



Power steering pump, reservoir and hydraulic lines, assembly overview

Assembly overview for vehicles with 4- cylinder engine

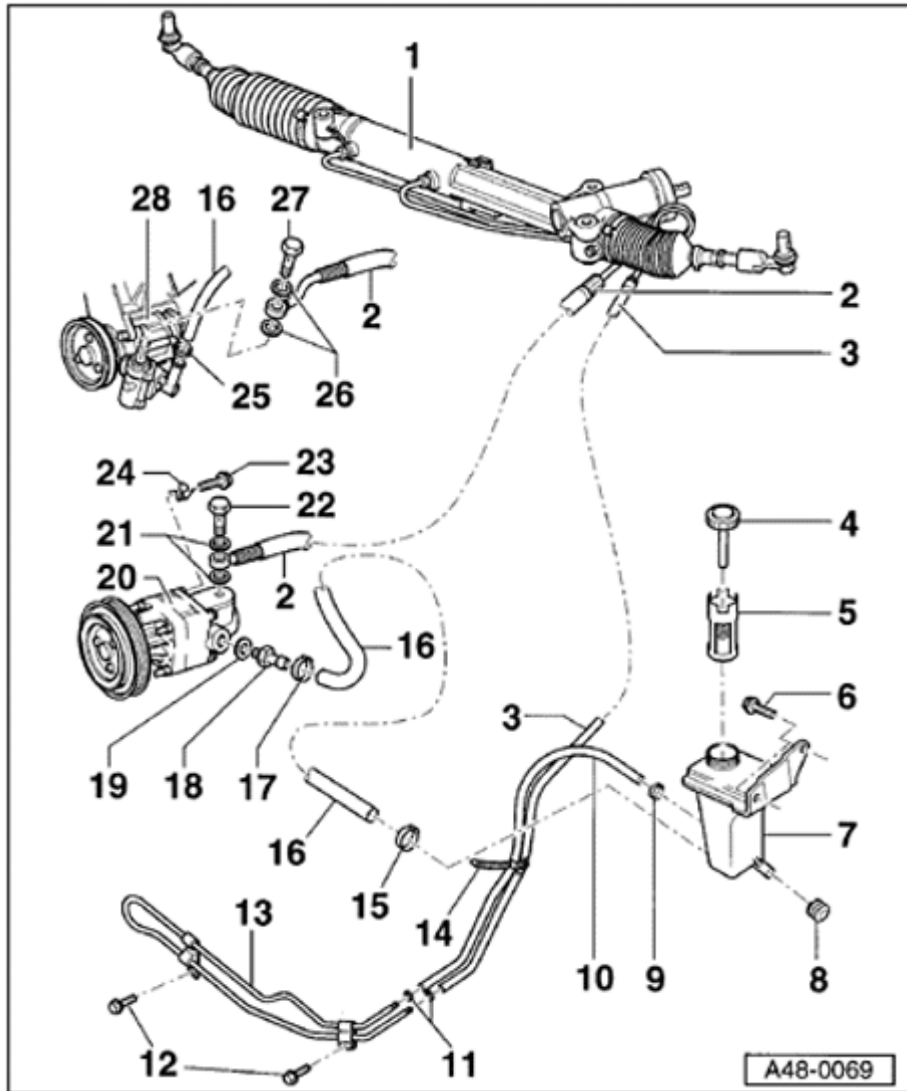
It is not intended that repair work be carried out on the power steering pump. If complaints are received determine cause with the help of pressure tests, leakage test and fault finding, steering gear No. 10. If a fault exists replace power steering pump.

Notes:

- ◆ *If reservoir fluid level is low then check steering system for leaks.*
- ◆ *In the case of leaks at the line connections first tighten connections and wipe dry then recheck for leaks.*
- ◆ *Pumps supplied as spare parts are not filled with oil. Therefore it is essential to fill the pump with hydraulic oil G 002 000 and to rotate pump by hand, otherwise the pump may be damaged or be noisy during operation.*

◆ *Type of oil: hydraulic oil G 002 000*

◆ *Oil system capacity: 0.7 ... 0.9 ltr.*



1 - Power steering gear

2 - Pressure hose

3 - Return hose

4 - Cap with dip stick

◆ Checking oil level ⇒ [Page 48-70](#)

5 - Strainer

6 - Hex bolt, 9 Nm

7 - Reservoir

8 - Rubber mounting

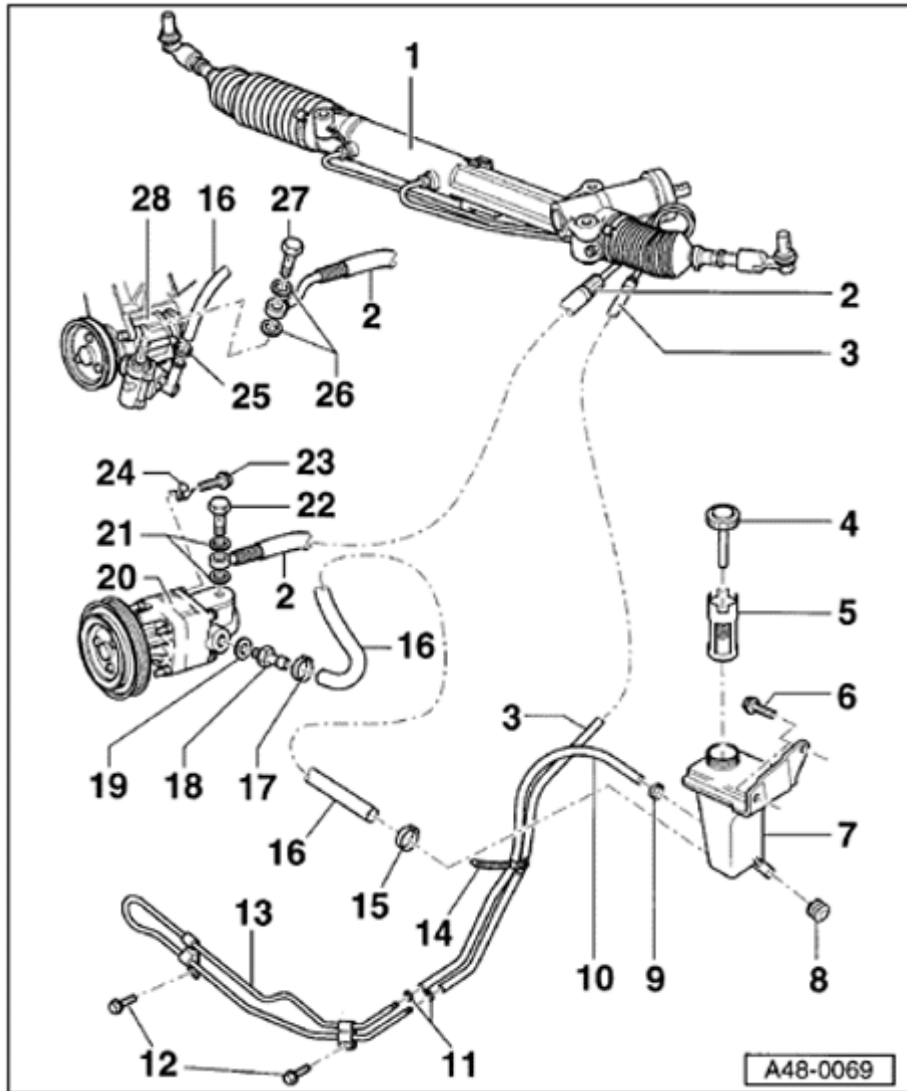
9 - Hose clip

◆ Tension with VAG 1275

◆ Always replace

10 - Return hose

Between reservoir and cooling line

**11 - Hose clip**

- ◆ Tension with VAG 1275
- ◆ Always replace

12 - Hex bolt, 18 Nm**13 - Cooling line****14 - Cable tie****15 - Hose clip**

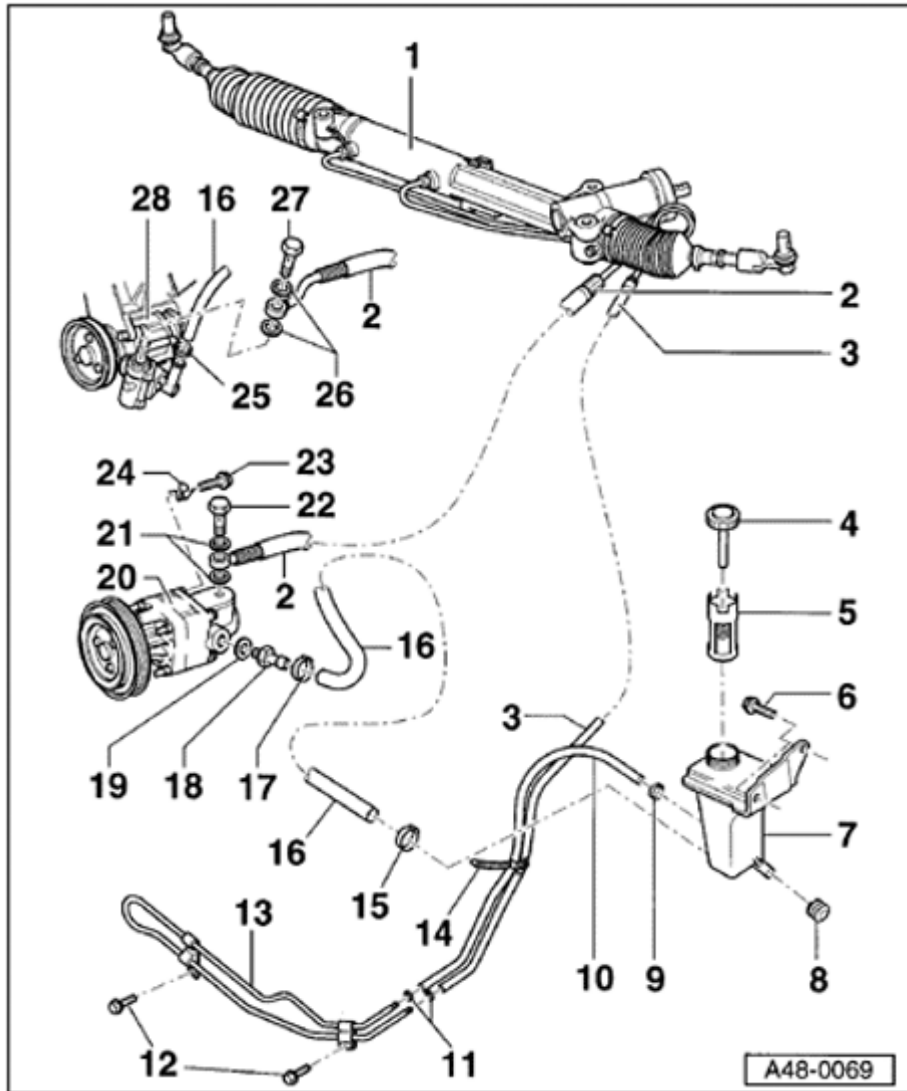
- ◆ Tension with VAG 1275
- ◆ Always replace

16 - Suction hose**17 - Hose clip**

- ◆ Tension with VAG 1275
- ◆ Always replace

18 - Threaded union, 50 Nm**19 - Oil seal, 18 x 24**

- ◆ Always replace



20 - Power steering pump

- ◆ Checking delivery pressure ⇒ [Page 48-80](#)
- ◆ Fill with oil before installing ⇒ Note Page ⇒ [Page 48-76](#)

21 - Oil seal, 16 x 22

- ◆ Always replace

22 - Banjo bolt, 50 Nm

23 - Hex bolt, 18 Nm

24 - Securing clip

25 - Hose clip

- ◆ Tension with VAG 1275

- ◆ Always replace

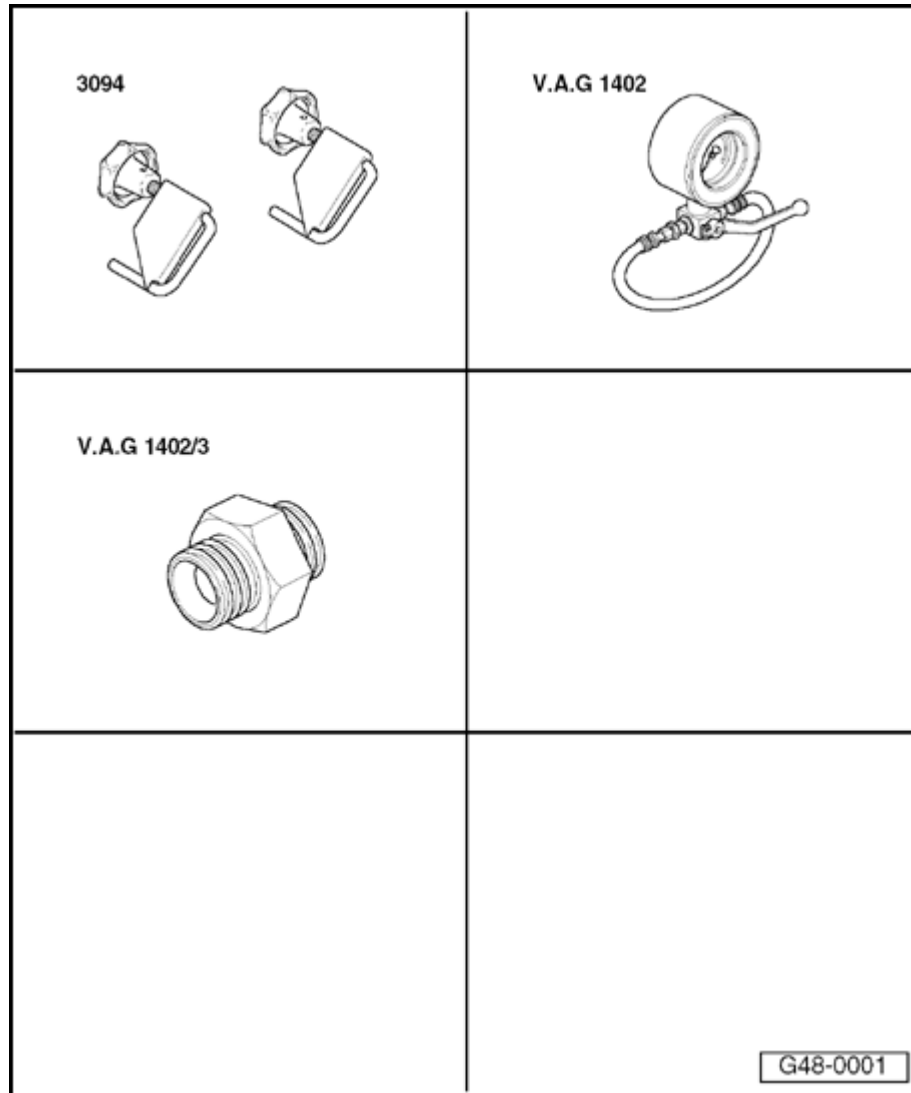
26 - Oil seal, 16 x 22

- ◆ Always replace

27 - Banjo bolt, 50 Nm

28 - Power steering pump for TDI

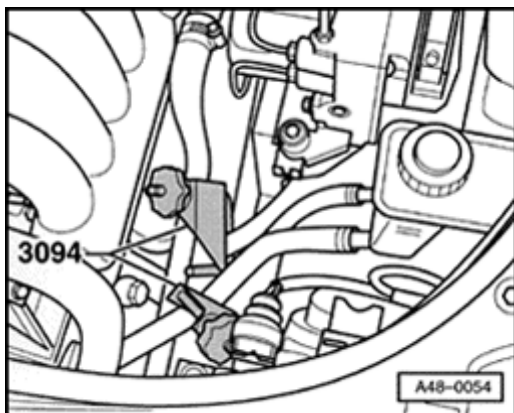
- ◆ Checking delivery pressure ⇒ [Page 48-80](#)
- ◆ Fill with oil before installing ⇒ Note Page ⇒ [Page 48-76](#)



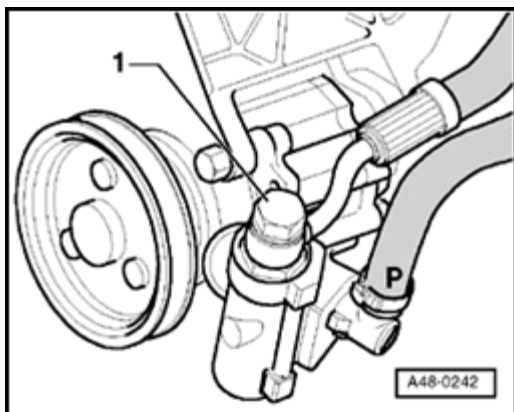
Power steering pump delivery pressure for vehicles with 4-cylinder engine, checking

Special tools, workshop equipment, test and measuring appliances and aux. items required

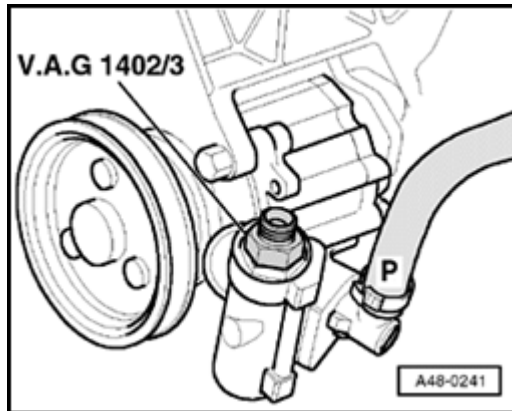
- ◆ 3094 Hose clamps
- ◆ VAG 1402 Power steering test module
- ◆ VAG 1402/3 Adapter



- A**
- Clamp off intake and return lines using hose clamps -3094-.
 - Position drip tray underneath.



- A**
- Remove banjo bolt -1- and place pressure line to side.



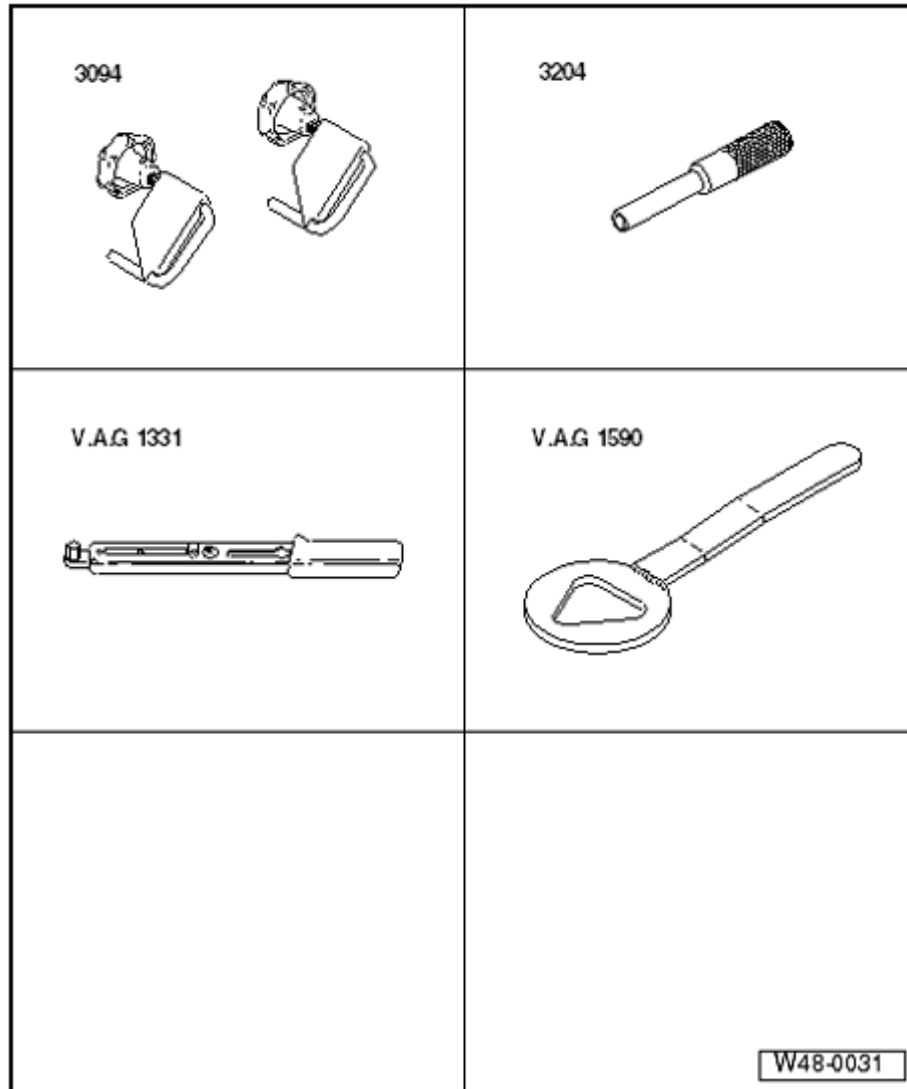
A

- Screw adapter -VAG 1402/3- into power steering pump in place of banjo bolt.
- Screw gauge -VAG 1402- onto adapter -VAG 1402/3-.
- Close gauge shut-off valve (lever to left).
- Remove hose clamps -3094-.
- Start engine and if necessary add fluid to reservoir.
- Read off gauge pressure with engine at idling speed (do not measure longer than 10 seconds). Specification: 110 - 120 bar.

Note:

If the specifications are not reached, replace power steering pump ⇒ [Page 48-83](#) .

- Check hydraulic oil level ⇒ [Page 48-70](#) .
- Check steering system for leaks ⇒ [Page 48-73](#) .
- Bleed steering system ⇒ [Page 48-72](#) .



Power steering pump for vehicles with 4 or 5-cylinder engine, removing and installing

Special tools, workshop equipment, test and measuring appliances and aux. items required

- ◆ 3094 Hose clamps
- ◆ 3204 Locking pin
- ◆ VAG 1331 Torque wrench
- ◆ VAG 1590 Water pump wrench

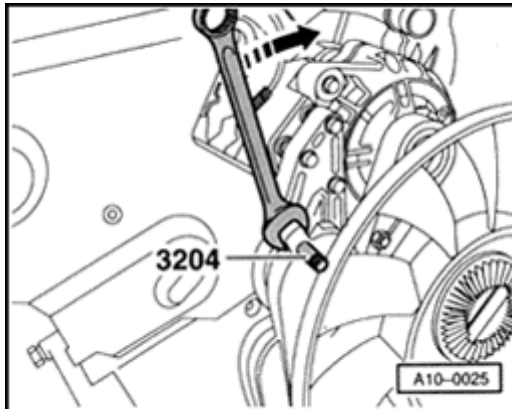


Removing

- Remove engine noise insulation.
- Set lock carrier to service position

⇒ [Repair Manual, Body Exterior, Repair Group 50; Body front lock carrier service position](#)

Removing ribbed V-belt on vehicles with 4-cyl. gasoline engine

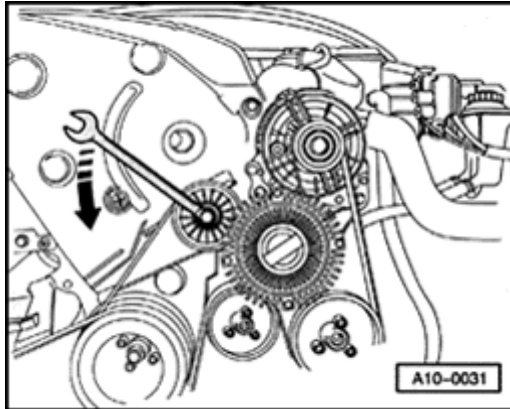


A

- Turn tensioning device in direction of arrow to relieve tension on ribbed belt.
- Secure with special tool -3204-.

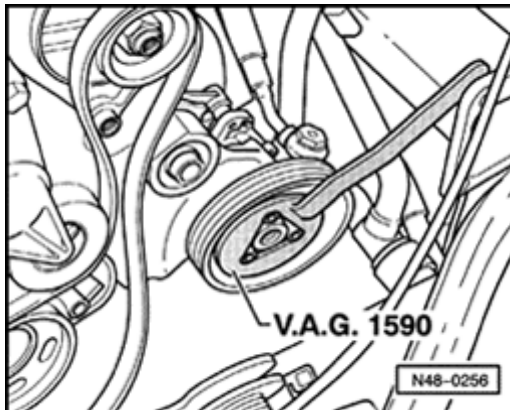


Removing ribbed V-belt on vehicles with 4-cyl. diesel engine

**A**

- Turn tensioning device in direction of arrow to relieve tension on ribbed belt.

This work sequence only affects vehicles with 4-cyl. gasoline engine

**A**

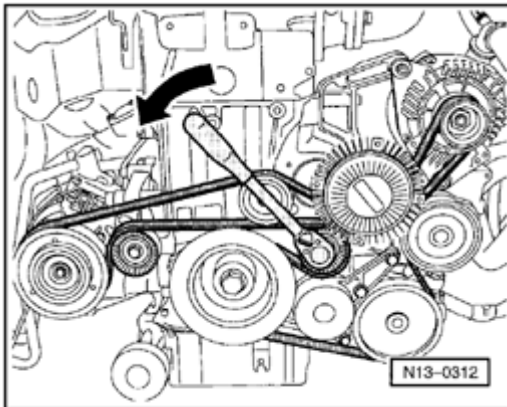
- Remove coolant pump ribbed belt pulley.
- Remove ribbed belt.
- Remove power steering pump ribbed belt pulley.

It may be necessary to file out corners of tool VAG 1590



This work sequence only affects vehicles with 5-cylinder engine.

- Loosen power steering pump belt pulley hex socket head bolt.
- Mark direction of rotation of ribbed belt.
- Remove radiator fan from viscous coupling.

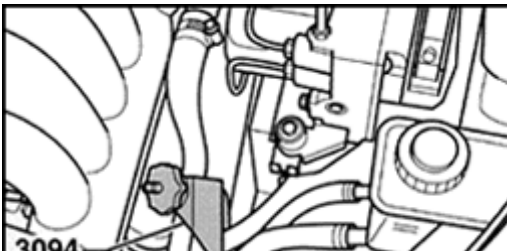


A

- Turn tensioning roller to left (arrow) until ribbed V-belt tension is relieved.
- Remove ribbed belt.

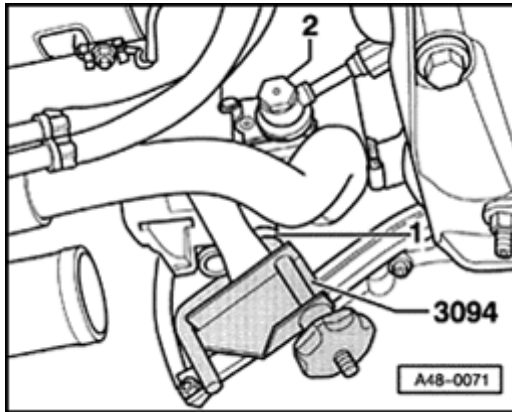
For ease of illustration the routing is shown without the lock carrier being in position

The continued work sequence is valid for all engines



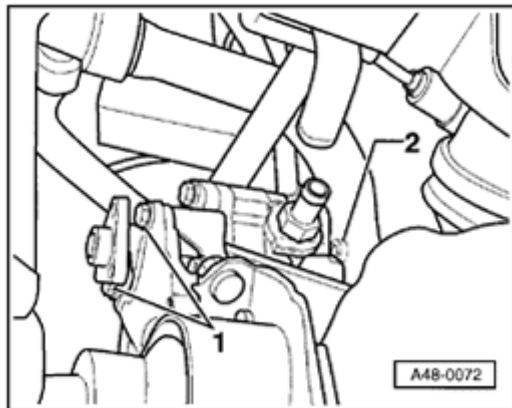
A

- Clamp off intake and return lines using hose clamps -3094-.



A

- Position drip tray underneath.
- Remove hose clamp -1- from suction hose.
- Pull off suction hose, remove from retainer and place to side.
- Unbolt pressure hose -2-, 22 mm AF.



A

- Remove hex bolts -1- and hex socket head bolt -2-.
- Take out pump.



Installing

- Fill power steering pump with hydraulic oil.

Fill pump with oil via suction union.

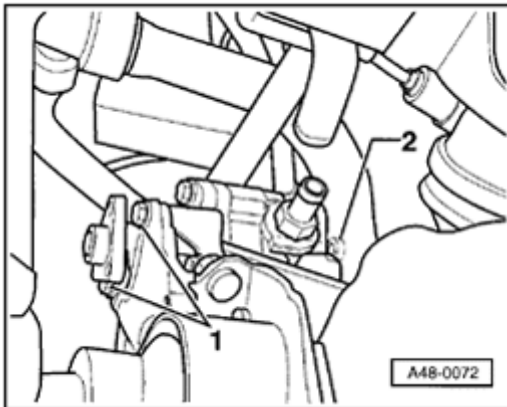
- Turn hub by hand until oil emits from pressure side.

A

- Tighten bolts -1- and -2- to 20 Nm.

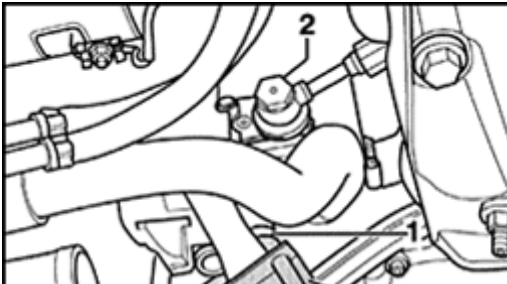
Installation is continued in reverse sequence

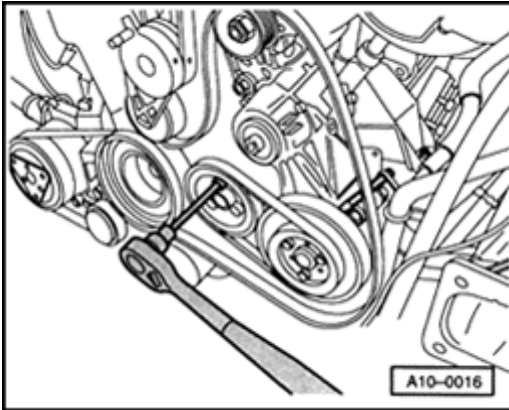
- Install new sealing rings onto banjo bolt.



A

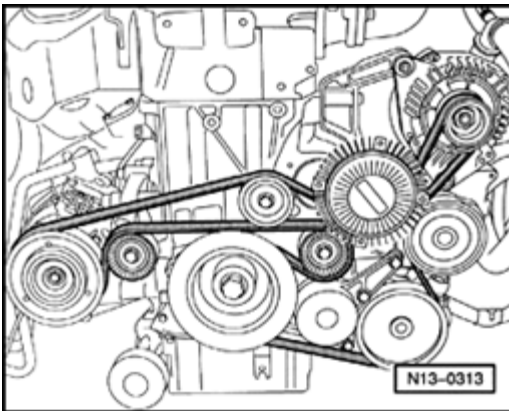
- Tighten pressure hose banjo bolt -2- ⇒ [Page 48-79](#) , item 22 .
- Install suction hose.





A

- Tighten coolant/power steering pump pulley hex socket head bolts to 25 Nm.
- Install radiator fan to viscous coupling.



A

- Install ribbed belt.

Note:

When installing the belt make sure it is correctly seated in the pulley.

For ease of illustration the routing is shown without the lock carrier being in position

- Top up hydraulic oil G 00200.
- Install bumper
- Start engine and check belt running.
- Check hydraulic oil level ⇒ [Page 48-70](#) .
- Check steering system for leaks ⇒ [Page 48-73](#) .

- Bleed steering system ⇒ [Page 48-72](#) .

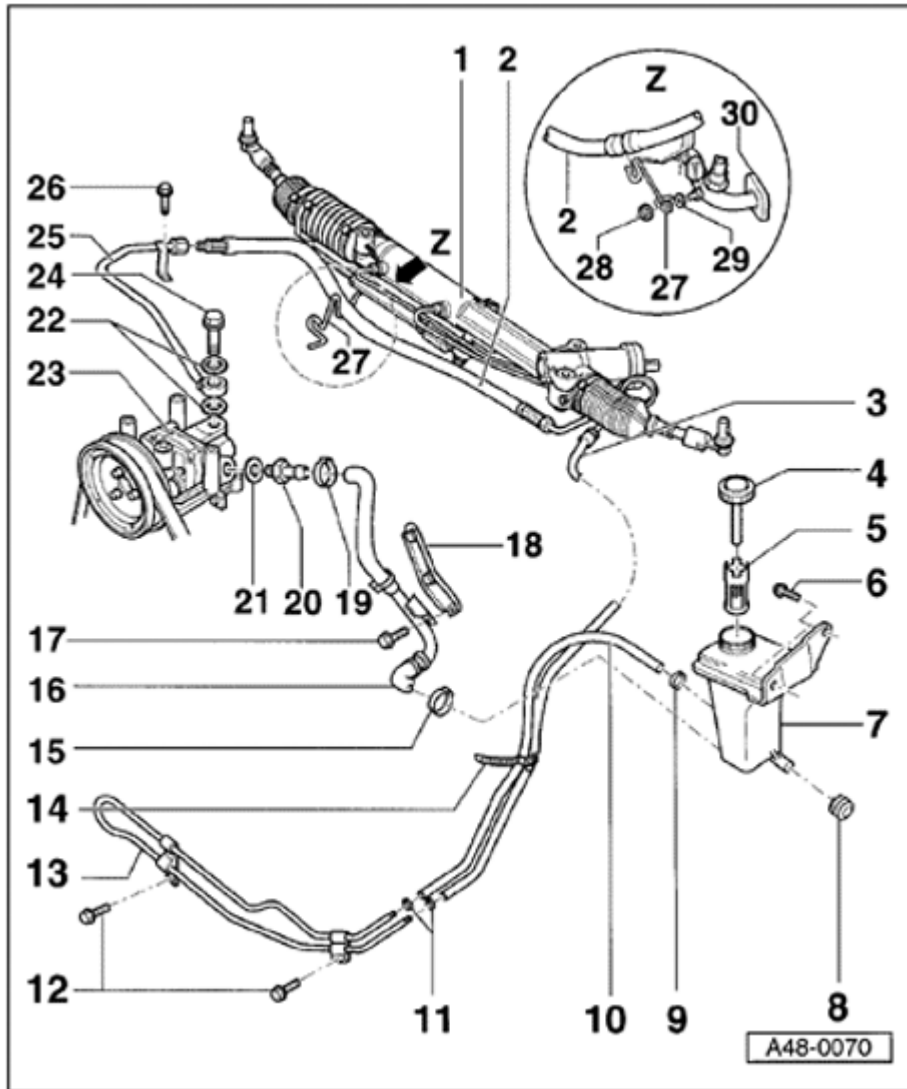


Assembly overview for vehicles with 6-cylinder injection engine,

It is not intended that repair work be carried out on the power steering pump. If complaints are received determine cause with the help of pressure tests.

Notes:

- ◆ *If reservoir fluid level is low then check steering system for leaks.*
- ◆ *In the case of leaks at the line connections first tighten connections and wipe dry then recheck for leaks.*
- ◆ *Pumps supplied as spare parts are not filled with oil. Therefore it is essential to fill the pump with hydraulic oil G 002 000 and to rotate pump by hand, otherwise the pump may be damaged or be noisy during operation.*
- ◆ *Type of oil: hydraulic oil G 002 000*
- ◆ *Oil system capacity: 0.7 - 0.9 liter.*



1 - Power assisted steering gear

2 - Pressure hose

3 - Return hose

4 - Cap with dip stick

◆ Checking oil level ⇒ [Page 48-70](#)

5 - Strainer

6 - Hex bolt, 9 Nm

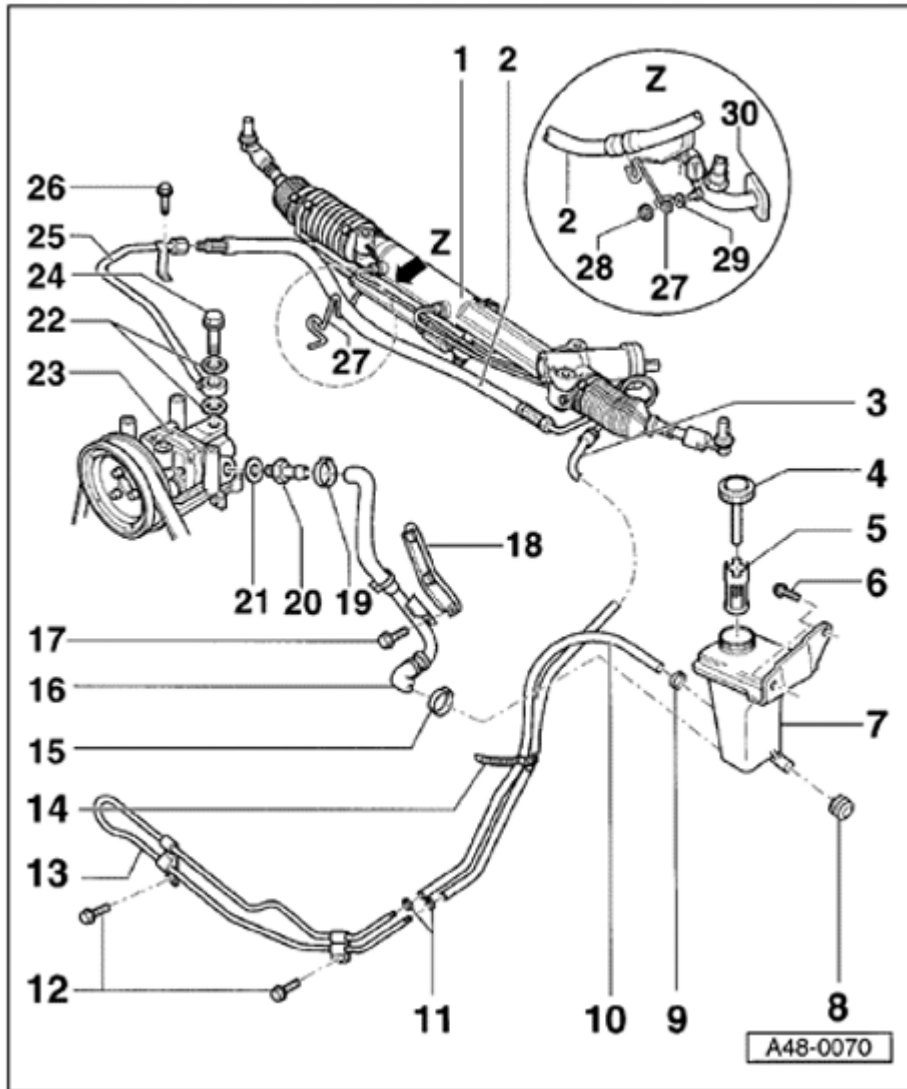
7 - Reservoir

8 - Rubber mounting

9 - Hose clip

◆ Tension with VAG 1275

◆ Always replace



10 - Return hose

Between reservoir and cooling line

11 - Hose clip

- ◆ Tension with VAG 1275
- ◆ Always replace

12 - Hex bolt, 10 Nm

13 - Cooling line

14 - Cable tie

15 - Hose clip

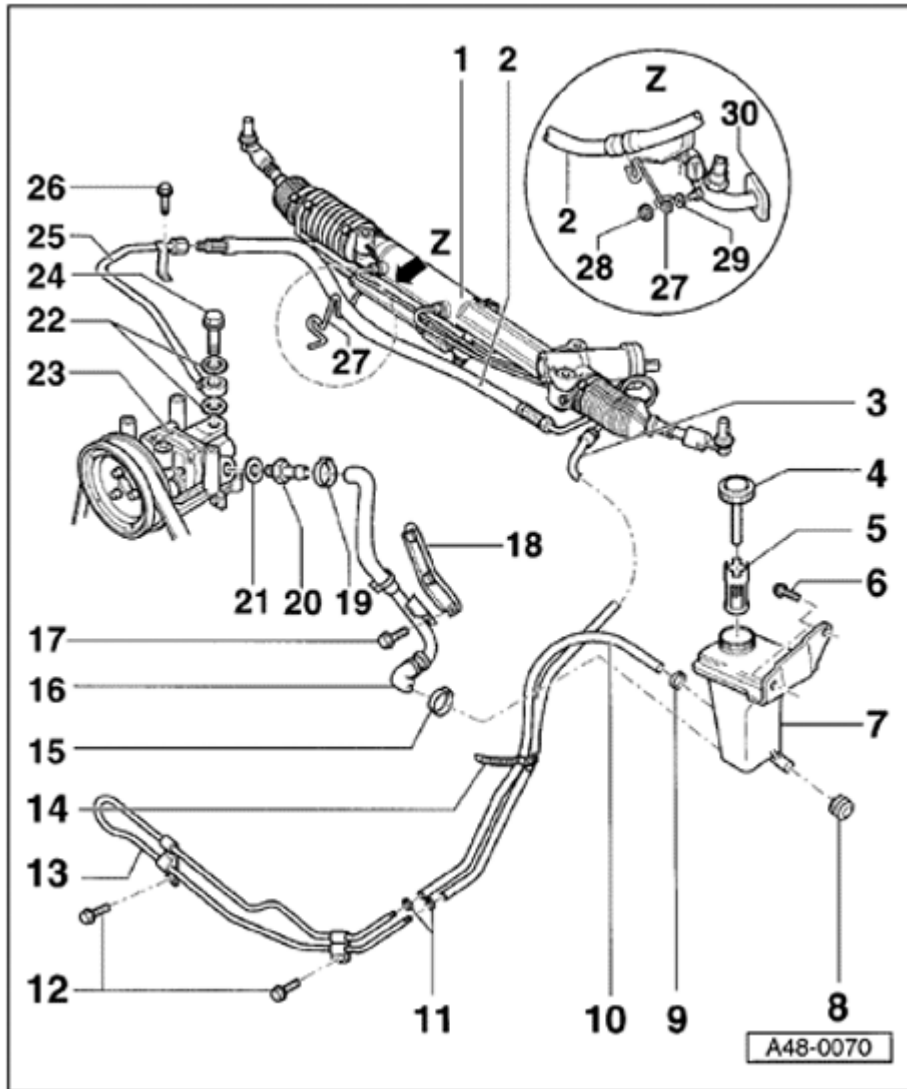
- ◆ Tension with VAG 1275
- ◆ Always replace

16 - Suction hose

17 - Hex bolt, 8 Nm

18 - Retainer

- ◆ Bolted to cylinder head



19 - Hose clip

- ◆ Tension with VAG 1275
- ◆ Always replace

20 - Threaded union, 50 Nm

21 - Oil seal, 18 x 24

- ◆ Always replace

22 - Oil seal, 16 x 22

- ◆ Always replace

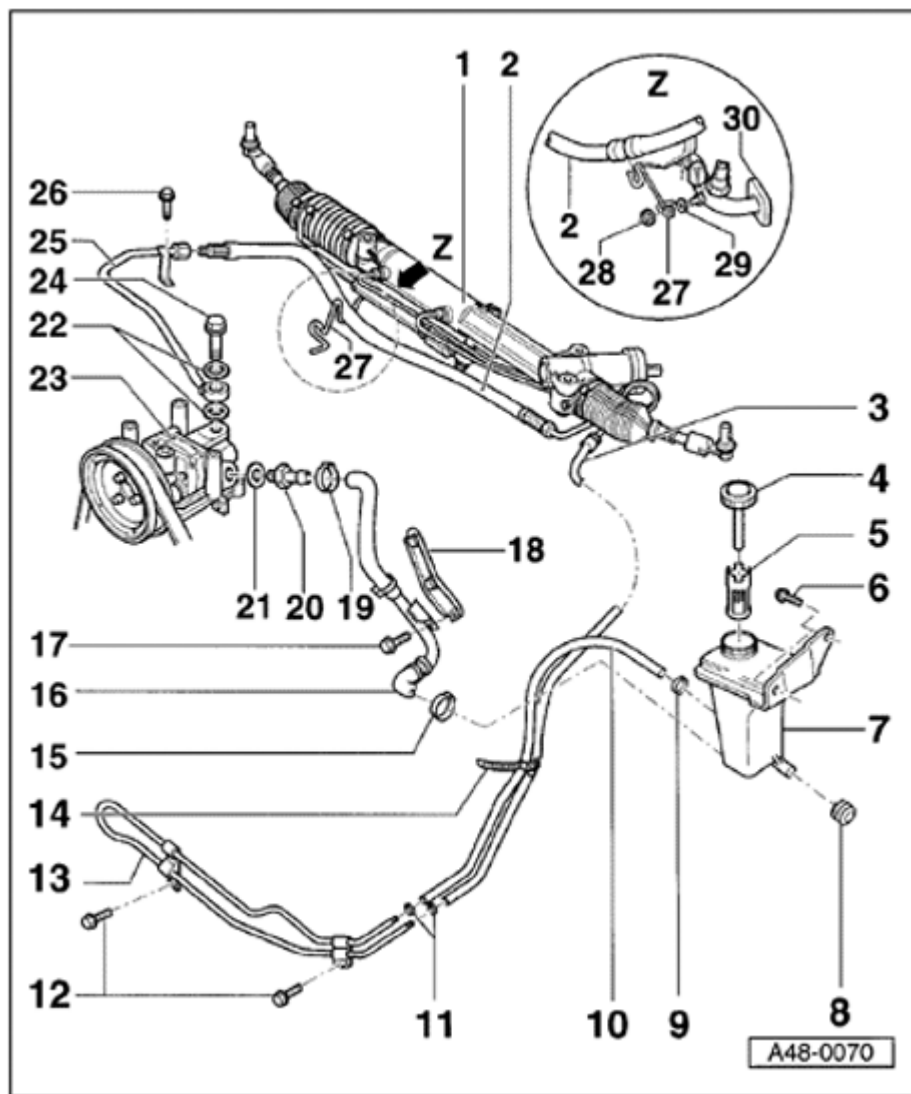
23 - Power steering pump

- ◆ Checking delivery pressure ⇒ [Page 48-95](#)
- ◆ Fill with oil before installing ⇒ Note page ⇒ [Page 48-90](#)

24 - Banjo bolt, 50 Nm

25 - Pressure hose

- ◆ Tighten to 40 Nm
 - Screw onto pressure hose, when doing this counter-hold on pressure hose hex.
- ◆ Bolted to intake line with hex bolt -item 26-.



26 - Hex bolt, 8 Nm

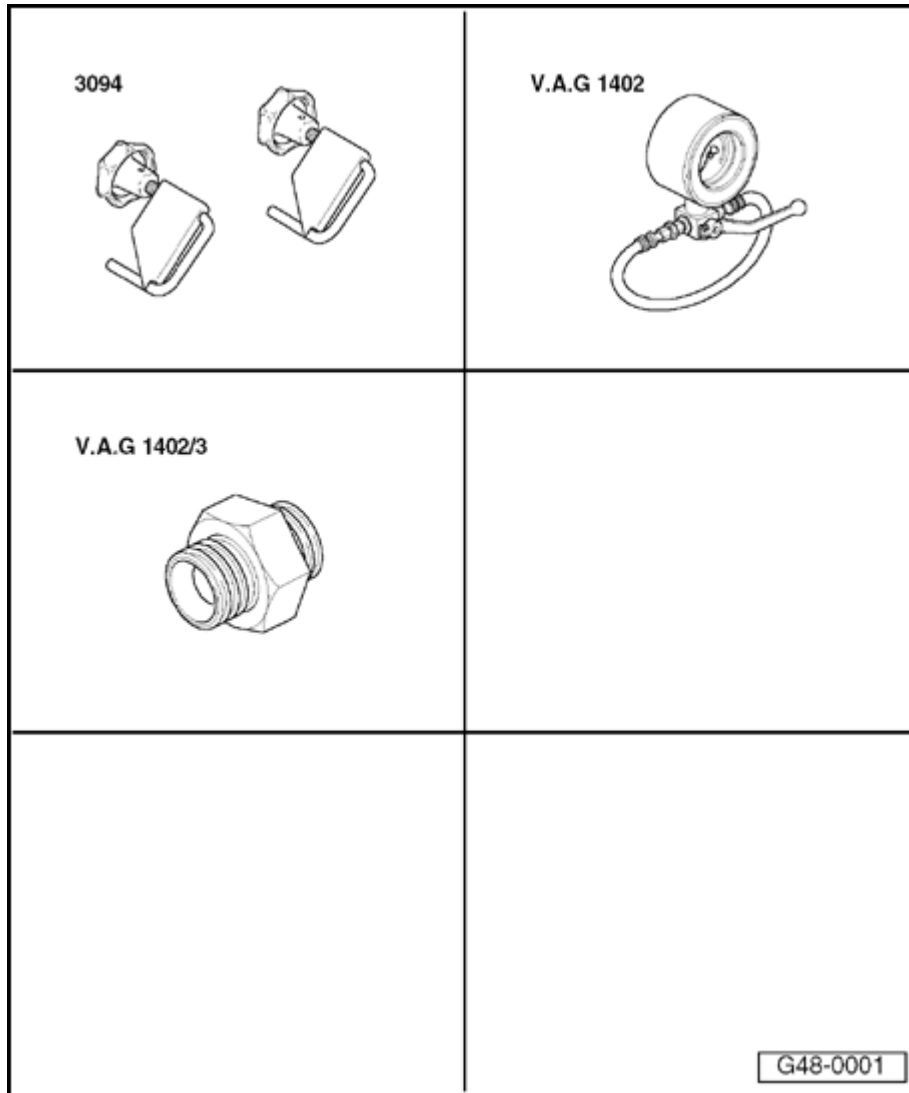
27 - Bracket

28 - Hex nut, 20 Nm

29 - Washer

30 - Coolant line

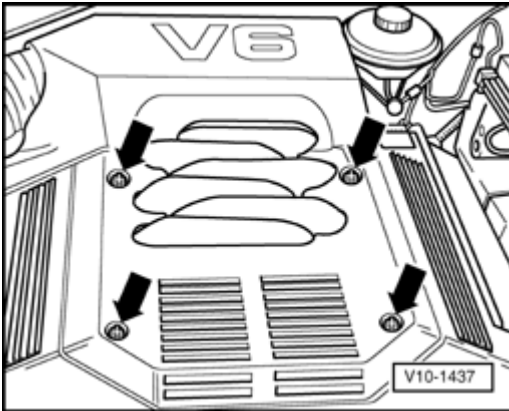
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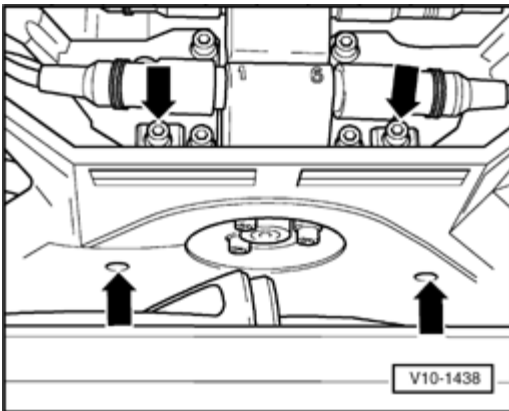
Power steering pump, assembly overview for vehicles with 6-cylinder engine

Special tools, workshop equipment, test and measuring appliances and aux. items required

- ◆ 3094 Hose clamps
- ◆ VAG 1402 Power steering test module
- ◆ VAG 1402/3 Adapter



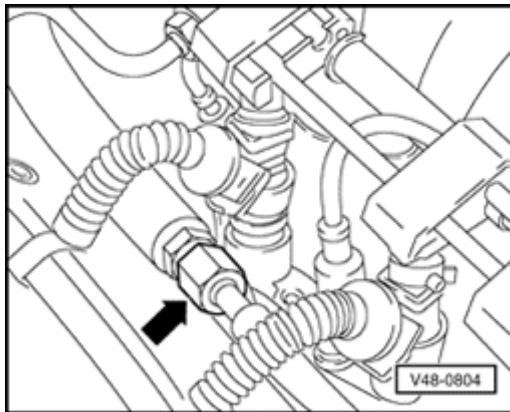
- A - Unclip engine cover and take off.



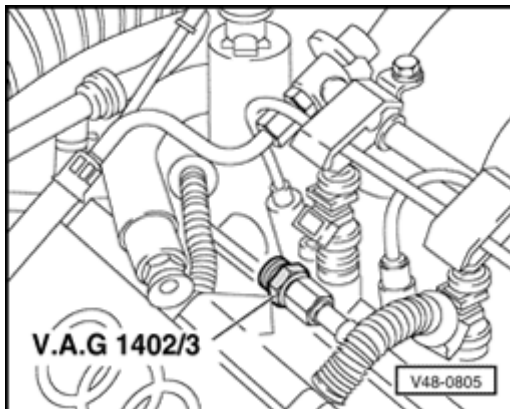
- A - Remove ribbed belt cover -arrows-.



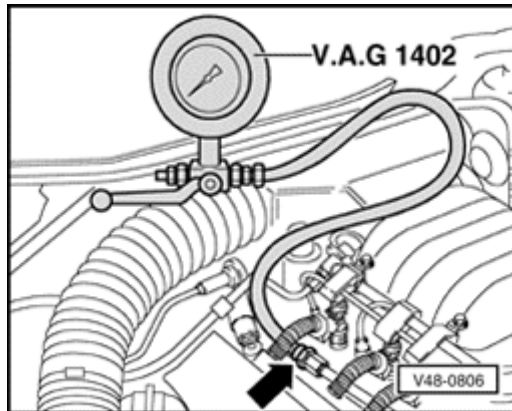
- Clamp off suction hose with hose clamp - 3094-.

**A**

- Press connector spring clip and pull connector off injector.
- Remove line from pressure hose (arrow), when doing this counter-hold on pressure hose hex.

**A**

- Screw adapter VAG 1402/3 into line in place of pressure hose.

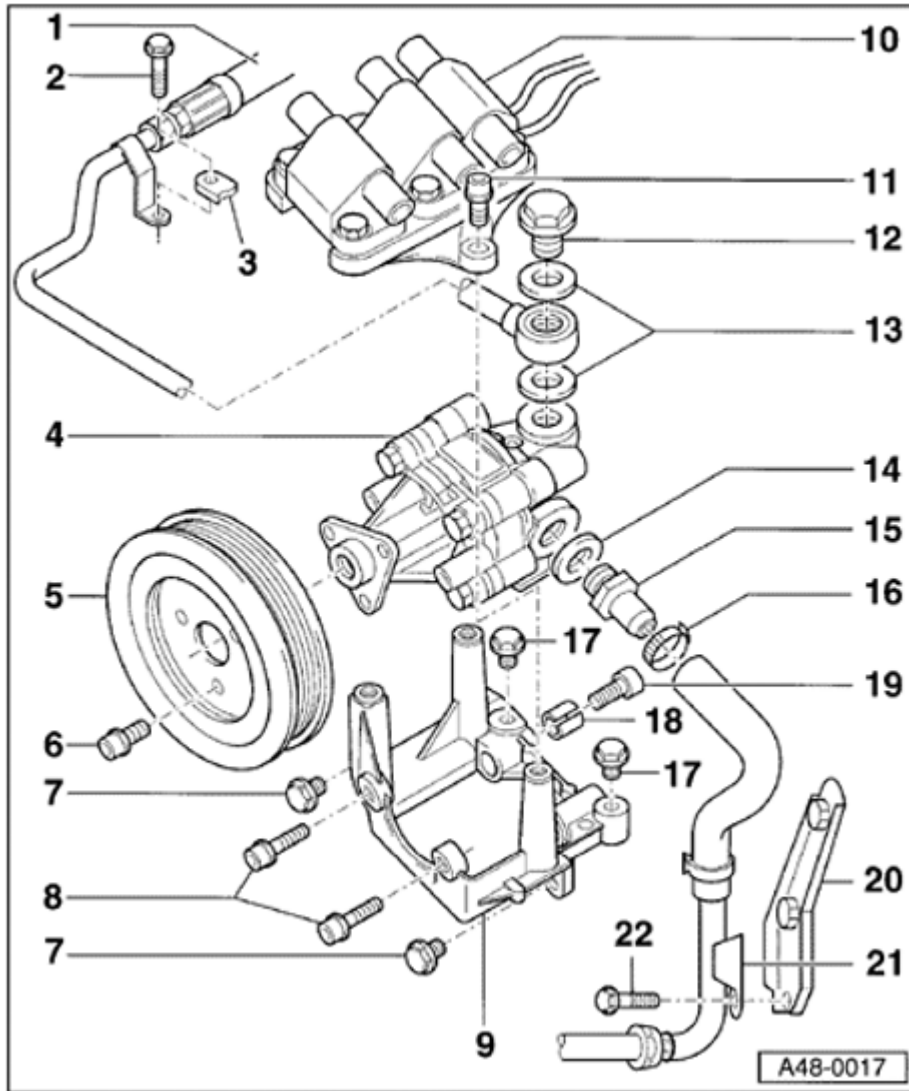


A

- Screw pressure gauge -VAG 1402- hose onto adapter -VAG 1402/3-.
- Close gauge shut-off valve (lever to left).
- Install injector connector onto injector.
- Remove hose clamp from suction hose.
- Start engine and if necessary add fluid to reservoir.
- Read off gauge pressure with engine at idling speed (do not measure longer than 10 seconds). Specification: 110 - 120 bar.

If the specifications are not reached, replace power steering pump ⇒ [Page 48-99](#) .

- Check hydraulic oil level ⇒ [Page 48-70](#) .
- Check steering system for leaks ⇒ [Page 48-73](#) .
- Bleed steering system ⇒ [Page 48-72](#) .



Power steering pump, assembly overview for vehicles with 6-cylinder engine

Notes:

- ◆ Replace sealing rings.
- ◆ Do not reuse drawn off hydraulic oil.
- ◆ Hydraulic oil: Part No. G 002 000
- ◆ Quantity of oil in system approx. 1 liter.

1 - Pressure line with hose

2 - Hex bolt, 8 Nm

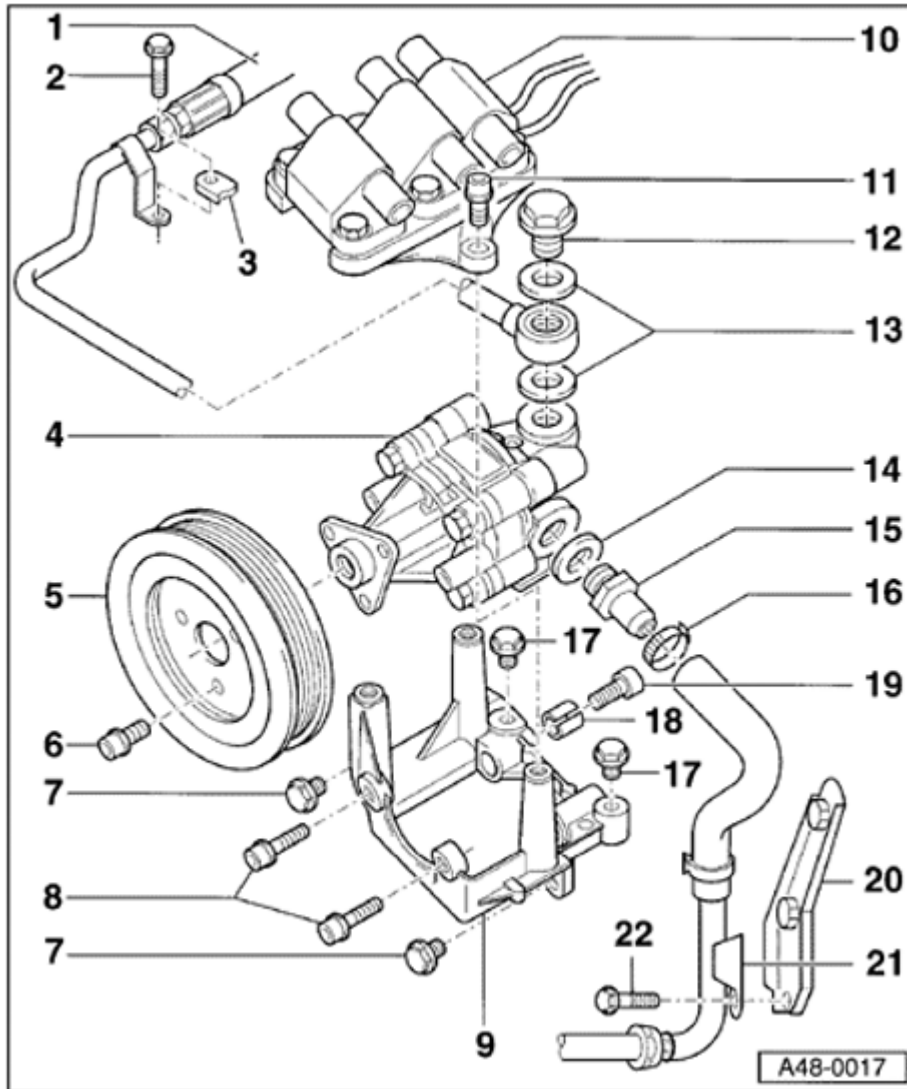
3 - Hole on intake line

4 - Power steering pump

◆ Checking delivery pressure ⇒ [Page 48-95](#)

◆ Fill with oil before installing ⇒ Note Page ⇒ [Page 48-90](#)

5 - Belt pulley



6 - Hex socket head bolt, 25 Nm

- ◆ When loosening and tightening counter-hold with VAG 1590 if necessary

7 - Hex bolt, 25 Nm

8 - Hex socket head bolt, 25 Nm

9 - Bracket

10 - Ignition coil with bracket

11 - Hex socket head bolt, 25 Nm

12 - Banjo bolt, 50 Nm

- ◆ ⇒ [Page 48-93](#) , item 24

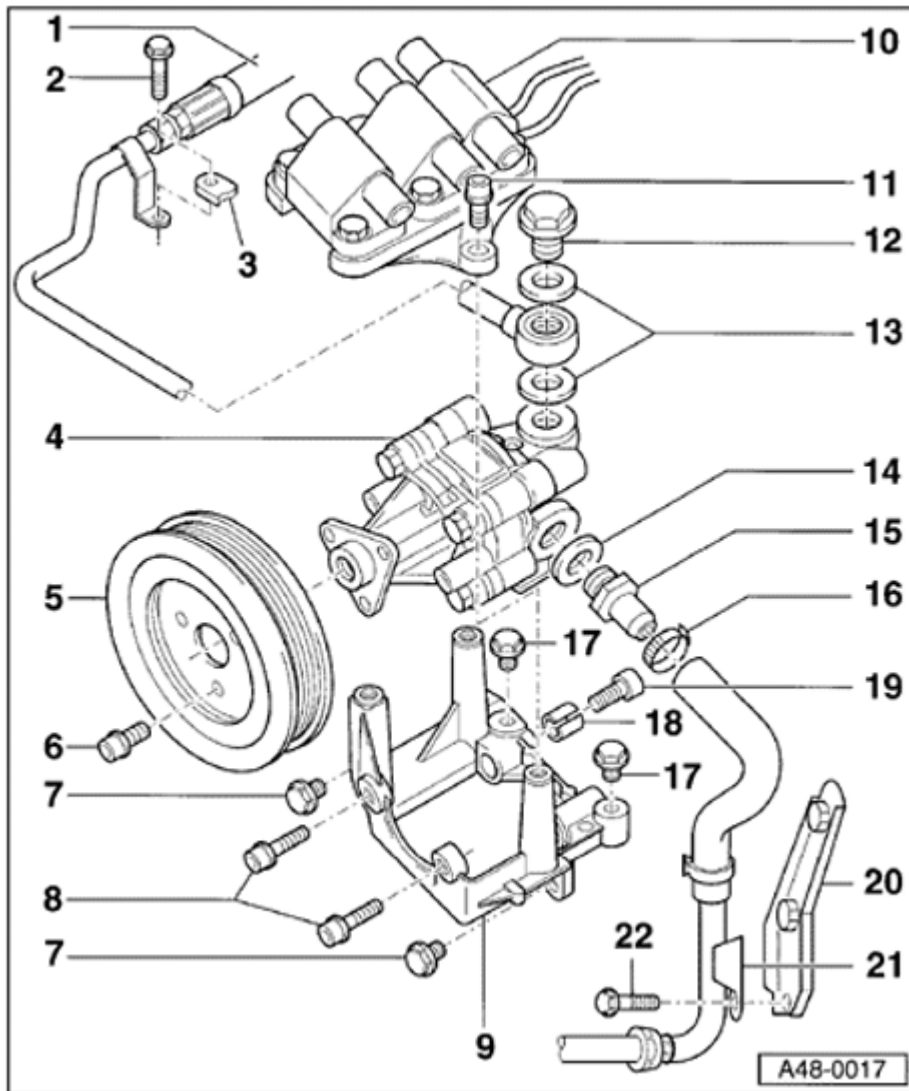
13 - Oil seal, 16 x 22

- ◆ Always replace

14 - Oil seal, 18 x 24

- ◆ Always replace

15 - Threaded union, 50 Nm



16 - Hose clip

◆ Tension with VAG 1275

◆ Always replace

17 - Hex bolt, 25 Nm

18 - Sleeve, slotted

19 - Hex socket head bolt, 25 Nm

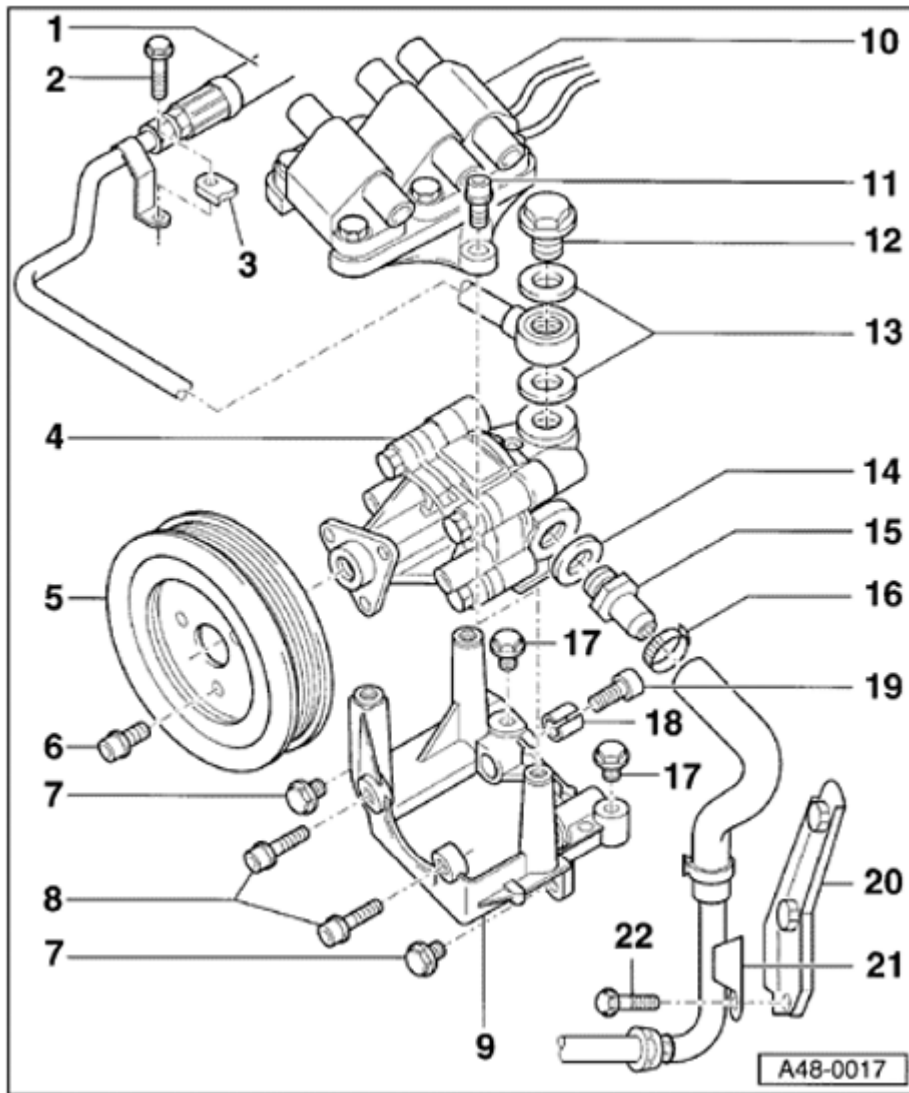
20 - Mounting bracket

21 - Suction line with hose

22 - Hex bolt, 8 Nm

Removing:

- Remove upper engine cover ⇒ Fig. ⇒ [1](#) .
- Remove ribbed belt guard ⇒ Fig. ⇒ [2](#) .
- Relieve tension on ribbed belt ⇒ Fig. ⇒ [3](#) .



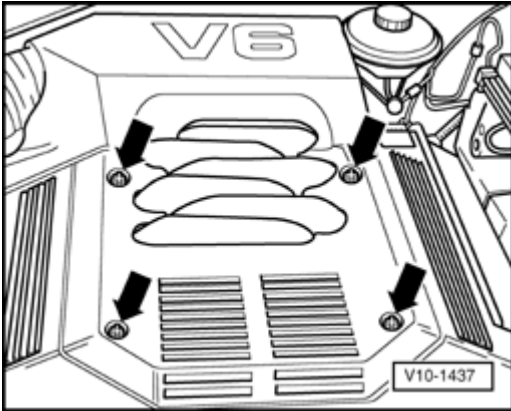
- Remove belt pulley, counter-hold with VAG 1590 if necessary.
- Pull ignition cable out of ignition coils - 10 -.
- Clamp off suction hose with 3094.
- Remove suction and pressure lines.
- Remove bracket item - 9 - and remove complete with power steering pump.
- Remove bolts for power steering pump from bracket and take off power steering pump.

Installing:

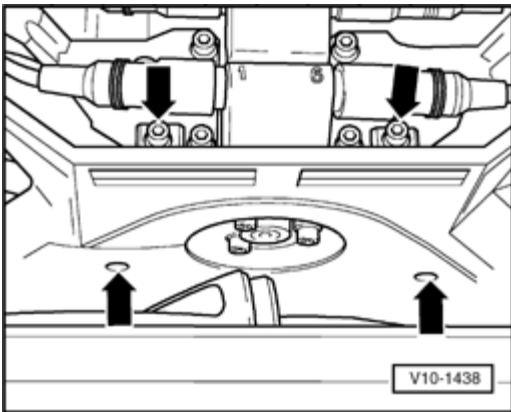
Install in reverse order.

Note:

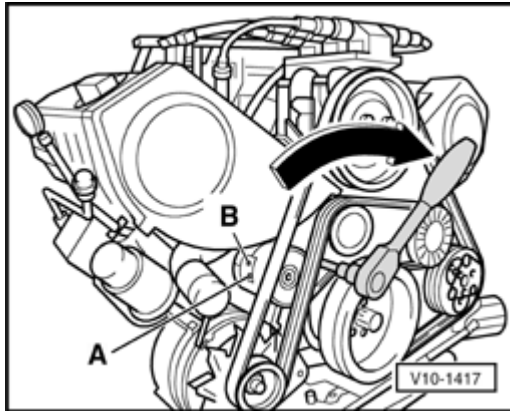
Ignition cable allocation must equate to numbers marked ⇒ Fig. ⇒ [4](#)



A Fig. 1 Unclipping top engine cover and removing



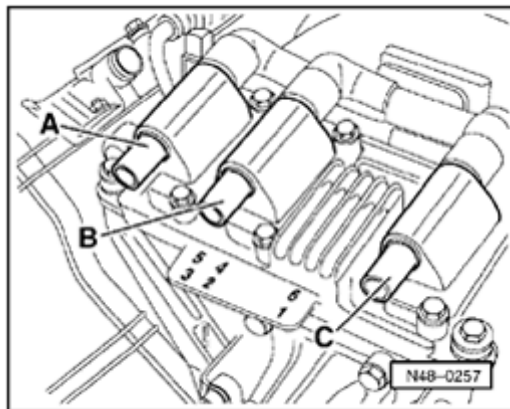
A Fig. 2 Removing ribbed belt guard



A

Fig. 3 Relieving tension and removing ribbed belt

- To relieve tension on ribbed belt, push hex socket head wrench (10 mm AF) downward.
- Align hole -A- with hole -B-.
- Insert pin -3204- to secure.
- Take ribbed belt off belt pulley.



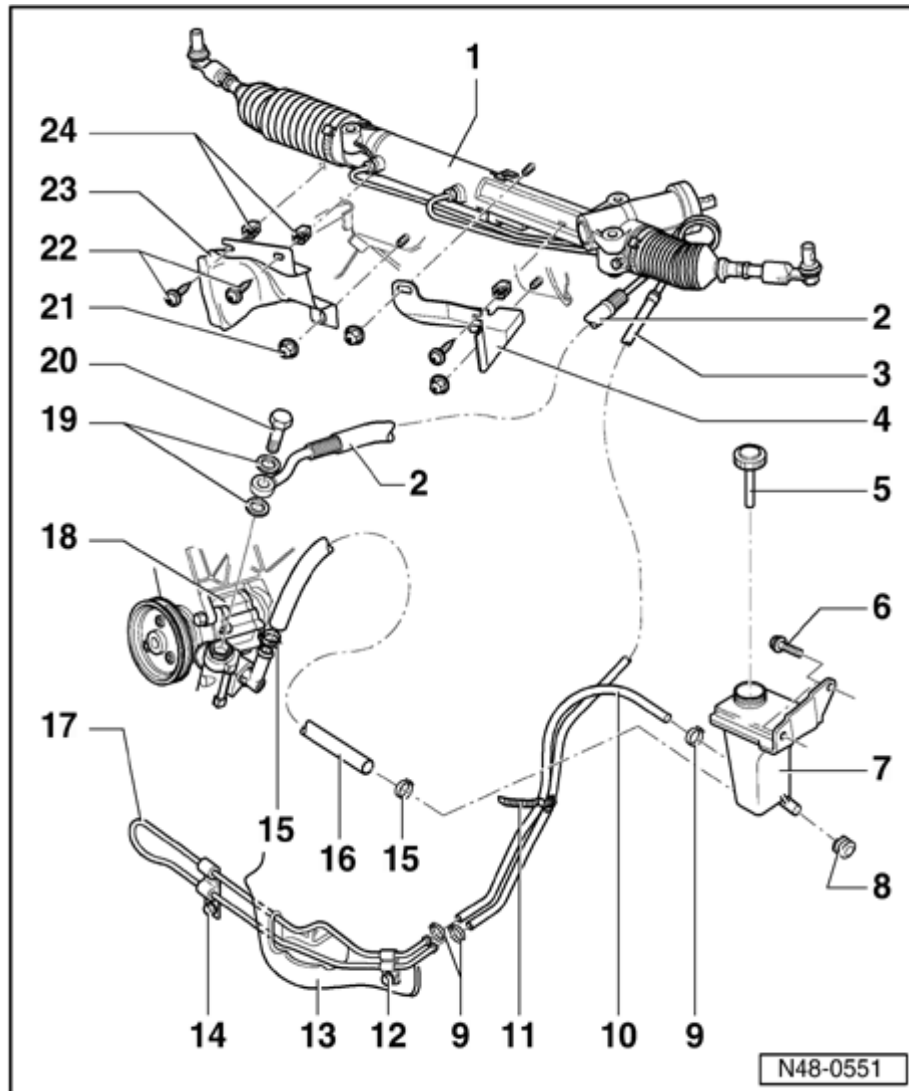
A

Fig. 4 Allocating ignition cables to ignition coils

- A - Ignition coil for cylinders 5 and 3
- B - Ignition coil for cylinders 4 and 2
- C - Ignition coil for cylinder 6 and 1

Ignition cables are marked with number 1 . . . 6.

- Allocate ignition cables 6 and 1 to ignition coil -C-.
- Allocate ignition cables 2, 3, 4 and 5 in the same manner.



1 - Power assisted steering gear

Assembly overview ⇒ [Page 48-63](#) .

2 - Pressure hose

3 - Return hose

4 - Backplate

5 - Cap with dip stick

◆ Checking oil level ⇒ [Page 48-70](#)

6 - Hex bolt, 9 Nm

7 - Reservoir

8 - Rubber mounting

9 - Hose clip

◆ Tension with VAG 1275

◆ Always replace



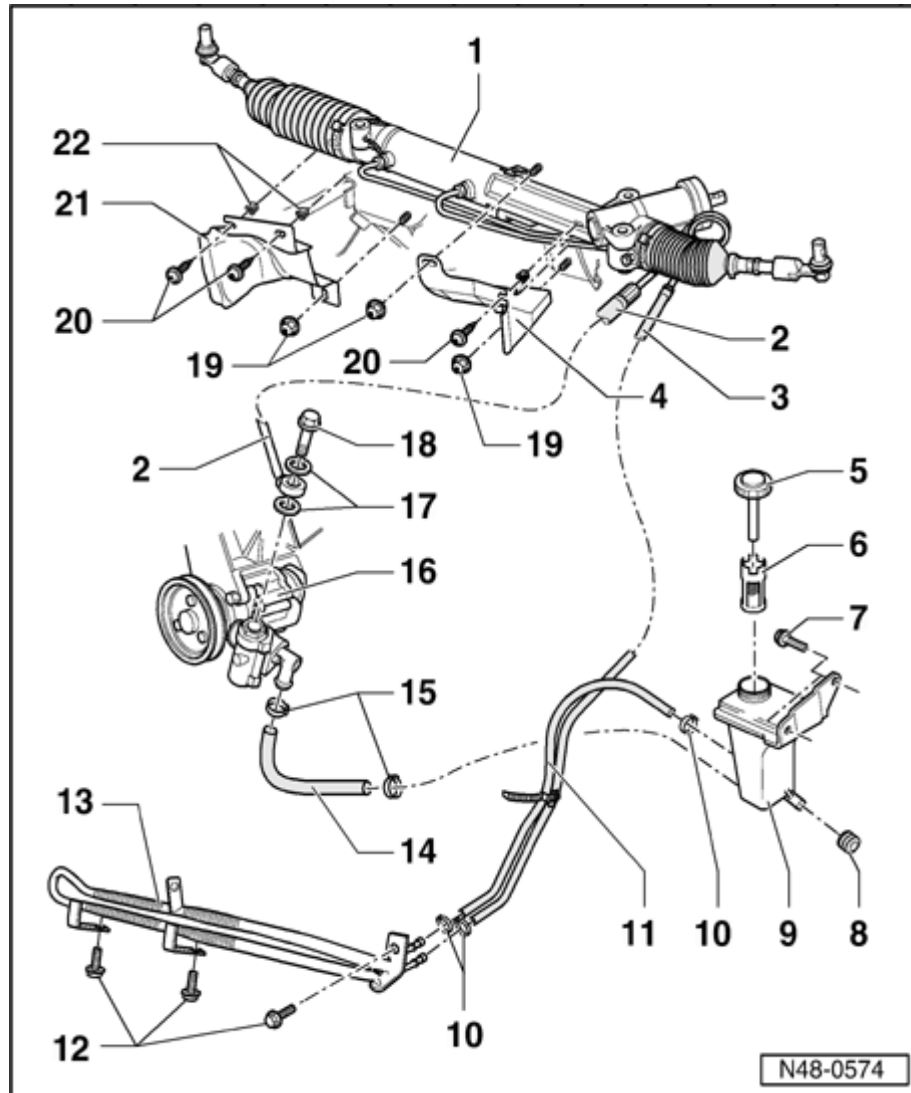
Assembly overview for vehicles with 8-cylinder engine

It is not intended that repair work be carried out on the power steering pump. If complaints are received determine cause with the help of pressure tests, leakage test and fault finding, steering gear No. 10. If a fault exists replace power steering pump.

Notes:

- ◆ *If reservoir fluid level is low then check steering system for leaks.*
- ◆ *In the case of leaks at the line connections first tighten connections and wipe dry then recheck for leaks.*
- ◆ *Pumps supplied as spare parts are not filled with oil. Therefore it is essential to fill the pump with hydraulic oil G 002 000 and to rotate pump by hand, otherwise the pump may be damaged or be noisy during operation.*
- ◆ *Type of oil: hydraulic oil G 002 000*

◆ *Oil system capacity: 0.7 ... 0.9 ltr.*



1 - Power assisted steering gear

Assembly overview ⇒ [Page 48-63](#) .

2 - Pressure hose

3 - Return hose

4 - Backplate

5 - Cap with dip stick

◆ Checking oil level ⇒ [Page 48-70](#)

6 - Strainer

7 - Hex bolt, 9 Nm

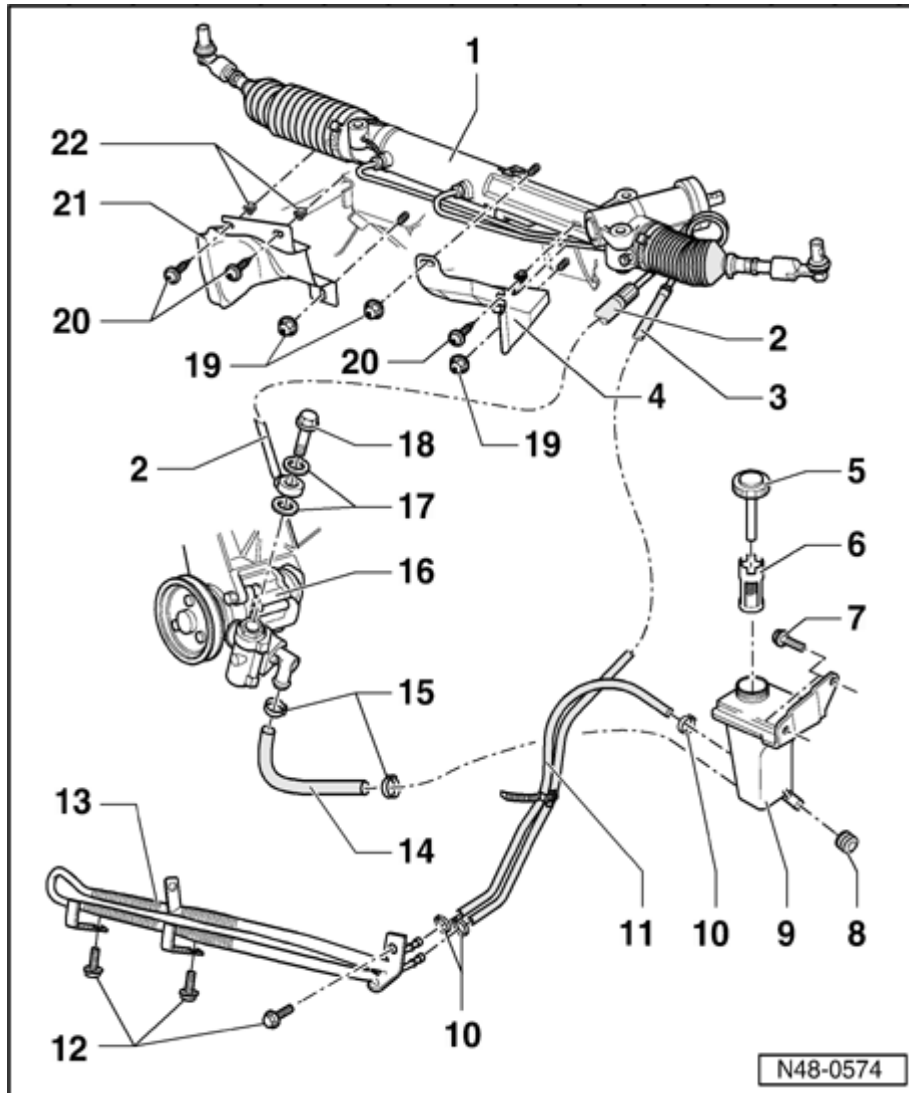
8 - Rubber mounting

9 - Reservoir

10 - Hose clip

◆ Tension with VAG 1275

◆ Always replace



11 - Return hose

Between reservoir and ribbed cooling line

12 - Hex bolt, 10 Nm

13 - Ribbed cooling line

14 - Suction hose

15 - Hose clip

◆ Tension with VAG 1275

◆ Always replace

16 - Power steering pump

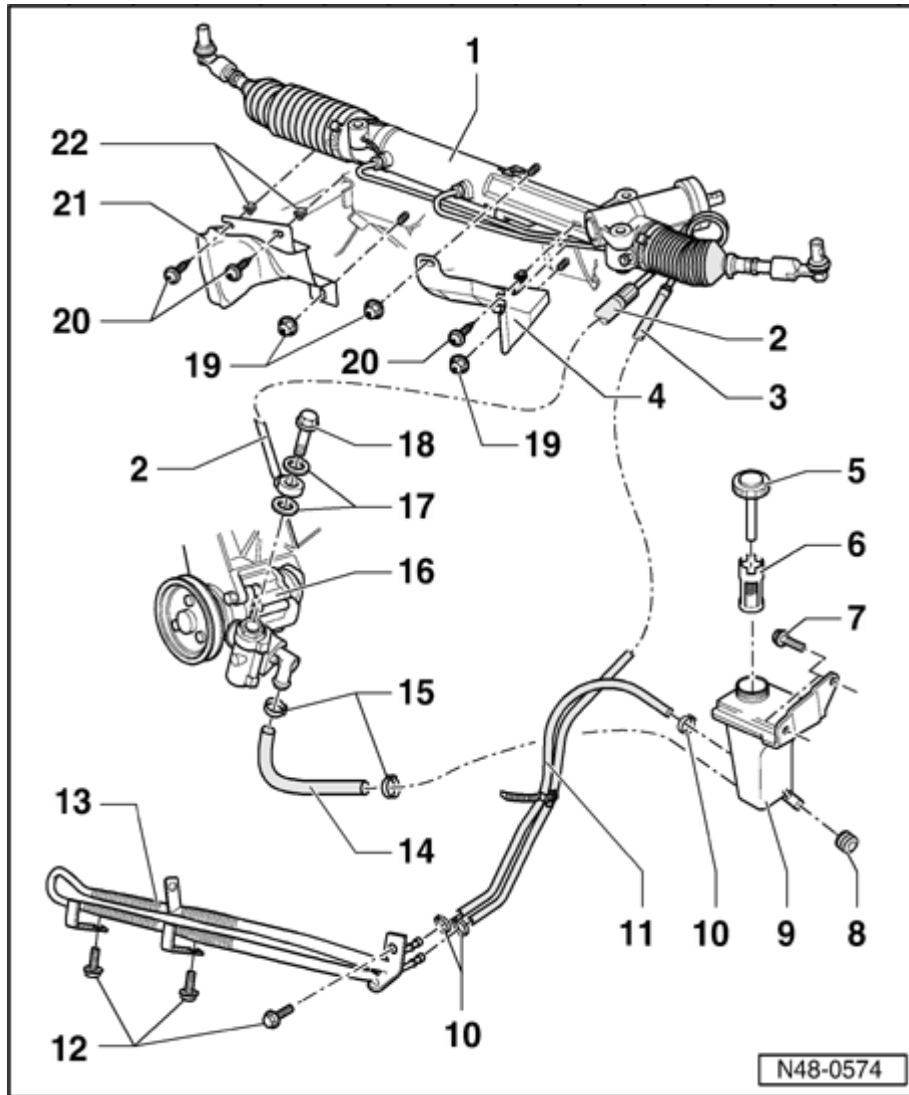
◆ Checking delivery pressure ⇒ [Page 48-110](#)

◆ Fill with oil before installing ⇒ Note Page ⇒ [Page 48-106](#)

17 - Oil seal, 16 x 22

◆ Always replace

18 - Banjo bolt, 50 Nm



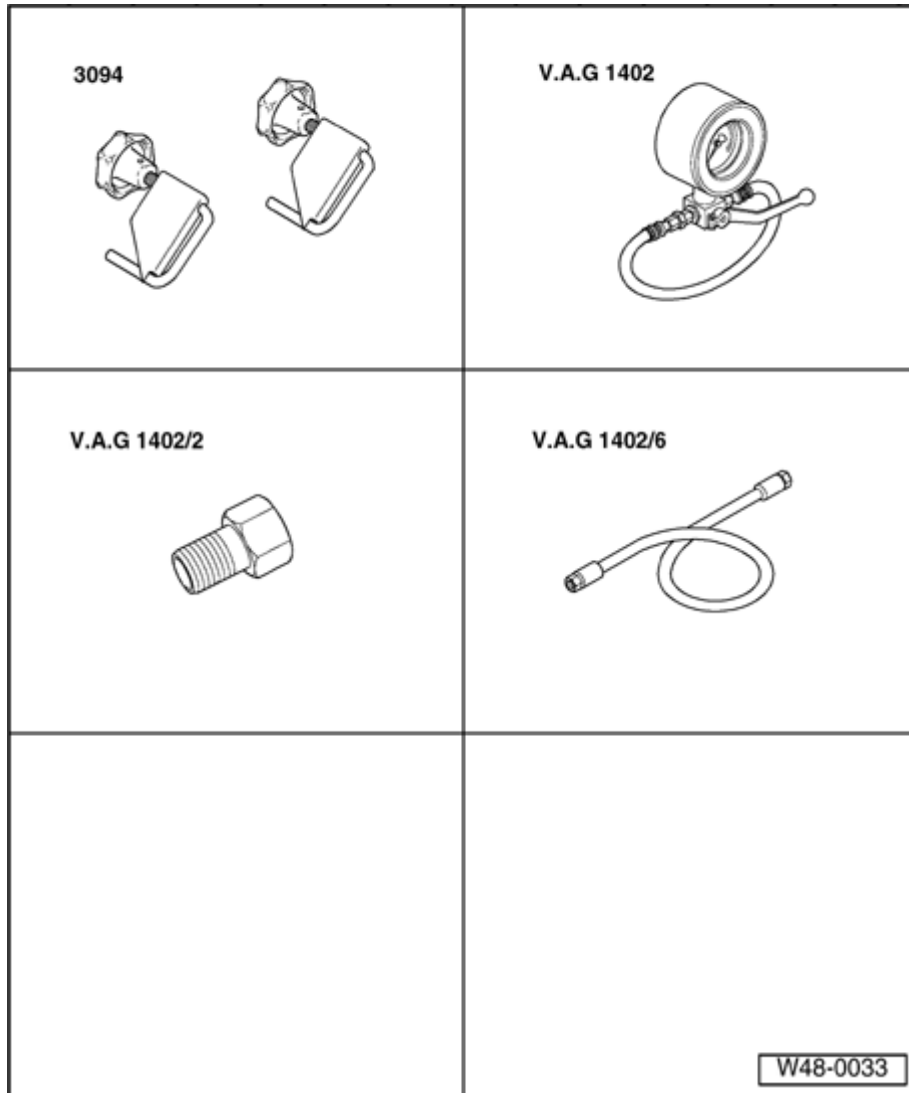
19 - Hex nut, 1.3 Nm

20 - Hex bolt, 2 Nm

21 - Backplate

22 - Spreader nut

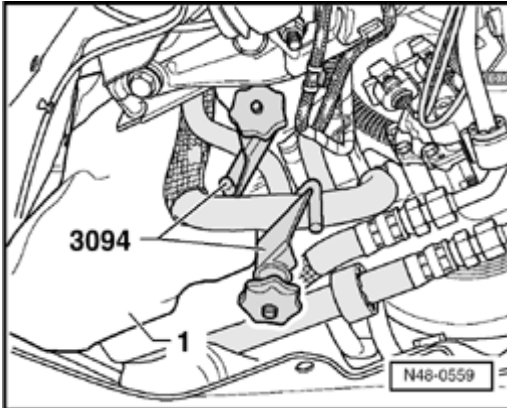
◆ Always replace



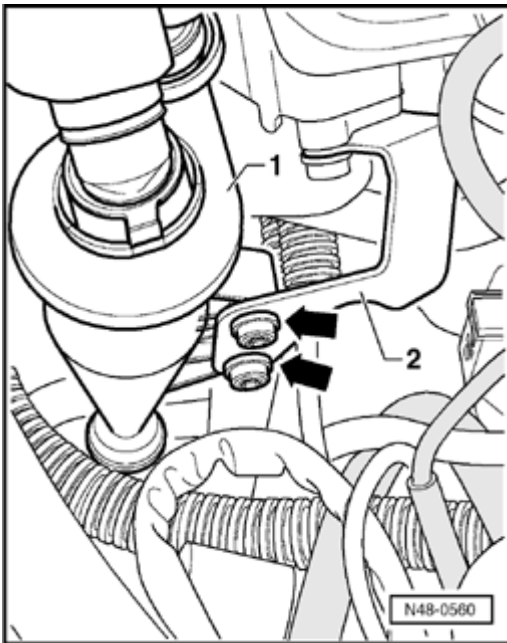
Power steering pump delivery pressure for vehicles with 8-cylinder engine, checking

Special tools, workshop equipment, test and measuring appliances and aux. items required

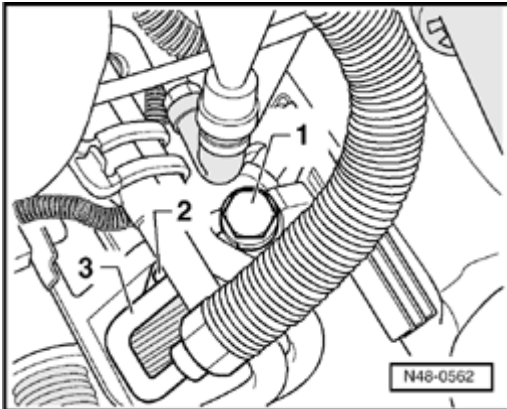
- ◆ 3094 Hose clamps
- ◆ VAG 1402 Power steering test unit
- ◆ VAG 1402/2 Adapter
- ◆ VAG 1402/6 Adapter set



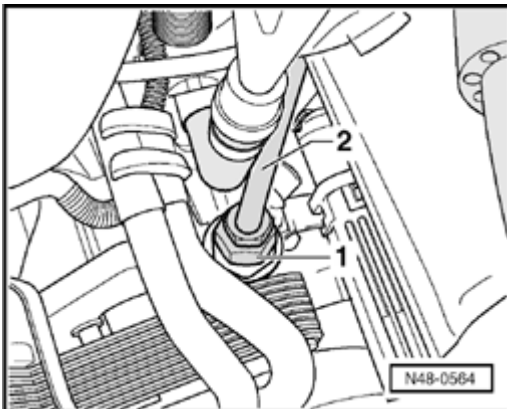
- A**
- Clamp off suction hose using hose clamp -3094-.



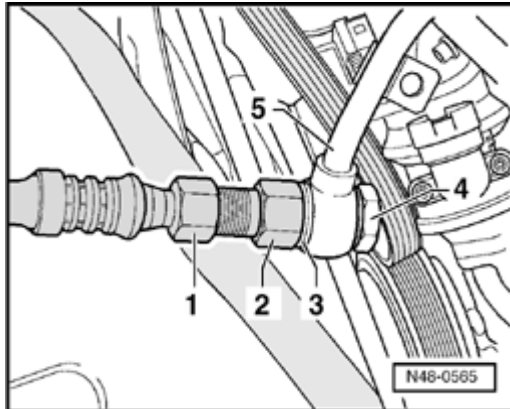
- A**
- Unbolt -arrows- crankcase breather -1- from bracket -2-.
 - Place oil tray under vehicle.

**A**

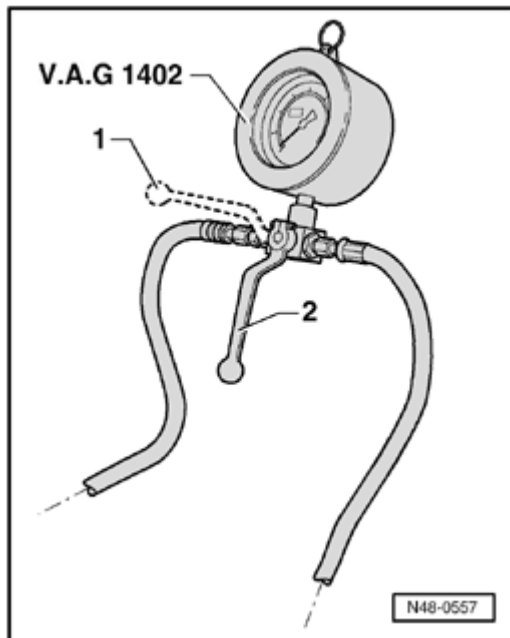
- Remove banjo bolt -1- and hex bolt -2-.
- Set pressure line -3- to side.
- Seal pressure line/hose with a plastic bag or similar.

**A**

- Screw adapter -1- from VAG 1402/6 into power steering pump in place of banjo bolt.
- Screw adapter -2- of VAG 1402/6 into adapter -1- from VAG 1402/6.
- Screw hose of pressure gauge VAG 1402 onto adapter -2- of VAG 1402/6.



- A**
- Assemble VAG adapter, banjo bolt and pressure line as shown in diagram.
 - 2 - VAG 1402/6
 - 1 - VAG 1402/2
 - 3 - Four seals
 - 4 - Banjo bolt
 - 5 - Pressure line
 - Remove hose clamp 3094 from suction hose.

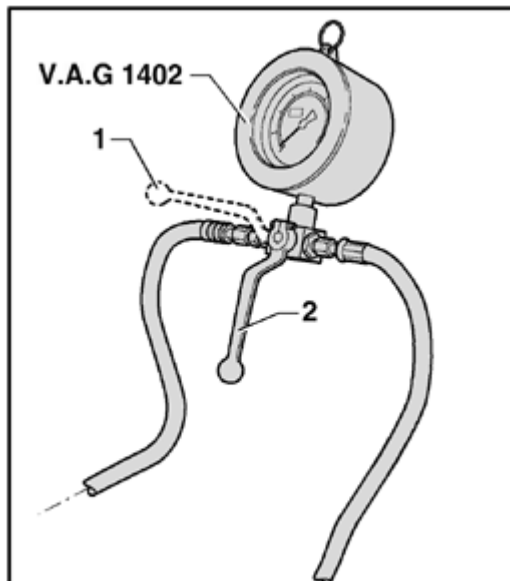


- A**
- Make sure that the lever on the pressure gauge remains in position -2-.
 - Start engine and if necessary add fluid to reservoir.
 - Turn steering wheel approx.10 times from lock to lock.
 - Now check delivery pressure.



Test prerequisites:

- V-belt/V-belt tension OK.
 - System not leaking.
 - Hoses/lines are not kinked or restricted.
- With engine running at idling speed. Close cut-off valve (not longer than 5 seconds) and read off pressure.
- Set lever to position -1-.
- Now check delivery pressure.

**A**

Specifications

110 - 120 bar



Power steering pump for vehicles with 8-cylinder engine, removing and installing

Special tools, workshop equipment, testers, measuring instruments and auxiliary items required

- ◆ 3094 Hose clamps

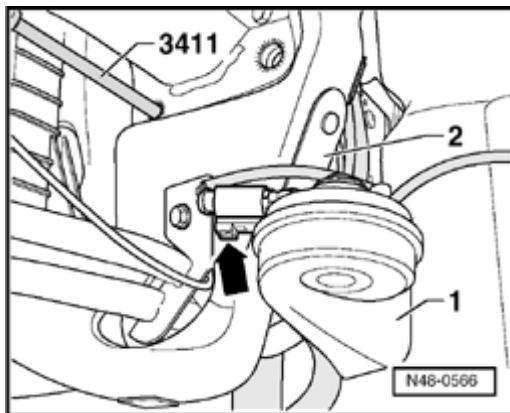
- ◆ VAG 1331 Torque wrench



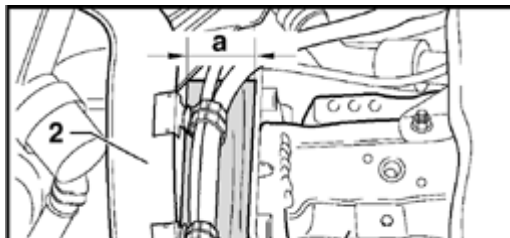
Removing

- Remove engine noise insulation.
- Set lock carrier to service position

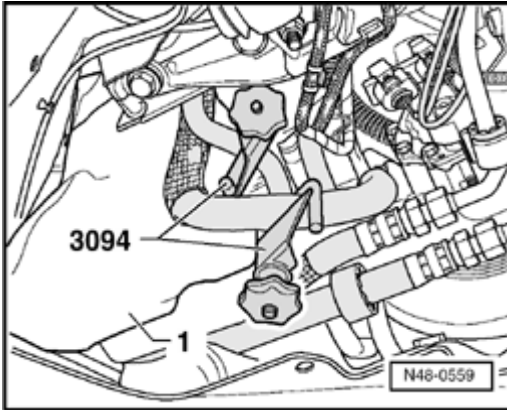
⇒ [Repair Manual, Body Exterior, Repair Group 50; Body front lock carrier service position](#)

**A**

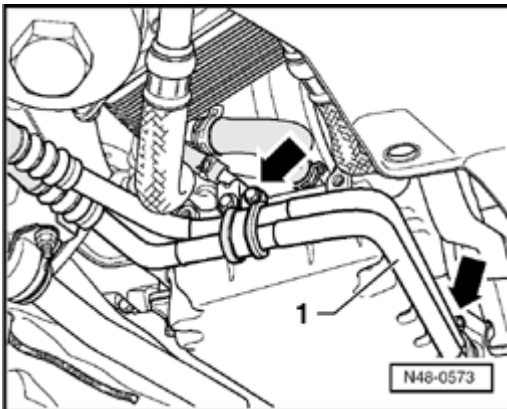
- Unclip connector -arrow- from horn -1-.
- 2 - Lock carrier

**A**

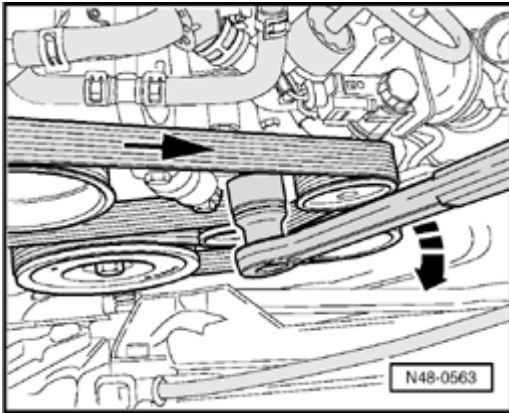
- Insert a piece of wood with thickness $a = 50$ mm between longitudinal member -1- and lock carrier -2-.



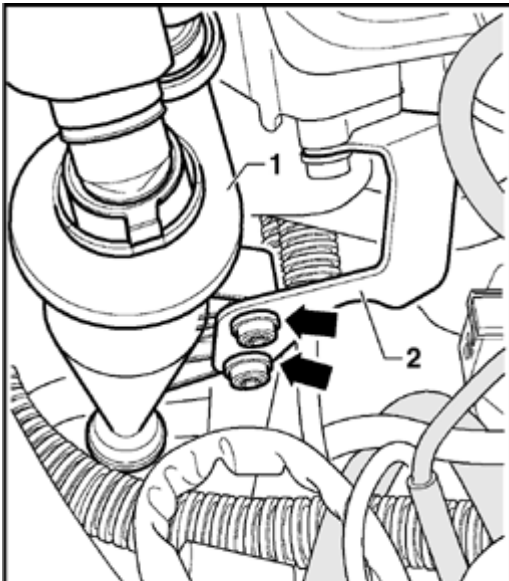
- A** - Clamp off suction and return hose using hose clamp 3094.



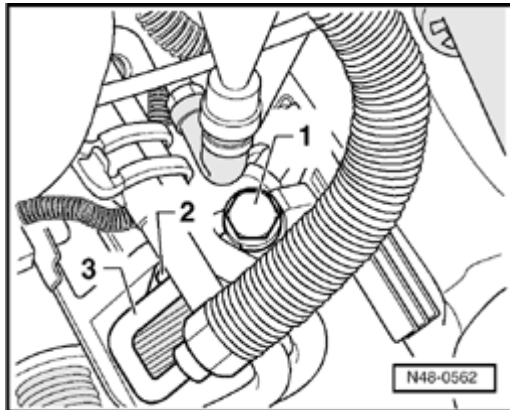
- A** - Remove hex bolts -arrows- for securing air conditioning line -1-.

**A**

- Mark direction of rotation of ribbed belt.
- Turn tensioning roller to stop in direction of arrow.
- Remove ribbed V-belt.

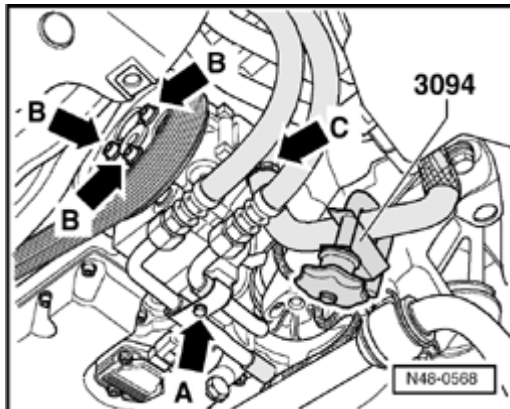
**A**

- Unbolt -arrows- crankcase breather -1- from bracket -2-.



A

- Place oil tray under vehicle.
- Remove banjo bolt -1- and hex bolt -2-.
- Set pressure line -3- to side.
- Seal pressure line/hose with a plastic bag or similar.

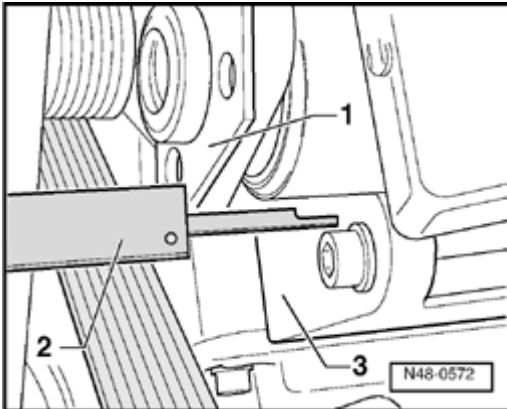


A

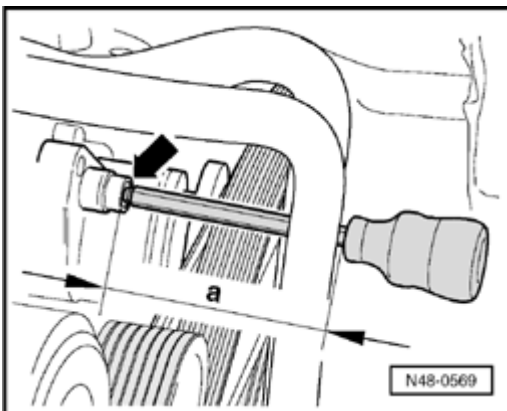
- Remove hex bolt -A-.
- Unbolt power steering pump pulley -arrows B-.

Notes:

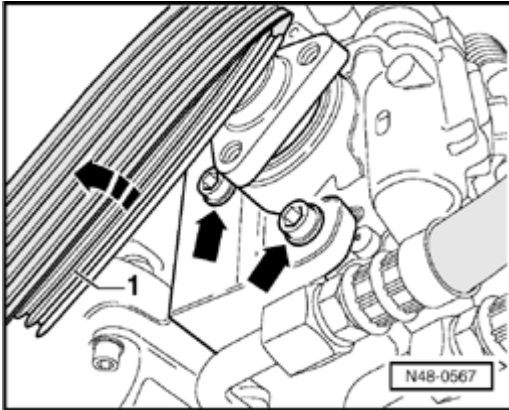
- ◆ *When removing power steering pump pulley, observe the shim located behind it. It is important for the measurement and adjustment of the power steering pump.*
- ◆ *Do not yet remove shim from power steering pump gear.*
- Open hose clip -arrow C- and pull suction hose off power steering pump.

**A**

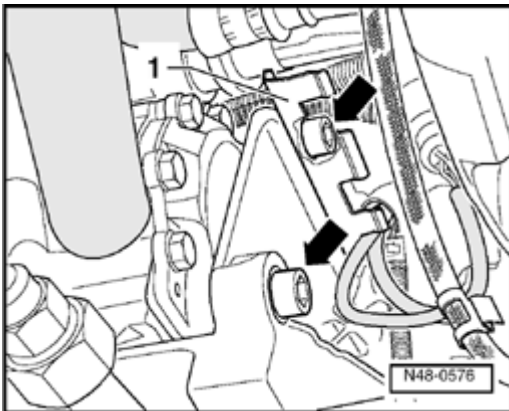
- Measure distance from front side of hub with shim -1- to power steering pump bracket -3- with depth gauge -2-.
- Note the measured value.

**A**

- Remove upper power steering pump securing bolt -arrow-.
- To do so, use an Allen key shortened to length -a-.
- a = about 75 mm



- A**
- Press pulley -1- in direction of arrow and remove bolts -arrows-.



- A**
- Unclip connectors -1- from bracket.
 - Remove bolts -arrows- from power steering pump.
 - Take out pump.

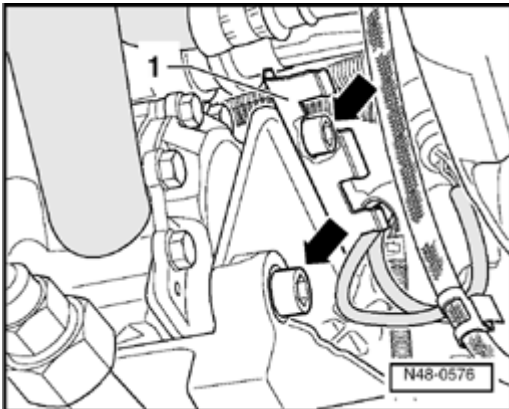


Installing

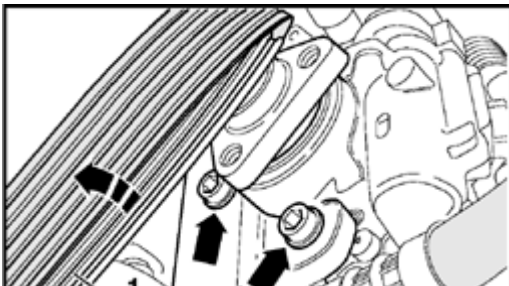
- Fill power steering pump with hydraulic oil.

Fill pump with oil via suction union.

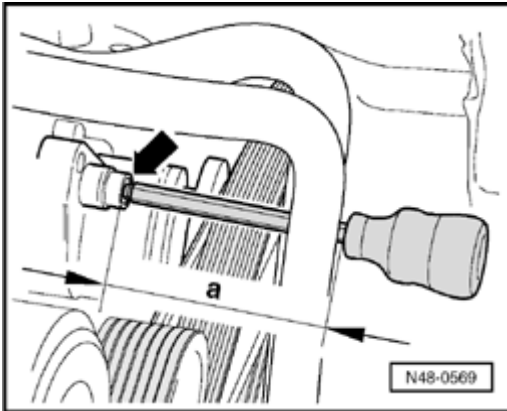
- Turn hub by hand until oil emits from pressure side.

**A**

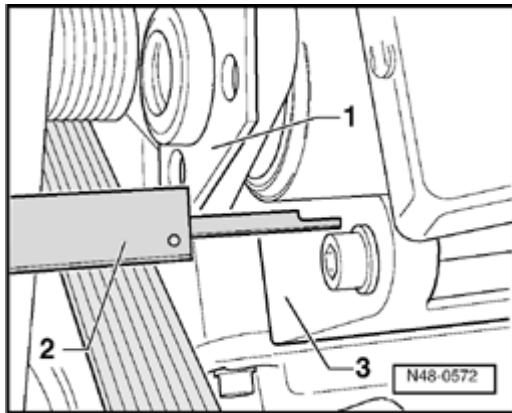
- Install power steering pump in bracket and tighten bolts -arrows- to 23 Nm.

**A**

- Then tighten bolts -arrows- on front side of power steering pump to 23 Nm.

**A**

- Tighten upper power steering pump securing bolt -arrow- to 23 Nm.
 - To do so, use an Allen key shortened to length -a-.
- a = about 75 mm



Determining shim thickness

A

- Measure distance from front of hub without shim -1- to power steering pump bracket -3- with depth gauge -2-.
- Note the measured value.
- Now determine shim thickness using values measured before removing and after installing.

Example:

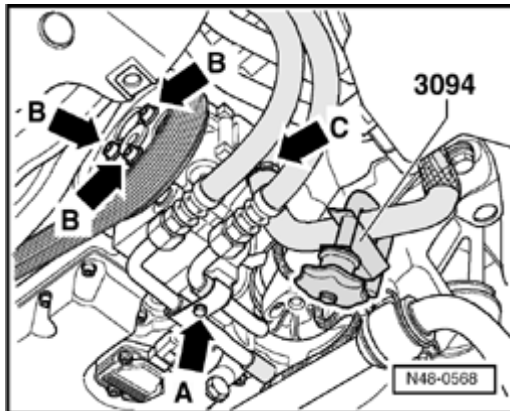
Value before removing power steering pump, with shim	33.65 mm
- Value after installing power steering pump, without shim	32.85 mm
Shim thickness =	0.80 mm

The following shims are available:

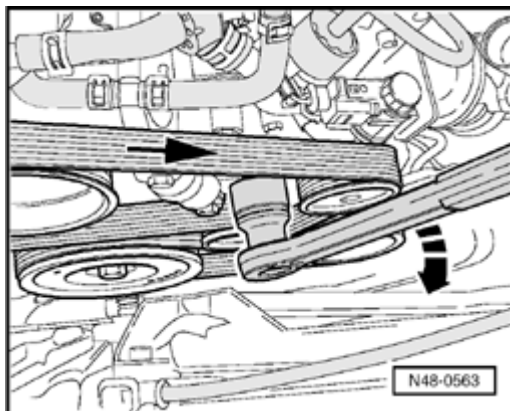
Thickness (mm)
0.6
0.8
1.0
1.2

1.4

Shim allocation \Rightarrow Parts catalog



- A**
- Install suction hose and install new hose clip -arrow C-.
 - Bolt on vane pump pulley with torque setting 23 Nm -arrows B-.
 - Screw in hex bolt -arrow A-.
 - Install pressure line to vane pump and tighten banjo bolt ⇒ [Page 48-108](#) , item 18 .
 - Remove hose clamp 3094 from suction and pressure lines.



- A**
- Turn tensioning roller to stop in direction of arrow.
 - Install ribbed belt and turn tensioning roller opposite direction of arrow until ribbed belt is tensioned.

Note:

When installing the ribbed belt make sure that the direction of rotation and seating in the pulley are correct.



Installation is continued in reverse sequence

- Check hydraulic oil level ⇒ [Page 48-70](#) .
- Check steering system for leaks ⇒ [Page 48-73](#) .
- Bleed steering system ⇒ [Page 48-72](#) .