 3-Pin Connector - Connector Type C
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Connector type C

1st speed for Coolant fan -V7- and Right coolant fan -V35- must run.

- Switch ignition on.
- Bridge contact -2- and contact -3- of connector with auxiliary cables from V.A.G 1594 A.
- 2nd speed for Coolant fan -V7- and Right coolant fan -V35- must run.

If fan 1st or 2nd speeds do not run:

- Locate and repair open circuit:

Refer to Electrical Wiring Diagrams, Troubleshooting & Component Locations

If no malfunction in wiring is detected:

- Replace Coolant fan -V7- and Right coolant fan -V35-.

20 FUEL SUPPLY

FUEL SUPPLY SYSTEM COMPONENTS, REMOVING AND INSTALLING

Fuel supply system components, removing and installing

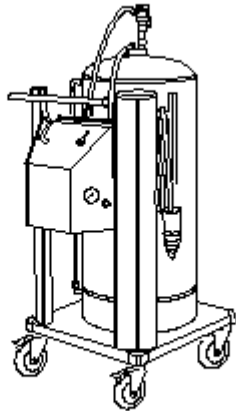
NOTE:

- Hose connections are secured with either spring-type or clamp-type clips.
- Always replace clamp-type clips with spring-type clips.
- Fuel hoses of engine must only be secured with spring-type clips. The use of clamp or screw-type clips is not permitted.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

VAS 5190



W00-1107

Fig. 200: Identifying Fuel pump Unit VAS 5190
Courtesy of VOLKSWAGEN UNITED STATES, INC.

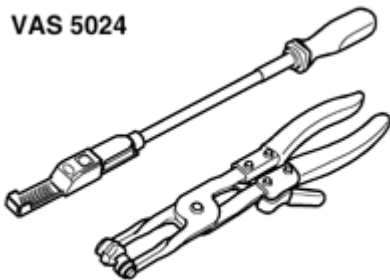
- Fuel pump unit VAS 5190 is recommended for emptying the fuel tank.

Engine code BBW

Contrary to the operating instructions the draining must not occur via the filler neck in this engine/vehicle or inner components will be damaged. Empty the fuel tank only via the open flange. Refer to **Engine code BBW**, Removing and installing fuel delivery unit.

Continued for all engines

VAS 5024



W00-0495

Fig. 201: Identifying Assembly Tool VAS 5024
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Assembly tool VAS 5024 or hose clip pliers V.A.G 1921 are recommended for installing spring-type clips.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Removing and installing fuel tank with attachments and fuel filter. Refer to **Fuel Tank, Removing and Installing** .

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

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

Engines: AEG, AVH, AZG

Servicing accelerator mechanism **Accelerator mechanism, servicing**

Adjusting throttle cable. Refer to **Throttle cable, adjusting**

Continued for all engines

Note crash fuel shut off. Refer to **Crash fuel shut-off**

Electronic Power Control (EPC), checking. Refer to **Electronic Power Control (EPC) system**

Evaporative Emissions system components, servicing. Refer to **Engine code AEG** .

Fuel tank with attachments and fuel filter, removing and installing

- Engine code BBW. Refer to **Engine code BBW**

Engine codes AEG, AVH, AZG, BEV

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

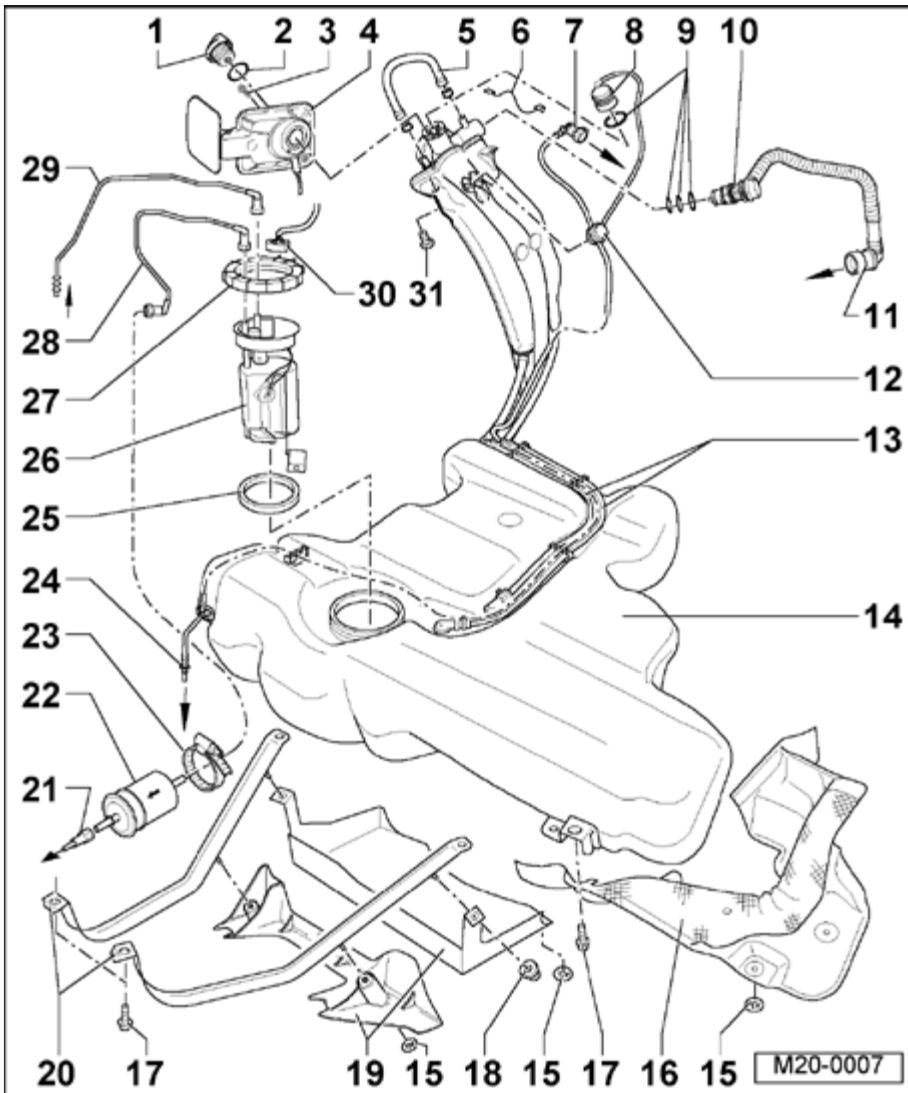


Fig. 202: Identifying Fuel Tank With Attachments And Fuel Filter (Engine Codes AEG, AVH, AZG, BEV)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Filler cap

- As of model year 2000 with lose protection

2 - Seal

- Replace if damaged

3 - Mounting screw

- With rubber cup

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

4 - Tank flap unit

5 - Breather line

- Black
- Check seated securely
- Clipped onto top of fuel tank

6 - Ground connection

- Check seated securely

7 - Breather pipe

- White
- Check seated securely
- From union. Refer to **Evaporative Emissions (EVAP) system components, servicing** , item 3
- Press together at front to release.

8 - Gravity valve

- To remove valve unclip upward out of support
- Check valve for through flow

Valve vertical: Open

Valve tilted 45 ° : Closed

9 - O-ring

- Replace if damaged

10 - Change-over valve

- To remove valve unclip sideways out of support
- Remove cover before installing. Refer to item 1
- Checking. Refer to **Fig. 203** & **Fig. 204**

11 - Breather line

- Black
- Check seated securely
- From union. Refer to **Engine code AEG** , item 2
- Press together at front to release

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

12 - Pressure retention valve

- Checking. Refer to **Fig. 205**

13 - Breather line

- Black
- Check seated securely
- Clipped onto top of fuel tank
- Press together at front to release

14 - Fuel tank

- When removing, support with engine and transmission jack V.A.G 1383 A
- Removing and installing. Refer to **Fuel Tank, Removing and Installing**

15 - Clamping washer

16 - Heat shield

- For fuel tank

17 - 25 Nm

18 - Lock nut, 2 Nm

19 - Fuel tank cover

20 - Securing strap

- Note different lengths
- Installation position: Fixing (holes) point forward

21 - Supply line

- Black
- Check for secure seating
- To remove from fuel filter, press release buttons on connecting piece.
- To fuel supply line on fuel rail

22 - Fuel filter

- Installation position: Arrows point in direction of flow

23 - Screw-type clip

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Note installation position. Refer to **Fig. 205**

24 - Breather line

- White
- Check seated securely
- Clipped onto side of fuel tank
- To Evaporative Emission (EVAP) Canister Purge Regulator Valve -N80-. Refer to **Engine code AEG**

25 - Seal

- Replace if damaged
- When installing, insert seal "dry" into fuel tank opening
- Moisten seal with fuel only when installing flange or fuel delivery unit. Refer to **Fuel gauge sender, removing and installing**

26 - Fuel delivery unit

- Note installation position of flange on fuel tank. Refer to **Fig. 208**
- Removing and installing. Refer to **Fuel delivery unit, removing and installing**
- Removing and installing fuel gauge sender. Refer to **Fuel gauge sender, removing and installing**
- Checking fuel pump. Refer to **Fuel Pump, Checking**
- Clean strainer if dirty

27 - Union nut, 75 Nm

- Remove and install using wrench 3217

28 - Supply line

- Black
- Check for secure seating
- Clipped onto side of fuel tank
- To remove from fuel filter, press release buttons on connecting piece.

29 - Return hose

- Blue or with blue markings
- Clipped onto side of fuel tank
- Check for secure seating
- To remove from flange press release buttons on connecting piece

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- From fuel return line on fuel rail

30 - Connector

- Black, 4-pin
- For Sender for fuel gauge -G- and Fuel Pump -G6-

31 - 10 Nm

Installed position of flange of fuel delivery unit

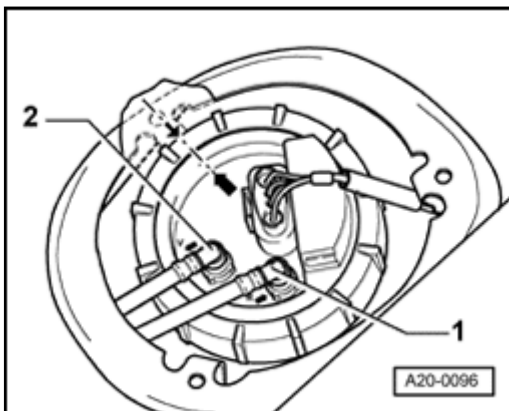


Fig. 203: Installed Position Of Flange Of Fuel Delivery Unit
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Marking on sender must align with the marking on fuel tank (arrows)

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

Black supply line -2- to connection marked -V-

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

Checking Switch Valve

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

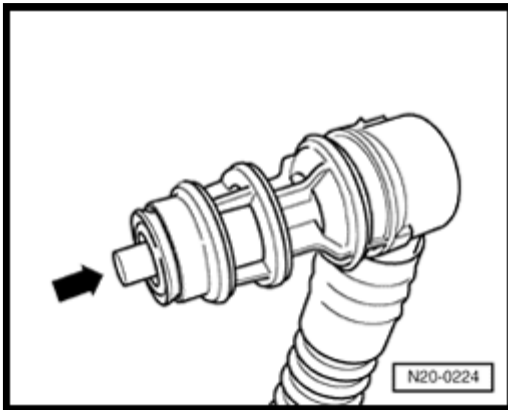


Fig. 204: Checking Switch Valve

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Lever in rest position: Closed

Lever pushed in direction of (arrow): Open

NOTE: Unscrew filler cap from fuel tank, before installing breather valve

Checking Pressure Retention Valve

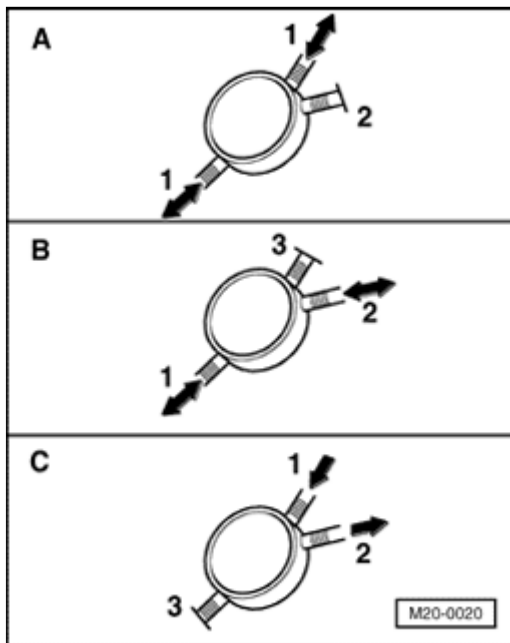


Fig. 205: Checking Pressure Retention Valve

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Check flow direction of valve.

A) Connection 1 - 1:

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Flow in both directions.
- Connection -2- is closed

B) Connection 1 - 2:

- Flow in both directions.
- Connection -3- is closed

C) Connection 1 - 2:

- Flow in both directions.
- Connection -2- is closed
- Valve must close when a vacuum is supplied to connection -1-

Installation position of screw-type clip relative to fuel filter bolt

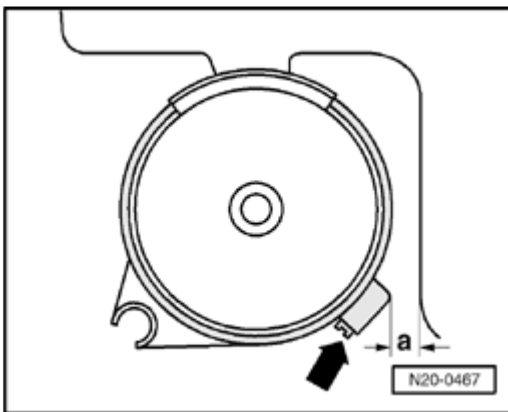


Fig. 206: Installation Position Of Screw-Type Clip Relative To Fuel Filter Bolt
Courtesy of VOLKSWAGEN UNITED STATES, INC.

NOTE: The illustration shows the fuel filter as seen from the front.

- Install screw-type clip (arrow) as shown in illustration.

Make sure there is sufficient distance between clip screw fixture and fuel tank. Dimension "a" must be at least 5 mm.

Engine code BBW

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

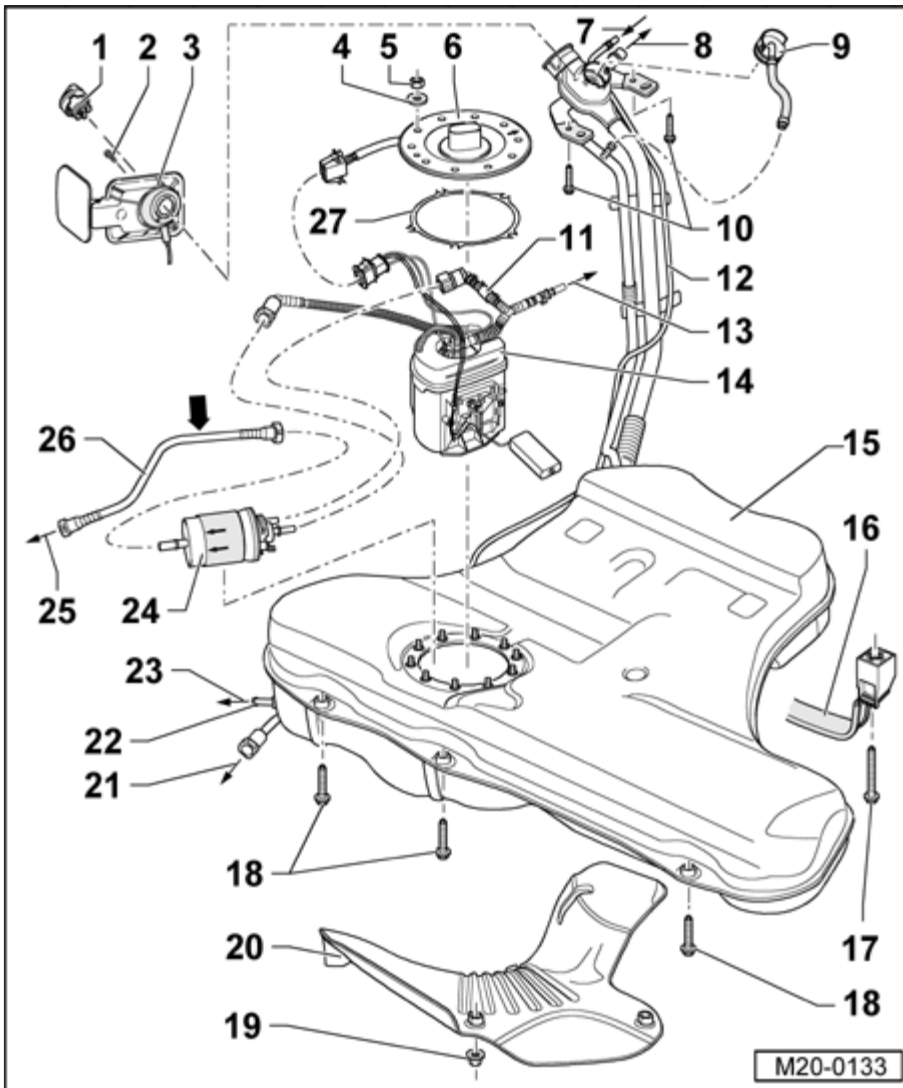


Fig. 207: Identifying Fuel Tank With Attachments And Fuel Filter (Engine Code BBW)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Filler cap

- With retaining device
- Replace if damaged

2 - Mounting screw

3 - Tank flap unit

- With rubber cup
- Removing and installing

Refer to **TANK FLAP UNIT**

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

4 - Washer

5 - 7 Nm

6 - Flange

- Observe installation position. See **Fig. 208** .

7 - From Evaporative Emissions (EVAP) canister

- Refer to **Engine code AEG**

8 - To EVAP canister

- Refer to **Engine code AEG**

9 - Non-return valve

- For removal remove fuel tank
- For removal press tabs in
- Must have a passageway in direction of filler neck

10 - 10 Nm

11 - Non-return valve for fuel pump

- Checking. Refer to **Fuel Pump, Checking**

12 - Breather pipe

- White
- Check seated securely
- Clipped onto side of fuel tank
- To EVAP canister purge regulator valve -N80-. Refer to **Engine code AEG**

13 - To suction jet pump

- Suction jet pump installed tightly in fuel tank to drain tank.

14 - Fuel delivery unit

- Removing and installing. Refer to **Fuel delivery unit, removing and installing**
- Removing and installing fuel gauge sender. Refer to **Fuel gauge sender, removing and installing**
- Checking fuel pump. Refer to **Fuel Pump, Checking**
- Clean strainer if soiled

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- If fuel delivery unit has been replaced, fuel system must be bled. Refer to **Fuel system, bleeding**

15 - Fuel tank

- When removing, support with engine/transmission jack V.A.G 1383 A
- Removing and installing. Refer to **Fuel Tank, Removing and Installing**

16 - Securing strap

- With rubber profile and distance piece

17 - 20 Nm plus 1/4 turn (90 °)

- Always replace

18 - 20 Nm plus 1/4 turn (90 °)

- Always replace

19 - 3 Nm

20 - Heat shield

- For fuel tank

21 - To EVAP canister purge regulator valve -N80-

- Refer to **Engines: BBW, BEV** , item -8-

22 - Union for supply line

23 - To fuel rail

24 - Fuel filter

- Installation position: Arrows point in direction of flow
- Installed in fuel tank
- Removing and installing. Refer to **Fuel filter, removing and installing**
- Removing and installing fuel pressure regulator. See **Fig. 209**
- If fuel filter has been replaced, the fuel system must be bled. Refer to **Fuel system, bleeding**

25 - To union in fuel tank

26 - Supply line

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Black
- Check if seated securely
- To remove fuel filter and union press safety ring in at junction piece
- Observe installed position: long straight connection (arrow) faces fuel filter

27 - Seal

- Replace
- Observe installed position: Bulge lies on fuel tank

Installed position of flange of fuel delivery unit

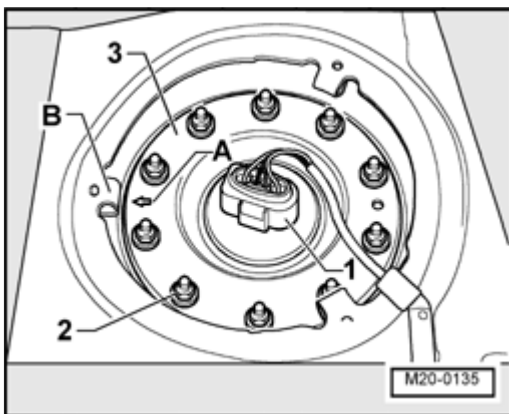


Fig. 208: Installed Position Of Flange Of Fuel Delivery Unit
Courtesy of VOLKSWAGEN UNITED STATES, INC.

The arrow -A- on the flange must be parallel with the vehicle longitudinal axle and must face backward, -B-.

Removing and installing fuel pressure regulator

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

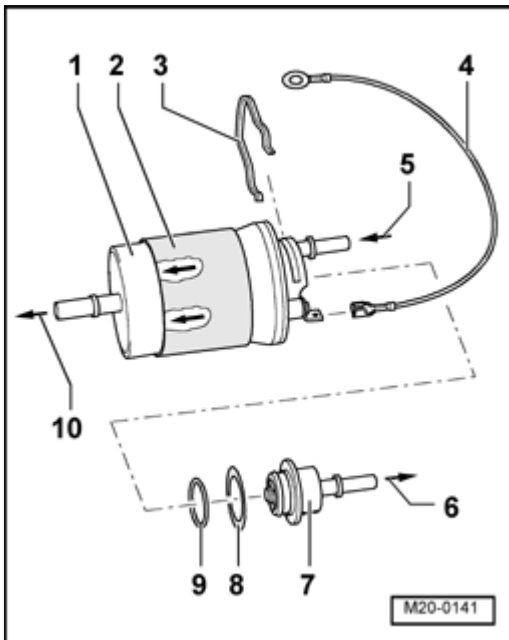


Fig. 209: Removing And Installing Fuel Pressure Regulator
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- 1 - Fuel filter: Arrows point in flow direction
- 2 - Rubber hose
- 3 - Retaining clip: Check if seated securely
- 4 - Ground strap: Mounted on fuel filter retainer
- 5 - Supply line: From fuel pump
- 6 - Return line: To fuel pump
- 7 - Fuel pressure regulator: Checking. Refer to **Fuel Pump, Checking**
- 8 - Seal: Replace
- 9 - O-ring: Replace
- 10 - Supply line: To union in fuel tank

Safety precautions when working on the fuel supply system

CAUTION: When performing repair work, especially due to the confined conditions in the engine compartment, pay attention to the following:

- **Route all types of lines (e.g. for fuel, hydraulics, EVAP system,**

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

coolant, refrigerant, brake fluid and vacuum) as well as electrical wiring so that the original positions are restored.

- **Ensure sufficient clearance to all moving or hot components.**

When removing and installing the fuel gauge sender or the fuel pump (fuel delivery unit) the following must be observed:

WARNING:

- **The fuel system is under pressure! Before opening the system place a cloth around the connection. Then release the pressure by carefully loosening the connection.**
- **Always wear eye protection and wear fuel-resistant gloves when disconnecting system connections.**
- Before beginning work, switch on exhaust extraction system and place an extraction hose close to the sender opening in the fuel tank to extract escaping fuel fumes. If no exhaust extraction system is available, a radial fan with a displacement greater than 15 m³/h can be used (as long as motor is not in air flow).
- Prevent skin contact with fuel! Wear fuel-resistant gloves!

All engines

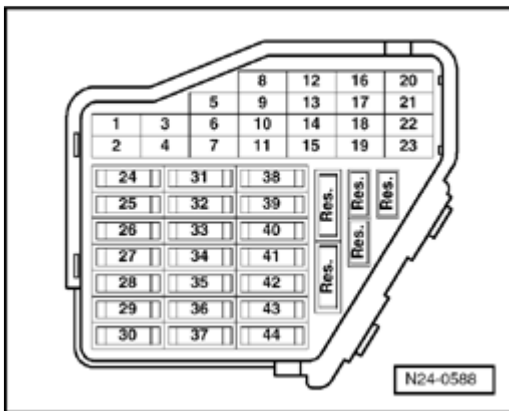


Fig. 210: Identifying Main Fuse Panel

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- For safety reasons, fuse No. 28 must be removed from the fuse holder before opening the fuel system. This is because the fuel pump can be activated by the door contact switch in driver's door.

Rules for cleanliness

When working on the fuel supply/injection system, pay careful attention to the following 5 rules:

- Thoroughly clean all unions and the adjacent areas before disconnecting.
- Place parts that have been removed on a clean surface and cover. Do not use fluffy cloths!

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Carefully cover opened components or seal, if the repair cannot be performed immediately.
- Only install clean components: Only unpack replacement parts immediately prior to installation. Do not use parts that have been stored loose (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.

Fuel delivery unit, removing and installing

Engine codes AEG, AVH, AZG, BEV

- Engine code BBW. Refer to **Engine code BBW**

Special tools and equipment

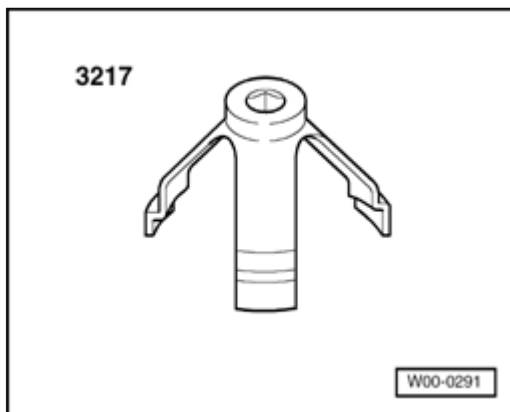


Fig. 211: 3217 Ring Nut Spanner

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- 3217 Ring nut spanner

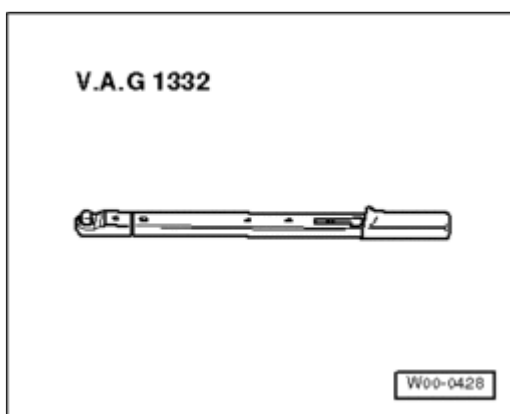


Fig. 212: Torque Wrench V.A.G. 1332 (40 To 200 Nm)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

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

Requirement

- Fuel tank must not be more than 1/2 full

Removing

NOTE:

- Empty fuel tank with fuel extractor VAS 5190, if necessary.
- Note safety precautions before beginning work. Refer to Safety precautions when working on the fuel supply system .

WARNING:

- The fuel system is under pressure! Before opening the system place a cloth around the connection. Then release the pressure by carefully loosening the connection.
- Always wear eye protection and wear fuel-resistant gloves when disconnecting system connections.

- Check whether a coded radio is installed. If so, obtain anti-theft coding.
- With ignition switched off, disconnect battery ground (GND) strap.
- Fold rear seat bench forward.
- Remove cover from fuel delivery unit.

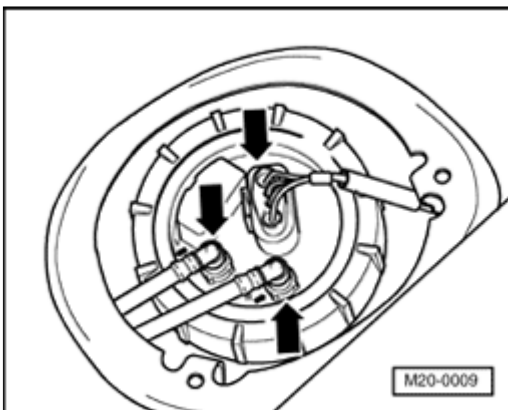


Fig. 213: Fuel Delivery Unit Connector & Supply And Return Lines
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect 4- pin connector as well as supply and return lines from flange (arrow).

NOTE: To do this, press on hose couplings.

- Seal lines so that fuel system is not contaminated by dirt etc.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

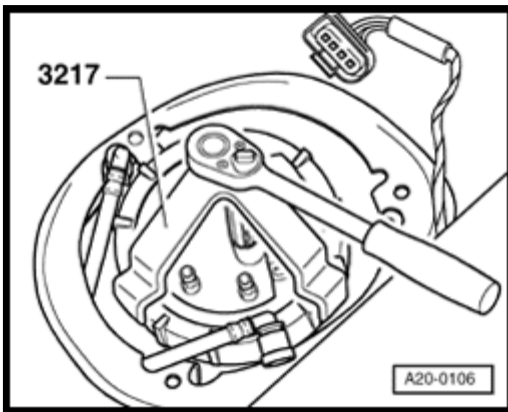


Fig. 214: Removing/Installing Union Nut With Wrench 3217
Courtesy of VOLKSWAGEN UNITED STATES, INC.

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

NOTE: If the delivery unit is to be replaced then drain old delivery unit before disposing.

Installing

Installation of fuel delivery unit is performed in reverse order.

- NOTE:**
- Insert seal for flange or fuel delivery unit dry into opening of fuel tank.
 - Moisten seal with fuel only when installing flange or fuel deliver unit.
 - Take care not to bend the fuel gauge sensor when installing fuel delivery unit.

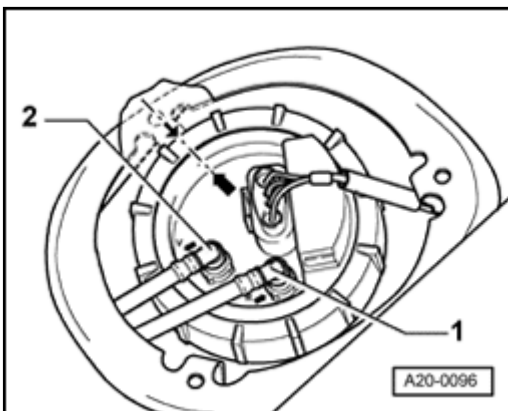


Fig. 215: Installed Position Of Flange Of Fuel Delivery Unit
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Note installation position of fuel delivery unit flange.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Mark on flange must align with mark on fuel tank (arrows).

- Make sure fuel hoses are tight.
- After installing fuel delivery unit, check that supply, return and breather lines are still clipped onto fuel tank.
- Adapt (match) engine control module to throttle valve control module. Refer to **Adapting components and functions** , Adapting components and functions.
- Generate readiness code again if DTC memory has been erased or engine control module was disconnected from permanent positive, refer to **Adapting components and functions** , Adapting components and functions.

Engine code BBW

Special tools and equipment

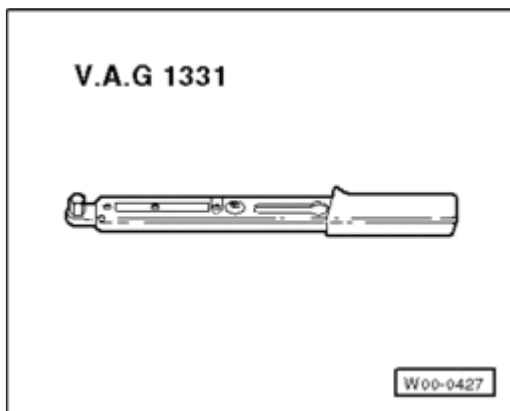


Fig. 216: Torque Wrench V.A.G. 1331 (5 To 50 Nm)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

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

Requirements

- Fuel tank must be empty

Removing

NOTE:

- **Observe safety precautions before starting work. Refer to Safety precautions when working on the fuel supply system .**
- **The fuel extraction unit VAS 5190 is recommended for emptying the fuel tank. Contrary to the operating instructions the draining must not occur via the filler neck in this engine/vehicle or inner components will be damaged. Drain the fuel tank only via the opened flange.**

WARNING:

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- **The fuel system is under pressure! Before opening the system place a cloth around the connection. Then release the pressure by carefully loosening the connection.**
- **Always wear eye protection and wear fuel-resistant gloves when disconnecting system connections.**

- 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.

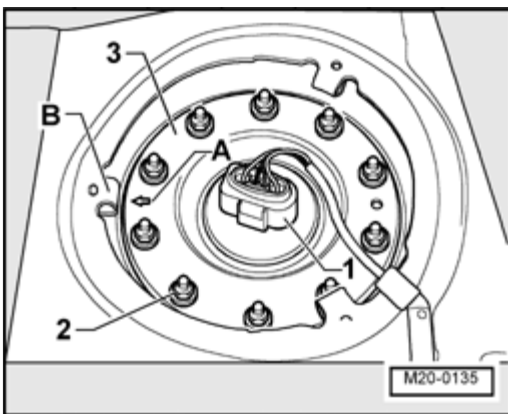


Fig. 217: Installed Position Of Flange Of Fuel Delivery Unit
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect 4-pin connector -1-.
- Unscrew nuts -2- and take flange -3- off.

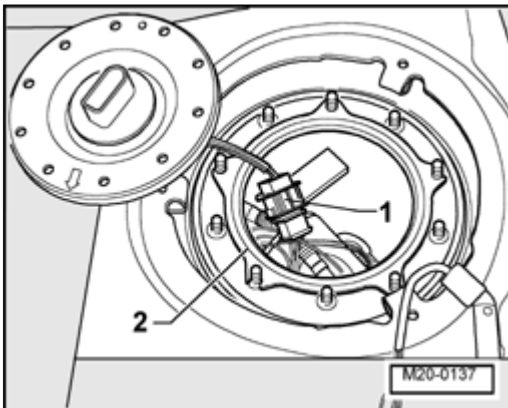


Fig. 218: Fuel Delivery Connector & Seal
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect connector -1-.
- Remove seal -2-

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Drain fuel tank via flange opening, e.g. with VAS 5190.

NOTE: For ease of illustration, the fuel tank upper shell is not shown. The components are shown simplified.

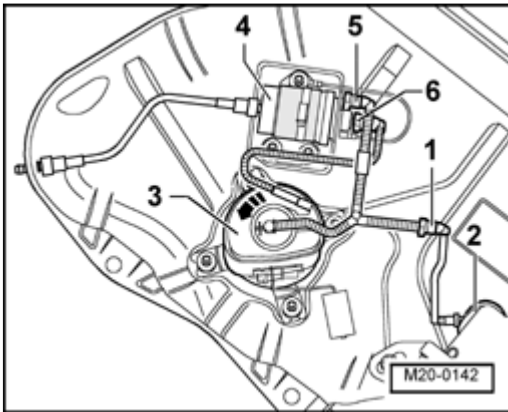


Fig. 219: Fuel Delivery Unit, Jet Pump, Connector & Fuel Return & Supply Lines
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Separate connector -1- on wiring to suction jet pump -2- by pressing in safety ring on connector.

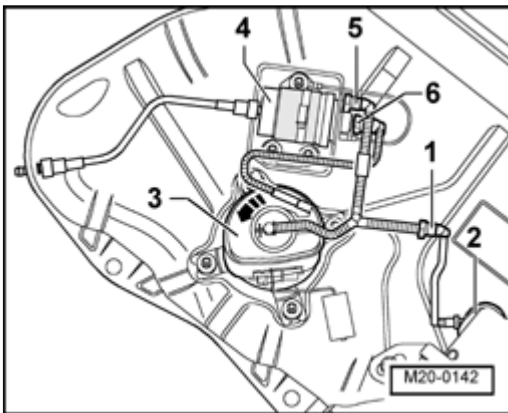


Fig. 220: Fuel Delivery Unit, Jet Pump, Connector & Fuel Return & Supply Lines
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Turn fuel delivery unit -3- in counter-clockwise direction (approx. 45 °), take it out of bayonet joint and place to side.

NOTE: Observe that the strainer filter and the fuel gauge sender are not damaged.

- Remove fuel return hose -6- first from fuel filter and then supply hose -5-.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

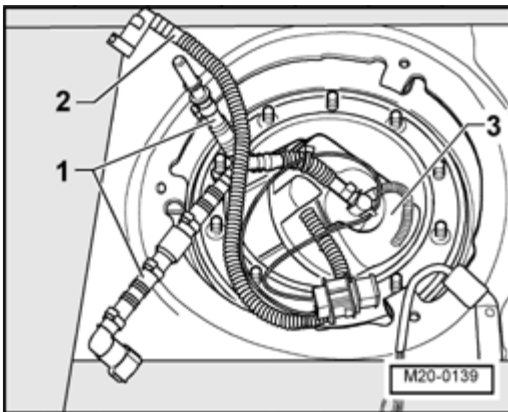


Fig. 221: Removing/Installing Supply Line, Return Hose & Fuel Supply Unit
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Take out supply line -1- of flange cut -out and then return hose -2-. Carefully remove fuel supply unit -3-.

NOTE:

- When removing the fuel supply unit observe that the fuel gauge sender is not damaged.
- If the fuel delivery unit is to be replaced then drain the old fuel delivery unit before disposal.

Installing

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

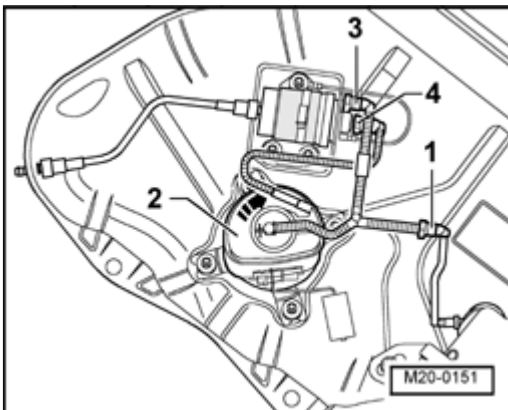


Fig. 222: Fuel Delivery Unit Connectors, Outer Supply Line, & Return Hose
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect connectors -1-, -3- and -4- (outer supply line -3-, return hose -4-, center of fuel retainer).

NOTE:

The supply and return hose connectors must audibly engage. Check for correct seat by tightening.

- Turn fuel delivery unit -2- in bayonet joint to right onto limit stop.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

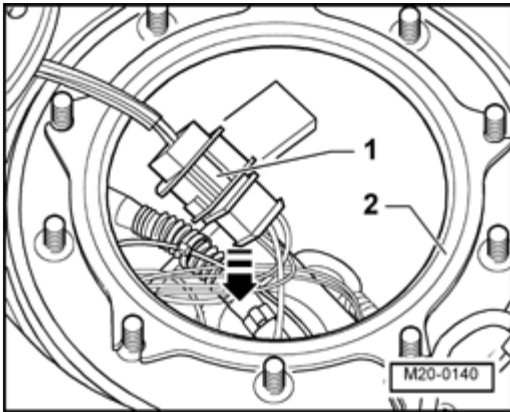


Fig. 223: Installing Fuel Delivery Unit Seal & Connector
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Install new seal -2- with bulge facing fuel tank.
- Place connector -1- in direction of arrow against fuel gauge sender behind fuel supply unit.

NOTE: The working area of the float must not be reduced.

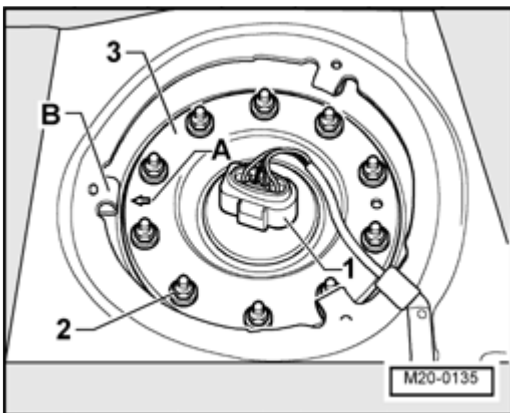


Fig. 224: Installed Position Of Flange Of Fuel Delivery Unit
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Install locking device -3- so that arrow -A- is parallel to vehicle longitudinal axle and faces backward, -B- .
- Tighten nuts -2- in a diagonal sequence.

Tightening torque: 7 Nm

- Connect 4-pin connector -1-.
- Adapt (match) engine control module to throttle valve control module. Refer to **Adapting components and functions** .
- Generate readiness code again if DTC memory has been erased or engine control module was disconnected from permanent positive, refer to **Adapting components and functions** .

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Fuel gauge sender, removing and installing

Engine codes AEG, AVH, AZG, BEV

- Engine code BBW. Refer to **Engine code BBW**

Removing

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

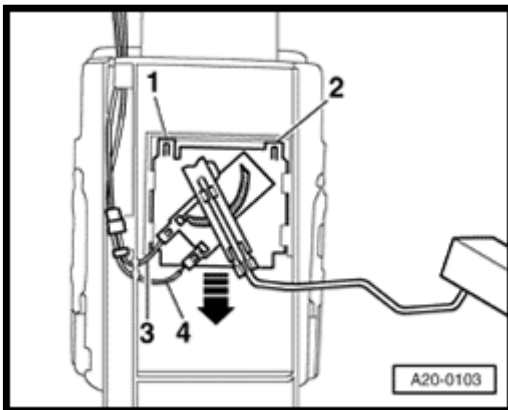


Fig. 225: Fuel Gauge Sender Connectors & Retaining Tabs (Engine Codes AEG, AVH, AZG, BEV)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Release line connector tabs -3- and -4- and pull off.
- Lift retaining tabs -1- and -2- with a screwdriver and pull fuel gauge sender out downward in direction of arrow.

Installing

- Insert fuel gauge sender in guides on fuel delivery unit and push up until it engages.
- Install fuel delivery unit. Refer to **Fuel delivery unit, removing and installing** .

Engine code BBW

Removing

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

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

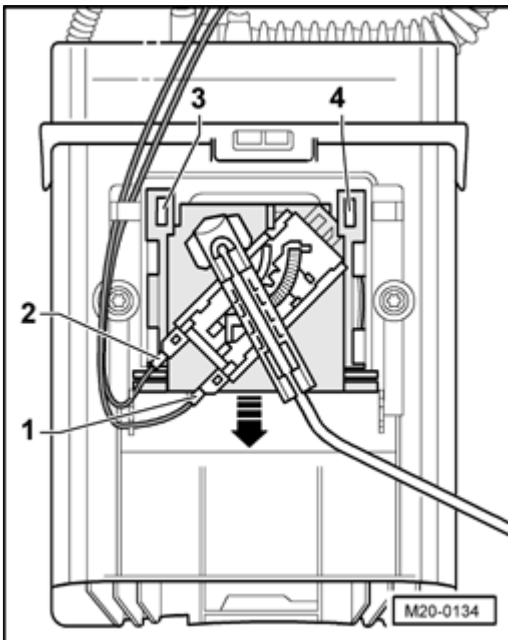


Fig. 226: Fuel Gauge Sender Connectors & Retaining Tabs (Engine Code BBW)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Release and disconnect terminals for wires -1- and -2-.
- Lift retaining tabs -3- and -4- with a screwdriver and pull fuel gauge sender out downward in direction of arrow.

Installing

- Insert fuel gauge sender in guides on fuel delivery unit and push up until it engages.
- Connect terminals for wires -1- (blue) and -2- (black).
- Install fuel delivery unit. Refer to **Fuel delivery unit, removing and installing** .

Fuel filter, removing and installing

Engine code BBW

Special tools and equipment

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

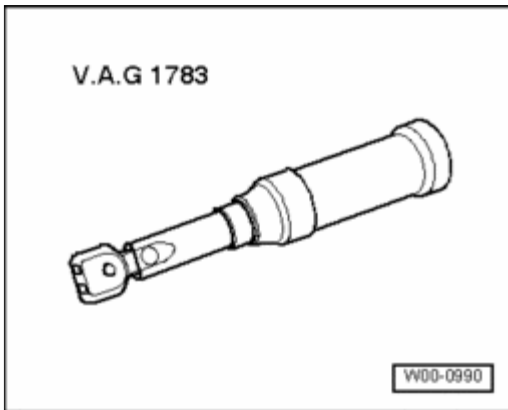


Fig. 227: V.A.G 1783 Torque Wrench (2 To 10 Nm)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- V.A.G 1783 Torque wrench (2 to 10 Nm)

Removing

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

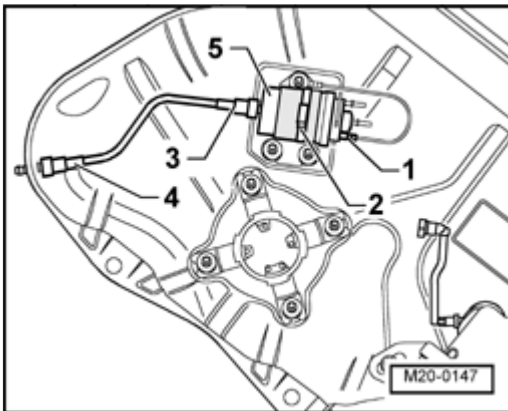


Fig. 228: Fuel Filter, Ground Strap, Supply Hose & Clamp
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect Ground strap -1-.
- Disconnect supply hose from connection -3- or -4- (depending upon accessibility) by pressing in safety ring on connector.
- Loosen clamp -2- and remove fuel filter -5- to side.

Installing

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

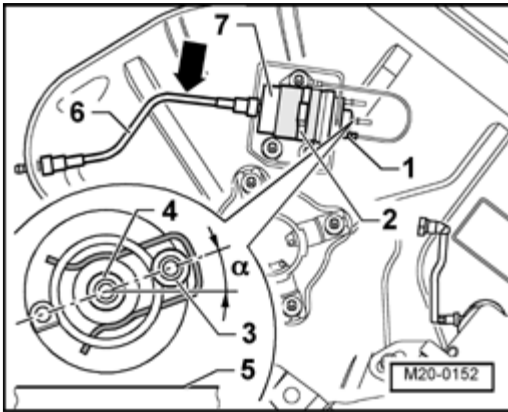


Fig. 229: Installation Position Of Fuel Filter

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Position fuel filter -7- as shown in figure.

a - approx. 20 °

3 - Supply line

4 - Return line

5 - Fuel tank

- Tighten fixed clamp -2-.

Tightening torque: 3 Nm

- Connect supply line -6- to fuel tank union or fuel filter.

NOTE:

- **Observe installed position: Long straight connection (arrow) faces fuel filter.**
- **Connector must audibly engage. Check for correct seat by tightening.**

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

Fuel Tank, Removing and Installing

Engine Codes AEG, AVH, AZG, BEV

- Engine code BBW

Special tools, testers and auxiliary items required

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

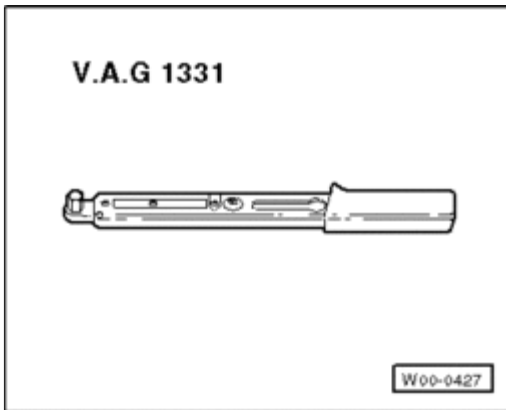


Fig. 230: Torque Wrench V.A.G. 1331 (5 To 50 Nm)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Torque wrench (5 to 50 Nm) VAG 1331

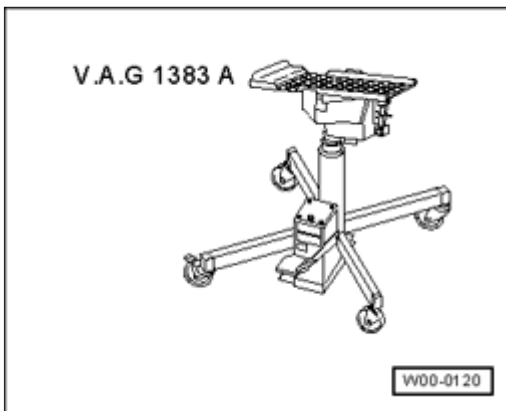


Fig. 231: Engine & Transmission Jack VAG 1383 A
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Engine and transmission jack VAG 1383 A

Removing

NOTE:

- **Observe safety precautions before starting work Refer to Safety precautions when working on fuel supply system under FUEL SUPPLY.**
- **The fuel extraction unit VAS 5190 is recommended for emptying the fuel tank.**

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

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Drain fuel tank and clean fuel filter neck and surrounding area.
- Remove securing bolt on filler neck.
- Fold rear seat bench forward.
- Remove cover from under fuel tank.
- Remove rear axle: Refer to **42 REAR SUSPENSION** .

CAUTION:

- The fuel system is under pressure! Before opening the system place a cloth around the connection. Then release the pressure by carefully loosening the connection.
- Always wear eye protection and wear fuel-resistant gloves when disconnecting system connections.

- Remove cover from fuel delivery unit.

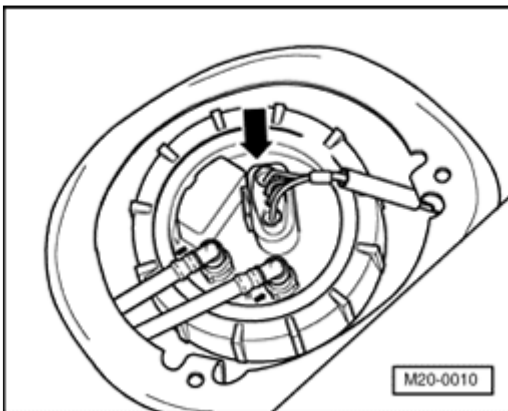


Fig. 232: Fuel Delivery Connector

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect 4- pin connector from flange - **arrow** -.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

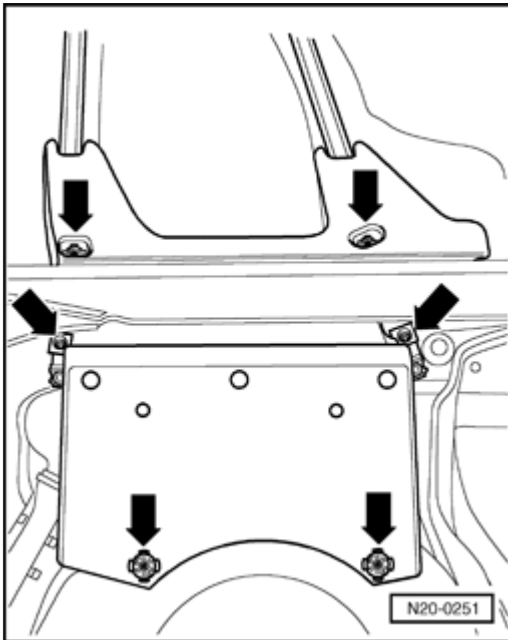


Fig. 233: Cover & Bolts From Under Fuel Tank
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove cover from under fuel tank - **arrow** -

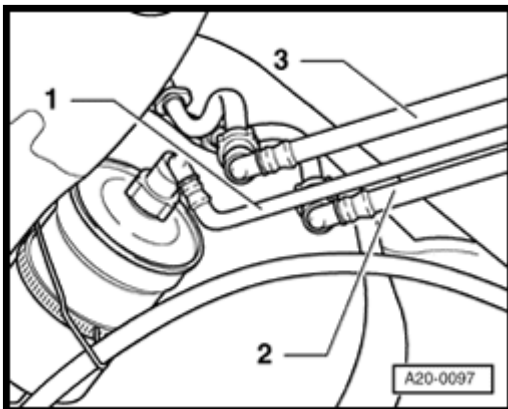


Fig. 234: Fuel Supply Hose, Return Hose & Breather Hose
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect return hose - **2** - (blue), supply hose - **1** - (black) and breather hose - **3** - (white) at connecting point.

NOTE:

- To disconnect, press buttons on hose couplings.

CAUTION:

- The fuel system is under pressure! Before opening the system place a cloth around the connection. Then release the pressure by carefully loosening the connection.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- **Always wear eye protection and wear fuel-resistant gloves when disconnecting system connections.**

- Seal lines so that fuel system is not contaminated by dirt etc.
- Remove tensioning strap. When doing this support fuel tank with engine and transmission jack VAG 1383 A.
- Lower fuel tank.

Installing

Installation is performed in reverse order to removal, note the following:

- Install breather and fuel hoses free of kinks.
- Secure fuel hoses with spring-type clips
- Ensure fuel hoses are tight.

NOTE:

- **Do not interchange supply and return hoses (return line blue or blue markings, supply line black)**

NOTE:

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

- Adapt (match) engine control module to throttle valve control module. Refer to *Adapting Components and Functions* under **Components, checking** .
- Generate readiness code again if DTC memory has been erased, Refer to *Adapting Components and Functions* under **Components, checking** .

Engine Code BBW

Special tools, testers and auxiliary items required

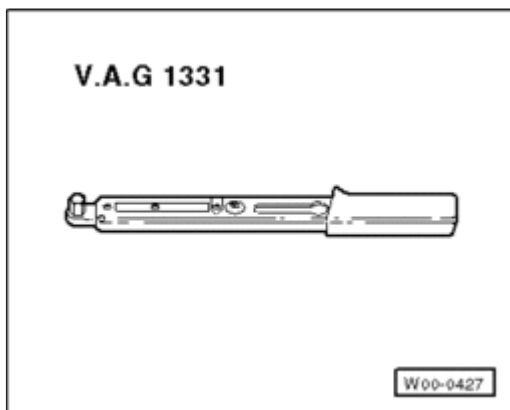


Fig. 235: Torque Wrench V.A.G. 1331 (5 To 50 Nm)

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Torque wrench (5 to 50 Nm) VAG 1331

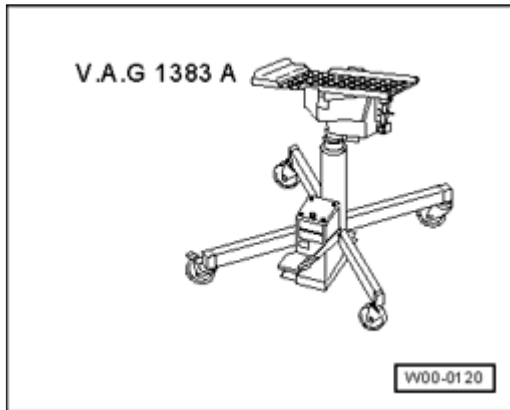


Fig. 236: Engine & Transmission Jack VAG 1383 A
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Engine/transmission jack VAG 1383 A
- Textile or rubber mat

Requirement

- Fuel tank must be empty

Removing

NOTE:

- Observe safety precautions before starting work. Refer to *Safety Precautions When Working on the Fuel Supply System* under Safety precautions when working on fuel supply system .
- The fuel extraction unit VAS 5190 is recommended for emptying the fuel tank. Contrary to the operating instructions the draining must not occur via the filler neck in this engine/vehicle or inner components will be damaged. Empty fuel tank only via the open flange. Refer to *Fuel Delivery Unit, Removing and Installing* under Fuel delivery unit, removing and installing .

- Open fuel flap.
- 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.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

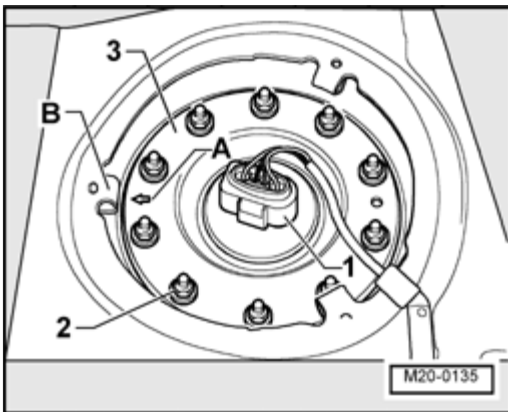


Fig. 237: Installed Position Of Flange Of Fuel Delivery Unit
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect 4-pin connector - **1** -.
- Unscrew nuts - **2** - and take flange - **3** - off.
- Drain fuel tank via flange opening, e.g. with VAS 5190.
- Bolt on flange again .
- Remove rear axle: Refer to **42 REAR SUSPENSION**
- Remove rear part of exhaust system. .
- Remove right rear wheelhousing liner: Refer to **66 EXTERIOR EQUIPMENT**
- Clean fuel filler neck and EVAP canister area.

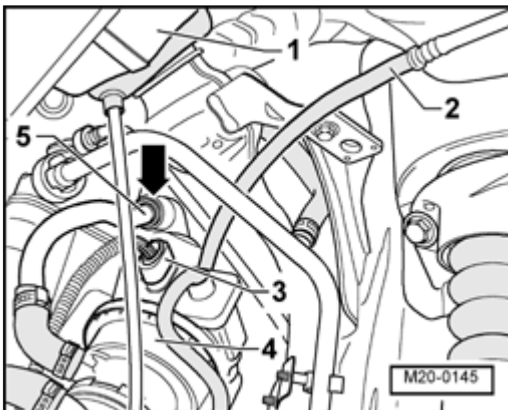


Fig. 238: Tank Flap, Leak Detection Pump, Vacuum Hose, Pressure Hose & Connector
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove tank flap unit with rubber cup - **1** -. Refer to **TANK FLAP UNIT**
- Pull vacuum hose for fuel system leak detection pump - **2** - off union.
- Remove 3-pin connector - **3** - and disconnect wiring.
- Pull pressure hose - **5** - off.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

NOTE: • To unlock, press the safety ring - arrow - into the EVAP canister.

- Remove fuel system leak detection pump - 4 - with detection pump air filter and bracket by pulling from center forward and then sliding downward.

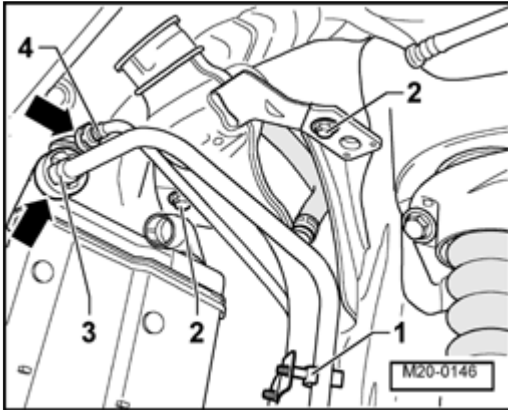


Fig. 239: EVAP Canister Breather Lines & Clips
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Pull breather lines - 3 - and - 4 - off by pressing safety rings at EVAP canister - **arrows** - on upper and lower part together and unclipping breather line - 3 - out of clip - 1 -.
- Remove bolts - 2 -.

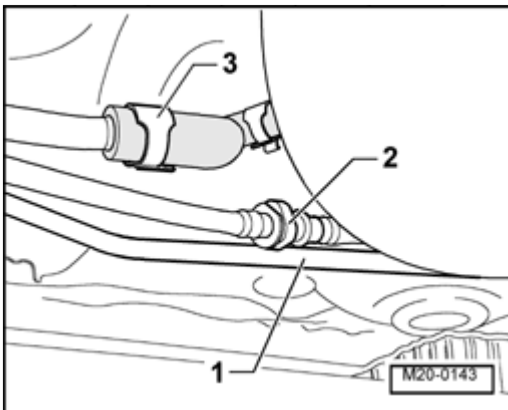


Fig. 240: Fuel Line, Vacuum Line, Breather Line & Clips
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Unclip vacuum line - 1 - at fuel tank.
- Disconnect breather line - 2 -.

CAUTION:

- The fuel system is under pressure! Before opening the system place a cloth around the connection. Then release the pressure by carefully loosening the connection.
- Always wear eye protection and wear fuel-resistant gloves when

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

disconnecting system connections.

- Loosen spring-type clamp - **3** - and pull supply hose off fuel line. Collect leaking oil.
- Seal lines to avoid contamination of fuel system.

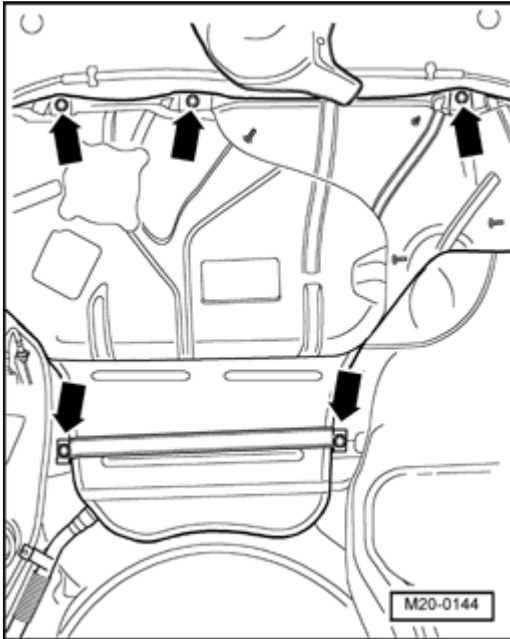


Fig. 241: Locating Fuel Tank Bolts

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Support fuel tank with engine/transmission jack VAG 1383 A and unscrew bolts - **arrows** -.

NOTE:

- To prevent paintwork being damaged place a textile or rubber mat between fuel tank and jack.

- Lower fuel tank.

Installing

Installation is performed in reverse order to removal, considering the following:

- Tensioning strap rubber profile must not be damaged.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

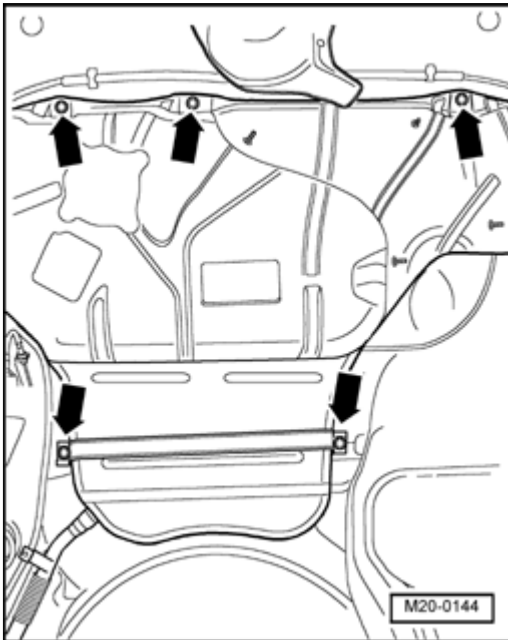


Fig. 242: Locating Fuel Tank Bolts

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Replace bolts - **arrows** -.
- Guide wirings on EVAP canister must be securely connected. Check for correct seat by tightening.
 - Adapt (match) engine control module to throttle valve control module. Refer to *Adapting Components and Functions* under **Components, checking** .
 - Generate readiness code again if DTC memory has been erased, refer to *Adapting Components and Functions* under **Components, checking** .

Crash fuel shut-off

Function

Models with an airbag are equipped with a crash fuel shut-off system. It reduces the danger of a fire in a crash when the fuel pump is switched off via the fuel pump relay.

At the same time this system improves starting of the engine. When the door is opened the fuel pump is activated for 2 seconds to build up pressure in the fuel system.

When opening the fuel system:

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

- Check activation of fuel pump relay using wiring diagram and V.A.G 1466 A.

Refer to Electrical Wiring Diagrams, Troubleshooting & Component Locations

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Fuel Pump, Checking

- Engine code BBW, refer to **Engine Code BBW**

Engine Codes AEG, AVH, AZG, BEV

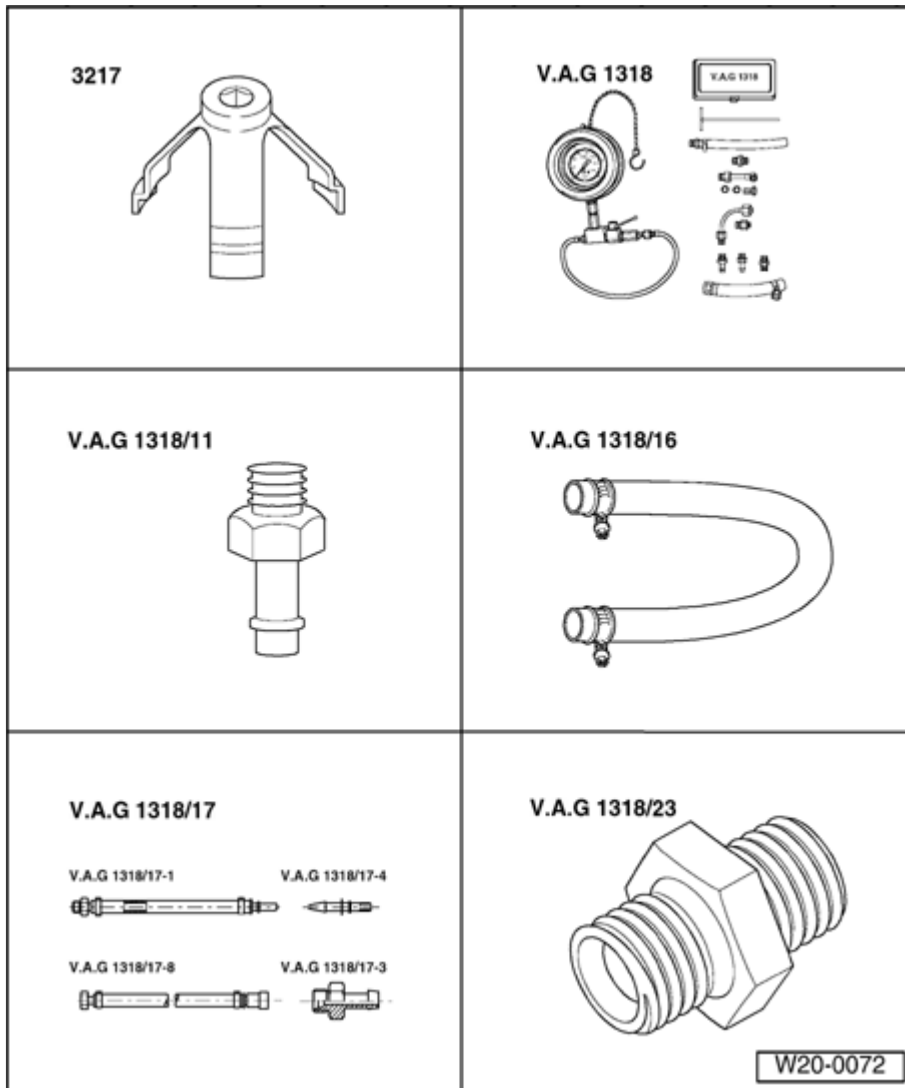


Fig. 243: Identifying Special Tools - Fuel Pump, Checking (Engine Codes AEG, AVH, AZG, BEV)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools, testers and auxiliary items required

- Union nut spanner 3217
- Pressure gauge VAG 1318
- Adapter VAG 1318/11
- Hose adapter VAG 1318/16
- Adapter VAG 1318/17

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Adapter VAG 1318/23
- Adapter VAG 1318/1

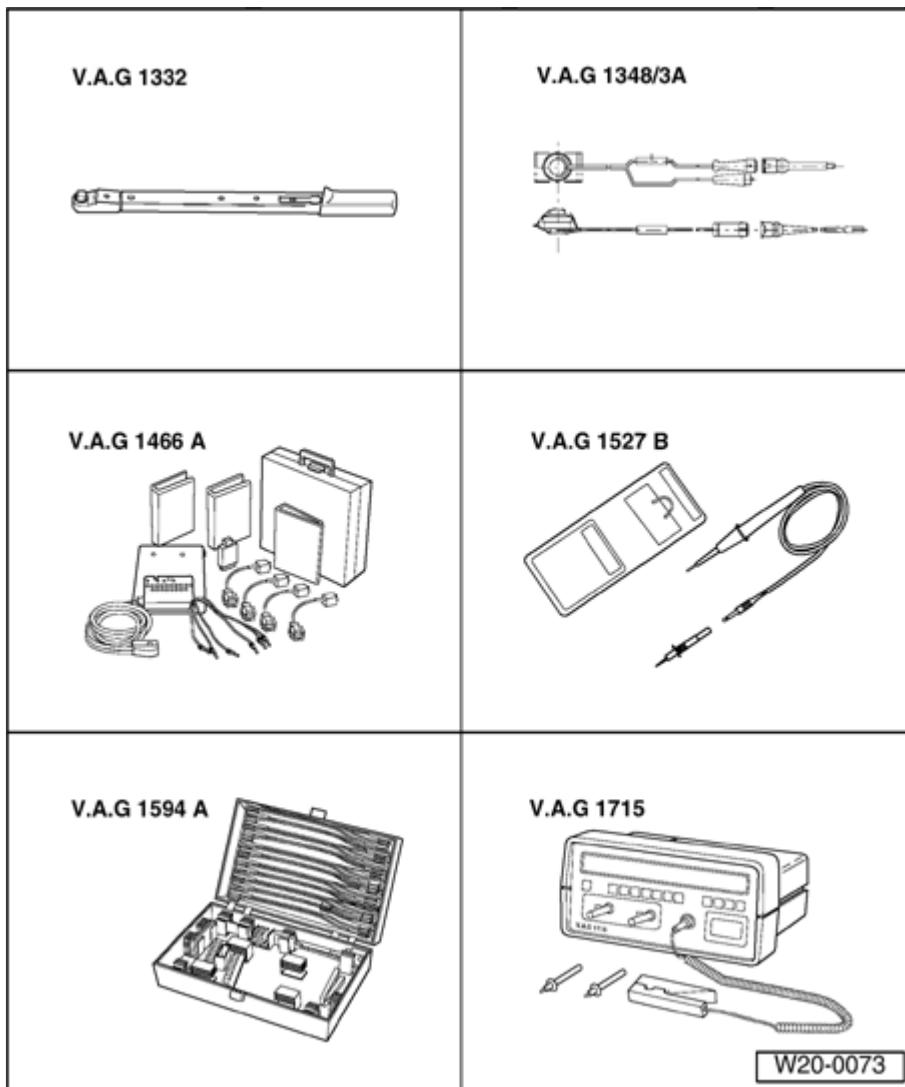


Fig. 244: Identifying Special Tools - Fuel Pump, Checking (Engine Codes AEG, AVH, AZG, BEV, BBW)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools, testers and auxiliary items required

- Torque wrench (40 to 200 Nm) VAG 1332
- Remote control VAG 1348/3A with adapter cable VAG 1348/3-2
- Test system VAG 1466 A
- Diode test lamp VAG 1527 B
- Adapter set VAG 1594 A
- Multimeter VAG 1715 or Fluke 83 Multimeter

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Measuring container
- Wiring diagram

Requirements

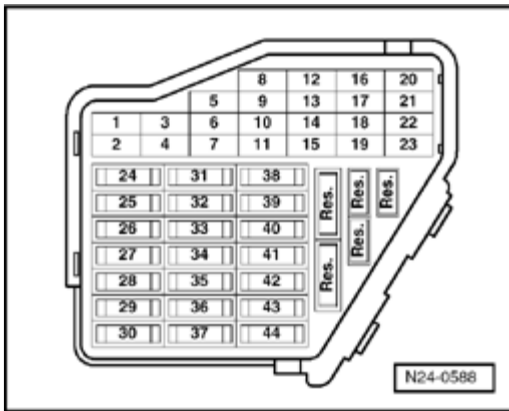


Fig. 245: Identifying Main Fuse Panel

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Fuse No. 28 OK.
- Battery voltage must be at least 11.5 V.
- All electrical consumers, e.g. lights and rear window defroster, must be switched off.
- If the vehicle is equipped with air conditioning, this must be switched off.
- On models with an automatic transmission the selector lever must be in position "P" or "N".

NOTE:

- **Observe description of crash fuel shut-off function. Refer to *Crash Fuel Shut-off* under Crash fuel shut-off .**

Checking Function and Voltage Supply

- Remove cover from fuel delivery unit.
- Briefly operate starter. Fuel pump must be heard to run
- Switch off ignition.

If fuel pump does not run:

- Remove cover in front of fuse holder.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

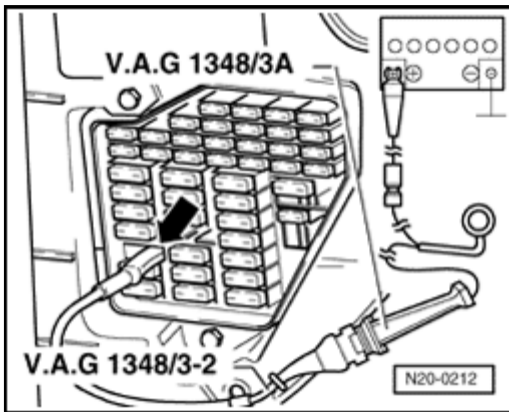


Fig. 246: Connecting VAG 1348/3A With Adapter Cable VAG 1348/3-2 To Contact And Battery Positive
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Pull fuse No. 28 out of fuse holder.
- Connect remote control VAG 1348/3A with adapter cable VAG 1348/3-2 to contact 28a to fuel pump and battery positive (+).
- Operate remote control.

Fuel pump runs:

- Check activation of fuel pump relay referring to wiring diagram: Refer to Electrical Wiring Diagrams, Troubleshooting and Component Locations

Fuel pump does not run:

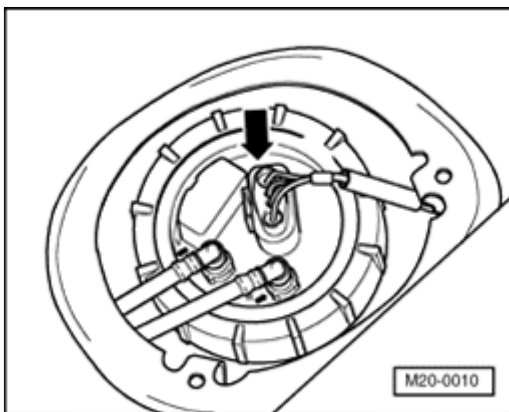


Fig. 247: Fuel Delivery Connector
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Take 4-pin connector off flange - **arrow** -.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

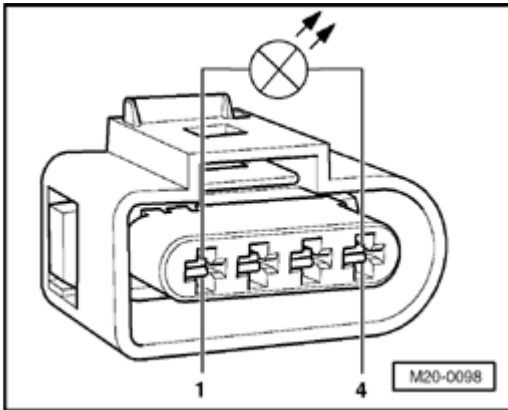


Fig. 248: Connecting Diode Test Lamp VAG 1527 B With Auxiliary Cables From VAG 1594 A To Outer Contacts Of Connector

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect diode test lamp VAG 1527 B with auxiliary cables from VAG 1594 A to outer contacts of connector.
- Operate remote control. LED must light up

If LED does not light up:

- Locate and eliminate open circuit using current wiring diagram: Refer to Electrical Wiring Diagrams, Troubleshooting and Component Locations

LED lights up (voltage supply OK.):

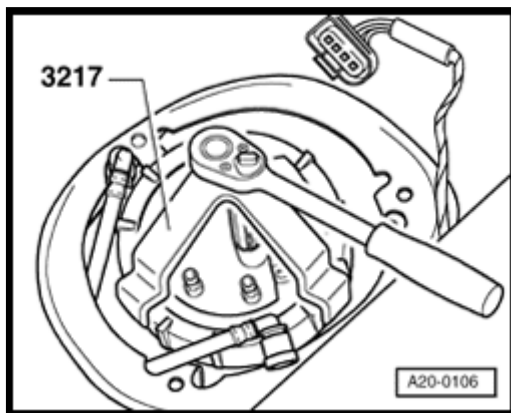


Fig. 249: Removing/Installing Union Nut With Wrench 3217

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove union nut with wrench 3217
- Check electrical wiring between flange and fuel pump for continuity.

If no open circuit can be found:

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Fuel pump is faulty, replace fuel delivery unit. Refer to *Fuel Delivery Unit, Removing and Installing* under **Fuel delivery unit, removing and installing**

Checking Delivery Rate

Requirements

- Voltage supply OK.
- Remote control VAG 1348/3A connected.

Work Sequence

- Remove filler cap from fuel tank filler neck.

CAUTION:

- The fuel system is under pressure! Before opening the system place a cloth around the connection. Then release the pressure by carefully loosening the connection.
- Always wear eye protection and wear fuel-resistant gloves when disconnecting system connections.

Engine Codes AEG, AVH, AZG

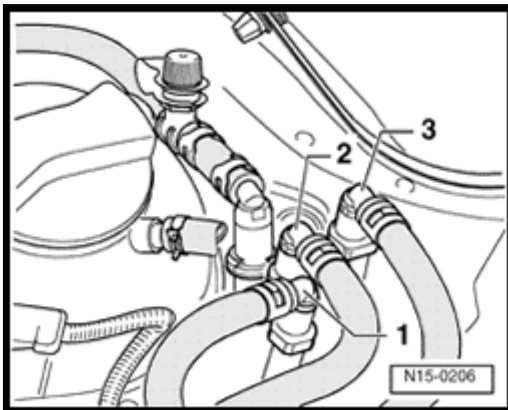


Fig. 250: Identifying Vacuum Hose To Throttle Valve Control Module, Fuel Return Hose & Fuel Supply Hose (AEG, AVH, AZG)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Pull off supply hose - 3 - (with white marking) and collect fuel which leaks out in a cloth.

NOTE:

- To disconnect, press buttons on hose couplings

Engine Code BEV

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

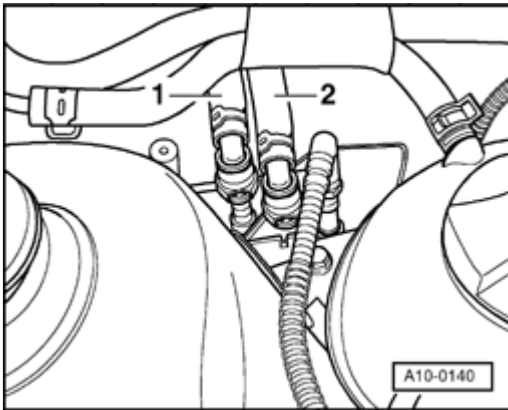


Fig. 251: Identifying Fuel Return Hose & Fuel Supply Hose (Engine Code BEV)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Pull off supply hose - 1 - (with white marking) and collect fuel which leaks out in a cloth.

NOTE:

- To disconnect, press buttons on hose couplings.

All Engines

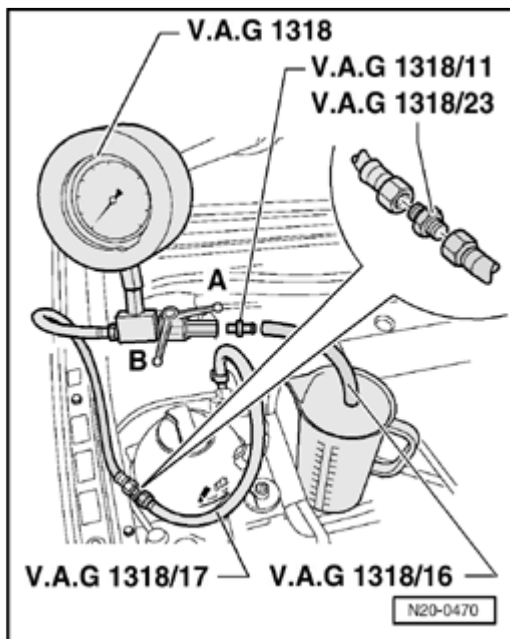


Fig. 252: Connecting VAG 1318 Components To Fuel Supply Line
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect pressure gauge VAG 1318 with adapter VAG 1318/23 and adapter VAG 1318/17 to fuel supply line.
- Push hose adapter VAG 1318/16 onto adapter VAG 1318/11 on pressure gauge and hold hose in a measuring container.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Open shut-off tap on pressure gauge. Lever then points in direction of flow - **A** -.
- Operate remote control VAG 1348/3A. Then close shut-off tap slowly until pressure gauge shows 3.5 bar pressure. From this point on do not alter setting of shut-off tap. Engine code BEV: approx. 3.5 bar
- Empty measuring container.
- Quantity of fuel delivered by fuel pump depends on battery voltage. Therefore connect multimeter to vehicle battery using adapter cables from VAG 1594 A.
- Operate remote control for 30 seconds and measure battery voltage.

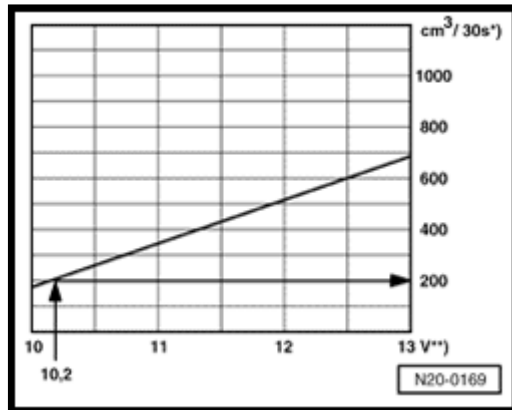


Fig. 253: Fuel Delivery Chart (Engine Codes AEG, AVH, AZG, BEV)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Compare quantity of fuel delivered with specification.

*) - Minimum delivery $\text{cm}^3 / 30 \text{ seconds}$

**) - Voltage at fuel pump with engine at rest and pump running (approx. 2 volts less than battery voltage).

Example:

During the test, a voltage of 12.5 volts is measured at the battery. As the voltage at the pump is approx. 2 volts less than the battery voltage, the result is a minimum delivery of approx. $200 \text{ cm}^3 / 30 \text{ seconds}$.

If the minimum delivery rate is not attained:

- Check fuel lines for possible restrictions (kinks) or blockages.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

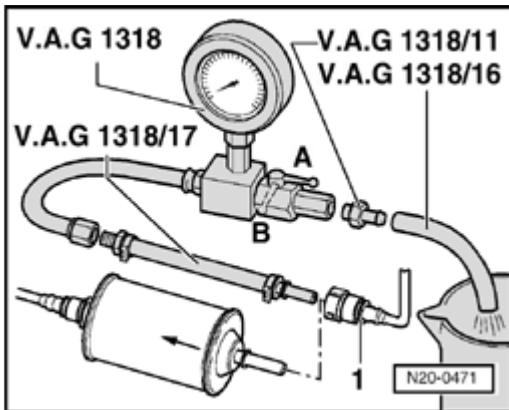


Fig. 254: Connecting Pressure Gauge VAG 1318 To Hose With Adapter VAG 1318/17 To Fuel Filter
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect supply hose - 1 - from inlet to fuel filter.

NOTE:

- To disconnect, press buttons on hose couplings

- Connect pressure gauge VAG 1318 to hose with adapter VAG 1318/17.
- Repeat delivery rate check.

If minimum delivery rate is now attained:

- Replace fuel filter

If minimum delivery rate is again not attained:

- Remove fuel delivery unit and check filter strainer for soiling.

Up to now no fault has been detected:

- Fuel pump faulty, replace fuel delivery unit. Refer to *Fuel Delivery Unit, Removing and Installing* under **Fuel delivery unit, removing and installing**.

If delivery quantity has been attained, but nevertheless a fuel supply system fault is suspected (e.g. intermittent failure of fuel supply system):

- Check current draw of fuel pump as follows:
- Reconnect all disconnected fuel lines.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

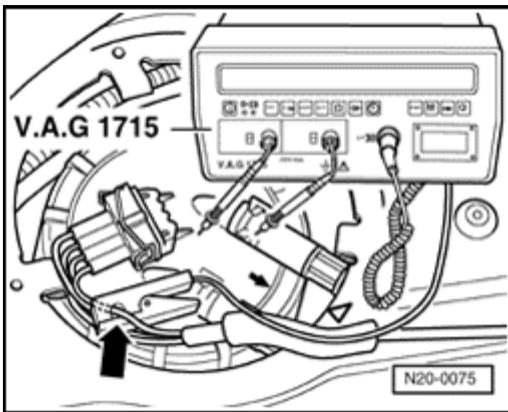


Fig. 255: Measuring Current Draw Of Fuel Pump Using VAG 1715
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect multimeter VAG 1715 using current clamp to green/yellow wire of wiring harness.
- Start engine and run at idle speed
- Measure current draw of fuel pump. Specification: max. 8 amps.

NOTE:

- If the fuel system malfunction is intermittent, the check can be performed during a road test, but a 2nd technician is necessary.

If current consumption is exceeded:

- Fuel pump faulty, replace fuel delivery unit. Refer to *Fuel Delivery Unit, Removing and Installing* under **Fuel delivery unit, removing and installing**.

Checking Fuel Pump Non-return Valve

Requirements

- Remote control VAG 1348/3A is still connected
- Pressure gauge VAG 1348 is still connected

With this check the fuel supply line connections from fuel delivery unit to the point at which the pressure gauge VAG 1318 is connected will be checked for leaks at the same time.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

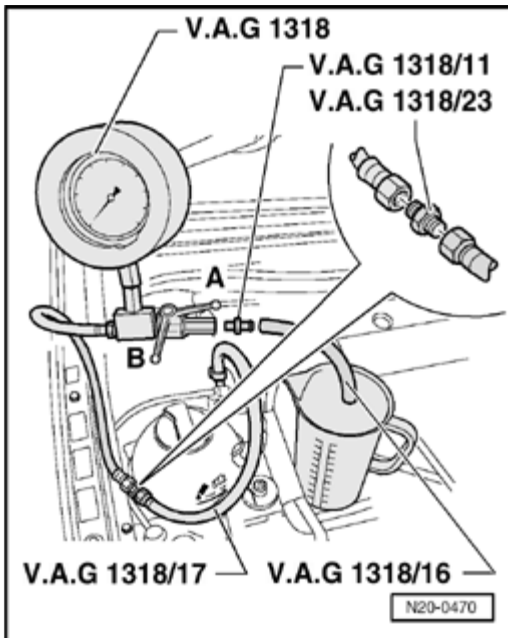


Fig. 256: Connecting VAG 1318 Components To Fuel Supply Line
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Close pressure gauge shut-off tap (lever at right angles to through flow direction position - **B** -).
- Operate remote control at short intervals until a pressure of approx. 3 bar has built up.

CAUTION: Danger of spray when opening the shut-off trap, hold container before connecting of pressure gauge.

- If pressure builds-up too high, relieve excess pressure by carefully opening shut-off tap.
- Observe pressure drop on gauge. After 10 minutes, pressure must not drop below 2.5 bar.

If the pressure drops further:

- Check line connections for leaks.

If no fault in lines is detected:

- Fuel pump faulty, replace fuel delivery unit. Refer to *Fuel Delivery Unit, Removing and Installing* under **Fuel delivery unit, removing and installing** .

Engine Code BBW

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

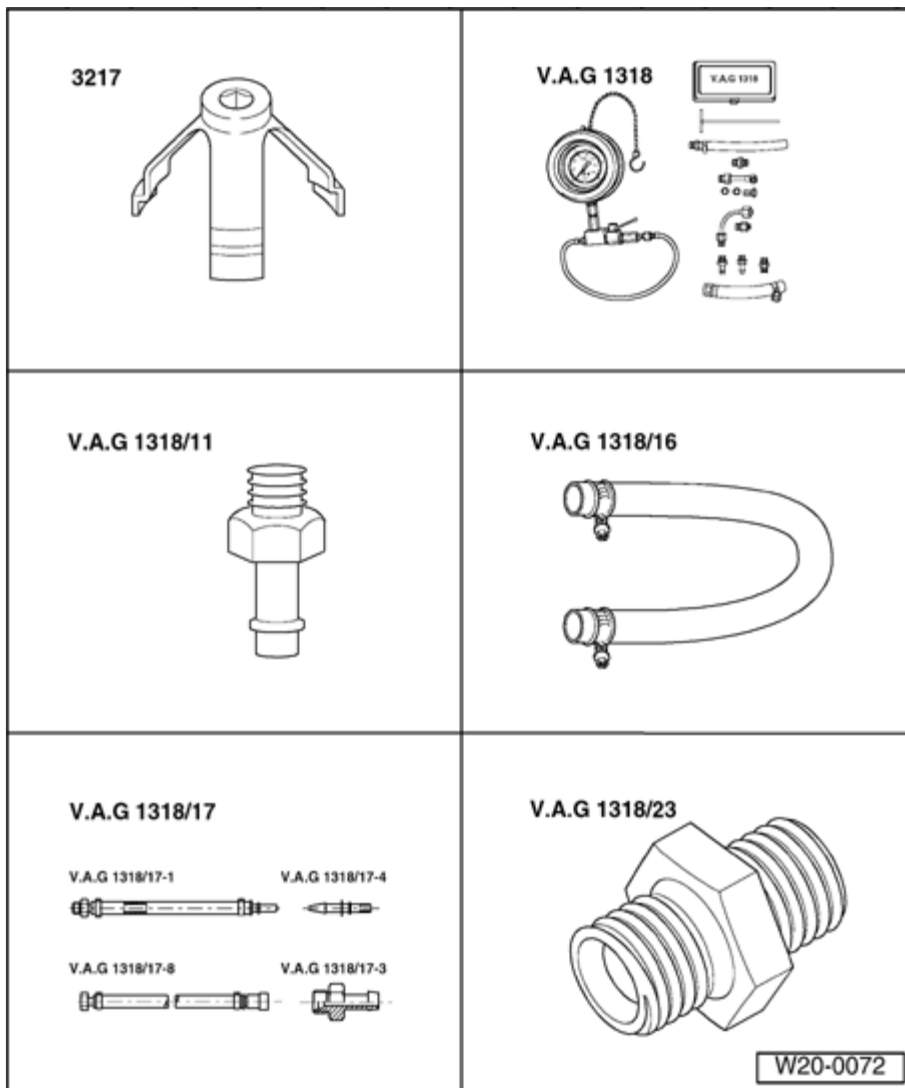


Fig. 257: Identifying Special Tools - Fuel Pump, Checking (Engine Codes BBW)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools, testers and auxiliary items required

- Union nut spanner 3217
- Pressure gauge VAG 1318
- Adapter VAG 1318/11
- Hose adapter VAG 1318/16
- Adapter VAG 1318/17
- Adapter VAG 1318/23
- Adapter VAG 1318/1

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

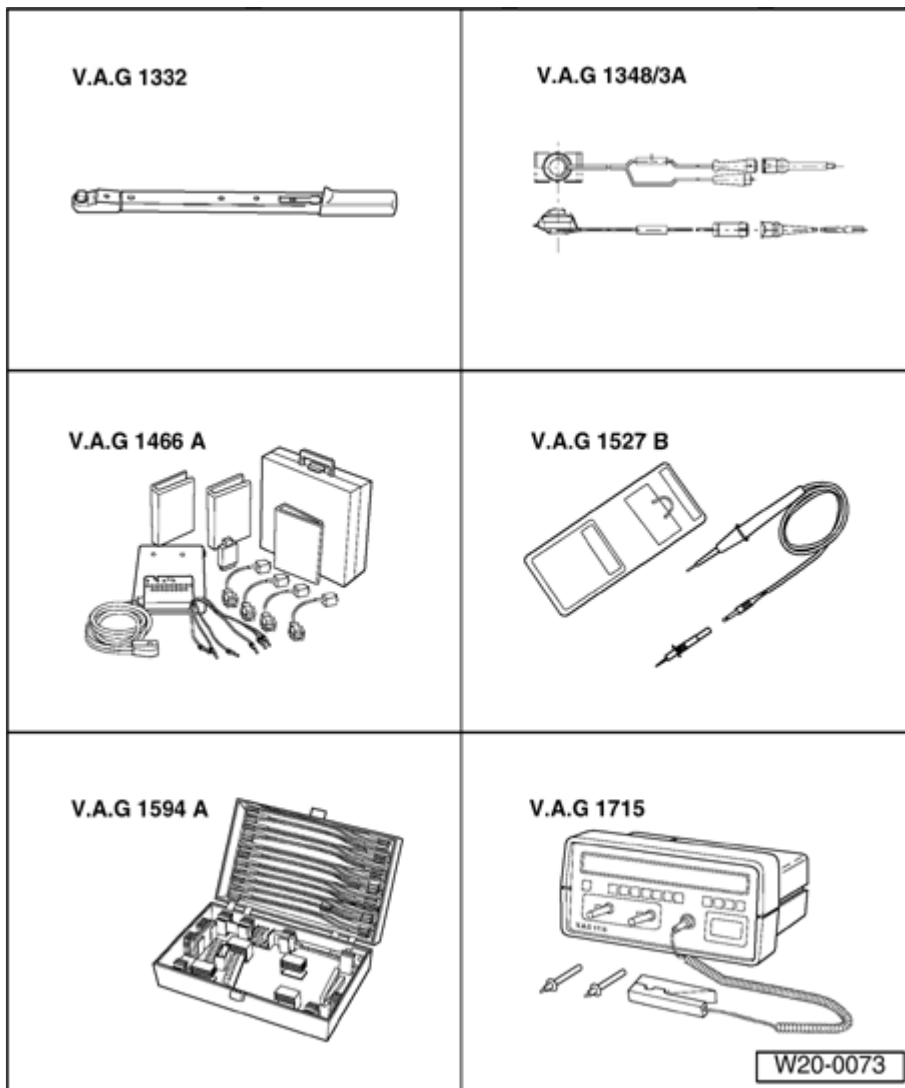


Fig. 258: Identifying Special Tools - Fuel Pump, Checking (Engine Codes AEG, AVH, AZG, BEV, BBW)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools, testers and auxiliary items required

- Torque wrench (40 to 200 Nm) VAG 1332
- Remote control with adapter cable VAG 1348/3A VAG 1348/3-2
- Test system VAG 1466 A
- Diode test lamp VAG 1527 B
- Adapter set VAG 1594 A
- Multimeter VAG 1715 or Fluke 83 Multimeter
- Measuring container
- Wiring diagram

Requirements

Afinacion de Motor y Diagnostico, OBDII,VW ,Audi

044 664 252 34 69

Wednesday, July 06, 2016 9:38:49 AM

Page 246

© 2011 Mitchell Repair Information Company, LLC.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

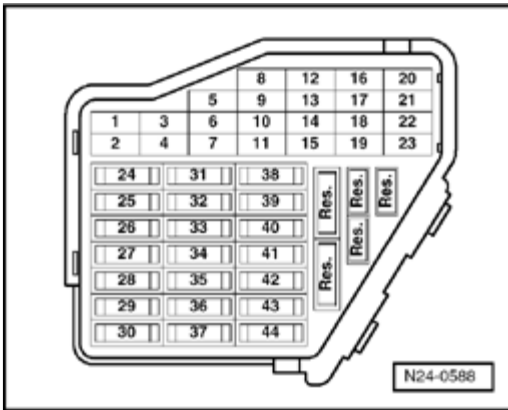


Fig. 259: Identifying Main Fuse Panel

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Fuse No. 28 OK.
- Battery voltage must be at least 11.5 V.
- All electrical consumers, e.g. lights and rear window defroster, must be switched off.
- If the vehicle is equipped with air conditioning, this must be switched off.
- On models with an automatic transmission the selector lever must be in position "P" or "N".

NOTE:

- **Observe description of crash fuel shut-off function. Refer to *Crash Fuel Shut-off* under Crash fuel shut-off .**

Checking Function and Voltage Supply

- Remove cover from fuel delivery unit.
- Briefly operate starter. Fuel pump must be heard to run
- Switch off ignition.

If the fuel pump does not run:

- Remove cover in front of fuse holder.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

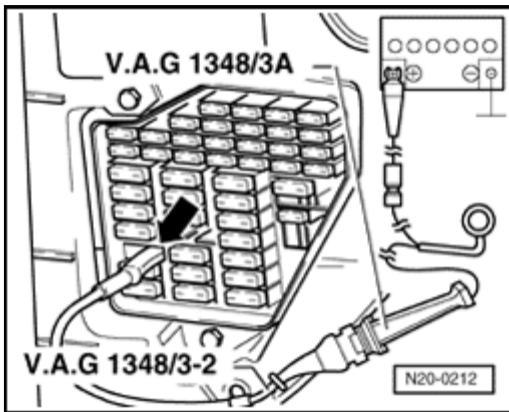


Fig. 260: Connecting VAG 1348/3A With Adapter Cable VAG 1348/3-2 To Contact And Battery Positive
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Pull fuse No. 28 out of fuse holder.
- Connect remote control VAG 1348/3A with adapter cable VAG 1348/3-2 to contact 28a to fuel pump and battery positive (+).
- Operate remote control.

Fuel pump runs:

- Check activation of fuel pump relay referring to wiring diagram: Refer to Electrical Wiring Diagrams, Troubleshooting and Component Locations

Fuel pump does not run:

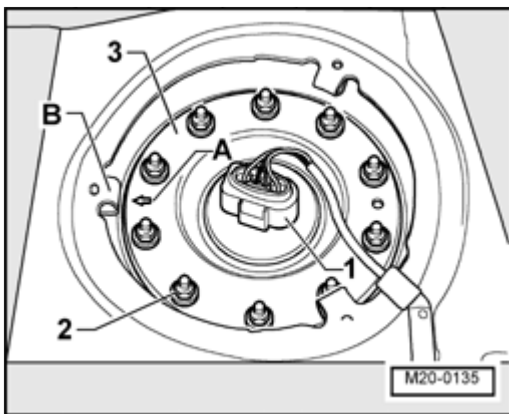


Fig. 261: Installed Position Of Flange Of Fuel Delivery Unit
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Take 4-pin connector - 1 - off flange - 3 -.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

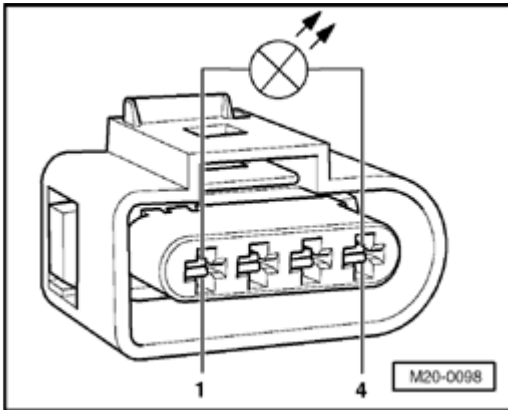


Fig. 262: Connecting Diode Test Lamp VAG 1527 B With Auxiliary Cables From VAG 1594 A To Outer Contacts Of Connector

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect diode test lamp VAG 1527 B with auxiliary cables from VAG 1594 A to outer contacts of connector.
- Operate remote control. LED must light up

If LED does not light up:

- Locate and eliminate open circuit using current wiring diagram: Refer to Electrical Wiring Diagrams, Troubleshooting and Component Locations

LED lights up (voltage supply OK.):

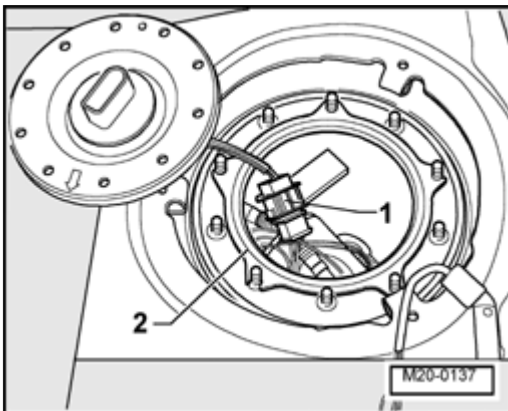


Fig. 263: Fuel Delivery Connector & Seal

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove flange.
- Check electrical wiring between flange and fuel pump for continuity.

If no open circuit can be found:

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Fuel pump is faulty, replace fuel delivery unit. Refer to *Fuel Delivery Unit, Removing and Installing* under **Fuel delivery unit, removing and installing**.

Checking delivery rate

Requirements

- Voltage supply OK.
- Remote control VAG 1348/3A connected.

Work Sequence

- Remove filler cap from fuel tank filler neck.

CAUTION:

- The fuel system is under pressure! Before opening the system place a cloth around the connection. Then release the pressure by carefully loosening the connection.
- Always wear eye protection and wear fuel-resistant gloves when disconnecting system connections.

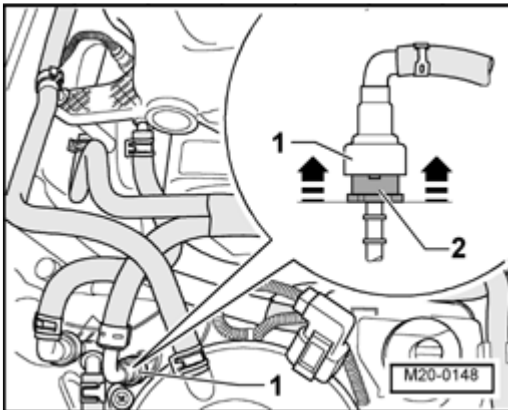


Fig. 264: Locating Supply Line, Union & Safety Ring
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Pull off supply line - 1 - and collect leaking fuel with a cloth.

NOTE:

- To do this slide safety ring - 2 - into the union - 1 -.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

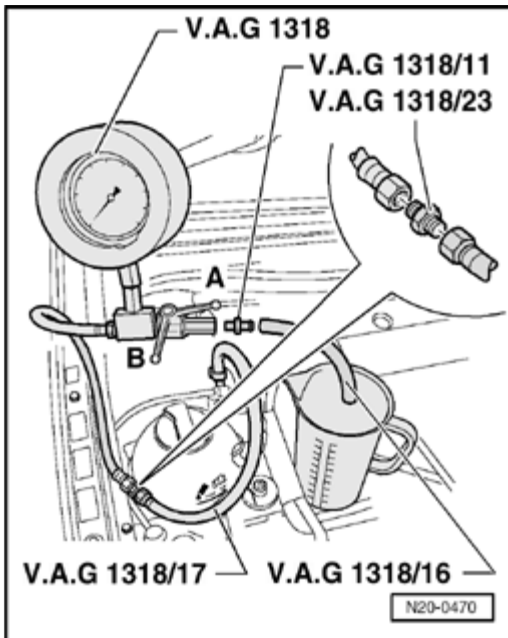
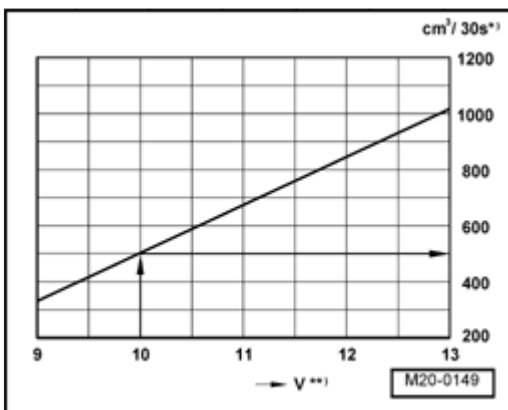


Fig. 265: Connecting VAG 1318 Components To Fuel Supply Line
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect pressure gauge VAG 1318 with adapter VAG 1318/23 and adapter VAG 1318/17 to fuel supply line.
- Push hose adapter VAG 1318/16 onto adapter VAG 1318/11 on pressure gauge and hold hose in a measuring container.
- Open shut-off tap on pressure gauge. Lever then points in direction of flow - **A** -.
- Operate remote control VAG 1348/3A. Then close shut-off tap slowly until pressure gauge shows 3.5 bar pressure. From this point on do not alter setting of shut-off tap.
- Empty measuring container.
- Quantity of fuel delivered by fuel pump depends on battery voltage. Therefore connect multimeter to vehicle battery using adapter cables from VAG 1594 A.
- Operate remote control for 30 seconds and measure battery voltage.



2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Fig. 266: Fuel Delivery Chart (Engine Code BBW - 1 Of 2)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Compare quantity of fuel delivered with nominal value.

*) - Minimum delivery $\text{cm}^3 / 30 \text{ seconds}$

**) - Voltage at fuel pump with engine at rest and pump running (approx. 2 volts less than battery voltage).

Example:

During the test, a voltage of 12.0 volts is measured at the battery. As the voltage at the pump is approx. 2 volts less than the battery voltage, the result is a minimum delivery of approx. $500 \text{ cm}^3 / 30 \text{ seconds}$.

If the minimum delivery rate is not attained:

- Check fuel pressure regulator.

Fuel pressure regulator is OK:

- Check supply line to fuel tank for possible constrictions (kinks).

If supply line is OK:

- Check fuel delivery rate before fuel filter.

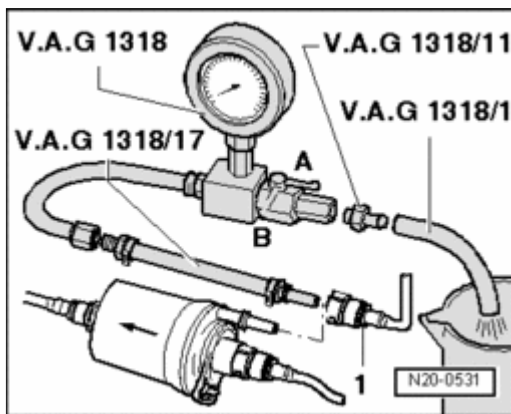


Fig. 267: Connecting Pressure Gauge VAG 1318 With Adapters
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Pull supply line - 1 - off fuel filter inlet. Refer to *Fuel Delivery Unit, Removing and Installing* under **Fuel delivery unit, removing and installing**.
- Connect pressure gauge VAG 1318 with adapter VAG 1318/17 as shown.
- Push adapter VAG 1318/1 onto adapter VAG 1318/11 on pressure gauge and hold hose in a measuring container.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

The connector to the suction jet pump must be installed -.

- Engage fuel delivery unit.
- Connect fuel pump again to current supply.
- Carefully pour in some fuel.
- Cover flange opening (danger of spray).
- Open shut-off tap on pressure gauge. Lever then points in direction of flow - A -.
- Operate remote control VAG 1348/3A. Then close shut-off tap slowly until pressure gauge shows 3.5 bar pressure. From this point on do not alter setting of shut-off tap.
- Empty measuring container.
- Operate remote control again for 30 seconds.

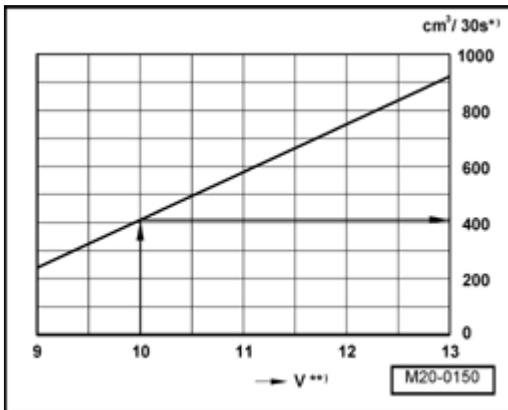


Fig. 268: Fuel Delivery Chart (Engine Code BBW - 2 Of 2)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Compare quantity of fuel delivered with nominal value.

*) - Minimum delivery $\text{cm}^3 / 30 \text{ seconds}$

**) - Voltage at fuel pump with engine at rest and pump running (approx. 2 volts less than battery voltage).

NOTE:

- Due to the operating of the suction jet pump the minimum delivery rate before the fuel filter/pressure regulator is lower.

Example:

During the test, a voltage of 12.0 volts is measured at the battery. As the voltage at the pump is approx. 2 volts less than the battery voltage, the result is a minimum delivery of approx. $415 \text{ cm}^3 / 30 \text{ seconds}$.

If minimum delivery rate is now attained:

- Replace fuel filter.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

If minimum delivery rate is again not attained:

- Remove fuel delivery unit and check the strainer filter for soiling.

Only if you have not detected any faults up to now:

- Replace fuel delivery unit.

If delivery rate has been attained but a fuel supply system fault is still suspected (e.g. intermittent failure of fuel supply system):

- Check current draw of fuel pump as follows:
- Install fuel delivery unit. Refer to *Fuel Delivery Unit, Removing and Installing* under **Fuel delivery unit, removing and installing**.

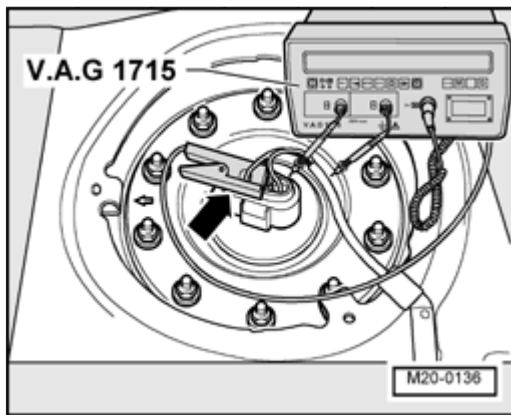


Fig. 269: Checking Current Draw Of Fuel Pump Using Multimeter VAG 1715

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect multimeter VAG 1715 to wire - **arrow** - for contact 1 of 4-pin connector using current pick-up clamp.
- Start engine and run at idling speed.
- Check current draw of fuel pump. Specification: max. 9 amps

NOTE:

- If the fuel system malfunction is intermittent, a check during a road test can be performed with the help of a 2nd person.

If current draw exceeds the specification:

- Fuel pump is faulty, replace fuel delivery unit. Refer to *Fuel Delivery Unit, Removing and Installing* under **Fuel delivery unit, removing and installing**.

Checking Non-return Valve for Fuel Pump

Requirements

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Remote control VAG 1348/3A connected.

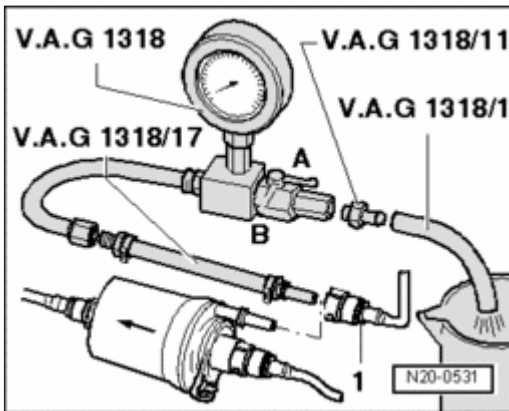


Fig. 270: Connecting Pressure Gauge VAG 1318 With Adapters
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Pull supply line - 1 - off fuel filter inlet. Refer to *Fuel Delivery Unit, Removing and Installing* under **Fuel delivery unit, removing and installing**.
- Connect pressure gauge VAG 1318 with adapter VAG 1318/17 as shown.
- Push adapter VAG 1318/1 onto adapter VAG 1318/11 on pressure gauge and hold hose in a measuring container.

The connector to the suction jet pump must be installed.

- Engage fuel delivery unit.
- Connect fuel pump again to current supply.
- Carefully pour in some fuel.
- Cover flange opening (danger of spray).
- Close pressure gauge shut-off tap (lever diagonal to direction of flow (position - **B** -)).
- Operate remote control at short intervals, until a pressure of approx. 4 bar has built up.

CAUTION: Danger of spray when opening the shut-off trap, hold container before connecting of pressure gauge.

- If pressure builds up too high, lower excess pressure by carefully opening shut-off tap.
- Observe pressure drop on gauge. Over a duration of 30 minutes pressure must not drop below 3.2 bar

If pressure drops further:

- Check line connections for leaks.

If no wiring fault is detected:

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Fuel pump is faulty, replace fuel delivery unit. Refer to *Fuel Delivery Unit, Removing and Installing* under **Fuel delivery unit, removing and installing**.

Fuel system, bleeding

Engine codes BBW, BEV

Special tools and equipment

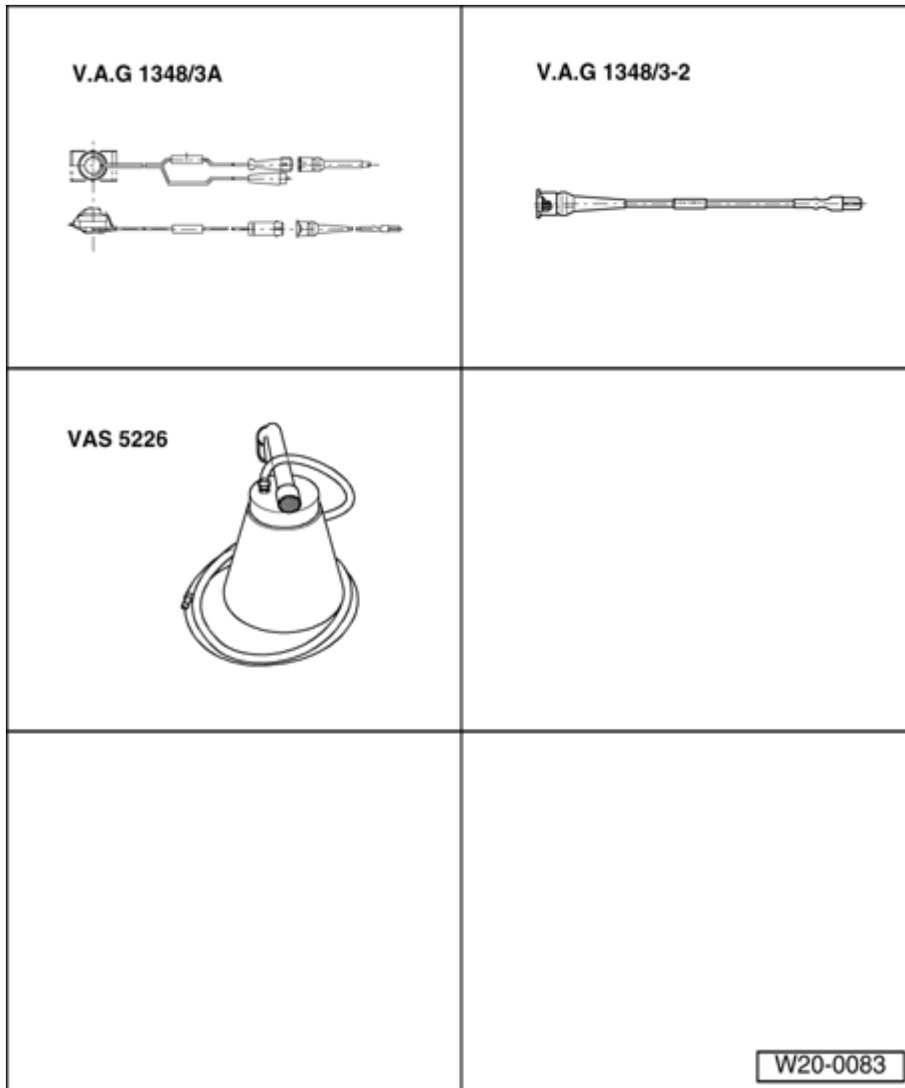


Fig. 271: Identifying Special Tools - Fuel System, Bleeding
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- V.A.G 1348/3 A Remote control
- V.A.G 1348/3-2 Adapter cable
- VAS 5226 Suction pump

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- V.A.G 1318/20 Adapter
- V.A.G 1318/20-1 Adapter

Requirements

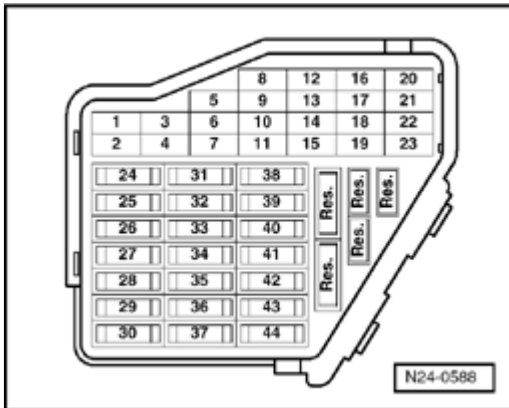


Fig. 272: Identifying Main Fuse Panel
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Fuses must be OK
- Battery voltage must be at least 11.5 V
- Fuel pump relay must be OK

Work sequence

- Remove cover in front of fuse holder.

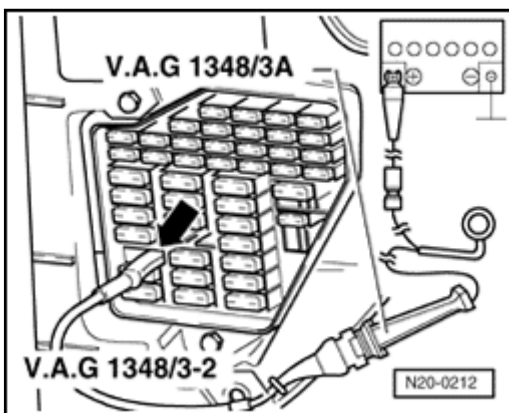


Fig. 273: Connecting VAG 1348/3A With Adapter Cable VAG 1348/3-2 To Contact And Battery Positive
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Pull fuse No. 28 out of fuse holder.
- Connect remote control V.A.G 1348/3A with adapter cable V.A.G 1348/3-2 to contact 28a to fuel pump and battery positive (+).

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Remove pressure hose from secondary air injection pump to combination valve.

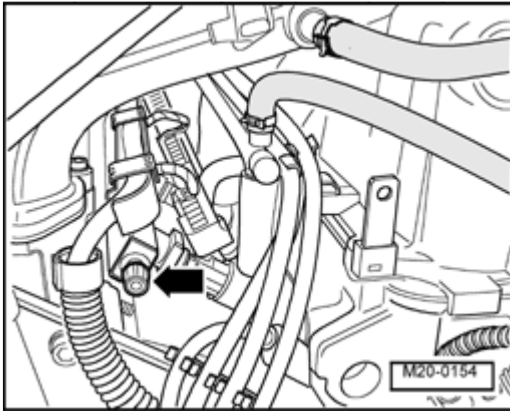


Fig. 274: Locating Breather Valve Cover Cap

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Unscrew cover cap (arrow) of breather valve.

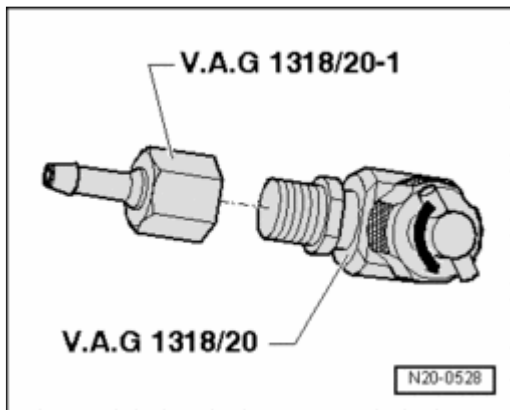


Fig. 275: V.A.G 1318/20-1 & V.A.G 1318/20

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Screw adapter V.A.G 1318/20-1 onto adapter V.A.G 1318/20.
- Turn valve (at T-piece) counter-clockwise until it is completely open.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

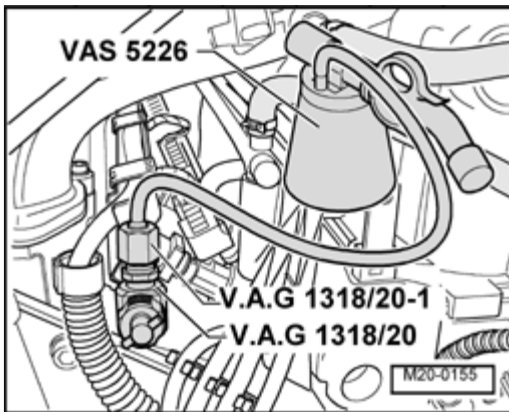


Fig. 276: VAS 5226 & V.A.G 1318/20

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Screw adapter V.A.G 1318/20 hand-tight onto breather valve.
- Connect hose of suction pump VAS 5226 as shown.
- Turn valve (at T-piece) clockwise into breather valve onto limit stop.
- Check adapters and hose connectors for leaks.

- Operate remote control V.A.G 1348/3A until bubble-free fuel comes out of breather valve.
- Turn valve (at T-piece) counter-clockwise again until it is completely open.
- Clamp-off hose of suction pump VAS 5226 (e.g. with hose clamp 3094) and disconnect it from adapter V.A.G 1318/20-1.
- Unscrew adapter V.A.G 1318/20 from breather valve.

ACCELERATOR MECHANISM

Accelerator mechanism, servicing

Engine code AEG

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

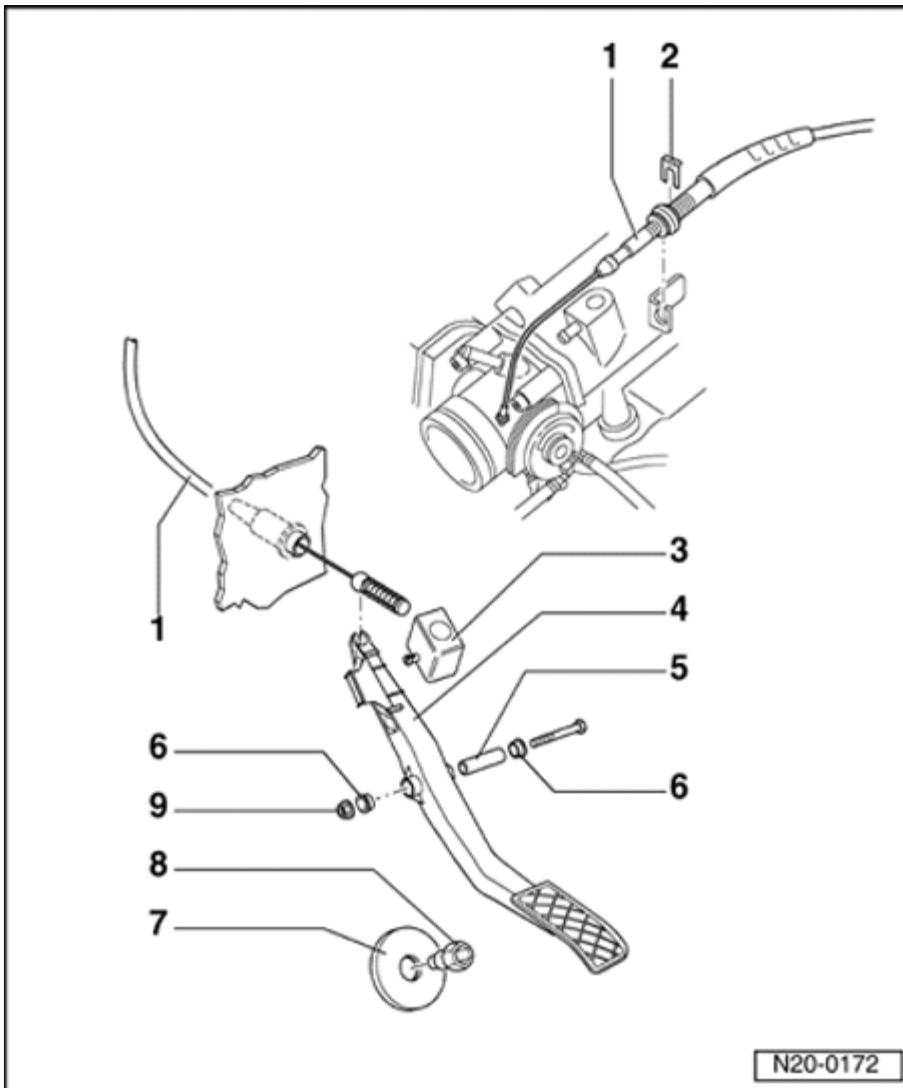


Fig. 277: Exploded View Of Accelerator Mechanism
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Accelerator cable

- Adjusting. Refer to **Throttle cable, adjusting**
- Do not reuse damaged accelerator cable, replace

2 - Clip

- Adjusting accelerator (throttle) cable. Refer to **Throttle cable, adjusting**

3 - Counterweight

4 - Accelerator pedal

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

5 - Spacer sleeve

6 - Bushing

7 - Washer

8 - Limit stop bolt

9 - 20 Nm

Throttle cable, adjusting

Engine code AEG

Vehicles with manual transmission

Special tools and equipment

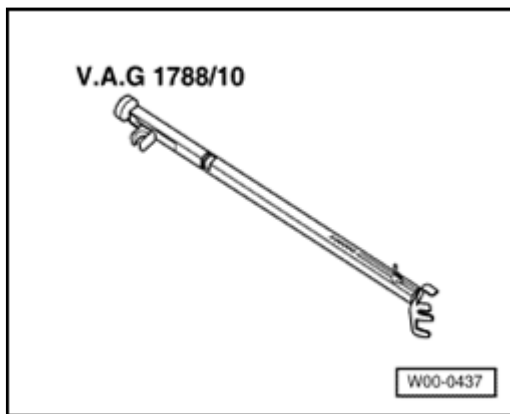


Fig. 278: V.A.G 1788/10 Speed Adjuster Tool
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- V.A.G 1788/10 Speed adjuster tool

Work sequence

- Hook accelerator cable into accelerator pedal and quadrant on throttle valve control module.
- Pull off retaining clip for accelerator cable core wire.
- Depress accelerator pedal into wide open throttle position.

NOTE: **Have a second technician depress the accelerator pedal or use speed adjuster tool V.A.G 1788/10 supported against the steering wheel.**

- Adjust accelerator cable by moving retainer at support bracket so that wide open throttle position is attained at throttle valve control module.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Vehicles with automatic transmission

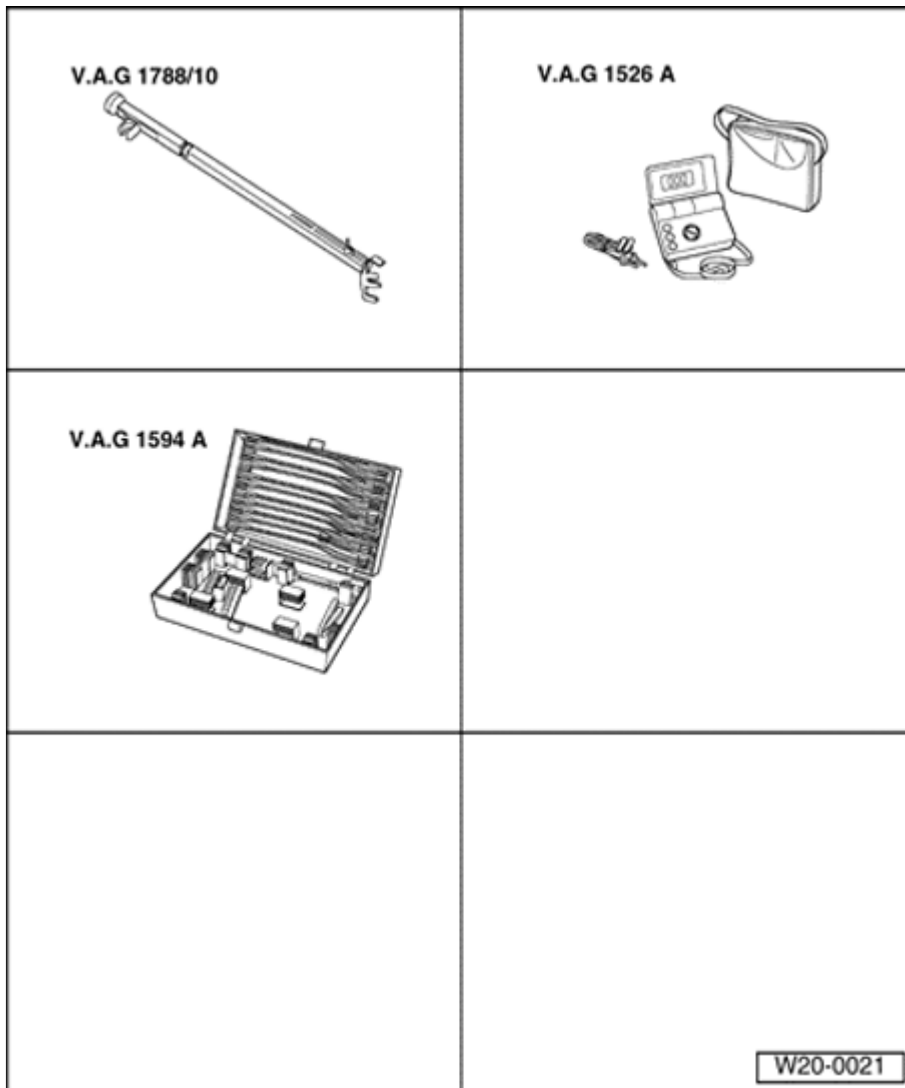


Fig. 279: Identifying Special Tools - Throttle Cable, Adjusting (Automatic Transmission)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools and equipment

- V.A.G 1788/10 Speed adjuster tool
- V.A.G 17526 A or Multimeter V.A.G 1715
- V.A.G 1594 Adapter set

Work sequence

- Adjust accelerator cable by moving retainer (arrow) at support bracket so that wide open throttle position is attained at quadrant of throttle valve control module.
- Release accelerator pedal.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Disconnect 2-pin connector off kick-down switch -F8- in engine compartment (on bulkhead).

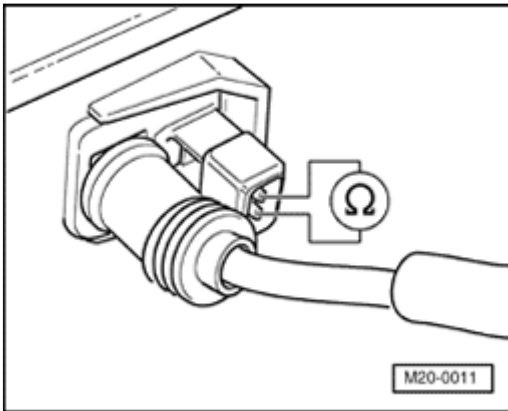


Fig. 280: Checking Resistance At Kick-Down Switch
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect multimeter V.A.G 1526 A to kick-down switch using auxiliary cables from V.A.G 1594.
- Check resistance at switch.

Specification: infinity ohms.

- Slowly move accelerator pedal in direction of wide open throttle.

Shortly after kick-down pressure point resistance must drop to 0 ohms.

At this point the accelerator pedal must be just before the limit stop.

- Adjust accelerator cable by moving retainer at support bracket so that wide open throttle position is attained at throttle valve control module and kick-down switch clicks audibly.
- Release accelerator pedal or remove pedal depressor.
- Check idling speed and wide open throttle limit stops on throttle valve after adjusting.

ELECTRONIC POWER CONTROL (EPC) SYSTEM

Electronic Power Control (EPC) system

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

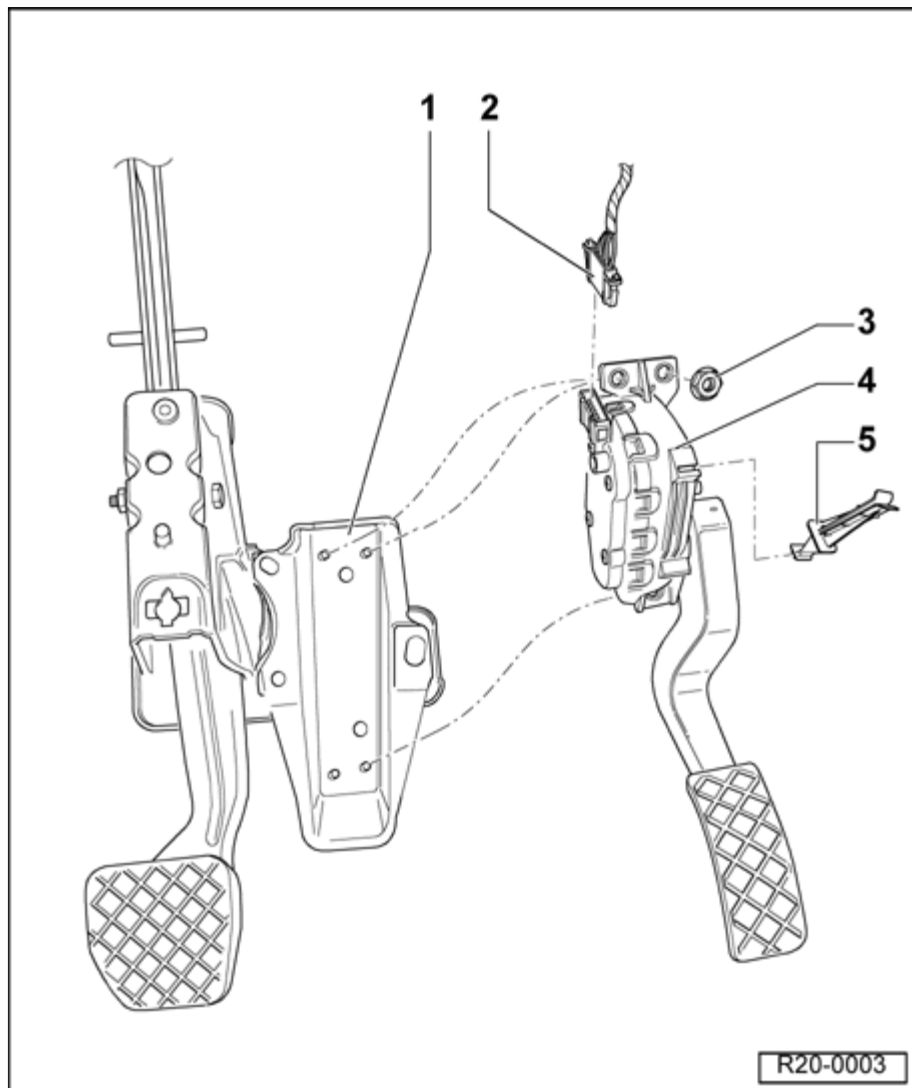


Fig. 281: Electronic Power Control Components
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Mounting

- Removing and installing:

Refer to **BRAKE PEDAL - ASSEMBLY OVERVIEW**

2 - Connector

- Black, 6-pin

3 - 10 Nm

4 - Throttle Position (TP) sensor -G79- and Sender 2 for accelerator pedal position -G185-

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- In vehicles with an automatic transmission kick down switch point must be learned again when sensor is replaced. Refer to **Adapting components and functions** .
- When removing remove cover under instrument panel

5 - Bracket

- For footwell cover
- Clipped onto accelerator pedal

Function of EPC system

With the EPC system the throttle valve is not operated by the throttle pedal via a cable. There is no mechanical connection between accelerator and throttle valve.

The position of the accelerator pedal is transmitted to the engine control module by two accelerator pedal position sensors (variable resistors; mounted in one housing) which are connected to the accelerator pedal.

The position of the accelerator pedal (drivers requirement) is the main input value for the engine control module.

The throttle valve is operated over the complete revolution and load range by an electric motor (throttle valve positioner) in the throttle valve control module.

The throttle valve is operated by the throttle valve positioner which is controlled by the engine control module.

When the engine is not running and the ignition is switched on the engine control module moves the throttle valve exactly as prescribed by the accelerator pedal position sensor. This means that when the accelerator pedal is depressed halfway the throttle valve positioner opens the throttle valve by the same amount. The throttle is then approximately half open.

When the engine is running (under load) the engine control module can open or close the throttle valve independently of the accelerator pedal position sensor.

This means that the throttle valve can already be completely open even though the accelerator pedal is depressed halfway. This gives vastly improved consumption and exhaust emission levels at certain load conditions.

After evaluating the torque requirements of various components (e.g. air conditioning, automatic transmission, ABS/ESP etc.), the engine control module calculates the optimal throttle valve opening angle for the respective situation.

This also gives vastly improved consumption and exhaust emission levels at certain load conditions.

EPC is a system comprising all components which contribute to determining, controlling or monitoring the position of the throttle valve, e.g. accelerator pedal position sensor, the throttle valve control module, the EPC warning lamp, the engine control module and so on.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

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

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

EVAPORATIVE EMISSIONS (EVAP) SYSTEM

Function of EVAP system

- Engine code BBW. Refer to **Engine code BBW**

Engine codes AEG, AVH, AZG, BEV

Depending on air pressure and ambient temperature, fuel vapor will form above the level of fuel in the tank.

The EVAP system prevents these hydrocarbon emissions from escaping into the atmosphere.

The fuel vapors from the highest point in the pass through the gravity valve (which closes at an angle of 45 °) and through a pressure retention valve (in limited quantities) to the EVAP filter.

The activated charcoal in the EVAP canister stores these vapors like a sponge.

When the oxygen sensor control is active during driving (engine warm), the EVAP canister purge regulator valve -N80- is activated (pulsed) from engine control module depending upon load and engine speed. The opening period is dependent on the input signals.

The intake manifold vacuum draws fresh air through the breather opening on the underside of the EVAP canister during the purging procedure (regenerating the activated charcoal). The fuel vapors stored in the activated charcoal and fresh air is fed for combustion in dosed quantities via the EVAP canister purge regulator valve -N80-.

The pressure retention valve prevents fuel vapors from being drawn from the tank when the solenoid valve is open and intake manifold vacuum is present. It therefore ensures that the evacuation of the activated charcoal filter has priority.

When no voltage is applied (e.g. wiring open circuit), the solenoid valve is closed. The activated charcoal canister will not be purged.

The vacuum line from the throttle valve control module to the EVAP canister has an additional by-pass which is connected with the crankcase breather valve. The non-return valve integrated in the crankcase breather valve prevents the intake air gassing into the crankcase during some partial load ranges. This improves the overall crankcase breathing. The by-pass guarantees the crankcase breathing.

Functional description of leak diagnosis

The EVAP canister system (including the fuel tank) is equipped with a leak diagnostic system. This system detects leaks in breather system.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

The diagnosis is based on the pressure principle and should detect leaks with a circumference larger than 1 mm.

During the diagnosis the fuel system Leak Detection Pump (LDP) -144- creates a pressure of 30 mbar in the EVAP system. When the pressure is attained the pump switches off. If the pressure drops below a predetermined value the pump switches on again. The On Board Diagnostic (OBD) monitors the switching periods and sets a fault in the Diagnostic Trouble Code (DTC) memory when the period is too short.

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

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

Servicing parts of the EVAP system. Refer to **Engine code AEG** .

Assembly overview of EVAP system. Refer to **EVAP system, assembly overview** .

NOTE:

- Hose connections are secured with either spring-type or clamp-type clips.
- Always replace clamp-type clips with spring-type clips.

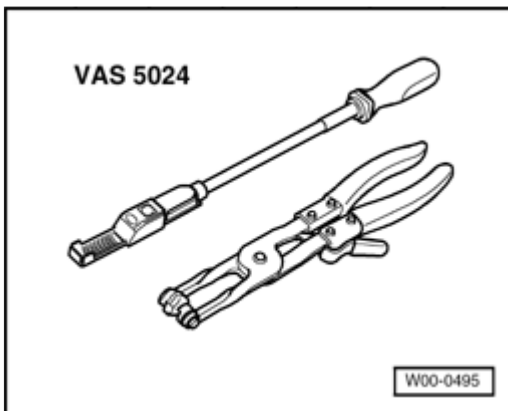


Fig. 282: Identifying Assembly Tool VAS 5024

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Assembly tool VAS 5024 or hose clip pliers V.A.G 1921 are recommended for installing spring-type clips.

Engine code BBW

Depending on air pressure and ambient temperature, fuel vapor will form above the level of fuel in the tank.

The EVAP system prevents these hydrocarbon emissions from escaping into the atmosphere.

The fuel vapors of the fuel tank flow via the internal bubble canister in the fuel tank, through the integrated gravity valve, into the EVAP canister.

The activated charcoal in the EVAP canister stores these vapors like a sponge.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

When the oxygen sensor control is active during driving (engine warm), the EVAP canister purge regulator valve -N80- is activated (pulsed) from engine control module depending upon load and engine speed. The opening period is dependent on the input signals.

The intake manifold vacuum draws fresh air through the breather opening on the underside of the EVAP canister during the purging procedure (regenerating the activated charcoal). The fuel vapors stored in the activated charcoal and fresh air are fed for combustion in dosed quantities via the EVAP canister purge regulator valve -N80-.

When no voltage is applied (e.g. wiring open circuit), the solenoid valve is closed. The activated charcoal canister will not be purged.

The vacuum line from the throttle valve control module to the EVAP canister has an additional by-pass which is connected with the crankcase breather valve. The non-return valve integrated in the crankcase breather valve prevents the intake air gassing into the crankcase during some partial load ranges. This improves the overall crankcase breathing. The by-pass guarantees the crankcase breathing.

Functional description of leak diagnosis

The EVAP canister system (including the fuel tank) is equipped with a leak diagnostic system. This system detects leaks in breather system.

The diagnosis is based on the pressure principle and should detect leaks with a circumference larger than 1 mm.

During the diagnosis the fuel system Leak Detection Pump (LDP) -144- creates a pressure of 30 mbar in the EVAP system. When the pressure is attained the pump switches off. If the pressure drops below a predetermined value the pump switches on again. The On Board Diagnostic (OBD) monitors the switching periods and sets a fault in the Diagnostic Trouble Code (DTC) memory when the period is too short.

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

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

Servicing parts of the EVAP system. Refer to **Engine code AEG** .

Assembly overview of EVAP system. Refer to **EVAP system, assembly overview** .

NOTE:

- **Hose connections are secured with either spring-type or clamp-type clips.**
- **Always replace clamp-type clips with spring-type clips.**

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

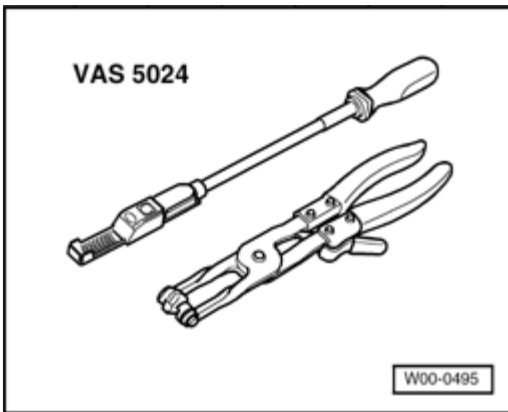


Fig. 283: Identifying Assembly Tool VAS 5024

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Assembly tool VAS 5024 or hose clip pliers V.A.G 1921 are recommended for installing spring-type clips.

Evaporative Emissions (EVAP) system components, servicing

Engine code AEG

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

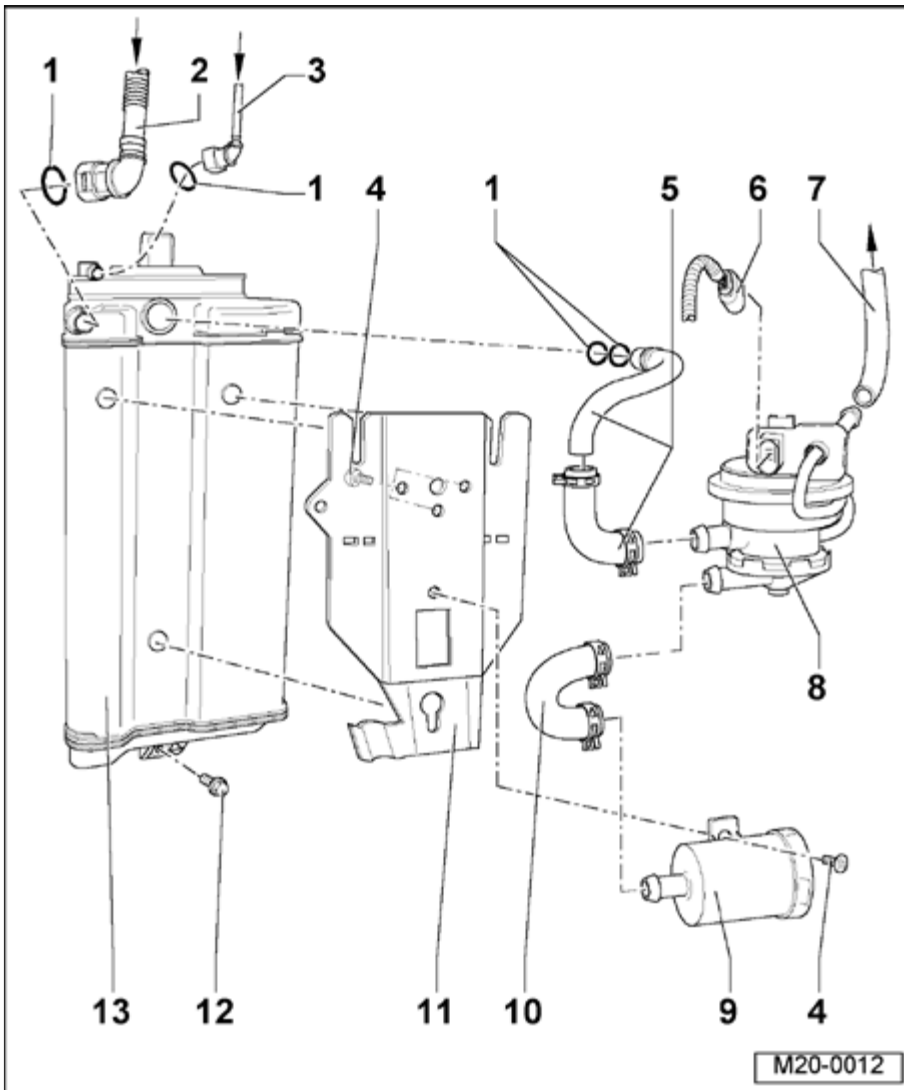


Fig. 284: Exploded View Of Evaporative Emissions System Components (Engine Code AEG)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Engine code BBW. Refer to **Engine code BBW**
- Engine codes AVH, AZG, BEV. Refer to **Engine codes AVH, AZG, BEV**

NOTE: **Checking for leaks in (EVAP) system. Refer to Adapting components and functions , Adapting functions and components**

1 - O-ring

- Replace if damaged

2 - Breather line

- Black

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Check if seated securely
- Press together at front to release
- To change-over valve. Refer to **Engine codes AEG, AVH, AZG, BEV**, item 11

3 - Breather line

- White
- Check if seated securely
- Press together at front to release
- To pressure retention valve. Refer to **Engine codes AEG, AVH, AZG, BEV** , item 12

4 - Securing bolt, 3 Nm

5 - Connecting hose

- Pressure side

6 - Connector

- Black, 3-pin

7 - Vacuum hose

- To intake manifold. Refer to **EVAP system, assembly overview** , item -6-

8 - Leak Detection Pump (LDP) -V144-

- In right rear wheelhousing, behind wheelhousing liner
- Pump will be activated by engine control module (pulsed)

9 - Air cleaner for leak detection pump

10 - Connecting hose

- Suction side

11 - Bracket

- Secured on (EVAP) filter

12 - 10 Nm

13 - Evaporative Emissions (EVAP) canister

- In right rear wheelhousing, behind wheelhousing liner

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Engine codes AVH, AZG, BEV

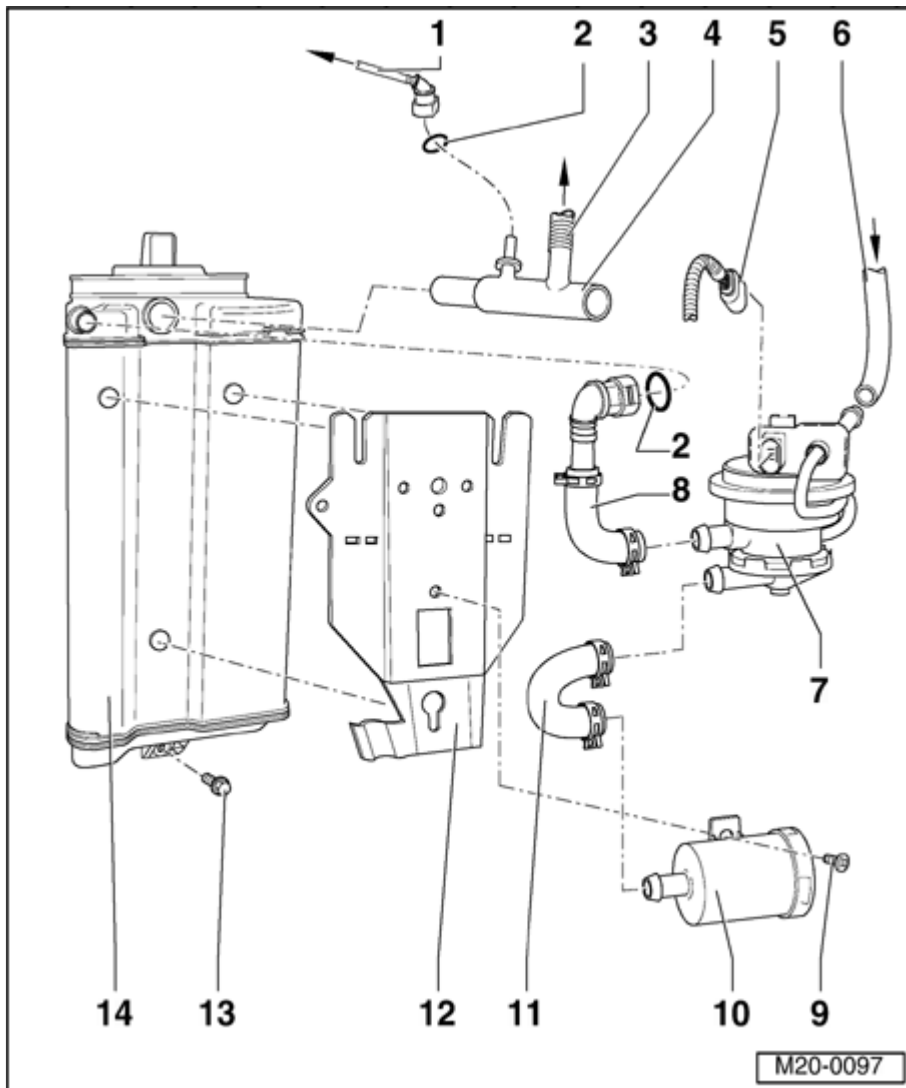


Fig. 285: Exploded View Of Evaporative Emissions System Components (Engine Codes AVH, AZG, BEV)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

NOTE: Checking for leaks in (EVAP) system. Refer to Adapting components and functions , Adapting functions and components

1 - Breather line

- White
- Check if seated securely
- Press together at front to release
- To pressure retention valve. Refer to Engine codes AEG, AVH, AZG, BEV , item 7

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

2 - O-ring

- Replace if damaged

3 - Breather line

- Black
- Check if seated securely
- Press together at front to release
- To change-over valve. Refer to **Engine codes AEG, AVH, AZG, BEV** , item 12

4 - Connecting piece

5 - Connector

- Black, 3-pin

6 - Vacuum hose

- To intake manifold. Refer to **EVAP system, assembly overview** , item -6-

7 - Leak Detection Pump (LDP) -V144-

- In right rear wheelhousing, behind wheelhousing liner
- Pump will be activated by engine control module (pulsed)

8 - Connecting hose

- Pressure side

9 - 3 Nm

10 - Air cleaner for leak detection pump

11 - Connecting hose

- Suction side

12 - Bracket

13 - 10 Nm

14 - Evaporative Emissions (EVAP) canister

- In right rear wheelhousing, behind wheelhousing liner

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Engine code BBW

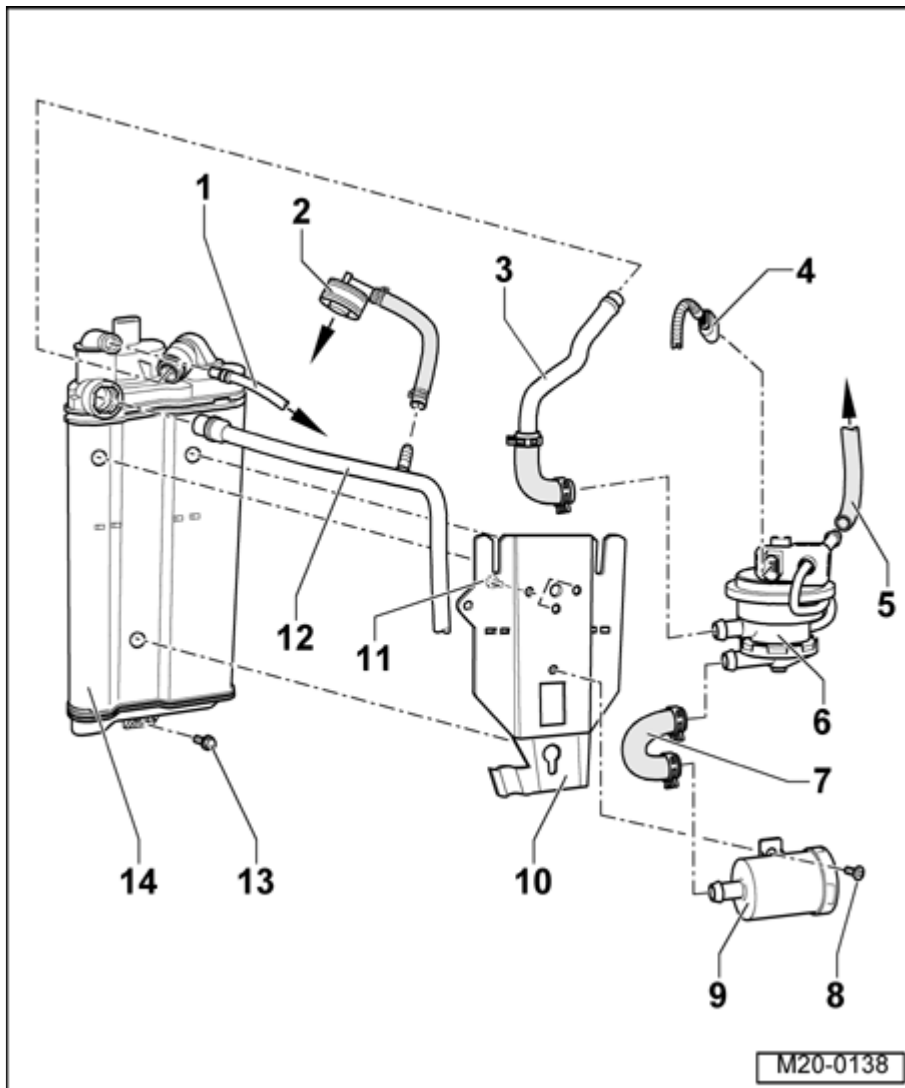


Fig. 286: Exploded View Of Evaporative Emissions System Components (Engine Codes BBW)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Breather pipe

- White
- Check if seated securely
- To unlock press safety ring at EVAP canister together
- To EVAP canister purge regulator valve. Refer to EVAP system, assembly overview , item -EVAP system, assembly overview

2 - Non-return valve

- Clipped into filler neck

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Must have a passageway in direction of filler neck

3 - Connecting hose

- Pressure side

4 - Connector

- Black, 3-pin

5 - Vacuum line

- To intake manifold. Refer to EVAP system, assembly overview , item -6-

6 - Leak Detection Pump (LDP) -V144-

- In right rear wheelhousing, behind wheelhousing liner
- Pump will be activated by engine control module (pulsed)

7 - Connecting hose

- Suction side

8 - 3 Nm

9 - Air filter for Leak Detection Pump -V144-

10 - Bracket

- To remove, pull forward in engage area (center) and slide bracket downward

11 - 3 Nm

12 - Breather pipe

- Part of fuel tank
- Check if seated securely
- To unlock press safety ring at EVAP canister together

13 - Evaporative Emissions (EVAP) canister

- In right rear wheelhousing, behind wheelhousing liner

EVAP system, assembly overview

Engine codes AEG, AVH, AZG, BEV

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

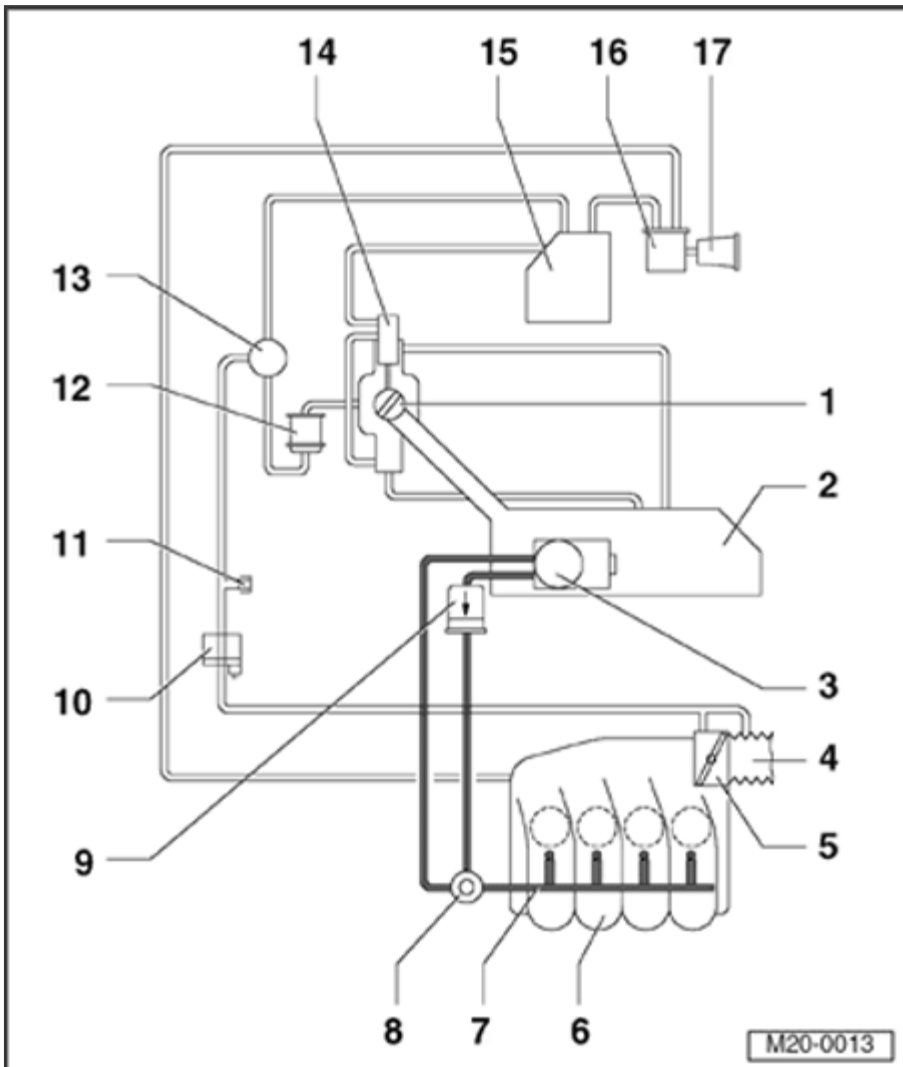


Fig. 287: EVAP System, Assembly Overview (Engine Codes AEG, AVH, AZG, BEV)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Engine code BBW. Refer to **Engine code BBW**

1 - Tank flap unit

2 - Fuel tank

3 - Fuel delivery unit

4 - Intake hose

5 - Throttle valve control module -J338-

6 - Intake manifold

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

7 - Fuel rail with injectors

8 - Fuel pressure regulator

9 - Fuel filter

- Installed position: Arrow points in direction of flow

10 - Evaporative Emissions (EVAP) canister purge regulator valve -N80-

- Installed position: Arrow points in direction of flow
- Valve will be activated by engine control module (pulsed)

11 - Test connection

12 - Gravity valve

13 - Pressure retention valve

14 - Change-over valve

15 - Evaporative Emissions (EVAP) canister

- In right rear wheelhousing, behind wheelhousing liner

16 - Leak Detection Pump (LDP) -V144-

- In right rear wheelhousing, behind wheelhousing liner
- Pump will be activated by engine control module (pulsed)

17 - Air filter for Leak Detection Pump (LDP) -V144-

Engine code BBW

2003 Volkswagen Jetta GL
ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

2003 Volkswagen Jetta GL
ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

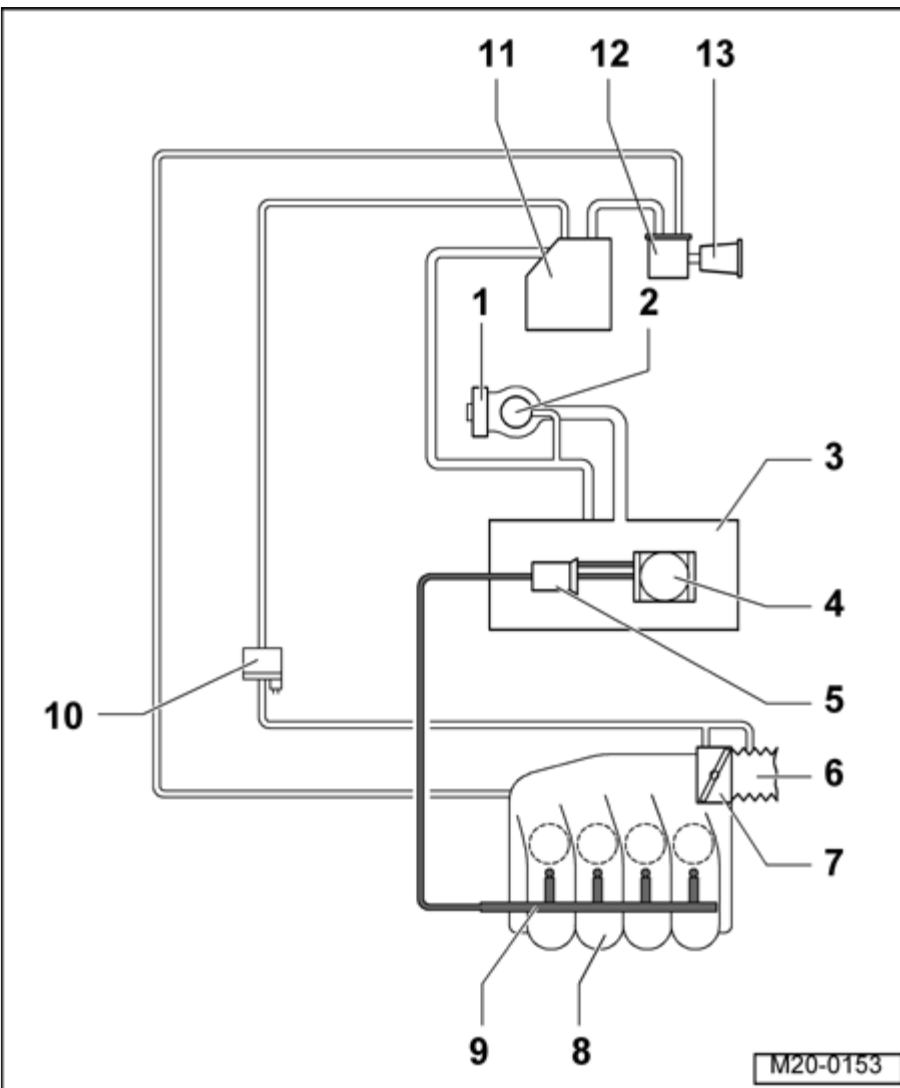


Fig. 288: EVAP System, Assembly Overview (Engine Codes BBW
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- 1 - Tank flap unit**
- 2 - Non-return valve**
- 3 - Fuel tank**
- 4 - Fuel delivery unit**
- 5 - Fuel filter**
 - Installed position: Arrow points in direction of flow
- 6 - Intake hose**

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

7 - Throttle valve control module -J338-

8 - Intake manifold

9 - Fuel rail with injectors

10 - Evaporative Emissions (EVAP) canister purge regulator valve -N80-

- Right front in engine compartment
- Installed position: Arrow points in direction of flow
- Valve will be activated by engine control module (pulsed)

11 - Evaporative Emissions (EVAP) canister

- In right rear wheelhousing, behind wheelhousing liner

12 - Leak Detection Pump (LDP) -V144-

- In right rear wheelhousing, behind wheelhousing liner
- Pump will be activated by engine control module (pulsed)

13 - Air filter for Leak Detection Pump -V144-

EVAP system, checking using KLI 9210 tester

Introduction

The KLI 9210 EVAP tester allows testing using nitrogen to pressurize the eVAP system and a smoke generator or ultrasonic tester to locate the source of EVAP system concerns.

This procedure is intended as a general guide for the use of the EVAP tester. EVAP systems vary between models.

Special tools and equipment

- VAS 5051 or VAS 5052 diagnostic tester
- KLI 9210 EVAP system tester (set to 14 in. H2O)
- Light source (for viewing smoke)
- Special tool 3094 or equivalent

Using the KLI 9210 EVAP system tester. Refer to Tester operating instructions

Calibrating the KLI 9210 tester

Determine the vehicle leak threshold:

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Up to and including M.Y. 1999 leak threshold = 0.040 in.
- From M.Y. 2000 leak threshold = 0.020 in.

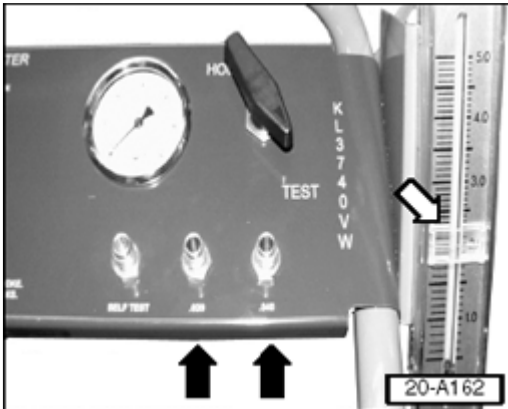


Fig. 289: Calibrating KLI 9210 Tester

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Attach test hose to appropriate pre-set port (black arrows).
- Turn control valve from "Hold" to "Test".
- Set flow meter flag (white arrow) at indicated value on flow meter.
- Turn control valve to "Hold"; remove test hose.

Testing the fuel cap

- Remove fuel cap.

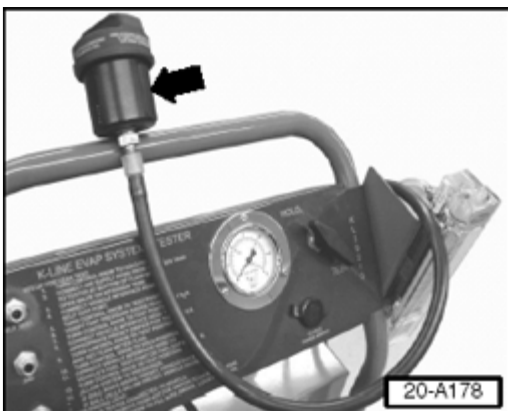


Fig. 290: Testing The Fuel Cap

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect fuel cap receiver (arrow) to hose.
- Screw fuel cap tightly to cap receiver.
- Turn control valve to "Test" pressurizing cap.
- Turn valve to "Hold".

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Watch pressure gauge for drop in pressure from 14 inches H₂O.

If no pressure drop is indicated:

- Proceed to "Checking Leak Detection Pump -V144- for internal leaks".

If pressure drop is indicated:

- Replace fuel cap and re-test.
- Proceed to "Checking Leak Detection Pump -V144- for internal leaks".

Checking Leak Detection Pump -V144- for internal leaks

Basically, in the following procedure the EVAP system will be filled with smoke, the engine started and the LDP activated using the VAS 5051 or VAS 5052. With the LDP activated, and after clearing initial smoke away from the LDP area using compressed air, the system is then filled with smoke again and rechecked for smoke at the LDP filter.

Conditions

- Ignition switched off
- LDP is visible. Refer to Component Locations



Fig. 291: Checking Leak Detection Pump -V144- For Internal Leaks
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Tester hose connected to fuel filler neck
- VAS 5051 or VAS 5052 Diagnostic tool connected to vehicle
- Smoke generator connected to battery
- Turn KLI 9210 valve to "Test" and use smoke generator trigger to fill system with smoke (wait until smoke is coming out of the LDP filter).
- Start engine.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- From VAS 5051 Start-up screen, select "Vehicle self diagnosis".

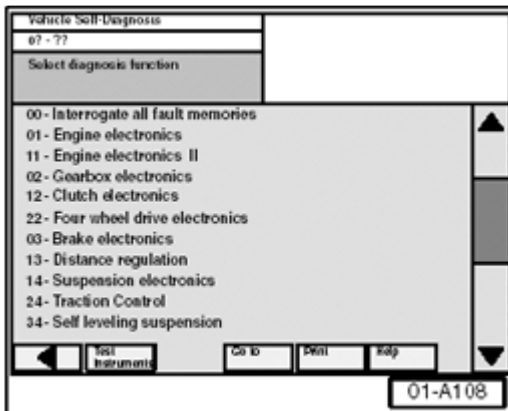


Fig. 292: Scan Tool Display - Selecting "01 - Engine Electronics".
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Select vehicle system "01 - Engine electronics".

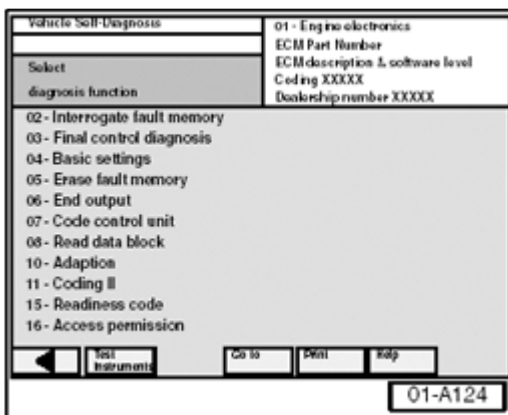


Fig. 293: Scan Tool Display - Selecting "04 - Basic Settings"
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Select Diagnosis Function "04 - Basic settings".



2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Fig. 294: Scan Tool Display - Keypad Display

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Input appropriate display group from table below on keypad.

Engine code	Display group
AEG, BEV	071
AVH, AZG, BBW	202

- Press "Q" on keypad to confirm.

LDP should activate

If LDP does not activate:

For some vehicles using Display group 202 a similar screen appears indicating "Test Off".

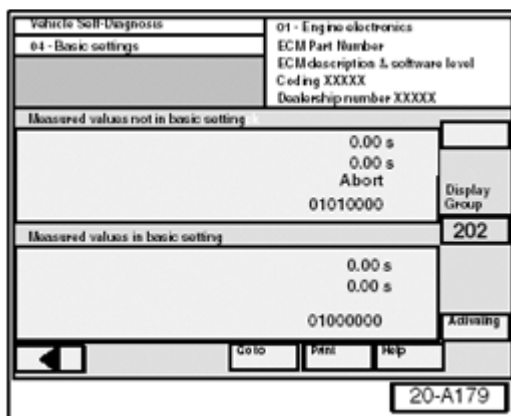


Fig. 295: Scan Tool Display - Selecting "Activating" Button

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Select "Activating" button.

If LDP does not activate:

- Check electrical connections to LDP.
- Check vacuum source to LDP.

If LDP activates:

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Vehicle Self-Diagnosis		01 - Engine electronics	
04 - Basic settings		ECM Part Number	
		ECM description & software level	
		Coding XXXXX	
		Dealership number XXXXX	
Measured values not in basic setting			
0.00 s		Display Group	
0.00 s			
Abort			
01010000		202	
Measured values in basic setting			
2.30 s		Display Group	
0.00 s			
00001000			
Advising			
◀		Go	
Print		Help	
20-181			

Fig. 296: Scan Tool Display - Indicating "1" In Position 5
Courtesy of VOLKSWAGEN UNITED STATES, INC.

A similar screen appears, Test is "ON" (indicated by a "1" in position 5, -arrow-).

Vehicle Self-Diagnosis		01 - Engine electronics	
04 - Basic settings		ECM Part Number	
		ECM description & software level	
		Coding XXXXX	
		Dealership number XXXXX	
Measured values not in basic setting			
0.00 s		Display Group	
0.00 s			
Abort			
01010000		202	
Measured values in basic setting			
0.14 s		Display Group	
0.00 s			
10001000			
Advising			
◀		Go	
Print		Help	
20-A182			

Fig. 297: Scan Tool Display - Indicating Position 1
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Position 1 (arrow) alternates between "0" and "1" during pump operation.

Vehicle Self-Diagnosis		01 - Engine electronics	
04 - Basic settings		ECM Part Number	
		ECM description & software level	
		Coding XXXXX	
		Dealership number XXXXX	
Measured values not in basic setting			
0.00 s		Display Group	
0.00 s			
Abort			
01010000		202	
Measured values in basic setting			
0.00 s		Display Group	
11.02 s			
01000100			
Advising			
◀		Go	
Print		Help	
20-A180			

Fig. 298: Scan Tool Display - Indicating "1" In Position 6 & "0" In Position 8
Courtesy of VOLKSWAGEN UNITED STATES, INC.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

If test is OK:

Indicated by "1" in position 6 and a "0" in position 8 as shown.

LDP has activated and the system is pressurized.

- Using a compressed air blow gun, clear area near LDP and LDP filter of any residual smoke.

If the test aborts and DTCs other than for small or large leaks are stored:

- Check and repair according to DTC listed in DTC table for appropriate engine code.

When "Check end" is indicated on VAS 5051 or VAS 5052:

NOTE: Only check LDP during "Check end" phase when "Test OK" was indicated.

- Use smoke generator trigger to fill system with smoke again.
- Check for smoke doming from LDP filter and LDP hose connections.
- Smoke coming from filter indicates a faulty LDP
- Smoke coming from LDP outlet or hose indicates a faulty hose or clamp
- Make repairs as necessary and check with smoke again.
- No smoke coming from filter indicates LDP is OK and leak is somewhere else in EVAP system

NOTE: If the KLI 9210 EVAP sytem tester is connected in "Test" mode and Basic settings (using Self Diagnosis) and Fault finding are activated, a false "System OK" message may be generated.

If the LDP is OK and a DTC was stored for the EVAP system:

- Switch ignition off.
- Continue checking EVAP system as follows:

Checking EVAP system for leaks

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

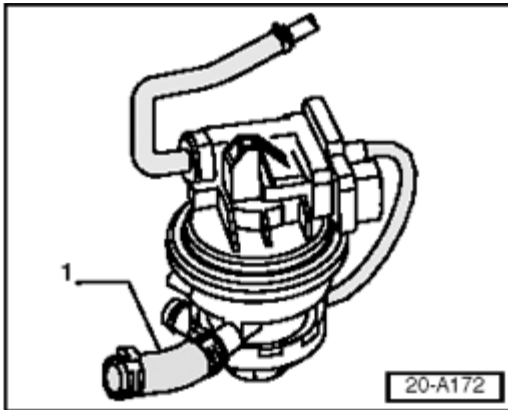


Fig. 299: LDP Outlet (EVAP side)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Clamp off LDP outlet (EVAP side) -1- using special tool 3094 or equivalent.

CAUTION: Clamp only soft rubber lines when isolating a leak. To avoid risk of damage, never clamp hard plastic lines!

- Turn control valve from "Hold" to "Test".
- Allow fuel system to pressurize.

NOTE: Fuel system pressurization depends on volume of fuel system and amount of fuel in tank.

If fuel system pressurization does not stabilize:

- Verify that all fuel system outlets have been sealed before continuing.

NOTE: Any flow shown on flow meter indicates a leak. Flow below flow meter flag set at vehicle leak standard may indicate a sporadic DTC.

If flow meter on tester registers flow near or above pre-set pressure:

- Clamp off hose leading from EVAP canister purge regulator valve -N80- to intake manifold.

If flow stops:

- Replace EVAP canister purge regulator valve -N80- and repeat test before continuing.

If meter indicates no flow after test:

- Perform quality check and return vehicle to customer.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

If flow continues:

- Use smoke generator trigger to charge fuel system with smoke again.
- Inspect complete EVAP system for escaping smoke.

NOTE: It may be necessary to move, twist, or wiggle EVAP components around to reproduce leak.

If leak cannot be found using smoke:



Fig. 300: Ultrasonic Tester
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Locate leak with ultrasonic tester.
- General search: tester only
- Localized search: tester with extension wand (left)

If leak cannot be located:

- Disconnect and plug or clamp shut EVAP lines to isolate fuel tank using special tool 3094 or equivalent before continuing.

CAUTION: Clamp only soft rubber lines when isolating a leak. To avoid risk of damage, never clamp hard plastic lines!

If flow stops:

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Reconnect EVAP lines and search area that was isolated.

When leak has been located:

- Repair leak and repeat EVAP system test.

NOTE:

- Because leak may be at top of fuel tank, it may not be possible to locate through fuel pump/sending unit access plate.
- Lower fuel tank if necessary to locate leak.

CAUTION: Do not return vehicle to the customer without having performed a proper diagnosis and repair.

24 MULTIPOINT FUEL INJECTION (MFI)

INJECTION SYSTEM, SERVICING

Component locations overview

- Engine codes AVH, AZG. Refer to Engine codes AVH, AZG
- Engine codes BBW, BEV. Refer to Engines: BBW, BEV

Engine code AEG

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

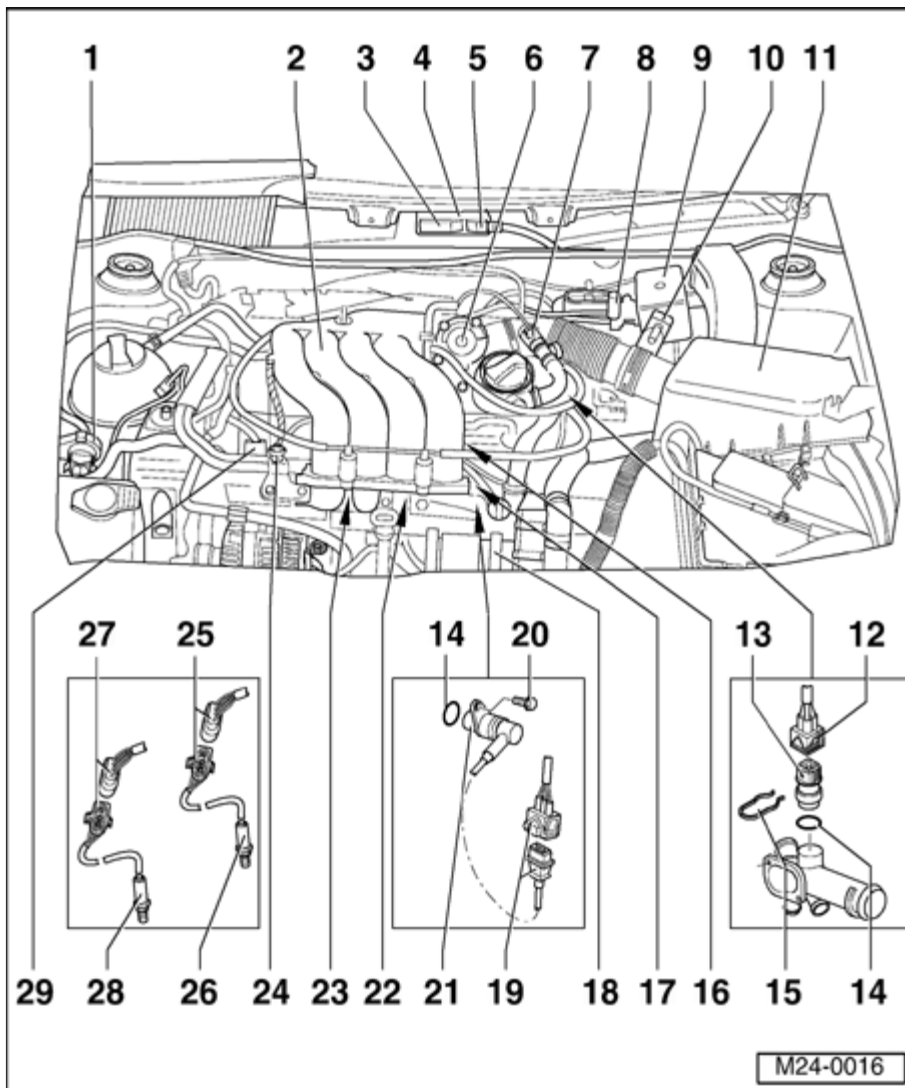


Fig. 301: Injection System (Engine Code AEG)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Evaporative Emissions (EVAP) canister purge regulator valve -N80-

- EVAP system, servicing. Refer to **Function of EVAP system**

2 - Intake manifold

Upper part:

- Disassembling and assembling. Refer to **Engine code AEG**

Lower part:

- Disassembling and assembling. Refer to **Intake manifold lower part, disassembling and assembling**

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

3 - 52-pin connector

- Only disconnect or connect with ignition switched off
- Release to disconnect

4 - Motronic Engine Control Module (ECM) -J220-

- On replacement, control module must be matched to electronic immobilizer. Refer to **Adapting components and functions** , adapting components
- Installed location: In plenum chamber
- Replace. Refer to **Engine control module, replacing**

5 - 28-pin connector

- Only disconnect or connect with ignition switched off
- Release to disconnect

6 - Throttle valve control module -J338-

- When replacing, adapt (match) engine control module to electronic immobilizer. Refer to **Adapting components and functions** , adapting components

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

8 - Secondary Air Injection (AIR) solenoid valve -N112-

- Removing and installing. Refer to **Engine code AEG (up to model year 1999)**

9 - Secondary Air Injection (AIR) pump relay -J299-

- Removing and installing. Refer to **Engine code AEG (up to model year 1999)**

10 - Mass Air Flow (MAF) sensor -G70- with Intake Air Temperature (IAT) sensor -G42-

11 - Air cleaner

- Removing and installing. Refer to **Air cleaner, disassembling and assembling**

12 - 4-pin connector

- Wiring chamber 1 and wiring chamber 3 for Engine Coolant Temperature (ECT) Sensor -G62-
- Connector contacts 1 and 3 are gold plated

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

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- For engine control module
- With Engine Coolant Temperature (ECT) Sensor -G2-
- Release pressure in cooling system before removing, if necessary
- Wiring chamber 1 and wiring chamber 3 for Engine Coolant Temperature (ECT) Sensor -G62-
- Connector contacts 1 and 3 are gold plated

14 - O-ring

- Replace if damaged

15 - Securing clip

- Check for secure seating

16 - Injector (-N30-, -N31-, -N32-, -N33-)

- Clean with air
- Checking quantity injected and for leaks. Refer to **Injectors, checking for leaks and quantity injected**

17 - Ignition coils -N-, -N128-

- With Power output stage -N122-
- Refer to **Ignition system components, removing and installing** , item -12-

18 - Secondary Air Injection (AIR) pump motor -V101-

- Removing and installing. Refer to **Engine code AEG (up to model year 1999)**

19 - 3-pin connector

- Gray for Engine Speed (RPM) sensor -G28-

20 - 10 Nm

21 - Engine speed (RPM) sensor -G28-

22 - Knock Sensor (KS) 2 -G66-

- Brown connector
- Refer to **Engine code BBW** , item -9-
- Sensor and connector contacts are gold plated

23 - Knock Sensor (KS) 1 -G61-

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Black connector
- Refer to **Engine code BBW** , item -9-
- Sensor and connector contacts are gold plated

24 - Fuel pressure regulator

25 - 4-pin connector

- Black
- For Heated Oxygen Sensor (HO2S) -G39- and Oxygen Sensor (O2S) Heater -Z19-
- Connector contacts 3 and 4 are gold plated
- On right under vehicle

26 - Heated Oxygen Sensor (HO2S) -G39-, 50 Nm

- Installed location: In exhaust manifold
- Remove and install with 3337
- When replacing erase DTC memory. Refer to **Engine control module Diagnostic Trouble Code (DTC) memory, interrogating and erasing**

27 - 4-pin connector

- Color brown
- For Oxygen Sensor (O2S) Behind Three Way Catalytic Converter (TWC) -G130- and -Oxygen Sensor (O2S) Heater 1 behind Three Way Catalytic Converter (TWC) -Z29-
- Contacts 3 and 4 are gold plated
- Installed location: On right on underside of vehicle

28 - Oxygen Sensor (O2S) Behind Three Way Catalytic Converter (TWC) -G130-, 50 Nm

- On rear of catalytic converter
- Remove and install with 3337
- When replacing erase DTC memory. Refer to **Engine control module Diagnostic Trouble Code (DTC) memory, interrogating and erasing**

29 - Camshaft Position (CMP) sensor -G40-

- Refer to **Engine code AEG** , item -9-

Engine codes AVH, AZG

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

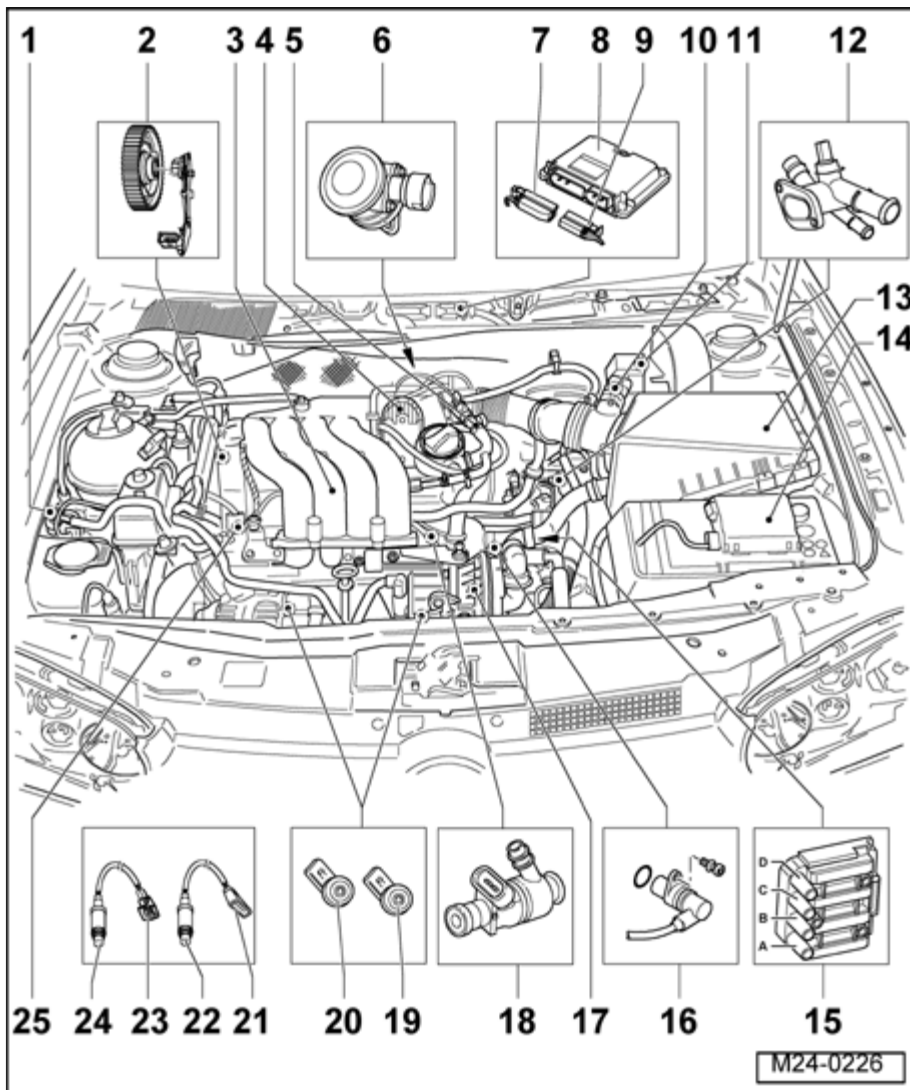


Fig. 302: Injection System (Engine Code AVH, AZG)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

The components A, B and C are not shown on the illustration.

A - Brake pedal switch -F47- or Brake light switch -F-

- Together in one housing in footwell

B - Throttle Position (TP) sensor -G79- and Sender 2 for accelerator pedal position -G185-

- In footwell at accelerator pedal

C - Clutch pedal switch -F36-

- In footwell

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

1 - Evaporative Emissions (EVAP) canister purge regulator valve -N80-

- EVAP system, servicing. Refer to Function of EVAP system

2 - Camshaft Position (CMP) sensor -G40-

- In cylinder head cover
- Controlled by engine control module

3 - Intake manifold

Upper part:

- Disassembling and assembling. Refer to Engine code AEG

Lower part:

- Disassembling and assembling. Refer to Intake manifold lower part, disassembling and assembling

4 - Throttle valve control module -J338-

- When replacing, adapt (match) engine control module to throttle valve control module. Refer to Adapting components and functions , adapting components
- 6-pin connector
- Gold plated contacts

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

- For crankcase breather
- Checking. Refer to Part II , item -2-

6 - Secondary Air Injection (AIR) solenoid valve -N112-

- Removing and installing. Refer to Engine code AEG (up to model year 1999)

7 - 81-pin connector

- Only disconnect or connect with ignition switched off
- Release to disconnect

8 - Motronic Engine Control Module (ECM) -J220-

- On replacement, control module must be matched to electronic immobilizer. Refer to Adapting components and functions , adapting components
- Installed location: In plenum chamber

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Replacing. Refer to **Engine control module, replacing**

9 - 40-pin connector

- Only disconnect or connect with ignition switched off

10 - Mass Air Flow (MAF) sensor -G70- with Intake Air Temperature (IAT) sensor -G42-

- Gold plated contacts

11 - Protective housing for relays

- Secondary Air Injection (AIR) pump relay -J299-
- Motronic ECM power supply relay -J271-
- Relay assignment in protective housing. See **Fig. 303** .

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

- Green
- For engine control module
- Gold plated contacts
- Release pressure in coolant system if necessary before removing components

13 - Air cleaner

- Disassembling and assembling. Refer to **Air cleaner, disassembling and assembling**

14 - Protective housing

- For supplementary fuses

15 - Ignition coils with final output stages -N70-, -N127-, -N291-, -N292-

- Refer to **Engine code BBW** , item -2-

16 - Engine speed (RPM) sensor -G28-

- Torque setting 10 Nm

17 - Secondary Air Injection (AIR) pump motor -V101-

- Secondary air system. Refer to **Engine code AEG (up to model year 1999)**

18 - Injector (-N30-, -N31-, -N32-, -N33-)

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Engine codes: AVH, AZG: Air shrouded
- Engine code: BEV: Not air shrouded
- Checking quantity injected and for leaks. Refer to **Fig. 303**

19 - Knock Sensor (KS) 2 -G66-

- Location: Cylinder block intake side
- Next to ignition transformer
- Black, 2-pin
- Gold plated contacts
- Mark connector before removing
- Tightening torque: Refer to **Engine code BBW** , item -9-

20 - Knock Sensor (KS) 1 -G61-

- Location: Cylinder block intake side
- Black, 2-pin
- Gold plated contacts
- Mark connector before removing
- Torque setting: Refer to **Engine code BBW** , item -9-

21 - 4-pin connector

- Brown
- Connector contacts 3 and 4 are gold plated
- For Oxygen Sensor (O2S) Behind Three Way Catalytic Converter (TWC) -G130- and Oxygen Sensor (O2S) heater 1 behind Three Way Catalytic Converter (TWC) -Z29-
- Location: On right on underside of vehicle. Refer to **Fig. 305**

22 - Oxygen Sensor (O2S) Behind Three Way Catalytic Converter (TWC) -G130-, 50 Nm

- Installed location: In rear of catalytic converter
- Remove and install with 3777
- When replacing erase Diagnostic Trouble Code (DTC) memory. Refer to **Engine control module Diagnostic Trouble Code (DTC) memory, interrogating and erasing**

23 - 6-pin connector

- Black for Heated Oxygen Sensor (HO2S) -G39- and Oxygen Sensor (O2S) heater -Z19-
- Gold plated contacts

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Installed location: On right on underside of vehicle. See **Fig. 308** .

24 - Heated Oxygen Sensor (HO2S) -G39-, 50 Nm

- Installed location: In exhaust manifold
- Remove and install with 3777
- When replacing erase Diagnostic Trouble Code (DTC) memory. Refer to **Engine control module Diagnostic Trouble Code (DTC) memory, interrogating and erasing**

25 - Fuel pressure regulator

- Checking. Refer to **Fuel pressure regulator and holding pressure, checking** , Checking fuel pressure regular and holding pressure

Position of relays in protective housing (on left in engine compartment)

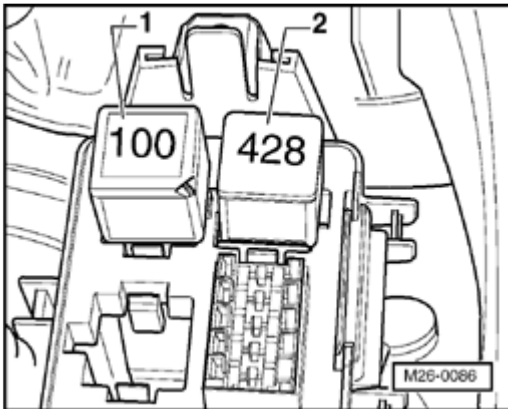


Fig. 303: Position Of Relays In Protective Housing (On Left In Engine Compartment)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Secondary Air Injection (AIR) pump relay -J299-, Distinguishing features: Control number 100

2 - Motronic Engine Control Module (ECM) power supply relay -J271-, Distinguishing features: Control number 428

NOTE:

- The relay locations may differ depending on level of equipment.
- For latest control numbers and installed locations:

Refer to Electrical Wiring Diagrams, Troubleshooting & Component Locations

- Disconnect battery Ground strap first if tools are required to pull relays or control modules out of the relay plate.
- Before disconnecting the battery Ground strap obtain code for radios with anti-theft coding.

Location: 6-pin connector -1- for Heated oxygen sensor (HO2S) before catalytic converter

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

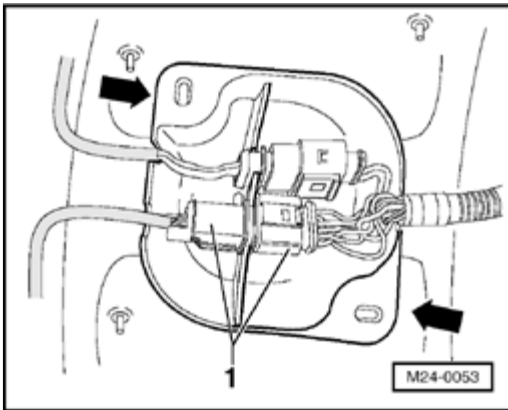


Fig. 304: Location: 6-Pin Connector -1- For Heated Oxygen Sensor (HO2S) Before Catalytic Converter
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Location: 4-pin connector -1- for Oxygen Sensor (O2S) Behind Three Way Catalytic Converter

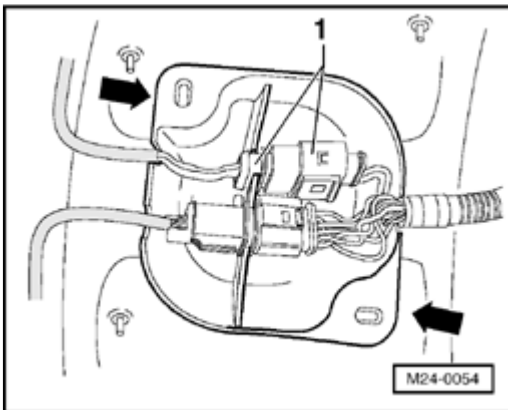


Fig. 305: Location: 4-Pin Connector -1- For Oxygen Sensor (O2S) Behind Three Way Catalytic Converter
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Engines: BBW, BEV

The components A, B C and D are not shown on the illustration.

A - Brake pedal switch -F47- or Brake light switch -F-

- Together in one housing in footwell

B - Throttle Position (TP) sensor -G79- and Sender 2 for accelerator pedal position -G185-

- In footwell at accelerator pedal. Refer to Accelerator mechanism, servicing

C - Clutch pedal switch -F36-

- In footwell

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

D - Fuel pressure regulator

- On fuel filter in fuel tank
- Checking. Refer to Checking fuel pressure regulator

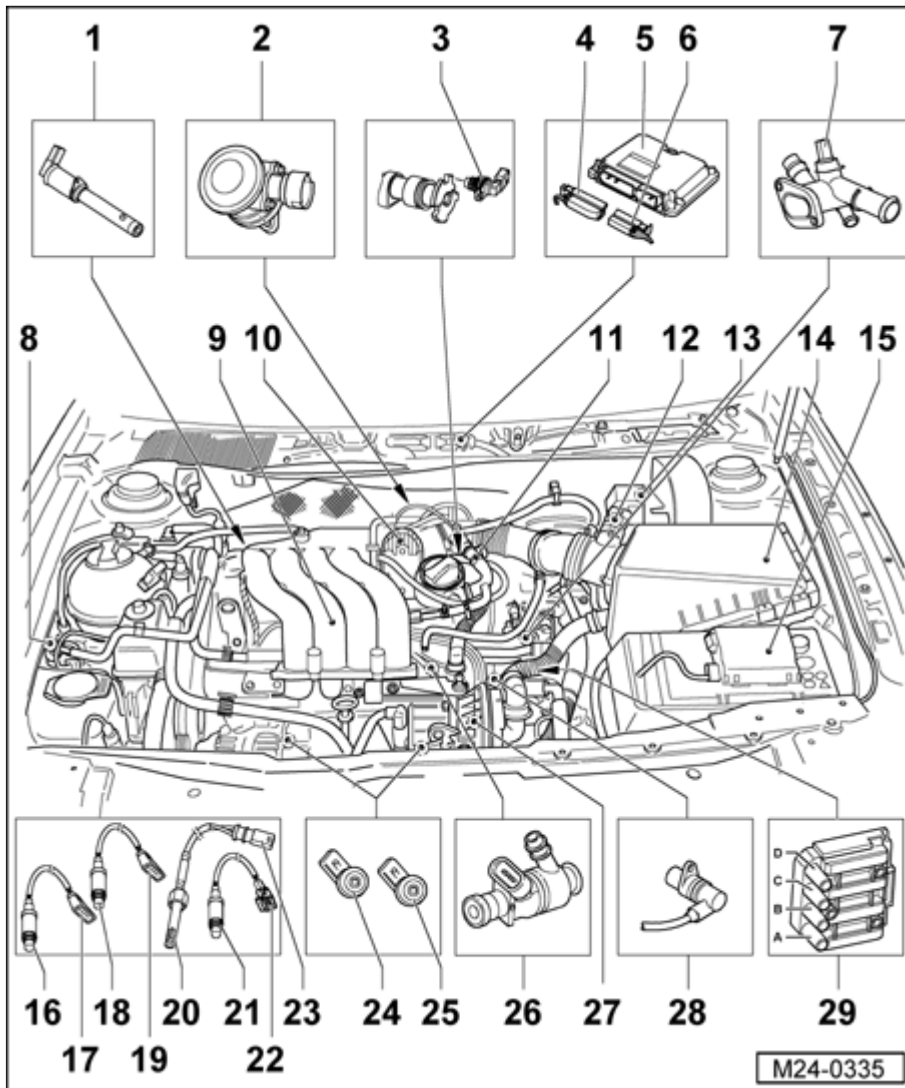


Fig. 306: Injection System (Engine Code BBW, BEV)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Valve 1 for camshaft adjustment -N205-

- Controlled by engine control module

2 - Secondary Air Injection (AIR) solenoid valve -N112-

- Removing and installing. Refer to Engine code AEG (up to model year 1999)

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

3 - Camshaft Position (CMP) sensor -G40-

- In cylinder head cover

4 - 81-pin connector

- Only disconnect or connect with ignition switched off
- Release to disconnect

5 - Motronic Engine Control Module (ECM) -J220-

- On replacement, control module must be matched to electronic immobilizer. Refer to **Adapting components and functions** , adapting components
- Installed location: In plenum chamber
- Replacing. Refer to **Engine control module, replacing**

6 - 40-pin connector

- Only disconnect or connect with ignition switched off
- Release to disconnect

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

- For engine control module
- Gold plated contacts
- Release pressure in coolant system if necessary before removing components

8 - Evaporative Emissions (EVAP) canister purge regulator valve -N80-

- EVAP system, servicing. Refer to **Function of EVAP system**

9 - Intake manifold

Upper part:

- Disassembling and assembling. Refer to **Engine code AEG**

Lower part:

- Disassembling and assembling. Refer to **Intake manifold lower part, disassembling and assembling**

10 - Throttle valve control module -J338-

- When replacing, adapt (match) engine control module to throttle valve control module. Refer to **Adapting components and functions** , adapting components

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- 6-pin connector
- Gold plated contacts

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

- For crankcase breather
- Checking. Refer to Air cleaner, disassembling and assembling , item -Air cleaner, disassembling and assembling

12 - Mass Air Flow (MAF) sensor -G70- with Intake Air Temperature (IAT) sensor -G42-

- Gold plated contacts

13 - Protective housing for relays

- Secondary Air Injection (AIR) pump relay -J299-
- Motronic ECM power supply relay -J271-
- Relay assignment in protective housing. See Fig. 307 .

14 - Air cleaner

- Disassembling and assembling. Refer to Air cleaner, disassembling and assembling

15 - Main fuses

16 - Oxygen Sensor (O2S) Behind Three Way Catalytic Converter (TWC) -G130-, 50 Nm

- Installed location: In rear of catalytic converter
- When replacing erase Diagnostic Trouble Code (DTC) memory. Refer to Engine control module Diagnostic Trouble Code (DTC) memory, interrogating and erasing
- Removing and installing. Refer to Exhaust system components, removing and installing

17 - 4-pin connector

- Brown
- Connector contacts 3 and 4 are gold plated
- For O2S Behind TWC -G130- and Oxygen Sensor (O2S) heater 1 Behind TWC -Z29-
- Installed location: On right on underside of vehicle. See Fig. 307 .

18 - Oxygen Sensor (O2S) in Center Three Way Catalytic Converter (TWC) bank 1 -G465-, 50 Nm

- Installed location: In center catalyst
- When replacing erase DTC memory. Refer to Engine control module Diagnostic Trouble Code (DTC) memory, interrogating and erasing

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Removing and installing. Refer to **Exhaust system components, removing and installing**

19 - 4-pin connector

- Black
- Connector contacts 3 and 4 are gold plated
- For O2S in center TWC bank 1 -G465- and O2S heater - center TWC -Z59-
- Installed location: On right on underside of vehicle. See **Fig. 307** .

20 - Exhaust Gas Temperature (EGT) sensor 1 -G235-, 45 Nm

- Installed location: In exhaust pipe
- When replacing erase DTC memory. Refer to **Engine control module Diagnostic Trouble Code (DTC) memory, interrogating and erasing**
- Removing and installing. Refer to **Exhaust system components, removing and installing**

21 - Heated Oxygen Sensor (HO2S) -G39-, 50 Nm

- Installed location: In exhaust manifold
- When replacing erase DTC memory. Refer to **Engine control module Diagnostic Trouble Code (DTC) memory, interrogating and erasing**
- Removing and installing. Refer to **Exhaust system components, removing and installing**

22 - 6-pin connector

- Black for HO2S -G39- and O2S heater -Z19-
- Gold plated contacts
- Installed location: On right on underside of vehicle. See **Fig. 307** .

23 - 2-pin connector

- Black for Exhaust Gas Temperature (EGT) sensor 1 -G235-
- Gold plated contacts
- Installed location: On right on underside of vehicle. See **Fig. 307** .

24 - Knock Sensor (KS) 1 -G61-

- Gold plated contacts
- Tightening torque: Refer to **Engine code BBW** , item -9-

25 - Knock Sensor (KS) 2 -G66-

- Next to ignition transformer

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Gold plated contacts
- Tightening torque: Refer to **Engine code BBW** , item -9-

26 - Injectors -N30-, -N31-, -N32-, -N33-

- Air shrouded
- Checking quantity injected and for leaks. Refer to **Injectors, checking for leaks and quantity injected**

27 - Secondary Air Injection (AIR) pump motor -V101-

- Secondary air system. Refer to **Engine code AEG (up to model year 1999)**

28 - Engine speed (RPM) sensor -G28-

- Torque setting 10 Nm

29 - Ignition coils with final output stages -N70-, -N127-, -N291-, -N292-

- Refer to **Engine code BBW** , item -2-

Position of relays in protective housing (on left in engine compartment)

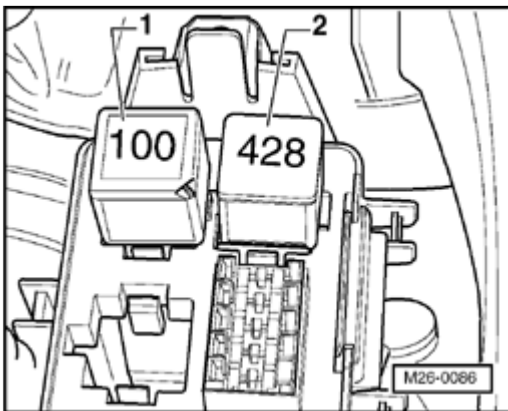


Fig. 307: Position Of Relays In Protective Housing (On Left In Engine Compartment)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Secondary Air Injection (AIR) pump relay -J299-, Distinguishing features: Control number 100

2 - Motronic Engine Control Module (ECM) power supply relay -J271-, Distinguishing features: Control number 428

NOTE:

- The relay locations may differ depending on level of equipment.
- For latest control numbers and installed locations:

Refer to Electrical Wiring Diagrams, Troubleshooting & Component Locations

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Disconnect battery Ground strap first if tools are required to pull relays or control modules out of the relay plate.
- Before disconnecting the battery Ground strap obtain code for radios with anti-theft coding.

Connectors, installed location

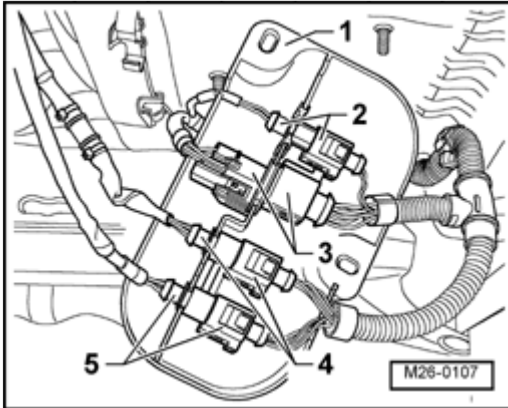


Fig. 308: Connectors, Installed Location

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- 1 - Protective housing, on vehicle underside right side
- 2 - For Exhaust Gas Temperature (EGT) sensor 1 -G235-
- 3 - For Heated Oxygen Sensor (HO2S) -G39-
- 4 - For Oxygen Sensor (O2S) in Center Three Way Catalytic Converter (TWC) bank 1 - G465-
- 5 - For Oxygen Sensor (O2S) Behind Three Way Catalytic Converter -G130-

General notes on injection

- The engine control module is equipped with On Board Diagnostic (OBD). Before performing repairs and troubleshooting the Diagnostic Trouble Code (DTC) memory of all control modules must be interrogated using the automatic test sequence (in Guided fault finding). This is necessary as the various control modules are interconnected via a data bus. Also the vacuum hoses and connections must be checked (unmetered air).
- Fuel hoses in the engine compartment must only be secured with spring-type clips. The use of clamp or screw-type clips is not permitted.
- The battery may only be disconnected when the ignition is switched off. If a coded radio is installed, obtain the radio code before disconnecting the battery.
- For trouble-free operation of the electrical components, a voltage of at least 11.5 V is necessary.
- Do not use sealing compounds containing silicone. Particles of silicone drawn into the engine will not be burned in the engine and cause damage to the oxygen sensors.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- If the engine starts, runs for a short period and then stops, after troubleshooting, repairs or component tests, then the cause may be the immobilizer blocking the engine control module. In such cases the control module must be adapted. Refer to **Adapting components and functions** ; Adapting components.
- During some checks it is possible that the control module will detect and store a fault. Therefore after completing all checks and repairs the DTC memory must be interrogated and if necessary erased. Refer to **Engine control module Diagnostic Trouble Code (DTC) memory, interrogating and erasing** , Interrogating and erasing DTC memory.
- Vehicles with an airbag are equipped with a crash fuel shut-off system. This system reduces the danger of a fire in a crash in that the fuel pump is switched off via the fuel pump relay.
- When the door is opened the fuel pump is activated for 2 seconds to build up pressure in fuel system. This improves the starting characteristics of the engine.

Safety precautions. Refer to **Safety precautions**

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

Technical data. Refer to **Technical data**

Intake manifold upper part, disassembling and assembling

- Engine codes AVH, AZG. Refer to **Engine codes AVH, AZG**
- Engine codes BBW, BEV. Refer to **Engine codes BBW, BEV**

Engine code AEG

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

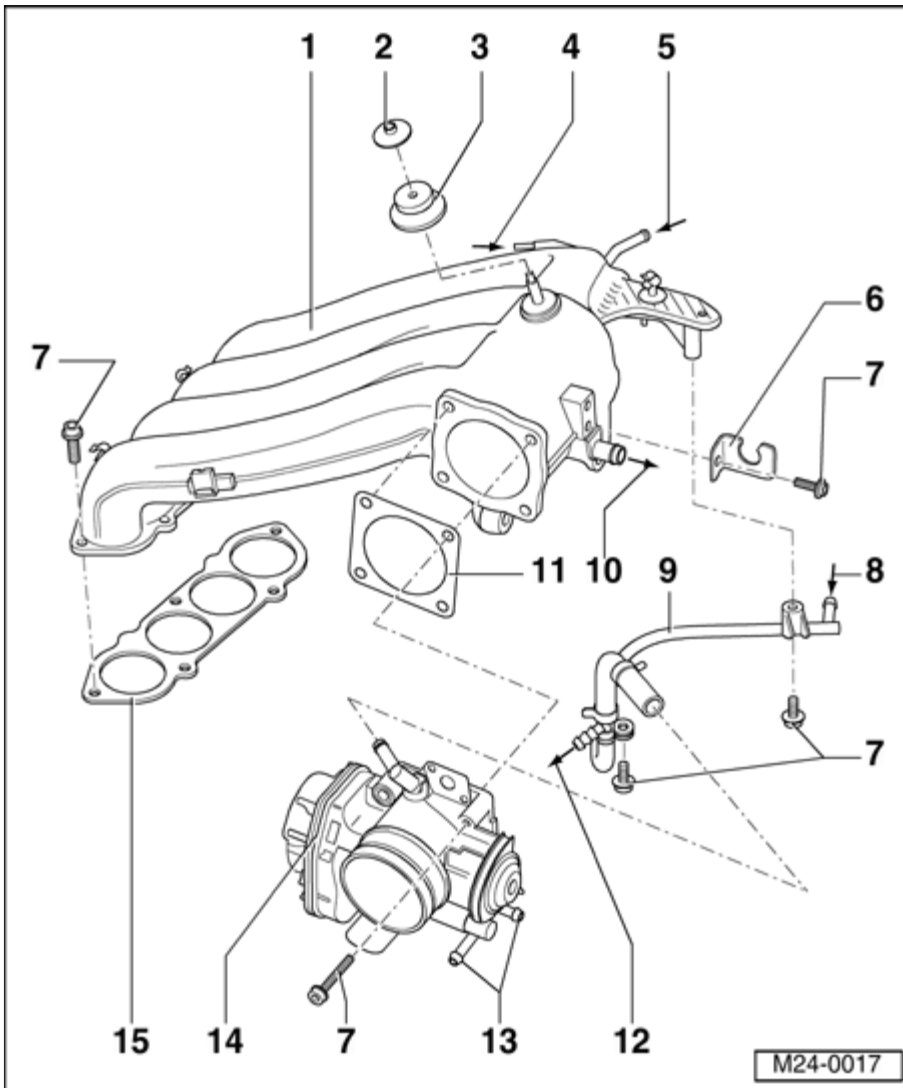


Fig. 309: Intake Manifold Upper Part & Components (Engine Code AEG)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Intake manifold upper part

2 - 6 Nm

3 - Rubber bushing

4 - From fuel pressure regulator

5 - From fuel system Leak Detection Pump (LDP) -V144-

- EVAP system. Refer to **Function of EVAP system**

6 - Support bracket

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- For accelerator cable
- Adjusting throttle cable. Refer to **Accelerator mechanism, servicing**

7 - 10 Nm

8 - From Evaporative Emissions canister purge regulator valve -N80-

- EVAP system. Refer to **Function of EVAP system**

9 - Connecting pipe

10 - To brake servo vacuum line

11 - Seal

- Always replace

12 - To intake hose

13 - Coolant hose connection

14 - Throttle valve control module -J338-

- Checking. Refer to **Adapting components and functions**
- 6-pin connector
- Connector contacts are gold plated

15 - Seal

- Always replace
- Observe installing position

Engine codes AVH, AZG

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

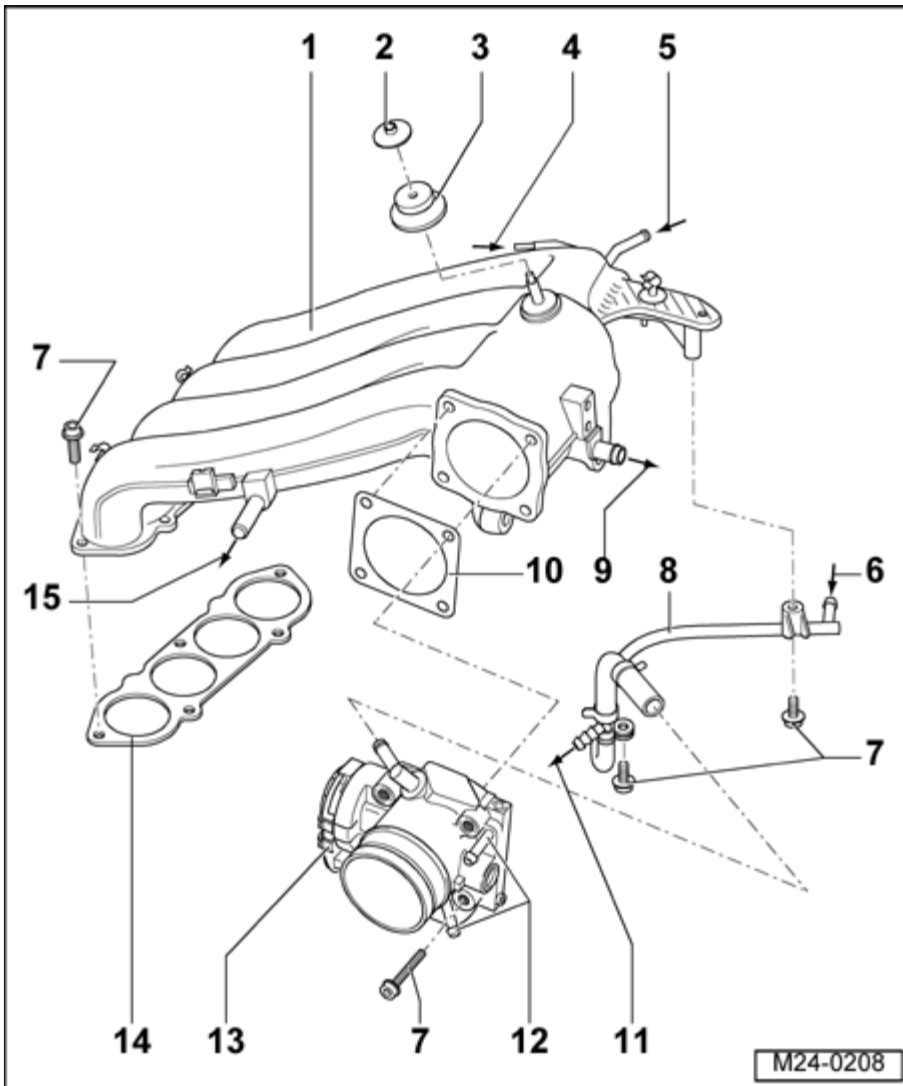


Fig. 310: Intake Manifold Upper Part & Components (Engine Code AVH, AZG)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Intake manifold upper part

2 - 6 Nm

3 - Rubber bushing

- For engine cover

4 - From fuel pressure regulator

5 - From fuel system Leak Detection Pump (LDP) -V144-

- EVAP system. Refer to **Function of EVAP system**

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

6 - From Evaporative Emissions canister purge regulator valve -N80-

- EVAP system. Refer to Function of EVAP system

7 - 10 Nm

8 - Connecting pipe

9 - To brake servo vacuum line

10 - Seal

- Always replace

11 - To intake hose

12 - Unions for coolant hoses

13 - Throttle valve control module -J338-

- Checking. Refer to Adapting components and functions , Adapting components
- 6-pin connector
- Connector contacts are gold plated

14 - Seal

- Always replace

15 - Connection union

- From model year 2002
- To shaped hose for cylinder head cover or intake hose

Engine codes BBW, BEV

2003 Volkswagen Jetta GL
ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

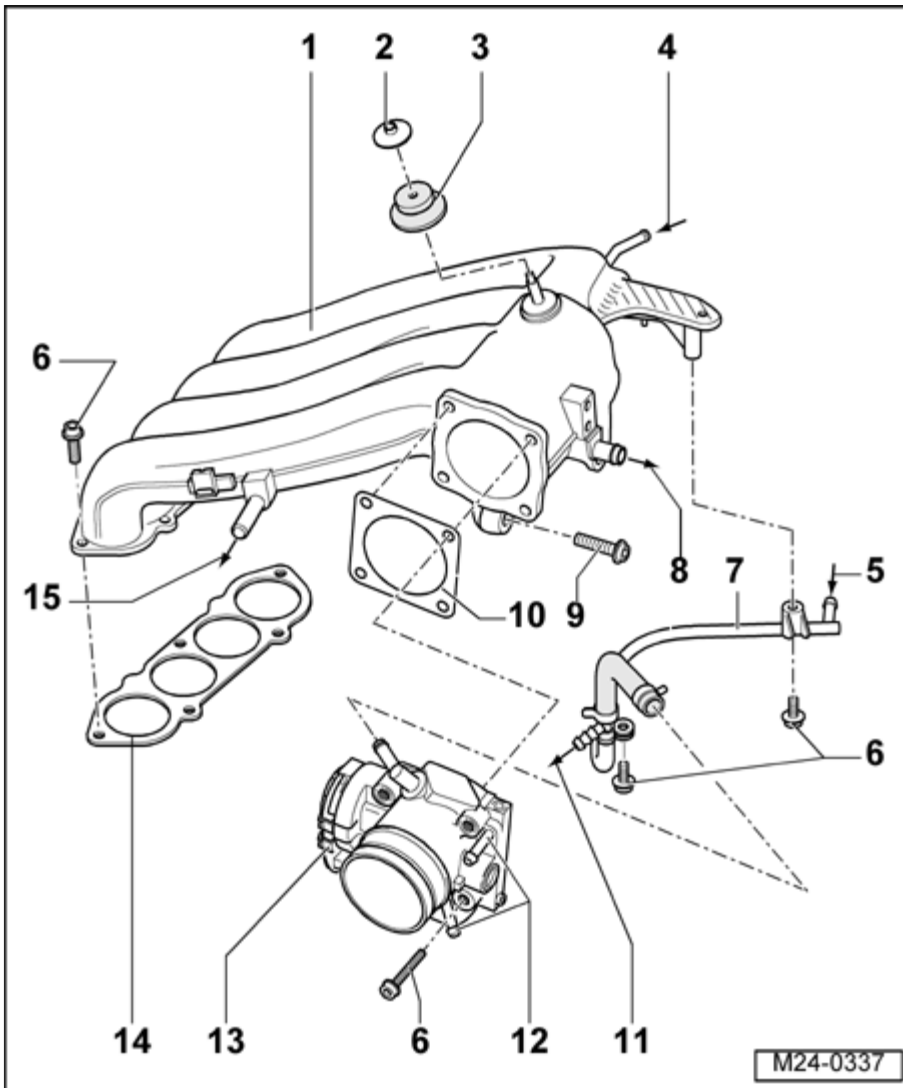


Fig. 311: Intake Manifold Upper Part & Components (Engine Code BBW, BEV)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Intake manifold upper part

- Removing and installing. Refer to **Intake manifold upper part, removing and installing**

2 - 6 Nm

3 - Rubber bushing

- For engine cover

4 - From fuel system Leak Detection Pump (LDP) -V144-

- Refer to **Evaporative Emissions (EVAP) system components, servicing**, item -**Evaporative**

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Emissions (EVAP) system components, servicing

5 - From Evaporative Emissions canister purge regulator valve -N80-

- Refer to EVAP system, assembly overview , item EVAP system, assembly overview

6 - 10 Nm

7 - Connecting pipe

8 - To brake servo vacuum line

9 - 25 Nm

10 - Seal

- Always replace

11 - To intake hose

12 - Coolant hose connection diagram

13 - Throttle valve control module -J338-

- If replaced adapt (match) engine control module. Refer to Adapting components and functions
- Connector contacts are gold plated

14 - Seal

- Always replace
- Observe installation position

15 - Union

- To cylinder head cover or intake specially formed hose

Intake manifold lower part, disassembling and assembling

Engine code AEG

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

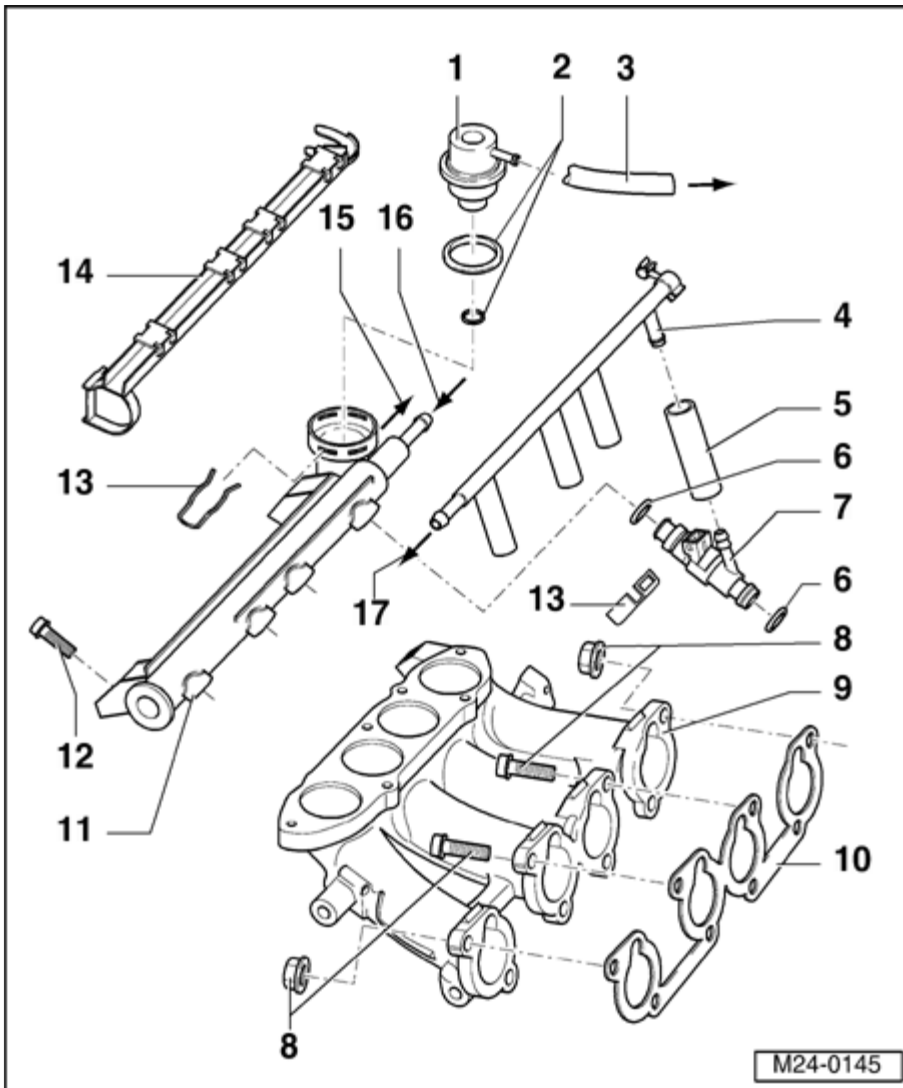


Fig. 312: Intake Manifold Lower Part & Components (Engine Code AEG)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Engines: AVH, AZG. Refer to **Intake manifold lower part, disassembling and assembling**
- Engines: BBW, BEV. Refer to **Intake manifold lower part, disassembling and assembling**

1 - Fuel pressure regulator

- Checking fuel pressure regulator and holding pressure. Refer to **Fuel pressure regulator and holding pressure, checking**

2 - O-ring

- Replace if damaged

3 - Vacuum hose

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- To intake manifold upper part

4 - Air line

5 - Air hose

- For air shrouded injectors

6 - O-ring

- Always replace
- Before installing moisten with clean engine oil

7 - Injectors -N30-, -N31-, -N32-, -N33-

- Checking. Refer to **Injectors, checking for leaks and quantity injected**
- Air shrouded

8 - 20 Nm

9 - Intake manifold lower part

10 - Seal

- Always replace

11 - Fuel rail

12 - 10 Nm

13 - Retaining clip

- Check if seated securely

14 - Cable guide

- Clipped onto fuel rail

15 - Return flow line union

16 - Supply line union

17 - To intake hose

Engine codes AVH, AZG

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

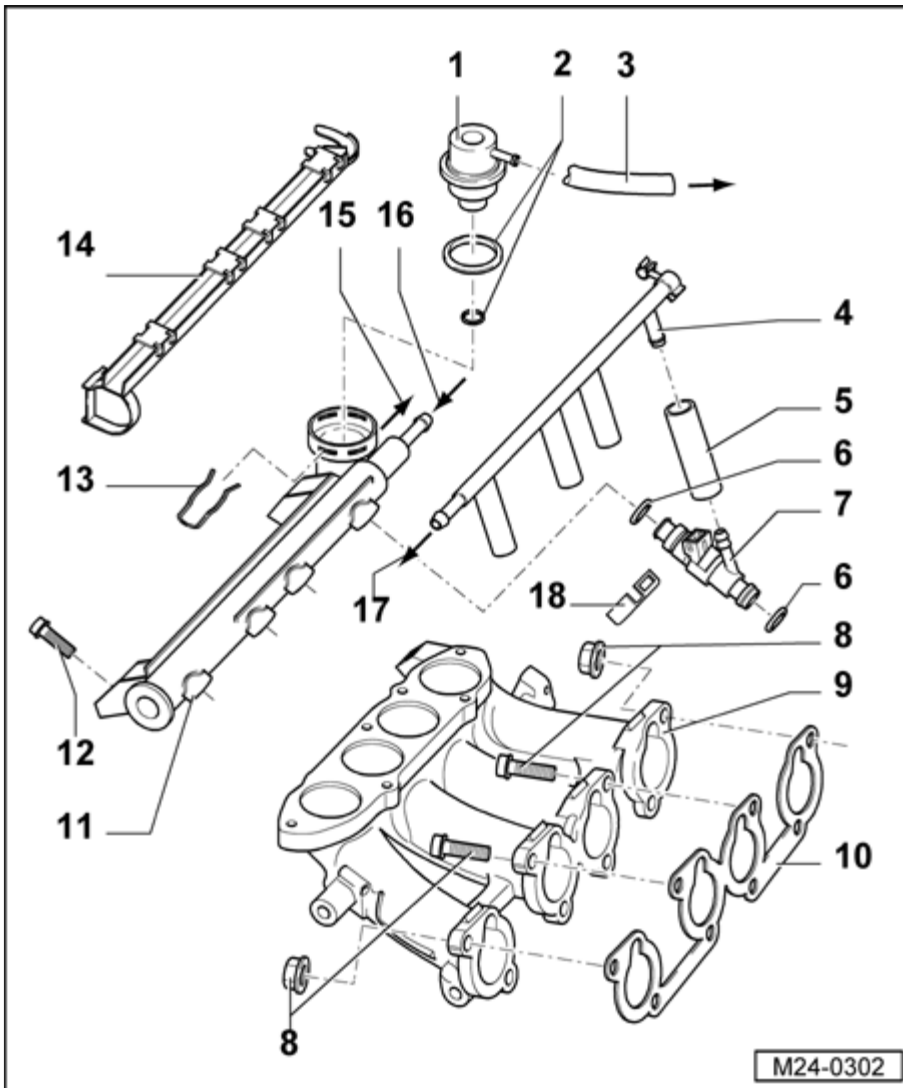


Fig. 313: Intake Manifold Lower Part & Components (Engine Codes AVH, AZG)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Fuel pressure regulator

- Checking fuel pressure regulator and holding pressure. Refer to **Injectors, checking for leaks and quantity injected**

2 - O-ring

- Replace if damaged

3 - Vacuum hose

- To intake manifold upper part

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

4 - Air line

5 - Air hose

- For air shrouded injectors

6 - O-ring

- Always replace
- Before installing moisten with clean engine oil

7 - Injectors -N30-, -N31-, -N32-, -N33-

- Checking. Refer to Injectors, checking for leaks and quantity injected
- Air shrouded

8 - 20 Nm

9 - Intake manifold lower part

10 - Seal

- Always replace

11 - Fuel rail

12 - 10 Nm

13 - Retaining clip

- Check if seated securely

14 - Cable guide

- Clipped onto fuel rail

15 - Return flow line union

16 - Supply line union

17 - To intake hose

18 - Securing clip

- Check for secure seating

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Engine codes BBW, BEV

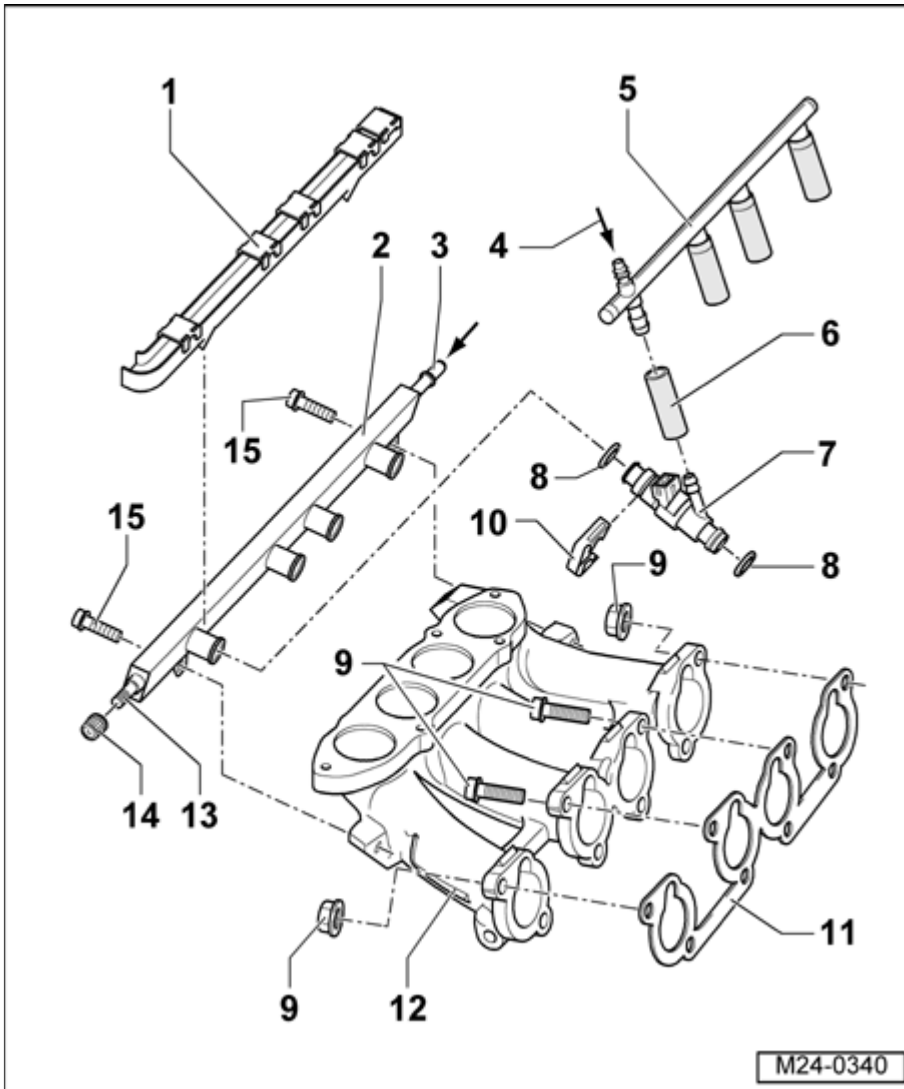


Fig. 314: Intake Manifold Lower Part & Components (Engine Codes BBW, BEV)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Cable guide

- Clipped onto fuel rail

2 - Fuel rail

- With breather valve. Refer to **Engine codes BBW, BEV** , item -13- for fuel system

3 - Supply union

4 - To intake hose

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Refer to **Air cleaner, disassembling and assembling** , item -16-

5 - Air pipe

6 - Air hose

- For air shrouded injectors

7 - Injectors -N30-, -N31-, -N32-, -N33-

- Checking quantity injected and for leaks. Refer to **Injectors, checking for leaks and quantity injected**
- Engine code BBW: Air shrouded
- Engine code BEV: Not air shrouded

8 - O-ring

- Always replace
- Before installing moisten with clean engine oil

9 - 20 Nm

10 - Retaining clip

- Check if seated securely

11 - Seal

- Always replace

12 - Intake manifold lower part

13 - Breather valve

- Bleeding fuel system. Refer to **Fuel system, bleeding**

14 - Cap

- For breather valve

15 - 10 Nm

Fuel rail with injectors, disassembling and assembling

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

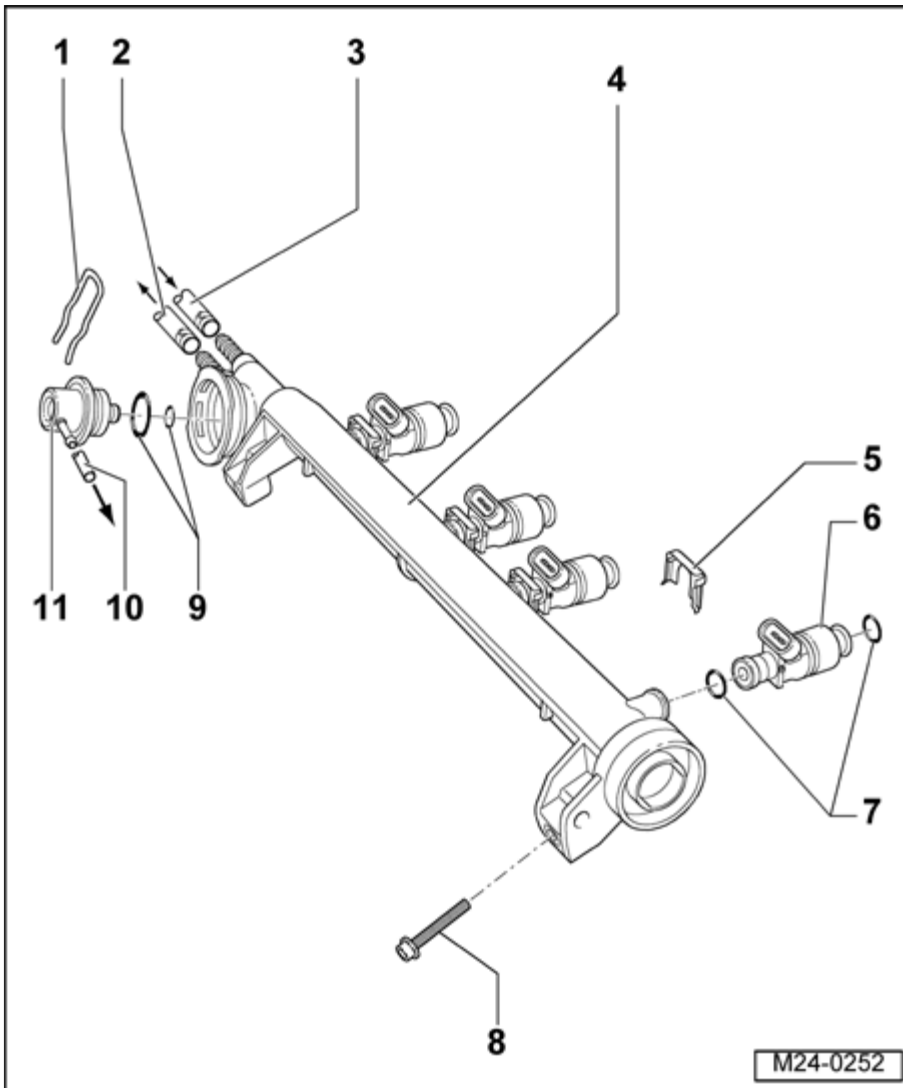


Fig. 315: Fuel Rail With Injectors (Engine Codes AEG, AVH, AZG)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Engine codes AEG, AVH, AZG

1 - Securing clip

- Check for secure seating

2 - Return hose

- Blue or with blue marking
- Secure with spring-type clips
- Check for secure seating
- To fuel supply unit in fuel tank

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

3 - Supply line

- Black with white marks
- Secure with spring-type clips
- Check for secure seating
- From fuel filter

4 - Fuel rail

5 - Securing clip

- Ensure correct seating at injector and fuel rail

6 - Injectors -N30-, -N31-, -N32-, -N33-

- Check quantity injected and for leaks. Refer to **Injectors, checking for leaks and quantity injected**
- When replacing erase Diagnostic Trouble Code (DTC) memory. Refer to **Engine control module Diagnostic Trouble Code (DTC) memory, interrogating and erasing**

7 - O-ring

- Always replace
- Before installing, moisten with clean engine oil

8 - 8 Nm

9 - O-ring

- Always replace

10 - Vacuum hose

- Not for engine codes AEG, AVH, AZG

11 - Fuel pressure regulator

- When replacing erase Diagnostic Trouble Code (DTC) memory. Refer to **Engine control module Diagnostic Trouble Code (DTC) memory, interrogating and erasing**
- Checking. Refer to **Injectors, checking for leaks and quantity injected**

Air cleaner, disassembling and assembling

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

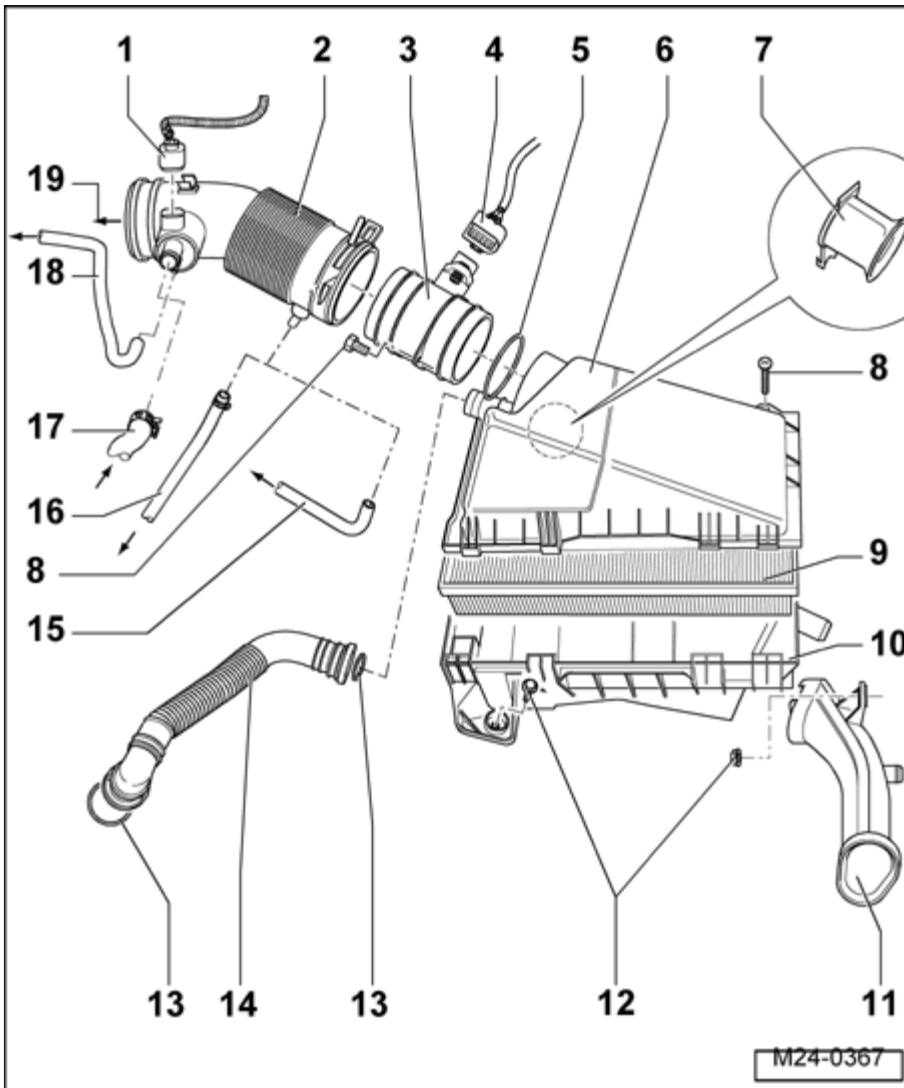


Fig. 316: Air Cleaner Assembly (Engine Codes AEG, AVH, AZG, BBW, BEV)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Engine codes AEG, AVH, AZG, BBW, BEV

1 - Connector

- Black, 2-pin
- For Positive Crankcase Ventilation (PCV) heating element -N79-
- Check heater element voltage supply between contacts 1 and 2 with engine running, Specification: min. 11.5 V

2 - Intake hose

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

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

3 - Mass Air Flow (MAF) sensor -G70- with Intake Air Temperature (IAT) sensor -G42-

- Sensor and connector contacts are gold plated

4 - 5-pin Connector

- Black
- Contacts gold plated

5 - Seal

- Replace if damaged

6 - Air cleaner upper part

7 - Air duct

- Clipped into air cleaner upper part

8 - 6 Nm

9 - Filter element

10 - Air cleaner lower part

11 - Air duct

12 - 10 Nm

13 - O-ring

- Replace if damaged

14 - Intake hose

- Check if seated securely
- Press together at front to release
- To Secondary Air Injection (AIR) pump motor -V101-. Refer to **Secondary air injection system components, removing and installing** , item **Secondary air injection system components, removing and installing** .

15 - Connecting hose

- Engine codes AEG, AVH, AZG
- To air line for air shroud injectors

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

16 - Connecting hose

- Engine code BBW

17 - Connecting hose

- For crankcase breather
- To cylinder head breather housing
- Engine: BBW: Do not separate from intake hose item -2- **Air cleaner, disassembling and assembling**

18 - Connecting hose

- To connecting pipe on intake manifold upper part

19 - To Throttle valve control module -J338-

Safety precautions

WARNING: The fuel system is under pressure! Before opening the system place a cloth around the connection. Then release the pressure by carefully loosening the connection.

To prevent injuries to persons and/or damage to the fuel injection and ignition system, observe the following:

Engines: AVH, AZG, BBW, BEV

- For safety reasons, fuse No. 28 must be removed from the fuse holder before opening the fuel system. Otherwise the fuel pump can be activated by the door contact switch.

Continued for all engines

- Do not touch or disconnect ignition wiring when engine is running or being turned at starter speed.
- The ignition must be switched off before connecting or disconnecting injection or ignition system wiring or tester cables.

CAUTION: When performing repair work, especially due to the confined conditions in the engine compartment, pay attention to the following:

- Route all types of lines (e.g. for fuel, hydraulics, EVAP system, coolant, refrigerant, brake fluid and vacuum) as well as electrical wiring so that the original positions are restored.
- Ensure sufficient clearance to all moving or hot components.

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

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Test and measuring instruments must be secured to the rear seat and operated by an assistant from this location.

If test and measuring instruments are operated from front passenger's 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.

- If the engine is to be turned at starter speed, without starting:

Engine code AEG

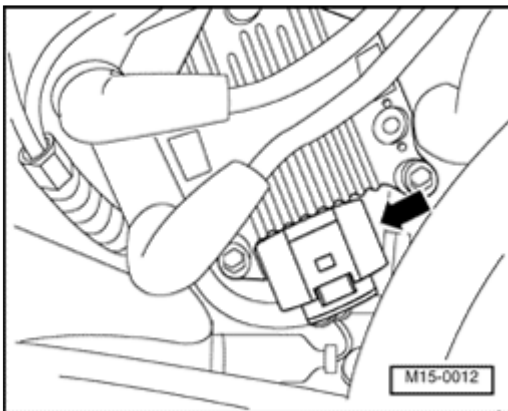
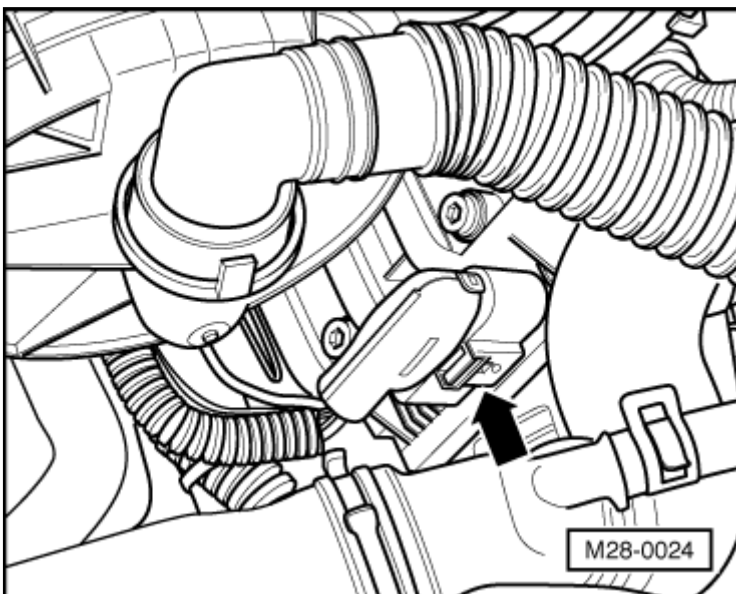


Fig. 317: Ignition Coil With Output Stage 6-Pin Connector (Engine Code AEG)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect black 6-pin connector from ignition coil with output stage (arrow).

Engine codes AVH, AZG, BBW, BEV



2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Fig. 318: Ignition Coil With Output Stage 6-Pin Connector (Engine Codes AVH, AZG, BBW, BEV)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect black 6-pin connector from ignition coil with output stage (arrow).

Continued for all engines

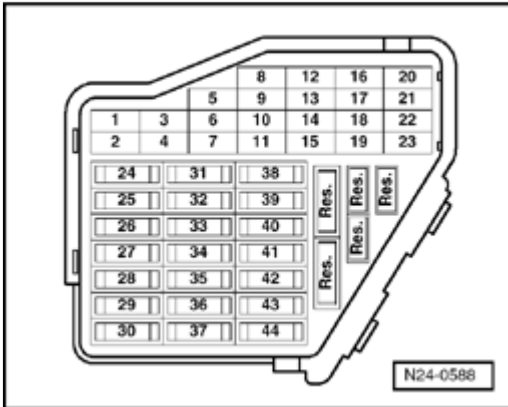


Fig. 319: Identifying Main Fuse Panel
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove fuse 32.

NOTE: Removing fuse 32 interrupts the voltage supply to the injectors.

Rules for cleanliness

When working on fuel supply/injection system, pay careful attention to the following 5 rules:

- Thoroughly clean all unions and adjacent areas before disconnecting.
- Place parts that have been removed on a clean surface and cover. Do not use fluffy cloths!
- Carefully cover opened components or seal, if the repair cannot be performed immediately.
- Only install clean components:
 - Only unpack replacement parts immediately prior to installation.
 - Do not use parts that have been stored loose (e.g. in tool boxes etc.).
- When system is open:
 - Do not work with compressed air if this can be avoided.
 - Do not move the vehicle unless absolutely necessary.

Intake manifold upper part, removing and installing

Special tools and equipment

Afinacion de Motor y Diagnostico, OBDII,VW ,Audi

044 664 252 34 69

Wednesday, July 06, 2016 9:38:54 AM

Page 324

© 2011 Mitchell Repair Information Company, LLC.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

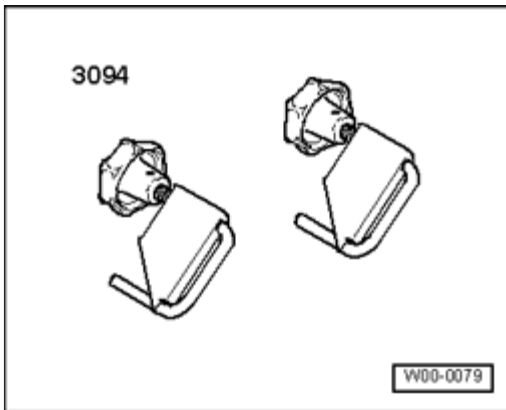


Fig. 320: 3094 Hose Clamps

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- 3094 Hose clamps

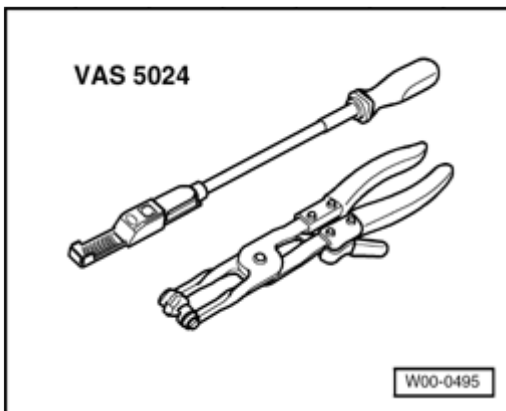


Fig. 321: Identifying Assembly Tool VAS 5024

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- VAS 5024 Assembly tool for spring-type clips
- V.A.G 1331 Torque wrench (5 to 50 Nm)

Engine codes BBW, BEV

Removing

CAUTION: When performing repair work, especially due to the confined conditions in the engine compartment, pay attention to the following:

- Route all types of lines (e.g. for fuel, hydraulics, EVAP system, coolant, refrigerant, brake fluid and vacuum) as well as electrical wiring so that the original positions are restored.
- Ensure sufficient clearance to all moving or hot components.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

NOTE: During this work procedure the battery Ground strap must be disconnected. Therefore, please check whether a coded radio is installed. Obtain the radio code first if necessary.

- With ignition switched off disconnect battery Ground strap.
- Remove engine cover.

WARNING: Hot steam can be released when removing the cap from the expansion tank. Always cover the cap with a cloth and open it carefully.

- Open cap on coolant expansion tank.

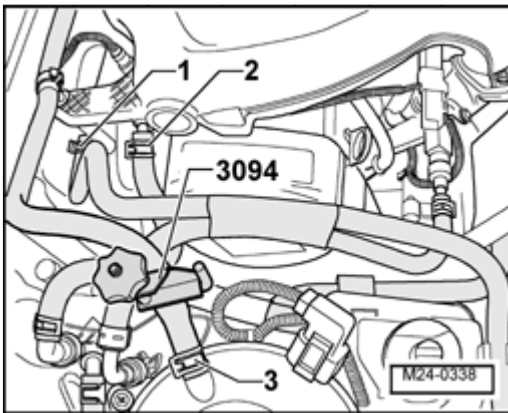


Fig. 322: Clamping Hose Using Special Tool 3094
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Clamp-off hose -3-.

Engine codes BBW, BEV

- Pull off hoses -1-, -2- and -3-.

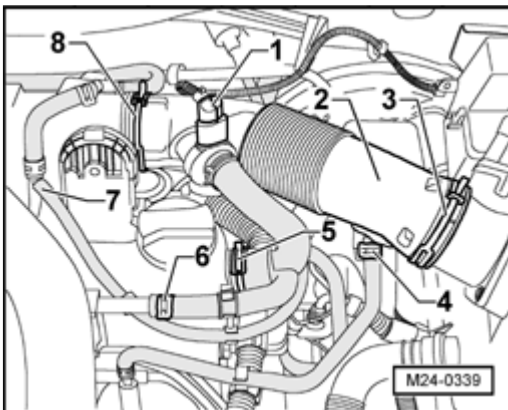


Fig. 323: Identifying Hoses & Clamps

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect connector -1- and pull off hoses -4-, -5-, -6- and -7-.

Continued for all engines

- Release clamps -3- and -8- and remove intake hose -2-.
- Disconnect connector from throttle valve control module.
- Remove rear bolts from warm air deflector plate and front bolts from intake manifold lower part.
- Remove intake manifold lower part, with connected coolant hoses to throttle valve control module and vacuum hose to brake booster, and lay to side.

NOTE:

- Seal the intake ports in the intake manifold lower part with clean cloths.
- To remove the intake manifold upper part, remove the throttle valve control module and vacuum hose from the brake booster.

Installing

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

- Considering installed position, replace intake manifold lower part seal.
- Adapt (match) engine control module to throttle valve control module. Refer to **Adapting components and functions** , Adapting components and functions.
- Generate readiness code again if DTC memory has been erased or engine control module was disconnected from permanent positive. Refer to **Adapting components and functions** , Adapting components and functions.

Technical data

Engine code				AEG	AVH
Idling check					
	Idling speed 1)		rpm	740 to 820	730 to 830
Engine control module 2)					
		System designation		Motronic M5.9.2	Motronic ME7.5
		Part number 3) Manual transmission Automatic transmission		See Parts catalog	06A 906 032 BP 06A 906 032 BQ
		Governed speed	rpm	from approx. 6300	from approx. 6300

1) Not adjustable

2) Replacing engine control module. Refer to **Function**

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

3) For latest part number for engine control module: see Parts catalog

Engine code				AZG	BBW	BEV
Idling check						
	Idling speed 1)		rpm	730 to 830	730 to 830	730 to 830
Engine control module 2)						
		System designation		Motronic ME7.1.1	Motronic ME7.1.1	Motronic ME7.5
		Part number 3)		06A 906 032	06A 906 032	See Parts catalog
		Manual transmission		DS	BG	
		Automatic transmission		06A 906 032 DT	06A 906 032 BH	
		Governed speed	rpm	from approx. 6300	from approx. 6500	from approx. 6400

1) Not adjustable

2) Replacing engine control module. Refer to **Function**

3) For latest part number for engine control module: see Parts catalog

COMPONENTS, CHECKING

Injectors, checking for leaks and quantity injected

Engine code AEG

- Engine codes AVH, AZG, BBW, BEV. Refer to **Engine codes AVH, AZG, BBW**

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

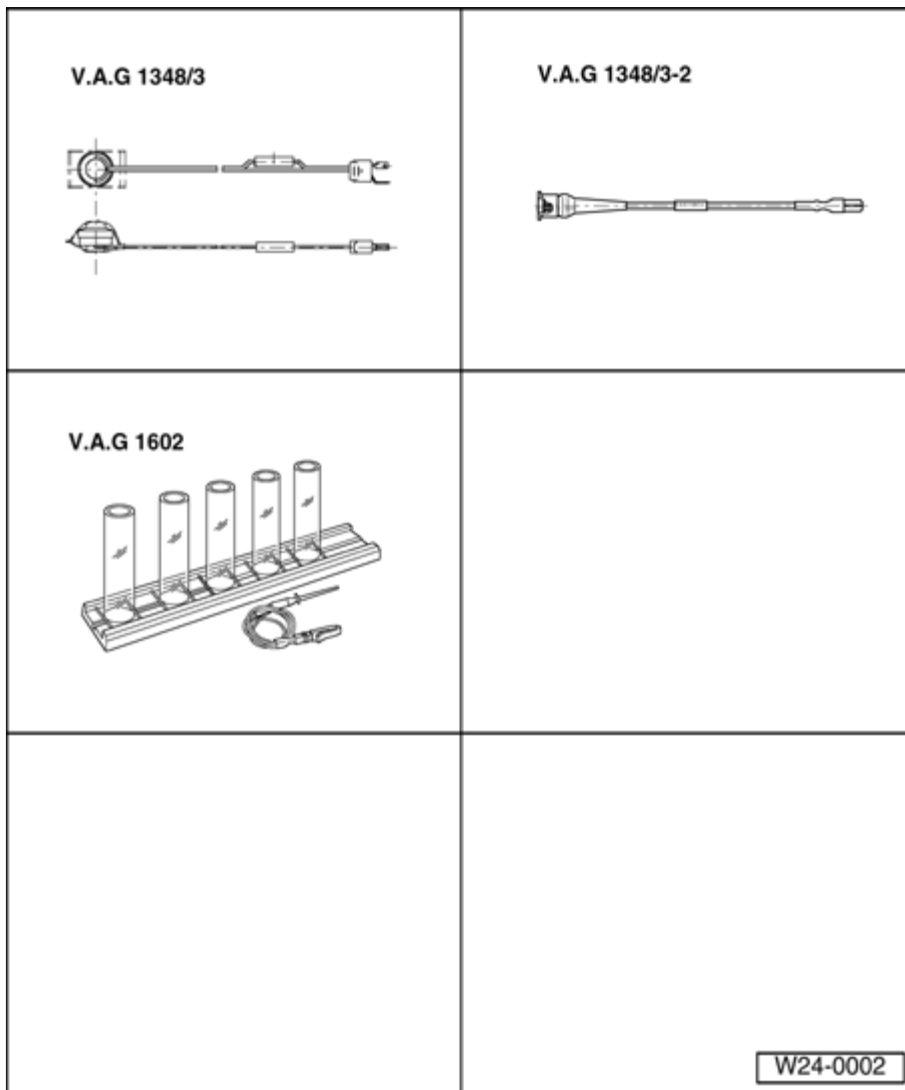


Fig. 324: Identifying Special Tools - Injectors, Checking For Leaks And Quantity Injected (Engine Code AEG)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools and equipment

- V.A.G 1348/3 Remote control
- V.A.G 1348/3-2 Adapter
- V.A.G 1602 Calibration tester

Requirements

- Fuel pressure must be OK, checking. Refer to **Fuel pressure regulator and holding pressure, checking**

Work sequence

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Remove intake manifold upper part. Refer to **Engine code AEG**
- Disconnect connectors from all injectors.
- Remove vacuum hose from fuel pressure regulator.
- Loosen securing bolts for fuel rail.
- Remove hose from air shrouded injectors.
- Remove fuel rail complete.

Checking for leaks

- Initiate final control diagnosis and activate Cylinder 1 Fuel Injector -N30-. Fuel pump must run.

NOTE: This step serves only to have the fuel pump running when the engine is stopped. The idling speed switch must remain closed for this check, otherwise the selected injector will activate and inject 5 times.

- Check injectors for leaks (visual check). Only 1 to 2 drops per minute may emit from each valve when fuel pump is running.

If fuel loss is greater:

- Switch ignition off.
- Replace faulty injector.

Pay attention to the following when installing the injectors:

- Replace O-ring and moistened with clean oil on all injectors.
- Insert injectors vertically and in the correct position into the fuel rail and secure with retaining clips.
- Set fuel rail with secured injectors on intake manifold and press in evenly.

Checking quantity injected

Requirements

- Insert injector to be checked in a measuring glass of calibration tester V.A.G 1602.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

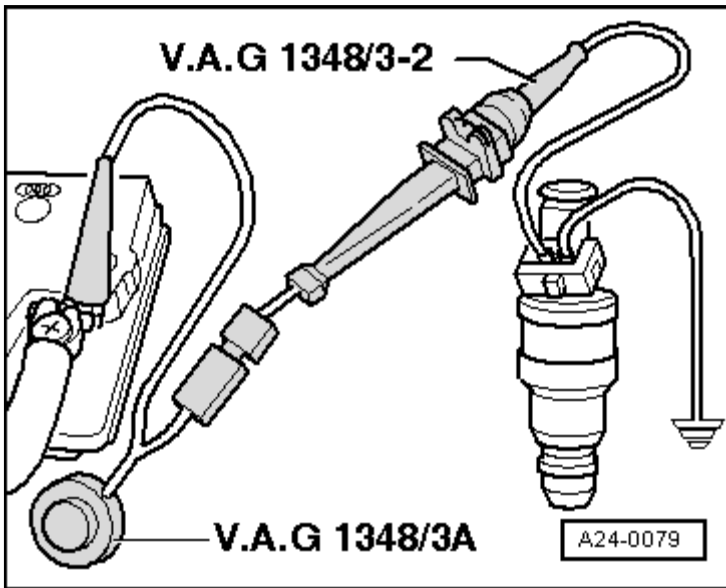


Fig. 325: Connecting Second Injector Contact To Remote Control V.A.G 1348/3 With V.A.G 1348/3-2
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect one contact of injector to be tested to engine Ground using adapter cables from V.A.G 1594.
- Using adapter cables connect second injector contact to remote control V.A.G 1348/3 with adapter cable V.A.G 1348/3-2.
- Connect alligator clip to battery positive (+).
- Initiate final control diagnosis and activate Cylinder 1 Fuel Injector -N30-. Fuel pump must run.
- Operate remote control V.A.G 1348/3 for 30 seconds.
- Repeat check on other injectors. Use another (clean and dry) measuring beaker for each.
- After all injectors have been activated, place measuring glasses on a horizontal surface and compare quantity injected.

Specification: 85 to 105 ml per injector

If the measured values of one or more injectors are above or below the prescribed specifications:

- Replace faulty injector

Perform installation of injectors in reverse order. Note the following:

- Replace O-rings on all injectors and moisten then lightly with clean engine oil.
- Insert injectors vertically and in the correct position into the fuel rail and secure with retaining clips.
- Set fuel rail with secured injectors on intake manifold and press in evenly.

Engine codes AVH, AZG, BBW

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

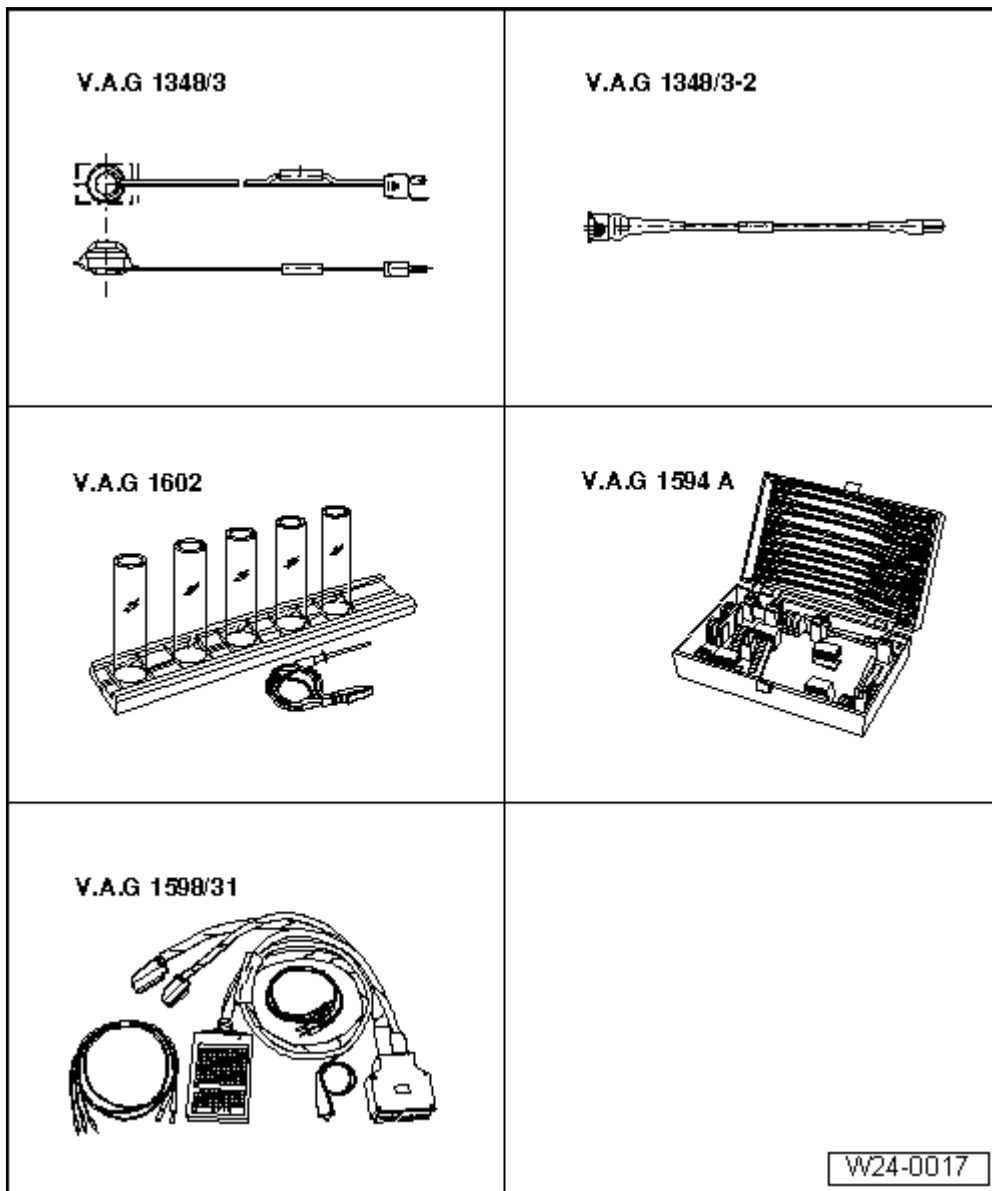


Fig. 326: Identifying Special Tools - Injectors, Checking For Leaks And Quantity Injected (Engine Code AVH, AZG, BBW)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools and equipment

- V.A.G 1348/3 Remote control
- V.A.G 1348/3-2 Adapter
- V.A.G 1602 Calibration tester
- V.A.G 1594 A Adapter set
- V.A.G 1598/31 Test box

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Requirements

- Fuel pressure must be OK, checking. Refer to **Fuel pressure regulator and holding pressure, checking**.

WARNING: The fuel system is under pressure! Before opening the system remove fuse 28 and place a cloth around the connection. Then release the pressure by carefully loosening the connection.

Work sequence

- Remove wiper arms and cowl panel:

Refer to **WINDSHIELD WIPER ASSEMBLY, REMOVING AND INSTALLING**

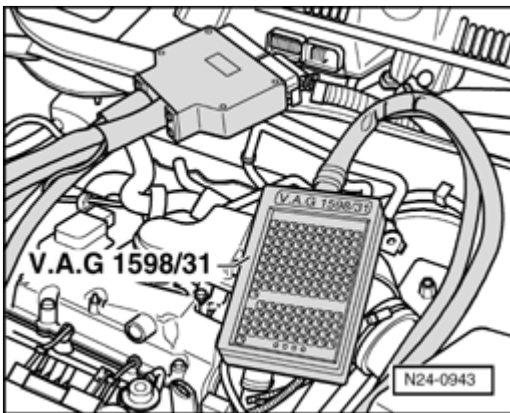


Fig. 327: Test Box V.A.G 1598/31

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect test box V.A.G 1598/31 to control module wiring harness. Engine control module remains disconnected.
- Remove intake manifold upper part. Refer to **Intake manifold upper part, removing and installing**.
- Disconnect connector from all injectors.

Engines: AVH, AZG

- Remove vacuum hose from fuel pressure regulator

Continued for all engines

- Remove securing bolts on fuel rail.
- Pull hose off air line for air shrouded injectors.
- Lift fuel rail along with injectors off intake manifold and support.
- Bridge test box sockets 1 and 65 using adapter cable from adapter set V.A.G 1594.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

NOTE: This work sequence allows the fuel pump to run when the engine is not running.

- Switch ignition on.

Checking for leaks

- Check injector for leaks (visual check).

Only 1 to 2 drops per minute must emit from each injector when fuel pump is running

If fuel loss is greater:

- Switch ignition off and replace leaky injector.
- Erase DTC memory to return learned values to a neutral (default) position. Refer to Engine control module Diagnostic Trouble Code (DTC) memory, interrogating and erasing , Interrogating and erasing DTC memory

NOTE: Always replace O-rings and moisten them with engine clean oil.

Checking quantity injected

Requirements

- Test box V.A.G 1598/31 still connected and test box sockets 1 and 65 are still bridged using adapter cables from adapter set V.A.G 1594.
- Insert injector to be checked in a measuring glass of calibration tester V.A.G 1602.

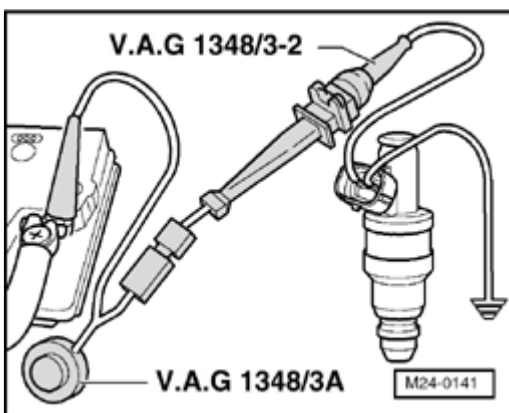


Fig. 328: Connecting Second Injector Contact To Remote Control V.A.G 1348/3 With V.A.G 1348/3-2
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect one contact of injector to be tested to engine Ground using adapter cables from V.A.G 1594.
- Using adapter cables connect second injector contact to remote control V.A.G 1348/3 with adapter cable

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

V.A.G 1348/3-2.

- Connect alligator clip to battery positive (+).
- Switch ignition on. Fuel pump must run.
- Operate remote control V.A.G 1348/3 for 30 seconds.
- Repeat check on other injectors. Use another (clean and dry) measuring beaker for each.
- After all injectors have been activated, place measuring glasses on a horizontal surface and compare quantity injected.

Specification: 85 to 105 ml per injector

If the measured values of one or more injectors are above or below the prescribed specifications:

- Replace faulty injector
- Erase DTC memory to return learned values to a neutral (default) position. Refer to **Engine control module Diagnostic Trouble Code (DTC) memory, interrogating and erasing**, Interrogating and erasing DTC memory

Perform installation of injectors in reverse order. Note the following:

- Replace O-rings on all injectors and moisten then lightly with clean engine oil.
- Insert injectors vertically and in the correct position into the fuel rail and secure with retaining clips.
- Set fuel rail with secured injectors on intake manifold and press in evenly.

Fuel pressure regulator and holding pressure, checking

Engine code AEG

- Engine codes AVH, AZG. Refer to **Engine control module Diagnostic Trouble Code (DTC) memory, interrogating and erasing**
- Engine codes BBW, BEV. Refer to **Fuel pressure regulator and holding pressure, checking**

The fuel pressure regulator regulates the fuel pressure depending on intake manifold pressure.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

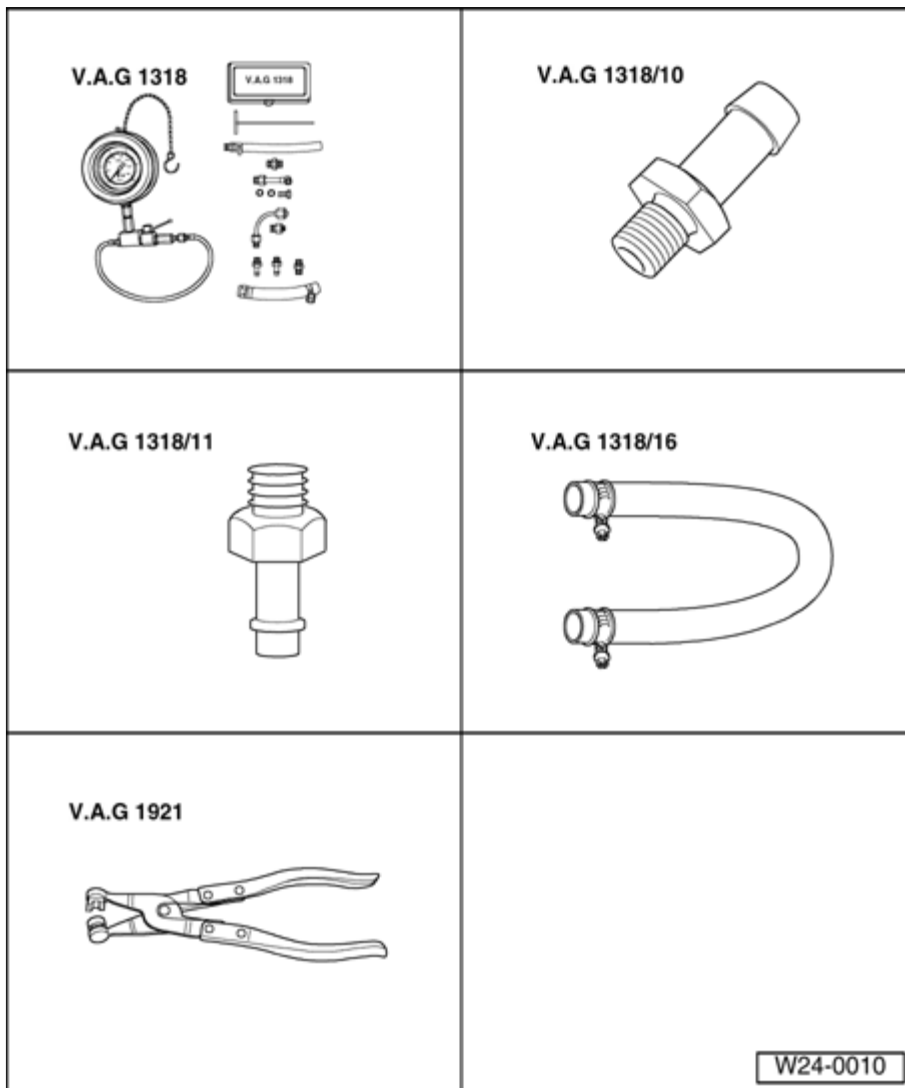


Fig. 329: Identifying Special Tools - Fuel Pressure Regulator And Holding Pressure, Checking (Engine Codes AEG, AVH, AZG)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools and equipment

- V.A.G 1318 Pressure gauge
- 1318/10 Adapter
- 1318/11 Adapter
- 1318/16 Hose adapter
- V.A.G 1921 Spring-type clip pliers

Requirements

- Fuel pump delivery rate in order, checking. Refer to **Fuel Pump, Checking**

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Work sequence

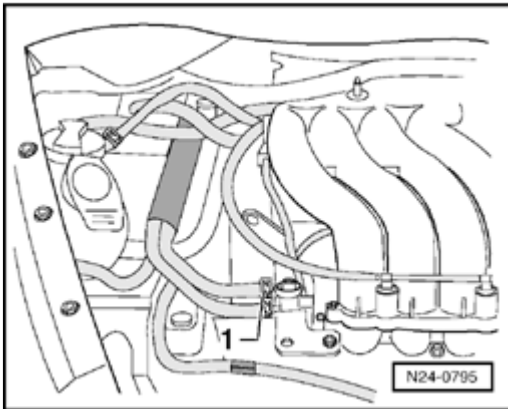


Fig. 330: Locating Fuel Pump Supply Line

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove supply line -1- and collect leaking fuel with a cloth.

WARNING: The fuel system is under pressure! Before opening the system place a cloth around the connection. Then release the pressure by carefully loosening the connection.

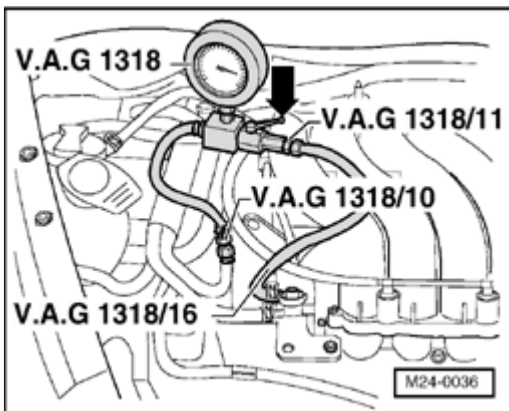


Fig. 331: Connecting V.A.G 1318 With V.A.G 1318/10, V.A.G 1318/11 & V.A.G 1318/6

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect pressure tester V.A.G 1318 with adapters V.A.G 1318/10, V.A.G 1318/11 and V.A.G 1318/6.
- Open pressure tester shut-off valve. Handle points in through-flow direction (arrow).
- Start engine and run at idling speed.
- Measure fuel pressure.

Specification: approx. 2.5 bar

If specification is obtained:

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

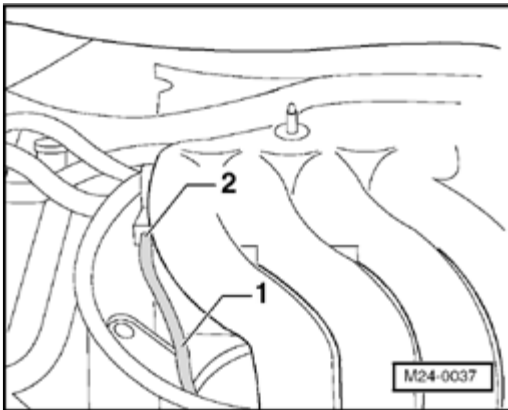


Fig. 332: Locating Vacuum Return Line And Connection
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect return line -1- from connection -2-. Fuel pressure must increase to approx. 3.0 bar.
- Switch ignition off.
- Hold pressure and check for leaks. Observe pressure drop on gauge. After 10 minutes, there must be a residual pressure of at least 2.0 bar.

If the holding pressure drops below 2 bar:

- Start engine and run at idling speed.

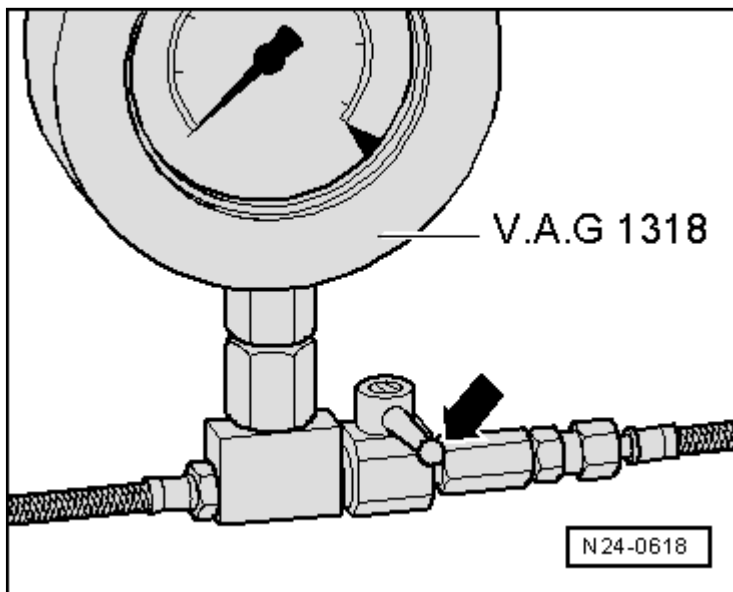


Fig. 333: Locating V.A.G 1318 Shut-Off Tap
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Switch ignition off after pressure has built-up. At same time close pressure tester V.A.G 1318 shut-off tap (handle at right angles to through-flow direction -arrow-).
- Observe pressure drop on gauge.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

If pressure drops again:

- Check fuel pump non-return valve. Refer to **Fuel rail with injectors, disassembling and assembling**

If pressure does not drop:

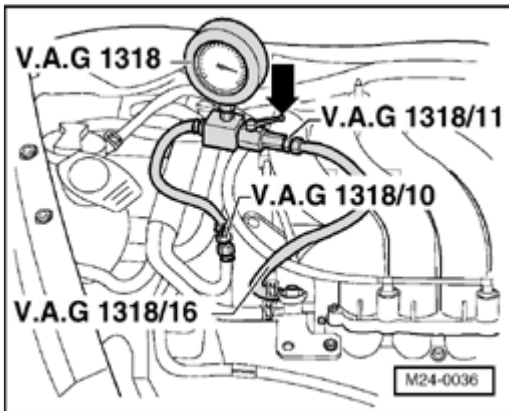


Fig. 334: Connecting V.A.G 1318 With V.A.G 1318/10, V.A.G 1318/11 & V.A.G 1318/6
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Open shut-off tap on pressure tester V.A.G 1318 (handle point in direction of through-flow -arrow-).
- Start engine and run at idling speed.
- Switch ignition off once pressure has built-up and clamp off return hose at same time.

If pressure does not drop:

- Replace fuel pressure regulator. Refer to **Component locations overview**

If pressure drops again:

- Check line connections, O-rings on fuel rail and injectors for leaks.
- Check pressure tester for leaks.

NOTE: Place a cloth around the connection before removing the test pressure tester.

Engine codes AVH, AZG

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

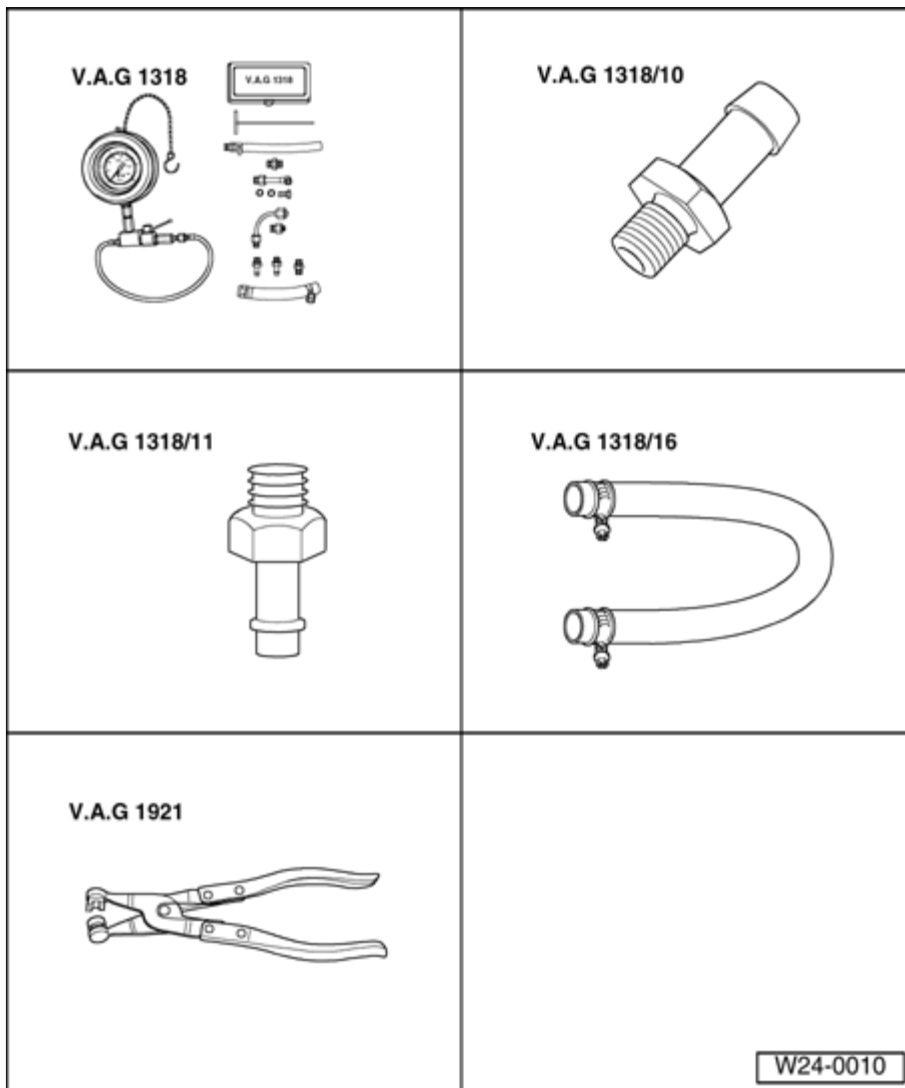


Fig. 335: Identifying Special Tools - Fuel Pressure Regulator And Holding Pressure, Checking (Engine Codes AEG, AVH, AZG)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

The fuel pressure regulator regulates the fuel pressure depending on intake manifold pressure.

Special tools and equipment

- V.A.G 1318 Pressure gauge
- 1318/10 Adapter
- 1318/11 Adapter
- 1318/16 Hose adapter
- V.A.G 1921 Spring-type clip pliers

Work sequence

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

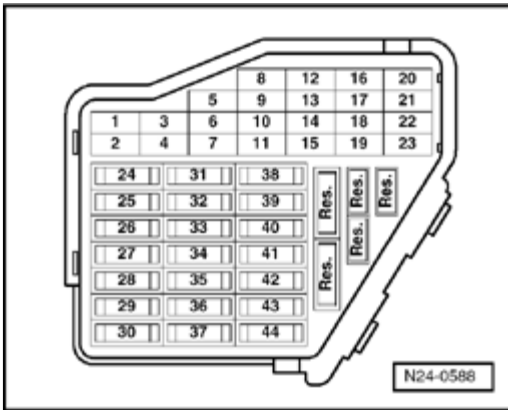


Fig. 336: Identifying Main Fuse Panel

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove fuse No. 28 (fuel pump) from fuse holder.

WARNING: The fuel system is under pressure! Before opening the system place a cloth around the connection. Then release the pressure by carefully loosening the connection.

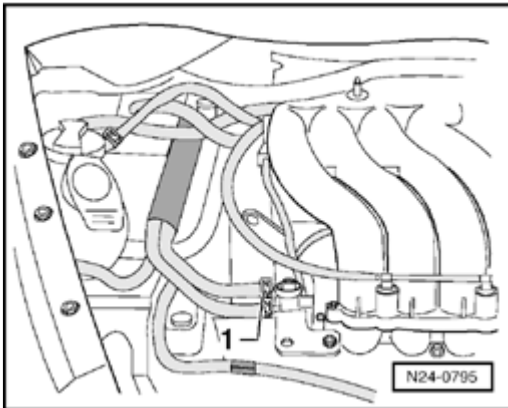


Fig. 337: Locating Fuel Pump Supply Line

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove supply line -1- and collect leaking fuel with a cloth.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

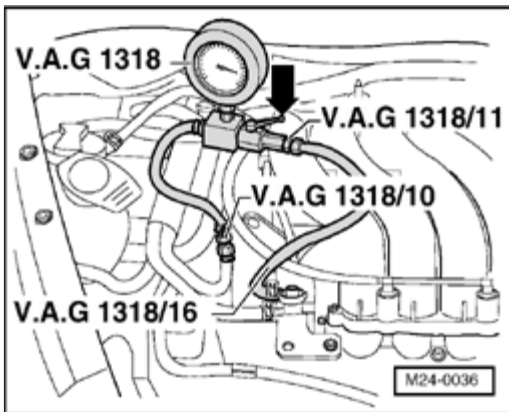


Fig. 338: Connecting V.A.G 1318 With V.A.G 1318/10, V.A.G 1318/11 & V.A.G 1318/6
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect pressure tester V.A.G 1318 with adapters V.A.G 1318/10, V.A.G 1318/11 and V.A.G 1318/6.
- Open pressure tester shut-off valve. Handle points in through-flow direction (arrow).
- Install fuse 28 (fuel pump) in fuse holder
- Start engine and run at idling speed.
- Measure fuel pressure.

Specification: approx. 2.5 bar

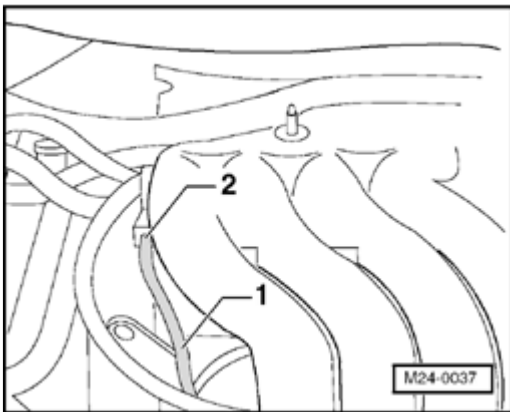


Fig. 339: Locating Vacuum Return Line And Connection
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect vacuum line -1- from union -2-. Fuel pressure must increase to approx. 3.0 bar.

If specification is not obtained:

- Check quantity supplied by fuel pump. Refer to **Fuel Pump, Checking**

If specification is obtained:

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Switch ignition off.
- Hold pressure and check for leaks. Observe pressure drop on gauge. After 10 minutes, there must be a residual pressure of at least 2.0 bar.

If holding pressure drops below 2 bar:

- Start engine and run at idling speed.

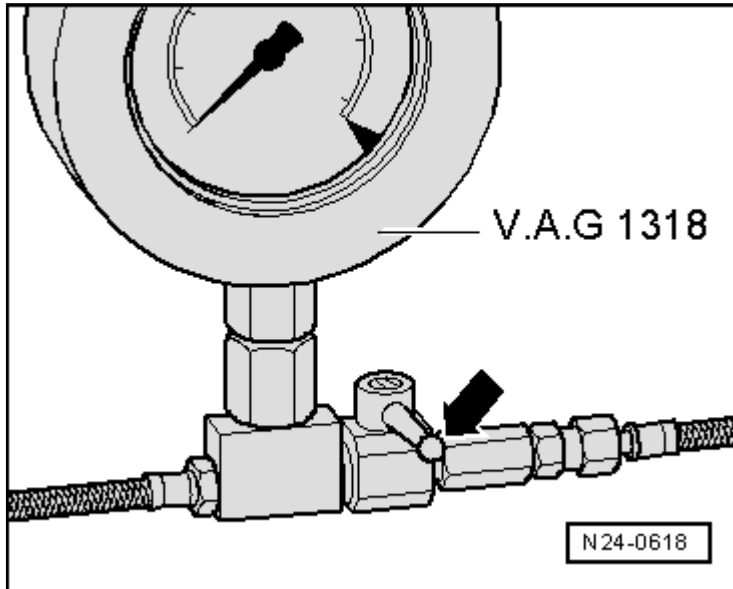


Fig. 340: Locating V.A.G 1318 Shut-Off Tap
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Switch ignition off after pressure has build-up. At same time close pressure tester V.A.G 1318 shut-off tap (handle at right angles to through-flow direction -arrow-).
- Observe pressure drop on gauge.

If pressure does not drop

- Check fuel pump non-return valve. Refer to **Fuel Pump, Checking**

If pressure drops again:

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

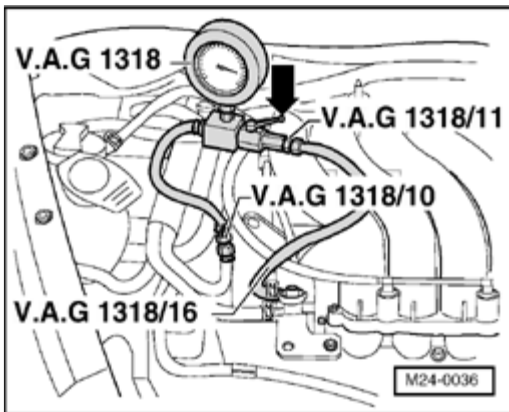


Fig. 341: Connecting V.A.G 1318 With V.A.G 1318/10, V.A.G 1318/11 & V.A.G 1318/6
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Open shut-off tap on pressure tester V.A.G 1318 (handle point in direction of flow -arrow-).
- Start engine and run at idling speed.

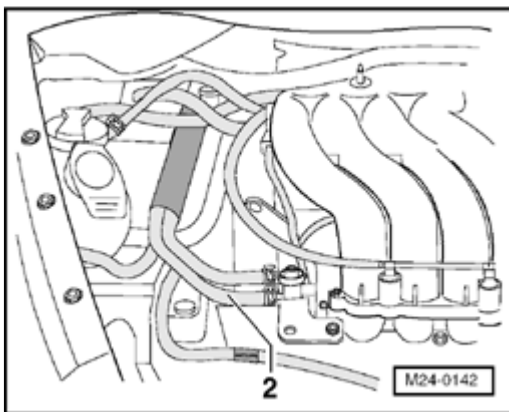


Fig. 342: Locating Return Hose
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Switch ignition off once pressure has built-up and clamp off return hose at same time.

If pressure does not drop:

- Replace fuel pressure regulator. Refer to **Component locations overview**
- Erase DTC memory to return learned values to a neutral (default) position. Refer to **Engine control module Diagnostic Trouble Code (DTC) memory, interrogating and erasing**, Interrogating and erasing DTC memory

If pressure drops again:

- Check line connections, O-rings on fuel rail and injectors for leaks.
- Check pressure tester for leaks.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

If a leak on vehicle has been corrected.

- Erase DTC memory to return learned values to a neutral (default) position. Refer to **Engine control module Diagnostic Trouble Code (DTC) memory, interrogating and erasing**, Interrogating and erasing DTC memory

NOTE: Before removing the pressure tester, remove fuse 28 again and place a cloth around the connection to be loosened.

Engine codes BBW, BEV

- NOTE:**
- The fuel pressure regulator regulates the fuel pressure to approx. 4 bar.
 - The fuel pressure regulator is located at the fuel filter (in the fuel tank).

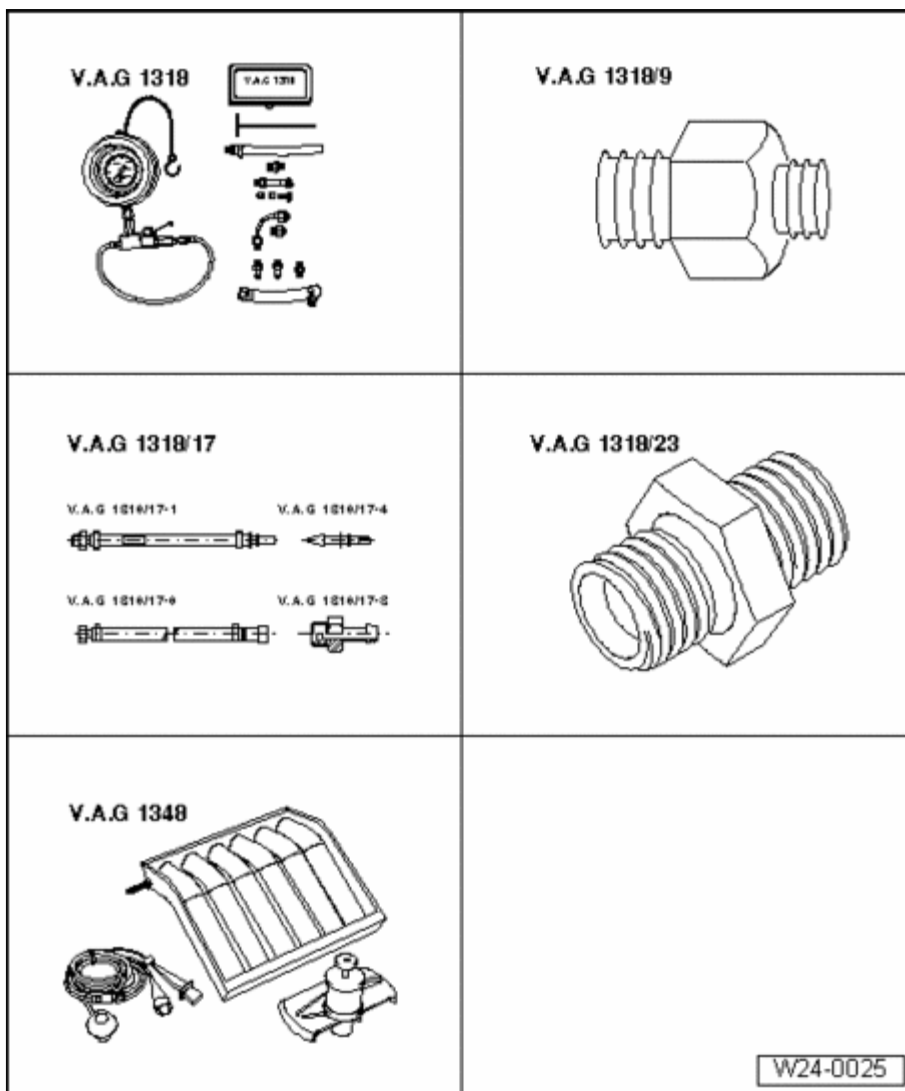


Fig. 343: Identifying Special tools - Fuel Pressure Regulator And Holding Pressure, Checking (Engine

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

codes BBW, BEV)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Special tools and equipment

- V.A.G 1318 Pressure gauge
- 1318/9 Adapter
- 1318/17 Adapter
- 1318/23 Adapter
- V.A.G 1348/3 A Remote control

Work sequence

- Remove cover in front of fuse holder.

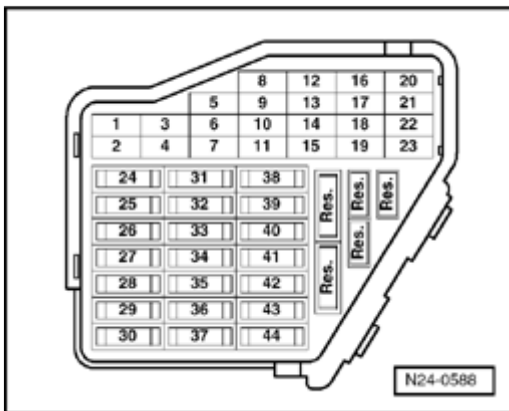


Fig. 344: Identifying Main Fuse Panel

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove fuse 28 (fuel pump) from fuse holder.

WARNING: The fuel system is under pressure! Before opening the system place a cloth around the connection. Then release the pressure by carefully loosening the connection.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

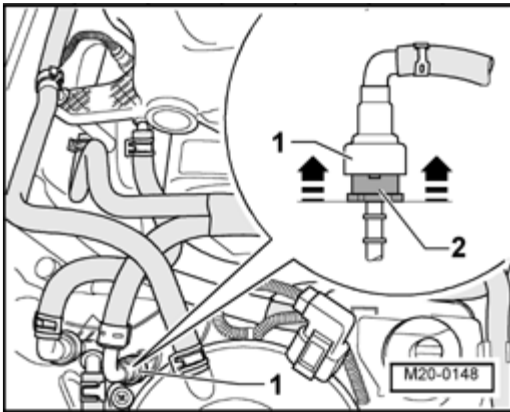


Fig. 345: Locating Supply Line, Union & Safety Ring
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Pull off supply line -1- and collect leaking fuel with a cloth.

NOTE: To disconnect line slide safety ring -2- into the union -1-.

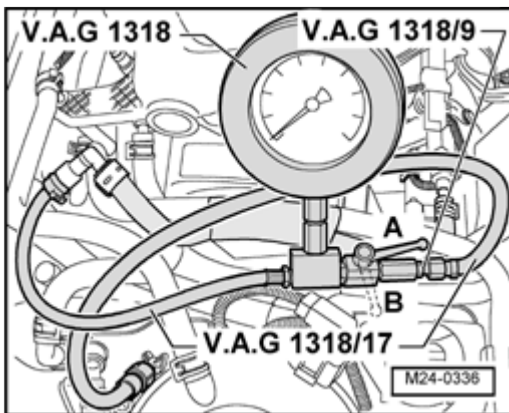


Fig. 346: Identifying V.A.G 1318 With Adapters 1318/9 & 1318/17
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect pressure gauge V.A.G 1318, as shown, with adapters 1318/9 and 1318/17.
- Open shut-off tap on pressure gauge. Handle points in direction of flow.
- Refit fuse 28 (fuel pump) in fuse holder.
- Start engine and run at idling speed.
- Measure fuel pressure.

Specification: Approx. 4.0 bar

If the specification is not obtained:

- Switch ignition off.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Check whether fuel pump can build up and maintain pressure. Refer to **Fuel Pump, Checking** , Checking non-return valve for fuel pump.
- Check fuel pressure regulator. Refer to **Checking fuel pressure regulator** .

If specification is obtained:

- Switch ignition off.
- Check for leaks and holding pressure (compound system). Watch pressure drop on gauge:

After 10 minutes there must be a residual pressure of at least 2.0 bar.

If the pressure drops below 2 bar:

- Start engine and run at idling speed.

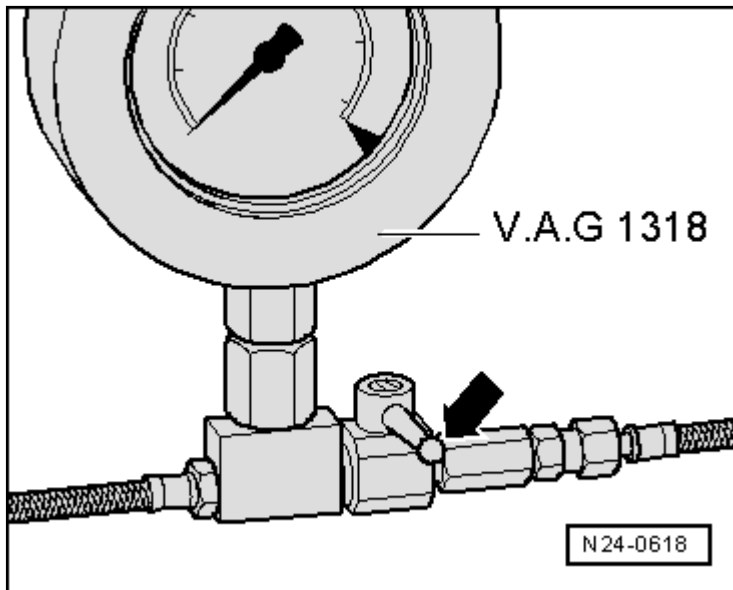


Fig. 347: Locating V.A.G 1318 Shut-Off Tap
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Switch ignition off after pressure has built-up. Simultaneously close pressure gauge V.A.G 1318 cut-off tap (handle cross through-flow direction -arrow-).
- Observe pressure drop (engine side) on gauge.

If the pressure drops again:

- Check line connections, O-rings on fuel manifold and injectors for leaks.
- Check pressure gauge for leaks.

NOTE: Before removing pressure gauge place a cloth around the connections to be

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

loosened.

If the pressure does not drop:

- Check non-return valve of fuel pump. Refer to **Fuel Pump, Checking** .
- Check fuel pressure regulator. Refer to **Checking fuel pressure regulator** .

Checking fuel pressure regulator

Requirements

- Non-return valve for fuel pump OK, checking. Refer to **Fuel Pump, Checking** .
- Fuel pump supply line OK.

Work sequence

- Remove cover in front of fuse holder.

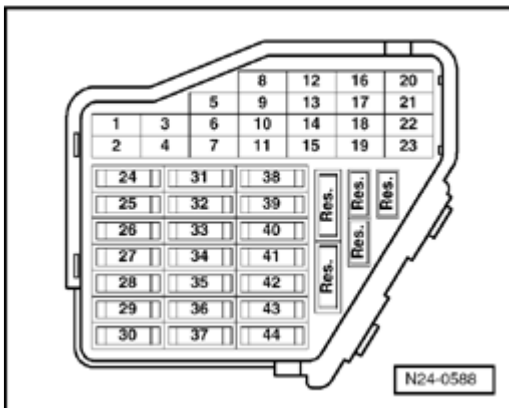
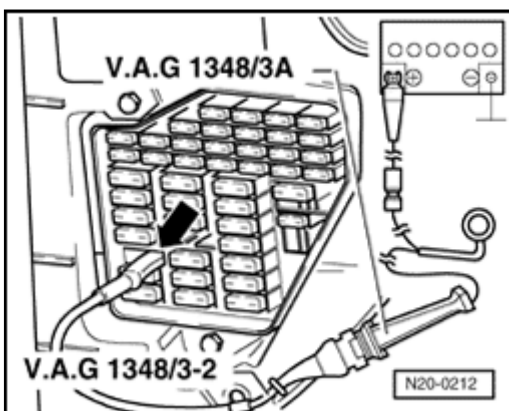


Fig. 348: Identifying Main Fuse Panel

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove fuse 28 (fuel pump) from fuse holder.



2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Fig. 349: Connecting VAG 1348/3A With Adapter Cable VAG 1348/3-2 To Contact And Battery Positive
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect remote control V.A.G 1348/3A with adapter cable V.A.G 1348/3-2 to contact 28a to fuel pump and battery positive (+).

WARNING: The fuel system is under pressure! Before opening the system place a cloth around the connection. Then release the pressure by carefully loosening the connection.

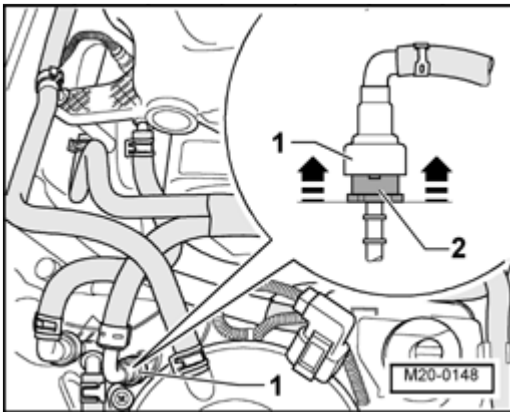
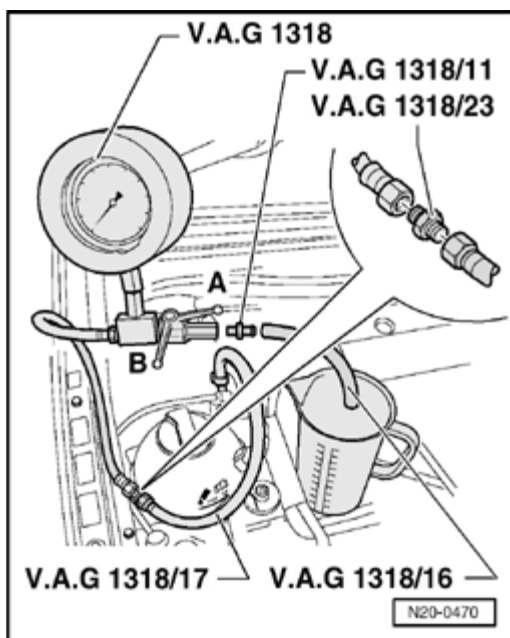


Fig. 350: Locating Supply Line, Union & Safety Ring
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Pull off supply line -1- and collect leaking fuel with a cloth.

NOTE: To disconnect line slide safety ring -2- into the union -1-.



2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Fig. 351: Connecting VAG 1318 Components To Fuel Supply Line **Courtesy of VOLKSWAGEN UNITED STATES, INC.**

- Connect pressure gauge V.A.G 1318 with adapter V.A.G 1318/23 and V.A.G 1318/17 to fuel supply line.
- Close pressure gauge shut-off tap (lever diagonal to direction of flow (position -B-)).
- Operate remote control V.A.G 1348/3A for approx. 10 seconds to build up a system pressure of approx. 4 bar.
- Observe pressure drop on gauge.

Over a duration of 30 minutes pressure must not drop below 3.2 bar.

If the pressure drops further:

- Check line connections for leaks.

If no wiring malfunction is detected:

- Replace fuel pressure regulator.

ENGINE CONTROL MODULE

Engine control module, replacing

Work sequence

- Print out control module identification. Refer to **Engine control module Diagnostic Trouble Code (DTC) memory, interrogating and erasing** .

NOTE: **Replace control module if the control module version displayed does not correspond to the vehicle. For latest part number for engine control module. Refer to Parts catalog**

- Switch ignition off.
- Remove wiper arms and cowl panel:

Refer to **WINDSHIELD WIPER ASSEMBLY, REMOVING AND INSTALLING**

- Release connector from control module and disconnect.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

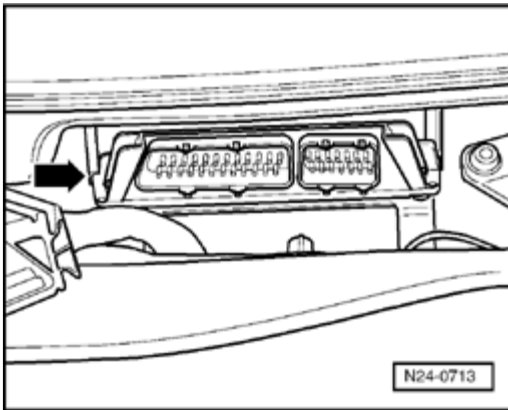


Fig. 352: Engine Control Module

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Press control module to right and pull out.
- Install new control module and press to left.
- Connect and lock connectors.
- Code control module in "guided fault finding" and adapt to electrical immobilizer and to throttle valve control module. Refer to **Adapting components and functions** , Adapting components and functions.

Vehicles with cruise control system (CCS)

- Check whether cruise control module is activated; activate if necessary. Refer to **Adapting components and functions** , Adapting components and functions.

Vehicles with automatic transmission

- Learn kick down switch point. Refer to **Adapting components and functions** , Adapting components.
- Adapt control module for automatic transmission. Refer to **Adapting components and functions** , Adapting components.

Continued for all models

- Road test vehicle.

Observe applicable safety precautions during road test. Refer to **Safety precautions**

During the road test the following conditions must be met:

- Coolant temperature must exceed 80 ° C.
- When temperature is reached, the operating conditions, as follows, must be attained several times:
 - Idling
 - Part throttle

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Enrichment:
- Wide open throttle
- Overrun
- Read control module DTC memory again.
- Generate readiness code in "Guided fault finding". Refer to **Adapting components and functions** , Adapting functions and components.

Adapting components and functions

Special tools and equipment

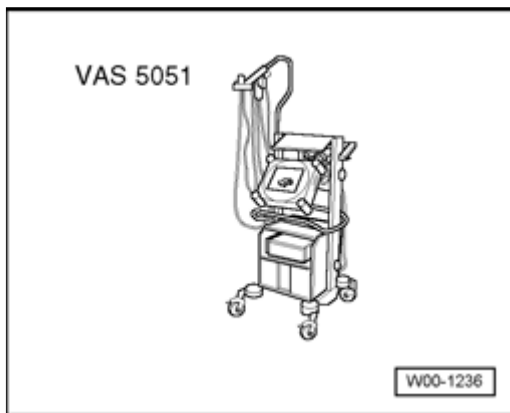


Fig. 353: VAS 5051 Vehicle Diagnosis, Testing and Information System
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- VAS 5051 Vehicle Diagnosis, Testing and Information System
- Diagnostic cable VAS 5051/1 or VAS 5051/3
- Connect Vehicle Diagnosis, Testing and Information System VAS 5051 as follows:

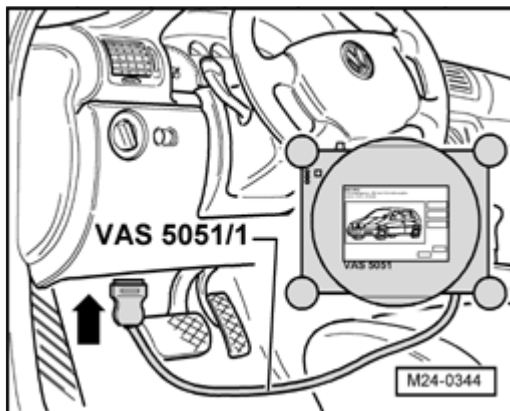


Fig. 354: Connecting VAS 5051/1 To DLC
Courtesy of VOLKSWAGEN UNITED STATES, INC.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Plug connector of diagnosis cable VAS 5051/1 or VAS 5051/3 to Data Link Connector (DLC) (arrow).

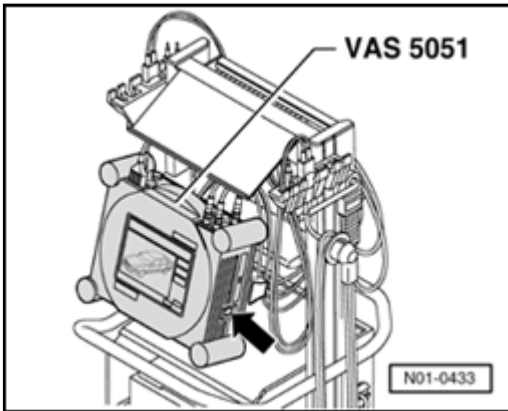


Fig. 355: VAS 5051 & On Switch

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Switch tester on (arrow).

The tester is operationally ready when a picture (photograph) of a vehicle appears on the display.

- Switch ignition on.
- Touch key on screen for: Guided Fault finding.
- Select one after another:
 - Brand
 - Model
 - Model year
 - Variant
- Engine code
- Confirm data as entered:

NOTE: **Wait until the tester has read all the available control modules (vehicle system test).**

After all control modules have been interrogated:

- Press "Go to" button.
- Select "Function/component selection".
- Press "Drive (Repair group. 01;10...26; 28...39)".
- Choose corresponding engine code.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Select "01-Systems capable of self-diagnosis"
- Select "Engine management system".
- Under "Function" or "Electrical components", select function or component to be adapted.

Engine control module Diagnostic Trouble Code (DTC) memory, interrogating and erasing

Diagnostic Trouble Code (DTC) memory is referred to as "fault memory" in the VAS 5051 tester.

When the DTC memory is erased the engine control module loses some learned values. This can lead to engine running malfunctions, depending upon the vehicle mileage.

In this case:

- Perform a longer road test until poor driving characteristics are eliminated.

Special tools and equipment

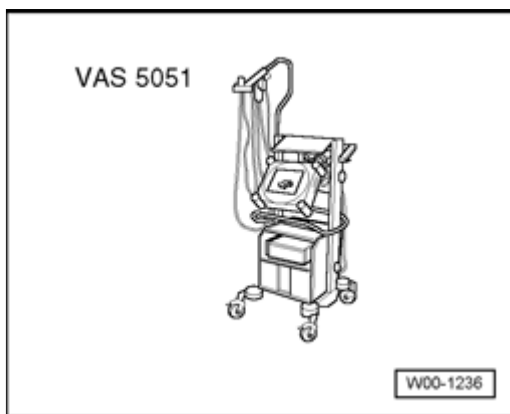


Fig. 356: VAS 5051 Vehicle Diagnosis, Testing and Information System
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- VAS 5051 Vehicle Diagnosis, Testing and Information System
- Diagnostic cable VAS 5051/1 or VAS 5051/3

Work sequence

Connect Vehicle Diagnosis, Testing and Information System VAS 5051 as follows:

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

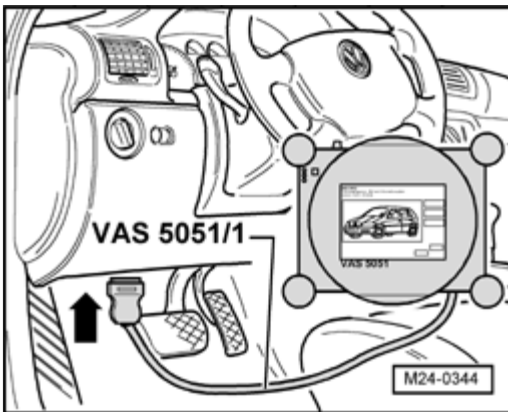


Fig. 357: Connecting VAS 5051/1 To DLC

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Plug connector of diagnosis cable VAS 5051/1 or VAS 5051/3 to Data Link Connector (DLC) (arrow).
- Start engine and run at idling speed.

Only when engine does not start:

- Switch ignition on.

Selecting operating mode

- Press button on screen for "Vehicle self-diagnosis".

Selecting vehicle system

- Press button "01 - Engine electronics" on screen.

The control module identification and engine control module coding are shown on the screen.

NOTE: A print-out can be produced if required. Press the "Print" button.

Selecting diagnostic function

- Press button "02 - Interrogating fault memory" on screen.
 - "No fault detected" appears on screen if no faults are stored in the engine control module.
 - If faults are stored in the engine control module they will appear on the screen listed one below the other.
- Press <-- button.
- Press button "05 - Erase fault memory" on screen.
- Press function 06-"End output".
- Generate readiness code in "Guided fault finding" after erasing fault memory. Refer to **Adapting**

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

components and functions , Adapting components and functions.

26 EXHAUST SYSTEM, EMISSION CONTROLS

EXHAUST SYSTEM COMPONENTS

Exhaust system components, removing and installing

Special tools and equipment

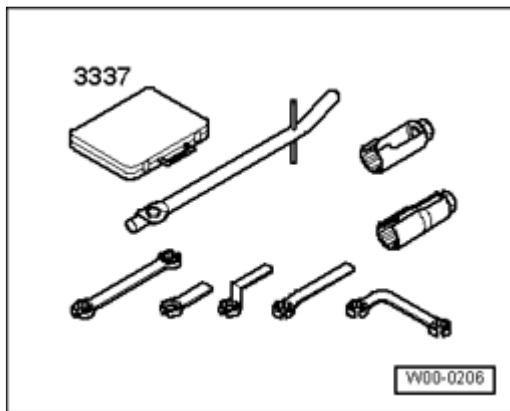


Fig. 358: 3337 Oxygen Sensor Ring Spanner
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- 3337 Oxygen sensor ring spanner

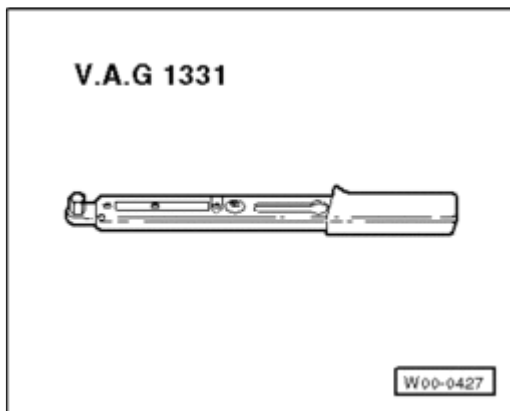


Fig. 359: Torque Wrench V.A.G. 1331 (5 To 50 Nm)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

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

NOTE:

- After working on the exhaust system ensure that the system is not under stress and that it has sufficient clearance to the bodywork. If necessary, loosen double clamp(s) and align muffler and exhaust pipe so that

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

sufficient clearance is maintained to the bodywork and the support hangers are evenly loaded.

- Replace self-locking nuts.

Exhaust manifold, front exhaust pipe and catalytic converter with attachments

- Engine codes AVH, and AZG. Refer to Engine codes AVH and AZG
- Engine code BBW. Refer to Engine code BBW
- Engine code BEV. Refer to Engine code BEV

Engine code AEG

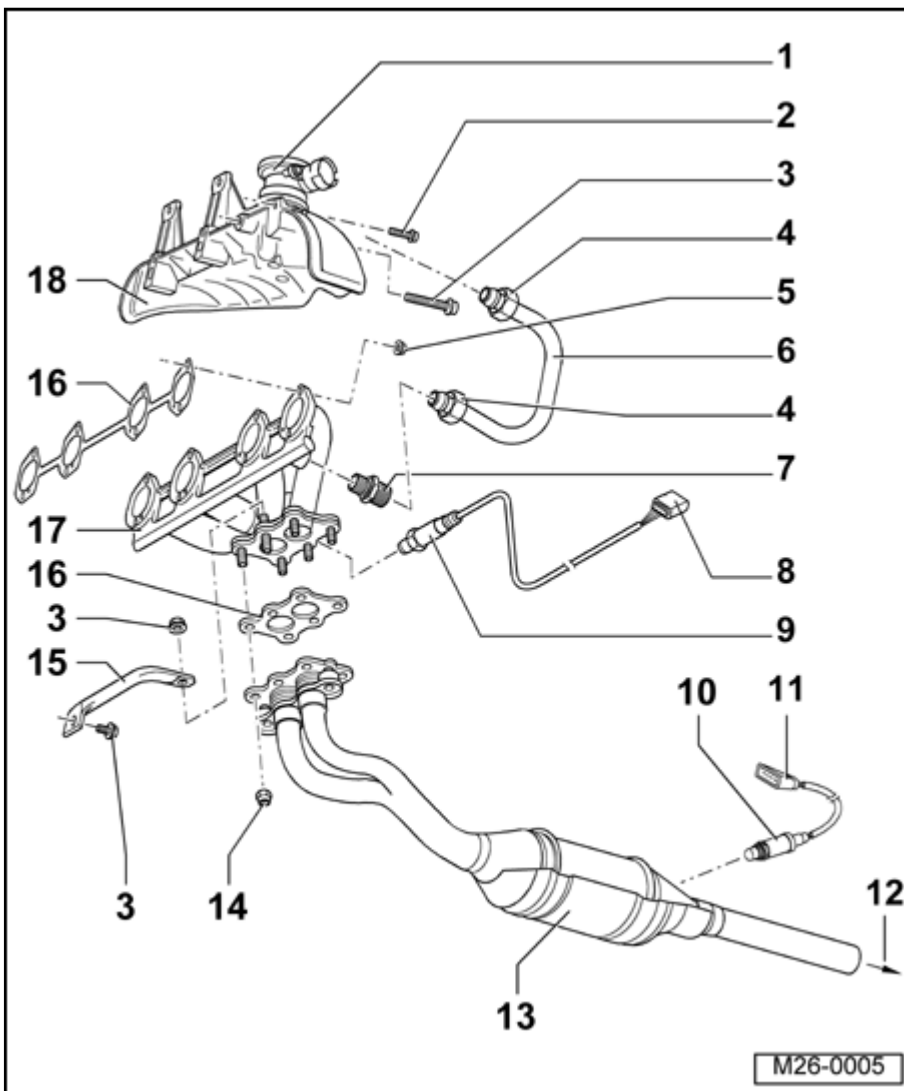


Fig. 360: Exhaust Manifold, Front Exhaust Pipe And Catalytic Converter With Attachments (Engine Code AEG)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

1 - Combination valve

- Checking. Refer to Combination valve, checking
- To remove, remove warm air collector plate

2 - 10 Nm

3 - 25 Nm

4 - 30 Nm

5 - 25 Nm

- Always replace

6 - Connecting pipe

- For secondary air inlet

7 - 35 Nm

8 - Connector

- Black, 6-pin
- Contacts are gold plated
- For Oxygen Sensor and Heated Oxygen Sensor

9 - Heated Oxygen Sensor (HO2S) -G39-, 50 Nm

- Grease only threads with G 052 112 A3 hot bolt paste (anti-seize compound). Paste must not get into slots on sensor body
- Removing and installing with 3337

10 - Oxygen Sensor (O2S) Behind Three Way Catalytic Converter (TWC) -G130-, 50 Nm

- Grease only threads with G 052 112 A3 hot bolt paste (anti-seize compound). Paste must not get into slots on sensor body
- Removing and installing with 3337

11 - Connector

- Brown, 4-pin
- Contacts 3 and 4 are gold plated
- For Oxygen Sensor and Heated Oxygen Sensor

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

12 - To middle muffler

13 - Front exhaust pipe with catalytic converter

14 - 40 Nm

- Always replace

15 - Bracket

16 - Seal

- Always replace

17 - Exhaust manifold

18 - Warm air collector plate

Engine codes AVH and AZG

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

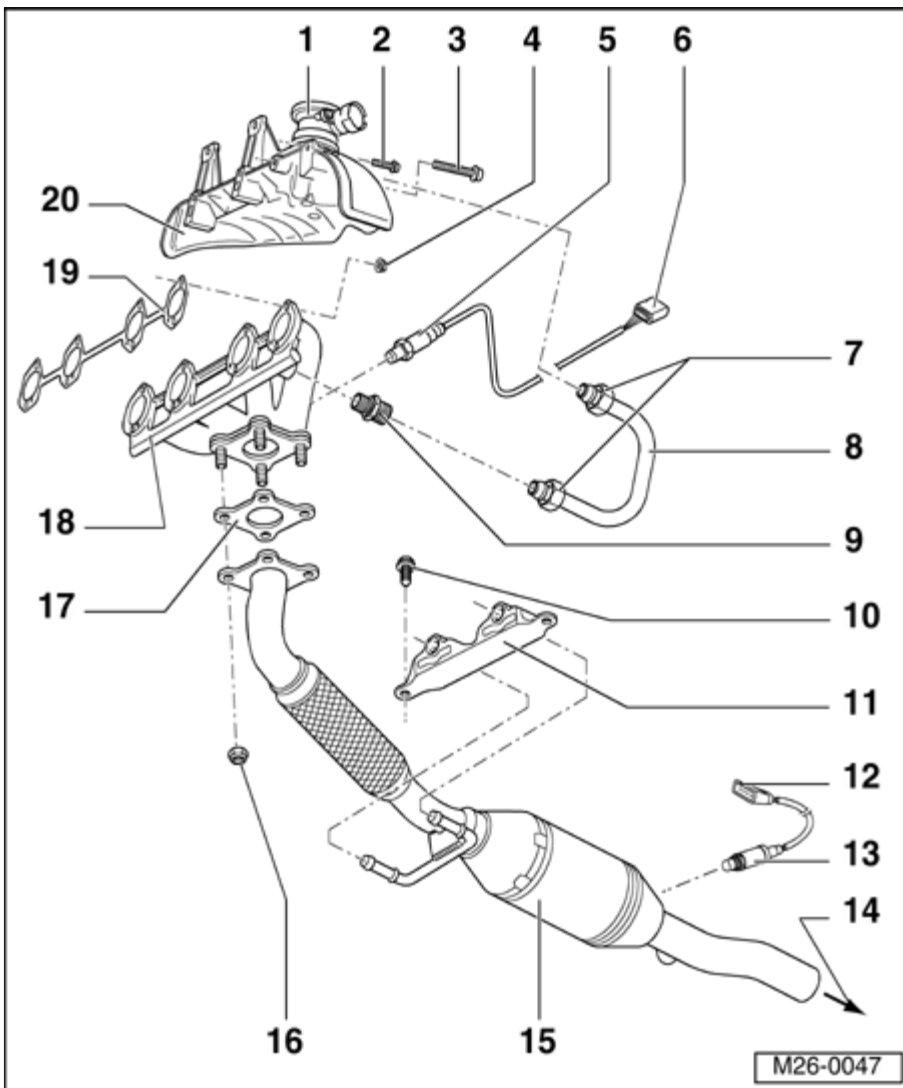


Fig. 361: Exhaust Manifold, Front Exhaust Pipe And Catalytic Converter With Attachments (Engine Codes AVH & AZG)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Combination valve

- Checking. Refer to Combination valve, checking
- To remove, remove warm air collector plate

2 - 10 Nm

3 - 25 Nm

4 - 30 Nm

5 - Heated Oxygen Sensor (HO2S) -G39-, 50 Nm

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Grease only threads with G 052 112 A3 hot bolt paste (anti-seize compound). Paste must not get into slots on sensor body
- Removing and installing with 3337

6 - Connector

- Black, 6-pin
- Contacts are gold plated
- For Oxygen Sensor and Heated Oxygen Sensor

7 - 30 Nm

8 - Connecting pipe

- For secondary air inlet system

9 - 35 Nm

10 - 25 Nm

11 - Bracket

12 - Connector

- Brown, 4-pin
- Contacts 3 and 4 are gold plated
- For Oxygen Sensor and Heated Oxygen Sensor

13 - Oxygen Sensor (O2S) Behind Three Way Catalytic Converter (TWC) -G130-, 50 Nm

- Grease only threads with G 052 112 A3 hot bolt paste (anti-seize compound). Paste must not get into slots on sensor body
- Removing and installing with 3337

14 - To middle muffler

15 - Front exhaust pipe with catalytic converter

16 - 40 Nm

- Always replace

17 - Seal

- Always replace

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

18 - Exhaust manifold

19 - Seal

- Always replace

20 - Warm air collector plate

Engine code BBW

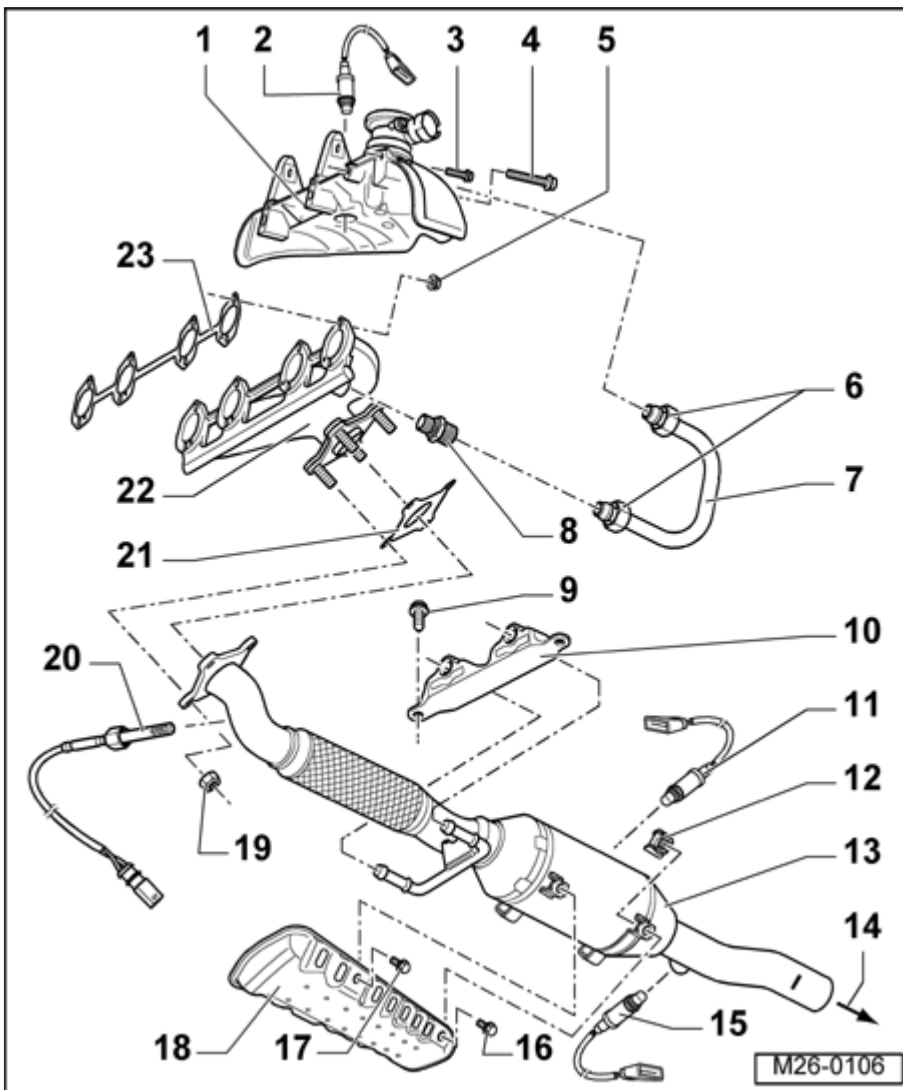


Fig. 362: Exhaust Manifold, Front Exhaust Pipe And Catalytic Converter With Attachments (Engine Code BBW)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Warm air collector plate

2 - Heated Oxygen Sensor (HO2S) G39). 50 Nm

Afinacion de Motor y Diagnostico, OBDII,VW ,Audi

044 664 252 34 69

Wednesday, July 06, 2016 9:38:57 AM

Page 363

© 2011 Mitchell Repair Information Company, LLC.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Grease only threads with G 052 112 A3 hot bolt paste (anti-seize compound). Paste must not get into slots on sensor body
- Removing and installing with 3337, separate connector. Refer to **Engine code BBW** , item -20-

3 - 10 Nm

4 - 25 Nm

5 - 25 Nm

- Always replace

6 - 40 Nm

7 - Connecting pipe

- For secondary air inlet

8 - 60 Nm

9 - 25 Nm

10 - Bracket

11 - Oxygen Sensor (O2S) in Center Three Way Catalytic Converter (TWC), Bank 1 -G465-, 50 Nm

- Grease only threads with G 052 112 A3 hot bolt paste (anti-seize compound). Paste must not get into slots on sensor body
- Removing and installing with 3337, separate connector. Refer to **Engine code BBW** , item -20-

12 - Speed nut

- Slide on from front

13 - Front exhaust pipe with catalytic converter

- With anti-vibration element

14 - To forward muffler

15 - Oxygen Sensor (O2S) Behind Three Way Catalytic Converter (TWC) -G130-, 50 Nm

- Grease only threads with G 052 112 A3 hot bolt paste (anti-seize compound). Paste must not get into slots on sensor body
- Removing and installing with 3337, separate connector. Refer to **Engine code BBW** , item -20-

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

16 - 5 Nm

17 - 10 Nm

18 - Heat shield

- For catalytic converter

19 - 25 Nm

- Always replace

20 - Exhaust Gas Temperature (EGT) sensor 1 -G235-, 45 Nm

- Removing and installing with 3337, separate connector. See **Fig. 363**

21 - Seal

- Always replace

22 - Exhaust manifold

23 - Seal

- Always replace

Connectors, installed location

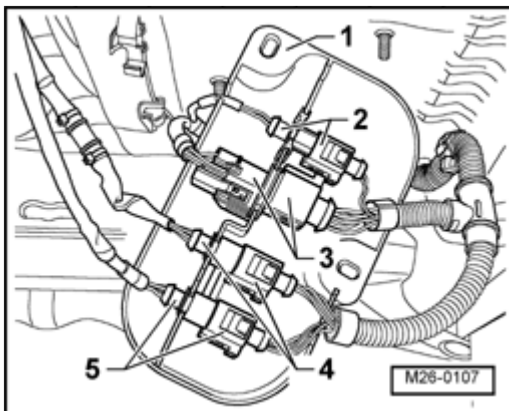


Fig. 363: Connectors, Installed Location

Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Protective housing, on vehicle underside right side

2 - For Exhaust Gas Temperature (EGT) sensor 1 -G235-

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

3 - For Heated Oxygen Sensor (HO2S) -G39-

4 - For Oxygen Sensor (O2S) in Center Three Way Catalytic Converter (TWC), Bank 1 -G465-

5 - For Oxygen Sensor (O2S) Behind Three Way Catalytic Converter (TWC) -G130-

Engine code BEV

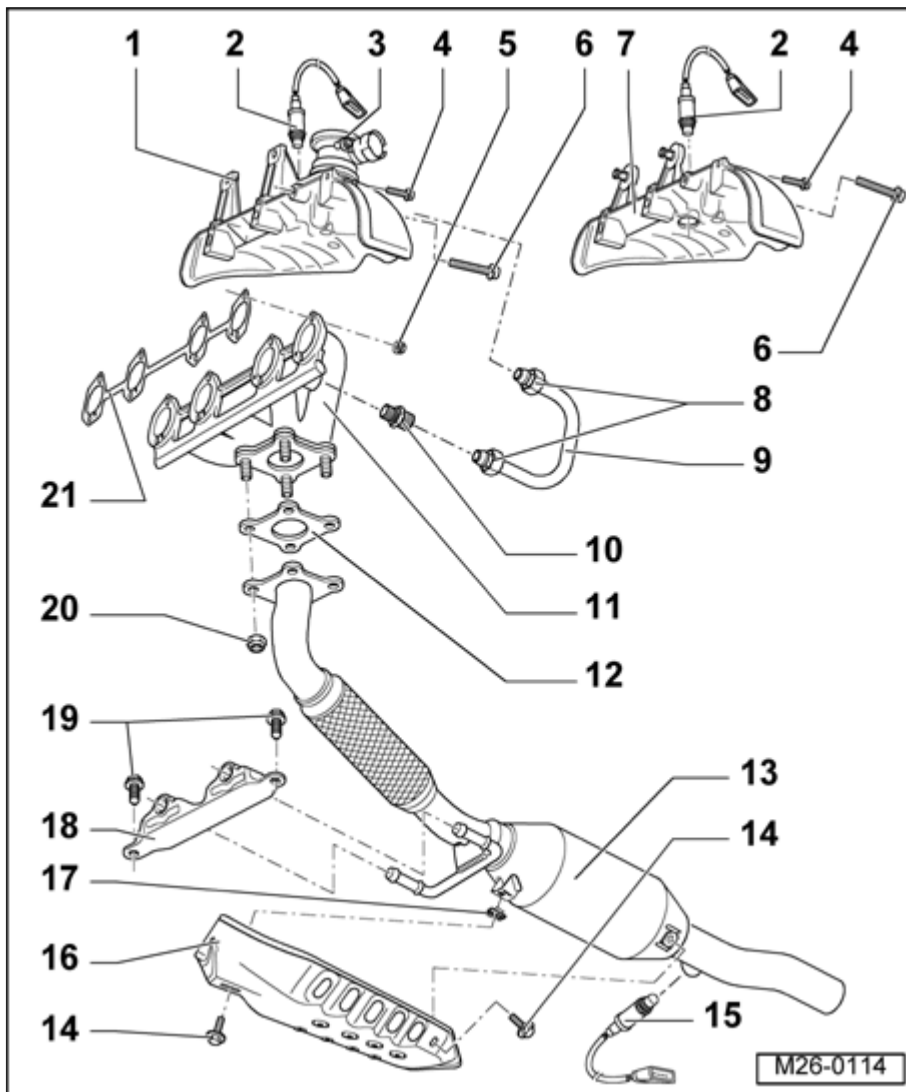


Fig. 364: Exhaust Manifold, Front Exhaust Pipe And Catalytic Converter With Attachments (Engine Code BEV)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Warm air collector plate

2 - Heated Oxygen Sensor (HO2S) G39), 50 Nm

- Grease only threads with G 052 112 A3 hot bolt paste (anti-seize compound). Paste must not get into slots.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

on sensor body

- Removing and installing with 3337, separate connector. See **Fig. 365**.

3 - Combination valve

- Checking. Refer to **Combination valve, checking**

4 - 25 Nm

5 - 25 Nm

- Always replace

6 - 30 Nm

7 - Warm air collector plate

- Not for engine code BEV

8 - 30 Nm

9 - Connecting pipe

- For secondary air inlet

10 - Threaded connection

- 35 Nm

11 - Exhaust manifold

12 - Seal

- Always replace

13 - Front exhaust pipe with catalytic converter

14 - 10 Nm

15 - Oxygen Sensor (O2S) Behind Three Way Catalytic Converter (TWC) -G130-, 50 Nm

- Grease only threads with G 052 112 A3 hot bolt paste (anti-seize compound). Paste must not get into slots on sensor body
- Removing and installing with 3337, separate connector. See **Fig. 365**.

16 - Heat shield

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- For catalytic converter

17 - Speed nut

18 - Bracket

19 - 25 Nm

20 - 40 Nm

- Always replace

21 - Seal

- Always replace

Connectors, installed location

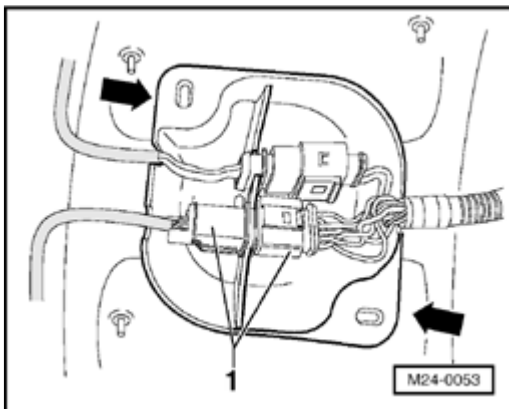


Fig. 365: Connectors, Installed Location

Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - For Heated Oxygen Sensor (HO2S) -G39-

2 - For Oxygen Sensor (O2S) Behind Three Way Catalytic Converter (TWC) -G130-

Muffler with mountings

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

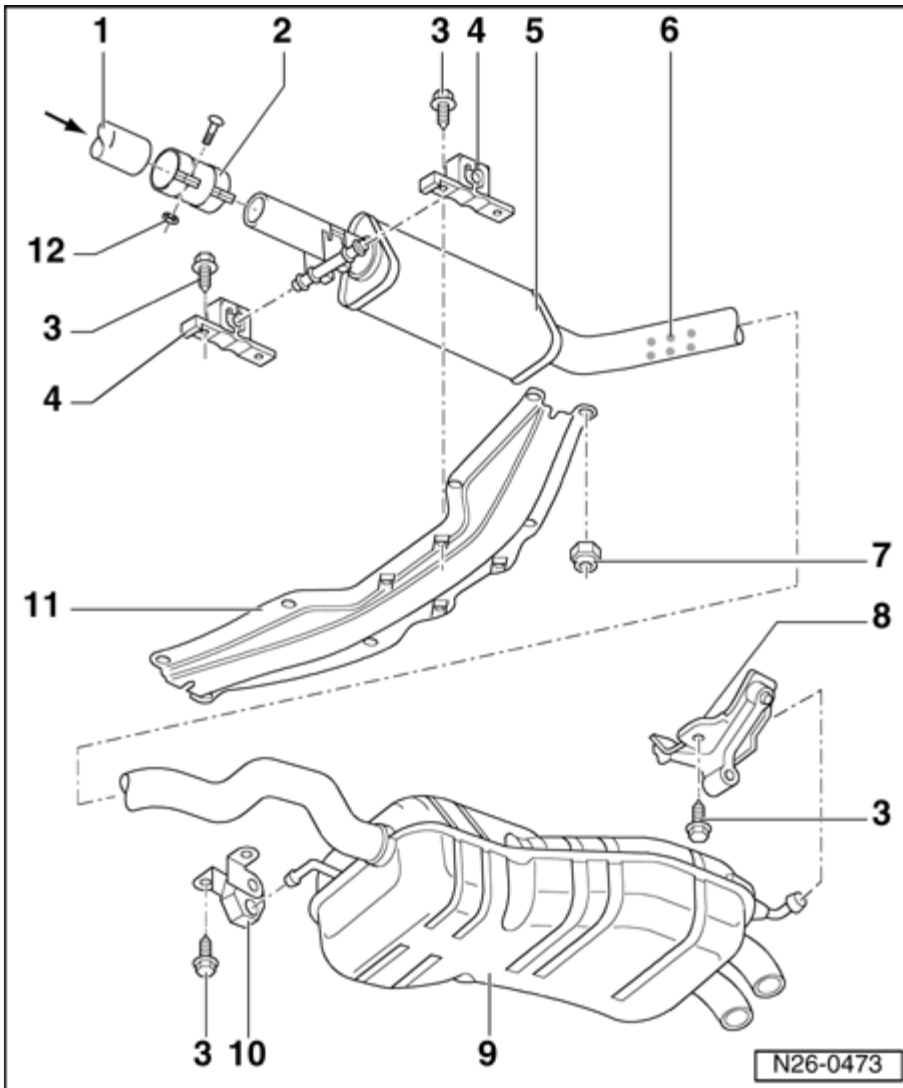


Fig. 366: Muffler With Mountings

Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - From catalytic converter

2 - Double clamp

- Observe installed position. Refer to **Checking installation position of double clamp**

3 - 25 Nm

4 - Mounting

- Observe installed position. Refer to **Checking installation position of double clamp** , **Installation position of mounting**

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

5 - Forward muffler

- Aligning. Refer to Separating point on exhaust pipe and Muffler with mountings

6 - Separating point

- For repairing
- As standard, pre-exhaust pipe and rear mufflers are installed as a single component. For repairs, front exhaust pipe and rear 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

7 - 20 Nm

8 - Mounting

9 - Muffler

10 - Mounting

- With retaining ring

11 - Tunnel bridge

12 - 40 Nm

Checking installation position of double clamp

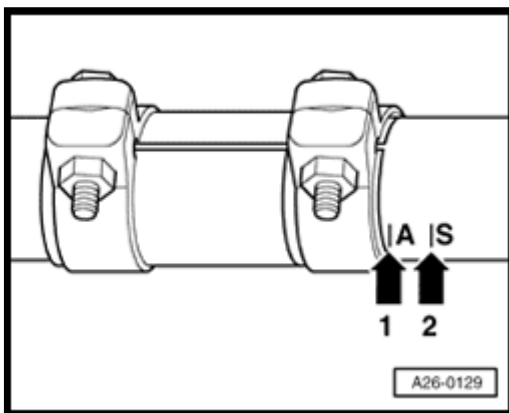


Fig. 367: Checking Installation Position Of Double Clamp
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Position double clamp with approx. 5 mm clearance to appropriate marking.
- Marking A (arrow -1-) for vehicles with an automatic transmission.
- Marking S (arrow -2-) for vehicles with a manual transmission.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Installation position of mounting

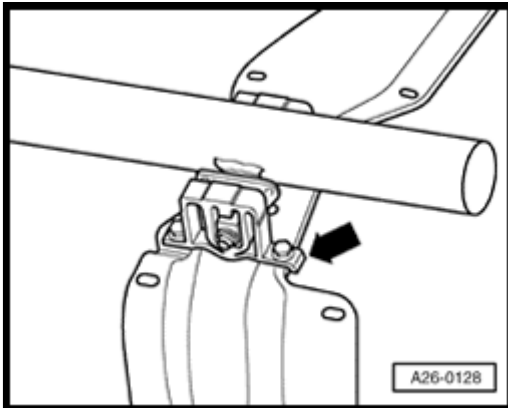


Fig. 368: Installation Position Of Mounting
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Angled side on base of mounting (arrow) points forward.

Separating point on exhaust pipe

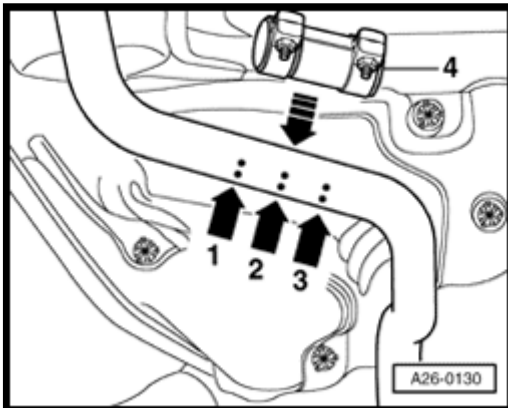


Fig. 369: Separating Point On Exhaust Pipe
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Separate exhaust pipe at right angles at separating point (arrow -2-).
- Position repair double clamp -4- on side markings (arrows -1- and -3-) to install.

Tightening torque: 40 Nm

Aligning front muffler free of stress

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

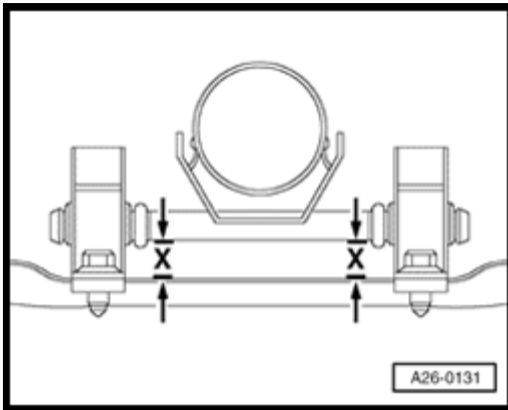


Fig. 370: Aligning Front Muffler Free Of Stress
Courtesy of VOLKSWAGEN UNITED STATES, INC.

The mounting pins on the front muffler must run parallel with the tunnel bridge (dimension -x- on left and right the same).

Exhaust manifold, removing and installing

Special tools and equipment

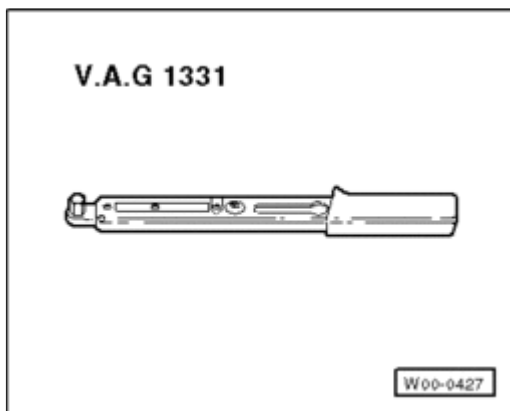


Fig. 371: Torque Wrench V.A.G. 1331 (5 To 50 Nm)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

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

Removing

- Remove engine cover
- Remove intake manifold upper part. Refer to **Engine code AEG**
- Remove pressure hose from secondary air pump and combination valve on vehicles with a secondary air system.
- Remove middle insulation tray

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Refer to **NOISE INSULATION (GASOLINE ENGINES), ASSEMBLY OVERVIEW** or **NOISE INSULATION (DIESEL ENGINES), ASSEMBLY OVERVIEW**

- Unbolt heat shield for right side drive axle.
- Depending on version, remove bolts/nuts for bracket on exhaust manifold and remove it.
- For vehicles with secondary air system, remove lower support for combination valve connection pipe to exhaust manifold.
- For vehicles with secondary air system, remove upper support for combination valve connection pipe to exhaust manifold.
- Depending on version, disconnect Heated Oxygen Sensor (HO2S) -G39-.
- Remove warm air collector plate.

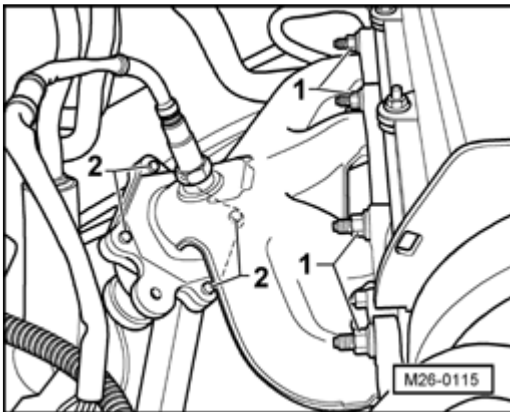


Fig. 372: Exhaust Pipe Securing Bolts & Nuts

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove securing bolts -2- for exhaust pipe on exhaust manifold.
- Remove upper four nuts -1- as well as lower four for exhaust manifold to cylinder head.
- Take out exhaust manifold upward.

Installing

NOTE:

- To prevent exhaust gases from escaping, the contact surfaces between exhaust manifold, exhaust pipe and cylinder head must be bolted together correctly.
- Replace all seals and gaskets.

Installation is performed in reverse sequence of removal.

SECONDARY AIR INJECTION SYSTEM

Secondary air injection system

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

CAUTION: When performing repair work, especially due to the confined conditions in the engine compartment, pay attention to the following:

- Route all types of lines (e.g. for fuel, hydraulics, EVAP system, coolant, refrigerant, brake fluid and vacuum) as well as electrical wiring so that the original positions are restored.
- Ensure sufficient clearance to all moving or hot components.

Function

- The secondary air injection system blows air behind the exhaust valves for 100 seconds during a cold start (+15 ° C to +35 ° C coolant temperature).
- This produces an oxygen rich exhaust gas, which initiates afterburning and reduces the heating-up phase of the catalytic converter.
- Activation is performed by the Engine Control Module (ECM) -J220- via the Secondary Air Injection (AIR) pump relay -J299- to the Secondary Air Injection (AIR solenoid valve -N112-1), change-over and combination valves.
- The secondary air pump motor is activated, this creates a pressure and opens the combination valve at 60 to 70 mbar1).
- After each subsequent engine start (up to max. 96 ° C engine temperature) the secondary air system will switch on for 10 seconds during idling and will be checked by On Board Diagnostic. The Oxygen sensor regulation must then be active.

1) Depending on version.

Secondary air injection system components, removing and installing

- Engine codes AEG, (from model year 1999), AVH AZG, BEV. Refer to **Engines: AEG, (from model year 1999), AVH, AZG, BEV**

Engine code AEG (up to model year 1999)

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

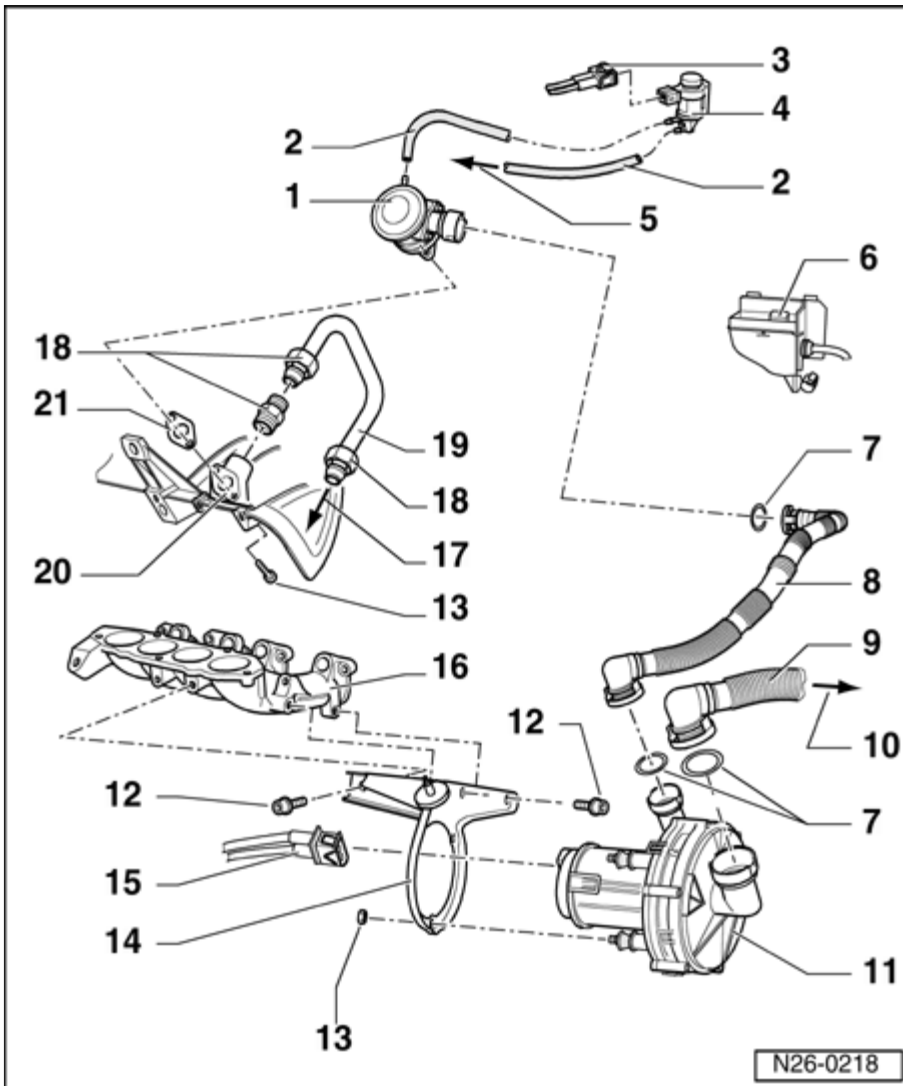


Fig. 373: Secondary Air Injection System Components (Engine Code AEG - Up To Model Year 1999)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Combination valve

- Checking. Refer to [Combination valve, checking](#)
- To replace, remove warm air collector plate

2 - Vacuum hose

3 - Connector

- 2-pin

4 - Secondary Air Injection (AIR) solenoid valve -N112-

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

5 - To connection on line to brake booster

6 - Secondary Air Injection (AIR) pump relay -J299-

- In protective housing for relays (engine compartment). See **Fig. 374 , Position of relays in protective housing (on left in engine compartment)**

7 - Sealing ring

- Always replace

8 - Pressure hose

- Check if seated securely
- Press together at front to release.

9 - Intake hose

- From air cleaner upper part
- For secondary air injection pump
- Check if seated securely
- Press together at front to release

10 - To air cleaner

11 - Secondary Air Injection (AIR) pump motor -V101-

- Checking. Refer to **Secondary air injection pump motor, checking**

12 - 25 Nm

13 - 10 Nm

14 - Bracket

- For secondary air injection pump motor
- Secured to intake manifold

15 - Connector

- 2-pin

16 - Intake manifold - lower part

17 - To connection on intake manifold

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

18 - 30 Nm

19 - Connecting pipe

20 - Warm air collector plate

- With mounting for combination valve

21 - Seal

- Always replace

Secondary Air Injection pump relay -J299-, control number 100

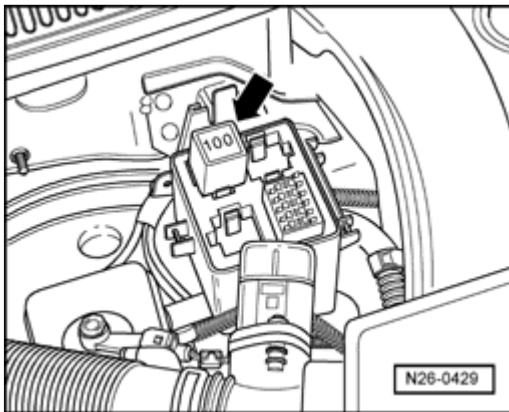


Fig. 374: Secondary Air Injection Pump Relay -J299-, Control Number 100
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- The relay positions can vary depending on vehicle equipment
- If tools are necessary to pull relays or control modules out of the relay plate, first disconnect battery Ground (GND) strap.
- Before disconnecting battery Ground (GND) strap obtain code for radios with anti-theft coding.

Engines: AEG (from model year 1999), AVH, AZG, BEV

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

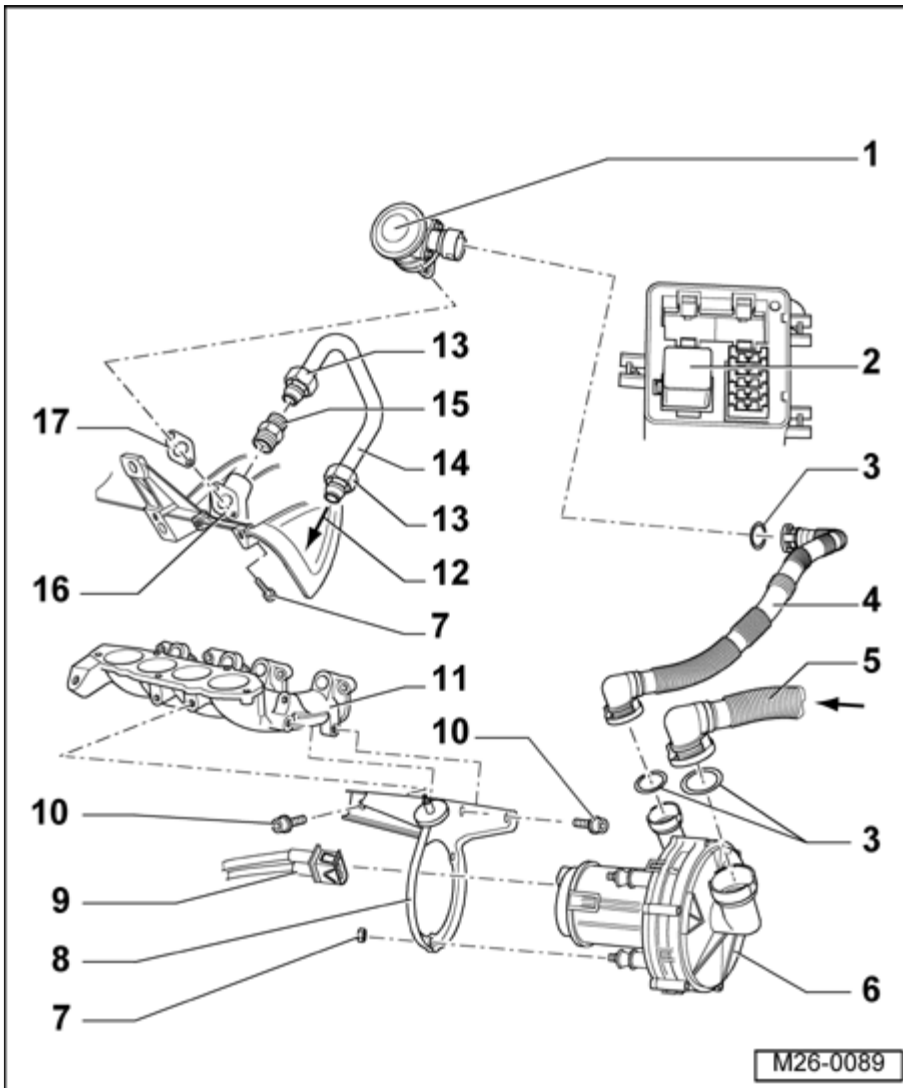


Fig. 375: Secondary Air Injection System Components (Engines: AEG (From Model Year 1999), AVH, AZG, BEV)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Combination valve

- Checking. Refer to **Combination valve, checking**
- To replace, remove warm air collector plate

2 - Secondary Air Injection (AIR) pump relay -J299-

- In protective housing for relays (engine compartment) BEV engines Page **Position of relays in protective housing (on left in engine compartment)** . See **Fig. 377**
- In protective housing for relays (engine compartment) AEG, AVH and AZG engines. Refer to **Position of relays in protective housing (on left in engine compartment)**

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

3 - O-ring

- Always replace

4 - Pressure hose

- Check if seated securely
- Press together at front to release

5 - Intake hose

- From air cleaner upper part
- For secondary air injection pump
- Check if seated securely
- Press together at front to release

6 - Secondary Air Injection (AIR) pump motor -V101-

- Not checked by final control diagnosis
- Checking. Refer to Secondary air injection pump motor, checking

7 - 10 Nm

8 - Bracket

- For secondary air injection pump motor
- Installed on intake manifold lower part, BEV engine.
- Installed on intake manifold, engines AEG, AVH and AZG

9 - Connector

- 2-pin

10 - 25 Nm

11 - Intake manifold lower part

12 - To union on exhaust manifold

13 - 40 Nm - BEV engine; 30 Nm - AEG, AVH and AZG engines

14 - Connecting pipe

15 - Nuts/bolts, 60 Nm - BEV engine; 35 Nm - AEG, AVH and AZG engines

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

16 - Warm air collector plate

- With mounting for combination valve

17 - Seal

- Always replace

Position of relays in protective housing (on left in engine compartment)

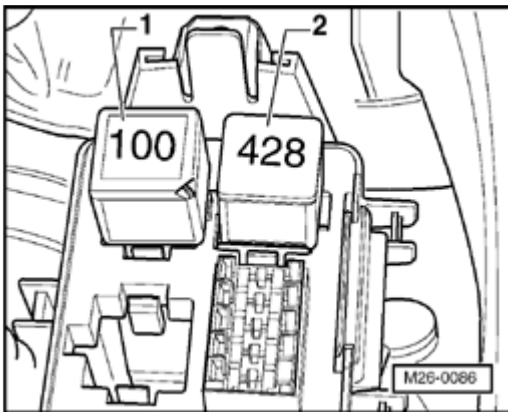


Fig. 376: Position Of Relays In Protective Housing (On Left In Engine Compartment)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Secondary Air Injection (AIR) pump relay -J299-, Distinguishing features: Control number 100

NOTE: • The relay locations may differ depending on equipment level.

For latest control numbers and component locations:

Refer to Electrical Wiring Diagrams, Troubleshooting & Component Locations

- Disconnect battery Ground strap first if tools are required to pull relays or control modules out of the relay plate.
- Before disconnecting the battery Ground strap obtain code for radios with anti-theft coding.

Secondary Air Injection pump relay -J299-, control number 100

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

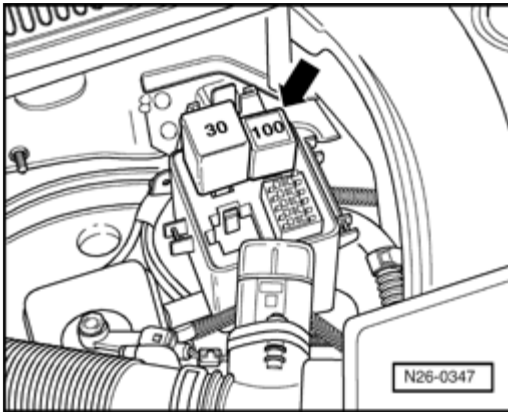


Fig. 377: Secondary Air Injection Pump Relay -J299-, Control Number 100
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- The relay positions can vary depending on vehicle equipment
- If tools are necessary to pull relays or control modules out of the relay plate, first disconnect battery Ground (GND) strap.
- Before disconnecting battery Ground (GND) strap obtain code for radios with anti-theft coding.

Combination valve, removing and installing

Special tools and equipment

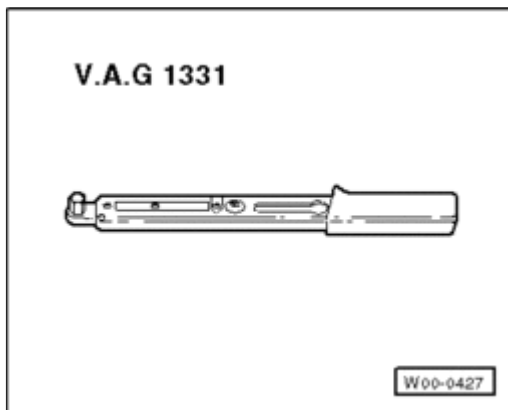


Fig. 378: Torque Wrench V.A.G. 1331 (5 To 50 Nm)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

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

Removing

- Remove engine cover.
- Remove intake manifold upper part. Refer to **Engine code AEG**
- Disconnect pressure hose from combination valve.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Remove middle insulation tray

Refer to **NOISE INSULATION (GASOLINE ENGINES), ASSEMBLY OVERVIEW** or **NOISE INSULATION (DIESEL ENGINES), ASSEMBLY OVERVIEW**

- Unbolt heat shield for right side drive axle.
- Unbolt lower support of combination valve connecting pipe to exhaust manifold.
- Unbolt upper support of combination valve connecting pipe to exhaust manifold and remove pipe.
- Depending on version, disconnect Heated Oxygen Sensor (HO2S) -G39-.
- Remove warm air collector plate with combination valve.

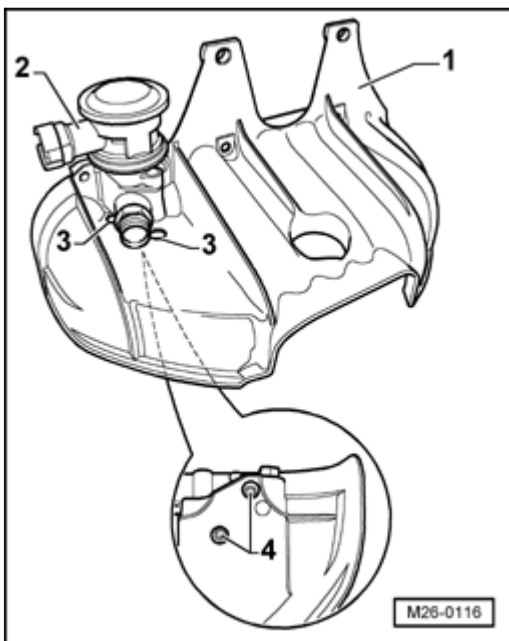


Fig. 379: Warm Air Collector Plate, Bolts, Combination Valve & Holes

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Guide a 5 mm hex socket head bolt into holes -3- of warm air collector plate -1- and remove bolts -4- for combination valve -2-.
- Remove combination valve.

Installing

NOTE:

- Thoroughly clean contact surfaces between combination valve and warm air collector.
- Replace seal

Installation is performed in reverse sequence of removal.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Combination valve, checking

Engine codes AEG, AVH, AZG, BBW and BEV

Requirements

- No malfunctions stored in DTC memory. Refer to Engine control module Diagnostic Trouble Code (DTC) memory, interrogating and erasing
- Final control diagnosis performed. Refer to Adapting components and functions , Adapting functions and components.
- Vacuum lines and hose unions must not leak.

Work sequence

NOTE: Do not use compressed air during the following check!

- Remove engine cover.

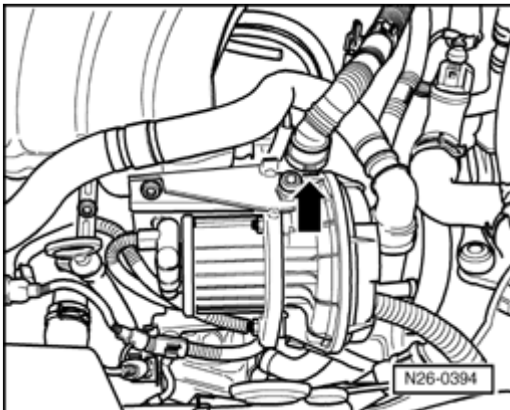


Fig. 380: Secondary Air Pump Motor Pressure Hose
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove pressure hose (arrow) from secondary air pump motor.

NOTE: Press buttons on hose couplings together to release coupling.

- Blow lightly into pressure hose to combination valve.

Combination valve must be closed.

- Blow forcibly into pressure hose to combination valve.

Combination valve must open

If combination valve does not open or is continually open:

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Replace combination valve.

Secondary air injection pump motor, checking

Requirements

- Fuse for secondary air injection pump in battery main fuse holder must be OK.
- Secondary air injection pump vacuum lines not blocked or kinked

Work sequence

- Remove engine cover.
- Remove pressure hose in secondary air injection pump motor.
- Activate secondary air injection pump relay via final control diagnosis. Refer to **Adapting components and functions** , Adapting functions and components.

Secondary air injection pump motor must run at intervals and air must exit at outlet union.

If motor runs but no air is pumped out:

- Replace secondary air injection pump motor.

If secondary air injection pump motor does not run at intervals:

- Check activation of secondary air injection pump motor. Refer to **Adapting components and functions** .

Secondary air injection solenoid valve, checking

Engine code AEG

Special tools and equipment

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

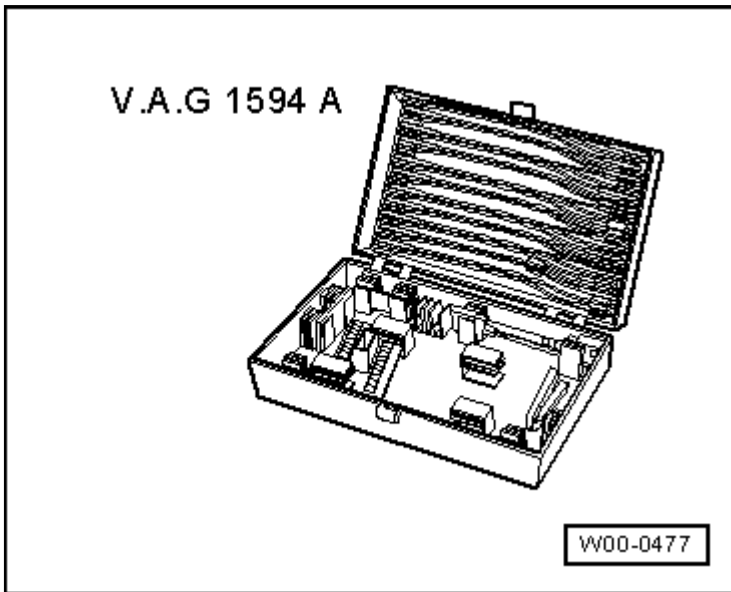


Fig. 381: Identifying V.A.G 1594 A Adapter Set
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- V.A.G 1594 Adapter set

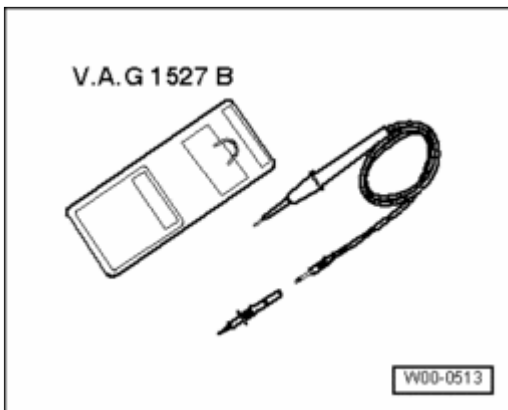


Fig. 382: V.A.G 15927 Diode Test Light
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- V.A.G 15927 Diode test light

Refer to Electrical Wiring Diagrams, Troubleshooting & Component Locations

Requirements

- Coolant temperature 5 ° to 33 ° C
- Secondary air injection pump motor OK

Work sequence

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

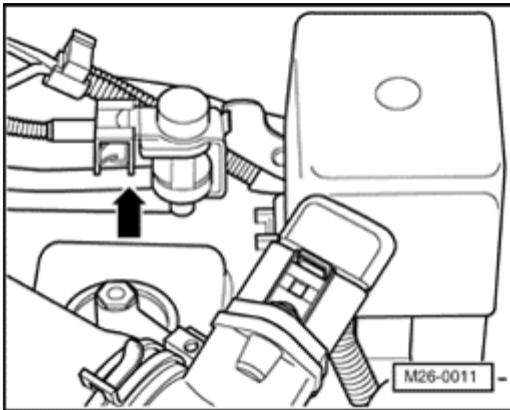


Fig. 383: Secondary Air Injection Solenoid Valve Upper Vacuum Hose
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Pull upper vacuum hose (arrow) off secondary air injection solenoid valve.
- Start engine and run at idling speed.

When secondary air injection pump motor runs a vacuum must be perceptible at secondary air injection solenoid valve union.

If no vacuum is perceptible:

- Switch engine off.

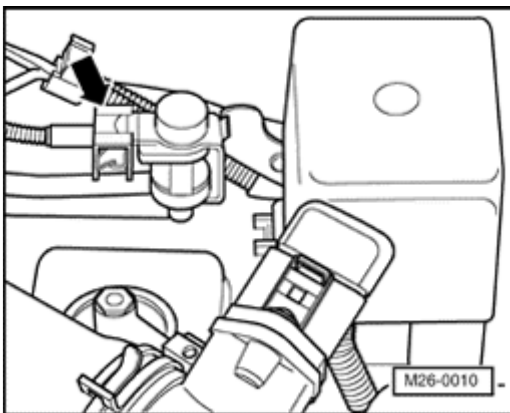


Fig. 384: Secondary Air Injection Solenoid Valve 2-Pin Connector
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect 2-pin connector from secondary air injection solenoid valve (arrow).

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

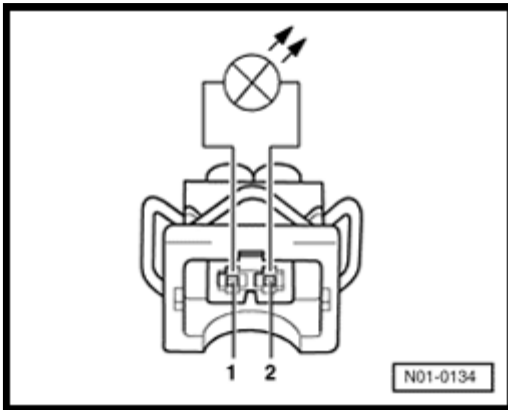


Fig. 385: Connecting Voltage Tester To The Outer Contacts Of Connector
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect voltage tester V.A.G 1527B to the outer contacts of connector with auxiliary cables from V.A.G 1594C.
- Start engine and run at idling speed.

LED must light up

LED lights up (voltage supply OK.):

- Replace secondary air injection solenoid valve.

If LED does not light up:

- Connect 2-pin connector
- Check activation of valve. Refer to **Adapting components and functions** , Adapting functions and components.
- Check wiring:

Refer to Electrical Wiring Diagrams, Troubleshooting & Component Locations

- Read DTC memory. Refer to **Engine control module Diagnostic Trouble Code (DTC) memory, interrogating and erasing**
- Read readiness code: Refer to **Adapting components and functions** , Adapting components and functions.
- Generate readiness code again if DTC memory has been erased or engine control module was disconnected from permanent positive. Refer to **Adapting components and functions** , Adapting components and functions.

28 IGNITION/GLOW PLUG SYSTEM

IGNITION COIL N152, CHECKING

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

The following procedure is used to diagnose Ignition Coil.

Special tools, testers and auxiliary items required

- Multimeter
- Diode test lamp.
- Wiring diagram

Requirements

- The Ignition Coil N152 fuse OK.
- The Fuel Pump (FP) Relay J17 OK.
- The Engine Speed (RPM) Sensor G28 OK.
- The Camshaft Position (CMP) Sensor G40 OK.
- The battery voltage must be at least 12.5 Volts.
- All electrical consumers such as, lights and rear window defroster, switched off.
- Vehicles with automatic transmission, shift selector lever into position "P" or "N".
- A/C switched off.
- Ground (GND) connections between engine/transmission/chassis OK.
- Ignition switched off

Test procedure

- Perform a preliminary check to verify the customers complaint.

Start diagnosis

- Remove the engine cover with air filter.
- Remove the Ignition Coil N152 electrical connector.

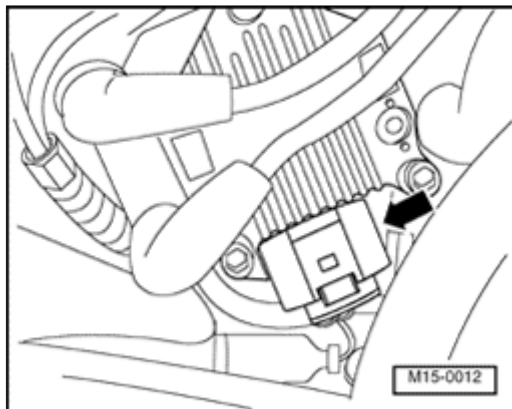


Fig. 386: Identifying Ignition Coil With Final Output Stage Black 6-Pin Connector

Checking voltage supply

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Switch the ignition on.
- Using a Multimeter , check the Ignition Coil electrical harness connector terminals 2 to 4 for voltage.

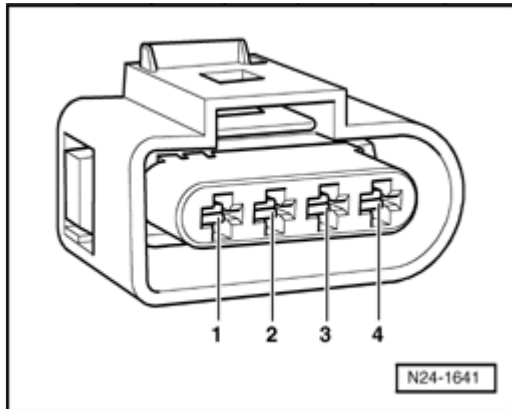


Fig. 387: 4-Pin Electrical Harness Connector & Terminals

Specified value: battery voltage.

- Switch the ignition off.

If the specification was not obtained:

- Check Ignition Coil electrical harness connector terminal 2 to the Fuse (on fuse panel) 29 for an open circuit.

Specified value: 1.5 Ω Max.

If the specified value was not obtained:

- Check the wiring connection for an open circuit, short circuit to Battery (+) or Ground (GND).
- Check the wiring connection for damage, corrosion, loose or broken terminals.
- If necessary, repair the faulty wiring connection.

If the specified values were obtained:

Checking activation

CAUTION: Do not touch the Ignition Coil connecting parts or adapter cables during the following test.

- Disable the power supply to the Fuel Injectors N30, N31, N32, N33, by removing Fuse 29 (on fuse panel B) from the fuse holder SB29, in the E-box, plenum chamber.
- Using a diode test lamp , check the Ignition Coil electrical harness connector terminals 1 to 4 and 3 to 4 for voltage.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

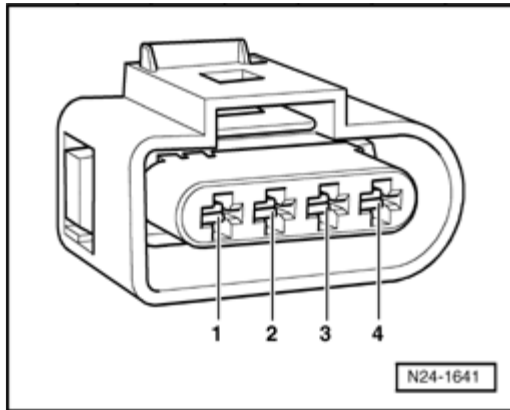


Fig. 388: 4-Pin Electrical Harness Connector & Terminals

- Operate the starter.

The LED should flicker.

- Switch the ignition off.

If the LED flickers and the voltage was OK:

- Replace the faulty Ignition Coil N152 .Refer to Ignition/Glow plug, Rep. Group. 28.

If the LED does not flicker:

Checking wiring

If the manufacturers test box is being used. Perform the following step.

- Install the test box Adapter - 68 Pin VAG1598/18.

If the manufacturers test box is not being used. Perform the following step.

- Remove the Motronic Engine Control Module (ECM) J220
- Using a Multimeter , Check the Ignition Coil electrical harness connector to the Motronic Engine Control Module (ECM) J220 electrical harness connector T80 for an open circuit.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

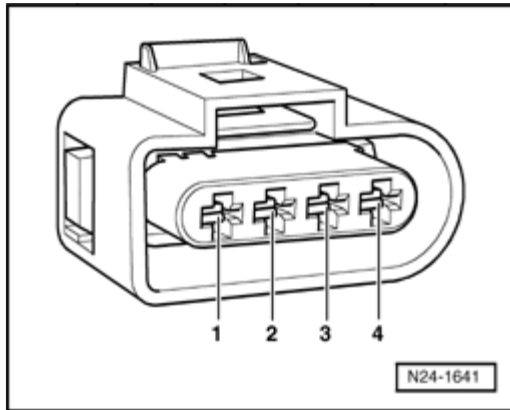


Fig. 389: 4-Pin Electrical Harness Connector & Terminals

Ignition Coil N152 electrical harness connector terminal	Motronic Engine Control Module (ECM) J220 electrical harness connector T80 terminal or test box socket
3	78
1	71

Specified value: 1.5 ohms Max.

If the specification was not obtained:

- Check the wiring for a short circuit to each other, Battery (+), and Ground (GND).
- Check the wiring connection for damage, corrosion, loose or broken terminals.
- If necessary, repair the faulty wiring connection.
- Re-enable the power supply to the Fuel Injectors N30, N31, N32, N33, by reinstalling Fuse 29 (on fuse panel B) from the fuse holder SB29, in the E-box, plenum chamber.
- Re-connect the Ignition Coil N152 electrical harness connector to the Ignition Coil N152.

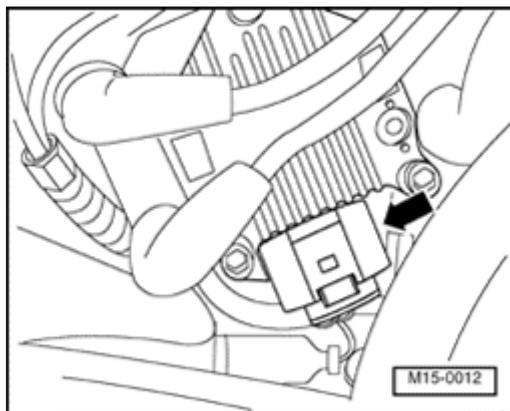


Fig. 390: Identifying Ignition Coil With Final Output Stage Black 6-Pin Connector

- Install the engine cover with air filter.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Erase the DTC memory. Refer to **DIAGNOSTIC MODE 04: RESET/DELETE DIAGNOSTIC DATA**
- Perform a road test to verify repair.

If the DTC does not return:

Repair complete, Generate readiness code. Refer to **READINESS CODE, GENERATING** .

- End diagnosis.

If the DTC does return and no malfunction is detected in the wiring and the voltage supply was OK:

- Replace the Motronic Engine Control Module (ECM) J220.
- Assembly is performed in the reverse of the removal.

Final Procedures

After the repair work, the following work steps must be performed in the following sequence:

1. Check the DTC memory.
2. If necessary, erase the DTC memory.
3. If the DTC memory was erased, generate readiness code.

IGNITION SYSTEM, SERVICING

General notes on ignition system

- Only the components which specifically relate to the ignition system are dealt with here. For the other components of the injection and ignition system. Refer to **Component locations overview**
- For trouble-free operation of the electrical components, a voltage of at least 11.5 V is necessary.
- Disconnecting and connecting the battery must only be done with the ignition switched off, otherwise the engine control module could be damaged.
- During some checks it is possible that the control module will detect and store a fault. Therefore after completing all checks and repairs the Diagnostic Trouble Code (DTC) memory must be interrogated and if necessary erased. Refer to **Engine control module Diagnostic Trouble Code (DTC) memory, interrogating and erasing** .
- If the engine starts, runs for a short period and then stops, after troubleshooting, repairs or component tests, then the cause may be the immobilizer, which is blocking the engine control module. In such cases the control module must be adapted. Refer to **Adapting components and functions** ; Adapting components and functions.

Safety precautions. Refer to **Safety precautions**

Test data, spark plugs. Refer to **Test data, spark plugs**

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Ignition system components, removing and installing

- Engine codes AVH, AZG, BEV. Refer to Engine codes AVH, AZG BEV
- Engine code BBW. Refer to Engine code BBW

Engine code AEG

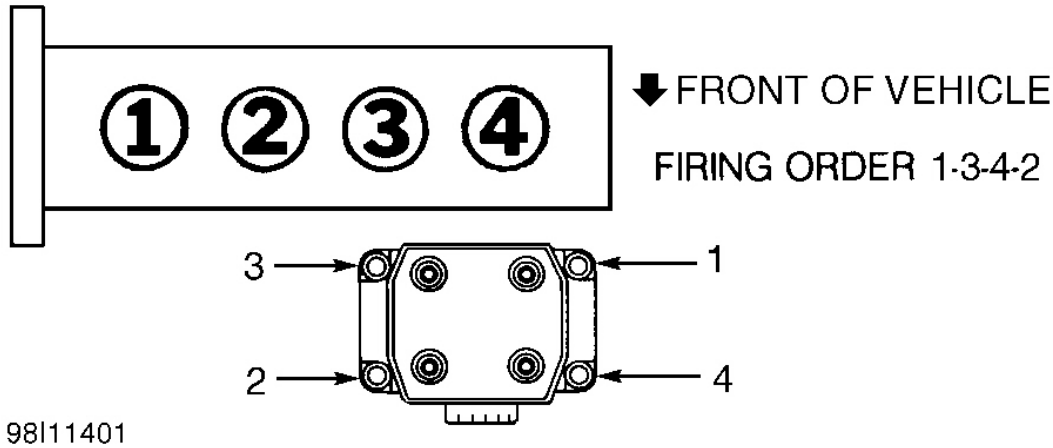


Fig. 391: Firing Order & Cylinder Identification (Engine Code AEG)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

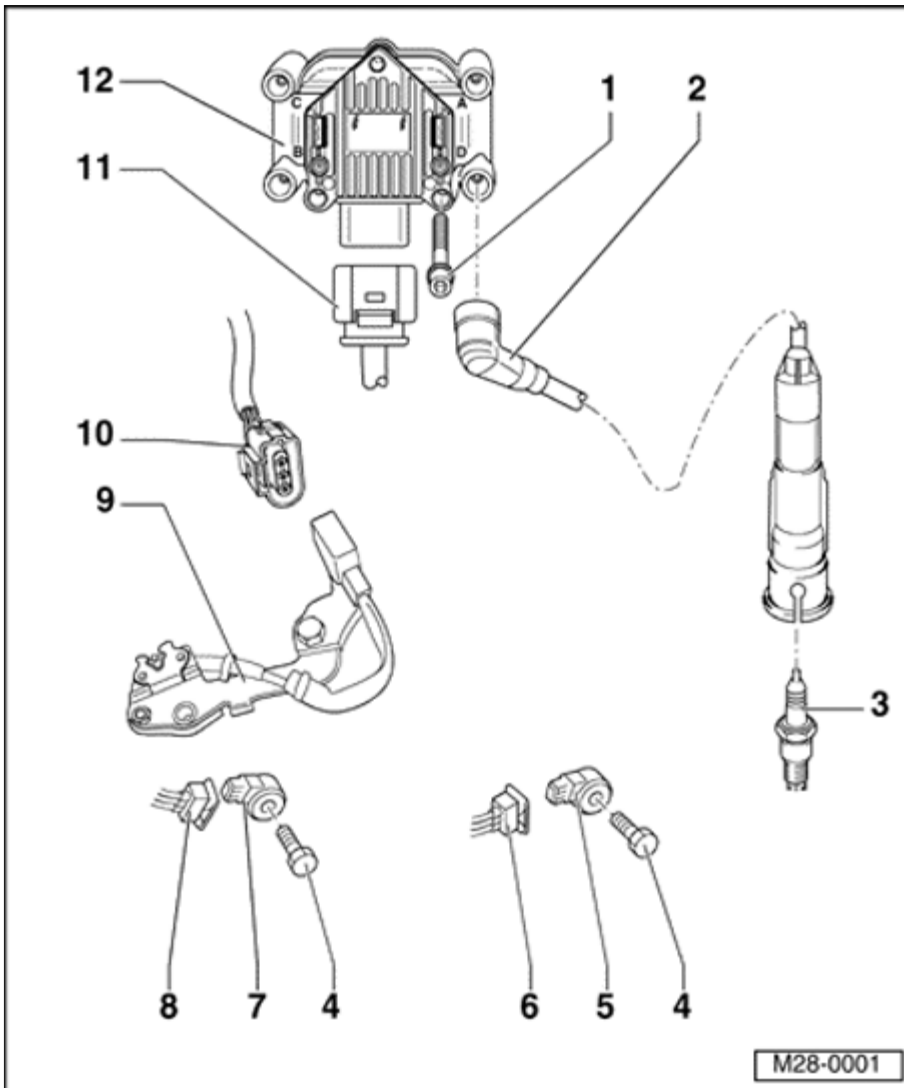


Fig. 392: Ignition System Components (Engine Code AEG)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - 10 Nm

2 - Ignition cable

- 4 to 8 k ohms
- With suppression connector and spark plug connector
- Disconnect spark plug connector with T10112.

3 - Spark plug, 25 Nm

- Remove and install with 3122 B
- Type and electrode gap. Refer to **Test data, spark plugs**

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

4 - 20 Nm

- Tightening torque influences function of knock sensor

5 - Knock Sensor (KS) 2 -G66-

- Gold plated contacts

6 - Connector

- Brown, 2-pin
- For Knock Sensor (KS) 2 -G66-
- Gold plated contacts

7 - Knock Sensor (KS) 1 -G61-

- Gold plated contacts

8 - Connector

- Black, 2-pin
- For Knock Sensor (KS) 1 -G61-
- Gold plated contacts

9 - Camshaft Position (CMP) Sensor -G40-

- Location. Refer to **Engine code AEG** item -29-

10 - Connector

- Black, 3-pin
- For Camshaft Position (CMP) Sensor -G40-

11 - Connector

- Black, 4-pin

12 - Ignition coils (-N-, -N128-)

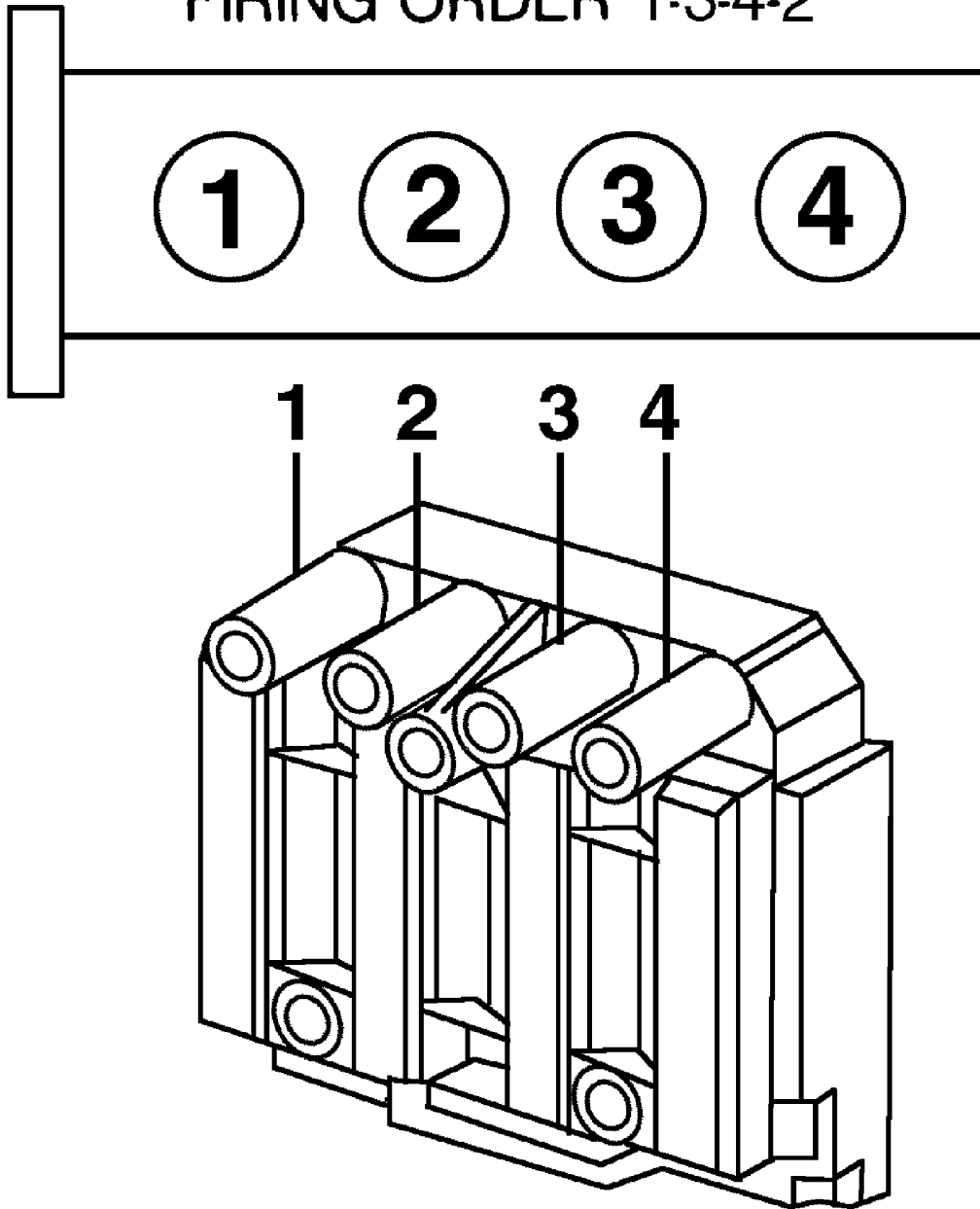
- With ignition cable identification: A = Cylinder 1, B = Cylinder 2, C = Cylinder 3, D = Cylinder 4
- With Power output stage -N122-
- Location. Refer to **Engine code AEG** item -11-

Engine codes AVH, AZG BEV

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

↓ FRONT OF VEHICLE
FIRING ORDER 1-3-4-2



G00078245

Fig. 393: Firing Order & Cylinder Identification (Engine Codes AVH, AZG & BEV)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

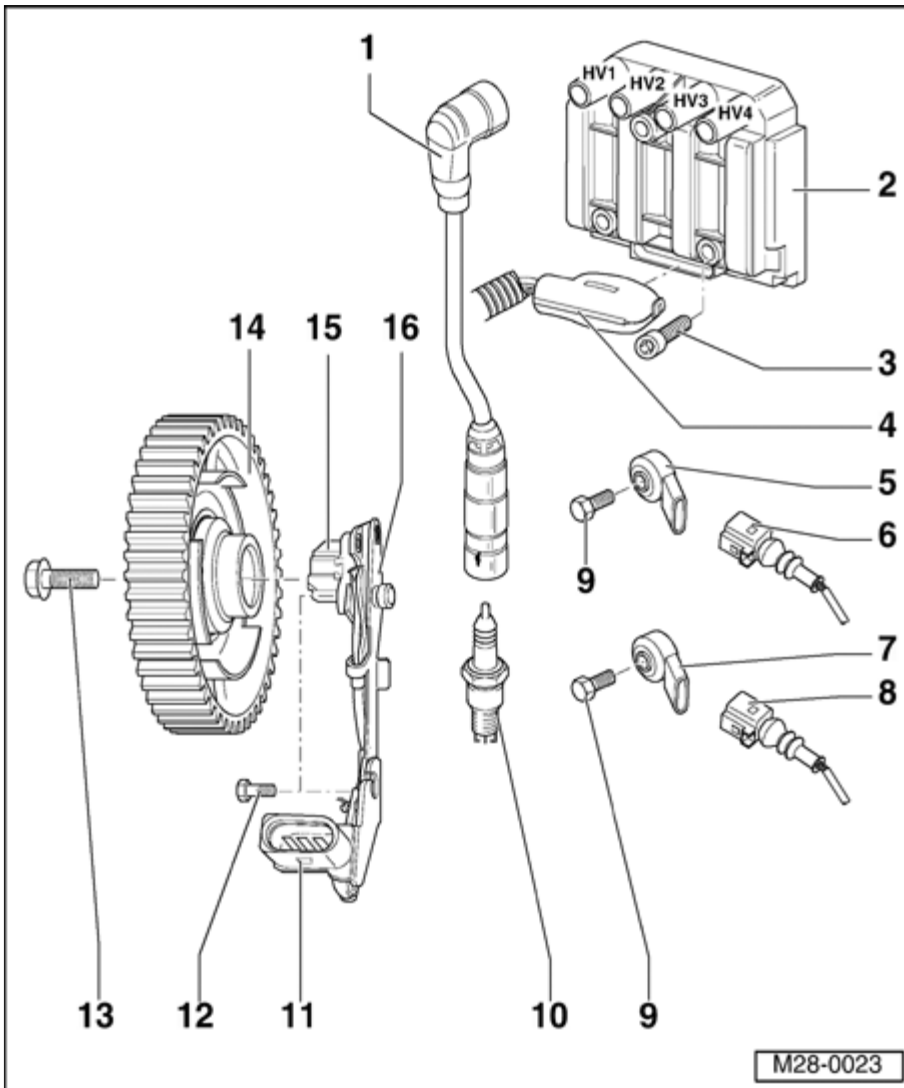


Fig. 394: Ignition System Components (Engine Code AVH, AZG & BEV)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Ignition cable

- 4 to 8 k ohms
- With suppression connector and spark plug connector
- Disconnect spark plug connector with T10112.

2 - Ignition coils with final output stages (-N70-, -N127-, -N291-, -N292-)

- Ignition cable connection:

HV1 = Cylinder 1

HV2 = Cylinder 2

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

HV3 = Cylinder 3

HV4 = Cylinder 4

3 - 10 Nm

4 - Connector

- 6-pin

5 - Knock Sensor (KS) 1 -G61-

- Gold plated contacts
- Location: Cylinder block intake side

6 - 2-pin connector

- For Knock Sensor (KS) 1 -G61-
- Gold plated contacts
- Do not interchange

7 - Knock Sensor (KS) 2 -G66-

- Gold plated contacts
- Location: Cylinder block intake side

8 - 2-pin Connector

- For Knock Sensor (KS) 2 -G66-
- Gold plated contacts
- Do not interchange

9 - 20 Nm

- Tightening torque influences function of knock sensor

10 - Spark plug, 25 Nm

- Type and electrode gap. Refer to **Test data, spark plugs**
- Remove and install with 3122 B

11 - Connector

- Gold plated contacts
- 3-pin

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

12 - 10 Nm

13 - 100 Nm

- Use counterhold 3415 when loosening and tightening.

14 - Camshaft pulley

- With screen for camshaft position sensor.
- Removing and installing. Refer to **Camshaft, removing and installing**

15 - Camshaft Position (CMP) Sensor -G40-

16 - Bracket

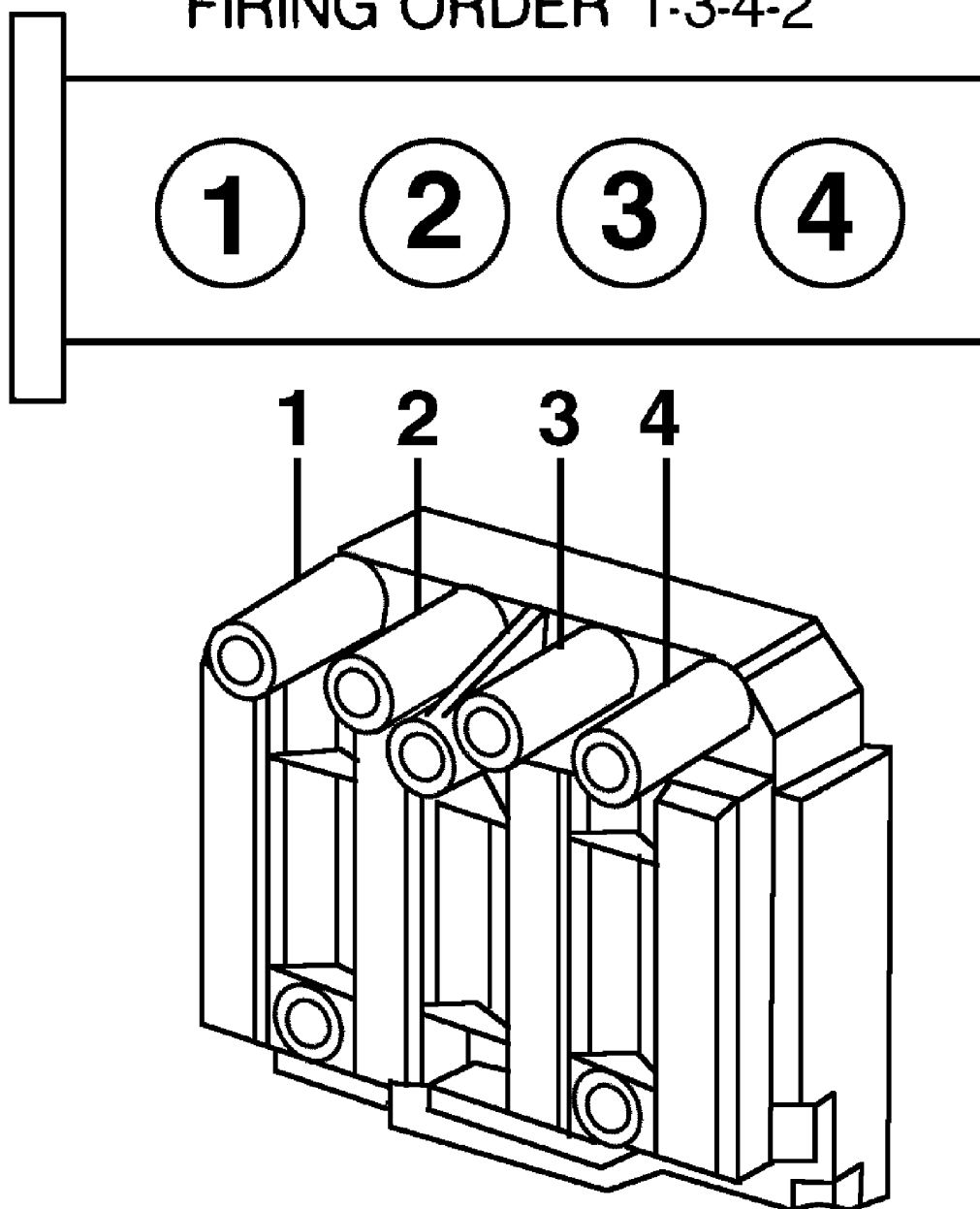
- For Camshaft position sensor.

Engine code BBW

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

↓ FRONT OF VEHICLE
FIRING ORDER 1-3-4-2



G00078245

Fig. 395: Firing Order & Cylinder Identification (Engine Code BBW)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

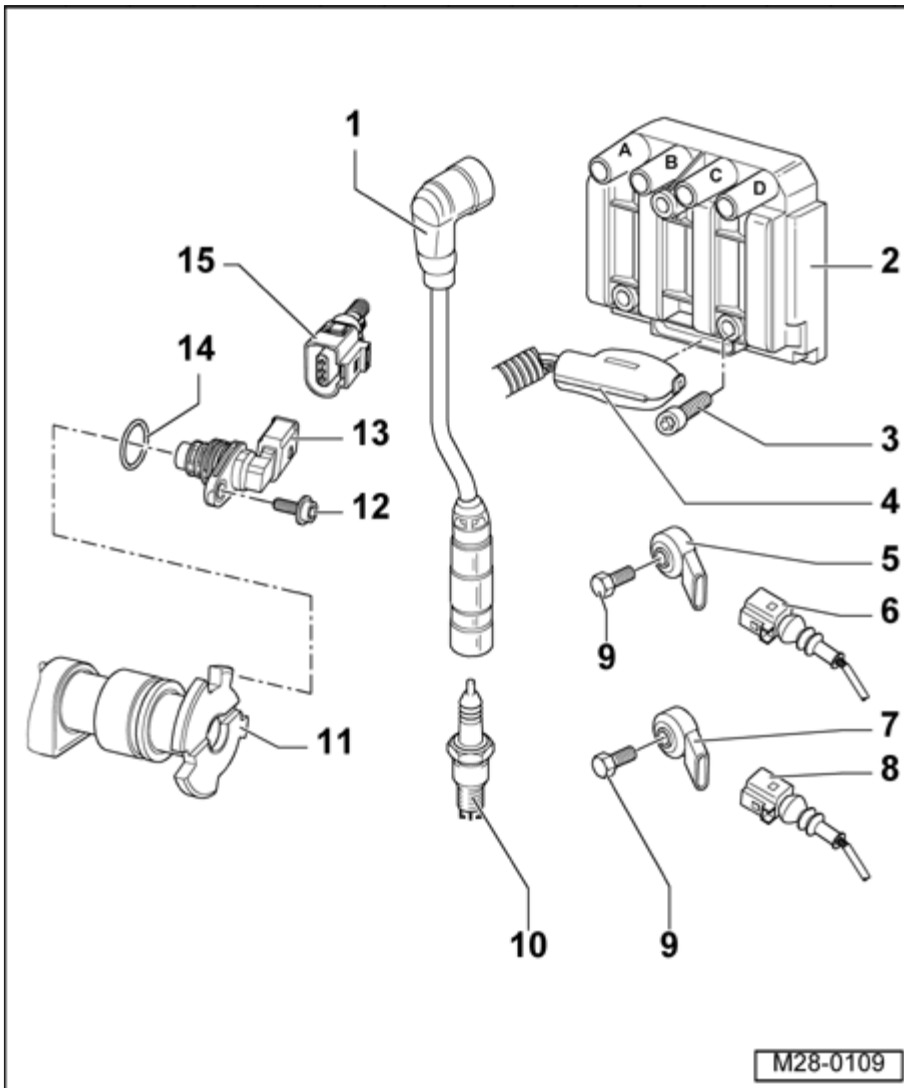


Fig. 396: Ignition System Components (Engine Code BBW)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1 - Ignition cable

- 4 to 8 k ohms
- With suppression connector and spark plug connector
- Check for continuity
- Disconnect spark plug connector with T10112.

2 - Ignition coils with final output stages -N70-, -N127-, -N291-, -N292-

- Marked for ignition cables:

A = Cylinder 1

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

B = Cylinder 2

C = Cylinder 3

D = Cylinder 4

3 - 10 Nm

4 - 6-pin connector

5 - Knock Sensor (KS) 1 -G61-

- Gold plated contacts

6 - 2-pin connector

- For Knock Sensor (KS) 1 -G61-
- Gold plated contacts

7 - Knock Sensor (KS) 2 -G66-

- Gold plated contacts
- Next to ignition transformer

8 - 2-pin connector

- For Knock Sensor (KS) 2 -G66-
- Gold plated contacts

9 - 20 Nm

- Tightening torque influences function of knock sensor

10 - Spark plug, 25 Nm

- Type and electrode gap. Refer to **Test data, spark plugs**
- To remove and install pull off connectors for outer injectors
- Remove and install with 3122 B

11 - Camshaft

12 - 9 Nm

13 - Camshaft Position (CMP) sensor -G40-

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- In cylinder head cover

14 - O-ring

- Always replace

15 - Connector

- Gold plated contacts
- 3-pin

Safety precautions

To prevent injuries to persons and/or damage to the fuel injection and ignition system, observe the following:

CAUTION: When performing repair work, especially due to the confined conditions in the engine compartment, pay attention to the following:

- Route all types of lines (e.g. for fuel, hydraulics, EVAP system, coolant, refrigerant, brake fluid and vacuum) as well as electrical wiring so that the original positions are restored.
- Ensure sufficient clearance to all moving or hot components.
- Do not touch or disconnect ignition wiring when the engine is running or being turned at starter speed.
- The ignition must be switched off before connecting or disconnecting fuel injection or ignition system wiring or tester cables.
- If the engine is to be turned at starter speed without starting:

Engine code AEG

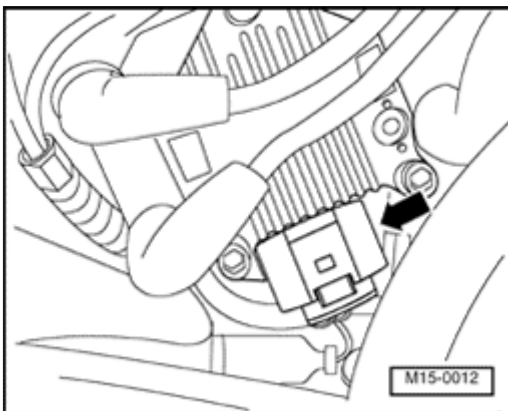


Fig. 397: Identifying Ignition Coil With Final Output Stage Black 6-Pin Connector
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect black 6-pin connector from ignition coil with final output stage (arrow).

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

Engine codes AVH, AZG, BBW, BEV

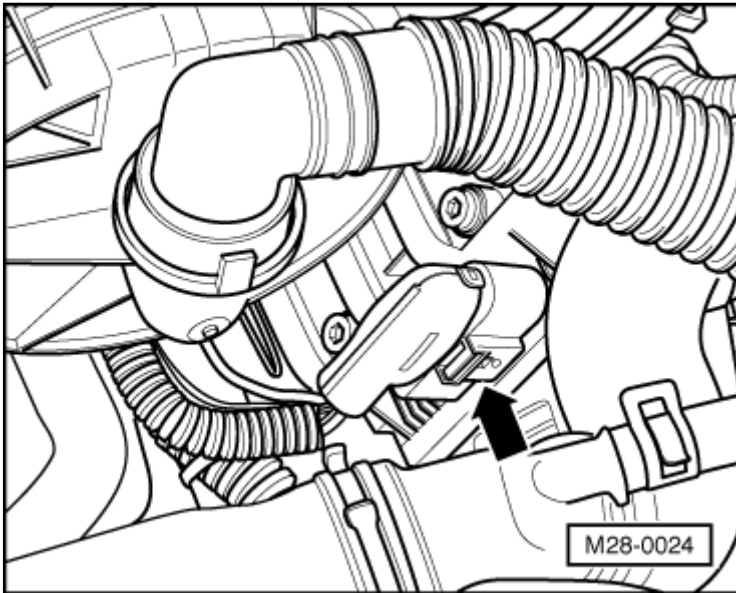


Fig. 398: Identifying Ignition Coil With Final Output Stage Black 6-Pin Connector
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect black 6-pin connector from ignition coil with final output stage (arrow).

Continued for all engines

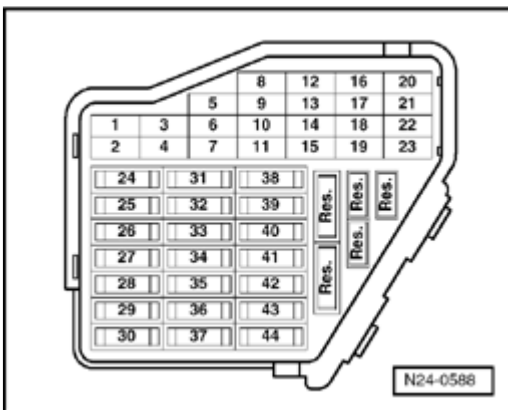


Fig. 399: Identifying Main Fuse Panel
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove fuse 32.

NOTE: Removing fuse 32 interrupts the voltage supply to the injectors.

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

2003 Volkswagen Jetta GL

ENGINE 2.0 Liter 4-Cyl. 2V Engine Mechanical, Fuel Injection & Ignition, Engine Code(s): AEG, AVH, AZG, BBW, BEV - Golf, Jetta & GTI (A4 Platform)

- Test and measuring instruments must be secured to rear seat and operated by an assistant from this location.

If test and measuring instruments are operated from front passenger's 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.

- Erase engine control module Diagnostic Trouble Code (DTC) memory on completion of work, this will remove any DTCs stored in memory caused when removing fuse. Refer to **Engine control module Diagnostic Trouble Code (DTC) memory, interrogating and erasing**.
- Generate readiness code again in "Guided fault finding" after erasing DTC memory. Refer to **Adapting components and functions** Adapting components and functions.

Test data, spark plugs

Engine code		AEG	AVH, AZG, BEV	BBW
Firing order		1-3-4-2	1-3-4-2	1-3-4-2
Spark plugs1)				
	VW	101 000 033 AA	101 000 062 AB	101 000 062 AB
	Manufacturer's designation	BKUR 6 ET-10	PZFR 5D-11	PZFR 5D-11
	Electrode gap	0.9 to 1.1 mm	0.9 to 1.1 mm	0.9 to 1.1 mm
	Specified torque	30 Nm	30 Nm	25 Nm

1) For spark plug change intervals:

Refer to Maintenance Service Circular