

Workshop Manual Audi A3 1997 ➤

Fuel supply system, petrol engines									
Engine ID	AEH	AGN	AGU	AJQ	AKL	AMK	APF	APG	APH
	APP	APY	AQA	ARY	ARZ	AUM	AUQ	AVU	ARX
	AUL	BAH	BFQ	BAM					

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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 General repair instructions

1.1 Safety precautions

When working on the fuel system note the following warnings:



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.*

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

To prevent 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.*

- ◆ Disconnect battery ⇒ Rep. Gr. 27 .
- ◆ Briefly open filler cap for fuel tank and close again.

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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.

Injuries can also be caused if the passenger's airbag is triggered in a collision.

- *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.*

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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: vehicles with front-wheel drive ⇒ [page 7](#) , vehicles with four-wheel drive ⇒ [page 25](#) .
- ◆ 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 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.

When removing and installing the fuel tank, note the following:

- ◆ Fuel tank must be empty to reduce weight. Drain the tank if necessary. Procedure: vehicles with front-wheel drive ⇒ [page 7](#) , vehicles with four-wheel drive ⇒ [page 25](#) .

1.2 Rules for cleanliness

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.
- ◆ Seal off open lines and connections immediately with suitable sealing caps.
- ◆ 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. Do not move the vehicle unless absolutely necessary.

- ◆ Protect unplugged electrical connectors against dirt and moisture and make sure connections are dry when attaching.

1.3 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 tank at least $\frac{1}{4}$ full.
- Fuel filter OK
- Fuel lines OK (not obstructed or crushed).
- Ignition off.

1.4 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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2 Fuel tank - vehicles with front-wheel drive



Note

- ◆ Secure all hose connections with the correct type of hose clips (same as original equipment) ⇒ *Electronic parts catalogue*.
- ◆ Hose clip pliers -V.A.G 1921- are recommended for fitting spring-type hose clips.
- ◆ The arrows marked on the hose and pipe connections should be aligned.

2.1 Fuel tank with attached components - exploded view



Note

Removing, installing and checking breather valve ⇒ [page 6](#).

1 - Bolt

- 26 Nm

2 - Securing strap

- Removing and installing ⇒ [page 8](#)
- Note different lengths

3 - Fuel filter

- Note correct position
- Installation position: Arrow points in through-flow direction

4 - Fuel supply pipe

- Black
- To fuel rail
- To disconnect from flange, press release tab on connection

5 - Screw-type clip

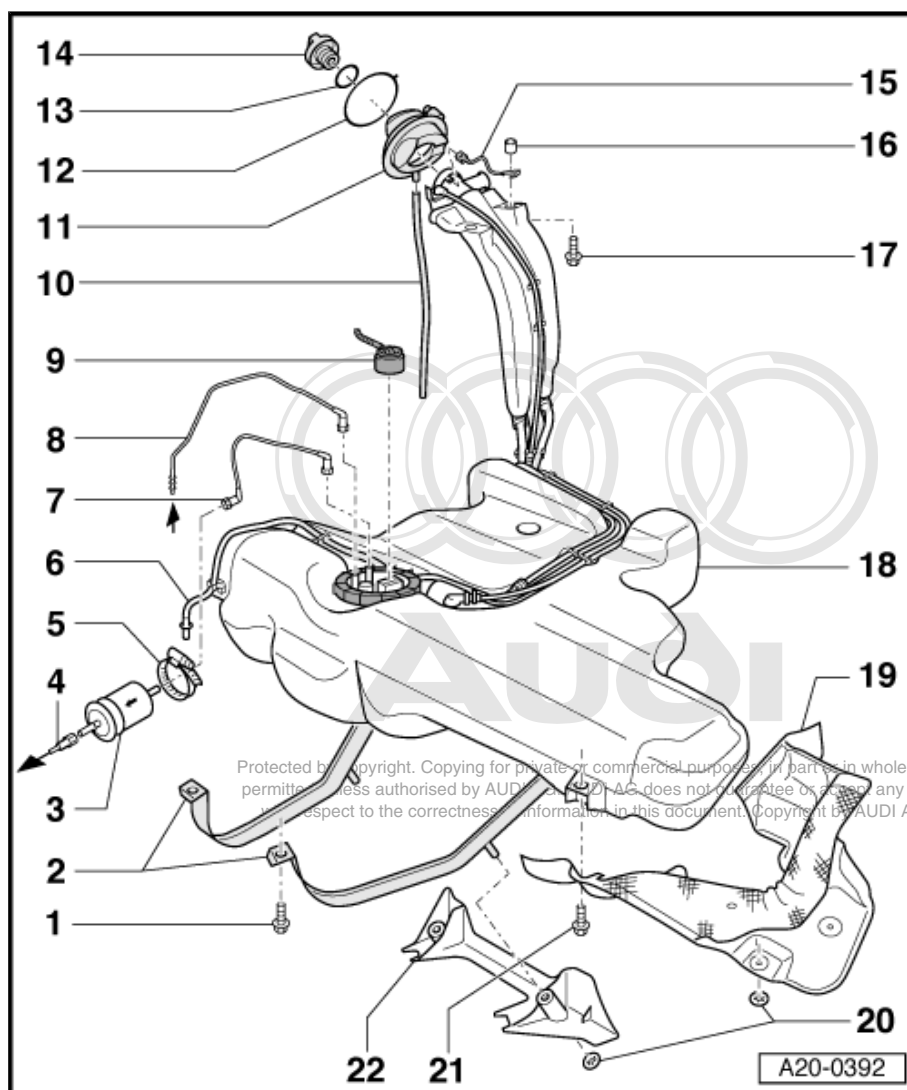
- For fuel filter
- Installation position ⇒ [page 7](#)

6 - Breather pipe

- White
- From gravity valve to activated charcoal filter
- Always remove and install together with gravity valve ⇒ [page 6](#)

7 - Fuel supply pipe

- Black
- To fuel filter
- Attached to connection marked "V" on flange



- ☐ To disconnect from flange, press release tab on connection

8 - Fuel return pipe

- ☐ Blue
- ☐ From fuel rail
- ☐ Attached to connection marked "R" on flange
- ☐ To disconnect from flange, press release tab on connection

9 - Electrical connector

10 - Overflow hose

11 - Rubber cup

12 - Retaining ring

13 - Seal

- ☐ Renew if damaged

14 - Filler cap

15 - Earth connection

- ☐ To eliminate electrostatic charge
- ☐ Installation position ⇒ [page 6](#)
- ☐ Ensure that connector is seated firmly on metal ring of fuel filler neck
- ☐ First engage earth connection in mounting hole on fuel tank and then press in spacer bush -item 16-
- ☐ After installing, use an ohmmeter to check electrical connection between metal ring on fuel filler neck and a bare metal part on body - Specification: approx. 0 Ω

16 - Spacer bush

- ☐ First engage earth connection -item 15- in mounting hole on fuel tank and then press in spacer bush

17 - Bolt

- ☐ 10 Nm

18 - Fuel tank

- ☐ Removing and installing ⇒ [page 8](#)

19 - Heat shield

- ☐ For fuel tank

20 - Locking washer

- ☐ Removing: turn anti-clockwise
- ☐ Tighten to 2 Nm

21 - Bolt

- ☐ 26 Nm

22 - Cover

- ☐ For fuel tank

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Installation position of earth connection

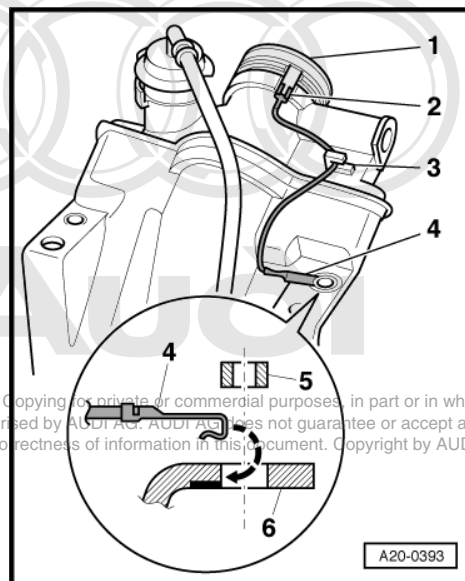
- Route earth connection as shown in illustration.
- First engage contact tab -4- of earth connection in mounting hole on fuel tank -6- and then press in spacer bush -5-.
- Hook earth connection into retaining clip -3- on fuel filler neck.
- Ensure that connector -2- for earth connection is firmly seated on metal ring -1- on fuel filler neck.



Caution

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**



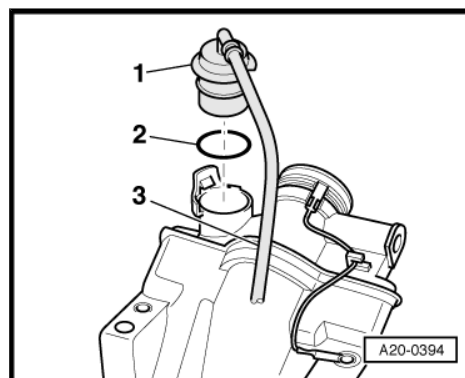
Removing, installing and checking gravity valve



Note

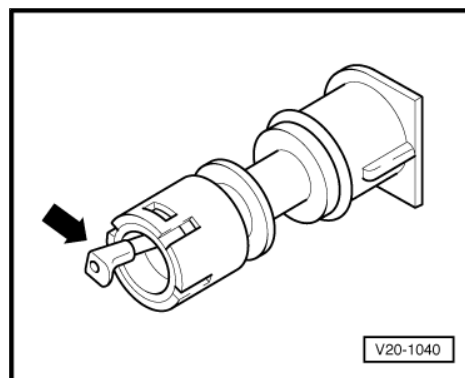
The gravity valve -1- can only be renewed together with breather pipe -3-.

- To remove gravity valve, unclip it from filler neck and lift it off.
- Checking gravity valve:
 - ◆ Hold gravity valve in a vertical position: it should be possible to blow through valve.
 - ◆ Tilt gravity valve by 45°; it should not be possible to blow through valve.
 - ◆ Make sure O-ring -2- is not damaged.



Removing, installing and checking breather valve

- To remove breather valve, unclip it from side of filler neck.
- Before installing breather valve, unscrew filler cap from fuel tank.
- Check breather valve:
 - ◆ Lever in released position: breather valve closed
 - ◆ Lever pressed in direction of arrow: breather valve open
 - ◆ Make sure O-rings are not damaged.



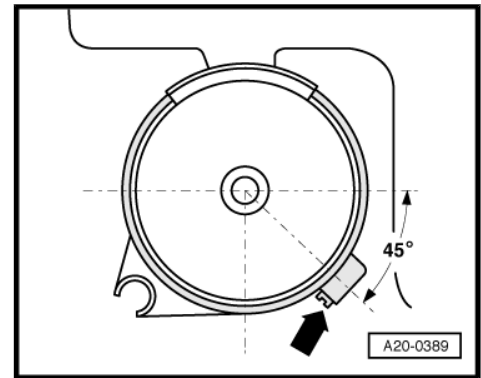
Installation position of screw-type clip for fuel filter

- Install screw-type clip as shown in illustration.
- It is important that there is enough space between fastener of screw-type clip and fuel tank.



Note

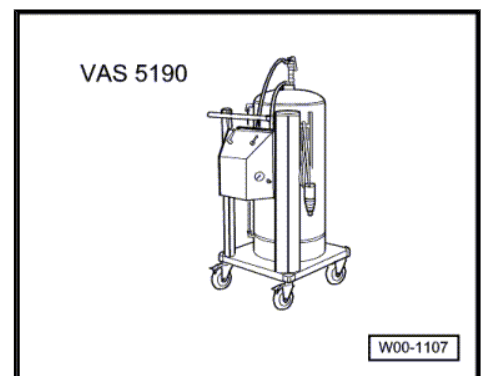
The illustration shows the fuel filter as seen from the front.



2.2 Draining fuel tank

Special tools and workshop equipment required

- ◆ Fuel extractor -VAS 5190-



- ◆ Hose with outer Ø of 11 ... 15 mm

Procedure

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

Observe rules for cleanliness ⇒ [page 2](#) .



Caution

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

- ◆ Observe notes on procedure for disconnecting the battery.

- Disconnect battery ⇒ Rep. Gr. 27 .

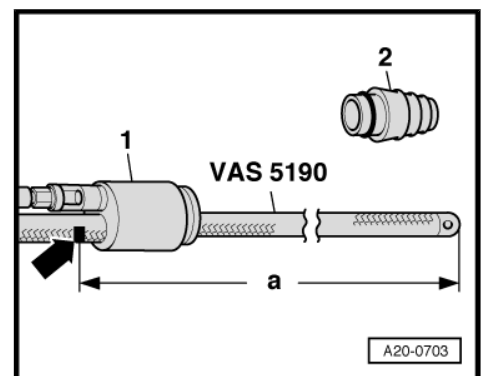
A - Procedure if fuel tank is more than $\frac{3}{4}$ full:



Caution

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

- Detach tapered adapter -2- from shaft end -1- of fuel extractor -VAS 5190- .
- Use insulating tape to mark the extraction hose -arrow- at a distance of -a- = 1,045 mm from the end of the hose.



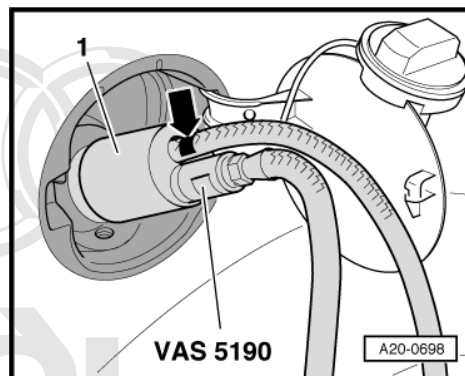
- Remove filler cap from fuel filler neck.
- Screw shaft end -1- of fuel extractor -VAS 5190- onto fuel filler neck.



Note

A ball valve is located at the bottom of the filler neck in the fuel tank; it must not be overpressed or damaged by the extraction hose. Therefore, only push the hose in as far as the marking -arrow-.

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



Note

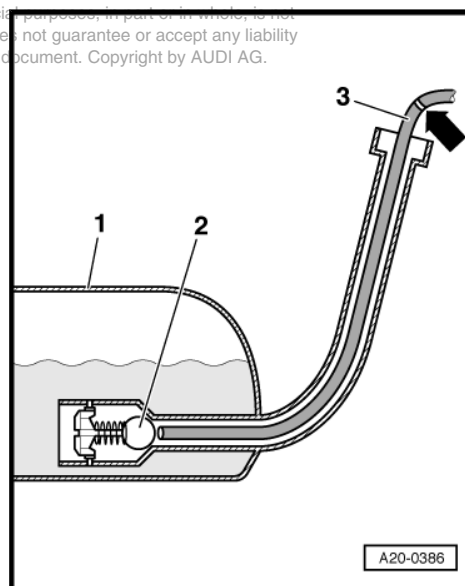
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- ◆ The procedure when using a fuel extractor without a shaft end is fundamentally the same.
- ◆ A ball valve -2- is located at the bottom of the filler neck in the fuel tank -1-; it must not be overpressed or damaged by the extraction hose -3-. Therefore, only push the hose in as far as the marking -arrow-.
- ◆ In this case, make a mark -arrow- on the extraction hose at distance -a- = 980 mm from the end of the hose using insulating tape. The extraction hose has been properly inserted when the affixed mark is level with the edge of the filler neck.
- ◆ If hose is difficult to insert, apply a thin coat of engine oil. DO NOT use silicone-based lubricant.

- Drain fuel tank as much as possible through fuel filler neck.
- Carefully remove extraction hose.
- Remove fuel delivery unit ⇒ [page 17](#) .
- Extract remaining fuel through opening for fuel delivery unit.
- Re-install fuel delivery unit ⇒ [page 18](#) ; observe instructions for connecting battery.

B - Procedure if fuel tank is less than $\frac{3}{4}$ full:

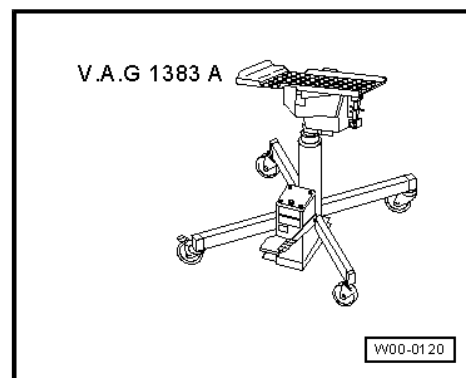
- Remove fuel delivery unit ⇒ [page 17](#) .
- Extract fuel through opening for fuel delivery unit.



2.3 Removing and installing fuel tank with attached components

Special tools and workshop equipment required

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



Removing

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

Observe rules for cleanliness ⇒ [page 2](#) .

- To reduce weight, the fuel tank must be empty when it is removed from the vehicle. Drain the tank if necessary. Procedure ⇒ [page 7](#) .

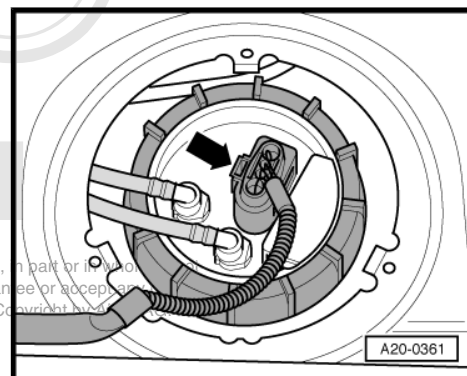


Caution

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

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

- Disconnect battery ⇒ Rep. Gr. 27 .
- Unbolt cover (right-side) underneath rear seat bench.
- Unplug electrical connector -arrow-.
- Open fuel tank flap and clean area around fuel filler neck.
- Prise out retaining ring in rubber cup (around filler neck).
- Press rubber cup through to the inside.
- Remove centre and rear silencers ⇒ Rep. Gr. 26 .
- Remove rear axle ⇒ Rep. Gr. 42 .



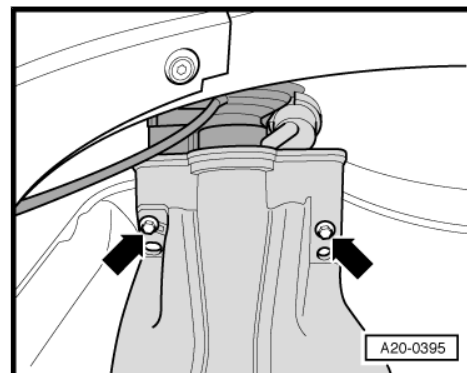
- Remove rear right wheel housing liner ⇒ Rep. Gr. 66 .
- Remove bolts -arrows- for fuel filler neck.



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.*



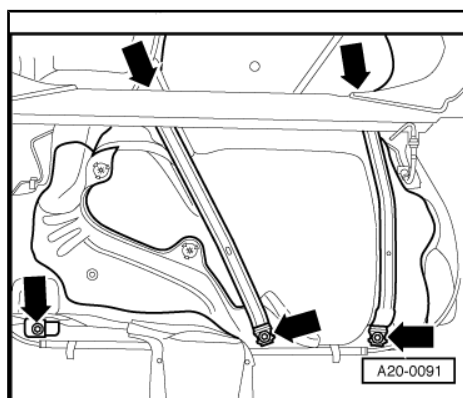
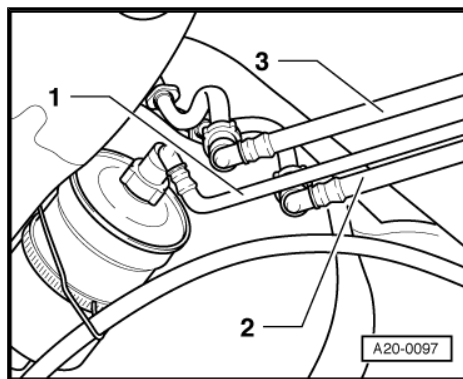
- Disconnect fuel return pipe -2- (blue), fuel supply pipe -1- (black) and breather pipe -3- (white) from right front of fuel tank by pressing release tabs.
- Remove cover ➔ [Item 22 \(page 5\)](#) under fuel tank.



WARNING

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

- Position engine and gearbox jack -V.A.G 1383 A- below vehicle to support tank.
- Loosen bolted connections -arrows-, starting at retaining lug -arrow bottom left-.
- Lower fuel tank.

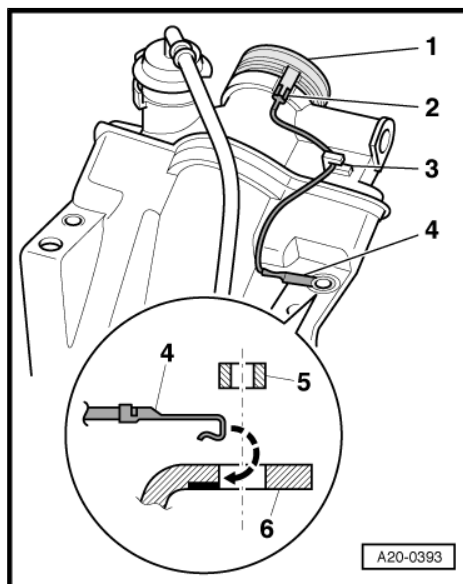


Installing

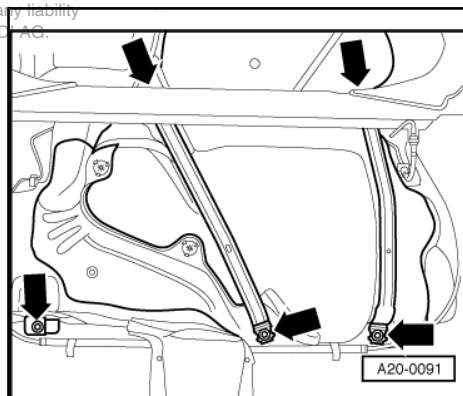
- Tightening torques ➔ [page 4](#)

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

- Check the earth wiring at both ends for traces of oxidation and remove oxidation if necessary.
- Check installation position of earth connection:
 - Connector -2- must be seated firmly on metal ring -1-.
 - Earth wire must be engaged in retaining clip -3-.
 - Contact tab -4- must be attached to fuel tank -6- and secured with spacer bush -5-.
- Position fuel tank and securing straps on underside of vehicle using engine and gearbox jack -V.A.G 1383 A-.



- Secure fuel tank at the points shown -arrows-. Tighten securing straps first.



- Tighten bolts -arrows-.

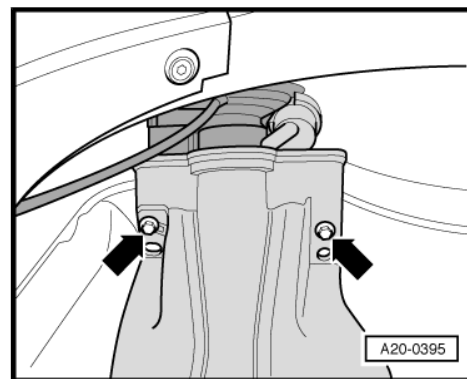


Caution

It is important that you make sure that the earth connection is bolted on and the connector is properly attached to the fuel filler neck. Installation position ⇒ [page 6](#) .

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*



- Install rear right wheel housing liner ⇒ Rep. Gr. 66 .
- Install rear axle ⇒ Rep. Gr. 42 .
- Install exhaust system and align free of stress ⇒ Rep. Gr. 26 .
- Connect battery. Observe notes on procedures required after connecting battery ⇒ Rep. Gr. 27 .

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3 Fuel delivery unit and fuel gauge sender - vehicles with front-wheel drive

3.1 Fuel delivery unit and fuel gauge sender - exploded view

1 - Fuel delivery unit

- ☐ With flange
- ☐ Checking fuel pump (electrical test)
⇒ [page 13](#)
- ☐ Checking residual pressure ⇒ Rep. Gr. 24
- ☐ Removing and installing
⇒ [page 17](#)

2 - Seal

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

3 - Fuel return pipe

- ☐ Blue
- ☐ From fuel rail
- ☐ Attached to connection marked "R" on flange
- ☐ To disconnect from flange, press release tab on connection

4 - Fuel supply pipe

- ☐ Black
- ☐ To fuel filter
- ☐ Attached to connection marked "V" on flange
- ☐ To disconnect from flange, press release tab on connection

5 - Electrical connector

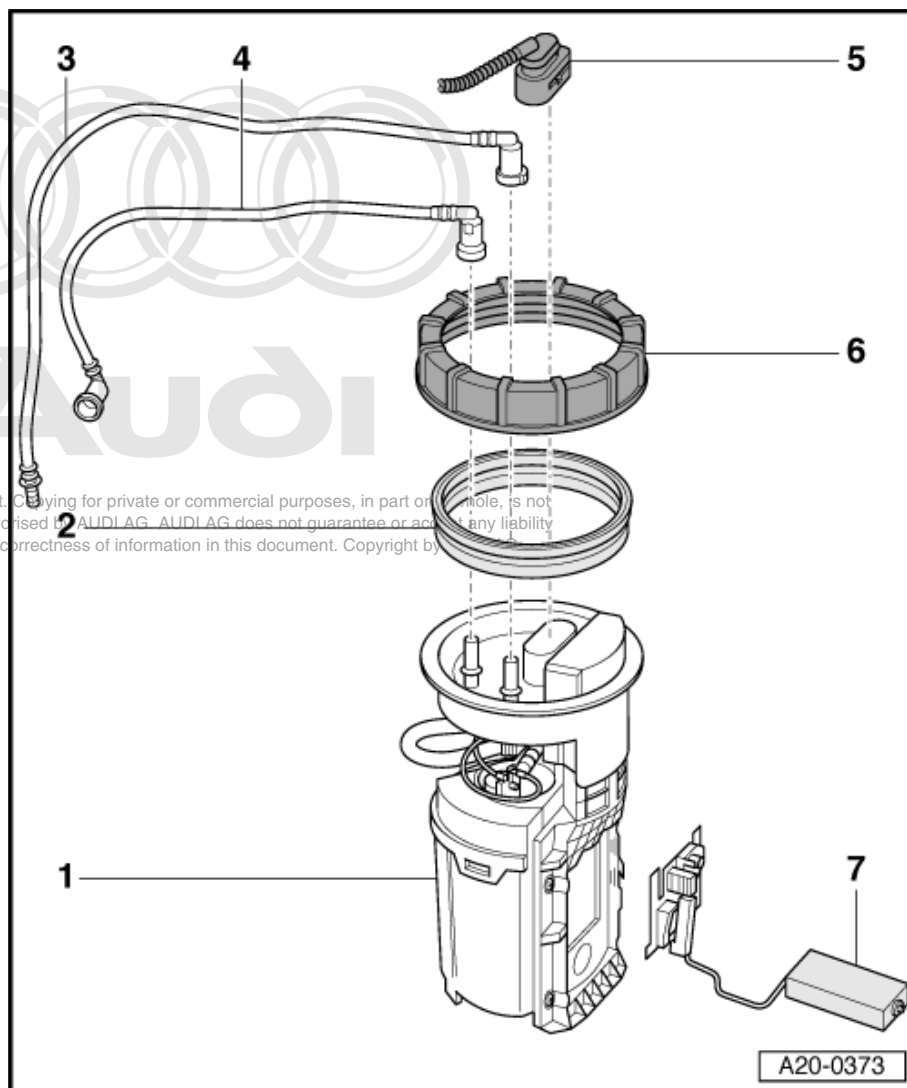
- ☐ For fuel pump and fuel gauge sender -G-

6 - Union nut

- ☐ Loosen and tighten with union nut tool -3217-
- ☐ 80 Nm

7 - Fuel gauge sender -G-

- ☐ Checking resistance values ⇒ [page 19](#)
- ☐ Removing and installing ⇒ [page 21](#)

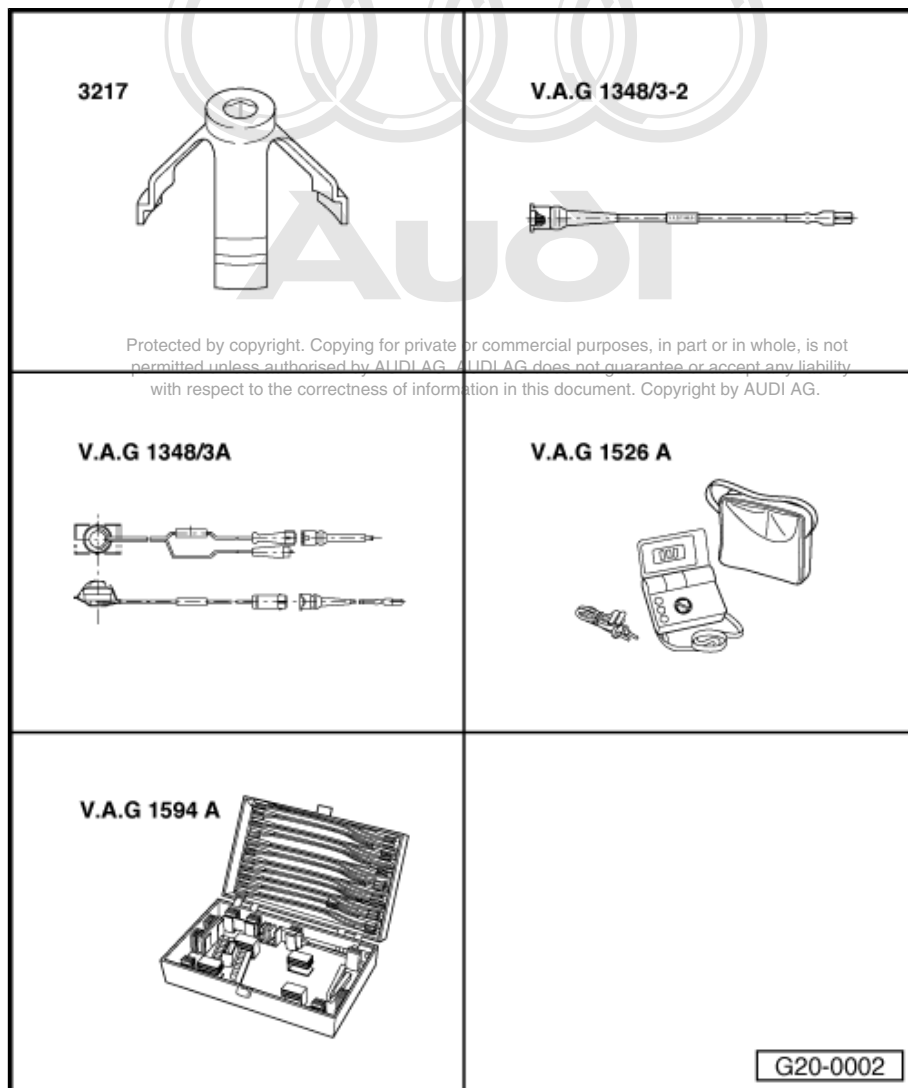


A20-0373

3.2 Checking fuel pump (electrical test)

Special tools and workshop equipment required

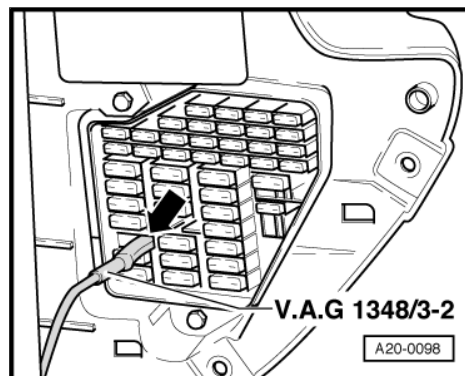
- ◆ Union nut tool -3217-
- ◆ Adapter cable -V.A.G 1348/3-2-
- ◆ Remote control for V.A.G 1348 -V.A.G 1348/3A-
- ◆ Hand-held multimeter - V.A.G 1526D-
- ◆ Auxiliary measuring set - V.A.G 1594C-



Procedure

Observe test conditions ⇒ [page 3](#) .

- Open lid of fuse box at left side of instrument panel.
- Pull fuse No. 28 off fuse holder (left row, 5th large fuse from the top).
- Connect remote control -V.A.G 1348/3A- for V.A.G 1348 with adapter cable -V.A.G 1348/3-2- to right-hand terminal on fuse socket no. 28 -arrow-.
- Connect crocodile clamp to vehicle battery (+).
- Press remote control switch.
- Pump should start running audibly.

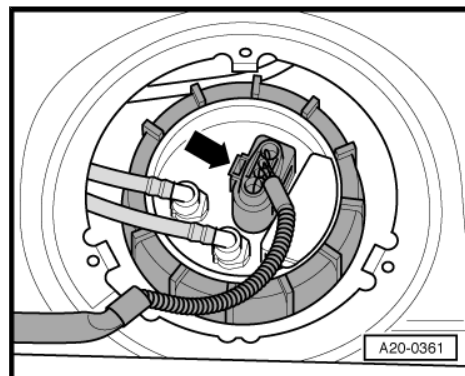


Note

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

If no noise can be heard from pump:

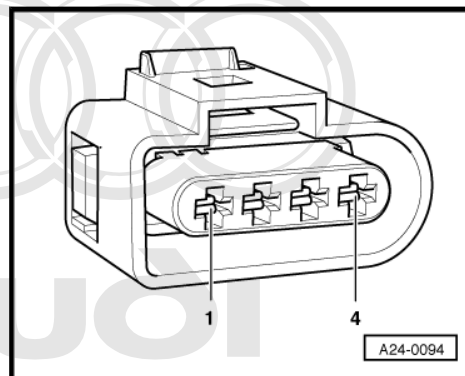
- Unbolt cover (right-side) underneath rear seat bench.
- Unplug electrical connector -arrow-.



- Connect multimeter (voltage test range) between contacts -1- and -4-.
- Press remote control switch.
- Specification: approx. battery voltage

If specification is not obtained:

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



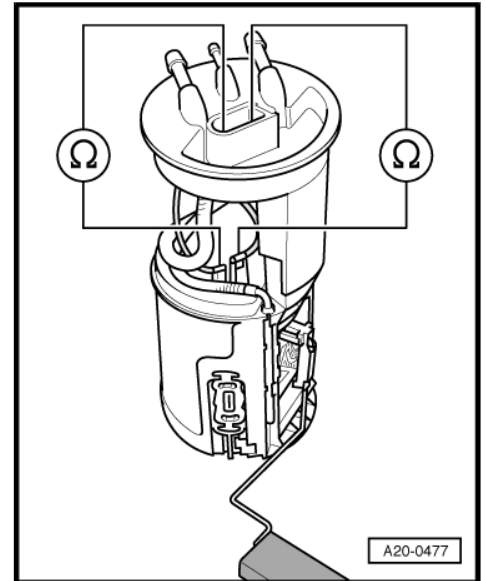
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If reading matches specification although no noise can be heard from pump:

- Remove fuel delivery unit [⇒ page 17](#) .
- Check that the electrical wires between flange and fuel pump are connected and test for continuity.

If no wiring fault is detected: fuel pump is defective.

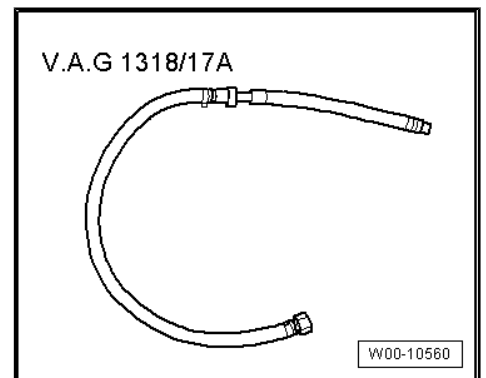
- Renew fuel delivery unit [⇒ page 17](#) .



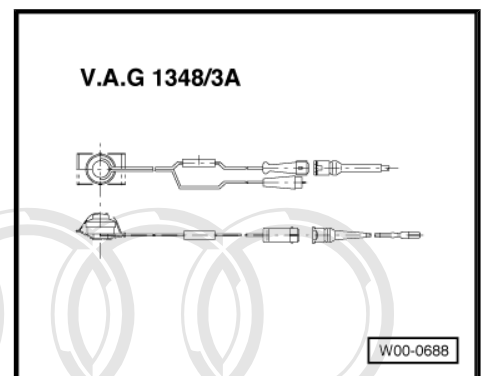
3.3 Checking fuel pump delivery rate

Special tools and workshop equipment required

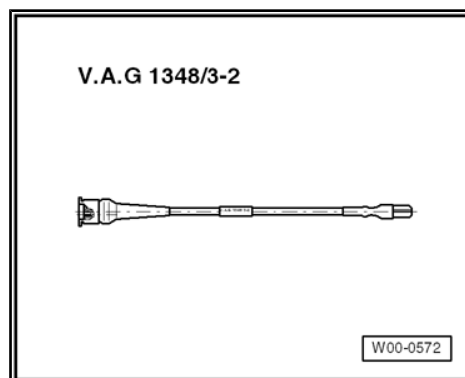
- ◆ Adapter set -V.A.G 1318/17A-



- ◆ Remote control for V.A.G 1348 -V.A.G 1348/3A-



◆ Adapter cable -V.A.G 1348/3-2-

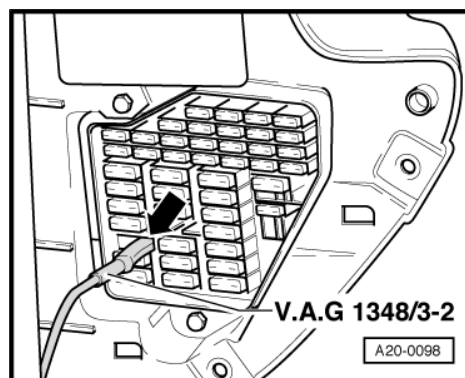


◆ Fuel-resistant measuring container

Procedure

Observe test conditions ⇒ [page 3](#) .

- Open lid of fuse box at left side of instrument panel.
- Pull fuse No. 28 off fuse holder (left row, 5th large fuse from the top).
- Connect remote control -V.A.G 1348/3A- with adapter cable - V.A.G 1348/3-2- to right-hand terminal of fuse socket no. 28 -arrow-.
- Connect crocodile clamp to vehicle battery (+).
- Remove filler cap from fuel filler neck.

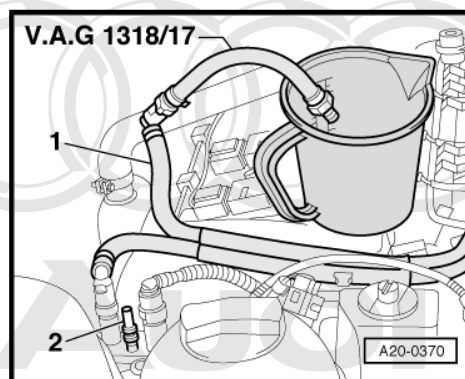


WARNING

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.*

- Press release tab and pull fuel return pipe -1- off pipe connection -2-.
- Fit adapter from adapter set -V.A.G 1318/17A- onto fuel return pipe coming from engine and hold adapter into measuring container.
- Press remote control button for 15 seconds.



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- Compare amount of fuel delivered with minimum delivery shown in diagram (cm³/15 sec.).



Note

Voltage at fuel pump with engine stationary and fuel 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 pump is defective.

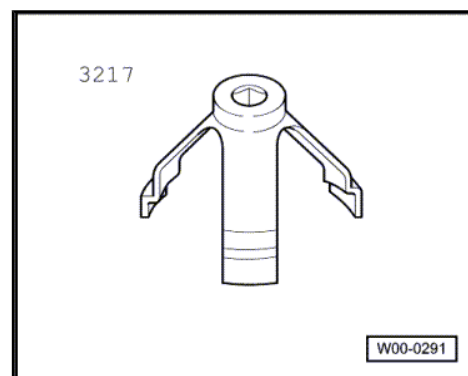
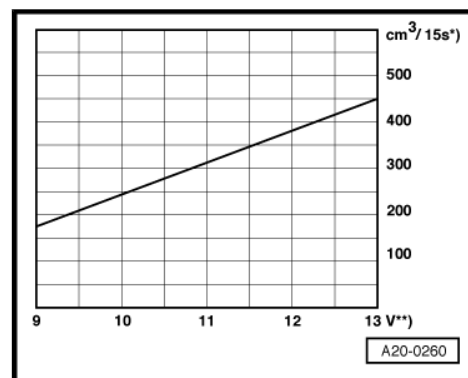
Assemble in reverse order.

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3.4 Removing and installing fuel delivery unit

Special tools and workshop equipment required

- ◆ Union nut tool -3217-



Removing

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

Observe rules for cleanliness ⇒ [page 2](#) .

- The fuel tank must not be more than ³/₄ full when removing the fuel delivery unit. Drain the tank if necessary. Procedure ⇒ [page 7](#) .



Caution

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

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

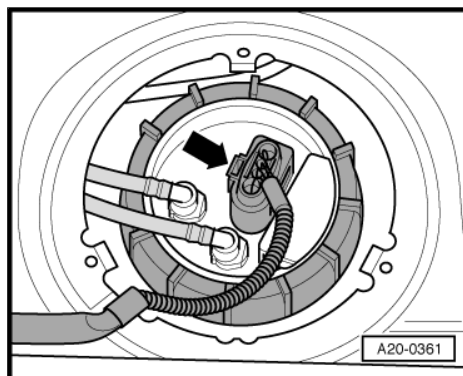
- Disconnect battery ⇒ Rep. Gr. 27 .

- Unbolt cover (right-side) underneath rear seat bench.
- Unplug electrical connector -arrow-.

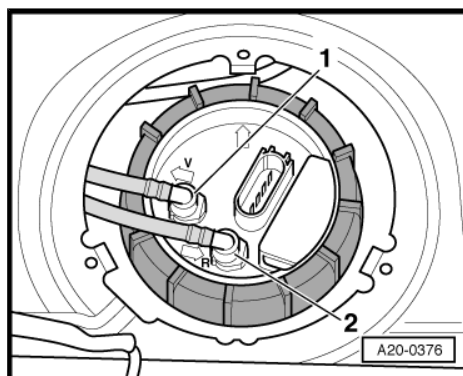

WARNING

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.*

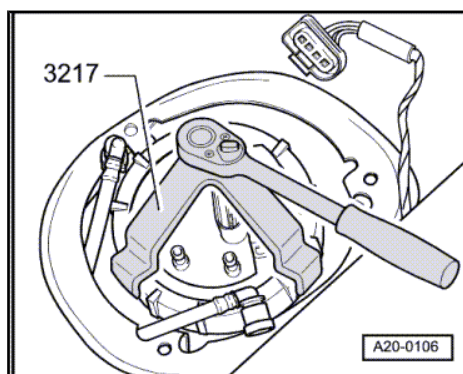


- Press release tabs and disconnect fuel supply pipe -1- and fuel return pipe -2-.


Caution

The fuel tank must not be more than $\frac{3}{4}$ full when removing the fuel delivery unit. Otherwise a large amount of fuel will escape.

- Unscrew union nut using union nut tool -3217- .
- Pull fuel delivery unit and seal out of opening in fuel tank.


Note

- ◆ *When removing fuel delivery unit, make sure you do not bend float arm of fuel gauge sender -G- .*
- ◆ *Keep in mind that the fuel delivery unit still contains fuel.*

Installing

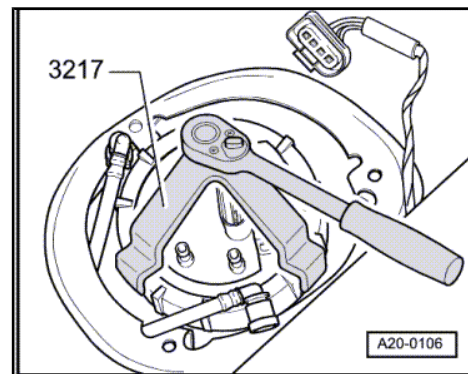
- Tightening torque ⇒ [page 12](#) .

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

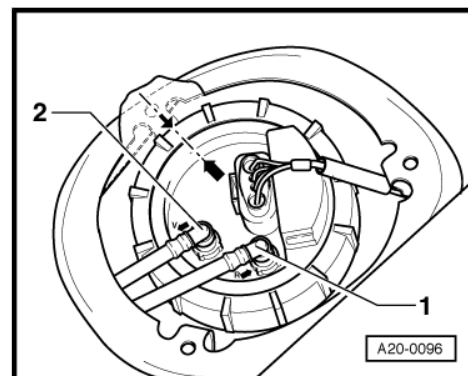

Note

- ◆ *Renew seal.*
- ◆ *Take care not to bend the fuel gauge sender when fitting fuel delivery unit.*

- Fit new seal for flange in fuel tank opening (seal should be dry).
- Tighten union nut using union nut tool -3217- .



- Observe correct installation position:
 - Marking on flange must align with marking on fuel tank -arrows-.
- Connect fuel pipes.
 - Fit blue fuel return pipe -1- onto connection marked -R-.
 - Fit black fuel supply pipe -2- onto connection marked -V-.
- Connect battery. Observe notes on procedures required after connecting battery ⇒ Rep. Gr. 27 .



3.5 Checking fuel gauge sender -G-

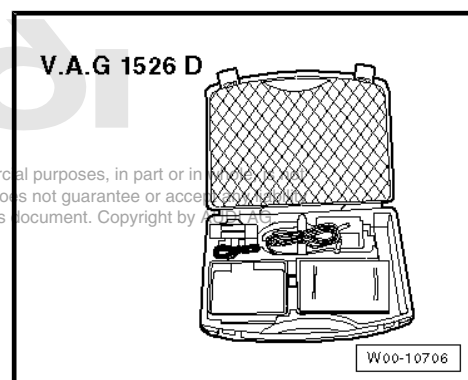


Note

Checking signal from fuel gauge sender ⇒ Rep. Gr. 90 .

Special tools and workshop equipment required

- ◆ Hand-held multimeter -V.A.G 1526D-



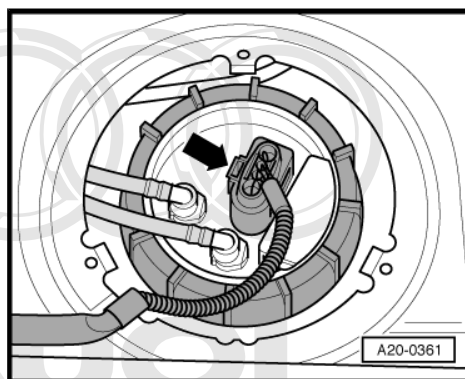
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♦ Auxiliary measuring set -V.A.G 1594C-



Procedure

- Unbolt cover (right-side) underneath rear seat bench.
- Unplug electrical connector -arrow-.



- Connect multimeter (resistance test) between contacts -2- and -3-.

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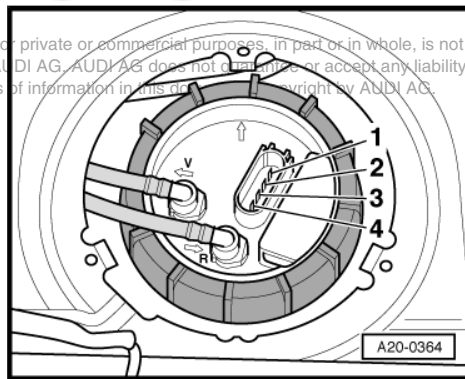
Fuel gauge sender -G- installed:

- Sender at lower stop: approx. 57 Ω .
- Sender at upper stop: approx. 290 Ω .



Note

- ♦ To test the maximum and minimum resistance values for “tank full” and “tank empty”, remove the fuel delivery unit ➔ [page 17](#) and move the sender float all the way to its top or bottom position.
- ♦ If the resistance is 0 Ω , there is a short circuit. If the resistance is $\infty \Omega$, there is an open circuit in the wiring.
- ♦ The following values are obtained with the fuel gauge sender -G- removed, due to the greater travel of the float arm:



Fuel gauge sender -G- removed:

- Sender at lower stop: approx. 54 Ω .
- Sender at upper stop: approx. 290 Ω .

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

3.6 Removing and installing fuel gauge sender -G-

Removing

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

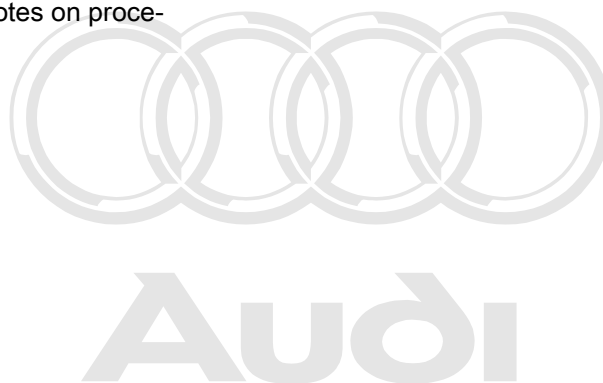
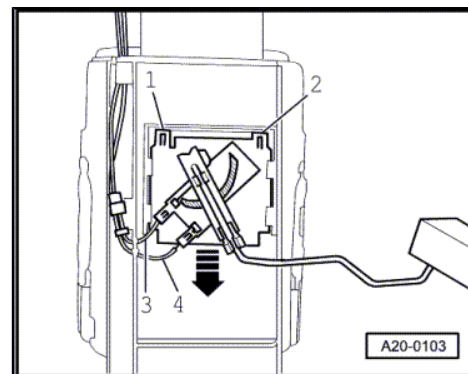
Observe rules for cleanliness ⇒ [page 2](#) .

- Remove fuel delivery unit ⇒ [page 17](#) .
- Release connector tabs on wires -3- and -4- and pull off.
- Lift retaining lugs -1- and -2- 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 guides on fuel delivery unit and press upwards until it clicks into place.
- Attach connector tabs and check that they have engaged properly.
- Install fuel delivery unit ⇒ [page 18](#) ; observe notes on procedure for connecting battery.



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4 Fuel tank - vehicles with four-wheel drive



Note

- ◆ Secure all hose connections with the correct type of hose clips (same as original equipment) ⇒ *Electronic parts catalogue*.
- ◆ Hose clip pliers -V.A.G 1921- are recommended for fitting spring-type hose clips.
- ◆ The arrows marked on the hose and pipe connections should be aligned.

4.1 Fuel tank with attached components - exploded view



Note

Removing, installing and checking breather valve ⇒ [page 24](#)

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1 - Heat shield

- ☐ For fuel tank
- ☐ With support bracket

2 - Fuel filter

- ☐ Note correct position
- ☐ Installation position: Arrow points in through-flow direction

3 - Fuel supply pipe

- ☐ Black
- ☐ To fuel rail
- ☐ To disconnect from flange, press release tab on connection

4 - Screw-type clip

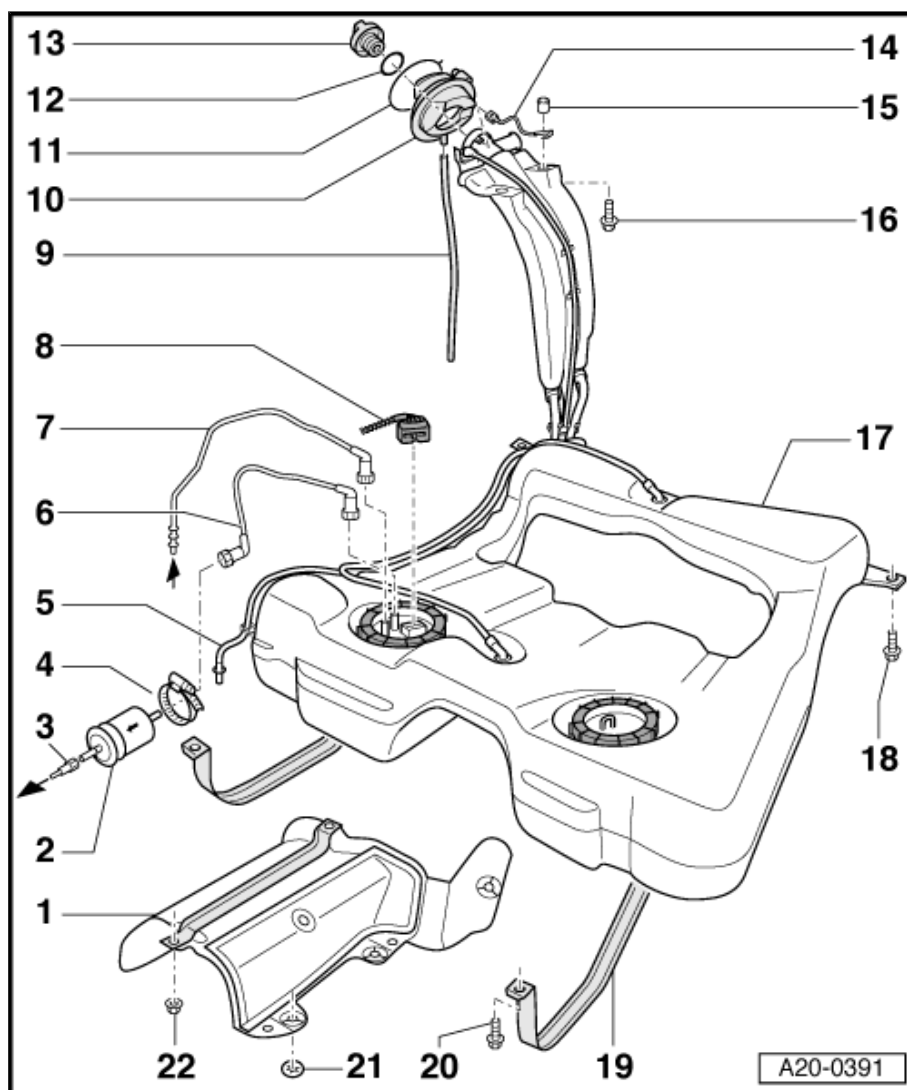
- ☐ For fuel filter
- ☐ Note installation position ⇒ [page 25](#)

5 - Breather pipe

- ☐ White
- ☐ From gravity valve to activated charcoal filter
- ☐ Always remove and install together with gravity valve ⇒ [page 24](#)

6 - Fuel supply pipe

- ☐ Black
- ☐ To fuel filter
- ☐ Attached to connection marked "V" on flange
- ☐ To disconnect from flange, press release tab on connection



7 - Fuel return pipe

- ☐ Blue
- ☐ From fuel rail
- ☐ Attached to connection marked "R" on flange
- ☐ To disconnect from flange, press release tab on connection

8 - Electrical connector

9 - Overflow hose

10 - Rubber cup

11 - Retaining ring

12 - Seal

- ☐ Renew if damaged

13 - Filler cap

14 - Earth connection

- ☐ To eliminate electrostatic charge
- ☐ Installation position ⇒ [page 24](#)
- ☐ Ensure that connector is seated firmly on metal ring of fuel filler neck
- ☐ First engage earth connection in mounting hole on fuel tank and then press in spacer bush -item 15-
- ☐ After installing, use an ohmmeter to check electrical connection between metal ring on fuel filler neck and a bare metal part on body - Specification: approx. 0 Ω

15 - Spacer bush

- ☐ First engage earth connection -item 14- in mounting hole on fuel tank and then press in spacer bush

16 - Bolt

- ☐ 10 Nm

17 - Fuel tank

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

18 - Bolt

- ☐ 26 Nm

19 - Securing strap

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

20 - Bolt

- ☐ 26 Nm

21 - Locking washer

- ☐ Removing: turn anti-clockwise
- ☐ Tighten to 2 Nm

22 -

- ☐ 26 Nm

Installation position of earth connection

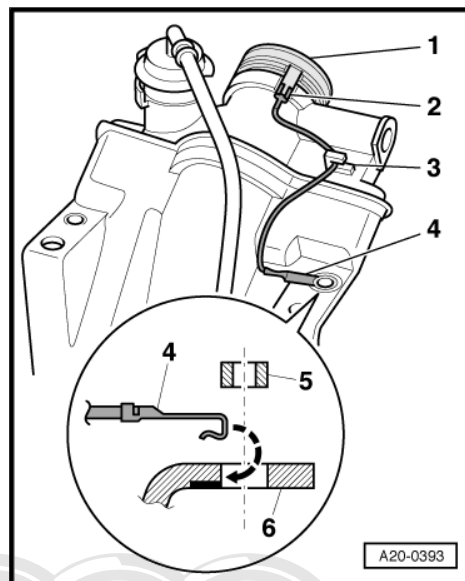
- Route earth connection as shown in illustration.
- First engage contact tab -4- of earth connection in mounting hole on fuel tank -6- and then press in spacer bush -5-.
- Hook earth connection into retaining clip -3- on fuel filler neck.
- Ensure that connector -2- for earth connection is firmly seated on metal ring -1- on fuel filler neck.



Caution

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*



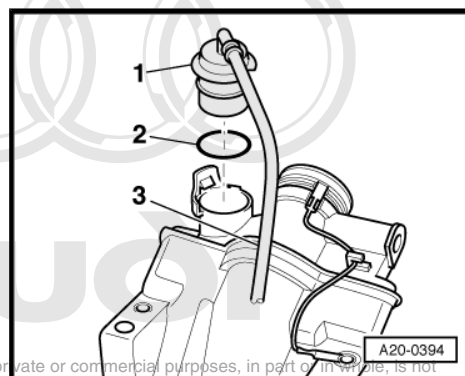
Removing, installing and checking gravity valve



Note

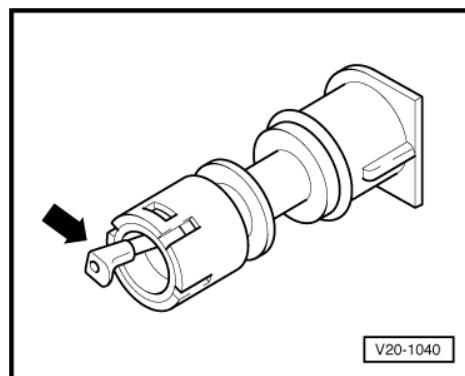
The gravity valve -1- can only be renewed together with breather pipe -3-.

- To remove gravity valve, unclip it from filler neck and lift it off.
- Checking gravity valve:
 - ◆ Hold gravity valve in a vertical position: it should be possible to blow through valve.
 - ◆ Tilt gravity valve by 45°; it should not be possible to blow through valve.
 - ◆ Make sure O-ring -2- is not damaged.



Removing, installing and checking breather valve

- To remove breather valve, unclip it from side of filler neck.
- Before installing breather valve, unscrew filler cap from fuel tank.
- Check breather valve:
 - ◆ Lever in released position: breather valve closed
 - ◆ Lever pressed in direction of arrow: breather valve open
 - ◆ Make sure O-rings are not damaged.

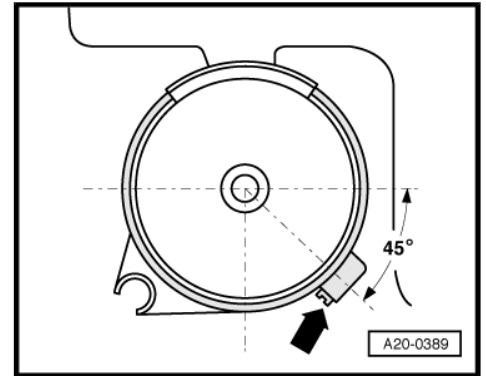


Installation position of screw-type clip for fuel filter

- Install screw-type clip as shown in illustration.
- It is important that there is enough space between fastener of screw-type clip and fuel tank.



The illustration shows the fuel filter as seen from the front.



4.2 Draining fuel tank

Special tools and workshop equipment required

- ◆ Fuel extractor -VAS 5190-



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- ◆ Hose with outer Ø of 11 ... 15 mm

Procedure

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

Observe rules for cleanliness ⇒ [page 2](#) .



Caution

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

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

- Disconnect battery ⇒ Rep. Gr. 27 .

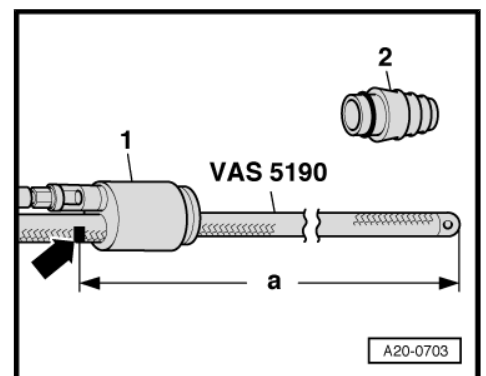
A - Procedure if fuel tank is more than $\frac{3}{4}$ full:



Caution

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

- Detach tapered adapter -2- from shaft end -1- of fuel extractor -VAS 5190- .
- Use insulating tape to mark the extraction hose -arrow- at a distance of -a- = 1,415 mm from the end of the hose.



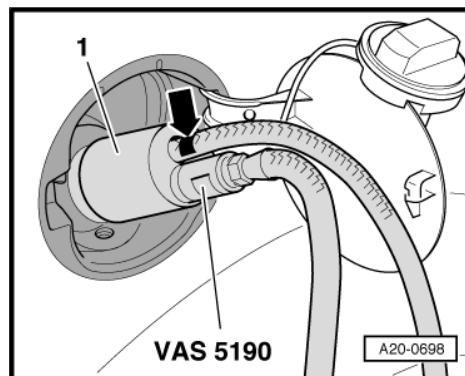
- Remove filler cap from fuel filler neck.
- Screw shaft end -1- of fuel extractor -VAS 5190- onto fuel filler neck.



Note

A ball valve is located at the bottom of the filler neck in the fuel tank; it must not be overpressed or damaged by the extraction hose. Therefore, only push the hose in as far as the marking -arrow-.

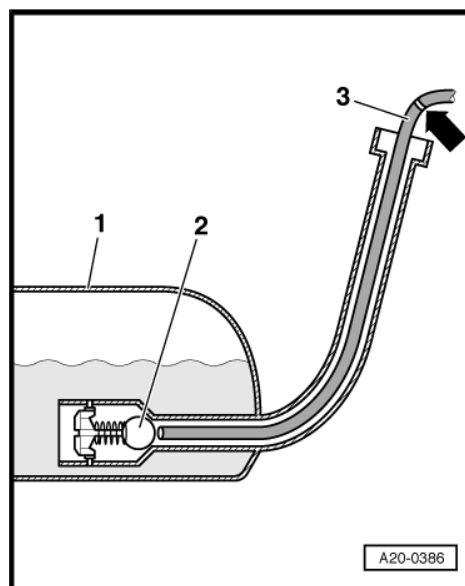
- Push extraction hose into fuel tank until marking on hose -arrow- coincides with shaft end.



Note

- ◆ The procedure when using a fuel extractor without a shaft end is fundamentally the same.
- ◆ A ball valve -2- is located at the bottom of the filler neck in the fuel tank -1-; it must not be overpressed or damaged by the extraction hose -3-. Therefore, only push the hose in as far as the marking -arrow-.
- ◆ In this case, make a mark -arrow- on the extraction hose at distance -a- = 1,350 mm from the end of the hose using insulating tape. The extraction hose has been properly inserted when the affixed mark is level with the edge of the filler neck.
- ◆ If hose is difficult to insert, apply a thin coat of engine oil. DO NOT use silicone-based lubricant.

- Drain fuel tank as much as possible through fuel filler neck.
- Carefully remove extraction hose.
- Remove fuel delivery unit ⇒ [page 36](#) .
- Extract remaining fuel from right chamber of fuel tank through opening for fuel delivery unit.
- Push hose into left chamber of fuel tank and extract remaining fuel.
- Re-install fuel delivery unit ⇒ [page 38](#) ; observe instructions for connecting battery.



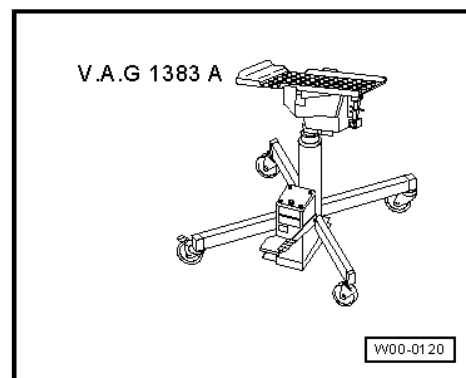
B - Procedure if fuel tank is less than $\frac{3}{4}$ full:

- Remove fuel delivery unit ⇒ [page 36](#) .
- Extract fuel from right chamber of fuel tank through opening for fuel delivery unit.
- Push hose into left chamber of fuel tank and extract remaining fuel.
- Re-install fuel delivery unit ⇒ [page 38](#) ; observe instructions for connecting battery.

4.3 Removing and installing fuel tank with attached components

Special tools and workshop equipment required

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



Removing

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

Observe rules for cleanliness ⇒ [page 2](#) .

- To reduce weight, the fuel tank must be empty when it is removed from the vehicle. Drain the tank if necessary. Procedure ⇒ [page 7](#) .

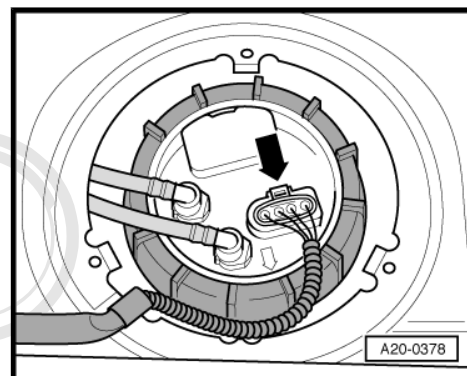


Caution

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

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

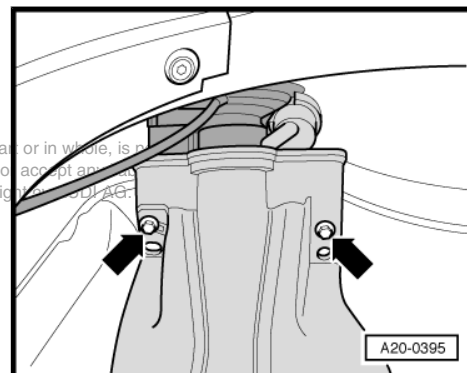
- Disconnect battery ⇒ Rep. Gr. 27 .
- Unbolt cover (right-side) underneath rear seat bench.
- Unplug electrical connector -arrow-.
- Open fuel tank flap and clean area around fuel filler neck.
- Prise out retaining ring in rubber cup (around filler neck).
- Press rubber cup through to the inside.
- Remove centre and rear silencers ⇒ Rep. Gr. 26 .
- Remove propshaft ⇒ Rep. Gr. 39 .
- Remove rear axle ⇒ Rep. Gr. 42 .
- Remove rear right wheel housing liner ⇒ Rep. Gr. 66 .
- Remove bolts -arrows- for fuel filler neck.



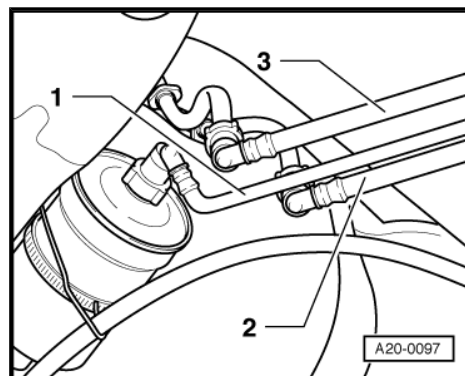
WARNING

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.*

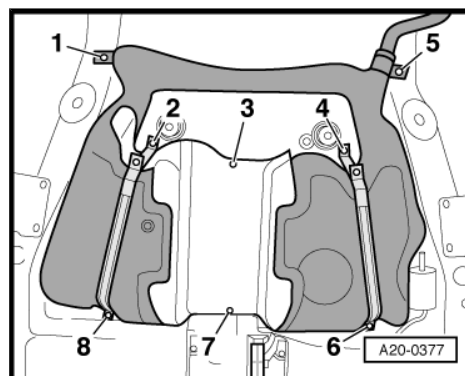


- Disconnect fuel return pipe -2- (blue), fuel supply pipe -1- (black) and breather pipe -3- (white) from right front of fuel tank by pressing release tabs.


WARNING

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

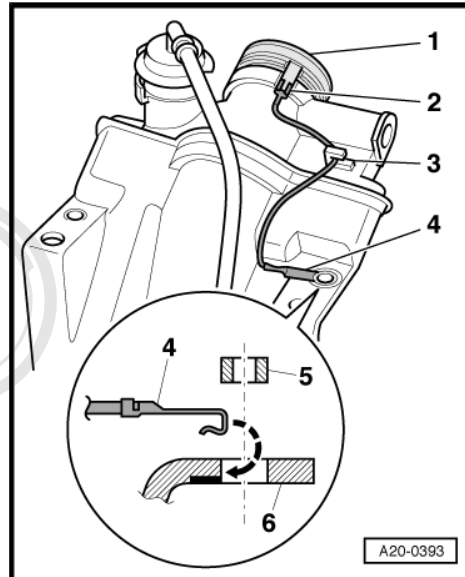
- Position engine and gearbox jack -V.A.G 1383 A- below vehicle to support tank.
- Slacken bolted connections in the following order:
 - ◆ Retaining lugs -1- and -5-
 - ◆ Support bracket -3- and -7-
 - ◆ Securing straps -2, 4, 6, 8-
- Lower fuel tank.


Installing

- Tightening torques ➔ [page 22](#)

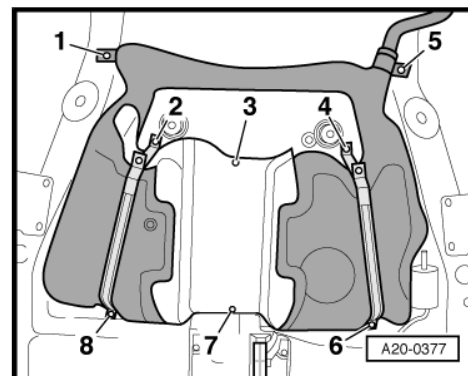
Installation is carried out in the reverse order; note the following:

- Check the earth wiring at both ends for traces of oxidation and remove oxidation if necessary.
- Check installation position of earth connection:
 - Connector -2- must be seated properly on metal ring -1-.
 - Earth wire must be engaged in retaining clip -3-.
 - Contact tab -4- must be attached on fuel tank -6- and secured with spacer bush -5-.
- Position fuel tank with securing straps and support bracket on underside of vehicle using engine and gearbox jack -V.A.G 1383 A- .



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- Bolt on fuel tank at attachment points as follows:
 - Securing straps -2, 4, 6, 8-
 - Support bracket -3- and -7-
 - Retaining lugs -1- and -5-



- Tighten bolts -arrows-.

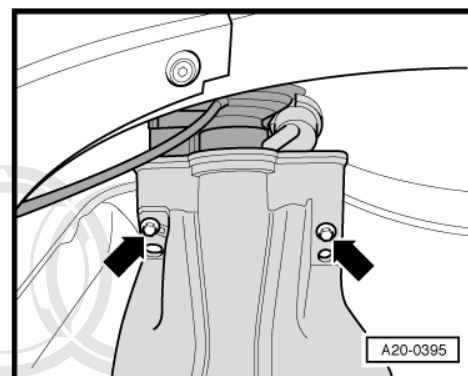


Caution

It is important that you make sure that the earth connection is bolted on and the connector is properly attached to the fuel filler neck. Installation position ⇒ [page 24](#) .

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*



- Install rear right wheel housing liner ⇒ Rep. Gr. 66 .
- Install rear axle ⇒ Rep. Gr. 42 .
- Install propshaft ⇒ Rep. Gr. 39 .
- Connect battery. Observe notes on procedures required after connecting battery ⇒ Rep. Gr. 27 .

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5 Fuel delivery unit and fuel gauge senders - vehicles with four-wheel drive

5.1 Fuel delivery unit, fuel gauge senders and suction-jet pump - exploded view

1 - Fuel gauge sender -G-

- ☐ Checking resistance values ➔ [page 40](#)
- ☐ Removing and installing ➔ [page 41](#)

2 - Fuel delivery unit

- ☐ With flange
- ☐ Checking fuel pump (electrical test) ➔ [page 32](#)
- ☐ Checking residual pressure ➔ Rep. Gr. 24
- ☐ Removing and installing ➔ [page 36](#)
- ☐ Put at least 5 litres of fuel into tank after installing

3 - Seal

- ☐ Renew Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability for the correctness of information in this document, nor for any damage caused by AUDI AG.
- ☐ When installing fit seal (dry) in opening in fuel tank

4 - Fuel return pipe

- ☐ Blue
- ☐ From fuel rail
- ☐ Attached to connection marked "R" on flange
- ☐ To disconnect from flange, press release tab on connection

5 - Fuel supply pipe

- ☐ Black
- ☐ To fuel filter
- ☐ Attached to connection marked "V" on flange
- ☐ To disconnect from flange, press release tab on connection

6 - Electrical connector

- ☐ For fuel pump, fuel gauge sender -G- and fuel gauge sender 2 -G169-

7 - Union nut

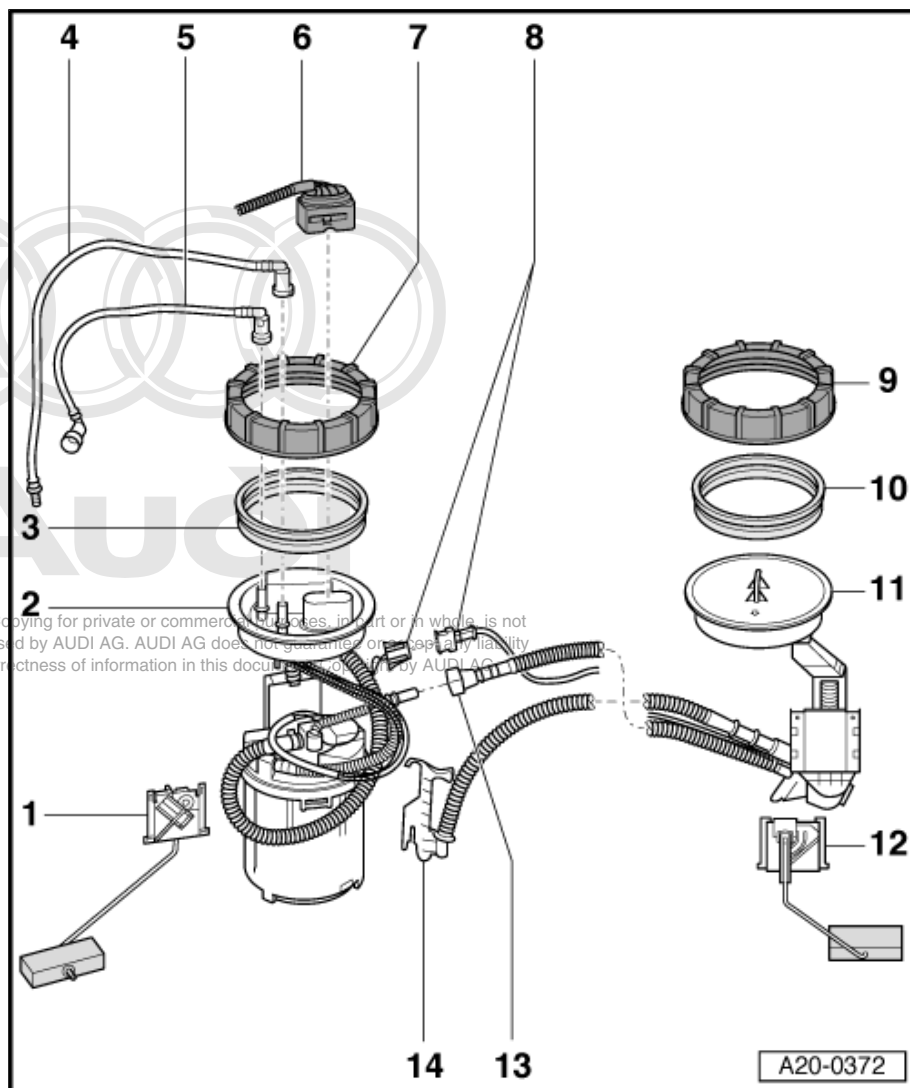
- ☐ 80 Nm
- ☐ Loosen and tighten with union nut tool -3217-

8 - Electrical connector

- ☐ For fuel gauge sender 2 -G169-

9 - Union nut

- ☐ 80 Nm



- ☐ Loosen and tighten with union nut tool -3217-

10 - Seal

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

11 - Suction-jet pump

- ☐ With pipes
- ☐ Only available together with -item 12-.
- ☐ Removing and installing ⇒ [page 43](#)
- ☐ Put at least 5 litres of fuel into tank after installing

12 - Fuel gauge sender 2 -G169-

- ☐ Only available together with -item 11-.
- ☐ Checking ⇒ [page 40](#)
- ☐ Removing and installing ⇒ [page 42](#)

13 - Hose connection

- ☐ Connects fuel hose to suction-jet pump
- ☐ Press release tab to disconnect

14 - Retainer

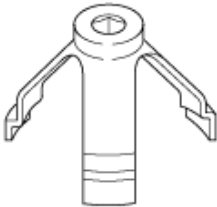
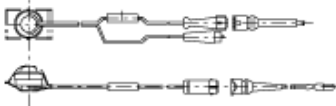
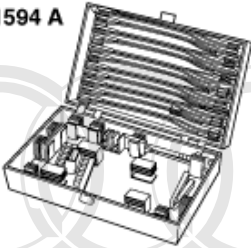
- ☐ Retains fuel hose (coming from suction-jet pump)
- ☐ Hook into fuel delivery unit and press in until it engages

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5.2 Checking fuel pump (electrical test)

Special tools and workshop equipment required

- ◆ Union nut tool -3217-
- ◆ Adapter cable -V.A.G 1348/3-2-
- ◆ Remote control for V.A.G 1348 -V.A.G 1348/3A-
- ◆ Hand-held multimeter - V.A.G 1526D-
- ◆ Auxiliary measuring set - V.A.G 1594C-

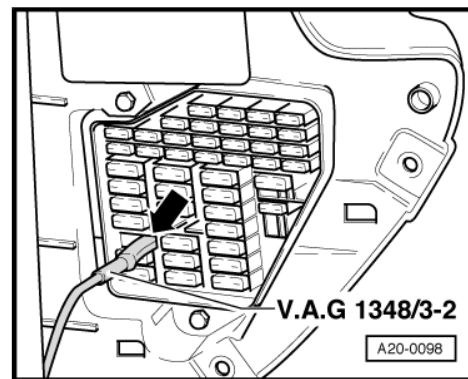
3217 	V.A.G 1348/3-2 
V.A.G 1348/3A 	V.A.G 1526 A 
V.A.G 1594 A 	G20-0002

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Procedure

Observe test conditions ⇒ [page 3](#) .

- Open lid of fuse box at left side of instrument panel.
- Pull fuse No. 28 off fuse holder (left row, 5th large fuse from the top).
- Connect remote control -V.A.G 1348/3A- for V.A.G 1348 with adapter cable -V.A.G 1348/3-2- to right-hand terminal on fuse socket no. 28 -arrow-.
- Connect crocodile clamp to vehicle battery (+).
- Press remote control switch.
- Pump should start running audibly.

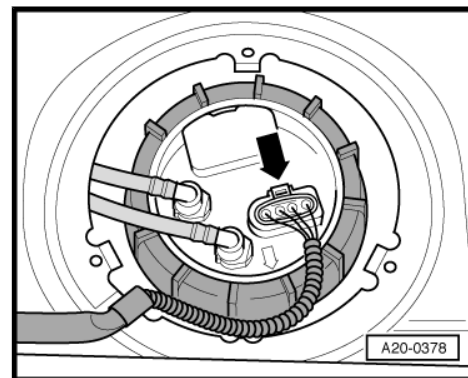


Note

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

If no noise can be heard from pump:

- Unbolt cover (right-side) underneath rear seat bench.
- Unplug electrical connector -arrow-.



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- Connect multimeter (voltage test range) between contacts -1- and -4-.

- Press remote control switch.

- Specification: approx. battery voltage

If specification is not obtained:

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

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



Caution

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

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

- Disconnect battery ⇒ Rep. Gr. 27 .

- The fuel tank must not be more than $\frac{3}{4}$ full when removing the flange. Drain the tank if necessary. Procedure ⇒ [page 7](#)



Caution

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

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

- Disconnect battery ⇒ Rep. Gr. 27 .

- Unbolt cover (right-side) underneath rear seat bench.

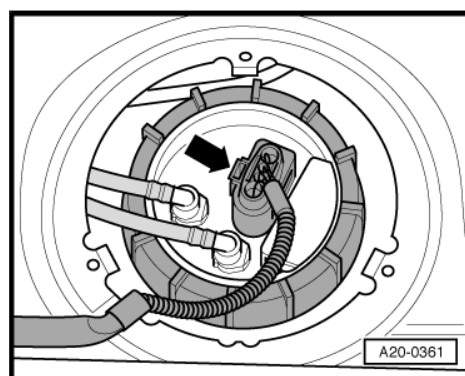
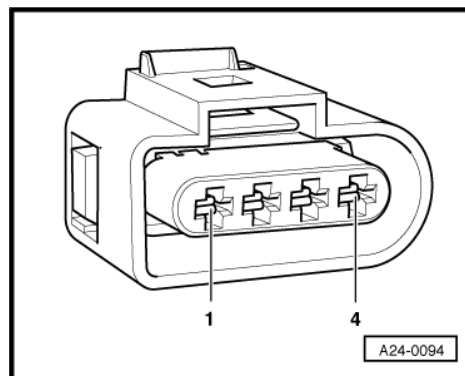
- Unplug electrical connector -arrow-.



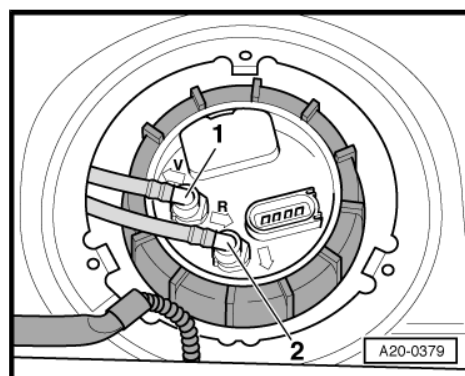
WARNING

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.*



- Press release tabs and disconnect fuel supply pipe -1- and fuel return pipe -2-.





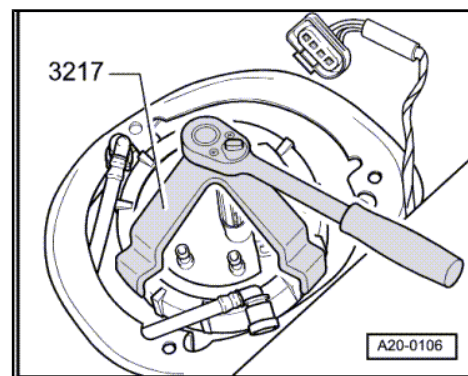
Caution

The fuel tank must not be more than $\frac{3}{4}$ full when removing the fuel delivery unit. Otherwise a large amount of fuel will escape.

- Unscrew union nut using union nut tool -3217- .
- Take flange of fuel delivery unit out of opening in fuel tank and move clear, leaving hoses connected.
- Check that wiring between flange and fuel pump is connected and test for continuity.

If no wiring fault is detected: fuel pump is defective.

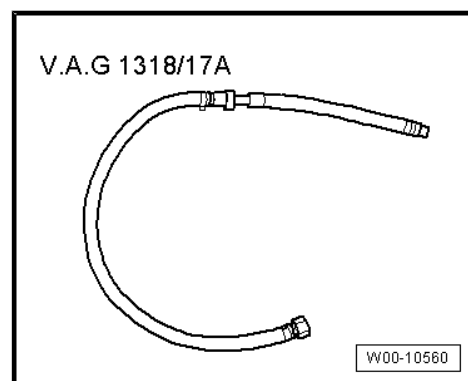
- Renew fuel delivery unit → [page 36](#) .



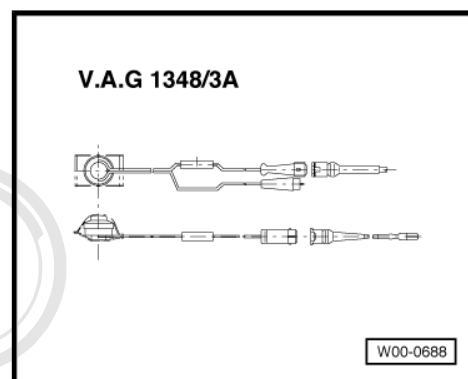
5.3 Checking fuel pump delivery rate

Special tools and workshop equipment required

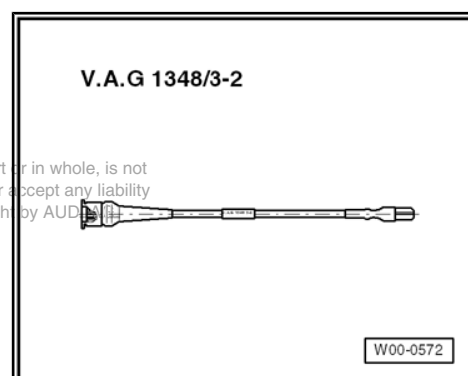
- ◆ Adapter set -V.A.G 1318/17A-



- ◆ Remote control for V.A.G 1348 -V.A.G 1348/3A-



- ◆ Adapter cable -V.A.G 1348/3-2-



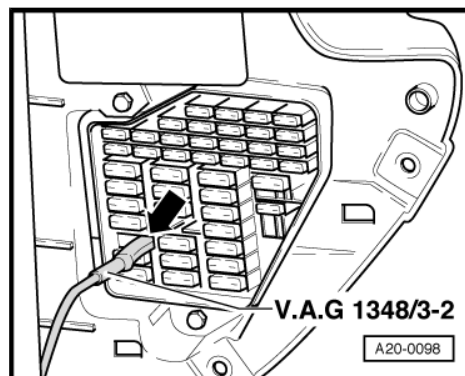
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- ◆ Fuel-resistant measuring container

Procedure

Observe test conditions ⇒ [page 3](#) .

- Open lid of fuse box at left side of instrument panel.
- Pull fuse No. 28 off fuse holder (left row, 5th large fuse from the top).
- Connect remote control -V.A.G 1348/3A- with adapter cable - V.A.G 1348/3-2- to right-hand terminal of fuse socket no. 28 -arrow-.
- Connect crocodile clamp to vehicle battery (+).
- Remove filler cap from fuel filler neck.

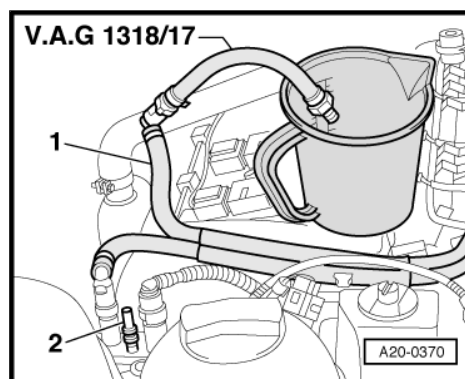


WARNING

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.*

- Press release tab and pull fuel return pipe -1- off pipe connection -2-.
- Fit adapter from adapter set -V.A.G 1318/17A- onto fuel return pipe coming from engine and hold adapter into measuring container.
- Press remote control button for 15 seconds.



- Compare amount of fuel delivered with minimum delivery shown in diagram (cm³/15 sec.).



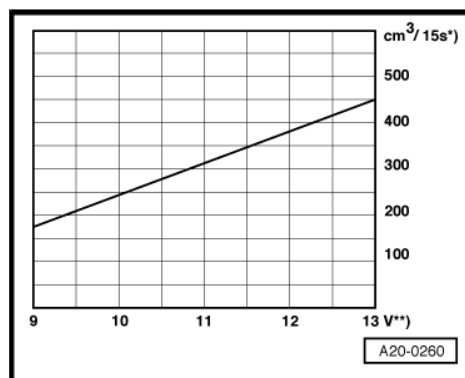
Note

Voltage at fuel pump with engine stationary and fuel 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 pump is defective.

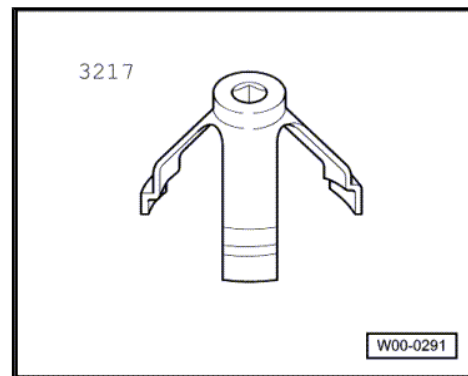
Assemble in reverse order.



5.4 Removing and installing fuel delivery unit

Special tools and workshop equipment required

◆ Union nut tool -3217-



Removing

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

Observe rules for cleanliness ⇒ [page 2](#) .

- The fuel tank must not be more than $\frac{1}{3}$ full when removing the fuel delivery unit. Drain the tank if necessary. Procedure ⇒ [page 7](#) .



Caution

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

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

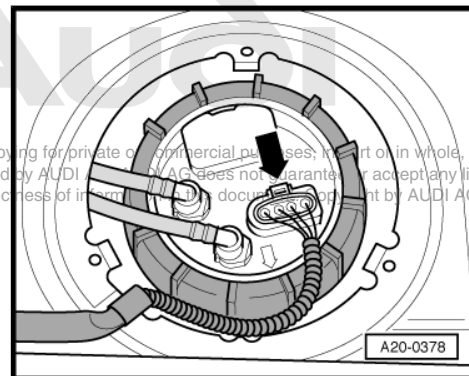
- Disconnect battery ⇒ Rep. Gr. 27 .
- Unbolt cover (right-side) underneath rear seat bench.
- Unplug electrical connector -arrow-.



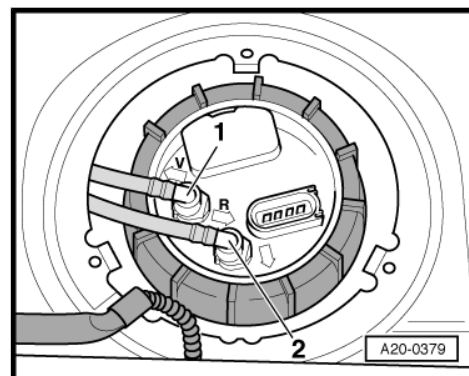
WARNING

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.*



- Press release tabs and disconnect fuel supply pipe -1- and fuel return pipe -2-.





Caution

The fuel tank must not be more than $\frac{1}{3}$ full when removing the fuel delivery unit. Otherwise a large amount of fuel will escape.

- Unscrew union nut using union nut tool -3217- .
- Take flange of fuel delivery unit out of opening in fuel tank and move clear, leaving hoses connected.
- Reach into fuel tank and disconnect connector -1-.
- Press release tab for hose connector and disconnect hose -2-.
- Lift retainer -3- upwards and disengage retainer and hose -4- from fuel delivery unit -5-.



Note

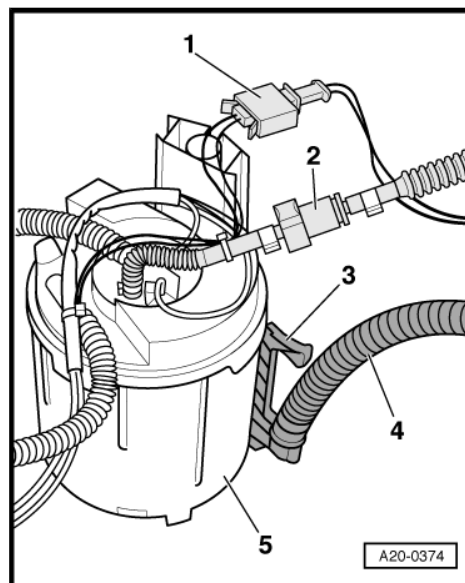
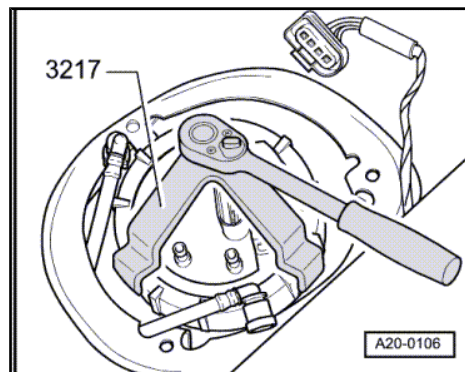
The fuel delivery unit has been removed in the illustration.

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



Note

- ◆ *When removing fuel delivery unit, make sure you do not bend float arm of fuel gauge sender -G- .*
- ◆ *Keep in mind that the fuel delivery unit still contains fuel.*



Installing

- Tightening torque ⇒ [page 30](#)

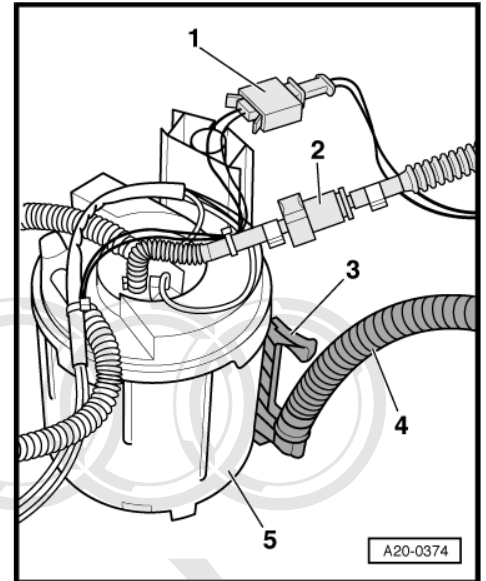
Installation is carried out in the reverse order; note the following:



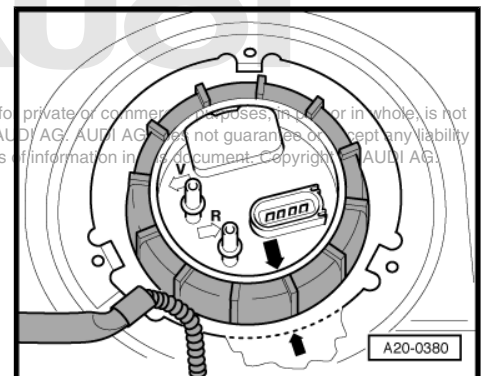
Note

- ◆ *Renew the seal.*
- ◆ *When installing fuel delivery unit, take care not to bend float arm of fuel gauge sender -G- .*
- ◆ *Make sure that fuel hoses are securely fitted.*

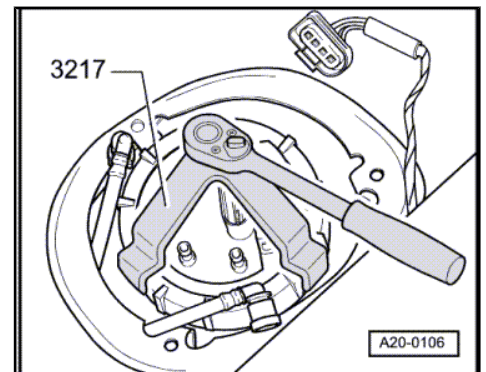
- Insert fuel delivery unit -5- into fuel tank, with flange set aside.
- Insert retainer -3- for hose -4- in fuel delivery unit and press in until it engages.
- The retainer must engage properly.
- Press hose connector onto hose -2- so that it engages.
- Plug in electrical connector -1- for fuel gauge sender 2-G169-.
- Slot guide sleeve on flange into guide sleeve on fuel delivery unit; make sure spring is not damaged.



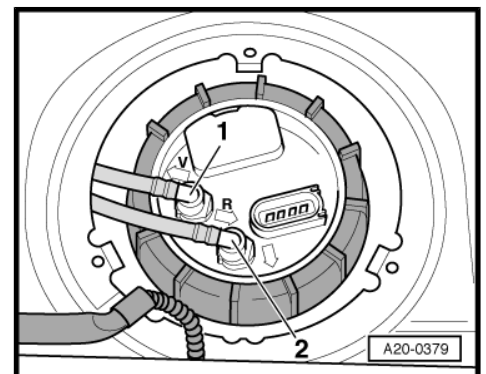
- Press flange down against spring pressure, and turn flange to installation position.
- Marking on flange must align with marking on fuel tank -arrows-.



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



- Connect fuel pipes:
 - ◆ Fit black fuel supply pipe -1- onto connection marked -V-.
 - ◆ Fit blue fuel return pipe -2- onto connection marked -R-.
- Plug in electrical connector.
- Connect battery and perform steps required after re-connecting battery ⇒ Rep. Gr. 27.
- Put at least 5 litres of fuel into tank after installing fuel delivery unit.



5.5 Checking fuel gauge sender -G- / -G169-



Note

Checking signal from fuel gauge sender ⇒ Rep. Gr. 90.

Special tools and workshop equipment required

- ◆ Hand-held multimeter -V.A.G 1526D-



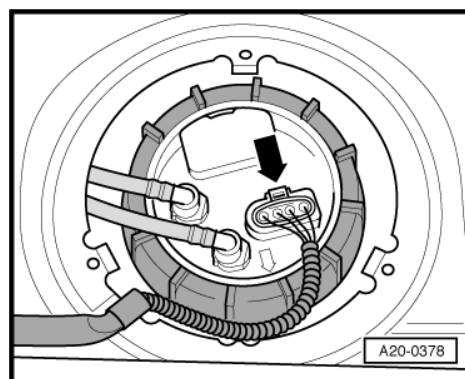
- ◆ Auxiliary measuring set -V.A.G 1594C-

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Procedure

- Unbolt cover (right-side) underneath rear seat bench.
- Unplug electrical connector -arrow-.



- Connect multimeter (resistance test) between contacts -2- and -3-.

Fuel gauge sender -G- installed:

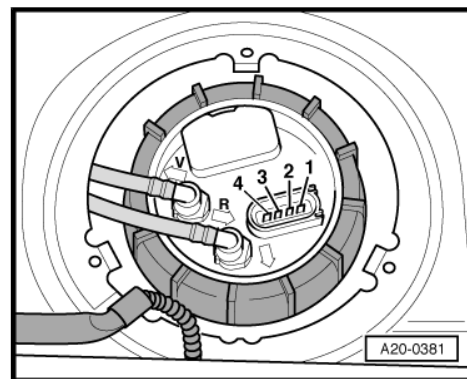
- Sender at lower stop: approx. 59 Ω .
- Sender at upper stop: approx. 282 Ω .



Note

- ◆ To test the maximum and minimum resistance values for “tank full” and “tank empty”, remove the fuel delivery unit [⇒ page 36](#) and move the sender floats all the way to their top or bottom position.
- ◆ If the resistance is 0 Ω , there is a short circuit. If the resistance is $\infty \Omega$, there is an open circuit in the wiring.
- ◆ The two fuel gauge senders are measured separately after removing.
- ◆ The following values are obtained with the fuel gauge sender removed, due to the greater travel of the float arm:

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Fuel gauge sender -G- removed:

- Sender at lower stop: approx. 29 Ω .
- Sender at upper stop: approx. 147 Ω .

With fuel gauge sender 2 -G169- removed:

- Sender at lower stop: approx. 27 Ω .
- Sender at upper stop: approx. 140 Ω .

Assemble in reverse order.

5.6 Removing and installing fuel gauge sender -G-

Removing

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

Observe rules for cleanliness [⇒ page 2](#).

- Remove fuel delivery unit [⇒ page 36](#).
- Remove suction-jet pump [⇒ page 43](#).



Caution

Risk of damage.

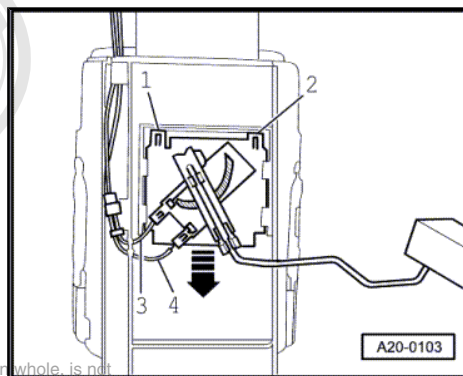
- ◆ *First release retainer tabs on connector contact before detaching electrical connectors on fuel gauge sender -G-.*

- Release connector tabs on wires -3- and -4- and pull off.
- Lift retaining lugs -1- and -2- 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 guides on fuel delivery unit and press upwards until it clicks into place.
- Attach connector tabs and check that they have engaged properly.
- Install fuel delivery unit ⇒ [page 38](#) , connect battery and perform steps required after re-connecting battery ⇒ Rep. Gr. 27 .



5.7 Removing and installing fuel gauge sender 2 -G169-

The fuel gauge sender 2 -G169- and the suction-jet pump are one component; they cannot be renewed separately if defective.

- Renewing suction-jet pump ⇒ [page 43](#) .

5.8 Suction-jet pump: operation

The electric fuel pump sends a pressurised stream of fuel into the suction-jet pump (entrainment pump) in the left chamber of the tank.

The suction-jet pump delivers the fuel from there into the right chamber, and from the right chamber it is drawn into the fuel delivery unit.

Faults caused by defective suction-jet pump



WARNING

If the suction-jet pump is defective, the engine can stop due to fuel starvation when the tank is still 1/4 full.

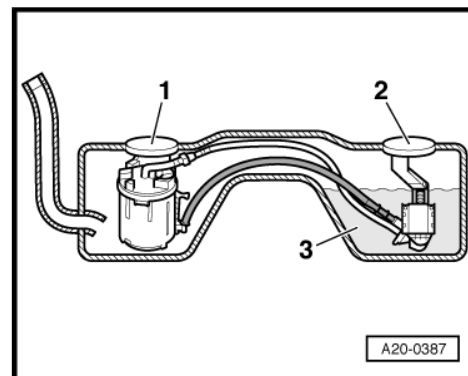
If suction-jet pump -2- is not working, up to 15 litres of fuel -3- (up to $\frac{1}{4}$ of tank capacity) may remain in the left chamber of the tank, where it cannot be drawn into the fuel delivery unit.

If the engine stops due to fuel starvation with the tank up to about $\frac{1}{4}$ full, proceed as follows:

- Check fuel pump ➔ [page 32](#) .

If fuel pump is OK, but no fuel is delivered:

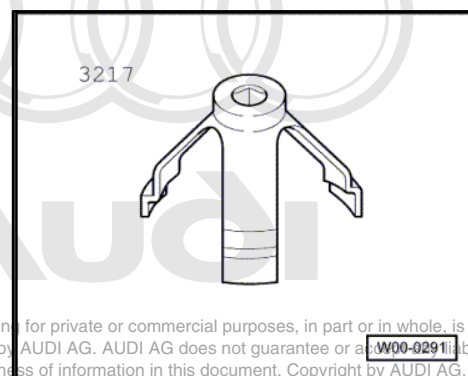
- Put another 5 litres (approx.) of fuel into tank.
- Start engine.
- If engine does start now, renew suction-jet pump ➔ [page 43](#) .



5.9 Removing and installing suction-jet pump

Special tools and workshop equipment required

- ◆ Union nut tool -3217-



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Removing

Observe safety precautions ➔ [page 1](#) .

Observe rules for cleanliness ➔ [page 2](#) .



Caution

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

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

- Disconnect battery ➔ Rep. Gr. 27 .



WARNING

Large amounts of fuel can escape.

- ◆ *The fuel tank must not be more than $\frac{1}{3}$ full when removing the fuel delivery unit and the suction-jet pump; otherwise a large amount of fuel will escape.*

- Remove fuel delivery unit ➔ [page 36](#) .

- Unbolt cover (left-side) under rear seat bench.
- Unscrew union nut using union nut tool -3217- .
- Take flange of suction-jet pump with fuel gauge sender 2 - G169- out of opening in fuel tank, leaving hoses connected.

Installing

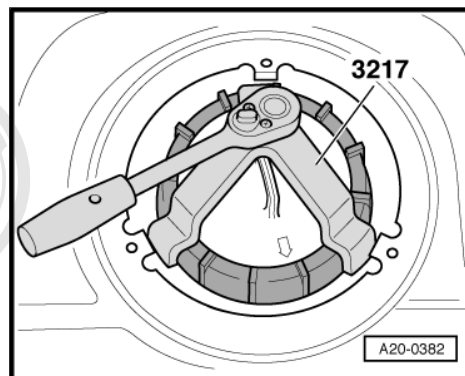
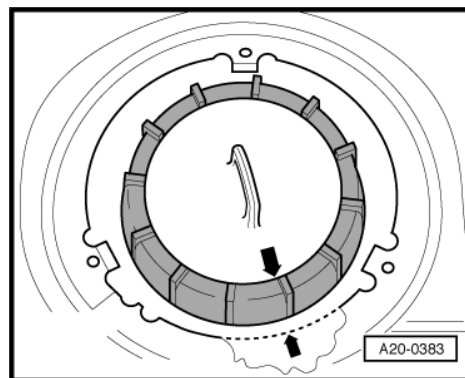
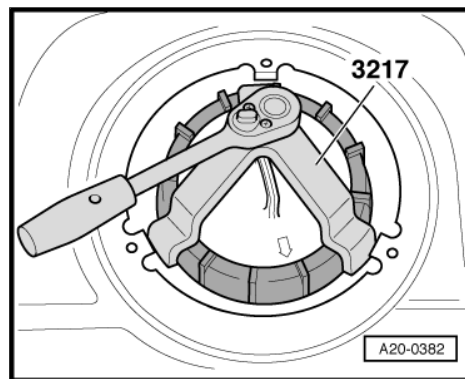
- Tightening torque ⇒ [page 30](#) .

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



Note

- ◆ *Renew the seal.*
- ◆ *When installing suction-jet pump, make sure you do not bend float arm of fuel gauge sender 2 -G169- .*
- ◆ *Make sure that fuel hoses are securely fitted.*
- Push hoses for suction-jet pump through opening for suction-jet pump and into fitting location of fuel delivery unit.
- Fit new seal for flange in fuel tank opening (seal should be dry).
- Press flange into opening and move to installation position.
- Marking on flange must align with marking on fuel tank -arrows-.
- Install fuel delivery unit ⇒ [page 38](#) .
- Screw on union nut by hand and use union nut tool -3217- to tighten.
- Connect battery and perform steps required after re-connecting battery ⇒ Rep. Gr. 27 .



6 Activated charcoal filter

6.1 Activated charcoal filter system - exploded view

1 - Rubber grommet

2 - Activated charcoal filter

- ☐ Fitting location: front of engine compartment, right-side
- ☐ With activated charcoal filter system solenoid valve 1 -N80-
- ☐ Cannot be renewed separately
- ☐ Checking operation and activation => Rep. Gr. 24

☐ To remove, unbolt power steering reservoir.

3 - Mounting element

4 - Washer

5 - Bolt

- ☐ 10 Nm

6 - Connector

- ☐ For active charcoal filter solenoid valve 1 -N80-

7 - Breather pipe

8 - Non-return valve

- ☐ Turbocharged engines only
- ☐ Installation position (light side/dark side) as shown in illustration. Arrow indicates direction of flow.

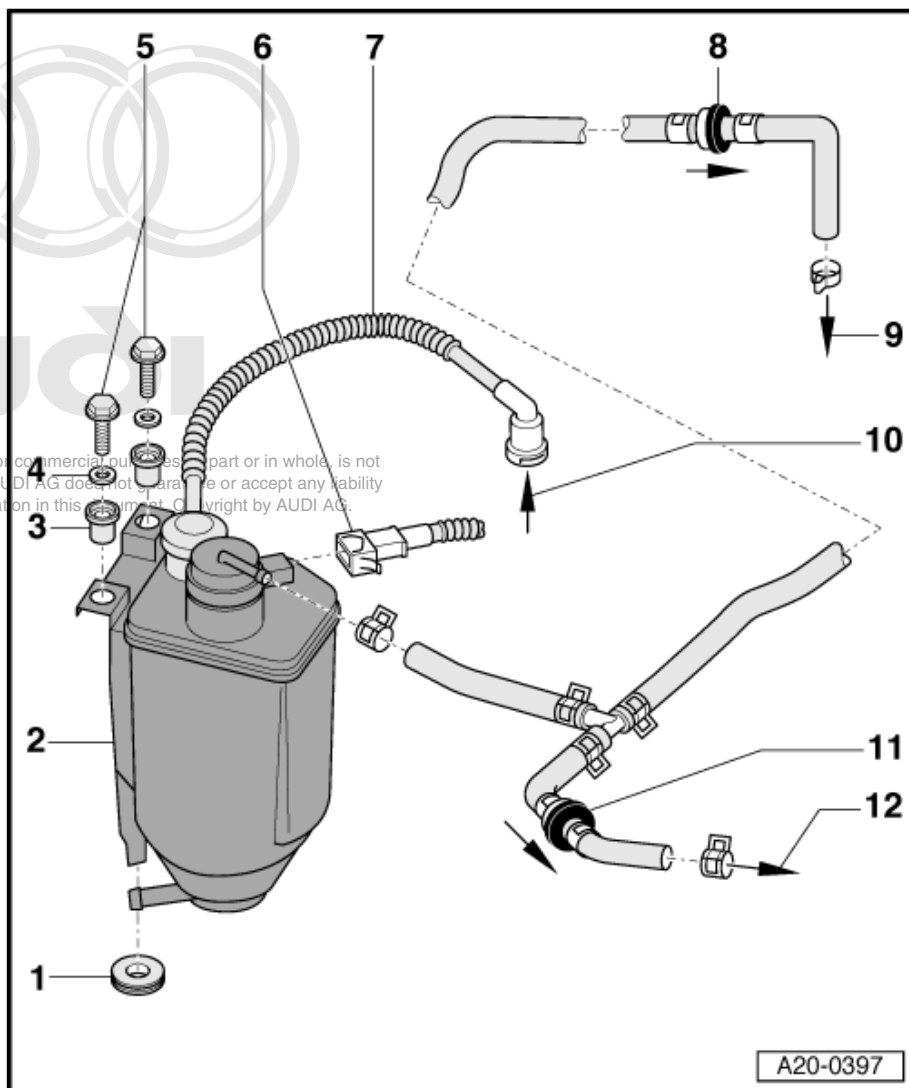
9 - To intake connection on turbocharger

10 - From fuel tank

11 - Non-return valve

- ☐ Turbocharged engines only
- ☐ Installation position (light side/dark side) as shown in illustration. Arrow indicates direction of flow.

12 - To intake manifold



7 Accelerator mechanism - vehicles with mechanical accelerator mechanism



Note

- ◆ *The throttle cable is liable to kink easily and must therefore be handled carefully when installing.*
- ◆ *Even one slight kink can cause it to break when driving. Therefore kinked throttle cables must not be installed.*
- ◆ *When installing the throttle cable, make sure it is aligned straight between its supporting brackets and the cable attachment points.*

7.1 Mechanical accelerator mechanism - exploded view

Left-hand drive vehicles

1 - Throttle cable

- ☐ Removing and installing
⇒ [page 47](#)
- ☐ Adjusting by re-positioning locking element at retainer ⇒ [page 48](#)

2 - Locking element

3 - Accelerator pedal

4 - Spacer bush

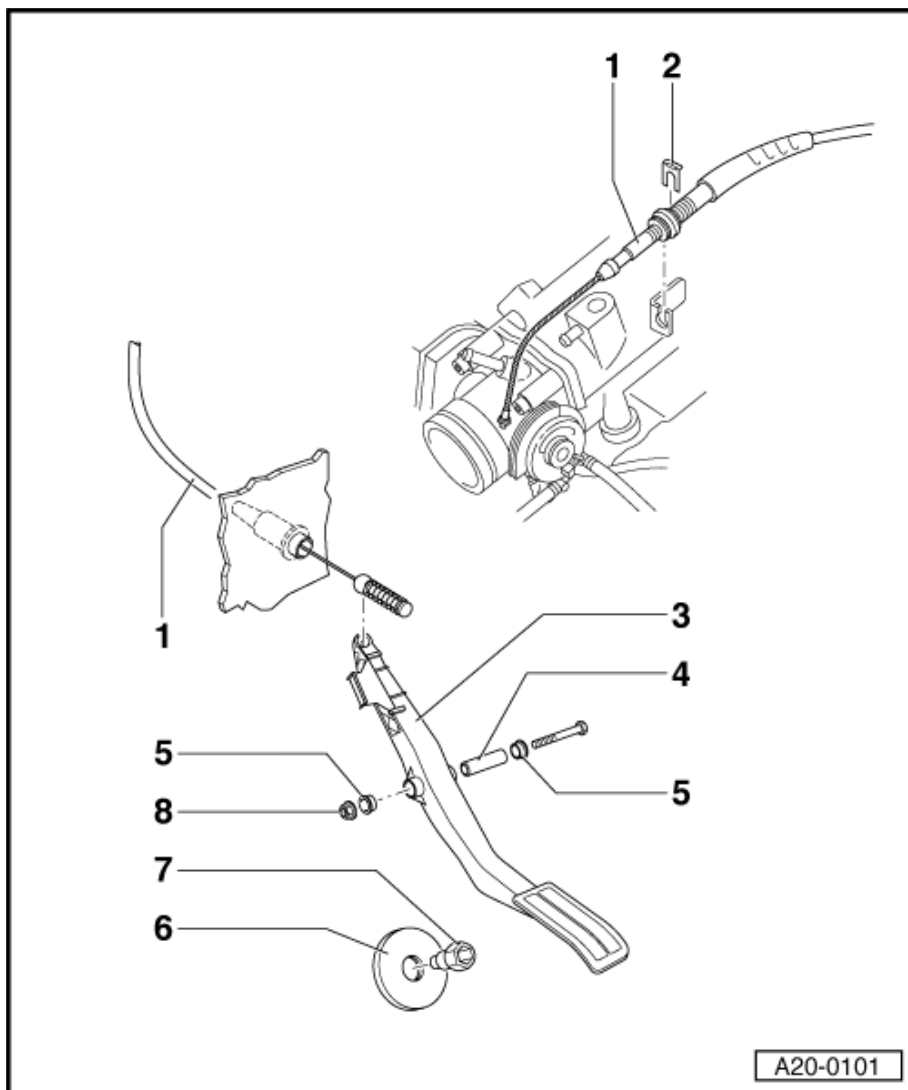
5 - Bearing bush

6 - Washer

7 - Stop bolt

8 - Nut

- ☐ 20 Nm



Right-hand drive vehicles

1 - Bearing bush

2 - Throttle cable

- ☐ Removing and installing
 ⇒ [page 47](#)
- ☐ Adjusting by re-position-
 ing locking element at
 retainer ⇒ [page 48](#)

3 - Operating rod

- ☐ With accelerator pedal
- ☐ To remove, lift locking
 lever on bearing bush
 -item 4- and turn bush

4 - Bearing bush

- ☐ With securing tab
- ☐ To remove operating
 rod -item 3-, lift locking
 lever on bearing bush
 and turn bush

5 - Pedal rubber

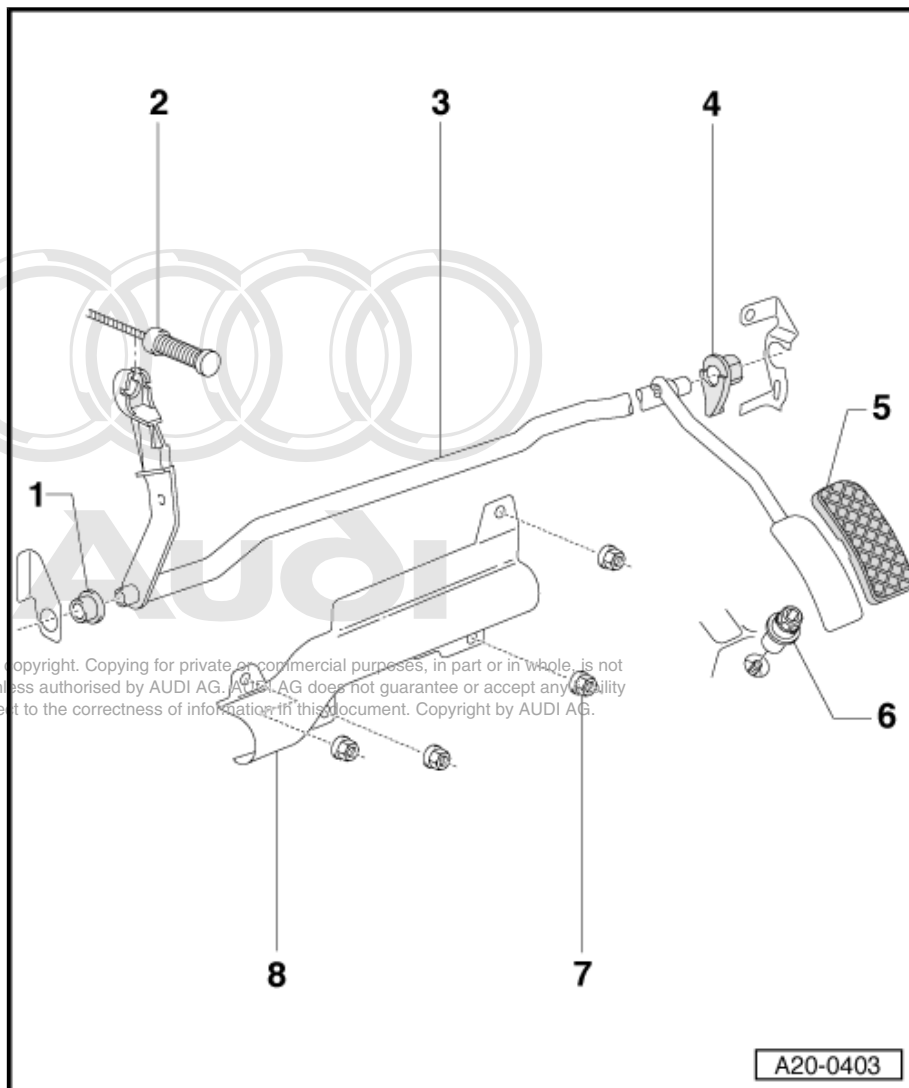
6 - Accelerator pedal stop

7 - Nut

- ☐ 10 Nm

8 - Cover

- ☐ For operating rod



7.2 Removing and installing throttle cable

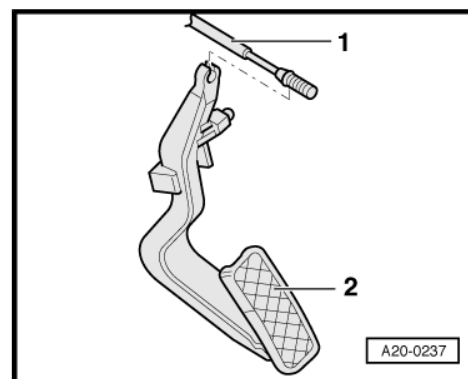
Removing

Left-hand drive vehicles:

- Remove storage compartment (driver's side) ⇒ Rep. Gr. 68 .
- Disengage end of throttle cable -1- at top of accelerator pedal -2-.

Right-hand drive vehicles:

- Remove glove box ⇒ Rep. Gr. 68 .
- Disengage end of throttle cable at operating rod
 ⇒ [Item 3 \(page 47\)](#) .



All vehicles (continued):

- Disengage nipple -1- on end of throttle cable from cable cam.
- Pull grooved section of throttle cable sheath -4- out of rubber grommet -2- at support bracket -5-.

Vehicles with automatic gearbox:

- Unplug electrical connector at kick-down switch -F8- on left side of bulkhead.

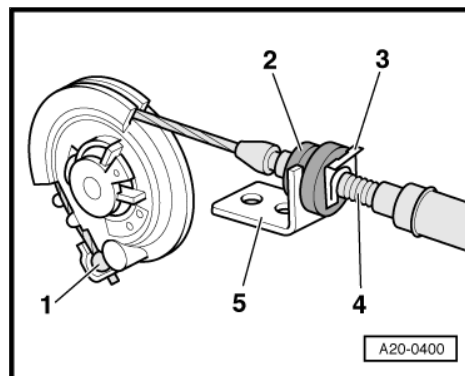
All vehicles (continued):

- Pull throttle cable out of bulkhead.

Installing

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

- Observe notes ➔ [page 46](#) .
- Adjust throttle cable ➔ [page 48](#) .



7.3 Adjusting throttle cable

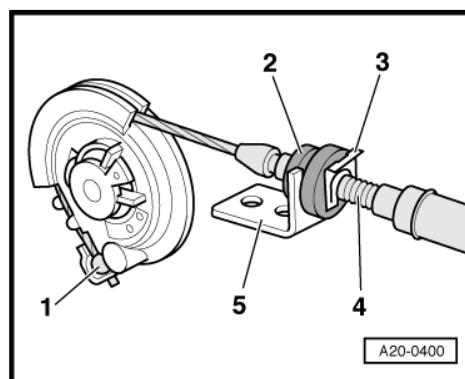
Procedure

- Throttle cable -1- attached to accelerator pedal and to cable cam on throttle valve module -J338- .
- Pull off locking element -3- at grooved section of throttle cable sheath -4-.
- Press accelerator pedal into full-throttle position.



Note

A second mechanic is required for this step; or use a spring tensioning rod braced against the steering wheel.



Vehicles with manual gearbox:

- Adjust throttle cable by re-positioning locking element -3- at rubber grommet -2- of support bracket -5- so that full-throttle position is reached at throttle valve.

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Vehicles with automatic gearbox:

- Adjust throttle cable by re-positioning locking element -3- at rubber grommet -2- of support bracket -5- so that throttle valve is fully open and kick-down switch -F8- clicks audibly.

All vehicles (continued):

- Release accelerator pedal / remove spring tensioning rod.
- After adjusting throttle cable, check position of throttle valve at idling speed and full-throttle stops ➔ Rep. Gr. 24 .

7.4 Checking adjustment - vehicles with automatic gearbox

Special tools and workshop equipment required

◆ Hand-held multimeter -V.A.G 1526D-

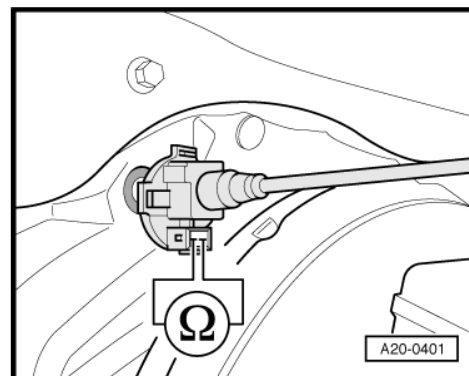


◆ Auxiliary measuring set -V.A.G 1594C-



Procedure

- Unplug electrical connector at kick-down switch -F8- on left side of bulkhead.
- Connect hand-held multimeter -V.A.G 1526D- to kick-down switch -F8- with adapter cables from auxiliary measuring set - V.A.G 1594C- .
- Check resistance at switch.
 - Specification: $\infty \Omega$.
- Slowly move accelerator pedal towards full throttle.
- The resistance value must drop to 0Ω shortly after the kick-down pressure point.
- At this point the accelerator pedal should be just before the end stop.



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8 Accelerator mechanism - vehicles with electronic power control (electronic throttle)

8.1 Accelerator pedal module (left-hand drive vehicles) - exploded view

1 - Nut

- 10 Nm

2 - Bracket

- For storage compartment (driver's side)
- Clip into accelerator pedal module

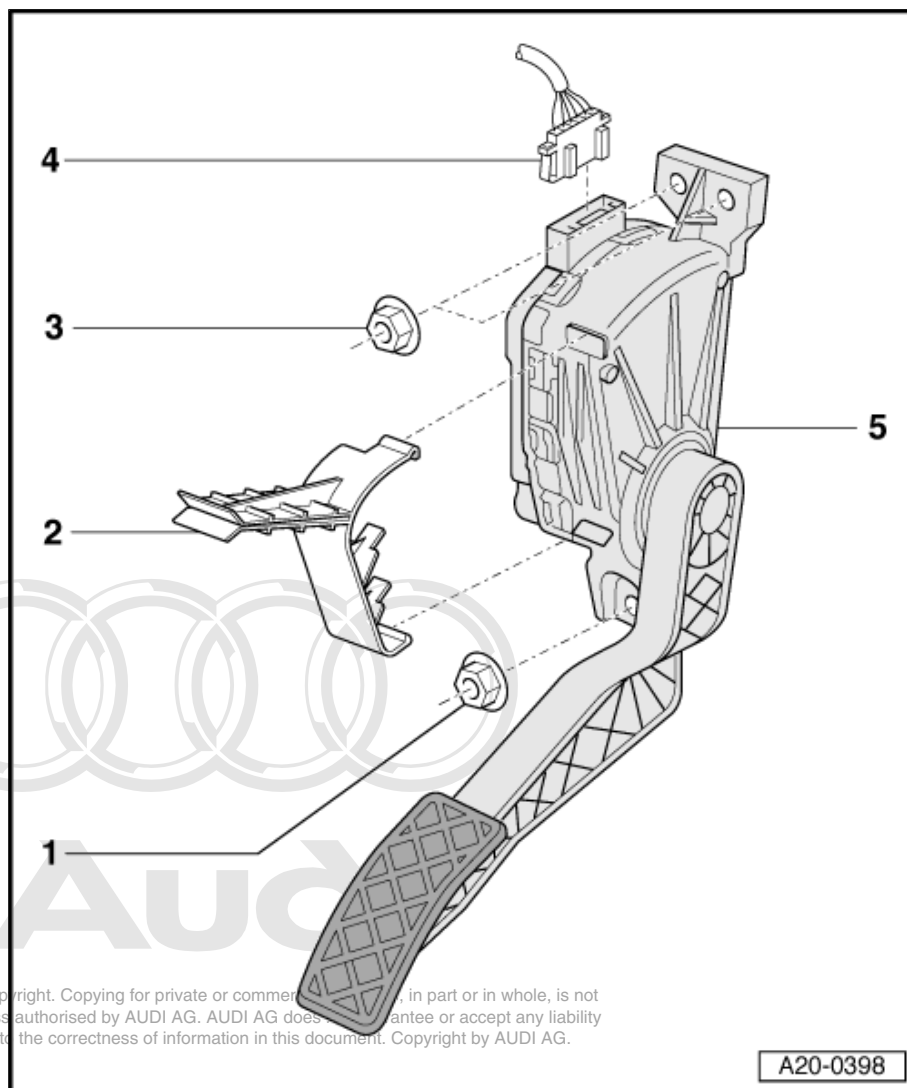
3 - Nut

- 10 Nm

4 - Electrical connector

5 - Accelerator pedal module

- With accelerator position sender -G79- and accelerator position sender 2 -G185-
- Removing and installing
⇒ [page 51](#)



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A20-0398

8.2 Removing and installing accelerator pedal module with accelerator position sender -G79- / -G185- - left-hand drive vehicles

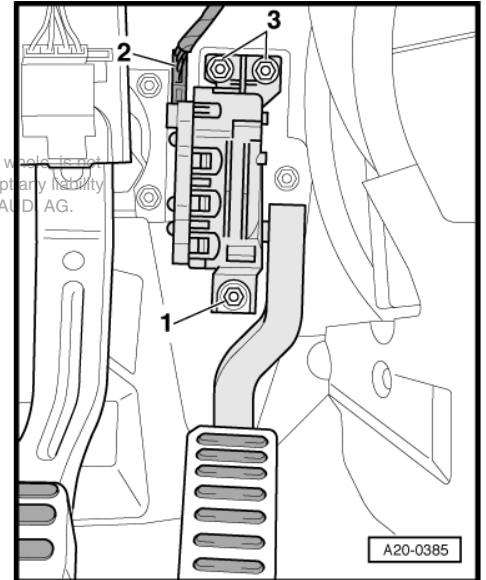
Removing

- Remove storage compartment on driver's side ⇒ Rep. Gr. 68 .
- Unplug electrical connector -2-.
- Remove nuts **1** and **3**.
- Detach accelerator pedal module.

Installing

- Tightening torque ⇒ [page 50](#) .

Install in reverse order.

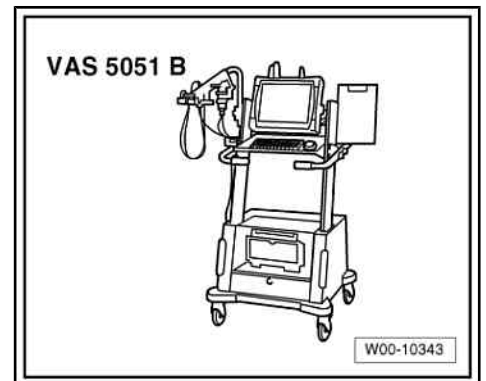


8.3 Performing kick-down adaption - vehicles with automatic gearbox

If accelerator pedal module or engine control unit is renewed on vehicles with automatic gearbox, kick-down function must be adapted.

Special tools and workshop equipment required

- ◆ Vehicle diagnostic, testing and information system -VAS 5051B-



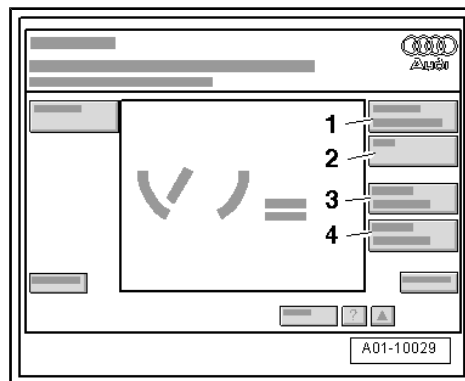
Procedure

- Handbrake applied.
- Vehicles with manual gearbox: gear lever in neutral.
- Vehicles with automatic gearbox: selector lever in position "P" or "N".
- No faults stored in fault memory.
- Ignition switched off and vehicle diagnostic, testing and information system -VAS 5051B- connected to diagnosis connection with diagnosis lead.

- Switch on ignition.

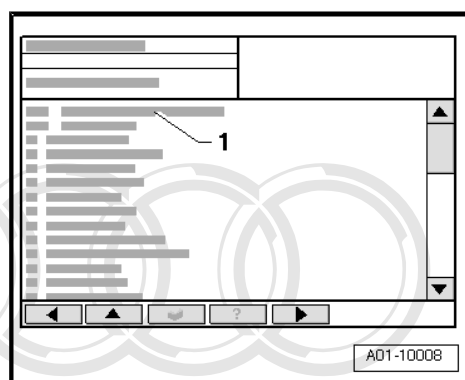
Display on -VAS 5051B- :

- Select Vehicle self-diagnosis from the list -item 1-.



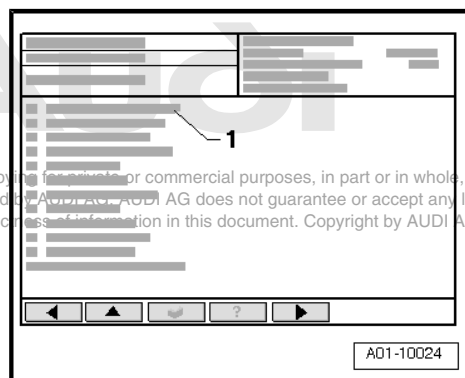
Display on -VAS 5051B- :

- From menu -1-, select vehicle system “Engine electronics” and press  key to continue.



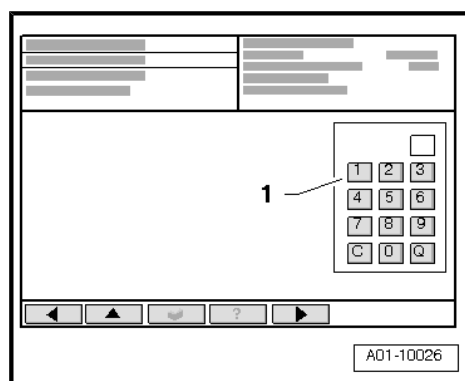
Display on -VAS 5051B- :

- From menu -1-, select diagnosis function “Basic setting” and press  key to continue.



Display on -VAS 5051B- :

- Press keys   on keypad -1- to select “Display group 063” and confirm entry by pressing  key.



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Display on -VAS 5051- :

- Check display in display zones -3- and -4-.
- Display shows: "Operate kickdown"
- Fully depress accelerator pedal beyond kickdown point and keep it pressed.
- Display during kick-down adaption: "kickdown ADP runs".
- Display after successful completion of kick-down adaption: "kickdown ADP runs".

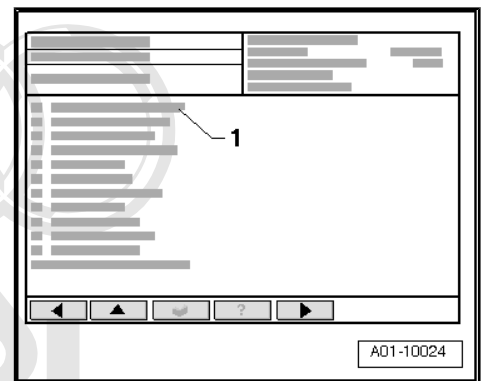
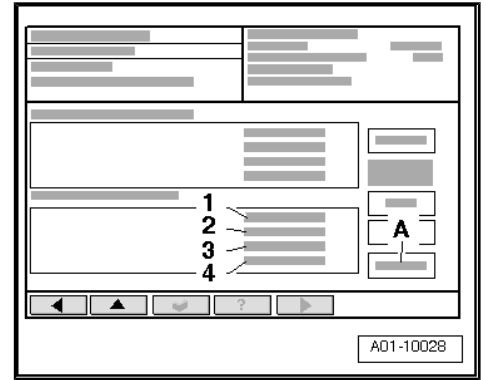


Note

- ◆ *If the display shows "Kickdown ERROR": interrogate fault memory.*
- ◆ *"ERROR" is indicated, for example, if the accelerator pedal is not pressed immediately after requested by the tester or if the accelerator pedal is released before the adaption process is finished. Exit function "Basic setting" by pressing  key and restart adaption.*
- Press  key to terminate function "Basic setting".

Display on -VAS 5051B- :

- From menu -1-, select function "End output" and press  key to continue.
- Switch off ignition and unplug diagnostic connector.



8.4 Accelerator mechanism on right-hand drive vehicles without accelerator pedal module - exploded view

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1 - Bearing bush

2 - Operating rod

- ☐ With accelerator pedal
- ☐ To remove, lift locking lever on bearing bush -item 9- and turn bush

3 - Nut

- ☐ 10 Nm

4 - Cable cam

5 - Bracket

- ☐ For accelerator position sender -G79-

6 - Accelerator position sender -G79-

- ☐ Adjusting [⇒ page 54](#)

7 - Bolt

- ☐ 10 Nm

8 - Nut

- ☐ 20 Nm

9 - Bearing bush

- ☐ With securing tab
- ☐ To remove operating rod -item 2-, lift locking lever on bearing bush and turn bush

10 - Pedal rubber

11 - Accelerator pedal stop

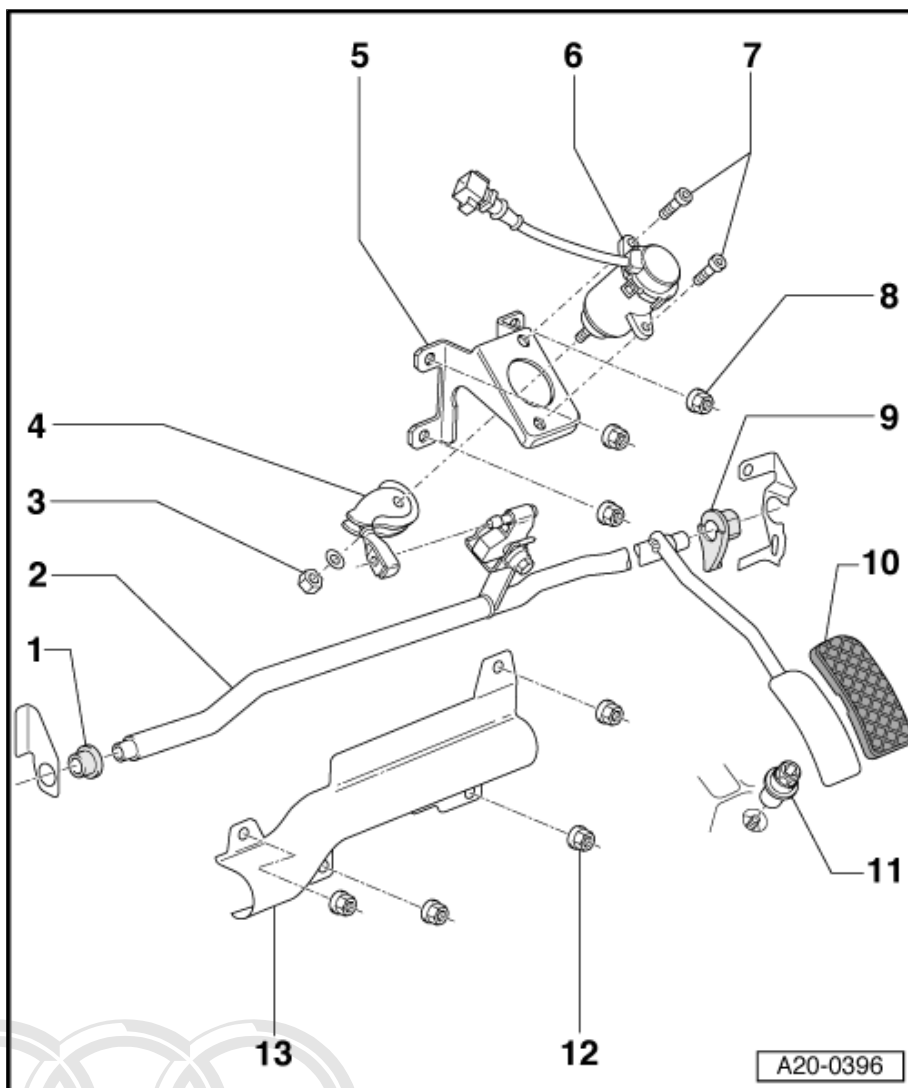
- ☐ Different versions for vehicles with manual gearbox and vehicles with automatic gearbox

12 - Nut

- ☐ 10 Nm

13 - Cover

- ☐ For operating rod



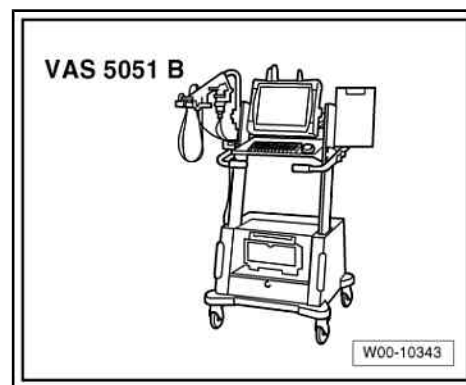
8.5 Adjusting accelerator position sender - G79- - right-hand drive vehicles without accelerator pedal module

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The accelerator position sender -G79- must be adjusted after removing and installing either the accelerator position sender -G79- or the cable cam.

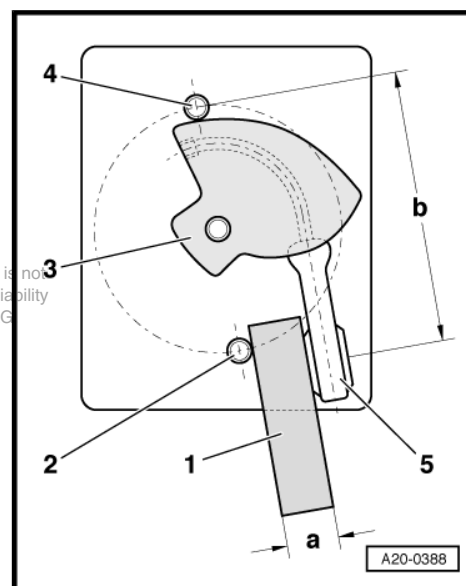
Special tools and workshop equipment required

- ◆ Vehicle diagnostic, testing and information system -VAS 5051B-



Procedure

- Tightening torque $\Rightarrow$ [page 53](#).
- Bolt accelerator position sender -G79- into bracket (removed earlier) $\Rightarrow$ [Item 5 \(page 54\)](#).
- Using a strip of sheet metal, make up adjuster tool -1- (with dimension -a-).
- Dimension -a- = 13.25 mm.
- Fit cable cam -3- loosely on shaft of accelerator position sender.
- Bring adjuster tool into contact with thread of lower securing bolt -2-.
- Bring cable eye -5- of cable cam into contact with adjuster tool -1-, as shown in illustration.
- With components in this position, measure distance between centre of cable eye and top securing bolt -4-. Make sure cable on cable cam is taut while measuring.
- Adjust according to distance -b-.
- Distance -b- = 65.59 mm.
- Secure cable cam in this position.
- Install accelerator position sender -G79- and bracket in vehicle.



Vehicles with automatic gearbox:

- Remove accelerator pedal stop from vehicle floor and in its place bolt on accelerator pedal stop for vehicles with manual gearbox.
- Accelerator pedal stops for vehicles with manual gearbox: black
- Accelerator pedal stops for vehicles with automatic gearbox: grey

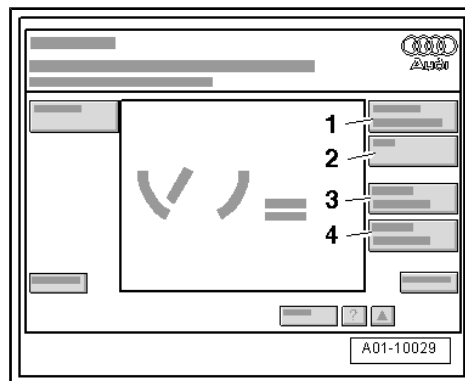
All vehicles (continued):

- With ignition switched off, connect vehicle diagnostic, testing and information system -VAS 5051B- with diagnosis lead to diagnosis connection.

- Start the engine and run at idling speed.

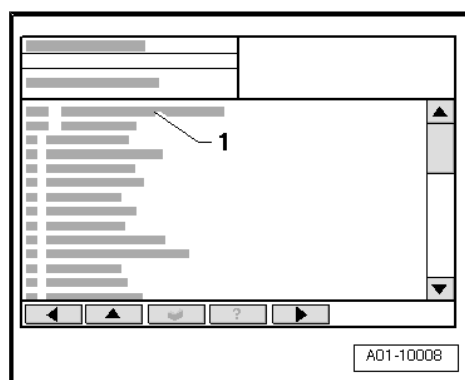
Display on -VAS 5051B- :

- Select **Vehicle self-diagnosis** from the list -item 1-.



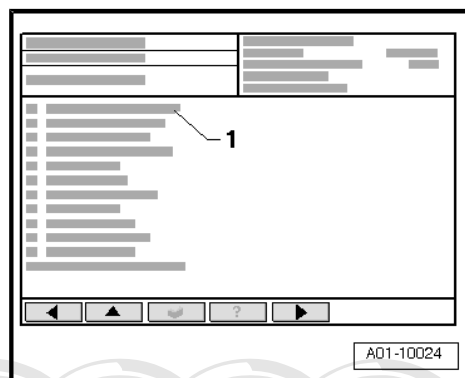
Display on -VAS 5051B- :

- From menu -1-, select vehicle system “Engine electronics” and press **[Enter]** key to continue.



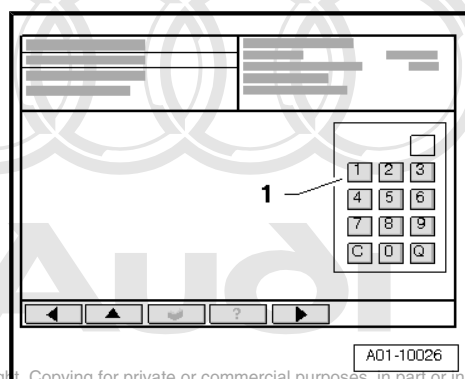
Display on -VAS 5051B- :

- From menu -1-, select diagnosis function “Measured values” and press **[Enter]** key to continue.



Display on -VAS 5051B- :

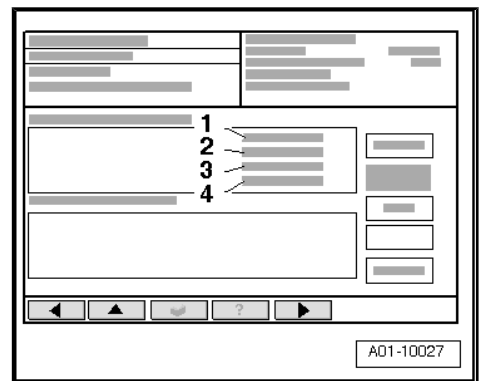
- Press keys **[6] [2]** on keypad -1- to select “Display group 062” and confirm entry by pressing **[Q]** key.



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Display on -VAS 5051B- :

- Check display in display zone -3-.
- Press accelerator all the way down and hold in position.
- Specification: 72 ... 74 % (accelerator pedal depressed)
- If specification is not attained, check installation position of cable cam and adjust if necessary ⇒ [page 55](#) .
- Check adjustment again:
- Press accelerator pedal down slowly.
- Specification: The readout in the display should increase steadily unit it reaches 72 ... 74 % (accelerator pedal fully depressed).
- Press  key to terminate function "Measured values".

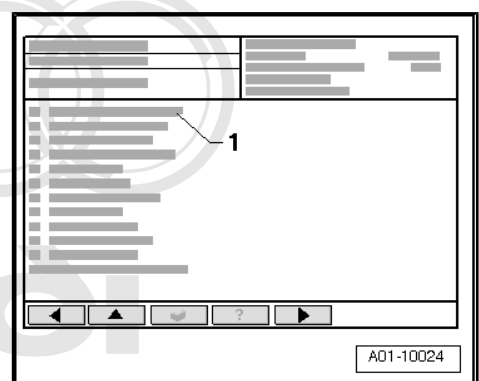


Display on -VAS 5051B- :

- From menu -1-, select function "End output" and press  key to continue.
- Switch off ignition and unplug diagnostic connector.

Vehicles with automatic gearbox:

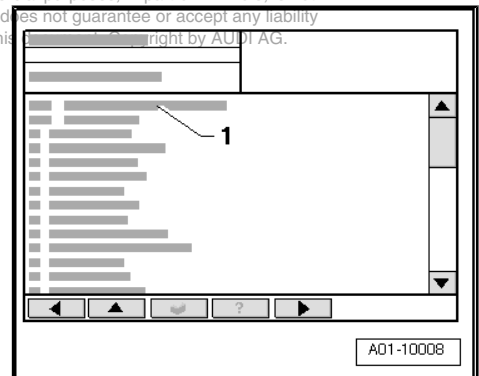
- Reinstall accelerator pedal stop for vehicles with automatic gearbox in vehicle floor.
- Then check kick-down switch -F8- :



Display on -VAS 5051B- :

- From menu -1-, select vehicle system "Gearbox electronics" and press  key to continue.

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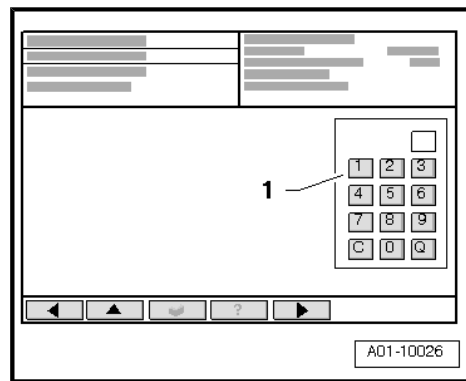
Display on -VAS 5051B- :

- From menu -1-, select diagnosis function "Measured values" and press  key to continue.



Display on -VAS 5051B- :

- Press key **1** on keypad -1- to select “Display group 001” and confirm entry by pressing key **Q**.



Display on -VAS 5051B- :

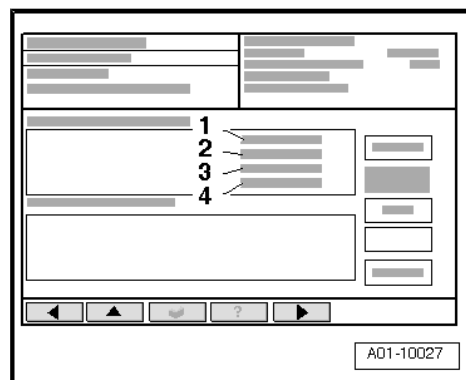
- Check display in display zone -4-.
- Press accelerator pedal all the way down to full-throttle position.
 - Specification: XXX0 XXXX.
- Press accelerator pedal all the way down past kick-down point.
 - Specification: XXX1 XXXX.



Note

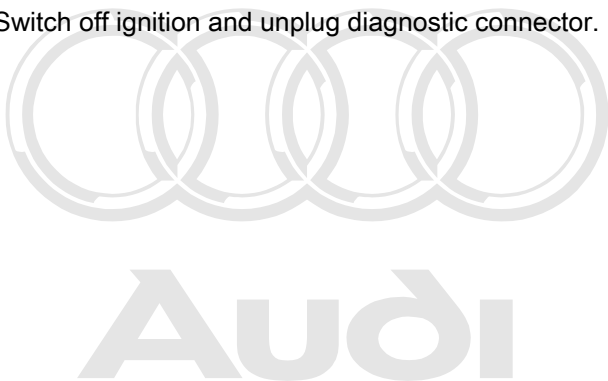
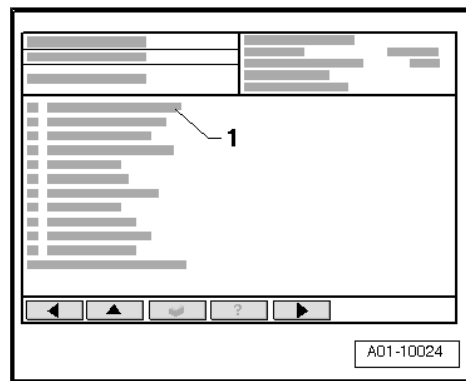
Switching inputs at the locations marked “X” can be ignored during this test.

- Repeat adjustment procedure if specification is not attained.
- Press **Q** key to terminate function “Measured values”.



Display on -VAS 5051B- :

- From menu -1-, select function “End output” and press **Q** key to continue.
- Switch off ignition and unplug diagnostic connector.



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