



## Front axle components, overview

### General Information

Load bearing components and parts of the suspension must not be welded or straightened.

Vehicles without drive axle must not be moved, or wheel bearing will be damaged. If vehicle does have to be moved, always note the following points:

- Install an outer joint in place of the drive axle.
- Tighten outer joint to 115 Nm (M14 bolt) or 190 Nm (M16 bolt).

Bonded rubber bushings can only be turned to a limited extent. The bolted connections on suspension links should only be tightened when vehicle is standing on the ground.

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## Threads in longmember, servicing

Servicing thread in weld nuts in longmember is possible under certain circumstances.

- ◆ Servicing must only be performed once per thread.
- ◆ If secondary servicing is required, the weld nut must be replaced.

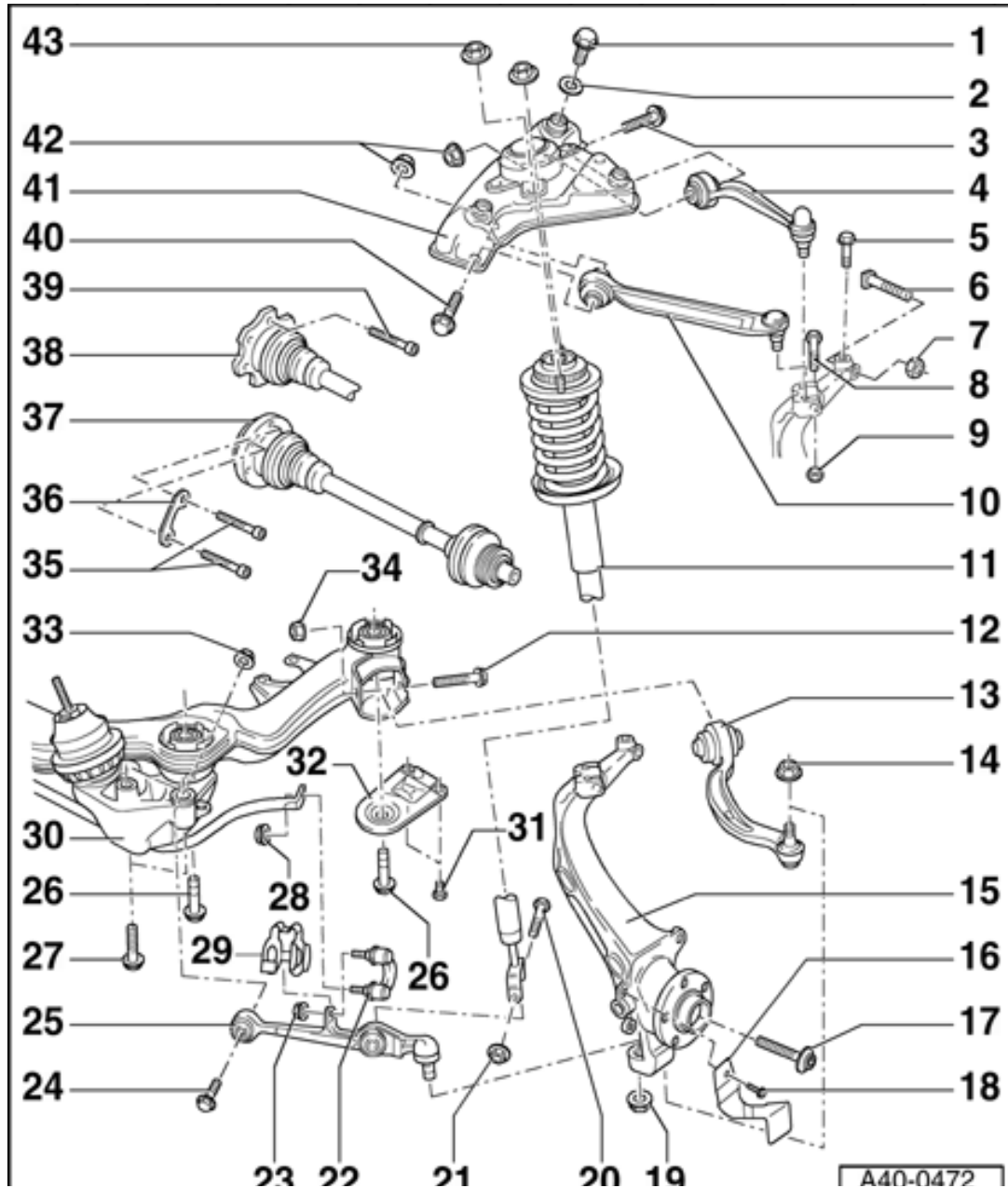
### **WARNING!**

#### ***Wear protective glasses when drilling!***

- ◆ Have responsible foreman or next superior check thread repair.
- ◆ Thread insert must have same length as thread in body.

- ◆ Repair possible damage to underbody; applicable notes can be found in:

⇒ [Repair Manual, Body Collision Repair, Repair Group 00; Corrosion protection measures](#)



## Component overview

1 - Hex bolt, 75 Nm

2 - Washer

3 - Hex bolt M10 x 62

- ◆ Always replace after disassembly

4 - Upper rear link

- ◆ Replace bushing

- ◆ Separating from wheel bearing housing ⇒ [Page 40-15](#)

5 - Hex bolt, 5 Nm

- ◆ Bolt onto system

6 - Bolt

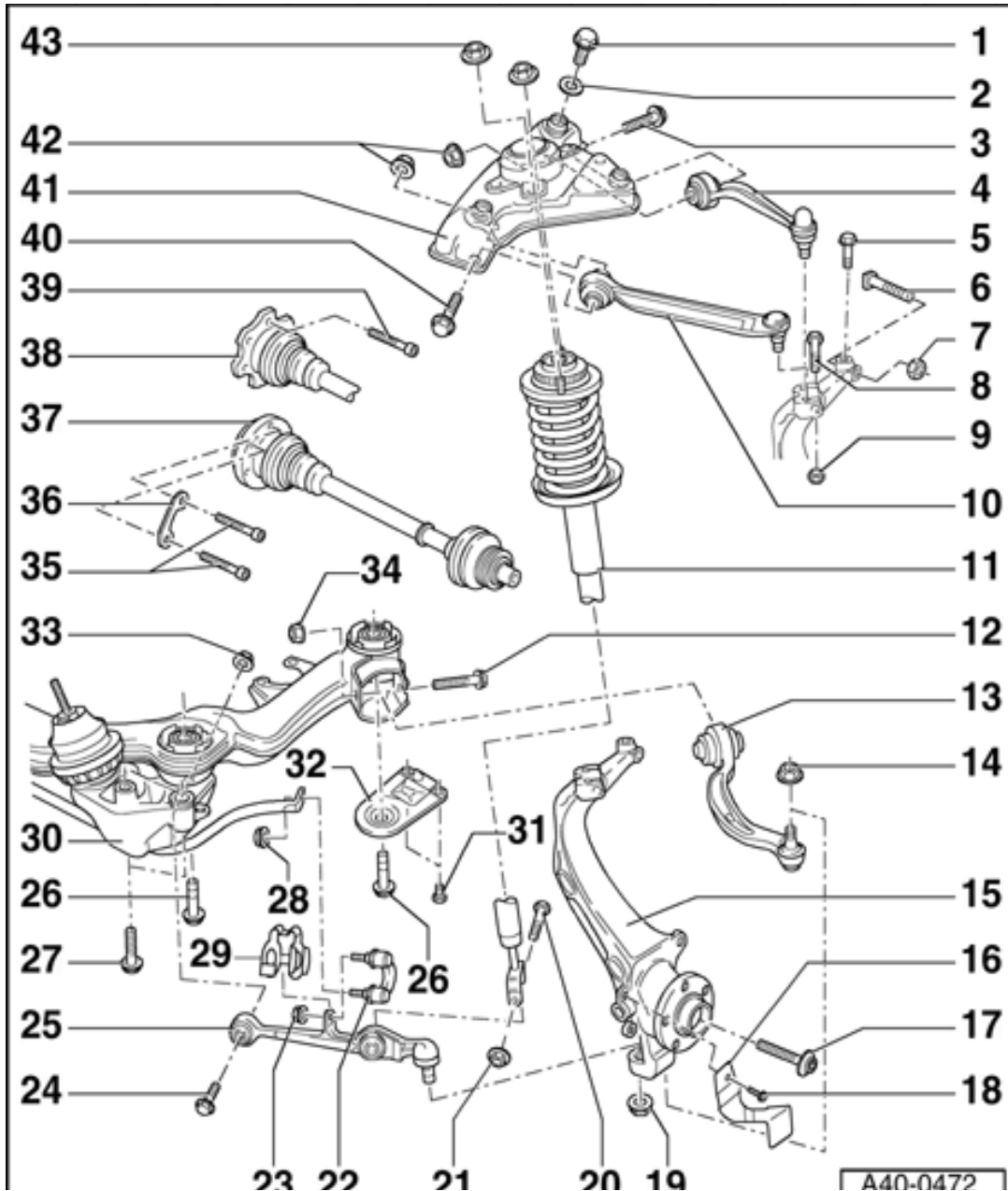
7 - Self-locking nut

- ◆ Always replace after disassembly



- ◆ 50 Nm for steel wheel bearing housing
- ◆ 45 Nm for aluminium wheel bearing housing

**8 - Hex bolt M10 x 100**



**9 - Self-locking nut, 40 Nm**

- ◆ Always replace after disassembly

**10 - Front upper link**

- ◆ Can be removed together with mounting bracket
- ◆ Mounting bracket, removing and installing ⇒ [Page 40-84](#)
- ◆ Replacing bushing ⇒ [Page 40-84](#)
- ◆ Separating from wheel bearing housing ⇒ [Page 40-15](#)

**11 - Suspension strut**

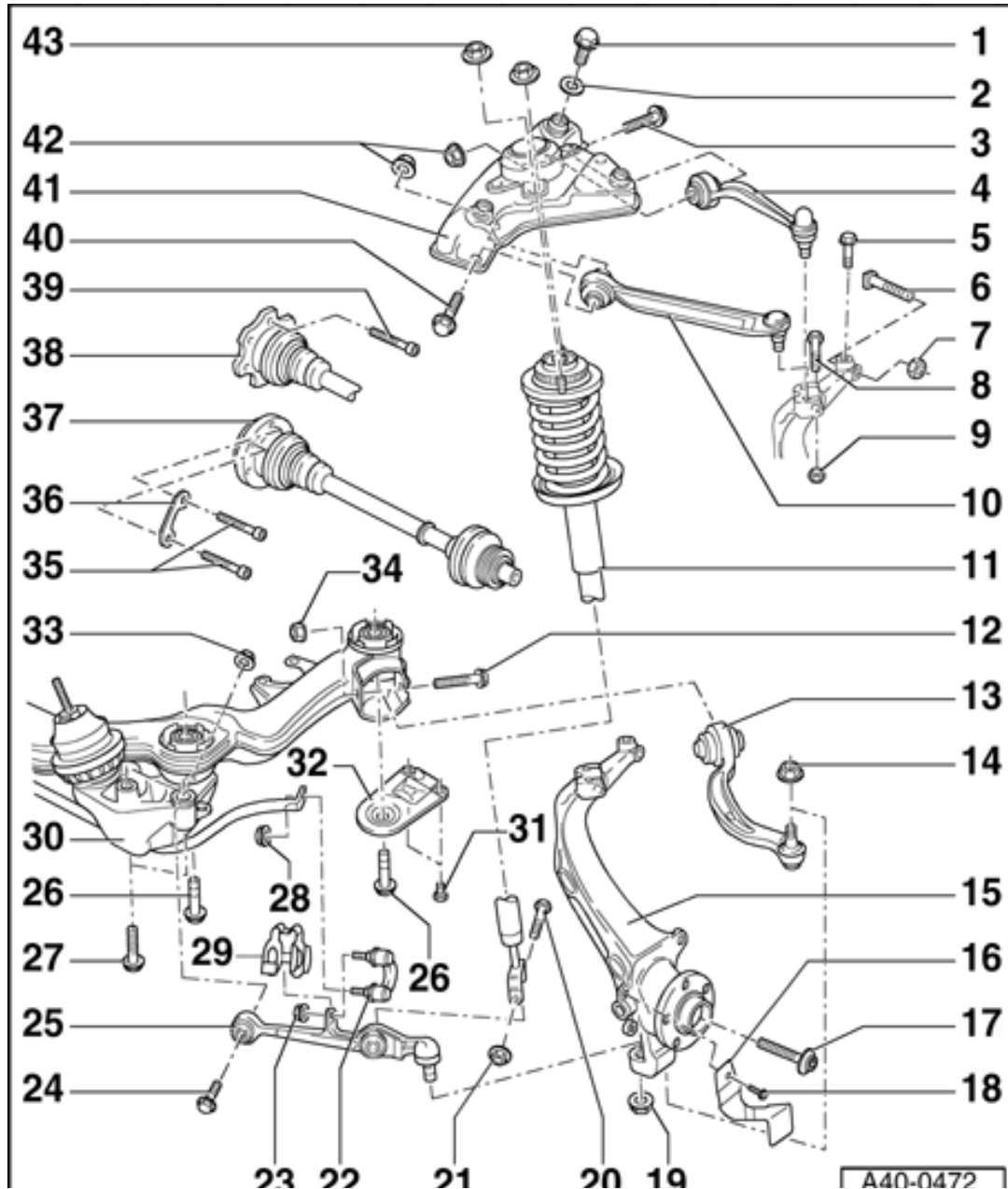
- ◆ Note varying spring/shock absorber versions, see vehicle data sticker ⇒ [Page 40-27](#)

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- ◆ Removing and installing ⇒ [Page 40-19](#)
- ◆ Servicing ⇒ [Page 40-24](#)

**12 - Hex bolt M12 x 1.5 x 120**

- ◆ Always replace after disassembly



### 13 - Lower guide link

- ◆ If anti-vibration mount leaks it must be replaced ⇒ [Page 40-136](#)
- ◆ Application
- ◆ See Parts catalog

### 14 - Self-locking nut, 100 Nm

- ◆ 100 Nm for steel wheel bearing housing
- ◆ 110 Nm for aluminium wheel bearing housing
- ◆ Always replace after disassembly

### 15 - Wheel bearing housing



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- ◆ There are versions with and without a groove for a ring on the tie rod end - only new version is supplied as a replacement part
- ◆ On vehicles with a headlight vertical aim control system be careful removing and installing ⇒ [Page 40-120](#)
- ◆ Removing and installing ⇒ [Page 40-35](#)
- ◆ Servicing ⇒ [Page 40-42](#)
- ◆ Separating from upper link ⇒ [Page 40-15](#)

## 16 - Backing plate



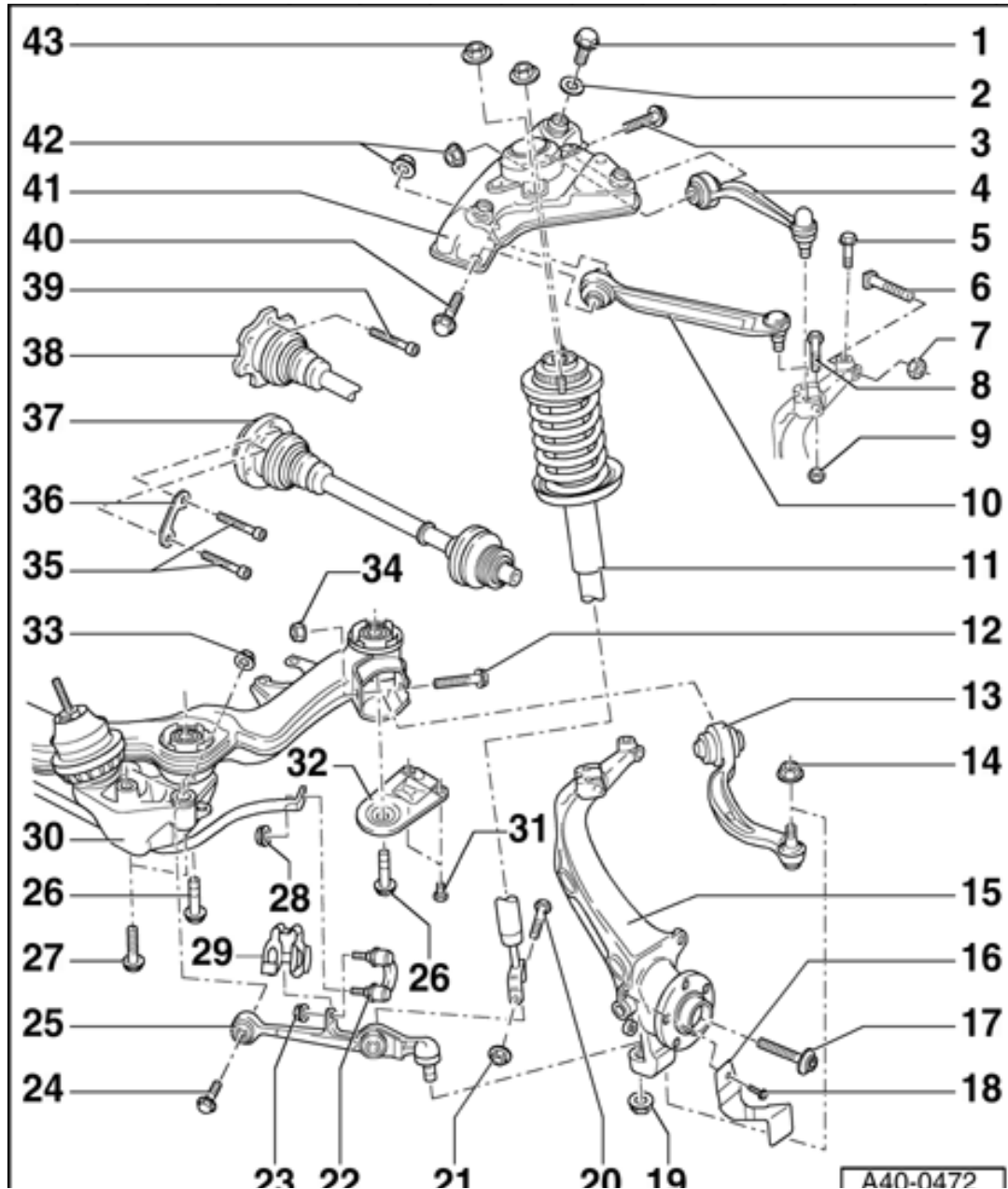


- ◆ 100 Nm for steel wheel bearing housing
- ◆ 120 Nm for aluminium wheel bearing housing
- ◆ Always replace after disassembly

**20 - Hex bolt M12 x 1.5 x 85**

**21 - Self-locking nut, 90 Nm**

- ◆ Always replace after disassembly



### 22 - Coupling

- ◆ Arrow on coupling points in direction of travel
- ◆ Note change in coupling and in tightening torques  
⇒ [Page 40-144](#)

### 23 - Self-locking hex nut

- ◆ Always replace after disassembly
- ◆ 40 Nm plus additional 90° (1/4 - turn)
- ◆ Nut has ribs on the bottom

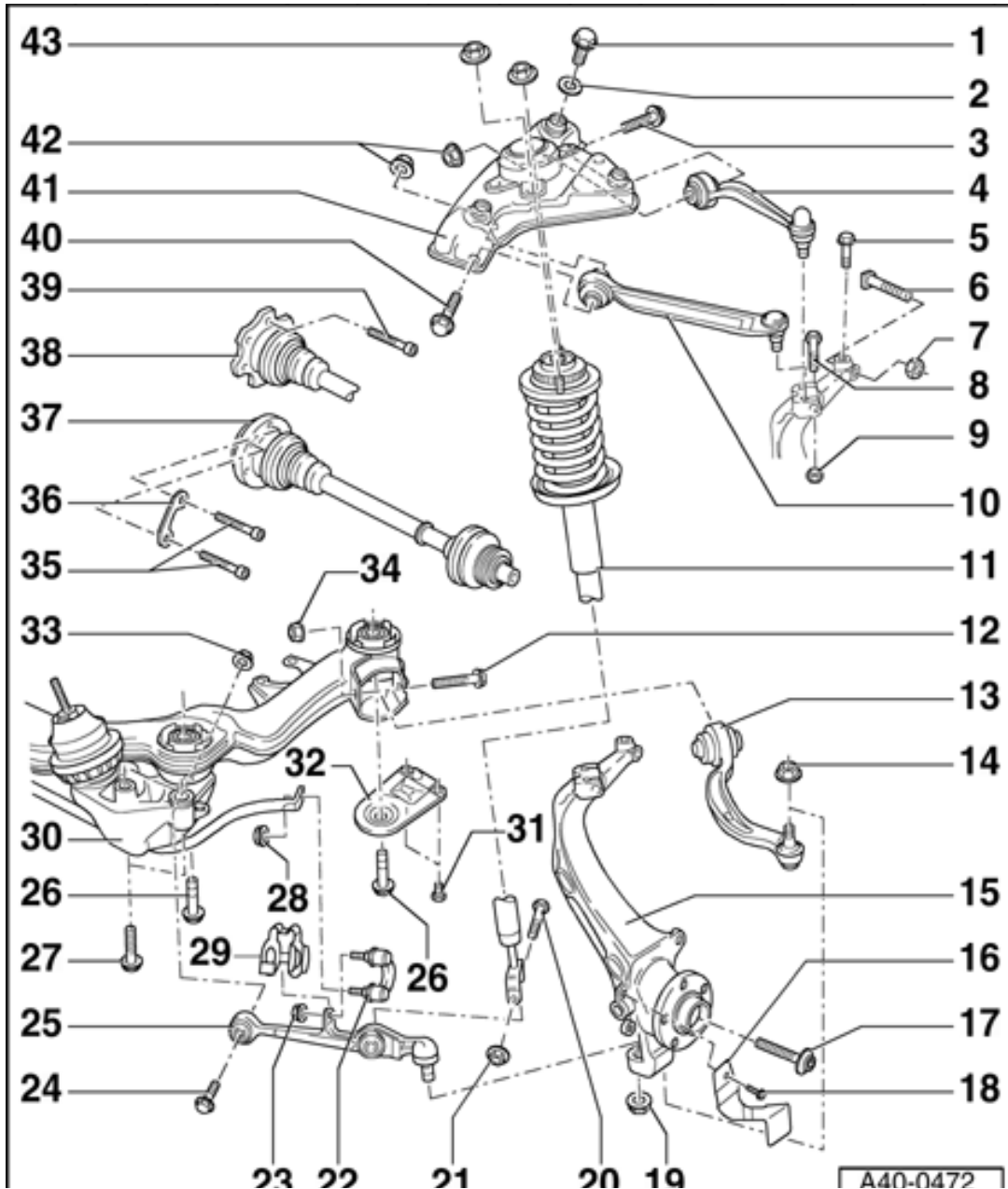
Only use this special nut as replacement!

### 24 - Hex bolt M12 x 1.5 x 100

- ◆ Always replace after disassembly

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### 25 - Lower track control link

- ◆ On vehicles with a headlight vertical aim control system be careful removing and installing vehicle level sensor ⇒ [Page 40-120](#)
- ◆ Removing and installing ⇒ [Page 40-117](#)
- ◆ Servicing ⇒ [Page 40-126](#)

### 26 - Hex bolt M12 x 1.5 x 110

- ◆ 110 Nm plus additional 90° (1/4 - turn)
- ◆ Always replace after disassembly

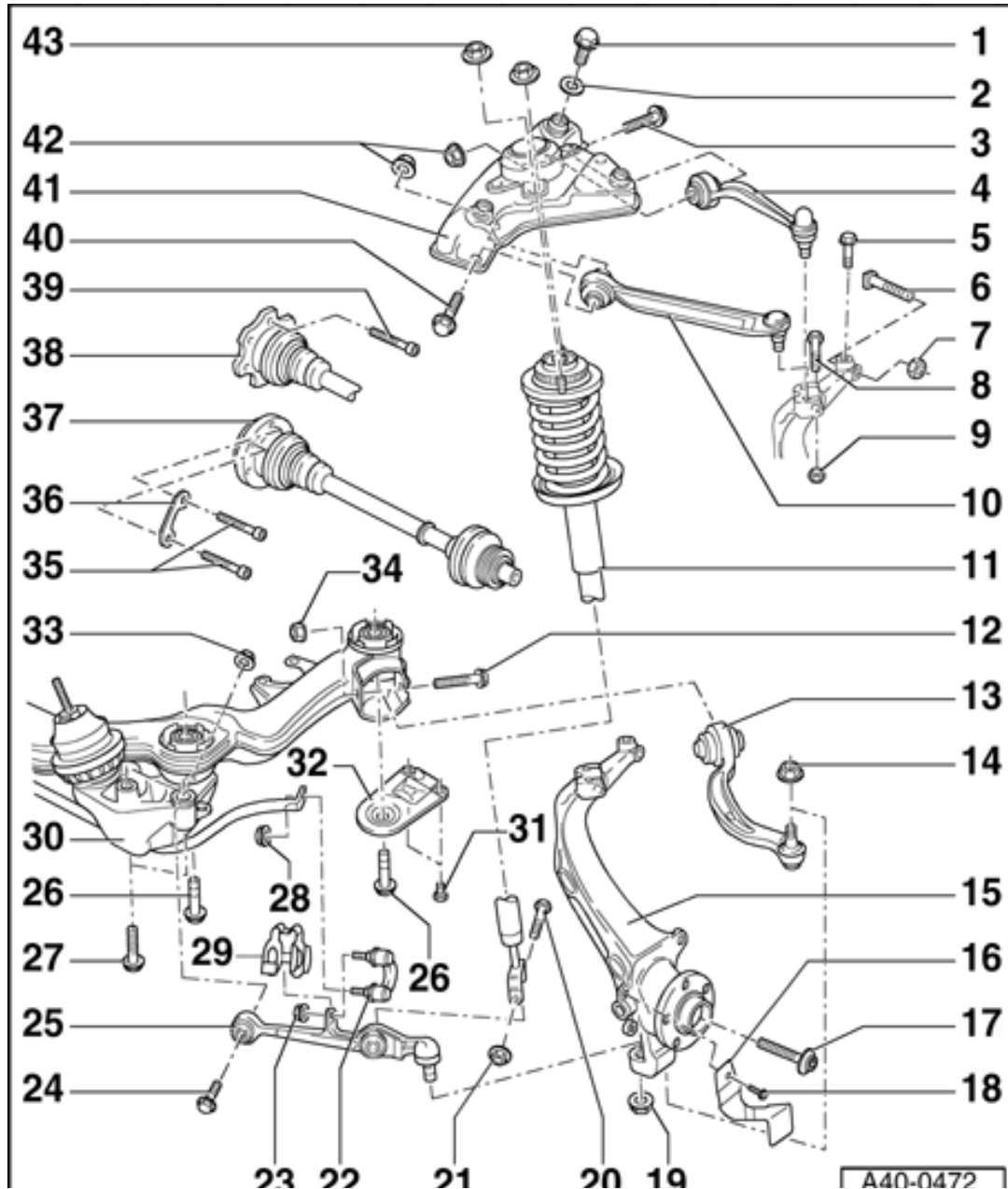
23 22 21 20 19

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- ◆ Thread in body can be repaired with thread insert made of wire according to DIN 8140 (Helicoil). Thread insert must have same length as thread in body.

### **27 - Hex bolt, 75 Nm**

- ◆ M10 X 70
- ◆ Always replace after disassembly



**28 - Self-locking nut, 100 Nm**

- ◆ Note change in coupling and in tightening torques ⇒ [Page 40-144](#)

- ◆ nut has ribs on the bottom

- ◆ Always replace after disassembly

Only use this special nut as replacement!

**29 - Clip**

- ◆ inserted in track control link

- ◆ Always replace

**30 - Subframe**

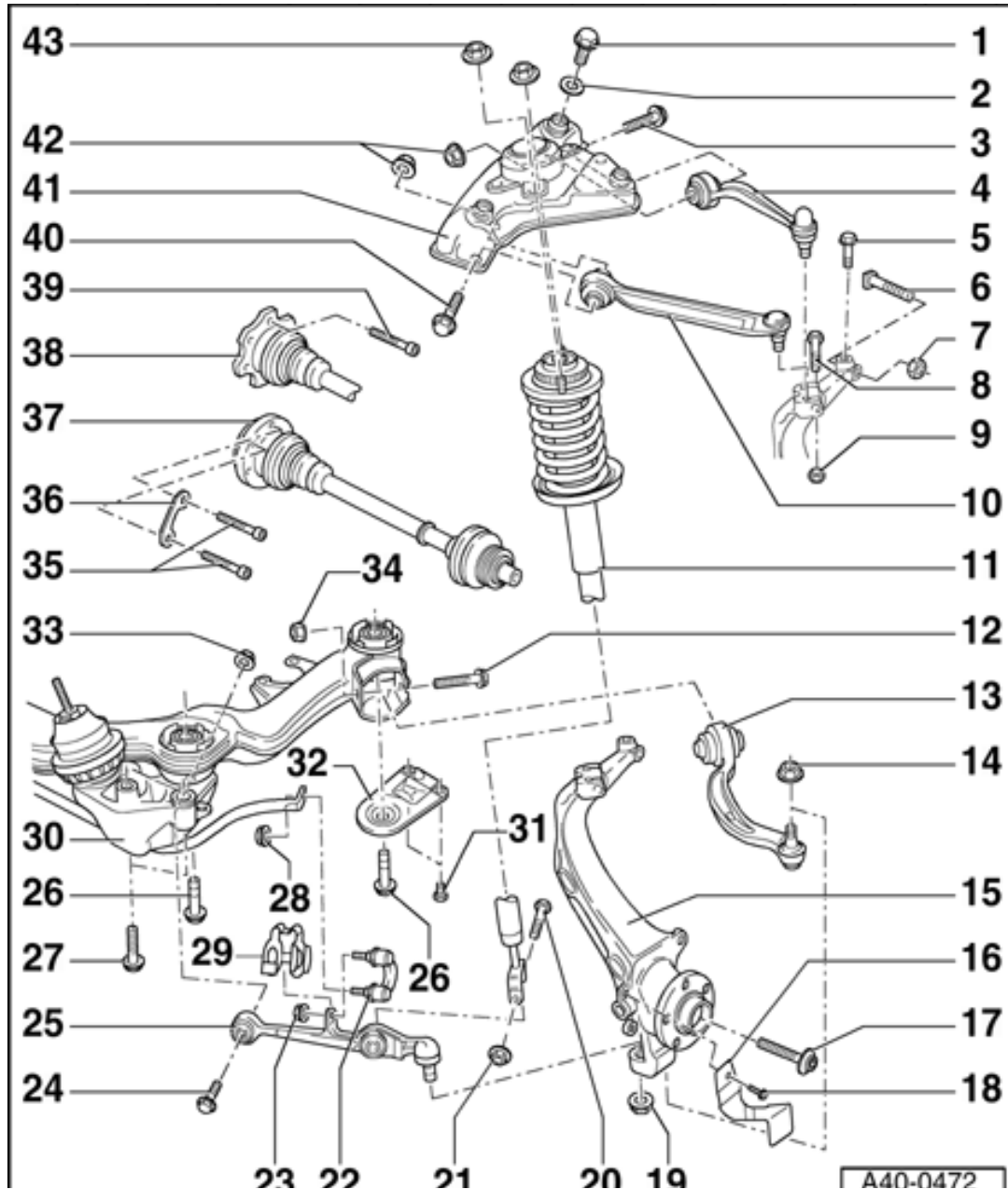
- ◆ On vehicles with a headlight vertical aim control system be careful removing and installing ⇒ [Page 40-120](#)



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- ◆ Removing and installing ⇒ [Page 40-102](#)
- ◆ Servicing ⇒ [Page 40-111](#)



**31 - Hex bolt, 25 Nm**

- ◆ Always replace after removing
- ◆ Observe different bolt versions and tightening torques  
⇒ [Fig. 6](#) ⇒ [Page 40-13](#)

**32 - Subframe support**

**33 - Self-locking nut**

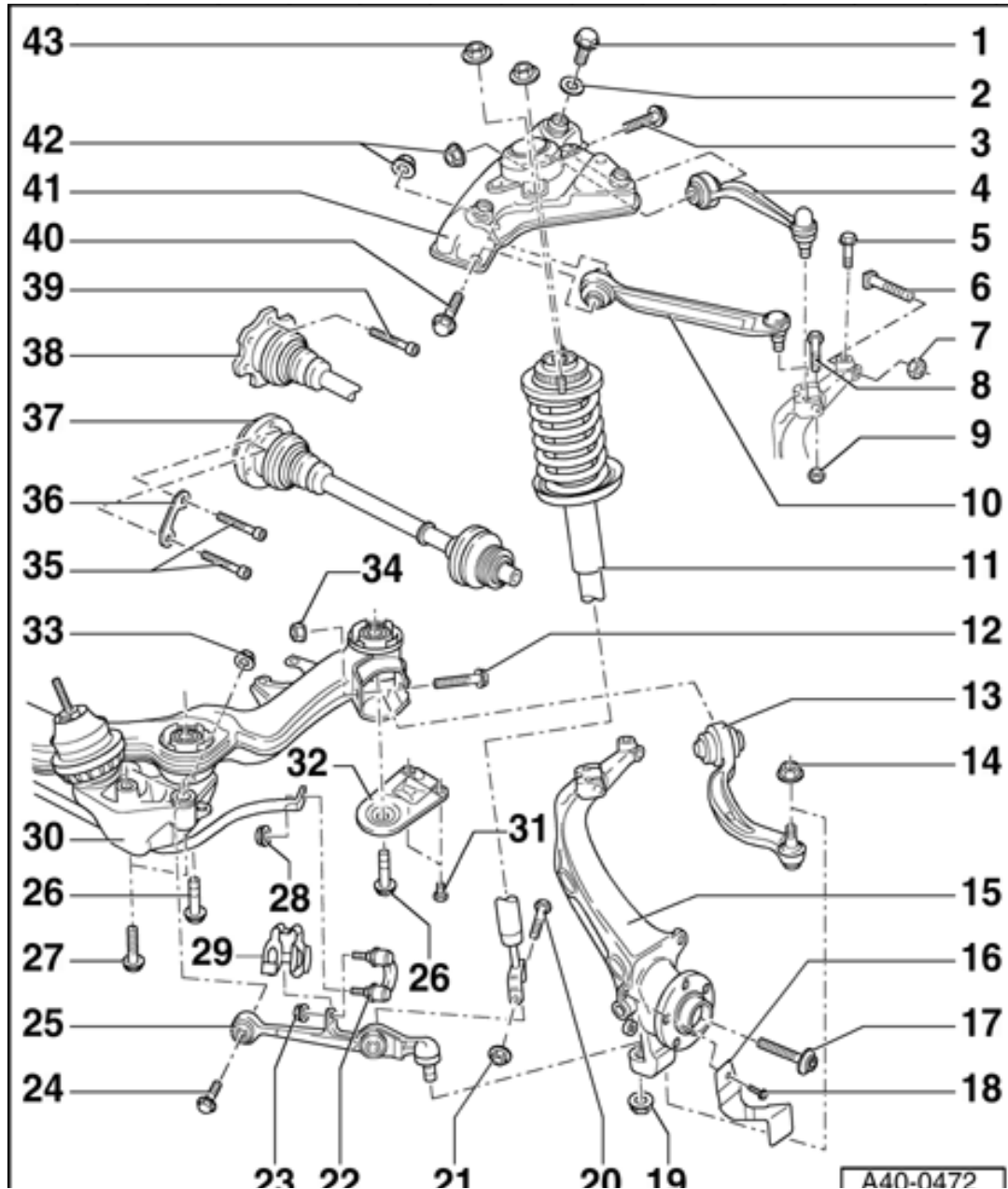
- ◆ 70 Nm plus additional  $180^\circ \cdot \frac{1}{2}$  turn
- ◆ Always replace after removing

**34 - Self-locking nut**

- ◆ 70 Nm plus additional  $180^\circ \cdot \frac{1}{2}$  turn
- ◆ Always replace after removing

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**35 - Socket-head bolt**

◆ Tightening torques:

Bolt M8 X 48: 40 Nm

Bolt M10 X 48: 70 Nm

**36 - Backing plate**

**37 - Drive axle**

◆ Removing and installing ⇒ [Page 40-147](#)

◆ Servicing ⇒ [Page 40-151](#)

**38 - Drive axle with triple roller joint**

◆ Servicing ⇒ [Page 40-164](#)

**39 - Twelve-point socket head bolt, 70 Nm**

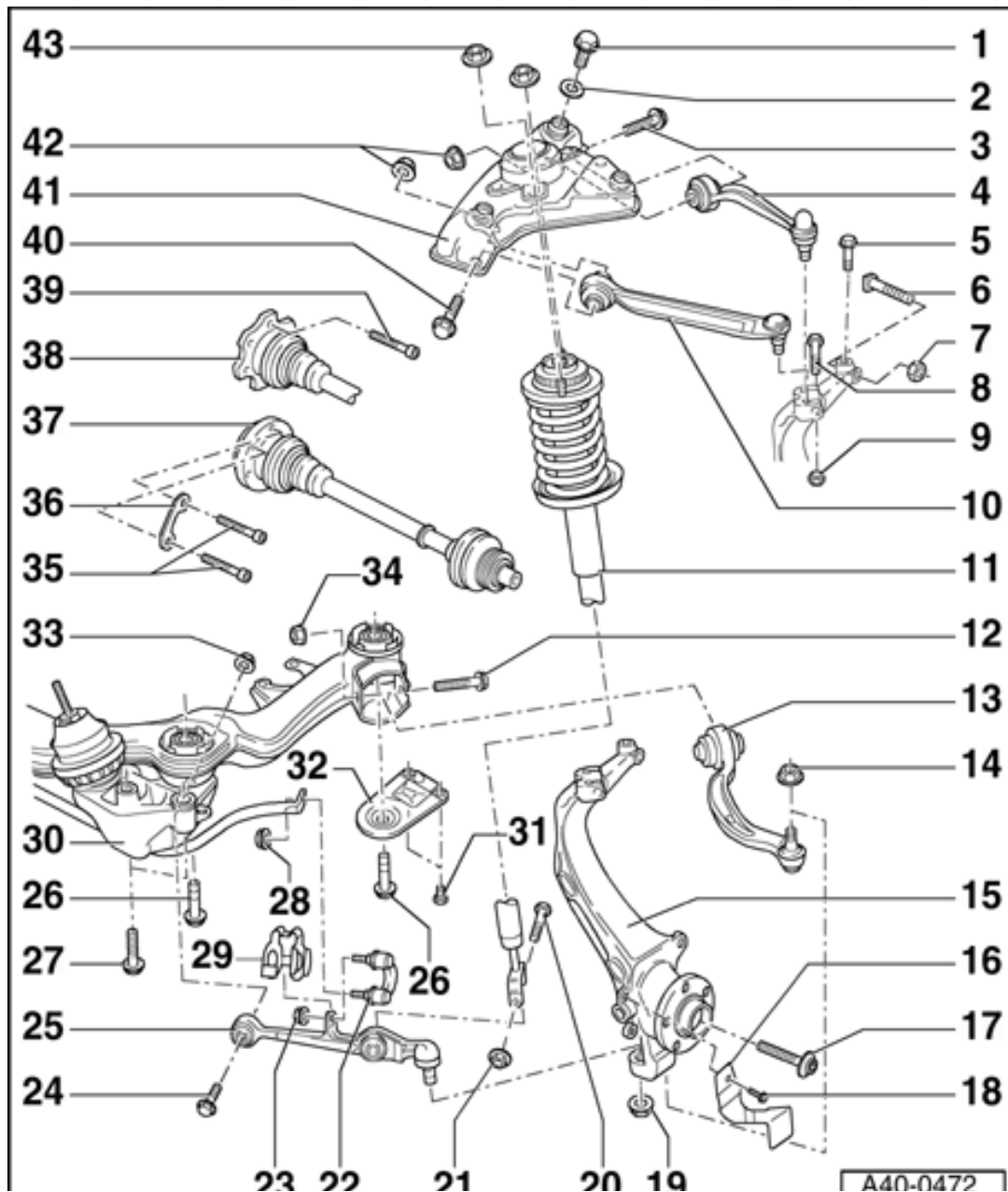
◆ For vehicles with triple roller joint

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◆ M10 X  
20

40-12



**40 - Hex bolt M10 x 62**

- ◆ Always replace after disassembly

**41 - Mounting bracket**

- ◆ Removing and installing ⇒ [Page 40-84](#)

**42 - Self-locking nut**

- ◆ 50 Nm plus additional 90° (1/4 - turn)
- ◆ Always replace after disassembly

**43 - Self-locking nut with flange, 20 Nm**

- ◆ Always replace after disassembly

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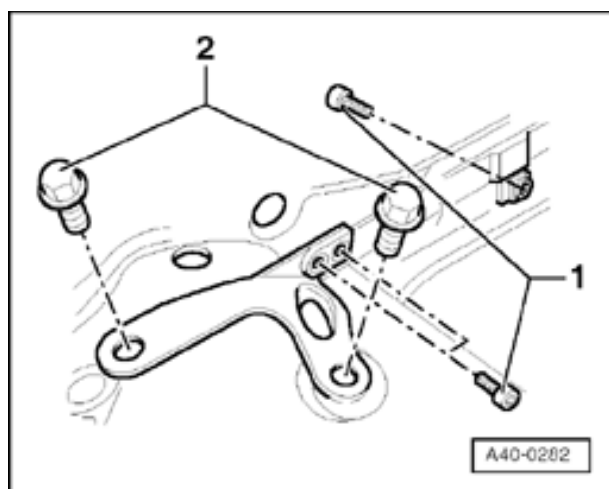




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## Mounting bracket with transverse beam, removing and installing



To remove and install mounting bracket with transverse beam, unscrew

- Hex bolt -1- ( 1x behind bulkhead)
- Hex bolts -2- ( 4x )

### Tightening torques

- Hex bolts -  
1-

Tightening torque 30  
Nm

- Hex bolts -  
2-

Tightening torque 75  
Nm

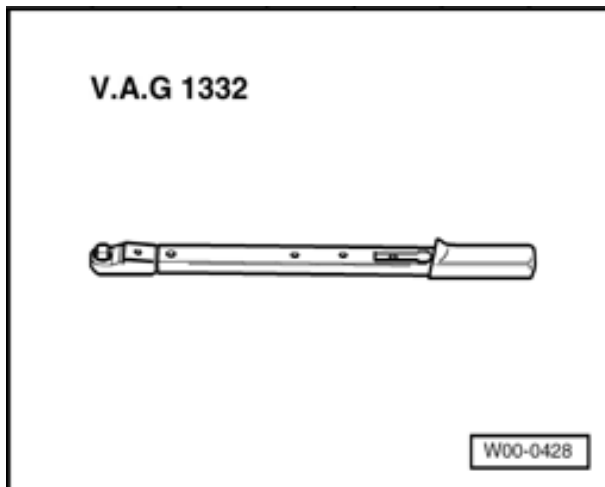
40-15



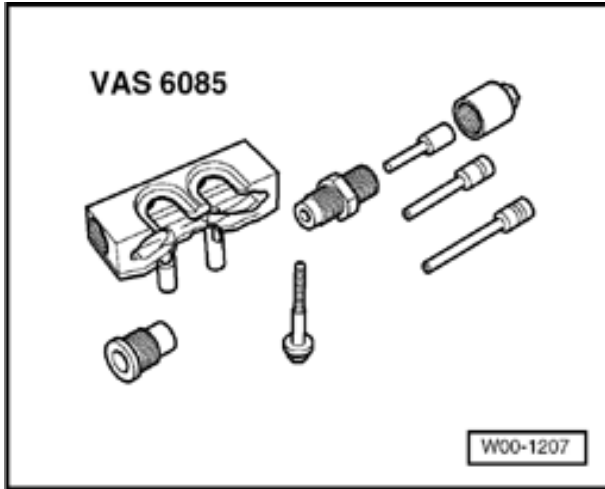
## Upper link connection at wheel bearing housing (steel), separating

This operation is only necessary if hex bolt for connecting upper links to wheel bearing housing cannot be removed.

### Special tools and equipment



- ◆ V.A.G 1332 Torque wrench

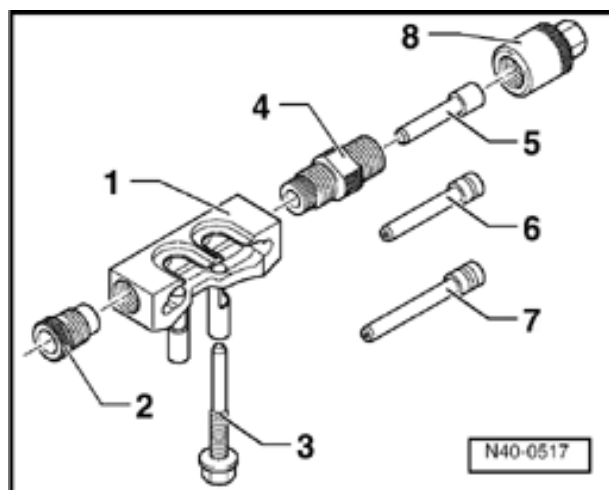


◆ VAS 6085 Pressing-out tool

40-16



## Removing



### Pressing-out tool VAS 6085 components

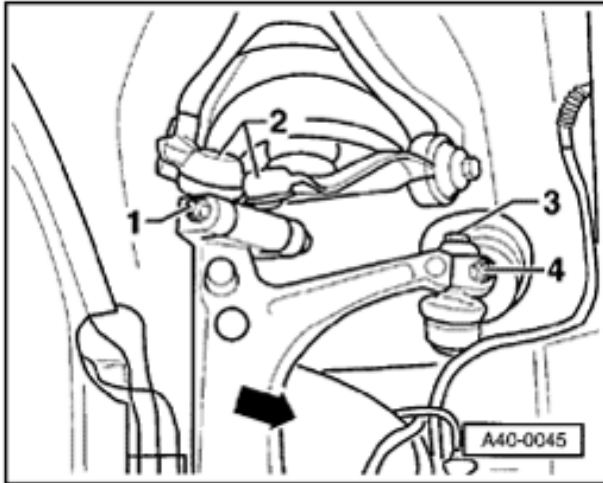
- 1 - Body
- 2 - Adapter
- 3 - Thrust bolt M10 x 1.25 x 95
- 4 - Threaded sleeve
- 5 - Press tool (length 78 mm)
- 6 - Press tool (length 98 mm)
- 7 - Press tool (length 118 mm)
- 8 - Nut

### **Note:**

*Apply polycarbamide grease Part no. G 052 142 A2*

*before starting work to thrust bolt, press tools and nut.*

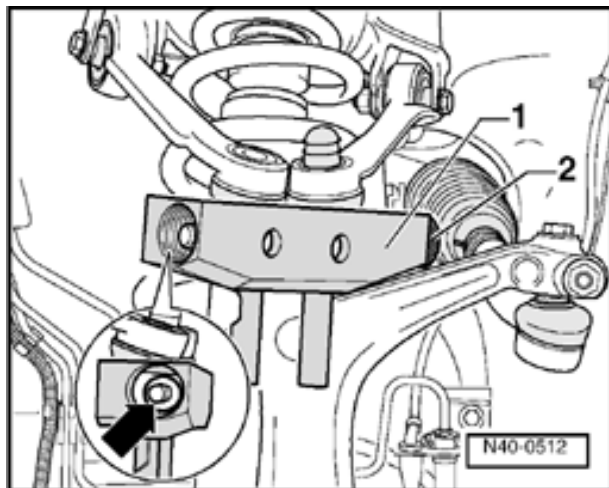
- Remove wheel.
- Disconnect ABS speed sensor wire out of holder at brake caliper.



- ▲ - Unscrew nut - 1-.

Bolts -3- and -4- are never to be loosened.

40-17

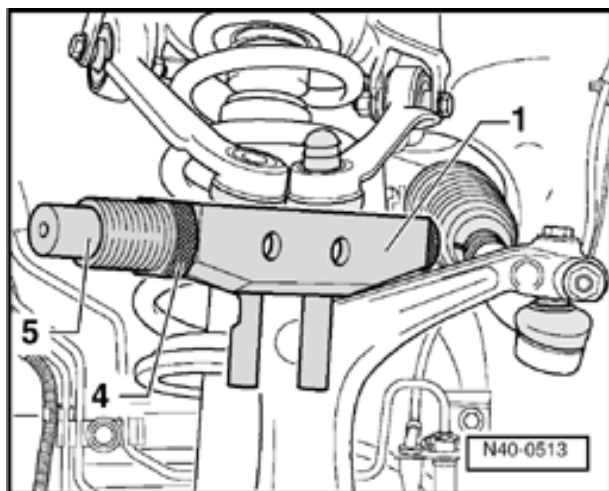


- Position body -1- on wheel bearing housing. In doing so, recesses engage beneath joints of links.

**Note:**

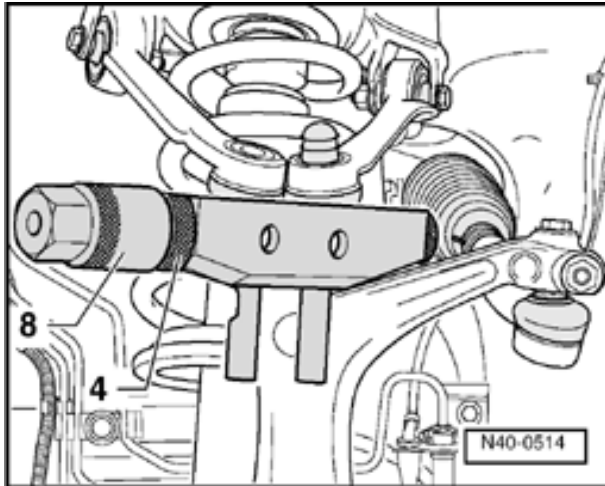
*On inserting body, pay attention to boot as to avoid damage.*

- Insert body -1- so that end of bolt (arrow) is centred in hole in body.
- Screw home adapter -2- in body -1- to lock body.



- Screw home threaded sleeve -4- in body -1-.
- Insert press tool -5- in threaded sleeve -4-.

40-18

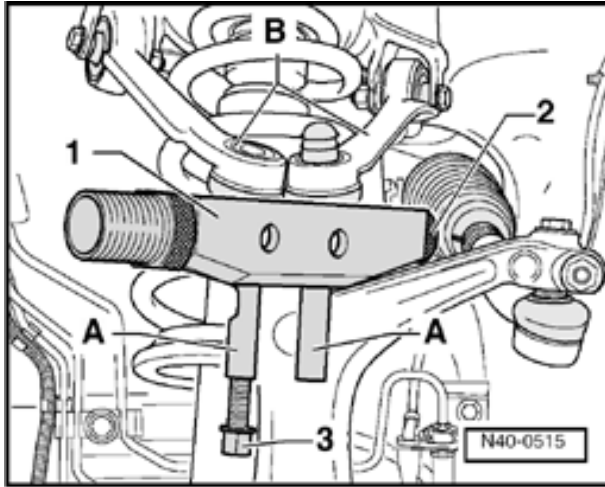


- Screw nut -8- onto threaded sleeve -4- and turn as far as it will go, thus pressing out bolt.

**Note:**

*Use a wrench or an impact screwdriver to turn nut -8-.*

- Unscrew nut -8- from threaded sleeve -4-, take out press tool -5- and insert press tool -6- in threaded sleeve -4-.
- Repeat pressing operation.
- If bolt can still not be taken out by hand, repeat pressing operation with press tool -7-.
- Unscrew nut -8- from threaded sleeve -4-. Take out press tool and bolt.



- Screw thrust bolt -3- into one of the guides -A- in each case and press links -B- out of wheel bearing housing.
- Screw thrust bolt -3- out of guide -A- and release adapter -2-.
- Detach body -1- from wheel bearing housing.



40-35



## Wheel bearing housing (steel), removing and installing

### Removing

- Remove hubcap, for light-alloy wheels pull off center cap (use pulling hook in vehicle tools).
- Unscrew hex bolt for drive axle. ⇒ [Page 40-147](#)
- Remove wheel.
- Thread in all 5 wheel bolts again.
- Pull cable of ABS wheel speed sensor out of bracket on brake caliper.

For brake disc HP - 2- see procedure ⇒ [Page 40-61](#)

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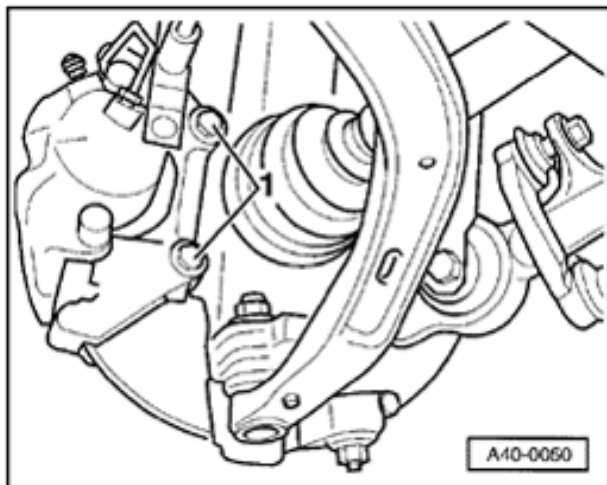
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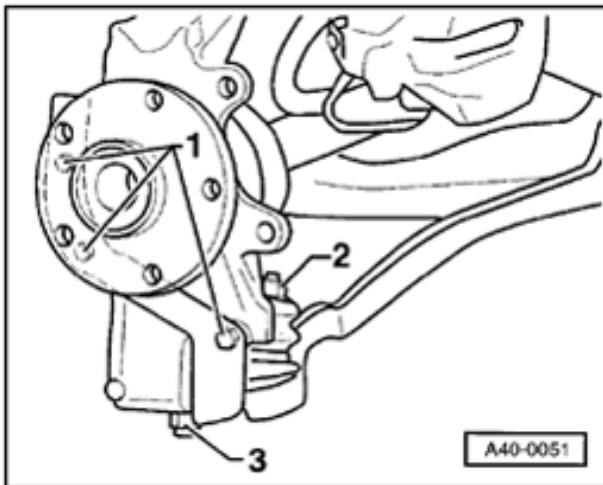
- ▲ - Secure brake caliper to body using wire.



**Note:**

◆ *Do not allow brake caliper to hang on brake hose.*

- Remove brake disc.

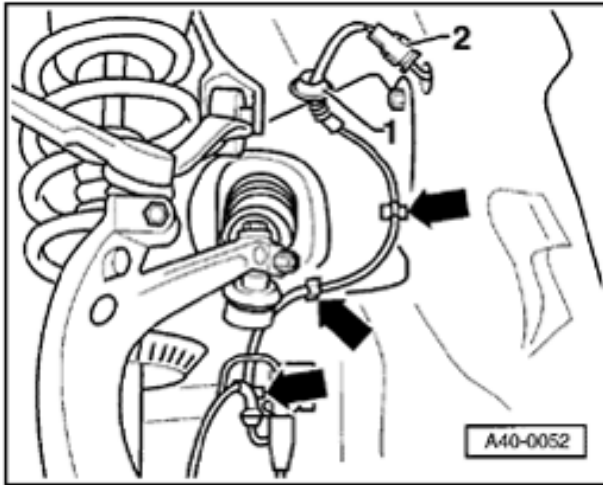


- Unscrew bolts -1- for backing plate.

- Pull ABS wheel speed sensor out of wheel bearing housing.

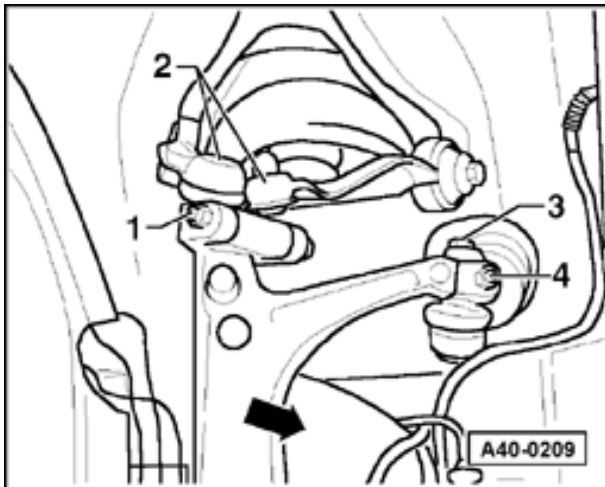
- Remove nuts -2- and -3-.

40-37



- Remove rubber grommet -1- and disconnect harness connector -2-.
- Remove cable for ABS wheel speed sensor from brackets (arrows).
- Guide wire through openings in wheel bearing housing and remove.

Do not damage rubber grommet!

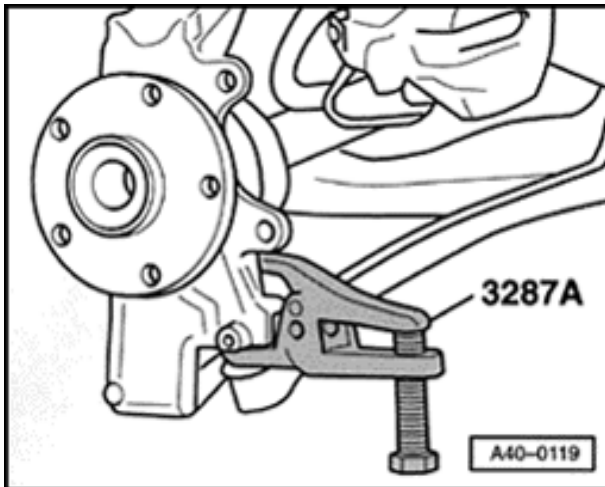


- Unscrew hex bolt -3- and nut -4-.
- Pull out tie rod end.



- Unscrew nut from joint bolt.

Use 4 mm socket wrench to hold joint bolt, if necessary.



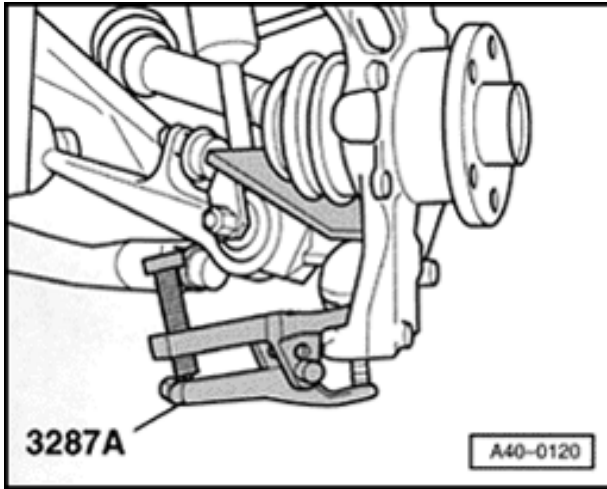
- ◀ - Press joint bolts of guide link off conical seating.

Be careful not to damage CV boot in the process!

For vehicles with headlight vertical aim control, ⇒ [Page 40-120](#) .

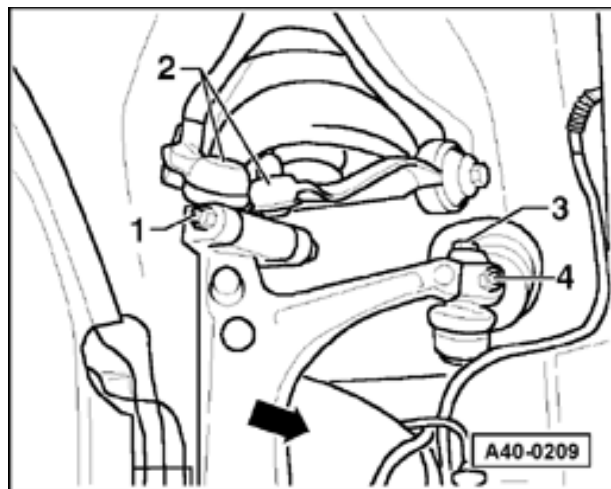
**Note:**

- ◆ *Protect CV boot from damage, e.g.: place a leather cloth in between.*
- ◆ *For safety reasons, put collar nut back on joint bolt of track control link with about 4 turns.*



- Press joint bolts of track control link off conical seating.

40-39



- Remove nut -1- and hex bolt, and lift out both links - 2-.

Slits in wheel bearing housing may not be widened with a chisel or similar tool!

- Swing away wheel bearing housing toward side, in direction of arrow, while pulling drive axle end out of wheel hub.
- Unscrew nut from joint bolt of track control link.
- Remove wheel bearing housing.

40-40



## Installing

- Insert wheel bearing housing.
- Push outer joint of drive axle into wheel hub and hand-tighten new hex bolt.

### **Note:**

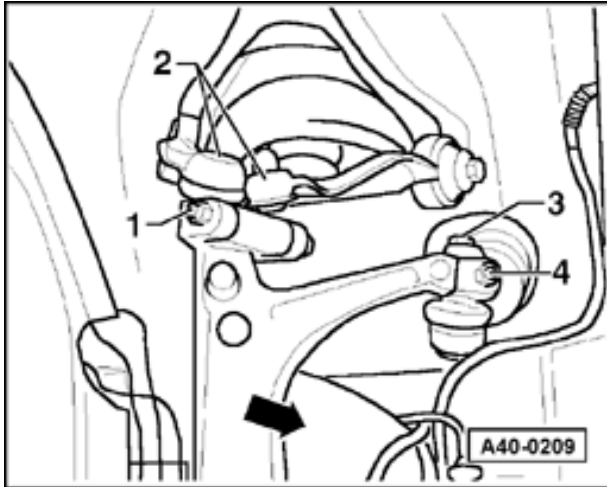
*Remove any adhesive remaining on thread of joint bolt.*

- Insert joint bolt of track control link and guide link into wheel bearing housing.
- Thread new self-locking nuts and tighten to 100 Nm.

Use 4 mm socket wrench to hold joint bolt, if necessary.



- Insert both joint bolts of top control arm into wheel bearing housing.



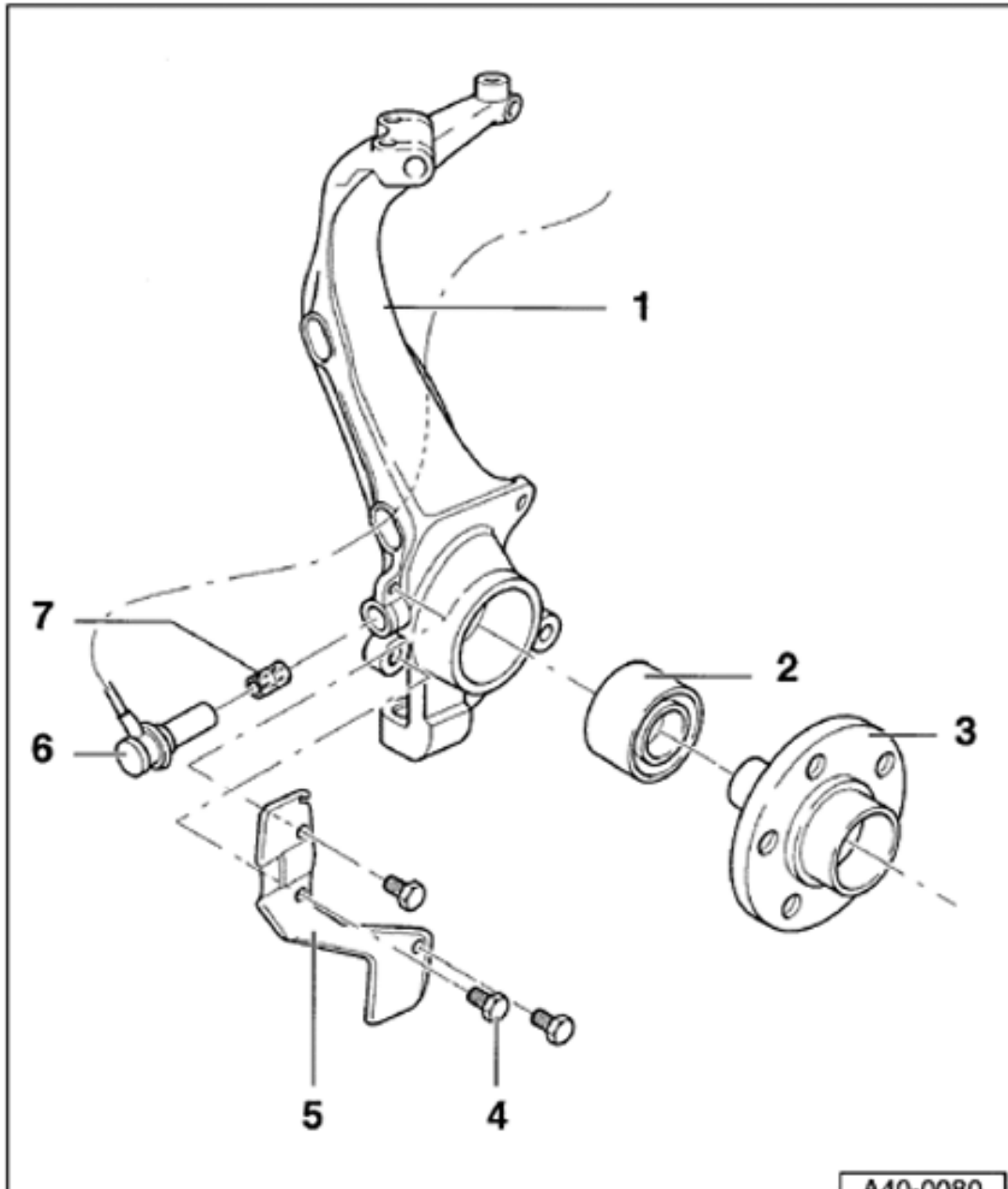
- Tighten new self-locking nuts -1- to 40 Nm.
- Press upper links down as far as possible when tightening!



- Insert tie rod.
  
- Screw on new self-locking nuts -4- and tighten to 50 Nm.
  
- Tighten hex bolts -3- to a maximum of 5 Nm.
  
- Install ABS wheel speed sensor
  
- Mount linkage for headlight vertical aim control ⇒ [Page 40-120](#)
  
- Screw on backing plate, and tighten to 10 Nm.
  
- Mount brake disc, screw on brake caliper, and tighten to 120 Nm.

- Mount wheel and tighten to 120 Nm.
- Tighten hex bolt for drive axle ⇒ [Page 40-149](#)

Suspension adjustment at front axle must be checked on an alignment stand recommended by VW/Audi, and corrected, if necessary.



## Front wheel bearing, pressing out and in (wheel bearing housing removed)

### 1 - Wheel bearing housing

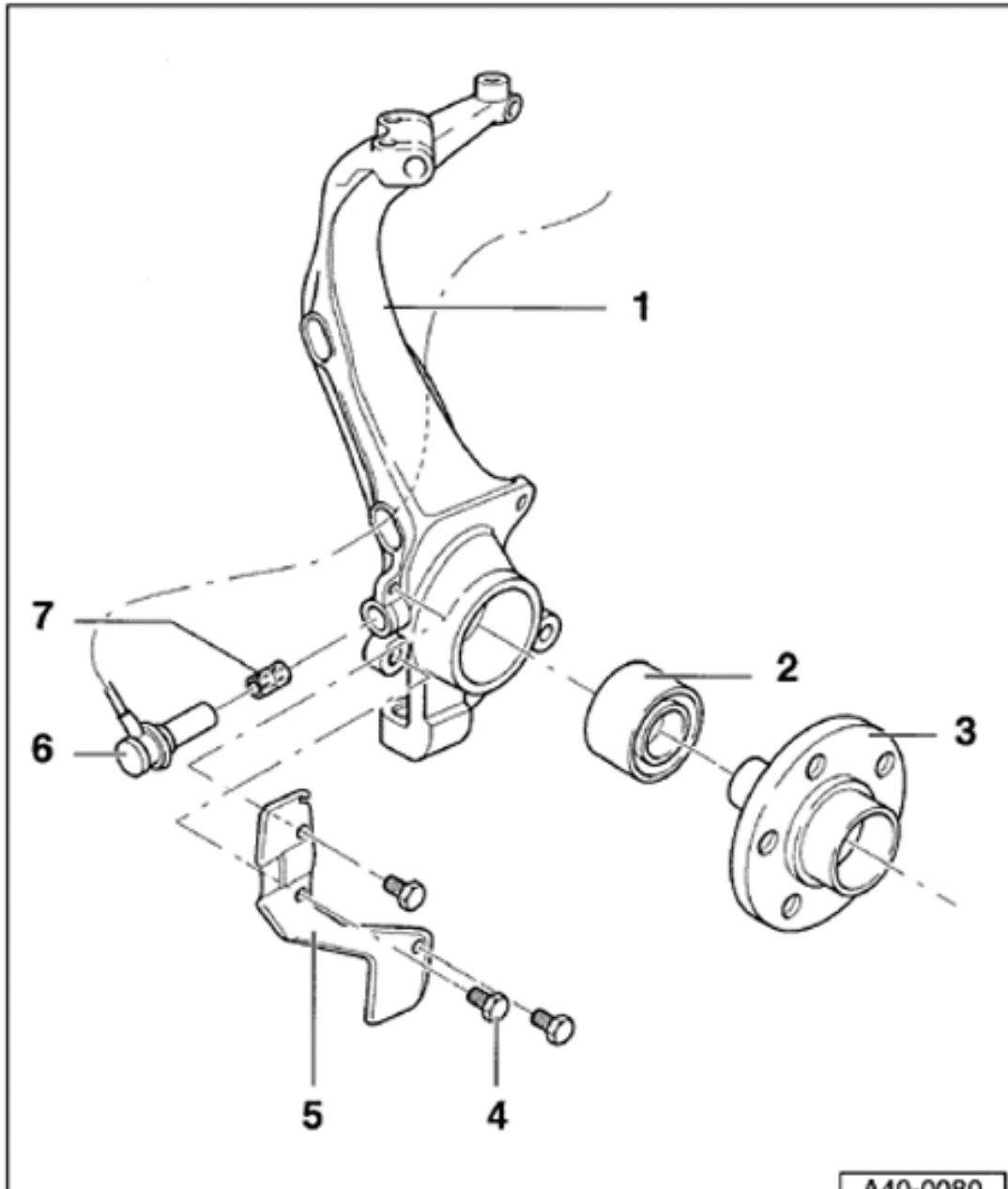
- ◆ Note different suspension versions
- ◆ Application
- ◆ See Parts catalog

### 2 - Wheel bearing

- ◆ Installation position:
  - Larger inside diameter of wheel bearing faces wheel hub.
- ◆ Pressing out 75 mm dia. ⇒ [Fig. 3](#)
- ◆ Pressing out 82 mm dia. ⇒ [Fig. 4](#)

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- ◆ Pressing off bearing inner race ⇒ [Fig. 5](#)  
and ⇒ [Fig. 6](#)
- ◆ Pressing in 75 mm dia. ⇒ [Fig. 7](#)
- ◆ Pressing in 82 mm dia. ⇒ [Fig. 8](#)
- ◆ Pressing out and pressing in with wheel bearing housing installed ⇒ [Page 40-54](#)



### 3 - Wheel hub

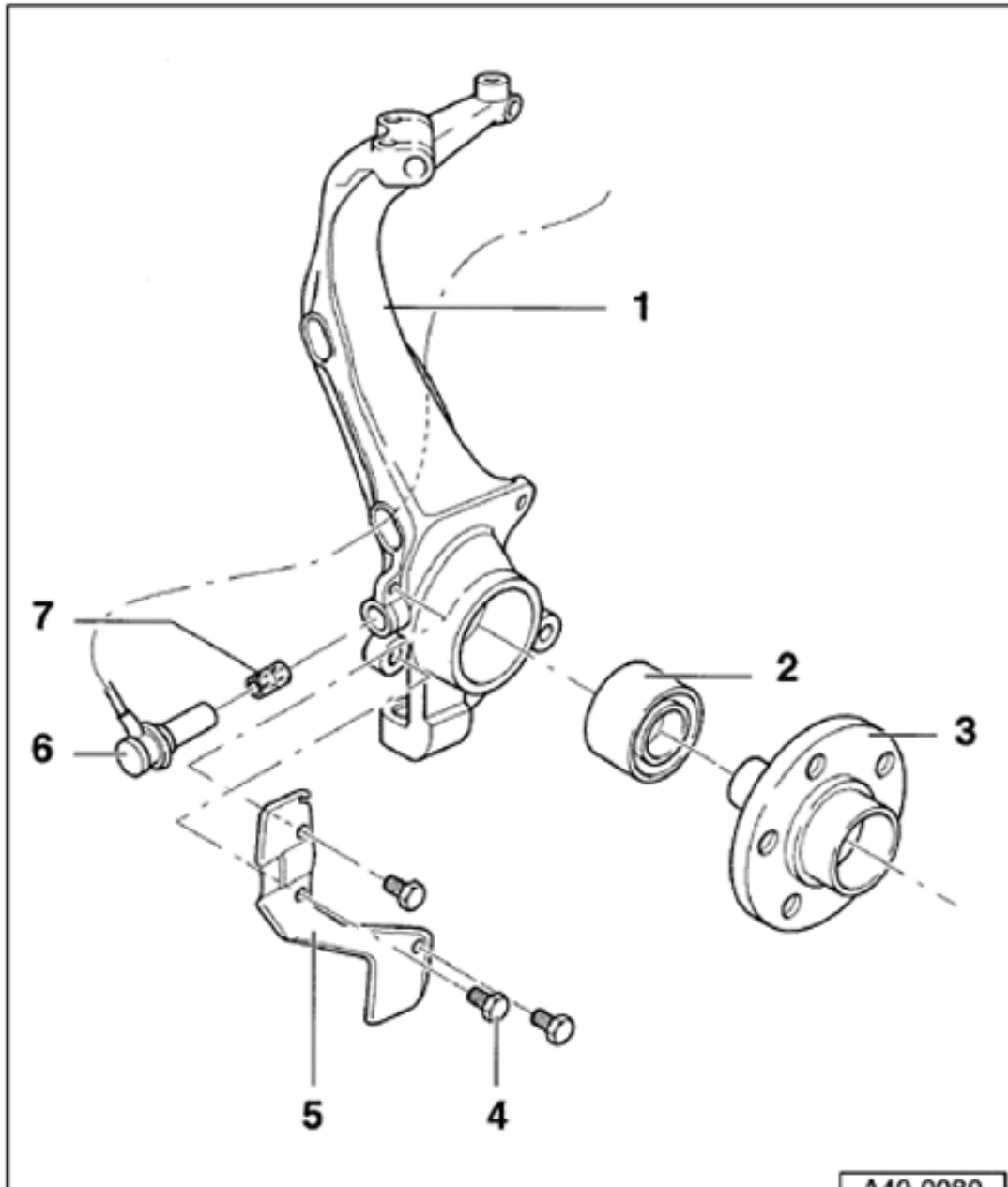
- ◆ Stepped design
- ◆ Pressing out 75 mm dia. ⇒ [Fig. 1](#)
- ◆ Pressing out 82 mm dia. ⇒ [Fig. 2](#)
- ◆ Pressing in 75 mm dia. ⇒ [Fig. 9](#)
- ◆ Pressing in 82 mm dia. ⇒ [Fig. 10](#)
- ◆ Contact surface between rim/brake disc as well as brake disc/wheel hub must be free from rust, corrosion products and dirt.
- ◆ Pressing out and pressing in with wheel bearing housing installed ⇒ [Page 40-54](#)
- ◆ Application

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- ◆ See Parts catalog
- ◆ Lightweight construction hub ⇒  
[Page 40-82](#)

**4 - Hex bolt, 10 Nm**

**5 - Backing plate**



### 6 - ABS wheel speed sensor

- ◆ Pull out to remove
- ◆ Install drive axle before installing wheel speed sensor
- ◆ Push into clamping sleeve up to stop
- ◆ To replace

⇒ [Repair Manual, Brake System, Repair Group 45](#)

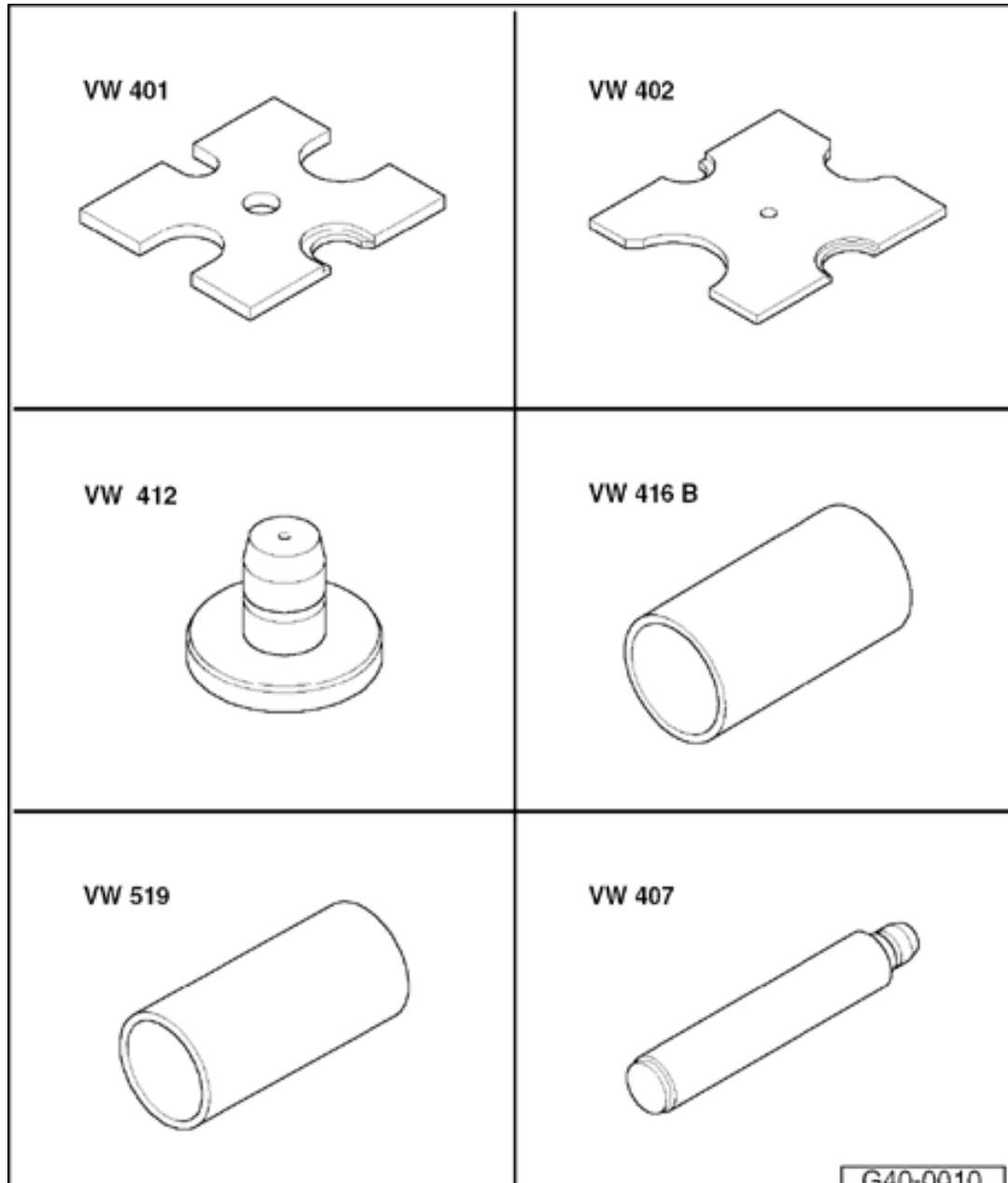
### 7 - Clamping sleeve

- ◆ Always replace
- ◆ Left and right sides are identical
- ◆ Before inserting, grease hole in wheel bearing housing with copper paste



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◆ Push into wheel bearing housing up to stop



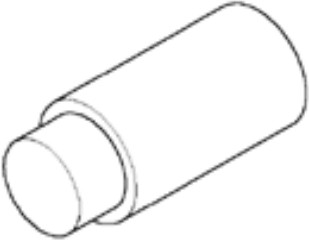
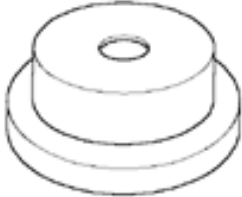
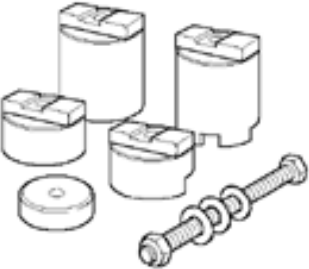
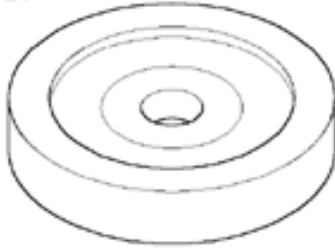

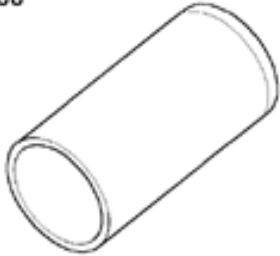
### Special tools and equipment

- ◆ VW401 thrust plate
- ◆ VW402 thrust plate
- ◆ VW412 punch
- ◆ 416 B pipe piece
- ◆ VW 519 pipe piece
- ◆ VW407 punch

Audi A6 Sedan 1998-2004, Audi A6 Avant 1999-2004, Audi allroad quattro 2001-2004, Audi S6 Avant 2002-2004, Audi RS6 2003-2004 - Suspension, Wheels, Steering

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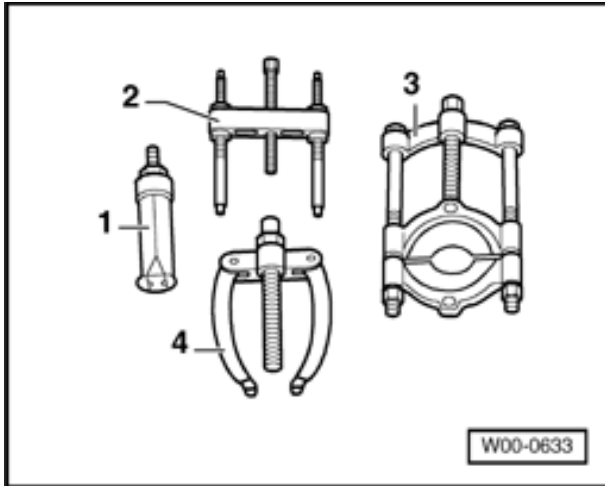


<p>VW 432</p> 	<p>VW 447 i</p> 
<p>3291</p> 	<p>3124</p> 
<p>3345</p> 	<p>30-100</p>  <p>G40-0011</p>

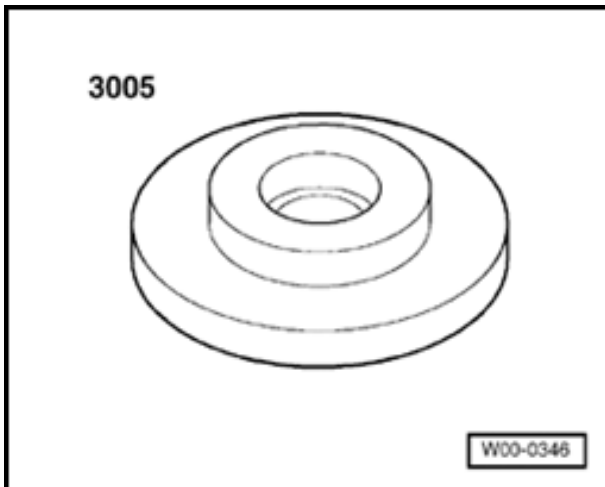
- ◆ VW 432 pressure piece
- ◆ VW447i pressure disc
- ◆ 3291/ 2 installation tool
- ◆ 3124 pressure piece
- ◆ 3345 pipe for wheel bearing
- ◆ 30-100 press tube

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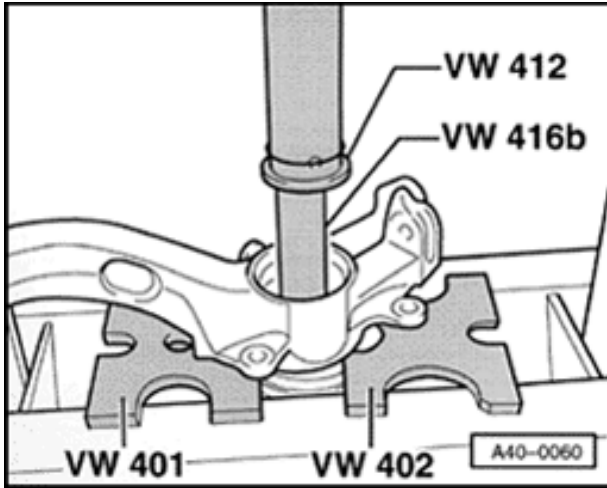
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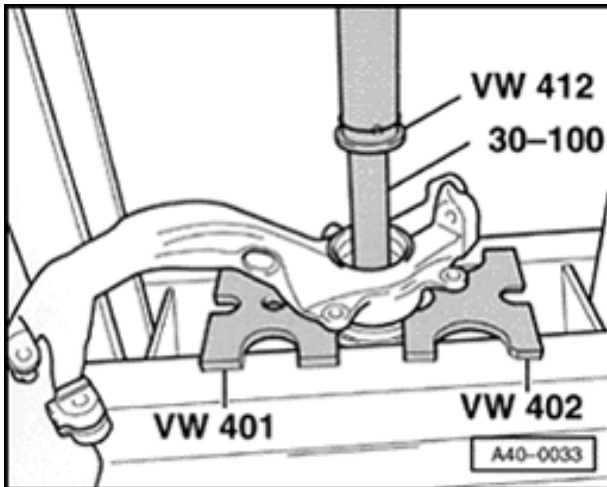
◀ ◆ 3- Kukko 15-17  
extractor



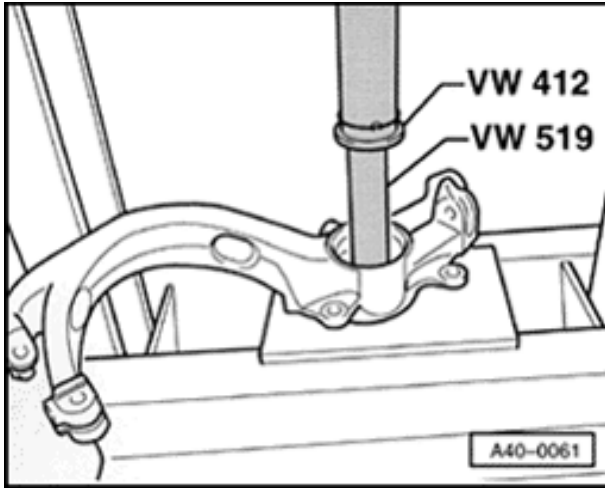
◀ ◆ 3005 pressure  
plate



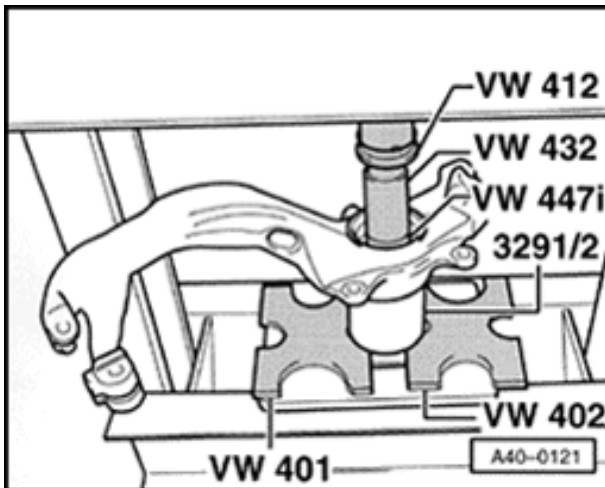
**Fig. 1** Pressing wheel hub out of wheel bearing housing with 75 mm diameter



**Fig. 2** Pressing wheel hub out of wheel bearing housing with 82 mm diameter

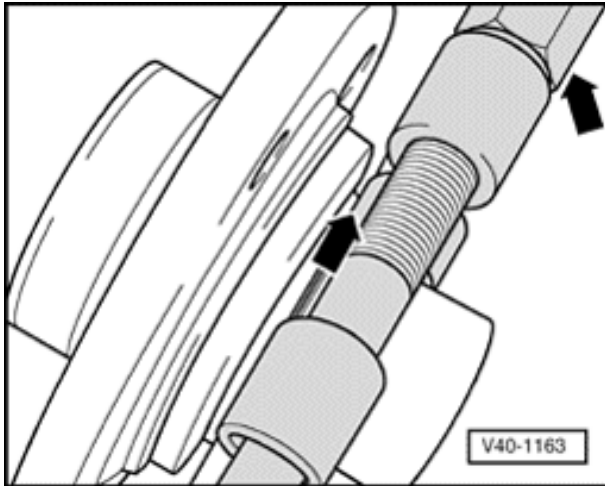


**Fig. 3** Pressing wheel bearing out of wheel bearing housing with 75 mm diameter



**Fig. 4** Pressing wheel bearing out of wheel bearing housing with 82 mm diameter



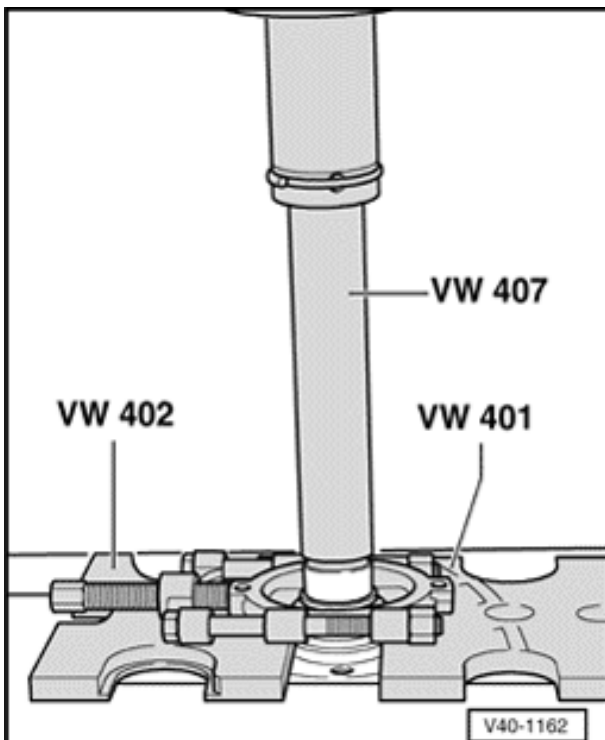


⚡ **Fig. 5 Inserting separator**

- Insert separator into ring groove of bearing inner race (arrow), and pretension with spindle.

**Note:**

*Use a commercially available separator, e.g. Kukko 15-17.*



⚡ **Fig. 6 Pressing bearing inner race off of wheel hub.**

Audi A6 Sedan 1998-2004, Audi A6 Avant 1999-2004, Audi allroad quattro 2001-2004, Audi S6 Avant 2002-2004, Audi RS6 2003-2004 - Suspension, Wheels, Steering

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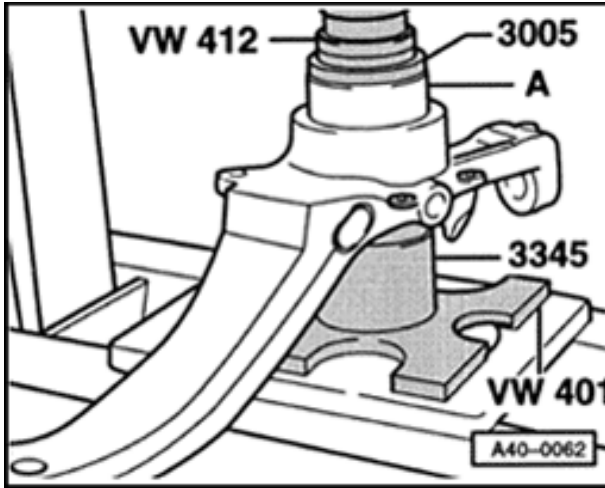


Fig. 7 Pressing wheel bearing into wheel bearing housing with 75 mm diameter

**Note:**

*Larger inside diameter of wheel bearing faces wheel hub.*

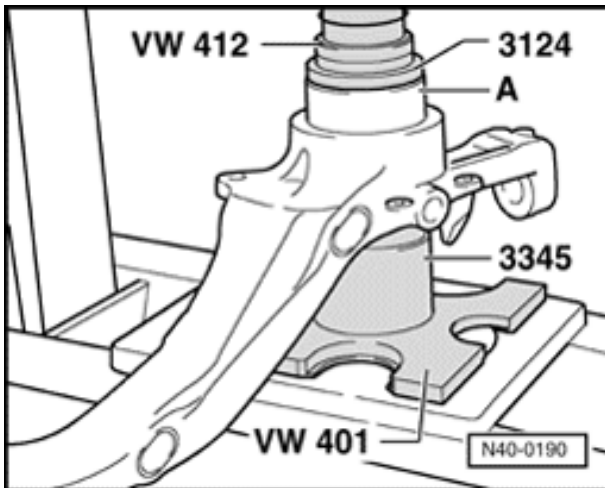
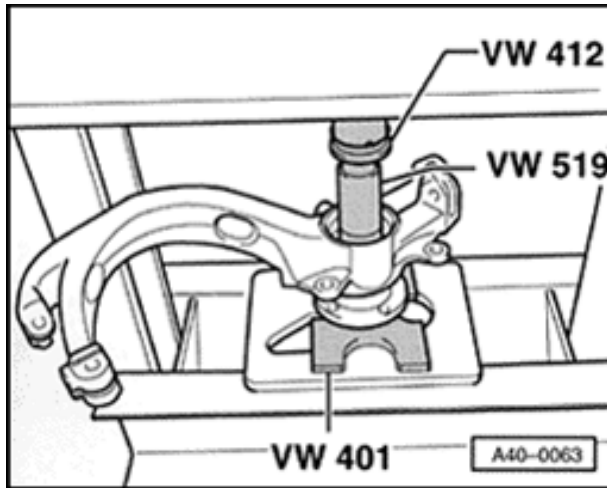


Fig. 8 Pressing wheel bearing into wheel bearing housing with 82 mm diameter

**Note:**

*Larger inside diameter of wheel bearing faces wheel hub.*



**Fig. 9 Pressing wheel hub into wheel bearing with 75 mm diameter**

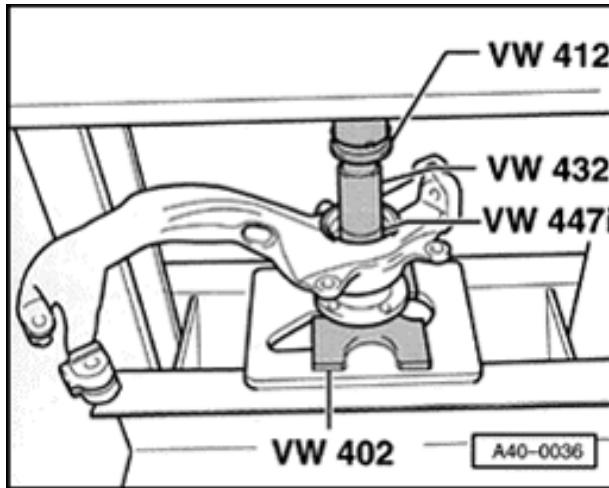
**Note:**

*Make sure that dead weight of wheel bearing housing does not press on wheel hub. This can damage wheel bearing.*

- When pressing in, pressure piece (VW519) may only lie against bearing inner ring.

**Note:**

*While pressing in wheel bearing housing, must be kept as horizontal as possible. Otherwise, wheel hub would tilt in wheel bearing, causing early damage to bearing.*



**Fig. 10 Pressing wheel hub into wheel bearing with 82 mm diameter**

**Note:**

*Make sure that dead weight of wheel bearing housing does not press on wheel hub. This can damage wheel bearing.*

- When pressing in, pressure piece (VW447i) must rest only against bearing inner race.

**Note:**

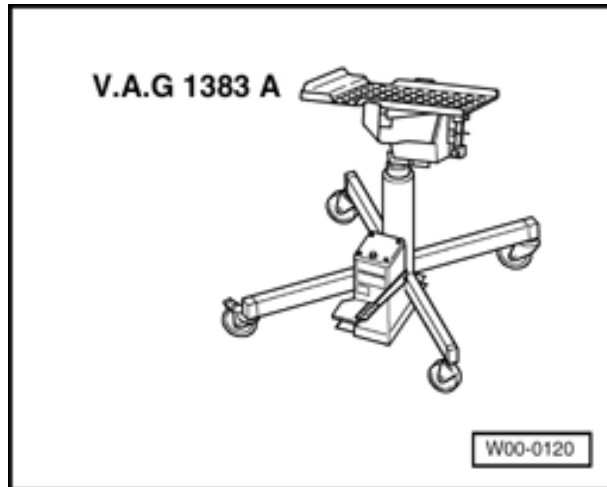
*While pressing in wheel bearing housing, must be kept as horizontal as possible. Otherwise, wheel hub would tilt in wheel bearing, causing early damage to bearing.*

40-54

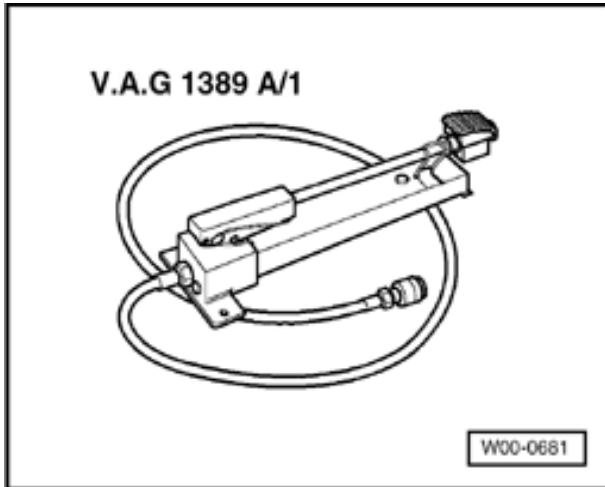


## Front wheel bearing, pressing out and in (wheel bearing housing installed)

### Special tools and equipment



- ◆ VAG1383 A engine/transmission jack with universal transmission holder VAG1359/2



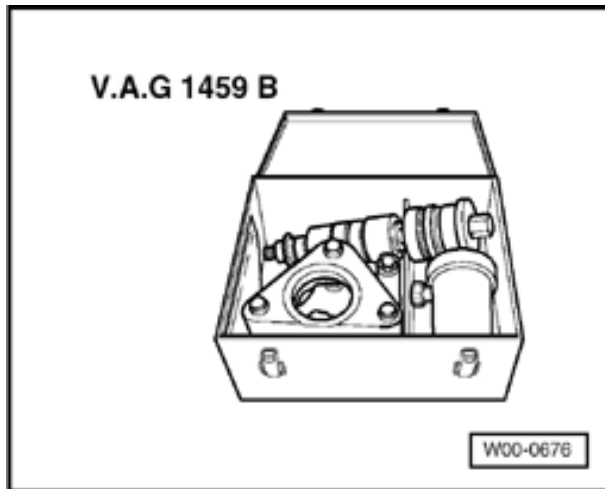
◆ VAG1389 A/1 foot pump with high pressure hose

If available in shop, VAG1389/1 hand pump can also be modified for use as a foot pump.

To do this use conversion kit VAG1389/3.

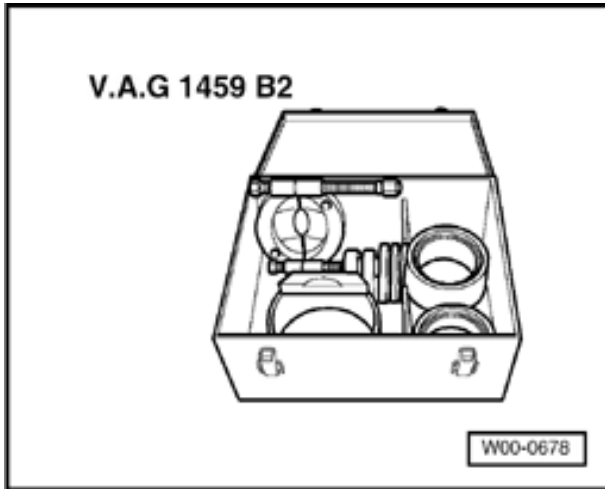


## Special tools and equipment



- ◆ VAG1459 B hydraulic removal/installation tool for wheel bearing
  - ◆ Hollow piston cylinder HKZ-15 with hydraulic pressure unit E-0-204-T
  - ◆ Tie bolts E-0-217 +218
  - ◆ Special nut E-8-214
  - ◆ Pressure piece E-5
  - ◆ Pressure piece E-14-1





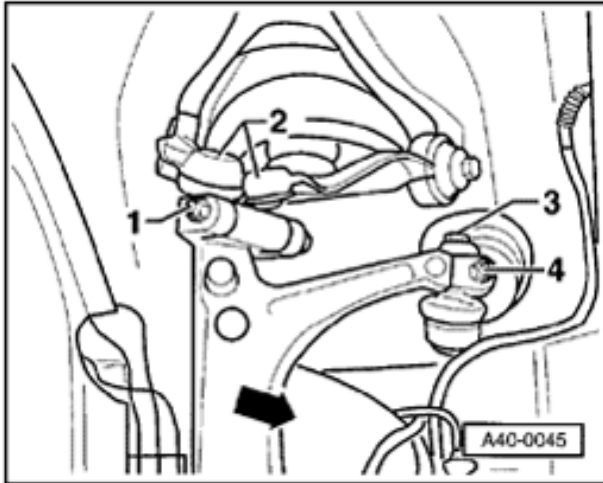
◆ VAG1459 B/2 supplementary kit

- ◆ Kukko 17/2 separator
- ◆ Bell E-40
- ◆ Pressure piece E-43
- ◆ Pressure sleeve E-44-1
- ◆ Pressure piece E-45

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- Loosen hex bolt for drive axle when vehicle is standing on its wheels (risk of accident).
- Remove wheel and raise vehicle.
- Pull cable of ABS wheel speed sensor out of bracket on brake caliper.
- Pull ABS wheel speed sensor out of wheel bearing housing.
- Remove adapter with brake caliper and hang on body with tie wire.
- Remove brake disc and backing plate.



- - Remove nut -1- and hex bolt, and lift out both links - 2-.

Slits in wheel bearing housing may not be widened with a chisel or similar tool!

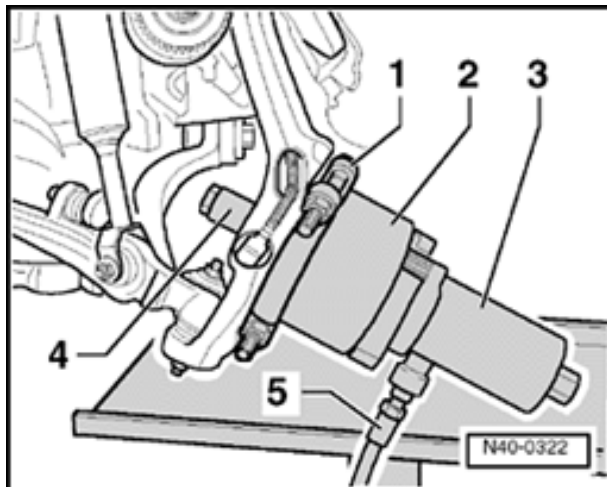
- Unscrew hex bolt for drive axle.
- Swing out wheel bearing housing.
- Take drive axle out of wheel bearing housing and tie up.

**Note:**

*Place VAG1383/A transmission lifter underneath (danger of accident if parts fall off when ejecting wheel hub and wheel bearing).*



## Pulling out wheel hub



- Place separator -1- between wheel bearing housing and wheel hub, and pretension.

Installation position: straight surfaces of blades point toward wheel hub.

- Attach bell -2-, hollow piston cylinder -3- with tie bolt, and special nut -4-.
- Pull out wheel hub while holding device securely.

1 - 17/2 Kukko separating tool

2 - Bell E-40

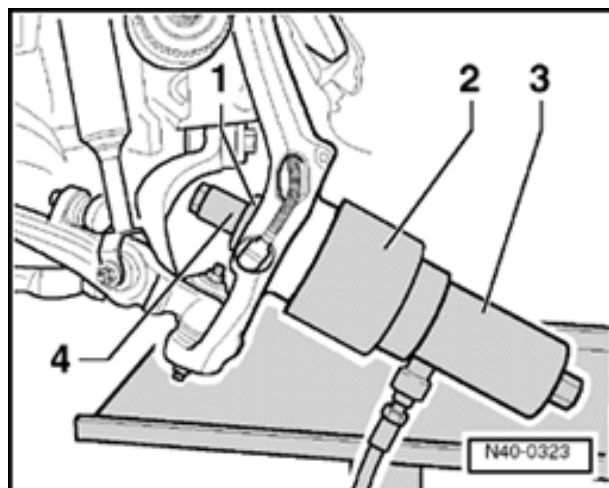
3 - Hollow piston cylinder HKZ-15

4 - Special nut E-8-214 and tie bolt

5 - High pressure hose with quick-release



## Pulling out wheel bearing



- Attach pressure piece -1- with collar to bearing, pressure sleeve -2- with four stepped inside diameters to wheel bearing housing, hollow piston cylinder -3- with tie bolt, and special nut -4-.
- Pull out wheel bearing by actuating pump.

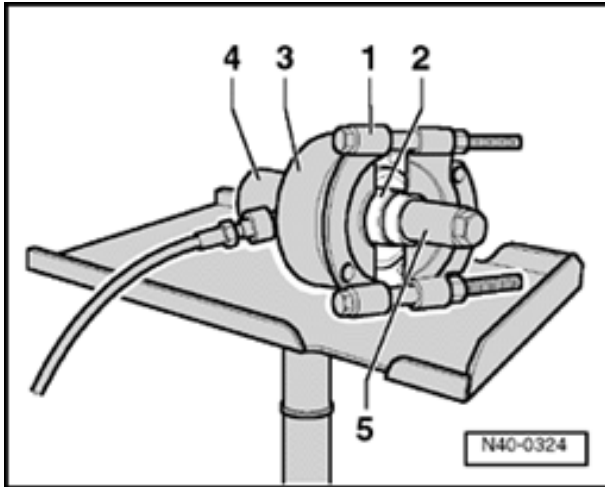
1 - Pressure piece E-5

2 - Pressure sleeve E-44-1

3 - Hollow piston cylinder HKZ-15

4 - Special nut E-8-214 and tie bolt

## Pull bearing inner race off hub



- Attach separator -1- behind bearing inner ring - 2-.

Installation position: Beveled part of blades faces bearing inner ring.

- Put on bell -3- and hollow piston cylinder -4- with tie bolt, screw on with special nut -5-, and pull off bearing inner ring.

1 - 17/2 Kukko separating tool

2 - Bearing inner ring

3 - Bell E-40

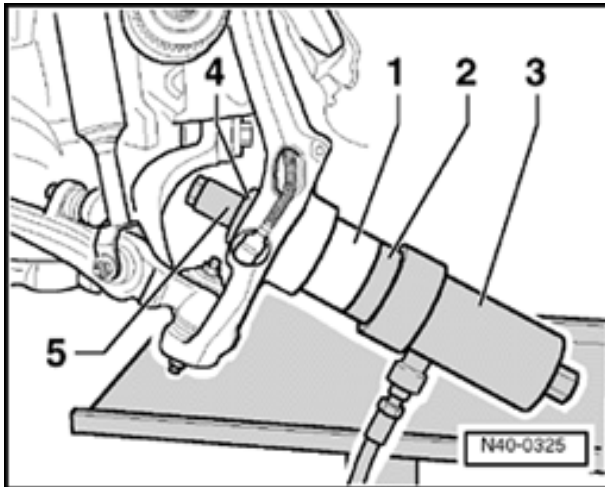
4 - Hollow piston cylinder HKZ-15

5 - Special nut E-8-214 and tie bolt



## Pressing in wheel bearing

Installation position: Large inside diameter of wheel bearing faces out.



- Put wheel bearing -1-, pressure piece -2- (put collar into bearing), and hollow piston cylinder -3- with tie bolt on wheel bearing housing.
- Attach pressure piece -4- with angles toward wheel bearing housing and special nut -5- from inside.
- Press in wheel bearing by actuating pump.

1 - Wheel bearing (note different versions: 75 mm diameter and 82 mm diameter)

2 - Pressure piece E-45 for wheel bearing with 75 mm diameter or pressure piece E-14-1 for wheel bearing with 82 mm diameter

3 - Hollow piston cylinder HKZ-15

4 - Pressure piece E-43

5 - Special nut E-8-214 and tie bolt

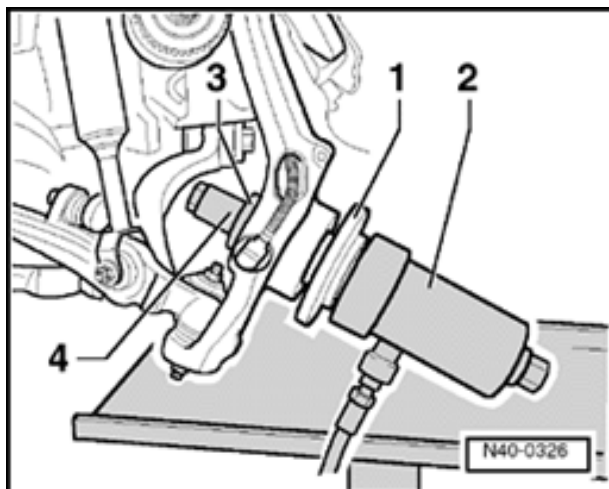
Audi A6 Sedan 1998-2004, Audi A6 Avant 1999-2004, Audi allroad quattro 2001-2004, Audi S6 Avant 2002-2004, Audi RS6 2003-2004 - Suspension, Wheels, Steering



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### Pressing in wheel hub



- Put wheel hub -1- and hollow piston cylinder -2- with tie bolt onto wheel bearing.
- Attach pressure piece -3- with collar to special nut -4- from inside.
- Press in wheel hub by actuating pump.

1 - wheel hub

2 - Hollow piston cylinder HKZ-15

3 - Pressure piece E-5

4 - Special nut E-8-214 and tie bolt

Rest of installation is the reverse of removal.