Workshop Manual

Fabia II 2007 ➤ , Fabia II 2009 ➤ , Fabia II 2011 ➤ , Rapid NH 2013 ➤ , Roomster 2006 ➤

1.2/44; 47; 51; 55 kW MPI engine									
Engine ID	BME	BZG	CGP A	BBM	CEV A	CHF A	CJLA	CGP B	CGP C

Edition 08.2012

List of Workshop Manual Repair GroupsList of Workshop Manual Repair GroupsList of Workshop Manual Repair Groups

Repair Group

00 - Technical data
01 - Self-diagnosis
10 - Removing and installing engine
13 - Crankshaft group
15 - Cylinder head, valve gear
17 - Lubrication
19 - Cooling
20 - Fuel supply system
24 - Mixture preparation - injection
26 - Exhaust system
28 - Ignition system

Contents

00 – Technical data

1 Technical data

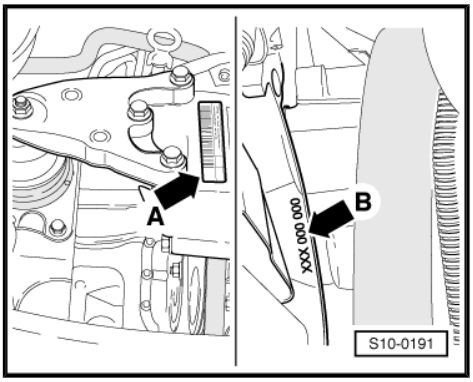
(SRL000515; Edition 08.2012)

Engine number

The engine number (“engine identification characters” and “serial number”) is located in the front left on the cylinder block at the engine/gearbox joint -arrow B-.

In addition, a sticker with “engine identification characters” and “serial number” is affixed to the timing case -arrow A-.

The engine identification characters are also indicated on the vehicle data sticker.



Engine characteristics

Edition 08.2012; version 3.0

Engine identification characters		BBM	BME	BZG	CEVA
Manufactured	Fabia II	12.2006 ▸ 05.2009	------	01.2007 ▸ 05.2009	03.2008 ▸ 07.2009
	Roomster	------	05.2006 ▸ 01.2007	01.2007 ▸.05.2009	------
	Rapid NH	------	------	------	------
Exhaust limit values conforming to		EU-4, EU-2 DDK	EU-4, EU-2 DDK	EU-4, EU-2 DDK	EU-3
Displacement	l	1,198	1,198	1,198	1,198
Power output	kW at rpm	44/5200	47/5400	51/5400	51/5400
Torque	Nm at rpm	108/3000	112/3000	112/3000	108/3000
Bore	∅ mm	76,5	76,5	76,5	76,5
Stroke	mm	86,9	86,9	86,9	86,9
Cylinder / valves per cylinder		3/2	3/4	3/4	3/4
Compression ratio		10,3 : 1	10,5 : 1	10,5 : 1	9,5 : 1
Firing order		1-2-3	1-2-3	1-2-3	1-2-3
Fuel - RON		unleaded 95 [1)]	unleaded 95 [1)]	unleaded 95 [1)]	unleaded 91 [2)]
The injection and ignition system		Simos 9	Simos 9	Simos 9	Simos 9
Lambda control		2 Lambda probes [3)]	2 Lambda probes [3)]	2 Lambda probes [3)]	2 Lambda probes [3)]
Catalytic converter		1 Catalyst	1 Catalyst	1 Catalyst	1 Catalyst
Turbocharging		no	no	no	no
Exhaust gas recirculation		no	no	no	no
Secondary air system		no	no	no	no
Camshaft adjustment		no	no	no	no

[1] at least 91 RON in exceptional cases; although engine output is reduced

[2] at least 87 RON in exceptional cases; although engine output is reduced

[3] Engine version complying with exhaust emission standard EU-2 DDK only with one lambda probe before catalyst

Engine identification characters		CHFA	CGPA	CJLA	CGPB	CGPC
Manufactured	Fabia II	05.2009 ►	05.2009 ►	08.2010 ►	11.2011 ►	------
	Roomster	------	05.2009 ►	------	------	------
	Rapid NH	------	------	------	------	10.2012 ►
Exhaust limit values conforming to		EU-5	EU-5, EU-2 DDK	EU-4, BS-4	EU-5	EU-5
Displacement		1,198	1,198	1,198	1,198	1,198
Power output	kW at rpm	44/5200	51/5400	55/5400	44/5200	55/5400
Torque	Nm at rpm	108/3000	112/3000	110/375	108/3000	112/3750
Bore	∅ mm	76,5	76,5	76,5	76,5	76,5
Stroke	mm	86,9	86,9	86,9	86,9	86,9
Cylinder / valves per cylinder		3/2	3/4	3/4	3/4	3/4
Compression ratio		10,3 : 1	10,5 : 1	10,0 : 1	10,4 : 1	10,5 : 1
Firing order		1-2-3	1-2-3	1-2-3	1-2-3	1-2-3
Fuel - RON		unleaded 95 [1)]	unleaded 95 [1)]	unleaded 91 [2)]	unleaded 95 [1)]	unleaded 95 [1)]
The injection and ignition system		Simos 9 ► 05.2011	Simos 9 ► 05.2011	Simos 9 ► 05.2011	Simos 11	Simos 10
		05.2011 ► Simos 11	05.2011 ► Simos 11	05.2011 ► Simos 11	------	------
Lambda control		2 Lambda probes	2 Lambda probes [3)]	2 Lambda probes	2 Lambda probes	2 Lambda probes
Catalytic converter		1 Catalyst	1 Catalyst	1 Catalyst	1 Catalyst	1 Catalyst
Turbocharging		no	no	no	no	no
Exhaust gas recirculation		no	no	no	no	no
Secondary air system		no	no	no	no	no
Camshaft adjustment		no	no	no	no	no

[1] at least 91 RON in exceptional cases; although engine output is reduced

[2] at least 87 RON in exceptional cases; although engine output is reduced

[3] Engine version complying with exhaust emission standard EU-2 DDK only with one lambda probe before catalyst

01 – Self-diagnosis

1 Self diagnosis, safety measures, cleanliness regulations, directions

1.1 Self-diagnosis

This Rep.-Gr. is deleted.

For this use “Vehicle self-diagnosis”, “Measuring method” and “Fault finding” ⇒ Vehicle diagnostic tester.

1.2 Safety precautions when working on the fuel supply system

WARNING

When undertaking all assembly work, particularly in the engine compartment due to its cramped construction, please observe the following:

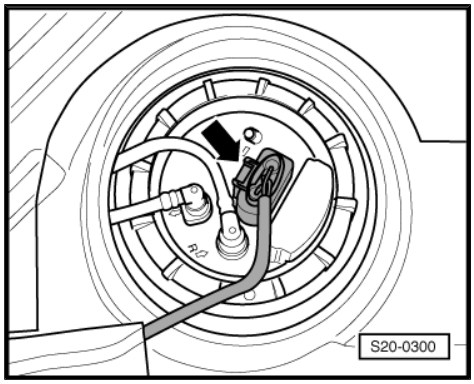
- *Lay lines of all kinds (e.g. for fuel, hydraulic fluid, the active charcoal container-unit, cooling fluid and refrigerant, brake fluid, vacuum) and electrical lines in such a way that the original line guide is re-established.*
- *Ensure that there is adequate free access to all moving or hot components.*

When removing and installing the delivery unit from a full or partly filled fuel tank pay attention to the following:

WARNING

The fuel system is under pressure! Place a clean cleaning cloth around the connection point before detaching hose connections. Reduce pressure by carefully removing the hose.

- The extraction hose of an exhaust extraction system which is switched on, must be positioned close to the assembly opening of the fuel tank in order to extract the released fuel vapours, even before the work is commenced. If no exhaust extraction system is available, a radial fan (motor not in air flow of fan) with a delivery volume of more than 15 m^3/h must be used.
- Avoid skin contact with fuel! Wear fuel-resistant gloves!
- The fuel delivery unit is activated when the ignition is switched on and by the door contact switch of the driver door. Before opening the fuel system and for reasons of safety, if the battery is not disconnected, the connector -arrow- must be disconnected from the fuel delivery unit.



1.3 Rules of cleanliness to observe when working on the fuel supply system

Pay careful attention to the following rules of cleanliness when working on the fuel supply or fuel injection systems:

- Thoroughly clean the connection points and their surroundings before releasing.
- Place removed parts on a clean surface and cover. Do not use fuzzy cloths!
- Carefully cover or seal opened or removed components if the repair is not carried out immediately.
- Only install clean parts. Remove spare parts from their wrapping immediately before fitting. Do not use any parts which have been stored unwrapped (e.g. in tool boxes).
- When the system is opened: Avoid using compressed air. Avoid moving the vehicle.

1.4 Safety measures to apply when working on the fuel injection and ignition system

WARNING

The fuel system is under pressure! Before opening the system lay cleaning cloths around the connection point. Reduce pressure by carefully releasing the connection point.

Observe the following points to prevent injury to persons and/or damage to the injection and ignition system:

- Do not touch or remove ignition leads with the engine running or at start speed.
- Ignition must be switched off before disconnecting and reconnecting the cables of the fuel injection and the ignition system as well as of the test equipment.

If test and measuring devices are required during test drives observe the following:

- Always secure the test and measuring devices on the rear seat and have a second person operate them there.
- If the test and measuring devices are operated from the front passenger seat, the passenger could be injured by the release of the front passenger airbag in the event of an accident.

1.5 General notes on the injection system

Repairing ignition ⇒ Vehicle diagnostic tester.

- The engine control unit is equipped with self-diagnosis. Before repairs and also for fault finding, first of all interrogate the fault memory. Also check the vacuum hoses and connections (unmetered air).
- Fuel hoses in the engine compartment must be secured with spring band clamps. The use of clamp-type or screw-type clips is not allowed.
- A minimum voltage of 11.5 V is required for perfect functioning of the electrical components.
- Do not use sealants containing silicone. Traces of silicone elements drawn in by the engine are not burnt in the engine and damage the lambda probe.

- Certain inspections may cause the control unit to detect and store a fault. It is therefore necessary to interrogate the fault memory after having completed all inspections and repairs, and if necessary delete ⇒ Vehicle diagnostic tester.

Safety measures ⇒ page 7 .

1.6 General notes on the ignition system

- Switch off the ignition before disconnecting and connecting the battery, as this may damage the 4AV control unit.
- The engine control unit and further components are equipped with self-diagnosis; inspect ⇒ Vehicle diagnostic tester.
- A minimum voltage of 11.5 V is required for perfect functioning of the electrical components.
- Certain inspections may cause the control unit to detect and store a fault. It is therefore necessary to interrogate the fault memory after having completed all inspections and repairs, and if necessary delete ⇒ Vehicle diagnostic tester.

Safety measures ⇒ page 7 .

Setting data, spark plugs:

- ⇒ Maintenance ; Booklet Fabia II .
- ⇒ Maintenance ; Booklet Roomster .
- ⇒ Maintenance ; Booklet Rapid NH .

1.7 Additional instructions when undertaking assembly work on the air-conditioning system

WARNING

Do not open the refrigerant circuit of the air conditioning system.

Note

In order to avoid damage to the condenser as well as to the refrigerant lines and hoses, ensure that the lines and hoses are not over-tensioned, kinked or bent.

Steps which should be taken in order to remove and install the engine without opening the refrigerant circuit:

– Remove the holding clamp(s) of the refrigerant lines.
– Remove AC compressor ⇒ Heating, Air Conditioning; Rep. gr. 87 .
– Mount the AC compressor in such a way that the refrigerant lines/hoses are not under tension.

1.8 Safety measures

Caution

The fuel system is under pressure! Place a cloth around the connecting point before releasing hose connections or when opening the system. Then reduce the pressure by carefully removing the hose or cap.

Observe the following points to prevent injury to persons and/or damage to the injection system:

- Do not touch or remove ignition coils with the engine running or at start speed.
- Disconnect and connect wires of the injection system and measuring device wires when the ignition is switched off.
- Do not carry out engine wash unless the ignition is switched off.
- Switch off the ignition before disconnecting and connecting the battery, as this may damage the 4AV control unit.
- If the engine must be operated at start speed without the engine starting:

– Disconnect all 4-pin plug connections from ignition coils with a power output stage -N70- , -N127- , -N291- ⇒ page 169 .

– Disconnect all plug connections of the injectors .

If test and measuring devices are required during test drives observe the following:

- Always secure the test and measuring devices on the rear seat and have a second person operate them there. If the test and measuring devices are operated from the front passenger seat, the passenger could be injured by the release of the front passenger airbag in the event of an accident.

10 – Removing and installing engine

1 Removing and installing engine

Special tools and workshop equipment required

- Workshop crane , e.g. -VAS 6100-
- Catch pan, e.g. -VAS 6208-
- Double ladder , e. g. -VAS 5085-
- Pliers for spring strap clamps
- Engine and gearbox mount -MP1-202-
- Assembly stand -MP9-101-
- Lifting device -MP9-201 (2024 A)-
- Engine/gearbox jack , e.g. -V.A.G 1383 A-
- Engine mount -T30104-
- Grease -G 000 100-
- Hot screw paste -G 052 112 A3-
- Wire
- Adhesive tape

1.1 Removing

Note

- *The engine is removed downwards together with the gearbox.*
- *Pay attention to the correct assignment of the plugs, if necessary mark.*
- *If the battery is disconnected and reconnected, carry out certain additional operations ⇒ Electrical System; Rep. gr. 27 .*
- *Jacking up points for raising the vehicle:*

  ⇒ Maintenance ; Booklet Fabia II .

  ⇒ Maintenance ; Booklet Roomster .

  ⇒ Maintenance ; Booklet Rapid NH .

Caution

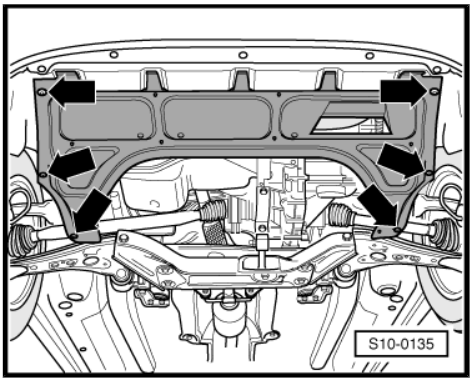
When undertaking all installation work, particularly in the engine compartment due to its cramped construction, please observe the following:

- ***Lay lines of all kinds (e.g. for fuel, hydraulic fluid, cooling fluid and refrigerant, brake fluid, vacuum) and electrical lines in such a way that the original line guide is re-established.***
- ***In order to avoid damage to the cables, ensure that there is adequate free access to all moving or hot components.***

Work procedure

– Disconnect the battery-earth strap with the ignition off.

– Remove noise insulation -arrows-.



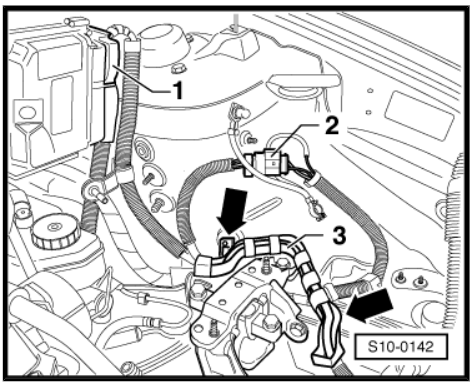
– Unscrew the right and left drive shafts from the gearbox flange ⇒ Chassis; Rep. gr. 40 .
– Raise drive shafts and secure.
– Remove pre-exhaust pipe ⇒ page 159 .
– Drain coolant ⇒ page 90 .

For vehicles Roomster with engine identification characters BME

– Remove engine cover with air filter ⇒ page 149 .

Continued for all vehicles

– Remove battery and battery tray ⇒ Electrical System; Rep. gr. 27 .



– Unplug connector -1- from the engine control unit.
– Separate plug connection -2-.
– Unclip cable clip -3- -arrows-.

Engine is removed together with wiring loom.

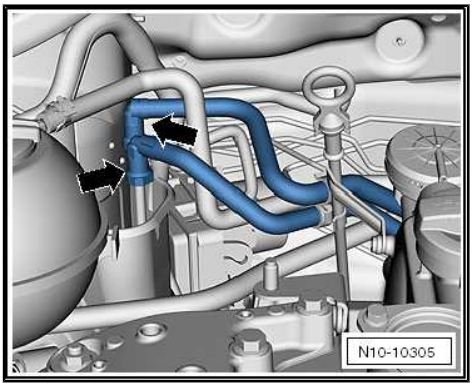
– Disconnect all cables for the engine, gearbox, starter motor and radiator which are will get in the way during removal.
– Remove the vacuum hose from the brake servo unit.

WARNING

The fuel system is under pressure! Before opening the system lay cleaning cloths around the connection point. Reduce pressure by carefully releasing the connection point.

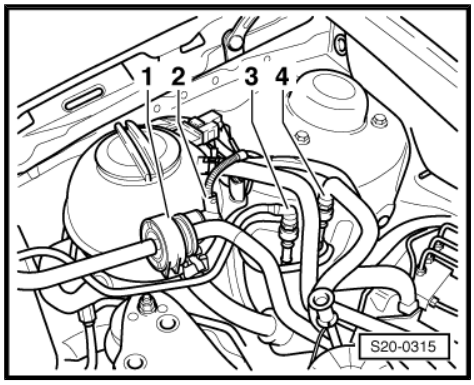
For vehicles Fabia II

– Detach fuel feed line and ventilation line -arrows- by pressing on the release buttons ⇒ page 108 .



For vehicles Roomster, Rapid NH

– Detach fuel feed line -4- and fuel return-flow line -3- by pressing on the release buttons ⇒ page 108 .



– Unplug the plug connection -2- and remove solenoid valve for the activated charcoal filter system -N80- -1-.

Continued for all vehicles

– Remove the bleeder hose of the cooling system from the front coolant pipe.

For vehicles Roomster, Rapid NH

– Remove the coolant hose on the pipe behind the expansion reservoir.

For vehicles Fabia II

– Remove the coolant hoses from the radiator to the coolant regulator housing.

– Pull off coolant hoses from heat exchanger for heating.

– Detach coolant hoses from coolant expansion bottle.

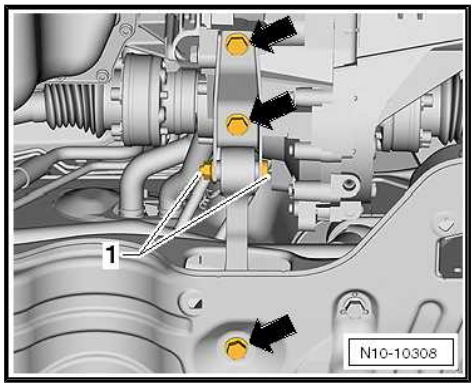
Continued for all vehicles

– Remove Bowden cable support ⇒ Gearbox; Rep. gr. 34 .

– Remove the slave cylinder of the hydraulic clutch ⇒ Gearbox; Rep. gr. 30 .

– Separate the coolant hose from the radiator at the top and bottom of the connection fittings.

– Unbolt the pendulum support -arrows-.



For vehicles with air conditioning

WARNING

Do not open the refrigerant circuit of the air conditioning system.

– Remove V-ribbed belt ⇒ page 18 .

– Remove connector from the AC compressor.

– Remove AC compressor with the refrigerant lines connected ⇒ Heating, Air Conditioning; Rep. gr. 87 .

– Fix the AC compressor firmly to the vehicle, in order to avoid damage when removing the unit from the vehicle.

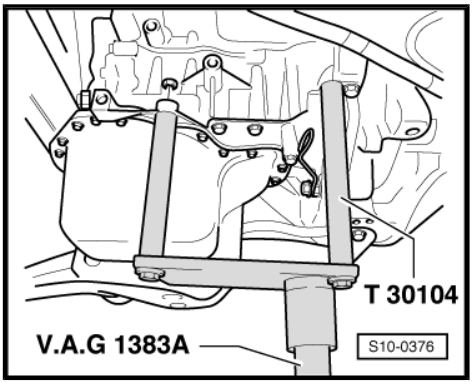
Note

Do not buckle the refrigerant lines.

Continued for all vehicles

– Insert engine mount -T30104- into the unit jack, e.g. -V.A.G 1383/A- -V.A.G 1383/A- .

– Fix engine mount -T30104- to the cylinder block using fixing nuts and bolts M8 with a tightening torque of 30 Nm.



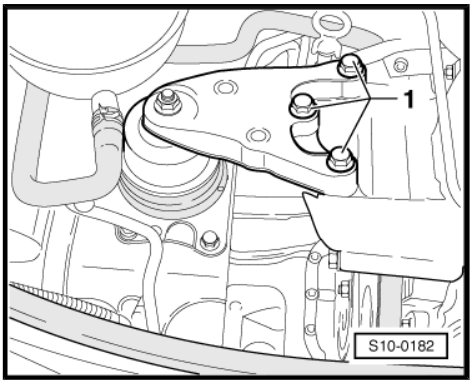
Note

- *Check whether all hose and line connections between engine, gearbox and body are released, if necessary release them.*
- *Use the double ladder for removing the fixing bolts.*

– Slightly raise the engine and gearbox with the unit jack, e.g. -V.A.G 1383/A- -V.A.G 1383/A- .

For vehicles with assembly bracket version 1

– Release screws -1- from the engine mount.

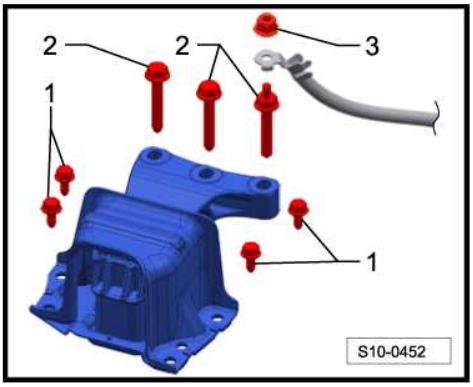


For vehicles with assembly bracket version 2

– Unscrew nut -3- and disconnect earth lead from engine mount.

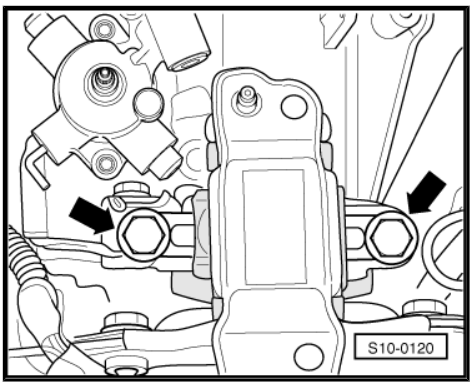
– Unscrew bolts -2-.

Continued for all vehicles



– Unscrew the screws -arrows- from the gearbox mount.

– Lower the engine with gearbox.



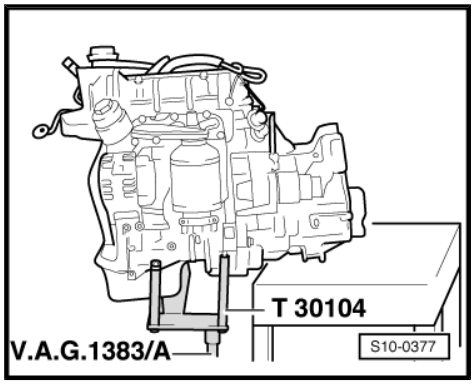
Note

When lowering the engine with the gearbox proceed with great care. There must always be enough space in the surrounding area.

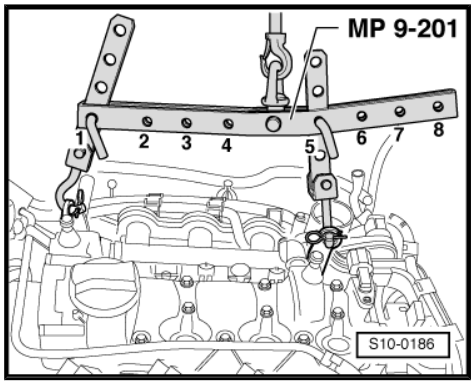
Securing the engine to the assembly stand

To perform the assembly work the engine must be secured to the assembly stand -MP9-101- .

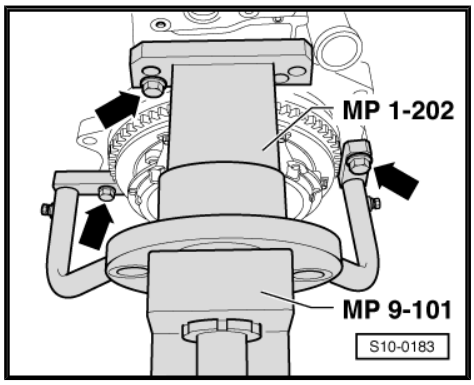
– Guide engine and gearbox using the unit jack onto a work bench, in such a way that the gearbox is positioned on the support.
– Unscrew the engine/gearbox connecting screws and separate the gearbox from the engine.



Attach the lifting device -MP9-201 (2024 A)- as shown in the illustration and raise from the unit jack using the workshop crane.



Secure the engine with engine and gearbox mount -MP1-202- (using 3 screws -arrows-) on the assembly stand -MP9-101- when carrying out assembly work.



1.2 Install

Note

- *Always replace the seals and gaskets during assembly work.*
- *Replace self-locking nuts.*
- *Tightening torques* ⇒ page 15 .
- *Assembly bracket* ⇒ page 16 .

Work procedure

Installation is performed in the reverse order, pay attention to the following points:

– Check whether the 2 dowel sleeves for centering the gearbox are present in the cylinder block, insert if necessary.
– If necessary check the centering of the clutch disc.
– Inspect clutch release bearing for wear, replace if necessary.
– Grease the drive shaft serration with grease -G 000 100- .

– When installing the engine/gearbox unit, ensure adequate clearance to other components.
– Align the engine and gearbox so that they are tension-free.
– Install the slave cylinder of the hydraulic clutch ⇒ Gearbox; Rep. gr. 30 .
– Adjust the gearshift mechanism and the shift cables ⇒ Gearbox; Rep. gr. 34 .

For vehicles with air conditioning

– Install AC compressor ⇒ Heating, Air Conditioning; Rep. gr. 87 .
– Install the V-ribbed belt ⇒ page 18 .

Continued for all vehicles

– Install the drive shaft on the right and left of the gearbox ⇒ Running gear; Rep. gr. 40 .
– Install the front exhaust pipe and the exhaust system so that they are not under tension ⇒ page 159 .
– Electrical connections and proper routing ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
– Install coolant hose ⇒ page 81 .

Note

The drained off coolant must only be then re-used if the cylinder block, cylinder head, radiator or heat exchanger were not replaced.

– Top up coolant ⇒ page 90 .
– Check oil level before starting the engine.
– Adapt the engine control unit to the throttle valve control unit -J338- ⇒ Vehicle diagnostic tester.

1.3 Tightening torques

Note

- *Tightening torques apply only for lightly greased, oiled, phosphatized or blackened nuts and screws.*
- *Other lubricants such as engine and gearbox oil are allowed. Under no circumstances use Molykote.*
- *Do not use degreased parts.*
- *Unless otherwise indicated the following tightening torques apply:*

Component		Nm
Screws and nuts	M6	9
	M7	15
	M8	23
	M10	40
	M12	60
deviations:		

Component		Nm
Engine mounting, gearbox mount, pendulum support		⇒ page 16
Engine/gearbox connecting screws	M10	45

1.4 Assembly bracket

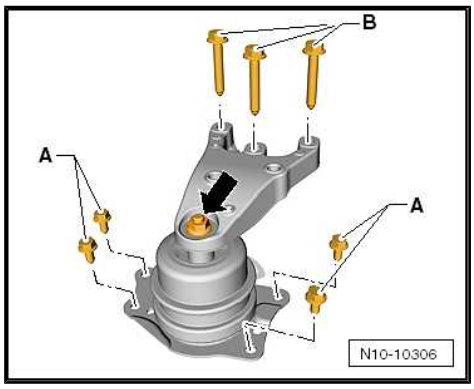
Tightening torques

Assembly bracket - engine, version 1

> **Caution**
>
> *Do not slacken the fixing nut -arrow-, the unit mounting for the engine cannot be disassembled.*

A - 20 Nm + torque a further 90° (1/4 turn) - replace

B - 30 Nm + torque a further 90° (1/4 turn) - replace

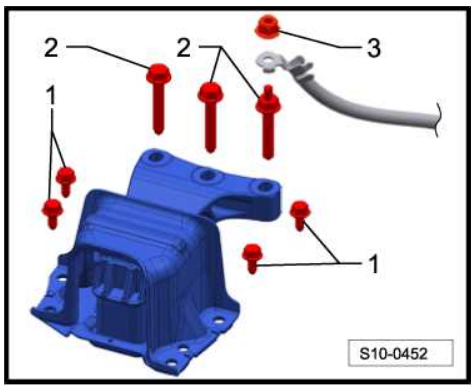


Assembly bracket - engine, version 2

1 - 20 Nm + torque a further 90° (1/4 turn) - replace

2 - 30 Nm + torque a further 90° (1/4 turn) - replace

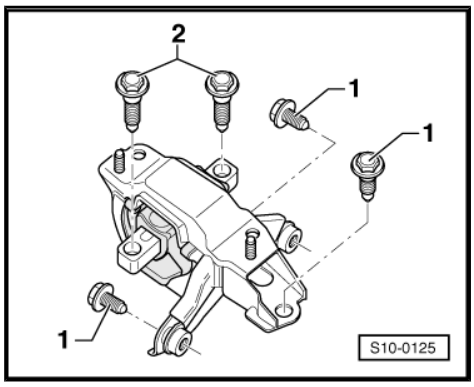
3 - 16 Nm



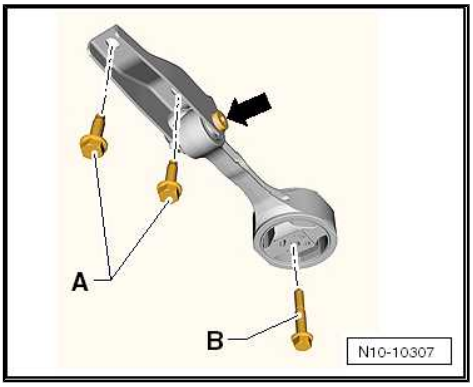
Unit mounting for gearbox

1 - 50 Nm + torque a further 90° (1/4 turn) - replace

2 - 40 Nm + torque a further 90° (1/4 turn) - replace



Pendulum support



Note

- *Position the screws -A- in the elongated holes of the pendulum support in such a way that there is maximum distance between the gearbox and the assembly carrier.*
- *The screwed connection -arrow- must not be loosened.*

A - 30 Nm + torque a further 90° ($^1/_4$ turn) - replace

B - 40 Nm + torque a further 90° ($^1/_4$ turn) - replace

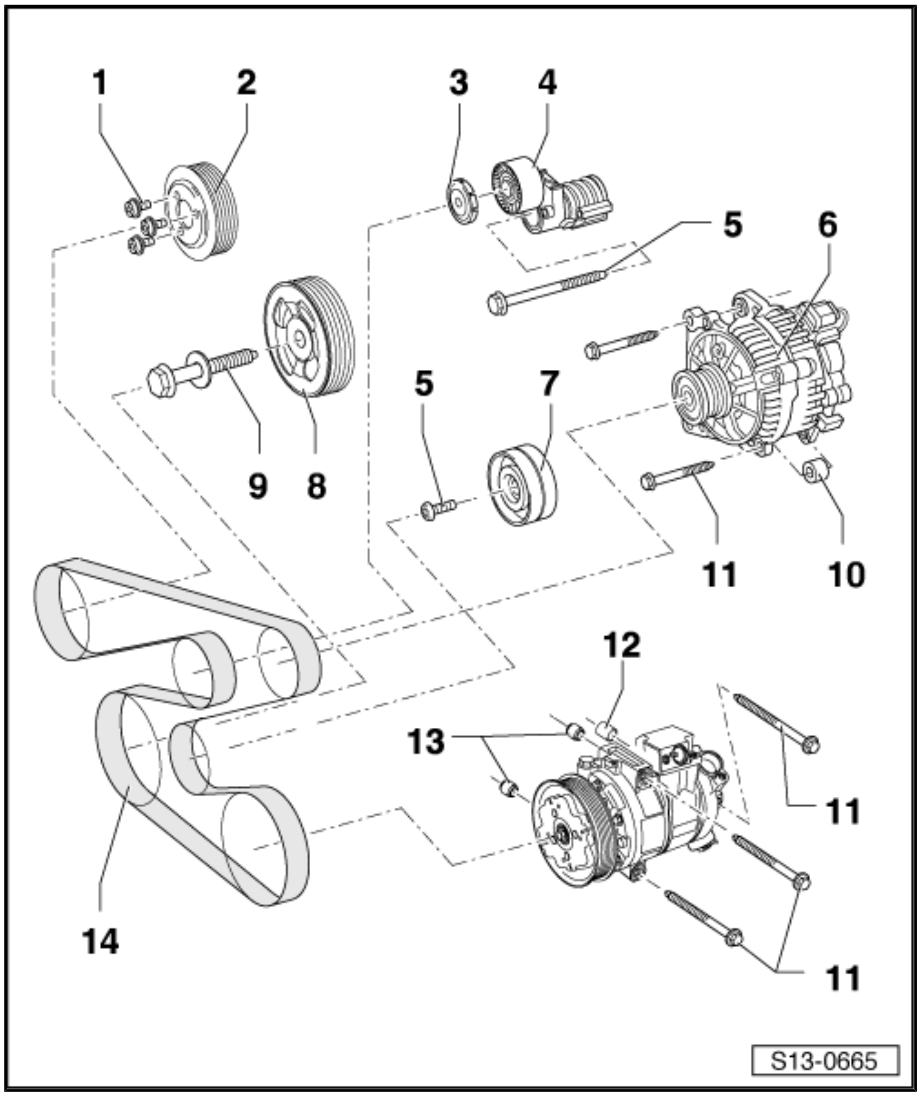
13 – Crankshaft group

1 Removing and installing V-ribbed belt

1.1 Summary of components - Vehicles with air conditioning

Note

- *Mark the rotation direction before removing the V-ribbed belt. Reversing the rotation direction of an already used belt may destroy it.*
- *Pay attention to the correct position of the V-ribbed belt in the belt pulley when installing it.*
- *Vehicles without an air-conditioning system do not have an air-conditioning compressor or guide pulley.*



1 - 22 Nm

2 - Belt pulley
- ❑ on the coolant pump

3 - Trim

4 - Tensioner with tensioning pulley
- ❑ do not remove the tensioning pulley.

5 - 40 Nm
- ❑ Component part of the guide pulley

6 - Generator
- ❑ to facilitate positioning of the generator on the cylinder block, drive the threaded bushings of the screws slightly backwards

7 - Guide pulley

8 - Belt pulley
- ❑ at the crankshaft

9 - 150 Nm + torque a further 180° (1/2 turn)
- ❑ replace
- ❑ interlock the crankshaft with fixing bolt -T10121- for loosening and tightening it up ⇒ page 33

10 - Spacer sleeve
- ❑ for generator

11 - 23 Nm

12 - Spacer sleeve
- ❑ for the AC compressor

13 - Dowel sleeves for AC compressor
- ❑ must be inserted in the cylinder block

14 - V-ribbed belt

❑ Routing of the ribbed V-belt:

- ♦ vehicles without air conditioning ⇒ page 20
- ♦ Vehicles with air conditioning ⇒ page 20

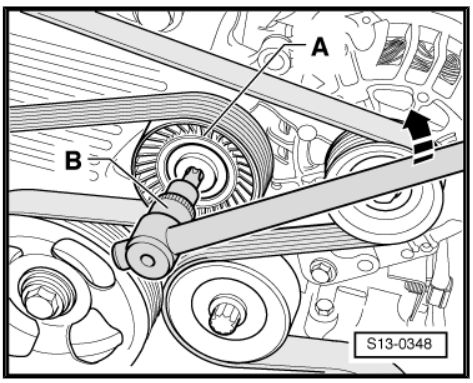
❑ removing and installing ⇒ page 18

Removing

– Mark the rotation direction of the V-ribbed belt.

– Lever off the cover for the tensioning roller -A-.

– Swing out the tensioning roller -A- with Torx key 50 -B- in the direction of travel up to the stop and remove the V-ribbed belt.



Note

The tensioning roller can be interlocked by inserting a rig pin.

Install

Note

- ♦ *Before fitting the V-ribbed belt make sure that all assemblies (generator, coolant pump and AC compressor) are securely mounted.*
- ♦ *Check smooth operation of belt pulley, tensioning and guide pulley.*
- ♦ *Pay attention to the rotation direction of the already used V-ribbed belt.*
- ♦ *Inspect the V-ribbed belt:*

⇒ Maintenance ; Booklet Fabia II .

⇒ Maintenance ; Booklet Roomster .

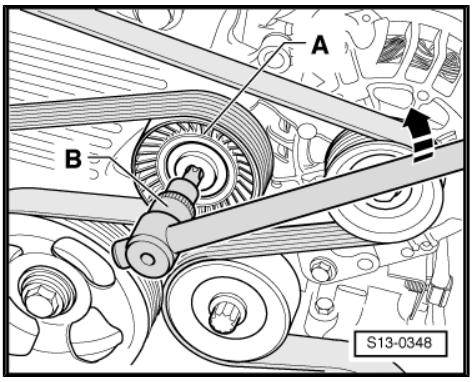
⇒ Maintenance ; Booklet Rapid NH .

– Position the V-ribbed belt on the belt pulleys and guide pulley.

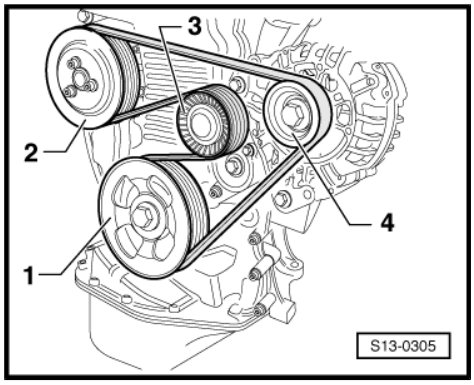
– Swing out the tensioning roller -A- with Torx key 50 -B- in the direction of travel up to the stop and lay the V-ribbed belt in place.

– Press on the cover of the tensioning roller -A-.

– Start engine and check belt run.

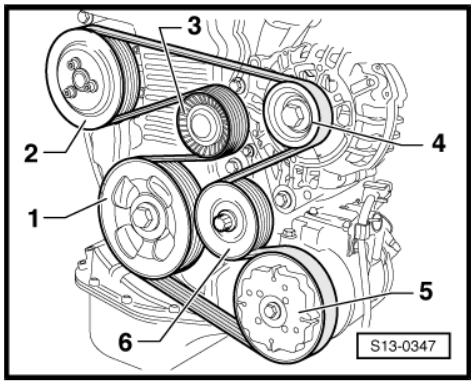


V-ribbed belt run - without an air conditioning system



1 - Belt pulley - crankshaft
2 - Belt pulley - coolant pump
3 - Tensioning pulley
4 - Belt pulley - AC generator

V-ribbed belt run - with an air conditioning system



1 - Belt pulley - crankshaft
2 - Belt pulley - coolant pump
3 - Tensioning pulley
4 - Belt pulley - AC generator
5 - Belt pulley - AC compressor
6 - Guide pulley

2 Disassembling and assembling engine

2.1 Valve control drive - summary of components

2.1.1 For engines with identification characters BBM, CHFA

Fabia II

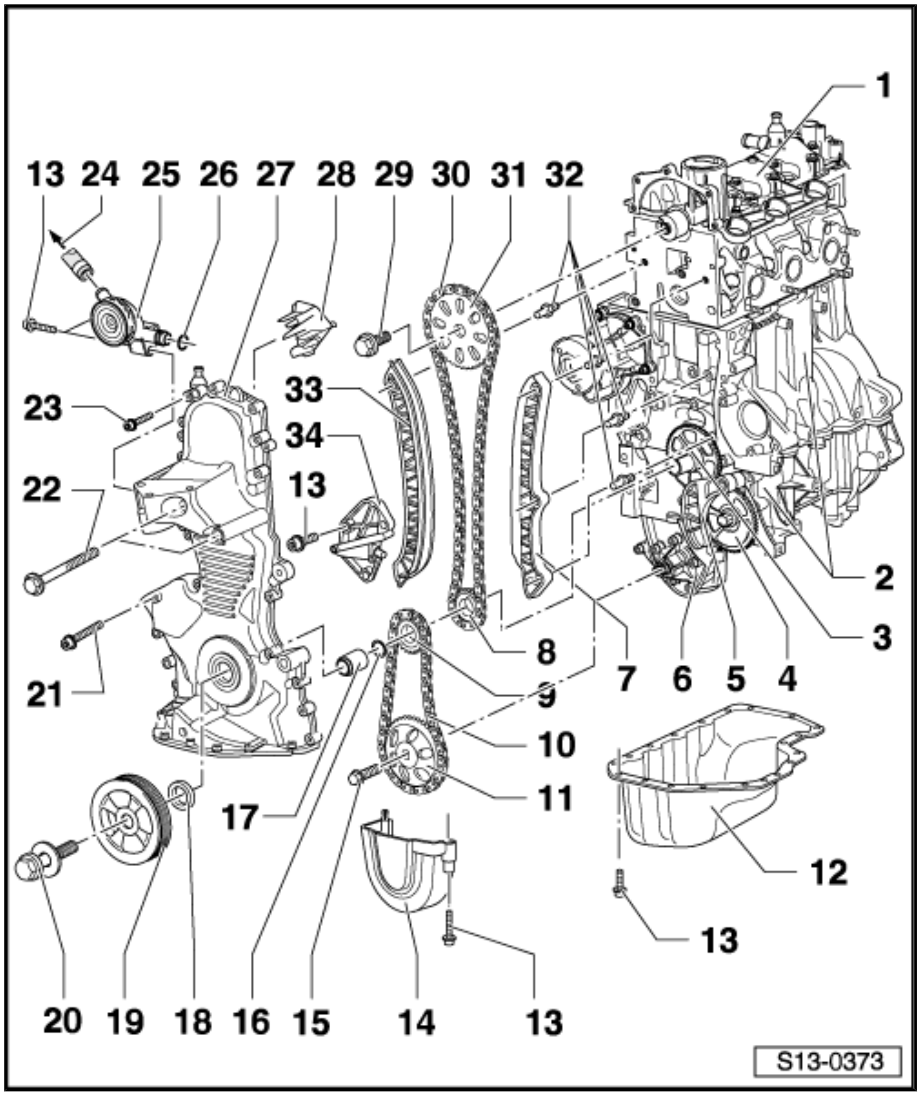
WARNING

Top and bottom part of cylinder block must not be disassembled.

The crankshaft must not be removed. Merely releasing the crankshaft bearing cover screws will result in deformations of the bearing seats of the cylinder block. These deformations reduce the bearing clearance. Even if the bearing shells were not replaced, the changed bearing clearance may cause damage to the bearing.

If the bearing cover screws have been released, replace the complete cylinder block together with the crankshaft.

It is not possible to measure the crankshaft bearing clearance under workshop conditions.



1 - Cylinder head with cover

- ❑ removing and installing ⇒ page 43

2 - Cylinder block

- ❑ 2 part
- ❑ do not separate

3 - Crankshaft gear

- ❑ for balancing shaft draft
- ❑ Wheel position for balancing shaft gear ⇒ page 24

4 - Balancing shaft gear

- ❑ do not remove
- ❑ Wheel position for crankshaft gear ⇒ page 24

5 - Chain tensioner for the oil pump

6 - Oil pump

- ❑ removing and installing ⇒ page 77

7 - Guide rail

8 - Chain sprocket on the crankshaft for the camshaft drive

- ❑ interlocked with spring on the crankshaft

9 - Chain sprocket on the crankshaft for the oil pump drive

- ❑ not interlocked on the crankshaft

10 - Oil pump chain

11 - Oil pump sprocket

12 - Oil pan

- ❑ removing and installing ⇒ page 76

13 - 9 Nm

14 - Cover

- ❑ for chain sprocket of the oil pump

15 - 20 Nm + torque a further 90° (1/4 turn)

- ❑ replace

16 - O-ring

- ❑ replace if damaged

17 - Housing

- ❑ replace together with O-ring (Pos. 16)
- ❑ fit onto cleaned crankshaft
- ❑ install only after putting the timing case in place, otherwise the gasket ring can be damaged

18 - Sealing ring

- ❑ replace if damaged ⇒ page 41
- ❑ replace together with housing (Pos. 17)

- ❑ for crankshaft on the belt pulley side
- ❑ Neither grease nor oil sealing lip of gasket ring
- ❑ before installing remove grease residue on the housing with a clean cloth

19 - Crankshaft-belt pulley

20 - 150 Nm + torque a further 180° (1/2 turn)

- ❑ replace
- ❑ interlock the crankshaft with fixing bolt -T10121- for removing and installing ⇒ page 33

21 - 25 Nm

22 - 45 Nm

23 - 10 Nm

- ❑ if no blue sealing compound is left in the thread of the M6 screws, replace the screws for ones which have sealant on them

24 - To intake manifold

- ❑ Overview of intake manifold ⇒ page 146

25 - The vacuum regulating valve (PCV valve)

- ❑ Pay attention to the part number

26 - O-ring

- ❑ replace if damaged

27 - Timing case

- ❑ removing and installing ⇒ page 27

28 - Oil separator

- ❑ clipped in the steering wheel housing

29 - 20 Nm + torque a further 90° (1/4 turn)

- ❑ replace
- ❑ interlock the camshaft with fixing bolt -T10120- for removing and installing ⇒ page 35

30 - Timing chain

- ❑ tensioning ⇒ page 26

31 - Camshaft sprocket

- ❑ not interlocked on the camshaft but simply fitted onto it
- ❑ removing and installing, setting the timing ⇒ page 35

32 - Bolt, 18 Nm

- ❑ for tensioning rail or possibly also guide rail

33 - Tensioning rail

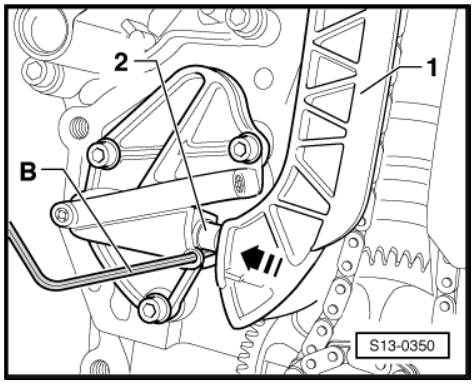
- ❑ interlock tensioner ⇒ page 24

34 - Hydraulic control chain tensioner

- ❑ tension (loosen control chain) ⇒ page 24

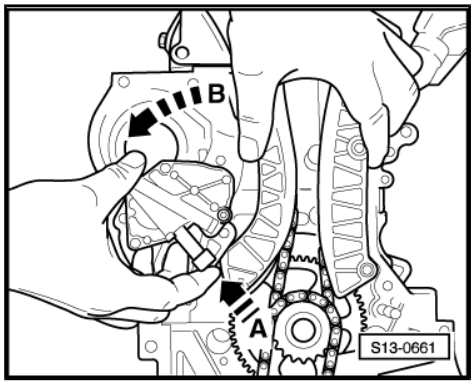
Interlock tensioner

– Press on the piston of the hydraulic tensioner -2- in the -direction of arrow- via the tensioning rail -1- until the piston can be interlocked with the safety drift -B- (e.g. with 3 mm hexagon socket wrench) or with locking pin -T40011- .



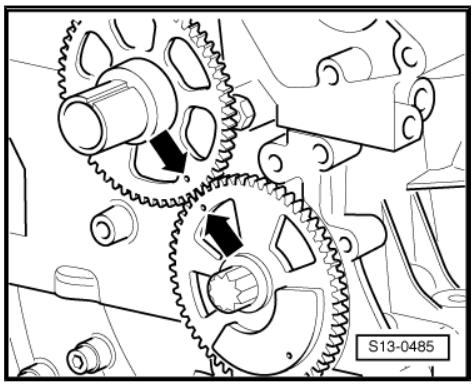
Install tensioner with rubber stop.

– Fix the hydraulic tensioner to the upper right screw when re-installing, press the piston with the finger in the direction of arrow -A- and insert the tensioner housing behind the tensioning rail by turning in the direction of arrow -B-.



Set the point of installation of the crankshaft gear

– Position the marking at the crankshaft gear opposite the marking at the balancing shaft gear -arrows-.



2.1.2 For engines with identification characters BZG, CGPA, CEVA, CJLA, BME, CGPB, CGPC

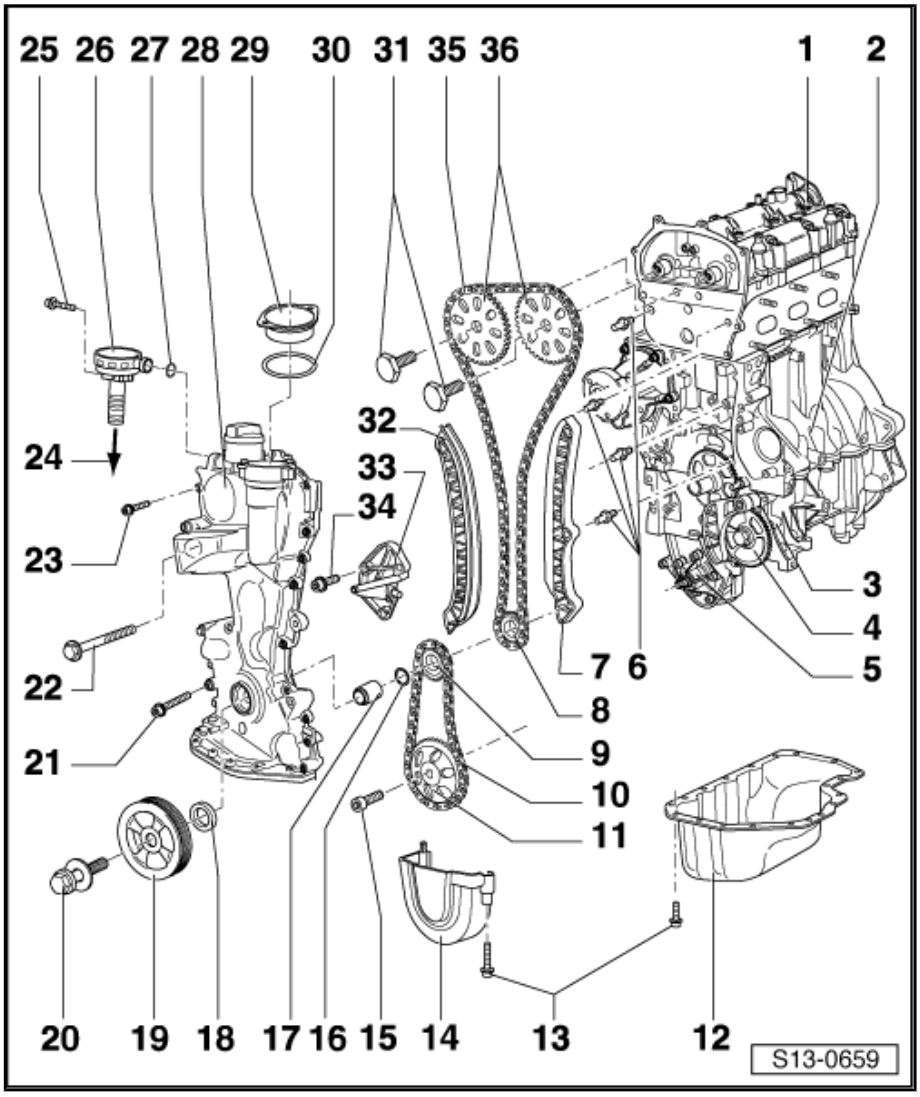
WARNING

Top and bottom part of cylinder block must not be disassembled.

The crankshaft must not be removed. Merely releasing the crankshaft bearing cover screws will result in deformations of the bearing seats of the cylinder block. These deformations reduce the bearing clearance. Even if the bearing shells were not replaced, the changed bearing clearance may cause damage to the bearing.

If the bearing cover screws have been released, replace the complete cylinder block together with the crankshaft.

It is not possible to measure the crankshaft bearing clearance under workshop conditions.



1 - Cylinder head with cover

- ❑ removing and installing ⇒ page 43

2 - Cylinder block

- ❑ 2 part
- ❑ do not separate

3 - Balancing shaft

4 - Balancing shaft gear

- ❑ do not remove
- ❑ Wheel position for crankshaft gear ⇒ page 27

5 - Oil pump

- ❑ removing and installing ⇒ page 77

6 - Bolt, 18 Nm

- ❑ for tensioning rail or possibly also guide rail

7 - Guide rail

8 - Chain sprocket on the crankshaft for the camshaft drive

- ❑ interlocked with spring on the crankshaft

9 - Chain sprocket on the crankshaft for the oil pump drive

- ❑ not interlocked on the crankshaft

10 - Oil pump chain

11 - Oil pump sprocket

12 - Oil pan

- ❑ removing and installing ⇒ page 76

13 - 9 Nm

14 - Cover

- ❑ for chain sprocket of the oil pump

15 - 20 Nm + torque a further 90° (1/4 turn)

- ❑ replace

16 - O-ring

- ❑ replace if damaged

17 - Housing

- ❑ replace together with O-ring (Pos. 16)
- ❑ fit onto cleaned crankshaft
- ❑ install only after putting the timing case in place, otherwise the gasket ring can be damaged

18 - Sealing ring

- ❑ replace if damaged ⇒ page 41
- ❑ replace together with housing (Pos. 17)
- ❑ for crankshaft on the belt pulley side
- ❑ Neither grease nor oil sealing lip of gasket ring

- ❑ before installing remove grease residue on the housing with a clean cloth

19 - Crankshaft-belt pulley

20 - 150 Nm + torque a further 180° (1/2 turn)

- ❑ replace
- ❑ interlock the crankshaft with fixing bolt -T10121- for removing and installing ⇒ page 33

21 - 25 Nm

22 - 50 Nm

23 - 8 Nm + torque a further 90° (1/4 turn)

- ❑ if no blue sealing compound is left in the thread of the M6 screws, replace the screws for ones which have sealant on them

24 - To intake manifold

- ❑ Overview of intake manifold ⇒ page 147

25 - 10 Nm

26 - The vacuum regulating valve (PCV valve)

- ❑ Pay attention to the part number

27 - O-ring

- ❑ replace if damaged

28 - Timing case

- ❑ removing and installing ⇒ page 27

29 - Cover

30 - O-ring

- ❑ replace if damaged

31 - 50 Nm + torque a further 90° (1/4 turn)

- ❑ replace
- ❑ for removing and installing, interlock camshafts with camshaft fixer/locator -T10123- ⇒ page 33 and use the counterholder -T10172- ⇒ page 35

32 - Tensioning rail

- ❑ interlock tensioner ⇒ page 26

33 - Hydraulic control chain tensioner

34 - 9 Nm

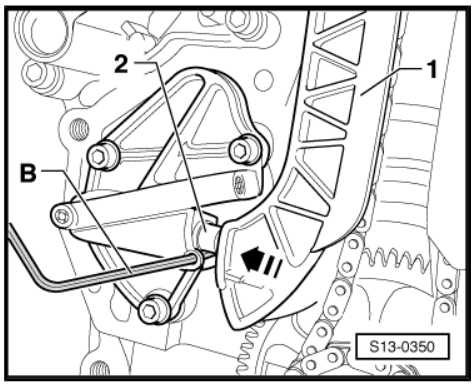
35 - Timing chain

36 - Camshaft sprocket

- ❑ removing and installing, setting the timing ⇒ page 35

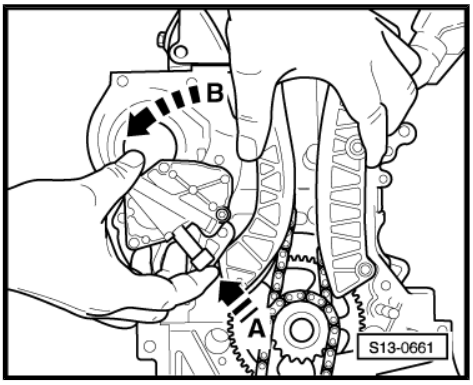
Interlock tensioner

– Press on the piston of the hydraulic tensioner -2- in the -direction of arrow- via the tensioning rail -1- until the piston can be interlocked with the safety drift -B- (e.g. with 3 mm hexagon socket wrench) or with locking pin -T40011- .



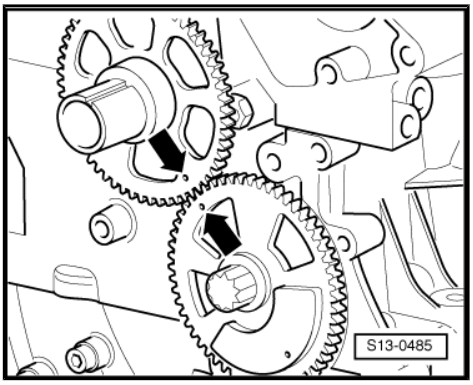
Install tensioner with rubber stop.

– Fix the hydraulic tensioner to the upper right screw when re-installing, press the piston with the finger in the direction of arrow -A- and insert the tensioner housing behind the tensioning rail by turning in the direction of arrow -B-.



Set the point of installation of the crankshaft gear

– Position the marking at the crankshaft gear opposite the marking at the balancing shaft gear -arrows-.



2.2 Removing and installing the timing case

- Engine installed in the vehicle

Special tools and workshop equipment required

- ♦ Fixing bolts -T10121-
- ♦ Sealant remover gasket stripper (bearing code GST, bearing article no. R 34402), manufacturer Retech s.r.o.
- ♦ Cleaning and degreasing agent , e.g. -D 009 401 04-
- ♦ Protective goggles and gloves
- ♦ Silicone sealant ⇒ ETKA - Electronic catalogue of original parts
- ♦ For vehicles Fabia II, Roomster:
- ♦ Supporting device -MP9-200 (10-222A)-
- ♦ Hook -MP9-200/10-
- ♦ For vehicles Rapid NH:
- ♦ Supporting device -T30099-
- ♦ Support -MP9-200/3-
- ♦ Surface -T30099/1-
- ♦ Support -T10358-

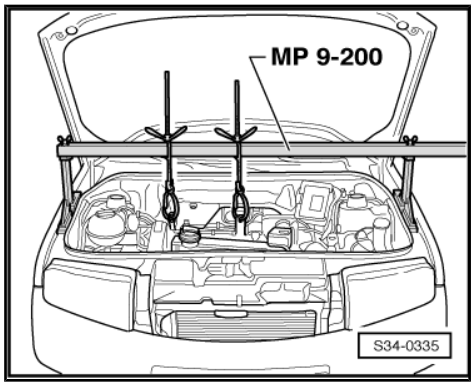
2.2.1 Removing

For vehicles Roomster with engine identification characters BME

– If necessary remove engine cover with air filter ⇒ page 149 .

For vehicles Fabia II, Roomster

– Mount supporting device -MP9-200- and take up the weight of the engine/gearbox assembly at the spindles.



For vehicles Rapid NH

– Remove the cooling water tank cover ⇒ Body Work; Rep. gr. 66 .

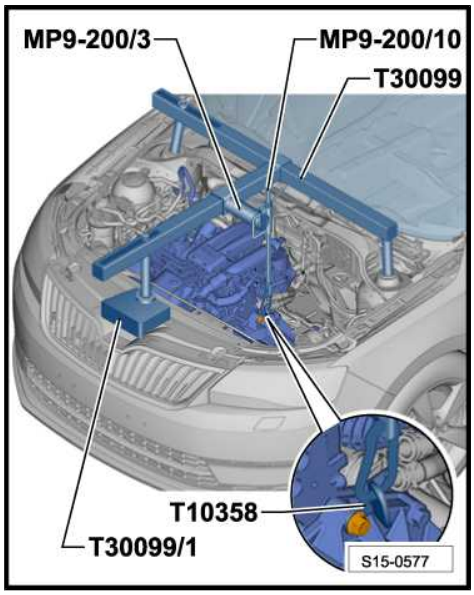
– Remove plastic covers for upper shock absorber mounting.

If the cylinder head is removed:

– Position supporting device -T30099- with bracket -MP9-200/3- .

– Unscrew the fixing screw for the gearbox and screw down the bracket -T10358- . (The figure shows the 1.2 ltr./63; 77 kW TSI Engine; the fixing system is identical).

– Support the engine via the spindle -MP9-200/10- in its installed position and slightly pre-tension.

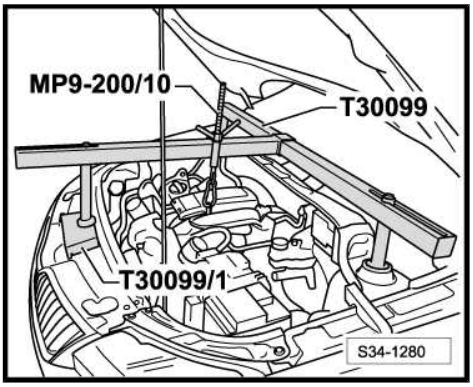


Note

Support supporting device -T30099- with base -T30099/1- and lock carrier.

If the cylinder head is not removed:

– Position supporting device -T30099- with base -T30099/1- .
– Support the engine on the lifting eye with the spindle -MP9-200/10- in its installed position and slightly pre-tension.



Note

Support supporting device -T30099- with base -T30099/1- and lock carrier.

Continued for all vehicles

– Remove V-ribbed belt ⇒ page 18 .
– Remove right engine mounts ⇒ page 10 .
– Remove belt pulley for control pump ⇒ page 87 .
– Remove guide pulley (only on vehicles with air conditioning) ⇒ page 18 .
– Remove tensioner with tensioning pulley ⇒ page 18 .
– Remove the generator ⇒ Electrical System; Rep. gr. 27 .
– Remove the ventilation pipe of the cooling system ⇒ page 81 .
– Interlock the crankshaft with fixing bolt -T10121- ⇒ page 33 , screw out the crankshaft screw and pull off the belt pulley - crankshaft.
– Remove the oil pan, guide pipe of the oil dipstick and possibly also the oil level and oil temperature sender -G266- (vehicles with WIV) ⇒ page 76 .
– Remove the connection for the vacuum regulating valve (PCV valve).
– Screw out all the screws from the timing case.
– Remove the timing case. Apply slight knocks with a rubber-headed hammer from outside to loosen the cover as necessary (the timing case sits on the dowel sleeves).

Note

Cover the area around the sealing surfaces so that no sealant residues can find their way into the timing gear drive.

WARNING

Wear protective gloves and goggles when working with gasket remover and degreasing agent!

Use a sealant remover to remove sealant residues on the timing case.

– Clean the sealing surfaces on the timing case and the engine. They must be free of oil and grease.

2.2.2 Install

Note

- *Install housing ⇒ page 21 (Pos. 17) only after putting the timing case in place, otherwise the gasket ring can be damaged.*
- *Remove sealant residues of silicone sealant applied inside the housing and insert a new O-ring ⇒ page 21 (Pos. 16) into the housing. 16).*
- *Check whether the oil scraper has been damaged while removing (e.g. broken off wings).*
- *Pay attention to the use by date on sealant.*
- *The timing case must be installed within 5 minutes after applying the sealant.*
- *If no blue sealing compound is left in the thread of the M6 screws, replace the screws for ones which have sealant on them.*

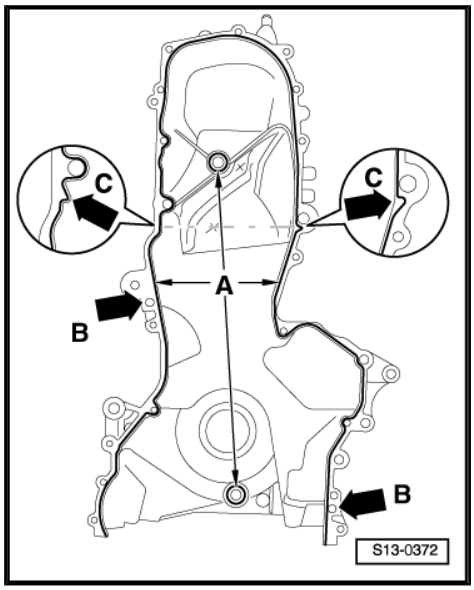
– Cut off nozzle tube at the front marking (∅ of nozzle approx. 3 mm).

– Apply silicone sealant to the clean sealing surface of the timing case, as shown in the illustration -arrow A-.

Note

Apply silicone sealant to the separation point of the cylinder head/ cylinder block according to the parting plane -arrows C-.

For engines with identification characters BBM, CHFA

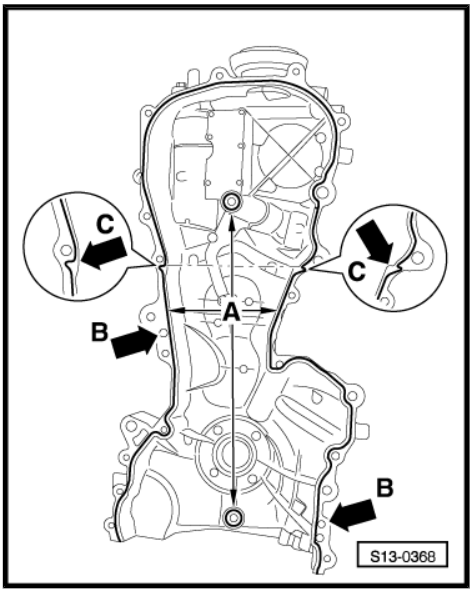


For engines with identification characters BZG, CGPA, CGPB, CEVA, CJLA, BME, CGPC

Continued for all engines

B - Position of the fitting sleeves

- Thickness of sealant bead: 2…3 mm.

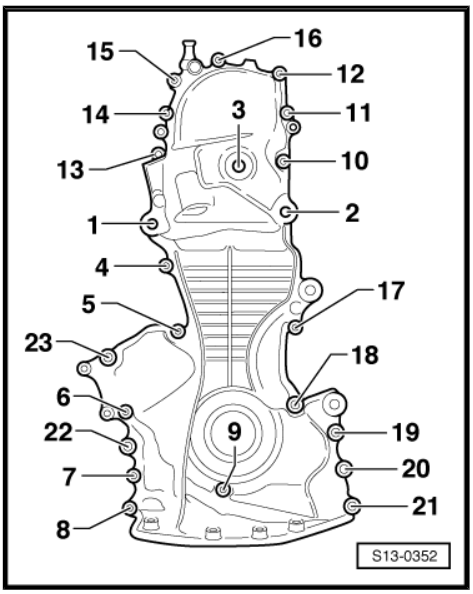


Note

The sealant bead must not be thicker than 3 mm otherwise excess sealant may get into the oil pan and clogg the oil pump strainer.

– Fit timing case immediately and lightly tighten all bolts.
– Tighten all bolts fully in the given sequence:

For engines with identification characters BBM, CHFA



For engines with identification characters BZG, CGPA, CGPB, CEVA, CJLA, BME, CGPC

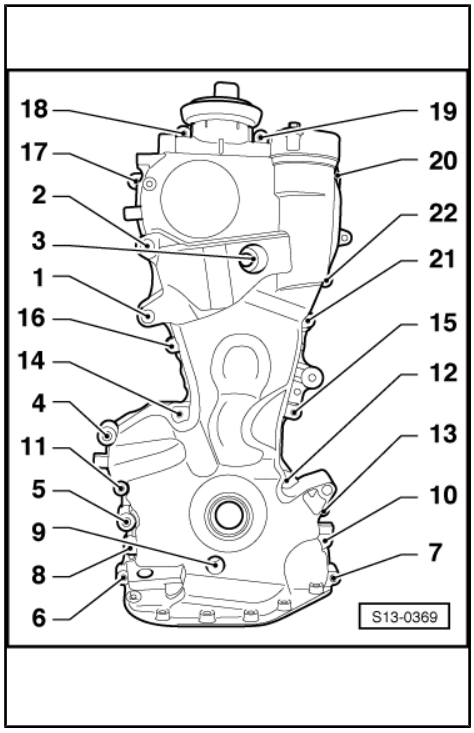
Continued for all engines

Tightening torques ⇒ page 32 .

– Install housing ⇒ page 21 (Pos. 17). 17).

Note

The sealing of the housing must be carried out with an O-ring ⇒ page 21 (Pos. 16). 16).



2.2.3 Size of screws and tightening torques

For engine with identification characters BBM, CHFA

Pos.	Size of bolt	Tightening torque
3	M10 x 162	45 Nm
1, 2	M10 x 142	45 Nm
22, 23	M8 x 55	25 Nm
others	M6 x 40 1)	10 Nm

1) If no sealing compound is left in the thread of the screw, replace the screw for one which has sealing compound on it.

For engines with identification characters BZG, CGPA, CGPB, CEVA, CJLA, BME, CGPC

Pos.	Size of bolt	Tightening torque
1, 2, 3	M10 x 120	50 Nm
4, 5	M8 x 55	25 Nm
6, 7, 8, 11, 14, 15	M6 x 40 1)	8 Nm + torque a further 90° ($^1/_4$ turn)
others	M6 x 22 1)	

1) If no sealing compound is left in the thread of the screw, replace the screw for one which has sealing compound on it.

Continued for all engines

Further installation occurs in reverse order. Pay attention to the following:

- Replace crankshaft screw.

  Tightening torque: 150 Nm + torque a further 180° ($^1/_2$ turn)

3 Removing and installing the camshaft sprocket, setting the timing

3.1 Inspect setting of the timing

For engines with identification characters BBM, CHFA

Special tools and workshop equipment required

- Fixing bolts -T10120-
- Fixing bolts -T10121-

Note

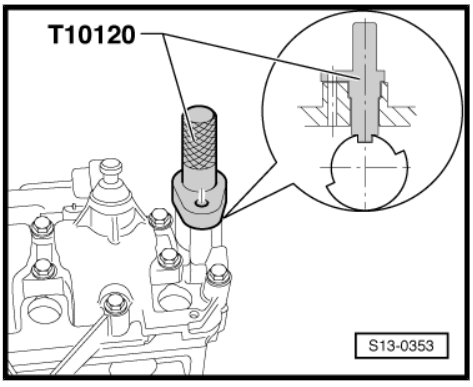
- *The crankshaft is at TDC of the piston for cylinder 1 for mixture ignition only then when the camshaft is standing at TDC of the piston for cylinder 1 (both devices must be interlocked).*
- *The fixing bolts -T10121- also serve at the same time as a fixing lever to loosen and tighten up the crankshaft screws.*
- *The engine can be easily turned once the spark plugs have been removed.*

– Remove the camshaft position sensor -G163- on the cylinder head cover.

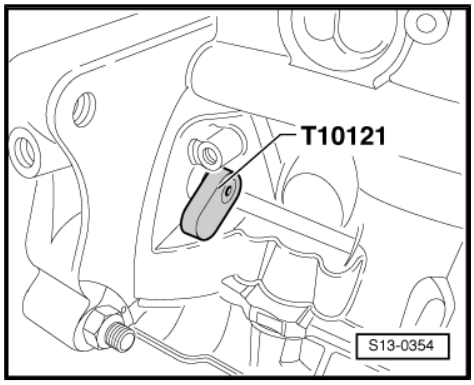
– Remove engine speed sender -G28- on the cylinder block.

– Insert fixing bolt -T10120- into the hole, as shown in the illustration.

– Rotate crankshaft in direction of rotation of engine long enough until the fixing bolt -T10120- can be inserted down to the stop.



– Interlock crankshaft, press the fixing bolt -T10121- into the hole in the flywheel.



Note

If the fixing bolt -T10121- cannot be inserted, remove the fixing bolt -T10120- from the camshaft. Rotate crankshaft in direction of rotation of engine (360°) and repeat the procedure.

If both fixing bolts cannot be inserted:

– Set the timing ⇒ page 35 .

If both fixing bolts can be inserted:

– Remove the fixing bolts from the holes and install camshaft position sensor as well as engine speed sender.

Further installation occurs in reverse order.

For engines with identification characters BZG, CGPA, CGPB, CEVA, CJLA, BME, CGPC

Special tools and workshop equipment required

- Camshaft fixer/locator -T10123-
- Fixing bolts -T10121-
- Extractor -T10094A-

Note

- *The crankshaft is at TDC of the piston for cylinder 1 for mixture ignition only then when the camshaft is standing at TDC of the piston for cylinder 1 (both devices must be interlocked).*
- *The fixing bolts -T10121- also serve at the same time as a fixing lever to loosen and tighten up the crankshaft screws.*
- *The camshaft fixer/locator -T10123- must not be used as a fixing lever to loosen and tighten up the camshaft screws.*
- *The engine can be easily turned once the spark plugs have been removed.*

For vehicles Roomster with engine identification characters BME

Note

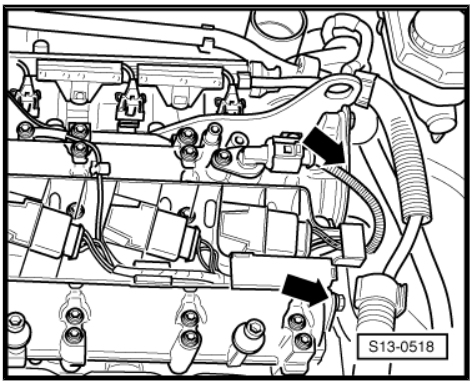
If necessary remove engine cover with air filter ⇒ page 149 .

Continued for all vehicles

– Remove caps at the cylinder head cover -arrows-.

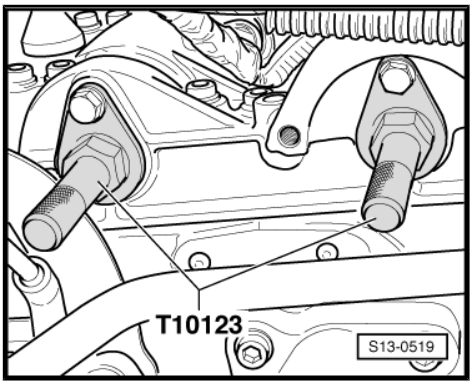
– Remove engine speed sender -G28- on the cylinder block.

– Rotate crankshaft in direction of rotation of engine long enough until the grooves are positioned horizontally in both camshafts.

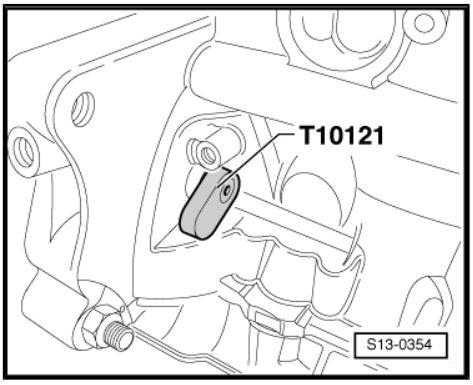


– Camshaft fixers/locators -T10123- must be lightly pushed into the camshafts.

– Fasten both devices with screws (M6).



– Interlock crankshaft, press the fixing bolt -T10121- into the hole in the flywheel.



Note

If the fixing bolt -T10121- cannot be inserted, remove the camshaft fixers/locators -T10123- from the camshafts. Rotate crankshaft in direction of rotation of engine (360°) and repeat the procedure.

If both devices cannot be inserted:

– Set the timing ⇒ page 35 .

If both devices can be inserted:

– Remove the devices from the holes and install caps as well as engine speed sender.

Further installation occurs in reverse order.

3.2 Removing and installing the camshaft sprocket, setting the timing

Special tools and workshop equipment required

- Camshaft fixer/locator -T10123-
- Fixing bolts -T10120-
- Fixing bolts -T10121-
- Counterholder -T10172-

For engines with identification characters BBM, CHFA

Removing the camshaft sprocket

– Interlock camshaft and crankshaft at TDC for cylinder 1 ⇒ page 33 .

– Remove timing case ⇒ page 27 .

– Interlock control chain tensioner without rubber stop ⇒ page 21 .

– Remove control chain tensioners with rubber stop.

– Remove the camshaft screw and take out the camshaft sprocket.

– Screw in the crankshaft screw with housing and belt pulley - crankshaft.

  Tightening torque: 90 Nm + torque a further 45° ($^1/_8$ turn)

– Remove the fixing bolt -T10121- and turn the crankshaft 45° against the direction of rotation of the engine.

Work can be performed on the valve drive while it is in this position.

Installing the camshaft sprocket, setting the timing

- The pistons must not be positioned at top dead centre.

Note

- *To turn the camshaft when the sprocket has been removed one can screw in a screw with two washers to a maximum of 20 Nm + 45° ($^1/_8$ turns) into the camshaft and turn the camshaft. The pistons must not be at TDC.*
- *The central screw of the camshaft is to be replaced whenever the camshaft is removed*
- *The fixing bolt -T10120- must not be used as a fixing lever to loosen and tighten up the camshaft screw.*
- *The engine can be easily turned once the spark plugs have been removed.*

– Position camshaft to TDC of cylinder 1 and lock into place ⇒ page 33 .

  One should not be able to move the camshaft in any direction after interlocking.

– Screw out the camshaft screws.

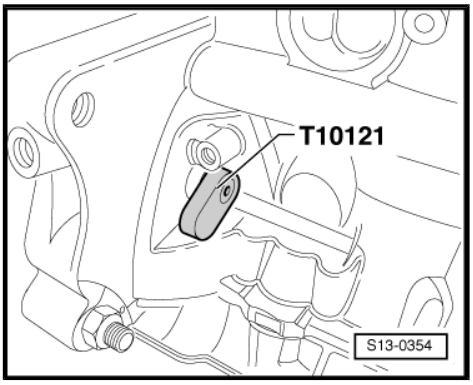
– Remove oil residues on the camshaft studs and camshaft sprocket in the points of contact using a clean cloth.

– Place the camshaft sprocket with the control chain laid on it on the camshaft and screw in the new camshaft screw so that the camshaft sprocket can still turn.

– Install tensioner with rubber stop ⇒ page 21 .

– Tension control chain ⇒ page 21 .

– Turn the crankshaft 45° in the direction of rotation of the engine to TDC for cylinder 1 and interlock.

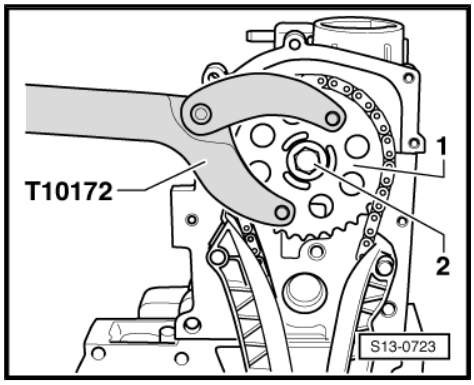


Note

- *If the crankshaft is turned beyond TDC for cylinder 1 (observe the marking on the flywheel) then it should turned back and the TDC for cylinder 1 set again.*
- *If the crankshaft is turned further it will collide with the piston on the valves.*

– Turn the camshaft sprocket -1- with dolly -T10172- against the direction of rotation of the engine -arrow- up to the stop, hold the camshaft sprocket in this position and tighten up the screw -2-.

  Tightening torque: 20 Nm + torque a further 90° ($^1/_4$ turn)



Note

The assistance of a 2nd mechanic is required for this work.

– Carefully crank engine at least 2 revolutions to ensure that no valve touches the piston when the engine is started, check timing again ⇒ page 33 .

Further installation occurs in reverse order.

– Check position of camshaft to crankshaft in the display group 012 display field 3 and 4 ⇒ Vehicle diagnostic tester.

For engines with identification characters BZG, CGPA, CGPB, CEVA, CJLA, BME, CGPC

Removing the camshaft sprockets

– Interlock camshafts and crankshaft at TDC for cylinder 1 ⇒ page 33 .

– Remove timing case ⇒ page 27 .

– Lock control chain tensioners ⇒ page 21 .

– Remove control chain tensioners with rubber stop.

– Remove the camshaft screws and take out the camshaft sprockets.

– Screw in the crankshaft screw with housing and belt pulley - crankshaft.

  Tightening torque: 90 Nm + torque a further 45° ($^1/_8$ turn)

– Remove the fixing bolt -T10121- and turn the crankshaft 45° against the direction of rotation of the engine.

Work can be performed on the valve drive while it is in this position.

Installing the camshaft sprockets, setting the timing

• The pistons must not be positioned at top dead centre.

Note

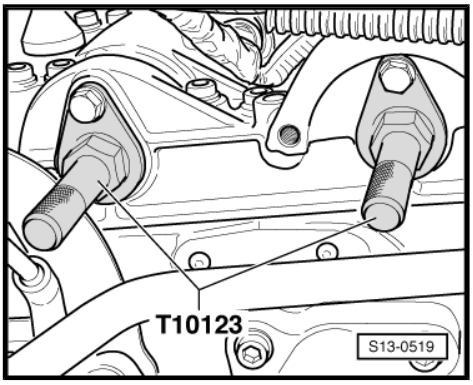
♦ *To turn the camshaft when the sprocket has been removed one can screw in a screw with two washers to a maximum of 50 Nm + 45° ($^1/_8$ turns) into the camshaft and turn the camshaft. The pistons must not be at TDC.*

♦ *The central screw of the camshaft is to be replaced whenever the camshaft is removed*

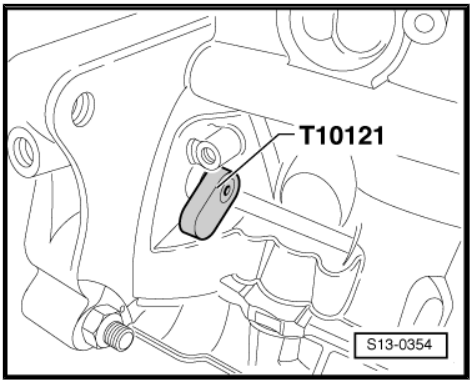
♦ *The camshaft fixer/locator -T10123- must not be used as a fixing lever to loosen and tighten up the camshaft screws.*

♦ *The engine can be easily turned once the spark plugs have been removed.*

– Position camshafts to TDC of cylinder 1 and lock into place ⇒ page 33 .
– Screw out the camshaft screws.
– Remove oil residues on the camshaft studs and camshaft sprockets in the points of contact using a clean cloth.
– Place the camshaft sprockets with the control chain laid on it on the camshafts and screw in the new camshaft screws so that the camshaft sprockets can still turn.
– Install tensioner with rubber stop ⇒ page 24 .
– Tension control chain ⇒ page 24 .



– Turn the crankshaft through a further 45° in the direction of rotation of the engine to TDC for cylinder 1 and interlock.

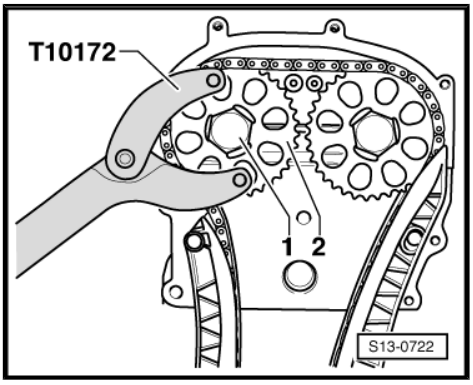


Note

- *If the crankshaft is turned beyond TDC for cylinder 1 (observe the marking on the flywheel) then it should turned back and the TDC for cylinder 1 set again.*
- *If the crankshaft is turned further it will collide with the piston on the valves.*

– Tighten the screw -1- of the camshaft sprockets -2- to 50 Nm (use counterholder -T10172-).
– Then, torque the bolts a further 90° ($^1/_4$ turn) with a rigid wrench.

  Tightening torque: 50 Nm + torque a further 90° ($^1/_4$ turn)



Note

The assistance of a 2nd mechanic is required for this work.

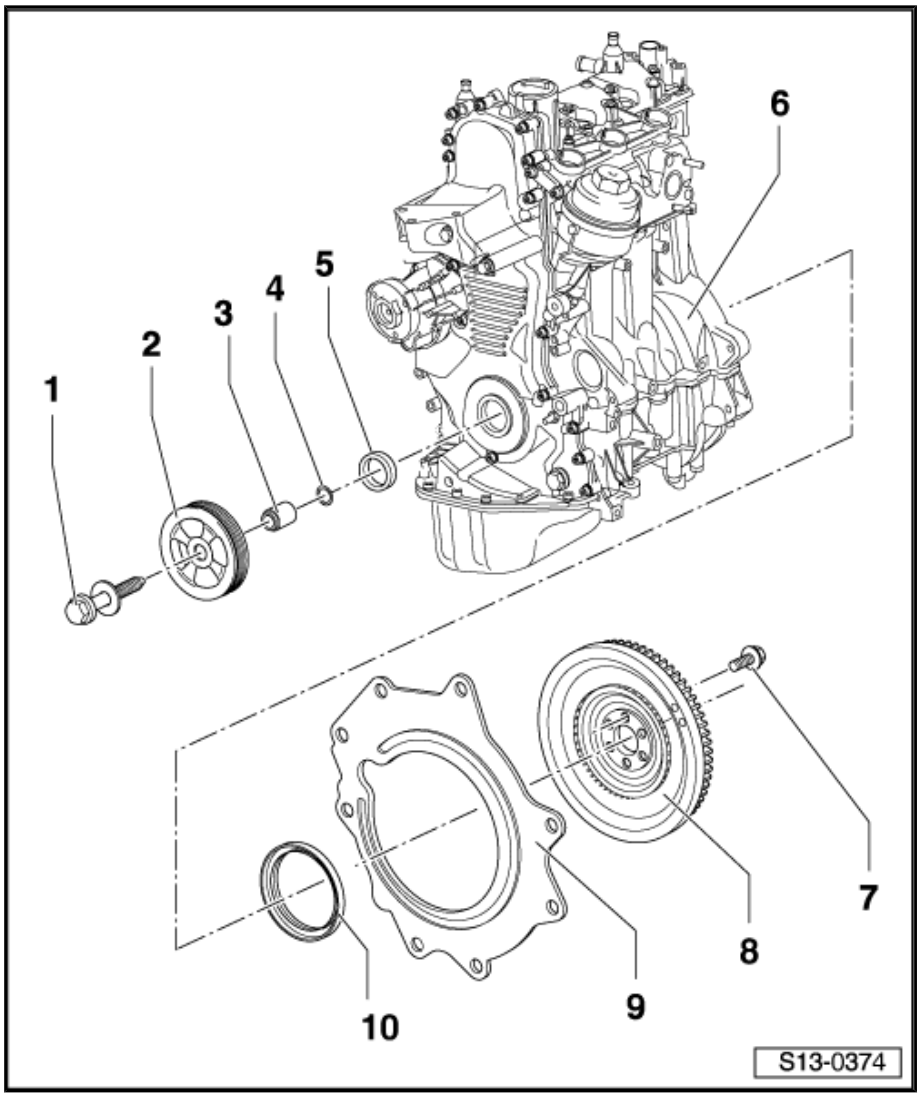
– Carefully crank engine at least 2 revolutions to ensure that no valve touches the piston when the engine is started, check timing again ⇒ page 33 .

Further installation occurs in reverse order.

4 Removing and installing gasket rings and flywheel

Note

- *Repairs to the clutch ⇒ Gearbox; Rep. gr. 30 .*
- *Secure the engine with the engine and gearbox mount -MP1-202- and on the assembly stand -MP9-101- before performing assembly work.*



1 - 150 Nm + torque a further 180° (1/2 turn)

- ❑ replace
- ❑ interlock the crankshaft with fixing bolt -T10121- for removing and installing ⇒ page 33

2 - Belt pulley - crankshaft

3 - Housing

- ❑ replace together with O-ring (Pos. 4)
- ❑ Replace silicone sealant sealing with O-Ring (Pos. 4)
- ❑ fit onto cleaned crankshaft

4 - O-ring

- ❑ replace if damaged
- ❑ replace the sealing of the housing with silicone sealant

5 - Sealing ring

- ❑ for crankshaft on the belt pulley side
- ❑ Neither grease nor oil sealing lip of gasket ring
- ❑ before installing remove grease residue on the housing with a clean cloth
- ❑ replace if damaged ⇒ page 41
- ❑ replace together with housing (Pos. 3)

6 - Cylinder block

7 - 60 Nm + torque a further 90° (1/4 turn)

- ❑ replace
- ❑ tighten up in two steps:

  Stage I = 60 Nm

  Step II = 90° (1/4 turn)

8 - Flywheel

- ❑ assembly only possible in one position -holes offset-

- ❑ Interlock crankshaft flywheel with a fixing bolt -T10121- for removing and installing it ⇒ page 33

9 - Intermediate plate

- ❑ must be positioned on dowel sleeves
- ❑ do not damage/bend during assembly work

10 - Sealing ring

- ❑ replace ⇒ page 41
- ❑ for crankshaft on the flywheel side
- ❑ Neither grease nor oil sealing lip of gasket ring
- ❑ before installing, remove grease residues on the crankshaft journal with a clean cloth

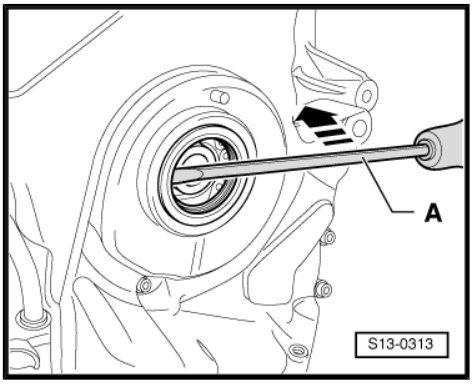
4.1 Replacing crankshaft seal on belt pulley side

Removing

– Remove V-ribbed belt ⇒ page 18 .

– Remove belt pulley - crankshaft and housing ⇒ page 21 .

– Remove the gasket ring carefully using a screwdriver -A-.



Note

The adhesive surface must not get damaged when removing the gasket ring.

Install

Special tools and workshop equipment required

♦ Thrust piece -T40008-

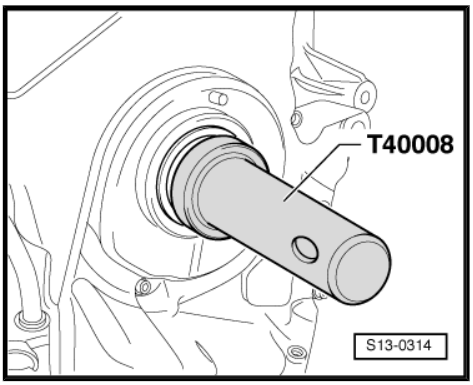
Note

The sealing lips of the gasket ring must be neither oiled nor greased.

– Position the gasket ring on the steering wheel housing and drive in using a pressure piece -T40008- down to the stop on the device.

– Carefully place a new grease and oil free housing (Pos. 3) into the gasket ring ⇒ page 40 .

Further installation occurs in reverse order.



4.2 Replacing the gasket ring for the crankshaft on the flywheel side

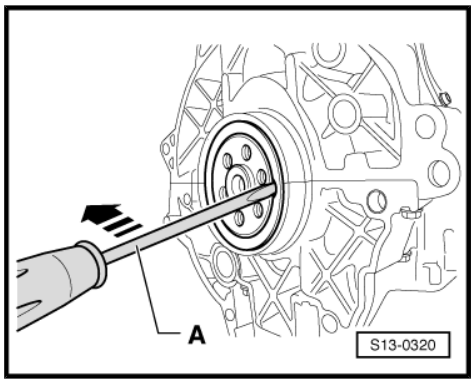
Special tools and workshop equipment required

♦ Assembly device -T10122-

• Gearbox removed

– Remove flywheel ⇒ page 40 (Pos. 8). 8).

– Remove the gasket ring carefully using a screwdriver -A-.



Note

The adhesive surface must not get damaged when removing the gasket ring.

Install

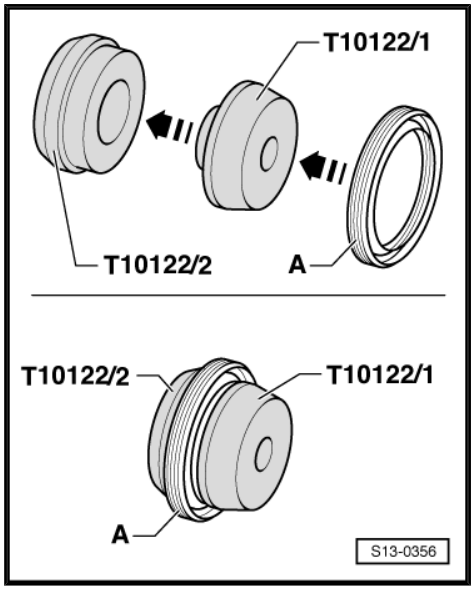
Note

The sealing lips of the gasket ring must be neither oiled nor greased.

– Push the assembly device -T10122/1- into the assembly device -T10122/2- and gasket ring -A-, then push onto the assembly device -T10122/2- , as shown.

– Remove assembly device -T10122/1- .

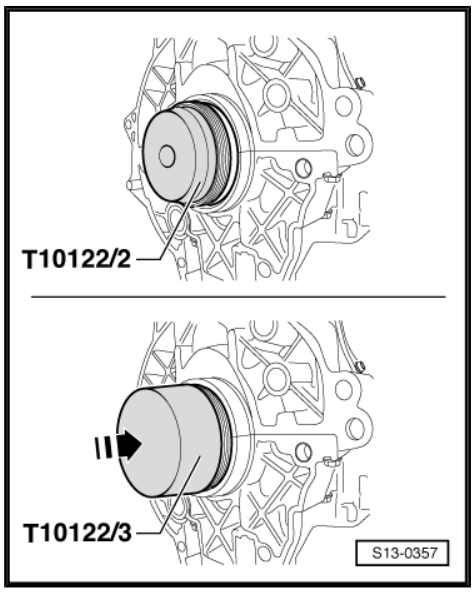
– Remove oil residue on the crankshaft journal with a clean cloth.



– Insert the gasket ring with assembly device -T10122/2- .

– Drive in gasket ring with assembly device -T10122/3- up to the stop.

Further installation occurs in reverse order.



15 – Cylinder head, valve gear

1 Removing and installing the cylinder head

1.1 Summary of components

– Testing compression pressure ⇒ page 50 .

Note

- *Removing and installing intake manifold ⇒ page 136 .*
- *Removing and installing exhaust manifold ⇒ page 159 .*
- *removing and installing coolant regulator housing ⇒ page 86 .*
- *If the cylinder head is replaced, the system must be completely filled with fresh coolant ⇒ page 90 .*

1.1.1 For engines with identification characters BBM, CHFA

1 - Cylinder head with cover
- ❑ check for distortion ⇒ page 44
- ❑ removing and installing ⇒ page 46
- ❑ after replacing fill entire system with fresh coolant ⇒ page 90
- ❑ Repairing valve gear ⇒ page 52 , ⇒ page 62

2 - Gasket
- ❑ replace if damaged

3 - Screw cap

4 - 20 Nm

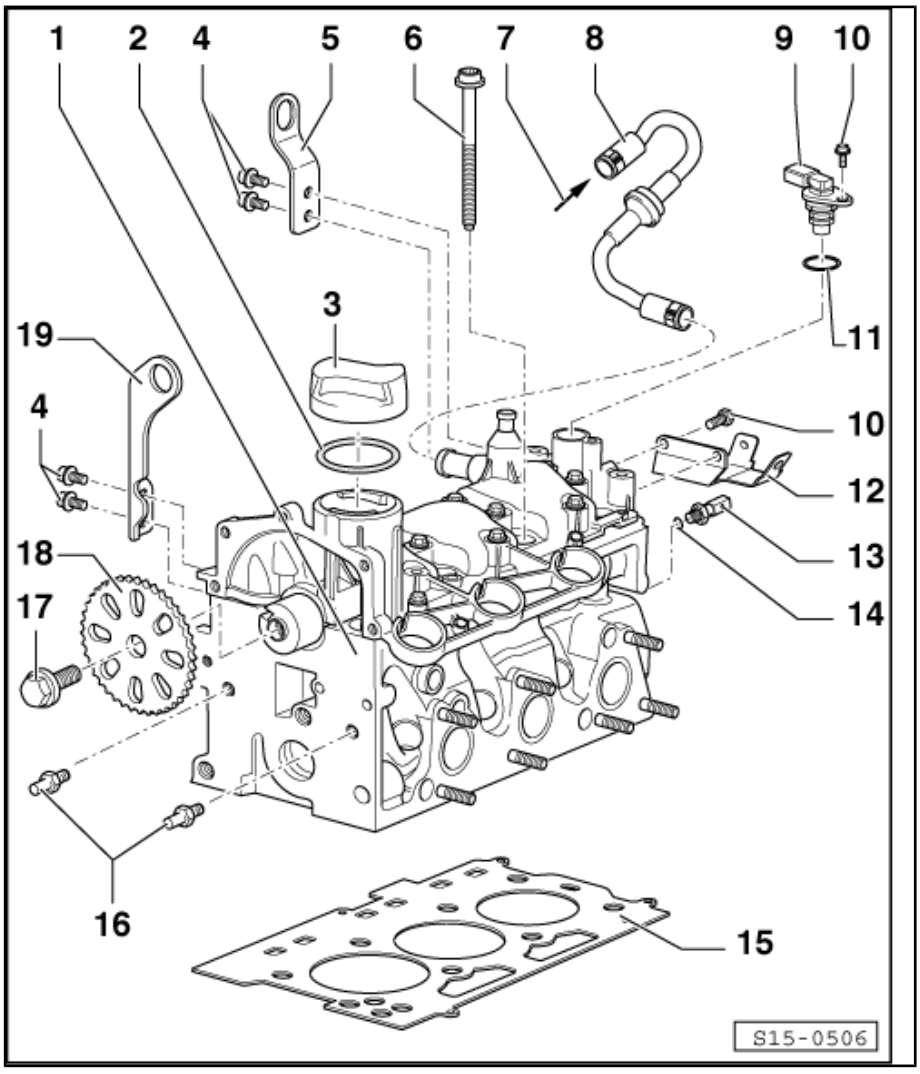
5 - Left lifting eye

6 - Cylinder head bolt
- ❑ replace
- ❑ observe the mounting instructions and sequence for loosening and tightening ⇒ page 46

7 - from connecting hose

8 - Ventilation hose with non-return valve

9 - Camshaft position sensor -



G163-

10 - 8 Nm

11 - Sealing ring

- ❑ replace if damaged

12 - Support

- ❑ for wiring loom

13 - Oil pressure switch -F1- , 25 Nm

- ❑ 0.045 MPa (0.45 bar)
- ❑ check ⇒ page 79

14 - Sealing ring

- ❑ replace

15 - Cylinder head gasket

- ❑ replace
- ❑ Observe fitting position: Part number must be legible

16 - Bolt, 18 Nm

- ❑ for tensioning rail or possibly also guide rail

17 - 20 Nm + torque a further 90° (1/4 turn)

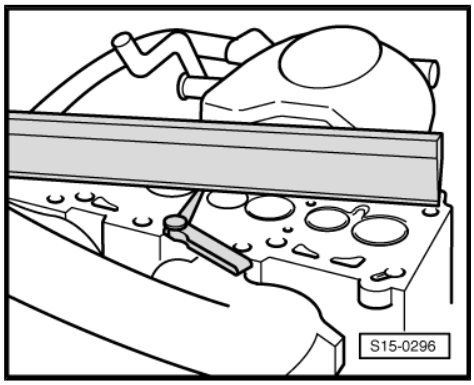
- ❑ replace

18 - Camshaft sprocket

- ❑ removing and installing ⇒ page 35

19 - Right lifting eye

Inspecting the cylinder head for distortion



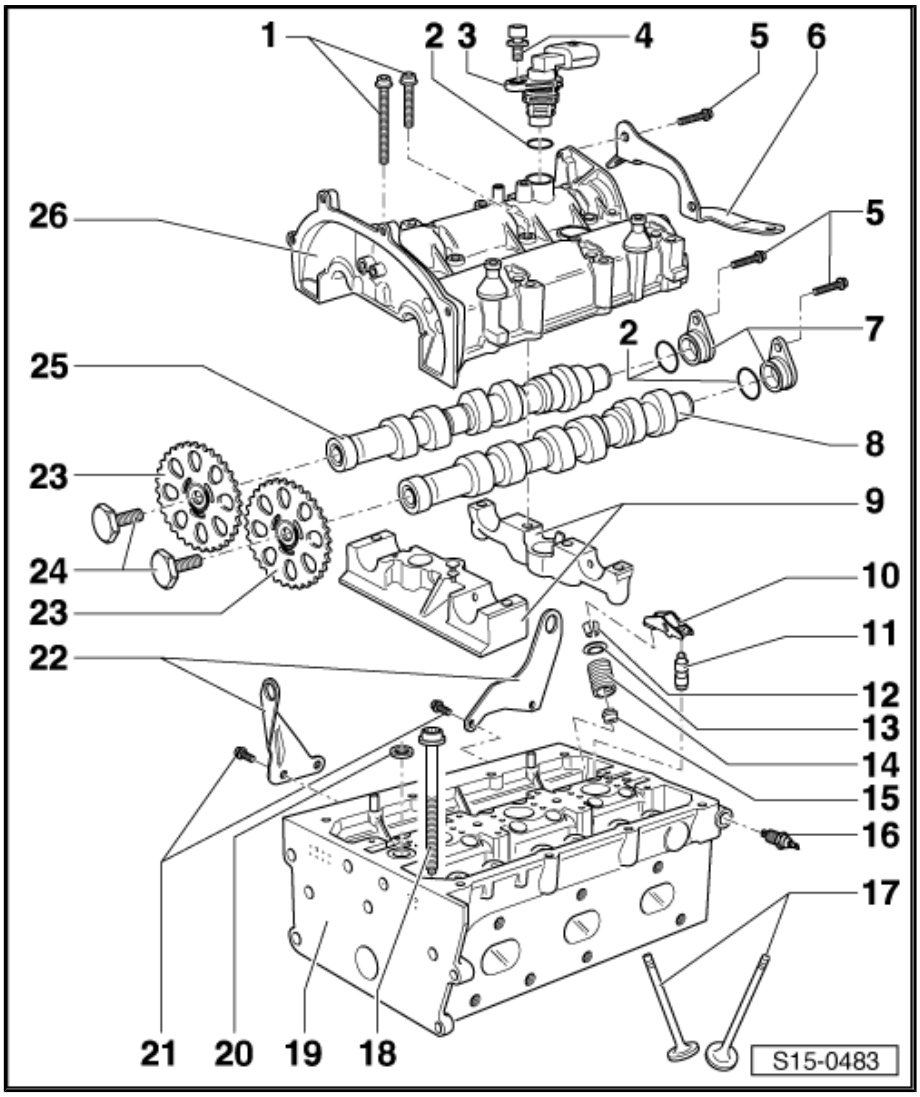
Special tools and workshop equipment required

- ♦ Straightedge
- ♦ Feeler gauge

Max. permissible distortion: 0,05 mm (minimum clearance of straightedge base: 100 mm)

If the distortion is greater than 0.05 mm, replace cylinder head.

1.1.2 For engines with identification characters BZG, CGPA, CGPB, CEVA, CJLA, BME, CGPC



1 - 10 Nm + torque a further 90° (1/4 turn)

- ❑ replace

2 - O-ring

- ❑ replace if damaged

3 - Camshaft position sensor -G163-

4 - 8 Nm

5 - 10 Nm

6 - Support

- ❑ for wiring loom

7 - Cap

8 - Exhaust camshaft

- ❑ Inspecting axial play ⇒ page 52

9 - Camshaft bearing cap

- ❑ When installing pay attention to the smooth operation of the camshaft
- ❑ Inspecting axial play ⇒ page 52

10 - Roller rocker arm

- ❑ do not get them confused with each other.
- ❑ inspect roller bearings
- ❑ Oil contact surface
- ❑ for installing, clip onto hydraulic supporting element with locking clips

11 - Supporting element

- ❑ do not get them confused with each other.
- ❑ with hydraulic valve clearance compensation
- ❑ Oil contact surface

12 - Valve collets

13 - Valve spring retainer

14 - Valve spring

- ❑ removing and installing ⇒ page 62 , replace the valve stem seal

15 - Valve stem seal

- ❑ replace ⇒ page 62

16 - Oil pressure switch -F1- , 25 Nm

- ❑ 0.045 MPa (0.45 bar)
- ❑ check ⇒ page 79

17 - Valve

- ❑ do not rework, only grinding in is permissible

- ❑ Valve dimensions ⇒ page 52

18 - Cylinder head bolt

- ❑ replace
- ❑ observe the mounting instructions and sequence for loosening and tightening ⇒ page 46

19 - Cylinder head

- ❑ inspecting valve guides ⇒ page 64
- ❑ check for distortion ⇒ page 46

20 - Sealing ring

- ❑ Clean strainer if dirty

21 - 20 Nm

22 - Lifting eye

23 - Camshaft sprocket

24 - 50 Nm + torque a further 90° (1/4 turn)

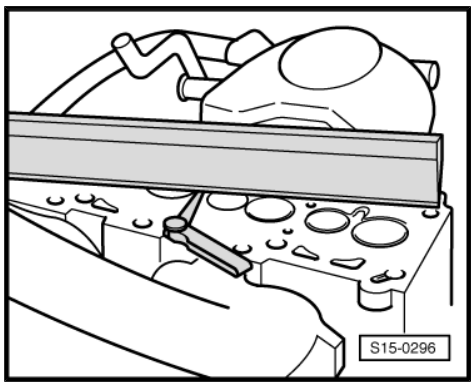
- ❑ replace
- ❑ Interlock the camshafts with counterholder -MP1-216 (3036)- for removing and installing ⇒ page 35

25 - Inlet camshaft

26 - Cylinder head cover

- ❑ sealing surfaces must not be reworked.
- ❑ removing and installing ⇒ page 56 , removing and installing the camshaft

Inspecting the cylinder head for distortion



Special tools and workshop equipment required

- ♦ Straightedge
- ♦ Feeler gauge

Max. permissible distortion: 0,05 mm (minimum clearance of straightedge base: 100 mm)

If the distortion is greater than 0.05 mm, replace cylinder head.

1.2 Removing and installing the cylinder head

Special tools and workshop equipment required

- ♦ Support -T10358-
- ♦ Camshaft fixer/locator -T10123-
- ♦ Fixing bolts -T10121-
- ♦ Extractor -T10094A-

- Sealant remover gasket stripper (bearing code GST, bearing article no. R 34402), manufacturer Retech s.r.o.
- Cleaning and degreasing agent , e.g. -D 009 401 04-
- Protective goggles and gloves
- For vehicles Fabia II, Roomster:
- Supporting device -MP9-200 (10-222A)-
- For vehicles Rapid NH:
- Supporting device -T30099-
- Support -MP9-200/3-
- Surface -T30099/1-

Removing

Requirements

- Engine temperature should not exceed 35 °C, because the cylinder head could be twisted when slackening the screws.
- No piston must be standing at TDC.

– Remove timing case ⇒ page 27 .

– Remove the camshaft sprocket, if necessary the camshaft sprockets ⇒ page 35 .

– Removing the intake manifold ⇒ page 136 .

– Remove fuel strip together with injectors ⇒ page 136 .

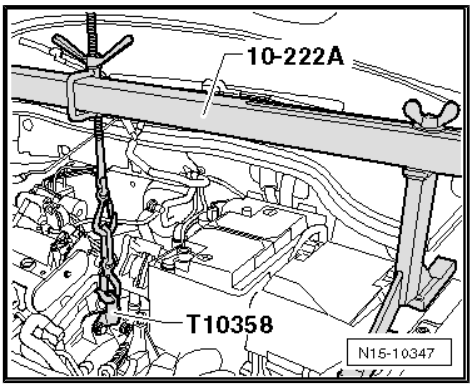
– Remove all other connecting hoses, coolant regulator and intake hoses from the cylinder head.

– Unscrew the exhaust manifold ⇒ page 159 .

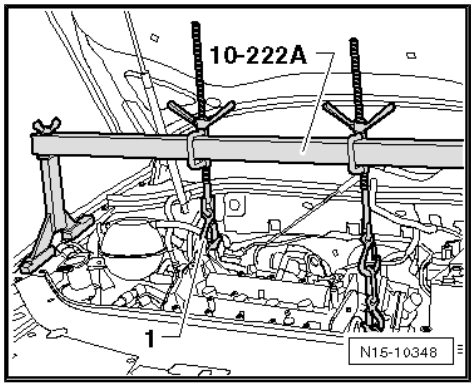
For vehicles Fabia II, Roomster

– Release fixing screw for gearbox and screw in the bracket -T10358- as shown.

– Hang the hook of the supporting device -MP9-200 (10-222A)- at the bracket -T10358- as shown.



– Unhook the hook -1- from the left lifting eye and push the spindle onto the supporting device -MP9-200 (10-222A)- on the left.



For vehicles Rapid NH

Note

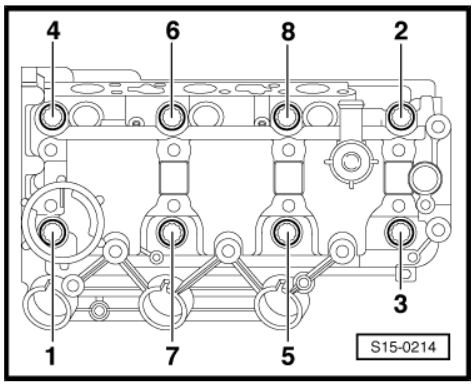
The unit is already tied up to the bracket -T10358- since the timing case has been removed.

Continued for all vehicles

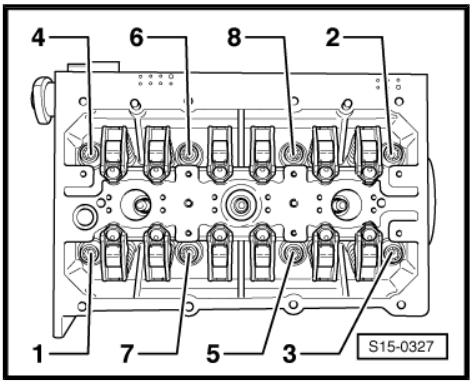
– Remove cylinder head cover ⇒ page 52 .

– Loosen the cylinder head screws in two stages and remove in the specified order.

For engines with identification characters BBM, CHFA



For engines with identification characters BZG, CGPA, CGPB, CEVA, CJLA, BME, CGPC



Continued for all engines

– Carefully remove the cylinder head.

Note

Do not lay the cylinder head on the surface with the head combustion chamber - danger of damaging the spark plugs.

Install

- The pistons must not be positioned at top dead centre.

WARNING

Wear protective gloves and goggles when working with gasket remover and degreasing agent!

Remove gasket residues on cyliner head with sealant remover.

Note

- *Always replace the cylinder head bolts.*
- *There must not be any oil or coolant present in the threaded holes for the cylinder head bolts.*
- *Remove the new cylinder head gasket from its wrapping immediately before fitting.*
- *Treat the new seal with the utmost care. Any damage will result in leaks.*

– Check whether both sleeves which are intended for the guide of the cylinder head, are inserted into the cylinder block above; insert if necessary.

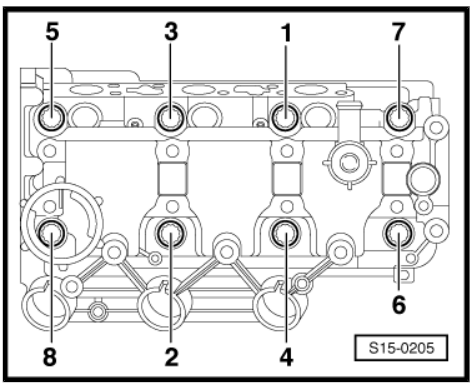
– Position the new cylinder heads. The legend (part number) must be legible.

– Insert the cylinder head.

– Insert new cylinder head screws into the screw contact surface lightly oiled and tighten by hand.

– Tighten cylinder head in three stages in the following order:

For engines with identification characters BBM, CHFA



For engines with identification characters BZG, CGPA, CGPB, CEVA, CJLA, BME, CGPC

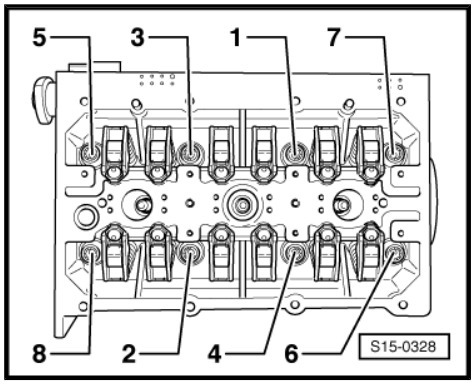
Continued for all engines

1. Pre-tighten with torque wrench:

   Stage I = 30 Nm

2. Tighten further with a rigid wrench:

   Stage II = torque a further 90° ($^1/_4$ turn)
   Stage III = once again torque a further 90° ($^1/_4$)



Further installation occurs in reverse order. Pay attention to the following:

- Carefully crank engine at least 2 revolutions to ensure that no valve touches the piston when the engine is started.

1.3 Testing the compression

Test condition

- Oil temperature at least 30 °C

Special tools and workshop equipment required

- Compression tester , e.g. -1763-
- Spark plug wrench , e.g. -3122 B-
- Extractor -T10094A-
- Assembly device -T10118-

Test sequence

For vehicles Roomster with engine identification characters BME

– If necessary remove engine cover with air filter ⇒ page 149 .

Continued for all vehicles

– Disconnect the plugs from the ignition coils with power output stage -N70- , -N127- , -N291- , if necessary slightly pull out the ignition coils.

– Pull out ignition coils with power output stage -N70 - , -N127- , -N291- with extractor -T10094A- .

– Disconnect all plug connections of the injectors .

– Unscrew the spark plugs.

– Test compression with compression tester , e.g. -V.A.G 1763- -V.A.G 1763- .

Note

Use of tester ⇒ Operating Instructions .

– Operate starter until the tester no longer indicates a pressure rise.

Compression readings

New engine	Wear limit	Difference between cylinders
min. 15 bar (1.5 MPa)	11 bar (1.1 MPa)	max. 3 bar (0.3 MPa)

If the specified values are not reached, test the combustion chamber for tightness ⇒ page 51 .

– Screw in the spark plugs and tighten to 30 Nm.

– Install ignition coils with power output stage -N70- , -N127- , -N291- .

– Plug in the plug connector for the ignition coils with the power output stage and the injectors.

For vehicles Roomster with engine identification characters BME

– Install engine cover with air filter.

Continued for all vehicles

– Interrogate fault memory and erase ⇒ Vehicle diagnostic tester.

Note

Separating the plug connections causes faults to be stored.

1.4 Testinf the combustion chamber for tightness

Special tools and workshop equipment required

♦ Pressure hose -MP1-210 (VW 653/3)- (replace gasket ring with a spark plug gasket ring)

♦ Spark plug wrench

Test sequence

– Unscrew the spark plugs.

– Position piston of the relevant cylinder to dead centre.

– Screw the pressure hose MP1-210 into the spark plug thread.

– Connect pressure hose to compressed air.

– With the assistance of a second mechanic, lock the screw at the crankshaft on TDC position in order to avoid the displacement of the piston after pressure build-up.

– Build up a pressure of 0.3 MPa (approx. 3 bar) in the combustion chamber.

– Determine how the pressure escapes:

1 - Via the inlet valve(s) - the pressure enters the throttle valve.

2 - Via the outlet valve(s) - the pressure enters the exhaust system.

3 - Via the piston rings - the pressure enters the oil filler inlet (in the crankcase).

2 Repairing the valve gear - Part 1

2.1 Summary of components

Note

- *After carrying out work on the valve gear, carefully crank engine at least 2 revolutions to ensure that no valve touches the piston when the engine is started.*
- *Before assembly moisten all bearing and contact surfaces with oil.*
- *When installing a replacement cylinder head, all the contact surfaces between the hydraulic balancing elements, the cam followers and the cam tracks must be oiled before installing the cylinder head cover.*
- *If the cylinder head is replaced, also the entire coolant must be replaced.*

2.1.1 For engines with identification characters BBM, CHFA

1 - Cylinder head cover

- ❑ sealing surfaces must not be reworked.
- ❑ with integrated camshaft bearings
- ❑ removing and installing ⇒ page 56 , removing and installing the camshaft

2 - 6 Nm + torque a further 90° (1/4 turn)

- ❑ replace

3 - Camshaft

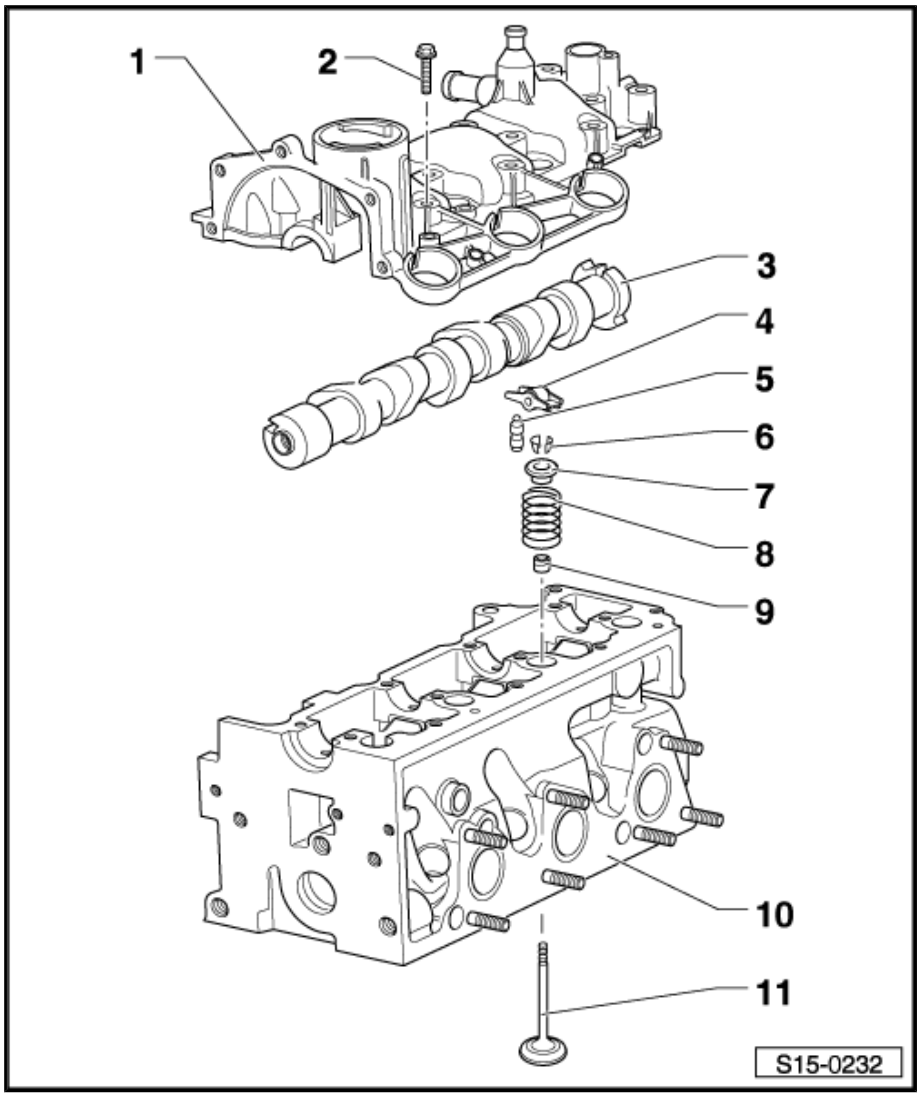
- ❑ removing and installing ⇒ page 56
- ❑ Pay attention to the marking ⇒ page 55
- ❑ Inspecting axial play ⇒ page 55

4 - Roller rocker arm

- ❑ do not get them confused with each other.
- ❑ inspect roller bearings
- ❑ Oil contact surface
- ❑ for installing, clip onto hydraulic supporting element with locking clip

5 - Supporting element

- ❑ do not get them confused with each other.
- ❑ with hydraulic valve clearance compensation



- ❑ Oil contact surface

6 - Valve collets

7 - Valve spring retainer

8 - Valve spring

- ❑ replace springs as a set only
- ❑ removing and installing ⇒ page 62

9 - Valve stem seal

- ❑ replace ⇒ page 62

10 - Cylinder head

- ❑ sealing surfaces on the camshaft side must not be reworked.
- ❑ inspecting valve guides ⇒ page 64

11 - Valve

- ❑ do not re-mill, only grinding with the valve seat is permissible
- ❑ Valve dimensions ⇒ page 56
- ❑ reworking valve seats ⇒ page 65

2.1.2 For engines with identification characters BME, BZG, CEVA, CGPA, CGPB, CJLA, CGPC

1 - 10 Nm + torque a further 90° (1/4 turn)

- ❑ replace
- ❑ tighten from inside to outside

2 - O-ring

- ❑ replace if damaged

3 - Hall sender -G163-

4 - 8 Nm

5 - 10 Nm

6 - Support

- ❑ Wiring loom

7 - Screw cap

8 - Exhaust camshaft

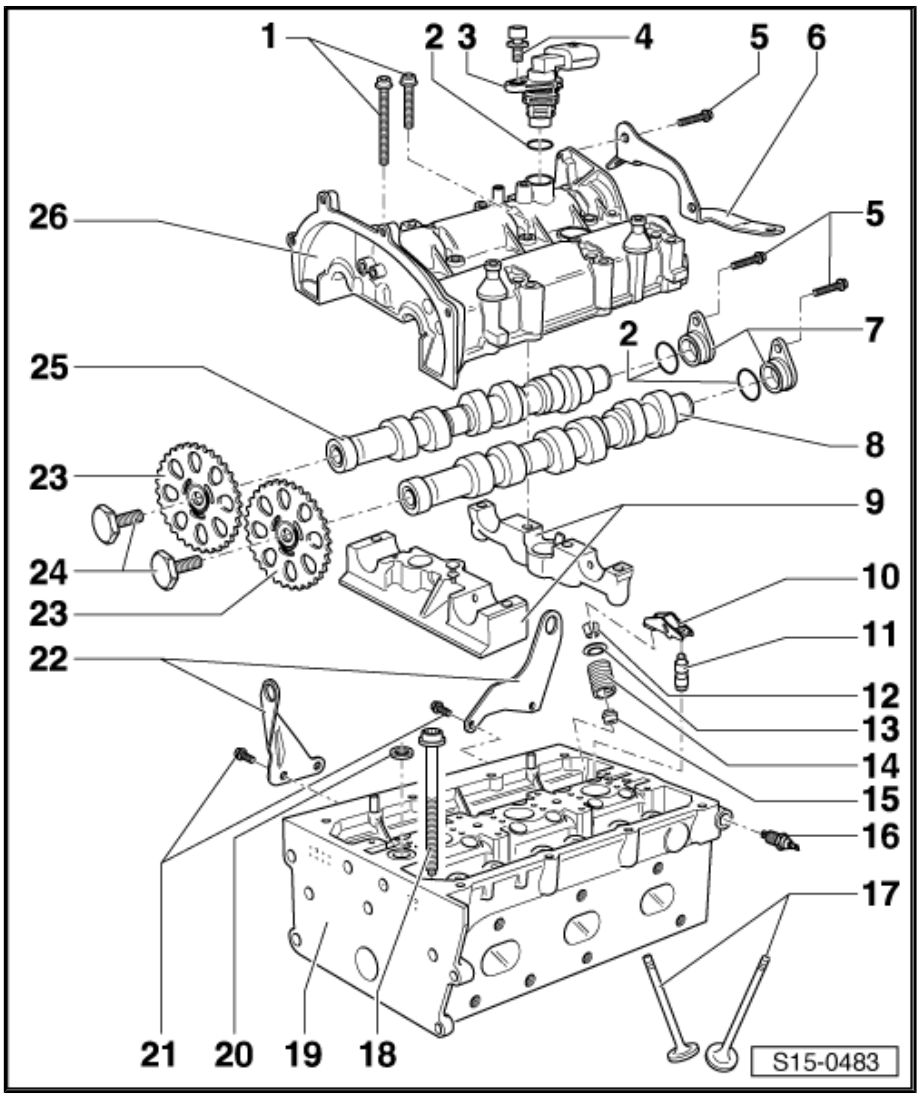
9 - Camshaft bearing cap

10 - Roller rocker arm

- ❑ do not get them confused with each other.
- ❑ inspect roller bearings
- ❑ Oil contact surface
- ❑ for installing, clip onto hydraulic supporting element with locking clip

11 - Supporting element

- ❑ do not get them confused with each other.
- ❑ with hydraulic valve clearance compensa-



tion

- ❑ Oil contact surface

12 - Valve collets

13 - Valve spring retainer

14 - Valve spring

15 - Valve stem seal

- ❑ replace ⇒ page 62

16 - Oil pressure switch -F1- , 25 Nm

- ❑ 0.045 MPa (0.45 bar)
- ❑ check ⇒ page 79

17 - Valves

- ❑ do not re-mill, only grinding with the valve seat is permissible
- ❑ Valve dimensions ⇒ page 56

18 - Cylinder head bolt

- ❑ replace
- ❑ observe the mounting instructions and sequence for loosening and tightening ⇒ page 46

19 - Cylinder head

- ❑ removing and installing ⇒ page 46
- ❑ check for distortion ⇒ page 46
- ❑ inspecting valve guides ⇒ page 64
- ❑ reworking valve seats ⇒ page 65

20 - Sealing ring

- ❑ Clean strainer if dirty

21 - 20 Nm

22 - Lifting eye

23 - Camshaft sprocket

24 - 50 Nm + torque a further 90° (1/4 turn)

- ❑ replace
- ❑ Interlock the camshafts with counterholder -MP1-216 (3036)- for removing and installing ⇒ page 35

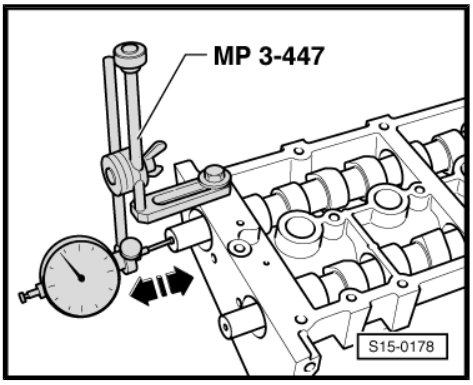
25 - Inlet camshaft

26 - Cylinder head cover

- ❑ sealing surfaces must not be reworked.
- ❑ removing and installing ⇒ page 56

Note

2.1.3 Checking the axial play of the camshaft



Special tools and workshop equipment required

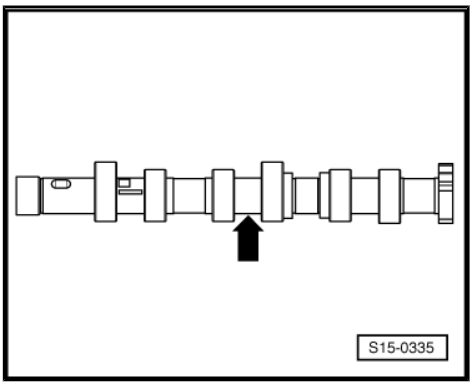
- Universal dial gauge holder -MP3-447-
- Dial gauge

Note

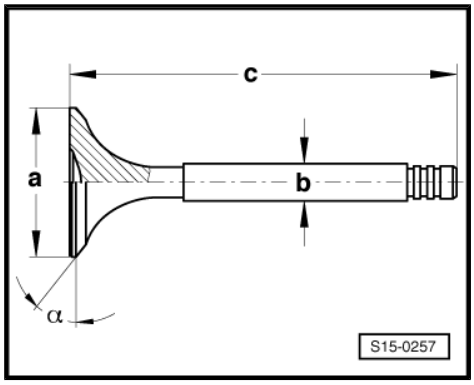
- *On engines with one camshaft, perform the measurement with the supporting elements removed and the cylinder head cover installed.*
- *On engines with two camshafts, perform the measurement with the cylinder head cover removed; while doing so load the middle camshaft bearing cap.*

Wear limit: max. 0,20 mm

Camshaft identification



2.1.4 Valve dimensions



Note

Valves must not be reworked. Only grinding in with grinding paste in the related valve seat is permissible.

For engines with identification characters BBM, CHFA

Dimension	Inlet valve	Exhaust valve
∅ a mm	34,5	28
∅ b mm	5,98	5,96
c mm	99,25	99,25
α ∠°	45	45

For engines with identification characters BZG, CGPA, CGPB, CEVA, CJLA, BME, CGPC

Dimension	Inlet valve	Exhaust valve
∅ a mm	29,5	26
∅ b mm	5,973	5,953
c mm	100,9	100,5
α ∠°	45	45

2.2 Removing and installing camshaft

2.2.1 For engines with identification characters BBM, CHFA

Special tools and workshop equipment required

- Sealant ⇒ ETKA - Electronic catalogue of original parts
- Fixing bolts -T10120-
- Grease -G 052 735 A2-
- Sealant remover gasket stripper (bearing code GST, bearing article no. R 34402), manufacturer Retech s.r.o.
- Cleaning and degreasing agent , e.g. -D 009 401 04-
- Protective goggles and gloves

Removing

– Remove timing case ⇒ page 27 .

– Removing the camshaft sprocket ⇒ page 35 .

– Remove fixing bolts -T10120- .

– Unscrew screws from the cylinder head cover.

– Remove the cylinder head cover and use slight knocks from above to loosen as necessary (the cylinder head cover sits on the dowel sleeves).

– Carefully lift out camshafts and place down on a clean surface.

– Remove the roller rocker arm together with the supporting elements and lay aside on a clean surface.

  Ensure that the roller rocker arms and the supporting elements are not mixed up.

– Cover the bore holes for the hydraulic supporting elements and valve springs with clean cloth.
– Cover or close the oil channel for camshaft bearings.

WARNING

Wear protective gloves and goggles when working with gasket remover and degreasing agent!

Remove the remaining sealant on the cylinder head and on the cylinder head cover with sealant remover.

Note

Sealant residues must not remain in the cylinder head.

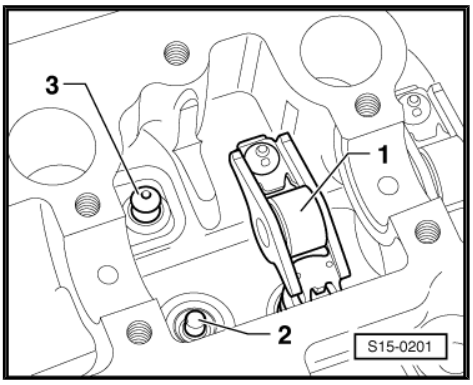
– Clean the camshaft bearings on the cylinder head and on the cylinder head cover.

Install

- The sealing surfaces must be free of oil and grease.
- The pistons must not be positioned at top dead centre.

– Oil the hydraulic supporting elements and insert at the same location together with the corresponding roller arms as when removing into the cylinder head.

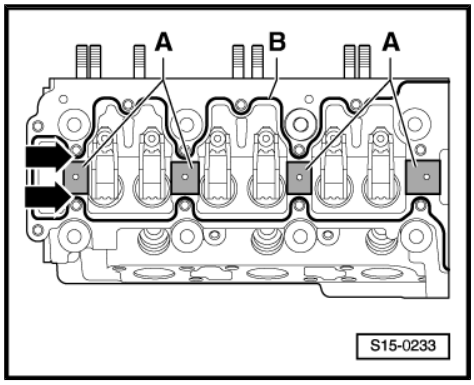
  Make sure all roller rocker arms -1- are correctly positioned on the end of valve stems -2- and on the corresponding hydraulic supporting elements -3-.



– Coat the camshaft bearing -A- on the cylinder head and the cylinder head cover with a constant layer of grease - G 052 735 A2- .

– Cut off nozzle of tube of the sealant ⇒ ETKA - Electronic catalogue of original parts at the front marking (∅ of nozzle approx. 2 mm).

– Apply sealant bead to the clean sealing surface of the cylinder head, as shown in the illustration.



♦ Thickness of sealant bead -B-: 2…3 mm

♦ Be careful how you apply sealant in the areas of -arrows- so that excess sealant is not pushed into the bearing and thus the camshaft is not glued solid by this.

♦ The sealant must be run past on the inside in the area of the bolt holes.

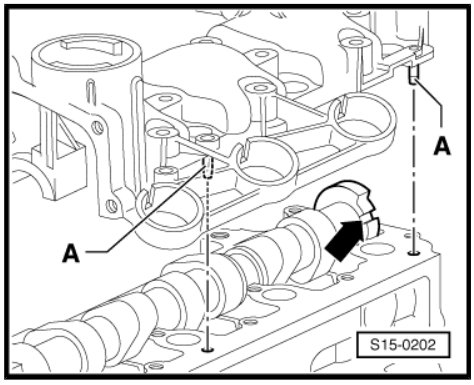
Note

♦ *The sealant bead must not be thicker than 3 mm otherwise excess sealant may get into the oil pan and clogg the oil pump strainer.*

♦ *The cylinder head cover must be installed within 15 minutes after applying the sealant.*

– Place the camshaft in such a way that the opening of the OT -arrow- points forwards towards exhaust gas channels.

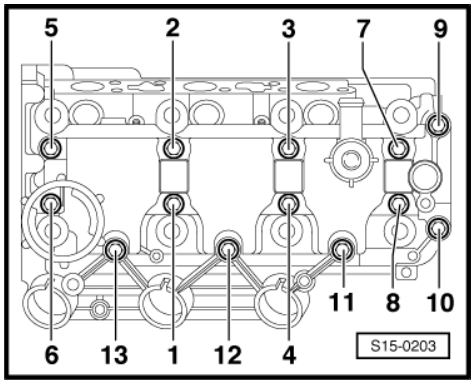
– Place the cylinder head cover so that the dowel sleeves -A- grip into the bore holes in the cylinder head.



– Screw in new fixing screws and tighten in the direction given.

  Tightening torque: 6 Nm + torque a further 90° ($^1/_4$ turn)

– Wipe away extruded excess sealant particularly in the area of the timing case.



Further installation occurs in reverse order.

2.2.2 For engines with identification characters BZG, CGPA, CEVA, CGPB, CJLA, BME

Special tools and workshop equipment required

♦ Sealant ⇒ ETKA - Electronic catalogue of original parts

♦ Grease -G 052 735 A2-

- Camshaft fixer/locator -T10123-
- Extractor -T10094A-
- Sealant remover gasket stripper (bearing code GST, bearing article no. R 34402), manufacturer Retech s.r.o.
- Cleaning and degreasing agent , e.g. -D 000 401 04-
- Protective goggles and gloves

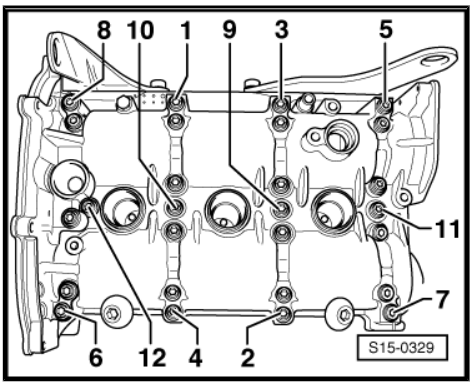
Removing

Remove cylinder head cover

Note

Sealing surfaces of cylinder head cover must not be reworked.

– Remove timing case ⇒ page 27 .
– Removing the camshaft sprockets ⇒ page 35 .
– Remove the camshaft fixer/locator -T10123- .
– Remove the ignition coils with power output stage -N70- , -N127- , -N291- using the extractor -T10094A- ⇒ page 170 .
– Slacken the cylinder head cover screws crosswise from outside to inside and remove.
– Carefully remove the cylinder head cover and apply slight knocks with a rubber-headed hammer from above to loosen as necessary (the cylinder head cover sits on the dowel sleeves).



WARNING

Wear protective gloves and goggles when working with gasket remover and degreasing agent!

Remove the remaining sealant on the cylinder head and on the cylinder head cover with sealant remover.

Degrease the sealing surfaces.

Note

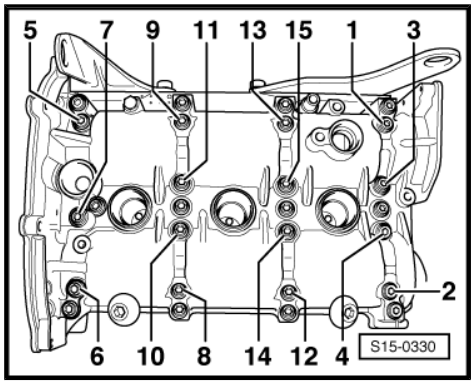
Sealant residues must not remain in the cylinder head.

Remove the camshafts

– Slacken the screws of the camshaft bearing in the given sequence and remove.

– Carefully remove camshaft bearing cap.

– Carefully lift out camshafts and place down on a clean surface.



Install

Install camshafts

Note

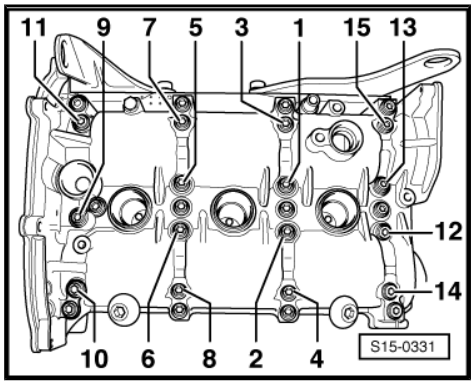
Lug of inlet camshaft must be positioned on the hole for the hall sender.

– Coat the camshaft bearing on the cylinder head cover and on the camshaft covers with a constant layer of grease - G 052 735 A2- .

– Carefully insert camshafts into the cylinder head cover.

– Fit on camshaft bearing cap.

– Install screws of camshaft bearing in given sequence and tighten forcefully by hand.



Make sure that the camshaft bearing caps are not tilted.

Tightening torque: 10 Nm + torque a further 90° ($^1/_4$ turn)

Pay attention to smooth operation of the camshafts.

Install cylinder head cover

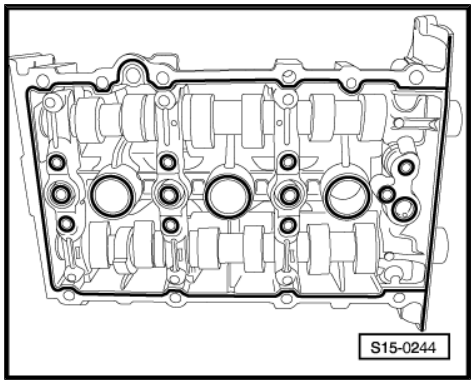
- The sealing surfaces must be free of oil and grease.
- The pistons must not be positioned at top dead centre.

Note

When turning the camshaft the valves may touch the piston in TDC.

– Cut off nozzle of tube of the sealant ⇒ ETKA - Electronic catalogue of original parts at the front marking (∅ of nozzle approx. 2 mm).

– Apply a thin even sealant bead on the clean sealing surface of the cylinder head.



♦ Thickness of sealant bead: 2…3 mm.

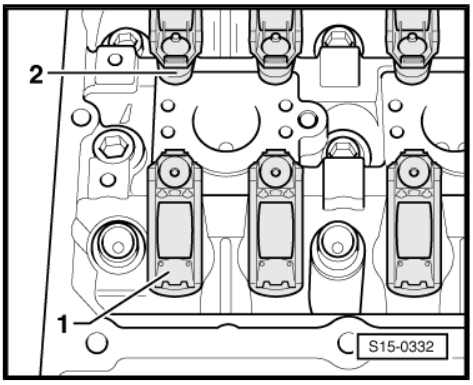
♦ The sealant must be run past on the inside in the area of the bolt holes.

Note

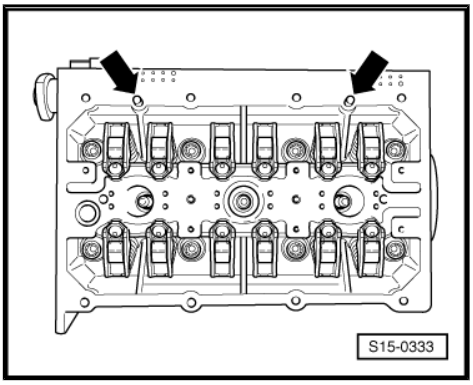
♦ *The sealant bead must not be thicker than 3 mm otherwise excess sealant may get into the oil ducts and can cause engine damage.*

♦ *The cylinder head cover must be installed within 15 minutes after applying the sealant.*

– Make sure all roller rocker arms are correctly positioned on the end of valve stems -1- and on the relevant hydraulic supporting elements -2-.



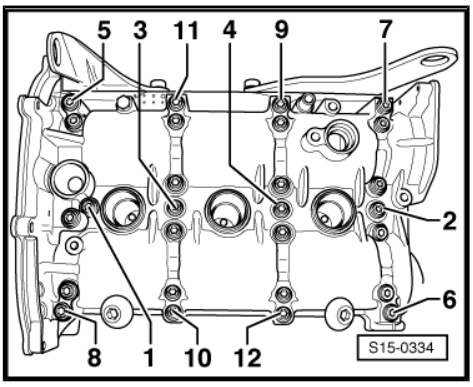
– Carefully fit cylinder head cover onto the dowel sleeves -arrows- vertically from above into the cylinder head.



– Screw in the new fixing screws and tighten diagonally and evenly from the inside to the outside.

Make sure that the cylinder head cover is not tilted.

Tightening torque: 10 Nm + torque a further 90° ($^1/_4$ turn)



– Wipe away extruded sealant particularly in the area of the timing case.

Note

After installing the cylinder head cover, allow the sealant to dry for about 30 minutes.

Further installation occurs in reverse order.

3 Repairing the valve gear - Part 2

3.1 Replacing valve stem seals

For engines with identification characters BBM, CHFA

(with cylinder head removed)

Special tools and workshop equipment required

- Valve lever -MP1-211 (VW 541/1a,/5)-
- Valve supporting plate -MP1-218-
- Assembly device for valves -MP1-213 (2036)-
- Valve stem seal extractor -MP1-230 (3364)-
- Valve stem seal insertion tool -MP1-233 (3365)-

Conditions

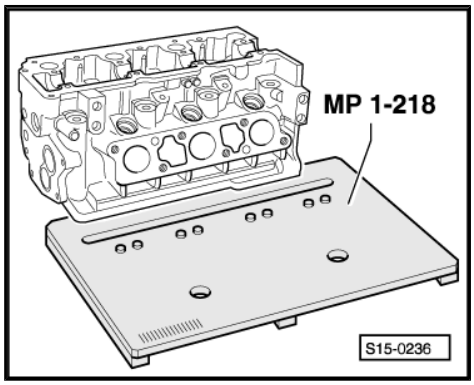
- Cylinder head and camshaft removed.
- Components removed (intake manifold, exhaust manifold, spark plugs etc.).

Note

Build up pressure with installed cylinder head, see procedure for engines with identification characters BZG, CGPA, CEVA, CJLA, BME, CGPC.

Removing

– Fit cylinder head onto the valve supporting plate.

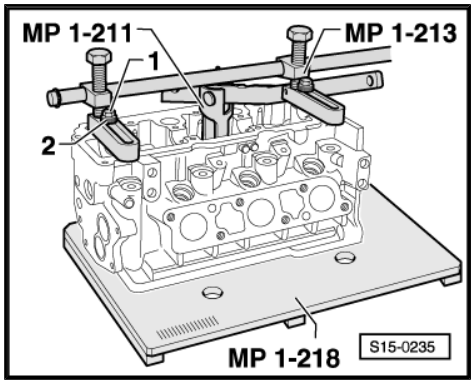


– Screw on assembly device for valves -MP1-213 (2036)- .

  Always use cylinder head cover screws (M7) -1- with 4 M8 washers -2-.

– Place the valve lever -MP1-211 (VW 541/1a,/5)- on the valve spring and press the valve spring together.

– Remove the safety valve collets.

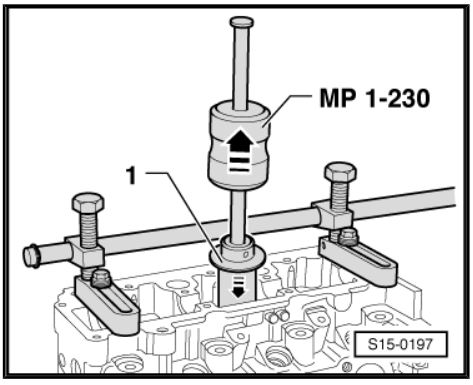


Note

Release safety valve collets that are tight by striking with light blows of a hammer on the valve lever.

– Pull off valve stem seal with extractor for valve stem seal - MP1-230 (3364)- .

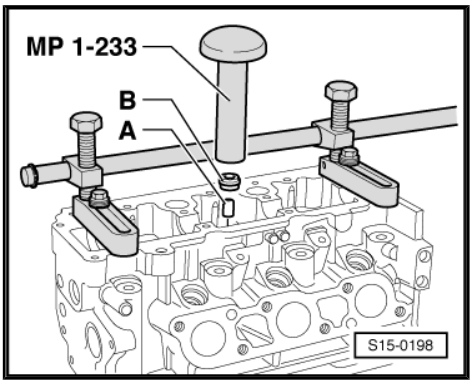
  Press sleeve -1- down slightly during this step.



Install

– In order to avoid damage to the new valve stem seals, fit the supplied plastic sleeve -A- onto the valve stem.

– Oil valve stem seal -B-, insert into the insertion tool -MP1-233 (3365)- and carefully push onto the valve guide.



– Remove plastic sleeve.

Further installation occurs in reverse order.

For engines with identification characters BZG, CGPA, CGPB, CEVA, CJLA, BME, CGPC

(with cylinder head installed)

Special tools and workshop equipment required

- Supporting device -MP9-200 (10-222A)-
- Spark plug wrench , e.g. -3122 B-
- Blank holder for valve spring -MP1-229 (3362)- with pressure plate -MP1-229/1 (3362/1)-
- Valve stem seal extractor -MP1-230 (3364)-
- Valve stem seal insertion tool -MP1-233 (3365)-
- Counterholder -T30004 (3415)- with replaceable bolts -T30004/1 (3415/1)-
- Counterholder -T10172-
- Pressure hose -MP1-210 (VW 653/3)-
- Extractor -T10094A-

Note

Use valve supporting plate -MP1-218- with cylinder head removed, see procedure for engines with identification characters BBM, CHFA.

Removing

– Remove V-ribbed belt ⇒ page 18 .

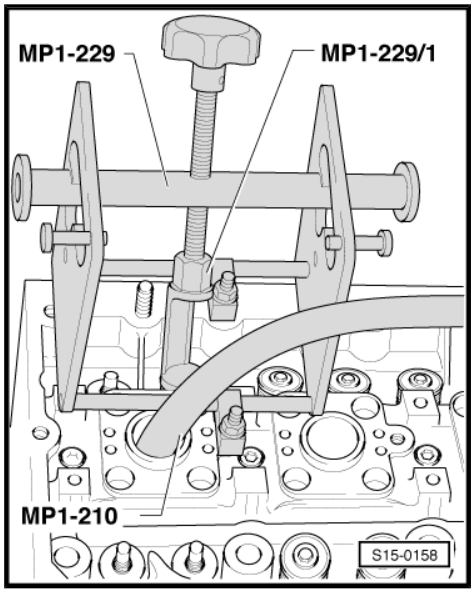
– Remove cylinder head cover ⇒ page 52 .

– Unscrew the spark plugs with spark plug wrench -3122 B- .

– Remove roller rocker arm and place on a clean surface. Make sure that you do not mix up the roller rocker arms.

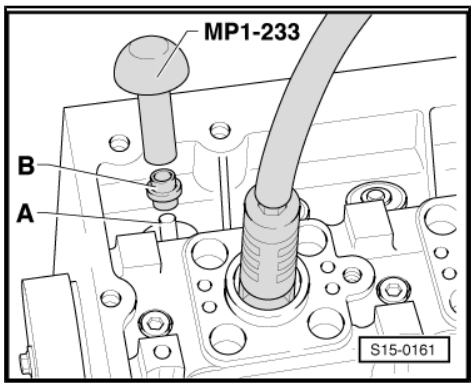
– Position piston of the relevant cylinder in bottom dead centre.

– Screw on blank holder for valve spring -MP1-229 (3362)- with pressure plate -MP1-229/1 (3362/1)- .
– Screw the pressure hose -MP1-210 (VW 653/3)- in the spark plug thread.
– Connect pressure hose to compressed air with a pressure of min. 0.6 MPa (6 bar) and remove the valve springs with blank holder for valve spring -MP1-229 (3362)- .
– Pull off valve stem seals with extractor for valve stem seal -MP1-230 (3364)- .



Install

– Insert the supplied plastic bushings on the relevant valve stem. This will prevent any damage to the new valve stem seals.
– Insert the new valve stem seal -B- in the insertion tool for valve stem seal -MP1-233 (3365)- .
– Oil the sealing lip of the valve stem seal and carefully slide onto the valve guide -A-.



Further installation occurs in reverse order.

– Install cylinder head cover ⇒ page 52 .
– Installing the camshaft sprockets, setting the timing ⇒ page 35 .

3.2 Inspect valve guides

• Cylinder head and valve spring removed

Special tools and workshop equipment required

♦ Universal dial gauge holder -MP3-447 (VW 387)-
♦ Dial gauge

Work procedure

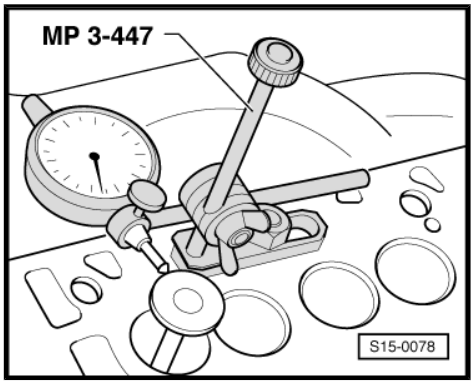
Note

If the valve is replaced when carrying out repair work, use a new valve for the measurement.

– Insert valve into guide. End of valve stem must be flush with end of guide (without valve stem seal).

  Because of the different stem diameters only use inlet valve in inlet guide or outlet valve in outlet guide.

– Determine valve rock.



Wear limit

Inlet valve guides	Outlet valve guides
0.8 mm	0.8 mm

Note

If the wear limit is exceeded, repeat measurement with new valve. If the wear limit is again exceeded, replace cylinder head.

3.3 Reworking valve seats

Special tools and workshop equipment required

- Universal dial gauge holder -MP3-447 (VW 387)-
- Dial gauge
- Micrometer or caliper gauge
- NAC milling cutter for reworking valve seats
- Grinding paste

Note

- *When carrying out repairs on engines with leaking valves, it is not sufficient to machine or replace the valve seats and valves. It is also necessary to inspect the valve guides for wear, particularly on engines with a high mileage ⇒ page 64 . If the wear limit is exceed, replace cylinder head.*
- *Calculate the maximum permissible reworking dimension before commencing ⇒ page 65 . If the reworking dimension is exceeded, proper operation of the valve gear is no longer assured and the cylinder head must be replaced.*
- *Do not remill valves. Only opposite grinding in of the valve with the corresponding valve seat using grinding paste is permissible, in order to obtain a proper contact pattern.*

Calculating maximum permissible reworking dimension

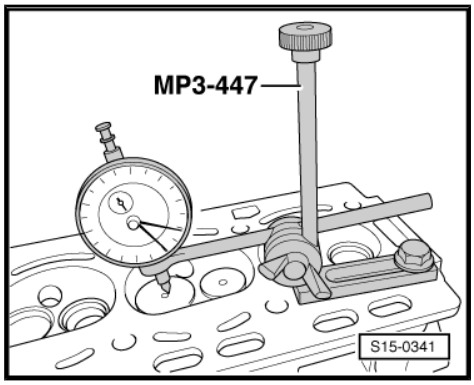
– Insert valve and press firmly against the valve seat.

Note

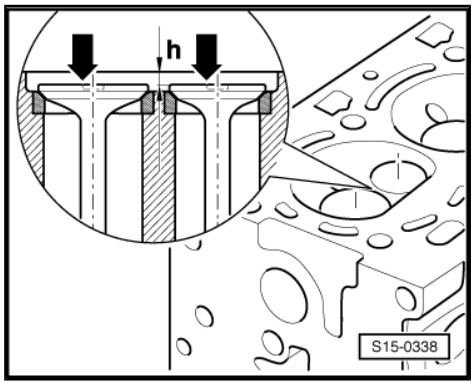
- *If the valve is replaced when carrying out repair work, use a new valve for the measurement.*
- *If no new valve is used, then the valve disc must be thoroughly cleaned.*

For engines with identification characters BBM, CHFA

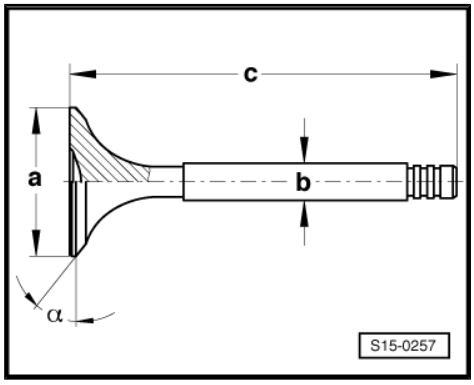
– Attach universal dial gauge holder with bolt to cylinder head.



– Measure distance -h- from the bottom edge of the cylinder head to the bottom edge of the valve disc. Measure in the immediate vicinity of the recess from the valve disc center -arrows-.



– Measure valve length -c-.



Note

Measure dimension -c- in the immediate vicinity of the recess from the valve disc center.

– Calculate max. permissible reworking dimension from the distances -c, h- measured and from the maximum dimension.

Maximum dimension for both valves: 103.7 mm

The maximum permissible reworking dimension = 103.7 - (c + h).

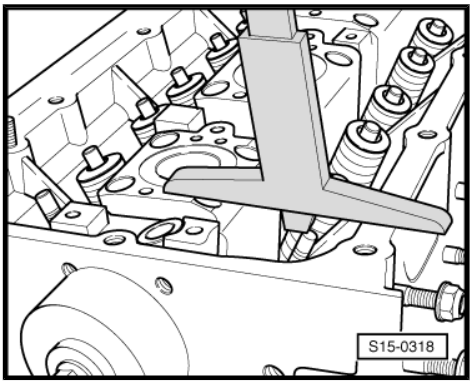
Example:

	Maximum dimension for both valves	103,7	mm
-	(Valve length -c- + measured distance -h-)	(99,2 + 4,35)	mm
=	max. permissible reworking dimension [1]	0,15	mm

1) The maximum permissible reworking dimension is shown in the figures for reworking the valve seats as dimension “b”.

For engines with identification characters BME, BZG, CGPA, CGPB, CEVA, CJLA

– Measure distance between the valve stem end and the upper face of the cylinder head.
– Calculate max. permissible reworking dimension from the distance measured and the minimum dimension.



Minimum dimension: for inlet and exhaust valve	7.6 mm

"Measured distance" - "minimum dimension" = "max. permissible reworking dimension".

Example:

Measured distance	8.0 mm
- Minimum dimension	7.6 mm
= max. permissible reworking dimension [1]	0.4 mm

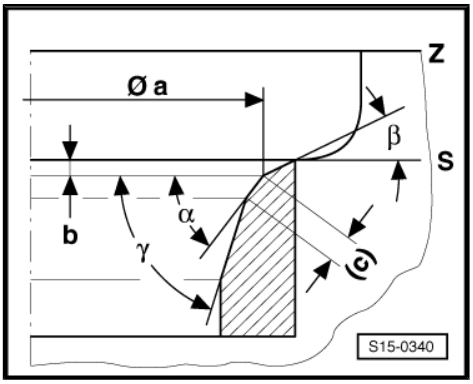
1) The max. permissible reworking dimension is shown in the figures for reworking the valve seats as dimension "b".

Continued for all engines

Note

If the max. permissible reworking dimension is 0 mm, if necessary repeat measurement with a new valve. If the max. permissible reworking dimension is again 0 mm, replace cylinder head.

3.3.1 Reworking inlet valve seat



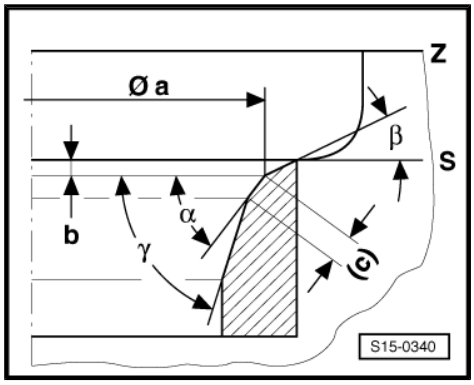
For engines with identification characters BBM, CHFA

Dimension		Inlet valve seat
∅ a	mm	33,4
b	mm	max. permissible reworking dimension
c	mm	1,5…1,7
Z		Bottom edge of cylinder head
α		45° valve seat angle
β		30° top correction angle
γ		60° bottom correction angle
S		Combustion chamber surface area

For engines with identification characters BME, BZG, CGPA, CGPB, CEVA, CJLA

Dimension		Inlet valve seat
∅ a	mm	28,7
b	mm	max. permissible reworking dimension
c	mm	1,5…1,8
Z		Bottom edge of cylinder head
α		45° valve seat angle
β		30° top correction angle
γ		60° bottom correction angle
S		Combustion chamber surface area

3.3.2 Reworking exhaust valve seat



For engines with identification characters BBM, CHFA

Dimension		Exhaust valve seat
∅ a	mm	27,1
b	mm	max. permissible reworking dimension
c	mm	1,6…1,8
Z		Bottom edge of cylinder head
α		45° valve seat angle
β		30° top correction angle
γ		60° bottom correction angle
S		Combustion chamber surface area

For engines with identification characters BME, BZG, CGPA, CGPB, CEVA, CJLA, CGPC

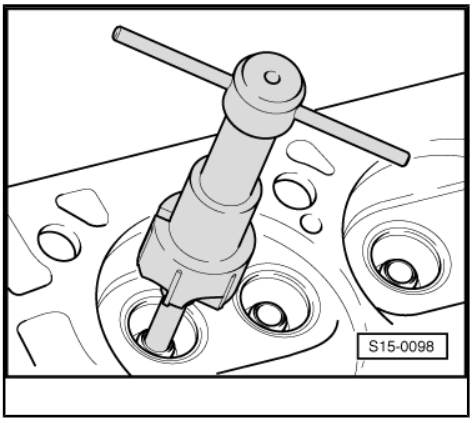
Dimension		Exhaust valve seat
∅ a	mm	25,0
b	mm	max. permissible reworking dimension
c	mm	approx. 1.8
Z		Bottom edge of cylinder head
α		45° valve seat angle
β		30° top correction angle
γ		60° bottom correction angle
S		Combustion chamber surface area

Work procedure

Reworking can be carried out by hand while complying with the following conditions:

- Wear limit of valve guides must not exceed the permissible dimension ⇒ page 64 .
- Use NAC milling cutter with carbide metal tips (min. 90 HRC).
- Mill with the milling cutter using slight pressure in such a way that an even removal of swarfs is ensured over the whole working surface.

3.3.3 Reworking valve seats with NAC milling cutter



– Place cylinder head on a felt base and secure to prevent it from turning.

– Match diameter of guide drift to diameter of valve guide.

Valve guide	Ø Guide drift in mm
Inlet valve	6,0 -0,01
Exhaust valve	

– Match diameter of milling cutter to diameter of valve seat.

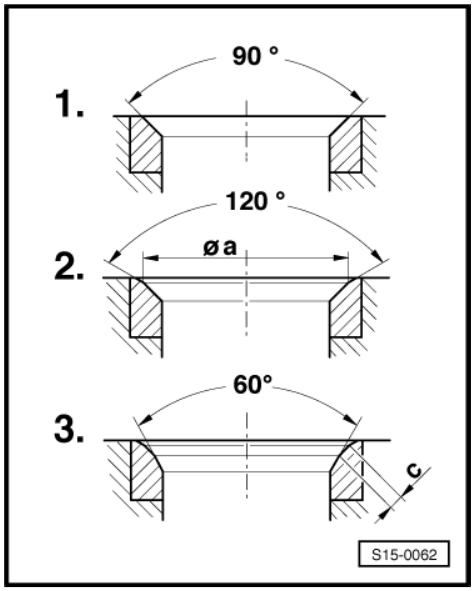
Valve seat		Ø Milling cutter 90° mm	Ø Milling cutter 120° mm	Ø Milling cutter 60° mm
Inlet valve	Engine BBM, CHFA	36	38	21/34
	Engine with identification characters BME, BZG, CGPA, CGPB, CEVA, CJLA, CGPC	32	32	21/34
Exhaust valve	Engine BBM, CHFA	30	30	21/34
	Engine with identification characters BME, BZG, CGPA, CGPB, CEVA, CJLA, CGPC	30	30	21/34

Milling sequence

1 - Mill valve seat with 90° milling cutter until a perfect contact pattern is achieved. (Do not exceed maximum permissible re-working dimension!)

2 - Chamfer top correction angle with 120° milling cutter until the valve seat diameter -a- (⇒ page 67) is achieved.

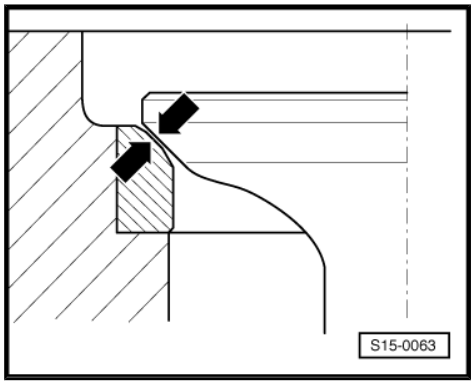
3 - Mill bottom correction angle with 60° milling cutter until valve seat width -c- (⇒ page 67) is achieved.



– Grind in valve/valve seat with fine grinding paste so as to achieve a perfect contact pattern -arrows-.
– Check contact pattern e.g. with water colour (perfect contact pattern over entire circumference).
– Install valve springs.
– Inspect valves for tightness.

The tightness of the valves can be checked by filling petrol into the inlet and outlet canal (no petrol must flow out at the valve seat).

After the repair measure the dimension -h- again and calculate the maximum permissible reworking dimension ⇒ page 65 .



Note

If the reworking dimension is exceeded, proper operation of the valve gear is no longer assured and the cylinder head must be replaced.

17 – Lubrication

1 Removing and installing parts of the lubrication system - Part 1

1.1 Summary of components

Note

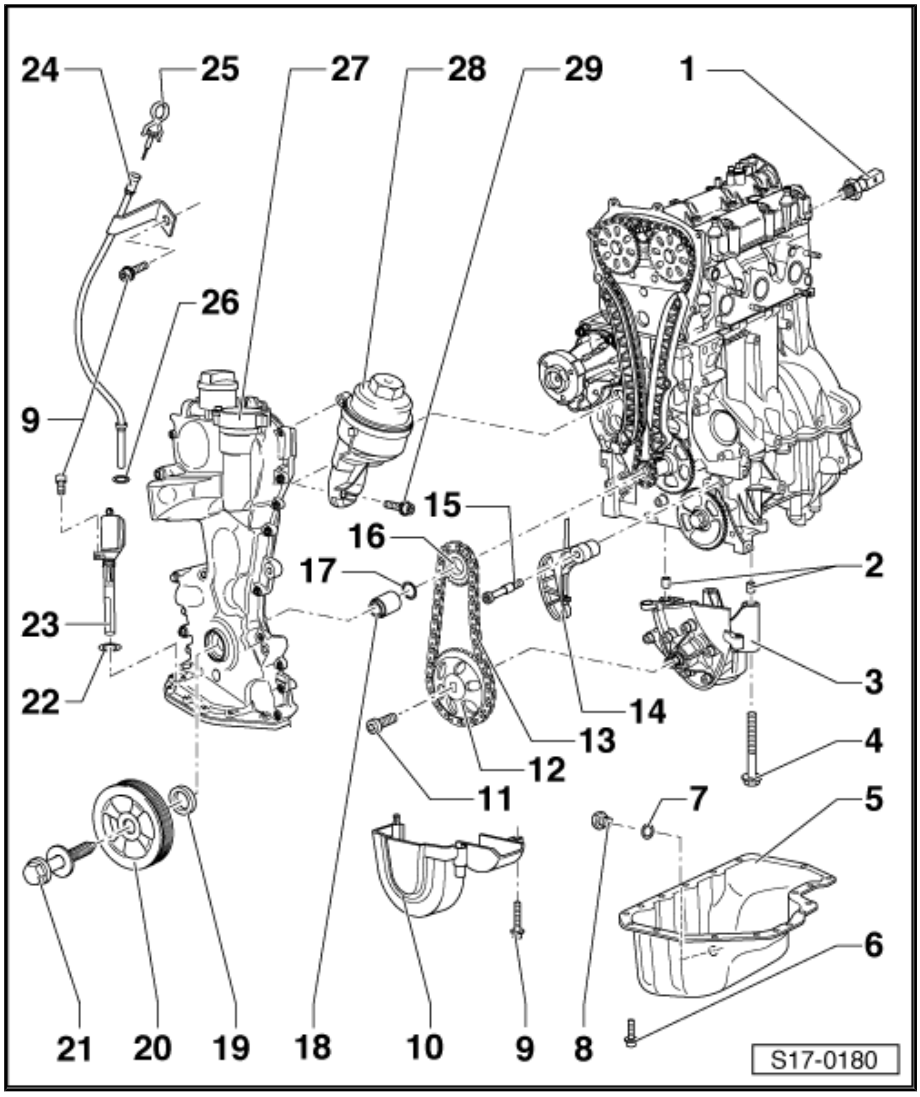
- *If considerable quantities of metal swarf or abrasion (caused by rubbing damage such as damage to the crankshaft and conrod bearings) is found in the engine when carrying out engine repairs, it is necessary to determine the cause of the rubbing damage and replace the damaged parts, then carefully clean the oil galleries in order to avoid consequential damage.*
- *The oil level must lie between the markings and not be above the max. marking - over-filling may result in damage to the catalytic converter!*

Check the oil level, oil capacity, oil specification:

- ⇒ Maintenance ; Booklet Fabia II .
- ⇒ Maintenance ; Booklet Roomster .
- ⇒ Maintenance ; Booklet Rapid NH .

Note

The illustration shows the twelve-valve engine with the identification characters BME, BZG, CEVA, CGPA, CLJA, CGPB, CGPC. Tightening torques and mounting instructions are also valid for six-valve engines with identification characters BBM, CHFA.



1 - Oil pressure switch -F1- , 25 Nm

- ❑ 0.045 MPa (0.45 bar)
- ❑ green insulation
- ❑ check ⇒ page 79
- ❑ Cut open gasket ring if leaking and replace

2 - Dowel sleeves

3 - Oil pump

- ❑ with the overpressure valve
- ❑ removing and installing ⇒ page 77

4 - 24 Nm

5 - Oil pan

- ❑ removing and installing ⇒ page 76
- ❑ clean sealing surface before installing
- ❑ before installing apply silicone sealant ⇒ ET-KA - Electronic catalogue of original parts

6 - 9 Nm

7 - Sealing ring

- ❑ replace

8 - Drain plug, 30 Nm

9 - 8 Nm

10 - Cover

- ❑ for oil pump chain

11 - 20 Nm + torque a further 90° (1/4 turn)

- ❑ replace

12 - Oil pump sprocket

- ❑ Check fitting position

13 - Oil pump chain

14 - Chain tensioner for the oil pump drive

15 - Guide bolt, 15 Nm

- ❑ for chain tensioner for the oil pump drive

16 - Chain sprocket on the crankshaft for the oil pump drive

- ❑ not interlocked on the crankshaft

17 - O-ring

- ❑ replace if damaged
- ❑ replace the sealing of the housing with silicone sealant

18 - Housing

- ❑ replace together with O-ring (Pos. 17)
- ❑ fit onto cleaned crankshaft
- ❑ install only after putting the timing case in place, otherwise the gasket ring can be damaged

19 - Sealing ring

- ❑ replace if damaged ⇒ page 41
- ❑ replace together with housing (Pos. 18)
- ❑ for crankshaft on the belt pulley side
- ❑ Neither grease nor oil sealing lip of gasket ring
- ❑ before installing remove grease residue on the housing with a clean cloth

20 - Belt pulley - crankshaft

21 - 150 Nm + torque a further 180° ($^1/_2$ turn)

- ❑ replace
- ❑ interlock the crankshaft with fixing bolt -T10121- for removing and installing ⇒ page 33

22 - O-ring

- ❑ replace if damaged

23 - Oil level and oil temperature sender -G266-

- ❑ only for vehicles with WIV
- ❑ check ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

24 - Guide tube

25 - Dipstick

- ❑ the oil level must not be above the “max” marking!
- ❑ Inspecting engine oil level:

♦ ⇒ Maintenance ; Booklet Fabia II

♦ ⇒ Maintenance ; Booklet Roomster

♦ ⇒ Maintenance ; Booklet Rapid NH .

26 - Sealing ring

- ❑ replace if damaged

27 - Timing case

- ❑ removing and installing ⇒ page 27

28 - Oil filter

- ❑ removing and installing oil filter insert ⇒ page 74
- ❑ disassembling and assembling ⇒ page 74

29 - 24 Nm

1.1.1 Oil filter - Summary of components

1 - Screw plug, 25 Nm
- ❑ with oil filter insert holder
- ❑ do not separate

2 - Sealing ring
- ❑ replace
- ❑ delivered with the oil filter insert

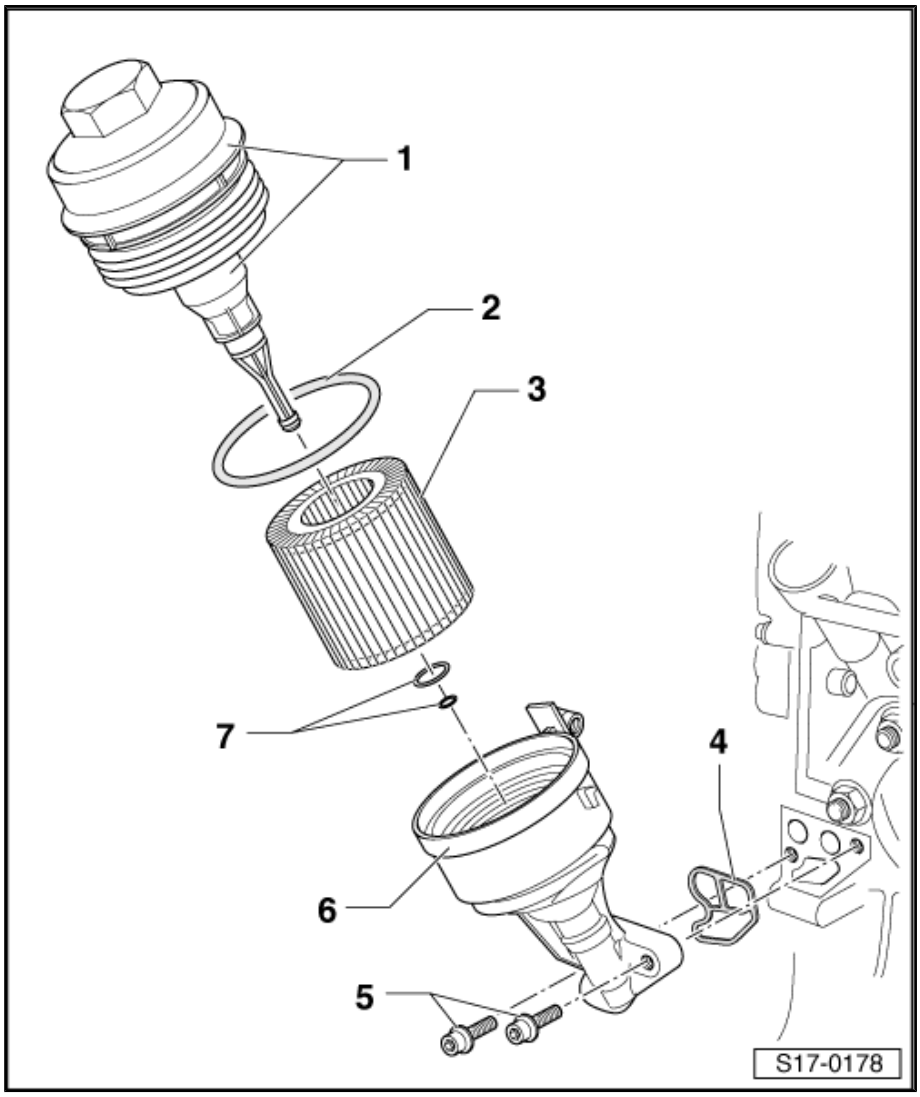
3 - Oil filter element
- ❑ removing and installing ⇒ page 74

4 - Gasket
- ❑ replace if damaged

5 - 24 Nm

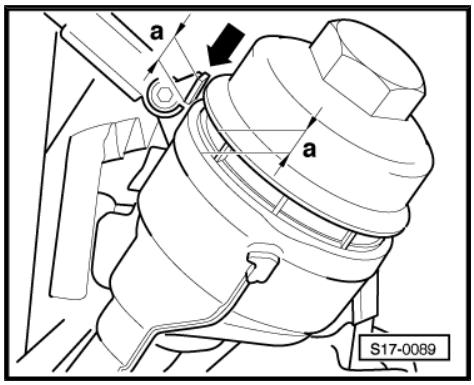
6 - Oil filter housing

7 - O-rings
- ❑ replace if damaged



1.1.2 Removing and installing oil filter insert

– Screw out the screw plug from the nose elevation -a- -arrow- (or by 3 turns, if the nose is no longer present) and leave in this position for at least one minute to allow the oil to run out of the oil filter insert.



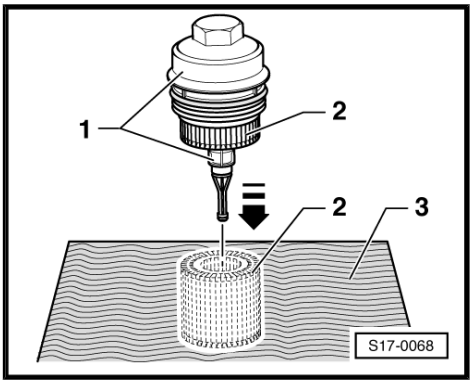
Note

If the screw plug is removed completely without waiting a while the oil will flow into the DC generator.

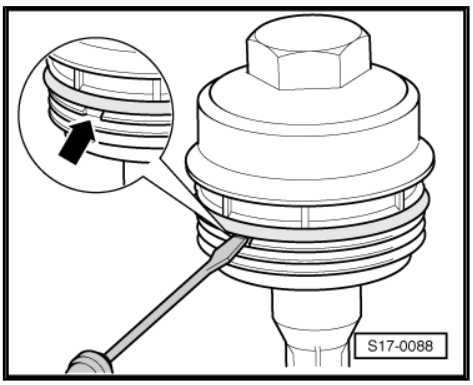
– Remove the screw plug with the oil filter insert holder.

– Lightly knock the screw plug with the oil filter insert holder -1- on a fixed base -3- (e.g. wooden plate) -arrow-.

  This loosens the oil filter insert -2-.



– Place the screwdriver carefully in the groove -arrow- of the screw plug and plug off the O-ring.
– Insert the new O-ring.
– Insert the new oil filter insert and tighten screw plug to 25 Nm.



2 Removing and installing parts of the lubrication system - Part 2

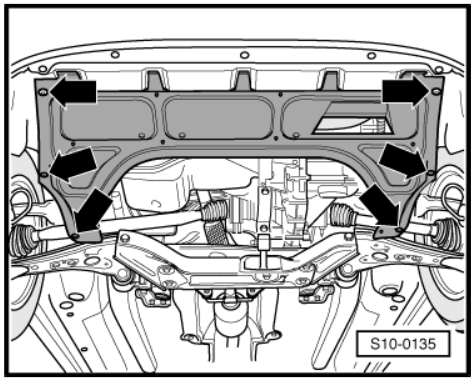
2.1 Removing and installing oil pan

Special tools and workshop equipment required

- Silicone sealant ⇒ ETKA - Electronic catalogue of original parts
- Sealant remover gasket stripper (bearing code GST, bearing article no. R 34402), manufacturer Retech s.r.o.
- Cleaning and degreasing agent , e.g. -D 009 401 04-
- Protective goggles and gloves

Removing

– Remove noise insulation -arrows-.



– Drain engine oil:

- ⇒ Maintenance ; Booklet Fabia II .
- ⇒ Maintenance ; Booklet Roomster .
- ⇒ Maintenance ; Booklet Rapid NH .

– Release the oil pan's fixing screws.

– Separate oil pan, if necessary loosen the oil pan by applying slight blows with a rubber-headed hammer.

WARNING

Wear protective gloves and goggles when working with gasket remover and degreasing agent!

Carefully remove the remaining sealant on the cylinder block and on the oil pan with sealant remover.

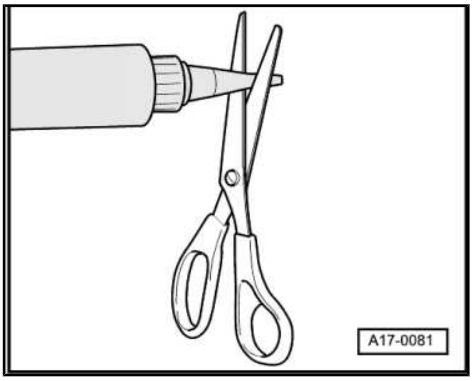
Degrease the sealing surfaces on the cylinder block and on the oil pan.

Install

Note

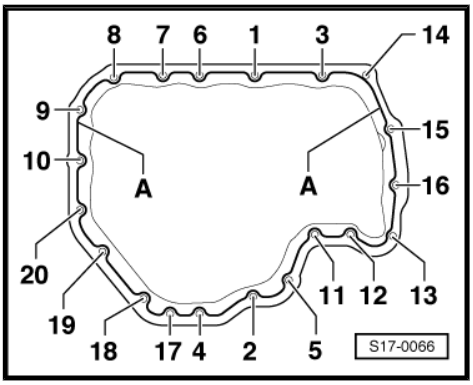
- *Pay attention to the use by date on sealant.*
- *The oil pan must be installed within 5 minutes after applying the silicone sealant.*

– Cut off nozzle tube at the front marking (∅ of nozzle approx. 3 mm).



– Apply silicone sealant -A- to the clean sealing surface of the oil pan, as shown in the illustration.

♦ Thickness of sealant bead: 2…4 mm



Note

The sealant bead must not be thicker than 4 mm otherwise excess sealant may get into the oil pan and clogg the oil pump strainer.

– Fit oil pan immediately and lightly tighten all bolts.

– Tighten all bolts fully in the given sequence:

Tightening torque: 9 Nm.

Note

After installing the oil pan, allow the sealant to dry for at least 30 minutes. Only then may engine oil be filled in.

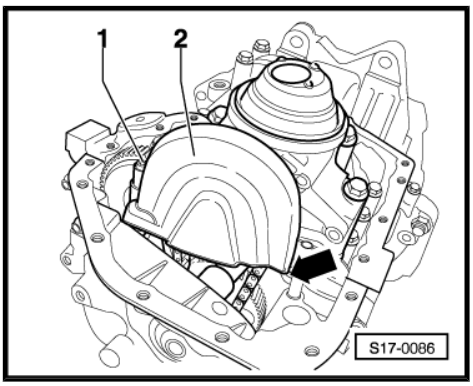
Further installation occurs in reverse order.

2.2 Removing and installing oil pump

Removing

– Removing the oil pan ⇒ page 76 .

– Screw out screw -1- and unclip the chain guard for the oil pump -2- in the area of -arrow-.

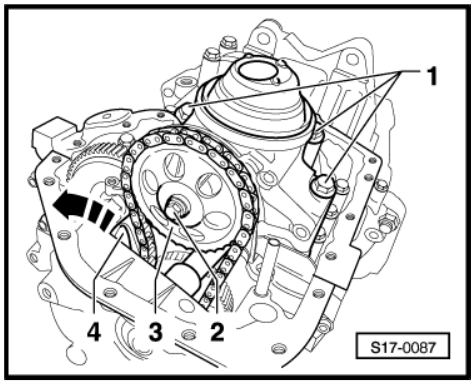


– Release screw -2-.

– Swing the chain tensioner for the oil pump drive -4- in the -direction of the arrow- and remove the sprocket for the oil pump from the oil pump.

  The sprocket for the oil pump stays in the chain for the oil pump.

– Screw out screws -1- and remove the oil pump from the cylinder block.



Install

Installation is carried out in the reverse order. Pay attention to the following:

- The oil pump must sit in the sleeves then tighten to 24 Nm.
- Replace the sprocket screw for the oil pump, tightening torque: 20 Nm + torque a further + 90° ($^1/_4$ turn).

3 Testing oil pressure and oil pressure switch

Special tools and workshop equipment required

- Oil pressure tester , e.g. -V.A.G 1342-
- Voltage tester , e. g. -V.A.G 1527 B-
- Adapter cable set , e.g. -V.A.G 1594 A- or -V.A.G 1594 C-
- Current flow diagram

Function of dynamic oil pressure warning system if oil pressure low

The oil pressure switch is opened when pressureless and closed when the switching pressure is reached.

The oil pressure warning is activated for about 10 seconds after the ignition is switched on (“terminal 15 on”).

Activation delay of oil pressure warning system: approx. 3 s.

De-activation delay of oil pressure warning system: approx. 5 s.

Test pressure warning light

After the ignition is switched on and the engine is not running, the oil pressure warning light in the dash panel insert must come on for about 3 s and then go out. The check is ended when the engine is started.

Warning criteria

The visual oil pressure warning is switched on (oil pressure warning light flashes) and the warning buzzer sounds 3 times as an audible warning if at least one of the following conditions exists:

- “Ignition on”, engine not running, oil pressure switch closed.
- Engine speed greater than 1500 rpm, oil pressure switch open

– At an engine speed above 5000 rpm, the oil pressure warning is also not cancelled if the oil pressure switch is closed. The oil pressure warning is cancelled once engine speed is below 5000 rpm.

– If the oil pressure switch is opened for only 0.5…3 seconds at an engine speed of more than 1500 rpm, this is stored in the dash panel insert. If this situation occurs 3 times when the engine is running, the oil pressure warning is immediately activated and is also not cancelled below 1500 rpm. The oil pressure warning is cancelled if the oil pressure switch is closed for more than 5 s at a speed of more than 1500 rpm, or at “Ignition off”.

Test conditions

- Oil pressure warning light -K3- must come on for about 3 seconds when the ignition is switched on.
- Engine oil temperature at least 80 °C (radiator fan must have run at least once).
- Engine oil level o.k., test:

  ⇒ Maintenance ; Booklet Fabia II .

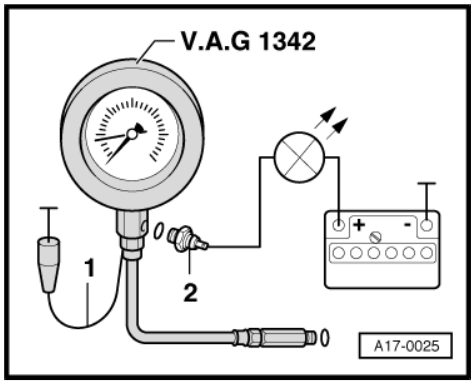
  ⇒ Maintenance ; Booklet Roomster .

  ⇒ Maintenance ; Booklet Rapid NH .

Testing oil pressure switch

– Detach cable from oil pressure switch.

– Unscrew oil pressure switch and screw in oil pressure tester , e.g. -V.A.G 1342- -V.A.G 1342- .
– Screw oil pressure switch -2- into the test equipment -V.A.G 1342- .
– Connect brown cable -1- of tester to earth (-).
– Connect voltage tester , e.g. -V.A.G 1527 B- , to oil pressure switch -2- and to battery positive (+).



The LED must not light up. If the LED lights up:

– Replace oil pressure switch.
– Start engine and slowly increase engine speed.
– Given an oil pressure of 0.03…0.06 MPa (0.3…0.6 bar) the LED must light up, otherwise replace the oil pressure switch.

Testing oil pressure

– Unscrew oil pressure switch and -V.A.G 1342- scew in.
– Screw oil pressure switch into -V.A.G 1342- .
– Start engine (engine oil temperature at least 80°C).
• Oil pressure at 2000 rpm: min. 0,2 MPa (2 bar).
• At a higher engine speed the oil pressure must not be greater than 0,6 MPa (6 bar).

If the specified value is not reached:

– Eliminate any mechanical damage, e. g. bearing damage.
– Replace oil pump with pressure relief valve ⇒ page 77 .

If the specified pressure is exceeded:

– Inspect oil galleries.
– Replace the oil pump with the pressure relief valve as required ⇒ page 77 .

19 – Cooling

1 Cooling system - Summary of components

Note

- *Let the engine cool down before the repair or reduce the pressure by carefully opening the overpressure lock at the expansion reservoir.*
- *The hose connections are secured with spring-type clips. In the event of repairs only use spring-type clips.*
- *Use pliers for spring strap clips for installing the spring strap clips.*
- *Always replace seals and gasket rings.*
- *When installing fit the coolant hoses free of stress, without them touching any other components (pay attention to the marking on the coolant connection and hose).*

Parts of the cooling system fitted to body ⇒ page 82 .

Parts of cooling system on the side next the engine ⇒ page 86 .

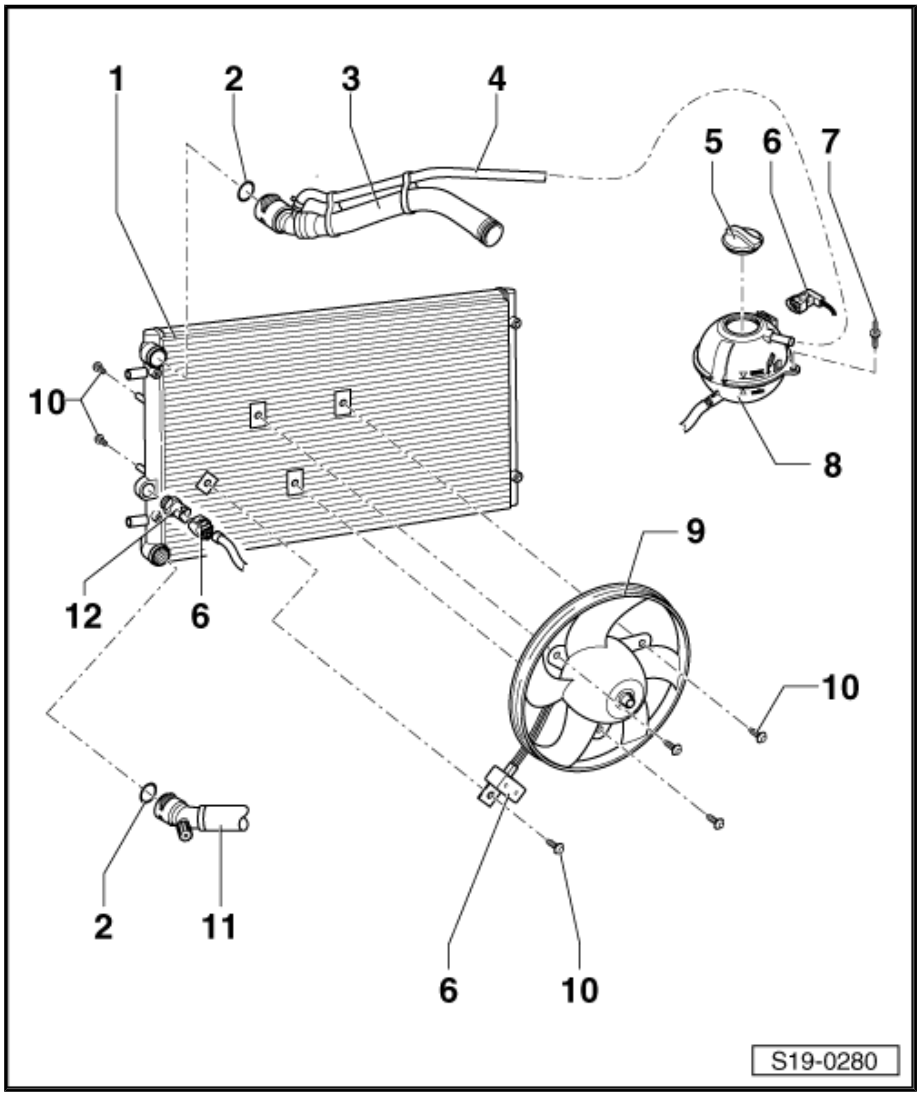
Connection diagram for coolant hoses:

- Fabia II ⇒ page 87 .
- Roomster, Rapid NH ⇒ page 88 .

Draining and filling up coolant ⇒ page 90 .

1.1 Parts of the cooling system fitted to body

1.1.1 Vehicles without air conditioning system - Summary of components



1 - Radiator

- ❑ only complete with radiator fan
- ❑ removing and installing ⇒ page 95
- ❑ after replacing fill entire system with fresh coolant

2 - O-ring

- ❑ replace if damaged

3 - Top coolant hose

- ❑ To connection fitting at cylinder head

4 - Coolant hose

- ❑ to the expansion reservoir

5 - Screw cap

6 - Connector

7 - Double screw, 2 Nm

8 - Expansion reservoir

- ❑ with coolant shortage warning light sender - G32-
- ❑ Check the cooling system for tightness ⇒ page 92

- ♦ Fabia II ⇒ page 87
- ♦ Roomster, Rapid NH ⇒ page 88

9 - Radiator fan -V7-

- ❑ with radiator fan control unit -J293-

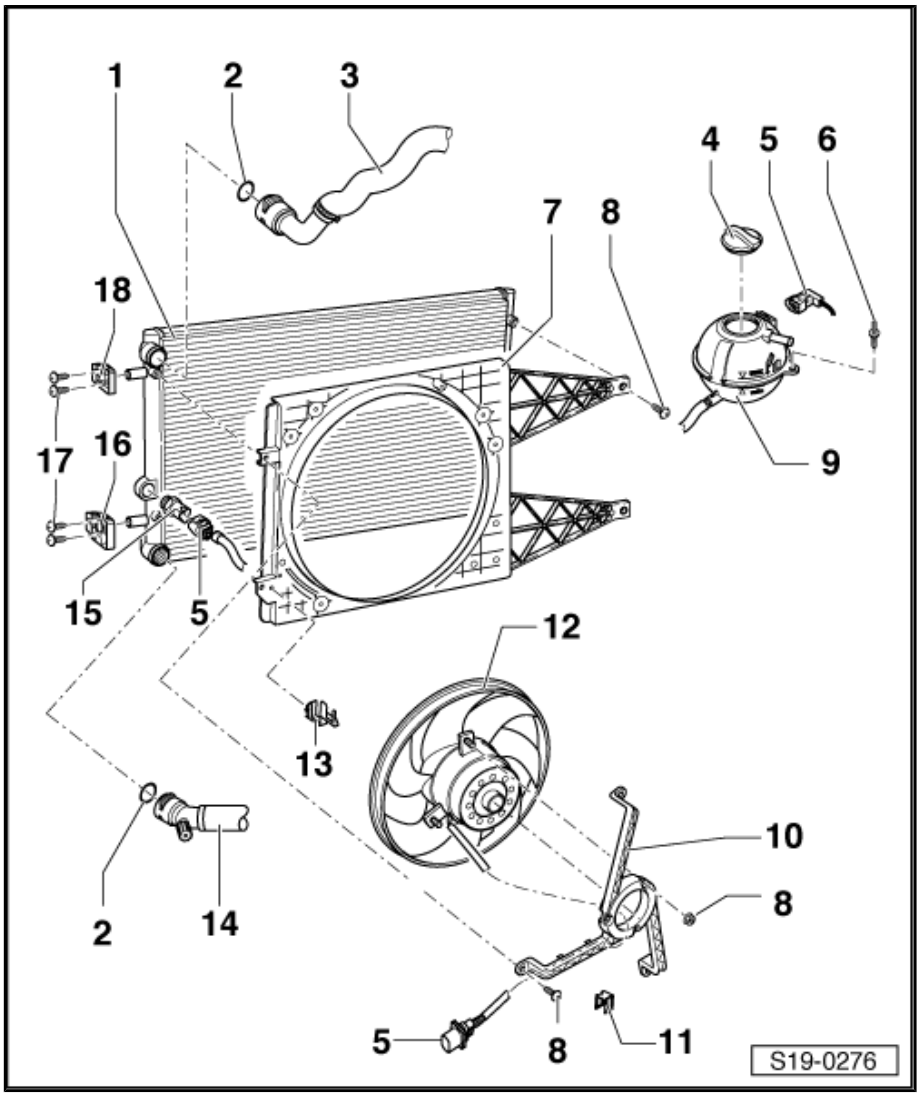
10 - 5 Nm

11 - Bottom coolant hose

- ❑ check tightness

12 - Thermo-switch for radiator fan -F18- , 35 Nm

1.1.2 Vehicles with air conditioning system up to 03.10 - Summary of components



1 - Radiator

- ❑ removing and installing ⇒ page 95
- ❑ after replacing fill entire system with fresh coolant

2 - O-ring

- ❑ replace

3 - Top coolant hose

- ❑ attached to radiator by retaining clips
- ❑ Connection diagram for coolant hoses:

♦ Fabia II ⇒ page 87

♦ Roomster, Rapid NH ⇒ page 88

4 - Screw cap

- ❑ with the overpressure valve
- ❑ check ⇒ page 92

5 - Connector

6 - Double screw, 2 Nm

7 - Fan shroud

- ❑ The fan shroud may have another shape depending on the version of the vehicle

8 - 5 Nm

9 - Expansion reservoir

- ❑ with coolant shortage warning light sender - G32-
- ❑ Check the cooling system for tightness ⇒ page 92
- ❑ Connection diagram for coolant hoses:

♦ Fabia II ⇒ page 87

♦ Roomster, Rapid NH ⇒ page 88

10 - Fan holder

11 - Retaining clip

- ❑ for fan cable

12 - Radiator fan -V7-

13 - Support

- ❑ for plug of fan

14 - Bottom coolant hose

- ❑ with drain valve
- ❑ Connection diagram for coolant hoses:

♦ Fabia II ⇒ page 87

♦ Roomster, Rapid NH ⇒ page 88

15 - Thermo-switch for radiator fan -F18- , 35 Nm

- ❑ with 3-pin plug
- ❑ switching temperatures:

1. Stage
- ♦ on: 92...97°C
- ♦ off: 84...91°C

2. Stage
- ♦ on: 99...105°C
- ♦ off: 91...98°C

16 - Bottom radiator bearing

- ❑ black

17 - 5 Nm

18 - Top radiator bearing

- ❑ white

1.1.3 Vehicles with air conditioning system as of 04.10 - Summary of components

1 - Coolant hose

- ❑ from the expansion reservoir

2 - Expansion reservoir

- ❑ Check the cooling system for tightness ⇒ page 92
- ❑ Connection diagram for coolant hoses:

- ♦ Fabia II ⇒ page 87
- ♦ Roomster, Rapid NH ⇒ page 88
  - ❑ with coolant shortage warning light sender - G32-

3 - Screw cap

- ❑ with the overpressure valve
- ❑ check ⇒ page 92

4 - Clamp

5 - Connector

6 - Retaining clip

7 - Support

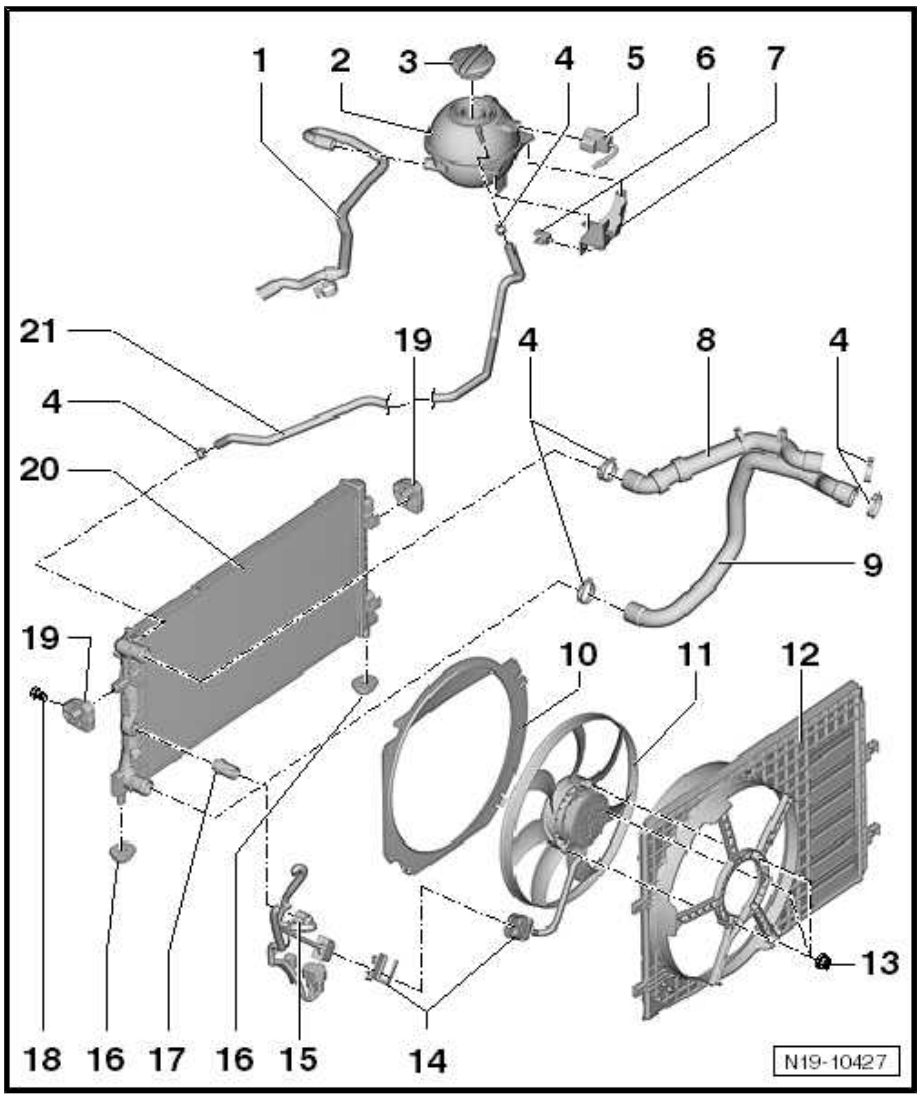
8 - Top coolant hose

- ❑ Connection diagram for coolant hoses:

- ♦ Fabia II ⇒ page 87
- ♦ Roomster, Rapid NH ⇒ page 88

9 - Bottom coolant hose

- ❑ Connection diagram for coolant hoses:



- Fabia II ⇒ page 87
- Roomster, Rapid NH ⇒ page 88

10 - Intermediate plate for fan

11 - Radiator fan -V7-

12 - Fan shroud

13 - 10 Nm

14 - Support

- for plug of fan

15 - Connector

- to thermoswitch for radiator fan -F18-

16 - Bottom radiator bearing

17 - Thermo-switch for radiator fan -F18- , 35 Nm

- with 3-pin plug
- switching temperatures:

1. Stage
- on: 92...97°C
- off: 84...91°C

2. Stage
- on: 99...105°C
- off: 91...98°C

18 - 10 Nm

19 - Top radiator bearing

20 - Radiator

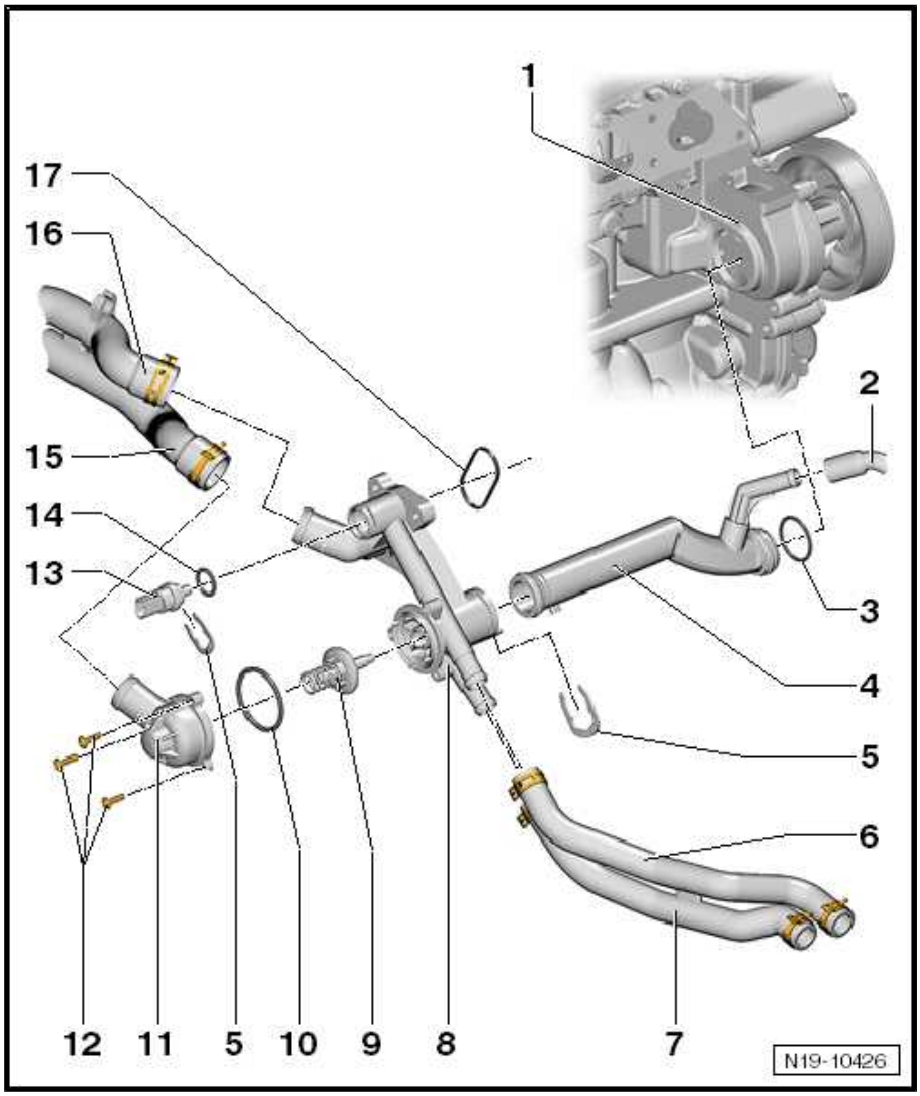
- removing and installing ⇒ page 95
- after replacing fill entire system with fresh coolant ⇒ page 90

21 - Coolant hose

- to the expansion reservoir

1.2 Parts of cooling system engine side

1.2.1 Coolant regulator - Summary of components



1 - Cooling pump housing at cylinder block

2 - Coolant hose

- ❑ to the expansion reservoir

3 - O-ring

- ❑ replace if damaged

4 - Coolant pipe

5 - Retaining clip

6 - to connection fitting on the heat exchanger

- ❑ connection on the duct on the right (in the direction of travel)
- ❑ connection diagram for coolant hoses ⇒ page 87

7 - from connection fitting on the heat exchanger

- ❑ connection on the duct on the left (in the direction of travel)
- ❑ connection diagram for coolant hoses ⇒ page 87

8 - Coolant regulator housing

- ❑ Tightening torque of screws for coolant regulator housing: 10 Nm

9 - Coolant regulator

- ❑ check: heat up regulator in a water bath
- ❑ Start of opening approx. 84 °C
- ❑ End of opening: approx. 98 °C
- ❑ Opening stroke: at least 7 mm

10 - O-ring

- ❑ replace if damaged

11 - Cover for coolant regulator housing

12 - 9 Nm

13 - Coolant temperature sender -G62-

14 - O-ring

- ❑ replace if damaged

15 - from bottom radiator connection

- ❑ connection diagram for coolant hoses ⇒ page 87

16 - to top radiator connection

- ❑ connection diagram for coolant hoses ⇒ page 87

17 - O-ring

- ❑ replace if damaged

1.2.2 Coolant pump - Summary of components

1 - 22 Nm

- ❑ Hold the belt pulley with V-ribbed belt attached for loosening and fixing it

2 - Belt pulley

- ❑ for the V-ribbed belt

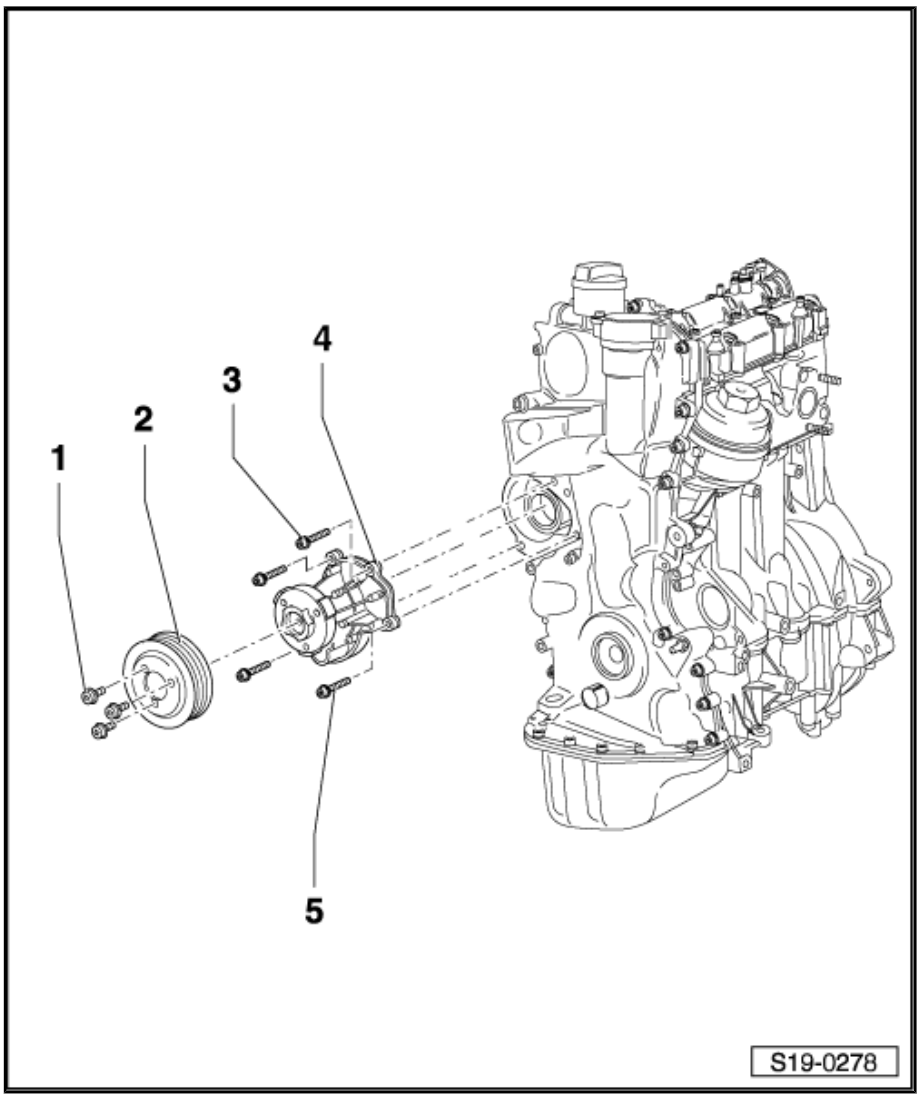
3 - 24 Nm

4 - Coolant pump

- ❑ check smooth operation
- ❑ Inspect the plastic rotor for tears
- ❑ the pump should be replaced completely if the seal on it is damaged
- ❑ removing and installing ⇒ page 96

5 - 24 Nm

- ❑ do not mix up with other screws
- ❑ cement should be spread on the thread



1.3 Connection diagram for coolant hoses

Fabia II

1 - Expansion reservoir

2 - Inlet

3 - Heat exchanger

4 - Radiator

- ❑ after replacing fill entire system with fresh coolant
- ❑ removing and installing ⇒ page 95

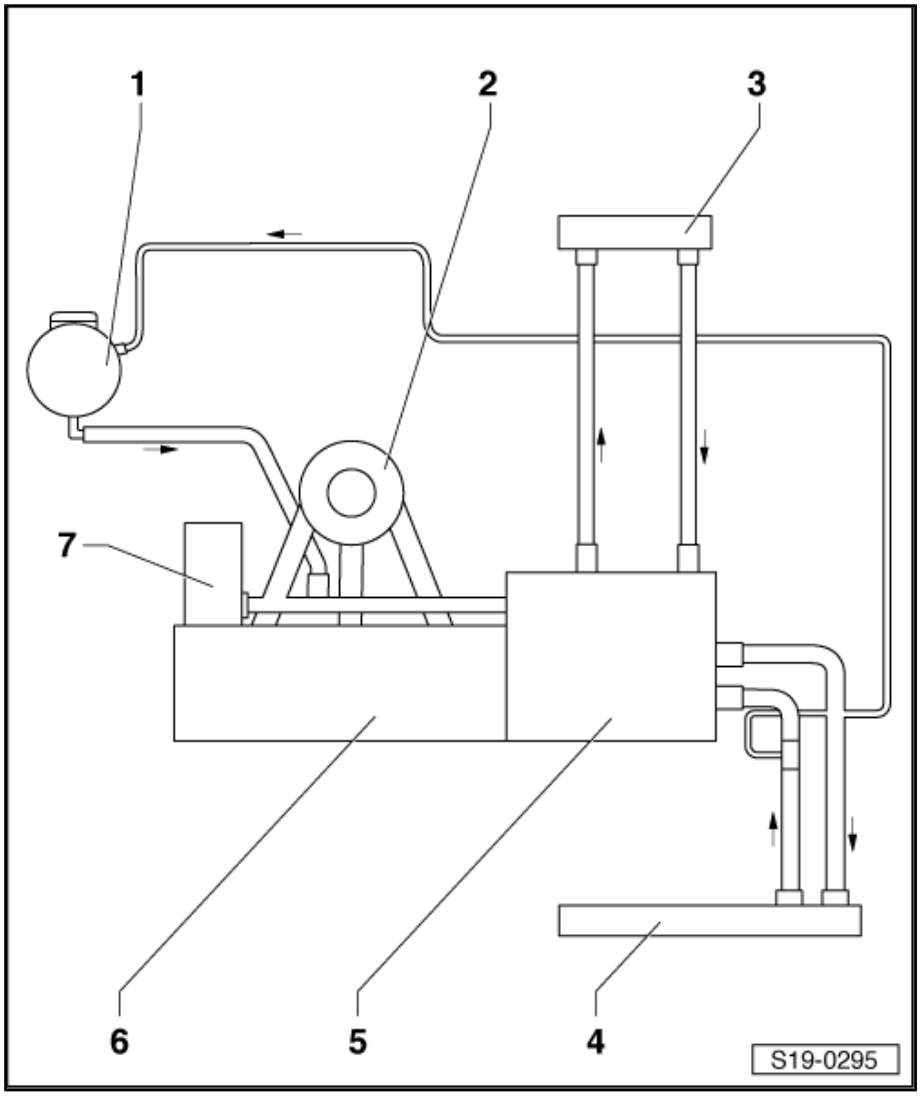
5 - Coolant regulator housing

- ❑ with coolant regulator
- ❑ removing and installing ⇒ page 86

6 - Crankcase

7 - Coolant pump

- ❑ removing and installing ⇒ page 96
- ❑ check smooth operation



1.4 Connection diagram for coolant hoses

Roomster, Rapid NH

1 - Radiator

- ❑ after replacing fill entire system with fresh coolant
- ❑ removing and installing ⇒ page 95

2 - Ventilation tube

3 - Crankcase

4 - Coolant pump

- ❑ removing and installing ⇒ page 96
- ❑ check smooth operation

5 - Expansion reservoir

6 - Coolant pipe

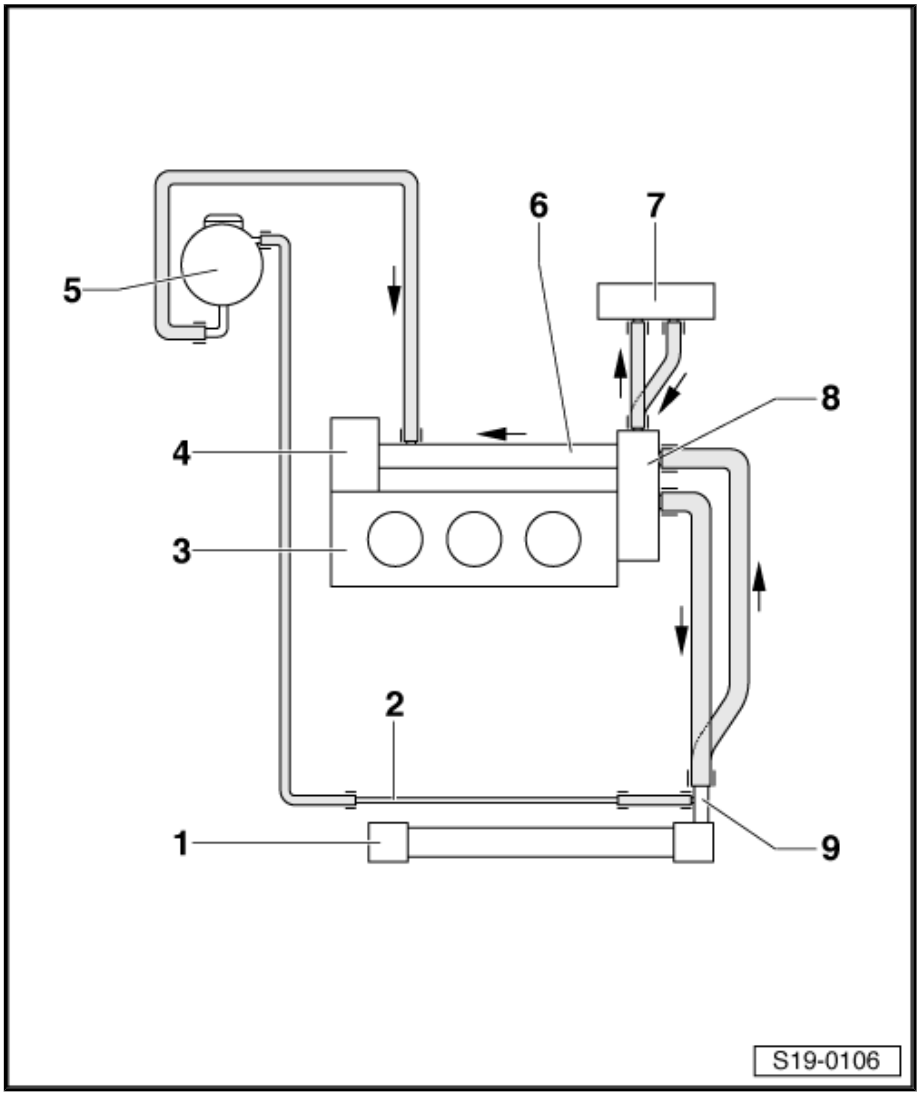
7 - Heat exchanger

8 - Coolant regulator housing

- ❑ with coolant regulator
- ❑ removing and installing ⇒ page 86

9 - Quick coupling

- ❑ for radiator connections
- ❑ replace the gaskets if damaged then wet with coolant additive before inserting



2 Removing and installing parts of the cooling system - Part 1

2.1 Draining and filling up coolant

Special tools and workshop equipment required

- Catch pan , e.g. -VAS 6208-
- Pliers for spring strap clamps
- Refractometer

Draining

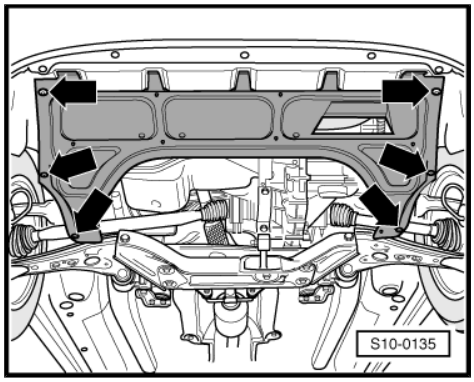
Note

- *Collect drained coolant in a clean container for reuse or proper disposal.*
- *Observe the disposal instructions.*

WARNING

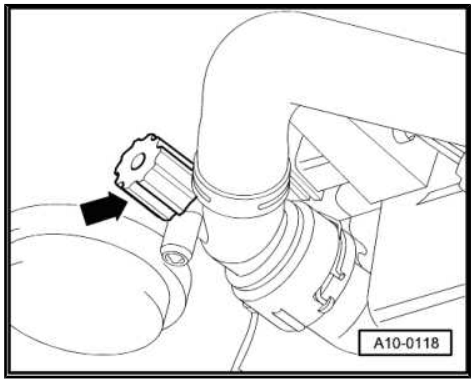
Hot steam may escape when the compensation bottle is opened. Wear safety goggles and safety clothing, in order to avoid eye injuries and scalding. Cover the cap with a cloth and open carefully.

– Open the cap of the coolant expansion reservoir.
– Remove noise insulation -arrows-.
– Position the catch pan , e.g. -VAS 6208- , under the engine.



For vehicles with drain plug

– Turn the drain plug -arrow- on the radiator to the left and to the rear; fit auxiliary hose onto connection if necessary.

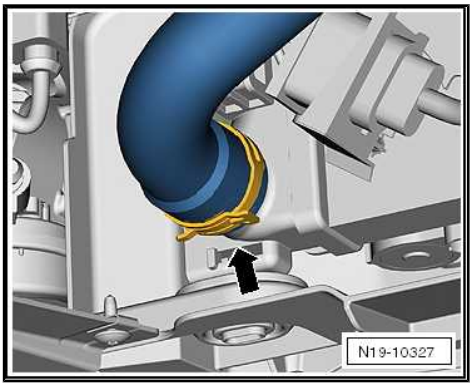


Note

Observe the disposal instructions for coolant.

For vehicles without drain plug

– Open spring strap clamp -arrow- and detach coolant hose from radiator.



Note

Observe the disposal instructions for coolant.

Continued for all vehicles

Filling up

Select the appropriate coolant additive from the ⇒ Electronic Catalogue of Original Parts :

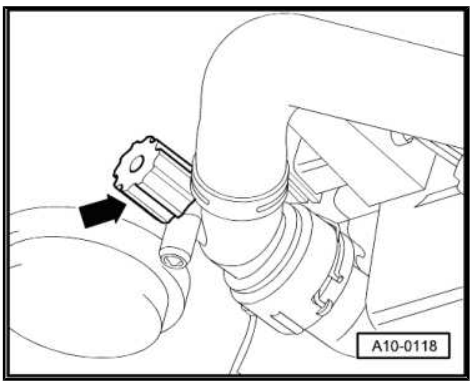
- ⇒ Maintenance ; Booklet Fabia II .
- ⇒ Maintenance ; Booklet Roomster .
- ⇒ Maintenance ; Booklet Rapid NH .

– In a clean reservoir mix water and coolant additive in the specified mixing ratio:

- ⇒ Maintenance ; Booklet Fabia II .
- ⇒ Maintenance ; Booklet Roomster .
- ⇒ Maintenance ; Booklet Rapid NH .

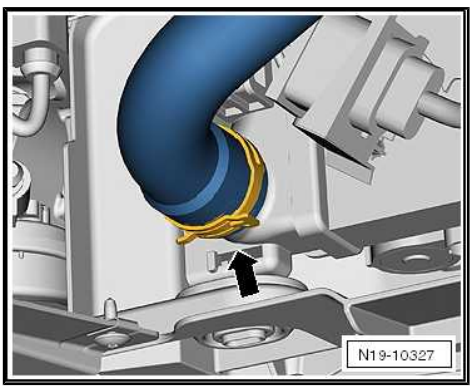
For vehicles with drain plug

– Insert and tighten the coolant drain plug.



For vehicles without drain plug

– Connect the removed coolant hose.



Continued for all vehicles

– Remove the coolant temperature sender attached to the coolant regulator housing.

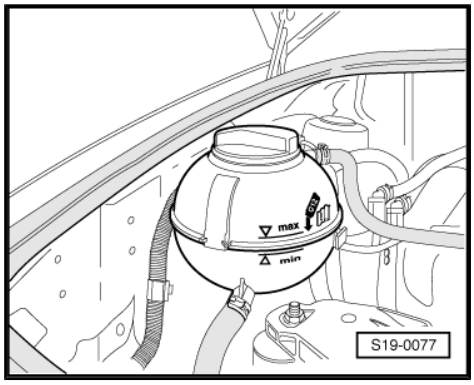
– Fill up coolant gradually until it is visible in the opening for the coolant temperature sender.

– Install coolant temperature sender

– Fill up coolant gradually up to the “max” marking on the compensation bottle.

– Seal expansion reservoir.

– Run engine until fan starts.



WARNING

Hot steam may escape when the compensation bottle is opened. Wear safety goggles and safety clothing, in order to avoid eye injuries and scalding. Cover the cap with a cloth and open carefully.

– Check the level of coolant and top up if necessary. When engine is at operating temperature the coolant level must be at the “max” marking, when engine is cold it must be between the “min” and “max” markings.

2.2 Checking the coolant system for leak-tightness

2.2.1 Inspecting coolant system with cooling system testing device -V.A.G 1274- for tightness

Special tools and workshop equipment required

- Cooling system testing device , e.g. -V.A.G 1274-
- Adapter for cooling system testing device , e.g. -V.A.G 1274/8-
- Adapter for cooling system testing device , e.g. -V.A.G 1274/9-

Test condition

- Engine is at operating temperature.

Test sequence

WARNING

Hot steam may escape when the compensation bottle is opened.

- *Wear safety goggles and safety clothing, in order to avoid eye injuries and scalding.*
- *Cover the cap with a cloth and open carefully.*

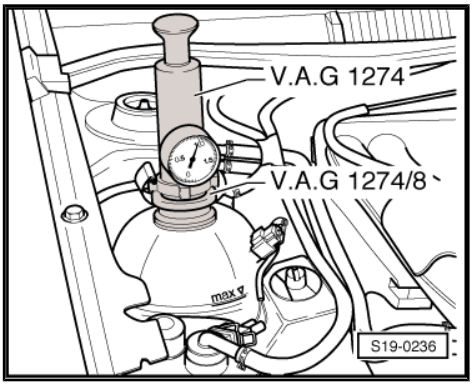
– Open compensation bottle.

– Position the cooling system testing device -V.A.G 1274- with adapter -V.A.G 1274/8- on the coolant expansion reservoir.

– Using the hand pump of the testing device generate an over-pressure of approx. 0,1 MPa (1,0 bar).

If the pressure drops:

– Search position of the leak and repair fault.



Testing the pressure relief valve in the cap

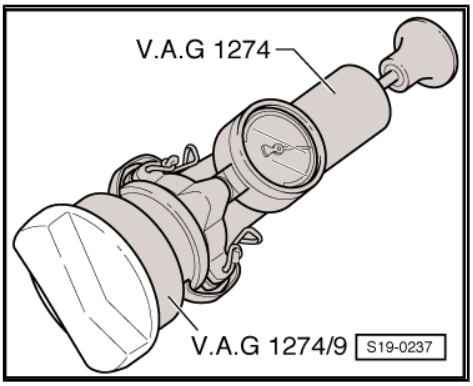
– Position the cooling system testing device -V.A.G 1274- with adapter -V.A.G 1274/9- on the cap.

– Operate the handpump.

• The pressure relief valve should open at a pressure of 0.14...0.16 MPa (1.4...1.6 bar).

If the pressure relief valve opens too early or too late:

– Replace cap.



2.2.2 Inspecting coolant system with cooling system testing device -V.A.G 1274 B- for tightness

Special tools and workshop equipment required

♦ Cooling system testing device , e.g. -V.A.G 1274 B-

♦ Adapter for cooling system testing device , e.g. -V.A.G 1274/8-

♦ Adapter for cooling system testing device , e.g. -V.A.G 1274/9-

Test condition

• Engine is at operating temperature.

Test sequence

WARNING

Hot steam may escape when the compensation bottle is opened.

- *Wear safety goggles and safety clothing, in order to avoid eye injuries and scalding.*
- *Cover the cap with a cloth and open carefully.*

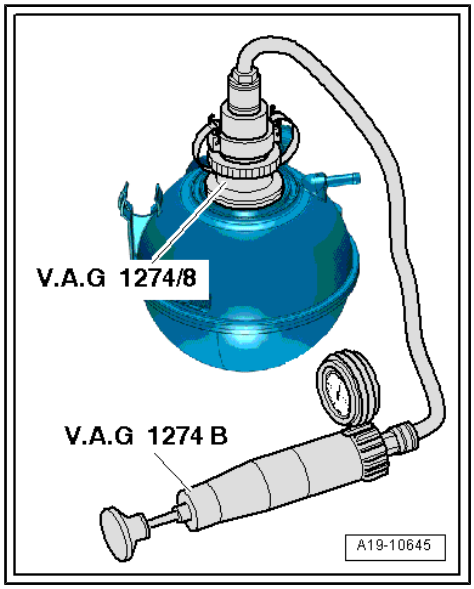
– Open compensation bottle.

– Screw the adapter for cooling system testing device -V.A.G 1274/8- into the coolant expansion bottle.

– Clamp the connecting piece -V.A.G 1274 B/1- in the adapter for cooling system testing device -V.A.G 1274/8- .

– Connect the connecting piece -V.A.G 1274 B/1- via the delivered connecting hose to the cooling system testing device -V.A.G 1274 B- .

– Using the hand pump of the testing device generate an overpressure of approx. 0,1 MPa (1,0 bar).



WARNING

Risk of scalding!

- *Before the cooling system testing device -V.A.G 1274 B- is separated from the connecting hose or the connecting piece -V.A.G 1274 B/1- , the existing pressure must absolutely be released.*
- *For this step, press the pressure relief valve on the cooling system testing device -V.A.G 1274 B- until the pressure gauge indicates the value »0«.*

If the pressure drops:

– Search position of the leak and repair fault.

Testing the pressure relief valve in the cap

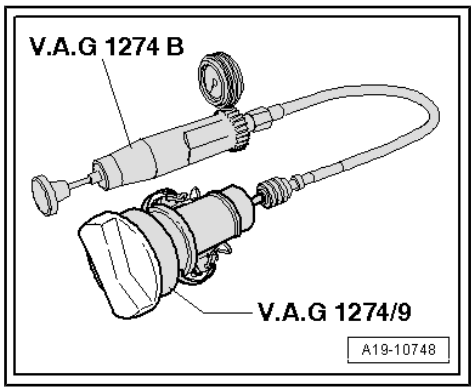
– Screw the screw cap into the adapter for cooling system testing device -V.A.G 1274/9- .

– Clamp the connecting piece -V.A.G 1274 B/1- in the adapter for cooling system testing device -V.A.G 1274/9- .

– Connect the connecting piece -V.A.G 1274 B/1- via the delivered connecting hose to the cooling system testing device -V.A.G 1274 B- .

– Operate the handpump.

• The pressure relief valve should open at a pressure of 0.14...0.16 MPa (1.4...1.6 bar).



If the pressure relief valve opens too early or too late:

– Replace cap.

3 Removing and installing parts of the cooling system - Part 2

3.1 Removing and installing radiator

Special tools and workshop equipment required

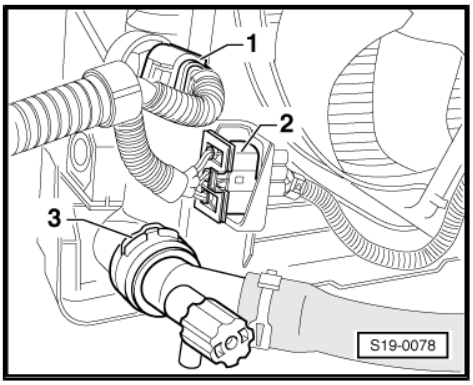
- Catch pan , e.g. -VAS 6208-
- Pliers for spring strap clamps

Removing

Note

Collect drained coolant in a clean container for proper disposal or reuse.

– Drain coolant ⇒ page 90 .
– Disconnect plug -1- from thermo-switch for radiator fan -F18- and separate plug -2- at the fan shroud.
– Pull off coolant hose at the top and bottom from the radiator connection fitting.



Note

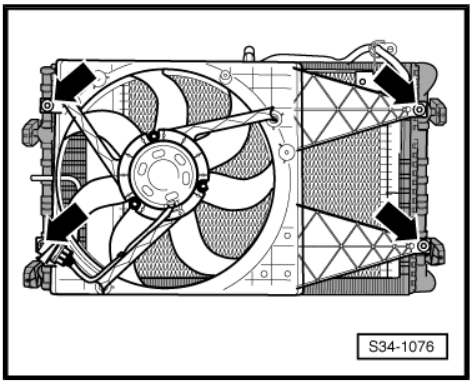
On vehicles without air conditioning, the radiator cannot be replaced separately without the radiator fan.

For vehicles with air conditioning

– Remove front bumper ⇒ Body Work; Rep. gr. 63 .
– Remove front headlights ⇒ Electrical System; Rep. gr. 94 .
– Remove the screw from the holder of the AC system line in the top fan shroud.

For vehicles with air conditioning system manufactured up to 03.10

– Remove screws -arrows- and remove fan shroud downwards.



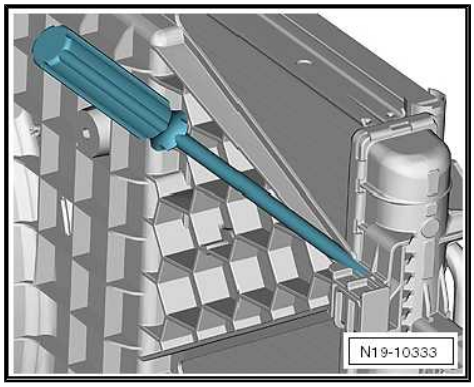
For vehicles with air conditioning system manufactured as of 04.10

Note

The fan shroud may have another shape depending on the version of the vehicle.

– Release the support for the top right fan shroud and lift the fan shroud out of the supports.

– Remove fan shroud downwards.



For vehicles with air conditioning

WARNING

Do not open the refrigerant circuit of the air conditioning system.

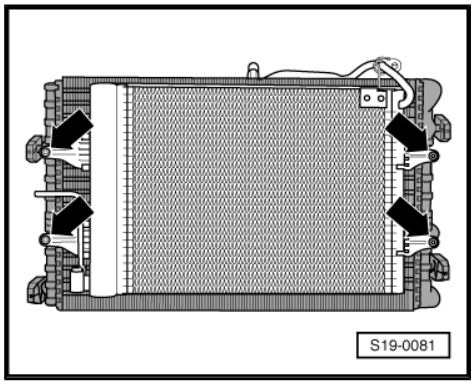
Note

- *Do not suspend the condenser to the wires.*
- *Do not fold the condenser wires.*

– Release the bolts securing the condenser -arrows-.

– Remove screw for bracket of condenser wire at the bottom from radiator.

– Suspend or support condenser in such a way that it is not damaged when removing the radiator.



For all vehicles

– Remove screws for radiator bearing ⇒ page 82 .

– Push radiator towards engine and take out downwards.

Install

Installation is performed in the reverse order, pay attention to the following points:

Note

Replace gasket rings and O-rings.

– Top up coolant ⇒ page 90 .

3.2 Removing and installing coolant pump

Note

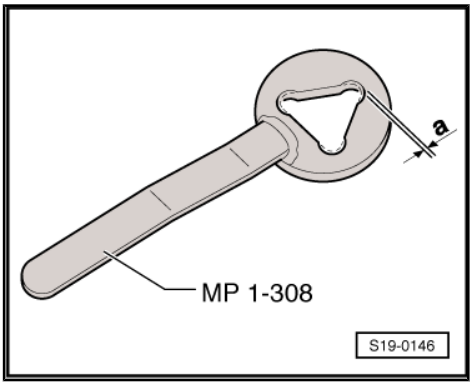
- *The integrated gasket of the coolant pump must not be separated from the pump.*
- *If damage or leak present, replace coolant pump with gasket completely.*

Special tools and workshop equipment required

- The adapted wrench for the water pump and power-assisted steering -MP1-308-

Because of modified fixing screws for the belt pulley of the coolant pump, these large curvatures must be filed open:

Dimension -a- at least 1 mm.



Removing

– Drain coolant ⇒ page 90 .
– Only slacken the bolts of the coolant pump belt pulley, do not remove them.
– Remove V-ribbed belt ⇒ page 18 .
– Remove belt pulley from the coolant pump.
– Unscrew bolts of the coolant pump.
– Remove the coolant pump from the cylinder block.

Install

Installation is carried out in the reverse order. Pay attention to the following:

Tightening torques: ⇒ page 87

♦ Inspect the plastic rotor of the coolant pump for tears.

– Top up coolant ⇒ page 90 .

20 – Fuel supply system

1 Removing and installing parts of the fuel supply - Part 1

Note

- *The fuel lines are connected with quick-release fittings, which are loosened by pressing in the circlip* ⇒ page 108 .
- *Fuel hoses at the engine must only be secured with spring-type clips. The use of clamp-type or screw-type clips is not allowed.*
- *Use pliers for spring strap clips to fit the spring strap clips.*
- *The fuel supply system must be bled after removal of the fuel filter, fuel delivery unit and the fuel strip* ⇒ page 121 .

Observe safety measures ⇒ page 6 .

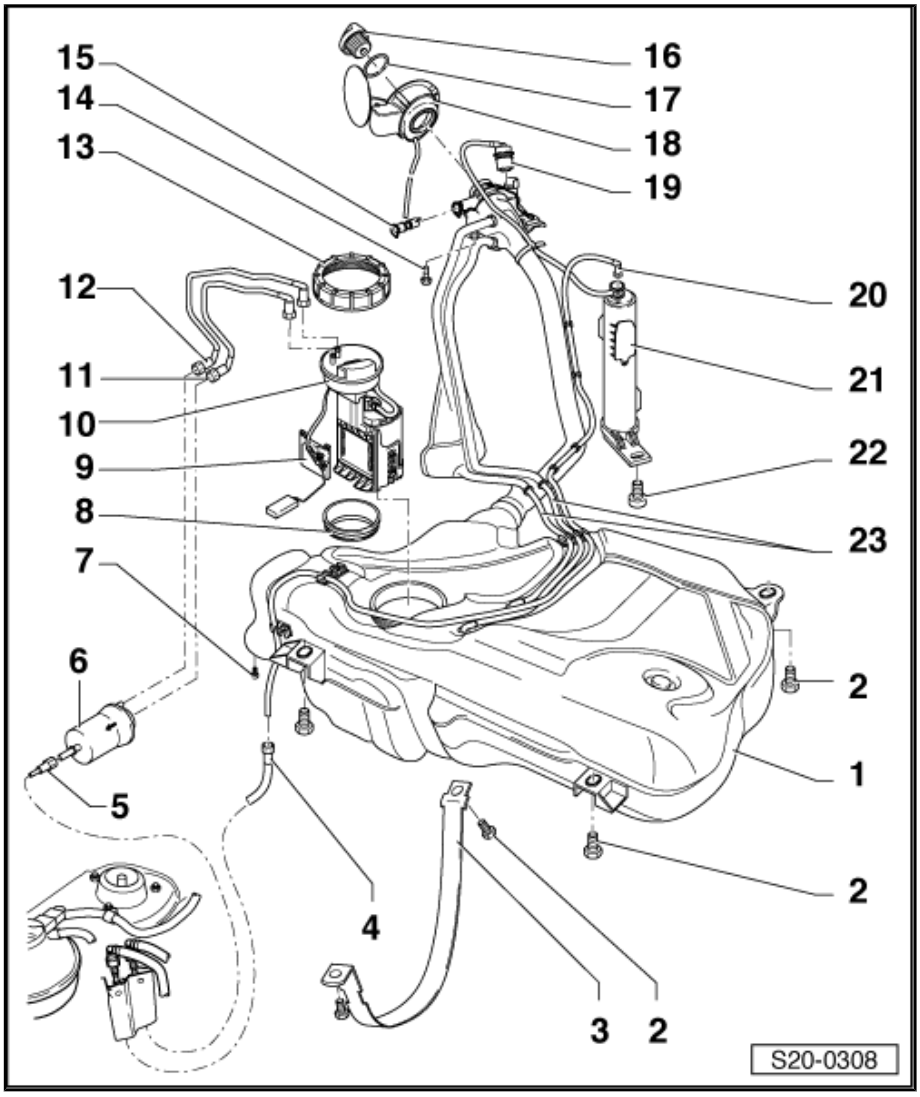
Observe rules for cleanliness ⇒ page 7 .

Electronic Engine Power Control (Electronic throttle) ⇒ page 123 .

Activated charcoal filter ⇒ page 124 .

1.1 Fuel tank with attached parts and fuel filter - Summary of components

Fabia II



1 - Fuel tank

- ❑ support with engine/ gearbox jack - V.A.G 1383 A- when removing
- ❑ removing and installing ⇒ page 112
- ❑ after replacing the fuel tank, bleed the fuel supply with the valve on the fuel strip ⇒ page 121

2 - 25 Nm

3 - Tensioning strap

4 - Vent line

- ❑ to solenoid valve 1 for activated charcoal filter - N80- in engine compartment

5 - Fuel feed line

- ❑ black
- ❑ to fuel strip at intake manifold

6 - Fuel filter

- ❑ with integrated fuel pressure regulator 0.4 MPa (4 bar)
- ❑ blue return-flow line in the middle and black feed line on the edge
- ❑ after replacing the fuel filter, bleed ⇒ page 121 the fuel supply with the valve on the fuel strip
- ❑ Fitting location: Pin at filter housing must engage in the recess of the guide for the fixing clamp
- ❑ the direction of flow is marked by arrow

7 - 5 Nm

- ❑ for collar clamp for fuel filter

8 - Sealing ring

- ❑ moisten with fuel before installing

9 - Fuel gauge sender -G-

- ❑ removing and installing ⇒ page 107

10 - Fuel delivery unit

- ❑ removing and installing ⇒ page 105
- ❑ inspecting fuel pump ⇒ page 115
- ❑ Clean strainer if dirty
- ❑ Fitting position of flange of fuel delivery unit

  Vehicles ▸ 03.10 ⇒ page 100

  Vehicles 04.10 ▸ ⇒ page 101

11 - Return-flow line

- ❑ between the fuel delivery unit and the fuel pressure regulator
- ❑ blue

12 - Feed line

- ❑ between the fuel delivery unit and the fuel filter
- ❑ black

13 - Union nut

- ❑ use wrench for union nut -MP1-227 (3217)- for removing and installing ⇒ page 105

14 - 10 Nm

15 - Vent valve

- ❑ to remove, unclip valve at side and take out of filler neck.
- ❑ before installing, unscrew screw cap (Pos. 16)
- ❑ check ⇒ page 101

16 - Screw cap

17 - Sealing ring

- ❑ replace if damaged

18 - Fuel tank lid unit

- ❑ with rubber bowl

19 - Gravity valve

- ❑ to remove, unclip valve at top and lift out of filler neck
- ❑ inspect valve for blockage:

- ◆ Valve in a vertical position: open
- ◆ Valve tilted 45°: closed

20 - Vent line

- ❑ between activated charcoal filter (Pos. 21) and vent line (Pos. 4)

21 - Activated charcoal filter

- ❑ Summary of components of activated charcoal container system ⇒ page 124
- ❑ Checking the fuel tank venting ⇒ page 127

22 - 10 Nm

23 - Vent line

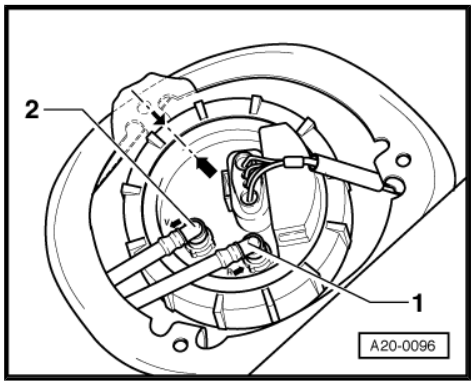
- ❑ clipped in place on fuel tank

Fitting position of flange of fuel delivery unit ► 03.10

Marking on the flange must be aligned with marking on the fuel tank -arrows-.

Connect blue or blue marked return-flow line -1- to the connection with the marking -R-.

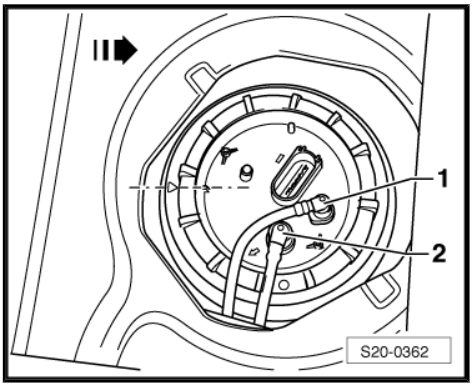
Connect black feed line -2- to connection with marking -V-.



Note

After installing the fuel delivery unit, check whether the feed, return-flow and vent lines are clipped in place on the fuel tank.

Fitting position of flange of fuel delivery unit 04.10 ►



Note

The fuel delivery unit can only be installed in this position.

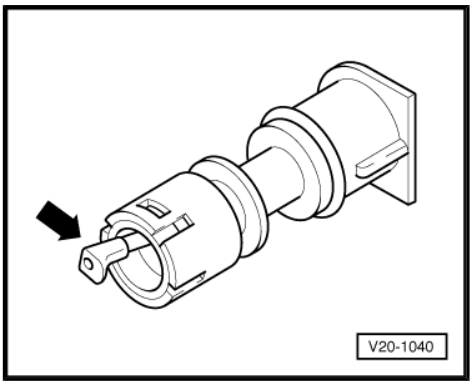
Marking on the flange must be aligned with marking on the fuel tank.

-Arrow- points in direction of travel.

Connect blue or blue marked return-flow line -1- to the connection with the marking -R-.

Connect black feed line -2- to connection with marking -V-.

Inspect vent valve



Lever in off position: valve closed.

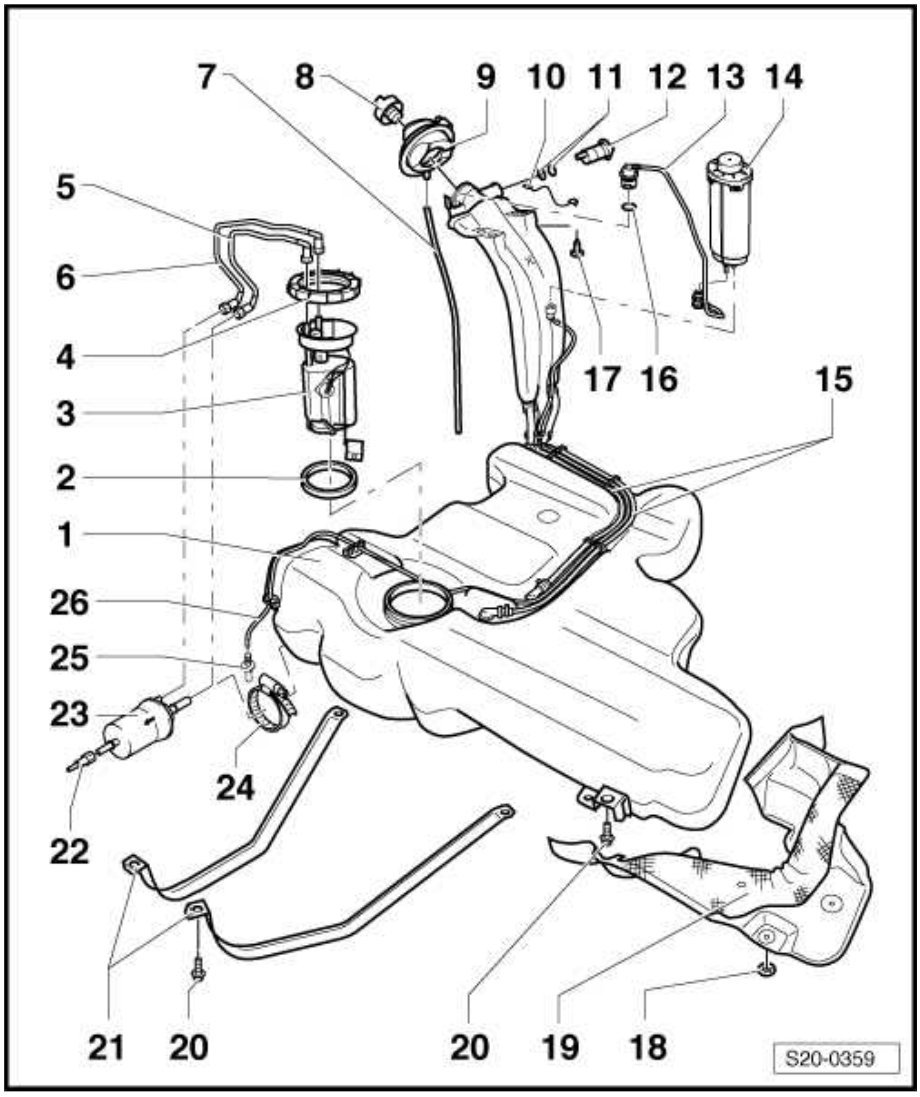
Lever pushed in direction of arrow: valve open.

Note

Before installing the vent valve, unscrew the cap from the filler neck.

1.2 Fuel tank with attached parts and fuel filter - Summary of components

Roomster, Rapid NH



1 - Fuel tank

- ❑ support with engine/ gearbox jack - V.A.G 1383 A- when removing
- ❑ removing and installing ⇒ page 112

2 - Sealing ring

- ❑ replace if damaged

3 - Fuel delivery unit

- ❑ Fitting position of flange of fuel delivery unit
- ❑ removing and installing ⇒ page 105
- ❑ inspecting fuel pump ⇒ page 115
- ❑ Removing and installing the sender for fuel gauge display -G- ⇒ page 107
- ❑ Clean strainer if dirty
- ❑ Fitting position of flange of fuel delivery unit

  Vehicles ► 03.10 ⇒ page 103

  Vehicles 04.10 ► ⇒ page 104

4 - Union nut

- ❑ slacken and tighten with wrench for union nut - MP1-227 (3217)-

5 - Return-flow line

- ❑ from the fuel delivery unit to the fuel filter
- ❑ blue

6 - Feed line

- ❑ from fuel filter to fuel delivery unit
- ❑ black

7 - Overflow hose

8 - Screw cap

9 - Fuel tank lid unit

- ❑ with rubber bowl
- ❑ Removing and installing ⇒ Body Work; Rep. gr. 55

10 - Earth connection

11 - O-ring

- ❑ replace

12 - Vent valve

- ❑ check ⇒ page 104

13 - Gravity valve

- ❑ to remove, unclip valve and lift up and out of the filler neck
- ❑ inspect valve for blockage:
- ❑ Valve in a vertical position: open

- ❑ Valve tilted 45°: closed

14 - Activated charcoal filter

- ❑ only vehicles 04.10 ►
- ❑ Summary of components of activated charcoal container system ⇒ page 126
- ❑ Checking the fuel tank venting ⇒ page 128

15 - Vent line

16 - O-ring

- ❑ replace

17 - 10 Nm

18 - Circlip

19 - Heat shield

- ❑ for fuel tank

20 - 25 Nm

- ❑ replace

21 - Straps

- ❑ pay attention to different lengths

22 - Fuel feed line

- ❑ black
- ❑ from fuel filter to fuel strip at intake manifold

23 - Fuel filter

- ❑ with integrated pressure limiting valve for fuel return-flow line

  Opening pressure: 0,40 MPa (4,0 bar)
- ❑ do not interchange connections
- ❑ The direction of flow of fuel is marked by arrow
- ❑ Fitting position: Pin at filter housing must engage in the recess of the guide at the filter holder

24 - Screw clamp

- ❑ replaced with integrated bracket for fuel filter

25 - Vent line

- ❑ to solenoid valve 1 for activated charcoal filter -N80- in engine compartment
- ❑ only vehicles 04.10 ►

26 - Vent line

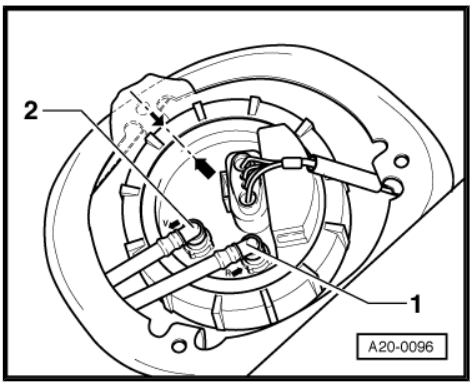
- ❑ between activated charcoal filter Pos. 14 and vent line Pos. 25
- ❑ only vehicles 04.10 ►

Fitting position of flange of fuel delivery unit ► 03.10

Marking on the flange must be aligned with marking on the fuel tank -arrows-.

Connect blue or blue marked return-flow line -1- to the connection with the marking -R-.

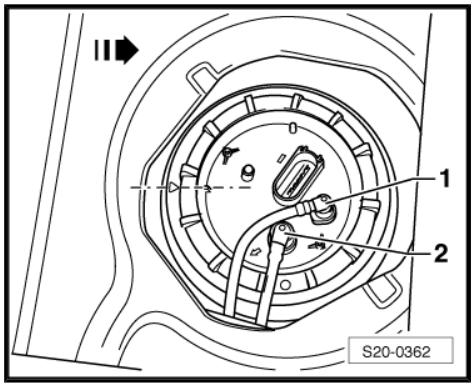
Connect black feed line -2- to connection with marking -V-.



Note

After installing the fuel delivery unit, check whether the feed, return-flow and vent lines are clipped in place on the fuel tank.

Fitting position of flange of fuel delivery unit 04.10 ►



Note

The fuel delivery unit can only be installed in this position.

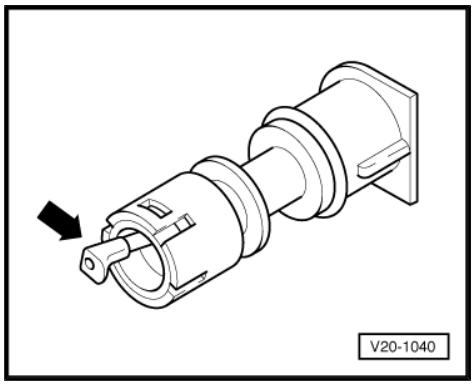
Marking on the flange must be aligned with marking on the fuel tank.

-Arrow- points in direction of travel.

Connect blue or blue marked return-flow line -1- to the connection with the marking -R-.

Connect black feed line -2- to connection with marking -V-.

Inspect vent valve



Lever in off position: valve closed.

Lever pushed in direction of arrow: valve open.

Note

Before installing the vent valve, unscrew the cap from the filler neck.

1.3 Extract fuel from the fuel tank

Special tools and workshop equipment required

- Hose adapter , e.g. -V.A.G 1318/16-
- Adapter , e.g. -V.A.G 1318/17-
- Measuring tool set , e.g. -V.A.G 1594 C-
- 12 V battery
- Catch pan for fuel

Note

If there are functional problems of the fuel delivery unit suction off fuel with fuel extraction device, e.g. -VAS 5190- -VAS 5190- .

Work procedure

Note

Observe the regulations concerning cleanliness when working on the fuel supply/injection system ⇒ page 7 .

Condition

- The ignition must be switched off and the ignition key must be withdrawn.

For vehicles Fabia II

– Remove right rear seat ⇒ Body Work; Rep. gr. 72 .

For vehicles Roomster

– Fold back the middle and rear seat and position vertically ⇒ Body Work; Rep. gr. 72 and fold back the floor covering.

For vehicles Rapid NH

– Removing rear seat bench ⇒ Body Work; Rep. gr. 72 .

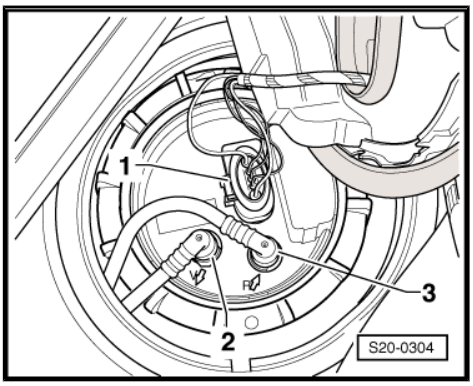
Continued for all vehicles

– Remove the cover from the fuel delivery unit.

WARNING

The fuel feed line is pressurized! Wear safety goggles and safety clothing, in order to avoid injuries and skin contact. Place cleaning cloths around the connection point before detaching cable connections. Reduce pressure by carefully removing the wiring.

– Disconnect plug -1- and and black feed line -2-.



Note

Always press in the securing ring in order to unlock the lines *⇒ page 108* .

– Connect the adapter -V.A.G 1318/16- and -V.A.G 1318/17- and fit this “drain pipe” onto the feed support of the fuel delivery unit.

– Hold the “drain pipe” in a suitable catch pan for fuel.

– Using auxiliary cables -A- from the measuring tool set -V.A.G 1594/C- connect up the battery through contacts of the fuel pump as follows:

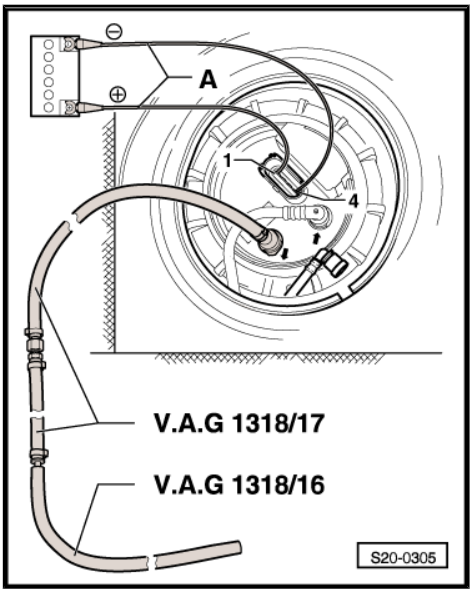
Battery positive terminal (+) to contact -1- of the fuel pump

Vehicles ► 03.10

Battery negative terminal (-) to contact -4- of the fuel pump

Vehicles 04.10 ►

Battery negative terminal (-) to contact -5- of the fuel pump



The fuel pump runs and suctions off fuel.

WARNING

In order to avoid fuel overflow due to the fuel tank not being sufficiently large enough, the fuel pump must not run unattended.

1.4 Removing and installing fuel delivery unit

Special tools and workshop equipment required

- Wrench for union nut -MP1-227 (3217)-

Condition

- The ignition must be switched off and the ignition key must be withdrawn.
- The fuel tank must not be more than $^3/_4$ full.

Removing

Note

- *Observe the safety instructions before starting fitting work* *⇒ page 6* *.*
- *Observe rules for cleanliness* *⇒ page 7* *.*
- *If necessary drain the fuel tank* *⇒ page 104* *.*

For vehicles Fabia II

– Remove right rear seat ⇒ Body Work; Rep. gr. 72 .

For vehicles Roomster

– Fold back the middle and rear seat and position vertically ⇒ Body Work; Rep. gr. 72 and fold back the floor covering.

For vehicles Rapid NH

– Removing rear seat bench ⇒ Body Work; Rep. gr. 72 .

Continued for all vehicles

– Remove the cover from the fuel delivery unit.
– Disconnect the plug as well as the feed line and the return-flow line from the flange of the fuel delivery unit.

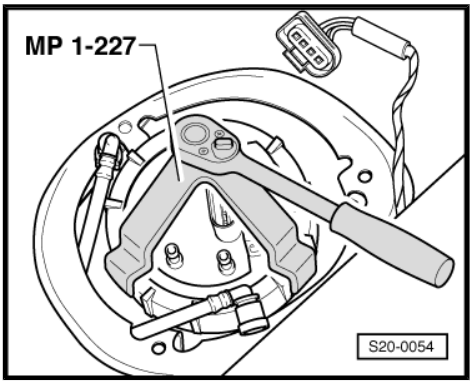
Note

Always press in the securing ring in order to unlock the fuel lines *⇒ page 108* *.*

WARNING

The fuel feed line is pressurized! Place a clean cleaning cloth around the connection point before detaching hose connections. Reduce pressure by carefully releasing the connection point.

– Unscrew union nut with wrench for union nut -MP1-227 (3217)- .
– Pull the fuel delivery unit and the gasket ring out of the opening of the fuel tank.



Note

You must empty the old delivery unit before disposing of it if you wish to replace the fuel delivery unit.

Install

Installation of the fuel delivery unit occurs in reverse order to removal. Pay attention to the following:

Note

- *When installing the fuel delivery unit, ensure that the float arm of the sender for fuel gauge display is not bent.*
- *Insert dry gasket ring of the fuel delivery unit into the opening of the fuel tank.*
- *Only moisten gasket ring with fuel before assembly of the fuel delivery unit.*
- *Fitting position of flange of fuel delivery unit ➢ 03.10 ⇒ page 100 .*
- *Fitting position of flange of fuel delivery unit 04.10 ➢ ⇒ page 101 .*
- *Do not interchange feed line and return-flow line.*
- *Make sure the fuel hoses fit tightly.*
- *After installing the fuel delivery unit, check whether the feed, return-flow and vent lines are clipped in place on the fuel tank.*

1.5 Removing and installing the sender for fuel gauge display -G-

Note

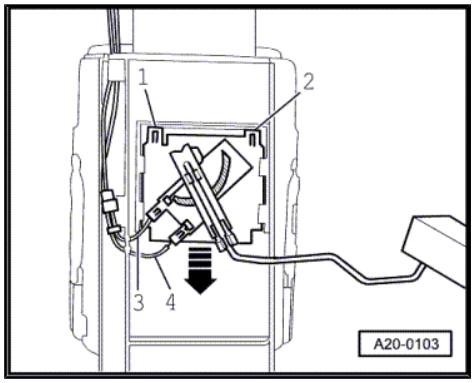
There are two types of senders for the fuel gauge display -G- installed in the vehicles.

Sender for fuel gauge display -G- type 1

Removing

– Remove fuel delivery unit ⇒ page 105 .

– Unlatch and disconnect the plug connection of the lines -3- and -4-.
– Raise catches -1- and -2- with a screwdriver and remove the sender for fuel gauge display -G- from the bottom -arrow-.



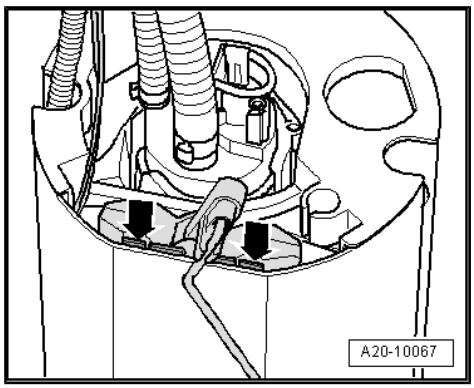
Install

– Insert the fuel gauge sender -G- into the guides at the fuel delivery unit and press fully upwards.
– Fit on plugs of lines and check for correct fitting position.
– Install fuel delivery unit ⇒ page 105 .

Sender for fuel gauge display -G- type 2

Removing

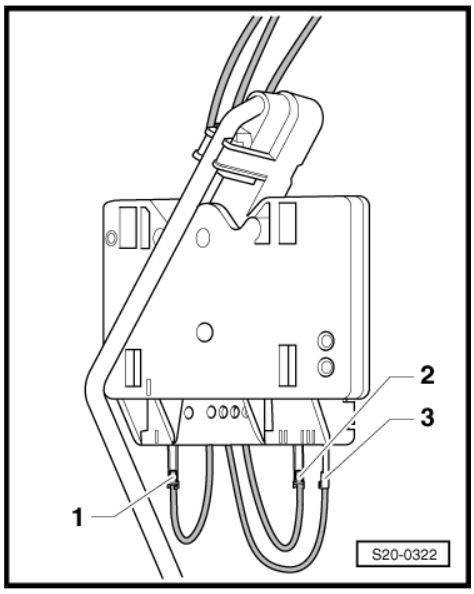
– Remove fuel delivery unit ⇒ page 105 .
– Unlock the catches -arrows- using a screwdriver and pull out the sender for fuel gauge display -G- towards the top.



– Unlatch and disconnect the plug connection of the lines -1- (brown), -2- (blue) and -3- (black).

Install

– Connect the wiring and check correct installation of the plug.
– Insert the sender for fuel gauge display -G- in the guides at the fuel delivery unit and press downwards until it latches into position.
– Install fuel delivery unit ⇒ page 105 .



1.6 Separating quick couplings

Special tools and workshop equipment required

♦ Lever -T10468-

Note

- *Quick couplings of fuel, vacuum and ventilation lines are colour marked. Either the colour point at the quick coupling or the release button has the corresponding colour.*
- *Observe safety measures ⇒ page 6 .*
- *Observe rules for cleanliness ⇒ page 7 .*

Quick coupling	Colour coding at the quick coupling
Fuel feed line	black
Fuel return-flow line	blue
Vent line	White, beige
Vacuum line	green

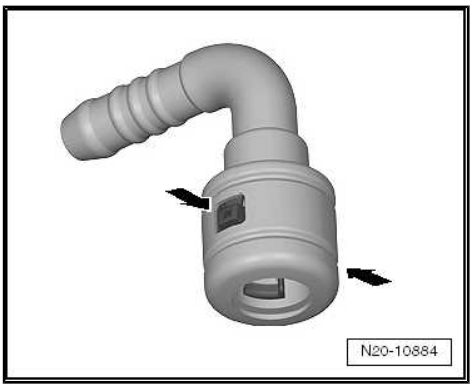
WARNING

The fuel feed line is pressurized! Wear safety goggles and safety clothing, in order to avoid injuries and skin contact with fuel. Place cleaning cloths around the connection point before detaching hose connections. Reduce pressure by carefully removing the hose.

Version 1

Push-on coupling with release buttons -arrows- on right and left

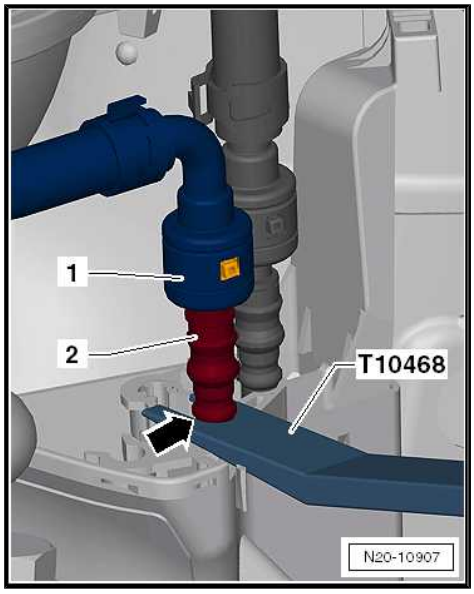
Open



The separation point -1- in the engine compartment must be held.

– Insert the lever -T10468- between the heat shield and the stop -arrow- of the fuel feed line -2- and hold it.

Continued for all separation points

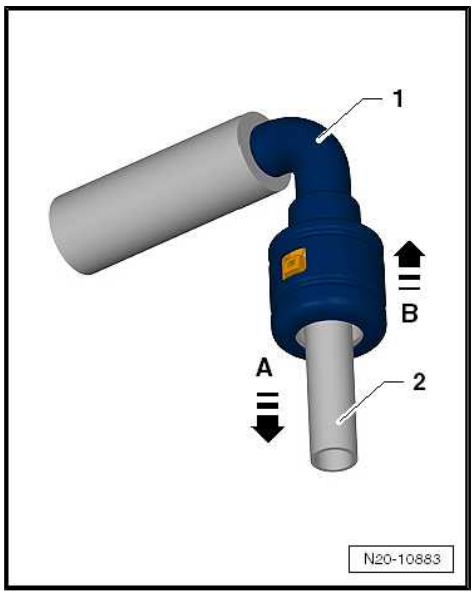


– Press quick coupling -1- in -direction of arrow A-.

– Press the release buttons and detach the quick coupling -1- in -direction of arrow B- from the fuel flow line -2-.

Pay attention to the assignment of the colours when installing ⇒ page 109 .

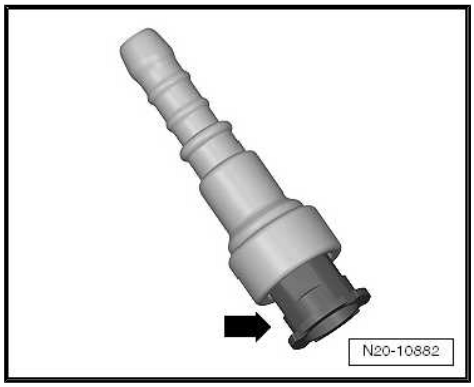
– Check the quick coupling for firm seating by pulling in the opposite direction!



Version 2

Push-on coupling with pull-release mechanism -arrow-

Open

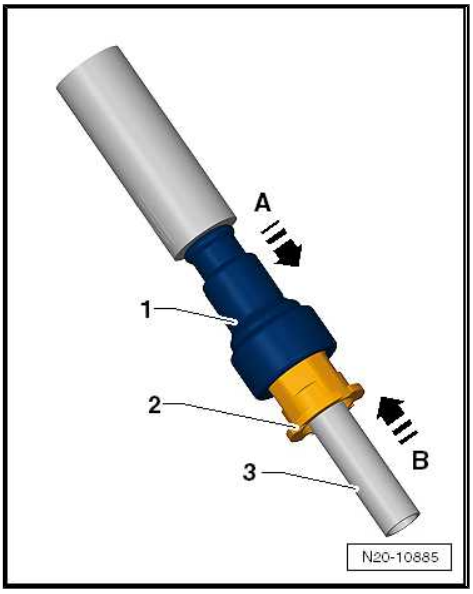


– Press quick coupling -1- in -direction of arrow A-.
– Pull on the pull release -2- in -direction of arrow B-.
– Detach the quick coupling -1- in -direction of arrow B- from the fuel flow line -3-.

Pay attention to the assignment of the colours when installing ⇒ page 109 .

– Check the quick coupling for firm seating by pulling in the opposite direction!

Version 3



Quick coupling with front button -arrow-.

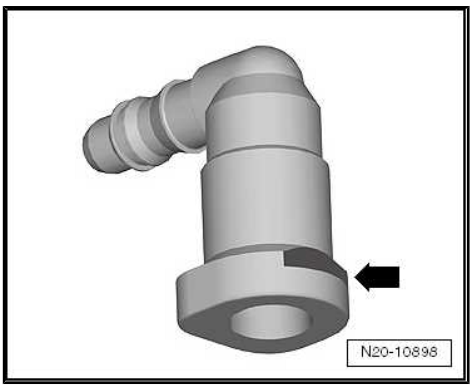
Open

– Press the release button -arrow- and detach the quick coupling.

Pay attention to the assignment of the colours when installing ⇒ page 109 .

– Check the quick coupling for firm seating by pulling in the opposite direction!

Version 4



Push-on coupling with release buttons -arrows- on right and left

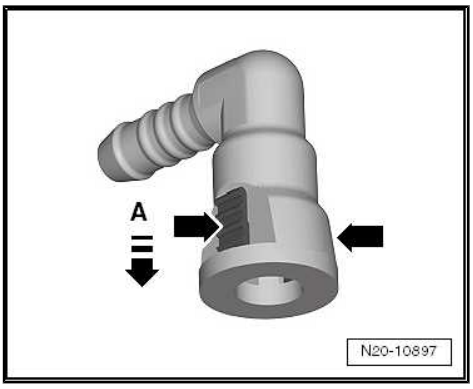
Open

– Press quick coupling in -direction of arrow A-.
– Press release buttons -arrow- and detach quick coupling.

Pay attention to the assignment of the colours when installing ⇒ page 109 .

– Check the quick coupling for firm seating by pulling in the opposite direction!

Version 5



Push-on coupling with release buttons -arrows- on right and left

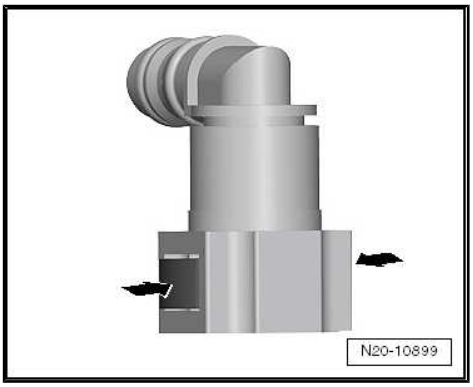
Open

– Press release buttons -arrow- and detach quick coupling.

Pay attention to the assignment of the colours when installing ⇒ page 109 .

– Check the quick coupling for firm seating by pulling in the opposite direction!

Version 6



Push-on coupling with release buttons -arrows- on right and left

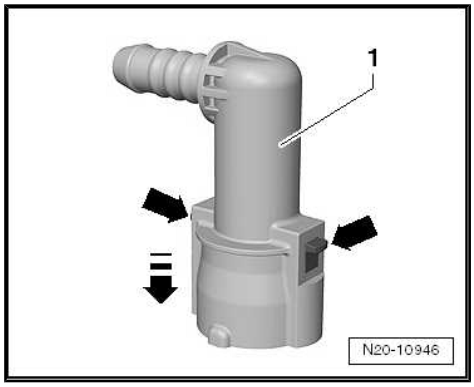
Open

– Press push-on coupling -1- in -direction of arrow- and hold pressed.

– Press release buttons -arrows- and detach quick coupling.

Pay attention to the assignment of the colours when installing ⇒ page 109 .

– Check the quick couplings for firm seating by pulling in the opposite direction!



1.7 Removing and installing the fuel tank

Special tools and workshop equipment required

♦ Engine/gearbox jack, e.g. -V.A.G 1383 A-

Condition

• The ignition must be switched off and the ignition key must be withdrawn.

Removing

• The fuel tank must be empty for weight reasons when removing it, if necessary suction the fuel out of the fuel tank ⇒ page 104 .

Note

♦ *Safety precautions when working on the fuel supply system* ⇒ page 6 .

♦ *Rules of cleanliness when working on the fuel supply system* ⇒ page 7 .

– Switch off the ignition and all electrical components and take out the ignition key.

– Open fuel tank flap and unscrew cap from filler neck.

For vehicles Fabia II

– Fold right rear seat forwards ⇒ Body Work; Rep. gr. 72 .

For vehicles Roomster

– Fold back the middle and rear seat and position vertically ⇒ Body Work; Rep. gr. 72 and fold back the floor covering.

For vehicles Rapid NH

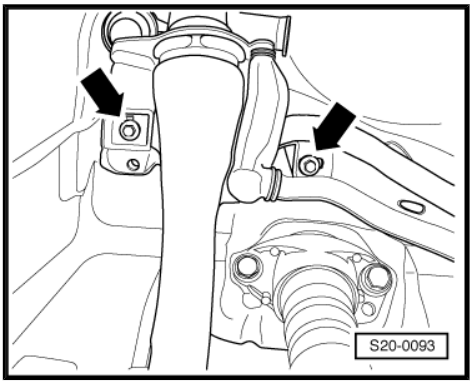
– Removing rear seat bench ⇒ Body Work; Rep. gr. 72 .

Continued for all vehicles

– Remove cover for fuel delivery unit and disconnect plug from flange of fuel delivery unit.

– Remove the rear right wheelhouse liner ⇒ Body Work; Rep. gr. 66 .

– Unscrew fixing screws at tank filler neck -arrows-.



For vehicles Fabia II

– Remove both ventilation lines ⇒ page 124 , Pos. 5 and 6 from activated charcoal filter.

For vehicles Roomster, Rapid NH

– Remove both ventilation lines ⇒ page 126 , Pos. 7 and 8 from activated charcoal filter.

– Remove middle and rear silencer ⇒ page 166 .

Continued for all vehicles

– Removing rear axle ⇒ Chassis; Rep. gr. 42 .

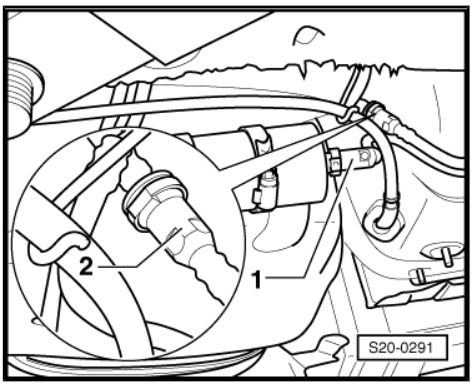
WARNING

The fuel feed line is pressurized! Place a clean cleaning cloth around the connection point before detaching hose connections. Reduce pressure by carefully releasing the connection point.

Note

Always press in the securing ring in order to unlock the caps of the fuel lines ⇒ page 108 .

– Disconnect the feed line -1- and the vent line -2-.



– Support the fuel tank using the engine/gearbox jack -V.A.G 1383 A- .

For vehicles Rapid NH

– Remove underbody cover on left ⇒ Body work; Rep. gr. 50 .

For vehicles Fabia II

– Unscrew tensioning strap for fuel tank.

– Unscrew the fixing screws from the fuel tank.

For vehicles Roomster, Rapid NH

– Unscrew tensioning straps and fixing screw of fuel tank ⇒ page 101 , Pos. 20.

Continued for all vehicles

– Carefully lower the engine/gearbox jack -V.A.G 1383 A- and remove the fuel tank with the assistance of a second mechanic.

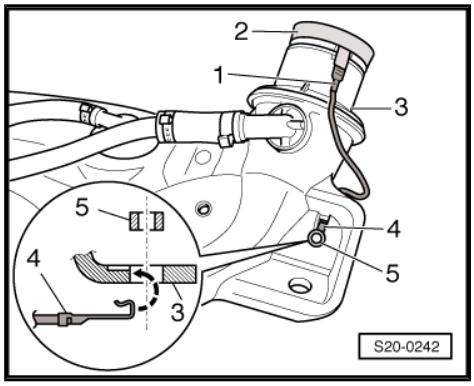
Install

– Check if the earth lead shows traces of oxidation on both connections, remove if necessary.

– Check fitting position of the earth lead -1-.

- The plug -1- on the metal plate ring -2- must be placed on firmly.
- The contact tab -4- must be hung in the fuel tank -3- and secured with the spacer bush -5-.

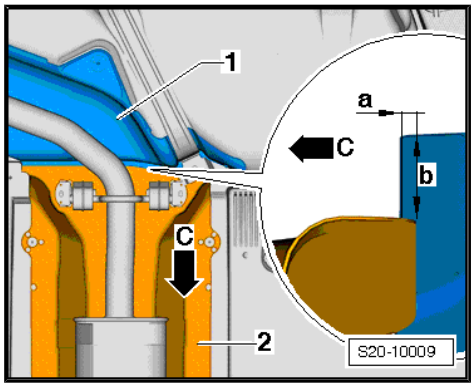
Installation is performed in the reverse order, pay attention to the following points:



For vehicles Rapid NH

Note

- *Make sure that the heat shield for fuel tank -1- does not collide with the tunnel-heat shield -2- when installing the fuel tank.*
- *Tunnel-heat shield -2- must moderately cover in direction of travel -C- tunnel-heat shield of fuel tank.*



Continued for all vehicles

- Check vent and fuel hoses for damage.
- Do not mix-up the feed, return-flow and vent lines (the return-flow line is blue or has a blue marking, the feed line is black).
- Make sure the caps of the fuel hoses fit tightly.
- After replacing the fuel tank, bleed the fuel supply with the valve on the fuel strip ⇒ page 121

Note

After installing the fuel tank, check whether the feed, return-flow and vent lines are clipped in place on the fuel tank.

2 Removing and installing parts of the fuel supply - Part 2

2.1 Testing fuel pump

Observe safety measures ⇒ page 6 .

Observe rules for cleanliness ⇒ page 7 .

Special tools and workshop equipment required

- Multimeter , e.g. -V.A.G 1526 A-
- Remote control , e.g. -V.A.G 1348/3A-
- Adapter cable set , e.g. -V.A.G 1594 A- or -V.A.G 1594 C-
- Wrench for union nut -MP1-227 (3217)-
- Pressure gauge appliance , e.g. -V.A.G 1318-
- Adapter , e.g. -V.A.G 1318/1-
- Adapter , e.g. -V.A.G 1318/11-
- Adapter , e.g. -V.A.G 1318/17-
- Adapter , e.g. -V.A.G 1318/23-
- Measuring vessel
- Current flow diagram

2.1.1 Inspecting proper operation and power supply

Test conditions

- Battery voltage at least 11.5 volts
- Fuse for protection of injection valves in fuse carrier below the dash panel O.K.

For vehicles Fabia II

– Remove right rear seat ⇒ Body Work; Rep. gr. 72 .

For vehicles Roomster

– Fold back the middle and rear seat and position vertically ⇒ Body Work; Rep. gr. 72 and fold back the floor covering.

For vehicles Rapid NH

– Removing rear seat bench ⇒ Body Work; Rep. gr. 72 .

Continued for all vehicles

– Remove the cover from the fuel delivery unit.

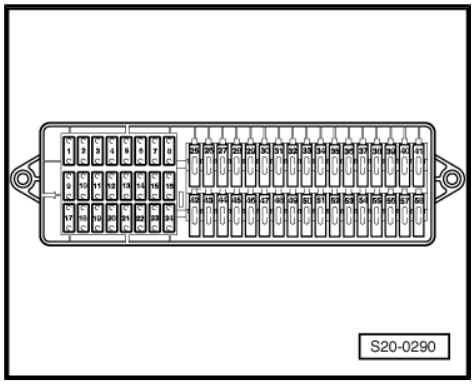
– Switch on ignition. The fuel pump must be heard to start running.

– Switch off ignition.

If the fuel pump does not run:

– Remove cover from the fuse holder.

– Remove fuse for protection of injection valves from the fuse carrier below the dash panel ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
– Connect the remote control -V.A.G 1348/3A- to the corresponding fuse holder and to battery positive (+) with the combination of adapter cables from the measuring tool set .
– Activate remote control.



If the fuel pump starts running:

– Testing fuel pump relay -J17- ⇒ Vehicle diagnostic tester.

If the fuel pump does not run:

– Disconnect the plug from the flange of the fuel delivery unit.

For vehicles manufactured up to 03.10

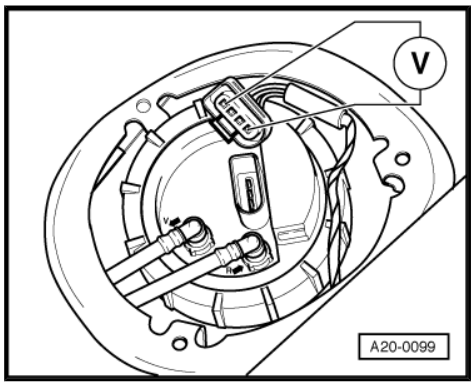
– Connect multimeter for voltage measurement to contacts 1 and 4.

For vehicles manufactured as of 04.10

– Connect multimeter for voltage measurement to contacts 1 and 5.

For all vehicles

– Activate remote control.



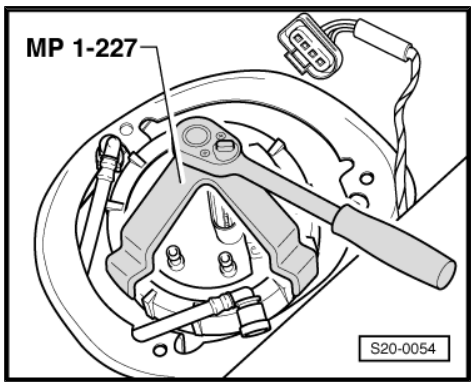
Specified value: approx. battery voltage.

If the nominal voltage is not reached:

– Determine and remove open circuit in the wiring according to the current flow diagram ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

If the nominal voltage is reached:

– Unscrew union nut with wrench for union nut -MP1-227 (3217)- .
– Remove the fuel delivery unit and check whether the electric wiring between the flange and fuel pump is connected.



If no open circuit was detected:

– Replace fuel delivery unit ⇒ page 105 .

2.1.2 Check fuel flow rate

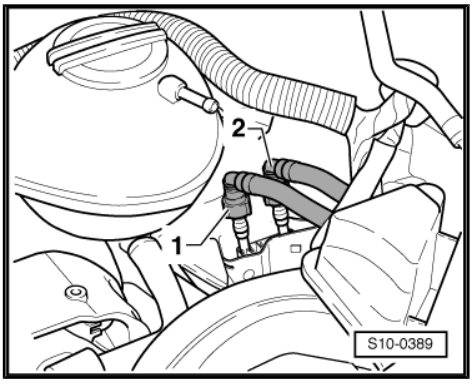
Test conditions

- Supply voltage o.k.
- Remote control -V.A.G 1348/3A- connected.

Test sequence

– Unscrew the cap from the filler neck.

– Pull out the fuel feed line -2- and catch the fuel which flows out with a cleaning cloth.



WARNING

The fuel feed line is pressurized! Place a clean cleaning cloth around the connection point before detaching hose connections. Reduce pressure by carefully releasing the connection point.

Note

Always press in the securing ring in order to unlock the caps of the fuel lines *⇒ page 108* *.*

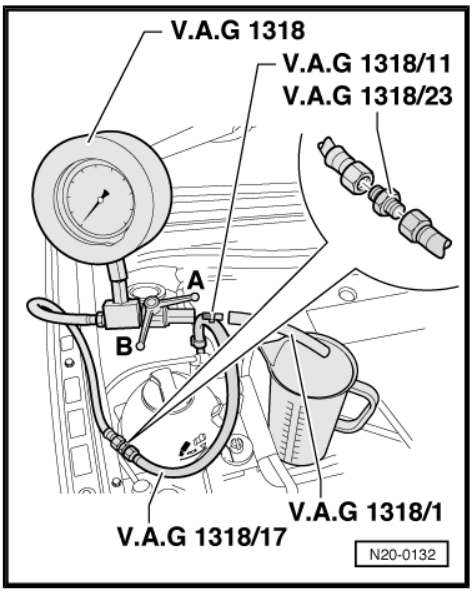
– Connect pressure gauge -V.A.G 1318- with adapter -V.A.G 1318/23- and -V.A.G 1318/17- to the fuel feed line.

– Connect hose -V.A.G 1318/1- with adapter -V.A.G 1318/11- of the pressure gauge and hold in the measuring vessel.

– Open shut-off cock of the pressure gauge. The lever points in the direction of flow -A-.

– Activate remote control -V.A.G 1348/3A- . While doing this, slowly close the shut-off cock until the pressure gauge displays 3 bar (0.3 MPa) pressure. Now do not change the position of the shut-off cock.

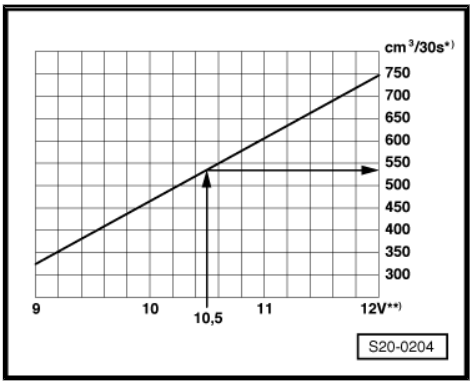
– Drain the measuring vessel.



The fuel flow rate of the fuel delivery unit is dependent on the battery voltage. Therefore connect the multimeter with the adapter cable to the vehicle battery.

– Activate remote control for 30 seconds while measuring the battery voltage.

– Compare the fuel rate with the specified value.



*) Minimum flow rate in cm^3/30 s.

**) Voltage at the fuel pump when engine is not running and pump is operating (approx. 2 volts less than battery voltage)

Read out examples:

During the test a voltage of 12.5 V was measured on the battery. As the voltage on the fuel pump is approx. 2 V less than the battery voltage, a minimum flow rate of 540 cm^3/30 s is shown in the diagram.

If the minimum flow rate is not reached:

– Check the fuel lines for possible restrictions (kinks) or blocking.

– Disconnect the hose -1- of the feed line from the fuel filter inlet (filter version with integrated fuel pressure regulator).
– Connect pressure gauge appliance -V.A.G 1318- with adapter -V.A.G 1318/17- to the hose -1-.
– Repeat fuel flow rate test.

If the minimum flow rate is now reached:

– Replace fuel filter.

If the minimum flow rate is again not reached:

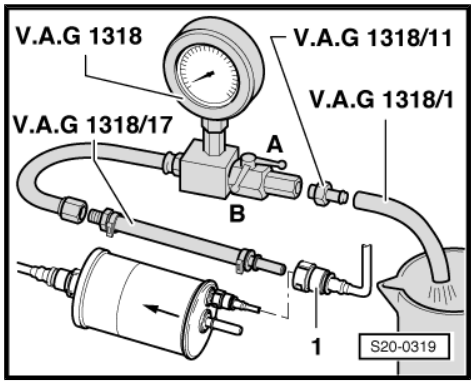
– Remove the fuel delivery unit and check whether the pump strainer is not clogged up.

If no fault was detected until now:

– Replace fuel delivery unit ⇒ page 105 .

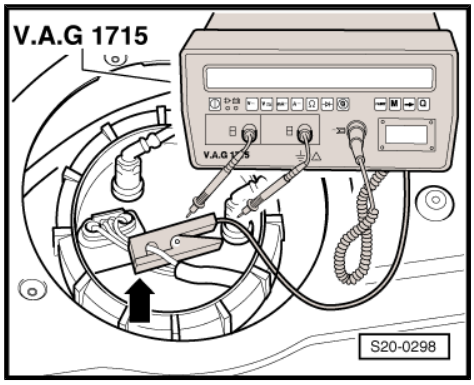
If the required fuel flow rate has been achieved, but a fault is still suspected in the fuel supply system (e.g. intermittent breakdown of the fuel supply):

– Check the power consumption of the fuel delivery unit as follows:
– Connect all released fuel lines.



– Connect multimeter with current probe on the line from contact -1- of the connector of the fuel delivery unit.
– Start engine and run in idle.
– Measure power consumption of the fuel delivery unit.

Specified value: max. 8 A



Note

If the failure in the fuel supply is occasional the test may be performed during a test drive. The assistance of a 2nd mechanic is required.

If the power consumption is exceeded:

– Replace fuel delivery unit ⇒ page 105 .

2.1.3 Inspecting the non-return valve of the fuel delivery unit and holding pressure

Test conditions

• Pressure gauge appliance connected -V.A.G 1318-

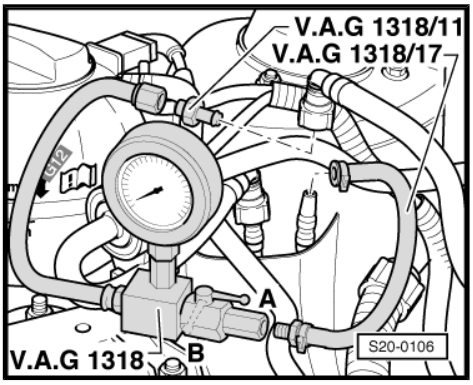
Note

This test simultaneously checks the tightness of the connections of the fuel feed line from the fuel delivery unit through to the connecting point of the pressure gauge appliance -V.A.G 1318- .

– Shut-off cock on measuring device in position -A- open.

– Activate remote control until an overpressure of 3.7 bar (0.37 MPa) is built up.

– Disconnect the remote control and observe the pressure drop on the pressure gauge. The pressure must not drop below 3 bar (0.3 MPa) after 10 minutes.



If the pressure still drops:

– Activate the remote control until an overpressure of at least 3.7 bar (0.37 MPa) is built up, and simultaneously close the shut-off cock on the measuring device in position -B-.

If the pressure does not drop:

– Test fuel strip for tightness.

If the pressure still drops:

– Check line connections for leaktightness.

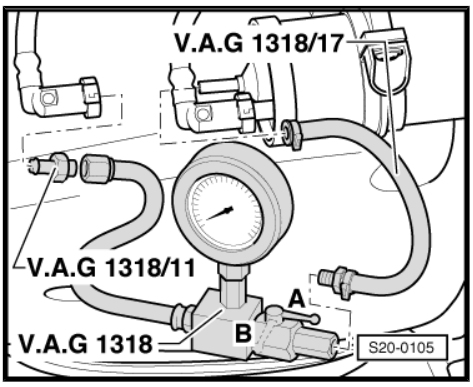
If the lines are not found to be faulty:

– Connect the pressure gauge -V.A.G 1318- with adapter -V.A.G 1318/11- and -V.A.G 1318/17- to the black feed line from the pump to the fuel filter (old version filter shown with integrated fuel pressure regulator). For the new version of the filter with disassembled fuel pressure regulator the black feed line is connected to the fuel filter outer connection.

– Shut-off cock on measuring device in position -A- open.

– Activate the remote control and simultaneously close the shut-off cock in the measuring device in position -B-.

– After reaching a pressure of min. 3.7 bar (0.37 MPa), disconnect the remote control and observe the drop in pressure on the pressure gauge. The pressure must not drop below 3 bar (0.3 MPa) after 10 minutes.



If the pressure still drops:

– Check the connections of the fuel lines for tightness.

If wiring is o.k.:

– Replace fuel delivery unit.

If the pressure does not drop and the delivery unit is O.K.:

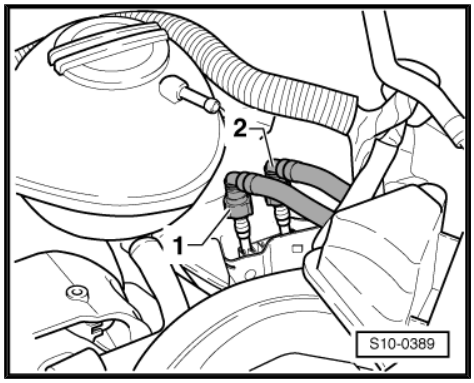
– Replace the fuel pressure regulator.

2.1.4 Checking fuel operating pressure

Special tools and workshop equipment required

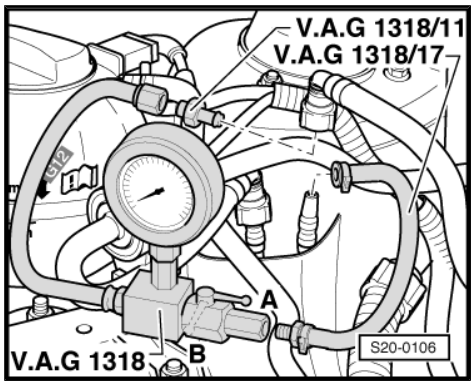
- Remote control , e.g. -V.A.G 1348/3A- with adapter cable -V.A.G 1348/3-2-
- Pressure gauge appliance , e.g. -V.A.G 1318-
- Adapter , e.g. -V.A.G 1318/1-
- Adapter , e.g. -V.A.G 1318/11-
- Adapter , e.g. -V.A.G 1318/17-

– Pull out the fuel feed line -2- and catch the fuel which flows out with a cleaning cloth.



– Connect the pressure gauge -V.A.G 1318- with adapter -V.A.G 1318/11- and -V.A.G 1318/17- to the fuel feed line, the shut-off cock on the measuring device must be in position -A-.

– Start engine.



Specified value 3.92...4.20 bar (0.392...0.420 MPa).

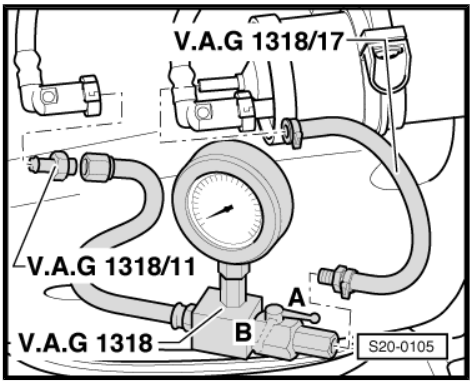
If the measured value is higher than 4,20 bar (0,420 MPa):

– Check fuel return-flow line between the fuel filter and the fuel pump for continuity or replace fuel pressure regulator.

If the measured value is lower than 3,92 bar (0,392 MPa):

– Check lines and fuel strip for leaktightness.

– Connect the pressure gauge -V.A.G 1318- with adapter -V.A.G 1318/11- and -V.A.G 1318/17- to the black feed line from the pump to the fuel filter (old version filter shown with integrated fuel pressure regulator). For the new version of the filter with disassembled fuel pressure regulator the black feed line is connected to the fuel filter outer connection.



– Open shut-off cock on the measuring device -position A-.

– Start engine.

Specified value 3.92...4.20 bar (0.392...0.420 MPa).

If the specified value is not reached:

– Close shut-off cock -position B-.

Actuate the fuel delivery unit with the remote control -V.A.G 1348/3A- .

– Connect remote control -V.A.G 1348/3A- .

– Activate remote control until a pressure of at least 3.7 bar (0.37 MPa) is built up.

The fuel delivery unit can also be actuated using the actuator diagnosis ⇒ Vehicle diagnostic tester.

WARNING

Maximum pressure of the fuel delivery unit is 7 bar (0.7 MPa). If this pressure is reached - risk of damage to the fuel delivery unit.

If the specified value of at least 3.7 bar (0.37 MPa) is reached:

– Replace the fuel pressure regulator.

If the nominal value of min. 3,7 bar (0,37 MPa) is not reached:

– Replace fuel delivery unit ⇒ page 105 .

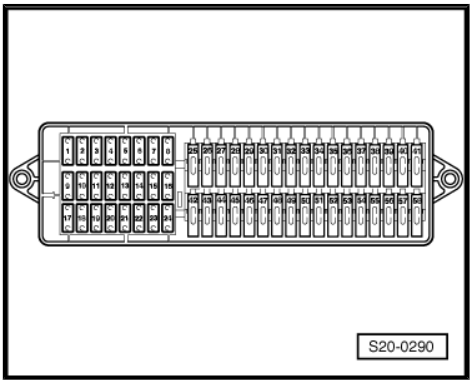
2.2 Venting air from the fuel system

Special tools and workshop equipment required

- Remote control , e.g. -V.A.G 1348/3A- with adapter cable -V.A.G 1348/3-2-
- Adapter -V.A.G 1318/20-
- Adapter -V.A.G 1318/20-1-
- Current flow diagram

– Remove cover from the fuse holder.

– Remove fuse for protection of injection valves from the fuse carrier below the dash panel according to current flow diagrams ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.



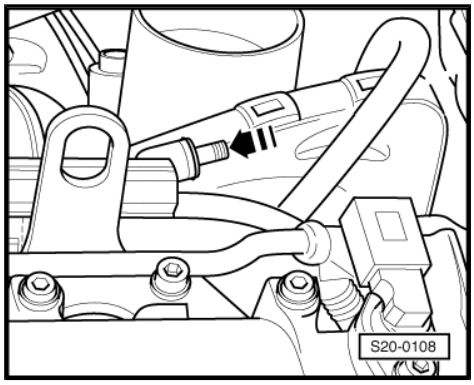
– Connect the remote control -V.A.G 1348/3A- to the corresponding fuse holder and to battery positive (+) with the combination of adapter cables from the measuring tool set .

For vehicles Roomster

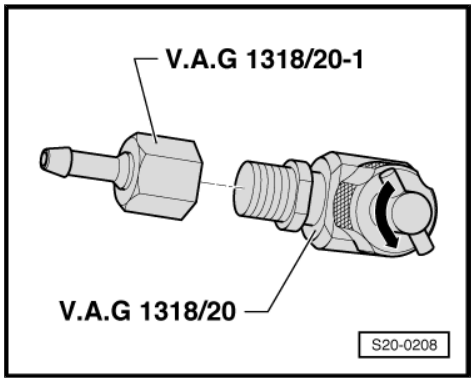
– Remove engine cover with air filter ⇒ page 149 upwards.

Continued for all vehicles

– Unscrew the ventilation valve cap -arrow- on the fuel strip.



– Screw adapter -V.A.G 1318/20-1- onto adapter -V.A.G 1318/20- (T-piece).
– Turn the valve at T-piece anti-clockwise, until it is fully opened.
– Screw adapter -V.A.G 1318/20- fully onto the vent valve on the fuel strip.
– Connect hose with catch pan to adapter -V.A.G 1318/20-1- .
– Screw valve at T-piece clockwise up to the stop into the vent valve.
– Check the adapter and hose connections for leaktightness.
– Activate remote control -V.A.G 1348/3A- .
– As soon as fuel flows out of the hose without bubbles, unscrew valve at T-piece anti-clockwise, until no more fuel escapes.
– Cover ventilation valve with a clean cloth.
– Throttle the bleeder hose and pull off from adapter -V.A.G 1318/20-1- .
– Unscrew adapter -V.A.G 1318/20- (T-piece) from the vent valve on the fuel strip.
– Screw cap onto the vent valve on the fuel strip.



2.3 Switching off the fuel delivery unit using the crash signal

Operation

The vehicles with airbag are equipped with a crash signal fuel shut-off system. If the airbag units are triggered while driving, the fuel pump relay -J17- opens and the fuel delivery unit is deactivated. This also enhances the starting behaviour of the engine. When the door is opened, the fuel pump is operated for about 2 seconds so that pressure is built up in the fuel system.

– Testing fuel pump relay ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

3 Electronic Engine Power Control (Electronic throttle)

3.1 Accelerator pedal module - Summary of components

1 - Bearing bracket

- ❑ removing and installing ⇒ Chassis; Rep. gr. 46

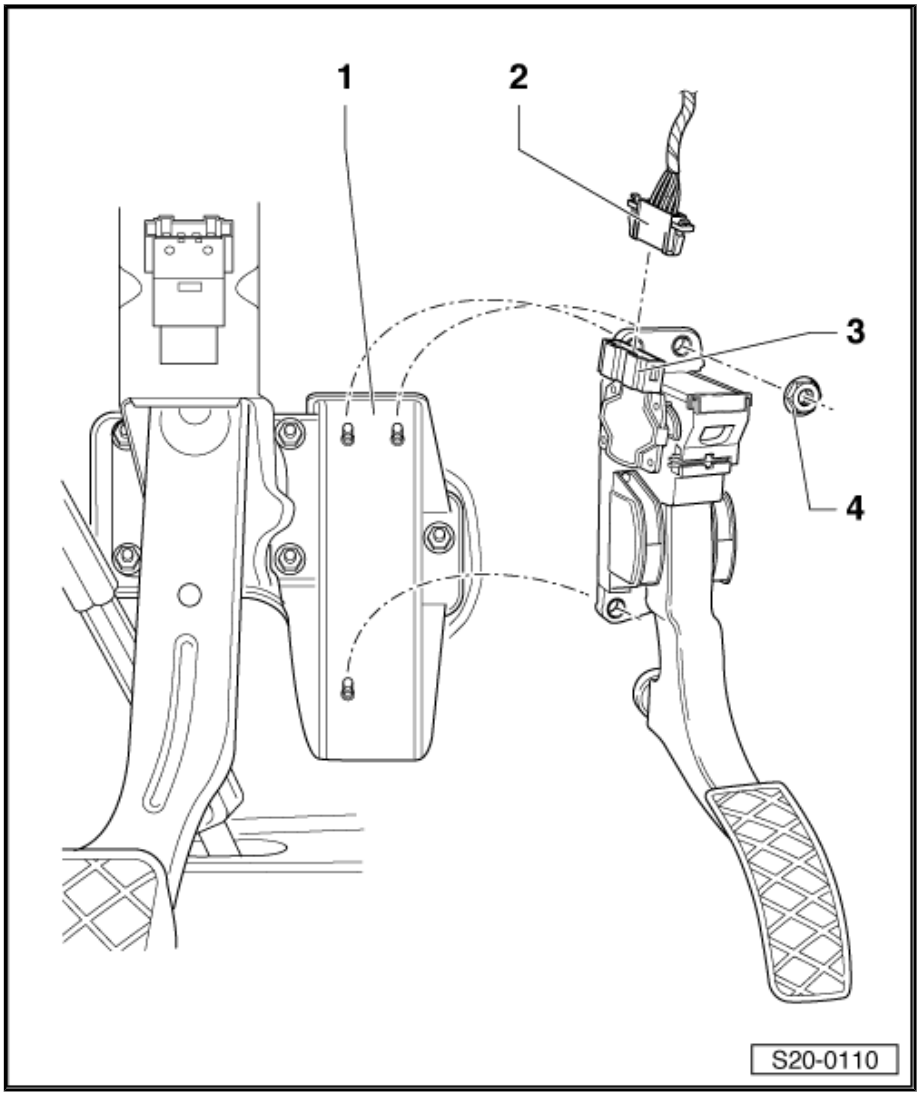
2 - Connector

- ❑ black
- ❑ 6-pin

3 - Accelerator pedal module

- ❑ with accelerator pedal position sender -G79- and accelerator pedal position sender 2 - G185-
- ❑ to remove the sender remove the bottom part of the dash panel on the driver's side
- ❑ if the accelerator pedal module is replaced, an adaptation of the engine control unit has to be performed on vehicles with automatic gearbox ⇒ Vehicle diagnostic tester

4 - 10 Nm



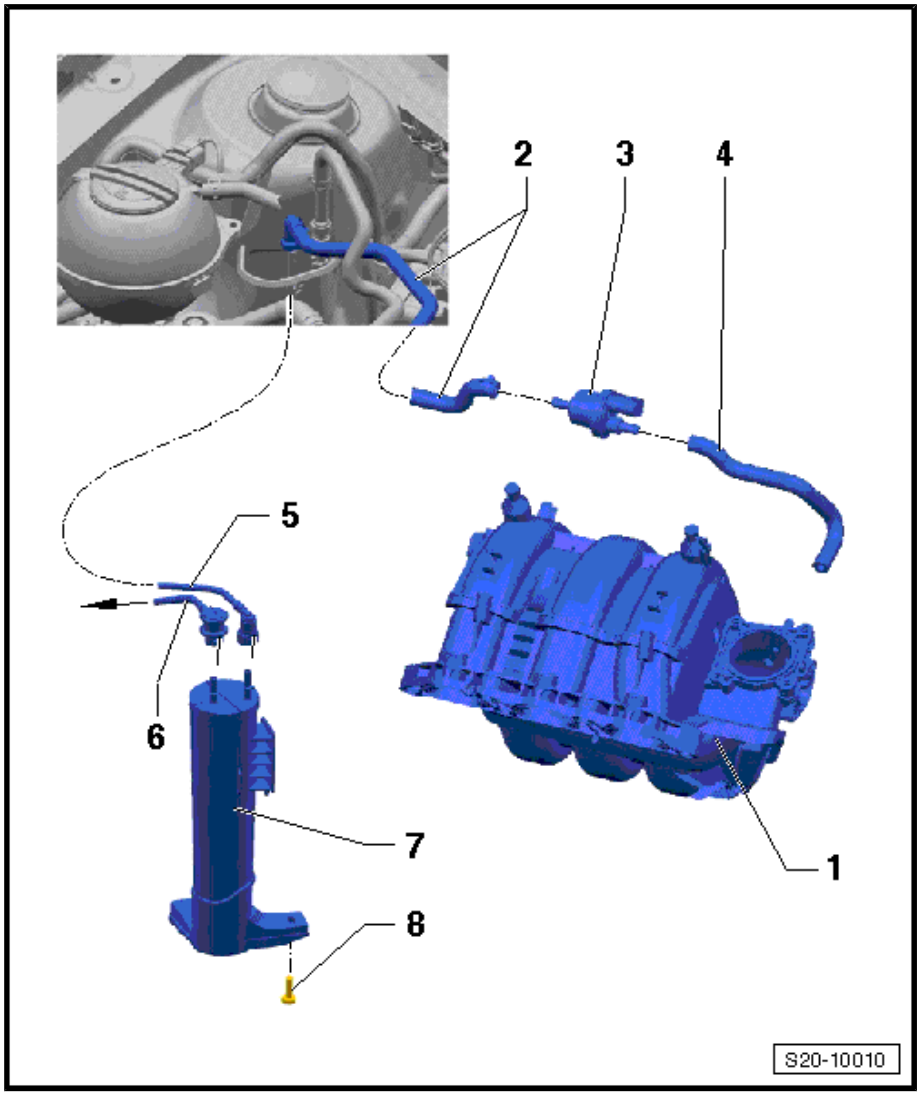
4 Activated charcoal container system

4.1 Activated charcoal container system - Summary of components

Fabia II

Note

- *The hose connections are secured with spring-type clips.*
- *Use pliers for spring strap clips to fit the spring strap clips.*
- *Observe safety measures ⇒ page 6 .*
- *Observe rules for cleanliness ⇒ page 7 .*



1 - Intake manifold

2 - Bleeder hose

3 - Solenoid valve 1 for activated charcoal filter -N80-

- ❑ attached with bracket to the intake manifold
- ❑ valve is actuated (pulsed) by engine control unit
- ❑ check ⇒ Vehicle diagnostic tester

4 - Bleeder hose

5 - Vent line

- ❑ from activated charcoal filter solenoid valve - N80-

6 - Vent line

- ❑ from gravity valve to fuel tank

7 - Activated charcoal filter

- ❑ Fitting location: in rear right wheelhouse
- ❑ attached to the vehicle body
- ❑ Checking the fuel tank venting ⇒ page 127
- ❑ removing:

– Removing the rear right wheel.

– Remove plastic wheelhouse liner ⇒ Body Work; Rep. gr. 66 .

– Disconnect lines -5- and -6-.

– Release screw -8-.

– Push filter down.

- ❑ the installation occurs in reverse order.

8 - 10 Nm

4.2 Activated charcoal container system ► 03.10 - Summary of components

Roomster

Note

The hose connections are secured with spring strap clamps or quick strap clamps.

Observe safety measures ⇒ page 6 .

Observe rules for cleanliness ⇒ page 7 .

1 - Activated charcoal filter

- ❑ Fitting location: behind right headlight
- ❑ attached to the vehicle body
- ❑ Checking the fuel tank venting ⇒ page 127
- ❑ removing:
  - – Disconnect lines -3- and -6-.
  - – Remove screws -7-.
- ❑ the installation occurs in reverse order.

2 - Clamp

3 - Connecting hose

- ❑ to solenoid valve -N80-

4 - Pressure holding valve with connection hose

5 - O-ring

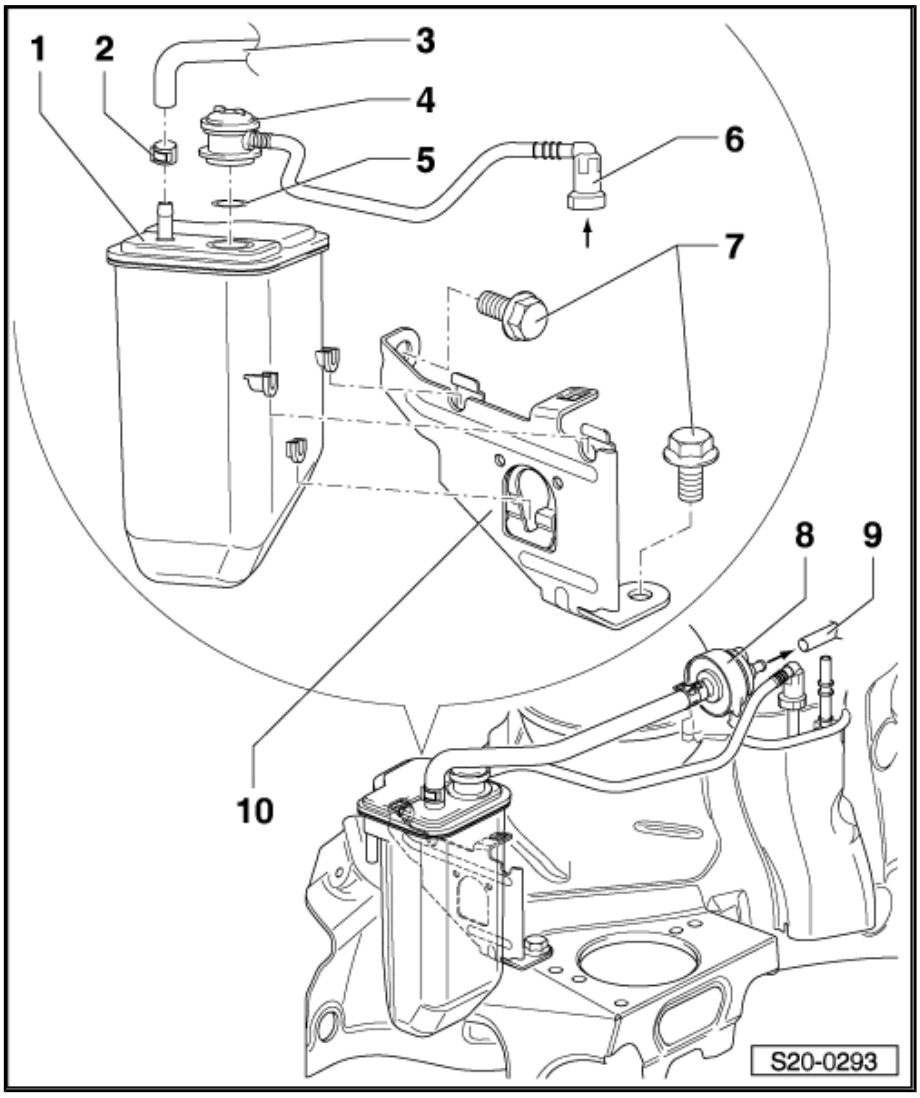
6 - Connecting hose

- ❑ check for firm seating
- ❑ from fuel tank

7 - 10 Nm

8 - Solenoid valve 1 for activated charcoal filter -N80-

- ❑ Resistance value: 22… 30 Ω
- ❑ in right of engine compartment
- ❑ valve is actuated (pulsed) by engine control unit
- ❑ check ⇒ Vehicle diagnostic tester



9 - to throttle valve control unit

10 - Support

- ❑ for activated charcoal filter

4.3 Activated charcoal container system 04.10 ► - Summary of components

Roomster, Rapid NH

Note

- ♦ *The hose connections are secured with spring strap clips or clamp-type clips.*
- ♦ *Always replace clamp-type clips with spring-type clips.*
- ♦ *Use pliers for spring strap clips to fit the spring strap clips.*
- ♦ *Safety precautions when working on the fuel supply system ⇒ page 6 .*
- ♦ *Rules of cleanliness when working on the fuel supply system ⇒ page 7 .*

1 - Bleeder hose

2 - Solenoid valve 1 for activated charcoal filter -N80-

- ❑ attached with bracket to the intake manifold
- ❑ Valve is actuated (pulsed) by engine control unit -J623- when engine is warm
- ❑ check ⇒ Vehicle diagnostic tester
- ❑ Valve closed when ignition is switched off

3 - Bleeder hose

4 - to the non-return valve

5 - Intake manifold

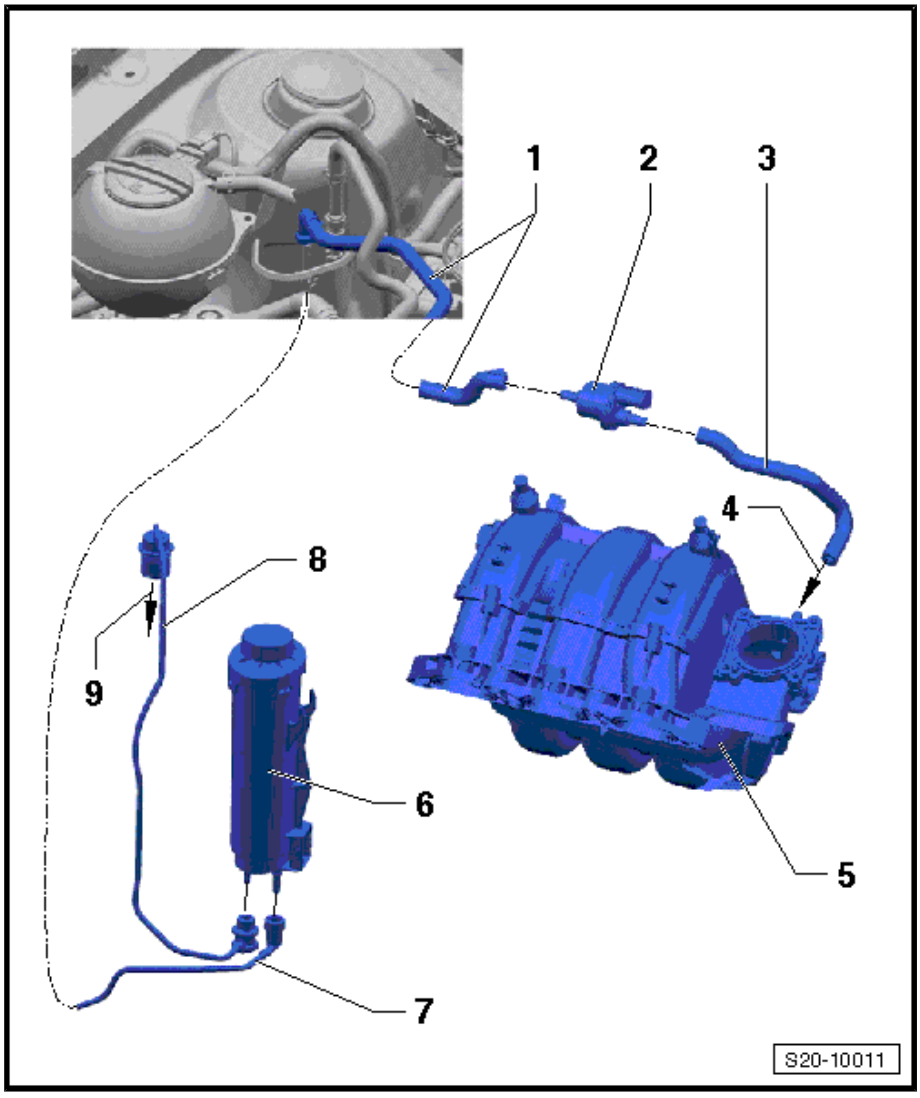
6 - Activated charcoal filter

- ❑ Fitting location: in rear right wheelhouse
- ❑ attached to the vehicle body
- ❑ filled by solenoid valve -N80- and by gravity valve
- ❑ Checking the fuel tank venting ⇒ page 128
- ❑ removing:

– Removing the rear right wheel.

– Remove plastic wheelhouse liner ⇒ Body Work; Rep. gr. 66 .

– Disconnect lines -6- and -7-.



– Remove the activated charcoal filter from the body and push down.

❑ the installation occurs in reverse order.

7 - Vent line

8 - Vent line with gravity valve

9 - to the fuel-tank lid unit

4.4 Checking the fuel tank venting

Fabia II

Special tools and workshop equipment required

♦ Hand vacuum pump , e.g. -V.A.G. 1390- or hand vacuum pump -VAS 6213-

Test condition

• The ignition must be switched off.

– Remove the ventilation line -1- from the activated charcoal filter to the activated charcoal filter system solenoid valve 1 -N80- -2-.

– Connect hand vacuum pump -VAS 6213- to vent line -1- as shown.

– Operate the hand vacuum pump several times. No vacuum should build up.

If a vacuum builds up.

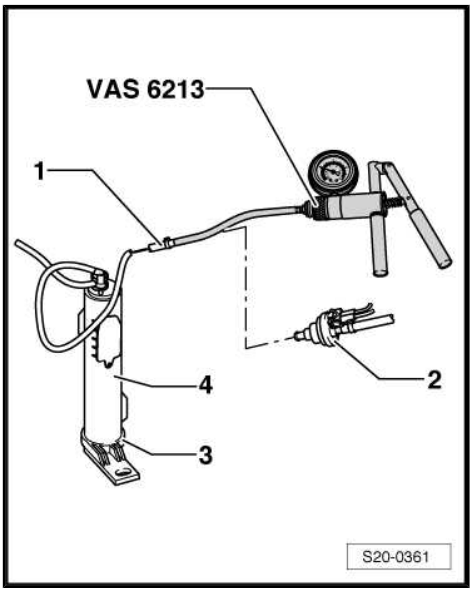
– Check the ventilation opening -3- on the activated charcoal filter -4- for dirt and clean as required.

If no vacuum builds up:

– Shut off ventilation opening -3- on the activated charcoal filter and once again operate the hand vacuum pump several times. A vacuum should build up.

If no vacuum builds up:

– Replace activated charcoal filter.



4.5 Checking the fuel tank venting ► 03.10

Roomster

Special tools and workshop equipment required

♦ Vacuum tester , e. g. -V.A.G. 1368-

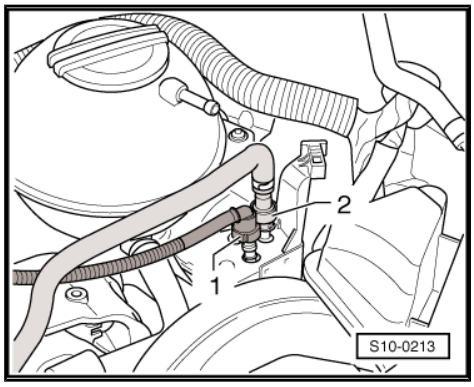
♦ Hand vacuum pump , e.g. -V.A.G. 1390- or hand vacuum pump -VAS 6213-

Test condition

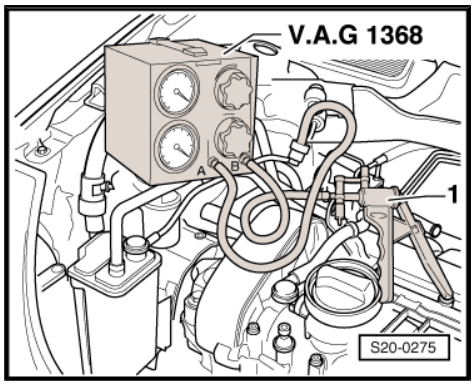
• The ignition must be switched off.

Test sequence

– Detach vent line -1-. To do so press the release button ⇒ page 108 .



– Connect hand vacuum pump -V.A.G. 1390- -1- and vacuum tester -V.A.G. 1368- to vent line as shown.



– Move vacuum tester into position - A/B -.

– Operate the hand vacuum pump several times. No vacuum should build up.

If a vacuum builds up.

– Check the ventilation opening on the activated charcoal filter for dirt and clean as required.

If no vacuum builds up:

– Shut off ventilation opening on the activated charcoal filter and once again operate the hand vacuum pump several times. A vacuum should build up.

If no vacuum builds up:

– Replace activated charcoal filter.

4.6 Checking the fuel tank venting 04.10 ►

Roomster, Rapid NH

Special tools and workshop equipment required

♦ Hand vacuum pump , e.g. -V.A.G 1390- or hand vacuum pump -VAS 6213-

Test condition

• The ignition must be switched off.

– Remove the ventilation line -1- from the activated charcoal filter to the activated charcoal filter system solenoid valve 1 - N80- -2-.
– Connect hand vacuum pump -VAS 6213- to vent line -1- as shown.
– Operate the hand vacuum pump several times. No vacuum should build up.

If a vacuum builds up.

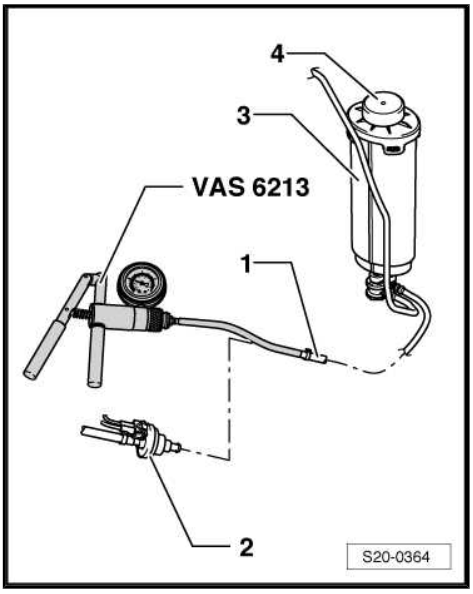
– Check the ventilation opening below the cover -4- on the activated charcoal filter -3- for dirt, clean as required.

If no vacuum builds up:

– Remove the cover -4-, shut off the ventilation opening on the activated charcoal filter and once again operate the hand vacuum pump several times. A vacuum should build up.

If no vacuum builds up:

– Replace activated charcoal filter.



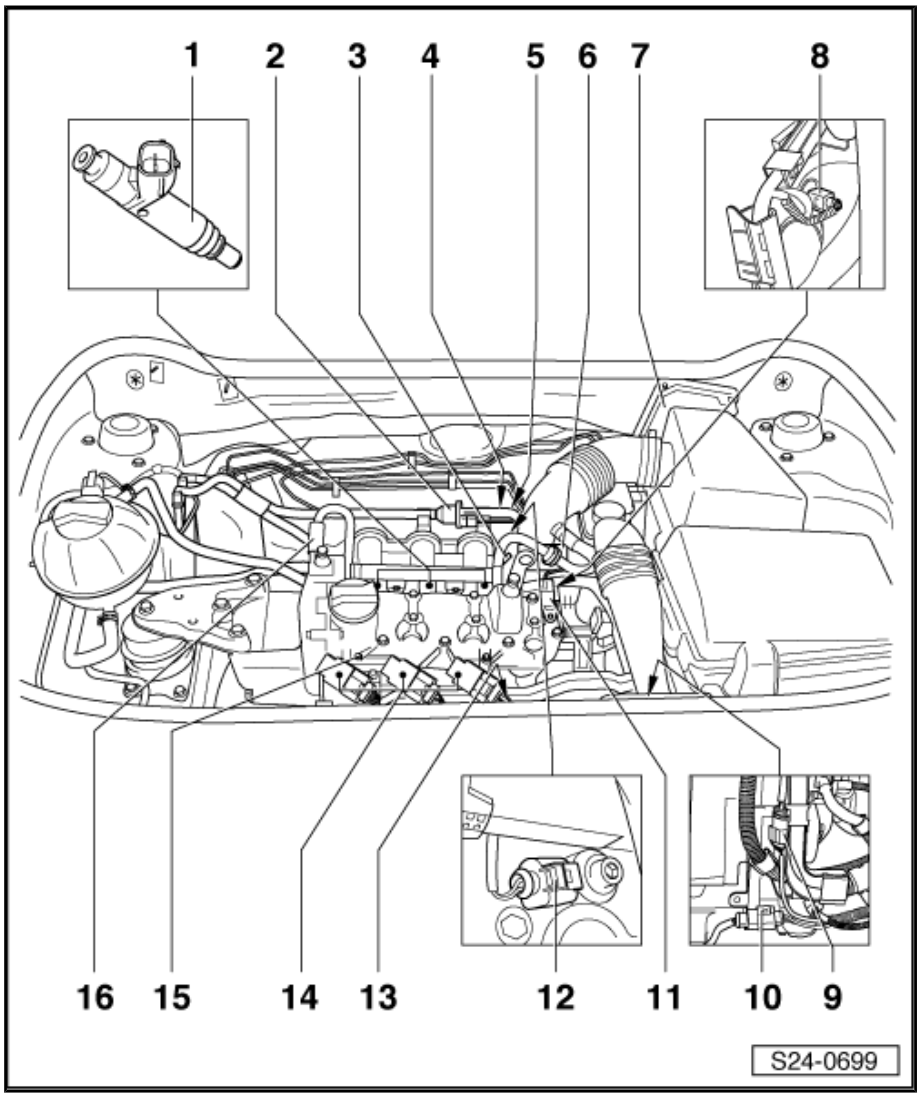
24 – Mixture preparation - injection

1 Fuel Injection System

1.1 Overview of fitting locations

1.1.1 For engines with identification characters BBM, CHFA

Fabia II



1 - Injection valves -N30… N32-

- Resistance value: 12… 17 Ω (at approx. 20 °C)
- Inspecting the injection rate, tightness and jet formation of the injectors ⇒ page 153
- Summary of components ⇒ page 144

2 - Solenoid valve 1 for activated charcoal filter -N80-

- Resistance value: 22… 30 Ω

3 - Vent valve

- Vent fuel system ⇒ page 121

4 - Engine speed sender -G28-

- Fitting location: on the suction side of the crankcase
- check ⇒ Vehicle diagnostic tester

5 - Intake manifold pressure sender -G71- and Intake manifold temperature sender -G72-

- Fitting location: at intake manifold

6 - Throttle valve control unit -J338-

- check ⇒ Vehicle diagnostic tester

7 - Engine control unit

8 - Coolant temperature sender -G62-

- resistances ⇒ Vehicle diagnostic tester

9 - 4-pin plug

- Brown
- for lambda probe downstream of catalytic converter -G130- and heater of lambda probe 1 downstream of catalytic converter -Z29-
- for engines complying with exhaust emission standard EU-4, BS-4 and EU-5

10 - 4-pin plug

- ❑ black
- ❑ black for lambda probe upstream of catalytic converter -G39- and heater for lambda probe upstream of catalytic converter -Z19-

11 - Camshaft position sensor -G163-

- ❑ check ⇒ Vehicle diagnostic tester

12 - Knock sensor 1 -G61-

- ❑ Fitting location: on the suction side of the crankcase

13 - Lambda probe upstream of catalytic converter -G39- , 50 Nm

- ❑ Pay attention to the part number
- ❑ Fitting location: in the exhaust manifold
- ❑ Testing lambda probe -G39- and lambda control upstream of catalytic converter ⇒ Vehicle diagnostic tester

14 - Ignition coils with power output stage -N70- , -N127- , -N291-

- ❑ check ⇒ Vehicle diagnostic tester
- ❑ resistances ⇒ page 170
- ❑ removing ⇒ page 170

15 - Earth point -19-

- ❑ on the cylinder head cover

16 - The vacuum regulating valve (PCV valve)

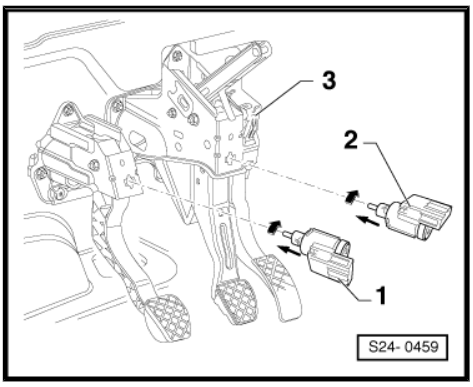
- ❑ Pay attention to the part number
- ❑ for crankcase ventilation
- ❑ sealed for northern countries

Foot controls - installed location

1 - Clutch pedal switch -F36-

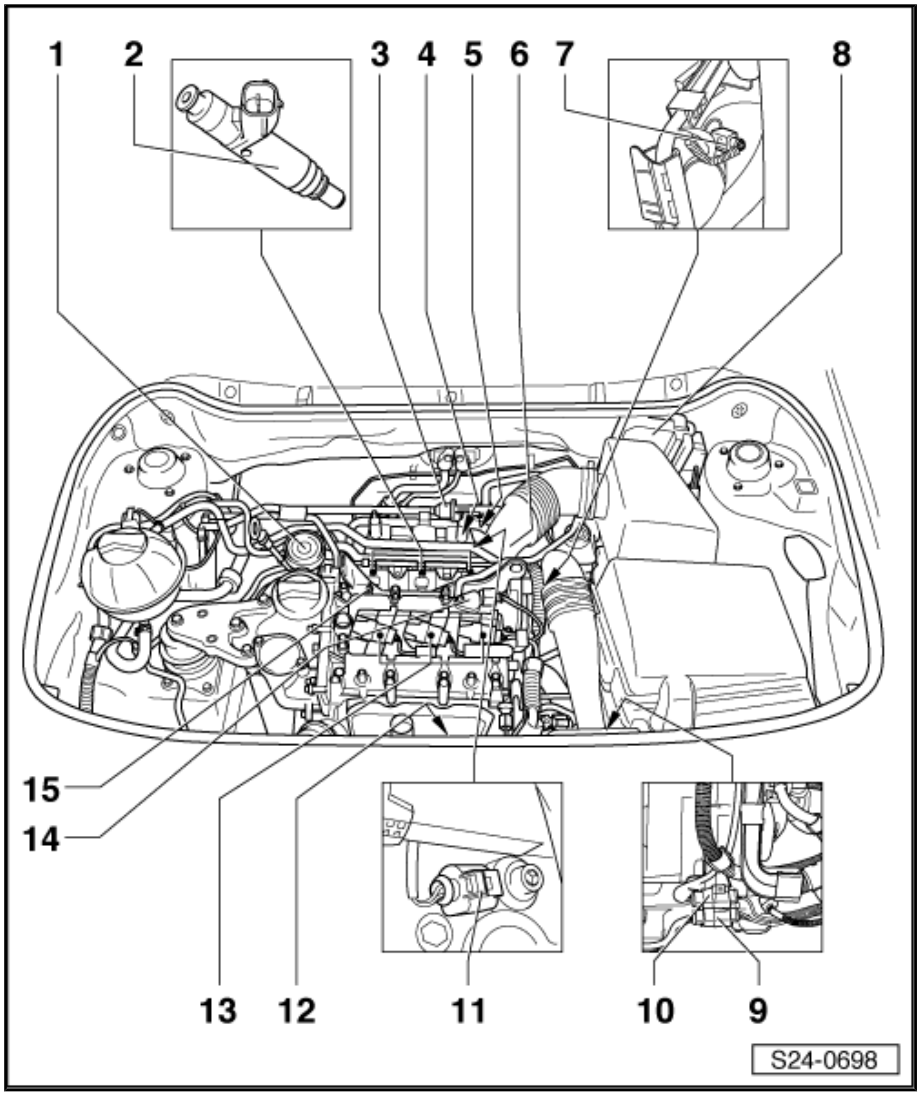
2 - Brake light switch -F- and brake pedal switch -F47-

3 - Accelerator pedal position sender -G79- and accelerator pedal position sender 2 -G185-



1.1.2 For engines with identification characters BZG, CGPA, CGPB, CEVA, CJLA

Fabia II



1 - The vacuum regulating valve (PCV valve)

- ❑ Pay attention to the part number
- ❑ for crankcase ventilation

2 - Injection valves -N30… N32-

- ❑ Resistance value: 12… 17 Ω (at approx. 20 °C)
- ❑ Inspecting the injection rate, tightness and jet formation of the injectors ⇒ page 153
- ❑ Summary of components ⇒ page 145

3 - Solenoid valve 1 for activated charcoal filter -N80-

- ❑ Resistance value: 22… 30 Ω

4 - Engine speed sender -G28-

- ❑ Fitting location: on the suction side of the crankcase

5 - Intake manifold pressure sender -G71- and Intake manifold temperature sender -G72-

- ❑ Fitting location: at intake manifold

6 - Throttle valve control unit -J338-

- ❑ check ⇒ Vehicle diagnostic tester

7 - Coolant temperature sender -G62-

8 - Engine control unit

9 - 4-pin plug

- ❑ Brown
- ❑ for lambda probe downstream of catalytic converter -G130- and heater of lambda probe 1 downstream of catalytic converter -Z29-
- ❑ for engines complying with exhaust emission standard EU-4, BS-4 and EU-5

10 - 4-pin plug

- ❑ black
- ❑ for lambda probe upstream of catalytic converter -G39- and heater for lambda probe upstream of catalytic converter -Z19-

11 - Knock sensor 1 -G61-

- ❑ Fitting location: on the suction side of the crankcase

12 - Lambda probe upstream of catalytic converter -G39- , 50 Nm

- ❑ Fitting location: in the exhaust manifold

13 - Ignition coils with power output stage -N70- , -N127- , -N291-

- ❑ check ⇒ Vehicle diagnostic tester
- ❑ resistances ⇒ page 170
- ❑ removing ⇒ page 170

14 - Camshaft position sensor -G163-

15 - Earth point -19-

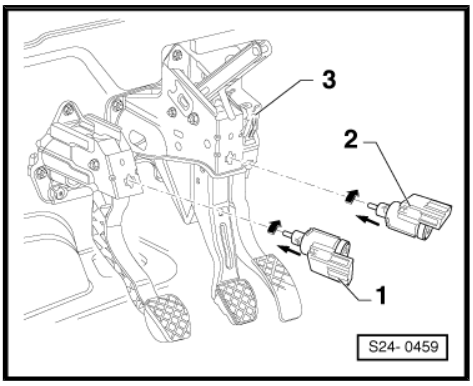
- ❑ on the cylinder head cover

Foot controls - installed location

1 - Clutch pedal switch -F36-

2 - Brake light switch -F- and brake pedal switch -F47-

3 - Accelerator pedal position sender -G79- and accelerator pedal position sender 2 -G185-



1.1.3 For engine with identification characters BME

Roomster

1 - Solenoid valve 1 for activated charcoal filter -N80-

- ❑ Resistance value: 22… 30 Ω

2 - The vacuum regulating valve (PCV valve)

- ❑ for crankcase ventilation
- ❑ Pay attention to the part number

3 - Injection valves -N30… N32-

- ❑ Resistance value: 12… 17 Ω (at approx. 20 °C)
- ❑ Inspecting the injection rate, tightness and jet formation of the injectors ⇒ page 153
- ❑ Summary of components ⇒ page 145

4 - Engine speed sender -G28-

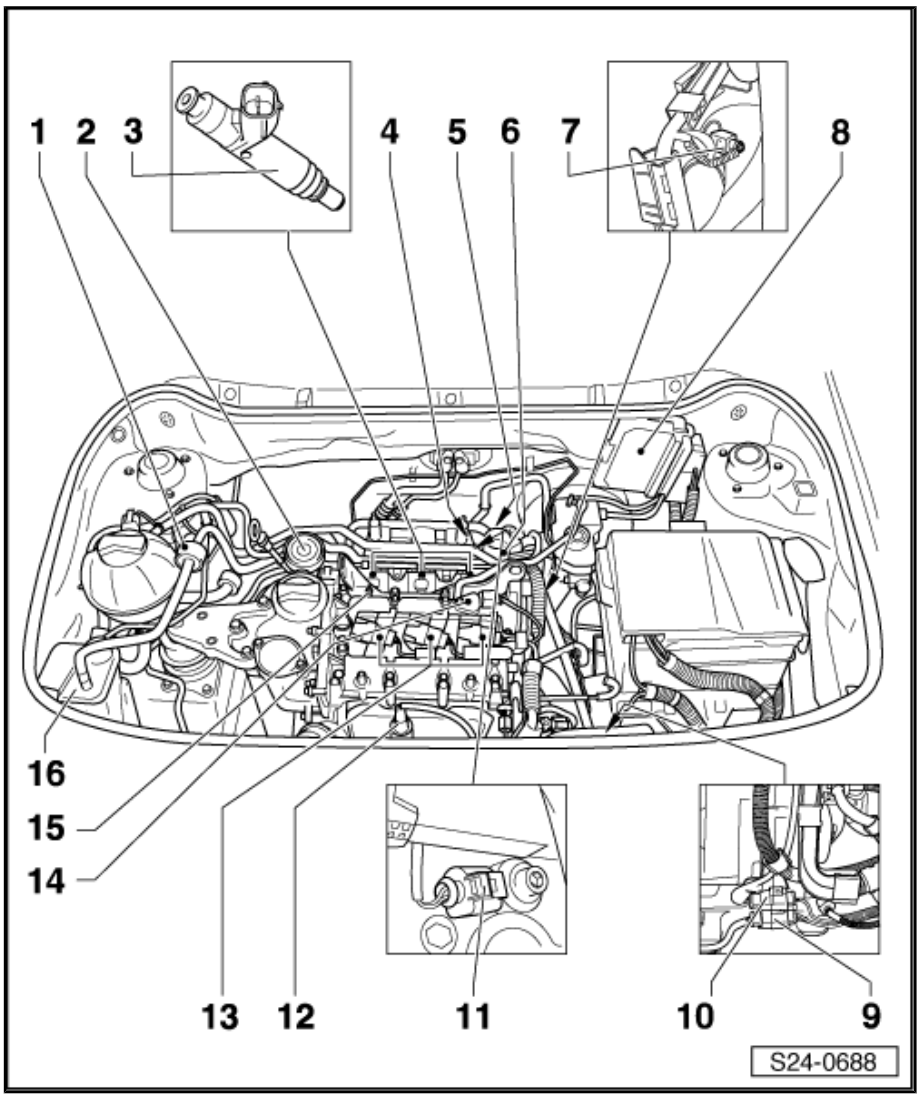
- ❑ Fitting location: at cylinder block suction side

5 - Intake manifold pressure sender -G71- and Intake manifold temperature sender -G72-

- ❑ Fitting location: at intake manifold

6 - Throttle valve control unit -J338-

7 - Coolant temperature send-



er -G62-

8 - Engine control unit -J623-

9 - 4-pin plug

- ❑ Brown
- ❑ for lambda probe downstream of catalytic converter -G130- and heater of lambda probe 1 downstream of catalytic converter -Z29-

10 - 4-pin plug

- ❑ black
- ❑ for lambda probe upstream of catalytic converter -G39- and heater for lambda probe upstream of catalytic converter -Z19-

11 - Knock sensor 1 -G61-

- ❑ Fitting location: at cylinder block suction side

12 - Lambda probe upstream of catalytic converter -G39- , 50 Nm

- ❑ Fitting location: in the exhaust manifold

13 - Ignition coils with power output stage -N70- , -N127- , -N291-

- ❑ check ⇒ Vehicle diagnostic tester
- ❑ resistances ⇒ page 170
- ❑ removing ⇒ page 170

14 - Camshaft position sensor -G163-

15 - Earth point -19-

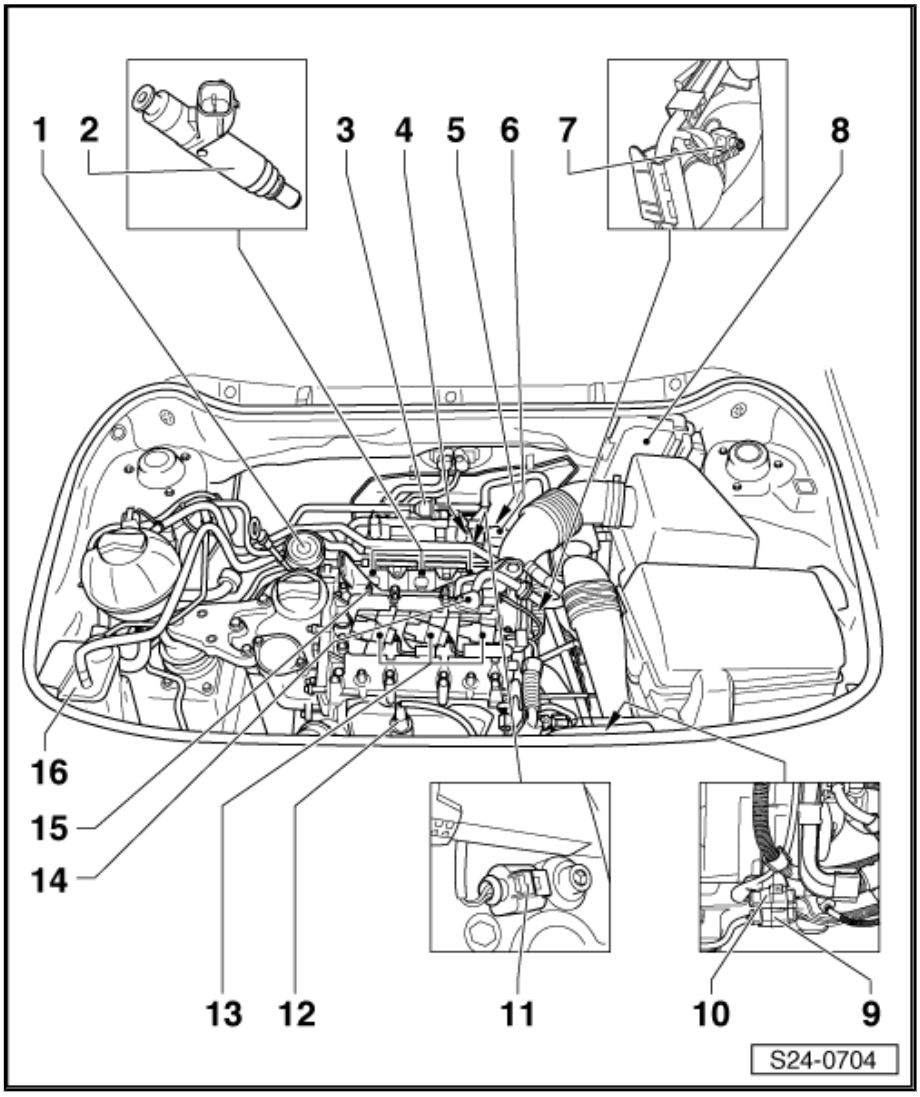
- ❑ on the cylinder head cover

16 - Activated charcoal filter

- ❑ for vehicles ► 03.2010

1.1.4 For engines with identification characters BZG, CGPA, CGPC

Roomster, Rapid NH



1 - The vacuum regulating valve (PCV valve)

- ❑ for crankcase ventilation
- ❑ Pay attention to the part number

2 - Injection valves -N30…N32-

- ❑ Resistance value: 12…17 Ω (at approx. 20 °C)
- ❑ Inspecting the injection rate, tightness and jet formation of the injectors ⇒ page 153
- ❑ Summary of components ⇒ page 145

3 - Solenoid valve 1 for activated charcoal filter -N80-

- ❑ Resistance value: 22…30 Ω

4 - Engine speed sender -G28-

- ❑ Fitting location: at cylinder block suction side

5 - Intake manifold pressure sender -G71- and Intake manifold temperature sender -G72-

- ❑ Fitting location: at intake manifold

6 - Throttle valve control unit -J338-

7 - Coolant temperature sender -G62-

8 - Engine control unit -J623-

9 - 4-pin plug

- ❑ Brown
- ❑ for lambda probe downstream of catalytic converter -G130- and heater of lambda probe 1 downstream of catalytic converter -Z29-

10 - Connector

- ❑ black for lambda probe upstream of catalytic converter -G39- and heater for lambda probe upstream of catalytic converter -Z19-
- ❑ 4-pin

11 - Knock sensor 1 -G61-

- ❑ Fitting location: at cylinder block suction side

12 - Lambda probe upstream of catalytic converter -G39- , 50 Nm

- ❑ Fitting location: in the exhaust manifold

13 - Ignition coils with power output stage -N70- , -N127- , -N291-

- ❑ check ⇒ Vehicle diagnostic tester
- ❑ resistances ⇒ page 170
- ❑ removing ⇒ page 170

14 - Camshaft position sensor -G163-

15 - Earth point -19-

- ❑ on the cylinder head cover

16 - Activated charcoal filter

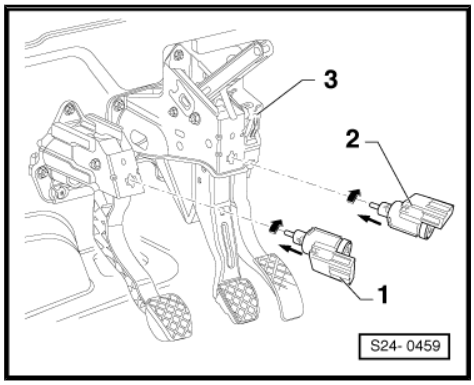
- ❑ for vehicles ▸ 03.2010

Foot controls - installed location

1 - Clutch pedal switch -F36-

2 - Brake light switch -F- and brake pedal switch -F47-

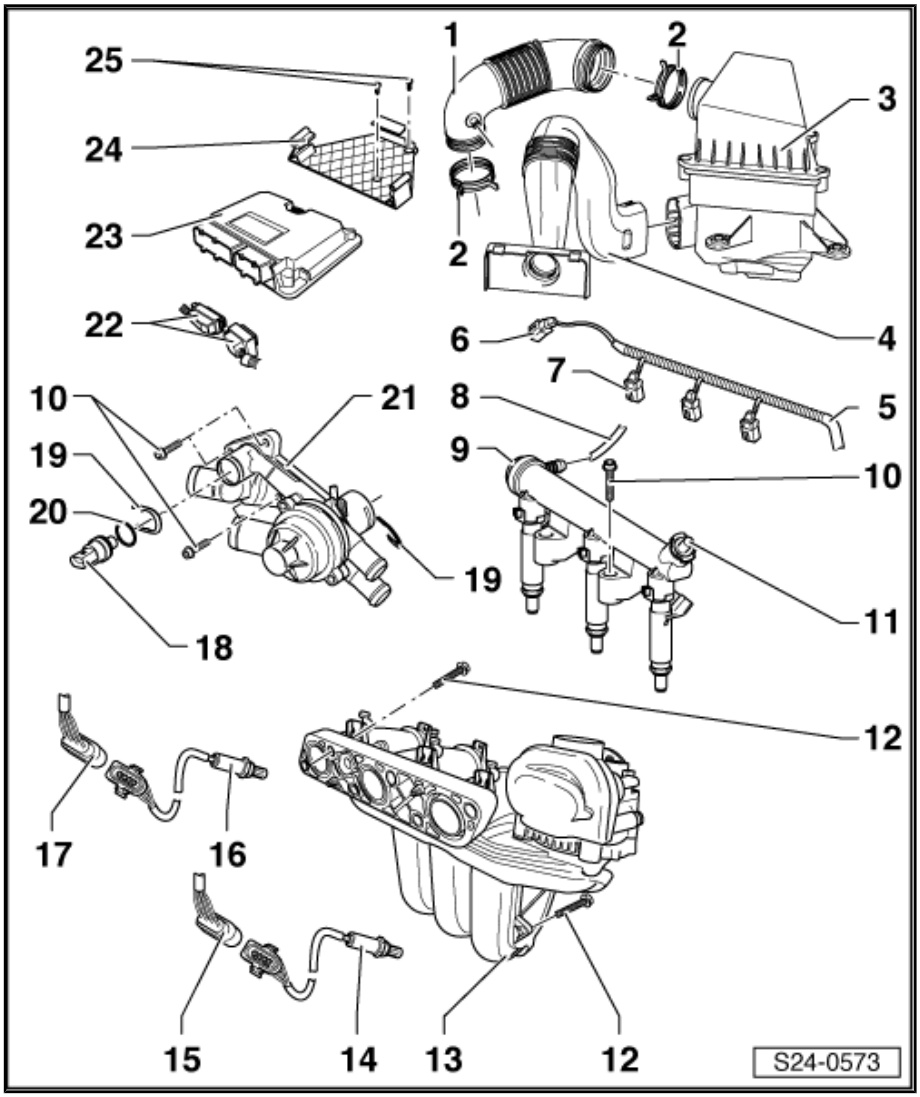
3 - Accelerator pedal position sender -G79- and accelerator pedal position sender 2 -G185-



1.2 Removing and installing parts of the injection system

1.2.1 For engines with identification characters BBM, CHFA

Fabia II



1 - Connecting hose

2 - Open warm-type clamp

3 - Air filter housing

- ❑ disassembling and assembling ⇒ page 148

4 - Intake manifold

5 - Cable guide

- ❑ clipped onto the intake manifold

6 - Connector

- ❑ only for vehicles with extended servicing intervals (ESI)
- ❑ 3-pin
- ❑ for oil level and oil temperature sender -G266-

7 - Connector

- ❑ 2-pin
- ❑ for injection valves -N30…N32-

8 - Intake hose

- ❑ secure with spring strap clamps
- ❑ check for firm seating

9 - Fuel strip together with injectors

- ❑ disassembling and assembling ⇒ page 144

10 - 8 Nm

11 - Vent valve

- ❑ Vent fuel system ⇒ page 121

12 - 20 Nm

13 - Intake manifold

- ❑ disassembling and assembling ⇒ page 146

14 - Lambda probe before catalyst -G39- , 50 Nm

- ❑ Pay attention to the part number
- ❑ Fitting location: in the exhaust manifold
- ❑ coat only thread with hot bolt paste -G 052 112 A3- ; hot bolt paste must not get into the slot of the probe body
- ❑ Testing lambda probe -G39- and lambda control upstream of catalytic converter ⇒ Vehicle diagnostic tester

15 - Connector

- ❑ for lambda probe upstream of catalytic converter -G39-
- ❑ 4-pin
- ❑ black
- ❑ Fitting location: ⇒ page 130

16 - Lambda probe downstream of catalytic converter -G130- , 50 Nm

- ❑ Fitting location: downstream of catalytic converter
- ❑ coat the thread with hot bolt paste -G 052 112 A3- ; hot bolt paste must not get into the slots of the probe body

- ❑ Testing lambda probe -G130- and lambda control downstream of catalytic converter ⇒ Vehicle diagnostic tester
- ❑ for engines complying with exhaust emission standard EU-4, BS-4 and EU-5

17 - Connector

- ❑ for lambda probe downstream of catalytic converter -G130-
- ❑ 4-pin
- ❑ Brown
- ❑ Fitting location: ⇒ page 130
- ❑ for engines complying with exhaust emission standard EU-4

18 - Coolant temperature sender -G62-

- ❑ resistances ⇒ Vehicle diagnostic tester
- ❑ before removing, reduce pressure in cooling system if necessary

19 - Retaining clip

- ❑ check tightness

20 - O-ring

- ❑ replace

21 - Coolant regulator housing

- ❑ disassembling and assembling ⇒ page 86

22 - 52-pin and 28-pin plugs

- ❑ for engine control unit
- ❑ only insert or remove plug when the ignition is switched off
- ❑ unlock before removing

23 - Engine control unit

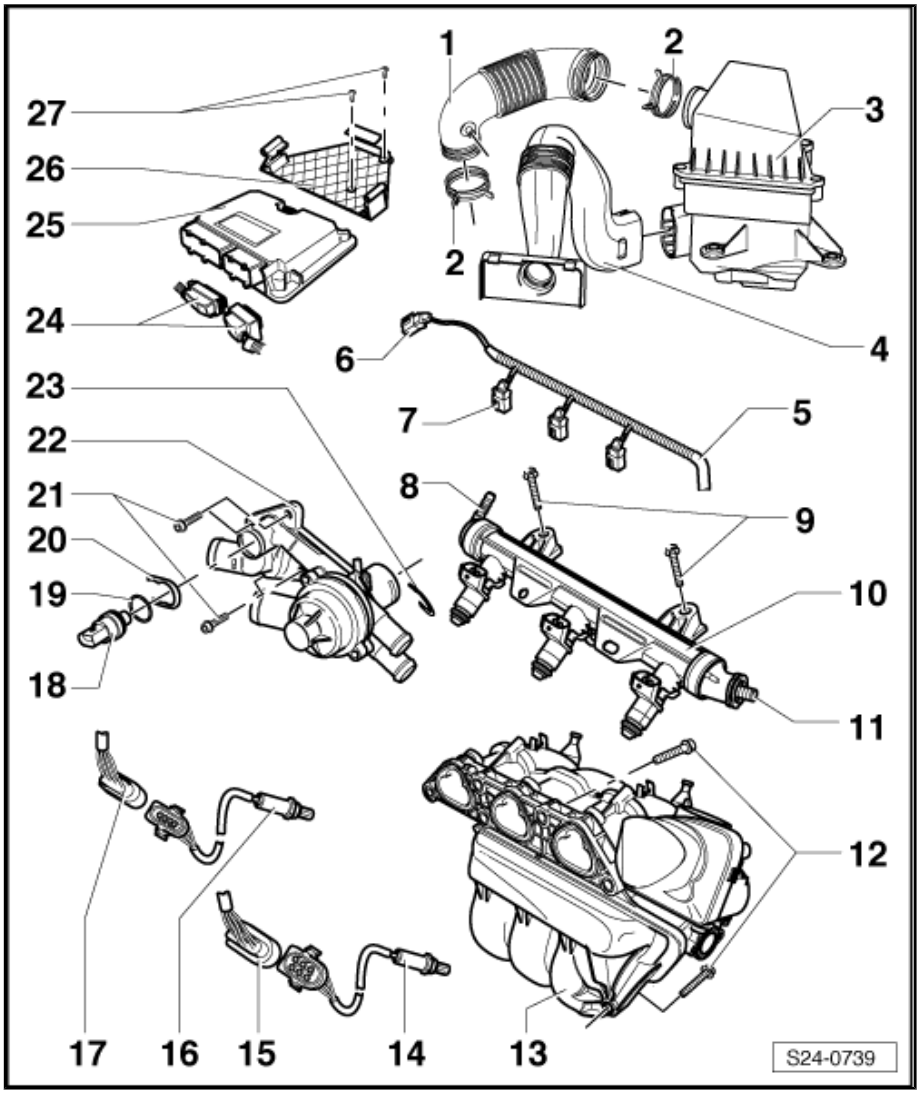
- ❑ Fitting location ⇒ page 130
- ❑ Check supply voltage ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ replace ⇒ page 158
- ❑ Coding ⇒ Vehicle diagnostic tester
- ❑ Adapt the engine control unit to the throttle valve control unit -J338- ⇒ Vehicle diagnostic tester

24 - Support

25 - 2 Nm

1.2.2 For engines with identification characters BZG, CGPA, CGPB, CEVA, CJLA

Fabia II



1 - Connecting hose

2 - Open warm-type clamp

3 - Air filter housing

- ❑ disassembling and assembling ⇒ page 148

4 - Intake manifold

5 - Cable guide

- ❑ clipped onto the intake manifold

6 - Connector

- ❑ only for vehicles with extended servicing intervals (ESI)
- ❑ 3-pin
- ❑ for oil level and oil temperature sender -G266-

7 - Connector

- ❑ 2-pin
- ❑ for injection valves -N30…N32-

8 - Connection for fuel supply hose

- ❑ from fuel filter

9 - 8 Nm

10 - Fuel strip together with injectors

- ❑ disassembling and assembling ⇒ page 145

11 - Vent valve

- ❑ Vent fuel system ⇒ page 121

12 - 20 Nm

13 - Intake manifold

- ❑ disassembling and assembling ⇒ page 147

14 - Lambda probe upstream of catalytic converter -G39- , 50 Nm

- ❑ Fitting location: in the exhaust manifold
- ❑ coat the thread with hot bolt paste -G 052 112 A3- ; hot bolt paste must not get into the slots of the probe body

15 - Connector

- ❑ for lambda probe upstream of catalytic converter -G39-
- ❑ 4-pin
- ❑ black
- ❑ Fitting location ⇒ page 131

16 - Lambda probe downstream of catalytic converter -G130- , 50 Nm

- ❑ Fitting location: downstream of catalytic converter
- ❑ coat the thread with hot bolt paste -G 052 112 A3- ; hot bolt paste must not get into the slots of the probe body
- ❑ for engines complying with exhaust emission standard EU-4, BS-4 and EU-5

17 - Connector

- ❑ for lambda probe downstream of catalytic converter -G130-

- ❑ 4-pin
- ❑ Brown
- ❑ Fitting location ⇒ page 131

18 - Coolant temperature sender -G62-

- ❑ before removing, reduce pressure in cooling system if necessary

19 - O-ring

- ❑ replace

20 - Retaining clip

- ❑ check tightness

21 - 8 Nm

22 - Coolant regulator housing

- ❑ disassembling and assembling ⇒ page 86

23 - Retaining clip

- ❑ check tightness

24 - 52-pin and 28-pin plugs

- ❑ for control unit
- ❑ only insert or remove plug when the ignition is switched off
- ❑ unlock before removing

25 - Engine control unit

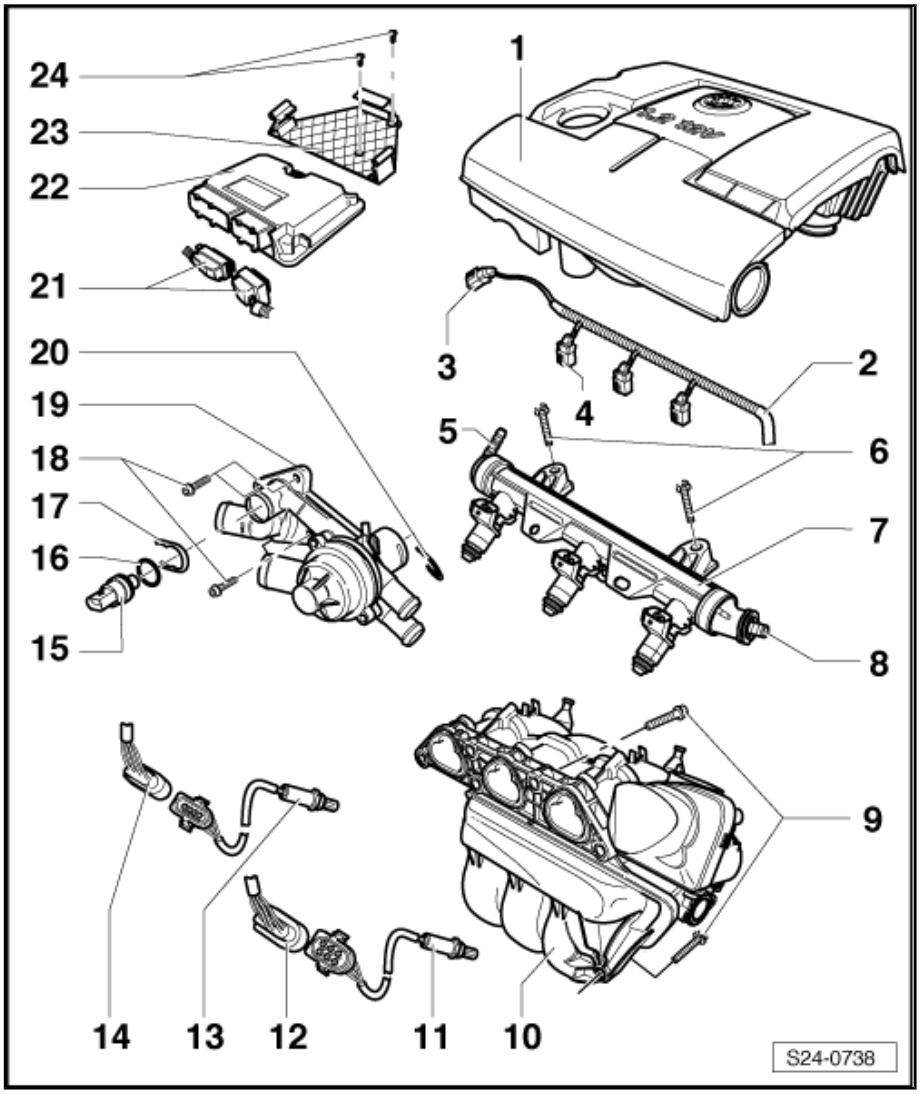
- ❑ Fitting location ⇒ page 131
- ❑ Check supply voltage ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ replace ⇒ page 158
- ❑ Coding ⇒ Vehicle diagnostic tester

26 - Support

27 - 2 Nm

1.2.3 For engine with identification characters BME

Roomster



1 - Engine cover with air filter

- ❑ removing and installing ⇒ page 149
- ❑ disassembling and assembling ⇒ page 151

2 - Cable guide

- ❑ clipped onto the intake manifold

3 - Connector

- ❑ for oil level and oil temperature sender -G266-
- ❑ only for vehicles with extended servicing intervals (ESI)
- ❑ 3-pin

4 - Connector

- ❑ 2-pin
- ❑ for injection valves -N30…N32-

5 - Connection for fuel supply hose

- ❑ from fuel filter

6 - 8 Nm

7 - Fuel strip together with injectors

- ❑ disassembling and assembling ⇒ page 145

8 - Vent valve

- ❑ Vent fuel system ⇒ page 121

9 - 20 Nm

10 - Intake manifold

- ❑ disassembling and assembling ⇒ page 147

11 - Lambda probe upstream of catalytic converter -G39- , 50 Nm

- ❑ Fitting location: in the exhaust manifold
- ❑ coat only thread with hot bolt paste -G 052 112 A3- ; hot bolt paste must not get into the slot of the probe body

12 - Connector

- ❑ 4-pin
- ❑ for lambda probe upstream of catalytic converter -G39-
- ❑ black
- ❑ Fitting location ⇒ page 133

13 - Lambda probe downstream of catalytic converter -G130- , 50 Nm

- ❑ Fitting location: downstream of catalytic converter
- ❑ coat only thread with hot bolt paste -G 052 112 A3- ; hot bolt paste must not get into the slot of the probe body

14 - Connector

- ❑ 4-pin
- ❑ for lambda probe downstream of catalytic converter -G130-
- ❑ Brown
- ❑ Fitting location ⇒ page 133

15 - Coolant temperature sender -G62-

- ❑ before removing, reduce pressure in cooling system if necessary

16 - O-ring

- ❑ replace

17 - Retaining clip

- ❑ check tightness

18 - 8 Nm

19 - Coolant regulator housing

- ❑ disassembling and assembling ⇒ page 86

20 - Retaining clip

- ❑ check tightness

21 - 52-pin and 28-pin plugs

- ❑ for engine control unit
- ❑ only insert or remove plug when the ignition is switched off
- ❑ unlock before removing

22 - Engine control unit -J623-

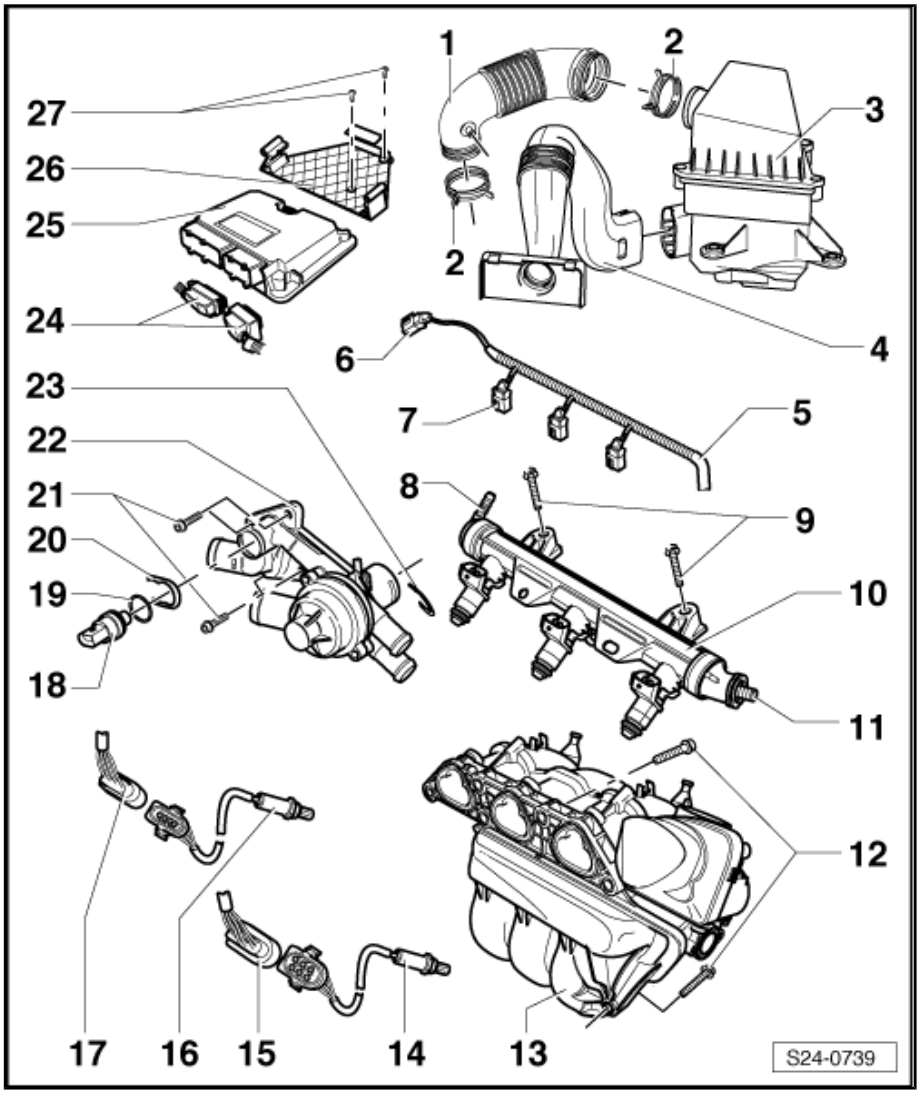
- ❑ Fitting location ⇒ page 133
- ❑ Check supply voltage ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ replace ⇒ page 158
- ❑ Coding ⇒ Vehicle diagnostic tester

23 - Support

24 - 2 Nm

1.2.4 For engines with identification characters BZG, CGPA, CGPC

Roomster, Rapid NH



1 - Connecting hose

2 - Open warm-type clamp

3 - Air filter housing

- ❑ disassembling and assembling ⇒ page 151

4 - Intake manifold

5 - Cable guide

- ❑ clipped onto the intake manifold

6 - Connector

- ❑ for oil level and oil temperature sender -G266-
- ❑ only for vehicles with extended servicing intervals (ESI)
- ❑ 3-pin

7 - Connector

- ❑ for injection valves - N30…N32-
- ❑ 2-pin

8 - Connection for fuel supply hose

- ❑ from fuel filter

9 - 8 Nm

10 - Fuel strip together with injectors

- ❑ disassembling and assembling ⇒ page 145

11 - Vent valve

- ❑ Vent fuel system ⇒ page 121

12 - 20 Nm

13 - Intake manifold

- ❑ disassembling and assembling ⇒ page 147

14 - Lambda probe upstream of catalytic converter -G39- , 50 Nm

- ❑ Fitting location: in the exhaust manifold
- ❑ coat only thread with hot bolt paste -G 052 112 A3- ; hot bolt paste must not get into the slot of the probe body

15 - Connector

- ❑ 4-pin
- ❑ for lambda probe upstream of catalytic converter -G39-
- ❑ black
- ❑ Fitting location ⇒ page 134

16 - Lambda probe downstream of catalytic converter -G130- , 50 Nm

- ❑ Fitting location: downstream of catalytic converter
- ❑ coat only thread with hot bolt paste -G 052 112 A3- ; hot bolt paste must not get into the slot of the probe body

17 - Connector

- ❑ 4-pin
- ❑ for lambda probe downstream of catalytic converter -G130-

- ❑ Brown
- ❑ Fitting location ⇒ page 134

18 - Coolant temperature sender -G62-

- ❑ before removing, reduce pressure in cooling system if necessary

19 - O-ring

- ❑ replace

20 - Retaining clip

- ❑ check tightness

21 - 8 Nm

22 - Coolant regulator housing

- ❑ disassembling and assembling ⇒ page 86

23 - Retaining clip

- ❑ check tightness

24 - 81- and 40-pin plugs

- ❑ for engine control unit
- ❑ only insert or remove plug when the ignition is switched off
- ❑ unlock before removing

25 - Engine control unit -J361-

- ❑ Fitting location ⇒ page 134
- ❑ Check supply voltage ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ replace ⇒ page 158
- ❑ Coding ⇒ Vehicle diagnostic tester

26 - Support

27 - 2 Nm

1.3 Fuel strip with injection valves - Summary of components

1.3.1 For engines with identification characters BBM, CHFA

Fabia II

1 - Connection for fuel supply hose

- ❑ from fuel filter

2 - Fuel strip

3 - O-ring

- ❑ replace

4 - Injection valves -N30… N32-

- ❑ mount with a retaining clip
- ❑ before fitting O-rings moisten lightly with clean engine oil
- ❑ Inspecting the injection rate, tightness and jet formation of the injectors ⇒ page 153
- ❑ Resistance value: 12… 17 Ω (at approx. 20 °C)

5 - Retaining clip

- ❑ pay attention to the correct seating on the injection valve and the fuel strip

6 - Vent valve

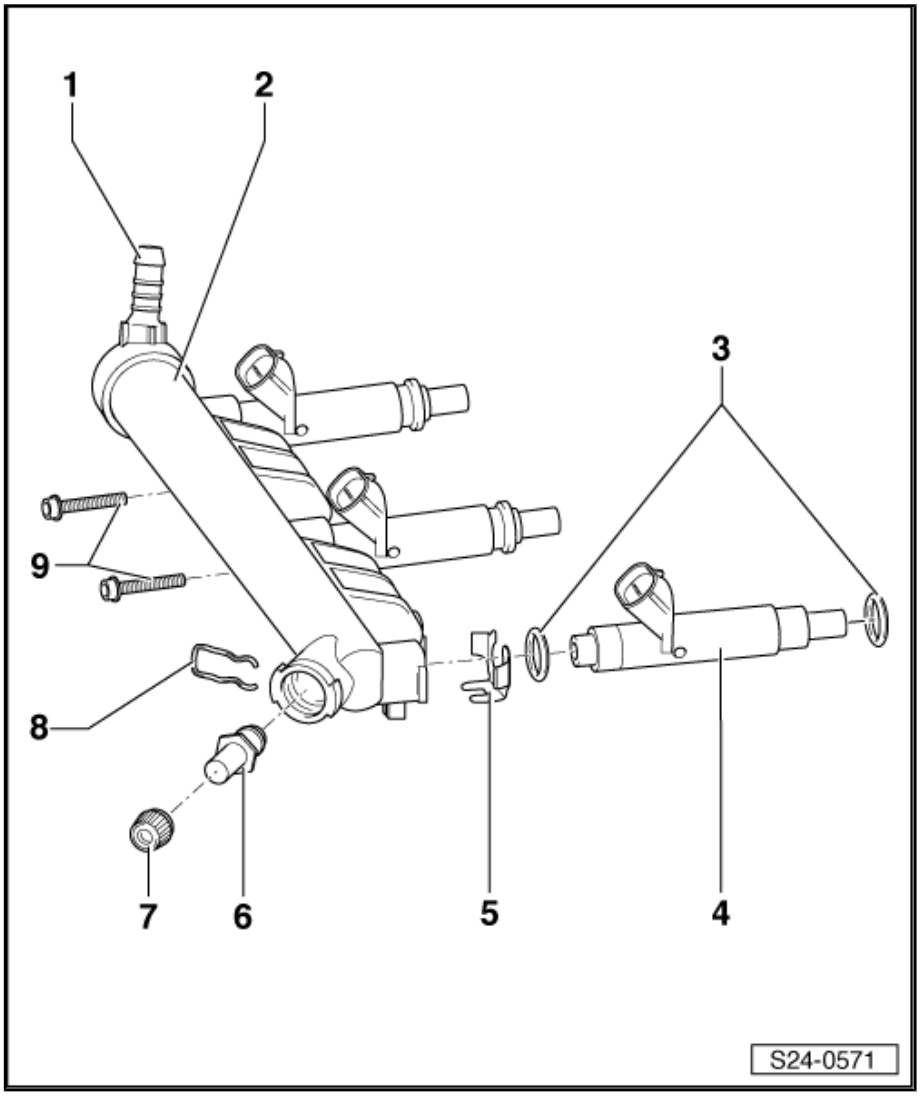
- ❑ Vent fuel system ⇒ page 121

7 - Cap for vent valve

8 - Retaining clip

- ❑ pay attention to the correct position on the supports of the vent valve and the fuel strip

9 - 8 Nm



1.3.2 For engines with identification characters BZG, CGPA, CGPB, CEVA, CJLA, BME, CGPC

Fabia II, Roomster, Rapid NH

1 - Bleeder supports

- ❑ after replacing the fuel tank, bleed the fuel supply with the valve on the fuel strip ⇒ page 121

2 - Fuel strip

3 - O-ring

- ❑ replace

4 - Injection valves -N30… N32-

- ❑ mount with a retaining clip
- ❑ before fitting O-rings moisten lightly with clean engine oil
- ❑ Inspecting the injection rate, tightness and jet formation of the injectors ⇒ page 153
- ❑ Resistance value: 12… 17 Ω (at approx. 20 °C)

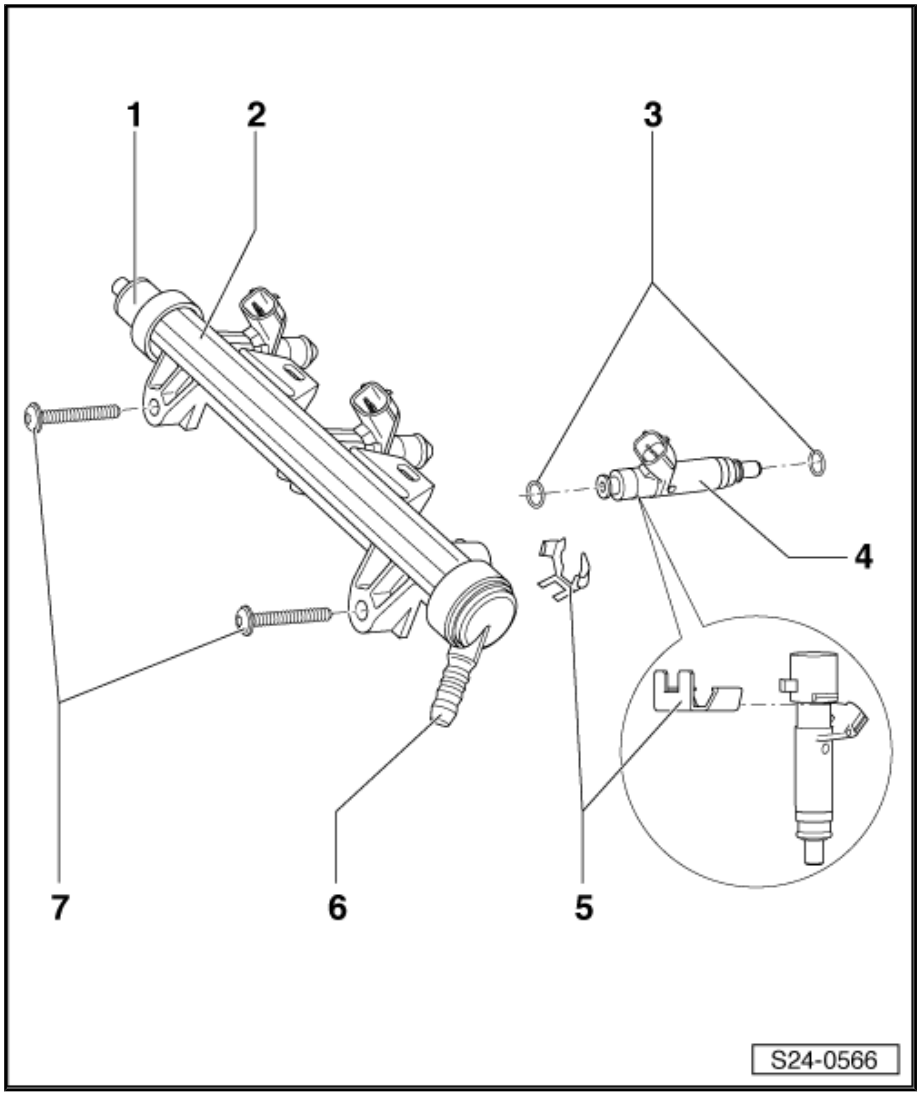
5 - Retaining clip

- ❑ pay attention to the correct seating on the injection valve and the fuel strip

6 - Feed line

- ❑ black hose with a white marking
- ❑ secure with spring strap clamps
- ❑ check for firm seating
- ❑ from fuel filter

7 - 10 Nm



1.4 Intake manifold - Summary of components

1.4.1 For engines with identification characters BBM, CHFA

Fabia II

1 - 8 Nm

2 - Throttle valve control unit -J338-

- ❑ check ⇒ Vehicle diagnostic tester
- ❑ when replacing the engine control unit perform adaptation ⇒ Vehicle diagnostic tester
- ❑ 6-pin plug

3 - O-ring

- ❑ pay attention to correct installation position
- ❑ replace

4 - from activated charcoal filter system solenoid valve 1 -N80-

5 - from vacuum regulating valve (PCV valve)

6 - Sealing ring

- ❑ replace

7 - 20 Nm

8 - 2 Nm

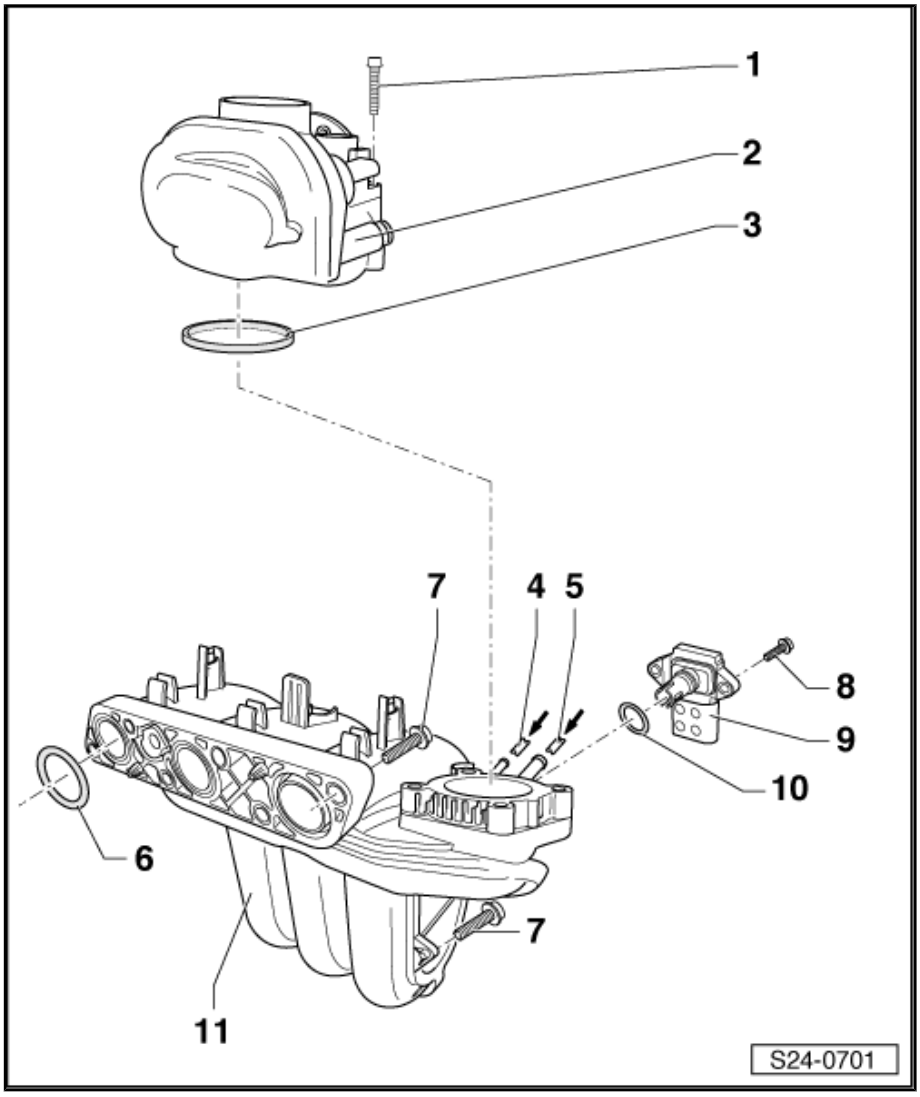
9 - Intake manifold pressure sender -G71- and Intake manifold temperature sender -G72-

- ❑ 4-pin plug
- ❑ contacts gold-plated

10 - O-ring

- ❑ replace if damaged

11 - Intake manifold



1.4.2 For engines with identification characters BZG, CGPA, CGPB, CEVA, CJLA, BME, CGPC

Fabia II, Roomster, Rapid NH

1 - Intake manifold

2 - 20 Nm

3 - Throttle valve control unit -J338-

- ❑ check ⇒ Vehicle diagnostic tester
- ❑ when replacing the engine control unit perform adaptation ⇒ Vehicle diagnostic tester
- ❑ 6-pin plug

4 - 8 Nm

5 - Sealing ring

- ❑ replace if damaged

6 - Sealing ring

- ❑ replace if damaged

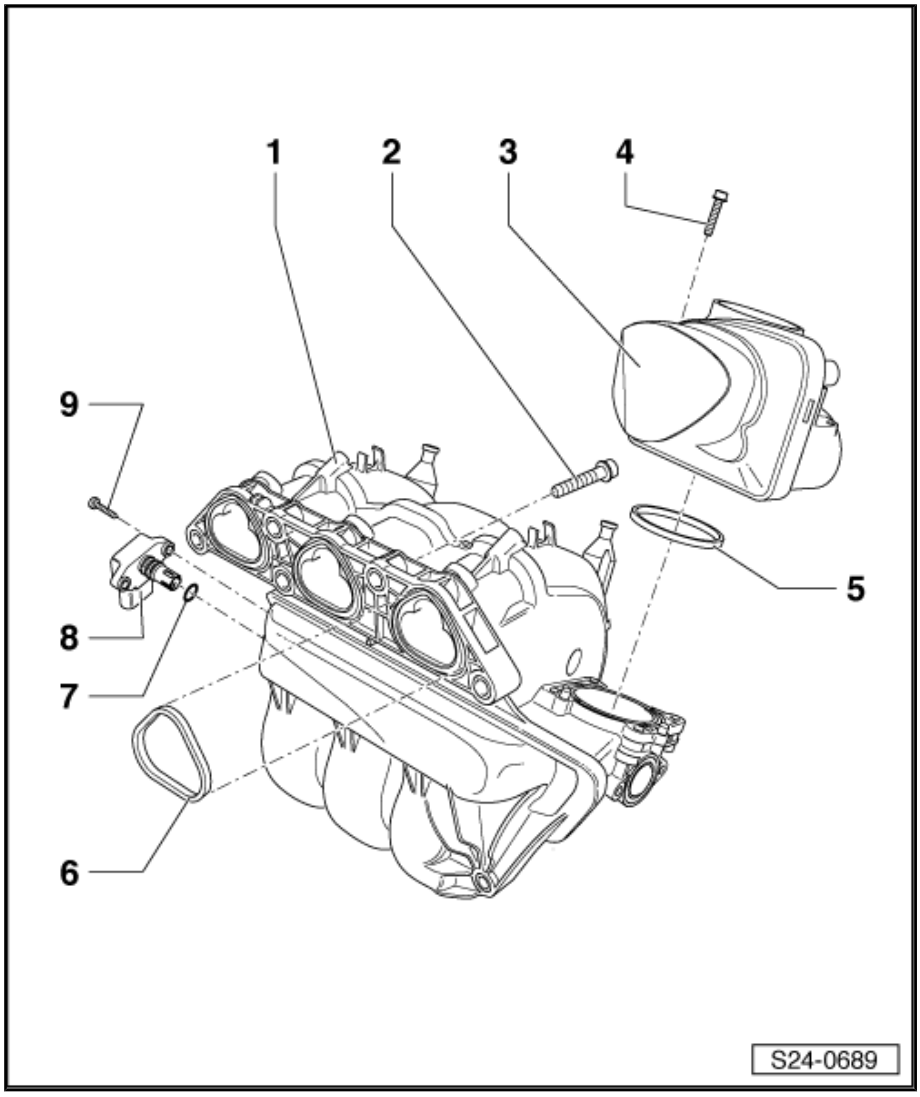
7 - O-ring

- ❑ replace if damaged

8 - Intake manifold pressure sender -G71- and intake manifold temperature sender -G72-

- ❑ 4-pin plug
- ❑ contacts gold-plated

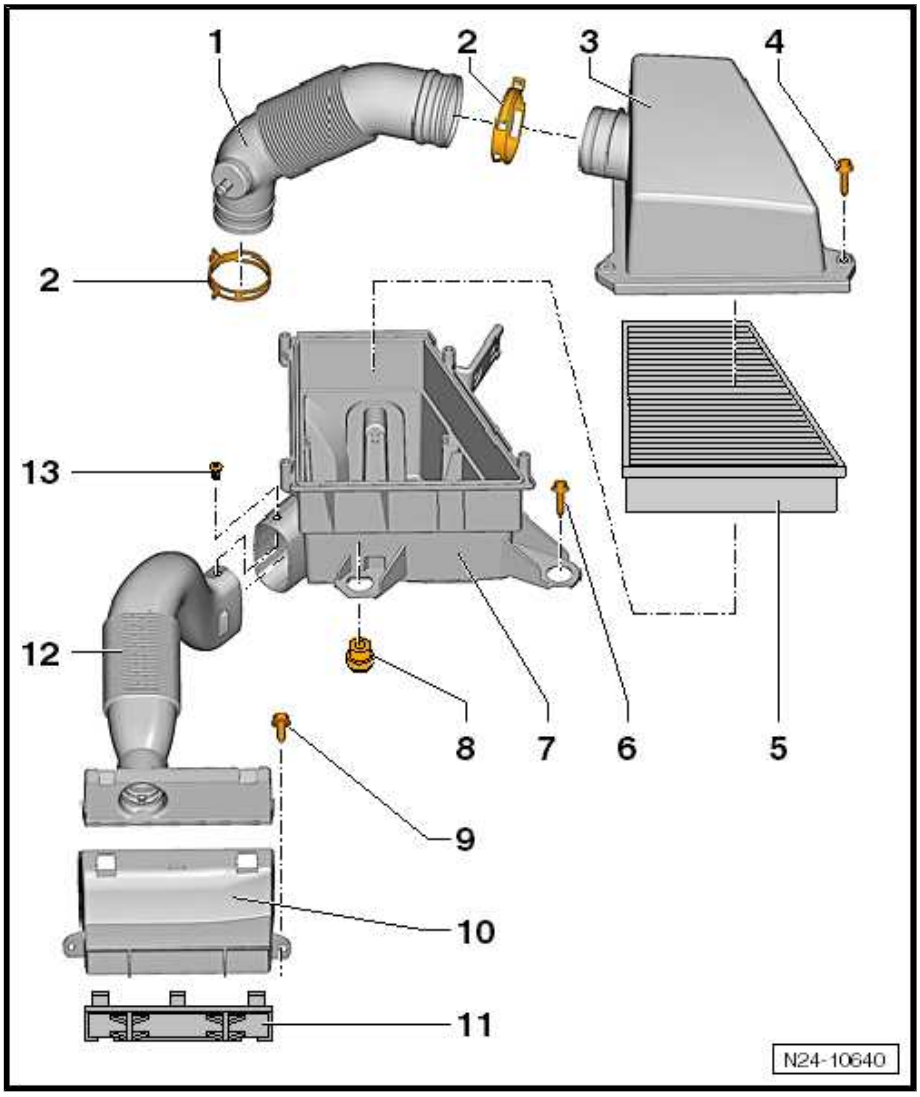
9 - 2 Nm



1.5 Air filter housing - Summary of components

Fabia II

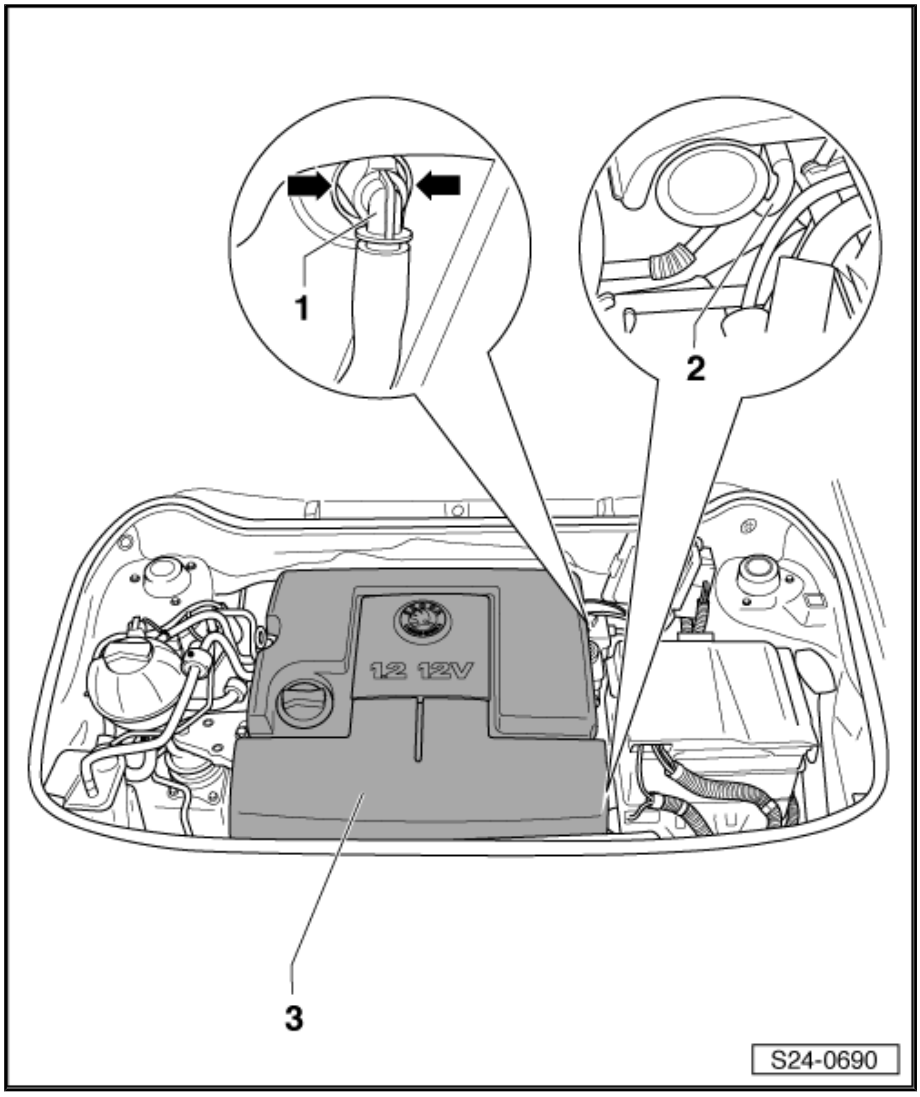
1 - Connecting hose
2 - Spring clamp
3 - Air filter top part
4 - 10 Nm
5 - Air filter element
6 - 8 Nm
7 - Air filter bottom part
8 - Elastic bearing
9 - 4 Nm
10 - Intake air duct
11 - Water protection element
12 - Intake manifold
13 - 4 Nm



1.6 Removing and installing engine cover with air filter housing for engine with identification characters BME

Roomster

Removing



– Compress the end part -arrows- and pull off the hose to the camshaft housing ventilation -1-.
– Pull off hose -2-.
– Remove engine cover with air filter housing -3- upwards.

Install

Installation is carried out in the reverse order.

1.7 Air filter housing - Summary of components

1.7.1 For engine with identification characters BME

Roomster

1 - Air filter bottom part

2 - Rubber grommet

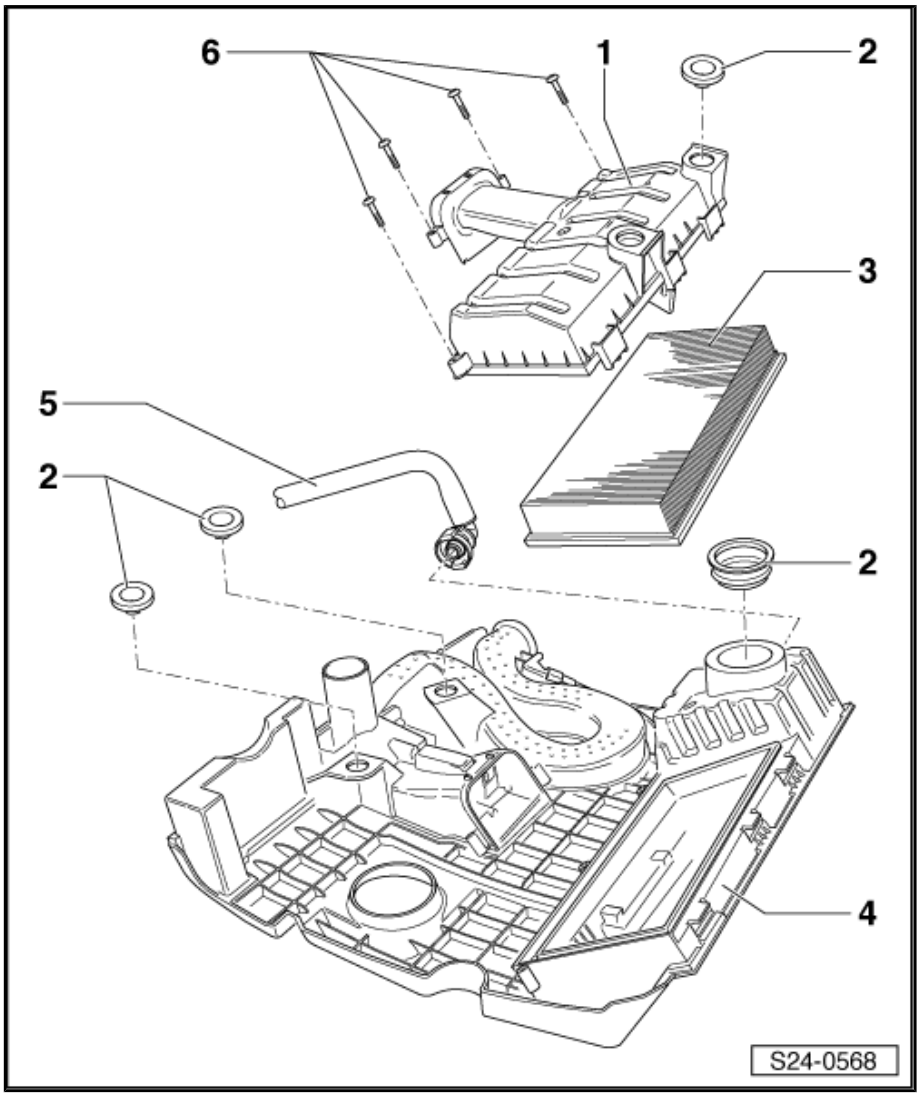
3 - Air filter element

4 - Air filter top part

5 - Vacuum hose

- ❑ from cylinder head cover

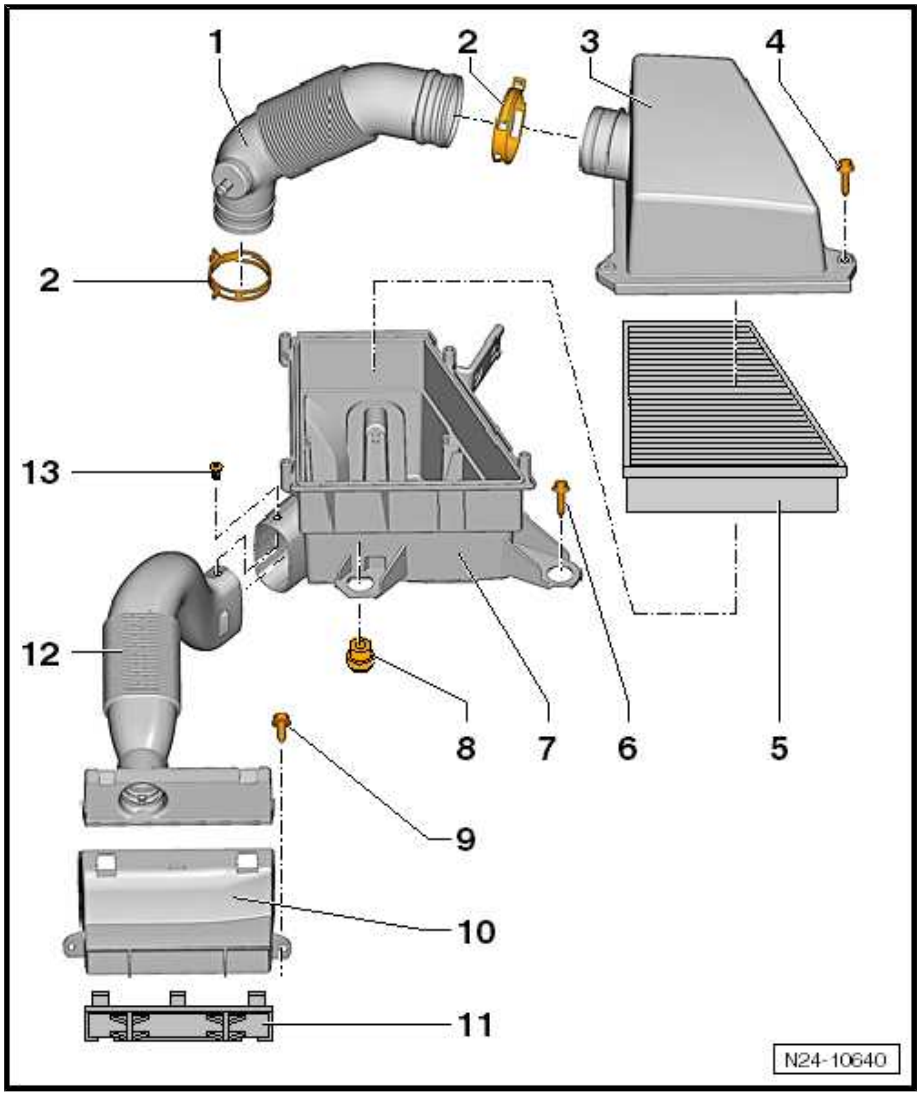
6 - 3 Nm



1.7.2 For engines with identification characters BZG, CGPA, CGPC

Roomster

1 - Connecting hose
2 - Spring clamp
3 - Air filter top part
4 - 10 Nm
5 - Air filter element
6 - 8 Nm
7 - Air filter bottom part
8 - Elastic bearing
9 - 4 Nm
10 - Intake air duct
11 - Water protection element
12 - Intake manifold
13 - 4 Nm



2 Testing components

2.1 Inspecting the injection rate, tightness and jet formation of the injectors

Special tools and workshop equipment required

- Remote control , e.g. -V.A.G 1348/3A-
- Adapter , e.g. -V.A.G 1348/3-2-
- Digital potentiometer , e. g. -V.A.G 1630-
- Measuring tool set , e.g. -V.A.G 1594 A, B oder C-
- Hand multimeter , e.g. -V.A.G 1602-

Test conditions

- Fuel pump relay o.k., test ⇒ Vehicle diagnostic tester.
- Fuel pump o.k., test ⇒ page 115 .
- Fuel temperature 15…20°C, fuel must be according to the valid standards.

Test sequence

For vehicles Roomster with engine identification characters BME

– If necessary remove engine cover with air filter ⇒ page 149 .

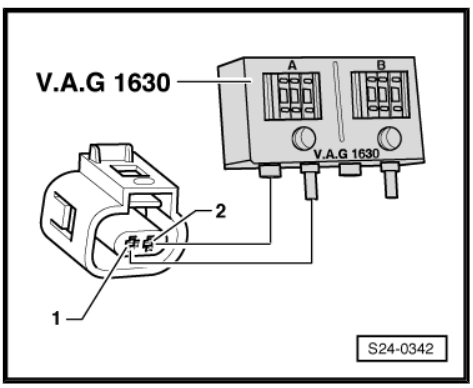
Continued for all vehicles

– Remove fuel strip together with installed injectors ⇒ page 136 . The fuel hoses remain connected.

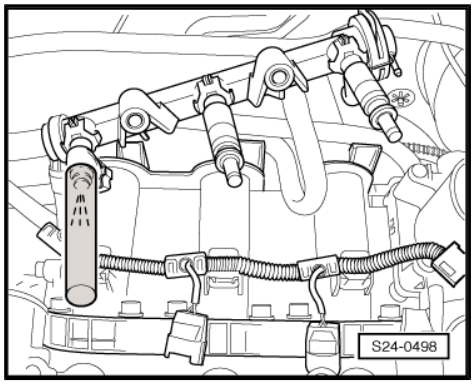
Testing jet formation and tightness

– Disconnect plug at coolant temperature sender -G62- ⇒ page 130 .

– Connect the digital potentiometer with auxiliary lines on both contacts of the plug connection and set to the connected side 15 kΩ.



– Hold a small vessel under the injection valve to be tested and disconnect the plug from the other injection valves.
– Operate the starter (a second person is needed here). The injection valve must emit a pulsed jet of fuel.
– Repeat test at the other injectors. Always check that it is only the checked valve which is connected up.
– Then check the injection valves for tightness. All injection valves must be absolutely tight for two minutes.



If fuel loss occurs at the injection valve:

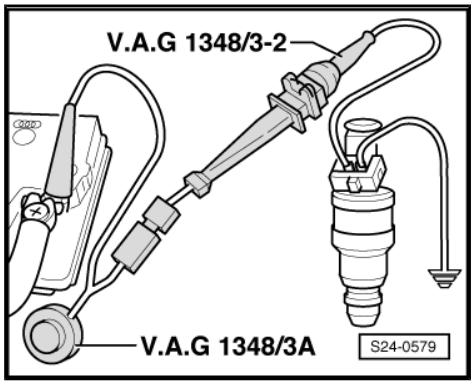
– Switch off ignition.
– Replace the faulty injector ⇒ page 144 .

Testing fuel injection rate

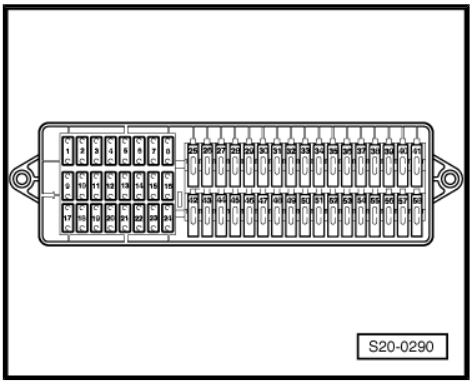
Note

When testing the injection rate also check the jet formation. The jet must be the same for all valves.

– Insert injector to be tested in a measuring glass.
– Connect one contact of injector to battery mass.
– Connect the second contact of the injector to the remote control.
– Connect terminal to battery positive terminal.



– Connect battery positive (+) and fuse holder for protection of injection valves with auxiliary lines and adapter - V.A.G 1348/3-2- ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.



The fuel pump must run.

– Operate remote control for 30 seconds.
– Repeat test at the other injectors. Always use a new measuring glass.
– Once all the injectors have been driven, position the graduated measuring glasses on an even base.
– Switch off voltage supply of fuel delivery unit.
– Compare the individual quantities of fuel injected.

Specified value for engines with identification characters BBM, CHFA:

80…88 ml per valve

Specified value for engines with identification characters BME, BZG, CEVA, CGPA, CGPB, CJLA, CGPC:

84…91 ml per valve

If the measurement obtained for one or several injectors is not within the specification:

– Replace the faulty injector ⇒ page 144 .

Installation of the injector occurs in reverse order. Pay attention to the following:

♦ Replace the O-rings and all the injectors and moisten lightly with clean engine oil.
♦ Insert injectors vertically and into the correct position in the fuel strip and secure with retaining clips.
♦ Fit fuel strip with secured injectors onto the cylinder head and screw up at the same time ⇒ page 136 .

2.2 Testing intake manifold preheating

Roomster

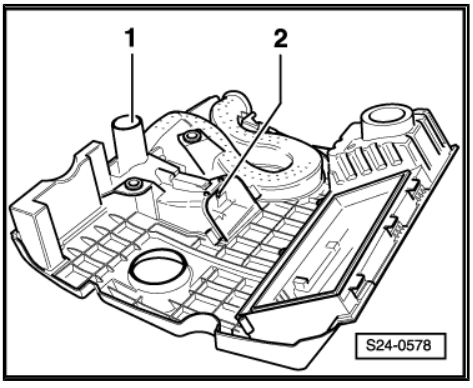
For engine with identification characters BME

Special tools and workshop equipment required

♦ Cooling spray

Testing control flap

– Remove engine cover with air filter ⇒ page 149 .
– Check position of the regulating flap -1-.



♦ The flap must close off the warm air connection when the temperature exceeds 23°C.
♦ The flap must open the warm air connection when the temperature is below 10°C.

Note

The operation of the thermo-element -2- can easily be tested by spraying on a cooling spray.

2.3 Testing the intake system for tightness (unmetered air)

Special tools and workshop equipment required

- Engine leak search spray -G 001 800 A1-

Test condition

- Coolant temperature minimum 80 °C.

Test sequence

Note

- *Because of the vacuum in the intake system the leak search spray is sucked in with the unmetered air. The leak search spray reduces the ignition performance of the mixture. This results in a drop in engine speed and a change in the lambda control value.*
- *You must comply with the safety instructions on the box.*

– Connect vehicle diagnosis, measurement and information system -VAS 5052- . Run engine at idling speed.

– Reading measured value block ⇒ Vehicle diagnostic tester

– Observe and take down engine speed and lambda control before catalyst.

– Systematically spray parts of the intake system with engine leak search spray.

If the engine speed drops or if the lambda control changes:

– Check the sprayed part of the intake system for leakage and eliminate leak.

2.4 Clean throttle valve control unit -J338-

Note

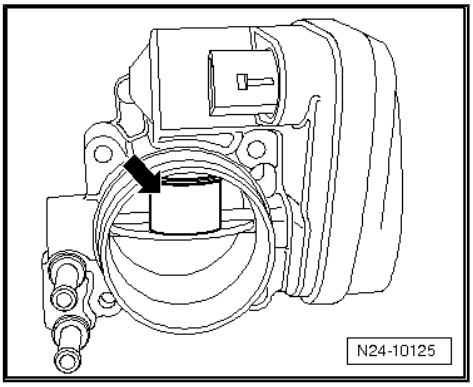
- *If a new engine control unit -J623- is fitted, the throttle valve control unit -J338- must be adapted. The adaptation must only be carried out with a new or cleaned throttle valve control unit -J338- , because dirt/carbon deposits in the end stop of the throttle valve can lead to incorrect adaptation values.*
- *The throttle valve support must not be scratched when cleaning.*

– Remove air filter housing:

- Fabia II ⇒ page 148 .
- Roomster ⇒ page 149 or ⇒ page 151 .

– Remove the throttle valve control unit ⇒ page 146 .

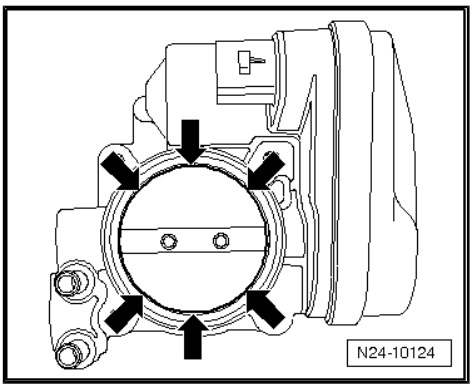
– Open the throttle valve manually and block the throttle valve in the opened position with a suitable object (e.g. plastic or wooden wedge)-arrow-.



WARNING

Acetone is easily inflammable. Observe the accident prevention regulations and the safety instructions when handling easily inflammable fluids. Do not use compressed air when cleaning the throttle valve. Wear safety goggles and safety clothing, in order to avoid injuries and skin contact.

– Thoroughly clean the throttle valve support, in particular the area of the closed throttle valve -arrows-, with commercially available acetone in accordance with DIN 53247 and a paint brush.



– Wipe the throttle valve support with a lint-free cloth.

– Let the acetone dry off completely and re-install the cleaned throttle valve control unit.

– Adapting the engine control unit -J623- to the throttle valve control unit -J338- ⇒ Vehicle diagnostic tester.

3 Engine control unit

3.1 Removing and installing engine control unit -J623-

Note

- *Before replacing the engine control unit -J623- first the control unit identification and hence the coding of the current control unit with the ⇒ Vehicle diagnostic tester must be interrogated.*
- *If replacing, the throttle valve control unit -J338- must be cleaned ⇒ page 156 before adapting a new control unit.*

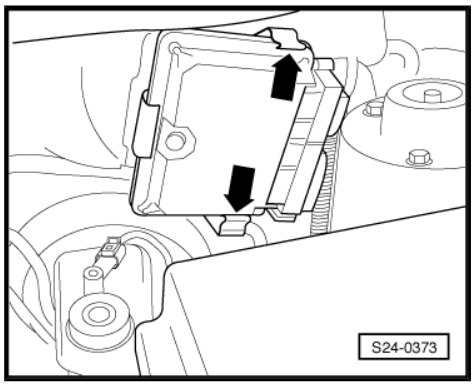
Special tools and workshop equipment required

- Body saw e.g. -V.A.G 1523/A-

Removing

– Switch off ignition.

– Press the bracket -arrows- outwards and pull the engine control unit out sideways.

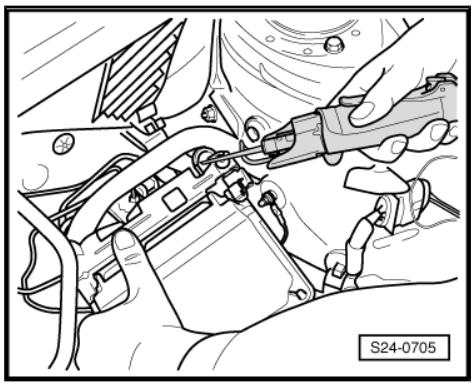


For vehicles with protective cover

– Cut with body saw a slot for the cross-head screwdriver in the heads of the pull-off screws.

Note

It must be sawed twice with the body saw, so that the slot is wide enough, in order to be able to unscrew the screws with a suitable screwdriver.



– Screw out the screws.

– Remove protective cover of control unit.

For all vehicles

– Disconnect plug at engine control unit and unplug.

Install

Connect both plugs and lock.

For vehicles with protective cover

– Insert protective cover and fix with new pull-off screws at engine control unit.

For all vehicles

Insert the control unit into the pressure retaining clips on the body.

– When replacing the control unit, adapt the engine control unit ⇒ Vehicle diagnostic tester.

26 – Exhaust system

1 Removing and installing parts of the exhaust system

1.1 Exhaust system for engines with identification characters BBM, BZG, CEVA, CHFA, CGPA, CGPB - Summary of components

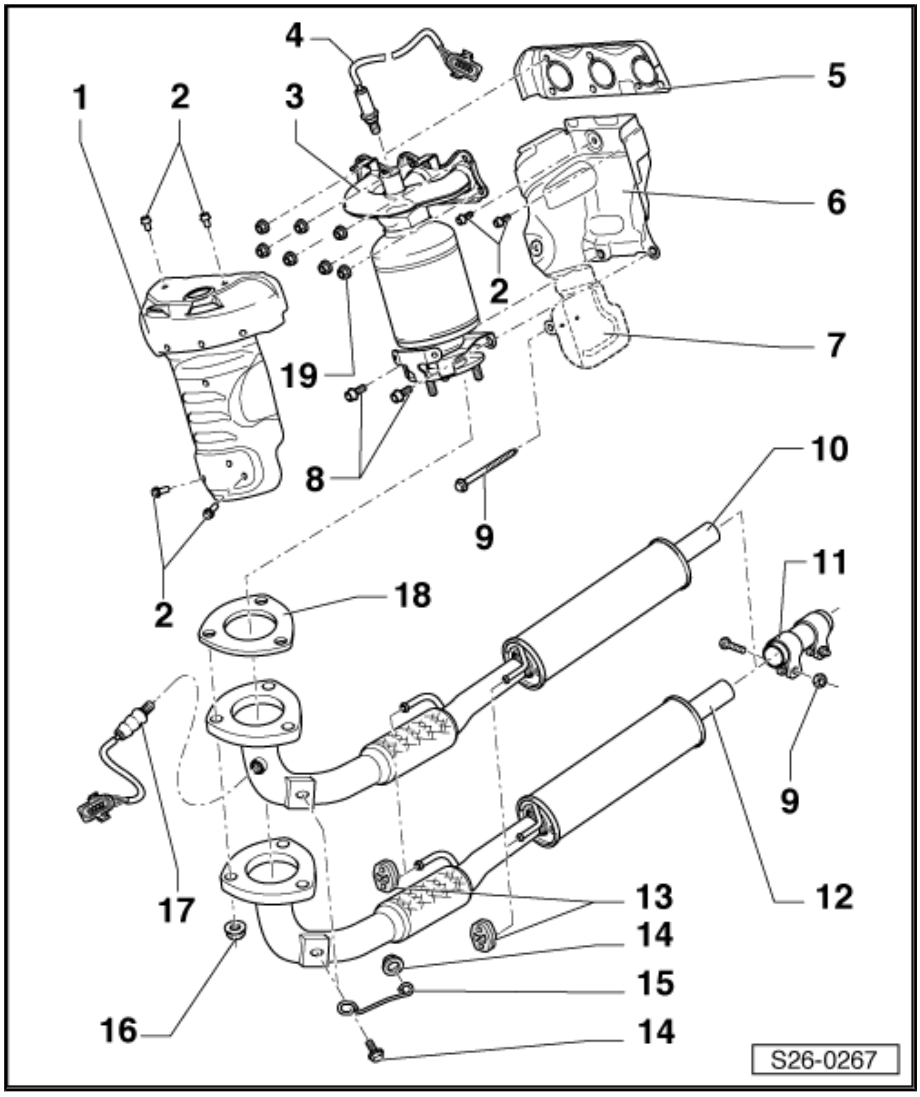
Fabia II

1.1.1 Exhaust manifold and pre-exhaust pipe - Summary of components

Fabia II

Note

Always replace gaskets and self-locking nuts.



1 - Heat shield

2 - 8 Nm

3 - Exhaust manifold with integrated catalytic converter

- ❑ Pay attention to the part number
- ❑ Inspecting catalyst ⇒ Vehicle diagnostic tester

4 - Lambda probe upstream of catalytic converter -G39- , 50 Nm

- ❑ Pay attention to the part number
- ❑ coat only thread with hot bolt paste -G 052 112 A3- ; hot bolt paste must not get into the slot of the probe body
- ❑ Testing lambda probe upstream of catalytic converter -G39- and lambda control ⇒ Vehicle diagnostic tester.

5 - Sealing ring

- ❑ replace

6 - Heat shield - short

- ❑ for vehicles without air conditioning

7 - Heat shield - extended

- ❑ for vehicles with an air conditioning system

8 - 22 Nm

9 - 23 Nm

10 - Pre-exhaust pipe

- ❑ for engines complying with exhaust emission standard EU-4 and EU-5
- ❑ with decoupling element
- ❑ do not twist decoupling element more than 10° - risk of damage
- ❑ secure the decoupling element with the transport security -T10403- against overtensioning and flexion

11 - Clamping sleeve

- ❑ align exhaust system free of stress before fitting on ⇒ page 166
- ❑ Fitting position: bolts at bottom and horizontal
- ❑ Tighten bolted connections evenly

12 - Pre-exhaust pipe

- ❑ for engines complying with exhaust emission standard EU-2 DDK
- ❑ with decoupling element
- ❑ do not twist decoupling element more than 10° - risk of damage
- ❑ secure the decoupling element with the transport security -T10403- against overtensioning and flexion

13 - Retaining strap

- ❑ replace if damaged

14 - 20 Nm

15 - Strut

16 - 40 Nm

- ❑ replace
- ❑ coat stud bolts of exhaust manifold with hot bolt paste -G 052 112 A3- before installing.

17 - Lambda probe downstream of catalytic converter -G130- , 50 Nm

- ❑ coat the thread with hot bolt paste -G 052 112 A3- ; hot bolt paste must not get into the slots of the probe body
- ❑ Testing lambda probe -G130- and lambda control downstream of catalytic converter ⇒ Vehicle diagnostic tester

18 - Sealing ring

- ❑ replace

19 - 26 Nm

- ❑ replace
- ❑ coat stud bolts of exhaust manifold with hot bolt paste -G 052 112 A3- before installing.

1.1.2 Middle and rear silencer - Summary of components

Fabia II

1 - 23 Nm

2 - Hanger

- ❑ Retaining strap
- ❑ Pay attention to the part number

3 - Hanger

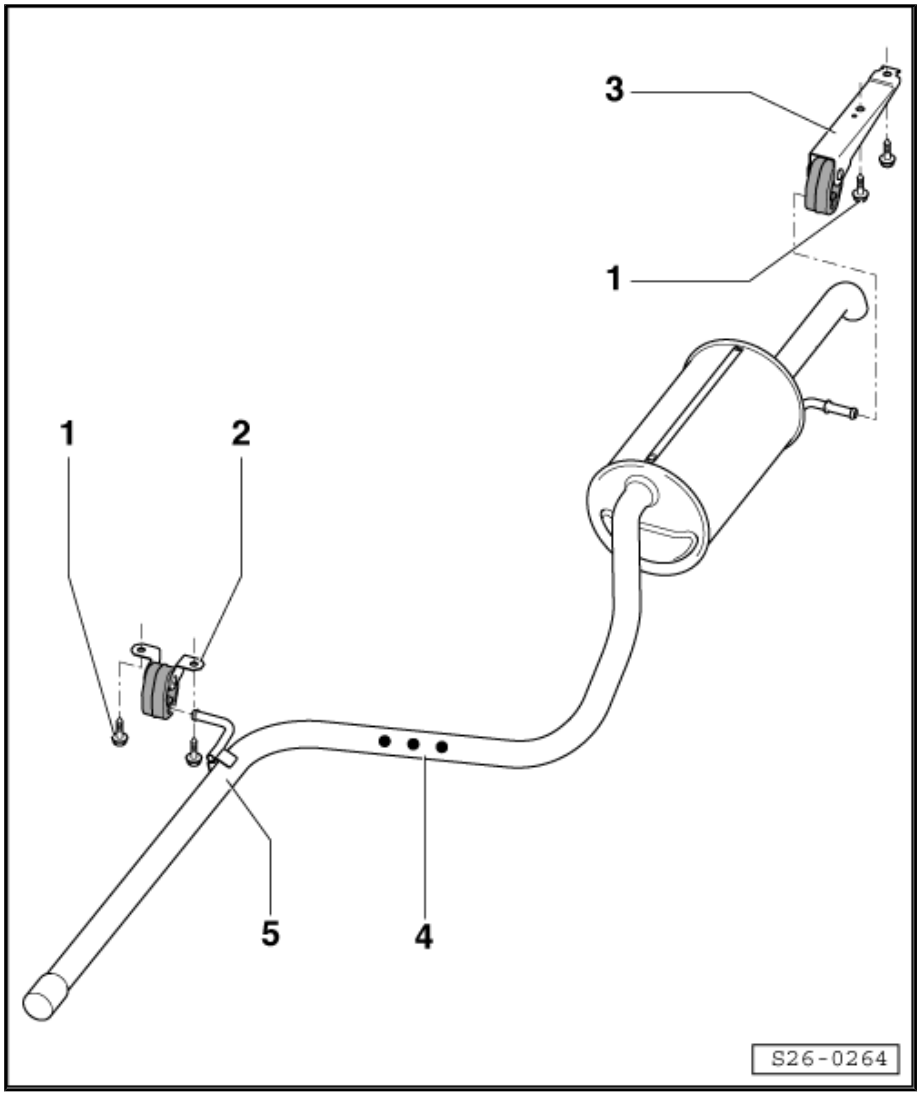
- ❑ Retaining strap
- ❑ Pay attention to the part number

4 - Separation point

- ❑ disconnect the middle and rear silencers when conducting repairs ⇒ page 167

5 - Middle and rear silencer

- ❑ Replace individually when carrying out repairs ⇒ page 167
- ❑ Align exhaust system free of stress ⇒ page 166

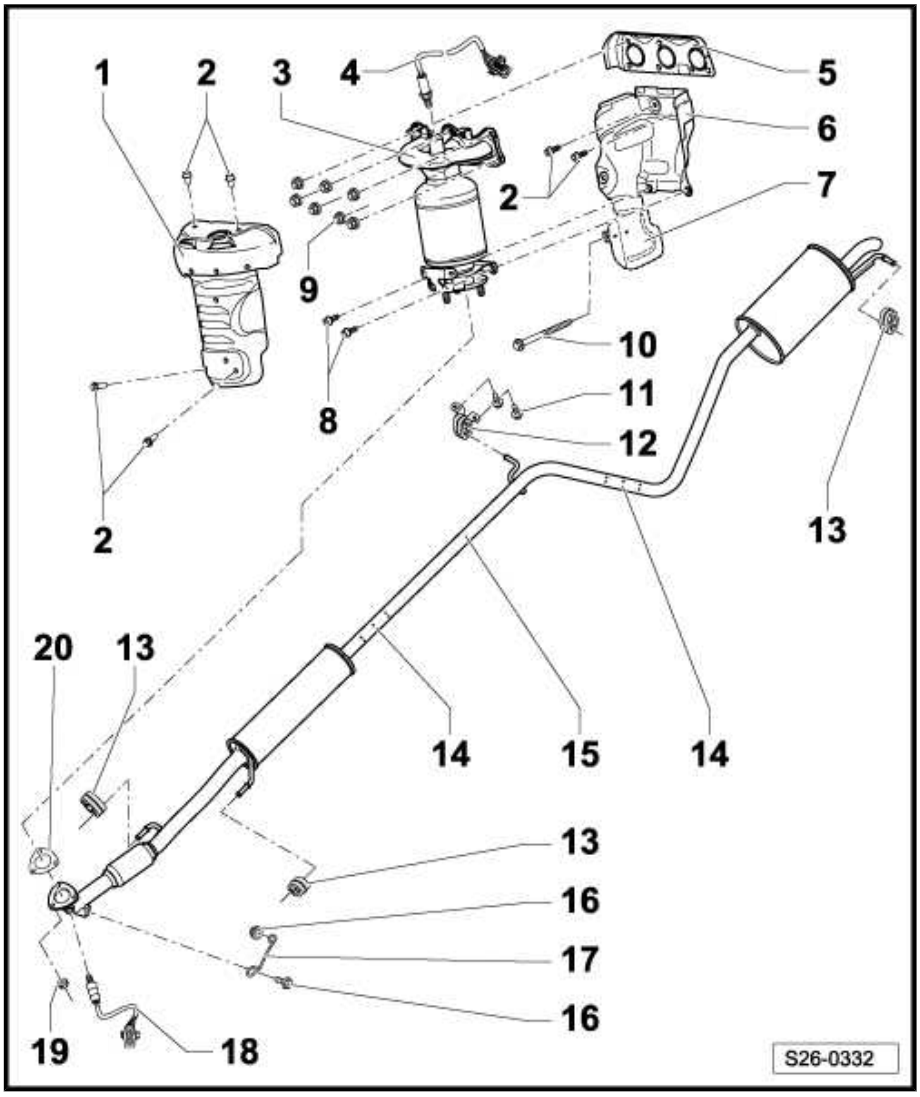


1.2 Exhaust system for engines with identification characters CJLA - Summary of components

Fabia II

Note

Always replace gaskets and self-locking nuts.



1 - Heat shield

2 - 8 Nm

3 - Exhaust manifold with integrated catalytic converter

- ❑ Pay attention to the part number
- ❑ Inspecting catalyst ⇒ Vehicle diagnostic tester

4 - Lambda probe upstream of catalytic converter -G39- , 50 Nm

- ❑ Pay attention to the part number
- ❑ coat the thread with hot bolt paste -G 052 112 A3- ; hot bolt paste must not get into the slots of the probe body
- ❑ Testing lambda probe upstream of catalytic converter -G39- and lambda control ⇒ Vehicle diagnostic tester.

5 - Sealing ring

- ❑ replace

6 - Heat shield - short

- ❑ for vehicles without air conditioning

7 - Heat shield - extended

- ❑ for vehicles with an air conditioning system

8 - 22 Nm

9 - 26 Nm

- ❑ replace
- ❑ coat stud bolts of exhaust manifold with hot bolt paste -G 052 112 A3- before installing.

10 - 23 Nm

11 - 23 Nm

12 - Hanger

- ❑ Retaining strap
- ❑ Pay attention to the part number

13 - Retaining strap

- ❑ replace if damaged

14 - Separation point

- ❑ for repairs
- ❑ marked with recesses around the circumference

15 - Remove front, middle and rear part of exhaust system.

- ❑ for first equipment a building unit
- ❑ Replace individually when carrying out repairs
- ❑ with decoupling element
- ❑ do not twist decoupling element more than 10° - risk of damage
- ❑ secure the decoupling element with the transport security -T10403- against overtensioning and flexion

16 - 20 Nm

17 - Strut

18 - Lambda probe downstream of catalytic converter -G130- , 50 Nm

- ❑ coat only thread with hot bolt paste -G 052 112 A3- ; hot bolt paste must not get into the slot of the probe body
- ❑ Testing lambda probe -G130- and lambda control downstream of catalytic converter ⇒ Vehicle diagnostic tester

19 - 40 Nm

- ❑ replace
- ❑ coat stud bolts of exhaust manifold with hot bolt paste -G 052 112 A3- before installing.

20 - Sealing ring

- ❑ replace

1.3 Exhaust gas system - Summary of components

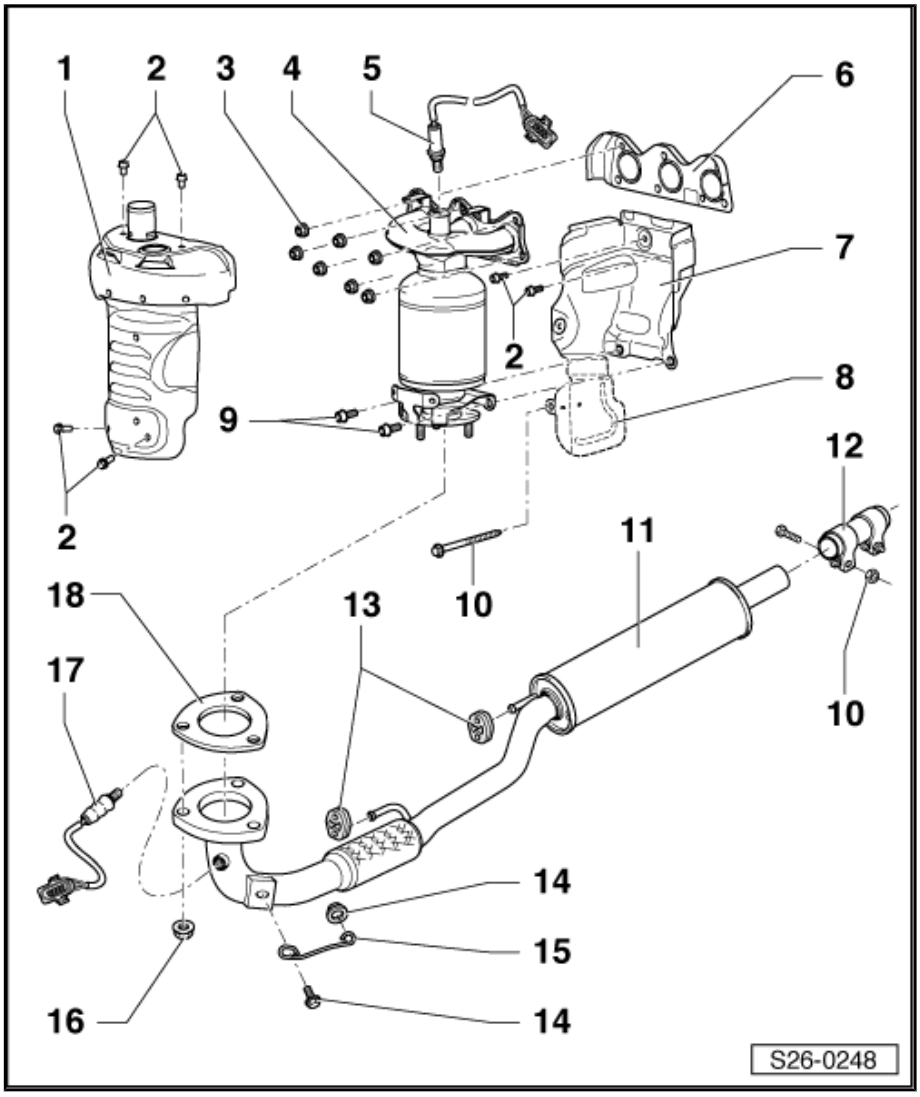
Roomster

1.3.1 Exhaust manifold and pre-exhaust pipe - Summary of components

Roomster, Rapid NH

Note

Always replace gaskets and self-locking nuts.



1 - Heat shield

2 - 8 Nm

3 - 26 Nm

- ❑ replace
- ❑ coat stud bolts of exhaust manifold with hot bolt paste - G 052 112 A3- before installing.

4 - Exhaust manifold with integrated catalytic converter

- ❑ Pay attention to the part number
- ❑ Inspecting catalyst ⇒ Vehicle diagnostic tester

5 - Lambda probe upstream of catalytic converter -G39- , 50 Nm

- ❑ coat only thread with hot bolt paste -G 052 112 A3- ; hot bolt paste must not get into the slot of the probe body
- ❑ Testing lambda probe upstream of catalytic converter -G39- and lambda control ⇒ Vehicle diagnostic tester.

6 - Sealing ring

- ❑ replace

7 - Heat shield - short

- ❑ for vehicles without air conditioning

8 - Heat shield - extended

- ❑ for vehicles with an air conditioning system

9 - 22 Nm

10 - 23 Nm

11 - Pre-exhaust pipe

- ❑ with decoupling element
- ❑ do not twist decoupling element more than 10° - risk of damage
- ❑ secure the decoupling element with the transport security -T10403- against overtensioning and flexion

12 - Clamping sleeve

- ❑ align exhaust system free of stress before fitting on ⇒ page 166
- ❑ Fitting position: bolts at bottom and horizontal
- ❑ Tighten bolted connections evenly

13 - Retaining strap

- ❑ replace if damaged

14 - 20 Nm

15 - Strut

16 - 40 Nm

- ❑ replace

- ❑ coat stud bolts of exhaust manifold with hot bolt paste -G 052 112 A3- before installing.

17 - Lambda probe downstream of catalytic converter -G130- , 50 Nm

- ❑ coat only thread with hot bolt paste -G 052 112 A3- ; hot bolt paste must not get into the slot of the probe body
- ❑ Testing lambda probe -G130- and lambda control downstream of catalytic converter ⇒ Vehicle diagnostic tester

18 - Sealing ring

- ❑ replace

1.3.2 Middle and rear silencer - Summary of components

Roomster, Rapid NH

1 - Clamping sleeve

- ❑ align exhaust system free of stress before fitting on ⇒ page 166
- ❑ Fitting position: bolts at bottom and horizontal
- ❑ Tighten bolted connections evenly

2 - Middle and rear silencer

- ❑ factory-fitted as a single part
- ❑ Replace individually when carrying out repairs ⇒ page 167
- ❑ Align exhaust system free of stress ⇒ page 166

3 - Hanger

- ❑ retaining strap made of silicone
- ❑ Pay attention to the part number

4 - 23 Nm

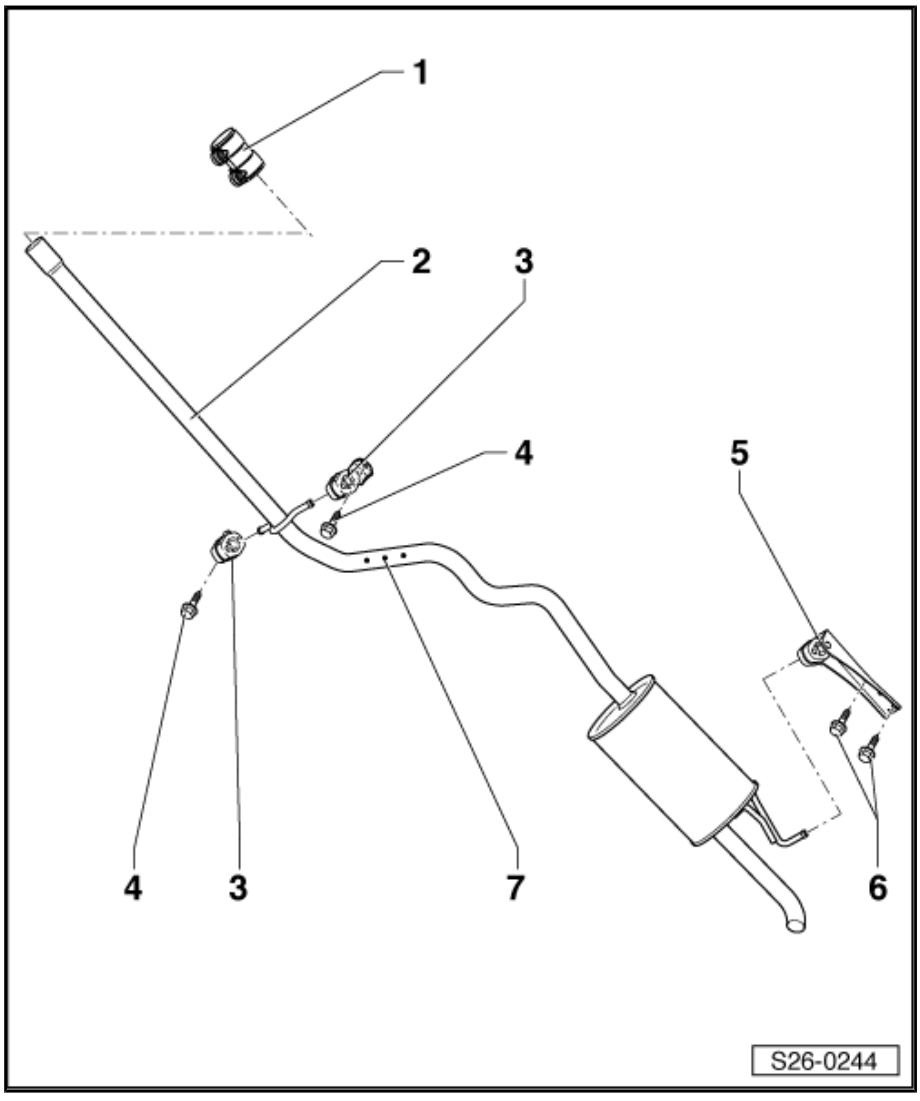
5 - Hanger

- ❑ retaining strap made of EPDM
- ❑ Pay attention to the part number

6 - 23 Nm

7 - Separation point

- ❑ disconnect the middle and rear silencers when conducting repairs ⇒ page 167

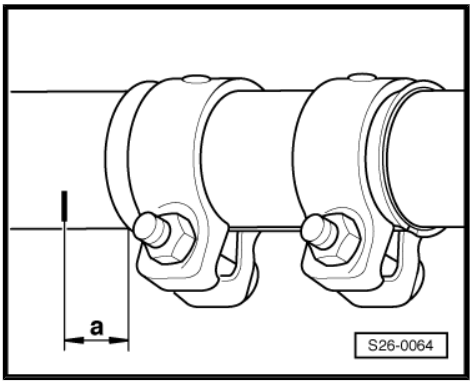


1.4 Aligning exhaust system free of stress

- The exhaust system is aligned when cold.

– Slacken bolted connections on the clamping sleeve between front and middle silencer and replace nuts.

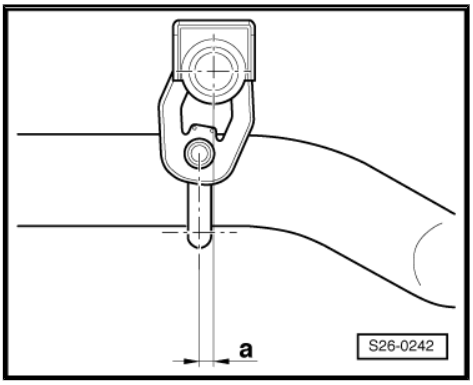
– Position clamping sleeve at the distance -a- = 5 mm from the marking on the pre-exhaust pipe (bolts at bottom and horizontal) and tighten front bolted connection slightly.



– Push the middle and rear silencer forward until the dimension -a- = 3 … 7 mm is obtained on the retaining strap/middle silencer.

– Tighten bolted connections on the clamping sleeve in this position.

  Tightening torque: 23 Nm



Note

After tightening, check dimension -a- and adjust if necessary.

1.5 Replace middle and rear silencer

Special tools and workshop equipment required

- Body saw e.g. -V.A.G 1523-
- Protective goggles

A separation point is provided for repair purposes for replacing the middle or rear silencer.

– Separate exhaust pipe at right angles at the separation point -arrow 2-.

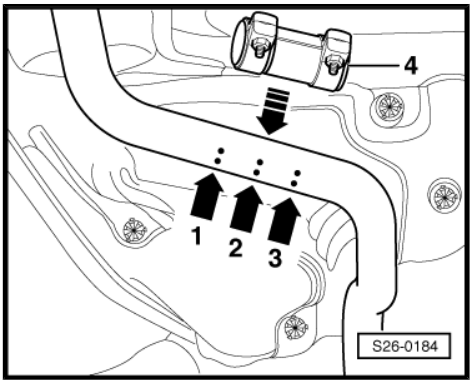
– When installing, position clamping sleeve -4- between the side markings -arrow 1- and -arrow 3-.

– Align exhaust system free of stress ⇒ page 166 .

– Align rear silencer horizontally.

– Tighten bolted connections of the clamping sleeve evenly to 23 Nm.

Installation position of clamping sleeve: Bolts positioned vertically at front of exhaust pipe.



1.6 Inspecting the exhaust system for leak-tightness

– Start engine and run in idle.

– Seal off exhaust tailpipe for the duration of the leak check (e.g. with cloths or plugs).

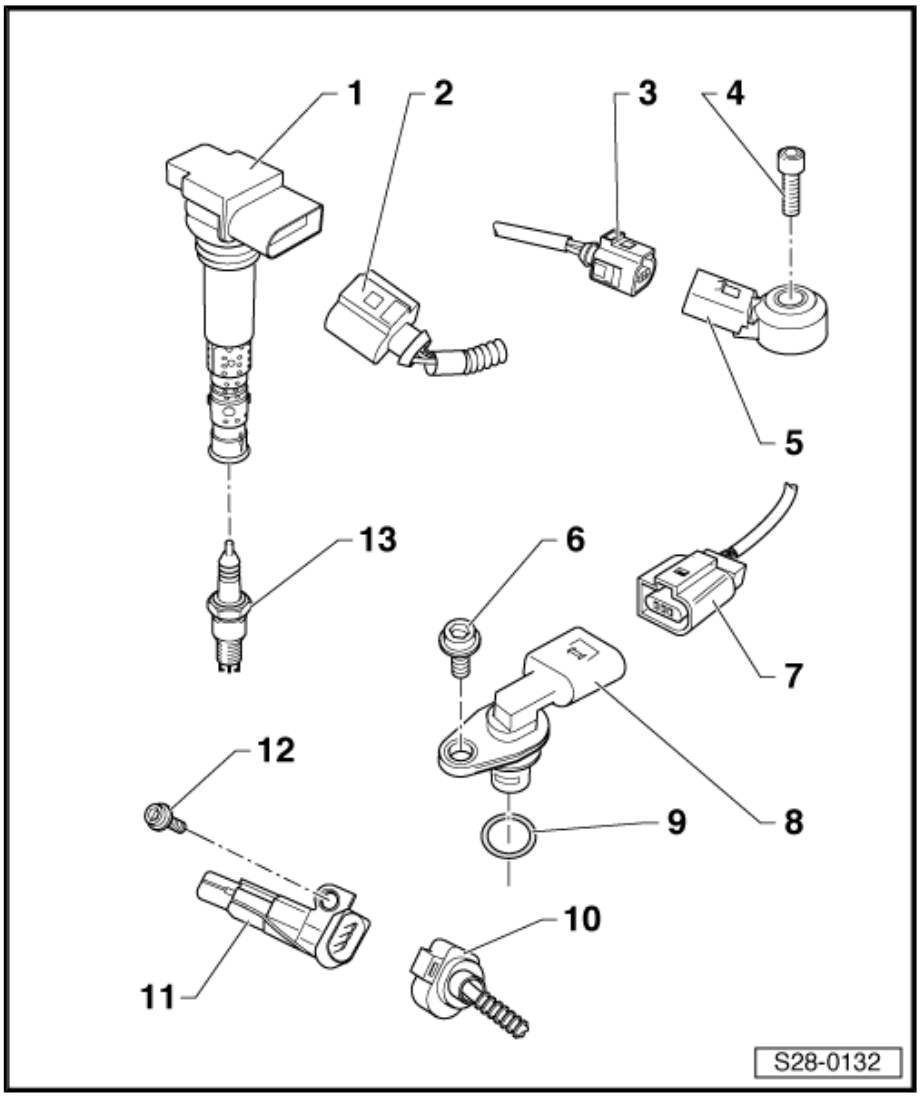
– Inspect connection points for tightness by listening: cylinder head/exhaust manifold, exhaust manifold/exhaust pipe with catalytic converter, etc.

– Eliminate any leak found.

28 – Ignition system

1 Ignition system

1.1 Ignition system - Summary of components



1 - Ignition coils with power output stage -N70- , -N127- , -N291-

- ❑ pull out with extractor -T10094A-
- ❑ check ⇒ Vehicle diagnostic tester
- ❑ removing ⇒ page 170
- ❑ resistances ⇒ page 170

2 - Connector

- ❑ for iIgnition coils with power output stage -N70- , -N127- , -N291-
- ❑ 4-pin

3 - Connector

- ❑ for knock sensor -G61-
- ❑ 2-pin

4 - 20 Nm

- ❑ the tightening torque influences the knock sensor function

5 - Knock sensor -G61-

6 - 8 Nm

7 - Connector

- ❑ for camshaft position sensor -G163-
- ❑ 3-pin

8 - Camshaft position sensor -G163-

9 - O-ring

- ❑ replace

10 - Connector

- ❑ for engine speed sender -G28-
- ❑ 3-pin

11 - Engine speed sender -G28-

12 - 8 Nm

13 - Spark plug, 30 Nm

- ❑ Type and electrode spacing:

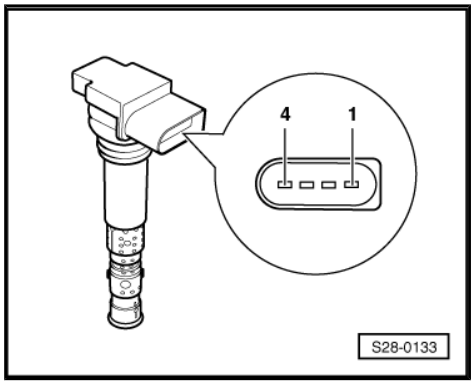
- ♦ ⇒ Maintenance ; Booklet Fabia II
- ♦ ⇒ Maintenance ; Booklet Roomster

- ⇒ Maintenance ; Booklet Rapid NH .
  - ❑ use spark plug wrench e.g. -3122 B- for removing and installing

1.2 Resistance values for ignition coils with power output stage -N70- , -N127- , -N291-

The resistance is checked between contacts 2 + 3.

Specified value: 370…410 Ω (at approx. 20°C)



1.3 Removing and installing ignition coils with power output stages

Special tools and workshop equipment required

- Assembly device -T10118-
- Extractor -T10094A-

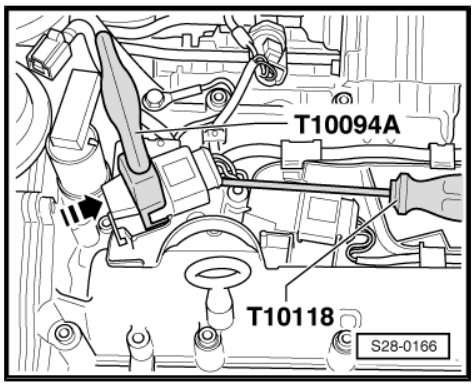
Removing

– Position extractor -T10094A- onto the ignition coil with power output stage in the -direction of the arrow-.

– Slightly pull out the ignition coil with power output stage.

– Position the assembly device -T10118- as shown.

– Carefully release the connector catch and unplug the connector.



Install

– Position extractor -T10094A- onto the ignition coil with power output stage.

– Push connector onto the ignition coil with power output stage until it audibly locks into place.

– Press the ignition coil with power output stage with extractor -T10094A- onto the spark plug in the cylinder head.