



Workshop Manual Audi A3 2004 ➤

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. We do not accept any liability for errors or omissions with respect to the correctness of information in this document. Copyright by AUDI AG.

TDI injection and glow plug system (4-cyl. 1.9 ltr.; 2.0 ltr. unit injector, 2-valve)

Engine ID	BMM	BLS							
-----------	-----	-----	--	--	--	--	--	--	--

Edition 11.2014

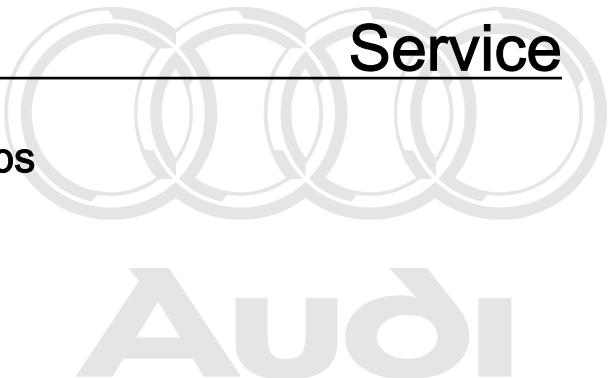


List of Workshop Manual Repair Groups

Repair Group

23 - Mixture preparation - injection

28 - Glow plug system



Audi

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.

Technical information should always be available to the foremen and mechanics, because their careful and constant adherence to the instructions is essential to ensure vehicle road-worthiness and safety. In addition, the normal basic safety precautions for working on motor vehicles must, as a matter of course, be observed.

Contents

23 - Mixture preparation - injection	1
1 Servicing diesel direct injection system	1
1.1 Safety precautions	1
1.2 Safety precautions when using testers and measuring instruments during a road test	1
1.3 Rules for cleanliness	1
1.4 Overview of fitting locations	2
1.5 Exploded view - air cleaner	10
1.6 Removing and installing air filter element	12
1.7 Removing and installing air mass meter G70	14
1.8 Exploded view - intake manifold	15
1.9 Removing and installing intake manifold flap motor V157	17
1.10 Removing and installing intake manifold	18
1.11 Servicing unit injector	24
1.12 Removing and installing unit injector	26
1.13 Renewing O-rings for unit injector	29
1.14 Removing and installing electrical wiring harness for unit injectors	31
1.15 Wiring and component check with test box V.A.G 1598/42	33
1.16 Removing and installing engine control unit	35
1.17 Removing and installing Lambda probe G39 with Lambda probe heater Z19	37
1.18 Removing and installing exhaust gas pressure sensor 1 G450	39
28 - Glow plug system	41
1 Glow plug system	41
1.1 Glow plugs	41
1.2 Removing and installing glow plugs	41
1.3 Removing and installing ceramic glow plugs	43
1.4 Removing and installing automatic glow period control unit J179	46
1.5 Removing and installing engine speed sender G28	47
1.6 Removing and installing sender wheel for engine speed sender G28	48

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.



Audi A3 2004 ►

Audi TDI injection and glow plug system (4-cyl. 1.9 ltr.; 2.0 ltr. unit injector, 2-valve) - Edition 11.2014



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.

23 – Mixture preparation - injection

1 Servicing diesel direct injection system

(ARL004109; Edition 11.2014)

1.1 Safety precautions

Please note the following to prevent injuries and/or irreparable damage to the injection and glow plug system:

- ◆ Switch off the ignition before connecting or disconnecting injection or glow plug system wiring or tester cables.
- ◆ If the engine has to be operated at starter cranking speed without actually starting, e.g. to test compression pressure, detach the multi-pin connector for the unit injectors on the cylinder head ⇒ [page 5](#).



Caution

- ◆ *Observe notes on procedure for disconnecting the battery ⇒ Electrical system; Rep. gr. 27.*
- ◆ *Always switch off the ignition before connecting or disconnecting the battery, otherwise the engine control unit may be damaged.*

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.

1.2 Safety precautions when using testers and measuring instruments during a road test

Note the following if testers and measuring instruments have to be used during a road test:



WARNING

Accidents can be caused if the driver is distracted by test equipment while road-testing, or if test equipment is not properly secured.

Persons sitting in the front passenger's seat could be injured if the airbag is triggered in an accident.

- *The use of test equipment while driving causes distraction.*
- *There is an increased risk of injury if test equipment is not secured.*
- ◆ *Test equipment must always be secured on the rear seat with a strap and operated from the rear seat by a second person.*

1.3 Rules for cleanliness

When working on the fuel supply/injection system, observe the following basic rules:

- ◆ Thoroughly clean all unions and surrounding areas before disconnecting.

- ◆ Place parts that have been removed on a clean surface and cover them over. Use plastic sheeting or paper. Do not use fluffy cloths.
- ◆ Carefully cover or seal open components if repairs cannot be carried out immediately.
- ◆ Only install clean components; replacement parts should only be unpacked immediately prior to installation. Do not use parts that have been previously unpacked and stored away loose (e.g. in toolboxes, etc.).
- ◆ When the system is open: Do not work with compressed air if this can be avoided. Do not move the vehicle unless absolutely necessary.
- ◆ Also ensure that no diesel fuel comes into contact with the coolant hoses. Should this occur, the hoses must be cleaned immediately. Damaged hoses must be renewed.

1.4 Overview of fitting locations



Note

Some components are located beneath the engine cover panel.
For removal refer to ➔ [page 4](#).

1 - Intake manifold flap motor - V157-

- ☐ Removing and installing
➔ [page 17](#)

2 - Temperature sender after particulate filter - G527-

- ☐ Fitting location
➔ [page 7](#)
- ☐ Removing and installing
➔ Rep. gr. 26

3 - Lambda probe - G39- with Lambda probe heater - Z19-

- ☐ Fitting location
➔ [page 7](#)
- ☐ Removing and installing
➔ [page 37](#)

4 - Exhaust gas recirculation valve - N18- with exhaust gas recirculation potentiometer - G212-

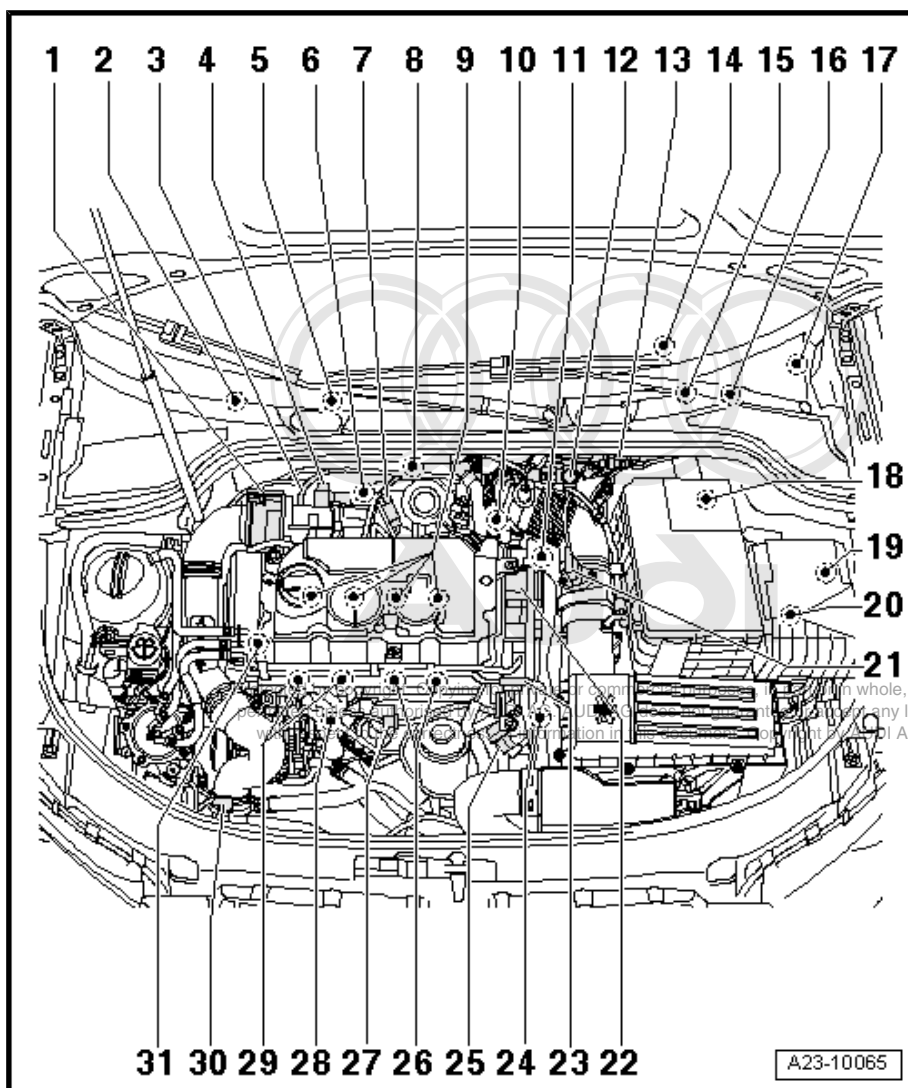
- ☐ Fitting location
➔ [page 8](#)
- ☐ Removing and installing
➔ Rep. gr. 26

5 - Engine control unit

- ☐ Removing and installing
➔ [page 35](#)

6 - Temperature sender before particulate filter - G506-

- ☐ Fitting location
➔ [page 7](#)
- ☐ Removing and installing
➔ Rep. gr. 26



7 - Exhaust gas pressure sensor 1 - G450-

- ☐ Fitting location ⇒ [page 7](#)
- ☐ Removing and installing ⇒ [page 39](#)

8 - Exhaust gas temperature sender 1 - G235-

- ☐ Fitting location ⇒ [page 7](#)
- ☐ Removing and installing ⇒ Rep. gr. 26

9 - Unit injectors

- ☐ Unit injector solenoid valve, No. 1 cyl. - N240-
- ☐ Unit injector solenoid valve, No. 2 cyl. - N241-
- ☐ Unit injector solenoid valve, No. 3 cyl. - N242-
- ☐ Unit injector solenoid valve, No. 4 cyl. - N243-
- ☐ Removing and installing ⇒ [page 26](#)

10 - Exhaust gas recirculation cooler change-over valve - N345-

- ☐ Fitting location ⇒ [page 8](#)

11 - Coolant temperature sender - G62-

- ☐ Fitting location ⇒ [page 6](#)
- ☐ If necessary release pressure in cooling system before removing

12 - Charge pressure control solenoid valve - N75-

- ☐ Fitting location ⇒ [page 7](#)

13 - Electrical connectors at plenum chamber partition panel (left-side)

- ☐ Fitting location ⇒ [page 7](#)

14 - Engine electronics warning lamp - K149-

- ☐ In instrument cluster

15 - Accelerator position sender - G79- with accelerator position sender 2 - G185-

- ☐ Fitting location ⇒ [page 5](#)
- ☐ Removing and installing ⇒ Rep. gr. 20

16 - Brake light switch - F- and brake pedal switch - F63-

- ☐ Fitting location ⇒ [page 5](#)
- ☐ Removing and installing ⇒ Rep. gr. 46

17 - Fuel pump relay - J17-

- ☐ Fitting location ⇒ [page 6](#)

18 - Clutch position sender - G476-

- ☐ Fitting location ⇒ [page 6](#)
- ☐ Removing and installing ⇒ Rep. gr. 30

19 - Relay and fuse holder in electronics box in engine compartment

- ☐ With terminal 30 voltage supply relay - J317-
- ☐ With terminal 15 voltage supply relay - J329-
- ☐ For identification of socket position refer to ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

20 - Automatic glow period control unit - J179-

- ☐ Under electronics box in engine compartment
- ☐ Fitting location ⇒ [page 6](#)
- ☐ Removing and installing ⇒ [page 46](#)

21 - Air mass meter - G70-

- ☐ Removing and installing ⇒ [page 14](#)

22 - Tandem pump

- ☐ Removing, installing and checking ⇒ Rep. gr. 20



23 - Multi-pin connector

- ☐ For unit injectors
- ☐ Fitting location ⇒ [page 5](#)

24 - Engine speed sender - G28-

- ☐ Fitting location ⇒ [page 9](#)
- ☐ Removing and installing ⇒ [page 47](#)
- ☐ 4.5 Nm

25 - Fuel temperature sender - G81-

- ☐ Fitting location ⇒ [page 9](#)

26 - Glow plugs

- ☐ Glow plug 3 - Q12-
- ☐ Glow plug 4 - Q13-
- ☐ Removing and installing ceramic glow plugs ⇒ [page 43](#)

27 - 3-pin connector

- ☐ For Hall sender - G40-
- ☐ Fitting location ⇒ [page 10](#)

28 - Radiator outlet coolant temperature sender - G83-

- ☐ Fitting location ⇒ [page 9](#)

29 - Glow plugs

- ☐ Glow plug 1 - Q10-
- ☐ Glow plug 2 - Q11-
- ☐ Removing and installing ceramic glow plugs ⇒ [page 43](#)

30 - Charge pressure sender - G31- with intake air temperature sender - G42-

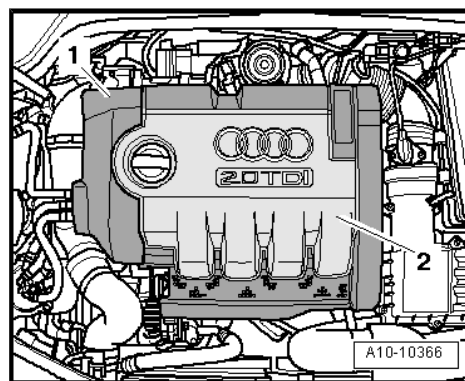
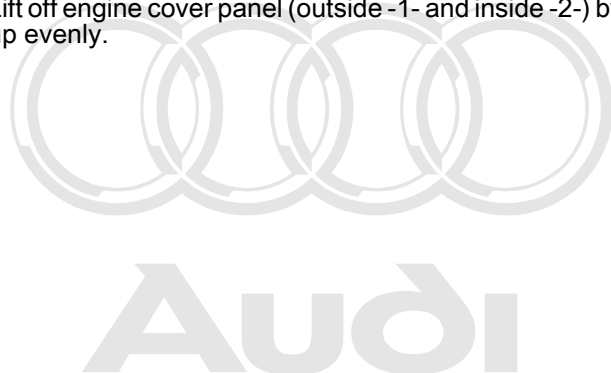
- ☐ Fitting location ⇒ [page 9](#)

31 - Hall sender - G40-

- ☐ For camshaft position
- ☐ Fitting location ⇒ [page 10](#)

Removing engine cover panel

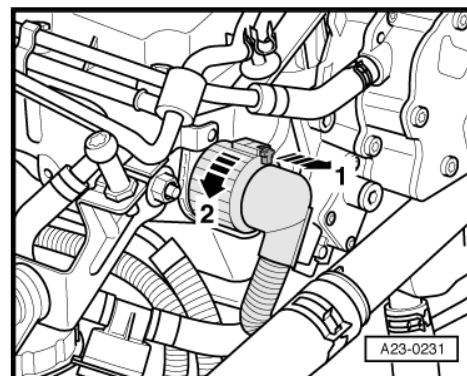
- Lift off engine cover panel (outside -1- and inside -2-) by pulling up evenly.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.

Fitting location of multi-pin connector for unit injectors

- ◆ To disconnect, pull release pin -arrow 1- and slacken knurled nut -arrow 2-.



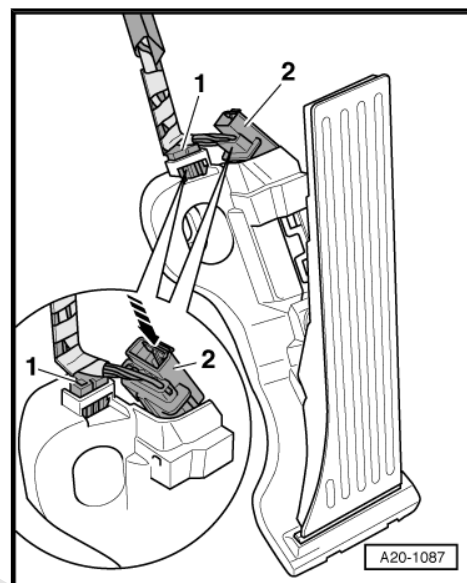
Fitting location of accelerator position sender - G79- with accelerator position sender 2 - G185-

- ◆ To detach the electrical connection -2-, press the release tab and pull off the cable guide -1-.
- ◆ Removing and installing ⇒ Rep. gr. 20



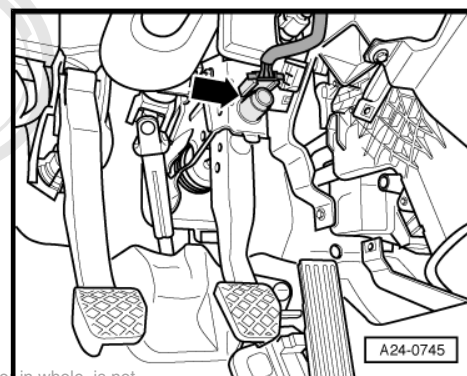
Note

Diagram shows set-up on left-hand drive vehicles.



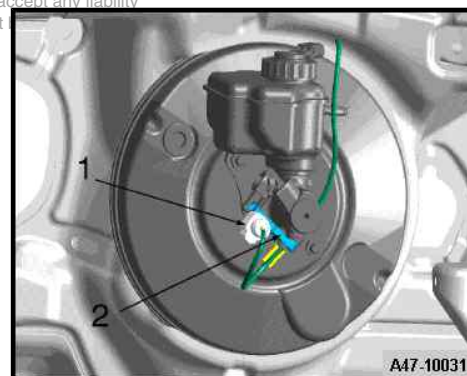
Fitting location of brake light switch - F- and brake pedal switch - F63- up to approx. 11.2005

- ◆ On pedal bracket above brake pedal -arrow-.
- ◆ Removing and installing ⇒ Rep. gr. 46



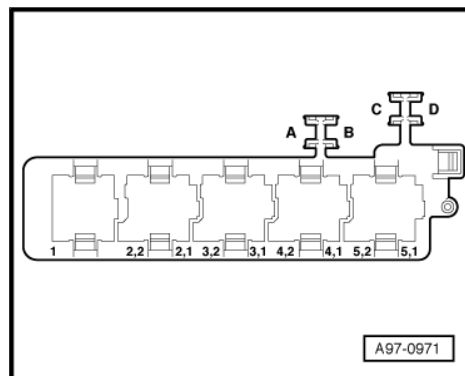
Fitting location of brake light switch - F- and brake pedal switch - F63- from approx. 11.2005 onwards (gradual introduction)

- ◆ On brake master cylinder in engine compartment.
- ◆ Removing and installing ⇒ Rep. gr. 46



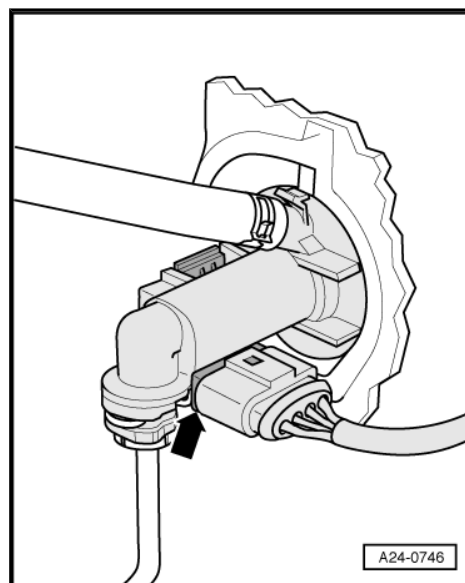
Fitting location of fuel pump relay - J17-

- ◆ Position -2.1- in 5-position relay carrier located above onboard supply control unit and beneath dash panel (driver's side).



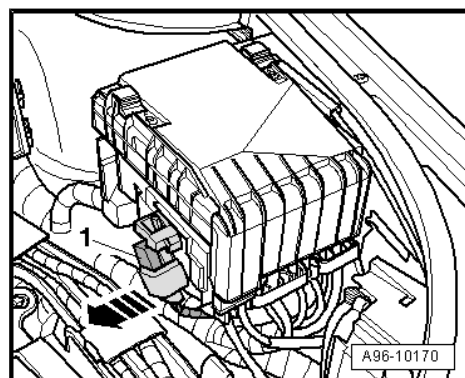
Fitting location of clutch position sender - G476-

- ◆ Removing and installing ⇒ Rep. gr. 30



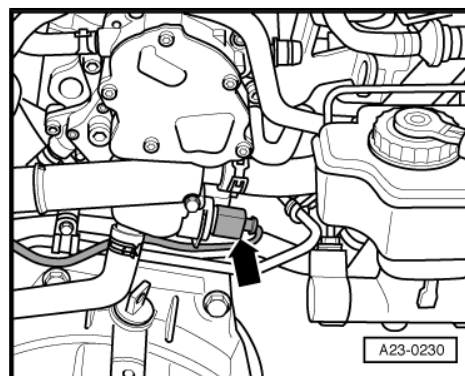
Fitting location of automatic glow period control unit - J179-

- ◆ -Item 1- on relay carrier below electronics box in engine compartment.



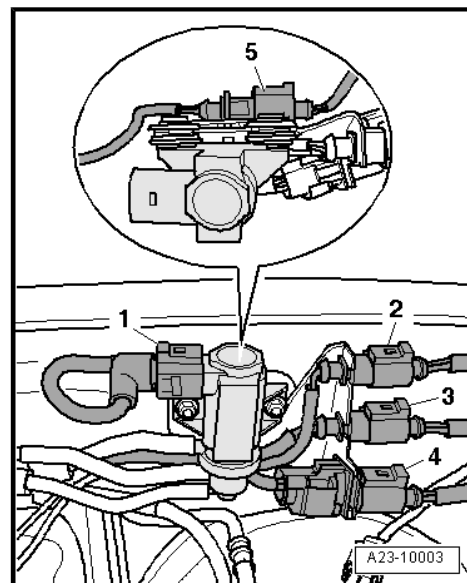
Fitting location of coolant temperature sender - G62-

- ◆ On left side of engine -arrow-.



Fitting locations at plenum chamber partition panel (left-side)

- 1 - Charge pressure control solenoid valve - N75-
- 2 - Electrical connector (orange) for temperature sender after particulate filter - G527-
- 3 - Electrical connector (black) for exhaust gas temperature sender 1 - G235-
- 4 - Electrical connector (black) for Lambda probe - G39-
- 5 - Electrical connector (brown) for temperature sender before particulate filter - G506-



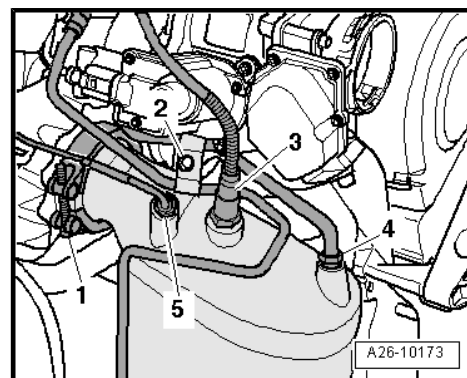
Fitting locations of components on top of particulate filter

- 3 - Lambda probe - G39- with Lambda probe heater - Z19- ; removing and installing ⇒ [page 37](#)
- 4 - Pressure pipe going to exhaust gas pressure sensor 1 - G450-
- 5 - Temperature sender before particulate filter - G506- ; removing and installing ⇒ Rep. gr. 26



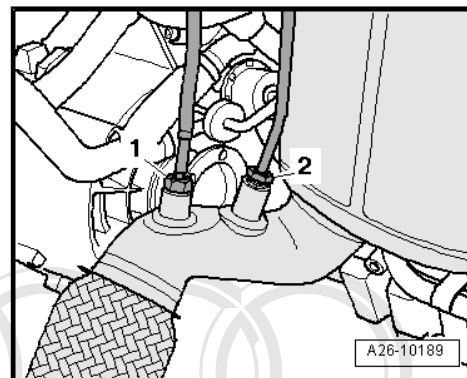
Note

Disregard items -1- and -2-.



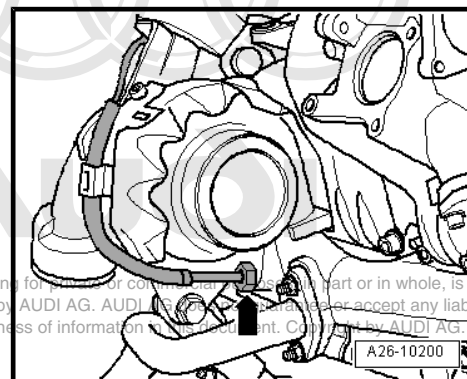
Fitting locations of components on underside of particulate filter

- 1 - Temperature sender after particulate filter - G527- ; removing and installing ⇒ Rep. gr. 26
- 2 - Pressure pipe going to exhaust gas pressure sensor 1 - G450-



Fitting location of exhaust gas temperature sender 1 - G235-

- ◆ In exhaust manifold -arrow-.
- ◆ Removing and installing ⇒ Rep. gr. 26



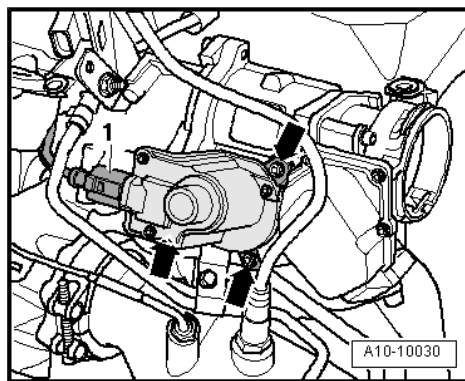
Protected by copyright. Copying for private or commercial purposes, in whole or in part, is not permitted unless authorised by AUDI AG. AUDI AG and its subsidiaries accept no liability with respect to the correctness of information contained herein. Copyright by AUDI AG.

Fitting location of exhaust gas recirculation valve - N18- with exhaust gas recirculation potentiometer - G212-

- ◆ At rear of intake manifold
- ◆ Removing and installing ⇒ Rep. gr. 26
- 1 - Electrical connector for exhaust gas recirculation valve - N18- with exhaust gas recirculation potentiometer - G212-

**Note**

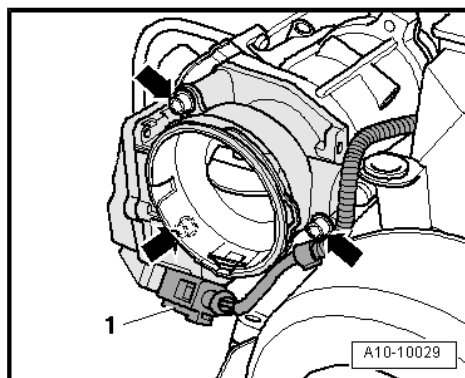
Disregard -arrows-.

**Fitting location of intake manifold flap motor - V157-**

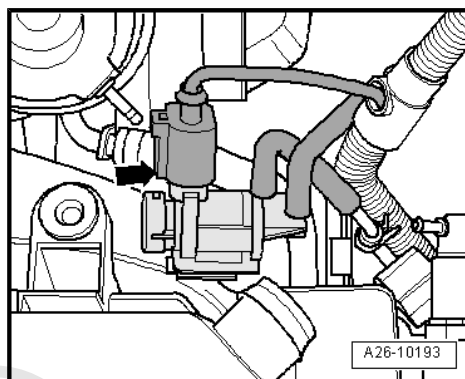
- ◆ On intake manifold
- ◆ Removing and installing ⇒ [page 17](#)
- 1 - Electrical connector for intake manifold flap motor - V157-

**Note**

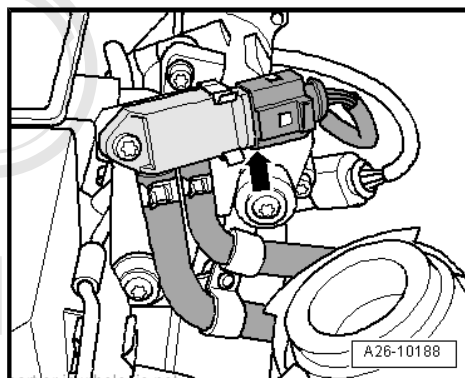
Disregard -arrows-.

**Fitting location of exhaust gas recirculation cooler change-over valve - N345-**

- ◆ On left side of intake manifold -arrow-.

**Fitting location of exhaust gas pressure sensor 1 - G450-**

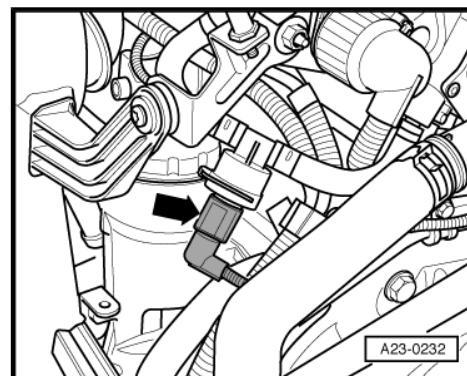
- ◆ On top of intake manifold -arrow-.
- ◆ Removing and installing ⇒ [page 39](#)



Protected by copyright. Copying for private or commercial purposes, in whole or in part, is permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.

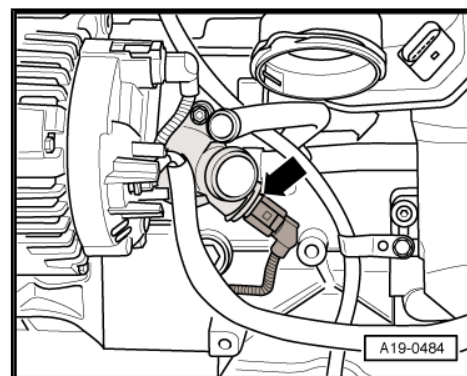
Fitting location of fuel temperature sender - G81-

- ◆ At front of engine -arrow-.



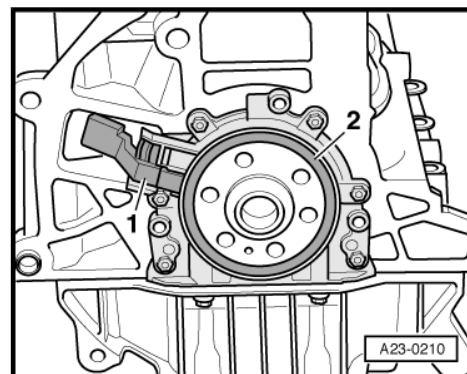
Fitting location of radiator outlet coolant temperature sender - G83-

- ◆ On connecting flange for thermostat -arrow-.



Fitting location of engine speed sender - G28-

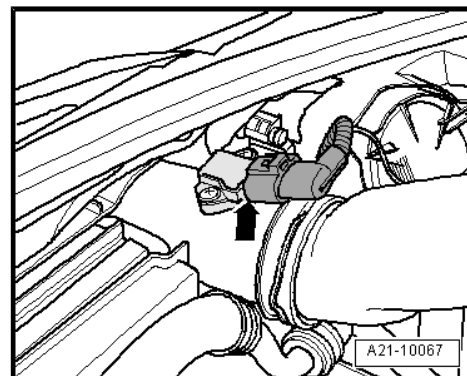
- ◆ On flywheel side of engine.
- ◆ Removing and installing ⇒ [page 47](#)
- 1 - Engine speed sender - G28-
- 2 - Sender wheel



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.

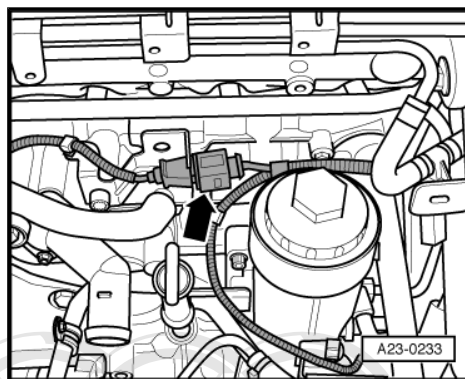
Fitting location of charge pressure sender - G31- with intake air temperature sender - G42-

- ◆ In charge air cooler at front right of engine compartment -arrow-

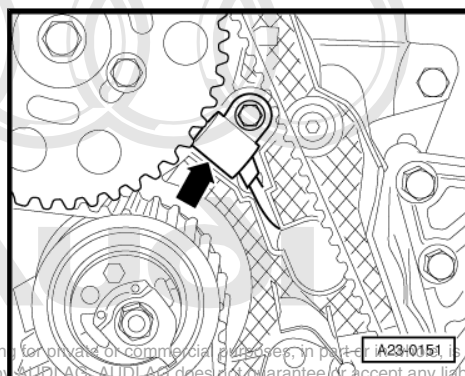


Fitting location of 3-pin connector for Hall sender - G40-

- ◆ At front of engine below intake manifold -arrow-.

**Fitting location of Hall sender - G40-**

- ◆ At camshaft sprocket on right side of engine -arrow-



Protected by copyright. Copying for private or commercial purposes, in part or in full, is not permitted unless authorised by AUDI AG. AUDI AG does not warrant or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.

1.5 Exploded view - air cleaner

1 - Air hose

- ☐ To turbocharger

2 - Air mass meter - G70-

- ☐ Removing and installing
⇒ [page 14](#)

3 - O-ring

- ☐ Renew if damaged

4 - Vent hose

- ☐ To charge pressure control solenoid valve - N75-

5 - Bolt

- ☐ 8 Nm

6 - Air cleaner (top section)

- ☐ Check for dirt and accumulated leaves, etc.

7 - Air duct

- ☐ Bolted to lock carrier

8 - Bolt

- ☐ 5 Nm

9 - Air hose

- ☐ Check for dirt and accumulated leaves, etc.

10 - Water drain hose

- ☐ IMPORTANT: Check for obstructions, clean if necessary

11 - Air cleaner (bottom section)

- ☐ Clean any salt residue, leaves and dirt out of air cleaner (bottom section)

12 - 10 Nm

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.

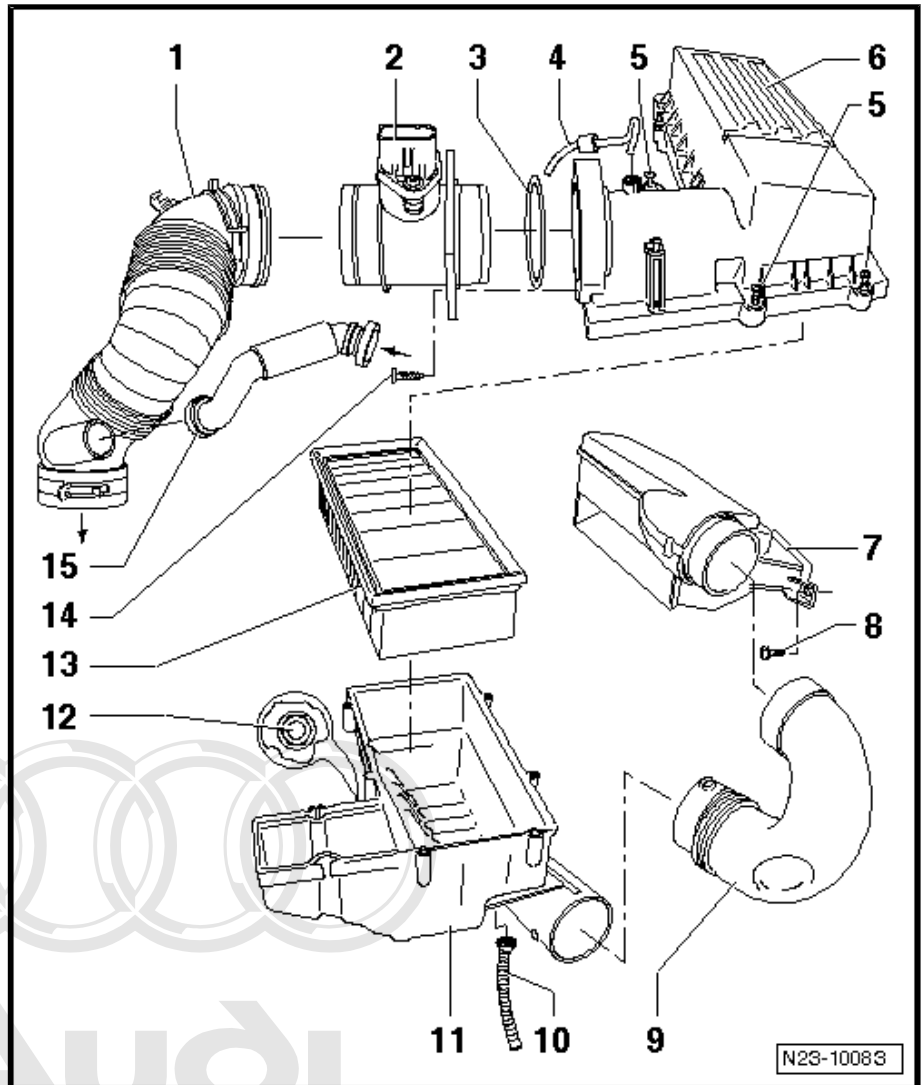
13 - Air filter element

- ☐ Always use genuine part for air filter element
- ☐ Observe change intervals ⇒ Maintenance ; Booklet 808
- ☐ Removing and installing ⇒ [page 12](#)

14 - Bolt

- ☐ 3.5 Nm

15 - Crankcase breather hose

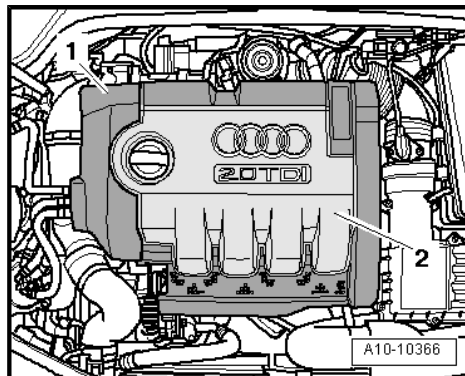




1.6 Removing and installing air filter element

Removing

- Lift off inside engine cover panel -2- by pulling up evenly.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.

- Unscrew bolts -arrows- and lift out air cleaner (top section).
- Take out air filter element.

Installing

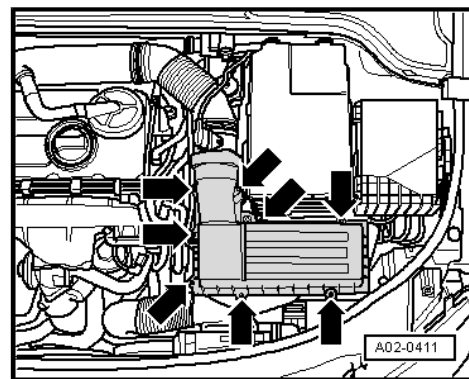
To ensure the proper function of the air mass meter it is important to observe the following notes and instructions.



Note

- ◆ *If the air filter element is very dirty or wet, dirt or water could reach the air mass meter and affect the air mass value. This would lead to loss of power, since a smaller injection quantity is calculated.*
- ◆ *Always use genuine part for air filter element.*
- ◆ *Hose connections and hoses for charge air system must be free of oil and grease before assembly. Do not use any lubricants containing silicone when assembling.*
- ◆ *The air cleaner housing MUST be clean.*
- ◆ *Secure all hose connections with the correct type of hose clips (same as original equipment) ⇒ Parts catalogue .*
- ◆ *To prevent malfunctions, cover all critical parts of the engine air intake tract (air mass meter, intake pipes, etc.) with a clean cloth when blowing out the air cleaner housing with compressed air.*
- ◆ *Please observe requirements for disposal.*
- Check water drain hose for obstructions; clean if necessary. It is important that water can drain off easily.
- Clean salt residue, dirt and leaves out of air cleaner housing (top and bottom sections); use a vacuum cleaner if necessary.
- Check for salt residue, dirt and leaves in air mass meter and air hose (engine intake side).
- Check for dirt and leaves in air duct going from lock carrier to air cleaner housing.
- When installing the air filter element, check that it is properly centred in the retainer in the air cleaner (bottom section).
- Fit the top section of the air cleaner carefully on the bottom section, without using force. Make sure the top section of the air cleaner is fitted straight on the air filter element (note position of sealing lip on air filter element).
- Ensure secure fit of intake hose at air mass meter - G70- .

The remaining installation steps are carried out in the reverse sequence.

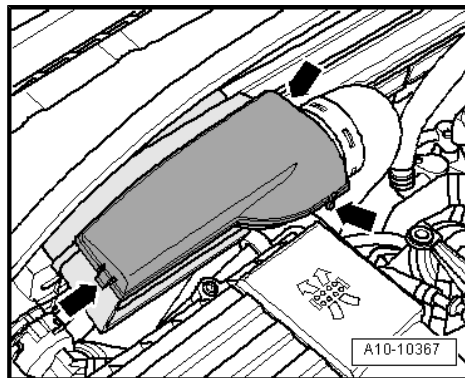


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.

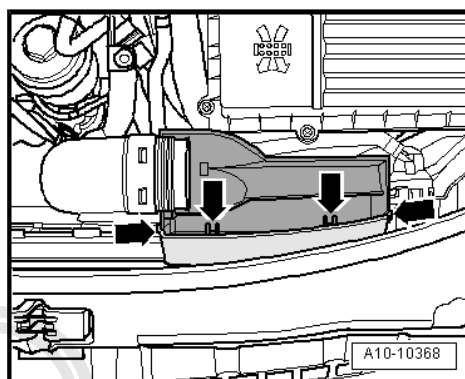
1.7 Removing and installing air mass meter - G70-

Removing

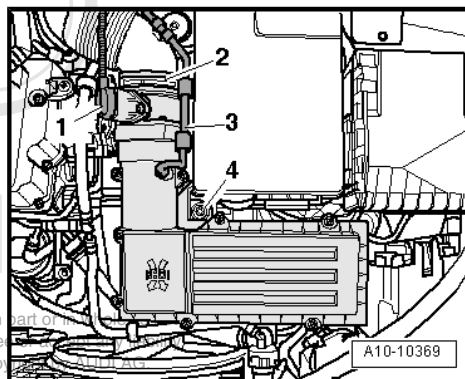
- Pull cover off air duct (release clips on sides) -arrows-.



- Unclip air duct at the bottom by releasing clips -arrows-.
- Detach air duct (bottom) together with air hose.



- Unplug electrical connector -1- at air mass meter - G70- .
- Detach vent hose -3- and air hose -2-.
- Unscrew bolt -4- and remove air cleaner housing.



Protected by copyright. Copying for private or commercial purposes, in part or in full, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee the accuracy of the information with respect to the correctness of information in this document. Copying is prohibited.

- Unscrew two securing bolts -arrows- on air mass meter - G70- .
- Then carefully pull air mass meter - G70- out of guide on air cleaner housing.

Installing

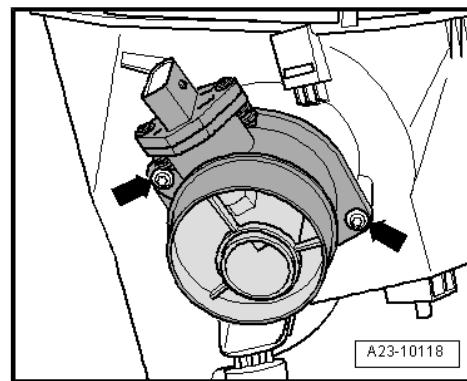
To ensure the proper function of the air mass meter it is important to observe the following notes and instructions.



Note

- ◆ *Renew O-ring.*
- ◆ *If the air filter element is very dirty or wet, dirt or water could reach the air mass meter and affect the air mass value. This would lead to loss of power, since a smaller injection quantity is calculated.*
- ◆ *Always use genuine part for air filter element.*
- ◆ *Use silicone-free lubricant when fitting air hose.*
- ◆ *Secure all hose connections with the correct type of hose clips (same as original equipment) ⇒ Parts catalogue .*
- Check for salt residue, dirt and leaves in air mass meter and air hose (engine intake side).
- Check for dirt in air duct leading to air filter element. Clean salt residue, dirt and leaves out of top and bottom sections of air cleaner housing (wash out or vacuum out if necessary). **Removing and installing air filter element ⇒ page 12**

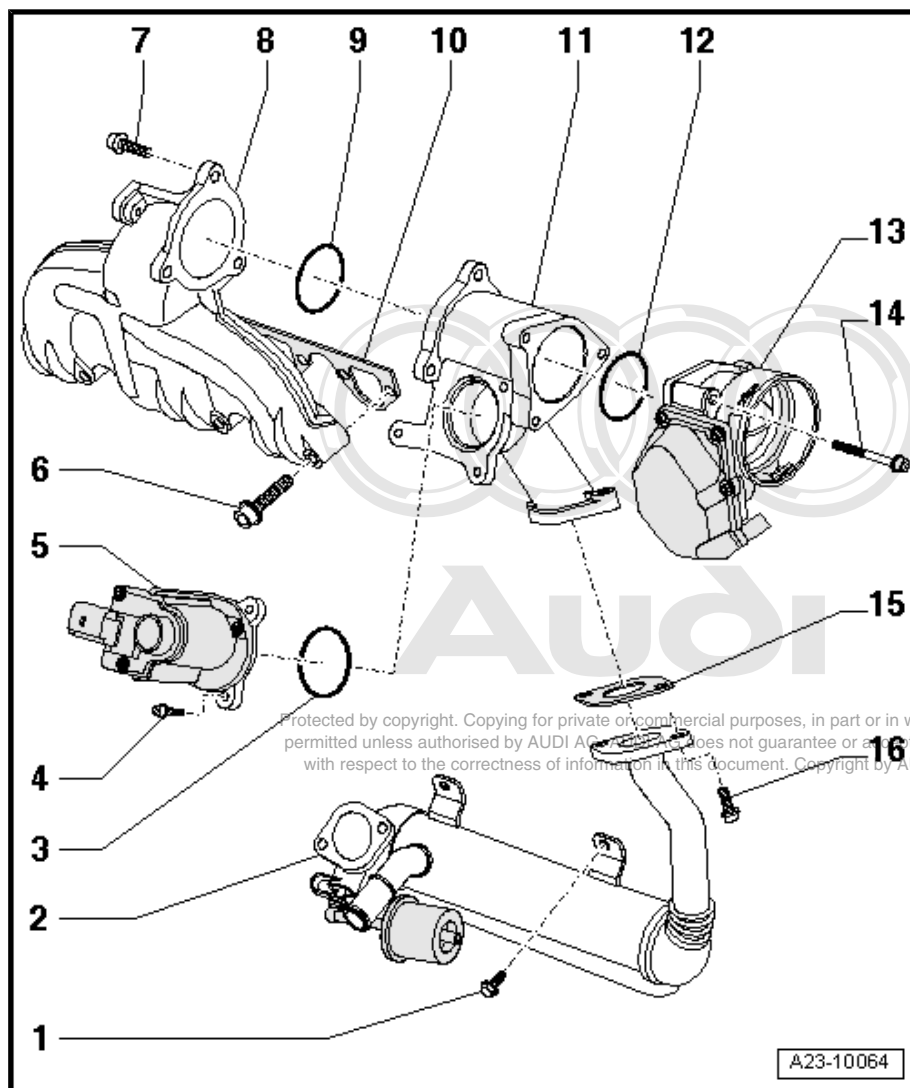
The remaining installation steps are carried out in the reverse sequence.



1.8 Exploded view - intake manifold

Protected by copyright. Copying for private or commercial purposes is prohibited. This document is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the content of this document. The content of this document is subject to change without notice.

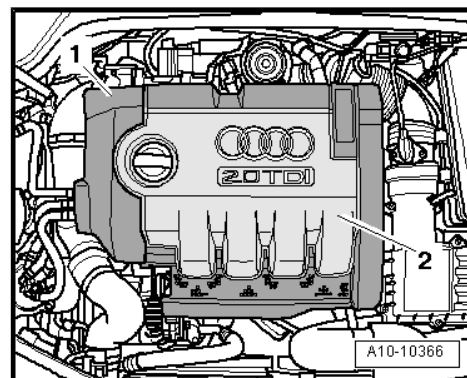
- 1 - Bolt
☐ 10 Nm
- 2 - Exhaust gas recirculation cooler
- 3 - O-ring
☐ Renew
- 4 - Bolt
☐ 10 Nm
- 5 - Exhaust gas recirculation valve - N18- with exhaust gas recirculation potentiometer - G212-
- 6 - Bolt
☐ 22 Nm
- 7 - Bolt
☐ 10 Nm
- 8 - Intake manifold
☐ Removing and installing
⇒ [page 18](#)
- 9 - O-ring
☐ Renew
- 10 - Gasket
☐ Renew
- 11 - Connecting flange
- 12 - O-ring
☐ Renew
- 13 - Intake manifold connection
☐ With intake manifold flap motor - V157-
- 14 - Bolt
☐ 10 Nm
- 15 - Gasket
☐ Renew
- 16 - Bolt
☐ 22 Nm



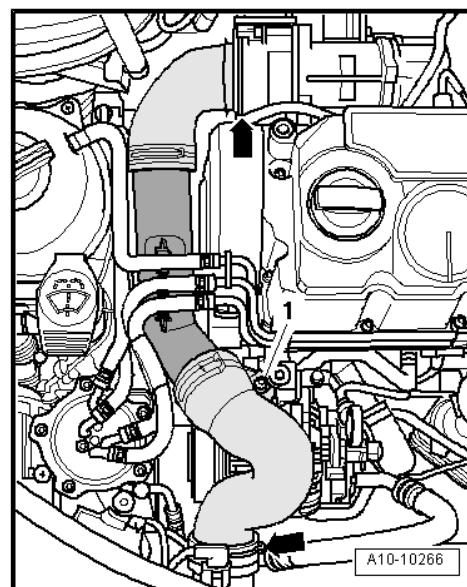
1.9 Removing and installing intake manifold flap motor - V157-

Removing

- Lift off engine cover panel (outside -1- and inside -2-) by pulling up evenly.



- Unclip fuel and coolant hoses from air intake pipe (right-side).
- Remove retaining bolt -1-.
- Remove air pipe (right-side) by lifting retaining clips -arrows- slightly.



- Unplug electrical connector -1-.
- Remove bolts -arrows- and detach intake manifold flap motor - V157-.

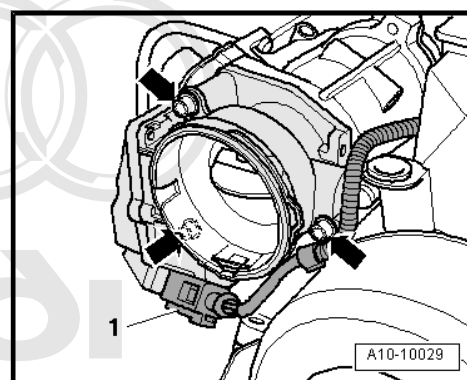
Installing

Installation is carried out in the reverse order; note the following:



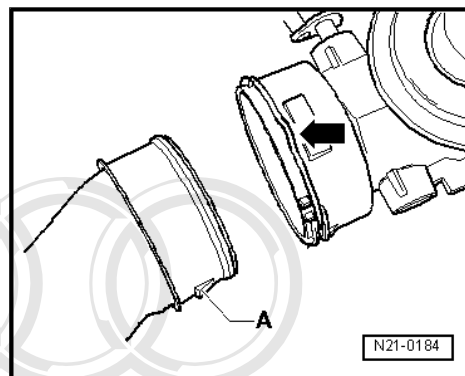
Note

- ◆ *Renew gaskets and seals.*
- ◆ *Secure all hose connections with the correct type of hose clips (same as original equipment) → **Parts catalogue***



Reproduction or use for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.

- When installing air pipes with plug-in connectors, ensure that the securing clip -arrow- engages audibly on the retaining lug -A-.
- Fill cooling system ⇒ Rep. gr. 19 .
- Tightening torque: exploded view - intake manifold
⇒ [page 15](#)

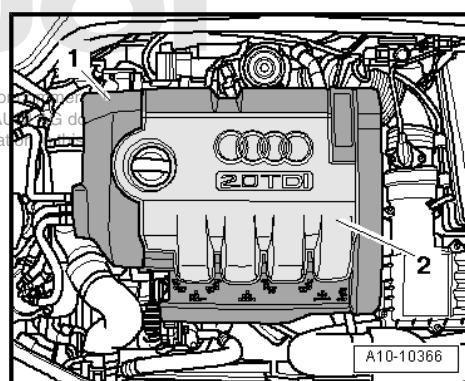


1.10 Removing and installing intake manifold

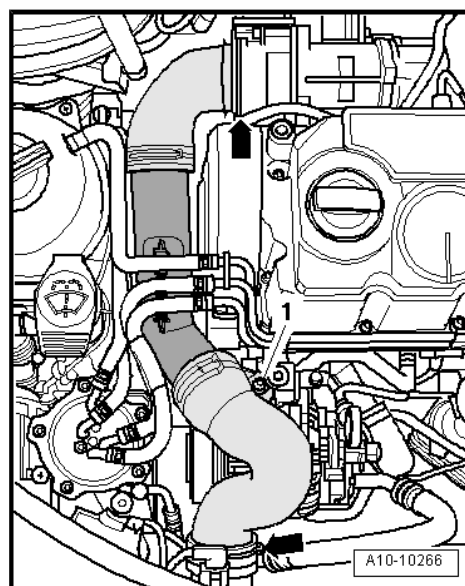
Removing

- Lift off engine cover panel (outside -1- and inside -2-) by pulling up evenly.

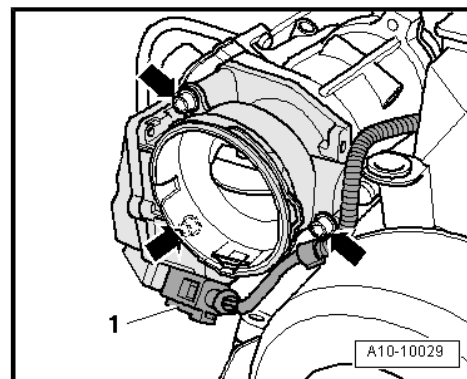
Protected by copyright. Copying for private or non-commercial use is permitted unless authorised by AUDI AG. All rights reserved. No responsibility is assumed with respect to the correctness of information.



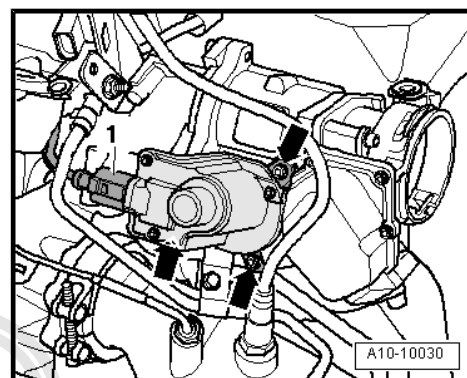
- Unclip fuel and coolant hoses from air intake pipe (right-side).
- Remove retaining bolt -1-.
- Remove air pipe (right-side) by lifting retaining clips -arrows- slightly.



- Detach electrical connector -1- at intake manifold flap motor - V157- .
- Remove bolts -arrows- and detach intake manifold flap motor - V157- .



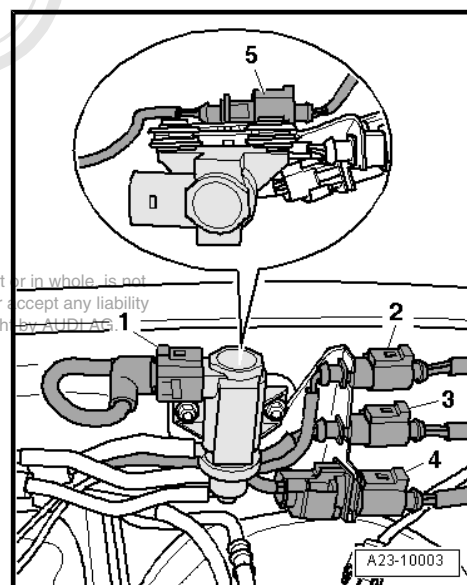
- Unplug electrical connector -1- at exhaust gas recirculation valve - N18- with exhaust gas recirculation potentiometer - G212- .
- Move electrical wiring harness clear.
- Remove bolts -arrows-.
- Detach exhaust gas recirculation valve - N18- at intake manifold.



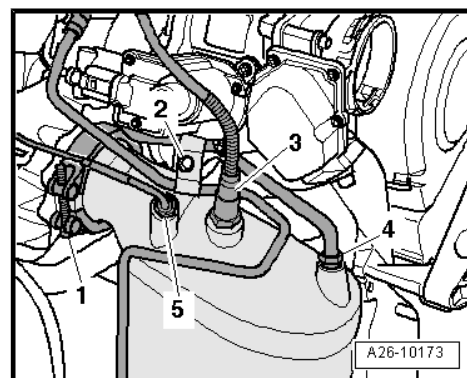
Note

Shown from rear with engine removed for illustration purposes.

- Unplug electrical connector -4- for Lambda probe - G39- .

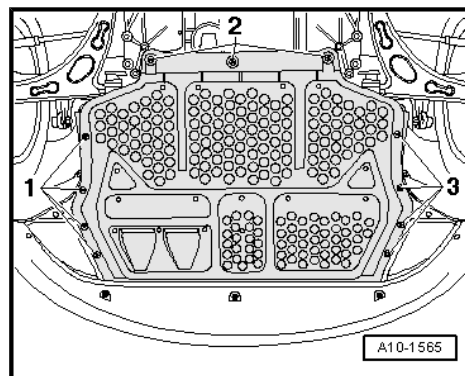


- Unscrew Lambda probe -3-.
- Remove temperature sender before particulate filter - G506- -item 5-.
- Unbolt bracket -2- for pressure pipes.
- Detach pressure pipe -4- at particulate filter.
- Slacken retaining clamp -1- for particulate filter.
- Detach retaining clamp.

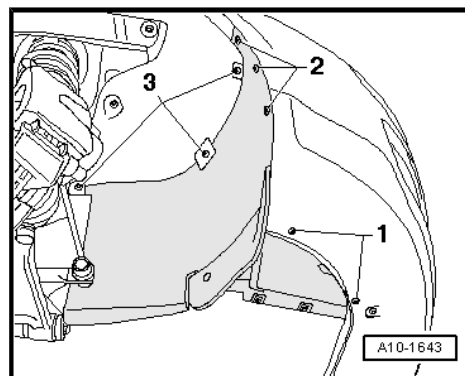


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.

- Remove front right wheel.
- Remove centre noise insulation -fasteners 1 ... 3-.



- Remove noise insulation (right-side) -fasteners 1 ... 3-.

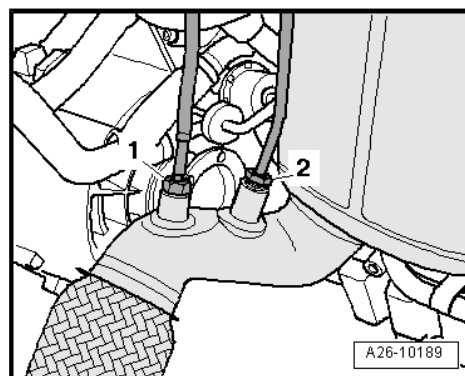


- Unscrew temperature sender after particulate filter - G527- -item 1- from exhaust pipe behind particulate filter.
- Unscrew pressure pipe -2- going to exhaust gas pressure sensor 1 - G450- .

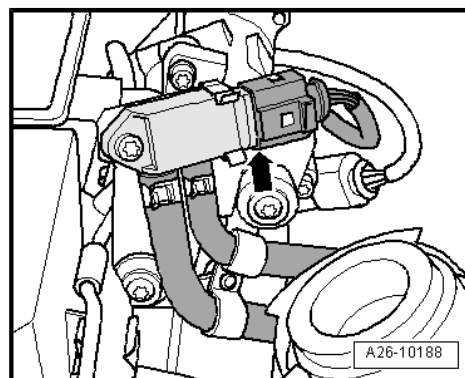


Note

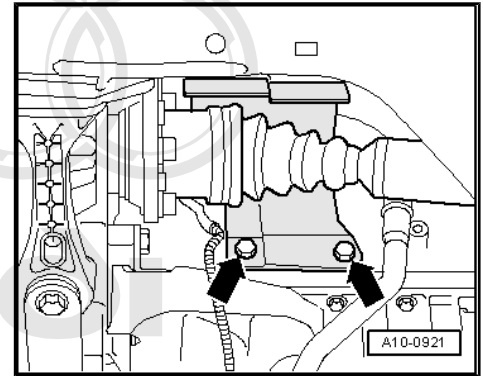
The threaded connections are accessible through the wheel housing (right-side).



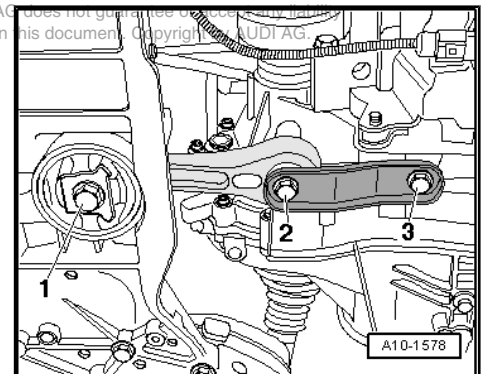
- Unplug electrical connector -arrow- at exhaust gas pressure sensor 1 - G450-.
- Unscrew exhaust gas pressure sensor 1 - G450- and detach together with pressure pipes.



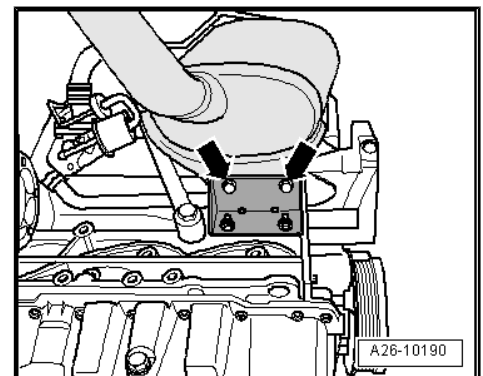
- Unbolt heat shield for drive shaft (right-side) -arrows-.
- Unbolt drive shaft (right-side) from gearbox flange.
- Push drive shaft (right-side) towards front of vehicle.



- Unscrew bolts -1 ... 3- and remove pendulum support.



- Remove bolts -arrows- on bracket for particulate filter.



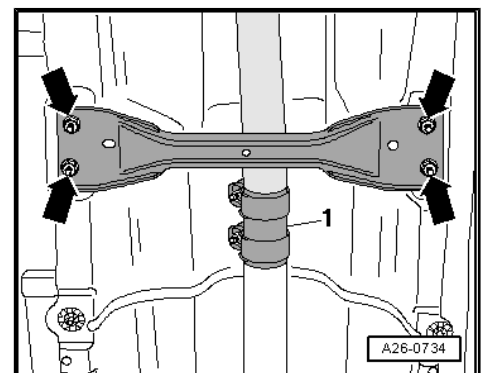
- Remove front cross member from underbody -arrows-.



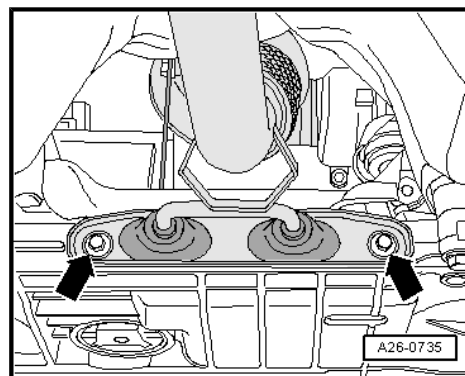
Note

To avoid damage, the flexible joints in the front exhaust pipe must not be bent more than 10°.

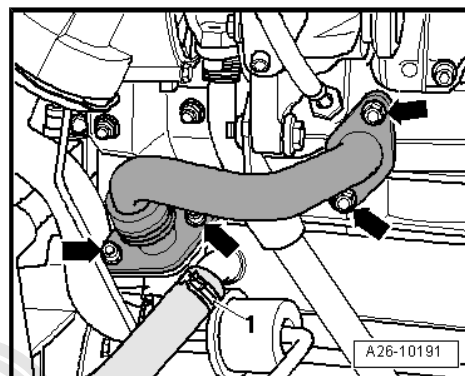
- Loosen nuts on clamp -1-.



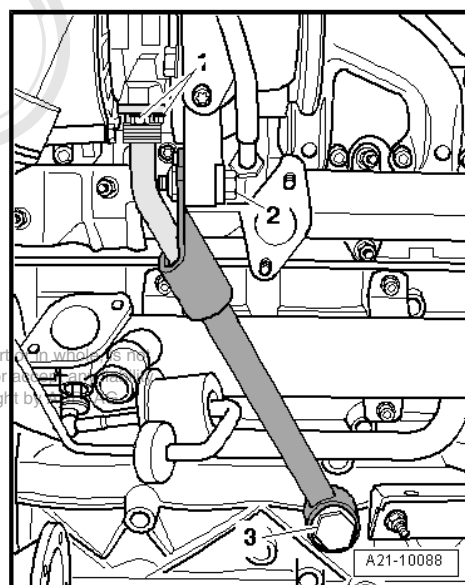
- Unbolt bracket for exhaust system -arrows-.
- Take out particulate filter: turn it 180° clockwise and at the same time push engine/gearbox assembly slightly forwards.



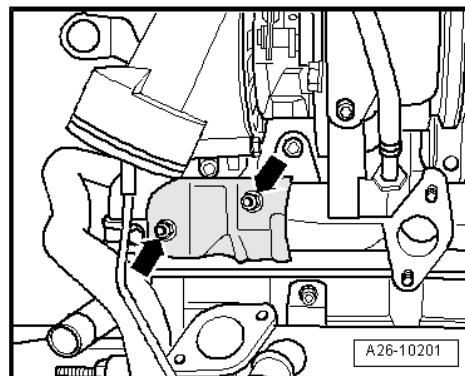
- Unbolt connecting pipe going to exhaust gas recirculation cooler -arrows-.



- Remove nuts -1-, bolt -2- and banjo bolt -3-.
- Remove support for turbocharger together with oil return line.

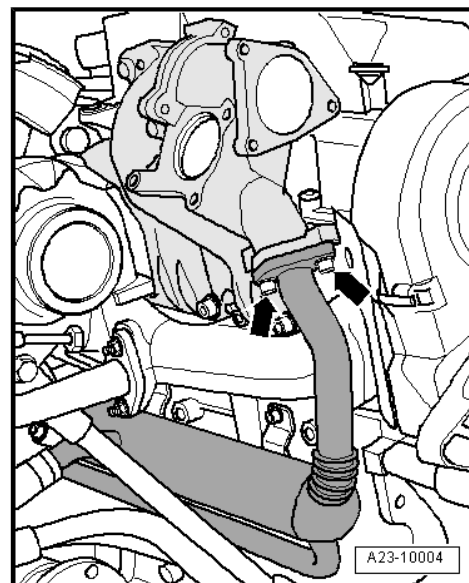


- Unbolt heat shield on exhaust manifold (left-side) -arrows-.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by Audi AG.

- Unscrew bolts -arrows- on flange between exhaust gas recirculation cooler and intake manifold.



- Remove bolts -arrows-.
- Remove intake manifold (lift out towards right side).

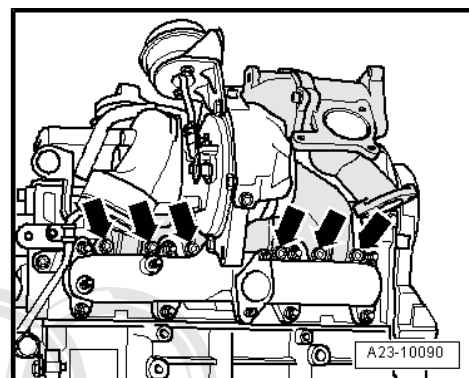
Installing

Installation is carried out in the reverse order; note the following:



Note

- ◆ *Renew gaskets and seals.*
- ◆ *Note the installation position of intake manifold gasket.*
- ◆ *Hose connections and hoses for charge air system must be free of oil and grease before assembly.*
- ◆ *Secure all hose connections with the correct type of hose clips (same as original equipment) ⇒ Parts catalogue .*



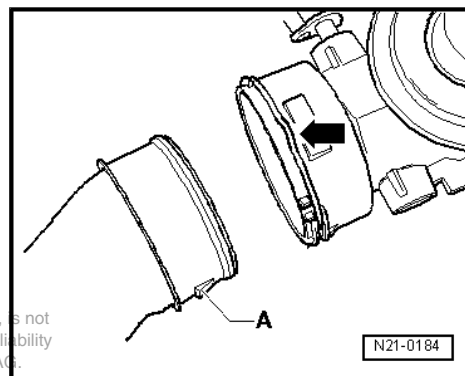
- Install particulate filter and front exhaust pipe ⇒ Rep. gr. 26 .
- Align exhaust system so it is free of stress ⇒ Rep. gr. 26 .
- Install front cross member for underbody ⇒ Rep. gr. 66 .

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.

- When installing air pipes with plug-in connectors, ensure that the securing clip -arrow- engages audibly on the retaining lug -A-.

Tightening torques

Component	Nm
Intake manifold to cylinder head	22
Exhaust gas recirculation cooler to intake manifold	22
Heat shield to exhaust manifold	25
Support for turbocharger - Cylinder block	60
er to: Turbocharger	25
Oil line to turbocharger	15
Pendulum support to: Gearbox	40 + 90° 1)2)
Subframe	100 + 90° 1)2)
Drive shaft heat shield to cylinder block	35
Exhaust gas recirculation valve - N18- to intake manifold	10
Intake manifold flap motor - V157- to intake manifold	10
Air pipe to bracket	10
♦ 1) Renew bolts.	
♦ 2) 90° = one quarter turn.	



1.11 Servicing unit injector



Note

Observe rules for cleanliness ⇒ [page 1](#) .

1 - Bolt

- ☐ Renew
- ☐ 20 Nm + 90° (1/4 turn further)

2 - Rocker arm shaft

- ☐ With rocker arms
- ☐ Removing and installing
⇒ [page 26](#)

3 - Lock nut

- ☐ 30 Nm

4 - Adjuster screw

- ☐ Renew

5 - Ball stud

- ☐ Renew

6 - Unit injector

- ☐ Removing and installing
⇒ [page 26](#)

7 - O-ring

- ☐ Renewing ⇒ [page 29](#)

8 - O-ring

- ☐ Renewing ⇒ [page 29](#)

9 - O-ring

- ☐ Renewing ⇒ [page 29](#)

10 - Insulating seal

- ☐ Renewing ⇒ [page 29](#)

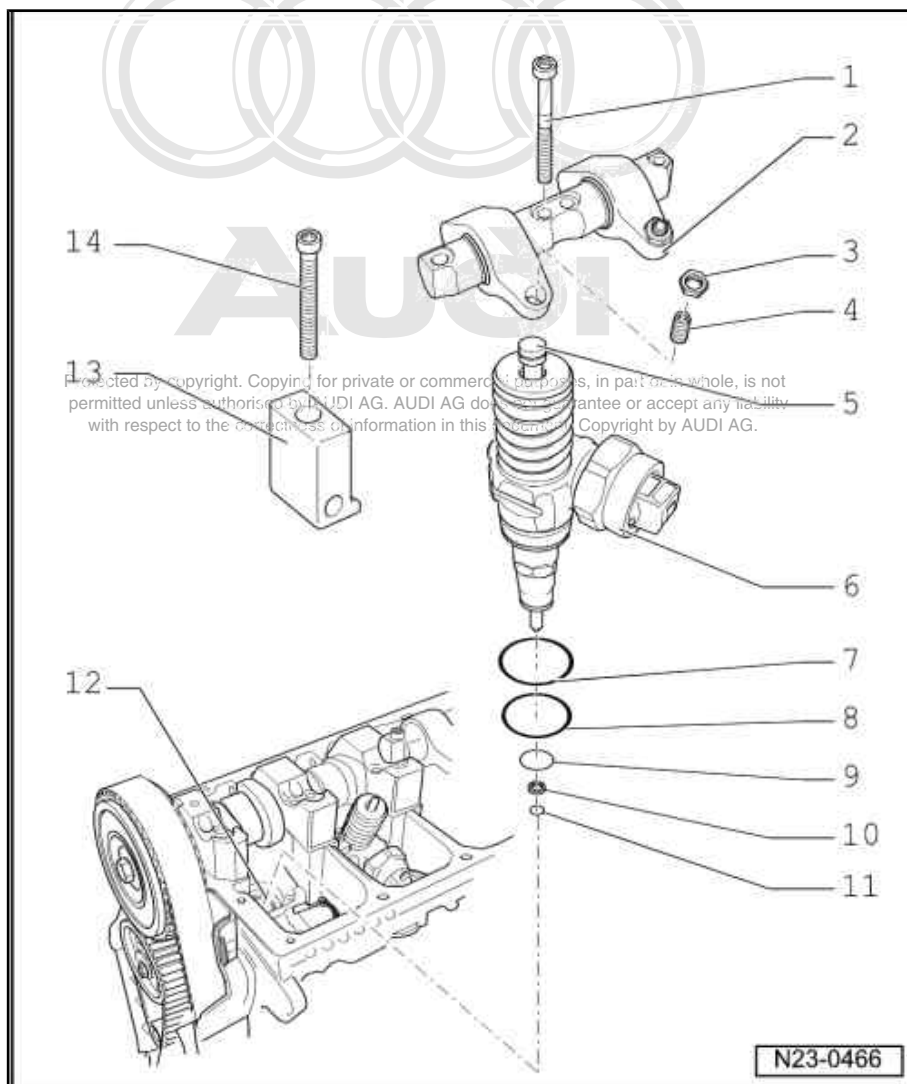
11 - Retaining ring

12 - Cylinder head

13 - Clamping block

14 - Bolt

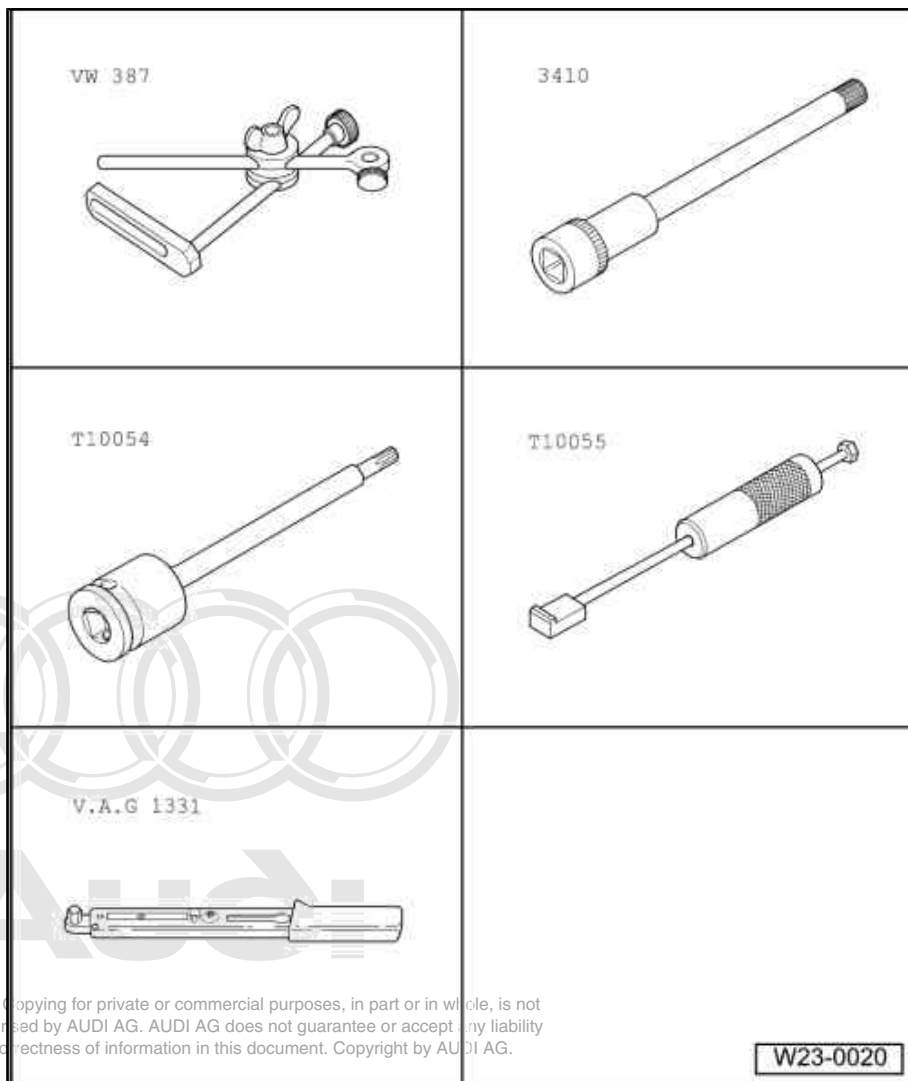
- ☐ Renew
- ☐ 12 Nm + 270° (3/4 turn further)



1.12 Removing and installing unit injector

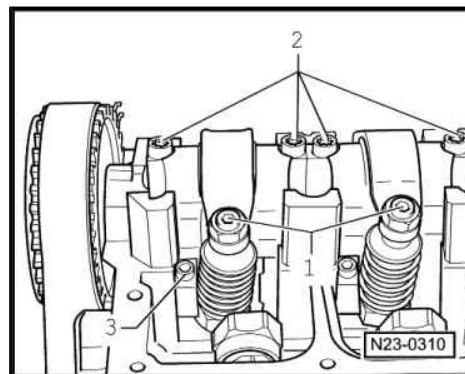
Special tools and workshop equipment required

- ◆ Universal dial gauge bracket - VW 387-
- ◆ Socket XZN 10 - 3410-
- ◆ Special wrench, long reach - T10054-
- ◆ Puller - T10055-
- ◆ Torque wrench - V.A.G 1331-
- ◆ Depth gauge (measuring range at least 400 mm)

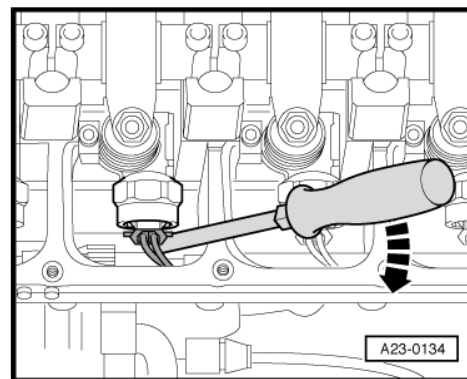


Removing

- Remove cylinder head cover ⇒ Rep. gr. 15 .
- Turn crankshaft until both cams for the unit injector to be removed face upwards.
- Loosen the lock nuts of the adjuster screws -1- on all unit injectors.
- Unscrew the adjuster screws until each rocker arm touches the tappet spring of the unit injector.
- Remove rocker arm shaft by unscrewing bolts -2- using socket - 3410- starting from the outside working inwards.
- Unscrew bolt -3- for clamping block using socket - T10054- and remove clamping block.



- Pry off connector from the unit injector using a screwdriver -arrow-. Press gently against the other side of connector with finger to prevent it from tilting.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.

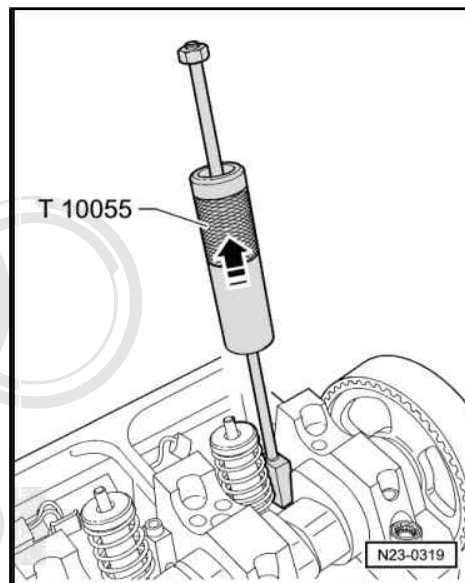
- Insert puller - T 10055- in place of the clamping block in the slot on the side of the unit injector.
- Pull unit injector out of cylinder head seat by gently tapping upwards.

Installing and adjusting



Note

- ◆ *When reinstalling old unit injector, you must renew the O-rings and insulating seals ⇒ [page 29](#) .*
- ◆ *Renew bolts on unit injectors.*
- ◆ *New unit injectors are supplied with O-rings and insulating seals.*
- ◆ *When installing a new unit injector, you must also renew the appropriate adjuster screw in rocker arm.*
- ◆ *Whenever an operation requires adjustment of a unit injector, the adjuster screw in the rocker arm and the ball stud of the unit injector must be cleaned and examined for signs of wear. Ball stud and adjuster screw must be renewed if signs of wear are found.*
- ◆ *Grease the contact surfaces between the ball stud and adjuster screw with lubricating grease - G 000 100- .*
- Before installing the unit injector, check the three O-rings, insulating seal and retaining ring for correct seating.
- The O-rings must not be twisted.
- Lubricate O-rings and guide in cylinder head with oil.
- Insert unit injector very carefully into cylinder head seat and press in as far as it will go.
- Insert the clamping block in the slot on the side of the unit injector.



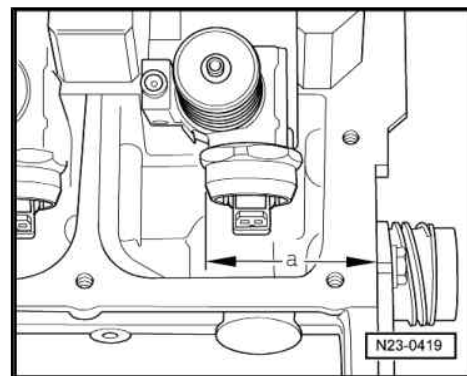
Note

If the unit injector is not seated at a right angle to the clamping block, the securing bolt may come loose, resulting in damage to the unit injector or cylinder head.

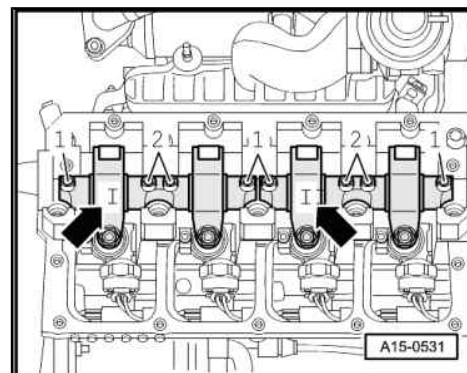
- Therefore, align the unit injector as follows:
- Screw new securing bolt into clamping block, but do not tighten (it must still be possible to turn the unit injector slightly).
- Now align the unit injector at a right angle to the bearing pedestals of the camshaft.

- Check dimension -a- from outer edge of cylinder head to rounded edge of unit injector with a depth gauge (measuring range at least 400 mm.)

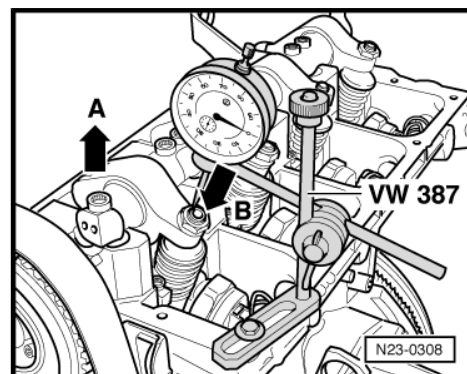
Cylinder	Dimension -a-
1	333.0 ± 0.8 mm
2	245.0 ± 0.8 mm
3	153.6 ± 0.8 mm
4	65.6 ± 0.8 mm



- If necessary, adjust the unit injector and tighten the securing bolt as follows:
 - Tightening torque: 12 Nm + 270° (3/4 turn further).
- First tighten inner bolts -2- and then outer bolts -1- in several stages.
 - Tightening torque: 20 Nm + 90° (1/4 turn further).



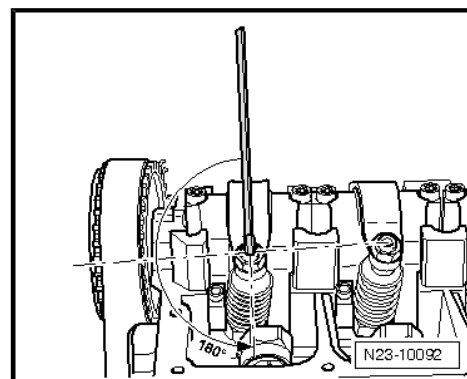
- Place a dial gauge on adjuster screw of unit injector, as shown in illustration.
- Turn crankshaft in direction of engine rotation until roller of rocker arm is located at tip of drive cam.
 - Roller side -arrow A- is at highest point.
 - Dial gauge -arrow B- is at lowest point.
- Remove dial gauge.
- Now turn the adjuster screw into rocker arm until significant resistance can be felt (unit injector is at limit stop).



- Turn adjuster screw 180° back off stop.
- Hold adjuster screw in this position and tighten lock nut to 30 Nm.

Remaining installation steps are carried out in reverse sequence; note the following:

- Attach connector for unit injector.
- Install cylinder head cover ⇒ Rep. gr. 15 .

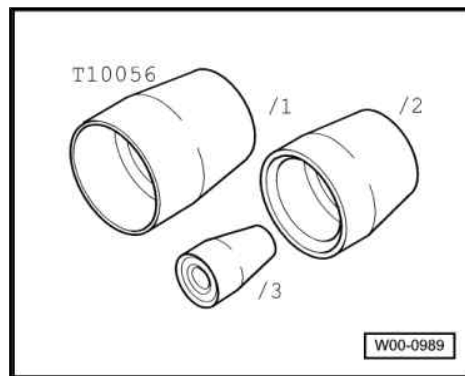


1.13 Renewing O-rings for unit injector

Special tools and workshop equipment required

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the content of this document. © 2014 AUDI AG.

◆ Assembly sleeves - T10056-



Removing

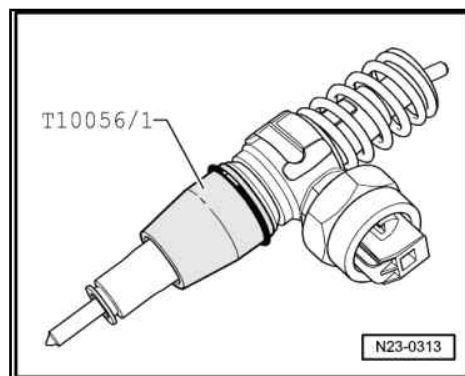
- Remove unit injector ⇒ [page 26](#) .
- Lever old O-rings very carefully off unit injector.
- Important: Ensure that no burrs are formed at the O-ring seats.
- Remove the insulating seal together with the retaining ring.

Installing

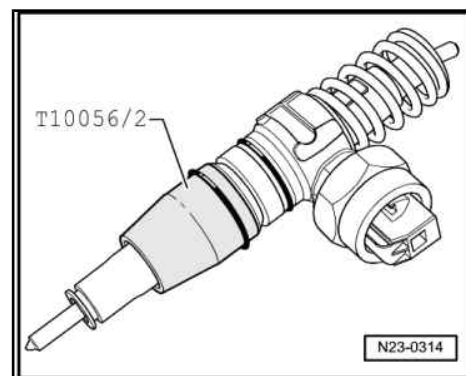


Note

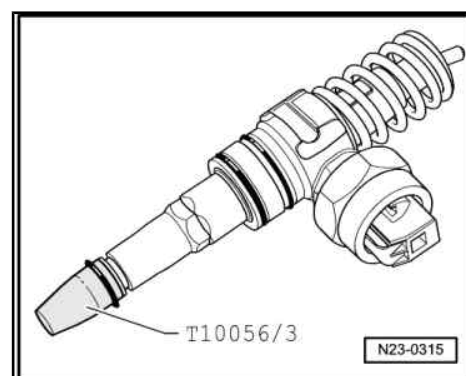
- ◆ *Always use the assembly sleeves to fit the O-rings. There is a danger of damaging the O-rings if the sleeves are not used.*
- ◆ *O-rings with no colour identification were phased in gradually. Make sure the correct O-rings are fitted in the different grooves: The thinner O-rings are fitted in the grooves closer to the injector nozzle.*
- ◆ *Prevent the O-rings from rolling when sliding them on. The O-rings must not be twisted when seated on the unit injector.*
- Clean seating surfaces for O-rings on unit injector very carefully.
- Fit assembly sleeve - T10056/1- onto unit injector, pushing it to the limit stop.
- Push upper (thicker) O-ring carefully onto assembly sleeve - T10056/1- and into groove on unit injector.
- Remove assembly sleeve - T10056/1- .



- Fit assembly sleeve - T10056/2- onto unit injector, pushing it to the limit stop.
- Push middle (thinner) O-ring carefully onto assembly sleeve - T10056/2- and into seat on unit injector.
- Remove assembly sleeve - T10056/2- .



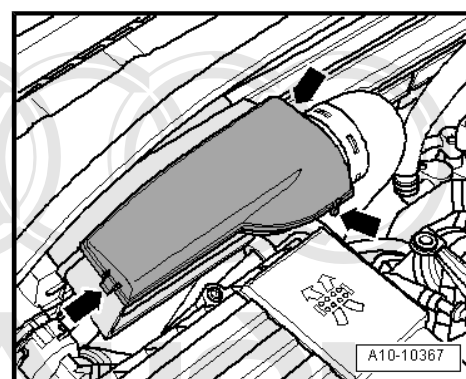
- Fit assembly sleeve - T10056/3- onto unit injector, pushing it to the limit stop.
- Push lower O-ring carefully onto assembly sleeve - T10056/3- and into groove on unit injector.
- Remove assembly sleeve - T10056/3- .
- Push on a new insulating seal together with the retaining ring.
- Install unit injector ⇒ [page 26](#) .



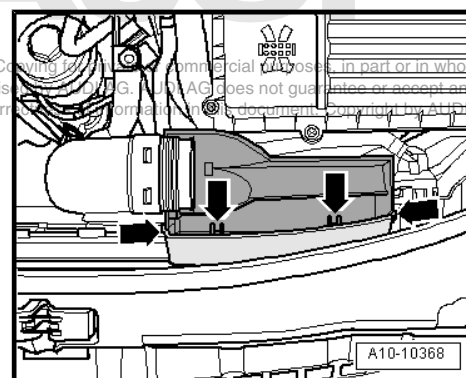
1.14 Removing and installing electrical wiring harness for unit injectors

Removing

- Pull cover off air duct (release clips on sides) -arrows-.

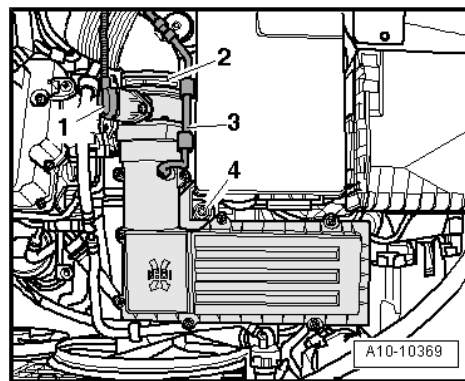


- Unclip air duct at the bottom by releasing clips -arrows-.
- Detach air duct (bottom) together with air hose.

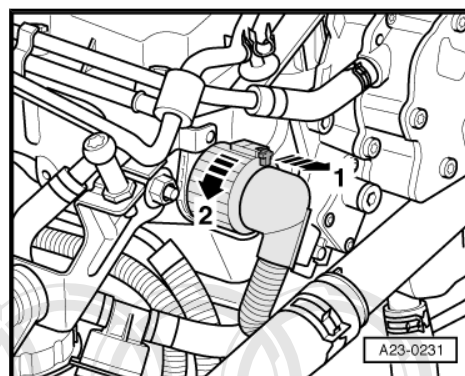


Protected by copyright. Copying for commercial purposes, in part or in whole, is not permitted unless authorised by Audi AG. Audi AG does not guarantee or accept any liability with respect to the correctness of this document. Copyright by Audi AG.

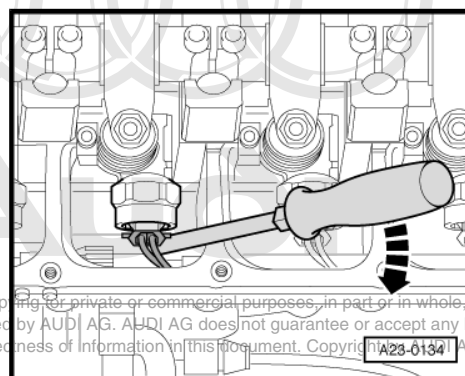
- Unplug electrical connector -1- at air mass meter - G70- .
- Detach vent hose -3- and air hose -2-.
- Unscrew bolt -4- and remove air cleaner housing.
- Remove cylinder head cover ⇒ Rep. gr. 15 .



- To unplug electrical multi-pin connector for unit injectors and glow plugs, pull release pin -arrow 1- and slacken knurled nut -arrow 2-.



- Pry off connector from the unit injector using a screwdriver -arrow-. Press gently against the other side of connector with finger to prevent it from tilting.

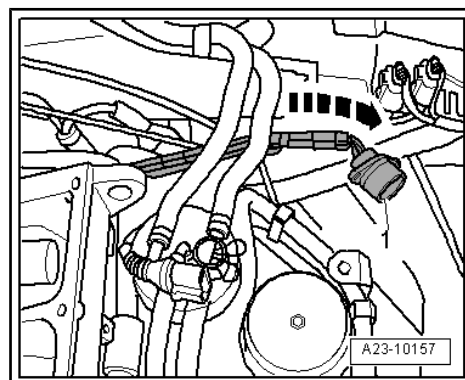


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright AUDI AG.

- Unbolt multi-pin connector from cylinder head and press it out of hole on cylinder head.
- Push wiring harness out of guides -arrow- and remove retaining clips.

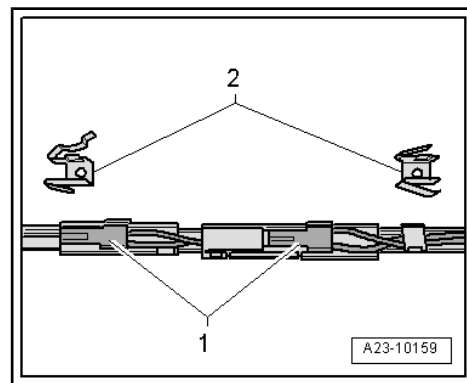

Note

If the wiring harness breaks when pulling it out, make sure that no fragments of the wiring harness get into the engine.

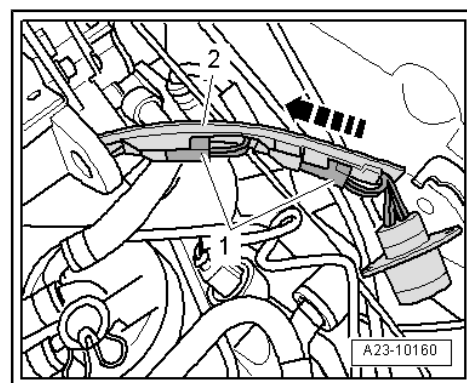


Installing

- Pull retaining clips -2- off new wiring harness.
- Insert connectors -1- into assembly guides to facilitate installation of wiring harness.



- Working from the bottom right side, slide wiring harness -2- into hole on cylinder head -arrow-.
- Guide wiring harness so that electrical connectors -1- for unit injectors come to rest in the position shown in the illustration.
- Attach retaining clips and move wiring harness into installation position.
- Tighten bolts on multi-pin connector.
- Attach electrical connectors for unit injectors.



Remaining installation steps are carried out in reverse sequence; note the following:

- Install cylinder head cover ⇒ Rep. gr. 15 .

Tightening torque

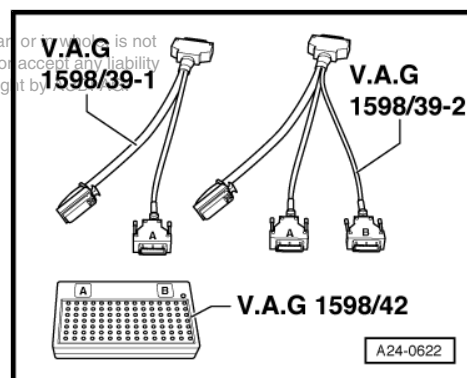
Component	Nm
Connector for wiring harness to cylinder head	10

1.15 Wiring and component check with test box - V.A.G 1598/42-

Special tools and workshop equipment required

- ◆ Adapter cable - V.A.G 1598/39-1-
- ◆ Adapter cable - V.A.G 1598/39-2-
- ◆ Test box - V.A.G 1598/42-

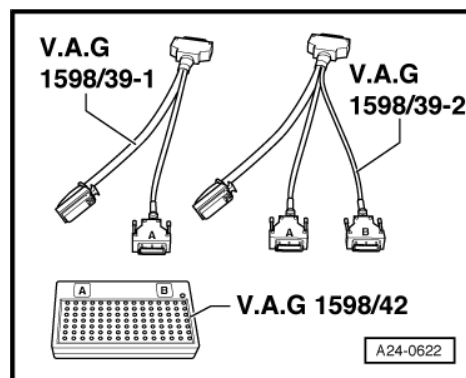
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG





Note

- ◆ The test box has 105 sockets. The connecting cable can be disconnected from the test box. This means that only the cable (and not the test box) has to be purchased for future engine control units with different types of connectors.
- ◆ The smaller of the two connectors on the engine control unit has the contacts 1 to 60. The larger of the two connectors has the contacts 1 to 94.
- ◆ To carry out tests on the 60-pin wiring harness connector, the adapter cable -V.A.G 1598/39-1- is connected to connector "A" on the test box. For components connected to 60-pin wiring harness connector → Current flow diagrams, Electrical fault finding and Fitting locations.
- ◆ To carry out tests on the 94-pin wiring harness connector, the adapter cable -V.A.G 1598/39-2- must be connected to connectors "A" and "B" on the test box. For components connected to 94-pin wiring harness connector → Current flow diagrams, Electrical fault finding and Fitting locations.
- ◆ The test box - V.A.G 1598/42- is designed so it can be connected both to the wiring harness for the engine control unit and to the engine control unit itself at the same time. The advantage of this is that the electronic engine control system remains fully functional when the test box is connected (for example, for measuring signals when the engine is running).
- ◆ The instructions for performing the individual tests indicate whether or not the engine control unit itself also needs to be connected to the test box.
- ◆ Always use auxiliary measuring set - V.A.G 1527 B- to connect test equipment (e.g. voltage tester - V.A.G 1526 B-, hand-held multimeter - V.A.G 1594 C- etc.).



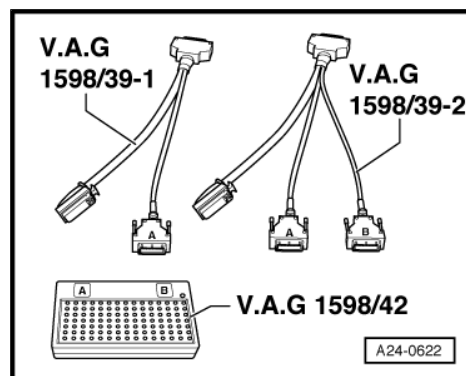
The engine control unit has to be removed before connectors can be unplugged from engine control unit → [page 35](#) .



Caution

To prevent damage to electronic components, select appropriate measuring range before connecting measuring leads and observe test requirements.

- Connect test box - V.A.G 1598/42- to wiring harness with adapter cable - V.A.G 1598/39-1- or adapter cable - V.A.G 1598/39-2- . Connect earth clip of test box to negative terminal of battery. The instructions for performing the individual tests indicate whether or not the engine control unit itself also needs to be connected to the test box.
- Carry out test as described in relevant repair procedure.
- After completing tests re-install engine control unit → [page 37](#) .
- After re-connecting engine control unit, interrogate event memory and erase it as necessary → Vehicle diagnostic tester.

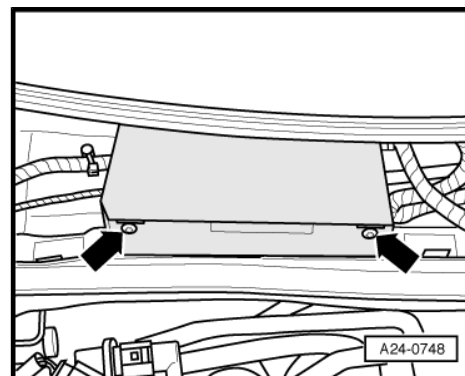


1.16 Removing and installing engine control unit



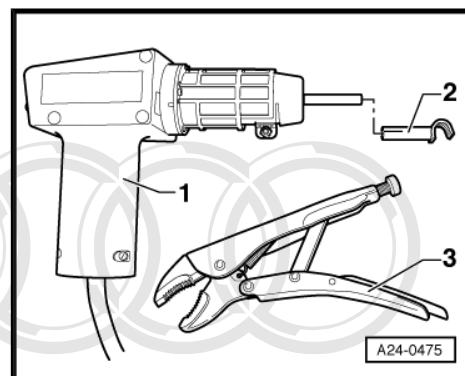
Note

- ◆ *The engine control unit is bolted to its protective housing. To make it more difficult to unscrew the shear bolts -arrows-, their threads have additionally been coated with locking fluid.*
- ◆ *The protective housing has to be removed before the connectors can be unplugged from the engine control unit (e.g. to connect the test box or renew the engine control unit).*



Special tools and workshop equipment required

- ◆ Hot air blower - VAS 1978/14A- -item 1- with nozzle attachment -2- from wiring harness repair set - VAS 1978 B-



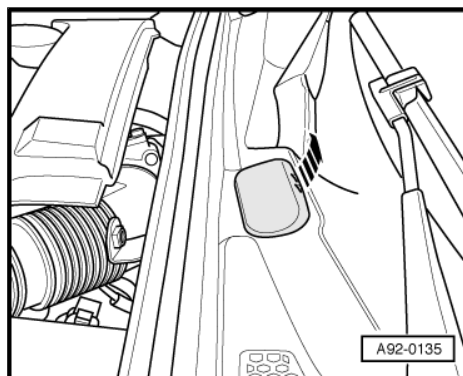
- ◆ Vice-grip pliers -3- (commercially available)

Removing

- When renewing engine control unit, select diagnosis object "Renew engine control unit" in "Guided Fault Finding" - Vehicle diagnostic tester.
- With bonnet closed, move windscreen wipers to service position (switch ignition on and off again briefly).
- Within 10 seconds, press wiper switch down once to "brief wipe" position.
- The wipers will now run onto the main part of the windscreen (service position).
- Remove ignition key.
- Open bonnet and lever off caps from windscreen wiper arms with a screwdriver.
- Loosen hexagon nuts several turns.
- Loosen wiper arms from wiper shafts by tilting slightly, remove hexagon nuts and take off wiper arms.

Copyright by Audi AG. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.

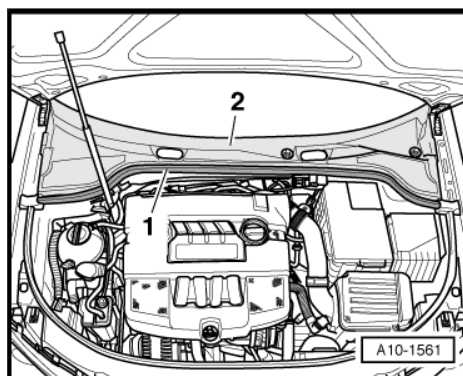
- Unclip washer jets -arrow-.
- Push washer jet through assembly opening back into plenum chamber, leaving hoses connected.



- Pull off rubber seal -1- on plenum chamber cover.
- Detach plenum chamber cover -2-.


Caution

The following procedure must be followed exactly to prevent any damage (burning) to wiring, connectors, insulation and control units. Observe operating instructions for hot air blower.

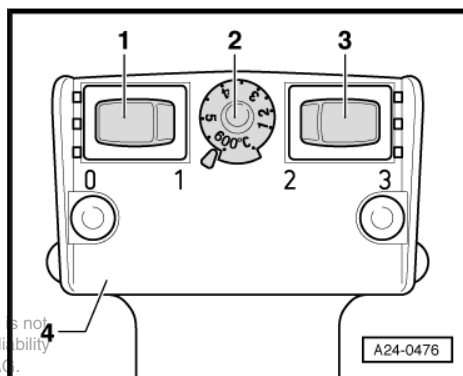


- Select settings on hot-air blower as shown in illustration, i.e. set temperature potentiometer -2- to maximum heat output and two-stage air flow switch -3- to position "3".


Note

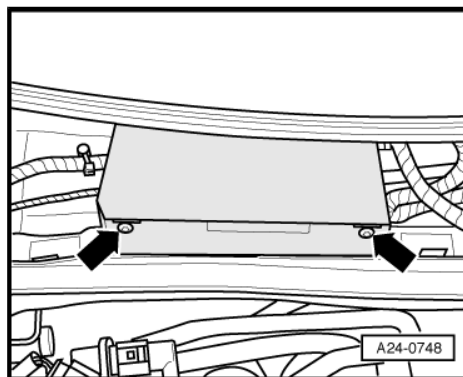
- ◆ Then use hot air blower to heat threaded holes in protective housing into which shear bolts have been screwed. This reduces the inhibiting action of the locking fluid on the shear bolt threads and makes it easier to unscrew these bolts.

- ◆ Cover up all painted parts to avoid any damage caused by hot air blower or vice-grip pliers.


WARNING

Parts of the protective housing will become very hot as a result of heating the shear bolts. Take care to avoid burns. Try to ensure that only the thread is heated and none of the nearby components. These should be covered if necessary.

- Carry out the following operations on the two shear bolts -arrows-, one after the other.
- Place the nozzle of the hot air blower close to the shear bolt on the protective housing.
- Switch on the hot air blower and heat the bolt for approximately 20 ... 25 seconds.
- Then grasp the bolt head with the vice-grip pliers and unscrew the shear bolt.
- Take off the protective housing.

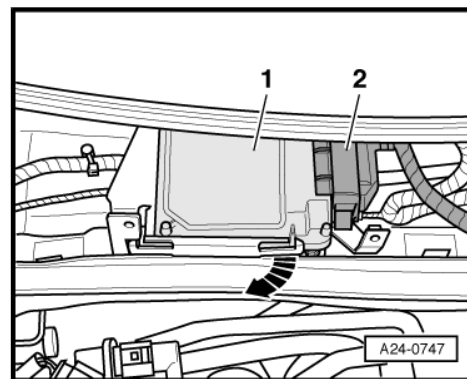


- Release and unplug front connector -2- on engine control unit.
- Release retaining clip -arrow-.
- Pull engine control unit -1- out of bracket.
- Release and unplug rear connector on engine control unit.



Note

When the connectors are unplugged from the engine control unit, the learnt values are erased, but the contents of the event memory remain intact.



Installing

Installation is carried out in the reverse order; note the following:

- Protective housing must be fitted back on engine control unit.
- Clean threaded holes for shear bolts to remove any residue from locking fluid. This can be done using a thread tap.
- Use new shear bolts.
- With bonnet closed, move windscreen wiper motor back to normal park position (switch ignition on and off again briefly).
- Within 10 seconds, press wiper switch down once to “brief wipe” position.
- The wiper motor will run back to the normal park position.
- Install windscreen wiper arms ➤ Rep. gr. 92

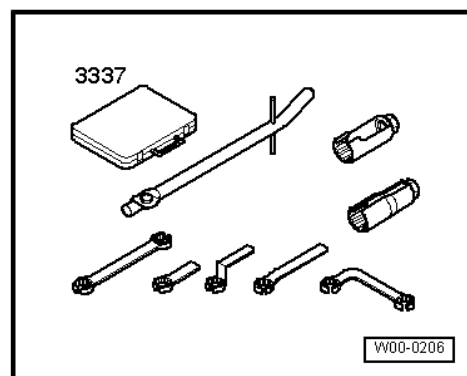
After installing a new engine control unit, the following operations must be performed:

- Activate engine control unit in “Guided Fault Finding” under diagnosis option “Replace engine control unit” ➤ Vehicle diagnostic tester.

1.17 Removing and installing Lambda probe - G39- with Lambda probe heater - Z19-

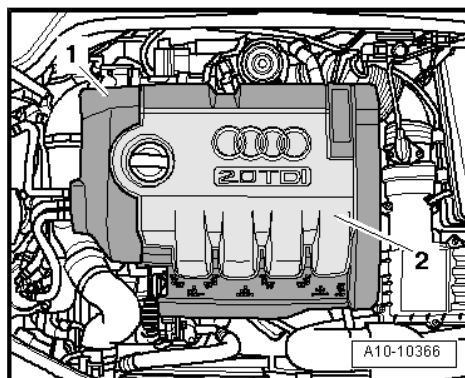
Special tools and workshop equipment required

- ◆ Lambda probe open ring spanner set - 3337-

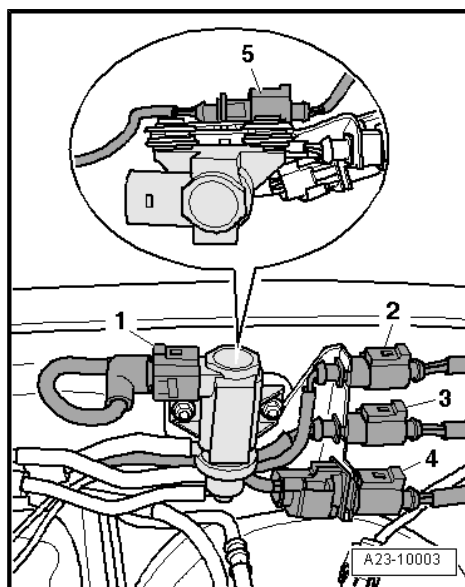


Removing

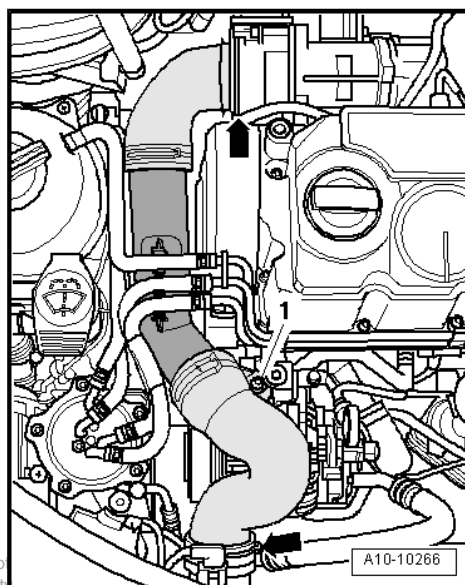
- Lift off outer engine cover panel -1- by pulling up evenly.



- Unplug electrical connector -4- for Lambda probe - G39- and move wiring clear.



- Unclip fuel and coolant hoses from air intake pipe (right-side).
- Remove retaining bolt -1-.
- Remove air pipe (right-side) by lifting retaining clips -arrows- slightly.



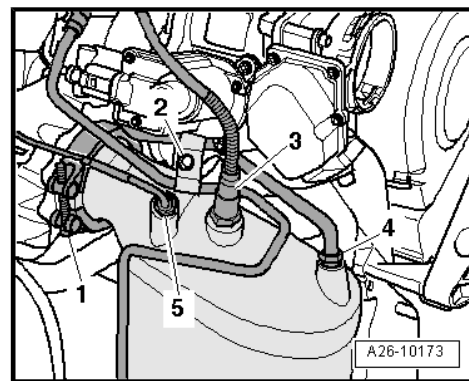
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.

- Unscrew Lambda probe -3- using special tool - 3337- .

Installing

Installation is carried out in the reverse order; note the following:

- ◆ Threads of new Lambda probes are already greased with assembly paste; the paste must not get into the slots on the Lambda probe body.
- ◆ When re-using the old Lambda probe, grease thread with high-temperature paste; the paste must not get into the slots on the probe body; high-temperature paste ⇒ Parts catalogue
- ◆ When installing, the Lambda probe wire must always be reattached at the same locations to prevent it from coming into contact with the exhaust pipe.



Tightening torque

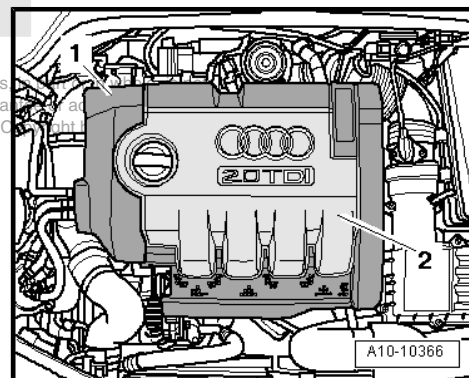
Component	Nm
Lambda probe - G39- in particulate filter	55

1.18 Removing and installing exhaust gas pressure sensor 1 - G450-

Removing

- Lift off outer engine cover panel -1- by pulling up evenly.

Protected by copyright. Copying for private or commercial purposes permitted unless authorised by AUDI AG. AUDI AG does not guarantee the correctness of information in this document.



- Unplug electrical connector -arrow-.
- Unbolt pressure sensor from bracket.
- Identify hoses on exhaust gas pressure sensor 1 - G450- item 1- for re-installation.
- Release hose clips and spray both hoses with silicone-free lubricant.
- Carefully disconnect the hoses from their connections (take care to keep the hoses straight: the connections can break off easily).

Installing

Installation is carried out in the reverse order; note the following:



Note

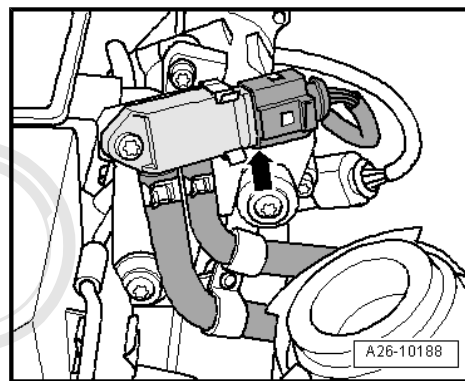
Secure all hose connections with the correct type of hose clips (same as original equipment) → Parts catalogue

Prohibited by Copyright. Copying for private or commercial purposes, in part or in whole, is not permitted. Audi AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.

- Blow through hoses (towards particulate filter) with compressed air.
- Connect hoses to exhaust gas pressure sensor 1 - G450- according to markings made earlier.

Tightening torque

Component	Nm
Exhaust gas pressure sensor 1 - G450- to bracket	8



28 – Glow plug system

1 Glow plug system

1.1 Glow plugs

Metal glow plugs are installed on Audi A3 with 4-cyl. 1.9 ltr. 2V TDI engine. Removing and installing ⇒ [page 41](#)

Metal or ceramic glow plugs are installed on Audi A3 with 4-cyl. 2.0 ltr. 2V TDI engine.

Visible features of ceramic glow plugs

Vehicles with 2-valve cylinder head

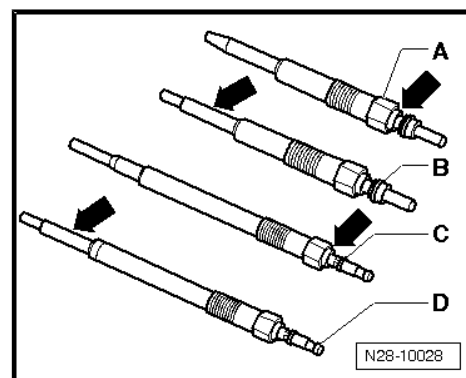
-A- = metal glow plug with colour coding -arrow-

-B- = ceramic glow plug with supporting tube -arrow- (no colour coding)



Note

Glow plugs -C and D- can be disregarded.



Important: Note the following points regarding ceramic glow plugs:



Caution

- ◆ *Due to the special properties of the material used, ceramic glow plugs are easily damaged and require extra care when handling and removing/installing.*
- ◆ *Use only the approved type of ceramic glow plugs ⇒ Parts catalogue .*
- ◆ *Transport and store only in original packaging or packed separately in bubble wrap.*
- ◆ *Do not remove new ceramic glow plugs from packaging until they are ready to be fitted.*
- ◆ *Ceramic glow plugs are sensitive to knocks and bending. For this reason, ceramic glow plugs which have been dropped (even from a height of only about 2 cm) must not be installed, even if no damage is apparent (hair-line cracks may not be visible).*
- ◆ *Always install a new ceramic glow plug if you are not sure the old one is in perfect condition.*
- ◆ *Damaged glow plugs (e.g. heater pin of ceramic glow plug is damaged) will invariably cause engine damage.*
- ◆ *If the heater pin of the glow plug is damaged, the fragments must be removed from the combustion chamber before starting the engine for the first time, otherwise this will invariably cause mechanical damage (piston seizure). If necessary, the cylinder head must be removed.*

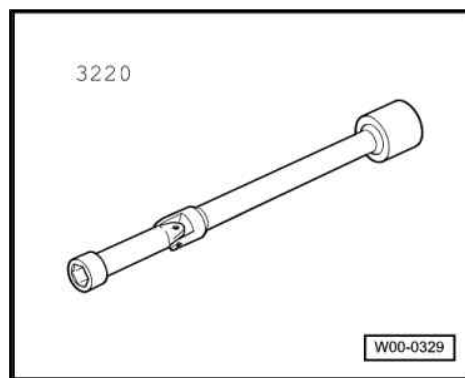
Prohibited by law from being used for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.

1.2 Removing and installing glow plugs

Special tools and workshop equipment required



- ◆ U/J extension and socket, 10 mm - 3220-



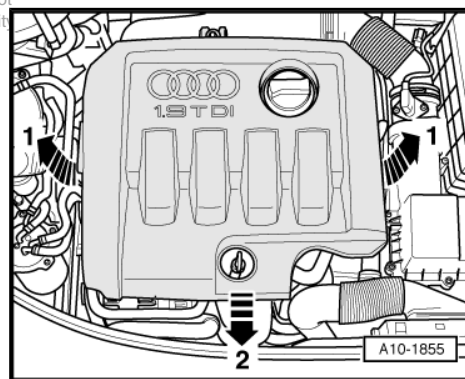
- ◆ Hand-held multimeter - V.A.G 1526 B- (for ceramic glow plugs)



- ◆ Torque wrench
- ◆ Hose - N 020 150 05- approx. 250 mm long (for ceramic glow plugs)

Removing

- Switch off ignition.
- Lift engine cover panel at sides -arrows 1- and pull off towards front -arrow 2-.



- Detach electrical connectors at glow plugs -arrows-.



Note

- ◆ For visible features of ceramic glow plugs, see illustration [⇒ page 41](#).
- ◆ When removing and installing, do not tilt ceramic glow plugs. Remove any components that impede assembly.

- Remove glow plugs using U/J extension and socket - 3220- .

Installing

Install in reverse order.

- Before installing, clean out all deposits from thread and opening in cylinder head.



Note

Do not oil or grease the threads in the cylinder head opening or on the ceramic glow plugs.

- Screw glow plugs into cylinder head by hand using U/J extension and socket - 3220- .
- Tightening torque: 15 Nm

The following step is only required for ceramic glow plugs



WARNING

- ◆ After installation and before starting engine for the first time, perform resistance test for all ceramic glow plugs (with engine cold).
- ◆ If the defective ceramic glow plug is broken, all fragments must be removed from the engine; otherwise this will cause damage to the engine.

- ◆ Specification: max. 1 Ω

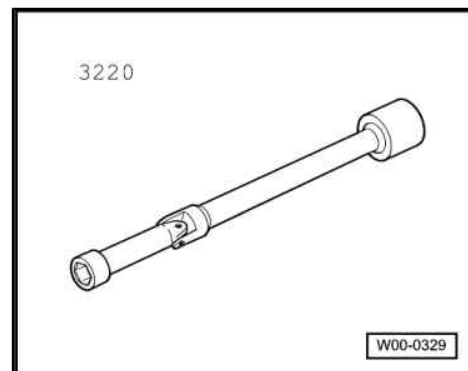
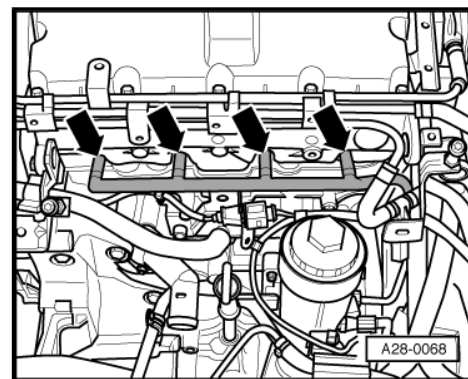
- If specification is exceeded, renew defective ceramic glow plug.

Exceeding the specified torque values for any of the purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.

1.3 Removing and installing ceramic glow plugs

Special tools and workshop equipment required

- ◆ U/J extension and socket, 10 mm - 3220-

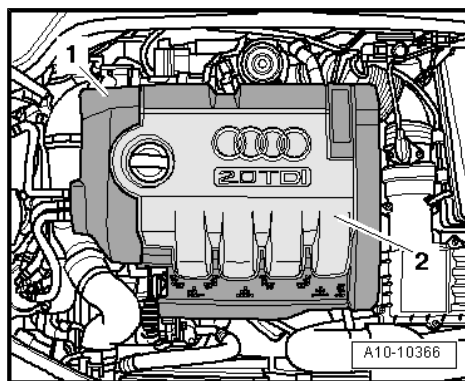




- ◆ Hand-held multimeter - V.A.G 1526 B- or hand-held multimeter - V.A.G 1526D-
- ◆ Torque wrench
- ◆ Hose - N 020 150 05- approx. 250 mm long

Removing

- Before removal, the ceramic glow plugs must be burnt clean using the “Final control diagnosis” function ⇒ Vehicle diagnostic tester.
- Lift off engine cover panel (outside -1- and inside -2-) by pulling up evenly.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.

- Detach electrical connectors at glow plugs -arrows-.



Caution

When loosening a ceramic glow plug, do not exceed the maximum release torque of 20 Nm. When loosening, always use U/J extension and socket, 10 mm - 3220- and a torque wrench.

- Carefully slacken glow plug. Do not exceed the maximum release torque of 20 Nm.

If the glow plug cannot be unscrewed with the maximum permitted torque of 20 Nm:

- Apply a suitable release agent (commercially available) and then try to unscrew the glow plug again.



Note

If it is still not possible to slacken the glow plug with the maximum release torque of 20 Nm after applying the release agent, remove the cylinder head and then unscrew the glow plug.

- Fit hose - N 020 150 05- (approx. 250 mm long) onto glow plug and unscrew glow plug, taking care to keep it straight.
- Carefully pull ceramic glow plug out from above using hose. Take care to prevent glow plug from contacting other parts.

Installing



Caution

- ◆ **IMPORTANT:** always observe the precautions listed above.
- ◆ **The threads in the cylinder head and on the ceramic glow plugs must be dry, and free of oil and grease.**

- Clean combustion deposits out of glow plug openings in cylinder head before installing glow plugs.
- Screw in ceramic glow plugs finger-tight.



Caution

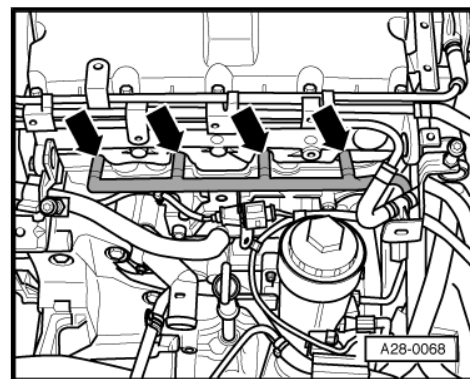
It is most important to keep to the specified tightening torque for the glow plugs: 12 Nm (threads dry, and free of oil and grease). The heater pins of the glow plugs can break if this torque setting is not observed, which would invariably cause engine damage.

Check function of ceramic glow plugs after installation and before starting engine for the first time.

- Connect multimeter (resistance test) to contact and body of glow plug.
- Specification: less than 1 Ω

If specification is exceeded (resistance more than 1 Ω):

- Renew ceramic glow plug.



- Re-attach electrical connectors, making sure that they are securely seated.
 - Additionally check ceramic glow plugs via self-diagnosis ⇒ Vehicle diagnostic tester.
1. Interrogate and erase event memory of engine control unit. Do not start engine.
 2. Perform final control diagnosis.
 3. Interrogate event memory of engine control unit once again. Do not start engine.


Note

protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.

The engine must not be started if the event memory has registered a fault relating to the ceramic glow plugs.

- Check electrical wiring and connectors, make sure connectors are securely seated.

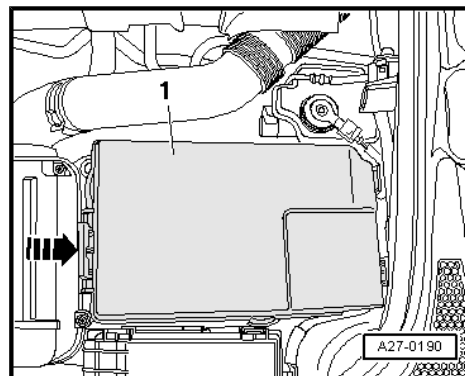
Tightening torque

Component	Nm
Ceramic glow plug in cylinder head	15

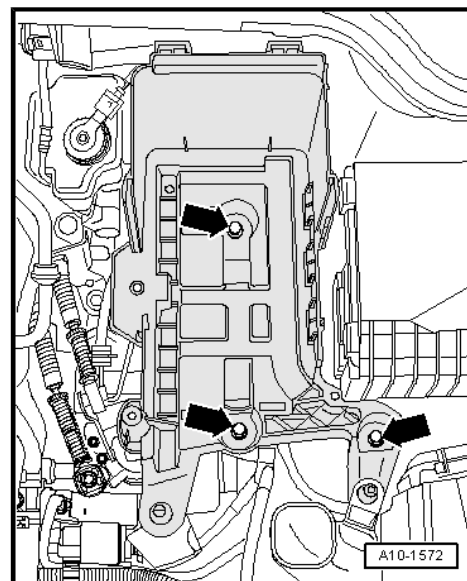
1.4 Removing and installing automatic glow period control unit - J179-

Removing

- Switch off ignition and remove ignition key.
- Remove cover -1- over battery; to do so, press release tab -arrow-.
- Remove battery ⇒ Rep. gr. 27 .



- Remove battery tray -arrows-.
- Detach battery tray from front of air duct.

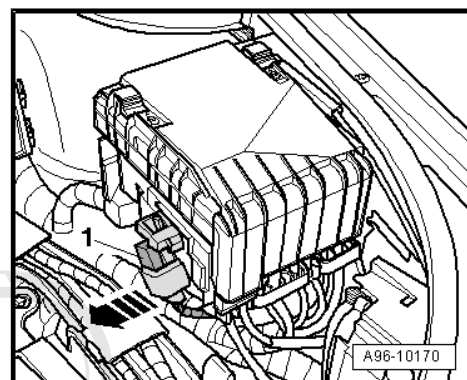


- Pull out the relay carrier from under the electronics box in engine compartment -arrow-.
- Pull automatic glow period control unit - J179- -item 1- out of relay carrier below electronics box in engine compartment.

Installing

Install in reverse order.

Additional steps must be performed when the battery is re-installed and connected ⇒ Rep. gr. 27 ; Disconnecting and connecting battery in engine compartment.

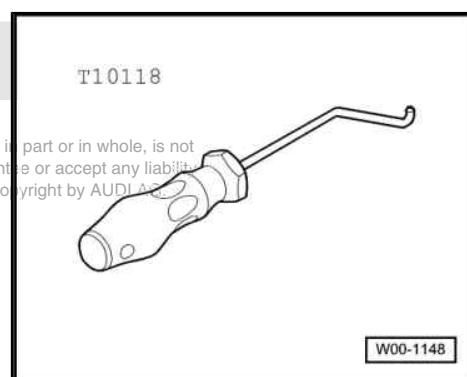


1.5 Removing and installing engine speed sender - G28-

Special tools and workshop equipment required

- ◆ Assembly tool - T10118-

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.



Removing

- Remove noise insulation ⇒ Rep. gr. 50 .
- Remove oil filter bracket ⇒ Rep. gr. 17 .
- Unplug electrical connector on engine speed sender - G28- using assembly tool - T10118- and move wire clear.



Note

To release electrical connector without assembly tool - T10118-, press connector on engine speed sender in with a screwdriver and at the same time lift release tab with a thin wire hook.

- Unscrew securing bolt for engine speed sender - G28- .

Installing

Installation is carried out in the reverse order; note the following:

- Install oil filter bracket ⇒ Rep. gr. 17 .
- Tightening torque: refer to overview of fitting locations
⇒ [page 2](#) .
- Install noise insulation ⇒ Rep. gr. 66 .

1.6 Removing and installing sender wheel for engine speed sender - G28-

The sender wheel for engine speed sender - G28- is removed and installed together with the rear sealing flange ⇒ Rep. gr. 13.

This document is a technical document and is not intended for general use. It is not permitted to be reproduced, stored in a retrieval system, or transmitted, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.