# Workshop Manual
## Audi A2 2001 ➢

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| Fuel supply system, petrol engines | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Engine ID | AUA | BAD | BBY | | | | | | |

Edition 02.2004

# List of Workshop Manual Repair Groups

## Repair Group

20 - Fuel supply system

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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.

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# 20 – Fuel supply system

## 1 Contact corrosion!

Contact corrosion can occur if unsuitable fasteners are used (e.g. bolts, nuts, washers, etc.).

For this reason, only fasteners with a special surface coating are used. These elements can be recognised by their greenish colour.

In addition, all rubber parts, plastic parts and adhesives are made of non-conductive materials.

Always fit new components when in doubt about the reuseability of old components.

**Caution**

- *Only use genuine Audi parts.*
- *Accessories must be approved by AUDI AG.*
- *Damage caused by contact corrosion is not covered under warranty.*

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# 2 Notes for working on fuel supply system

## 2.1 Safety precautions when working on the fuel supply system

**WARNING**

***The fuel system is pressurised. Before opening the system place a cloth around the connection. Then dissipate pressure by carefully unfastening the connection.***

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Take the following measures before starting work on fuel supply system:

**Caution**

***Observe notes on procedure for disconnecting the battery ⇒ Electrical system; Rep. Gr. 27 .***

- With ignition switched off, disconnect earth strap from battery.
- Briefly open filler cap for fuel tank and close again.

When removing and installing components from a full or partly full fuel tank, note the following:

- Fuel tank must not be full. The amount of fuel which can be left in the tank is indicated in the corresponding procedure description. Drain the tank if necessary. Procedure ⇒ page 6 .
- Before commencing work, switch on exhaust extraction system and place an extraction hose close to the sender opening in the fuel tank to extract escaping petrol fumes. If no exhaust extraction system is available, a radial fan with a displacement greater than 15 $m^3$/h can be used (as long as motor is not in air flow).
- Avoid skin contact with fuel. Wear fuel-resistant gloves.

When removing and installing fuel tank, note the following:

- Fuel tank must be empty to reduce weight. Drain the tank if necessary. Procedure ⇒ page 6 .

## 2.2 Rules for cleanliness

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

- Thoroughly clean all unions and the adjacent areas before disconnecting.
- Place parts that have been removed on a clean surface and cover them over. Do not use fluffy cloths.
- Carefully cover or seal opened components if repairs are not to be performed 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.
  Do not move vehicle unless absolutely necessary.

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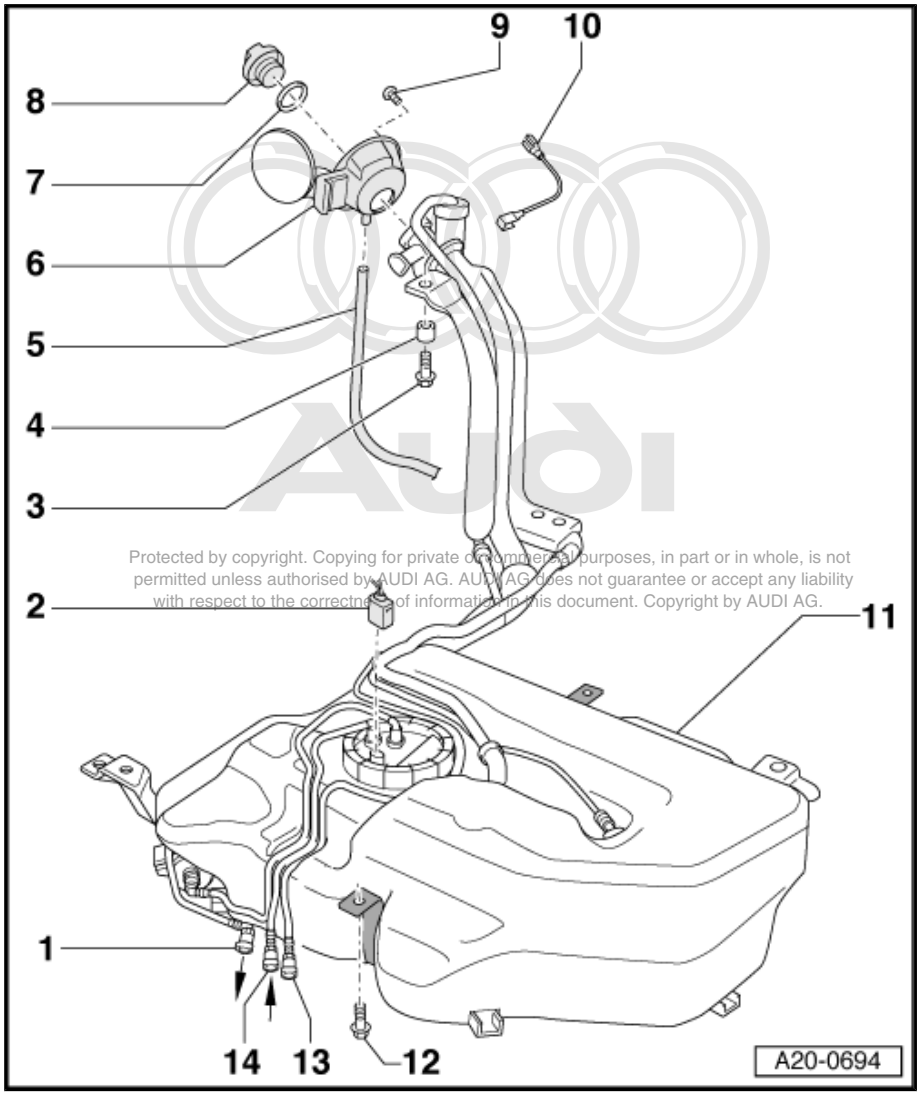
# 3 Fuel supply system

**Note**

- *Secure all hose connections with the correct type of hose clips (same as original equipment) ⇒ Parts catalogue.*
- *Hose clip pliers -V.A.G 1921- are recommended for fitting spring-type hose clips.*
- *Always renew seals and gaskets when assembling.*
- *The arrows on the hose and pipe connections should be aligned with each other.*

## 3.1 Overview: fuel tank with components

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**1 - Fuel supply pipe**
- ❑ From fuel filter
- ❑ Mark before removing
- ❑ Do not kink
- ❑ Press release tabs on connection piece to disconnect
- ❑ Clip onto fuel tank

**2 - Electrical connector**
- ❑ For fuel pump -G6- and fuel gauge sender -G-

**3 - 23 Nm**
- ❑ Secures fuel filler neck and earth connection ⇒ Item 10 (page 4)

**4 - Spacer bush**
- ❑ First engage earth connection ⇒ Item 10 (page 4) in mounting hole on fuel tank and then press in spacer bush.

**5 - Overflow hose**

**6 - Tank flap unit**
- ❑ With rubber cup

**7 - Seal**
- ❑ Renew if damaged

**8 - Filler cap**

**9 - 1.5 Nm**

**10 - Earth connection**
- ❑ Installation position ⇒ page 5
- ❑ Ensure that connector is properly seated on metal ring on fuel filler neck
- ❑ First engage earth connection in mounting hole on fuel tank and then press in spacer bush ⇒ Item 4 (page 4) .
- ❑ After installation, use an ohmmeter to check the electrical connection between the metal ring on the fuel filler neck and a bare metal part on the body - Specification: approx. 0 Ω

**11 - Fuel tank**

- ❑ Removing and installing ⇒ page 8

**12 - 23 Nm**

**13 - Breather pipe**

- ❑ Leading to activated charcoal filter in wheel housing (front right)
- ❑ Mark before removing
- ❑ Do not kink
- ❑ Press release tabs on connection piece to disconnect
- ❑ Clip onto fuel tank

**14 - Fuel return line**

- ❑ From engine
- ❑ Not fitted on vehicles with fuel system without fuel return pipe
- ❑ Mark before removing
- ❑ Do not kink
- ❑ Press release tabs on connection piece to disconnect
- ❑ Clip onto fuel tank

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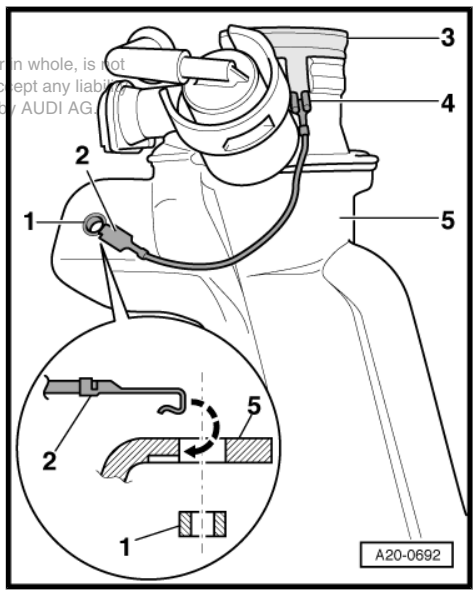
**Installation position of earth connection**

– Route earth connection as shown in illustration.

– First engage contact tab -2- of earth connection in mounting hole on fuel tank -5- and then press in spacer bush -1-.

– Ensure that connector -4- for earth connection is properly seated on metal ring -3- on fuel filler neck.




**Caution**

*After installation, use an ohmmeter to check the electrical connection between the metal ring on the fuel filler neck and a bare metal part on the body:*

- *Specification: approx. 0 Ohm*

## 3.2 Removing, installing and checking gravity valve

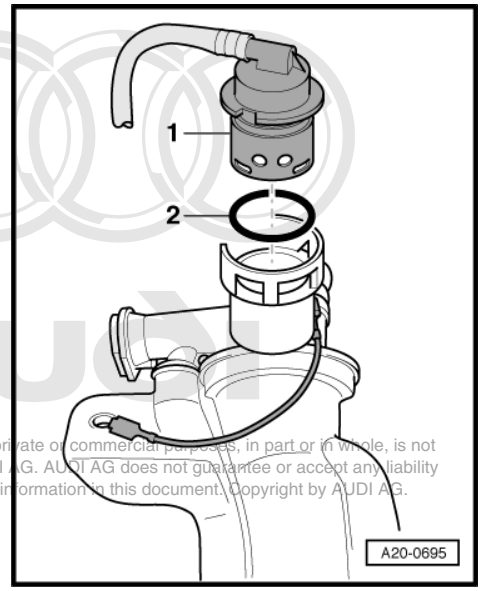
**Removing**

- Fuel tank removed

**Note**

*The gravity valve -1- can only be renewed together with the breather pipe.*

– Unclip gravity valve -1- on fuel filler neck and take out from above.




Checking gravity valve:

- Hold valve in a vertical position: it should be possible to blow through valve.
- Tilt valve to 45°; it should not be possible to blow through valve.
- Make sure O-ring -2- is not damaged.

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**Installing**

Install in reverse order.

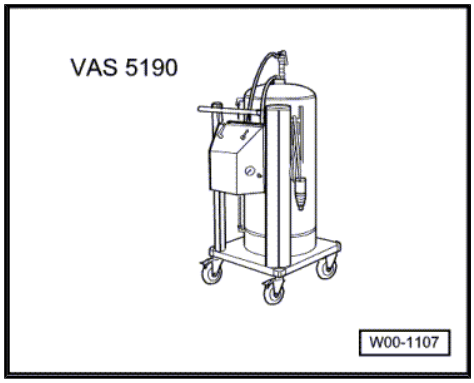
## 3.3 Draining fuel tank

**A - Procedure if fuel tank is more than 3/4 full** ⇒ page 7 .

**B - Procedure if fuel tank is less than 3/4 full** ⇒ page 7 .

**Special tools and workshop equipment required**

♦ Fuel extractor unit -VAS 5190-




**Procedure**

Note safety precautions ⇒ page 2 .

Observe rules for cleanliness ⇒ page 2 .

**Caution**

*Observe notes on procedure for disconnecting the battery ⇒ Electrical system; Rep. Gr. 27 .*

– Disconnect earth wire at battery with ignition switched off.

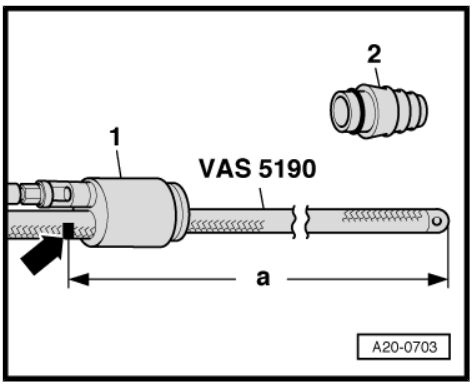
**Caution**

***Secure earth wire of fuel extractor unit -VAS 5190- to a bare metal part on the body.***

### A - Procedure if fuel tank is more than 3/4 full

– Detach tapered adapter -2- from shaft end -1- of fuel extractor unit -VAS 5190- .

– Use insulating tape to mark the extraction hose -arrow- at a distance of -a- = 190 mm from the end of the hose.

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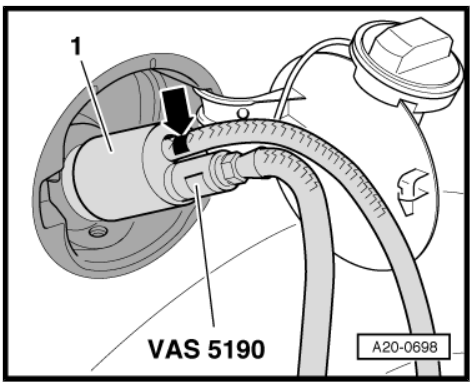
– Remove filler cap from fuel filler neck.

**Note**

*Do not insert extraction hose into fuel tank further than marking on hose to avoid damaging the fuel gauge sender -G- .*




– Fit shaft end -1- of fuel extractor unit -VAS 5190- onto fuel filler neck.

– Push extraction hose into fuel tank until marking on hose -arrow- coincides with shaft end.

– Drain fuel tank as much as possible through fuel filler neck.

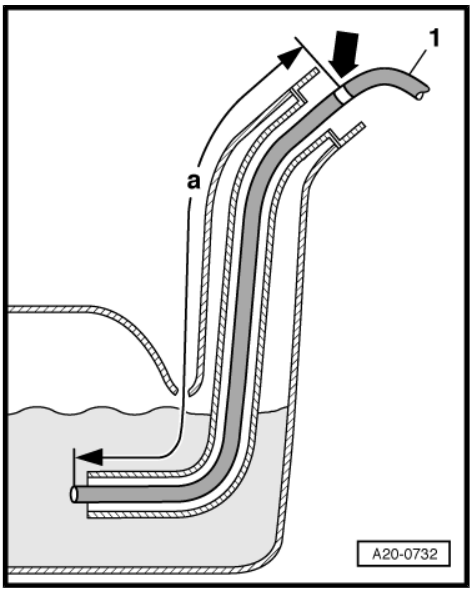
– Carefully remove extraction hose.

– Remove the fuel delivery unit ⇒ page 23 .

– Extract remaining fuel through opening for fuel delivery unit.

**Note**

- *The procedure when using a fuel extractor without shaft end is basically the same.*
- *In this case, make a mark -arrow- on the hose at distance -a- = 125 mm from end of extraction hose -1- using insulating tape. The extraction hose has been properly inserted when the affixed mark is opposite the edge of the filler neck.*
- *If hose is difficult to insert, apply a thin coat of engine oil. Do not under any circumstances use silicone-based lubricant.*




### A - Procedure if fuel tank is less than 3/4 full

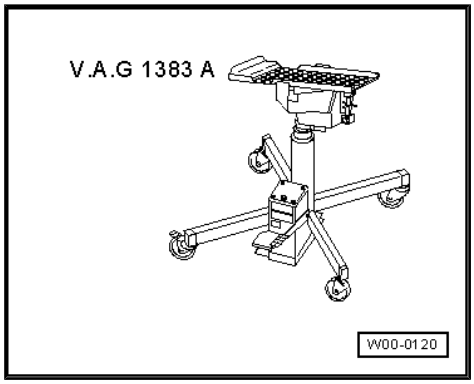
– Remove the fuel delivery unit ⇒ page 23 .

– Extract fuel through opening for fuel delivery unit.

## 3.4 Removing and installing fuel tank with components

### Special tools and workshop equipment required

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




### Removing

Note safety precautions ⇒ page 2 .

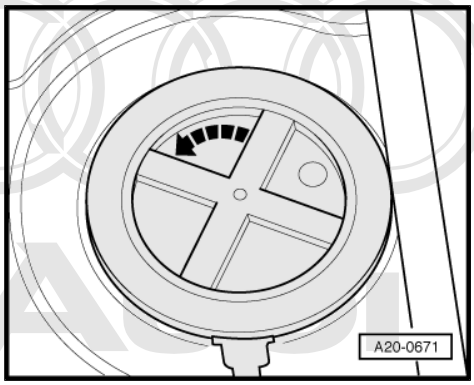
Observe rules for cleanliness ⇒ page 2 .

- Fuel tank must be empty when removing it from vehicle to reduce weight. Drain the tank if necessary. Procedure ⇒ page 6 .

**Caution**

*Observe notes on procedure for disconnecting the battery ⇒ Electrical system; Rep. Gr. 27 .*

– Disconnect earth wire at battery with ignition switched off.
– Fold down rear seat bench.
– Fold back lining under rear set.
– Turn fuel delivery unit cover in -direction of arrow- and detach.

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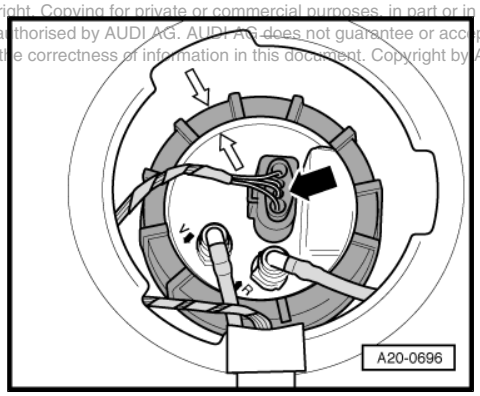
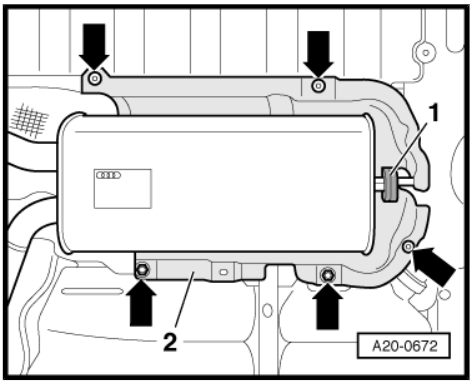
– Carefully release electrical connector from flange -arrow- and unplug.
– Remove rear right wheel housing liner ⇒ General body repairs, exterior; Rep. Gr. 66 .
– Remove rear suspension ⇒ Running gear, front-wheel drive ; Rep. Gr. 42 .



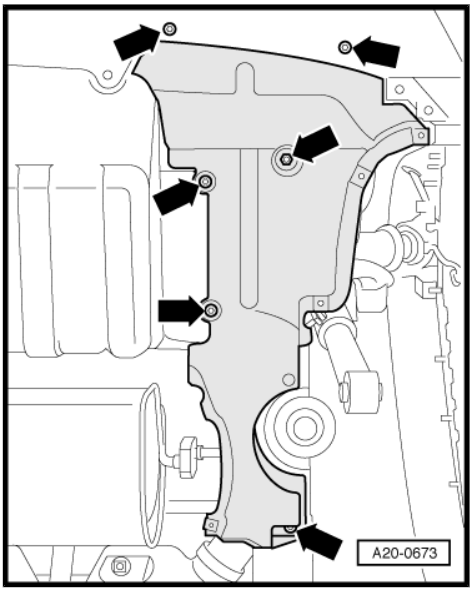
– Unscrew bolts and nuts -arrows-.
– Detach rear silencer from rubber mounting -1- (right-side).
– Remove heat shield -2-.
– Re-attach rear silencer.



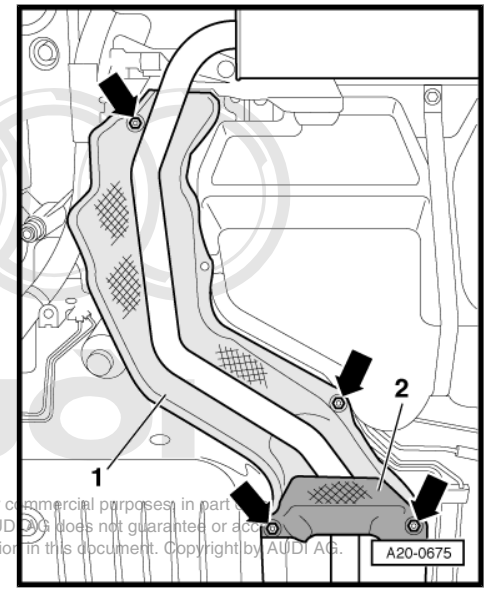

**Note**

*Re-attach silencer immediately to prevent damage to flexible joint.*

– Unbolt cover -arrows-.




– Unscrew nuts -arrows- and remove heat shield -2-.
– Detach rear silencer from both rubber mountings (left-side).
– Remove heat shield -1-.
– Re-attach rear silencer.




**Note**

*Re-attach silencer immediately to prevent damage to flexible joint.*

**WARNING**

***The fuel system is pressurised. Before opening the system place a cloth around the connection. Then dissipate pressure by carefully unfastening the connection.***

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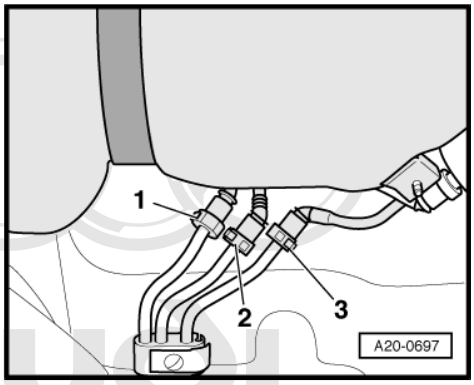
– Disconnect fuel return pipe -2- (blue), fuel supply pipe -3- (black) and breather pipe -1- (white) from the front right of the fuel tank by pressing the release tabs.




**Note**

*The blue fuel return pipe -2- is not fitted on vehicles with fuel system without fuel return pipe.*

– Open the tank flap.
– Clean the area around fuel filler neck.
– Remove filler cap from fuel filler neck.
– Unscrew bolts -arrows- for fuel filler neck.

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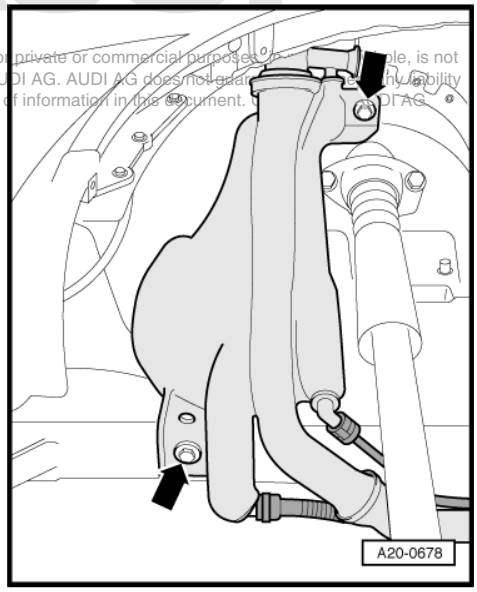
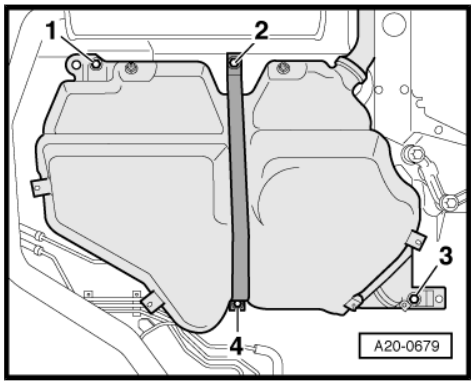



**WARNING**

***To reduce weight, fuel tank must be empty upon removal.***

– First unscrew bolts -1- and -3-.
– Position engine/gearbox jack -V.A.G 1383 A- below vehicle to support tank.
– Unscrew bolts -2- and -4-.
– Then lower fuel tank using engine and gearbox jack -V.A.G 1383 A- .



### Installing

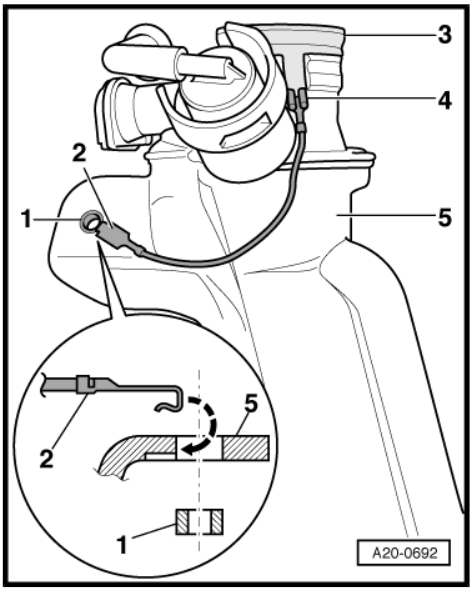
Installation is carried out in the reverse order; note the following:

– Check the earth wiring at both ends for traces of oxidation. Remove any traces of oxidation if necessary.

– Inspect installation position of earth connection:

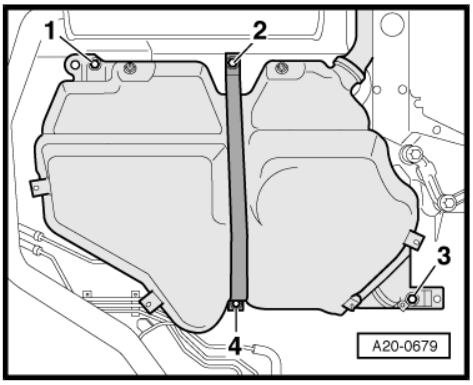
• Ensure connector -4- is seated properly on metal ring -3-.

• Contact tab -2- must be attached on fuel tank -5- and secured with spacer bush -1-.

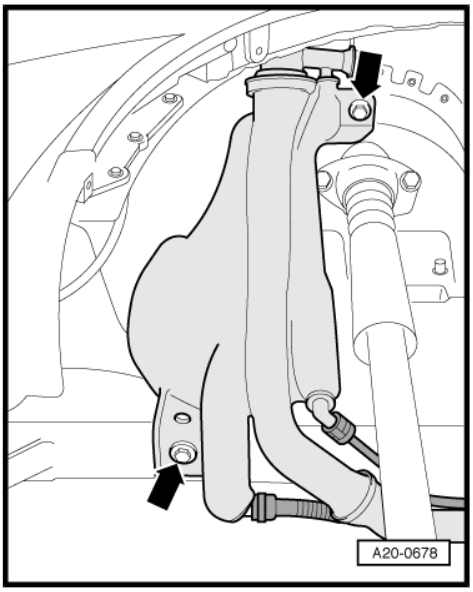



– Position the fuel tank with securing strap on underbody, using the engine and gearbox jack -V.A.G 1383 A- .

– Secure fuel tank by first tightening bolts at points -2- and -4-, then at points -1- and -3-.




– Secure fuel filler neck with earth connection in wheel housing -arrows-.




**Caution**

***After installation, use an ohmmeter to check the electrical connection between the metal ring on the fuel filler neck and a bare metal part on the body:***

- ***Specification: approx. 0 Ohm***

– Install rear suspension ⇒ Running gear, front-wheel drive ; Rep. Gr. 42 .

– Install rear right wheel housing liner ⇒ General body repairs, exterior; Rep. Gr. 66 .

– Connect battery. Observe notes on procedures required after connecting battery ⇒ Electrical system; Rep. Gr. 27 .

### Tightening torques

| Component | Nm |
|---|---|
| Securing strap to body | 23 |
| Fuel filler neck to wheel housing | 23 |
| Fuel tank to body | 23 |

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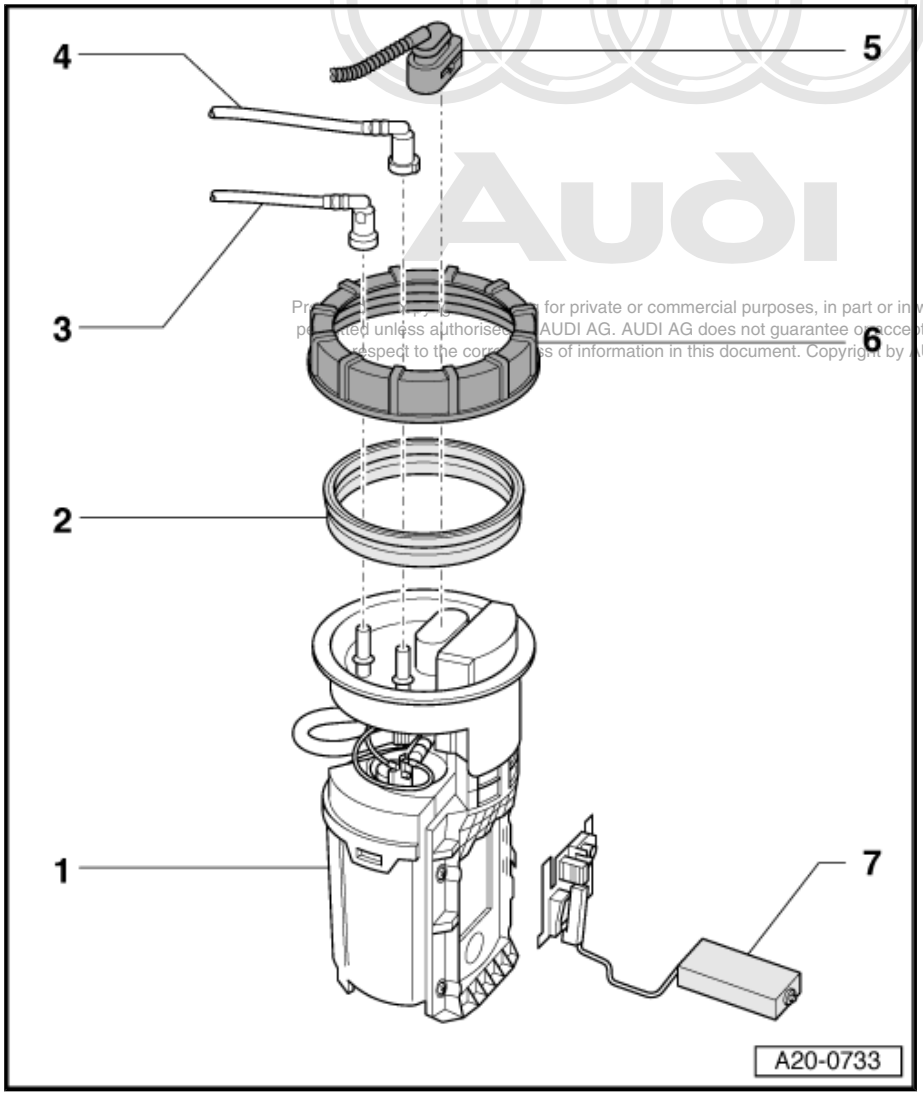
## 3.5 Fuel delivery unit and fuel gauge senders - exploded view of components




**1 - Fuel delivery unit with flange**

- ❑ Removing and installing ⇒ page 23
- ❑ Checking fuel pump (electrical test) ⇒ page 13
- ❑ Checking residual pressure ⇒ Injection and ignition system; Rep. Gr. 24

**2 - Seal**

- ❑ Renew
- ❑ When installing, fit seal (dry) in opening in fuel tank

**3 - Fuel supply pipe**

- ❑ To fuel filter
- ❑ Mark before removing
- ❑ To disconnect from flange, press release tab on connection
- ❑ Do not kink
- ❑ Attached to connection marked “V” on flange
- ❑ Clip onto fuel tank

**4 - Fuel return line**

- ❑ From fuel rail
- ❑ Mark before removing
- ❑ To disconnect from flange, press release tab on connection
- ❑ Do not kink
- ❑ Attached to connection marked “R” on flange
- ❑ Clip onto fuel tank

**5 - Electrical connector**

- ❑ For fuel pump (pre-supply pump) -G6- and fuel gauge sender -G-

**6 - Union nut -80 Nm-**

- ❑ Remove and install with spanner for union nuts -3217-

**7 - Fuel gauge sender -G-**

- ❑ Checking resistance values ⇒ page 25
- ❑ Removing and installing ⇒ page 27

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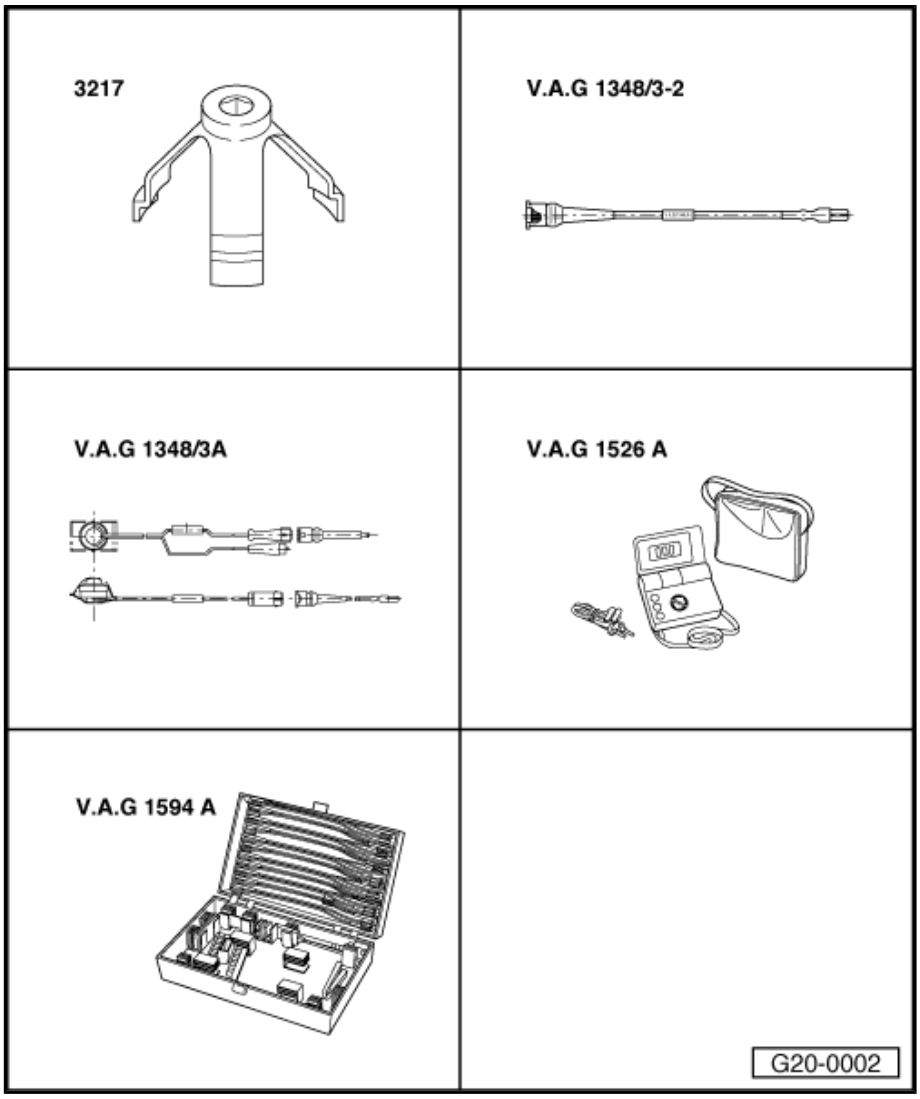
## 3.6 Checking fuel pump (electrical test)

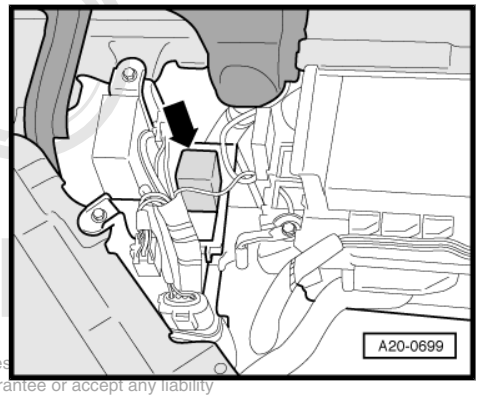
**Special tools and workshop equipment required**

- Spanner for union nuts -3217-
- Adapter cable -V.A.G 1348/3-2-
- Remote control -V.A.G 1348/3 A-
- Hand-held multimeter -V.A.G 1526 A- or -V.A.G 1526 B-
- Adapter set -V.A.G 1594 A- or -V.A.G 1594 C-




**Test requirements**

- Battery voltage at least 12.5 V
- Fuse No. 18 OK
- Fuel pump relay -J17- -arrow- on 6-position relay carrier, position 5 in driver's footwell (left-side) OK; checking ⇒ Injection and ignition system; Rep. Gr. 24 .
- Fuel filter OK
- Ignition off.

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**Test sequence**

– Open fuse box cover on instrument panel (left-side).

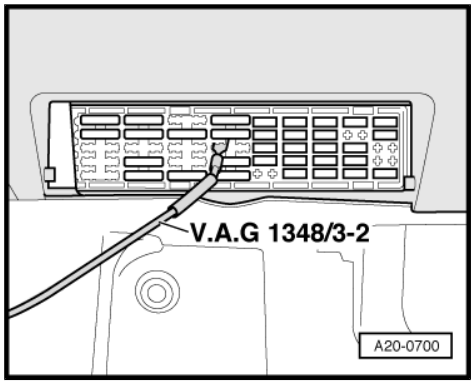
– Detach fuse S18 from fuse carrier (3rd fuse in 4th row as seen from top).

– Connect remote control -V.A.G 1348/3 A- with adapter cable -V.A.G 1348/3-2- to left-hand terminal of fuse socket S18.

– Connect clamp to vehicle battery (+).

– Press remote control button.

• Pump should start running audibly.




**Note**

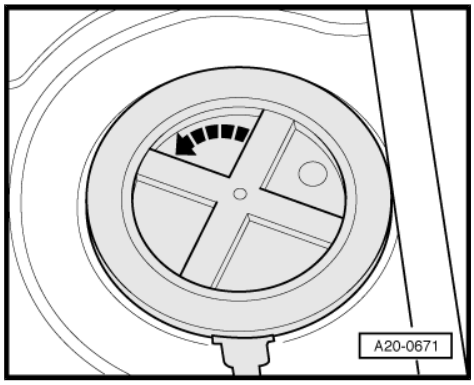
*The fuel pump runs very quietly. Where possible, avoid noisy surroundings for this test.*

If pump does not start running:

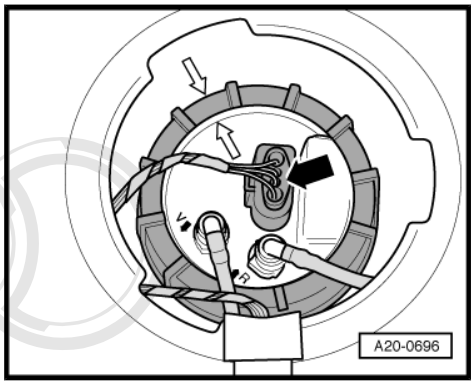
– Fold down rear seat bench.

– Fold back lining under rear set.

– Turn fuel delivery unit cover in -direction of arrow- and detach.




– Carefully release electrical connector from flange -arrow- and unplug.



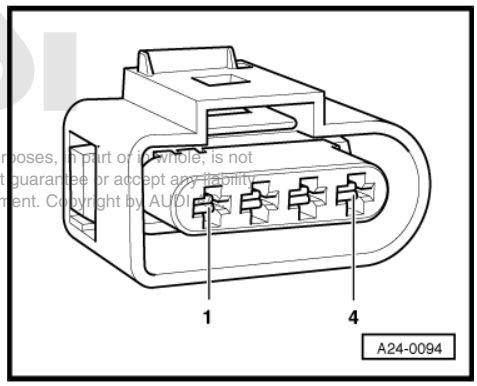

– Connect multimeter between contacts -1- and -4- to measure voltage.

– Press remote control button.

• Specification: approx. battery voltage

If specification is not reached:

– Eliminate open circuit in wiring (refer to current flow diagram).

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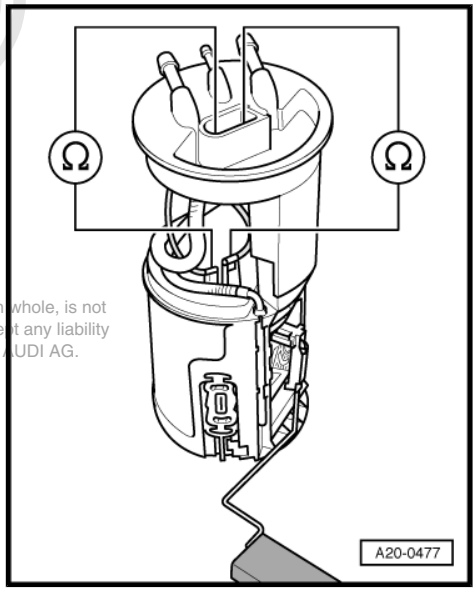
If reading matches specification although no pump running noise can be heard:

– Remove the fuel delivery unit ⇒ page 23 .

– Check that the electrical wires between flange and fuel pump are connected and test for continuity.

If no fault is found in wiring, fuel pump is defective. Renew fuel delivery unit.

– Install fuel delivery unit ⇒ page 24 .

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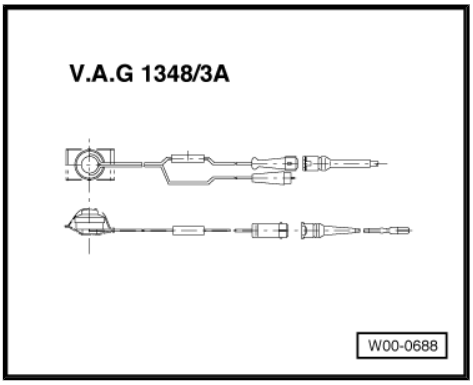
## 3.7 Checking fuel pump delivery rate - MPI engine to 04.2002

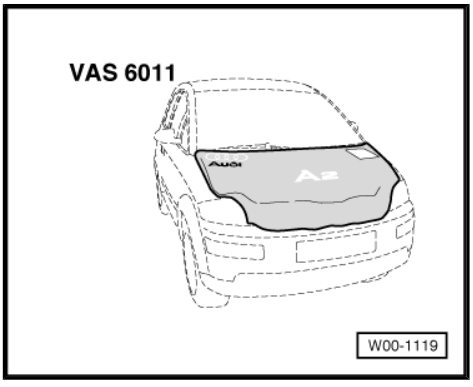
**Special tools and workshop equipment required**

♦ Remote control -V.A.G 1348/3 A- with adapter cable -V.A.G 1348/3-2-




♦ Engine cover protector -VAS 6011-

♦ Fuel-resistant measuring container

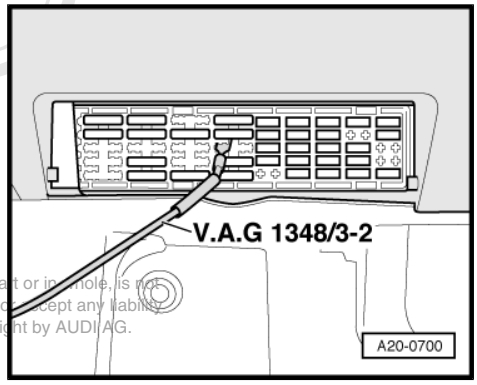



**Test requirements**

- Battery voltage at least 12.5 V
- Fuel tank at least $^1/_4$ full.
- Ignition off.

**Test sequence**

– Open fuse box cover on instrument panel (left-side).
– Detach fuse S18 from fuse carrier (3rd fuse in 4th row as seen from top).
– Connect remote control -V.A.G 1348/3 A- with adapter cable -V.A.G 1348/3-2- to left-hand terminal of fuse socket S18.
– Connect clamp to vehicle battery (+).
– Remove filler cap from fuel filler neck.

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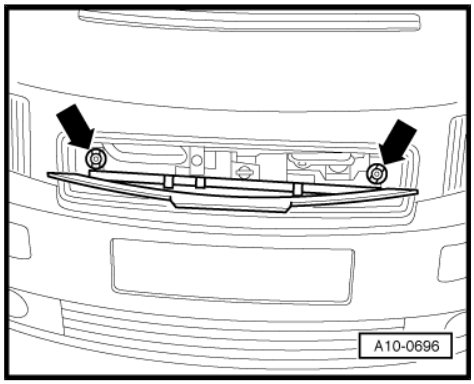
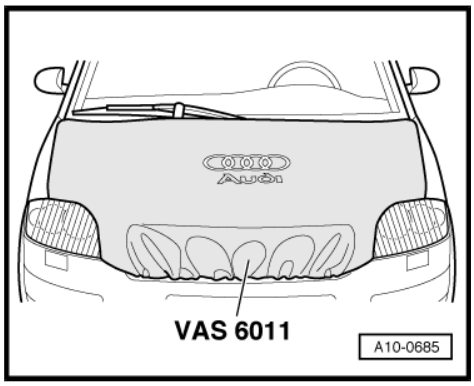
– Wash outer side of bonnet and dry with chamois leather.
– Release service flap from inside the vehicle.
– Release bonnet -arrows- and pull it forwards slightly.



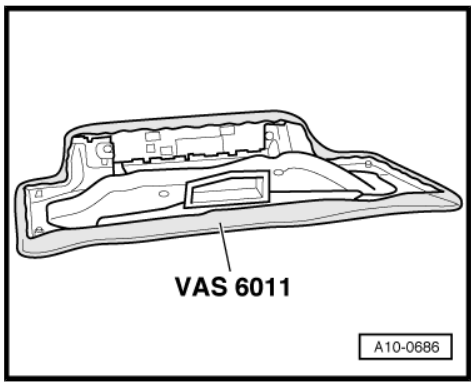

– Fasten protective cover -VAS 6011- over bonnet.



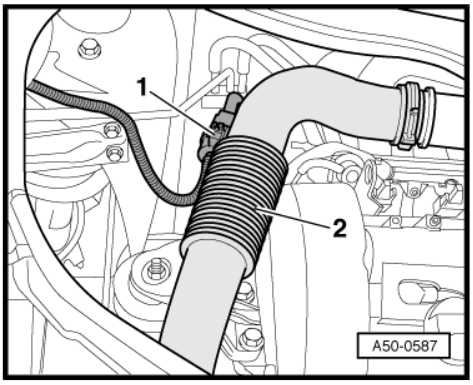

– Remove bonnet and put aside with the protective cover -VAS 6011- facing downwards.

**Note**

*Do not store bonnet in upright position.*



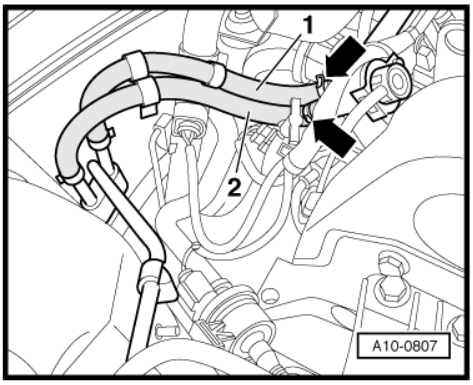
– Disconnect the solenoid valve 1 for activated charcoal filter system -N80- -Item 1- with retainer at air duct.
– Loosen hose clip using hose clip pliers -V.A.G 1921- and detach air duct -2- from intake connecting pipe of engine.
– Move air duct clear.




**WARNING**

***The fuel system is pressurised. Before opening the system place a cloth around the connection. Then dissipate pressure by carefully unfastening the connection.***

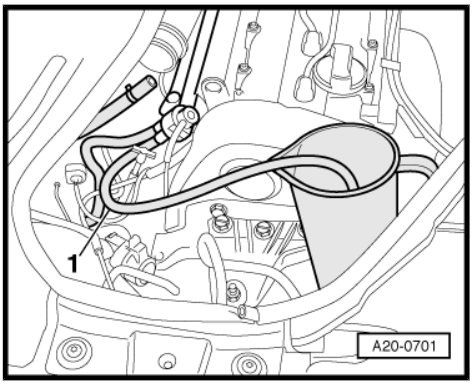
– Detach fuel return pipe -2- from pipe connection -bottom arrow-.




**Note**

*The fuel supply pipe -1- remains connected.*

– Fit a hose -1- onto open pipe connection and hold end of hose in fuel-resistant measuring container.

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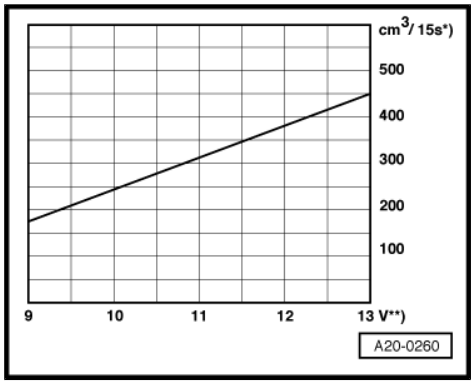
– Press remote control button for 15 seconds.
– Compare amount of fuel delivered with minimum delivery shown in diagram ($cm^3$/15 sec.).




**Note**

*Voltage at fuel pump with engine stationary and pump running is approx. 2 volts less than battery voltage.*

If minimum delivery rate is not reached, check for the following causes:

- Fuel lines have been crushed.
- Fuel filter is blocked.
- Fuel pressure regulator; checking ⇒ Injection and ignition system; Rep. Gr. 24 .
- Fuel pump is defective.

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

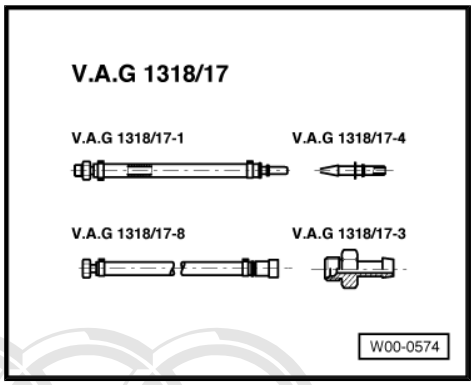
**Note**

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

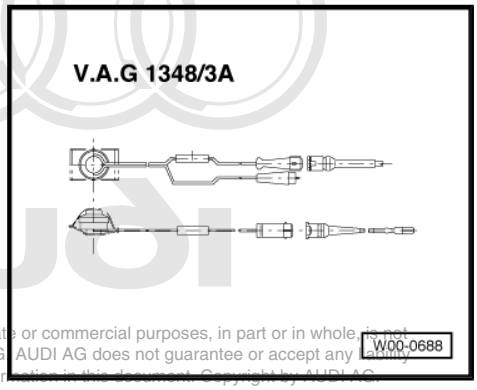
## 3.8 Checking fuel pump delivery rate - MPI engine from 05.2002

**Special tools and workshop equipment required**

- Adapter -V.A.G 1318/17-1- from adapter set -V.A.G 1318/17-




- Remote control -V.A.G 1348/3 A- with adapter cable -V.A.G 1348/3-2-

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- Fuel-resistant measuring container

**Test requirements**

- Battery voltage at least 12.5 V
- Fuel tank at least $^1/_4$ full.
- Ignition off.

**Test sequence**

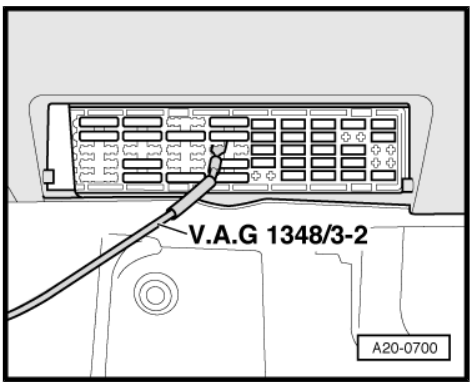
– Open fuse box cover on instrument panel (left-side).

– Detach fuse S18 from fuse carrier (3rd fuse in 4th row as seen from top).

– Connect remote control -V.A.G 1348/3 A- with adapter cable -V.A.G 1348/3-2- to left-hand terminal of fuse socket S18.

– Connect clamp to vehicle battery (+).

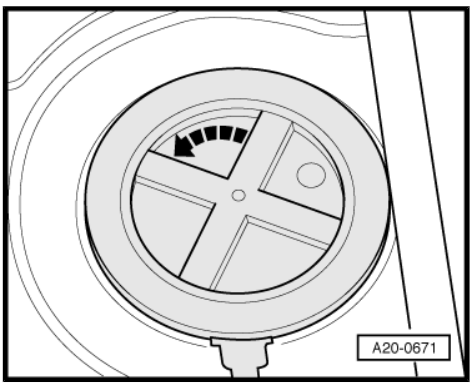
– Remove filler cap from fuel filler neck.




– Fold down rear seat bench.

– Fold back lining under rear set.

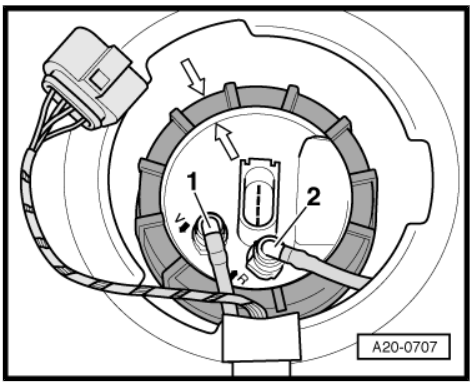
– Turn fuel delivery unit cover in -direction of arrow- and detach.




**WARNING**

***The fuel system is pressurised. Before opening the system place a cloth around the connection. Then dissipate pressure by carefully unfastening the connection.***

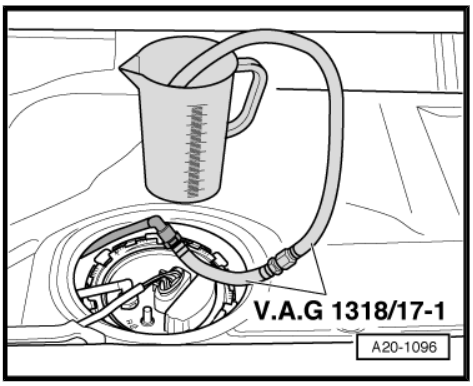
– Disconnect fuel return pipe -2- by pressing release tab.




**Note**

*The fuel supply pipe -1- and electrical connector remain connected.*

– Fit adapter -V.A.G 1318/17-1- onto disconnected fuel return pipe and hold adapter hose in measuring container.

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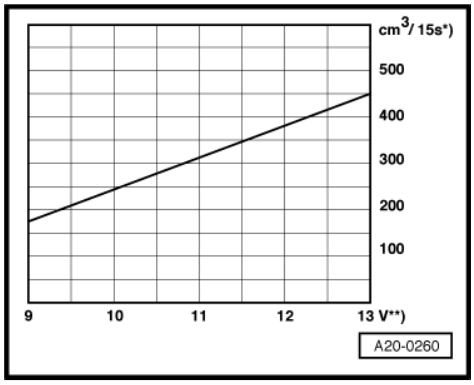
– Press remote control button for 15 seconds.
– Compare amount of fuel delivered with minimum delivery shown in diagram ($cm^3$/15 sec.).




**Note**

*Voltage at fuel pump with engine stationary and pump running is approx. 2 volts less than battery voltage.*

If minimum delivery rate is not reached, check for the following causes:

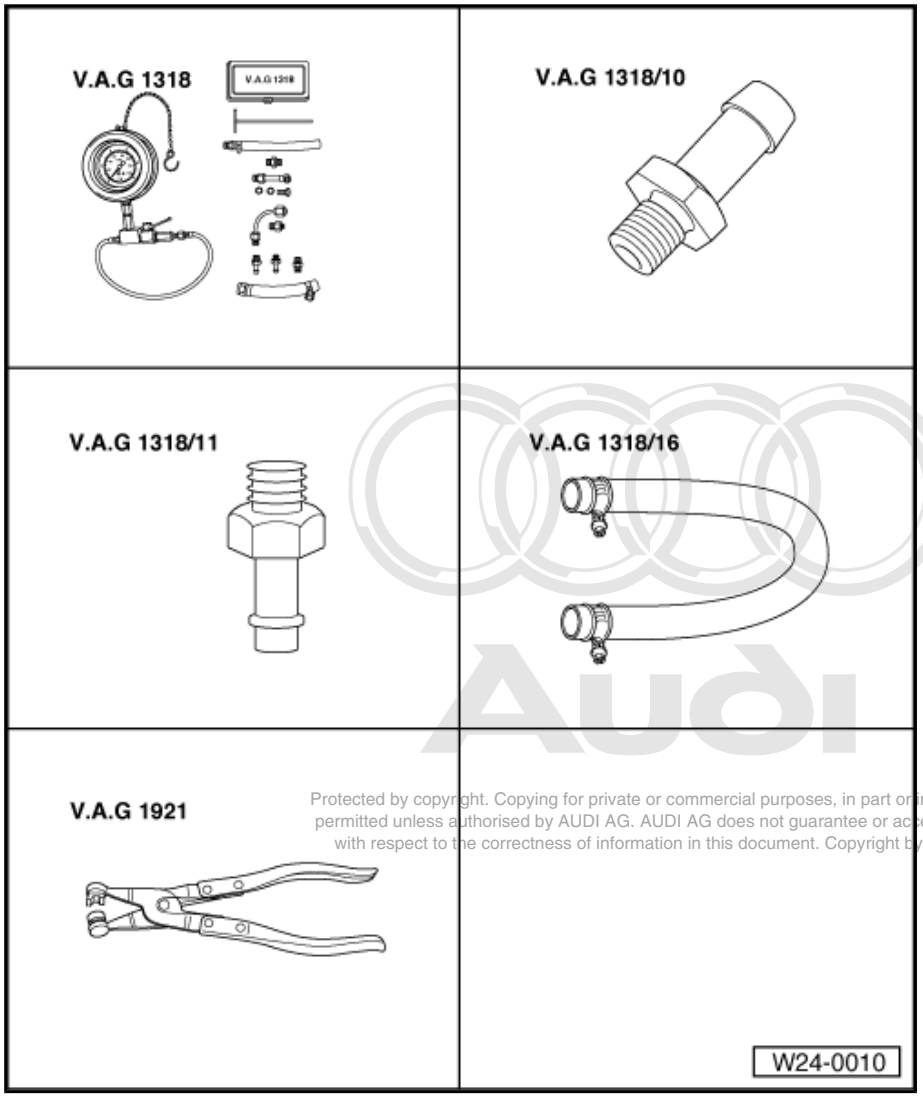
- Fuel lines have been crushed.
- Fuel filter is blocked.
- Fuel pressure regulator; checking ⇒ Injection and ignition system; Rep. Gr. 24 .
- Fuel pump is defective.

Assemble in reverse order.

## 3.9 Checking fuel pump delivery rate - FSI engine

**Special tools and workshop equipment required**

- Pressure gauge -V.A.G 1318-
- Adapter -V.A.G 1318/10-
- Adapter -V.A.G 1318/11-
- Hose adapter -V.A.G 1318/16-
- Hose clip pliers -V.A.G 1921-
- Fuel-resistant measuring container

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**Test requirements**

- Battery voltage at least 12.5 V
- Fuel tank at least $^1/_4$ full.
- Ignition off.

**Test sequence**

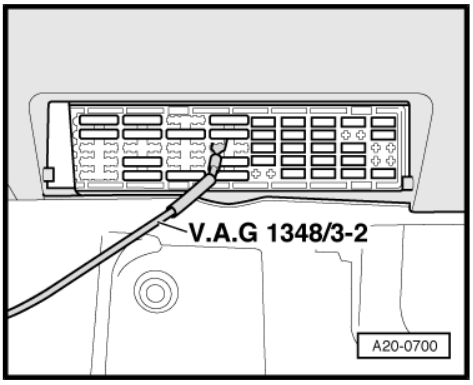
– Open fuse box cover on instrument panel (left-side).

– Detach fuse S18 from fuse carrier (3rd fuse in 4th row as seen from top).

– Connect remote control -V.A.G 1348/3 A- with adapter cable -V.A.G 1348/3-2- to left-hand terminal of fuse socket S18.

– Connect clamp to vehicle battery (+).

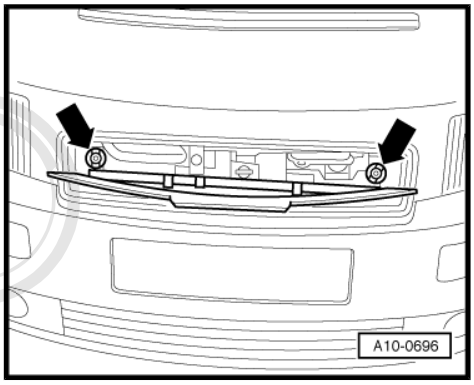
– Remove filler cap from fuel filler neck.




– Wash outer side of bonnet and dry with chamois leather.

– Release service flap from inside the vehicle.

– Release bonnet -arrows- and pull it forwards slightly.




– Fasten protective cover -VAS 6011- over bonnet.

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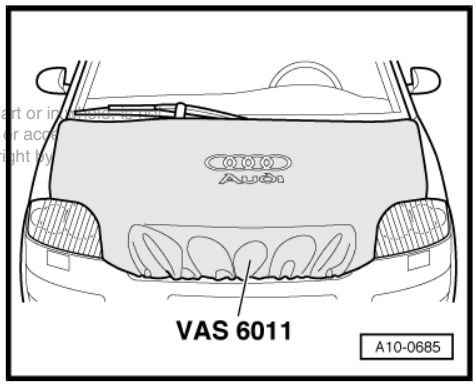
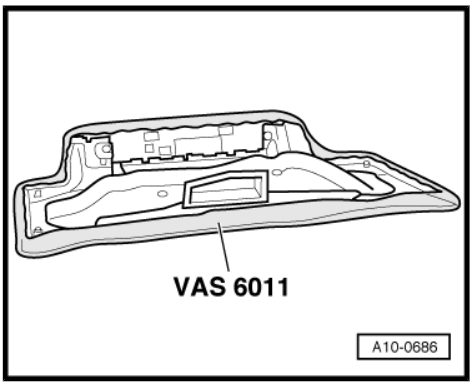



– Remove bonnet and put aside with the protective cover -VAS 6011- facing downwards.

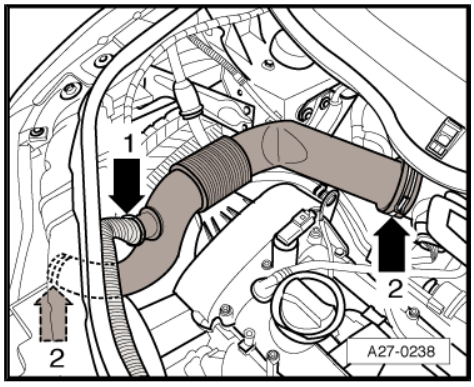



**Note**

*Do not store bonnet in upright position.*

– Loosen hose clip using hose clip pliers -V.A.G 1921- and detach air duct -arrow 2 (right-side)- from intake connecting pipe of engine.

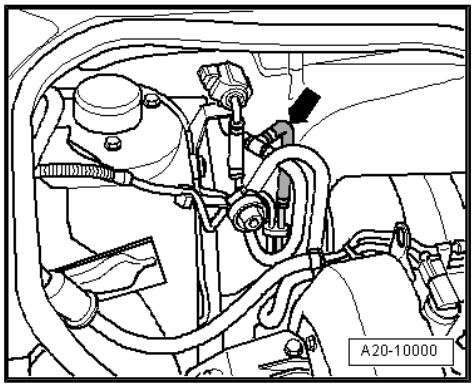
– Move air duct clear.




**WARNING**

*The fuel system is pressurised. Before opening the system place a cloth around the connection. Then dissipate pressure by carefully unfastening the connection.*

– Detach fuel supply hose -arrow- going to T-connection directly from the pipe coming from the fuel tank.




– Screw the adapter -V.A.G 1318/10- and adapter -V.A.G 1318/11- onto the pressure gauge -V.A.G 1318- . Connect hose adapter -V.A.G 1318/16- to pressure gauge and fuel supply pipe -arrow- and secure with hose clips.

– Fit adapter hose -1- onto side where tap of pressure gauge is located and hold end of hose in measuring container.

– Open cut-off tap on pressure gauge.

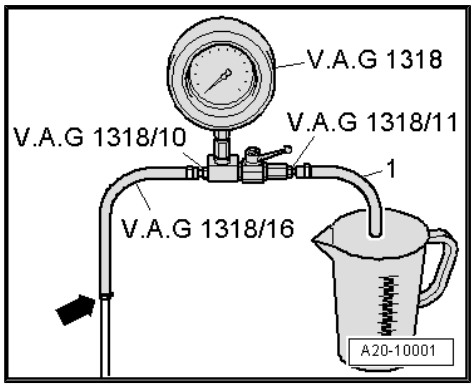
• Lever must point in direction of flow.

– Build up pressure in fuel system by pressing the remote control and slowly closing the cut-off tap on the pressure gauge.

• Specification: 3 bar

– From this point on do not move position of cut-off tap.

– Empty the measuring container.

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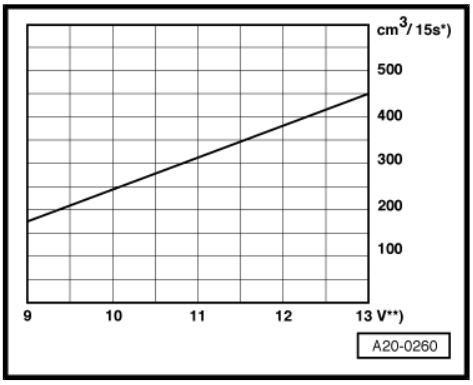
– Press remote control button for 15 seconds.
– Compare amount of fuel delivered with minimum delivery shown in diagram ($cm^3$/15 sec.).




**Note**

*Voltage at fuel pump with engine stationary and pump running is approx. 2 volts less than battery voltage.*

If minimum delivery rate is not reached, check for the following causes:

- Fuel lines have been crushed.
- Fuel filter is blocked.
- Fuel pressure regulator; checking ⇒ Injection and ignition system; Rep. Gr. 24 .
- Fuel pump is defective.

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.*

## 3.10 Removing and installing fuel delivery unit

### Special tools and workshop equipment required

- Spanner for union nuts -3217-

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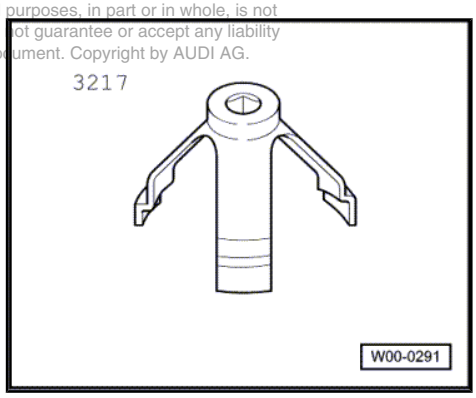



### Removing

Note safety precautions ⇒ page 2 .

Observe rules for cleanliness ⇒ page 2 .

**Caution**

***Observe notes on procedure for disconnecting the battery ⇒ Electrical system; Rep. Gr. 27 .***

– Disconnect earth wire at battery with ignition switched off.

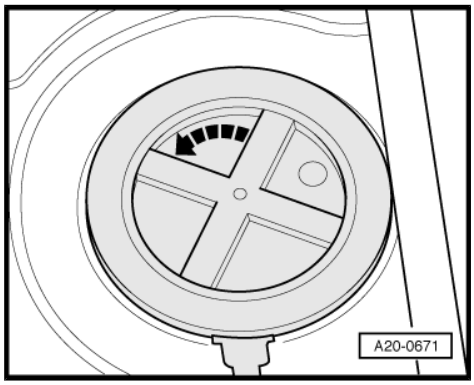
- The fuel tank must not be more than $^{3}/_{4}$ full when removing the fuel delivery unit. Drain the tank if necessary. Procedure ⇒ page 6 .

– Briefly open the fuel tank filler cap (to release pressure).

– Fold down rear seat bench.

– Fold back lining under rear set.

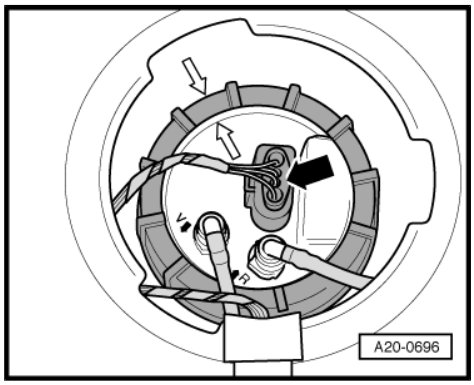
– Turn fuel delivery unit cover in -direction of arrow- and detach.



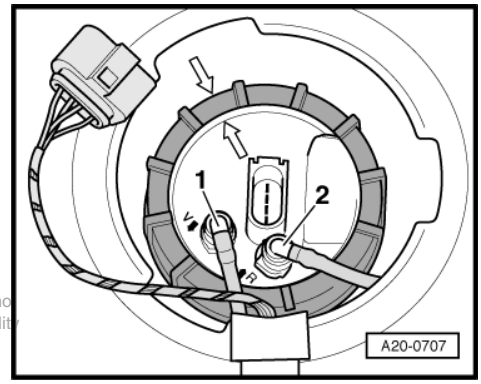

– Carefully release electrical connector from flange -arrow- and unplug.

**WARNING**

***The fuel system is pressurised. Before opening the system place a cloth around the connection. Then dissipate pressure by carefully unfastening the connection.***




– Disconnect fuel supply pipe -1- and fuel return pipe -2- by pressing release tabs.

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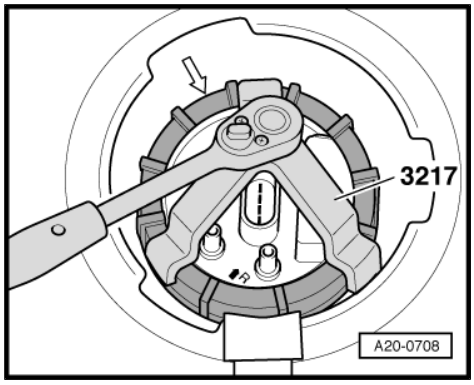
– Unscrew union nut using union nut tool -3217- .

– Pull fuel delivery unit and seal out of the opening in fuel tank.




### Installing

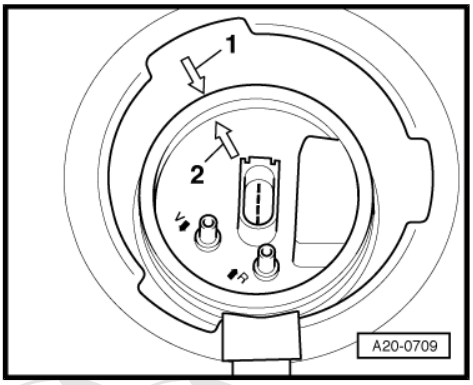
Installation is carried out in the reverse order; note the following:

**Note**

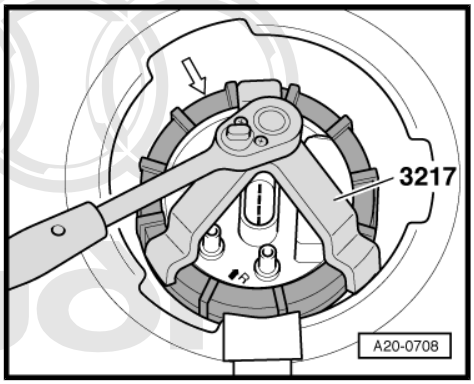
- *Take care not to bend the fuel gauge sender when fitting fuel delivery unit.*
- *Ensure that fuel pipes are securely seated.*

– Note installation position:

• Arrow -2- on flange must align with arrow -1- on fuel tank.




– Tighten union nut using union nut tool -3217- .

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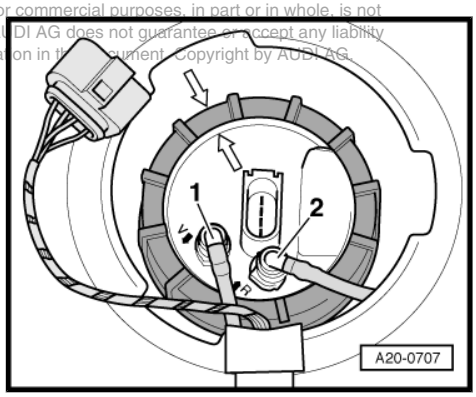
– Connect fuel pipes.

• Fit blue return pipe -2- onto connection marked “R”.

• Fit black supply pipe -1- onto connection marked “V”.

– Connect battery. Observe notes on procedures required after connecting battery ⇒ Electrical system; Rep. Gr. 27 .




**Tightening torque**

| Component | Nm |
|---|---|
| Union nut for fuel delivery unit | 80 |

## 3.11 Checking fuel gauge sender -G-

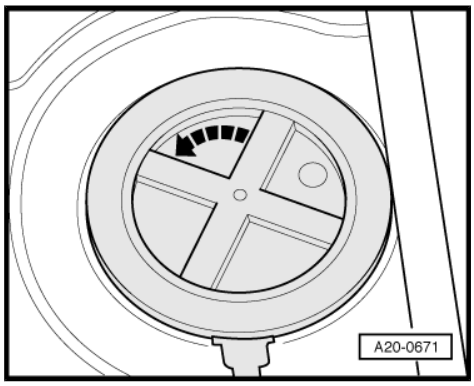
**Special tools and workshop equipment required**

♦ Hand-held multimeter -V.A.G 1526 B-

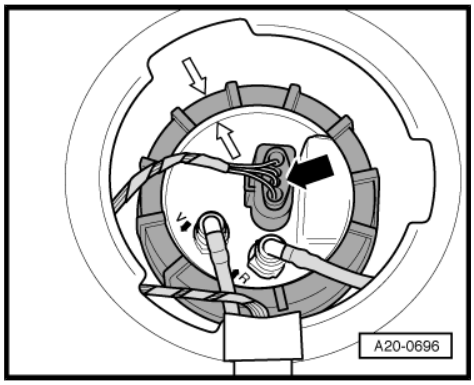
♦ Adapter set -V.A.G 1594 C-

**Test sequence**

– Fold down rear seat bench.
– Fold back lining under rear set.
– Turn fuel delivery unit cover in -direction of arrow- and detach.




– Carefully release electrical connector from flange -arrow- and unplug.

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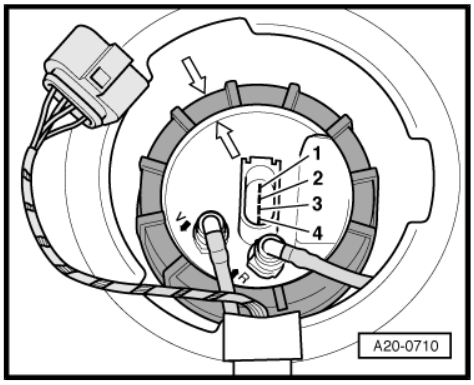
**Vehicles to 04.2002:**




– Connect multimeter between contacts -2- and -3- to measure resistance.

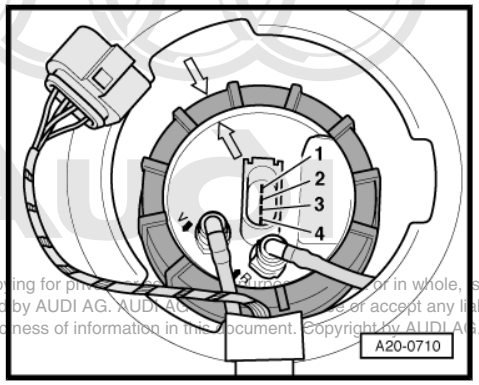
– Check resistance in relation to fuel tank level.

| Fuel tank 34 ltrs. | |
|---|---|
| **Resistance Ω** [1] | **Content Litre** |
| 54 [2] | 0 |
| 70 | 2 |
| 83 | 4 |
| 97 | 7 |
| 120 | 11 |
| 170 | 18 |
| 220 | 26 |
| 270 | 33 |
| 290 [2] | 34 |

1) Tolerance ± 5 Ω

2) The value is only attained with sender removed due to the increased travel of the float arm. Value with sender installed: approx. 58 Ω for “Tank empty” or approx. 287 Ω for “Tank full”.

**Vehicles from 05.2002:**




– Connect multimeter between contacts -2- and -3- to measure resistance.

– Check resistance in relation to fuel tank level.

| Fuel tank 34 ltrs. | | Fuel tank 42 ltrs. | |
|---|---|---|---|
| **Resistance Ω** [3] | **Content Litre** | **Resistance Ω** [3] | **Content Litre** |
| 284.1 [4] | 0 | 284.1 [4] | 0 |
| 273.0 | 2.0 | 278.5 | 2.0 |
| 250.4 | 4.0 | 261.7 | 4.0 |
| 223.9 | 7.0 | 237.2 | 7.0 |
| 193.0 | 11.0 | 208.5 | 12.0 |
| 140.3 | 18.0 | 146.2 | 22.0 |
| 100.1 | 25.5 | 100.1 | 32.0 |
| 68.5 | 32.5 | 72.5 | 40.0 |
| 68.5 | 34.0 | 68.5 [4] | 42.0 |

3) Tolerance ± 5 Ω

4) Value is only attained with sender removed due to the increased inclination of the float arm.

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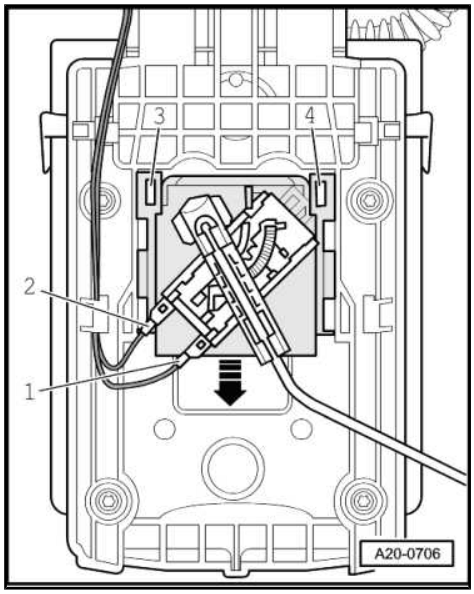
## 3.12 Removing and installing fuel gauge sender -G-

**Removing**

Note safety precautions ⇒ page 2 .

Observe rules for cleanliness ⇒ page 2 .

– Remove the fuel delivery unit ⇒ page 23 .
– Release and unplug electrical connectors -1- and -2-.
– Lift retaining lugs -3- and -4- with a screwdriver and pull fuel gauge sender -G- off downwards -arrow-.




**Installing**

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

– Insert fuel gauge sender -G- into the guide sleeves on fuel delivery unit and press upwards until it clicks into place.
– Attach connectors and check they have engaged properly.
– Install fuel delivery unit ⇒ page 24 , observing the instructions for connecting the battery.

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# 4 Servicing fuel filter

## 4.1 Fuel filter for a fuel system with fuel return pipe - exploded view of components

**1 - Fuel filter**

- ❑ Flow direction is marked by arrows
- ❑ Do not interchange connections
- ❑ Removing and installing ⇒ page 29

**2 - Fuel supply pipe**

- ❑ Black
- ❑ From fuel tank
- ❑ Press release tab on connection piece to disconnect

**3 - Fuel supply pipe**

- ❑ Black
- ❑ To engine
- ❑ Press release tab on connection piece to disconnect

**4 - 3 Nm**

**5 - Bracket**

- ❑ For fuel filter
- ❑ Attached to fuel tank

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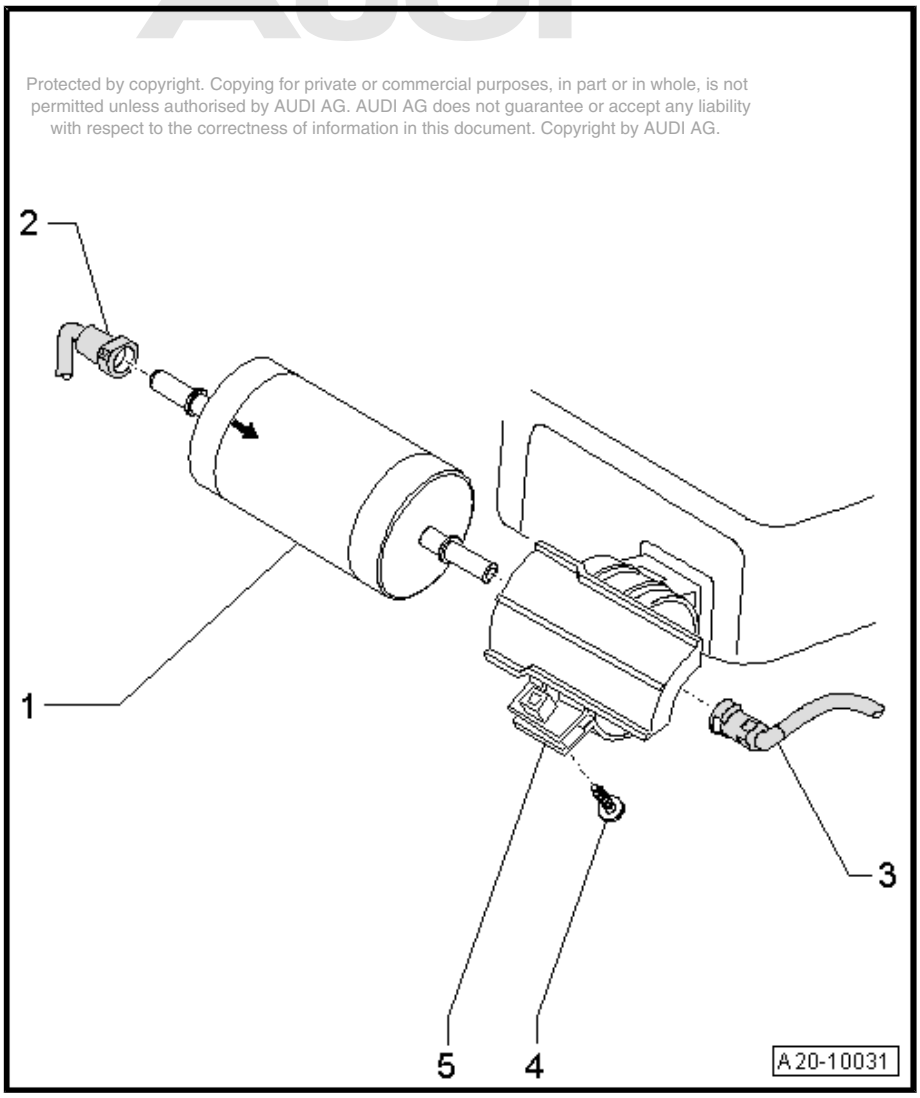
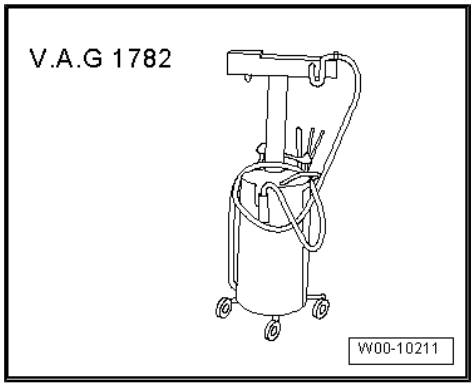



## 4.2 Removing and installing fuel filter for a fuel system with fuel return pipe

**Special tools and workshop equipment required**

♦ Used oil collection and extraction unit -V.A.G 1782-



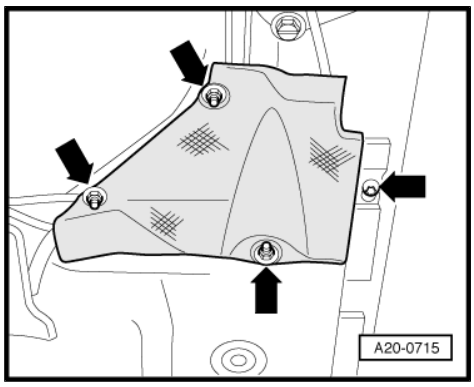

**Removing**

– Remove heat shield at front right of fuel tank-arrows-.

– Place used oil collection and extraction unit -V.A.G 1782- under fuel filter.

**WARNING**

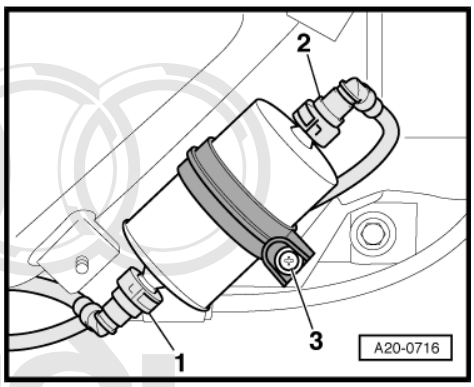
***The fuel system is pressurised. Before opening the system place a cloth around the connection. Then dissipate pressure by carefully unfastening the connection.***




– Disconnect fuel pipes -1- and -2- by pressing the release tabs.

– Unscrew bolt -3-.

– Remove fuel filter.




**Installing**

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

- Flow direction is marked with arrows on filter housing.
- The filter housing has to come into contact with the guide.

**Tightening torque**

| Component | Nm |
|---|---|
| Retaining clamp for fuel filter | 3 |

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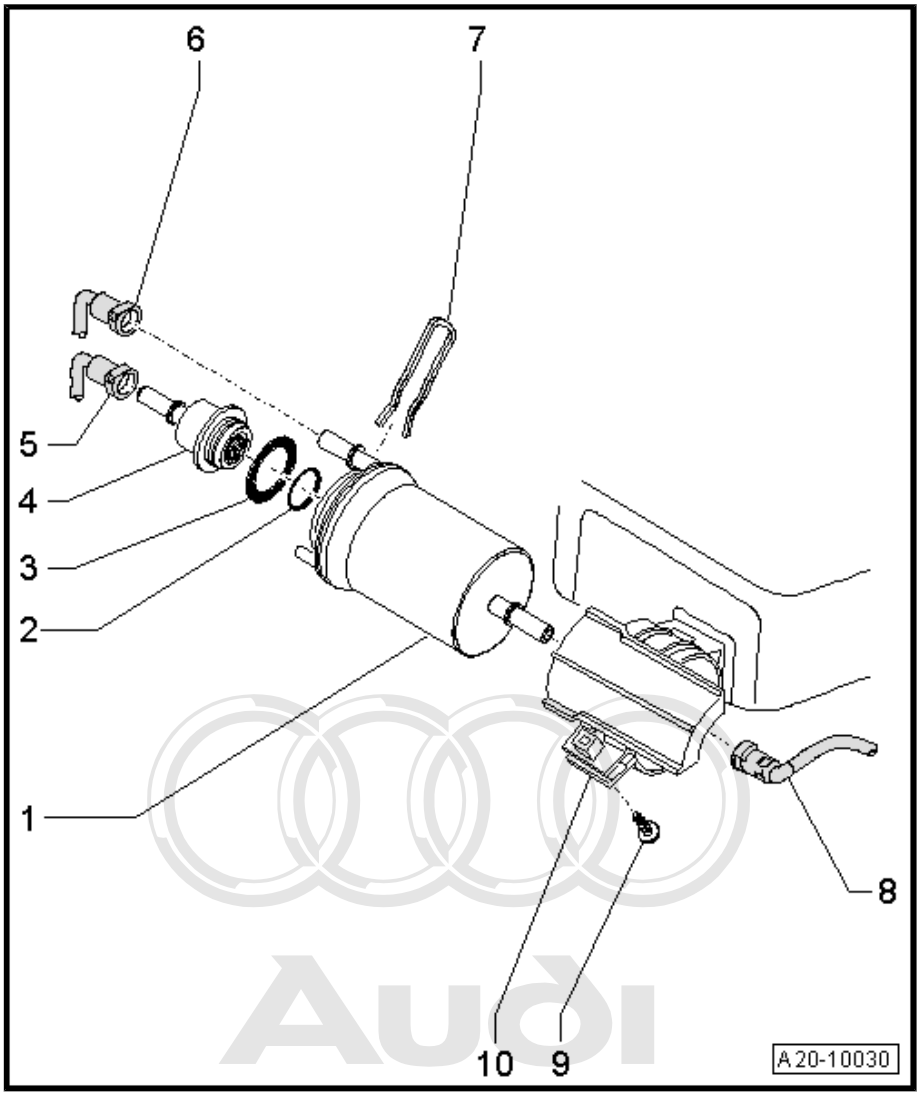
## 4.3 Fuel filter for fuel system without fuel return pipe - exploded view

In the case of a fuel system without fuel return pipe, the fuel pressure regulator is located in the fuel filter. In this system, only the fuel supply pipe is routed to the front, to the engine compartment. Excess fuel flows directly back from the filter to the fuel tank via a return line.

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**1 - Fuel filter**

- ❑ Flow direction is marked by arrows
- ❑ Do not interchange connections
- ❑ Removing and installing ⇒ page 31
- ❑ Installation position: pin on filter housing must be level with edge of guide on filter bracket ⇒ page 32

**2 - O-ring**

- ❑ Renew

**3 - Seal**

- ❑ Renew

**4 - Fuel pressure regulator**

**5 - Fuel return line**

- ❑ Blue
- ❑ To fuel tank
- ❑ Press release tab on connection piece to disconnect

**6 - Fuel supply pipe**

- ❑ Black
- ❑ From fuel tank
- ❑ Press release tab on connection piece to disconnect

**7 - Retaining clip**

- ❑ For fuel pressure regulator

**8 - Fuel supply pipe**

- ❑ Black
- ❑ To engine
- ❑ Press release tab on connection piece to disconnect

**9 - 2.5 Nm**

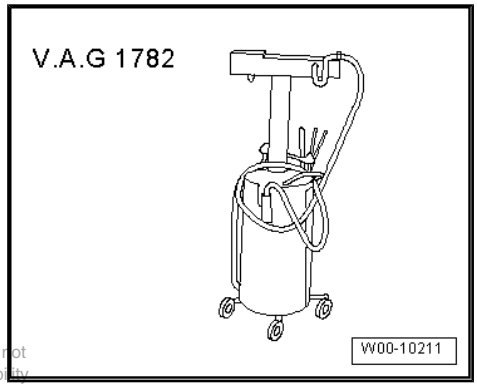
**10 - Bracket**

- ❑ For fuel filter
- ❑ Attached to fuel tank

## 4.4 Removing and installing the fuel filter for a fuel system without fuel return pipe

**Special tools and workshop equipment required**

♦ Used oil collection and extraction unit -V.A.G 1782-

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### Removing

Note safety precautions ⇒ page 2 .

Observe rules for cleanliness ⇒ page 2 .

– Place used oil collection and extraction unit -V.A.G 1782- under fuel filter.

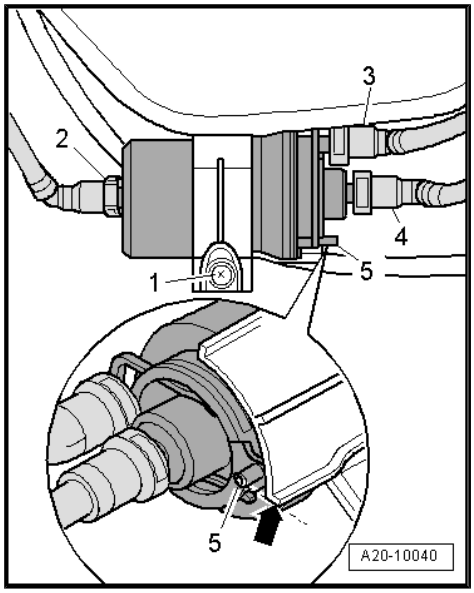
**WARNING**

***The fuel system is pressurised. Before opening the system place a cloth around the connection. Then dissipate pressure by carefully unfastening the connection.***

– Disconnect fuel pipes -2-, -3- and -4- by pressing the release tab.

– Unscrew bolt -1-.

– Remove fuel filter.




### Installing

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

Installation position:

- Flow direction is marked with arrows on filter housing.
- Pin -5- on filter housing must be level with edge -arrow- of guide on filter bracket.

### Tightening torque

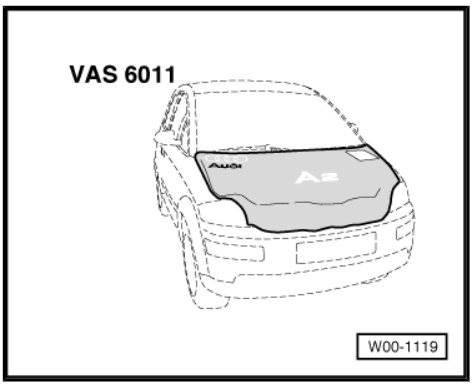
| Component | Nm |
|---|---|
| Retaining clamp for fuel filter | 2.5 |

# 5 Servicing components of activated charcoal filter system

## 5.1 Removing and installing activated charcoal filter

**Special tools and workshop equipment required**

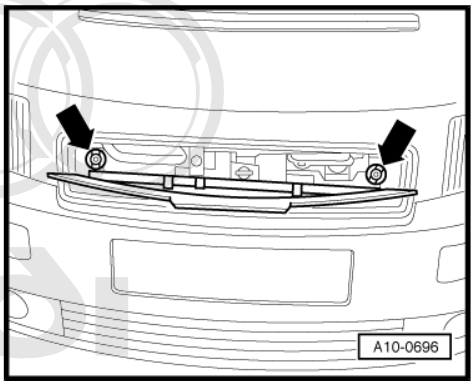
- Engine cover protector -VAS 6011-




**Removing**

Observe rules for cleanliness ⇒ page 2 .

– Wash outer side of bonnet and dry with chamois leather.
– Release service flap from inside the vehicle.
– Release bonnet -arrows- and pull it forwards slightly.

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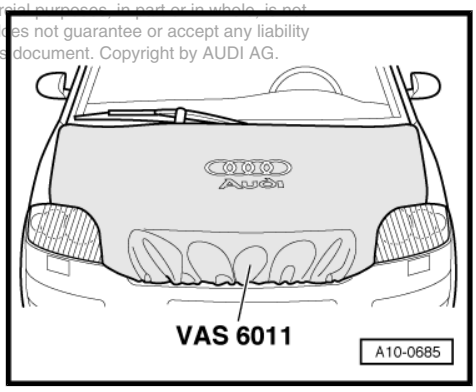
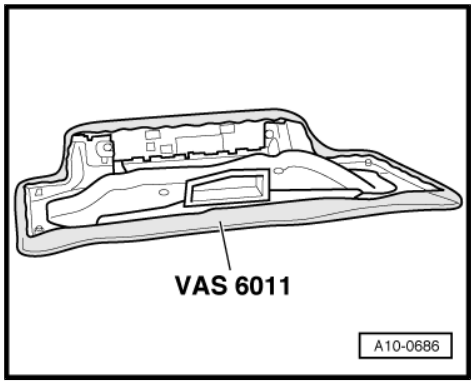
– Fasten protective cover -VAS 6011- over bonnet.



– Remove bonnet and put aside with the protective cover - VAS 6011- facing downwards.

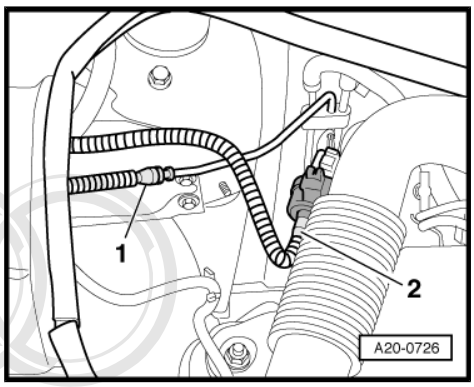



**Note**

*Do not store bonnet in upright position.*

– Remove engine cover panel if necessary.

– Disconnect breather pipes -1- and -2-.

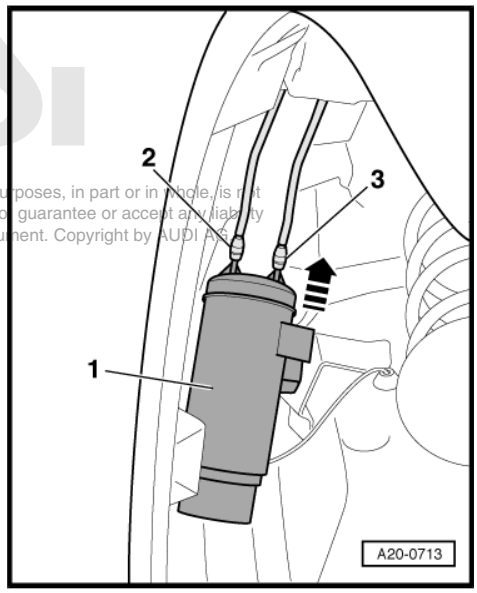



– Remove front wheel (right-side).

– Remove front right wheel housing liner ⇒ General body repairs, exterior; Rep. Gr. 66 .

– Press activated charcoal filter -1- upwards to disengage from retainer -arrow-.

– Remove activated charcoal filter with breather pipes -2- and -3-.

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**Installing**

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

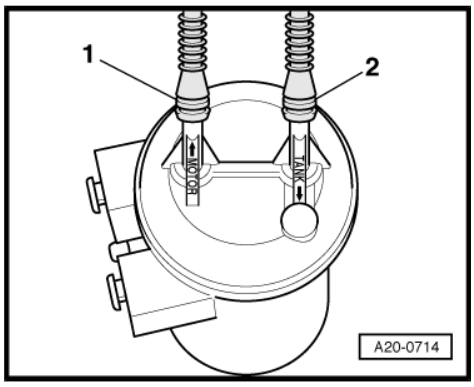
– Connect breather pipes according to allocation:

- Engine = breather pipe -1- to activated charcoal filter system solenoid valve I (pulsed) -N80- .
- Tank = Breather pipe -2- to fuel tank.

– Fit activated charcoal filter into retainer.

– Press down activated charcoal filter until it engages with a clicking sound.

– Install front right wheel housing liner ⇒ General body repairs, exterior; Rep. Gr. 66 .



# 6 Servicing accelerator mechanism

**1 - Accelerator pedal stop**

- ❑ Vehicles with left-hand drive only
- ❑ Adjusting ⇒ page 36

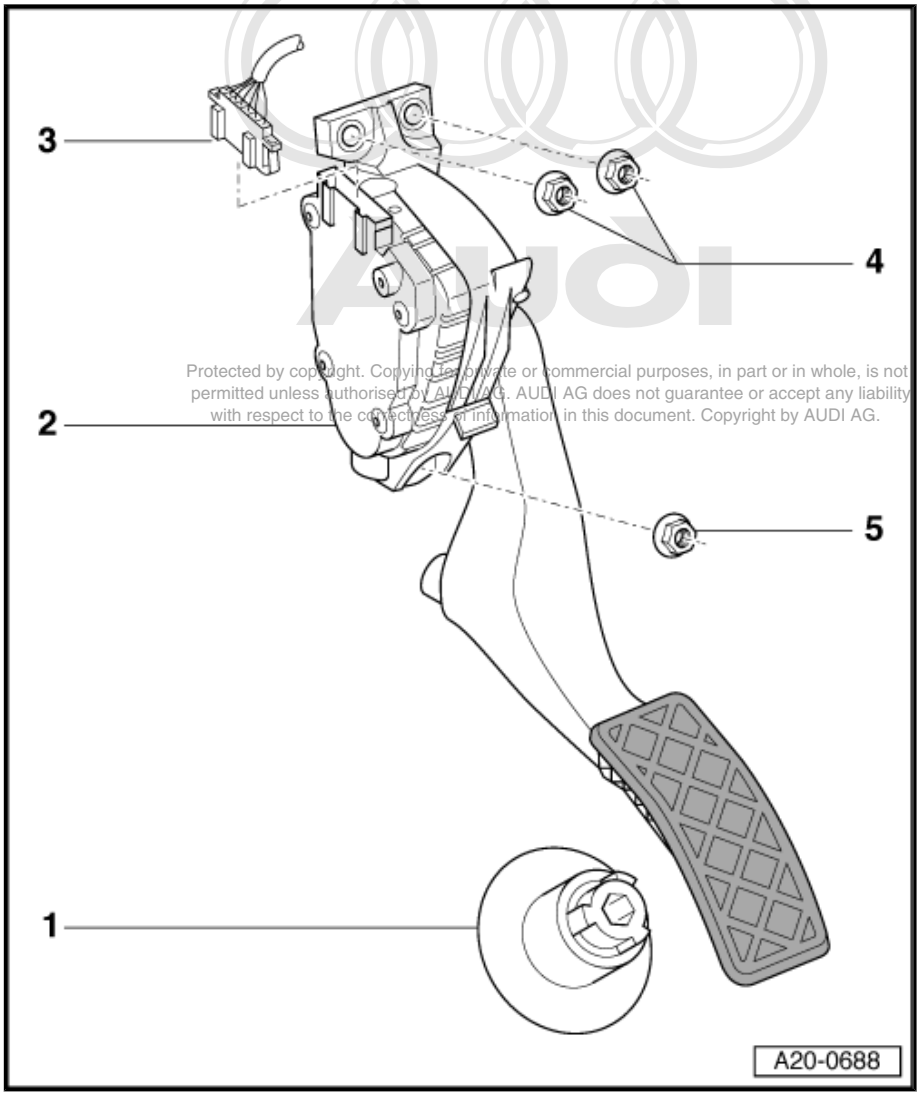
**2 - Accelerator pedal module**

- ❑ With accelerator pedal position sender -G79- and accelerator pedal position sender -G185-
- ❑ Removing and installing ⇒ page 36

**3 - Electrical connector**

**4 - 10 Nm**

**5 - 10 Nm**

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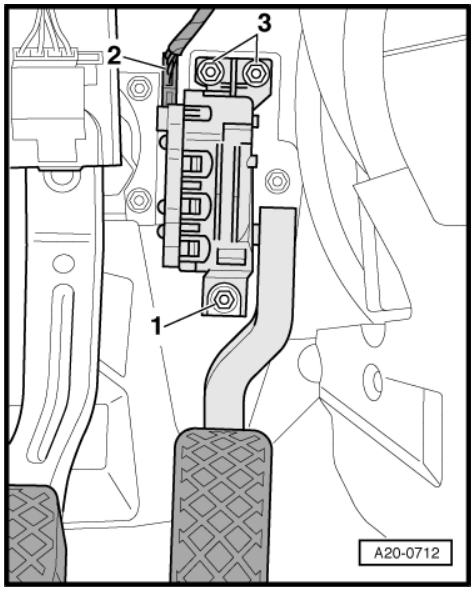
## 6.1 Removing and installing accelerator pedal module with accelerator pedal sender




### Removing

– Remove driver's storage compartment ⇒ General body repairs, interior; Rep. Gr. 68 .

– Unplug electrical connector -2-.

– Unscrew nuts -1- and -3-.

– Remove accelerator pedal module.

### Installing

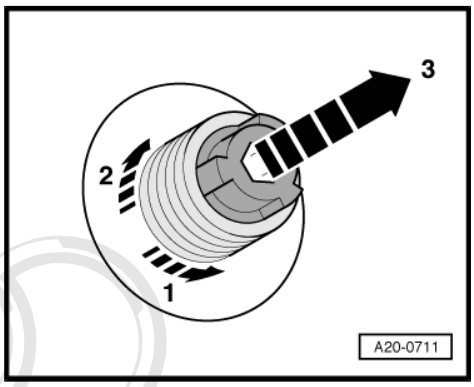
Install in reverse order.

– Install driver's storage compartment ⇒ General body repairs, interior; Rep. Gr. 68 .

### Tightening torque

| Component | Nm |
|---|---|
| Accelerator pedal module to pedal bracket | 10 |

## 6.2 Adjusting accelerator pedal stop - vehicles with left-hand drive




### Procedure

– Turn click stop ring anti-clockwise onto stop -arrow 1-.

– Pull out pedal stop all the way -arrow 3-.

– Depress accelerator pedal all the way by hand.

• As a result, the pedal stop is pushed together to the correct length.

– Lock click stop ring into position by turning clockwise -arrow 2-.

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