

SUSPENSION**Steering (Sedan)****48 STEERING****GENERAL INFORMATION****REPAIR INFORMATION**

To perform a problem-free and successful steering gear repair, extreme caution and cleanliness, as well as properly functioning tools are an important requirement. Understandably, general safety guidelines apply when performing repairs.

A series of applicable general notes for individual repair procedures - otherwise listed several times at many points in the repair information - has been collected here. They apply for this repair information.

CAUTION: The suspension components could be damaged.

If the subframe mount, the steering gear or the subframe crossbrace are not installed correctly, do not rest the vehicle on its wheels.

The vehicle must not be supported on the subframe or the subframe crossbrace (for example using a floor jack).

WARNING: All bolts and nuts must be tightened properly before driving the vehicle!

WARNING: Danger of personal injury caused by the engine starting automatically on vehicles with the Start/Stop System.

- **When the Start/Stop System is on (recognizable by a message in the instrument cluster), the engine may start automatically.**
- **Make sure the Start/Stop System is off whenever working on the vehicle. Turn off the ignition and turn it back on only when necessary.**

STEERING GEAR

- Thoroughly clean connecting points and their surrounding areas before loosening.
- Place removed parts on a clean surface and cover to prevent contamination. Use foils and paper. Only use lint-free cloths!
- Only install clean components: Only unpack replacement parts immediately prior to installation.
- Use exclusively lubricants and sealants marked with part numbers.
- Carefully cover or seal open components, if repairs are not carried out immediately.

SEALS, SEALING RINGS

- Always replace seals and gaskets.
- After removing seals/boots, inspect the contact surfaces on housings and shafts for burrs and damage and repair if necessary.
- Remove all residual sealant of fluid seals from sealing surfaces, no sealant residue must enter the steering gear housing when doing this.

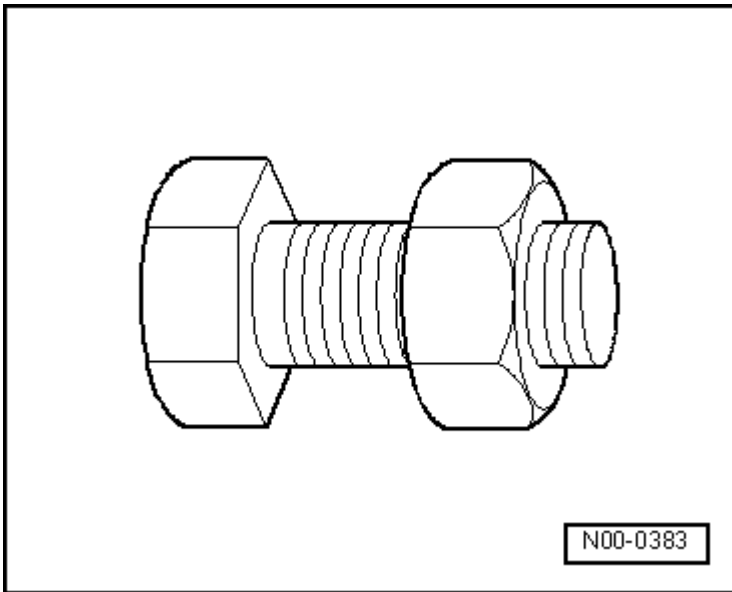
BOLTS AND NUTS

Fig. 1: Identifying Nut And Bolt
Courtesy of AUDI OF AMERICA, LLC

- Loosen and tighten the bolts and nuts of covers and housings in a diagonal sequence.
- Components that are extremely sensitive must not be distorted and should be loosened and tightened in stages in a diagonal sequence.
- Tightening specifications for unlubricated bolts and nuts are given.
- Always replace self-locking nuts and bolts.
- Always replace the bolts and nuts, which are tightened with an additional tightening angle.

ELECTRICAL COMPONENTS

Surely everyone has been shocked at one time or another when coming into contact with a metal object. The reason for this is the build-up of static electricity in the human body. This charge can lead to functional problems by touching the electrical components of steering gear.

-- Touch a grounded object - for example a water pipe or a vehicle hoist - before working on electrical components. Do not make direct contact on connector terminals.

STEERING, BLEEDING AFTER REPLACING

After steering system reconstruction, system must be bled differently depending on extent of reconstruction.

Bleed after replacing entire steering system or replacing steering gear:

- Fill the reservoir completely.
- Lift the vehicle just enough so that all the wheels are off the ground.
 - Engine turned off
- Turn steering wheel from lock to lock 10 times, with engine switched off.
- Fill the reservoir completely.
- Briefly start engine (max. 2 seconds).

Pump must not draw in any air. Steering wheel must not be turned under any circumstances.

Approximately 30 seconds wait between individual engine starts.

- Inspect hydraulic oil level and fill as needed.
- Repeat this process until oil level remains constant.
- Turn steering wheel from lock to lock 10 times, with engine switched off.
- Inspect hydraulic oil level and fill as needed.
- Start the engine.
- Turn steering wheel 10 times from stop to stop.
- Inspect hydraulic oil level and fill as needed.

Any air in remaining in the steering system will dissipate by itself when driving over the next 10 to 20 km.

Bleeding after replacing a component in the steering system, except for the steering gear:

- Inspect hydraulic oil level and fill as needed.
- Briefly start engine (max. 2 seconds).

Pump must not draw in any air and steering wheel must not be turned under any circumstances.

Approximately 30 sec. wait between individual engine starts.

- Inspect hydraulic oil level and fill as needed.

-- Repeat this process until oil level remains constant.

-- Start the engine and allow it to run 2-3 minutes, do not turn the steering wheel.

Any air remaining in the steering system will dissipate by itself when driving over the next 10 to 20 km.

POWER STEERING FLUID LEVEL, CHECKING

-- Do not run engine and turn front wheels to straight ahead position.

Fluid cold (approximately 20 °C (68 °F)):

-- Remove the cap.

-- Wipe dipstick off with a clean cloth.

-- Screw cap on hand-tight and unscrew it again.

NOTE: **The cap must be fully screwed in order to obtain an accurate fluid level reading.**

-- Check the fluid level: Oil level must be within the -A- area.

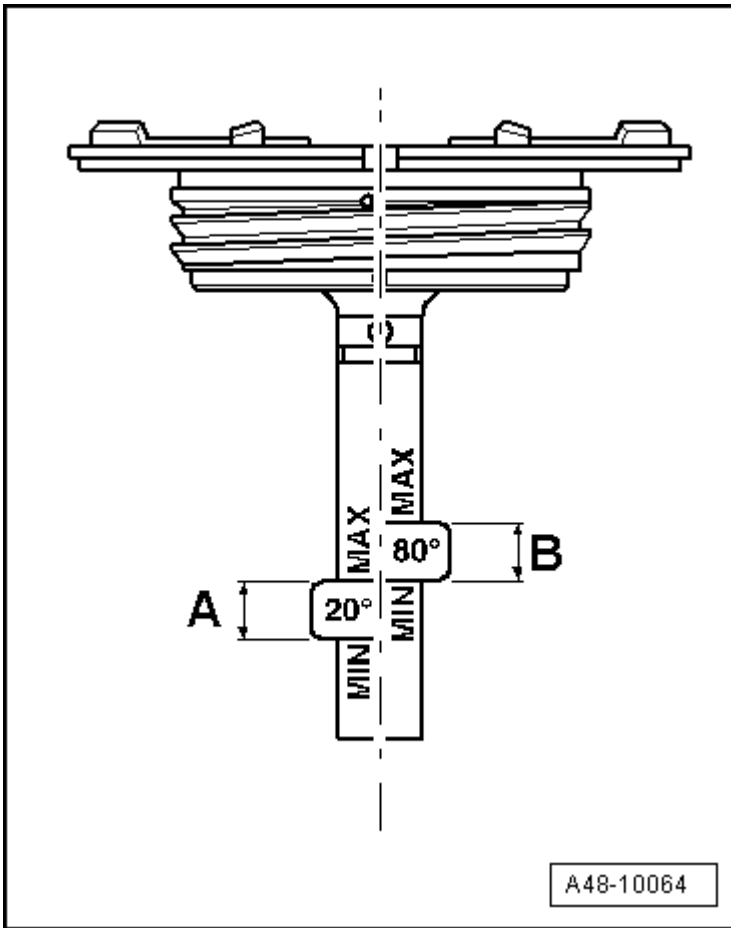


Fig. 2: Identifying Fluid Level Range (Fluid Cold)

Courtesy of AUDI OF AMERICA, LLC

Fluid at operating state temperature (approximately 80 °C (176 °F)):

- Remove the cap.
- Wipe dipstick off with a clean cloth.
- Screw cap on hand-tight and unscrew it again.

NOTE: The cap must be fully screwed in order to obtain an accurate fluid level reading.

- Check fluid level: Oil level must be within area -B-.

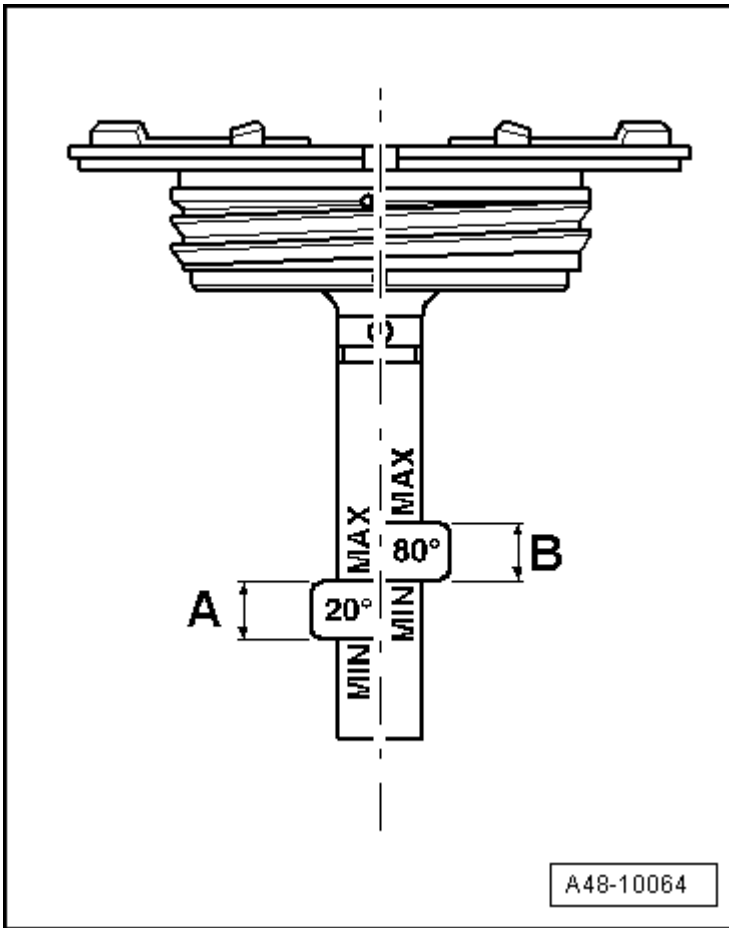


Fig. 3: Identifying Fluid Level Range (Fluid At Operating Temp.)

Courtesy of AUDI OF AMERICA, LLC

NOTE: Fluid must be drawn off if the level is above the specified range.

If oil level is below aforementioned area, then the hydraulic system must be checked for leaks. It is not enough to just add fluid.

Do not use drained hydraulic oil.

DESCRIPTION AND OPERATION

AIRBAG STEERING WHEEL OVERVIEW

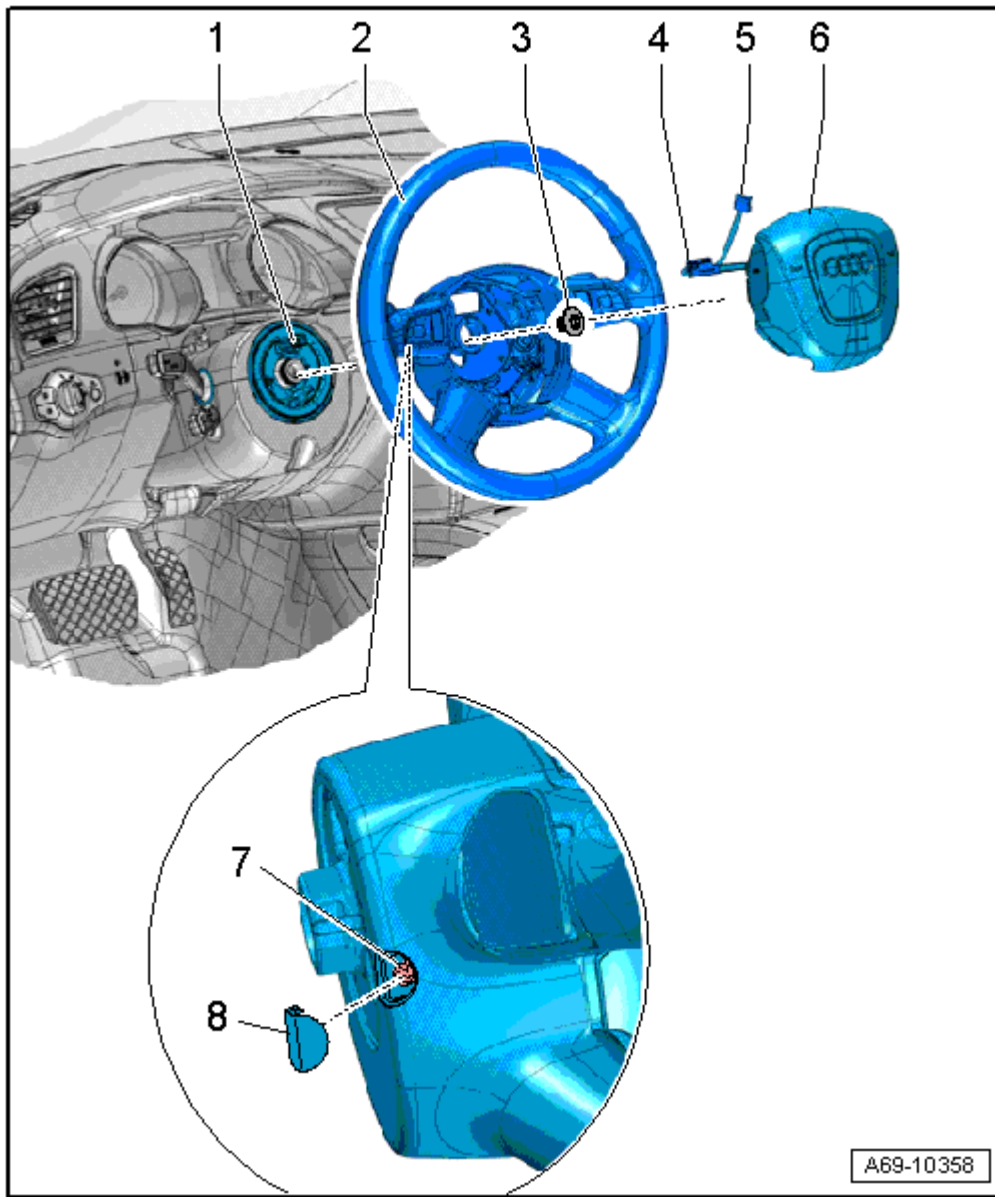


Fig. 4: Airbag Steering Wheel Overview
Courtesy of AUDI OF AMERICA, LLC

1. Airbag Spiral Spring/Return Spring with Slip Ring -F138-
 - Removing and installing, refer to **Removal and Installation**
2. Steering Wheel
 - Removing and installing, refer to **AIRBAG STEERING WHEEL**
3. Bolt
 - 50 Nm
 - Always replace if removed.
4. Connector
5. Connector

6. Driver Side Airbag

- Removing and installing, refer to **Removal and Installation**

WARNING: Follow safety precautions when working on airbag. Refer to **General Safety Precautions** .

7. Bolt

- Depending on the model year

Description and Operation

8. Cap

- Installed depending on the model year

STEERING COLUMN OVERVIEW

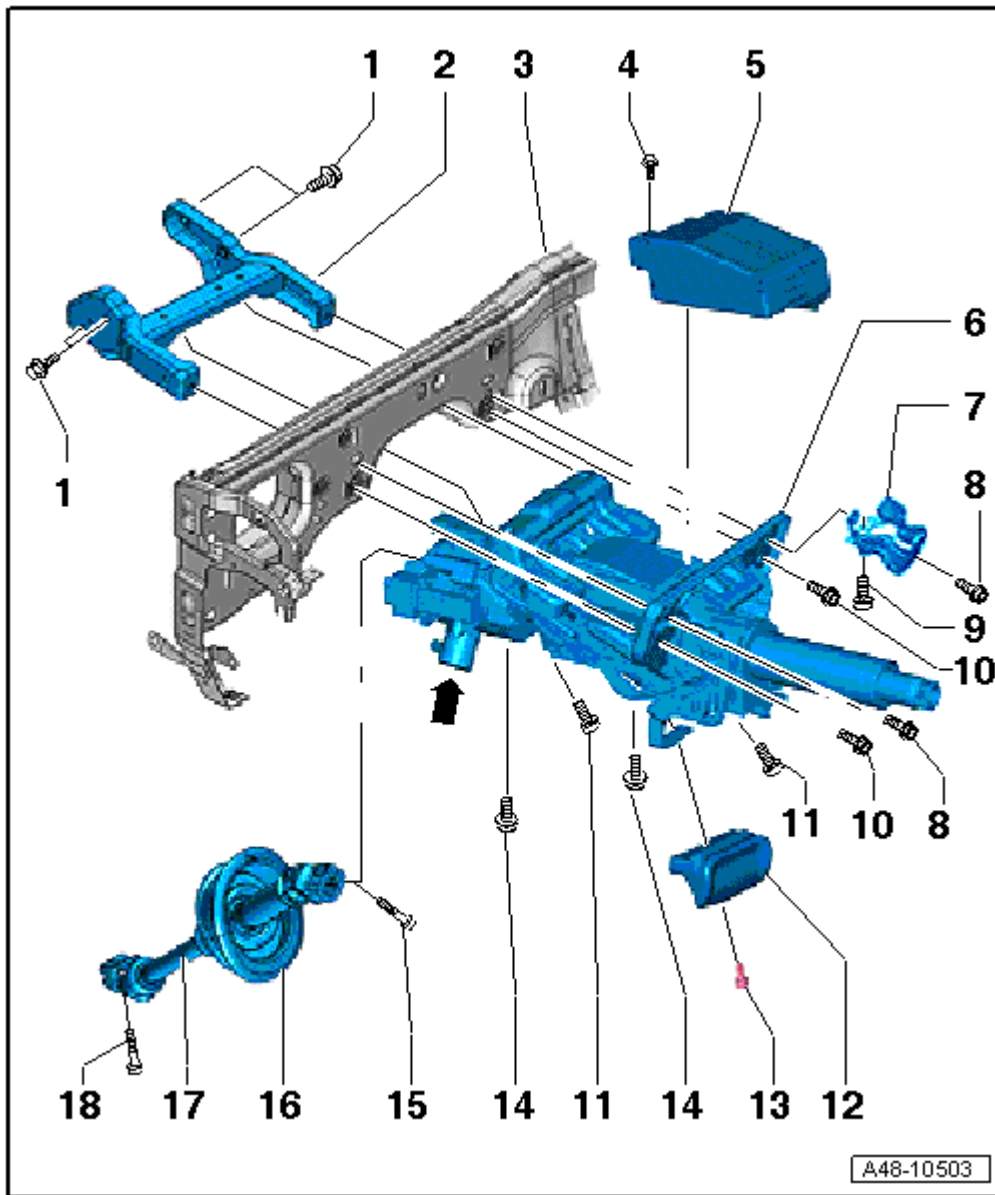


Fig. 5: Steering Column Overview

Courtesy of AUDI OF AMERICA, LLC

1. Bolt
 - Tightening specification, refer to **Description and Operation**
2. Bracket
3. Central Tube
4. Bolt
 - 5 Nm
5. Electronic Steering Column Lock Control Module -J764-
 - Installed on vehicles with lock lock-up system
 - Removing and installing, refer to **Electronic Steering Column Lock Control Module -J764-**

- If the electronic steering column lock control module -- was replaced, the following work must be performed vehicle diagnostic tester. Select the program in "Guided Functions" and follow the prompts on the screen.

6. Steering Column

- Depending on the version of the steering (with or without dynamic steering) different versions of the steering columns are installed.
- Actuator -arrow- installed on vehicles with dynamic steering.
- The actuator -arrow- must not be loosened or separated from the steering column.
- The actuator and the steering column are one component; they are replaced together.
- The actuator -arrows- has a "safety lock for the active steering" (locking magnet).
- "Safety lock for active steering" (locking magnet), removing and installing, refer to **ACTIVE STEERING SAFETY LOCK, LOCKING MAGNET**
- If the steering column and adjuster were replaced, then it is necessary to perform a basic setting on the dynamic steering. Refer to **DYNAMIC STEERING BASIC SETTING** .
- Removing and installing, refer to **STEERING COLUMN**
- Check for damage, refer to **STEERING COLUMN, CHECKING FOR DAMAGE**

7. Right Knee Bar

- Installed depending on the market

8. Bolt

- 20 Nm
- Quantity: 2
- Depending on the market, the knee bar is bolted on the right driver side
- Follow the assembly sequence when installing, refer to **Fig. 95**.

9. Bolt

- Tightening specification, refer to **Description and Operation**

10. Bolt

- 20 Nm
- Quantity: 2
- Follow the assembly sequence when installing, refer to **Fig. 95**.

11. Bolt

- 20 Nm
- Quantity: 2
- Follow the assembly sequence when installing, refer to **Fig. 95**.

12. Handle

13. Bolt

- 3 Nm

14. Bolt

- 20 Nm
- Quantity: 2

- Follow the assembly sequence when installing, refer to **Fig. 95**.

15. Bolt

- 30 Nm + 90° turn
- Always replace if removed.
- The threaded hole for the bolt must always be cleaned (for example, using a thread tap).

16. Sealing Boot

- Align the positioning arrow to the "12 o'clock position".

17. Steering Intermediate Shaft

- Removing and installing, refer to **STEERING INTERMEDIATE SHAFT**

18. Bolt

- 30 Nm + 90° turn
- Always replace if removed.
- The threaded hole for the bolt must always be cleaned (for example, using a thread tap).

STEERING COLUMN, HANDLING AND TRANSPORTING**WARNING:**

- **The correct handling of the steering column must always be observed.**
- **Incorrect handling of steering column may cause damage to the steering column and therefore lead to a safety risk.**

Correct Handling and Transport of Steering Column

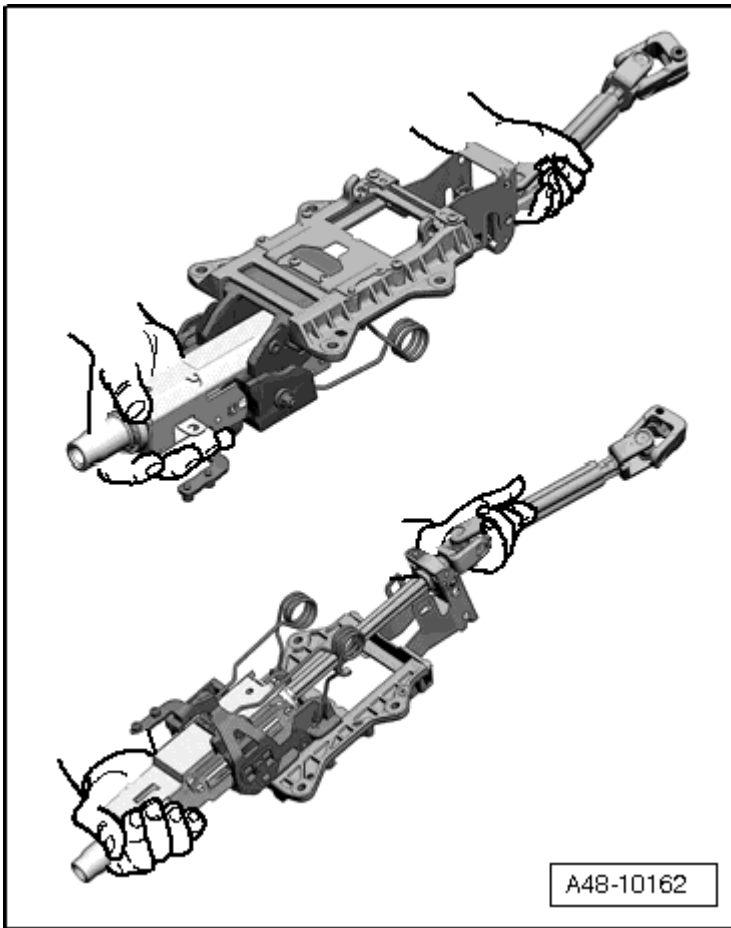


Fig. 6: Correct Handling And Transport Of Steering Column
Courtesy of AUDI OF AMERICA, LLC

- Transport steering column using two hands.
- Hold steering column at upper steering rod tube and in area of upper universal joint.

Incorrect Handling of Steering Column

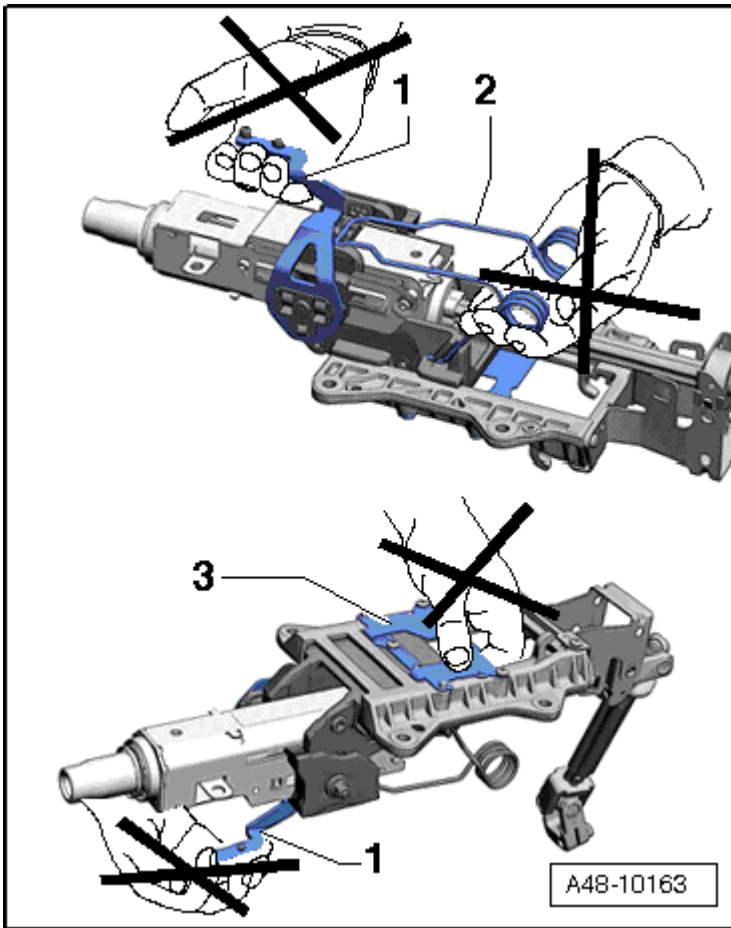


Fig. 7: Incorrect Handling Of Steering Column
Courtesy of AUDI OF AMERICA, LLC

Transporting at the following components leads to pre-damage to the steering column:

1. Clamping Lever
2. Weight Compensation Springs
3. Deformation Element

Damage to the universal joint bushings on lower steering column bushing due to:

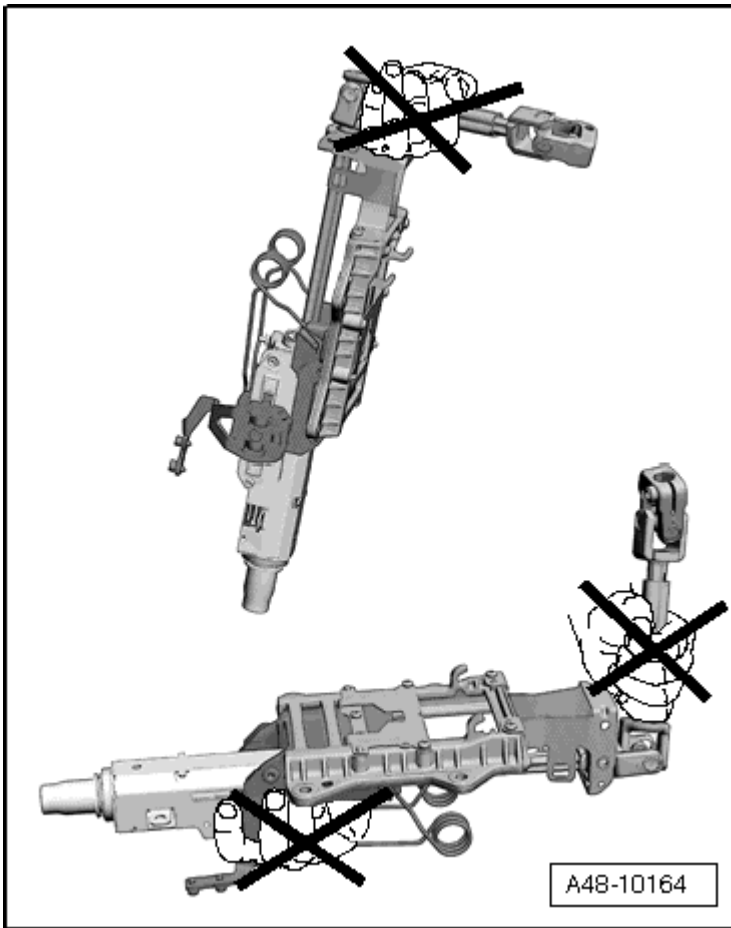


Fig. 8: Incorrect Handling Of Lower Steering Column
Courtesy of AUDI OF AMERICA, LLC

- Holding and carrying the steering column with a hand on the connecting shaft
- Bending joints more than 90°

ELECTRO-MECHANICAL STEERING GEAR WITH TIE RODS OVERVIEW

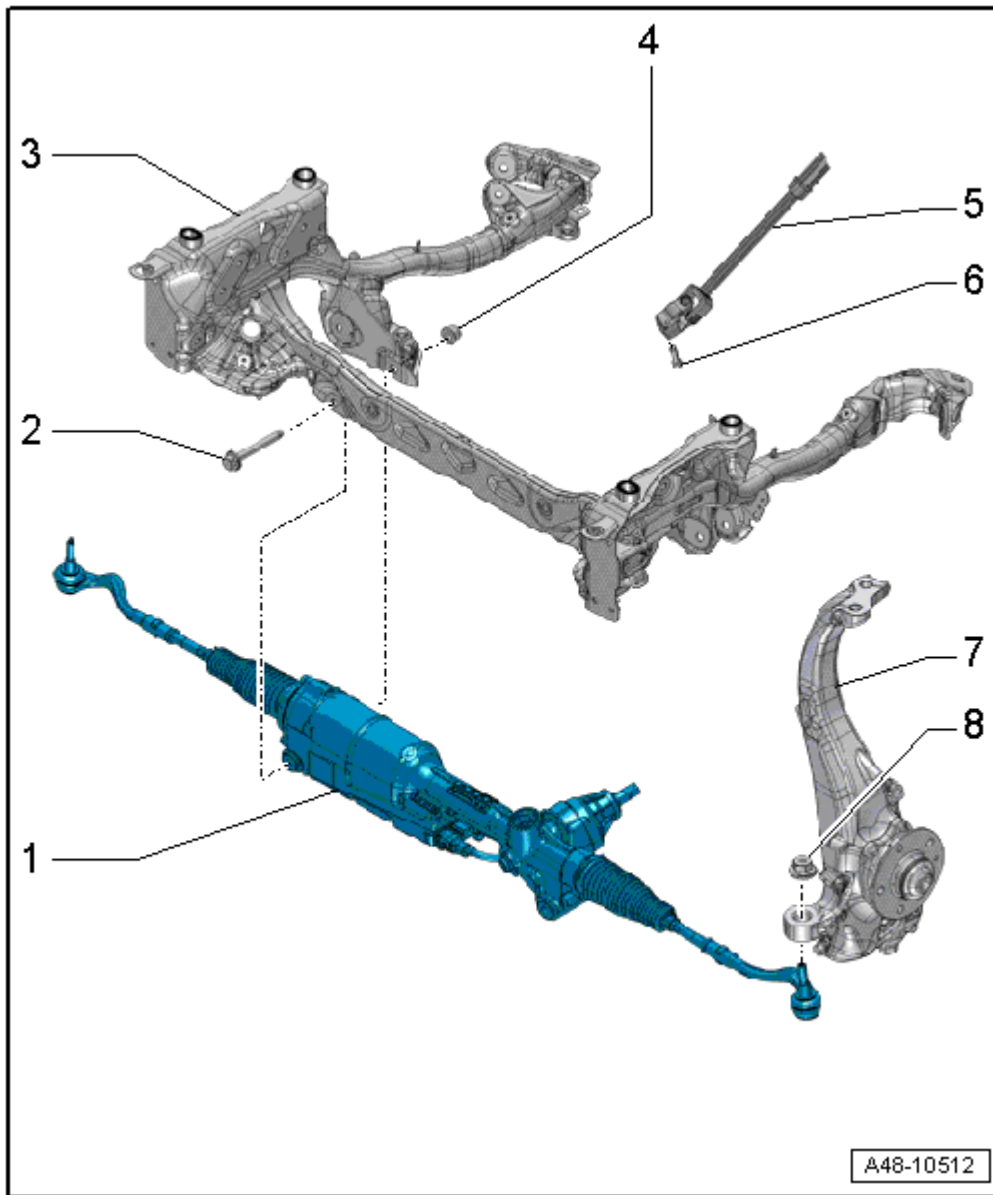


Fig. 9: Electro-Mechanical Steering Gear With Tie Rods Overview

Courtesy of AUDI OF AMERICA, LLC

1. Electro-Mechanical Steering Gear with Tie Rods

- With Power Steering Control Module -J500-
- Removing and installing, refer to **ELECTRO-MECHANICAL STEERING GEAR**
- Servicing, refer to **ELECTRO-MECHANICAL STEERING GEAR OVERVIEW**
- Different versions

A removable heat shield mat was installed on the steering gear at start of production. Be sure to install this mat if installing the old steering gear again.

A removable heat shield mat on the steering gear was replaced by a bonded heat shield mat as a

running change. It is therefore not necessary to take the mat from the old steering gear and installing on a new steering gear.

A replacement steering gear comes with the bonded heat shield mat.

2. Bolt
 - 80 Nm + 180° turn
 - Always replace if removed.
3. Subframe
4. Nut
 - Pushed into the subframe
 - Always replace if removed.
5. Steering Intermediate Shaft
6. Bolt
 - Tightening specification, see item 18
7. Wheel Bearing Housing
8. Nut
 - 100 Nm
 - Always replace if removed.

ELECTRO-MECHANICAL STEERING GEAR OVERVIEW

NOTE: Always replace self-locking nuts and bolts.

Welding or straighten work on any steering components is not permissible.

Use only power steering gear grease to lubricate the steering rack (on the pinion side) and the ball paths (on the engine side). Note: there are different types of grease for the left and right.

The clamps -1 and 8- are tensioned to different tightening specifications.

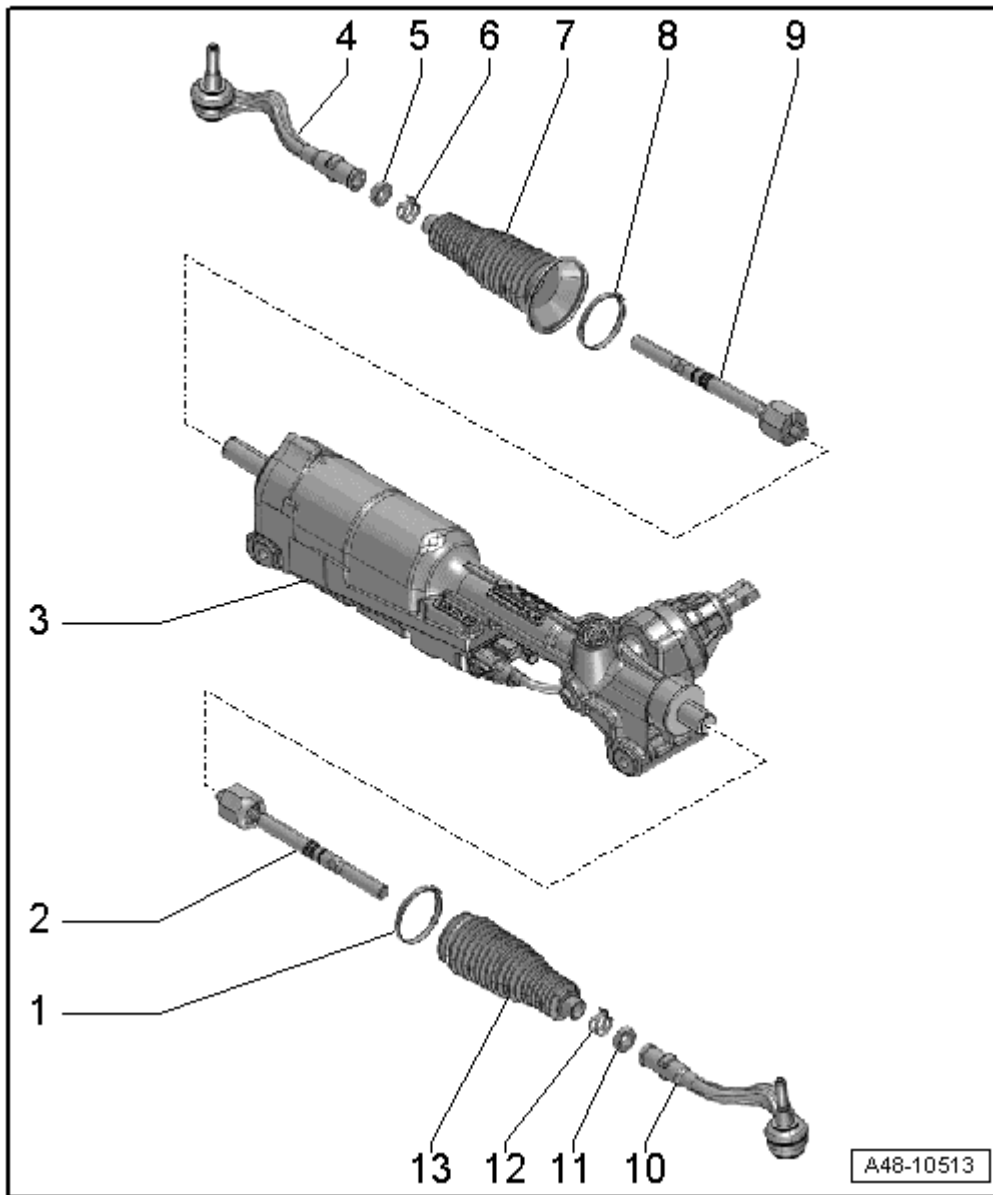


Fig. 10: Electro-Mechanical Steering Gear Overview

Courtesy of AUDI OF AMERICA, LLC

1. Clamp

- Always replace if removed.
- Use the CV joint boot clamp tool to tensions the clamp. Refer to **Fig. 12**.

NOTE: Do not open or bend the new clamp.

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2. Tie Rod

- 100 Nm

- Removing and installing, refer to **TIE ROD**
- Grease the joint with power steering gear grease

3. Electro-Mechanical Steering Gear

- Removing and installing, refer to **ELECTRO-MECHANICAL STEERING GEAR**
- Grease the steering rack with power steering gear grease Note: there are different types of grease for the left and right.
- Different versions

A removable heat shield mat was installed on the steering gear at the start of production. Be sure to install this mat if installing the old steering gear again.

A removable heat shield mat on the steering gear was replaced by a bonded heat shield mat as a running change. It is not necessary to take the mat from the old steering gear and installing on a new steering gear.

A replacement steering gear comes with the bonded heat shield mat.

4. Tie Rod End

- Removing and installing, refer to **TIE ROD END**
- Check dust caps for damage and correct seating
- Check dimension, refer to **Fig. 11**

5. Nut

- 80 Nm
- Counter hold on the tie rod end when loosening or tightening

6. Spring Clamp

- Always replace if removed.
- Spring clamp, installing **Boot Assembly**

7. Boot

- Check for damage
- Always replace if removed.
- Coat the inside of slits in the boot all the way around and evenly with power steering gear grease before installing.
- Check the boot seat on the steering gear housing for damage. The steering gear must be replaced if there is damage.
- Must not be twisted when toe is being adjusted
- Make sure it is installed correctly **Boot Assembly**.
- Replace, refer to **BOOT, REPLACING**

8. Clamp

- Always replace if removed.
- Use the CV joint boot clamp tool to tensions the clamp. Refer to **Fig. 12**.

NOTE: Do not open or bend the new clamp.

- For the correct version,

9. Tie Rod

- 100 Nm
- Removing and installing, refer to **TIE ROD**
- Grease the joint with power steering gear grease

10. Tie Rod End

- Removing and installing, refer to **TIE ROD END**
- Check dust caps for damage and correct seating
- Check dimension, refer to **Fig. 11**

11. Lock Nut

- 80 Nm
- Counter hold on the tie rod end when loosening or tightening

12. Spring Clamp

- Always replace if removed.
- Spring clamp, installing **Boot Assembly**

13. Boot

- Check for damage
- Always replace if removed.
- Coat the inside of slits in the boot all the way around and evenly with power steering gear grease before installing.
- Check the seat for the boot on the steering gear for damage before installing. If the steering gear housing is damaged, replace the steering gear.
- Must not be twisted when toe is being adjusted
- Make sure it is installed correctly **Boot Assembly**.
- Replace, refer to **BOOT, REPLACING**

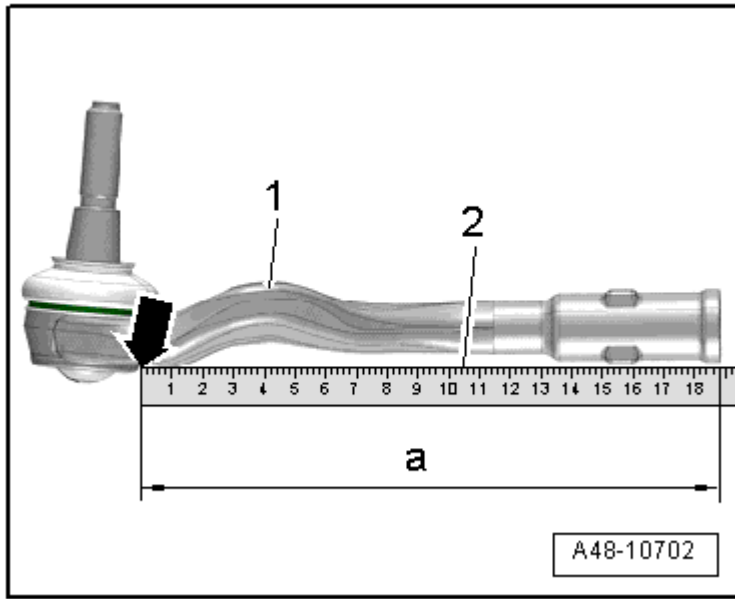


Fig. 11: Tie Rod End Check Dimension
 Courtesy of AUDI OF AMERICA, LLC

- Place a steel ruler -2- on the tie rod end and push it all the way up to the edge -arrow- of the tie rod end -1-.
- Replace the complete steering gear with the tie rod and tie rod end if the check dimension -a- is less than 188 mm.

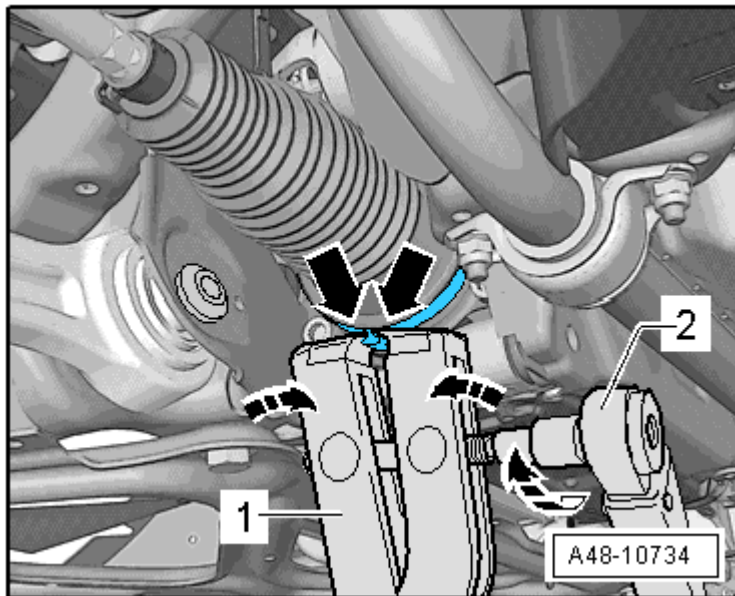


Fig. 12: Tensioning Inner Clamp
 Courtesy of AUDI OF AMERICA, LLC

-- Mount the CV joint boot clamp tool -1- as illustrated. Make sure that the jaws of the clamp tool are seated in

the corners -arrows- of the clamp.

-- Tighten the clamp by turning the spindle using a torque wrench -2- (do not tilt the pliers).

- Use torque wrench -2- with a 5 to 50 Nm range (for example, V.A.G 1331).
- Make sure the spindle threads on the pliers -1- move freely. Grease with MoS₂ grease if necessary.
- If the thread is tight for example dirty, the required tensioning force for the hose clamp will not be achieved in spite of correct torque specification settings.

Clamp Style	Pliers V.A.G 1682 A (Hazet) with adapter V.A.G 1682 A/1	Pliers V.A.G 1682 (O tiker) with adapter V.A.G 1682 A/1
85 mm clamp (front passenger side), see item 8	7 Nm	9 Nm
59 mm clamp (driver side), see item 1	10 Nm	12 Nm

Outer Boot Assembly

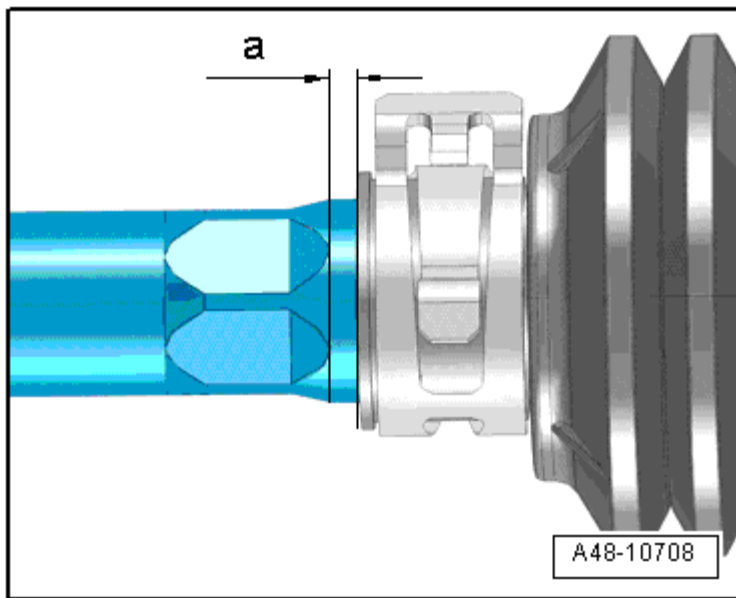


Fig. 13: Outer Boot Assembly Dimension -A-
Courtesy of AUDI OF AMERICA, LLC

- Dimension -a- 2 mm

HYDRAULIC POWER STEERING GEAR OVERVIEW

Power steering gear is completely removed and installed with tie rods.

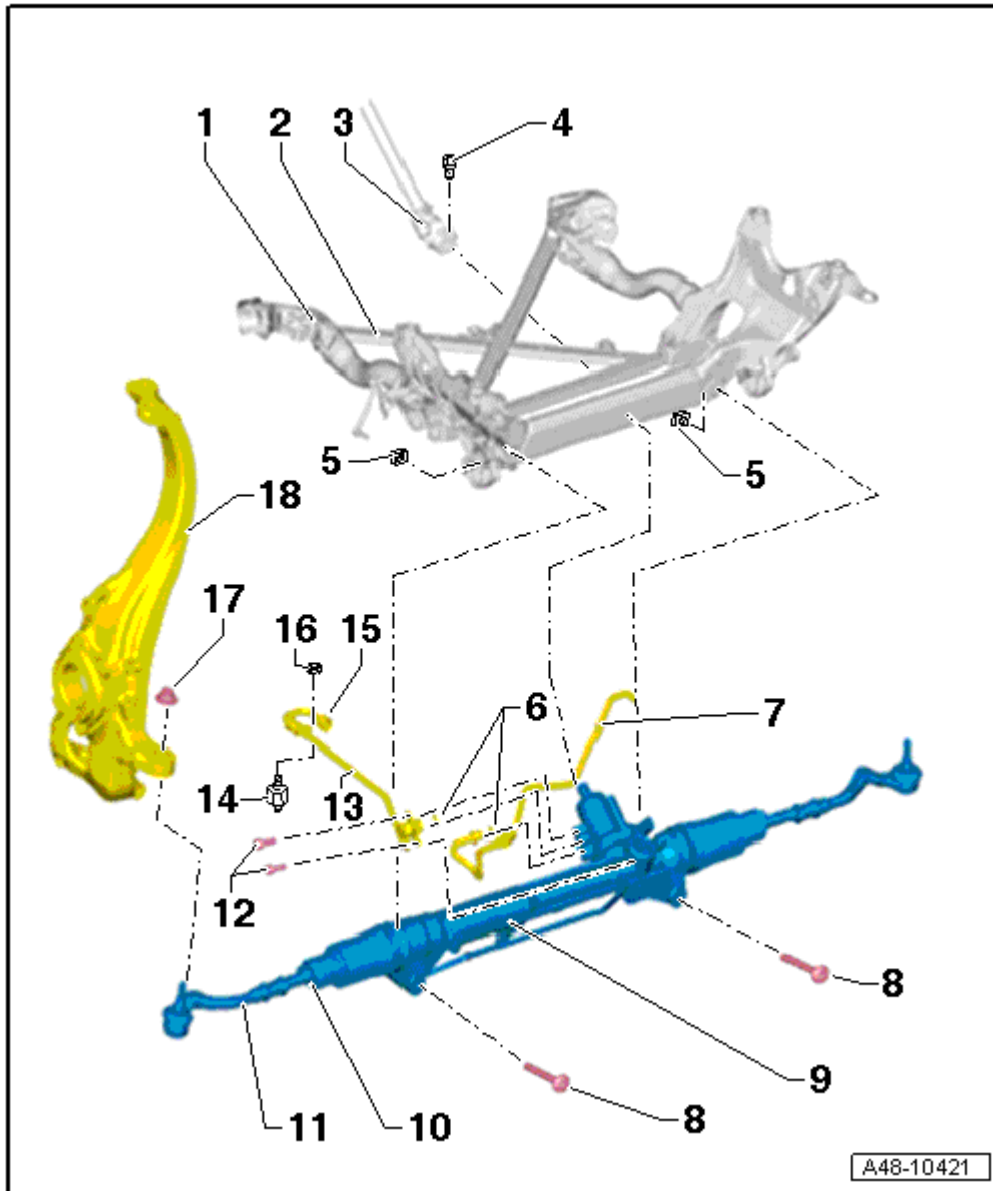


Fig. 14: Hydraulic Power Steering Gear Overview
Courtesy of AUDI OF AMERICA, LLC

1. Subframe
2. Crossbrace
3. Steering Column
4. Bolt
 - 30 Nm + 90° turn
 - Always replace if removed.

- The threaded hole for the bolt must always be cleaned (for example, using a thread tap).
5. Nut
 - Always replace if removed.
 6. Seal
 - Always replace if removed.
 7. Return Line

CAUTION: • Insert the return line completely when installing.

- There are different versions.
8. Bolt
 - 80 Nm + 180° turn
 - Always replace if removed.
 9. Hydraulic Power Steering Gear with Tie Rods
 - Removing and installing, refer to **HYDRAULIC POWER STEERING GEAR**
 - Servicing, refer to **HYDRAULIC POWER STEERING GEAR, SERVICING**
 - Adjusting, refer to **HYDRAULIC POWER STEERING GEAR, ADJUSTING**
 - There are different versions.
 10. Tie Rod
 - Removing and installing, refer to **TIE RODS**
 11. Tie Rod End
 - There are different versions, with long or short thread on the joint pin

WARNING: When replacing, make sure the length of the thread on the tie rod end is sufficient (there must be approximately 5 mm extra thread). If this is not the case, then install a tie rod end with a longer thread pin.

- Removing and installing, refer to **TIE ROD END**
12. Bolt
 - 20 Nm
 13. Pressure Line
 - There are different versions, with and without a separating point.

CAUTION: • Insert the pressure line completely when installing.

- There are different versions.
14. Rubber Bushing

- 6 Nm
15. Union Nut
- 40 Nm
 - A pressure line with a separating point does not have a union nut.
16. Nut
- 6 Nm
17. Nut
- There are different versions.
 - Pay attention to the different nut versions and to the tightening specifications **Nut Versions**
 - Always replace if removed.
18. Wheel Bearing Housing

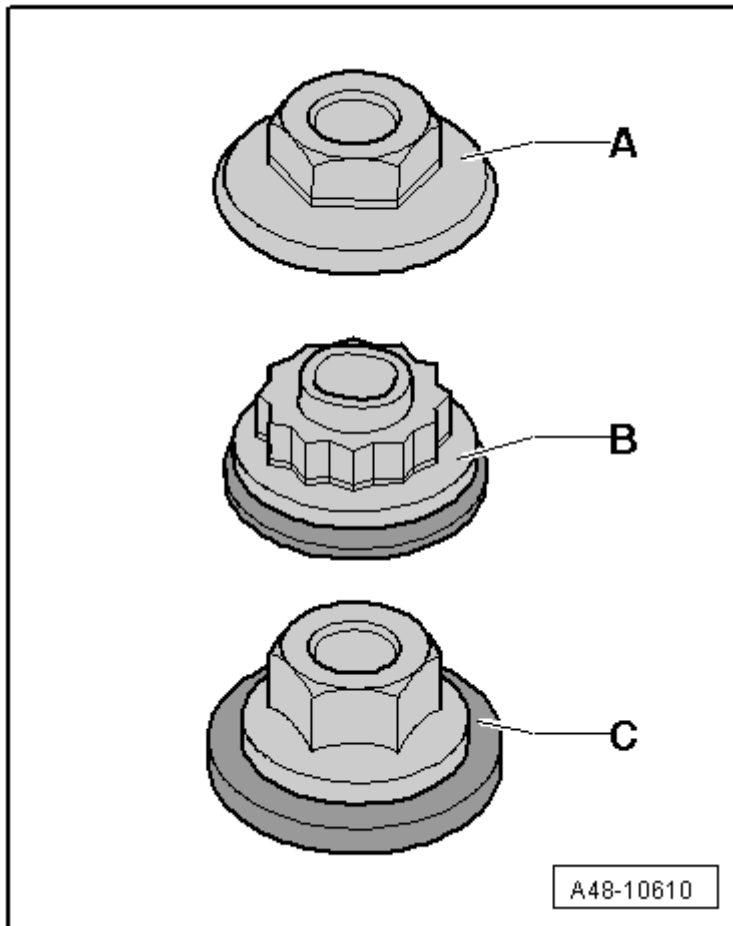
Nut Versions

Fig. 15: Identifying Nut Versions

Courtesy of AUDI OF AMERICA, LLC

- Hex collar nut -A-

Tightening Specifications 20 Nm + 90° turn

- 12-point combi nut -B-

Tightening Specifications 100 Nm

- Hex combi nut -C-

Tightening Specifications 110 Nm

POWER STEERING PUMP, HYDRAULIC LINES AND RESERVOIR, 4-CYLINDER TFSI ENGINE

VEHICLES WITH DYNAMIC STEERING OVERVIEW (4-CYLINDER TFSI ENGINE)

Vane pump is not designed to be serviced. If there are customer complaints, the cause must be determined using a pressure and leak test. If there is a malfunction, replace the vane pump.

NOTE: **If power steering fluid is low in reservoir, check steering system for leaks.**

If there are leaks in the area of the line connections, the lines/connections must first be inspected for leaks, tightened as necessary and wiped dry.

Power steering pump is delivered without oil. Therefore, hydraulic oil must be filled before installation and turned by hand. Otherwise, noises when driving or damage to power steering pump may occur.

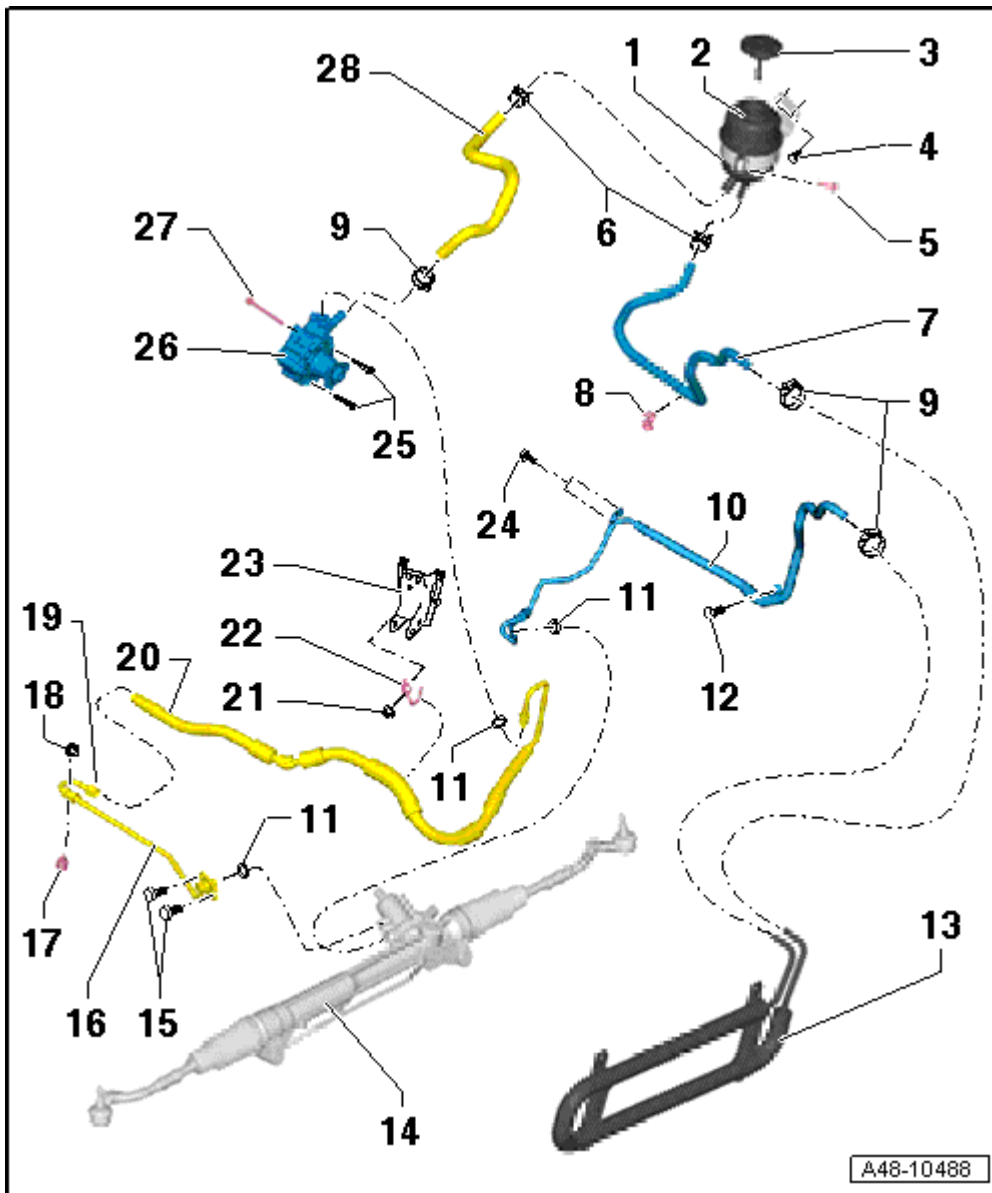


Fig. 16: Vehicles With Dynamic Steering Overview (4-Cylinder TFSI Engine)
 Courtesy of AUDI OF AMERICA, LLC

1. Tensioning Strap
 - Secure to body, refer to **LINES AND HOSES OVERVIEW**
2. Reservoir
 - Note installed position, refer to **LINES AND HOSES OVERVIEW**
 - Installation position of hoses on the reservoir, refer to **HOSE LINES TO RESERVOIR, HYDRAULIC FLUID COOLER AND RETURN LINE INSTALLED POSITION.**
3. Cap with Dip Stick
 - Check fluid level, refer to **POWER STEERING FLUID LEVEL, CHECKING**
4. Bolt

- 9 Nm
- 5. Bolt
 - 9 Nm
- 6. Spring Clamp
 - Removing and install using the hose clip pliers V.A.G 1921
- 7. Return Hose
 - From the hydraulic oil cooler to the reservoir
 - Mounting on longitudinal member, refer to **LINES AND HOSES OVERVIEW**
 - Note location on reservoir, refer to **HOSE LINES TO RESERVOIR, HYDRAULIC FLUID COOLER AND RETURN LINE INSTALLED POSITION**
 - Note location on hydraulic oil cooler, refer to **HOSE LINES TO RESERVOIR, HYDRAULIC FLUID COOLER AND RETURN LINE INSTALLED POSITION**
- 8. Clip
- 9. Clamp
 - Tension using hose clamp pliers V.A.G 1275
 - Always replace if removed.
- 10. Return Line
 - From the power steering gear to the hydraulic oil cooler

CAUTION: • Insert the return line completely when installing.

- Mounting on the subframe, refer to **LINES AND HOSES OVERVIEW**
- Note location on hydraulic oil cooler, refer to **HOSE LINES TO RESERVOIR, HYDRAULIC FLUID COOLER AND RETURN LINE INSTALLED POSITION**
- Installation location on the wiring connection, refer to **HOSE LINES TO RESERVOIR, HYDRAULIC FLUID COOLER AND RETURN LINE INSTALLED POSITION**
- 11. Seal
 - Always replace if removed.
- 12. Bolt
 - 9 Nm
- 13. Hydraulic Oil Cooler
 - Clipped to the condenser, refer to **LINES AND HOSES OVERVIEW**
 - Removing and installing, refer to **HYDRAULIC OIL COOLER, VEHICLES WITH DYNAMIC STEERING**
- 14. Power-Assisted Steering Gear
 -
 - Removing and installing, refer to **HYDRAULIC POWER STEERING GEAR**
- 15. Bolt

- 20 Nm

16. Pressure Line

- from the power steering pump to the power steering gear

CAUTION: • Insert the pressure line completely when installing.

- Mounting on crossbrace, refer to **LINES AND HOSES OVERVIEW**
- Wiring connection installation location, refer to **LINES AND HOSES OVERVIEW**

17. Rubber Bushing

- 6 Nm

18. Nut

- 6 Nm

19. Union Nut

- 40 Nm
- Wiring connection installation location, refer to **LINES AND HOSES OVERVIEW**

20. Pressure Line

- from the power steering pump to the power steering gear

CAUTION: • Insert the pressure line completely when installing.

- Union nut tightening specification: 38 Nm
- Mounting on engine mount, refer to **LINES AND HOSES OVERVIEW**
- Wiring connection installation location, refer to **HOSE LINES TO RESERVOIR, HYDRAULIC FLUID COOLER AND RETURN LINE INSTALLED POSITION**

21. Nut

- 9 Nm

22. Retaining Bracket

23. Connector

- For the engine mount

24. Bolt

- 9 Nm

25. Bolt

- 25 Nm

26. Power Steering Pump

-
- Fill with hydraulic oil before installation
- Checking delivery pressure, refer to **POWER STEERING PUMP DELIVERY PRESSURE,**

CHECKING

- Removing and installing, refer to **POWER STEERING PUMP, VEHICLES WITH DYNAMIC STEERING**

27. Bolt

- 25 Nm

28. Intake Hose

- Note location on reservoir, refer to **HOSE LINES TO RESERVOIR, HYDRAULIC FLUID COOLER AND RETURN LINE INSTALLED POSITION**
- Note power steering pump location, refer to **POWER STEERING PUMP, VEHICLES WITH DYNAMIC STEERING**

VEHICLES WITHOUT DYNAMIC STEERING OVERVIEW (4-CYLINDER TFSI ENGINE)

Vane pump is not designed to be serviced. If there are customer complaints, the cause must be determined using a pressure and leak test. If there is a malfunction, replace the vane pump.

NOTE: If power steering fluid is low in reservoir, check steering system for leaks.

If there are leaks in the area of the line connections, the lines/connections must first be inspected for leaks, tightened as necessary and wiped dry.

Power steering pump is delivered without oil. Therefore, hydraulic oil must be filled before installation and turned by hand. Otherwise, noises when driving or damage to power steering pump may occur.

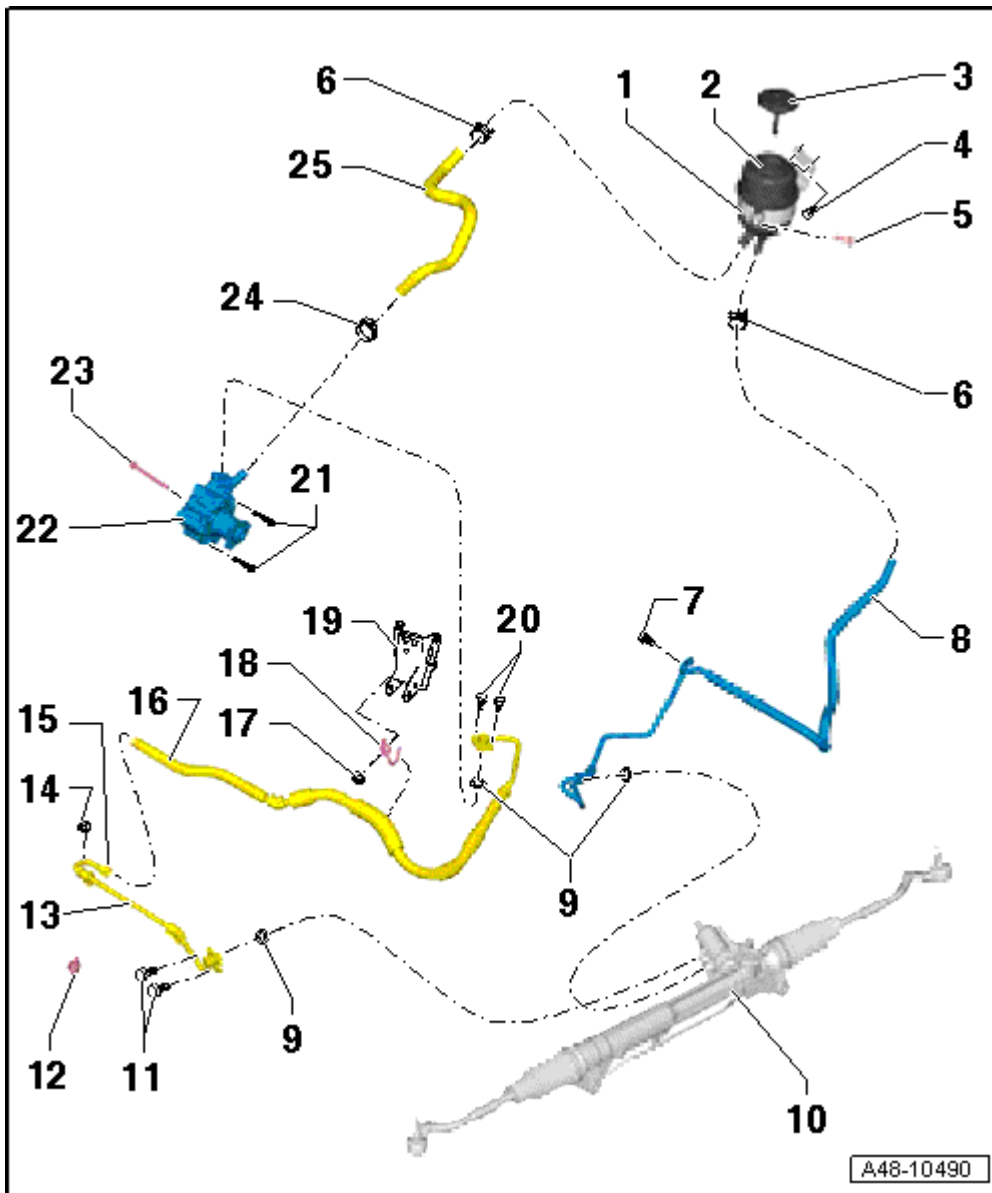


Fig. 17: Vehicles Without Dynamic Steering Overview (4-Cylinder TFSI Engine)

Courtesy of AUDI OF AMERICA, LLC

1. Tensioning Strap
 - Secure to body, refer to **LINES AND HOSES OVERVIEW**
2. Reservoir
 - Note installed position, refer to **LINES AND HOSES OVERVIEW**
 - Installation position of hoses on the reservoir, refer to **HOSE LINES TO RESERVOIR, HYDRAULIC FLUID COOLER AND RETURN LINE INSTALLED POSITION.**
3. Cap with Dip Stick
 - Check fluid level, refer to **POWER STEERING FLUID LEVEL, CHECKING**
4. Bolt

- 9 Nm
- 5. Bolt
 - 9 Nm
- 6. Spring Clamp
 - Removing and install using the hose clip pliers V.A.G 1921
- 7. Bolt
 - 9 Nm
- 8. Return Line
 - From the power steering gear to the reservoir

CAUTION: • Insert the return line completely when installing.

- Mounting on the subframe, refer to **LINES AND HOSES OVERVIEW**
- Note location on reservoir, refer to **HOSE LINES TO RESERVOIR, HYDRAULIC FLUID COOLER AND RETURN LINE INSTALLED POSITION**
- 9. Seal
 - Always replace if removed.
- 10. Power-assisted Steering Gear
 -
 - Removing and installing, refer to **HYDRAULIC POWER STEERING GEAR**
- 11. Bolt
 - 20 Nm
- 12. Rubber Bushing
 - 6 Nm
- 13. Pressure Line
 - From the power steering pump to the power steering gear; there are different versions, with and with a separating point.

CAUTION: • Insert the pressure line completely when installing.

- Mounting on crossbrace, refer to **LINES AND HOSES OVERVIEW**
- Wiring connection installation location, refer to **LINES AND HOSES OVERVIEW**
- 14. Nut
 - 6 Nm
- 15. Union Nut
 - 40 Nm
 - Wiring connection installation location, refer to **LINES AND HOSES OVERVIEW**

- A pressure line with a separating point does not have a union nut.

16. Pressure Line

- From the power steering pump to the power steering gear

CAUTION: • Insert the pressure line completely when installing.

- Mounting on engine mount, refer to **LINES AND HOSES OVERVIEW**
- Wiring connection installation location, refer to **LINES AND HOSES OVERVIEW**

17. Nut

- 9 Nm

18. Retaining Bracket

19. Connector

- For the engine mount

20. Bolt

- 9 Nm

21. Bolt

- 25 Nm

22. Power Steering Pump

-
- Fill with hydraulic oil before installation
- Checking delivery pressure, refer to **POWER STEERING PUMP DELIVERY PRESSURE, CHECKING**
- Removing and installing, refer to **POWER STEERING PUMP, WITHOUT DYNAMIC STEERING**

23. Bolt

- 25 Nm

24. Clamp

- Tension using hose clamp pliers V.A.G 1275
- Always replace if removed.

25. Intake Hose

- Note location on reservoir, refer to **HOSE LINES TO RESERVOIR, HYDRAULIC FLUID COOLER AND RETURN LINE INSTALLED POSITION**
- Note power steering pump location, refer to **POWER STEERING PUMP, WITHOUT DYNAMIC STEERING**

LINES AND HOSES OVERVIEW (4-CYLINDER TFSI ENGINE)

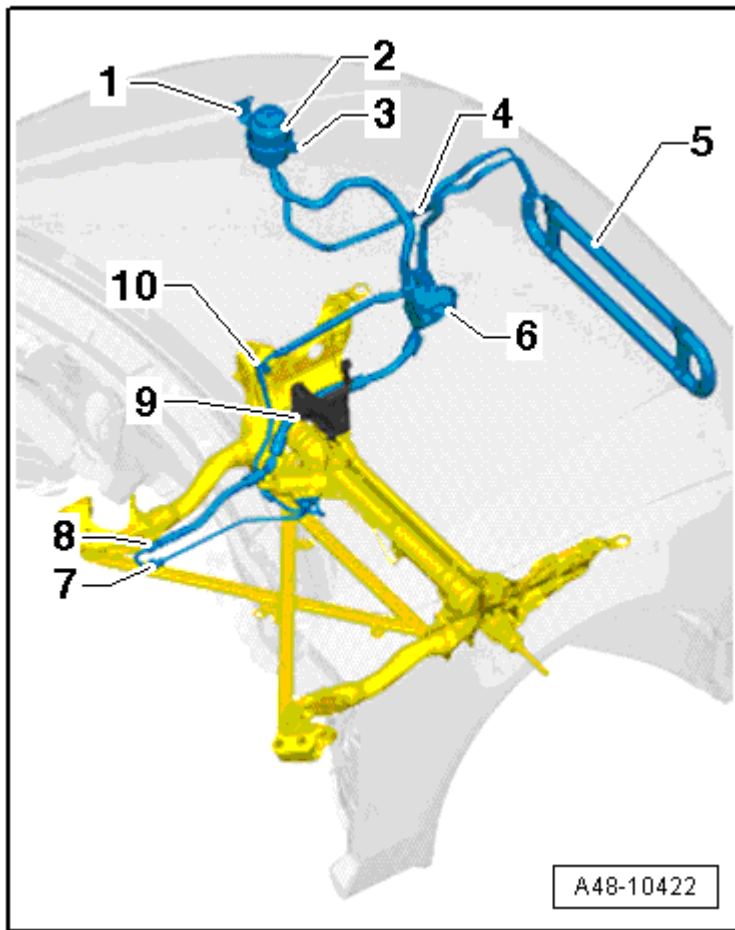


Fig. 18: Lines And Hoses Overview (4-Cylinder TFSI Engine)

Courtesy of AUDI OF AMERICA, LLC

1. Reservoir bracket to body, refer to **Fig. 19**
2. Reservoir in bracket, refer to **Fig. 20**
3. Bolt in bracket, refer to **Fig. 20**
4. Return line clip to the longitudinal member, refer to **Fig. 21** and intake hose clip to the pressure pipe, refer to **Fig. 22**
5. Hydraulic oil cooler to condenser, refer to **Fig. 23**
6. Power steering pump in bracket, refer to **POWER STEERING PUMP, VEHICLES WITH DYNAMIC STEERING** or **POWER STEERING PUMP, WITHOUT DYNAMIC STEERING.**
7. Pressurized line to crossbrace, refer to **Fig. 24**
8. Pressure line connection installation location, refer to **Fig. 24**
9. Pressurized line to the engine mount, refer to **Fig. 25**
10. Return line to the subframe, refer to **Fig. 27**, return line bracket to the longitudinal member, refer to **Fig. 26**

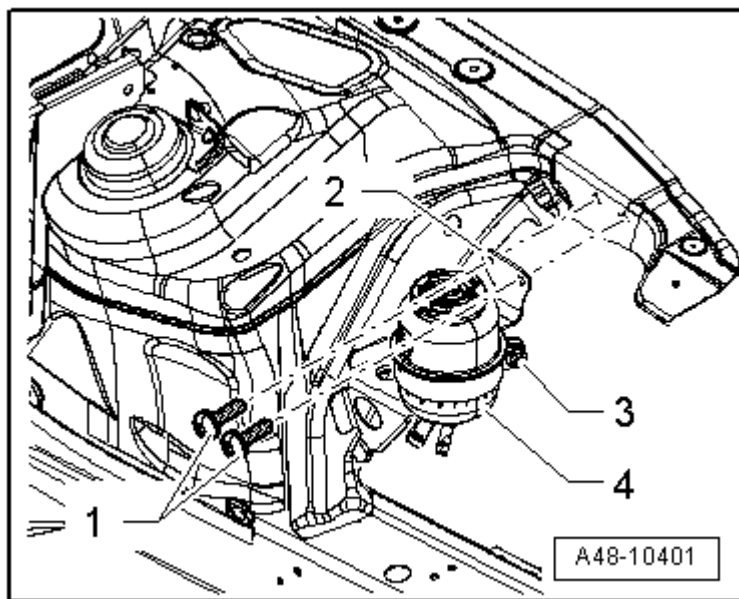


Fig. 19: Reservoir Bracket To Body

Courtesy of AUDI OF AMERICA, LLC

- Secure the bracket -2- to the body with bolts -1-.
- Secure the reservoir -4- in the bracket -2- using the bolt -3-.

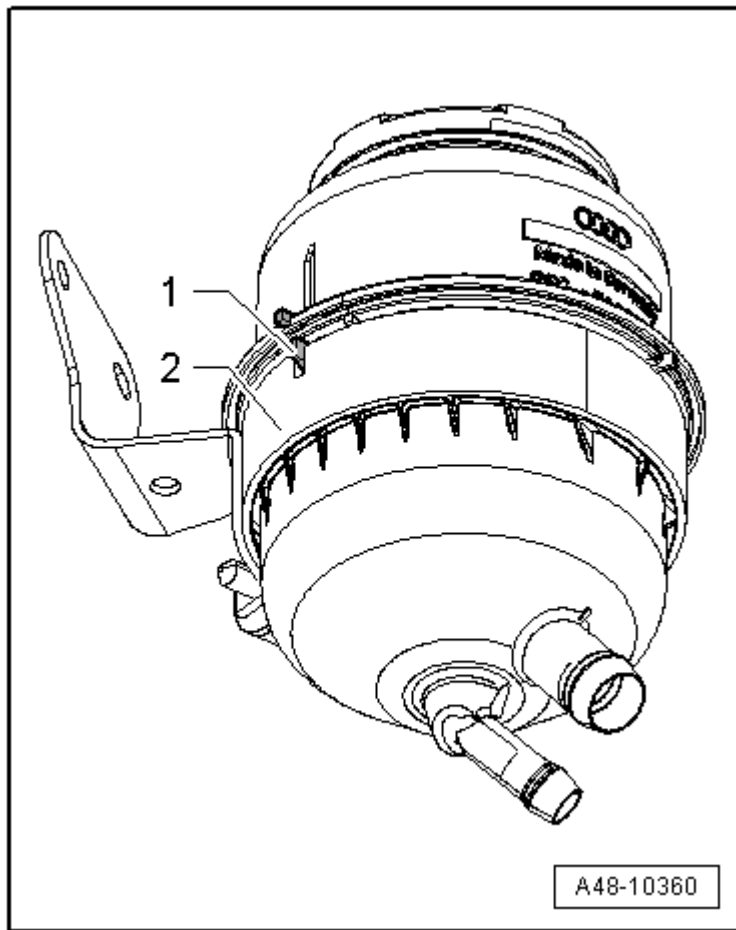


Fig. 20: Reservoir In Bracket

Courtesy of AUDI OF AMERICA, LLC

-- Insert the reservoir with the tab -1- in the opening in the bracket -2-.

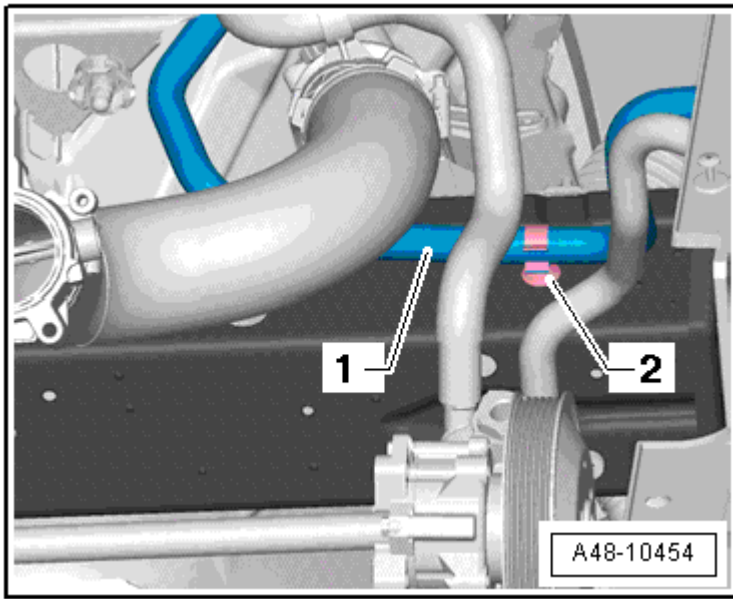


Fig. 21: Return Line Clip To Longitudinal Member
Courtesy of AUDI OF AMERICA, LLC

-- Secure the return line -1- to the left longitudinal member using the clip -2-.

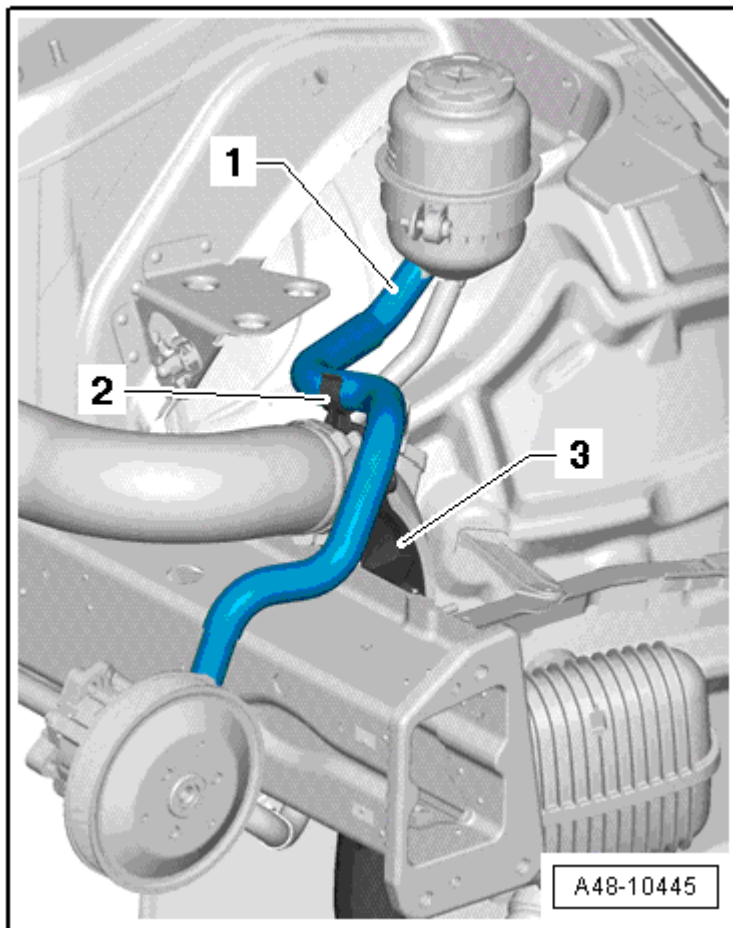


Fig. 22: Intake Hose In Pressure Tube Clip
Courtesy of AUDI OF AMERICA, LLC

-- Insert the intake hose -1- in the clip -2- on the pressure tube -3-.

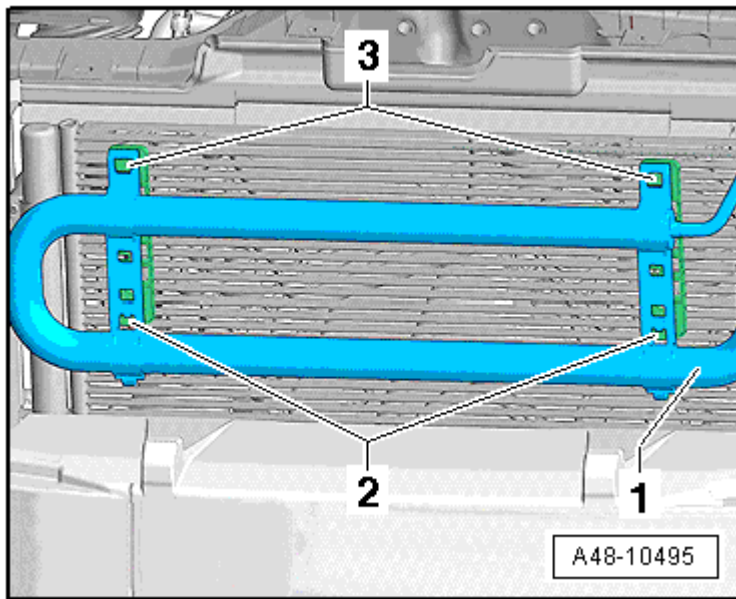


Fig. 23: Hydraulic Oil Cooler To Condenser
 Courtesy of AUDI OF AMERICA, LLC

-- Position the hydraulic oil cooler -1- on the brackets -2- and then engage it into the brackets -3-.

Lines to the hydraulic oil cooler. Refer to **HOSE LINES TO RESERVOIR, HYDRAULIC FLUID COOLER AND RETURN LINE INSTALLED POSITION.**

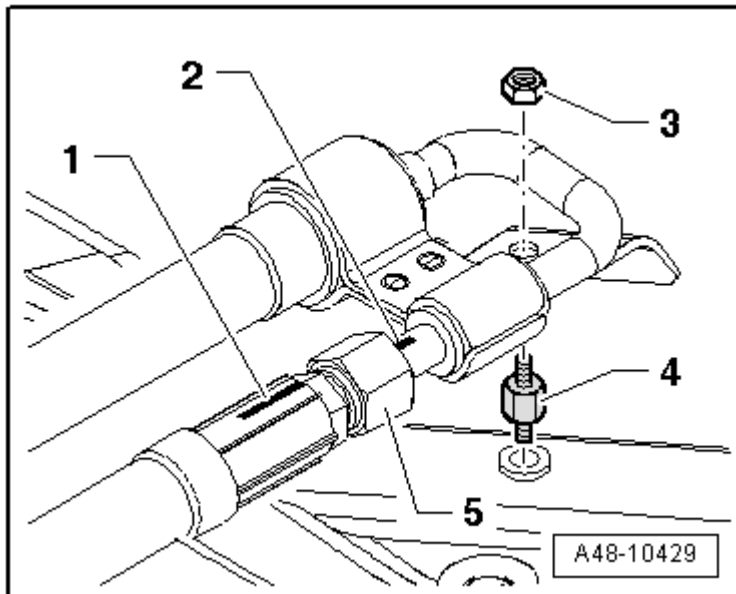


Fig. 24: Pressurized Line To Crossbrace
 Courtesy of AUDI OF AMERICA, LLC

-- Install the pressure line on the crossbrace using the nut -3- and rubber bushing -4-.

-- Note the line installation location when bolting the line connection. The markings -1 and 2- must be opposite each other.

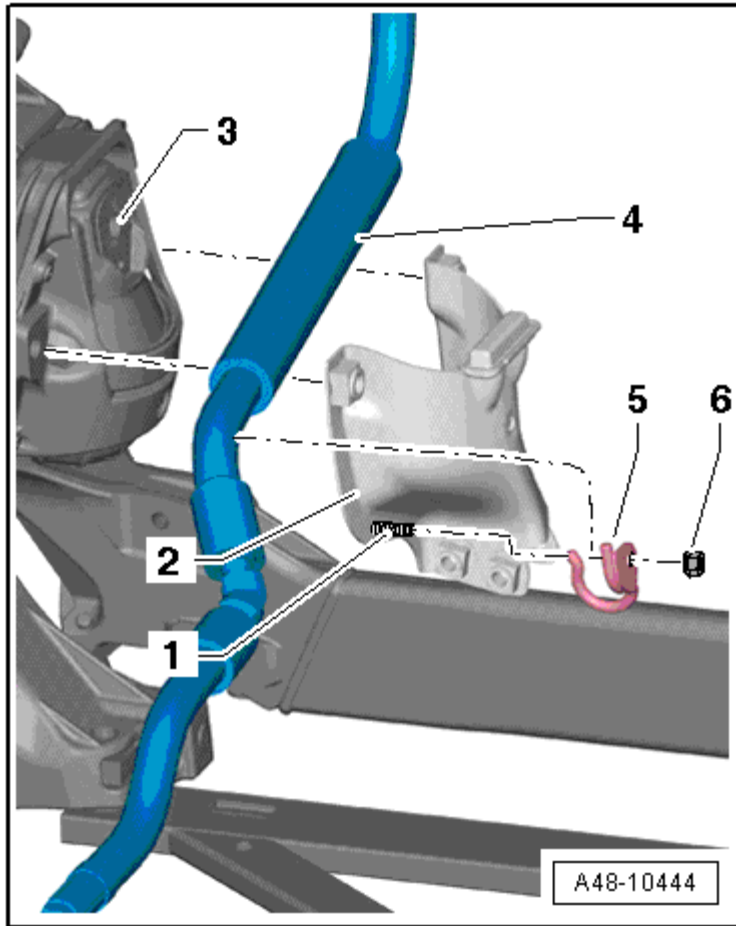


Fig. 25: Pressurized Line To Engine Mount
Courtesy of AUDI OF AMERICA, LLC

- Route the pressure line -4- between the connector -2- and the engine mount -3-.
- Tighten the retaining bracket -5- on the threaded pin -1- using the nut -6-.

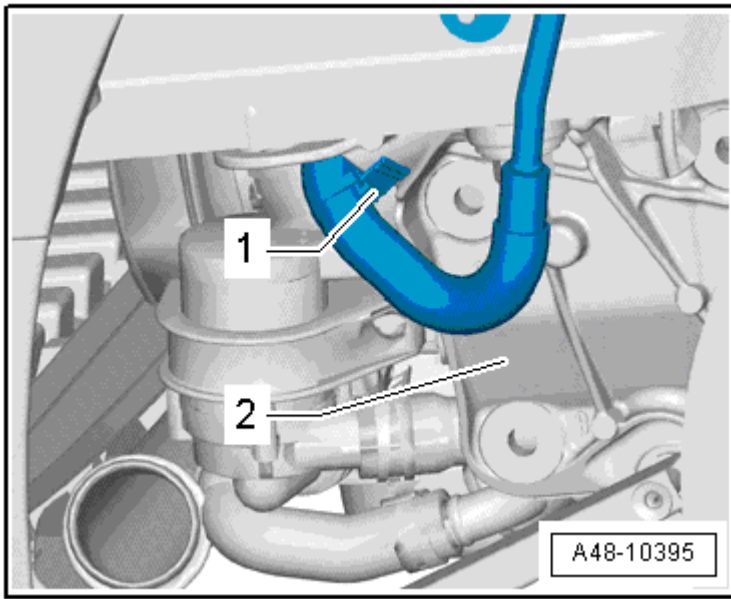


Fig. 26: Return Line Bracket To Subframe
Courtesy of AUDI OF AMERICA, LLC

-- Secure the return line with the wiring bracket -1- to the left front of the subframe -2-.

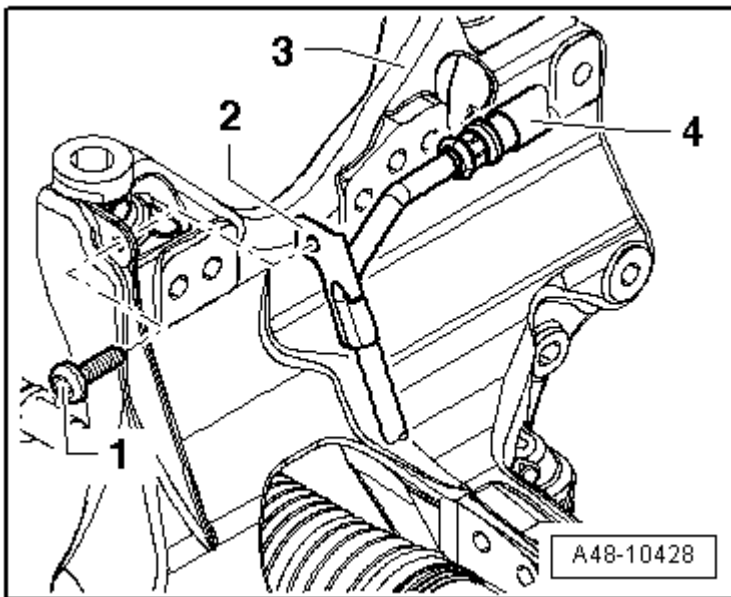


Fig. 27: Return Line To Subframe
Courtesy of AUDI OF AMERICA, LLC

-- Install the return line -4- on the subframe -3- using the bracket -2- and bolt -1-.

POWER STEERING PUMP, HYDRAULIC LINES AND RESERVOIR, 6-CYLINDER FSI ENGINE

VEHICLES WITH DYNAMIC STEERING OVERVIEW (6-CYLINDER FSI ENGINE)

Vane pump is not designed to be serviced. If there are customer complaints, the cause must be determined using a pressure and leak test. If there is a malfunction, replace the vane pump.

NOTE: If power steering fluid is low in reservoir, check steering system for leaks.

If there are leaks in the area of the line connections, the lines/connections must first be inspected for leaks, tightened as necessary and wiped dry.

Power steering pump is delivered without oil. Therefore, hydraulic oil must be filled before installation and turned by hand. Otherwise, noises when driving or damage to power steering pump may occur.

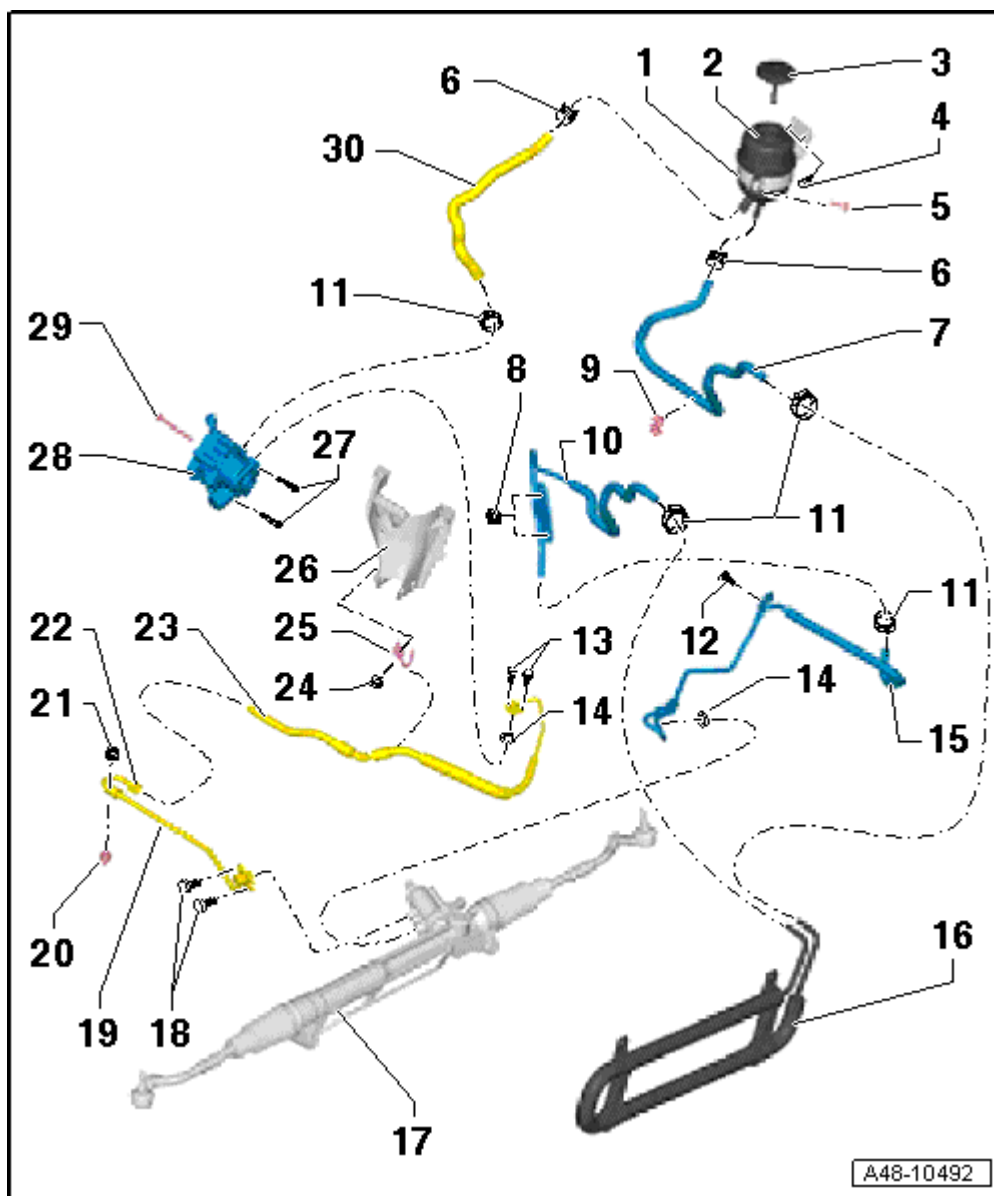


Fig. 28: Vehicles With Dynamic Steering Overview (6-Cylinder FSI Engine)
Courtesy of AUDI OF AMERICA, LLC

1. Tensioning Strap
 - Secure to body, refer to **LINES AND HOSES OVERVIEW**
2. Reservoir
 - Note installed position, refer to **LINES AND HOSES OVERVIEW**
 - Installation position of hoses on the reservoir, refer to **HOSE LINES TO RESERVOIR, HYDRAULIC FLUID COOLER AND RETURN LINE INSTALLED POSITION.**
3. Cap with Dip Stick
 - Check fluid level, refer to **POWER STEERING FLUID LEVEL, CHECKING**
4. Bolt
 - 9 Nm
5. Bolt
 - 9 Nm
6. Spring Clamp
 - Removing and install using the hose clip pliers V.A.G 1921
7. Return Hose
 - From the hydraulic oil cooler to the reservoir
 - Mounting on longitudinal member, refer to **LINES AND HOSES OVERVIEW**
 - Note location on reservoir, refer to **HOSE LINES TO RESERVOIR, HYDRAULIC FLUID COOLER AND RETURN LINE INSTALLED POSITION**
 - Note location on hydraulic oil cooler, refer to **HOSE LINES TO RESERVOIR, HYDRAULIC FLUID COOLER AND RETURN LINE INSTALLED POSITION**
8. Nut
 - 6 Nm
9. Clip
10. Return Line
 - From the power steering gear to the hydraulic oil cooler
 - Mounting on the subframe, refer to **LINES AND HOSES OVERVIEW**
 - Note location on reservoir, refer to **HOSE LINES TO RESERVOIR, HYDRAULIC FLUID COOLER AND RETURN LINE INSTALLED POSITION**
 - Note location on hydraulic oil cooler, refer to **HOSE LINES TO RESERVOIR, HYDRAULIC FLUID COOLER AND RETURN LINE INSTALLED POSITION**
11. Clamp
 - Tension using hose clamp pliers V.A.G 1275
 - Always replace if removed.
12. Bolt
 - 9 Nm
13. Bolt
 - 9 Nm
14. Seal

- Always replace if removed.

15. Return Line

- From the power steering gear to the hydraulic oil cooler

CAUTION: • Insert the return line completely when installing.

- Mounting on the subframe, refer to **LINES AND HOSES OVERVIEW**
- Installation location on the wiring connection, refer to **HOSE LINES TO RESERVOIR, HYDRAULIC FLUID COOLER AND RETURN LINE INSTALLED POSITION**

16. Hydraulic Oil Cooler

- Clipped to the condenser, refer to **LINES AND HOSES OVERVIEW**
- Removing and installing, refer to **HYDRAULIC OIL COOLER, VEHICLES WITH DYNAMIC STEERING**

17. Power Steering Gear

-
- Removing and installing, refer to **HYDRAULIC POWER STEERING GEAR**

18. Bolt

- 20 Nm

19. Pressure Line

- From the power steering pump to the power steering gear

CAUTION: • Insert the pressure line completely when installing.

- Mounting on crossbrace, refer to **LINES AND HOSES OVERVIEW**
- Wiring connection installation location, refer to **LINES AND HOSES OVERVIEW**

20. Rubber Bushing

- 6 Nm

21. Nut

- 6 Nm

22. Union Nut

- 40 Nm
- Wiring connection installation location, refer to **LINES AND HOSES OVERVIEW**

23. Pressure Line

- From the power steering pump to the power steering gear

CAUTION: • Insert the pressure line completely when installing.

- Mounting on crossbrace, refer to **LINES AND HOSES OVERVIEW**
 - Wiring connection installation location, refer to **LINES AND HOSES OVERVIEW**
24. Nut
- 9 Nm
25. Retaining Bracket
26. Connector
- For the engine mount
27. Bolt
- 20 Nm
28. Pump Steering Pump -V119-
- With power steering pump control valve -V119-
 - The pump and control valve are a single component and are replaced together.
 -
 - Fill with hydraulic oil before installation
 - Checking delivery pressure, refer to **POWER STEERING PUMP DELIVERY PRESSURE, CHECKING**
 - Removing and installing, refer to **POWER STEERING PUMP, VEHICLES WITH DYNAMIC STEERING**
29. Bolt
- 20 Nm
30. Intake Hose
- Note location on reservoir, refer to **HOSE LINES TO RESERVOIR, HYDRAULIC FLUID COOLER AND RETURN LINE INSTALLED POSITION**
 - Note power steering pump location, refer to **POWER STEERING PUMP, VEHICLES WITHOUT DYNAMIC STEERING**

VEHICLES WITHOUT DYNAMIC STEERING OVERVIEW (6-CYLINDER FSI ENGINE)

Vane pump is not designed to be serviced. If there are customer complaints, the cause must be determined using a pressure and leak test. If there is a malfunction, replace the vane pump.

NOTE: **If power steering fluid is low in reservoir, check steering system for leaks.**

If there are leaks in the area of the line connections, the lines/connections must first be inspected for leaks, tightened as necessary and wiped dry.

Power steering pump is delivered without oil. Therefore, hydraulic oil must be filled before installation and turned by hand. Otherwise, noises when driving or damage to power steering pump may occur.

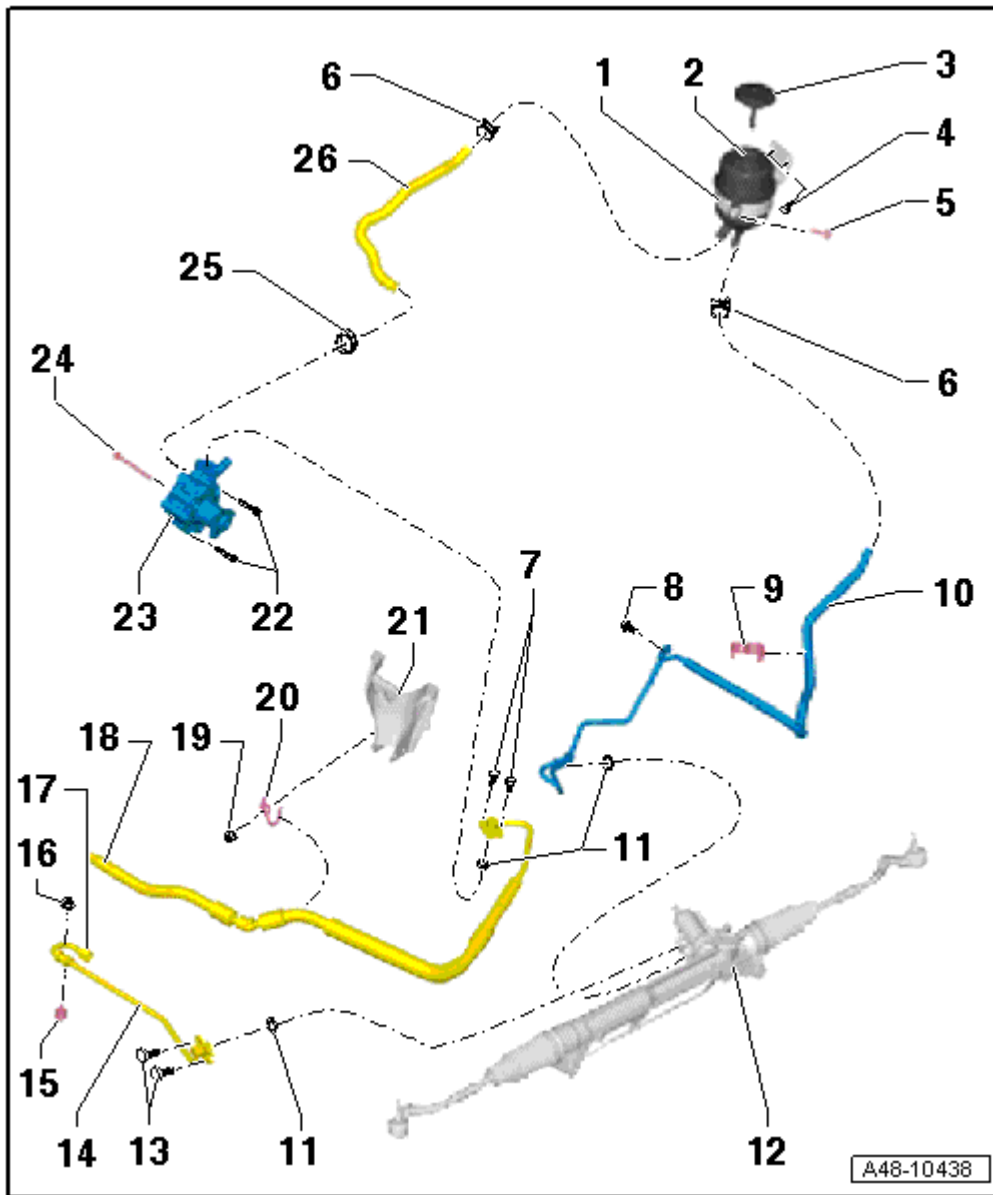


Fig. 29: Vehicles Without Dynamic Steering Overview (6-Cylinder FSI Engine)

Courtesy of AUDI OF AMERICA, LLC

1. Tensioning Strap
 - Secure to body **LINES AND HOSES OVERVIEW**
2. Reservoir
 - Note installed position **LINES AND HOSES OVERVIEW**
 - Installation position of hoses on the reservoir **HOSE LINES TO RESERVOIR, HYDRAULIC FLUID COOLER AND RETURN LINE INSTALLED POSITION.**
3. Cap with Dip Stick
 - Check fluid level **POWER STEERING FLUID LEVEL, CHECKING**
4. Bolt

- 9 Nm
- 5. Bolt
 - 9 Nm
- 6. Spring Clamp
 - Removing and install using the hose clip pliers V.A.G 1921
- 7. Bolt
 - 9 Nm
- 8. Bolt
 - 9 Nm
- 9. Wiring Bracket
 - For securing the intake hose on the longitudinal member **LINES AND HOSES OVERVIEW**.
- 10. Return Line
 - From the power steering gear to the reservoir

CAUTION: • Insert the return line completely when installing.

- Mounting on the subframe, refer to **LINES AND HOSES OVERVIEW**
- Note location on reservoir, refer to **HOSE LINES TO RESERVOIR, HYDRAULIC FLUID COOLER AND RETURN LINE INSTALLED POSITION**
- 11. Seal
 - Always replace if removed.
- 12. Power Steering Gear
 -
 - Removing and installing, refer to **HYDRAULIC POWER STEERING GEAR**
- 13. Bolt
 - 20 Nm
- 14. Pressure Line
 - From the power steering pump to the power steering gear; there are different versions, with and with a separating point.
 - Mounting on crossbrace, refer to **LINES AND HOSES OVERVIEW**
 - Wiring connection installation location, refer to **LINES AND HOSES OVERVIEW**

CAUTION: • Insert the pressure line completely when installing.

- 15. Rubber Bushing
 - 6 Nm
- 16. Nut

- 6 Nm
17. Union Nut
- 40 Nm
 - Wiring connection installation location, refer to **LINES AND HOSES OVERVIEW**
 - A pressure line with a separating point does not have a union nut.

18. Pressure Line
- From the power steering pump to the power steering gear

CAUTION: • Insert the pressure line completely when installing.

- Mounting on crossbrace, refer to **LINES AND HOSES OVERVIEW**
 - Wiring connection installation location, refer to **LINES AND HOSES OVERVIEW**
19. Nut
- 9 Nm
20. Retaining Bracket
21. Connector
- For the engine mount
22. Bolt
- 20 Nm
23. Power Steering Pump
- - Fill with hydraulic oil before installation
 - Checking delivery pressure, refer to **POWER STEERING PUMP DELIVERY PRESSURE, CHECKING**
 - Removing and installing, refer to **POWER STEERING PUMP, VEHICLES WITHOUT DYNAMIC STEERING**
24. Bolt
- 20 Nm
25. Clamp
- Tension using hose clamp pliers V.A.G 1275
 - Always replace if removed.
26. Intake Hose
- Note location on reservoir, refer to **HOSE LINES TO RESERVOIR, HYDRAULIC FLUID COOLER AND RETURN LINE INSTALLED POSITION**
 - Note power steering pump location, refer to **POWER STEERING PUMP, VEHICLES WITHOUT DYNAMIC STEERING**

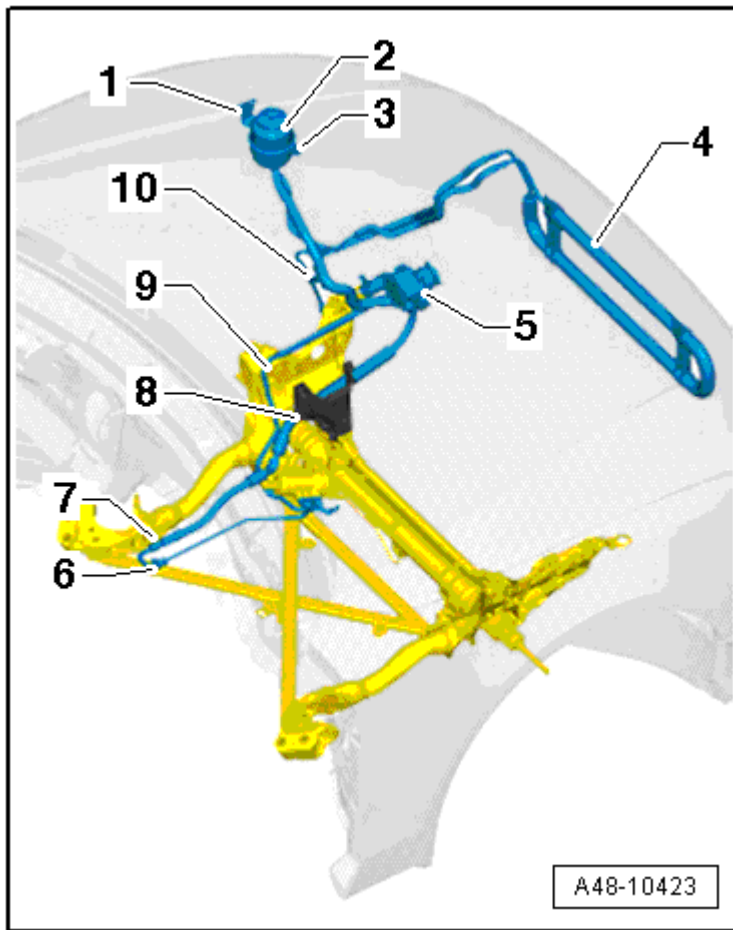


Fig. 30: Lines And Hoses Overview (6-Cylinder FSI Engine)

Courtesy of AUDI OF AMERICA, LLC

1. Reservoir bracket to body, refer to **Fig. 31**
2. Reservoir in bracket, refer to **Fig. 32**
3. Bolt in bracket, refer to **Fig. 31**
4. Hydraulic oil cooler to condenser, refer to **Fig. 33**
5. Power steering pump in the bracket, refer to **POWER STEERING PUMP, VEHICLES WITH DYNAMIC STEERING** or **POWER STEERING PUMP, VEHICLES WITHOUT DYNAMIC STEERING**.
6. Pressurized line to crossbrace, refer to **Fig. 34**
7. Pressure line connection installation location, refer to **Fig. 34**
8. Pressurized line to the engine mount, refer to **Fig. 35**
9. Return line to the subframe, refer to **Fig. 37**
10. Return line bracket to the longitudinal member, refer to **Fig. 36**

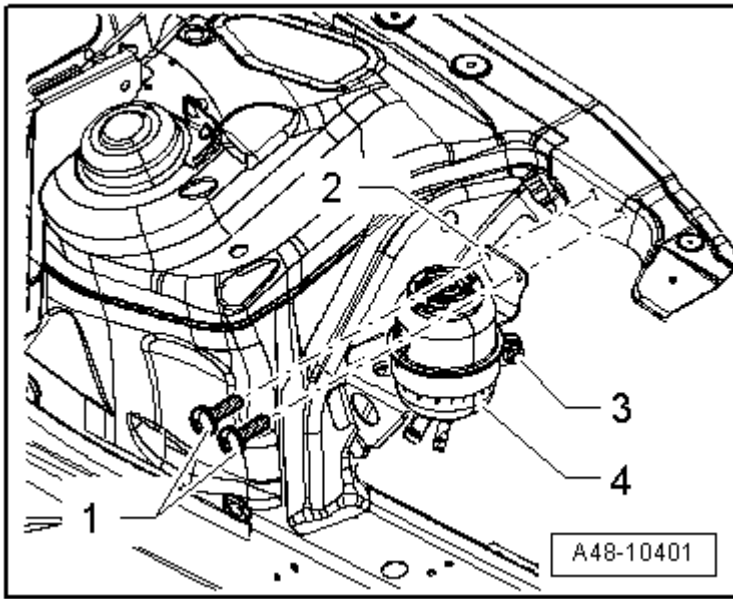


Fig. 31: Reservoir Bracket To Body

Courtesy of AUDI OF AMERICA, LLC

- Secure the bracket -2- to the body with bolts -1-.
- Secure the reservoir -4- in the bracket -2- using the bolt -3-.

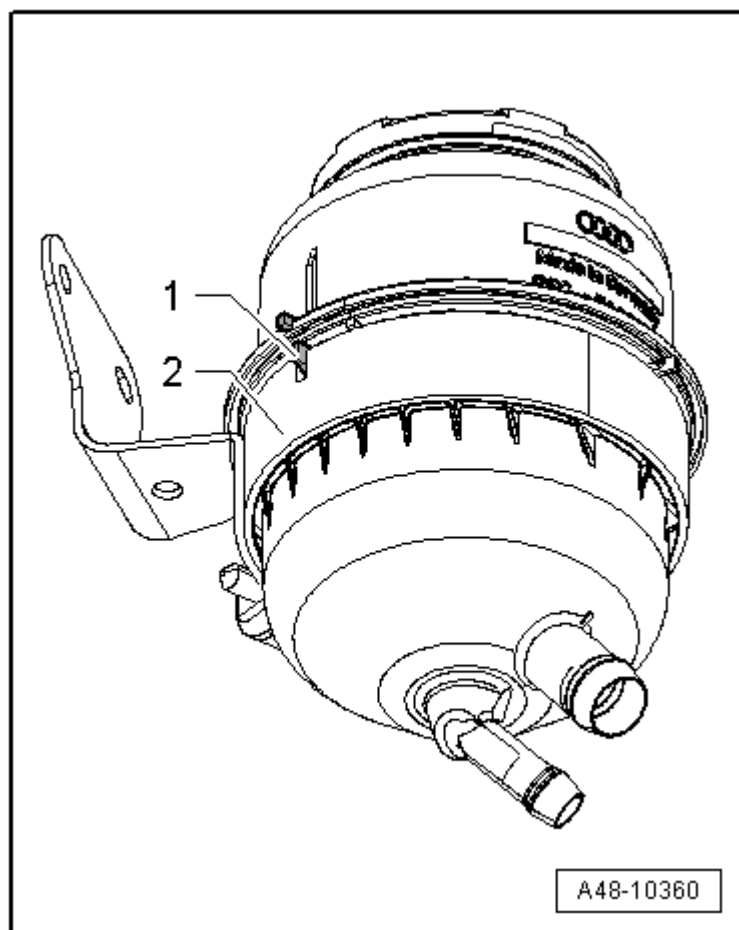


Fig. 32: Reservoir In Bracket

Courtesy of AUDI OF AMERICA, LLC

-- Insert the reservoir with the tab -1- in the opening in the bracket -2-.

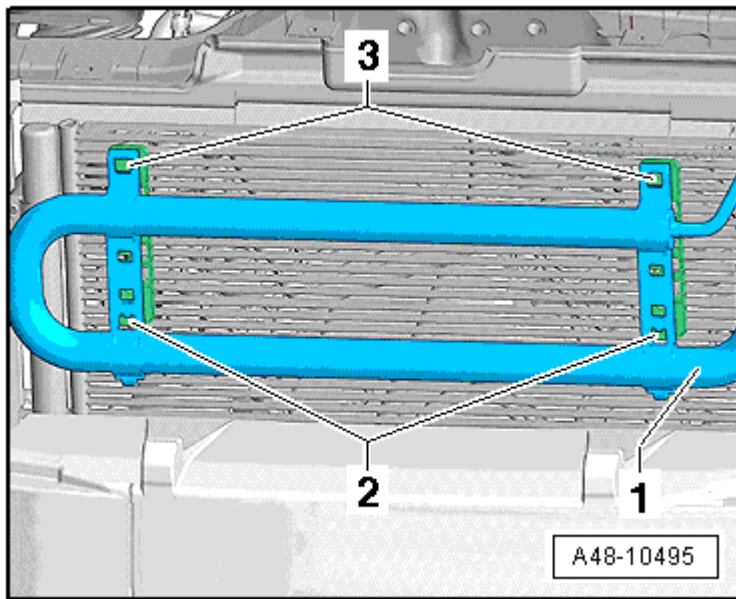


Fig. 33: Hydraulic Oil Cooler To Condenser
 Courtesy of AUDI OF AMERICA, LLC

-- Position the hydraulic oil cooler -1- on the brackets -2- and then engage it into the brackets -3-.

Lines to the hydraulic oil cooler. Refer to **HOSE LINES TO RESERVOIR, HYDRAULIC FLUID COOLER AND RETURN LINE INSTALLED POSITION.**

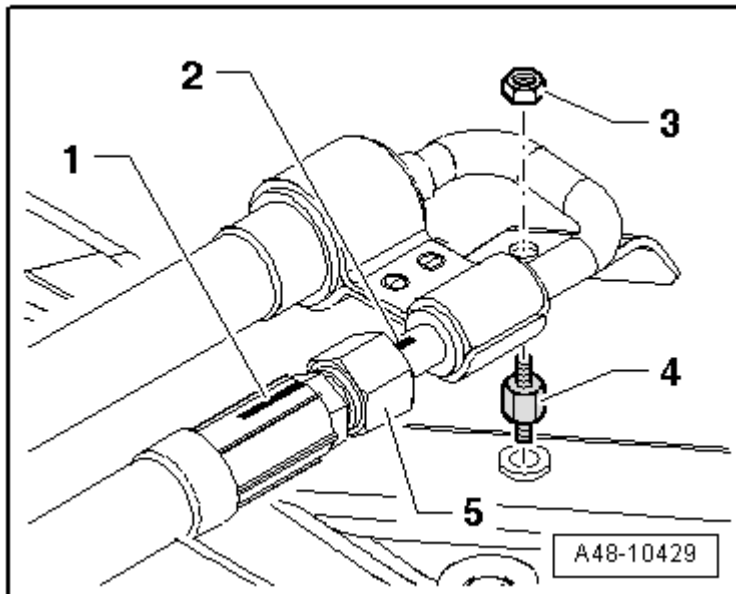


Fig. 34: Pressurized Line To Crossbrace
 Courtesy of AUDI OF AMERICA, LLC

-- Install the pressure line on the crossbrace using the nut -3- and rubber bushing -4-.

-- Note the line installation location when bolting the line connection. The markings -1 and 2- must be opposite each other.

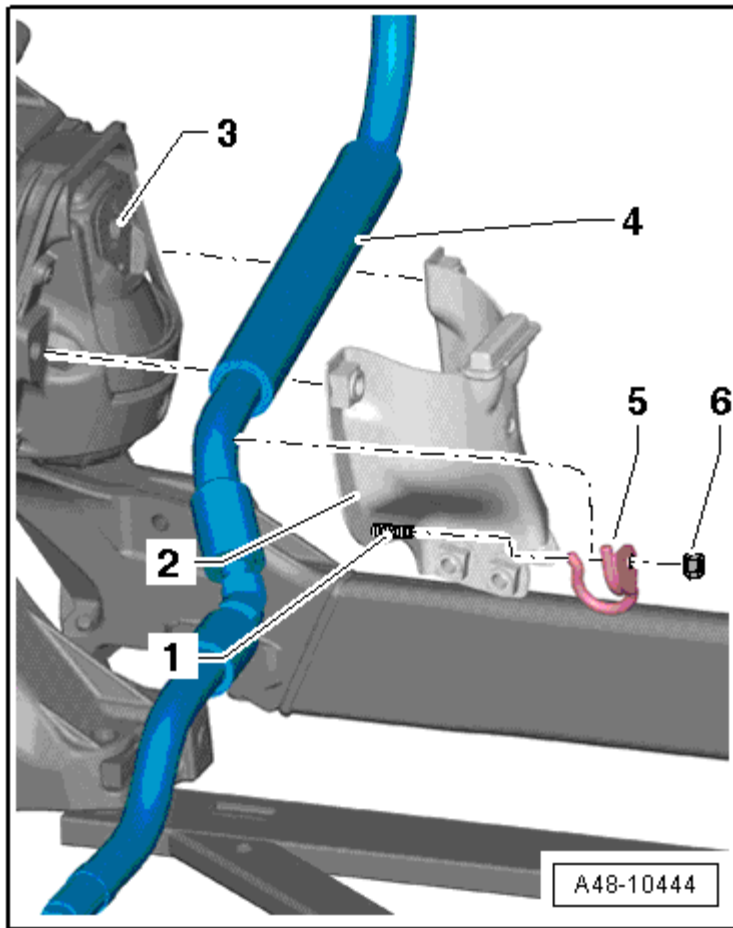


Fig. 35: Pressurized Line To Engine Mount
Courtesy of AUDI OF AMERICA, LLC

- Route the pressure line -4- between the connector -2- and the engine mount -3-.
- Tighten the retaining bracket -5- on the threaded pin -1- using the nut -6-.

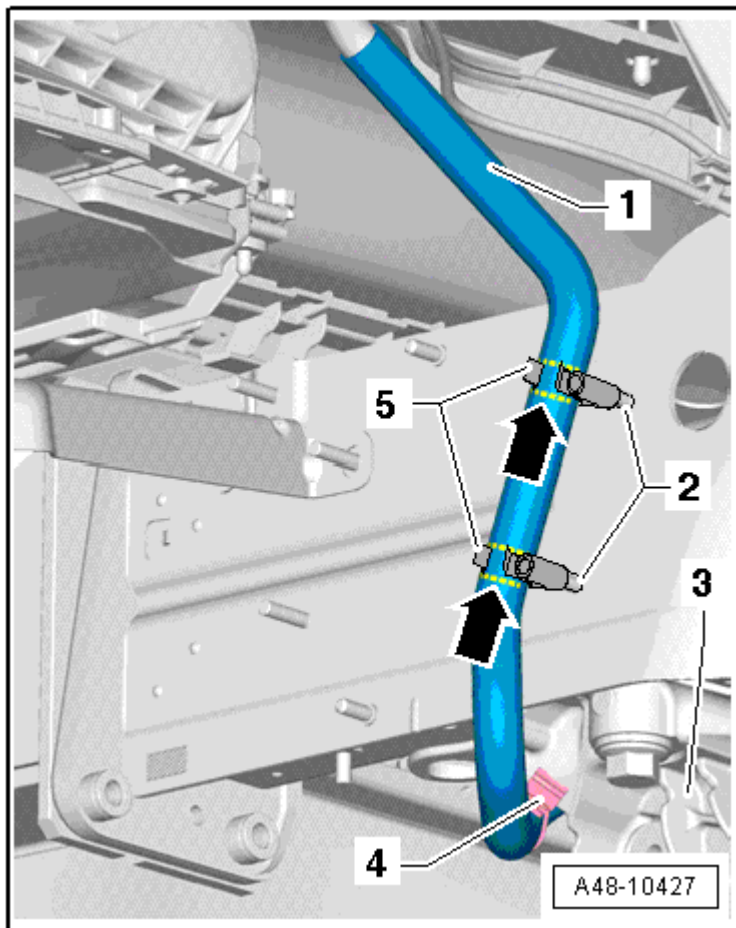


Fig. 36: Return Line Bracket To Subframe
Courtesy of AUDI OF AMERICA, LLC

- Install the return line -1- on the longitudinal member threaded pins -2- using the clips -5-.
- Install the return line -1- with the colored markings -arrows- in the clips -5-.
- Secure the return line -1- with the line bracket -4- to the left front of the subframe -3-.

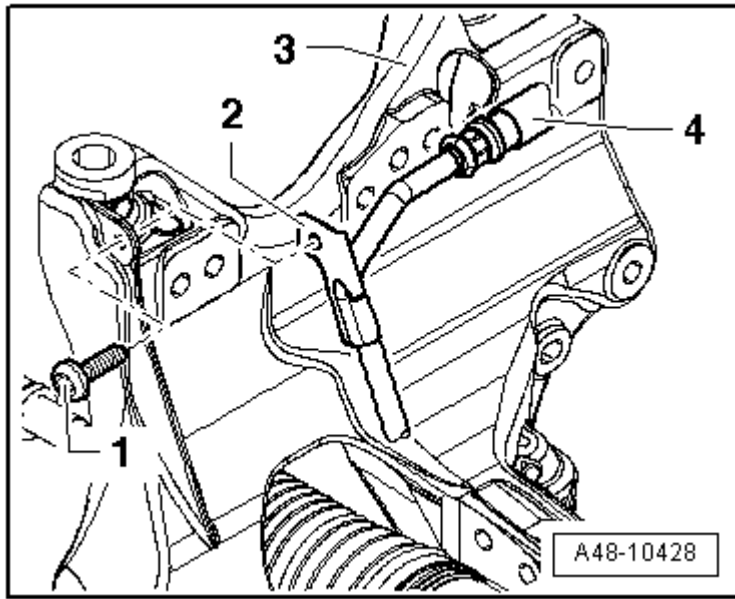


Fig. 37: Return Line To Subframe

Courtesy of AUDI OF AMERICA, LLC

-- Install the return line -4- on the subframe -3- using the bracket -2- and bolt -1-.

POWER STEERING PUMP, HYDRAULIC LINES AND RESERVOIR, 6-CYLINDER TFSI ENGINE

VEHICLES WITH DYNAMIC STEERING OVERVIEW (6-CYLINDER TFSI ENGINE)

Vane pump is not designed to be serviced. If there are customer complaints, the cause must be determined using a pressure and leak test. If there is a malfunction, replace the vane pump.

NOTE: If power steering fluid is low in reservoir, check steering system for leaks.

If there are leaks in the area of the line connections, the lines/connections must first be inspected for leaks, tightened as necessary and wiped dry.

Power steering pump is delivered without oil. Therefore, hydraulic oil must be filled before installation and turned by hand. Otherwise, noises when driving or damage to power steering pump may occur.

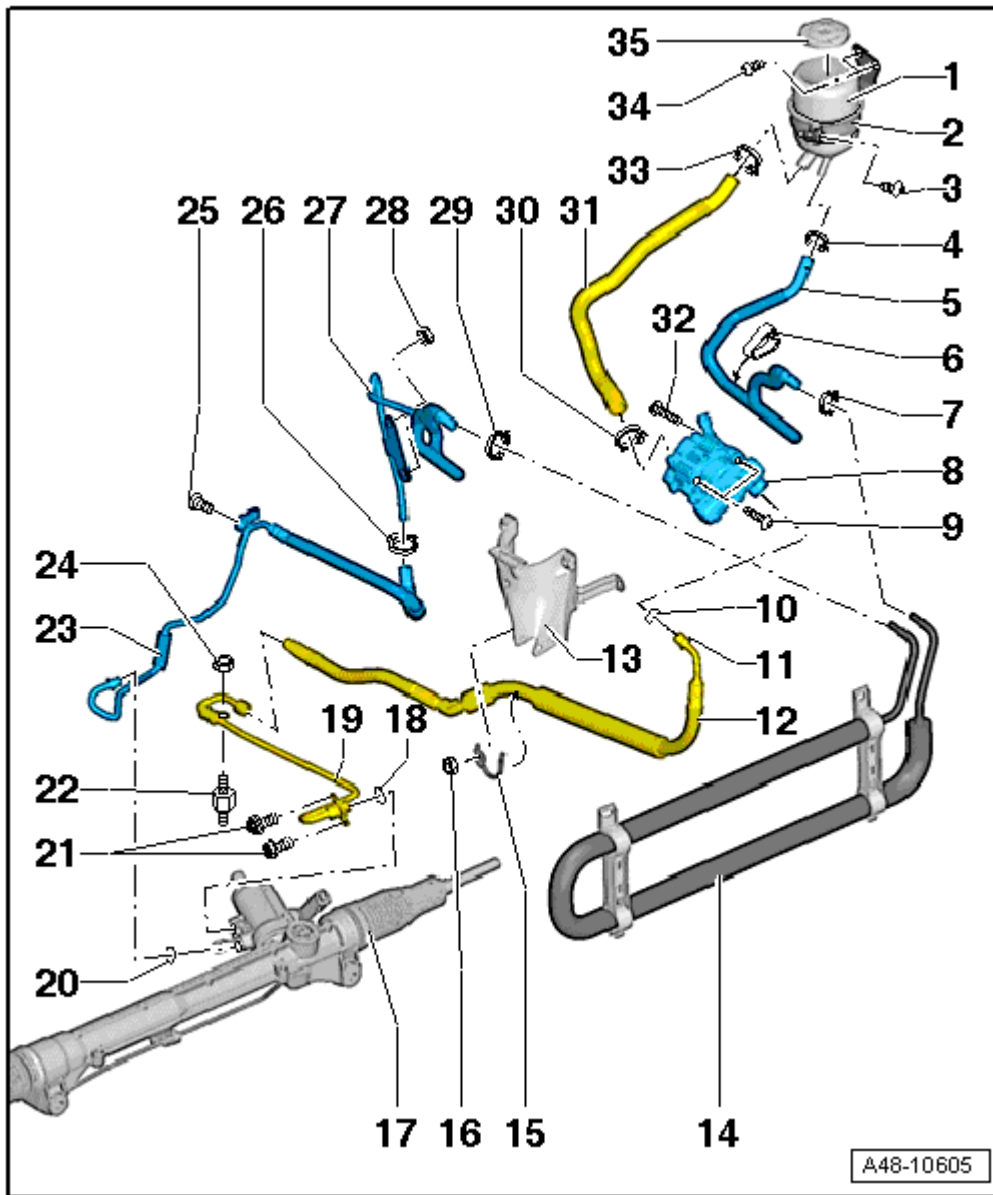


Fig. 38: Vehicles With Dynamic Steering Overview (6-Cylinder TFSI Engine)

Courtesy of AUDI OF AMERICA, LLC

1. Reservoir
 - Note installed position, refer to **LINES AND HOSES OVERVIEW**
 - Installation position of hoses on the reservoir, refer to **HOSE LINES TO RESERVOIR, HYDRAULIC FLUID COOLER AND RETURN LINE INSTALLED POSITION.**
2. Tensioning Strap
 - Secure to body, refer to **LINES AND HOSES OVERVIEW**
3. Bolt
 - 9 Nm
4. Spring Clamp

- Removing and install using the hose clip pliers V.A.G 1921
5. Return Hose
 - From the hydraulic oil cooler to the reservoir
 - Mounting on longitudinal member, refer to **LINES AND HOSES OVERVIEW**
 - Note location on reservoir, refer to **HOSE LINES TO RESERVOIR, HYDRAULIC FLUID COOLER AND RETURN LINE INSTALLED POSITION**
 - Note location on hydraulic oil cooler, refer to **HOSE LINES TO RESERVOIR, HYDRAULIC FLUID COOLER AND RETURN LINE INSTALLED POSITION**
 6. Clip
 7. Clamp
 - Tension using hose clamp pliers V.A.G 1275
 - Always replace if removed.
 8. Pump Steering Pump -V119-
 - With power steering pump control valve -V119-
 - The pump and control valve are a single component and are replaced together.
 -
 - Fill with hydraulic oil before installation
 - Checking delivery pressure, refer to **POWER STEERING PUMP DELIVERY PRESSURE, CHECKING**
 - Removing and installing, refer to **POWER STEERING PUMP, VEHICLES WITH DYNAMIC STEERING**
 9. Bolt
 - 20 Nm
 10. Seal
 - Always replace if removed.
 11. Union Bolt
 - 38 Nm
 - Wiring connection installation location, refer to **LINES AND HOSES OVERVIEW**
 - Installation location, wire connection to power steering pump, refer to **POWER STEERING PUMP, VEHICLES WITH DYNAMIC STEERING**
 12. Pressure Line
 - From the power steering pump to the power steering gear

CAUTION: • Insert the pressure line completely when installing.

- Attaching to the engine mount, refer to **LINES AND HOSES OVERVIEW**
 - Wiring connection installation location, refer to **LINES AND HOSES OVERVIEW**
13. Connector

- For the engine mount
- 14. Hydraulic Oil Cooler
 - Clipped to the condenser, refer to **LINES AND HOSES OVERVIEW**
 - Removing and installing, refer to **HYDRAULIC OIL COOLER, VEHICLES WITH DYNAMIC STEERING**
- 15. Retaining Bracket
- 16. Nut
 - 9 Nm
- 17. Power-assisted Steering Gear
 -
 - Removing and installing, refer to **HYDRAULIC POWER STEERING GEAR**
- 18. Seal
 - Always replace if removed.
- 19. Pressure Line
 - Union nut tightening specification: 40 Nm
 - From the power steering pump to the power steering gear

CAUTION: • Insert the pressure line completely when installing.

- Mounting on crossbrace, refer to **LINES AND HOSES OVERVIEW**
- Wiring connection installation location, refer to **LINES AND HOSES OVERVIEW**
- 20. Seal
 - Always replace if removed.
- 21. Bolt
 - 20 Nm
- 22. Rubber Bushing
 - 6 Nm
- 23. Return Line
 - From the power steering gear to the hydraulic oil cooler
 - Mounting on the subframe, refer to **LINES AND HOSES OVERVIEW**
 - Note location on reservoir, refer to **HOSE LINES TO RESERVOIR, HYDRAULIC FLUID COOLER AND RETURN LINE INSTALLED POSITION**
 - Note location on hydraulic oil cooler, refer to **HOSE LINES TO RESERVOIR, HYDRAULIC FLUID COOLER AND RETURN LINE INSTALLED POSITION**
- 24. Nut
 - 6 Nm
- 25. Bolt
 - 9 Nm

26. Clamp

- Tension using hose clamp pliers V.A.G 1275
- Always replace if removed.

27. Return Line

- From the power steering gear to the hydraulic oil cooler

CAUTION: • Insert the return line completely when installing.

- Mounting on the subframe, refer to **LINES AND HOSES OVERVIEW**
- Installation location on the wiring connection, refer to **HOSE LINES TO RESERVOIR, HYDRAULIC FLUID COOLER AND RETURN LINE INSTALLED POSITION**

28. Nut

- 9 Nm

29. Clamp

- Tension using hose clamp pliers V.A.G 1275
- Always replace if removed.

30. Clamp

- Tension using hose clamp pliers V.A.G 1275
- Always replace if removed.

31. Intake Hose

- Note location on reservoir, refer to **HOSE LINES TO RESERVOIR, HYDRAULIC FLUID COOLER AND RETURN LINE INSTALLED POSITION**
- Note power steering pump location, refer to **POWER STEERING PUMP, VEHICLES WITH DYNAMIC STEERING**

32. Bolt

- 20 Nm

33. Spring Clamp

- Removing and install using the hose clip pliers V.A.G 1921

34. Bolt

- 9 Nm

35. Cap with Dip Stick

- Check fluid level, refer to **POWER STEERING FLUID LEVEL, CHECKING**

VEHICLES WITHOUT DYNAMIC STEERING OVERVIEW (6-CYLINDER TFSI ENGINE)

Vane pump is not designed to be serviced. If there are customer complaints, the cause must be determined using a pressure and leak test. If there is a malfunction, replace the vane pump.

NOTE: If power steering fluid is low in reservoir, check steering system for leaks.

If there are leaks in the area of the line connections, the lines/connections must first be inspected for leaks, tightened as necessary and wiped dry.

Power steering pump is delivered without oil. Therefore, hydraulic oil must be filled before installation and turned by hand. Otherwise, noises when driving or damage to power steering pump may occur.

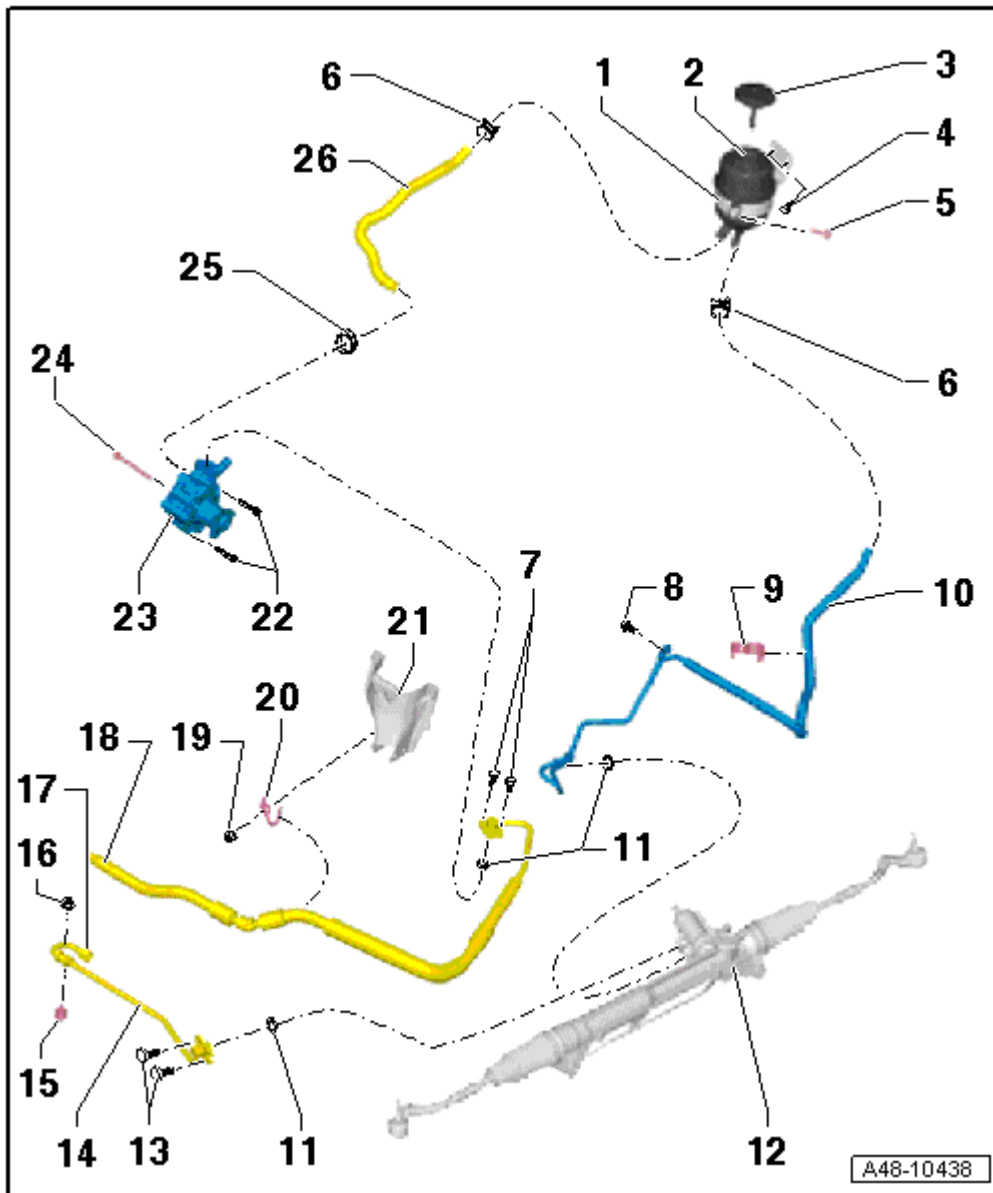


Fig. 39: Vehicles Without Dynamic Steering Overview (6-Cylinder TFSI Engine)
 Courtesy of AUDI OF AMERICA, LLC

1. Tensioning Strap

- Secure to body, refer to **LINES AND HOSES OVERVIEW**

2. Reservoir
 - Note installed position, refer to **LINES AND HOSES OVERVIEW**
 - Installation position of hoses on the reservoir, refer to **HOSE LINES TO RESERVOIR, HYDRAULIC FLUID COOLER AND RETURN LINE INSTALLED POSITION**.
3. Cap with Dip Stick
 - Check fluid level, refer to **POWER STEERING FLUID LEVEL, CHECKING**
4. Bolt
 - 9 Nm
5. Bolt
 - 9 Nm
6. Spring Clamp
 - Removing and install using the hose clip pliers V.A.G 1921
7. Bolt
 - 9 Nm
8. Bolt
 - 9 Nm
9. Wiring Bracket
 - For securing the intake hose on the longitudinal member, refer to **LINES AND HOSES OVERVIEW**.
10. Return Line
 - From the power steering gear to the reservoir

CAUTION: • Insert the return line completely when installing.

- Mounting on the subframe, refer to **LINES AND HOSES OVERVIEW**
 - Note location on reservoir, refer to **HOSE LINES TO RESERVOIR, HYDRAULIC FLUID COOLER AND RETURN LINE INSTALLED POSITION**
11. Seal
 - Always replace if removed.
 12. Power Steering Gear
 -
 - Removing and installing, refer to **HYDRAULIC POWER STEERING GEAR**
 13. Bolt
 - 20 Nm
 14. Pressure Line
 - From the power steering pump to the power steering gear; there are different versions, with and with a separating point.
 - Mounting on crossbrace, refer to **LINES AND HOSES OVERVIEW**

- Wiring connection installation location, refer to **LINES AND HOSES OVERVIEW**

CAUTION: • Insert the pressure line completely when installing.

15. Rubber Bushing

- 6 Nm

16. Nut

- 6 Nm

17. Union Nut

- 40 Nm
- Wiring connection installation location, refer to **LINES AND HOSES OVERVIEW**
- A pressure line with a separating point does not have a union nut.

18. Pressure Line

- From the power steering pump to the power steering gear

CAUTION: • Insert the pressure line completely when installing.

- Mounting on crossbrace, refer to **LINES AND HOSES OVERVIEW**
- Wiring connection installation location, refer to **LINES AND HOSES OVERVIEW**

19. Nut

- 9 Nm

20. Retaining Bracket

21. Connector

- For the engine mount

22. Bolt

- 20 Nm

23. Power Steering Pump

-
- Fill with hydraulic oil before installation
- Checking delivery pressure, refer to **POWER STEERING PUMP DELIVERY PRESSURE, CHECKING**
- Removing and installing, refer to **POWER STEERING PUMP, VEHICLES WITHOUT DYNAMIC STEERING**

24. Bolt

- 20 Nm

25. Clamp

- Tension using hose clamp pliers V.A.G 1275

- Always replace if removed.

26. Intake Hose

- Note location on reservoir, refer to **HOSE LINES TO RESERVOIR, HYDRAULIC FLUID COOLER AND RETURN LINE INSTALLED POSITION**
- Note power steering pump location, refer to **POWER STEERING PUMP, VEHICLES WITHOUT DYNAMIC STEERING**

LINES AND HOSES OVERVIEW (6-CYLINDER TFSI ENGINE)

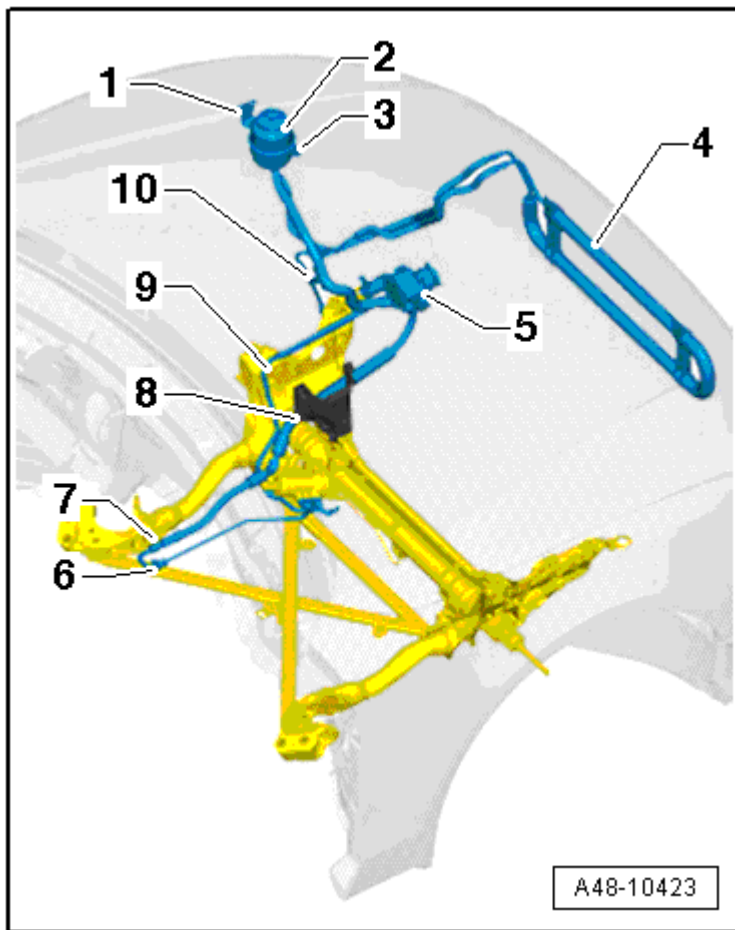


Fig. 40: Lines And Hoses Overview (6-Cylinder TFSI Engine)

Courtesy of AUDI OF AMERICA, LLC

1. Reservoir bracket to body, refer to **Fig. 41**
2. Reservoir in bracket, refer to **Fig. 42**
3. Bolt inside the bracket, refer to **Fig. 41**
4. Hydraulic oil cooler to condenser, refer to **Fig. 43**
5. Power steering pump inside the bracket with power steering pump control valve -V119- **Power Steering Pump Overview** or without the power steering pump control valve -V119- **Power Steering Pump Overview**

6. Pressurized line to crossbrace, refer to **Fig. 44**
7. Pressure line connection installation location, refer to **Fig. 44**
8. Pressurized line to the engine mount, refer to **Fig. 45**
9. Return line to the subframe, refer to **Fig. 48**
10. Return line bracket to the longitudinal member, refer to **Fig. 46** or **Fig. 47**

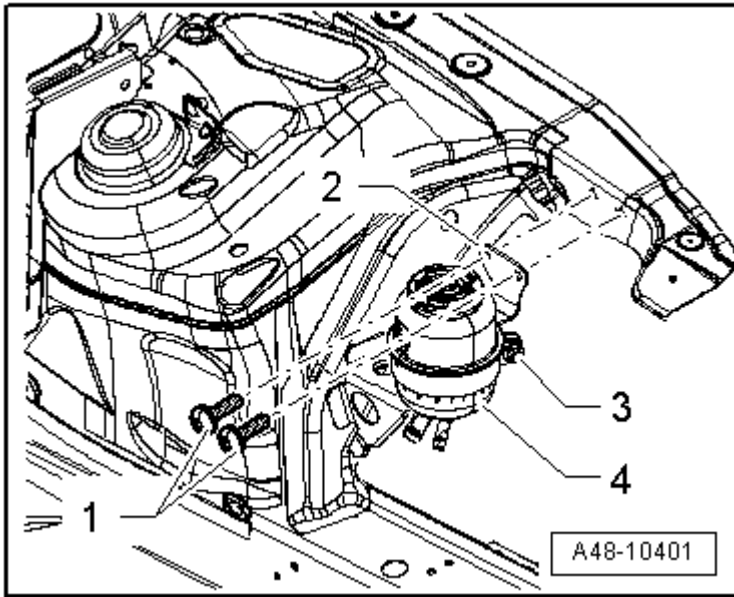


Fig. 41: Reservoir Bracket To Body
Courtesy of AUDI OF AMERICA, LLC

- Secure the bracket -2- to the body with bolts -1-.
- Secure the reservoir -4- in the bracket -2- using the bolt -3-.

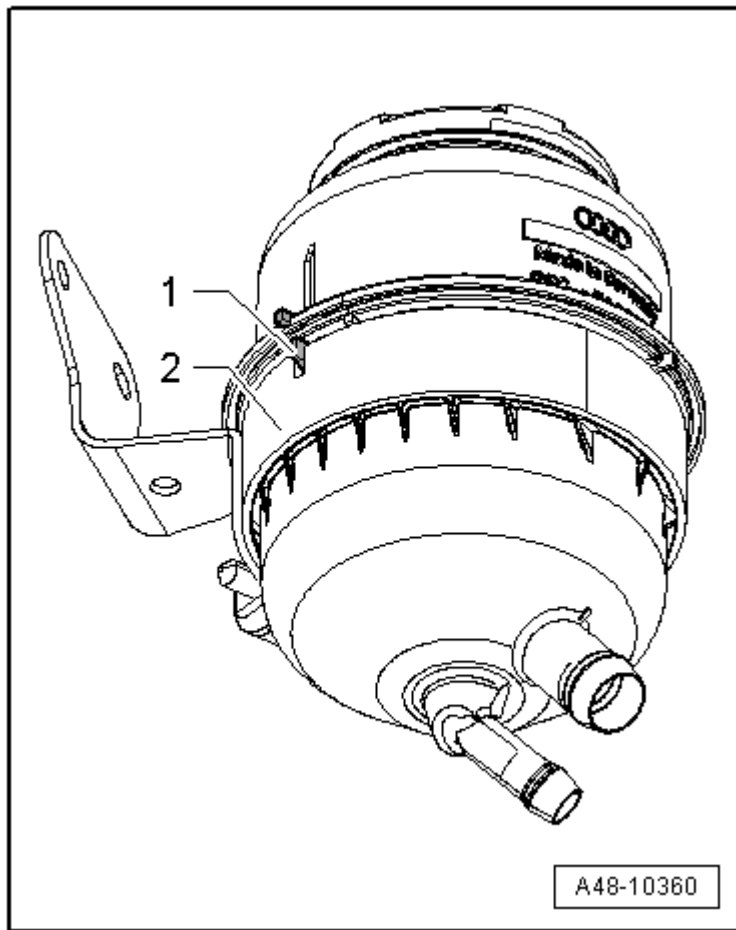


Fig. 42: Reservoir In Bracket

Courtesy of AUDI OF AMERICA, LLC

-- Insert the reservoir with the tab -1- in the opening in the bracket -2-.

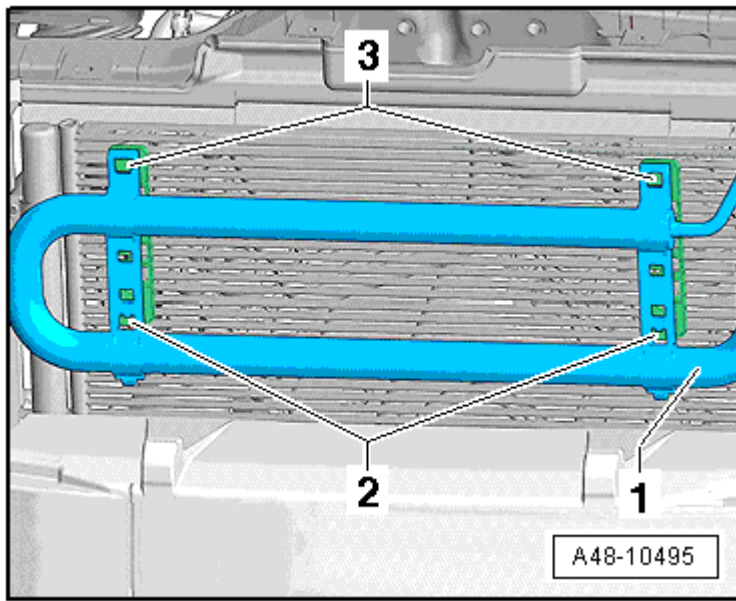


Fig. 43: Hydraulic Oil Cooler To Condenser
Courtesy of AUDI OF AMERICA, LLC

-- Position the hydraulic oil cooler -1- on the brackets -2- and then engage it into the brackets -3-.

Lines to the hydraulic oil cooler. Refer to **HOSE LINES TO RESERVOIR, HYDRAULIC FLUID COOLER AND RETURN LINE INSTALLED POSITION.**

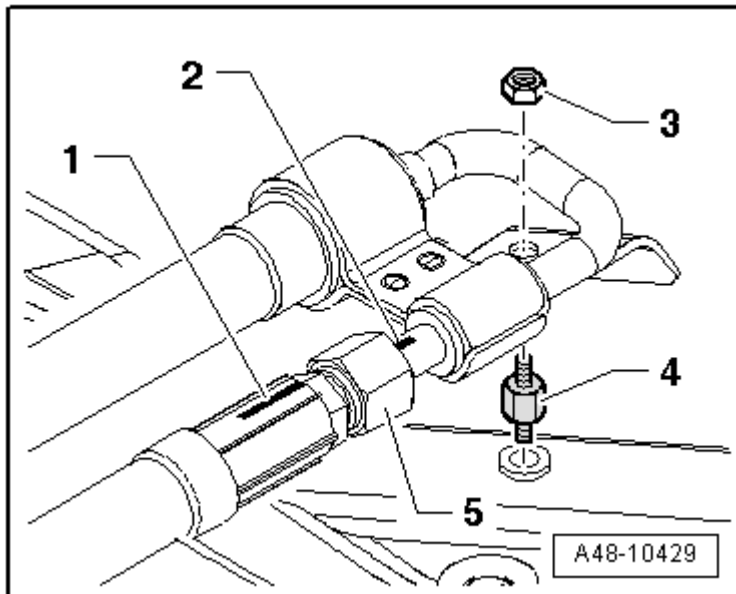


Fig. 44: Pressurized Line To Crossbrace
Courtesy of AUDI OF AMERICA, LLC

-- Install the pressure line on the crossbrace using the nut -3- and rubber bushing -4-.

-- Note the line installation location when bolting the line connection. The markings -1 and 2- must be opposite each other.

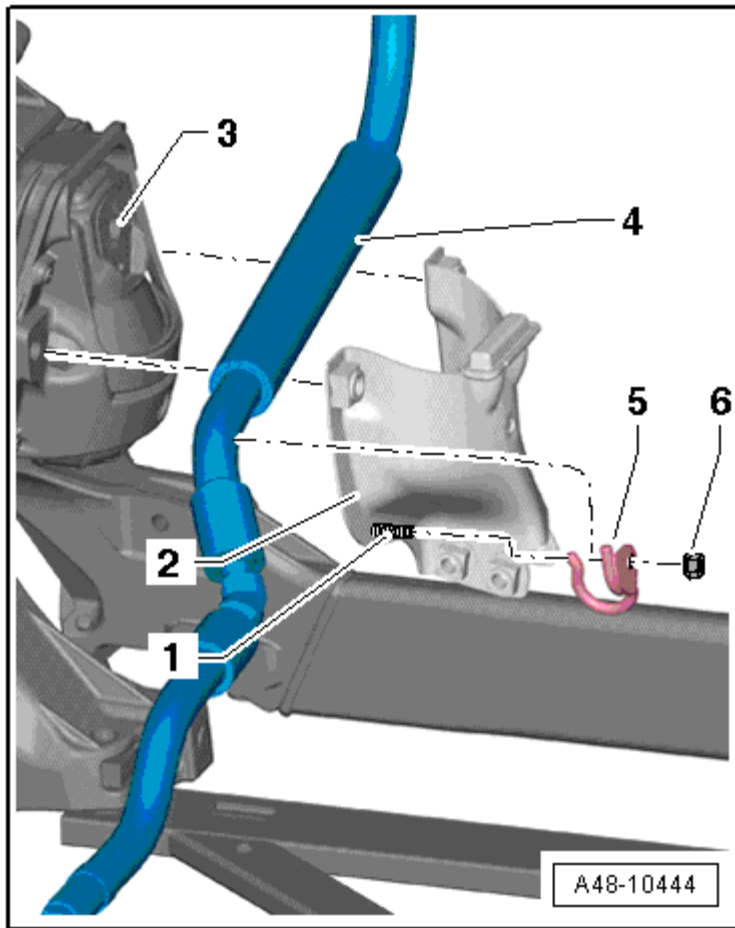


Fig. 45: Pressurized Line To Engine Mount
Courtesy of AUDI OF AMERICA, LLC

- Route the pressure line -4- between the connector -2- and the engine mount -3-.
- Tighten the retaining bracket -5- on the threaded pin -1- using the nut -6-.

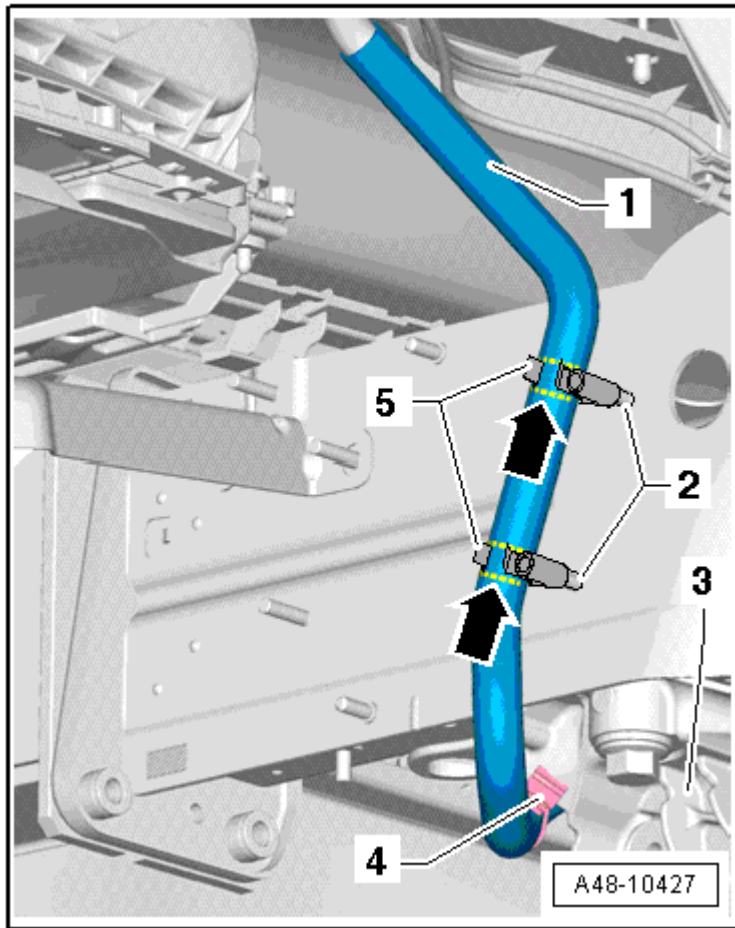


Fig. 46: Return Line Bracket To Subframe
Courtesy of AUDI OF AMERICA, LLC

- Install the return line -1- on the longitudinal member threaded pins -2- using the clips -5-.
- Install the return line -1- with the colored markings -arrows- in the clips -5-.
- Secure the return line -1- with the line bracket -4- to the left front of the subframe -3-.

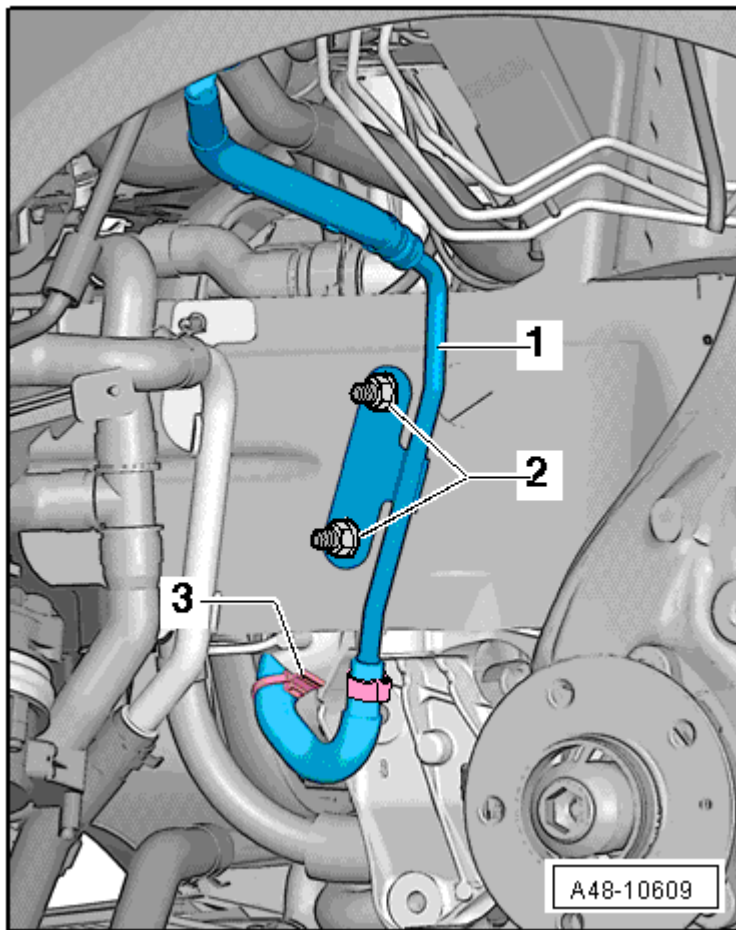
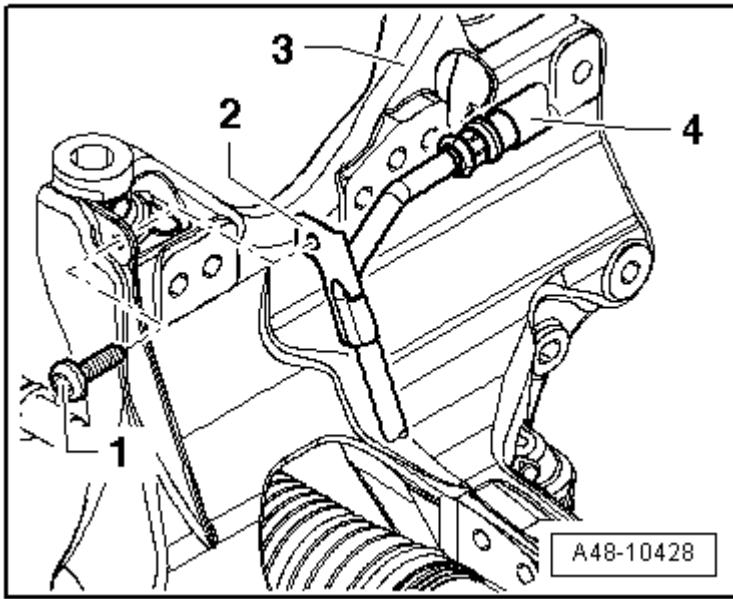


Fig. 47: Return Line Bracket To Longitudinal Member
Courtesy of AUDI OF AMERICA, LLC

-- Mount the return line plate -1- and nuts -2- onto the threaded pins on the longitudinal member and then tighten the nuts.

-- Secure the return line -1- and the line bracket -3- to the front of the subframe on the left side.

**Fig. 48: Return Line To Subframe**

Courtesy of AUDI OF AMERICA, LLC

-- Install the return line -4- on the subframe -3- using the bracket -2- and bolt -1-.

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Component	Fastener Size	Nm
Belt Pulley	-	22
Electronic Steering Column Lock Control Module to Steering Column Bolt	-	5
Handle to Steering Column Bolt	-	3
Mounting Bracket for Steering Column	-	5
Power Steering Fluid Reservoir Bolt	-	9
Power Steering Line to Steering Gear Bolt	-	20
Power Steering Line to Body Retaining Nut	-	9
Power Steering Line to Pump Bolt	-	9
Power Steering Line to Pump Union Nut	-	38
Power Steering Line to Pump Union Nut		
This tightening specification applies only with the 17 mm ring spanner insert, open V.A.G 1331/10	-	36
Power Steering Line to Steering Gear Retaining Nut	-	6
Power Steering Pump Mounting Bolt		
- 4-Cylinder	-	25
- 6-Cylinder	-	20

2012 Audi S4

SUSPENSION Steering (Sedan)

Power Steering Pump Bracket to Engine Bolt, 6-Cylinder	-	20
Pressurized Line Union Nut	-	40
Right Knee Bar to Steering Column Bolt ^{2, 3}	-	20
Rubber Bushing to Steering Gear	-	6
Servotronic Solenoid Valve to Steering Gear Mounting Bolt ⁵	-	3
Steering Column to Mounting Bracket Bolt ²	-	20
Steering Gear to Subframe Bolt ¹	-	80 + 180° turn
Steering Intermediate Shaft to Steering Column Bolt ^{1, 4}	-	30 + 90° turn
Steering Intermediate Shaft to Steering Gear Bolt ^{1, 4}	-	30 + 90° turn
Steering Wheel to Steering Column Bolt ¹	-	50
Tie Rod to Steering Gear	-	90
Tie Rod End to Tie Rod Lock Nut	-	80
Tie Rod End to Wheel Bearing Housing Nut ¹		
- 12-Point Combi Nut	-	100
- Hex Collar Nut	-	20 + 90° turn
- Hex Combi Nut	-	110
¹ Always replace after removal. ² Follow the assembly sequence when installing. Refer to Fig. 95 ³ Installed depending on the country version. ⁴ The threaded hole for the bolt must always be cleaned (for example, using a thread tap). ⁵ Always follow bolt tightening sequence. Refer to Servotronic Solenoid Valve -N119-		

Clamp Style	Pliers V.A.G 1682 A (Hazet) with adapter V.A.G 1682 A/1	Pliers V.A.G 1682 (O tiker) with adapter V.A.G 1682 A/1
85 mm clamp (front passenger side), see item 8	7 Nm	9 Nm
59 mm clamp (driver side), see item 1	10 Nm	12 Nm

DIAGNOSIS AND TESTING

STEERING COLUMN, CHECKING FOR DAMAGE

Visual Check

-- Check whether steering column parts show signs of damage.

Functional Check

-- Check whether steering column can be turned without catching or difficulty of movement.

-- Check whether steering column can be easily adjusted laterally and vertically.

-- Check if the tube clearly moves in the direction of -arrow A- or the direction of -arrow B-.

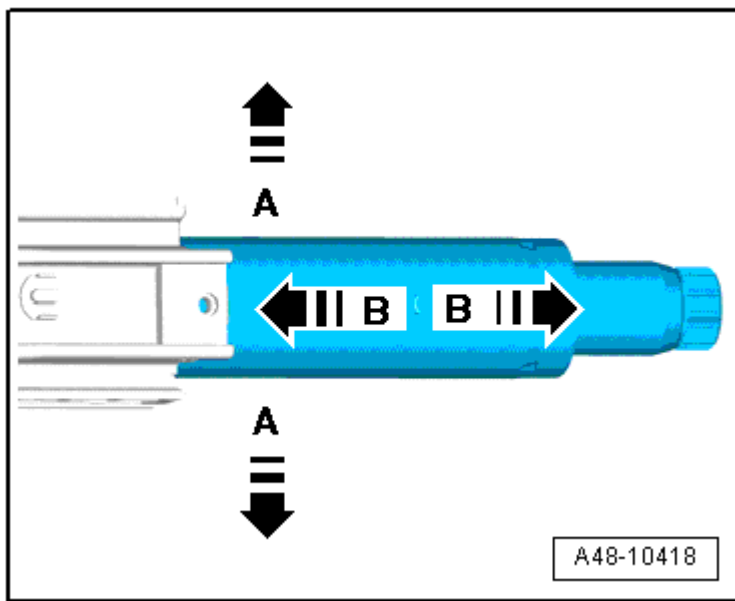


Fig. 49: Steering Column, Checking For Damage
 Courtesy of AUDI OF AMERICA, LLC

-- If this is the case, the steering column must be replaced.

ELECTRO-MECHANICAL STEERING, CENTERING

NOTE: Centering the steering is meant only for "aligning" the steering for subsequent work.

The steering wheel center position is determined exactly via the steering angle with the help of the alignment computer.

If a steering wheel fault is determined when setting the center position of the steering, then check the steering and suspension for damage or deformations and replace any damaged components. Check the tie rod symmetry as well, refer to MAXIMUM STEERING ANGLE, CHECKING .

HYDRAULIC POWER STEERING GEAR STEERING, CENTERING

Affects All Vehicles

NOTE: Centering the steering is meant only for "aligning" the steering for subsequent work.

The steering wheel center position is determined exactly via the steering angle with the help of the alignment computer.

If a steering wheel fault is determined when setting the center position of the steering, then check the steering and suspension for damage or deformations and replace any damaged components. Check the tie rod symmetry as well. Refer to **MAXIMUM STEERING ANGLE, CHECKING**

-- Remove noise insulation. Refer to **Description and Operation** .

-- Bring the steering gear into the center position.

The point -1- must be opposite the marking -2-. The distances of the tie rod ends to the steering gear must be the same at the left and right.

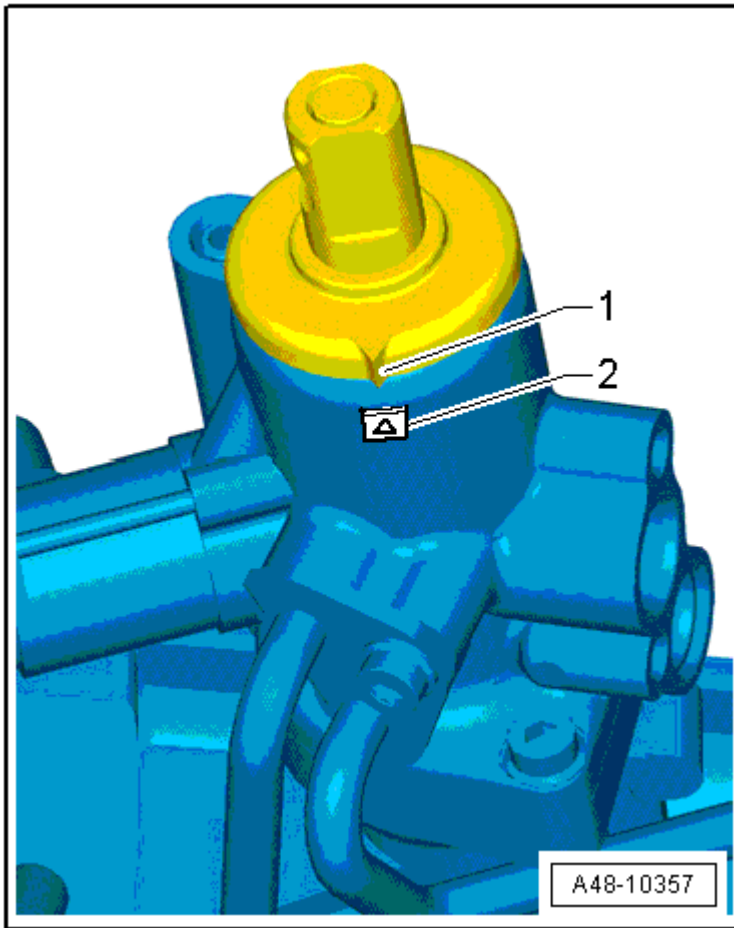


Fig. 50: Hydraulic Power Steering Gear Steering, Centering
Courtesy of AUDI OF AMERICA, LLC

NOTE: These designations only serve to assist in a general positioning of the steering center position.

HYDRAULIC POWER STEERING GEAR, ADJUSTING

Special tools and workshop equipment required

- Torque Wrench 5-50 Nm V.A.G 1331

NOTE: Two technicians are required for adjustments. Adjust with engine off.

-- Remove noise insulation. Refer to Description and Operation .

-- Bring the steering gear into the center position. Refer to HYDRAULIC POWER STEERING GEAR STEERING, CENTERING.

-- Turning the steering wheel back and forth (approximately 30° off center axis) will produce a rattling noise if

steering play is too large.

-- The second technician must carefully turn the adjustment screw -arrow- until the knocking noise can no longer be heard inside the vehicle.

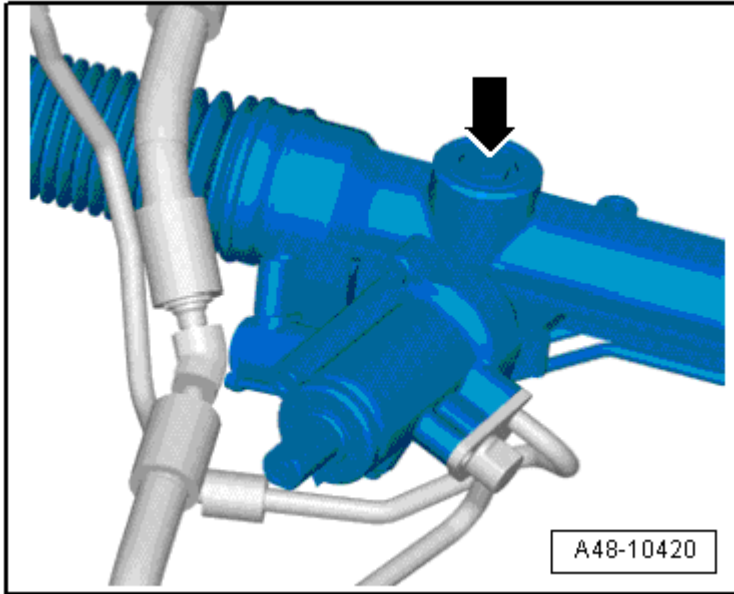


Fig. 51: Locating Adjustment Screw
Courtesy of AUDI OF AMERICA, LLC

-- Carry out a road test.

-- Make sure that when maneuvering or negotiating corners the steering self-centers without sticking, adjust if necessary.

STEERING, CHECKING FOR LEAKS

NOTE: Following installation operations and with no hydraulic fluid in the expansion tank, the steering system must be checked for leaks.

-- Remove noise insulation. Refer to Description and Operation .

-- Start engine.

-- Turn the steering wheel in both directions to full lock and hold briefly.

This builds up the maximum possible pressure.

NOTE: To avoid damage to pump, steering wheel must not be held at stop longer than 10 seconds during this test.

In this position, the following components must be checked for leaks.

- Seal ring for steering pinion at the steering gear valve housing.
- All line connections.
- All wiring connections.
- Power Steering Pump
- Seal rings for steering rack.

This test can only be performed with the boot slid back.

-- Open spring-type hose clamp and boot hose clamp.

-- Slide back boot.

If fluid is visible in steering gear housing and/or in boot, steering gear must be replaced.

POWER STEERING PUMP DELIVERY PRESSURE, CHECKING - ENGINE CODE(S): CAEB & CPMA

Special tools and workshop equipment required

- Hose Clamps Up to 25 mm Dia. 3094
- Torque Wrench 5-50 Nm V.A.G 1331
- Adapter Set V.A.G 1402/18
- Adapter V.A.G 1402/3
- Power Steering Test Unit V.A.G 1402
- Adapter Hose V.A.G 1402/6
- Drip Tray for VAS 6100 VAS 6208
- Adapter V.A.G 1402/3 is needed for vehicles that have a pressure line with a separating point, see item 13
- Adapter Set V.A.G 1402/18 is needed for vehicles that have a pressure line without a separating point, see item 13.

Test Prerequisites

- Ribbed belt/ribbed belt tension OK
- Sealing of system
- Hoses/lines are not kinked or constricted

Checking

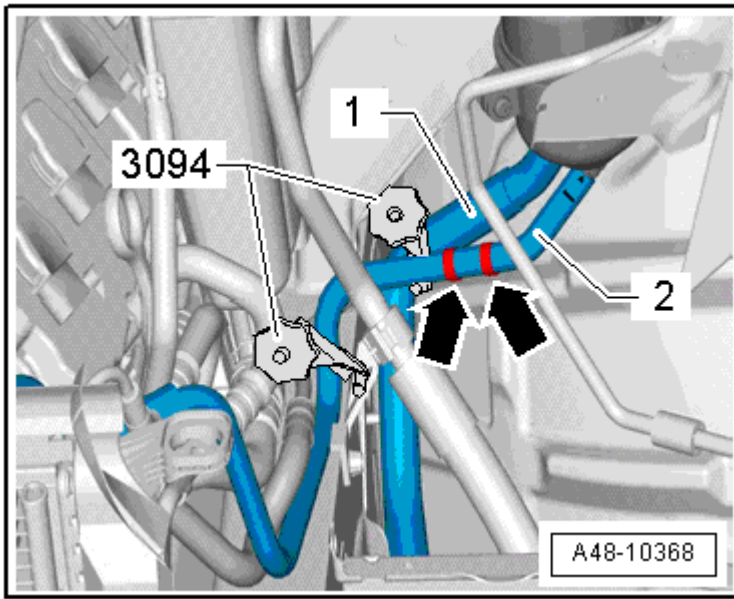


Fig. 52: Locating Suction & Return Hose Clamping Location
 Courtesy of AUDI OF AMERICA, LLC

-- Clamp off the suction hose -1- and return hose -2- using the 3094.

CAUTION:

- The 3094 must not be secured on the return hose -2- in the check valve area. Otherwise, check valve will be damaged.
- The check valve is located in the return hose -2- between the hose clamps -arrows-.

Applies to vehicles that have a pressure line with a separating point, see item 13.

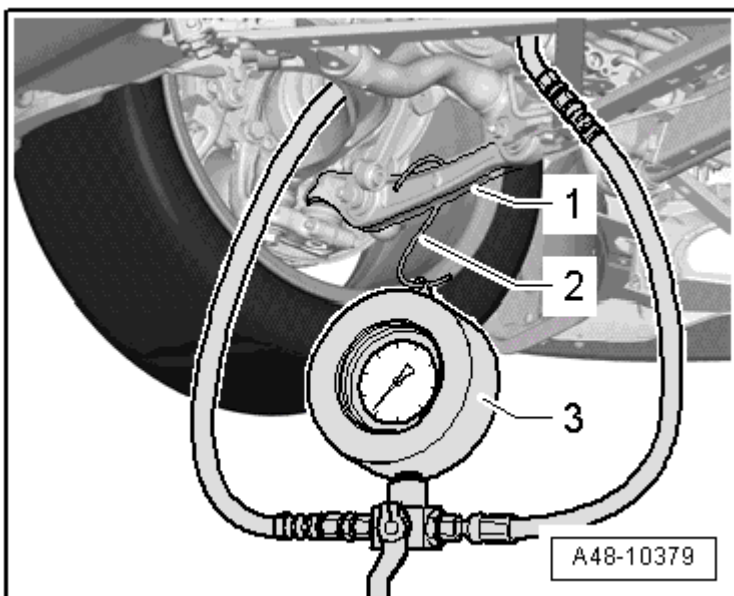
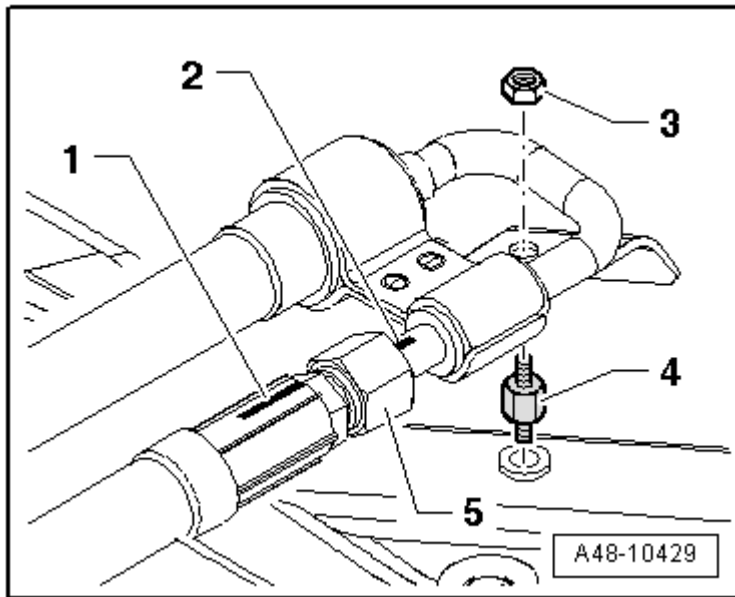


Fig. 53: Identifying Tester

Courtesy of AUDI OF AMERICA, LLC

- Remove noise insulation. Refer to **Description and Operation** .
- Engage the tester -3- on the control arm -1- using a hook -2-.
- Position the VAS 6208 below to collect the hydraulic oil.
- Loosen the union nut -5-. Counter hold at the hex head.

**Fig. 54: Pressurized Line To Crossbrace**

Courtesy of AUDI OF AMERICA, LLC

- Remove nut -3-.
- Install V.A.G 1402 as shown in the illustration.

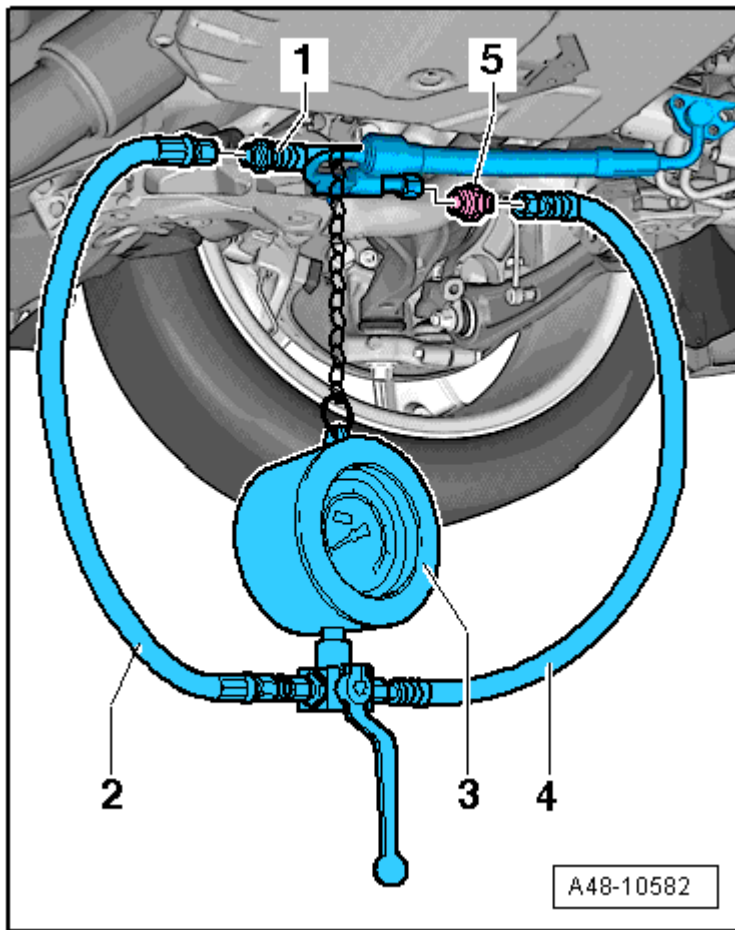


Fig. 55: Installing V.A.G 1402

Courtesy of AUDI OF AMERICA, LLC

1. Pressure line with separating point
2. Hose from adapter set V.A.G 1402/6
3. Pressure gauge V.A.G 1402
4. Hose from adapter set V.A.G 1402/6
5. Adapter V.A.G 1402/3

-- Attach the V.A.G 1402 hoses to the open connections on the pressure hose as illustrated.

Applies to vehicles without a separating point, see item 13.

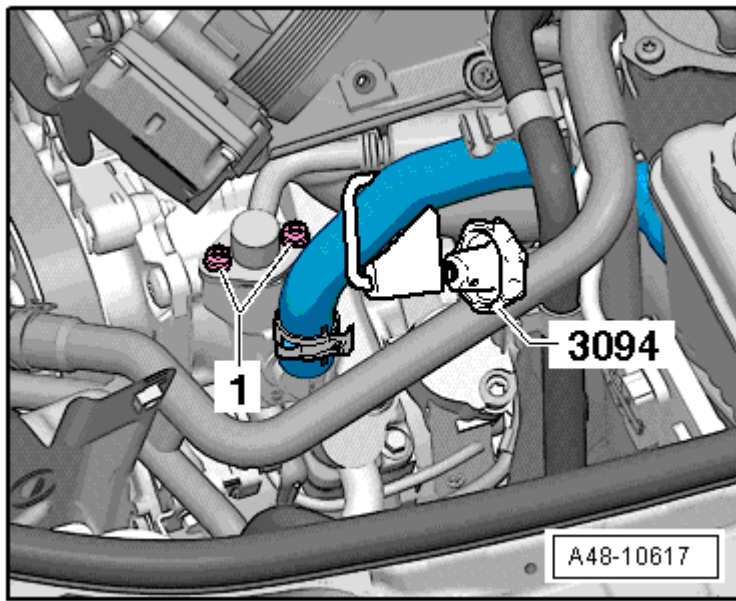


Fig. 56: Identifying Bolts -1- And Hose Clamp 3094
Courtesy of AUDI OF AMERICA, LLC

- Remove the bolts -1- and remove the pressure line from the power steering pump.
- Mount the V.A.G 1402 as illustrated.

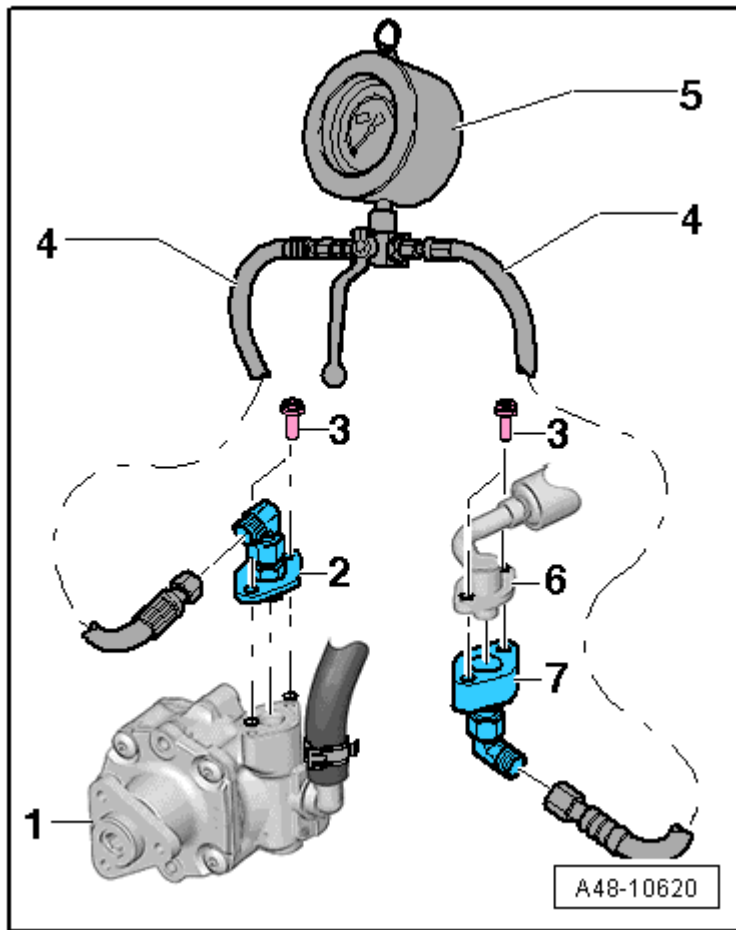


Fig. 57: Identifying Power Steering Pump Delivery Pressure, V6 TDI, Generation I With SCR And V6 TDI, Generation II, Test Assembly

Courtesy of AUDI OF AMERICA, LLC

1. Power Steering Pump
2. Adapter V.A.G 1402/18-1 with elbow V.A.G 1402/17-3. See 1
3. Screw for mounting the pressure line
4. Hose from adapter set V.A.G 1402/6
5. Power steering tester V.A.G 1402
6. Pressure Line
7. Adapter V.A.G 1402/18-2 with elbow V.A.G 1402/17-3

1. Replace the adapter V.A.G 1402/18-1 seal if it is damaged or leaking.

NOTE: Position the elbow V.A.G 1402/17-3 on the adapter V.A.G 1402/18-1 so that the hose from the adapter set V.A.G 1402/6 does not touch the pulley and/or ribbed belt.

Tighten the union nuts on the V.A.G 1402/17-3 and the adapter set V.A.G 1402/6

hoses hand-tight with an open-end wrench.

Continuation for All

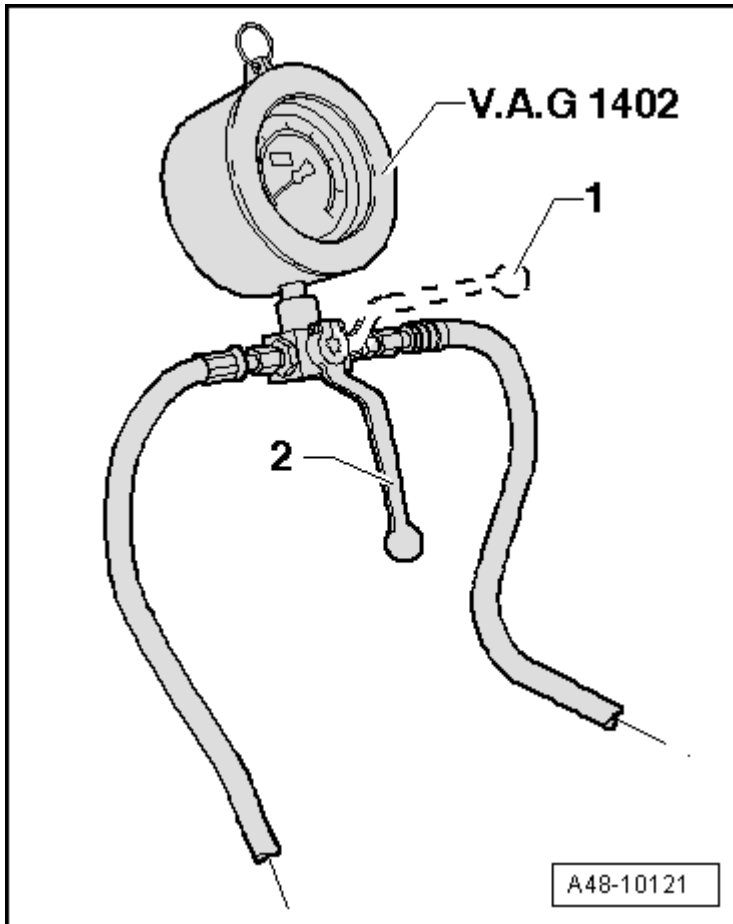


Fig. 58: Ensuring Lever On Pressure Gauge Stands In Open/Closed Position
Courtesy of AUDI OF AMERICA, LLC

- Make sure that lever on pressure gauge stands in position -2-.
- Remove the 3094.
- Start engine without giving gas.
- Turn the steering wheel from lock to lock about 10 times.
- Turn off engine and, if needed, fill hydraulic fluid in reservoir.

NOTE: To avoid damage to pump, observe the following:

Pressure gauge shut-off valve must not remained closed longer than 10 seconds during this test.

Start engine without giving gas and run at idle.

Read the pump pressure immediately after starting at idle speed (have it read by second technician, if necessary).

Because pressure falls over the course of the test, the highest pressure shown is the decisive measurement.

-- Now check delivery pressure.

-- Start engine.

-- With the engine at idle, close the shut-off valve to position -1- and read the pressure (the lever must face away from the pressure hose). Do not perform measurement longer than 10 seconds.

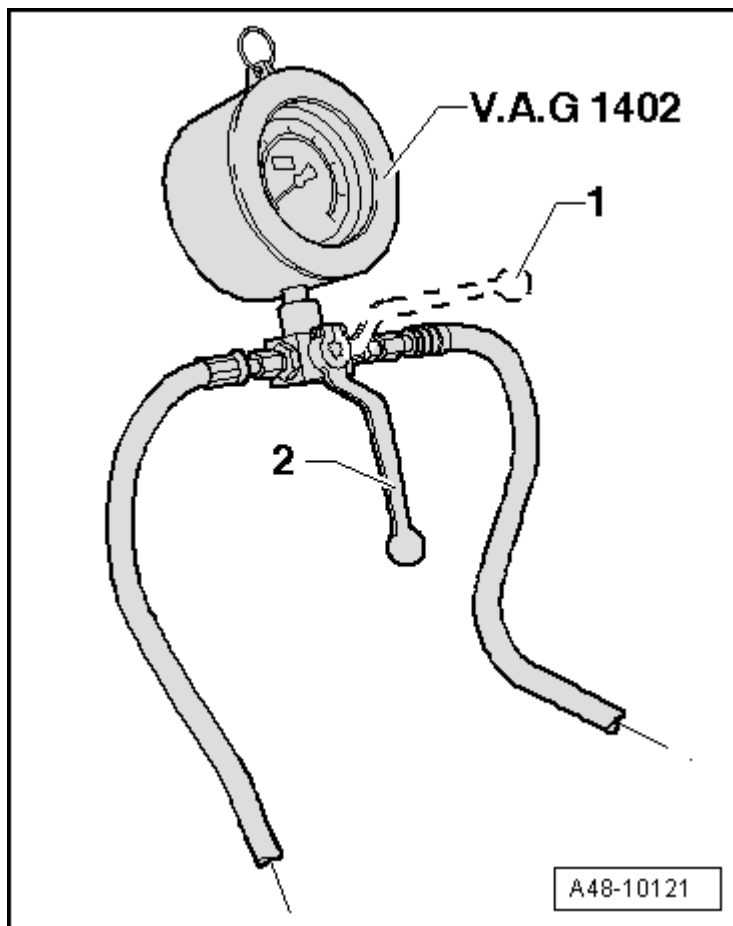


Fig. 59: Ensuring Lever On Pressure Gauge Stands In Open/Closed Position
Courtesy of AUDI OF AMERICA, LLC

NOTE: **Delivery pressure target value - vehicles with and without dynamic steering: 110 to 130 bar.**

If the pressure is not at the specified value, replace the power steering pump. Refer to **POWER STEERING PUMP, VEHICLES WITH DYNAMIC STEERING** or **POWER STEERING PUMP, WITHOUT DYNAMIC STEERING**.

-- Turn off engine.

-- Remove V.A.G 1402.

Tightening specifications, refer to **VEHICLES WITH DYNAMIC STEERING OVERVIEW**

-- Note the line installation location when bolting the line connection. The markings -1 and 2- must be opposite each other.

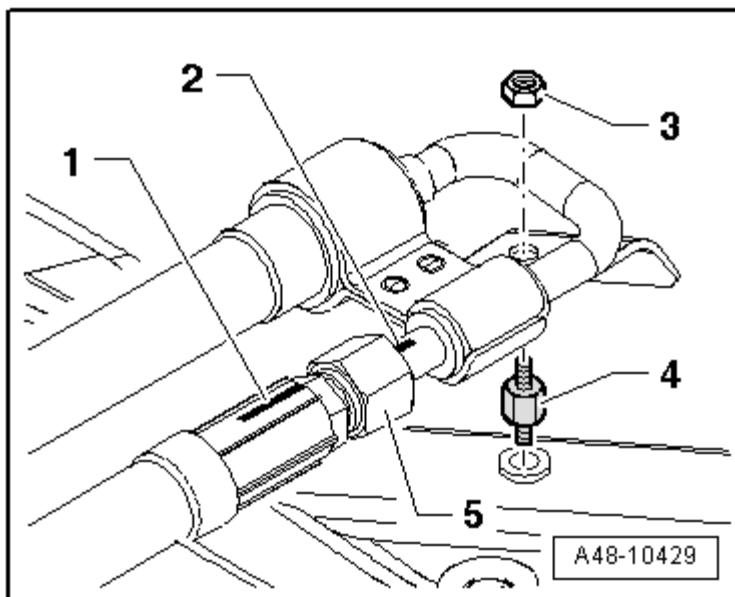


Fig. 60: Pressurized Line To Crossbrace
Courtesy of AUDI OF AMERICA, LLC

-- Tighten the union nut -1-. Counter hold at the hex head.

-- Tighten the nut -3- and the rubber bushing -4- if necessary.

-- Bleed the steering. Refer to **STEERING, BLEEDING AFTER REPLACING**.

-- Check power steering fluid level. Refer to **POWER STEERING FLUID LEVEL, CHECKING**.

-- Check all open line connections for leaks. Refer to **STEERING, CHECKING FOR LEAKS**.

POWER STEERING PUMP DELIVERY PRESSURE, CHECKING - ENGINE CODE(S): CALA

Special tools and workshop equipment required

- Hose Clamps Up to 25 mm Dia. 3094
- Torque Wrench 5-50 Nm V.A.G 1331
- Power Steering Test Unit V.A.G 1402
- Adapter Hose V.A.G 1402/6
- Drip Tray for VAS 6100 VAS 6208
- Adapter V.A.G 1402/3 is needed for vehicles that have a pressure line with a separating point, see item 14
- Adapter Set V.A.G 1402/17 is needed for vehicles that have a pressure line without a separating point, see item 14.

Prerequisites

- Ribbed belt/ribbed belt tension OK
- Sealing of system
- Hoses/lines are not kinked or constricted

Checking

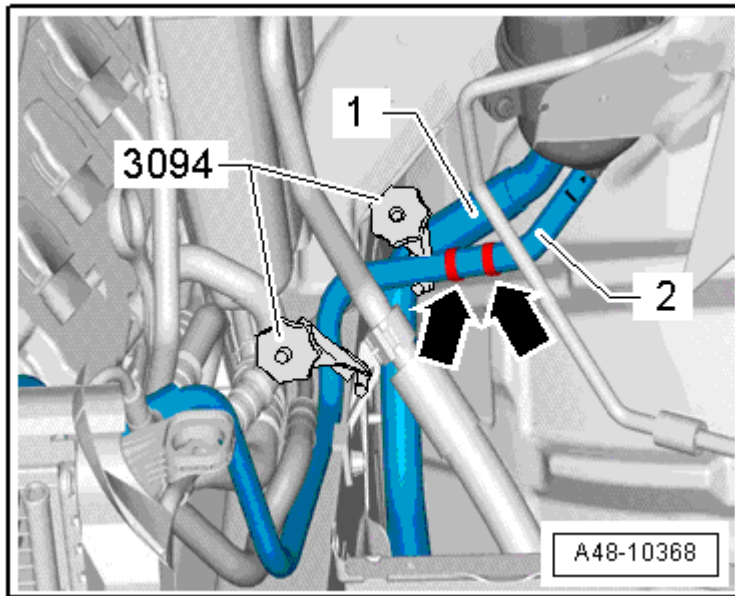


Fig. 61: Locating Suction & Return Hose Clamping Location
Courtesy of AUDI OF AMERICA, LLC

-- Clamp off the suction hose -1- and return hose -2- using the 3094.

CAUTION:

- The 3094 must not be secured on the return hose -2- in the check valve area. Otherwise, check valve will be damaged.
- The check valve is located in the return hose -2- between the hose clamps -arrows-.

Applies to vehicles that have a pressure line with a separating point, see item 14.

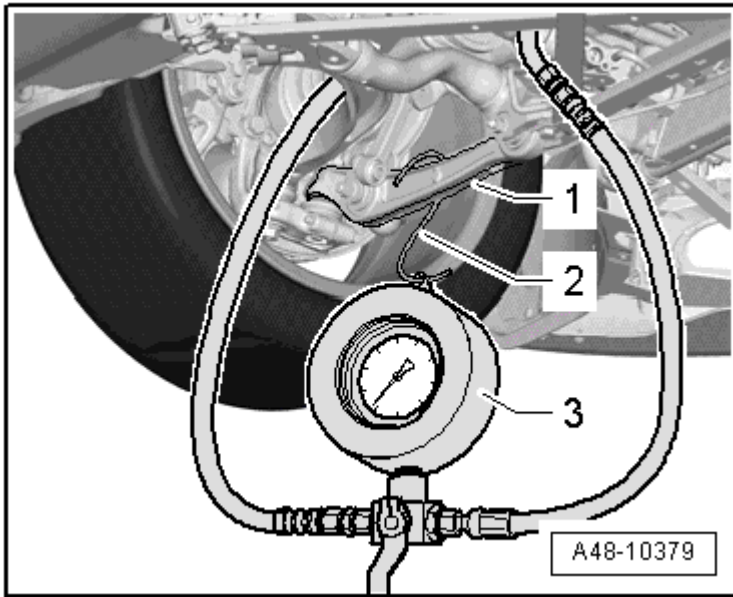


Fig. 62: Identifying Tester

Courtesy of AUDI OF AMERICA, LLC

- Remove noise insulation. Refer to **Description and Operation** .
- Engage the tester -3- on the control arm -1- using a hook -2-.
- Position the VAS 6208 below to collect the hydraulic oil.
- Loosen the union nut -5-. Counter hold at the hex head.

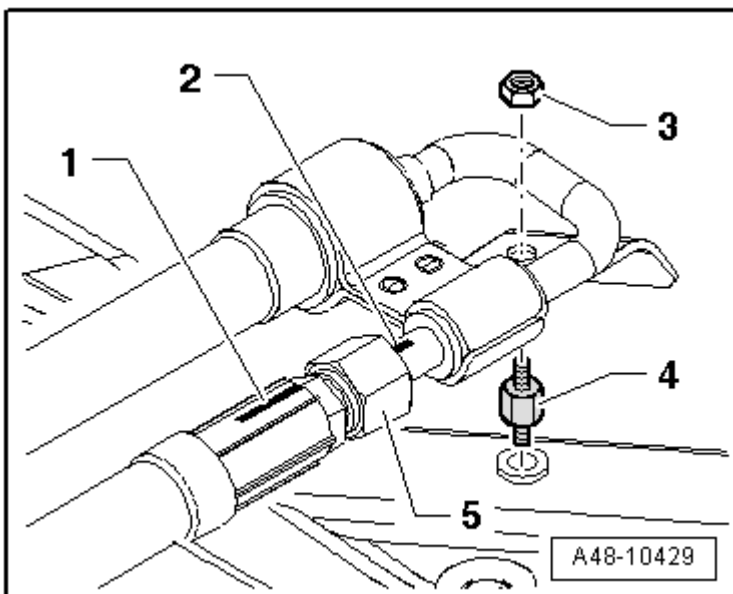


Fig. 63: Pressurized Line To Crossbrace
Courtesy of AUDI OF AMERICA, LLC

-- Install V.A.G 1402 as shown in illustration.

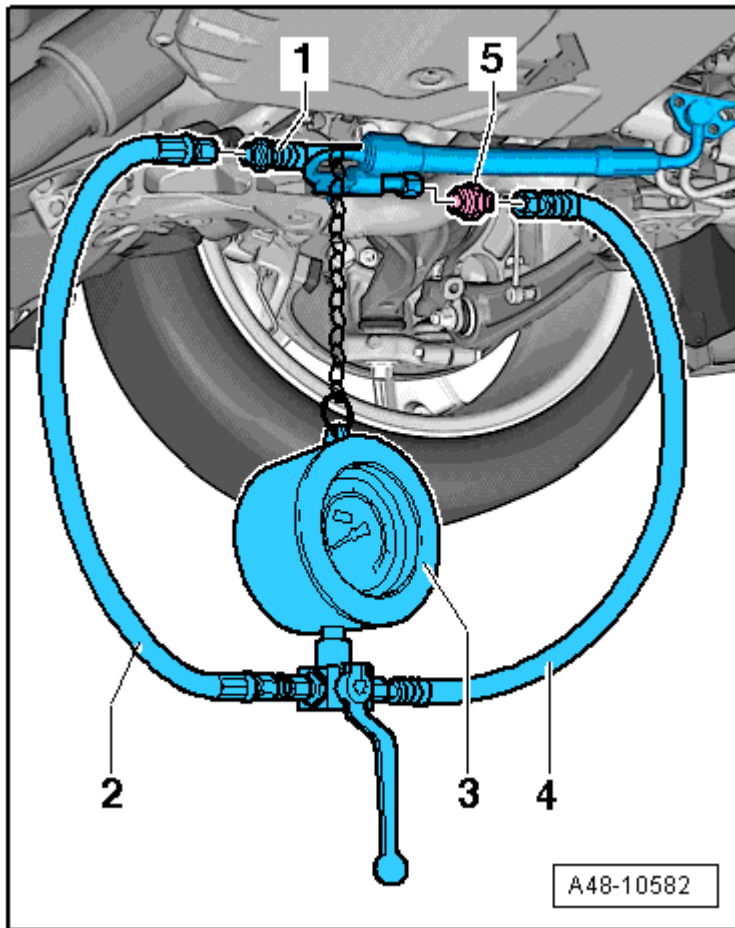


Fig. 64: Installing V.A.G 1402
Courtesy of AUDI OF AMERICA, LLC

1. Pressure line with separating point
2. Hose from adapter set V.A.G 1402/6
3. Pressure gauge V.A.G 1402
4. Hose from adapter set V.A.G 1402/6
5. Adapter V.A.G 1402/3

-- Attach the V.A.G 1402 hoses to the open connections on the pressure hose as illustrated.

Applies to vehicles without a separating point, see item 14.

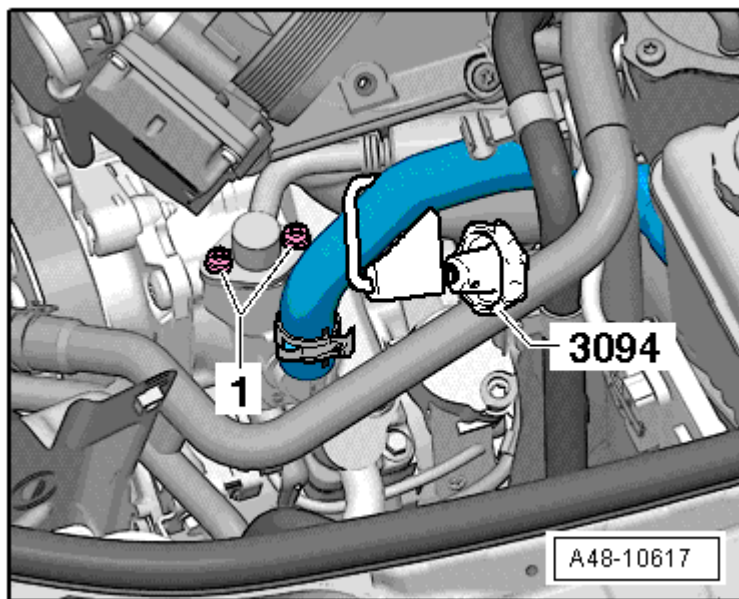


Fig. 65: Identifying Bolts -1- And Hose Clamp 3094
 Courtesy of AUDI OF AMERICA, LLC

- Remove the bolts -1- and remove the pressure line from the power steering pump.
- If the pressure line is also attached to the A/C compressor, then remove the bolt -C- for the bracket -D-.

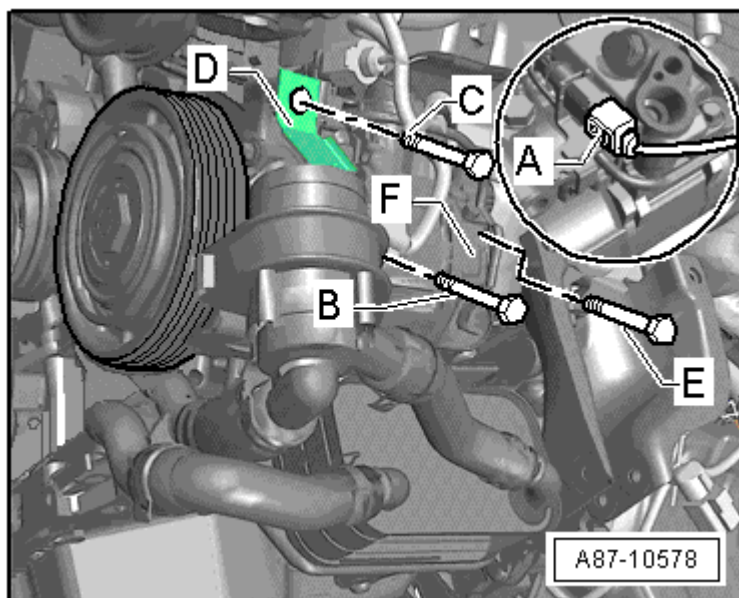


Fig. 66: Identifying A/C Compressor & Bolts
 Courtesy of AUDI OF AMERICA, LLC

- Mount the V.A.G 1402 as illustrated.

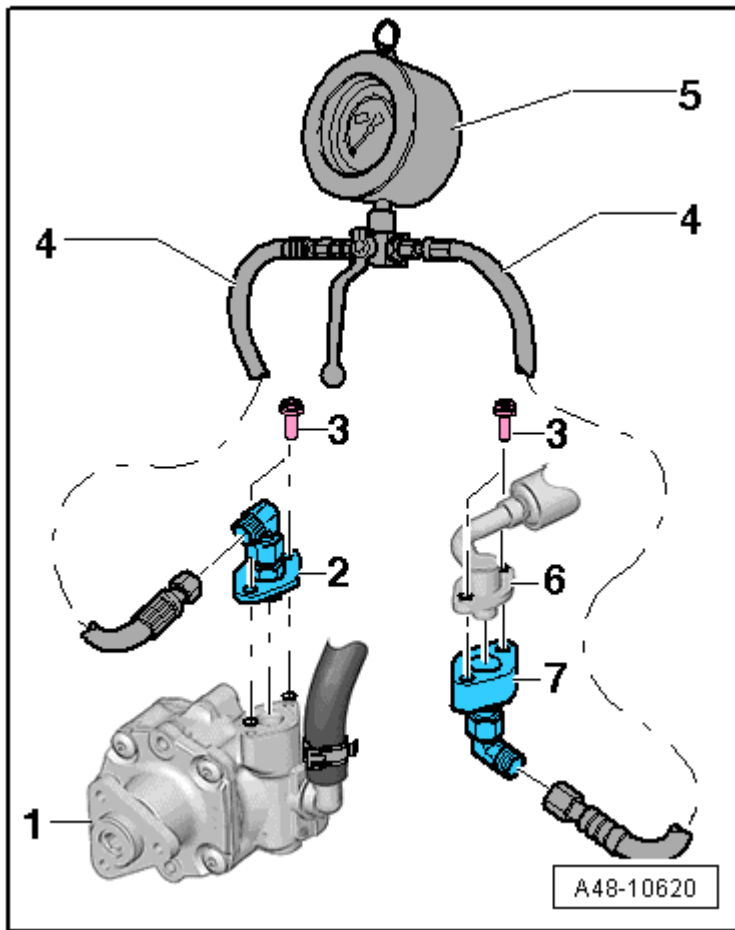


Fig. 67: Identifying Power Steering Pump Delivery Pressure, V6 TDI, Generation I With SCR And V6 TDI, Generation II, Test Assembly

Courtesy of AUDI OF AMERICA, LLC

1. Power Steering Pump
2. Adapter V.A.G 1402/17-1 with elbow V.A.G 1402/17-3. See 1
3. Bolt for mounting the pressure line
4. Hose from adapter set V.A.G 1402/6
5. Power steering tester V.A.G 1402
6. Pressure Line
7. Adapter V.A.G 1402/17-2 with elbow V.A.G 1402/17-3

1. Replace the adapter V.A.G 1402/17-1 seal if it is damaged or leaking.

NOTE: Position the elbow V.A.G 1402/17-3 on the adapter V.A.G 1402/17-1 so that the hose from the adapter set V.A.G 1402/6 does not touch the pulley and/or ribbed belt.

Tighten the union nuts on the V.A.G 1402/17-3 and the V.A.G 1402/6 hoses

hand-tight with an open-end wrench.

Continuation for All

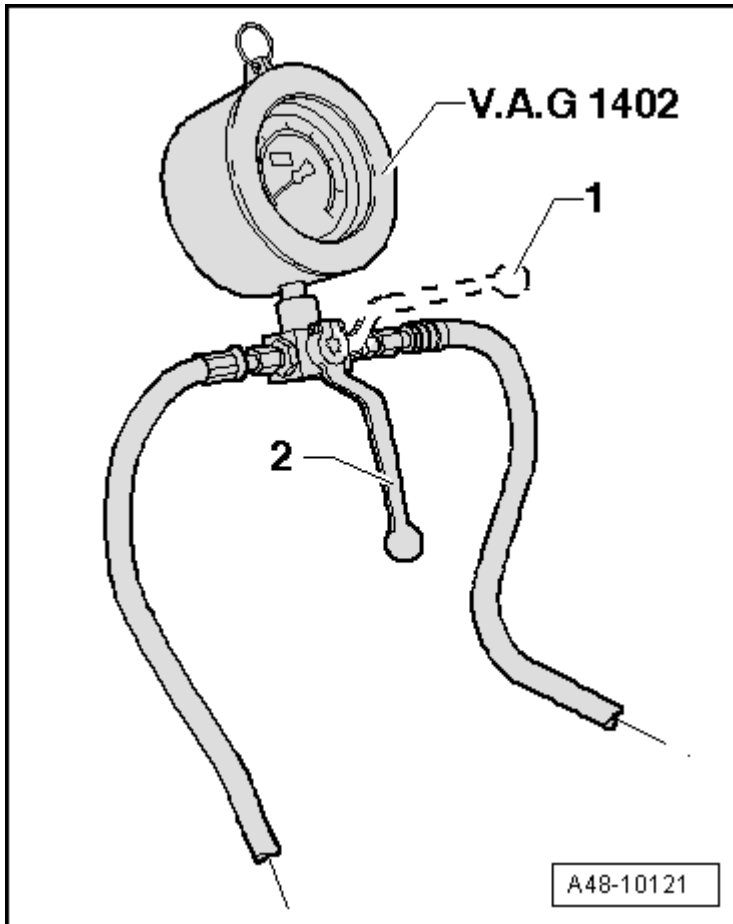


Fig. 68: Ensuring Lever On Pressure Gauge Stands In Open/Closed Position
Courtesy of AUDI OF AMERICA, LLC

- Make sure that lever on pressure gauge stands in position -2-.
- Remove the 3094.
- Start engine without giving gas.
- Turn the steering wheel from lock to lock about 10 times.
- Turn off the engine and, if needed, fill hydraulic fluid in reservoir.

NOTE: To avoid damage to the pump, observe the following:

Pressure gauge shutoff valve must not remained closed longer than 10 seconds during this test.

Start engine without giving gas and run at idle.

Read the pump pressure immediately after starting at idle speed (have it read by a second technician, if necessary).

Because pressure falls over the course of the test, the highest pressure shown is the decisive measurement.

-- Now check delivery pressure.

-- Start engine.

-- With the engine at idle, close the shutoff valve to position -1- and read the pressure (the lever must face away from the pressure hose). Do not perform measurement longer than 10 seconds.

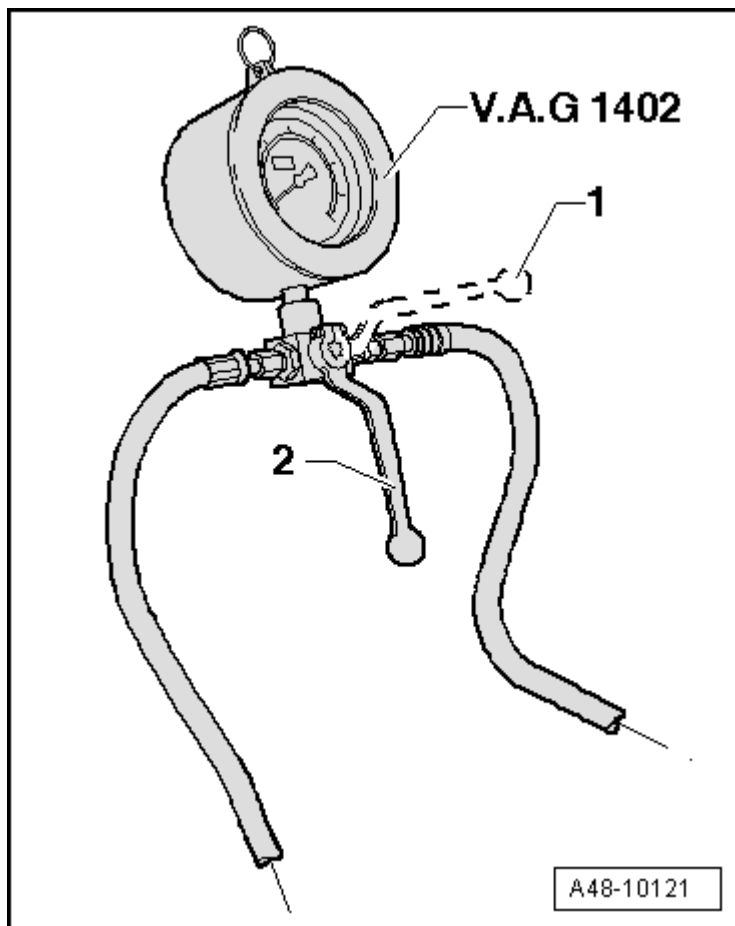


Fig. 69: Ensuring Lever On Pressure Gauge Stands In Open/Closed Position
Courtesy of AUDI OF AMERICA, LLC

Delivery pressure specified value, vehicles without dynamic steering: 115 to 0.132 bar

Delivery pressure target value - vehicles with dynamic steering: 114 to 131 bar

If the pressure is not at the specified value, replace the power steering pump. Refer to **POWER STEERING PUMP, VEHICLES WITH DYNAMIC STEERING** or **POWER STEERING PUMP, VEHICLES WITHOUT DYNAMIC STEERING**.

-- Turn off engine.

-- Remove V.A.G 1402.

Tightening specifications, refer to **VEHICLES WITHOUT DYNAMIC STEERING OVERVIEW**

-- Note the line installation location when bolting the line connection. The markings -1 and 2- must be opposite each other.

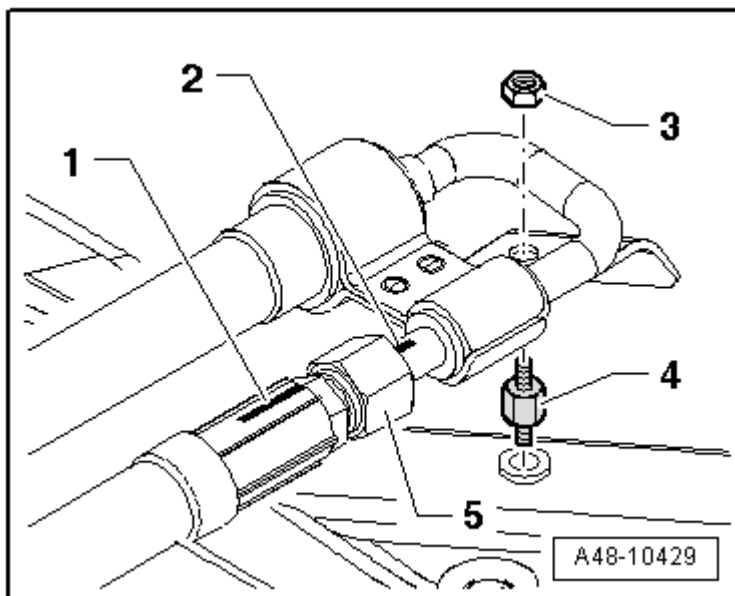


Fig. 70: Pressurized Line To Crossbrace
Courtesy of AUDI OF AMERICA, LLC

-- Tighten the union nut -1-. Counter hold at the hex head.

-- Tighten the nut -3- and the rubber bushing -4- if necessary.

-- Bleed the steering. Refer to **STEERING, BLEEDING AFTER REPLACING**.

-- Check power steering fluid level. Refer to **POWER STEERING FLUID LEVEL, CHECKING**.

-- Check all open line connections for leaks. Refer to **STEERING, CHECKING FOR LEAKS**.

POWER STEERING PUMP DELIVERY PRESSURE, CHECKING - ENGINE CODE(S): CCBA & CGXC

Special tools and workshop equipment required

- Hose Clamps Up to 25 mm Dia. 3094
- Torque Wrench 5-50 Nm V.A.G 1331
- Power Steering Test Unit V.A.G 1402
- Adapter Hose V.A.G 1402/6
- Drip Tray for VAS 6100 VAS 6208
- Adapter V.A.G 1402/3 is needed for vehicles that have a pressure line with a separating point, see item 14
- Adapter Set V.A.G 1402/17 is needed for vehicles that have a pressure line without a separating point, see item 14.

Prerequisites

- Ribbed belt/ribbed belt tension OK
- Sealing of system
- Hoses/lines are not kinked or constricted

Checking

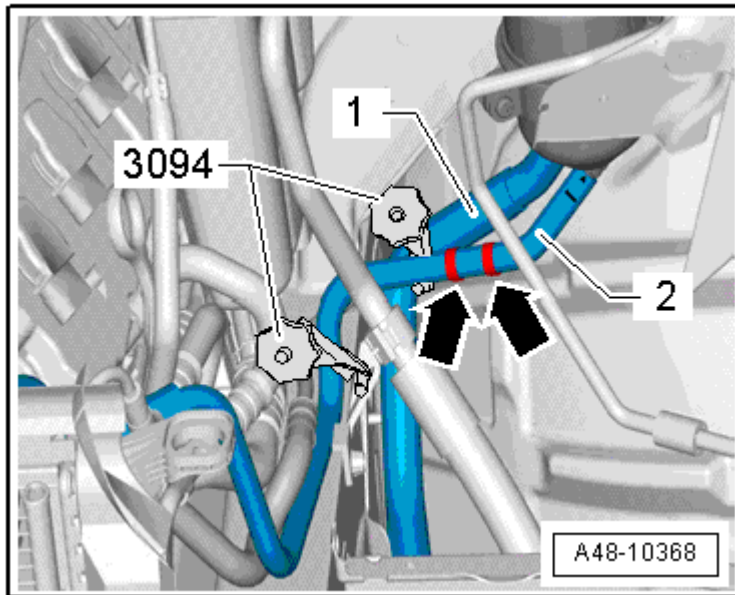


Fig. 71: Locating Suction & Return Hose Clamping Location
Courtesy of AUDI OF AMERICA, LLC

-- Clamp off the suction hose -1- and return hose -2- using the 3094.

CAUTION:

- The 3094 must not be secured on the return hose -2- in the check valve area. Otherwise, check valve will be damaged.
- The check valve is located in the return hose -2- between the hose

clamps -arrows-.

-- Remove noise insulation. Refer to **Description and Operation** .

-- Engage the tester -3- on the control arm -1- using a hook -2-.

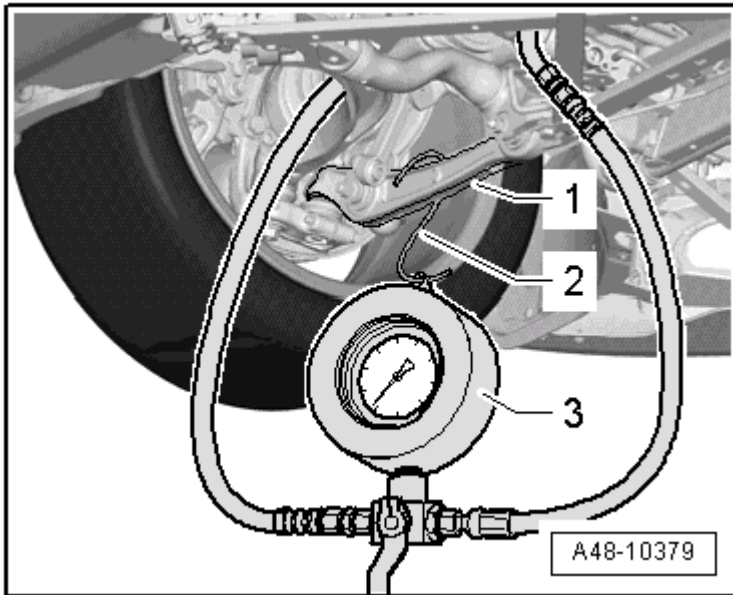


Fig. 72: Identifying Tester

Courtesy of AUDI OF AMERICA, LLC

-- Position the VAS 6208 below to collect the hydraulic oil.

-- Loosen the union nut -5-. Counter hold at the hex head.

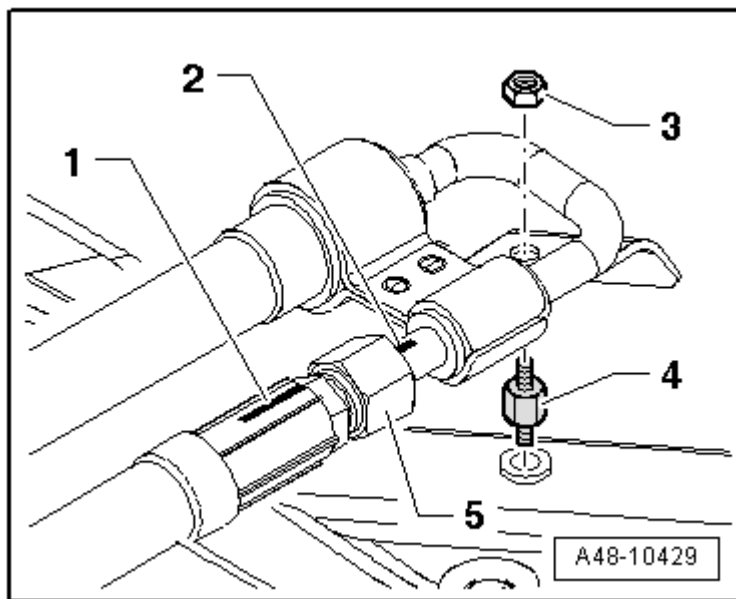


Fig. 73: Pressurized Line To Crossbrace
 Courtesy of AUDI OF AMERICA, LLC

-- Install V.A.G 1402 as shown in the illustration.

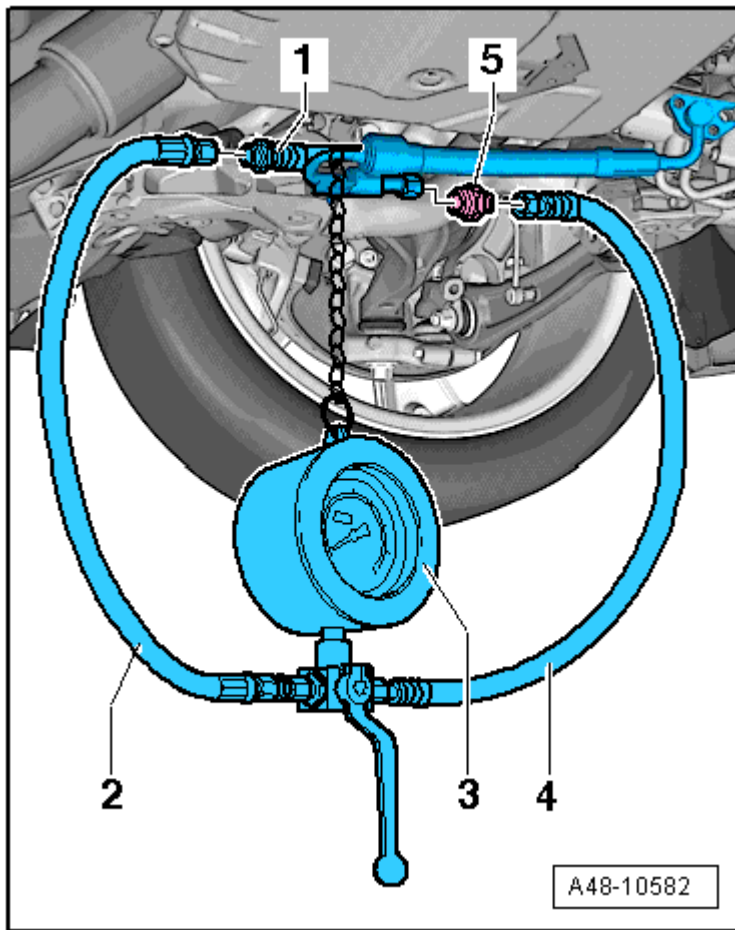


Fig. 74: Installing V.A.G 1402

Courtesy of AUDI OF AMERICA, LLC

1. Pressure line with separating point
2. Hose from adapter set V.A.G 1402/6
3. Pressure gauge V.A.G 1402
4. Hose from adapter set V.A.G 1402/6
5. Adapter V.A.G 1402/3

-- Attach the V.A.G 1402 hoses to the open connections on the pressure hose as illustrated.

-- Make sure that lever on pressure gauge stands in position -2-.

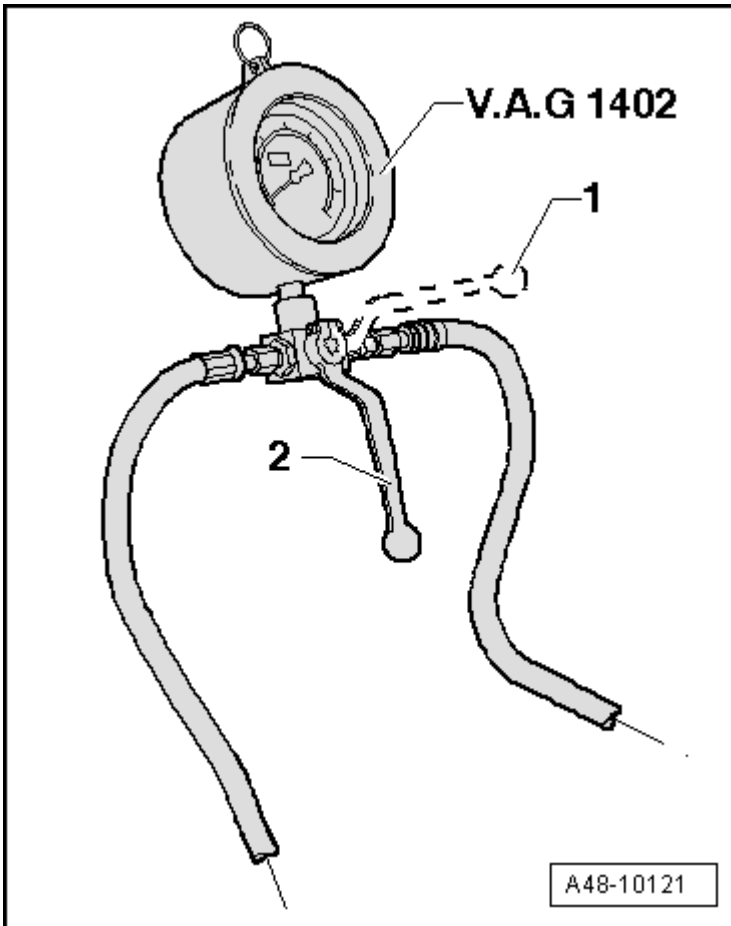


Fig. 75: Ensuring Lever On Pressure Gauge Stands In Open/Closed Position
Courtesy of AUDI OF AMERICA, LLC

- Remove the 3094.
- Start engine without giving gas.
- Turn the steering wheel from lock to lock about 10 times.
- Turn off engine and, if needed, fill hydraulic fluid in reservoir.

NOTE: To avoid damage to pump, observe the following:

Pressure gauge shutoff valve must not remain closed longer than 10 seconds during this test.

Start engine without giving gas and run at idle.

Read the pump pressure immediately after starting at idle speed (have it read by second technician, if necessary).

Because pressure falls over the course of the test, the highest pressure shown is the decisive measurement.

-- Now check delivery pressure.

-- Start engine.

-- Raise the vehicle.

-- With the engine at idle, close the shutoff valve to position -1- and read the pressure (the lever must face away from the pressure hose). Do not perform measurement longer than 10 seconds.

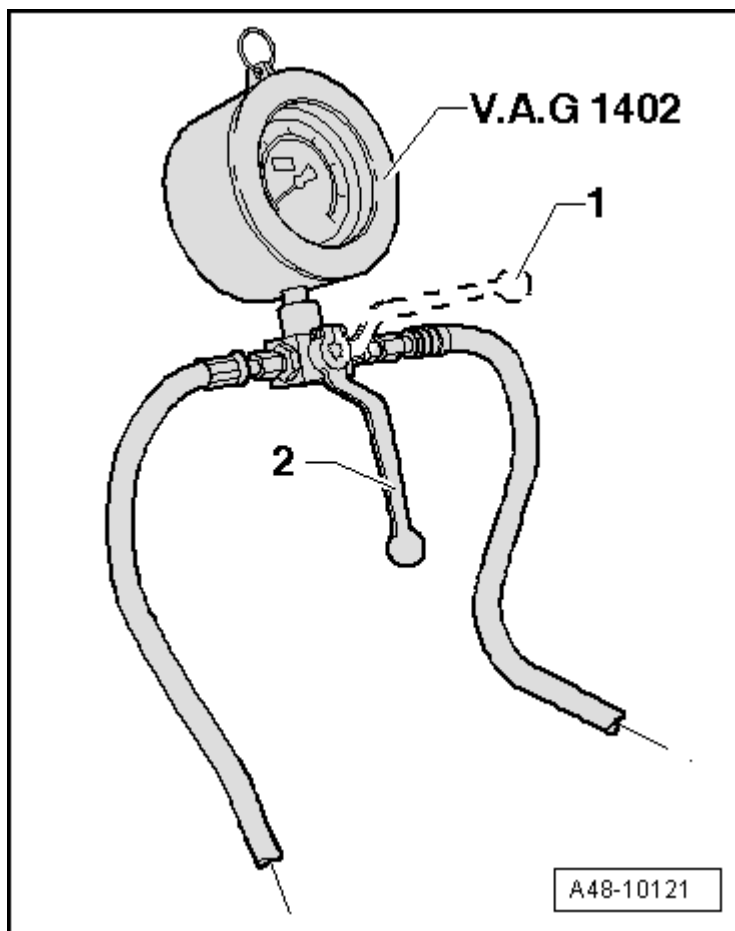


Fig. 76: Ensuring Lever On Pressure Gauge Stands In Open/Closed Position
Courtesy of AUDI OF AMERICA, LLC

Delivery pressure target value - vehicles without dynamic steering: 115 to 132 bar

Delivery pressure target value - vehicles with dynamic steering: 114 to 131 bar

If the pressure is not at the specified value, replace the power steering pump **POWER STEERING PUMP, VEHICLES WITH DYNAMIC STEERING** or **POWER STEERING PUMP, VEHICLES WITHOUT**

DYNAMIC STEERING.

- Switch off engine.
- Remove V.A.G 1402.

Tightening specifications, refer to **VEHICLES WITH DYNAMIC STEERING OVERVIEW**, **VEHICLES WITHOUT DYNAMIC STEERING OVERVIEW**

- Note the line installation location when bolting the line connection. The markings -1 and 2- must be opposite each other.

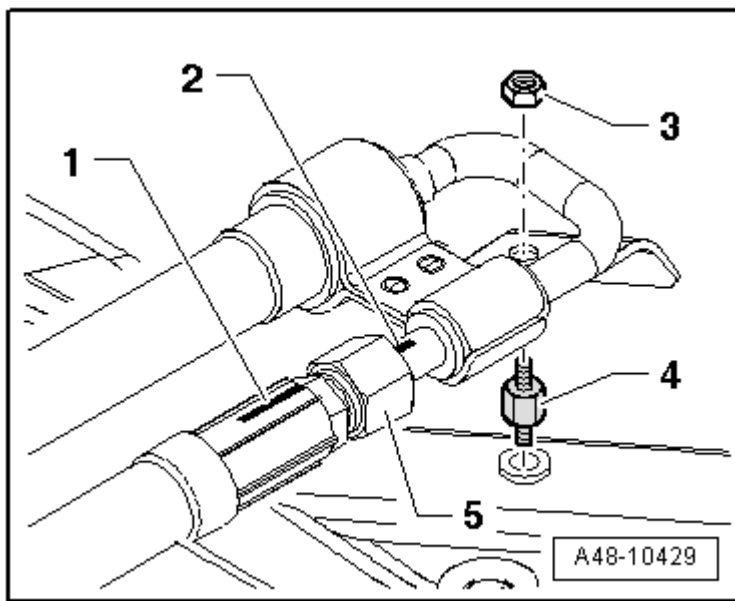


Fig. 77: Pressurized Line To Crossbrace
Courtesy of AUDI OF AMERICA, LLC

- Tighten the union nut -1-. Counter hold at the hex head.
- Tighten the nut -3- and the rubber bushing -4- if necessary.
- Bleed the steering. Refer to **STEERING, BLEEDING AFTER REPLACING.**
- Check power steering fluid level. Refer to **POWER STEERING FLUID LEVEL, CHECKING.**
- Check all open line connections for leaks. Refer to **STEERING, CHECKING FOR LEAKS.**

REMOVAL AND INSTALLATION**AIRBAG STEERING WHEEL**

Special tools and workshop equipment required

- Steering Wheel Scales VAS 6458

Removing

NOTE: Applies to vehicles equipped with dynamic steering:

Before the steering wheel can be removed from the steering column, the steering wheel must be in the exact horizontal using the VAS 6458. Mount the new steering wheel so that it is horizontal using the VAS 6458.

After doing this step, the steering angle sensor -G85- for setting the steering wheel position must be checked. While doing this, select the appropriate measured values block in the steering column electronics control module - J527- in On Board Diagnostics (OBD). If the displayed value is $> 0.5^\circ$, then the steering angle sensor -- must be calibrated again and the dynamic steering must be adapted. Select the program in Guided Fault Finding. Refer to DYNAMIC STEERING BASIC SETTING .

- Set the wheels to the straight ahead position.
- Position steering wheel as far back as possible. Use the entire steering column adjustment range to do this.
- Remove the airbag unit. Refer to Removal and Installation .

NOTE: Removing and installing of the steering wheel must take place in the center position (wheels in straight-ahead position).

- Remove bolt -2-.

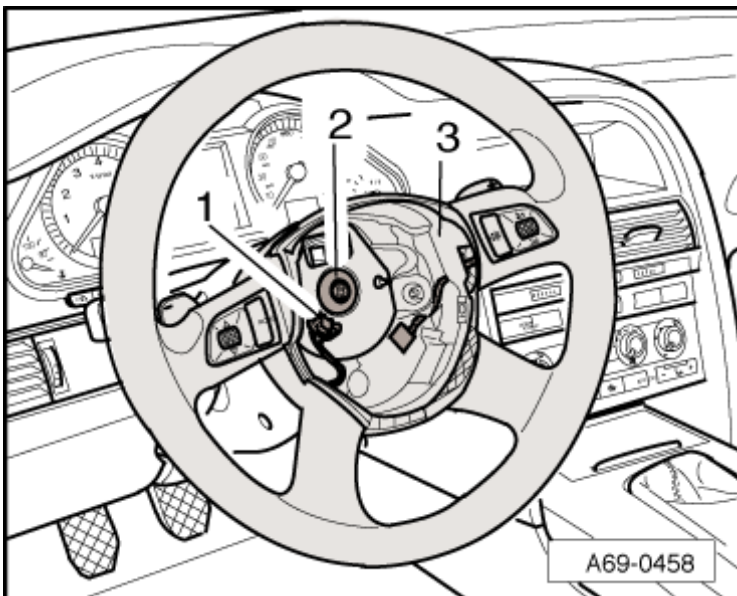


Fig. 78: Identifying Bolt And Steering Wheel

Courtesy of AUDI OF AMERICA, LLC

- Mark position of steering wheel/column with a felt-tip pen.
- Remove steering wheel -3- from steering column.

Installing

Install in reverse order of removal. Note the following:

Tightening specifications, refer to **AIRBAG STEERING WHEEL OVERVIEW**

Before positioning steering wheel, make sure wheels are in straight position.

- When installing removed steering wheel: Make sure that markings on steering column/wheel align.
- When installing a new steering wheel (without marking): Steering wheel must be position in center position (steering wheel spoke must be horizontal and wheels in straight-ahead position).
- Install steering wheel.
- Install the airbag unit. Refer to **Removal and Installation** .
- Perform road test.
- If steering wheel is crooked, remove it again and rotate it on steering column splines.

STEERING INTERMEDIATE SHAFT**Special tools and workshop equipment required**

- Torque Wrench 5-50 Nm V.A.G 1331

Removing

- Set the wheels to the straight ahead position.
- Position the steering wheel as far down as possible using the full range of the steering column adjuster.
- Turn the steering wheel to the center position (wheels are straight).
- Turn the steering wheel so that the wheels are in the straight-ahead position and then tape it secure -arrow- so that it cannot turn.



Fig. 79: Taping Steering Wheel

Courtesy of AUDI OF AMERICA, LLC

NOTE: Be sure to use tape that will not leave behind any residue when it is removed.

Be careful not to turn the steering wheel during the repair other the airbag spiral spring/return spring with slip ring -F138- will get damaged.

-- Move the driver seat forward to the stop.

-- Remove the bolt -2- and remove the steering intermediate shaft -3- from the steering column -1-.

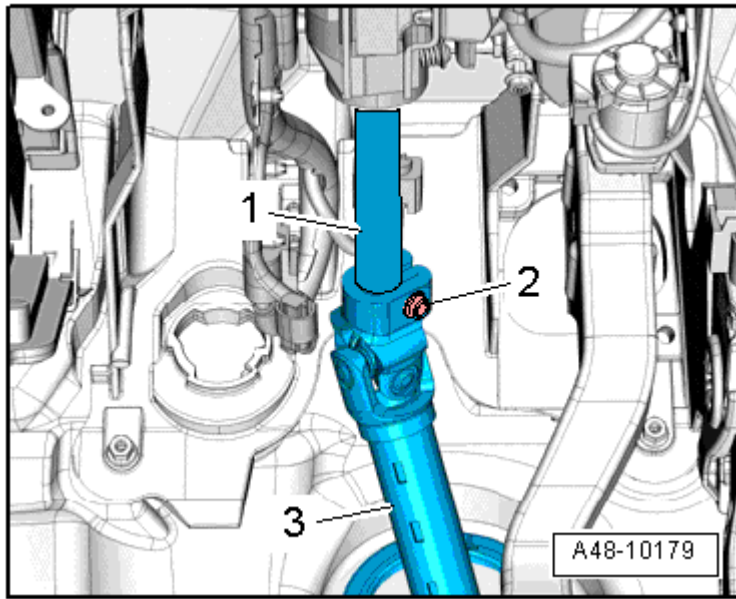


Fig. 80: Steering Intermediate Shaft
Courtesy of AUDI OF AMERICA, LLC

- Place the vehicle on a hoist.
- Remove the rear noise insulation -arrow-.

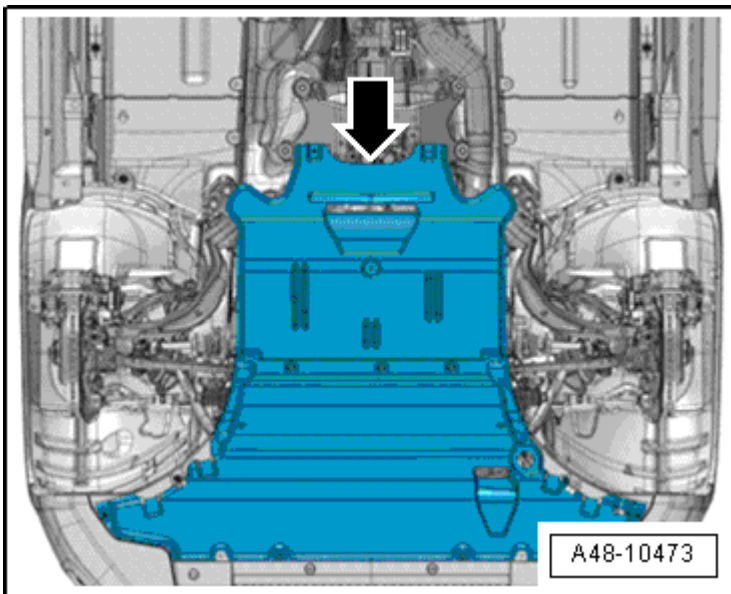


Fig. 81: Rear Noise Insulation
Courtesy of AUDI OF AMERICA, LLC

- Remove the bolt -arrow-.

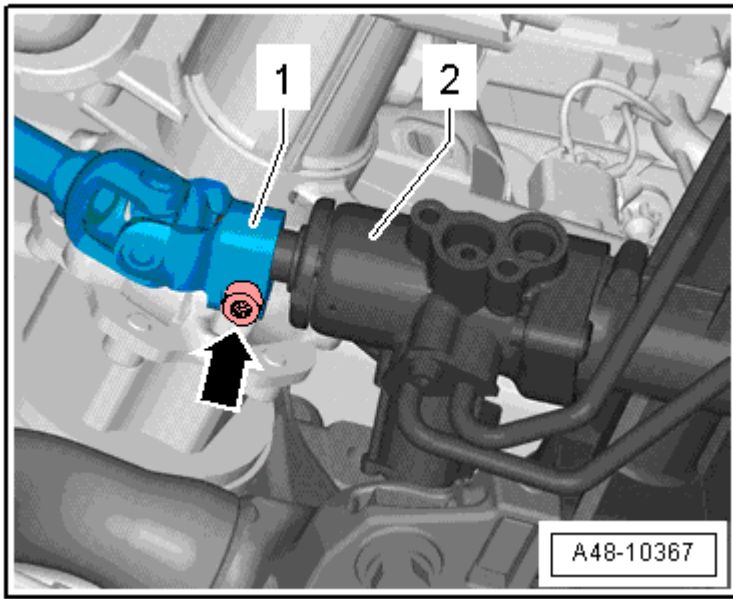


Fig. 82: Locating Steering Intermediate Shaft Bolt
Courtesy of AUDI OF AMERICA, LLC

-- Remove the steering intermediate shaft -1- from the steering gear -2-.

WARNING:

- **Danger of getting burned by the exhaust system depending on the engine installed.**

-- Remove the protective boot on the straps -arrows- from the body.

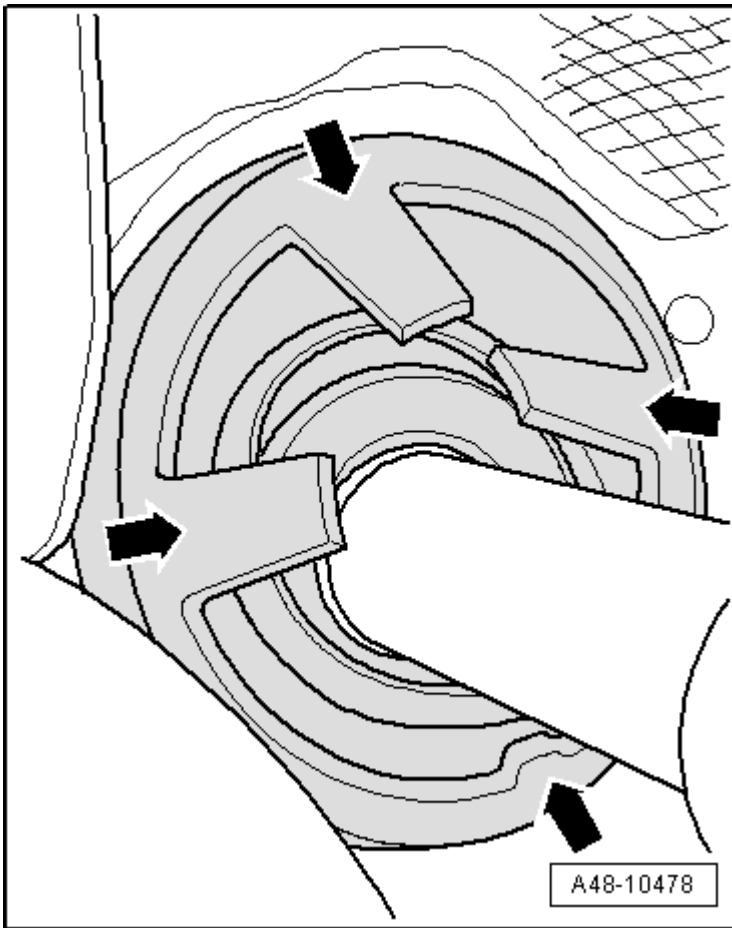


Fig. 83: Locating Protective Boot Straps
Courtesy of AUDI OF AMERICA, LLC

-- Remove the steering intermediate shaft toward the passenger compartment.

Installing

Install in reverse order of removal. Note the following:

-- The threaded hole for the bolt must always be cleaned (for example, using a thread tap).

Tightening specifications, refer to **STEERING COLUMN OVERVIEW**

-- Install the steering intermediate shaft.

-- Install the steering intermediate shaft -3- on the steering column -1- as far as the stop and tighten the bolt -2-.

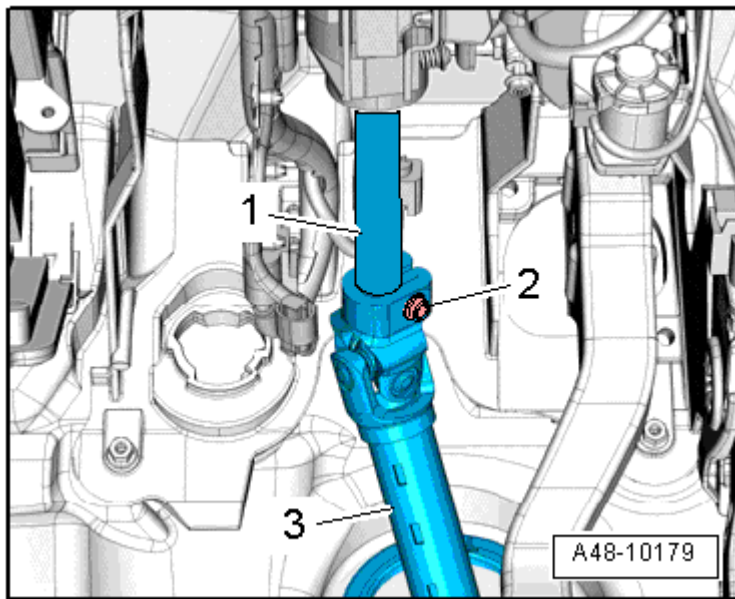


Fig. 84: Steering Intermediate Shaft
Courtesy of AUDI OF AMERICA, LLC

-- Install the protective boot -2- as far as possible. Make sure, that the arrow -1- points upward.

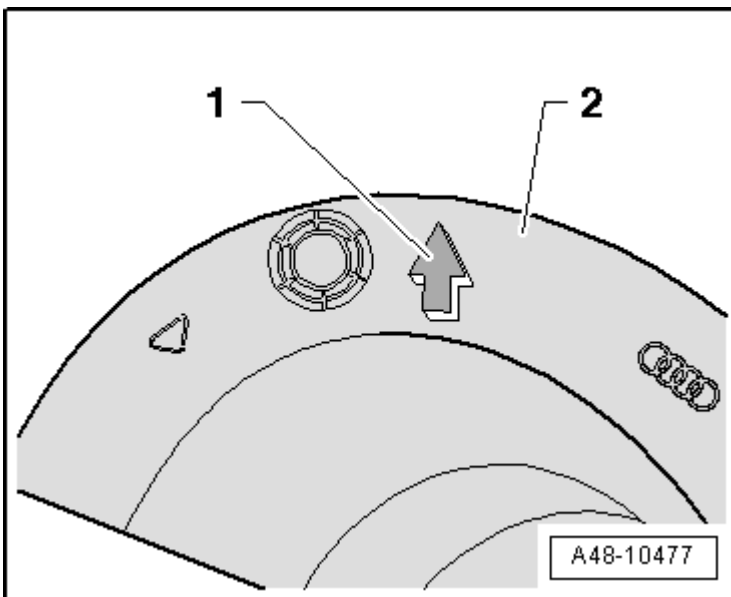


Fig. 85: Identifying Protective Boot Arrow
Courtesy of AUDI OF AMERICA, LLC

-- Pull the protective boot -1- through the opening.

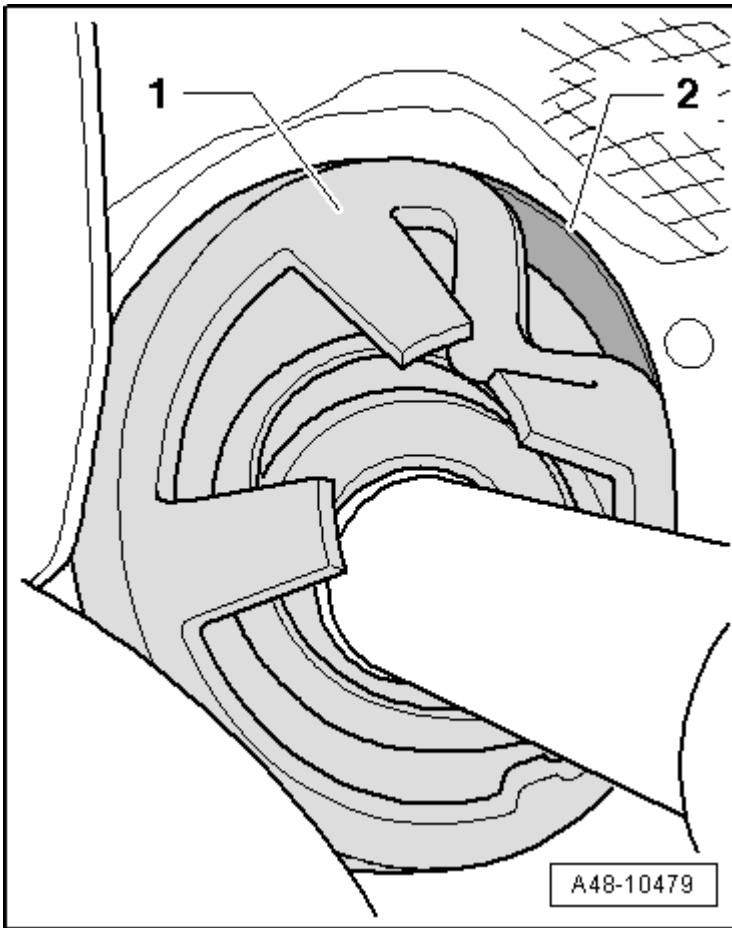


Fig. 86: Removing Protective Boot

Courtesy of AUDI OF AMERICA, LLC

- Mount the protective boot -1-, without turning it, completely over the collar -2-.
- Then check the installation position of the protective boot above the marking inside the passenger compartment. If necessary, loosen the protective boot and turn it to the correct installation position.
- The mount the steering intermediate shaft -1- all the way onto the steering gear -2- and tighten the bolt - arrow-.

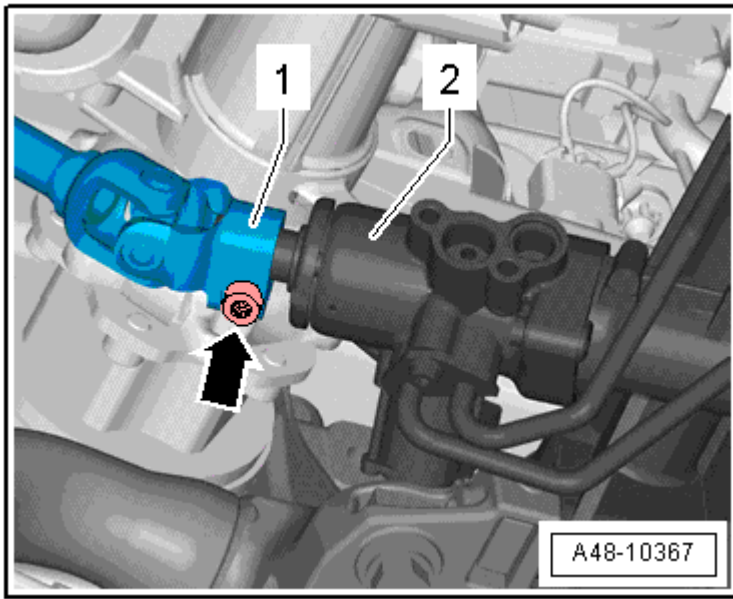


Fig. 87: Locating Steering Intermediate Shaft Bolt
Courtesy of AUDI OF AMERICA, LLC

Install in reverse order of removal.

STEERING COLUMN

Special tools and workshop equipment required

- Torque Wrench 5-50 Nm V.A.G 1331
- Vehicle Diagnostic Tester

WARNING: Note the following before removing the steering column:

Create a sketch showing the:

- Routing of the electrical wiring harnesses,
- Securing the electrical wiring harnesses,
- Cable tie locations.

This especially applies to the wiring harness to the electronic steering column lock control module -J764-.

Note the following before installing the steering column:

- Route the electrical wiring harnesses exactly the way they were before removal.
- Secure the electrical wiring harnesses exactly the way they were before removal.

- **Install all the cable ties that were loosened or cut in the same locations when installing the steering column.**
- **Make sure the wiring harness to the electronic steering column lock control module -- is not pinched and does not come into contact with sharp edges when adjusting the steering column.**

Removing

NOTE: The steering column is delivered only as a complete replacement part. Service is not possible.

Only the electronic steering column lock control module -- can be replaced separately.

- Set the wheels to the straight ahead position.
- Position the steering wheel as far down as possible using the full range of the steering column adjuster.
- Remove the driver airbag. Refer to **Removal and Installation** .
- Remove the airbag steering wheel. Refer to **AIRBAG STEERING WHEEL**.
- Remove the driver side instrument panel cover. Refer to **Removal and Installation** .
- If installed, remove the right driver side knee bar. Refer to **Removal and Installation** .
- Remove the driver side footwell vent. Refer to **Removal and Installation** .
- Remove the steering column trim. Refer to **Removal and Installation** .
- Remove the steering column switch module. Refer to **Removal and Installation** .

WARNING: On dynamic steering system steering columns, never loosen or remove the dynamic steering unit bolts.

- Disengage the wiring guide -1- at the steering column -arrows- and lay it aside.

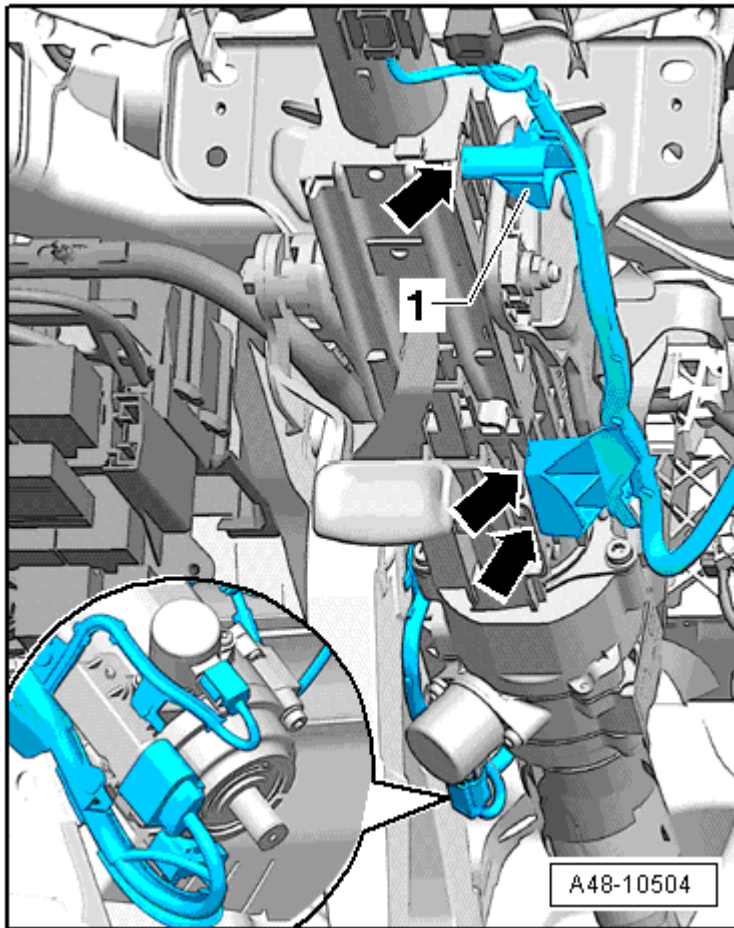


Fig. 88: Identifying Steering Column Wiring Guide

Courtesy of AUDI OF AMERICA, LLC

-- On vehicles equipped with dynamic steering, disconnect the connector on the adjustor and free up the cable guide on the left side of the steering column.

-- Remove the bolt -2- and remove the steering intermediate shaft -3- from the steering column -1-.

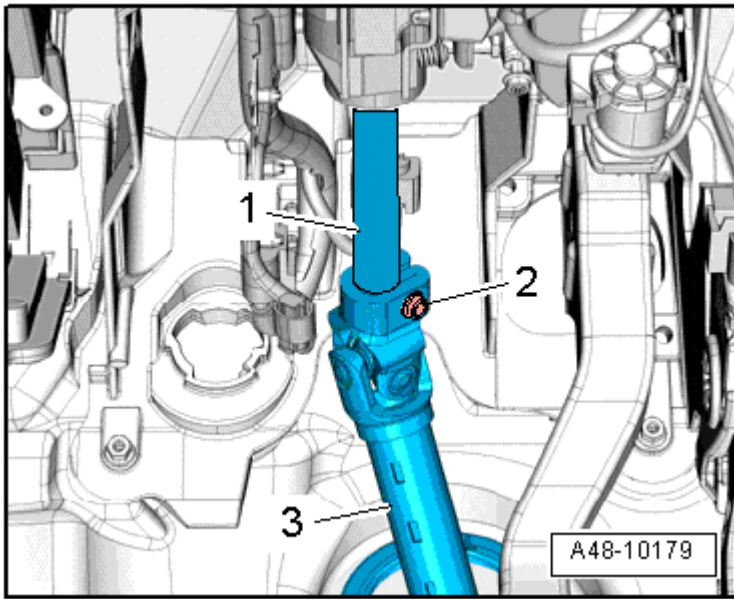


Fig. 89: Steering Intermediate Shaft

Courtesy of AUDI OF AMERICA, LLC

-- Remove the lower steering column bolts -1 through 4- on the mounting bracket and pedal assembly.

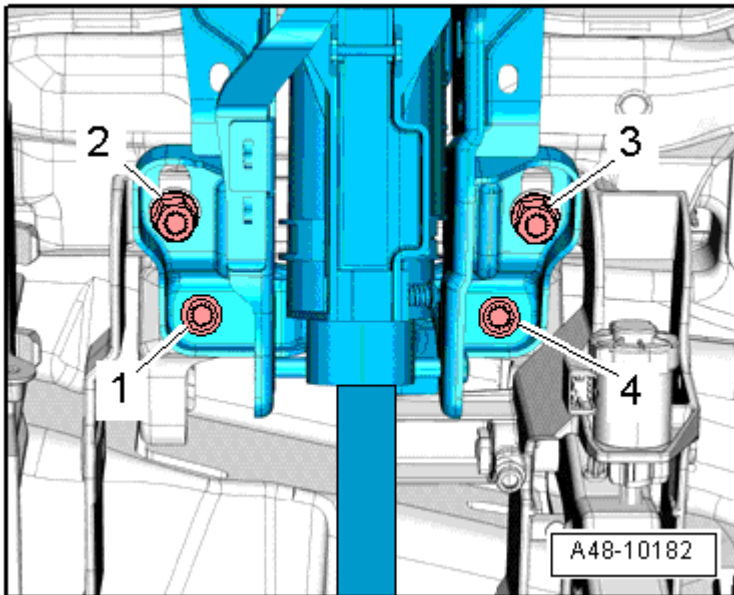


Fig. 90: Lower Steering Column Bolts

Courtesy of AUDI OF AMERICA, LLC

-- Remove the steering column bolts -1 and 2- on the central tube while supporting the steering column from below with the hand.

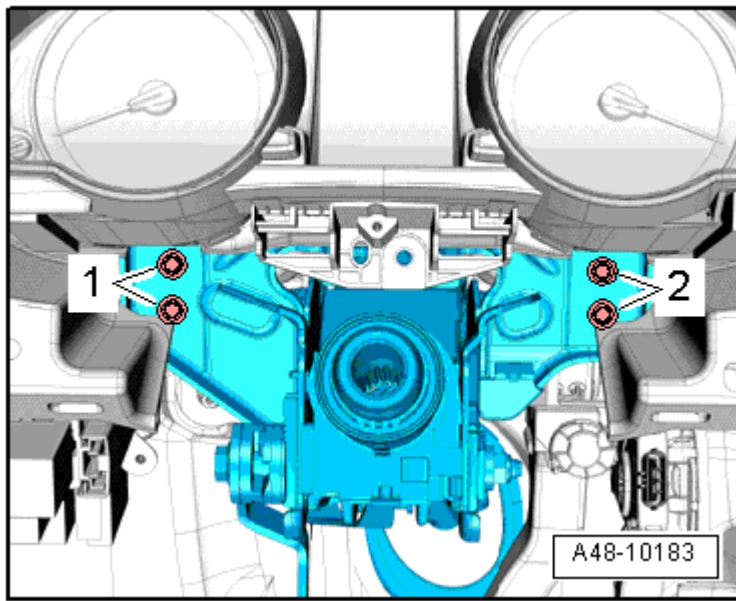


Fig. 91: Steering Column Bolts

Courtesy of AUDI OF AMERICA, LLC

-- Pull the steering column back slightly, disengage it from the positioning holes on the central tube and lower it.

-- If the vehicle has a steering lock lock-up system, disconnect the connector -2- from the electronic steering column lock control module -- -1-, remove the clip -5-, free up the wiring harness -3- and remove the steering column.

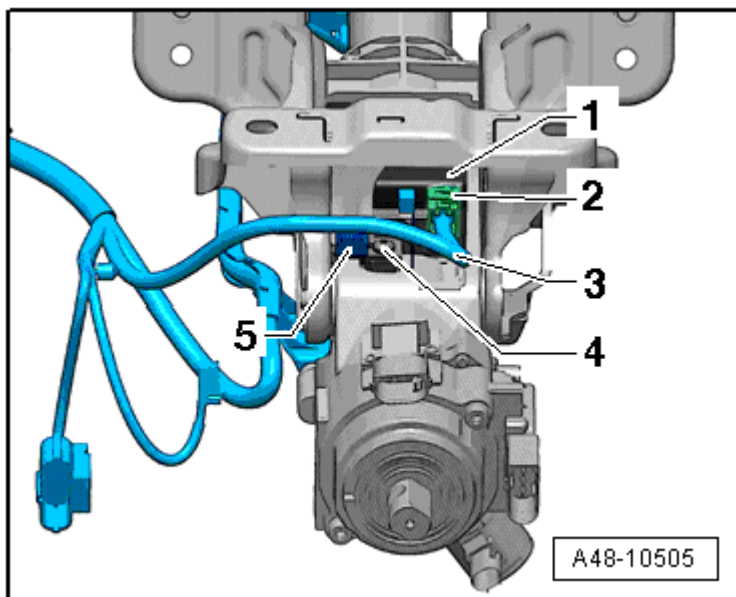


Fig. 92: Electronic Steering Column Lock Control Module Wiring Harness

Courtesy of AUDI OF AMERICA, LLC

Installing

Install in reverse order of removal. Note the following:

- If the steering column on a vehicle with steering lock lock-up system was replaced, then use the bolt installed in the new steering column, see item 4 for the electronic steering column lock control module --.

Tightening specifications, refer to **STEERING COLUMN OVERVIEW**

-- Clean the threaded hole (for example, using a thread tap) before installing the new bolt -2-.

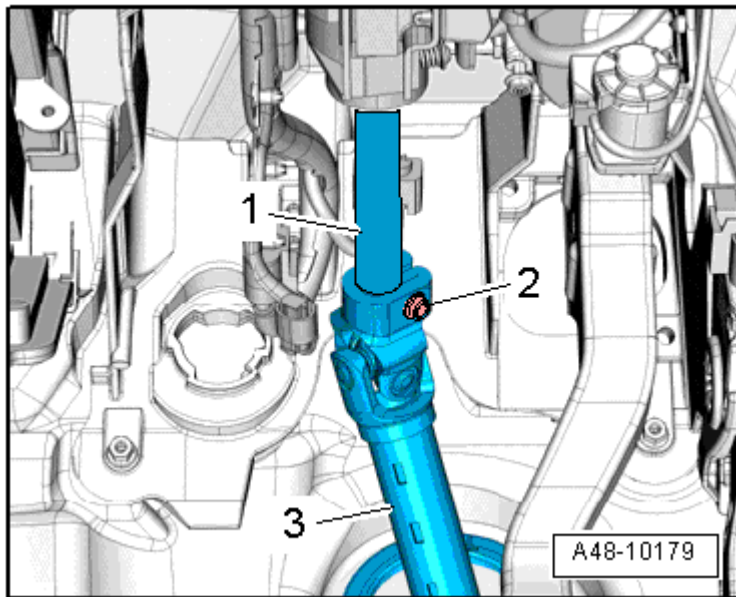


Fig. 93: Steering Intermediate Shaft

Courtesy of AUDI OF AMERICA, LLC

Applies to Vehicles with the Steering Lock Lock-Up System

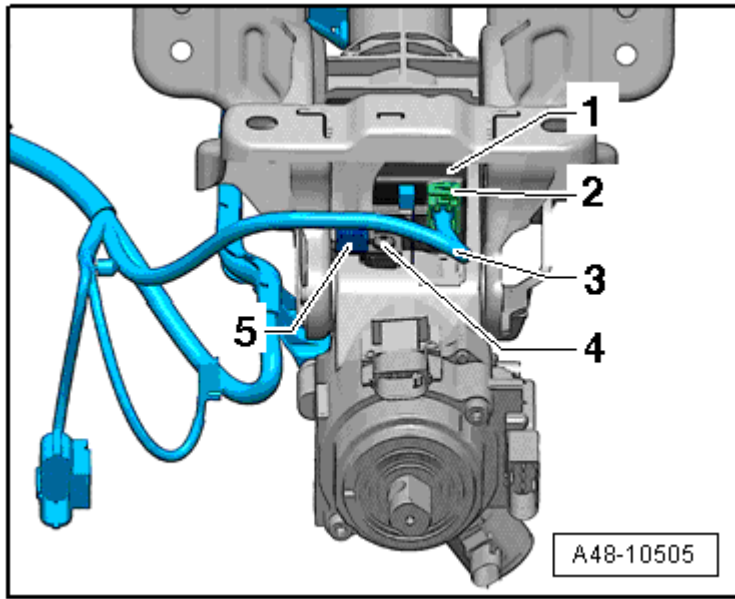


Fig. 94: Electronic Steering Column Lock Control Module Wiring Harness
Courtesy of AUDI OF AMERICA, LLC

- After reconnecting the connector, -2- make sure the wiring harness -3- is secured by the clip -5-.
- If the steering column needs to be adjusted, be careful not to pinch the wiring harness -3- for the electronic steering column lock control module -- -1- and that it does not come in contact with any sharp edges.

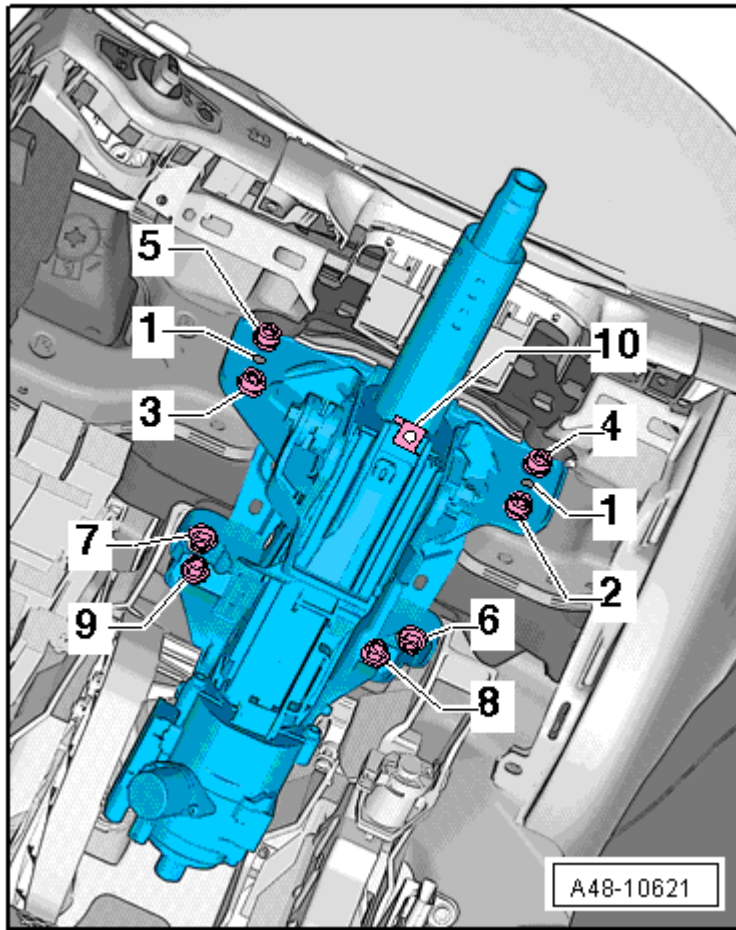


Fig. 95: Identifying Assembly Sequence When Installing
Courtesy of AUDI OF AMERICA, LLC

- Position the steering column with the positioning pins -1- in the positioning holes on the central tube.
- Install all bolts loosely.
- First tighten bolt -2- to the tightening specification.
- Then tighten bolt -3- to the tightening specification.
- Then tighten bolt -4- and bolt -5- to the tightening specification.
- If equipped, install the right driver side knee bar. Refer to **Removal and Installation**
- Then tighten the bolt -6- and bolt -7- to the tightening specification.
- Tighten bolt -8- and bolt -9- to the tightening specification.
- Replace the spring nut -10- if the steering column was replaced.

-- Install the steering intermediate shaft -3- on the steering column -1- as far as the stop and tighten the bolt -2-.

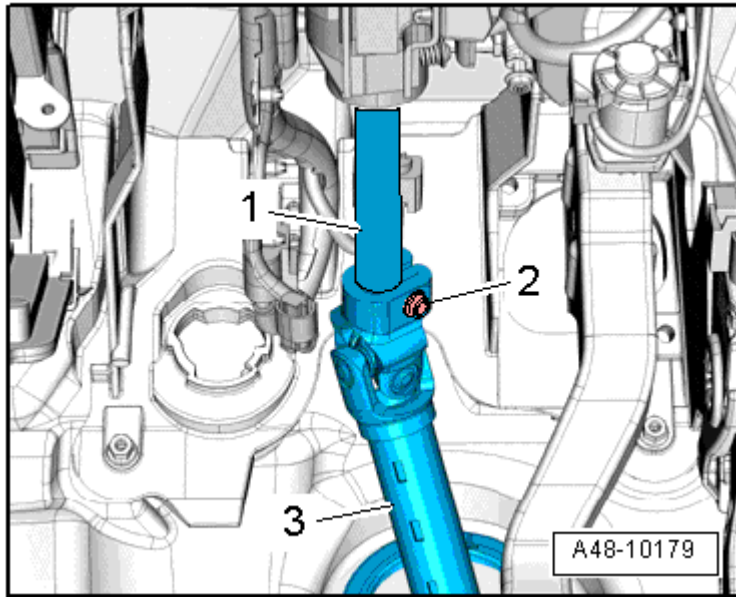


Fig. 96: Steering Intermediate Shaft

Courtesy of AUDI OF AMERICA, LLC

-- Install the steering column switch module. Refer to **Removal and Installation** .

-- Install the steering column trim. Refer to **Removal and Installation** .

-- Install the driver side footwell vent. Refer to **Removal and Installation** .

-- Install the driver side instrument panel cover. Refer to **Removal and Installation** .

-- Install the airbag steering wheel. Refer to **AIRBAG STEERING WHEEL**.

-- Install the driver airbag. Refer to **Removal and Installation** .

-- After replacing the electronic steering column lock control module --, the module must be adapted to the immobilizer.

NOTE: **If the same steering column and the same electronic steering column lock control module -- are being re-installed, then it is not necessary to adapt the electronic steering column lock control module -- again.**

-- Connect the vehicle diagnosis, testing and information system VAS 5052 and proceed with a vehicle-specific entry in Guided Fault Finding.

-- Select the corresponding program in "Guided Functions".

-- Follow the prompts on the screen.

- The steering angle sensor -G85- must be calibrated after installing the steering column switch module.
- Connect the vehicle diagnosis, testing and information system VAS 5052 and proceed with a vehicle-specific entry in Guided Fault Finding.
- Follow the prompts on the screen.

Electronic Steering Column Lock Control Module -J764-**Removing**

WARNING: Note the following before removing the steering column:

Create a sketch showing the:

- Routing of the electrical wiring harnesses,
- Securing the electrical wiring harnesses,
- Cable tie locations.

This especially applies to the wiring harness to the electronic steering column lock control module -J764-.

Note the following before installing the steering column:

- Route the electrical wiring harnesses exactly the way they were before removal.
- Secure the electrical wiring harnesses exactly the way they were before removal.
- Install all the cable ties that were loosened or cut in the same locations when installing the steering column.
- Make sure the wiring harness to the electronic steering column lock control module -J764- is not pinched and does not come into contact with sharp edges when adjusting the steering column.

Only the following steering column components need to be removed to replace the electronic steering column lock control module -- :

- Driver airbag, refer to **Removal and Installation**
- Steering wheel, refer to **AIRBAG STEERING WHEEL**
- Steering column trim, refer to **Removal and Installation**
- The required electrical wires and connectors

-- Remove the steering column. Refer to **STEERING COLUMN**.

-- Remove the bolt -1- and the electronic steering column lock control module -- -2-.

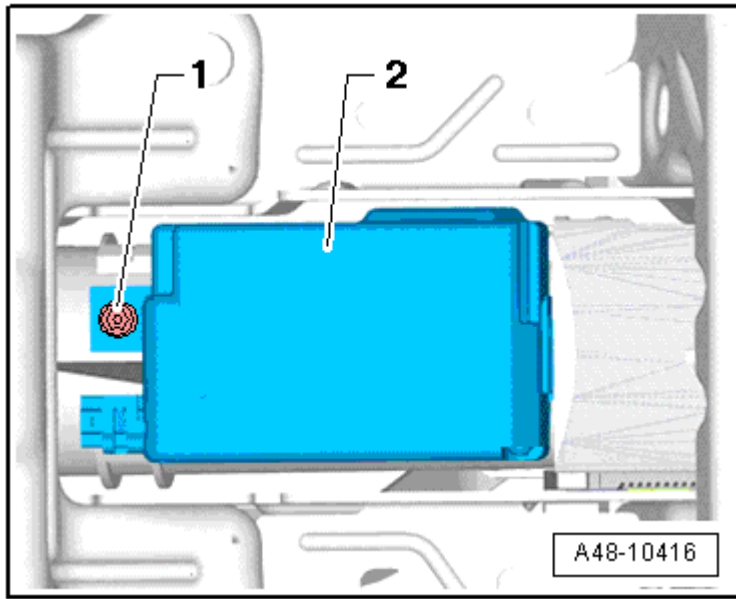


Fig. 97: Electronic Steering Column Lock Control Module
Courtesy of AUDI OF AMERICA, LLC

WARNING:

- After removing the control module, make sure no dirt or foreign objects enter the steering column.

Installing

Install in reverse order of removal. Note the following:

Tightening specification, refer to **STEERING COLUMN OVERVIEW**

- If only the electronic steering column lock control module -- -2- was replaced, used the previously used control module bolt -1-.

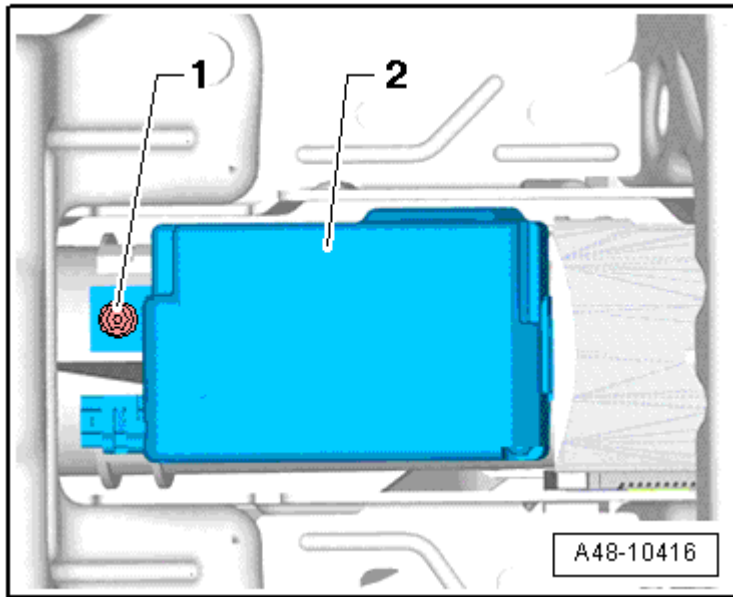


Fig. 98: Electronic Steering Column Lock Control Module
Courtesy of AUDI OF AMERICA, LLC

- Use the bolt -1- that comes with the new steering column for the electronic steering column lock control module -- -2- if the steering column is being replaced.

-- Insert the electronic steering column lock control module -- with the tab -arrow A- into the groove -arrow B- in the steering column and then push on the electronic steering column lock control module -- by hand.

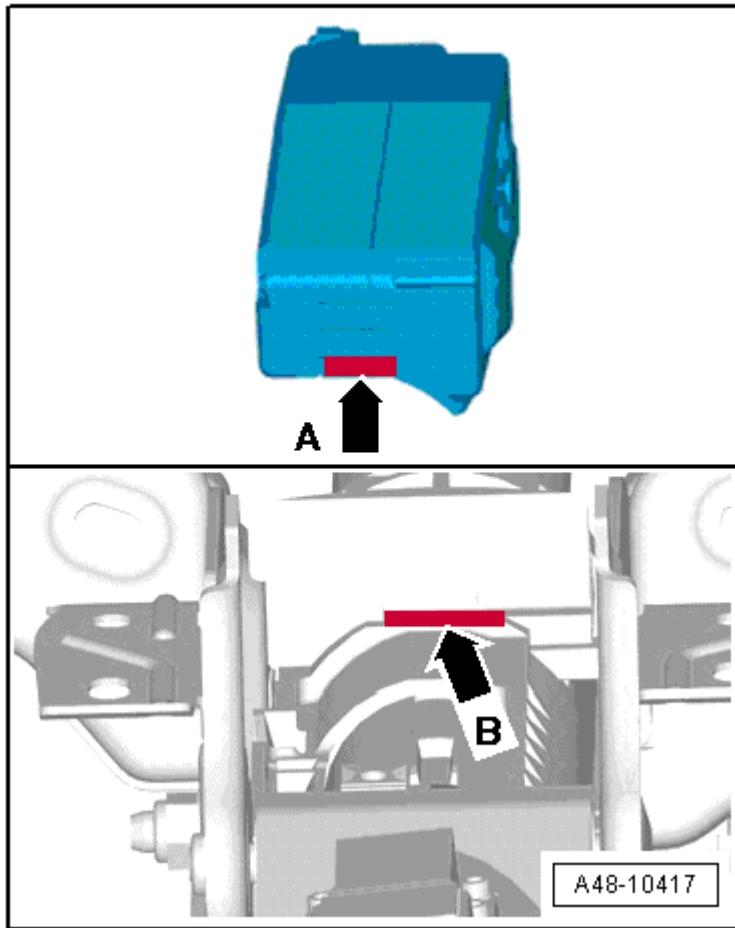


Fig. 99: Inserting Control Module Tab Into Groove
Courtesy of AUDI OF AMERICA, LLC

-- Once the electronic steering column lock control module -- -2- it touching the entire surface of the steering column, install the bolt -1- and tighten it.

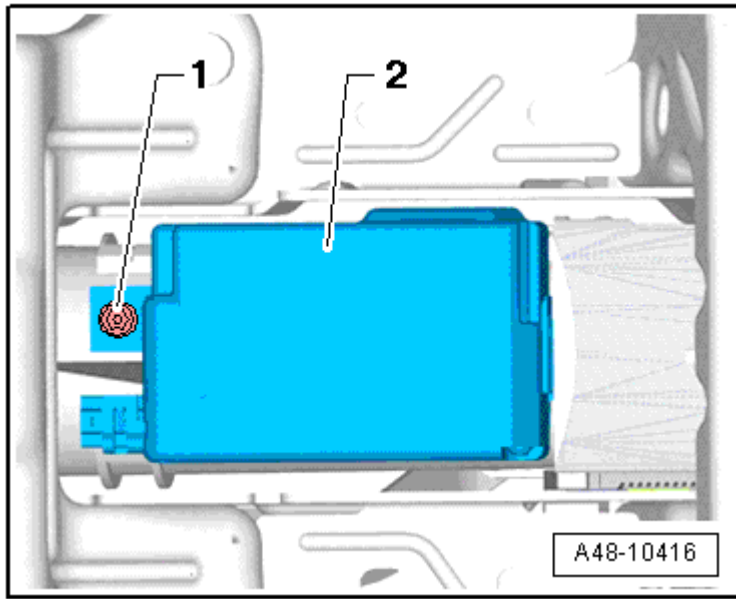


Fig. 100: Electronic Steering Column Lock Control Module
 Courtesy of AUDI OF AMERICA, LLC

-- After reconnecting the connector, -2- make sure the wiring harness -3- is secured by the clip -5-.

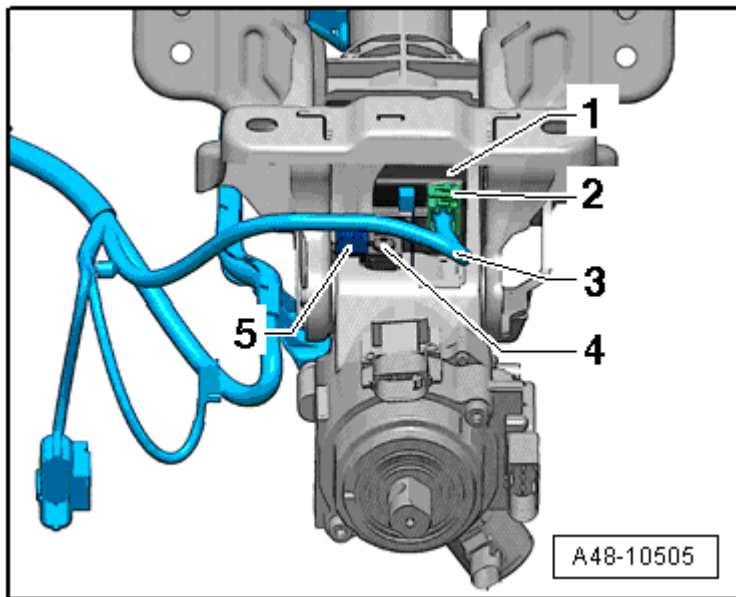


Fig. 101: Electronic Steering Column Lock Control Module Wiring Harness
 Courtesy of AUDI OF AMERICA, LLC

If the steering column needs to be adjusted, be careful not to pinch the wiring harness -3- for the electronic steering column lock control module -- -1- and that it does not come in contact with any sharp edges.

-- If the electronic steering column lock control module -- was replaced, the following work must be performed in vehicle diagnostic tester. Select the program in "Guided Functions" and follow the prompts on the screen.

-- If the steering angle sensor -G85- indicator lamp in the instrument cluster illuminates after replacing, correct the malfunction using "Guided Fault Finding" in the vehicle diagnostic tester. The system may need to be re-calibrated. Refer to **DYNAMIC STEERING BASIC SETTING** .

ACTIVE STEERING SAFETY LOCK, LOCKING MAGNET

Special tools and workshop equipment required

- Torque Wrench V.A.G 1783
- Vehicle Diagnosis Tester, for example, VAS 5052 with its Diagnostic Cable

WARNING: Note the following before working on the steering column:

- **Components of the steering are safety related!**
- **Only specially trained technician should work on the steering system for reasons of safety. Incorrect work could result in serious crashes.**
- **Route the electrical wiring harnesses exactly the way they were before removal.**
- **Secure the electrical wiring harnesses exactly the way they were before removal.**

Removing

NOTE: The steering wheel cannot be turned nor can the front wheels be moved out of the straight ahead position when the locking magnet is removed. Otherwise the position of the steering wheel may be incorrect after the work is completed. Follow all the rule for cleanliness when performing the following work.

-- Turn the steering wheel into the straight-ahead position (the wheels on the front and rear axle must now line up) and lock the steering wheel lock in the straight-ahead position.

-- Turn off the ignition and remove the key.

-- Mark the installed position of the locking magnet -arrow- (it will be needed later).

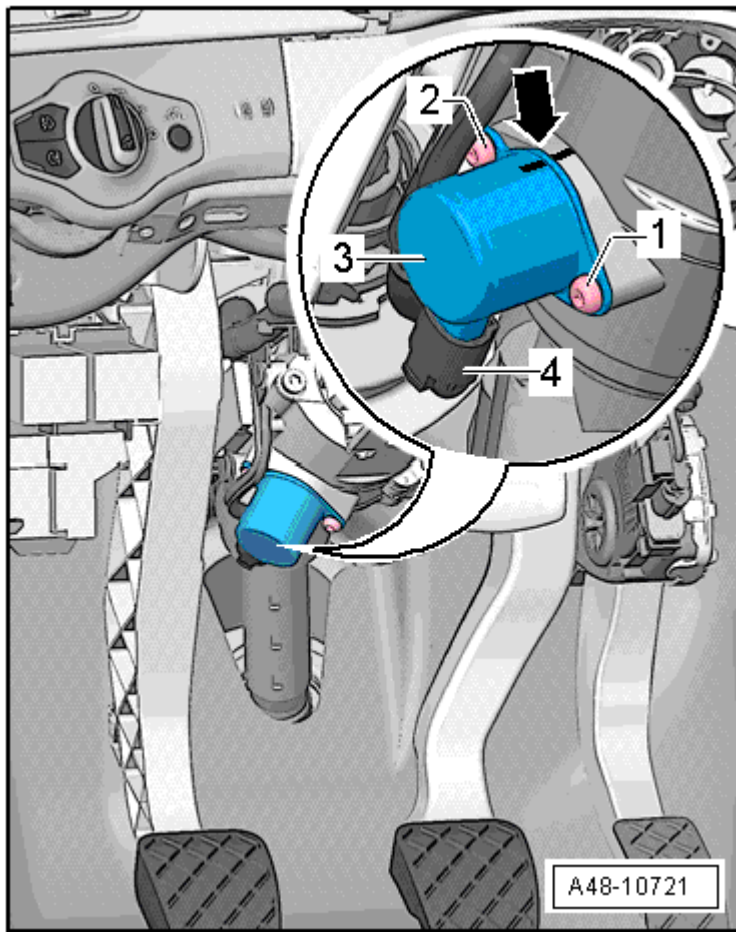


Fig. 102: Remove/Install Locking Magnet
Courtesy of AUDI OF AMERICA, LLC

- Disconnect the connector -4- from the locking magnet -3-.
- Remove any paint still on the bolt head (TORX®) -1 and 2-.
- Remove the bolts -1 and 2- and the locking magnet -3- from the steering column.

Installing

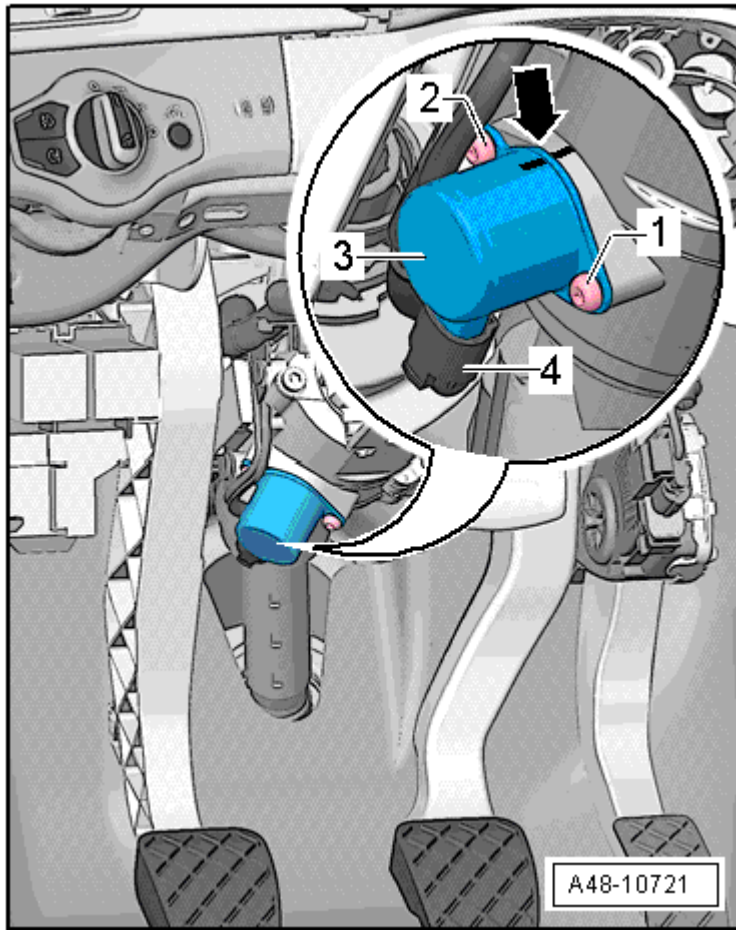


Fig. 103: Remove/Install Locking Magnet
 Courtesy of AUDI OF AMERICA, LLC

Install in reverse order of removal. Note the following:

- Update the active steering control module -J792- software using the vehicle Diagnosis Tester after replacing the locking magnet.

-- Transfer the marking from the old magnet onto the new one if a new locking magnet is being installed.

-- Install the new locking magnet as shown in the following table and secure it with both new bolts -1 and 2- (use the supplied tool).

Sequence	Screw number	Tightening specification
1	1	2 + 2 Nm
2	2	4 + 2 Nm
3	1	8 + 2 Nm
4	2	8 + 2 Nm

- Connect the connector to the locking magnet.
- Erase the Diagnostic Trouble Code (DTC) memory.
- Perform an initializing drive - turn the vehicle 45° to the left/right from the straight-ahead position.

Functional Check

Check the function of the steering during the road test and a fenced off area.

- Operating force
- Reset
- Play
- Noise
- Indicator lamp
- Read the DTC memory after the road test. There must be no faults in the DTC memory.

ELECTRO-MECHANICAL STEERING GEAR

NOTE: **Power steering gear is completely removed and installed with tie rods.**

A removable heat shield mat was installed on the steering gear at start of production. Be sure to install this mat if installing the old steering gear again.

A removable heat shield mat on the steering gear was replaced by a bonded heat shield mat as a running change. It is therefore not necessary to take the mat from the old steering gear and installing on a new steering gear.

A replacement steering gear comes with the bonded heat shield mat.

Special tools and workshop equipment required

- Torque Wrench 5-50 Nm V.A.G 1331
- Torque Wrench 50-200 Nm V.A.G 1332
- Ring Spanner Insert, AF 21 mm V.A.G 1332/7
- Ball Joint Puller T40010 A

Removing



Fig. 104: Taping Steering Wheel

Courtesy of AUDI OF AMERICA, LLC

-- Turn the steering wheel so that the wheels are in the straight-ahead position and then tape it secure -arrow- so that it cannot turn.

NOTE: Be sure to use tape that will not leave behind any residue when it is removed.

Be careful not to turn the steering wheel during the repair other the airbag spiral spring/return spring with slip ring -F138- will get damaged.

-- Remove the front wheels. Refer to **Removal and Installation** .

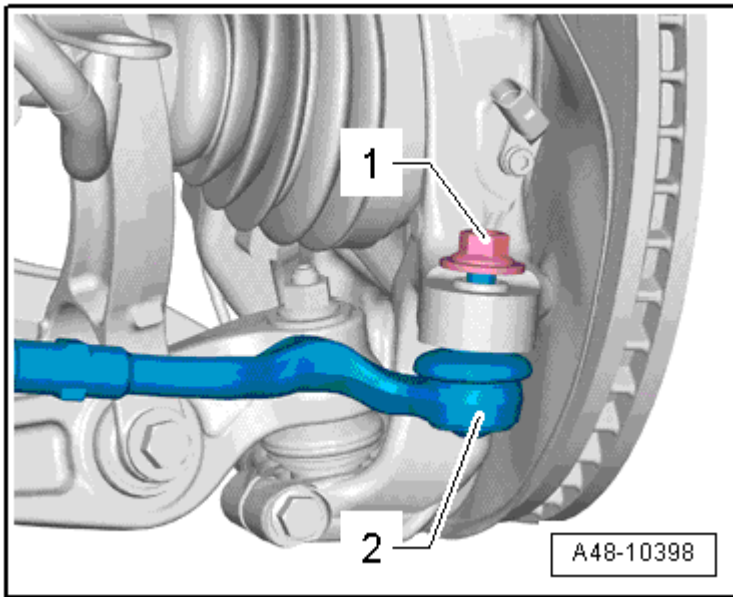


Fig. 105: Tie Rod End Joint Pin

Courtesy of AUDI OF AMERICA, LLC

-- Remove the nut -1- from the tie rod end joint pin -2- until it is flush with the joint pin threads. Counter hold when loosening.

NOTE: To protect thread, screw nut on pin a few turns.

-- Press off tie rod ball joint from wheel bearing housing using T40010 A. Remove the nut.

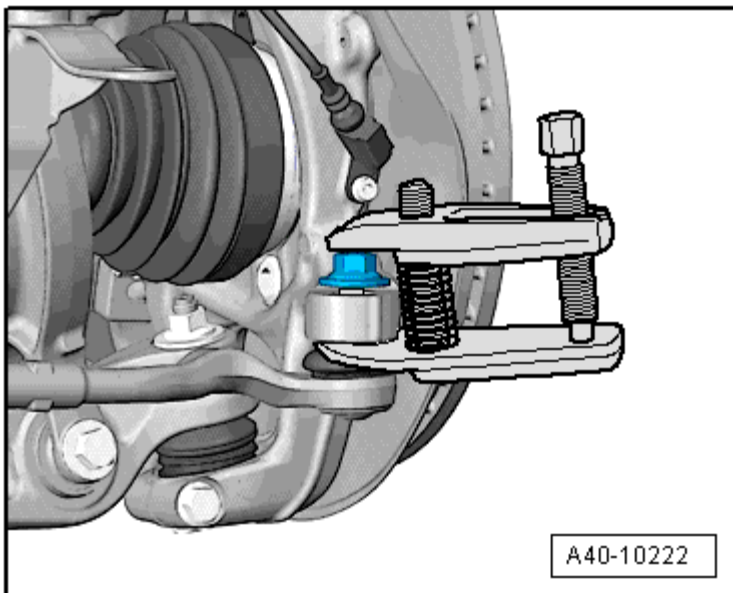


Fig. 106: Removing Tie Rod Ball Joint

Courtesy of AUDI OF AMERICA, LLC

NOTE: Make sure that both puller lever arms are parallel to each other when using the greatest force, adjust if necessary.

-- Remove noise insulation. Refer to Description and Operation .

-- Remove the nuts -arrows- and lower the stabilizer bar.

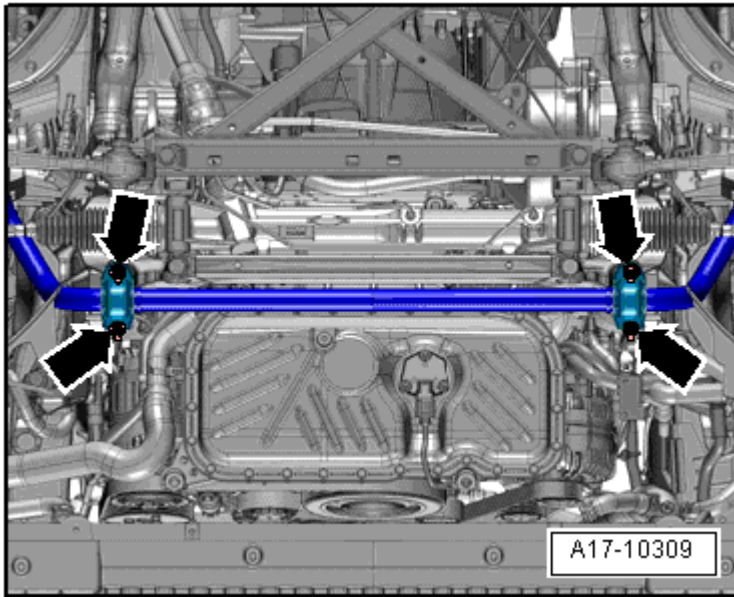


Fig. 107: Identifying Stabilizer Bar Components
Courtesy of AUDI OF AMERICA, LLC

-- Remove the crossbrace. Refer to SUBFRAME CROSSBRACE .

CAUTION: The suspension components could be damaged.

- If the subframe mount, the steering gear or the subframe crossbrace are not installed correctly, do not rest the vehicle on its wheels.
- The vehicle must not be supported on the subframe or the subframe crossbrace (for example using a floor jack).

-- Remove the bolt -arrow-.

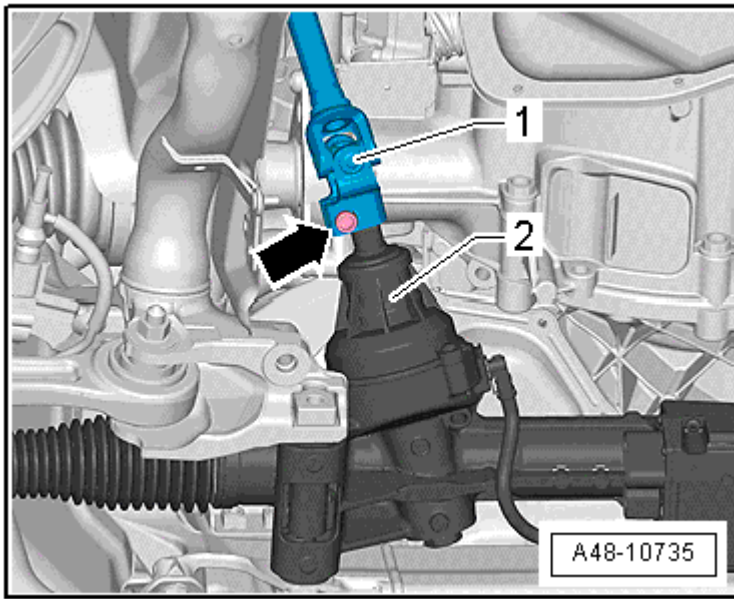


Fig. 108: Locating Steering Intermediate Shaft Bolt
Courtesy of AUDI OF AMERICA, LLC

- Remove the steering intermediate shaft -1- from the steering gear -2-.
- Loosen the lock and push the retainer down and remove the connector -1- for the vehicle signals (CAN bus and terminal 15) from the power steering control module -J500-.

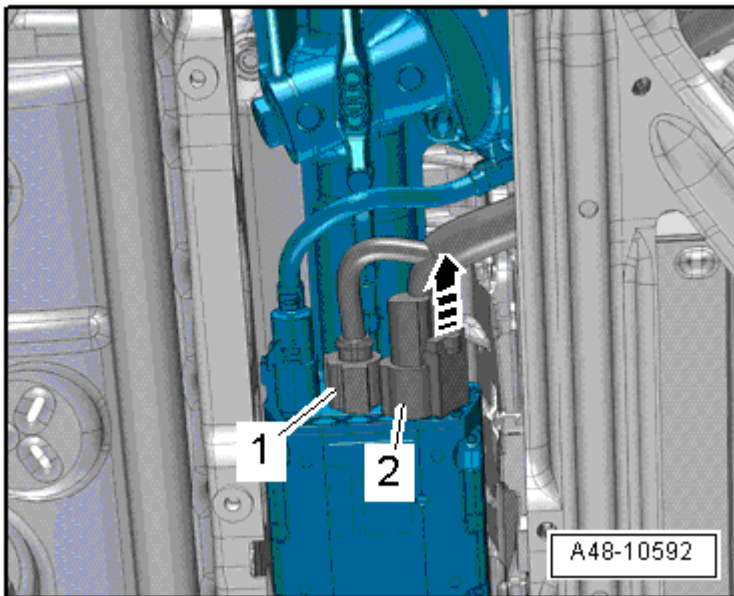


Fig. 109: Power Steering Control Module
Courtesy of AUDI OF AMERICA, LLC

- Releases the retainer -arrow-, push the release down and disconnect the connector -2- for the voltage (terminal 30) from the power steering control module -J500-.

-- Remove the bolts -1 and 2-.

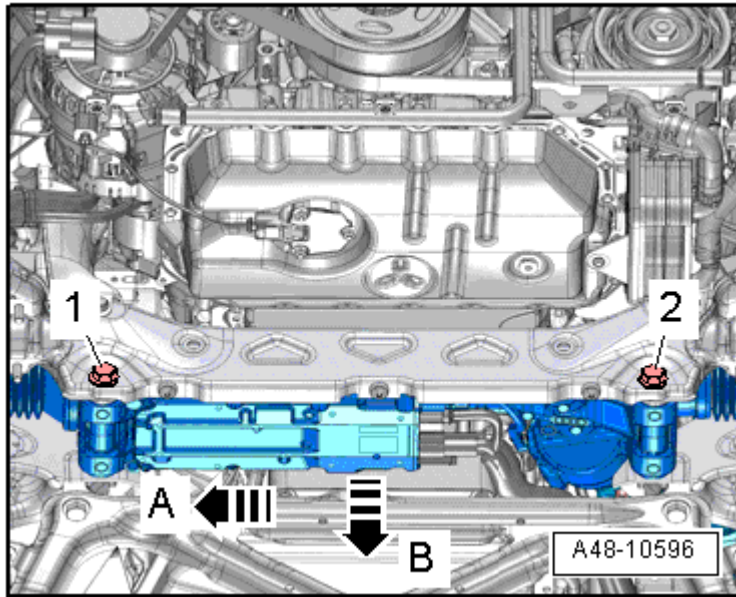


Fig. 110: Steering Gear

Courtesy of AUDI OF AMERICA, LLC

-- Push the steering gear slightly to the side -arrow A- and remove it downward -arrow B-.

Installing

Install in reverse order of removal. Note the following:

Tightening specifications, refer to **ELECTRO-MECHANICAL STEERING GEAR WITH TIE RODS OVERVIEW**

-- Install both bolts -1- loosely at first and then tighten them.

-- Install stabilizer bar. Refer to **STABILIZER BAR** .

-- Install the crossbrace. Refer to **SUBFRAME CROSSBRACE** .

The "program" **J 500 replace control module** must be started vehicle diagnostic tester in **Guided Fault Finding** if a new electro-mechanical steering gear is installed.

-- Perform an axle alignment. Refer to **WHEN VEHICLE ALIGNMENT IS NECESSARY** .

TIE ROD END - ELECTRO-MECHANICAL

Special tools and workshop equipment required

- Torque Wrench 5-50 Nm V.A.G 1331

- Torque Wrench 50-200 Nm V.A.G 1332
- Ring Spanner Insert, AF 21 mm V.A.G 1332/7
- Ball Joint Puller T40010 A

Removing

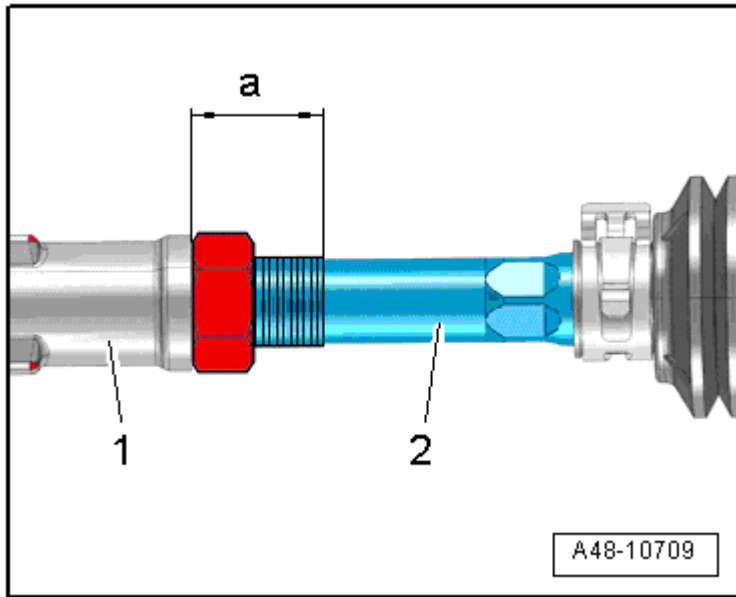


Fig. 111: Measuring Tie Rod Head / Tie Rod Dimension
Courtesy of AUDI OF AMERICA, LLC

- Remove the front wheel. Refer to **Removal and Installation** .
- Measure the dimension -a- between the tie rod head -1- and the left and right tie rod -2- and make a note of the value. Dimension -a- must be the same on the left and right sides after installing.
- If necessary, shorten the "longer" tie rod head (installed it deeper into the tie rod).
- Remove the nut -1- from the tie rod end joint pin -2- until it is flush with the joint pin threads. Counter hold when loosening.

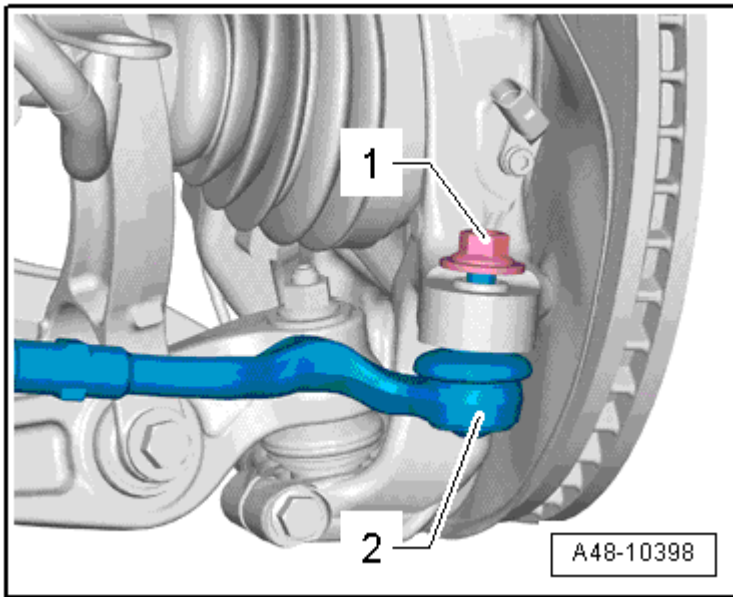


Fig. 112: Tie Rod End Joint Pin

Courtesy of AUDI OF AMERICA, LLC

NOTE: To protect thread, screw nut on pin a few turns.

-- Press off tie rod ball joint from wheel bearing housing using T40010 A. Remove the nut.

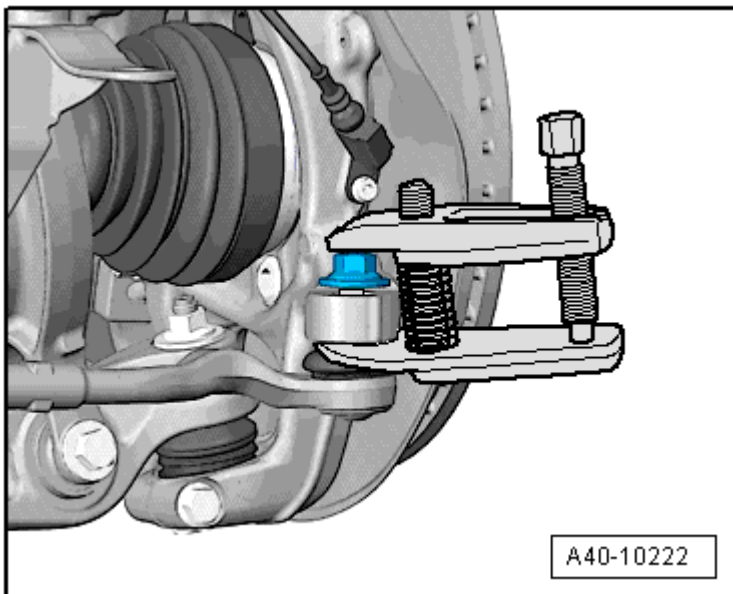


Fig. 113: Removing Tie Rod Ball Joint

Courtesy of AUDI OF AMERICA, LLC

NOTE: Make sure that both puller lever arms are parallel to each other when using the greatest force, adjust if necessary.

-- Loosen the nut -2-. Counter hold the tie rod end -3-.

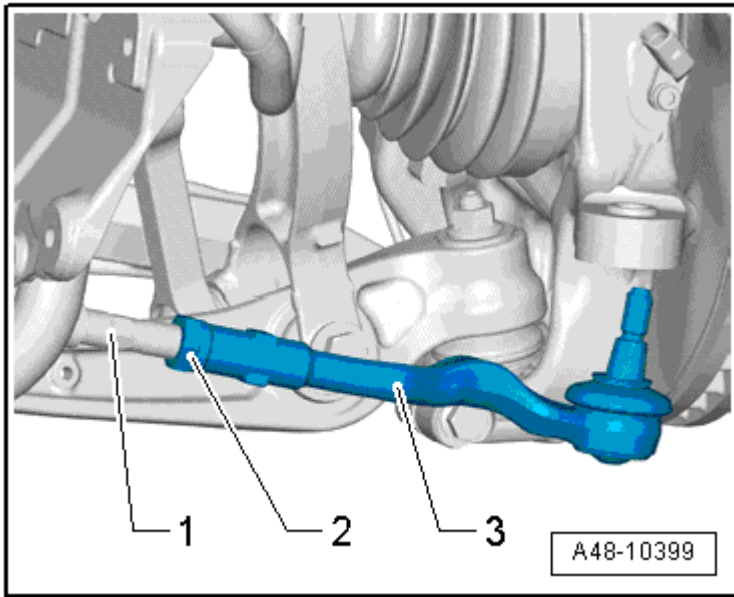


Fig. 114: Identifying Tie Rod End & Nut
Courtesy of AUDI OF AMERICA, LLC

-- Remove the tie rod end -3-.

Installing

Install in reverse order of removal. Note the following:

Tightening specifications, refer to **ELECTRO-MECHANICAL STEERING GEAR OVERVIEW**

Tightening specifications, refer to **ELECTRO-MECHANICAL STEERING GEAR WITH TIE RODS OVERVIEW**

-- Mount the tie rod head -1- on the tie rod -2- until dimension -a-, which was measured during removal, is reached.

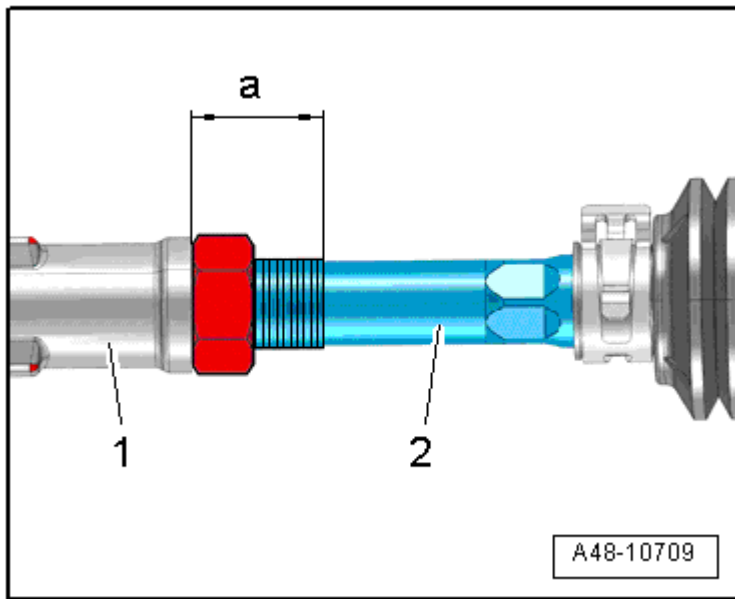


Fig. 115: Measuring Tie Rod Head / Tie Rod Dimension
Courtesy of AUDI OF AMERICA, LLC

- Align the tie rod head -1- so that the pin is in the installation position.
- Insert the tie rod end into the wheel bearing housing as far as the stop.
- Tighten the nut -1-. Counter hold when tightening.

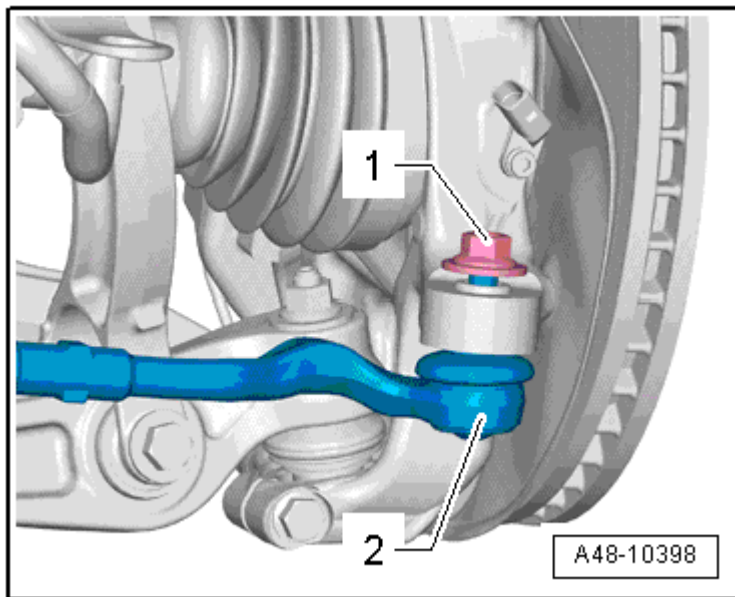


Fig. 116: Tie Rod End Joint Pin
Courtesy of AUDI OF AMERICA, LLC

- Tighten the nut -2-.

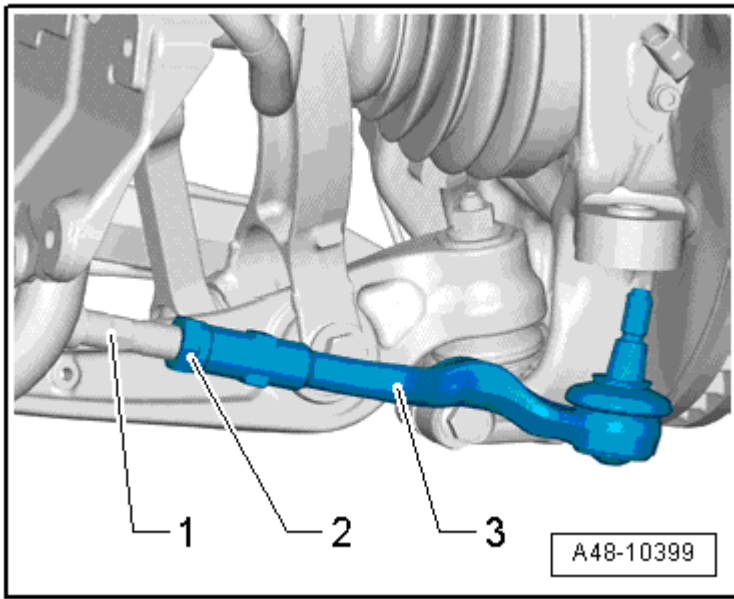


Fig. 117: Identifying Tie Rod End & Nut
 Courtesy of AUDI OF AMERICA, LLC

-- Install the front wheel. Refer to **Wheels, Tires, Wheel Alignment** .

-- Axle alignment is required, see table, refer to **WHEN VEHICLE ALIGNMENT IS NECESSARY** .

The axle alignment must be performed on a VW/Audi approved alignment stand.

TIE ROD - ELECTRO-MECHANICAL

Special tools and workshop equipment required

- Torque Wrench 50-200 Nm V.A.G 1332
- Ring Spanner Insert, AF 21 mm V.A.G 1332/7
- Hose Clip Pliers V.A.G 1921
- Open-Jaw Torque Wrench Insert V.A.G 1923
- CV Joint Boot Clamp Tool V.A.G 1682 A with Adapter V.A.G 1682 A/1
- Ball Joint Puller T40010 A

Removing

The tie rods can be removed and installed with the steering gear in the vehicle.

-- Remove the front wheel. Refer to **Removal and Installation** .

-- Remove noise insulation. Refer to **Description and Operation** .

-- Measure the dimension -a- between the tie rod head -1- and the left and right tie rod -2- and make a note of

the value. Dimension -a- must be the same on the left and right sides after installing.

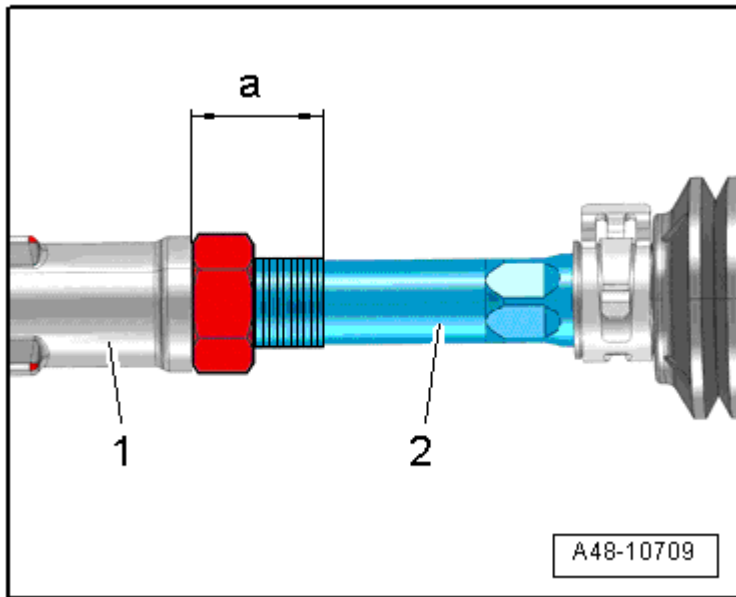


Fig. 118: Measuring Tie Rod Head / Tie Rod Dimension
Courtesy of AUDI OF AMERICA, LLC

- If necessary, shorten the "longer" tie rod head (installed it deeper into the tie rod).
- Clean the power steering gear and subframe in the boot area.

CAUTION: Dirt must not enter the power steering gear and boot when replacing the tie rod.

- Open and remove the spring clip -3- using the V.A.G 1921.

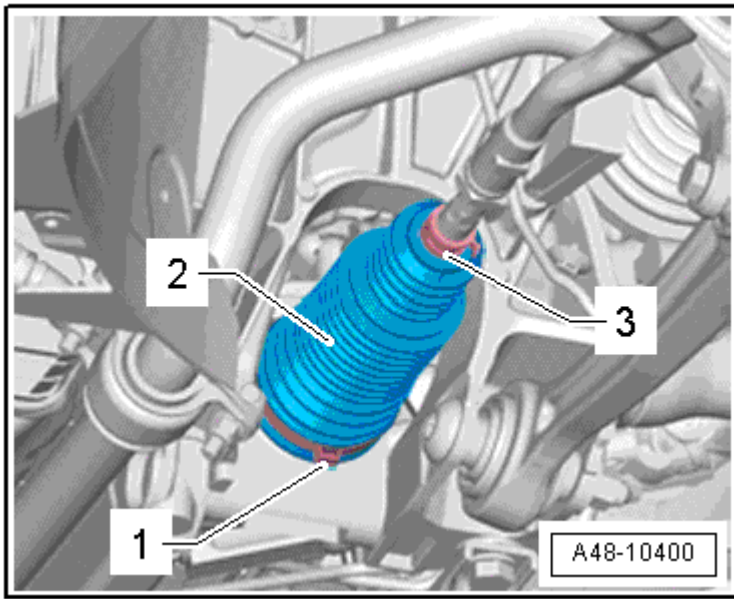


Fig. 119: Power Steering Gear Boot
Courtesy of AUDI OF AMERICA, LLC

-- Remove the clamp -1- and remove the boot -2- from the power steering gear.

-- Remove the nut -1- from the tie rod end joint pin -2- until it is flush with the joint pin threads. Counter hold when loosening.

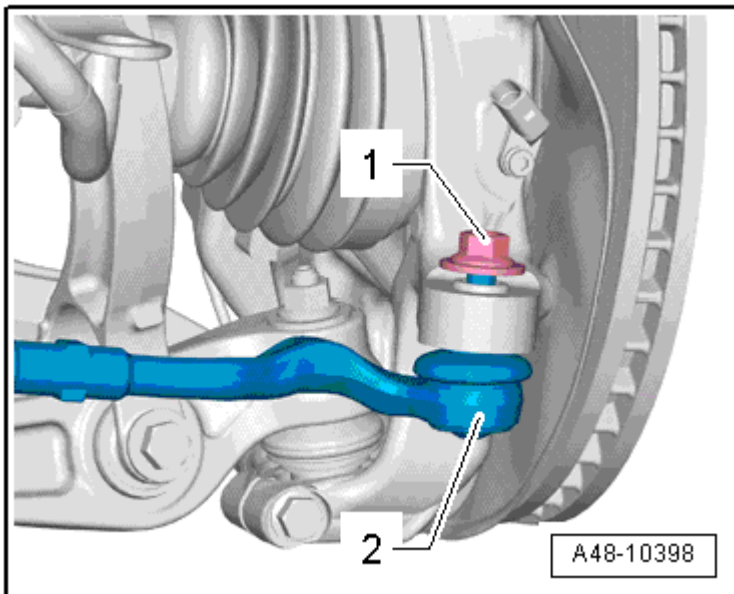


Fig. 120: Tie Rod End Joint Pin
Courtesy of AUDI OF AMERICA, LLC

To protect thread, screw nut on pin a few turns.

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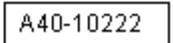


Fig. 121: Removing Tie Rod Ball Joint

NOTE: Make sure that both puller lever arms are parallel to each other when using greatest force, adjust if necessary.

-- Remove tie rod. Counter hold at the power steering gear coupling rod with an open end wrench -1-.

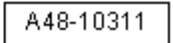


Fig. 122: Removing Tie Rod

Courtesy of AUDI OF AMERICA, LLC

2 - Open-Jaw Torque Wrench Insert V.A.G 1923**Installing**

Install in reverse order of removal. Note the following:

Replace the boot each time it is removed.

Coat the inside of slits in the boot all the way around and evenly with power steering gear grease before installing.

Check the seat for the boot on the steering gear for damage before installing. If the steering gear housing is damaged, replace the steering gear.

Tightening specifications, refer to **ELECTRO-MECHANICAL STEERING GEAR OVERVIEW**

Tightening specifications, refer to **ELECTRO-MECHANICAL STEERING GEAR WITH TIE RODS OVERVIEW**

-- Install tie rod using the V.A.G 1923 -2-. Counter hold at the power steering gear coupling rod with an open end wrench -1-.

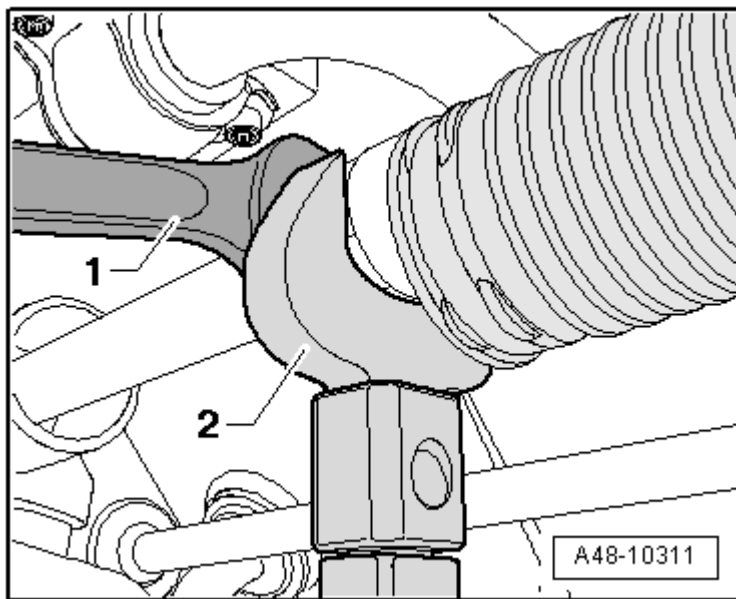


Fig. 123: Removing Tie Rod
Courtesy of AUDI OF AMERICA, LLC

-- Replace the spring clamp -3- and the clamp -1-.

Clamping Sleeves, Installing

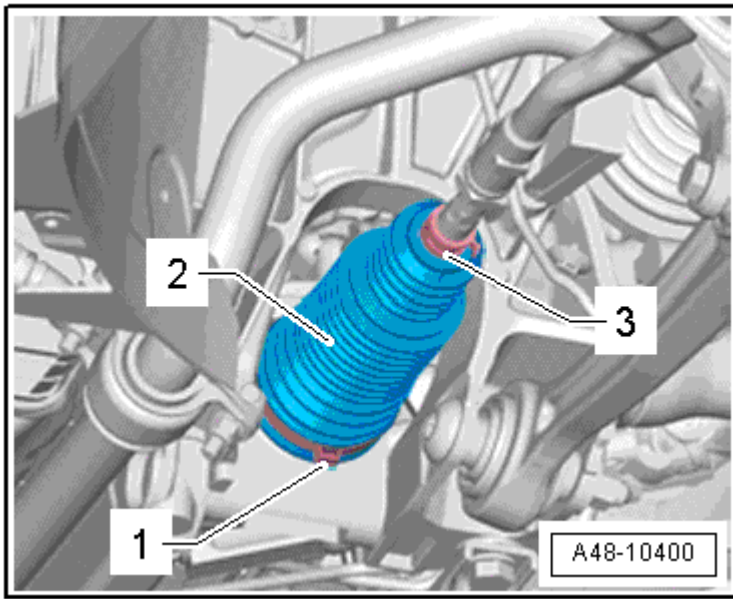


Fig. 124: Power Steering Gear Boot
Courtesy of AUDI OF AMERICA, LLC

-- Install the new clamp -1- and tension it with the pliers, **Fig. 12**.

Boot Assembly

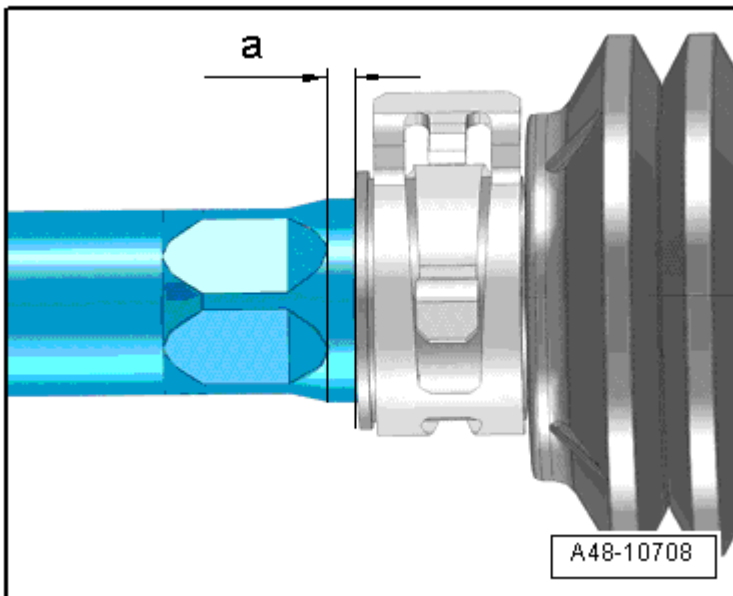


Fig. 125: Outer Boot Assembly Dimension -A-
Courtesy of AUDI OF AMERICA, LLC

- Dimension -a- 2 mm

-- Align tie rod so that the tie rod ball joint pints are in installation location.

- Insert the tie rod into the wheel bearing housing as far as the stop.
- Install the front wheel. Refer to **Removal and Installation** .
- Axle alignment is required, see table, refer to **WHEN VEHICLE ALIGNMENT IS NECESSARY** .

The axle alignment must be performed on a VW/Audi approved alignment stand.

BOOT, REPLACING

Special tools and workshop equipment required

- Torque Wrench 5-50 Nm V.A.G 1331
- Torque Wrench 50-200 Nm V.A.G 1332
- Ring Spanner Insert, AF 21 mm V.A.G 1332/7
- Hose Clip Pliers V.A.G 1921
- CV Joint Boot Clamp Tool V.A.G 1682 A with Adapter V.A.G 1682 A/1
- Ball Joint Puller T40010 A

Removing

Replace the boot each time it is removed.

CAUTION: If the boot is faulty, moisture and dirt will penetrate into steering gear. There must be a noticeable grease film present on the steering rack in the area of the splines. If grease film is not present, steering gear must be replaced. Steering gear must also be replaced if there is corrosion or steering gear is damaged or worn out.

- Remove the front wheel. Refer to **Removal and Installation** .
- Set the wheels to the straight ahead position.
- Remove noise insulation. Refer to **Description and Operation** .
- Clean the power steering gear and subframe in the boot area.

CAUTION: • While doing this, no dirt must enter the steering gear through the faulty bellows.

- Remove the nut -1- from the tie rod end joint pin -2- until it is flush with the joint pin threads. Counter hold when loosening.

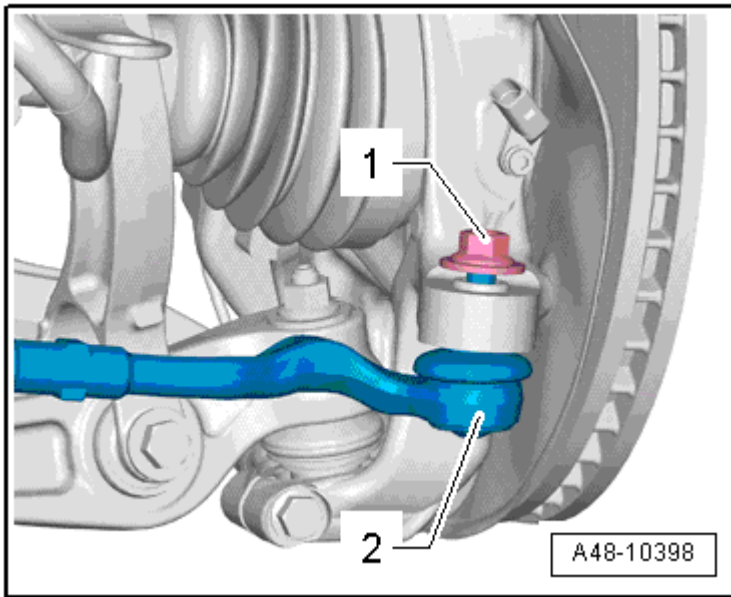


Fig. 126: Tie Rod End Joint Pin

Courtesy of AUDI OF AMERICA, LLC

To protect thread, screw nut on pin a few turns.

-- Press off tie rod ball joint from wheel bearing housing using T40010 A. Remove the nut.

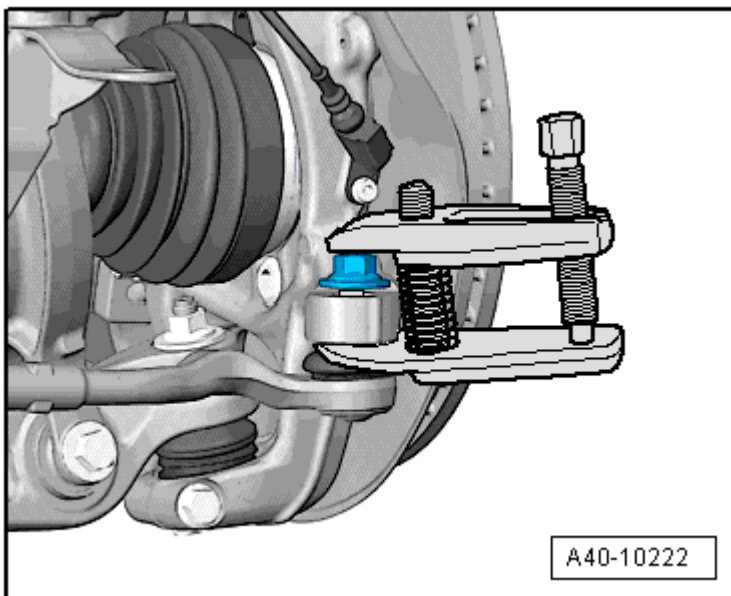


Fig. 127: Removing Tie Rod Ball Joint

Courtesy of AUDI OF AMERICA, LLC

NOTE: Make sure that both puller lever arms are parallel to each other when using greatest force, adjust if necessary.

-- Mark the installed position of the nut -2- on the tie rod -1- for later.

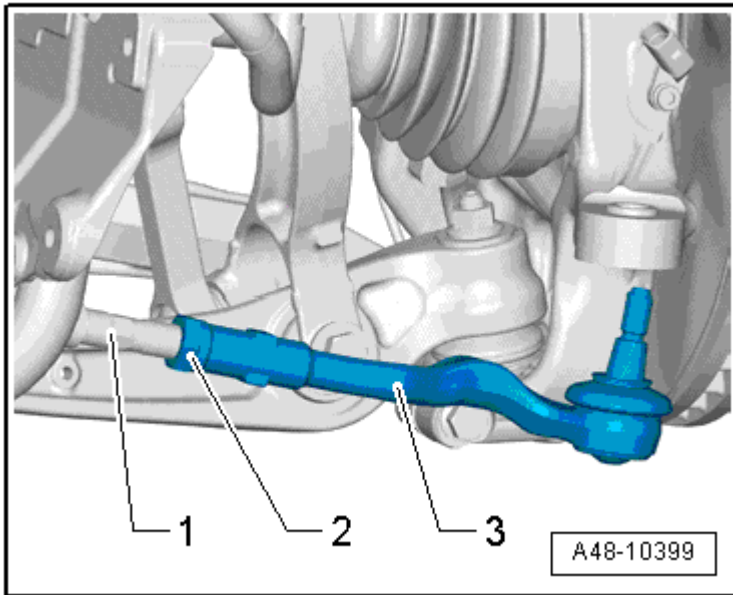


Fig. 128: Identifying Tie Rod End & Nut
Courtesy of AUDI OF AMERICA, LLC

-- Counter hold the tie rod end -3- and loosen the nut -2-.

-- Open and remove the spring clip -3- using the V.A.G 1921.

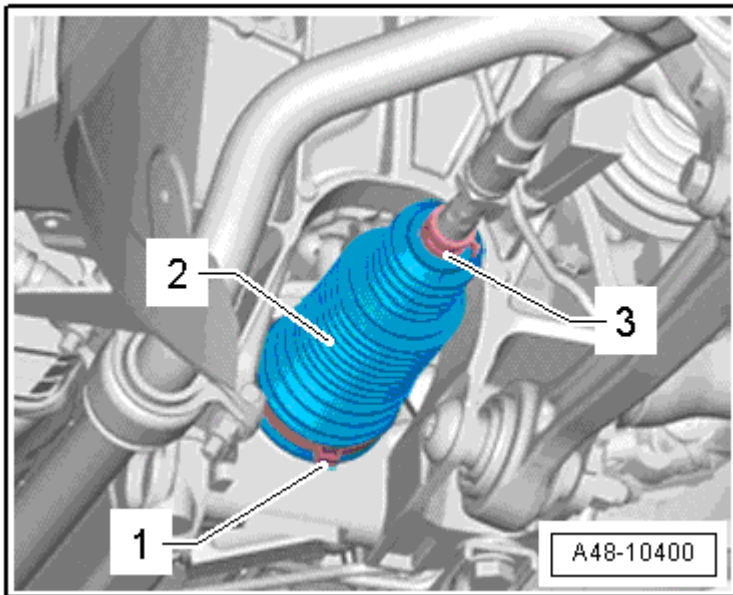


Fig. 129: Power Steering Gear Boot
Courtesy of AUDI OF AMERICA, LLC

-- Remove the clamp -1- and remove the boot -2- from the power steering gear.

-- Remove the tie rod end -3- and nut -2- from the tie rod -1-.

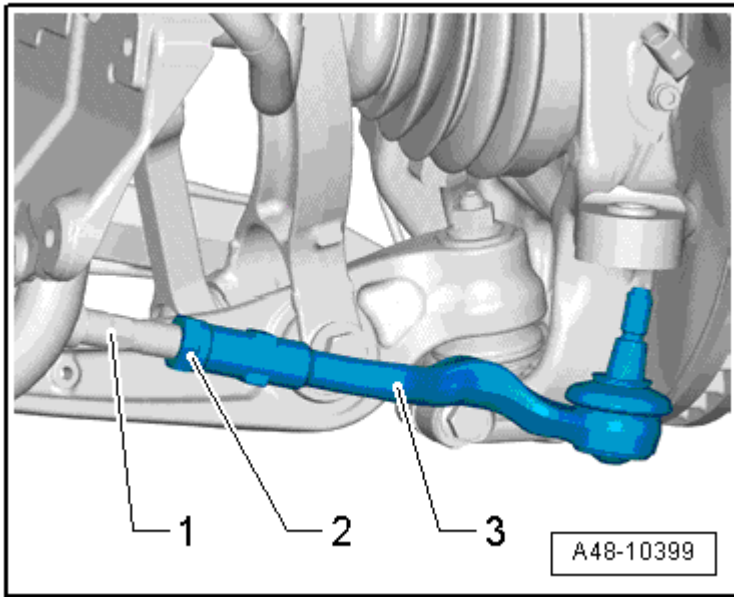


Fig. 130: Identifying Tie Rod End & Nut
Courtesy of AUDI OF AMERICA, LLC

-- Pull off boot with spring clamp from tie rod.

NOTE: If corrosion, damage, wear-out or first signs of soiling on steering rack can be seen, complete steering gear must be replaced.

If no grease film is visible on steering rack, steering gear must also be replaced completely.

Installing

Install in reverse order of removal. Note the following:

- Replace the boot each time it is removed.
- Coat the inside of slits in the boot all the way around and evenly with power steering gear grease before installing.
- Check the seat for the boot on the steering gear for damage before installing. If the steering gear housing is damaged, replace the steering gear.
- Before installing, coat the steering rack with the grease supplied in the repair set.

CAUTION: Do not use other grease under any circumstances.

-- For this purpose, turn steering to stop toward both sides in succession.

For clearer illustration, steering gear has been removed in the illustration.

-- Grease the steering rack on the toothed side -A- and on the thrust piece side with grease.

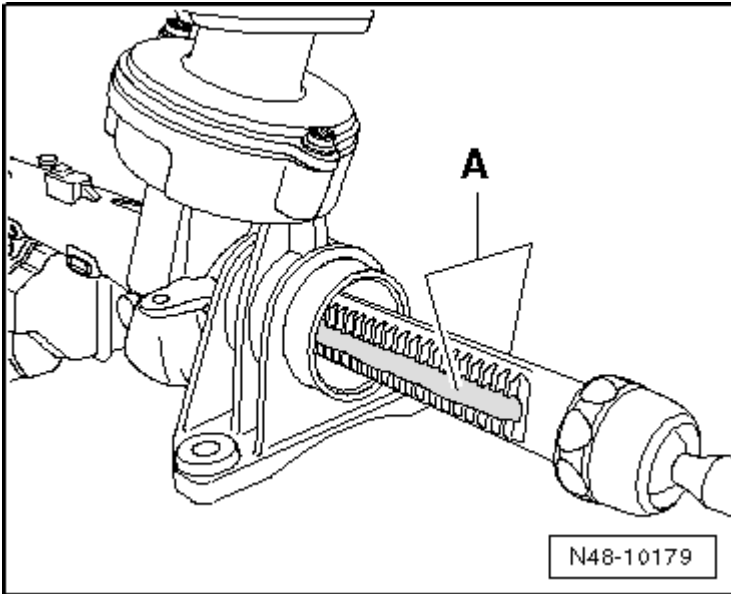


Fig. 131: Locating Steering Rack Grease Application Location
Courtesy of AUDI OF AMERICA, LLC

NOTE: To grease the rack, only use power steering gear grease. Note: there are different types of grease for the left and right.

- Set the wheels to the straight ahead position.
- Guide new clamp and boot onto the tie rod.
- Install the nut -1- and tie rod -3- up to the marking applied during removal.

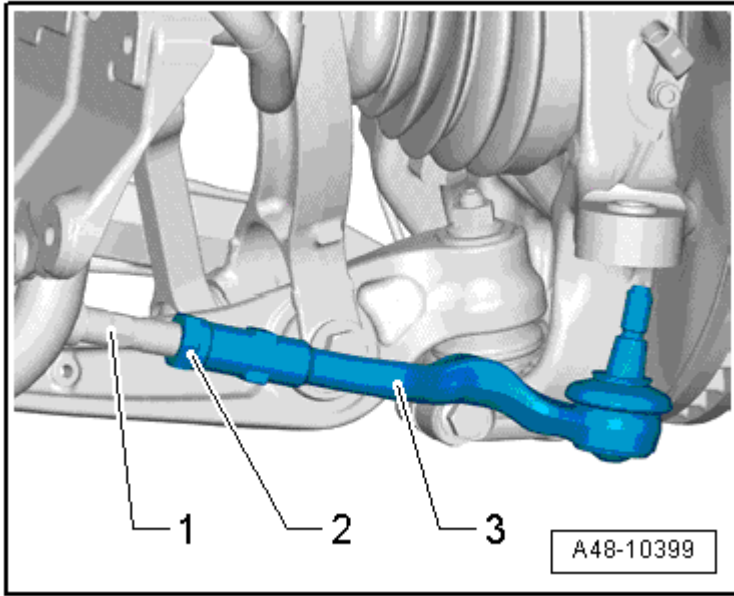


Fig. 132: Identifying Tie Rod End & Nut
Courtesy of AUDI OF AMERICA, LLC

-- Tighten the nut -2- to the specification. Counter hold the tie rod end -3-.

The boot/power steering gear sealing surface must be free of grease when installing.

-- Slide the boot onto the steering gear housing with a new clamp.

-- Make sure the boot is seated correctly on the power steering gear.

-- The boot must fit in the groove and on the contour of the power steering gear.

Clamping Sleeves, Installing, refer to **Fig. 12**

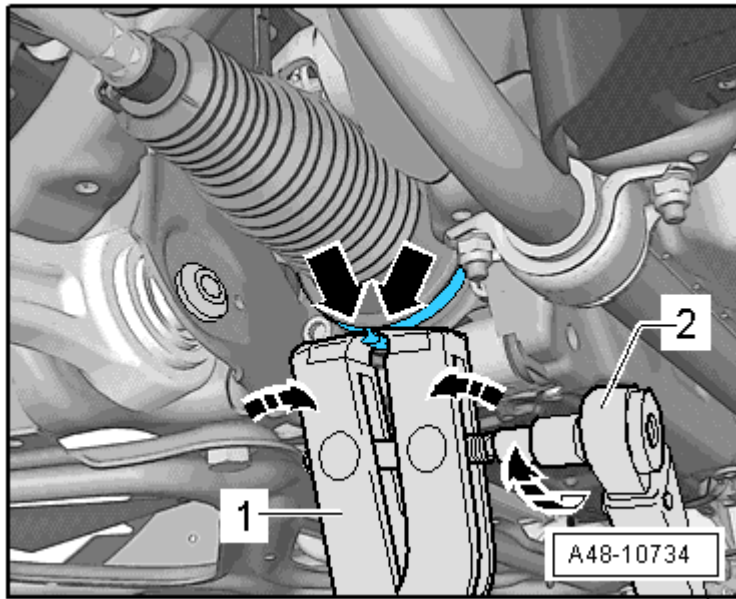


Fig. 133: Tensioning Inner Clamp

Courtesy of AUDI OF AMERICA, LLC

-- Secure the spring clamp -3- on the boot -2- using the V.A.G 1921.

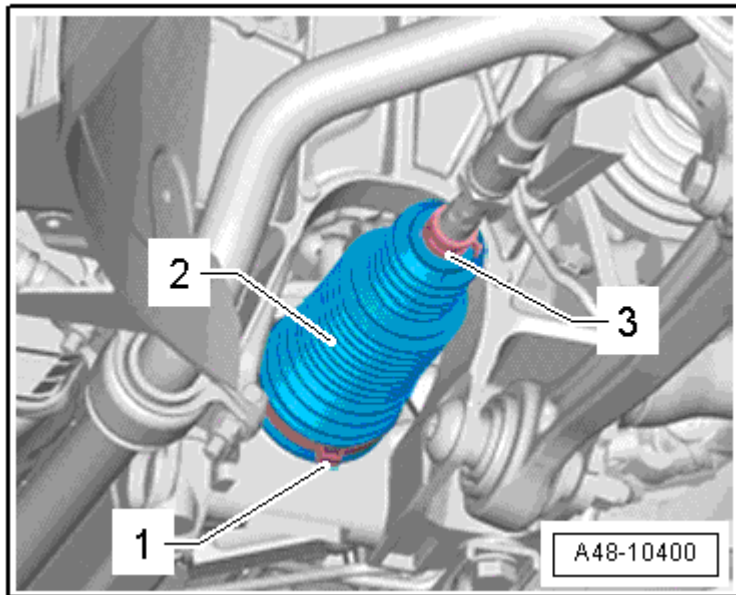


Fig. 134: Power Steering Gear Boot

Courtesy of AUDI OF AMERICA, LLC

Boot Assembling

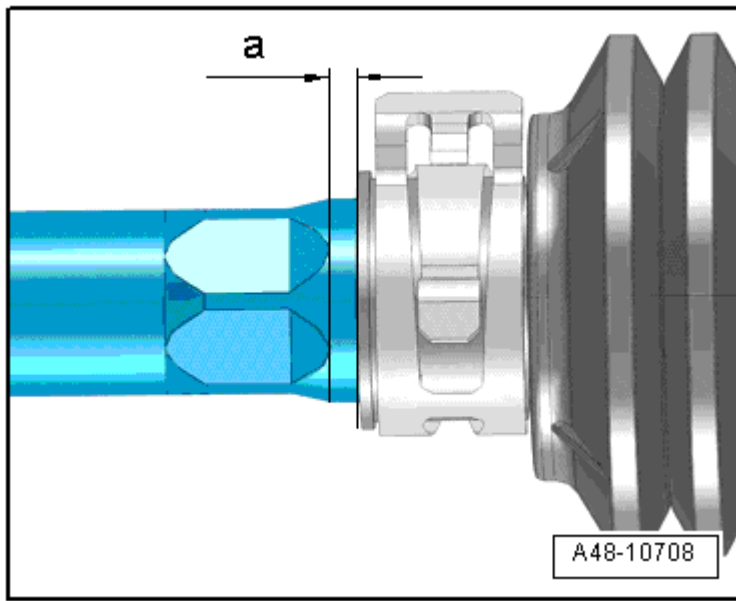


Fig. 135: Outer Boot Assembly Dimension -A-
Courtesy of AUDI OF AMERICA, LLC

- Dimension -a- = 2 mm

Install in reverse order of removal.

Tightening specifications, refer to **ELECTRO-MECHANICAL STEERING GEAR OVERVIEW**

Tightening specifications, refer to **ELECTRO-MECHANICAL STEERING GEAR WITH TIE RODS OVERVIEW**

-- Axle alignment is required, see table, refer to **WHEN VEHICLE ALIGNMENT IS NECESSARY** .

The axle alignment must be performed on a VW/Audi approved alignment stand.

HYDRAULIC POWER STEERING GEAR

Special tools and workshop equipment required

- Torque Wrench 5-50 Nm V.A.G 1331
- Torque Wrench 50-200 Nm V.A.G 1332
- Ring Spanner Insert, AF 21 mm V.A.G 1332/7
- Ball Joint Puller T40010 A
- Hose Clamps Up to 25 mm Dia. 3094
- Engine Bung Set VAS 6122

Removing



Fig. 136: Taping Steering Wheel

Courtesy of AUDI OF AMERICA, LLC

-- Place the vehicle on a hoist.

-- Turn the steering wheel so that the wheels are in the straight-ahead position and then tape it secure -arrow- so that it cannot turn.

NOTE: Be sure to use tape that will not leave behind any residue when it is removed.

Be careful not to turn the steering wheel during the repair other the airbag spiral spring/return spring with slip ring -F138- will get damaged.

-- Clamp off the suction hose -1- and return hose -2- using the 3094.

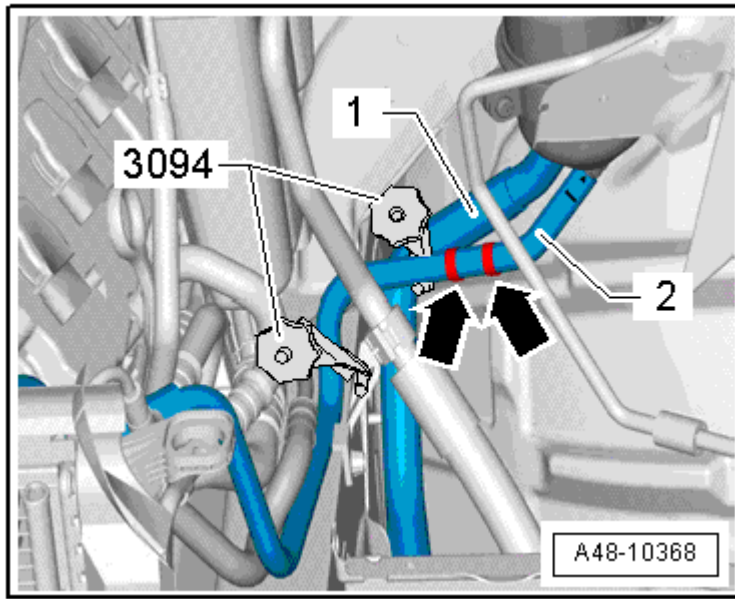


Fig. 137: Locating Suction & Return Hose Clamping Location
Courtesy of AUDI OF AMERICA, LLC

CAUTION:

- The 3094 must not be secured on the return hose -2- in the check valve area. Otherwise, check valve will be damaged.
- The check valve is located in the return hose -2- between the hose clamps -arrows-.

-- Remove front wheels.

-- Remove the nut -1- from the tie rod end joint pin -2- until it is flush with the joint pin threads. Counter hold when loosening.

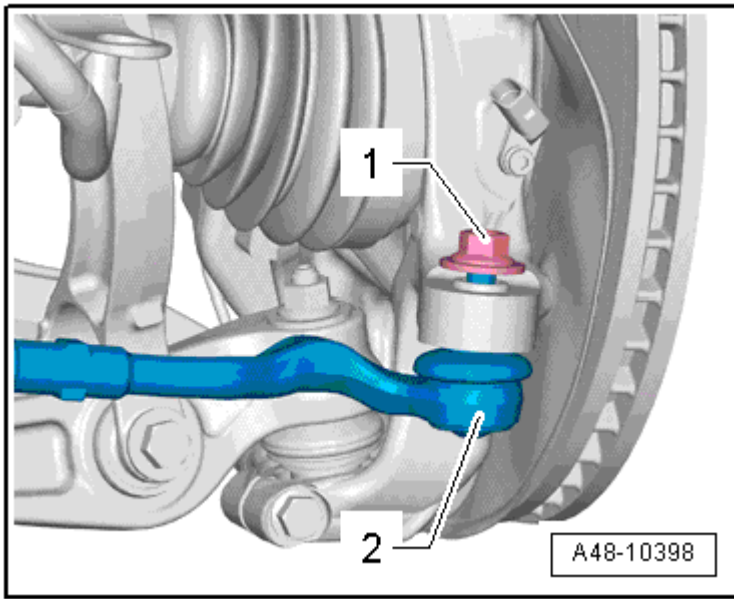


Fig. 138: Tie Rod End Joint Pin

Courtesy of AUDI OF AMERICA, LLC

To protect thread, screw nut on pin a few turns.

-- Press off tie rod ball joint from wheel bearing housing using T40010 A. Remove the nut.

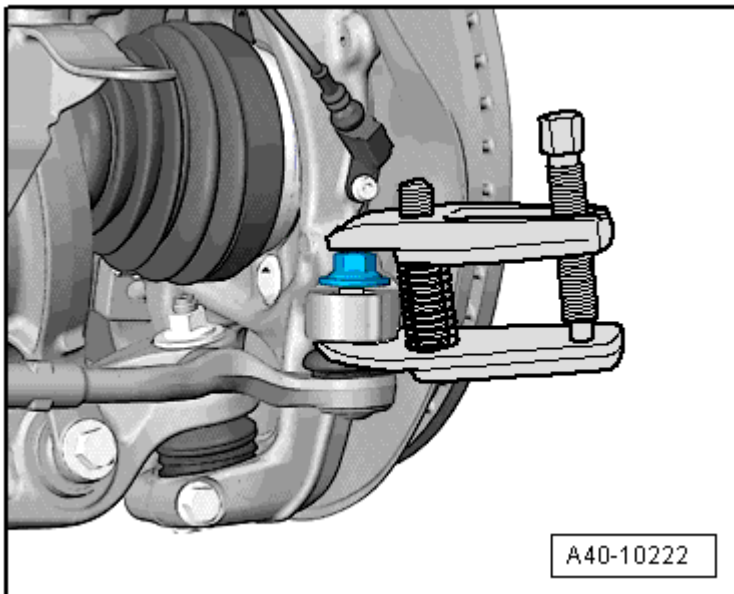


Fig. 139: Removing Tie Rod Ball Joint

Courtesy of AUDI OF AMERICA, LLC

NOTE: Make sure that both puller lever arms are parallel to each other when using greatest force, adjust if necessary.

-- Remove noise insulation. Refer to **Description and Operation** .

-- Remove the nut -3- from the rubber bushing -4-.

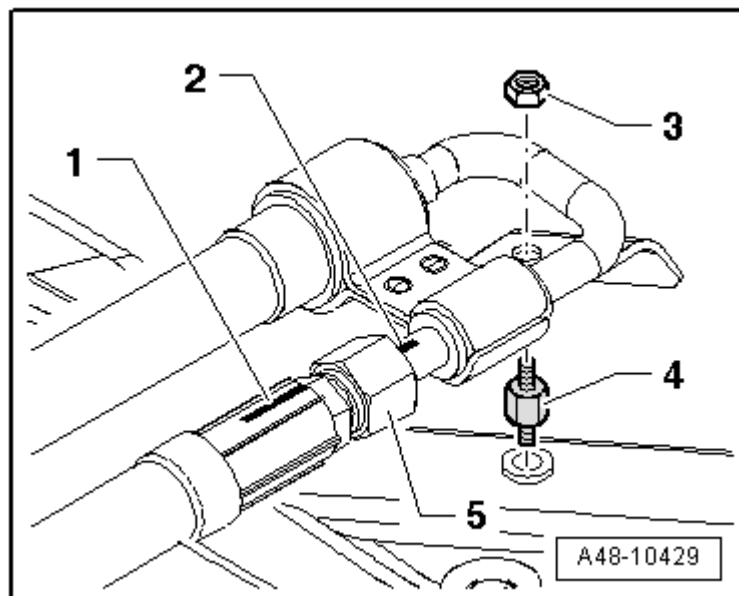


Fig. 140: Pressurized Line To Crossbrace
Courtesy of AUDI OF AMERICA, LLC

-- Remove the stabilizer bar -1-. Refer to **STABILIZER BAR** .

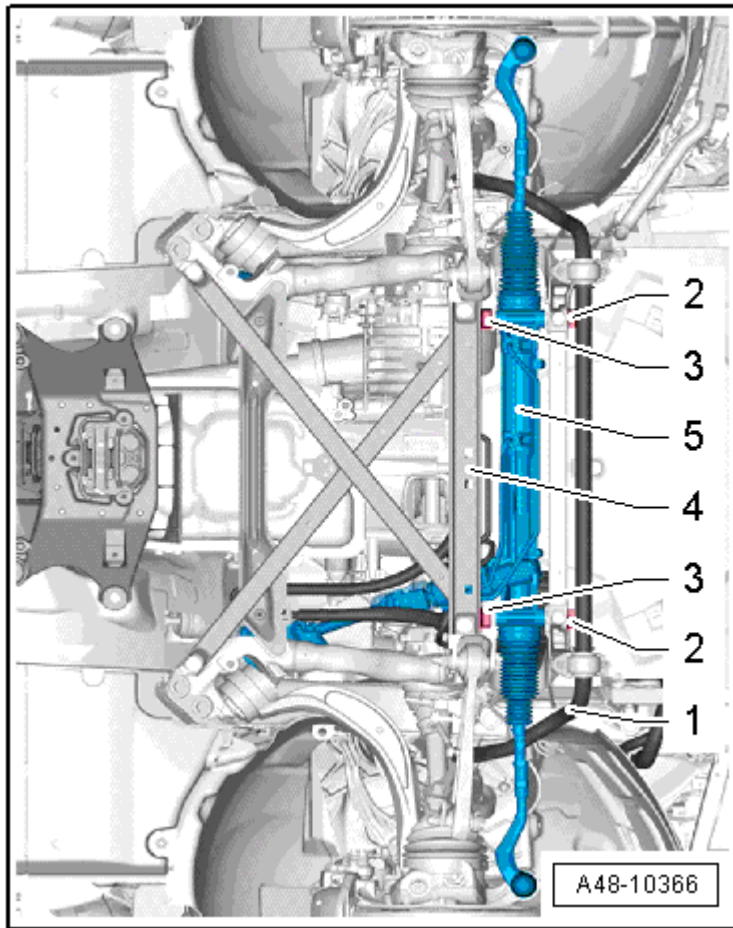


Fig. 141: Remove/Install Stabilizer Bar
 Courtesy of AUDI OF AMERICA, LLC

-- Remove the crossbrace -4-. Refer to SUBFRAME CROSSBRACE .

CAUTION: The suspension components could be damaged.

If the subframe mount, the steering gear or the subframe crossbrace are not installed correctly, do not rest the vehicle on its wheels.

The vehicle must not be supported on the subframe or the subframe crossbrace (for example using a floor jack).

-- Remove the bolts -4- and the pressure line -3-.

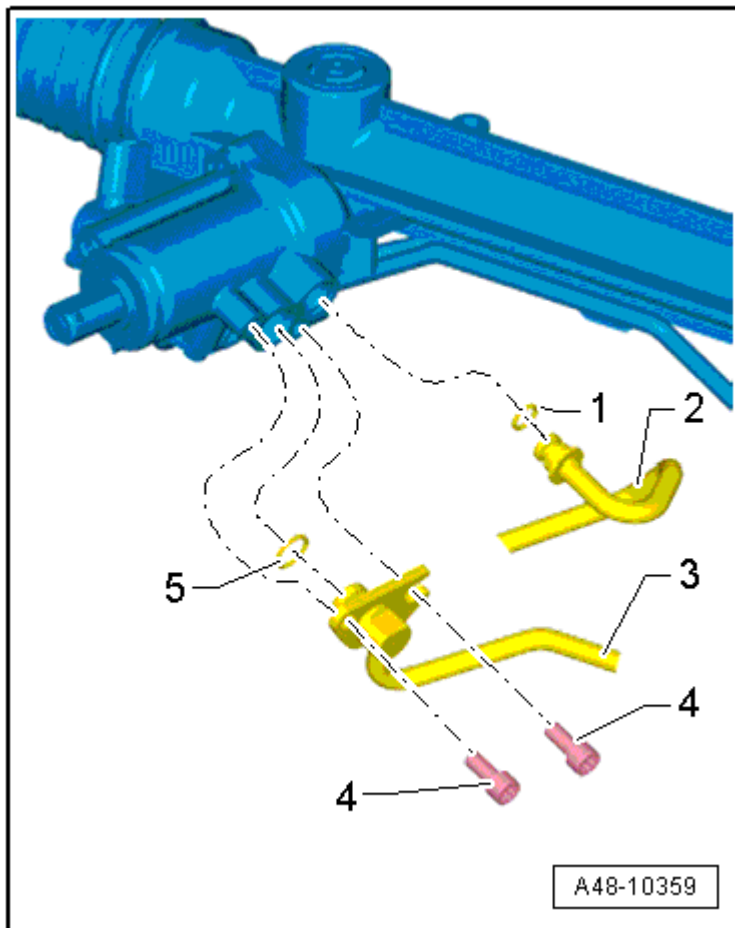


Fig. 142: Identifying Pressure Line & Bolts

Courtesy of AUDI OF AMERICA, LLC

- Remove the return line -2-. Carefully pry the return line -2- out of the power steering gear if necessary using a screwdriver.
- Seal the power steering gear connections with clean plugs.
- Seal the pressure line -3- and the return line -2- with clean sealing plugs.
- Remove the bolt -arrow-.

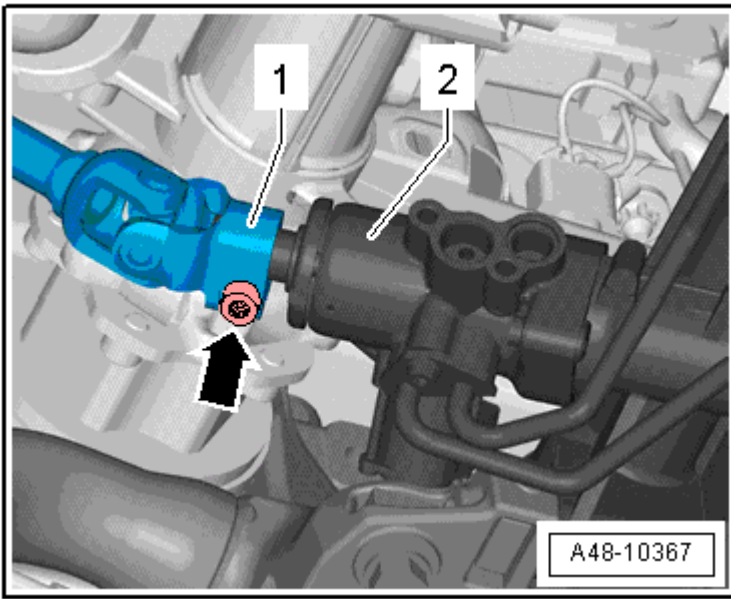


Fig. 143: Locating Steering Intermediate Shaft Bolt
Courtesy of AUDI OF AMERICA, LLC

-- Remove the steering column -1- from the steering gear -2-.

Applies to 8-Cylinder Vehicles with an FSI Engine

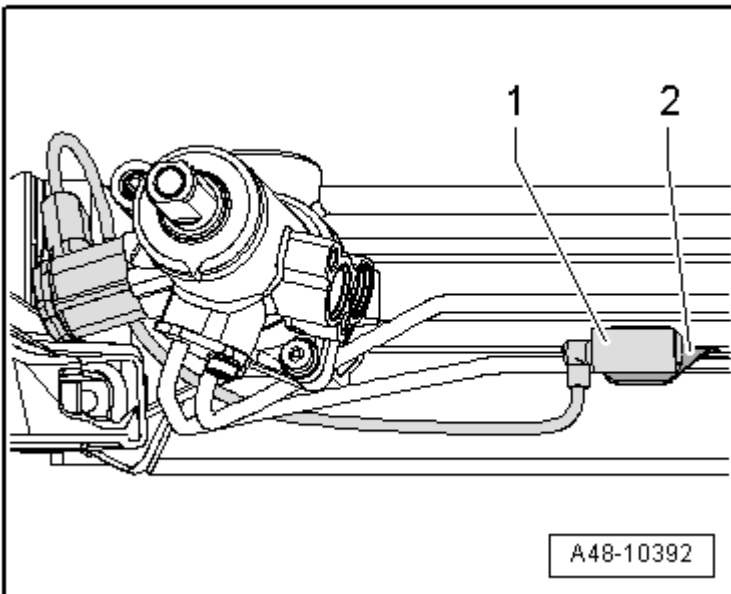


Fig. 144: Identifying Steering Gear Connector
Courtesy of AUDI OF AMERICA, LLC

-- Disconnect the connector -1- and remove it from the bracket -2-.

Applies to All other Engines

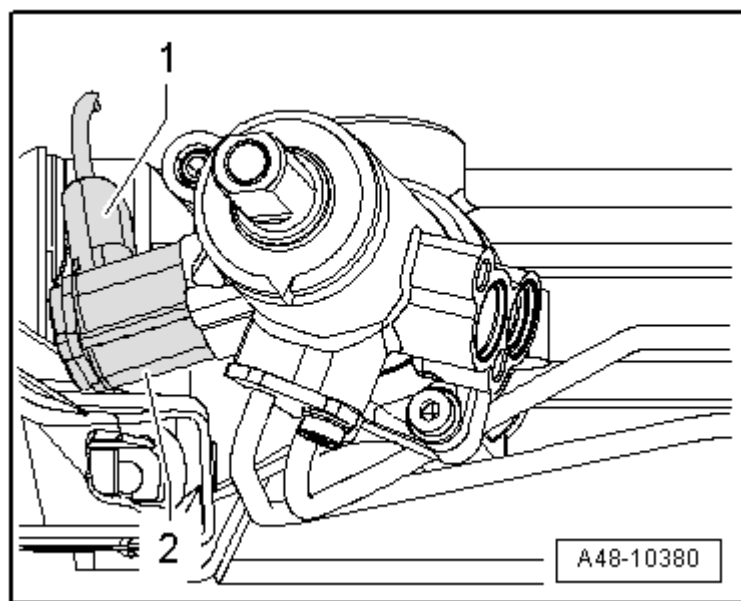


Fig. 145: Servotronic Solenoid Valve Connector
Courtesy of AUDI OF AMERICA, LLC

-- Disconnect the connector -1- and remove it from the servotronic solenoid valve -N119- -2-.

Continued for All Engines

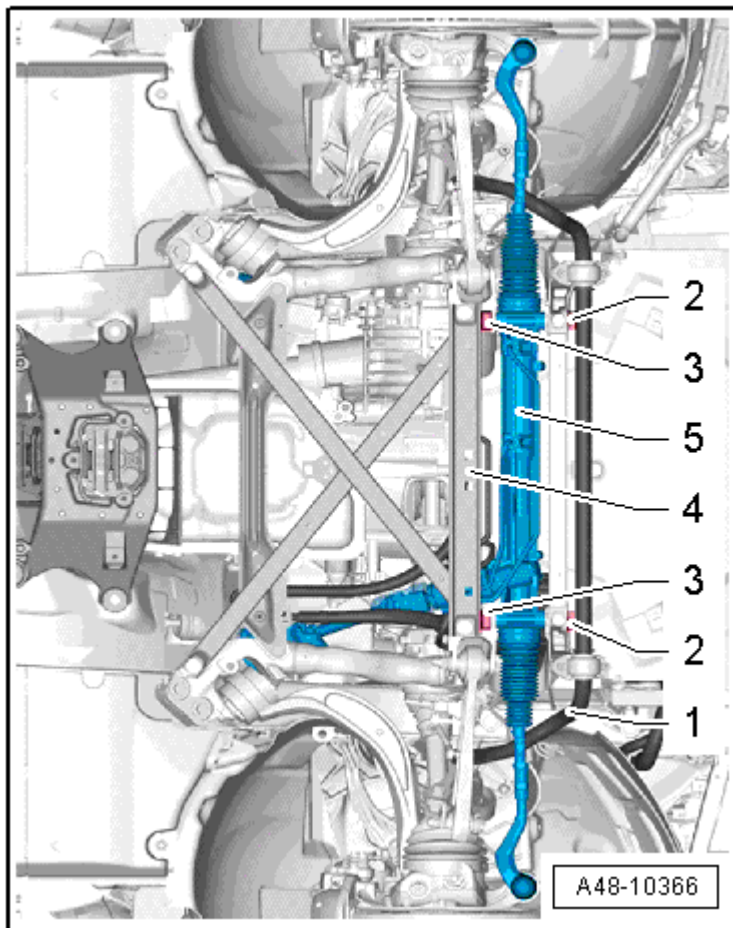


Fig. 146: Remove/Install Stabilizer Bar
Courtesy of AUDI OF AMERICA, LLC

- Remove the bolts -2- and the nuts -3-.
- Guide the steering gear -5- to the right slightly and remove it.

Installing

Install in reverse order of removal. Note the following:

Tightening specifications, refer to **HYDRAULIC POWER STEERING GEAR OVERVIEW**

- Lightly coat the seals -1 and 5- with hydraulic oil before installing.

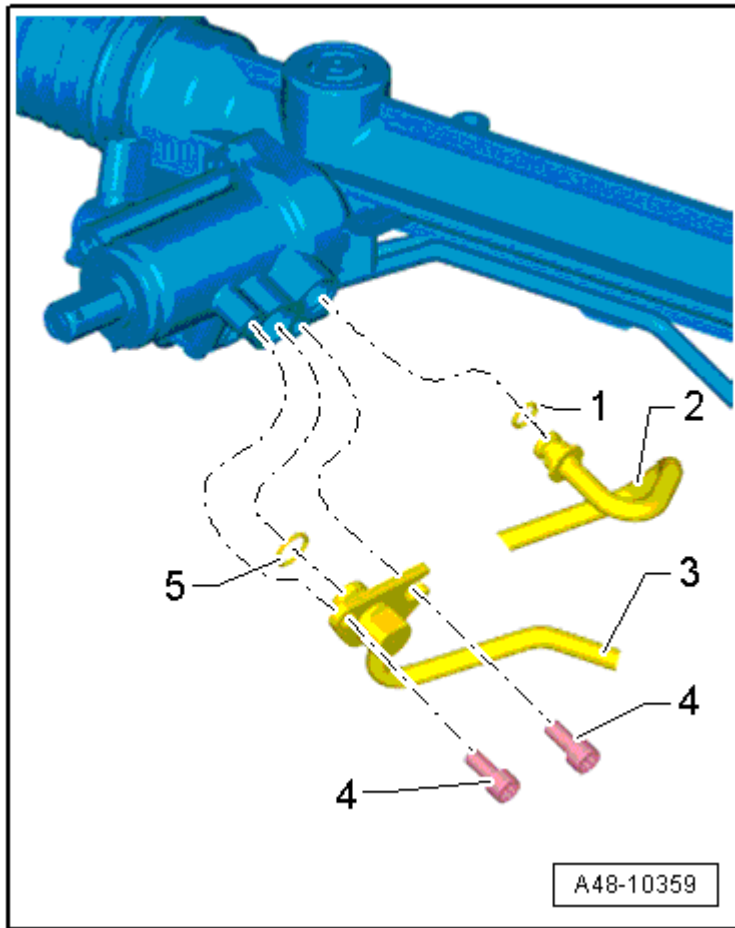


Fig. 147: Identifying Pressure Line & Bolts
Courtesy of AUDI OF AMERICA, LLC

- Insert the pressure line -3- and return line -2- completely when installing.
- Install the stabilizer bar -1-. Refer to **STABILIZER BAR** .

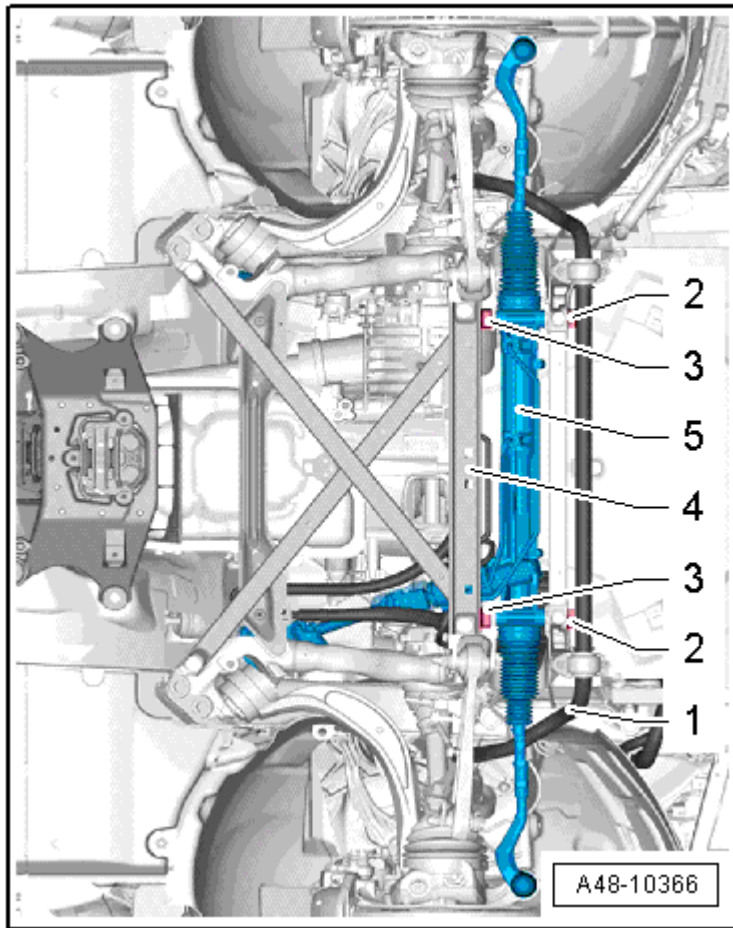


Fig. 148: Remove/Install Stabilizer Bar
 Courtesy of AUDI OF AMERICA, LLC

- Install both bolts -2- loosely at first and then tighten them.
- Install the crossbrace -4-. Refer to **SUBFRAME CROSSBRACE** .
- Remove the 3094 from the suction hose -1- and return hose -2-.

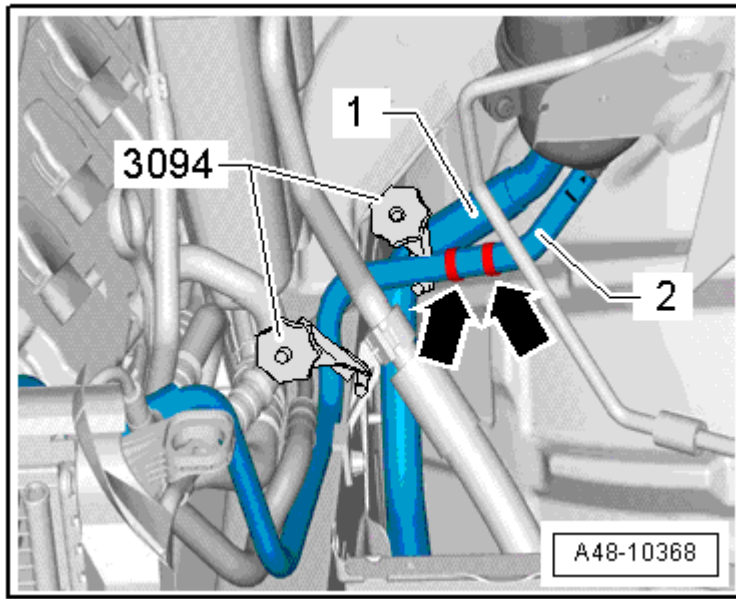


Fig. 149: Locating Suction & Return Hose Clamping Location
Courtesy of AUDI OF AMERICA, LLC

- Bring the steering gear into the center position. Refer to **HYDRAULIC POWER STEERING GEAR STEERING, CENTERING**.
- Bleed the steering. Refer to **STEERING, BLEEDING AFTER REPLACING**.
- Check power steering fluid level. Refer to **POWER STEERING FLUID LEVEL, CHECKING**.
- Check all open line connections for leaks. Refer to **STEERING, CHECKING FOR LEAKS**.
- Perform an axle alignment. Refer to **WHEN VEHICLE ALIGNMENT IS NECESSARY**.

Servotronic Solenoid Valve -N119-

Special tools and workshop equipment required

- Torque Wrench V.A.G 1332
- Steering gear grease

Removing

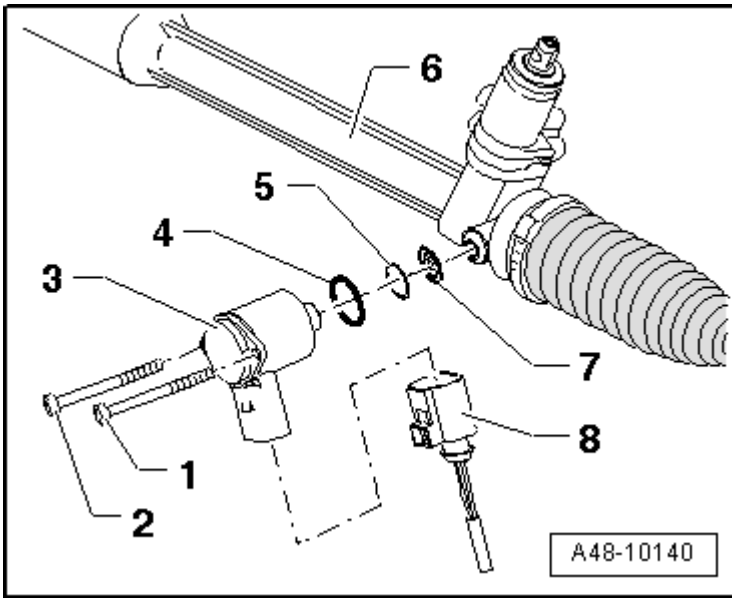


Fig. 150: Remove/Install Servotronic Solenoid Valve
 Courtesy of AUDI OF AMERICA, LLC

Replacement is only possible when the steering gear is removed.

- Steering gear, removing; refer to **HYDRAULIC POWER STEERING GEAR**.
- Always clean steering gear -6- in servotronic solenoid valve -- -3- area.
- Make sure that no dirt enters steering gear -6-.
- Separate connector -8-.
- Make sure no dirt enters the connector -8-.
- Remove bolts -1 and 2-.
- Remove servotronic solenoid valve -- -3- from steering gear -6-.
- Remove screen -7- from steering gear -6-, clean steering gear if necessary.

Installing

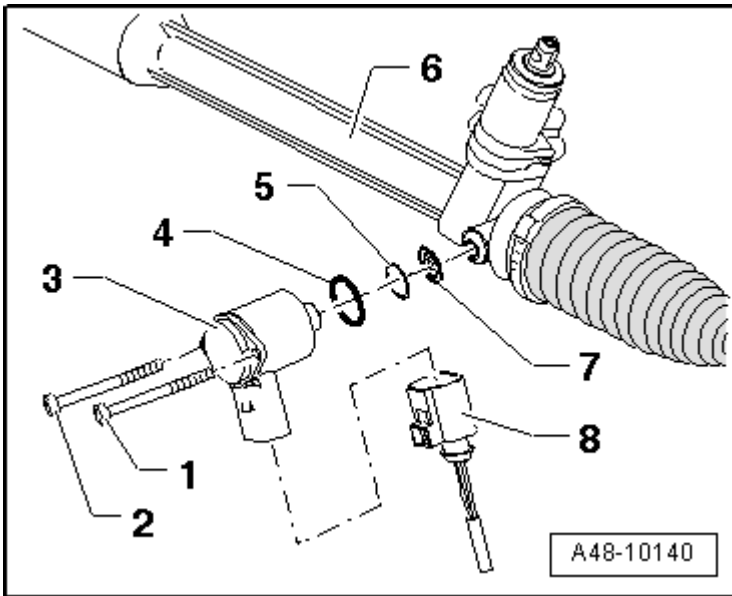


Fig. 151: Remove/Install Servotronic Solenoid Valve
 Courtesy of AUDI OF AMERICA, LLC

Install in reverse order of removal. Note the following:

- Insert a new screen -7-.
- Lightly coat gasket -4 and 5- with steering gear grease and insert.
- Place servotronic solenoid valve -3- in steering gear -6- as far as stop. Do not tilt servotronic solenoid valve when doing so.

CAUTION: • Always follow bolt tightening sequence.

-- Tighten screws -1- and -2- as follows:

1. Tighten bolt -1- to 0.5 Nm.
2. Tighten bolt -2- to 1.5 Nm.
3. Tighten bolt -1- to 3.0 Nm.
4. Tighten bolt -2- to 3.0 Nm.

-- Steering gear, installing, refer to **HYDRAULIC POWER STEERING GEAR**.

TIE ROD END - HYDRAULIC

Different tie rod ends were installed during production; the difference is the joint pin thread length.

When exchanging the tie rod end, make sure the length of the thread on the tie rod end is sufficient (there must

be approximately 5 mm extra thread). If this is not the case, then install a new tie rod end with a longer thread pin.

Special tools and workshop equipment required

- Torque Wrench 5-50 Nm V.A.G 1331
- Torque Wrench 50-200 Nm V.A.G 1332
- Ball Joint Puller T40010 A
- Ring Spanner Insert, AF 21 mm V.A.G 1332/7
- or Ring Spanner Insert V.A.G 1332/10

Removing

-- Place the vehicle on a hoist.

-- Remove the wheel.

-- Measure the dimension -a- between the tie rod head -1- and the left and right tie rod -2- and make a note of the value. Dimension -a- must be the same on the left and right sides after installing.

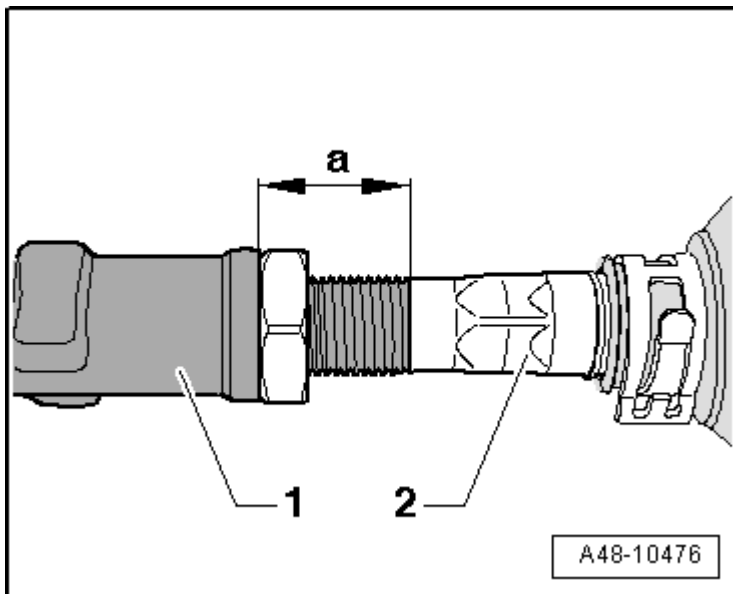


Fig. 152: Measuring Tie Rod / Tie Rod Head Dimension
Courtesy of AUDI OF AMERICA, LLC

-- If necessary, shorten the "longer" tie rod head (installed it deeper into the tie rod).

-- Remove the nut -1- from the tie rod end joint pin -2- until it is flush with the joint pin threads. Counter hold when loosening.

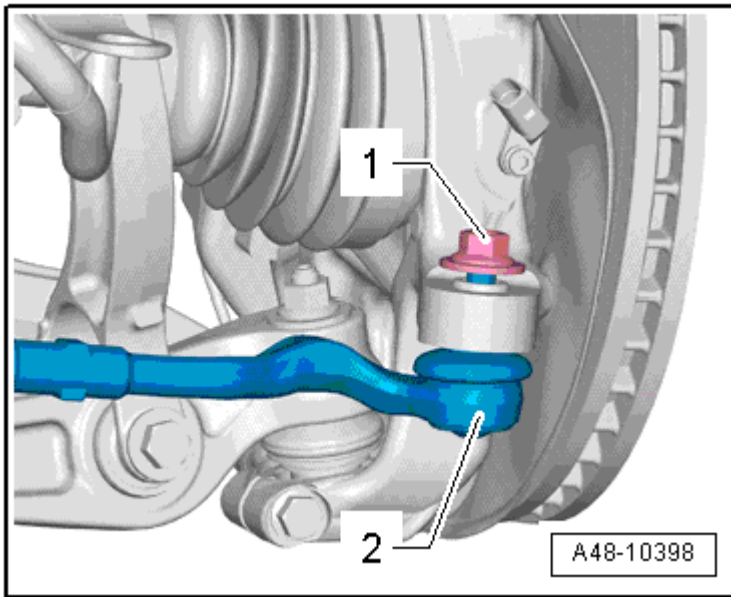


Fig. 153: Tie Rod End Joint Pin

Courtesy of AUDI OF AMERICA, LLC

To protect thread, screw nut on pin a few turns.

-- Press off tie rod ball joint from wheel bearing housing using T40010 A. Remove the nut.

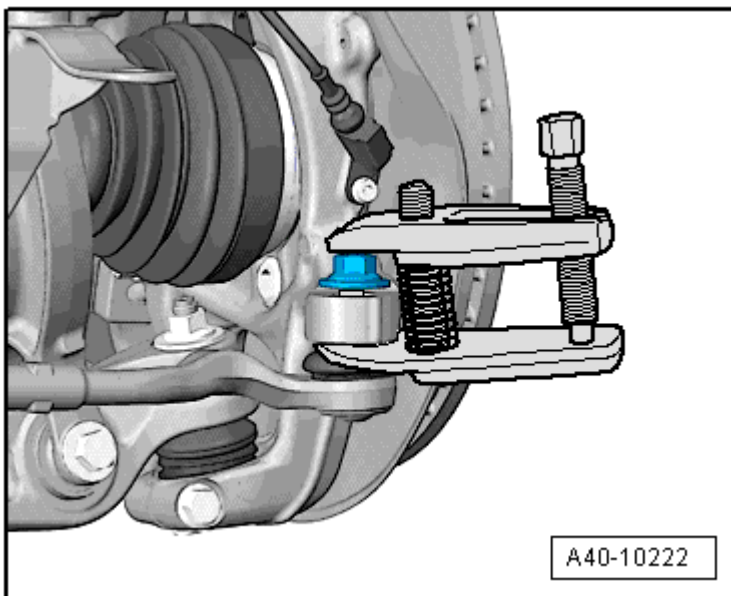


Fig. 154: Removing Tie Rod Ball Joint

Courtesy of AUDI OF AMERICA, LLC

NOTE: Make sure that both puller lever arms are parallel to each other when using greatest force, adjust if necessary.

-- Loosen the nut -2-. Counter hold the tie rod end -3-.

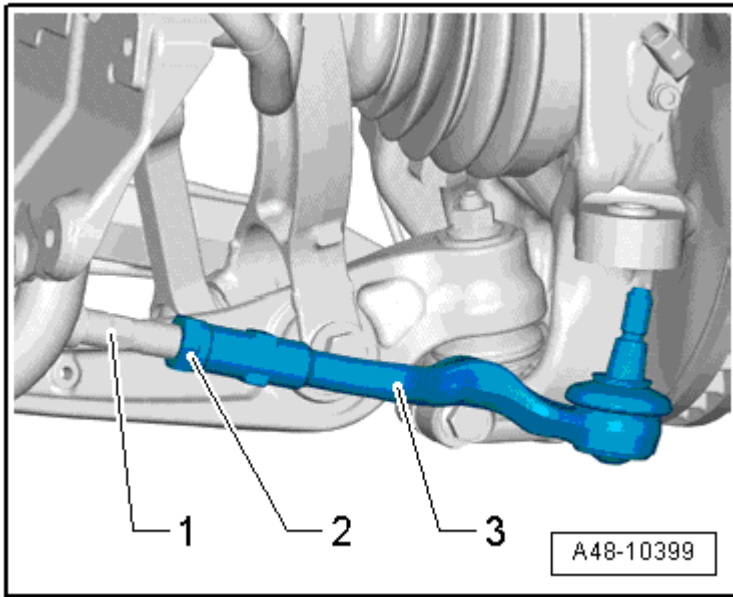


Fig. 155: Identifying Tie Rod End & Nut
Courtesy of AUDI OF AMERICA, LLC

-- Remove the tie rod end -3-.

Installing

Install in reverse order of removal. Note the following:

Tightening specifications, refer to **HYDRAULIC POWER STEERING GEAR, SERVICING**

Tightening specifications, refer to **HYDRAULIC POWER STEERING GEAR OVERVIEW**

-- Mount the tie rod head -1- on the tie rod -2- until dimension -a-, which was measured during removal, is reached.

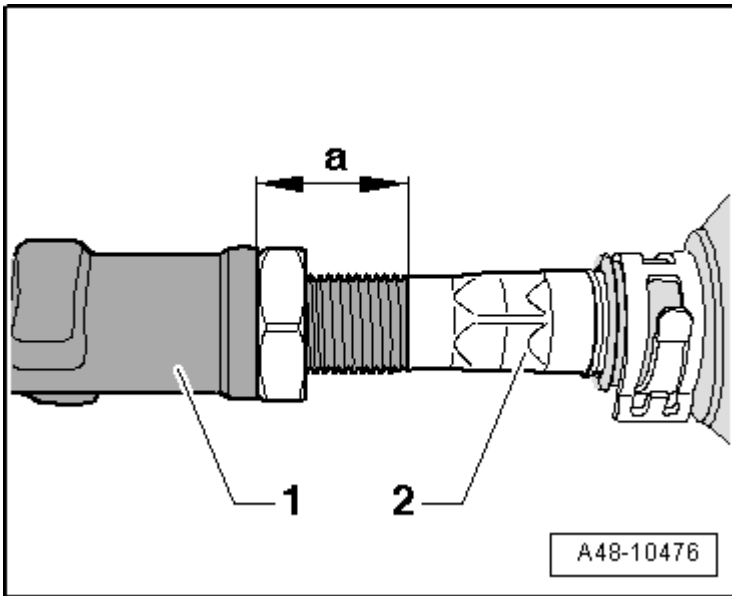


Fig. 156: Measuring Tie Rod / Tie Rod Head Dimension
Courtesy of AUDI OF AMERICA, LLC

- Align the tie rod head -2- so that the pin is in the installation position.
- Insert the tie rod end into the wheel bearing housing as far as the stop.
- Tighten the nut -1-. Counter hold when tightening.

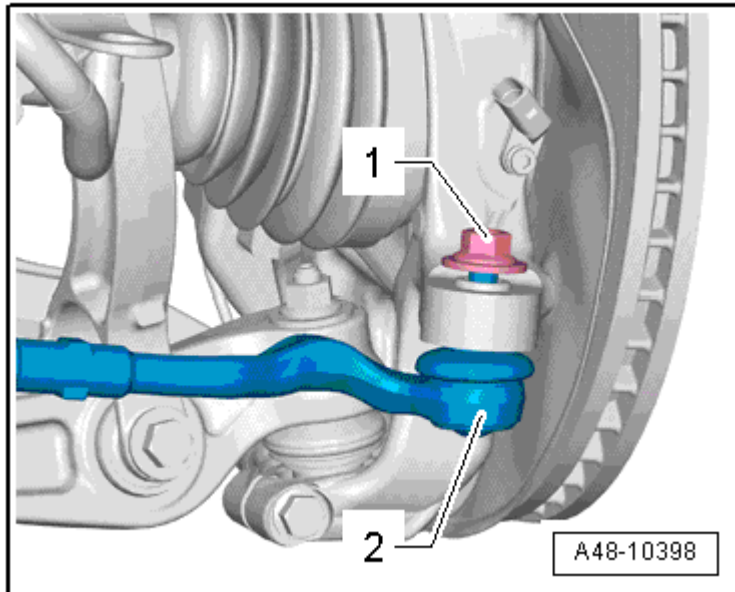


Fig. 157: Tie Rod End Joint Pin
Courtesy of AUDI OF AMERICA, LLC

- Tighten the nut -2-.

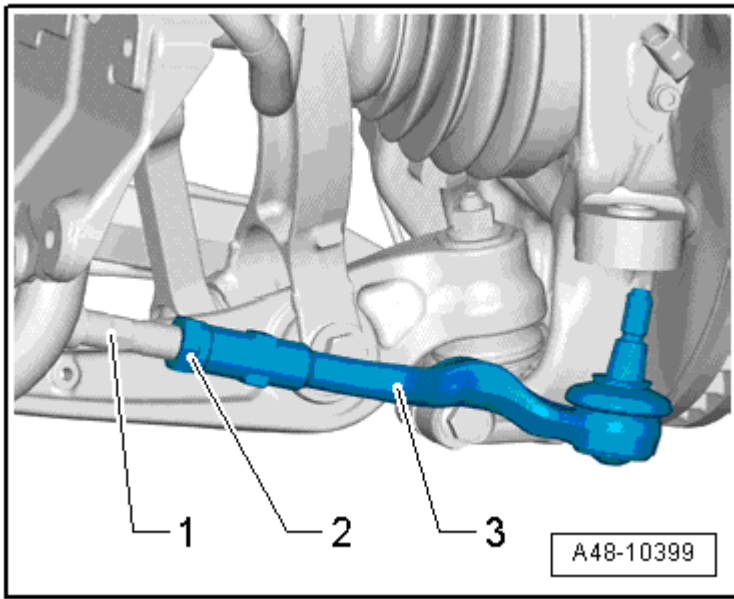


Fig. 158: Identifying Tie Rod End & Nut
Courtesy of AUDI OF AMERICA, LLC

-- Mount wheel and tighten. Refer to **Removal and Installation** .

-- Axle alignment is required, see table, refer to **WHEN VEHICLE ALIGNMENT IS NECESSARY** .

TIE ROD - HYDRAULIC

Special tools and workshop equipment required

- Torque Wrench 50-200 Nm V.A.G 1332
- Hose Clip Pliers V.A.G 1921
- Open-Jaw Torque Wrench Insert V.A.G 1923
- Locking Pliers VAS 6199
- Ball Joint Puller T40010 A
- Ring Spanner Insert V.A.G 1332/10

Removing

The tie rods can be removed and installed with the steering gear in the vehicle.

-- Place the vehicle on a hoist.

-- Remove the wheel.

-- Remove noise insulation. Refer to **Description and Operation** .

-- Measure the dimension -a- between the tie rod head -1- and the left and right tie rod -2- and make a note of

the value. Dimension -a- must be the same on the left and right sides after installing.

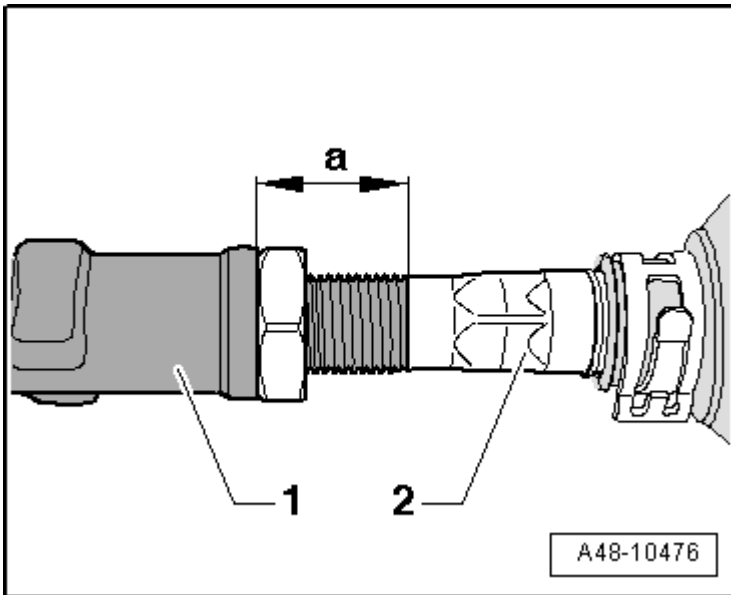


Fig. 159: Measuring Tie Rod / Tie Rod Head Dimension

Courtesy of AUDI OF AMERICA, LLC

- If necessary, shorten the "longer" tie rod head (installed it deeper into the tie rod).
- Clean the power steering gear and subframe in the boot area.

CAUTION: Dirt must not enter the power steering gear and boot when replacing the tie rod.

- Open and remove the spring clip -3- using the V.A.G 1921.

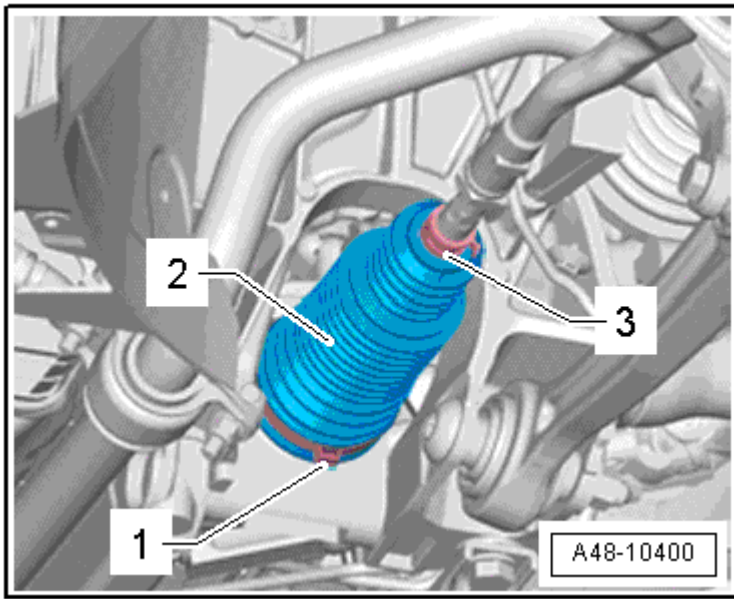


Fig. 160: Power Steering Gear Boot

Courtesy of AUDI OF AMERICA, LLC

-- Remove the clamp -1- and remove the boot -2- from the power steering gear.

-- Remove the nut -1- from the tie rod end joint pin -2- until it is flush with the joint pin threads. Counter hold when loosening.

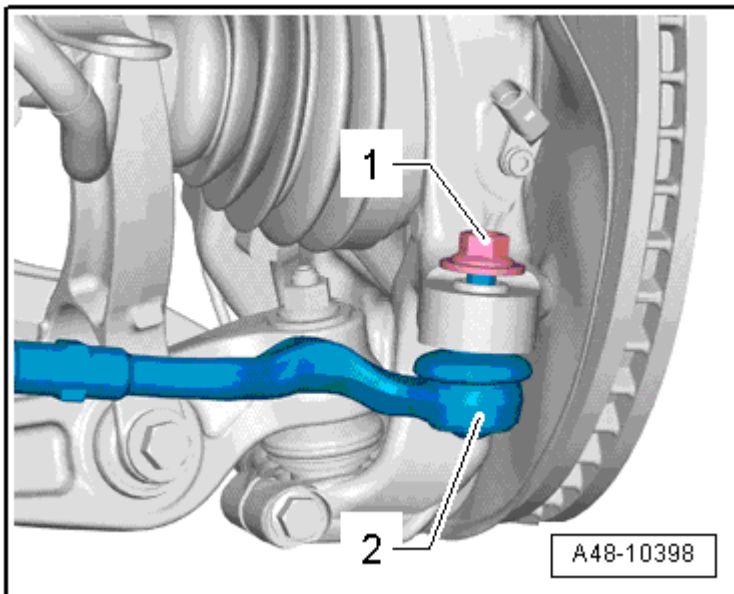


Fig. 161: Tie Rod End Joint Pin

Courtesy of AUDI OF AMERICA, LLC

To protect thread, screw nut on pin a few turns.

-- Press off tie rod ball joint from wheel bearing housing using T40010 A. Remove the nut.

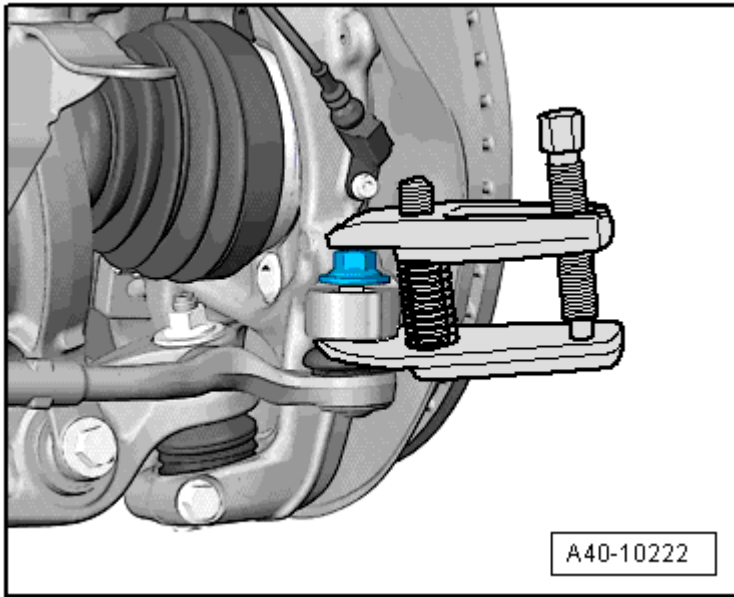


Fig. 162: Removing Tie Rod Ball Joint

Courtesy of AUDI OF AMERICA, LLC

NOTE: Make sure that both puller lever arms are parallel to each other when using greatest force, adjust if necessary.

-- Remove the tie rod. Counter hold at the power steering gear coupling rod with an open end wrench -1-.

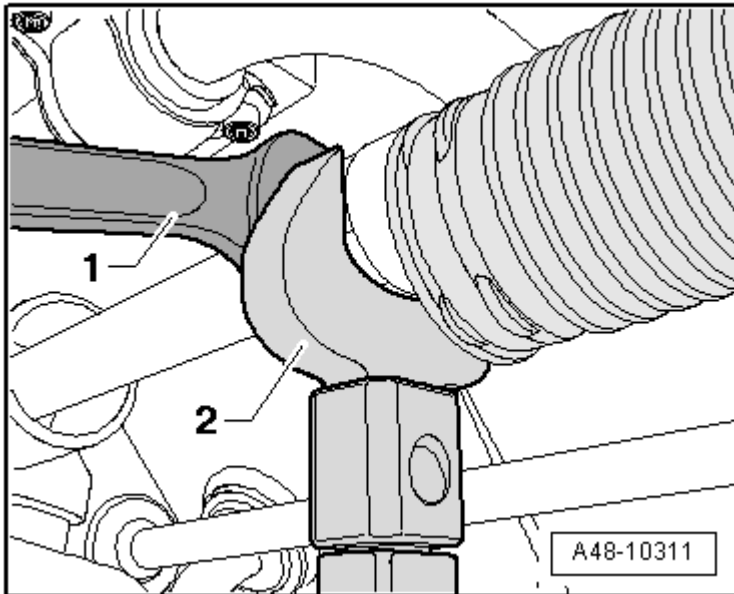


Fig. 163: Removing Tie Rod

Courtesy of AUDI OF AMERICA, LLC

2 - Open-jaw torque wrench insert V.A.G 1923

Installing

Install in reverse order of removal. Note the following:

Tightening specifications, refer to **HYDRAULIC POWER STEERING GEAR, SERVICING**

Tightening specifications, refer to **HYDRAULIC POWER STEERING GEAR OVERVIEW**

-- Install tie rod using the V.A.G 1923 -2-. Counter hold at the power steering gear coupling rod with an open end wrench -1-.

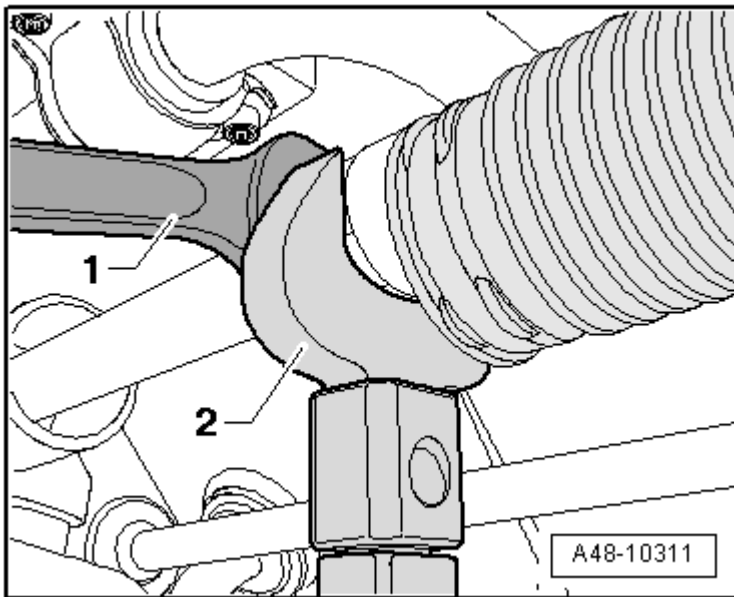


Fig. 164: Removing Tie Rod

Courtesy of AUDI OF AMERICA, LLC

-- Replace the spring clamp -3- and the clamp -1-.

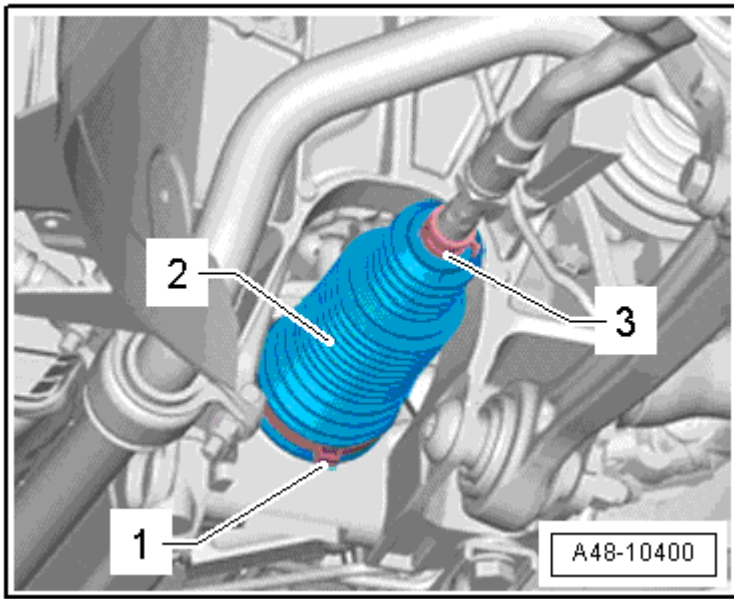


Fig. 165: Power Steering Gear Boot
Courtesy of AUDI OF AMERICA, LLC

Clamping Sleeves, Installing:

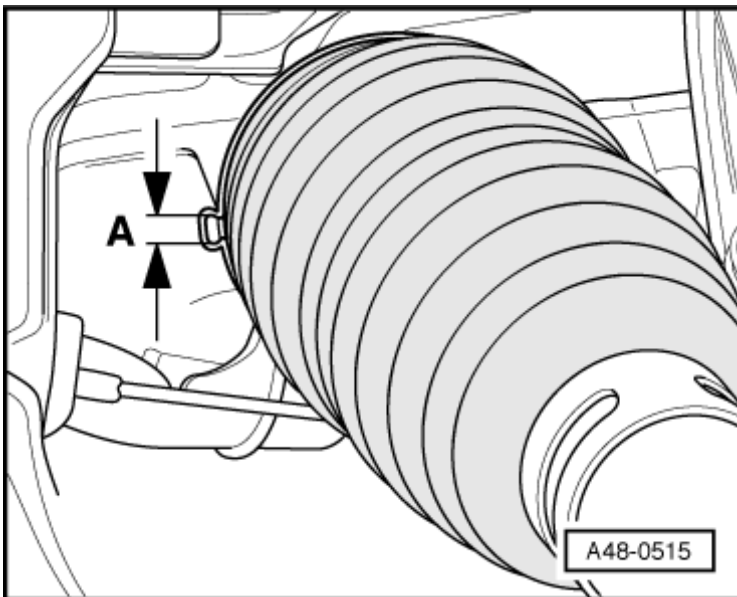


Fig. 166: Identifying Clamp Installation Dimension
Courtesy of AUDI OF AMERICA, LLC

Make sure that dimension -A- of 5.7 mm maximum is observed. Dimension -A- must never be greater than 5.7 mm, otherwise there may be problems with the seal.

-- Insert a new clamping sleeve and tension with the VAS 6199.

- Align tie rod so that tie rod ball joint pints are in installation location.
- Insert the tie rod into the wheel bearing housing as far as the stop.
- Mount wheel and tighten. Refer to **Removal and Installation** .
- Axle alignment is required, see table **WHEN VEHICLE ALIGNMENT IS NECESSARY**

BOOT**Special tools and workshop equipment required**

- Torque Wrench 5-50 Nm V.A.G 1331
- Torque Wrench 50-200 Nm V.A.G 1332
- Hose Clip Pliers V.A.G 1921
- Locking Pliers VAS 6199
- Ball Joint Puller T40010 A
- Ring Spanner Insert, AF 21 mm V.A.G 1332/7
- Ring Spanner Insert V.A.G 1332/10

Removing

NOTE: If the boot is faulty, moisture and dirt will penetrate into steering gear. There must be a noticeable grease film present on steering rack in area of splines. If grease film is not present, steering gear must be replaced. Steering gear must also be replaced if there is corrosion or steering gear is damaged or worn out.

- Place the vehicle on a hoist.
- Remove the wheel.
- Turn steering wheel into straight ahead position.
- Remove noise insulation. Refer to **Description and Operation** .
- Clean the power steering gear and subframe in the boot area.

CAUTION: • While doing this, no dirt must enter the steering gear through the faulty boot.

- Remove the nut -1- from the tie rod end joint pin -2- until it is flush with the joint pin threads. Counter hold when loosening.

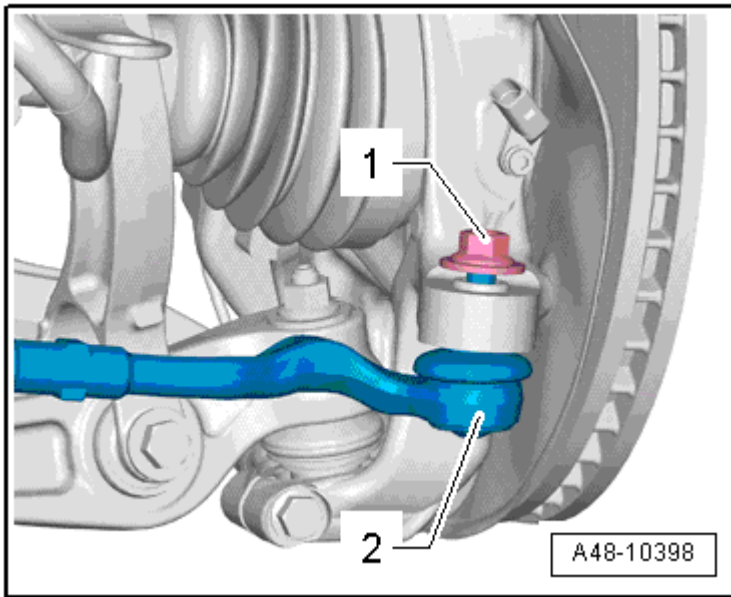


Fig. 167: Tie Rod End Joint Pin

Courtesy of AUDI OF AMERICA, LLC

To protect thread, screw nut on pin a few turns.

-- Press off tie rod ball joint from wheel bearing housing using ball joint puller T40010 A. Remove the nut.

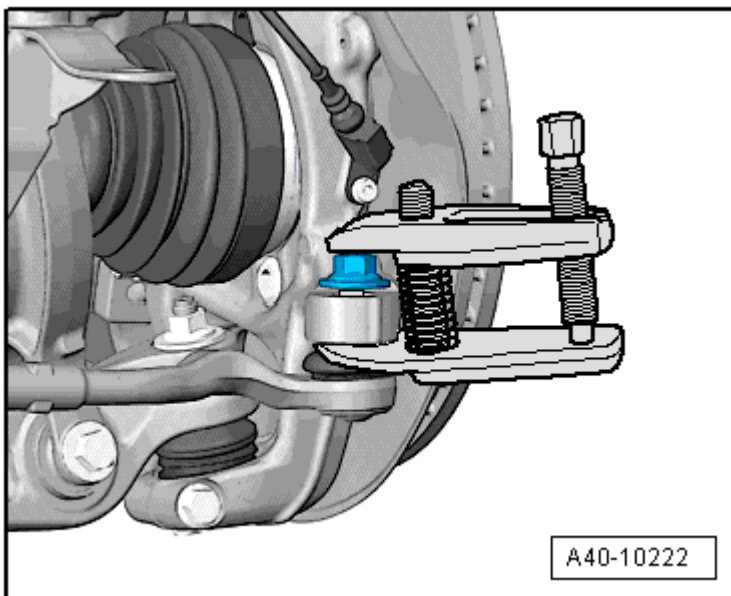


Fig. 168: Removing Tie Rod Ball Joint

Courtesy of AUDI OF AMERICA, LLC

NOTE: Make sure that both puller lever arms are parallel to each other when using greatest force, adjust if necessary.

-- Mark the position of the nut -2- on the tie rod -1- for installation later.

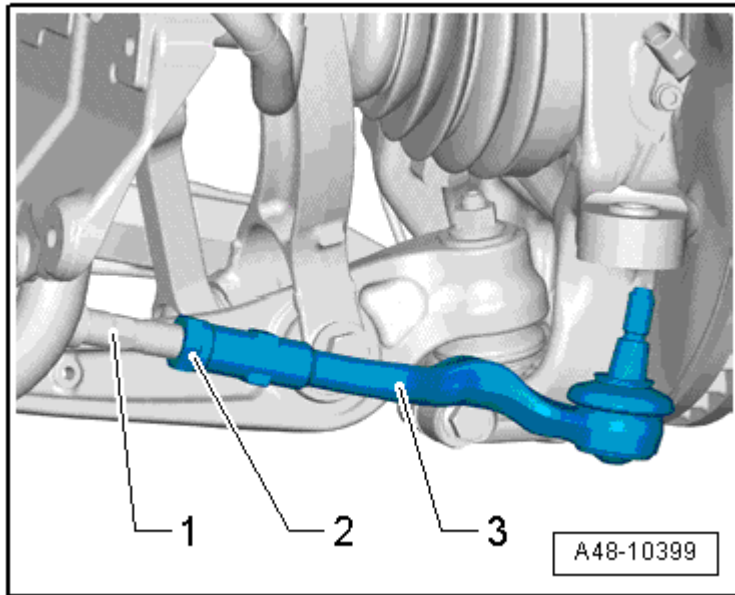


Fig. 169: Identifying Tie Rod End & Nut
Courtesy of AUDI OF AMERICA, LLC

-- Counter hold the tie rod end -3- and loosen the nut -2-.

-- Open and remove the spring clip -3- using the V.A.G 1921.

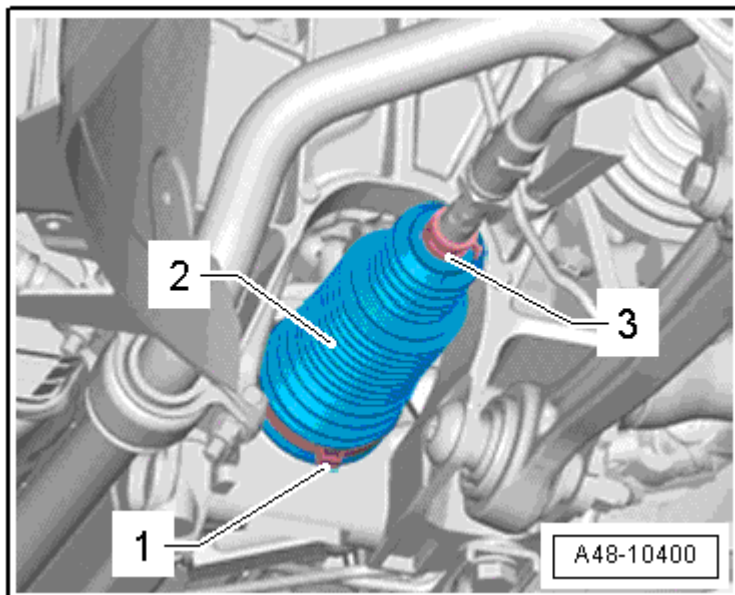


Fig. 170: Power Steering Gear Boot
Courtesy of AUDI OF AMERICA, LLC

-- Remove the clamp -1- and remove the boot -2- from the power steering gear.

-- Remove the tie rod end -3- and nut -2- from the tie rod -1-.

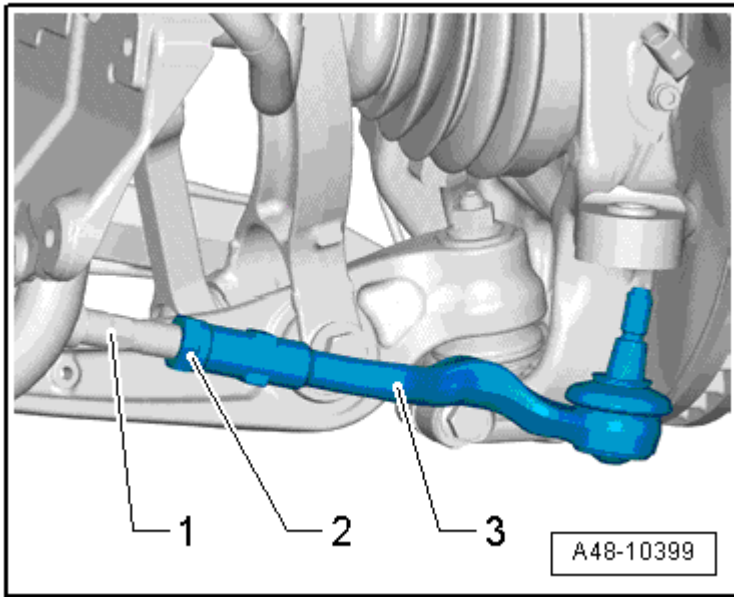


Fig. 171: Identifying Tie Rod End & Nut
Courtesy of AUDI OF AMERICA, LLC

-- Pull off boot with spring clamp from tie rod.

NOTE: If corrosion, damage, wear-out or first signs of contamination on the steering rack can be seen, complete steering gear must be replaced.

If no grease film is visible on steering rack, steering gear must also be replaced completely.

Installing

Before installing, coat the steering rack with the grease supplied in the repair set.

CAUTION: Do not use other grease under any circumstances.

For this purpose, turn steering to stop toward both sides in succession.

For clearer illustration, steering gear has been removed in the illustration.

-- Grease the steering rack on the toothed side -A- and on the thrust piece side with grease.

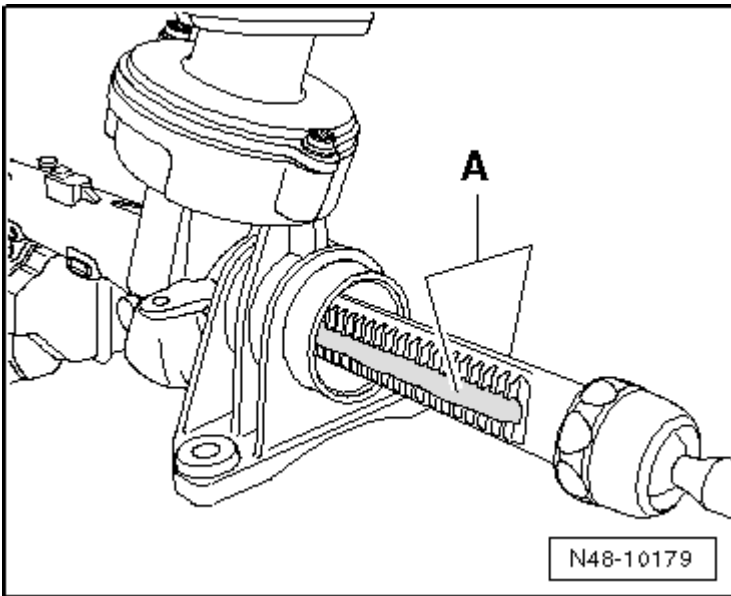


Fig. 172: Locating Steering Rack Grease Application Location
Courtesy of AUDI OF AMERICA, LLC

- Turn the steering wheel into the straight ahead position.
- Guide new clamp and boot onto the tie rod.
- Install the nut -1- and tie rod -3- up to the marking applied during removal.

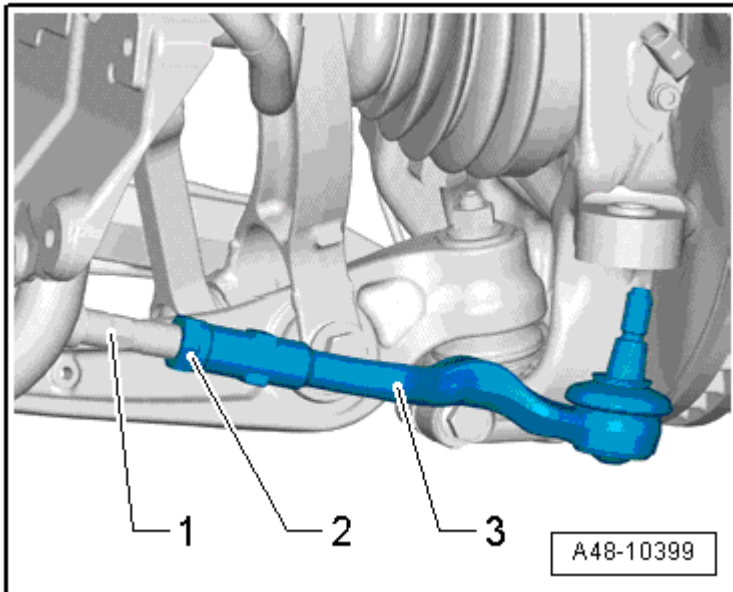


Fig. 173: Identifying Tie Rod End & Nut
Courtesy of AUDI OF AMERICA, LLC

- Tighten the nut -2- to the specification. Counter hold the tie rod end -3-.

The boot/power steering gear sealing surface must be free of grease when installing.

- Slide the boot onto the steering gear housing with a new clamp.
- Make sure the boot is seated correctly on the power steering gear.
- The boot must fit in the groove and on the contour of the power steering gear.

Clamping Sleeves, Installing

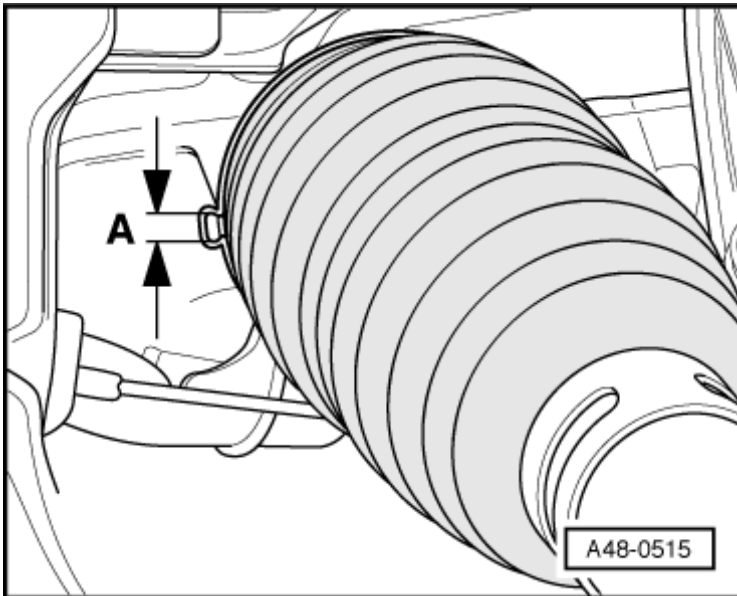


Fig. 174: Identifying Clamp Installation Dimension
Courtesy of AUDI OF AMERICA, LLC

Make sure that dimension -A- of 5.7 mm maximum is observed. Dimension -A- must never be greater than 5.7 mm, otherwise there may be problems with the seal.

- Tighten the clamp -1- using the VAS 6199.

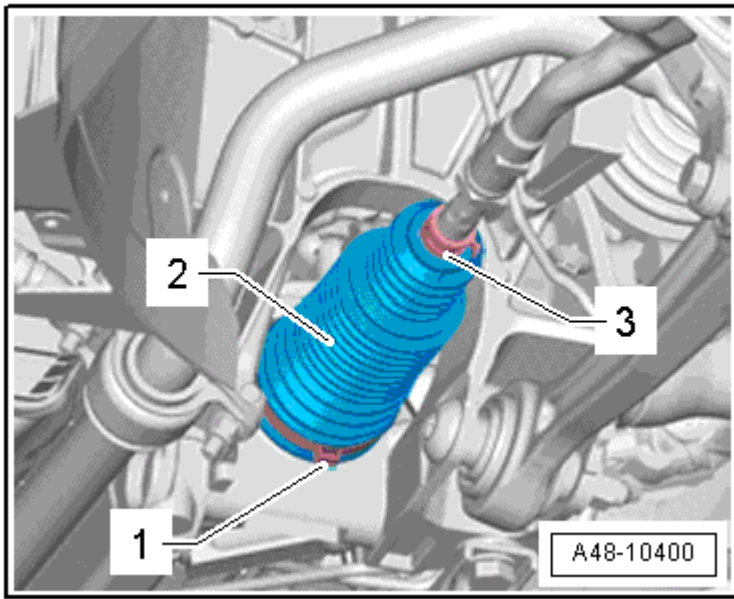


Fig. 175: Power Steering Gear Boot
Courtesy of AUDI OF AMERICA, LLC

-- Secure the spring clamp -3- on the boot -2- using the V.A.G 1921.

Install in reverse order of removal.

Tightening specifications, refer to **HYDRAULIC POWER STEERING GEAR, SERVICING**

Tightening specifications, refer to **HYDRAULIC POWER STEERING GEAR OVERVIEW**

-- Axle alignment is required, see table. Refer to **WHEN VEHICLE ALIGNMENT IS NECESSARY** .

HYDRAULIC OIL COOLER, VEHICLES WITH DYNAMIC STEERING

Special tools and workshop equipment required

- Hose Clamps Up to 25 mm Dia. 3094
- Hose Clamp Pliers V.A.G 1275
- Drip Tray for VAS 6100 VAS 6208

Removing

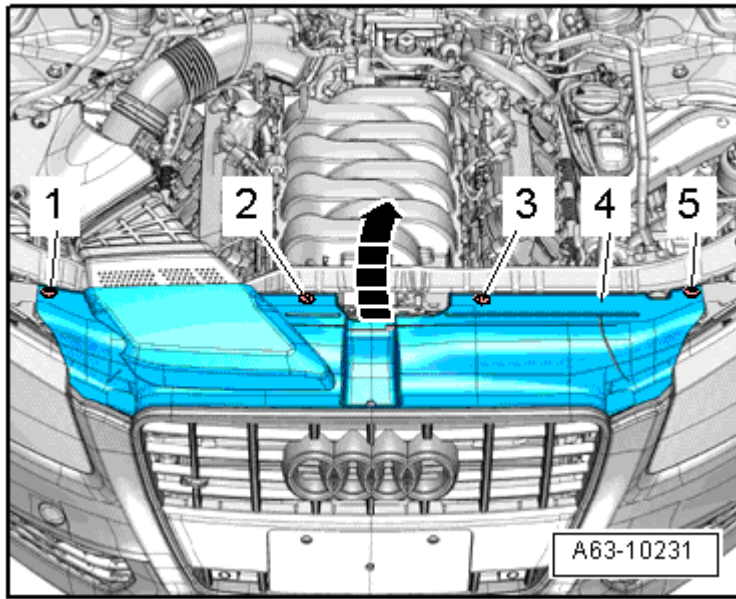


Fig. 176: Front Lock Carrier Cover

Courtesy of AUDI OF AMERICA, LLC

-- Remove the screws -1, 2, 3 and 5- and remove the front lock carrier cover -4-. Refer to **Removal and Installation** .

-- Lift the lock carrier cover -4- -arrow- and disengage it from the radiator grille. Refer to **Description and Operation** .

-- Clamp off the hydraulic lines -5 and 6- with the 3094.

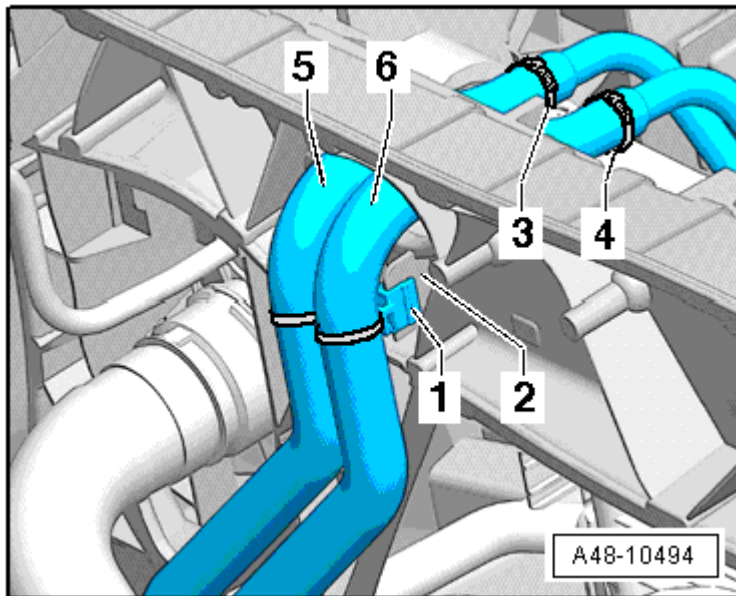


Fig. 177: Hydraulic Oil Cooler, Vehicles With Dynamic Steering (1 Of 2)

Courtesy of AUDI OF AMERICA, LLC

-- Remove the clamping sleeves -3 and 4-

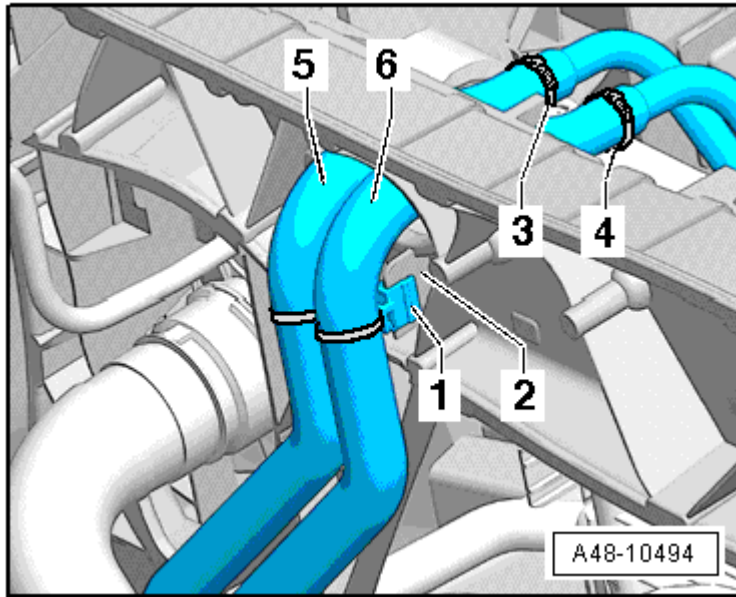


Fig. 178: Hydraulic Oil Cooler, Vehicles With Dynamic Steering (2 Of 2)

Courtesy of AUDI OF AMERICA, LLC

-- Disconnect the hydraulic lines -5 and 6- from the hydraulic oil cooler.

-- Release the retaining tabs -3-, tilt the hydraulic oil cooler -1- forward slightly and remove it from the mounts -2- on the A/C condenser.

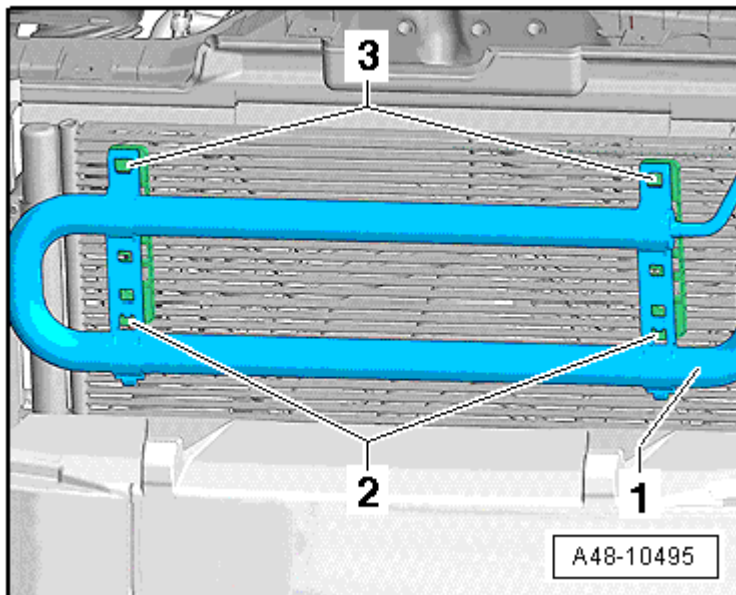


Fig. 179: Hydraulic Oil Cooler To Condenser

Courtesy of AUDI OF AMERICA, LLC

Installing

Install in reverse order of removal. Note the following:

-- The markings -2- on the hose line must point upward in the 12 o'clock position.

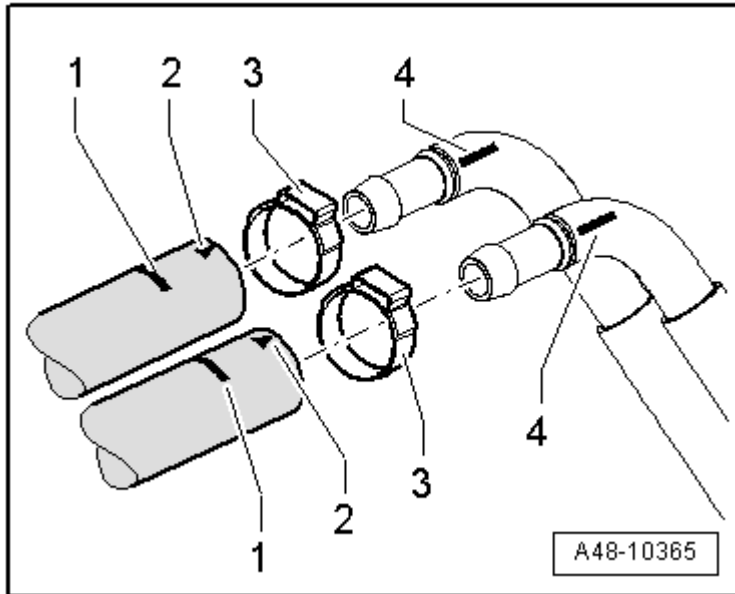


Fig. 180: Locating Hose Line Markings
Courtesy of AUDI OF AMERICA, LLC

CAUTION: • When attaching the hose lines -1-, counter hold on the pipe lines -4-.

- Top off hydraulic oil.
- Clean any oiled places.
- Bleed the steering. Refer to **STEERING, BLEEDING AFTER REPLACING.**
- Check power steering fluid level. Refer to **POWER STEERING FLUID LEVEL, CHECKING.**
- Check all open line connections for leaks. Refer to **STEERING, CHECKING FOR LEAKS.**
- Install the front lock carrier cover. Refer to **Removal and Installation** .

NOTE: **Secure all hose connections with hose clamps appropriate to the model.**

HOSE LINES TO RESERVOIR, HYDRAULIC FLUID COOLER AND RETURN LINE INSTALLED POSITION

Installation position of the lines on the reservoir, applies to all engines

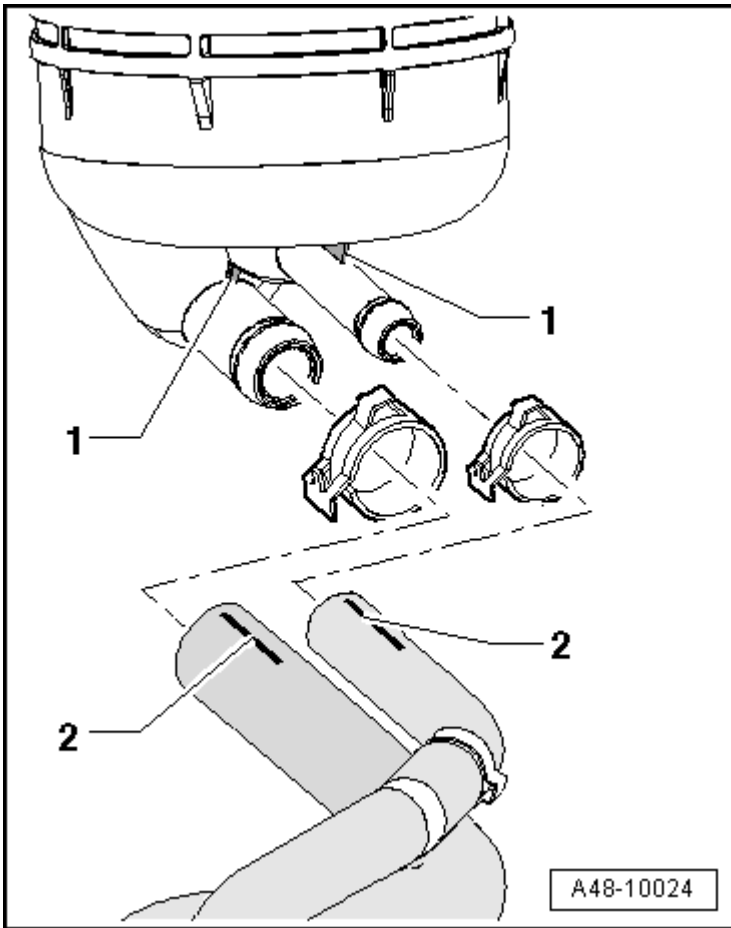


Fig. 181: Identifying Markings On Hoses And Webs On Fluid Reservoir
Courtesy of AUDI OF AMERICA, LLC

-- The markings -2- on the lines must align with the bars -1- on the reservoir.

Installation position of the lines on the hydraulic oil cooler, applies to all engines

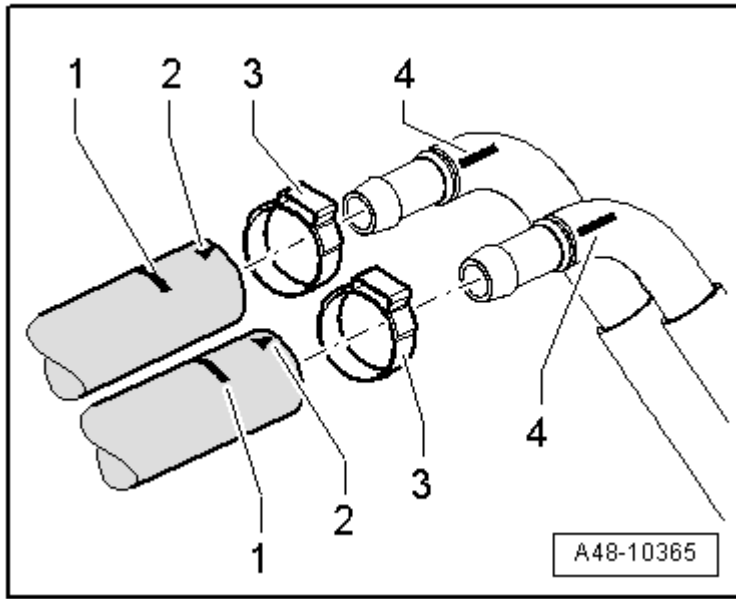


Fig. 182: Locating Hose Line Markings
 Courtesy of AUDI OF AMERICA, LLC

-- The markings -2- on the lines must align with the markings -4- on the hydraulic oil cooler.

CAUTION: • Counter hold the pipes when connecting the lines.

-- Secure the clamps -3- on the markings -1-.

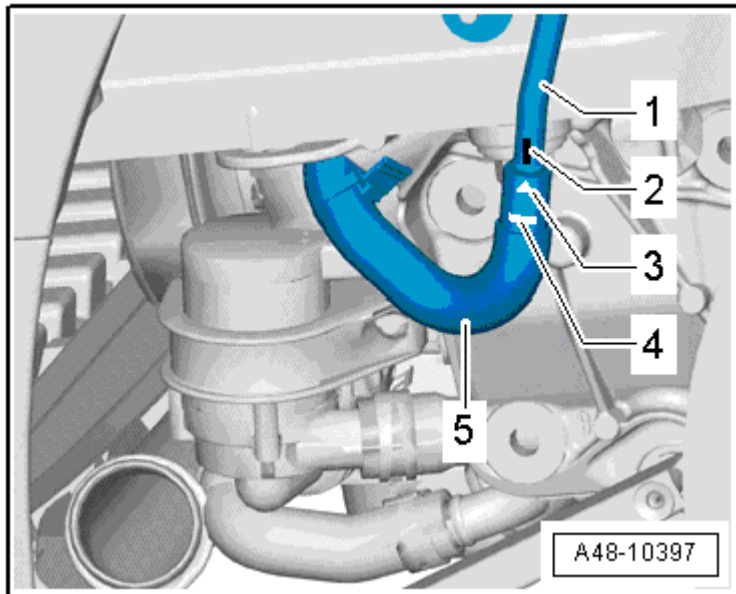


Fig. 183: Hose Lines To Reservoir, Hydraulic Fluid Cooler And Return Line Installed Position
 Courtesy of AUDI OF AMERICA, LLC

2012 Audi S4

SUSPENSION Steering (Sedan)

-- The marking -3- on the line -5- must align with the marking -2- on the pipe -1-.

-- Secure the clamp (not pictured) on the marking -4-.

4-CYLINDER TFSI

POWER STEERING PUMP, VEHICLES WITH DYNAMIC STEERING (4-CYLINDER TFSI)

Power steering pump, removing and installing, vehicles with 4-cylinder TFSI engine and vehicles with dynamic steering **Removing**.

Power Steering Pump, with Dynamic Steering Overview.

- NOTE:**
- Always replace seals.**
 - Do not reuse fluid you have drained.**
 - Only use hydraulic oil.**

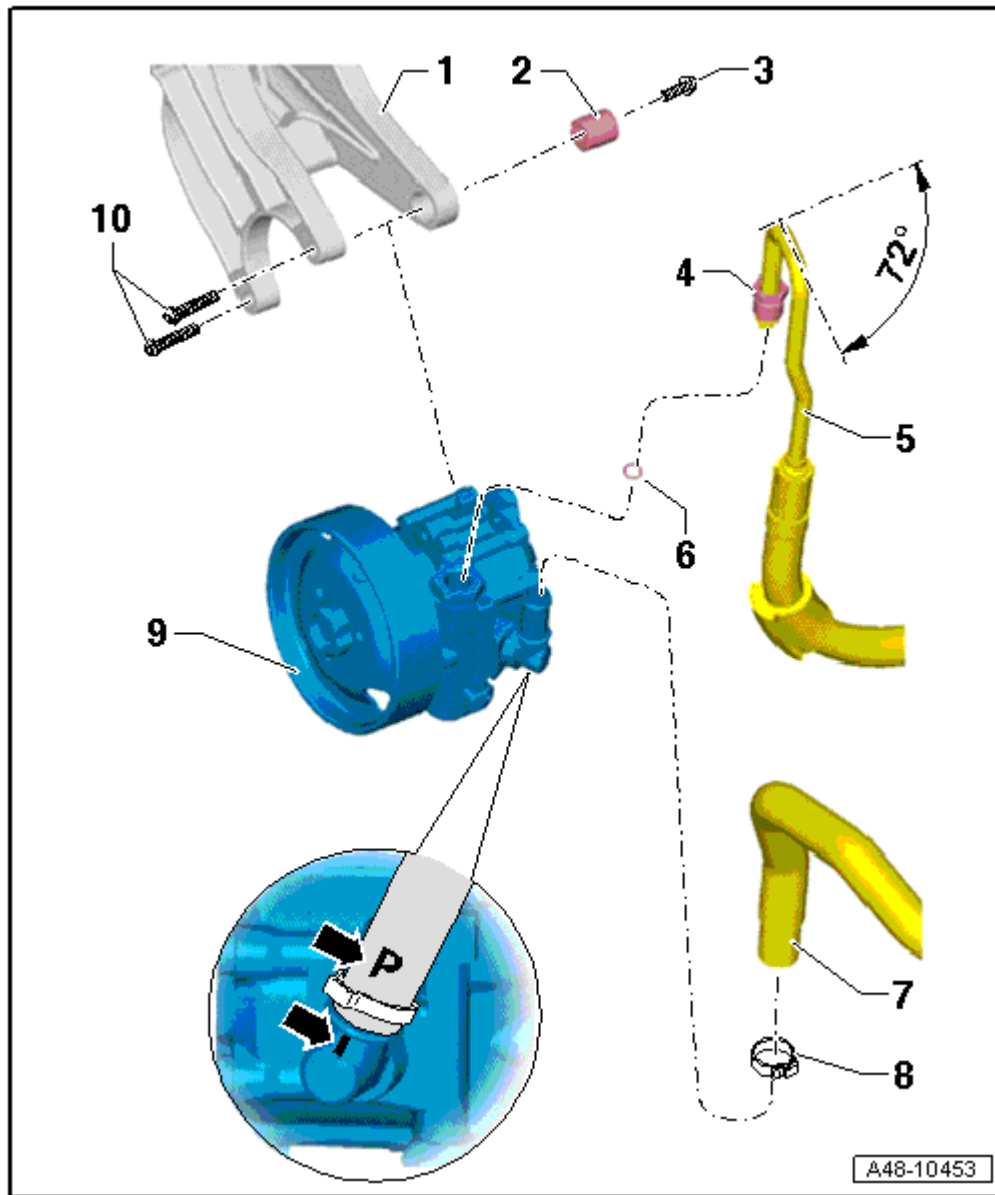


Fig. 184: Power Steering Pump, Vehicles With Dynamic Steering (4-Cylinder TFSD)
 Courtesy of AUDI OF AMERICA, LLC

1. Bracket
2. Sleeve
 - Drive the sleeve back slightly to install the power steering pump.
3. Bolt
 - 25 Nm
4. Union Nut
 - 38 Nm
5. Pressure Line

CAUTION: • Insert the pressure line completely when installing.

- Observe installation position: The angle between the line connection and power steering pump axle is approximately 72°
- 6. Seal
 - Always replace if removed.
- 7. Intake Hose
 - The marking "P" on the suction hose -arrow- must align with the formed seam -arrow- on the power steering pump.
- 8. Clamp
 - Tension using hose clamp pliers V.A.G 1275
 - Always replace if removed.
- 9. Power Steering Pump
 -
 - fill with hydraulic oil before installation
 - Checking delivery pressure, refer to **POWER STEERING PUMP DELIVERY PRESSURE, CHECKING**
 - Removing and installing, refer to **Removing**
 - Bleed the steering, refer to **STEERING, BLEEDING AFTER REPLACING**.
 - Check hydraulic fluid level, refer to **POWER STEERING FLUID LEVEL, CHECKING**.
 - Steering system, checking for leaks, refer to **STEERING, CHECKING FOR LEAKS**
- 10. Bolt
 - 25 Nm

Removing**Special tools and workshop equipment required**

- Hose Clamps Up to 25 mm Dia. 3094
- Hose Clamp Pliers V.A.G 1275
- Torque Wrench 5-50 Nm V.A.G 1331
- Tool Insert, AF 17 V.A.G 1331/6
- Used Oil Collection and Extraction Device V.A.G 1782
- Drip Tray for VAS 6100 VAS 6208
- Spanner Wrench 3212
- Engine Bung Set VAS 6122

General Information

Vane pump is not designed to be serviced. If there are customer complaints, the cause must be determined using

a pressure and leak test. If there is a malfunction, replace the vane pump.

- If power steering fluid is low in reservoir, check steering system for leaks.
- If there are leaks in the area of the line connections, the lines/connections must first be inspected for leaks, tightened as necessary and wiped dry.
- Power steering pump is delivered without oil. Therefore, hydraulic oil must be filled before installation and turned by hand. Otherwise, noises when driving or damage to power steering pump may occur.

-- Place the vehicle on a hoist.

-- Remove the engine cover upward.

NOTE: Identify direction of travel before removing ribbed belt. Reversed direction of travel with a used belt can lead to malfunctions. When installing ribbed belt, make sure it is seated correctly on pulleys.

-- Remove the ribbed belt. Refer to Removal and Installation .

-- Remove the ribbed belt from the power steering pump belt pulley.

-- Extract hydraulic oil from reservoir using V.A.G 1782.

-- Clamp off the suction hose -1- and return hose -2- using the 3094.

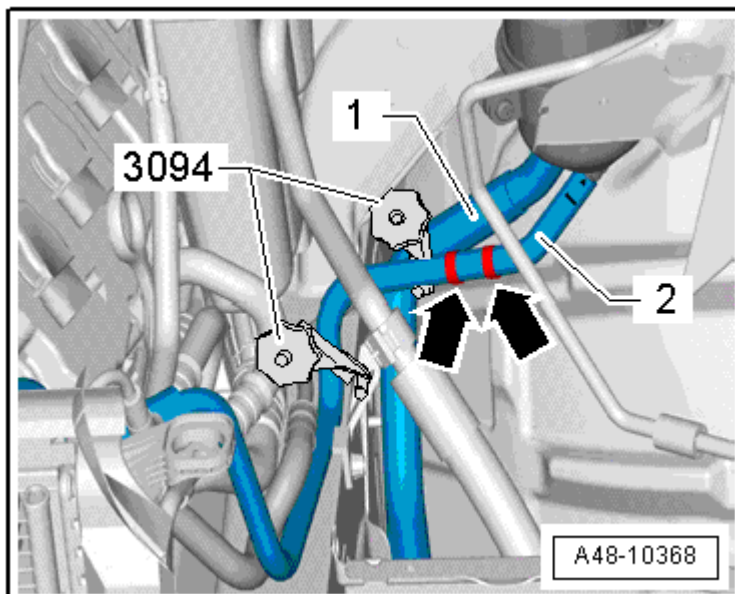


Fig. 185: Locating Suction & Return Hose Clamping Location
Courtesy of AUDI OF AMERICA, LLC

CAUTION: • The 3094 must not be secured on the return hose -2- in the check

valve area. Otherwise, check valve will be damaged.

- The check valve is located in the return hose -2- between the hose clamps -arrows-.

- Remove noise insulation. Refer to Description and Operation .
- Place the VAS 6208 under the power steering pump.
- Mark the position of the belt pulley to the hub. Make a marking -arrow-.

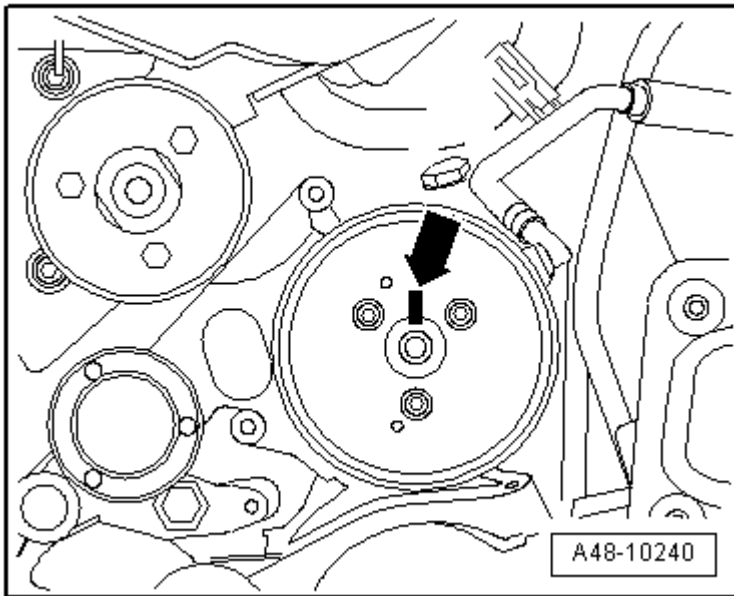


Fig. 186: Identifying Belt Pulley To Hub Marking
Courtesy of AUDI OF AMERICA, LLC

NOTE: If the power steering pump will be replaced, transfer the marking from the hub on the old pump to the new one.

Because of space restrictions, it is not possible to see the position of the belt pulley holes to the holes in the hub when installing.

- First loosen the belt pulley bolts (only possible on 2 of the 3 bolts because of restricted space). Use the 3212 as a counter hold tool if necessary.

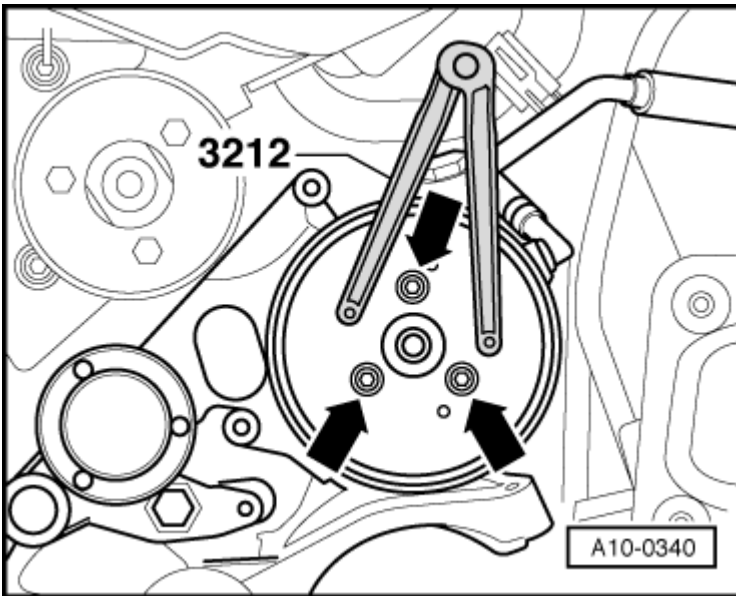


Fig. 187: Identifying Pulley Bolts

Courtesy of AUDI OF AMERICA, LLC

- Turn the power steering pump belt pulley so that the third bolt can be loosened.
- Remove the bolt and remove the belt pulley.
- Open the hose clamps -arrows- and remove the air guide hose.

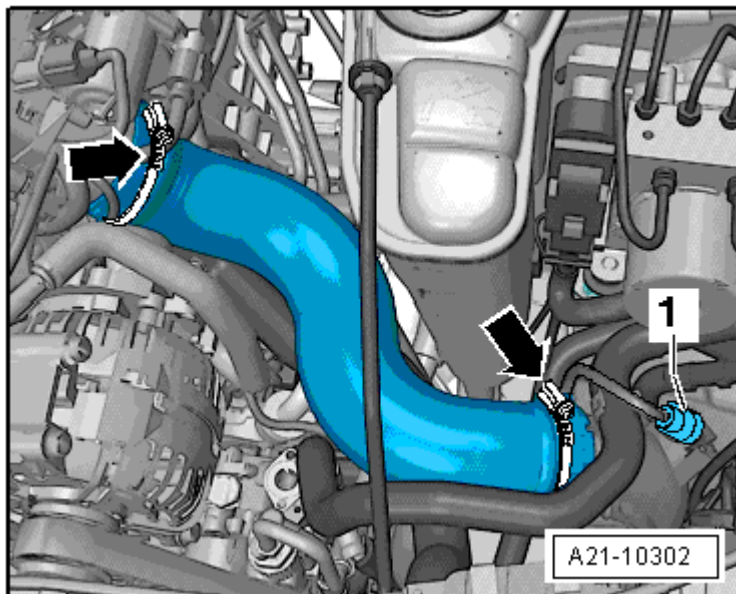


Fig. 188: Loosen Hose Clamps

Courtesy of AUDI OF AMERICA, LLC

Applies to Hot Climate Vehicles

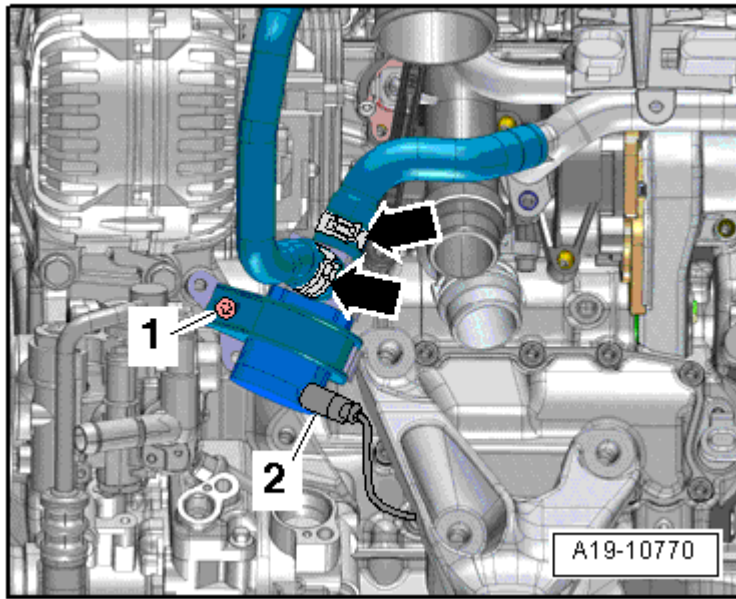


Fig. 189: Identifying After-Run Coolant Pump Electrical Connector
Courtesy of AUDI OF AMERICA, LLC

- Disconnect electrical connector -2-.
- Remove the bolt -1- and move the after-run coolant pump -V51- to the side.
- Carefully cut through the cable ties -1- for the wiring harness -2- if applicable.

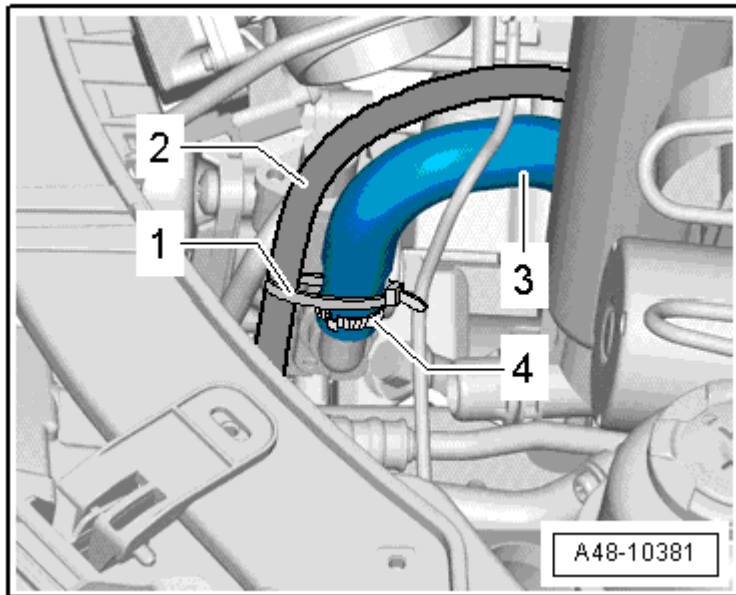


Fig. 190: Identifying Intake & Suction Hose
Courtesy of AUDI OF AMERICA, LLC

- Remove the clamp -4- from the intake hose -3-. Remove the suction hose -3-.

- Lay several cloths under the power steering pump and pressure line.
- Remove the union nut -1- and pull the pressure line out of the power steering pump.

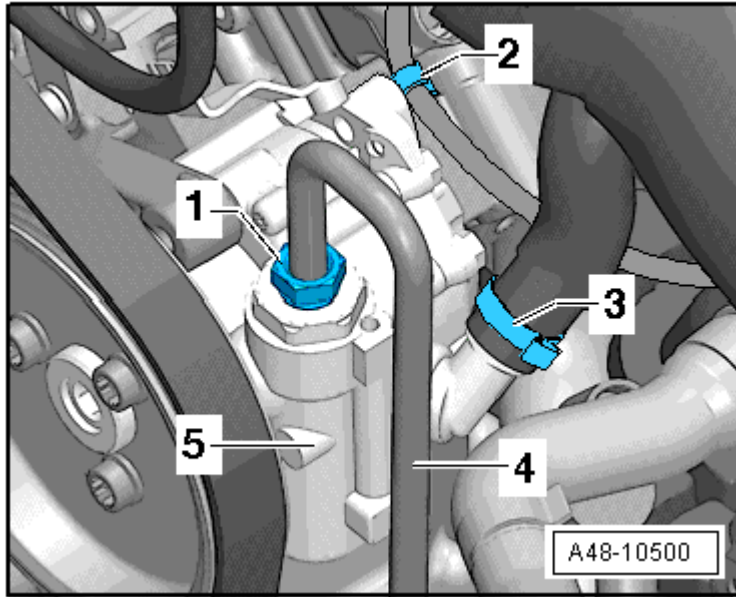


Fig. 191: Identifying Power Steering Pump Pressure Line
Courtesy of AUDI OF AMERICA, LLC

- Seal the power steering pump and line connections using clean sealing plugs.
- Remove the two bolts -1- for mounting the power steering pump from the front.

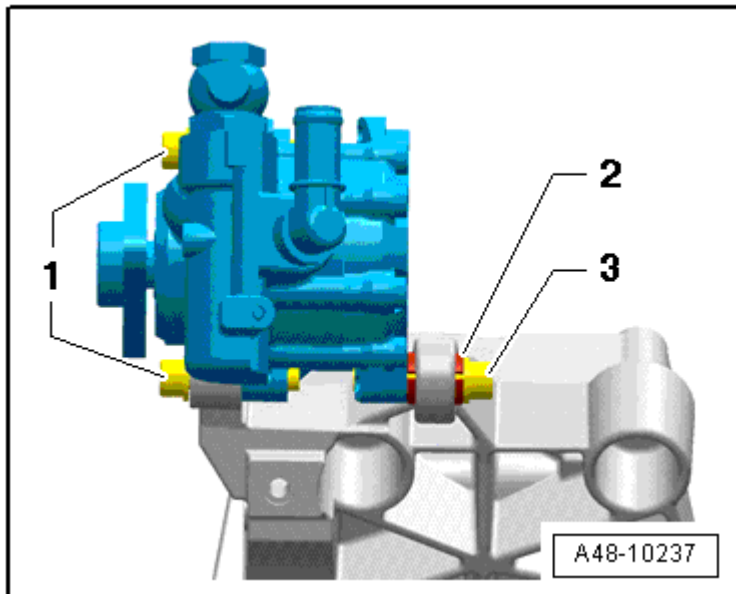


Fig. 192: Identifying Power Steering Pump
Courtesy of AUDI OF AMERICA, LLC

- Drive the sleeve -2- for the bolt -3- in the bracket back slightly to install the power steering pump.
- Remove the power steering pump.

Installing

Install in reverse order of removal. Note the following:

Tightening specifications, refer to **POWER STEERING PUMP, VEHICLES WITH DYNAMIC STEERING**

NOTE: Replace seals and gaskets.

Before installing the new power steering pump on the intake side, fill the hydraulic oil and install it by hand until oil drains out on the high pressure side.

Secure all hose connections with new hose clamps.

- Note the installation position of the intake hose on the power steering pump.
- Note the installation dimension of the clamp. Dimension -a- must be 4 mm.

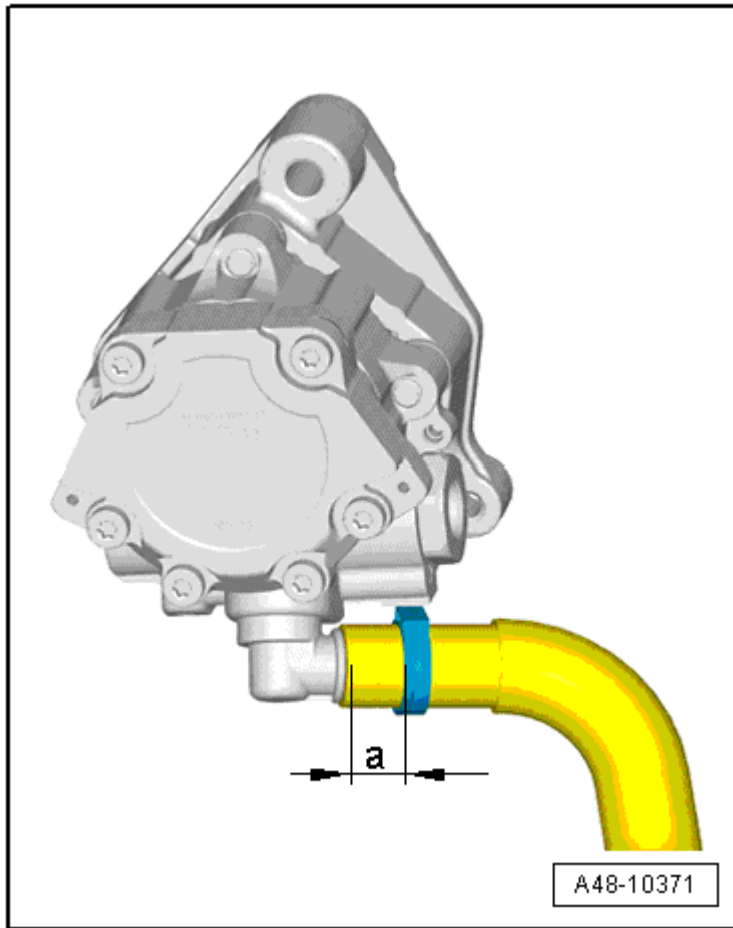


Fig. 193: Power Steering Pump Intake Hose Installation Dimension
Courtesy of AUDI OF AMERICA, LLC

- Turn the hub by hand until oil runs out of the pressure side.
- Insert the power steering pump in the bracket.

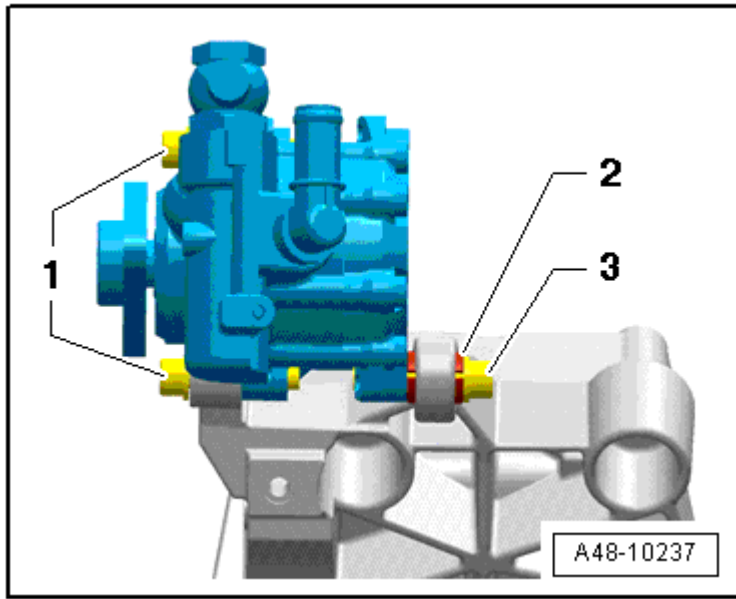


Fig. 194: Identifying Power Steering Pump
 Courtesy of AUDI OF AMERICA, LLC

- The sleeve -2- is driven back slightly.
- First install the front bolts -1- (quantity: 3) loosely.
- Then install the rear bolt -3- loosely.
- First tighten the bolts -1- and then the bolt -2-.
- Press the pressure line into the power steering pump as far as the stop. Then tighten the union nut -1-.

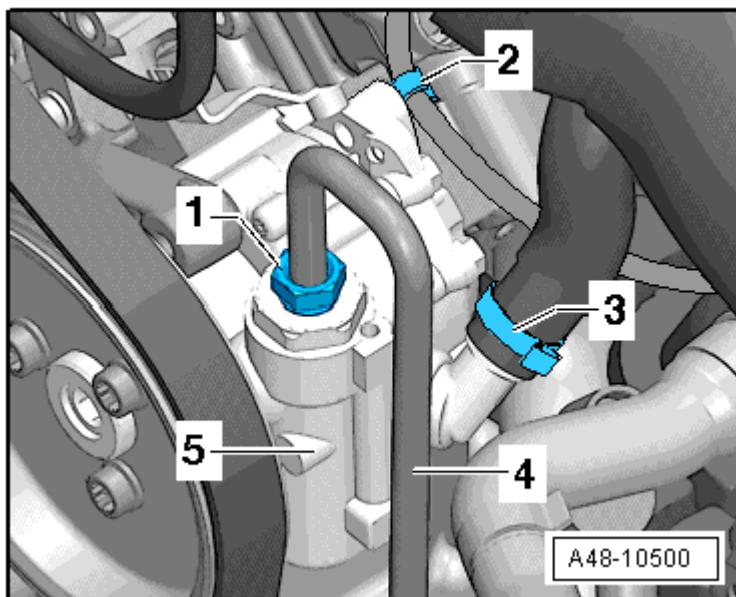


Fig. 195: Identifying Power Steering Pump Pressure Line

Courtesy of AUDI OF AMERICA, LLC

NOTE: When installing the pressure line -4- make sure the angle between the line connection and the steering pump axle is approximately 72°.

-- Attach the suction hose to the connection and install the new clamp -3-.

-- Align the marking -arrow- made on the belt pulley to the marking made on the hub.

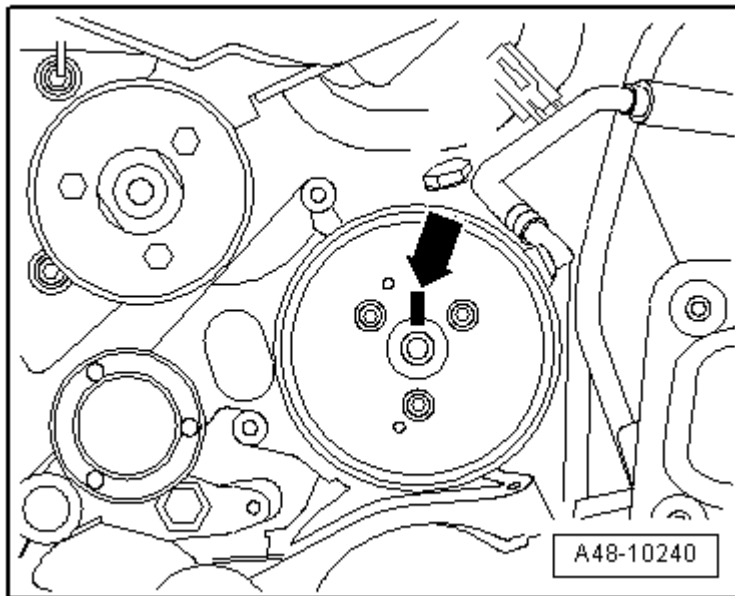


Fig. 196: Identifying Belt Pulley To Hub Marking

Courtesy of AUDI OF AMERICA, LLC

-- Tighten the belt pulley bolts -arrows-.

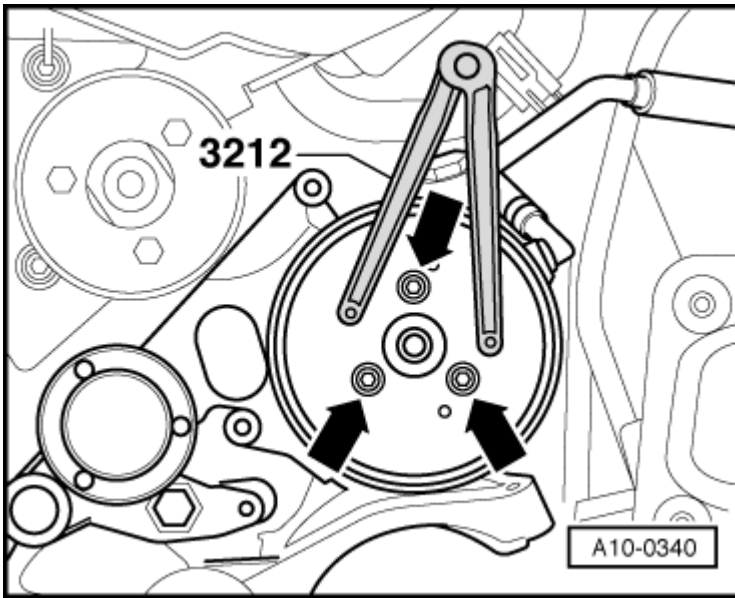


Fig. 197: Identifying Pulley Bolts

Courtesy of AUDI OF AMERICA, LLC

-- Clean oiled places in engine compartment.

Install power steering pump ribbed belt. Refer to **Removal and Installation** .

-- Check power steering fluid level. Refer to **POWER STEERING FLUID LEVEL, CHECKING**.

-- Bleed the steering. Refer to **STEERING, BLEEDING AFTER REPLACING**.

-- Check the steering for leaks. Refer to **STEERING, CHECKING FOR LEAKS**.

-- Install noise insulation. Refer to **Description and Operation** .

-- Install ribbed belt and check alignment of ribbed belt. Refer to **Removal and Installation** .

NOTE: **When installing the ribbed belt, ensure it is correctly seated in ribbed belt pulley.**

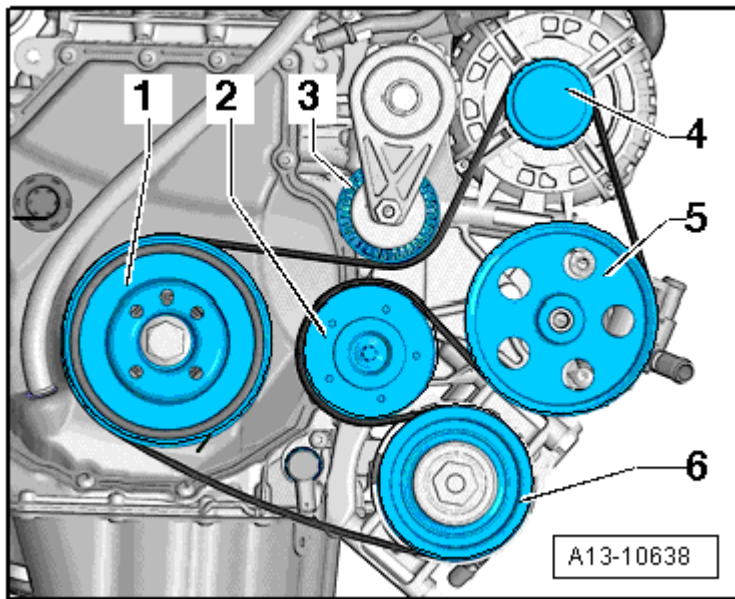


Fig. 198: Ribbed Belt Routing

Courtesy of AUDI OF AMERICA, LLC

1. Vibration damper
2. Idler pulley
3. Tensioning element for the ribbed belt
4. Generator
5. Power Steering Pump
6. Air Conditioning (A/C) Compressor

-- Start the engine and check the ribbed belt travel.

POWER STEERING PUMP, WITHOUT DYNAMIC STEERING (4-CYLINDER TFSI)

Power steering pump, removing and installing, vehicles with 4-cylinder TFSI engine and vehicles without dynamic steering **Removing**.

Power Steering Pump, without Dynamic Steering Overview

- NOTE:**
- Always replace seals.**
 - Do not reuse fluid you have drained.**
 - Only use hydraulic oil.**

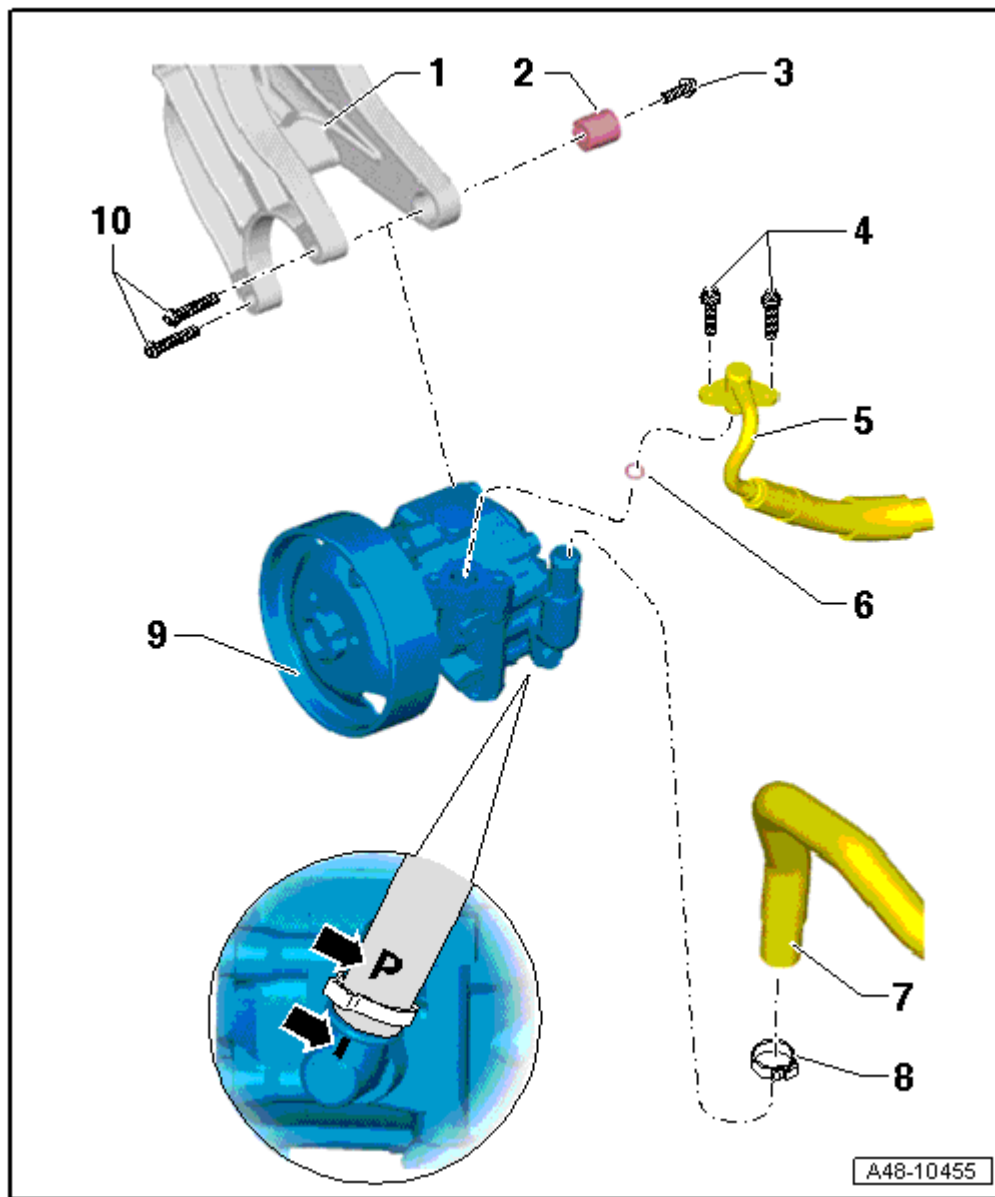


Fig. 199: Power Steering Pump, Without Dynamic Steering (4-Cylinder TFSI)
 Courtesy of AUDI OF AMERICA, LLC

1. Bracket
2. Sleeve
 - Drive the sleeve back slightly to install the power steering pump.
3. Bolt
 - 25 Nm
4. Bolt
 - 9 Nm
5. Pressure Line

CAUTION: • Insert the pressure line completely when installing.

6. Seal

- Always replace if removed.

7. Intake Hose

- The marking "P" on the suction hose -arrow- must align with the formed seam -arrow- on the power steering pump.

8. Clamp

- Tension using hose clamp pliers V.A.G 1275
- Always replace if removed.

9. Power Steering Pump

-
- Fill with hydraulic oil before installation
- Checking delivery pressure, refer to **POWER STEERING PUMP DELIVERY PRESSURE, CHECKING**
- Removing and installing, refer to **Removing**
- Bleed the steering. Refer to **STEERING, BLEEDING AFTER REPLACING.**
- Check hydraulic fluid level. Refer to **POWER STEERING FLUID LEVEL, CHECKING.**
- Steering system, checking for leaks, refer to **STEERING, CHECKING FOR LEAKS**

10. Bolt

- 25 Nm

Removing

Special tools and workshop equipment required

- Hose Clamps Up to 25 mm Dia. 3094
- Hose Clamp Pliers V.A.G 1275
- Torque Wrench 5-50 Nm V.A.G 1331
- Tool Insert, AF 17 V.A.G 1331/6
- Used Oil Collection and Extraction Device V.A.G 1782
- Drip Tray for VAS 6100 VAS 6208
- Spanner Wrench 3212
- Engine Bung Set VAS 6122

General Information

Vane pump is not designed to be serviced. If there are customer complaints, the cause must be determined using a pressure and leak test. If there is a malfunction, replace the vane pump.

- If power steering fluid is low in reservoir, check steering system for leaks.
- If there are leaks in the area of the line connections, the lines/connections must first be inspected for leaks, tightened as necessary and wiped dry.
- Power steering pump is delivered without oil. Therefore, hydraulic oil must be filled before installation and turned by hand. Otherwise, noises when driving or damage to power steering pump may occur.

-- Place the vehicle on a hoist.

-- Remove the engine cover upward.

NOTE: Identify direction of travel before removing ribbed belt. Reversed direction of travel with a used belt can lead to malfunctions. When installing ribbed belt, make sure it is seated correctly on pulleys.

-- Remove the ribbed belt. Refer to Removal and Installation .

-- Remove the ribbed belt from the power steering pump belt pulley.

-- Extract hydraulic oil from reservoir using V.A.G 1782.

-- Clamp off the suction hose -1- and return hose -2- using the 3094.

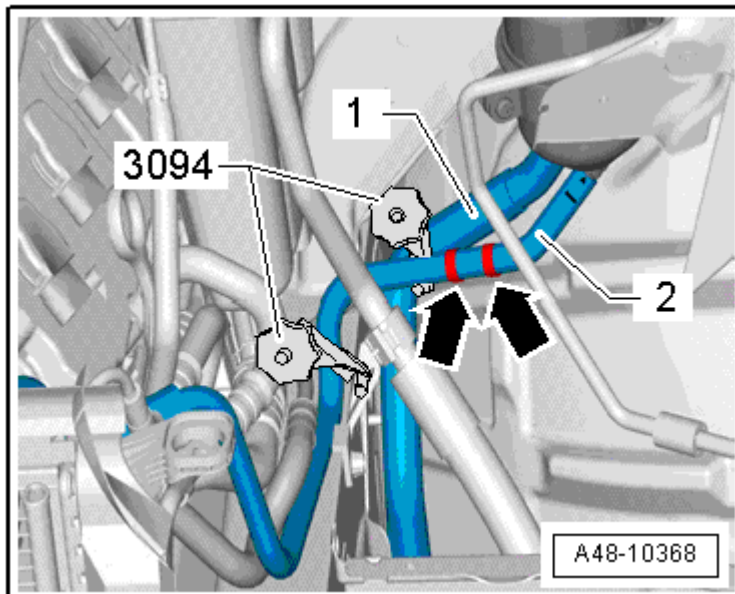


Fig. 200: Locating Suction & Return Hose Clamping Location
Courtesy of AUDI OF AMERICA, LLC

CAUTION:

- The 3094 must not be secured on the return hose -2- in the check valve area. Otherwise, check valve will be damaged.
- The check valve is located in the return hose -2- between the hose

clamps -arrows-.

- Remove noise insulation. Refer to **Description and Operation** .
- Place the VAS 6208 under the power steering pump.
- Open the hose clamps -arrows- and remove the air guide hose.

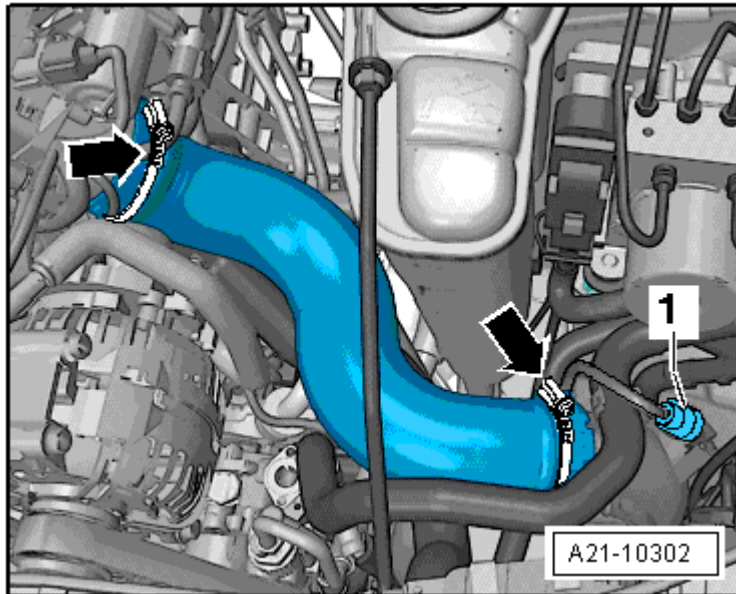


Fig. 201: Loosen Hose Clamps
Courtesy of AUDI OF AMERICA, LLC

Applies to Hot Climate Vehicles

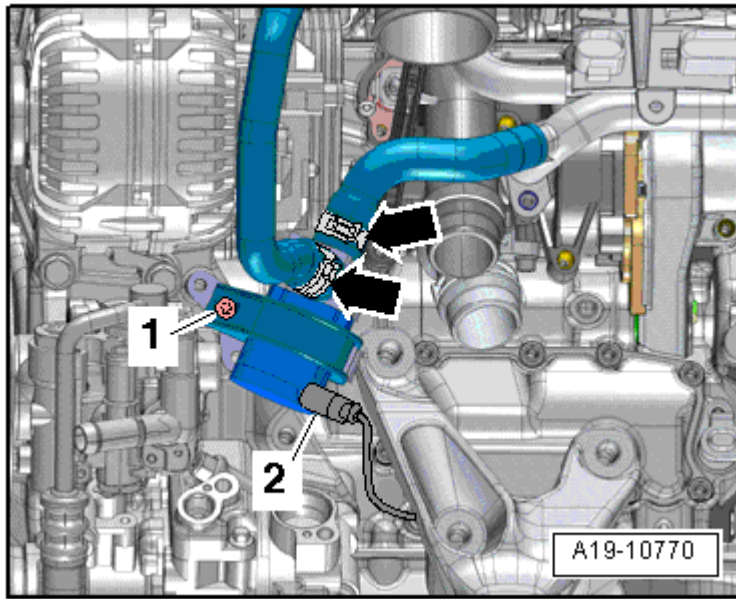


Fig. 202: Identifying After-Run Coolant Pump Electrical Connector
Courtesy of AUDI OF AMERICA, LLC

- Disconnect electrical connector -2-.
- Remove the bolt -1- and move the after-run coolant pump -V51- to the side.
- Carefully cut through the cable ties -1- for the wiring harness -2- if applicable.

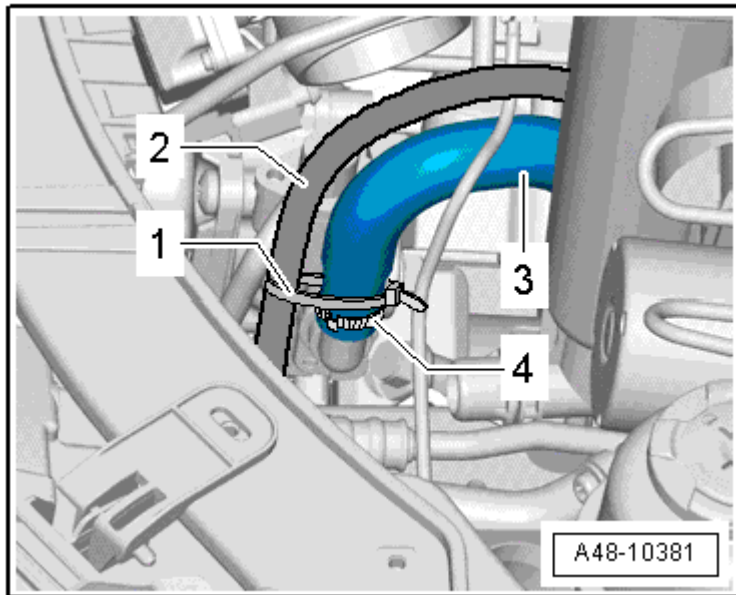


Fig. 203: Identifying Intake & Suction Hose
Courtesy of AUDI OF AMERICA, LLC

- Remove the clamp -4- from the intake hose -3-. Remove the suction hose -3-.

- Lay several cloths under the power steering pump and pressure line.
- Remove the bolts -1- and pull the pressure line -2- out of the power steering pump.

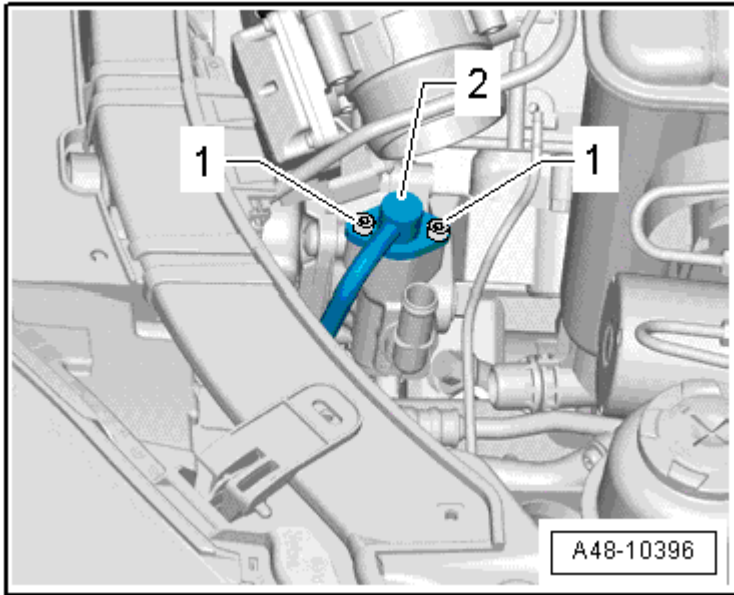


Fig. 204: Power Steering Pump Pressure Line
Courtesy of AUDI OF AMERICA, LLC

- Seal the power steering pump and line connections using clean sealing plugs.
- Remove the two bolts -1- for the power steering pump mounting from the front and through the belt pulley.

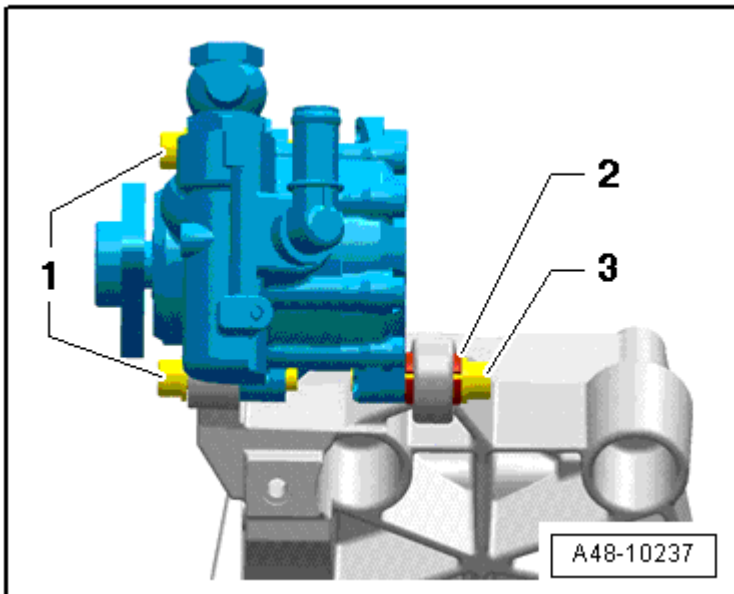


Fig. 205: Identifying Power Steering Pump
Courtesy of AUDI OF AMERICA, LLC

NOTE: **The illustration shows the power steering pump without belt pulley.**

-- Drive the sleeve -2- for the bolt -3- in the bracket back slightly to install the power steering pump.

-- Remove the power steering pump.

Installing

Install in reverse order of removal. Note the following:

Tightening specifications, refer to **VEHICLES WITHOUT DYNAMIC STEERING OVERVIEW**

NOTE: **Replace seals and gaskets.**

Before installing the new power steering pump on the intake side, fill the hydraulic oil and install it by hand until oil drains out on the high pressure side.

Secure all hose connections with new hose clamps,

-- Note the installation position of the intake hose on the power steering pump.

-- Note the installation dimension of the clamp. Dimension -a- must be 4 mm.

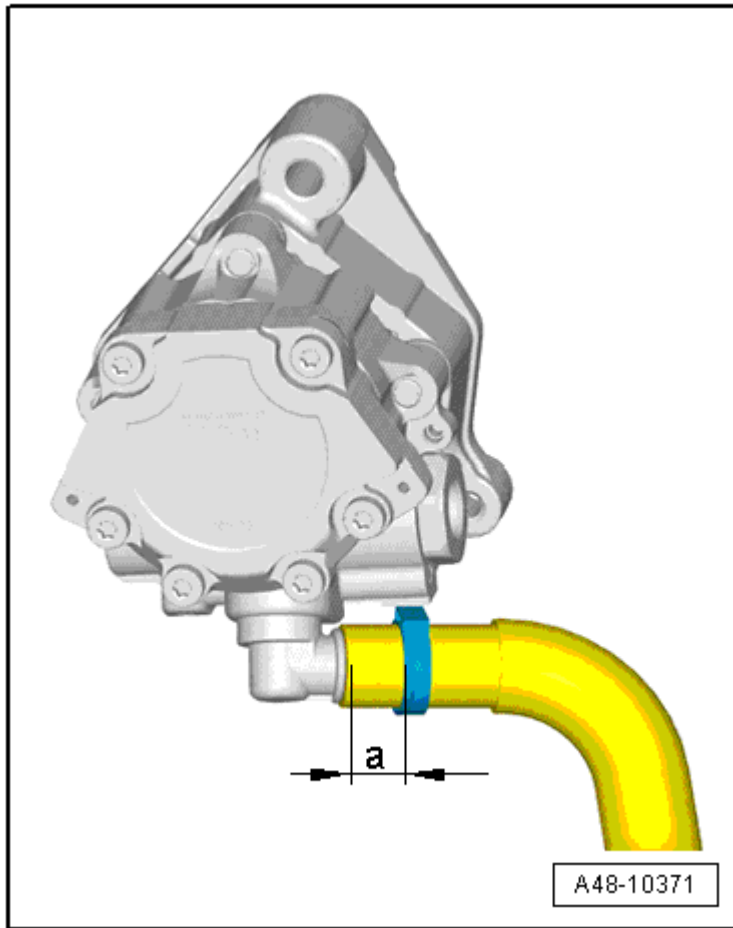


Fig. 206: Power Steering Pump Intake Hose Installation Dimension
Courtesy of AUDI OF AMERICA, LLC

- Turn the hub by hand until oil runs out of the pressure side.
- Insert the power steering pump in the bracket.

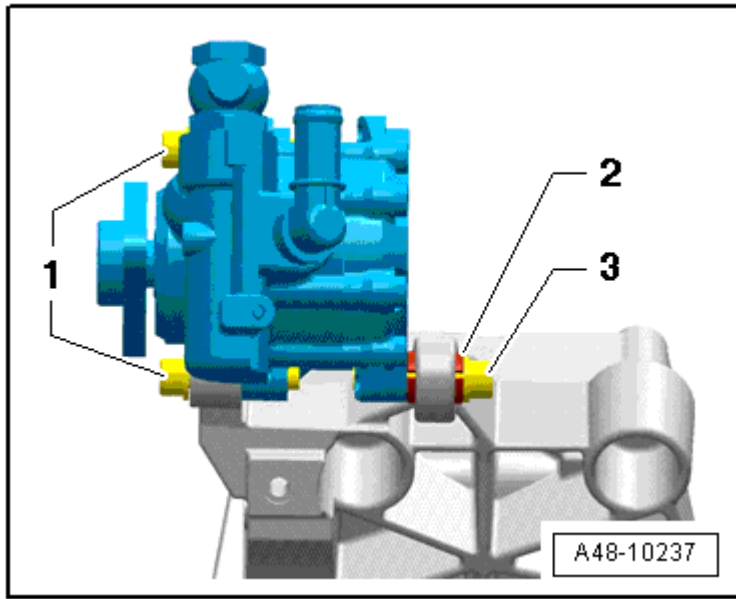


Fig. 207: Identifying Power Steering Pump
Courtesy of AUDI OF AMERICA, LLC

- The sleeve -2- is driven back slightly.
- First install the front bolts -1- (quantity: 3) loosely.
- Then install the rear bolt -3- loosely.
- First tighten the bolts -1- and then the bolt -2-.
- Insert the pressure line -2- into the power steering pump as far as the stop and tighten the bolts -1-.

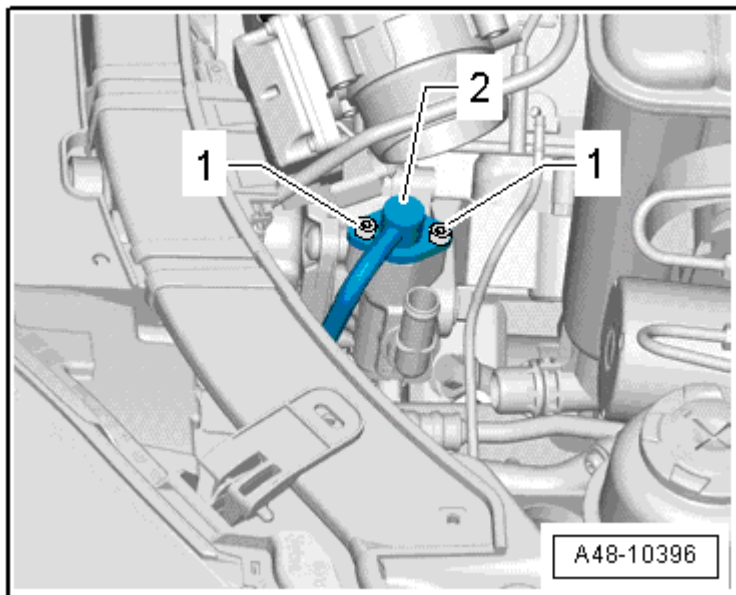


Fig. 208: Power Steering Pump Pressure Line

Courtesy of AUDI OF AMERICA, LLC

-- Clean oiled places in engine compartment.

Install power steering pump ribbed belt. Refer to **Removal and Installation** .

-- Check power steering fluid level. Refer to **POWER STEERING FLUID LEVEL, CHECKING**.

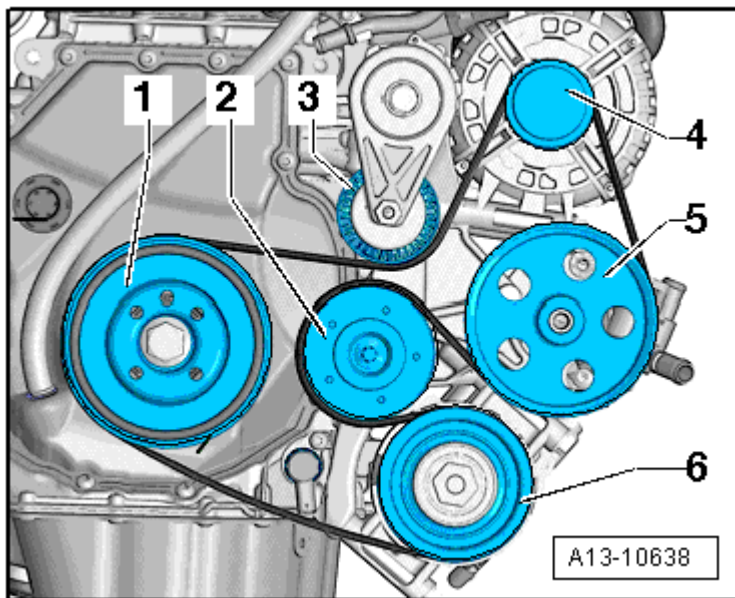
-- Bleed the steering. Refer to **STEERING, BLEEDING AFTER REPLACING**.

-- Check the steering for leaks. Refer to **STEERING, CHECKING FOR LEAKS**.

-- Install noise insulation. Refer to **Description and Operation** .

-- Install ribbed belt and check alignment of ribbed belt. Refer to **Removal and Installation** .

NOTE: When installing ribbed belt, ensure it is correctly seated in ribbed belt pulley.

**Fig. 209: Ribbed Belt Routing**

Courtesy of AUDI OF AMERICA, LLC

1. Vibration damper
2. Idler pulley
3. Tensioning element for the ribbed belt
4. Generator
5. Power Steering Pump
6. A/C Compressor

-- Start the engine and check the ribbed belt travel.

6-CYLINDER FSI

POWER STEERING PUMP, VEHICLES WITH DYNAMIC STEERING (6-CYLINDER FSI)

Power Steering Pump Overview

- NOTE:** **Always replace seals.**
- Do not reuse fluid you have drained.**
- Only use hydraulic oil.**

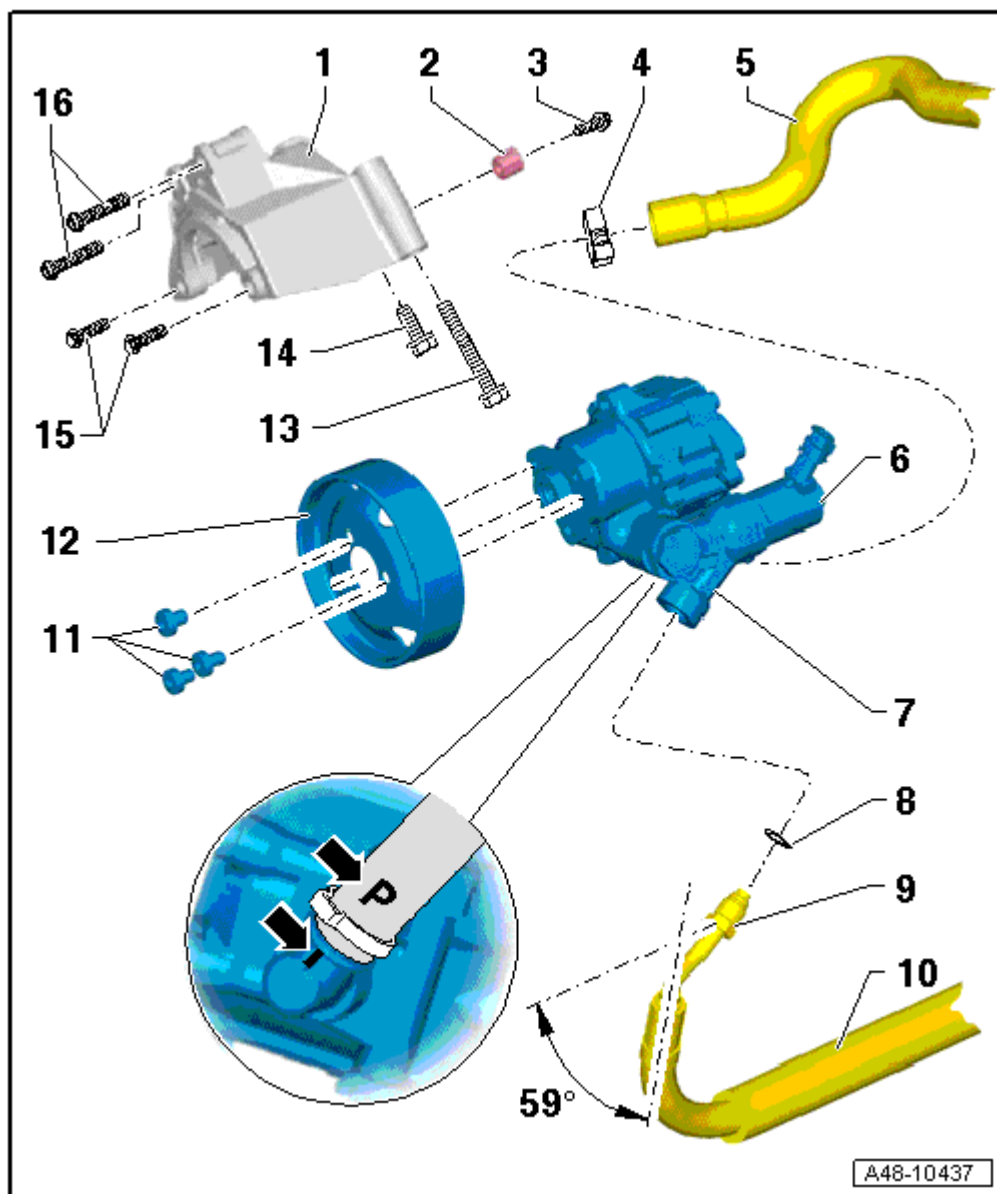


Fig. 210: Power Steering Pump, Vehicles With Dynamic Steering (6-Cylinder FSI)

Courtesy of AUDI OF AMERICA, LLC

1. Bracket
2. Sleeve
 - Drive the sleeve back slightly to install the power steering pump.
3. Bolt
 - 20 Nm
4. Clamp
 - Tension using hose clamp pliers V.A.G 1275
 - Always replace if removed.
5. Intake Hose
 - The marking "P" on the suction hose -arrow- must align with the formed seam -arrow- on the power steering pump.
6. Power Steering Pump Control Valve -V119-
 - The power steering pump and the control valve are one component and can only be replaced together.
7. Steering Hydraulic Pump -V119-
 - With power steering pump control valve --
 - The power steering pump and the control valve, see item 6, are one component and can only be replaced together.
 -
 - Fill with hydraulic oil before installation
 - Checking delivery pressure, refer to **POWER STEERING PUMP DELIVERY PRESSURE, CHECKING**
 - Bleed the steering, refer to **STEERING, BLEEDING AFTER REPLACING**.
 - Check hydraulic fluid level, refer to **POWER STEERING FLUID LEVEL, CHECKING**.
 - Steering system, checking for leaks, refer to **STEERING, CHECKING FOR LEAKS**
8. Seal
 - Always replace if removed.
9. Union Nut
 - 38 Nm
10. Pressure Line

CAUTION: • Insert the pressure line completely when installing.

- Note the installation position: The angle between the line connection and power steering pump axle is approximately 59°
- Depending on the version, also mounted to the A/C compressor

11. Bolt
 - 22 Nm
12. Belt Pulley
13. Bolt
 - 20 Nm
 - For securing the bracket to the engine.
 - Note the different bolt lengths.
14. Bolt
 - 20 Nm
 - For securing the bracket to the engine.
 - Note the different bolt lengths.
15. Bolt
 - 20 Nm
 - For securing the power steering pump to the bracket
16. Bolt
 - 20 Nm
 - For securing the bracket to the engine.

Removing

Special tools and workshop equipment required

- Hose Clamps Up to 25 mm Dia. 3094
- Hose Clamp Pliers V.A.G 1275
- Torque Wrench 5-50 Nm V.A.G 1331
- Tool Insert, AF 17 V.A.G 1331/6
- Used Oil Collection and Extraction Device V.A.G 1782
- Drip Tray for VAS 6100 VAS 6208
- Spanner Wrench 3212
- Engine Bung Set VAS 6122

General Information

Vane pump is not designed to be serviced. If there are customer complaints, the cause must be determined using a pressure and leak test. If there is a malfunction, replace the vane pump.

- If power steering fluid is low in reservoir, check steering system for leaks.
- If there are leaks in the area of the line connections, the lines/connections must first be inspected for leaks, tightened as necessary and wiped dry.
- Power steering pump is delivered without oil. Therefore, hydraulic oil must be filled before installation and turned by hand. Otherwise, noises when driving or damage to power steering pump may occur.

- Place the vehicle on a hoist.
- Remove the engine cover upward -arrows-.

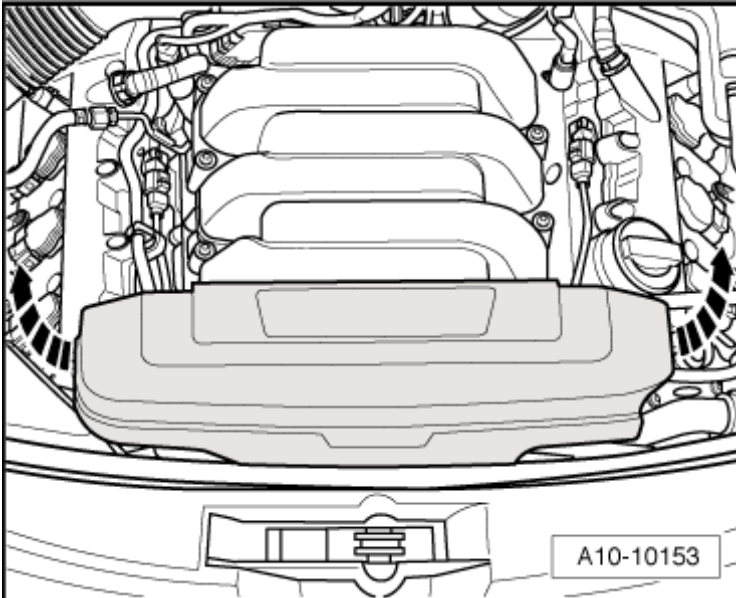


Fig. 211: Identifying Front Engine Cover
Courtesy of AUDI OF AMERICA, LLC

- Extract hydraulic oil from reservoir using V.A.G 1782.
- Clamp off the suction hose -1- and return hose -2- using the 3094.

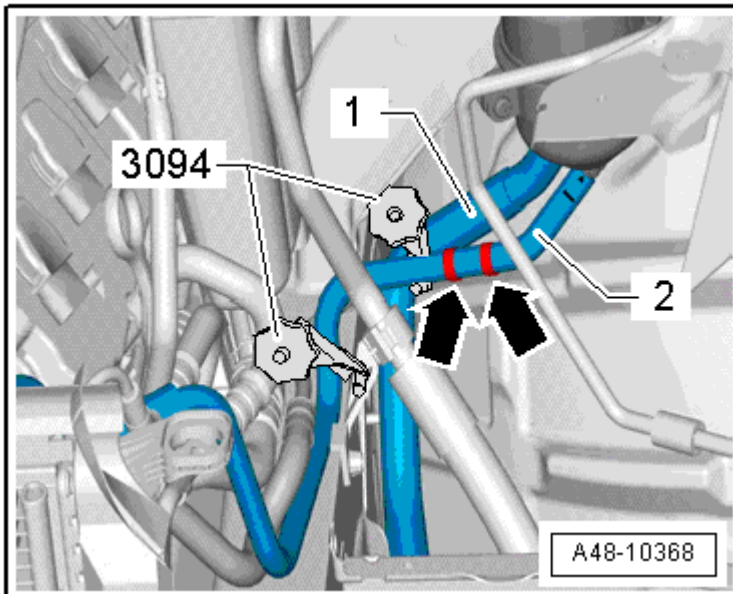


Fig. 212: Locating Suction & Return Hose Clamping Location
Courtesy of AUDI OF AMERICA, LLC

CAUTION:

- The 3094 must not be secured on the return hose -2- in the check valve area. Otherwise, check valve will be damaged.
- The check valve is located in the return hose -2- between the hose clamps -arrows-.

-- Remove noise insulation. Refer to Description and Operation .

-- Open the clamp -1- on the left longitudinal member and remove the coolant hose -2-.

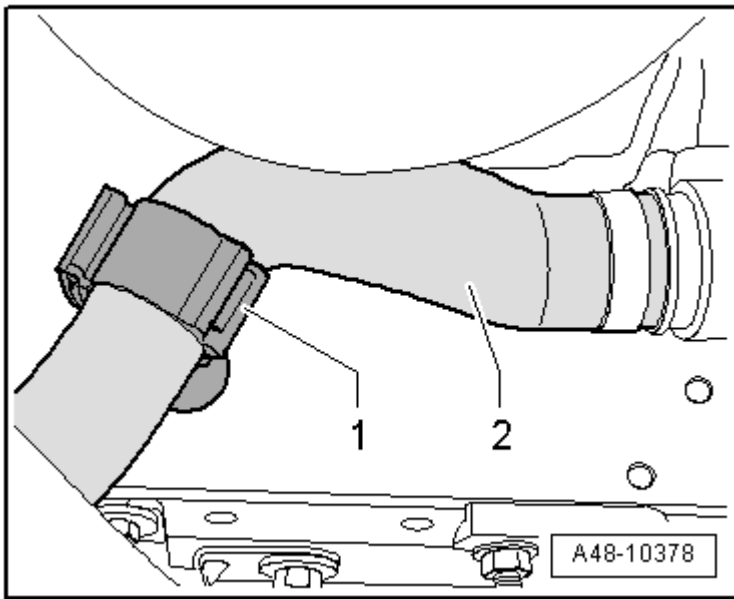


Fig. 213: Identifying Coolant Hose

Courtesy of AUDI OF AMERICA, LLC

-- Remove the nuts -1- and the coolant reservoir -2- with the lines attached.

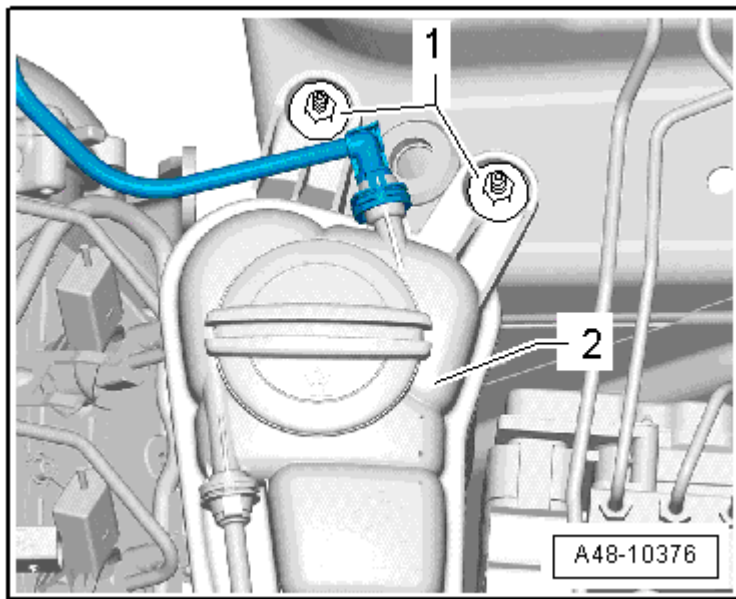


Fig. 214: Identifying Coolant Reservoir
Courtesy of AUDI OF AMERICA, LLC

-- Release and disconnect the connector on the coolant reservoir -2-.

NOTE: Identify direction of travel before removing ribbed belt. Reversed direction of travel with a used belt can lead to malfunctions. When installing ribbed belt, make sure it is seated correctly on pulleys.

-- Move the tensioner in the direction of the -arrow- to release the tension on the ribbed belt.

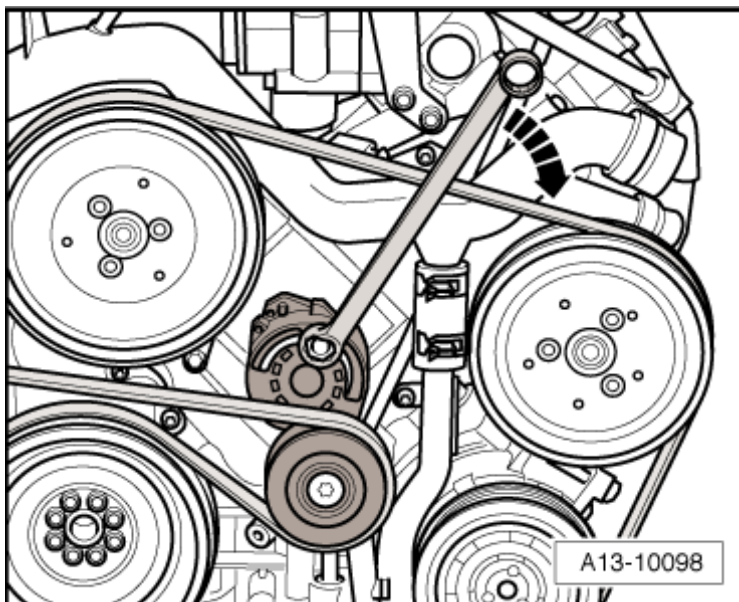


Fig. 215: Pivoting Tensioning Device To Relieve Tension On Ribbed Belt
Courtesy of AUDI OF AMERICA, LLC

- Remove the ribbed belt from the power steering pump belt pulley.
- Release the tensioner and remove the tool.
- Mark the position of the belt pulley to the hub. Make a marking -arrow-.

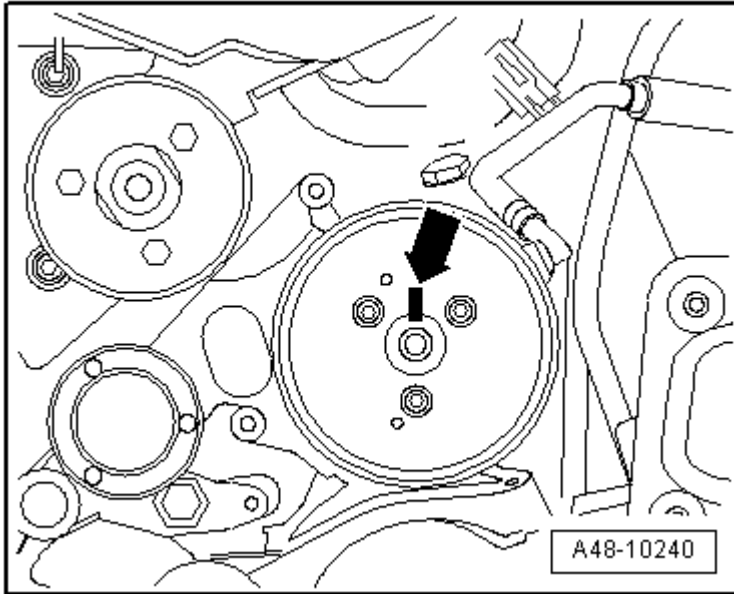


Fig. 216: Identifying Belt Pulley To Hub Marking
Courtesy of AUDI OF AMERICA, LLC

NOTE: If the power steering pump will be replaced, transfer the marking from the hub on the old pump to the new one.

Because of space restrictions, it is not possible to see the position of the belt pulley holes to the holes in the hub when installing.

- Remove bolts -arrows-. Use 3212 as counter hold.

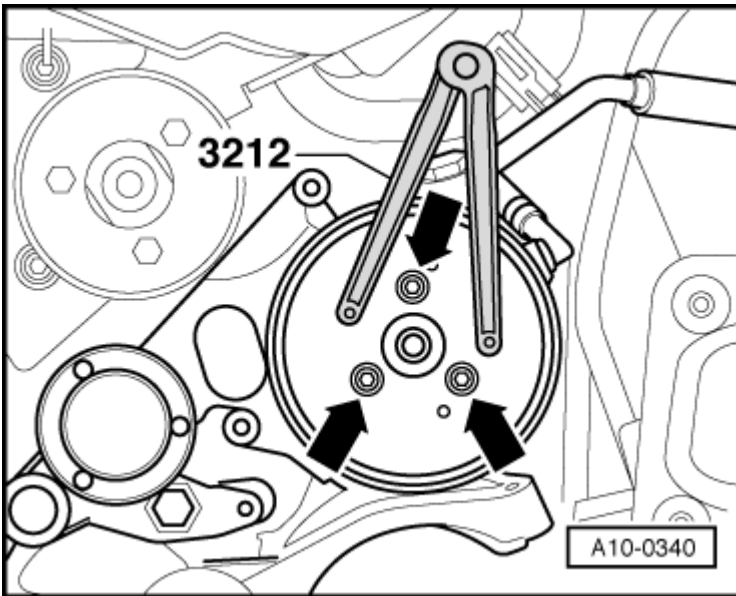


Fig. 217: Identifying Pulley Bolts

Courtesy of AUDI OF AMERICA, LLC

- Remove belt pulley for vane pump.
- Place the VAS 6208 under the power steering pump.
- Carefully cut through the cable ties -1- for the wiring harness -2-.

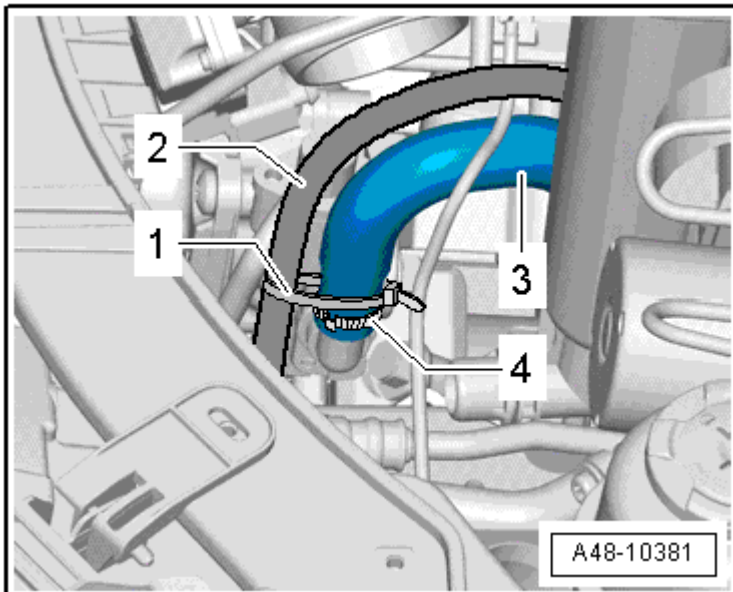


Fig. 218: Identifying Intake & Suction Hose

Courtesy of AUDI OF AMERICA, LLC

- Remove the clamp -4- from the intake hose -3-. Remove the suction hose -3-.

-- If the pressure line is also attached to the Air Conditioning (A/C) compressor, then remove the bolt -C- for the bracket -D-.

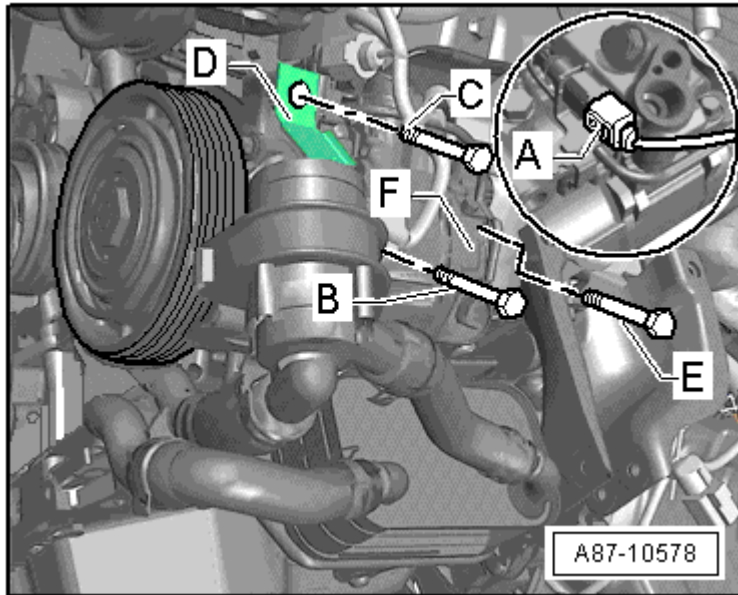


Fig. 219: Identifying A/C Compressor & Bolts
Courtesy of AUDI OF AMERICA, LLC

-- Remove the union nut -1- and pull the pressure line out of the power steering pump.

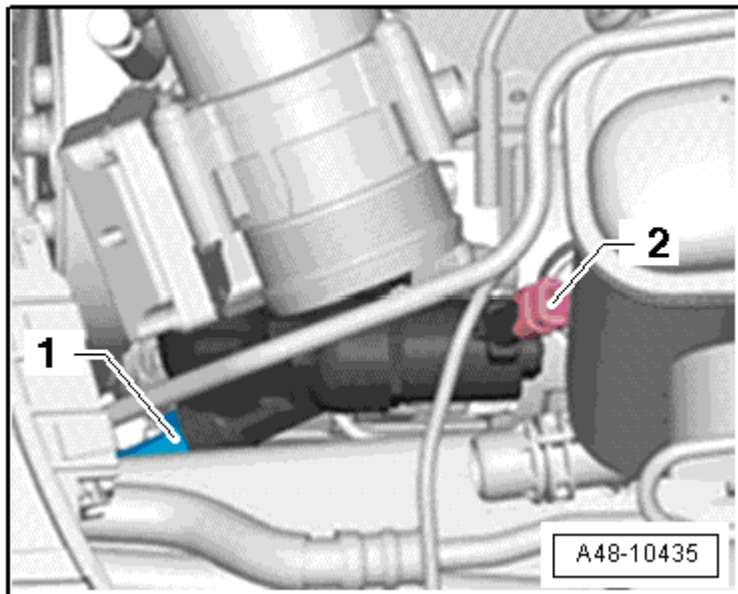


Fig. 220: Locating Union Nut & Connector
Courtesy of AUDI OF AMERICA, LLC

-- Release and disconnect the connector -2-.

- Seal the power steering pump and line connections using clean sealing plugs.
- Remove the power steering pump from the bracket. Remove the front bolts -1- and rear bolt -2-.

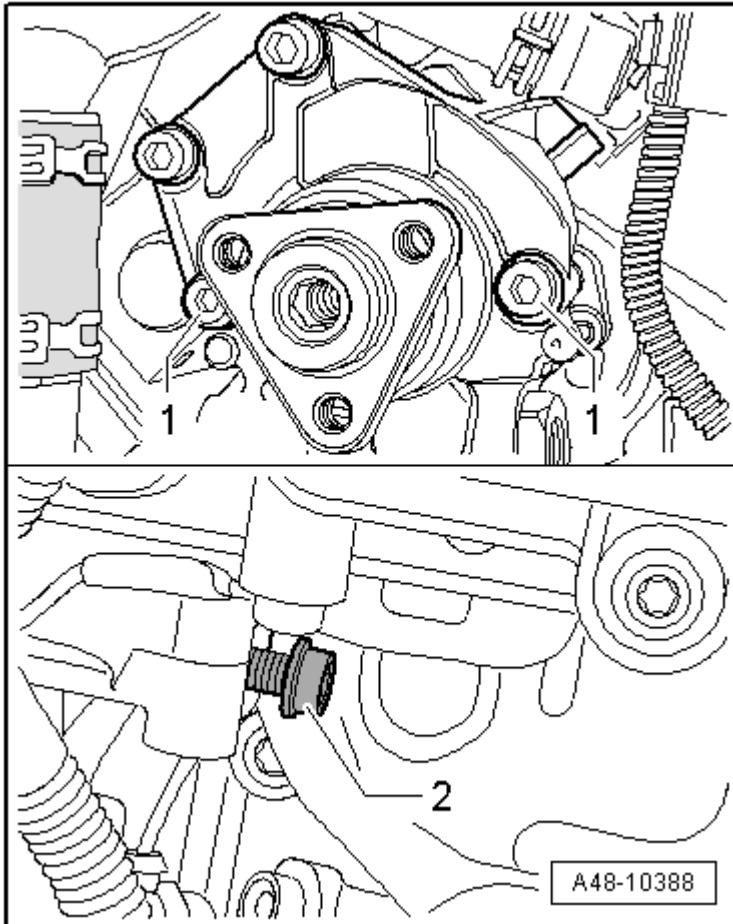


Fig. 221: Locating Power Steering Pump Bracket Bolts
Courtesy of AUDI OF AMERICA, LLC

NOTE: The bolt -2- cannot be seen in the bracket. The illustration shows it unscrewed.

- Remove the bolts -1- from the bracket -3-.

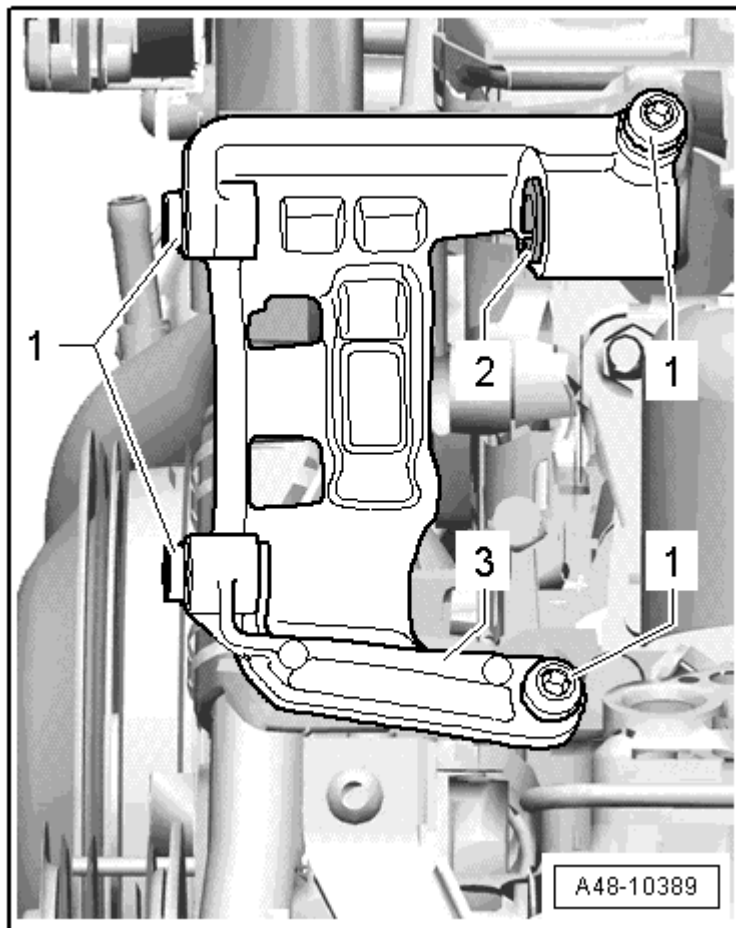


Fig. 222: Identifying Power Steering Bracket
Courtesy of AUDI OF AMERICA, LLC

-- Release and disconnect the connector -3-.

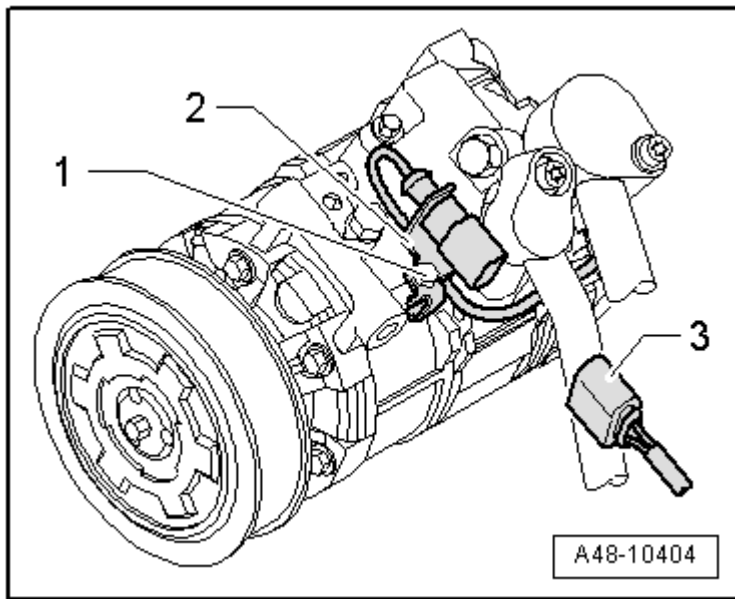


Fig. 223: Identifying Power Steering Pump Connector
Courtesy of AUDI OF AMERICA, LLC

-- Remove the bolt -1- and the bracket -2-.

-- Remove the bolt -3-.

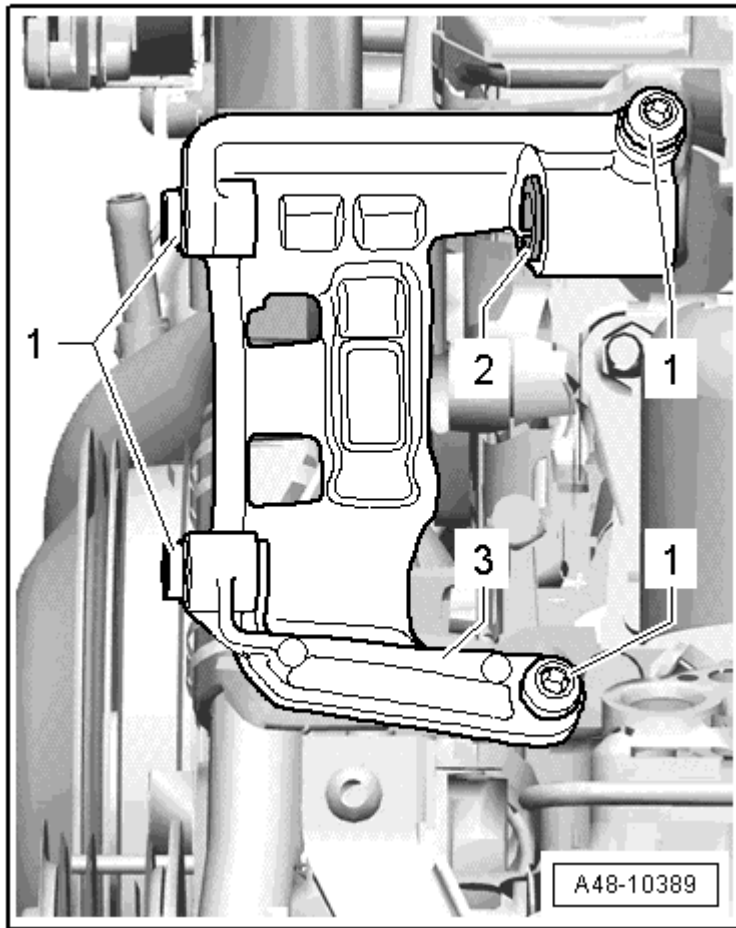


Fig. 224: Identifying Power Steering Bracket

Courtesy of AUDI OF AMERICA, LLC

-- Drive the sleeve -2- in the bracket back slightly to install the power steering pump.

-- Remove the power steering pump.

Installing

Install in reverse order of removal. Note the following:

Tightening specifications, refer to **POWER STEERING PUMP, VEHICLES WITH DYNAMIC STEERING**

Tightening specifications, refer to **Description and Operation**

NOTE: Replace seals and gaskets.

Before installing the new power steering pump on the intake side, fill the hydraulic oil and install it by hand until oil drains out on the high pressure side.

Secure all hose connections with new hose clamps.

- Insert the power steering pump with the bracket.
- Position the bracket -2- using the bolt -1-. Refer to **Removal and Installation** .

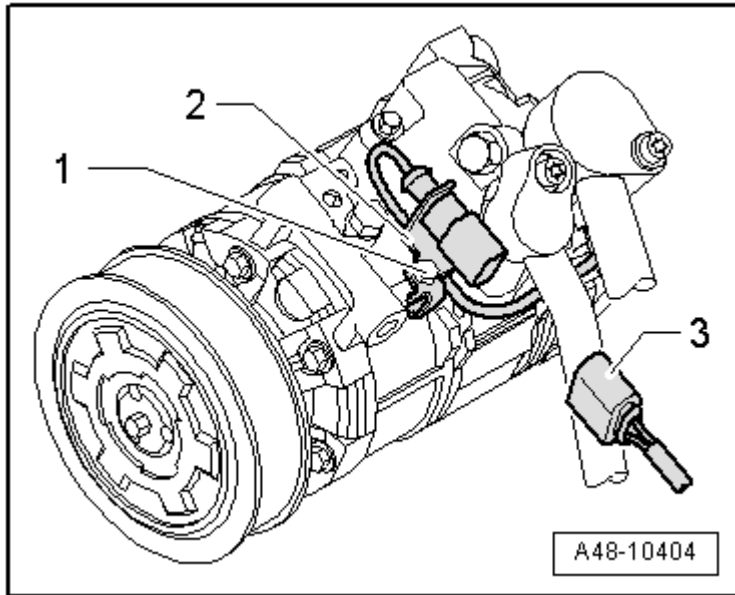


Fig. 225: Identifying Power Steering Pump Connector
Courtesy of AUDI OF AMERICA, LLC

- Connect the connector -3-.
- Note the installation dimension of the clamp. Dimension -a- must be 4 mm.

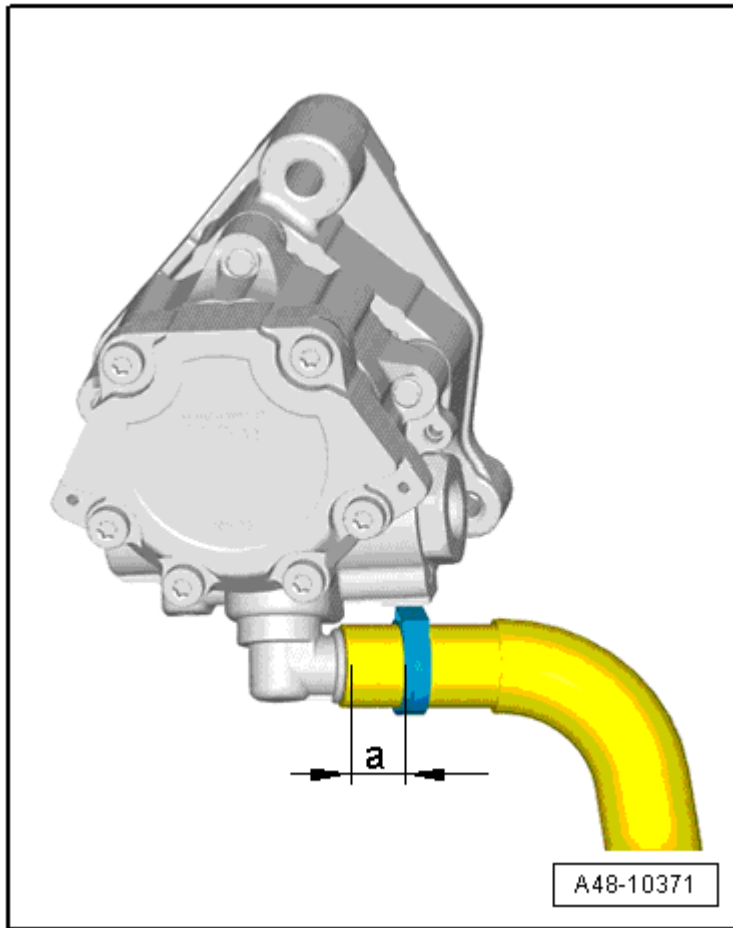


Fig. 226: Power Steering Pump Intake Hose Installation Dimension
Courtesy of AUDI OF AMERICA, LLC

-- Before installing the power steering pump, connect the intake hose -1- and align the marking -5- on the power steering pump with the "P" marking -3-.

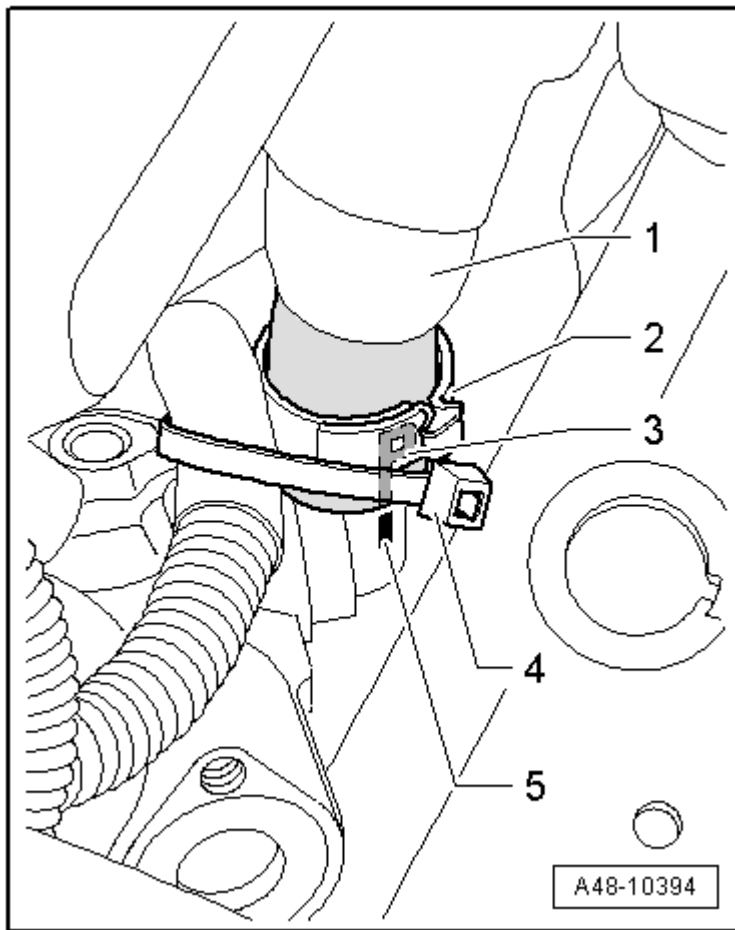


Fig. 227: Identifying Intake Hose

Courtesy of AUDI OF AMERICA, LLC

- Secure the suction hose -1- with the new clamp -2-.
- Secure the wiring harness on the supports using a new cable tie -4-.

NOTE: **The clamp -2- cannot be tightened using the V.A.G 1275 when the power steering pump is installed due to restricted space.**

- Attach the bracket -3- and tighten the bolts -1-.

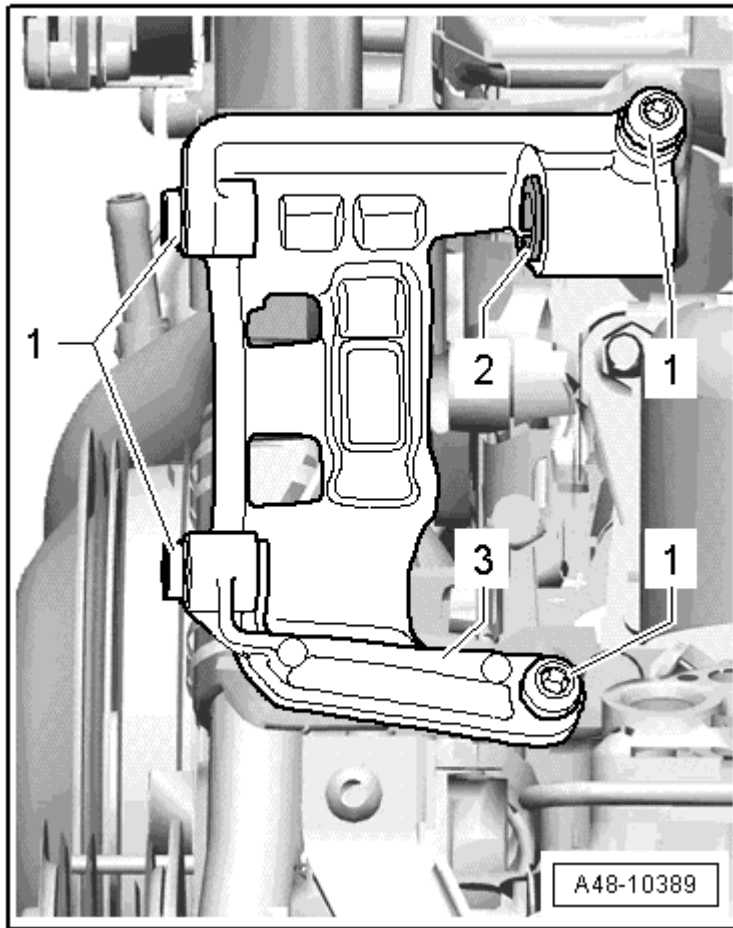


Fig. 228: Identifying Power Steering Bracket
Courtesy of AUDI OF AMERICA, LLC

- The sleeve -2- is driven back slightly.
- Turn the hub by hand until oil runs out of the pressure side.
- Insert the power steering pump in the bracket.
- First install the bolts -1- loosely.

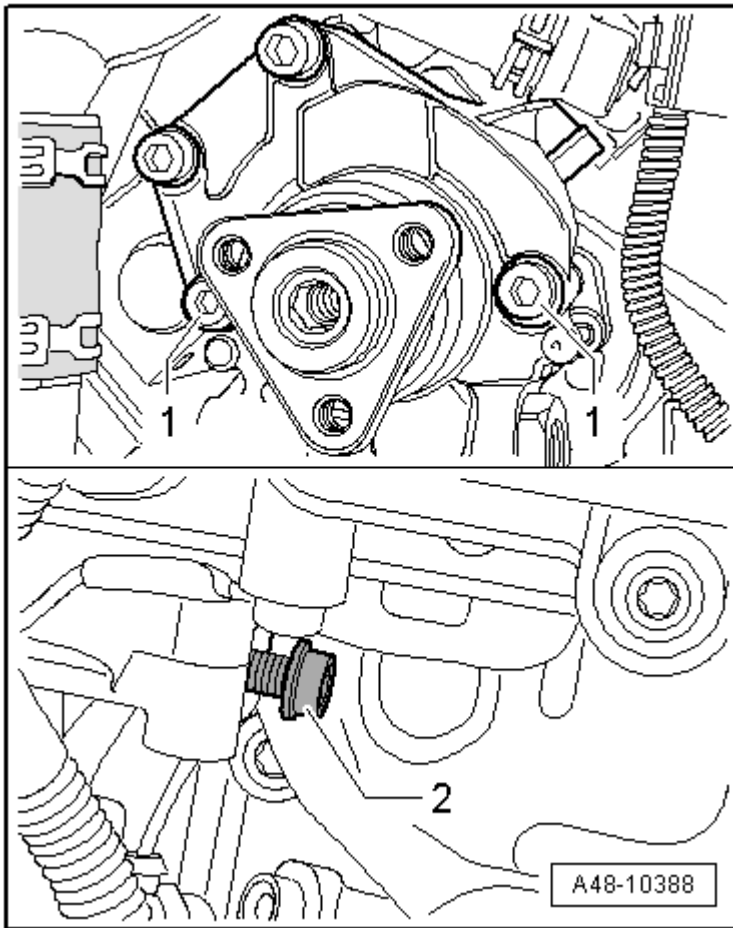


Fig. 229: Locating Power Steering Pump Bracket Bolts
Courtesy of AUDI OF AMERICA, LLC

- Then install the rear bolt -2- loosely.
- Install and tighten the bolts -1 and 2-.
- Press the pressure line into the power steering pump as far as the stop. Then tighten the union nut -1-.

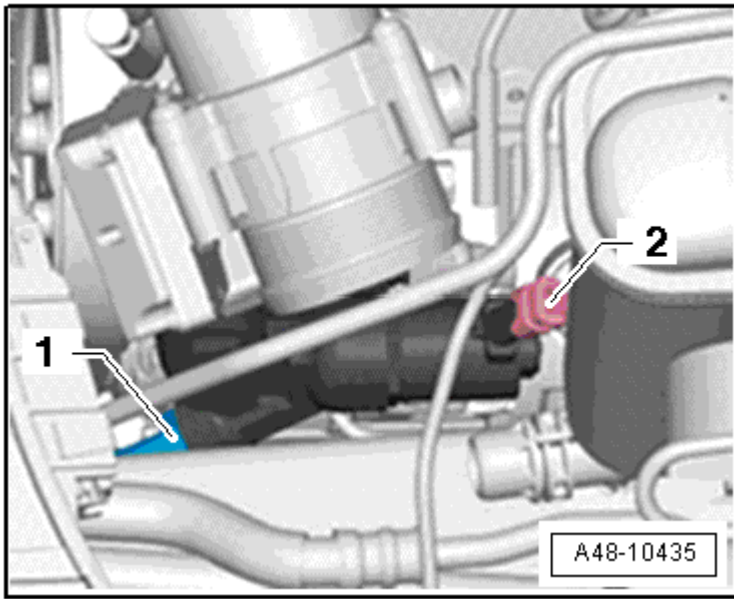


Fig. 230: Locating Union Nut & Connector
 Courtesy of AUDI OF AMERICA, LLC

-- Connect the connector -2-.

-- If the pressure line is also attached to the A/C compressor, then tighten the bolt -C- for the bracket -D-.

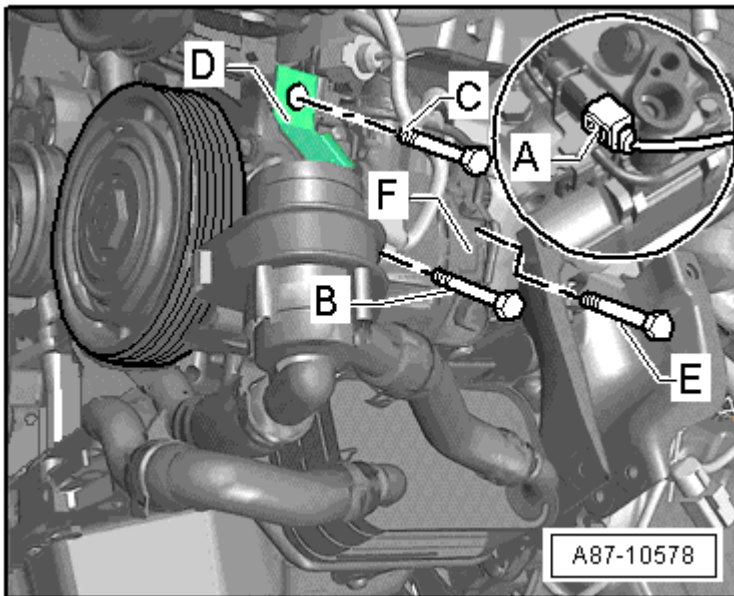


Fig. 231: Identifying A/C Compressor & Bolts
 Courtesy of AUDI OF AMERICA, LLC

-- Clean oiled places in engine compartment.

-- Align the marking -arrow- made on the belt pulley to the marking made on the hub.

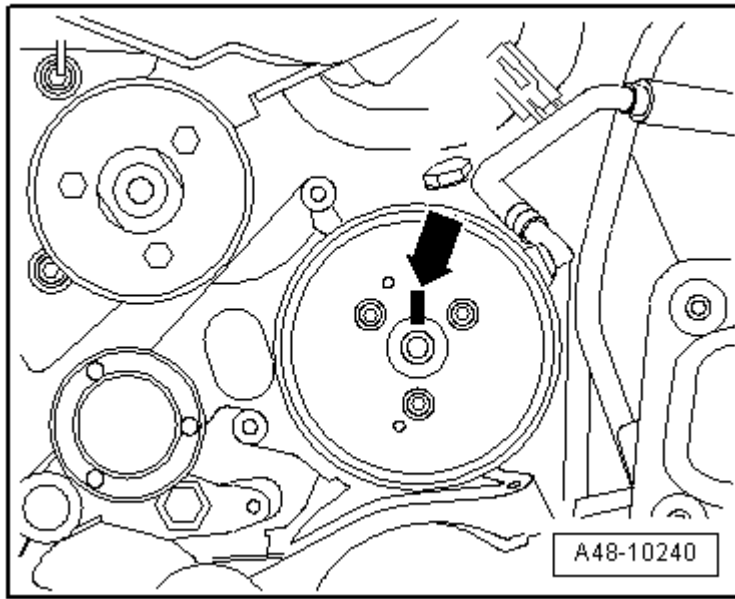


Fig. 232: Identifying Belt Pulley To Hub Marking
Courtesy of AUDI OF AMERICA, LLC

-- Tighten the belt pulley bolts -arrows-. Refer to **[For transmission(s) 0AW] Removal and Installation** .

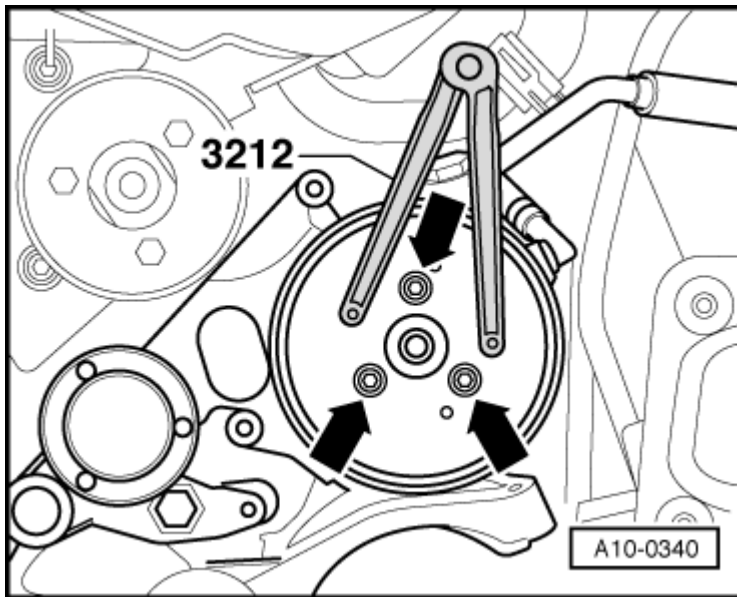


Fig. 233: Identifying Pulley Bolts
Courtesy of AUDI OF AMERICA, LLC

Install power steering pump ribbed belt. Refer to **[For transmission(s) 0AW] Removal and Installation** .

-- Check power steering fluid level. Refer to **POWER STEERING FLUID LEVEL, CHECKING**.

-- Bleed the steering. Refer to **STEERING, BLEEDING AFTER REPLACING**.

-- Check the steering for leaks. Refer to **STEERING, CHECKING FOR LEAKS**.

-- Install noise insulation. Refer to **Description and Operation** .

-- Install ribbed belt and check alignment of ribbed belt. Refer to **[For transmission(s) 0AW] Removal and Installation** .

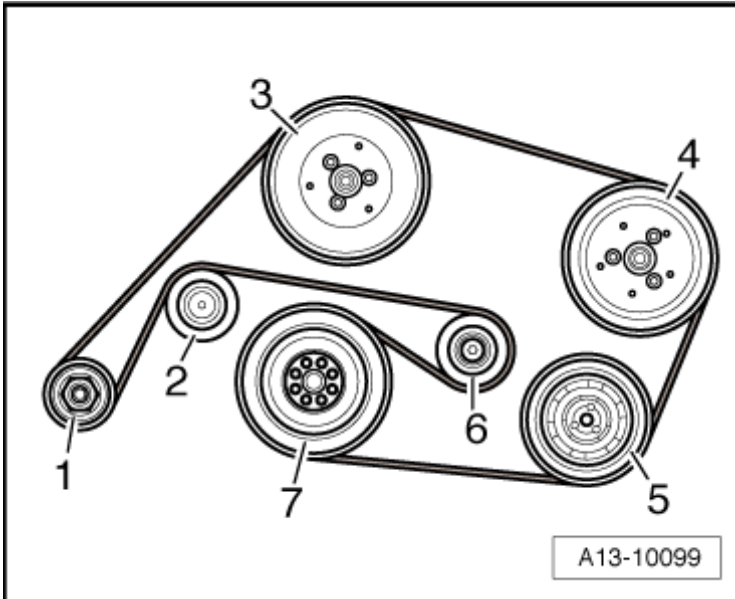


Fig. 234: Placing Ribbed Belt Over Belt Pulley
Courtesy of AUDI OF AMERICA, LLC

NOTE: When installing ribbed belt, ensure it is correctly seated in ribbed belt pulley.

1. Generator
2. Idler pulley
3. Coolant pump
4. Power Steering Pump
5. A/C Compressor
6. Tensioner pulley
7. Crankshaft

POWER STEERING PUMP, VEHICLES WITHOUT DYNAMIC STEERING (6-CYLINDER FSI)

Power Steering Pump Overview

NOTE: Always replace seals.

Do not reuse fluid you have drained.

Only use hydraulic oil.

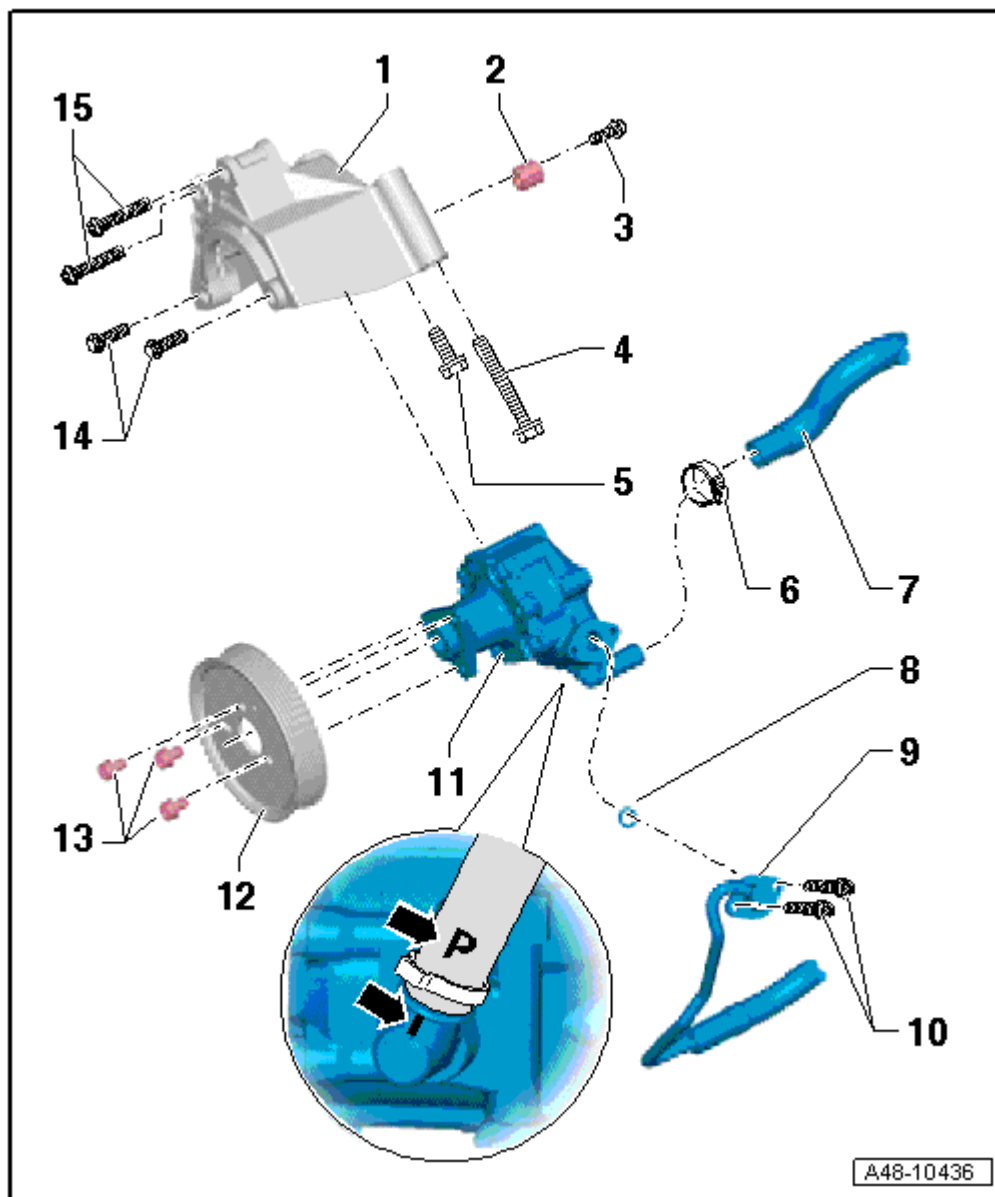


Fig. 235: Power Steering Pump, Vehicles Without Dynamic Steering (6-Cylinder FSI)
 Courtesy of AUDI OF AMERICA, LLC

1. Bracket
2. Sleeve
 - Drive the sleeve back slightly to install the power steering pump.
3. Bolt
 - 20 Nm
4. Bolt
 - 20 Nm

- For securing the bracket to the engine.
 - Note the different bolt lengths.
5. Bolt
- 20 Nm
 - For securing the bracket to the engine.
 - Note the different bolt lengths.
6. Clamp
- Tension using hose clamp pliers V.A.G 1275
 - Always replace if removed.
7. Intake Hose
- The marking "P" on the suction hose -arrow- must align with the formed seam -arrow- on the power steering pump.
8. Seal
- Always replace if removed.
9. Pressure Line

CAUTION: • Insert the pressure line completely when installing.

- Depending on the version, also mounted to the Air Conditioning (A/C) compressor
10. Bolt
- 9 Nm
11. Power Steering Pump
- - Fill with hydraulic oil before installation
 - Checking delivery pressure, refer to **POWER STEERING PUMP DELIVERY PRESSURE, CHECKING**
 - Bleed the steering, refer to **STEERING, BLEEDING AFTER REPLACING.**
 - Check hydraulic fluid level, refer to **POWER STEERING FLUID LEVEL, CHECKING.**
 - Steering system, checking for leaks, refer to **STEERING, CHECKING FOR LEAKS**
12. Belt Pulley
13. Bolt
- 22 Nm
14. Bolt
- 20 Nm
 - For securing the power steering pump to the bracket
15. Bolt
- 20 Nm

- For securing the bracket to the engine.

Removing

Special tools and workshop equipment required

- Hose Clamps Up to 25 mm Dia. 3094
- Hose Clamp Pliers V.A.G 1275
- Torque Wrench 5-50 Nm V.A.G 1331
- Tool Insert, AF 17 V.A.G 1331/6
- Used Oil Collection and Extraction Device V.A.G 1782
- Drip Tray for VAS 6100 VAS 6208
- Spanner Wrench 3212
- Engine Bung Set VAS 6122

General Information

Vane pump is not designed to be serviced. If there are customer complaints, the cause must be determined using a pressure and leak test. If there is a malfunction, replace the vane pump.

- If power steering fluid is low in reservoir, check steering system for leaks.
- If there are leaks in the area of the line connections, the lines/connections must first be inspected for leaks, tightened as necessary and wiped dry.
- Power steering pump is delivered without oil. Therefore, hydraulic oil must be filled before installation and turned by hand. Otherwise, noises when driving or damage to power steering pump may occur.

-- Place the vehicle on a hoist.

-- Remove the engine cover upward -arrows-.

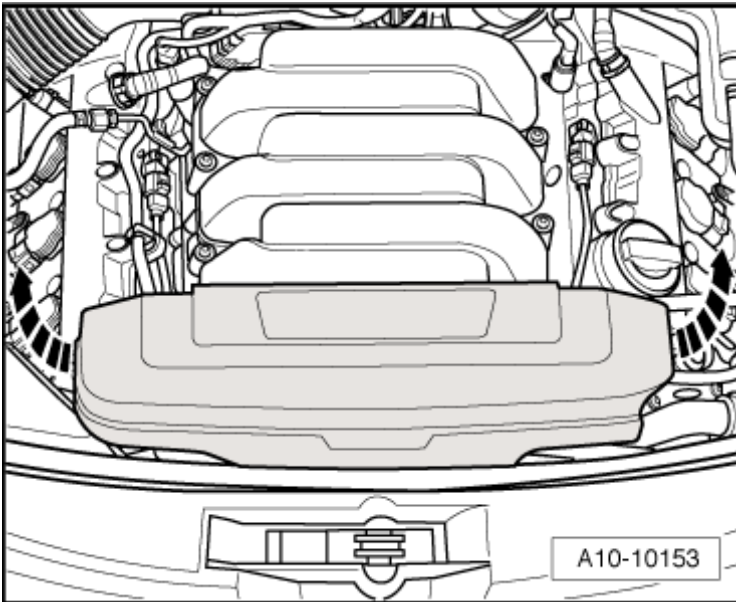


Fig. 236: Identifying Front Engine Cover
Courtesy of AUDI OF AMERICA, LLC

- Extract hydraulic oil from reservoir using V.A.G 1782.
- Clamp off the suction hose -1- and return hose -2- using the 3094.

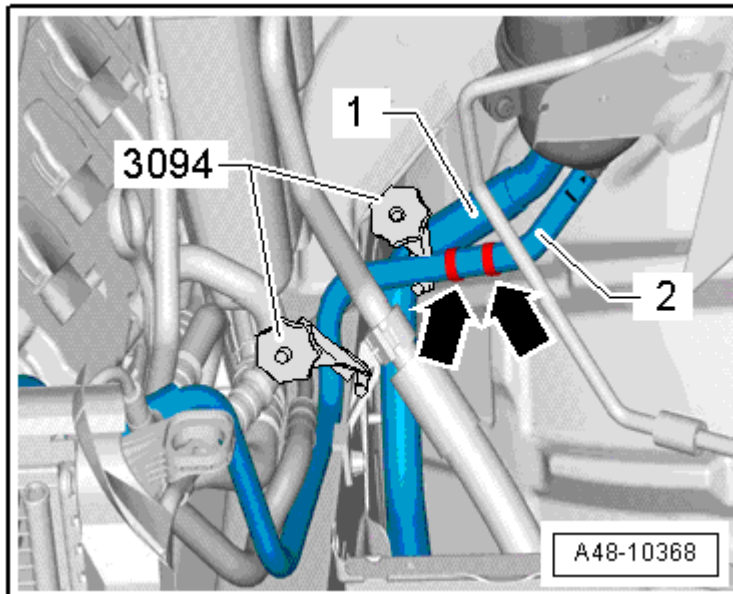


Fig. 237: Locating Suction & Return Hose Clamping Location
Courtesy of AUDI OF AMERICA, LLC

- CAUTION:**
- The 3094 must not be secured on the return hose -2- in the check valve area. Otherwise, check valve will be damaged.

- The check valve is located in the return hose -2- between the hose clamps -arrows-.

-- Remove noise insulation. Refer to **Description and Operation** .

-- Open the clamp -1- on the left longitudinal member and remove the coolant hose -2-.

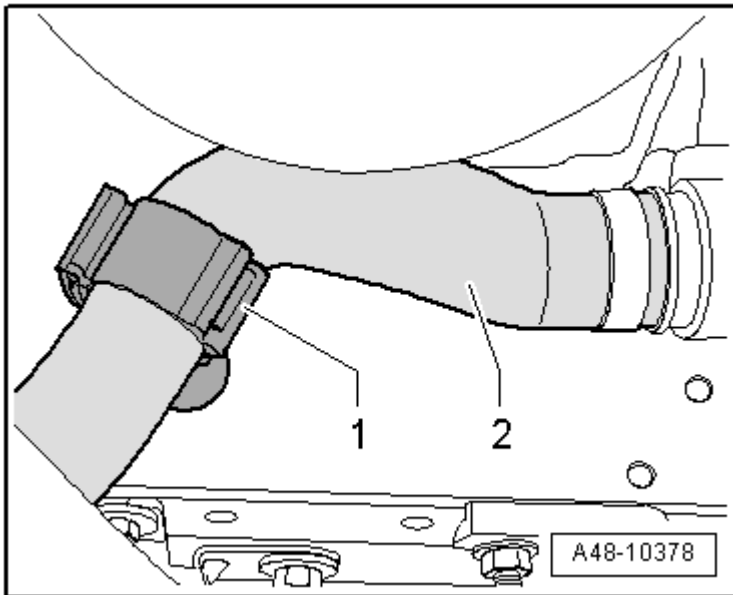


Fig. 238: Identifying Coolant Hose
Courtesy of AUDI OF AMERICA, LLC

-- Remove the nuts -1- and the coolant reservoir -2- with the lines attached.

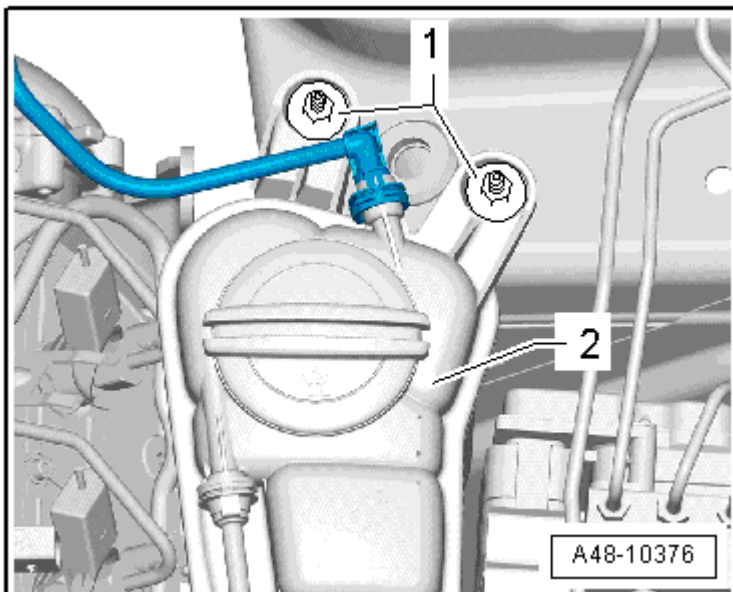


Fig. 239: Identifying Coolant Reservoir
Courtesy of AUDI OF AMERICA, LLC

-- Release and disconnect the connector on the coolant reservoir -2-.

NOTE: Identify direction of travel before removing ribbed belt. Reversed direction of travel with a used belt can lead to malfunctions. When installing ribbed belt, make sure it is seated correctly on pulleys.

-- Move the tensioner in the direction of the -arrow- to release the tension on the ribbed belt.

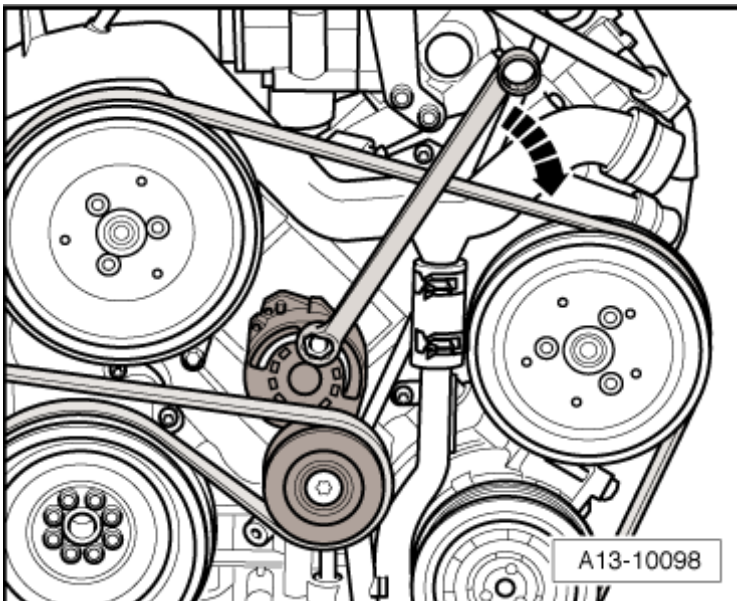


Fig. 240: Pivoting Tensioning Device To Relieve Tension On Ribbed Belt
Courtesy of AUDI OF AMERICA, LLC

-- Remove the ribbed belt from the power steering pump belt pulley.

-- Release the tensioner and remove the tool.

-- Mark the position of the belt pulley to the hub. Make a marking -arrow-.

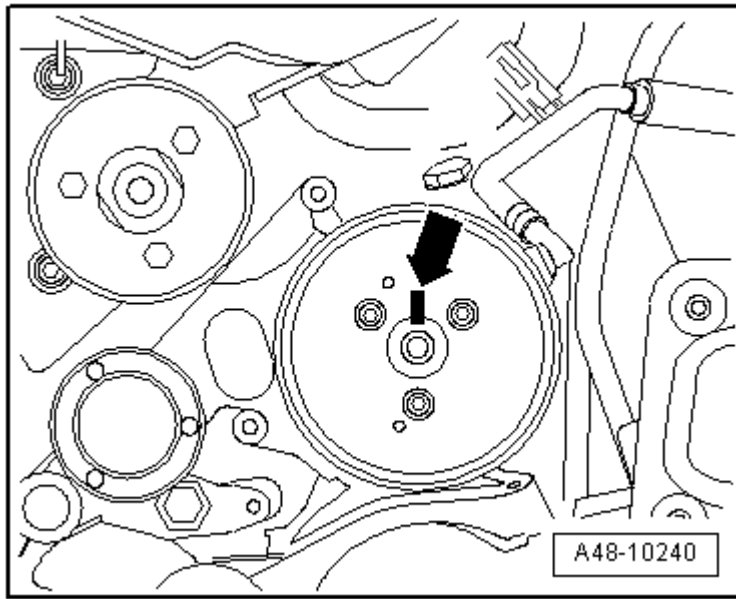


Fig. 241: Identifying Belt Pulley To Hub Marking
Courtesy of AUDI OF AMERICA, LLC

NOTE: If the power steering pump will be replaced, transfer the marking from the hub on the old pump to the new one.

Because of space restrictions, it is not possible to see the position of the belt pulley holes to the holes in the hub when installing.

-- Remove bolts -arrows-. Use 3212 as a counter hold.

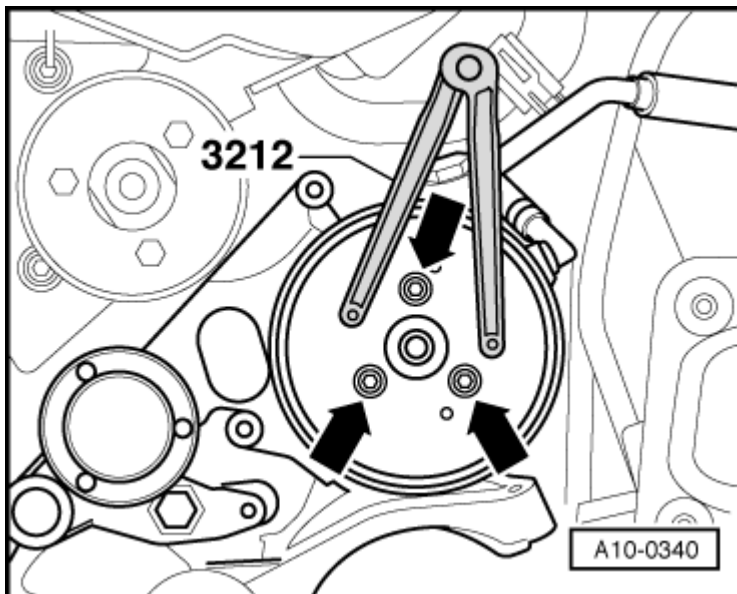


Fig. 242: Identifying Pulley Bolts
Courtesy of AUDI OF AMERICA, LLC

- Remove belt pulley for vane pump.
- Place the VAS 6208 under the power steering pump.
- Carefully cut through the cable ties -1- for the wiring harness -2-.

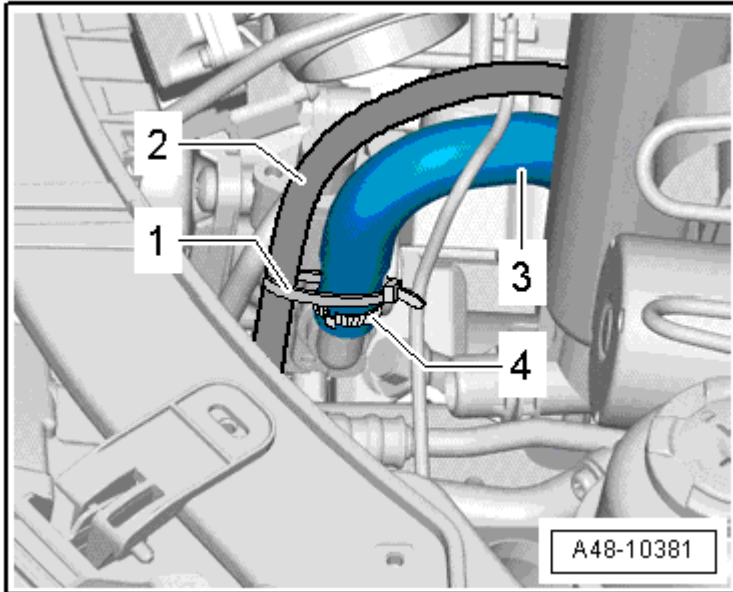


Fig. 243: Identifying Intake & Suction Hose
Courtesy of AUDI OF AMERICA, LLC

- Remove the clamp -4- from the intake hose -3-. Remove the suction hose -3-.
- If the pressure line is also attached to the Air Conditioning (A/C) compressor, then remove the bolt -C- for the bracket -D-.

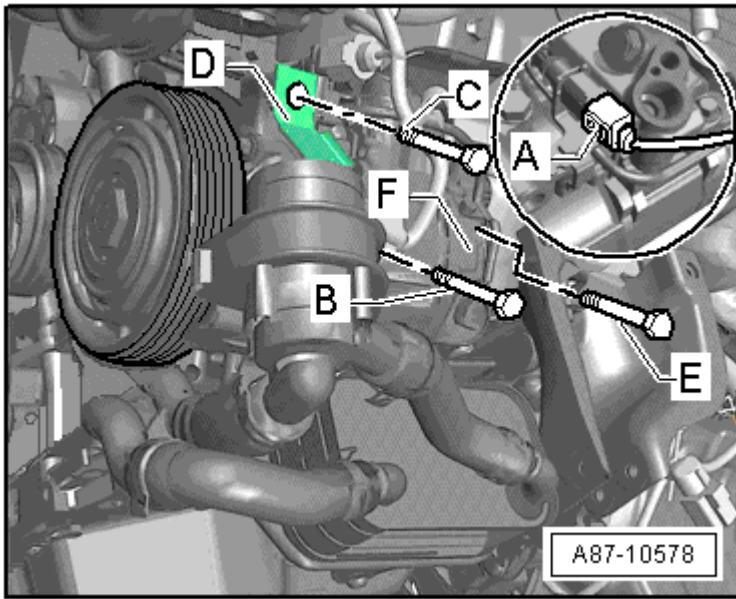


Fig. 244: Identifying A/C Compressor & Bolts
Courtesy of AUDI OF AMERICA, LLC

-- Remove the bolts -1- and pull the pressure line -2- out of the power steering pump.

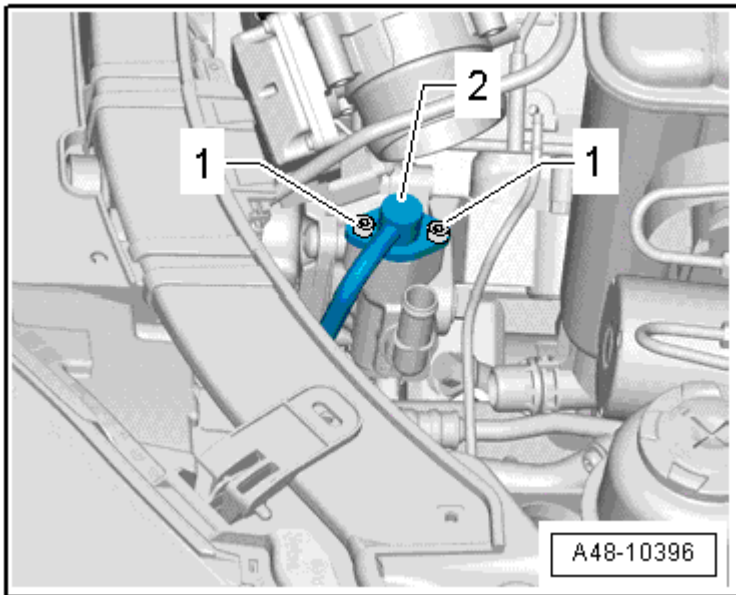


Fig. 245: Power Steering Pump Pressure Line
Courtesy of AUDI OF AMERICA, LLC

-- Seal the power steering pump and line connections using clean sealing plugs.

-- Remove the power steering pump from the bracket. Remove the front bolts -1- and rear bolt -2-.

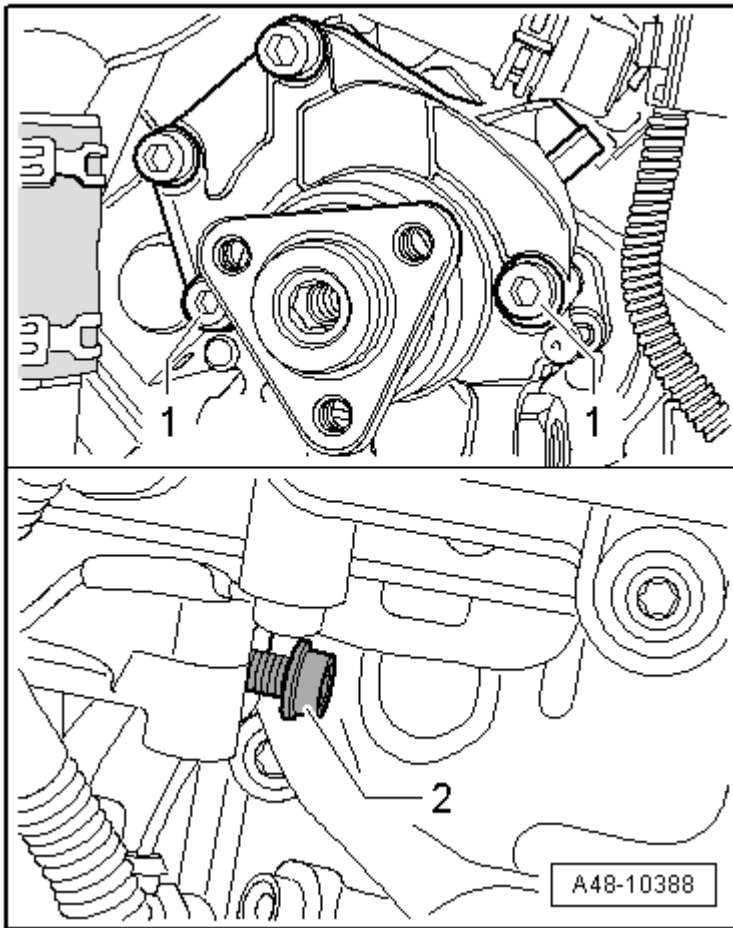


Fig. 246: Locating Power Steering Pump Bracket Bolts
Courtesy of AUDI OF AMERICA, LLC

NOTE: The bolt -2- cannot be seen in the bracket. The illustration shows it unscrewed.

-- Remove the bolts -1- from the bracket -3-.

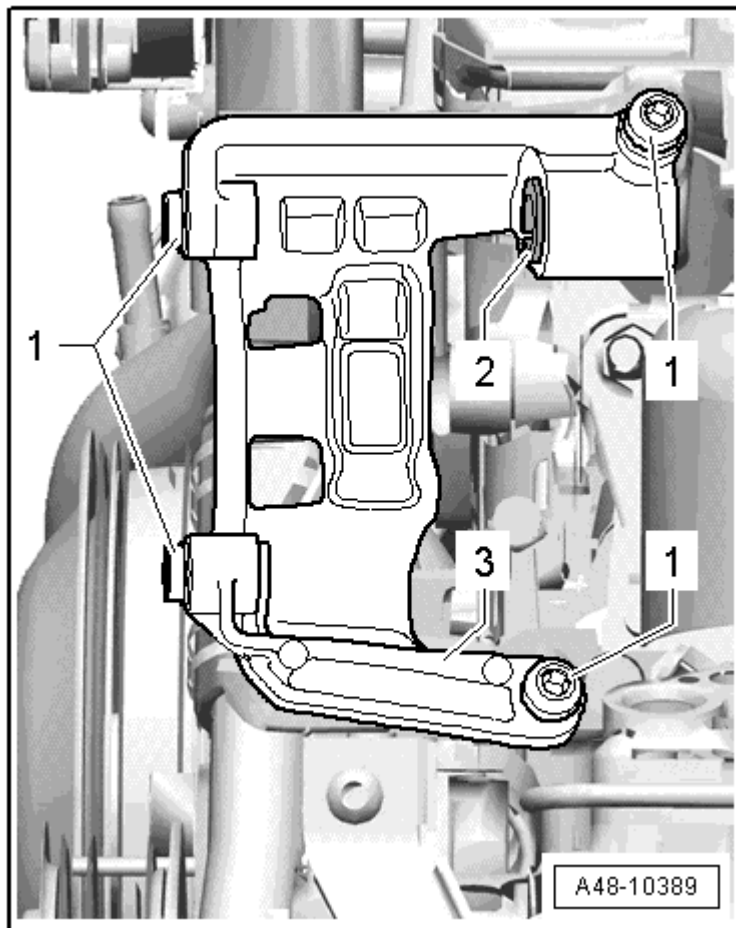


Fig. 247: Identifying Power Steering Bracket
Courtesy of AUDI OF AMERICA, LLC

-- Release and disconnect the connector -3-.

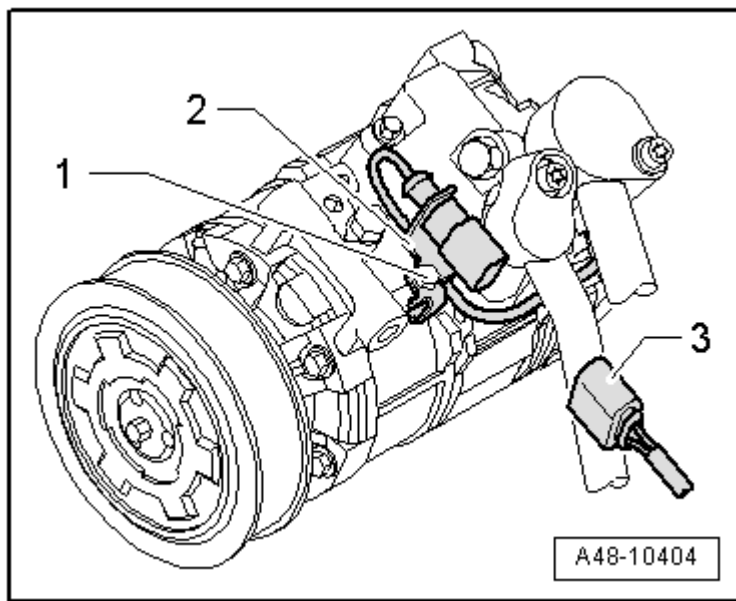


Fig. 248: Identifying Power Steering Pump Connector
Courtesy of AUDI OF AMERICA, LLC

-- Remove the bolt -1- and the bracket -2-.

-- Remove the bolt -3-.

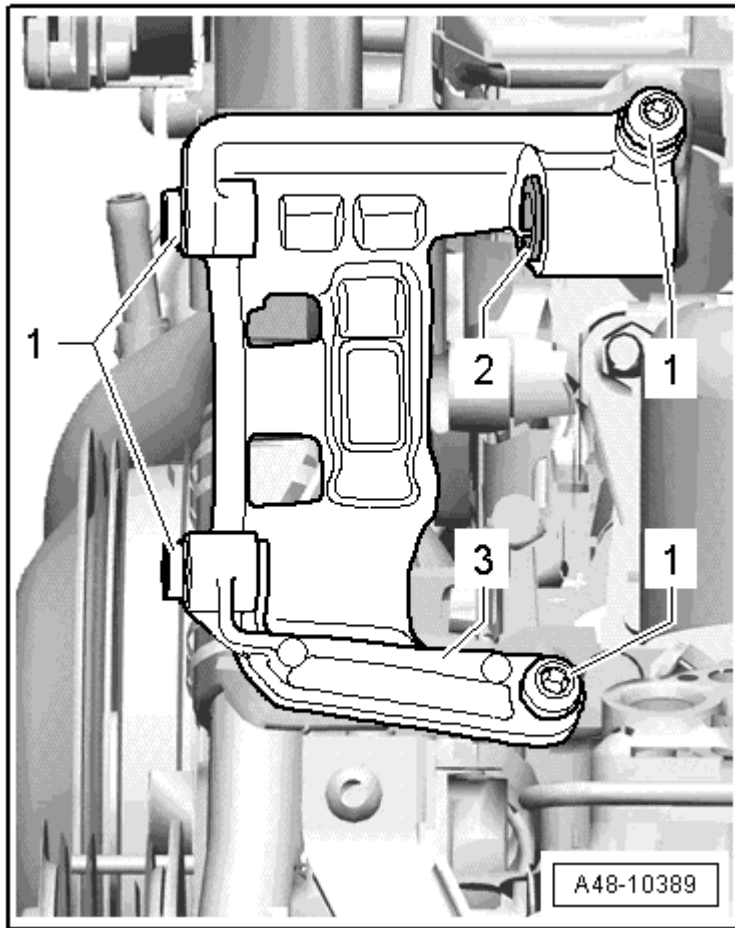


Fig. 249: Identifying Power Steering Bracket
Courtesy of AUDI OF AMERICA, LLC

- Drive the sleeve -2- in the bracket back slightly to install the power steering pump.
- Remove the power steering pump.

Installing

Install in reverse order of removal. Note the following:

Tightening specifications, refer to **POWER STEERING PUMP, VEHICLES WITHOUT DYNAMIC STEERING**

Tightening specifications, refer to **Description and Operation**

NOTE: Replace seals and gaskets.

Before installing the new power steering pump on the intake side, fill the hydraulic oil and install it by hand until oil drains out on the high pressure side.

Secure all hose connections with new hose clamps.

- Insert the power steering pump with the bracket.
- Position the bracket -2- using the bolt -1-. Refer to **Removal and Installation** .

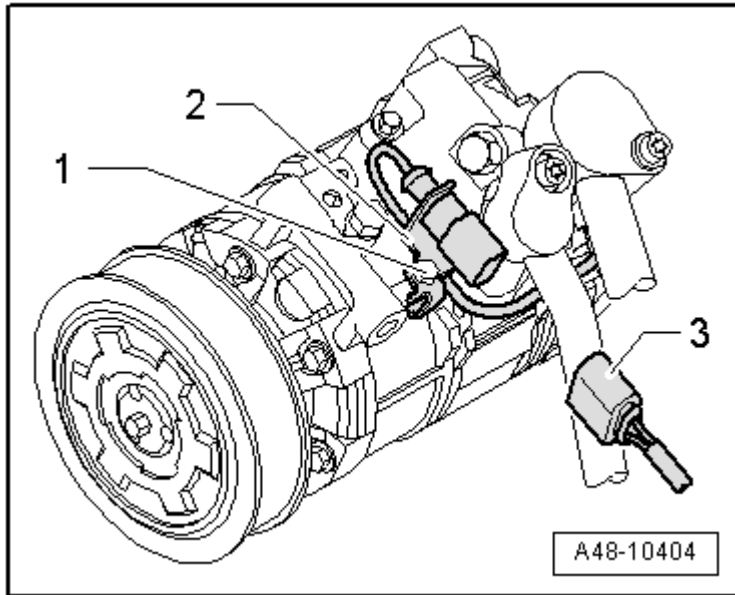


Fig. 250: Identifying Power Steering Pump Connector
Courtesy of AUDI OF AMERICA, LLC

- Connect the connector -3-.
- Note the installation dimension of the clamp. Dimension -a- must be 4 mm.

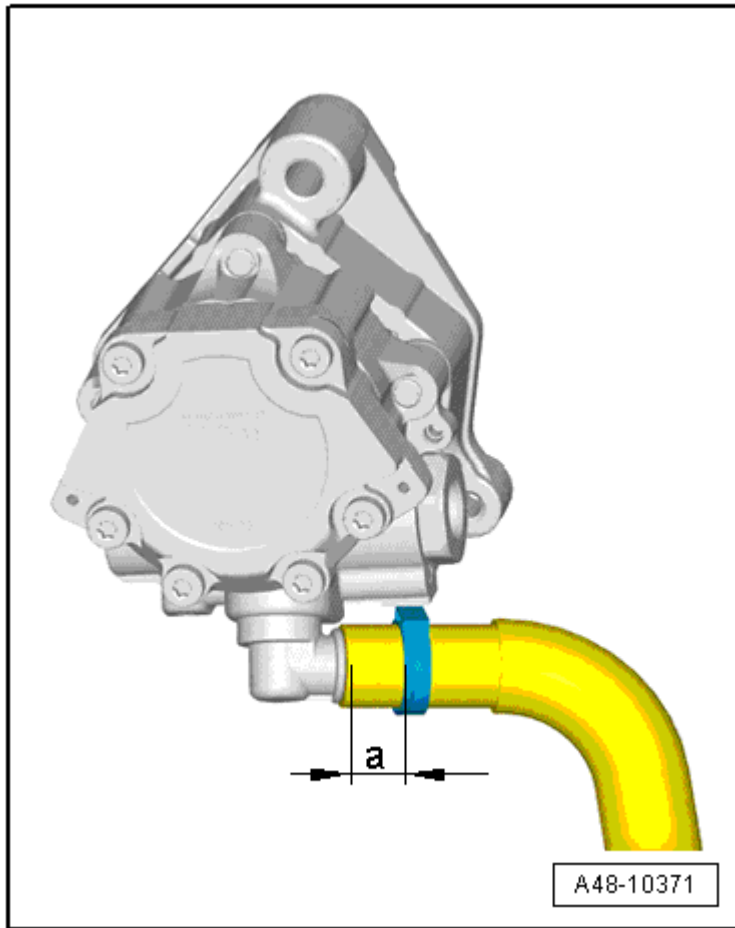


Fig. 251: Power Steering Pump Intake Hose Installation Dimension
Courtesy of AUDI OF AMERICA, LLC

-- Before installing the power steering pump, connect the intake hose -1- and align the marking -5- on the power steering pump with the "P" marking -3-.

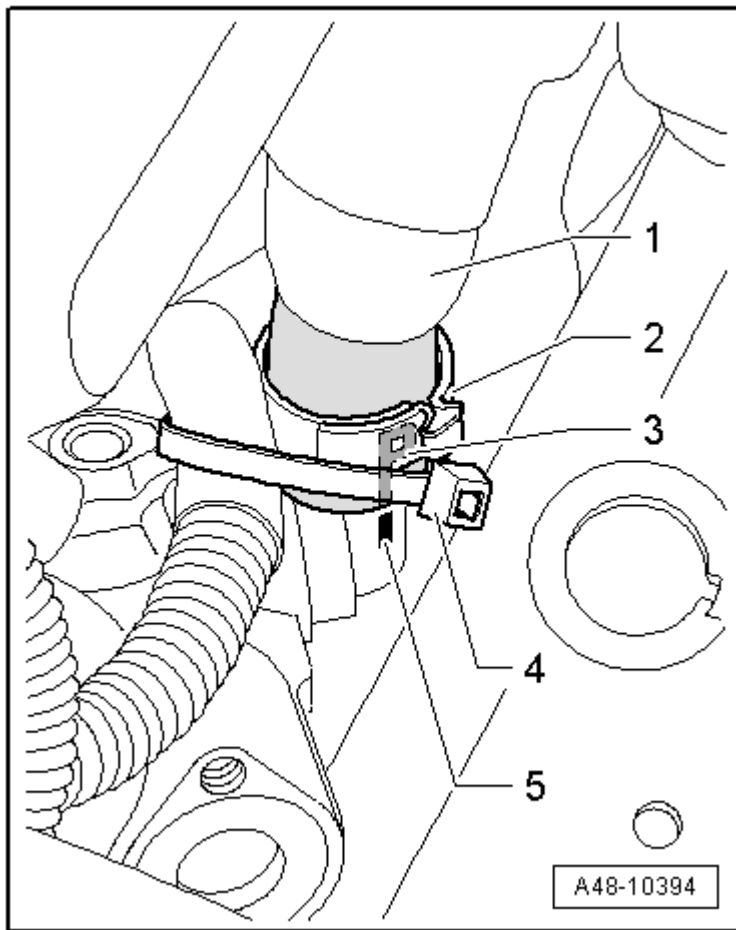


Fig. 252: Identifying Intake Hose

Courtesy of AUDI OF AMERICA, LLC

- Secure the suction hose -1- with the new clamp -2-.
- Secure the wiring harness on the supports using a new cable tie -4-.

NOTE: The clamp -2- cannot be tightened using the V.A.G 1275 when the power steering pump is installed due to restricted space.

- Attach the bracket -3- and tighten the bolts -1-.

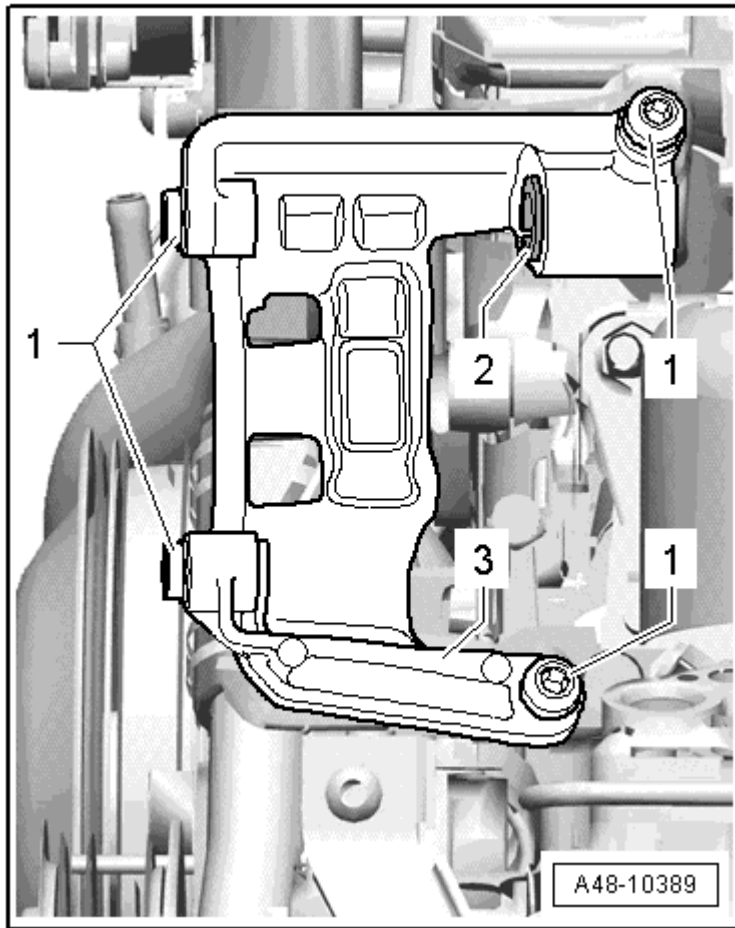


Fig. 253: Identifying Power Steering Bracket
Courtesy of AUDI OF AMERICA, LLC

- The sleeve -2- is driven back slightly.
- Turn the hub by hand until oil runs out of the pressure side.
- Insert the power steering pump in the bracket.
- First install the bolts -1- loosely.

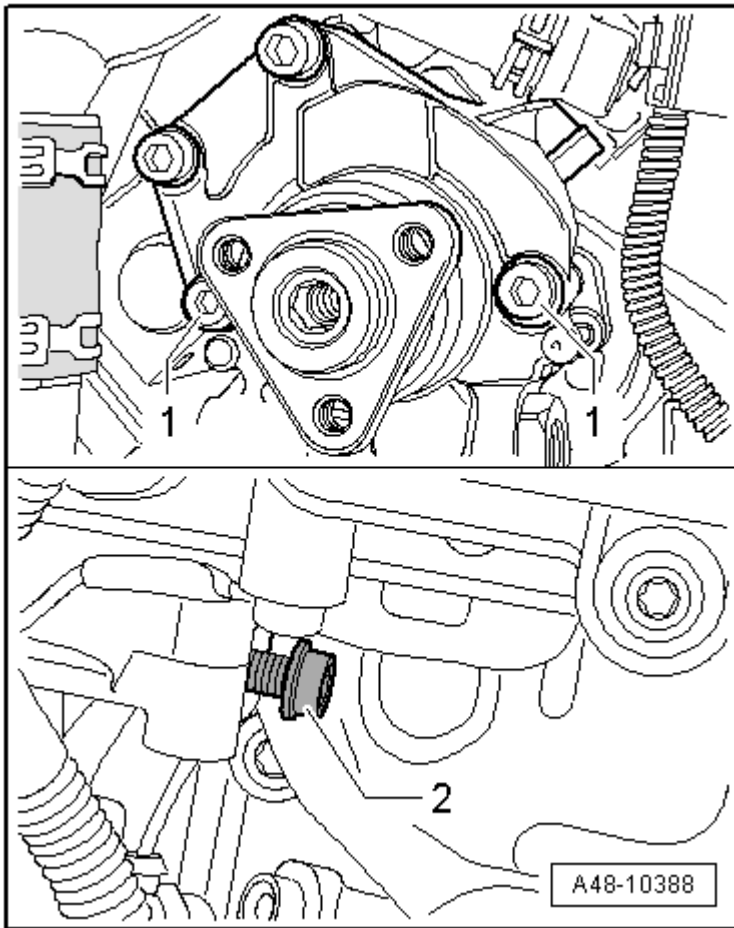


Fig. 254: Locating Power Steering Pump Bracket Bolts
Courtesy of AUDI OF AMERICA, LLC

- Then install the rear bolt -2- loosely.
- Install and tighten the bolts -1 and 2-.
- Press the pressure line -2- into the power steering pump as far as the stop. Then tighten bolts -1-.

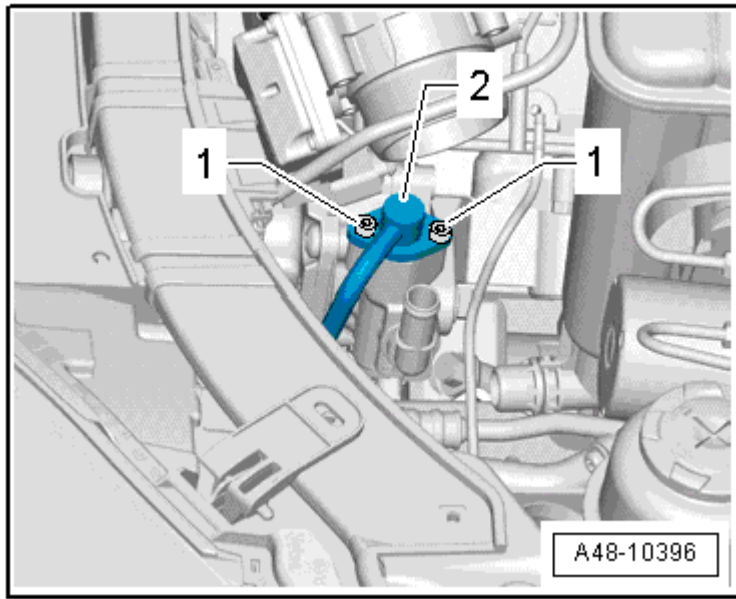


Fig. 255: Power Steering Pump Pressure Line
 Courtesy of AUDI OF AMERICA, LLC

-- If the pressure line is also attached to the Air Conditioning (A/C) compressor, then tighten the bolt -C- for the bracket -D-.

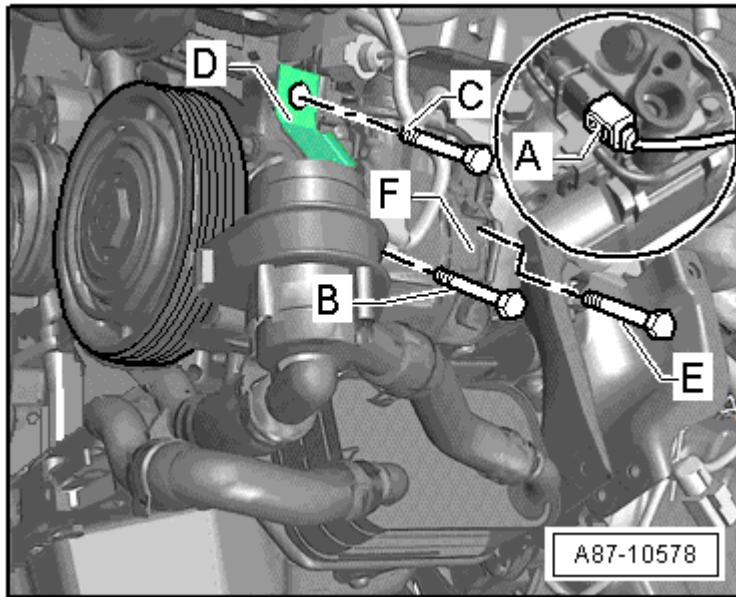


Fig. 256: Identifying A/C Compressor & Bolts
 Courtesy of AUDI OF AMERICA, LLC

-- Clean oiled places in engine compartment.

-- Align the marking -arrow- made on the belt pulley to the marking made on the hub.

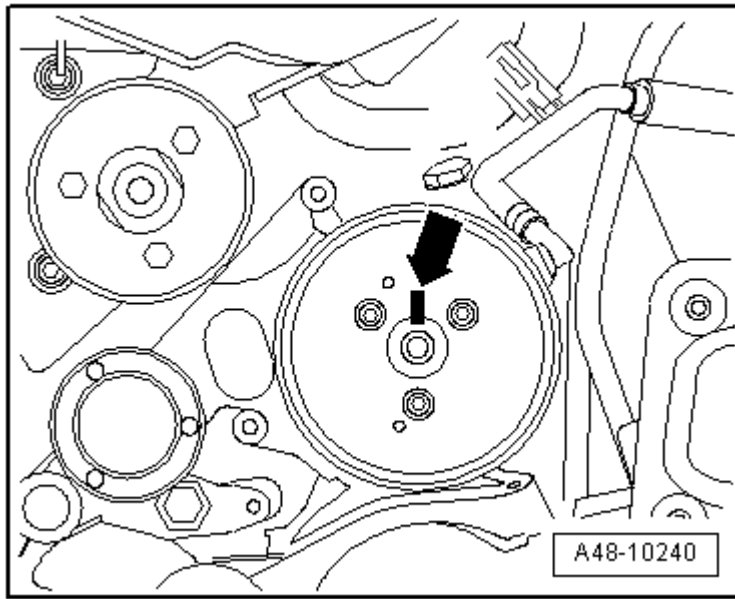


Fig. 257: Identifying Belt Pulley To Hub Marking
Courtesy of AUDI OF AMERICA, LLC

-- Tighten the belt pulley bolts -arrows-. Refer to **[For transmission(s) 0AW] Removal and Installation** .

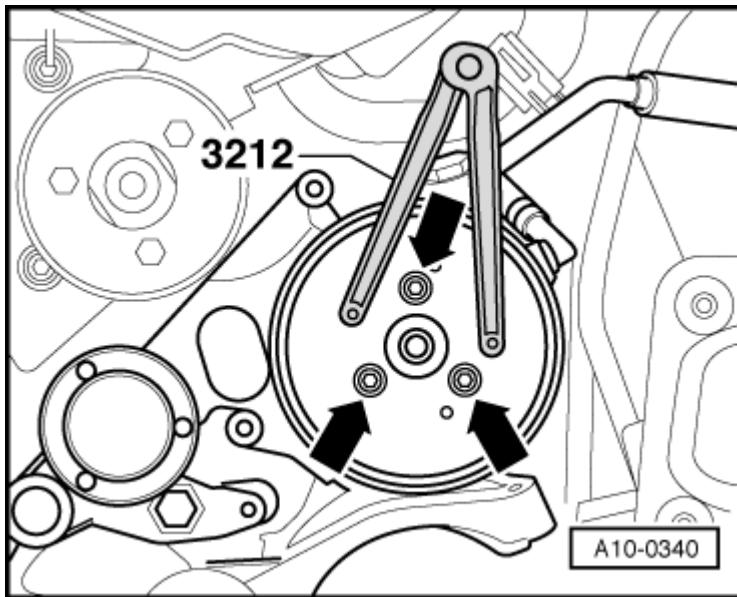


Fig. 258: Identifying Pulley Bolts
Courtesy of AUDI OF AMERICA, LLC

Install power steering pump ribbed belt. Refer to **[For transmission(s) 0AW] Removal and Installation** .

-- Check power steering fluid level. Refer to **POWER STEERING FLUID LEVEL, CHECKING**.

-- Bleed the steering. Refer to **STEERING, BLEEDING AFTER REPLACING**.

-- Check the steering for leaks. Refer to **STEERING, CHECKING FOR LEAKS**.

-- Install noise insulation. Refer to **Description and Operation** .

-- Install ribbed belt and check alignment of ribbed belt. Refer to **[For transmission(s) 0AW] Removal and Installation** .

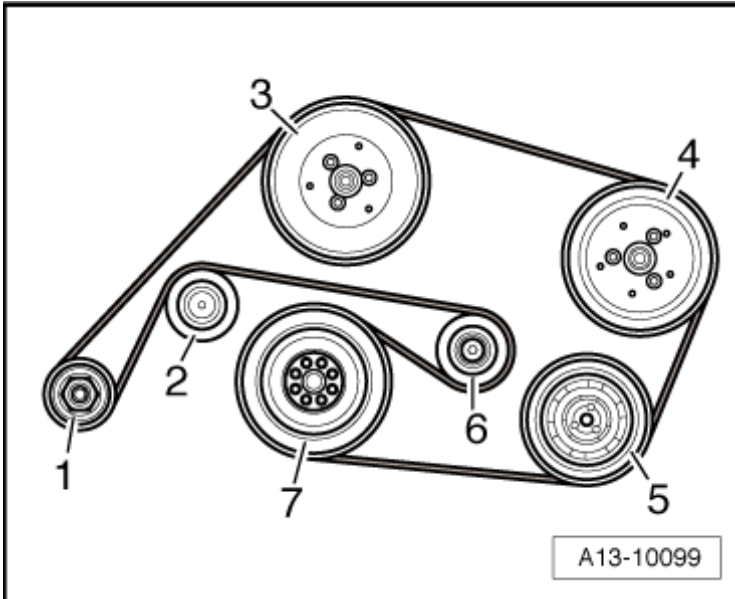


Fig. 259: Placing Ribbed Belt Over Belt Pulley
Courtesy of AUDI OF AMERICA, LLC

NOTE: When installing ribbed belt, ensure it is correctly seated in ribbed belt pulley.

1. Generator
2. Idler pulley
3. Coolant pump
4. Power Steering Pump
5. A/C Compressor
6. Tensioner pulley
7. Crankshaft

6-CYLINDER TFSI

POWER STEERING PUMP, VEHICLES WITH DYNAMIC STEERING (6-CYLINDER TFSI)

Power Steering Pump Overview

NOTE: Always replace seals.

Do not reuse fluid you have drained.

Only use hydraulic oil.

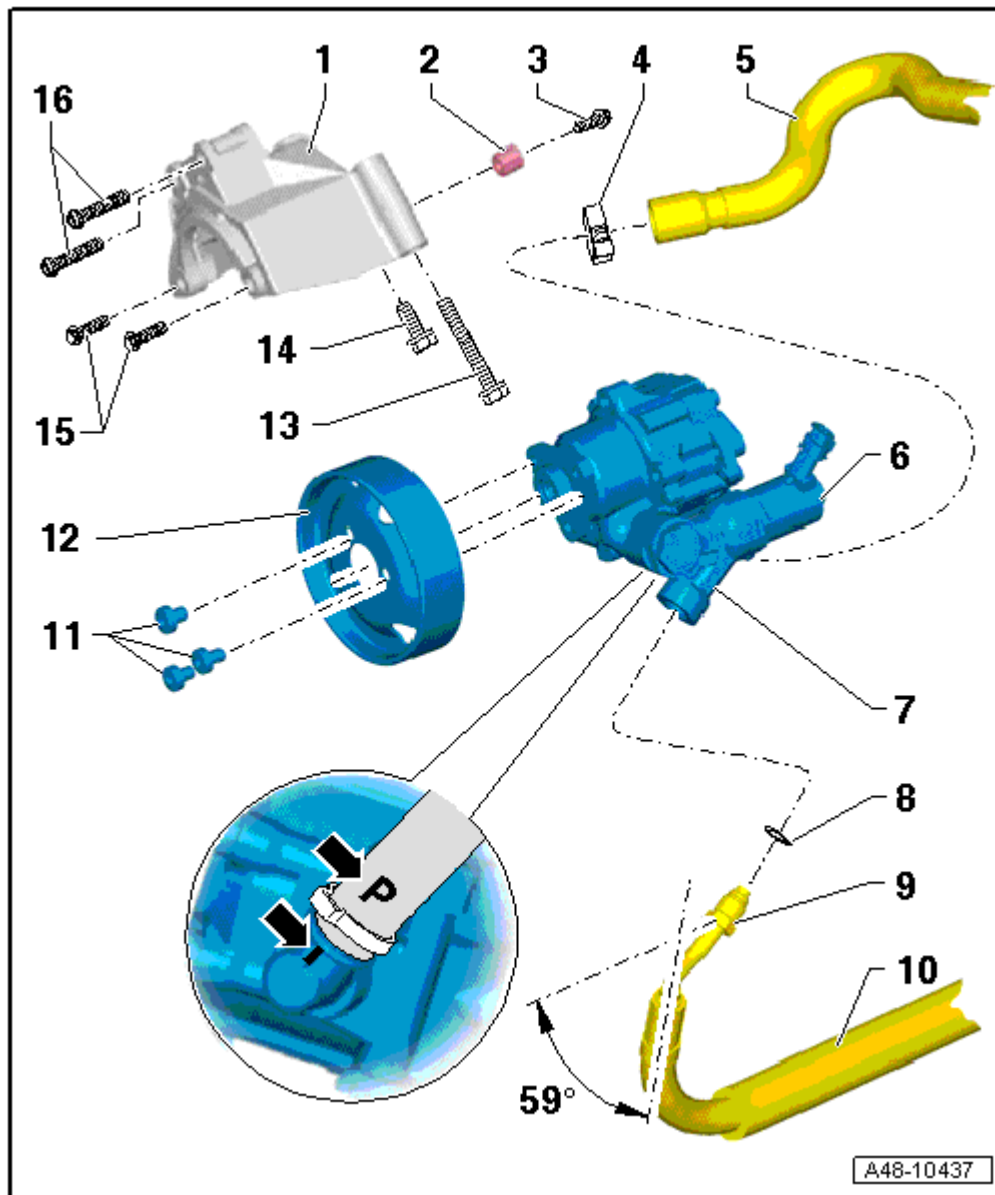


Fig. 260: Power Steering Pump, Vehicles With Dynamic Steering (6-Cylinder TFSI)
 Courtesy of AUDI OF AMERICA, LLC

1. Bracket
2. Sleeve
 - Drive the sleeve back slightly to install the power steering pump.
3. Bolt
 - 20 Nm
4. Clamp

- Tension using hose clamp pliers V.A.G 1275
 - Always replace if removed.
5. Intake Hose
 - The marking "P" on the suction hose -arrow- must align with the formed seam -arrow- on the power steering pump.
 6. Power Steering Pump Control Valve -V119-
 - The power steering pump and the control valve are one component and can only be replaced together.
 7. Steering Hydraulic Pump -V119-
 - With power steering pump control valve --
 - The power steering pump and the control valve, see item 6 are one component and can only be replaced together.
 -
 - Fill with hydraulic oil before installation
 - Checking delivery pressure, refer to **POWER STEERING PUMP DELIVERY PRESSURE, CHECKING**
 - Bleed the steering, refer to **STEERING, BLEEDING AFTER REPLACING.**
 - Check hydraulic fluid level, refer to **POWER STEERING FLUID LEVEL, CHECKING.**
 - Steering system, checking for leaks, refer to **STEERING, CHECKING FOR LEAKS**
 8. Seal
 - Always replace if removed.
 9. Union Nut
 - 38 Nm
 - 36 Nm, this tightening specification applies only with the 17 mm ring spanner insert, open V.A.G 1331/10
 10. Pressure Line

CAUTION: • Insert the pressure line completely when installing.

 - Observe installation position: The angle between the line connection and power steering pump axle is approximately 59°
 11. Bolt
 - 22 Nm
 12. Belt Pulley
 13. Bolt
 - 20 Nm
 - For securing the bracket to the engine.
 - note the different bolt lengths.

14. Bolt

- 20 Nm
- For securing the bracket to the engine.
- Note the different bolt lengths.

15. Bolt

- 20 Nm
- For securing the power steering pump to the bracket

16. Bolt

- 20 Nm
- For securing the bracket to the engine.

Removing**Special tools and workshop equipment required**

- Hose Clamps Up to 25 mm Dia. 3094
- Spanner Wrench 3212
- Hose Clamp Pliers V.A.G 1275
- Torque Wrench 5-50 Nm V.A.G 1331
- Ratchet, Reversible V.A.G 1331/1
- Flared Ring Spanner Tool Insert AF17 V.A.G 1331/10
- Used Oil Collection and Extraction Device V.A.G 1782
- Drip Tray for VAS 6100 VAS 6208
- Engine Bung Set VAS 6122

General Information

Vane pump is not designed to be serviced. If there are customer complaints, the cause must be determined using a pressure and leak test. If there is a malfunction, replace the vane pump.

- If power steering fluid is low in reservoir, check steering system for leaks.
- If there are leaks in the area of the line connections, the lines/connections must first be inspected for leaks, tightened as necessary and wiped dry.
- Power steering pump is delivered without oil. Therefore, hydraulic oil must be filled before installation and turned by hand. Otherwise, noises when driving or damage to power steering pump may occur.

-- Place the vehicle on a hoist.

-- Remove the engine cover -1-.

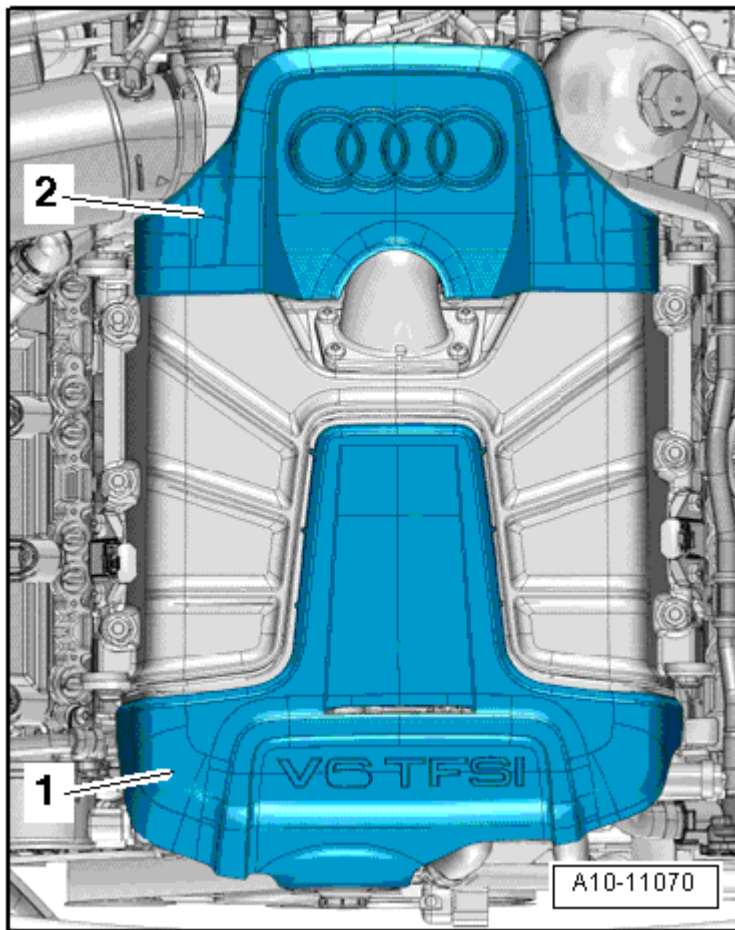


Fig. 261: Engine Cover -1- and -2-
Courtesy of AUDI OF AMERICA, LLC

- Extract hydraulic oil from reservoir using V.A.G 1782.
- Clamp off the suction hose -1- and return hose -2- using the 3094.

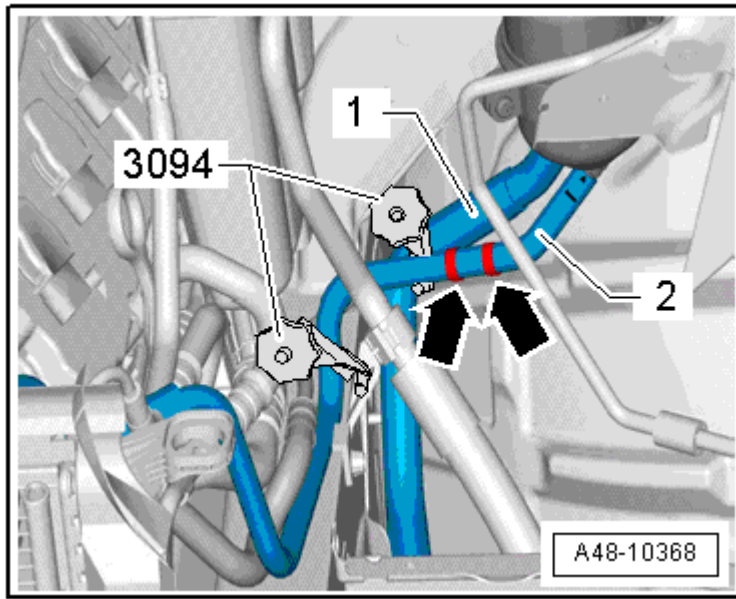


Fig. 262: Locating Suction & Return Hose Clamping Location
Courtesy of AUDI OF AMERICA, LLC

CAUTION:

- The 3094 must not be secured on the return hose -2- in the check valve area. Otherwise, check valve will be damaged.
- The check valve is located in the return hose -2- between the hose clamps -arrows-.

-- Remove noise insulation. Refer to Description and Operation .

-- Drain the coolant. Refer to General Information .

-- Disconnect the coolant lines -1 and 2- from the coolant reservoir. Remove the nuts -arrows- and remove the coolant reservoir -3- from its mount.

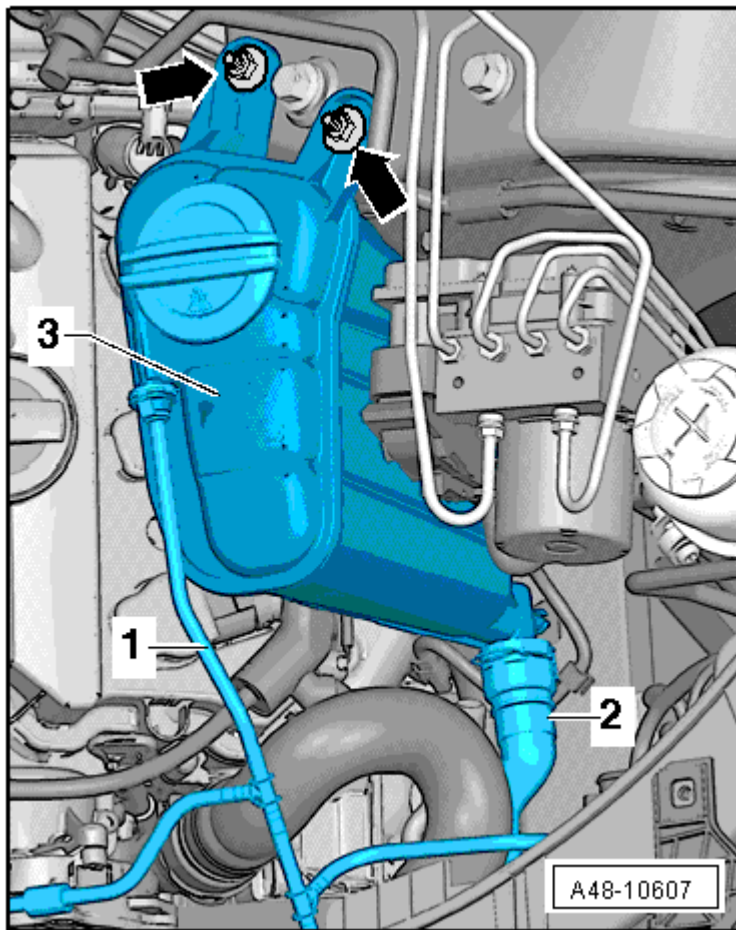


Fig. 263: Identifying Coolant Reservoir

Courtesy of AUDI OF AMERICA, LLC

-- Disconnect the connector on the bottom of the coolant reservoir -3-. Move the coolant reservoir -3- to the side.

-- Remove the coolant hose -1 and 2- from the coolant pipe and move it to the side.

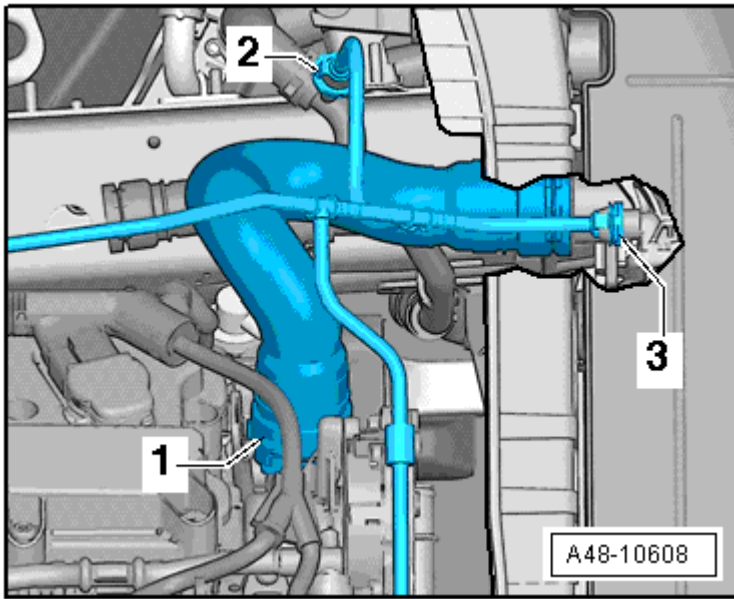


Fig. 264: Identifying Coolant Hose & Line
Courtesy of AUDI OF AMERICA, LLC

- Remove the coolant line -3- from the radiator and move it to the side.
- Remove the screw -1- on the upper coolant pipes.

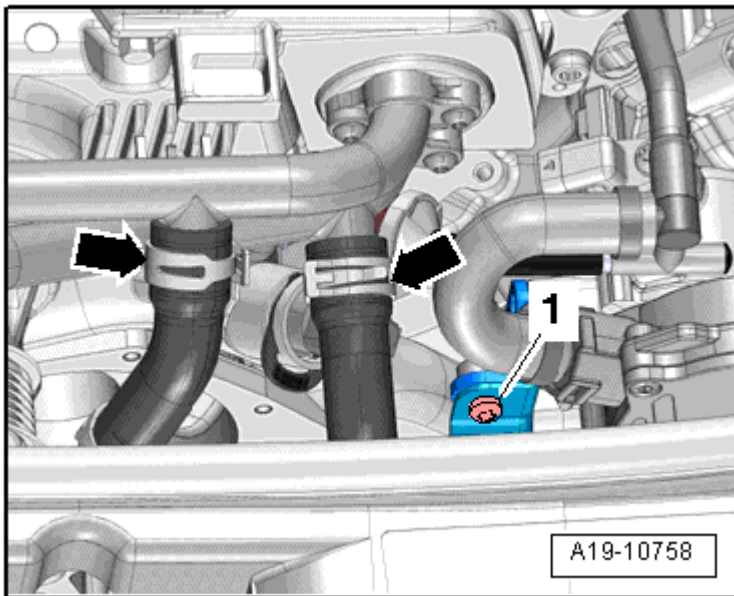


Fig. 265: Identifying Clamps -Arrows- To Coolant Hoses
Courtesy of AUDI OF AMERICA, LLC

- Ignore the -arrows-
- Remove the bolt -1- on the lower coolant pipes.

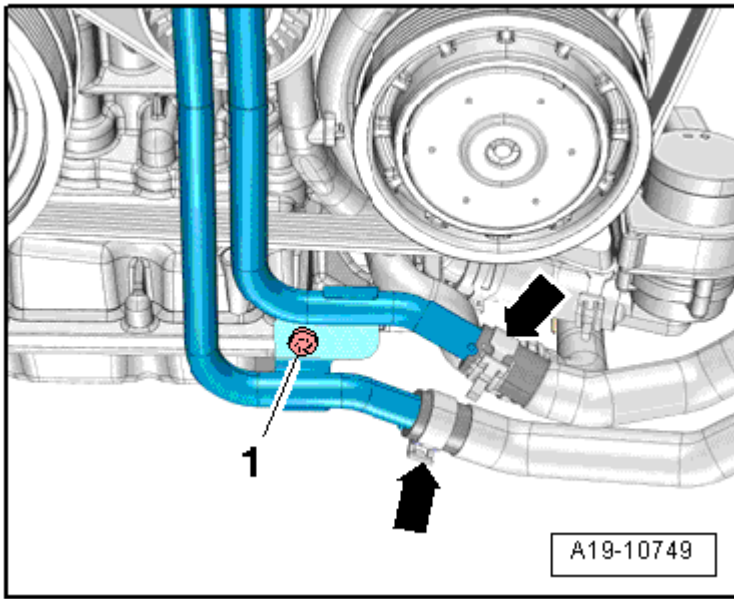


Fig. 266: Locating Lower Coolant Pipe Bolt
Courtesy of AUDI OF AMERICA, LLC

- Ignore the -arrows-

NOTE: Identify direction of travel before removing ribbed belt. Reversed direction of travel with a used belt can lead to malfunctions. When installing ribbed belt, make sure it is seated correctly on pulleys.

-- Release the tension on the ribbed belt and remove it from the power steering pump belt pulley.

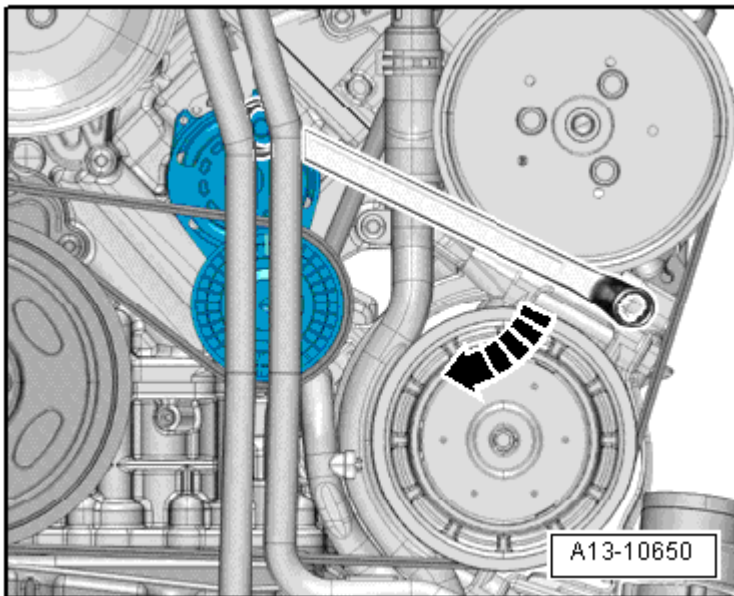


Fig. 267: Releasing Belt Tension

Courtesy of AUDI OF AMERICA, LLC

- Move the tensioner in the direction of the -arrow- to release the tension on the ribbed belt.
- Remove the ribbed belt from the power steering pump belt pulley.
- Release the tensioner and remove the tool.
- Mark the position of the belt pulley to the hub. Make a marking -arrow-.

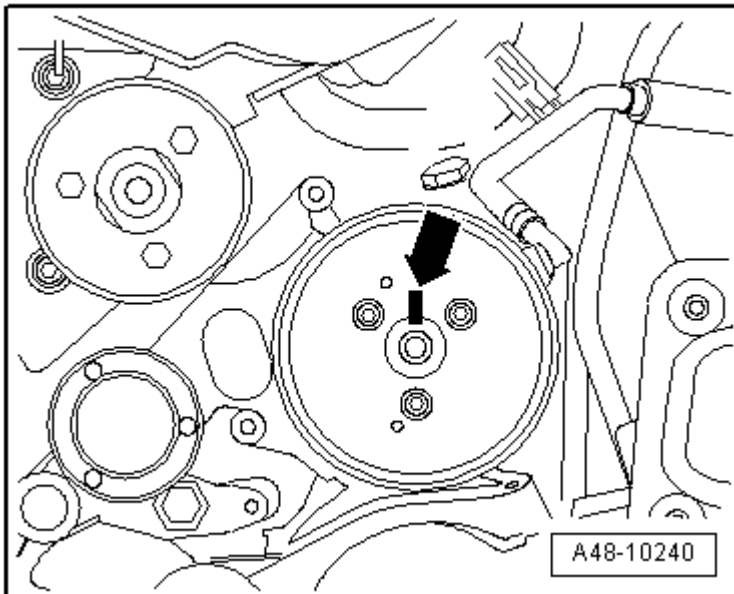


Fig. 268: Identifying Belt Pulley To Hub Marking

Courtesy of AUDI OF AMERICA, LLC

NOTE: If the power steering pump will be replaced, transfer the marking from the hub on the old pump to the new one.

Because of space restrictions, it is not possible to see the position of the belt pulley holes to the holes in the hub when installing.

- Remove bolts -arrows-. Use 3212 as counter hold.

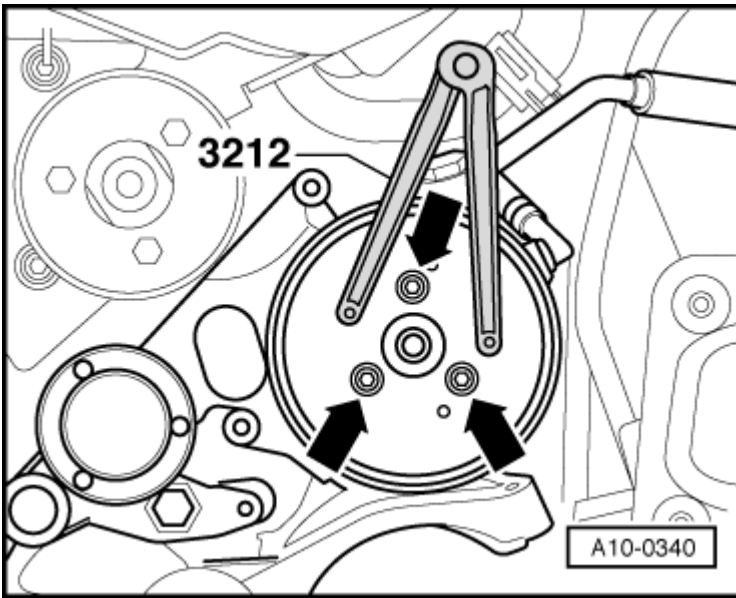


Fig. 269: Identifying Pulley Bolts

Courtesy of AUDI OF AMERICA, LLC

- Remove belt pulley for vane pump.
- Place the VAS 6208 under the power steering pump.
- Release and disconnect the connector -2-.

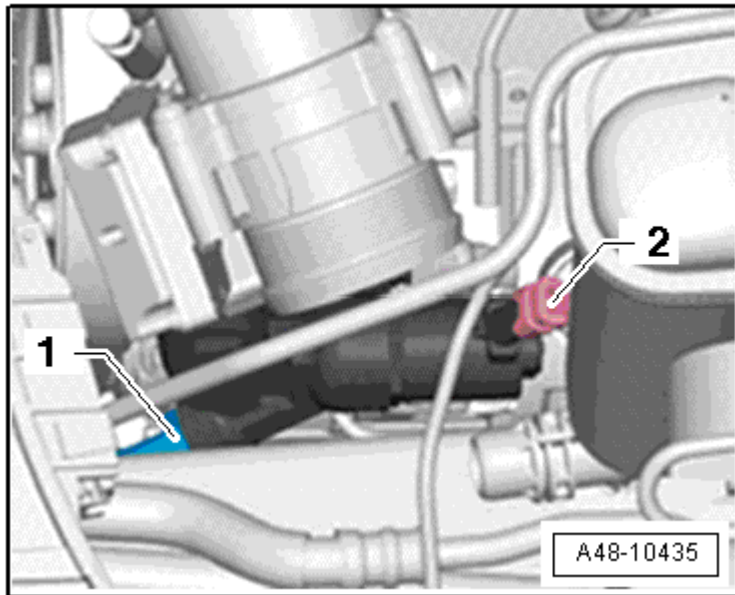


Fig. 270: Locating Union Nut & Connector

Courtesy of AUDI OF AMERICA, LLC

- Remove the union nut -1- and pull the pressure line out of the power steering pump.

- Seal the power steering pump and line connections using clean sealing plugs.
- Remove the power steering pump from the bracket. Remove the front bolts -1- and rear bolt -2-.

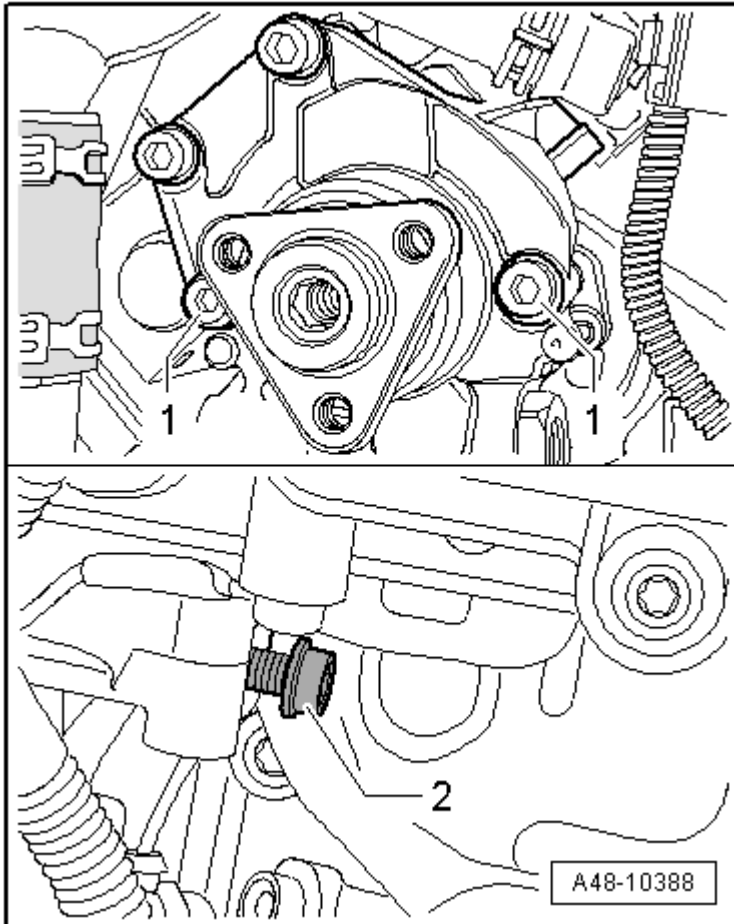


Fig. 271: Locating Power Steering Pump Bracket Bolts
Courtesy of AUDI OF AMERICA, LLC

NOTE: The bolt -2- cannot be seen in the bracket. The illustration shows it unscrewed.

- Release the tension on the intake hose spring clamp -arrow- -2- on the reservoir -1- and remove the hose -2- from the reservoir.

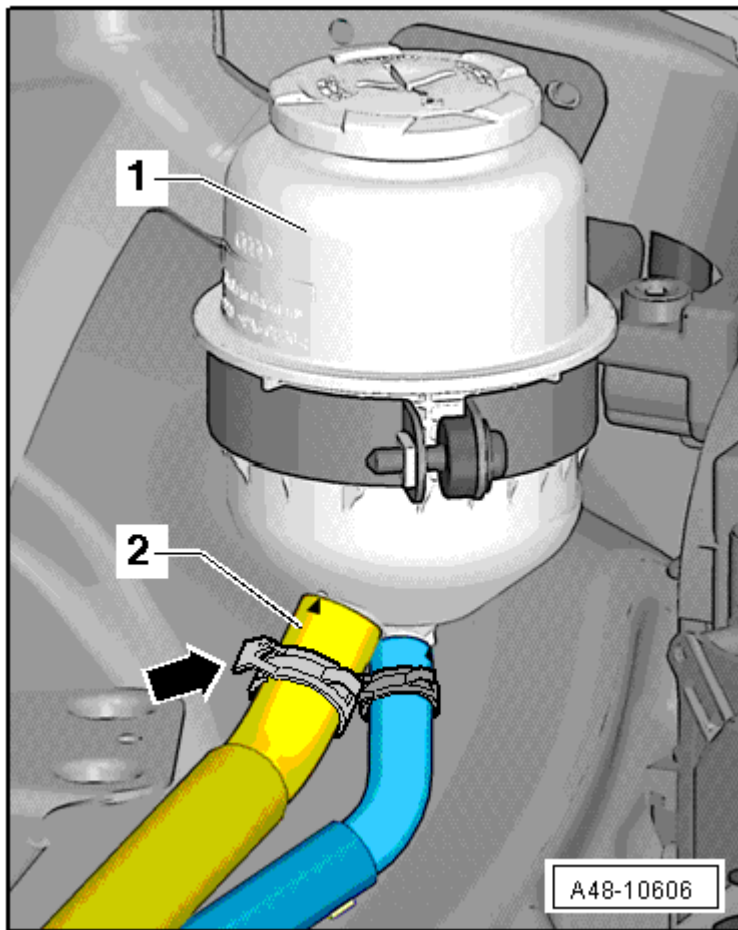


Fig. 272: Releasing Intake Hose Spring Clamp Tension
Courtesy of AUDI OF AMERICA, LLC

-- Remove the power steering pump and intake hose from the bracket.

Installing

Install in reverse order of removal. Note the following:

Tightening specifications, refer to **POWER STEERING PUMP, VEHICLES WITH DYNAMIC STEERING**

Installation position, hose lines, refer to **HOSE LINES TO RESERVOIR, HYDRAULIC FLUID COOLER AND RETURN LINE INSTALLED POSITION**

NOTE: Replace seals and gaskets.

Before installing the new power steering pump on the intake side, fill the hydraulic oil and install it by hand until oil drains out on the high pressure side.

Secure all hose connections with new hose clamps.

Due to a lack of space, it is not possible to tension the clamp with the V.A.G 1275 when the power steering pump is installed. Therefore perform this step when the pump is removed.

- Mount the intake hose, see item 5 before installing. The "P" must align with the seam.
- Secure suction hose with new hose clamp.

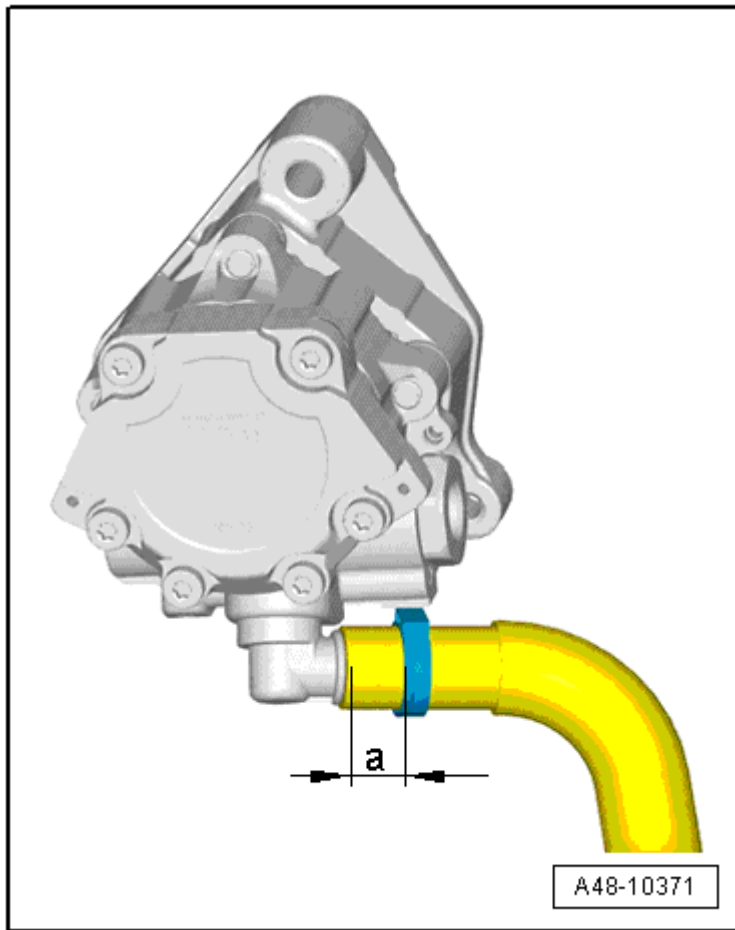


Fig. 273: Power Steering Pump Intake Hose Installation Dimension
Courtesy of AUDI OF AMERICA, LLC

- Note the installation dimension of the clamp. Dimension -a- must be 4 mm.
- Install the power steering pump and intake hose into the bracket -3-.

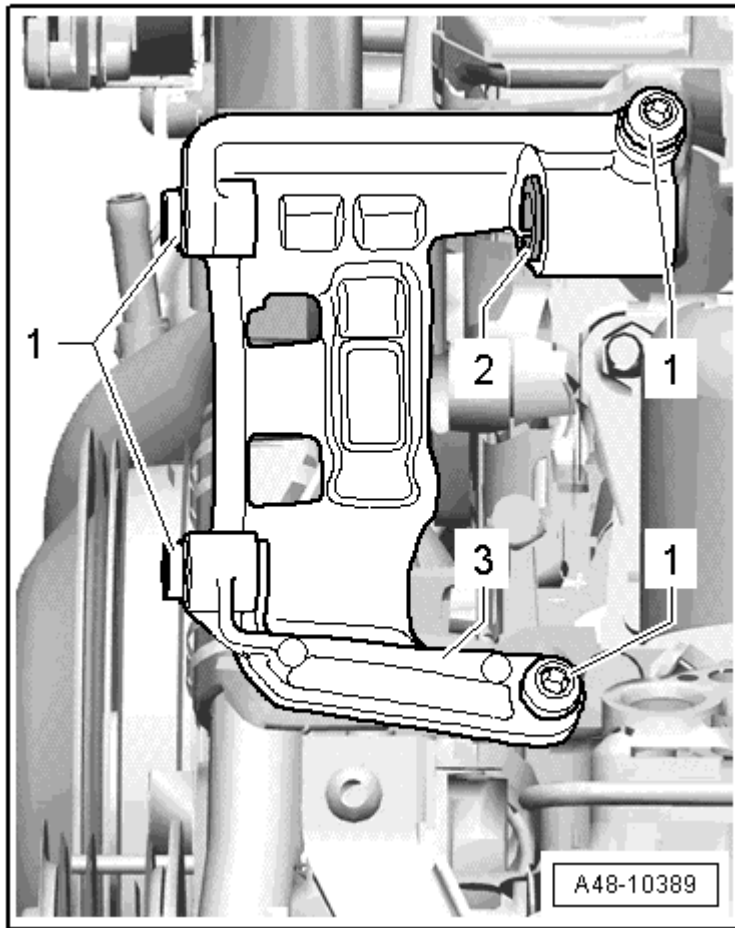


Fig. 274: Identifying Power Steering Bracket
Courtesy of AUDI OF AMERICA, LLC

- The sleeve -2- is driven back slightly.

-- First install the bolts -1- loosely.

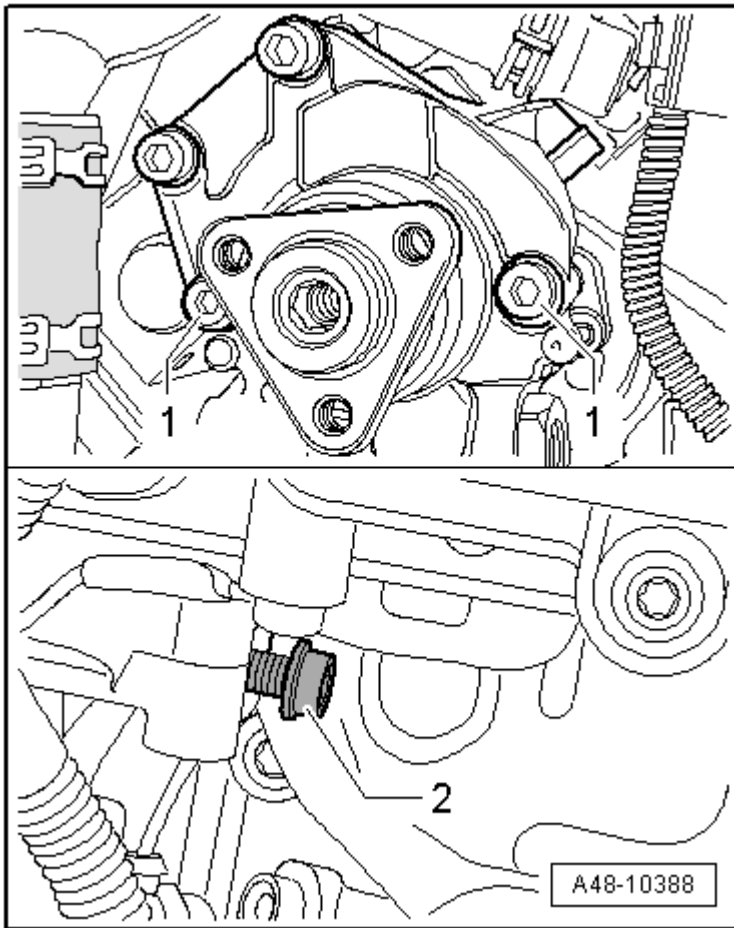


Fig. 275: Locating Power Steering Pump Bracket Bolts
Courtesy of AUDI OF AMERICA, LLC

- Then install the rear bolt -2- loosely.
- Install and tighten the bolts -1- and -2-.
- Press the pressure line into the power steering pump as far as the stop. Then install the union nut -1-.

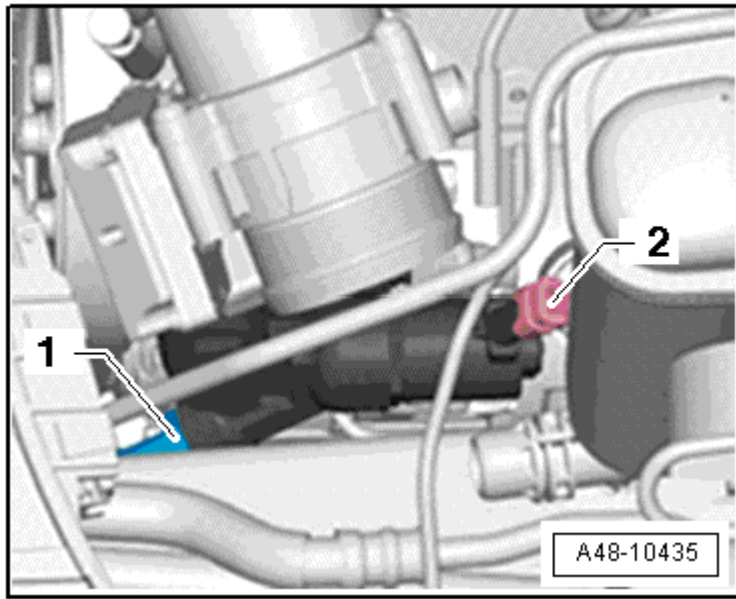


Fig. 276: Locating Union Nut & Connector
Courtesy of AUDI OF AMERICA, LLC

-- Connect the connector -2-.

-- Tighten the union nut with the V.A.G 1331/10 as illustrated.

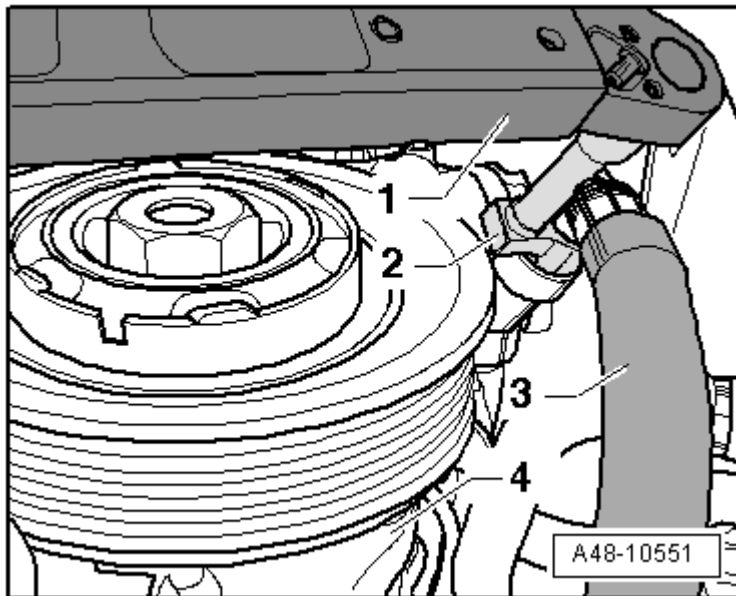


Fig. 277: Tightening A/C Compressor Union Nut
Courtesy of AUDI OF AMERICA, LLC

1. Torque wrench 5 - 50 Nm V.A.G 1331 with extension
2. Flared Ring Spanner Tool Insert AF17 V.A.G 1331/10

3. Pressure line with union nut
4. Air Conditioning (A/C) compressor

-- Route the intake hose -2- inside the engine compartment so that it is free of tension and not bent and attach it to the reservoir.

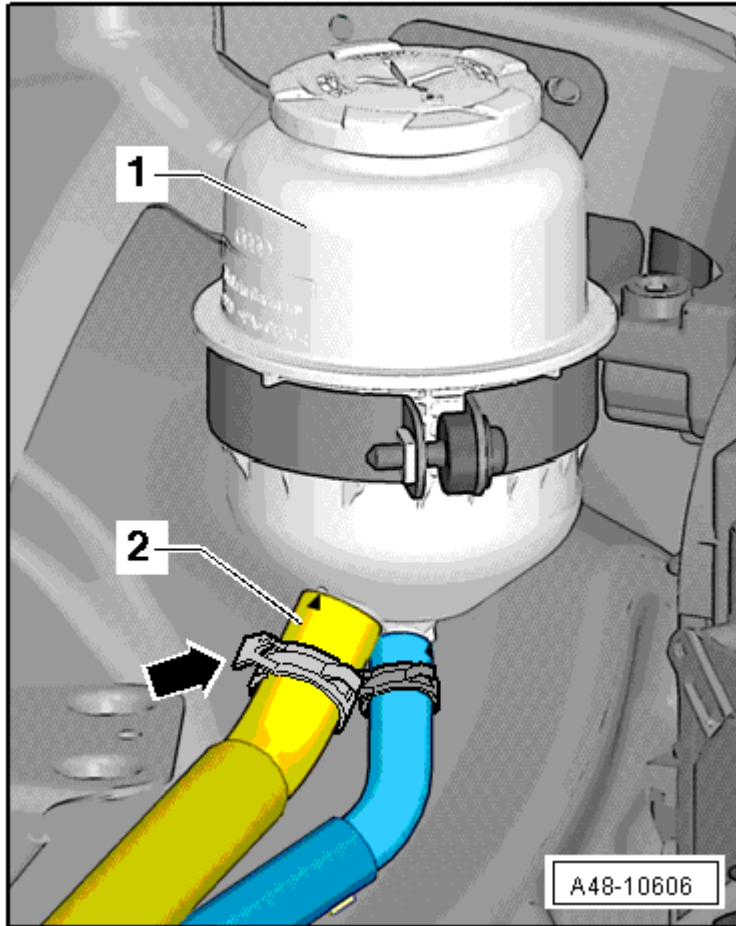


Fig. 278: Releasing Intake Hose Spring Clamp Tension
Courtesy of AUDI OF AMERICA, LLC

NOTE: Make sure the hose is not bent or twisted.

-- Clean oiled places in engine compartment.

-- Align the marking -arrow- made on the belt pulley to the marking made on the hub.

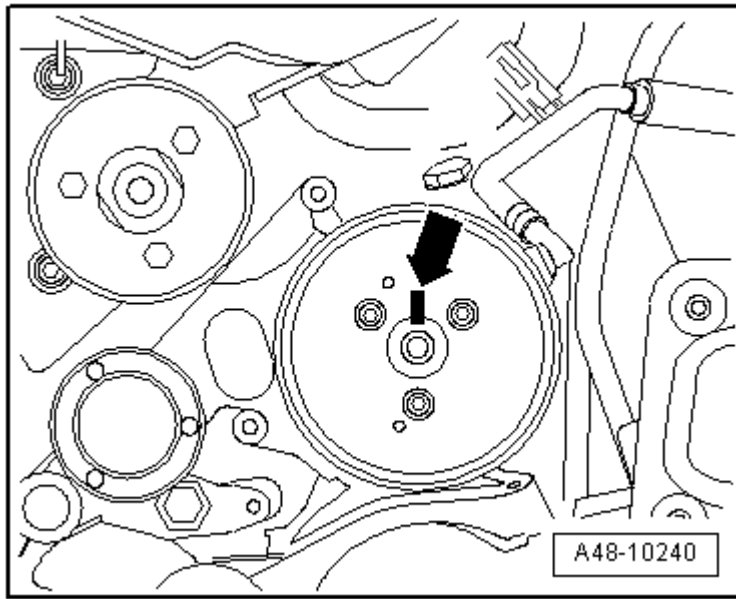


Fig. 279: Identifying Belt Pulley To Hub Marking
Courtesy of AUDI OF AMERICA, LLC

-- Tighten the belt pulley bolts -arrows-. Refer to **Removal and Installation** .

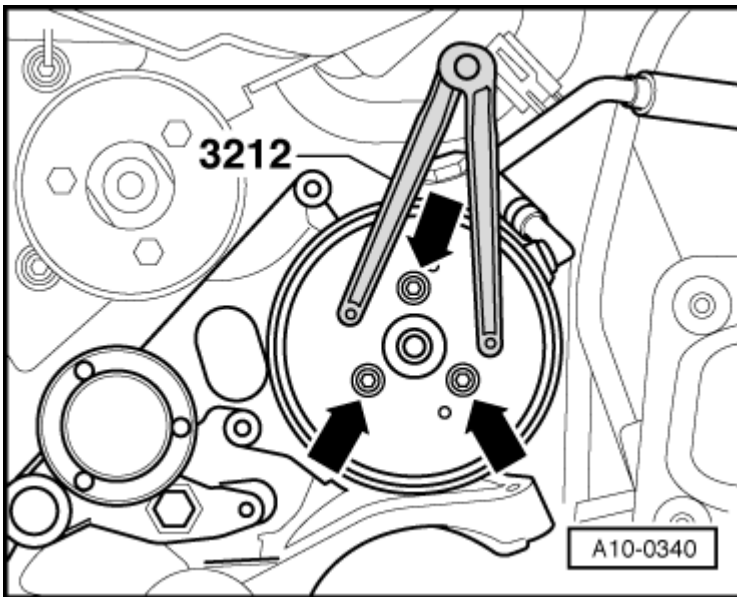


Fig. 280: Identifying Pulley Bolts
Courtesy of AUDI OF AMERICA, LLC

Install power steering pump ribbed belt. Refer to **Removal and Installation** .

-- Check power steering fluid level. Refer to **POWER STEERING FLUID LEVEL, CHECKING**.

-- Bleed the steering. Refer to **STEERING, BLEEDING AFTER REPLACING**.

- Check the steering for leaks. Refer to **STEERING, CHECKING FOR LEAKS**.
- Install noise insulation. Refer to **Description and Operation** .
- Install ribbed belt and check alignment of ribbed belt. Refer to **Removal and Installation** .

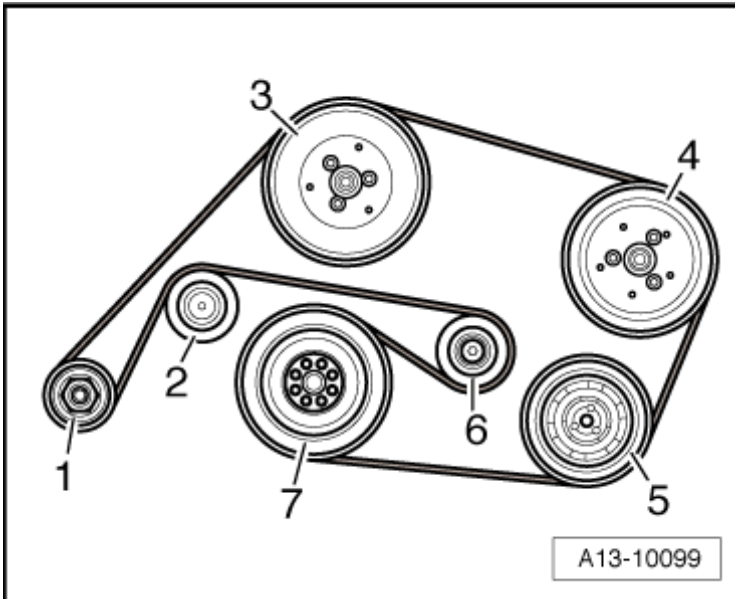


Fig. 281: Placing Ribbed Belt Over Belt Pulley

Courtesy of AUDI OF AMERICA, LLC

NOTE: When installing ribbed belt, ensure it is correctly seated in ribbed belt pulley.

1. Generator
2. Idler pulley
3. Coolant pump
4. Power Steering Pump
5. A/C Compressor
6. Tensioner pulley
7. Crankshaft

POWER STEERING PUMP, VEHICLES WITHOUT DYNAMIC STEERING (6-CYLINDER TFSI)

Power Steering Pump Overview

NOTE: Always replace seals.

Do not reuse fluid you have drained.

Only use hydraulic oil.

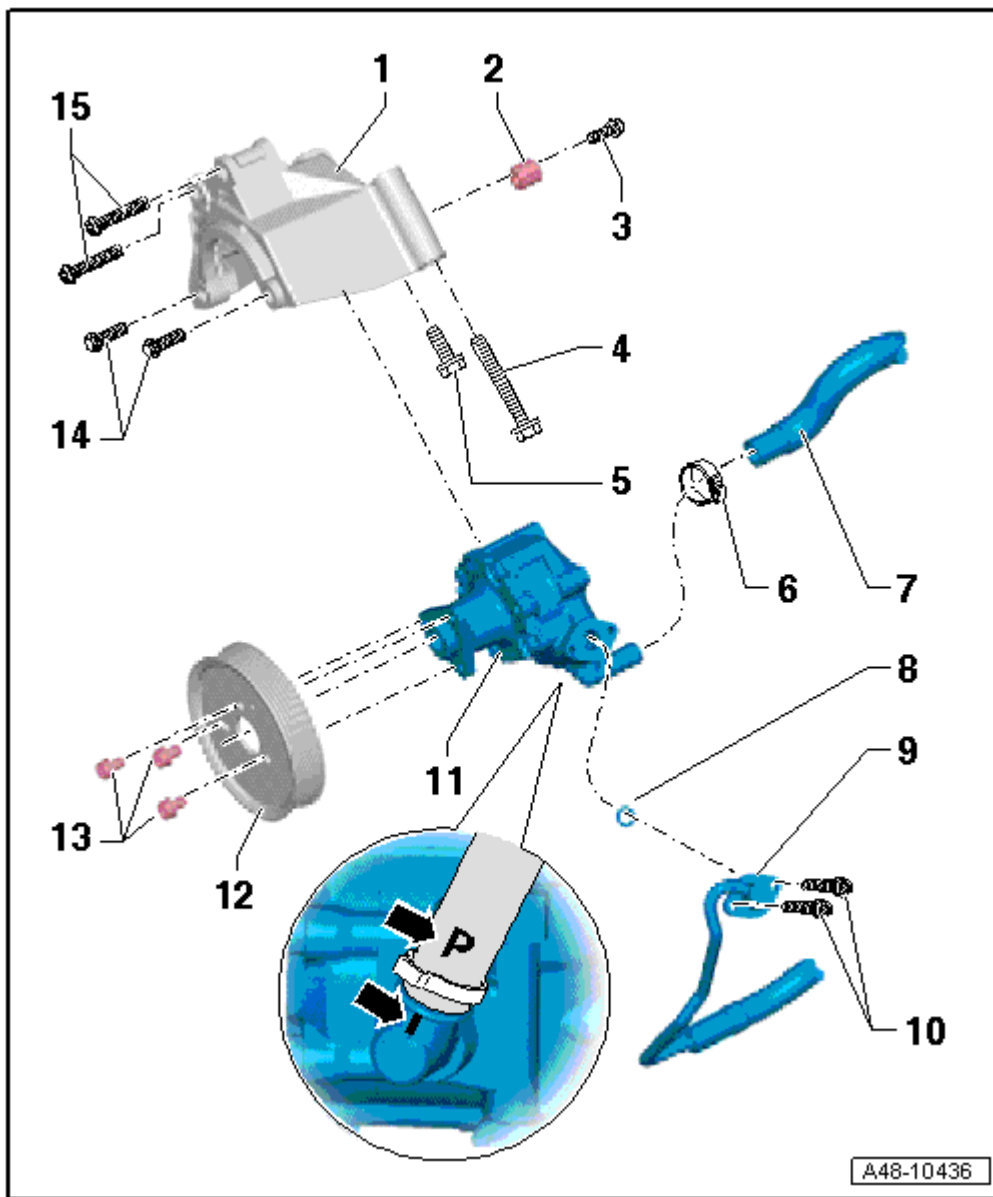


Fig. 282: Power Steering Pump, Vehicles Without Dynamic Steering (6-Cylinder TFSI)
 Courtesy of AUDI OF AMERICA, LLC

1. Bracket
2. Sleeve
 - Drive the sleeve back slightly to install the power steering pump.
3. Bolt
 - 20 Nm
4. Bolt
 - 20 Nm
 - For securing the bracket to the engine.
 - Note the different bolt lengths.

5. Bolt

- 20 Nm
- For securing the bracket to the engine.
- Note the different bolt lengths.

6. Clamp

- Tension using hose clamp pliers V.A.G 1275
- Always replace if removed.

7. Intake Hose

- The marking "P" on the suction hose -arrow- must align with the formed seam -arrow- on the power steering pump.

8. Seal

- Always replace if removed.

9. Pressure Line

CAUTION: • Insert the pressure line completely when installing.

10. Bolt

- 9 Nm

11. Power Steering Pump

-
- Fill with hydraulic oil before installation
- Checking delivery pressure, refer to **POWER STEERING PUMP DELIVERY PRESSURE, CHECKING**
- Bleed the steering, refer to **STEERING, BLEEDING AFTER REPLACING.**
- Check hydraulic fluid level, refer to **POWER STEERING FLUID LEVEL, CHECKING.**
- Steering system, checking for leaks, refer to **STEERING, CHECKING FOR LEAKS**

12. Belt Pulley

13. Bolt

- 22 Nm

14. Bolt

- 20 Nm
- For securing the power steering pump to the bracket

15. Bolt

- 20 Nm
- For securing the bracket to the engine.

Removing

Special tools and workshop equipment required

- Hose Clamps Up to 25 mm Dia. 3094
- Spanner Wrench 3212
- Hose Clamp Pliers V.A.G 1275
- Torque Wrench 5-50 Nm V.A.G 1331
- Ratchet, Reversible V.A.G 1331/1
- Flared Ring Spanner Tool Insert AF17 V.A.G 1331/10
- Used Oil Collection and Extraction Device V.A.G 1782
- Drip Tray for VAS 6100 VAS 6208
- Engine Bung Set VAS 6122

General Information

Vane pump is not designed to be serviced. If there are customer complaints, the cause must be determined using a pressure and leak test. If there is a malfunction, replace the vane pump.

- If power steering fluid is low in reservoir, check steering system for leaks.
- If there are leaks in the area of the line connections, the lines/connections must first be inspected for leaks, tightened as necessary and wiped dry.
- Power steering pump is delivered without oil. Therefore, hydraulic oil must be filled before installation and turned by hand. Otherwise, noises when driving or damage to power steering pump may occur.

-- Place the vehicle on a hoist.

-- Remove the engine cover -1-.

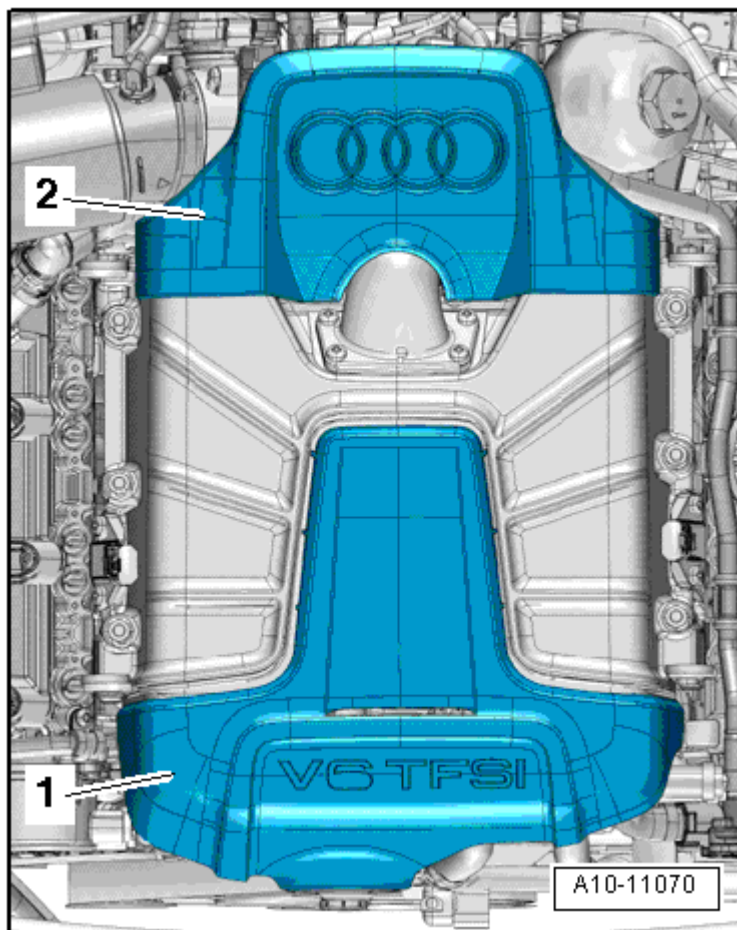


Fig. 283: Engine Cover -1- and -2-
Courtesy of AUDI OF AMERICA, LLC

- Extract hydraulic oil from reservoir using V.A.G 1782.
- Clamp off the suction hose -1- and return hose -2- using the 3094.

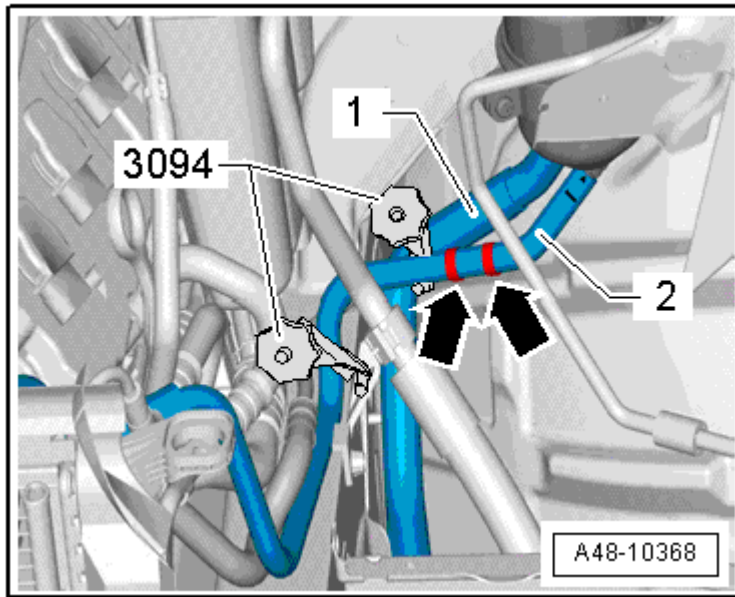


Fig. 284: Locating Suction & Return Hose Clamping Location
Courtesy of AUDI OF AMERICA, LLC

CAUTION:

- The 3094 must not be secured on the return hose -2- in the check valve area. Otherwise, check valve will be damaged.
- The check valve is located in the return hose -2- between the hose clamps -arrows-.

-- Remove noise insulation. Refer to Description and Operation .

-- Drain the coolant. Refer to General Information .

-- Disconnect the coolant lines -1 and 2- from the coolant reservoir. Remove the nuts -arrows- and remove the coolant reservoir -3- from its mount.

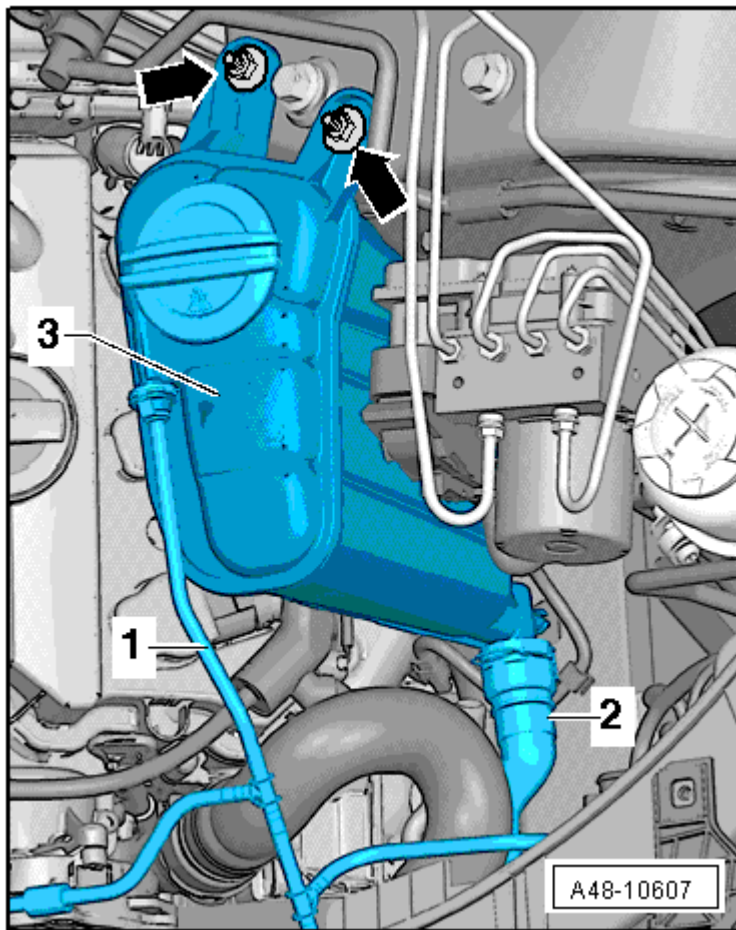


Fig. 285: Identifying Coolant Reservoir

Courtesy of AUDI OF AMERICA, LLC

-- Disconnect the connector on the bottom of the coolant reservoir -3-. Move the coolant reservoir -3- to the side.

-- Remove the coolant hose -1 and 2- from the coolant pipe and move it to the side.

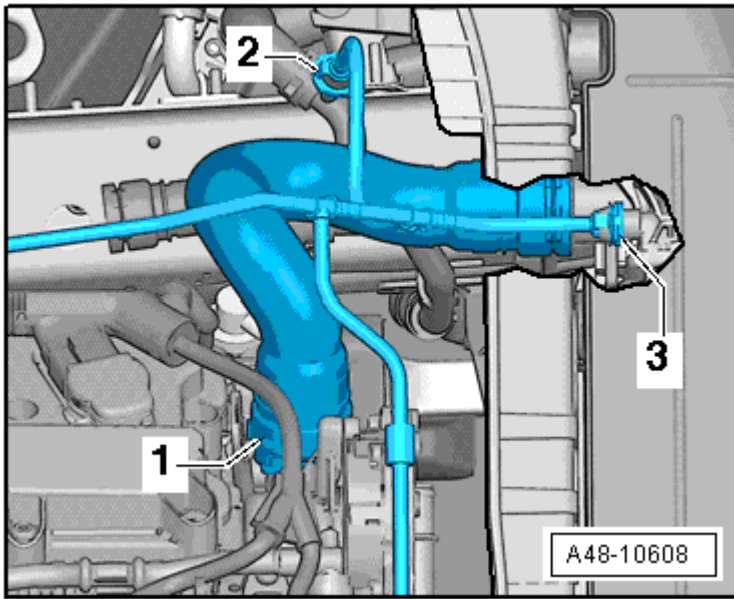


Fig. 286: Identifying Coolant Hose & Line
Courtesy of AUDI OF AMERICA, LLC

- Remove the coolant line -3- from the radiator and move it to the side.
- Remove the bolt -1- on the upper coolant pipes.

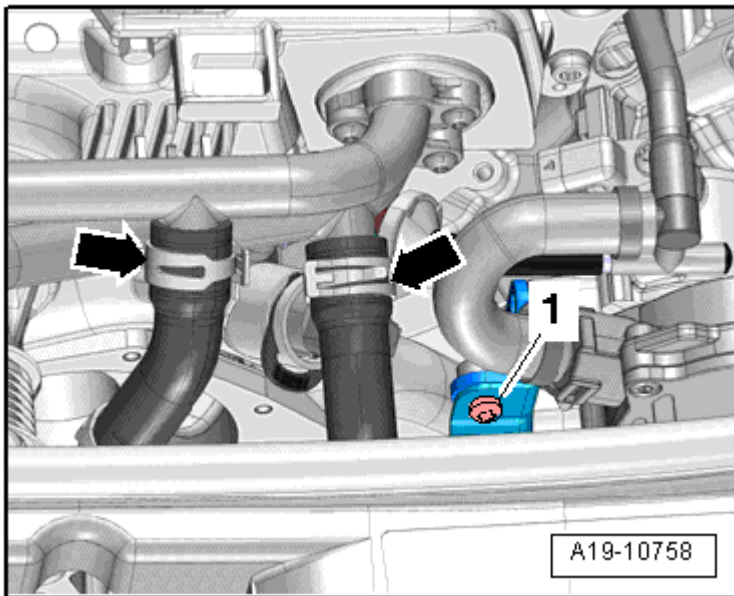


Fig. 287: Identifying Clamps -Arrows- To Coolant Hoses
Courtesy of AUDI OF AMERICA, LLC

- Ignore the -arrows-
- Remove the bolt -1- on the lower coolant pipes.

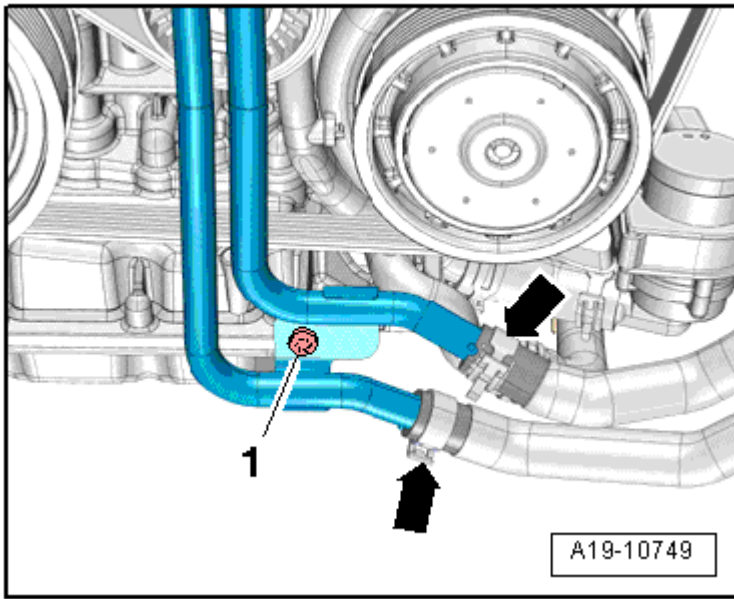


Fig. 288: Locating Lower Coolant Pipe Bolt
Courtesy of AUDI OF AMERICA, LLC

- Ignore the -arrows-

NOTE: Identify direction of travel before removing ribbed belt. Reversed direction of travel with a used belt can lead to malfunctions. When installing ribbed belt, make sure it is seated correctly on pulleys.

-- Release the tension on the ribbed belt and remove it from the power steering pump belt pulley.

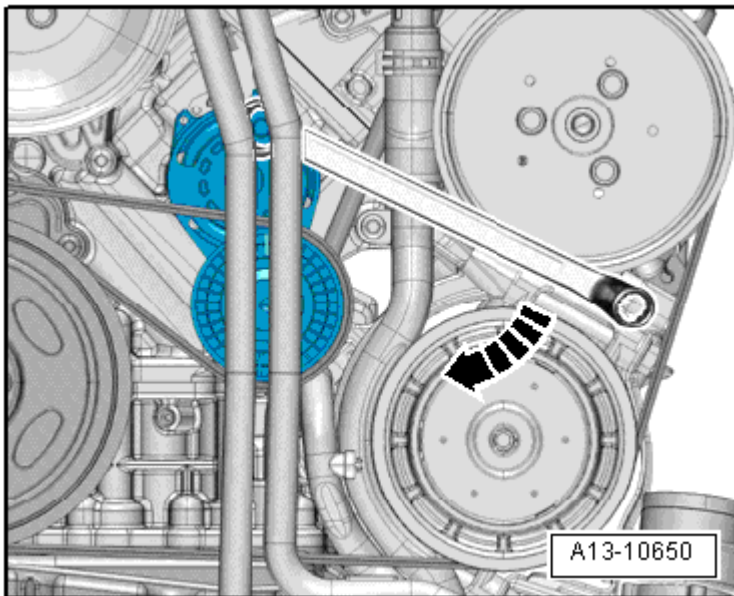


Fig. 289: Releasing Belt Tension

Courtesy of AUDI OF AMERICA, LLC

- Move the tensioner in the direction of the -arrow- to release the tension on the ribbed belt.
- Remove the ribbed belt from the power steering pump belt pulley.
- Release the tensioner and remove the tool.
- Mark the position of the belt pulley to the hub. Make a marking -arrow-.

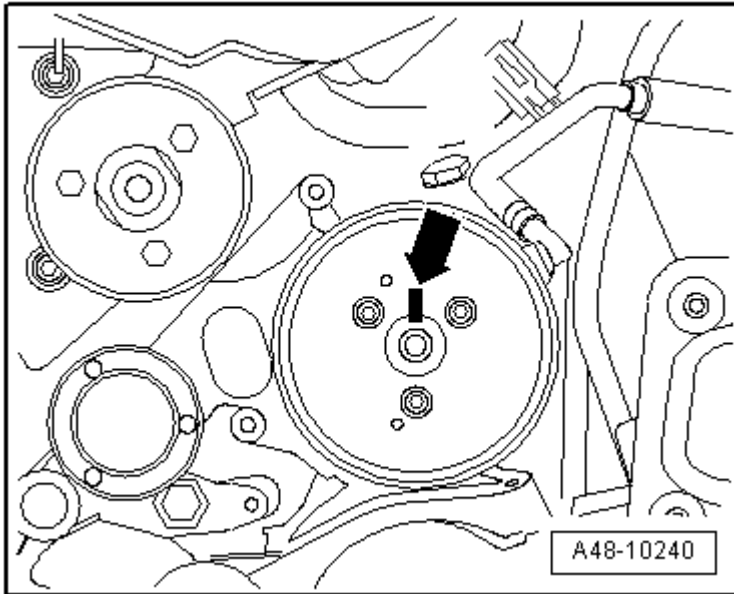


Fig. 290: Identifying Belt Pulley To Hub Marking

Courtesy of AUDI OF AMERICA, LLC

NOTE: If the power steering pump will be replaced, transfer the marking from the hub on the old pump to the new one.

Because of space restrictions, it is not possible to see the position of the belt pulley holes to the holes in the hub when installing.

- Remove bolts -arrows-. Use 3212 as counter hold.

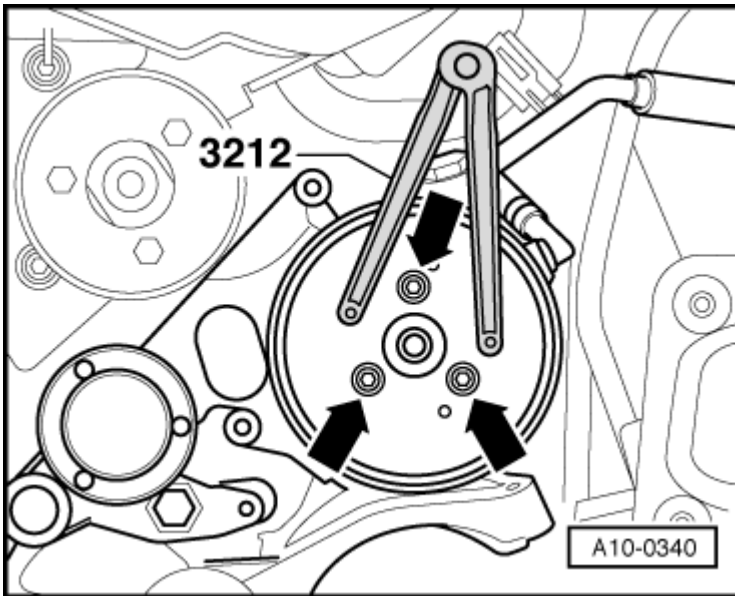


Fig. 291: Identifying Pulley Bolts

Courtesy of AUDI OF AMERICA, LLC

- Remove belt pulley for vane pump.
- Place the VAS 6208 under the power steering pump.
- Carefully cut through the cable ties -1- for the wiring harness -2- if applicable.

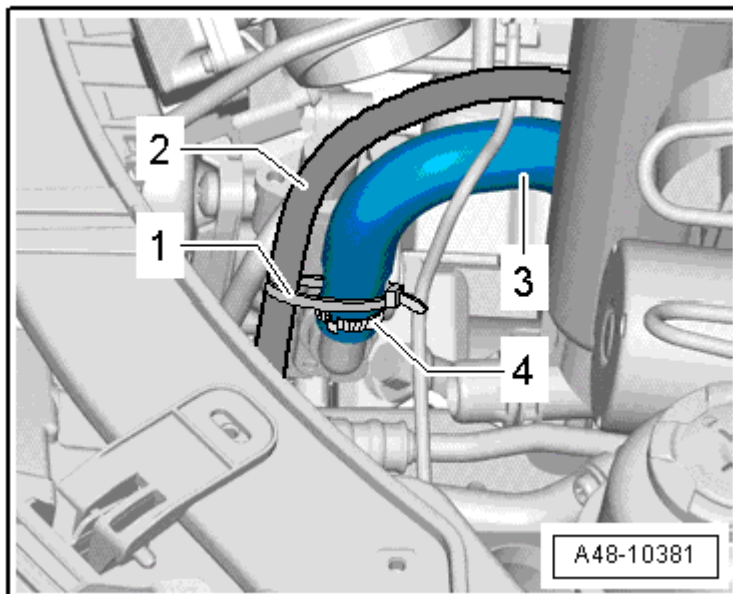


Fig. 292: Identifying Intake & Suction Hose

Courtesy of AUDI OF AMERICA, LLC

- Remove the bolts -1- and pull the pressure line -2- out of the power steering pump.

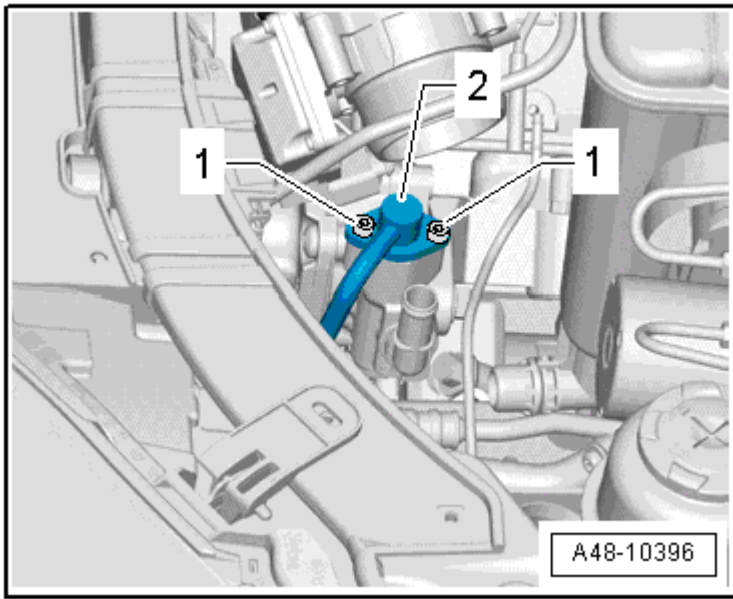


Fig. 293: Power Steering Pump Pressure Line
Courtesy of AUDI OF AMERICA, LLC

- Seal the power steering pump and line connections using clean sealing plugs.
- Remove the power steering pump from the bracket. Remove the front bolts -1- and rear bolt -2-.

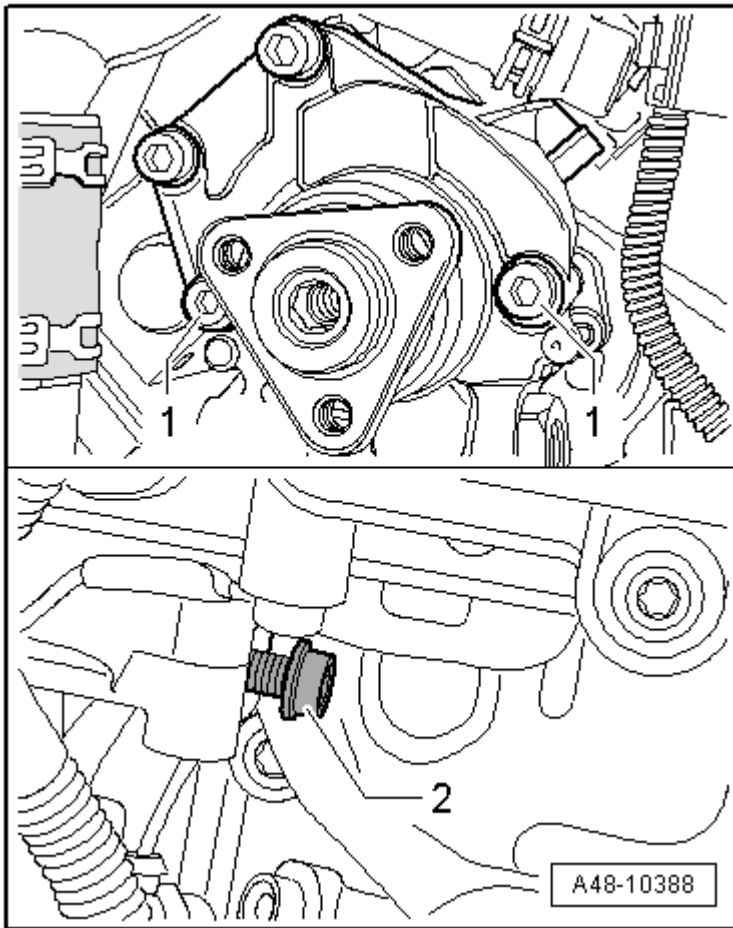


Fig. 294: Locating Power Steering Pump Bracket Bolts
Courtesy of AUDI OF AMERICA, LLC

NOTE: The bolt -2- cannot be seen in the bracket. The illustration shows it unscrewed.

-- Release the tension on the intake hose spring clamp -arrow- -2- on the reservoir -1- and remove the hose -2- from the reservoir.

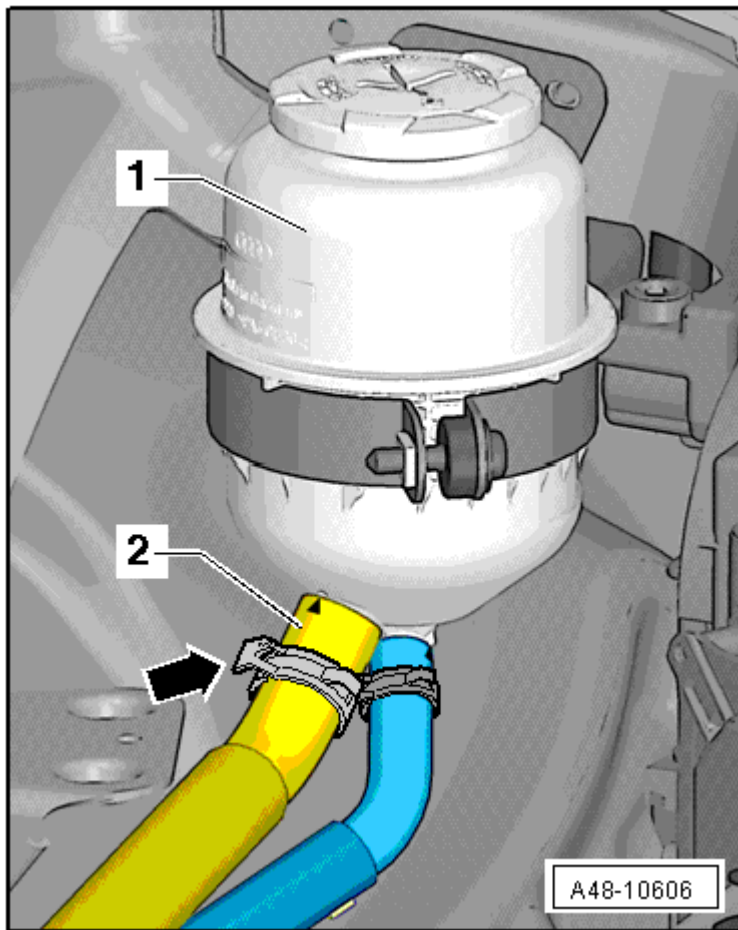


Fig. 295: Releasing Intake Hose Spring Clamp Tension
Courtesy of AUDI OF AMERICA, LLC

-- Remove the power steering pump and intake hose from the bracket.

Installing

Install in reverse order of removal. Note the following:

Tightening specifications, refer to **POWER STEERING PUMP, VEHICLES WITHOUT DYNAMIC STEERING**

Installation position, hose lines, refer to **HOSE LINES TO RESERVOIR, HYDRAULIC FLUID COOLER AND RETURN LINE INSTALLED POSITION**

NOTE: Replace seals and gaskets.

Before installing the new power steering pump on the intake side, fill the hydraulic oil and install it by hand until oil drains out on the high pressure side.

Secure all hose connections with new hose clamps.

Due to a lack of space, it is not possible to tension the clamp with the V.A.G 1275 when the power steering pump is installed. Therefore perform this step when the pump is removed.

-- Mount the intake hose, see item 7 before installing. The "P" must align with the seam.

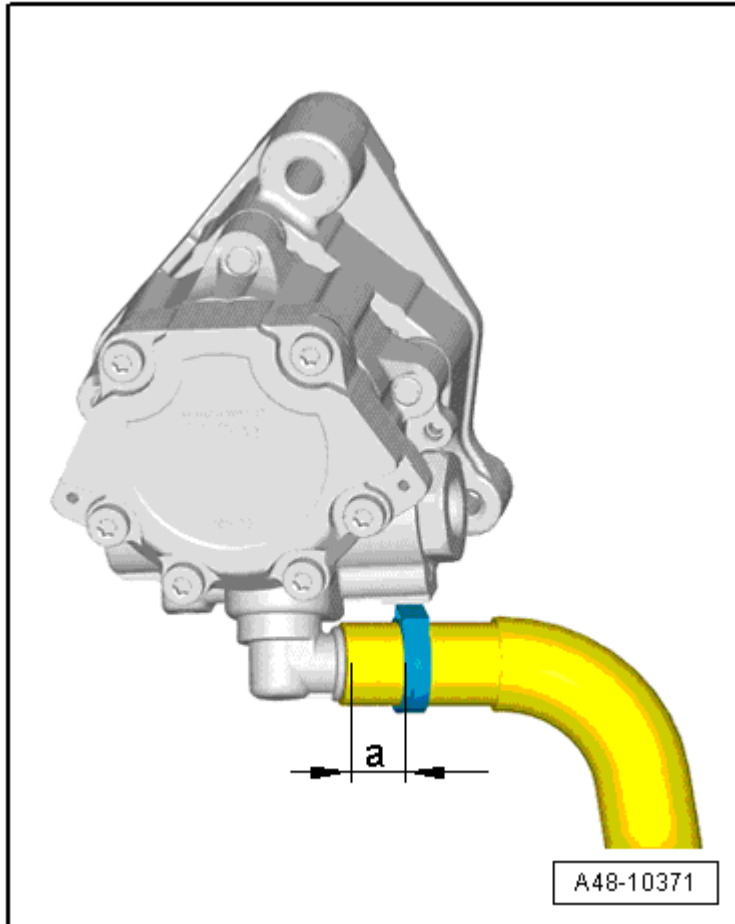


Fig. 296: Power Steering Pump Intake Hose Installation Dimension
Courtesy of AUDI OF AMERICA, LLC

- Secure suction hose with new hose clamp.
- Note the installation dimension of the clamp. Dimension -a- must be 4 mm.
- Install the power steering pump and intake hose into the bracket -3-.

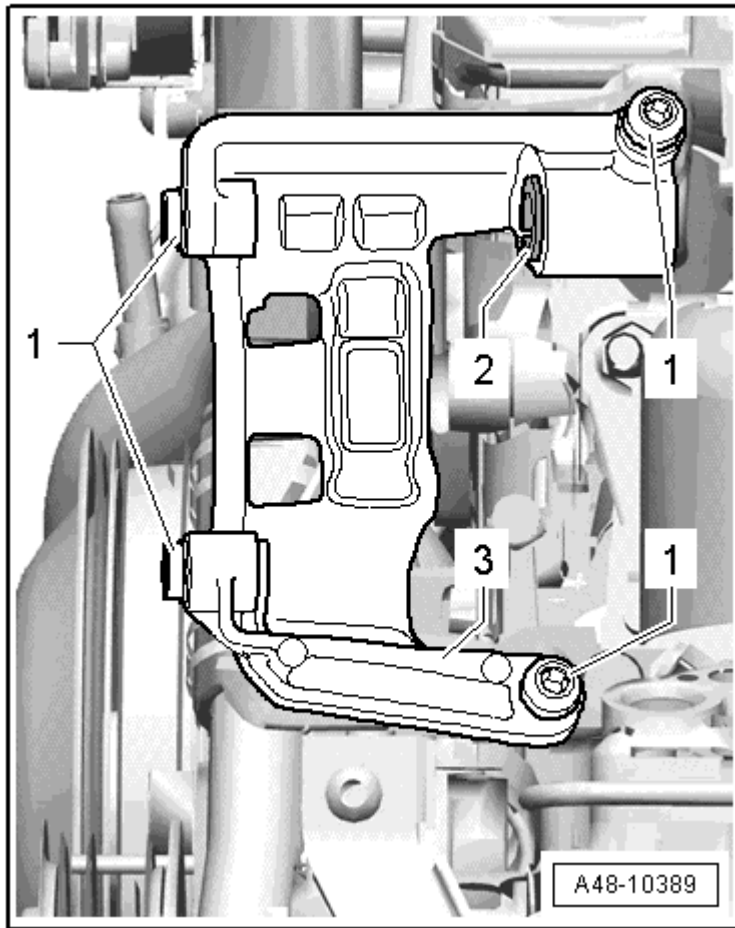


Fig. 297: Identifying Power Steering Bracket
Courtesy of AUDI OF AMERICA, LLC

- The sleeve -2- is driven back slightly.

-- First install the bolts -1- loosely.

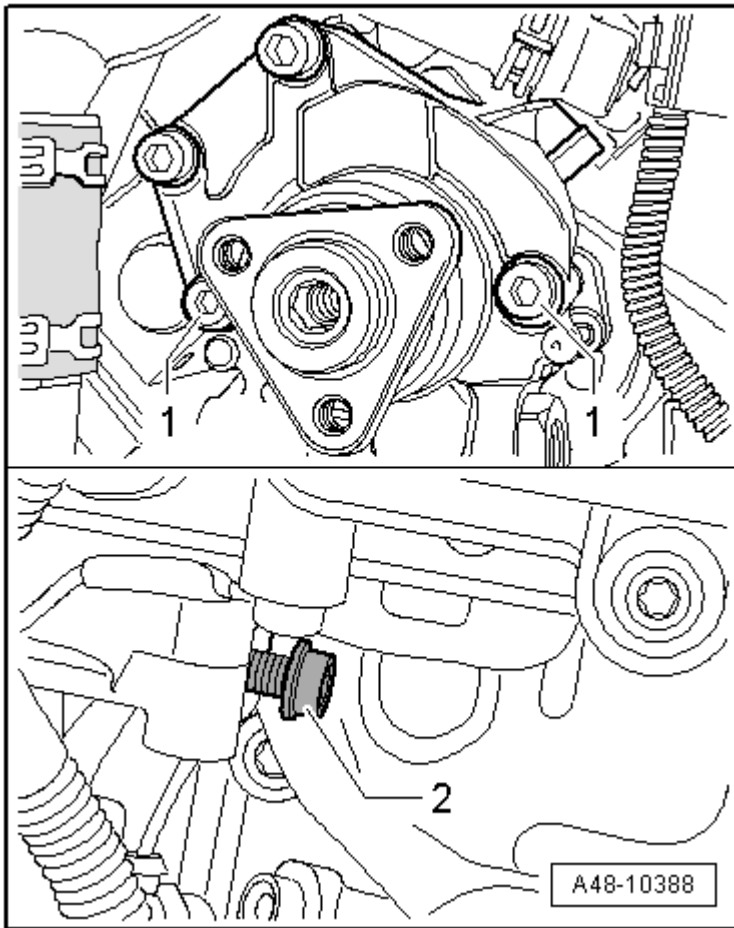


Fig. 298: Locating Power Steering Pump Bracket Bolts
Courtesy of AUDI OF AMERICA, LLC

- Then install the rear bolt -2- loosely.
- Install and tighten the bolts -1 and 2-.
- Press the pressure line -2- into the power steering pump as far as the stop. Then tighten bolts -1-.

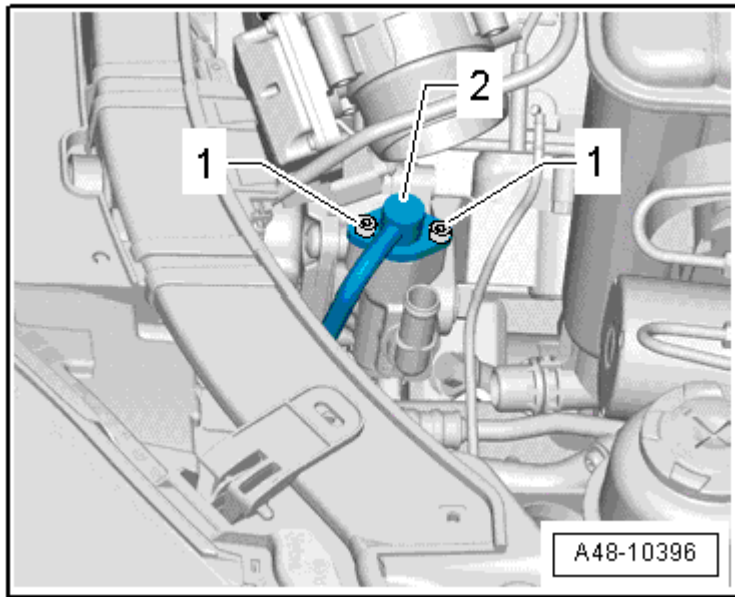


Fig. 299: Power Steering Pump Pressure Line
Courtesy of AUDI OF AMERICA, LLC

-- Secure the wiring harness on the supports using a new cable tie -4-, where applicable.

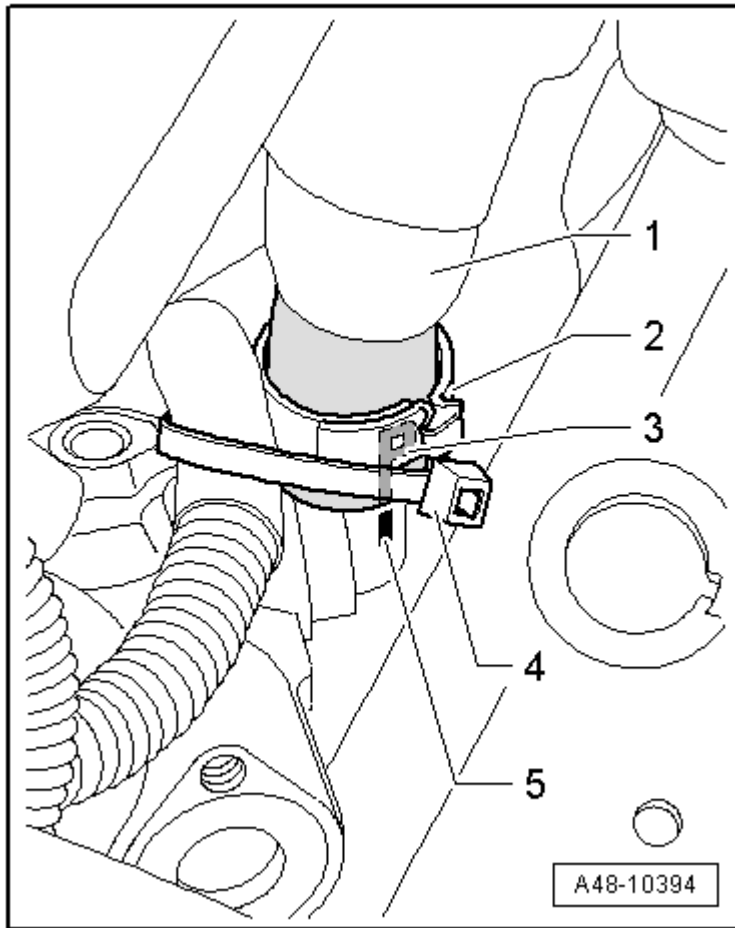


Fig. 300: Identifying Intake Hose

Courtesy of AUDI OF AMERICA, LLC

-- Route the intake hose -2- inside the engine compartment so that it is free of tension and not bent and attach it to the reservoir.

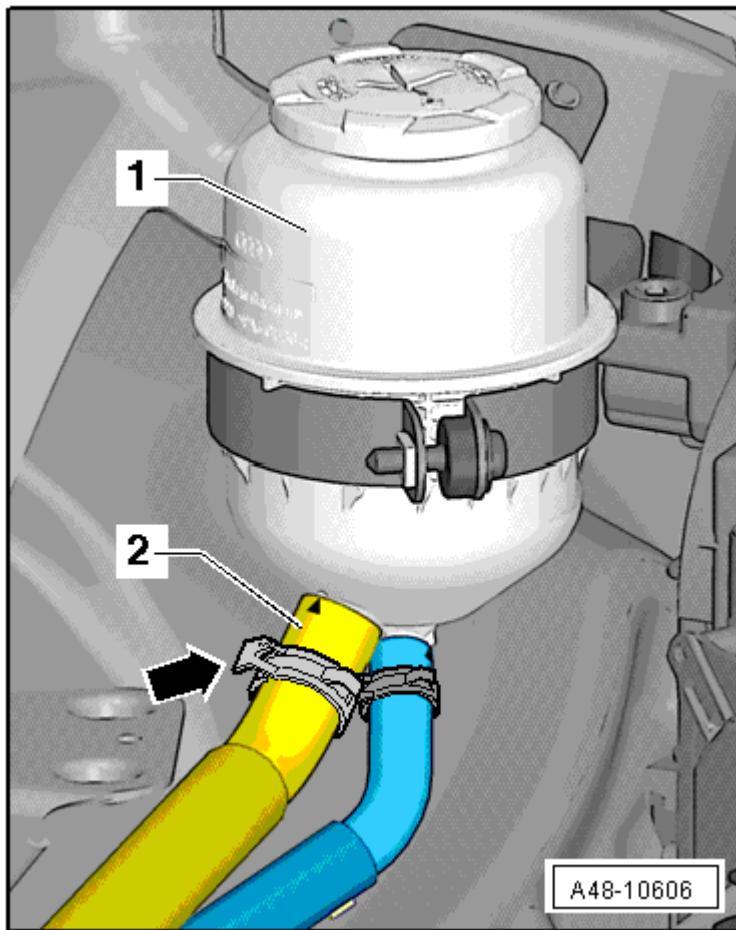


Fig. 301: Releasing Intake Hose Spring Clamp Tension
Courtesy of AUDI OF AMERICA, LLC

NOTE: **Make sure the hose is not bent or twisted.**

- Clean oiled places in engine compartment.
- Align the marking -arrow- made on the belt pulley to the marking made on the hub.

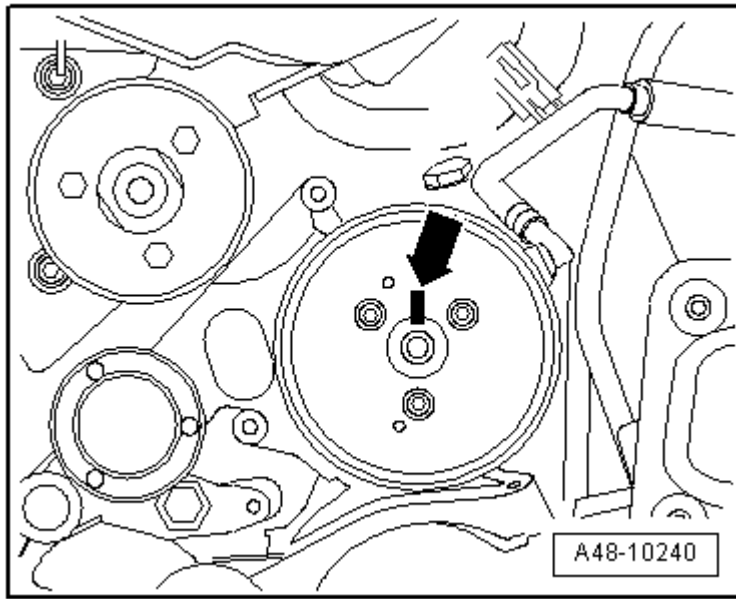


Fig. 302: Identifying Belt Pulley To Hub Marking
Courtesy of AUDI OF AMERICA, LLC

-- Tighten the belt pulley bolts -arrows-. Refer to **Removal and Installation** .

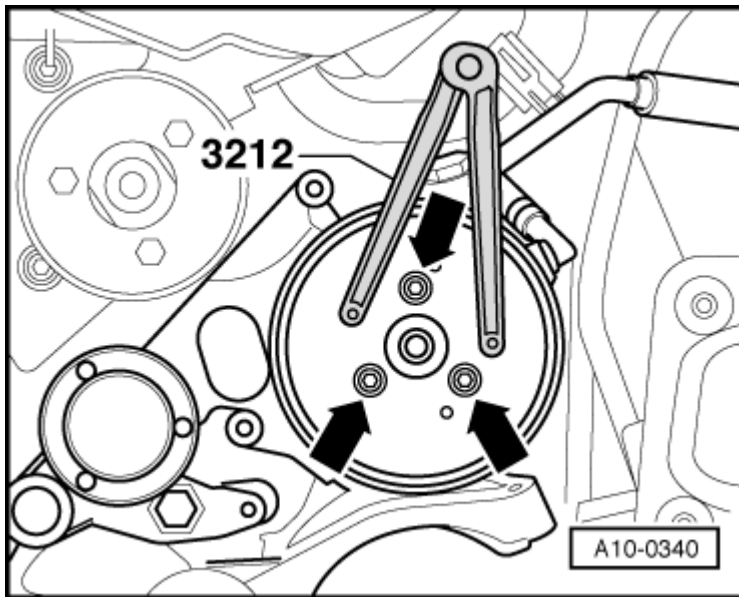


Fig. 303: Identifying Pulley Bolts
Courtesy of AUDI OF AMERICA, LLC

Install power steering pump ribbed belt. Refer to **Removal and Installation** .

-- Check power steering fluid level. Refer to **POWER STEERING FLUID LEVEL, CHECKING**.

-- Bleed the steering. Refer to **STEERING, BLEEDING AFTER REPLACING**.

- Check the steering for leaks. Refer to **STEERING, CHECKING FOR LEAKS**.
- Install noise insulation. Refer to **Description and Operation** .
- Install ribbed belt and check alignment of ribbed belt. Refer to **Removal and Installation** .

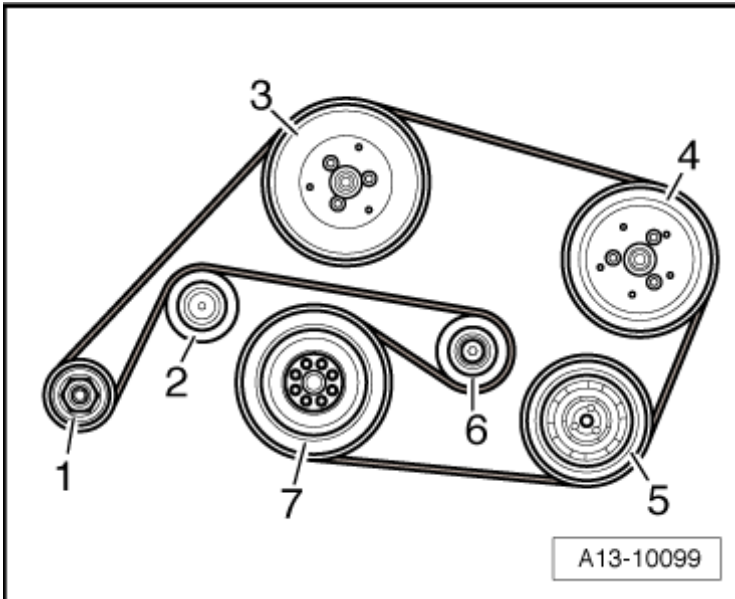


Fig. 304: Placing Ribbed Belt Over Belt Pulley

Courtesy of AUDI OF AMERICA, LLC

NOTE: When installing ribbed belt, ensure it is correctly seated in ribbed belt pulley.

1. Generator
2. Idler pulley
3. Coolant pump
4. Power Steering Pump
5. Air Conditioning (A/C) Compressor
6. Tensioner pulley
7. Crankshaft

DISASSEMBLY AND ASSEMBLY

HYDRAULIC POWER STEERING GEAR, SERVICING

Special tools and workshop equipment required

- Torque Wrench 50-200 Nm V.A.G 1332
- Hose Clip Pliers V.A.G 1921
- Locking Pliers VAS 6199

- Steering gear grease

NOTE: Always replace self-locking nuts and bolts.

Welding or straighten work on any steering components is not permissible.

To grease the rack, only use steering gear grease.

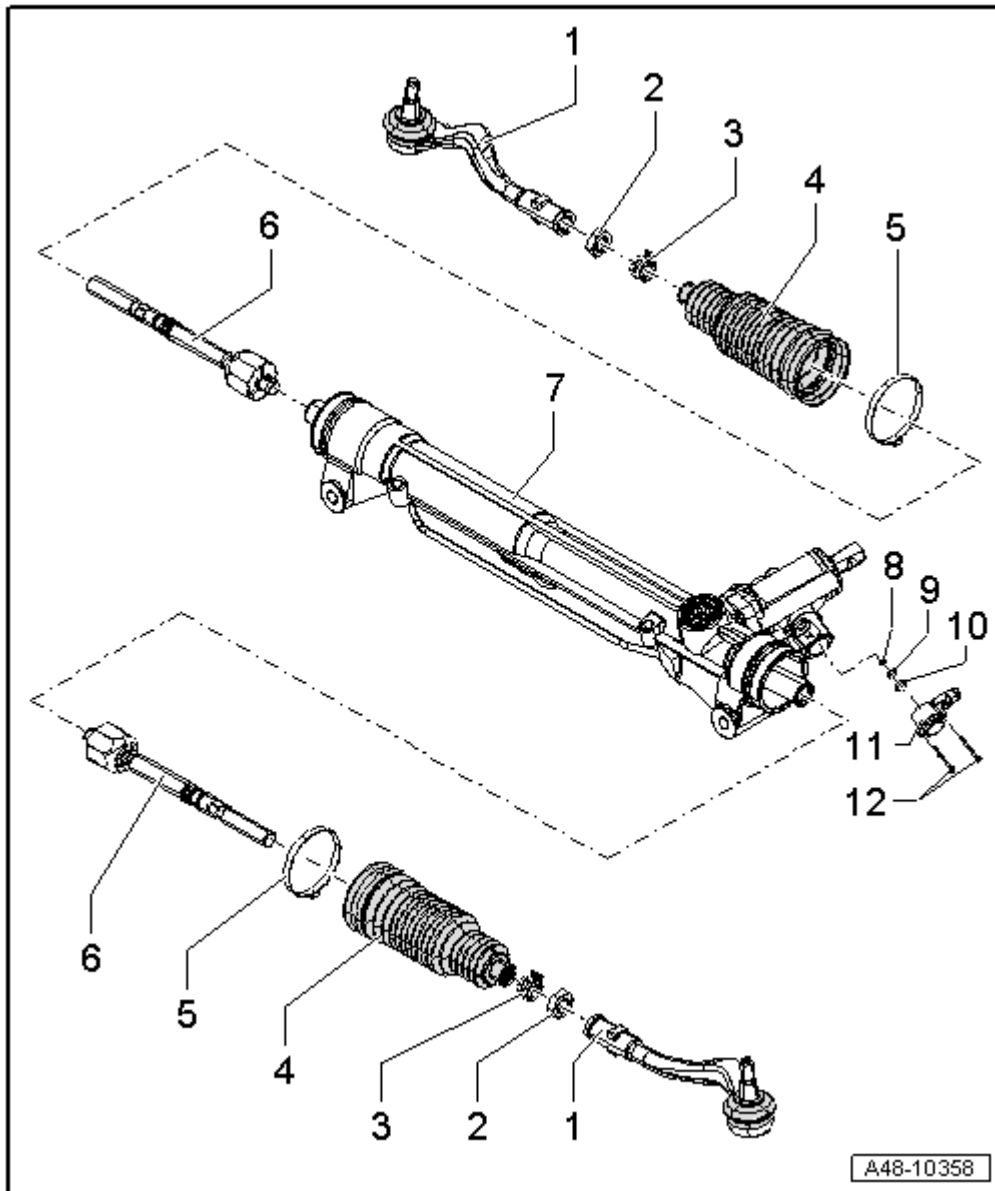


Fig. 305: Hydraulic Power Steering Gear, Servicing
Courtesy of AUDI OF AMERICA, LLC

1. Tie Rod End

- There are different versions, with long or short thread on the joint pin.

WARNING: When replacing, make sure the length of the thread on the tie rod end is sufficient (there must be approximately 5 mm extra thread). If this is not the case, then install a tie rod end with a longer thread pin.

- Check dust caps for damage and correct seating
 - Removing and installing, refer to **TIE ROD END**
2. Nut
 - 60 Nm
 3. Spring Clamp
 - Always replace if removed.
 -
 4. Boot
 - Check for damage
 - Do not twist after adjusting the toe
 - Can be replaced with steering gear installed
 - Replace, refer to **BOOT**
 5. Clamp
 - Always replace if removed.
 - Clamping sleeves, installing **Fig. 166**
 6. Tie Rod
 - 90 Nm
 - Removing and installing, refer to **TIE RODS**
 - Grease joint with steering gear grease.
 7. Power Steering Gear
 - Grease joint with steering gear grease.
 - There are different versions.
 8. Strainer
 - Always replace if removed.
 9. Seal
 - Always replace if removed.
 10. Seal
 - Always replace if removed.
 11. Servotronic Solenoid Valve -N119-
 - Removing and installing, refer to **Servotronic Solenoid Valve -N119-**
 - Follow values can be requested VAS 5051:
 - Speed signal
 - The vehicle electrical system control module -J519- voltage
 - Solenoid Valve -- status

- Measured current for Solenoid Valve -- control

-- Connect vehicle diagnostic tester and then select troubleshooting using "Functions/Component selection".

-- Then "body".

-- Select "Electrical system".

-- "01- On Board Diagnostic (OBD) capable systems".

-- vehicle electrical system control module --.

-- "Electrical components".

-- Servotronic solenoid valve --.

12. Bolt

- 3 Nm

CAUTION: • Always follow bolt tightening sequence.

- Tightening sequence, refer to Servotronic Solenoid Valve -N119-

SPECIAL TOOLS

Special tools and workshop equipment required

- Hose Clamps Up to 25 mm Dia. 3094

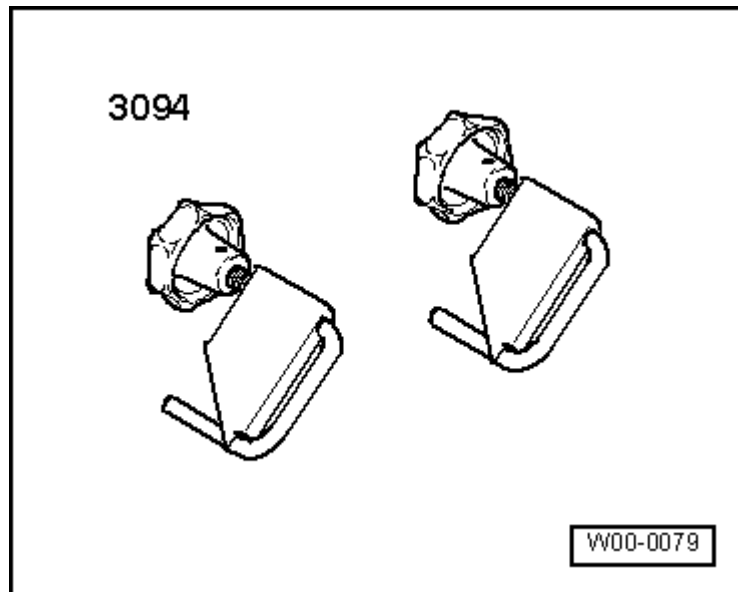


Fig. 306: 3094 Hose Clamps
Courtesy of AUDI OF AMERICA, LLC

- Ball Joint Puller T40010 A

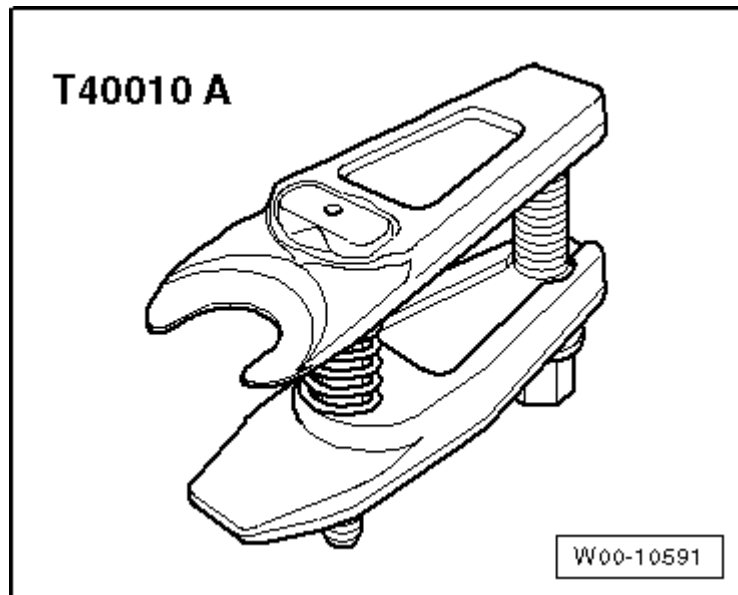


Fig. 307: Ball Joint Puller T40010 A
Courtesy of AUDI OF AMERICA, LLC

- Hose Clamp Pliers V.A.G 1275

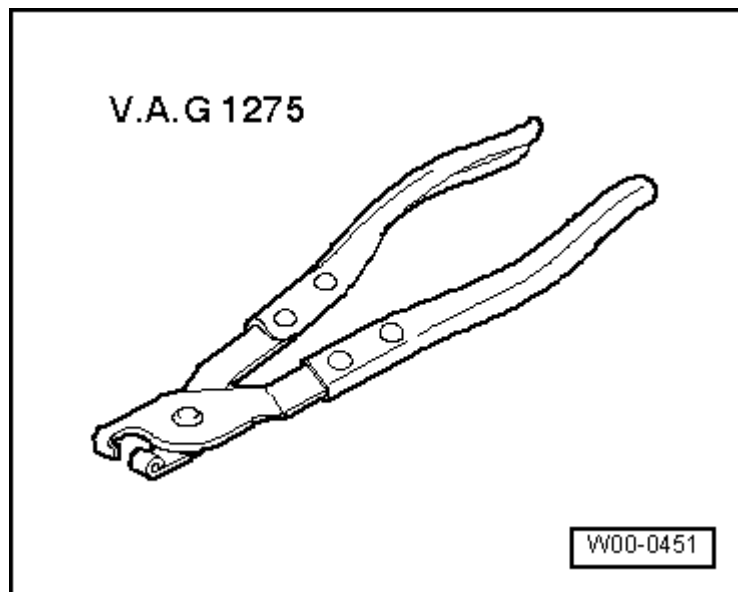


Fig. 308: Hose Clamp Pliers V.A.G 1275
Courtesy of AUDI OF AMERICA, LLC

- Torque Wrench 5-50 Nm V.A.G 1331

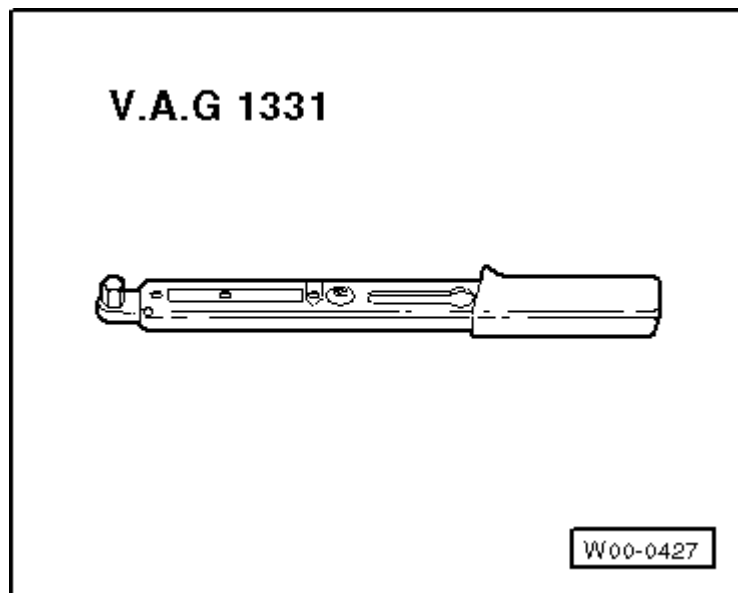


Fig. 309: Torque Wrench 5-50 Nm V.A.G 1331
Courtesy of AUDI OF AMERICA, LLC

- Ratchet, Reversible V.A.G 1331/1

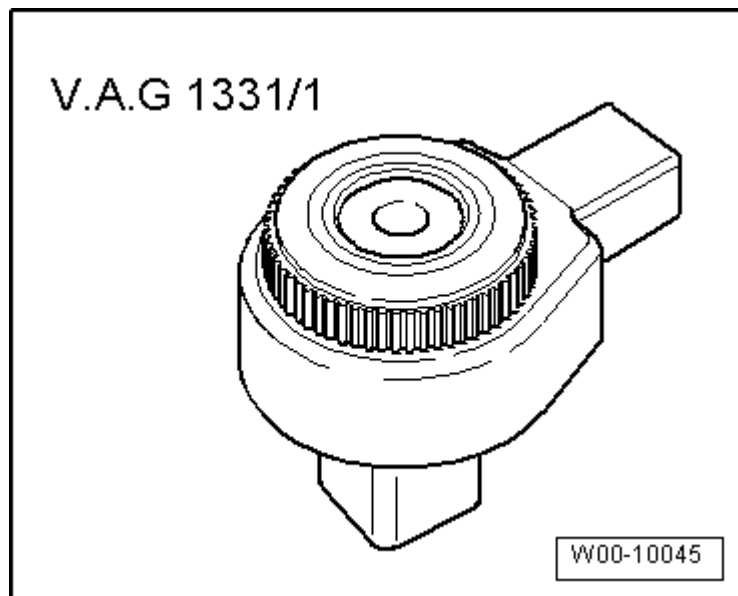


Fig. 310: Ratchet, Reversible V.A.G 1331/1
Courtesy of AUDI OF AMERICA, LLC

- Tool Insert, AF 17 V.A.G 1331/6

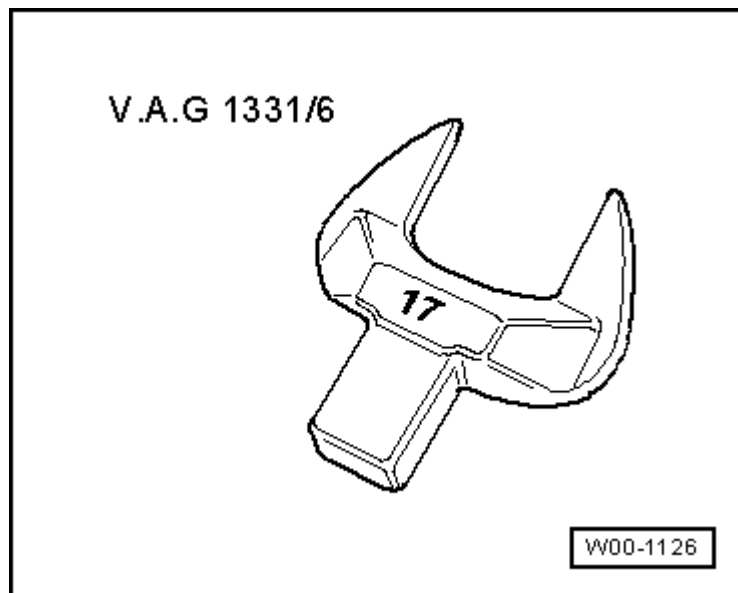


Fig. 311: Tool Insert, AF 17 V.A.G 1331/6
Courtesy of AUDI OF AMERICA, LLC

- Flared Ring Spanner Tool Insert AF17 V.A.G 1331/10

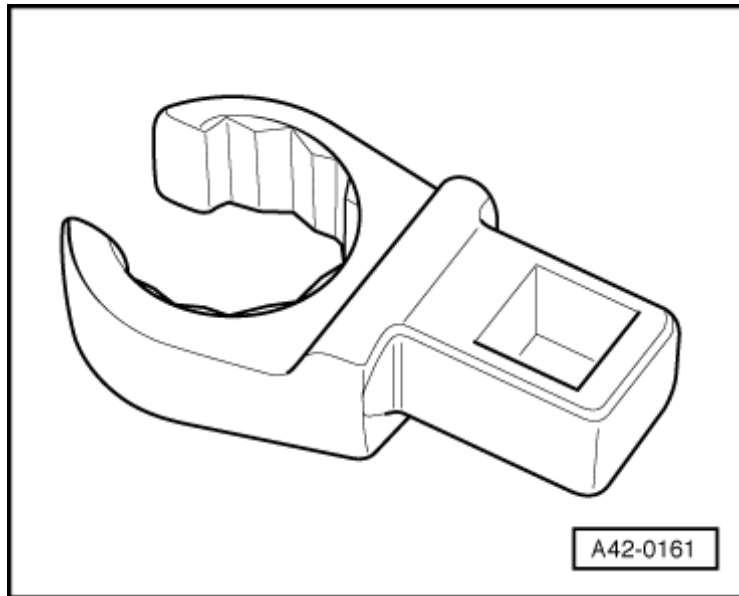


Fig. 312: Flared Ring Spanner Tool Insert AF17 V.A.G 1331/10
Courtesy of AUDI OF AMERICA, LLC

- Torque Wrench 50-200 Nm V.A.G 1332

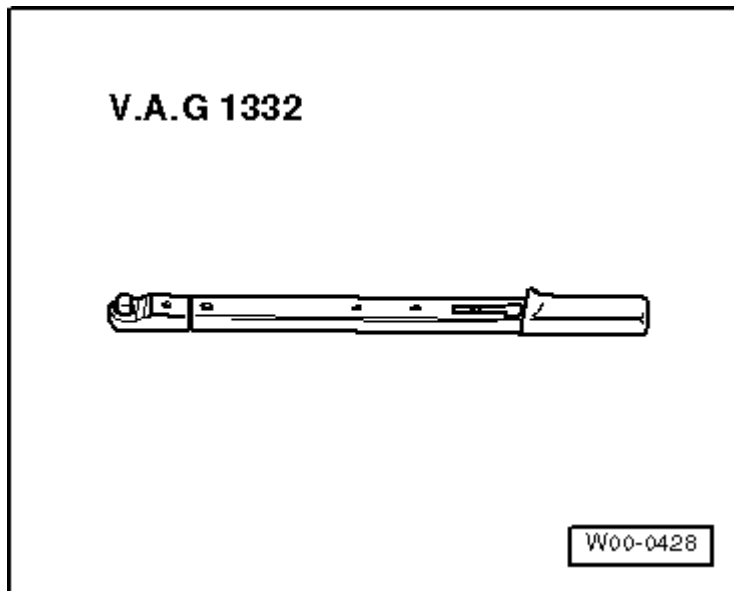


Fig. 313: Torque Wrench 50-200 Nm V.A.G 1332
Courtesy of AUDI OF AMERICA, LLC

- Ring Spanner Insert, AF 21 mm V.A.G 1332/7

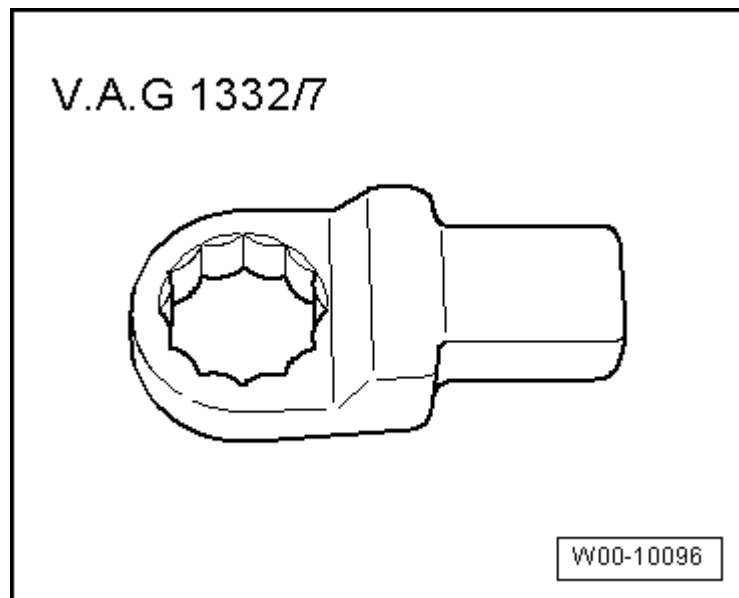


Fig. 314: Ring Spanner Insert, AF 21 mm V.A.G 1332/7
Courtesy of AUDI OF AMERICA, LLC

- Ring Spanner Insert V.A.G 1332/10

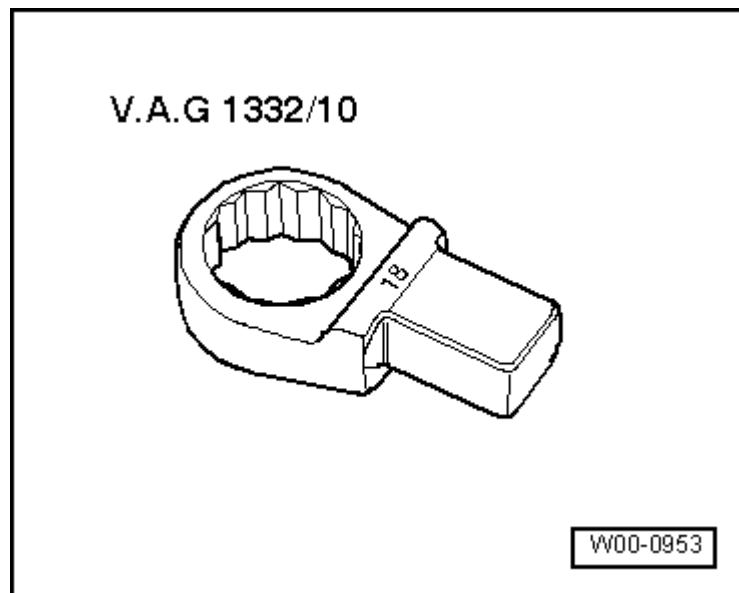


Fig. 315: Ring Spanner Insert V.A.G 1332/10
Courtesy of AUDI OF AMERICA, LLC

- Power Steering Test Unit V.A.G 1402

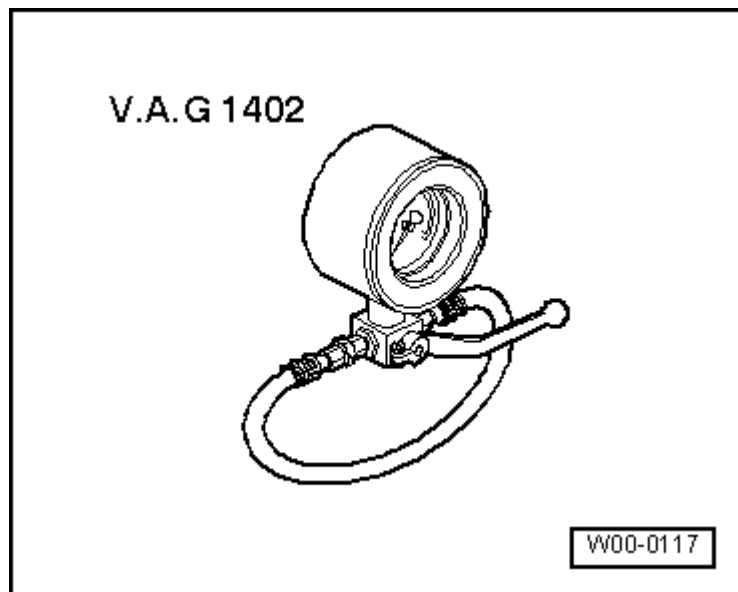


Fig. 316: Power Steering Test Unit V.A.G 1402
Courtesy of AUDI OF AMERICA, LLC

- Adapter V.A.G 1402/3

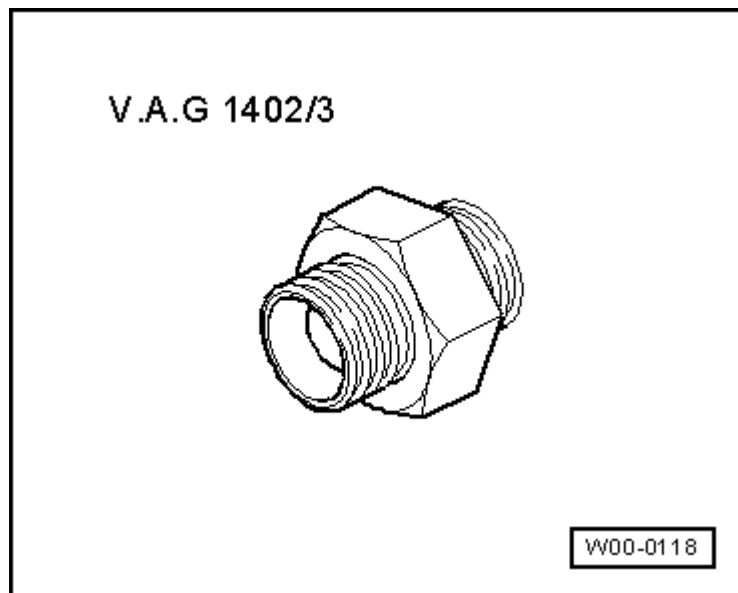


Fig. 317: Adapter V.A.G 1402/3
Courtesy of AUDI OF AMERICA, LLC

- Adapter Hose V.A.G 1402/6

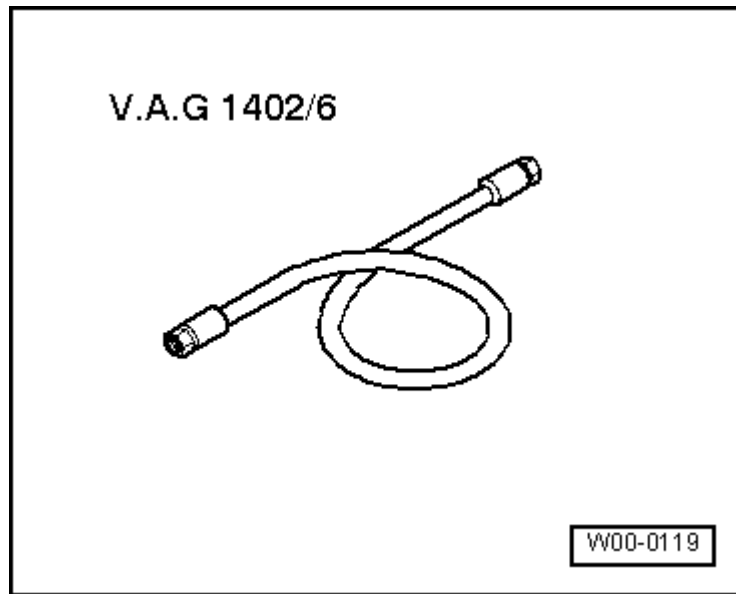


Fig. 318: Adapter Set V.A.G 1402/6
Courtesy of AUDI OF AMERICA, LLC

- CV Joint Boot Clamp Tool V.A.G 1682 A with Adapter V.A.G 1682 A/1

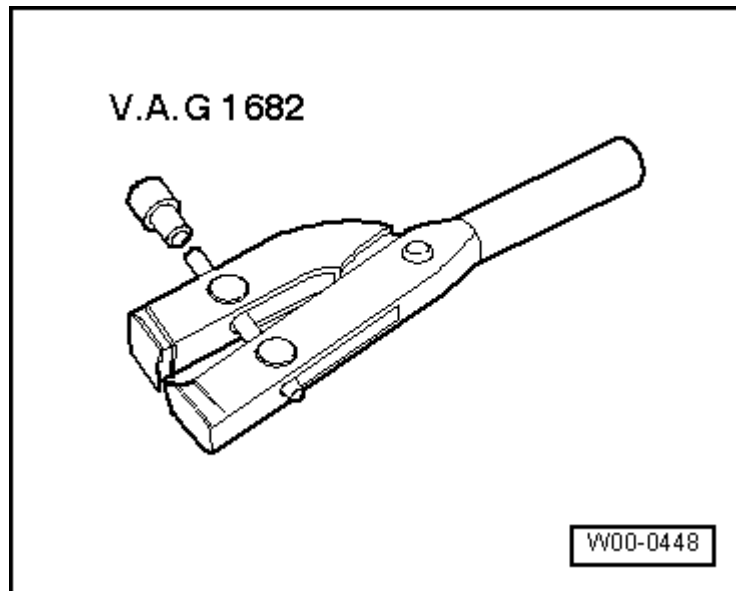


Fig. 319: CV Joint Boot Clamp Tool V.A.G 1682 A With Adapter V.A.G 1682 A/1
Courtesy of AUDI OF AMERICA, LLC

- Used Oil Collection and Extraction Device V.A.G 1782

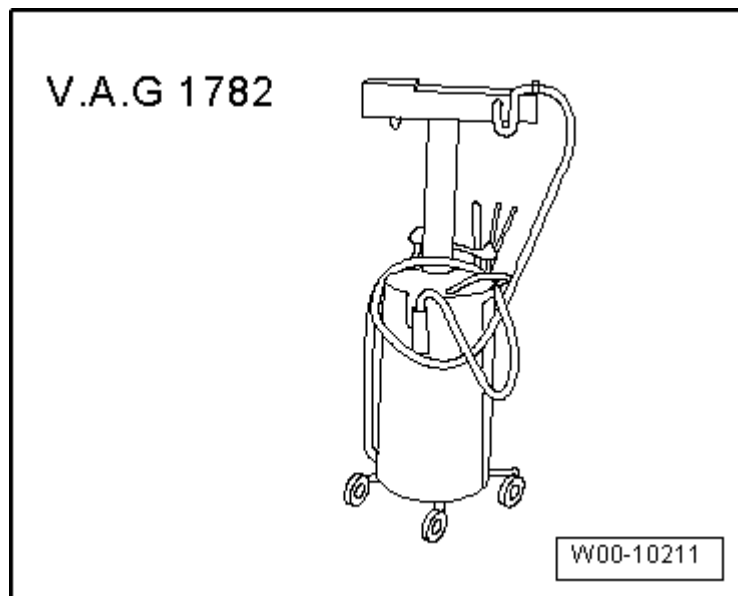


Fig. 320: Used Oil Collection and Extraction Device V.A.G 1782
Courtesy of AUDI OF AMERICA, LLC

- Torque Wrench V.A.G 1783

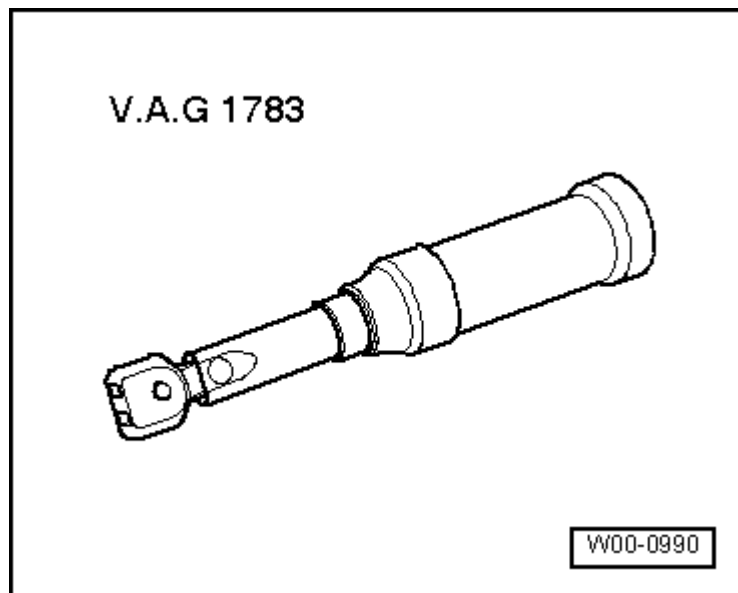


Fig. 321: Identifying Torque Wrench V.A.G 1783
Courtesy of AUDI OF AMERICA, LLC

- Hose Clip Pliers V.A.G 1921

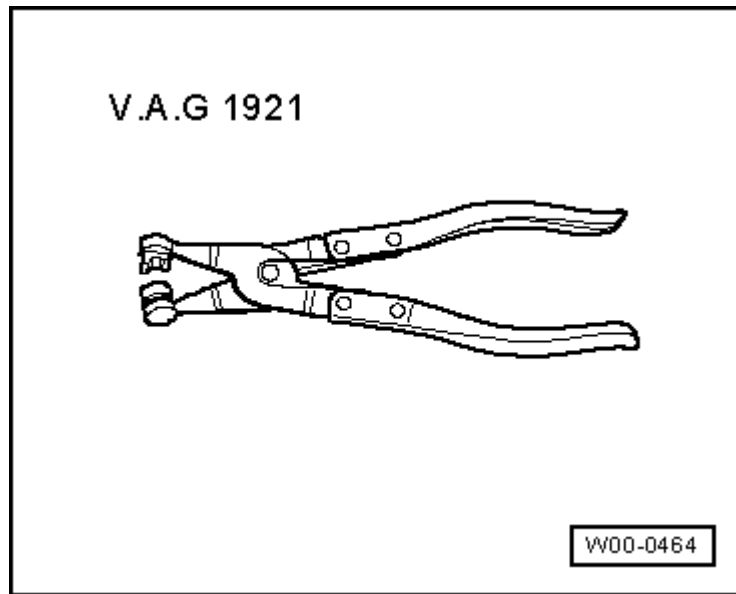


Fig. 322: Hose Clamp Pliers V.A.G 1921
Courtesy of AUDI OF AMERICA, LLC

- Open-Jaw Torque Wrench Insert V.A.G 1923

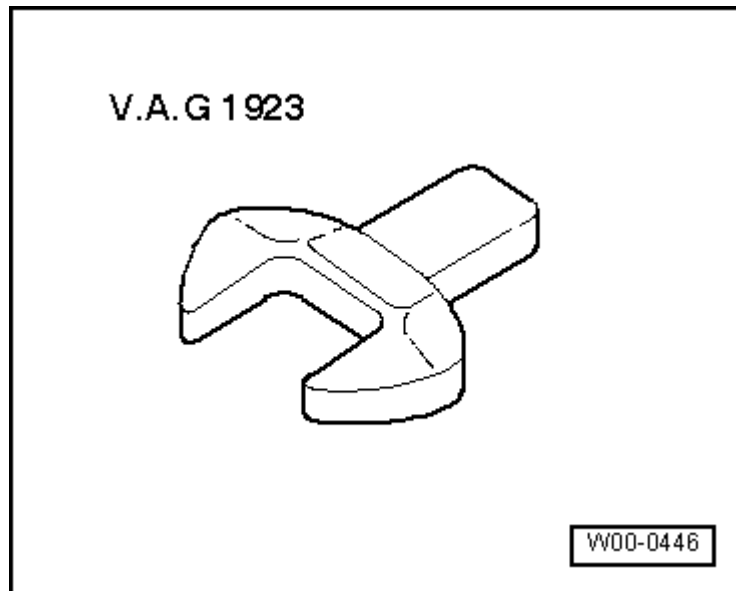


Fig. 323: Open-Jaw Torque Wrench Insert V.A.G 1923
Courtesy of AUDI OF AMERICA, LLC

- Vehicle Diagnosis Tester, for example, VAS 5052 with its diagnostic cable

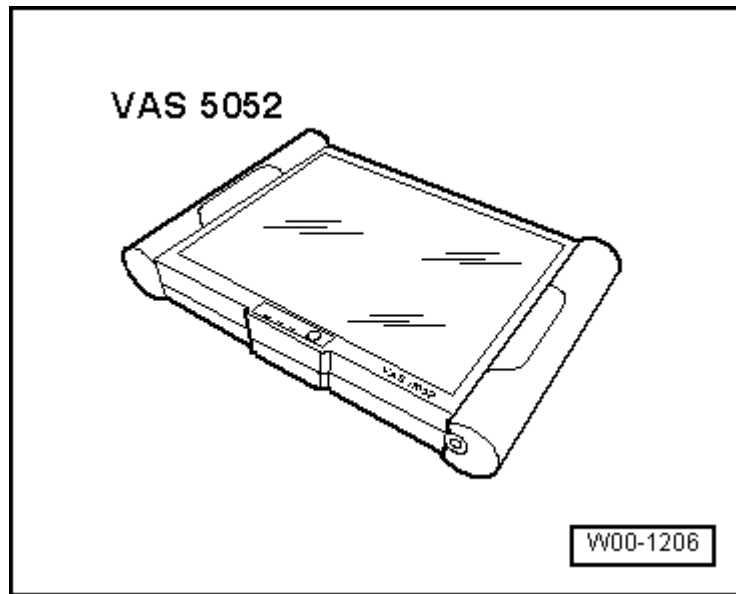


Fig. 324: Vehicle Diagnosis Tester, for example, VAS 5052 with its diagnostic cable
Courtesy of AUDI OF AMERICA, LLC

- Drip Tray for VAS 6100 VAS 6208

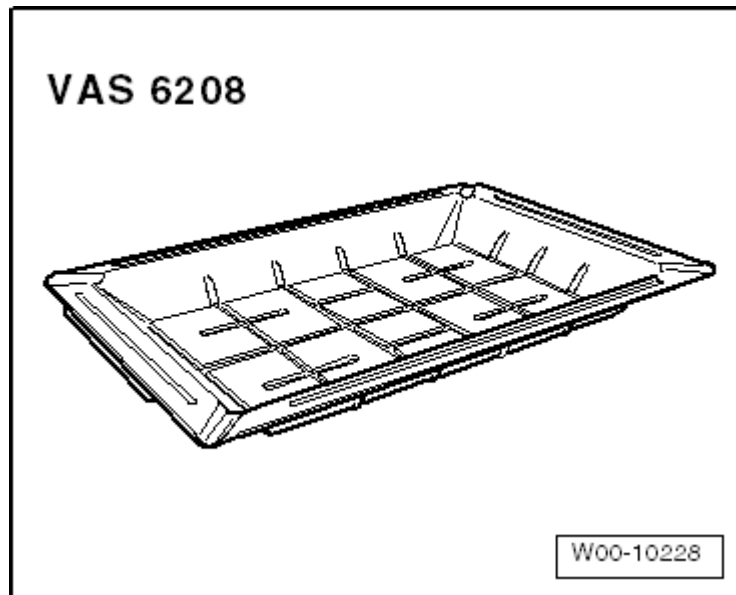


Fig. 325: Drip Tray for VAS 6100 VAS 6208
Courtesy of AUDI OF AMERICA, LLC

- Locking Pliers VAS 6199

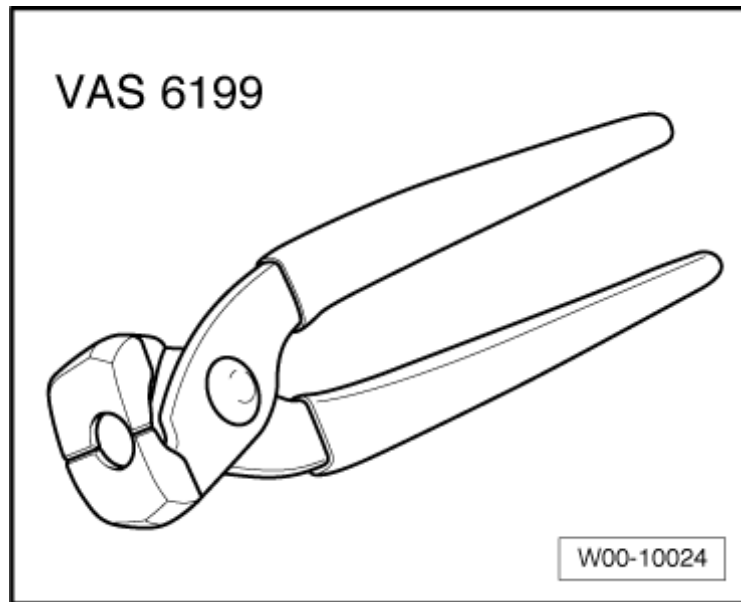


Fig. 326: Locking Pliers VAS 6199
Courtesy of AUDI OF AMERICA, LLC

- Steering Wheel Scales VAS 6458

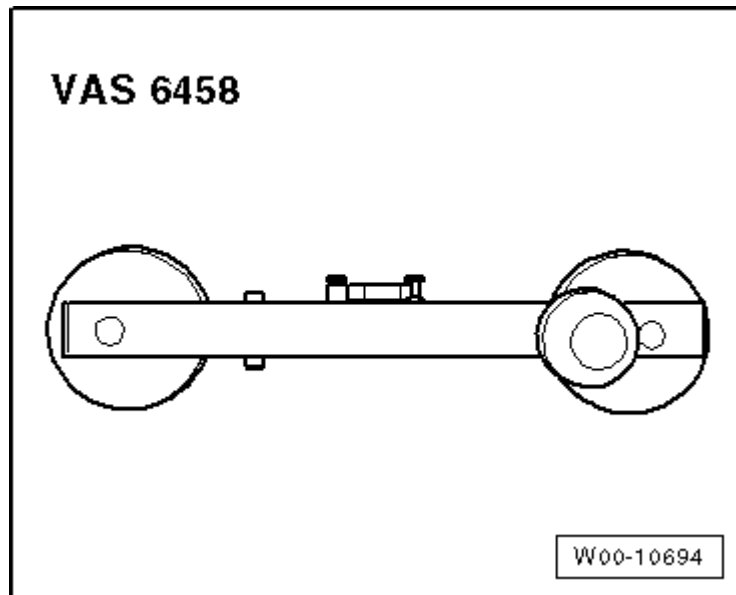


Fig. 327: Steering Wheel Scales VAS 6458
Courtesy of AUDI OF AMERICA, LLC

- Not illustrated:
- Spanner Wrench 3212
- Adapter Set V.A.G 1402/17
- Adapter Set V.A.G 1402/18
- Engine Bung Set VAS 6122

2012 Audi S4

SUSPENSION Steering (Sedan)

Edition 2 3 2012