

Fuel supply system, servicing guidelines

Safety precautions

WARNING!

When removing and installing fuel pump or fuel gauge sensor from a partially filled fuel tank:

- ♦ *BEFORE beginning work, place exhaust extraction system suction pipe near fuel tank opening so escaping fuel vapors can be immediately sucked off.*
- ♦ *If no exhaust extraction system is available, use a radial fan (with motor located outside airflow) with volume of at least 9 cfm.*
- ♦ *Wear fuel-resistant gloves whenever working with open parts of the fuel system.*

Be sure the ignition is switched off when:

- ♦ *Disconnecting fuel injection system wiring.*
- ♦ *Connecting or disconnecting test equipment leads.*

BEFORE cranking the engine at starting RPM (such as compression testing) disable the fuel injection and ignition systems:

- ♦ ***Disconnect the ignition coil power output stage.***
- ♦ ***Disconnect harness connectors from all fuel injectors.***
- ♦ ***After the work is completed, erase Diagnostic Trouble Code (DTC) memory.***

WARNING!

- ♦ *Fire hazard! Do NOT have anything in the area that can ignite gasoline!*
- ♦ *Fuel system is under pressure! Before opening, place clean cloths around the connections to be opened. Carefully loosen the connections to relieve pressure.*

CAUTION!***BEFORE disconnecting the battery:***

- ♦ ***Stop the engine.***
- ♦ ***Be sure the ignition is switched off (also applies when connecting the battery). Failure to do so may damage the Engine Control Module (ECM).***
- ♦ ***Be sure of the proper radio code (for vehicles equipped with coded anti-theft radio)***

Be sure the battery negative (-) cable is disconnected, when:

- ♦ ***Working on the electrical system.***
- ♦ ***Resistance (spot) welding or electric arc-welding anywhere on the vehicle.***

When connecting and disconnecting electrical test equipment (LED voltage tester, multimeter, etc.)

- ♦ ***Be sure the ignition is switched off.***
- ♦ ***Use correct adapters from VW 1594***

connector test kit.

Always refer to the latest parts catalog to ensure that you use original equipment fuel hose clamps.

Rules of cleanliness

CAUTION!

Whenever working on the fuel supply and fuel injection systems, carefully observe the following five rules of cleanliness:

- 1.- Thoroughly clean fuel system lines and hose connections and surrounding area before disconnecting.
 - 2.- Place removed components on a clean surface and cover them. Use plastic sheeting or paper. Do not use fluffy rags that could leave lint.
 - 3.- Carefully cover or seal any components that have been opened if repairs are not carried out immediately.
 - 4.- Install only clean parts. Do not remove replacement parts from the packaging until immediately before they are installed.
- Do not use parts that have been stored without packaging (from toolboxes, for example).
- 5.- When fuel system is opened avoid working with compressed air whenever possible. Avoid moving the vehicle if possible

Observe following points before working on the fuel supply system

CAUTION!

Obtain the radio Anti-theft code from the customer before disconnecting the Battery Ground strap.

- ◆ With ignition switched OFF, disconnect Battery Ground strap.
- ◆ Open the fuel filler cap briefly and close again.

Observe the following precautions when removing or installing components from a filled or partially filled fuel tank.

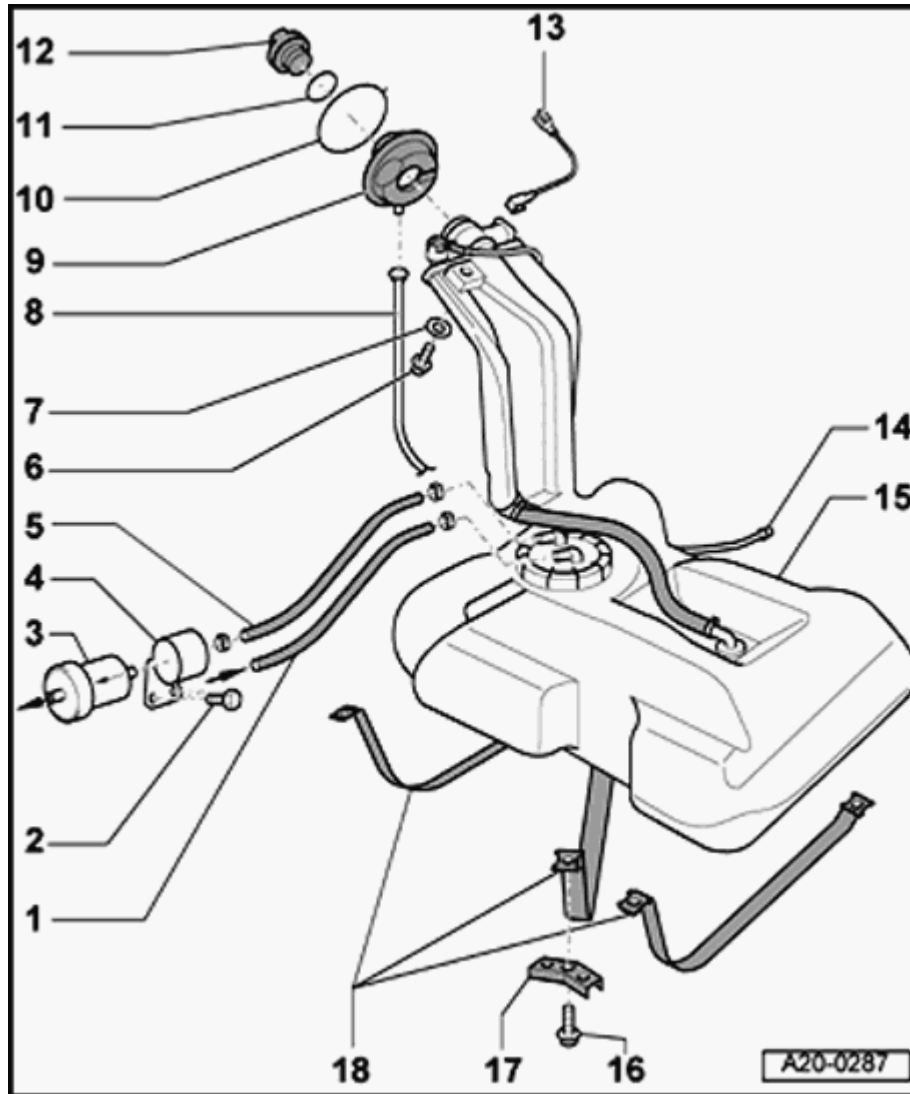
WARNING!

Empty the fuel tank before removal! If it is not empty, the weight and sloshing fuel could lead to injury, component damage or possible fuel spillage.

- ◆ Fuel tank must not be filled more than $\frac{1}{3}$ maximum.
- ◆ Reduce fuel quantity using fuel cart, if

necessary.

- ◆ Do NOT allow fuel to contact skin! Wear fuel-resistant gloves!



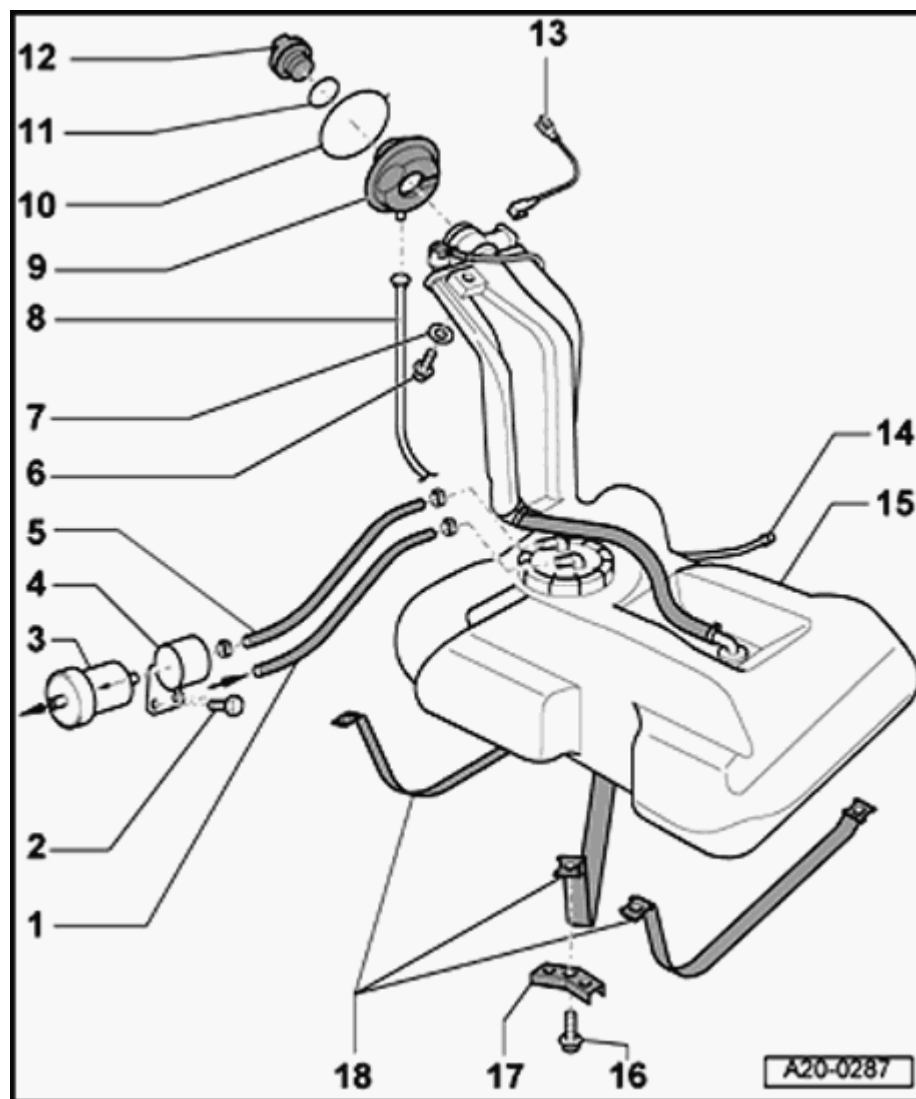
Fuel supply system, servicing (vehicles with front wheel drive and 1.8 ltr. turbo or 2.8 ltr. engine)

Note:

- ◆ VAG1921 spring clamp pliers are recommended for installation
- ◆ Always replace seals, O-rings and gaskets during installation work.

CAUTION!

Always refer to the latest parts catalog to ensure that you use original equipment fuel hose clamps.



Fuel tank assembly, component overview

Note:

Always refer to the Parts Catalog for availability of individual items in an assembly.

Vehicles with front wheel drive and 1.8 ltr. turbo or 2.8 ltr. engine

1 - Return line

- ◆ From engine
- Mark before removing
- Note direction of arrow on connecting flange

2 - 20 Nm

3 - Fuel filter

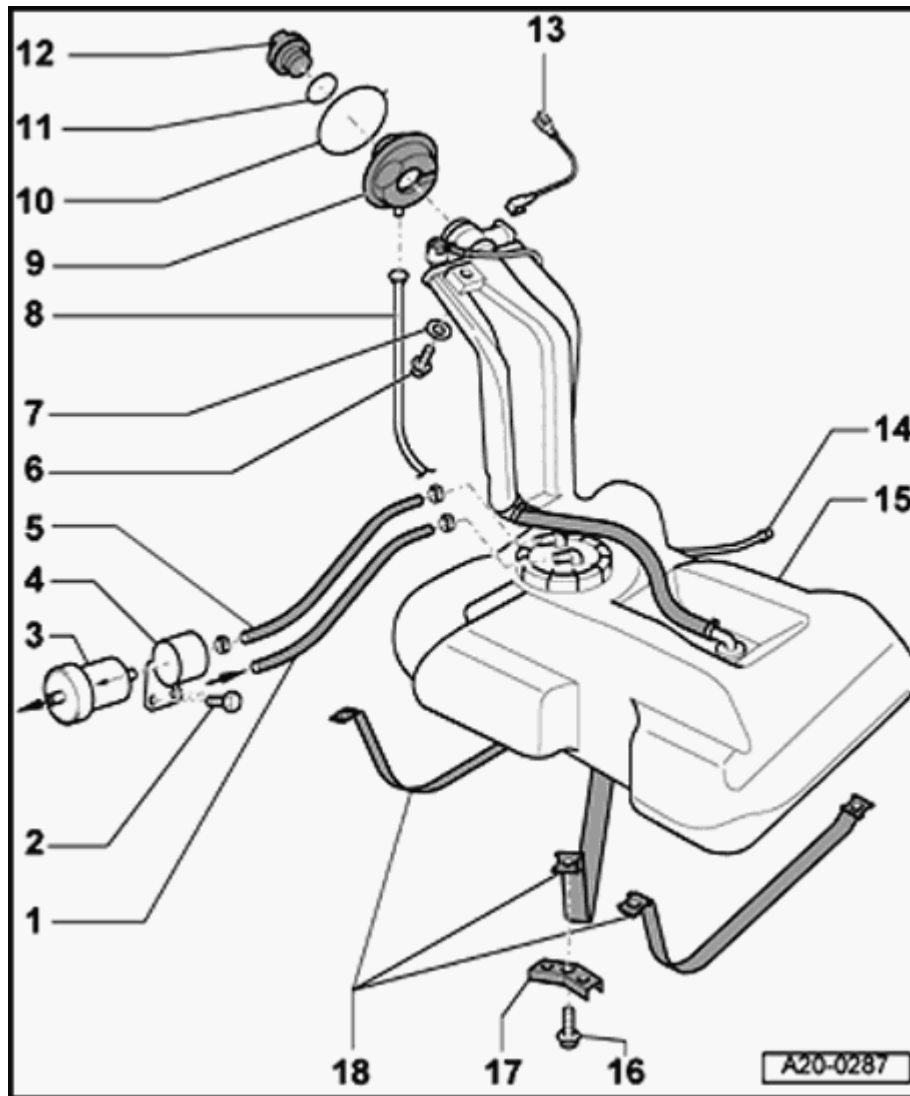
- ◆ Location: Arrow points in flow direction.

4 - Holding clamp

- ◆ For fuel filter

5 - Supply line

- ◆ To the fuel filter
- Mark before removal
- Note direction of arrow on connecting flange

**6 - Mounting screw**

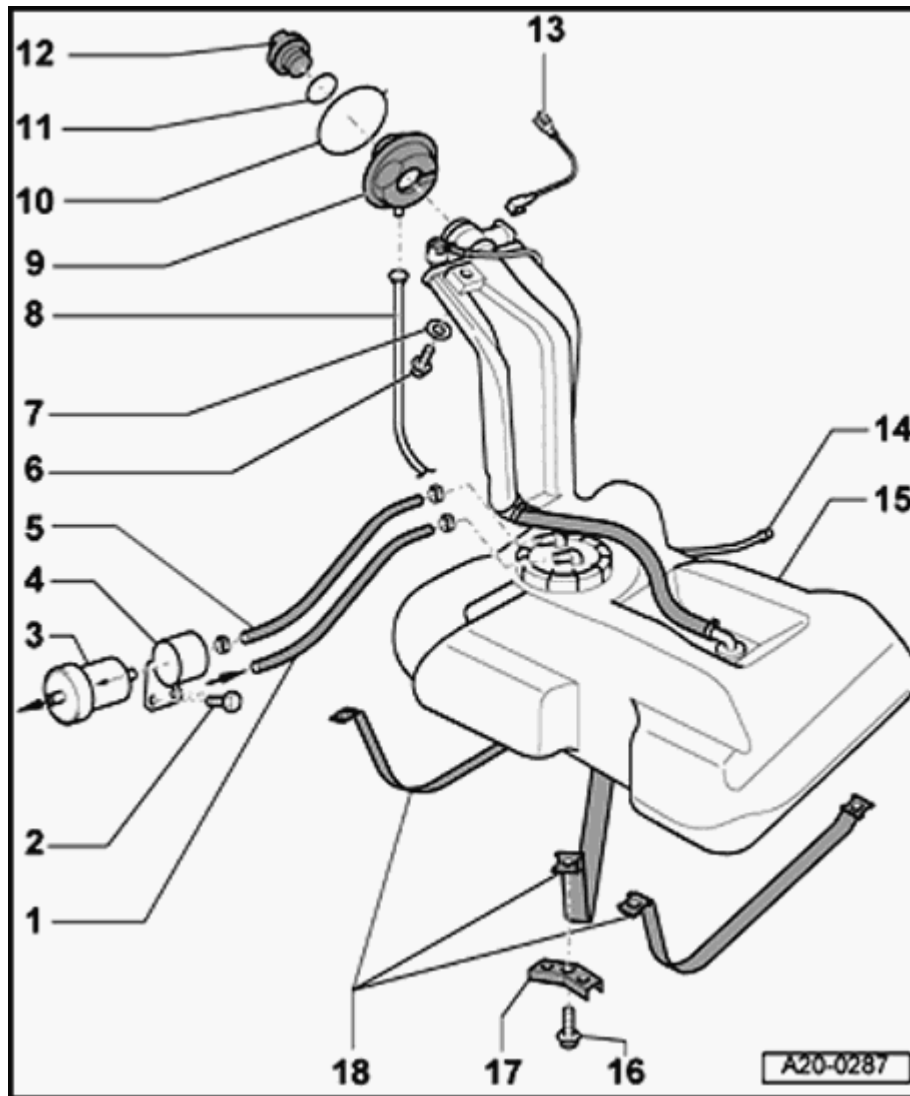
- ◆ 25 Nm
- ◆ To connect fuel-filler neck and Ground (item 13 ⇒ [Page 20-8](#))

7 - Washer**8 - Overflow hose****9 - Rubber cap****10 - Locking ring****11 - Sealing ring**

- Replace if damaged.

12 - Cover**13 - Ground connection**

- ◆ Location ⇒ Fig. ⇒ [1](#) , ⇒ [Page 20-10](#)
- Connect wiring terminal with mounting screw (item 6) ⇒ [Page 20-8](#) .
- After installing, check continuity between metal ring on fuel filler neck and bare chassis Ground point. spec: approx. 0 Ω

**14 - Bleed line**

- ◆ To EVAP canister

15 - Fuel tank

- ◆ Removing and installing ⇒ [Page 20-19](#)

16 - 25 Nm

- Note tightening sequence ⇒ [Page 20-23](#)

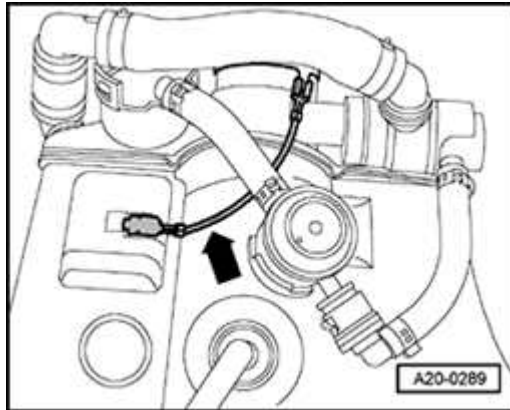
17 - Bracket

- ◆ For clamp bands

18 - Clamp bands

- ◆ Removing and installing ⇒ [Page 20-19](#)
 - Note different lengths
 - Note installation direction

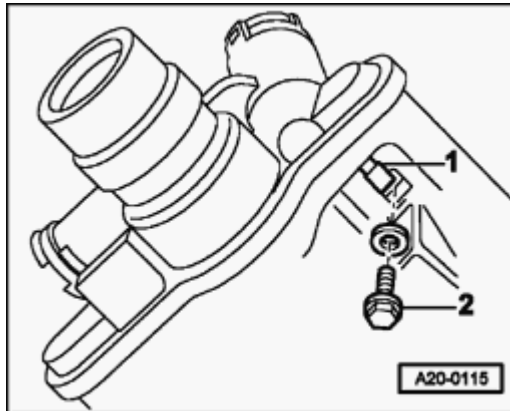
20-10



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Fig. 1 Ground connection installation position

- Route Ground connection -arrow-, as shown in illustration.
- Ensure tight fit of electrical Ground connection to fuel filler neck Ground clamp.



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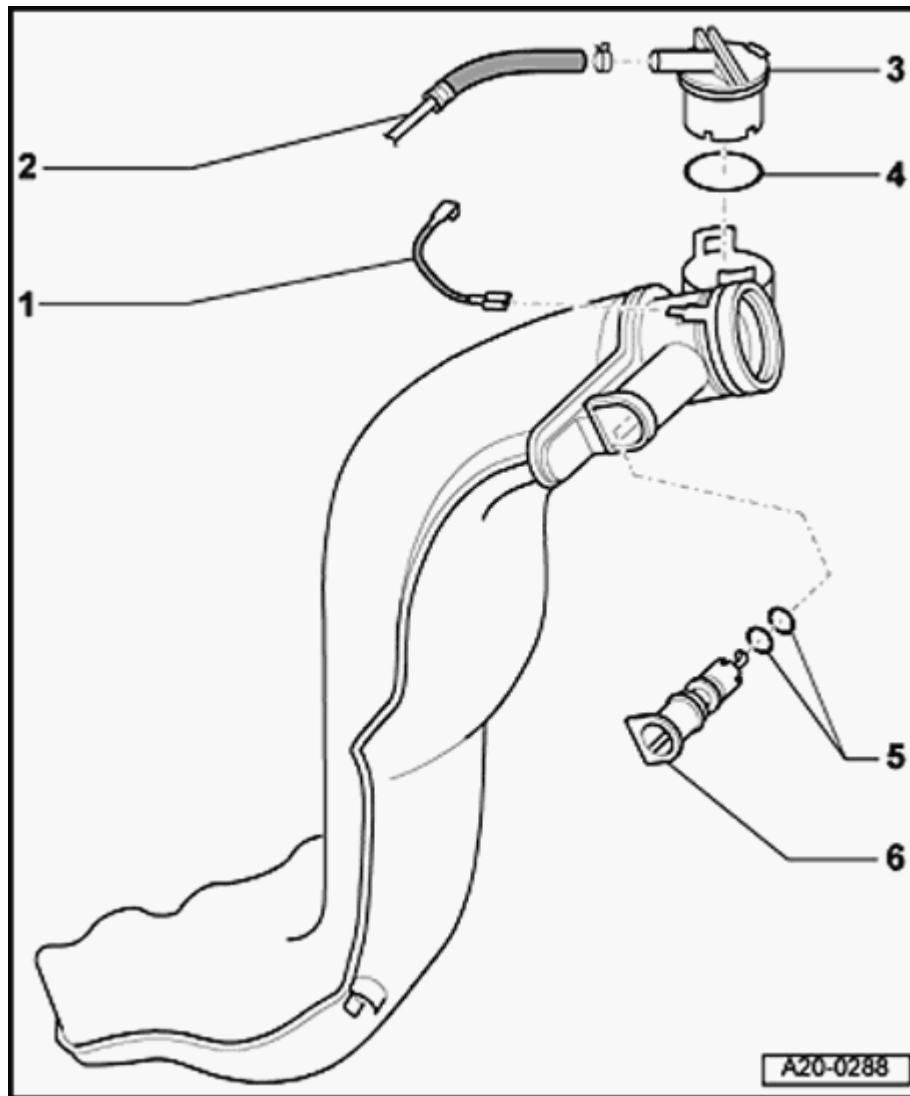
- Attach wiring terminal -1- with screw -2- for fuel filler neck.

CAUTION!

After installation, check for continuity between Ground clamp on filler neck and chassis Ground.

♦ **Specification: approximately 0 Ω .**

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Fuel filler neck, component overview (vehicles without ORVR)

Vehicles with front wheel drive and 1.8 ltr. turbo
or 2.8 ltr. engine

1 - Ground connection

- ◆ Location ⇒ Fig. ⇒ [1](#) , ⇒ [Page 20-10](#)
 - Ensure tight fit of connector on filler neck ring
 - Connect wiring terminal with mounting screw for plastic fuel filler neck (item 6 ⇒ [Page 20-8](#))
 - After installing, check continuity between metal ring on fuel filler neck and chassis Ground. Specified: approx. 0 Ω

2 - Bleed line

- ◆ To EVAP canister

3 - Gravity valve

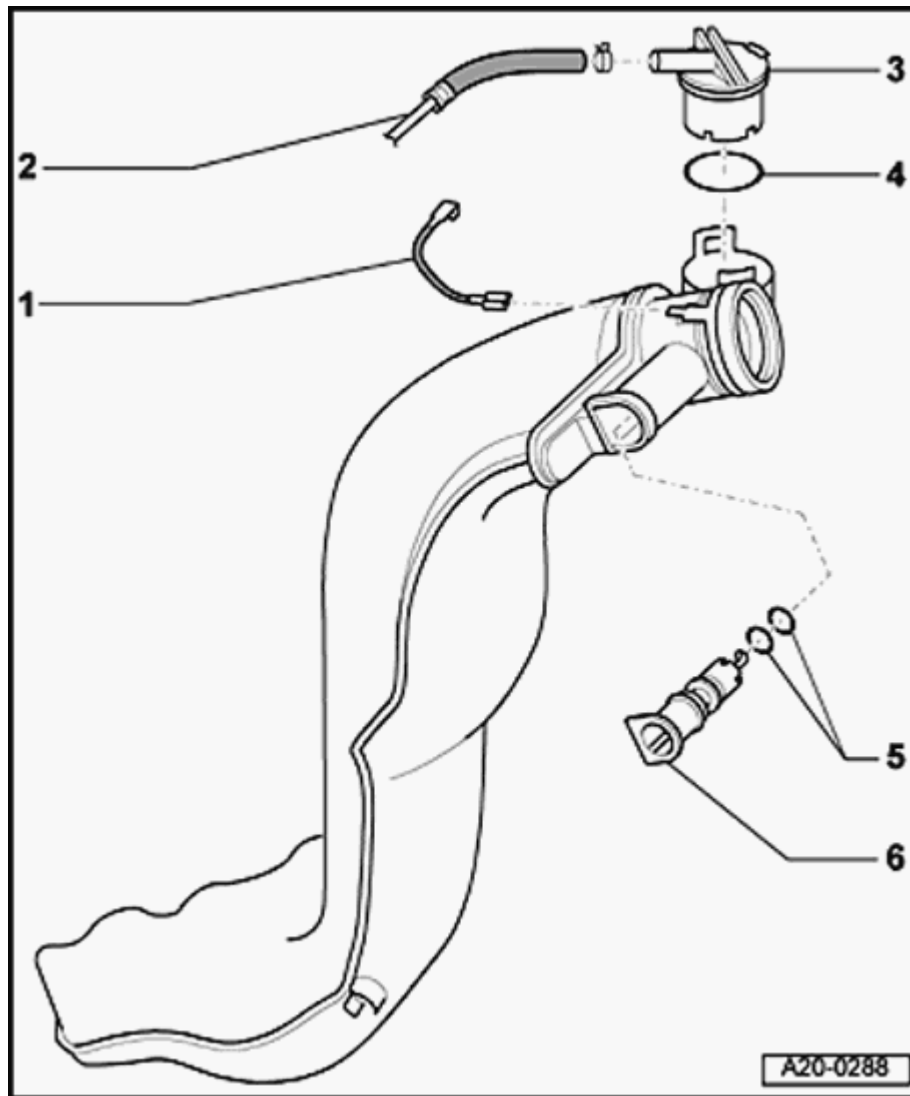
- ◆ To remove valve, unclip upward out of the filler neck

- Check valve for flow:

Valve vertical: open,

Valve tipped 45 ° : closed

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**4 - O-ring**

- Replace

5 - O-rings

- Replace

6 - Bleed valve

◆ Removing, installing, checking ⇒ Fig. ⇒ [1](#) ,
⇒ [Page 20-13](#)

20-13

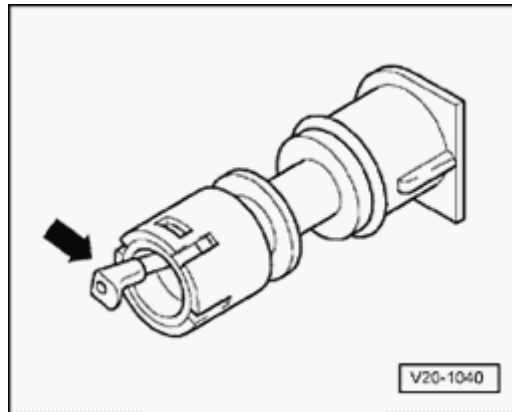
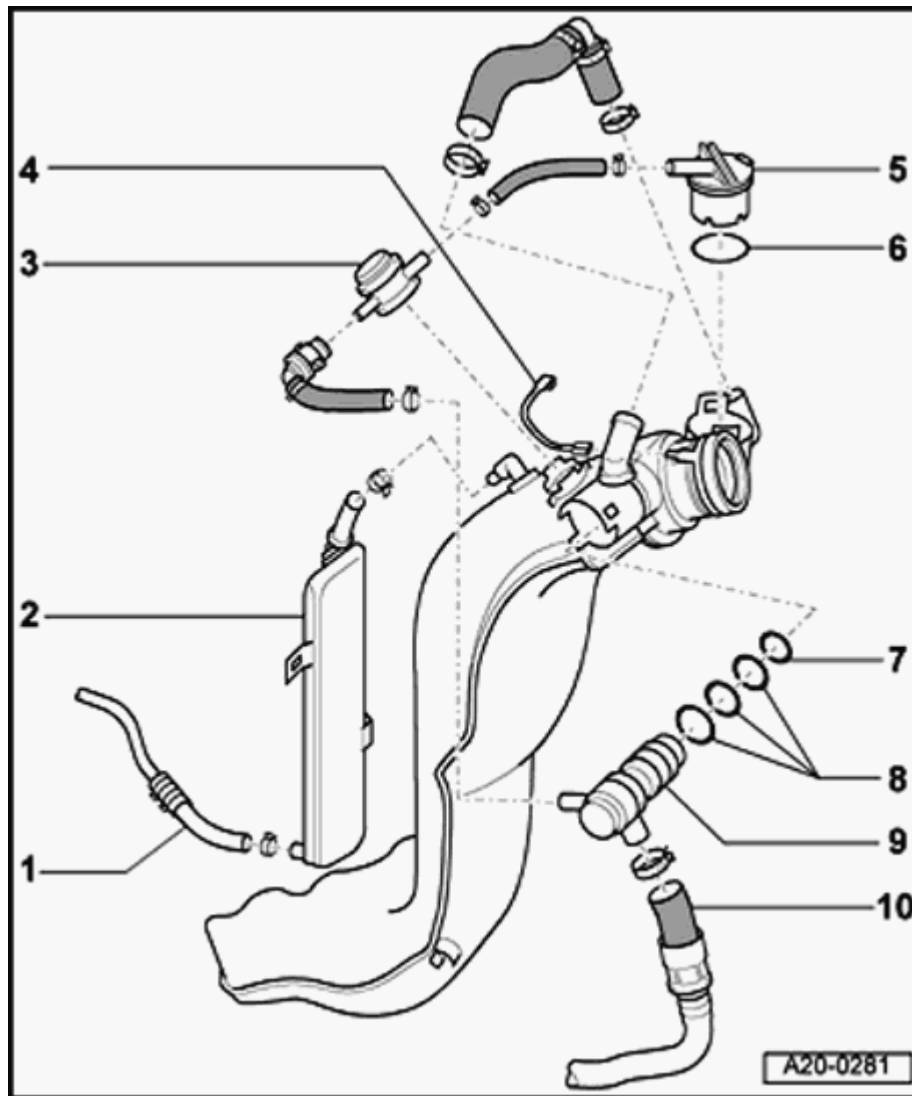


Fig. 1 Bleed valve removing, installing, checking

- To remove, unclip valve from side of filler neck.
 - ◆ Lever in rest position: Valve closed
 - ◆ Lever pressed in direction of arrow: Valve open



Fuel filler neck, component overview (vehicles with ORVR)

Vehicles with front wheel drive and 1.8 ltr. turbo
or 2.8 ltr. engine

1 - Bleed line

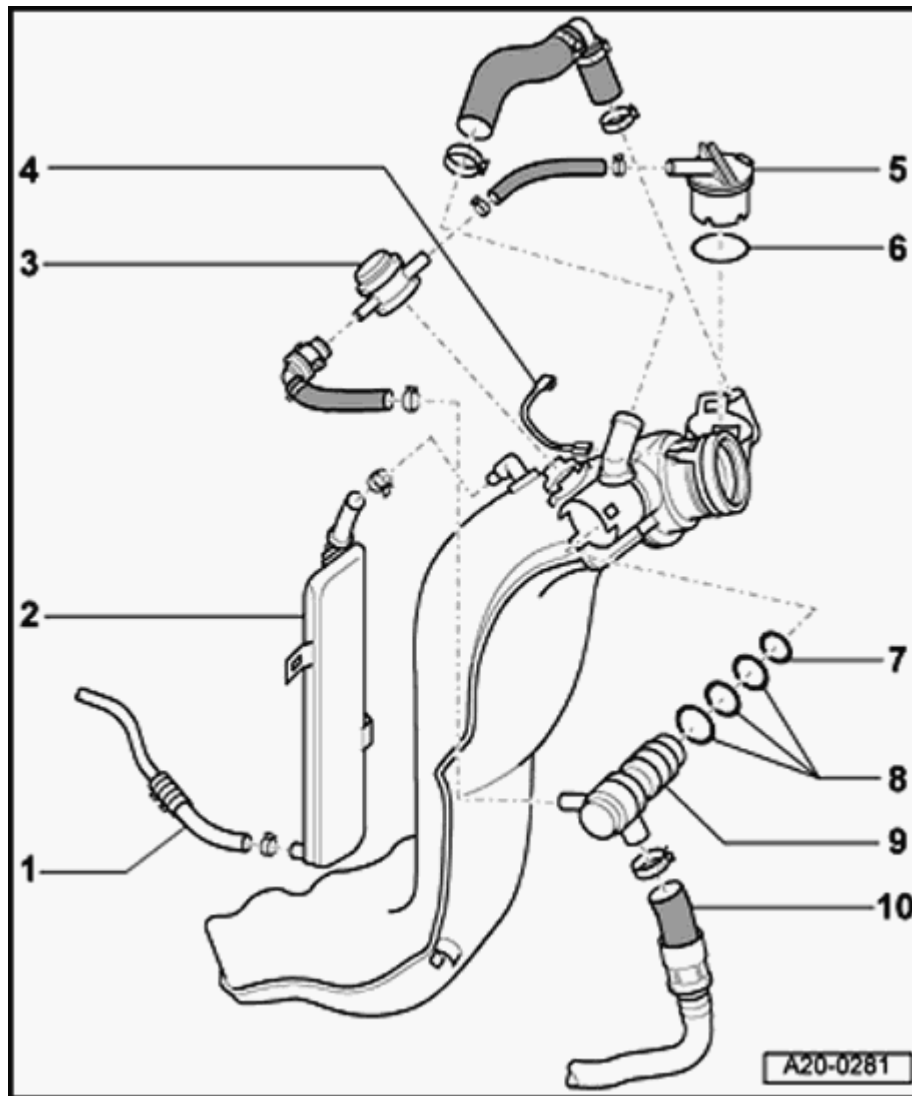
- ◆ To top of filler neck on fuel tank

2 - Expansion tank

- ◆ Clipped to fuel-filler neck

3 - Tank ventilation valve

- ◆ Clipped to fuel-filler neck
- ◆ Ventilates fuel tank for pressure compensation



4 - Ground connection

◆ Location ⇒ Fig. ⇒ [1](#) , ⇒ [Page 20-10](#)

- Ensure tight fit of connector on filler neck ring
- Connect wiring terminal with mounting screw for plastic fuel filler neck (item 6 ⇒ [Page 20-8](#)).
- After installing, check continuity between ring on fuel filler neck and chassis Ground, spec: approx. 0 Ω

5 - Gravity valve

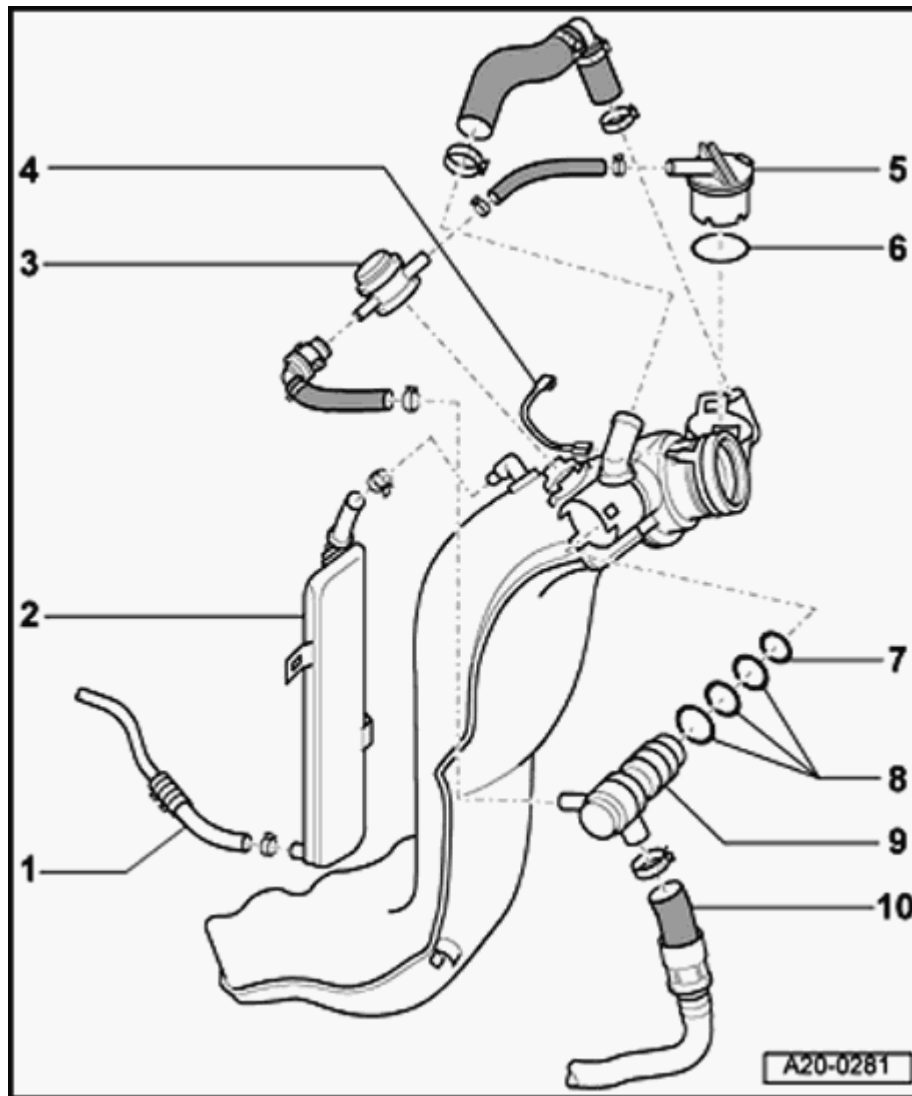
◆ To remove valve, unclip upward out of filler neck

- Check valve for flow:

Valve vertical: Flow

Valve tipped 45 ° : No Flow

20-16

**6 - O-ring**

- Replace

7 - Sealing ring

◆ Installation position: Sealing lip points to the fuel filler neck

8 - O-rings

◆ Different sizes

- Replace

9 - Bleed valve

◆ Removing, installing, checking ⇒ Fig. ⇒ [1](#),
⇒ [Page 20-17](#)

10 - Bleed line

◆ To EVAP canister

20-17

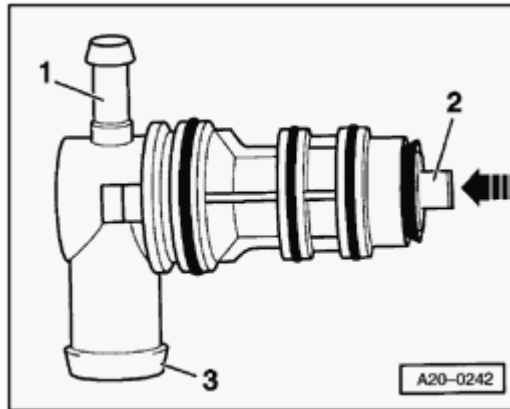


Fig. 1 Bleed valve, removing, installing, checking

Requirement

- Fuel tank removed
- To remove, unclip valve from side of filler neck.
- Plug port -3- by hand.
- Blow into port -1-

Tab -2- pressed in direction of arrow:

- Must be flow

Tab -2- in OFF position:

- Must NOT be flow.

Fuel tank, draining

Vehicles with front wheel drive and 1.8 ltr. turbo or 2.8 ltr. engine

WARNING!

Fire hazard! Do NOT have anything in the area that can ignite gasoline!

Observe Safety measures ⇒ [Page 20-1](#) .

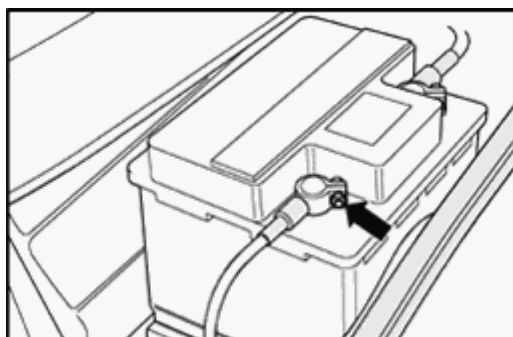
Observe Rules of cleanliness ⇒ [Page 20-4](#) .

Auxiliary equipment required

- ◆ FM 3000 fuel cart (or equivalent)

CAUTION!

Obtain the radio Anti-theft code from the customer before disconnecting the Battery Ground strap.



4

- Disconnect Battery Ground strap with ignition switched OFF.
- Remove filler cap from fuel filler neck.
- Empty fuel tank as completely as possible through the filler neck.

Fuel tank assembly, removing and installing

Vehicles with front wheel drive and 1.8 ltr. turbo or 2.8 ltr. engine

Observe Safety measures ⇒ [Page 20-1](#) .

Observe Rules of cleanliness ⇒ [Page 20-4](#) .

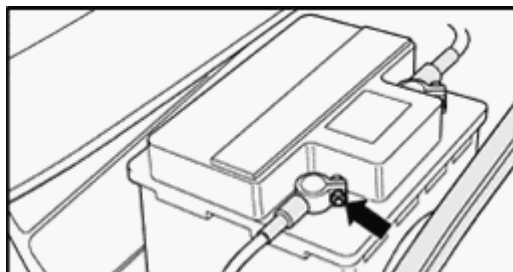
Required special tools, testing equipment and auxiliary equipment

- ◆ VAG1359/2 Universal holder
- ◆ VAG1383 A Engine / transmission jack

Removing

CAUTION!

Obtain the radio Anti-theft code from the customer before disconnecting the Battery Ground strap.



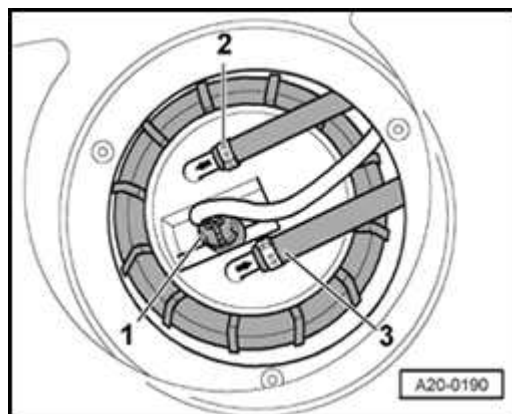
- Disconnect Battery Ground strap with ignition switched OFF.
- Open fuel tank cover briefly and close again.

- If necessary, drain fuel tank using fuel cart ⇒ [Page 20-18](#).

Note:

For handling reasons, fuel tank must be empty before removing.

- Remove connector flange cover under luggage compartment trim.

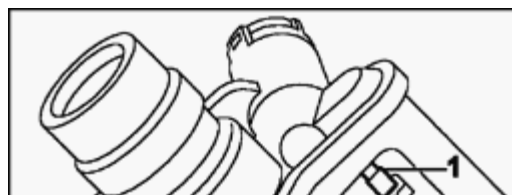
**A**

- Unlatch and disconnect 4-pin harness connector -1-.

Note:

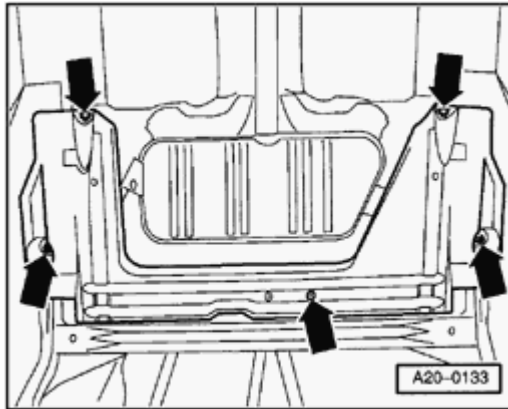
Return line -2- and supply line -3- stay connected.

- Clean area around fuel filler neck.
- With filler cap removed, pry out clamping ring on rubber seal (around filler neck).
- Push rubber seal toward inside.
- Remove right rear wheel.
- Remove right rear wheel house liner.

**A**

- Remove screw -2- for fuel filler neck under wheel house liner.

20-21

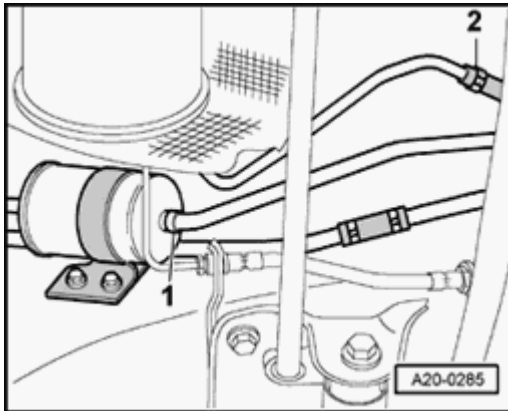


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- If present, remove the aerodynamic trim panel from the rear axle - arrows-

WARNING!

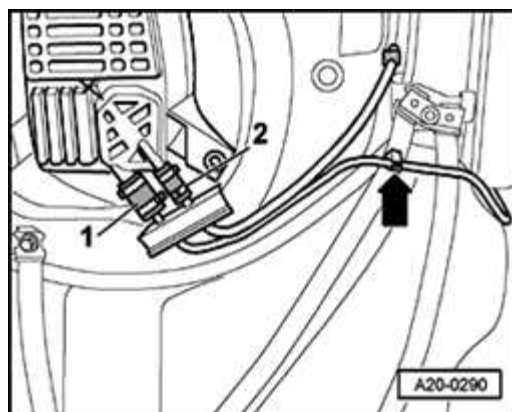
Fuel system is under pressure! Before opening, place clean cloths around the connections to be opened. Carefully loosen the connections to relieve pressure.



A

- Mark and remove the supply line -1- and return line -2- .
 - On bottom of vehicle

20-22



- Remove EVAP canister cover on bottom of spare tire well ⇒ [Page 20-130](#) .

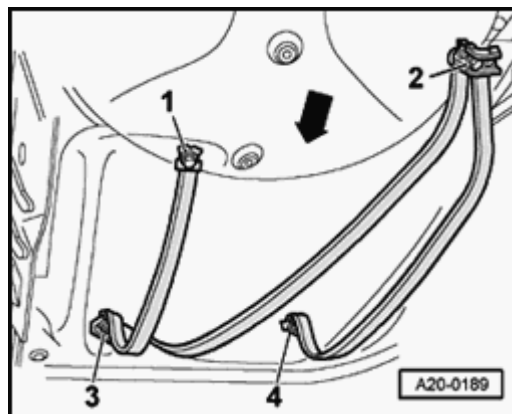
A

- Loosen hose connection -1- on bleed line to fuel filler neck.
- Unclip line out from bracket -arrow-.

Note:

Bleed line -2- to the EVAP canister purge regulator valve remains connected.

- Place VAG1383A engine / transmission jack under fuel tank for support.
- Mark installation position of clamp bands.



A

- Remove clamp bands -1- to -4-.
- Lower fuel tank.

Note:

Arrow points in driving direction.

Installing

Installation is performed in the reverse order of the removal procedure, during installation, note the following:

CAUTION!

Always refer to the latest parts catalog to ensure that you use original equipment fuel hose clamps.

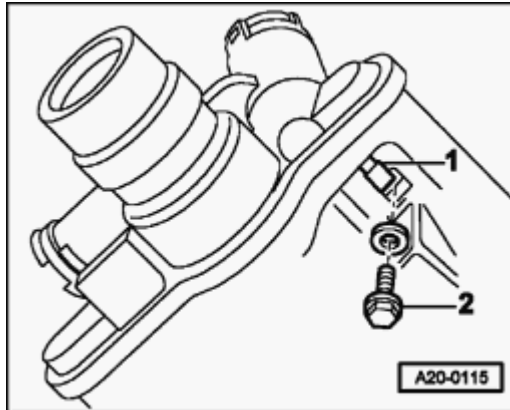
Note:

- ◆ *Replace all adhesive tapes removed during disassembly in the original location during installation.*
- ◆ *Use VAG1921 hose clamp pliers to install spring clamps,*
- ◆ *Always replace sealing rings and gaskets during installation work.*
- Position fuel tank using clamp strips with VAG1383 A engine / transmission jack on vehicle floor pan.
- Push fuel tank all the way to the left.





- First tighten screws -1- and -2-, then screws -3- and -4-.
- 25 Nm

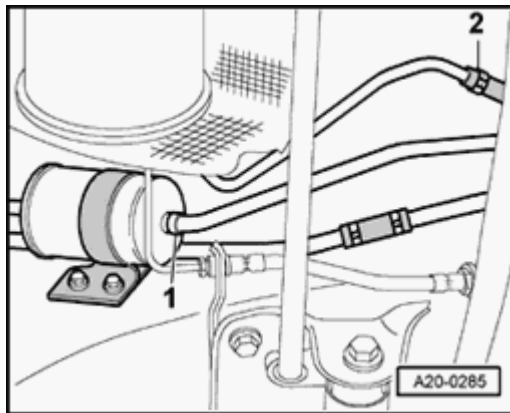


A

- Attach wiring terminal -1- with screw -2- for fuel filler neck.

CAUTION!

Ensure that the Ground connection is unfastened and the connector is securely fitted into the fuel filler neck ⇒ Fig. ⇒ [1](#) , ⇒ [Page 20-10](#) .



A

- Connect lines according to marks:
 - 1 - Supply line
 - 2 - Return line
- Connect fuel pump and sender for fuel gauge -G harness connectors.

CAUTION!

After installation, check for continuity between Ground clamp on filler neck and chassis Ground.

♦ **Specification: approximately 0 Ω .**

- With ignition switched OFF, connect Battery Ground strap.
- After connecting Battery, input Radio anti-theft coding

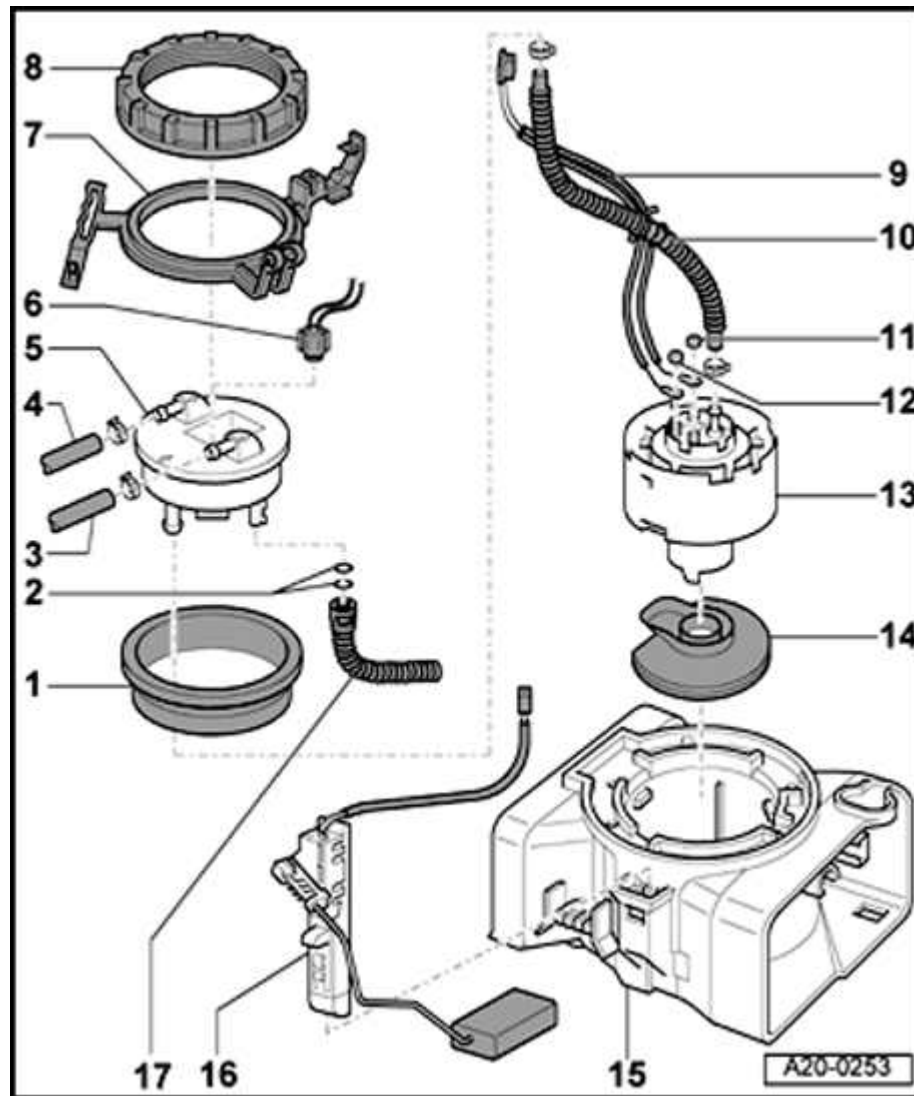
⇒ *Radio operating instructions*

- Run door windows up to stop with window switches.
- Operate all window lifters again for at least 1 second in "closed" position to activate the automatic up/down.
- Set the clock.

Tightening torques

Component	Nm
Clamp bands for fuel tank on body	25
Aerodynamic trim (on body) in front of rear axle	10
Cover on spare wheel well	10

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Fuel supply unit and sender for fuel gauge -G, component overview

Vehicles with front wheel drive and 1.8 ltr. turbo
or 2.8 ltr. engine

1 - Sealing ring

- Replace

- ◆ Installing: insert (dry) into fuel tank opening

2 - O-rings

- Always replace.

- Check installation position

3 - Return line

- ◆ From fuel distributor

- Mark before removal

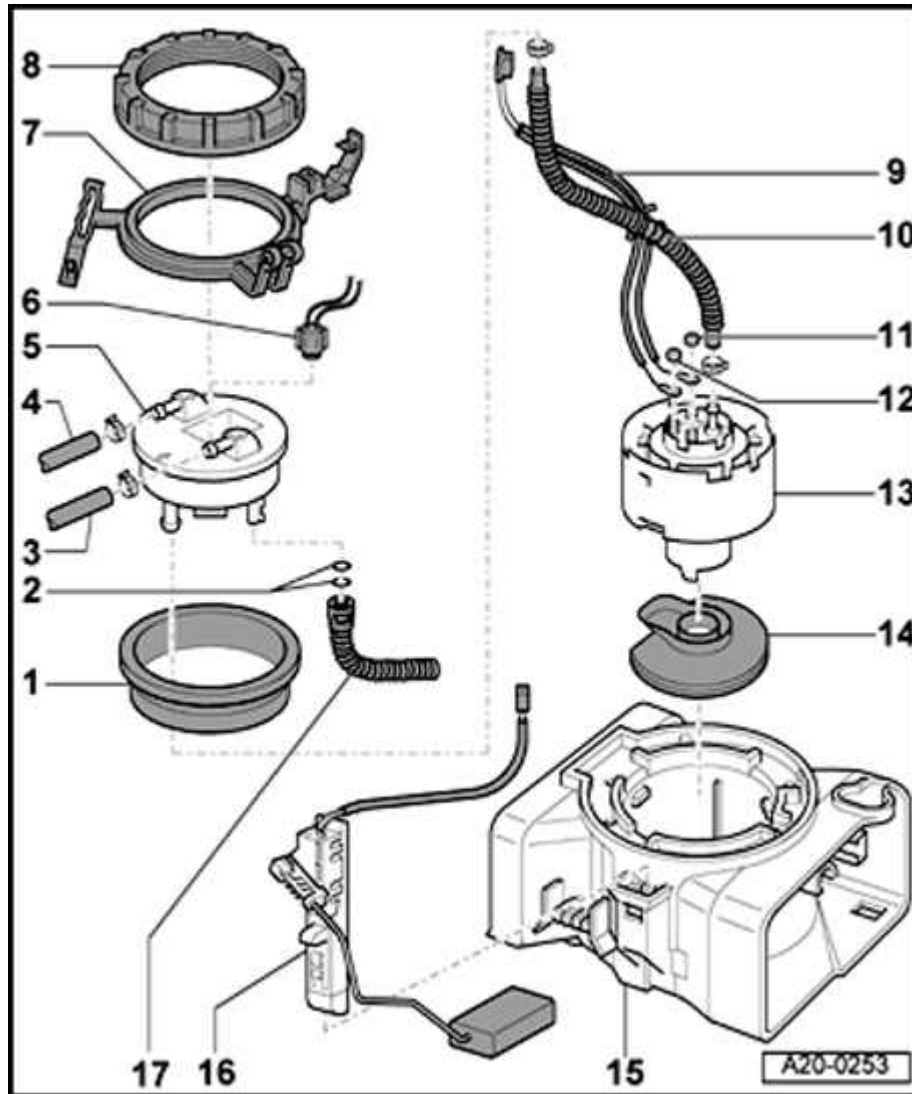
- Note direction of arrow on connecting flange

4 - Supply line

- ◆ To fuel distributor

- Mark before removal

- Note direction of arrow on connecting flange



5 - Cover flange

- ◆ Removing and installing ⇒ [Page 20-40](#)
- ◆ Location: Note arrow Mark ⇒ [Page 20-46](#)

6 - Harness connector

- ◆ For fuel pump and sender for fuel gauge -G

7 - Hose guide

- ◆ Installed position as shown.
- ◆ Must be kept in position while union nut is being tightened.

8 - Union nut

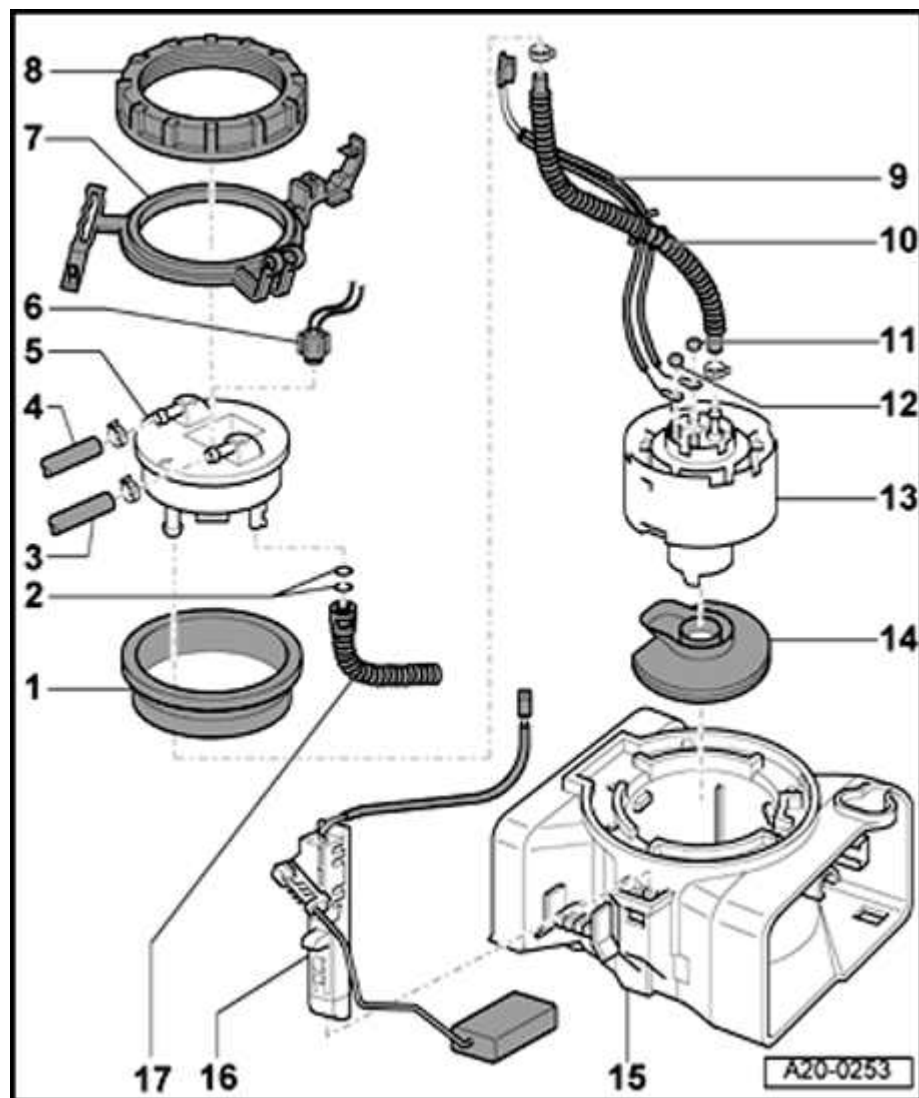
- ◆ 60 Nm
- Remove and install using 3217 wrench

9 - Wiring to fuel pump

- Attach with fuel resistant cable ties (item 10)

10 - Supply line

- ◆ Fuel pump/surge housing
- ◆ Location ⇒ [Page 20-43](#)
- ◆ 2 Nm
 - Install toothed washer beneath

**11 - Nut M4**

- ◆ 1.5 Nm
- Install toothed washer beneath

12 - Nut M5**13 - Fuel supply unit**

- ◆ Removing and installing ⇒ [Page 20-40](#)
- Electrically check fuel pump ⇒ [Page 20-31](#)
- Check the residual pressure

⇒ *Repair Manual, Fuel Injection & Ignition, Repair Group 24*

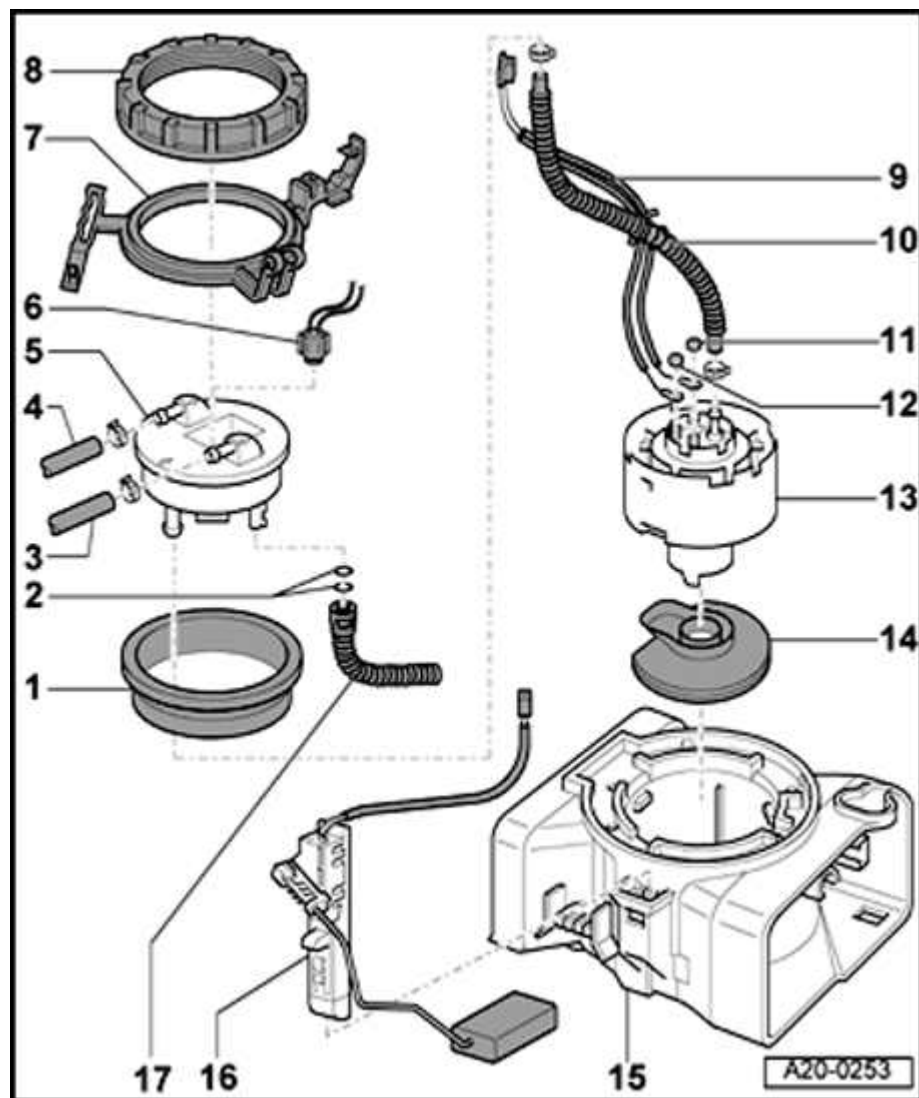
14 - Fuel strainer

- ◆ Connected to fuel supply unit
- ◆ Can not be individually replaced
- Clean if dirty

15 - Surge housing lower section

- ◆ Mounted in fuel tank
- ◆ Can not be removed
- ◆ Disconnecting: press unlatching buttons on connector piece

20-30

**16 - Sender for fuel gauge -G**

- ◆ Float is cube shaped
- ◆ Checking ⇒ [Page 20-48](#)
- ◆ Removing and installing ⇒ [Page 20-50](#)

17 - Return line

- ◆ Installed inside cover flange

Fuel pump, electrical checking

Vehicles with front wheel drive and 1.8 ltr. turbo or 2.8 ltr. engine

Required special tools, testing equipment and auxiliary equipment

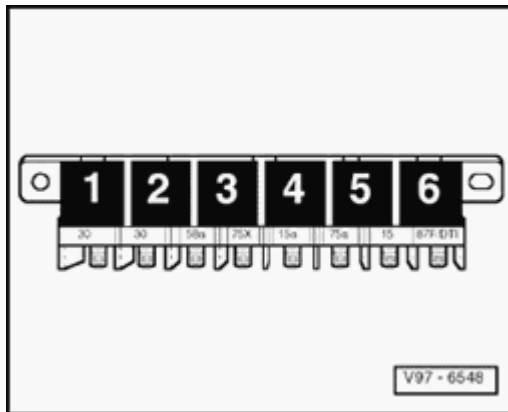
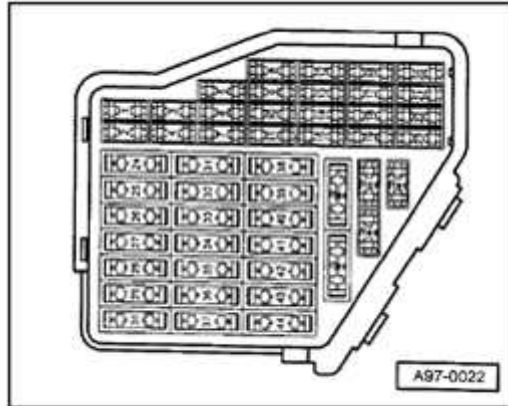
- ◆ VAG1348/3A Remote control using VAG1348/3-2 adaptor cable
- ◆ Fluke 83 multimeter
- ◆ VW 1594 Adaptor kit

20-32

Checking requirements

◆ Battery Voltage 12 Volts minimum

◆ Fuse 28 OK



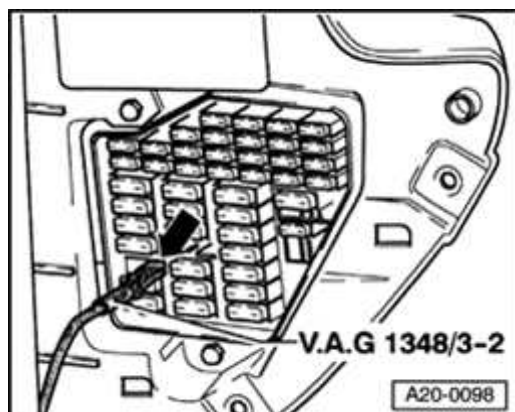
◆ Relay 6 in Fuse/Relay panel OK

◆ Fuel filter OK

◆ Ignition switched OFF.

Test sequence

- Open fuse box cover on left side of instrument panel.
- Pull fuse 28 from fuse holder (left row, 5Th fuse from top)



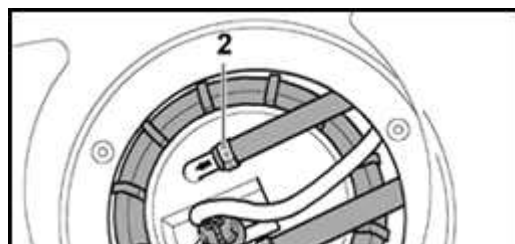
- Connect VAG1348/3A remote control on right side of fuse holder 28 using VAG1348/3-2 adaptor wire -arrow-.
- Connect test lead to Battery +.
- Press remote control switch.
 - Fuel pump running noise must be audible

Note:

The fuel pump runs very quietly. Avoid ambient background noise as much as possible during fuel pump checks.

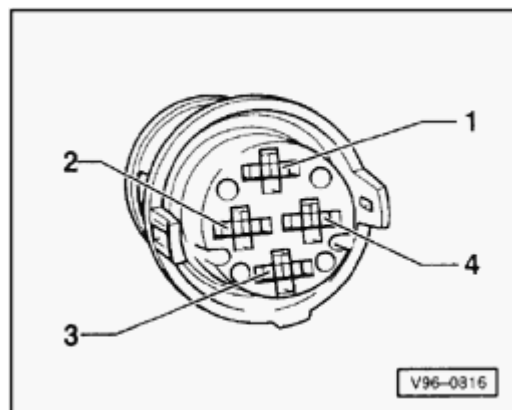
If running noise not audible

- Remove connector flange cover under luggage compartment trim.



- Unlatch and disconnect 4-pin harness connector -1-.

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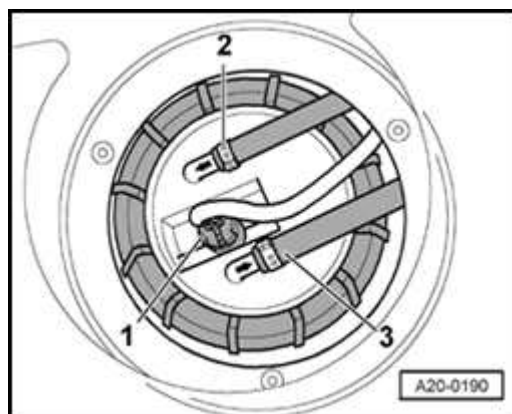
- Switch Fluke 83 multimeter to 20 Volt range and connect to terminal 1 (green/yellow) and 4 (brown) of harness connector using jumper wires from VW 1594 Adaptor kit.
- Press remote control switch continuously while reading Voltage.
 - Specified value: approx. Battery Voltage.

If specified value obtained but no running noise audible from pump

- Remove cover flange as follows:

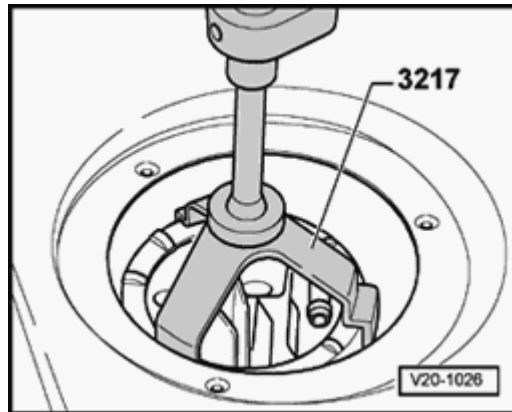
WARNING!

Fuel system is under pressure! Before opening, place clean cloths around the connections to be opened. Carefully loosen the connections to relieve pressure.

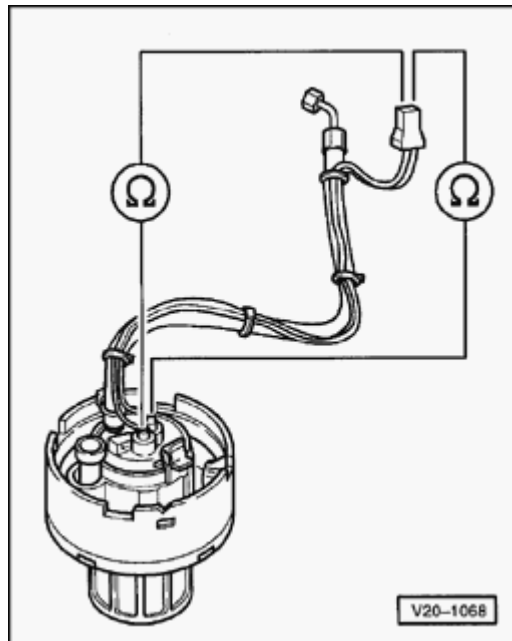


- Mark supply line -2- and return line -3- and remove from cover flange.

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- ⚠ - Unscrew union nut using 3217 wrench.
- Remove cover flange and sealing ring from fuel tank opening.



- ⚠ - Check wiring for continuity between flange and fuel pump.

If wiring OK; fuel pump is faulty

- Replace fuel supply unit ⇒ [Page 20-40](#)
- Re-install cover flange ⇒ [Page 20-44](#)

Fuel pump delivery volume, checking

Vehicles with front wheel drive and 1.8 ltr. turbo or 2.8 ltr. engine

Required special tools, testing equipment and auxiliary equipment

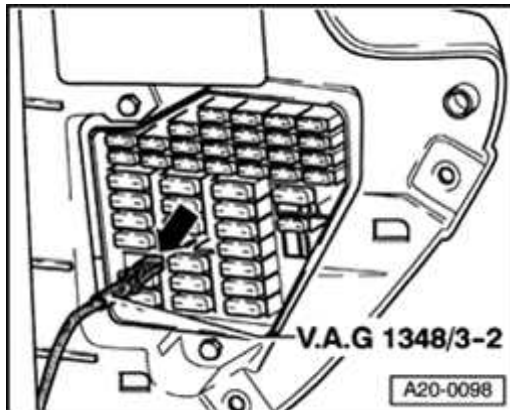
- ◆ VAG1348/3A Remote control using VAG1348/3-2 adaptor cable
- ◆ Calibrated measuring container

Checking requirements

- Battery Voltage: 12 Volts minimum
- Fuel filter OK
- Ignition switched OFF.

Test sequence

- Open fuse box cover on left side of instrument panel.
- Remove fuse 28 from fuse holder (left row, 5th fuse from top).

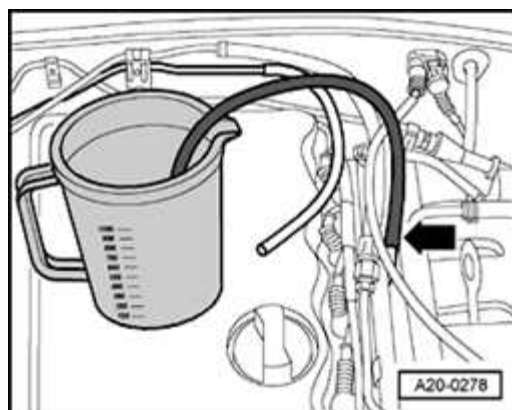


- Connect remote control to right side of fuse 28 holder using adaptor cable -arrow-.
- Connect tester lead to Battery +.
- Remove fuel filler cap.
- Remove engine cover.

Vehicles with 1.8 ltr. turbo engine

WARNING!

Fuel system is under pressure! Before opening, place clean cloths around the connections to be opened. Carefully loosen the connections to relieve pressure.



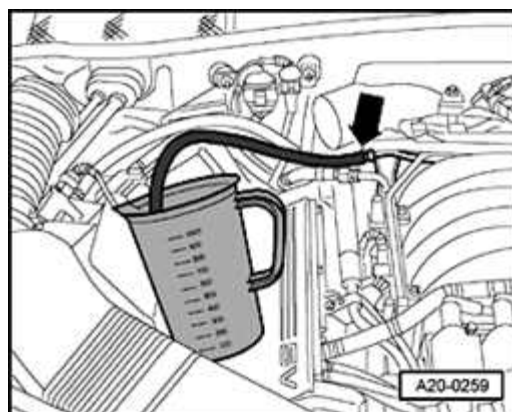
A

- Disconnect fuel return hose from connection on fuel distributor line.
- Connect auxiliary hose -arrow- to distributor line and hold in measuring container.

Vehicles with 2.8 ltr. engine

WARNING!

Fuel system is under pressure! Before opening, place clean cloths around the connections to be opened. Carefully loosen the connections to relieve pressure.



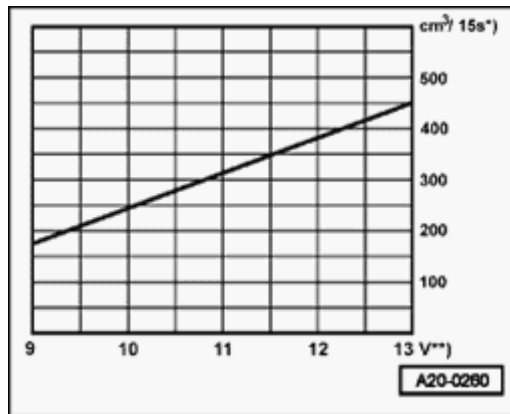
A

- Disconnect fuel return hose from hose connection on fuel distributor line.
- Connect auxiliary hose -arrow- to distributor line and hold in measuring container.

All vehicles

- Operate remote control for 15 seconds.

- Press remote button continuously



- Compare fuel quantity pumped to specified value.

*) Minimum supply quantity $\text{cm}^3/15 \text{ s}$

**) Voltage on fuel pump with engine off and pump running (approx. 2 Volts less than Battery Voltage).

Fuel supply unit, removing and installing

Vehicles with front wheel drive and 1.8 ltr. turbo or 2.8 ltr. engine

Observe Safety measures ⇒ [Page 20-1](#) .

Observe Rules of cleanliness ⇒ [Page 20-4](#) .

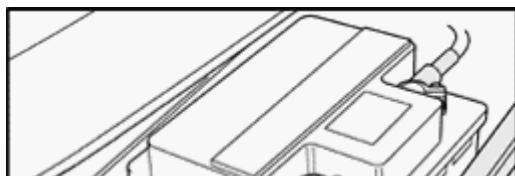
Required special tools, testing equipment and auxiliary equipment

- ◆ 3217 Union nut wrench
- ◆ 3307 fuel pump wrench
- ◆ VAG1275 Hose clamp pliers

Removing

CAUTION!

Obtain the radio Anti-theft code from the customer before disconnecting the Battery Ground strap.



- Disconnect Battery Ground strap with ignition switched OFF.

- Open fuel-filler cap briefly and close again.
- If necessary, drain fuel tank using fuel cart ⇒ [Page 20-18](#) .

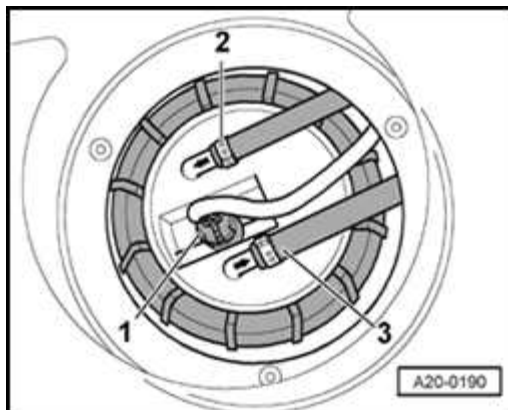
Note:

The fuel tank must not be filled more than $\frac{1}{3}$ maximum.

- Remove connector flange cover under luggage compartment trim.

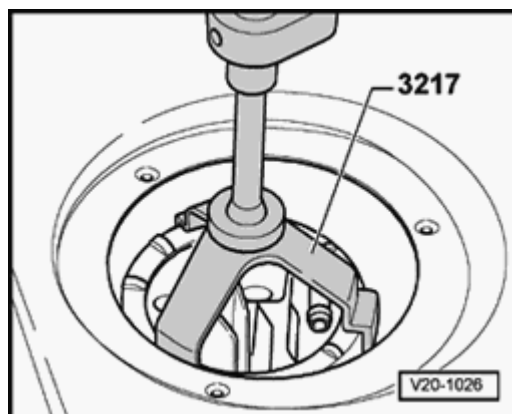
WARNING!

Fuel system is under pressure! Before opening, place clean cloths around the connections to be opened. Carefully loosen the connections to relieve pressure.

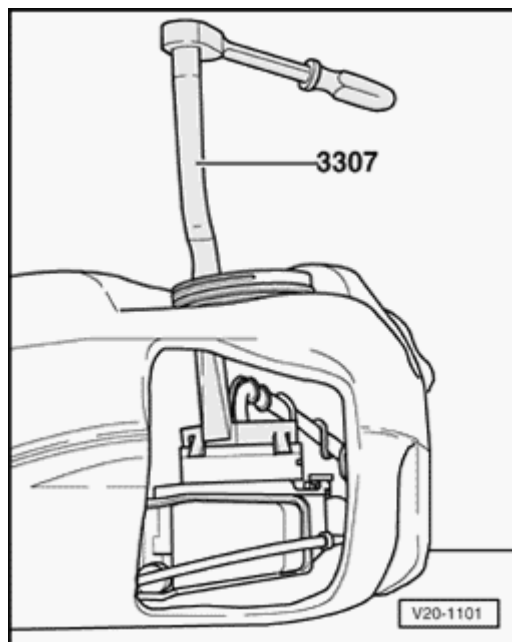
**A**

- Mark return line -2- and supply line -3- and pull off of cover flange.
- Unlatch and disconnect 4-pin harness connector -1-.

20-42



- Unscrew union nut with 3217 wrench.
- Remove cover flange and sealing ring from fuel tank opening.
- Disconnect sender for fuel gauge -G harness connector on inside of cover flange.
- Disconnect return line on inside of cover flange by pressing unlatch buttons.



- Insert 3307 fuel pump wrench through fuel tank opening and place on inner section of surge housing.
- Using wrench 3307, turn surge housing inner section approx. 15° to the left up to the stop and take fuel pump out complete with inner section of housing.

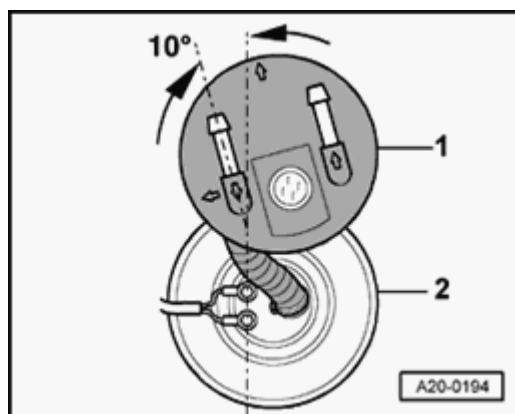
Note:

If the supply unit is replaced, empty the old supply unit of any remaining fuel before properly disposing of it.

Cover flange and surge housing inner section, pre-assembling

If cover flange and supply unit were separated

- Pre-assemble parts ⇒ [Page 20-27](#) .



- Angle position cover flange to inner section of surge housing 10°
- Press together clamps for supply line (between pump and cover flange) using VAG1275 pliers.
- Attach wiring to fuel pump
 - M4: 1.5 Nm
 - M5: 2 Nm

Note:

Install a toothed washer beneath each of the nuts.

- Attach wiring using fuel-resistant cable ties.

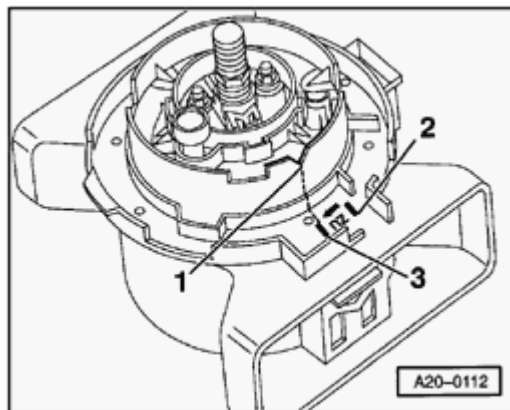
Installing

Installation is performed in the reverse order of the removal procedure, during installation note the following:

CAUTION!

Always refer to the latest parts catalog to ensure that you use original equipment fuel hose clamps.

- Install surge housing inner section, supply hose and cover flange in fuel tank.



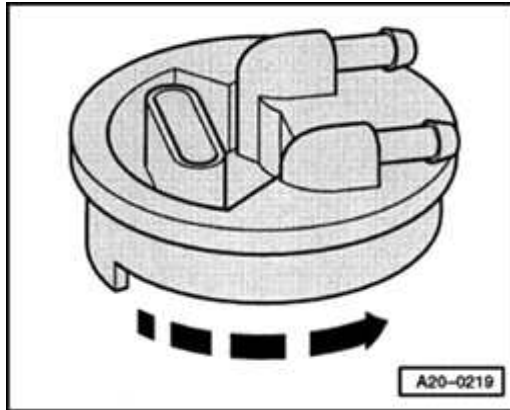
A

- Place inner section of surge housing into outer section of surge housing (in tank) in such a way that notch 1 on inner section of surge housing matches mark 2 on outer section of surge housing.
 - The inner section of the surge housing can be pressed downward until it is clearly heard to engage.
- Put fuel pump wrench 3307 in place and turn surge housing inner section with pump to the right approx. 15° to the stop. The notch -1- will then be in front of the marking -3- (bayonet closure).

Note:

For clarity, the inner and outer surge housing sections are shown without the tank.

20-45

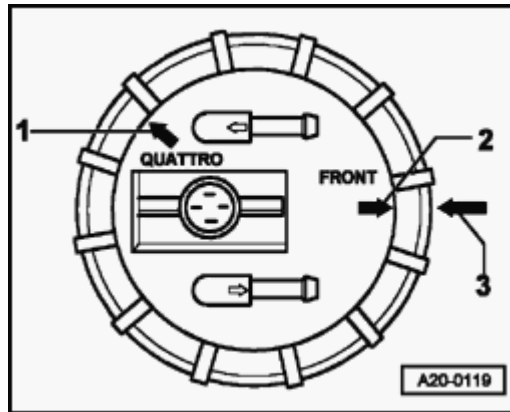


- When installing, turn the cover flange in direction of arrow as shown in illustration.
- Connect the return line inside on the cover flange.

Note:

- ◆ *Always use new O-rings.*
- ◆ *Lubricate O-rings with fuel or coat with a lubricant.*
- ◆ *Place the new gasket (dry) for the cover flange into the opening of the fuel tank.*
- Wrap sender for fuel gauge -G wiring once around the supply line (in fuel tank) and install on cover flange.

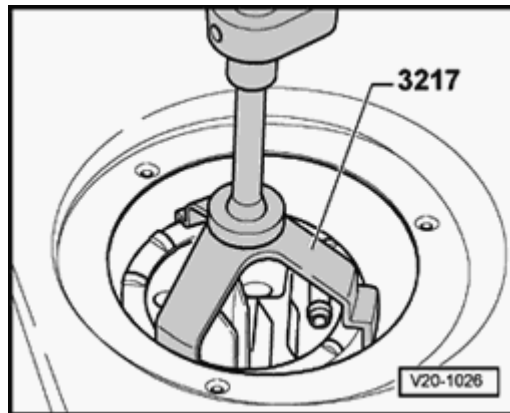
20-46



- Connect cover flange to fuel tank
- Installation for vehicles with Front-Wheel Drive: -arrow 2- must be opposite -arrow 3-.

Note:

-Arrow 1- applies to vehicles with All-Wheel Drive (Not applicable).



- Tighten union nut with 3217 wrench.
- 60 Nm

Note:

Ensure that hose guide (item 7 ⇒ [Page 20-28](#)) is kept in position while tightening the union nut.

- Connect wiring and harness connector.

Note:

Ensure that fuel hoses fit tight.

- Connect Ground strap to Battery with ignition switched OFF.
- After connecting Battery, input radio anti-theft code

⇒ *Radio operating instructions*

- Run door windows up to stop using the window switches.
- Operate all window lifters again for at least 1 second in "closed" position to activate automatic up/down.
- Set the clock.

Tightening torque

Component	Nm
Union nut for cover flange	60

Sender for fuel gauge -G, checking

Vehicles with front wheel drive and 1.8 ltr. turbo or 2.8 ltr. engine

Note:

Checking signal between sender for fuel gauge - G and fuel gauge.

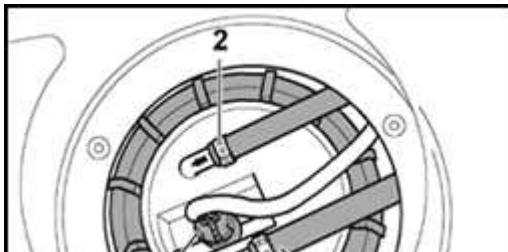
⇒ [Repair Manual, Electrical Equipment, Repair Group 90](#)

Required special tools, testing equipment and auxiliary equipment

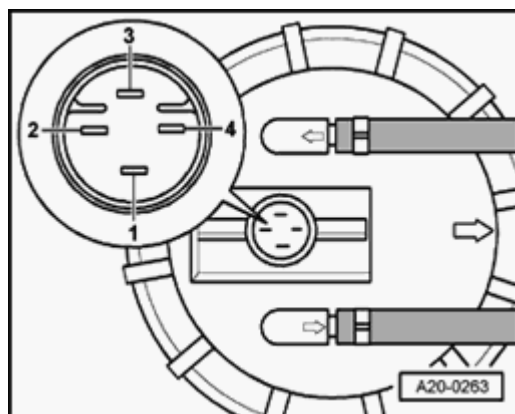
◆ Fluke 83 Multimeter

◆ VW 1594 Adaptor kit

- Remove connector flange cover under luggage compartment trim.



- Unlatch and disconnect 4-pin harness connector -1-.



- Measure resistance at terminals -2- and -3- on cover flange:

Sensor	Tank full	Tank empty
Sender for fuel gauge -G	40 Ω	280 Ω

Fuel level between "Tank full" and "Tank empty" must cause a resistance value that falls between the two specified values.

If 0 Ω or ∞ Ω is measured

- There is an open or short circuit in the tank wiring.

Note:

To check the resistance values for "Tank full" or "Tank empty" remove the sender for fuel gauge ($\Rightarrow$ [Page 20-50](#)) and swing the sensor float to the top or bottom stop.

Sender for fuel gauge -G, removing and installing

Vehicles with front wheel drive and 1.8 ltr. turbo or 2.8 ltr. engine

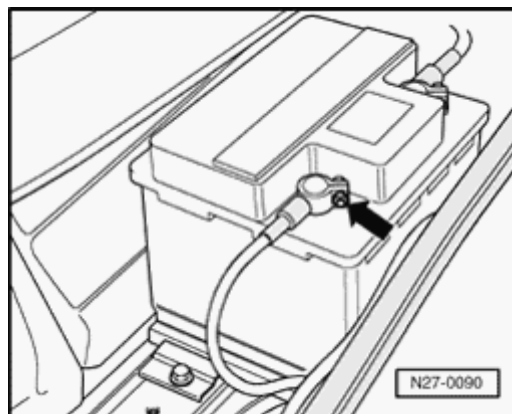
Observe Safety measures ⇒ [Page 20-1](#) .

Observe Rules of cleanliness ⇒ [Page 20-4](#) .

Removing

CAUTION!

Obtain the radio Anti-theft code from the customer before disconnecting the Battery Ground strap.



A

- Disconnect Battery Ground strap with ignition switched OFF.
- Open fuel tank cover briefly and close again.
- If necessary, drain fuel tank using fuel cart ⇒ [Page 20-18](#) .

Note:

The fuel tank must not be filled more than $\frac{1}{3}$ maximum.

- Fuel supply unit, removing, starting ⇒ [Page 20-40](#) .

- Carefully pull cover flange out and push to the side with hoses connected.

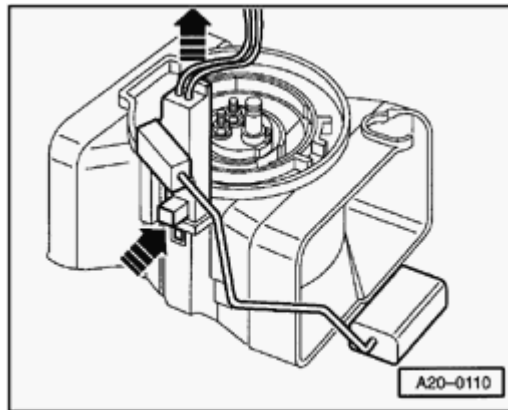
- Disconnect harness connector for fuel level display on inside of cover flange.



- Pull sensor out of surge housing in fuel tank while simultaneously pressing latching tab -arrow-.

Note:

For clarity, surge housing illustration is shown without tank.



Installing

Installation is performed in the reverse order of the removal procedure, when installing, note the following:

- Install the sender for fuel gauge in the guide on the surge housing outer section and press down until it engages.
- Wrap sender for fuel gauge wiring once around return line (in tank).
- Cover flange, installing ⇒ [Page 20-45](#) .
- Connect Ground strap to Battery with ignition switched OFF.
- After connecting Battery, input radio anti-theft coding.

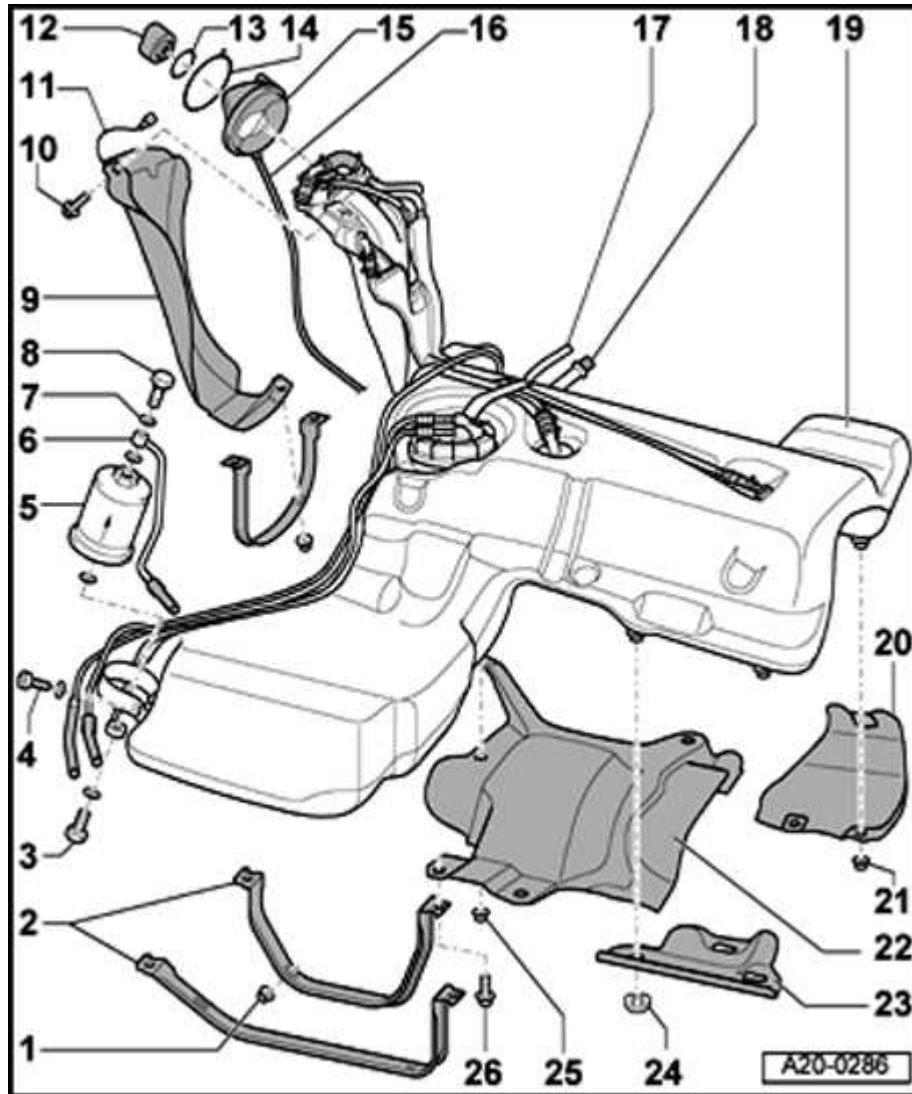
⇒ *Radio operating instructions*

- Run door windows up to stop with electric window lifters.
- Operate all window lifters again for at least 1

second in "closed" position to activate automatic up/down.

- Set the clock.

20-53



Fuel supply system, servicing (vehicles with all wheel drive and 1.8 ltr. turbo or 2.8 ltr. engine)

Fuel tank assembly, component overview

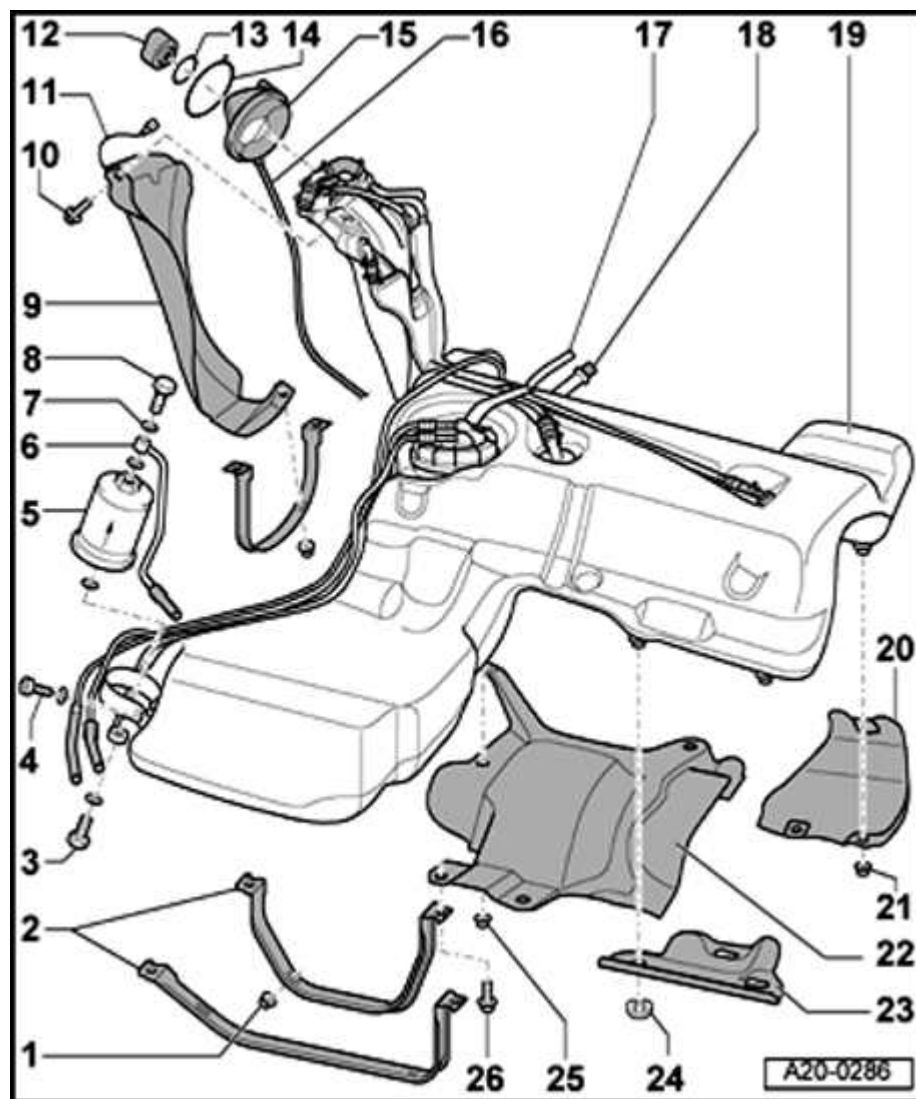
Note:

- ◆ Checking fuel pump relay and triggering:

⇒ Repair Manual, Fuel Injection & Ignition, Repair Group 24

- ◆ Secure all hose connections using spring clamps.
- ◆ VAG1921 pliers are recommended for installing spring clamps
- ◆ Always replace sealing rings and gaskets during installation work.
- ◆ Always refer to the Parts Catalog for availability of individual items in an assembly.

20-54

**1 - Plastic nut**

◆ 2 Nm

- Lightly twist on to fasten fuel tank clamp bands

- Tighten nut after tightening clamp bands

2 - Clamp bands◆ Removing and installing ⇒ [Page 20-69](#)

- Note different lengths

- Note installation orientation

3 - Banjo bolt M14

◆ 30 Nm

4 - 1.2 Nm**5 - Fuel filter**

◆ Location: Arrow points in direction of flow.

6 - Supply line

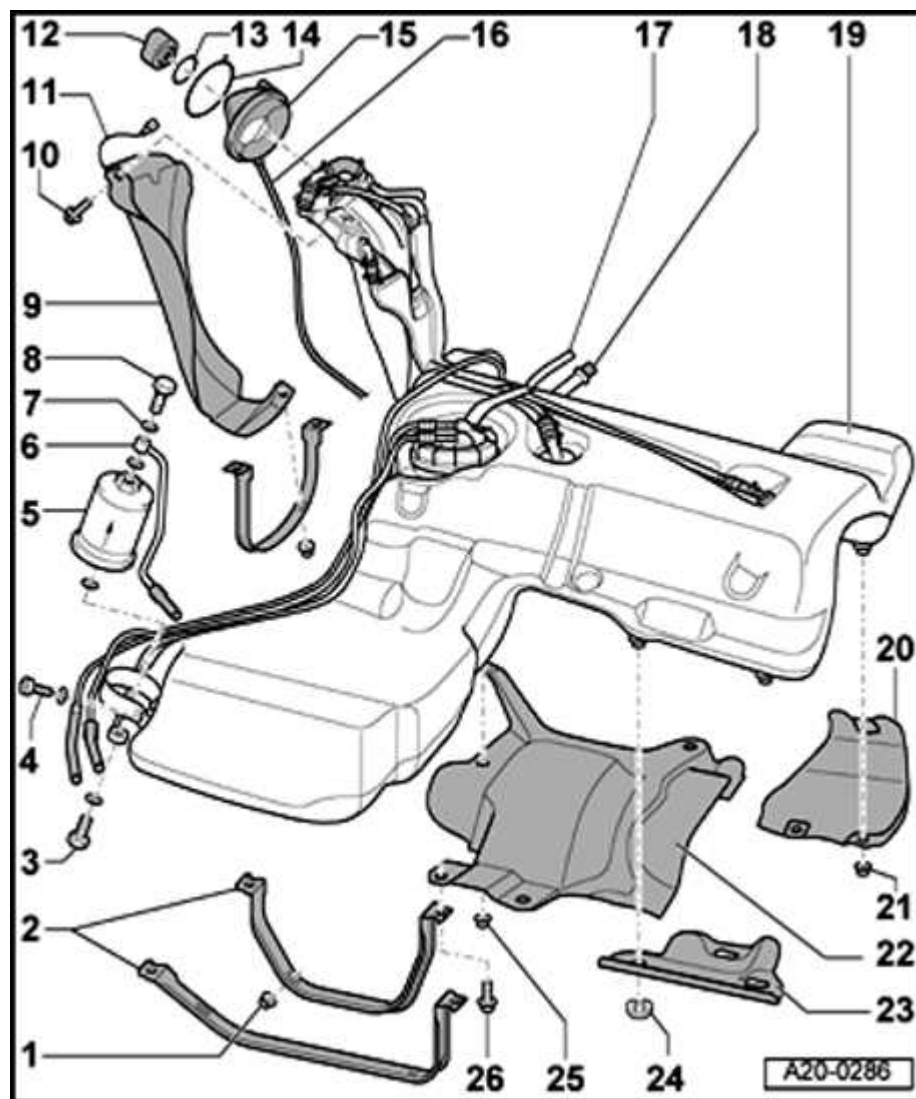
◆ To fuel supply on fuel distributor

7 - Sealing ring

- Replace

8 - Banjo bolt M12

◆ 20 Nm



9 - Protector plate

- ◆ For fuel filler neck
- ◆ With Ground connection
 - Before installing a mounting screw (item 10) ensure that screw eye of Ground connection fits tightly

10 - 25 Nm

11 - Ground connection

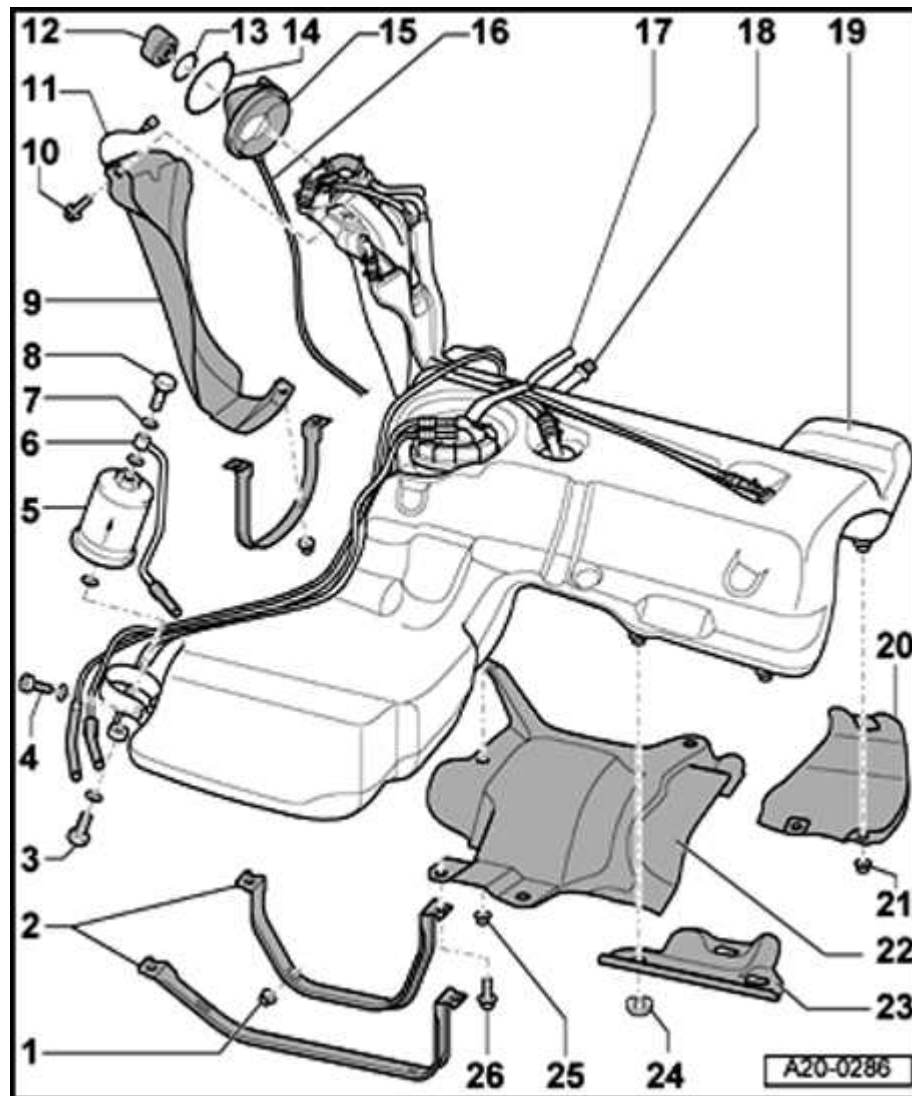
- ◆ Location ⇒ Fig. ⇒ [1](#) , ⇒ [Page 20-58](#)
 - Ensure tight fit of metal ring on fuel filler neck
 - Check chamfer on protective plate (Item 9).
 - After installation, check continuity between metal ring on fuel filler neck and chassis Ground: must be approx. 0 Ω

12 - Cover

13 - Gasket

- Replace if damaged.

20-56



14 - Locking ring

15 - Rubber cap

16 - Overflow hose

17 - Bleed line

- ◆ Between EVAP canister and EVAP canister purge regulator valve N80

18 - Bleed line

- ◆ Between the bleed valve on fuel filler neck and EVAP canister

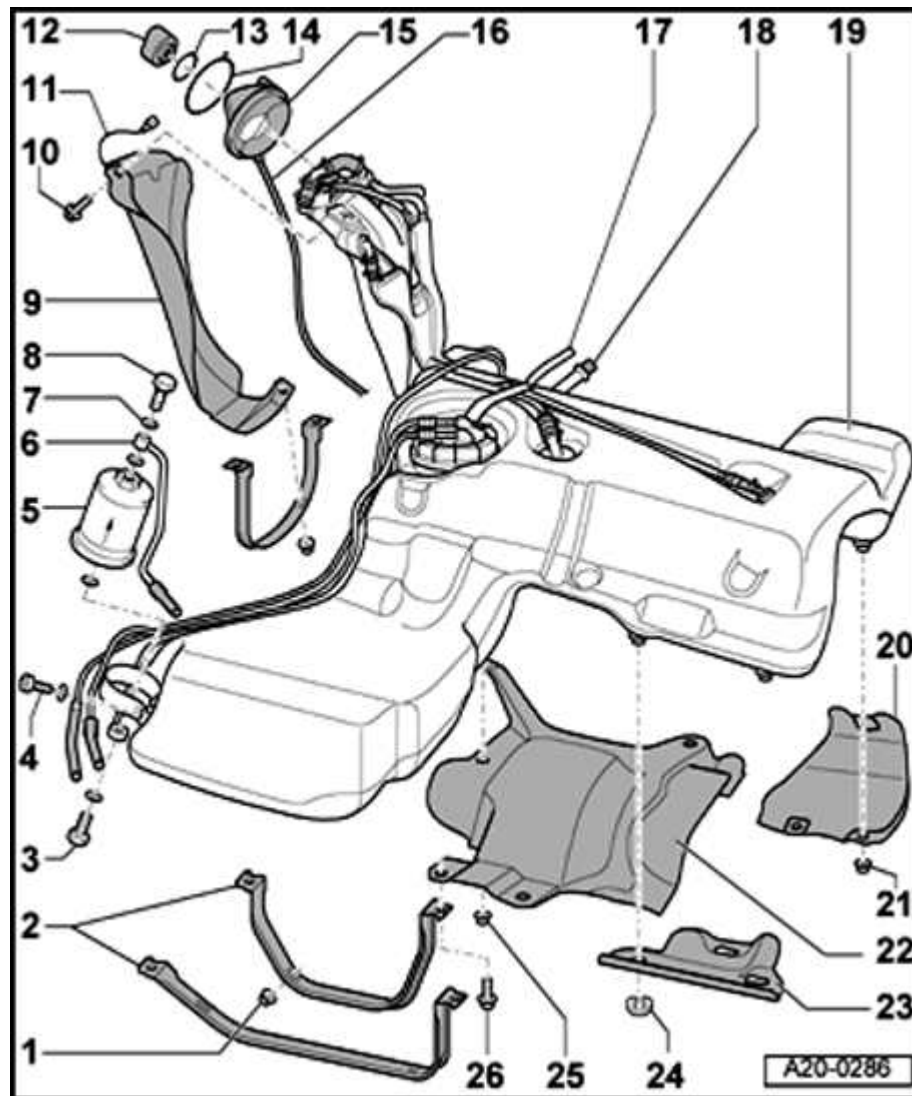
19 - Fuel tank

- ◆ Removing and installing ⇒ [Page 20-69](#)

20 - Heat shield

- ◆ For fuel tank
- ◆ Fastened on rear edge of fuel tank with adhesive tape

20-57



21 - Plastic nut

◆ 2 Nm

22 - Carrier plate

23 - Heat shield

◆ For fuel filler neck

24 - Mounting clamp

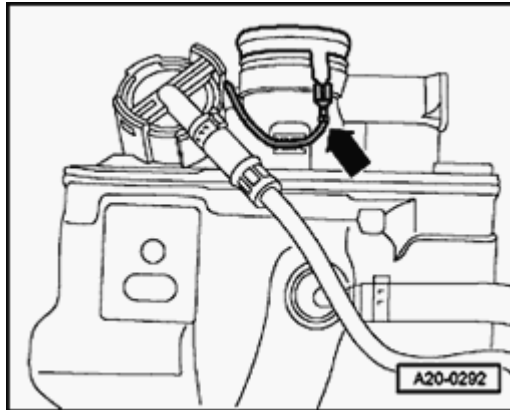
- Ensure tight fit

25 - Plastic nut

◆ 2 Nm

26 - 25 Nm

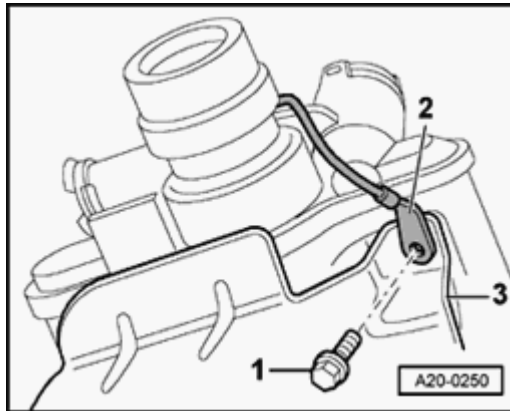
20-58



A

Fig. 1 Ground connection, installed position

- Route the Ground connection -Arrow-, as shown in illustration.
- Ensure Ground connector fits tightly on filler neck Ground clamp.



A

Fig. 2 Ground connection, installed position, cont.

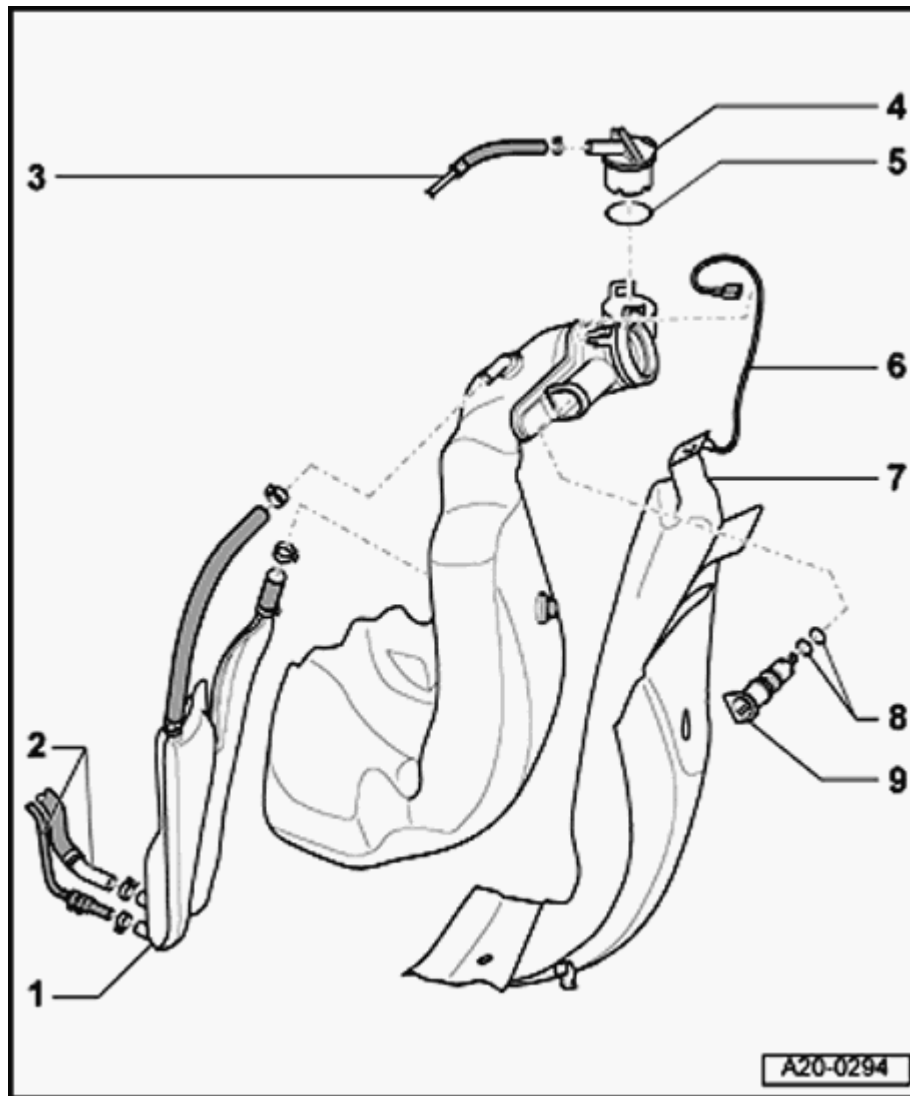
- Before threading in screw -1-, ensure tight fit of screw eye -2- on fuel filler neck protection plate Ground -3-.

CAUTION!

After installation, check for continuity between Ground clamp on filler neck and chassis Ground.

♦ **Specification: approximately 0 Ω .**

20-59



Fuel filler neck, component overview (vehicles without ORVR)

Vehicles with all wheel drive and 1.8 ltr. turbo or
2.8 ltr. engine

1 - Expansion tank

- Attach wires to expansion tank using adhesive tape

2 - Bleed lines

- ◆ To connector line at top of fuel tank

3 - Bleed line

- ◆ To EVAP canister

4 - Gravity valve

- ◆ Removing: unclip upward out of the filler neck

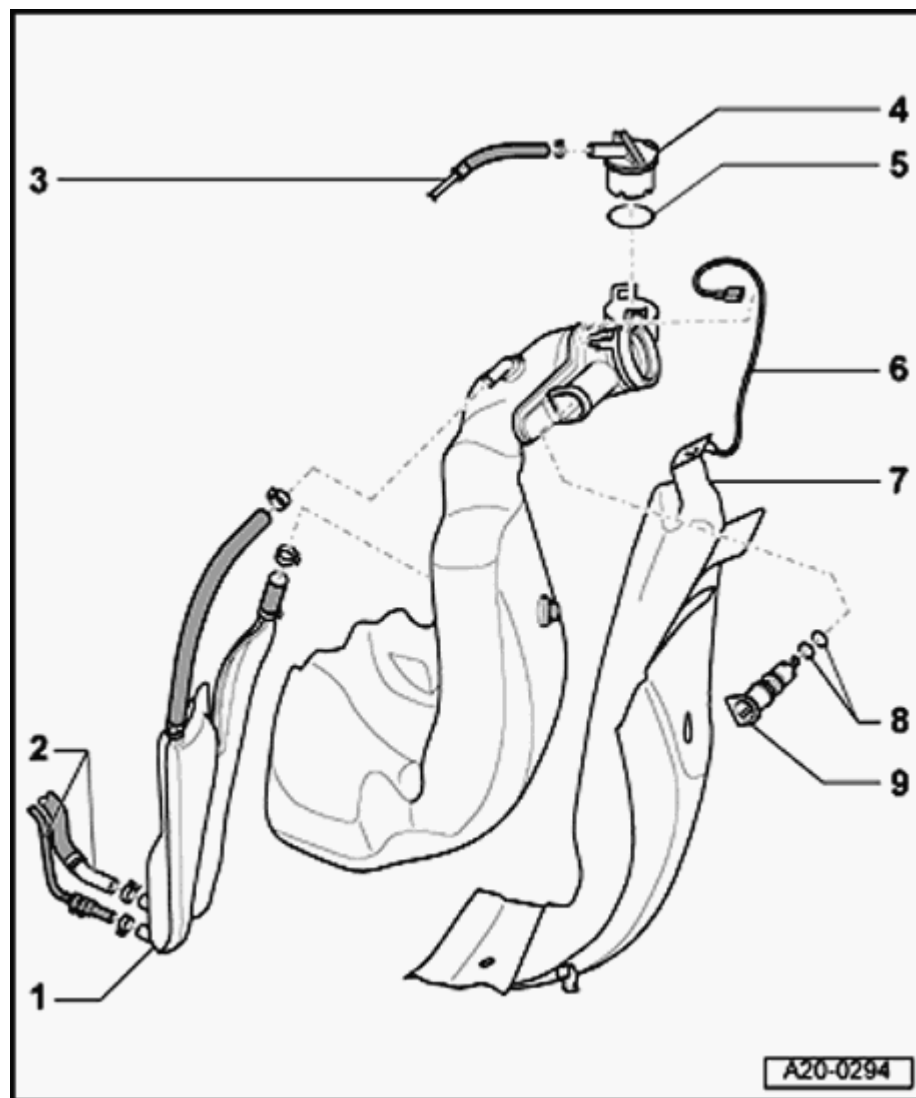
- Check valve for flow:

Valve vertical: Flow

Valve tipped 45 ° : No Flow

5 - O-ring

- Replace



6 - Ground connection

◆ Location ⇒ Fig. ⇒ [1](#) , ⇒ [Page 20-58](#)

- Ensure tight fit of metal ring on fuel filler neck
- Check chamfer on protective plate (item 7).
- After installing, check continuity between metal ring on fuel filler neck and chassis Ground using multimeter, specified value: approx. 0 Ω

7 - Protector plate

- ◆ For fuel filler neck
- ◆ With Ground connection
 - Ensure Ground screw is tight before threading in mounting screw (item 10 ⇒ [Page 20-55](#))

8 - O-rings

- Replace

9 - Bleed valve

- ◆ Removing, installing, checking ⇒ Fig. ⇒ [1](#) , ⇒ [Page 20-61](#)

20-61

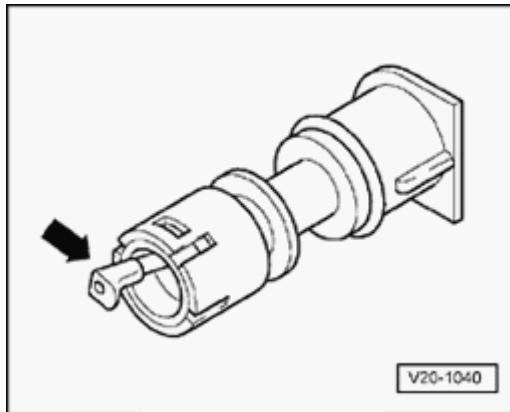
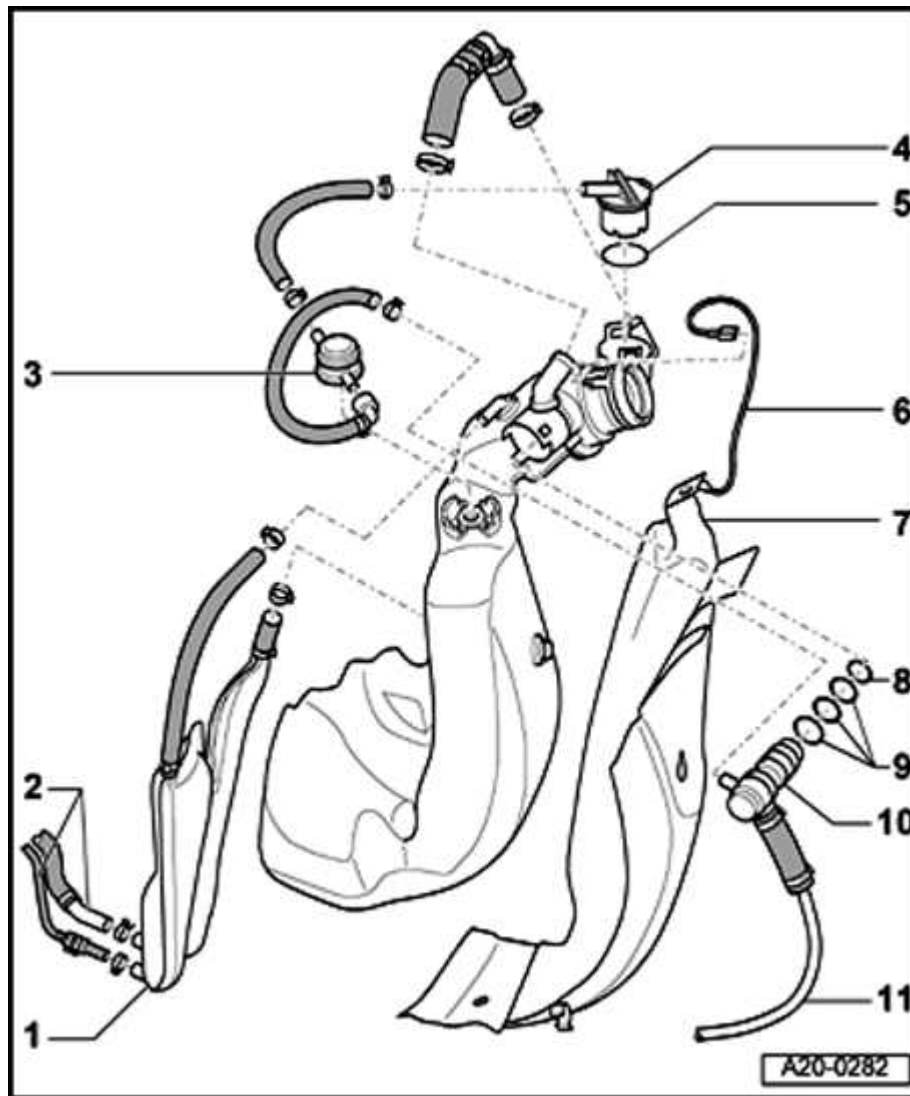


Fig. 1 Bleed valve removing, installing, checking

- To remove, unclip valve from side of filler neck.

- Lever in rest position: Valve closed
- Lever pressed in direction of arrow: Valve open

20-62



Fuel filler neck, component overview (vehicles with ORVR)

Vehicles with all wheel drive and 1.8 ltr. turbo or 2.8 ltr. engine

1 - Expansion tank

- Secure wires to expansion tank using adhesive tape

2 - Bleed lines

- ◆ To connector line at top of fuel tank

3 - Tank protection valve

- ◆ Clipped to fuel filler neck
- ◆ Ventilates fuel tank for pressure compensation

4 - Gravity valve

- ◆ To remove valve, unclip upward out of the filler neck

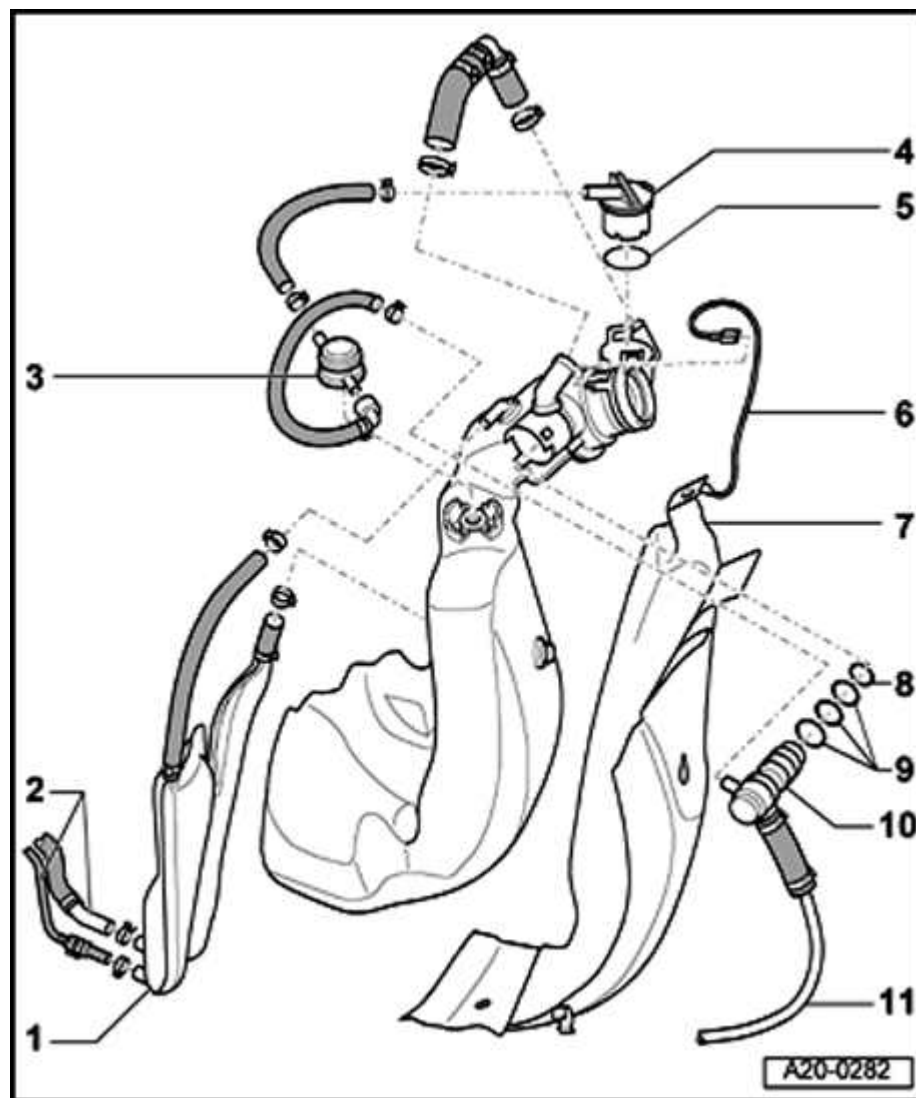
- Check valve for flow:

Valve vertical: Flow

Valve tilted 45 ° : No Flow

5 - O-ring

- Replace



6 - Ground connection

◆ Location ⇒ Fig. ⇒ [1](#) , ⇒ [Page 20-58](#)

- Ensure tight fit of metal ring on fuel filler neck
- Check chamfer on protective plate (item 7).
- After installing, check continuity between metal ring on fuel filler neck and chassis Ground point. Specified value: approx. 0 Ω

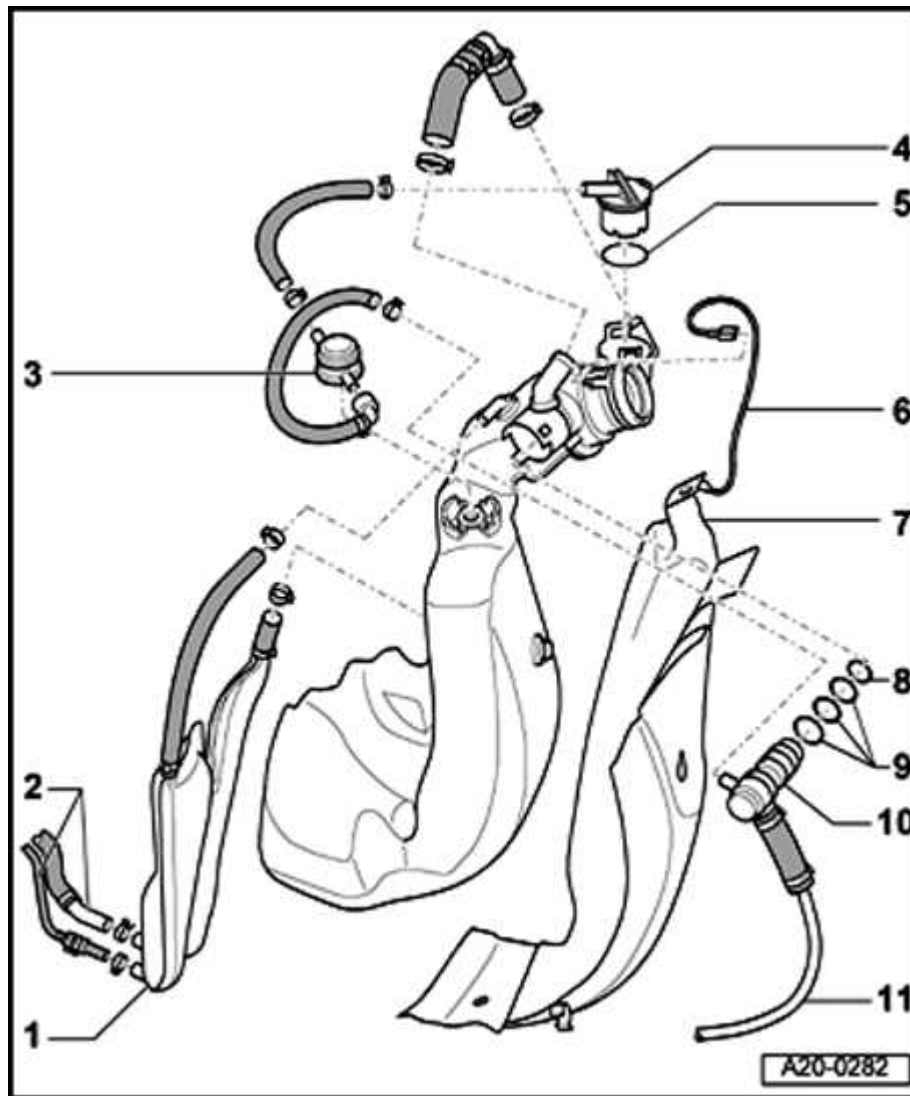
7 - Protective plate

- ◆ For fuel filler neck
- ◆ With Ground connection
 - Before threading in mounting screw (item 10 ⇒ [Page 20-55](#)) check for tight fit on screw eye of Ground connection

8 - Sealing ring

- ◆ Installed position: Sealing lip points to fuel filler neck

20-64

**9 - O-rings**

- ◆ Different sizes
- Replace

10 - Bleed valve

- ◆ Removing, installing, checking ⇒ Fig. ⇒ [1](#),
⇒ [Page 20-65](#)

11 - Bleed line

- ◆ To EVAP canister

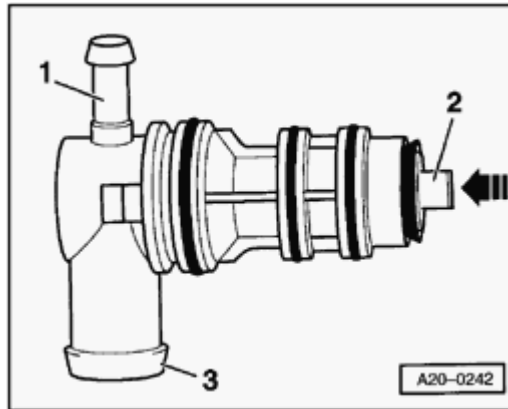


Fig. 1 Bleed valve removing, installing, checking

Requirement

- ◆ Fuel tank removed.
- To remove, unclip valve from side of filler neck.
- Close off filler neck by hand -3-.
- Blow into filler neck -1-
 - Button -2- pressed in direction of arrow: Flow
 - Button -2- in OFF direction: NO Flow.

Fuel tank, draining

Vehicles with all wheel drive and 1.8 ltr. turbo
or 2.8 ltr. engine

WARNING!

***Fire hazard! Do NOT have anything in the
area that can ignite gasoline!***

Observe Safety measures ⇒ [Page 20-1](#) .

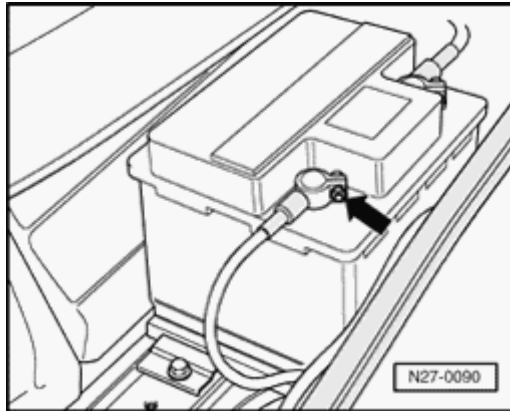
Observe Rules of cleanliness ⇒ [Page 20-4](#) .

Required equipment

- ◆ FM 3000 fuel storage cart (or equivalent)

CAUTION!

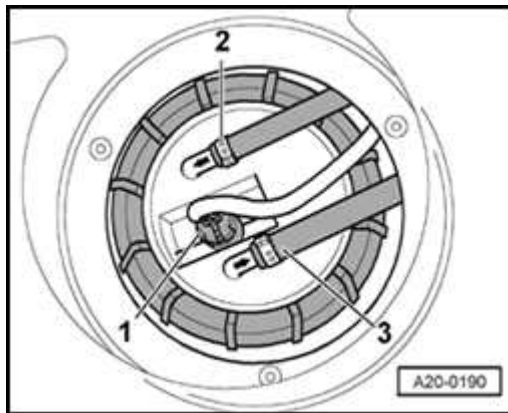
Obtain the radio Anti-theft code from the customer before disconnecting the Battery Ground strap.

**A**

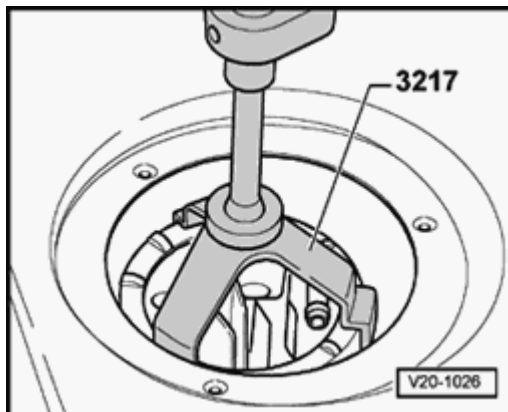
- Disconnect Battery Ground strap.
 - Ensure that ignition is switched OFF.
- Remove cover from fuel filler neck.
- Empty as much fuel as possible through the filler neck.
- Remove connector flange cover under luggage compartment trim.

WARNING!

Fuel system is under pressure! Before opening, place clean cloths around the connections to be opened. Carefully loosen the connections to relieve pressure.



- Mark return line -2-, supply line -3- and remove cover flange.
- Unlatch and disconnect 4-pin harness connector -1-.



- Unscrew union nut using 3217 wrench.
- Remove cover flange and sealing ring from fuel tank opening.
- Pump remaining fuel through the flange opening.

Fuel tank assembly, removing and installing

Vehicles with all wheel drive and 1.8 ltr. turbo or 2.8 ltr. engine

WARNING!

Fire hazard! Do NOT have anything in the area that can ignite gasoline!

Observe Safety measures ⇒ [Page 20-1](#) .

Observe Rules of cleanliness ⇒ [Page 20-4](#) .

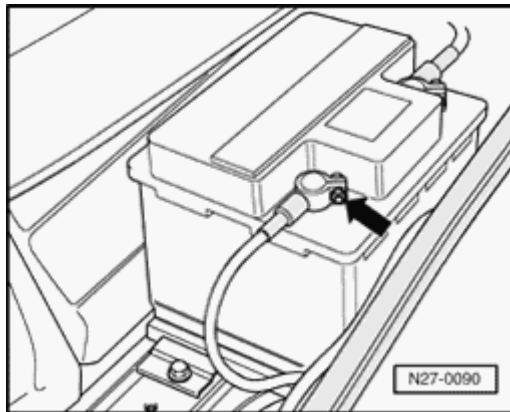
Required special tools, testing equipment and auxiliary equipment

- ◆ VAG1359/2 Universal holder
- ◆ VAG1383 A Engine and transmission jack

Removing

CAUTION!

Obtain the radio Anti-theft code from the customer before disconnecting the Battery Ground strap.



A

- Disconnect Battery Ground strap.
 - First ensure that ignition is switched OFF.
- Open fuel tank cover briefly and close again.
- If necessary, drain fuel tank using fuel cart ⇒ [Page 20-66](#) .

WARNING!

Empty the fuel tank before removing it! If it is not empty, the weight and sloshing fuel could lead to injury, component damage or possible fuel spillage.

20-71

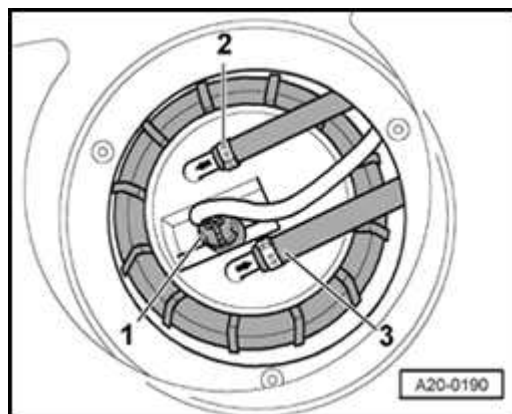
Note:

For weight reasons, fuel tank must be empty before removing.

- Remove rear axle.

⇒ [Repair Manual, Suspension, Wheels, Steering, Repair Group 42](#)

- Remove connector flange cover under luggage compartment trim.



A

- Unlatch and disconnect 4-pin harness connector -1-.

Note:

Return line -2- and supply line -3- remain connected.

- Clean area around fuel filler neck.
- With fuel filler cap removed, pry out clamp ring on rubber seal (around filler neck).
- Push rubber seal through and toward the inside.
- Remove right rear wheel house liner.



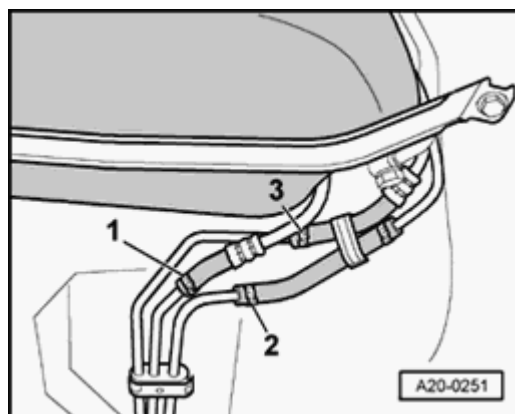
A

- Remove screw -1- for fuel filler neck, Ground connection -2- and

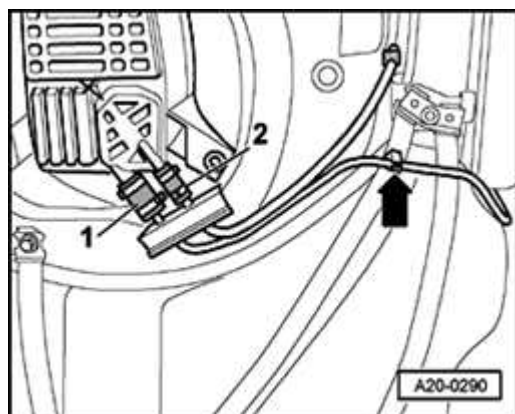
protective plate -3- under the wheel house shell.

WARNING!

Fuel system is under pressure! Before opening, place clean cloths around the connections to be opened. Carefully loosen the connections to relieve pressure.

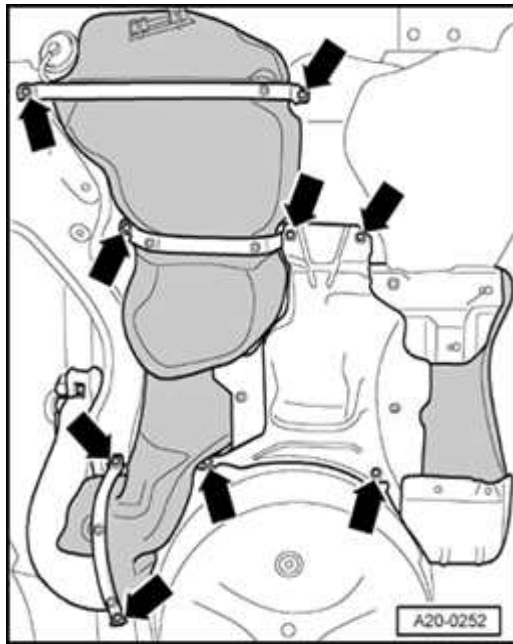


- 4 - From bottom of vehicle, mark supply line -1-, return line -3- and bleed line to EVAP canister and disconnect -2-.
- Remove the EVAP canister cover near bottom of spare wheel well ⇒ [Page 20-130](#) .



- 4 - Loosen hose connections -1- and -2- on bleed lines.
- Unclip line from bracket -arrow-.
- Place VAG1383A engine and transmission jack under the fuel tank for support.
- Mark installed position of the clamp bands.

20-73



A

- Disconnect clamp bands and carrier plate -arrows-.
- Lower fuel tank.

Note:

Ensure that the bleed line stays clipped to the fuel tank during fuel tank removal.

Installing

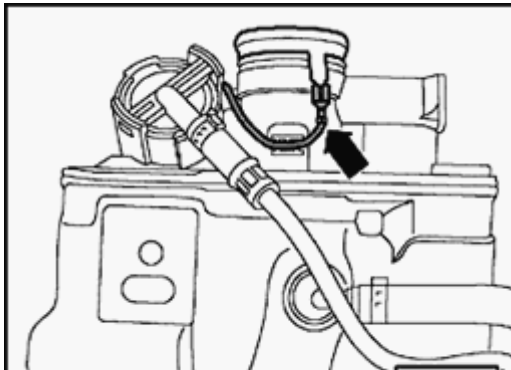
Installation is performed in the reverse order of removal, during installation note the following:

CAUTION!

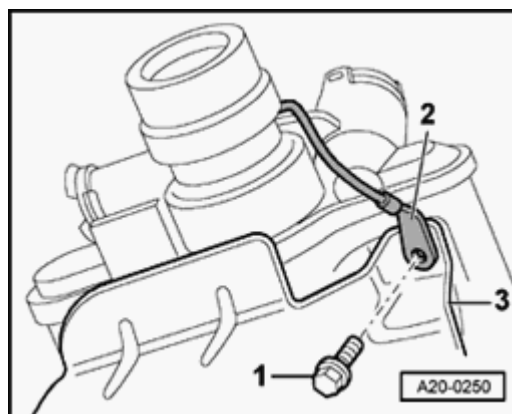
Always refer to the latest parts catalog to ensure that you use original equipment fuel hose clamps.

Note:

- ◆ *Secure all hose connections using spring clamps:*
 - ◆ *VAG1921 Hose clamp pliers are recommended for installing spring clamps.*
 - ◆ *Always replace sealing rings and gaskets during installation work.*
- A**
- Ensure that Ground connection -arrow- connects to metal ring on filler neck.
 - Check Ground wire routing.



- Loosely fasten clamp bands and carrier plate to fuel tank.
- Position fuel tank on floor pan complete with clamp bands and carrier plate using VAG1383 A engine transmission jack.

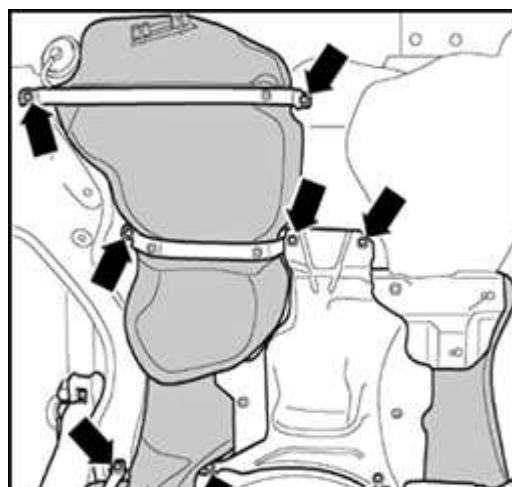


A

- Before threading in mounting screw -1- ensure tight fit (chamfer) of screw eye -2- on protective plate Ground connection -3- for fuel filler neck.

CAUTION!

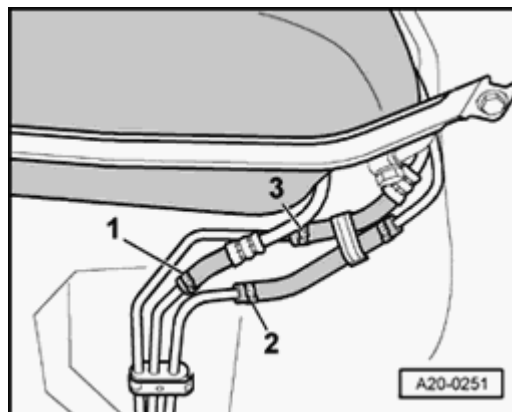
Ensure that Ground connection is surrounded with a protective shield and connector on fuel filler neck is securely attached.
Installed position ⇒ Fig. ⇒ 1 , ⇒ Page 20-58 .



A

- Screw the clamp bands and carrier plate tight -arrows-.
- Tighten plastic nuts on clamp bands and carrier plate.

20-76



- Connect lines according to markings:
- 1 - Supply line
- 2 - Bleed line to EVAP canister
- 3 - Return line
- Re-connect fuel pump and sender for fuel gauge harness connectors.

CAUTION!

After installation, check for continuity between Ground clamp on filler neck and chassis Ground.

♦ Specification: approximately 0 Ω .

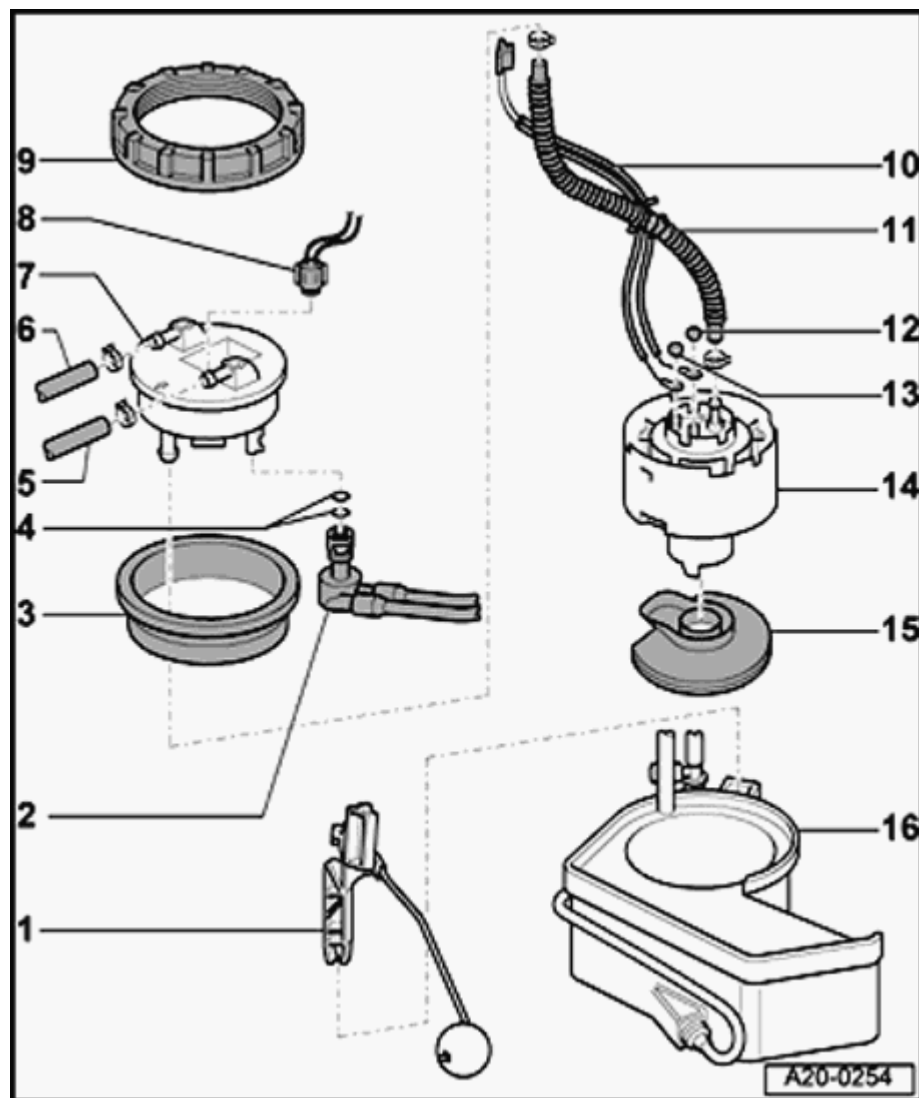
- Connect Ground strap to Battery with ignition OFF.
- After connecting Battery, input radio anti-theft code

⇒ Radio operating instructions

- Run door windows up to the stop using window switches.
- Operate all window switches again for at least 1 second in "closed" position to activate automatic up/down.
- Re-set the clock.

20-77**Tightening torques**

Component	Nm
Clamp bands and/or carrier plate (for fuel tank) on chassis	25 Nm
Clamp bands on fuel tank	2 Nm
Carrier plate on fuel tank	2 Nm
Cover on spare wheel well	10 Nm



Fuel supply unit and sender for fuel gauge -G, component overview

Vehicles with all wheel drive and 1.8 ltr. turbo or 2.8 ltr. engine

1 - Sender for fuel gauge -G

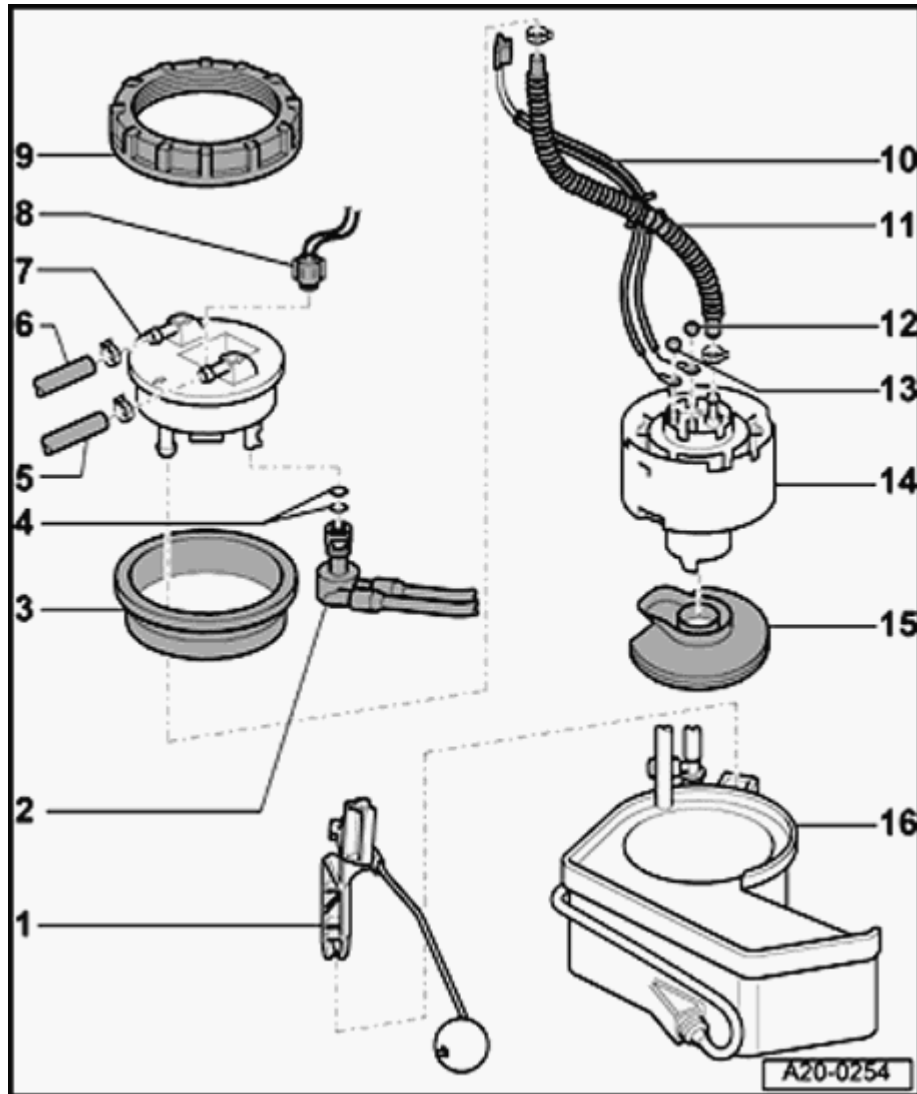
- ◆ Float is cube-shaped
 - Check resistance values: ⇒ [Page 20-99](#)
- ◆ Removing and installing: ⇒ [Page 20-101](#)

2 - Return line

- ◆ With fuel pump
- ◆ On inside of cover flange
- ◆ Removing and installing ⇒ [Page 20-104](#)
- ◆ Disconnecting: press unlatch buttons on connector piece

3 - Sealing ring

- Replace
- ◆ Installing: insert dry into fuel tank opening

**4 - O-rings**

- Always replace.
- Check installation position

5 - Return line

- ◆ From fuel distributor
- Mark before removal
- Note direction of arrow on flange

6 - Supply line

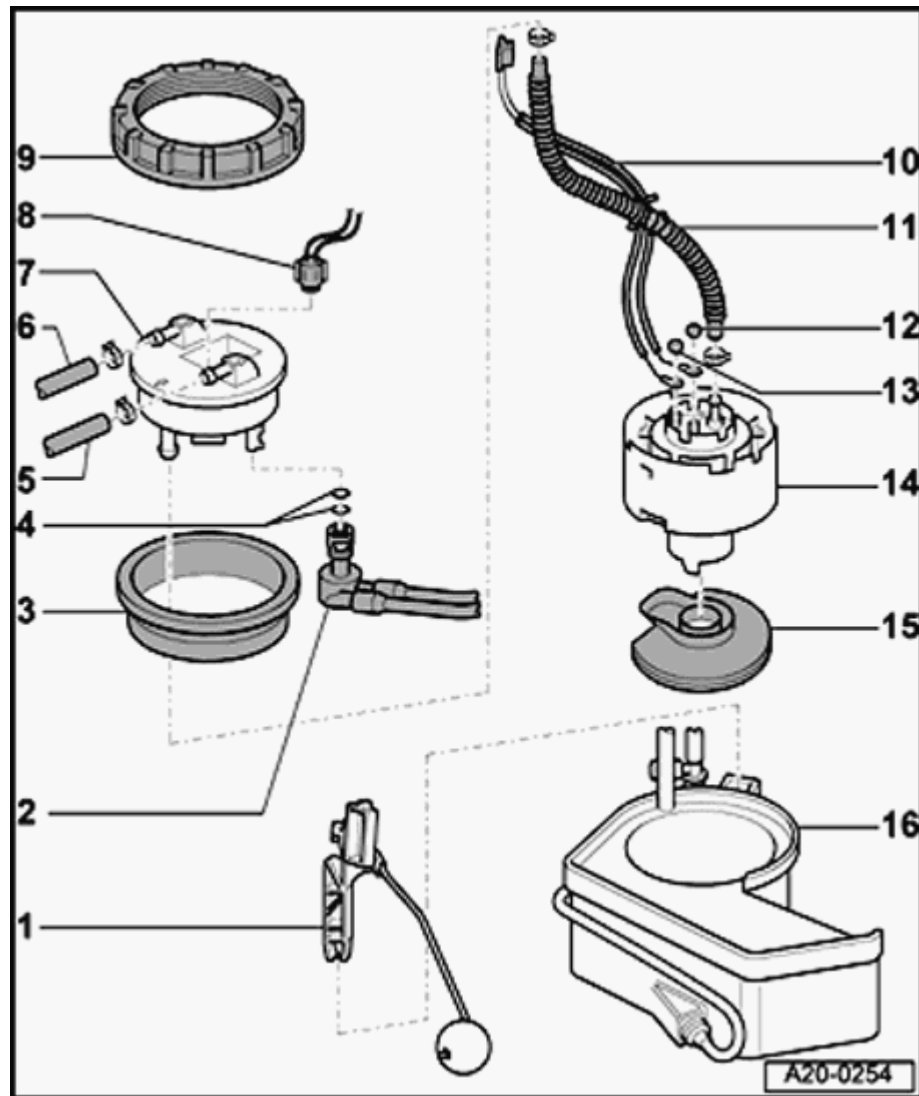
- ◆ To fuel distributor
- Mark before removing
- Note direction of arrow on flange

7 - Cover flange

- ◆ Removing and installing ⇒ [Page 20-91](#)
- ◆ Location: Note arrow marking ⇒ [Page 20-97](#)

8 - Harness connector

- ◆ For fuel Pump and sender for fuel gauge - G

**9 - Union nut**

- ◆ 60 Nm

10 - Wiring

- ◆ To fuel pump
 - Attach with fuel resistant cable ties (item 11)

11 - Supply line

- ◆ Fuel pump/surge housing
- ◆ Location ⇒ [Page 20-95](#)

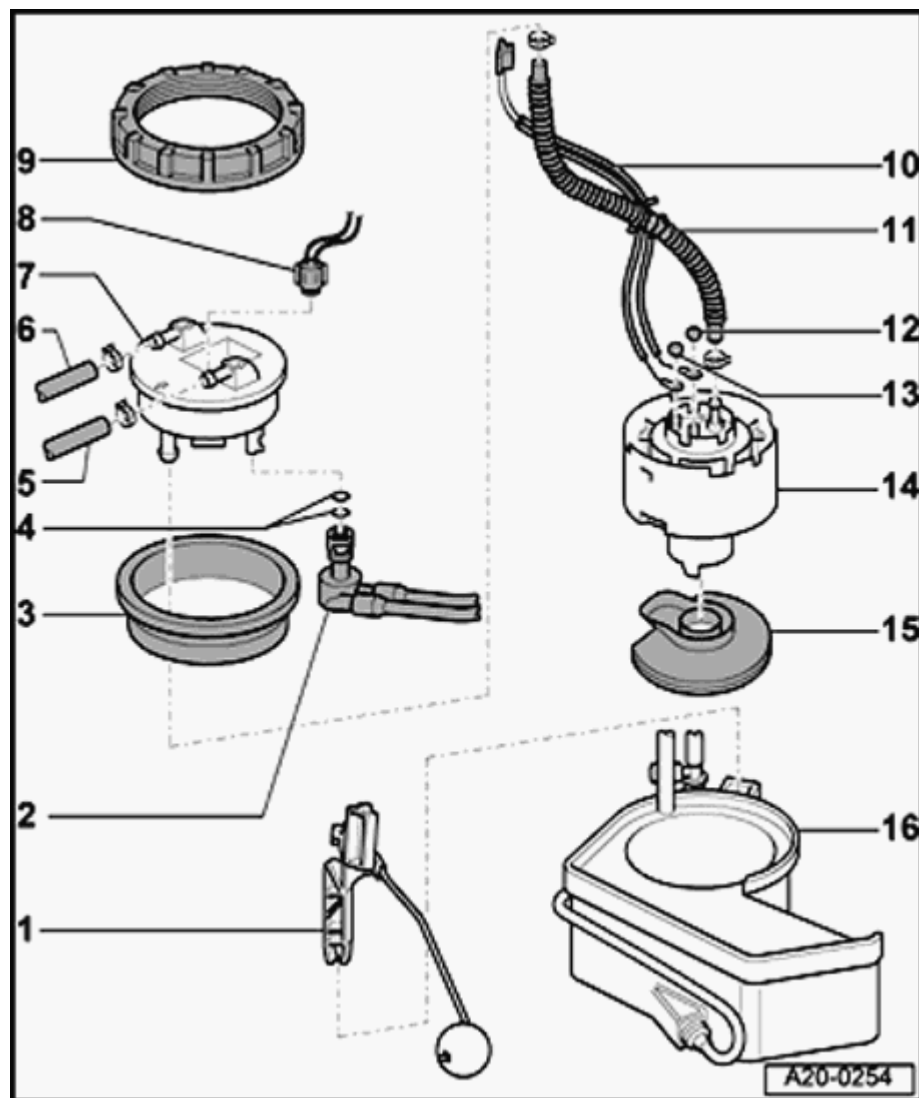
12 - Nut M4

- ◆ 1.5 Nm
 - Install toothed washer beneath.

13 - Nut M5

- ◆ 2 Nm
 - Install toothed washer beneath.

20-81



14 - Fuel supply unit

- ◆ Removing and installing ⇒ [Page 20-91](#)
- Fuel pump electrical checks ⇒ [Page 20-82](#)
- Residual pressure, checking:

⇒ *Repair Manual, Fuel Injection & Ignition, Repair Group 24*

15 - Fuel strainer

- ◆ Connected to fuel supply unit
- ◆ Can not be replaced individually
- Clean if dirty

16 - Surge housing lower section

- ◆ Installed in fuel tank
- ◆ Can not be removed

Fuel pump, electrical checking

**Vehicles with all wheel drive and 1.8 ltr. turbo
or 2.8 ltr. engine**

Required special tools, testing equipment and auxiliary equipment

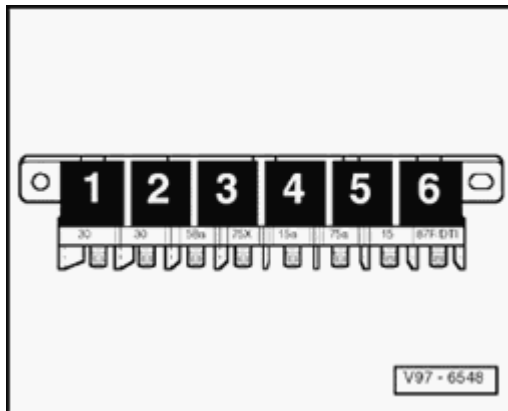
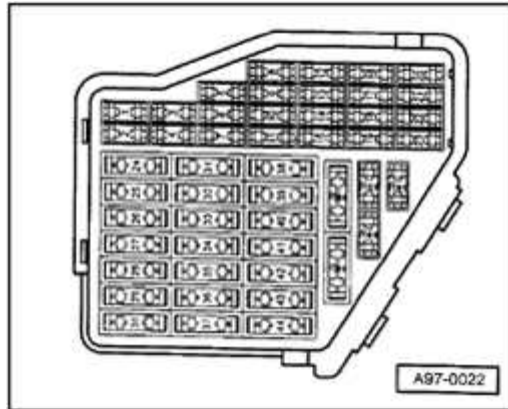
- ◆ VAG1348/3A Remote control using
VAG1348/3-2 adaptor cable
- ◆ Fluke 83 multimeter (or equivalent)
- ◆ VW 1594A adaptor kit

20-83

Test requirements

- Battery Voltage: 12 Volts minimum

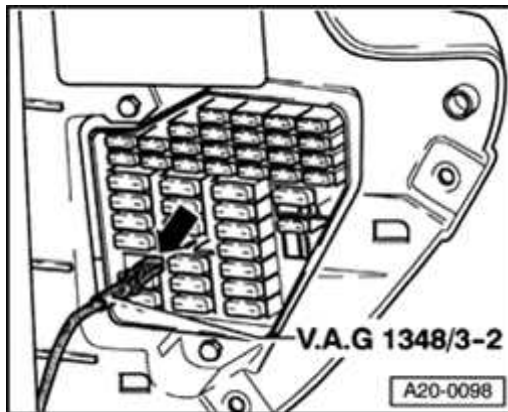
- Fuse 28 OK



- Relay 6 in Fuse / Relay panel OK
- Fuel filter OK
- Ignition switched OFF.

Test sequence

- Open fuse box cover on left side of instrument panel.
- Remove fuse 28 from fuse panel
 - Left row, 5Th fuse from top



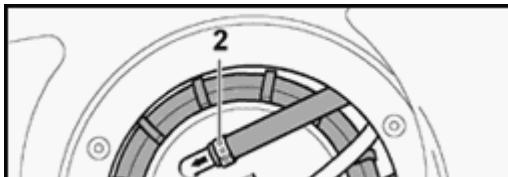
- Connect remote control VAG1348/3A on right side of fuse socket 28 using VAG1348/3-2 adaptor wire -arrow-.
- Connect clamp to Battery +.
- Press remote control switch.
 - Fuel pump when running must be audible.

Note:

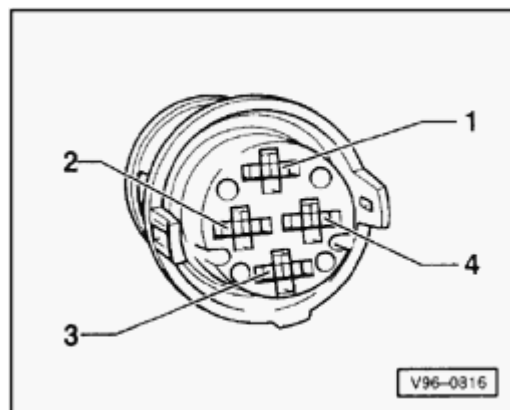
The fuel pump runs very quietly. Avoid ambient background noise as much as possible during fuel pump checks.

If pump running noise is not audible

- Remove connector flange cover under luggage compartment trim.
- 4
- Unlatch and disconnect 4-pin harness connector -1-.



20-85



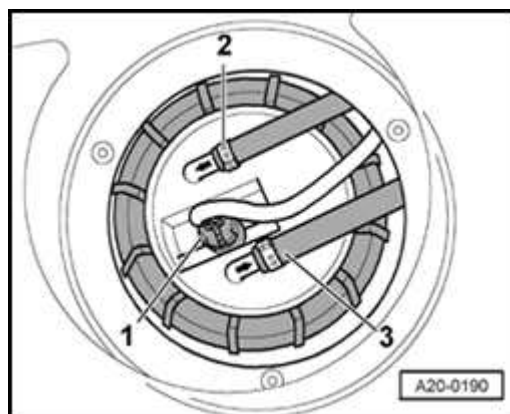
- Switch Fluke 83 multimeter to 20 Volt range
- Connect multimeter between terminals 1 (green/yellow) and 4 (brown) of harness connector using jumper wires from VW 1594 adaptor kit.
- Press remote control switch continuously and read Voltage.
 - ◆ Specification: approx. Battery Voltage.

If specified value obtained but no audible sound from pump

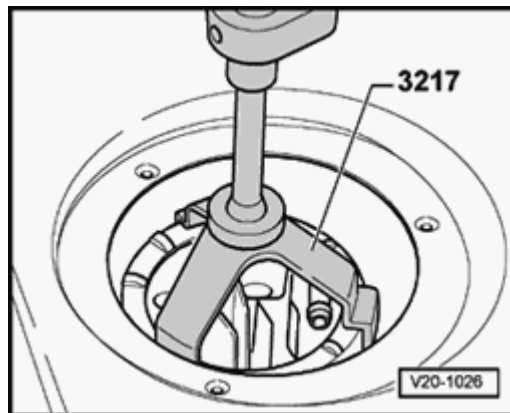
- Remove cover flange as follows

WARNING!

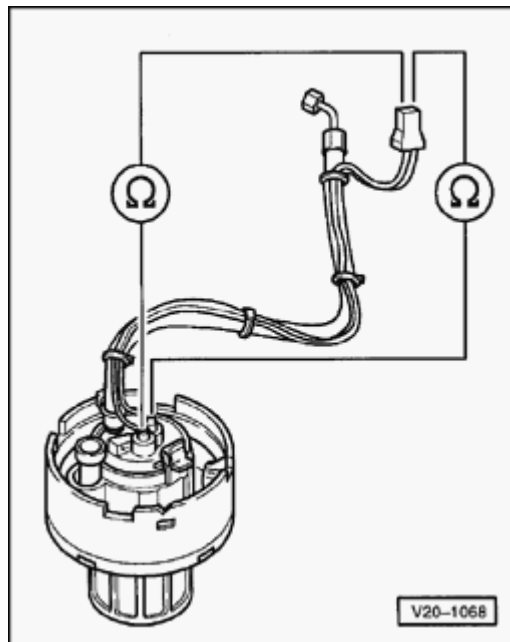
Fuel system is under pressure! Before opening, place clean cloths around the connections to be opened. Carefully loosen the connections to relieve pressure.



- Mark return line -2- and supply line -3- and remove from cover flange.



- ⚠
- Unscrew union nut using wrench 3217.
 - Take cover flange and sealing ring out of the fuel tank opening.



- ⚠
- Check wiring between flange and fuel pump for continuity.

If wiring OK

- Fuel pump faulty, replace ⇒ [Page 20-91](#) .
- Fuel supply unit, installing ⇒ [Page 20-96](#) .

Fuel pump delivery volume, checking

Vehicles with all wheel drive and 1.8 ltr. turbo or 2.8 ltr. engine

Required special tools, testing equipment and auxiliary equipment

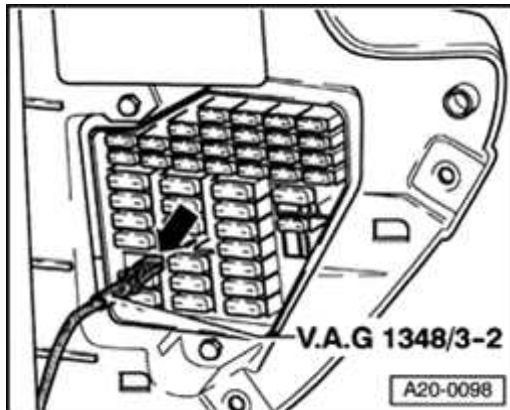
- ◆ VAG1348/3A Remote control with VAG1348/3-2 adaptor cable
- ◆ Calibrated measuring container

Test requirements

- ◆ Battery Voltage: 12 Volts minimum
- ◆ Fuel filter OK
- ◆ Ignition switched OFF.

Test sequence

- Open fuse panel cover on left side of instrument panel.
- Remove fuse 28 from fuse panel (left row, 5Th fuse from top)



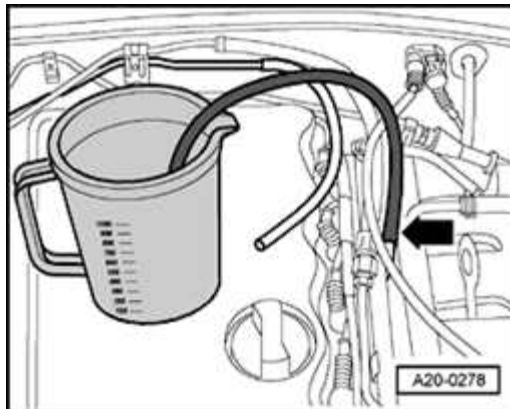
- Connect VAG1348/3A remote control to right terminal of fuse 28 using VAG1348/3-2 adaptor cable -arrow-.
- Connect tester clamp to Battery +.
- Remove fuel filler cap.
- Remove engine cover.

WARNING!

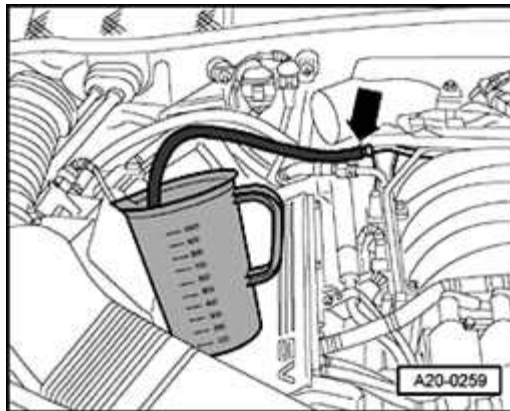
Fuel system is under pressure! Before opening, place clean cloths around the connections to be opened. Carefully loosen the connections to relieve pressure.

Vehicles with 1.8 ltr. turbo engine

- Disconnect fuel return hose from connection on fuel distributor line.
- Connect auxiliary hose -arrow- to distributor line and place in a measuring container.

**Vehicles with 2.8 ltr. engine**

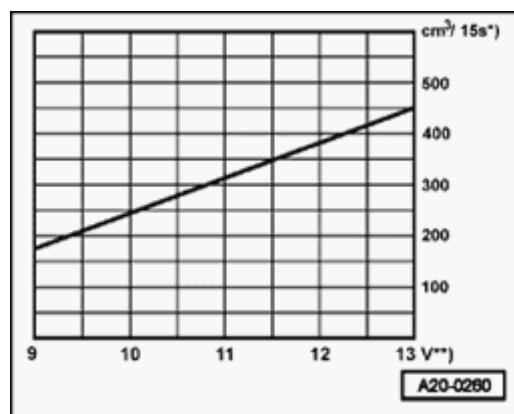
- Disconnect fuel return hose from the hose connection on the fuel distributor line.
- Connect auxiliary hose -arrow- to distributor line and place in a measuring container.



All vehicles

- Operate remote control for 15 seconds.

- Keep button depressed continuously



- Compare delivered quantity to specified value.

*) Minimum supply quantity $\text{cm}^3/15 \text{ s}$

**) Voltage across fuel pump with engine off and pump running (approx. 2 Volts less than Battery Voltage).

Fuel supply unit, removing and installing

Vehicles with all wheel drive and 1.8 ltr. turbo or 2.8 ltr. engine

Observe Safety measures ⇒ [Page 20-1](#) .

Observe Rules of cleanliness ⇒ [Page 20-4](#) .

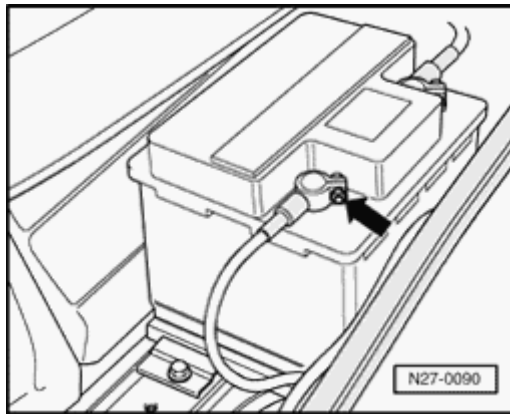
Required special tools, testing equipment and auxiliary equipment

- ◆ FM 3000 fuel cart (or equivalent)
- ◆ 3217 Union nut wrench
- ◆ 3307 fuel pump wrench
- ◆ VAG1275 Hose clamp pliers

Removing

CAUTION!

Obtain the radio Anti-theft code from the customer before disconnecting the Battery Ground strap.



A

- Disconnect Battery Ground strap with ignition switched OFF.
- Open fuel tank cover briefly and close again.
- If necessary, drain fuel tank using fuel cart ⇒ [Page 20-66](#) .

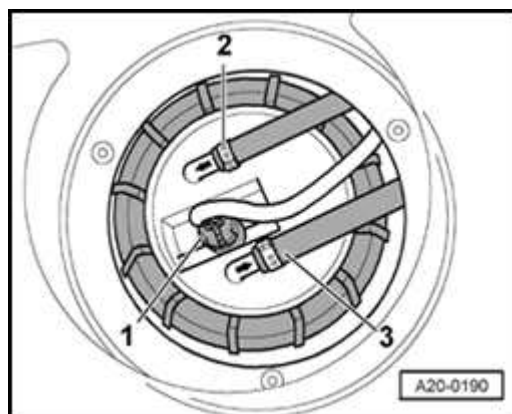
Note:

The fuel tank must not be filled to more than $\frac{1}{3}$ maximum.

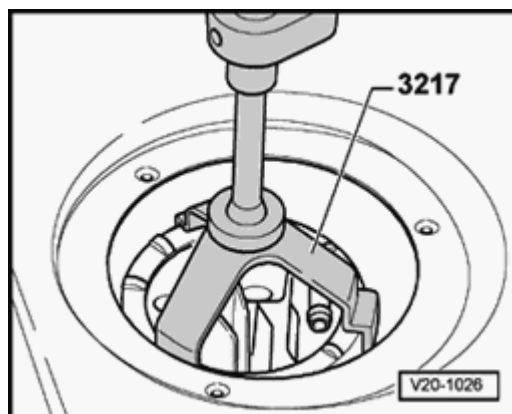
- Remove connector flange cover under luggage compartment trim.

WARNING!

Fuel system is under pressure! Before opening, place clean cloths around the connections to be opened. Carefully loosen the connections to relieve pressure.

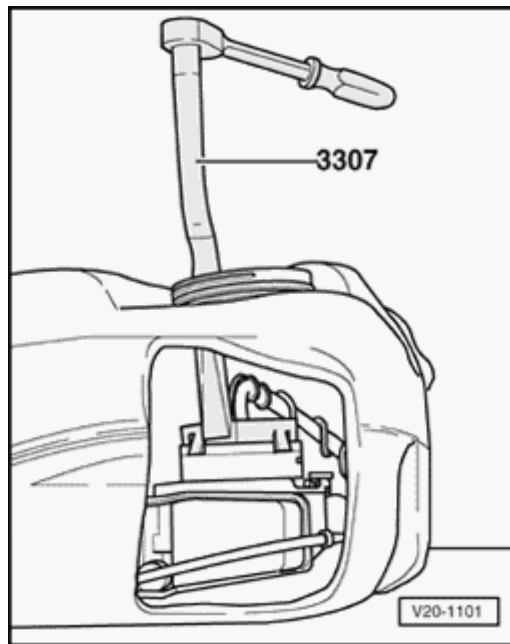


- 4 - Mark return line -2- and supply line -3- and disconnect from cover flange.
- Unlatch and disconnect 4-pin harness connector -1-.



- 4 - Unscrew union nut using 3217 wrench .
- Remove cover flange and sealing ring from fuel tank opening.
- Disconnect fuel level display harness connector on inside of flange cover.
- Disconnect return line on inside of cover flange (press unlatching buttons).

20-94



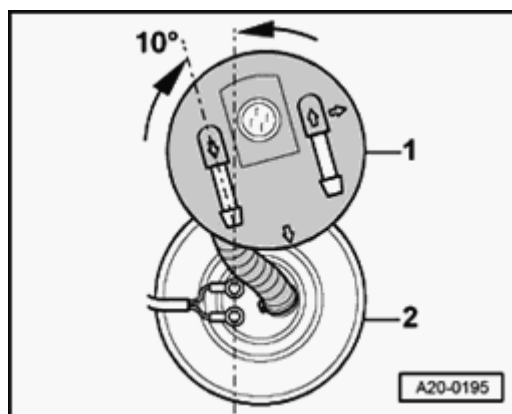
A

- Insert 3307 wrench through fuel tank opening and place over the inner section of the surge housing.
- Using 3307 wrench, turn inner section of surge housing approx. 15° to the left up to the stop and withdraw fuel pump assembly complete with the inner housing section.

Cover flange and surge housing inner section, pre-assembling

If cover flange and supply unit were separated

- Pre-assemble parts ⇒ [Page 20-78](#) .



- Angle position, cover flange to inner section of surge housing: 10°
- Press together clamps for supply line (between pump and cover flange) with VAG1275 pliers.
- Attach wiring to fuel pump.
 - M4: 1.5 Nm
 - M5: 2 Nm

Note:

Install a toothed washer beneath each nut.

- Attach wiring with fuel-resistant cable ties.

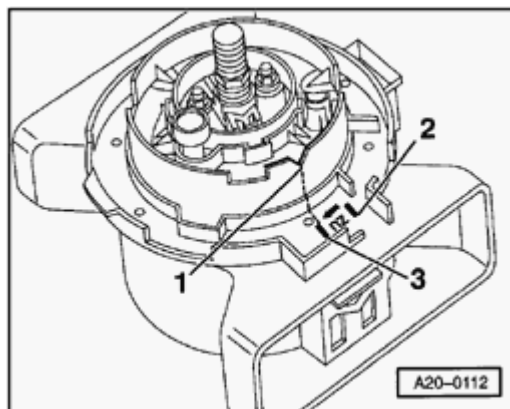
Installing

Installation is performed in the reverse of removal, when installing, note the following:

CAUTION!

Always refer to the latest parts catalog to ensure that you use original equipment fuel hose clamps.

- Install surge housing inner section, supply hose and cover flange in the fuel tank.



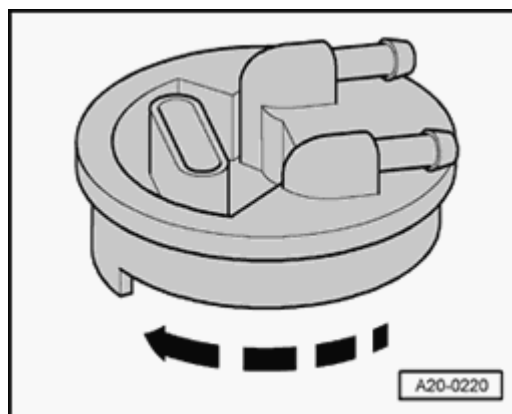
4

- Place inner section of surge housing into outer section of surge housing in tank such that notch -1- on inner section of surge housing matches mark -2- on outer section of surge housing.
 - The inner section of the surge housing can be audibly pressed downward.
- Attach 3307 pump wrench and turn surge housing inner section to the right approx. 15° (up to the stop).
 - Notch -1- will then be in front of mark -3- (bayonet closure)

Note:

For clarity, the surge housing outer and inner sections are shown in the illustration without the fuel tank.

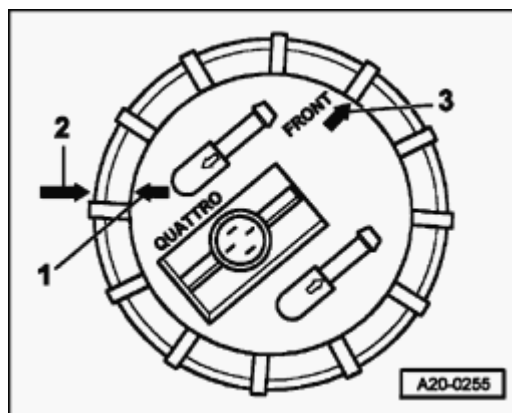
20-97



- When installing, turn cover flange in direction of arrow to the right as shown in the illustration.
- Connect the return line inside on the cover flange.

Note:

- ◆ Always use new O-rings.
- ◆ Lubricate O-rings with fuel or coat with lubricant.
- ◆ Install new cover flange gasket (dry) in fuel tank opening.
- Wrap sender for fuel gauge wire once around the supply line (in fuel tank) and install on cover flange.

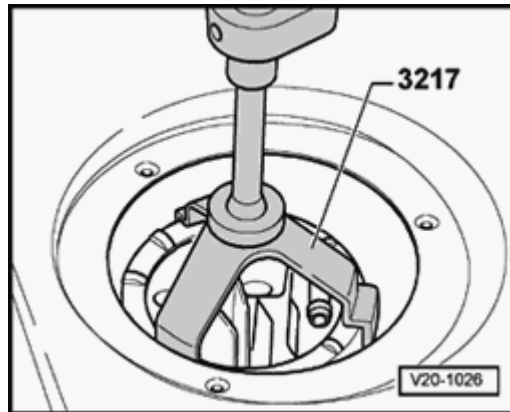


- Attach cover flange to fuel tank
 - Vehicles with all wheel drive: arrow 1 must be opposite arrow 2

Note:

- Arrow 3- only applies to vehicles with front-wheel drive.

20-98



- Tighten union nut with 3217 wrench.
 - 60 Nm
- Connect wiring and harness connector.

Note:

Ensure that fuel hoses fit tightly.

- Connect Battery Ground strap with ignition switched OFF.
- After connecting Battery, input radio anti-theft code

⇒ *Radio operating instructions*

- Run door windows up to stop using electric window lifters.
- Operate all window lifters again for at least 1 second in "closed" position to activate automatic up/down.
- Set the clock.

Sender for fuel gauge -G, checking

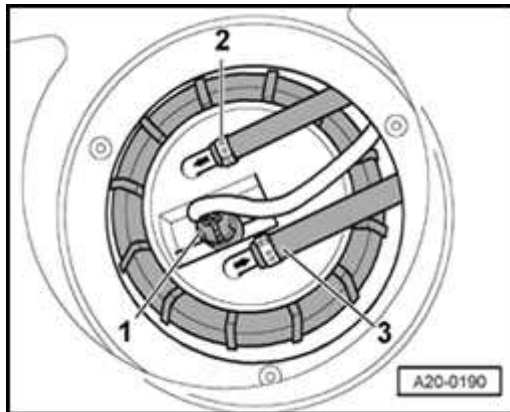
Vehicles with all wheel drive and 1.8 ltr. turbo
or 2.8 ltr. engine

Required special tools, testing equipment and auxiliary equipment

◆ Fluke 83 multimeter

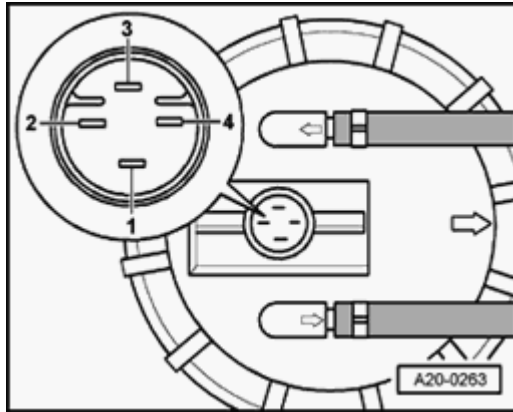
◆ VW 1594 Adaptor kit

- Remove connector flange cover under luggage
compartment trim.



A

- Unlatch and disconnect 4-pin harness connector -1-.



- Measure resistance at terminals -2- and -3- on cover flange

Sensor	Tank full	Tank empty
Sender for fuel gauge -G	40 Ω	280 Ω

Note:

- ◆ If fuel level falls between "Tank full" and "Tank empty", resistance value between the two specified values must be displayed.
- ◆ If 0 Ω or ∞ Ω is displayed there is an open or closed circuit in tank wiring.
- ◆ To check "Tank full" or "Tank empty" resistance values; remove sender for fuel gauge -G $\Rightarrow$ [Page 20-101](#) and swing sensor float to top or bottom stop.

Sender for fuel gauge -G, removing and installing

Vehicles with all wheel drive and 1.8 ltr. turbo or 2.8 ltr. engine

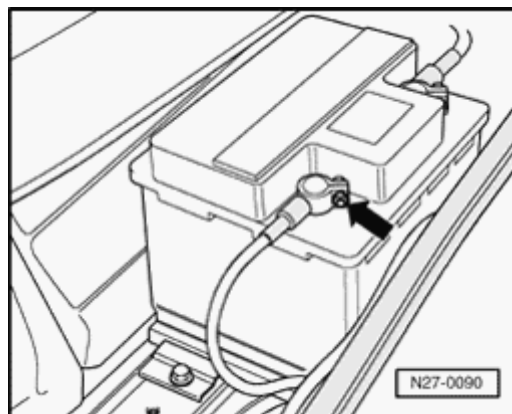
Observe Safety measures ⇒ [Page 20-1](#) .

Observe Rules of cleanliness ⇒ [Page 20-4](#) .

Removing

CAUTION!

Obtain the radio Anti-theft code from the customer before disconnecting the Battery Ground strap.



A

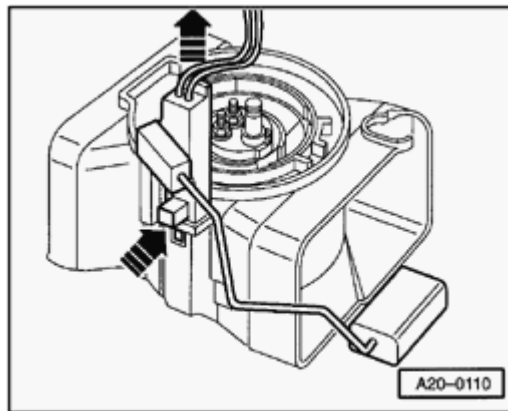
- Disconnect Battery Ground strap with ignition switched OFF.
- Open fuel tank cover briefly and close again.
- If necessary, drain fuel tank using fuel cart ⇒ [Page 20-66](#) .

Note:

Fuel tank must not be filled higher than $\frac{1}{3}$ maximum.

- Fuel supply unit, removing ⇒ [Page 20-91](#) .

- Carefully pull cover flange out and put to the side with supply line connected.
- Disconnect harness connector for fuel level display on inside of cover flange.



- Pull sensor out of surge housing in fuel tank while simultaneously pressing latching tab -arrow-.

Note:

- ◆ *Illustration shows sensor and surge housing for vehicles with Front-Wheel Drive.*
- ◆ *For clarity, the surge housing illustration is shown without tank.*

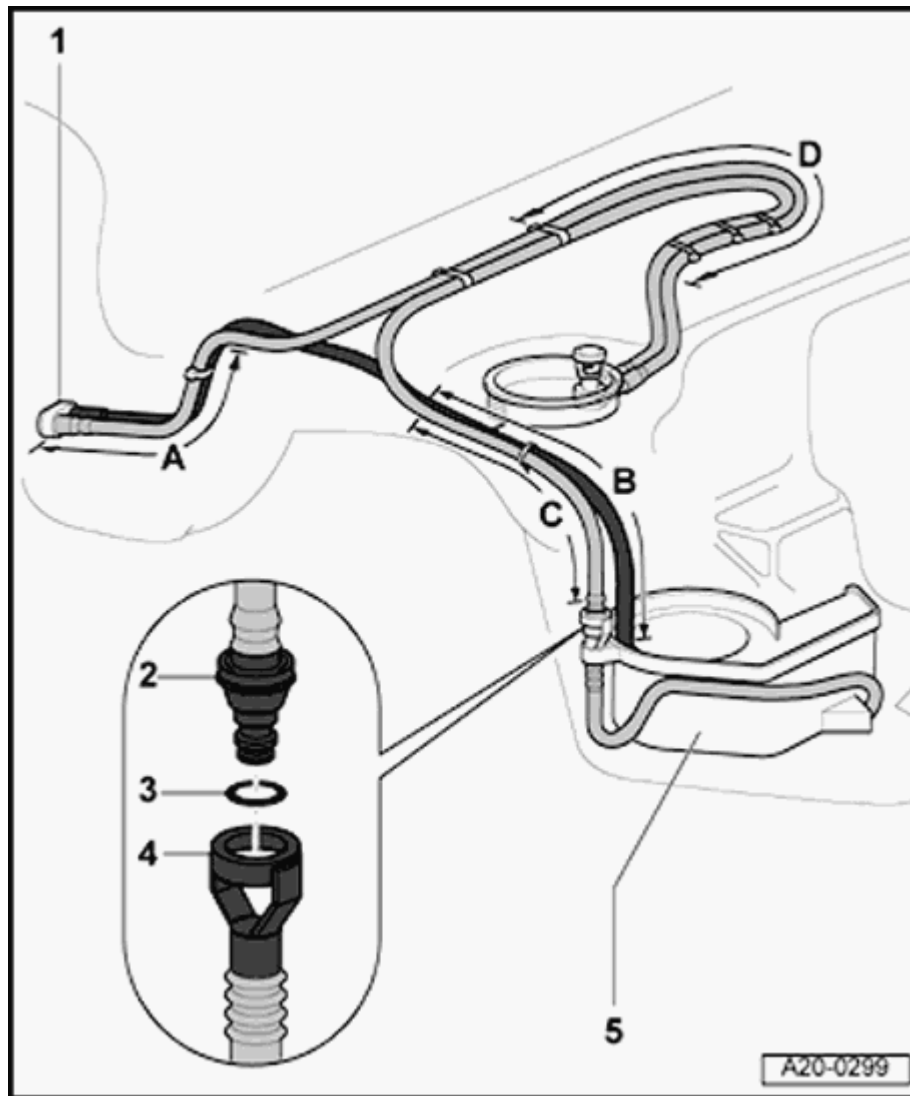
Installing

Installation is performed in reverse order, when performing, note the following:

- Install sender for fuel gauge in guide on surge housing outer section and press down until it engages ⇒ [Page 20-97](#) .
- Connect battery Ground strap with ignition switched OFF.
- After connecting battery, input radio anti-theft code

⇒ *Radio operating instructions*

- Operate door windows up to the stop using window switches.
- Operate all window lifters again for at least 1 second in the "closed" position to activate the automatic up/down.
- Set the clock.



Fuel pump, removing and installing

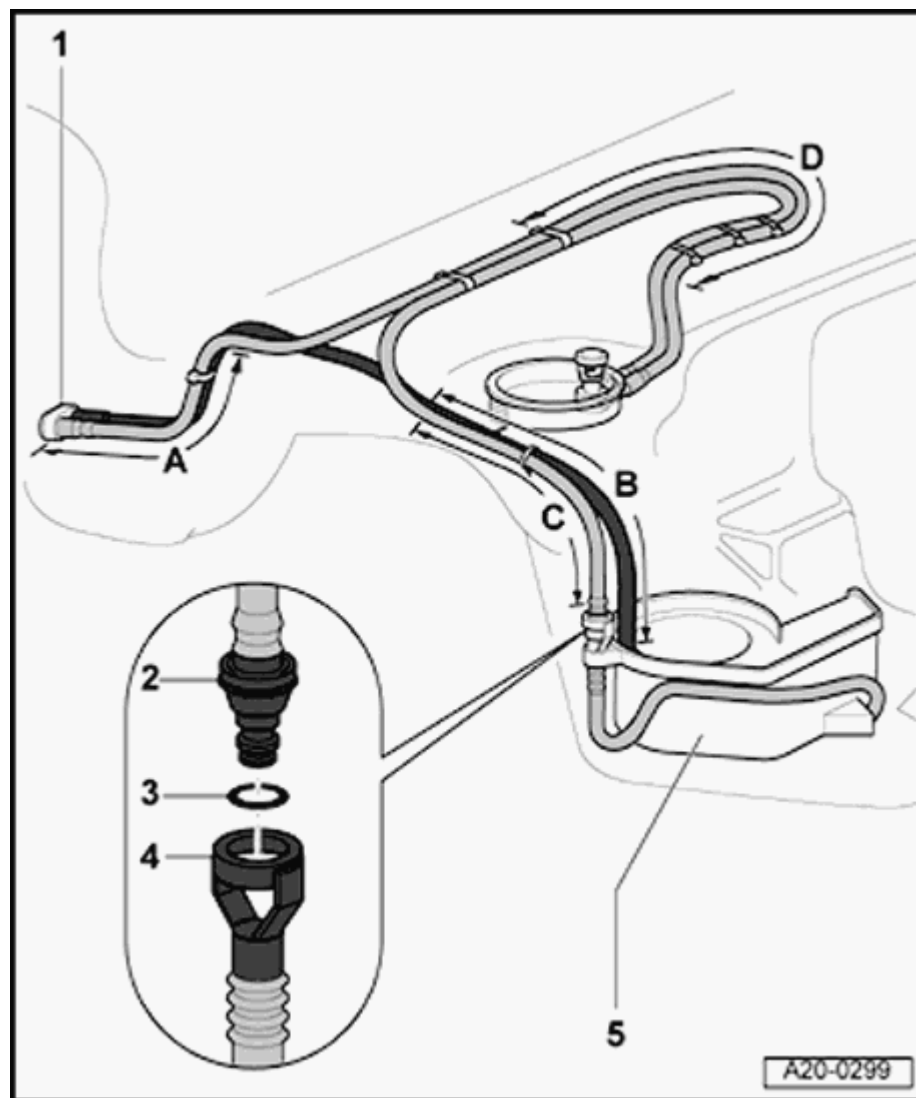
Vehicles with all wheel drive and 1.8 ltr. turbo or 2.8 ltr. engine

Observe Safety measures ⇒ [Page 20-1](#) .

Observe Rules of cleanliness ⇒ [Page 20-4](#) .

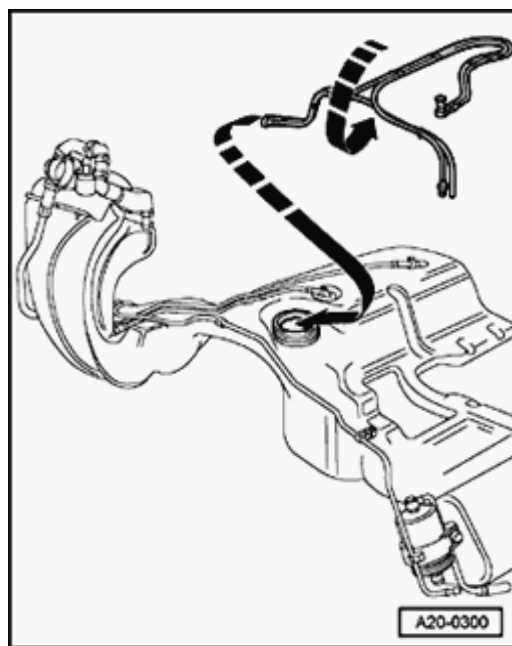
Note:

- ◆ The following steps describe fuel pump installation. Removal is the reverse of the installation steps.
- ◆ Fuel pump lines -1- may not be kinked. Replace kinked fuel lines and immediately dispose of old parts.
- Replace O-ring -3-.
- Install fuel supply unit ⇒ [Page 20-91](#) .
- Install sender for fuel gauge ⇒ [Page 20-101](#) .



- Vacuum booster -1-, installed position
- Location -A- slide through the flange lock opening.
- Location A in fuel tank, slide in direction of filler neck while turning approx. 1 additional turn to the left ⇒ Fig. ⇒ [1](#) , ⇒ [Page 20-106](#) .
- Location B, place (black wire) in fuel tank but do not yet fasten in surge housing 5.
- Location C (white wire) place in fuel tank, but do not yet fasten in hose coupling 4.
- Location D place in fuel tank. Ensure it comes to rest above the thick fuel filler hose in the fuel tank.
- Attach black wire to surge housing 5.
- Connect white wire 2 to hose coupling 4.

20-106

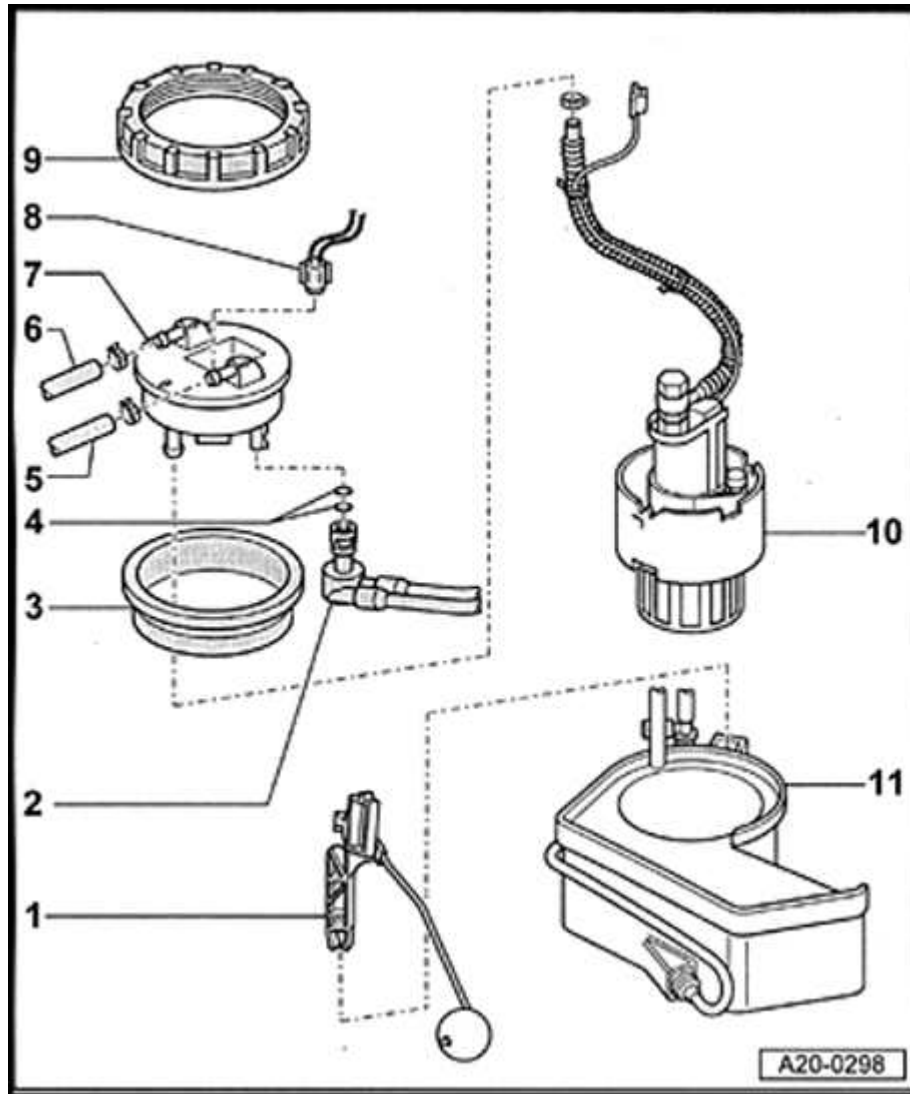


A

Fig. 1 Fuel pump, installing

- Turn fuel pump in direction of filler neck, into fuel tank, approx. 1 turn to the left-arrows-.

20-107



Fuel supply system, servicing (vehicles with 2.7 ltr. turbo engine)

WARNING!

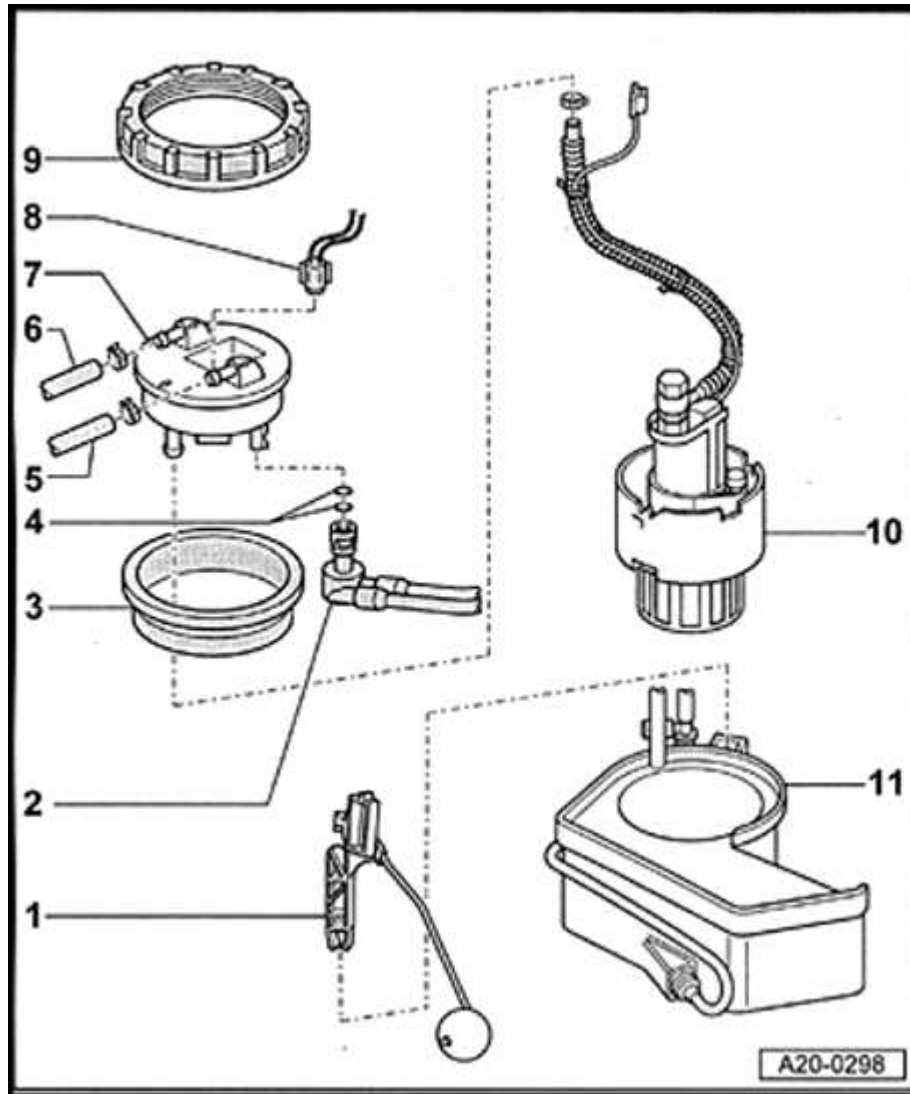
Always comply with all applicable safety precautions when working on the fuel system

Note:

- ◆ Always replace gaskets, seals and hose clamps when working on the fuel system.
- ◆ Hose connections are secured either with screw-type or spring-type clamps. Always replace clamps with factory clamps, see Parts catalogue.

1 - Sender for fuel gauge -G

- ◆ Ball-shaped float
- ◆ Check resistance ⇒ [Page 20-125](#)
- ◆ Removing and installing ⇒ [Page 20-128](#)



2 - Fuel return line

- ◆ With Fuel Pump (FP)
- ◆ Attached from the inside to fuel pump flange
- ◆ To remove depress tab at connector

3 - Seal

- ◆ Replace
- ◆ When installing, insert dry into opening of fuel tank

4 - O-Rings

- ◆ Replace
- ◆ Check for correct installation

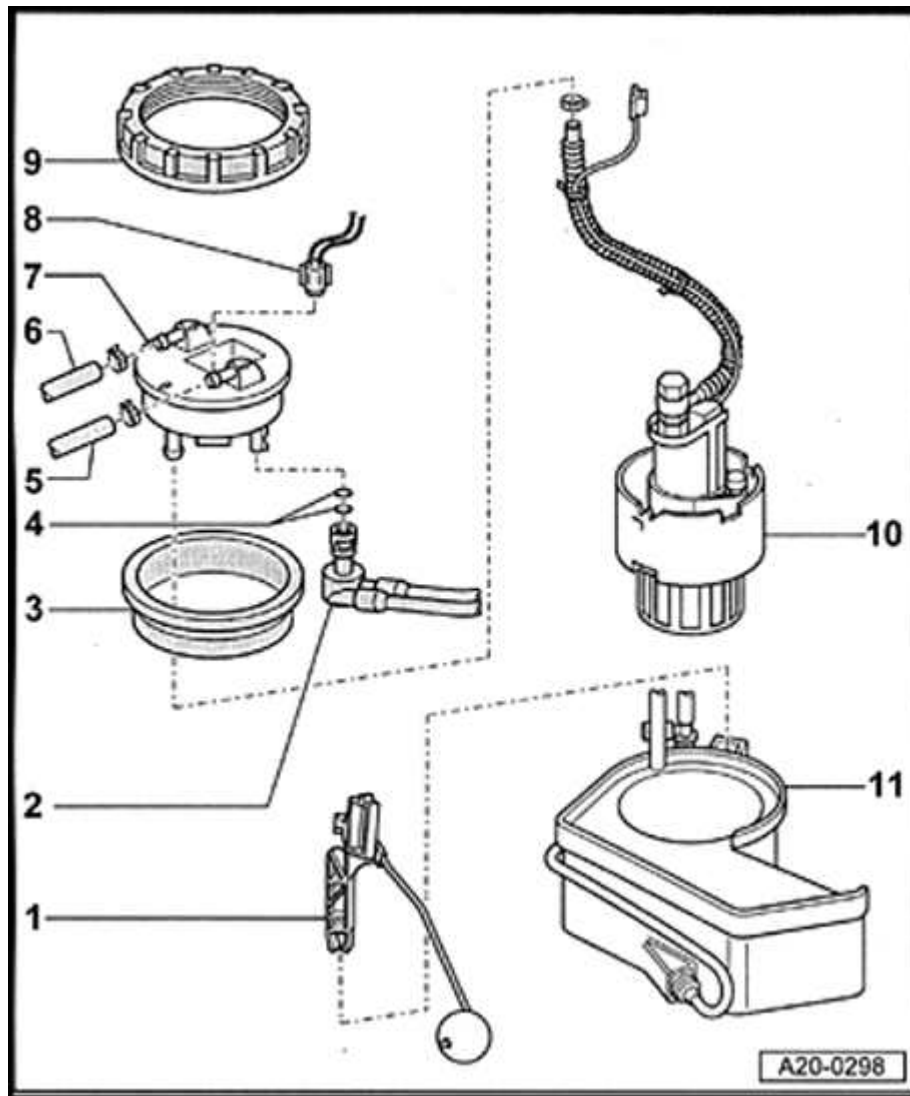
5 - Fuel return line

- ◆ From fuel distributor
- ◆ Mark before disconnecting
- ◆ Look for arrow on fuel pump flange

6 - Fuel supply line

- ◆ To fuel distributor
- ◆ Mark before disconnecting
- ◆ Look for arrow on fuel pump flange

20-109

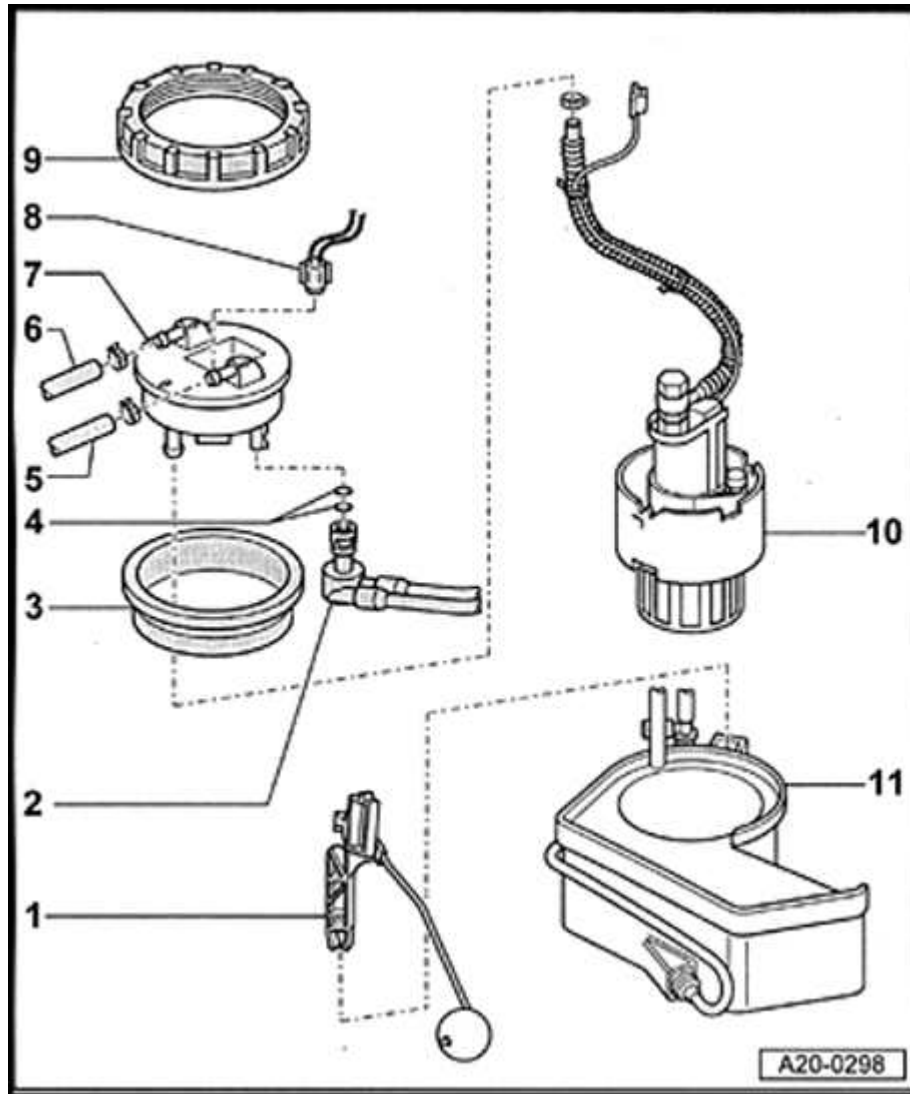
**7 - Fuel pump flange**

- ◆ Can only be installed together with fuel pump.
- ◆ Removing and installing ⇒ [Page 20-118](#)
- ◆ Installation position: Note arrow ⇒ [Page 20-123](#)

8 - Connector

- ◆ For fuel pump and sender for fuel gauge -G

9 - Threaded cap nut - 60 Nm



10 - Fuel Pump (FP)

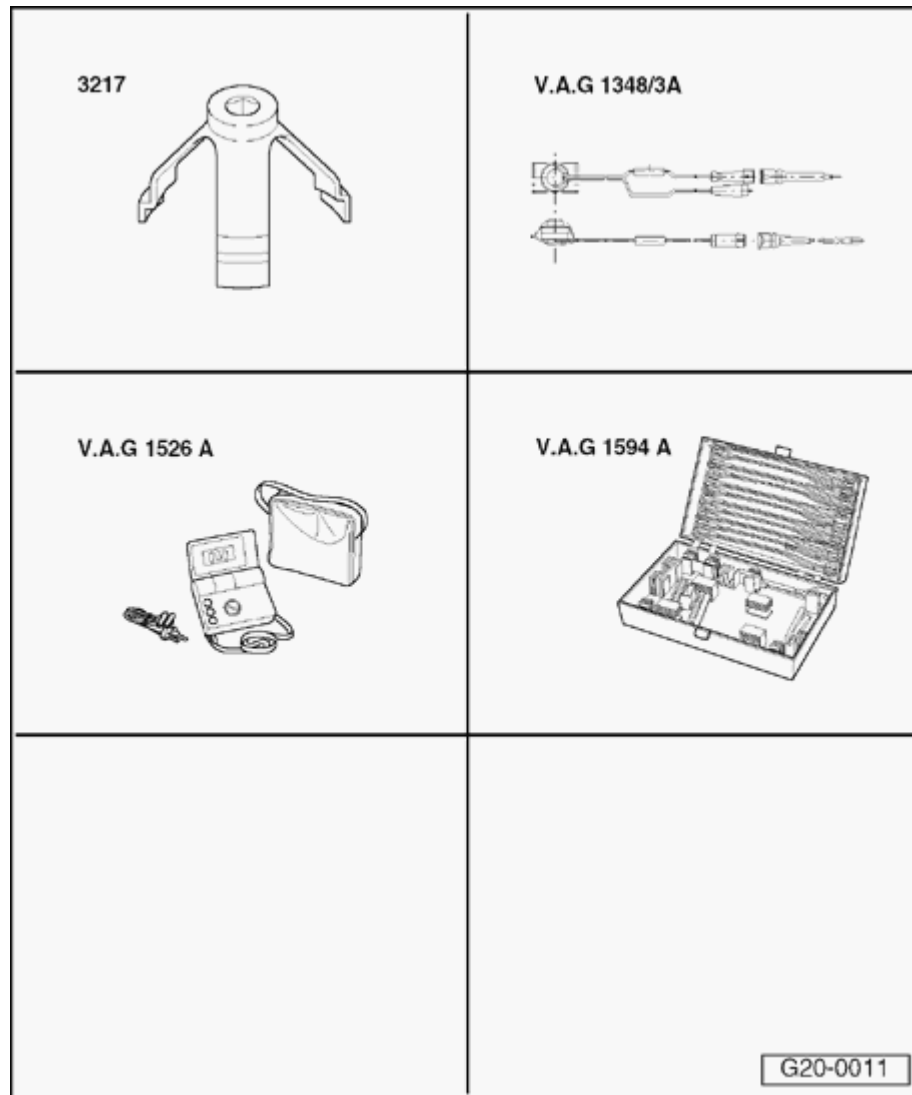
- ◆ With fuel screen
- ◆ Can only be replaced with fuel pump flange
- ◆ Removing and installing ⇒ [Page 20-118](#)
- ◆ Fuel pump, electrical check ⇒ [Page 20-111](#)
- ◆ Pressure test:

⇒ *Repair Manual, Fuel Injection & Ignition, Repair Group 24*

11 - Fuel accumulator housing, lower part

- ◆ Part of fuel tank
- ◆ Cannot be replaced separately

20-111



Fuel pump, checking electrically

Vehicles with 2.7 ltr. turbo engine

Special tools needed:

- ◆ VAG3217
- ◆ VAG1348/3A with VAG1348/3-2
- ◆ VAG1526 A
- ◆ VAG1594 A

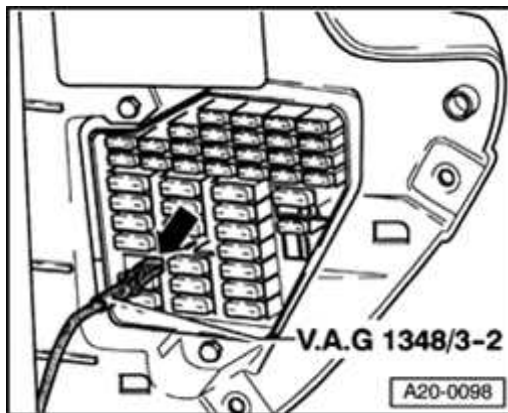
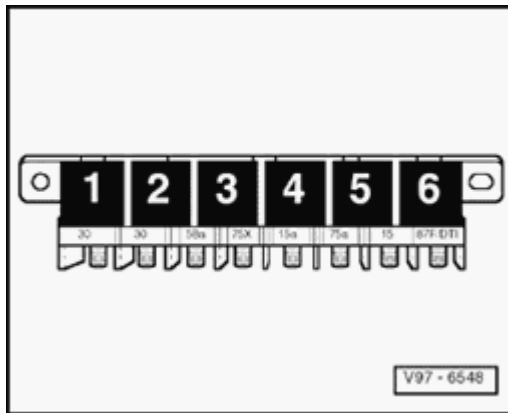
20-112

Test conditions:

- Battery voltage at least 12 V
- Fuse 28 OK
- Relay 6 in central electric OK
- Fuel filter OK
- Ignition switched off.

Test sequence

- Open cover for fuse panel on left side of instrument panel.
- Remove fuse 28 from fuse panel (left row, fifth large fuse from the top).
- Connect remote switch VAG1348/3A with adapter wire VAG1348/3-2 to right terminal of fuse socket 28 -arrow-.
- Connect alligator clip to vehicle battery (+).
- Press remote switch button.
- Fuel pump must be heard to run.



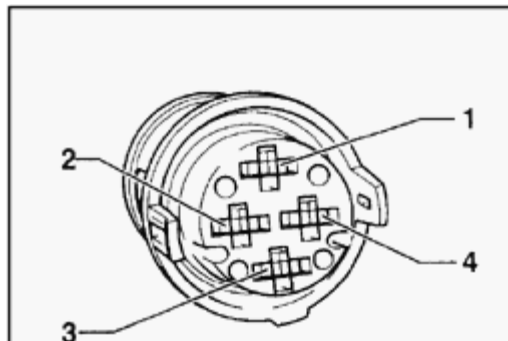
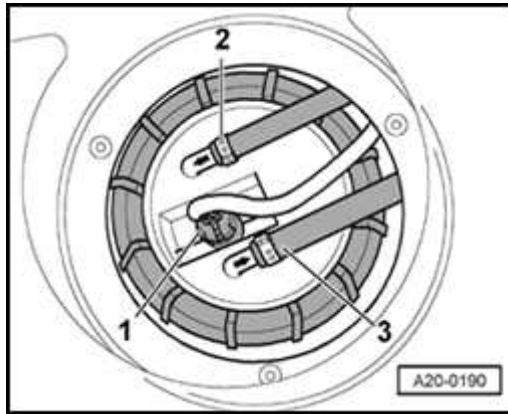
20-113

Note:

The fuel pump runs very quietly. Be sure to keep outside noise low when testing the fuel pump.

If you cannot hear the fuel pump run:

- Remove carpet liner in luggage compartment.
- Unscrew cover fuel pump flange.
- A** - Unclip 4-pin connector and disconnect connector.



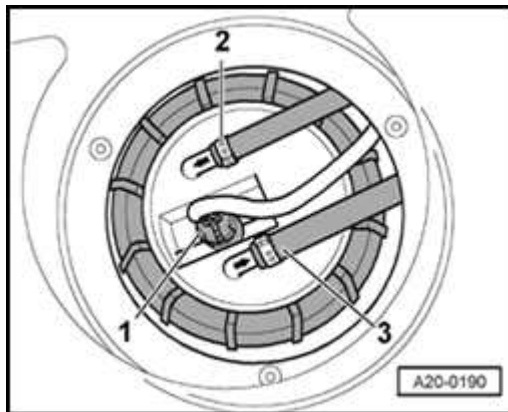
- A** - Switch multimeter Fluke 83 to DC voltage range 20 V and using test wire from VAG1594 A, connect to terminal 1 (green/yellow) and 4 (brown) of connector.
- Press remote switch continuously and read voltage.
 - Specified value: Approx. battery voltage

20-114

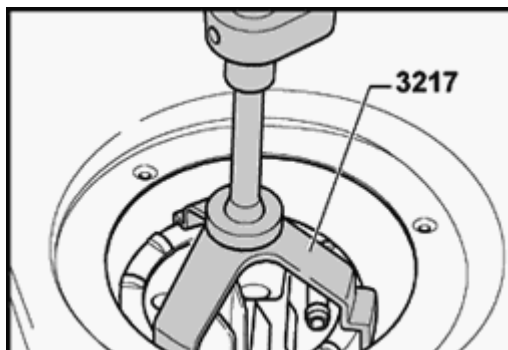
If specified value was obtained even so you could not hear the fuel pump run, remove the fuel pump flange as follows:

WARNING!

Fire hazard! Remove everything from the area that could ignite fuel or fuel vapor. fuel system is under pressure. Cover connection with rag and carefully release pressure by slowly opening the connection.

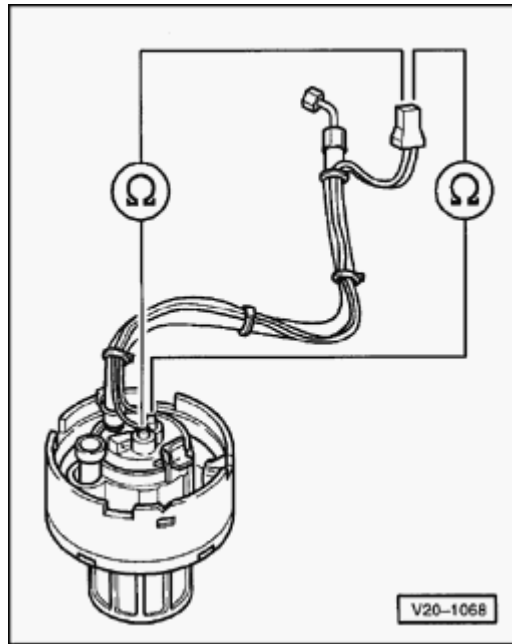


- Mark fuel return line -2- and fuel supply line -3- and remove from fuel pump flange.



- Remove threaded cap nut with wrench 3217.
- Lift flange and seal from tank opening.

20-115



- Check electrical connections between flange and fuel pump, check for continuity.

If wiring and connections are OK:

- Fuel pump is faulty; replace pump $\Rightarrow$ [Page 20-118](#) .

20-116

Fuel pump delivery volume, checking

Vehicles with 2.7 ltr. turbo engine



Special tools needed:

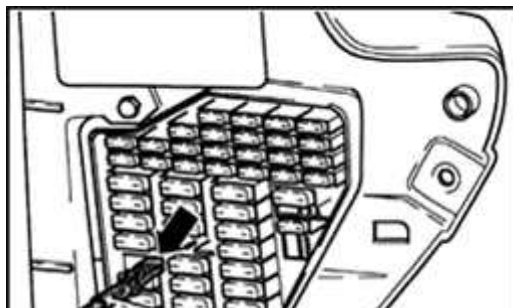
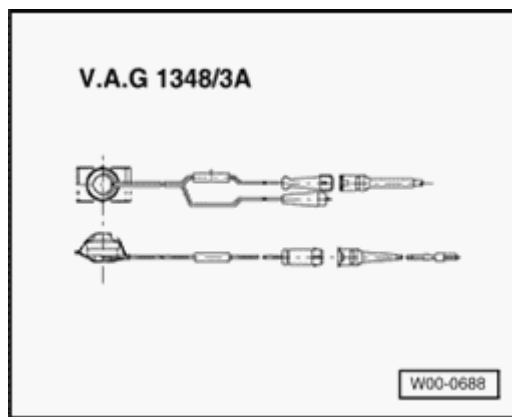
- ◆ Remote switch VAG1348/3A with adapter wire VAG1348/3-2
- ◆ Measuring cup

Test conditions:

- Battery voltage at least 12 V
- Fuel filter OK
- Ignition switched off.

Test sequence

- Open fuse panel cover at left side of instrument panel.
 - Remove fuse 28 from fuse panel (left row, fifth. large fuse from the top).
- A
- Connect remote switch VAG1348/3A with adapter wire VAG1348/3-2 to right terminal of fuse socket 28 -arrow-.

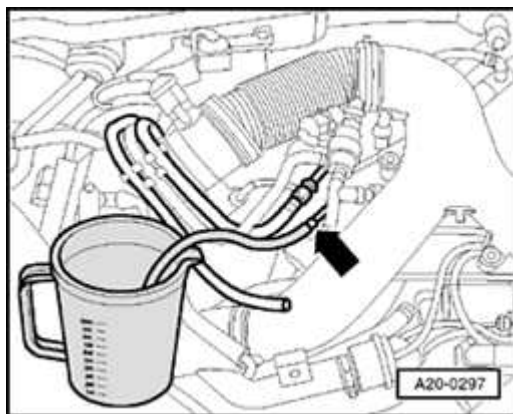


20-117

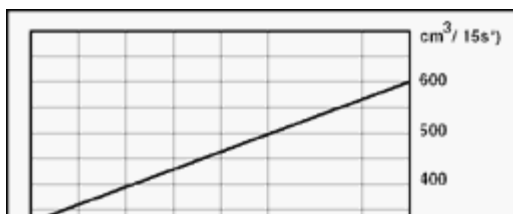
- Connect alligator clip to battery (+) .
- Remove fuel filler cap
- Remove engine cover

WARNING!

Fire hazard! Remove everything from the area that could ignite fuel or fuel vapor. fuel system is under pressure. Cover connection with rag and carefully release pressure by slowly opening the connection.



- Disconnect fuel return line from line connection at fuel distributor.
- Connect test hose -arrow- at fuel distributor line and place other hose end into measuring cup.
- Operate remote switch for 15 seconds (press button continuously).



- Compare collected fuel with specified value.

*) Volume of fuel delivered in cm³/15 s

^{**}) Voltage at fuel pump with engine not running but pump running
(approx. 2 Volt less than battery voltage).

20-118

Fuel pump, removing and installing

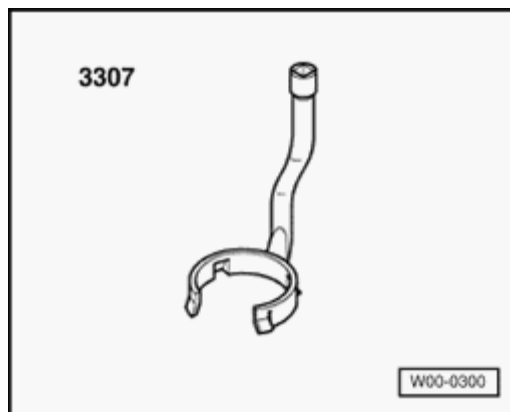
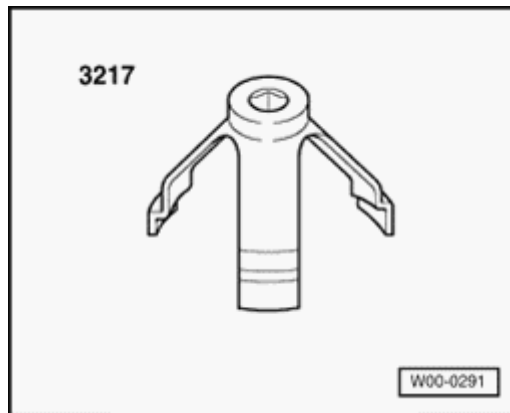
Vehicles with 2.7 ltr. turbo engine

Observe all safety precautions ⇒ [Page 20-1](#) .

Observe rules of cleanliness ⇒ [Page 20-4](#) .

Special tools needed:

◆ Wrench 3217 for threaded cap nut



◆ Wrench 3307 for fuel pump

Removing

- Obtain radio code for radio with anti-theft coding.
- Switch off ignition and disconnect battery ground (GND) cable.
- Briefly open fuel filler cap and then close it again.
- Empty fuel tank if necessary using fuel evacuator unit VAG1433 A.
 - ◆ Front wheel drive ⇒ [Page 20-18](#) .
 - ◆ All wheel drive ⇒ [Page 20-66](#) .

Note:

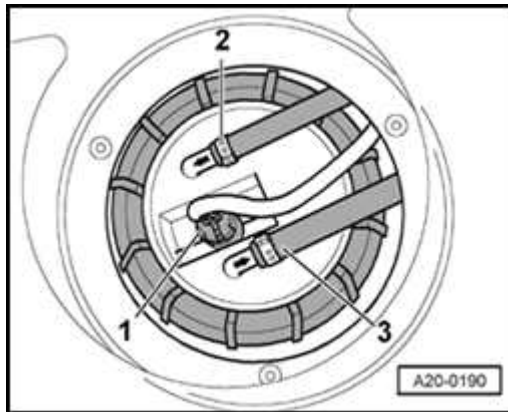
The fuel tank may not be filled more than $\frac{1}{3}$.

- Remove luggage compartment liner.
- Remove cover for fuel pump flange.

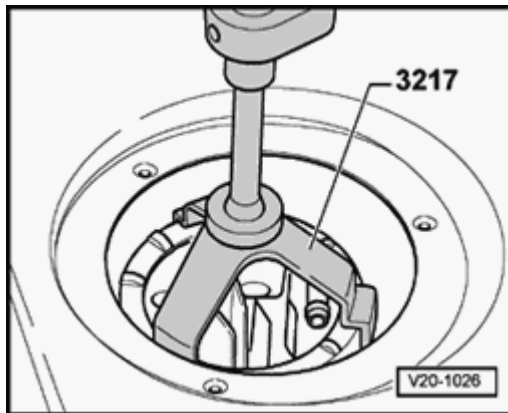
WARNING!

Fire hazard! Remove everything from the area that could ignite fuel or fuel vapor. fuel system is under pressure. Cover connection with rag and carefully release pressure by slowly opening the connection.

20-120

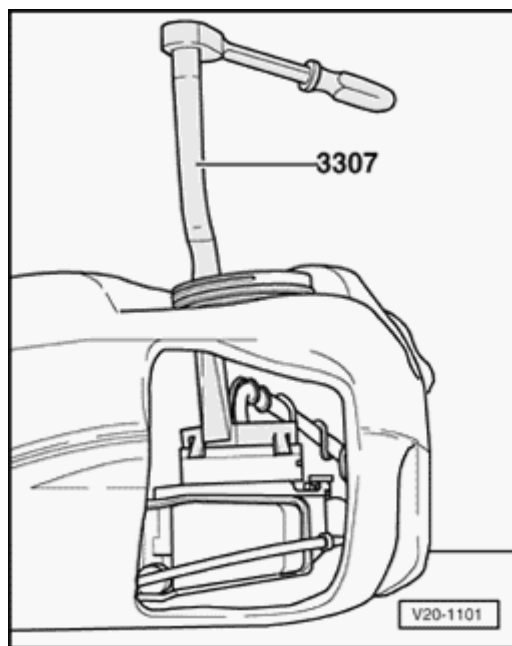


- Mark fuel return line -2- and fuel supply line -3- and disconnect from flange.
- Unclip 4-pin connector -1- and disconnect connector.



- Remove threaded cap nut with wrench 3217.
- Remove fuel pump flange and seal from fuel tank opening.
- On inside of flange disconnect connector for fuel gauge sender.
- Disconnect fuel return line on inside of flange (press release tabs).

20-121



A

- Insert wrench 3307 through fuel tank opening and place on inner part of fuel accumulator housing.
- Turn wrench 3307 approx. 15° to the left to stop and remove fuel pump with inner part of fuel accumulator housing.

Installing

Installation is in reverse order of removal, but do the following:

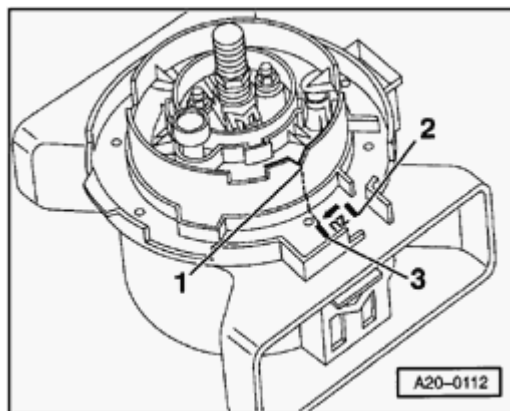
Note:

Secure all hose connections with hose clamps identical to factory-installed clamps.

⇒ *Parts catalog.*

- Install inner fuel accumulator housing, fuel supply hose and fuel pump flange in fuel tank.

20-122



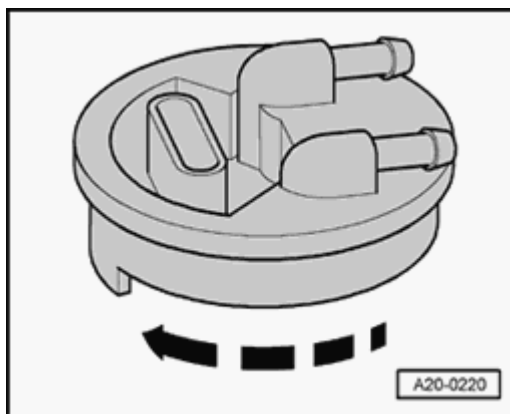
- Install outer fuel accumulator housing in fuel tank by aligning notch -1- on inner accumulator housing with notch -2- at outer accumulator housing.

The inner accumulator housing can be pushed down noticeably.

- Apply wrench 3307 and turn inner fuel accumulator housing with pump approx. 15° to the right to stop. Notch -1- is then aligned with marking -3- (bayonet-type connection).

Note:

The fuel accumulator housing is shown in the illustration without fuel tank.



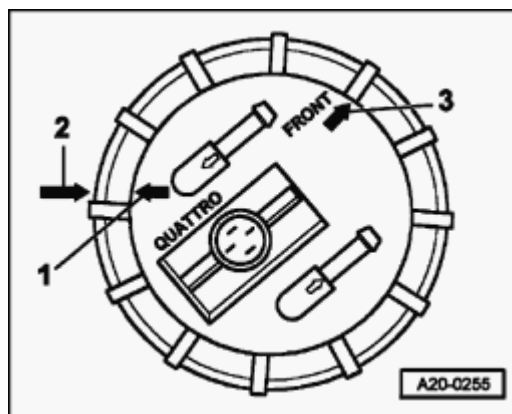
- When installing, turn flange to the right (direction of arrow).
- Connect fuel return line on the inside of flange.

Note:

Lubricate O-rings with fuel before installing.

20-123

- Wrap wire for fuel gauge sensor around fuel supply line (inside fuel tank) and connect to flange.
- Seal for flange must be dry when inserted in opening of fuel tank.



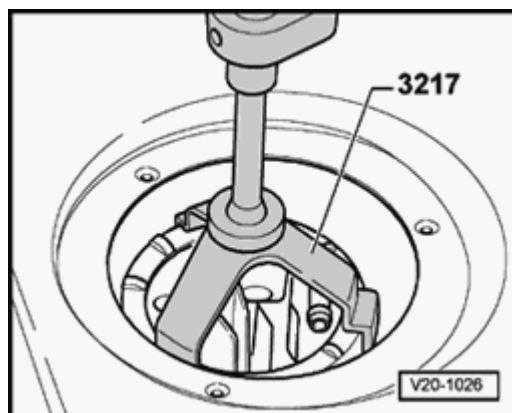
A

- Insert flange in fuel tank.

Installation position for vehicles with all-wheel drive: -arrow 1- must be opposite -arrow 2-.

Note:

-Arrow 3- applies for vehicles with front wheel drive.



A

- Tighten threaded cap nut to 60 Nm with wrench 3217.
- Connect wiring and connector.

Note:

Check that all fuel line and hose connections are securely seated.

- After reconnecting the battery enter radio anti-theft code.

⇒ Radio operating manual

20-124

- Move power windows up to stop.
- Then operate power window closing switches again for at least 1 second to activate the automatic up-and-down run.
- Adjust time clock.
- Activate readiness code:

⇒ *Repair Manual, Fuel Injection & Ignition,
Repair Group 01*

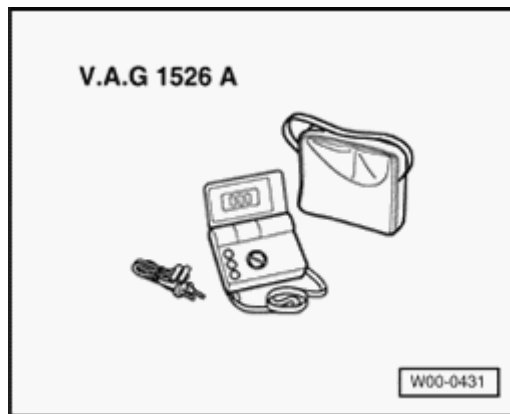
Sender for fuel gauge -G, checking

Vehicles with 2.7 ltr. turbo engine

Note:

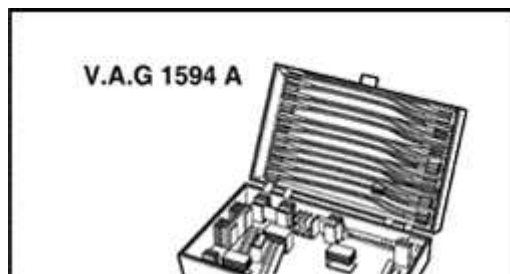
To check the signal/wiring between the sender -G and the fuel gauge:

⇒ [Repair Manual, Electrical Equipment, Repair Group 90](#)



Special tools needed:

◆ VAG1526 A

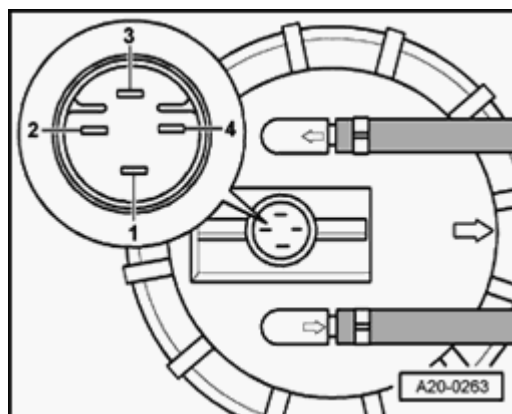
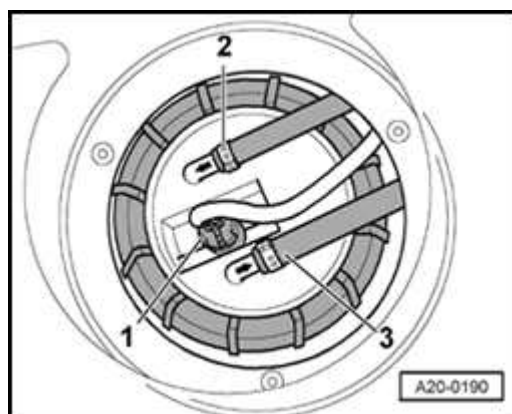


◆ VAG1594 A

20-126

Test sequence

- Remove luggage compartment liner.
- Remove cover for fuel pump.
- Unclip 4-pin connector and disconnect.



- Measure resistance at both terminals -2- and -3- at fuel pump flange

Sender	Tank full	Tank empty
Sender for fuel gauge -G	40 Ω	280 Ω

If the fuel tank contains fuel, the measured value must be between the specified values for full and empty.

20-127

- If you measure 0 Ω (continuity) or $\infty \Omega$ (no continuity), check for open circuit inside the tank or for short circuit.

Note:

To check resistance for "tank full" or "tank empty" you must move the float for fuel gauge sender to upper or lower stop. Removing sender $\Rightarrow$ [Page 20-128](#)

Sender for fuel gauge -G, removing and installing

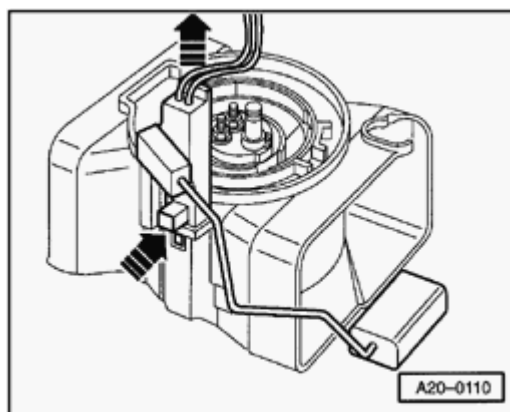
Vehicles with 2.7 ltr. turbo engine

Observe all safety precautions ⇒ [Page 20-1](#) .

Observe rules of cleanliness ⇒ [Page 20-4](#) .

Removing

- Fuel pump flange, removing ⇒ [Page 20-118](#) .
- Carefully lift out fuel pump flange with fuel supply line connected and set aside.
- On the inside of the fuel pump flange disconnect connector for fuel gauge sender.



- Remove sender by pressing tab -arrows-.

Note:

- ◆ The fuel accumulator housing is shown in the illustration without the fuel tank.
- ◆ The illustration shows the fuel gauge sender for vehicles with front wheel drive.

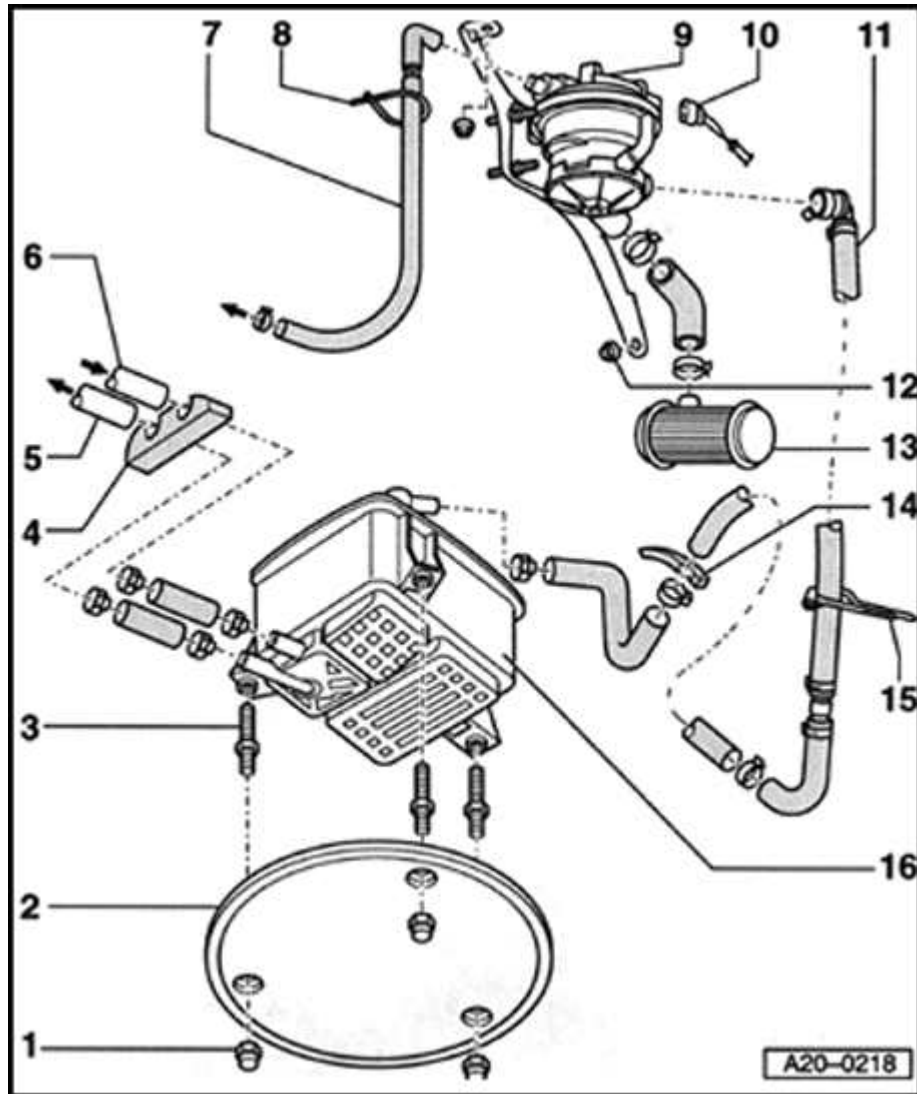
Installing

Installation is in reverse order of removal, but do the following:

- Install sender for fuel gauge in guides of outer fuel accumulator housing and press down until locked in place.

Fuel pump flange, installing ⇒ [Page 20-121](#) .
Observe note regarding disconnecting battery.

20-130



EVAP system, servicing

EVAP system components

1 - Cap nut

◆ 10 Nm

2 - Cover

◆ For EVAP canister

3 - Stud

◆ 15 Nm

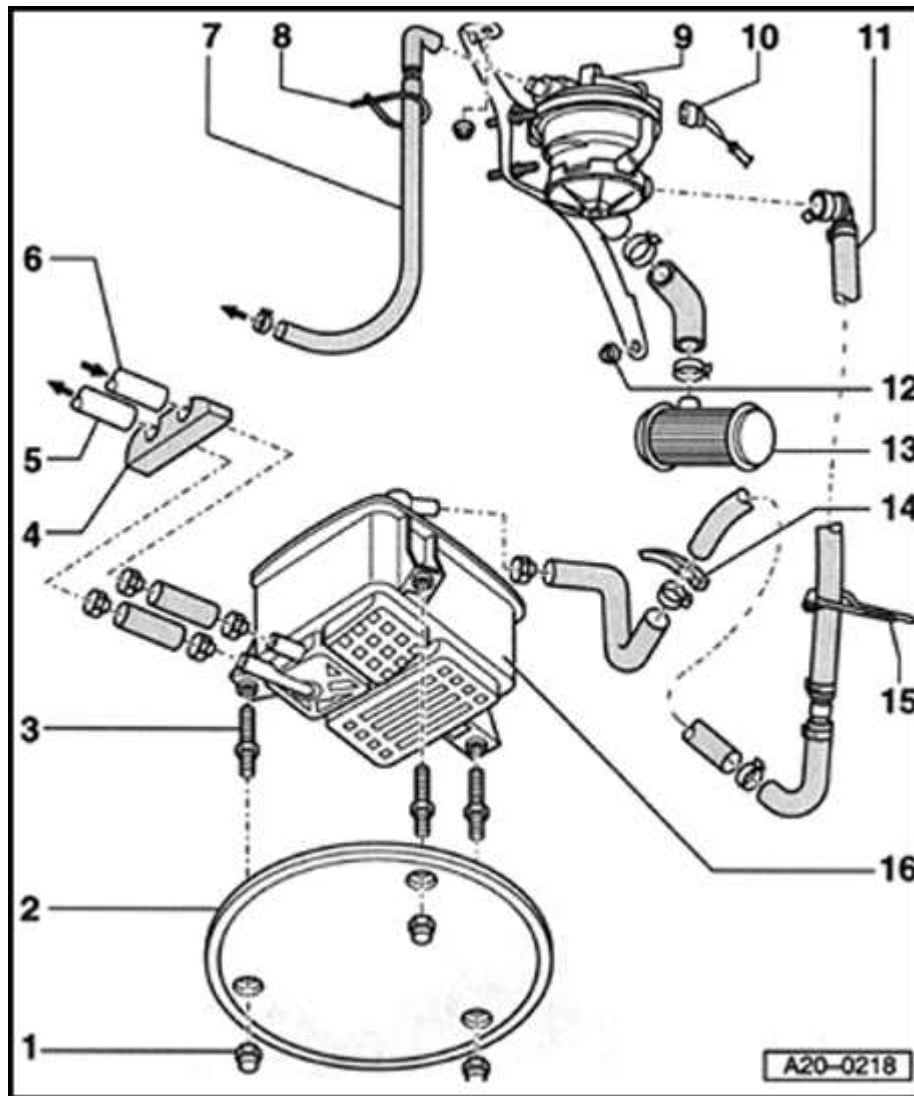
4 - Sealing piece

5 - Bleed line

◆ To EVAP canister purge regulator valve - N80

6 - Bleed line

◆ From gravity valve



7 - Vacuum hose

- ◆ LDP / throttle actuator control module

Connection in engine compartment

- ◆ 4 cylinder engine ⇒ Fig. ⇒ [1](#)

- ◆ 6 cylinder engine ⇒ Fig. ⇒ [2](#)

8 - Cable tie

- ◆ To mounting of vacuum line on LDP bracket

9 - Leak Detection Pump (LDP) -V144

- ◆ Location: in left rear wheel house behind wheel well

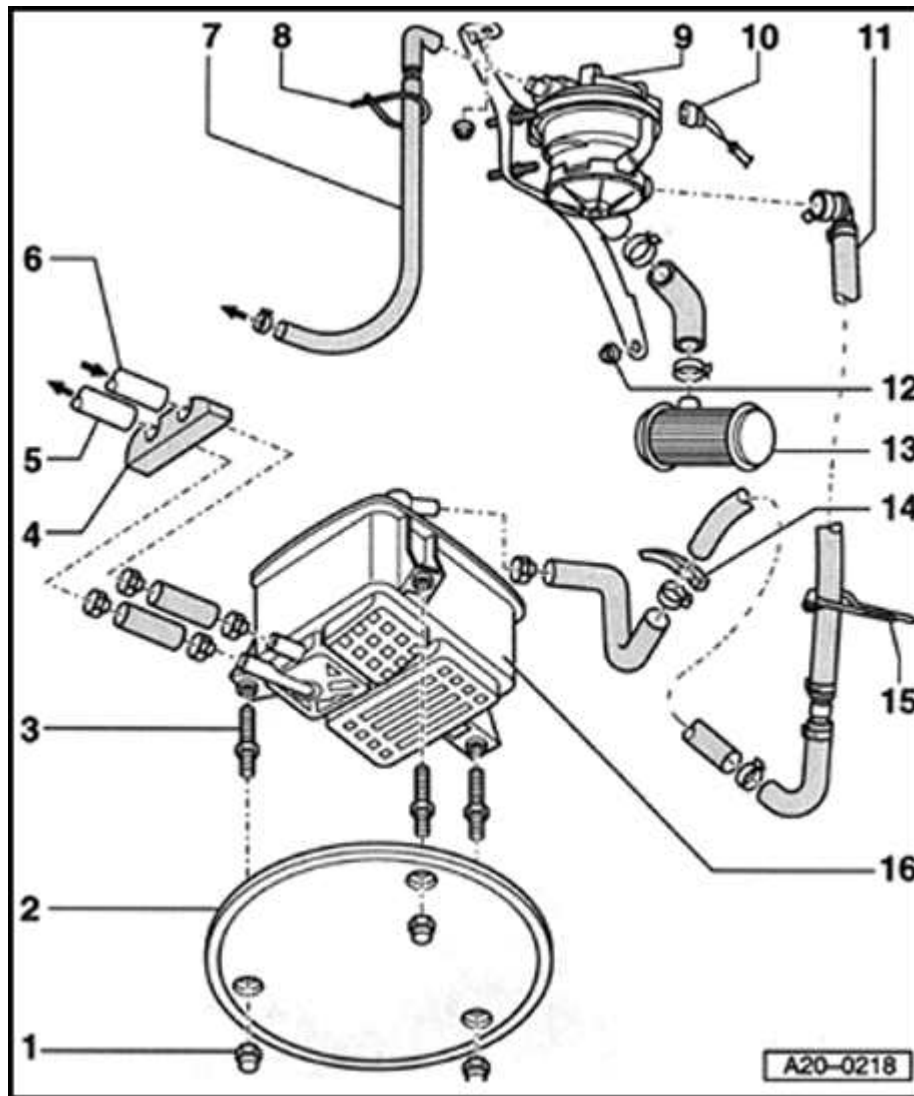
- ◆ Checking ⇒ [Page 20-139](#)

- ◆ Removing and installing ⇒ [Page 20-162](#)

10 - 3-pin harness connector

- ◆ Black

20-132

**11 - Connecting hose**

- ◆ LDP / EVAP canister
- ◆ Pressure side
- ◆ To remove at LDP, press unlocking tab on connector

12 - 10 Nm**13 - Air filter**

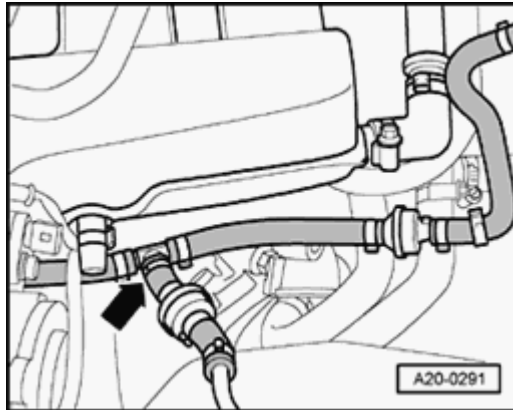
- ◆ For LDP

14 - Sealing piece**15 - Cable tie**

- ◆ For mounting connecting hose on wheel house

16 - EVAP canister

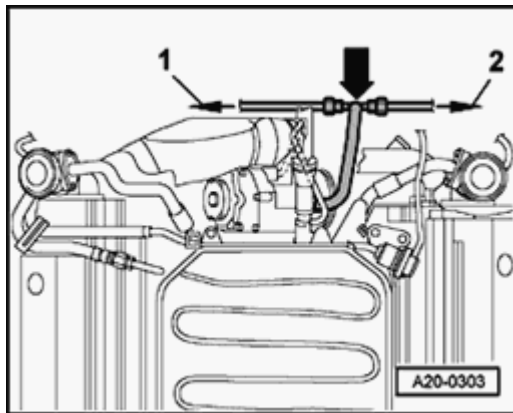
- ◆ Location: lower front in spare wheel well
- ◆ Removing and installing ⇒ [Page 20-164](#)



A

Fig. 1 Connections to LDP in engine compartment**Vehicles with 1.8 ltr. turbo engine**

The vacuum line for the LDP -V144 is connected to the Throttle actuator control module line with a T-piece -arrow-.



A

Fig. 2 Connections to LDP in engine compartment**Vehicles with 2.8 ltr. engine**

The vacuum line from the LDP -V144 is connected to the EVAP canister purge regulator valve with a T-piece -arrow-.

1 - to EVAP canister

2 - to LDP -V144

EVAP system leak detection

Function of leak detection system

The leak detection system can recognize leaks in the entire fuel system, including the main fuel tank, the EVAP canister and EVAP canister purge regulator valve -N80.

On the mechanical side, the leak detection system consists of a vacuum-operated diaphragm pump (LDP) with a reed contact on the pump diaphragm rod. The pump receives vacuum from the intake manifold.

- ◆ If the leak detection system is triggered; the diaphragm pump pressurizes the fuel system between 20 and 30 mbar.
- ◆ If specified pressure is reached, the pump diaphragm remains extended and the reed contact remains in the "open" position.
- ◆ If the pressure drops (i.e. there is a leak), the diaphragm moves back and the reed contact closes.
- ◆ During diagnosis, first there is a measurement of whether the reed contact has closed within 10 seconds. If this does NOT occur, the tank system is then sealed.

- ◆ If; however, the reed contact closes within 10 seconds, there is a leak. Then, the pump continues to cycle for four more strokes. The ECM measures the time for each of these four strokes until the next time the reed contact closes. In this fashion, the ECM can differentiate between "fine" and "large" leaks.
- ◆ Leak detection is automatically triggered, shortly after each engine start. If there is an incorrect measurement, a malfunction is stored in DTC memory.
- ◆ A warning will appear on the instrument panel if the malfunction has occurred during two successive drives. Also, leak detection can also be activated using the VAG1551 Scan Tool ⇒ [Page 20-139](#) .

Fuel tank and EVAP system, checking for leaks

Note:

In the following, individual questionable points will be considered that could be leaks in the fuel tank and tank ventilation system. After eliminating a possible leak, it is effective to then perform a tank leak diagnosis to determine whether the leak was successfully sealed.

- Switch OFF ignition.
- Check if filler cap was completely closed for the test.
- Check if filler cap seal is damaged or crimped, replace if necessary.
- Check if the gaskets under the cover flanges are OK and if the union nut on the fuel tank cover flange is correctly tightened.
- Check hose connections for tightness and integrity repair or replace as necessary.
- Remove luggage compartment trim.

- Remove connector flange cover under luggage compartment trim.

Note:

Observe the cover flange installation instructions.

◆ *Front wheel drive* ⇒ [Page 20-44](#)

◆ *All wheel drive* ⇒ [Page 20-97](#) .

- Visually inspect all fuel tank system line and hose connections and replace any leaking lines, for example:

- ◆ Line from EVAP canister to EVAP canister purge regulator valve in engine compartment.
- ◆ Lines from EVAP canister to the LDP (under left wheel house liner).
- ◆ Line from the fuel tank to the EVAP canister (under the cover for the EVAP canister).
- ◆ Lines of the tank ventilation system (under right wheel house liner).
- ◆ Fuel lines to the engine.

Note:

Locate leaks at lines and components of the tank system by using a non-combustible, environmentally friendly, leak detector spray. Perform several leak diagnostics in a row to build up the system pressure. Bubbles will form at points of leakage.

- Visually inspect the fuel supply system components:
 - ◆ Fuel tank
 - ◆ EVAP canister
 - ◆ LDP
 - ◆ EVAP canister purge regulator valve -N80

Note:

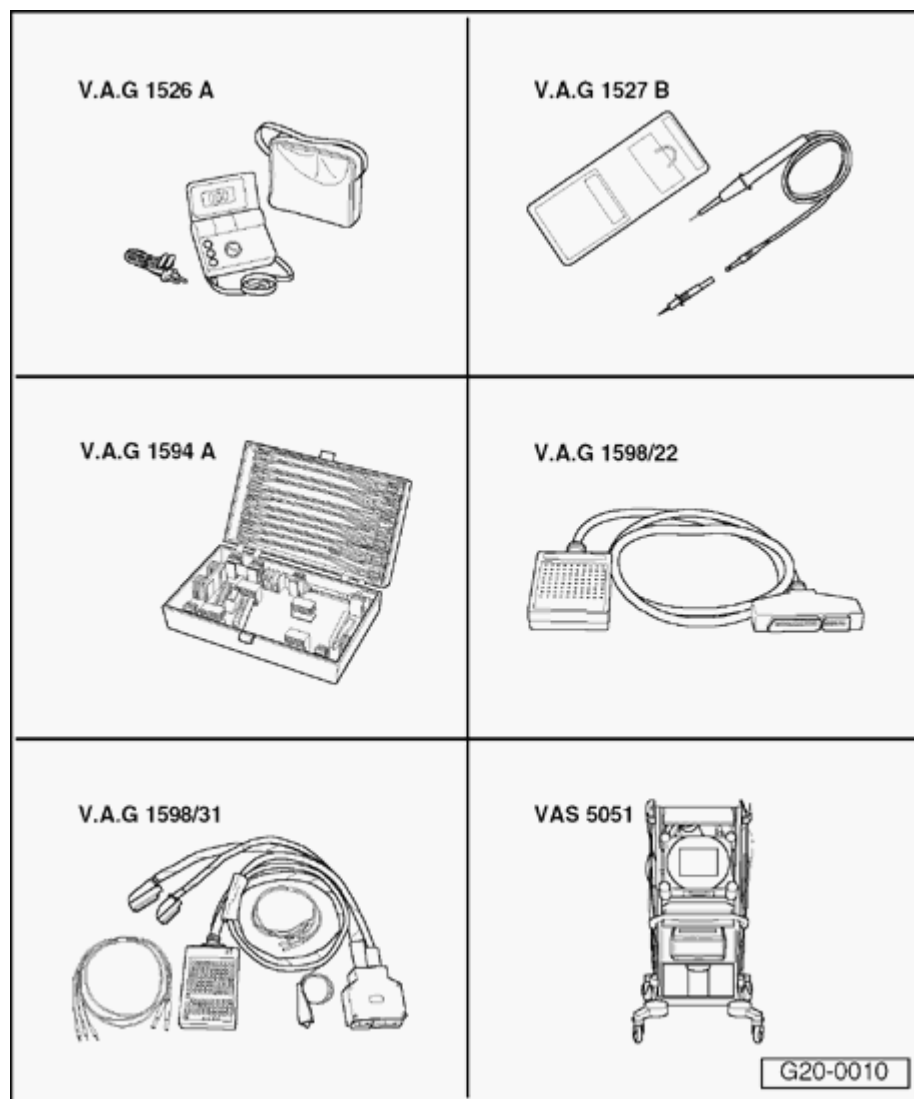
At times, the above components cannot be effectively leak tested using a leak detection spray, either because of component location or function. In such cases, clamp off the lines to the component involved and perform a leak check. If the leak is no longer displayed, the clamped off component is faulty. If the LDP is clamped off and there is still a leak displayed, the LDP is faulty.

- Check EVAP canister purge regulator valve - N80

⇒ *Repair Manual, Fuel Injection & Ignition,*

Repair Group 24

20-139



Leak Detection Pump (LDP) -V144, checking

Special tools needed:

- ◆ VAG1526 A
- ◆ VAG1527 B
- ◆ VAG1594 A
- ◆ VAG1598/22 (vehicles with mechanical accelerator cable)
- ◆ VAG1598/31 (vehicles with electronic throttle control)
- ◆ VAS5051 with VAS5051/1

or

- ◆ VAG1551 with VAG1551/3 A

Observe Safety measures ⇒ [Page 20-1](#) .

Observe Rules of cleanliness ⇒ [Page 20-4](#) .

Checking LDP via Read Measuring Value Block (vehicles with mechanical throttle control)

Note:

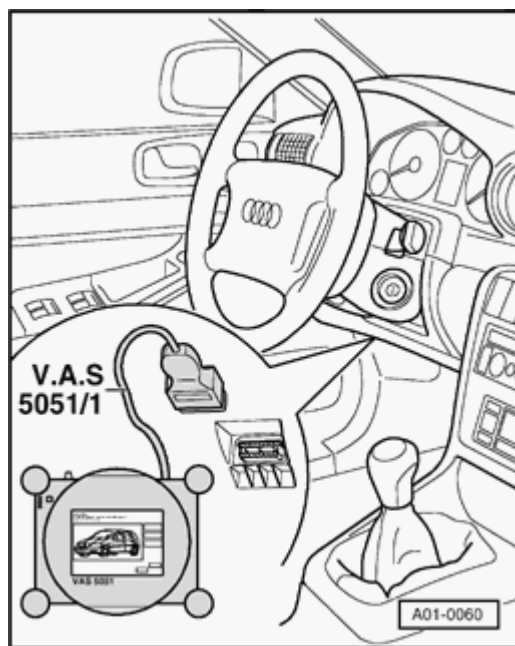
- ◆ *Always replace O-rings, sealing rings and gaskets.*
- ◆ *Radiator fan must not come on during the test!*

Troubleshooting requirements

- DTC memory checked and no DTCs stored
- All electrical consumers switched OFF
- A/C switched OFF
- Intake Air Temperature lower than 90 °C ⇒ Display group 004, channel 4.
- Engine Coolant Temperature less than 95 °C ⇒ Display group 004, channel 3.
- Throttle angle less than 10 ° % Display

group 003, channel 3.

20-141



On Board Diagnostic HELP

1 - Rapid data transfer 1)

2 - Blink code 1)

Rapid data transfer HELP

Enter address word XX



- Connect VAS5051 with diagnostic cable VAS5051/1 or VAG1551 Scan Tool (ST) with adapter cable VAG1551/3B.
- Start engine and let idle.

Note:

In the following description the performance of the On Board Diagnostic (OBD) procedure the VAG1551 Scan Tool (ST) is used. When using Vehicle Diagnostics Test and Information System VAS5051, use the operating instructions.



Indicated on display:

1) Appears alternately

- Switch ignition on.
- Press button 1 to select "Rapid data transfer".



Display will appear as shown

20-142

Rapid data transfer HELP
Select Function XX

- Press 0 and 1 buttons to select Address word 01: "Engine electronics".

- Press Q button to enter input.

- Press → button.



Display will appear as shown

- Press 0 and 8 buttons to select Function 08: "Read measuring value block"
- Press Q button to enter input.

Read measuring value block
Enter display group number XXX



Display will appear as shown

- Press 0, 7 and 1 buttons to select "display group 71".
- Press Q button to enter input.

Read measuring value block →
Reed closed break Test OFF

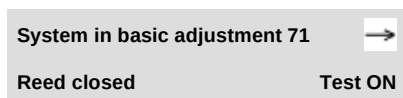


Display will appear as shown

Note:

- ◆ Condition for continuing test is "Reed closed" on the display.
- ◆ The display does not always show "Abort".
- ◆ If the display: "reed open" appears: Briefly open the filler cap to reduce pressure - this will close the reed contact. Continue checking as follows:

20-143

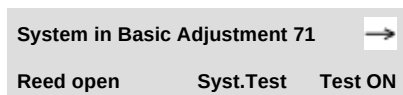


- Press 0 and 4 buttons to select Function 04: "Basic Setting".

◀ Display will appear as shown

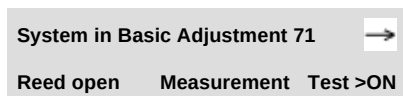
- The EVAP canister valve is opened to allow pressure relief in the system.
- Then the LDP -V144 will be triggered.
- The total procedure lasts approx. 60 seconds.

- Press → button .



◀ Display will appear as shown

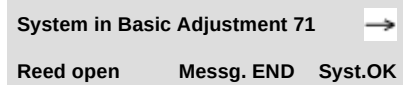
- The system makes a test, the LDP -V144 starts running and shuts off when the pump running time reaches a pre-determined time-out.
- The total procedure lasts approx. 60 seconds.



◀ Display will appear as shown

- Measurement phase begins. The LDP -V144 is switched off and the ECM checks whether the reed contact has closed within 10 seconds.

20-144



If NO

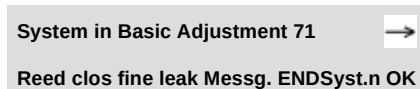


Display will appear as shown

- The system is sealed and the measurement is ended.
- Press → button.
- Press 0 and 6 buttons to select Function 06: "End output"
- Press Q button to enter input.

If contact does not close within 10 seconds

- The LDP -V144 performs 4 pump strokes. The ECM compares the time it takes to carry out the pump strokes and the time until the reed contact closes again.



Display will appear as shown

- The system has recognized a fine leak (∅ greater than 1 mm).

20-145

System in Basic Adjustment 71 
Reed clos lrg leak Messg. ENDSyst.not oK



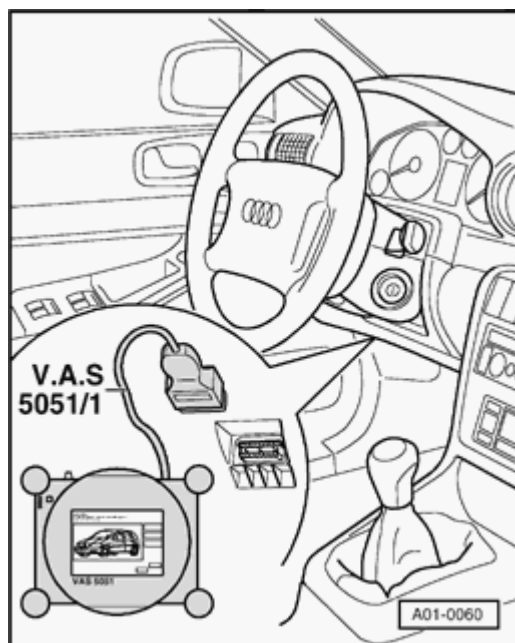
Display will appear as shown

- The Leak detection system has recognized a large leak.
- Press  button.

If system has recognized a fine or large leak

- Check tank system and tank ventilation system for leaks ⇒ [Page 20-136](#) .
- Perform tank leak diagnosis again.

Checking LDP via output DTM (vehicles with electronic throttle control)



On Board Diagnostic **HELP**

1 - Rapid data transfer 1)
2 - Blink code 1)



- Connect VAS5051 with diagnostic cable VAS5051/1 or VAG1551 Scan Tool (ST) with adapter cable VAG1551/3B.

Note:

In the following description the performance of the On Board Diagnostic (OBD) procedure the VAG1551 Scan Tool (ST) is used. When using Vehicle Diagnostics Test and Information System VAS5051, use the operating instructions.



Indicated on display:

1) Appears alternately

- Switch ignition on.
- Press button 1 to select "Rapid data transfer".

20-147

Rapid data transfer HELP
Enter address word XX



Indicated on display:

- Enter "01" for address word "Engine electronics" and confirm input by pressing Q button.
- Press → button.

Rapid data transfer HELP
Select function XX



Indicated on display:

- Enter "03" for function "Output Diagnostic Test Mode (DTM)."

Rapid data transfer Q
03-Output Diagnostic Test Mode



Indicated on display:

- Confirm input by pressing Q-button.

Output Diagnostic Test Mode →
EVAP Purge Regulator Valve -N80



Indicated on display (EVAP canister purge regulator valve -N80)

- Press → button until following display is shown:

Output Diagnostic Test Mode →
Leak Detection Pump



Indicated on display:

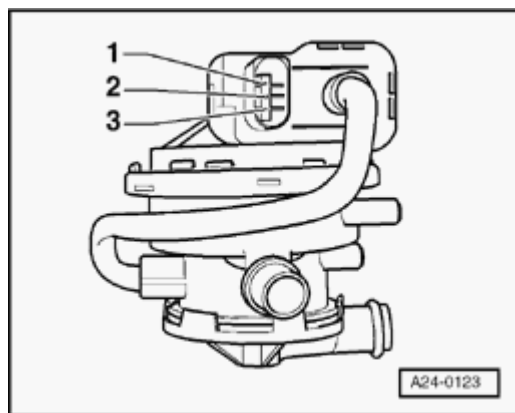
The leak detection pump is activated for about 1 minute.

Note:

You can hear the leak detection pump run at the left rear wheel housing when it is working. This will be difficult to hear. Make sure to be as close to LDP as possible and to eliminate as much surrounding noise as possible.

If LDP -V144 is not activated (pump is silent):

- Switch ignition off.
- Remove LDP (⇒ [Page 20-162](#)) and disconnect electrical connector.



Checking resistance (all vehicles)



- Switch multimeter Fluke 83 to resistance and connect as follows:

Vehicles manufactured ➤ approx. 05.97

Leak detection pump terminal	Specified value
1 + 3	640 to 720 Ω
2 + 3	17.5 to 27.5 Ω

Vehicles manufactured approx. 05.97 ➤

Leak detection pump terminal	Specified value
1 + 3	640 to 720 Ω
2 + 3	15 to 17 Ω

20-150

If you measure values other than specified values:

- Replace Leak Detection Pump (LDP) -V144 ⇒ [Page 20-162](#) .

If you reached specified values:

- Check voltage supply to electrical connector of LDP ⇒ [Page 20-151](#) .

20-151

Checking voltage supply (all vehicles)**Note:**

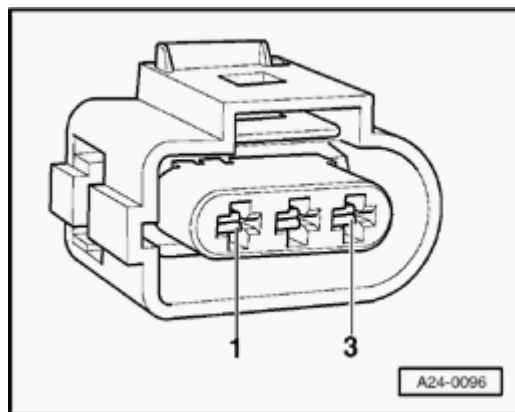
Voltage supply to the LDP is via the fuel pump relay.

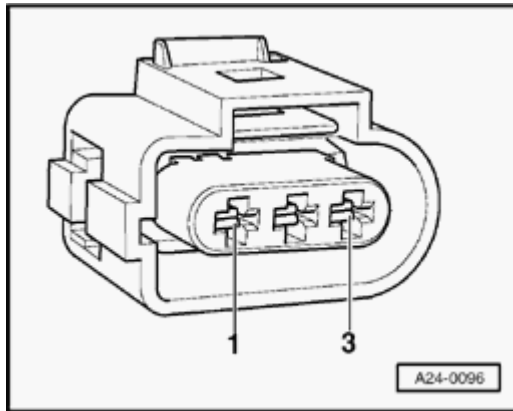
Test condition:

- Fuse for LDP is OK
- Disconnect connector from LDP.
- Connect voltage tester VAG1527 B as follows:

Connector terminal	Measure
3	Engine Ground (GND)

- Briefly operate starter motor.
- LED must light up.





If LED does not light up:



- Check electrical wiring from terminal 3 via fuse for fuel pump relay for open circuit.

⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations*

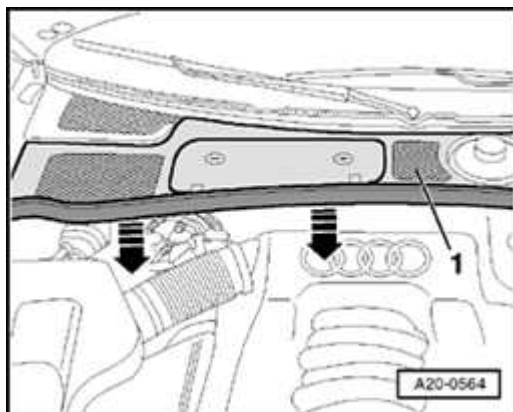
- Repair wiring as necessary.

If wiring is OK:

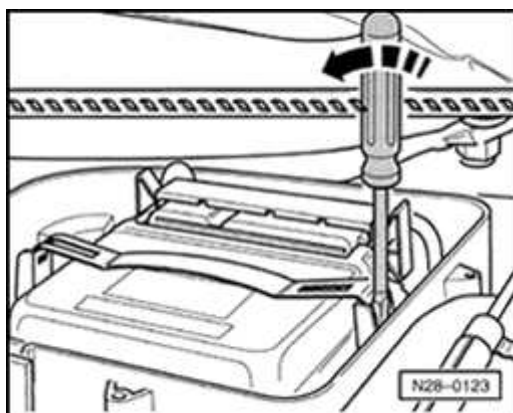
- Check fuel pump relay:

⇒ *Repair Manual, Fuel Injection & Ignition, Repair Group 24*

Checking output wiring (vehicles with mechanical throttle activator)



- Remove weatherstrip at plenum chamber -arrows-.
- Remove cover for plenum chamber -1- toward front.
- Remove cover for E-box in plenum chamber.



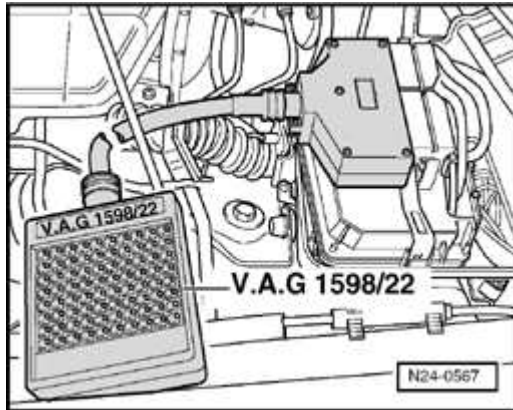
- Carefully lever off clamp -arrow- with screwdriver.

Note:

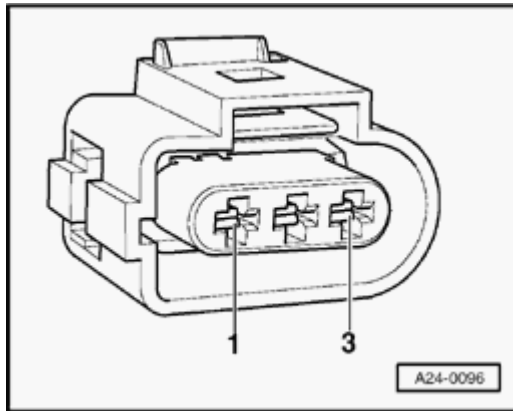
Disconnect or connect the Engine Control Module (ECM) connector only with ignition switched off.

- Unlatch clip and disconnect connector for Engine Control Module (ECM).

20-154



- Connect test box VAG1598/22 to harness connector. Do not connect ECM.



- Check the following wire connection for open circuit and short circuit to Ground (GND) or to plus (B+):

Electrical connector terminal	Test box VAG1598/22 socket
2	16

- Repair wiring or short circuit as necessary.

If you did not find any malfunction, however the Leak Detection Pump (LDP) did not function during the output Diagnostic Test Mode (DTM):

- Replace Leak Detection Pump (LDP) -V144 ⇒ [Page 20-162](#) .

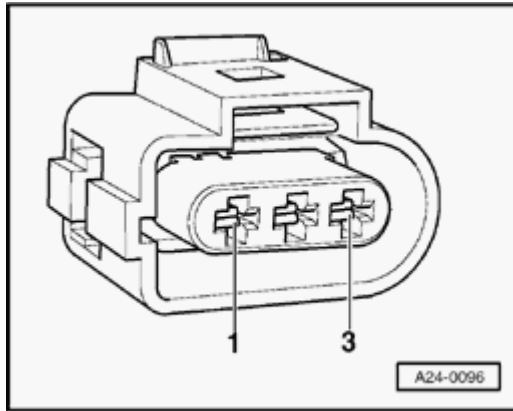
If the LED does not blink, although wiring is OK:

- Replace Engine Control Module (ECM):

⇒ *Repair Manual, Fuel Injection & Ignition, Repair Group 24*

- Generate readiness code:

⇒ *Repair Manual, Fuel Injection & Ignition, Repair Group 24*



Output Diagnostic Test Mode



LDP leak test

Checking output wiring (vehicles with electronic throttle control)



- Connect voltage tester VAG1527B as follows:

Electrical connector terminal	Specification
2	Battery Positive

- Initiate Diagnostic Test Mode (DTM) ⇒ [Page 20-146](#) .
- Press → button until following display is shown:



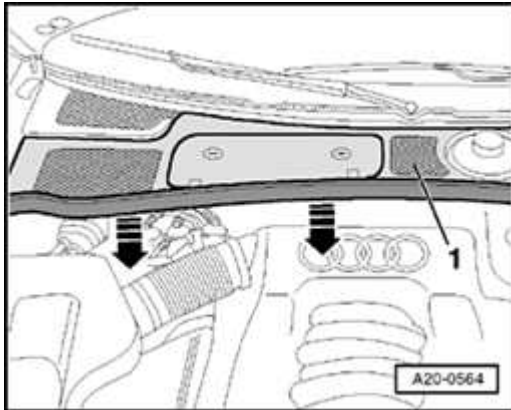
Indicated on display:

- ◆ LED must blink

If LED does not blink:

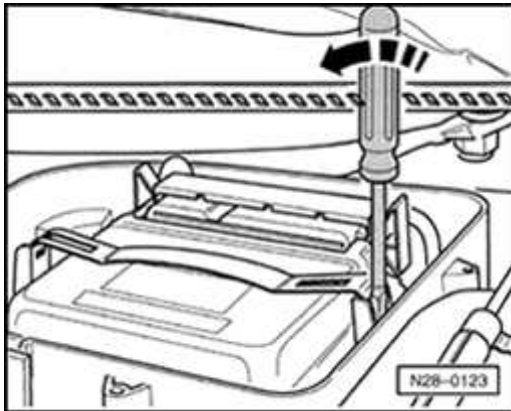
- Switch ignition off.

20-157



A

- Remove weatherstrip at plenum chamber -arrows-.
- Remove cover for plenum chamber -1- toward front.
- Remove cover for E-box in plenum chamber.



A

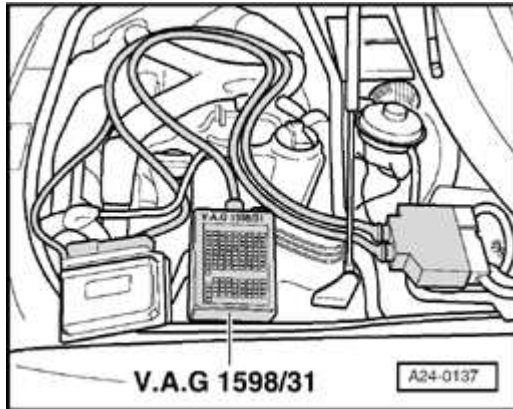
- Carefully lever off clamp -arrow- with screwdriver.

Note:

Disconnect or connect the Engine Control Module (ECM) connector only with ignition switched off.

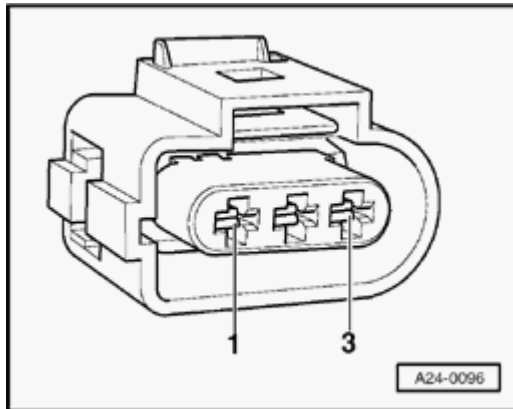
- Unlatch clip and disconnect connector for Engine Control Module (ECM).

20-158



A

- Connect test box VAG1598/22 to harness connector. The ground clamp (not visible in the illustration) must be connected to battery ground connection. Do not connect ECM.



A

- Check the following wire connection for open circuit or short circuit to Ground or plus (B+):

Electrical connector terminal	Test box VAG1598/22 socket
2	25

- Repair wiring or short circuit if necessary.

If you did not find any malfunction, however the Leak Detection Pump (LDP) did not function during the Output Diagnostic Test Mode (DTM):

- Replace LDP ⇒ [Page 20-162](#)

If the LED does not blink, although wiring is OK:

- Replace the Engine Control Module (ECM)

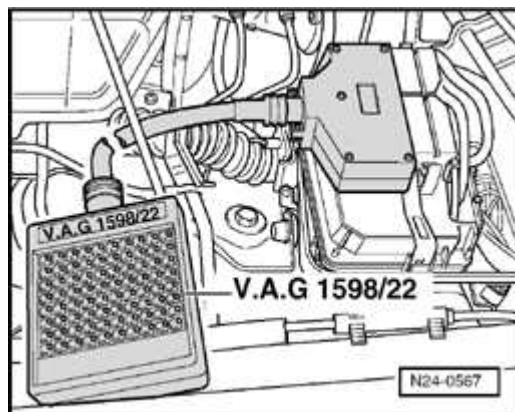
⇒ *Repair Manual, Fuel Injection & Ignition,
Repair Group 24*

- Generate readiness code:

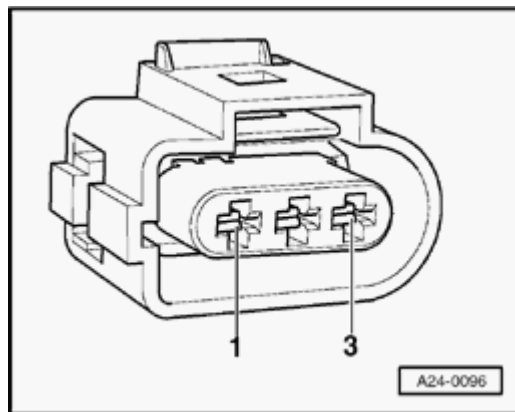
⇒ *Repair Manual, Fuel Injection & Ignition,
Repair Group 24*

Checking input wiring (vehicles with mechanical throttle activator)

- Switch ignition off.



- Connect test box VAG1598/22 to harness connector ⇒ [Page 20-153](#) , "Checking output wiring."



- Check the following wire connections for open circuit or short circuit to Ground or plus (B+):

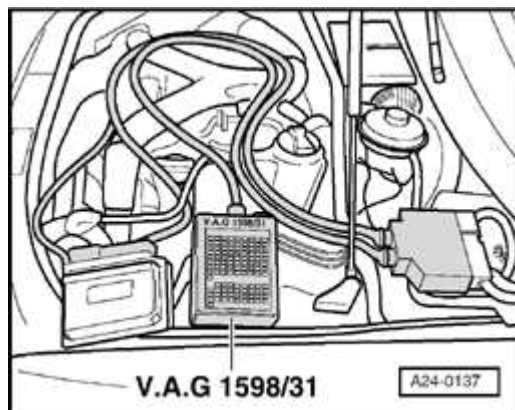
Electrical connector terminal	Test box VAG1598/22 socket
2	37

- Repair open or short circuit as necessary.
- Generate readiness code:

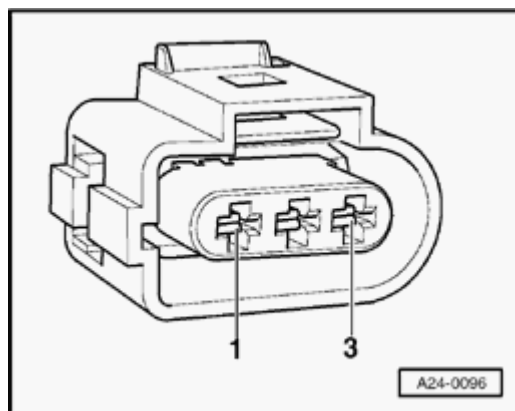
⇒ *Repair Manual, Fuel Injection & Ignition, Repair Group 24*

Checking input wiring (vehicles with electronic throttle control)

- Switch ignition off.



- Connect test box VAG1598/31 to harness connector ⇒ [Page 20-156](#) , "Check output wiring."



- Check the following wire connections for open circuit or short circuit to Ground or plus (B+):

Electrical connector terminal	Test box VAG1598/31 socket
1	80

- Repair open or short circuit as necessary.
- Generate readiness code:

⇒ *Repair Manual, Fuel Injection & Ignition, Repair Group 24*

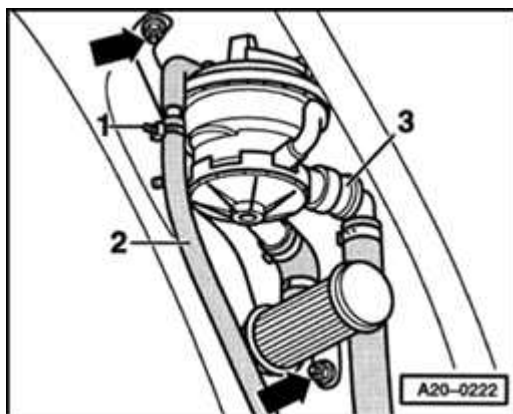
Leak Detection Pump (LDP) -V144, removing and installing

Checking LDP ⇒ [Page 20-139](#)

Removing

- Remove left rear wheel.
- Remove left rear wheel housing liner.

⇒ [Repair Manual, Body Exterior, Repair Group 66](#)



4

- Cut tie wrap -1- and remove hose -2- .
- Disconnect hose coupling -3- after pressing tab.
- Remove nuts -arrows-.
- Switch off ignition.
- Remove LDP, unclip and disconnect connector.

Installing

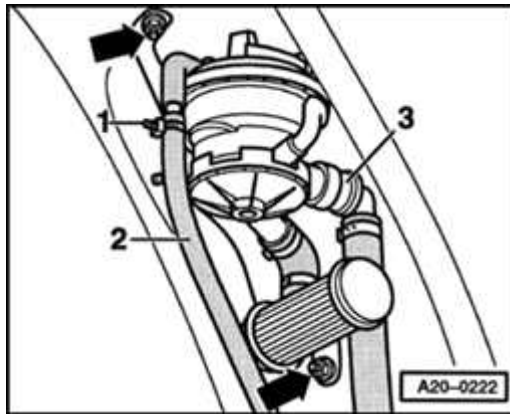
Installation is in reverse order of removal, but do the following:

Note:

Secure all hoses with clamps that are the same as factory installed.

CAUTION!

Always refer to the latest parts catalog to ensure that you use original equipment fuel hose clamps.



4

- Secure hose -2- with tie wrap -1- to bracket of LDP.

Tightening torque:

Component	Nm
Bracket for Leak Detection Pump (LDP)	7.5

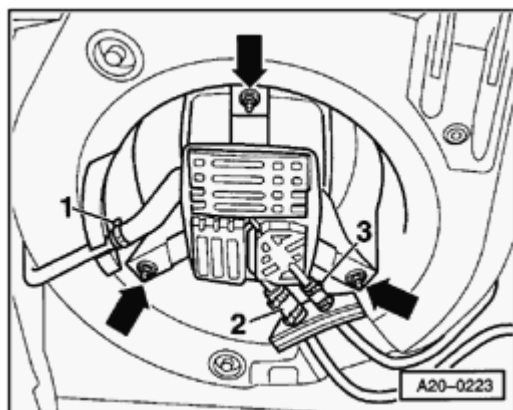
EVAP canister, removing and installing

Note:

To check seal integrity, perform tank leak diagnosis ⇒ [Page 20-139](#).

Removing

- Remove cover for EVAP canister at bottom of spare tire well.



4

- Loosen hose connections -1- and -3- on bleed lines.
- Remove sealing pieces out and over the bleed lines.
- Loosen studs -arrows-.

Installing

Installation is performed in the reverse order of the removal procedure, during installation note the following:

CAUTION!

Always refer to the latest parts catalog to ensure that you use original equipment fuel hose clamps.

20-165**Tightening torques**

Component	Nm
EVAP canister to body	15
Cover on spare wheel well	10

Evaporative Emissions (EVAP) System, Diagnosis using KLI9210 EVAP Tester

Description

The leak detection threshold has recently changed from 1.0 mm (0.040 in.) to 0.5 mm (0.020 in.). These changes to EPA regulations regarding EVAP system integrity indicated that additional resources for more accurate EVAP system diagnosis are necessary.

The KLI9210 EVAP Tester allows testing using nitrogen to pressurize the EVAP system and a smoke generator or ultrasonic tester to locate the source of EVAP system concerns.

The following procedure will outline general use of the KLI9210 EVAP Tester. It is intended as a guideline, as EVAP systems vary between models.

Test EVAP system using Leak Detection Pump (LDP) -V144- (m.y. 1998 and later)

For vehicles without LDP, proceed to "Perform EVAP tester self-test".

For vehicles with LDP:

- Perform leak test using VAS 5051 Scan Tool and Basic Setting mode, ⇒ [Page 20-139](#) .

If vehicle fails above test ("System not OK"):

- Verify fuel cap is properly closed; repeat test.

If "System OK" after re-test:

- Erase DTC memory (if necessary).
- Repeat test several times to ensure proper EVAP system operation (remove and re-install fuel cap before each test).
- Perform quality check and return vehicle to customer.

Note:

If the vehicle passes the above EVAP system test, DTCs may be sporadic; the entire EVAP system should be carefully inspected.

If VAS 5051 continues to indicate "System not OK" after re-test, proceed to next step.

Perform EVAP tester self-test

Note:

- ◆ *Always perform system self-test of KLI9210 EVAP Tester prior to use to ensure that there are no leaks.*
- ◆ *Refer to KLI9210 instruction manual for specific instructions.*

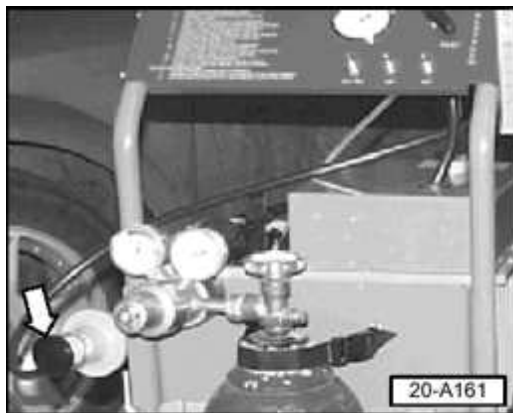


- Connect vehicle interface hose to self-test port -1-, ensuring that fitting is finger-tight. Over-tightening will damage fitting.
- Turn control valve -2- to "Test".

Gauge -3- should read 14 ± 1 in. of water.

If gauge does not read 14 ± 1 in. of water:

20-168



- Verify that valve on EVAP tester nitrogen cylinder is open and that cylinder has sufficient pressure before continuing.

A

- Turn fine adjust regulator knob (arrow) until gauge reads 14 in. of water; tighten lock nut.

Note:

If gauge still does not read within above range, contact K-Line Customer Service - Technical Support for additional instructions before continuing.

- Check flow meter -4-. (upper illustration).
Meter must indicate no flow.
- Turn control valve to "Hold" position.
- Check gauge.
Gauge must hold pressure

If gauge leaks down:

- Verify that vehicle interface hose is firmly seated and repeat previous six steps before continuing.

If gauge continues to leak down:

- Use ultrasonic tester (described later) to locate and repair leak before continuing.

20-169

Note:

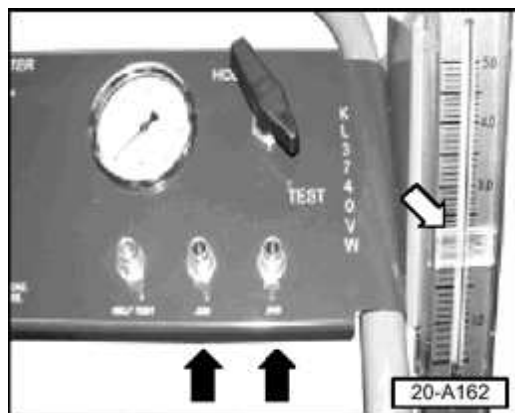
If the leak cannot be located or repaired, contact K-Line Customer Service - Technical Support.

Calibrate KLI9210 Tester

Determine vehicle leak threshold:

To m.y. 2000: leak threshold 0.040 in.

From m.y. 2001: leak threshold 0.020 in.



- Attach test hose to appropriate preset port (black arrows).
- Turn control valve from "Hold" to "Test".
- Set flow meter flag (white arrow) at indicated value on flow meter.
- Turn control valve to "Hold"; remove test hose.

Test fuel cap

- Connect fuel cap tester to hose.



- Screw fuel cap tightly to cap receiver (arrow).
- Turn control valve to "Test".
- Read flow meter on tester.

If no flow is indicated:

- Proceed to "Test LDP for internal leaks".

If flow is indicated:

- Replace fuel cap and re-test.

If new fuel cap shows no flow:

- Repeat Leak Test, with new fuel cap installed, using VAS 5051 and Basic Settings mode, ⇒ [Page 20-139](#) .

If Leak Test shows 'System OK':

- Perform quality check and return vehicle to customer.

Test LDP -V144- for internal leaks

If vehicle is not LDP-equipped, proceed to "Test EVAP system".

- Clamp off LDP outlet (EVAP side) using Special Tool No. 3094 or equivalent.

CAUTION!

Clamp only soft rubber lines when isolating a leak. To avoid risk of damage, never clamp hard plastic lines!

- Repeat Leak Test using VAS 5051 and Basic

Setting mode.

VAS 5051 should immediately indicate "System OK"

- Repeat test several times to verify result.

If test continues to indicate "System OK", remove clamp and proceed to "Test EVAP System".

If VAS 5051 indicates "System not OK":

- Replace LDP and repeat test.

If VAS 5051 indicates "System OK" after LDP is replaced and test result is verified:

- Perform quality check and return vehicle to customer.

Test EVAP System

Also ⇒ [Page 20-134](#) .

If vehicle is not LDP-equipped:

- Plug or clamp EVAP canister outlet and proceed to step "Continued for all vehicles" (below).

If vehicle is LDP-equipped:

- Plug or clamp LDP inlet (filter side) using Special Tool No. 3094 or equivalent.

20-172



- Attach fuel cap adapter to filler neck (arrow) and test hose to adapter.
- Turn control valve from "Hold" to "Test".
- Allow fuel system to pressurize.

Note:

Fuel system pressurization depends on volume of fuel system and amount of fuel in tank.

If fuel system pressurization does not stabilize:

- Verify all fuel system outlets have been sealed before continuing.

CAUTION!

Clamp only soft rubber lines when isolating a leak. To avoid risk of damage, never clamp hard plastic lines!

Note:

Any flow shown on flow meter indicates a leak. Flow before flow meter flag set at vehicle leak standard may indicate a sporadic DTC.

If flow meter on tester registers flow near or above preset pressure:



- Clamp off hose (arrow) leading from EVAP purge regulator valve -N80- to intake manifold (pictured: AHA engine in A6).

20-173

If flow stops:

- Replace EVAP purge regulator valve -N80- and repeat test before continuing.

If meter indicates no flow after test:

- Perform a quality check and return vehicle to customer.

If flow continues, proceed as follows:

Method 1: Locate leak with smoke generator

- Connect leads from smoke generator to vehicle battery.
- Use smoke generator trigger to charge fuel system with smoke.
- Inspect complete EVAP system for escaping smoke.

20-174



Method 2: Locate leak with ultrasonic tester

General search: tester only

Localized search: tester with extension (on left in illustration)

If leak cannot be located:

- Disconnect and plug or clamp shut EVAP lines to isolate fuel tank, using Special Tool No. 3094 or equivalent, before continuing.

CAUTION!

Clamp only soft rubber lines when isolating a leak. To avoid risk of damage, never clamp hard plastic lines!

20-175

If flow stops:

- Reconnect EVAP lines to search area that was isolated

If leak or source of fuel odor cannot be found:

- Contact Audi Dealer Technician Helpline.

CAUTION!

Under no circumstances should the vehicle be returned to the customer without proper diagnosis and repair.

When leak has been located:

- Repair leak and repeat EVAP system test.
- Perform quality check and return vehicle to customer.

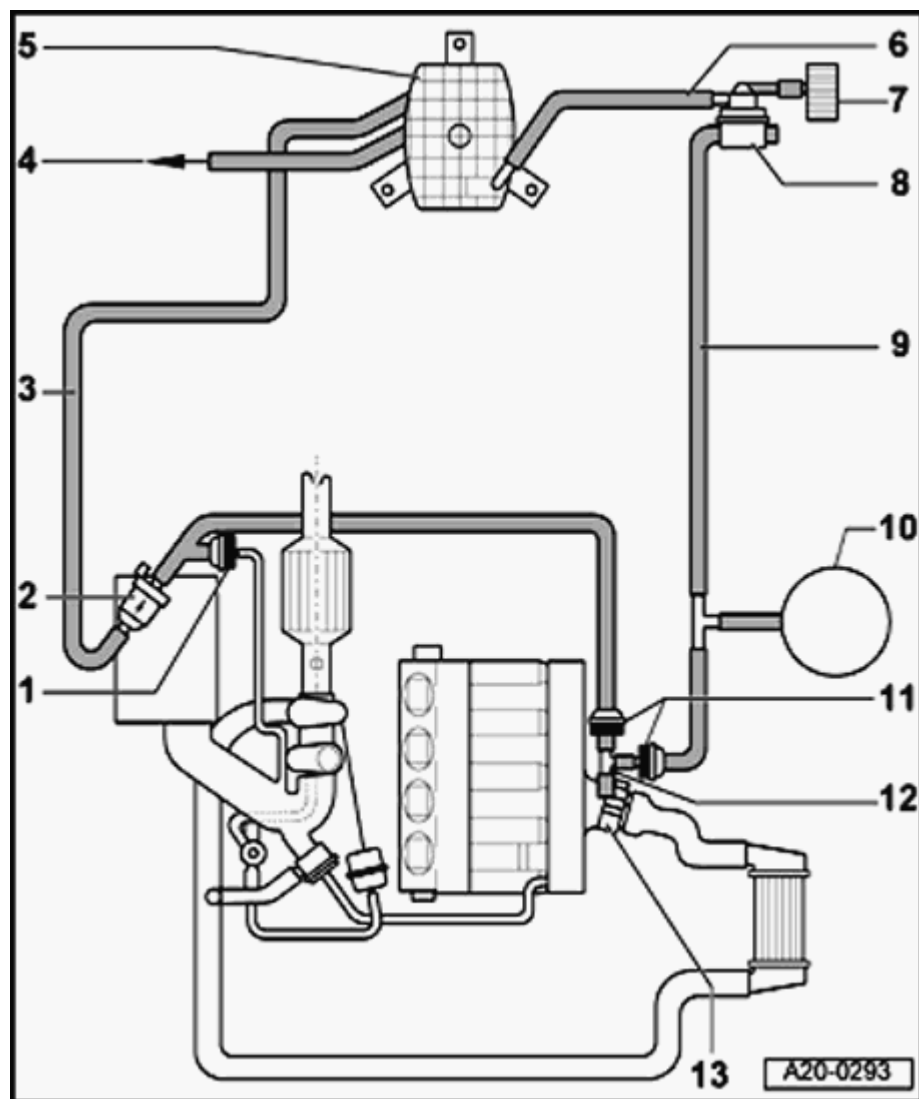
Note:

◆ *Because leak may be at top of fuel tank, it may not be possible to locate through fuel pump/sending unit access plate.*

◆ *Fuel tank may need to be lowered to locate the*

leak.

20-176



EVAP system leak detection circuit, schematic diagram (vehicles with 1.8 ltr. turbo engine)

1 - Check valve

- ◆ Location (light/dark side): as shown in illustration

2 - EVAP canister purge regulator valve -N80-

- ◆ Location: in engine compartment
- ◆ Checking

⇒ *Repair Manual, 1.8 Liter 4-Cyl. 5V Turbo Fuel Injection & Ignition, Repair Group 24*

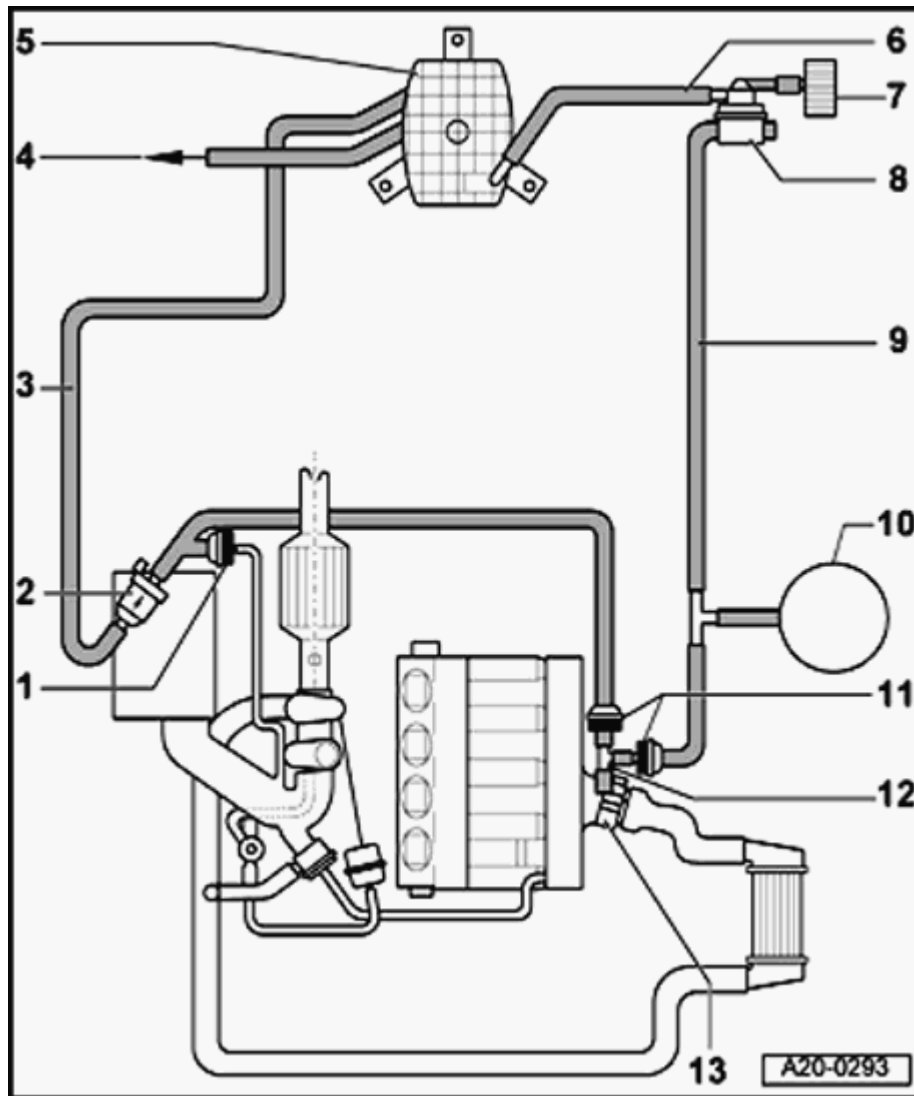
3 - Bleed line

- ◆ From EVAP canister purge regulator valve -N80-

Location

- ◆ Right side under floor pan
- ◆ Front-wheel drive: on floor pan in area of fuel tank
- ◆ All-wheel drive: on fuel tank in area of fuel tank

20-177

**4 - Bleed line**

- ◆ From gravity valve

5 - EVAP canister

- ◆ Location: bottom of spare wheel well

6 - Connecting hose

- ◆ LDP/EVAP canister
- ◆ Pressure side

7 - Air filter

- ◆ For LDP

8 - LDP -V144-

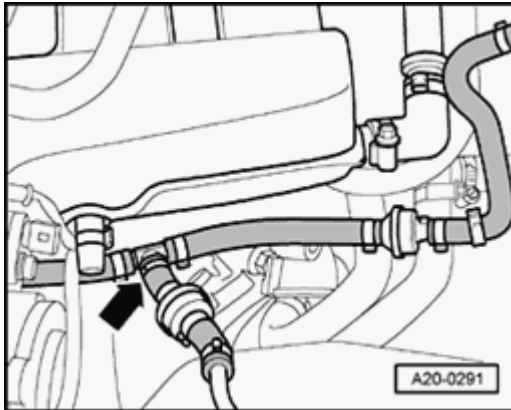
- ◆ Location: left rear wheel house behind wheel well ⇒ [Page 20-130](#)

9 - Vacuum hose

- ◆ LDP / Throttle actuator control module



20-179

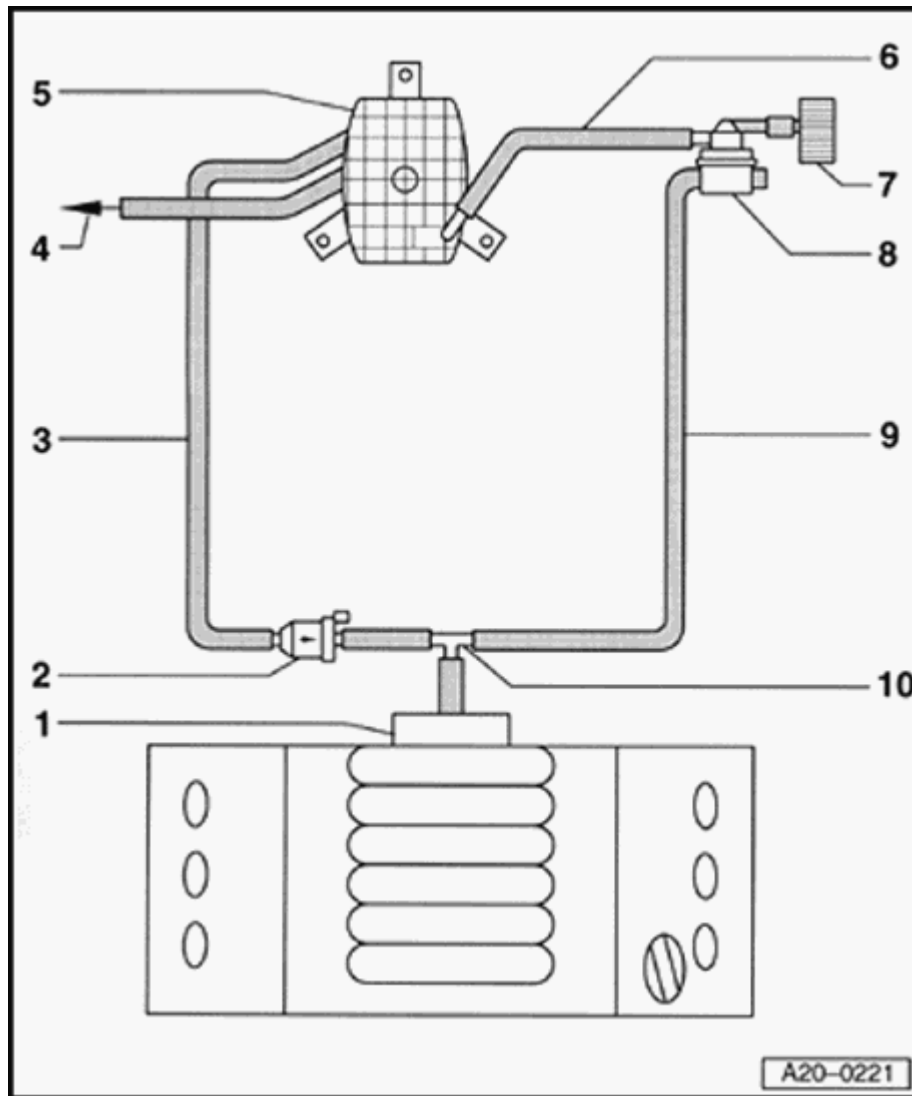


A

Fig. 1 T-piece, location

T - piece -arrow- is located on left side of engine compartment.

20-180



EVAP system leak detection circuit, schematic diagram (vehicles with 2.8 ltr. engine)

1 - Throttle actuator control module -J338-

2 - EVAP canister purge regulator valve -N80-

- ◆ Location: in engine compartment
- ◆ Checking:

⇒ *Repair Manual, 2.8 Liter V6 5V Fuel Injection & Ignition, Repair Group 24*

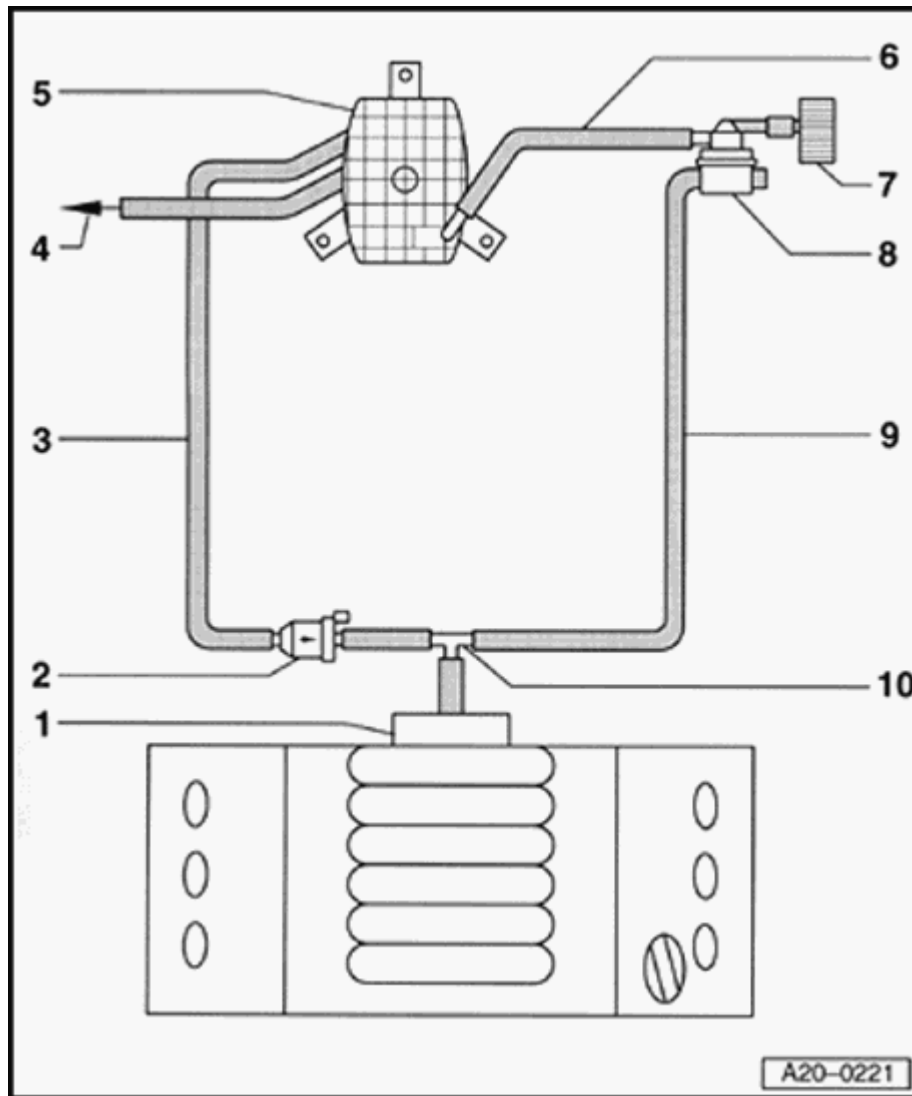
3 - Bleed line

- ◆ From EVAP canister to EVAP canister purge regulator valve -N80-

Location

- ◆ On right side under floor pan
- ◆ Vehicles with front-wheel drive: mounted on floor pan in area of fuel tank
- ◆ Vehicles with all-wheel drive: mounted on fuel tank

20-181

**4 - Bleed line**

- ◆ To gravity valve on fuel tank

5 - EVAP canister

- ◆ Location: in bottom of spare tire well

6 - Connecting hose

- ◆ LDP / EVAP canister
- ◆ Pressure side

7 - Air filter

- ◆ For LDP

8 - LDP -V144

- ◆ Location: in left rear wheel house behind wheel well ⇒ [Page 20-130](#)

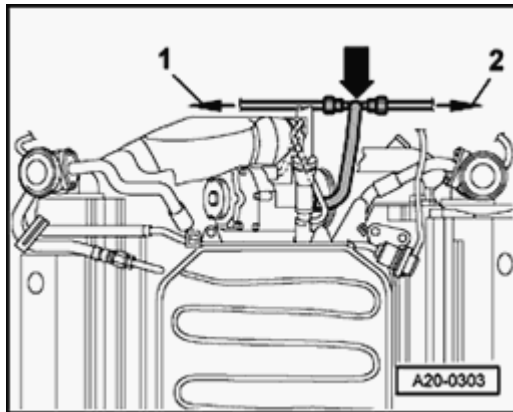
9 - Vacuum hose

- ◆ LDP / throttle actuator control module

10 - T - piece

- ◆ Location ⇒ Fig. ⇒ [1](#)

20-182



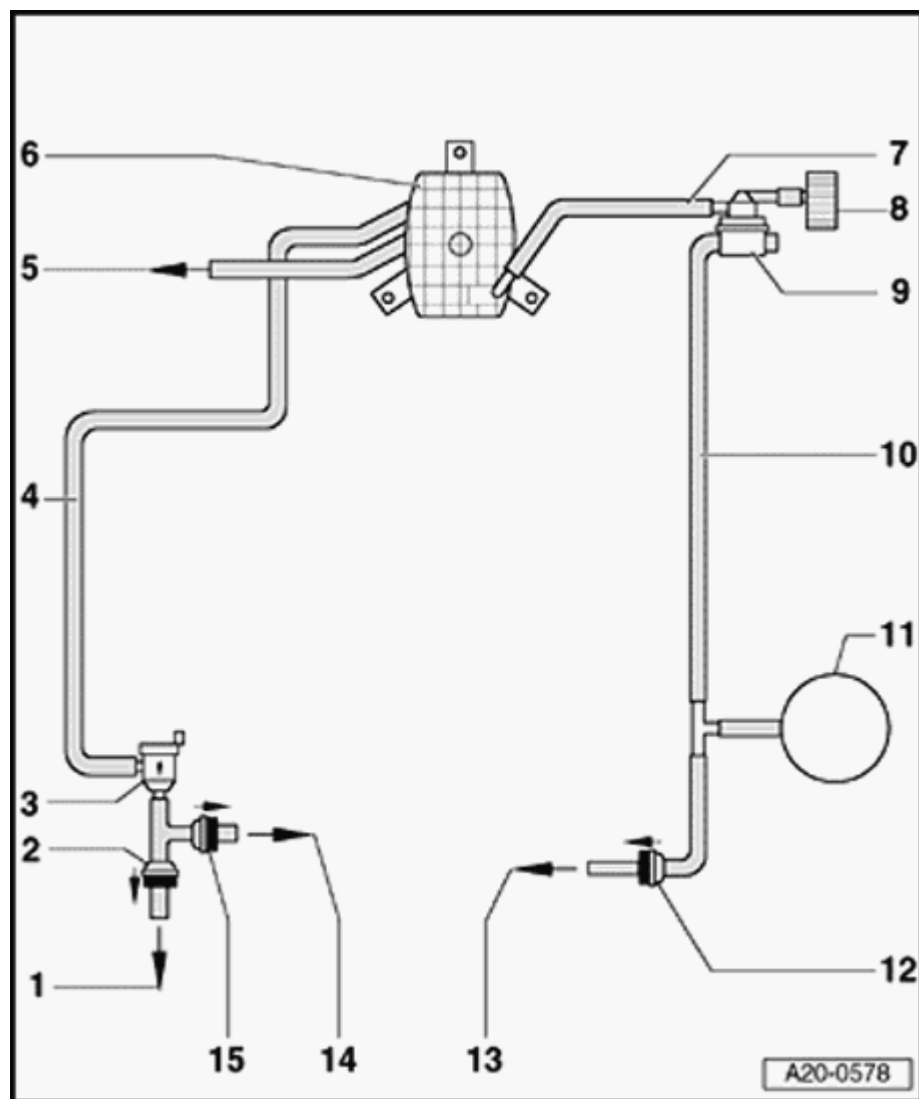
A

Fig. 1 T - piece Location

The T-piece -arrow- is located between the engine and firewall.

1 - To the EVAP canister

2 - to LDP -V144-



EVAP system leak detection circuit, schematic diagram (vehicles with 2.7 ltr. turbo engine)

1 - To air intake before both turbo chargers

2 - Check valve

- ◆ Installation position: Arrow at housing indicates flow-through direction.

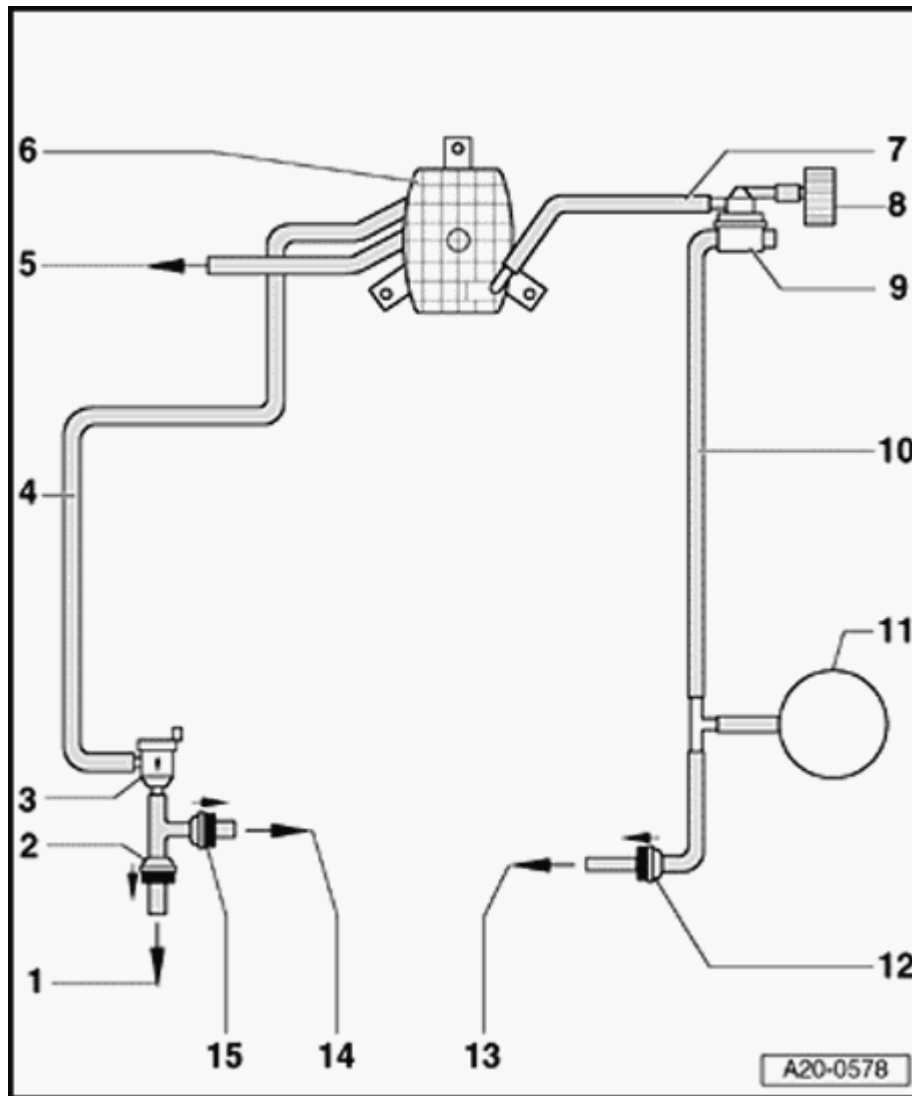
3 - Evaporative Emission (EVAP) canister purge regulator valve -N80-

- ◆ Location: On right side of engine compartment
- ◆ Checking:

⇒ [Repair Manual, 2.7 Liter V6 5V BiTurbo Fuel Injection & Ignition, Engine Code\(s\): APB, Repair Group 24](#)

4 - Vent line

- ◆ From EVAP canister to EVAP canister purge valve regulator valve -N80
- ◆ Installation position: On right side on vehicle under-side.
- ◆ Attached to fuel tank.



5 - Vent valve

- ◆ To gravity valve at fuel tank

6 - Evaporative Emission (EVAP) canister

- ◆ Location: At bottom of spare tire well

7 - Connecting hose

- ◆ Leak Detection Pump (LDP) /EVAP canister
- ◆ Pressure side

8 - Air cleaner

- ◆ For Leak Detection Pump (LDP) -V144-

9 - Leak Detection Pump (LDP) -V144-

- ◆ Location: In left rear wheel well under wheel well liner
- ◆ Removing and installing ⇒ [Page 20-162](#)

10 - Vacuum line

- ◆ To Leak Detection Pump (LDP) -V144-



- ## 12 - Check valve

- 13 - To intake manifold at top rear**

- 14 - To intake manifold at top**

- ## 15 - Check valve

- ◆ Installation position: Arrow at housing indicates flow-through direction.

20-186

Mechanical throttle control, servicing

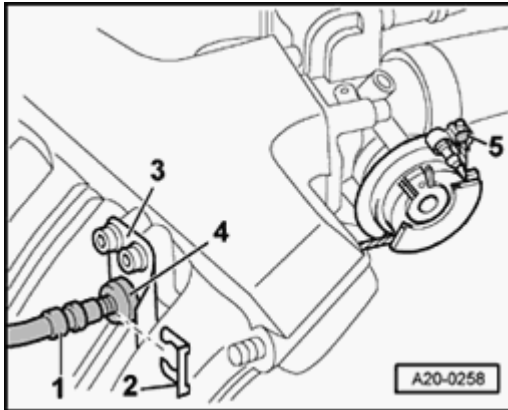
Vehicles with front-wheel drive and all-wheel drive, without electronic throttle control

Note:

- ◆ *The accelerator pedal cable bends easily. Handle it very carefully during installation.*
- ◆ *A single slight kink can lead to later breakage while the vehicle is being driven. Never install a kinked cable, instead replace it and immediately dispose of the kinked cable.*
- ◆ *During installation, ensure that the accelerator pedal cable fits between its brackets and cable mounting points without stretch, bending, kinking or stress.*

20-187

Accelerator pedal cable, adjusting (vehicles with 1.8 ltr. turbo engine)



Accelerator pedal cable -5- connected to accelerator pedal and routed over the throttle actuator control module cable quadrant.

- Remove clip -2- from notched section of outer cable sleeve -1-.
- Fully depress accelerator pedal to Wide Open Throttle position.

Note:

Either use a second technician or a mechanical device to depress the accelerator pedal.

Vehicles with manual transmission

- Move outer sleeve -1- in or out of grommet -4- (as necessary) until Wide Open Throttle position is just reached.
- Re-install clip -2- into the first completely exposed notch closest to the grommet.

Vehicles with automatic transmission

- Move outer sleeve -1- in or out of grommet -4- (as necessary) until Wide Open Throttle position is just reached and the kick-down switch clicks audibly.
- Re-install clip -2- into the first completely exposed notch closest to the grommet.

All vehicles

- Release accelerator pedal (remove mechanical device, if used).
- After adjusting, check the Closed and Wide open Throttle stops.

Vehicles with automatic transmission, checking adjustment

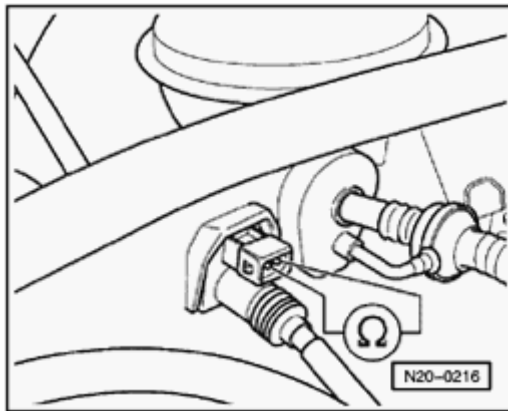
Test and auxiliary equipment required

◆ Fluke 83 Multimeter

◆ VW 1594 Adaptor kit

- Disconnect 2-pin harness connector from kick-down switch.

• In engine compartment on firewall.



- Connect multimeter between kick-down switch terminals using jumper wires from VW 1594 adaptor kit.

- Measure resistance across switch.

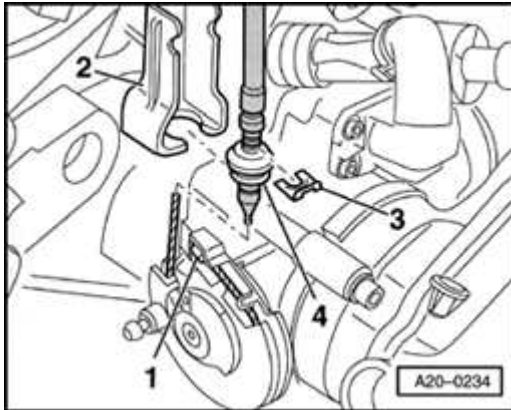
• Specified Value: $\infty \Omega$

- Slowly depress accelerator pedal until Wide Open Throttle is reached. If properly adjusted, following conditions will be met:

• Shortly after kick-down point, resistance must drop to 0Ω

• Accelerator pedal must almost be up to the full travel stop

Accelerator pedal cable, adjusting (vehicles with 2.8 ltr. engine)



Accelerator pedal cable -1- connected to accelerator pedal and routed over the Throttle actuator control module cable quadrant.

- Remove clip -3- from notched section of cable sleeve -4-.
- Fully depress accelerator pedal to Wide Open Throttle position.

Note:

Either use a second technician or a mechanical device to depress the accelerator pedal.

Vehicles with manual transmission

- Move notched outer sleeve in or out of grommet -4- (as necessary) until Wide Open Throttle position is just reached.
- Re-install clip -3- into the first completely exposed notch closest to the top of the grommet.

Vehicles with automatic transmission

- Move outer sleeve in or out of grommet -4- (as necessary) until Wide Open Throttle position is just reached and the kick-down switch clicks audibly.
- Re-install clip -3- into the first completely exposed notch closest to the top of the grommet.

All vehicles

- Release accelerator pedal (remove mechanical device, if used).
- After adjusting, check the Closed and Wide open Throttle stops.

Vehicles with automatic transmission, adjustment checking

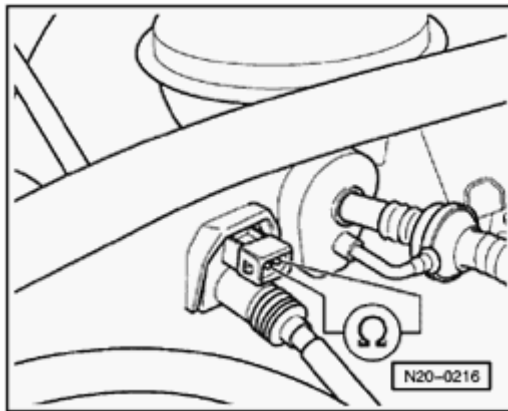
Test and auxiliary equipment required

◆ Fluke 83 Multimeter

◆ VW 1594 Adaptor kit

- Disconnect 2-pin harness connector from kick-down switch

• In engine compartment on firewall



- Connect multimeter between kick-down switch terminals using jumper wires from VW 1594 adaptor kit.

- Measure resistance across switch.

• Specified Value: $\infty \Omega$

- Slowly depress accelerator pedal until Wide Open Throttle is reached. If properly adjusted, following conditions will be met:

• Shortly after kick-down point, resistance must drop to 0Ω

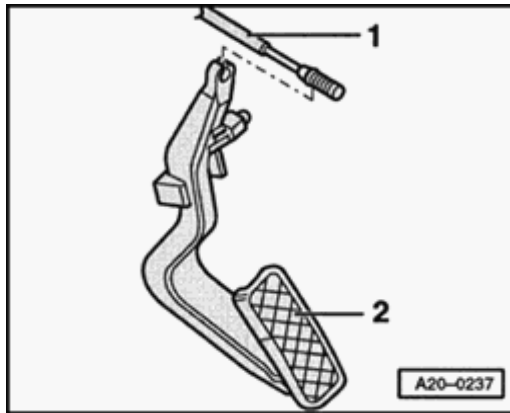
• Accelerator pedal must almost be up to the full travel stop

Accelerator pedal cable, removing and installing (vehicles with 1.8 ltr. turbo engine)

Removing

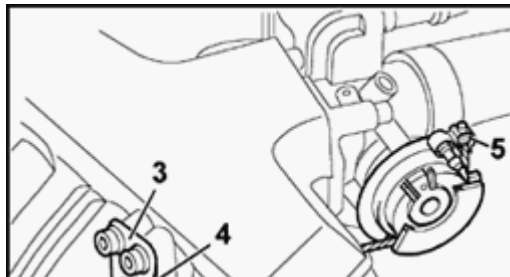
- Remove driver's side storage compartment.

⇒ [Repair Manual, Body Interior, Repair Group 70](#)



A

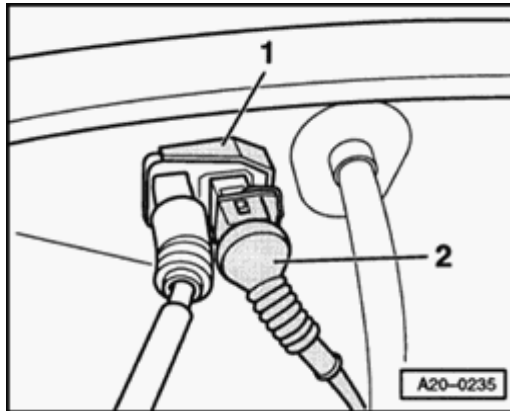
- Disconnect end of accelerator pedal cable -1- from top of accelerator pedal -2-.



A

- Release accelerator pedal cable ferrule -5- from location in quadrant.
- Pull notched section of cable sleeve -1- out of grommet -4- in bracket -3-.

20-194



Vehicles with automatic transmission



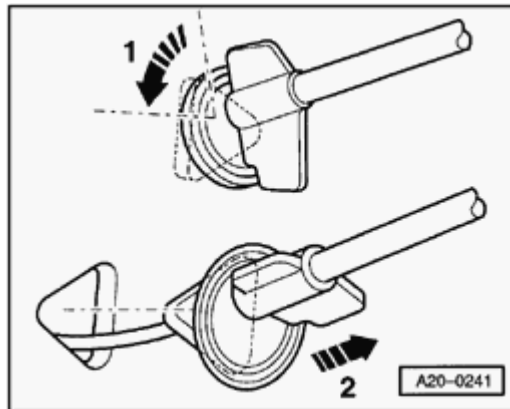
- Disconnect harness connector -2- from kick-down switch -1-.

All vehicles

- Remove retaining clip -1- on accelerator pedal cable bracket or kick-down switch, whichever is installed.

Note:

Vehicles with manual transmission: retaining clip is located behind the front wall of the plenum.



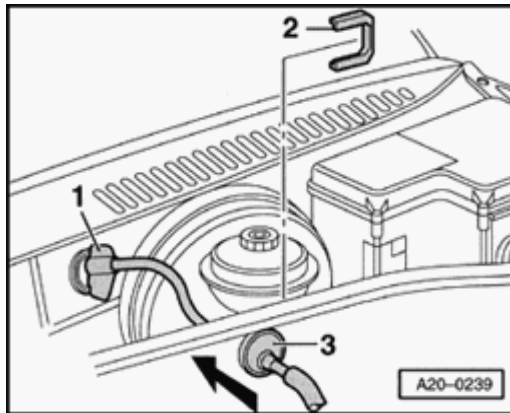
- Twist cable positioning tab approx. 90° in counter-clockwise direction - arrow 1- and pull positioner out through the fire wall and into the plenum -arrow 2-.
- Remove accelerator pedal cable.

Installing

Installation is performed in the reverse order of the removal procedure, during installation, note the following:

- See notes ⇒ [Page 20-186](#) .

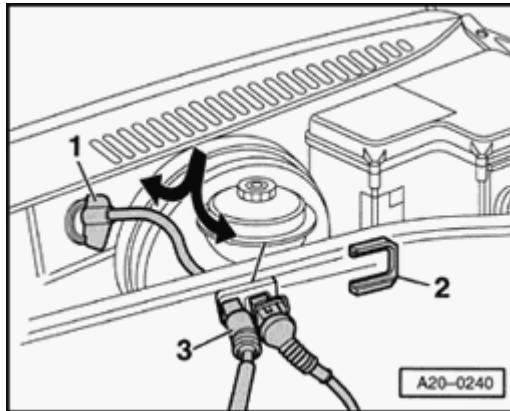
Vehicles with manual transmission



4

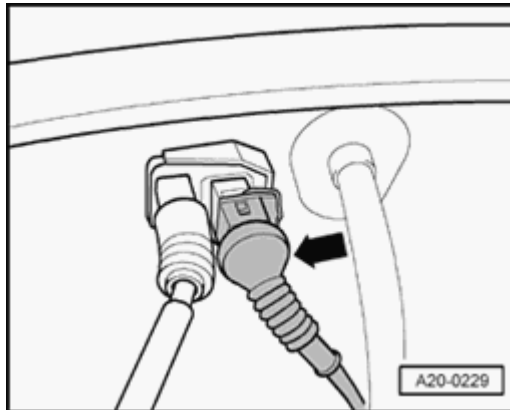
- Slide cable with cable bracket -3- and cable positioner -1- out of the engine compartment and through the front and rear plenum walls in - direction of the arrow-.
- Attach cable bracket with retaining clip -2- behind firewall, in the plenum.

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Vehicles with automatic transmission

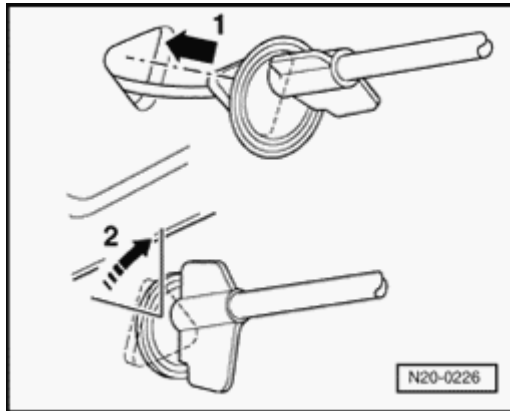
A

- Slide cable with cable bracket -3- and cable mounting -1- out of the plenum toward the front, through the firewall to the engine and backward through the fire wall to the vehicle interior.
- Arrow points in installation direction.
- Attach cable bracket with retaining clip -2- in front of firewall in the plenum.



A

- Connect kick-down-switch harness connector -arrow-.

All vehicles

A

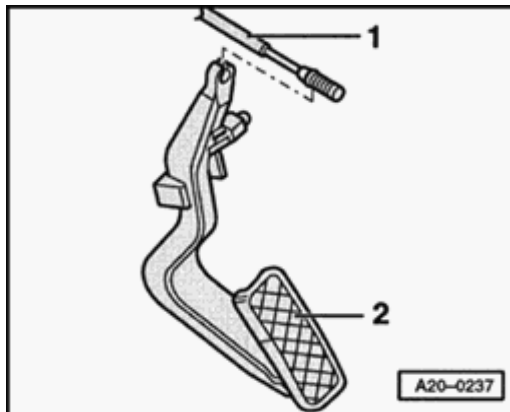
- Twist the cable positioner tab 90° in clock-wise direction -arrow 1 - and push into same shaped opening in fire wall and let positioner come to rest with the tab in a vertical position -arrow 2-.
- Adjust accelerator pedal cable ⇒ [Page 20-187](#) .

Accelerator pedal cable, removing and installing (vehicles with 2.8 ltr. engine)

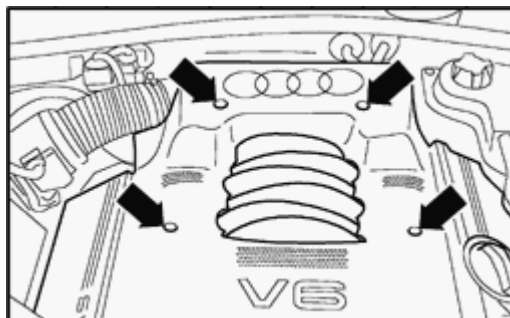
Removing

- Remove driver's side storage compartment

⇒ [Repair Manual, Body Interior, Repair Group 70](#)



- Disconnect cable -1- from top of accelerator pedal -2- (dotted lines).

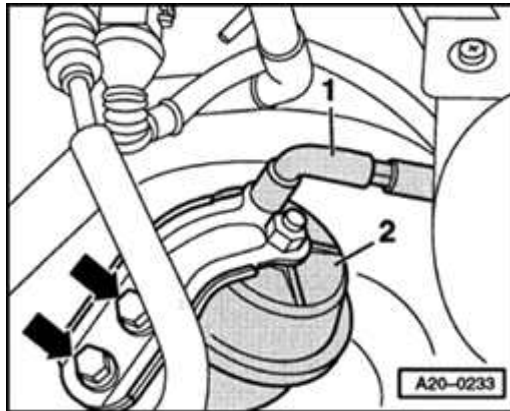


- Remove engine cover -arrows-.

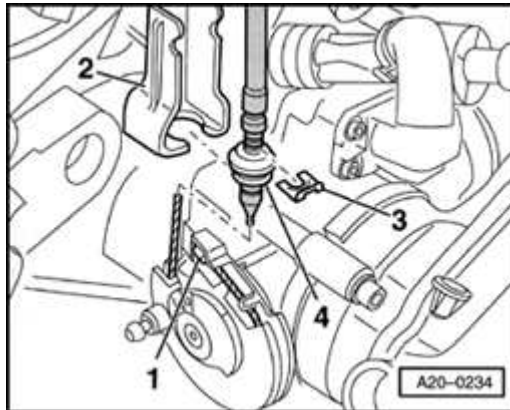
20-199

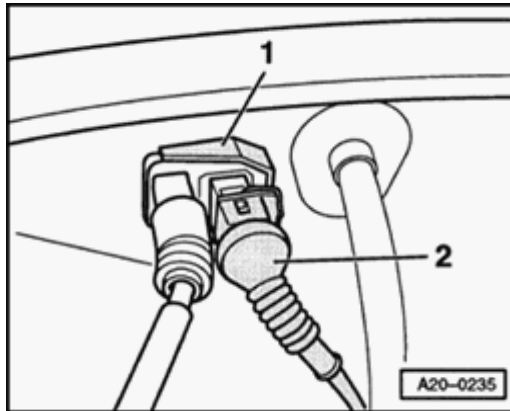
Vehicles with cruise control**A**

- Disconnect vacuum hose -1- from cruise control vacuum unit -2-.
- Loosen cruise control vacuum unit mounting bracket bolts -arrows-.
- Disconnect actuator rod from Throttle actuator control module.

**All vehicles****A**

- Remove clip -3- from notched section of outer accelerator pedal cable sleeve.
- Disengage cable ferrule -1- from its captured position in the accelerator pedal cable quadrant.
- Remove accelerator pedal cable -4- from mounting bracket -2- by sliding the grooved rubber grommet sideways out of mounting bracket -2-.





Vehicles with automatic transmission

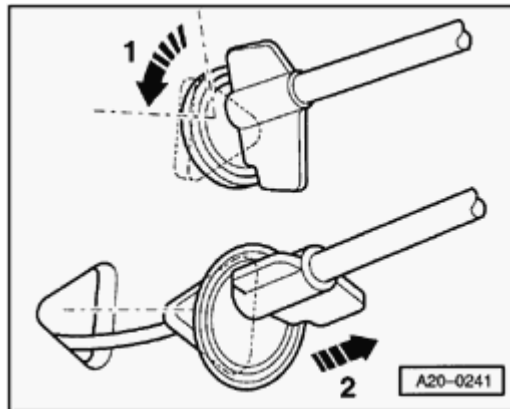
- Disconnect harness connector -2- from kick-down switch.

All vehicles

- Remove retaining clip -1- from the kick-down switch.

Note:

For vehicles with a manual transmission (no kick-down switch), the clip is located on the cable bracket behind the front plenum.



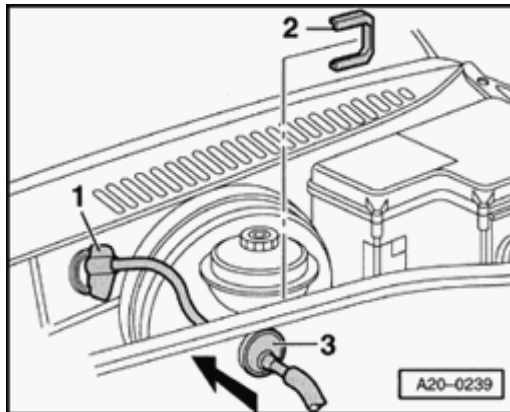
- Twist cable positioner approx. 90° in counter-clockwise direction - arrow 1- and pull out through the firewall side of plenum in direction of - arrow 2- toward the engine.
- Remove the accelerator pedal cable.

Installing

Installation is performed in the reverse order of the removal procedure. During installation, note the following:

- See notes ⇒ [Page 20-186](#) .

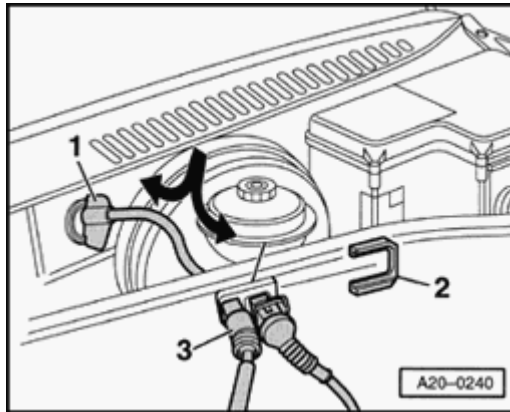
Vehicles with manual transmission



4

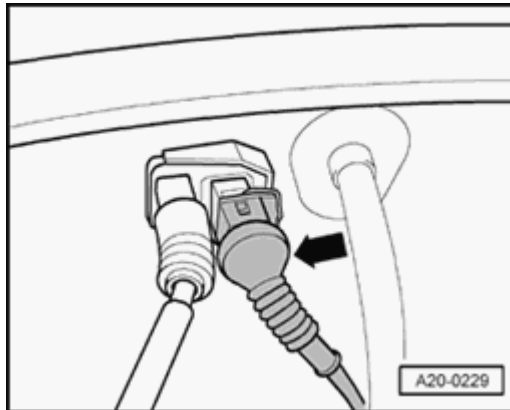
- Slide accelerator pedal cable with bracket -3- and cable positioner -1- through the back and front plenum walls in direction of -arrow- as shown in illustration.
- Attach bracket -3- to the front wall of the plenum by installing retaining clip -2- onto back side of bracket -3- (in plenum)

20-202

Vehicles with automatic transmission

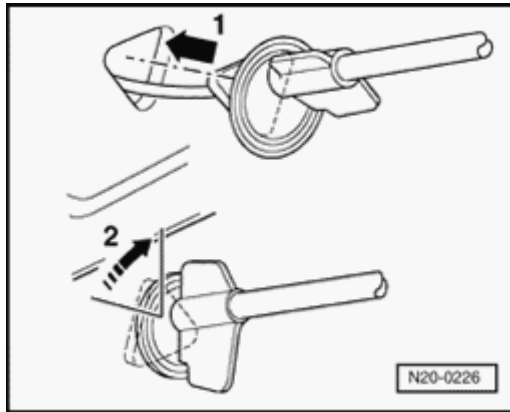
A

- Slide accelerator pedal cable -3- (with kick-down switch bracket) and cable positioner -1- through the back and front plenum walls as shown in illustration.
 - -arrow- shows installed position
- Secure kick-down switch bracket with retaining clip -2-.
 - On engine compartment side of plenum



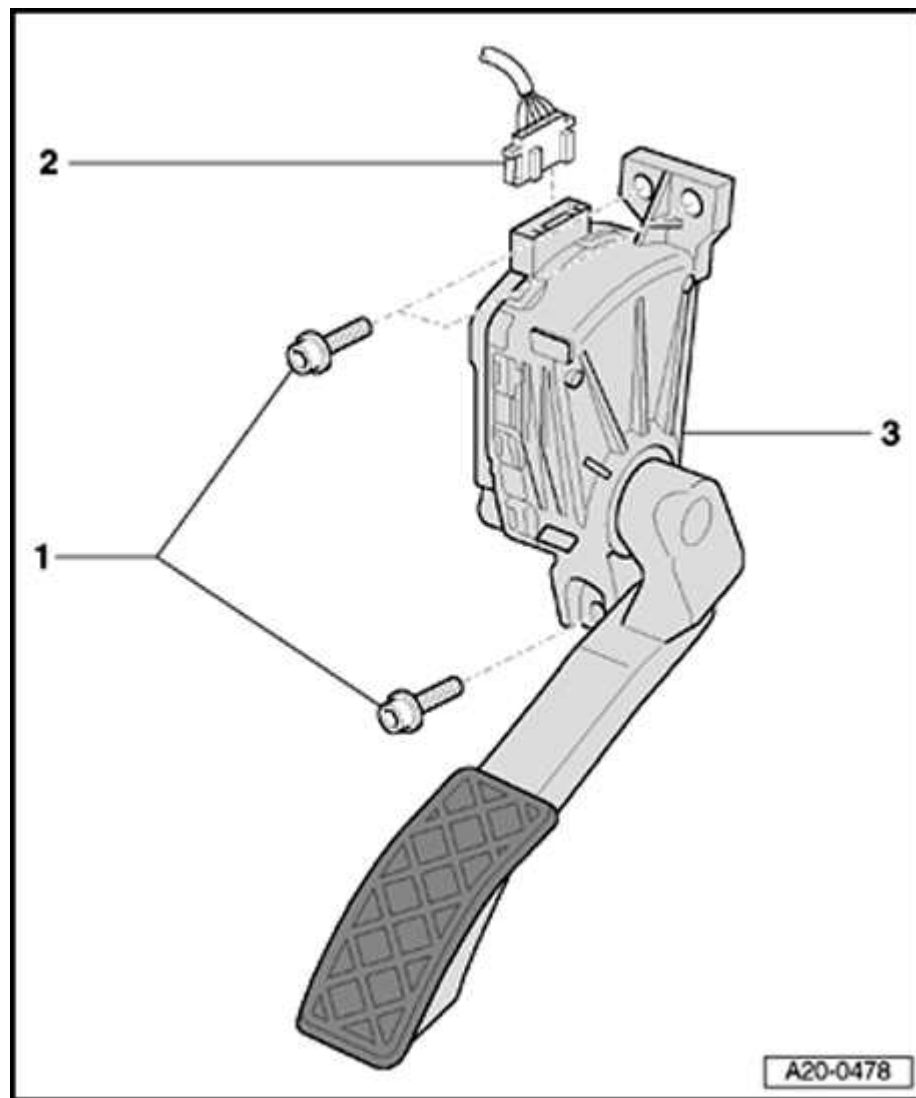
A

- Connect kick-down-switch harness connector -arrow-.

All vehicles

A

- Slide cable end through back wall of plenum -arrow 1-, secure by twisting cable positioner tab 90° in clockwise direction -arrow 2- until triangular shaped piece on cable passes through the same shaped opening in the back wall of the plenum.
- Ensure that when cable comes to rest position, the positioner tab has returned to a vertical position; thus capturing and correctly positioning the cable assembly in the firewall opening.
- Adjust the accelerator pedal cable ⇒ [Page 20-190](#) .



Electronic throttle control (E-Gas), servicing

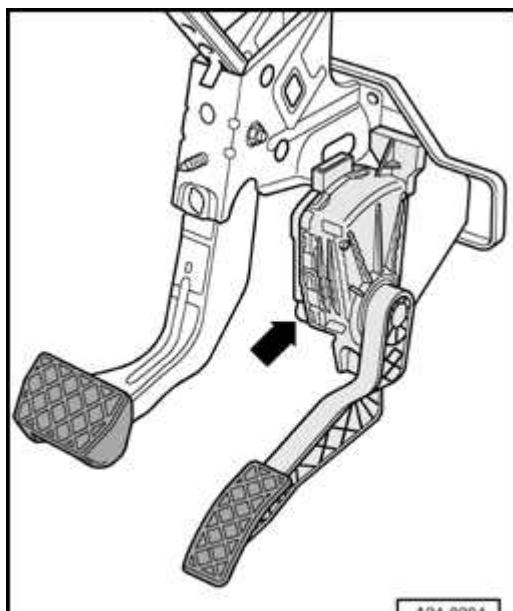
- 1 - Socket head bolt 9 Nm**
 - 2 - 6-pin connector**
 - 3 - Accelerator pedal module**
 - ◆ With Throttle Position (TP) sensor -G79- and sender 2 for Accelerator Pedal (AP) position -G185-
 - ◆ Checking:
- *Repair Manual, Fuel Injection & Ignition, Repair group 24*
- ◆ Removing and installing ⇒ [Page 20-205](#)

Accelerator pedal module with Throttle Position (TP) sensor, removing and installing

- Remove storage shelf on driver's side:

⇒ [Repair Manual, Body Interior, Repair Group 68](#)

- Disconnect 6-pin connector.
- Remove 3 bolts.



- Remove accelerator pedal module -arrow-.

Installation is in reverse order of removal, but do the following:

Tightening torque

Component	Nm
Accelerator pedal module to pedal cluster	9

- Vehicles with automatic transmission must "learn" the kickdown function:

⇒ [Repair Manual, Fuel Injection & Ignition, Repair Group 24](#)