

Workshop Manual Audi A1 2011 ➤

Fuel supply system - petrol engines, four-wheel drive

Engine ID	CDL H								
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Edition 06.2012



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List of Workshop Manual Repair Groups

Repair Group

00 - Technical data

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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00 – Technical data

1 Safety precautions

⇒ „1.1 Working on the fuel system“, page 1

⇒ „1.2 Using testers and measuring instruments during a road test“, page 2

⇒ „1.3 Working on vehicles with start/stop system“, page 3

⇒ „1.4 Removing and installing components from a full or partly full fuel tank“, page 3

⇒ „1.5 Removing and installing fuel tank“, page 3

1.1 Working on the fuel system

When working on the fuel system note the following warnings:

**WARNING**

The fuel system operates at extremely high pressure. This can cause injury.

- ◆ *The fuel pressure in the high-pressure section of the injection system must be reduced to a residual pressure prior to opening the system.*
- ◆ *Wrap a clean cloth around the connection and carefully loosen the connection to allow the residual pressure to dissipate.*

Fuel can escape.

- ◆ *The fuel pump is normally activated when the driver's door is opened. Therefore, unless the battery has been disconnected or the electrical connector for the fuel delivery unit has been unplugged, the fuse for the fuel pump must be removed as a safety precaution before opening the fuel system.*

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- Procedure before opening high-pressure section of injection system ⇒ Rep. gr. 24 .

Observe the following to prevent injuries to persons and damage to the injection and ignition system:

- ◆ Always switch off the ignition before connecting or disconnecting electrical wiring for the injection or ignition system or tester cables.
- ◆ Always switch off ignition before washing engine.
- ◆ Entries are stored in event memory of engine control unit if electrical connectors were unplugged and engine was started: Generate readiness code in Guided Functions ⇒ Vehicle diagnostic tester.

**Caution**

To prevent irreparable damage to the electronic components when disconnecting the battery:

- ◆ *Observe notes on procedure for disconnecting the battery.*
- ◆ *Always switch off the ignition before disconnecting the battery.*

– Disconnecting battery ⇒ Electrical system; Rep. gr. 27

Perform the following steps before starting to work on the fuel supply system:

**WARNING**

Mobile phones can cause an explosion risk.

- ◆ *Ensure that any mobile phones are well clear of the work-bay.*

**Caution**

Electronic components are susceptible to damage.

- ◆ *Observe notes on procedure for disconnecting the battery.*

◆ Disconnecting battery ⇒ Electrical system; Rep. gr. 27

◆ Briefly open filler cap for fuel tank and close again.

1.2 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 Working on vehicles with start/stop system

When performing repairs on vehicles with start/stop system, note the following:



WARNING

Risk of injury due to automatic engine start on vehicles with start/stop system.

- ◆ ***On vehicles with activated start/stop system (this is indicated by a message in the instrument cluster display), the engine may start automatically on demand.***
- ◆ ***Therefore it is important to ensure that the start/stop system is deactivated when performing repairs (switch off ignition, if required switch on ignition again).***

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1.4 Removing and installing components from a full or partly full fuel tank

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 fuel tank is indicated in the corresponding procedure description. Drain fuel tank if necessary ⇒ [page 9](#).
- ◆ Before starting 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 of at least 15 m³/h can be used (the fan motor must be clear of the air stream).
- ◆ Avoid skin contact with fuel. Wear fuel-resistant gloves.

1.5 Removing and installing fuel tank

- ◆ Fuel tank must be empty to reduce weight. Drain fuel tank if necessary ⇒ [page 9](#).



2 General repair instructions

⇒ „2.1 Rules for cleanliness when working on fuel supply system and injection system“, page 4

⇒ „2.2 Test conditions“, page 4

⇒ „2.3 Contact corrosion!“, page 4

2.1 Rules for cleanliness when working on fuel supply system and injection system

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Even small amounts of dirt can cause malfunctions. When working on the fuel supply system and injection system, pay careful attention to the following basic rules:

- ◆ Carefully clean connection points and the surrounding area with engine cleaner or brake cleaner and dry thoroughly before opening.
- ◆ Immediately seal open lines and unions with clean plugs, for example from engine bung set -VAS 6122- .
- ◆ Place parts that have been removed on a clean surface and cover them over. Use only lint-free 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 and do not move the vehicle.
- ◆ Protect unplugged electrical connectors against dirt and moisture and make sure connections are dry when attaching.

2.2 Test conditions

- Battery voltage at least 12.5 V.
- Fuel pump fuse OK ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- Fuel pump relay -J17- OK ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- Fuel pump control unit -J538- OK; checking in Guided Fault Finding ⇒ Vehicle diagnostic tester.
- Fuel tank at least $\frac{1}{4}$ full.
- Fuel filter OK.
- Fuel lines OK (not obstructed or crushed).
- Ignition off.

2.3 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.

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

Always install new parts if you are not sure whether used parts can be re-fitted ⇒ Electronic parts catalogue .

Note the following:

- ◆ We recommend using only genuine replacement parts; these have been tested and are compatible with aluminium.
- ◆ We recommend the use of Audi accessories.
- ◆ Damage caused by contact corrosion is not covered under warranty.

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20 – Fuel supply system

1 Fuel tank with attached components

⇒ „1.1 Exploded view - fuel tank“, page 6

⇒ „1.2 Draining fuel tank“, page 9

⇒ „1.3 Removing and installing fuel tank“, page 17

1.1 Exploded view - fuel tank



Note

- ◆ *Hose connections are secured either with plug-in connectors or with spring-type or O-type clips.*
- ◆ *Fuel hoses on engine must only be secured with spring-type clips. O-type clips or screw-type clips must not be used.*
- ◆ *Observe correct installation position of all components.*
- ◆ *Plug-in connectors should engage audibly when connecting.*
- ◆ *When installing, note colour coding of plug-in connectors ⇒ [page 36](#) .*
- ◆ *Check that plug-in connector is securely seated by pulling at it.*

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1 - Fuel filler pipe

- ☐ Removing and installing
⇒ [page 23](#)
- ☐ Note installation position of earth wire
⇒ [page 9](#)

2 - Locking ring

- ☐ 110 Nm
- ☐ Check that it is securely seated
- ☐ Remove and install using wrench -T10202-

3 - Fuel delivery unit

- ☐ With fuel gauge sender -G-
- ☐ Exploded view
⇒ [page 26](#)
- ☐ Removing and installing
⇒ [page 32](#)
- ☐ Installation position
⇒ [page 8](#)
- ☐ Checking ⇒ [page 42](#)
- ☐ Removing and installing fuel gauge sender -G-
⇒ [page 32](#)
- ☐ Disconnecting
⇒ [page 29](#)

4 - Seal

- ☐ Renew
- ☐ When installing, fit dry seal in fuel tank opening
- ☐ Lightly lubricate with fuel only when installing flange

5 - Breather line

- ☐ Check that it is securely seated
- ☐ Connecting line between two sides of fuel tank

6 - Locking ring

- ☐ 110 Nm
- ☐ Check that it is securely seated
- ☐ Remove and install using wrench -T10202-

7 - Fuel gauge sender 2 -G169-

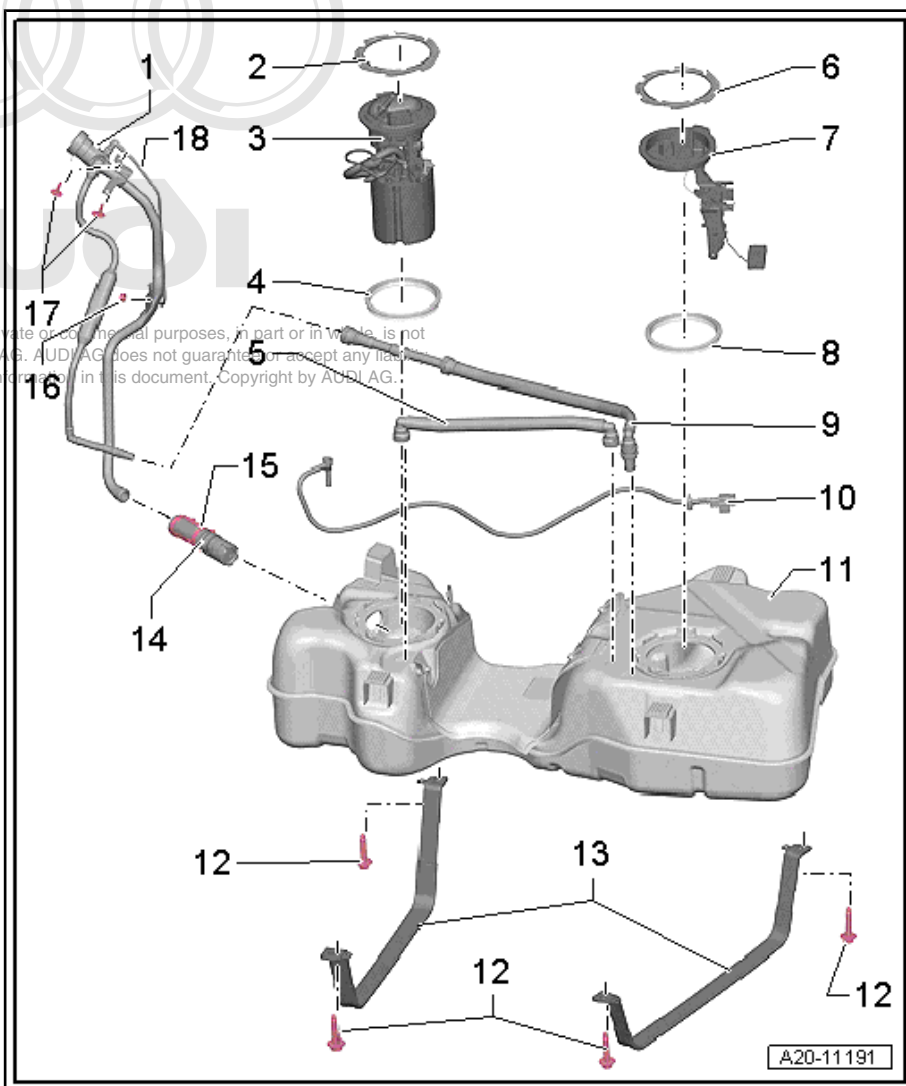
- ☐ Note installation position on fuel tank ⇒ [page 8](#)
- ☐ Removing and installing ⇒ [page 33](#)

8 - Seal

- ☐ Renew
- ☐ When installing, fit dry seal in fuel tank opening
- ☐ Lightly lubricate with fuel only when installing flange

9 - Breather line

- ☐ Check that it is securely seated
- ☐ Connected to filler pipe



10 - Suction-jet pump

- ☐ Removing and installing ⇒ [page 62](#)

11 - Fuel tank

- ☐ Draining ⇒ [page 9](#)
- ☐ Removing and installing ⇒ [page 17](#)
- ☐ Note installation position of earth wire ⇒ [page 9](#)

12 - Bolt

- ☐ 4x
- ☐ 26 Nm
- ☐ Renew

13 - Securing strap

- ☐ Secure against turning out of position

14 - Connecting hose

- ☐ Note installation position ⇒ [page 9](#)
- ☐ Check that it is securely seated
- ☐ Between filler pipe and fuel tank

15 - Double clamp

- ☐ Note installation position ⇒ [page 9](#)
- ☐ Check that it is securely seated
- ☐ 5.5 ± 0.5 Nm

16 - Nut

- ☐ Fuel filler pipe to wheel housing
- ☐ 20 Nm

17 - Bolts

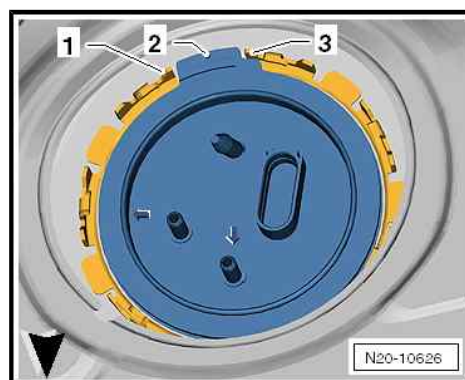
- ☐ 8 Nm
- ☐ Note installation position of earth wire ⇒ [page 9](#)

18 - Breather line

- ☐ To activated charcoal filter ⇒ [Item 3 \(page 67\)](#)

Installation position of flange for fuel delivery unit and fuel gauge sender 2 -G169-

- Lug -2- on flange must be between tabs -1- and -3- on fuel tank.
- The -arrow- points in direction of travel.



Installation position of earth connection

Installation position	Tightening torque
1 Secure earth wire -4- to stud on body by tightening nut -5-	9 Nm
2 Secure earth wire -4- to filler pipe by tightening bolt -2-	8 Nm
3 Secure earth wire -6- from fuel tank to body by tightening nut -7-	9 Nm

Eliminates electrostatic charge.

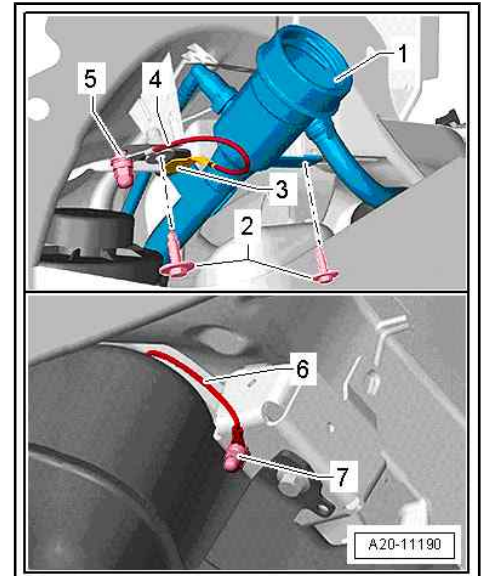


Caution

Check the electrical connection after installing.

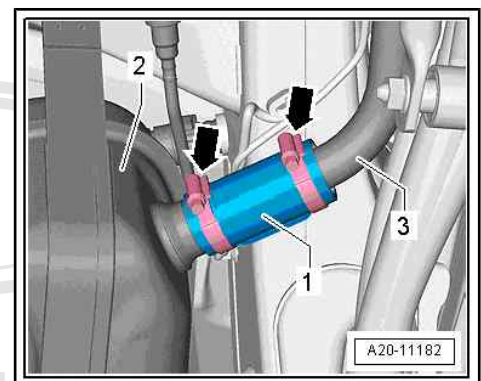
Use an ohmmeter to check the electrical connection between the metal ring on the fuel filler neck and a bare metal part on the body:

- *Specification: approx. 0 Ohm*



Installation position of connecting piece

- Connecting piece -1- fits flush with sleeve of filler pipe -3-.



1.2 Draining fuel tank

⇒ „1.2.1 Draining fuel tank with intact fuel pump“, page 9

⇒ „1.2.2 Draining fuel tank with defective fuel pump“, page 13

1.2.1 Draining fuel tank with intact fuel pump



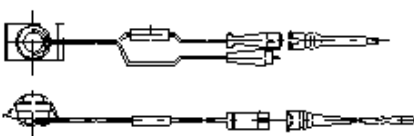
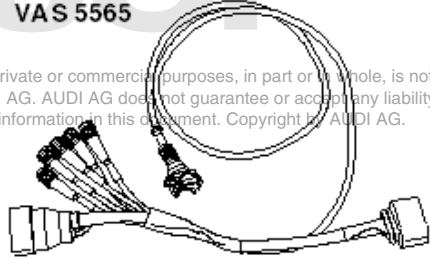
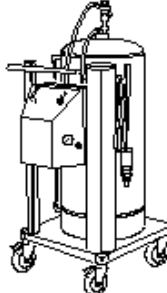
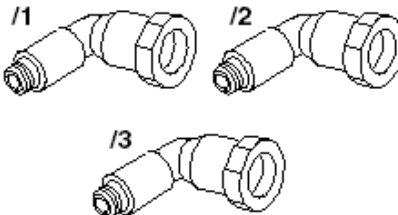
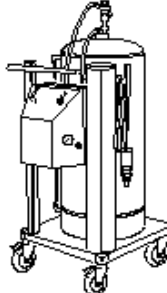
Caution

Secure earth wire of fuel extractor to a bare metal part on the body.

Special tools and workshop equipment required

- ◆ Removal wedge -3409-
- ◆ Remote control -V.A.G 1348/3A-
- ◆ Test instrument adapter/DSO (5-pin) -VAS 5565-
- ◆ Fuel extractor -VAS 5190-
- ◆ Adapter for fuel extraction -VAS 5190-

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3409 	V.A.G 1348/3A 
VAS 5565 	VAS 5565 
VAS 5190 	 W20-10053

 Note

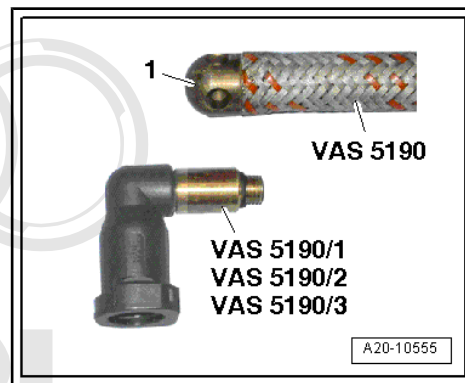
If fuel extractor -VAS 5190- is still fitted with extraction hose with fixed tip, replace with version with screw-on tip.



Caution

Fuel supply line is pressurised. Wear safety goggles and protective clothing to avoid possible injury and skin contact. Before opening hose connections wrap a cloth around the connection. Then release pressure by carefully pulling hose off connection.

Connect earth wire of fuel extractor to earth.



 Note

- ◆ Plug-in connectors should engage audibly when connecting.
- ◆ When installing, note colour coding of plug-in connectors ⇒ [page 36](#).
- ◆ Check that plug-in connector is securely seated by pulling at it.
- ◆ Disconnecting plug-in connectors ⇒ [page 36](#)

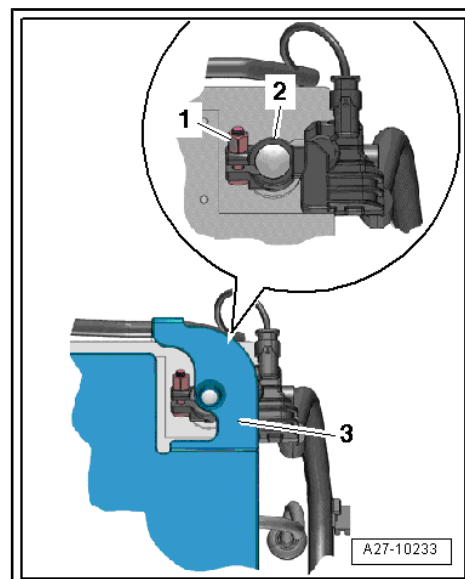
- Disconnect battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .



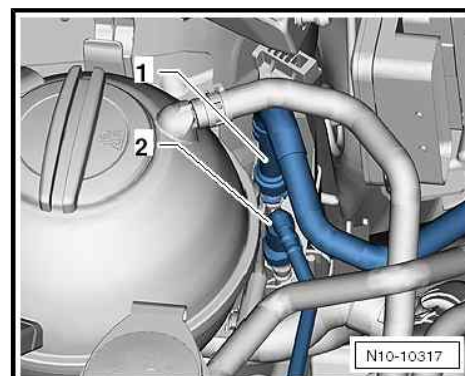
Caution

To prevent irreparable damage to the electronic components when disconnecting the battery:

- ◆ Observe notes on procedure for disconnecting the battery.



- Disconnect supply line (metal connection) -1-. Use a cloth to catch escaping fuel. Disconnecting plug-in connectors ⇒ [page 36](#)

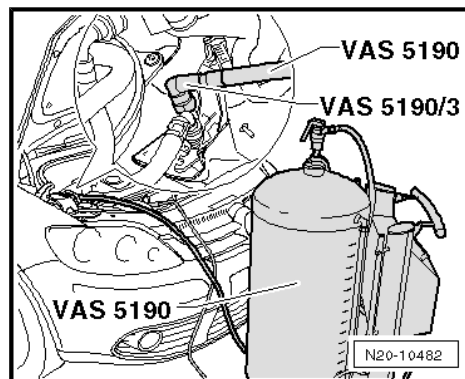


- Connect fuel extractor -VAS 5190- with adapter for fuel extractor -VAS 5190- to fuel supply line.

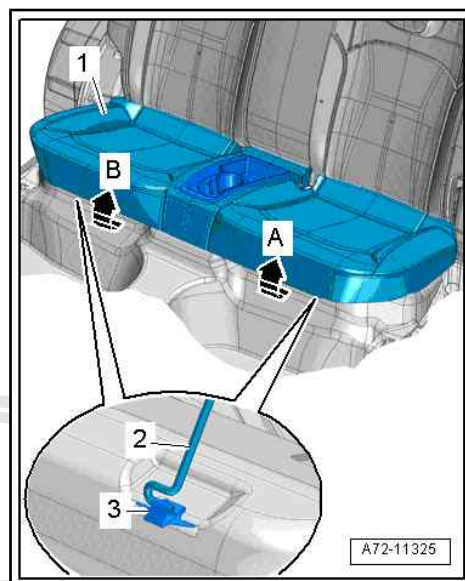


Caution

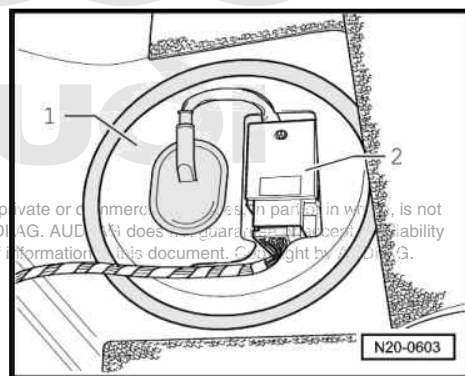
Secure earth wire of fuel extractor to a bare metal part on the body.



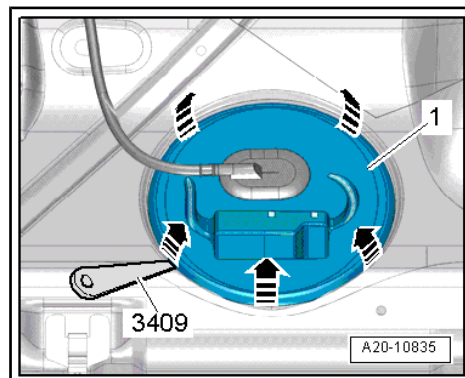
- Remove seat bench or fold upwards ⇒ General body repairs, interior; Rep. gr. 72 ; Rear seats; Removing and installing seat bench/individual seats .
- If fitted, unfasten carpet and fold upwards.



- Detach cover (right-side) with fuel pump control unit -J538- -2- from assembly opening above fuel delivery unit.

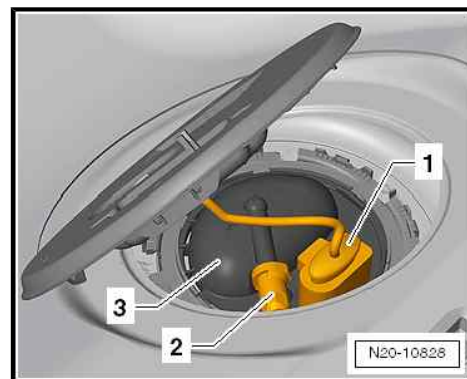


- To do so, unclip cover (right-side) -1- at retainers -arrows- using removal wedge -3409- .



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- Release connector -1- from flange -3- and disconnect.

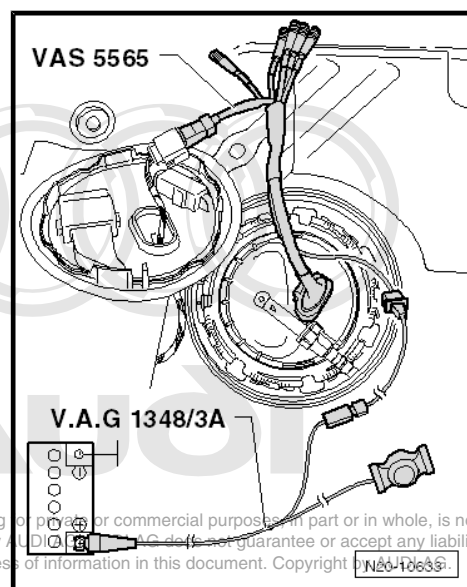


- Plug test instrument adapter/DSO (5-pin) -VAS 5565- into connector and fuel delivery unit.
- Connect remote control -V.A.G 1348/3A- to adapter -VAS 5565- and battery positive (+).



Note

This step merely allows the fuel pump to run when the engine is stopped.



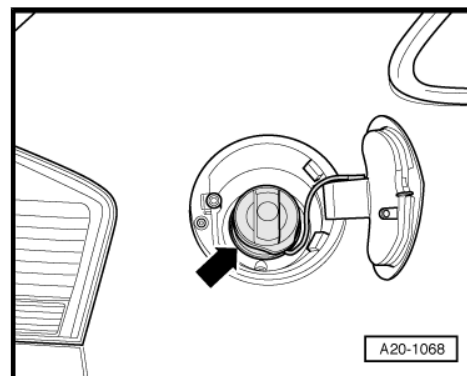
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- Open flap for fuel filler neck.
- Remove filler cap -arrow- from fuel filler neck.
- Clean area around fuel filler neck.
- Operate remote control -V.A.G 1348/3A- and cut-off valve on fuel extractor -VAS 5190- until fuel tank is empty.



Caution

The fuel pump must not be allowed to run dry.



1.2.2 Draining fuel tank with defective fuel pump

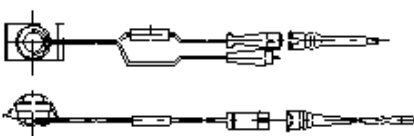
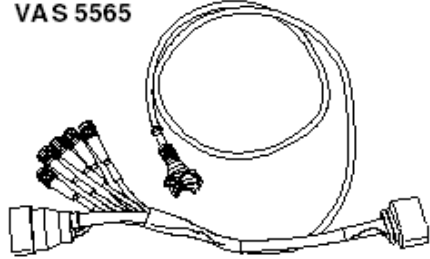
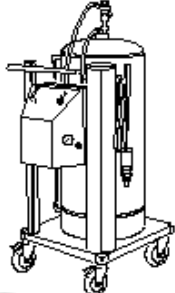
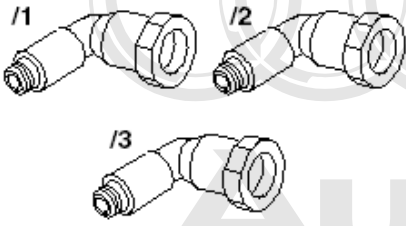
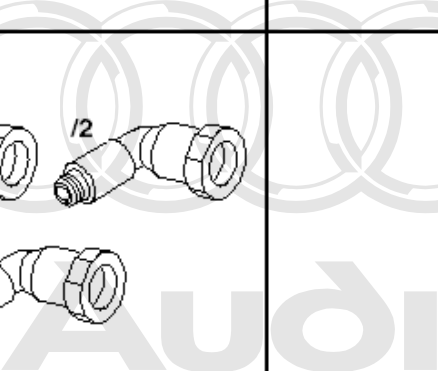


Caution

Secure earth wire of fuel extractor to a bare metal part on the body.

Special tools and workshop equipment required

- ◆ Removal wedge -3409-
- ◆ Fuel extractor -VAS 5190-
- ◆ Adapter for fuel extraction - VAS 5190-

3409 	V.A.G 1348/3A 
VAS 5565 	VAS 5565 
VAS 5190 /1 /2 /3 	 W20-10053

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 Note

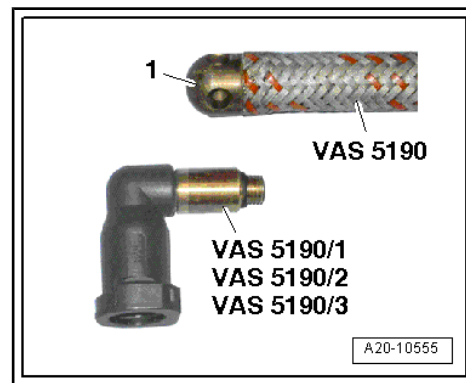
If fuel extractor -VAS 5190- is still fitted with extraction hose with fixed tip, replace with version with screw-on tip.



Caution

Fuel supply line is pressurised. Wear safety goggles and protective clothing to avoid possible injury and skin contact. Before removing from hose connection wrap a cloth around the connection. Then release pressure by carefully pulling hose off connection.

Connect earth wire from fuel extractor to earth.

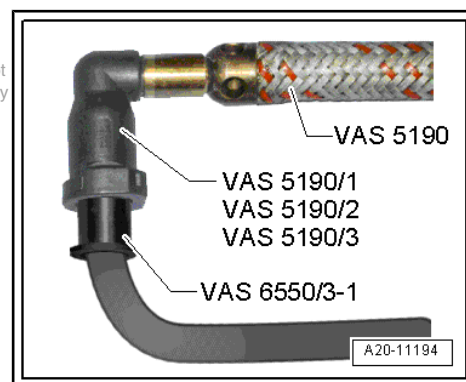


 Note

- ◆ Plug-in connectors should engage audibly when connecting.
- ◆ When installing, note colour coding of plug-in connectors ⇒ [page 36](#).
- ◆ Check that plug-in connector is securely seated by pulling at it.
- ◆ Disconnecting plug-in connectors ⇒ [page 36](#)

- Connect a commercially available hose to fuel extractor -VAS 5190- with connection fitting -VAS 6550/3-1- .

- Minimum length: 25 cm
- Maximum diameter Ø: 1.5 cm



- Disconnect battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .



Caution

To prevent irreparable damage to the electronic components when disconnecting the battery:

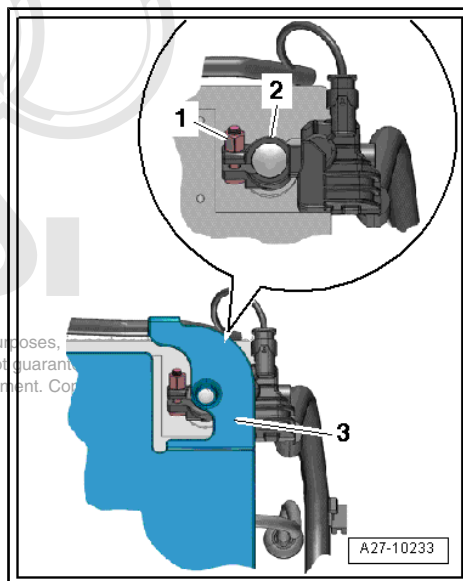
- ◆ *Observe notes on procedure for disconnecting the battery.*



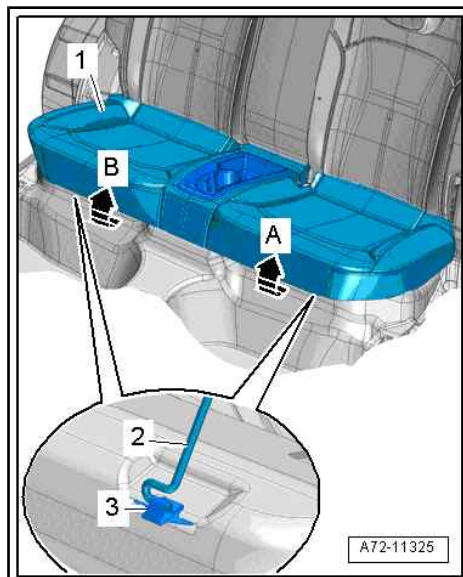
Caution

Secure earth wire of fuel extractor to a bare metal part on the body.

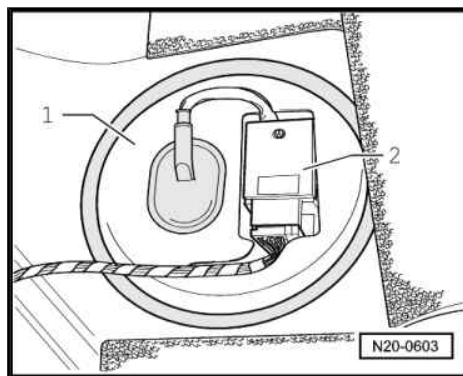
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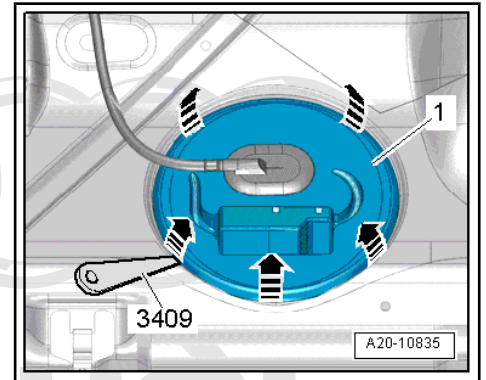
- Remove seat bench or fold upwards ⇒ General body repairs, interior; Rep. gr. 72 ; Rear seats; Removing and installing seat bench/individual seats .
- If fitted, unfasten carpet and fold upwards.



- Detach cover (right-side) with fuel pump control unit -J538-2- from assembly opening above fuel delivery unit.

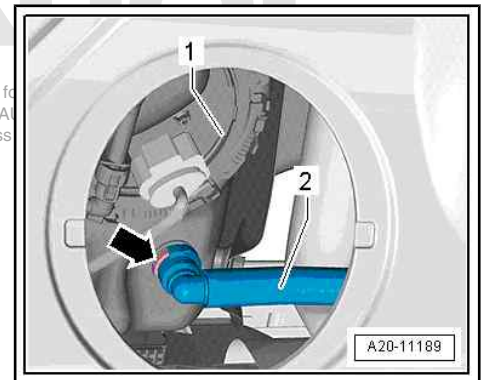


- To do so, unclip cover (right-side) -1- at retainers -arrows- using removal wedge -3409- .



- Release and disconnect line -2- at fuel tank -1-.
- To do so, press release tab -arrow-.
- Insert hose into opening in fuel tank.
- Drain fuel tank using fuel extractor -VAS 5190- .

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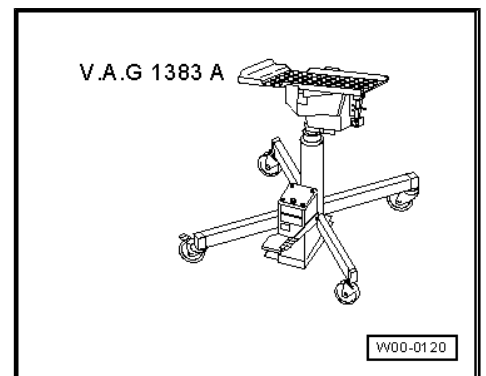


1.3 Removing and installing fuel tank

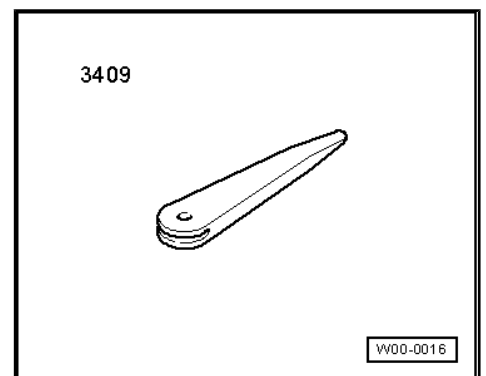
⇒ „1.3.1 Removing and installing fuel filler neck“, page 23

Special tools and workshop equipment required

- ◆ Engine and gearbox jack -V.A.G 1383 A-



- ◆ Removal wedge -3409-



Removing

- Observe safety precautions ⇒ [page 1](#) .

- Observe rules for cleanliness ⇒ [page 4](#) .



Caution

To prevent irreparable damage to the electronic components when disconnecting the battery:

- ◆ Observe notes on procedure for disconnecting the battery.

- Disconnect earth cable from battery terminal ⇒ Electrical system; Rep. gr. 27 .



WARNING

Risk of accident caused by weight of fuel tank

- ◆ Fuel tank must be empty when it is removed.

- Drain fuel tank ⇒ [page 9](#) .



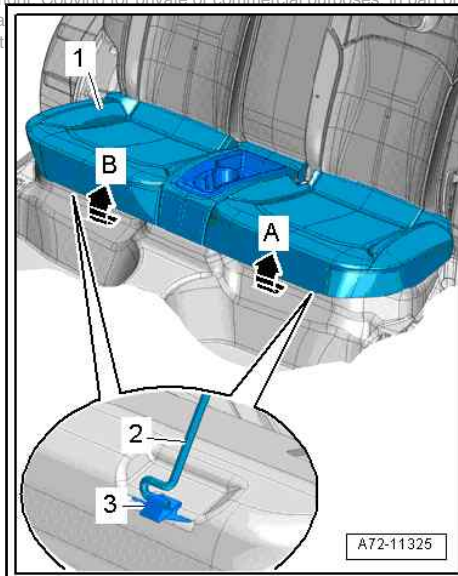
WARNING

Risk of injury - fuel system operates under high pressure.

- ◆ To reduce the pressure in the fuel system, wrap a clean cloth around the connection and carefully loosen the connection.

- Remove rear seat bench ⇒ Rep. gr. 72 .

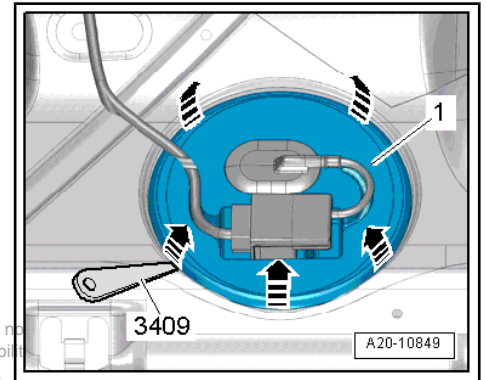
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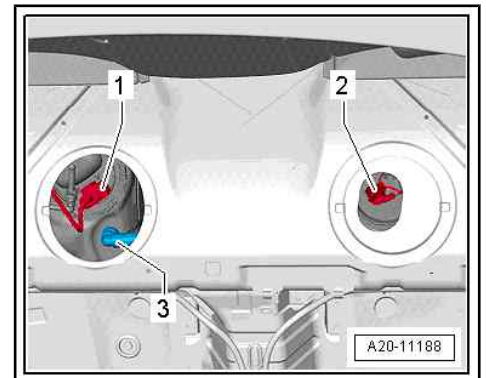
- Unclip cover -1- for fuel tank flange at retainers -arrows- using removal wedge -3409- .
- Unclip cable duct for fuel gauge sender on driver's side.

Audi

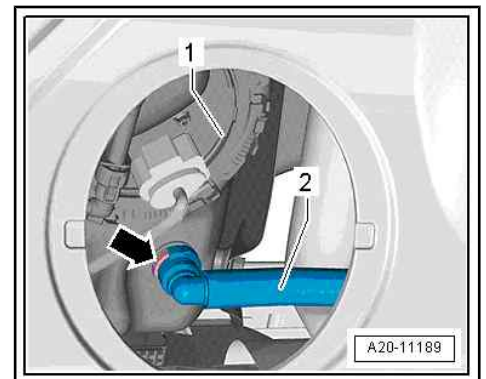
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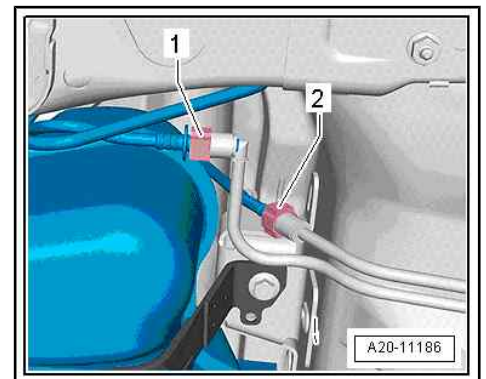
- Unplug electrical connector for fuel delivery unit -1- and fuel gauge sender -2-.



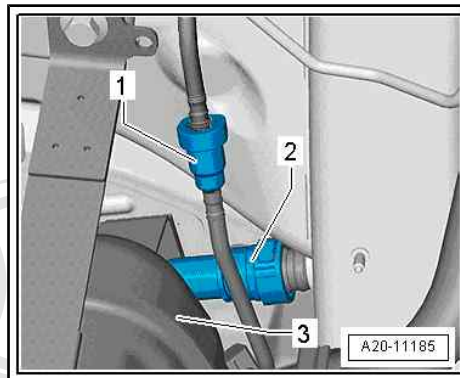
- Press release tab and disconnect connecting line -2- from fuel tank -1-.
- Pivot connecting line -2- over propshaft and exhaust system.



- Press release tab and disconnect fuel supply line -1- and breather line -2- at coupling point.

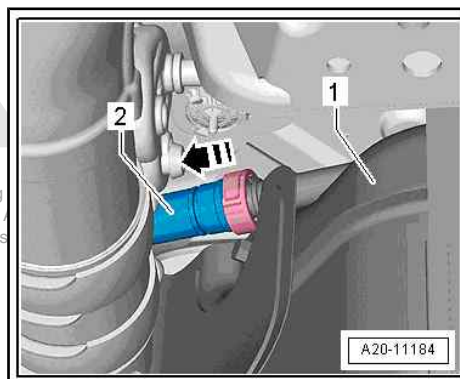


- Press release tab and disconnect breather line -1- at coupling point.

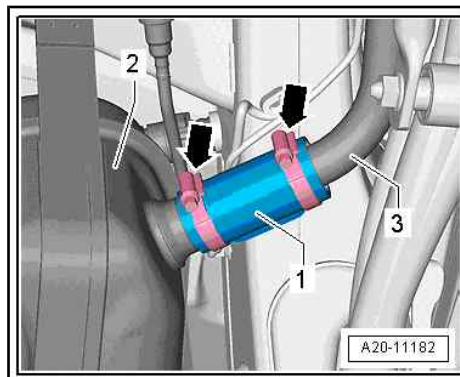


- Press release tab and disconnect breather line -2-.
- Press release tab and disconnect connecting line -2- from connecting pipe of fuel tank -1-.
- Pivot connecting line -2- clockwise (towards left) over prop-shaft and exhaust system.

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- Loosen screw-type clips -arrows- on connecting piece -1-.
- Push connecting piece -1- from connection of fuel tank -2- onto filler pipe -3-.



- Position engine and gearbox jack -V.A.G 1383 A- under vehicle to support tank, as shown in illustration.

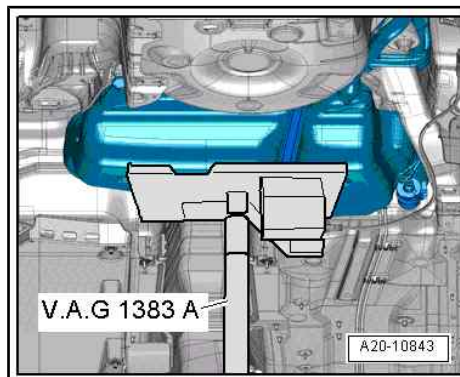


WARNING

Risk of accident caused by weight of fuel tank

♦ *Fuel tank must be empty when it is removed.*

- Unscrew nut at earth point -3- and detach earth wire.



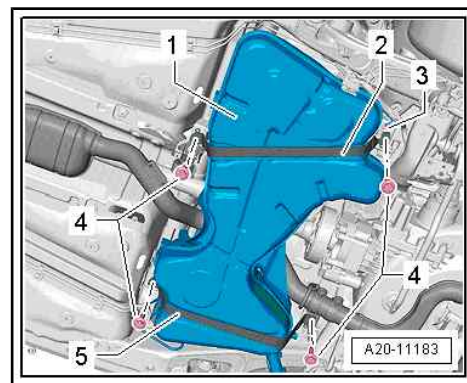
- Remove bolts -4-.



Note

The securing straps -2- and -5- are bonded to the fuel tank with adhesive but can come loose.

- Lower fuel tank -1- approx. 150 mm using engine and gearbox jack -V.A.G 1383 A- (guide tank down by hand).
- Check that no hoses or electrical wires are connected to fuel tank.
- Lower fuel tank completely.

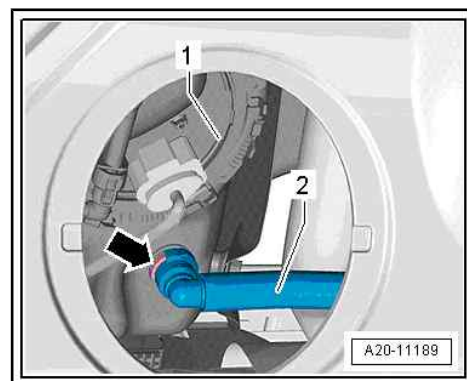


Note

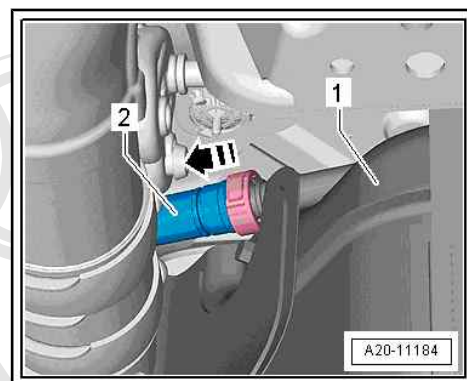
Installing

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

- Tightening torques ⇒ [page 6](#)
- Lift fuel tank to approx. 150 mm below installation position using engine and gearbox jack -V.A.G 1383 A- (guide tank by hand).
- Working from below, pivot connecting line -2- over propshaft and exhaust system into installation position and connect.

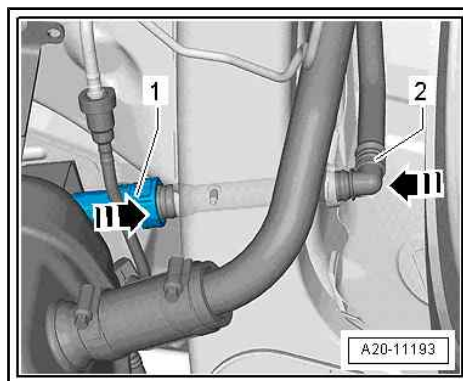


- Working from below, pivot connecting line -2- over propshaft and exhaust system into installation position and connect to connecting pipe of fuel tank -1-.
- Check that both plug-in connectors are securely seated by pulling at them.
- Carefully lift fuel tank further into installation position using engine and gearbox jack -V.A.G 1383 A- (guide tank by hand).
- Connect breather line -1- and connecting line -2-.



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- Counterhold connecting line -2- from outside.
- Check that plug-in connectors are securely seated by pulling at them.
- Connect all remaining lines.
- Position fuel tank with both securing straps on underbody.
- Use new securing bolts.
- When fitting bolts, ensure that securing straps cannot move out of position.

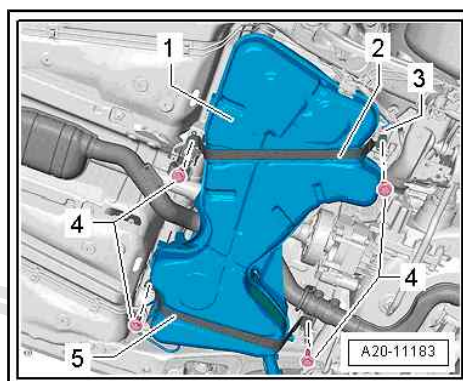


- Fit bolts -4-. Tightening torque ⇒ [page 6](#)
- Connect earth wire -3-. Connection for earth point ⇒ [page 9](#).

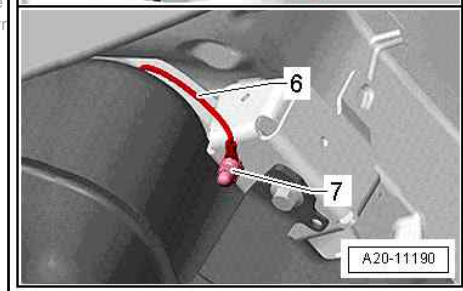
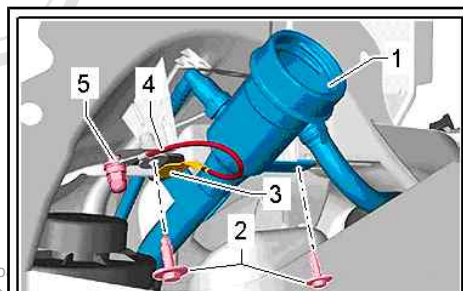

WARNING

Risk of explosion caused by electrostatic discharge.

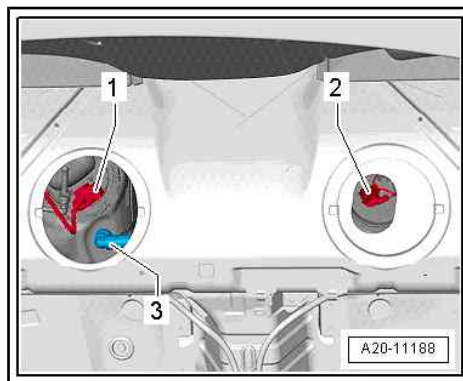
- ◆ **After installation, use an ohmmeter to check the electrical connection between the metal ring on the fuel filler neck and a bare metal part on the body:**
- **Specification: approx. 0 Ω**



- Check earth wire for traces of oxidation at connectors; remove any oxidation if necessary.
- Check connections for both earth wires -3- and -7- ⇒ [page 9](#).



- Plug in electrical connector for fuel delivery unit -1- and fuel gauge sender-2-.
- Connect battery (observe notes on procedure for connecting the battery ⇒ Electrical system; Rep. gr. 27).



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1.3.1 Removing and installing fuel filler neck

- Observe safety precautions ⇒ [page 1](#) .
- Observe rules for cleanliness ⇒ [page 4](#) .



Caution

To prevent irreparable damage to the electronic components when disconnecting the battery:

- ◆ *Observe notes on procedure for disconnecting the battery.*

Removing

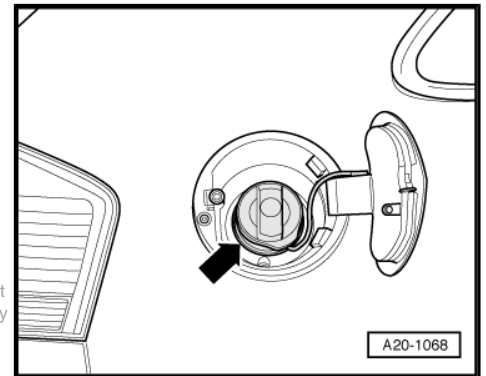
- Open flap for fuel filler neck.
- Remove filler cap -arrow- from fuel filler neck.
- Clean area around fuel filler neck.
- Disconnect earth cable from battery terminal ⇒ Electrical system; Rep. gr. 27 .



WARNING

Risk of injury: fuel system operates under high pressure.

- ◆ *To reduce the pressure in the fuel system, wrap a clean cloth around the connection and carefully loosen the connection.*



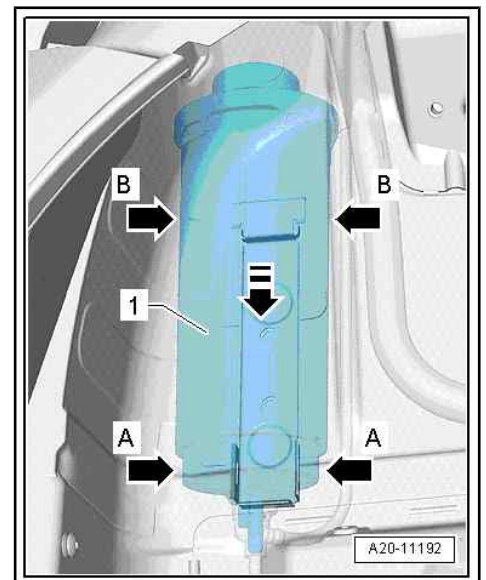
- Drain fuel tank ⇒ [page 9](#) .

Remove activated charcoal filter ⇒ [page 69](#) .

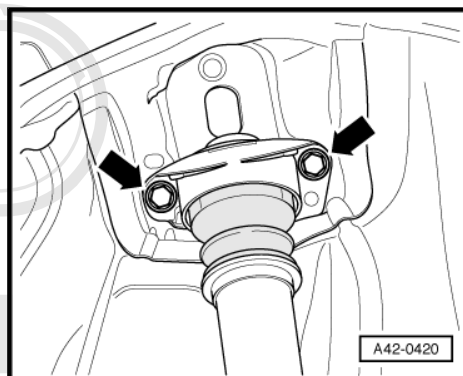


Note

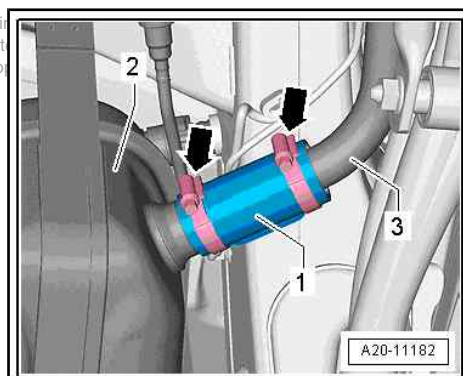
In order to obtain sufficient clearance, the rear shock absorber (right-side) must be detached at top.



- Remove bolts -arrows- securing rear shock absorber (right-side) at top.
- Take shock absorber out of guide at top.



- Open screw-type clips -arrows- and detach connecting hose -1- with fuel filler neck -3- from fuel tank -2-.

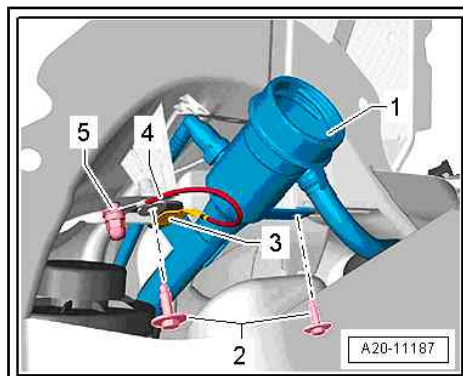


- Disconnect breather lines from fuel filler pipe.
- Unscrew bolts -arrow 2-.
- Unscrew nut securing fuel filler neck at wheel housing and detach fuel filler neck upwards.

Installing

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

- Tightening torques ⇒ „1.1 Exploded view - fuel tank“, page 6
- Installation position of earth connection
⇒ Fig. „Installation position of earth connection“, page 9
- Shock absorber at top to body ⇒ Rear suspension; Rep. gr. 42 ; Suspension strut/shock absorber, spring; Removing and installing suspension strut



2 Fuel delivery unit/fuel gauge sender

⇒ „2.1 Exploded view - fuel delivery unit/fuel gauge sender“, page 25

⇒ „2.2 Removing and installing fuel delivery unit/fuel gauge sender“, page 26

⇒ „2.3 Removing and installing fuel gauge senders“, page 32

2.1 Exploded view - fuel delivery unit/fuel gauge sender

1 - Locking ring

- ☐ 110 Nm
- ☐ Loosen and tighten with wrench -T10202-

2 - Flange

- ☐ For fuel delivery unit
- ☐ Can be disconnected from delivery unit
⇒ page 29
- ☐ Note installation position of flange on fuel tank ⇒ page 26
- ☐ With fuel filter and pressure limiting valve
⇒ page 40

3 - Fuel gauge sender -G-

- ☐ Removing and installing
⇒ page 32

4 - Fuel delivery unit

- ☐ Removing and installing
⇒ page 26
- ☐ With fuel system pressurisation pump -G6-
- ☐ Checking ⇒ page 42
- ☐ Can be disconnected from flange
⇒ page 29

5 - Seal

- ☐ Renew
- ☐ When installing, fit dry seal in fuel tank opening
- ☐ Lightly lubricate with fuel only when installing flange

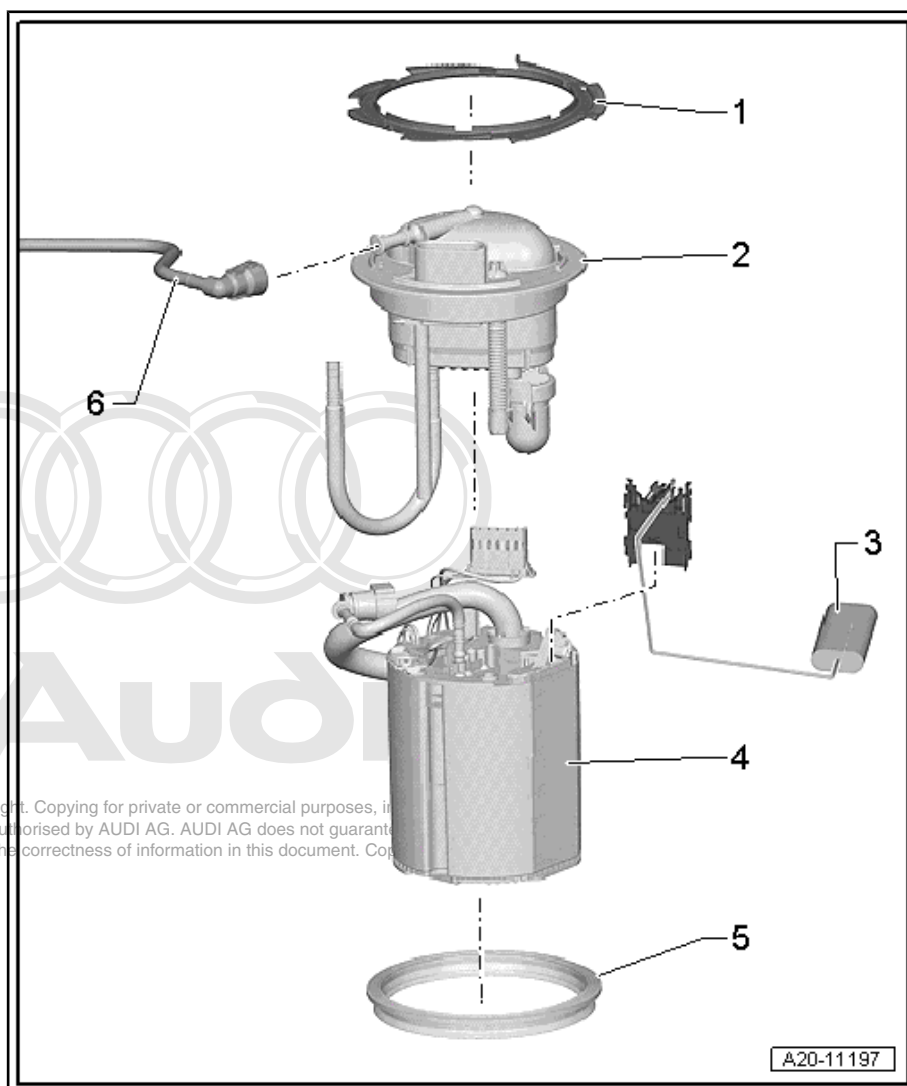
6 - Fuel line

- ☐ Black
- ☐ Clipped onto side of fuel tank



Note

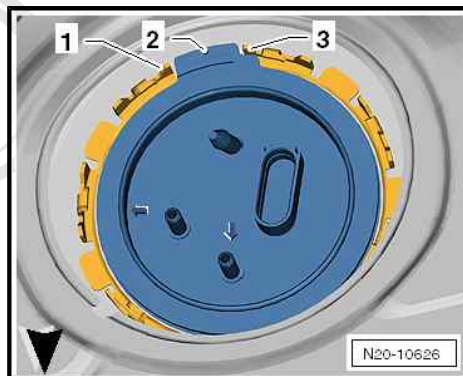
- ◆ Plug-in connectors should engage audibly when connecting.
- ◆ When installing, note colour coding ⇒ page 36.



- ◆ *Check that connection is securely seated by pulling at it.*

Fitting position of flange on fuel delivery unit

- Lug -2- on flange must be between tabs -1- and -3- on fuel tank.
- -Arrow- points in direction of travel.



2.2 Removing and installing fuel delivery unit/fuel gauge sender

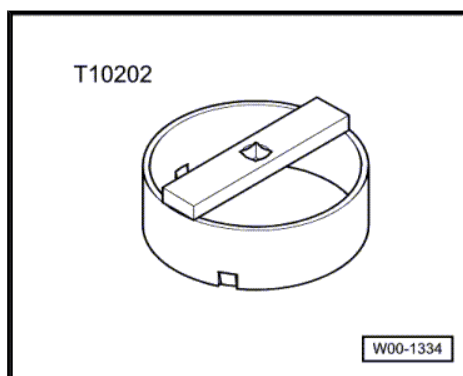


Note

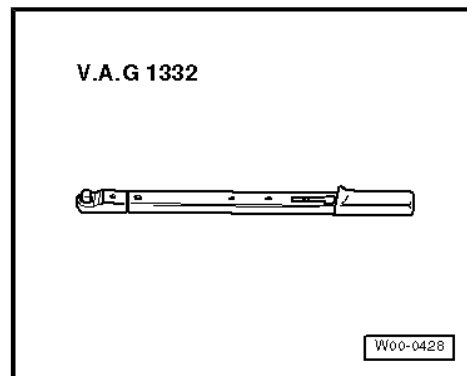
- ◆ *After removing the fuel delivery unit, check the fuel tank for dirt and clean if necessary.*
- ◆ *Hose connections are secured with spring-type or O-type clips.*
- ◆ *Replace O-type clips with spring-type clips.*
- ◆ *Fuel hoses on engine must only be secured with spring-type clips. O-type clips or screw-type clips must not be used.*
- ◆ *Hose clip pliers -VAS 6340- are recommended for fitting spring-type hose clips.*

Special tools and workshop equipment required

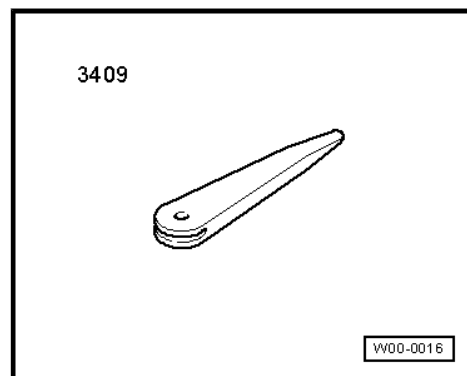
- ◆ Wrench -T10202-



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



- ◆ Removal wedge -3409-



Removing



Note

- ◆ Drain fuel tank using fuel extractor .
- ◆ Exploded view - fuel tank ⇒ [page 6](#)
- ◆ Exploded view - fuel delivery unit ⇒ [page 25](#)



WARNING

Fuel line is pressurised.

Risk of injury to eyes and skin caused by fuel.

Wear safety goggles and protective clothing to avoid possible injury and skin contact. Before removing from hose connection wrap a cloth around the connection. Then relieve pressure by carefully opening the connection.

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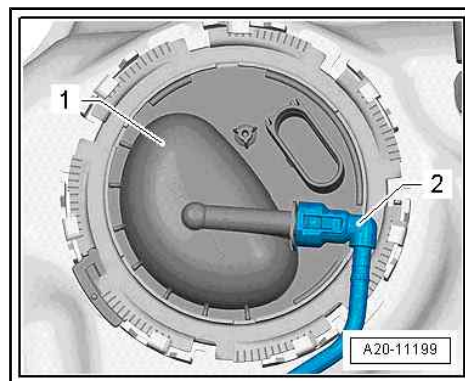
- Drain fuel tank ⇒ [page 9](#) .
- Removing fuel tank ⇒ [page 17](#) .



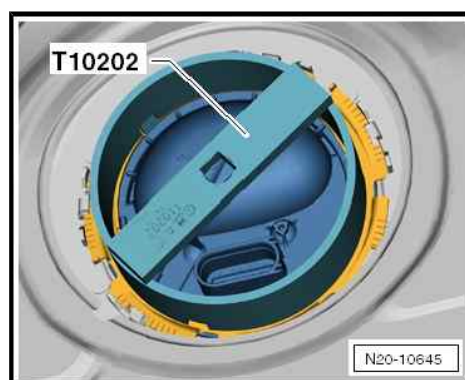
Note

Observe correct installation position of all components.

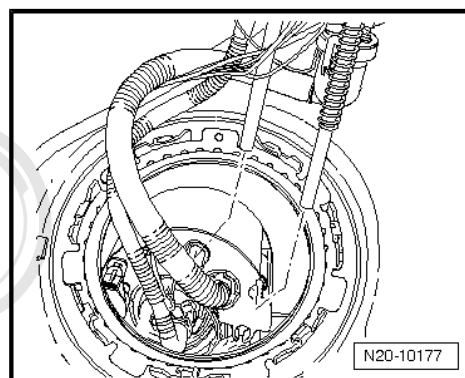
- Release and disconnect fuel line -2- at flange -1- of fuel delivery unit. Disconnecting plug-in connectors ⇒ [page 36](#)



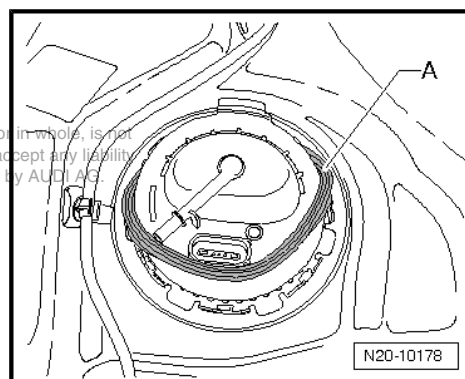
- Loosen locking ring using wrench -T10202- and lift flange slightly.



- Take flange of fuel delivery unit out of opening in fuel tank as far as possible.

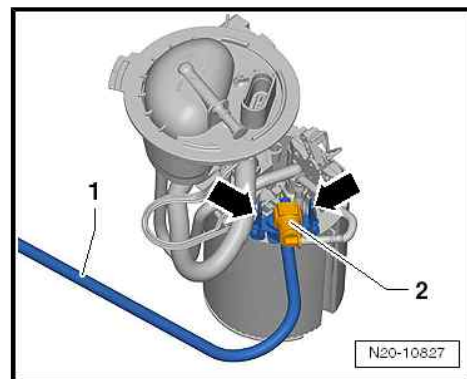


- Detach seal -A- from fuel tank and pull off over flange.



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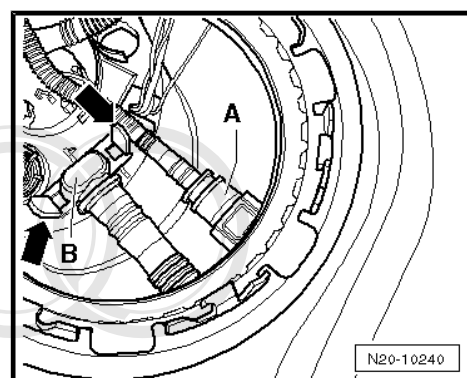
- Release and disconnect plug-in connector -2- from suction-jet pump -1-. Disconnecting plug-in connectors ⇒ [page 36](#)



- Release suction-jet pump -B- -arrows- and detach.
- Take delivery unit out of fuel tank via opening in tank.

i Note

- ◆ If the delivery unit is to be renewed, drain old delivery unit before disposal.
- ◆ Please observe requirements for disposal.



Separating flange and fuel delivery unit

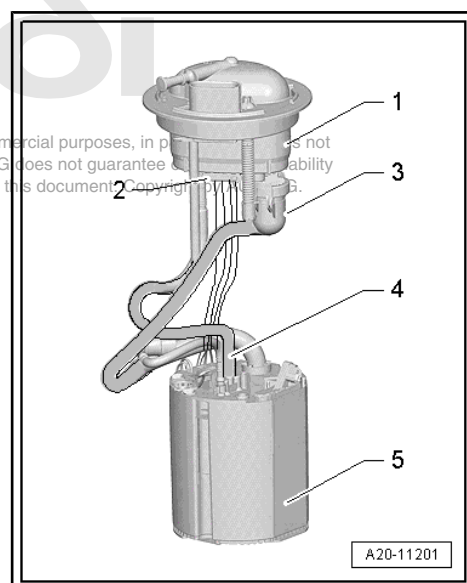
- Release connector -2- at flange -1- and unplug.
- Disconnect fuel line -3- at flange -1-. Disconnecting plug-in connectors ⇒ [page 36](#)
- Disconnect fuel line -4- at fuel delivery unit -5-. Disconnecting plug-in connectors ⇒ [page 36](#)

Installing

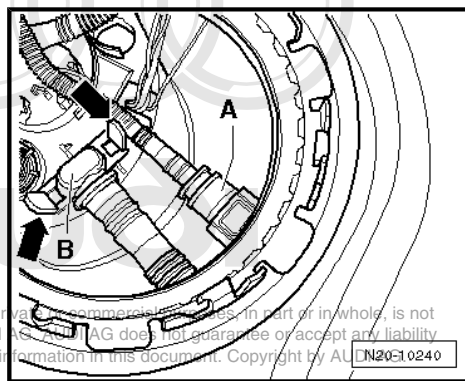
Install in reverse order. Note the following:

i Note

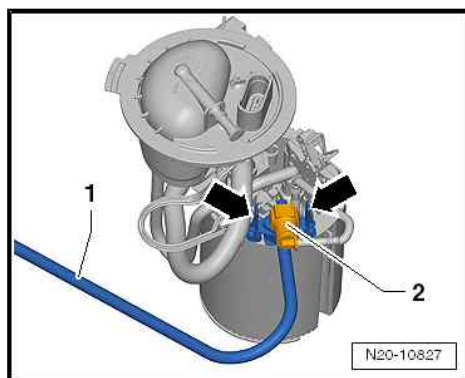
- ◆ Observe correct installation position of all components.
 - ◆ Plug-in connectors should engage audibly when connecting.
 - ◆ When installing, note colour coding of plug-in connectors ⇒ [page 36](#).
 - ◆ Check that plug-in connector is securely seated by pulling at it.
- Fit fuel delivery unit without flange, taking care not to bend the fuel gauge sender.



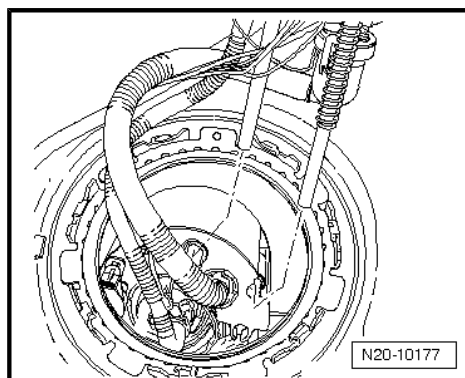
- Connect suction-jet pump -B-.



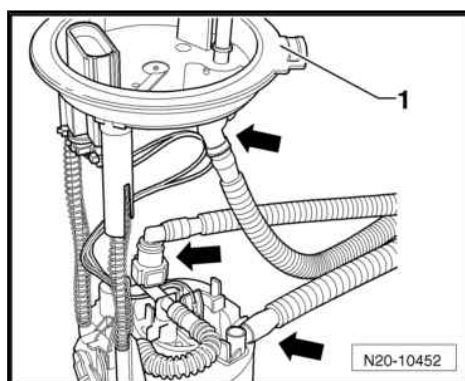
- Connect plug-in connector -2- to suction-jet pump -1-.



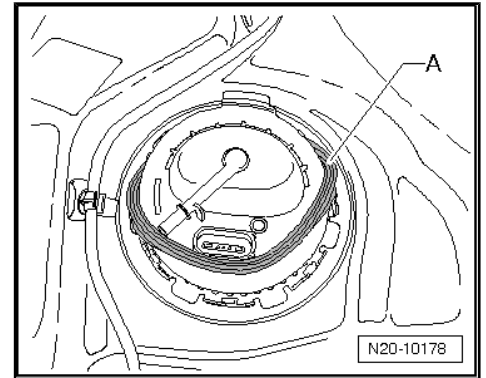
- Fit flange onto delivery unit.



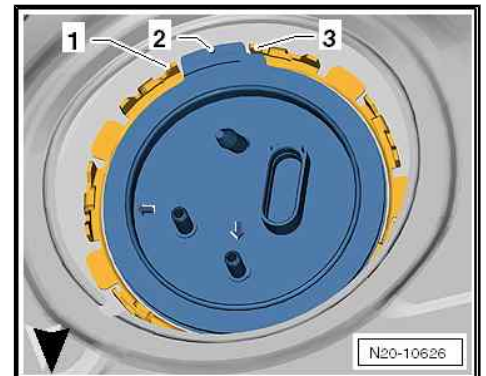
- Check that flange -1- is seated correctly on fuel delivery unit.



- Pull seal -A- over flange and insert into opening in fuel tank.
- Fit dry seal for fuel delivery unit into opening in fuel tank.
- Lubricate inside of seal with fuel.

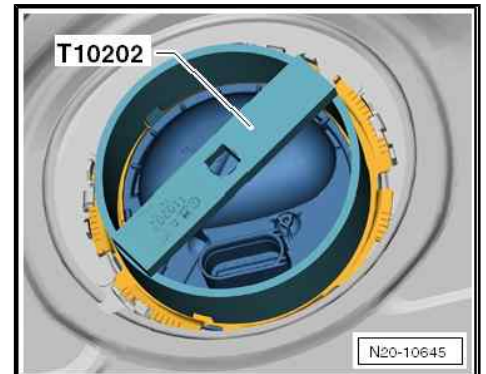


- Press flange down against spring pressure and turn flange to installation position.
- Lug -2- on flange must be between tabs -1- and -3- on fuel tank.
- The -arrow- points in direction of travel.

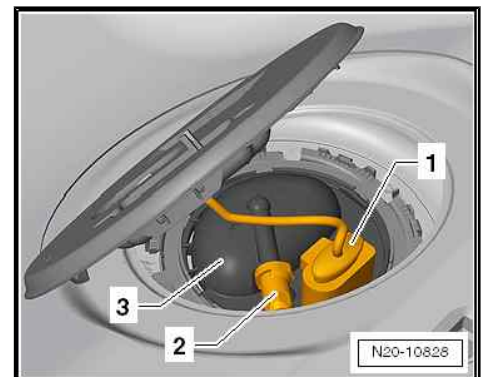


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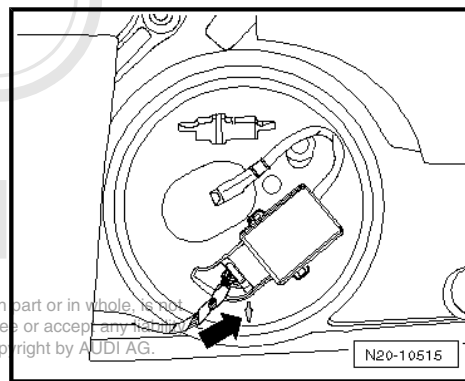
- Tighten locking ring using wrench -T10202-
⇒ [Item 1 \(page 25\)](#) .



- Connect fuel lines -2-.
- Check that plug-in connector is securely seated by pulling at it.
- Install fuel tank ⇒ [page 17](#) .



- ◆ -Arrow- on cover points in direction of travel.



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2.3 Removing and installing fuel gauge senders

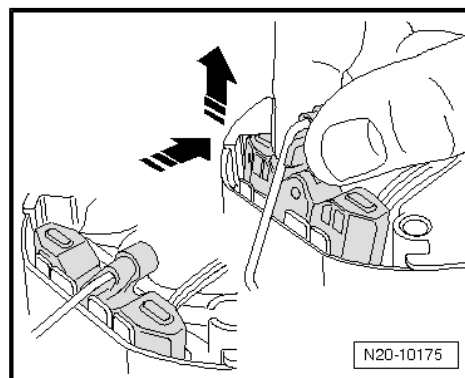
⇒ „2.3.1 Removing and installing fuel gauge sender G“, page 32

⇒ „2.3.2 Removing and installing fuel gauge sender 2 G169“, page 33

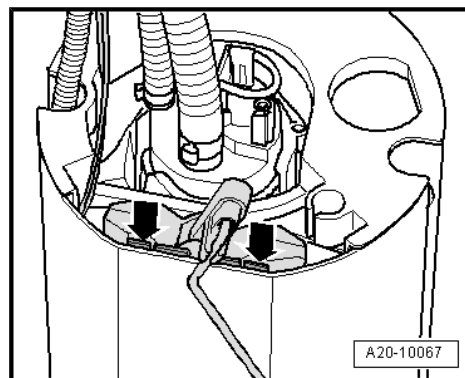
2.3.1 Removing and installing fuel gauge sender -G-

Removing:

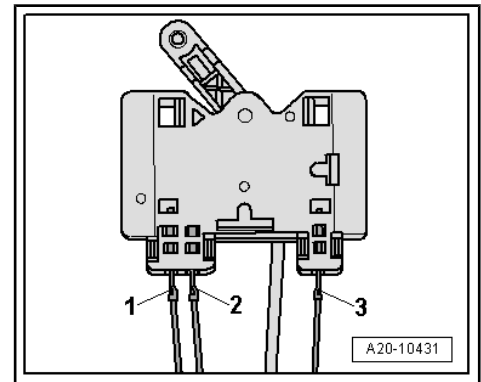
- Remove fuel delivery unit ⇒ page 26 .
- Pull fuel gauge sender -G- slightly to side and upwards simultaneously.



- If sender cannot be released in this manner, press retaining tabs -arrows- slightly to one side.
- Note colour coding of cables for re-installation.

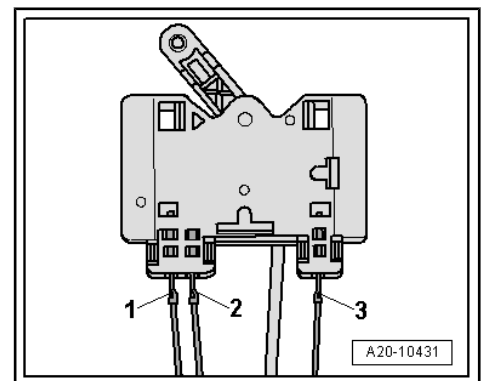


- Release and unplug electrical connectors -1...3- and bend back retaining hooks of connectors.



Installing:

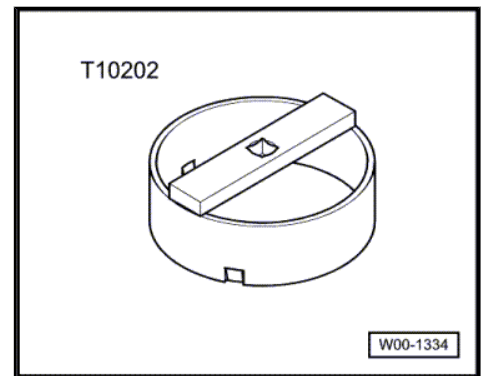
- Connect electrical connectors -1...3-. Observe colour coding.
- Check that connectors are securely seated by pulling at them.
- Insert fuel gauge sender -G- into guide on fuel delivery unit and press downwards until it clicks into place.
- Install fuel delivery unit ⇒ [page 29](#) .
- Secure locking ring ⇒ [Item 1 \(page 25\)](#) .



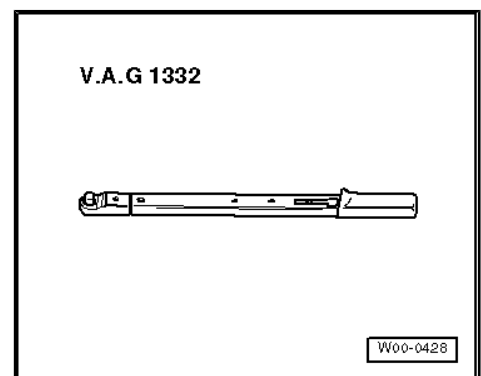
2.3.2 Removing and installing fuel gauge sender 2 -G169-

Special tools and workshop equipment required

- ◆ Wrench -T10202-



- ◆ Torque wrench -V.A.G 1332-

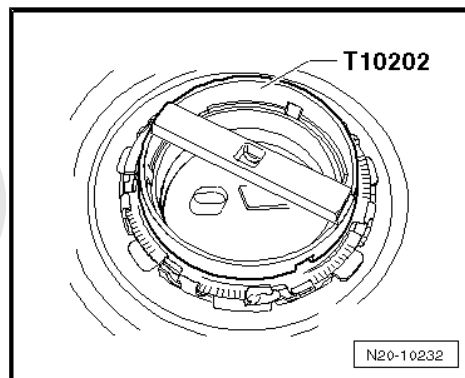


Procedure:



Note

- ◆ Exploded view - fuel tank ⇒ [page 6](#)
- ◆ Make sure you do not bend float arm of fuel gauge sender 2 - G169- .
- Drain fuel tank ⇒ [page 9](#) .
- Removing fuel tank ⇒ [page 17](#) .
- Open locking ring using wrench -T10202- .



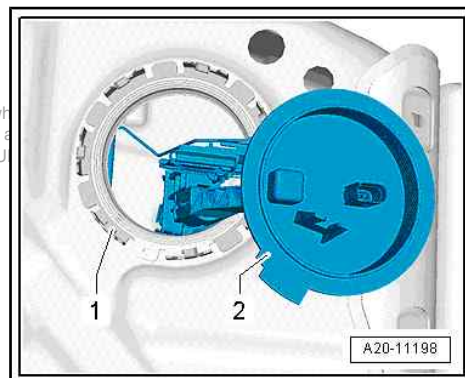
- Pull fuel gauge sender 2 -G169- -2- upwards out of fuel tank -1-.



Note

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Make sure you do not bend float arm of fuel gauge sender 2 - G169- .



Installing

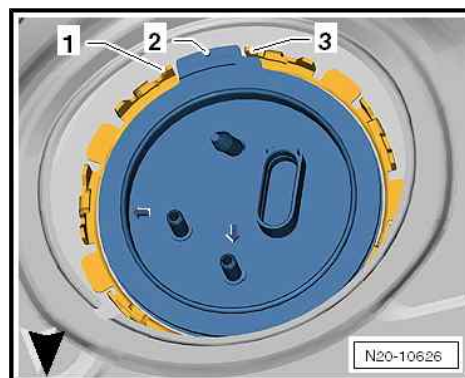
Install in reverse order. Note the following:



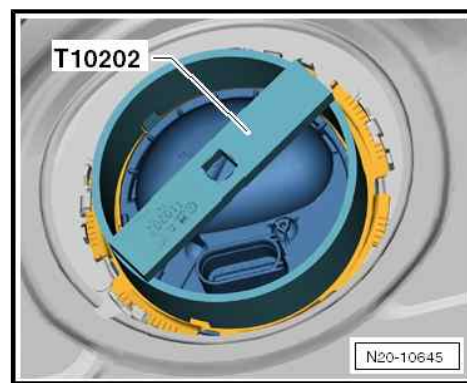
Caution

When installing, do not bend float arm of fuel gauge sender 2 -G169- .

- Insert fuel gauge sender 2 -G169- in fuel tank.
- Fit dry seal for fuel delivery unit into opening in fuel tank.
- Lubricate inside of seal with fuel.
- Press flange down against spring pressure and turn flange to installation position.
- Lug -2- on flange must be between tabs -1- and -3- on fuel tank.
- The -arrow- points in direction of travel.



- Tighten locking ring using wrench -T10202-
⇒ [Item 1 \(page 25\)](#) .
- Install fuel tank ⇒ [page 17](#) .

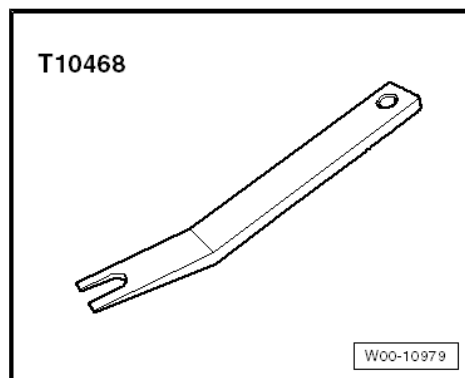


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3 Disconnecting plug-in connectors

Special tools and workshop equipment required

- ◆ Lever -T10468-



Allocation of plug-in connectors



Note

- ◆ The plug-in connectors for the fuel lines, vacuum lines, and breather lines are colour coded. There is either a coloured marking on the plug-in connector, or the release tab is the corresponding colour.
- ◆ Plug-in connectors should engage audibly when connecting.
- ◆ Check that plug-in connector is securely seated by pulling at it.

Plug-in connector	Colour coding on plug-in connector
Fuel supply	Black
Fuel return line	Blue
Breather	White-beige
Vacuum	Green



WARNING

Fuel supply line is pressurised. Wear safety goggles and protective clothing to avoid possible injury and skin contact. Before removing from hose connection wrap a cloth around the connection. Then release pressure by carefully pulling hose off connection.

Version 1

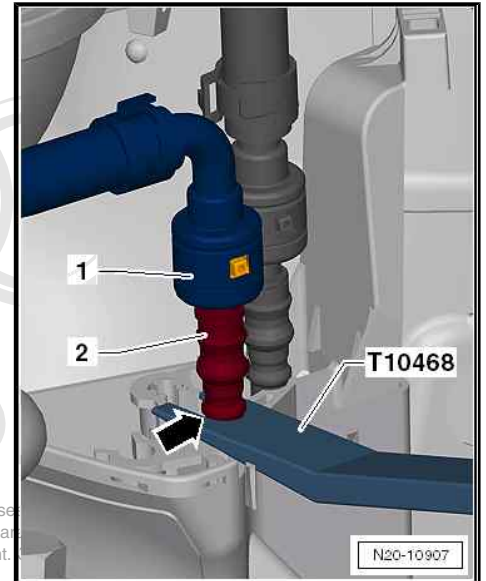
Plug-in connector with release tabs -arrows- on both sides



Disconnecting

Counter-hold connection point for fuel -1- in engine compartment.

- Insert lever -T10468- between heat shield and stop -arrow- of fuel line -2- and counter-hold.



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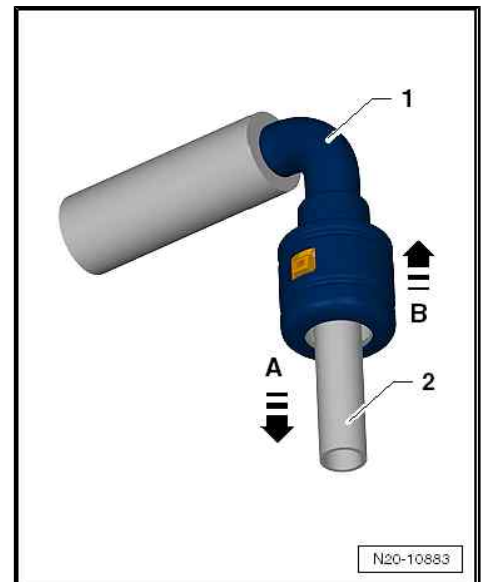
Continued for all connection points in fuel system

- Press plug-in connector -1- in direction of -arrow A-.
- Press and hold release tabs.
- Unplug plug-in connector -1- from fuel line -2- in direction of -arrow B-.

When installing observe colour coding ⇒ [page 36](#) .

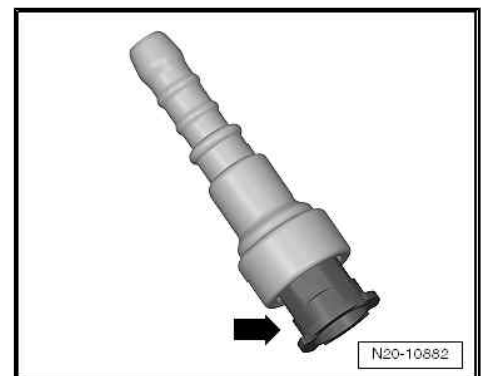
Plug-in connectors should engage audibly when connecting.

- Check that plug-in connector is securely seated by pulling at it.



Version 2

Plug-in connector with pull release -arrow-



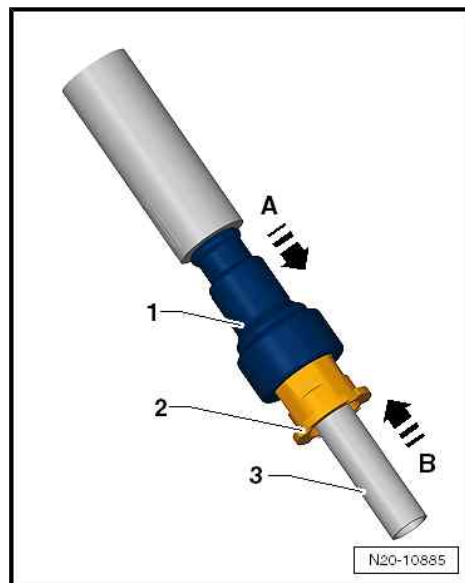
Disconnecting

- Press plug-in connector -1- in direction of -arrow A-.
- Pull the pull release catch -2- in direction of -arrow B-.
- Unplug plug-in connector -1- from fuel line -3- in direction of -arrow B-.

When installing observe colour coding ⇒ [page 36](#) .

Plug-in connectors should engage audibly when connecting.

- Check that plug-in connector is securely seated by pulling at it.



Version 3

Plug-in connector with release tab at front -arrow-

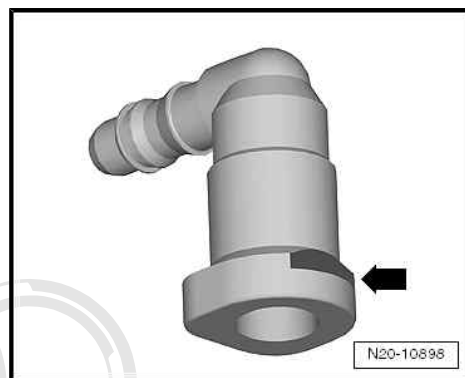
Disconnecting

- Press release tab -arrow- and disconnect plug-in connectors.

When installing observe colour coding ⇒ [page 36](#) .

Plug-in connectors should engage audibly when connecting.

- Check that plug-in connector is securely seated by pulling at it.



Version 4

Plug-in connector with release tab -arrows- on both sides

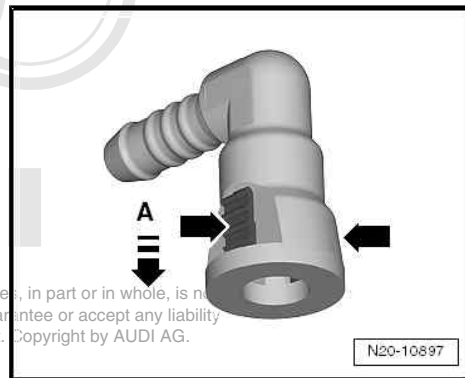
Disconnecting

- Press plug-in connector in direction of -arrow A-.
- Press release tabs -arrows- and disconnect plug-in connector.

When installing observe colour coding ⇒ [page 36](#) .

Plug-in connectors should engage audibly when connecting.

- Check that plug-in connector is securely seated by pulling at it.



Version 5

Plug-in connector with release tabs -arrows- on both sides

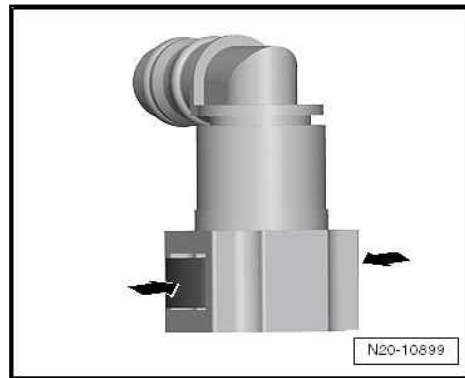
Disconnecting

- Press release tabs -arrows- and disconnect plug-in connector.

When installing observe colour coding ⇒ [page 36](#) .

Plug-in connectors should engage audibly when connecting.

- Check that plug-in connector is securely seated by pulling at it.



Version 6

Plug-in connector with release tabs -arrows- on both sides

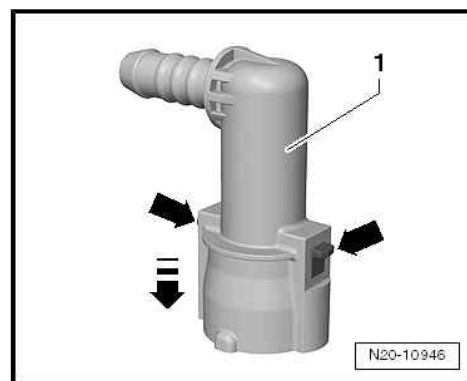
Disconnecting

- Press and hold plug-in connector -1- in direction of -arrow -.
- Press release tabs -arrows- and disconnect plug-in connector.

When installing observe colour coding ⇒ [page 36](#) .

Plug-in connectors should engage audibly when connecting.

- Check that plug-in connector is securely seated by pulling at it.



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4 Fuel filter



Note

- ◆ *The pressure limiting valve and the fuel filter are integrated in the flange of the fuel supply unit and cannot be renewed separately.*
- ◆ *Renewing flange of fuel delivery unit ⇒ [page 26](#)*
- ◆ *Plug-in connectors should engage audibly when connecting.*
- ◆ *When installing, note colour coding of plug-in connectors ⇒ [page 36](#).*
- ◆ *Check that plug-in connector is securely seated by pulling at it.*
- ◆ *Disconnecting plug-in connectors ⇒ [page 36](#)*



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5 Bleeding fuel system

- ◆ Due to the design of the engine, with a fuel system pressurisation pump located in the fuel tank, it is not necessary to bleed the fuel system.
- ◆ The fuel system bleeds itself when the starter is operated.



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6 Fuel pump

⇒ „6.1 Check fuel pump“, page 42

⇒ „6.2 Removing and installing suction-jet pump“, page 62

6.1 Check fuel pump

⇒ „6.1.1 Checking function and voltage supply“, page 42

⇒ „6.1.2 Checking fuel pressure“, page 45

⇒ „6.1.3 Checking residual pressure“, page 49

⇒ „6.1.4 Checking fuel delivery rate“, page 52

⇒ „6.1.5 Checking current draw“, page 57

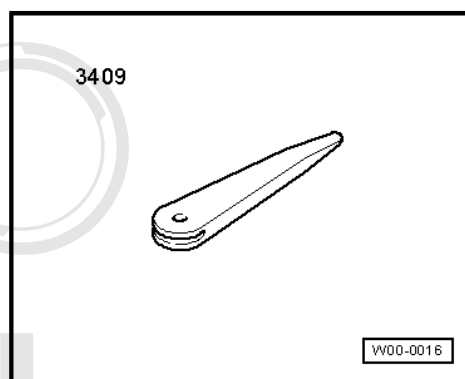
⇒ „6.1.6 Checking fuel pump control unit J538“, page 60

⇒ „6.1.7 Removing and installing fuel pump control unit J538“, page 60

6.1.1 Checking function and voltage supply

Special tools and workshop equipment required

◆ Removal wedge -3409-



◆ Multimeter, e.g. hand-held multimeter -V.A.G 1526E-

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◆ Vehicle diagnostic tester

Test conditions:

- Battery voltage at least 11.5 V.
- Fuse for fuel pump control unit -J538- OK.
- Fuel pump control unit -J538- OK.

Test sequence:

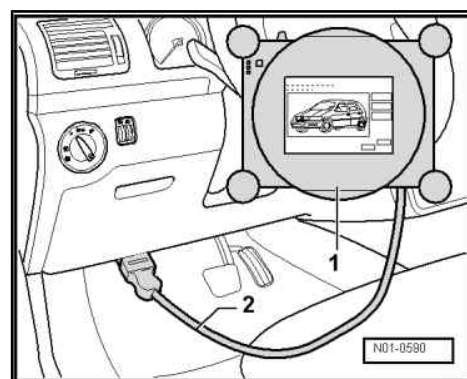


Note

- ◆ The function of the fuel pump is tested using the final control diagnosis.
- ◆ Plug-in connectors should engage audibly when connecting.
- ◆ When installing, note colour coding of plug-in connectors ⇒ [page 36](#).
- ◆ Check that plug-in connector is securely seated by pulling at it.
- ◆ Disconnecting plug-in connectors ⇒ [page 36](#)

- Connect vehicle diagnostic tester as follows:
- Plug connector for diagnostic cable into diagnostic connection in driver's footwell.
- Switch on ignition.
- Press buttons on touch screen for Vehicle self-diagnosis, then Engine electronics, then Final control diagnosis.
- Press right-hand arrow button on touch screen until tester advances to final control diagnosis of fuel pump electronics.

The fuel pump must now run up slowly to maximum speed.



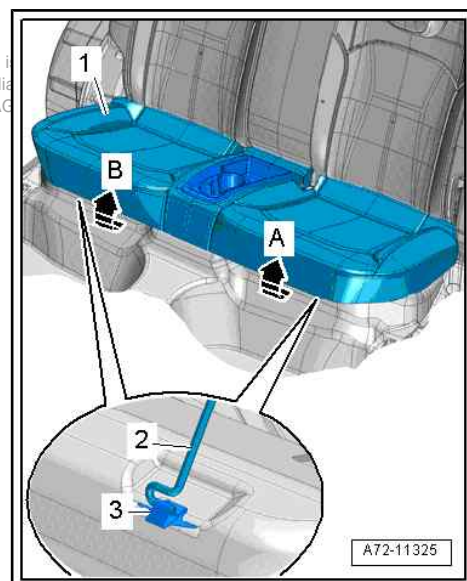
Note

The fuel pump runs very quietly.

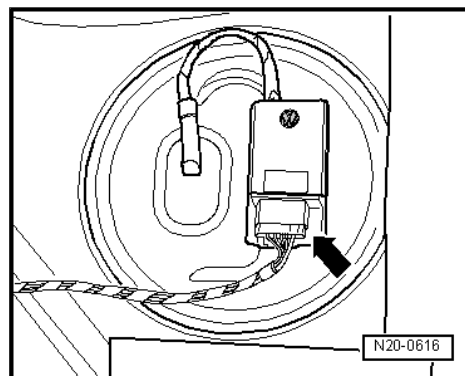
- Switch off ignition.

If fuel pump does not start running:

- Remove seat bench or fold upwards ⇒ General body repairs, interior; Rep. gr. 72 : Rear seats: Removing and installing seat bench/individual seats
- If fitted, unfasten carpet and fold upwards.



- Check that plug -arrow- is securely seated by pulling on plug without pressing retainer. If connector was not seated correctly, repeat test of fuel pump function.
- Unplug connector -arrow- from fuel pump control unit -J538- .
- Check contacts on connector and on fuel delivery unit for damage.

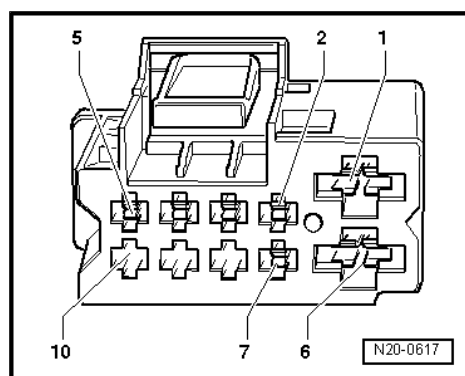


- Check voltage supply between contacts -1- and -6- using multimeter .
- Specification: approx. battery voltage

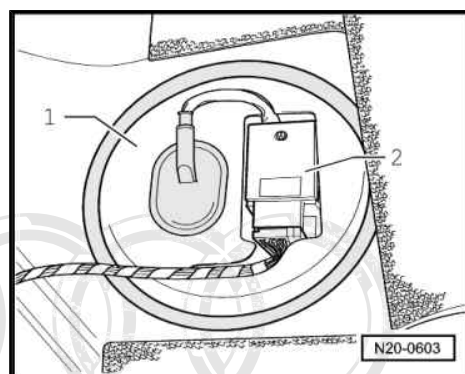
If voltage supply is not OK:

- Locate and eliminate open circuit using current flow diagram
⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

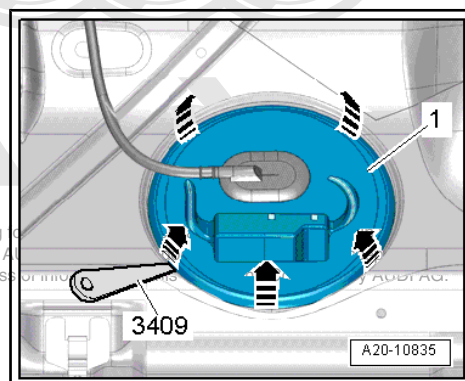
If voltage supply is OK:



- Detach cover (right-side) with fuel pump control unit -J538-2- from assembly opening above fuel delivery unit.



- To do so, unclip cover (right-side) -1- at retainers -arrows- using removal wedge -3409- .



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- Check that connector -1- is securely seated by pulling on it without pressing retainer. If connector was not seated correctly, repeat test of fuel pump function.
- Release connector -1- and unplug.
- Check contacts on connector and on fuel delivery unit for damage.

If no faults are visible:

Remove fuel delivery unit to perform check ⇒ [page 26](#) .

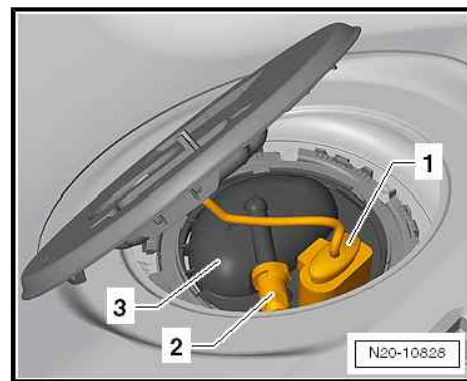


WARNING

Fuel line is pressurised.

Risk of injury to eyes and skin caused by fuel.

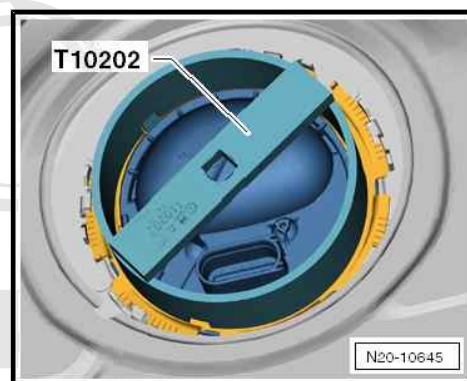
Wear safety goggles and protective clothing to avoid possible injury and skin contact. Before removing from hose connection wrap a cloth around the connection. Then dissipate pressure by carefully opening the connection.



- Remove fuel tank ⇒ [page 17](#) .
- Open locking ring using wrench -T10202- .
- Check that electrical wiring between flange and fuel pump is connected.
- Check contacts for damage.

If no open circuits are found:

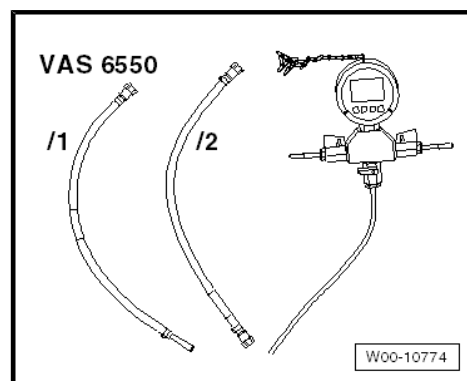
- Renew fuel delivery unit ⇒ [page 26](#) .



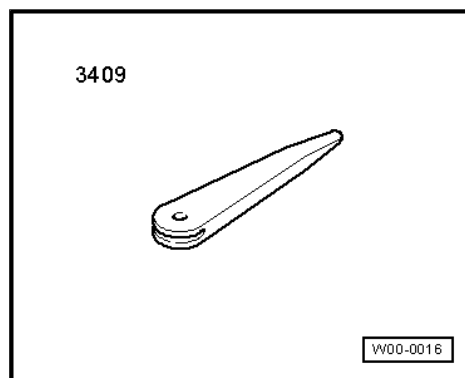
6.1.2 Checking fuel pressure

Special tools and workshop equipment required

- ◆ Pressure tester -VAS 6550-



◆ Removal wedge -3409-



◆ Vehicle diagnostic tester



WARNING

Fuel line is pressurised.

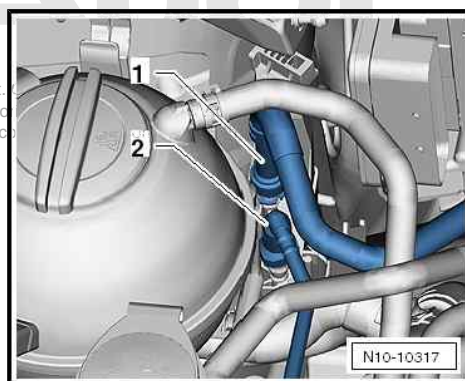
Risk of injury to eyes and skin caused by fuel.

Wear safety goggles and protective clothing to avoid possible injury and skin contact. Before removing from hose connection wrap a cloth around the connection. Then dissipate pressure by carefully opening the connection.



Note

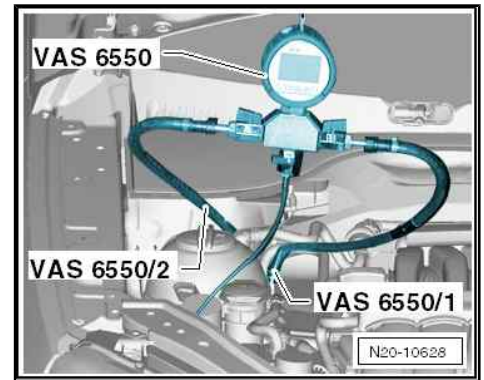
- ◆ Plug-in connectors should engage audibly when connecting.
- ◆ When installing, note colour coding of plug-in connectors ⇒ [page 36](#).
- ◆ Check that plug-in connector is securely seated by pulling at it.
- ◆ Disconnecting plug-in connectors ⇒ [page 36](#)
- If voltage supply is OK:
- Disconnect supply line (metal connection) -1-. Use a cloth to catch escaping fuel. Disconnecting plug-in connectors ⇒ [page 36](#)



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- Connect pressure tester -VAS 6550- with adapters -VAS 6550/1- and -VAS 6550/2- to fuel supply line.

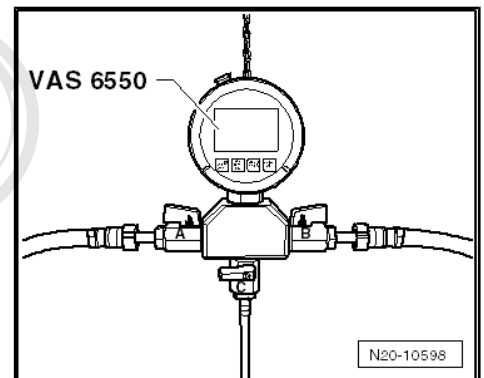


- Make sure that drain tap -C- is closed and cut-off valves -A- and -B- are open.
- Use final control diagnosis to activate fuel pump; this will allow fuel pressure to build up.
- Read fuel pressure off pressure tester.
- Specification: 4.0 ... 7.0 bar

Fuel pressure OK, checking residual pressure ⇒ [page 49](#)

If specification is exceeded:

- Pressure limiting valve in flange of fuel delivery unit is defective.



Note

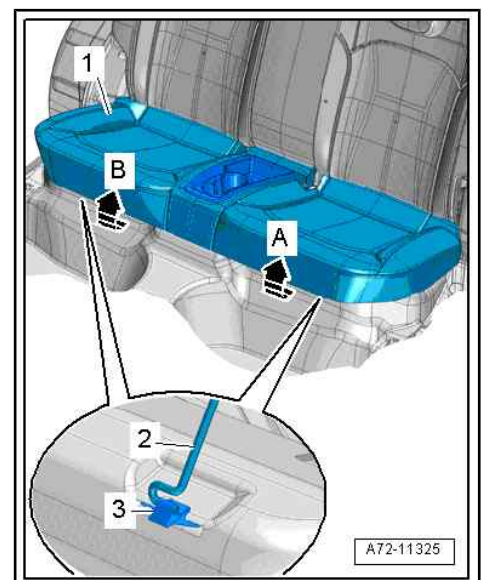
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The pressure limiting valve and the fuel filter are integrated in the flange of the fuel supply unit and cannot be renewed separately.

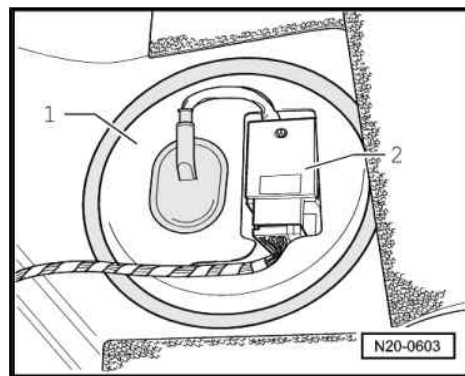
- Renewing flange of fuel delivery unit ⇒ [page 26](#)

If specification is not obtained:

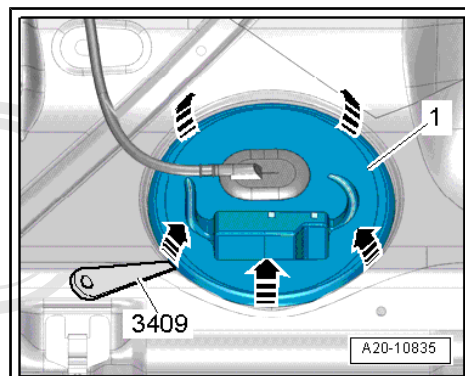
- Remove seat bench or fold upwards ⇒ General body repairs, interior; Rep. gr. 72 ; Rear seats; Removing and installing seat bench/individual seats .
- If fitted, unfasten carpet and fold upwards.



- Detach cover (right-side) with fuel pump control unit -J538- -2- from assembly opening above fuel delivery unit.

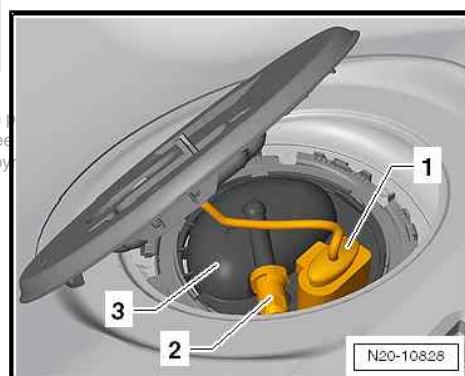


- To do so, unclip cover (right-side) -1- at retainers -arrows- using removal wedge -3409- .



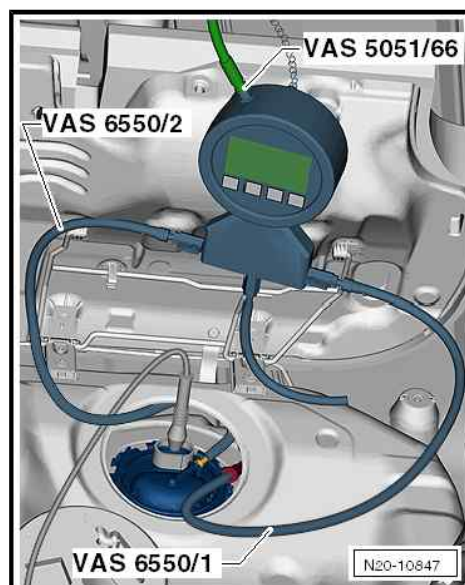
- Disconnect fuel line -2-. Disconnecting plug-in connectors
⇒ [page 36](#)

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- Connect pressure tester -VAS 6550- with adapter -VAS 6550/1- and adapter -VAS 6550/2- between fuel line and fuel delivery unit.

- ◆ VAS 6550/1 between fuel line and cut-off valve -B-
- ◆ VAS 6550/2 between fuel delivery unit and cut-off valve -A-



- Make sure that drain tap -C- is closed and cut-off valves -A- and -B- are open.
- Use final control diagnosis to activate fuel pumps; this will allow fuel pressure to build up.

If specification is obtained:

- Check fuel lines for any restrictions (kinks) or blockages.

If specification is not obtained:

- Remove fuel delivery unit → [page 26](#) and check for dirt.

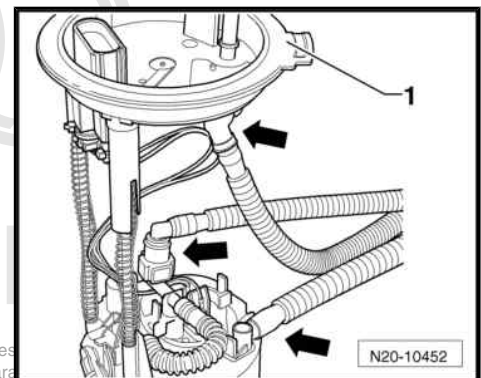
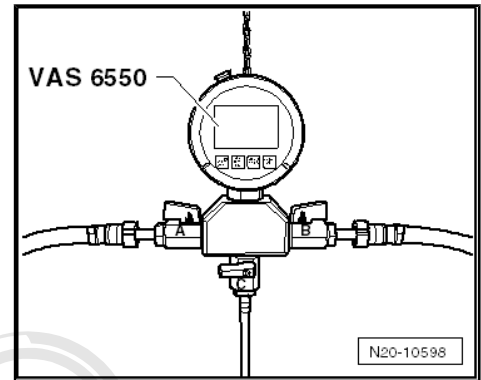
- Check that all hoses are connected -arrows-.

If no fault is found:

- Renew flange of fuel delivery unit together with fuel filter and pressure limiting valve.

If the specification is still not obtained:

- Fuel pump is defective; renew fuel delivery unit → [page 26](#).

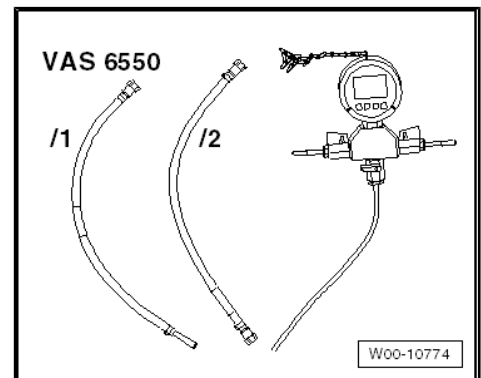


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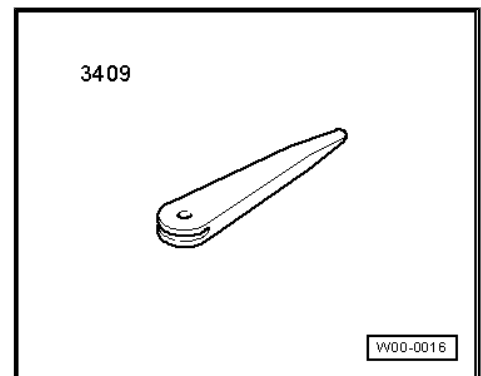
6.1.3 Checking residual pressure

Special tools and workshop equipment required

- ◆ Pressure tester -VAS 6550-



- ◆ Removal wedge -3409-



- ◆ Vehicle diagnostic tester



Note

- ◆ *Plug-in connectors should engage audibly when connecting.*
- ◆ *When installing, note colour coding of plug-in connectors
⇒ [page 36](#).*
- ◆ *Check that plug-in connector is securely seated by pulling at it.*
- ◆ *Disconnecting plug-in connectors ⇒ [page 36](#)*
- Fuel pressure is OK and pressure gauge -VAS 6550- is connected. Checking fuel pressure ⇒ [page 45](#)

Test sequence:

- Use final control diagnosis to activate fuel pumps; this will allow fuel pressure to build up.
- Read fuel pressure off pressure tester.
- Specification: 4.0 ... 7.0 bar
- Observe pressure drop on pressure gauge. After 10 minutes pressure should not drop below 3.0 bar.

If pressure drops further:

- Use final control diagnosis to activate fuel pump; this will allow fuel pressure to build up.
- Close cut-off valve -B- on pressure tester immediately once pressure has built up. Lever then points perpendicular to throughflow direction.

If pressure now no longer drops:



Note

Look for leak at engine side. Repeat residual pressure test. Close the cut-off valve -A- this time to find out if there really is a leak on the engine side.

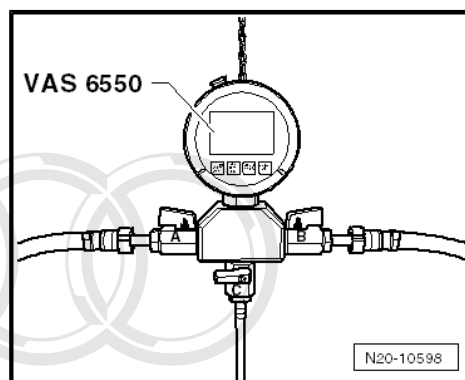
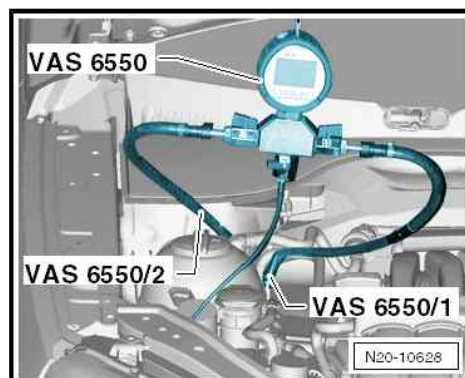
- Check fuel pipe connected to high-pressure pump for leaks.

If no fault is found:

- Renew high-pressure pump ⇒ Mixture preparation - injection; Rep. gr. 24 ; High-pressure pump; Removing and installing high-pressure pump .

If the pressure drops again:

Look for leak on fuel tank side; to do so, proceed as follows.

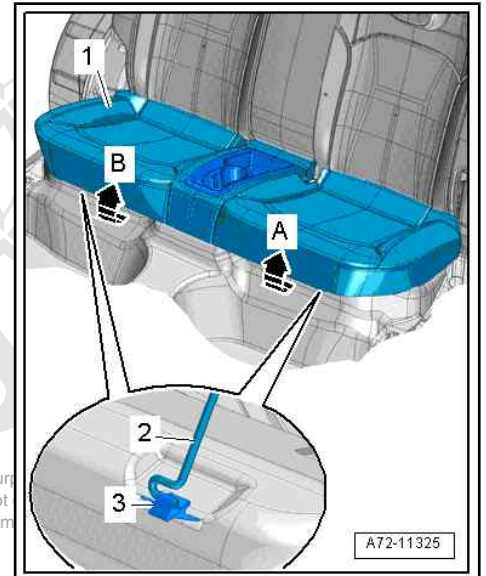


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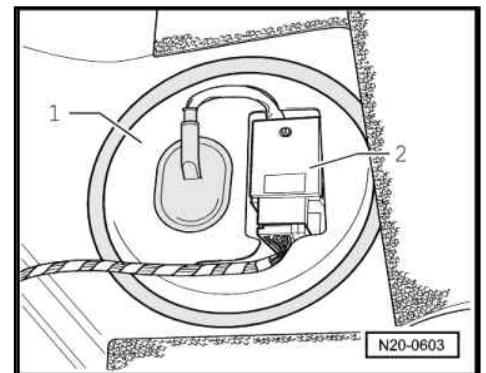
Checking residual pressure at flange for delivery unit

- Remove seat bench or fold upwards ⇒ General body repairs, interior; Rep. gr. 72 ; Rear seats; Removing and installing seat bench/individual seats .
- If fitted, unfasten carpet and fold upwards.

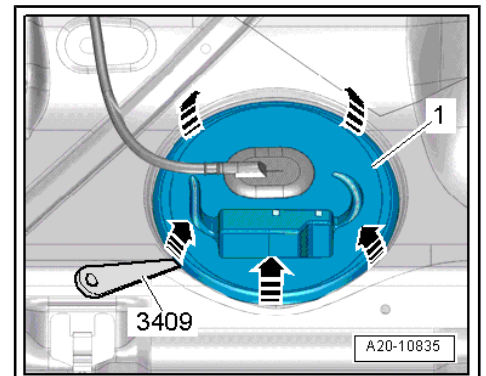
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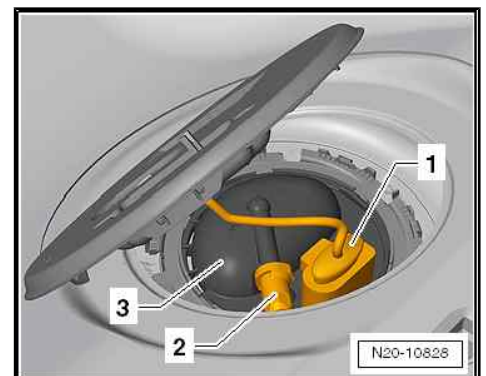
- Detach cover (right-side) with fuel pump control unit -J538- -2- from assembly opening above fuel delivery unit.



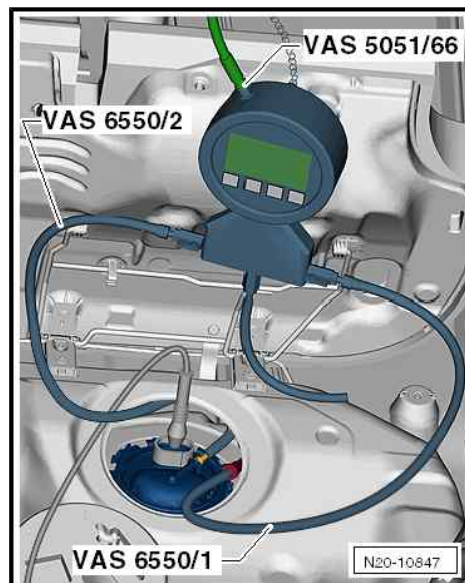
- To do so, unclip cover (right-side) -1- at retainers -arrows- using removal wedge -3409- .



- Disconnect fuel line -2-. Disconnecting plug-in connectors ⇒ [page 36](#)



- Connect pressure tester -VAS 6550- with adapter -VAS 6550/1- and adapter -VAS 6550/2- between fuel line and fuel delivery unit.
- ◆ VAS 6550/1 between fuel line and cut-off valve -B-
- ◆ VAS 6550/2 between fuel delivery unit and cut-off valve -A-



- Make sure that drain tap -C- is closed and cut-off valves -A- and -B- are open.
- Use final control diagnosis to activate fuel pumps; this will allow fuel pressure to build up.
- Close cut-off valve -B- on pressure tester immediately once pressure has built up. Lever then points perpendicular to throughflow direction.
- Check residual pressure again.

If pressure does not drop further:

- Check fuel line connected to fuel tank for leaks.

If no fault is found on fuel line:

- Open flange of fuel delivery unit -1- ⇒ [page 26](#) .
- Check that all hoses -arrows- are connected.

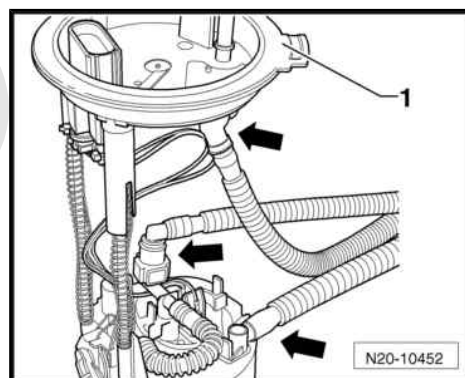
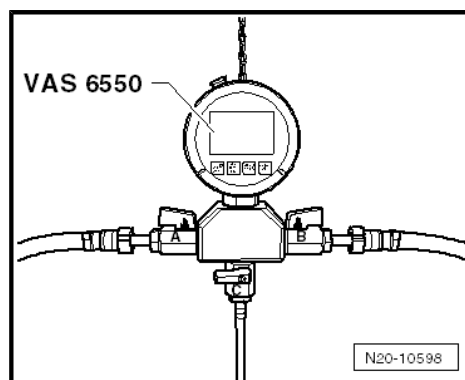
If no fault is found:

Pressure limiting valve in flange of fuel delivery unit or pressure retention valve in fuel pump is leaking.

- First renew flange with fuel filter and check residual pressure again.

If leak persists:

- Renew fuel delivery unit ⇒ [page 26](#) .

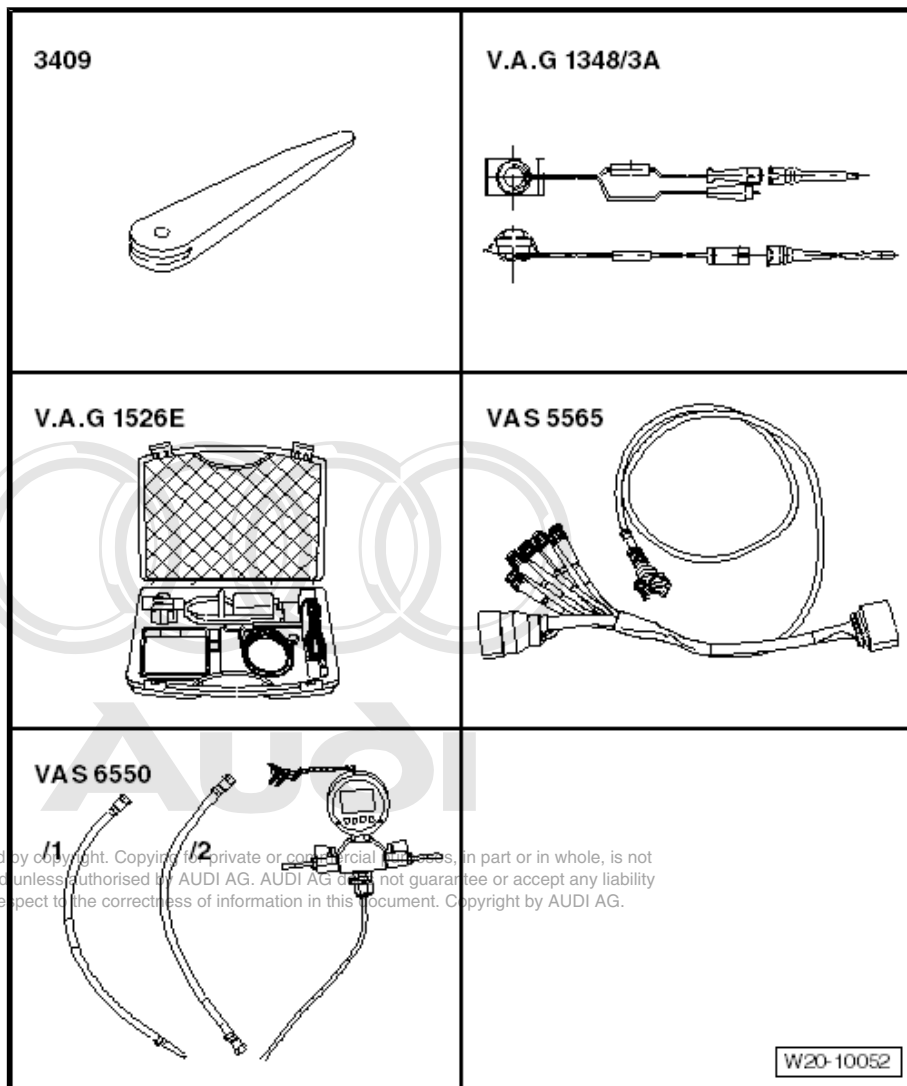


6.1.4 Checking fuel delivery rate

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Special tools and workshop equipment required

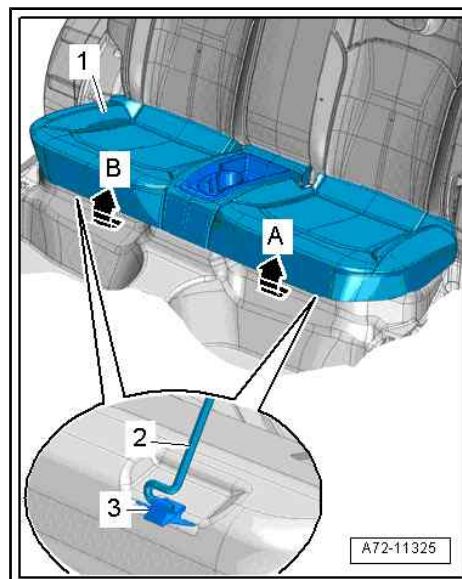
- ◆ Removal wedge -3409-
- ◆ Remote control for V.A.G 1348 -V.A.G 1348/3A-
- ◆ Multimeter, e.g. hand-held multimeter -V.A.G 1526E-
- ◆ Test instrument adapter/ DSO (5-pin) -VAS 5565-
- ◆ Pressure tester -VAS 6550-
- ◆ Vehicle diagnostic tester
- ◆ Measuring container, 3 litre capacity



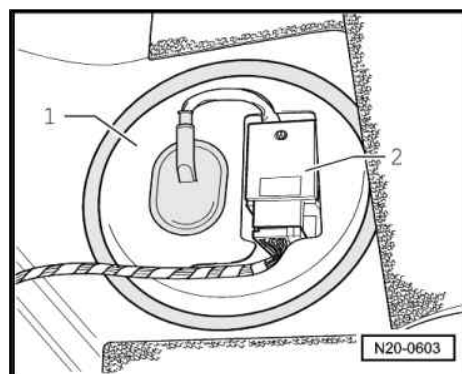
Note

- ◆ *Plug-in connectors should engage audibly when connecting.*
- ◆ *When installing, note colour coding of plug-in connectors ⇒ [page 36](#).*
- ◆ *Check that plug-in connector is securely seated by pulling at it.*
- ◆ *Disconnecting plug-in connectors ⇒ [page 36](#)*
- ◆ *If driveability problems occur when the fuel tank is no more than 1/4 full, check the fuel delivery rate with the fuel tank 1/4 full (or less).*
- If fuel pressure is OK:

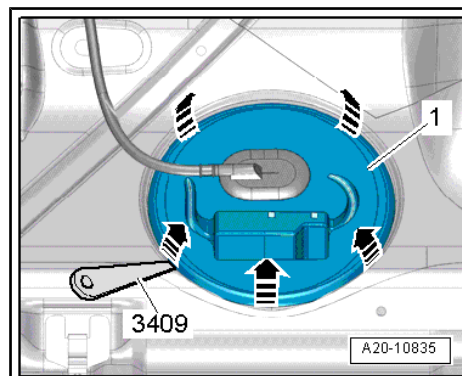
- Remove seat bench or fold upwards ⇒ General body repairs, interior; Rep. gr. 72 ; Rear seats; Removing and installing seat bench/individual seats .
- If fitted, unfasten carpet and fold upwards.



- Detach cover (right-side) with fuel pump control unit -J538-2- from assembly opening above fuel delivery unit.

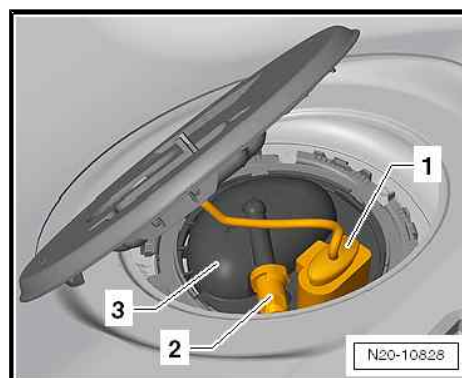


- To do so, unclip cover (right-side) -1- at retainers -arrows- using removal wedge -3409- .



- Unplug connector -1- from flange -3-.
- Check contacts on connector and on fuel delivery unit for damage.

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- Plug test instrument adapter/DSO (5-pin) -VAS 5565- into connector and fuel delivery unit.
- Connect remote control -V.A.G 1348/3A- to adapter -VAS 5565- and battery positive terminal in engine compartment.



Note

This step merely allows the fuel pump to run when the engine is stopped.

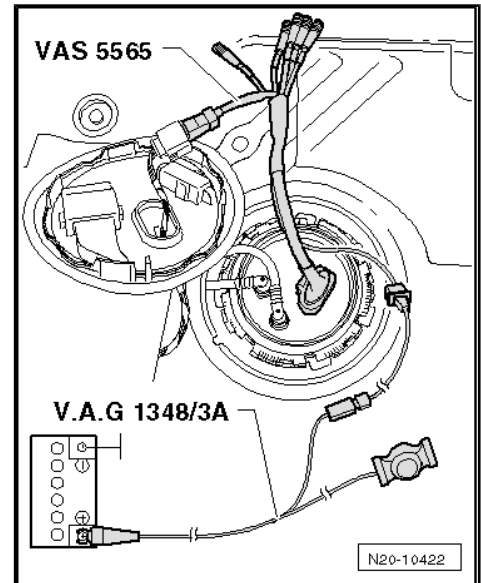


WARNING

Fuel line is pressurised.

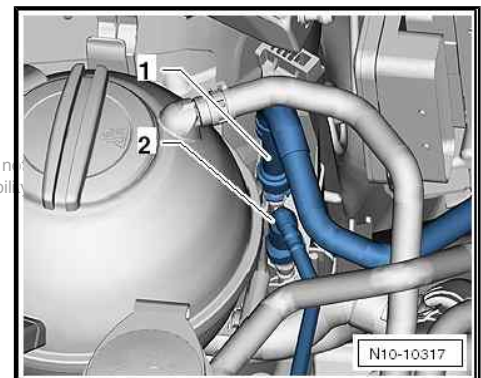
Risk of injury to eyes and skin caused by fuel.

Wear safety goggles and protective clothing to avoid possible injury and skin contact. Before removing from hose connection wrap a cloth around the connection. Then dissipate pressure by carefully opening the connection.

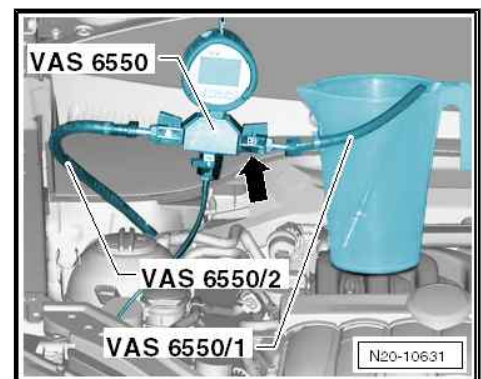


- Disconnect supply line (metal connection) -1-. Use a cloth to catch escaping fuel. Disconnecting plug-in connectors
⇒ [page 36](#)

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- Connect pressure tester -VAS 6550- with adapter -VAS 6550/2- to fuel supply line. Hold adapter -VAS 6550/1- in measuring container.



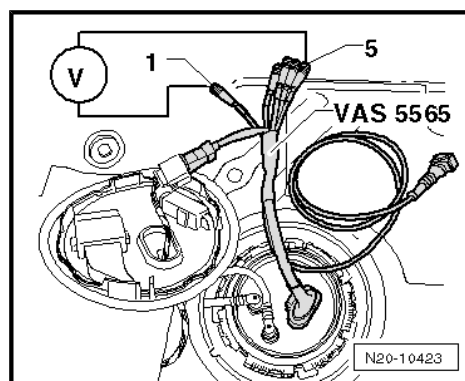
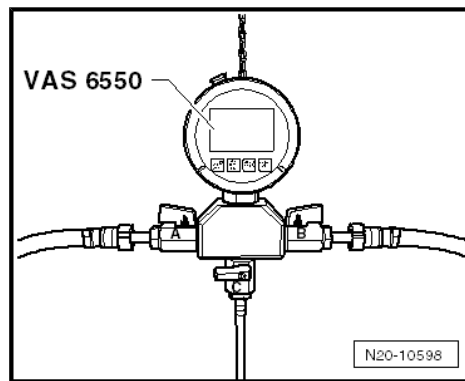
- Make sure that drain tap -C- is closed and cut-off valves -A- and -B- are open.



WARNING

Danger of fuel spray. Wear safety goggles and protective clothing to avoid possible injury and skin contact. Hold container under open connection of pressure gauge -VAS 6550-.

- Operate remote control -V.A.G 1348/3A- and slowly close cut-off valve -arrow- until pressure gauge shows 4 bar. From this point on, do not change position of cut-off valve.
- Drain measuring container.
- Quantity of fuel delivered by fuel pump depends on battery voltage. Therefore, also connect multimeter at output -1- and -5- of test instrument adapter/DSO (5-pin) -VAS 5565-.
- Press and hold button on remote control for 60 seconds while measuring voltage at fuel pump.



- Compare quantity of fuel with specification.

*) Minimum delivery $\text{cm}^3/60 \text{ seconds}$

**) Voltage at fuel pump with engine stopped and pump running

Example:

During the test a voltage of 10.5 volts is measured. This means that minimum delivery rate is approx. $1200 \text{ cm}^3/60 \text{ sec}$.

If specification is not obtained:

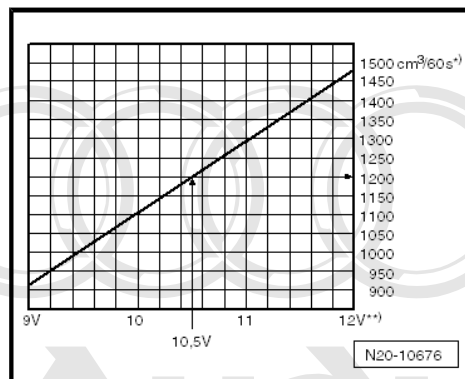
- Check fuel lines for any restrictions (kinks) or blockages.

If no fault is found:

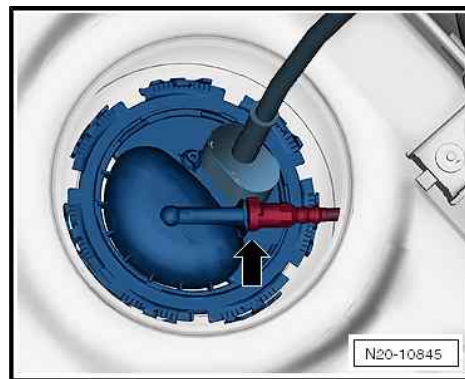
- Remove filler cap from fuel filler neck and repeat check. If reading now matches specification, check breather line of fuel tank [⇒ page 67](#).

If the specification is still not obtained:

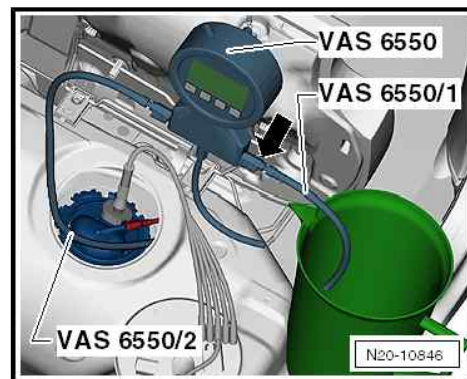
- Disconnect fuel line -arrow- at flange and catch escaping fuel with a cloth. Disconnecting plug-in connectors [⇒ page 36](#)



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- Connect pressure tester -VAS 6550- with adapter -VAS 6550/2- to flange. Hold adapter -VAS 6550/1- in measuring container.



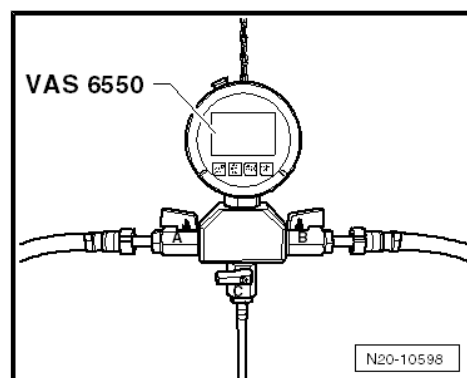
- Make sure that drain tap -C- is closed and cut-off valves -A- and -B- are open.
- Check fuel delivery rate again.

If specification is obtained:

- Check fuel lines for any restrictions (kinks), damage or blockages.
- Renew fuel lines if necessary.

If the specification is still not obtained:

- Remove fuel tank ⇒ [page 17](#) .



- Remove fuel delivery unit and check filter strainer for dirt ⇒ [page 26](#) .
- Check that all hoses -arrows- are connected to fuel delivery unit -1-.

If no fault is found:

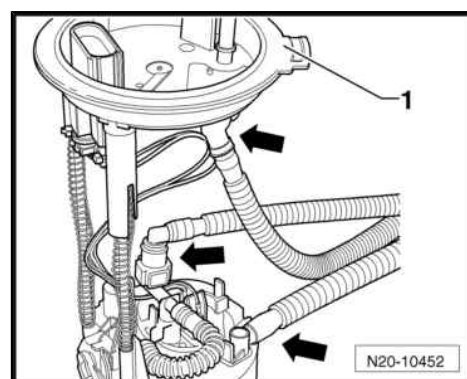
- Check the current draw of the fuel pump ⇒ [page 57](#) .

If no fault is found:

- Renew fuel delivery unit ⇒ [page 26](#) .

If fuel delivery rate is attained but a fault in fuel delivery system (e.g. intermittent failure of fuel supply system) is still suspected:

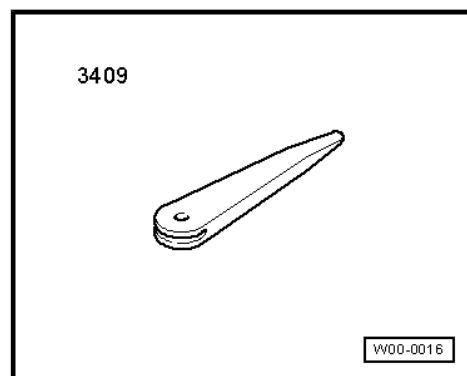
- Check the current draw of the fuel pump ⇒ [page 57](#) .



6.1.5 Checking current draw

Special tools and workshop equipment required

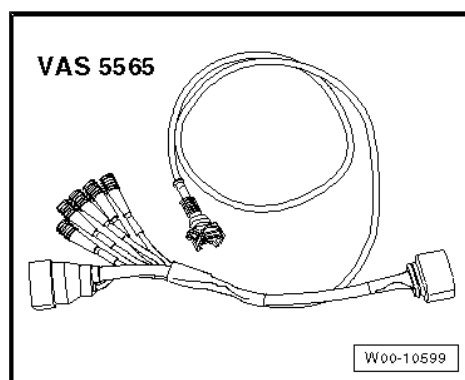
- ◆ Removal wedge -3409-



- ◆ Multimeter, e.g. hand-held multimeter -V.A.G 1526E-

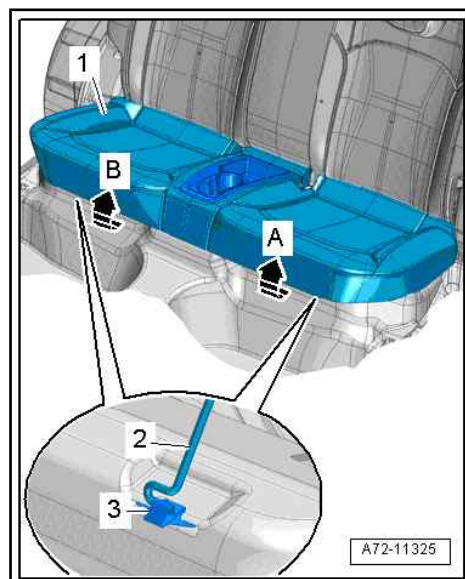


- ◆ Pickup clamp, e.g. pickup clamp -V.A.G 1526B/2-
- ◆ Test instrument adapter/DSO (5-pin) -VAS 5565-

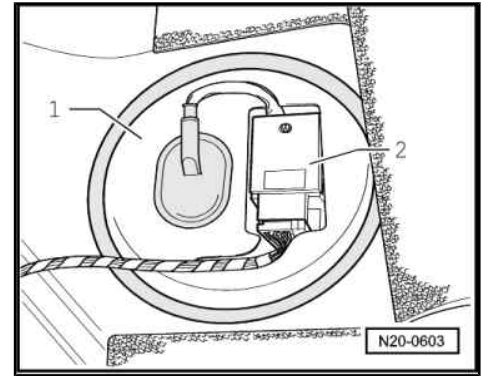


Note

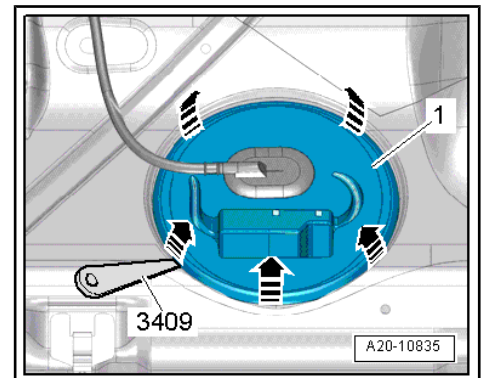
- ◆ *Plug-in connectors should engage audibly when connecting.*
- ◆ *When installing, note colour coding of plug-in connectors
⇒ [page 36](#).*
- ◆ *Check that plug-in connector is securely seated by pulling at it.*
- ◆ *Disconnecting plug-in connectors ⇒ [page 36](#)*
- Remove seat bench or fold upwards ⇒ General body repairs, interior; Rep. gr. 72 ; Rear seats; Removing and installing seat bench/individual seats .
- If fitted, unfasten carpet and fold upwards.



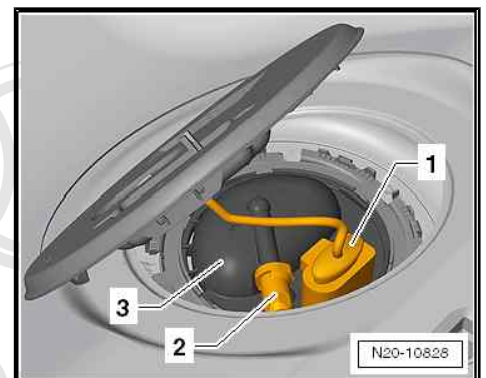
- Detach cover (right-side) with fuel pump control unit -J538-
-2- from assembly opening above fuel delivery unit.



- To do so, unclip cover (right-side) -1- at retainers -arrows- using removal wedge -3409- .



- Unplug connector -1- from flange -3-.
- Check contacts on connector and on fuel delivery unit for damage.



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- Plug test instrument adapter/DSO (5-pin) -VAS 5565- into connector and fuel delivery unit.
- Connect pickup clamp -A- to red cable (marked „Stromzange“) of test instrument adapter/DSO (5-pin) -VAS 5565- .
- Start the engine and run at idling speed.
- Measure current draw of fuel pump.
- Specification: max. 10 amps.



Note

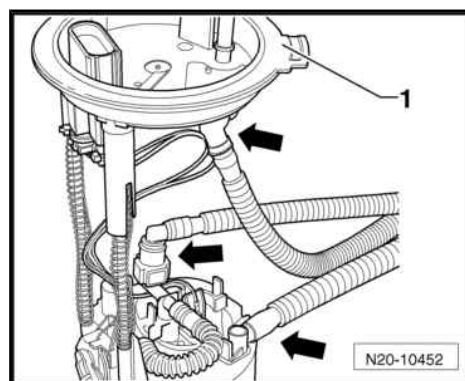
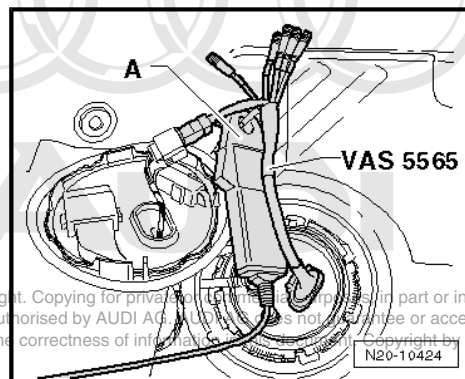
- ◆ *The initial current of the fuel pump may be greater than the specification for a short time when the engine is started.*
- ◆ *If the fault in the fuel system occurs only intermittently, the check may be performed during a test drive (a second person is required).*

If the current draw is exceeded:

- Check fuel lines for any restrictions (kinks) or blockages.
- Checking fuel pressure ⇒ [page 45](#)
- Remove fuel delivery unit ⇒ [page 26](#) and check for dirt.
- Check that all hoses -arrows- are connected to fuel delivery unit -1-.

If no fault is found:

- Renew fuel delivery unit ⇒ [page 26](#) .



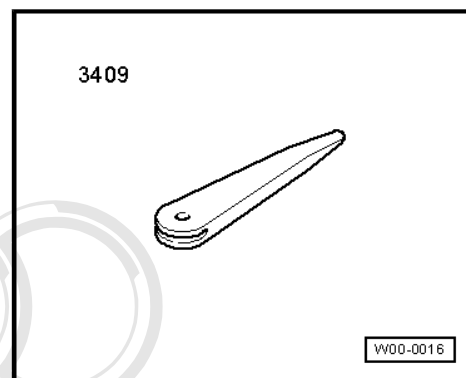
6.1.6 Checking fuel pump control unit -J538-

- ◆ The voltage supply for the fuel pump is taken from fuel pump control unit -J538- .
- ◆ Check fuel pump control unit -J538- in Guided Fault Find-
ing function ⇒ Vehicle diagnostic tester.

6.1.7 Removing and installing fuel pump control unit -J538-

Special tools and workshop equipment required

◆ Removal wedge -3409-



Removing

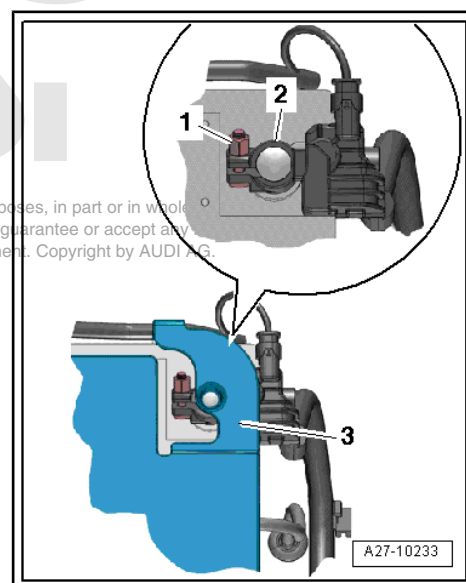


Caution

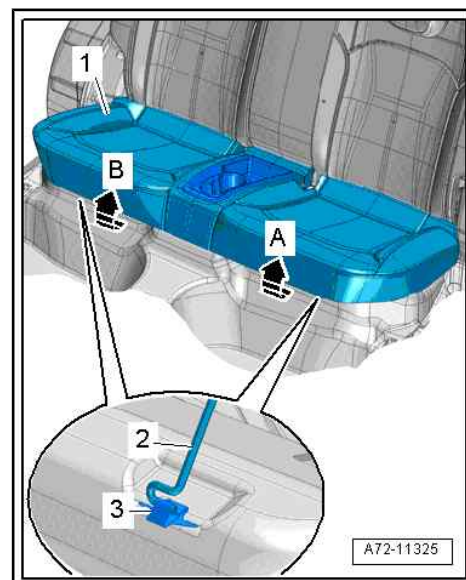
To prevent irreparable damage to the electronic components when disconnecting the battery:

◆ *Observe notes on procedure for disconnecting the battery.*

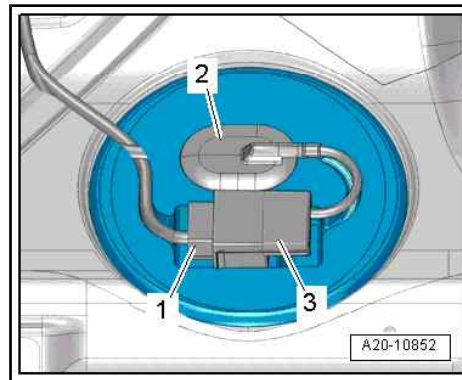
- Disconnect earth wire -2- from battery terminal ⇒ Electrical system; Rep. gr. 27 .
- Move front right seat all the way forwards.



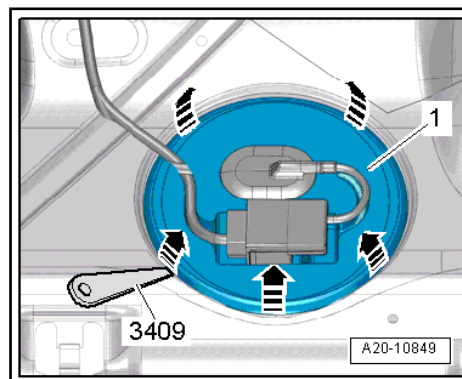
- Remove rear seat bench ⇒ Rep. gr. 72 .



- Detach fuel pump control unit -J538- -item 3- from cover for fuel tank flange.
- Release and unplug electrical connector -1-.
- Press grommet -2- out of cover for flange.



- Unclip cover -1- for fuel tank flange at retainers -arrows- using removal wedge -3409- .

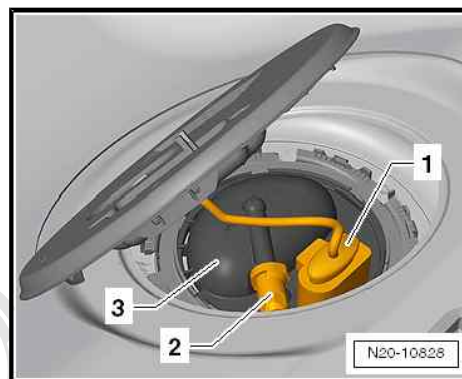


- Release connector -1- from flange -3- and disconnect.
- Check contacts on connector and on fuel delivery unit for damage.

Installing

Install in reverse order. Note the following:

- Install rear seat bench ⇒ Rep. gr. 72 .
- Connect battery (observe notes on procedure for connecting the battery ⇒ Electrical system; Rep. gr. 27).



6.2 Removing and installing suction-jet pump

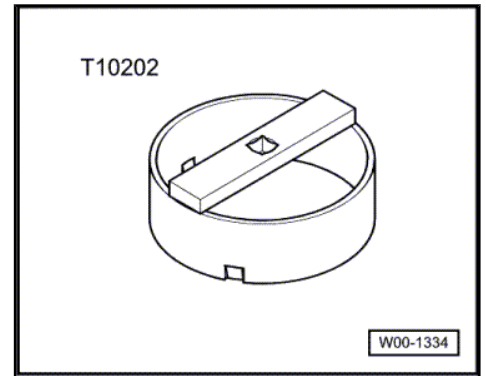


Note

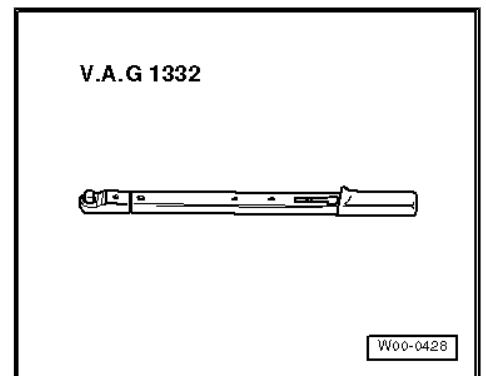
- ◆ *Due to the shape of the fuel tank, the fuel must be pumped from the area of fuel gauge sender 2 -G169- to the fuel delivery unit on vehicles with four-wheel drive. To this end, a suction-jet pump pumps the fuel from left chamber of the fuel tank into the right chamber.*
- ◆ *It is only necessary to check the fuel gauge sender 2 -G169- if the engine stops due to fuel starvation although the fuel gauge indicates that the tank is still 1/4 full.*
- ◆ *After removing the suction-jet pump, check the fuel tank for dirt and clean if necessary.*

Special tools and workshop equipment required

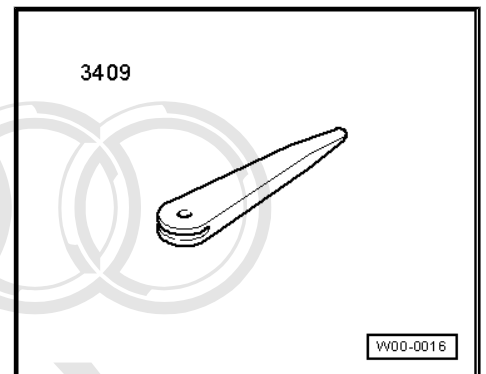
◆ Wrench -T10202-



◆ Torque wrench -V.A.G 1332-



◆ Removal wedge -3409-



Removing suction-jet pump



Note

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- ◆ *Exploded view - fuel tank* ⇒ [page 6](#)
- ◆ *Make sure you do not bend float arm of fuel gauge sender 2 - G169-.*
- Drain fuel tank ⇒ [page 9](#) .
- Removing fuel tank ⇒ [page 17](#) .
- Remove fuel delivery unit ⇒ [page 26](#) .
- Remove fuel gauge sender 2 -G169- ⇒ [page 33](#) .



Note

Check that the fuel lines on the suction-jet pump are fitted securely and are not damaged.

- Open cable tie -3-.
- Pull suction-jet pump -1- out of retainer -2- on bottom of fuel tank in direction of -arrow-.
- Pull suction-jet pump of opening in fuel delivery unit.
- Check suction-jet pump and fuel tank for any dirt.

Installing suction-jet pump

Install in reverse order. Note the following:



Note

- ◆ *Plug-in connectors should engage audibly when connecting.*
- ◆ *When installing, note colour coding of plug-in connectors
⇒ [page 36](#).*
- ◆ *Check that plug-in connector is securely seated by pulling at it.*
- ◆ *Disconnecting plug-in connectors ⇒ [page 36](#)*
- Pull suction-jet pump from fuel delivery unit side (right side of vehicle) through to left side. If necessary, use a piece of wire to thread it through.
- Fit new cable tie -3-.

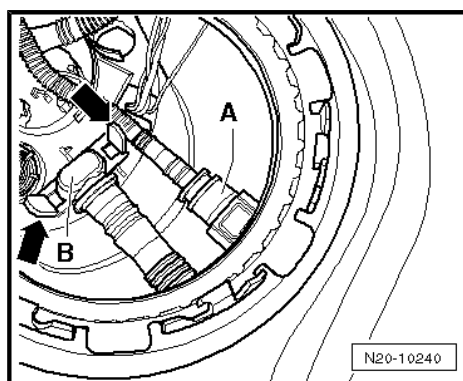
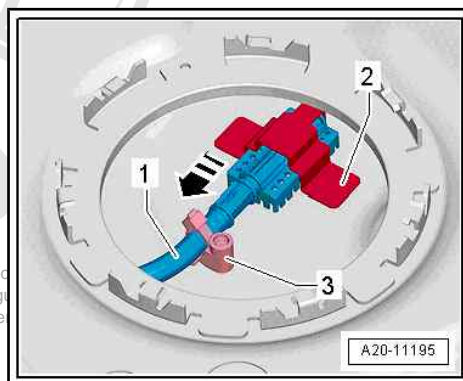
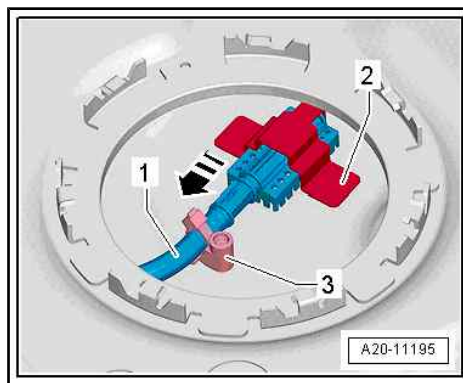


Note

Allocation ⇒ *Electronic parts catalogue „ETKA“.*

- Install fuel delivery unit ⇒ [page 26](#).

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- Connect suction-jet pump -B- to fuel delivery unit.

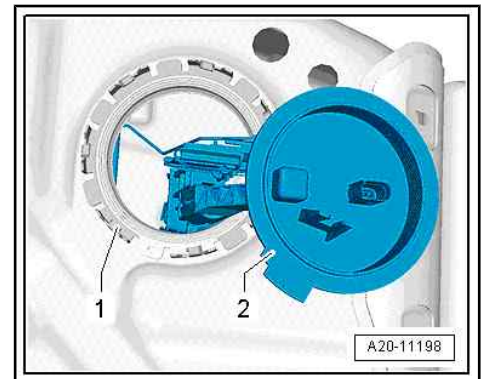
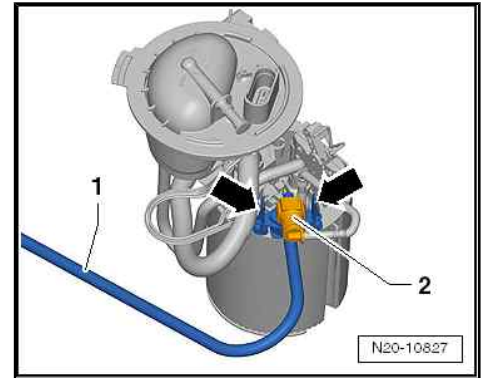
- Connect plug-in connector -2- to suction-jet pump -1-.
- Check that connectors are securely seated by pulling at them.



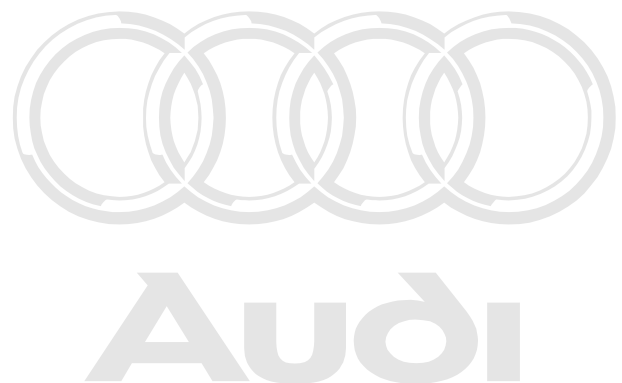
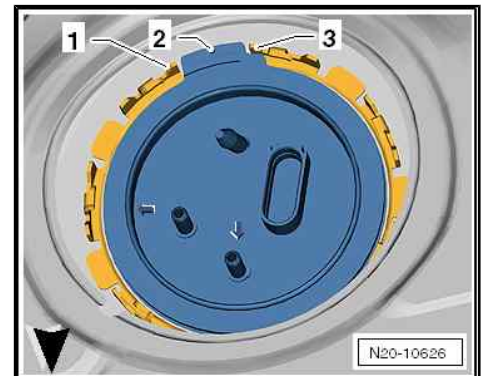
Caution

When installing, do not bend float arm of fuel gauge sender 2 -G169- .

- Route fuel lines so they are free of kinks.
- Insert fuel gauge sender 2 -G169- -2- into fuel tank -1-
⇒ [page 33](#) .



- Fit dry seals in fuel tank opening.
- Lubricate inside of seals with fuel.
- Press flange down against spring pressure on both sides and move flange into installation position.
- Lug -2- on flange must be between tabs -1- and -3- on fuel tank.
- The -arrow- points in direction of travel.



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7 Activated charcoal filter system

⇒ „7.1 Exploded view - activated charcoal filter system“,
[page 66](#)

⇒ „7.2 Checking fuel tank breather“, [page 67](#)

⇒ „7.3 Removing and installing activated charcoal filter“,
[page 69](#)

7.1 Exploded view - activated charcoal filter system

⇒ „7.1.1 Exploded view - activated charcoal filter system“,
[page 66](#)

7.1.1 Exploded view - activated charcoal filter system

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Note

- ◆ *Plug-in connectors should engage audibly when connecting.*
- ◆ *When installing, note colour coding of plug-in connectors ⇒ [page 36](#) .*
- ◆ *Check that plug-in connector is securely seated by pulling at it.*
- ◆ *Disconnecting plug-in connectors ⇒ [page 36](#)*

1 - Activated charcoal filter

- ☐ Fitting location: in rear wheel housing (right-side)
- ☐ Checking ⇒ [page 67](#)
- ☐ Removing and installing ⇒ [page 69](#)

2 - Breather connection

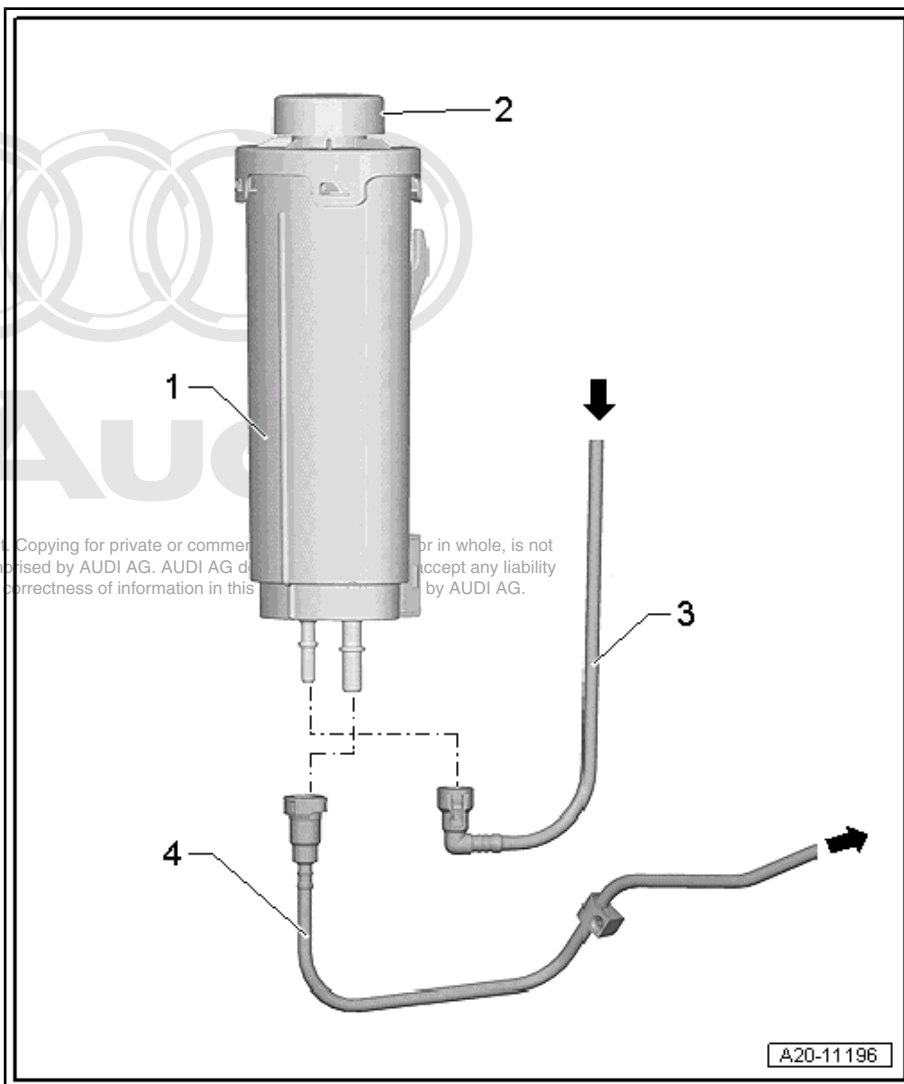
- ☐ Checking breather ⇒ [page 67](#)

3 - Breather line

- ☐ With pressure retention valve
- ☐ Check that it is securely seated
- ☐ Connected to fuel filler neck of fuel tank
⇒ [Item 18 \(page 8\)](#)

4 - Breather line

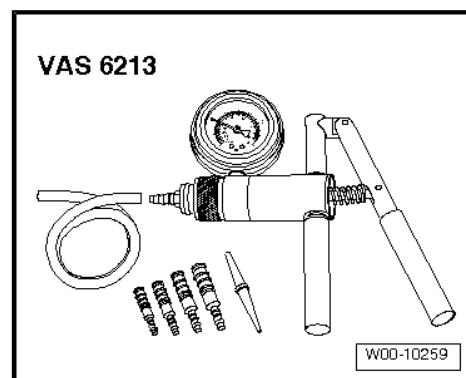
- ☐ Check that it is securely seated
- ☐ Connected to activated charcoal filter solenoid valve 1 -N80- ⇒ Rep. gr. 24 ; Injection system; Overview of fitting locations - injection system
- ☐ Valve closed when ignition is switched off
- ☐ Valve is actuated (pulsed) by engine control unit when engine is warm



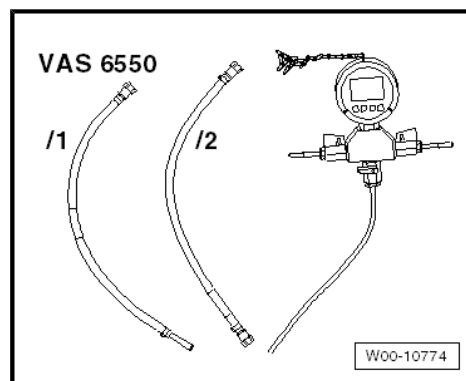
7.2 Checking fuel tank breather

Special tools and workshop equipment required

- ◆ Hand vacuum pump -VAS 6213-



◆ Adapter set -VAS 6550/3-



Note

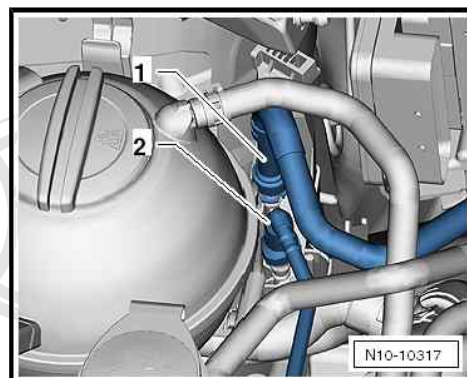
- ◆ *Plug-in connectors should engage audibly when connecting.*
- ◆ *When installing, note colour coding of plug-in connectors*
⇒ [page 36](#).
- ◆ *Check that plug-in connector is securely seated by pulling at it.*
- ◆ *Disconnecting plug-in connectors* ⇒ [page 36](#)

Test condition

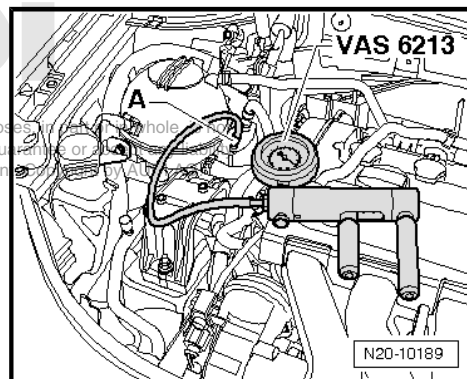
- The ignition must be switched off.

Test sequence

- Disconnect breather line -2-. Disconnecting plug-in connectors ⇒ [page 36](#)

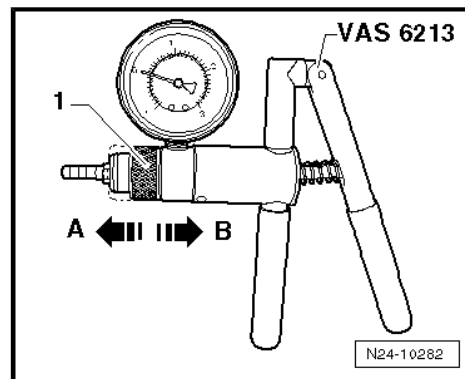


- Connect hand vacuum pump -VAS 6213- with connection lead -VAS 6550/3-2- -A- to breather line as shown.



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- Move adjuster ring -1- on hand vacuum pump -VAS 6213- to position -A- to select vacuum.



- Operate hand vacuum pump -VAS 6213- several times. Vacuum should not build up.
- Remove rear wheel housing liner (right-side) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Removing and installing wheel housing liner

If vacuum builds up:

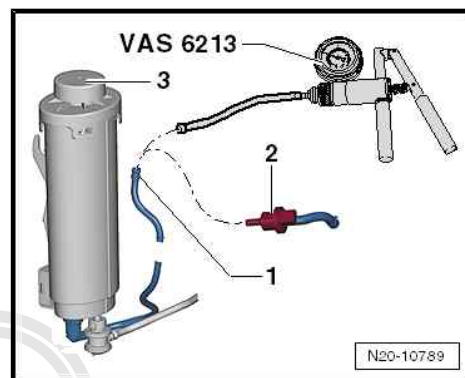
- Check breather opening -3- at top of activated charcoal filter for dirt and clean if necessary.

If vacuum does not build up:

- Close off breather opening -3- and operate vacuum pump again several times. Vacuum should build up.

If vacuum does not build up:

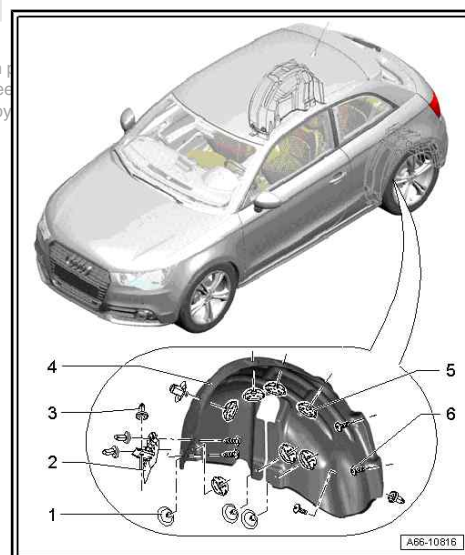
- Renew activated charcoal filter ⇒ [page 69](#) .



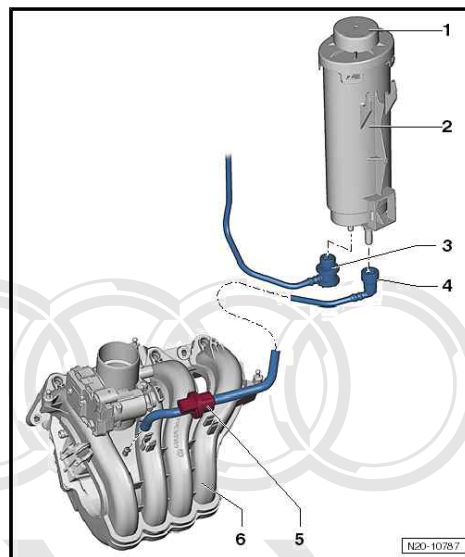
7.3 Removing and installing activated charcoal filter

Removing

- Remove rear wheel housing liner (right-side) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Removing and installing wheel housing liner.



- Release lines -3- and -4- and disconnect. Disconnecting plug-in connectors ⇒ [page 36](#)



- Unclip activated charcoal filter -1- from body at bottom -arrows A-.
- Pull activated charcoal filter -1- upwards out of mounting -arrows B- in direction of -arrow-.

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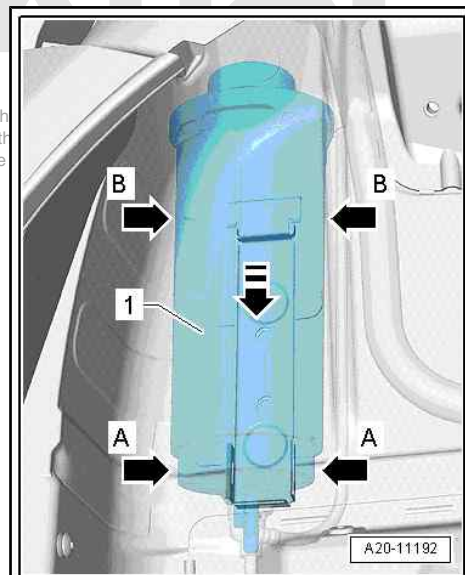
Installing:

Install in reverse order. Note the following:



Note

- ◆ Observe correct installation position of all components.
- ◆ Plug-in connectors should engage audibly when connecting.
- ◆ When installing, note colour coding of plug-in connectors ⇒ [page 36](#).
- ◆ Check that plug-in connector is securely seated by pulling at it.



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8 Accelerator mechanism

⇒ „8.1 Accelerator pedal module - exploded view“, page 71

⇒ „8.2 Removing and installing accelerator pedal module with accelerator position sender G79 / G185“, page 72

8.1 Accelerator pedal module - exploded view

1 - Bolt

- 8 Nm

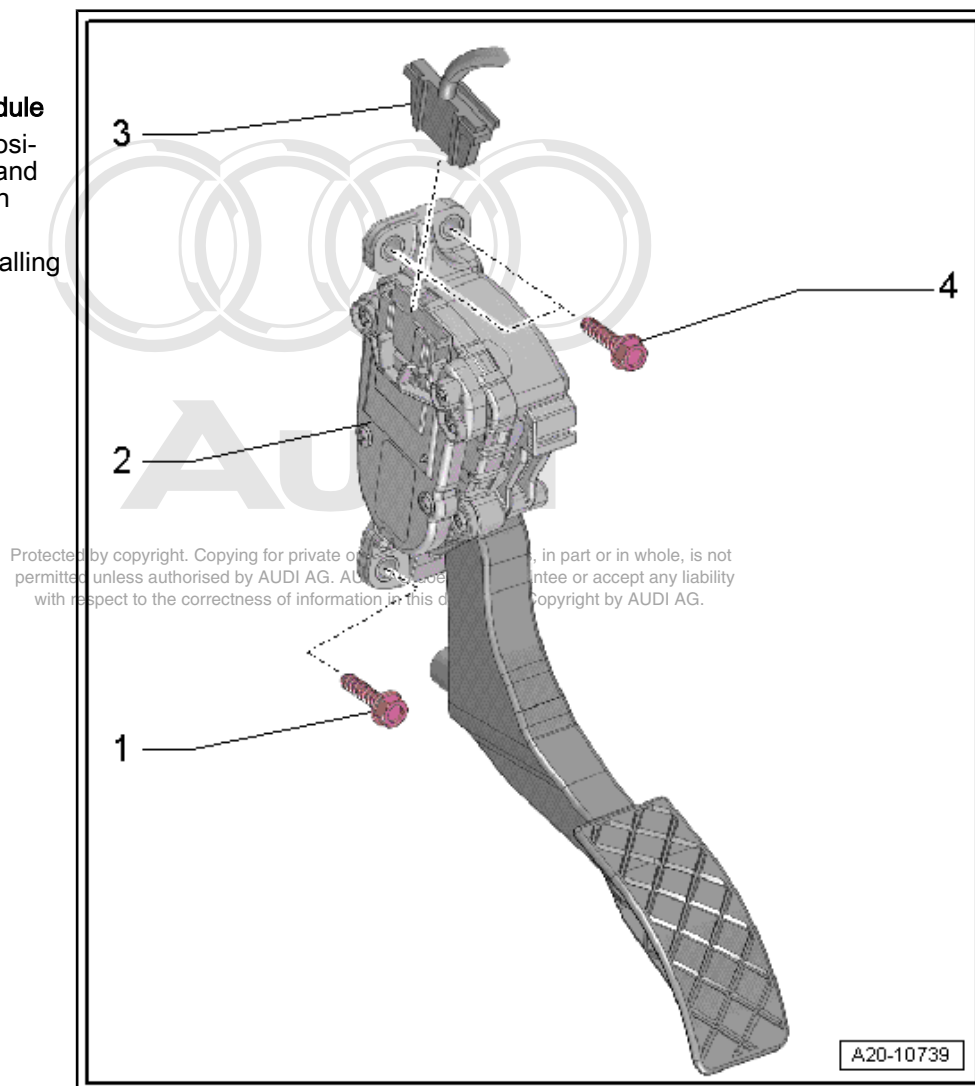
2 - Accelerator pedal module

- With accelerator position sender -G79- and accelerator position sender 2 -G185-
- Removing and installing
⇒ [page 72](#)

3 - Electrical connector

4 - Bolt

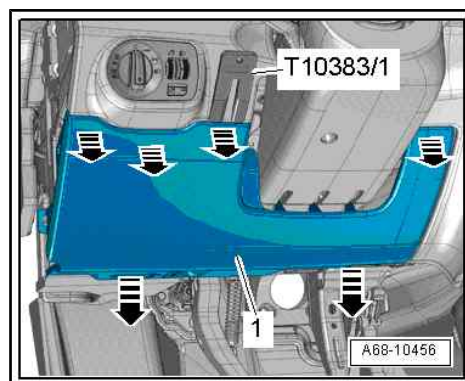
- 8 Nm



8.2 Removing and installing accelerator pedal module with accelerator position sender -G79- / -G185-

Removing

- Remove dash panel trim (driver's side) ⇒ Rep. gr. 68 .

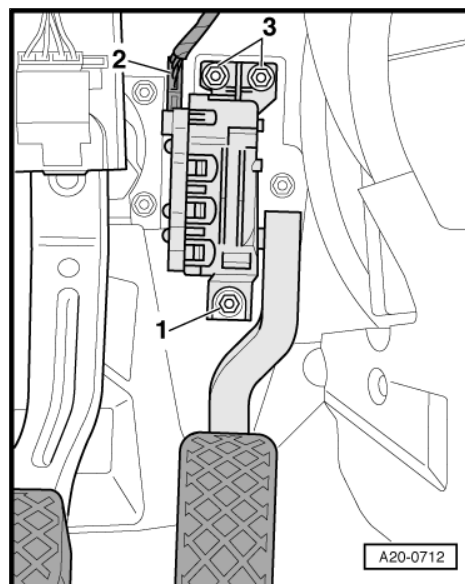


- Press release tab and unplug electrical connector -2-.
- Unscrew bolts -1 and 3- and detach accelerator pedal module.

Installing

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

- Tightening torque
⇒ [„8.1 Accelerator pedal module - exploded view“, page 71](#)
- Install dash panel trim (driver's side) ⇒ Rep. gr. 68 .



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