Fuel supply system components

Note:

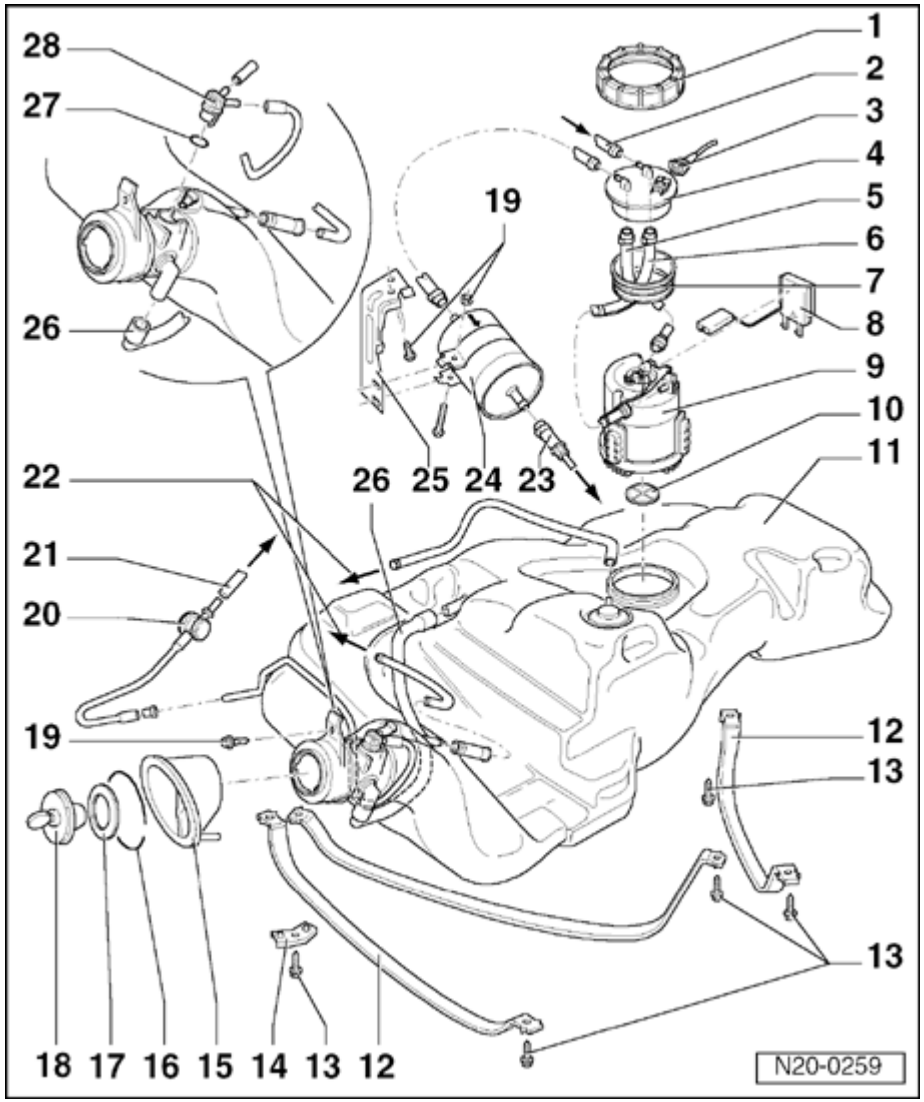
- *Hose connections are secured with either screw, spring or clamp-type clips.*
- *Always replace clamp-type clips or screw or spring-type clips with spring type clips.*
- *Fuel hoses in engine compartment must only be secured with spring-type clips. Do not use clamp or screw-type clips.*
- *VAG 1921 pliers are recommended for installing spring-type clips.*

Observe safety precautions ⇒ Page 20-8

Observe rules of cleanliness ⇒ Page 20-9

Accelerator mechanism, servicing ⇒ Page 20-23

Evaporative emissions system components, servicing ⇒ Page 20-27



Fuel supply system components, removing and installing

Note:

After repairs to fuel supply unit or fuel gauge sender unit are completed, be sure supply and return hoses do not make contact with fuel tank which could cause pump noise transfer.

1 - Collar nut

- Remove and install using tool 3217.

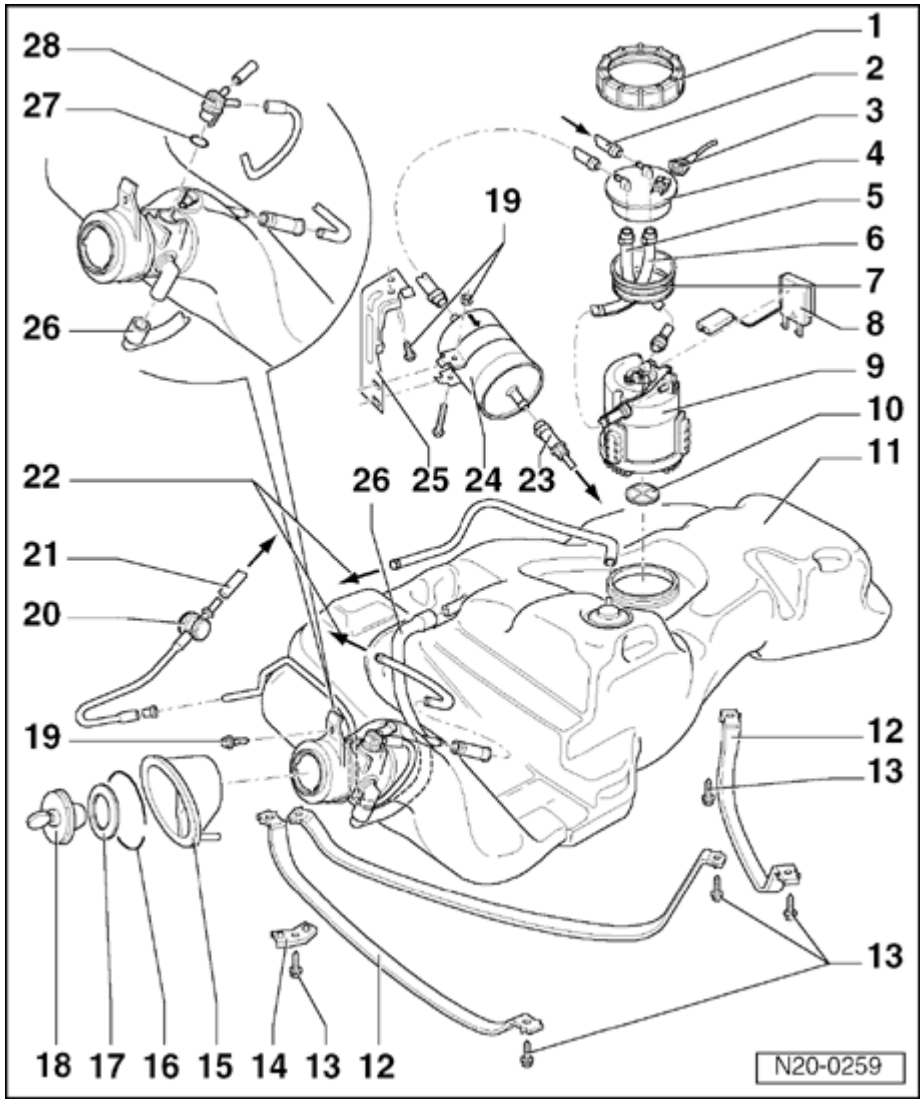
2 - Fuel return line

- Blue
  - Secure with spring-type clips.
- Return line must be securely seated.
  - Secure from fuel pressure regulator bracket

⇒ *Repair Manual, 2.8 Liter VR6 2V Fuel Injection & Ignition, Engine Code(s): AES, Repair Group 24*

3 - 4-pin connector

- Black
- For Fuel Level sensor -G- and Fuel Pump -G6-



4 - Flange

- Note installed position on fuel tank ⇒ Page 20-6 , ⇒ Fig. 1 .

♦ Underside marked with a "V" (for supply) and an "R" (for return) hoses.

5 - Supply hose

6 - Return hose

7 - Sealing ring

- Coat with fuel when installing.

- Replace if damaged.

8 - Fuel Level sensor -G-

9 - Fuel delivery unit

♦ Removing and installing ⇒ Page 20-10

♦ Fuel pump, checking ⇒ Page 20-15

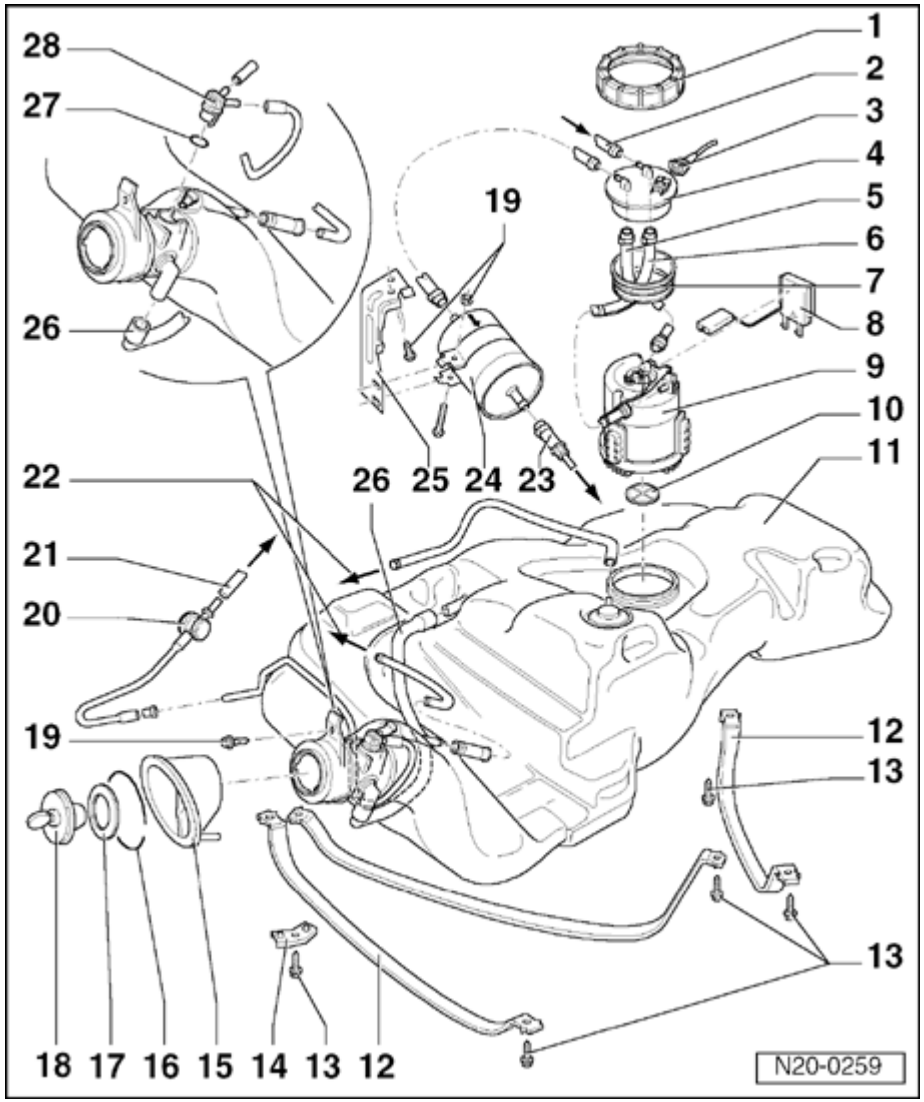
10 - Strainer

- Clean if contaminated.

11 - Fuel tank

♦ Removing and installing ⇒ Page 20-13

- When removing; support using engine/transmission jack VAG 1383 A.



12 - Mounting straps

- Note different lengths.

13 - 25 Nm (18 ft lb)

14 - Bracket

- For mounting straps

15 - Splash shield

16 - Retaining ring

17 - Gasket

- If damaged; replace together with cap as an assembly

18 - Cap

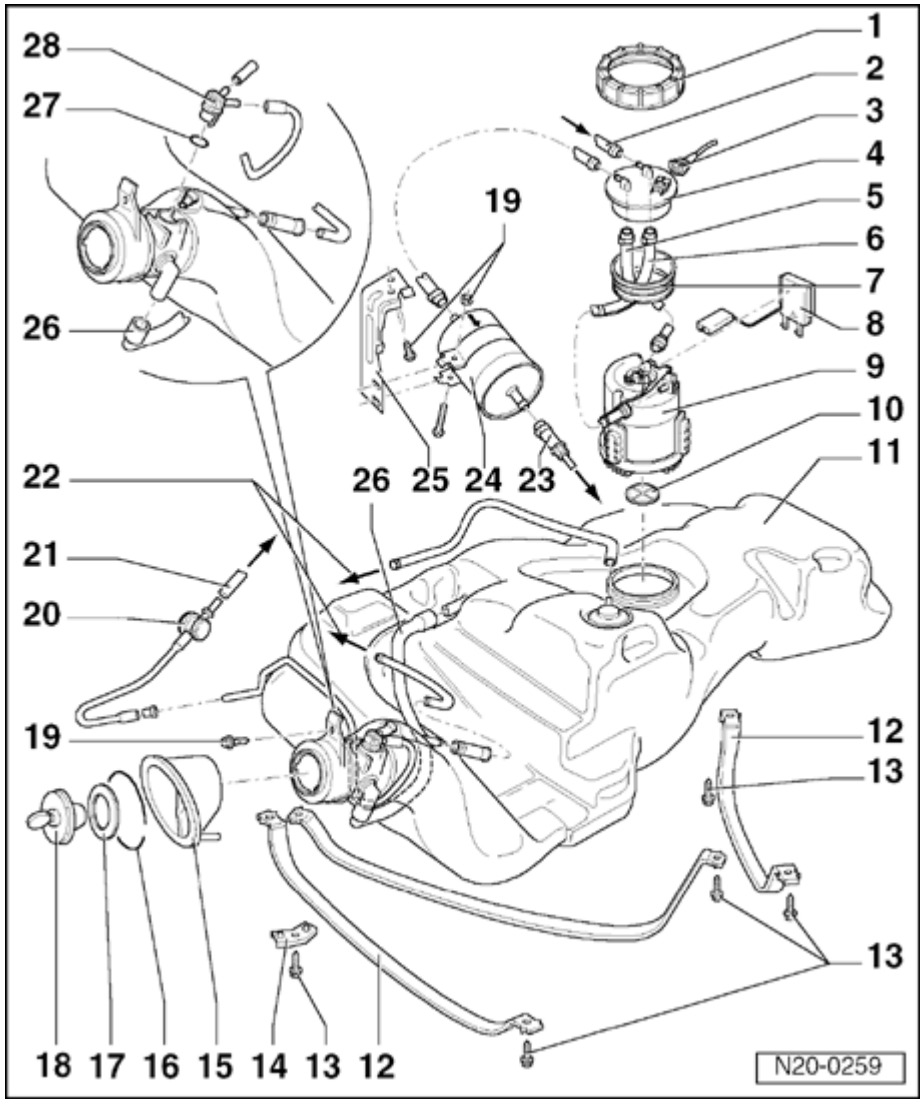
19 - 10 Nm (7 ft lb)

20 - Check valve

- For fuel tank ventilation
- Checking ⇒ Page 20-7 , ⇒ Fig. 3

21 - Breather tube

- To junction piece between EVAP canister and EVAP canister purge regulator valve



22 - Breather tube

- To EVAP canister

23 - Supply line

- Black
- Mount using spring clips
- Must be securely seated
- To fuel supply line (on lower intake manifold)

⇒ *Repair Manual, 2.8 Liter VR6 2V Fuel Injection & Ignition, Engine Code(s): AES, Repair Group 24*

24 - Fuel filter

- Installed position: -arrow- points in direction of flow

25 - Bracket

- For fuel filter

26 - Breather tube

- Fill vent

27 - O-ring

28 - Gravity/vent valve

- Cannot be removed.

- Replace as an assembly together with filler neck.
- Checking ⇒ Page 20-6 , ⇒ Fig. 2

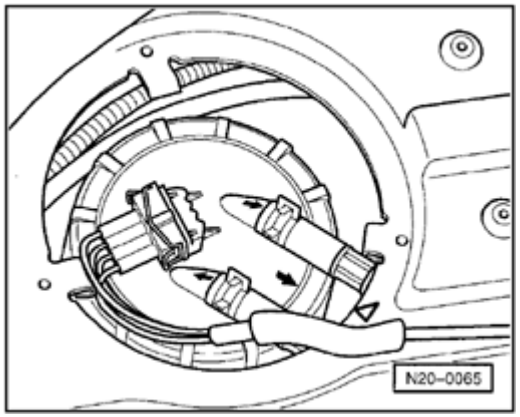


Fig. 1 Fuel delivery unit/flange, installed position

Mark on flange must align with mark on fuel tank.

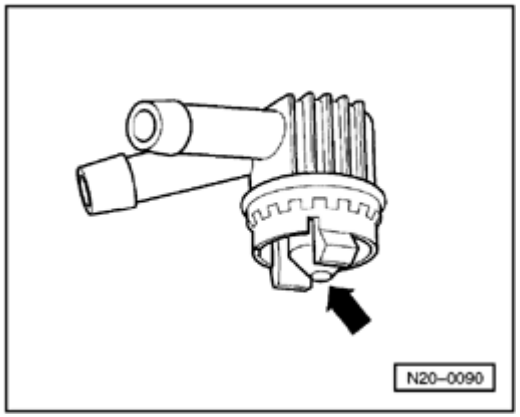


Fig. 2 Gravity/vent valve, checking

- Lever in rest position: No Flow
- Lever pushed in direction of arrow: Flow

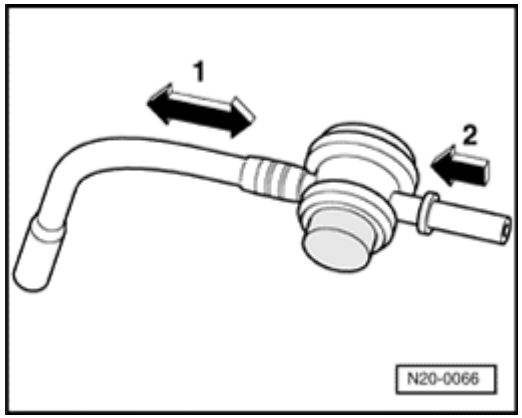


Fig. 3 Check valve, checking

From direction of gravity/vent valve:

- Check valve is open in both directions of flow: arrow -1-.

From direction of EVAP canister/EVAP canister purge regulator valve 1 junction piece:

- Check valve is open in only one flow direction: arrow -2-.

Safety precautions

WARNING!

Fire hazard! Do not smoke or have anything in the area that can ignite fuel.

When removing and installing fuel gauge sending unit or fuel pump (fuel delivery unit) from a filled or partly filled fuel tank; observe the following:

- Before starting work, provide air extraction close to opening for fuel delivery unit in the fuel tank to draw off escaping fumes. If no extraction system is available, use a fan (but DO NOT place fan in path of fumes).

- Wear fuel-resistant disposable protective gloves whenever handling fuel.

WARNING!

Fuel system is under pressure! Before opening system, place a rag around connection and release pressure by slowly loosening connection.

Rules for cleanliness

CAUTION!

When working on fuel system, carefully observe following "Rules for cleanliness".

- Thoroughly clean fuel system line and hose connections as well as surrounding area before disconnecting fuel connections.
- Place removed components on a clean surface and cover them with plastic sheeting or paper. Don't use fluffy rags or materials that could leave lint.
- If repair cannot be done immediately, carefully cover up any opened components.

Only install clean components.

- Only unpack replacement parts at time of installation.
- Do not use parts that have been stored loose or without their protective package (e.g. in tool boxes, etc.).

When fuel system is open:

- Do not work with compressed air if it can be avoided.
- Do not move vehicle if it can be avoided.

Fuel delivery unit, removing and installing

Special tools and equipment

- 3217 Collar wrench

Removing

- Observe safety precautions ⇒ Page 20-8 .

- Switch off ignition.

CAUTION!

Obtain Anti-theft radio code before disconnecting battery ground strap.

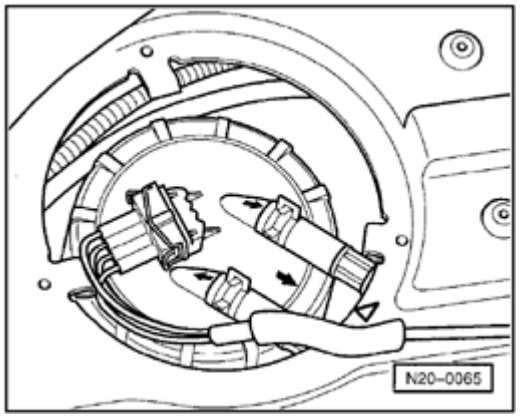
- Disconnect battery ground strap.

- Remove driver's seat.

⇒ *Repair Manual, Body Interior, Repair Group 72*

- Lift carpeting above parking brake lever.

- Remove cover plate.

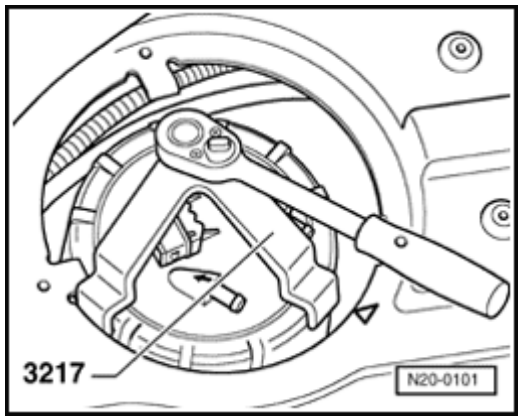


- Disconnect 4-pin connector from flange.

WARNING!

Fuel system is under pressure! Before opening system, place a rag around connection and release pressure by slowly loosening connection.

- Disconnect supply and return lines from flange.



- Remove collar nut using tool 3217.
- Remove flange and seal from opening in fuel tank.
- Release delivery unit by turning left and then out of bayonet connection.
- Remove delivery unit.

WARNING!

If delivery unit contains any fuel, empty it before replacing.

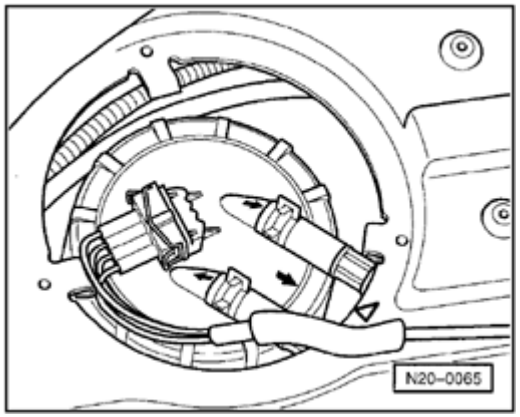
Installing

Note:

Reinstall fuel delivery unit in reverse sequence.

Note:

- *When installing fuel delivery unit, be sure fuel level sender is not bent.*
- *Coat flange seal with fuel when installing.*
- Fuel lines must be correctly located and properly tightened



- *Note installed position of fuel delivery unit flange: marking on flange must align with marking on fuel tank.*
- *Do not interchange supply and return lines (return line is -blue-).*

- *When fuel delivery unit is correctly installed, fuel level sender float*

points in direction of travel A: α *= 25 to 35*$^{\circ}$ *.*

Fuel tank, removing and installing

Special tools and equipment

- 3217 Collar wrench
- VAG 1383A Engine/transmission jack

Removing

Observe safety precautions ⇒ Page 20-8 .

- Switch OFF ignition.

CAUTION!

Obtain radio code before disconnecting battery ground strap.

- Disconnect battery ground strap.
- Drain fuel tank and clean area around filler neck.
- Remove retaining ring and splash shield from filler neck and remove bolt.

- Disconnect fuel tank mount straps.

- Support fuel tank with VAG 1383A engine/transmission jack.

WARNING!

Fuel system is under pressure! Before opening system, place a rag around connection and release pressure by slowly loosening connection.

- Lower jack just enough to allow supply lines, return lines and connector to be pulled from flange

Note:

For vehicles with auxiliary heating, also disconnect additional fuel lines mounted between supply and return lines.

- Lower fuel tank

Installing

Install fuel tank in reverse sequence and note the following:

- Route breather hoses kink free.

- Fuel hoses must be correctly located and tight.

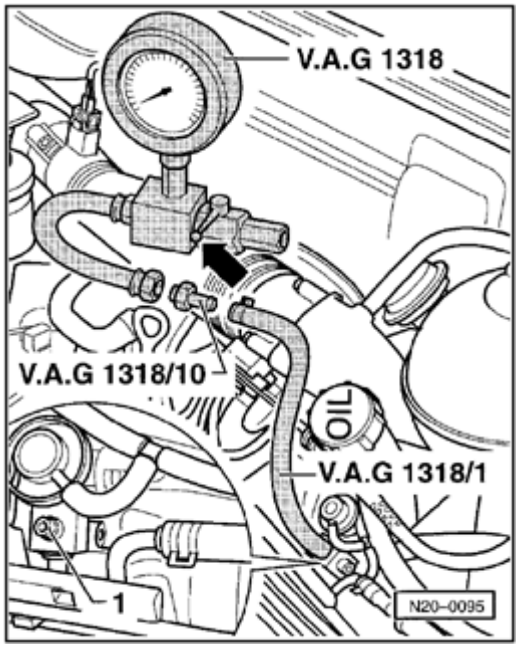
- Do not interchange supply and return lines (return hose is -blue-).

Fuel pumps, checking

Special tools and equipment

- Fluke 83 Multimeter
- VAG 1348/3A Remote control with VAG 1348/3-2 Adaptor cable
- VAG 1466 Fuel analyzer
- VAG 1527B LED tester
- VW 1594 Adaptor kit
- 3217 Collar nut wrench
- VAG 1318 Pressure tester
- VAG 1318/1 Hose
- 1318/10 Adaptor
- 1318/11 Adaptor

- Measuring container
- Wiring diagram



Checking conditions

- Battery voltage: 11.5 Volts minimum

- Fuse 18 OK

- Remove sealing plug -1- on fuel pressure regulator bracket.
- Connect VAG 1318 pressure gauge to test connection using VAG 1318/10 adapter and hose VAG 1318/1.
  - Pressure gauge lever must be closed (-arrow- at right angle to direction of flow)

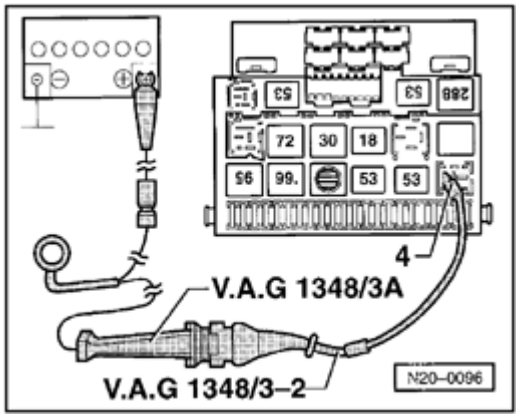
WARNING!

Fuel system is under pressure! Before opening system, place a rag around connection and release pressure by slowly loosening connection.

- Start engine and let idle.
- Check fuel pressure.
  - Specification: approx. 2.5 bar

If fuel pressure does not build-up:

- Switch off ignition.



- Remove cover in front of fuse/relay panel.

- Remove fuel pump (FP) relay -J17- from fuse relay panel position 12.

Note:

- *If tools are required to pull relays or control modules from relay panel, first disconnect battery ground.*

- *Obtain radio Anti-theft code before disconnecting battery ground strap.*

- Connect remote control VAG 1348/3A between terminal 4 and battery positive (+) using adapter cable VAG 1348/3-2.

- Operate remote control.

If fuel pressure builds-up:

- Check activation of fuel pump relay.

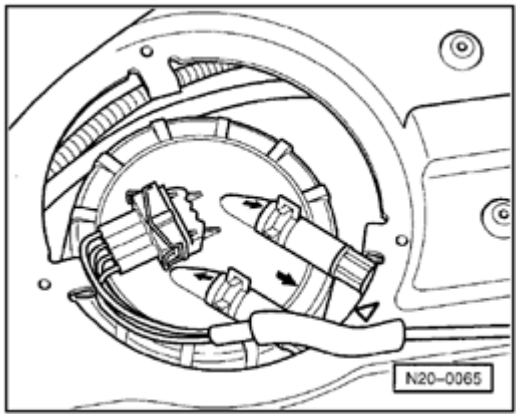
If fuel pressure is not built-up.

- Remove driver's seat.

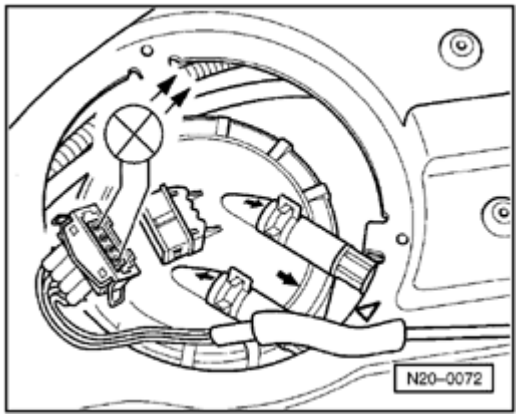
⇒ *Repair Manual, Body Interior, Repair Group 72*

- Lift carpeting above parking brake lever.

- Remove access plate.



- Disconnect 4-pin connector from fuel tank flange.

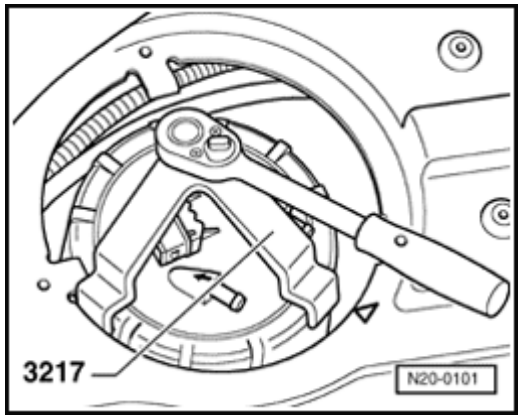


- Connect VAG 1527B LED tester to connector outer terminals using jumper wires from VW 1594 adaptor kit.
- Operate remote control.
  - ♦ LED tester must light up.

If LED does not light up:

- Locate and eliminate open circuit using wiring diagram.

If LED lights up (voltage supply OK):



- Unscrew collar nut using 3217 tool.
- Check for good wire connection between flange and fuel pump.

If no open circuit can be found:

- Replace malfunctioning fuel pump ⇒ Page 20-10 .

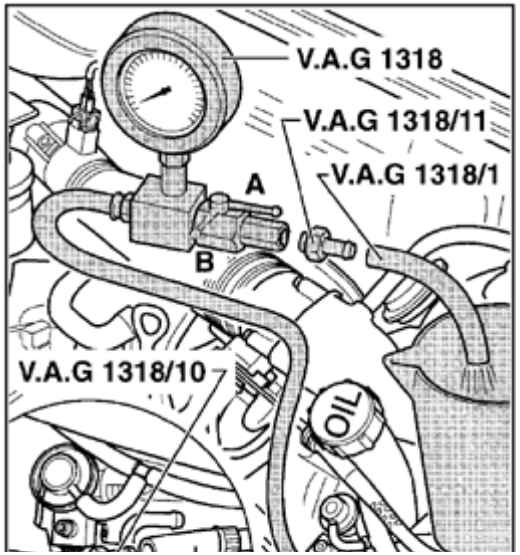
Delivery rate, checking

- Voltage supply OK
- VAG 1348/3A Remote control connected

- Remove filler cap from fuel tank filler neck.

WARNING!

Fuel system is under pressure! Before opening system, place a rag around connection and release pressure by slowly loosening connection.

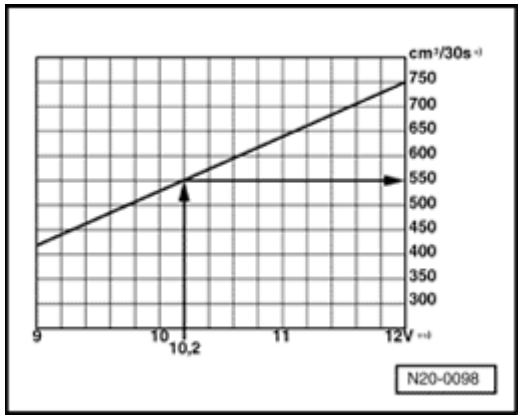


- Disconnect fuel supply line -1- from fuel pipe.
- Connect the VAG 1318 pressure gauge to fuel supply line -1- using 1318/10 adapter.
- Push VAG 1318/1 hose on adapter VAG 1318/11 on pressure gauge and hold hose in measuring container.
- Open pressure gauge tap.
  - Lever must point in direction of flow -A-.
- Operate VAG 1348/3A remote control and slowly close lever until pressure gauge shows 3 bar. Once you reached pressure, do not move lever any further.

- Empty measuring container.

- Measure battery voltage using Fluke 83 multimeter.

- Operate remote control for 30 seconds.



- Compare quantity of fuel delivered with specification.

*) Minimum delivery in cc's per 30 seconds

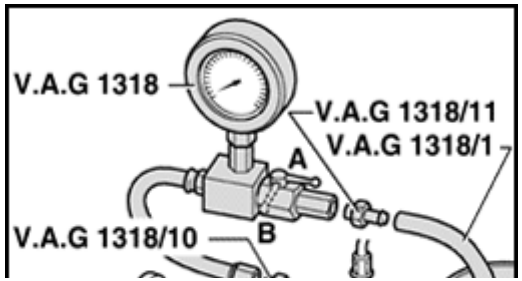
**) Voltage at fuel pump (running) with engine not running (approx. 2 volts less than battery voltage)

Example:

For this example, 12.2 volts was measured at battery. If voltage at pump is approx. 2 volts less than battery voltage,it equals a minimum delivery of 550 cc's in 30 seconds.

If minimum delivery rate is not obtained:

- Check fuel lines for possible restrictions, kinks or blockages.



- Disconnect supply line -1- from fuel filter inlet.
- Connect VAG 1318 pressure gauge to hose using 1318/10 adaptor.
- Repeat delivery rate check.

If minimum delivery rate was not reached:

- Replace fuel filter.

If minimum delivery rate was still not reached:

- Remove fuel delivery unit and inspect strainer for clogging ⇒ Page 20-10 .

If you did not find malfunctions to this point, fuel pump is inoperative.

- Replace fuel delivery unit ⇒ Page 20-10 .

If you measured minimum delivery but you still suspect an intermittent fuel supply system malfunction:

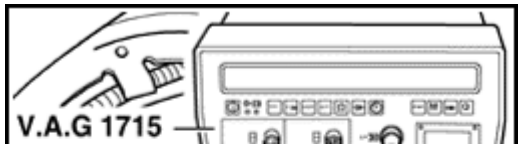
- Reconnect all disconnected fuel lines.

- Remove driver's seat.

⇒ *Repair Manual, Body Interior, Repair Group 72*

- Lift carpet above parking brake lever.

- Remove cover plate.



- Connect Fluke 83 multimeter to red/yellow wire with Fluke current measuring adaptor.

- Start engine and let idle.
- Measure fuel pump amperage draw.
    - Specification: 8 amps maximum

Note:

If fuel system malfunction is intermittent, you can also perform check during a test drive with a 2nd technician to read data.

If amperage draw is too high, fuel pump is malfunctioning.

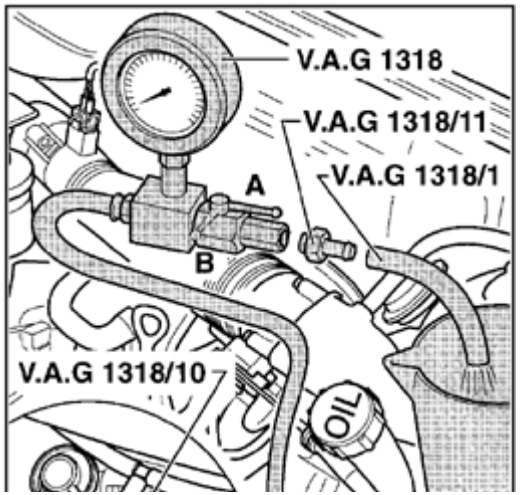
- Replace fuel delivery unit ⇒ Page 20-10 .

Fuel pump check valve, checking

- VAG 1348/3A Remote control connected
- VAG 1318 Pressure gauge connected to fuel supply line

Note:

This setup checks entire fuel supply line from fuel delivery unit to VAG 1318 pressure gauge.

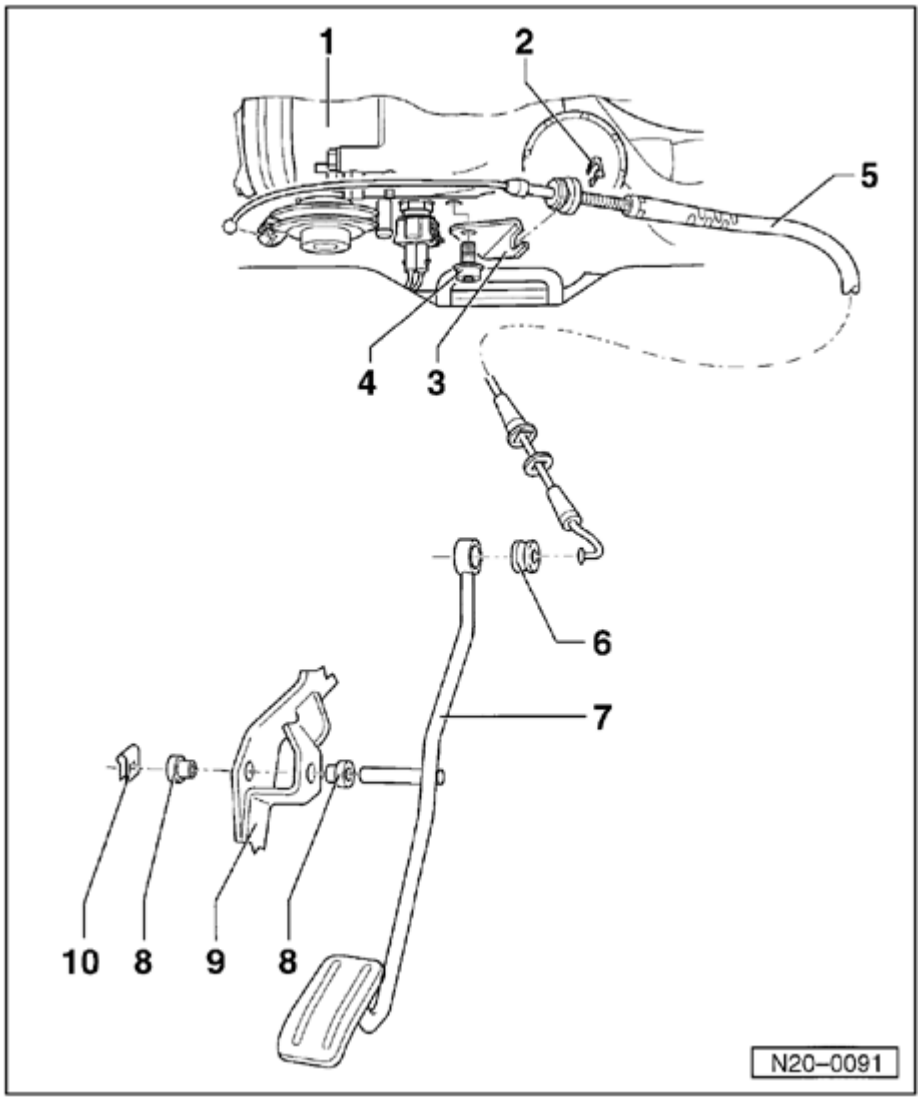


- Close pressure gauge tap position -B- (lever at right angle to direction of flow).
- Operate remote control at short intervals until a pressure of approx. 3 bar has built-up.
- If pressure builds up too high, lower excess pressure by carefully opening tap.

WARNING!

Danger of fuel spray when opening pressure tap. Hold open end of pressure gauge over a suitable container to catch over spray.

- Observe pressure drop.
  - After 10 minutes pressure must not drop below 2.2 bar.
- Check line connections for leaks and/or replace fuel delivery unit if necessary ⇒ Page 20-10 .



Accelerator mechanism, servicing

1 - Throttle Valve Control Module -J338-

2 - Tab

3 - Support bracket

- For accelerator cable

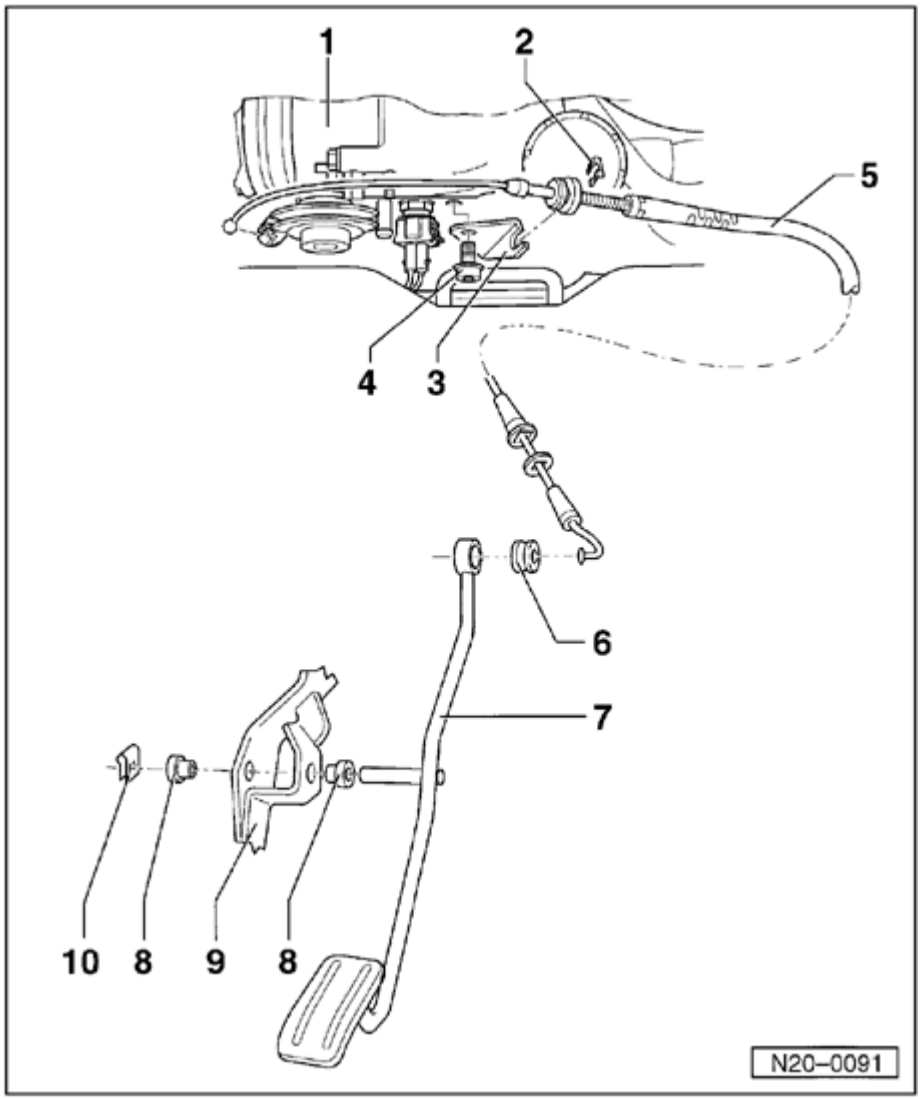
4 - 25 Nm (18 ft lb)

5 - Accelerator cable

- Adjusting ⇒ Page 20-25
- Removing:
  - Disconnect accelerator cable at accelerator pedal bracket. Support bracket and Throttle Valve Control Module. Break off spreader clips (in vehicle interior) and pass accelerator cable through to engine compartment.
- Do not re-use damaged accelerator cable, ALWAYS replace.

6 - Rubber bushing

7 - Accelerator pedal



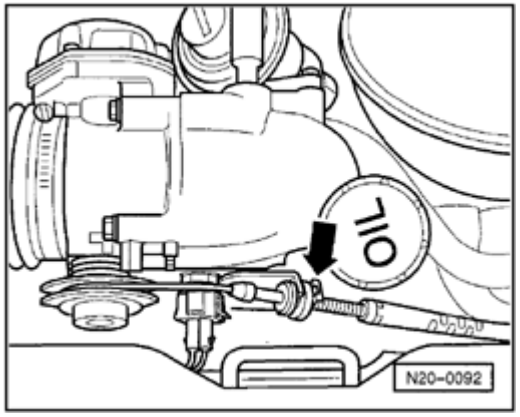
8 - Bushing

9 - Accelerator pedal bracket

10 - Circlip

Throttle cable, adjusting

Vehicles with manual transmission



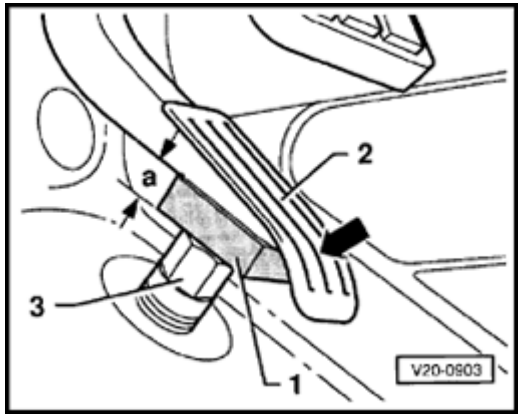
- Adjust throttle cable by moving support bracket retainer -arrow- until Wide Open Throttle position is obtained at throttle body lever.

Vehicles with automatic transmission

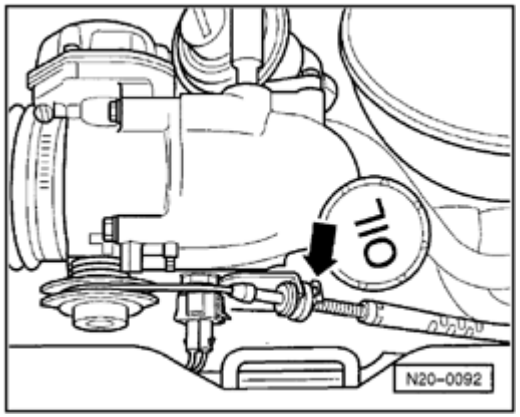
Special tools and equipment

- Fluke 83 Multimeter
- VW 1594 Adaptor kit
- 11 mm Spacer

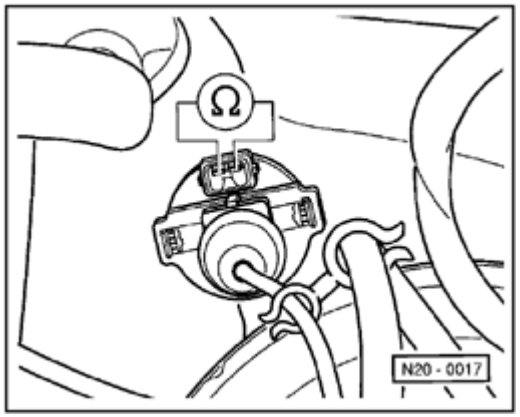
Work sequence



- Clamp spacer -1- (a = 11 mm) between accelerator pedal -2- and stop -3-, hold accelerator pedal in this position.



- Fully open throttle body by pulling on outer cable and secure in this position with retainer -arrow-.
- Release accelerator pedal.
- Disconnect 2-pin connector from Kick Down switch -F8- in engine compartment on bulkhead.



- Connect multimeter to kick-down switch with jumper wires from VW 1594 adaptor kit.
- Measure switch resistance.
  - Specification: ∞ Ω (open)
- Slowly move accelerator pedal in direction of Wide Open Throttle (WOT).

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

- At this point, pedal must be just off the stop.