



Workshop Manual

Golf 2004 ➤

Golf Plus 2005 ➤

Running gear, axles, steering

Edition 08.2009





List of Workshop Manual Repair Groups

Repair Group

- 00 - Technical data
- 40 - Front suspension
- 42 - Rear suspension
- 44 - Wheels, tyres, vehicle geometry
- 48 - Steering

Technical information should always be available to the foremen and mechanics, because their careful and constant adherence to the instructions is essential to ensure vehicle road-worthiness and safety. In addition, the normal basic safety precautions for working on motor vehicles must, as a matter of course, be observed.

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00 – Technical data

1 Checklist for evaluating running gear of accident vehicles

Damage to running gear may go unnoticed during repairs to load-bearing and suspension parts of accident vehicles. Under certain circumstances, this undiscovered damage could lead to serious consequential damage during later vehicle operation. Therefore, the following parts of accident vehicles must be examined in the manner and order described independent of wheel alignment which may have to be performed. If no deviations from specifications are measured during wheel alignment, there are no deformations of the running gear.

Visual and functional examination of steering system

- ◆ Visual examination for deformation and cracks
- ◆ Examination for play in track rod joints and steering box
- ◆ Visual examination for tears in boots
- ◆ Examine electrical and hydraulic lines and hoses for chafing, cuts and kinks.
- ◆ Examine hydraulic lines, threaded connections and steering gear for leaks.
- ◆ Check steering box and lines for secure seating.
- ◆ Check for flawless function from lock to lock by moving the steering from stop to stop. In the process, the steering wheel must turn with a constant force without resistance.

Visual inspection and functional check of running gear

- Adhere to the sequence of the following inspection steps!
- ◆ Exam all components shown in the assembly overviews for deformation, cracks and other damage.
- ◆ Renew damaged parts
- ◆ Align wheels on a VOLKSWAGEN AG-approved wheel alignment stand.

Visual and functional check of wheels and tyres

- ◆ Check for true running and imbalance ⇒ Wheels, tyres, wheel alignment; Rep. Gr. 44
- ◆ Check tyres for cuts and impact damage in the profile and on the flanks ⇒ Wheels, tyres, wheel alignment; Rep. Gr. 44 .
- ◆ Check tyre inflation pressure; see tyre inflation pressure sticker in fuel tank flap or ⇒ Maintenance ; Booklet ; Check tyres: condition, profile, inflation pressure, depth of tread

If rim of wheel and/or tyre is damaged, renew tyre. This also applies if the circumstances of the accident and the damage to the vehicle indicate possible damage which is not visible.

A further factor in the decision is the age of the tyre. Tyres should not be older than 6 years.

Generally, in case of doubt:

- Whenever a safety risk cannot be excluded, the tyre(s) must be renewed.



Entire vehicle

Check other vehicle systems as well, for example:

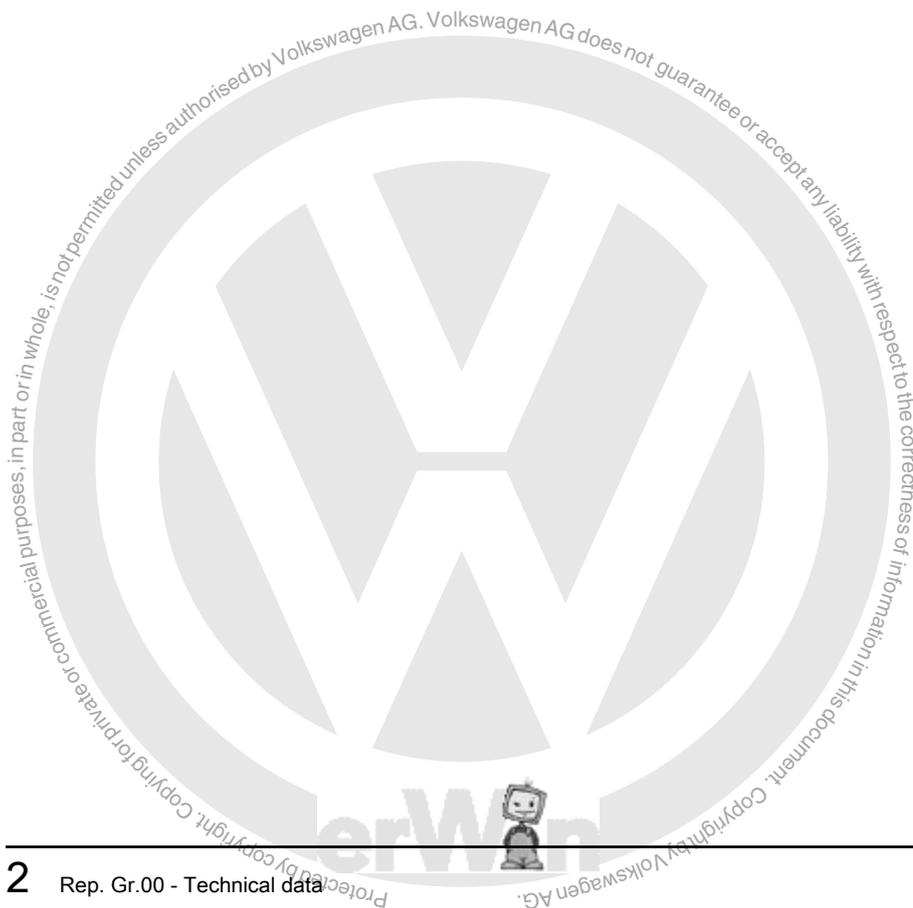
- ◆ Brake system including ABS
- ◆ Visual and functional examination of exhaust system and passenger protection

Specifications for testing and adjusting can be found in the respective workshop manual in ELSA.

The examination for accident vehicles described here refers to the running gear and does not purport to be a complete examination of the entire vehicle.

Electronic vehicle systems

Safety-relevant systems like, for example, ABS/EDL; airbags; electronically regulated suspension systems; electromechanical or electrohydraulic steering and other driver assist systems, must be read with the vehicle diagnosis, testing and information system -VAS 5051- for possible stored fault messages. If faults are saved in the fault memories of the systems mentioned above, repair them according to instructions in workshop manuals in ELSA. Following repairs, read fault memories of the affected systems again to be sure that complete function has been restored.





2 General information

Information concerning wheels, tyres and snow chains can be found in "Wheel and Tyre Guide" ⇒ Wheels, tyres, wheel alignment; Rep. Gr. 44 .





40 – Front suspension

1 Appraisal of accident vehicles

A checklist for evaluating running gear of accident vehicles can be found under ⇒ [page 1](#) .



2 Repairing front suspension

2.1 Overview - front axle

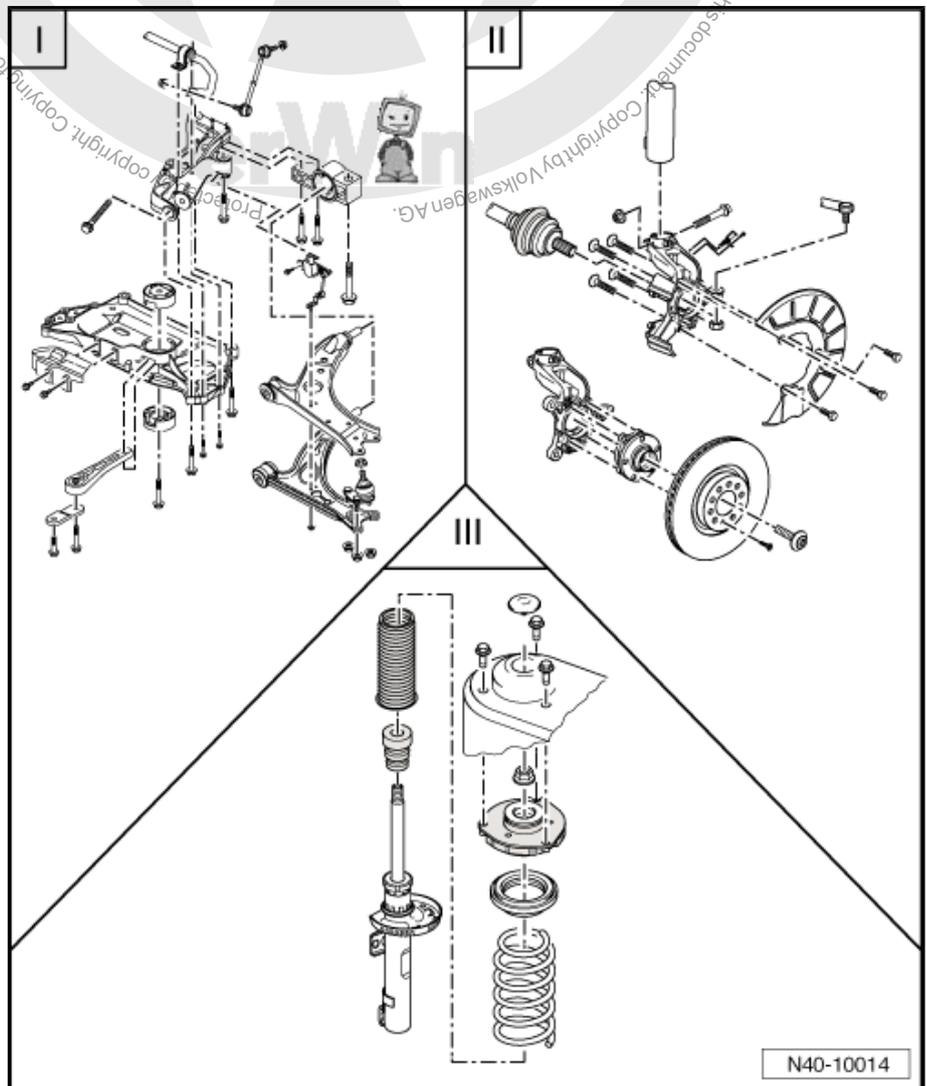
i Note

- ◆ It is not permitted to weld or straighten load-bearing or wheel-guiding components of the suspension.
- ◆ Always renew self-locking nuts.
- ◆ Always renew corroded nuts and bolts.
- ◆ Bonded rubber bushes can be twisted only to a limited extent. Therefore, you should only tighten the threaded connections of components with bonded rubber bushes when the wheel bearing housing is raised to unladen position, Golf ⇒ [page 6](#) ; Golf Plus, CrossGolf ⇒ [page 8](#) .

I - Assembly overview - sub-frame, anti-roll bar, suspension links ⇒ [page 10](#)

II - Assembly overview - wheel bearing ⇒ [page 56](#)

III - Assembly overview - suspension strut ⇒ [page 64](#)





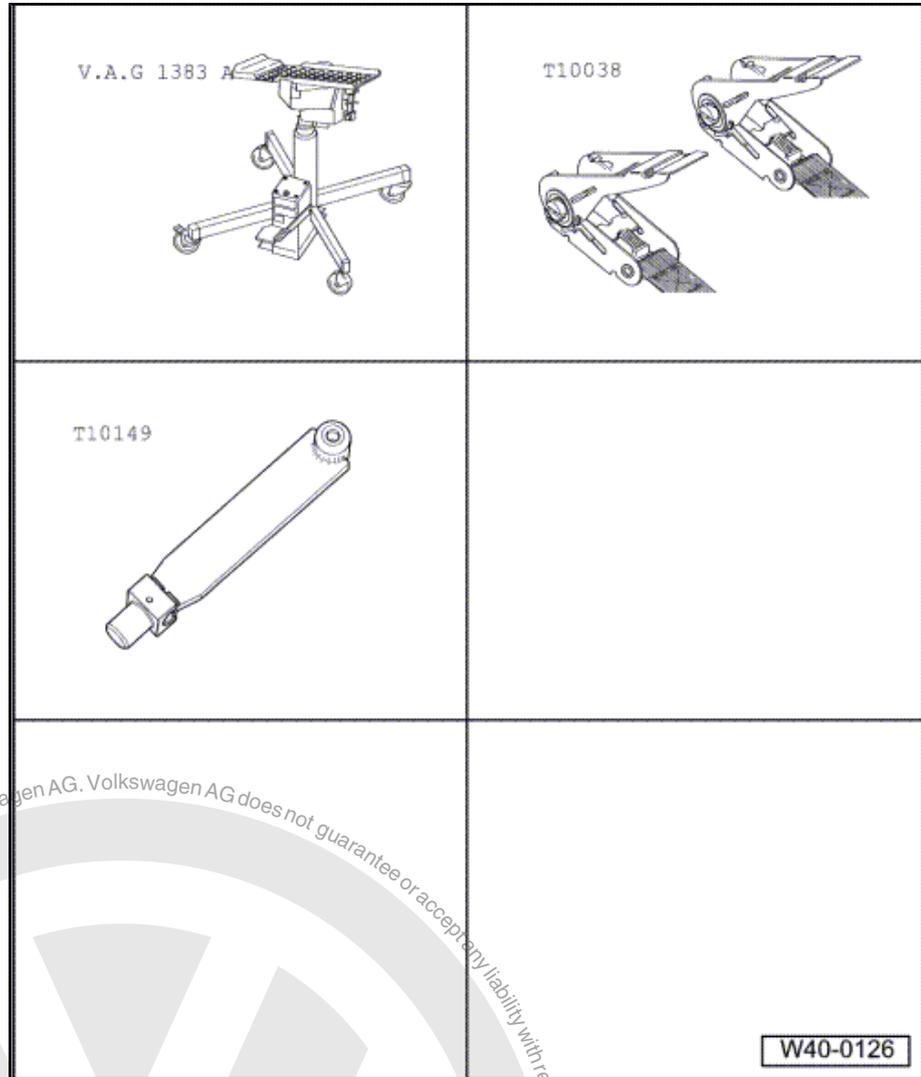
The chapter "Removing and installing drive shafts" can be found on ⇒ [page 77](#) .

The chapter "Repairing drive shaft" can be found on ⇒ [page 94](#) .

2.2 Raising wheel suspension to unladen position, Golf

Special tools and workshop equipment required

- ◆ Engine and gearbox jack - V.A.G 1383 A-
- ◆ Tensioning strap -T10038-
- ◆ Support -T10149-



Caution

All bolts on running gear components with bonded rubber bushes may be tightened only when the component is in the unladen position (normal position).

Bonded rubber bushes can be twisted only to a limited extent.

Axle components with bonded rubber bushes must therefore be brought to a position equivalent to the unladen (normal) position before being tightened.

Otherwise, the bonded rubber bush would be subject to torsion loading, shortening its service life.



To simulate this position on the lifting platform, raise the respective wheel suspension with the engine and gearbox jack -V.A.G 1383 A- and support -T10149- .

Before the axle on one side is raised, both sides of the vehicle must be strapped to the lifting platform arms with tensioning straps -T10038- .



WARNING

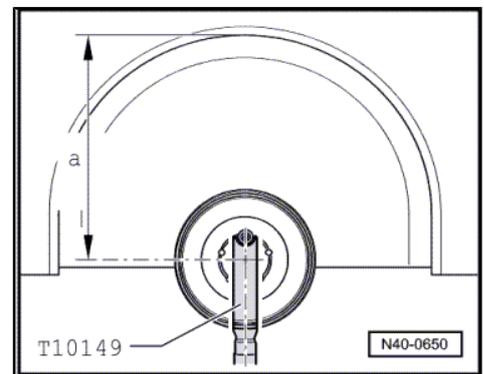
If the vehicle is not strapped down, there is a danger that the vehicle will slip off the lifting platform!

- Turn wheel hub until one of the wheel bolt holes is at the top.
- Attach support -T10149- to wheel hub using wheel bolt.

Respective nuts and bolts may be tightened only when dimension -a- between the centre of wheel hub and edge of wheel housing has been attained.

The dimension -a- depends on the ride height of the installed running gear:

Running gear ¹⁾	Ride height -a- in mm
Standard running gear (2UA)	382 ± 10 mm
Heavy-duty running gear (2UB)	402 ± 10 mm
Sports running gear except 18" wheels (2UC)	367 ± 10 mm
Sports running gear with 18" wheels (G02/G05/G07/2UC)	367 ± 10 mm
Sports running gear GTI (G08)	360 ± 10 mm
Sports running gear R32 (G09)	362 ± 10 mm
Sports running gear GTI; US version (G11)	382 ± 10 mm
BlueMotion (G04/2UC)	367 ± 10 mm



¹⁾ The type of running gear fitted to the vehicle is recorded on the vehicle data sticker. The running gear is identified by the PR number. Which PR. No. refers to which running gear can be found here ⇒ [page 317](#) .

- Raise wheel bearing housing using engine and gearbox jack -V.A.G 1383 A- until dimension -a- is attained.



WARNING

- ◆ ***Never raise or lower the vehicle while the engine and gearbox jack is positioned beneath the vehicle.***
- ◆ ***Do not leave the engine and gearbox jack -V.A.G 1383 A- under the vehicle for longer than necessary.***

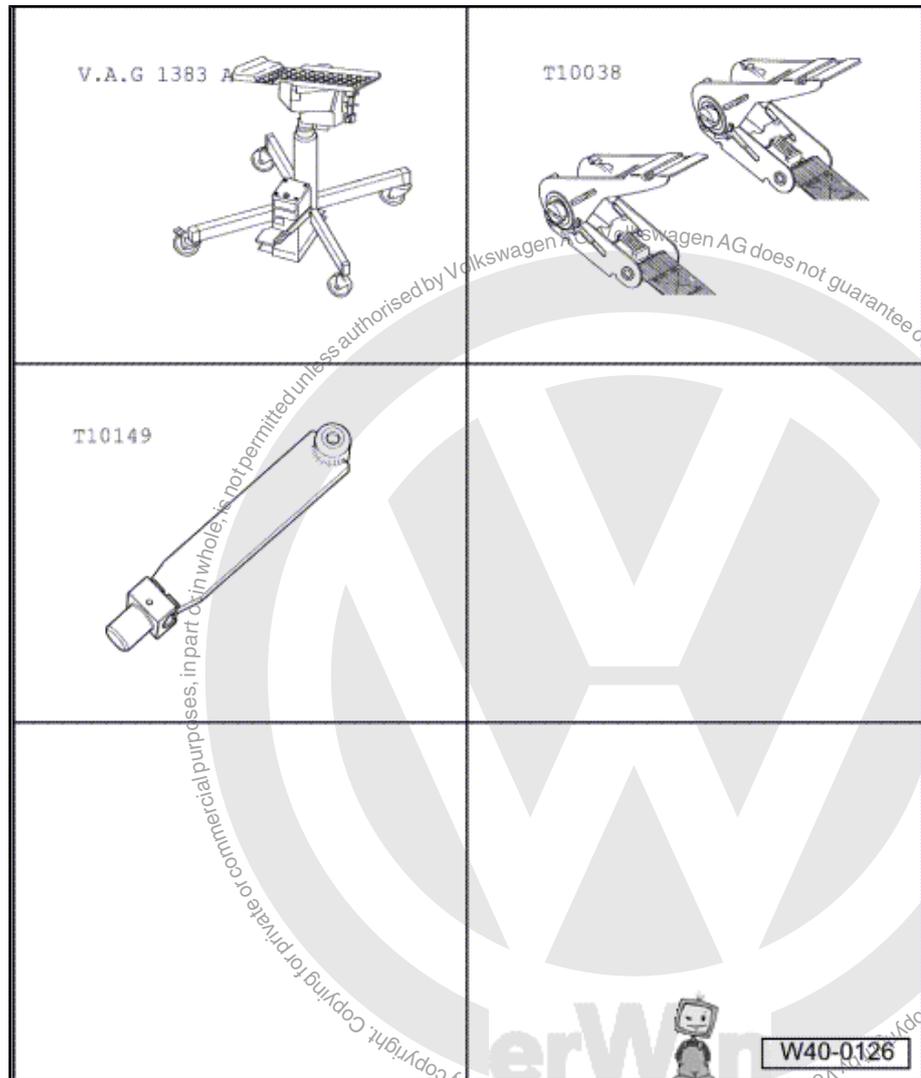
- Tighten affected nuts and bolts.
- Lower wheel bearing housing.
- Pull engine and gearbox jack -V.A.G 1383 A- out from under vehicle.
- Detach support -T10149- .



2.3 Raising wheel suspension to unladen position, Golf Plus, CrossGolf

Special tools and workshop equipment required

- ◆ Engine and gearbox jack - V.A.G 1383 A-
- ◆ Tensioning strap -T10038-
- ◆ Support -T10149-



Note

All bolts on running gear components with bonded rubber bushes may be tightened only when the component is in the unladen position (normal position).

Bonded rubber bushes can be twisted only to a limited extent.

Axle components with bonded rubber bushes must therefore be brought to a position equivalent to the unladen (normal) position before being tightened.

Otherwise, the bonded rubber bush would be subject to torsion loading, shortening its service life.

To simulate this position on the lifting platform, raise the respective wheel suspension with the engine and gearbox jack -V.A.G 1383 A- and support -T10149- .



Before the axle on one side is raised, both sides of the vehicle must be strapped to the lifting platform arms with tensioning straps -T10038- .

WARNING

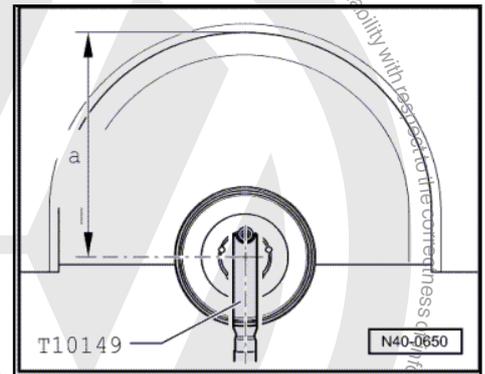
If the vehicle is not strapped down, there is a danger that the vehicle will slip off the lifting platform!

- Turn wheel hub until one of the wheel bolt holes is at the top.
- Attach support -T10149- to wheel hub using wheel bolt.

Respective nuts and bolts may be tightened only when dimension -a- between the centre of wheel hub and edge of wheel housing has been attained.

The dimension -a- depends on the ride height of the installed running gear:

Running gear ¹⁾	Ride height -a- in mm
Standard running gear (2UA)	383 ± 10 mm
Heavy-duty running gear (2UB)	403 ± 10 mm
Sports running gear except 18" wheels (2UC)	368 ± 10 mm
Sports running gear with 18" wheels (G02/G07/2UC)	368 ± 10 mm
CrossGolf (2UB)	400 ± 10 mm
BlueMotion (G06)	373 ± 10 mm



¹⁾ The type of running gear fitted to the vehicle is recorded on the vehicle data sticker. The running gear is identified by the PR number. Which PR. No. refers to which running gear can be found here [⇒ page 317](#) .

- Raise wheel bearing housing using engine and gearbox jack -V.A.G 1383 A- until dimension -a- is attained.

WARNING

- ◆ *Never raise or lower the vehicle while the engine and gearbox jack is positioned beneath the vehicle.*
- ◆ *Do not leave the engine and gearbox jack -V.A.G 1383 A- under the vehicle for longer than necessary.*

- Tighten affected nuts and bolts.
- Lower wheel bearing housing.
- Pull engine and gearbox jack -V.A.G 1383 A- out from under vehicle.
- Detach support -T10149- .



3 Subframe, anti-roll bar, suspension link

3.1 Assembly overview: subframe, anti-roll bar, suspension links



Caution

- ◆ *It is not permitted to weld or straighten load-bearing or wheel-guiding components of the suspension.*
- ◆ *Always renew self-locking nuts.*
- ◆ *Always renew corroded nuts and bolts.*

1 - Nut

- 65 Nm
- When tightening, counter hold on hexagon socket of joint stub.
- Self-locking
- Always renew after removing

2 - Coupling rod

- Link between anti-roll bar and suspension strut

3 - Bracket

- Fixing position
⇒ [page 17](#)
- If bracket is renewed, the wheels must be aligned ⇒ [page 305](#)

4 - Mounting bracket

- Fixing position
⇒ [page 17](#)
- With bonded rubber bush

5 - Bolt

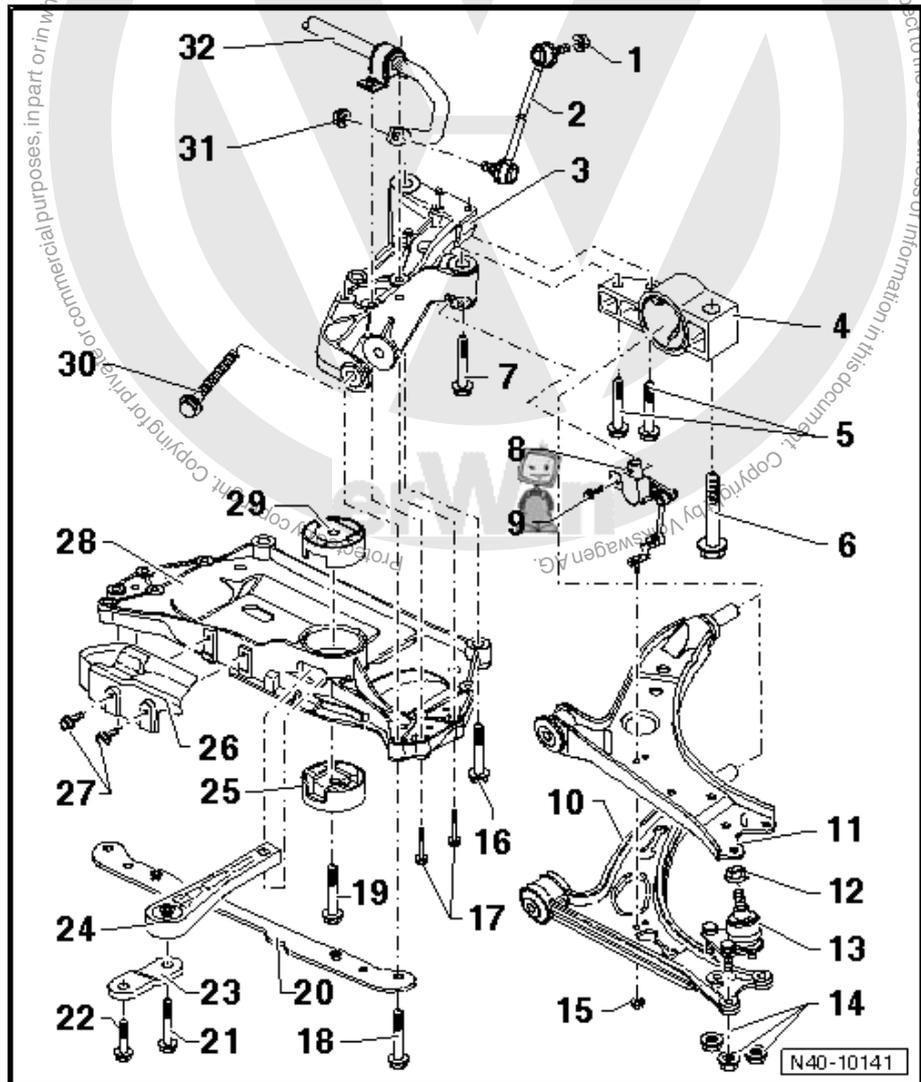
- 50 Nm + 90° further
- Always renew after removing

6 - Bolt

- M12 x 1.5 x 90
- 70 Nm + 90° further
- Always renew after removing

7 - Bolt

- M12 x 1.5 x 90
- 70 Nm + 90° further
- Always renew after removing



N40-10141



8 - Front left vehicle level sender -G78-

- Removing and installing ⇒ [page 15](#)
- Can be tested in guided fault finding using ⇒ Vehicle diagnosis, testing and information system VAS 5051

9 - Bolt

- 9 Nm

10 - Suspension link

- Different versions of suspension links are possible (cast steel, aluminium).
- Allocation ⇒ Electronic parts catalogue "ETKA"



Note

- If damaged, also renew swivel joint.
- Removing and installing ⇒ [page 36](#)
- Renew bush ⇒ [page 47](#)

11 - Suspension link

- Different versions of suspension links are possible (welded steel sheet, single-shell steel sheet).
- Allocation ⇒ Electronic parts catalogue "ETKA"



Note

- If damaged, also renew swivel joint.
- Removing and installing ⇒ [page 36](#)
- Renew bush ⇒ [page 47](#)

12 - Nut

- M12 x 1.5
- 60 Nm
- Self-locking
- Always renew after removing

13 - Swivel joint

- Checking ⇒ [page 33](#)
- Removing and installing ⇒ [page 34](#)
- Renew together with suspension link if suspension link is damaged

14 - Nut

- For cast steel suspension link: 60 Nm
- For sheet steel and forged aluminium suspension link: 100 Nm
- Self-locking
- Always renew after removing

15 - Nut

- 9 Nm

16 - Bolt

- M12 x 1.5 x 100
- 70 Nm + 90° further
- Always renew after removing

17 - Bolt

- 20 Nm + 90° further
- Always renew after removing

18 - Bolt

- M12 x 1.5 x 75
- 70 Nm + 90° further



- Always renew after removing

19 - Bolt

- M14 x 1.5 x 70
- 100 Nm + 90° further
- Do not tighten until pendulum support is bolted to gearbox
- Always renew after removing

20 - Bracket for skid plate

- Allocation ⇒ Electronic parts catalogue "ETKA"

21 - Bolt

Always observe size and strength class of the bolt. Different torque specifications apply.

- M10 x 75 strength class 8.8: 40 Nm and turn 90° further
- M10 x 75 strength class 10.9: 50 Nm and turn 90° further

 **Caution**

From model year 08, HeliCoil inserts are installed in the pendulum support connection in the 02Q gearboxes. Identification ⇒ Rep. Gr. 34

Use a bolt with hardness class 10.9 for this and all other gearboxes.

If there is no HeliCoil insert in the 02Q gearbox, use bolts with the strength class 8.8 and the corresponding torque setting.

- Always renew after removing

22 - Bolt

Always observe strength class of the bolt. Different torque specifications apply.

- M10 x 35 strength class 8.8: 40 Nm and turn 90° further
- M10 x 35 strength class 10.9: 50 Nm and turn 90° further



Caution

From model year 08, HeliCoil inserts are installed in the pendulum support connection in the 02Q gearboxes. Identification ⇒ Rep. Gr. 34.

Use a bolt with hardness class 10.9 for this and all other gearboxes.

If there is no HeliCoil insert in the 02Q gearbox, use bolts with the strength class 8.8 and the corresponding torque setting.

- Always renew after removing

23 - Bracket to pendulum support

- Not an individual part

24 - Pendulum support

- Bolt first to gearbox and then to subframe
- Various versions
- Allocation ⇒ Electronic parts catalogue "ETKA"

25 - Lower bonded rubber bush for pendulum support

- Pressing out and in for vehicles with front-wheel drive ⇒ [page 28](#)
- Pressing out and in for vehicles with four-wheel drive ⇒ [page 31](#)

26 - Shield

- For vehicles with front-wheel drive only

27 - Bolt

- 6 Nm
- Self-locking

28 - Subframe

- Various versions
- Removing and installing without steering box ⇒ [page 21](#)
- Removing and installing with steering box ⇒ [page 23](#)
- Allocation ⇒ Electronic parts catalogue "ETKA"

29 - Upper bonder rubber bush for pendulum support

- Pressing out and in for vehicles with front-wheel drive ⇒ [page 28](#)
- Pressing out and in for vehicles with four-wheel drive ⇒ [page 31](#)

30 - Bolt

- M12 x 1.5 x 110
- 70 Nm +180° further
- Always renew after removing
- Always tighten threaded connections in unladen position:

Golf ⇒ [page 6](#)

Golf Plus, CrossGolf ⇒ [page 8](#)



31 - Nut

- 65 Nm
- When tightening, counter hold on hexagon socket of joint stub.
- Self-locking
- Always renew after removing

32 - Anti-roll bar

- Various versions
- Allocation ⇒ Electronic parts catalogue "ETKA"
- Removing and installing ⇒ [page 51](#)

3.2 Assembly overview - front left vehicle level sender -G78-



Note

- ◆ *The front left vehicle level sender -G78/- is only available as a replacement part complete with coupling rod and upper and lower retaining plates.*
- ◆ *Replace with subframe installed.*

1 - Subframe

2 - Bolt

- M6 x 16
- 9 Nm

3 - Front left vehicle level sender -G78- and front right vehicle level sender -G289-

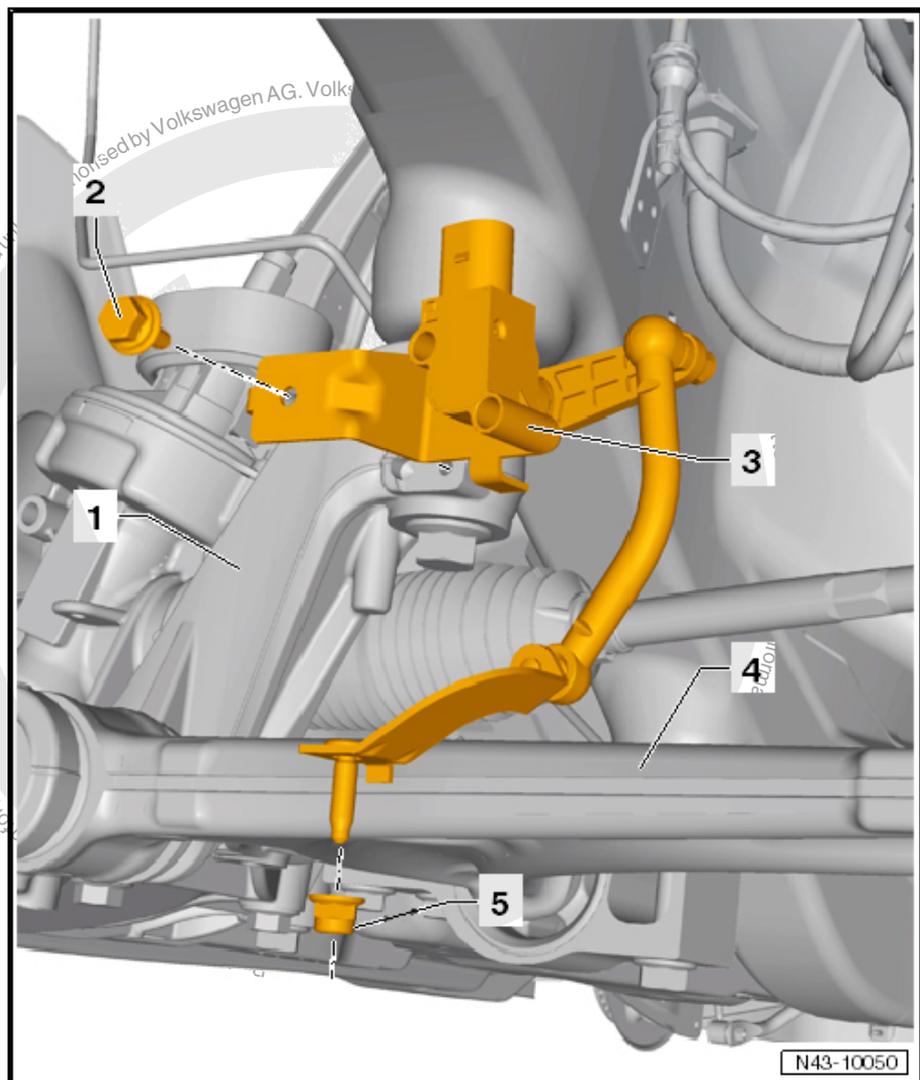
- Complete with attachments
- Lever -arrow- must face outwards
- Removing and installing ⇒ [page 15](#)
- Following renewal, basic settings for headlight must be performed.

Basic setting of headlights ⇒
"Guided fault-finding" function
of vehicle diagnosis, testing
and information system
VAS 5051

4 - Suspension link

5 - Nut

- 9 Nm
- Self-locking
- Always renew after removing

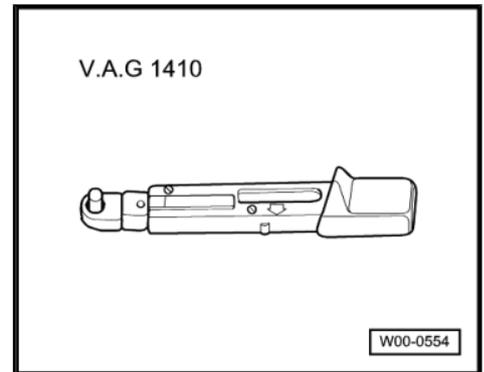




3.3 Removing and installing front left vehicle level sender -G78-

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1410-



Removing



To remove front left vehicle level sender -G78- , steering must be turned to right lock to ensure clearance between suspension link and anti-roll bar.

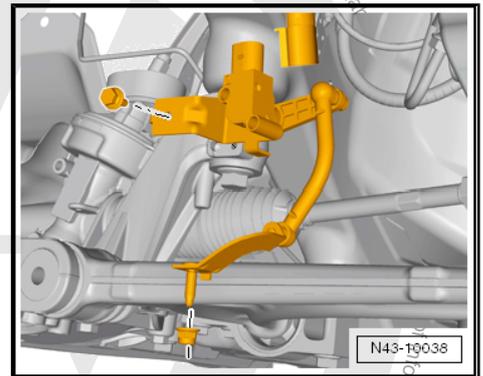
- Separate connector.
- Remove bolt and nut.
- Take out vehicle level sender.

Installing

Install in reverse order. Note the following points:



- ◆ *Lever on vehicle level sender must face towards outside of vehicle.*
- ◆ *Thread of vehicle level sender must be screwed into front hole in suspension link. Lug of bracket for vehicle level sender must engage in rear hole in order to guarantee correct installation position.*
- Perform basic setting of headlights ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051



Specified torques

Component	Specified torque
Bolt on subframe	9 Nm
Nut	9 Nm
◆ Use new nut	



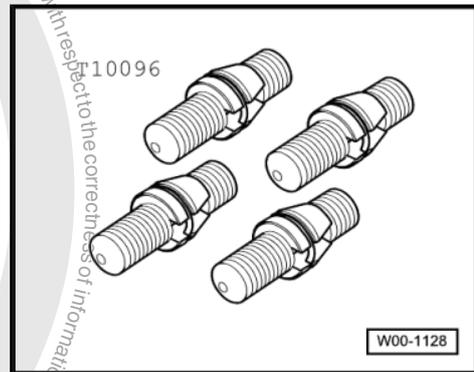
3.4 Repairing thread in longitudinal member

Repairing the thread in captive nuts in the longitudinal member is possible only under certain conditions ⇒ Body Repairs; Rep. Gr. 50 .

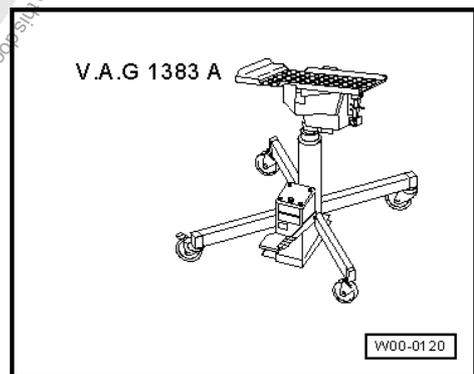
3.5 Fixing position of subframe and brackets

Special tools and workshop equipment required

- ◆ Locating pins -T10096-



- ◆ Engine and gearbox jack -V.A.G 1383 A-



Installing locating pins -T10096-

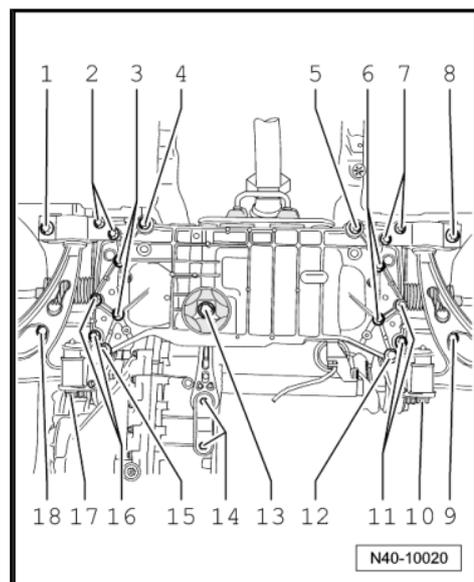
To fix position of subframe with brackets, locating pins -T10096- must be screwed one after the other into positions -1-, -8-, -9- and -18-.



Note

The locating pins -T10096- may be tightened only to a maximum of 20 Nm; otherwise the threads of the locating pins may be damaged.

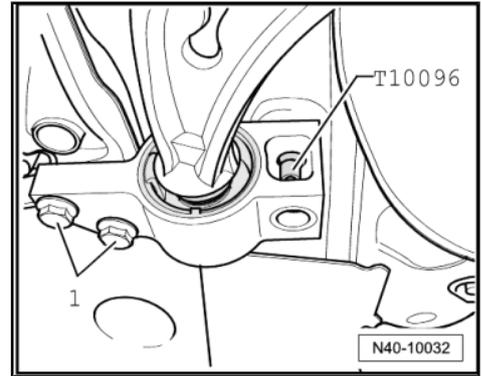
- Replace mounting bracket securing bolts along both sides one after the other with locating pins -T10096- and tighten them to 20 Nm.





Fixing position of mounting bracket

- Replace the bracket securing bolts along both sides one after the other with locating pins -T10096- and tighten them to 20 Nm.



Fixing position of bracket

The position of the front axle is now fixed.

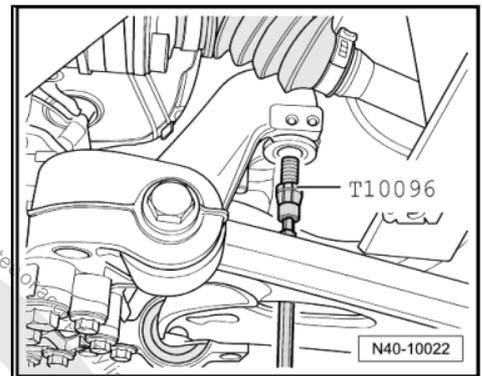
Continue with removal of anti-roll bar ⇒ [page 52](#) .

Continue with removing and installing steering box, left-hand drive (1st and 2nd generations) up to model year 2008 ⇒ [page 369](#) .

Continue with removing and installing steering box, right-hand drive (2nd generation) up to model year 2008 ⇒ [page 378](#) .

Continue with removing and installing steering box, left-hand drive (3rd generation) after model year 2009 ⇒ [page 387](#) .

Continue with removing and installing steering box, right-hand drive (3rd generation) after model year 2009 ⇒ [page 394](#) .



Removing locating pins -T10096-

Remove in reverse order. Ensure that the locating pins -T10096- are replaced one after the other with new bolts.

Specified torques

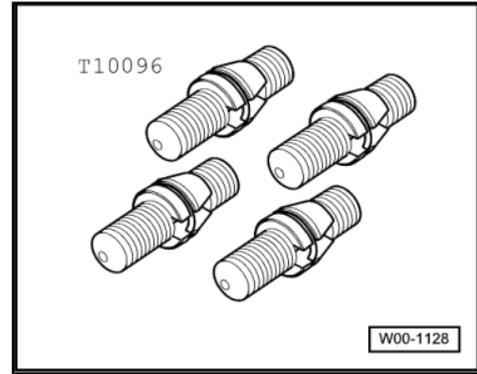
Component	Specified torque
Subframe to body ◆ Use new bolts	70 Nm + 90°
Bracket to body ◆ Use new bolts	70 Nm + 90°
Mounting bracket to body ◆ Use new bolts	70 Nm + 90°

3.6 Lowering subframe

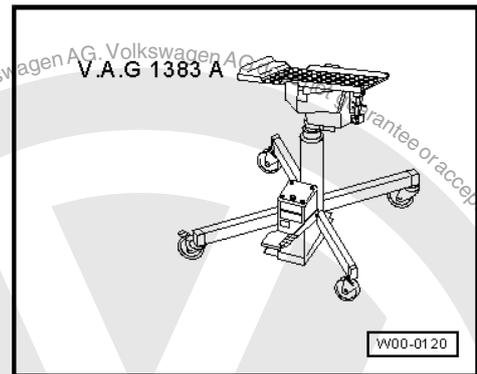
Special tools and workshop equipment required



◆ Locating pins -T10096-

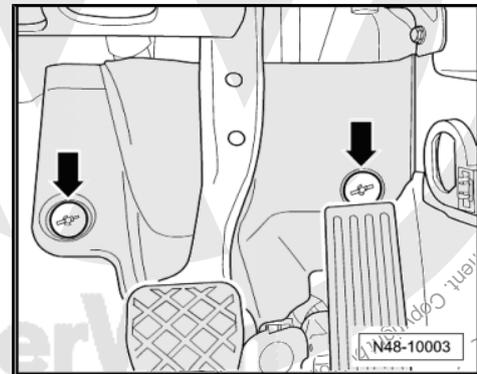


◆ Engine and gearbox jack -V.A.G 1383 A-

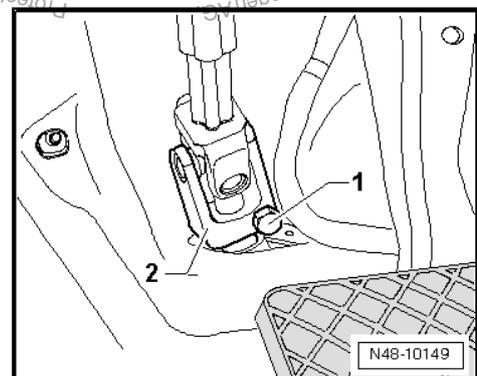


Removing

- Turn steering wheel to straight-ahead position and remove ignition key so that the steering lock engages.
- Remove footwell trim by removing nuts -arrows-.

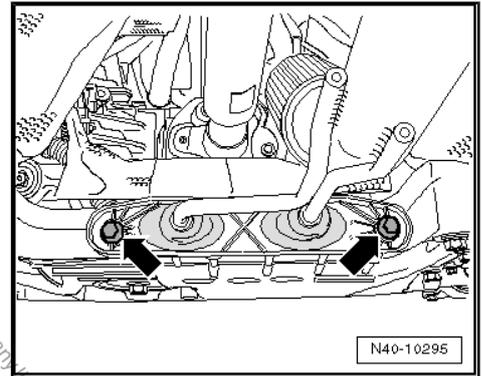


- Remove bolt -1- and pull universal joint -2- off steering box.
- Install lower noise insulation ⇒ General body repairs, exterior; Rep. Gr. 50 ; Overview - noise insulation .

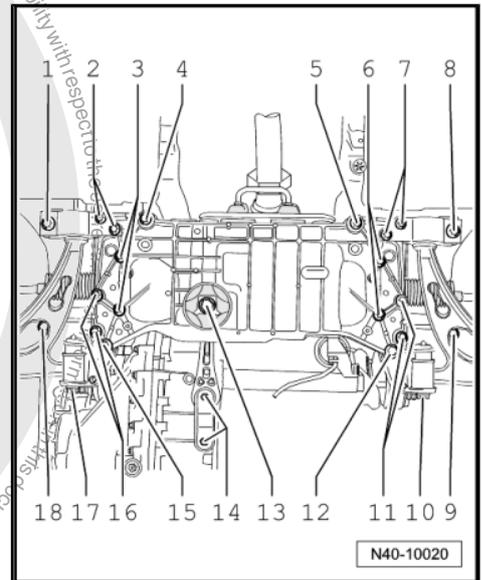




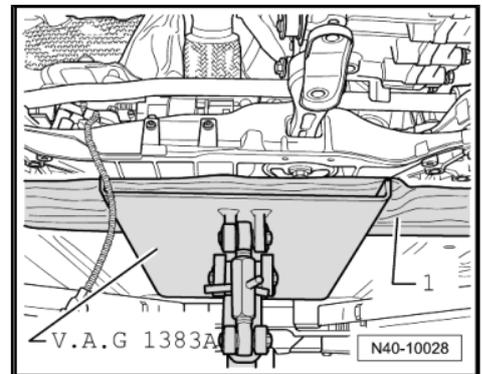
- Detach exhaust system bracket from subframe -arrows-.



- Disconnect pendulum support from gearbox by removing bolts -14-.
- Disconnect coupling rods from anti-roll bar.
- Fixing subframe in position ⇒ [page 16](#)



- Position engine and gearbox jack -V.A.G 1383 A- under subframe.
- Place, for example, a wooden block -1- between engine and gearbox jack -V.A.G 1383 A- and subframe.





- Remove bolts -4- and -5- and lower subframe a maximum of 10 cm.



Note

Be sure to observe electrical wires to avoid overstretching them.

Installing

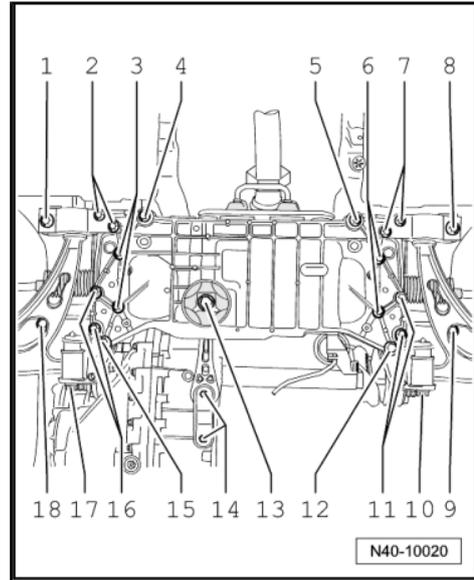
Install in reverse order.

- Install lower noise insulation ⇒ General body repairs, exterior; Rep. Gr. 50 ; Overview - noise insulation .



Note

Ensure boot is not damaged or twisted.



Specified torques

Component	Specified torque
Subframe to body ◆ Use new bolts!	70 Nm + 90°
Subframe to bracket ◆ Use new bolts!	70 Nm + 90°
Anti-roll bar to coupling rod ◆ Use new nut. ◆ Counterhold on multi-point socket of joint pin	65 Nm
Universal joint to steering box ◆ Use new bolt	30 Nm
Exhaust system bracket to subframe ⇒ Engine; Rep. Gr. 26	

Specified torques for pendulum support to gearbox



Caution

From model year 08, HeliCoil inserts are installed in the pendulum support connection in the 02Q gearboxes. Identification ⇒ Rep. Gr. 34

Use a bolt with hardness class 10.9 for this and all other gearboxes.

If there is no HeliCoil insert in the 02Q gearbox, use bolts with the strength class 8.8 and the corresponding torque setting.

Bolt	Specified torque
M10 x 35 strength class 8.8 ◆ Use new bolt	40 Nm + 90° further
M10 x 35 strength class 10.9 ◆ Use new bolt	50 Nm + 90° further

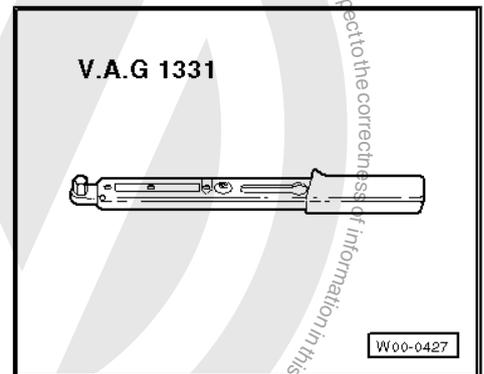


Bolt	Specified torque
M10 x 75 strength class 8.8 ◆ Use new bolt	40 Nm + 90° further
M10 x 75 strength class 10.9 ◆ Use new bolt	50 Nm + 90° further

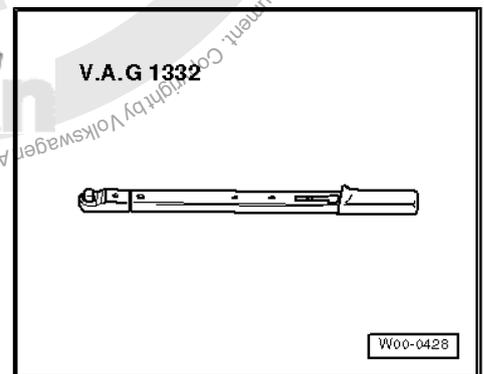
3.7 Removing and installing subframe without steering box

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-



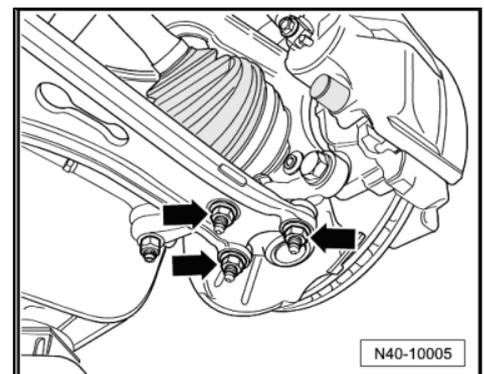
- ◆ Torque wrench -V.A.G 1332-



Removing

- Remove lower noise insulation ⇒ General body repairs, exterior; Rep. Gr. 50 ; Overview - noise insulation .
- Remove wheels.
- Remove nuts -arrows-.
- Detach exhaust system bracket from subframe.

Vehicles with front-wheel drive

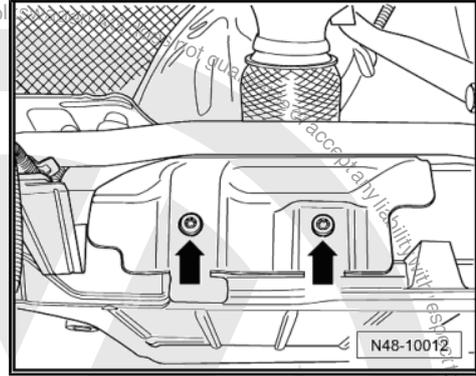




- Remove bolts -arrows- on heat shield.
- Remove heat shield from subframe.

Continuation for all vehicles

- Remove coupling rods from anti-roll bar.

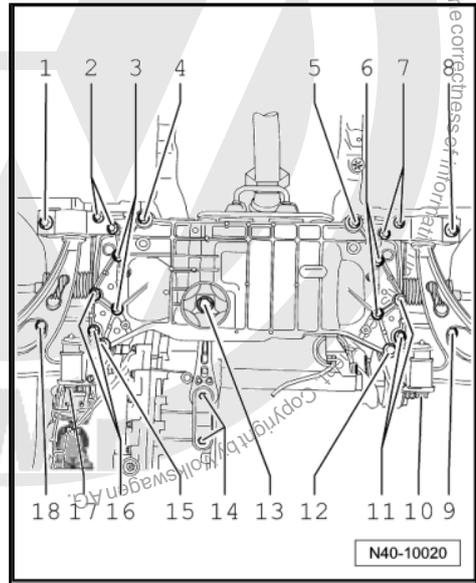


- Disconnect pendulum support from gearbox by removing bolts -14-.
- Fix position of subframe => [page 16](#) .
- Now unscrew bolts for:
 - ◆ steering box -3- and -6-
 - ◆ anti-roll bar -11- and -16-
 - ◆ and subframe -4- and -5-.

Installing

Install in reverse order.

- Install noise insulation and tighten, specified torque => General body repairs, exterior; Rep. Gr. 50 ; Assembly overview - noise insulation .



Specified torques

Component	Specified torque
Subframe to body ◆ Use new bolts	70 Nm + 90°
Bracket to body ◆ Use new bolts	70 Nm + 90°
Anti-roll bar to subframe ◆ Use new bolts	20 Nm + 90°
Anti-roll bar to coupling rod ◆ Use new nut ◆ Counterhold on multi-point socket of joint pin	65 Nm
Shield to subframe ◆ Bolt M6 is self-locking	6 Nm
Swivel joint to cast steel suspension link ◆ Use new nuts	60 Nm
Swivel joint to sheet steel or forged aluminium suspension link ◆ Use new nuts	100 Nm



Component	Specified torque
Steering box to subframe ◆ Use new bolts ◆ Always renew clamp on 1st and 2nd generation steering boxes	50 Nm + 90°
Exhaust system bracket to subframe ⇒ Engine; Rep. Gr. 26	

Specified torques for pendulum support to gearbox

Caution

From model year 08, HeliCoil inserts are installed in the pendulum support connection in the 02Q gearboxes. Identification ⇒ Rep. Gr. 34.

Use a bolt with hardness class 10.9 for this and all other gearboxes.

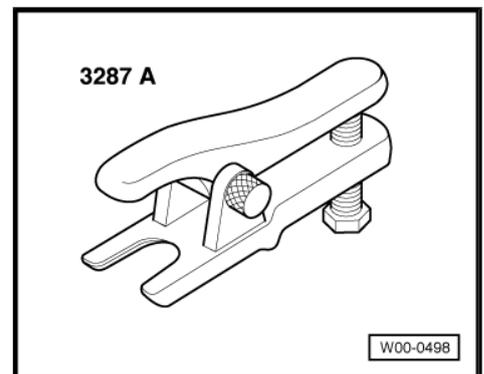
If there is no HeliCoil insert in the 02Q gearbox, use bolts with the strength class 8.8 and the corresponding torque setting.

Bolt	Specified torque
M10 x 35 strength class 8.8 ◆ Use new bolt	40 Nm + 90° further
M10 x 35 strength class 10.9 ◆ Use new bolt	50 Nm + 90° further
M10 x 75 strength class 8.8 ◆ Use new bolt	40 Nm + 90° further
M10 x 75 strength class 10.9 ◆ Use new bolt	50 Nm + 90° further

3.8 Removing and installing subframe with steering box

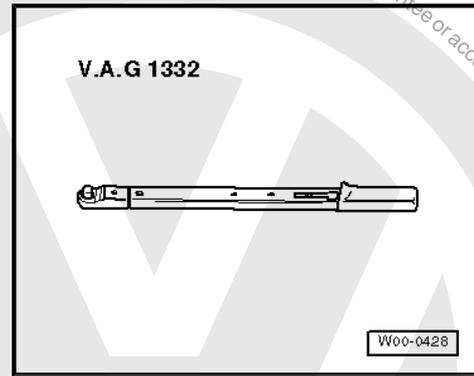
Special tools and workshop equipment required

- ◆ Ball joint puller -3287 A-



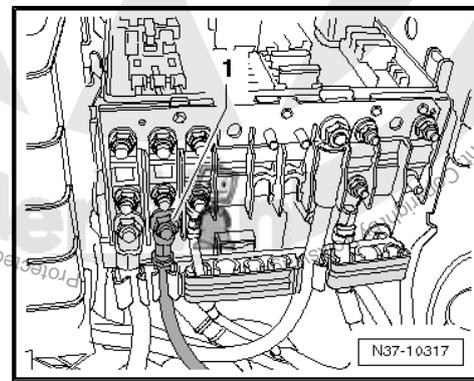


- ◆ Torque wrench -V.A.G 1332-

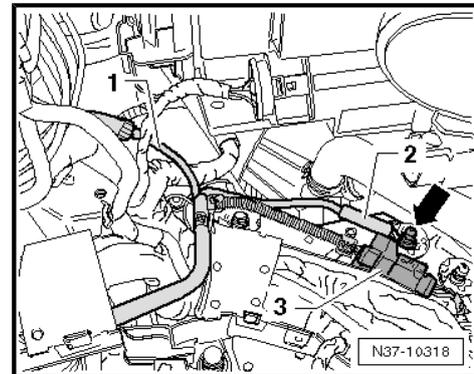


Removing

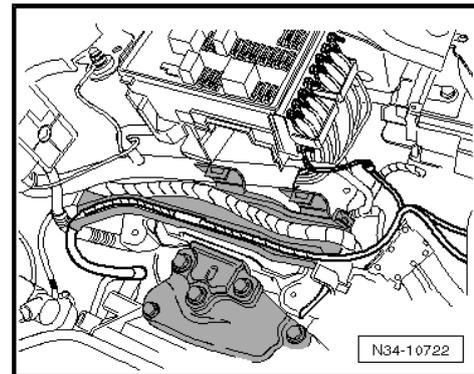
- Remove battery and battery tray ⇒ Electrical system; Rep. Gr. 27 ; Battery; Removing and installing battery .
- Disconnect cable -1- from electrics box.



- Disconnect earth cable -2-.
- Separate connection -3-.

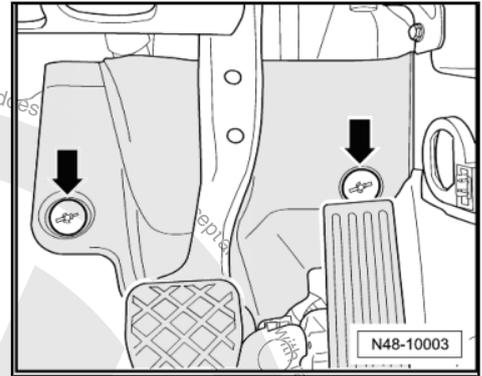


- Thread wiring harness out of all retainers along longitudinal member so that it can be removed together with the steering harness.

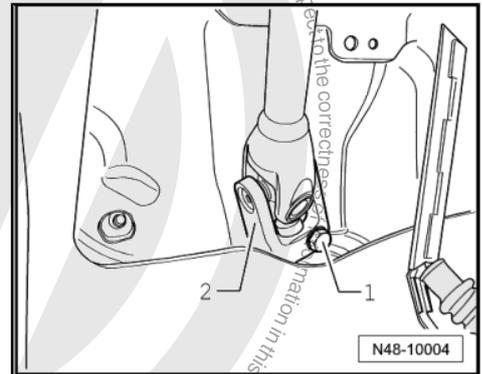




- Remove footwell trim by removing nuts -arrows-.

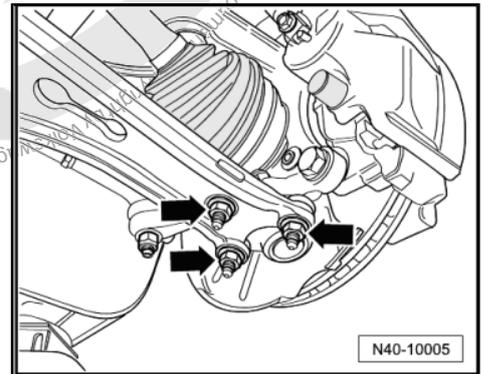


- Remove bolt -1- and pull universal joint -2- off steering box.
- Remove front wheels.
- Remove lower noise insulation => General body repairs, exterior; Rep. Gr. 50 ; Overview - noise insulation .
- Separate connector for extended service intervals on oil sump.
- Detach exhaust system bracket from subframe.
- Detach coupling rods from anti-roll bar.

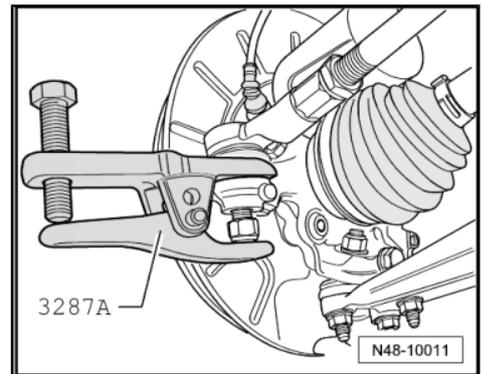


- Remove nuts -arrows-.
- Loosen nut on track rod ball joint but do not remove completely.

Leave nut screwed on a few turns to protect thread on pin.

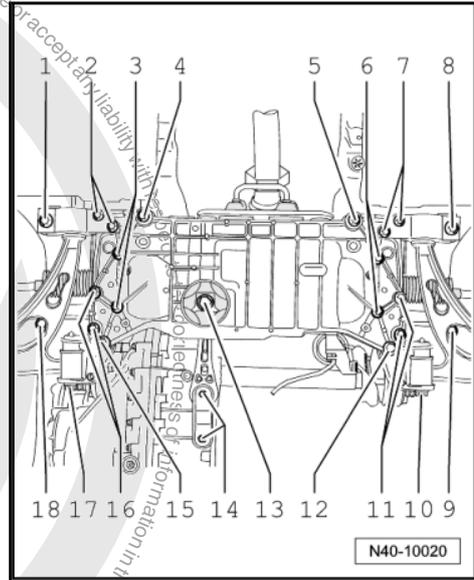


- Press track rod ball joint off wheel bearing housing using ball joint splitter -3287A- and remove nut now.

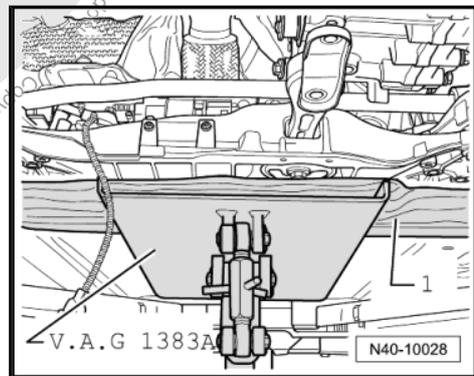




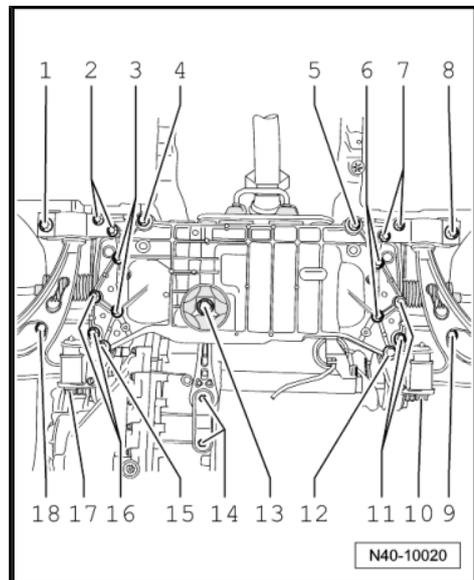
- Disconnect pendulum support from gearbox by removing bolts -14-.
- Fix position of subframe with brackets. => [page 16](#)



- Place engine and gearbox jack -V.A.G 1383 A- under subframe.
- Place a wooden block -1- or similar between V.A.G 1383 A and subframe.



- Remove bolts -4 and 5- and lower subframe with brackets slightly, observing electrical wires.
- Lower engine and gearbox jack -V.A.G 1383 A- slowly while guiding out wiring harness for steering box.



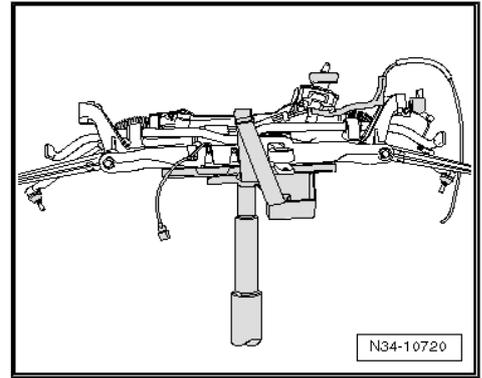


- Secure subframe to engine and gearbox jack -V.A.G 1383 A- with the appropriate strap.

Installing

Install in reverse order.

- Install noise insulation and tighten, specified torque => General body repairs, exterior; Rep. Gr. 50 ; Assembly overview - noise insulation .



Specified torques

Component	Specified torque
Subframe to body ◆ Use new bolts	70 Nm + 90°
Anti-roll bar to coupling rod ◆ Use new nut ◆ Counterhold on multi-point socket of joint pin	65 Nm
Track rod ball joint to wheel bearing housing ◆ Use new nut	20 Nm + 90°
Swivel joint to cast steel suspension link ◆ Use new nuts	60 Nm
Swivel joint to sheet steel or forged aluminium suspension link ◆ Use new nuts	100 Nm
Universal joint to steering box ◆ Use new bolt	30 Nm
Exhaust system bracket to subframe => Engine; Rep. Gr. 26	

Specified torques for pendulum support to gearbox

Caution

From model year 08, HeliCoil inserts are installed in the pendulum support connection in the 02Q gearboxes. Identification => Rep. Gr. 34 .

Use a bolt with hardness class 10.9 for this and all other gearboxes.

If there is no HeliCoil insert in the 02Q gearbox, use bolts with the strength class 8.8 and the corresponding torque setting.

Bolt	Specified torque
M10 x 35 strength class 8.8 ◆ Use new bolt	40 Nm + 90° further
M10 x 35 strength class 10.9 ◆ Use new bolt	50 Nm + 90° further

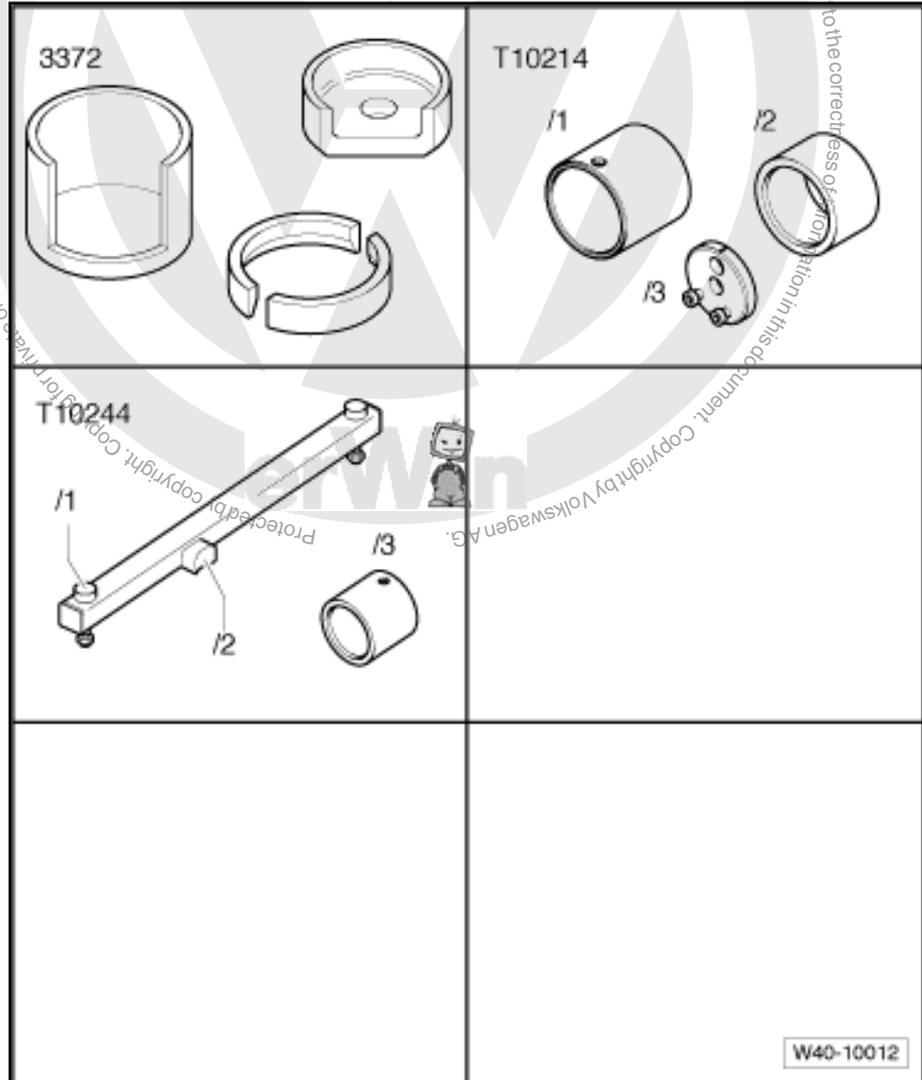


Bolt	Specified torque
M10 x 75 strength class 8.8 ◆ Use new bolt	40 Nm + 90° further
M10 x 75 strength class 10.9 ◆ Use new bolt	50 Nm + 90° further

3.9 Repairing subframe (front-wheel drive)

Special tools and workshop equipment required

- ◆ Removal tool -3372-
- ◆ Assembly tool -T10214-
- ◆ Assembly tool -T10244-



Pressing out bonded rubber bush

- Remove subframe ⇒ [page 21](#) .
- Attach assembly tool -T10244- to subframe.



- Press out both bonded rubber bushes at the same time as illustrated.

i Note

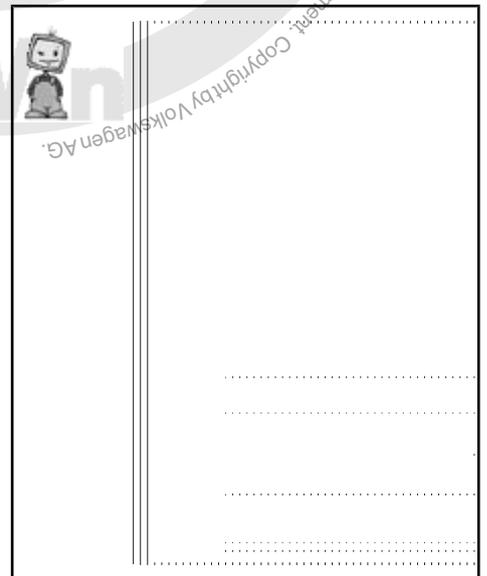
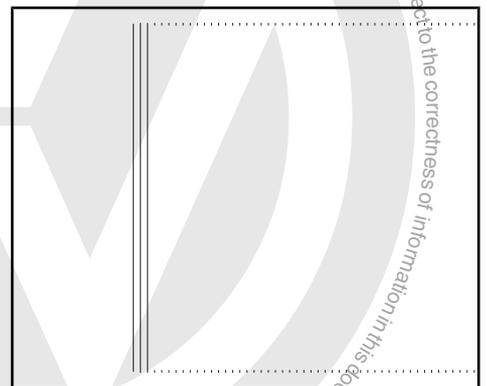
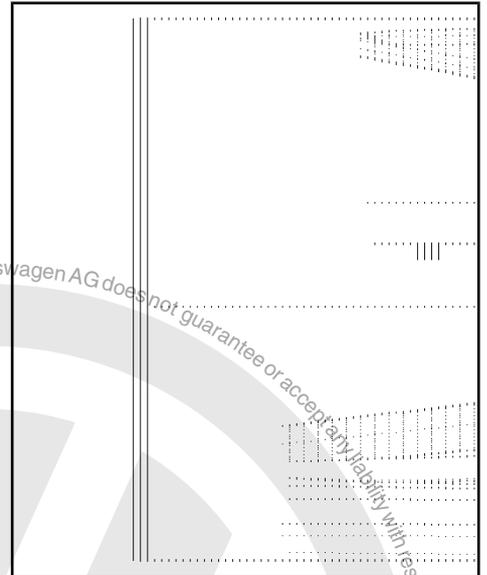
- ◆ *Flattened side of thrust piece -3372/1- must face towards insert -A- of traverse -T10244- because otherwise insert may be damaged.*
- ◆ *Tube -T10244/3- has a larger and a smaller internal diameter. The subframe must lie against the large internal diameter of tube -T10244/3-.*

Pressing in bonded rubber bush

- Bolt bonded rubber bushes together using original bolt, making sure that both notches  line up precisely.

- Insert assembled bonded rubber bushes with bolt head downwards into tube -T10214/2- .

- 1 - Thrust piece -T10214/3-
- 2 - Bonded rubber bush
- 3 - Tube -T10214/2-
- 4 - Tube -T10214/1-
- 5 - Thrust plate -VW 401-
- 6 - Thrust plate -VW 402-





- Press in bonded rubber bushes -1- until dimension -a- is obtained.

Dimension -a- = 2 - 3 mm.

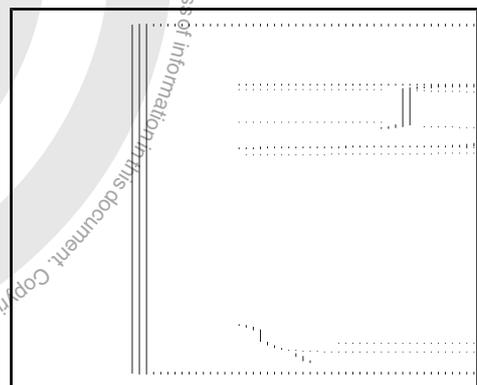
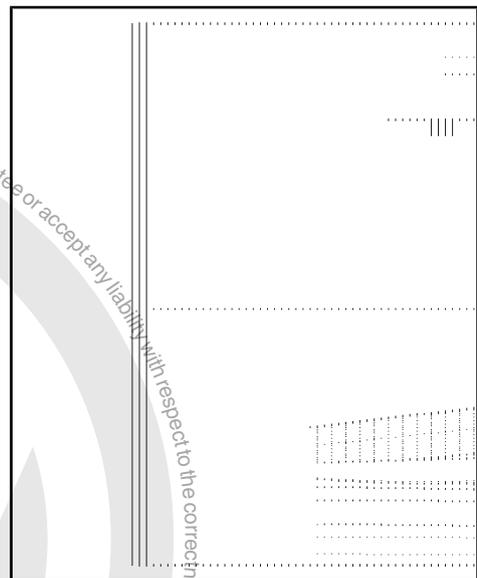
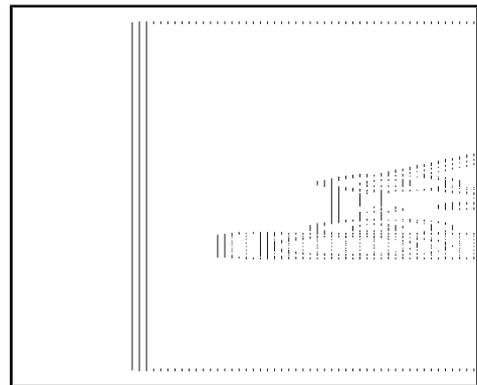
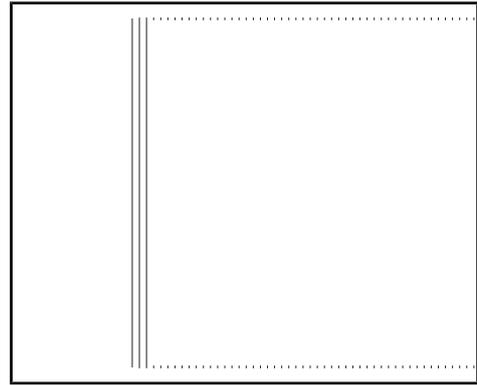
- Align tube -T10214/2- with pressed-in bonded rubber bushes on subframe. Corners of inner core should be parallel to edge of assembly tool -T10244- .

The distance -a- must be identical on the right and left to ensure parallel installation.

- Position subframe against smaller internal diameter of tube -T10244/3-.

- Press in bushes to stop and until a force of 20 kN is attained.
- Detach assembly tool -T10244- from subframe and check pressed-in bonded rubber bushes for proper seating.

- It is permissible for the outer circumference -1- of the two bonded rubber bushes to project up to 2 mm over the edge in the area of the opening for the pendulum support.
- The notches in the bonded rubber bushes must be centred in the subframe opening.
- A gap -arrow- between the bonded rubber bushes is acceptable.
- Install subframe [page 22](#) .

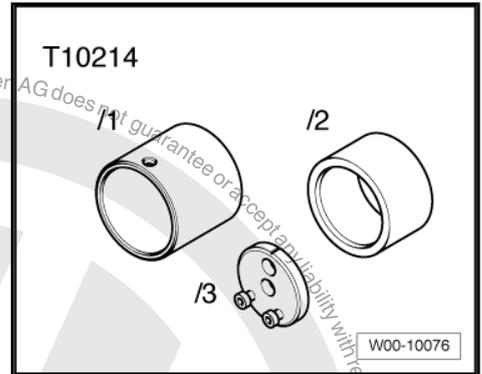




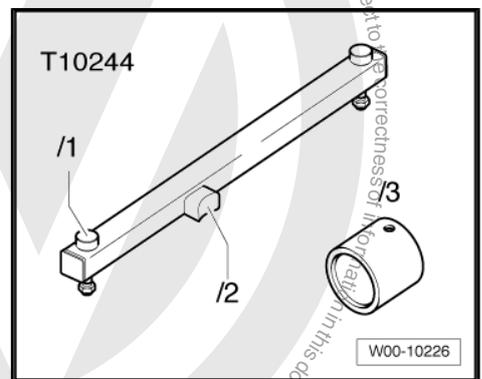
3.10 Repairing subframe (four-wheel drive)

Special tools and workshop equipment required

- ◆ Assembly tool -T10214-



- ◆ Assembly tool -T10244-



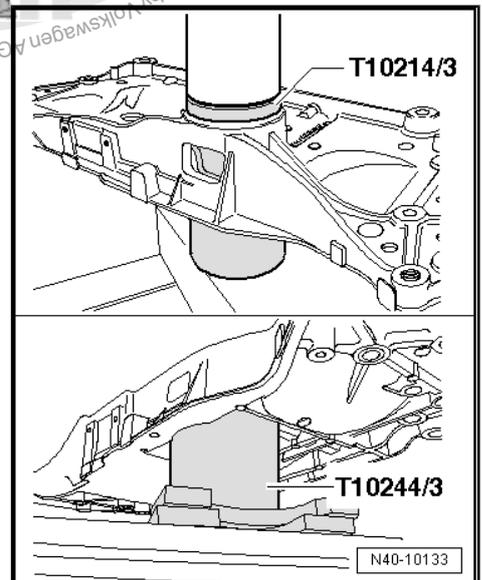
Pressing out bonded rubber bush

- Remove subframe ⇒ [page 21](#) .
- Press out both bonded rubber bushes at the same time as illustrated.

i Note

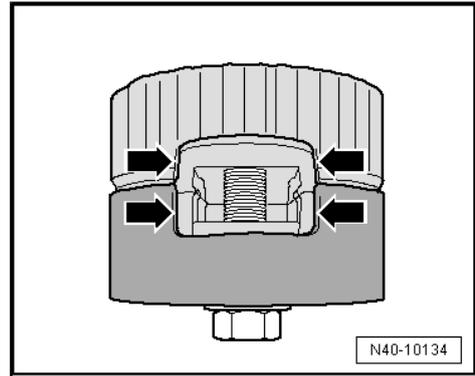
- ◆ Chamfer of thrust piece -T10214/3- must point up.
- ◆ Tube -T10244/3- has a larger and a smaller internal diameter. The subframe must lie against the larger internal diameter of the tube -T10244/3-.

Pressing in bonded rubber bush



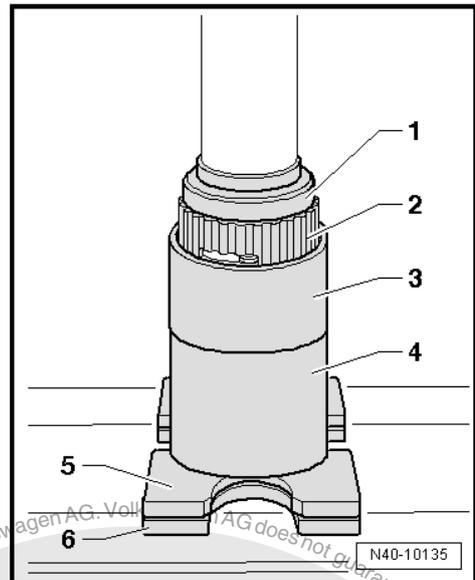


- Bolt bonded rubber bushes together using original bolt, making sure that both notches -arrows- line up precisely.



- Insert assembled bonded rubber bushes with bolt head downwards into tube -T10214/2- .

- 1 - Thrust piece -T10214/3-
- 2 - Bonded rubber bush
- 3 - Tube -T10214/2-
- 4 - Tube -T10214/1-
- 5 - Thrust plate -VW 401-
- 6 - Thrust plate -VW 402-



- Press in bonded rubber bushes -1- until dimension -a- is obtained.

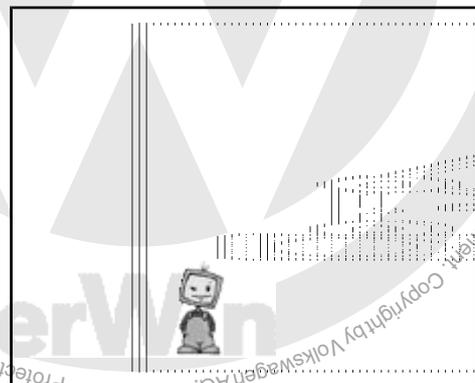
Dimension -a- = 2 - 3 mm.



- Align tube -T10214/2- with pressed-in bonded rubber bushes on subframe. Corners of inner core should be parallel to edge of assembly tool -T10244- .

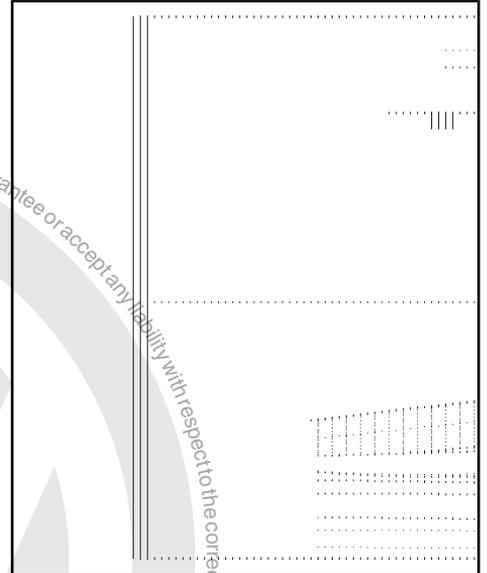
The distance -a- must be identical on the right and left to ensure parallel installation.

- Position subframe against smaller internal diameter of tube -T10244/3-.

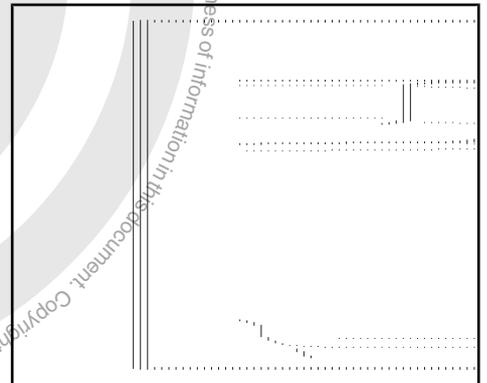




- Press in bushes to stop and until a force of 20 kN is attained.
- Detach assembly tool -T10244- from subframe and check pressed-in bonded rubber bushes for proper seating.



- The notches in the bonded rubber bushes must be centred in the subframe opening.
- A gap -arrow- between the bonded rubber bushes is acceptable.
- Install subframe => [page 22](#) .

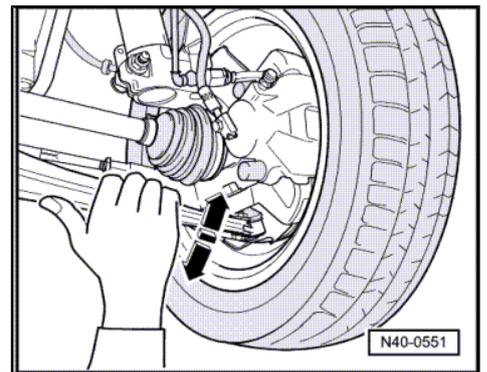


3.11 Checking swivel joint

Checking axial play

- Firmly pull suspension link down in -direction of arrow- and press up again.

Checking radial play



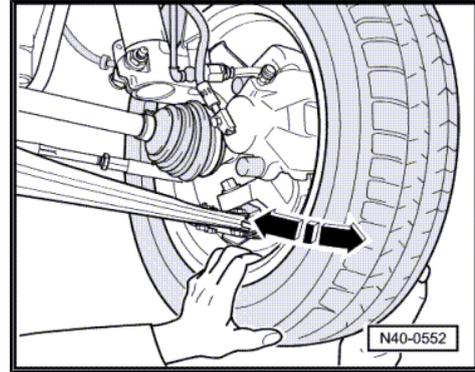


- Press lower part of wheel forcefully inwards and outwards in -direction of arrow-



Note

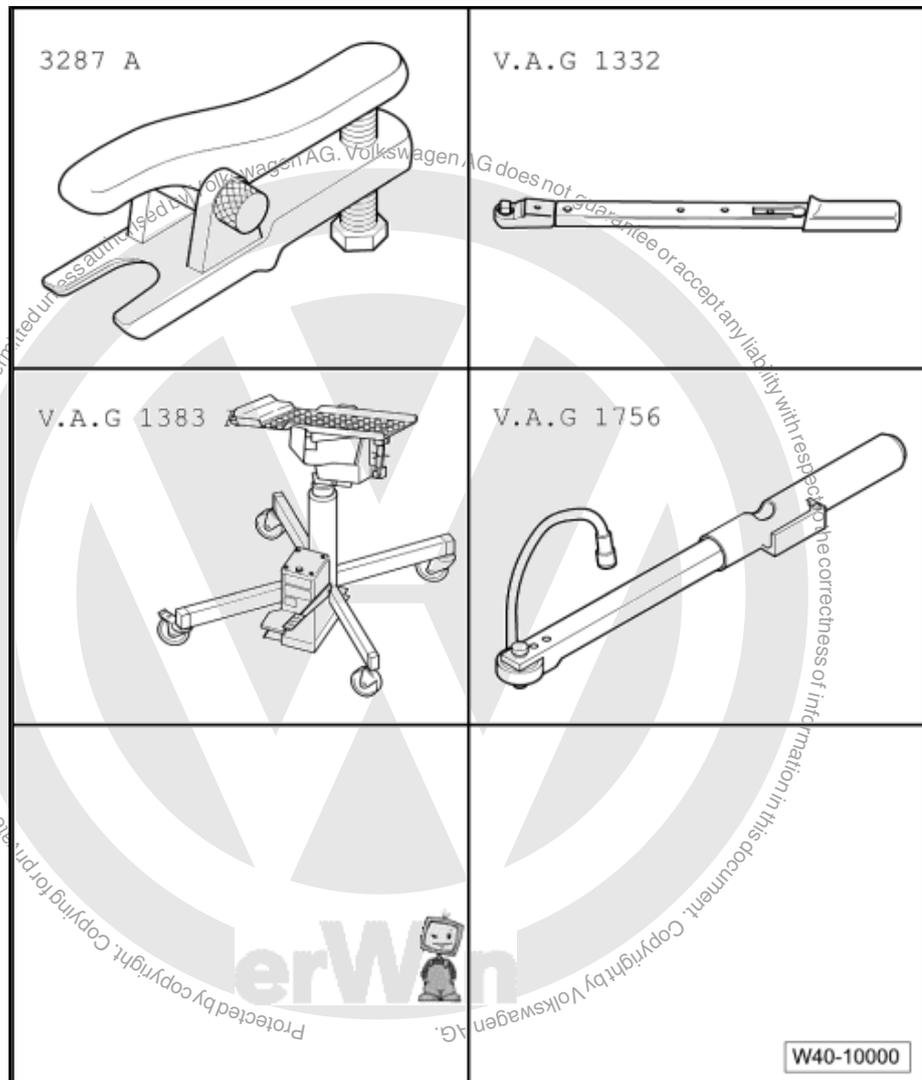
- ◆ *There should be no palpable or visible "play" during both tests.*
- ◆ *Observe swivel joint while performing tests.*
- ◆ *Take into account possible existing "play" in wheel bearing or in upper suspension strut mounting.*
- ◆ *Check rubber boot for damage and renew swivel joint if necessary.*



3.12 Removing and installing swivel joint

Special tools and workshop equipment required

- ◆ Ball joint puller -3287A-
- ◆ Torque wrench -V.A.G 1332-
- ◆ Engine and gearbox jack - V.A.G 1383 A-
- ◆ Torque/angle wrench - V.A.G 1756-



Removing

- Loosen drive shaft bolt at wheel hub:
- ◆ Hexagon bolt ⇒ [page 77](#)
- ◆ Twelve-point bolt ⇒ [page 78](#)



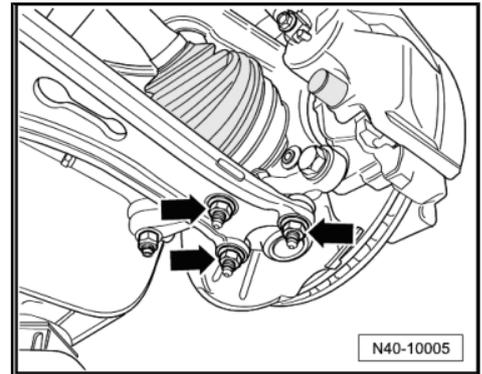
Caution

When bolt is loosened or tightened, vehicle must not be standing on its wheels.

The wheel bearing can be damaged by the weight of the vehicle if the bolt is loosened.

If a vehicle must be moved with the drive shaft removed, an outer joint must be fitted and tightened to 50 Nm.

- Remove wheel.
- Remove nuts -arrows-.
- Pull drive shaft slightly out of wheel hub.
- Pull swivel bearing out of suspension link.
- Bend suspension link downwards as far as necessary.

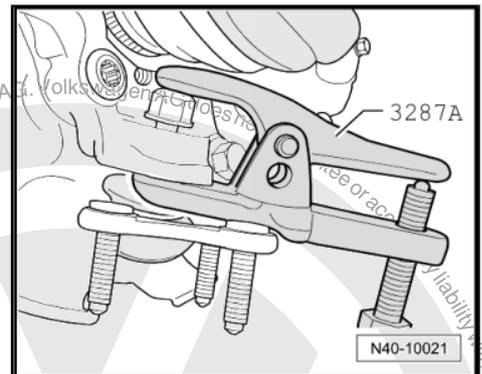


- Install ball joint splitter -3287 A- as shown in illustration and press out swivel joint.



Note

- ◆ *Place engine and gearbox jack -V.A.G 1383 A- or similar underneath (danger of accident through falling parts when swivel joint is pressed out).*
- ◆ *Leave nut screwed on a few turns to protect thread on swivel joint.*



Installing

- Fit swivel joint in wheel bearing housing.
- Fit drive shaft in wheel hub.
- Screw on new self-locking nut and counterhold with -T40- Torx key.



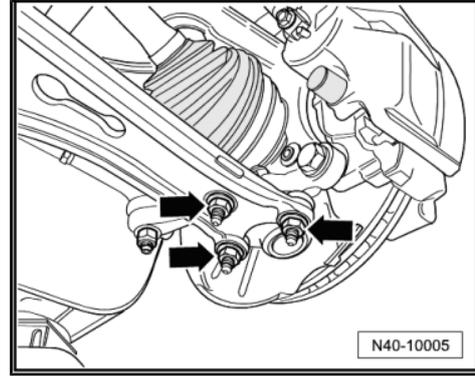
- Tighten nuts -arrows-.



Note

Ensure boot is not damaged or twisted.

- Install wheel and tighten ⇒ [page 288](#) .
- Tighten drive shaft bolt at wheel hub:
- ◆ Hexagon bolt ⇒ [page 77](#)
- ◆ Twelve-point bolt ⇒ [page 78](#)



Note

During this step, vehicle must not be standing on its wheels or wheel bearing will be damaged.

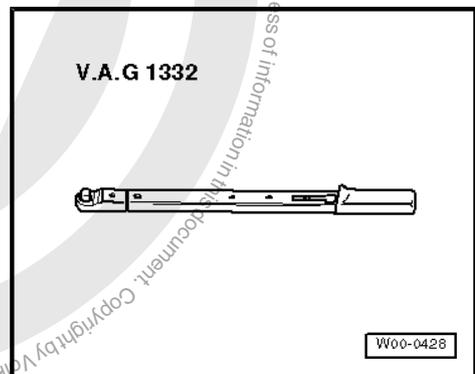
Specified torques

Component	Specified torque
Swivel joint to cast steel suspension link ◆ Use new nuts	60 Nm
Swivel joint to sheet steel or forged aluminium suspension link ◆ Use new nuts	100 Nm
Swivel joint to wheel bearing housing ◆ Use new nut	60 Nm
Drive shaft to wheel hub "hexagon bolt" ◆ Use new bolt	200 Nm +180°
Drive shaft to wheel hub "12-point bolt" ◆ Use new bolt	70 Nm +90°

3.13 Removing and installing suspension link with mounting bracket

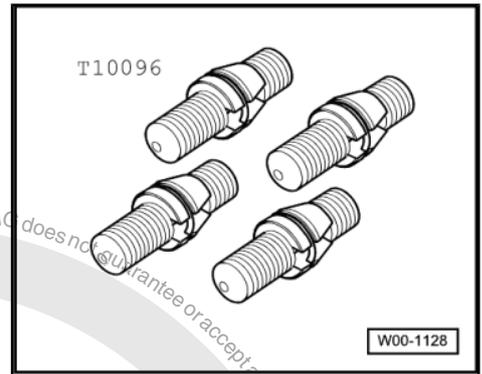
Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1332-



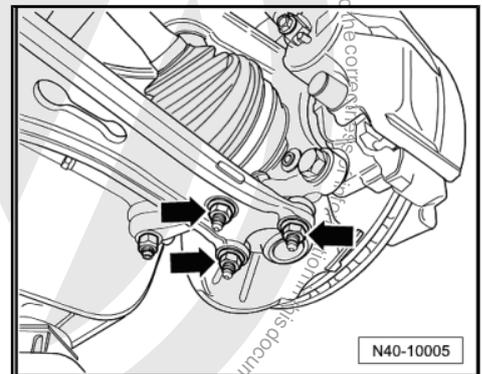


◆ Locating pins -T10096-



Removing

- Remove wheel.
- Remove lower noise insulation ⇒ Rep. Gr. 50 ; Assembly overview - noise insulation .
- Remove nuts -arrows-.
- Pull swivel joint out of suspension link.
- Fixing position of mounting bracket ⇒ [page 17](#) .



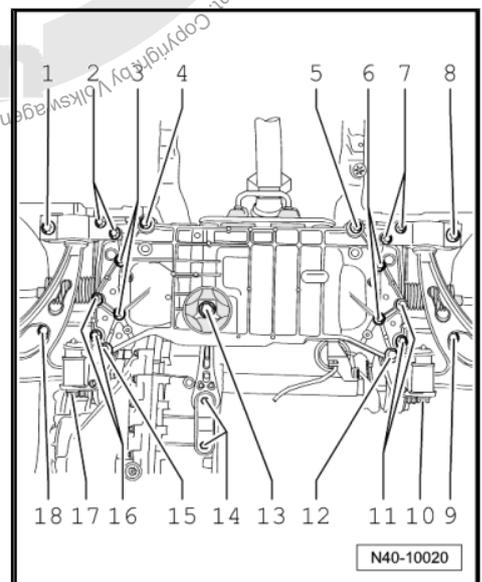
- Replace bolt for left side -1- and for right side -8- with locating pins -T10096- and tighten locating pins to 20 Nm.



Note

The locating pins -T10096- may be tightened only to a maximum of 20 Nm; otherwise the threads of the locating pins may be damaged.

- Now remove bolt -10- for left side and bolt -17- for right side.

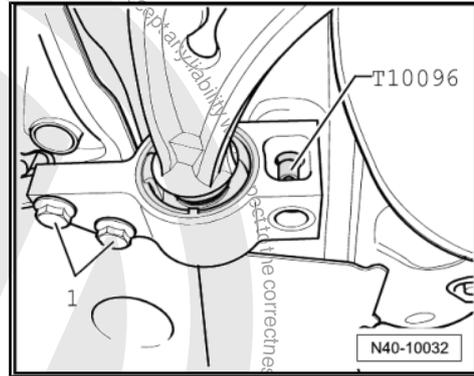




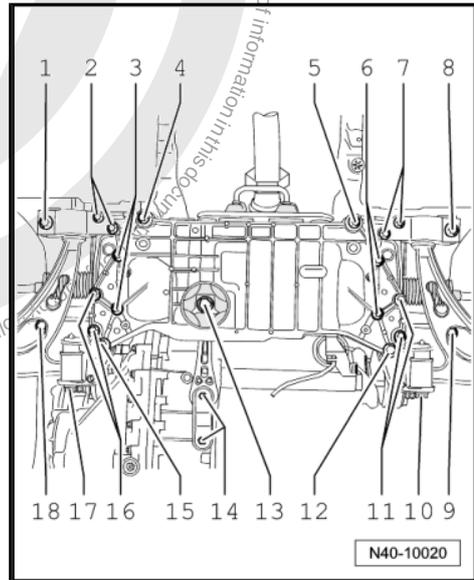
- Remove bolts -1-.
- Remove suspension link with mounting bracket.

Installing

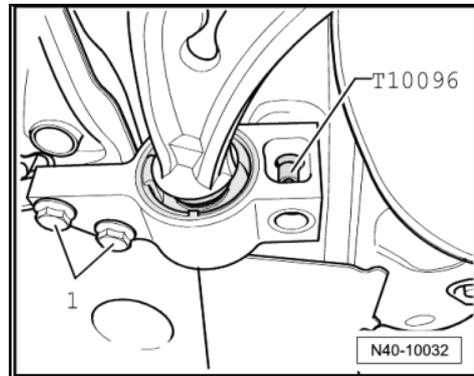
- Insert suspension link with mounting bracket into subframe.



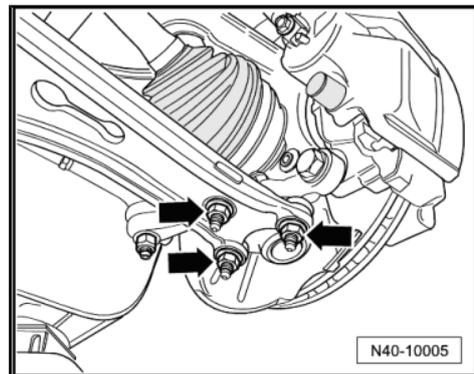
- Start bolts -10- and -17-, but do not yet tighten.



- Start bolt -1- and tighten.
- Now replace locating pin -T10096- with a new bolt and tighten to specified torque.



- Bolt suspension link to swivel joint and tighten -arrows-.



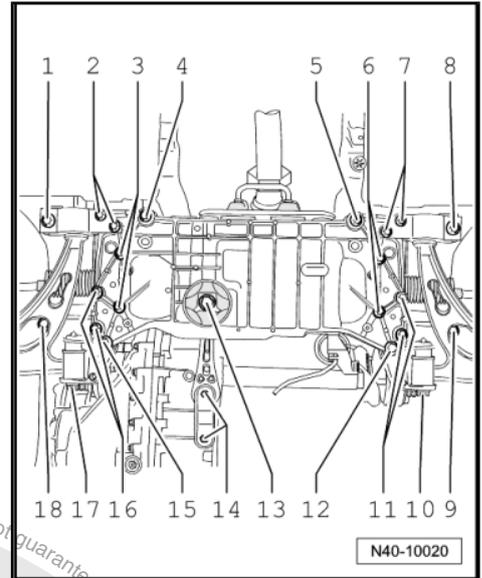


- Bolt suspension link to bracket -10- and -17- in unladen state.
Continue installation in reverse order.

i Note

Ensure boot is not damaged or twisted.

- Install lower noise insulation. ⇒ Rep. Gr. 50 ; Assembly over-view - noise insulation .
- Install wheel and tighten ⇒ [page 288](#) .



Specified torques

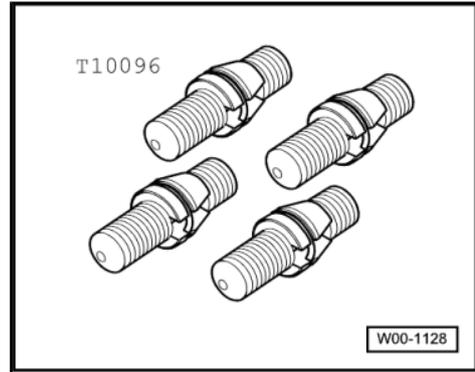
Component	Specified torque
Mounting bracket to bracket ◆ Use new bolts	50 Nm + 90°
Mounting bracket to body ◆ Use new bolts	70 Nm + 90°
Swivel joint to cast steel suspension link ◆ Use new nuts	60 Nm
Swivel joint to sheet steel or forged aluminium suspension link ◆ Use new nuts	100 Nm
Suspension link to bracket ◆ Use new bolt ◆ Tighten bolt in unladen state	70 Nm + 180°

3.14 Removing and installing suspension link with mounting bracket (left side for vehicles with DSG or automatic gearboxes)

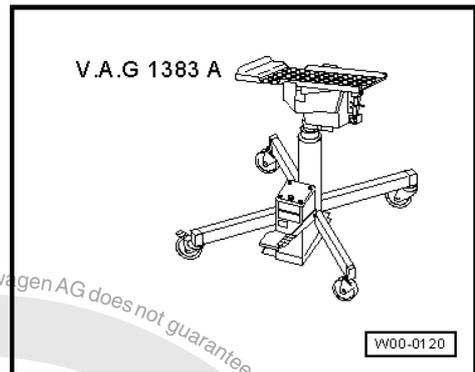
Special tools and workshop equipment required



◆ Locating pins -T10096-



◆ Engine and gearbox jack -V.A.G 1383 A-



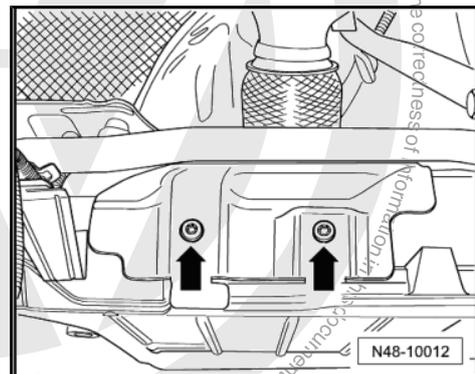
Removing

- Remove left front wheel.
- Remove lower noise insulation ⇒ General body repairs, exterior; Rep. Gr. 50 ; Overview - noise insulation .
- Detach exhaust system bracket from subframe.

Vehicles with front-wheel drive

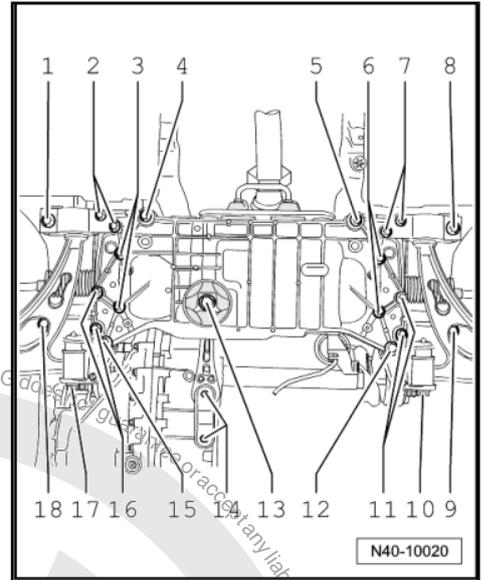
- Remove bolts -arrows- on heat shield.
- Remove heat shield from subframe.

Continuation for all vehicles

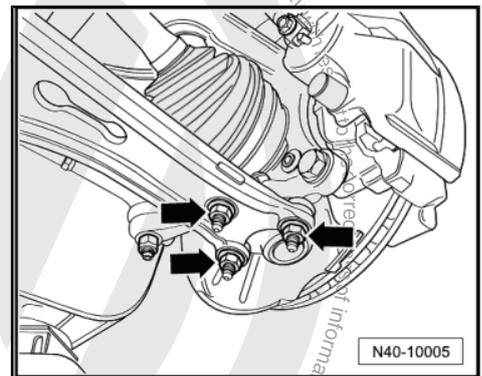




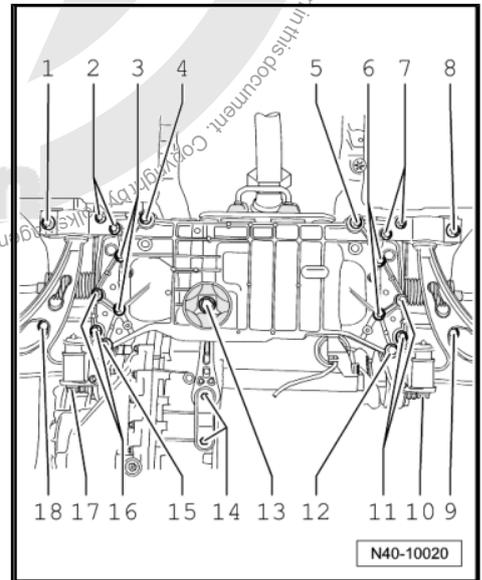
- Disconnect pendulum support from gearbox by removing bolts -14-.
- If present, detach coupling rod of front left vehicle level sender -G78- from suspension link.
- Fix position of bracket and mounting bracket of suspension link on left side of vehicle with locating device -T10096- => [page 16](#) .



- Remove nuts -arrows-

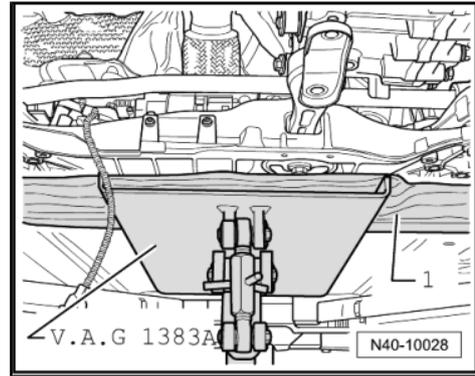


- Loosen bolt -17-.
- Now unscrew bolts for:
 - ◆ steering box -3- and -6-
 - ◆ anti-roll bar -11- and -16-
 - ◆ subframe on right side -5- and -12-.





- Position engine and gearbox jack -V.A.G 1383 A- under sub-frame.
- Place, for example, a wooden block -1- between engine and gearbox jack -V.A.G 1383 A- and subframe.



- Remove bolts -2-, -4-, -5- and -12- and lower subframe with brackets as far as necessary.
- At the same time, lever dowel sleeves of steering box out of left bracket.
- Remove bolt -17- and remove suspension link from bracket.

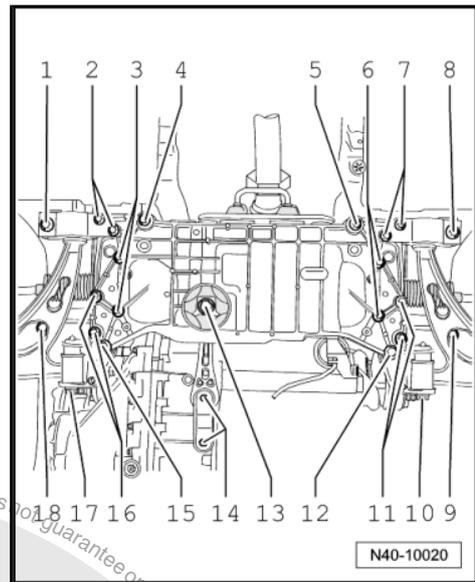
Installing

Install in reverse order.



Note

- ◆ Ensure proper seating of dowel sleeves for steering box in suspension bracket.
- ◆ Ensure boot is not damaged or twisted.
- Install lower noise insulation ⇒ General body repairs, exterior; Rep. Gr. 50 ; Assembly overview - noise insulation .
- Install wheel and tighten ⇒ [page 288](#) .



Specified torques

Component	Specified torque
Subframe to body ◆ Use new bolts	70 Nm + 90°
Bracket to body ◆ Use new bolts	70 Nm + 90°
Mounting bracket to body ◆ Use new bolts	70 Nm + 90°
Mounting bracket to bracket ◆ Use new bolts	50 Nm + 90°
Subframe to bracket ◆ Use new bolts	70 Nm + 90°
Swivel joint to cast steel suspension link ◆ Use new nuts	60 Nm
Swivel joint to sheet steel or forged aluminium suspension link ◆ Use new nuts	100 Nm
Anti-roll bar to subframe ◆ Use new bolts	20 Nm + 90°



Component	Specified torque
Shield to subframe ◆ Bolt M6 is self-locking	6 Nm
Steering box to subframe ◆ Use new bolts ◆ Always renew clamp on 1st and 2nd generation steering boxes	50 Nm + 90°
Exhaust system bracket to subframe ⇒ Engine; Rep. Gr. 26	

Specified torques for pendulum support to gearbox



Caution

From model year 08, HeliCoil inserts are installed in the pendulum support connection in the 02Q gearboxes. Identification ⇒ Rep. Gr. 34.

Use a bolt with hardness class 10.9 for this and all other gearboxes.

If there is no HeliCoil insert in the 02Q gearbox, use bolts with the strength class 8.8 and the corresponding torque setting.

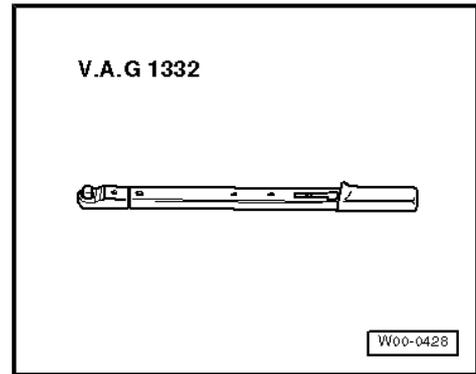
Bolt	Specified torque
M10 x 35 strength class 8.8 ◆ Use new bolt	40 Nm + 90° further
M10 x 35 strength class 10.9 ◆ Use new bolt	50 Nm + 90° further
M10 x 75 strength class 8.8 ◆ Use new bolt	40 Nm + 90° further
M10 x 75 strength class 10.9 ◆ Use new bolt	50 Nm + 90° further

3.15 Removing and installing suspension link with mounting bracket (right side for vehicles with 6-cylinder engines)

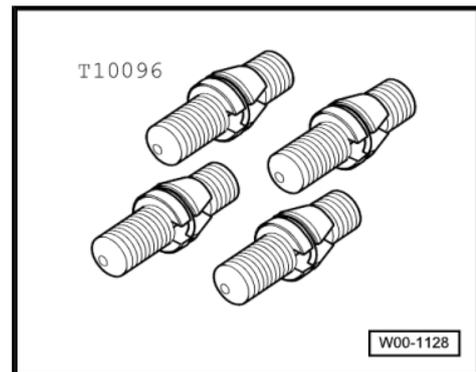
Special tools and workshop equipment required



- ◆ Torque wrench -V.A.G 1332-

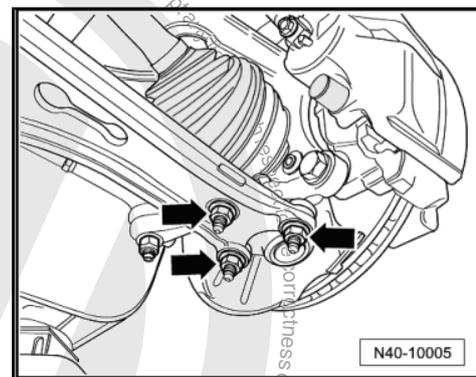


- ◆ Locating pins -T10096-



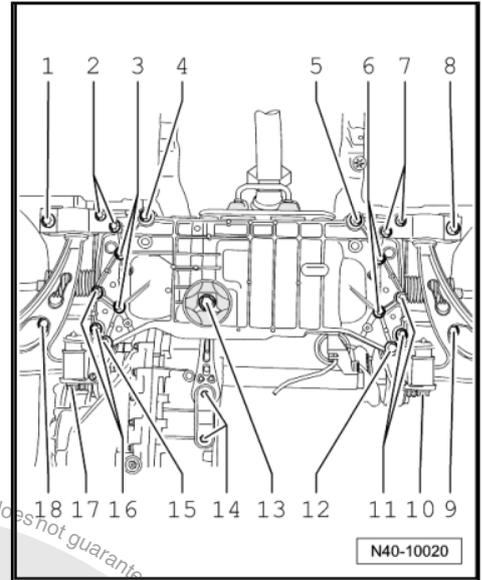
Removing

- Remove wheel.
- Remove lower noise insulation ⇒ Rep. Gr. 50 ; Assembly overview - noise insulation.
- Remove nuts -arrows-
- Pull swivel joint out of suspension link.

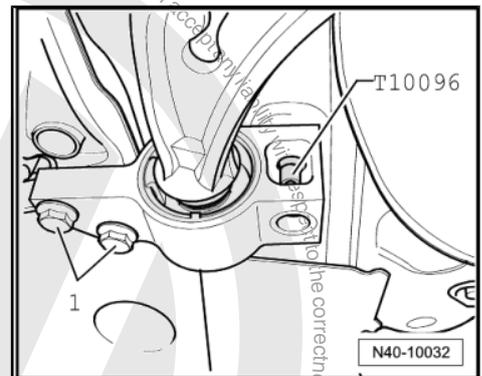




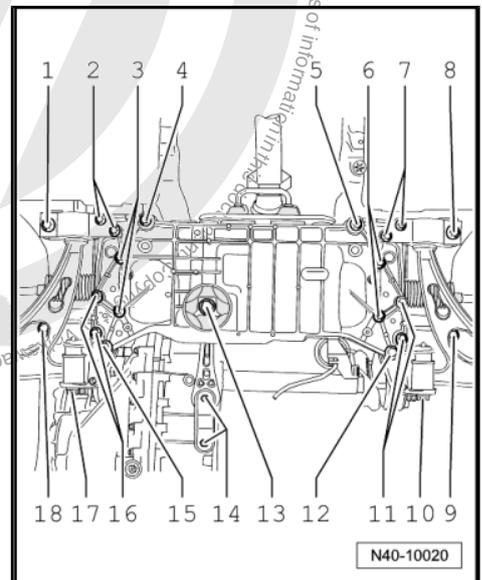
- Loosen bolt -10-.
- Fix position of subframe => [page 16](#) .
- Remove coupling rods from anti-roll bar.
- Now unscrew bolts for:
 - ◆ steering box -3- and -6-
 - ◆ and subframe -4- and -5-.
- Lower subframe until bolt -10- can be unscrewed completely.



- Unscrew bolts -1- and remove suspension link with bracket.
- Installing**
- Insert suspension link with mounting bracket into subframe.

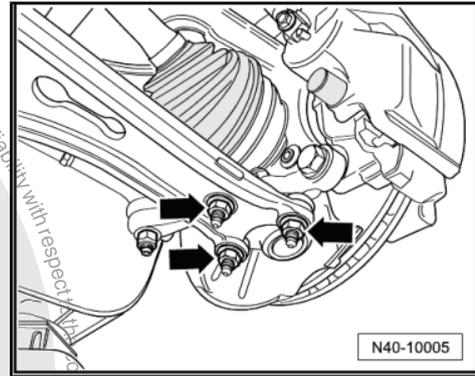


- Start bolts -7- and -10-, but do not yet tighten.
- Raise subframe back to its original position.
- Now replace locating pins -T10096- at positions -1-, -8-, -9- and -18- with new bolts and tighten them to specified torque.
- Screw in bolts -4- and -5- and tighten.
- Tighten bolts -7-.





- Bolt suspension link to swivel joint and tighten -arrows-

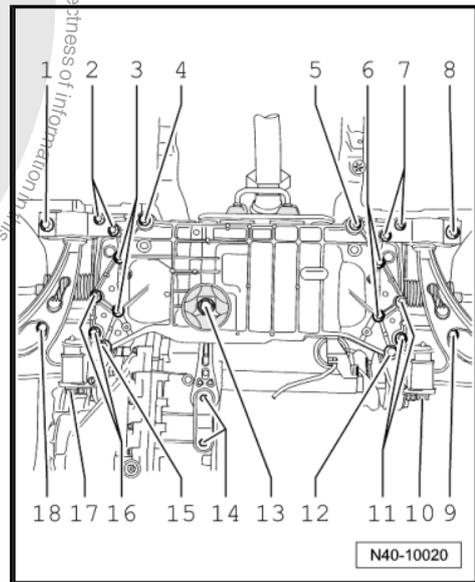


Bolt suspension link to bracket in unladen state -10-.

Bolt coupling rods to anti-roll bar.

Attach lower noise insulation => Rep. Gr. 50 ; Assembly over-view - noise insulation .

- Install wheel and tighten => [page 288](#) .



Specified torques

Component	Specified torque
Subframe to body ◆ Use new bolts	70 Nm + 90°
Bracket to body ◆ Use new bolts	70 Nm + 90°
Mounting bracket to body ◆ Use new bolts	70 Nm + 90°
Subframe to bracket ◆ Use new bolts	70 Nm + 90°
Swivel joint to cast steel suspension link ◆ Use new nuts	60 Nm
Swivel joint to sheet steel or forged aluminium suspension link ◆ Use new nuts	100 Nm
Anti-roll bar to coupling rod ◆ Use new nut ◆ Counterhold on multi-point socket of joint pin	20 Nm + 90°

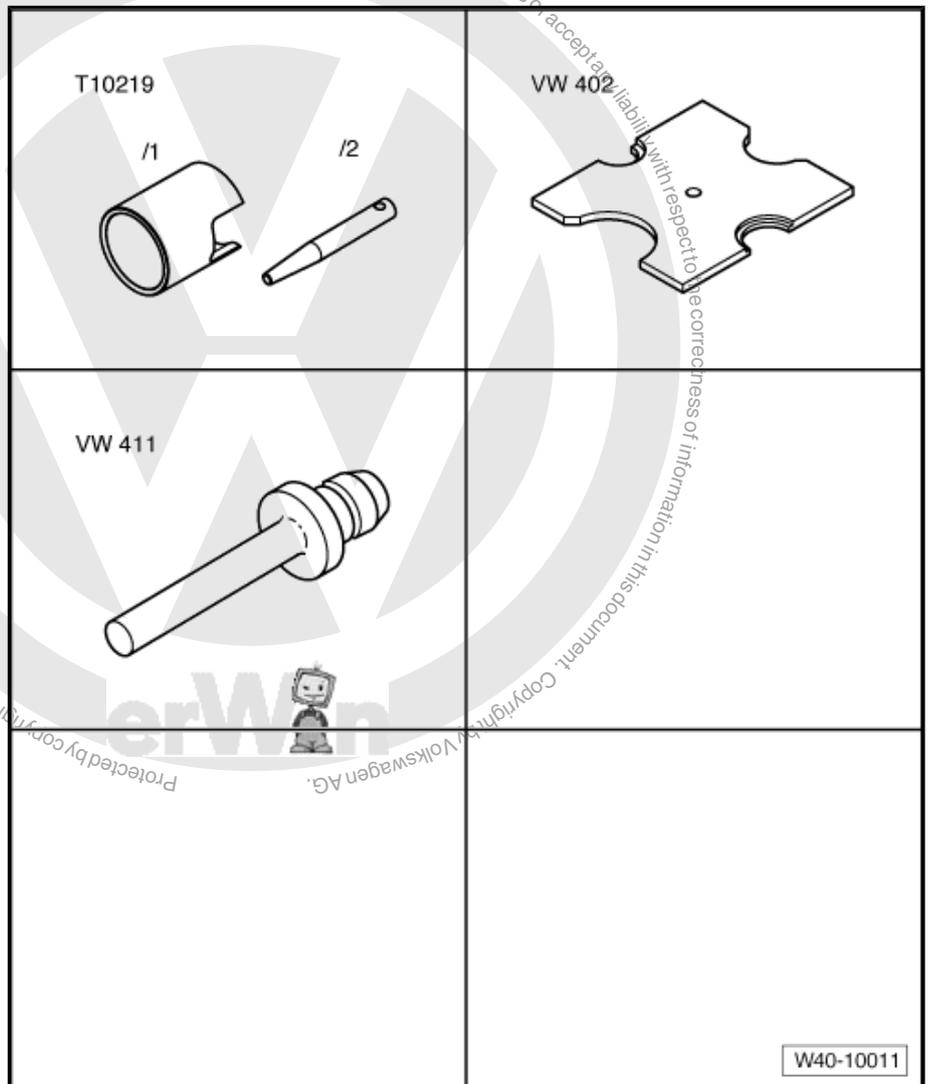


Component	Specified torque
Suspension link to bracket ♦ Use new bolt ♦ Tighten bolt in unladen state	70 Nm +180°
Steering box to subframe ♦ Use new bolts ♦ Always renew clamp on 1st and 2nd generation steering boxes	50 Nm + 90°
Exhaust system bracket to subframe => Engine; Rep. Gr. 26	

3.16 Renewing bonded rubber bush for suspension link

Special tools and workshop equipment required

- ♦ Tube -T10219/1-
- ♦ Drift -T10219/2-
- ♦ Thrust plate -VW 402-
- ♦ Press tool -VW 411-

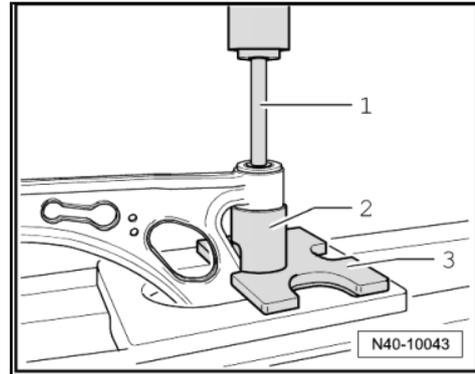




Pressing out bonded rubber bush

– Press out bonded rubber bush as illustrated.

- 1 - Press tool -VW 411-
- 2 - Tube -T10219/1-
- 3 - Thrust plate -VW 402-



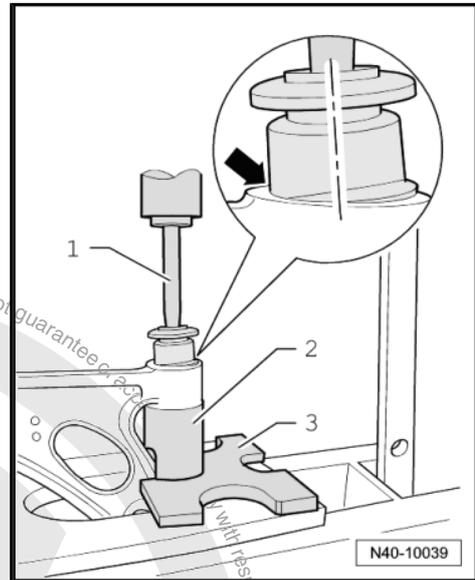
Pressing in bonded rubber bush

Apply the bonded rubber bush at an angle to prevent damage when pressing in. The bonded rubber bush will then straighten up as it is pressed in.

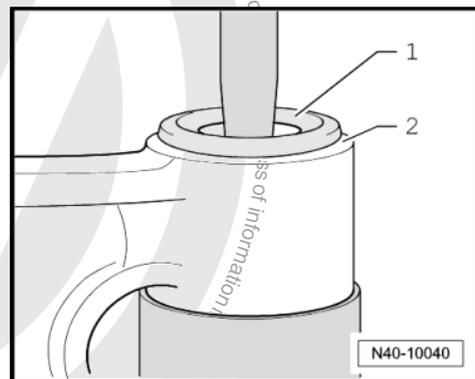
– Moisten outer surface of bonded rubber bush with assembly oil -G 294 421 A1- .

– Apply bonded rubber bush at an angle (towards suspension link). Lip -arrow- must slide into hole as shown.

- 1 - Drift -T10219/2-
- 2 - Tube -T10219/1-
- 3 - Thrust plate -VW 402-

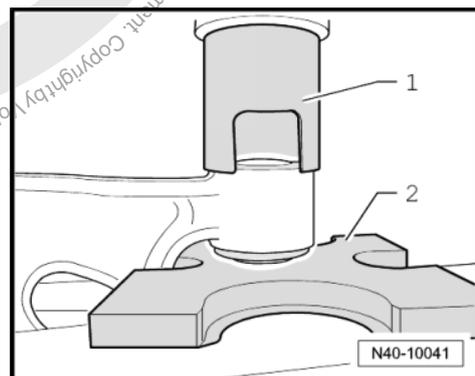


– Press in bonded rubber bush until core of bush -1- and hole in suspension link -2- are flush.



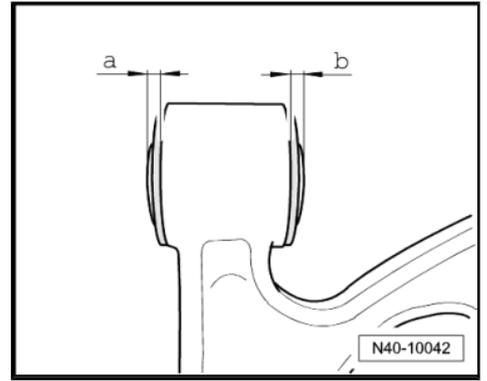
– Press bush back slightly in the suspension link.

- 1 - Tube -T10219/1-
- 2 - Thrust plate -VW 402-





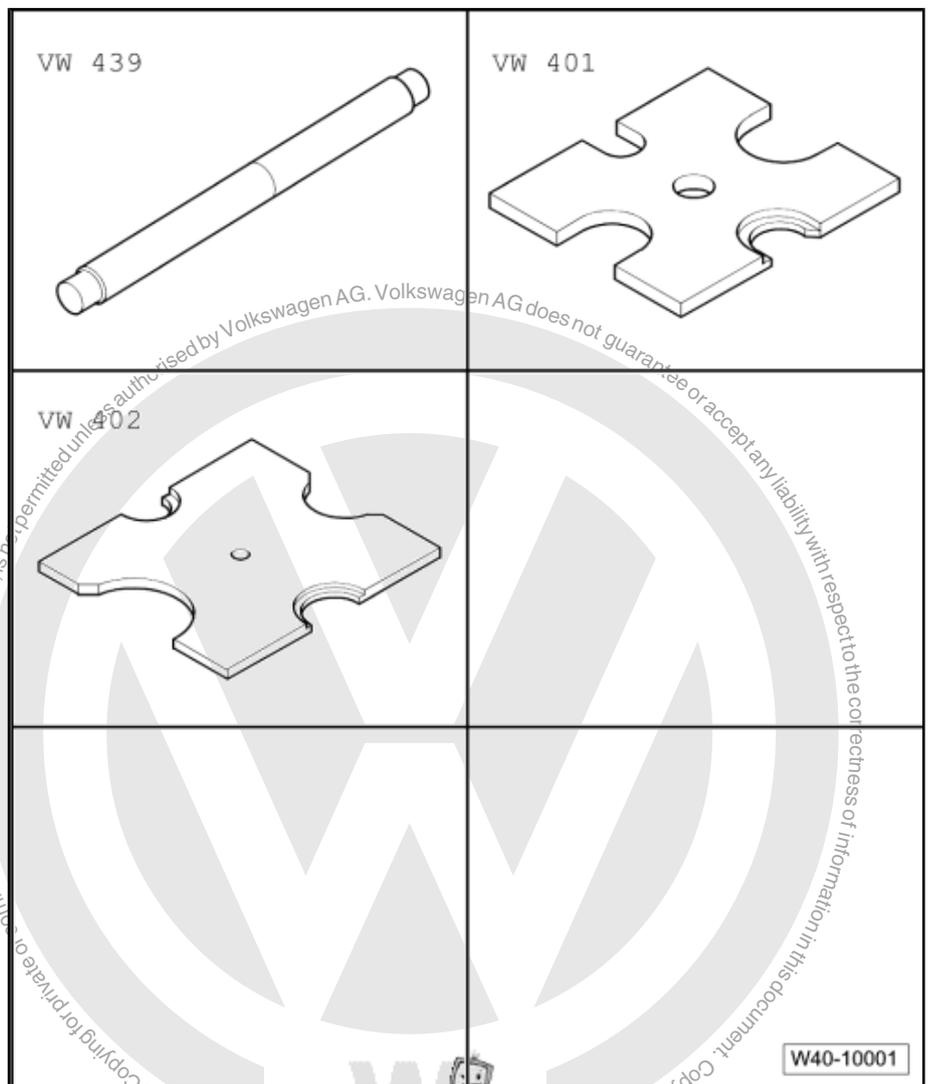
The dimensions -a- and -b- must be the same.



3.17 Renewing mounting bracket with suspension link bush

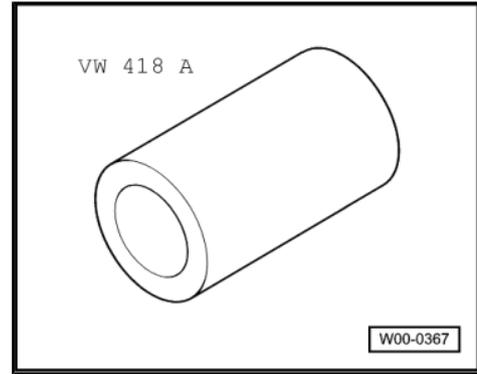
Special tools and workshop equipment required

- ◆ Guide -VW 439-
- ◆ Thrust plate -VW 401-
- ◆ Thrust plate -VW 402-





◆ Tube -VW 418 A-



Pressing mounting bracket with bush off suspension link

The bonded rubber bush is available as a replacement part only in conjunction with the mounting bracket.

- Press mounting bracket with bonded rubber bush off suspension link.

Note

Hold suspension link when pressing off.

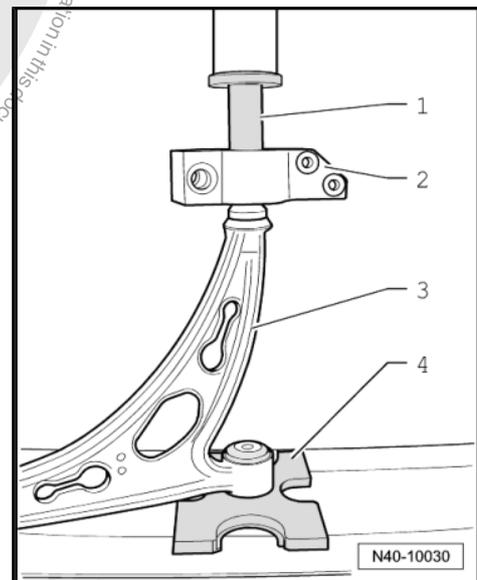
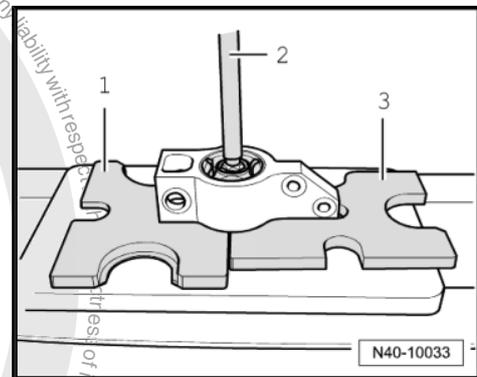
- 1 - Thrust plate -VW 401-
- 2 - Guide -VW 439-
- 3 - Thrust plate -VW 402-

Pressing in mounting bracket with bush onto suspension link

- Moisten hexagon flats of suspension link with assembly lubricant -G 294 421 A1- diluted 1:20.

- Carefully press bush onto suspension link to stop.

- 1 - Tube -VW 418 A-
- 2 - Bearing bracket with bonded rubber bush.
- 3 - Suspension link
- 4 - Thrust plate -VW 401-

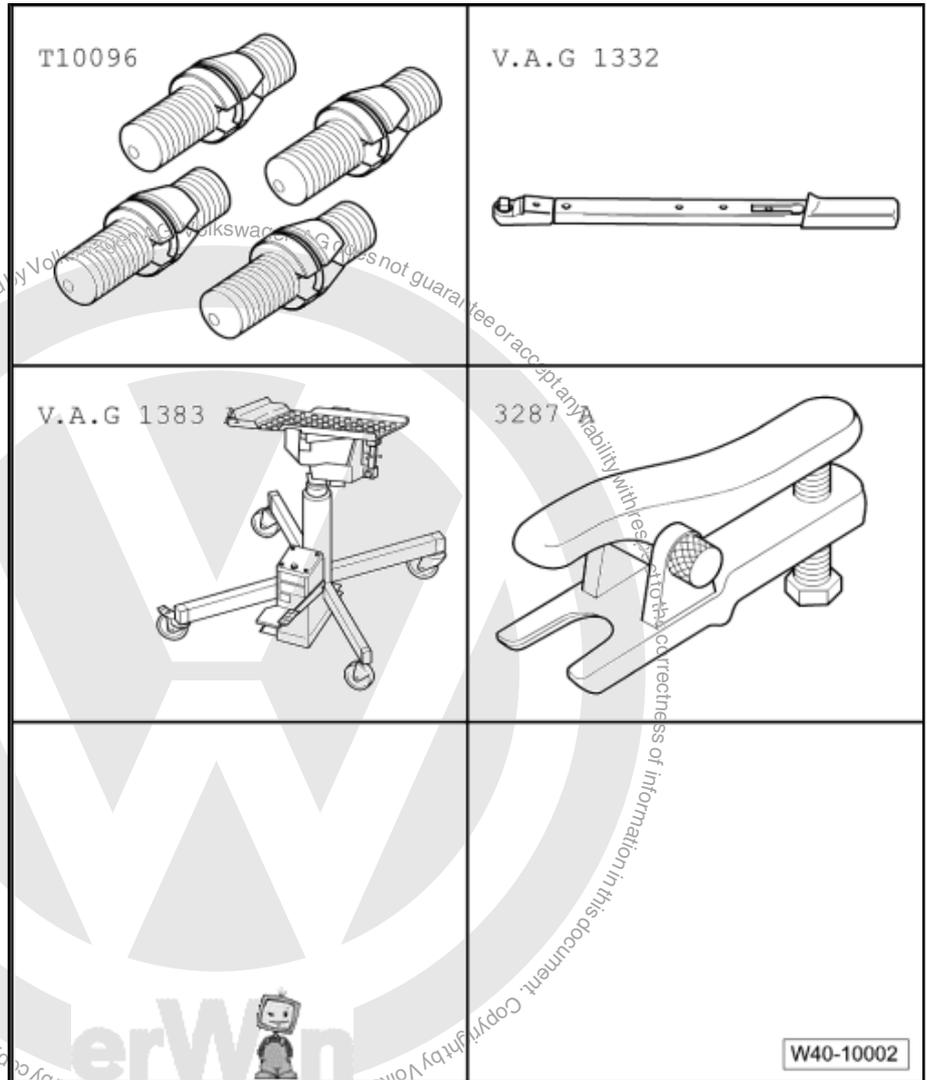




3.18 Removing and installing anti-roll bar

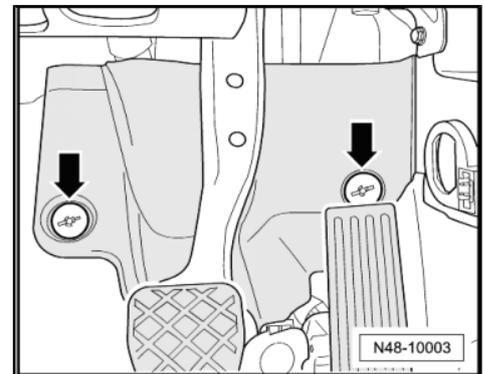
Special tools and workshop equipment required

- ◆ Locating pins -T10096-
- ◆ Torque wrench -V.A.G 1332-
- ◆ Engine and gearbox jack - V.A.G 1383 A-
- ◆ Ball joint puller -3287 A-



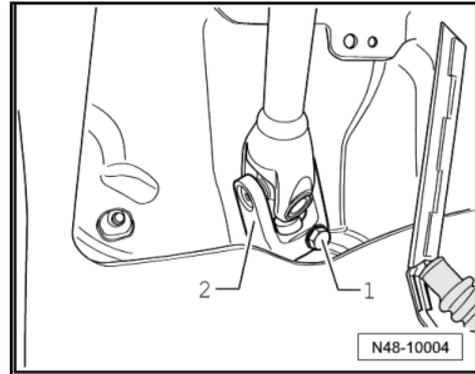
Removing

- Remove front wheels.
- Remove footwell trim by removing nuts -arrows-.



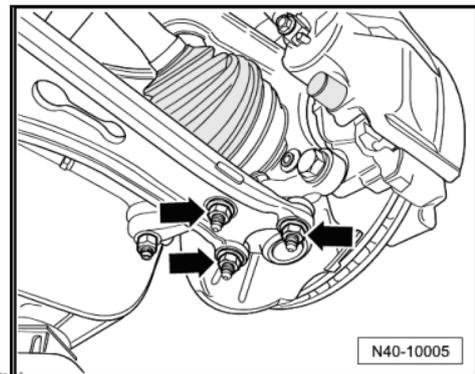


- Remove bolt -1- and pull universal joint -2- off steering box.
- Remove lower noise insulation => Rep. Gr. 50 ; Assembly overview - noise insulation .
- Detach coupling rods from anti-roll bar.

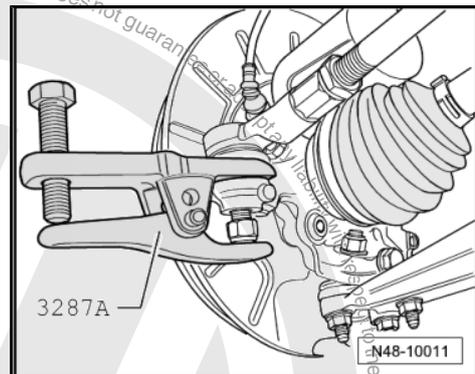


- Remove nuts -arrows-.
- Loosen nut on track rod ball joint on each side but do not remove completely.

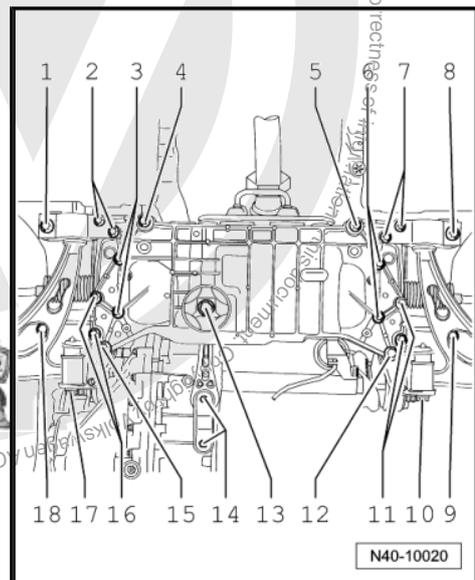
Leave nut screwed on a few turns to protect thread on pin.



- Press track rod ball joint off wheel bearing housing using ball joint splitter -3287A-.
- Fixing position of subframe with bracket => [page 16](#) .

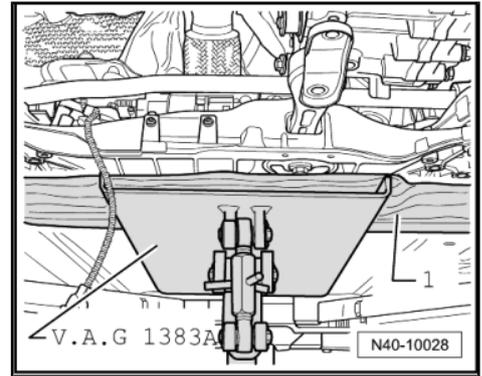


- Unbolt anti-roll bar from subframe -11 and 16- .
- Disconnect pendulum support from gearbox by removing bolts -14- .

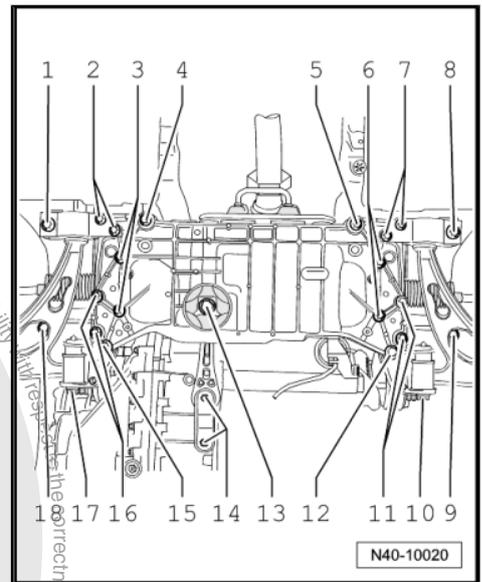




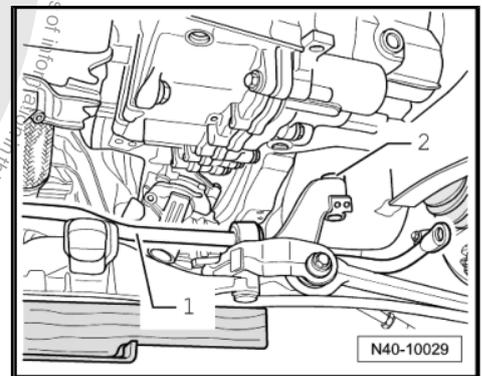
- Place engine and gearbox jack -V.A.G 1383 A- under sub-frame.
- Place, for example, a wooden block -1- between engine and gearbox jack -V.A.G 1383 A- and subframe.



- Remove bolts -4 and 5- and lower subframe with brackets slightly, observing electrical wires.



- Now lift anti-roll bar -1- forwards over bracket -2- and down from subframe.



Installing

Install in reverse order.

Note

- ◆ Coat seal on steering box with suitable lubricant, e.g. soft soap, before installing steering box.
 - ◆ After fitting the steering box to the jointed shaft, ensure that the seal is not kinked when lying against the assembly plate and that the opening to the footwell is correctly sealed. Otherwise, this can result in water leaks and/or noise.
 - ◆ Ensure sealing surfaces are clean.
- Install lower noise insulation ⇒ Rep. Gr. 50 ; Assembly over-view - noise insulation .
 - Install front wheels and tighten ⇒ [page 288](#) .

Specified torques

Component	Specified torque
Subframe to body ◆ Use new bolts	70 Nm + 90°



Component	Specified torque
Bracket to body ◆ Use new bolts	70 Nm + 90°
Mounting bracket to body ◆ Use new bolts	70 Nm + 90°
Subframe to bracket ◆ Use new bolts	70 Nm + 90°
Swivel joint to cast steel suspension link ◆ Use new nuts	60 Nm
Swivel joint to sheet steel or forged aluminium suspension link ◆ Use new nuts	100 Nm
Anti-roll bar to coupling rod ◆ Use new nut ◆ Counterhold on multi-point socket of joint pin	65 Nm
Anti-roll bar to subframe ◆ Use new bolts	20 Nm + 90°
Suspension link to bracket ◆ Use new bolt ◆ Tighten bolt in unladen state	70 Nm + 180°
Steering box to subframe ◆ Use new bolts ◆ Always renew clamp on 1st and 2nd generation steering boxes	50 Nm + 90°
Universal joint to steering box ◆ Use new bolt	30 Nm

Specified torques for pendulum support to gearbox

 **Caution**

From model year 08, HeliCoil inserts are installed in the pendulum support connection in the 02Q gearboxes. Identification ⇒ Rep. Gr. 34 .

Use a bolt with hardness class 10.9 for this and all other gearboxes.

If there is no HeliCoil insert in the 02Q gearbox, use bolts with the strength class 8.8 and the corresponding torque setting.

Bolt	Specified torque
M10 x 35 strength class 8.8 ◆ Use new bolt	40 Nm + 90° further
M10 x 35 strength class 10.9 ◆ Use new bolt	50 Nm + 90° further
M10 x 75 strength class 8.8 ◆ Use new bolt	40 Nm + 90° further



Bolt	Specified torque
M10 x 75 strength class 10.9 ◆ Use new bolt	50 Nm + 90° further

- After installing, perform basic settings for steering angle sender -G85- ⇒ Vehicle diagnosis, testing and information system VAS 5051.





4 Assembly overview - wheel bearing

1 - Wheel bearing housing (3-point mounting) - FS III brakes

- Removing and installing ⇒ [page 60](#)
- With integrated brake carrier.
- If wheel bearing housing is renewed, wheels must be aligned ⇒ [page 305](#) .
- Allocation ⇒ Electronic parts catalogue "ETKA"

2 - Wheel hub with wheel bearing (3-point mounting) - FS III brakes

- Removing and installing ⇒ [page 57](#)
- The ABS sensor ring is installed in the wheel hub
- Allocation ⇒ Electronic parts catalogue "ETKA"

3 - Suspension strut

4 - Multi-point socket head bolt

- Tip of bolt must point in direction of travel

5 - Front left speed sensor - G47- / front right speed sensor - G45-

- Before inserting speed sensor, clean inner surface of fitting hole and coat with lubricating paste -G 000 650- .

6 - Hexagon socket bolt

- 8 Nm

7 - Track rod ball joint

8 - Splash plate

9 - Bolt

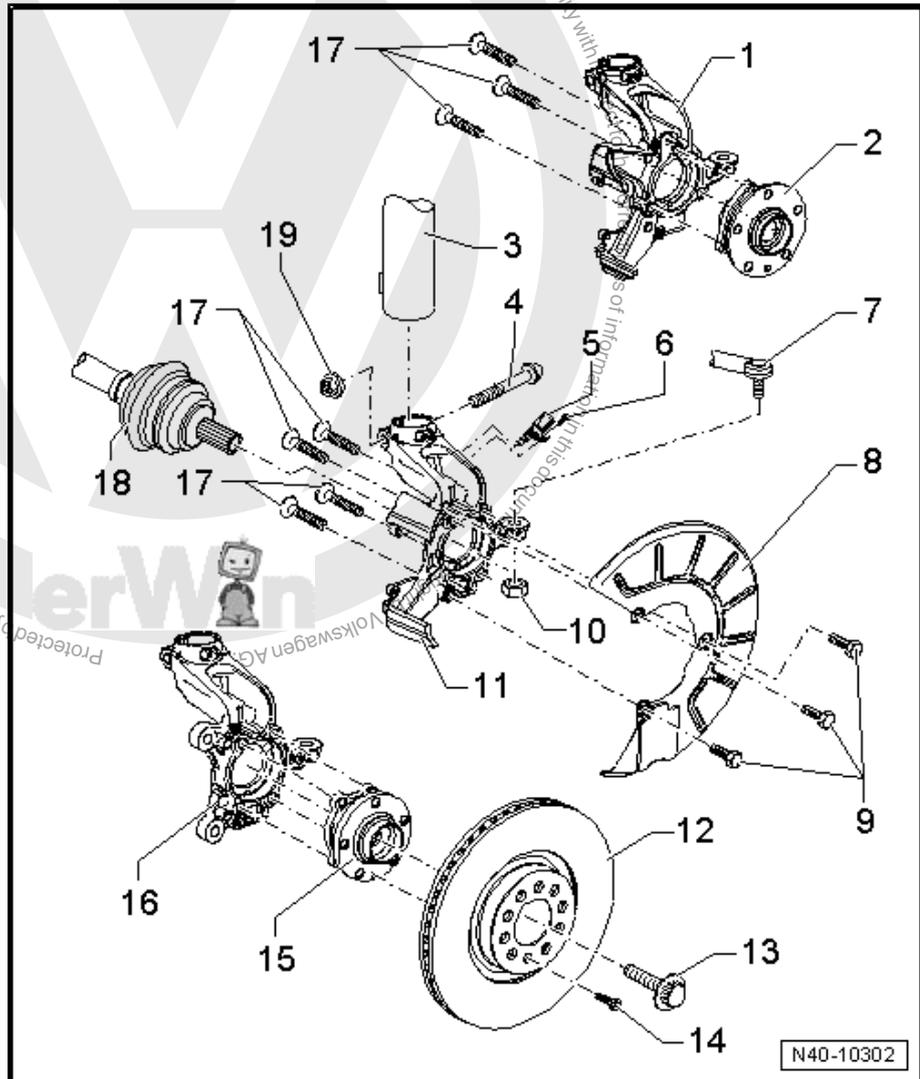
- 10 Nm

10 - Nut

- M12 x 1.5
- 20 Nm + 90° further
- Self-locking
- Always renew after removing

11 - Wheel bearing housing (4-point mounting) - FS III brakes

- Removing and installing ⇒ [page 60](#)
- With integrated brake carrier.
- If wheel bearing housing is renewed, wheels must be aligned ⇒ [page 305](#) .
- Allocation ⇒ Electronic parts catalogue "ETKA"





12 - Ventilated brake disc

13 - Bolt

- M16 x 1.5 x 80
- Hexagon bolt, 200 Nm and turn +180° further
- 12-point bolt, 70 Nm + 90° further
- Always renew after removing

When bolt is loosened or tightened, vehicle must not be standing on its wheels

14 - Bolt

- Torque setting ⇒ Brake systems; Rep. Gr. 46 ; Repairing front brake

15 - Wheel hub with wheel bearing (4-point mounting)

- Removing and installing ⇒ [page 58](#)
- The ABS sensor ring is installed in the wheel hub
- Various versions
- Allocation ⇒ Electronic parts catalogue "ETKA"

16 - Wheel bearing housing (4-point mounting) - FN3 brakes

- Removing and installing ⇒ [page 60](#)
- With bolted on brake carrier.
- If wheel bearing housing is renewed, wheels must be aligned ⇒ [page 305](#) .
- Allocation ⇒ Electronic parts catalogue "ETKA"

17 - Multi-point socket head bolt

- M12 x 1.5 x 45
- 70 Nm + 90° further
- Always renew after removing

18 - Drive shaft

- Removing and installing ⇒ [page 77](#)

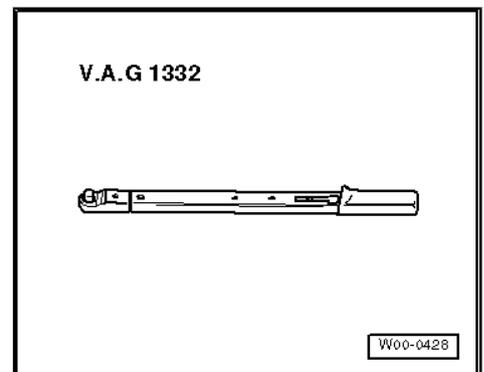
19 - Nut

- M12 x 1.5
- 70 Nm + 90° further
- Self-locking
- Always renew after removing

4.1 Removing and installing wheel bearing housing (3-point mounting)

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1332-





Removing

- Loosen drive shaft bolt at wheel hub:
- ◆ Hexagon bolt ⇒ [page 77](#)
- ◆ Twelve-point bolt ⇒ [page 78](#)



Note

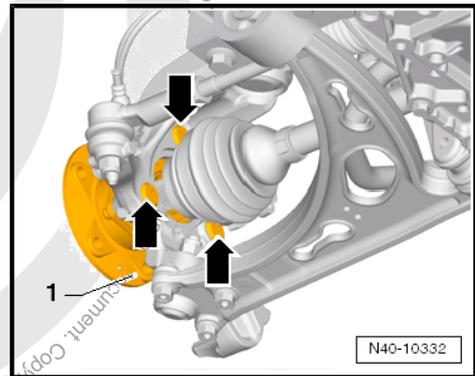
During this step, vehicle must not be standing on its wheels or wheel bearing will be damaged.

- Remove wheel.
- Remove brake caliper and hang from body using wire ⇒ Brake system; Rep. Gr. 46 ; Repairing front brake .
- Remove ABS speed sensor ⇒ Brake systems; Rep. Gr. 46 ; Repairing front brake.
- Remove brake disc.
- Press drive shaft as far as possible out of wheel hub (towards gearbox).
- Remove bolts -arrows-.
- Take wheel bearing unit out of wheel bearing housing.

Installing

Install in reverse order.

- Install brake caliper ⇒ Brake systems; Rep. Gr. 46 ; Repairing front brake
- Tighten drive shaft bolt at wheel hub:
- ◆ Hexagon bolt ⇒ [page 77](#)
- ◆ Twelve-point bolt ⇒ [page 78](#)



Note

During this step, vehicle must not be standing on its wheels or wheel bearing will be damaged.

- Install ABS speed sensor ⇒ Brake systems; Rep. Gr. 46 ; Repairing front brake .
- Install wheel and tighten ⇒ [page 288](#) .

Specified torques

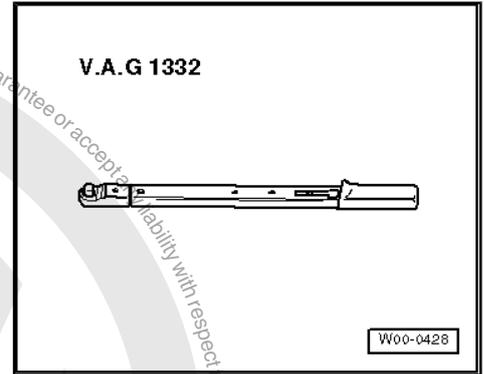
Component	Specified torque
Drive shaft to hub ◆ Use new bolt	70 Nm + 90°
Wheel hub with wheel bearing to wheel bearing housing ◆ Use new bolts	70 Nm + 90°

4.2 Removing and installing wheel bearing housing (4-point mounting)

Special tools and workshop equipment required



- ◆ Torque wrench -V.A.G 1332-



Removing

- Loosen drive shaft bolt at wheel hub:
- ◆ Hexagon bolt ⇒ [page 77](#)
- ◆ Twelve-point bolt ⇒ [page 78](#)



Note

During this step, vehicle must not be standing on its wheels or wheel bearing will be damaged.

- Remove wheel.
- Remove brake caliper and hang from body using wire ⇒ Brake system; Rep. Gr. 46 ; Repairing front brake .
- Remove ABS speed sensor ⇒ Brake systems; Rep. Gr. 46 ; Repairing front brake.
- Remove brake disc.
- Press drive shaft as far as possible out of wheel hub (towards gearbox).
- Remove bolts -arrows-.
- Take wheel bearing unit out of wheel bearing housing.

Installing

Install in reverse order.

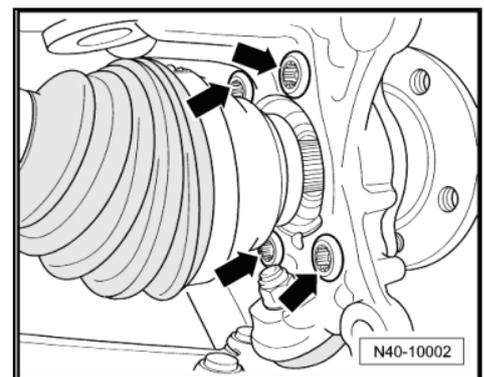
- Install brake caliper ⇒ Brake systems; Rep. Gr. 46 ; Repairing front brake .
- Tighten drive shaft bolt at wheel hub:
- ◆ Hexagon bolt ⇒ [page 77](#)
- ◆ Twelve-point bolt ⇒ [page 78](#)



Note

During this step, vehicle must not be standing on its wheels or wheel bearing will be damaged.

- Install ABS speed sensor ⇒ Brake systems; Rep. Gr. 46 ; Repairing front brake .
- Install wheel and tighten ⇒ [page 288](#) .





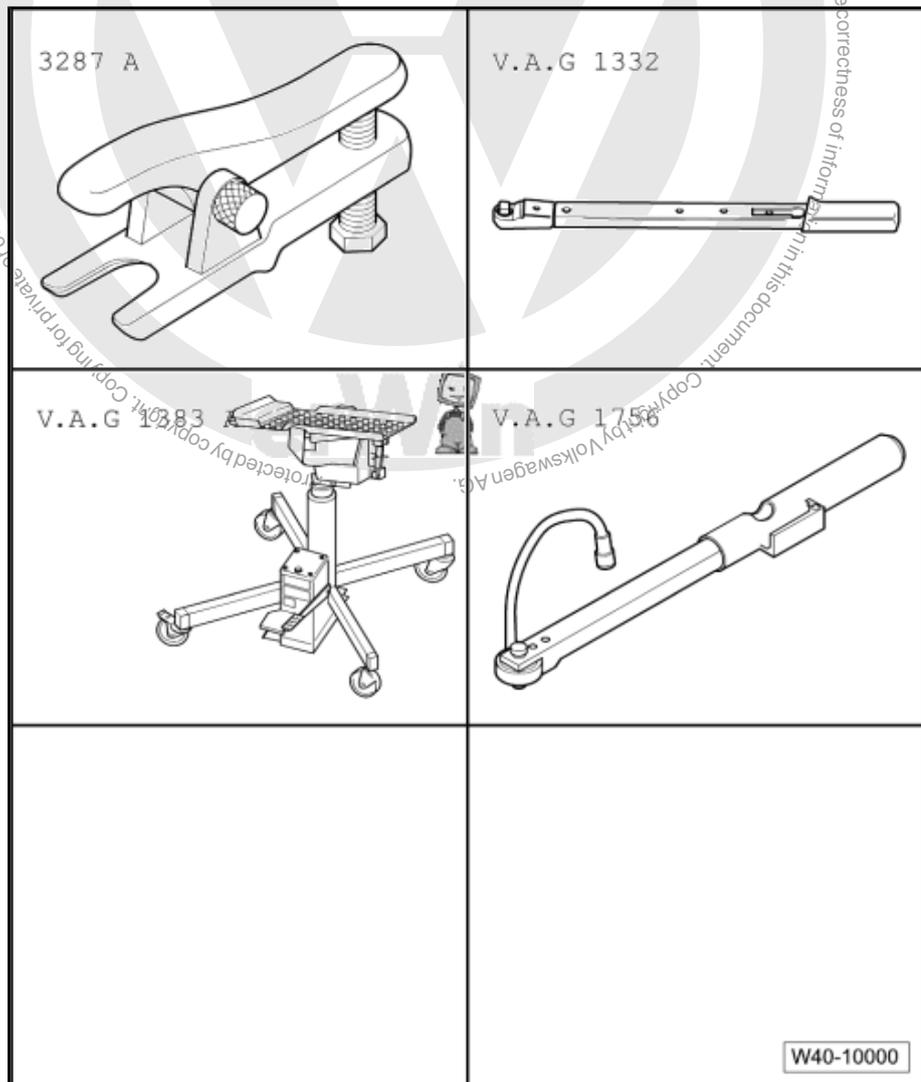
Specified torques

Component	Specified torque
Drive shaft to wheel hub "hexagon bolt" ◆ Use new bolt	200 Nm +180°
Drive shaft to wheel hub "12-point bolt" ◆ Use new bolt	70 Nm +90°
Wheel hub with wheel bearing to wheel bearing housing ◆ Use new bolts	70 Nm + 90°

4.3 Removing and installing wheel bearing housing

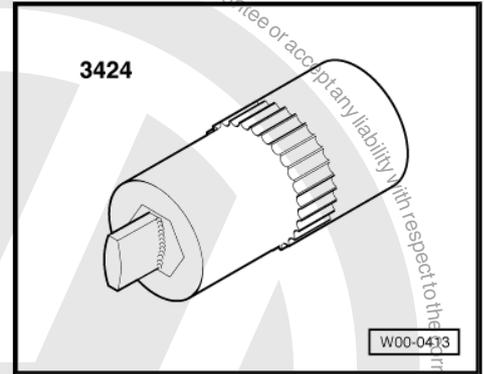
Special tools and workshop equipment required

- ◆ Ball joint puller -3287A-
- ◆ Torque wrench -V.A.G 1332-
- ◆ Engine and gearbox jack V.A.G 1383 A-
- ◆ Torque/angle wrench - V.A.G 1756-





◆ Spreader -3424-



Removing

- Loosen drive shaft bolt at wheel hub:
- ◆ Hexagon bolt ⇒ [page 77](#)
- ◆ Twelve-point bolt ⇒ [page 78](#)



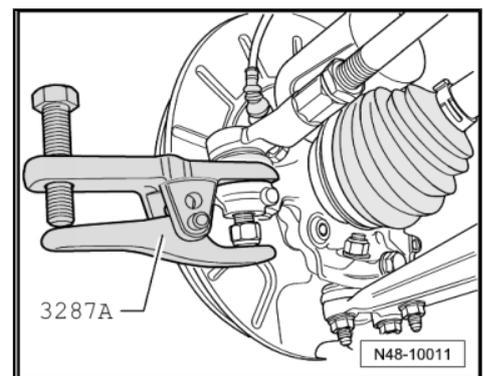
Note

During this step, vehicle must not be standing on its wheels or wheel bearing will be damaged.

- Remove wheel.
- Remove brake caliper and hang from body using wire ⇒ Brake system; Rep. Gr. 46 ; Repairing front brake .
- Remove ABS speed sensor ⇒ Brake systems; Rep. Gr. 46 ; Repairing front brake.
- Remove brake disc.
- Now remove backplate from wheel bearing housing.
- Loosen nut on track rod ball joint but do not remove completely.

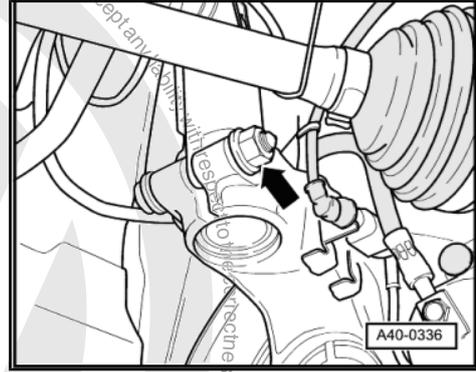
Leave nut screwed on a few turns to protect thread on pin.

- Press track rod ball joint off wheel bearing housing using ball joint splitter -3287A- and remove nut now.
- Press drive shaft as far as possible out of wheel hub (towards gearbox).

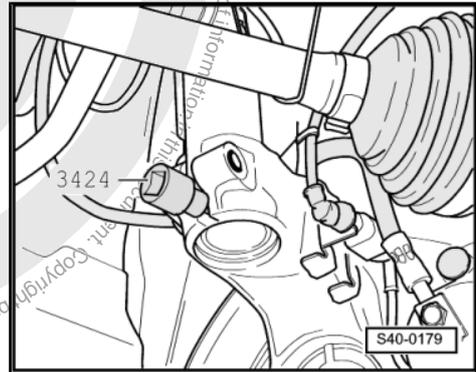




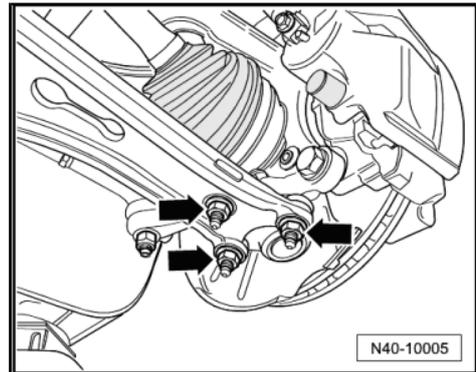
- Remove threaded connection between wheel bearing housing and suspension strut -arrow-.



- Insert spreader -3424- into slot of wheel bearing housing.
- Turn ratchet handle through 90° and detach from spreader -3424- .



- Loosen nuts -arrows-.
- Now position engine and gearbox jack -V.A.G 1383 A- under wheel bearing housing.
- First press swivel joint off suspension link in order to press wheel bearing housing off suspension strut.



Note

If wheel bearing housing is renewed, swivel joint must be transferred. Always use new nuts.

Installing

Carry out installation in the reverse sequence, noting the following:

- Tighten drive shaft bolt at wheel hub:
- ◆ Hexagon bolt ⇒ [page 77](#)
- ◆ Twelve-point bolt ⇒ [page 78](#)



Note

During this step, vehicle must not be standing on its wheels or wheel bearing will be damaged.

If wheel bearing housing is renewed, wheels must be aligned ⇒ [page 305](#) .

- Install wheel and tighten ⇒ [page 288](#) .



Specified torques

Component	Specified torque
Suspension strut to wheel bearing housing ◆ Use new nut	70 Nm + 90°
Swivel joint to cast steel suspension link ◆ Use new nuts	60 Nm
Swivel joint to sheet steel or forged aluminium suspension link ◆ Use new nuts	100 Nm
Track rod ball joint to wheel bearing housing ◆ Use new nut	20 Nm + 90°
Drive shaft to wheel hub "hexagon bolt" ◆ Use new bolt	200 Nm +180°
Drive shaft to wheel hub "12-point bolt" ◆ Use new bolt	70 Nm + 90°





5 Assembly overview: suspension strut

1 - Shock absorber

- Can be renewed separately
- Allocation ⇒ Electronic parts catalogue "ETKA"

2 - Bump stop

3 - Protective sleeve

4 - Coil spring

- Removing and installing ⇒ [page 76](#)
- Observe colour coding
- Allocation ⇒ Electronic parts catalogue "ETKA"

Spring allocation via PR No.

These numbers are located on the vehicle data sticker.

- Surface of coil must not be damaged.

5 - Deep groove ball thrust bearing

6 - Suspension strut mounting

- Note correct installation position ⇒ [page 67](#)

7 - Nut

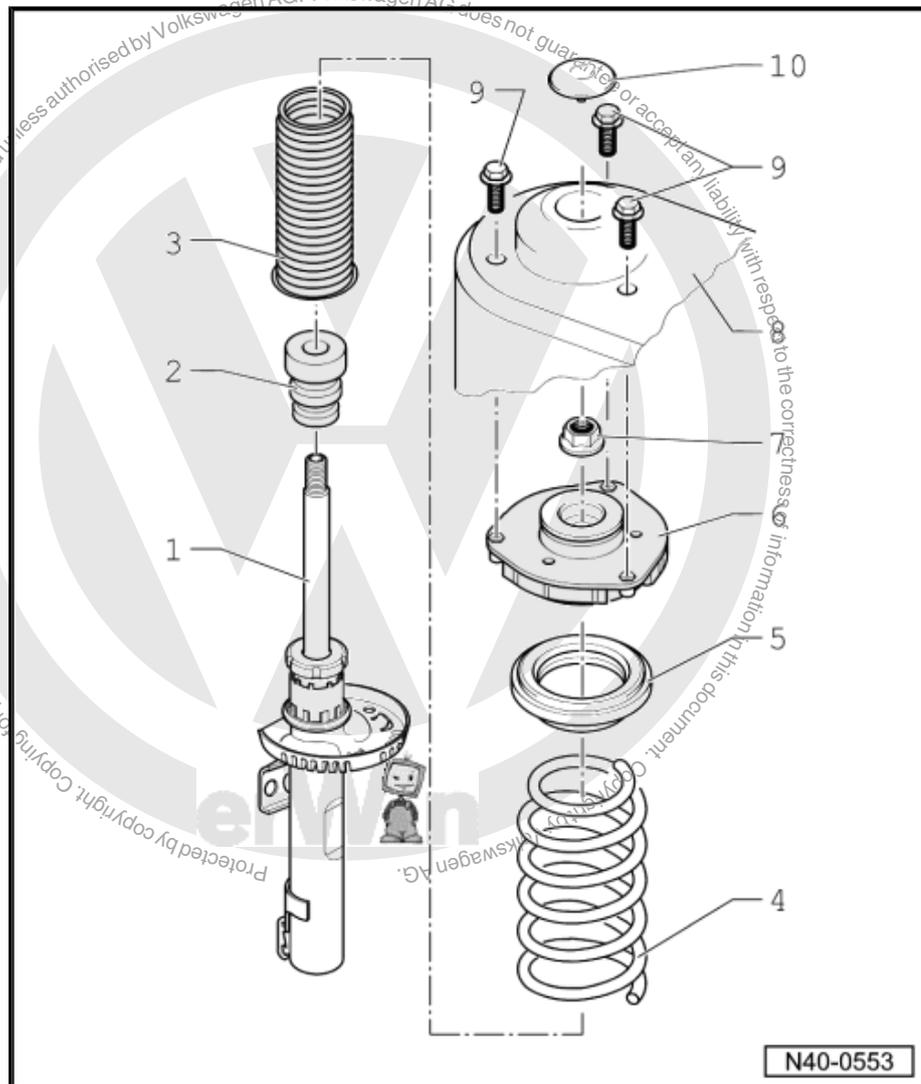
- M14 x 1.5
- 60 Nm
- Self-locking
- Always renew after removing

8 - Suspension strut turret

9 - Bolt

- 15 Nm + 90° further
- Always renew after removing

10 - Protective cap

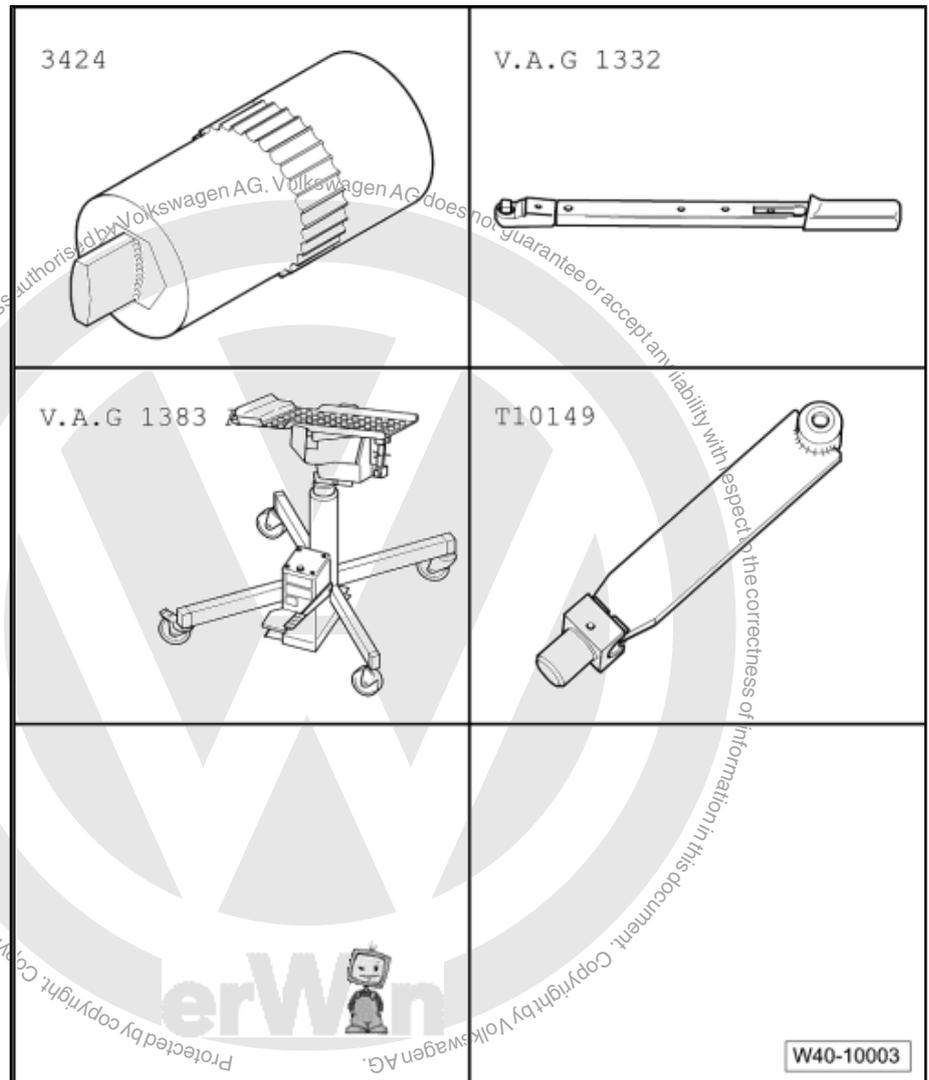




5.1 Removing and installing suspension strut, Golf

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1332-
- ◆ Spreader -3424-
- ◆ Engine and gearbox jack - V.A.G 1383 A-
- ◆ Support -T10149-



Removing

- Loosen drive shaft bolt at wheel hub:
- ◆ Hexagon bolt ⇒ [page 77](#)
- ◆ Twelve-point bolt ⇒ [page 78](#)



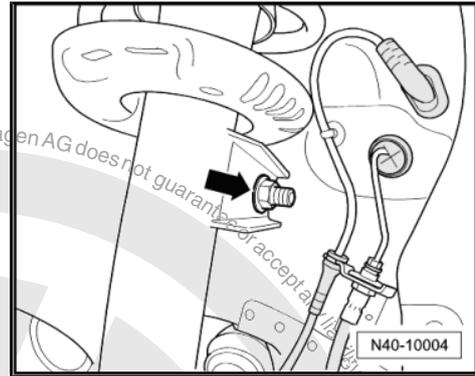
Note

During this step, vehicle must not be standing on its wheels or wheel bearing will be damaged.

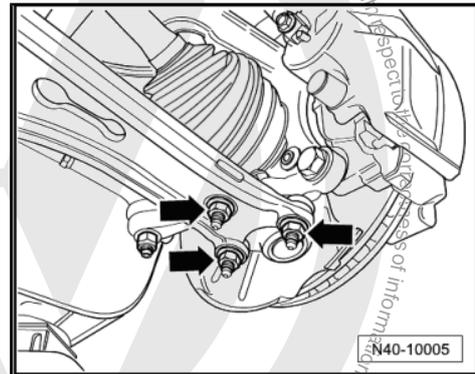
- Remove wheel.



- Unscrew hexagon nut for coupling rod -arrow- from suspension strut.
- Unhook speed sensor wiring from suspension strut.



- Remove nuts -arrows-.
- Pull wheel bearing housing with swivel joint out of suspension link.
- Pull outer joint of drive shaft out of wheel hub.
- Secure drive shaft to body with wire.



Caution

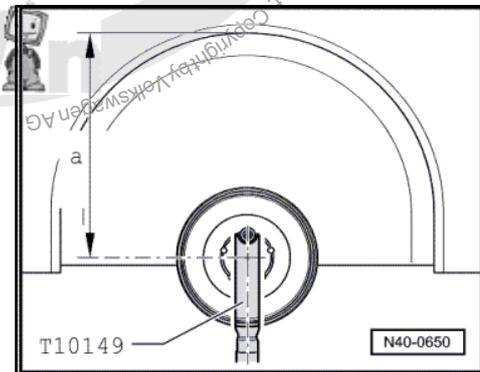
Do not allow the drive shaft to hang down under its own weight, for this would allow the inner joint to bend too far and be damaged.

- Bolt swivel joint to suspension link again.
- Bolt engine and gearbox jack -V.A.G 1383 A- with support -T10149- to wheel hub using a wheel bolt.

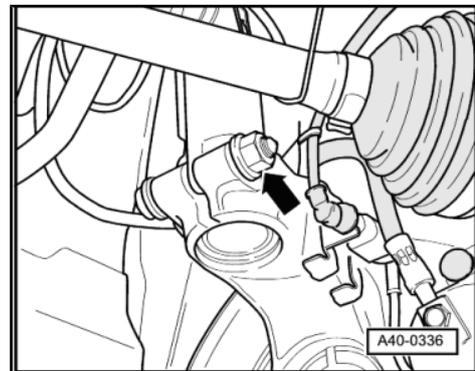


WARNING

- ◆ *Do not lift or lower the vehicle while the engine and gearbox jack -V.A.G 1383 A- is under the vehicle. The vehicle could slip off the lifting platform.*
- ◆ *Do not leave the engine and gearbox jack -V.A.G 1383 A- under the vehicle for longer than necessary.*



- Separate threaded connection between wheel bearing housing and suspension strut -arrow-.

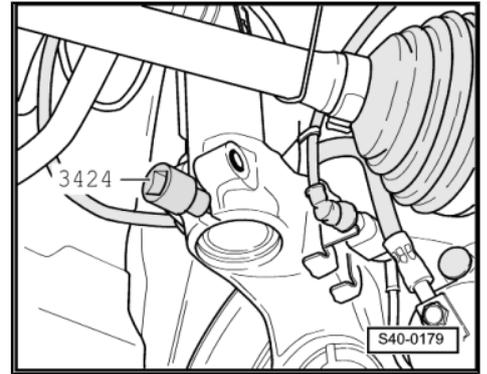




- Insert spreader -3424- into slot of wheel bearing housing.
- Turn ratchet handle through 90° and detach from spreader -3424- .
- Press brake disc towards suspension strut by hand.

Otherwise the shock absorber tube can cant in the bore of the wheel bearing housing.

- Pull wheel bearing housing downwards off shock absorber tube and lower with engine and gearbox jack -V.A.G 1383 A- until shock absorber tube is free.
- Tie wheel bearing housing up to subframe bracket using a piece of wire.
- Pull engine and gearbox jack -V.A.G 1383 A- out from under wheel bearing housing.



WARNING

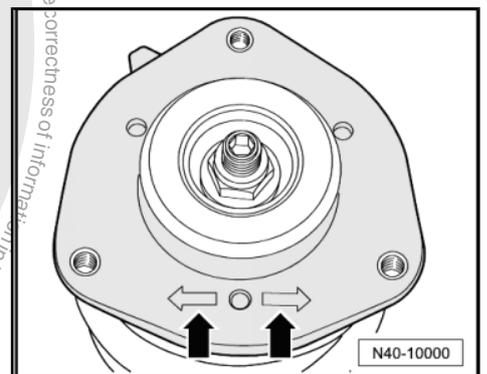
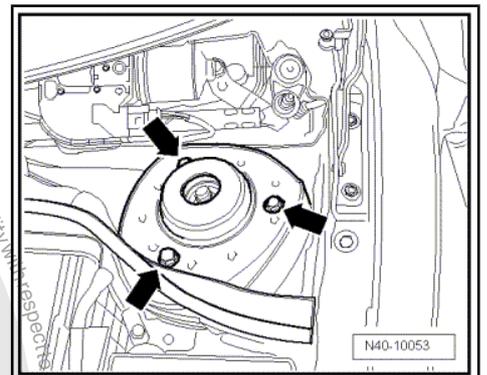
- ◆ *Do not leave the engine and gearbox jack -V.A.G 1383 A- under the vehicle for longer than necessary.*

- Remove wiper arms => Rep. Gr. 92 ; Wiper system; Removing and installing wiper arms .
- Remove plenum chamber cover.
- Remove hexagon bolts -arrows- for upper shock absorber mounting and remove suspension strut.

Installing

Installation position of spring plate

- Insert suspension strut with one of the two markings -arrows- pointing forwards.





Tighten hexagon bolts -arrows- for upper shock absorber mounting.

- Install plenum chamber cover.
- Install wiper arms => Rep. Gr. 92 ; Wiper system; Removing and installing wiper arms .

Bolt engine and gearbox jack -V.A.G 1383 A- with support -T10149- to wheel hub using a wheel bolt.



WARNING

- ◆ *Do not lift or lower the vehicle while the engine and gearbox jack -V.A.G 1383 A- is under the vehicle. The vehicle could slip off the lifting platform.*
- ◆ *Do not leave the engine and gearbox jack -V.A.G 1383 A- under the vehicle for longer than necessary.*

- Position suspension strut on wheel bearing housing.
- Remove wire from wheel bearing housing.
- Using gearbox jack, carefully raise wheel bearing housing until bolt securing suspension strut to wheel bearing housing can be inserted.
- Press brake disc towards suspension strut by hand while lifting.

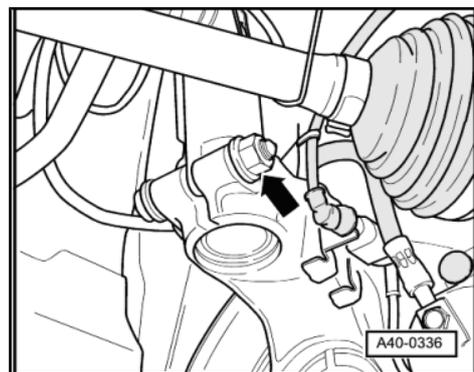
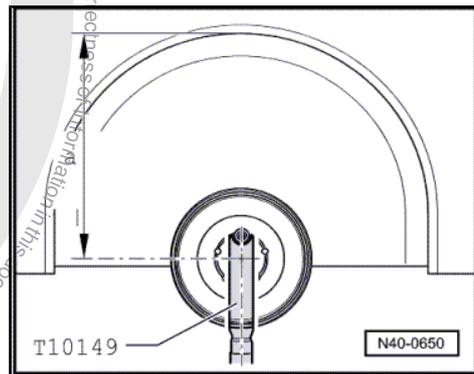
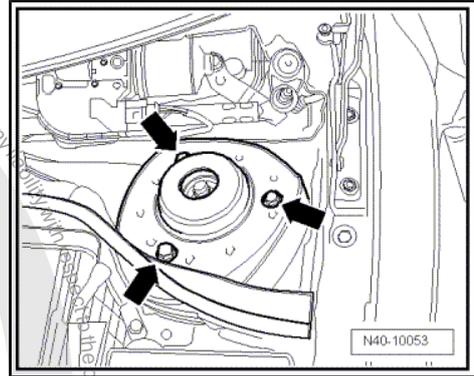
Otherwise the shock absorber tube can cant in the bore of the wheel bearing housing.

- Remove spreader -3424- .
- Tighten threaded connection between wheel bearing housing and suspension strut -arrow-



WARNING

- ◆ *Do not leave the engine and gearbox jack -V.A.G 1383 A- under the vehicle for longer than necessary.*





- Remove nuts -arrows-
- Fit drive shaft in wheel hub.
- Fit wheel bearing housing with swivel joint in suspension link.
- Bolt swivel joint to suspension link.

i Note

Ensure boot is not damaged or twisted.

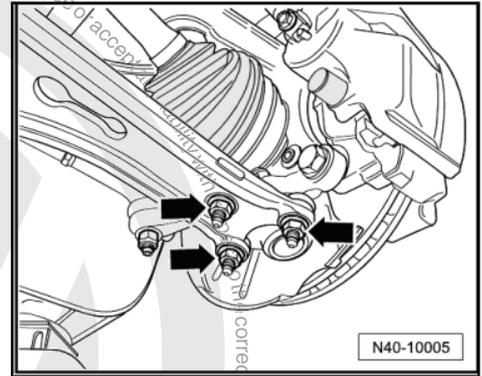
- Tighten drive shaft bolt at wheel hub:
- ◆ Hexagon bolt ⇒ [page 77](#)
- ◆ Twelve-point bolt ⇒ [page 78](#)

i Note

During this step, vehicle must not be standing on its wheels or wheel bearing will be damaged.

Continue installation in reverse order.

- Install wheel and tighten ⇒ [page 288](#).



Specified torques

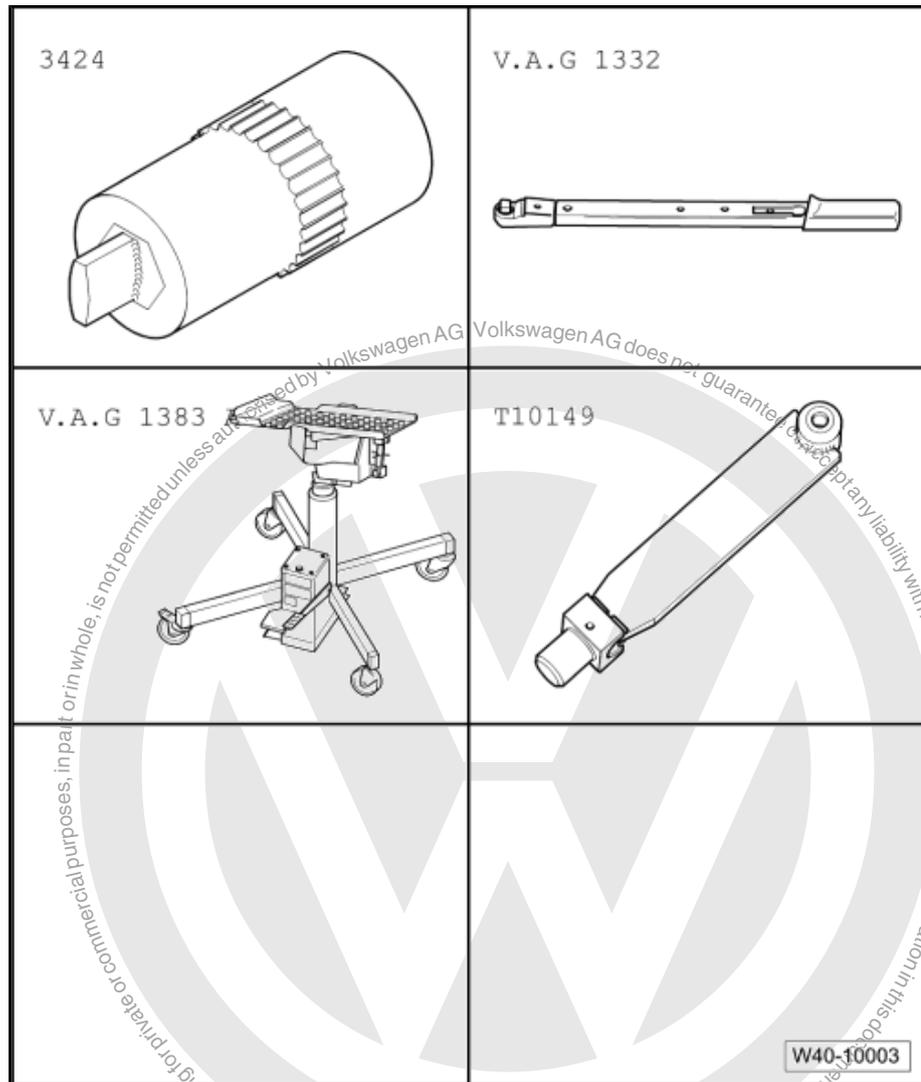
Component	Specified torque
Suspension strut to wheel bearing housing ◆ Use new nut	70 Nm + 90°
Suspension strut to body (suspension turret) ◆ Use new bolts	15 Nm + 90°
Swivel joint to cast steel suspension link ◆ Use new nuts	60 Nm
Swivel joint to sheet steel or forged aluminium suspension link ◆ Use new nuts	100 Nm
Coupling rod to suspension strut ◆ Use new nut ◆ Counterhold on multi-point socket of joint pin	65 Nm
Drive shaft to wheel hub "hexagon bolt" ◆ Use new bolt	200 Nm +180°
Drive shaft to wheel hub "12-point bolt" ◆ Use new bolt	70 Nm + 90°



5.2 Removing and installing suspension strut, Golf Plus, CrossGolf

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1332-
- ◆ Spreader -3424-
- ◆ Engine and gearbox jack - V.A.G 1383 A-
- ◆ Support -T10149-



Removing

- Loosen drive shaft bolt at wheel hub:
- ◆ Hexagon bolt ⇒ [page 77](#)
- ◆ Twelve-point bolt ⇒ [page 78](#)



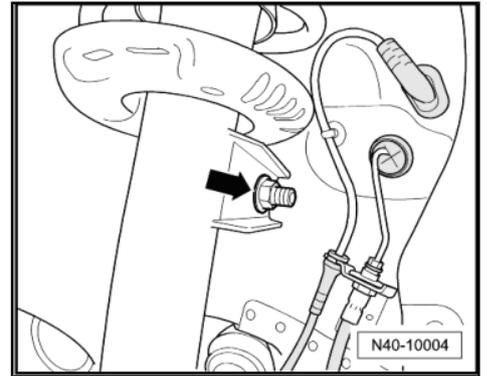
Note

During this step, vehicle must not be standing on its wheels or wheel bearing will be damaged.

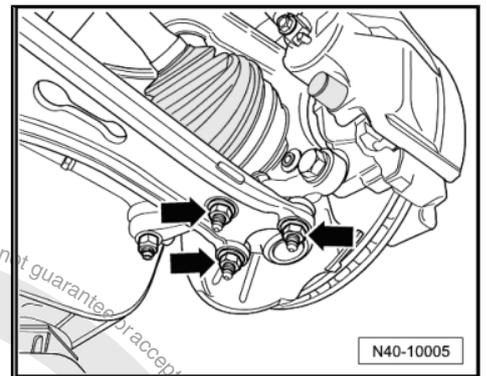
- Remove wheel.



- Unscrew hexagon nut for coupling rod -arrow- from suspension strut.
- Unhook speed sensor wiring at suspension strut.



- Remove nuts -arrows-.
- Pull wheel bearing housing with swivel joint out of suspension link.
- Pull outer joint of drive shaft out of wheel hub.
- Secure drive shaft to body with wire.



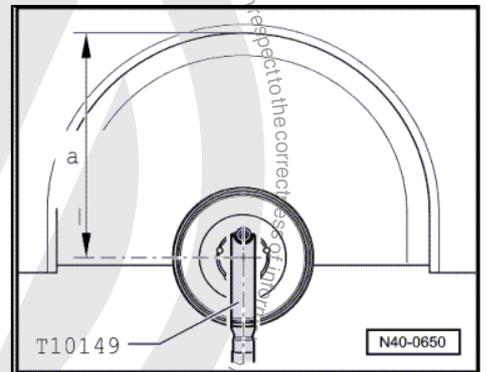
Caution

Do not allow the drive shaft to hang down under its own weight, for this would allow the inner joint to bend too far and be damaged.

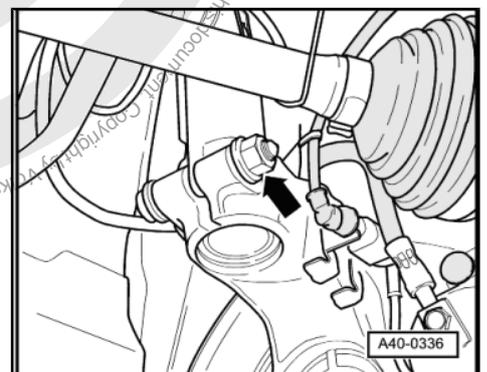
- Bolt swivel joint to suspension link again.
- Bolt engine and gearbox jack -V.A.G 1383 A- with support -T10149- to wheel hub using a wheel bolt.

WARNING

- ◆ *Do not lift or lower the vehicle while the engine and gearbox jack -V.A.G 1383 A- is under the vehicle. The vehicle could slip off the lifting platform.*
- ◆ *Do not leave the engine and gearbox jack -V.A.G 1383 A- under the vehicle for longer than necessary.*



- Separate threaded connection between wheel bearing housing and suspension strut -arrow-.





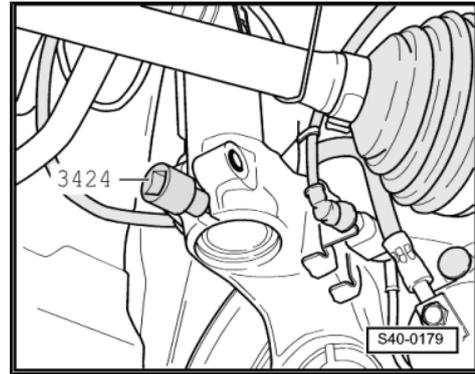
- Insert spreader -3424- into slot of wheel bearing housing.
- Turn ratchet handle through 90° and detach from spreader -3424- .
- Press brake disc towards suspension strut by hand.



Note

Otherwise the shock absorber tube can cant in the bore of the wheel bearing housing.

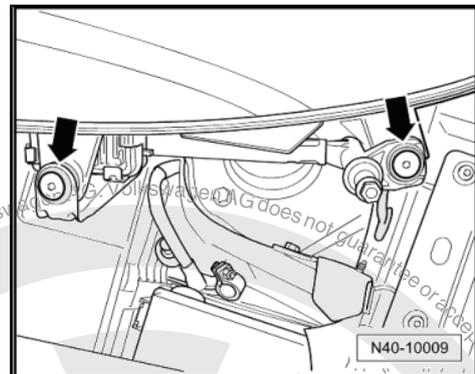
- Pull wheel bearing housing downwards off shock absorber tube and lower with engine and gearbox jack -V.A.G 1383 A- until shock absorber tube is free.
- Tie wheel bearing housing up to subframe bracket using a piece of wire.
- Pull engine and gearbox jack -V.A.G 1383 A- out from under wheel bearing housing.



WARNING

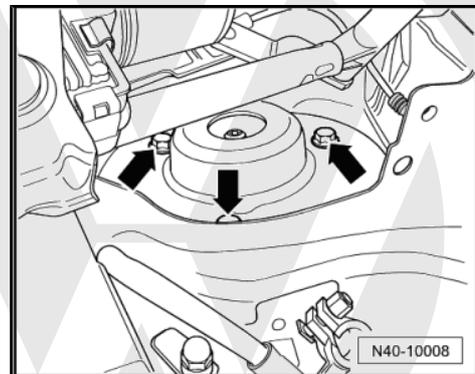
- ◆ Do not leave the engine and gearbox jack -V.A.G 1383 A- under the vehicle for longer than necessary.

- Remove centre section of bulkhead ⇒ Rep. Gr. 50 ; Assembly overview - plenum chamber bulkhead .
- Remove bolts -arrows- ⇒ Rep. Gr. 92 ; Windscreen wash/wipe system; Removing and installing windscreen wiper system and then remove windscreen wiper motor.



- Remove hexagon bolts -arrows- for upper shock absorber mounting and remove suspension strut.

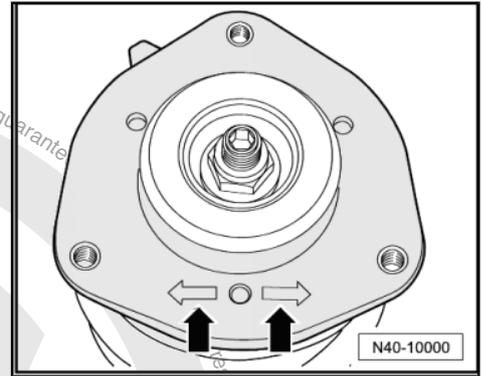
Installing





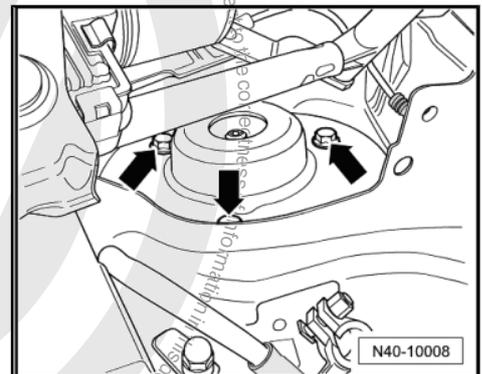
Installation position of spring plate

- Insert suspension strut with one of the two markings -arrows- pointing forwards.



Tighten hexagon bolts -arrows- for upper shock absorber mounting.

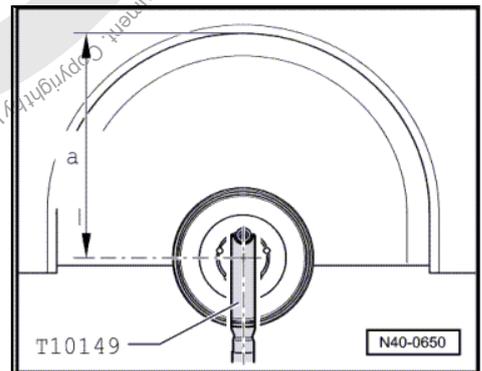
- Install windscreen wiper motor => Rep. Gr. 92 ; Windscreen wash/wipe system; Removing and installing windscreen wiper system .
- Install centre section of bulkhead => Rep. Gr. 50 ; Assembly overview - plenum chamber bulkhead .



- Bolt engine and gearbox jack -V.A.G 1383 A- with support -T10149- to wheel hub using a wheel bolt.

WARNING

- ◆ *Do not lift or lower the vehicle while the engine and gearbox jack -V.A.G 1383 A- is under the vehicle. The vehicle could slip off the lifting platform.*
- ◆ *Do not leave the engine and gearbox jack -V.A.G 1383 A- under the vehicle for longer than necessary.*



- Position suspension strut on wheel bearing housing.
- Remove wire from wheel bearing housing.
- Using gearbox jack, carefully raise wheel bearing housing until bolt securing suspension strut to wheel bearing housing can be inserted.
- Press brake disc towards suspension strut by hand while lifting.

Otherwise the shock absorber tube can cant in the bore of the wheel bearing housing.

- Remove spreader -3424- .

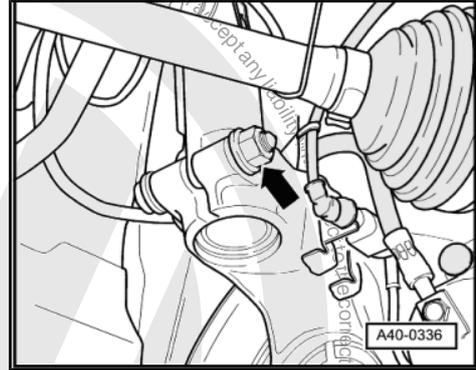


- Tighten threaded connection between wheel bearing housing and suspension strut -arrow



WARNING

- ◆ Do not leave the engine and gearbox jack -V.A.G 1383 A- under the vehicle for longer than necessary.



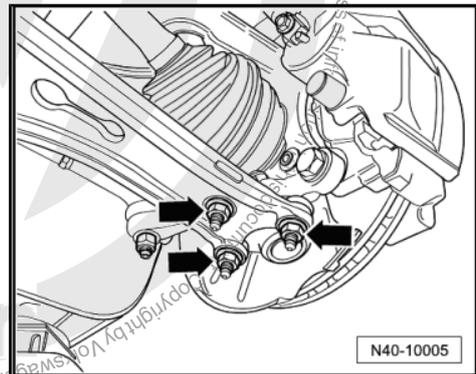
- Remove nuts -arrows-
- Fit drive shaft into wheel bearing.
- Fit wheel bearing housing with swivel joint in suspension link.
- Bolt swivel joint to suspension link.



Note

Ensure boot is not damaged or twisted.

- Tighten drive shaft bolt at wheel hub:
- ◆ Hexagon bolt ⇒ [page 77](#)
- ◆ Twelve-point bolt ⇒ [page 78](#)



Note

During this step, vehicle must not be standing on its wheels or wheel bearing will be damaged.

Continue installation in reverse order.

- Install wheel and tighten ⇒ [page 288](#) .

Specified torques

Component	Specified torque
Suspension strut to wheel bearing housing ◆ Use new nut	70 Nm + 90°
Suspension strut to body (suspension turret) ◆ Use new bolts	15 Nm + 90°
Swivel joint to cast steel suspension link ◆ Use new nuts	60 Nm
Swivel joint to sheet steel or forged aluminium suspension link ◆ Use new nuts	100 Nm
Coupling rod to suspension strut ◆ Use new nut ◆ Counterhold on multi-point socket of joint pin	65 Nm
Drive shaft to wheel hub "hexagon bolt" ◆ Use new bolt	200 Nm + 180°

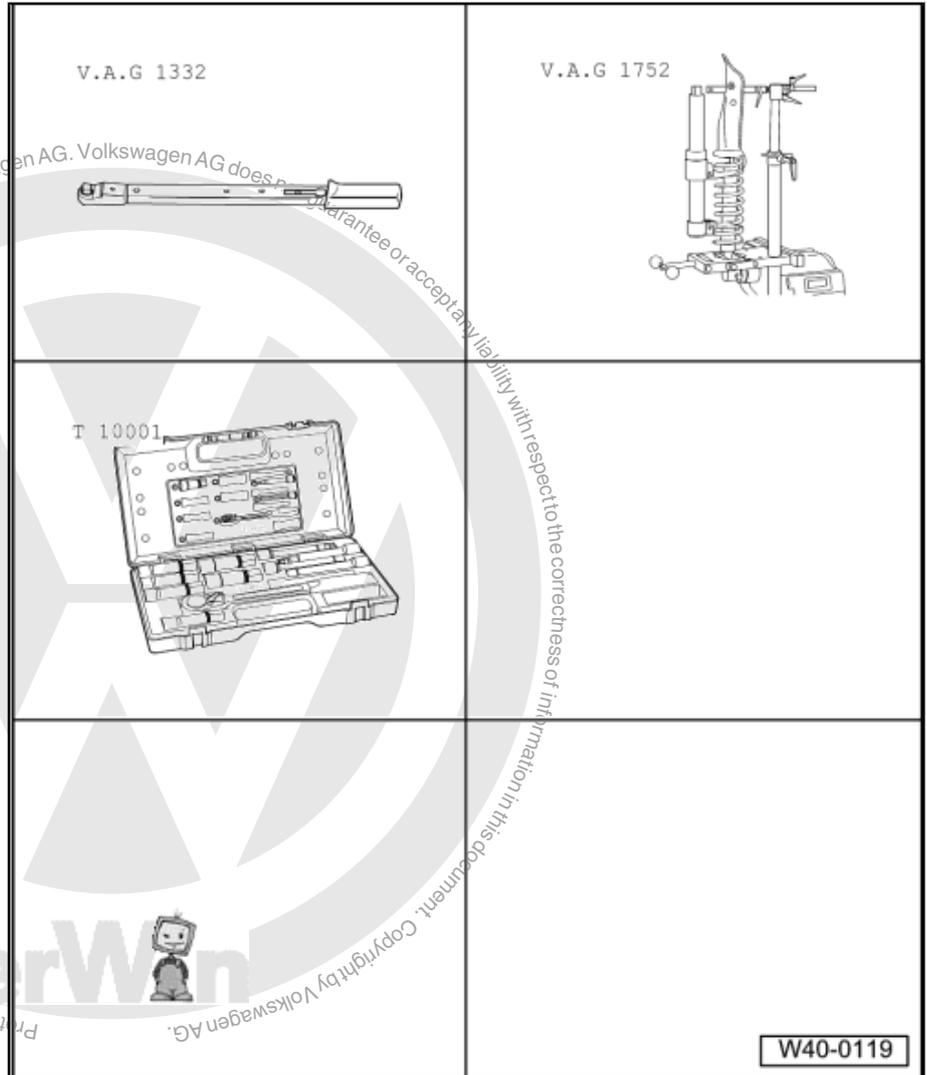


Component	Specified torque
Drive shaft to wheel hub "12-point bolt" ♦ Use new bolt	70 Nm + 90°

5.3 Repairing suspension strut

Special tools and workshop equipment required

- ♦ Torque wrench -V.A.G 1332-
- ♦ Spring compressor -V.A.G 1752/1-
- ♦ Spring retainer -V.A.G 1752/4-
- ♦ Shock absorber set - T10001-
- ♦ Commercially available ratchet handle



– Remove suspension strut ⇒ [page 70](#) or ⇒ [page 65](#) .



Removing coil spring

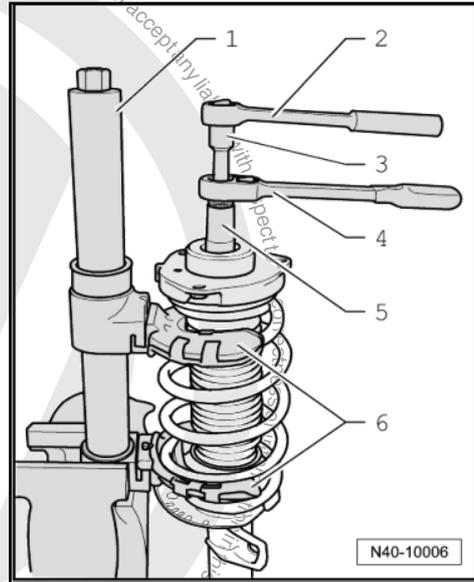
– Compress coil spring with spring compressor -V.A.G 1752/1- until deep groove ball thrust bearing is free at top.

- 1 - Spring compressor -V.A.G 1752/1-
- 2 - Torque wrench -V.A.G 1332-
- 3 - Tool insert -T10001/8-
- 4 - Ratchet handle -T10001/11-
- 5 - Tool insert -T10001/5-
- 6 - Spring retainer -V.A.G 1752/4-



WARNING

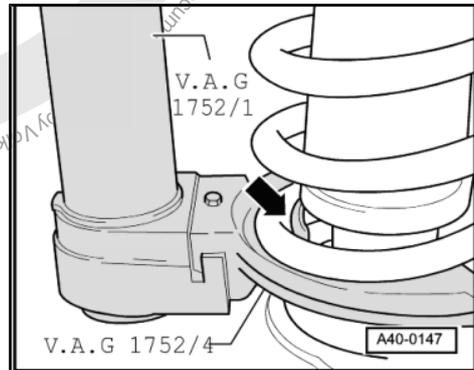
First compress spring far enough to ensure that upper spring plate is free.



- Ensure that coil spring is seated correctly in spring retainer - V.A.G 1752/4 - arrow-.
- Unscrew hexagon nut from piston rod.
- Remove individual components of suspension strut and coil spring with spring compressor -V.A.G 1752/1- .

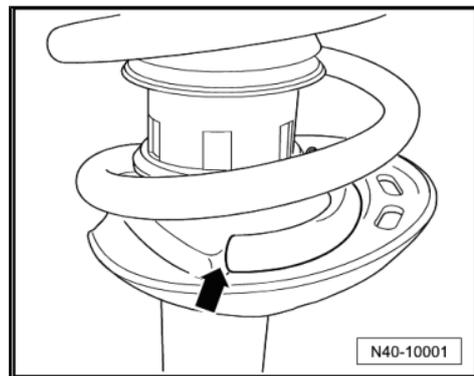
Installing coil spring

– Fit coil spring with spring compressor -V.A.G 1752/1- onto lower spring plate.



The end of the coil spring must lie against the stop -arrow-.

- Tighten new hexagon nut on piston rod.
- Relieve tension on spring compressor -V.A.G 1752/1- and remove from coil spring.
- Install suspension strut => [page 72](#) or => [page 67](#) .



Specified torques

Component	Specified torque
Suspension strut mounting to shock absorber ◆ Use new nut	60 Nm



6 Removing and installing drive shafts

Removing and installing drive shaft with constant velocity joint
⇒ [page 79](#) .

Removing and installing left drive shaft with (push-on) constant velocity slip joint ⇒ [page 81](#) .

Removing and installing right drive shaft with (push-on) constant velocity slip joint ⇒ [page 85](#) .

Removing and installing drive shafts with triple roller joint
AAR2600i ⇒ [page 88](#) .

Removing and installing drive shafts with triple roller joint
AAR3300i ⇒ [page 90](#) .

Removing and installing intermediate shaft ⇒ [page 92](#) .



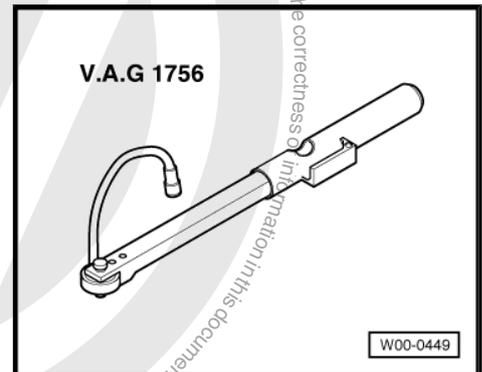
WARNING

When removing and installing drive shafts, do not allow them to hang free and stop against joints due to over bending.

6.1 Loosening and tightening drive shaft hexagon bolt

Special tools and workshop equipment required

- ◆ Torque/angle wrench -V.A.G 1756-



Wheel bearings must not be subjected to load after bolt securing drive shaft to wheel hub has been loosened.

If wheel bearings are loaded with weight of vehicle, bearing will be damaged. This reduces the service life of the wheel bearing. It is therefore important to note the following:

- ◆ Procedure for loosening hexagon bolt.

Do not attempt to move the vehicle without the drive shafts fitted as this would result in wheel bearing damage. If the vehicle does have to be moved, always note the following points:

- Fit an outer joint in place of drive shaft.
- Tighten outer joint to 120 Nm.

Loosening hexagon bolt

- For vehicles which are still standing on their wheels, loosen the hexagon bolt a maximum of 90°, as the wheel bearing will otherwise be damaged.
- Raise vehicle so that wheels are off the ground.
- Have second mechanic apply brakes.



- Remove hexagon bolt -arrow-.

Tightening hexagon bolt

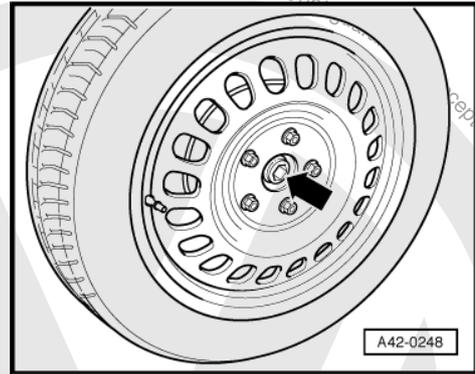
- Renew hexagon bolt.



Note

The wheels must not be in contact with the ground when the drive shaft bolt is tightened; otherwise, the wheel bearing will be damaged.

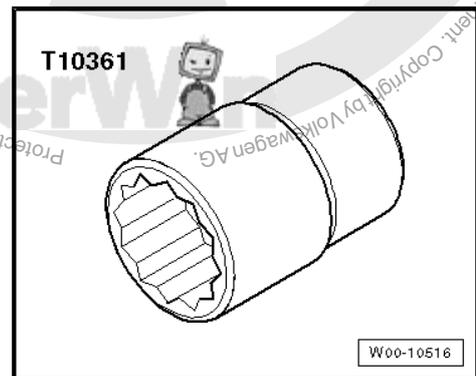
- Have second mechanic apply brakes.
- Tighten hexagon bolt to 200 Nm.
- Lower vehicle onto its wheels.
- Turn hexagon bolt 180° further.



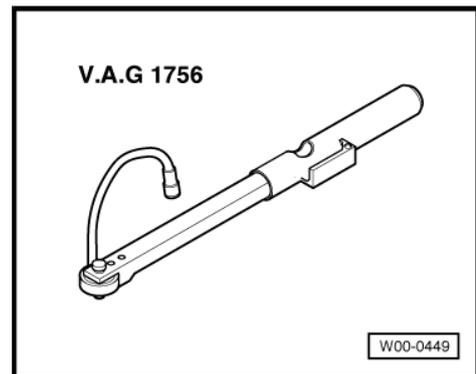
6.2 Loosening and tightening 12-point flange bolt securing drive shaft

Special tools and workshop equipment required

- ◆ Socket, 24 mm -T10361-



- ◆ Torque/angle wrench -V.A.G 1756-



Wheel bearings must not be subjected to load after bolt securing drive shaft to wheel hub has been loosened.

If wheel bearings are loaded with weight of vehicle, bearing will be damaged. This reduces the service life of the wheel bearing. It is therefore important to note the following:

- ◆ Procedure for loosening 12-point flange bolt.

Do not attempt to move the vehicle without the drive shafts fitted as this would result in wheel bearing damage. If the vehicle does have to be moved, always note the following points:

- Fit an outer joint in place of drive shaft.



- Tighten outer joint to 120 Nm.

Loosening 12-point bolt

- To avoid damage to wheel bearing, do not loosen 12-point bolt using 24 mm socket -T10361- further than 90° with vehicle still standing on its wheels.
- Raise vehicle so that wheels are off the ground.
- Have second mechanic apply brakes.
- Remove 12-point bolt -arrow-.

Fitting 12-point bolt

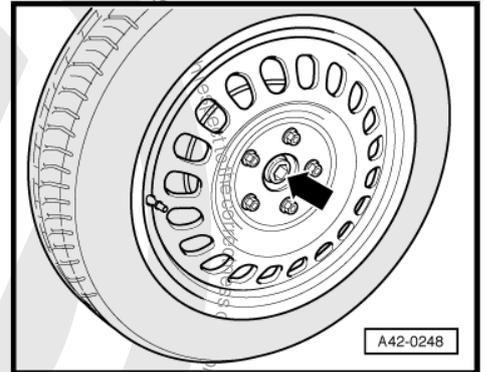
- Renew 12-point bolt.



Note

The wheels must not be in contact with the ground when the drive shaft bolt is tightened; otherwise, the wheel bearing will be damaged.

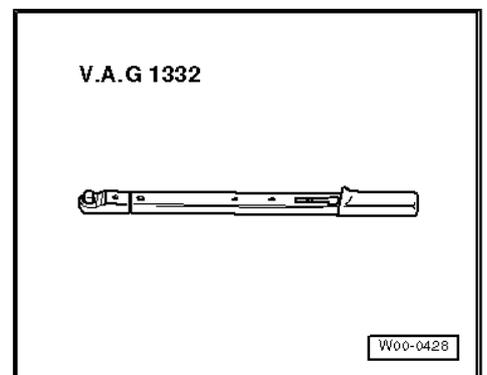
- Have second mechanic apply brakes.
- Tighten 12-point bolt to 70 Nm.
- Lower vehicle onto its wheels.
- Turn 12-point bolt 90° further.



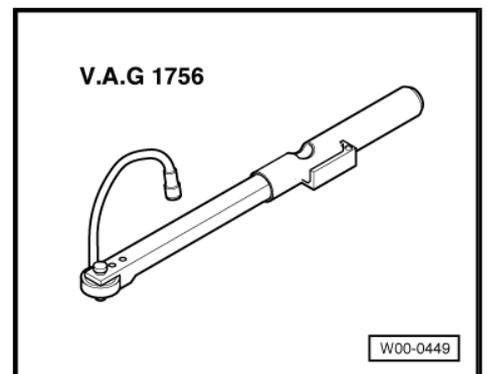
6.3 Removing and installing drive shaft with constant velocity joint

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1332-



- ◆ Torque/angle wrench -V.A.G 1756-





Removing

- Loosen drive shaft bolt at wheel hub:
- ◆ Hexagon bolt ⇒ [page 77](#)
- ◆ Twelve-point bolt ⇒ [page 78](#)



Caution

During this step, vehicle must not be standing on its wheels.

The wheel bearing can be damaged by the weight of the vehicle if the bolt is loosened.

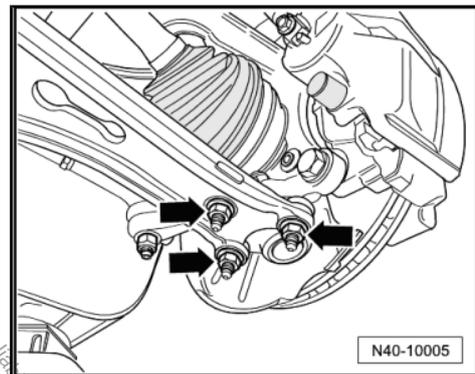
If a vehicle must be moved with the drive shaft removed, an outer joint must be fitted and tightened to 120 Nm.

- Remove lower noise insulation ⇒ Rep. Gr. 50 ; Assembly overview - noise insulation .
- Unbolt drive shaft from gearbox flange shaft.
- Remove wheel.
- Push drive shaft outer joint out of wheel hub by hand.
- Remove nuts -arrows-.
- Pull wheel bearing housing with swivel joint out of suspension link.
- Pull drive shaft out of wheel hub.

Installing

Remove any paint residue and/or corrosion on thread and splines of outer joint.

- Insert drive shaft.
- Guide outer joint into wheel hub splines as far as possible.



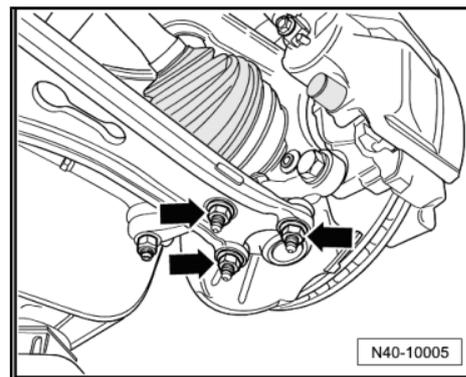


- Bolt swivel joint to suspension link -arrows-.

i Note

Ensure boot is not damaged or twisted.

- Place inner joint of drive shaft in position and tighten bolts diagonally to 10 Nm.
- Tighten multi-point socket-head bolts diagonally to the specified torque.
- Attach lower noise insulation => Rep. Gr. 50 ; Assembly overview - noise insulation .
- Tighten drive shaft bolt at wheel hub:
 - ◆ Hexagon bolt => [page 77](#)
 - ◆ Twelve-point bolt => [page 78](#)



i Note

During this step, vehicle must not be standing on its wheels or wheel bearing will be damaged.

- Install wheel and tighten => [page 288](#) .

Specified torques

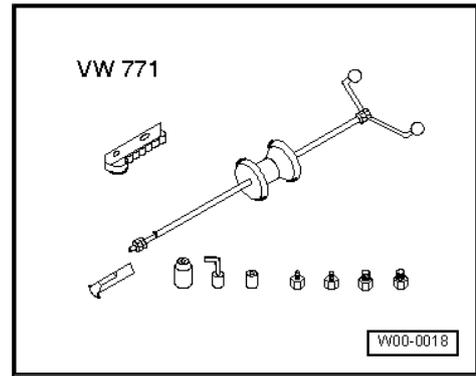
Component	Specified torque
Swivel joint to cast steel suspension link ◆ Use new nuts	60 Nm
Swivel joint to sheet steel or forged aluminium suspension link ◆ Use new nuts	100 Nm
Drive shaft to wheel hub "hexagon bolt" ◆ Use new bolt	200 Nm + 180°
Drive shaft to wheel hub "12-point bolt" ◆ Use new bolt	70 Nm + 90°
Drive shaft to flange shaft on gearbox "M8 multi-point socket" ◆ Use new bolts ◆ Use new backing plates	40 Nm ◆ Initially tighten diagonally to 10 Nm.
Drive shaft to flange shaft on gearbox "M10 multi-point socket" ◆ Use new bolts ◆ Use new backing plates	70 Nm ◆ Initially tighten diagonally to 10 Nm.

6.4 Removing and installing left drive shaft with (push-on) constant velocity slip joint

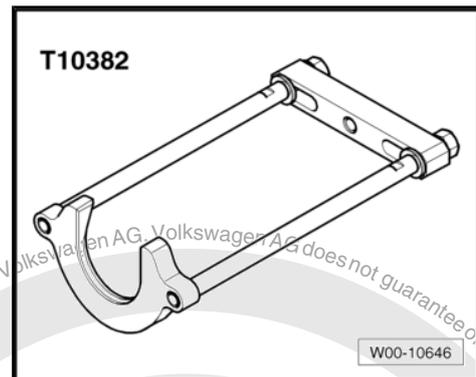
Special tools and workshop equipment required



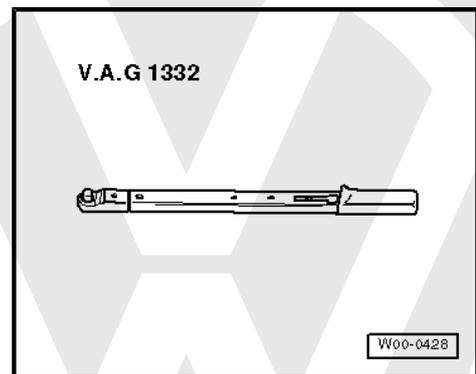
- ◆ Multi-purpose tool -VW 771-



- ◆ Drive shaft puller -T10382-



- ◆ Torque wrench -V.A.G 1332-



Removing

- Loosen drive shaft bolt at wheel hub ⇒ [page 78](#)



Caution

During this step, vehicle must not be standing on its wheels.

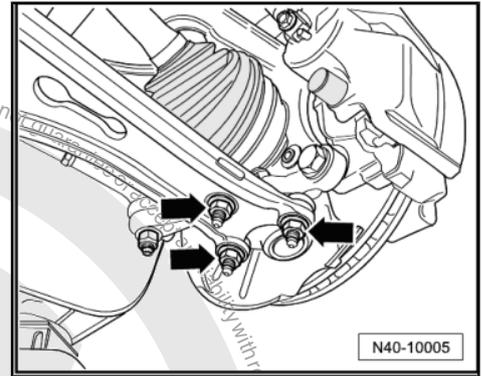
The wheel bearing can be damaged by the weight of the vehicle if the bolt is loosened.

If a vehicle must be moved with the drive shaft removed, an outer joint must be fitted and tightened to 120 Nm.

- Remove lower noise insulation ⇒ Rep. Gr. 50 ; Assembly overview - noise insulation .
- Remove wheel.

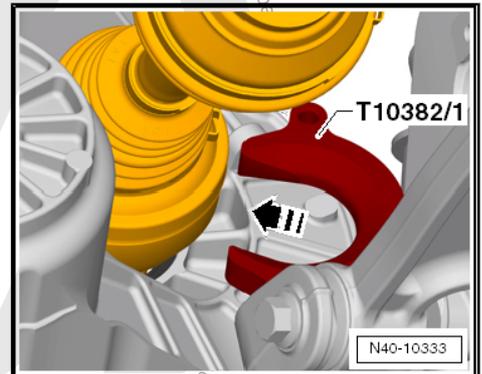


- Remove nuts -arrows-.
- Pull wheel bearing housing with swivel joint out of suspension link.
- Push drive shaft outer joint out of wheel hub by hand.
- Secure drive shaft to prevent it from falling.



- Position puller T10382/1- behind constant velocity slip joint -1-.

Cut-out -arrow- of puller -T10382/1- must face constant velocity slip joint -1-.



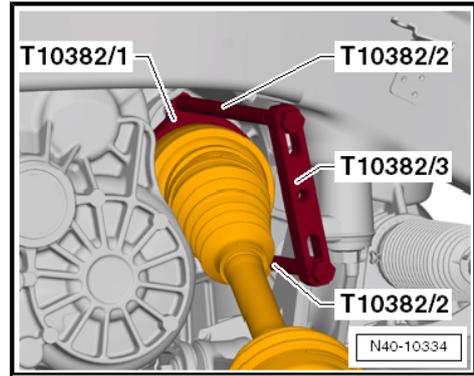


- Install spindles -T10382/2- and traverse -T10382/3- on puller plate -T10382/1- .
- Install multi-purpose tool -VW 771- on traverse -T10382/3- .
- Pull out drive shaft with a couple of strikes of multi-purpose tool -VW 771- .
- Remove drive shaft from vehicle.

Installing

Remove any paint residue and/or corrosion on thread and splines of outer joint.

- Insert new retaining ring in groove in stub shaft on gearbox.
- Lightly grease splines of stub shaft with universal grease -G 060 735 A2-
- Mesh outer and inner splines of gearbox and constant velocity slip joint.
- Slide drive shaft into constant velocity joint to stop by hand.
- Now push constant velocity joint onto stub shaft of gearbox with a "sudden, hard push".



Note

Never use a hammer or other striking tool!

- Check that constant velocity slip joint is seated securely by pulling on constant velocity joint against resistance of retaining ring.



Caution

For this check, pull only on constant velocity slip joint, not on drive shaft.

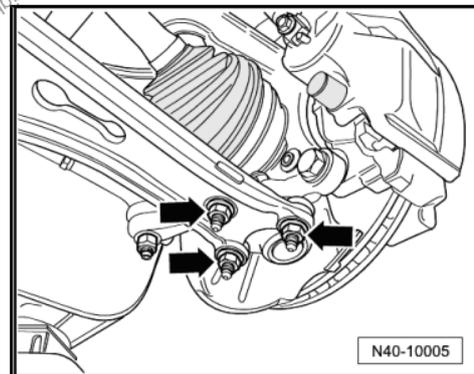
- Detach tensioning strap -T10038- .
- Guide outer joint into wheel hub splines as far as possible.
- Bolt swivel joint to suspension link -arrows-.



Note

Ensure boot is not damaged or twisted.

- Attach lower noise insulation ⇒ Rep. Gr. 50 ; Assembly overview - noise insulation .
- Tighten drive shaft bolt at wheel hub ⇒ [page 78](#) .



Note

During this step, vehicle must not be standing on its wheels or wheel bearing will be damaged.

- Install wheel and tighten ⇒ [page 288](#) .



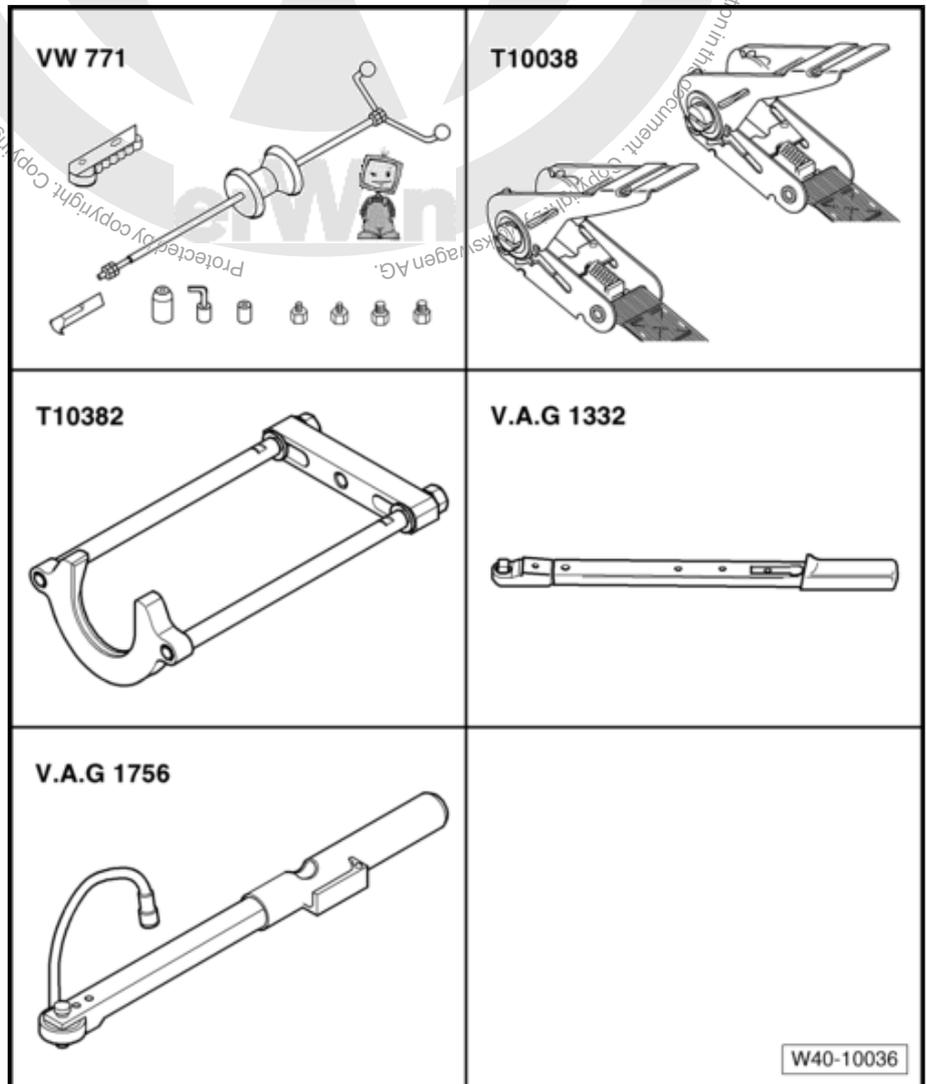
Specified torques

Component	Specified torque
Swivel joint to cast steel suspension link ◆ Use new nuts	60 Nm
Swivel joint to sheet steel or forged aluminium suspension link ◆ Use new nuts	100 Nm
Drive shaft to wheel hub "12-point bolt" ◆ Use new bolt	70 Nm + 90° further

6.5 Removing and installing right drive shaft with (push-on) constant velocity slip joint

Special tools and workshop equipment required

- ◆ Multi-purpose tool -VW 771-
- ◆ Tensioning strap -T10038-
- ◆ Drive shaft puller -T10382-
- ◆ Torque wrench -V.A.G 1332-
- ◆ Torque/angle wrench - V.A.G 1756-



Removing

- Loosen drive shaft bolt at wheel hub ⇒ [page 78](#) .



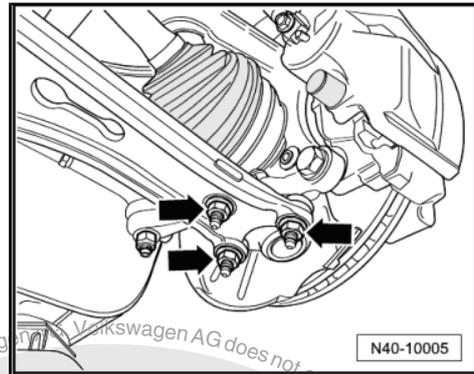
Caution

During this step, vehicle must not be standing on its wheels.

The wheel bearing can be damaged by the weight of the vehicle if the bolt is loosened.

If a vehicle must be moved with the drive shaft removed, an outer joint must be fitted and tightened to 120 Nm.

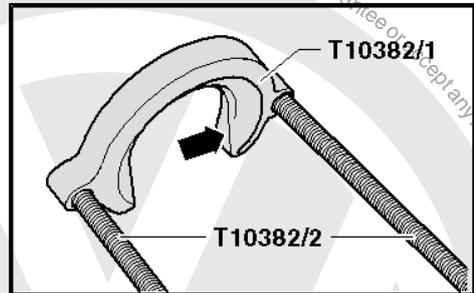
- Remove lower noise insulation ⇒ Rep. Gr. 50 ; Assembly overview - noise insulation .
- Remove wheel.
- Remove nuts -arrows-.
- Pull wheel bearing housing with swivel joint out of suspension link.
- Unbolt coupling rods from anti-roll bars on both sides.
- Push drive shaft outer joint out of wheel hub by hand.
- Secure drive shaft to prevent it from falling.



- Set up drive shaft puller -T10382- .

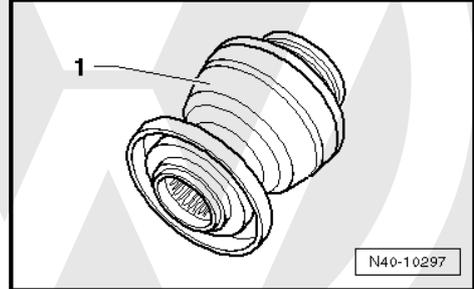
For the constant velocity slip joint -1-, notch -arrow- in the puller plate -T10382/1- must face the spindles -T10382/2- .

- Assemble drive shaft puller -T10382- complete with multi-purpose tool -VW 771- .

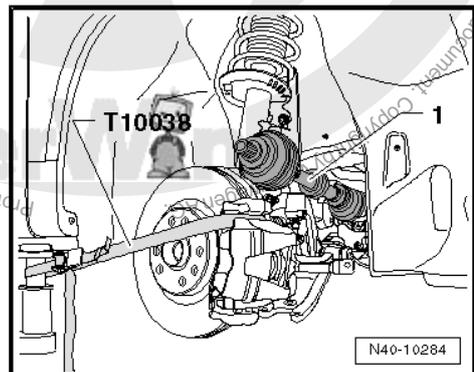


Note

In order to pull the drive shaft out of the gearbox using the drive shaft puller -T10382- , the suspension strut with all attachments must be pulled to the rear.



- Using tensioning strap -T10038- e.g. on lifting platform arm, pull suspension strut with attachments back until the drive shaft puller -T10382- can be applied parallel to drive shaft.



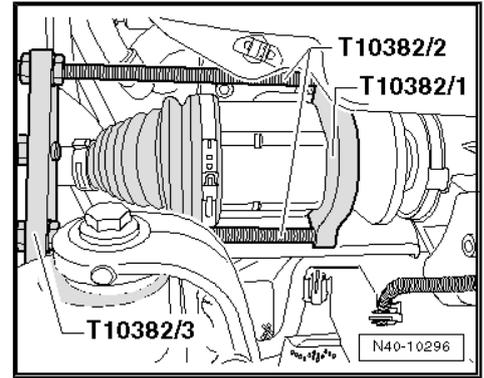


- Set up drive shaft puller -T10382- and pull out drive shaft.
- Remove drive shaft from vehicle.

Installing

Remove any paint residue and/or corrosion on thread and splines of outer joint.

- Insert new retaining ring in groove in stub shaft on gearbox.
- Grease splines of stub shaft lightly with universal grease -G 060 735 A2-
- Mesh outer and inner splines of gearbox and constant velocity slip joint.
- Slide drive shaft into constant velocity joint to stop by hand.
- Now push constant velocity joint onto stub shaft of gearbox with a "sudden, hard push".



Note

Never use a hammer or other striking tool!

- Check that constant velocity slip joint is seated securely by pulling on constant velocity joint against resistance of retaining ring.

Caution

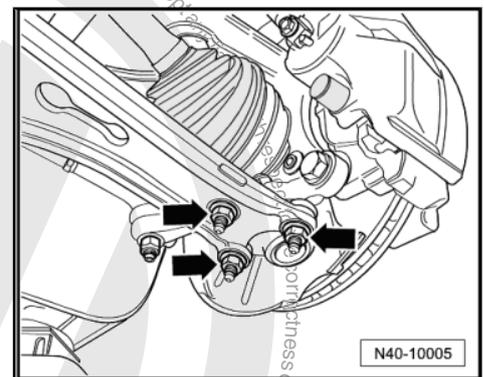
For this check, pull only on constant velocity slip joint, not on drive shaft.

- Detach tensioning strap -T10038-
- Guide outer joint into wheel hub splines as far as possible.
- Bolt swivel joint to suspension link -arrows-.

Note

Ensure boot is not damaged or twisted.

- Attach lower noise insulation => Rep. Gr. 50 ; Assembly over-view - noise insulation .
- Tighten drive shaft bolt at wheel hub => [page 78](#) .



Note

During this step, vehicle must not be standing on its wheels or wheel bearing will be damaged.

- Install wheel and tighten => [page 288](#) .

Specified torques

Component	Specified torque
Swivel joint to cast steel suspension link ◆ Use new nuts	60 Nm

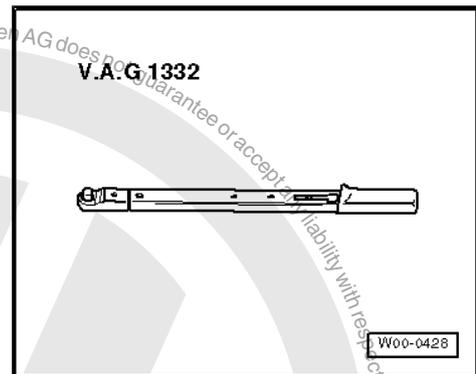


Component	Specified torque
Swivel joint to sheet steel or forged aluminium suspension link ◆ Use new nuts	100 Nm
Drive shaft to wheel hub "12-point bolt" ◆ Use new bolt	70 Nm + 90° further

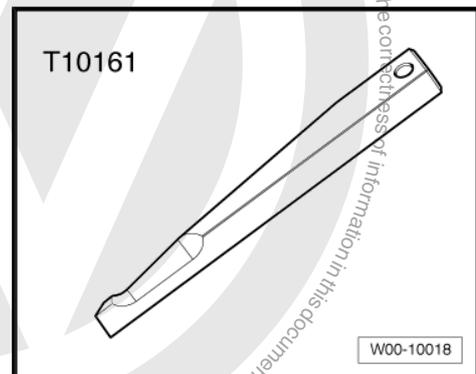
6.6 Removing and installing drive shafts with triple roller joint AAR2600i

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1332-



- ◆ Wedge -T10161-



Removing

- Loosen drive shaft bolt at wheel hub:
 - ◆ Hexagon bolt ⇒ [page 77](#)
 - ◆ Twelve-point bolt ⇒ [page 78](#)



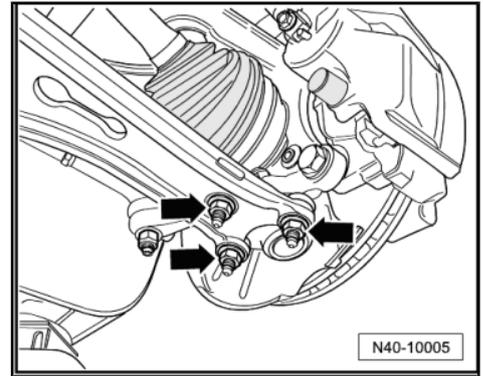
Note

During this step, vehicle must not be standing on its wheels or wheel bearing will be damaged.

- Remove wheel.
- Remove lower noise insulation ⇒ Rep. Gr. 50 ; Assembly overview - noise insulation .



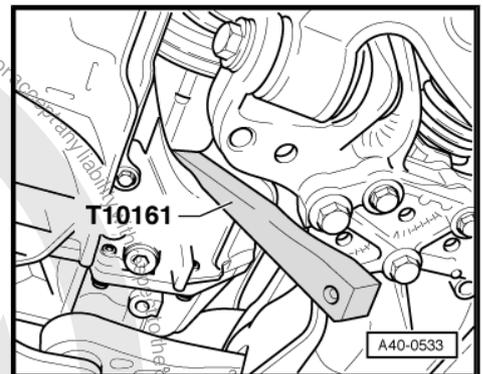
- Remove nuts -arrows-.
- Pull wheel bearing housing with swivel joint out of suspension link.
- Pull drive shaft out of wheel hub and tie up to body.



- Insert wedge -T10161- between gearbox housing and triple roller joint.
- Press inner joint out of gearbox by striking wedge -T10161- with a hammer.
- Remove drive shaft.

Installing

- Fit new retaining ring into groove of joint pin.
- Mesh outer and inner splines of joint body and gearbox.
- Slide drive shaft into joint body to stop by hand.
- Now "suddenly" push joint body into gearbox.



The joint travel can be used for the "sudden push". Do not, however, pull the drive shaft too far out of the joint body.



Note

Never use a hammer or other striking tool!

- Check that drive shaft is seated securely in gearbox by pulling on joint body against resistance of retaining ring.

For this check, pull only on joint body and not on drive shaft.

- Guide outer joint into wheel hub splines as far as possible.
- Attach lower noise insulation → Rep. Gr. 50 ; Assembly overview - noise insulation .



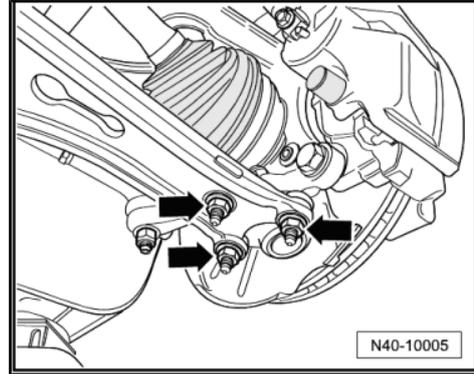
- Bolt swivel joint to suspension link -arrows-.



Note

Ensure boot is not damaged or twisted.

- Tighten drive shaft bolt at wheel hub:
- ◆ Hexagon bolt ⇒ [page 77](#)
- ◆ Twelve-point bolt ⇒ [page 78](#)



Note

During this step, vehicle must not be standing on its wheels or wheel bearing will be damaged.

- Install wheel and tighten ⇒ [page 288](#) .

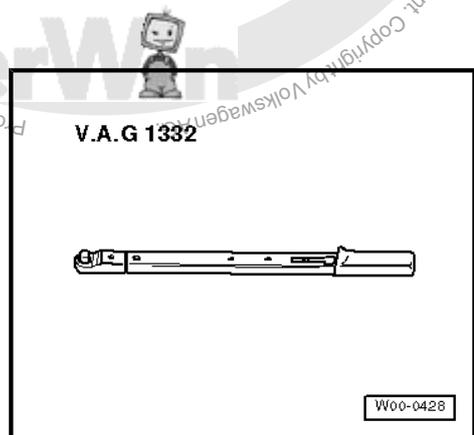
Specified torques

Component	Specified torque
Swivel joint to cast steel suspension link ◆ Use new nuts	60 Nm
Swivel joint to sheet steel or forged aluminium suspension link ◆ Use new nuts	100 Nm
Drive shaft to wheel hub "hexagon bolt" ◆ Use new bolt	200 Nm +180°
Drive shaft to wheel hub "12-point bolt" ◆ Use new bolt	70 Nm + 90°

6.7 Removing and installing drive shafts with triple roller joint AAR3300i

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1332-



Removing

- Loosen drive shaft bolt at wheel hub:
- ◆ Hexagon bolt ⇒ [page 77](#)
- ◆ Twelve-point bolt ⇒ [page 78](#)

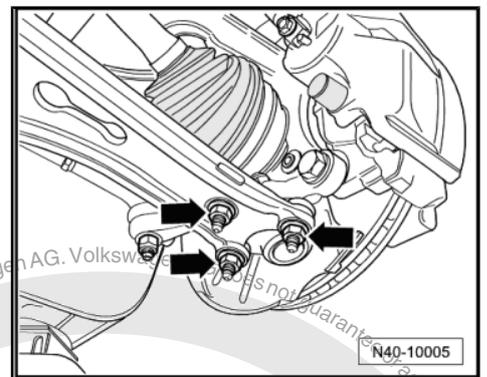
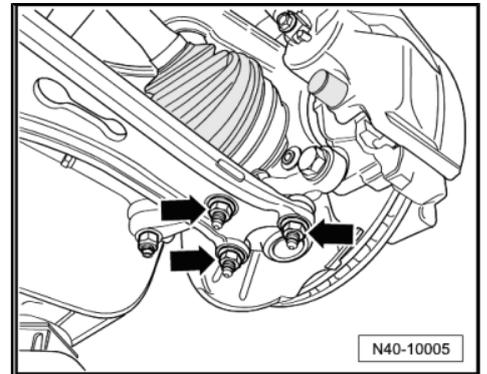


- Remove wheel.
- Remove lower noise insulation => Rep. Gr. 50 ; Assembly overview - noise insulation .
- Unbolt drive shaft from gearbox flange shaft.
- Remove nuts -arrows-.
- Pull wheel bearing housing with swivel joint out of suspension link.
- Pull drive shaft out of wheel hub.

Installing

Remove any paint residue and/or corrosion on thread and splines of outer joint.

- Insert drive shaft.
- Guide outer joint into wheel hub splines as far as possible.
- Bolt swivel joint to suspension link -arrows-.



i Note

Ensure boot is not damaged or twisted.

- Place inner joint of drive shaft in position and tighten bolts diagonally to 10 Nm.
- Tighten multi-point socket-head bolts diagonally to the specified torque.
- Install lower noise insulation. => Rep. Gr. 50 ; Assembly overview - noise insulation .
- Tighten drive shaft bolt at wheel hub:
 - ◆ Hexagon bolt => [page 77](#)
 - ◆ Twelve-point bolt => [page 78](#)

i Note

During this step, vehicle must not be standing on its wheels or wheel bearing will be damaged.

- Install wheel and tighten => [page 288](#)

Specified torques

Component	Specified torque
Swivel joint to cast steel suspension link ◆ Use new nuts	60 Nm
Swivel joint to sheet steel or forged aluminium suspension link ◆ Use new nuts	100 Nm
Drive shaft to wheel hub "hexagon bolt" ◆ Use new bolt	200 Nm +180°
Drive shaft to wheel hub "12-point bolt" ◆ Use new bolt	70 Nm + 90°

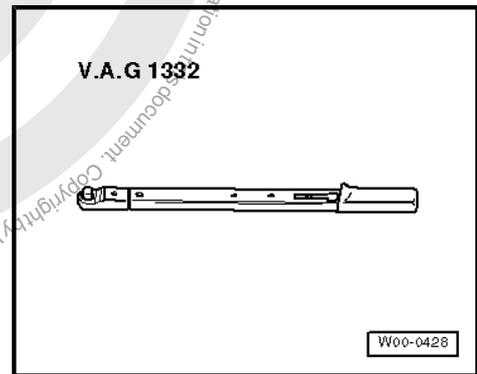


Component	Specified torque
Drive shaft to flange shaft on gearbox "M8 multi-point socket" ◆ Use new bolts	40 Nm ◆ Initially tighten diagonally to 10 Nm.
Drive shaft to flange shaft on gearbox "M10 multi-point socket" ◆ Use new bolts	70 Nm ◆ Initially tighten diagonally to 10 Nm.

6.8 Removing and installing intermediate shaft

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1332-



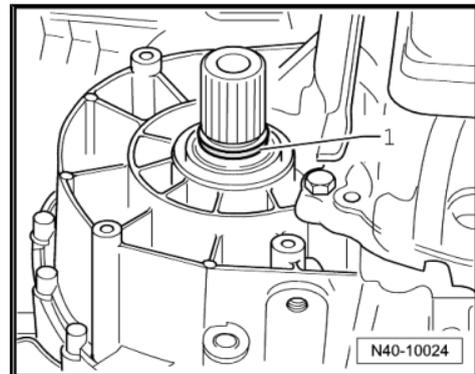
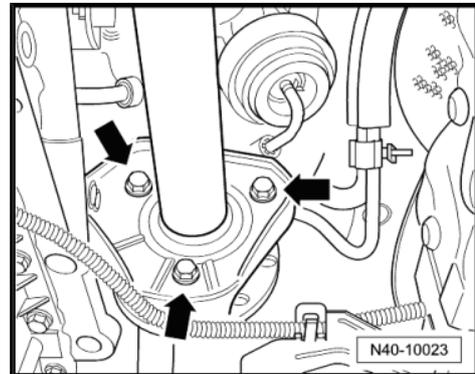
Removing

- Remove drive shaft on right side ⇒ [page 80](#) .
- Loosen all bolts on bearing bracket -arrows-.
- Pull intermediate shaft off gearbox.

Repairing intermediate shaft ⇒ [page 114](#) .

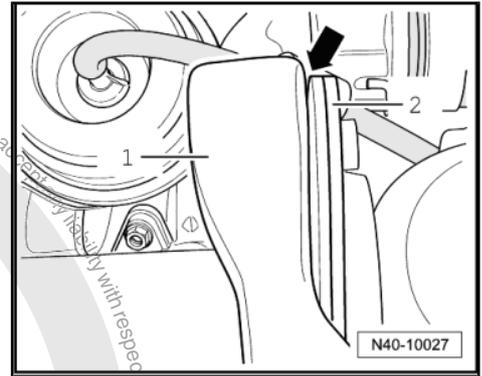
Installing

- First renew seal -1- on gearbox.

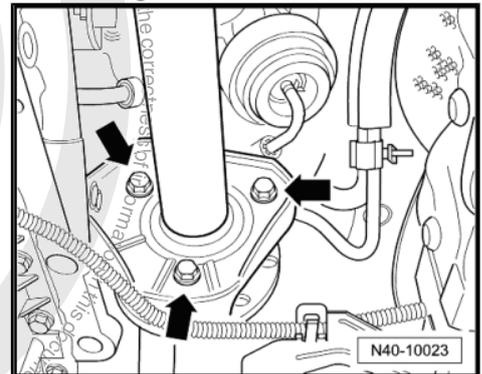




- Now push intermediate shaft onto stub shaft of gearbox until bearing -2- contacts bearing bracket -1- without "gap" -arrow-.



- Tighten bolts -arrows- to prescribed torque.
- Install drive shaft ⇒ [page 80](#) .



Specified torques

Component	Specified torque
Intermediate shaft bearing to bearing bracket	20 Nm

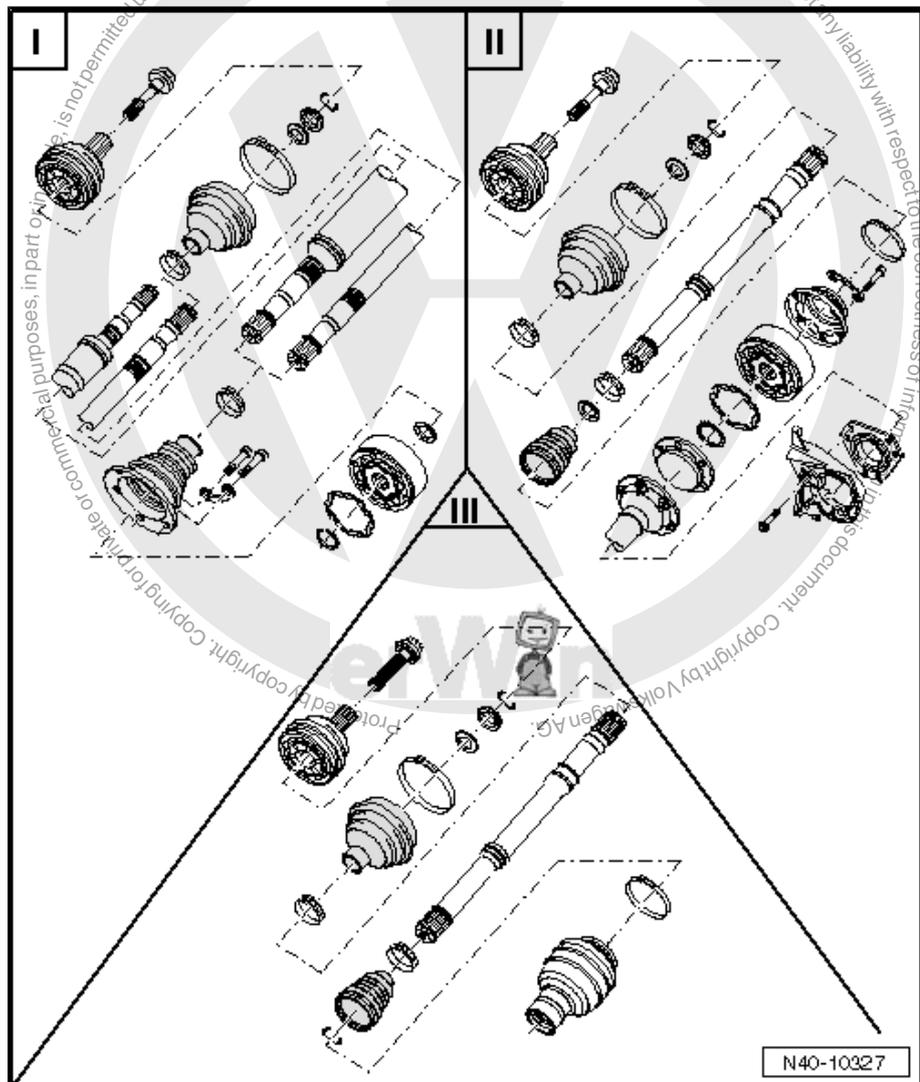


7 Repairing drive shaft - overview of drive shafts

I - Assembly overview - drive shaft with VL90 or VL100 constant velocity joint
⇒ [page 97](#)

II - Assembly overview - drive shaft with VL107 constant velocity joint (bolt-on)
⇒ [page 107](#)

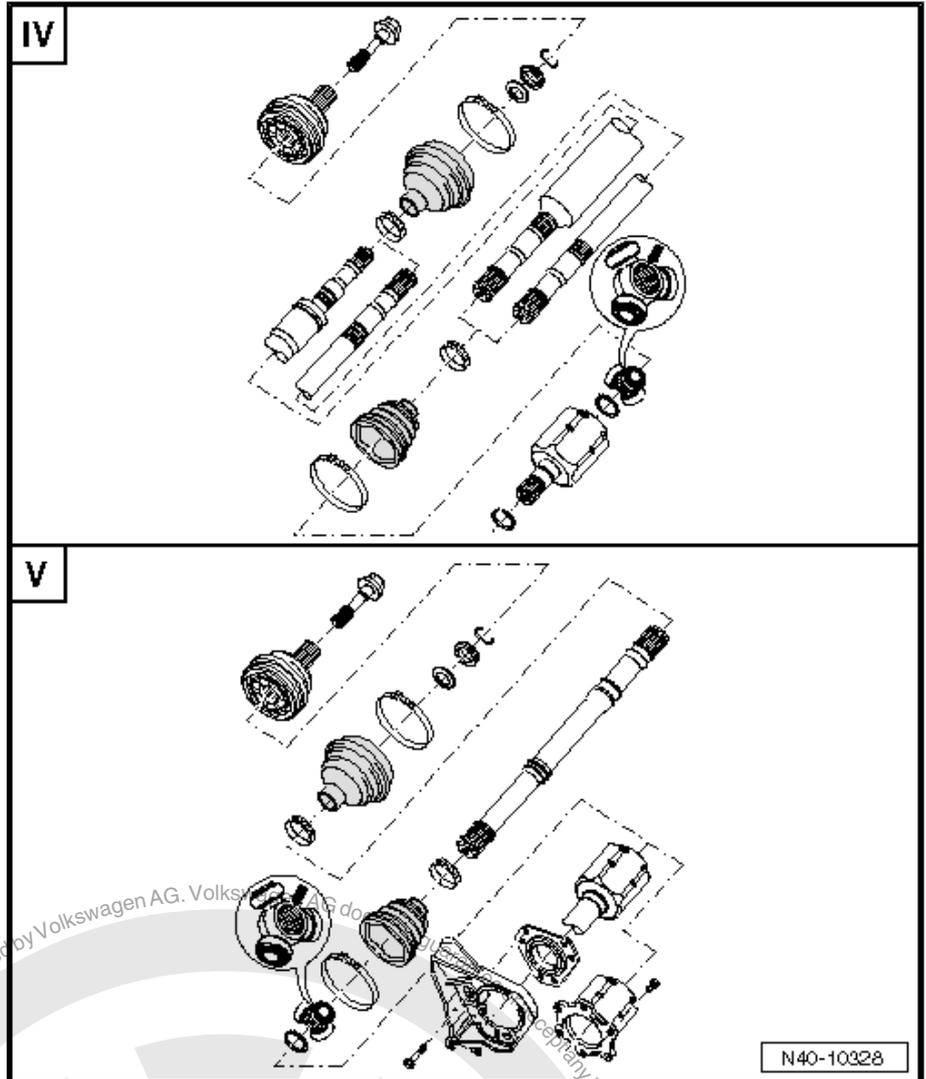
III - Assembly overview - drive shaft with VL107 constant velocity slip joint (push-on)
⇒ [page 116](#)





IV - Assembly overview - drive shaft with triple roller joint
 AAR2600i => [page 121](#)

V - Assembly overview - drive shaft with triple roller joint
 AAR3300i => [page 127](#)



Distinguishing between drive shafts when installed

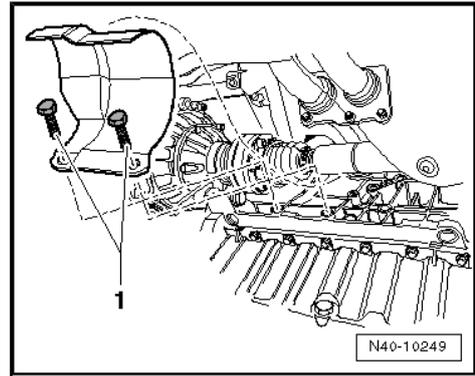
	VL90	VL100	VL107 (bolt-on)	VL 107 (push-on)	AAR2600i	AAR3300i
Diameter of inner joint in mm	90	100	107	-	-	-
Cover between inner joint and drive flange	-	-	X	-	-	-
With bearing bracket on right side	-	-	X	-	-	X
Inner joint fitted in gearbox	-	-	-	-	X	-
Inner joint pushed onto stub shaft	-	-	-	X	-	-



7.1 Heat shields for drive shafts

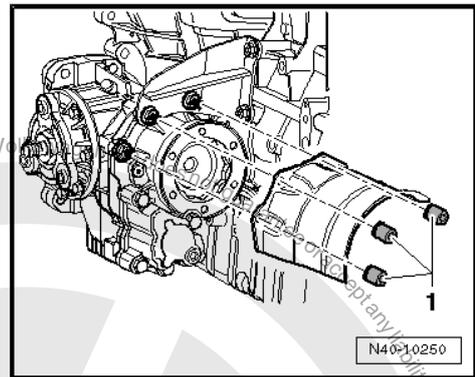
Front-wheel drive

Component	Specified torque
Hexagon bolt -1-	25 Nm



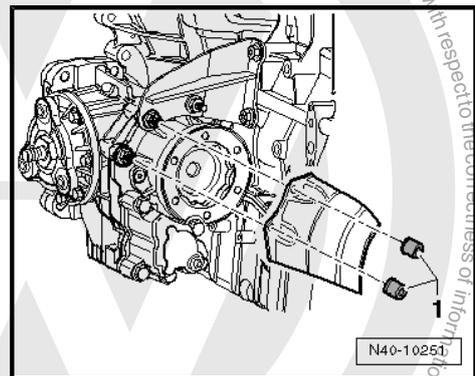
Four-wheel drive:

Component	Specified torque
Nuts -1-	20 Nm ◆ Initially tighten all nuts to 10 Nm



Four-wheel drive:

Component	Specified torque
Nuts -1-	20 Nm ◆ Initially tighten all nuts to 10 Nm





8 Assembly overview - drive shaft with VL90 or VL100 constant velocity joint

1 - Outer constant velocity joint

- Renew only as complete unit
- Removing ⇒ [page 101](#)
- Installing: drive onto shaft to stop using a plastic mallet
- Checking ⇒ [page 103](#)

2 - Bolt

- M16 x 1.5 x 80
- Hexagon bolt, 200 Nm and turn +180° further
- 12-point bolt, 70 Nm + 90° further
- Always renew after removing

When bolt is loosened or tightened, vehicle must not be standing on its wheels

3 - Right drive shaft

4 - Hose clip

- Always renew after removing
- Tightening ⇒ [page 103](#)

5 - Boot

- Check for splits and chafing
- Material: Hytrel (polyester elastomer)

6 - Hose clip

- Always renew after removing
- Tightening ⇒ [page 103](#)

7 - Dished spring

- Installation position ⇒ [page 101](#)

8 - Thrust washer

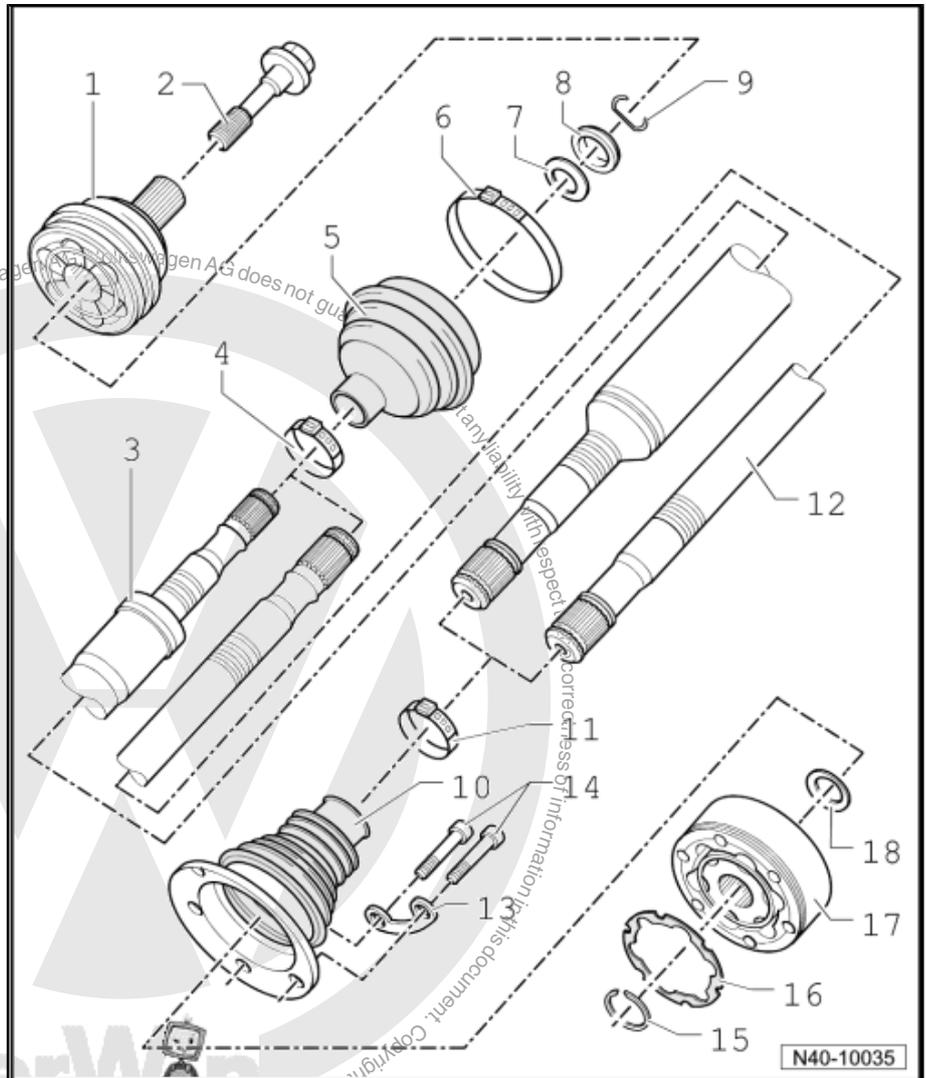
- Installation position ⇒ [page 101](#)

9 - Retaining ring

- Always renew after removing
- Insert in groove in shaft

10 - Boot for constant velocity joint

- Material: Hytrel (polyester elastomer)
- Without breather hole
- Check for splits and chafing
- Drive off constant velocity joint with a drift
- Coat sealing surface with D 454 300 A2 before installing constant velocity joint





11 - Hose clip

- Always renew after removing
- Tightening ⇒ [page 103](#)

12 - Left drive shaft

13 - Locking plate

- Renew each time after removing

14 - Multi-point socket head bolt

- Initially tighten diagonally to 10 Nm and then tighten diagonally to specified torque.

M8 bolt: 40 Nm

M10 bolt: 70 Nm

- Always renew bolts after removing

15 - Retaining ring

- Remove and install with -VW 161- A.

16 - Seal

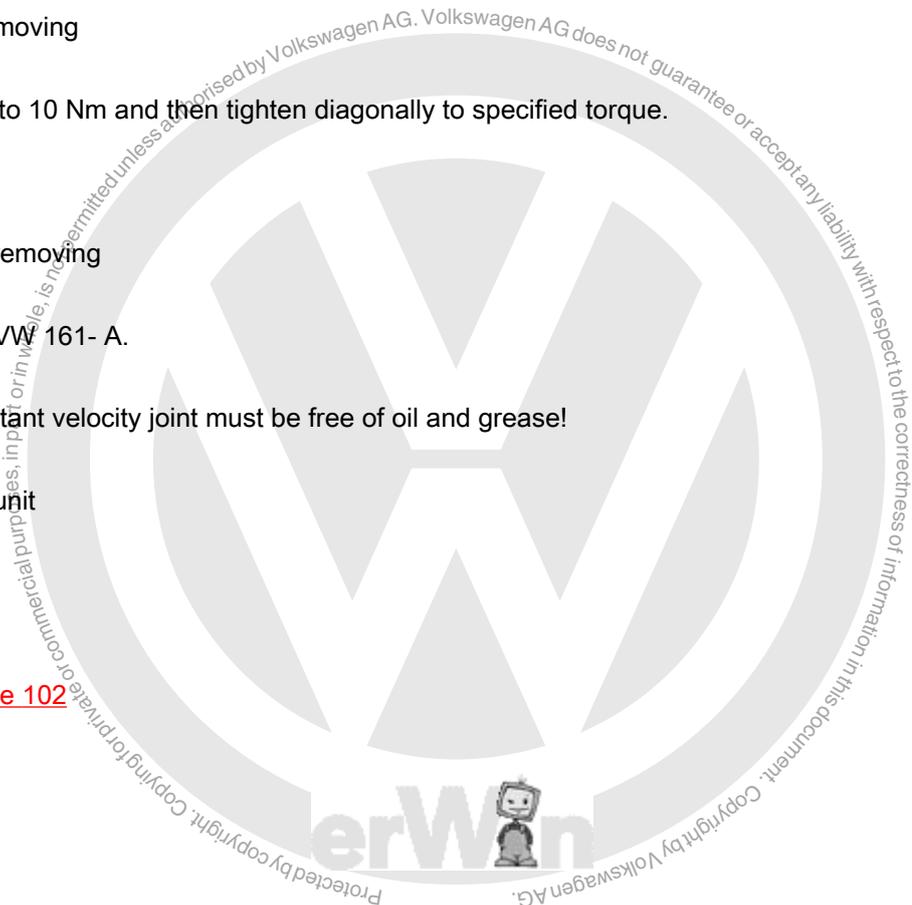
- Adhesive surface on constant velocity joint must be free of oil and grease!

17 - Inner constant velocity joint

- Renew only as complete unit
- Pressing off ⇒ [page 102](#)
- Pressing on ⇒ [page 102](#)
- Checking ⇒ [page 104](#)

18 - Dished spring

- Installation position ⇒ [page 102](#)

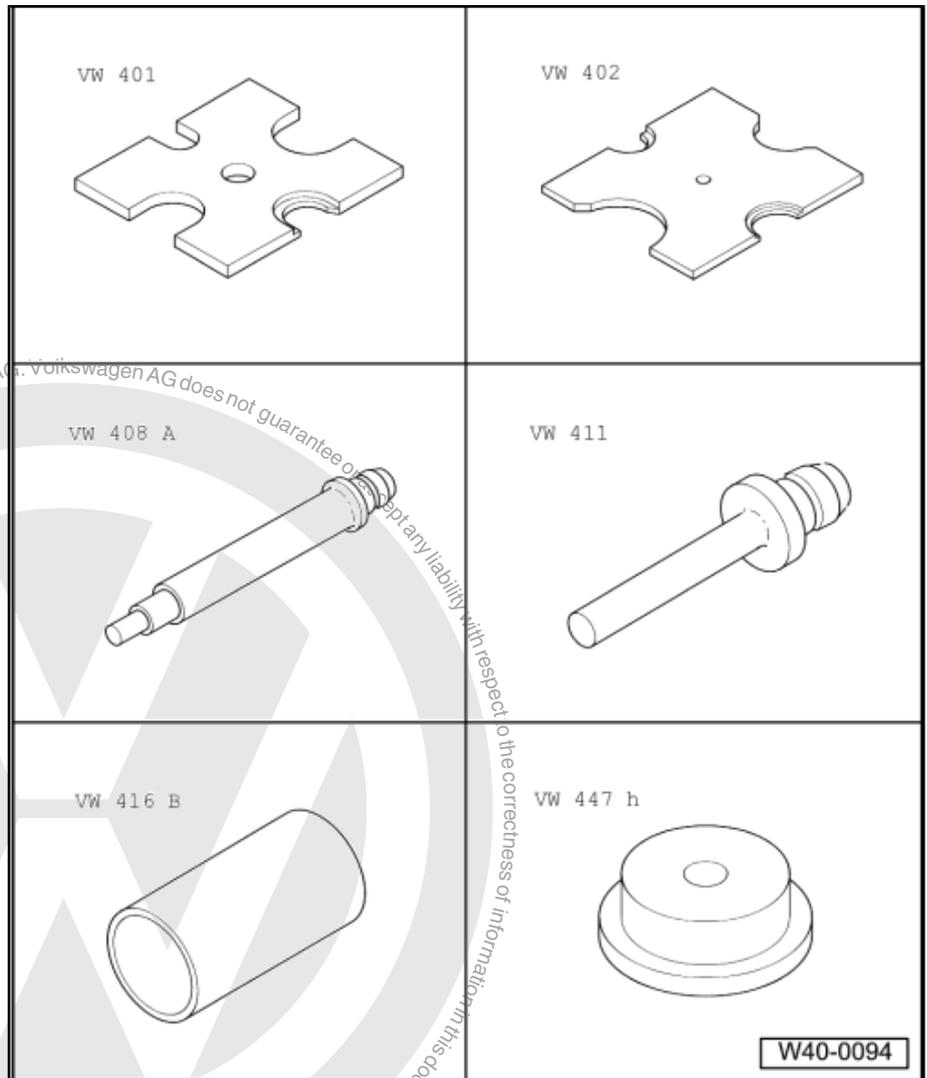




8.1 Dismantling and assembling drive shaft with VL90 or VL100 constant velocity joint

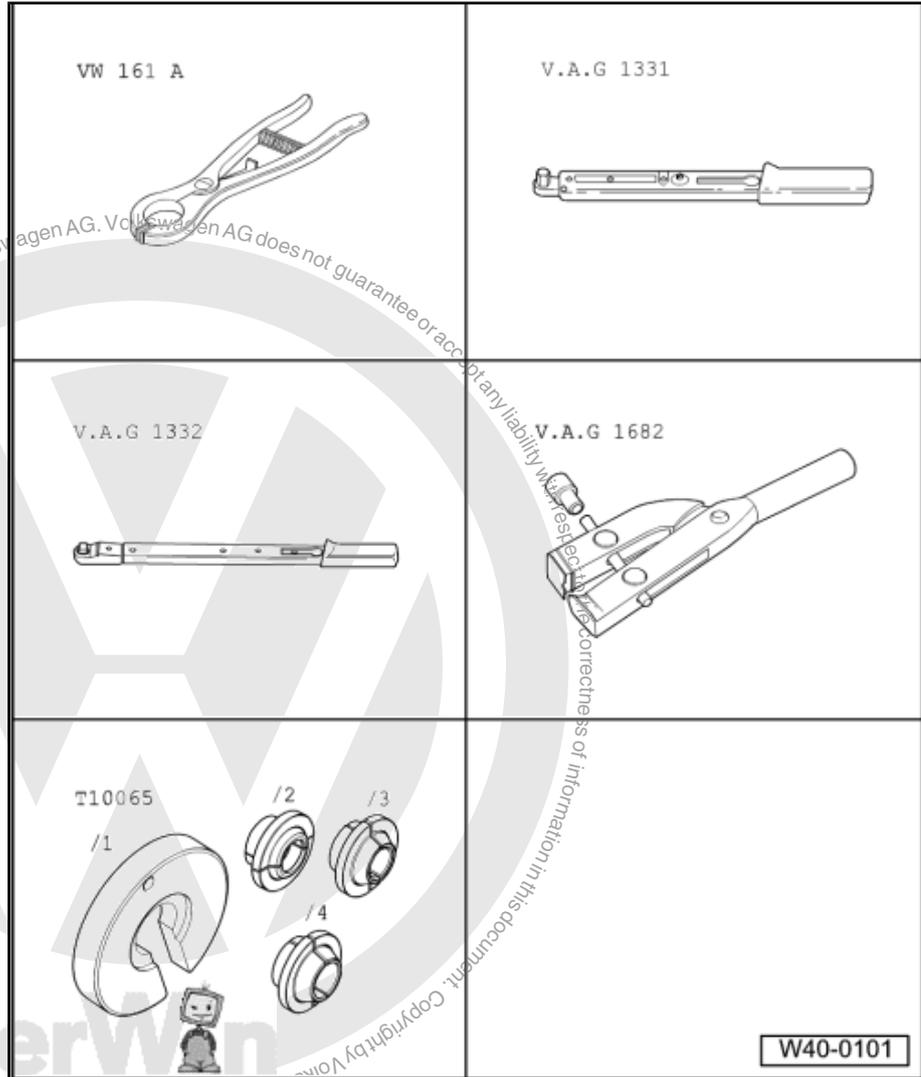
Special tools and workshop equipment required

- ◆ Thrust plate -VW 401-
- ◆ Thrust plate -VW 402-
- ◆ Press tool -VW 408 A-
- ◆ Press tool -VW 411-
- ◆ Tube -VW 416 B-
- ◆ Thrust plate -VW 447 H-

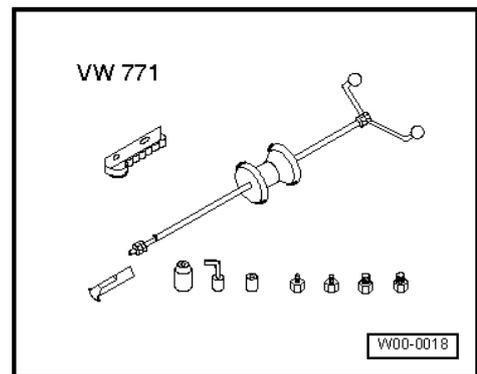




- ◆ Circlip pliers -VW 161 A-
- ◆ Torque wrench -V.A.G 1331-
- ◆ Torque wrench -V.A.G 1332-
- ◆ Special pliers -V.A.G 1682-
- ◆ Assembly tool -T10065-

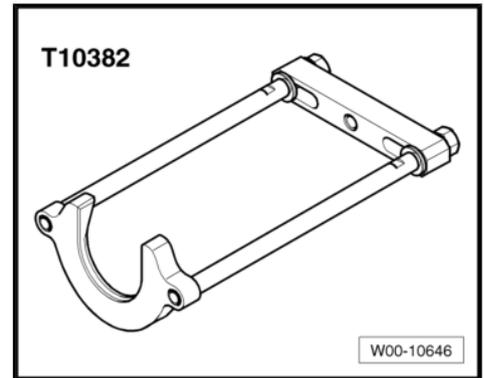


- ◆ Multi-purpose tool -VW 771-





◆ Puller -T10382-

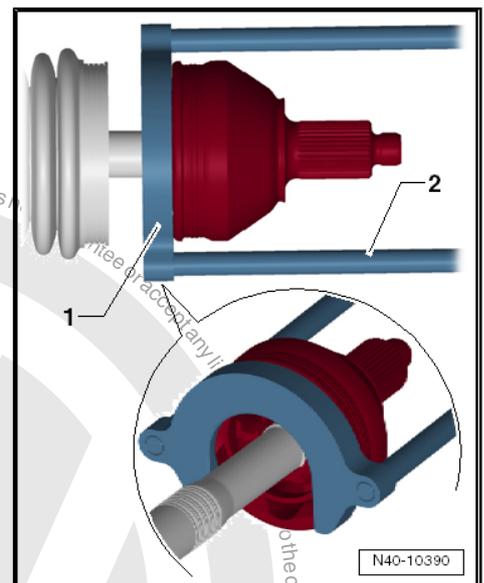


Removing outer constant velocity joint

- Clamp drive shaft in vice using protective jaw covers.
- Fold back boot.
- Set puller -T10382- up so that smooth side of puller plate - T10382/1- points to spindles -T10382/2- .
- Assemble puller -T10382- complete with multi-purpose tool - VW 771- .
- Pull constant velocity joint from drive shaft with puller -T10382- and multi-purpose tool -VW 771- .

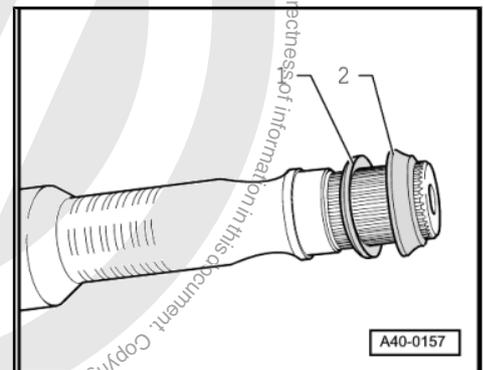
- 1 - Puller plate -T10382/1-
- 2 - Spindles -T10382/2-

Driving on outer constant velocity joint



Installation position of dished spring 1 and thrust washer 2 on outer joint

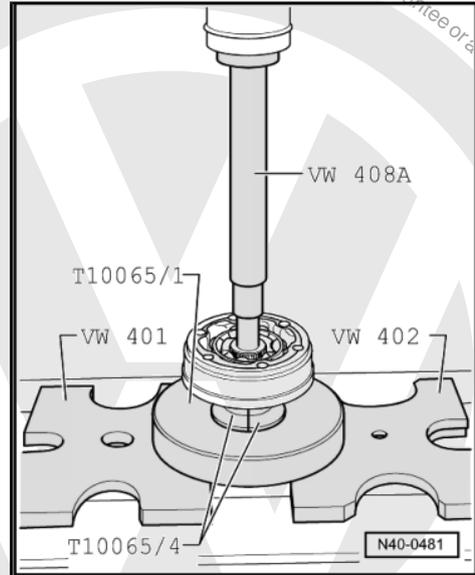
- 1 - Dished spring
 - 2 - Thrust washer
- Install new retaining ring.
 - If necessary, push new joint boot onto drive shaft.
 - Drive onto shaft with plastic head hammer until retaining ring engages.





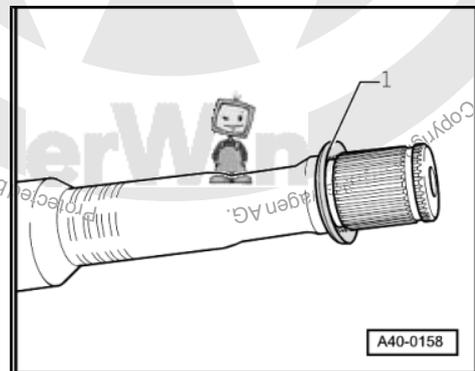
Pressing off inner constant velocity joint

Assembling



Installation position of dished spring at inner joint

- 1 - Dished spring

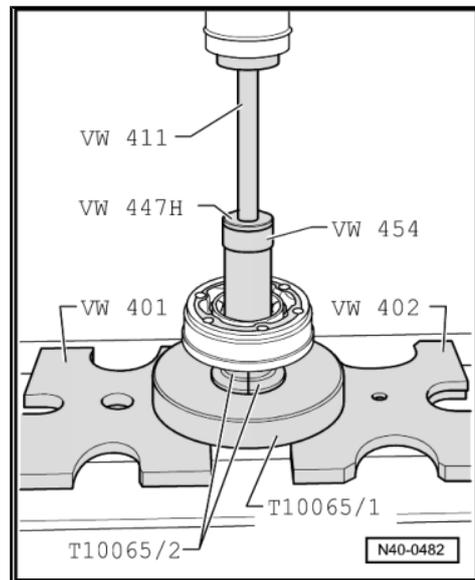


Pressing on inner constant velocity joint



Note

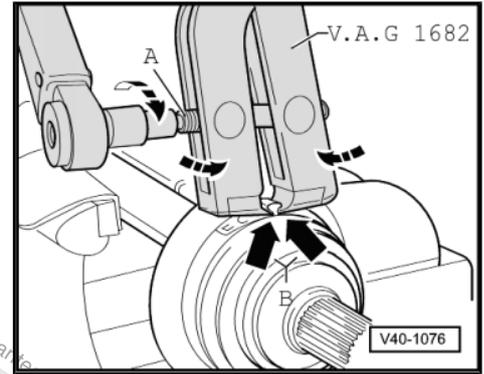
Chamfer on internal circumference of ball hub (splines) must face contact shoulder on drive shaft.





Tighten hose clip on outer joint

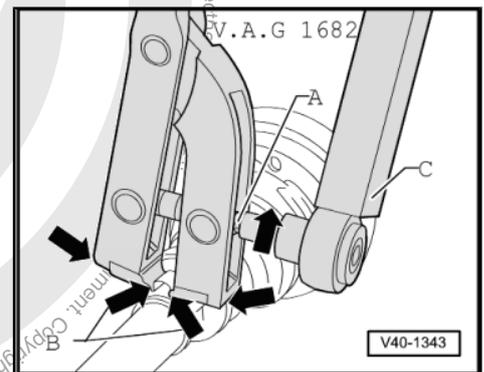
- Apply special pliers -V.A.G 1682- as shown in diagram. Ensure that the jaws of the pliers seat in the ends of the hose clip -arrows B-.
- Tighten hose clip by turning spindle with a torque wrench (do not cant pliers).



i Note

- ◆ Because a stainless steel hose clip is required due to the hard material of the joint boot (compared to rubber), it is possible to tighten the hose clip only with special pliers -V.A.G 1682-.
- ◆ Specified torque: 25 Nm.
- ◆ Use torque wrench -C- with adjustment range 5 ... 50 Nm, (e.g. torque wrench -V.A.G 1331-).
- ◆ Make sure thread of spindle -A- on pliers moves freely. Lubricate with MoS2 grease if necessary.
- ◆ If the thread is tight (e.g. due to dirt), the required clamping force for the clip will not be attained although the correct torque is applied.

Tightening hose clip on small diameter

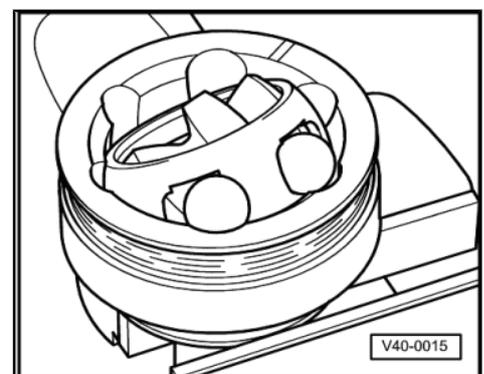


8.2 Checking outer constant velocity joint

The joint is to be dismantled to renew the grease if it is heavily soiled, or to check the running surfaces of the balls for wear and damage.

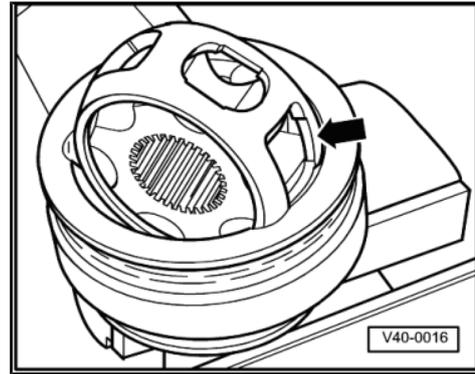
Removing

- Before dismantling, mark position of ball hub in relation to ball cage and joint body with an electric scribe or oil stone.
- Swing ball hub and ball cage.
- Remove balls one at a time.





- Turn cage until the two rectangular windows -arrow- align with joint body.
- Take out cage with hub.

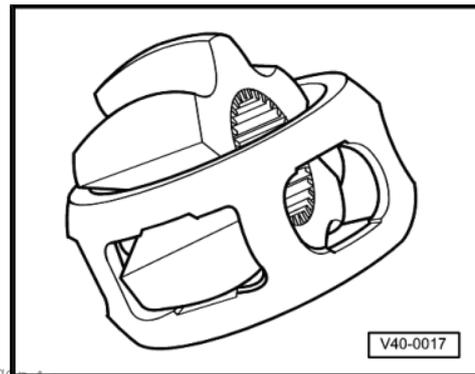


- Swing segment of hub into square cage window.
- Tip hub out of cage.

The six balls for each joint belong to a tolerance group. Check stub axle, hub, cage and balls for small indentations (pitting) and traces of seizing. Too much circumferential backlash in the joint becomes noticeable during load change jolts; in such cases, the joint must be renewed. Smoothing and traces of wear of the balls are no reason to change the joint.

Installing

- Pack half of total grease quantity (40 g) into joint body.
- Fit cage with hub into joint body.
- Press in opposing balls one after the other; the original position of the hub relative to the cage and joint body must be restored.
- Fit new retaining ring into hub.
- Distribute remaining grease in boot.



8.3 Checking inner constant velocity joint

Removing

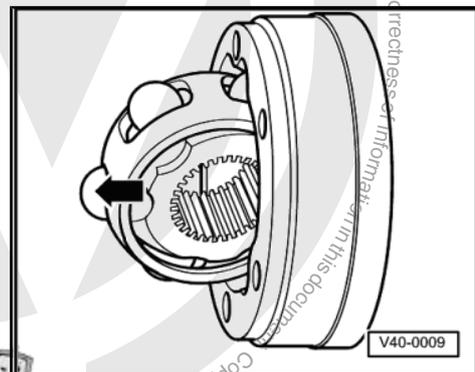
The joint is to be dismantled to renew the grease if it is heavily soiled, and to check the running surfaces and the balls for wear and damage.

- Swing ball hub and ball cage.
- Press out joint body in direction of arrow.
- Press balls out of cage.



Note

The ball hub and joint body are paired. Do not interchange them.





- Tip ball hub out of ball cage via ball track -arrows-.
- Check joint body, ball hub, ball cage and balls for pitting and traces of seizing.

Excessive circumferential backlash in the joint is noticeable during load change jolts. In this case the joint must be replaced. Smoothing and traces of wear of the balls are no reason to renew the joint.

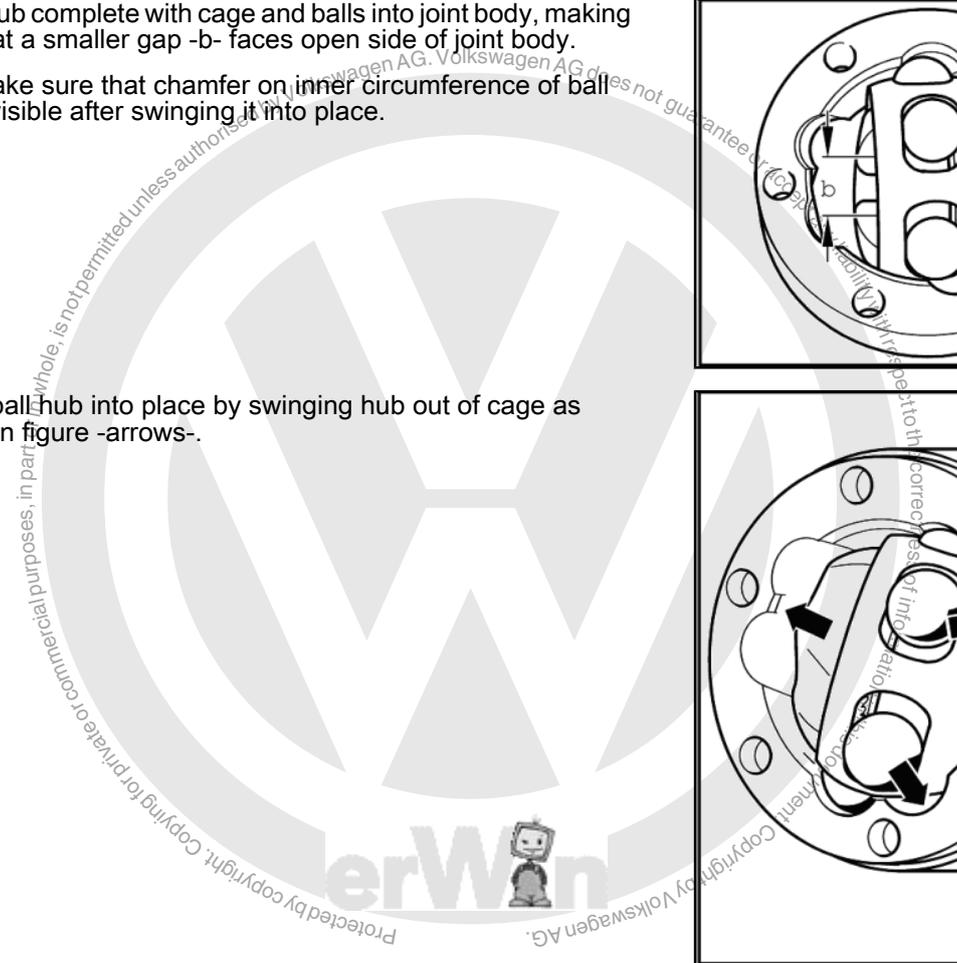
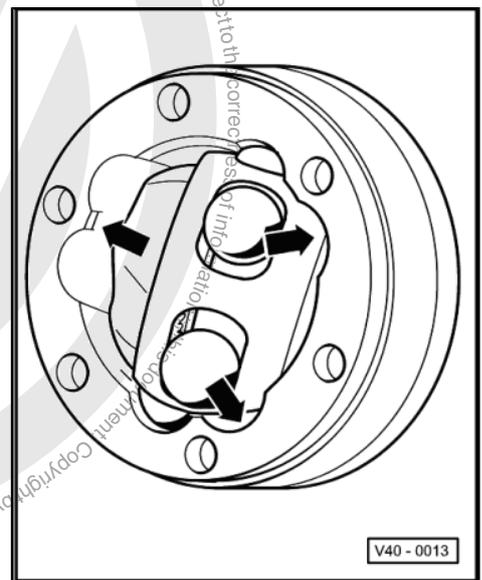
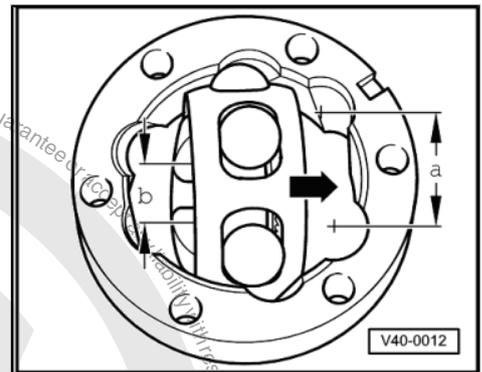
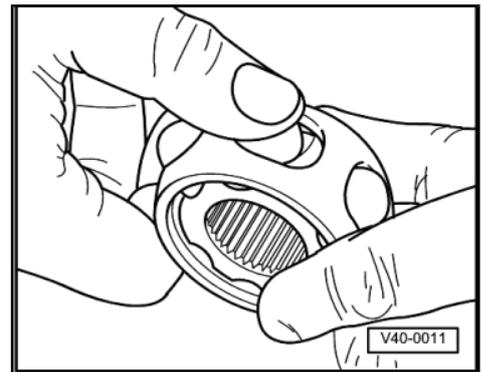
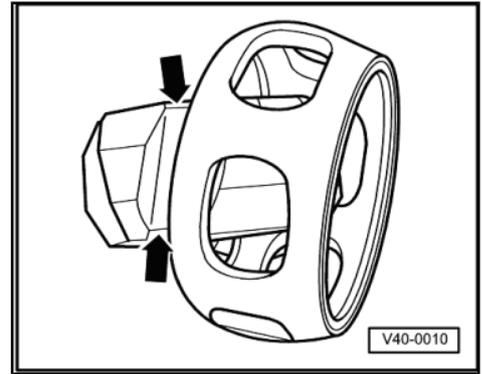
Installing

- Insert hub into cage via the two chamfers. The hub can be installed in any position. Press balls into cage.

The ball hub has two different distances between the ball tracks: a smaller one and a larger one.

- Insert hub complete with cage and balls into joint body, making sure that a smaller gap -b- faces open side of joint body.
- Also make sure that chamfer on inner circumference of ball hub is visible after swinging it into place.

- Swing ball hub into place by swinging hub out of cage as shown in figure -arrows-.

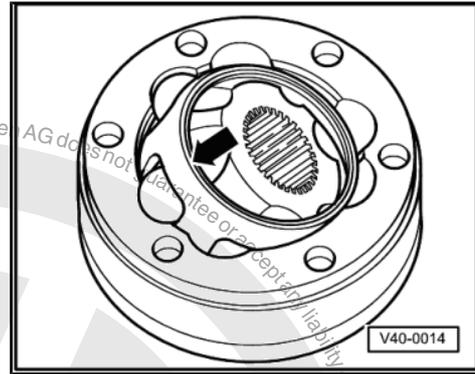




- Swivel in hub with balls by applying firm pressure to cage
-arrow-

Checking function of constant velocity joint

The constant velocity joint is correctly assembled if the ball hub can be moved by hand backwards and forwards over its entire range of axial movement.





9 Assembly overview - drive shaft with VL107 constant velocity joint (bolt-on)

1 - Outer constant velocity joint

- Renew only as complete unit
- Removing ⇒ [page 110](#) .
- Installing: drive onto shaft to stop using a plastic mallet
- Checking ⇒ [page 103](#)

2 - Bolt

- M16 x 1.5 x 80
- Hexagon bolt, 200 Nm and turn +180° further
- 12-point bolt, 70 Nm + 90° further
- Always renew after removing

When bolt is loosened or tightened, vehicle must not be standing on its wheels

3 - Hose clip

- Always renew after removing
- Tightening ⇒ [page 113](#)

4 - Boot

- Check for splits and chafing
- Material: Hytrel (polyester elastomer)

5 - Hose clip

- Always renew after removing
- Tightening ⇒ [page 113](#)

6 - Dished spring

- Installation position ⇒ [page 111](#)

7 - Thrust washer

- Installation position ⇒ [page 111](#)

8 - Retaining ring

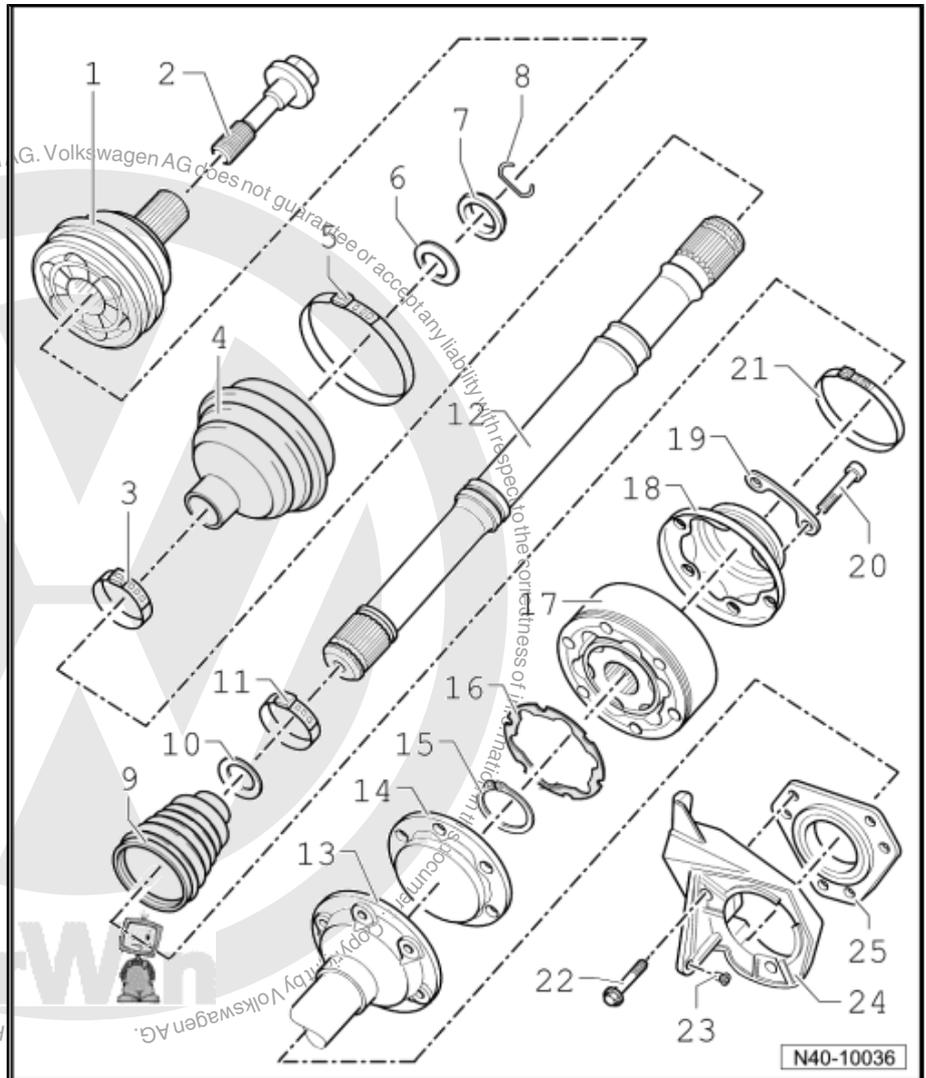
- Always renew after removing
- Insert in groove in shaft

9 - Boot for constant velocity joint

- Material: Hytrel (polyester elastomer)
- Without breather hole
- Check for splits and chafing
- Drive off constant velocity joint with a drift
- Coat sealing surface with D 454 300 A2 before installing constant velocity joint

10 - Dished spring

- Installation position ⇒ [page 111](#)





11 - Hose clip

- Always renew after removing
- Tightening ⇒ [page 113](#)

12 - Drive shaft

13 - Intermediate shaft

- For Golf only
- Right side of vehicle:
- Removing and installing ⇒ [page 92](#)
- Repairing ⇒ [page 114](#)

14 - Cover

- Always renew after removing
- Always renew
- Pressing off ⇒ [page 111](#)

15 - Retaining ring

- Remove and install with circlip pliers -VW 161 A-

16 - Seal

- Adhesive surface on constant velocity joint must be free of oil and grease!

17 - Inner constant velocity joint

- Renew only as complete unit
- Pressing off ⇒ [page 111](#)
- Pressing on ⇒ [page 112](#)
- Checking ⇒ [page 104](#)

18 - Cap

- Drive off carefully with drift
- Coat sealing surface with D 454 300 A2 before installing constant velocity joint
- Adhesive surface must be free of oil and grease!

19 - Locking plate

- Renew each time after removing

20 - Multi-point socket head bolt

- Initially tighten diagonally to 10 Nm and then tighten diagonally to specified torque.
M8 bolt: 40 Nm
M10 bolt: 70 Nm
- Always renew bolts after removing

21 - Hose clip

- Always renew after removing
- Tightening ⇒ [page 113](#)

22 - Bolt

- 20 Nm
- For Golf only

23 - Countersunk head bolt

- Initially tighten to 5 Nm and then to 35 Nm
- For Golf only
- Qty. 3

24 - Bearing bracket

- For Golf only



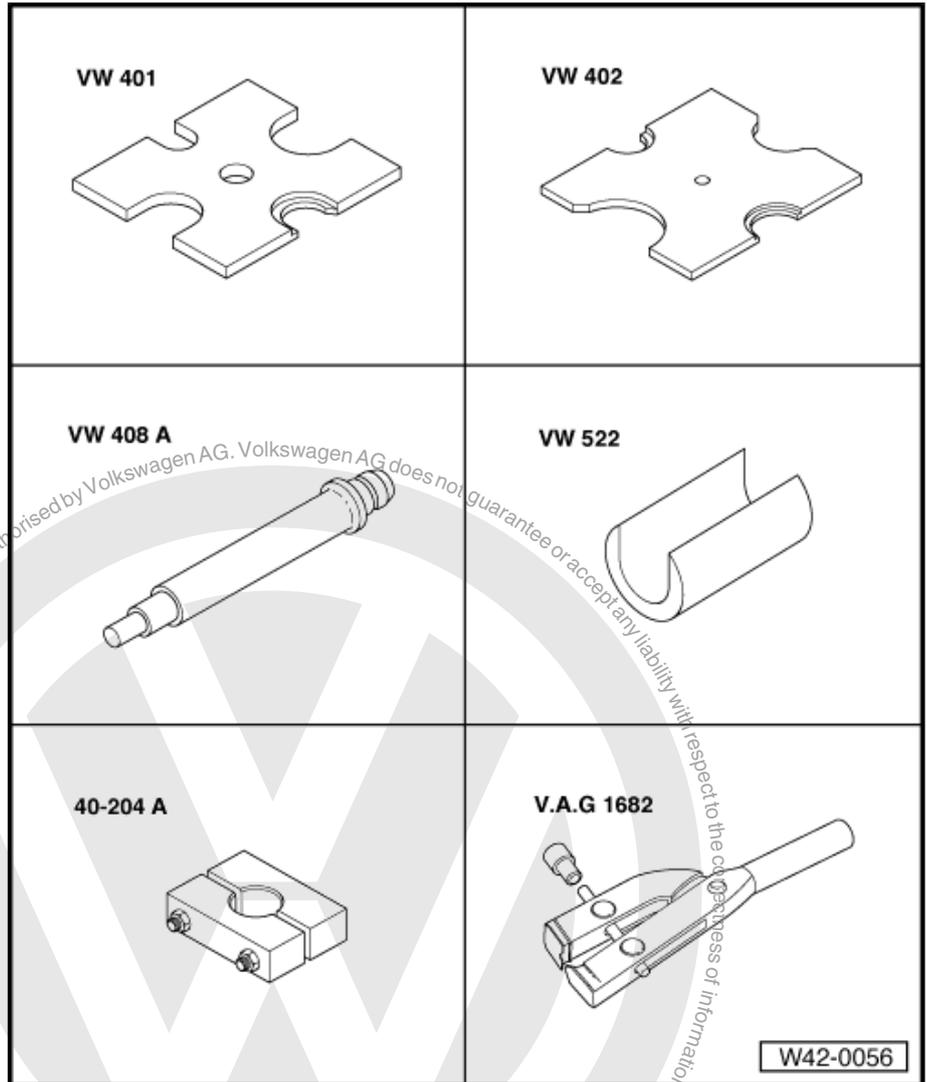
25 - Bearing

- For Golf only
- Pressing off on [⇒ page 114](#)

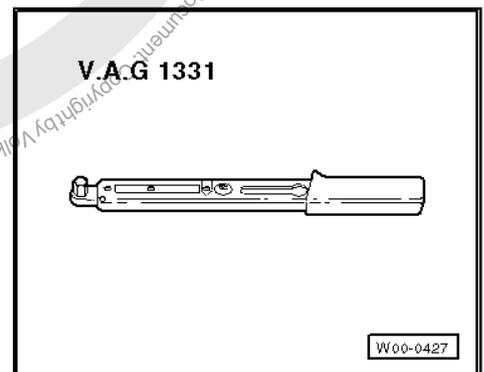
9.1 Dismantling and assembling drive shaft with VL107 constant velocity joint

Special tools and workshop equipment required

- ◆ Thrust plate -VW 401-
- ◆ Thrust plate -VW 402-
- ◆ Press tool -VW 408 A-
- ◆ Support sleeve -VW 522-
- ◆ Tensioner -40 - 204 A-
- ◆ Special pliers -V.A.G 1682-

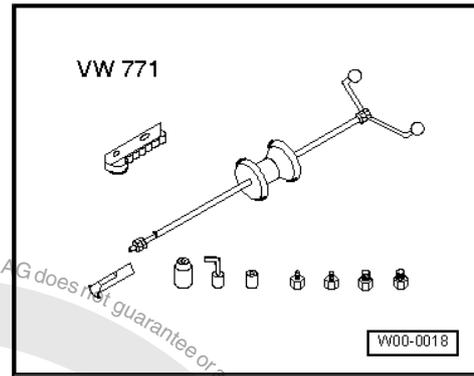


- ◆ Torque wrench -V.A.G 1331-

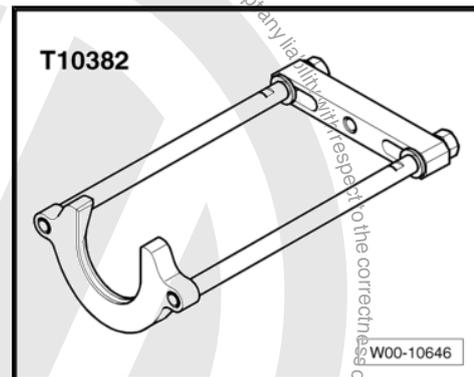




◆ Multi-purpose tool -VW 771-



◆ Puller -T10382-



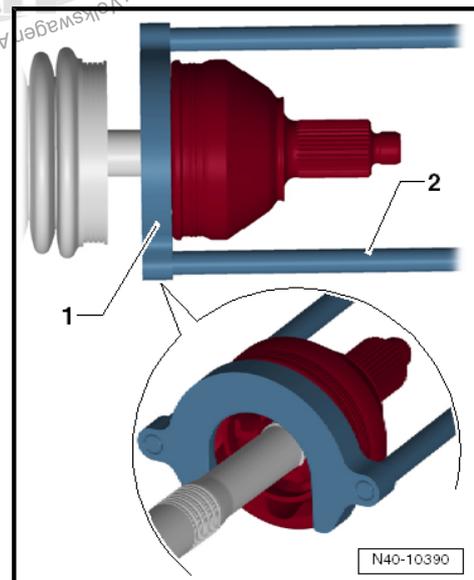
Removing outer constant velocity joint

- Clamp drive shaft in vice using protective jaw covers.
- Fold back boot.
- Set puller -T10382- up so that smooth side of puller plate - T10382/1- points to spindles -T10382/2- .
- Assemble puller -T10382- complete with multi-purpose tool - VW 771- .
- Pull constant velocity joint from drive shaft with puller -T10382- and multi-purpose tool -VW 771- .

1 - Puller plate -T10382/1-

2 - Spindles -T10382/2-

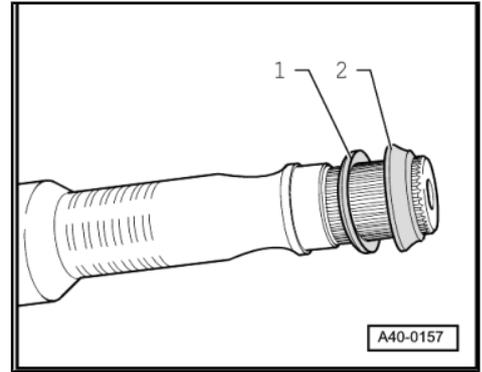
Driving on outer constant velocity joint





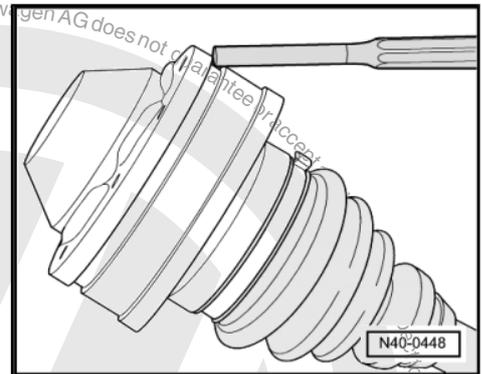
Installation position of dished spring and thrust washer on outer joint

- 1 - Dished spring
- 2 - Thrust washer
- Knock onto shaft with plastic hammer until circlip engages.

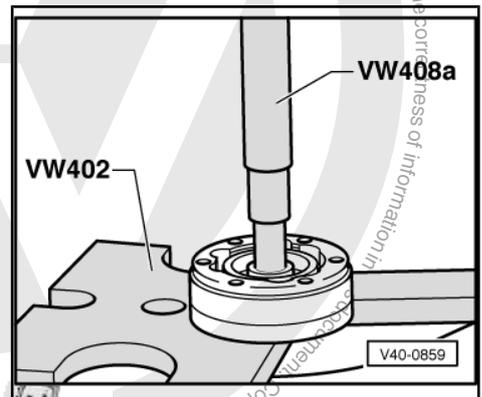


Driving off cover for inner joint

- Remove retaining ring.
- Remove both hose clips and slide boot towards outer joint.
- Use drift to drive off boot.

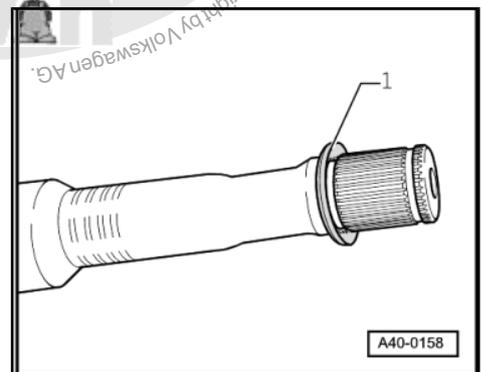


Pressing off inner constant velocity joint Assembling



Installation position of dished spring at inner joint

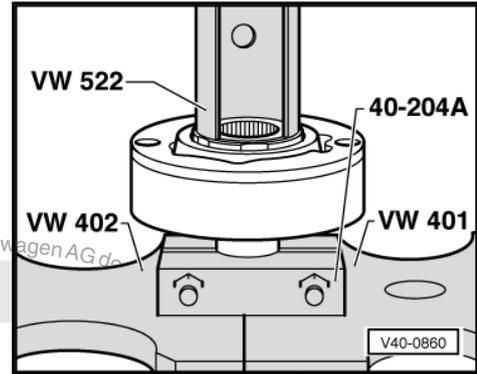
- 1 - Dished spring



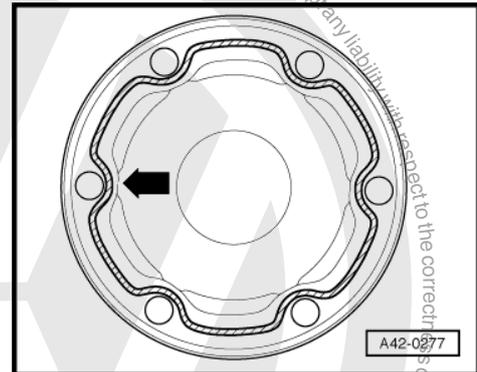


Pressing on inner constant velocity joint

- Press joint on to stop.
- Install retaining ring.



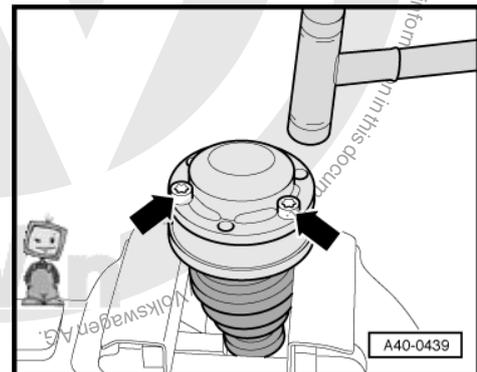
- Coat sealing surface of cover with -D 454 300 A2- .
- Apply continuous bead of sealant (2...3 mm Ø) past inner edge of holes -arrow- to clean surface of cover.



- Using bolts -arrows-, align new cover in relation to bolt holes.

The alignment must be very accurate, because no further alignment is possible once the part has been hammered on.

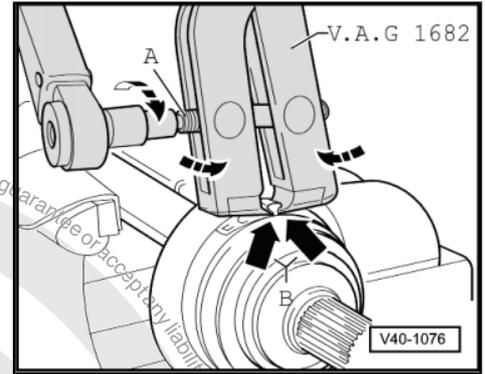
- Drive on cover using a plastic hammer.
- Wipe off surplus sealant.





Tighten hose clip on outer joint

- Apply special pliers -V.A.G 1682- as shown in diagram. Ensure that the jaws of the pliers seat in the ends of the hose clip -arrows B-.
- Tighten hose clip by turning spindle with a torque wrench (do not cant pliers).



Note

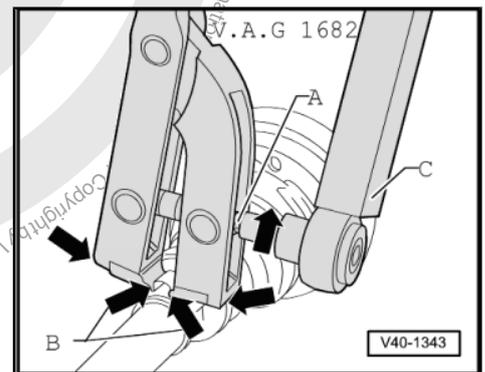
- ◆ Because a stainless steel hose clip is required due to the hard material of the joint boot (compared to rubber), it is possible to tighten the hose clip only with special pliers -V.A.G 1682-.
- ◆ Specified torque: 25 Nm.
- ◆ Use torque wrench -C- with adjustment range 5... 50 Nm, (e.g. torque wrench -V.A.G 1331-).
- ◆ Make sure thread of spindle -A- on pliers moves freely. Lubricate with MoS2 grease if necessary.
- ◆ If the thread is tight (e.g. due to dirt), the required clamping force for the clip will not be attained although the correct torque is applied.

Tightening hose clip on small diameter

Checking outer constant velocity joint ⇒ [page 103](#)

Checking inner constant velocity joint ⇒ [page 104](#)

Checking function of constant velocity joint ⇒ [page 106](#)

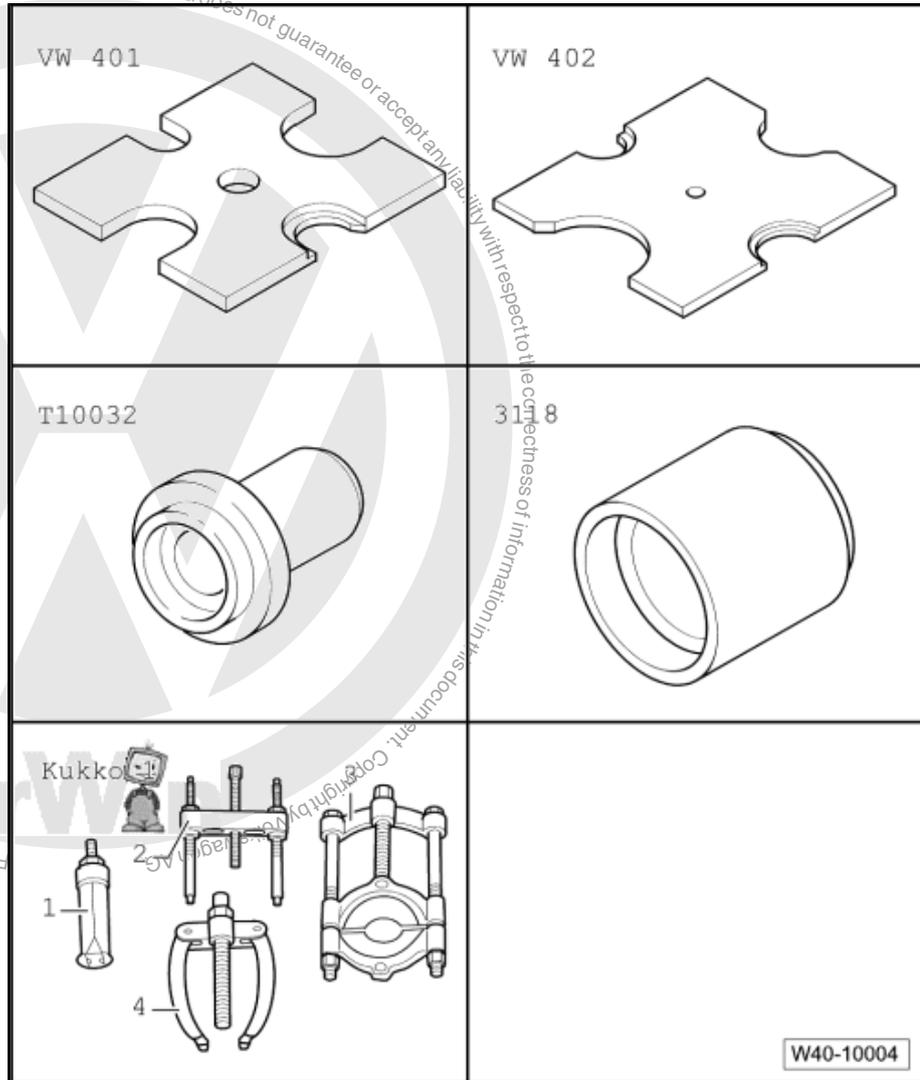




9.2 Repairing intermediate shaft

Special tools and workshop equipment required

- ◆ Thrust plate -VW 401-
- ◆ Thrust plate -VW 402-
- ◆ Thrust piece -T10032-
- ◆ Thrust piece -3118-
- ◆ Separating device Kukko -15-2-



Pressing off bearing

– Press bearing off intermediate shaft as shown in figure.

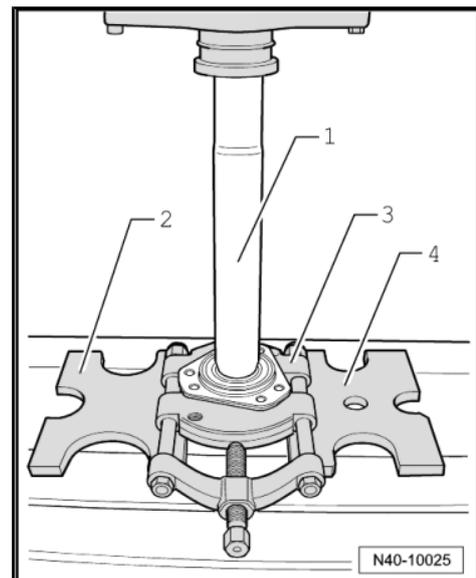
The jaws of the Kukko splitter -15-2- must be facing shaft.

- 1 - Intermediate shaft with bearing
- 2 - Thrust plate -VW 402-
- 3 - Thrust plate -VW 401-
- 4 - Separating device Kukko -15-2-



Note

Hold shaft when pressing out.



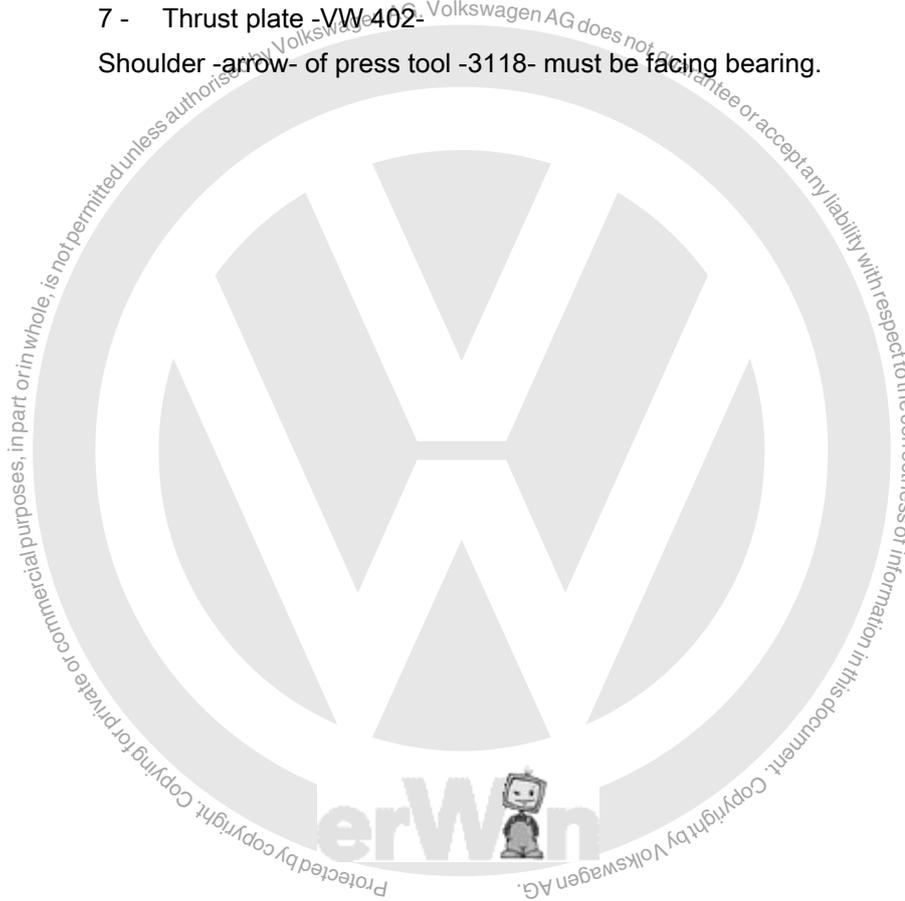
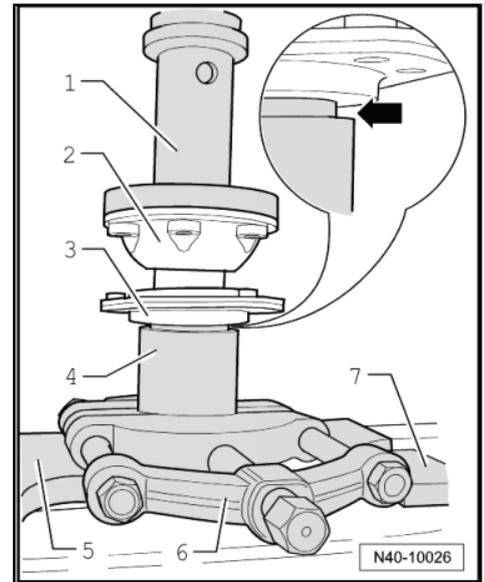


Pressing on bearing

– Press bearing to stop on intermediate shaft as shown in figure.

- 1- Thrust piece -T10032-
- 2- Intermediate shaft
- 3- Bearing
- 4- Thrust piece -3118-
- 5- Thrust plate -VW 401-
- 6- Separating device Kukko -15-2-
- 7- Thrust plate -VW 402-

Shoulder -arrow- of press tool -3118- must be facing bearing.





10 Assembly overview - drive shaft with VL107 constant velocity slip joint (push-on)

1 - Outer constant velocity joint

- Renew only complete
- Removing ⇒ [page 117](#)
- Installing: drive onto shaft to stop using a plastic mallet
- Checking ⇒ [page 119](#)

2 - Bolt

- 70 Nm + 90° further
- Always renew after removing

When bolt is loosened or tightened, vehicle must not be standing on its wheels

3 - Circlip

- Always renew after removing
- Insert in groove in shaft

4 - Thrust washer

- Installation position ⇒ [page 118](#)

5 - Dished spring

- Installation position ⇒ [page 118](#)

6 - Clamp

- Always renew after removing
- Tightening ⇒ [page 119](#)

7 - Boot

- Check for splits and chafing
- Material: Hytrel (polyester elastomer)

8 - Clamp

- Always renew after removing
- Tightening ⇒ [page 119](#)

9 - Drive shaft

10 - Clamp

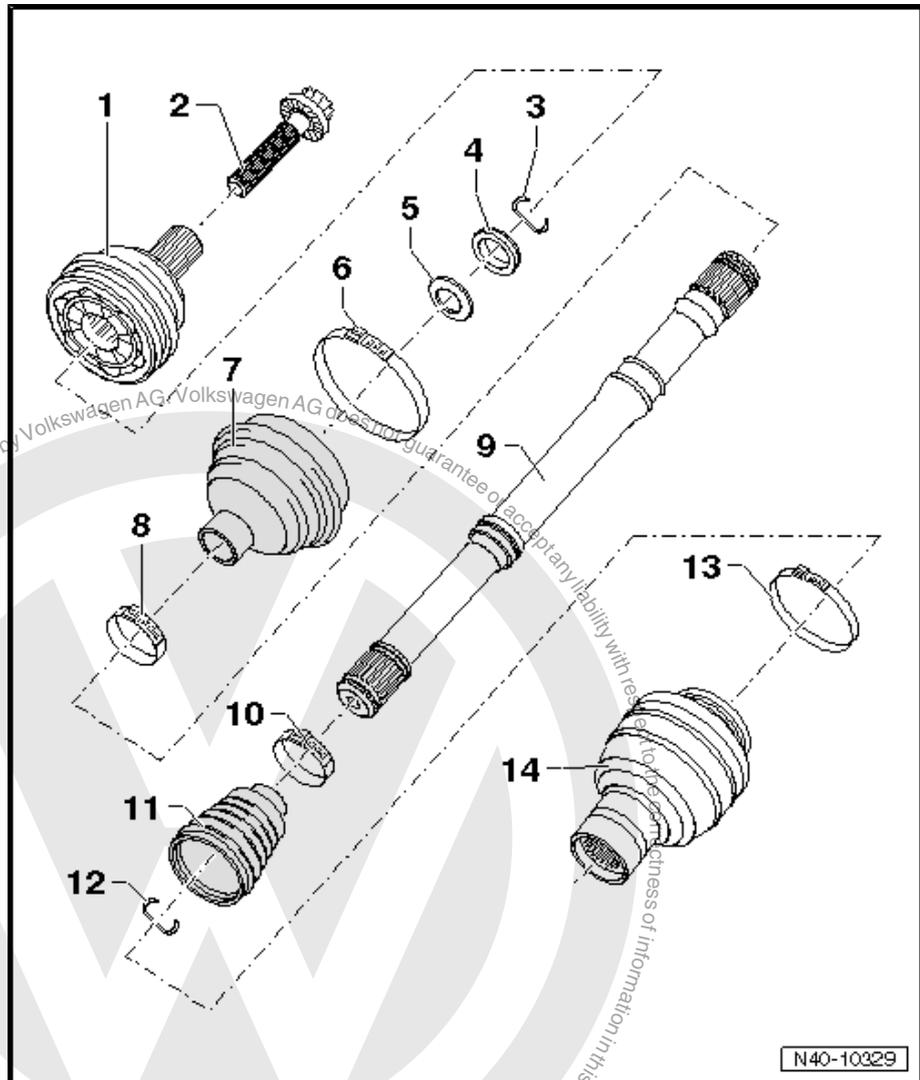
- Always renew after removing
- Tightening ⇒ [page 119](#)

11 - Boot for constant velocity slip joint

- Material: Hytrel (polyester elastomer)
- Without breather hole
- Check for splits and chafing

12 - Circlip

- Always renew after removing
- Insert in groove in shaft





13 - Clamp

- Always renew after removing
- Tightening ⇒ [page 119](#)

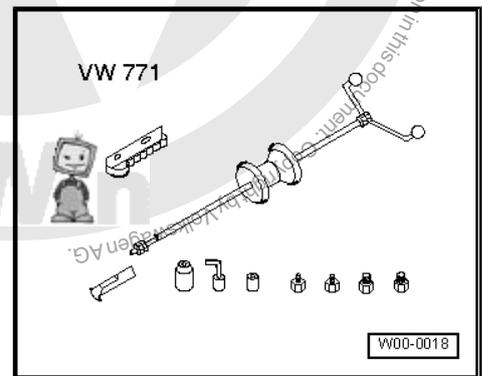
14 - Constant velocity slip joint

- Renew only complete
- Removing ⇒ [page 118](#)
- Installing: drive onto shaft to stop using a plastic mallet

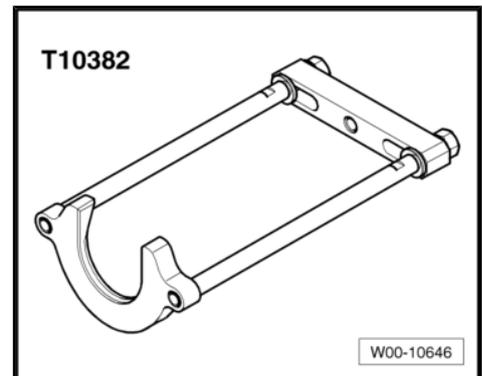
10.1 Dismantling and assembling drive shaft with VL107 (push-on) constant velocity slip joint

Special tools and workshop equipment required

- ◆ Multi-purpose tool -VW 771-



- ◆ Puller -T10382-



Removing outer constant velocity joint

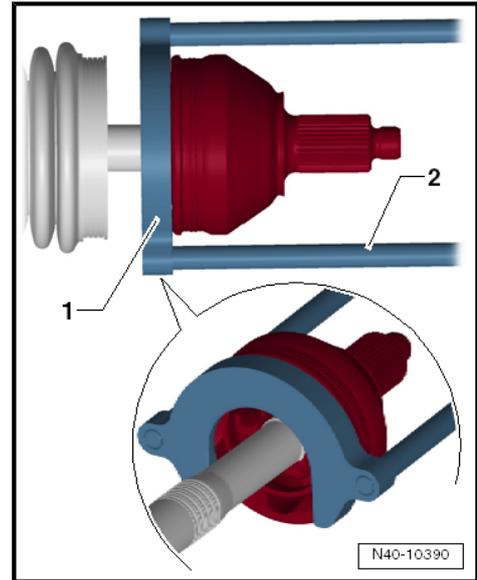
- Clamp drive shaft in vice using protective jaw covers.
- Fold back boot.
- Set puller -T10382- up so that smooth side of puller plate - T10382/1- points to spindles -T10382/2- .
- Assemble puller -T10382- complete with multi-purpose tool - VW 771- .



- Pull constant velocity joint from drive shaft with puller -T10382- and multi-purpose tool -VW 771- .

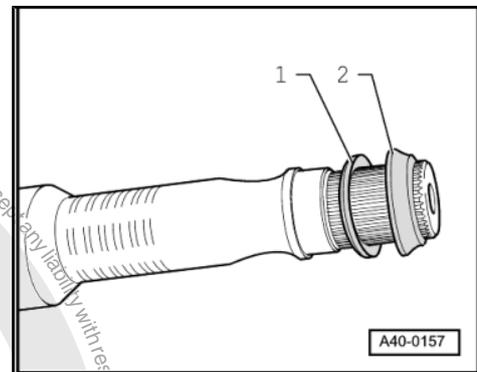
- 1 - Puller plate -T10382/1-
- 2 - Spindles -T10382/2-

Driving on outer constant velocity joint



Installation position of dished spring 1 and thrust washer 2 on outer joint

- 1 - Dished spring
 - 2 - Thrust washer
- Install new retaining ring.
 - If necessary, push new joint boot onto drive shaft.
 - Knock onto shaft with plastic hammer until circlip engages.



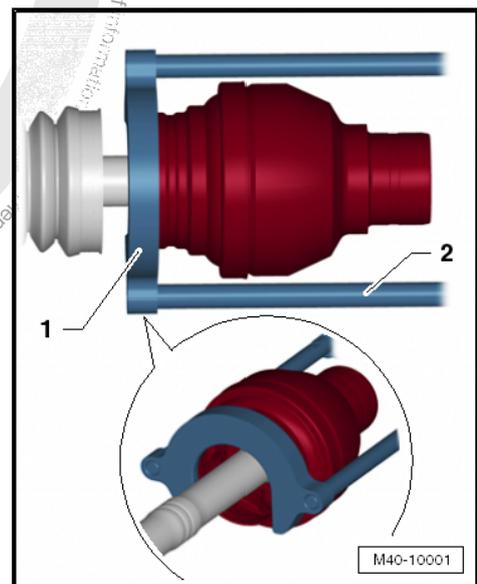
Removing inner constant velocity slip joint

- Clamp drive shaft in vice using protective jaw covers.
- Fold back boot.
- Set puller -T10382- up so that smooth side of puller plate -T10382/1- points to spindles -T10382/2- .
- Assemble puller -T10382- complete with multi-purpose tool -VW 771- .
- Pull constant velocity joint from drive shaft with puller -T10382- and multi-purpose tool -VW 771- .

- 1 - Puller plate -T10382/1-
- 2 - Spindles -T10382/2-

Driving on inner constant velocity slip joint

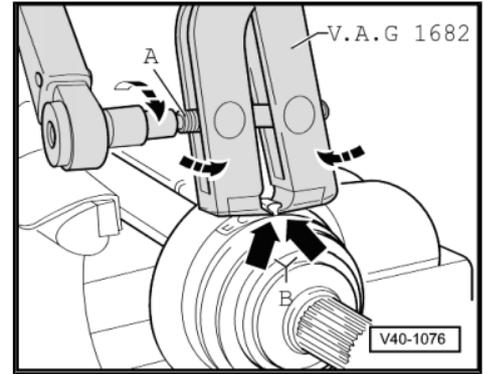
- Install new retaining ring.
- If necessary, push new joint boot onto drive shaft.
- Knock onto shaft with plastic hammer until circlip engages.





Tighten hose clip on outer joint

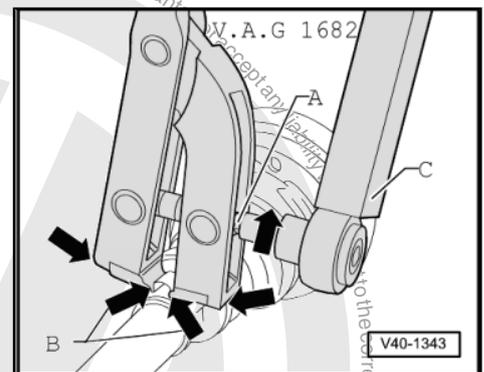
- Apply special pliers -V.A.G 1682- as shown in diagram. Ensure jaws of tool contact corners -arrows B- of hose clamp.
- Tighten hose clip by turning spindle with a torque wrench (do not cant pliers).



Note

- ◆ Because a stainless steel clip is required due to the hard material of the joint boot (compared to rubber), it is possible to tighten the clip only with special pliers -V.A.G 1682-.
- ◆ Specified torque: 25 Nm.
- ◆ Use torque wrench -C- with adjustment range 5... 50 Nm, (e.g. torque wrench -V.A.G 1331-).
- ◆ Make sure thread of spindle -A- on pliers moves freely. Lubricate with MoS2 grease if necessary.
- ◆ If the thread is tight (e.g. due to dirt), the required clamping force for the clip will not be attained although the correct torque is applied.

Tightening hose clip on small diameter

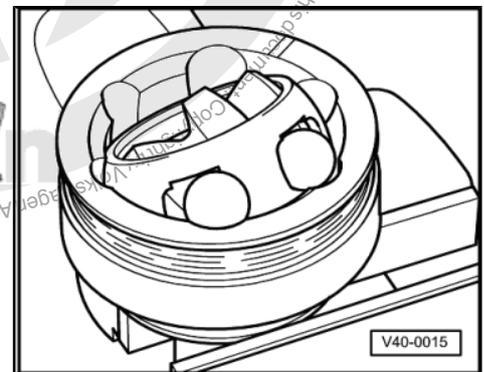


10.2 Checking outer constant velocity joint

The joint is to be dismantled to renew the grease if it is heavily soiled, or to check the running surfaces of the balls for wear and damage.

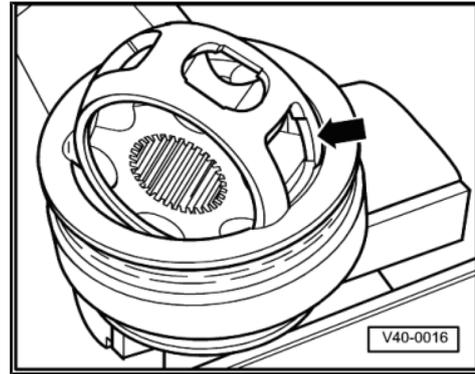
Removing

- Before dismantling, mark position of ball hub in relation to ball cage and joint body with an electric scribe or oil stone.
- Swing ball hub and ball cage.
- Remove balls one at a time.





- Turn cage until the two rectangular windows -arrow- align with joint body.
- Take out cage with hub.

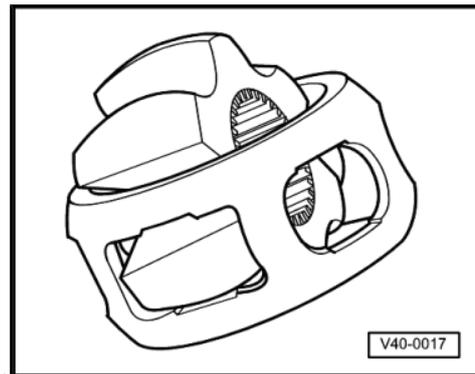


- Swing segment of hub into square cage window.
- Tip hub out of cage.

The six balls for each joint belong to a tolerance group. Check stub axle, hub, cage and balls for small indentations (pitting) and traces of seizing. Too much circumferential backlash in the joint becomes noticeable during load change jolts; in such cases, the joint must be renewed. Smoothing and traces of wear of the balls are no reason to change the joint.

Installing

- Pack half of total grease quantity (40 g) into joint body.
- Fit cage with hub into joint body.
- Press in opposing balls one after the other; the original position of the hub relative to the cage and joint body must be restored.
- Fit new retaining ring into hub.
- Distribute remaining grease in boot.



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11 Assembly overview - drive shaft with triple roller joint AAR2600i

1 - Outer constant velocity joint

- Renew only as complete unit
- Removing ⇒ [page 124](#) .
- Installing: drive onto shaft with plastic mallet until compressed retaining ring seats.
- Checking ⇒ [page 103](#)

2 - Bolt

- M16 x 1.5 x 80
- Hexagon bolt, 200 Nm and turn +180° further
- 12-point bolt, 70 Nm + 90° further
- Always renew after removing

When bolt is loosened or tightened, vehicle must not be standing on its wheels

3 - Right drive shaft

4 - Left drive shaft

5 - Hose clip

- Always renew after removing
- Tightening ⇒ [page 103](#)

6 - Boot for constant velocity joint

- Check for splits and chafing
- Material: Hytrel (polyester elastomer)

7 - Hose clip

- Always renew after removing
- Tightening ⇒ [page 103](#)

8 - Dished spring

- Installation position ⇒ [page 124](#) .

9 - Thrust washer

- Installation position ⇒ [page 124](#) .

10 - Retaining ring

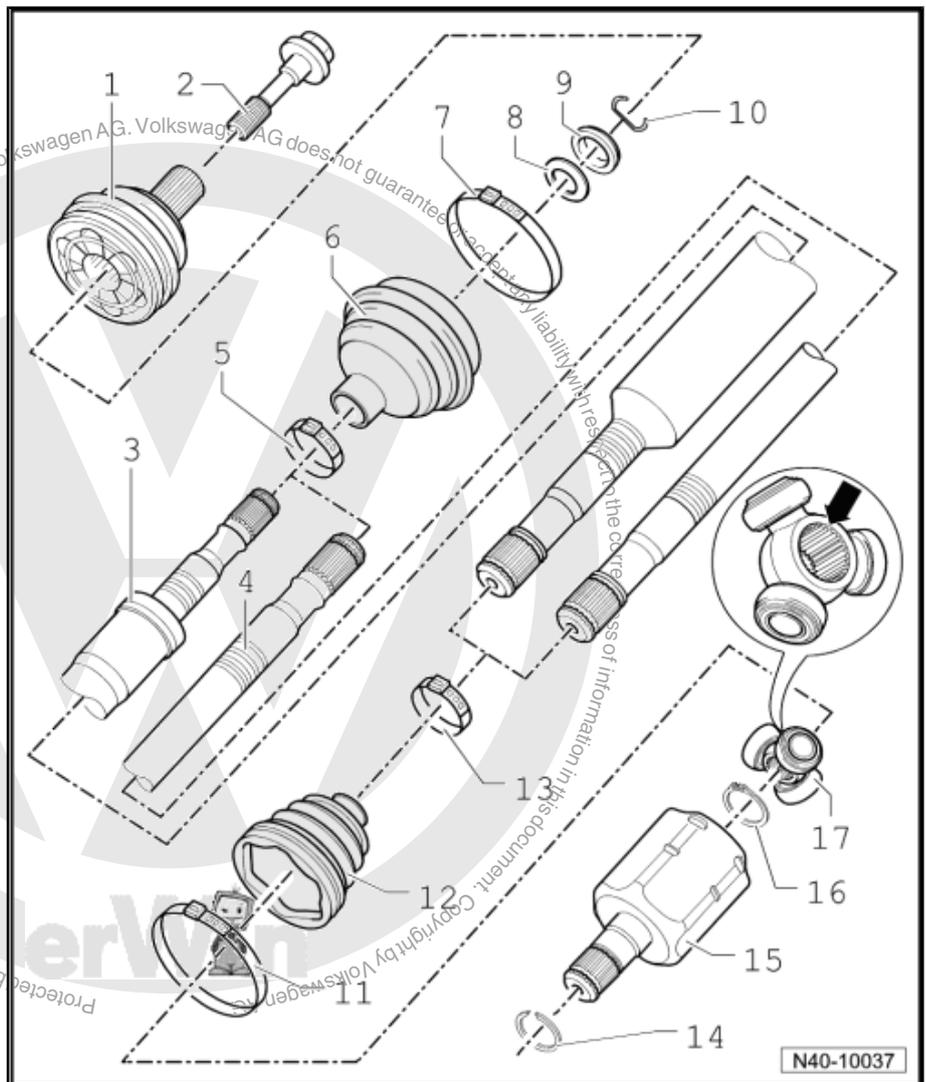
- Always renew after removing
- Insert in groove in shaft

11 - Hose clip

- Always renew after removing
- Tighten hose clip with hose clip pliers -V.A.G 1275-

12 - Boot for triple roller joint

- Check for splits and chafing





13 - Hose clip

- Always renew after removing
- Tighten hose clip with hose clip pliers -V.A.G 1275-

14 - Retaining ring

- Always renew after removing

15 - Joint body

16 - Retaining ring

- Always renew after removing
- Insert in groove in shaft using circlip pliers -VW 161 A- .

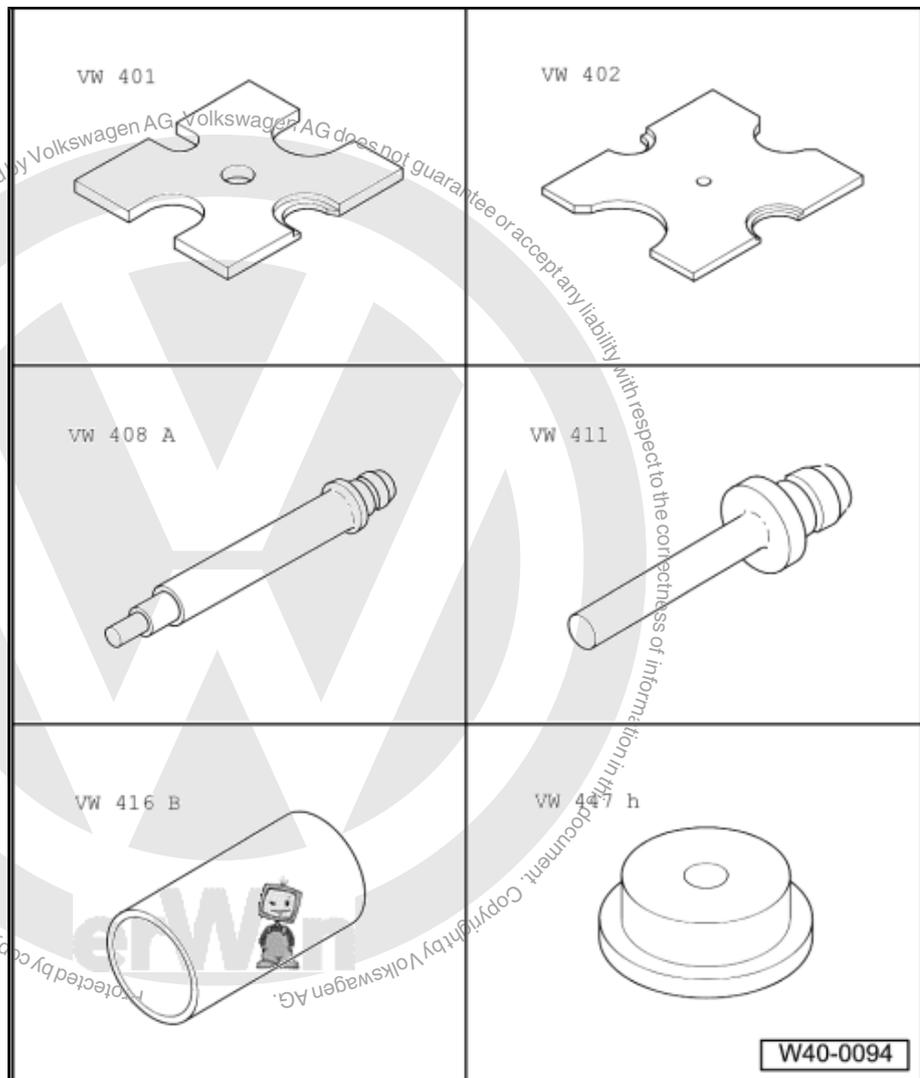
17 - Triple roller spider with rollers

The chamfer -arrow- points towards drive shaft splines.

11.1 Dismantling and assembling drive shaft with triple roller joint AAR2600i

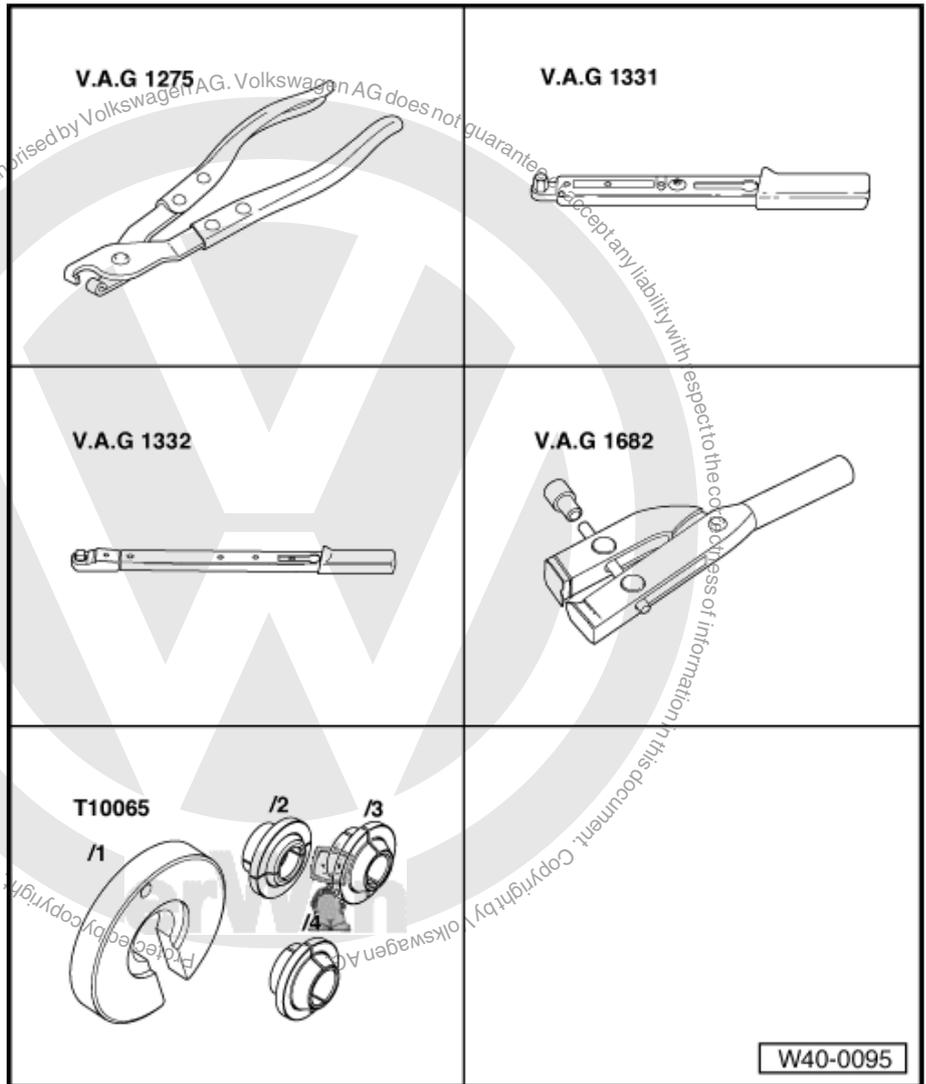
Special tools and workshop equipment required

- ◆ Thrust plate -VW 401-
- ◆ Thrust plate -VW 402-
- ◆ Press tool -VW 408 A-
- ◆ Press tool -VW 411-
- ◆ Tube -VW 416 B-
- ◆ Thrust washer -VW 447 H-

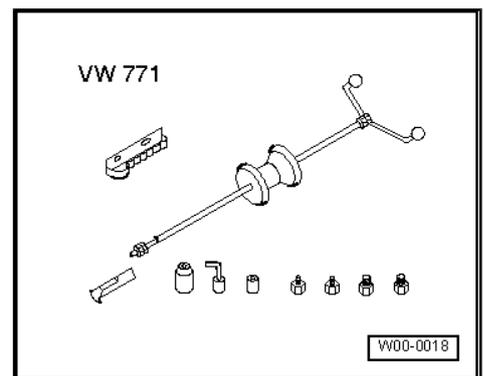




- ◆ Hose clip pliers -V.A.G 1275-
- ◆ Torque wrench -V.A.G 1331-
- ◆ Torque wrench - V.A.G 1332-
- ◆ Special pliers -V.A.G 1682-
- ◆ Assembly tool -T10065-

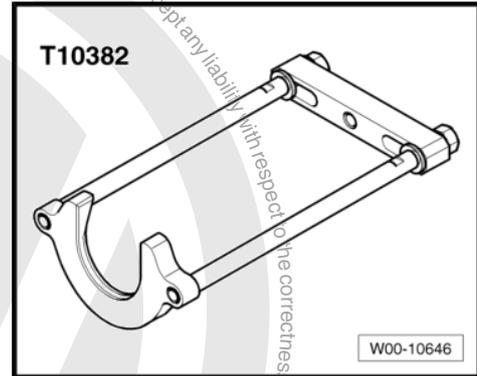


- ◆ Multi-purpose tool -VW 771-





◆ Puller -T10382-

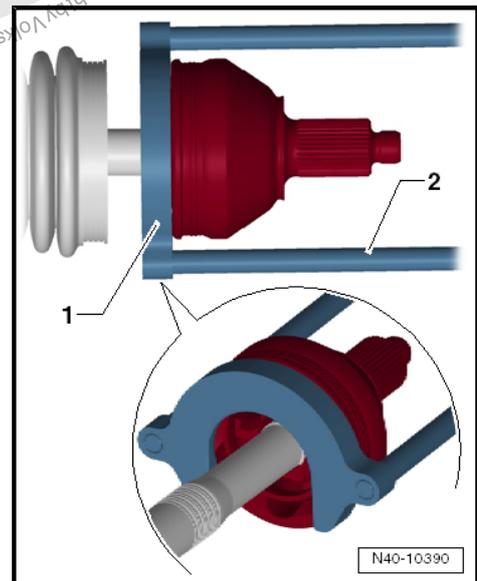


Removing outer constant velocity joint

- Clamp drive shaft in vice using protective jaw covers.
- Fold back boot.
- Set puller -T10382- up so that smooth side of puller plate - T10382/1- points to spindles -T10382/2- .
- Assemble puller -T10382- complete with multi-purpose tool - VW 771- .
- Pull constant velocity joint from drive shaft with puller -T10382- and multi-purpose tool -VW 771- .

- 1 - Puller plate -T10382/1-
- 2 - Spindles -T10382/2-

Driving on outer constant velocity joint

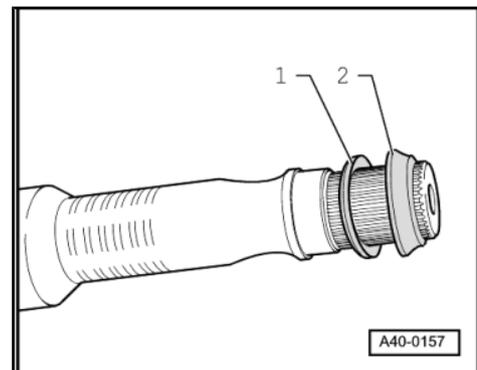


Installation position of dished spring and thrust washer on outer joint

- 1 - Dished spring
 - 2 - Thrust washer
- Install new retaining ring.
 - If necessary, push new joint boot onto drive shaft.
 - Knock onto shaft with plastic hammer until circlip engages.

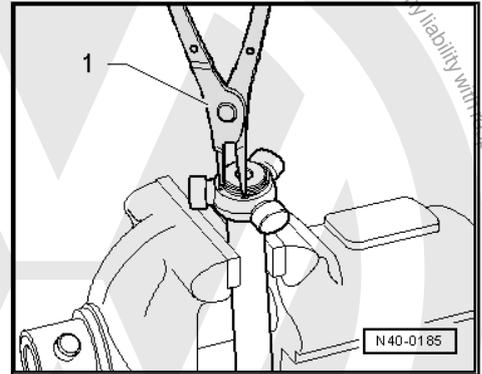
Dismantling

- Unfasten both hose clips on inner joint and push back boot.
- Pull joint body off drive shaft.





- Remove retaining ring.
- 1 - Pliers (commercially available)
- or -VW 161 A-
- Set drive shaft into press.



- Press triple roller spider off drive shaft.
- Pull boot off shaft.
- Clean shaft, joint body and groove for seal.

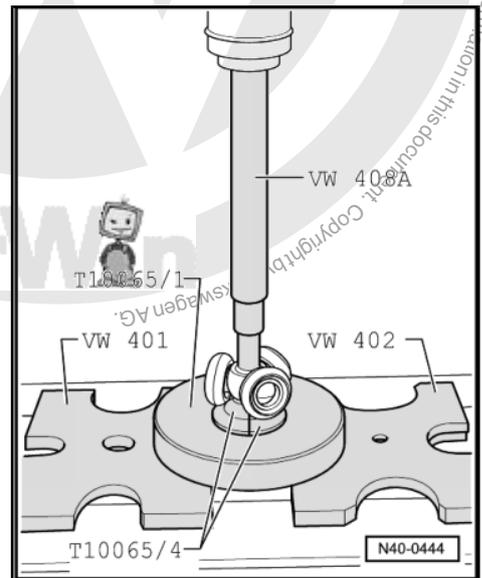
Assembling

- Push small hose clip for boot onto shaft.
- Push joint boot onto shaft.
- Push joint body onto shaft.

Fitting triple roller spider

Drive shaft (tapered version)

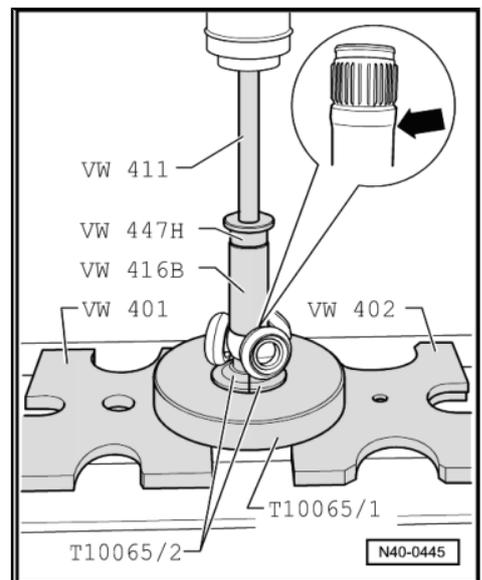
Chamfer on spider faces towards shaft and is used as an assembly aid.



- Fit triple roller spider onto shaft and press on to stop.
- Ensure that pressure does not exceed 3.0 t.
- If necessary, coat splines of drive shaft and triple roller spider with lubricant paste G 052 142 A2.
- Insert retaining ring, ensuring that it is seated correctly.

As of 08.2004, a different grease is used in the triple roller joints. This grease cannot be mixed with the previous one. The triple roller joint must therefore be cleaned before greasing during repair work.

- Press 70 grammes of drive shaft grease from repair set into triple roller joint.
- Slide joint body over rollers and hold.
- Press 60 g of drive shaft grease from repair kit into rear of triple roller joint.
- Install joint boot.

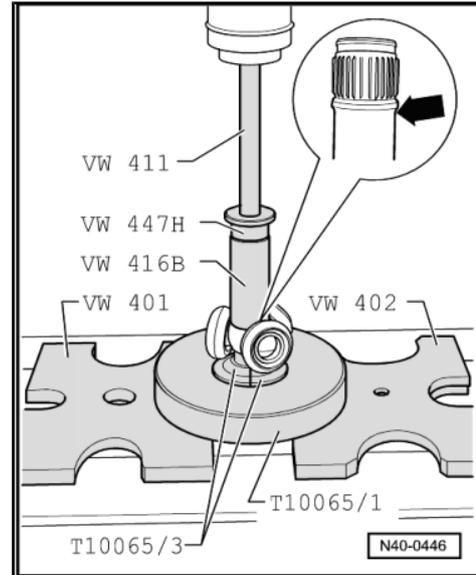


Fitting triple roller spider

Drive shaft (cylindrical version)



- Fit triple roller spider onto shaft and press on to stop.
- Ensure that pressure does not exceed 3.0 t.
- If necessary, coat splines of drive shaft and triple roller spider with lubricant paste G 052 142 A2.
- Insert retaining ring, ensuring that it is seated correctly.
- Press 70 grammes of drive shaft grease from repair set into triple roller joint.
- Slide joint body over rollers and hold.
- Press 60 g of drive shaft grease from repair kit into rear of triple roller joint.
- Install joint boot.
- Tighten both hose clips with hose clip pliers -V.A.G 1275- .





12 Assembly overview - drive shaft with triple roller joint AAR3300i

1 - Outer constant velocity joint

- Renew only as complete unit
- Removing ⇒ [page 131](#) .
- Installing: drive onto shaft with plastic mallet until compressed retaining ring seats.
- Checking ⇒ [page 103](#)

2 - Bolt

- M16 x 1.5 x 80
- Hexagon bolt, 200 Nm and turn +180° further
- 12-point bolt, 70 Nm + 90° further
- Always renew after removing

When bolt is loosened or tightened, vehicle must not be standing on its wheels

3 - Hose clip

- Always renew after removing
- Tightening ⇒ [page 103](#)

4 - Boot for constant velocity joint

- Check for splits and chafing
- Material: Hytrel (polyester elastomer)

5 - Hose clip

- Always renew after removing
- Tightening ⇒ [page 103](#)

6 - Dished spring

- Installation position ⇒ [page 131](#) .

7 - Thrust washer

- Installation position ⇒ [page 131](#) .

8 - Retaining ring

- Always renew after removing
- Insert in groove in shaft

9 - Retaining ring

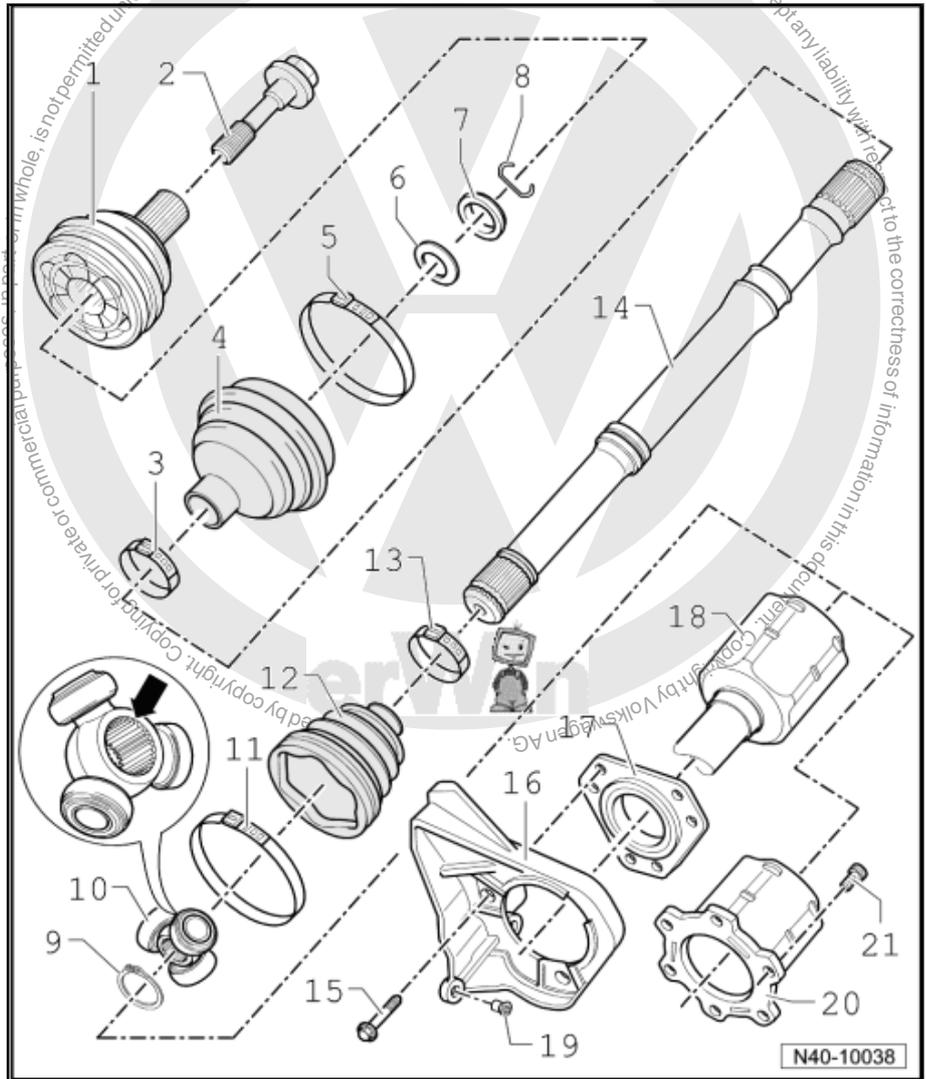
- Always renew after removing
- Insert in groove in shaft

10 - Triple roller spider with rollers

The chamfer -arrow- points towards drive shaft splines.

11 - Hose clip

- Always renew after removing





- Tighten hose clip with hose clip pliers -V.A.G 1275-

12 - Boot for triple roller joint

- Check for splits and chafing

13 - Hose clip

- Always renew after removing
- Tighten hose clip with hose clip pliers -V.A.G 1275-

14 - Drive shaft

15 - Bolt

- 20 Nm
- For Golf only

16 - Bearing bracket

- For Golf only

17 - Bearing

- For Golf only

18 - Joint body with intermediate shaft

- For Golf only
- For right side of vehicle

19 - Countersunk head bolt

- Initially tighten to 5 Nm and then to 35 Nm
- For Golf only

20 - Joint body

- For left side of vehicle

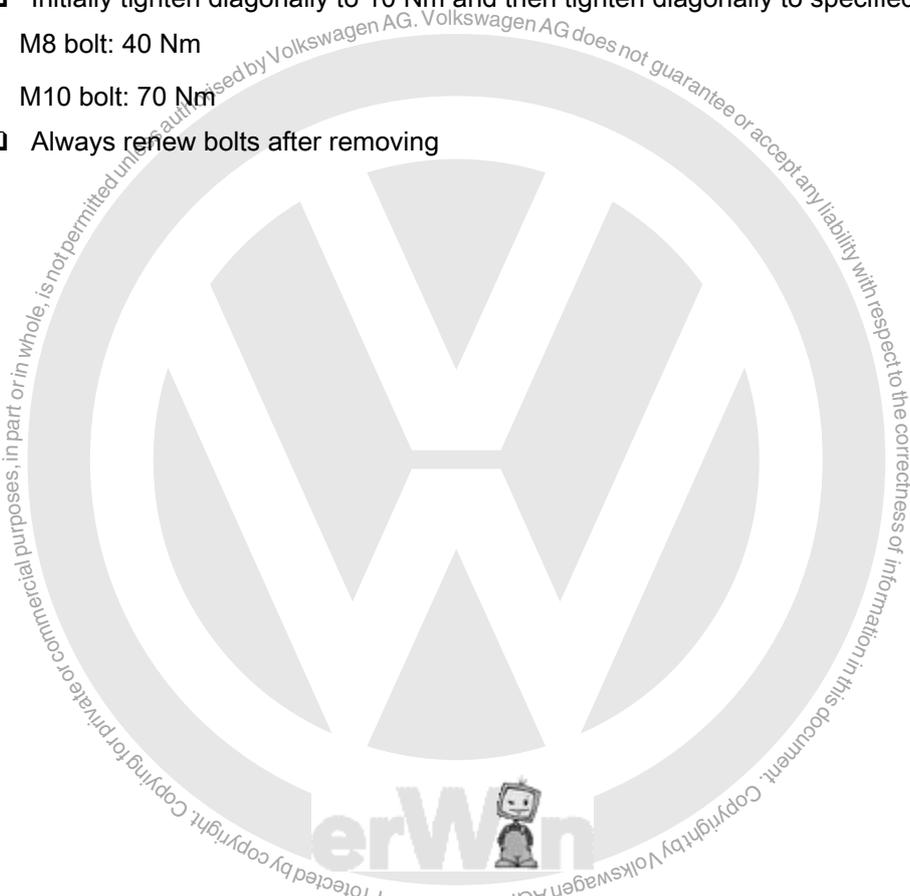
21 - Multi-point socket head bolt

- Initially tighten diagonally to 10 Nm and then tighten diagonally to specified torque.

M8 bolt: 40 Nm

M10 bolt: 70 Nm

- Always renew bolts after removing

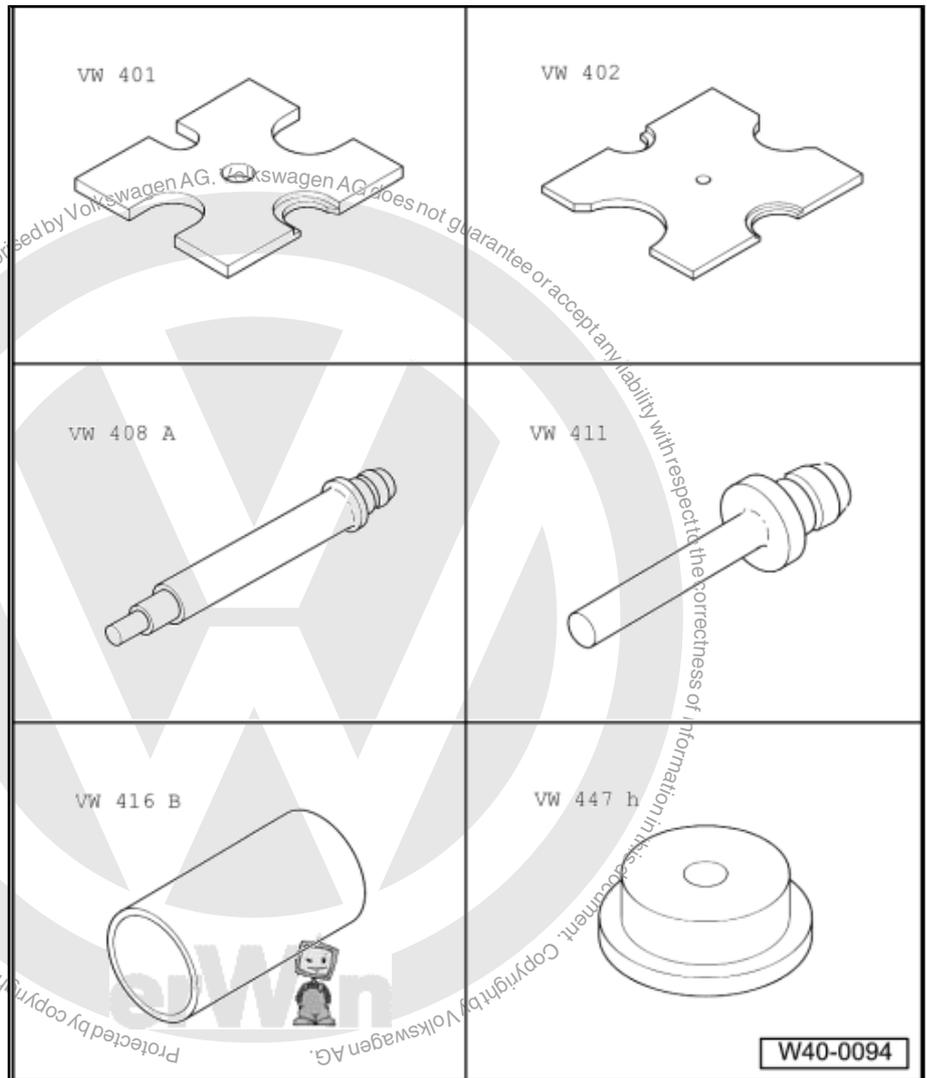




12.1 Dismantling and assembling drive shaft with triple roller joint AAR3300i

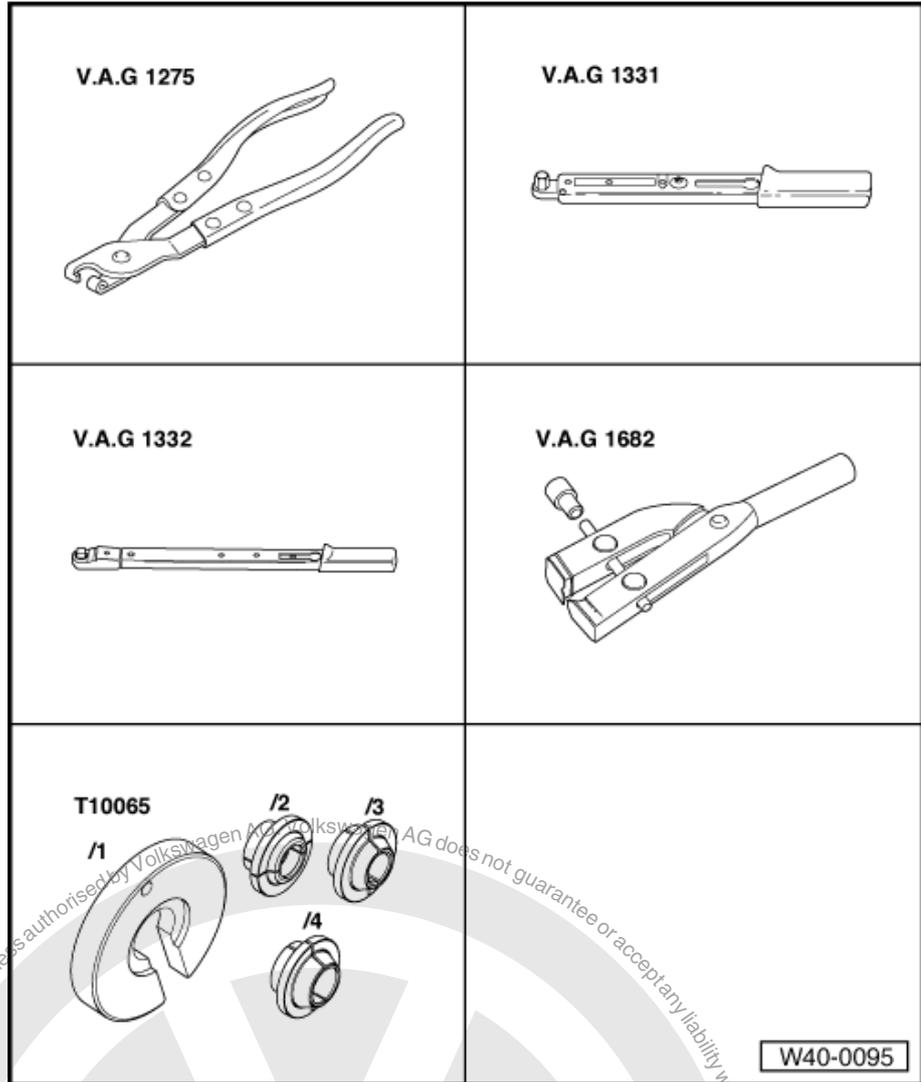
Special tools and workshop equipment required

- ◆ Thrust plate -VW 401-
- ◆ Thrust plate -VW 402-
- ◆ Press tool -VW 408 A-
- ◆ Press tool -VW 411-
- ◆ Tube -VW 416 B-
- ◆ Thrust washer -VW 447 H-

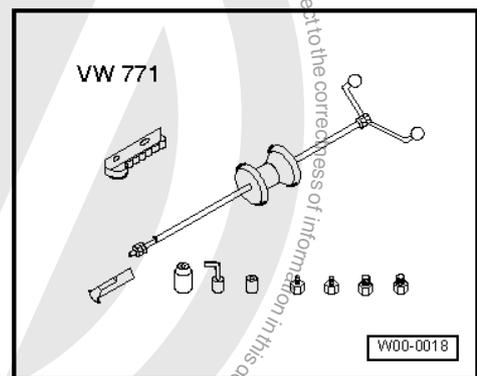




- ◆ Hose clip pliers -V.A.G 1275-
- ◆ Torque wrench -V.A.G 1331-
- ◆ Torque wrench - V.A.G 1332-
- ◆ Special pliers -V.A.G 1682-
- ◆ Assembly tool -T10065-

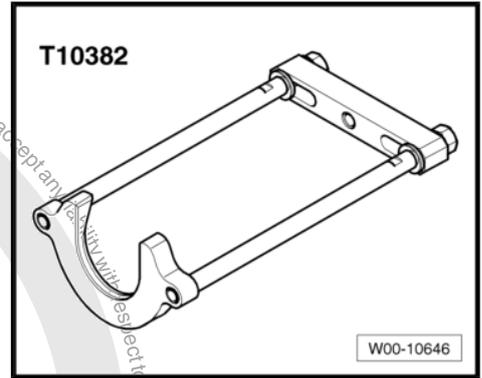


- ◆ Multi-purpose tool -VW 771-





◆ Puller -T10382-

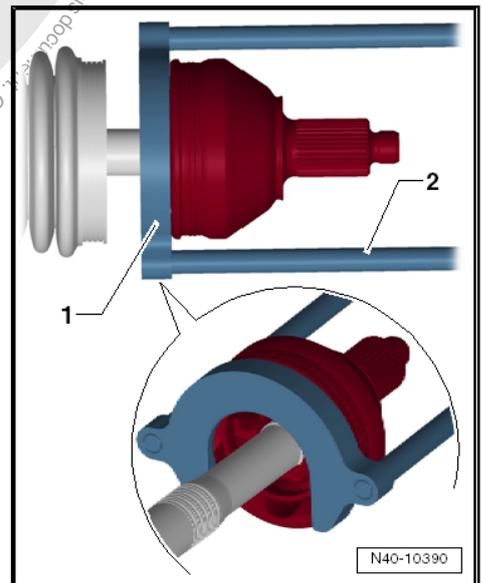


Removing outer constant velocity joint

- Clamp drive shaft in vice using protective jaw covers.
- Fold back boot.
- Set puller -T10382- up so that smooth side of puller plate - T10382/1- points to spindles -T10382/2- .
- Assemble puller -T10382- complete with multi-purpose tool - VW 771- .
- Pull constant velocity joint from drive shaft with puller -T10382- and multi-purpose tool -VW 771- .

- 1 - Puller plate -T10382/1-
- 2 - Spindles -T10382/2-

Driving on outer constant velocity joint

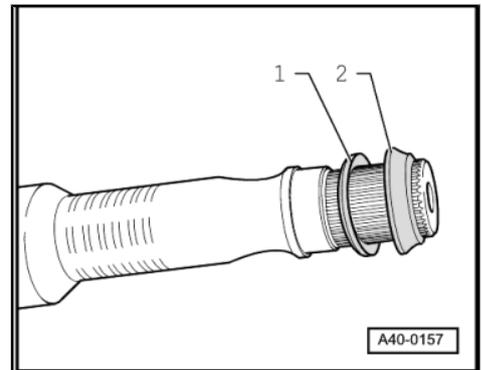


Installation position of dished spring and thrust washer on outer joint

- 1 - Dished spring
 - 2 - Thrust washer
- Install new retaining ring.
 - If necessary, push new joint boot onto drive shaft.
 - Knock onto shaft with plastic hammer until circlip engages.

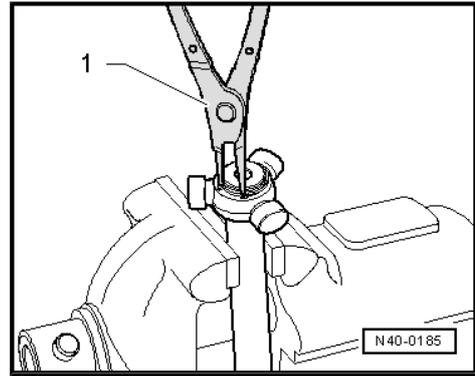
Dismantling

- Unfasten both hose clips on inner joint and push back boot.
- Pull joint body off drive shaft.





- Remove retaining ring.
- 1 - Pliers (commercially available)
- or -VW 161 A-
- Set drive shaft into press.



- Press triple roller spider off drive shaft.
- Pull boot off shaft.
- Clean shaft, joint body and groove for seal.

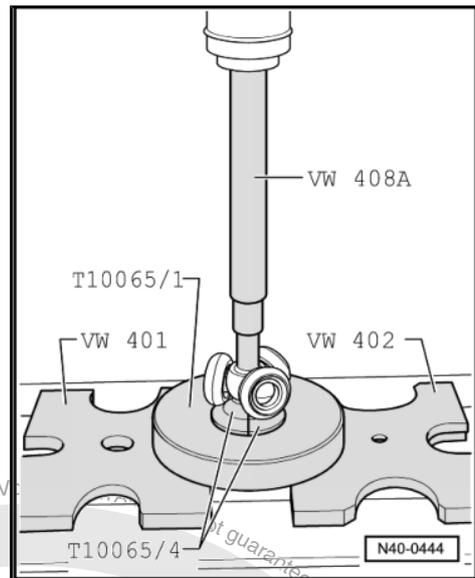
Assembling

- Push small hose clip for boot onto shaft.
- Push joint boot onto shaft.
- Push joint body onto shaft.

Fitting triple roller spider

Drive shaft (tapered version)

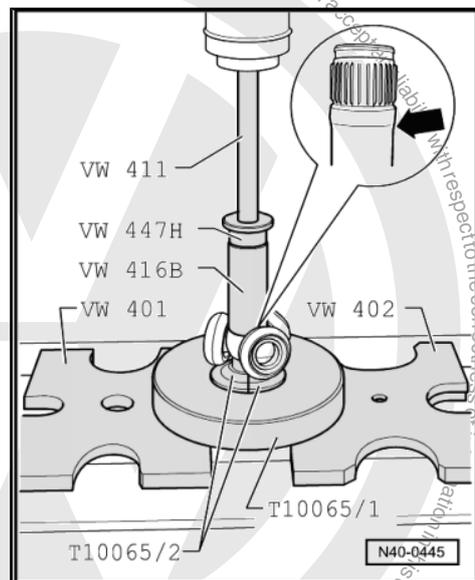
Chamfer on spider faces towards shaft and is used as an assembly aid.



- Fit triple roller spider onto shaft and press on to stop.
- Ensure that pressure does not exceed 3.0 t.
- If necessary, coat splines of drive shaft and triple roller spider with lubricant paste G 052 142 A2.
- Insert retaining ring, ensuring that it is seated correctly.

As of 08.2004, a different grease is used in the triple roller joints. This grease cannot be mixed with the previous one. The triple roller joint must therefore be cleaned before greasing during repair work.

- Press 70 grammes of drive shaft grease from repair set into triple roller joint.
- Slide joint body over rollers and hold.
- Press 60 g of drive shaft grease from repair kit into rear of triple roller joint.
- Install joint boot.

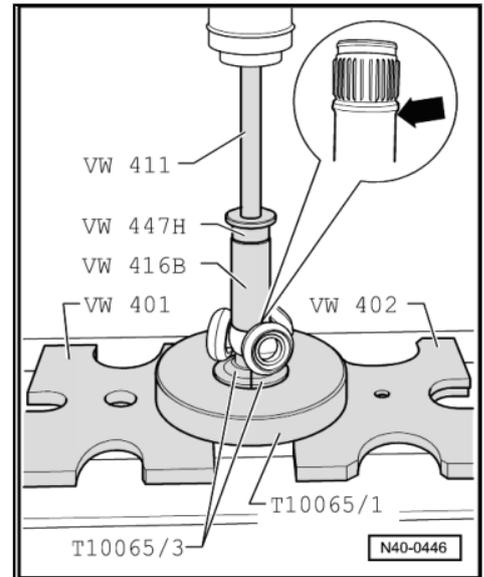


Fitting triple roller spider

Drive shaft (cylindrical version)



- Fit triple roller spider onto shaft and press on to stop.
- Ensure that pressure does not exceed 3.0 t.
- If necessary, coat splines of drive shafts and triple roller star with lubricating paste -G 052 142 A2- .
- Insert retaining ring, ensuring that it is seated correctly.
- Press 70 grammes of drive shaft grease from repair set into triple roller joint.
- Slide joint body over rollers and hold.
- Press 60 g of drive shaft grease from repair kit into rear of triple roller joint.
- Install joint boot.

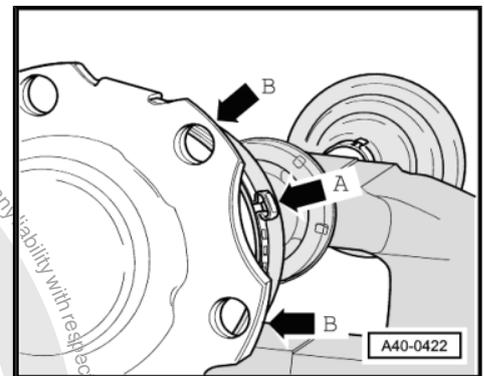


- Install hose clip.

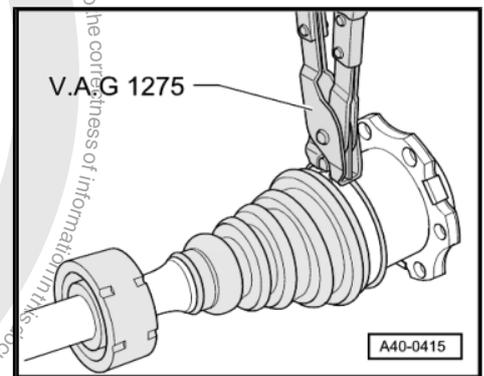


Note

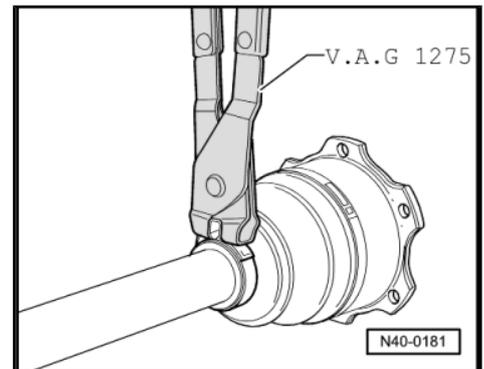
To make it easier to insert the multi-point socket-head bolts when installing the drive shaft, position ear -arrow A- of hose clip between mounting flanges -arrows B- of joint body.



- Tighten hose clip using hose clip pliers -V.A.G 1275-.



- Tighten small hose clip using hose clip pliers -V.A.G 1275-.





42 – Rear suspension

1 Appraisal of accident vehicles

A checklist for evaluating running gear of accident vehicles can be found under => [page 1](#) .





2 Repairing rear suspension (front-wheel drive)

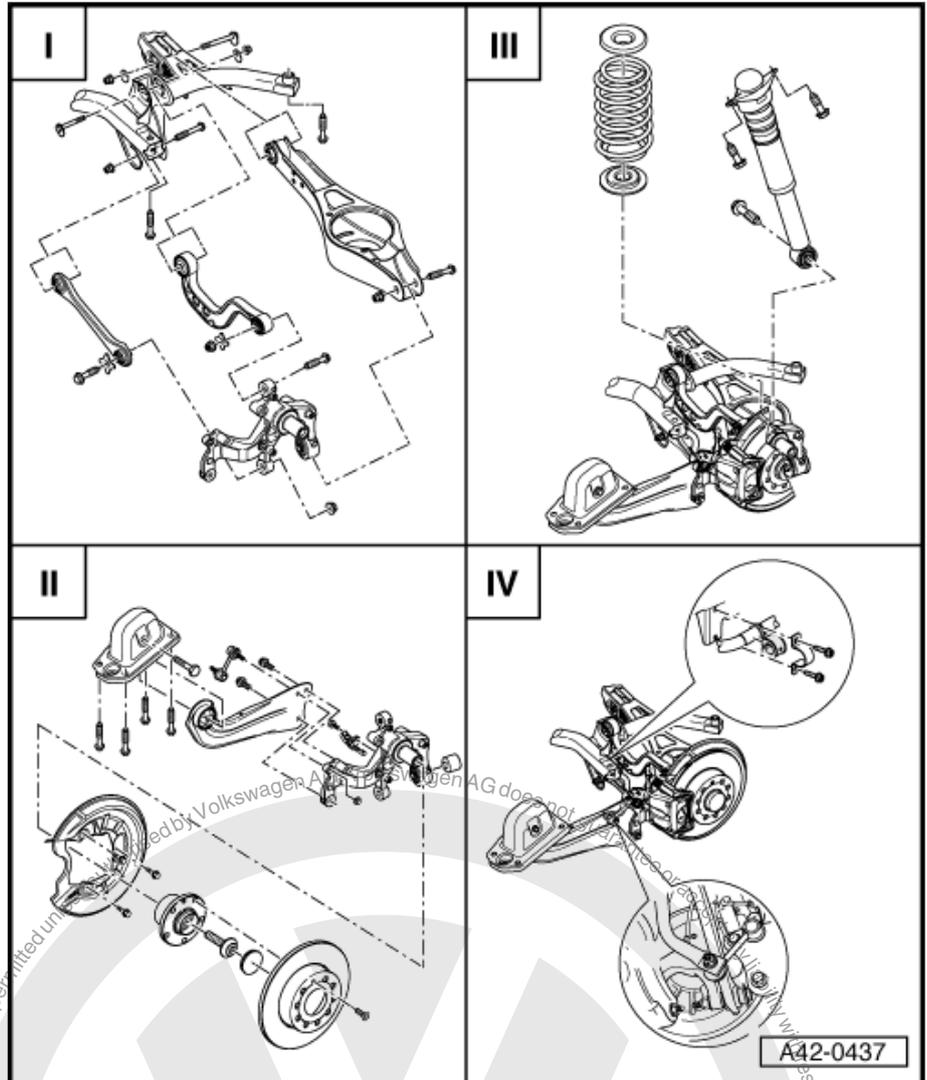
2.1 Overview - rear axle

I - Assembly overview: sub-frame, transverse link, track rod (front-wheel drive)
 ⇒ [page 140](#)

II - Assembly overview: wheel bearing housing, trailing arm (front-wheel drive)
 ⇒ [page 156](#)

III - Assembly overview: shock absorber, coil spring (front-wheel drive) ⇒ [page 173](#)

IV - Assembly overview: anti-roll bar (front-wheel drive)
 ⇒ [page 179](#)



Note

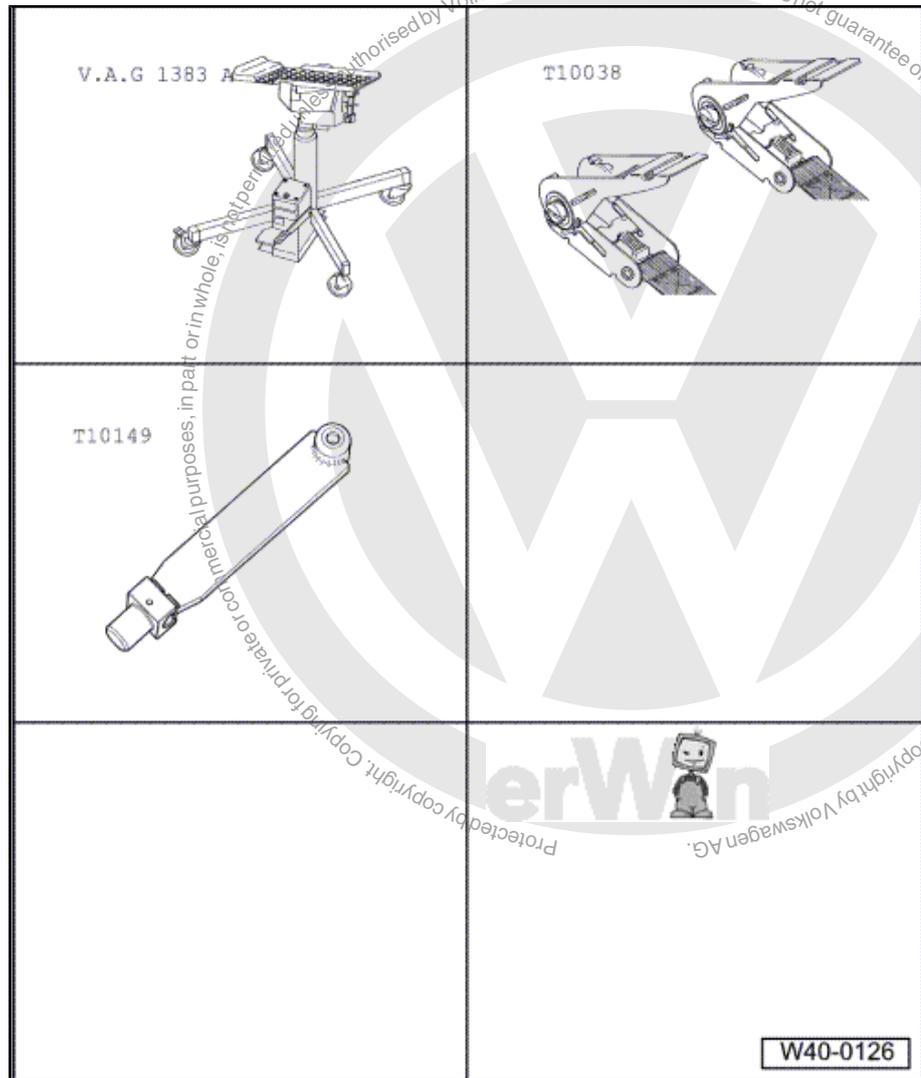
- ◆ It is not permitted to weld or straighten load-bearing or wheel-guiding components of the suspension.
- ◆ Always renew self-locking nuts.
- ◆ Always renew corroded nuts and bolts.
- ◆ Bonded rubber bushes can be twisted only to a limited extent. Therefore, you should only tighten the threaded connections of components with bonded rubber bushes when the wheel bearing housing is raised to unladen position, Golf ⇒ [page 136](#) ; Golf Plus, CrossGolf ⇒ [page 138](#) .



2.2 Rear axle in unladen position, Golf

Special tools and workshop equipment required

- ◆ Engine and gearbox jack - V.A.G 1383 A-
- ◆ Tensioning strap -T10038-
- ◆ Support -T10149-



Note

All bolts on running gear components with bonded rubber bushes may be tightened only when the component is in the unladen position (normal position).

Bonded rubber bushes can be twisted only to a limited extent.

Axle components with bonded rubber bushes must therefore be brought to a position equivalent to the unladen (normal) position before being tightened.

Otherwise, the bonded rubber bush would be subject to torsion loading, shortening its service life.

To simulate this position on the lifting platform, raise the axle on one side using the engine and gearbox jack -V.A.G 1383 A- and support -T10149- .



Before the axle on one side is raised, both sides of the vehicle must be strapped to the lifting platform arms with tensioning straps -T10038- .

⚠ WARNING

If the vehicle is not strapped down, there is a danger that the vehicle will slip off the lifting platform!

- Turn wheel hub until one of the wheel bolt holes is at the top.
- Attach support -T10149- with a wheel bolt.

Threaded connections may be tightened only when dimension -a- between the centre of wheel hub and lower edge of wheel housing, measured before starting work, has been attained.

Measuring dimension -a-

The dimension -a- depends on the ride height of the installed running gear:

Running gear ¹⁾	Ride height -a- in mm
Standard running gear (2UA)	380 ± 10 mm
Heavy-duty running gear (2UB)	400 ± 10 mm
Sports running gear except 18" wheels (2UC)	365 ± 10 mm
Sports running gear with 18" wheels (G02/G05/G07/2UC)	365 ± 10 mm
Sports running gear GTI (G08)	365 ± 10 mm
Sports running gear R32 (G09)	360 ± 10 mm
Sports running gear GTI; US version (G11)	380 ± 10 mm
BlueMotion (G04/2UC)	365 ± 10 mm

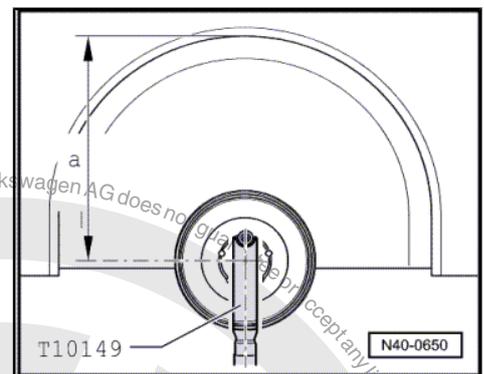
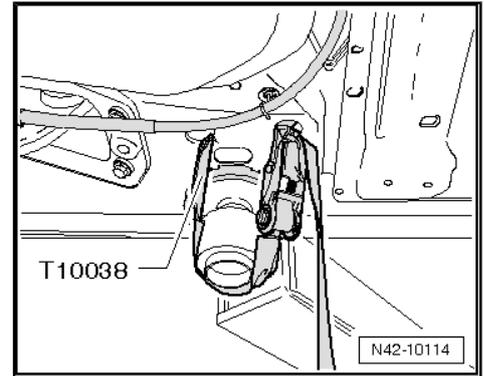
¹⁾ The type of running gear fitted to the vehicle is recorded on the vehicle data sticker. The running gear is identified by the PR number. Which PR. No. refers to which running gear can be found here ⇒ [page 317](#) .

- Raise wheel bearing housing using engine and gearbox jack until dimension -a- is attained

⚠ WARNING

- ◆ *Never raise or lower the vehicle while the engine and gearbox jack is positioned beneath the vehicle.*
- ◆ *Do not leave the engine and gearbox jack under the vehicle for longer than necessary.*

- Tighten affected nuts and bolts.
- Lower wheel bearing housing.
- Pull engine and gearbox jack out from underneath vehicle.
- Remove support -T10149- .

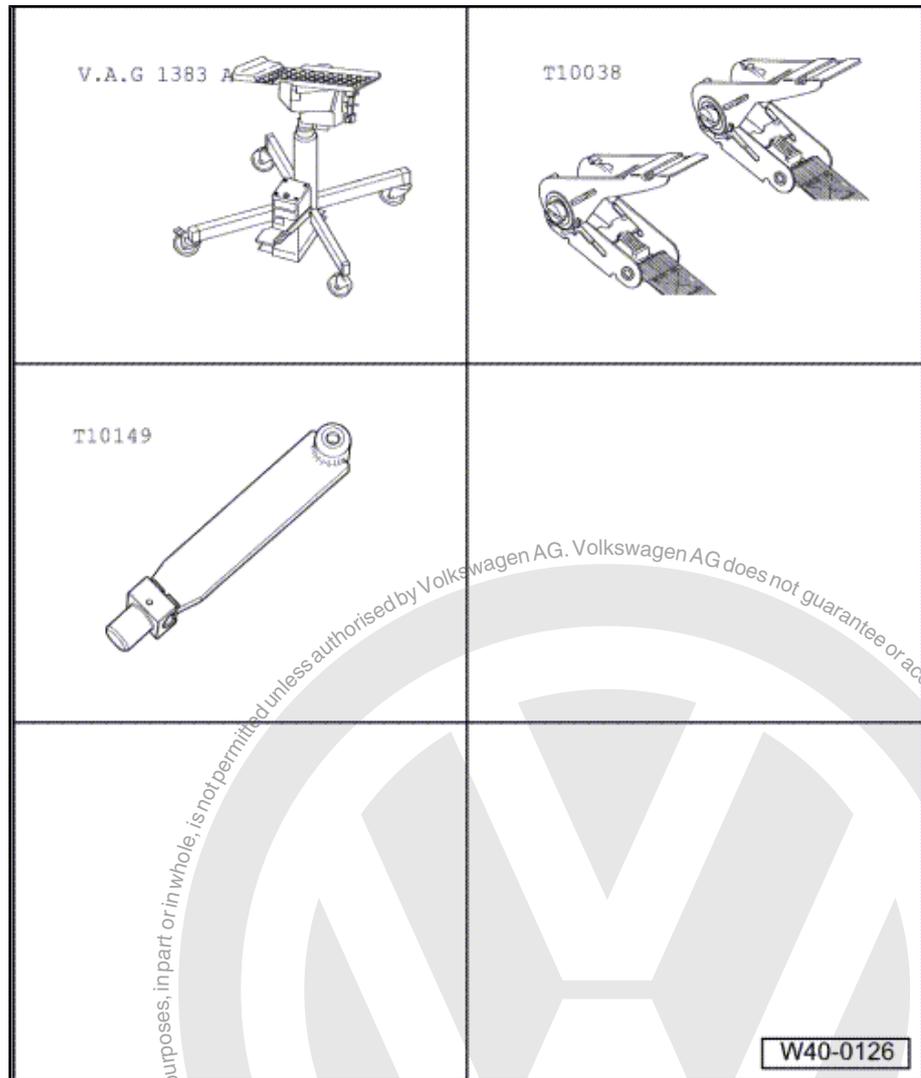




2.3 Rear axle in unladen position, Golf Plus, CrossGolf

Special tools and workshop equipment required

- ◆ Engine and gearbox jack - V.A.G 1383 A-
- ◆ Tensioning strap -T10038-
- ◆ Support -T10149-



Note

All bolts on running gear components with bonded rubber bushes may be tightened only when the component is in the unladen position (normal position).

Bonded rubber bushes can be twisted only to a limited extent.

Axle components with bonded rubber bushes must therefore be brought to a position equivalent to the unladen (normal) position before being tightened.

Otherwise, the bonded rubber bush would be subject to torsion loading, shortening its service life.

To simulate this position on the lifting platform, raise the axle on one side using the engine and gearbox jack -V.A.G 1383 A- and support -T10149- .



Before the axle on one side is raised, both sides of the vehicle must be strapped to the lifting platform arms with tensioning straps -T10038- .

⚠ WARNING

If the vehicle is not strapped down, there is a danger that the vehicle will slip off the lifting platform!

- Turn wheel hub until one of the wheel bolt holes is at the top.
- Attach support -T10149- with a wheel bolt.

Threaded connections may be tightened only when dimension -a- between the centre of wheel hub and lower edge of wheel housing, measured before starting work, has been attained.

Measuring dimension -a-

The dimension -a- depends on the ride height of the installed running gear:

Running gear ¹⁾	Ride height -a- in mm
Standard running gear (2UA)	378 ± 10 mm
Heavy-duty running gear (2UB)	398 ± 10 mm
Sports running gear except 18" wheels (2UC)	363 ± 10 mm
Sports running gear with 18" wheels (G02/G07/2UC)	363 ± 10 mm
CrossGolf (2UB)	395 ± 10 mm
BlueMotion (G06)	370 ± 10 mm

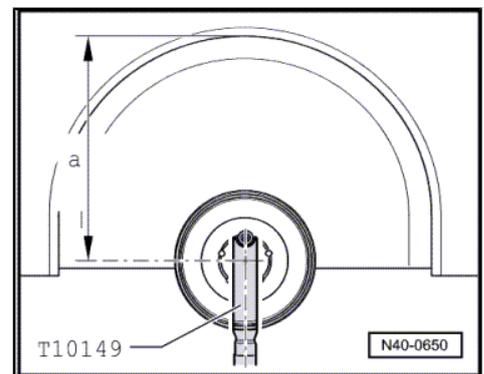
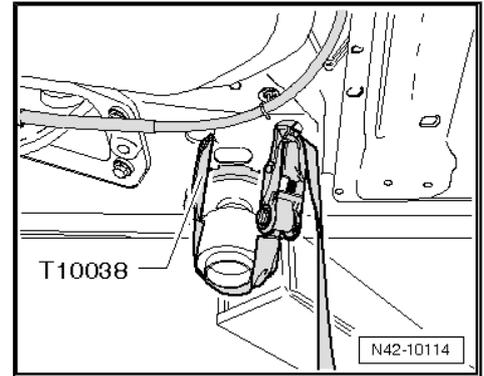
¹⁾ The type of running gear fitted to the vehicle is recorded on the vehicle data sticker. The running gear is identified by the PR number. Which PR. No. refers to which running gear can be found here ⇒ [page 317](#) .

- Raise wheel bearing housing using engine and gearbox jack until dimension -a- is attained.

⚠ WARNING

- ◆ *Never raise or lower the vehicle while the engine and gearbox jack is positioned beneath the vehicle.*
- ◆ *Do not leave the engine and gearbox jack under the vehicle for longer than necessary.*

- Tighten affected nuts and bolts.
- Lower wheel bearing housing.
- Pull engine and gearbox jack out from underneath vehicle.
- Remove support -T10149- .





3 Assembly overview: subframe, transverse link, track rod (front-wheel drive)

1 - Eccentric bolt

- For camber adjustment
- Check wheel alignment whenever this component is loosened
⇒ [page 305](#) .

2 - Nut

- M12 x 1.5
- 95 Nm
- Self-locking
- Always renew after removing
- Always tighten threaded connections in unladen position:

Golf ⇒ [page 136](#)

Golf Plus, CrossGolf
⇒ [page 138](#)

3 - Eccentric washer

- Inner hole with lug

4 - Eccentric bolt

- For track adjustment
- Check wheel alignment whenever this component is loosened
⇒ [page 305](#) .

5 - Eccentric washer

- Inner hole with lug

6 - Nut

- 95 Nm



Note

- M12 x 1.5
- Self-locking
- Always renew after removing
- Always tighten threaded connections in unladen position:

Golf ⇒ [page 136](#)

Golf Plus, CrossGolf ⇒ [page 138](#)

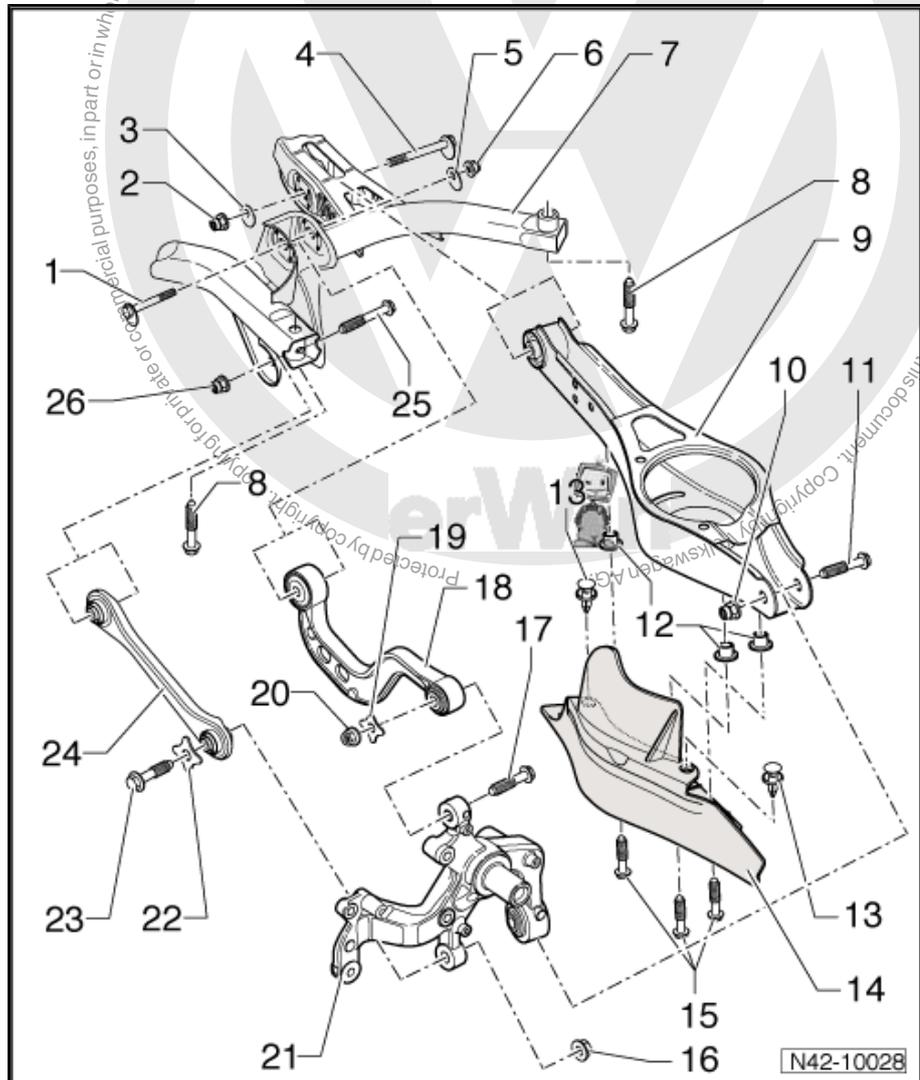
7 - Subframe

8 - Bolt

- M12 x 1.5 x 90
- 90 Nm + 90° further
- Always renew after removing

9 - Lower transverse link

- Removing and installing ⇒ [page 151](#)





10 - Nut

- M12 x 1.5 x 75
- 90 Nm + 90° further
- Self-locking
- Always renew after removing
- Always tighten threaded connections in unladen position:

Golf ⇒ [page 136](#)

Golf Plus, CrossGolf ⇒ [page 138](#)

11 - Bolt

- Always renew after removing

12 - Threaded rivet

- M6

13 - Spreader rivet

14 - Stone deflector

- Allocation ⇒ Electronic parts catalogue “ETKA”

15 - Bolt

- 8 Nm

16 - Nut

- M14 x 1.5
- 130 Nm + 90° further
- Self-locking
- Always renew after removing
- Always tighten threaded connections in unladen position:

Golf ⇒ [page 136](#)

Golf Plus, CrossGolf ⇒ [page 138](#)

17 - Bolt

- Always renew after removing
- Always tighten threaded connections in unladen position:

Golf ⇒ [page 136](#)

Golf Plus, CrossGolf ⇒ [page 138](#)

18 - Upper transverse link

- Removing and installing ⇒ [page 149](#)

19 - Washer

20 - Nut

- M14 x 1.5
- 130 Nm + 90° further
- Self-locking
- Always renew after removing
- Always tighten threaded connections in unladen position:

Golf ⇒ [page 136](#)

Golf Plus, CrossGolf ⇒ [page 138](#)

21 - Wheel bearing housing

- Removing and installing ⇒ [page 157](#)



22 - Washer

23 - Bolt

- Always renew after removing
- Always tighten threaded connections in unladen position:

Golf ⇒ [page 136](#)

Golf Plus, CrossGolf ⇒ [page 138](#)

24 - Track rod

- Various versions
- ◆ Forwards closed (left and right track rods differ)
- ◆ Downwards open (left and right track rods identical)
 - It is permitted to install mixed types.
 - Allocation ↘ Electronic parts catalogue "ETKA"
 - Removing and installing ⇒ [page 152](#)

25 - Bolt

- Always renew after removing

26 - Nut

- M12 x 1.5
- 90 Nm + 90° further
- Self-locking
- Always renew after removing
- Always tighten threaded connections in unladen position:

Golf ⇒ [page 136](#)

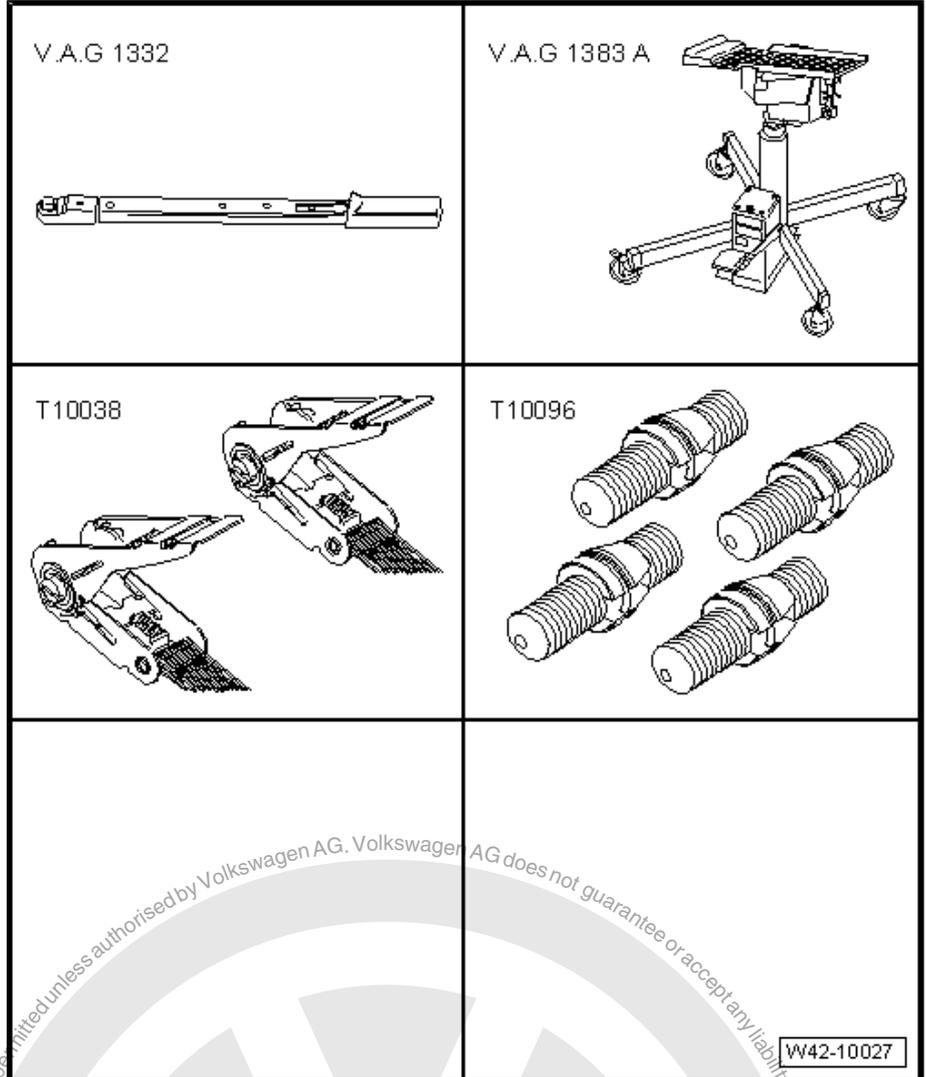
Golf Plus, CrossGolf ⇒ [page 138](#)



3.1 Removing and installing rear axle

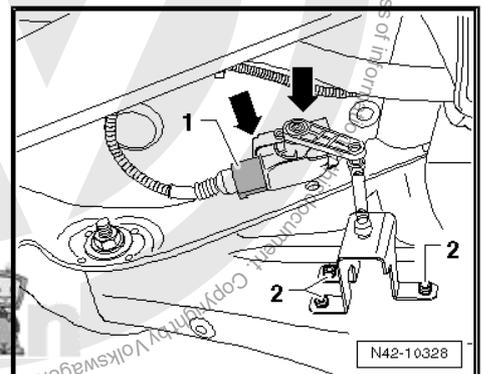
Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1332-
- ◆ Engine/gearbox jack - V.A.G 1383/A -
- ◆ Tensioning strap -T10038-
- ◆ Locating pins -T10096-



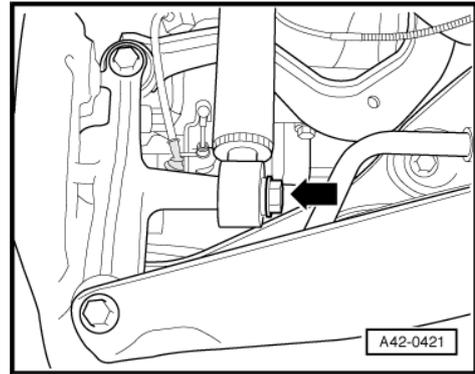
Removing subframe with attachments

- Remove wheels.
- Removing coil springs [page 174](#)
- Remove front and rear silencers of exhaust system => Engine => Rep. Gr. 26
- On vehicles with automatic headlight range control, separate wiring connection -1-.
- Remove ABS speed sensor out of wheel bearing housing.

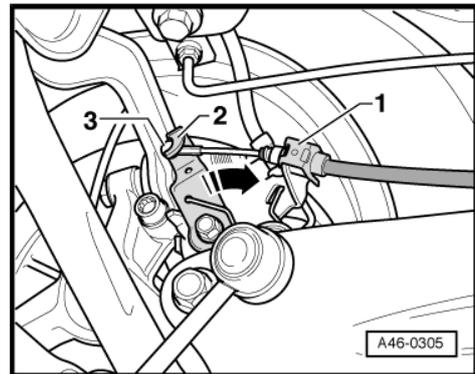




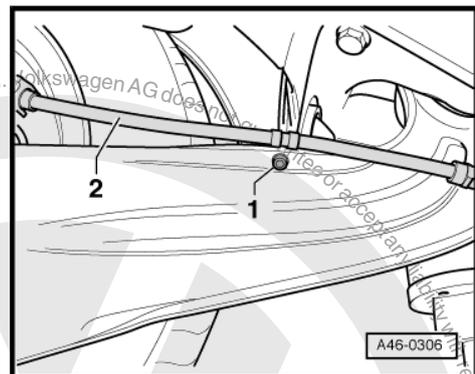
- Remove screw -arrow-.



- Lever off spring clip -1- for handbrake cable.
- Push lever -2- in -direction of arrow- and unhook brake cable -3-.



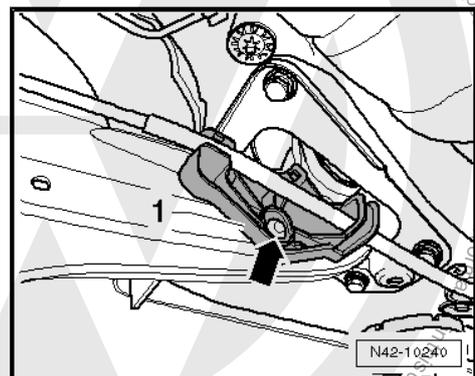
- Unscrew hexagon bolt -1- and detach handbrake cable -2- from brake cable bracket.



Vehicles with retainer for handbrake cable

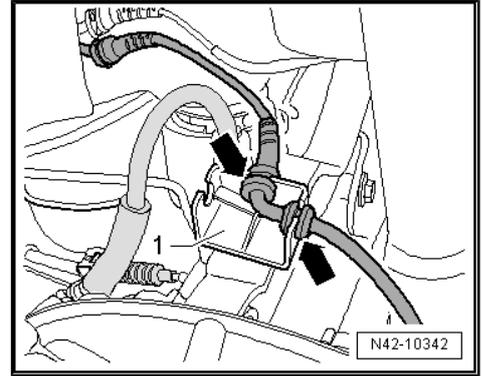
- Remove retainer -1- by pushing out inner pin of rivet -arrow-.

Continuation for all vehicles

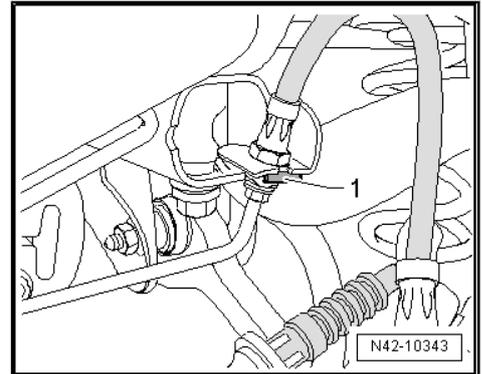




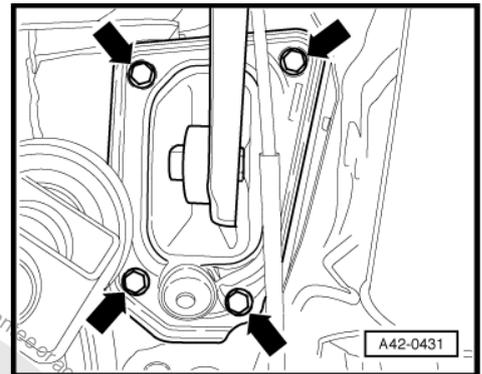
- Unclip speed sensor wire from retainer -1- -arrows-.



- Pull out hose retainer -1- on both sides of vehicle.

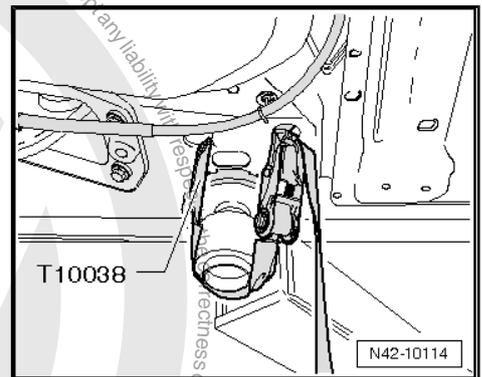


- Mark installation position of bearing bracket on body.
- Remove bolts -arrows-.



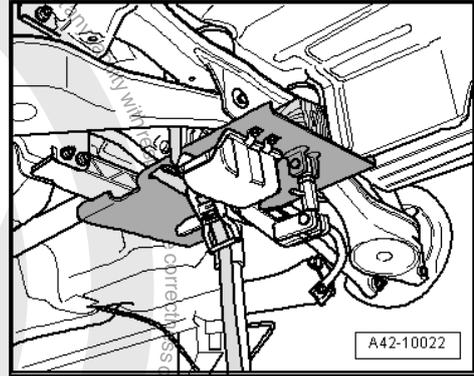
- Now secure vehicle to hoist using tensioning straps -T10038-

 **WARNING**
If the vehicle is not strapped down, there is a danger that the vehicle will slip off the lifting platform/hoist.





- Position engine and gearbox jack -V.A.G 1383 A- under subframe using universal gearbox mounting -V.A.G 1359/2- and secure with tensioning strap.

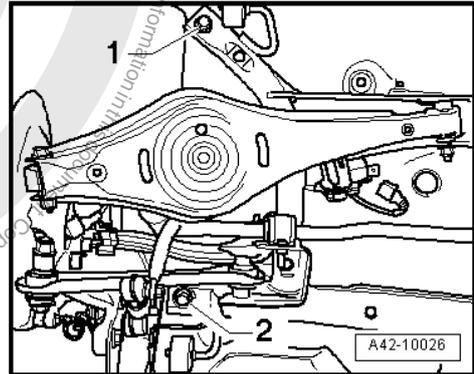


- Unscrew bolt -1- or -2- on both sides.



Note

Only the left vehicle side is shown to improve clarity.

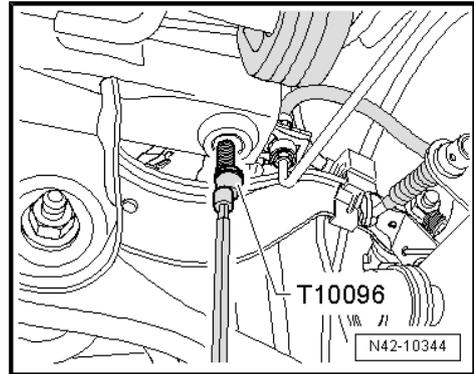


- Secure position of subframe using 2 locking devices -T10096- and tighten to 20 Nm.



Note

The locating devices -T10096- must only be tightened to a maximum of 20 Nm; otherwise the threads of the locating pins may be damaged.



- Unscrew remaining 2 bolts from subframe.
- Carefully lower subframe with attachments a maximum of 30 mm.



Note

When lowering, ensure there is sufficient clearance to the brake lines and electrical cables.

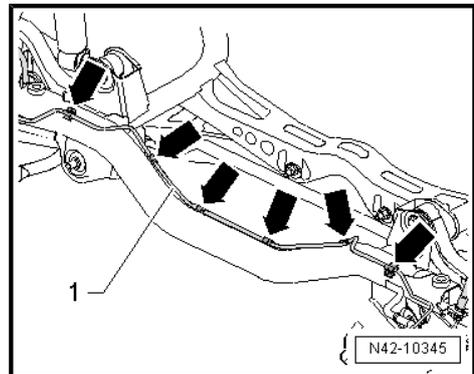
- Unclip brake line -1- from clips -arrows-.



Note

- ◆ The clips will be destroyed and must be renewed.
- ◆ For reasons of clarity, the illustration shows the subframe from above in removed state.

- Lower subframe with attachments.



Installing subframe with attachments

Install in reverse order. Note the following points:



Specified torques

Component	Specified torque
Subframe to body ◆ Use new bolts	90 Nm + 90°
Shock absorber to wheel bearing housing	180 Nm
Mounting bracket to body ◆ Use new bolts	50 Nm + 45°
Handbrake cable to trailing arm ⇒ Brake systems; Rep. Gr. 46	



3.2 Vehicle level sender for vehicles with automatic headlight range control



Note

- ◆ The vehicle level sender is available as a replacement part only complete with coupling rod and upper and lower retaining plates.
- ◆ Renewing without removing subframe ⇒ [page 148](#).
- ◆ Control unit for headlight range control -J431-.

1 - Subframe

2 - Lower transverse link

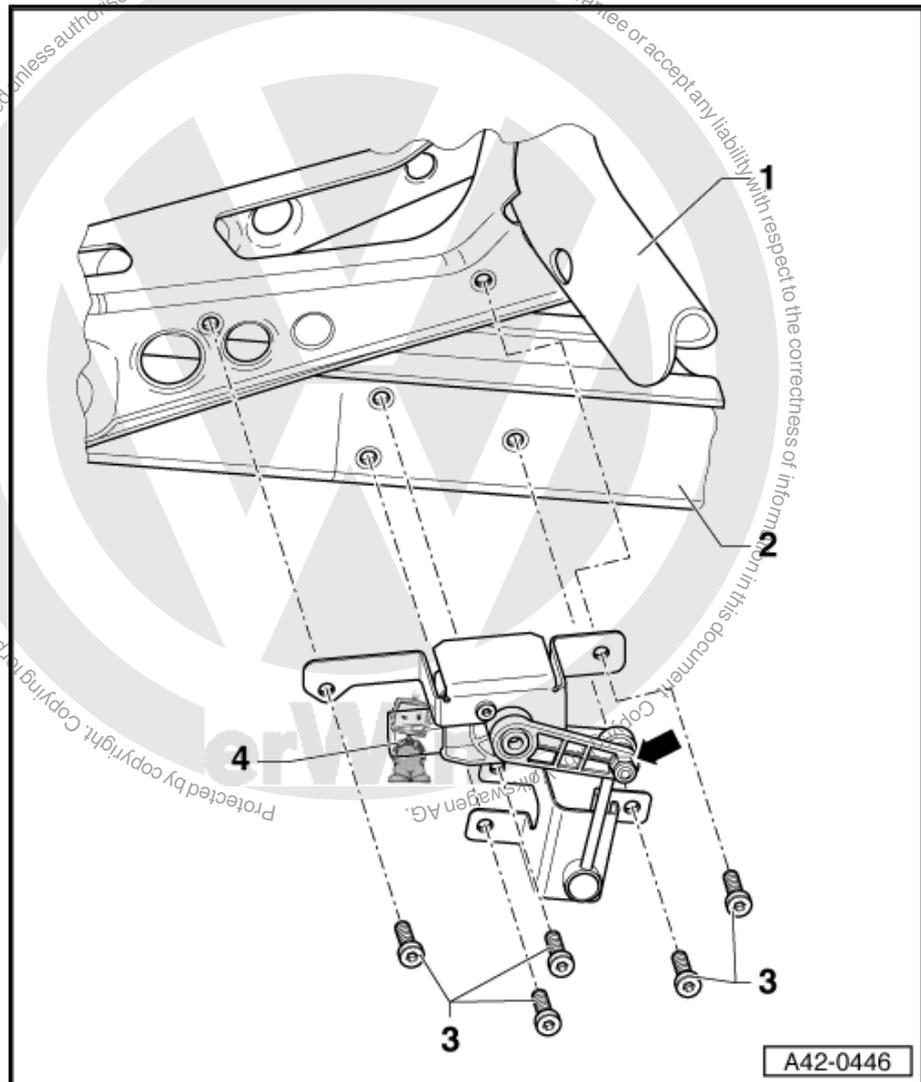
3 - Bolt

- 5 Nm

4 - Rear left vehicle level sender -G76-

- Complete with attachments
- Lever -arrow- must face outwards
- Renewing in vehicle ⇒ [page 148](#)
- Allocation ⇒ Electronic parts catalogue "ETKA"
- Following renewal, basic settings for headlight must be performed.

Perform basic settings of headlights using ⇒ Vehicle diagnosis, testing and information system VAS 5051.

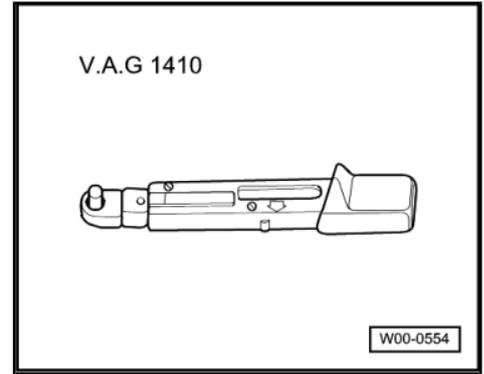


3.3 Renew vehicle level sender in vehicle

Special tools and workshop equipment required



- ◆ Torque wrench -V.A.G 1410-



Removing

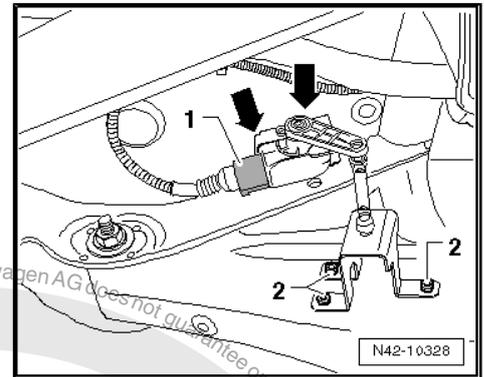
- Separate connection -1-.
- Remove bolts -2- from lower transverse link.
- Remove bolts -arrows- from subframe.
- Remove rear left vehicle level sender -G76- .

Installing

Install in reverse order. Note the following points:

The lever of rear left vehicle level sender -G76- must face outside of vehicle.

- After completing installation, carry out basic setting of head-lights ⇒ "Guided fault-finding" function of vehicle diagnosis, testing and information system VAS 5051 .



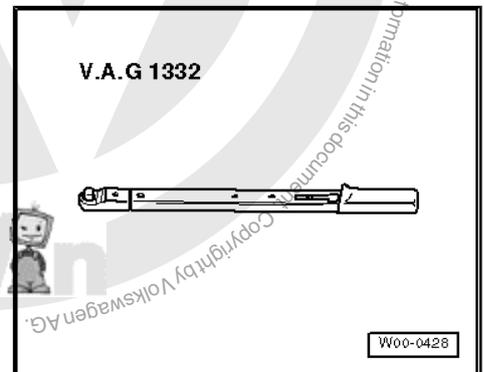
Specified torques

Component	Specified torque
Rear left vehicle level sender -G76- to lower transverse link and subframe	5 Nm

3.4 Removing and installing upper transverse link

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1332-

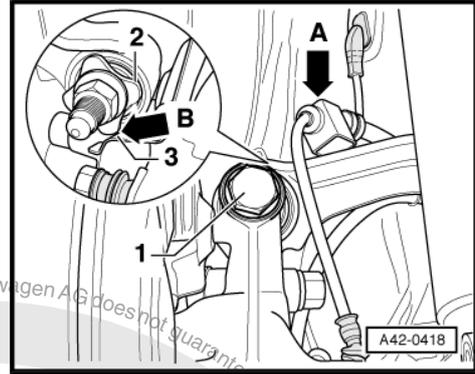


Removing

- Remove wheel.
- Remove coil spring ⇒ [page 173](#) .



- Unhook speed sensor line -arrow A- from upper transverse link.
- Remove bolt -1-.



- Mark position of eccentric bolt -arrow- relative to subframe using e.g. a felt tip pen.
- Remove bolt -arrow-.
- Remove upper transverse link.

Installing

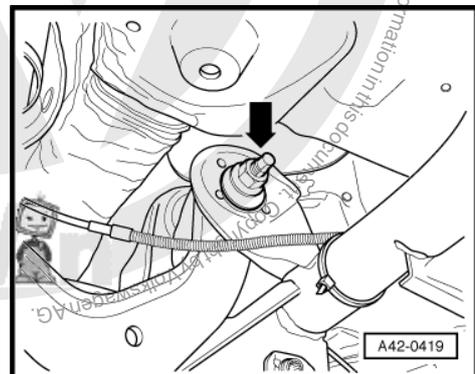
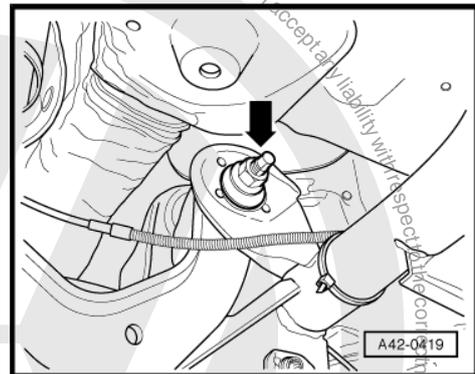
- Install upper transverse link on vehicle and tighten bolts hand tight.

The transverse link may be bolted only when dimension "a" has been attained.

Golf ⇒ [page 137](#)

Golf Plus, CrossGolf ⇒ [page 139](#)

- Bolt upper transverse link to subframe and tighten new nut to specified torque.
- Observe mark made for position of eccentric bolt -arrow- relative to subframe.

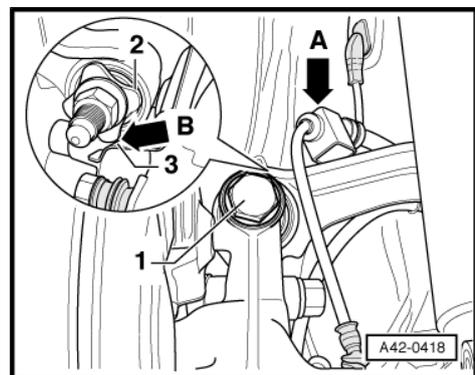


- Tighten bolt -1- for upper transverse link.

Note

The washer -2- must be installed so that there is a gap -arrow B- between the washer and the backplate -3-.

- Attach speed sensor line -arrow A- from upper transverse link.
- Install coil spring ⇒ [page 173](#) .
- Install wheel and tighten ⇒ [page 288](#) .
- Perform wheel alignment ⇒ [page 305](#) .





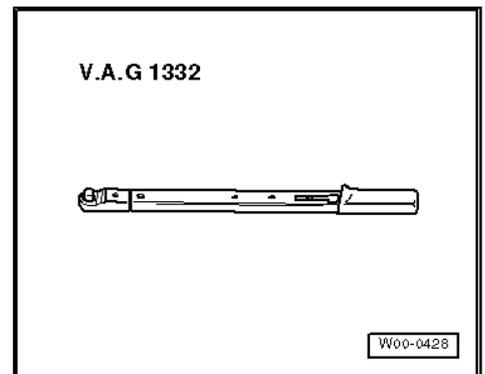
Specified torques

Component	Specified torque
Upper transverse link to wheel bearing housing ♦ Use new nuts and bolts ♦ Tighten threaded connections only when vehicle is in the normal running position.	130 Nm + 90°
Upper transverse link to subframe ♦ Use new nut ♦ Tighten threaded connections only when vehicle is in the normal running position.	95 Nm ♦ To tighten nuts, set torque wrench -V.A.G 1332- to 80 Nm. ♦ Applies only in conjunction with insert tool, 18 mm -T10179-

3.5 Removing and installing lower transverse link

Special tools and workshop equipment required

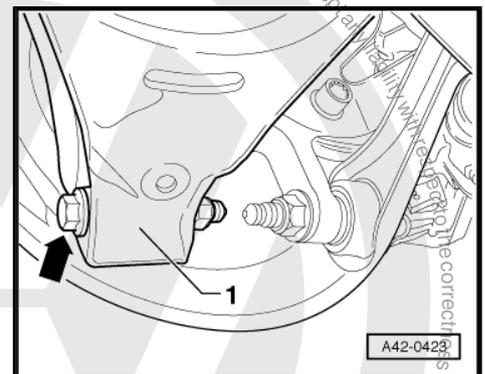
- ♦ Torque wrench -V.A.G 1332-



Removing

- Remove wheel.
- Remove coil spring. ⇒ [page 173](#) .
- Remove bolt -arrow- for lower transverse link -1-.

Vehicles with dynamic headlight range control





- Remove bolts -1- from lower transverse link.

Continuation for all vehicles

- Mark position of eccentric bolt -arrow- relative to subframe using e.g. a felt tip pen.
- Disconnect and lower rear part of exhaust system.
- Remove bolt -arrow-.
- Remove lower transverse link.

Installing

- Install lower transverse link on vehicle and tighten bolts hand tight.

The transverse link may be bolted only when dimension "a" has been attained ⇒ [page 137](#) .

- Bolt upper transverse link to subframe and tighten new nut -arrow- only to specified torque.
- Observe mark made for position of eccentric bolt -arrow- relative to subframe.
- Reinstall rear section of exhaust system.

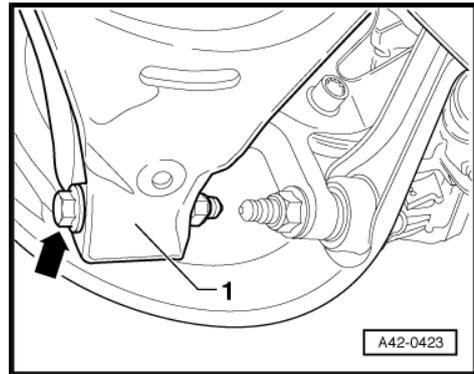
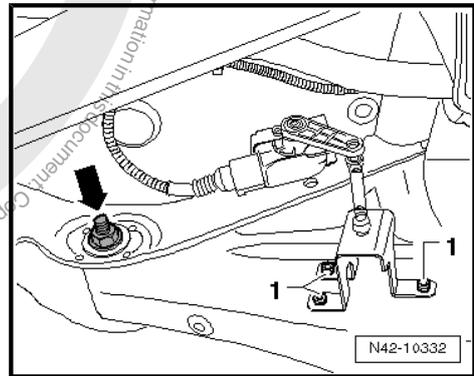
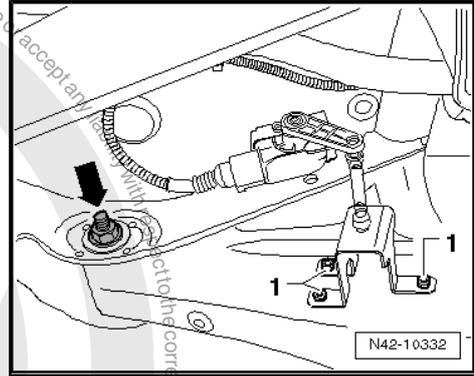
Vehicles with dynamic headlight range control

- Install bolts -1- in lower transverse link.



Continuation for all vehicles

- Tighten bolt -arrow- for lower transverse link -1-.
- Install coil spring ⇒ [page 173](#) .
- Install wheel and tighten ⇒ [page 288](#) .
- Perform wheel alignment ⇒ [page 305](#) .



Specified torques

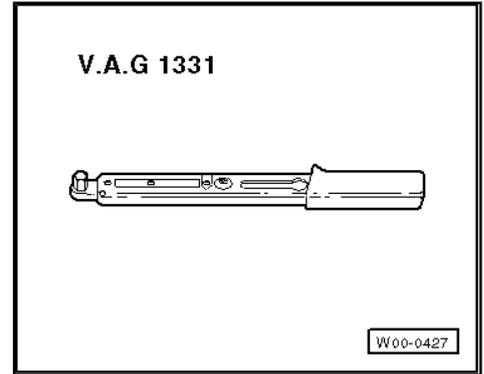
Component	Specified torque
Lower transverse link to wheel bearing housing ◆ Use new nuts and bolts ◆ Tighten threaded connections only when vehicle is in the normal running position.	90 Nm + 90°
Lower transverse link to subframe ◆ Use new nut ◆ Tighten threaded connections only when vehicle is in the normal running position	95 Nm

3.6 Removing and installing track rod

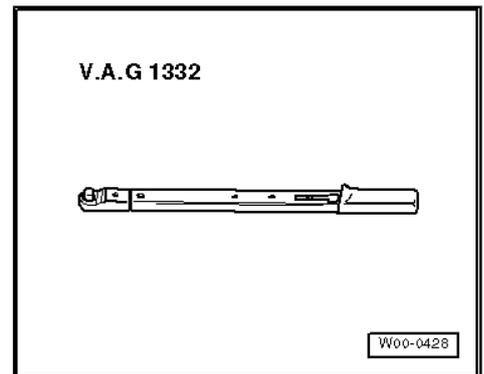
Special tools and workshop equipment required



- ◆ Torque wrench -V.A.G 1331-

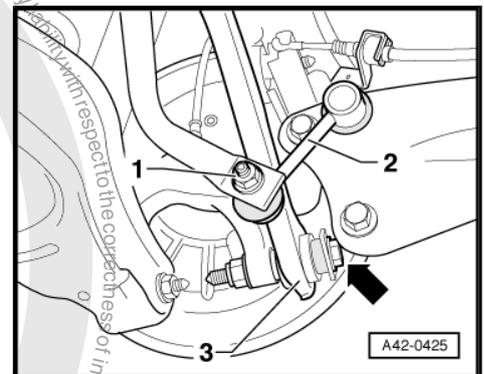


- ◆ Torque wrench -V.A.G 1332-

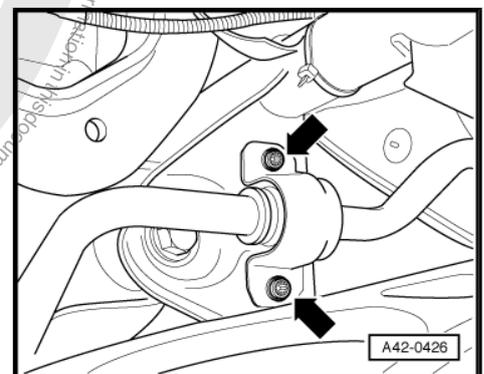


Removing

- Remove wheel.
- Remove coil spring ⇒ [page 174](#) .
- Remove nut -1- and pull coupling rod -2- out of anti-roll bar.
- Remove bolt -arrow- for track rod -3-.



- Remove bolts -arrows- for anti-roll bar clamp.





- Remove nut -arrow- and remove bolt towards rear.
- Remove track rod.

Installing

- Install track rod on vehicle and tighten bolts hand tight.

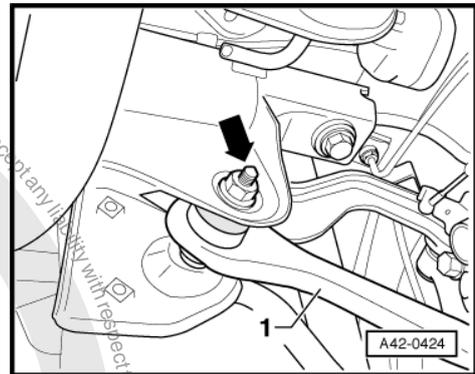
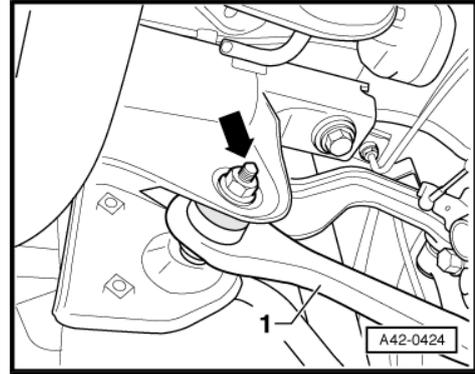


Note

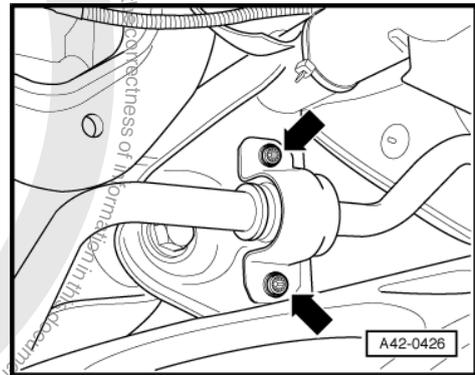
Note different versions of track rods: downwards open or forwards closed.

The track rod may be bolted only when dimension "a" has been attained ⇒ [page 137](#) .

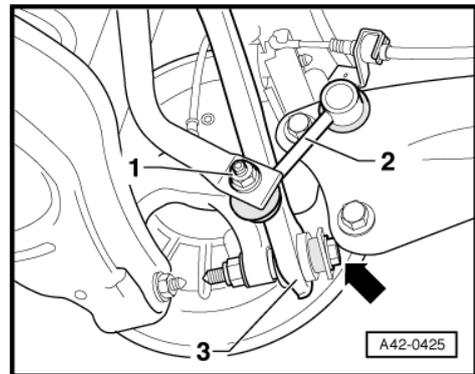
- Bolt track rod to subframe and tighten new nut to specified torque.



- Tighten bolts -arrows- for anti-roll bar clamp.



- Tighten bolt -arrow- for track rod -3-.
- Connect coupling rod -2- to anti-roll bar and tighten nut -1-.
- Install coil spring ⇒ [page 174](#) .
- Install wheel and tighten ⇒ [page 288](#) .
- Perform wheel alignment ⇒ [page 305](#) .





Specified torques

Component	Specified torque
Track rod to wheel bearing housing ♦ Use new nuts and bolts ♦ Tighten threaded connections only when vehicle is in the normal running position	130 Nm + 90°
Track rod to subframe ♦ Use new nuts and bolts	90 Nm + 90°
Anti-roll bar to subframe ♦ Use new bolts ♦ Tighten threaded connections only when vehicle is in the normal running position	25 Nm +45°
Anti-roll bar to coupling rod ♦ Use new nut	45 Nm



4 Assembly overview: wheel bearing housing, trailing arm (front-wheel drive)

1 - Bolt

- 50 Nm +45° further
- Always renew after removing

2 - Mounting bracket

3 - Bolt

- M12 x 1.5 x 80
- 90 Nm + 90° further
- Always renew after removing

4 - Coupling rod

- Modified coupling rod for model year 2004

During production start up, a change was made from coupling rods with two ball joints to coupling rods with one ball joint and one bonded rubber bush. The end with the bonded rubber bush is bolted to the anti-roll bar.

A mixed installation is not permissible.

- Connects anti-roll bar to trailing arm and wheel bearing housing

5 - Bolt

- 90 Nm +45° further
- Observe tightening sequence ⇒ [page 168](#)
- Always renew after removing

6 - Trailing arm

- Removing and installing ⇒ [page 166](#)
- Repairing ⇒ [page 170](#)

7 - Bolt

- 8 Nm

8 - Rear right speed sensor -G44- / rear left speed sensor -G46-

- Can be tested in guided fault finding using ⇒ Vehicle diagnosis, testing and information system VAS 5051
- Before inserting sensor, clean inner surface of bore and coat with lubricating paste -G 000 650

9 - Wheel bearing housing

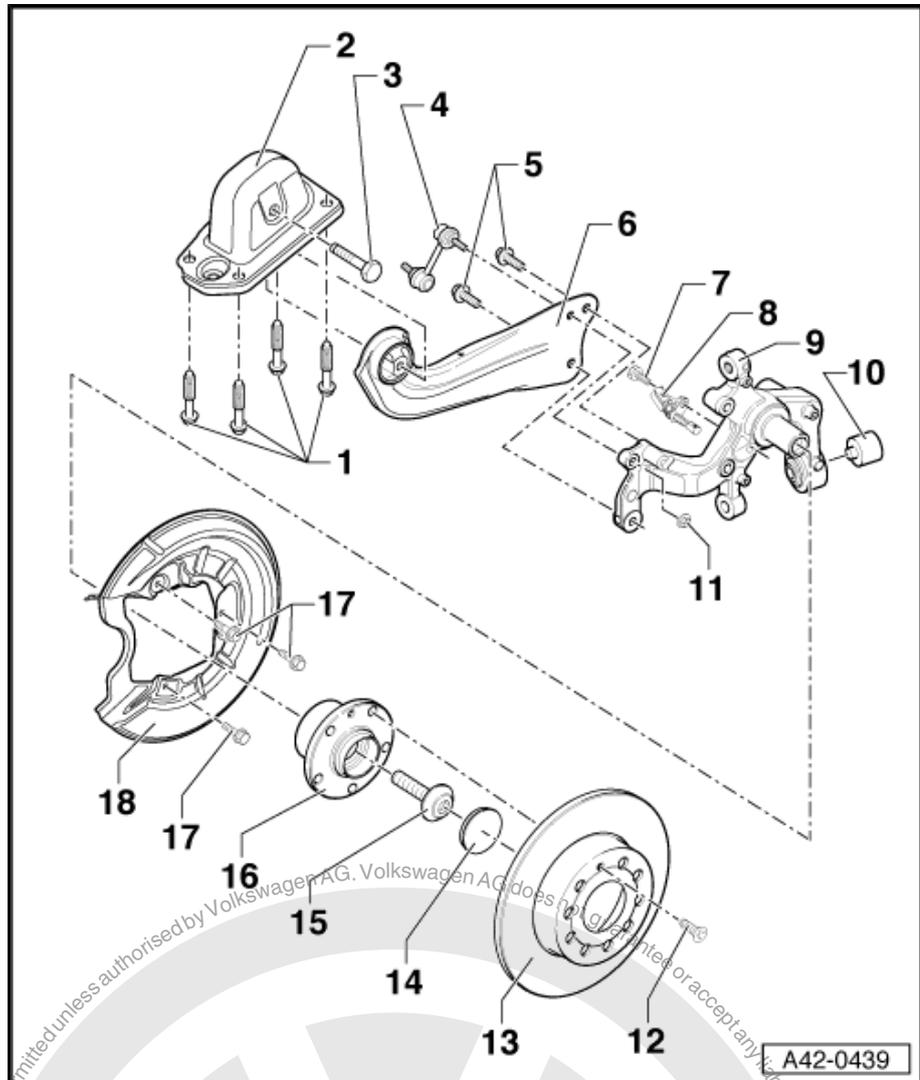
- Removing and installing ⇒ [page 157](#)

10 - Bonded rubber bush

- Renewing ⇒ [page 161](#)

11 - Nut

- 45 Nm
- Always renew after removing



A42-0439



12 - Bolt

- 4 Nm

13 - Brake disc

14 - Grease cap

- Always renew after removing
- Pressing off and driving in ⇒ [page 164](#)

A proper seal can be achieved only by installing a new grease cap.

15 - Bolt

- M16 x 1.5 x 70
- 180 Nm +180° further
- Loosen and tighten with bit XZN 18 -T10162-
- Always renew after removing

16 - Wheel hub with wheel bearing

- ABS sensor ring is installed in wheel bearing.
- Removing and installing ⇒ [page 164](#)

The wheel bearing and wheel hub are assembled one housing.

This wheel bearing/wheel hub unit is maintenance-free and has zero play. Adjustments and repairs are not possible!

17 - Bolt

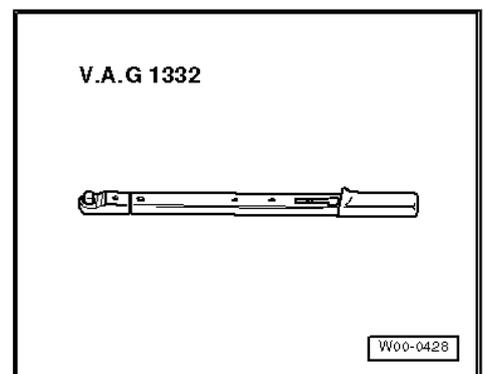
- 12 Nm

18 - Backplate

4.1 Removing and installing wheel bearing housing

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1332-

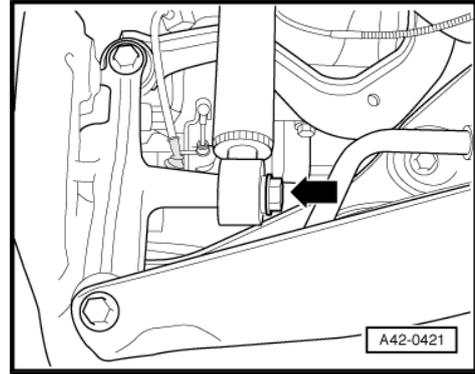


Removing

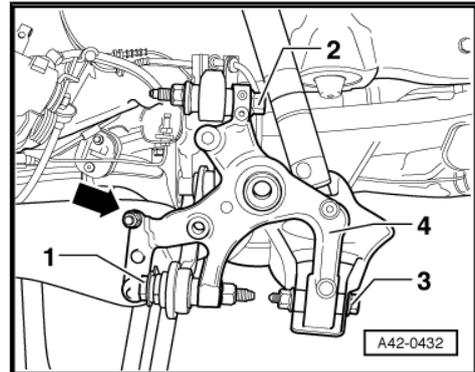
- Remove wheel.
- Remove coil spring ⇒ [page 173](#) .
- Remove wheel bearing/wheel hub unit ⇒ [page 164](#) .
- Remove backplate.
- Remove ABS speed sensor out of wheel bearing housing.



- Remove bolt -arrow-.

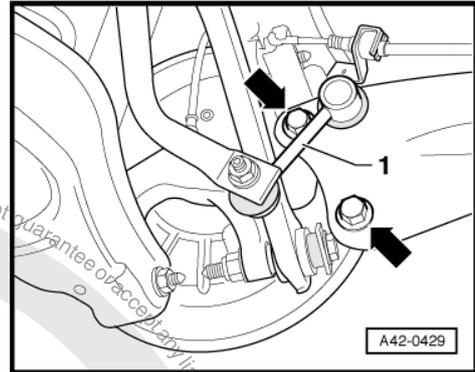


- Remove bolt for track rod -1-, upper transverse link -2- and lower transverse link -3- from wheel housing -4-.
- Remove coupling rod -arrow- from wheel bearing housing.

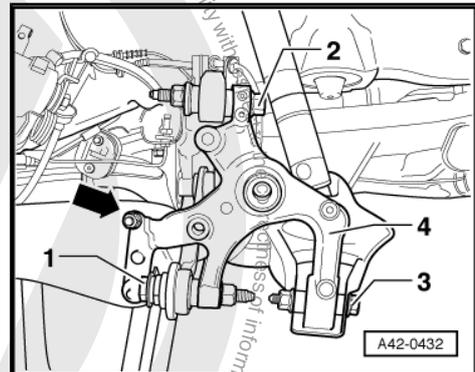


- Hold wheel bearing housing and remove bolts -arrows-.
- Remove coupling rod -1- from trailing arm.

Installing



- Install bolts for track rod -1-, upper transverse link -2- and lower transverse link -3-.
- Attach coupling rod -arrow- to wheel bearing housing hand tight.

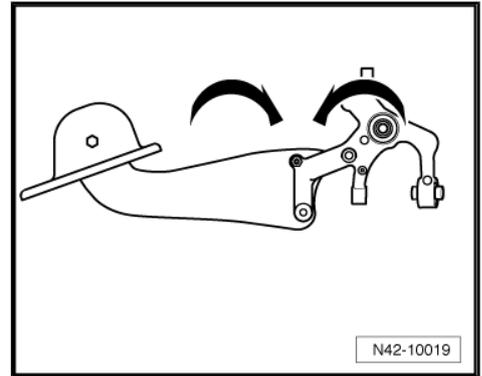




Threaded connection for trailing arm and wheel bearing housing may be tightened only after all other components (particularly the spring and shock absorber) of respective wheel suspension have been installed. To tighten, wheel suspension must be in extended position. Only then do trailing arm and wheel bearing housing move to the necessary position -arrows-.

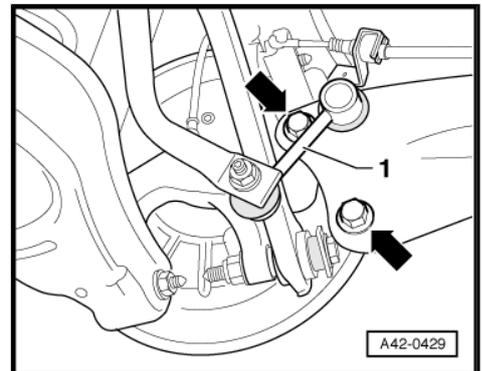
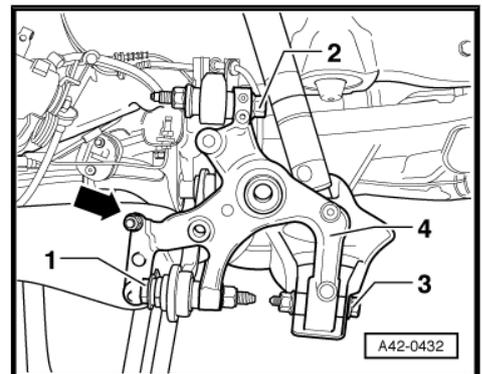
It is important to keep to the specified sequence for the following operations.

- Position trailing arm and mounting bracket on wheel bearing housing using bolts -2- but do not tighten yet.

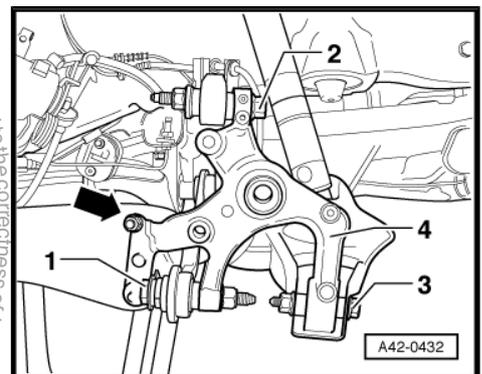


- Install bolts -arrows- and tighten to prescribed torque.
- Install backplate.
- Install wheel bearing/wheel hub unit.

Bolt connections on wheel bearing housing may be tightened only when dimension "a" has been obtained => page 137 .



- Tighten bolt for track rod -1-.
- Tighten bolt for lower transverse link -3-.



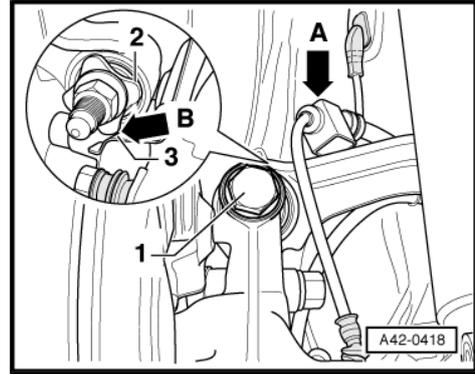


- Tighten bolt -1- for upper transverse link.

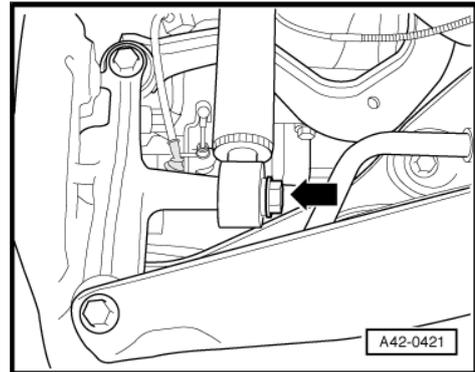


Note

The washer -2- must be installed so that there is a gap -arrow B- between the washer and the backplate -3-.



- Tighten bolt -arrow-.
- Install coil spring ⇒ [page 174](#) .
- Install ABS speed sensor in wheel bearing housing.
- Install brake disc.
- Attach brake carrier with brake caliper ⇒ Brake systems; Rep. Gr. 46 .
- Install wheel and tighten ⇒ [page 288](#) .



Specified torques

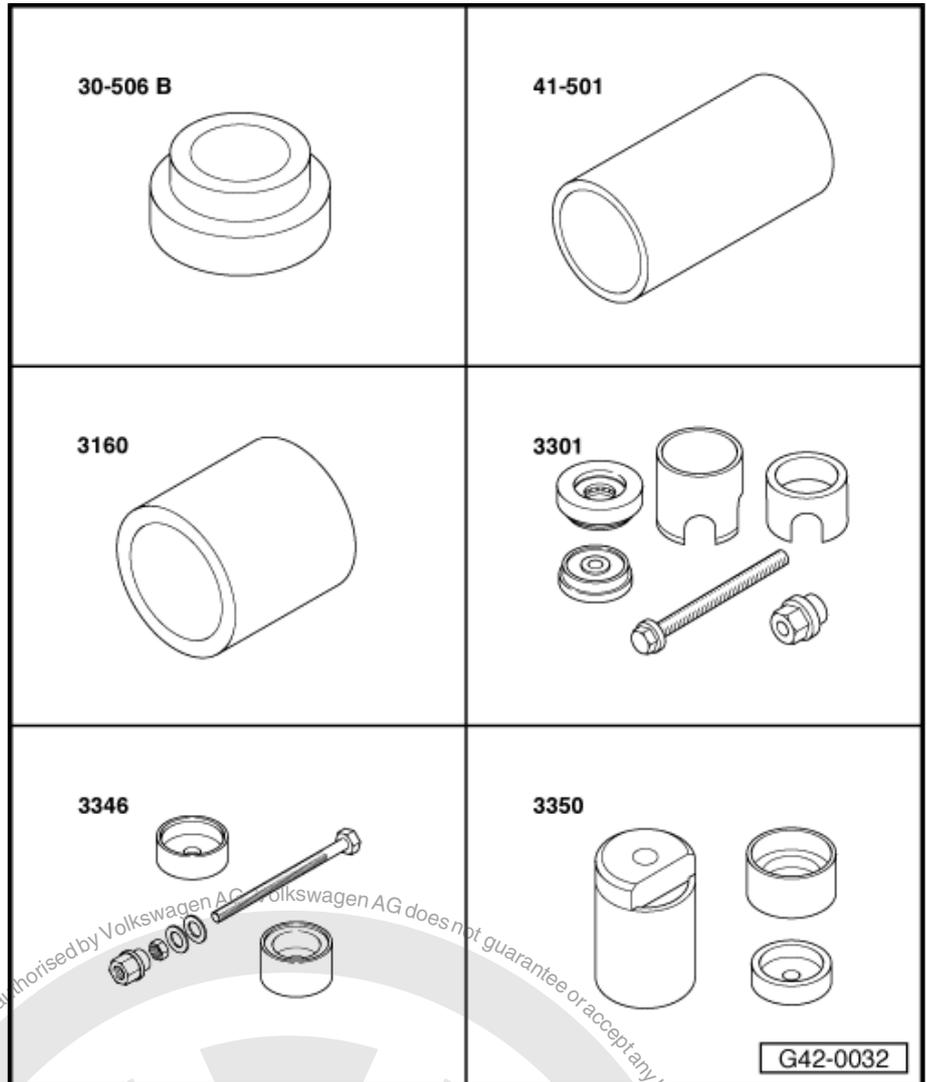
Component	Specified torque
Upper transverse link to wheel bearing housing ◆ Use new nuts and bolts ◆ Tighten threaded connections only when vehicle is in the normal running position.	130 Nm + 90°
Wheel bearing housing to lower suspension link ◆ Use new nuts and bolts ◆ Tighten threaded connections only when vehicle is in the normal running position.	90 Nm + 90°
Wheel bearing housing to track rod ◆ Use new nuts and bolts ◆ Tighten threaded connections only when vehicle is in the normal running position.	130 Nm + 90°
Trailing arm to wheel bearing housing ◆ Use new bolts	90 Nm +45°
Coupling rod to wheel bearing housing ◆ Use new nut	45 Nm
Splash plate to wheel bearing housing	12 Nm
ABS speed sensor to wheel bearing housing	8 Nm
Shock absorber to wheel bearing housing	180 Nm
Brake disc to wheel bearing housing.	4 Nm



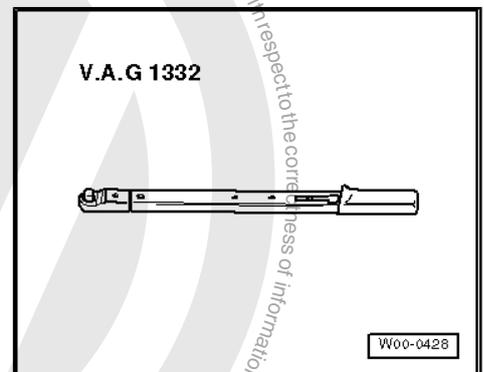
4.2 Renewing bonded rubber bush for wheel bearing housing

Special tools and workshop equipment required

- ◆ Press tool -30 - 506 B-
- ◆ Drift sleeve -41-501-
- ◆ Sleeve -3160-
- ◆ Assembly tool -3301-
- ◆ Assembly tool -3346-
- ◆ Assembly tool -3350-



- ◆ Torque wrench -V.A.G 1332-



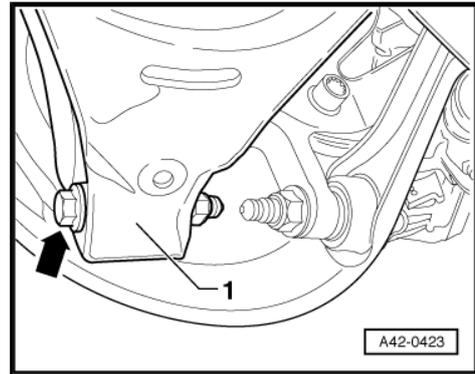
Removing

- Remove wheel.
- Remove coil spring ⇒ [page 173](#).
- Remove wheel bearing/wheel hub unit ⇒ [page 164](#).

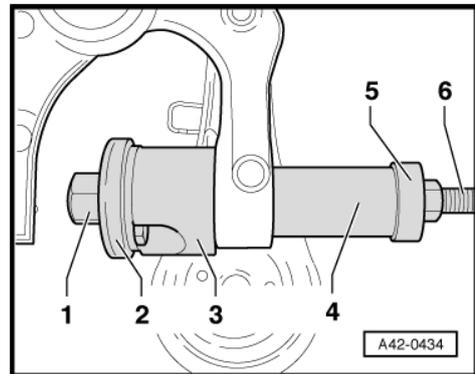


- Remove backplate.
- Remove bolt -arrow- for lower transverse link -1-.

Pressing out bonded rubber bush

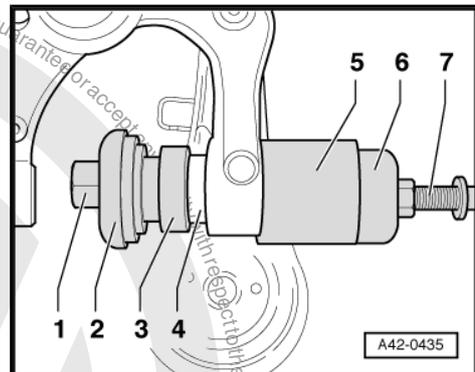


- Attach tools as shown in figure.
- 1 - Nut -3346/3-
- 2 - Thrust piece -3301-
- 3 - Tube -3301/3-
- 4 - Drift sleeve -41 - 501-
- 5 - Thrust piece -3350/1-
- 6 - Spindle -3346/2-
- Pull out bonded rubber bush by tightening spindle.



Pulling in bonded rubber bush

- Attach tools as shown in figure.
- 1 - Nut -3346/3-
- 2 - Thrust piece -3301-
- 3 - Press tool -30 - 506 B-
- 4 - Bonded rubber bush
- 5 - Sleeve -3160-
- 6 - Thrust piece -3350/2-
- 7 - Spindle -3346/2-
- Pull in bonded rubber bush by turning spindle.



Note

- ◆ Do not use lubricant.
- ◆ Install bonded rubber bush carefully so that it does not cant.

Installing

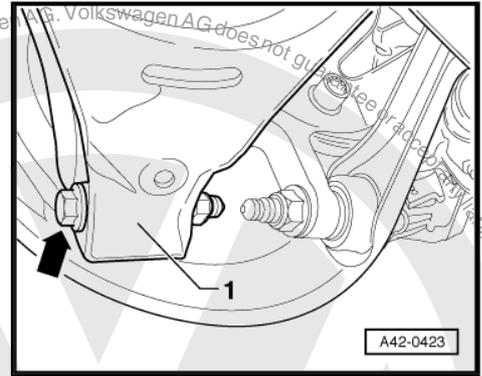
- Install backplate.
- Install wheel bearing/wheel hub unit.

Bolt connections on wheel bearing housing may be tightened only when dimension "a" has been obtained ⇒ [page 137](#) .





- Tighten bolt -arrow- for lower transverse link -1-.
- Install coil spring ⇒ [page 173](#) .
- Install brake disc.
- Attach brake carrier with brake caliper ⇒ **Brake systems; Rep. Gr. 46** .
- Install wheel and tighten ⇒ [page 288](#) .



Specified torques

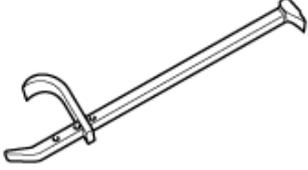
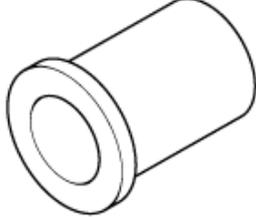
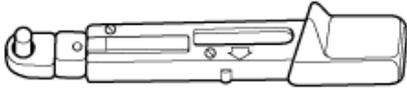
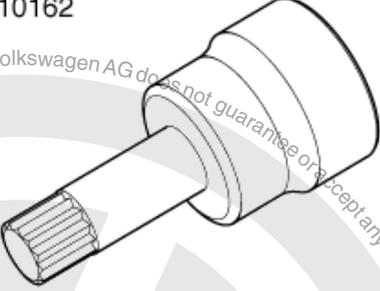
Component	Specified torque
Wheel bearing housing to lower suspension link ♦ Use new nuts and bolts ♦ Tighten threaded connections only when vehicle is in the normal running position.	90 Nm + 90°
Splash plate to wheel bearing housing	12 Nm
Brake disc to wheel bearing housing.	4 Nm



4.3 Removing and installing wheel bearing/wheel hub unit

Special tools and workshop equipment required

- ◆ Hub grease cap puller -VW 637/2-
- ◆ Fitting sleeve -3241-
- ◆ Torque wrench -V.A.G 1332-
- ◆ Torque wrench -V.A.G 1410-
- ◆ Tool insert -T10162-

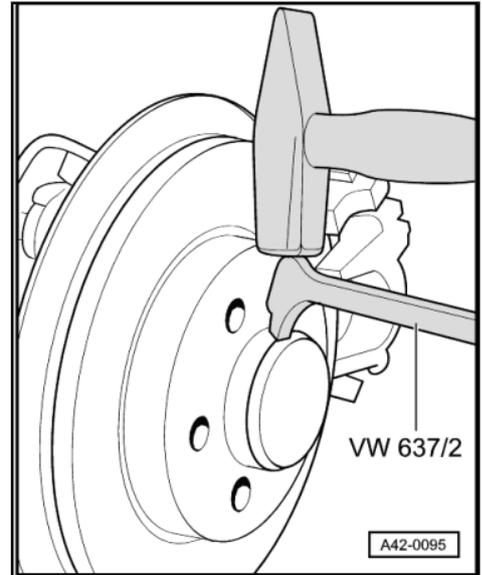
<p>VW 637/2</p> 	<p>3241/4</p> 
<p>V.A.G 1332</p> 	<p>V.A.G 1410</p> 
<p>T10162</p>  <p style="text-align: right;">W42-10003</p>	

Removing

- Raise vehicle.
- Remove wheel.



Loosen grease cap from seat by tapping lightly on the claw of hub grease cap puller -VW 637/2-.



- Lever off grease cap.
- Remove brake carrier with brake caliper and hang from body with wire => Brake systems; Rep. Gr. 46 .

i Note

Hang brake caliper from body.

- Remove cross-head screw for brake disc and remove brake disc.
- Remove multi-point socket head bolt using socket insert - T10162- .
- Pull wheel hub/wheel bearing unit off stub axle.

Installing

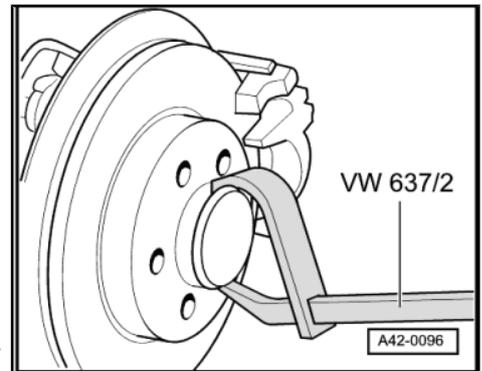
- Carefully push wheel bearing/wheel hub unit onto stub axle

Ensure that the wheel bearing/wheel hub unit does not cant!

- Use a new multi-point socket head bolt and tighten it.

i Note

- ◆ *First tighten the bolt to the prescribed torque using a torque wrench.*
- ◆ *Use a rigid spanner to turn bolt further for specified additional turn.*





- Drive on grease cap with fitting sleeve -3241/4-.

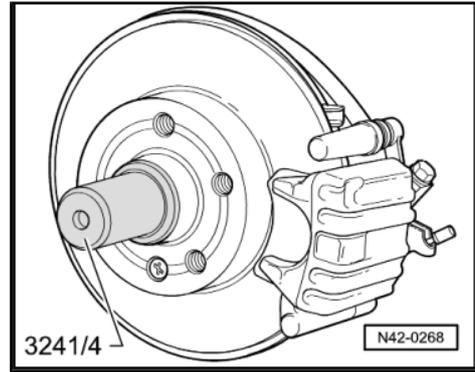


Note

- ◆ Always renew removed grease caps.
- ◆ Damaged grease caps may allow moisture to enter the bearing. Therefore, always use the tool shown in the illustration.

Continue installation in reverse order.

- Install wheel and tighten bolts or nuts ⇒ [page 288](#) .



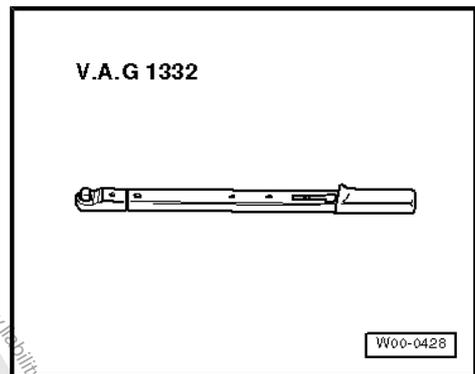
Specified torques

Component	Specified torque
Wheel hub with wheel bearing to wheel bearing housing ◆ Use new bolt	180 Nm + 180°
Brake disc to wheel bearing housing.	4 Nm

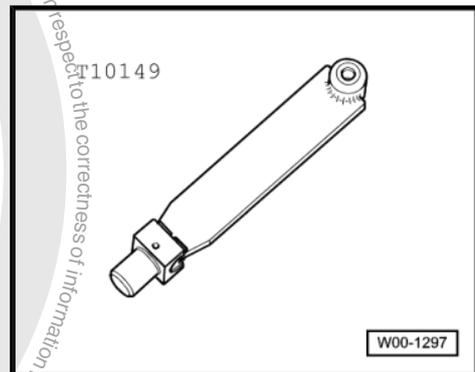
4.4 Removing and installing trailing arm with mounting bracket

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1332-



- ◆ Support -T10149-

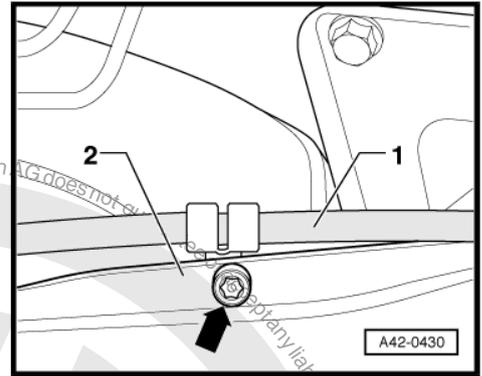


Removing

- Remove wheel.
- Remove coil spring ⇒ [page 173](#) .



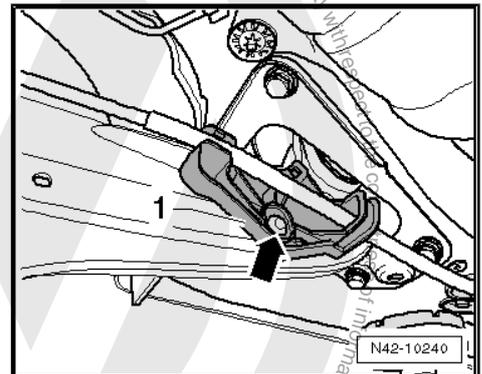
- Remove bolt -arrow- securing handbrake cable -1- to trailing arm -2-.



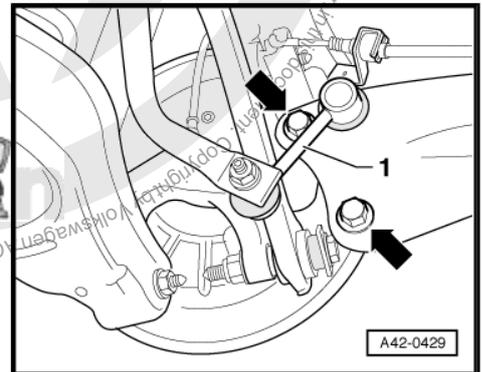
Vehicles with retainer for handbrake cable

- Remove retainer -1- by pushing out inner pin of rivet -arrow-.

Continuation for all vehicles



- Unbolt coupling rod -1- from trailing arm.
- Remove bolts -arrows-.
- Mark installation position of mounting bracket on body.

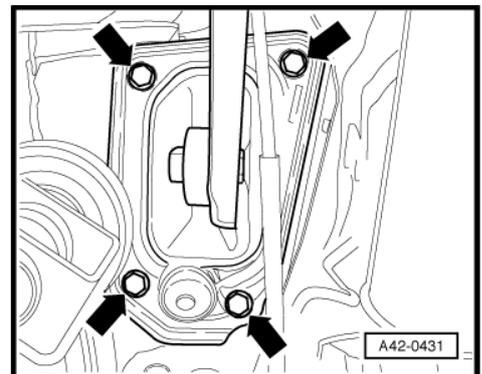


- Remove bolts -arrows-.
- Remove trailing arm with mounting bracket.

If the trailing arm is to be renewed, the mounting bracket must be removed from the longitudinal member.

The position of the mounting bracket relative to the trailing arm must then be adjusted => [page 167](#) .

Determining position of mounting bracket in relation to trailing arm





Dimension -a- is 34 ± 1 mm.

- 1 - Mounting bracket
- 2 - Trailing arm
- Tighten bolt when dimension -a- is set.

Installing

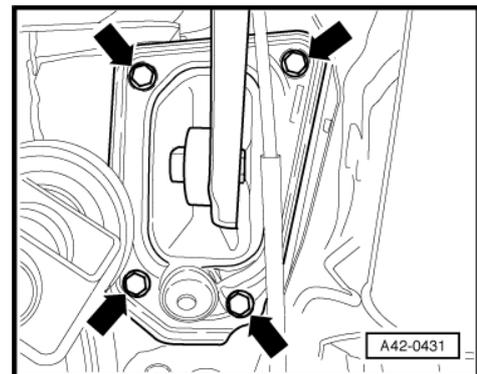
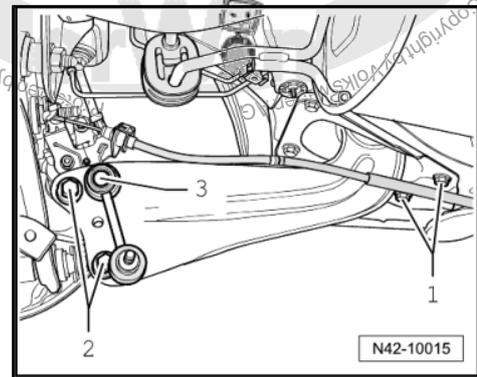
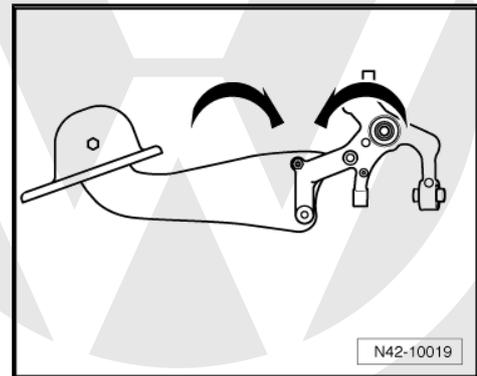
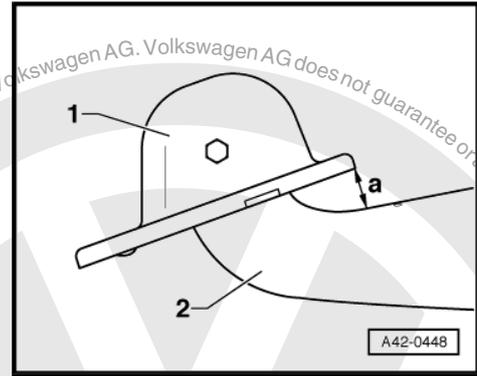
Threaded connection for trailing arm and wheel bearing housing may be tightened only after all other components (particularly the spring and shock absorber) of respective wheel suspension have been installed. To tighten, wheel suspension must be in extended position. Only then do trailing arm and wheel bearing housing move to the necessary position -arrows-.

Position: threaded connection between trailing arm and wheel bearing housing

It is important to keep to the specified sequence for the following operations.

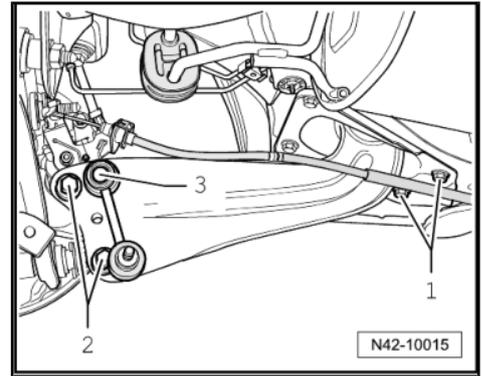
- Position trailing arm and mounting bracket on wheel bearing housing using bolts -2- but do not tighten yet.
- Attach coupling rod -3- to trailing arm but do not tighten nut yet.
- Raise wheel suspension using engine and gearbox jack - V.A.G 1383 A- and support -T10149- until mounting bracket contacts body.

- Tighten bolts -arrows- on position of old imprint.
- Lower wheel suspension again using engine and gearbox jack -V.A.G 1383 A- and remove support -T10149- from wheel hub.

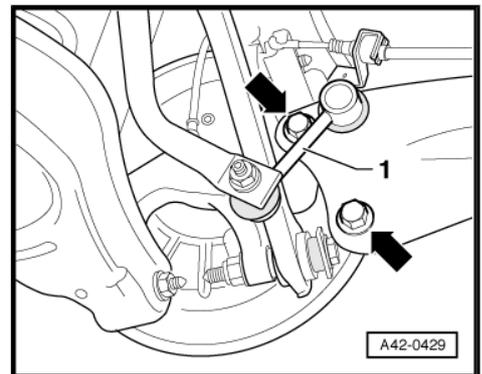




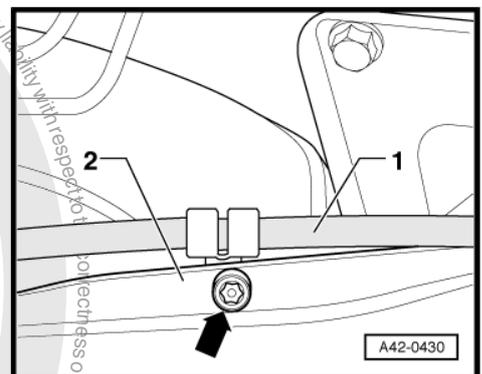
- Tighten bolts -2- for trailing arm to specified torque, observing the required component position => [page 168](#) .



- Bolt coupling rod -1- to wheel bearing housing and anti-roll bar.



- Bolt handbrake cable -1- to trailing arm -2- -arrow-.

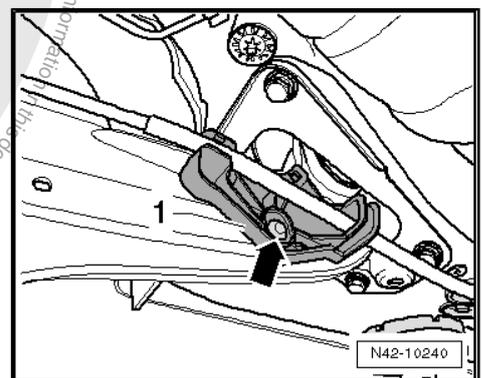


Vehicles with retainer for handbrake cable

- Attach retainer -1- by pushing in inner pin of rivet -arrow-.

Continuation for all vehicles

- Install coil spring => [page 173](#) .
- Install wheel and tighten => [page 288](#) .
- Perform wheel alignment => [page 305](#) .



Specified torques

Component	Specified torque
Trailing arm to wheel bearing housing ◆ Use new bolts	90 Nm +45°
Trailing arm to mounting bracket ◆ Use new bolt	90 Nm + 90°

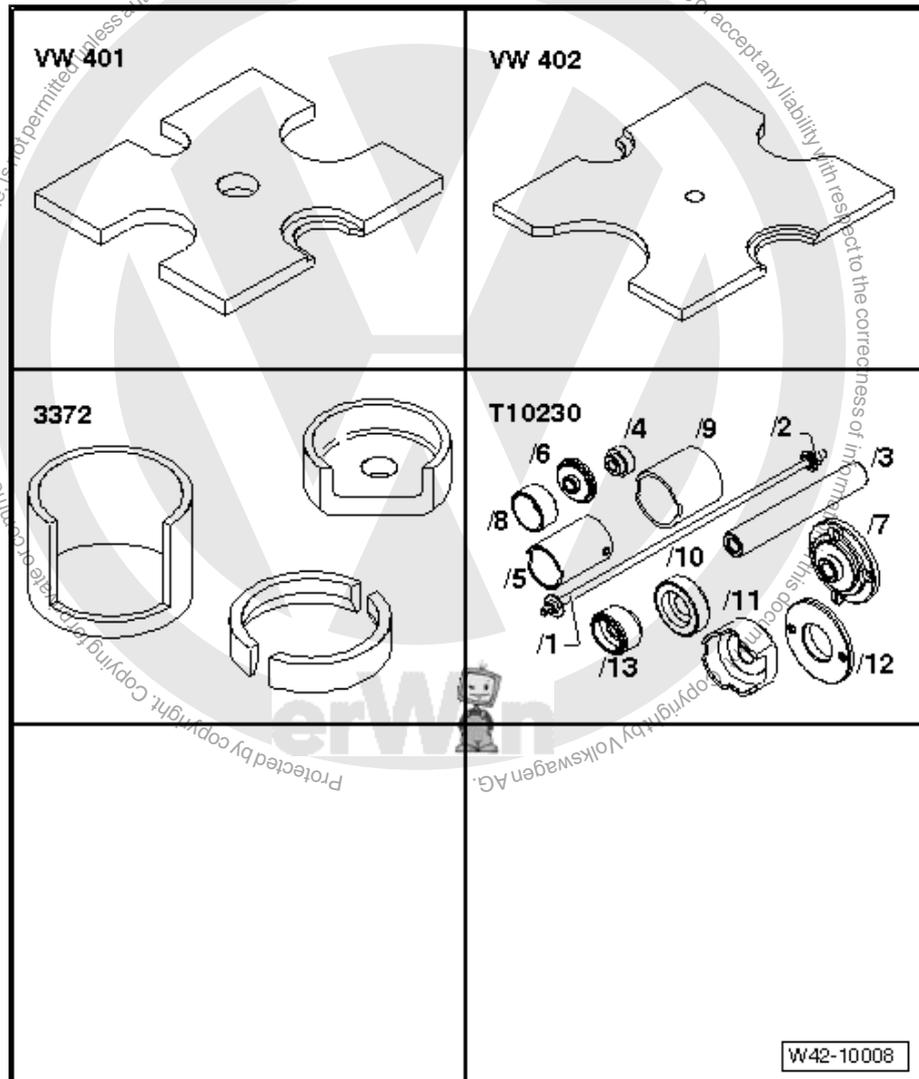


Component	Specified torque
Mounting bracket to body ◆ Use new bolts	50 Nm +45°
Coupling rod to trailing arm. ◆ Use new nut	45 Nm
Handbrake cable to trailing arm ⇒ Brake systems; Rep. Gr. 46	

4.5 Repairing trailing arm

Special tools and workshop equipment required

- ◆ Assembly tool -T10230-
- ◆ Removal tool -3372-
- ◆ Thrust plate -VW 401-
- ◆ Thrust plate -VW 402-



Pressing out bonded rubber bush

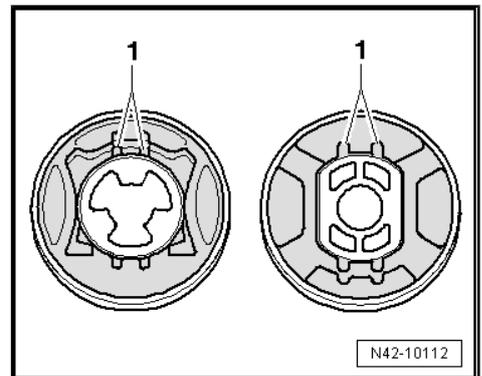
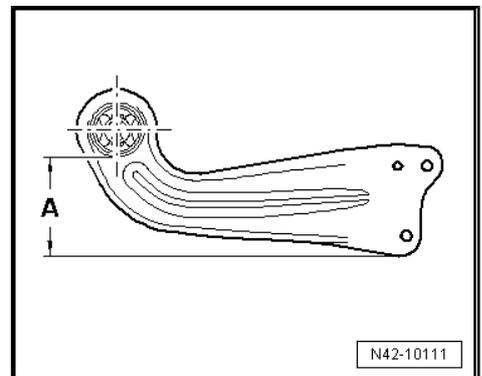
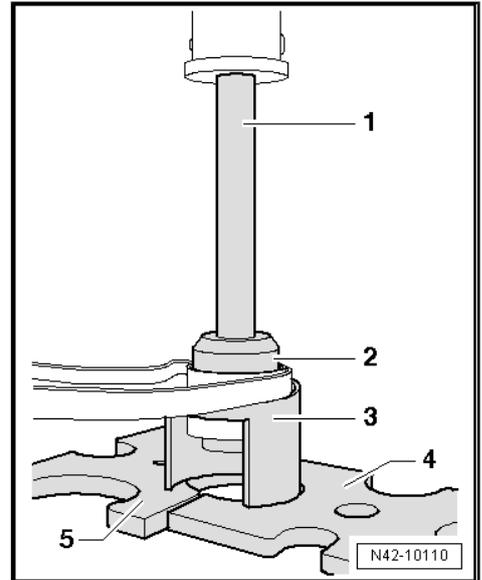
- Remove trailing arm ⇒ [page 166](#) .



- Set up tools as shown in figure.
- 1- Tube -T10230/3-
- 2- Thrust piece -T10230/10-
- 3- Removal tool -3372-
- 4- Thrust plate -VW 401-
- 5- Thrust plate -VW 402-
- Press out bonded rubber bush.

Pressing in bonded rubber bush

- Place trailing arm on a flat surface.
- Mark a vertical line on trailing arm bush.

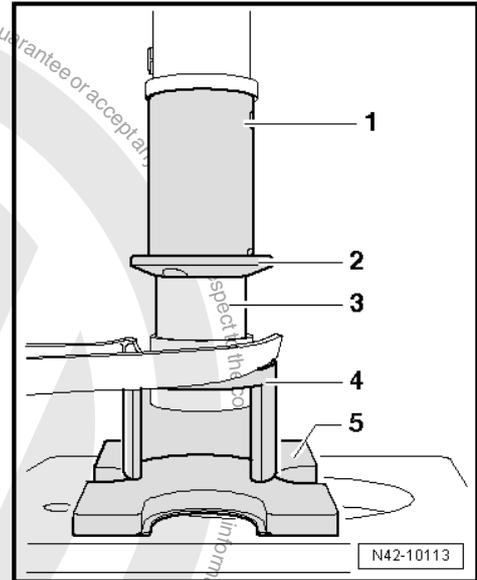


Dimension -A- = 114 mm

There are two different types of bonded rubber bushes. On both types, the marked line must be between the projections -1- after being pressed in.



- Set up tools as shown in figure.
 - 1- Tube -T10230/5-
 - 2- Thrust plate -T10230/12- (chamfer must face bonded rubber bush)
 - 3- Bonded rubber bush
 - 4- Removal tool -3372-
 - 5- Thrust plate -VW 402-
- Press bonded rubber bush in flush.
 - Attach mounting bracket to trailing arm ⇒ [page 167](#) .
 - Install trailing arm ⇒ [page 168](#) .





5 Assembly overview: shock absorber, coil spring (front-wheel drive)

1 - Upper spring seat

2 - Coil spring

- Note various versions of running gear
 ⇒ [page 317](#)
- Removing and installing
 ⇒ [page 173](#)

3 - Lower spring seat

- End of coil spring turned to stop

4 - Bolt

- M14 x 1.5 x 70
- 180 Nm

5 - Bolt

- 50 Nm +45° further
- Always renew after removing

6 - Shock absorber

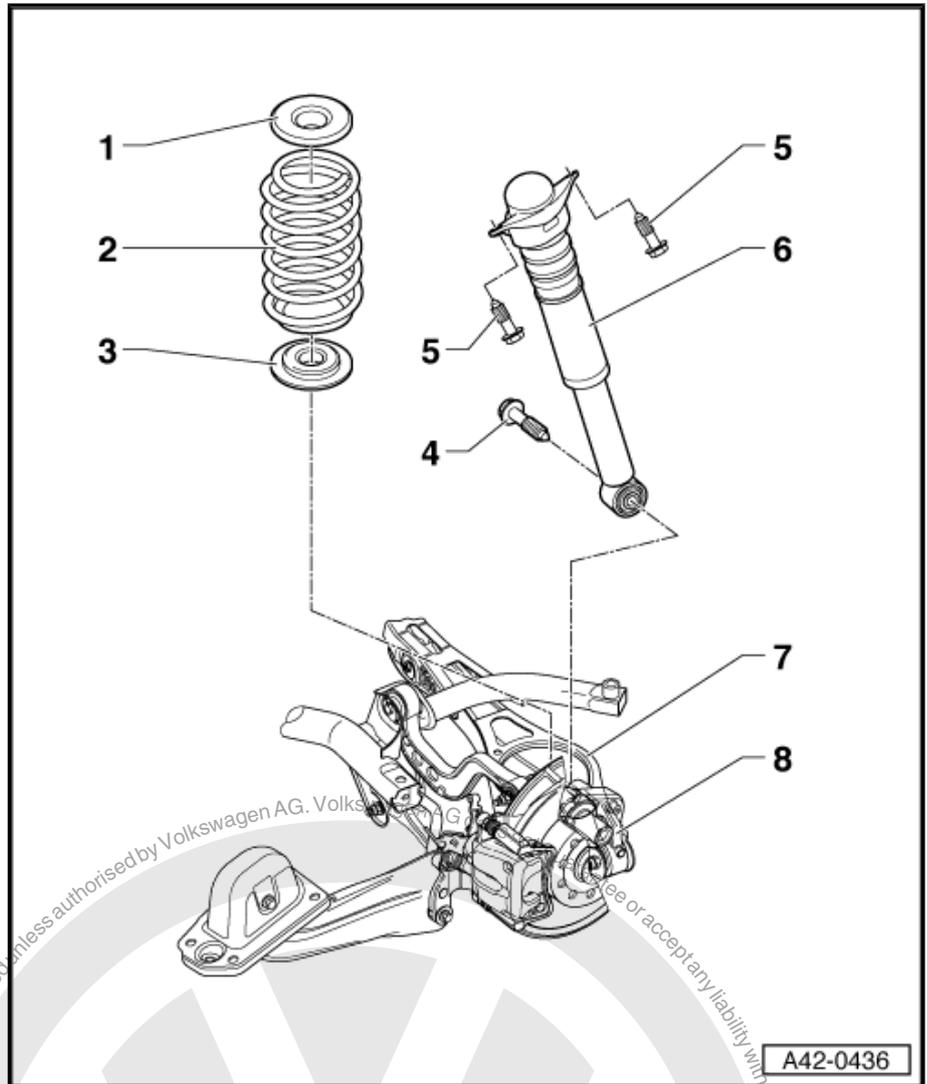
- Removing and installing
 ⇒ [page 175](#)
- Note different versions of running gear
 ⇒ [page 317](#) , vehicle data plate

7 - Lower transverse link

- Removing and installing
 ⇒ [page 151](#)

8 - Wheel bearing housing

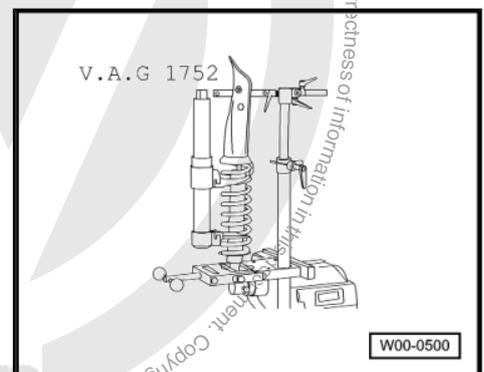
- Removing and installing
 ⇒ [page 157](#)



5.1 Removing and installing coil spring

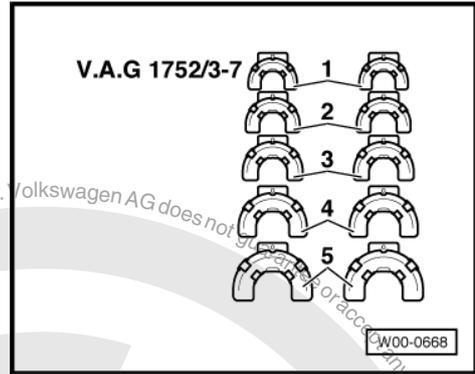
Special tools and workshop equipment required

- ◆ Suspension strut clamp -V.A.G 1752-





◆ Spring retainer -V.A.G 1752/4-



◆ Adapter -V.A.G 1752/9- , not illustrated

Removing

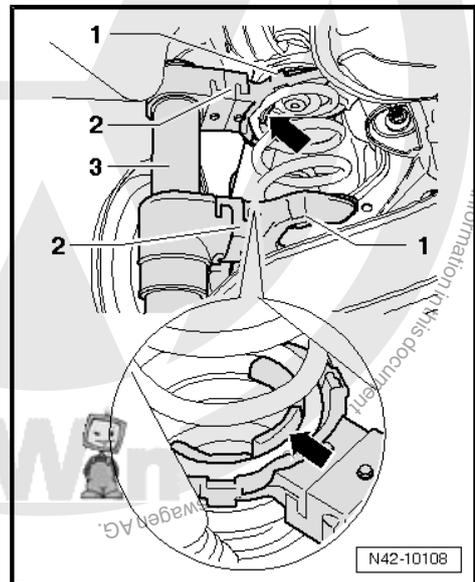
- Remove wheel.
- Insert spring compressor -3-



WARNING

Ensure that coil spring is correctly seated in spring retainers - V.A.G 1752/4- -2- (accident risk).

- Use a spanner or a reversible ratchet handle to compress spring compressor.
 - Compress coil spring until it can be removed.
 - Remove spring.
- 1 - Spring retainer -V.A.G 1752/4-
 - 2 - Adapter -V.A.G 1752/9-
 - 3 - Spring compressor -V.A.G 1752/1-

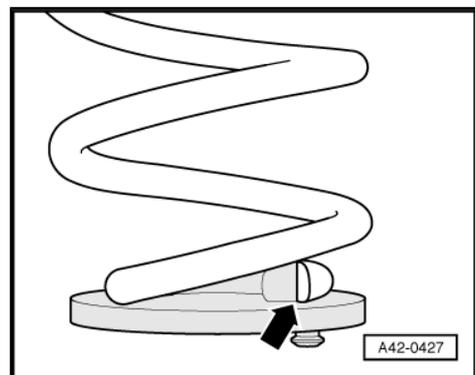


Installing

Note correct installation position.

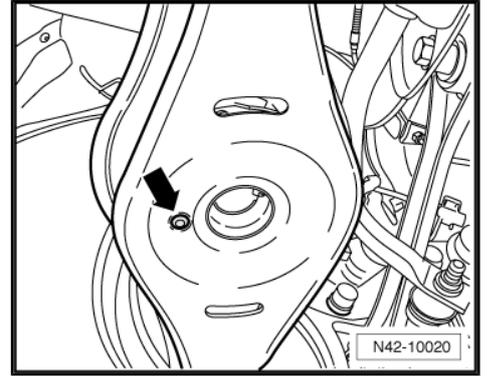
End of spring -arrow- must lie against stop on lower spring seat.

- Install spring together with spring seat.
- The bottom spring seat has a pin.





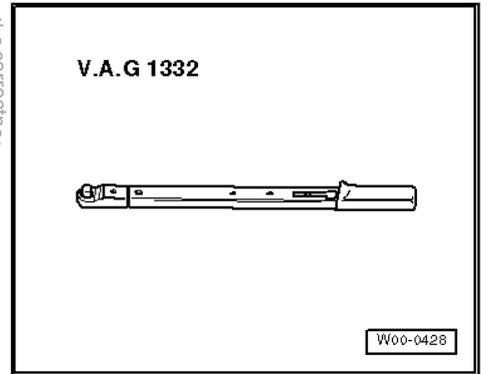
- Insert this pin in holes in lower transverse link -arrow-.
- Then insert top spring seat into upper end of spring.
- Release tension on spring while locating upper spring seat on lug on body.
- Remove spring compressor.
- Install wheel and tighten ⇒ [page 288](#) .



5.2 Removing and installing shock absorbers

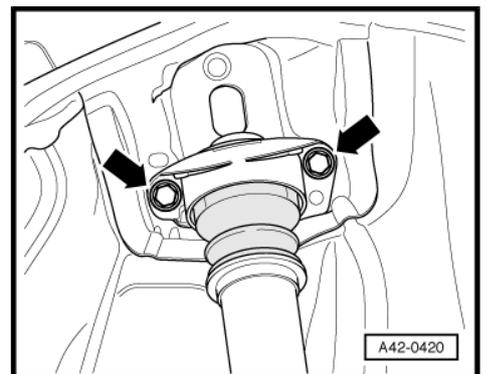
Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1332-



Removing

- Remove wheel.
- Remove wheel housing liner ⇒ General body repairs, exterior; Rep. Gr. 66 .
- Remove coil spring ⇒ [page 173](#) .
- Remove bolts -arrows-.



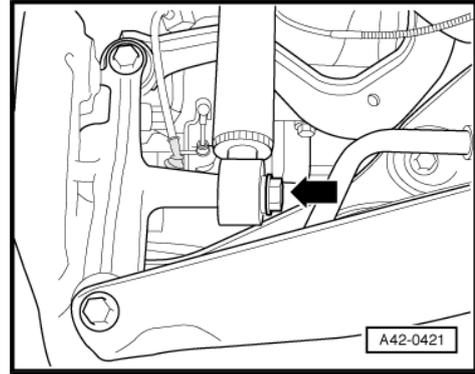


- Remove bolt -arrow-.
- Remove shock absorber.

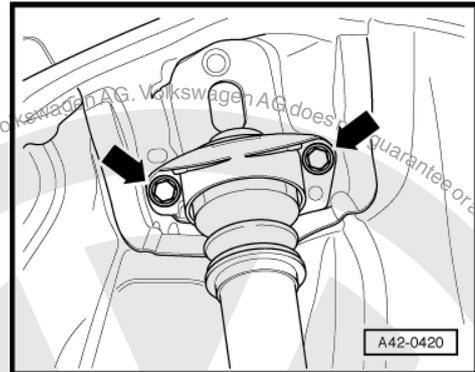
Installing

Install in reverse order. Note the following points:

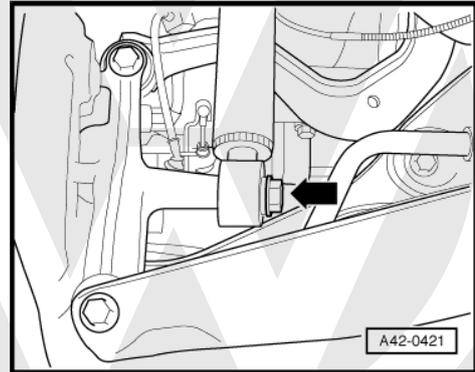
The shock absorber may be bolted to the wheel bearing housing only when dimension "a" has been attained ⇒ [page 137](#) .



- Install shock absorber and tighten bolts -arrows-.



- Tighten bolt -arrow-.
- Install coil spring ⇒ [page 173](#) .
- Install wheel housing liner ⇒ General body repairs, exterior; Rep. Gr. 66 .
- Install wheel and tighten ⇒ [page 288](#) .



Specified torques

Component	Specified torque
Shock absorber to body ◆ Use new bolts	50 Nm +45°
Shock absorber to wheel bearing housing	180 Nm



5.3 Repairing shock absorber

1 - Shock absorber

- Removing and installing ⇒ [page 175](#)
- Note different versions of running gear ⇒ [page 317](#) , vehicle data plate

2 - Protective cap

3 - Protective tube

4 - Support ring

- Allocation ⇒ Electronic parts catalogue "ETKA"

5 - Bump stop

- For shock absorbers with support ring ⇒ [Item 4 \(page 177\)](#)
- Allocation ⇒ Electronic parts catalogue "ETKA"

6 - Shock absorber mounting

- For shock absorbers with support ring ⇒ [Item 4 \(page 177\)](#)
- Allocation ⇒ Electronic parts catalogue "ETKA"

7 - Nut

- M10 x 1.0
- 25 Nm
- Always renew after removing
- Loosening and tightening ⇒ [page 178](#)

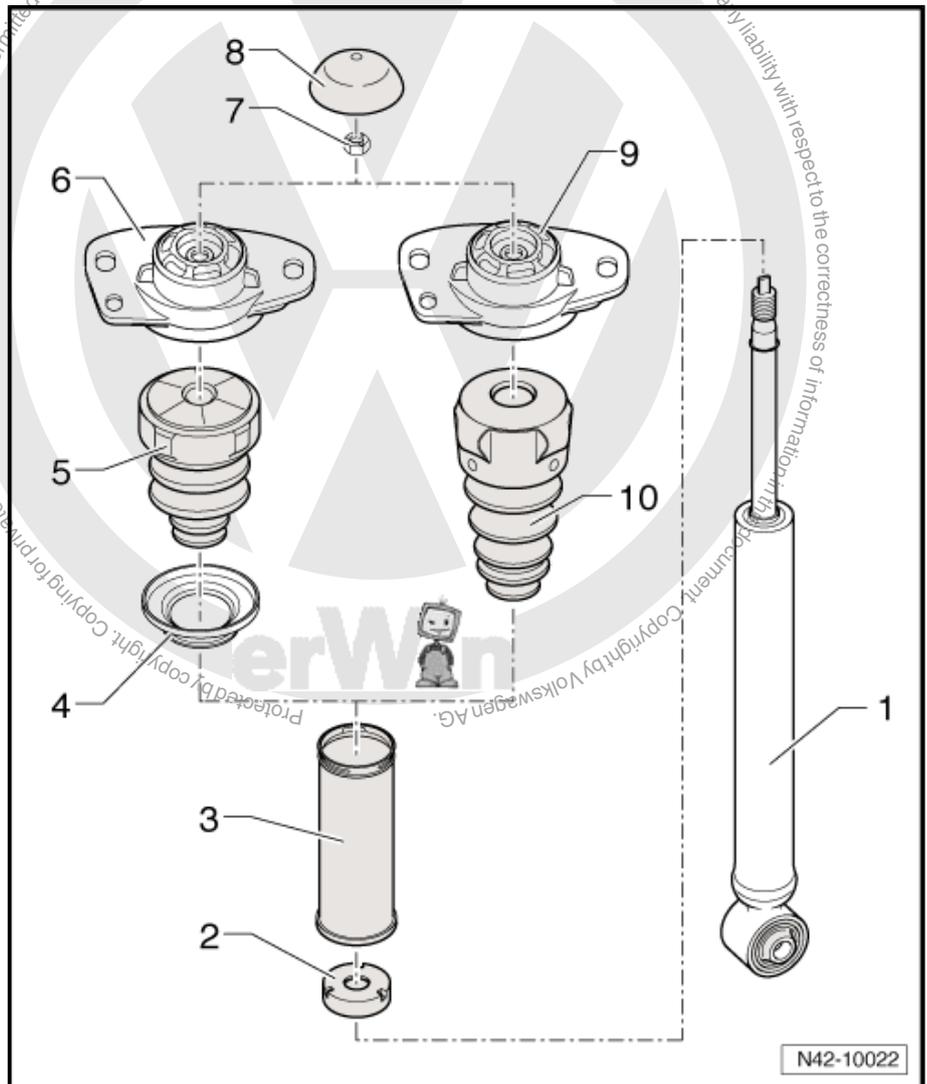
8 - Cover

9 - Shock absorber mounting

- For shock absorbers without support ring ⇒ [Item 4 \(page 177\)](#)
- Allocation ⇒ Electronic parts catalogue "ETKA"

10 - Bump stop

- For shock absorbers without support ring ⇒ [Item 4 \(page 177\)](#)
- Allocation ⇒ Electronic parts catalogue "ETKA"

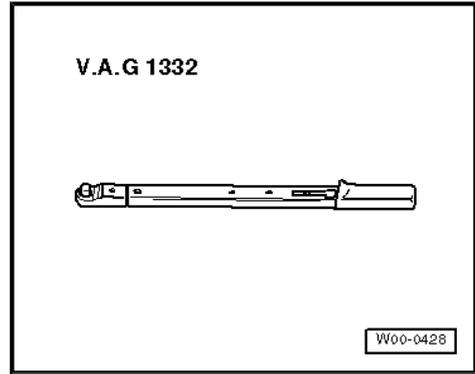


N42-10022

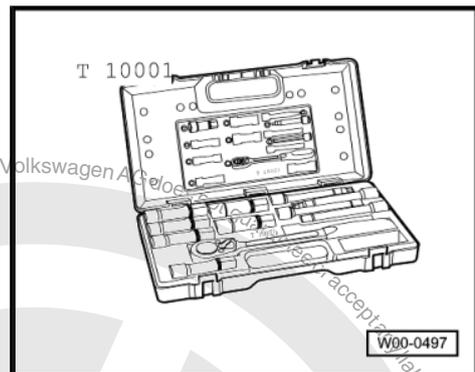
Special tools and workshop equipment required



- ◆ Torque wrench -V.A.G 1332-



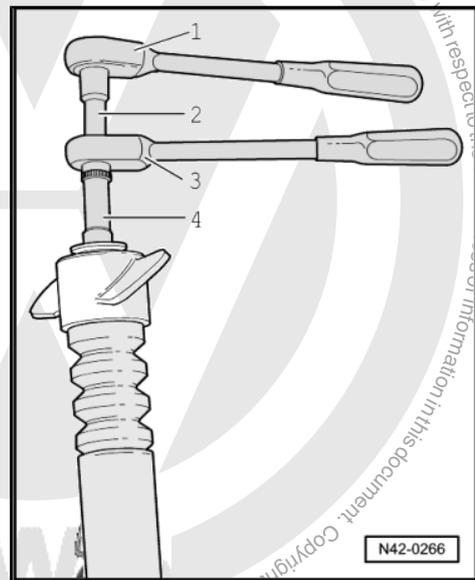
- ◆ Shock absorber set -T10001-



Dismantling and assembling

Loosening and tightening threaded connection for shock absorber mounting

- 1 - Commercially available ratchet handle
- 2 - Socket -T10001/9-
- 3 - Ratchet handle -T10001/11-
- 4 - Socket -T10001/1-



Specified torque

Component	Specified torque
Shock absorber mounting to shock absorber ◆ Use new nut	25 Nm



6 Assembly overview: anti-roll bar (front-wheel drive)

1 - Anti-roll bar

- Note different versions of running gear
 => [page 317](#) , vehicle data plate
- Removing and installing
 => [page 179](#)

2 - Bush

- Always renew bushes on both sides of the vehicle.

3 - Clamp

4 - Bolt

- 25 Nm +45° further
- Tighten evenly.
- Always renew after removing
- Always tighten threaded connections in unladen position:

Golf => [page 136](#)

Golf Plus, CrossGolf
 => [page 138](#)

5 - Wheel bearing housing

6 - Nut

- 45 Nm
- Self-locking
- Always renew after removing

7 - Coupling rod

- Modified coupling rod for model year 2004

During production start up, a change was made from coupling rods with two ball joints to coupling rods with one ball joint and one bonded rubber bush. The end with the bonded rubber bush is bolted to the anti-roll bar.

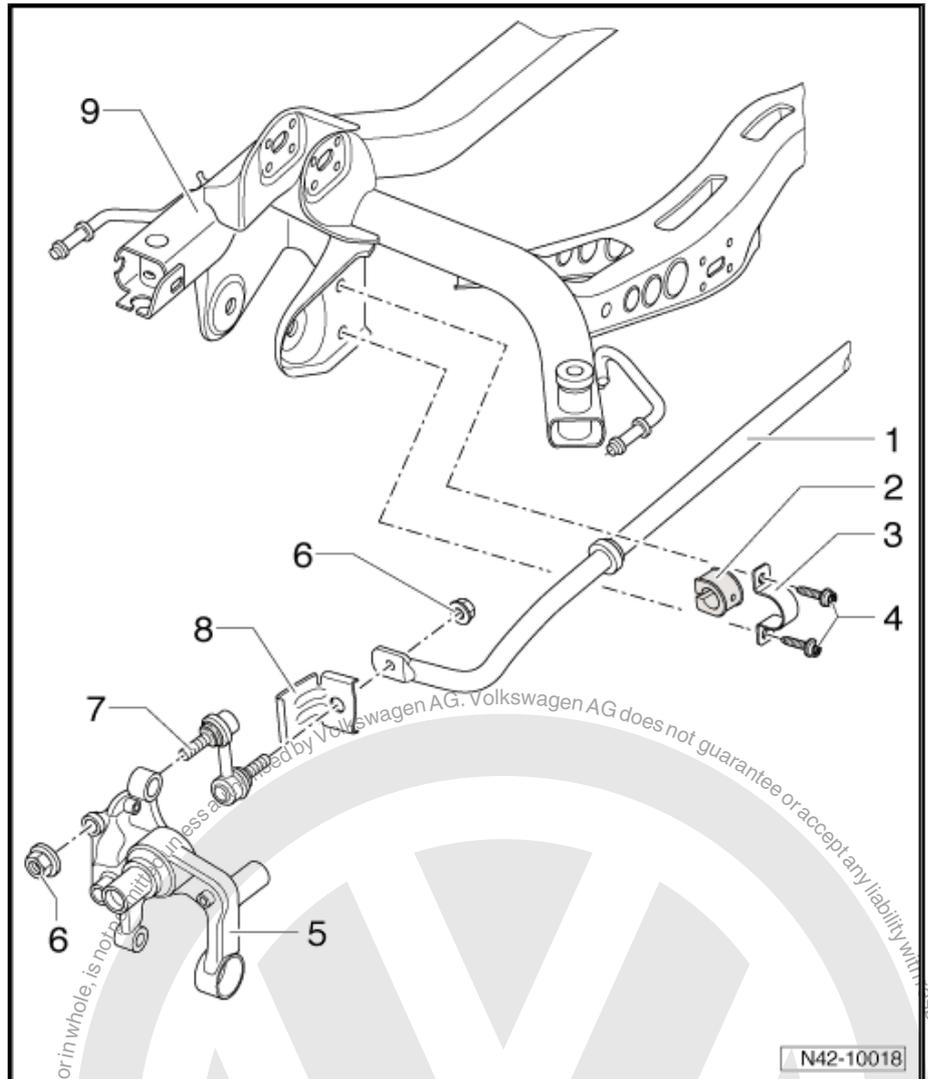
A mixed installation is not permissible.

- Connects anti-roll bar to trailing arm and wheel bearing housing

8 - Shield

- Only in vehicles having two ball joints in coupling rod. For vehicles with new coupling rod (one ball joint and one bonded rubber bush), no shield is installed. See also => [Item 7 \(page 179\)](#) .

9 - Subframe

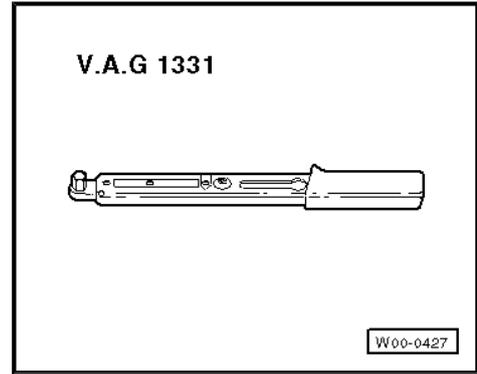


6.1 Removing and installing anti-roll bar

Special tools and workshop equipment required



- ◆ Torque wrench -V.A.G 1331-



Removing



Note

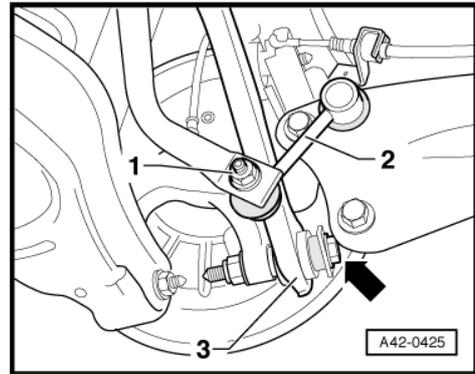
The following procedure is for the left side of the vehicle. The procedure for the right side of the vehicle is identical.

- Remove nut -1- and pull coupling rod -2- out of anti-roll bar.



Note

Do not loosen bolt -arrow- for track rod -3-.

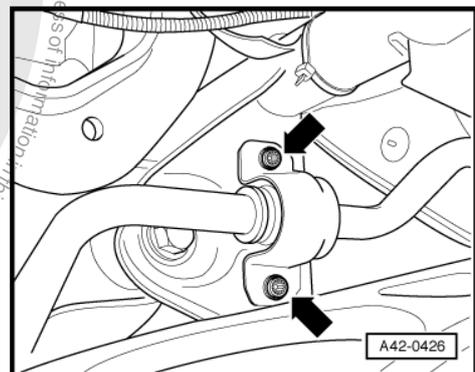
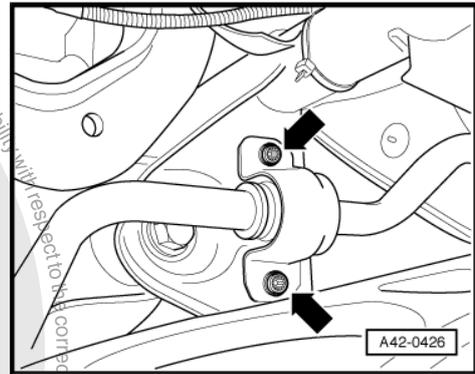


- Remove bolts -arrows- for anti-roll bar clamp.
- Remove anti-roll bar.

Installing

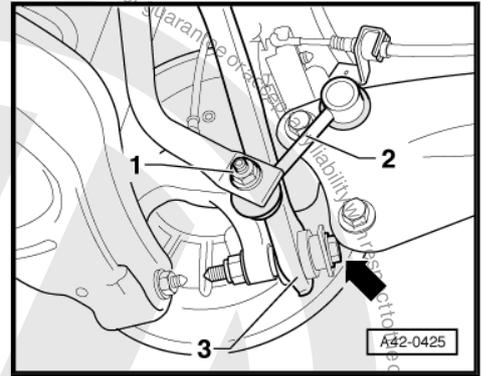
- Install anti-roll bar in vehicle.

- Evenly tighten bolts -arrows- for anti-roll bar clamp.





- Connect coupling rod -2- to anti-roll bar and tighten nut -1-.



Specified torques

Component	Specified torque
Anti-roll bar to subframe ♦ Use new bolts ♦ Tighten threaded connections only when vehicle is in the normal running position	25 Nm + 45°
Anti-roll bar to coupling rod ♦ Use new nut	45 Nm



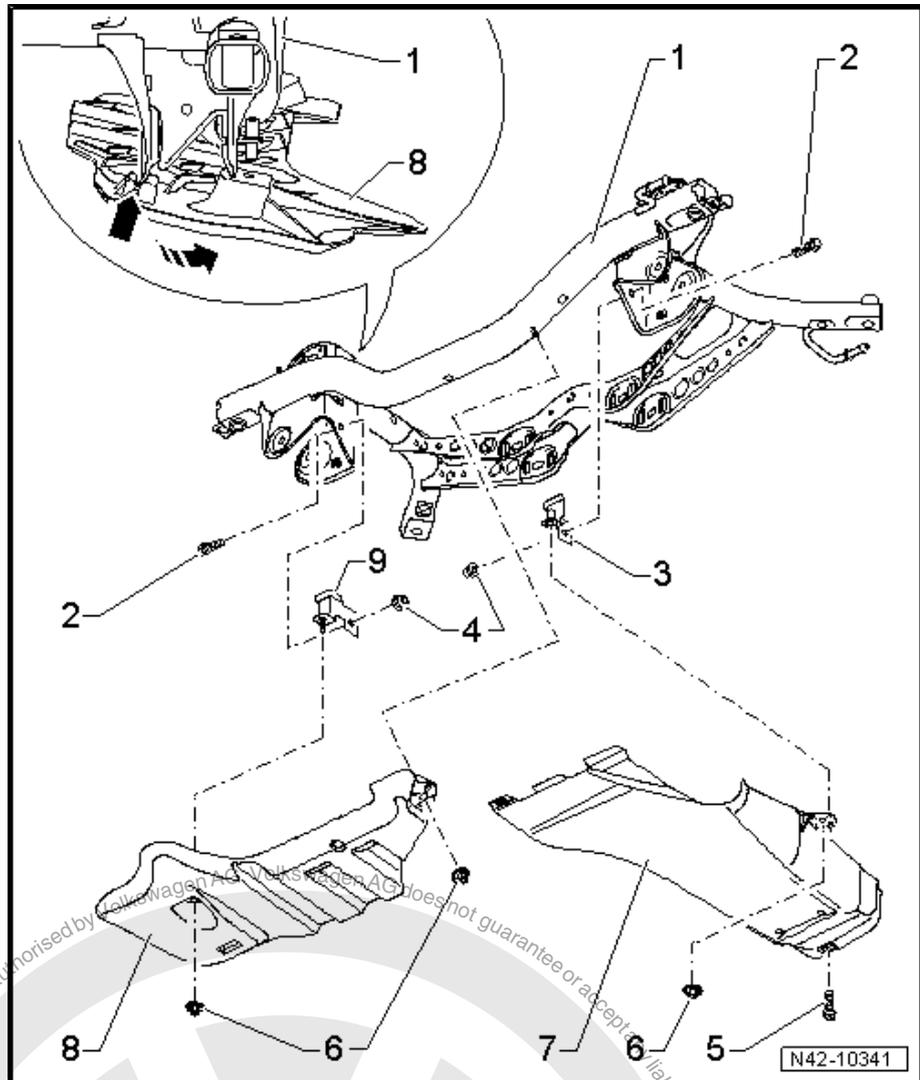
7 Assembly overview - attachment parts for subframe Golf BlueMotion, Golf Plus BlueMotion (front-wheel drive)

- 1 - Subframe
- 2 - Bolt
- 3 - Angle piece
- 4 - Nut
 - 20 Nm
- 5 - Bolt
- 6 - Nut
 - 2 Nm
- 7 - Left shield
- 8 - Right shield

Installing

- Hook in shield on subframe
⇒ [Item 1 \(page 182\)](#)
-arrow-
- Pivot shield in
-direction of arrow- onto
rivet screws and tighten
nuts

- 9 - Angle piece
 - With rivet screw





8 Repairing rear suspension (four-wheel drive)

8.1 Overview of rear axle (aluminium)

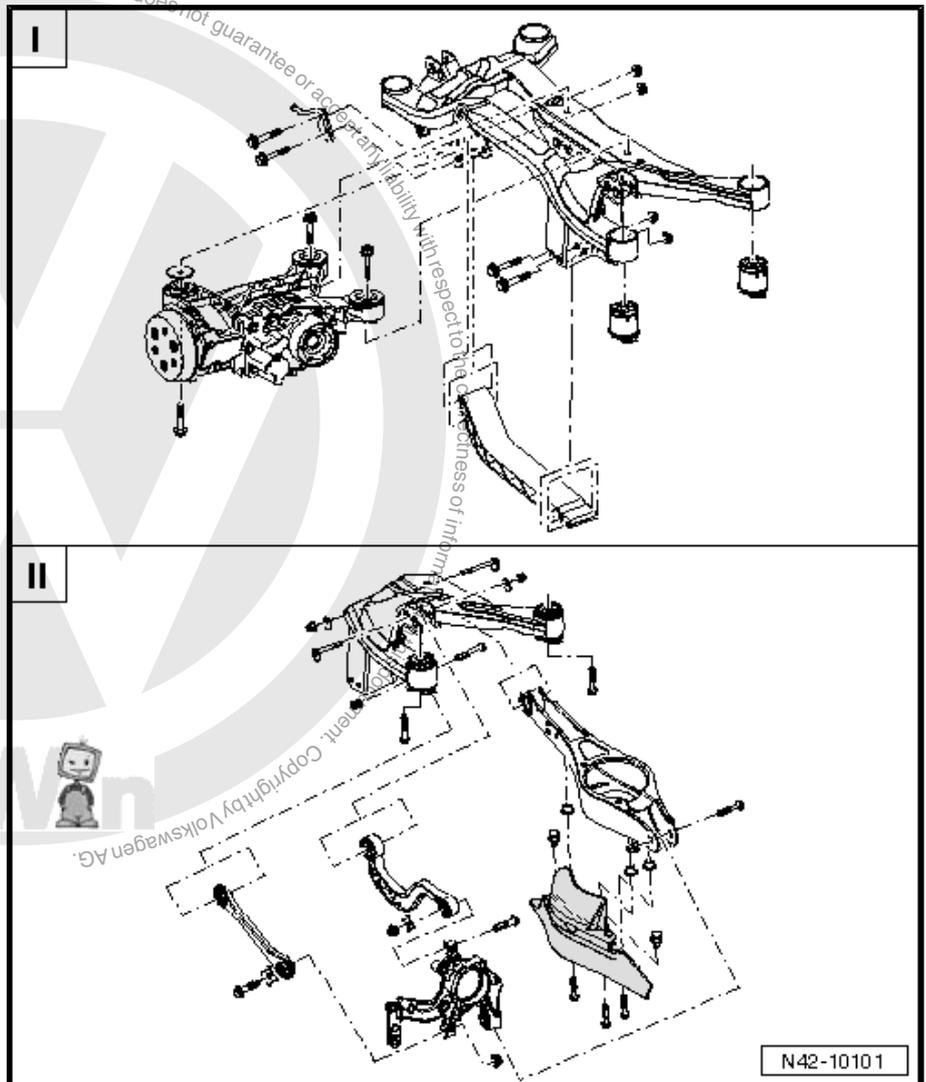


Note

- ◆ It is not permitted to weld or straighten load-bearing or wheel-guiding components of the suspension.
- ◆ Always renew self-locking nuts.
- ◆ Always renew corroded nuts and bolts.
- ◆ Bonded rubber bushes can be twisted only to a limited extent. Therefore, tighten the bolted connections of components with bonded rubber bushes only when the wheel bearing housing is raised to unladen position ⇒ [page 187](#).
- ◆ Always renew bonded rubber bush on both sides of the vehicle.

I - Assembly overview - sub-frame, final drive (four-wheel drive, aluminium) ⇒ [page 189](#)

II - Assembly overview - control arm, track rod (four-wheel drive, subframe made from aluminium and wheel bearing housing made from cast steel) ⇒ [page 212](#)

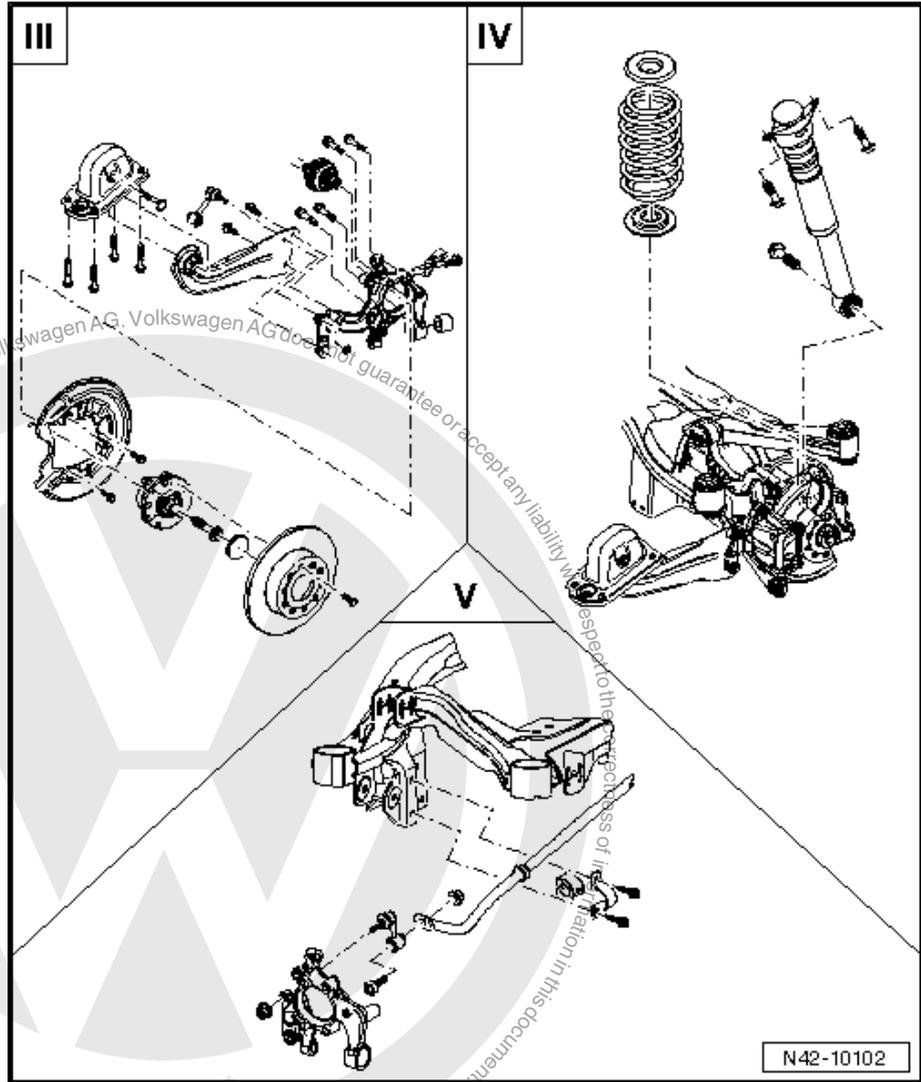




III - Wheel bearing housing, trailing link (four-wheel drive, subframe made from aluminium and wheel bearing housing made from cast steel)
⇒ [page 234](#)

IV - Shock absorber, coil spring (four-wheel drive, subframe made from aluminium and wheel bearing housing made from cast steel) ⇒ [page 257](#)

V - Anti-roll bar (four-wheel drive, subframe made from aluminium and wheel bearing housing made from cast steel)
⇒ [page 265](#)



N42-10102



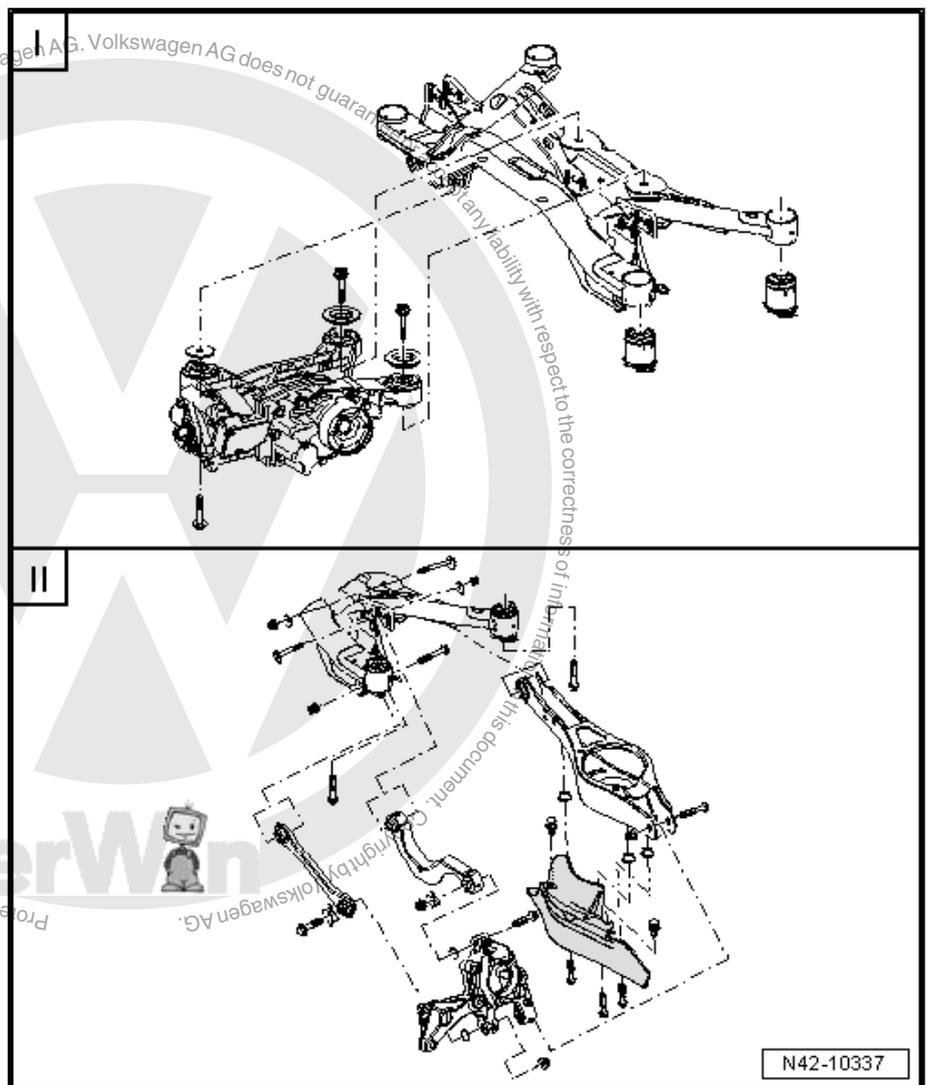
8.2 Overview of rear axle (steel)

Note

- ◆ It is not permitted to weld or straighten load-bearing or wheel-guiding components of the suspension.
- ◆ Always renew self-locking nuts.
- ◆ Always renew corroded nuts and bolts.
- ◆ Bonded rubber bushes can be twisted only to a limited extent. Therefore, tighten the bolted connections of components with bonded rubber bushes only when the wheel bearing housing is raised to unladen position ⇒ [page 187](#).
- ◆ Always renew bonded rubber bush on both sides of the vehicle.

I - Assembly overview - subframe, final drive (four-wheel drive, steel) ⇒ [page 199](#)

II - Assembly overview - control arm, track rod (four-wheel drive, subframe made from steel and wheel bearing housing made from aluminium) ⇒ [page 223](#)

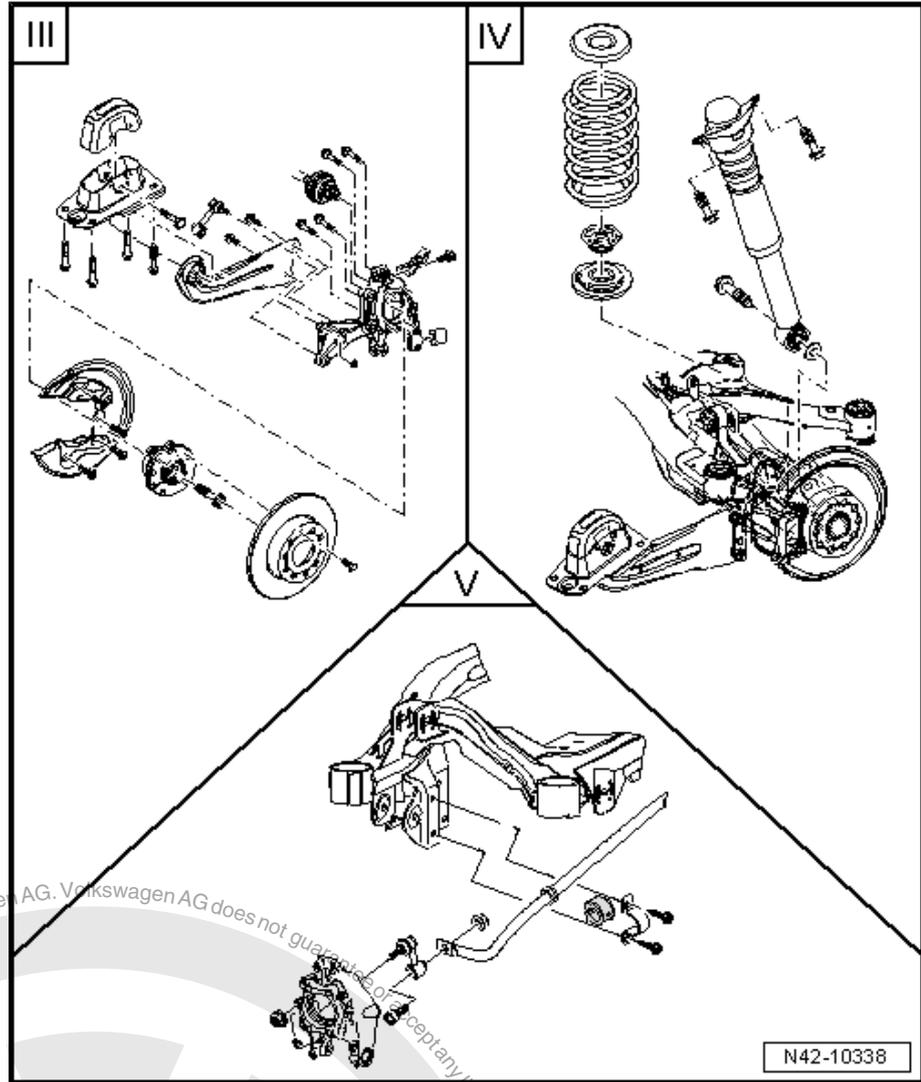




III - Wheel bearing housing, trailing link (four-wheel drive, subframe made from steel and wheel bearing housing made from aluminium) ⇒ [page 251](#)

IV - Shock absorber, coil spring (four-wheel drive, subframe made from steel and wheel bearing housing made from aluminium) ⇒ [page 262](#)

V - Anti-roll bar (four-wheel drive, subframe made from steel and wheel bearing housing made from aluminium) ⇒ [page 269](#)



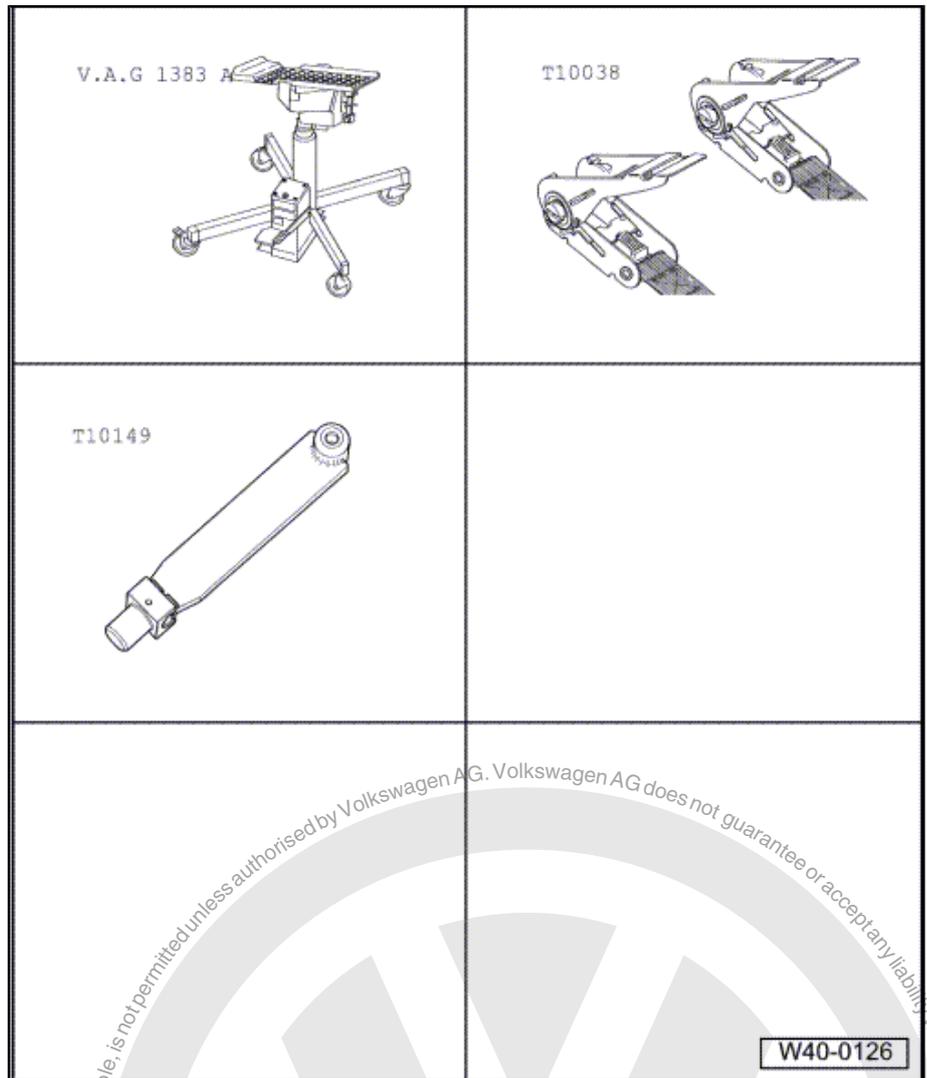
N42-10338



8.3 Rear axle in unladen state (aluminium and steel)

Special tools and workshop equipment required

- ◆ Engine and gearbox jack - V.A.G 1383 A-
- ◆ Tensioning strap -T10038-
- ◆ Support -T10149-



Note

All bolts on running gear components with bonded rubber bushes may be tightened only when the component is in the unladen position (normal position).

Bonded rubber bushes can be twisted only to a limited extent.

Axle components with bonded rubber bushes must therefore be brought to a position equivalent to the unladen (normal) position before being tightened.

Otherwise, the bonded rubber bush would be subject to torsion loading, shortening its service life.

To simulate this position on the lifting platform, raise the axle on one side using the engine and gearbox jack -V.A.G 1383 A- and support -T10149- .



Before the axle on one side is raised, both sides of the vehicle must be strapped to the lifting platform arms with tensioning straps -T10038- .



WARNING

If the vehicle is not strapped down, there is a danger that the vehicle will slip off the lifting platform!

- Turn wheel hub until one of the wheel bolt holes is at the top.
- Attach support -T10149- with a wheel bolt.

Threaded connections may be tightened only when dimension -a- between the centre of wheel hub and lower edge of wheel housing, measured before starting work, has been attained.

Measuring dimension -a-

The dimension -a- depends on the ride height of the installed running gear:

Running gear ¹⁾	Ride height -a- in mm
Standard running gear (2UA)	380 ± 10 mm
Heavy-duty running gear (2UB)	400 ± 10 mm
Sports running gear except 18" wheels (2UC)	365 ± 10 mm
Sports running gear with 18" wheels (G02/G05/G07/2UC)	365 ± 10 mm
Sports running gear GTI (G08)	365 ± 10 mm
Sports running gear R32 (G09)	360 ± 10 mm
Sports running gear GTI; US version (G11)	380 ± 10 mm

¹⁾ The type of running gear fitted to the vehicle is recorded on the vehicle data sticker. The running gear is identified by the PR number. Which PR. No. refers to which running gear can be found here => [page 317](#) .

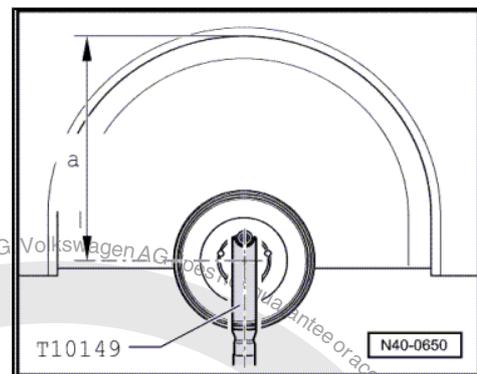
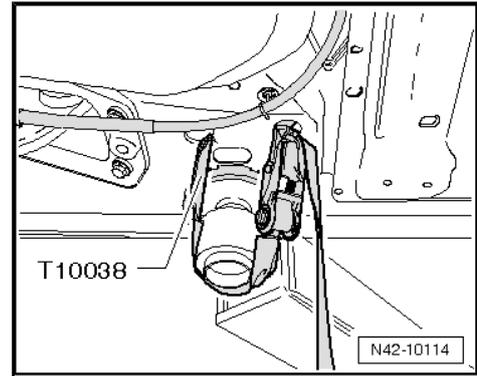
- Raise wheel bearing housing using engine and gearbox jack until dimension -a- is attained.



WARNING

- ◆ *Never raise or lower the vehicle while the engine and gearbox jack is positioned beneath the vehicle.*
- ◆ *Do not leave the engine and gearbox jack under the vehicle for longer than necessary.*

- Tighten affected nuts and bolts.
- Lower wheel bearing housing.
- Pull engine and gearbox jack out from underneath vehicle.
- Remove support -T10149- .





9 Assembly overview - subframe made from aluminium, final drive (four-wheel drive)

-Arrow- indicates direction of travel.

1 - Subframe



Note

2 - Nut

- 50 Nm +180° further
- Always renew after removing

3 - Rear bonded rubber bush

- Renewing ⇒ [page 195](#)

4 - Front bonded rubber bush

- Renewing ⇒ [page 195](#)

5 - Cross member

6 - Bolt

7 - Final drive

- Removing and installing
⇒ Rep. Gr. 39 ; Removing
and installing rear final
drive

8 - Bolt

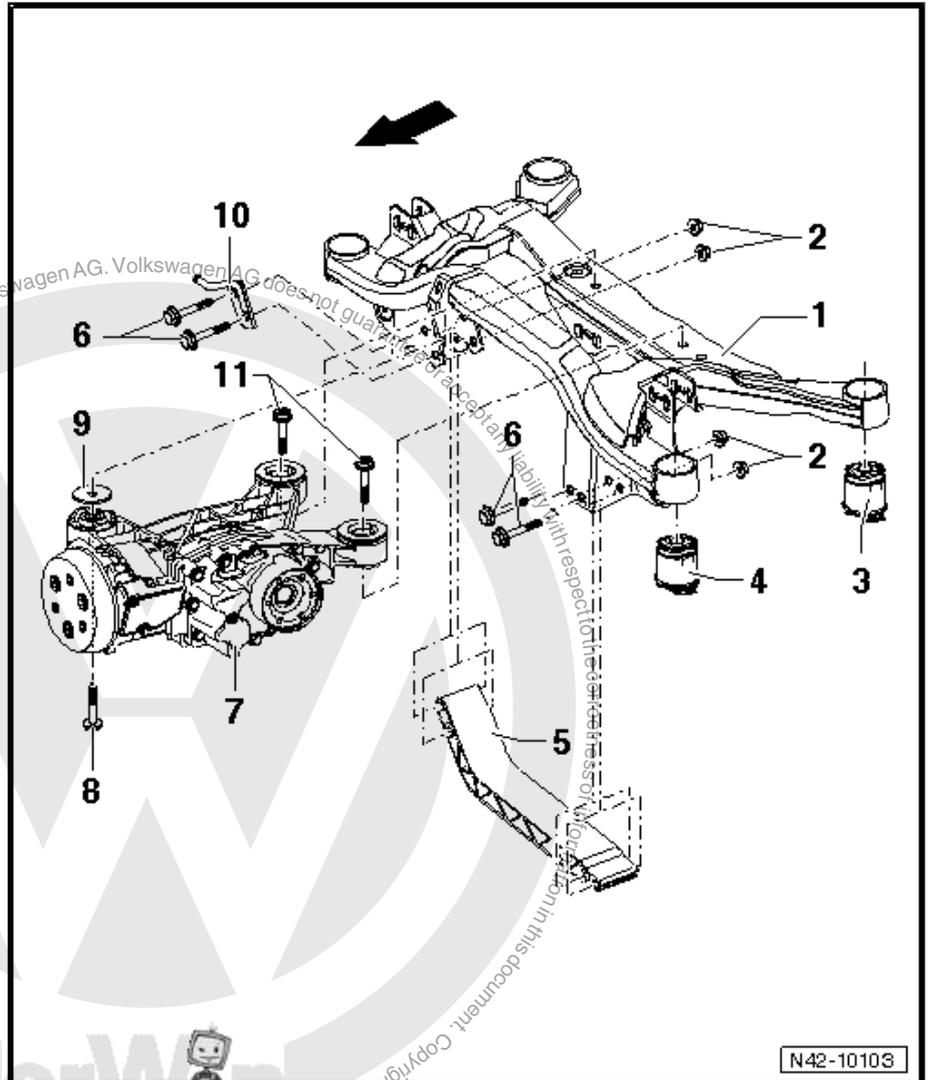
- M12 x 1.5 x 85
- 60 Nm + 90° further

9 - Washer

10 - Bracket

11 - Bolt

- M12 x 1.5 x 85
- 60 Nm + 90° further

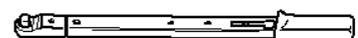


9.1 Removing and installing rear axle

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1332-

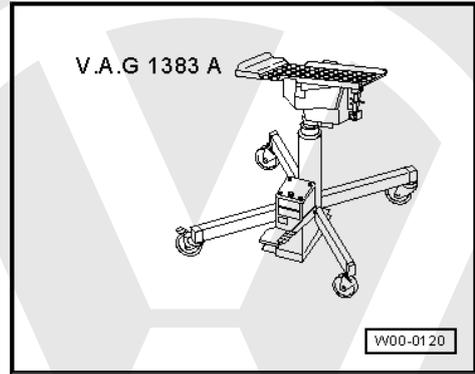
V.A.G 1332



W00-0428



◆ Engine and gearbox jack -V.A.G 1383 A-



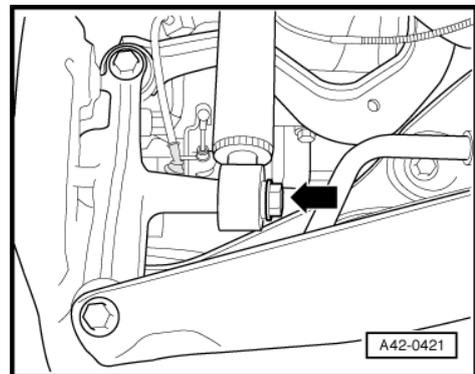
Removing subframe with attachments



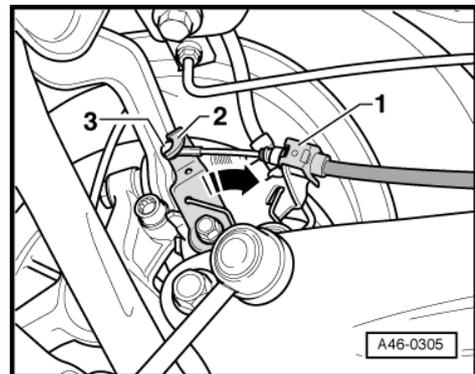
Note

Please note that subsequent assembly work for which the hexagon or twelve-point bolt of the drive shaft has to be loosened requires that the vehicle is stood on its wheels. Loosen hexagon bolt ⇒ [page 274](#) or loosen twelve-point bolt of drive shaft ⇒ [page 275](#).

- Remove wheels.
- Remove coil springs ⇒ [page 257](#) .
- Remove front and rear exhaust system silencer ⇒ Rep. Gr. 26 ; Exhaust system; Removing and installing parts of the exhaust system .
- Disconnect electrical connections between rear axle and body.
- Remove bolt -arrow-.

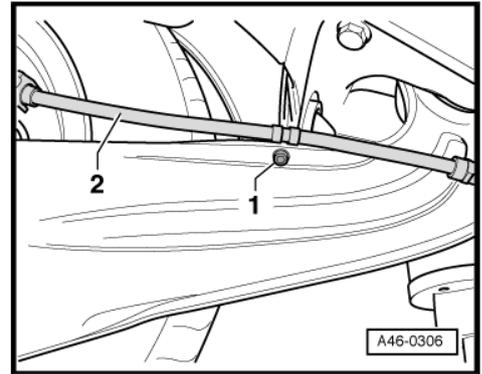


- Lever off retainer -1- for handbrake cable.
- Press lever -2- in direction of arrow and unhook handbrake cable -3-.





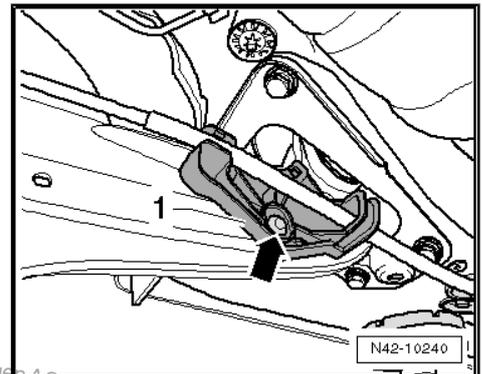
- Unscrew hexagon bolt -1- and detach handbrake cable -2- from brake cable bracket.



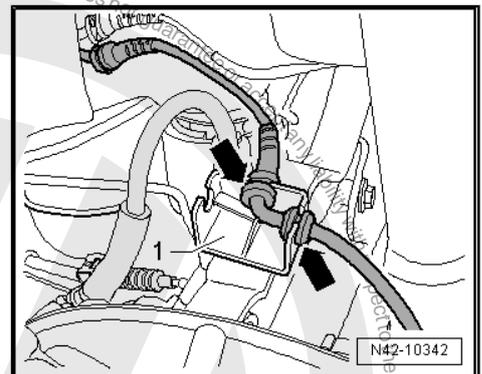
Vehicles with retainer for handbrake cable

- Remove retainer -1- by pushing out inner pin of rivet -arrow-.

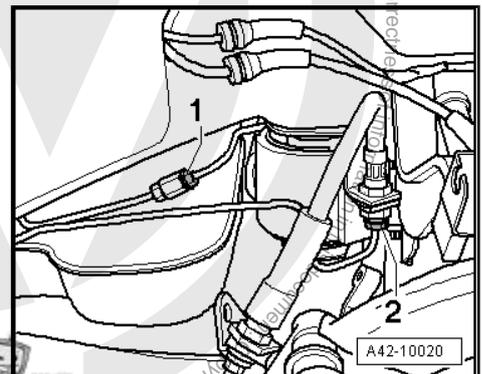
Continuation for all vehicles



- Unclip speed sensor wire from retainer -1- -arrows-.

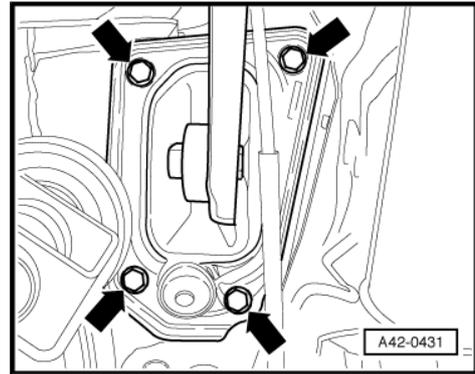


- Disconnect brake pipes, items-1- and -2-.

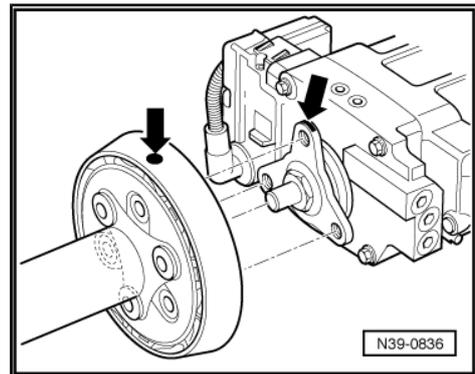




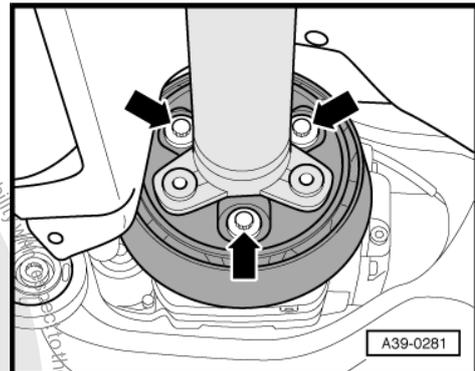
- Mark installation position of mounting bracket on body.
- Remove bolts -arrows-.



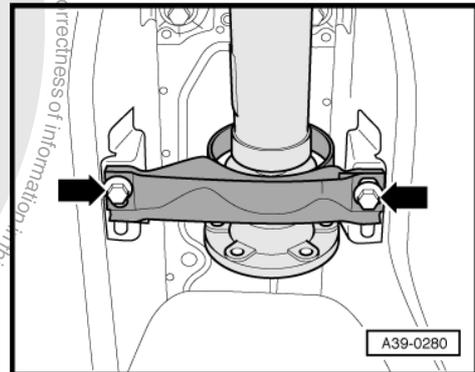
- Check whether marks (spots of paint) are present on flexible coupling and final drive flange -arrows-. If no marks are present, mark positions of flexible coupling and final drive flange relative to each other -arrows-.



- Unbolt rear propshaft tube with flexible coupling and vibration damper from rear final drive -arrows-.

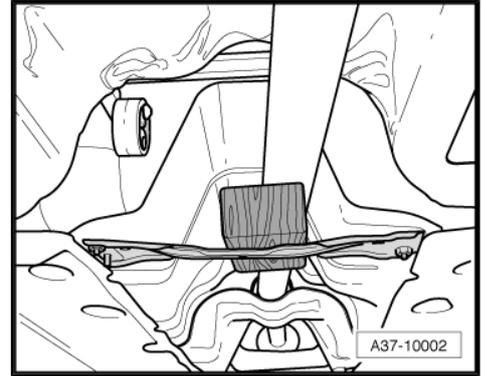


- Unscrew centre bearing bolts -arrows- two turns.



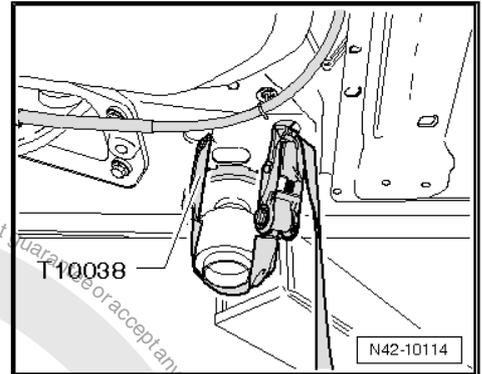


- Support propshaft on tunnel support using a wooden block.
- Push rear propshaft tube towards gearbox as far as possible.

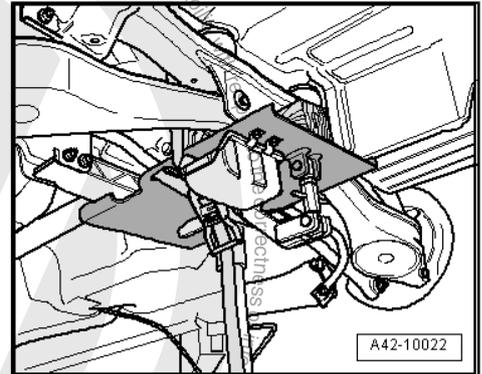


- Now secure vehicle to lifting platform on both sides using tensioning straps -T10038-.

 **WARNING**
If the vehicle is not strapped down, there is a great danger that the vehicle will slip off the lifting platform!



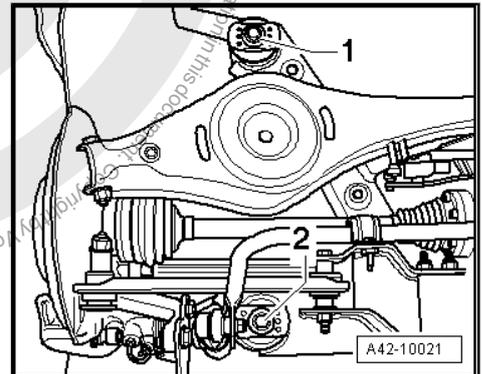
- Position engine and gearbox jack -V.A.G 1383 A- under sub-frame using universal gearbox mounting -V.A.G 1359/2- and secure with tensioning strap.



- Unscrew one hexagon bolt -1- or -2- on each side.

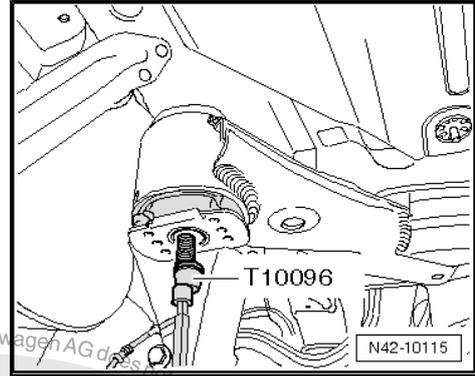
 **Note**

Only the left side of vehicle is shown to improve clarity.





- Secure position of subframe using 2 locking devices -T10096- and tighten to 20 Nm.
- Unscrew remaining 2 bolts from subframe.
- Carefully lower subframe with attachments.



i Note

When lowering, ensure sufficient clearance of brake lines, electrical cables and centring pin to propshaft.

Installing subframe with attachments

Install in reverse order. In the process, note the following:

Attach propshaft to rear final drive ⇒ Final drive 02D; Rep. Gr. 39 ; Removing and installing propshaft.

- Bleed brake system ⇒ Rep. Gr. 47 ; Bleeding brake system ⇒ Rep. Gr. 47 .
- Perform wheel alignment ⇒ [page 305](#) .

i Note

If an aluminium subframe is to be replaced by one made of steel, then please proceed with the following work sequence ⇒ [page 204](#) .

Specified torques

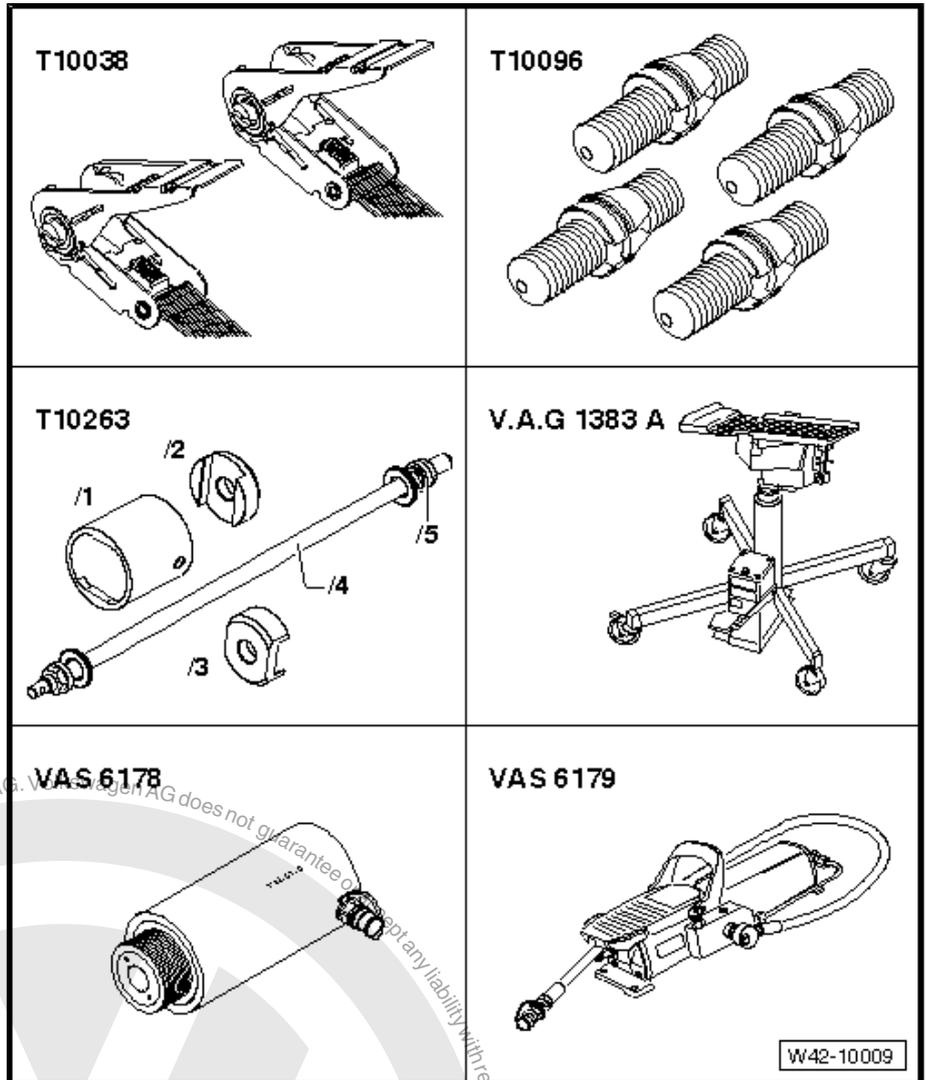
Component	Specified torque
Subframe to body ◆ Use new bolts	90 Nm + 90°
Shock absorber to wheel bearing housing	180 Nm
Mounting bracket to body ◆ Use new bolts	50 Nm +45°
Handbrake cable to trailing arm ⇒ Brake systems; Rep. Gr. 46	



9.2 Repairing subframe

Special tools and workshop equipment required

- ◆ Hydraulic press -VAS 6178-
- ◆ Engine and gearbox jack - V.A.G 1383 A-
- ◆ Assembly tool -T10263-
- ◆ Tensioning strap -T10038-
- ◆ Foot pump -VAS 6179-
- ◆ Locating pins -T10096-



Pulling out front or rear bonded rubber bushes

- Remove rear wheels.
- Remove coil springs ⇒ [page 257](#) .
- Remove front and rear exhaust system silencer ⇒ Rep. Gr. 26 ; Exhaust system; Removing and installing parts of the exhaust system .
- Disconnect electrical connections between rear axle and body.
- Remove anti-roll bar ⇒ [page 265](#) .
- Remove track rods.
- Remove brake line bracket from front mountings of subframe.

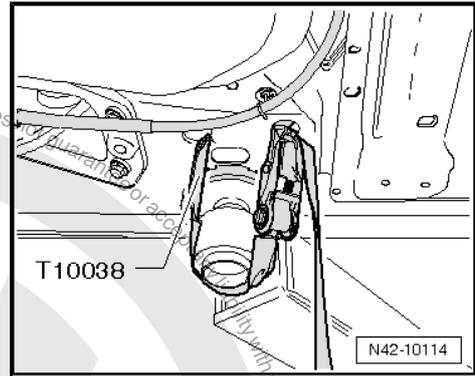


- Now secure vehicle to lifting platform on both sides using tensioning straps -T10038-.

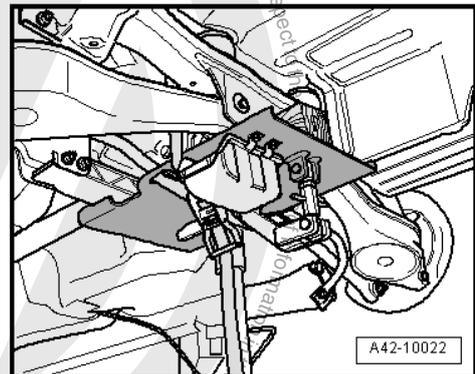


WARNING

If the vehicle is not strapped down, there is a great danger that the vehicle will slip off the lifting platform!



- Position engine and gearbox jack -V.A.G 1383 A- with universal gearbox support -V.A.G 1359/2- beneath subframe and secure with strap.

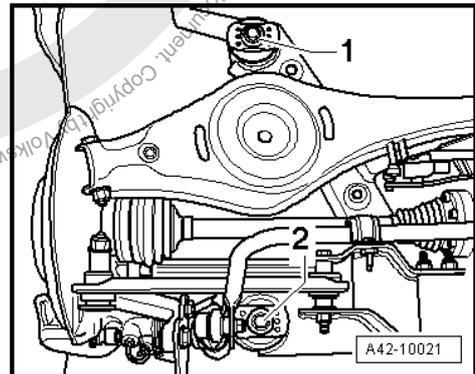


- Unscrew one hexagon bolt -1- or -2- on each side.

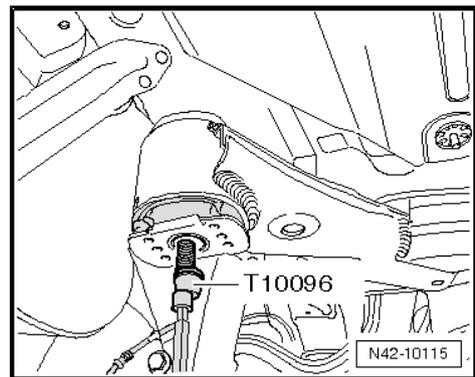


Note

Only the left side of vehicle is shown to improve clarity.



- Secure position of subframe using 2 locking devices -T10096- and tighten to 20 Nm.
- Lower subframe 10 cm using engine and gearbox jack -V.A.G 1383 A- .
- Using, e.g. a felt-tipped pen, mark installation position of bonded rubber bush relative to subframe.





– Set up special tools as shown in figure.

- 1 - Nut -T10263/5-
- 2 - Washer (commercial type)
- 3 - Subframe
- 4 - Tube -T10263/1-
- 5 - Hydraulic press -VAS 6178-
- 6 - Washer (commercial type)
- 7 - Nut -T10263/5-
- 8 - Spindle -T10263/4-

– Take up play in special tools.

– Pull out bonded rubber bush by actuating pump.

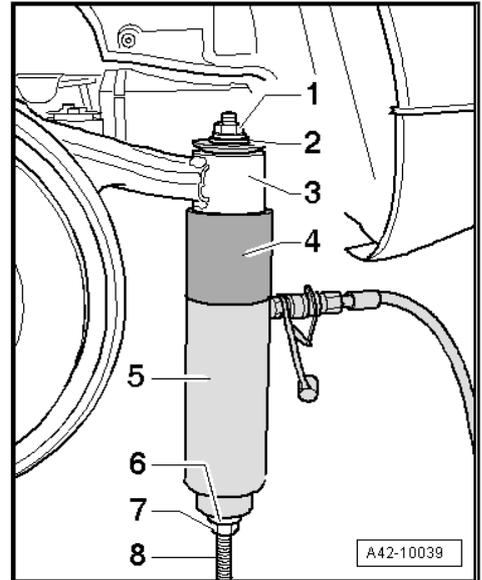
Pulling in front or rear bonded rubber bush

Install in reverse order. In the process, note the following:

The front and rear bonded rubber bushes differ slightly in height. When installing, ensure the correct allocation => Electronic parts catalogue "ETKA" .

The bonded rubber bush must be installed in a certain direction; note mark on subframe.

– Set up special tools with bonded rubber bush on subframe as shown.



WARNING

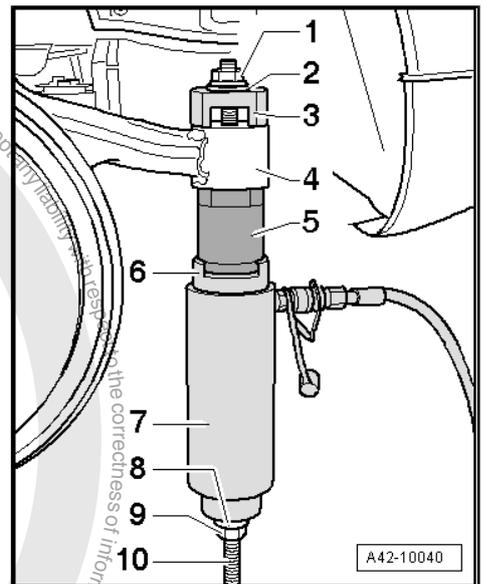
Thrust piece -T10263/3- must be positioned so that lugs on bonded rubber bush align with free aperture on thrust piece -T10263/3- .

- 1 - Nut -T10263/5-
- 2 - Washer (commercial type)
- 3 - Thrust piece -T10263/3-
- 4 - Subframe
- 5 - Bonded rubber bush
- 6 - Thrust piece -T10263/2-
- 7 - Hydraulic press -VAS 6178-
- 8 - Washer (commercial type)
- 9 - Nut -T10263/5-
- 10 - Spindle -T10263/4-

– Take up play in special tools and bonded rubber bush.

– Operate pump to carefully pull bonded rubber bush in until collar lies "flush" on subframe.

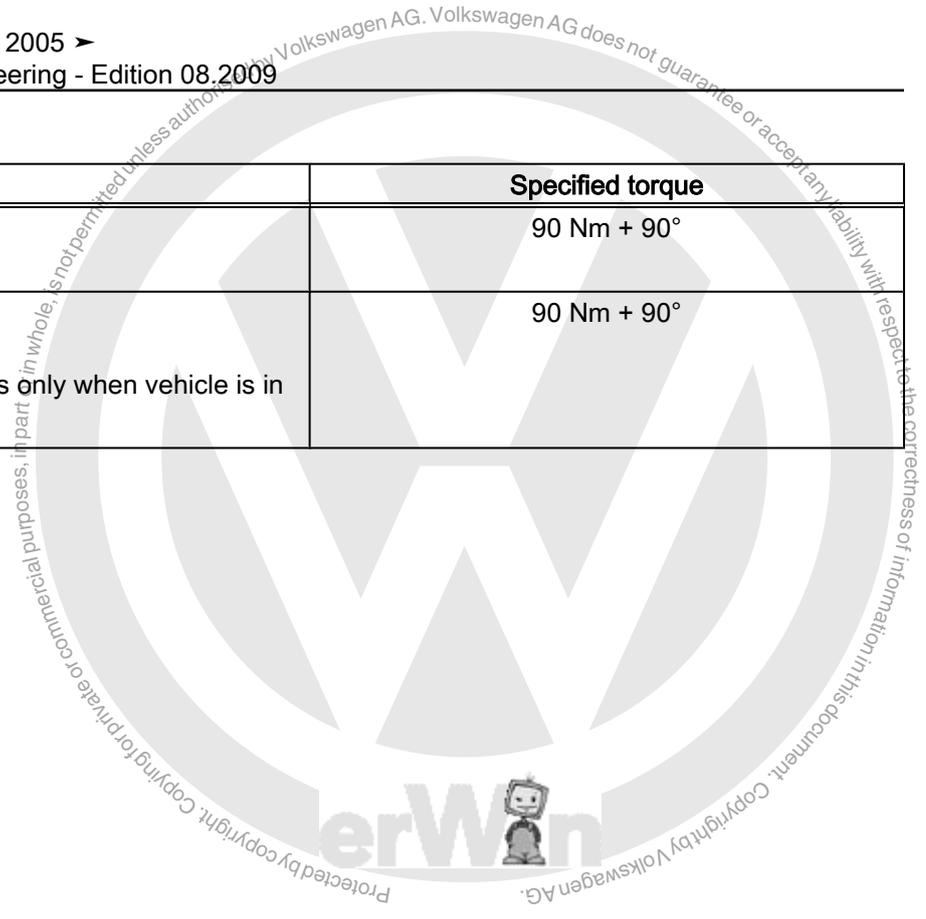
– Perform wheel alignment => [page 305](#) .





Specified torques

Component	Specified torque
Subframe to body ◆ Use new bolts	90 Nm + 90°
Track rod to subframe ◆ Use new nuts and bolts ◆ Tighten threaded connections only when vehicle is in the normal running position.	90 Nm + 90°





10 Assembly overview - subframe made from steel, final drive (four-wheel drive)

-Arrow- indicates direction of travel.

1 - Subframe

2 - Rear bonded rubber bush

- Renewing ⇒ [page 205](#)

3 - Front bonded rubber bush

- Renewing ⇒ [page 205](#)

4 - Final drive

- Removing and installing ⇒ Rep. Gr. 39 ; Removing and installing rear final drive .

5 - Bolt

- M12 x 105
- 60 Nm + 90° further
- Renew each time after removing

6 - Washer

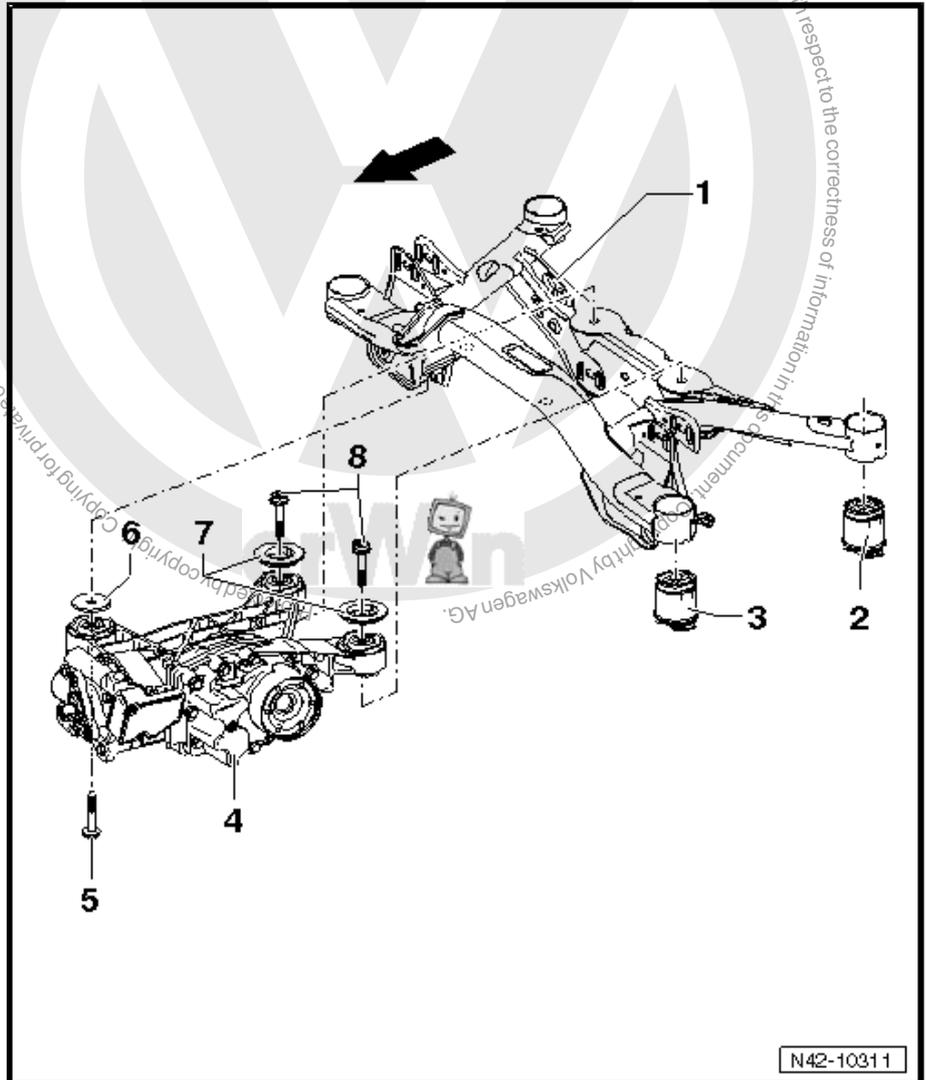
- Installed between final drive and subframe.

7 - Washer

- Washer must be placed with holes on lugs of bonded rubber bush.

8 - Bolt

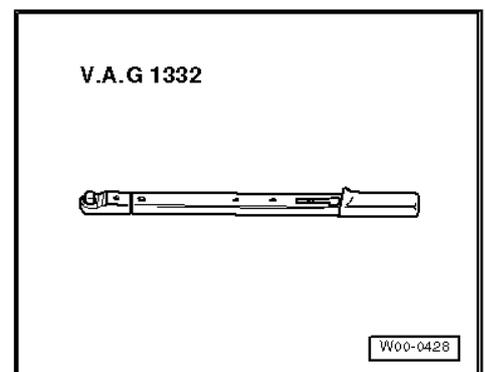
- M12 x 105
- 60 Nm + 90° further
- Renew each time after removing



10.1 Removing and installing rear axle

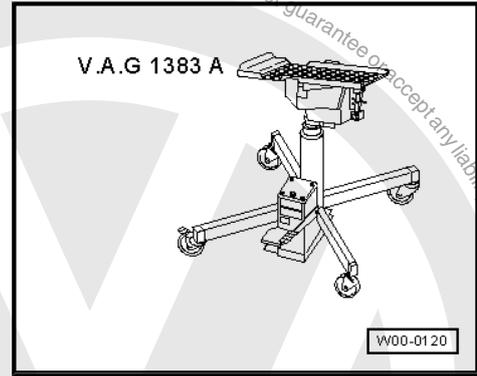
Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1332-





◆ Engine/gearbox jack -V.A.G 1383 A-

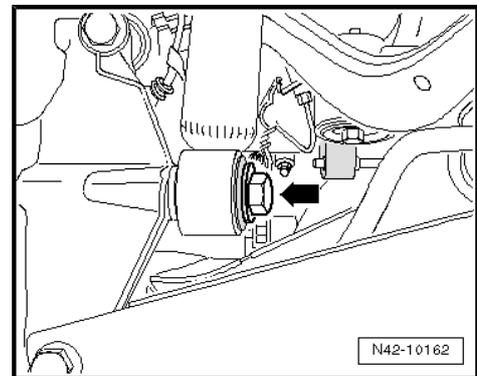


Removing subframe with attachments

i Note

Please note that subsequent assembly work for which the hexagon or twelve-point bolt of the drive shaft has to be loosened requires that the vehicle is stood on its wheels. Loosen hexagon bolt ⇒ [page 274](#) or loosen twelve-point bolt of drive shaft ⇒ [page 275](#) .

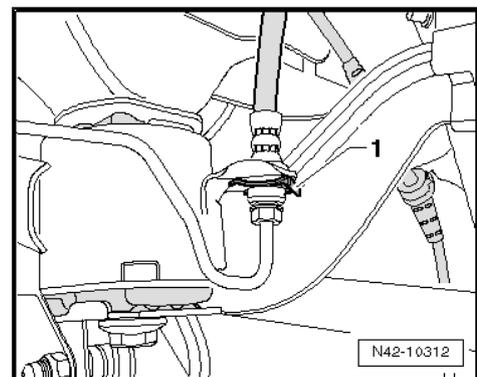
- Remove wheels.
- Removing coil spring ⇒ [page 257](#) .
- Remove rear exhaust system silencer ⇒ Rep. Gr. 26 ; Exhaust system; Removing and installing parts of the exhaust system .
- Disconnect electrical connections between rear axle and body.
- Remove bolt -arrow-.



- Remove clip -1-.

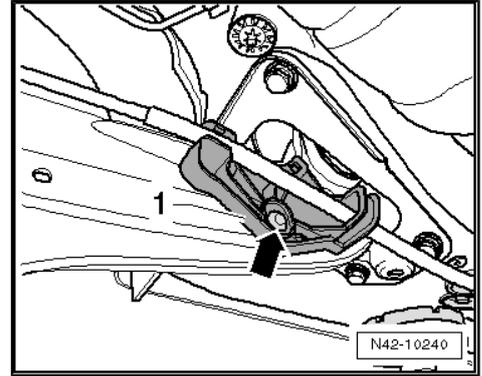
i Note

Do not open brake line.

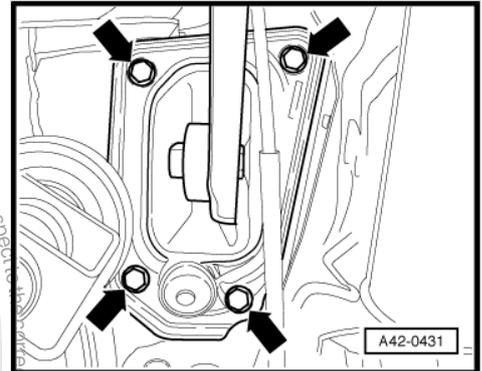




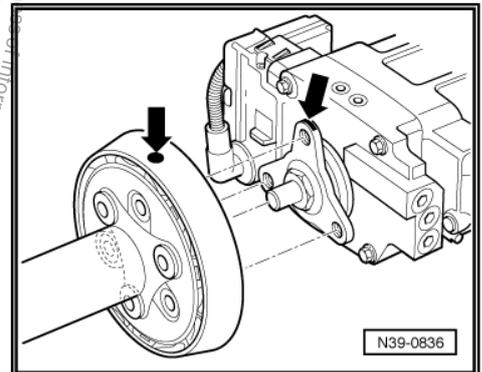
- Remove retainer -1- by pushing out inner pin of rivet -arrow-.



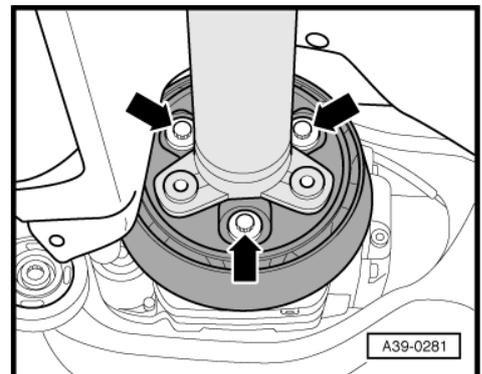
- Mark installation position of mounting bracket on body.
- Remove bolts -arrows-.
- Disconnect connector for rear left vehicle level sender -G76-



- Check whether a mark is present on the flexible coupling and the final drive flange (coloured dot) -arrows-. If no mark is present, mark the position of the flexible coupling and the final drive flange to one another -arrows-.
- Disconnect connectors for rear right speed sensor -G44- and rear left speed sensor -G46- .

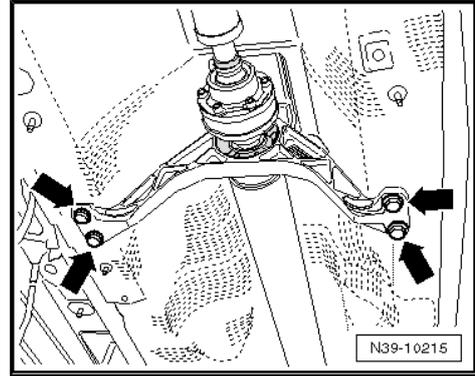


- Unbolt rear propshaft tube with flexible coupling and vibration damper from rear final drive -arrows-.

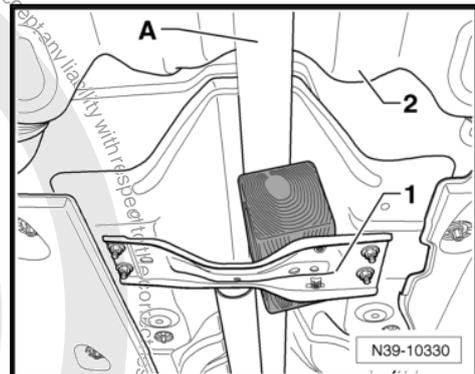




- Unscrew centre bearing bolts -arrows- two turns.

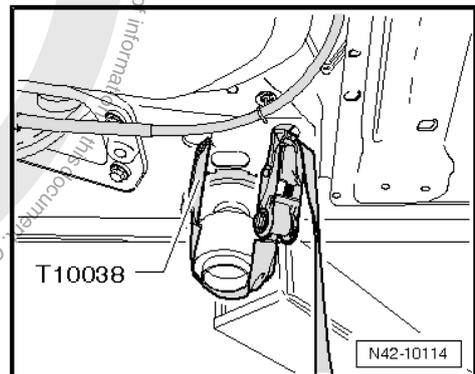


- Support propshaft -A- on tunnel support -1- using a wooden block.
- Push rear propshaft tube towards gearbox as far as possible.
- Disconnect Haldex coupling connector above final drive.

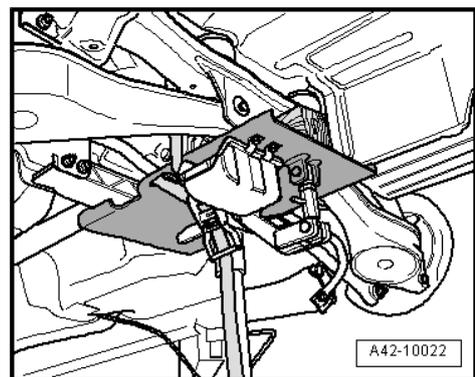


- Now strap vehicle to the lifting platform arms on both sides of the vehicle using tensioning straps -T10038- .

 **WARNING**
If the vehicle is not strapped down there is a great danger that the vehicle will slip off the lifting platform!



- Position engine and gearbox jack -V.A.G 1383 A- under sub-frame using universal gearbox mounting -V.A.G 1359/2- and secure with tensioning strap.



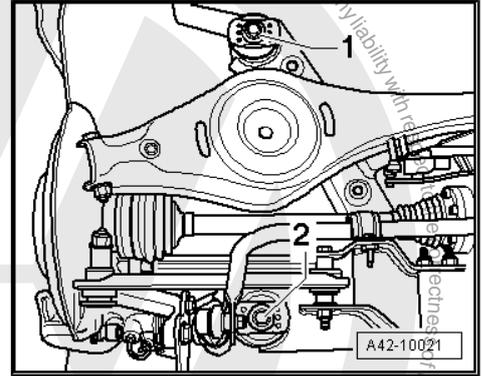


To secure the subframe in place, ensure that at positions -1- and -2- the locating pins -T10096- are screwed in one after the other on both sides of vehicle.

- Unscrew one hexagon bolt -1- or -2- on both sides.

i Note

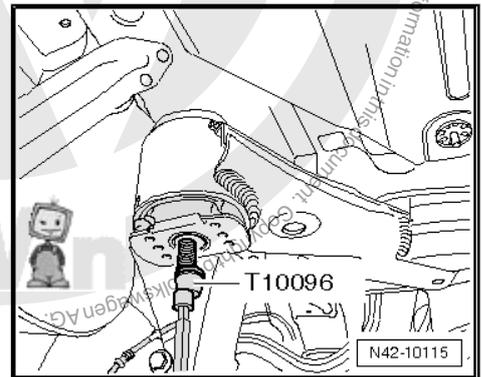
Only the left vehicle side is shown to improve clarity.



- Secure position of subframe using 2 locking devices -T10096- and tighten to 20 Nm.

i Note

The locating devices -T10096- must only be tightened to a maximum of 20 Nm; otherwise the threads of the locating pins may be damaged.



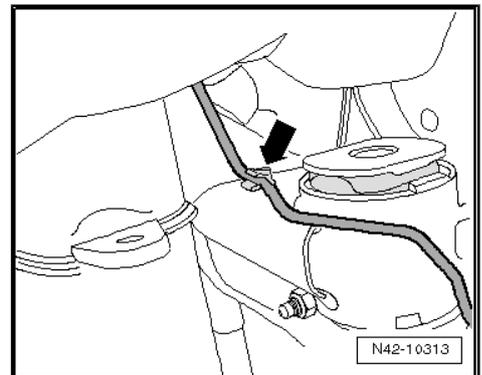
- Replace the subframe securing bolts on both sides one after the other with locating pins -T10096- and tighten to 20 Nm.

The position of the subframe is now fixed.

- Carefully lower subframe with attachments about 2 cm.
- Unclip brake lines on both sides -arrow-.

i Note

The clips will be destroyed and must be renewed.





- Unclip brake line from clips -arrows- above drive shaft flange on gearbox -1-.



Note

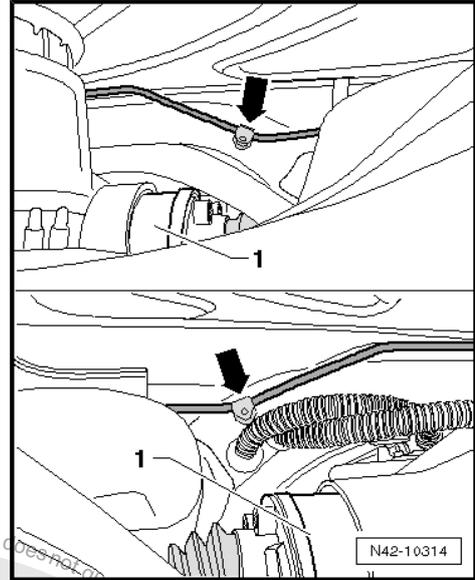
The clips will be destroyed and must be renewed.

- Carefully lower subframe with attachments.



Note

When lowering, ensure sufficient clearance between brake lines, electrical cables and centring pin and the propshaft.



Installing subframe with attachments

Install in reverse order. Note the following points:



Note

- ◆ *Make sure that the plate between wheel bearing housing and shock absorber is also installed.*
- ◆ *Renew the damaged brake line clips on the subframe.*
- ◆ *If an aluminium subframe has to be replaced, a new brake line must also be installed ⇒ Braking systems; Rep. Gr. 47; Brake line repair and ⇒ Electronic parts catalogue "ETKA".*

Attach propshaft to rear final drive ⇒ Final drive 02D/0AV; Rep. Gr. 39; Removing and installing propshaft .

Specified torques

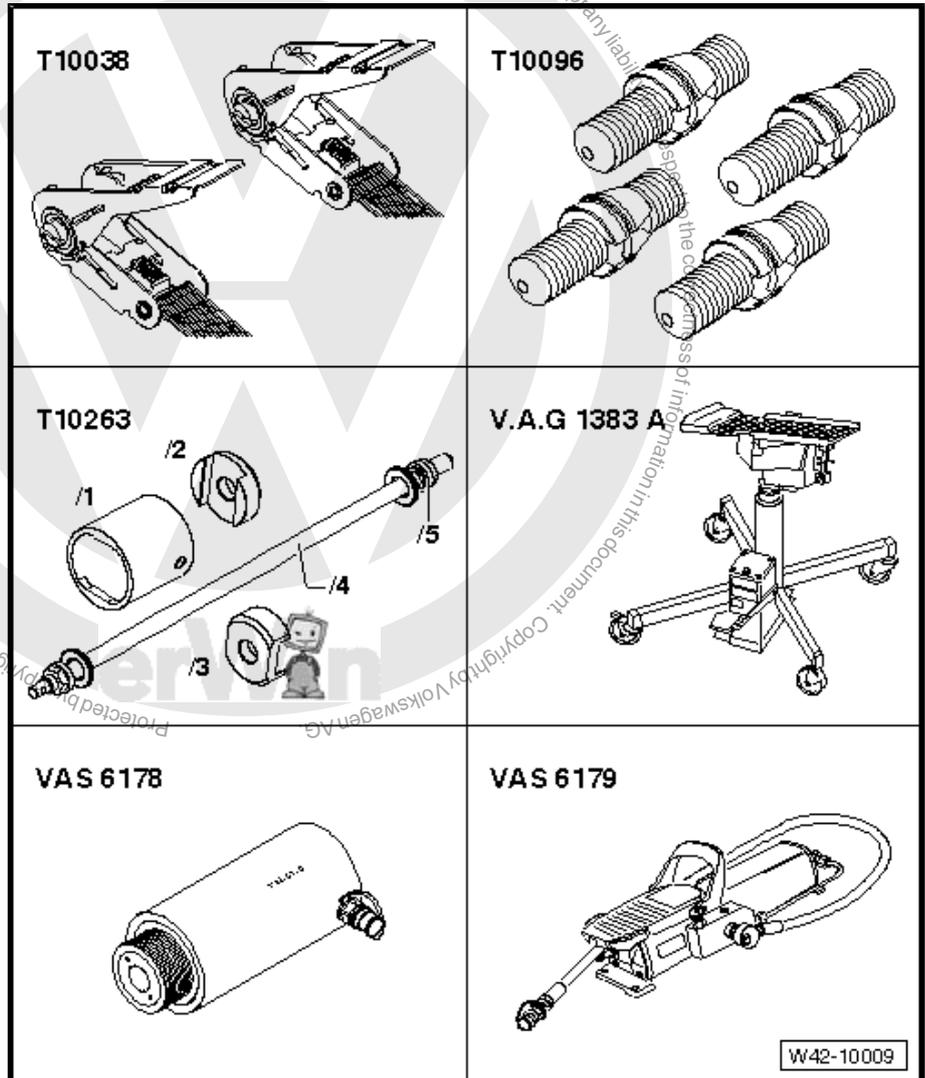
Component	Specified torque
Subframe to body ◆ Use new bolts!	90 Nm + 90° further
Shock absorber to wheel bearing housing	180 Nm
Mounting bracket to body ◆ Use new bolts!	50 Nm + 45° further



10.2 Repairing subframe

Special tools and workshop equipment required

- ◆ Tensioning strap -T10038-
- ◆ Locating pins -T10096-
- ◆ Assembly tool -T10263-
- ◆ Engine and gearbox jack - V.A.G 1383 A-
- ◆ Hydraulic press -VAS 6178- and thrust piece - T10205/13-
- ◆ Foot pump VAS 6179-



Pulling out front bonded rubber bush ⇒ [page 205](#)

Pulling in front bonded rubber bush ⇒ [page 207](#)

Pulling out rear bonded rubber bush ⇒ [page 208](#)

Pulling in rear bonded rubber bush ⇒ [page 210](#)

Pulling out front bonded rubber bush

- Remove rear wheels.
- Removing coil spring ⇒ [page 257](#) .
- Remove rear exhaust system silencer ⇒ Rep. Gr. 26 ; Exhaust system; Removing and installing parts of the exhaust system .
- Disconnect electrical connections between rear axle and body.
- Remove anti-roll bar ⇒ [page 265](#) .
- Remove track rods ⇒ [page 231](#) .

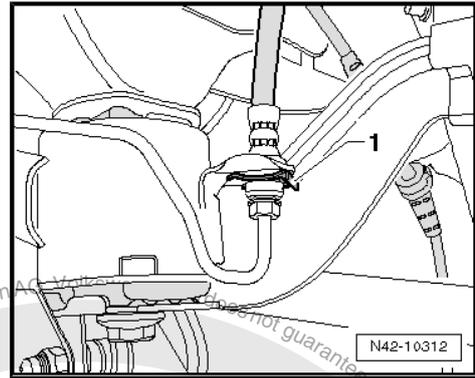


- Remove clip -1-.



Note

Do not open brake line.

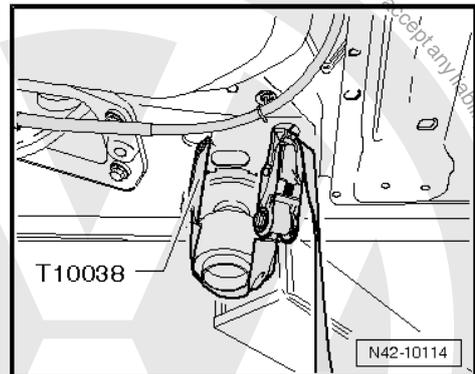


- Now strap vehicle to the lifting platform arms on both sides of the vehicle using tensioning straps -T10038-.

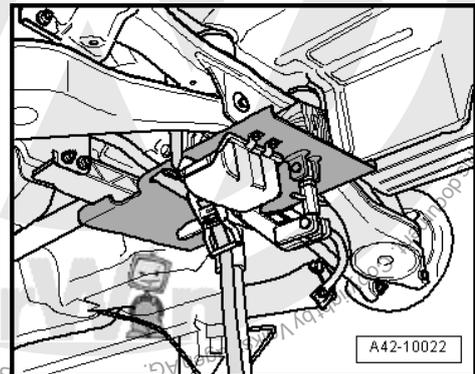


WARNING

If the vehicle is not strapped down there is a great danger that the vehicle will slip off the lifting platform!



- Position engine and gearbox jack -V.A.G 1383 A- with universal gearbox support -V.A.G 1359/2- beneath subframe and secure with strap.



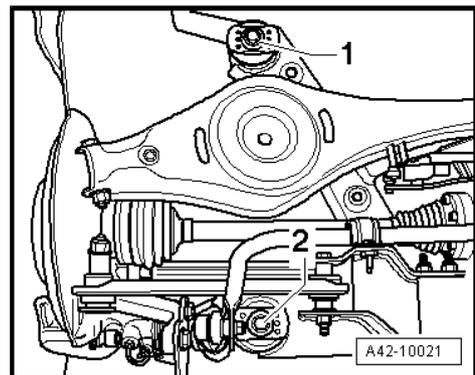
- Unscrew one hexagon bolt -1- or -2- on both sides.



Note

Only the left vehicle side is shown to improve clarity.

To secure the subframe in place, ensure that at positions -1- and -2- the locating pins -T10096- are screwed in one after the other on both sides of vehicle.





- Secure position of subframe using 2 locking devices -T10096- and tighten to 20 Nm.

i Note

The locating devices -T10096- must only be tightened to a maximum of 20 Nm, otherwise the threads of the locating pins may be damaged.

- Replace the subframe securing bolts on both sides one after the other with locating pins -T10096- and tighten to 20 Nm.

The position of the subframe is now fixed.

- Lower subframe 10 cm using engine and gearbox jack -V.A.G 1383 A- .

- Mark installation position of bonded rubber bush relative to subframe using e.g. a felt tip pen.

- Position special tools as shown in illustration.

1 - Nut -T10263/5-

2 - Washer , from -T10263-

3 - Tube -T10263/6-

4 - Hydraulic press -VAS 6178- and thrust piece -T10205/13-

5 - Nut -T10263/5-

6 - Spindle -T10263/4-

- Take up play in special tools.

- Pull out bonded rubber bush by actuating the pump.

i Note

The outer ring of the bush shears off when pulling out the bonded rubber bush. This occurs with a loud bang.

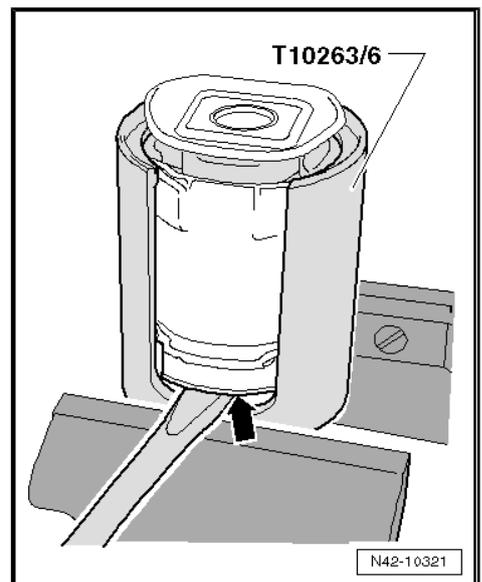
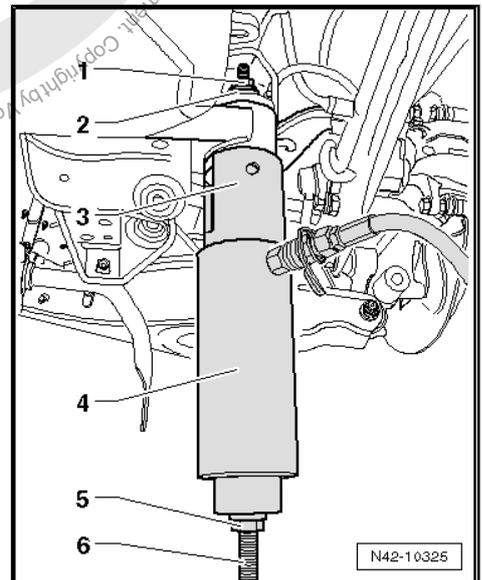
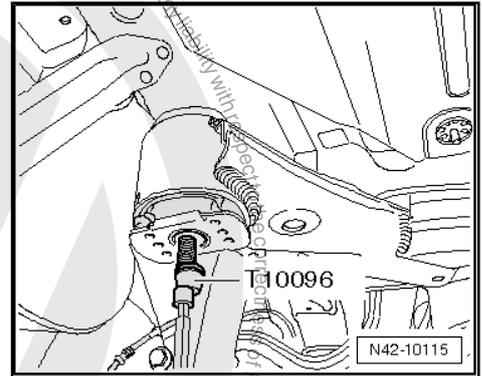
- The bonded rubber bush must be removed from the tube -T10356/6- once the bush has been pulled out.

- Clamp tube -T10356/6- on the intended surfaces in a vice.

- Insert a screwdriver between tube -T10356/6- and bonded rubber bush and lever bush out of tube -arrow-. If necessary, apply a drift to bush and drive out with light hammer blows.

Pulling in front bonded rubber bush

Install in reverse order. Note the following points:





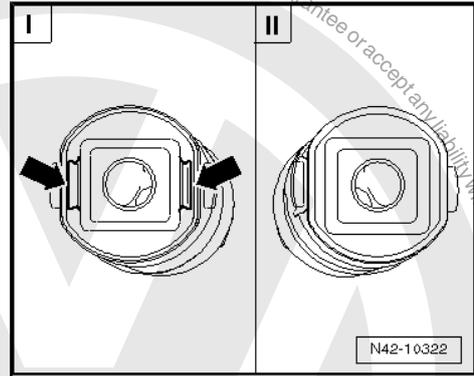
Distinguishing features of bonded rubber bushes

I - Front bonded rubber bush

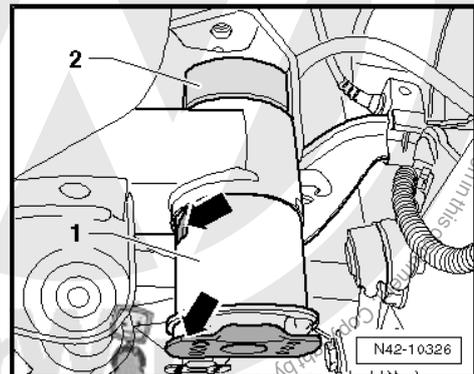
II - Rear bonded rubber bush

The front bonded rubber bushes have two notches on the upper side -arrows- and differ to the rear slightly in height => Electronic parts catalogue "ETKA" .

The bonded rubber bush must be installed in a certain direction; note mark on subframe.



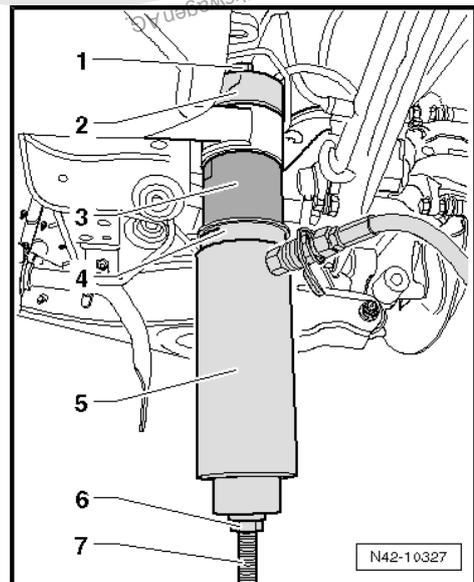
- Insert bonded rubber bush -1- in subframe so that the nose and the plate -arrows- face perpendicular to direction of travel.
- Apply thrust piece -T10263/3- -2- so that flattened sides also face perpendicular to direction of travel.



- Insert special tools with bonded rubber bush into subframe as shown.

- 1 - Nut -T10263/5-
- 2 - Thrust piece -T10263/3-
- 3 - Bonded rubber bush
- 4 - Thrust piece -T10263/2-
- 5 - Hydraulic press -VAS 6178- and thrust piece -T10205/13-
- 6 - Nut -T10263/5-
- 7 - Spindle -T10263/4-

- Pre-tension special tools with bonded rubber bush.
- By actuating the pump, carefully draw bonded rubber bush in until collar lies "flush" on subframe.
- Install track rods => [page 231](#) .
- Install anti-roll bar => [page 265](#) .



- Join electrical connections between rear axle and body.
- Install rear silencer of exhaust system => Rep. Gr. 26 ; Exhaust system; Removing and installing parts of the exhaust system .
- Install coil springs => [page 257](#) .
- Fit rear wheels.

Pulling out rear bonded rubber bush

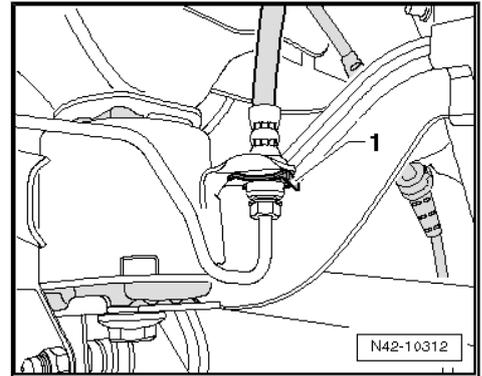
- Remove rear wheels.
- Removing coil spring => [page 257](#) .
- Remove rear exhaust system silencer => Rep. Gr. 26 ; Exhaust system; Removing and installing parts of the exhaust system .



- Remove clip -1-.

i Note

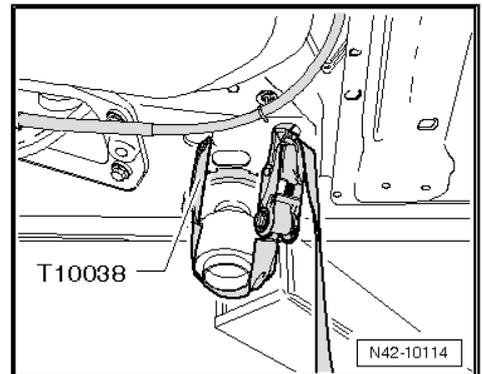
Do not open brake line.



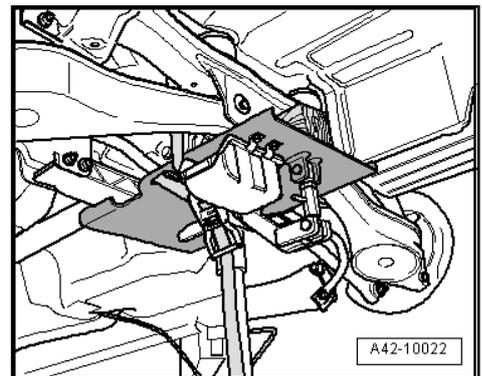
- Now strap vehicle to the lifting platform arms on both sides of the vehicle using tensioning straps -T10038- .

! WARNING

If the vehicle is not strapped down there is a great danger that the vehicle will slip off the lifting platform!



- Position engine and gearbox jack -V.A.G 1383 A- with universal gearbox support -V.A.G 1359/2- beneath subframe and secure with strap.

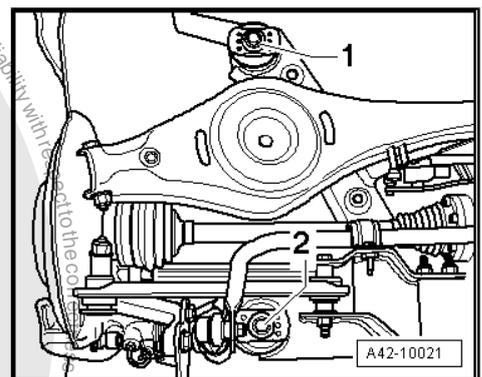


- Unscrew one hexagon bolt -1- or -2- on both sides.

i Note

Only the left vehicle side is shown to improve clarity.

To secure the subframe in place, ensure that at positions -1- and -2- the locating pins -T10096- are screwed in one after the other on both sides of vehicle.





- Fix position of subframe using locating pins -T10096- .



Note

The locating devices -T10096- must only be tightened to a maximum of 20 Nm; otherwise the threads of the locating pins may be damaged.

- Replace the subframe securing bolts on both sides one after the other with locating pins -T10096- and tighten to 20 Nm.

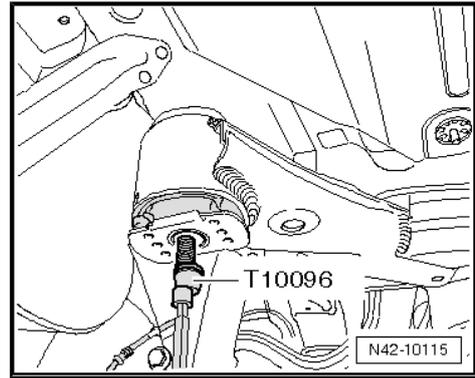
The position of the subframe is now fixed.

- Lower subframe 10 cm using engine and gearbox jack -V.A.G 1383 A- .
- Mark installation position of bonded rubber bush relative to subframe using e.g. a felt tip pen.

- Position special tools as shown in illustration.

- 1 - Nut -T10263/5-
- 2 - Washer , from -T10263-
- 3 - Tube -T10263/6-
- 4 - Hydraulic press -VAS 6178- and thrust piece -T10205/13-
- 5 - Nut -T10263/5-
- 6 - Spindle -T10263/4-

- Take up play in special tools.
- Pull out bonded rubber bush by actuating the pump.



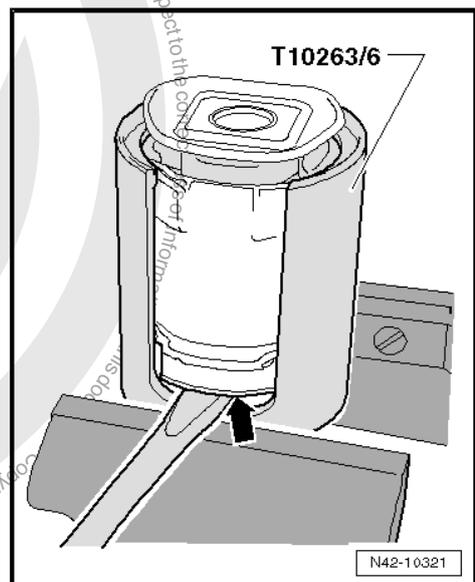
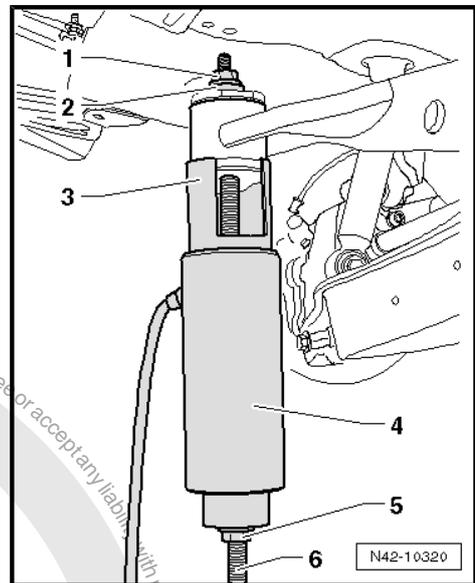
Note

The outer ring of the bush shears off when pulling out the bonded rubber bush. This occurs with a loud bang.

- The bonded rubber bush must be removed from the tube -T10356/6- once the bush has been pulled out.
- Clamp tube -T10356/6- on the intended surfaces in a vice.
- Insert a screwdriver between tube -T10356/6- and bonded rubber bush and lever bush out of tube -arrow-. If necessary, apply a drift to bush and drive out with light hammer blows.

Pulling in rear bonded rubber bush

Install in reverse order. Note the following points:





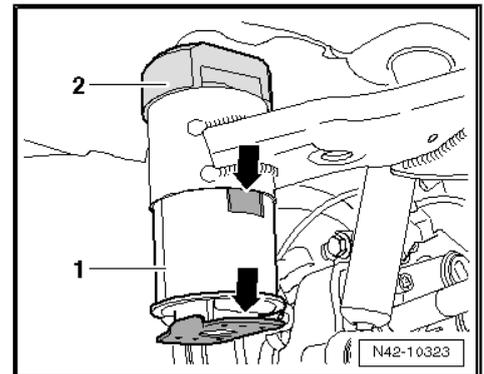
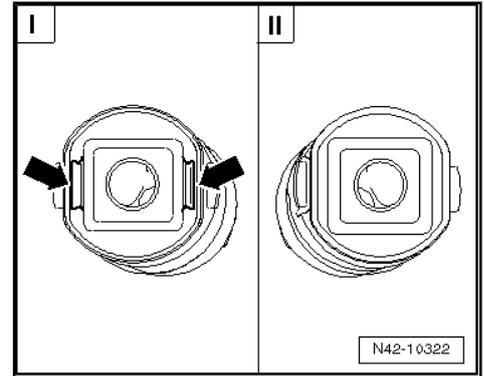
Distinguishing features of bonded rubber bushes

- I - Front bonded rubber bush
- II - Rear bonded rubber bush

The front bonded rubber bushes have two notches on the upper side -arrows- and differ to the rear slightly in height => Electronic parts catalogue "ETKA" .

The bonded rubber bush must be installed in a certain direction; note mark on subframe.

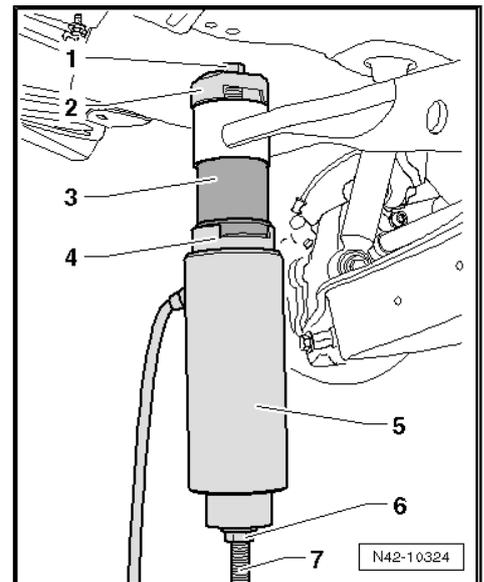
- Insert bonded rubber bush -1- in subframe so that the nose and the plate -arrows- face perpendicular to direction of travel.
- Apply thrust piece -T10263/3- -2- so that flattened sides also face perpendicular to direction of travel.



- Insert special tools with bonded rubber bush into subframe as shown.

- 1 - Nut -T10263/5-
- 2 - Thrust piece -T10263/3-
- 3 - Bonded rubber bush
- 4 - Thrust piece -T10263/2-
- 5 - Hydraulic press -VAS 6178- and thrust piece -T10205/13-
- 6 - Nut -T10263/5-
- 7 - Spindle -T10263/4-

- Pre-tension special tools with bonded rubber bush.
- By actuating the pump, carefully draw bonded rubber bush until collar lies "flush" on subframe.
- Install rear silencer of exhaust system => Rep. Gr. 26 ; Exhaust system; Removing and installing parts of the exhaust system .
- Install coil springs => [page 257](#) .
- Fit rear wheels.



Specified torques

Component	Specified torque
Subframe to body ◆ Use new bolts!	90 Nm + 90° further



11 Assembly overview - control arm, track rod (four-wheel drive, sub-frame made from aluminium and wheel bearing housing made from cast steel)

-Arrow- indicates direction of travel.

1 - Eccentric bolt

- Check wheel alignment whenever this component is loosened ⇒ [page 305](#) .
- Do not turn more than 90° in either direction (i.e. from minimum to maximum adjustment position).

2 - Nut

- M12 x 1.5
- 95 Nm
- Self-locking
- Always renew after removing
- Always tighten threaded connections in unladen position ⇒ [page 187](#)

3 - Eccentric washer

- Inner hole with lug

4 - Eccentric bolt

- Check wheel alignment whenever this component is loosened ⇒ [page 305](#) .
- Do not turn more than 90° in either direction (i.e. from minimum to maximum adjustment position)

5 - Eccentric washer

- Inner hole with lug

6 - Nut

- M12 x 1.5
- 95 Nm
- Self-locking
- Always renew after removing
- Always tighten threaded connections in unladen position ⇒ [page 187](#)

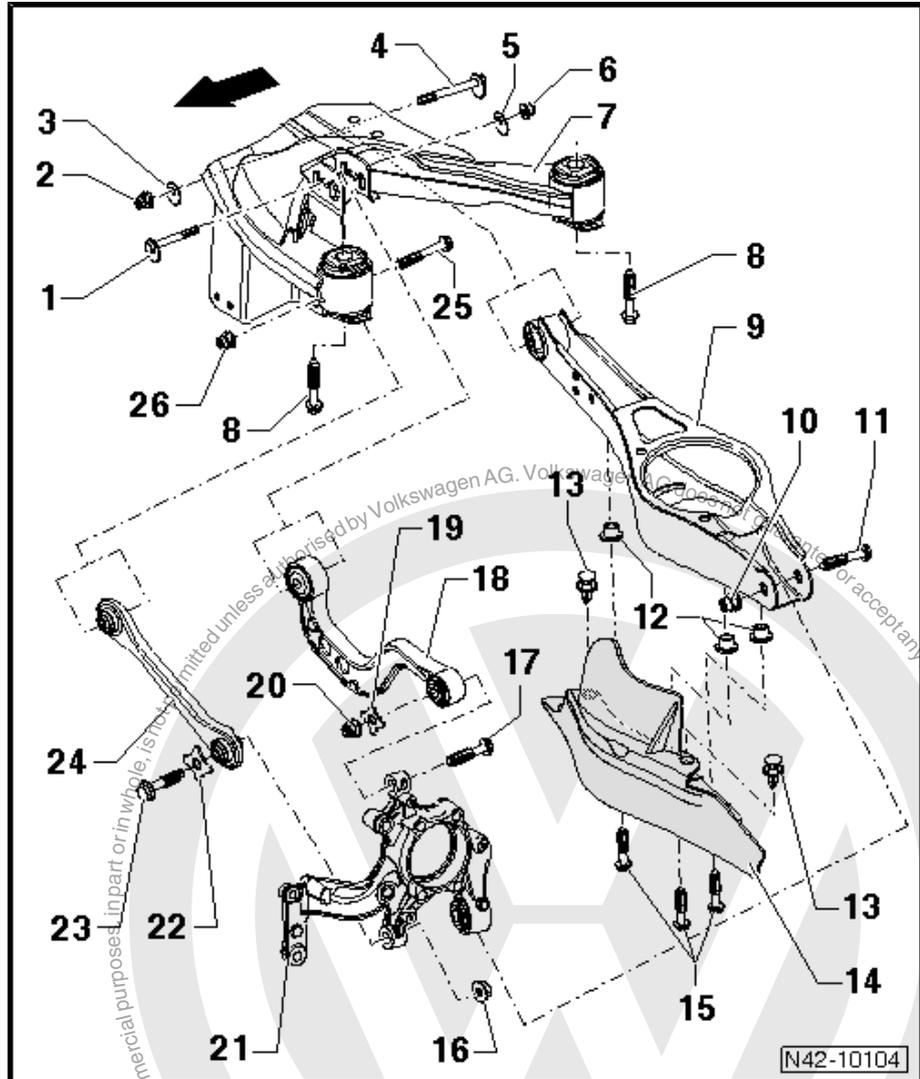


Note

7 - Subframe

8 - Bolt

- M12 x 1.5 x 125
- 90 Nm + 90° further
- Always renew after removing





9 - Lower transverse link

- Removing and installing ⇒ [page 217](#)

10 - Nut

- M12 x 1.5
- 90 Nm + 90° further
- Self-locking
- Always renew after removing
- Always tighten threaded connections in unladen position ⇒ [page 187](#)

11 - Bolt

- Always renew after removing

12 - Threaded rivet

- M6

13 - Spreader rivet

14 - Stone deflector

15 - Bolt

- 8 Nm

16 - Nut

- M14 x 1.5
- 130 Nm + 90° further
- Self-locking
- Always renew after removing
- Always tighten threaded connections in unladen position ⇒ [page 187](#)

17 - Bolt

- Always renew after removing
- Always tighten threaded connections in unladen position ⇒ [page 187](#)

18 - Upper transverse link

- Removing and installing ⇒ [page 215](#)

19 - Washer

20 - Nut

- M14 x 1.5
- 130 Nm + 90° further
- Self-locking
- Always renew after removing

21 - Wheel bearing housing

- Removing and installing ⇒ [page 236](#)
- Installing with wheel bearing housings made from aluminium is permissible ⇒ Electronic parts catalogue "ETKA"
- Only wheel bearing housings made from aluminium are available as replacement parts. Therefore, certain parts have to be exchanged and/or installed in addition when replacing ⇒ [page 235](#)

22 - Washer

23 - Bolt

- Always renew after removing
- Always tighten threaded connections in unladen position ⇒ [page 187](#)

24 - Track rod

- Closed in direction of travel

25 - Bolt

- Always renew after removing



- Always tighten threaded connections in unladen position ⇒ [page 187](#)

26 - Nut

- M12 x 1.5
- 90 Nm + 90° further
- Self-locking
- Always renew after removing

11.1 Overview - rear left vehicle level sender -G76-



Note

- ◆ The vehicle level sender is available as a replacement part only complete with coupling rod and upper and lower retaining plates.
- ◆ Renewing without removing subframe ⇒ [page 215](#).
- ◆ Control unit for headlight range control -J431-

1 - Subframe

2 - Lower transverse link

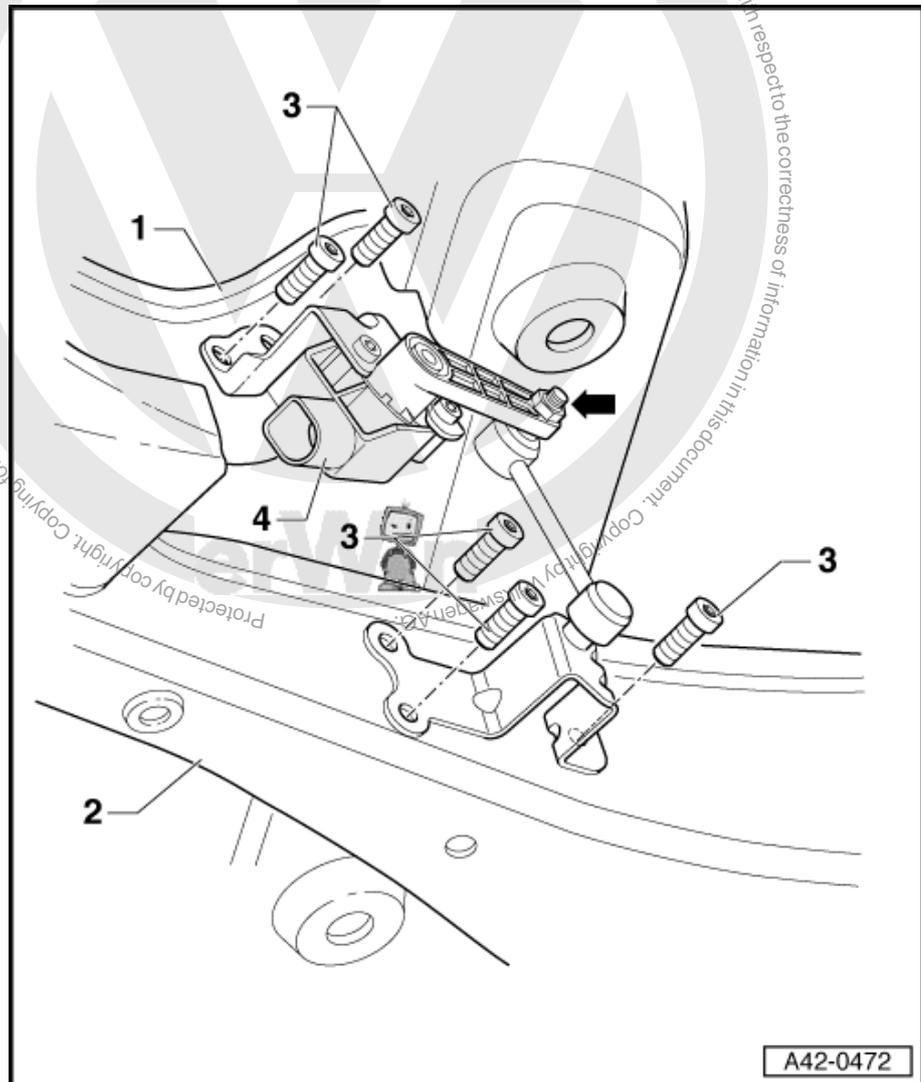
3 - Bolt

- 5 Nm

4 - Rear left vehicle level sender -G76-

- Complete with attachments
- Lever -arrow- must face outwards
- Renewing in vehicle ⇒ [page 215](#)
- Allocation ⇒ Electronic parts catalogue "ETKA"
- Following renewal, basic settings for headlight must be performed.

Basic setting of headlights ⇒
"Guided fault-finding" function
of vehicle diagnosis, testing
and information system
VAS 5051





11.2 Renew vehicle level sender in vehicle

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-

Removing

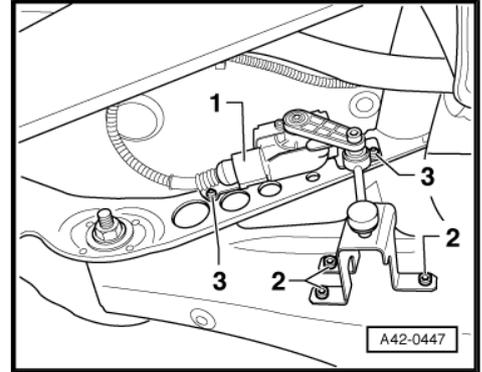
- Separate connection -1-.
- Remove bolts -2- and -3-.
- Take out sender.

Installing

Install in reverse order. Note the following points:

Lever on sender must face outwards.

- Perform basic setting of headlights following replacement.



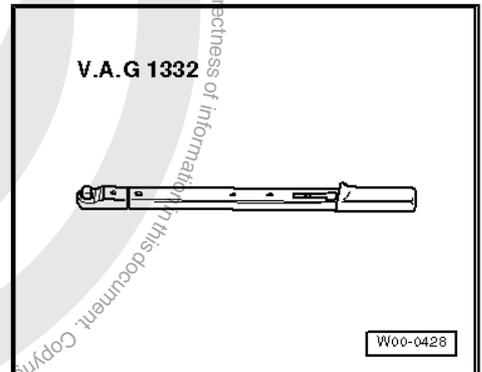
Specified torques

Component	Specified torque
Rear left vehicle level sender -G76- to subframe	5 Nm
Rear left vehicle level sender -G76- to lower transverse link	5 Nm

11.3 Removing and installing upper transverse link

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1332-

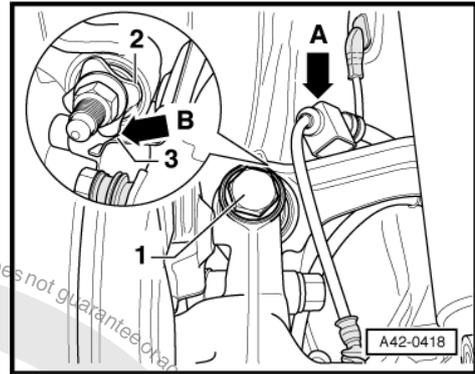


Removing

- Remove wheel.
- Remove coil spring ⇒ [page 257](#) .



- Unhook speed sensor line -arrow A- from upper transverse link.
- Remove bolt -1-.



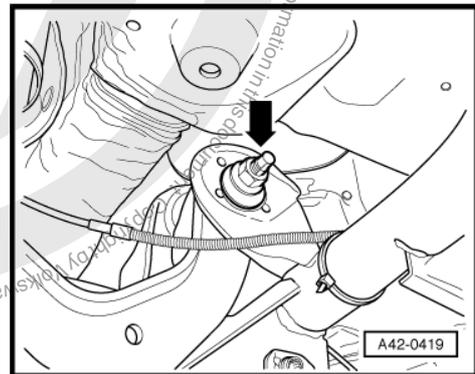
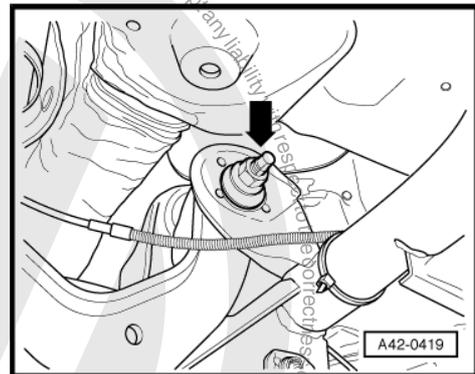
- Mark position of eccentric bolt -arrow- relative to subframe using e.g. a felt tip pen.
- Remove bolt -arrow-.
- Remove upper transverse link.

Installing

Carry out installation in the reverse sequence, noting the following:

The threaded connections of the wishbone may only be tightened when the dimension measured between the centre of wheel hub and edge of wheel housing before starting the work has been attained => [page 187](#).

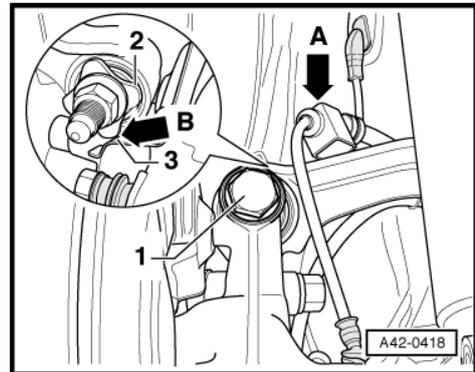
- Observe mark made for position of eccentric bolt -arrow- relative to subframe.



Note

The washer -2- must be installed so that there is a gap -arrow B- between the washer and the backplate -3-.

- Perform wheel alignment => [page 305](#) .



Specified torques

Component	Specified torque
Upper transverse link to wheel bearing housing ◆ Use new nuts and bolts ◆ Tighten threaded connections only when vehicle is in the normal running position.	130 Nm + 90°

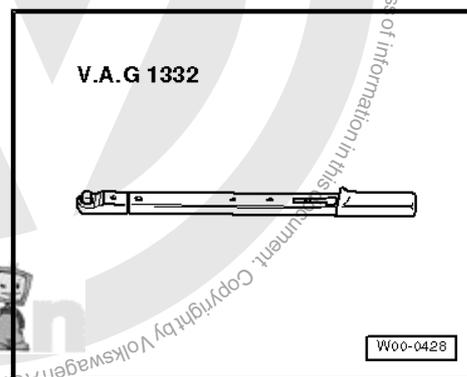


Component	Specified torque
Upper transverse link to subframe ♦ Use new nut ♦ Tighten threaded connections only when vehicle is in the normal running position.	95 Nm ♦ To tighten nuts, set torque wrench -V.A.G 1332- to 80 Nm. ♦ Applies only in conjunction with insert tool, 18 mm -T10179-

11.4 Removing and installing lower transverse link

Special tools and workshop equipment required

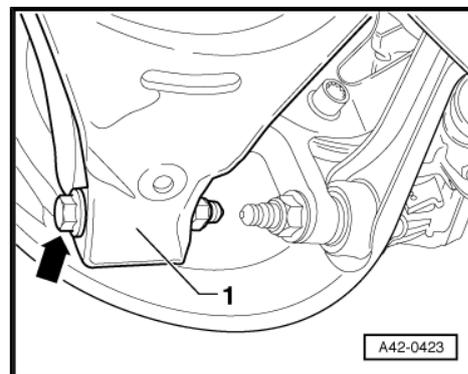
- ♦ Torque wrench -V.A.G 1332-



Removing

- Remove wheel.
- Remove coil spring ⇒ [page 257](#) .
- Remove bolt -arrow- for lower transverse link -1-.

Vehicles with dynamic headlight range control





- Remove bolts -1- from lower transverse link.

Continuation for all vehicles

- Mark position of eccentric bolt -arrow- relative to subframe using e.g. a felt tip pen.
- Disconnect and lower rear part of exhaust system.
- Remove bolt -arrow-.
- Remove lower transverse link.

Installing

Carry out installation in the reverse sequence, noting the following:

The threaded connections of the wishbone may only be tightened when the dimension measured between the centre of wheel hub and edge of wheel housing before starting the work has been attained => page 187 .

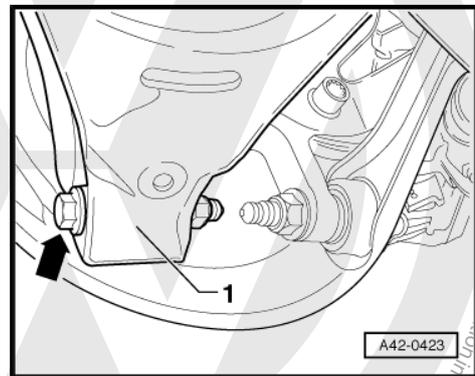
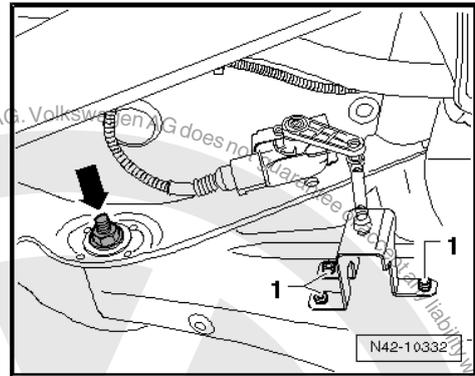
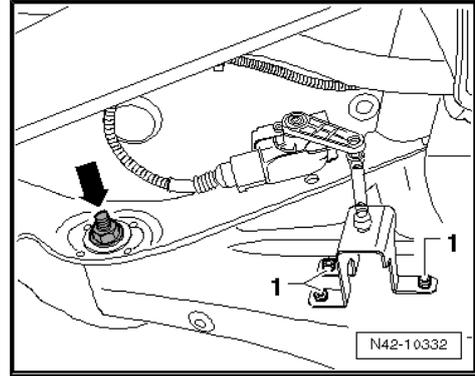
- Bolt upper transverse link to subframe and tighten new nut -arrow- only to specified torque.
- Observe mark made for position of eccentric bolt -arrow- relative to subframe.
- Reinstall rear section of exhaust system.

Vehicles with dynamic headlight range control

- Install bolts -1- in lower transverse link.

Continuation for all vehicles

- Tighten bolt -arrow- for lower transverse link -1-.
- Perform wheel alignment => page 305 .
- Carry out basic setting of headlights => Maintenance ; Booklet 38



Specified torques

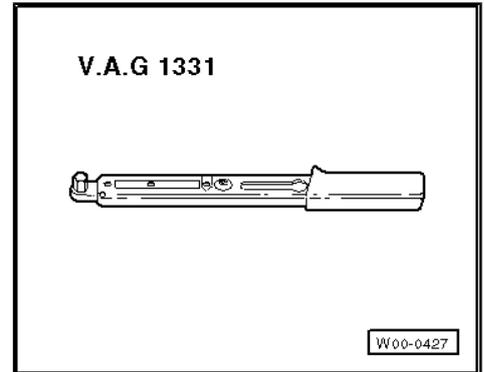
Component	Specified torque
Lower transverse link to wheel bearing housing ♦ Use new nuts and bolts ♦ Tighten threaded connections only when vehicle is in the normal running position	90 Nm + 90° 
Lower transverse link to subframe ♦ Use new nut ♦ Tighten threaded connections only when vehicle is in the normal running position	95 Nm



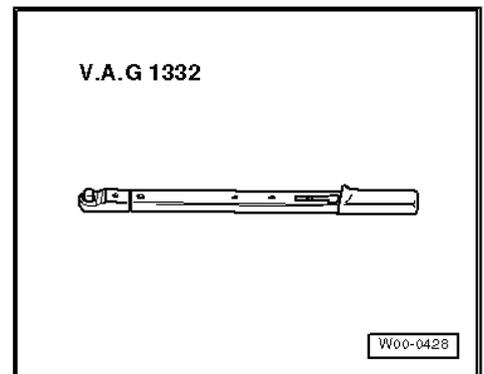
11.5 Removing and installing track rod

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-

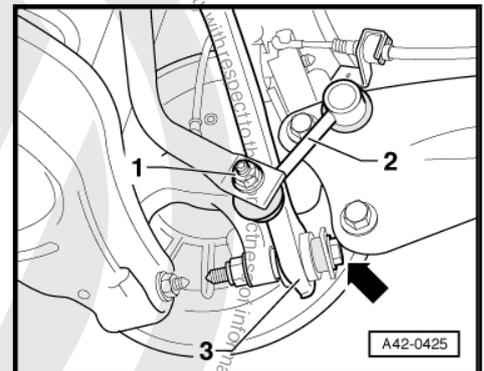


- ◆ Torque wrench -V.A.G 1332-



Removing

- Measure distance from centre of wheel to lower edge of wheel housing ⇒ [page 187](#).
- Remove wheel.
- Remove coil spring ⇒ [page 257](#).
- Remove nut -1- and pull coupling rod -2- out of anti-roll bar.
- Remove bolt  for track rod -3-.

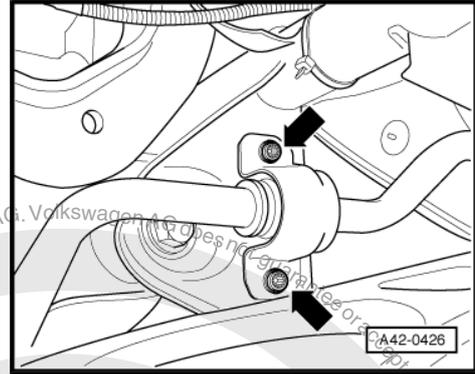




- Remove bolts -arrows- for anti-roll bar clamp.

If the upper bolt of the anti-roll bar clamp on the right side of the vehicle cannot be removed, then additional work must be performed ⇒ [page 220](#) .

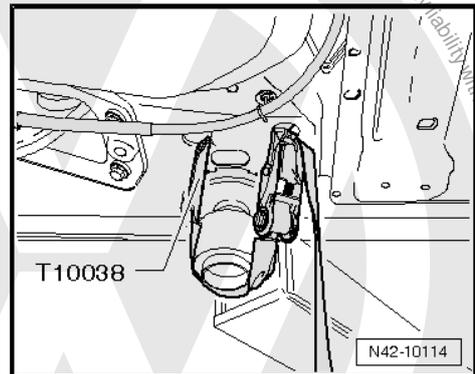
For the right side of the vehicle only (depending on equipment)



- Now strap vehicle to the lifting platform arms on both sides of the vehicle using tensioning straps -T10038- .

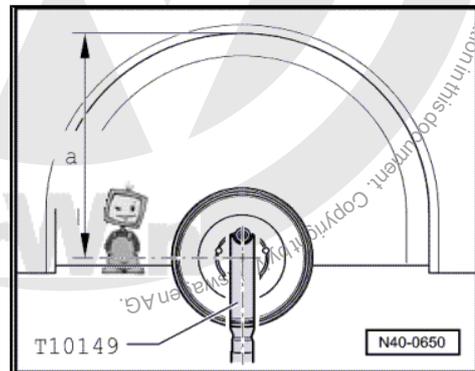
⚠ WARNING

If the vehicle is not strapped down there is a great danger that the vehicle will slip off the lifting platform!



- Attach support -T10149- to wheel hub using wheel bolt.
- Raise wheel hub with support -T10149- and engine and gear-box jack -V.A.G 1383 A- far enough that bolts of right anti-roll bar clamp are accessible.

Continuation for both sides of vehicle:

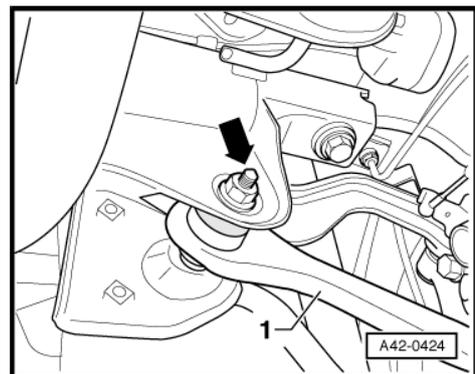


- Remove nut -arrow- and remove bolt towards rear.
- Remove track rod.

Installing

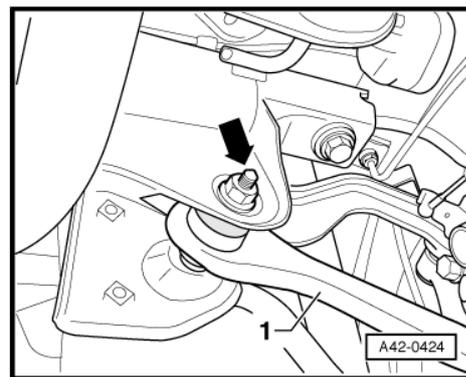
- Install track rod on vehicle and tighten bolts hand tight.

The track rod may only be bolted when dimension "a" has been attained ⇒ [page 188](#) .





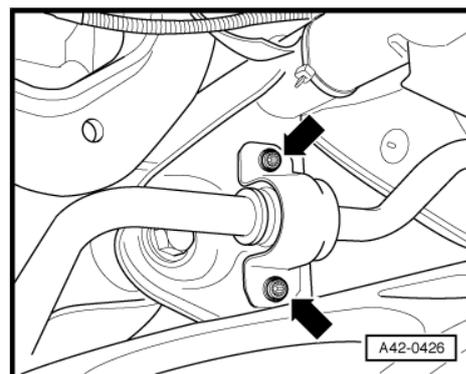
- Bolt track rod -1- to subframe and tighten new nut -arrow- to prescribed torque.



- Tighten bolts -arrows- for anti-roll bar clamp.

For the right side of the vehicle only (depending on equipment)

- Lower wheel suspension again using engine and gearbox jack -V.A.G 1383 A- and remove support -T10149- from wheel hub.
- Remove tensioning strap -T10038- .



Continuation for both sides of vehicle:

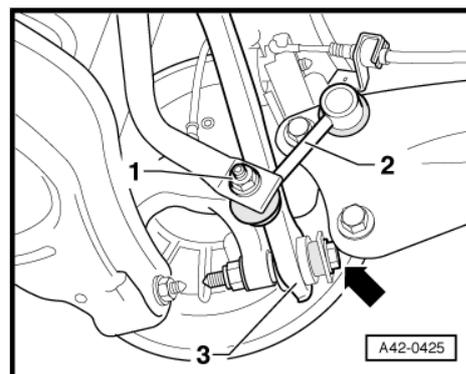
- Tighten bolt -arrow- for track rod -3-.



Note

Ensure that a washer is installed between the nut and the wheel bearing housing.

- Connect coupling rod -2- to anti-roll bar and tighten nut -1-.
- Install coil spring ⇒ [page 257](#) .
- Install wheel and tighten ⇒ [page 288](#) .



The threaded connections of the track rod may be tightened only when the dimension measured between the centre of wheel hub and lower edge of wheel housing before starting the work has been attained ⇒ [page 188](#) .

- Perform wheel alignment ⇒ [page 305](#) .

Specified torques

Component	Specified torque
Track rod to wheel bearing housing ◆ Use new nuts and bolts ◆ Tighten threaded connections only when vehicle is in the normal running position.	130 Nm + 90°
Track rod to subframe ◆ Use new nuts and bolts	90 Nm + 90°
Anti-roll bar to subframe ◆ Use new bolts ◆ Tighten threaded connections only when vehicle is in the normal running position.	25 Nm +45°



Component	Specified torque
Anti-roll bar to coupling rod ◆ Use new nut	45 Nm





12 Assembly overview - control arm, track rod (four-wheel drive, subframe made from steel and wheel bearing housing made from aluminium)

-Arrow- indicates direction of travel.

1 - Eccentric bolt

- Check wheel alignment whenever this component is loosened
 => [page 305](#) .
- Do not turn more than 90° in either direction (i.e. from minimum to maximum adjustment position).

2 - Nut

- M12 x 1.5
- 95 Nm
- Self-locking
- Can be loosened and tightened up to 5 times for adjustment work
- Renew each time after removing
- Always tighten threaded connections in unladen position => [page 187](#)

3 - Eccentric washer

- Inner hole with lug

4 - Eccentric bolt

- Check wheel alignment whenever this component is loosened
 => [page 305](#) .
- Do not turn more than 90° in either direction (i.e. from minimum to maximum adjustment position).

5 - Eccentric washer

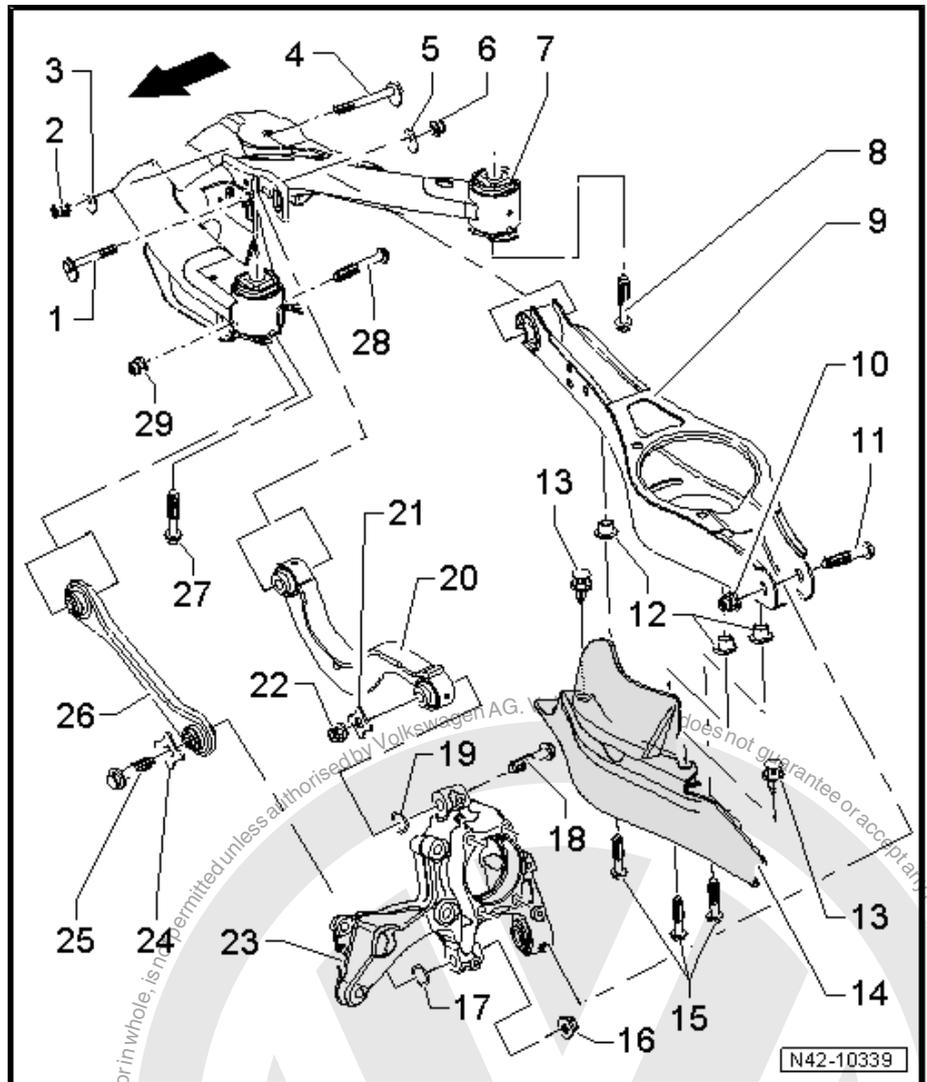
- Inner hole with lug

6 - Nut

- M12 x 1.5
- 95 Nm
- Self-locking
- Can be loosened and tightened up to 5 times for adjustment work
- Renew each time after removing
- Always tighten threaded connections in unladen position => [page 187](#)



Note





7 - Subframe

8 - Bolt

- M12 x 1.5 x 125
- 90 Nm + 90° further
- Renew each time after removing

9 - Lower transverse link

- Removing and installing ⇒ [page 229](#)

10 - Nut

- 90 Nm + 90° further
- Self-locking
- Renew each time after removing
- Always tighten threaded connections in unladen position ⇒ [page 187](#)

11 - Bolt

- M12 x 1.5 x 75
- Renew each time after removing

12 - Threaded rivet

- M6

13 - Spreader rivet

14 - Stone deflector

15 - Hexagon bolt

- M6 x 12
- 8 Nm

16 - Nut

- Self-locking
- Renew each time after removing
- Always tighten threaded connections in unladen position ⇒ [page 187](#)

17 - Washer

18 - Bolt

- M14 x 1.5 x 115
- 130 Nm + 90° further
- Renew each time after removing
- Always tighten threaded connections in unladen position ⇒ [page 187](#)

19 - Washer

20 - Upper transverse link

- Removing and installing ⇒ [page 227](#)

21 - Washer

22 - Nut

- Self-locking
- Renew each time after removing

23 - Wheel bearing housing

- Removing and installing ⇒ [page 236](#)
- Installing with wheel bearing housings made from cast steel is permissible ⇒ Electronic parts catalogue "ETKA"

24 - Washer

25 - Bolt

- M14 x 1.5 x 115



- 130 Nm + 90° further
- Renew each time after removing
- Always tighten threaded connections in unladen position ⇒ [page 187](#)

26 - Track rod

- Various versions
- ◆ Forwards closed (left and right track rods differ)
- ◆ Downwards open (left and right track rods identical)
 - It is permitted to install mixed types.
 - Allocation ⇒ Electronic parts catalogue “ETKA”
 - Removing and installing ⇒ [page 231](#)

27 - Bolt

- M12 x 1.5 x 125
- 90 Nm + 90° further
- Renew each time after removing

28 - Bolt

- M12 x 1.5 x 95
- Renew each time after removing
- Always tighten threaded connections in unladen position ⇒ [page 187](#)

29 - Nut

- 90 Nm + 90° further
- Self-locking
- Renew each time after removing





12.1 Overview - rear left vehicle level sender -G76-



Note

- ◆ The vehicle level sender is available as a replacement part only complete with coupling rod and upper and lower retaining plates.
- ◆ Renewing without removing subframe ⇒ [page 215](#) .
- ◆ Control unit for headlight range control -J431-

1 - Subframe

2 - Lower transverse link

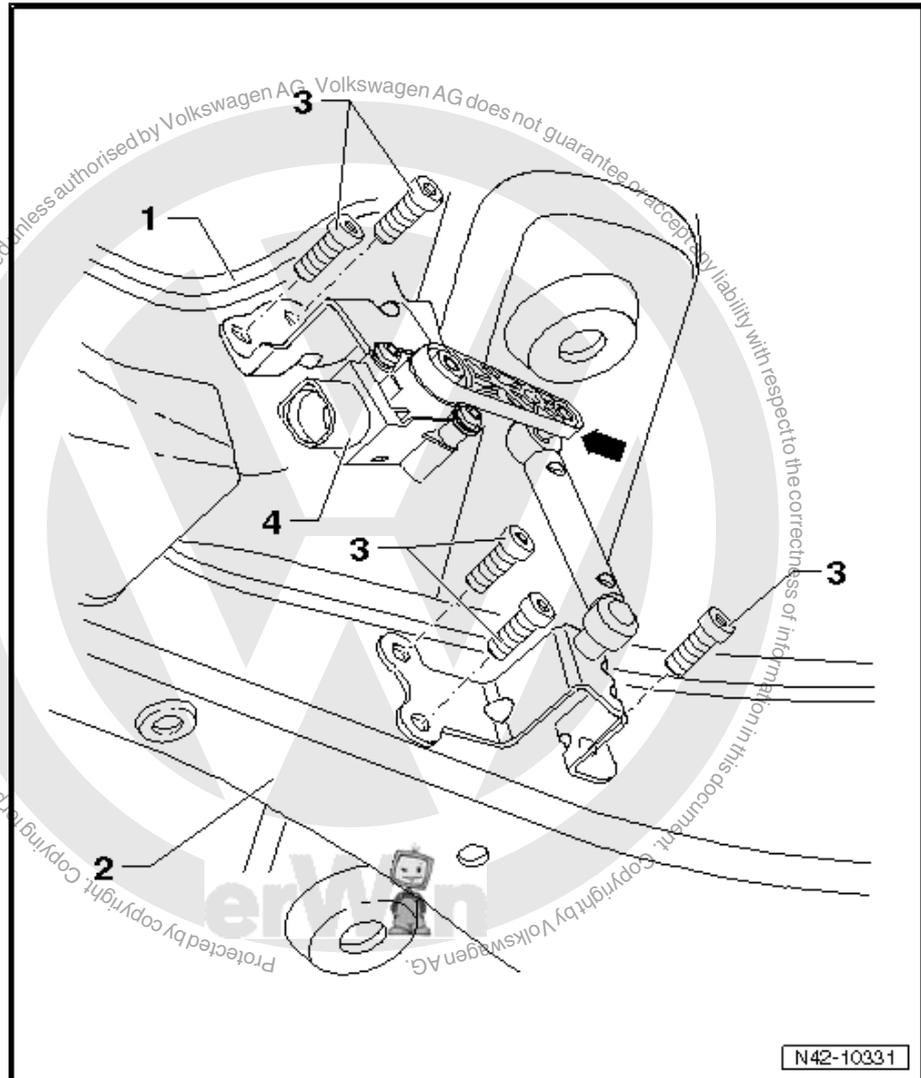
3 - Bolt

- M5 x 20
- 5 Nm

4 - Rear left vehicle level sender -G76-

- Complete with attachments
- Lever -arrow- must face outwards
- Renewing in vehicle ⇒ [page 226](#)
- Following renewal, basic settings for headlight must be performed.

Basic setting of headlights →
"Guided fault-finding" function
of vehicle diagnosis, testing
and information system
VAS 5051

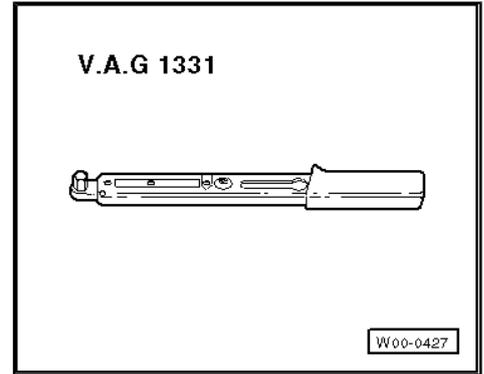


12.2 Renew vehicle level sender in vehicle

Special tools and workshop equipment required



- ◆ Torque wrench -V.A.G 1331-



Removing

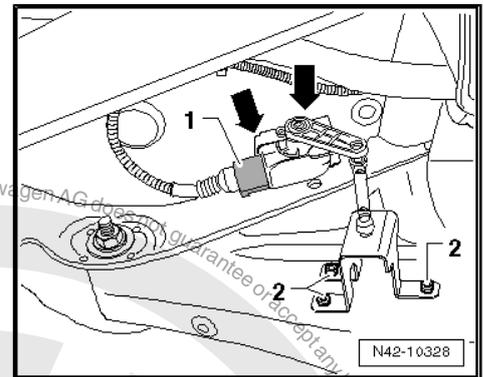
- Separate connection -1-.
- Remove bolts -2- from lower transverse link.
- Remove bolts -arrows- from subframe.
- Remove rear left vehicle level sender -G76- .

Installing

Install in reverse order. Note the following points:

The lever of rear left vehicle level sender -G76- must face outside of vehicle.

- Following renewal, carry out basic setting of headlights => "Guided fault-finding" function of vehicle diagnosis, testing and information system VAS 5051.



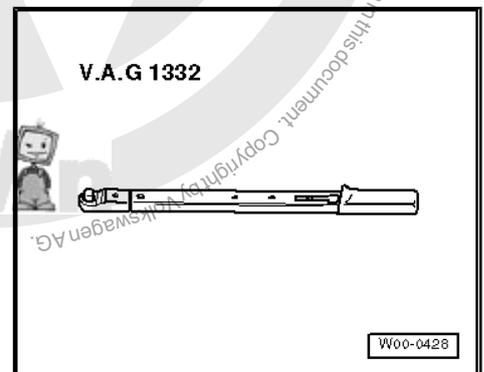
Specified torques

Component	Specified torque
Rear left vehicle level sender -G76- to lower transverse link and subframe	5 Nm

12.3 Removing and installing upper transverse link

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1332-

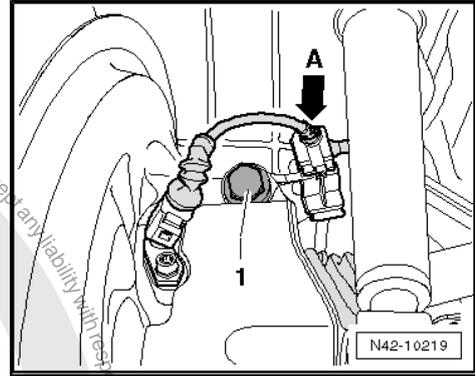


Removing

- Remove wheel.
- Remove coil spring => [page 257](#) .



- Unhook speed sensor line -arrow A- from upper transverse link.
- Remove bolt -1-.

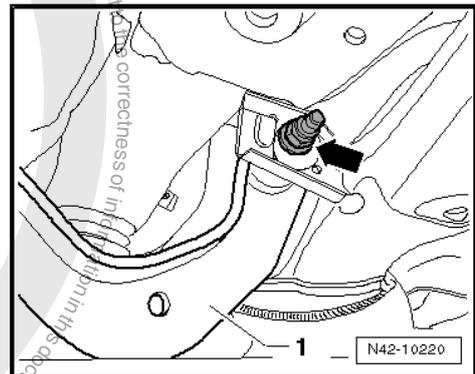


- Mark position of eccentric bolt -arrow- relative to subframe using e.g. a felt tip pen.
- Remove bolt -arrow-.
- Remove upper transverse link -1-.

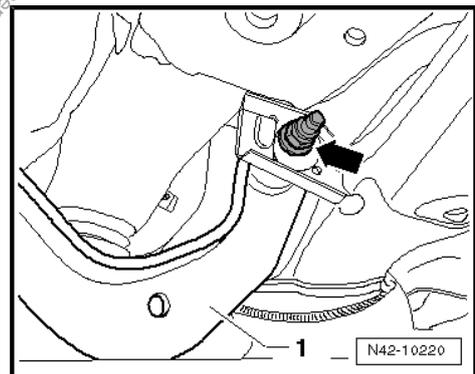
Installing

- Install upper transverse link on vehicle and tighten bolts hand tight.

The transverse link may only be bolted when dimension "a" has been attained ⇒ [page 188](#) .



- Bolt upper transverse link -1- to subframe and tighten new nut -arrow-.
- Observe mark made for position of eccentric bolt -arrow- relative to subframe.

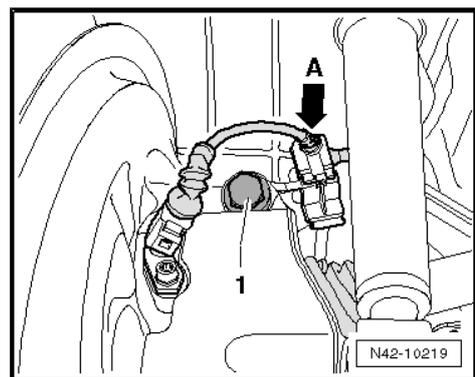


- Tighten bolt -1- for upper transverse link.

Note

Ensure that a washer is installed between the bolt and the wheel bearing housing.

- Attach speed sensor line -arrow A- from upper transverse link.
- Install coil spring ⇒ [page 257](#) .
- Install wheel and tighten ⇒ [page 288](#) .
- Check and adjust wheel alignment ⇒ [page 305](#) .



Specified torques

Component	Specified torque
Upper transverse link to wheel bearing housing ◆ Use new nuts and bolts ◆ Tighten threaded connections only when vehicle is in the normal running position	130 Nm + 90° further

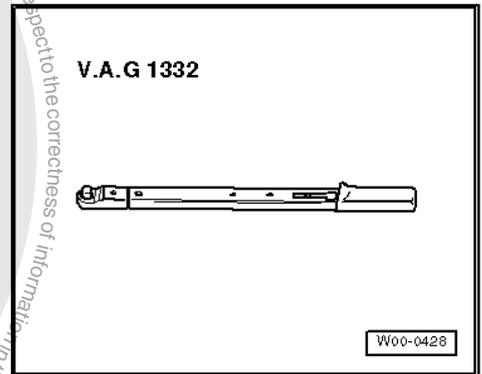


Component	Specified torque
Upper transverse link to subframe ♦ Use new nut. ♦ Tighten threaded connections only when vehicle is in the normal running position	95 Nm ♦ To tighten nuts, set torque wrench -V.A.G 1332- to 80 Nm. ♦ Applies only in conjunction with insert tool, 18 mm -T10179-

12.4 Removing and installing lower transverse link

Special tools and workshop equipment required

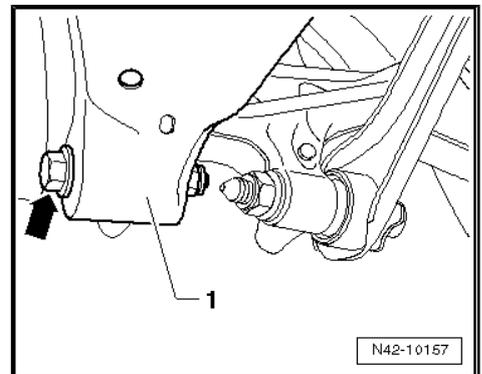
- ♦ Torque wrench -V.A.G 1332-



Removing

- Remove wheel.
- Remove coil spring ⇒ [page 257](#).
- Remove bolt -arrow- for lower transverse link -1-.

Vehicles with dynamic headlight range control





- Remove bolts -1- from lower transverse link.

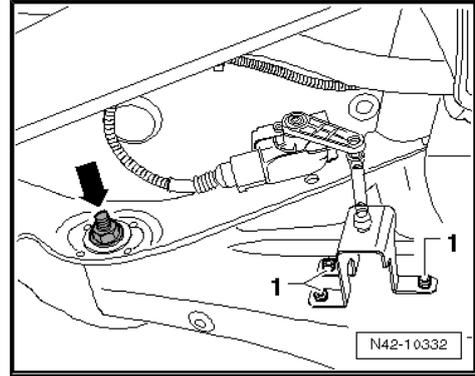
Continuation for all vehicles

- Mark position of eccentric bolt -arrow- relative to subframe using e.g. a felt tip pen.
- Disconnect and lower rear part of exhaust system.
- Remove bolt -arrow-.
- Remove lower transverse link.

Installing

- Install lower transverse link on vehicle and tighten bolts hand tight.

The transverse link may only be bolted when dimension "a" has been attained ⇒ [page 188](#) .

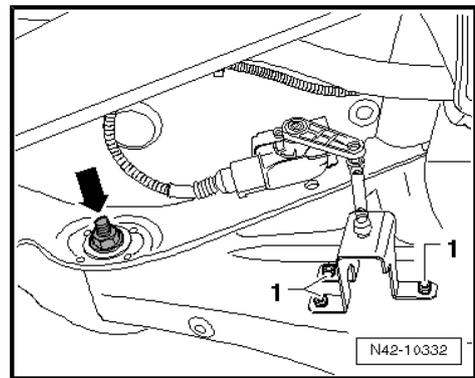


- Bolt upper transverse link to subframe and tighten new nut -arrow- only to specified torque.
- Observe mark made for position of eccentric bolt -arrow- relative to subframe.
- Reinstall rear section of exhaust system.

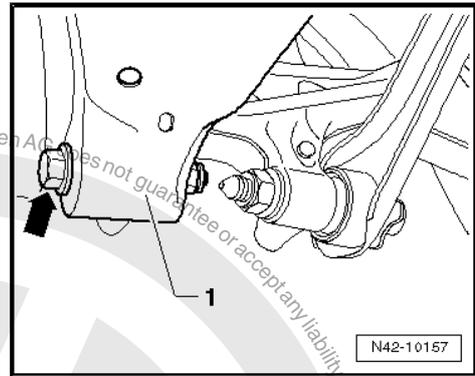
Vehicles with dynamic headlight range control

- Install bolts -1- in lower transverse link.

Continuation for all vehicles



- Tighten bolt -arrow- for lower transverse link -1-.
- Install coil spring ⇒ [page 257](#) .
- Install wheel and tighten ⇒ [page 288](#) .
- Check and adjust wheel alignment ⇒ [page 305](#) .



Specified torques

Component	Specified torque
Lower transverse link to wheel bearing housing ♦ Use new nuts and bolts ♦ Tighten threaded connections only when vehicle is in the normal running position	90 Nm + 90° further
Lower transverse link to subframe ♦ Use new nut. ♦ Tighten threaded connections only when vehicle is in the normal running position	95 Nm

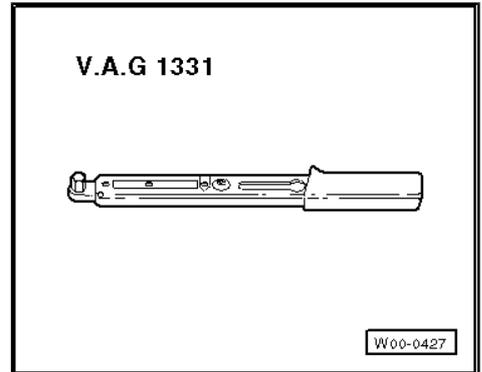
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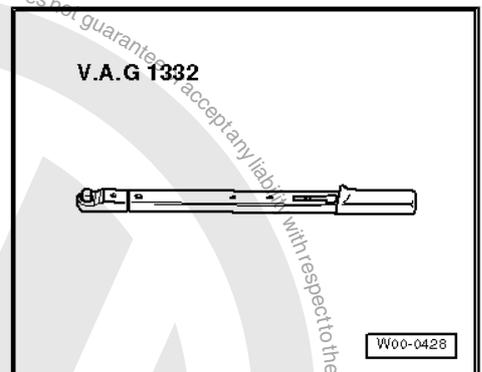
12.5 Removing and installing track rod

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-

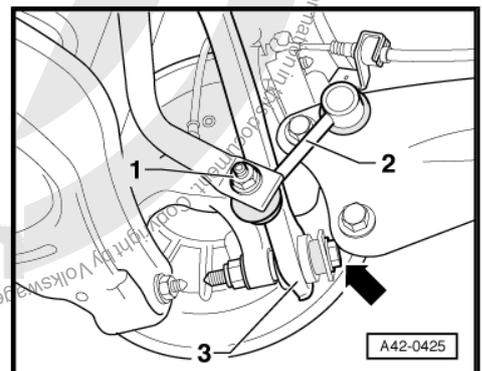


- ◆ Torque wrench -V.A.G 1332-



Removing

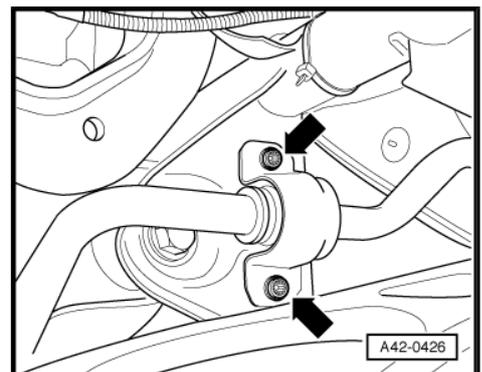
- Remove wheel.
- Remove coil spring ⇒ [page 257](#) .
- Remove nut -1- and pull coupling rod -2- out of anti-roll bar.
- Remove bolt -arrow- for track rod -3-.



- Remove bolts -arrows- for anti-roll bar clamp.

If the upper bolt of the anti-roll bar clamp on the right side of the vehicle cannot be removed, then additional work must be performed ⇒ [page 231](#) .

For the right side of the vehicle only (depending on equipment)



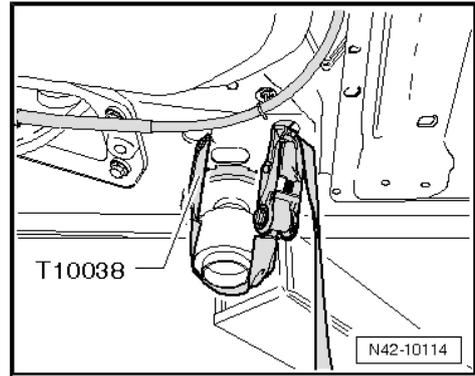


- Now strap vehicle to the lifting platform arms on both sides of the vehicle using tensioning straps -T10038- .



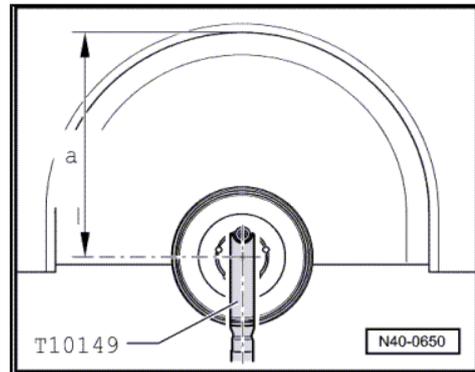
WARNING

If the vehicle is not strapped down there is a great danger that the vehicle will slip off the lifting platform!



- Attach support -T10149- to wheel hub using wheel bolt.
- Raise wheel hub with support -T10149- and engine and gear-box jack -V.A.G 1383 A- far enough that bolts of right anti-roll bar clamp are accessible.

Continuation for both sides of vehicle:



- Remove nut -arrow- and remove bolt towards rear.
- Remove track rod -1-.

Installing

- Install track rod on vehicle and tighten bolts hand tight.

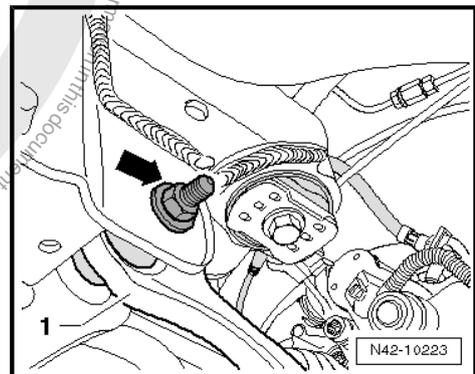
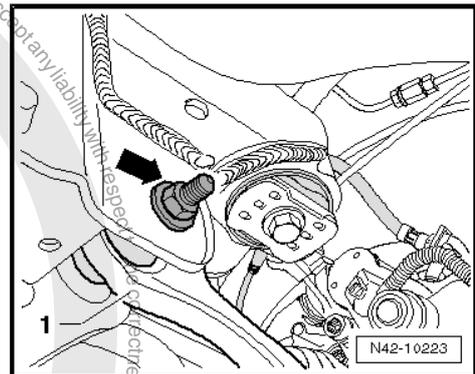


Note

Note different versions of track rods: downwards open or forwards closed.

The track rod may only be bolted when dimension "a" has been attained => page 188 .

- Bolt track rod -1- to subframe and tighten new nut -arrow- to prescribed torque.





- Tighten bolts -arrows- for anti-roll bar clamp.

For the right side of the vehicle only (depending on equipment)

- Lower wheel suspension again using engine and gearbox jack -V.A.G 1383 A- and remove support -T10149- from wheel hub.
- Remove tensioning strap -T10038- .

Continuation for both sides of vehicle:

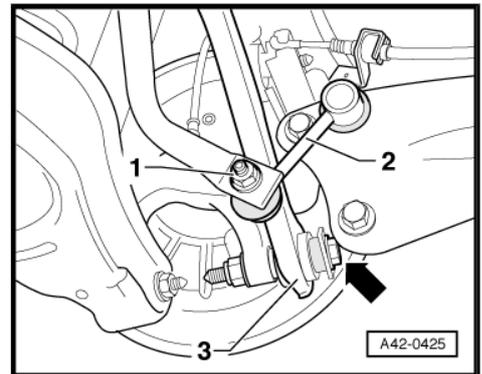
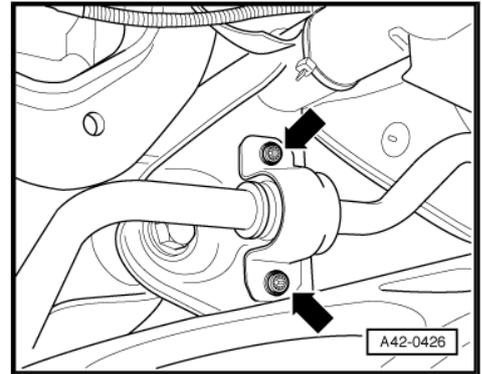
- Tighten bolt -arrow- for track rod -3-.



Note

Ensure that a washer is installed between the nut and the wheel bearing housing.

- Connect coupling rod -2- to anti-roll bar and tighten nut -1-.
- Install coil spring => [page 257](#) .
- Install wheel and tighten => [page 288](#) .
- Check and adjust wheel alignment => [page 305](#) .



Specified torques

Component	Specified torque
Track rod to wheel bearing housing ◆ Use new nuts and bolts ◆ Tighten threaded connections only when vehicle is in the normal running position	130 Nm + 90° further
Track rod to subframe ◆ Use new nuts and bolts	90 Nm + 90° further
Anti-roll bar to subframe ◆ Use new bolts! ◆ Tighten threaded connections only when vehicle is in the normal running position	25 Nm + 45° further
Anti-roll bar to coupling rod ◆ Use new nut.	45 Nm



13 Assembly overview - wheel bearing housing, trailing link (four-wheel drive, subframe made from aluminium and wheel bearing housing made from cast steel)

-Arrow- indicates direction of travel.

1 - Bolt

- 50 Nm +45° further
- Always renew after removing

2 - Mounting bracket

3 - Bolt

- M12 x 1.5 x 80
- 90 Nm + 90° further
- Always renew after removing

4 - Coupling rod

5 - Bolt

- 90 Nm + 90° further
- Always renew after removing
- Only wheel bearing housings made from aluminium are available as replacement parts. Therefore, certain parts have to be exchanged and/or installed in addition when replacing
⇒ [page 235](#)

6 - Trailing arm

- Removing and installing
⇒ [page 243](#)
- Repairing ⇒ [page 248](#)

7 - Drive shaft

- Assembly overview
⇒ [page 273](#) .
- Removing and installing
⇒ [page 276](#)

8 - Bolt

- M12 x 1.5 x 45
- 70 Nm + 90° further
- Always renew after removing

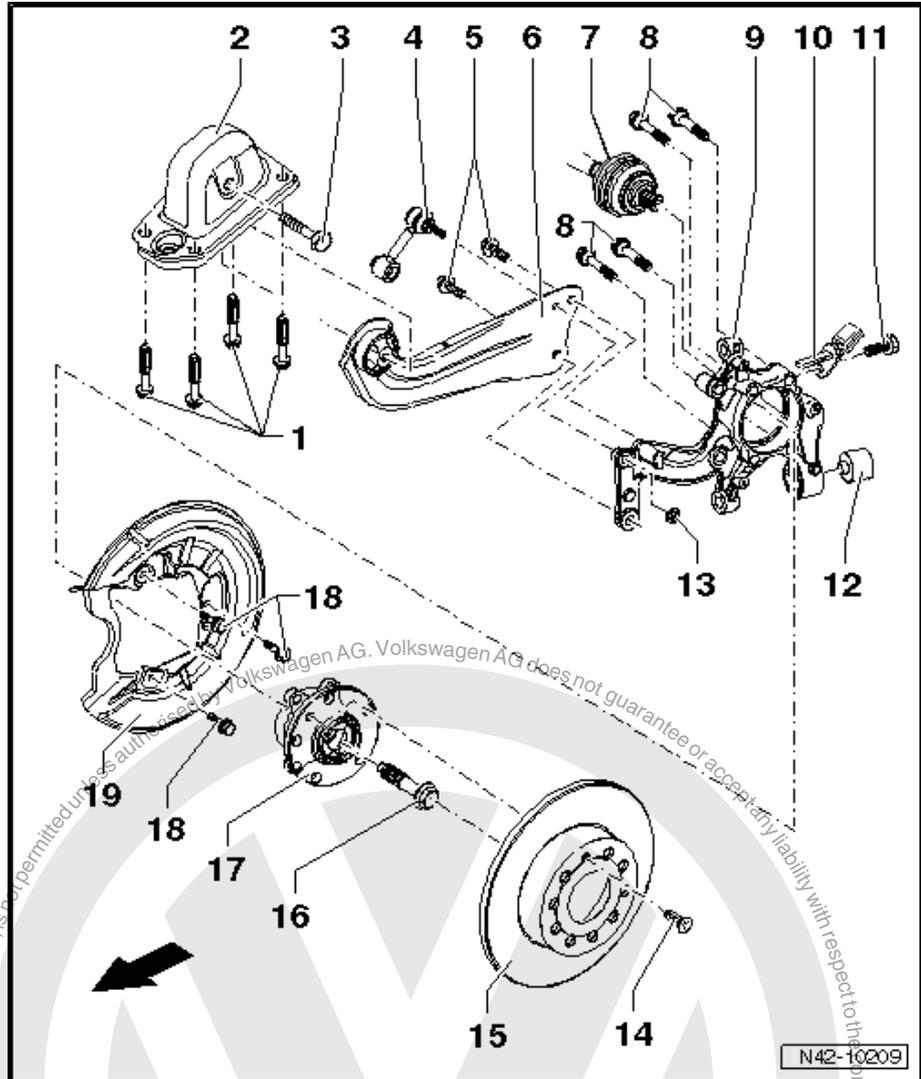
9 - Wheel bearing housing

- Removing and installing ⇒ [page 236](#)
- Installing with wheel bearing housings made from aluminium is permissible ⇒ Electronic parts catalogue "ETKA"
- Only wheel bearing housings made from aluminium are available as replacement parts. Therefore, certain parts have to be exchanged and/or installed in addition when replacing ⇒ [page 235](#)

10 - Rear speed sensor -G44/G46-

11 - Bolt

- 9 Nm





12 - Bonded rubber bush

- Renewing ⇒ [page 240](#)

13 - Nut

- 45 Nm
- Self-locking
- Always renew after removing

14 - Cross-head screw

- 4 Nm

15 - Brake disc

16 - Bolt

- Hexagon bolt, 180 Nm and turn +180° further
- Loosening and tightening hexagon bolt for drive shaft ⇒ [page 274](#)
- 12-point bolt, 70 Nm + 90° further
- Loosening and tightening twelve-point bolt for drive shaft ⇒ [page 275](#)
- Renew each time after removing



Note

17 - Wheel hub with wheel bearing

- ABS sensor ring is installed in wheel bearing.
- Removing and installing ⇒ [page 255](#)

The wheel bearing and wheel hub are assembled one housing.

This wheel bearing/wheel hub unit is maintenance free and has no play. Adjustments and repairs are not possible!

18 - Bolt

- 10 Nm
- Only wheel bearing housings made from aluminium are available as replacement parts. Therefore, certain parts have to be exchanged and/or installed in addition when replacing ⇒ [page 235](#)

19 - Splash plate

- Only wheel bearing housings made from aluminium are available as replacement parts. Therefore, certain parts have to be exchanged and/or installed in addition when replacing ⇒ [page 235](#)

13.1 Changing from wheel housing bearing made from cast steel to wheel bearing housing made from aluminium

A wheel housing bearing made from cast steel has been changed to a wheel bearing housing made from aluminium. Only wheel bearing housings made from aluminium are available as replacement parts. Therefore, certain parts have to be exchanged and/or installed in addition when replacing ⇒ Electronic parts catalogue "ETKA".

The following parts have to be renewed and/or installed in addition:

- ◆ Brake carrier
- ◆ Bolts (qty. 2) for backing plate
- ◆ Bolt, nut and washer for top control arm to wheel bearing housing
- ◆ Bolt, nut and washer for track rod to wheel bearing housing



- ◆ Bolt and washer for shock absorber to wheel bearing housing
- ◆ Bolts (qty. 2) for trailing link to wheel bearing housing
- ◆ Cover plate with bolts (qty. 4) to wheel bearing housing



Caution

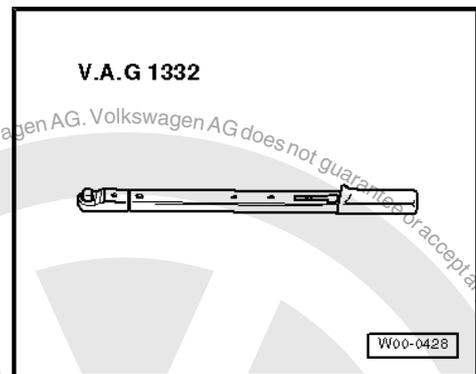
The additional washers that have to be installed must always be placed between the component and the wheel bearing housing.

Installing a wheel bearing housing made from aluminium on one side of the vehicle and a wheel bearing housing made from cast steel on the other is permissible → Electronic parts catalogue "ETKA".

13.2 Removing and installing wheel bearing housing

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1332-



Removing

- Remove coil spring ⇒ [page 257](#) .
- Loosen outer threaded connection for drive shaft ⇒ [page 274](#) .
- Remove wheel.
- Remove brake carrier with brake caliper and tie to body with wire ⇒ Rep. Gr. 46 .



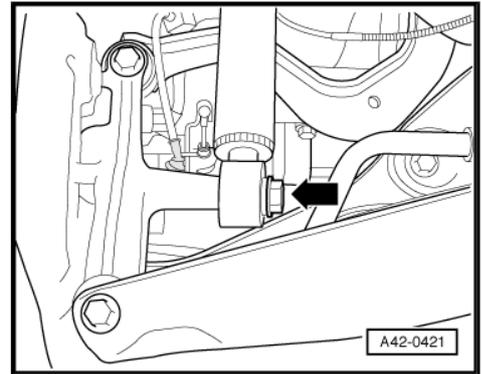
Note

Hang brake caliper from body.

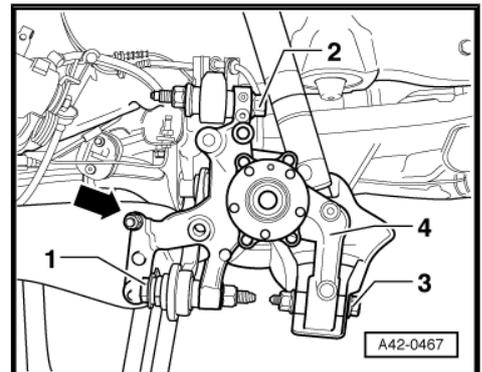
- Remove cross-head screw for brake disc and remove brake disc.
- Remove ABS speed sensor from wheel bearing housing.



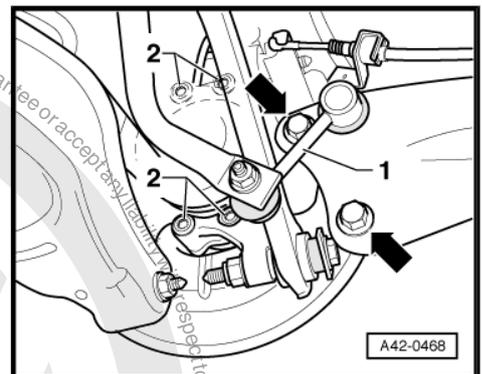
- Remove bolt -arrow-.



- Remove bolt for track rod -1-, upper transverse link -2- and lower transverse link -3- from wheel housing -4-.
- Unbolt coupling rod from wheel bearing housing -arrow-.



- Hold wheel bearing housing and unscrew bolts -arrows-.
- Remove coupling rod -1- from trailing arm.
- Take out wheel bearing housing.



Installing

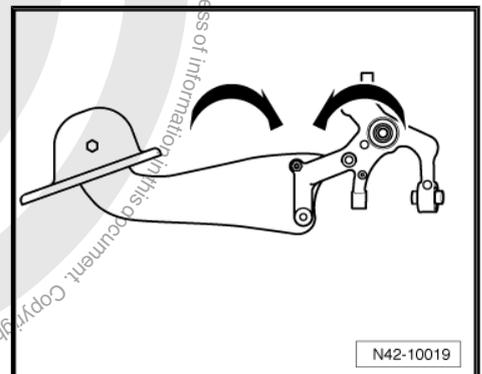
Carry out installation in the reverse sequence, noting the following:

Threaded connection for trailing arm and wheel bearing housing may be tightened only after all other components (particularly the spring and shock absorber) of respective wheel suspension have been installed. To tighten, wheel suspension must be in extended position. Only then do trailing arm and wheel bearing housing move to the necessary position -arrows-.

- Install coil spring ⇒ [page 173](#) .

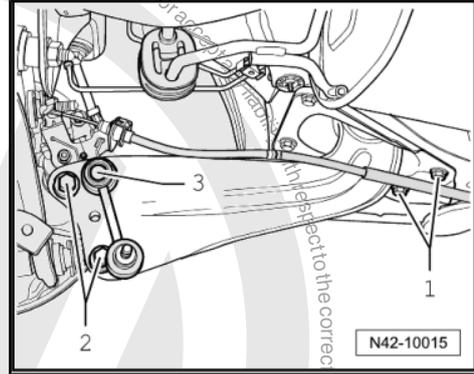
Position: threaded connection between trailing arm and wheel bearing housing

It is important to keep to the specified sequence for the following operations.

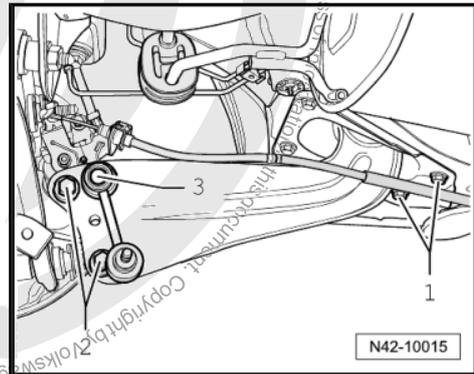




- Position trailing arm on wheel bearing housing using bolts -2- but do not tighten yet.
- Attach coupling rod -3- to trailing arm but do not tighten nut yet.
- Lower wheel suspension again using engine and gearbox jack -V.A.G 1383 A- and remove support -T10149- from wheel hub.

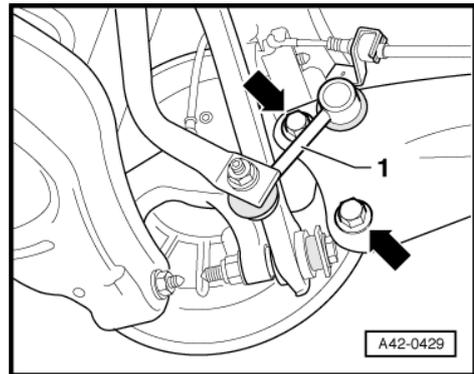


- Tighten bolts -2- for trailing arm to specified torque, observing the required component position => [page 237](#) .



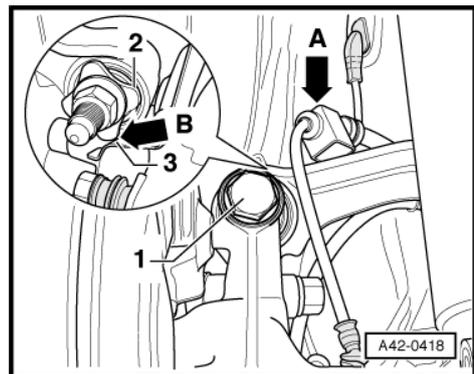
- Bolt coupling rod -1- to wheel bearing housing and anti-roll bar.

The threaded connections on the wheel bearing housing may be tightened only when the dimension measured between the centre of wheel hub and lower edge of wheel housing before work was started has been attained => [page 188](#) .



i Note

The washer -2- must be installed so that there is a gap -arrow B- between the washer and the backplate -3-.



Specified torques

Component	Specified torque
Upper transverse link to wheel bearing housing ◆ Use new nuts and bolts ◆ Tighten threaded connections only when vehicle is in the normal running position.	130 Nm + 90°



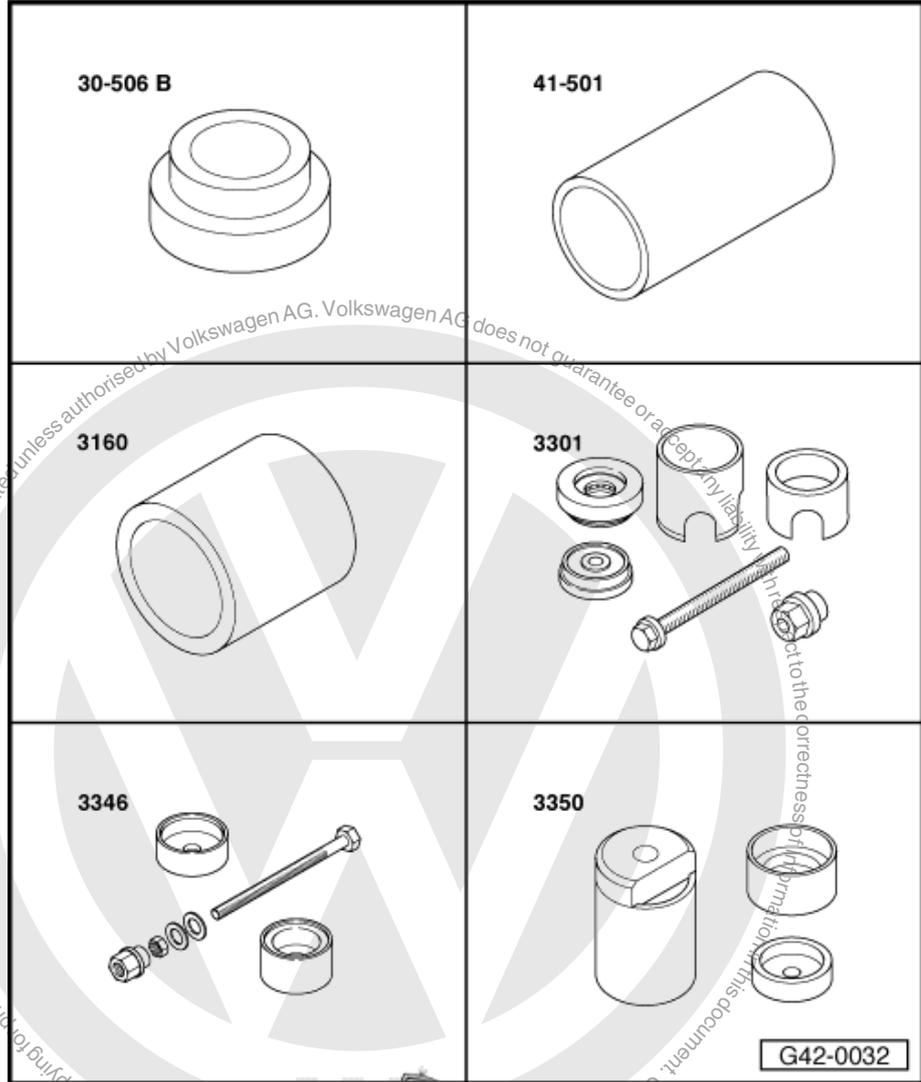
Component	Specified torque
Wheel bearing housing to lower suspension link ♦ Use new nuts and bolts ♦ Tighten threaded connections only when vehicle is in the normal running position.	90 Nm + 90°
Wheel bearing housing to track rod ♦ Use new nuts and bolts ♦ Tighten threaded connections only when vehicle is in the normal running position.	130 Nm + 90°
Trailing arm to wheel bearing housing ♦ Use new bolts	90 Nm + 90°
Coupling rod to wheel bearing housing ♦ Use new nut	45 Nm
Splash plate to wheel bearing housing	10 Nm
ABS speed sensor to wheel bearing housing	9 Nm
Shock absorber to wheel bearing housing	180 Nm
Brake disc to wheel bearing housing.	4 Nm
Drive shaft to wheel hub "hexagon bolt" ♦ Use new bolt	180 Nm + 180°
Drive shaft to wheel hub "12-point bolt" ♦ Use new bolt	70 Nm + 90°



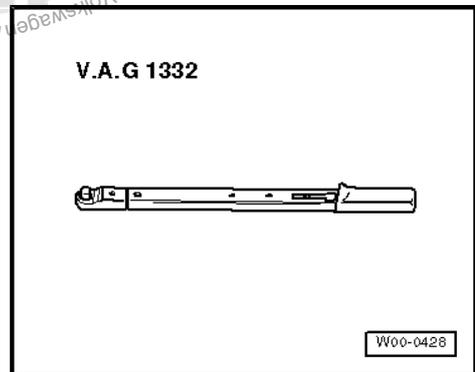
13.3 Renewing bonded rubber bush for wheel bearing housing

Special tools and workshop equipment required

- ◆ Press tool -30 - 506 B-
- ◆ Drift sleeve -41 - 501-
- ◆ Sleeve -3160-
- ◆ Assembly tool -3301-
- ◆ Assembly tool -3346-
- ◆ Assembly tool -3350-



- ◆ Torque wrench -V.A.G 1332-



Removing

- Remove wheel.
- Remove coil spring ⇒ [page 257](#) .
- Remove brake carrier with brake caliper and tie to body with wire ⇒ Rep. Gr. 46 .



i Note

Hang brake caliper from body.

- Remove cross-head screw for brake disc and remove brake disc.
- Remove backplate.
- Remove bolt -arrow- for lower transverse link -1-.

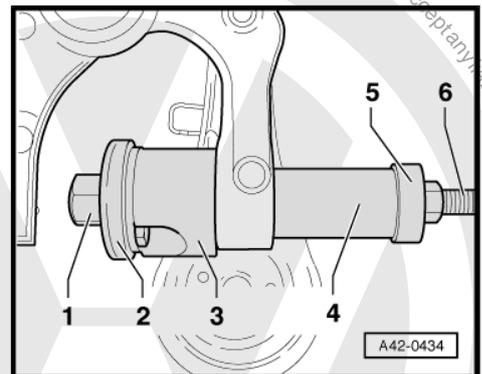
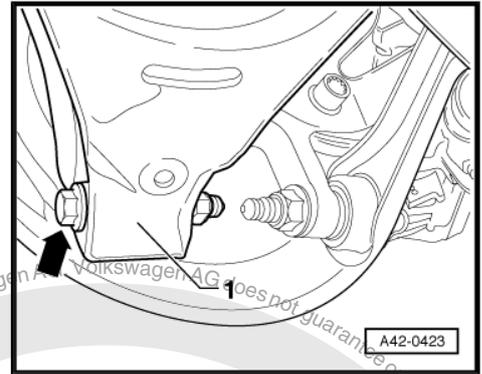
Pressing out bonded rubber bush

- Attach tools as shown in figure.

- 1 - -3346/3-
- 2 - -3301-
- 3 - -3301/3-
- 4 - -41-501-
- 5 - -3350/1-
- 6 - -3346/2-

- Pull out bonded rubber bush by tightening spindle.

Pulling in bonded rubber bush





– Attach tools as shown in figure.

1 - -3346/3-

2 - -3301-

3 - -30-506 B-

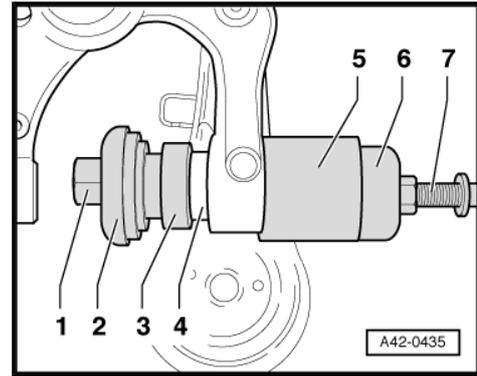
4 - Bonded rubber bush

5 - -3160-

6 - -3350/2-

7 - -3346/2-

– Pull in bonded rubber bush by turning spindle.



Note

- ◆ Do not use lubricant.
- ◆ Install bonded rubber bush carefully so that it does not cant.

Installing

Carry out installation in the reverse sequence, noting the following:

The threaded connections on the wheel bearing housing may be tightened only when the dimension measured between the centre of wheel hub and lower edge of wheel housing before work was started has been attained → [page 188](#) .

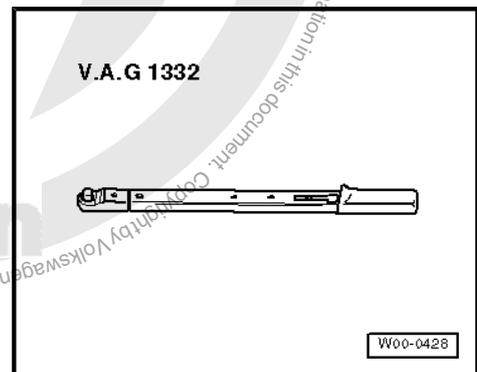
Specified torques

Component	Specified torque
Wheel bearing housing to lower suspension link ◆ Use new nuts and bolts ◆ Tighten threaded connections only when vehicle is in the normal running position.	90 Nm + 90°
Splash plate to wheel bearing housing	10 Nm
Brake disc to wheel bearing housing.	4 Nm

13.4 Removing and installing wheel bearing/ wheel hub unit

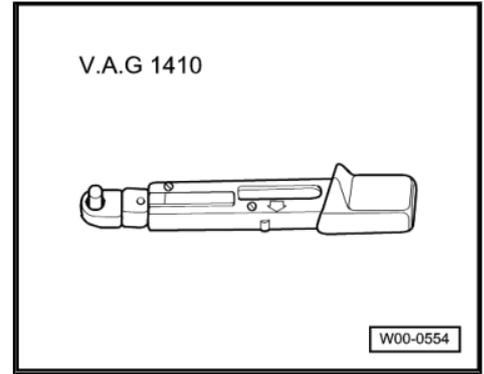
Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1332-





- ◆ Torque wrench -V.A.G 1410-



Removing

- Remove coil spring ⇒ [page 257](#) .
- Remove drive shaft ⇒ [page 276](#) .
- Remove brake carrier with brake caliper and tie to body with wire ⇒ Rep. Gr. 46 .



Note

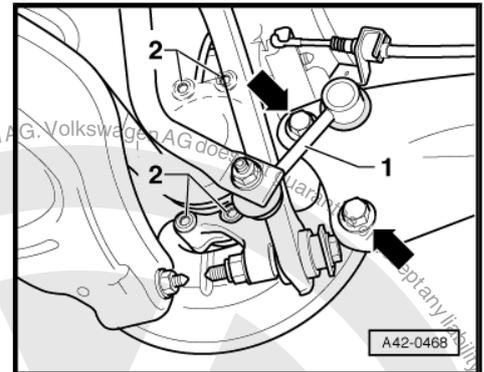
Do not suspend the brake caliper from the brake hose.

- Remove cross-head screw for brake disc and remove brake disc.
- Remove bolts -2-.
- Pull wheel hub/wheel bearing unit out from wheel bearing housing.

Installing

Carry out installation in the reverse sequence, noting the following:

- Use a new hexagon bolt and tighten ⇒ [page 274](#) .



Specified torques

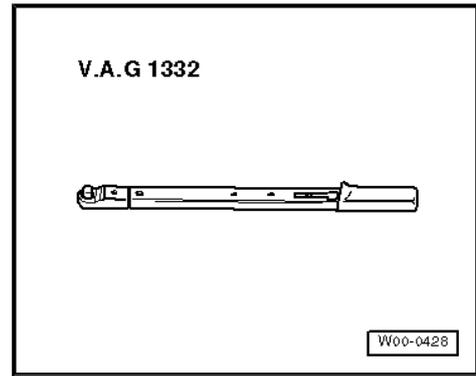
Component	Specified torque
Wheel hub with wheel bearing to wheel bearing housing ◆ Use new bolt	70 Nm + 90°
Brake disc to wheel bearing housing	4 Nm

13.5 Removing and installing trailing arm with mounting bracket

Special tools and workshop equipment required

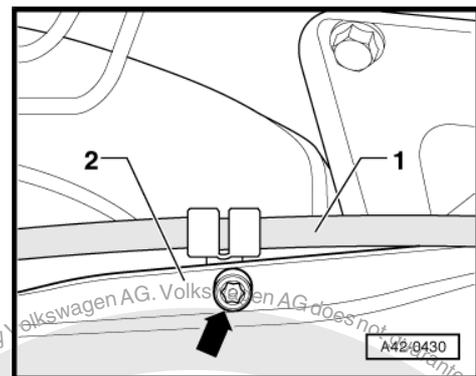


- ◆ Torque wrench -V.A.G 1332-



Removing

- Remove wheel.
- Remove coil spring => [page 257](#) .
- Remove bolt -arrow- securing handbrake cable -1- to trailing arm -2-.

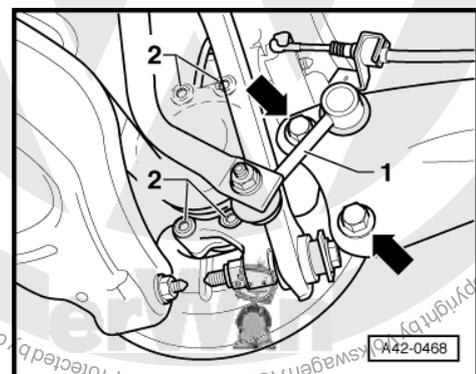
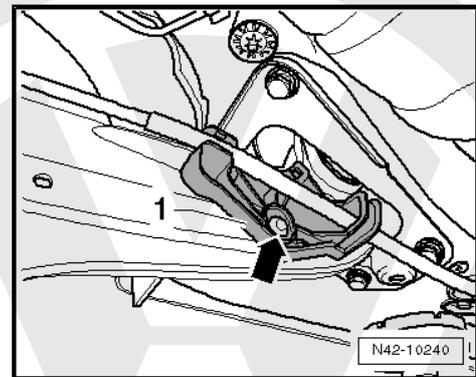


Vehicles with retainer for handbrake cable

- Remove retainer -1- by pushing out inner pin of rivet -arrow-.

Continuation for all vehicles

- Unbolt coupling rod -1- from trailing arm.
- Remove bolts -arrows-.
- Mark installation position of mounting bracket on body.

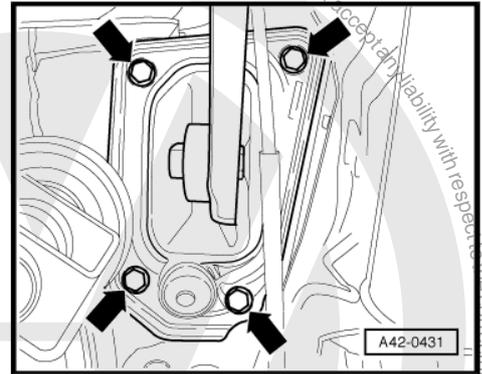




- Remove bolts -arrows-.
- Remove trailing arm with mounting bracket.

If the trailing arm is to be renewed, the mounting bracket must be removed from the longitudinal member.

The position of the mounting bracket must then be adjusted in relation to the trailing arm.

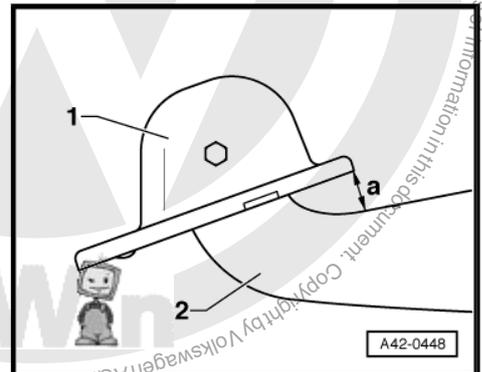


Determining position of mounting bracket in relation to trailing arm

Dimension -a- is 34 mm.

- 1 - Mounting bracket
- 2 - Trailing arm

- Tighten bolt when dimension -a- is set



Installing

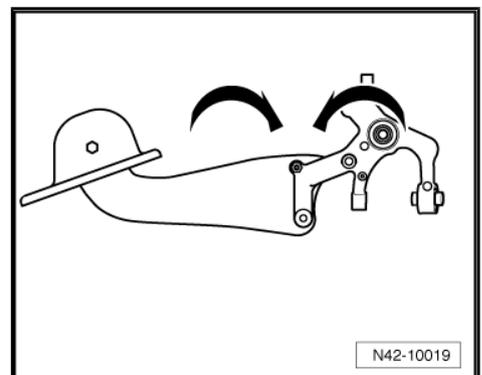
Carry out installation in the reverse sequence, noting the following:

Threaded connection for trailing arm and wheel bearing housing may be tightened only after all other components (particularly the spring and shock absorber) of respective wheel suspension have been installed. To tighten, wheel suspension must be in extended position. Only then do trailing arm and wheel bearing housing move to the necessary position -arrows-.

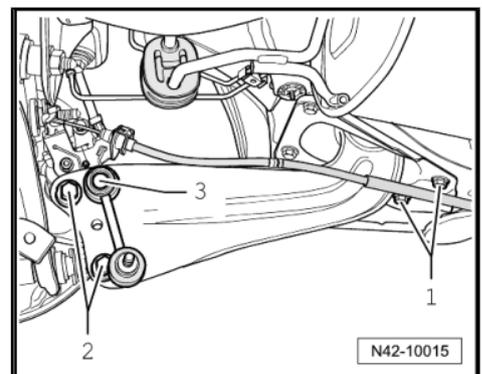
- Install coil spring ⇒ [page 173](#) .

Position: threaded connection between trailing arm and wheel bearing housing

It is important to keep to the specified sequence for the following operations.

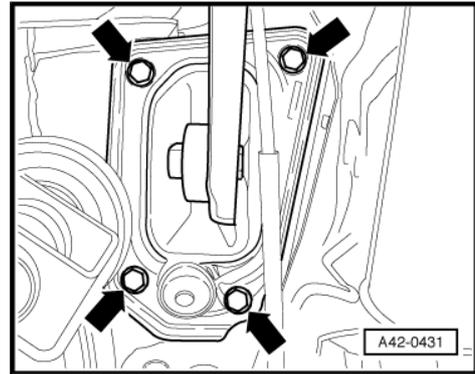


- Position trailing arm and mounting bracket on wheel bearing housing using bolts -2- but do not tighten yet.
- Attach coupling rod -3- to trailing arm but do not tighten nut yet.
- Raise wheel suspension using engine and gearbox jack - V.A.G 1383 A- and support -T10149- until mounting bracket contacts body.

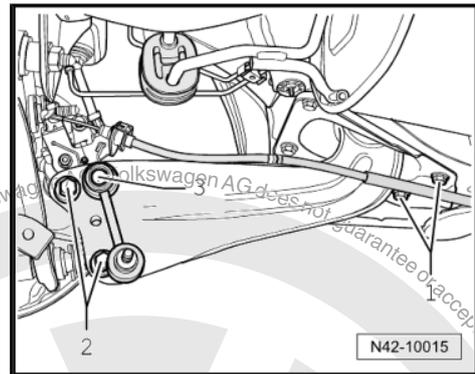




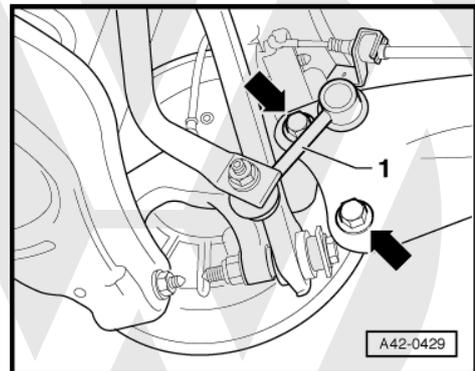
- Tighten bolts -arrows- on position of old imprint.
- Lower wheel suspension again using engine and gearbox jack -V.A.G 1383 A- and remove support -T10149- from wheel hub.



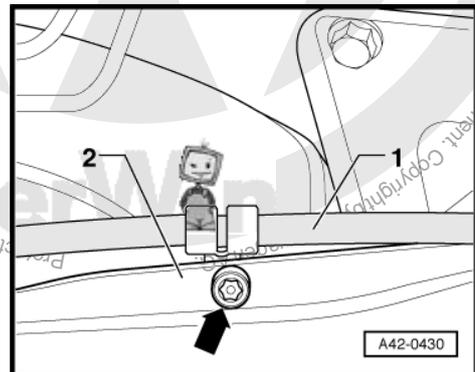
- Tighten bolts -2- for trailing arm to specified torque, observing the required component position => [page 245](#) .



- Bolt coupling rod -1- to wheel bearing housing and anti-roll bar.



- Bolt handbrake cable -1- to trailing arm -2- -arrow-.





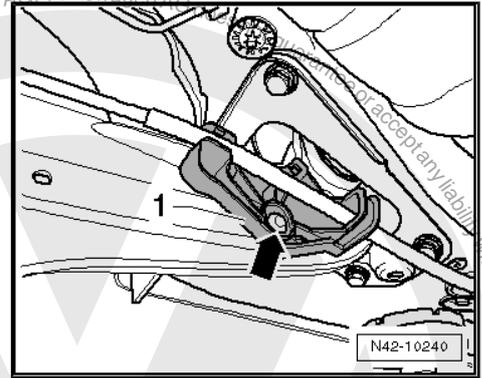
Vehicles with retainer for handbrake cable

- Attach retainer -1- by pushing in inner pin of rivet -arrow-.

Continuation for all vehicles

After installation, toe setting must be checked on wheel alignment unit.

- Install coil spring ⇒ [page 173](#) .
- Install wheel and tighten ⇒ [page 288](#)
- Perform wheel alignment ⇒ [page 305](#) .



Specified torques

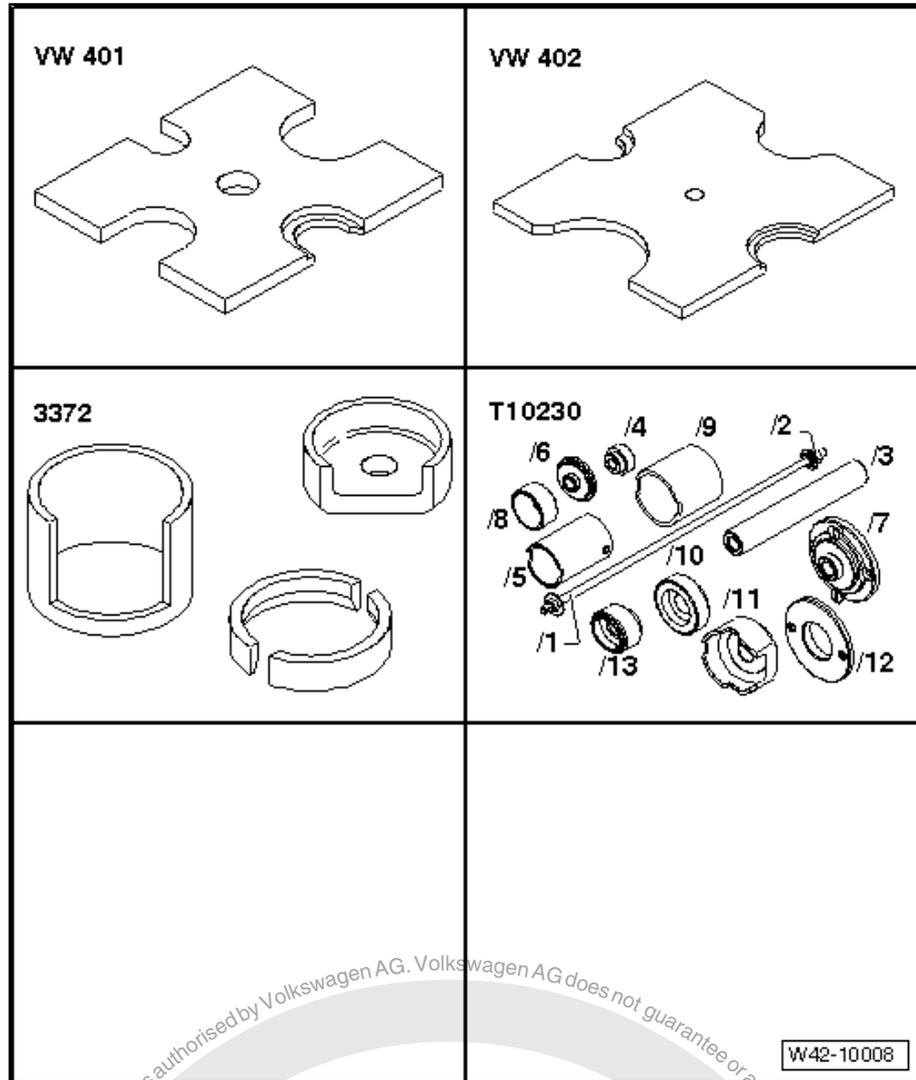
Component	Specified torque
Trailing arm to wheel bearing housing ◆ Use new bolts	90 Nm + 90°
Trailing arm to mounting bracket ◆ Use new bolt	90 Nm + 90°
Mounting bracket to body ◆ Use new bolts	50 Nm +45°
Coupling rod to trailing arm. ◆ Use new nut	45 Nm
Handbrake cable to trailing arm ⇒ Brake systems; Rep. Gr. 46	



13.6 Repairing trailing arm

Special tools and workshop equipment required

- ◆ Assembly tool -T10230-
- ◆ Removal tool -3372-
- ◆ Thrust plate -VW 401-
- ◆ Thrust plate -VW 402-



Pressing out bonded rubber bush

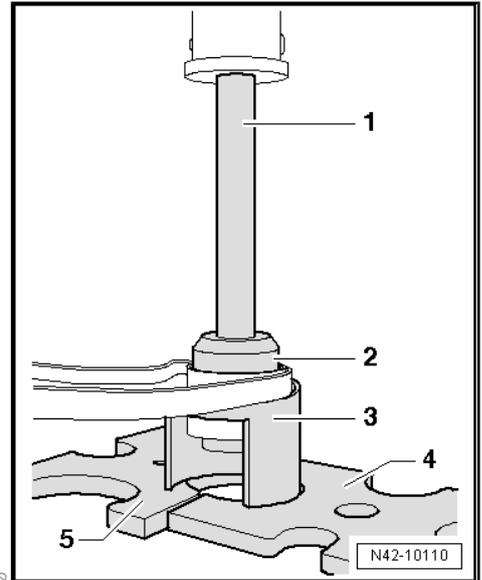
- Remove trailing arm ⇒ [page 243](#).



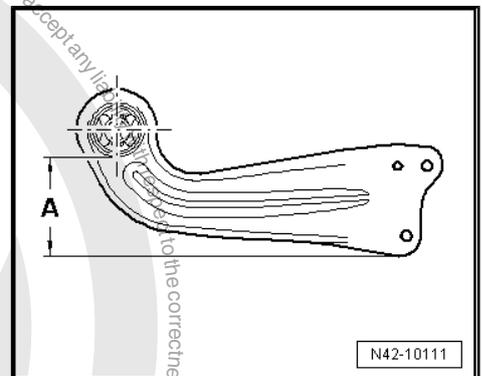
- Set up tools as shown in figure.
- 1- Tube -T10230/3-
- 2- Thrust piece -T10230/10-
- 3- Removal tool -3372-
- 4- Thrust plate -VW 401-
- 5- Thrust plate -VW 402-
- Press out bonded rubber bush.

Pressing in bonded rubber bush

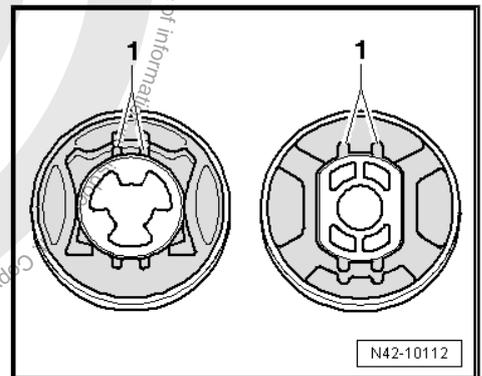
- Place trailing arm on a flat surface.
- Mark a vertical line on trailing arm bush.



Dimension -A- = 114 mm

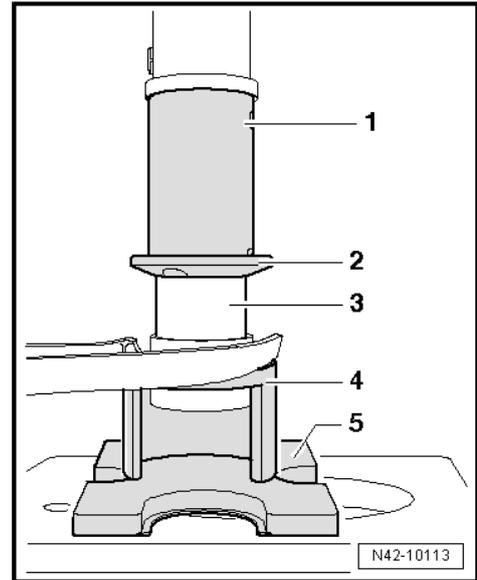


There are two different types of bonded rubber bushes. On both types, the marked line must be between the projections -1- after being pressed in.





- Set up tools as shown in figure.
- 1- Tube -T10230/5-
- 2- Thrust plate -T10230/12- (chamfer must face bonded rubber bush)
- 3- Bonded rubber bush
- 4- Removal tool -3372-
- 5- Thrust plate -VW 402-
- Press bonded rubber bush in flush.
- Attach mounting bracket to trailing arm ⇒ [page 245](#) .
- Install trailing arm ⇒ [page 243](#) .





14 Assembly overview - wheel bearing housing, trailing link (four-wheel drive, subframe made from steel and wheel bearing housing made from aluminium)

-Arrow- indicates direction of travel.

1 - Mounting bracket

2 - Cover

3 - Bolt

- M12 x 1.5 x 80
- 90 Nm + 90° further
- Renew each time after removing

4 - Coupling rod

- Connects anti-roll bar to trailing arm and wheel bearing housing

5 - Bolt

- 90 Nm + 45° further
- Observe tightening sequence ⇒ [page 254](#)
- Renew each time after removing

6 - Trailing arm

- Removing and installing ⇒ [page 243](#)
- Repairing ⇒ [page 248](#)

7 - Drive shaft

- Assembly overview ⇒ [page 273](#)
- Removing and installing ⇒ [page 276](#)

8 - Multi-point socket head bolt

- M14 x 1.5 x 45
- 70 Nm + 90° further
- Renew each time after removing

9 - Wheel bearing housing

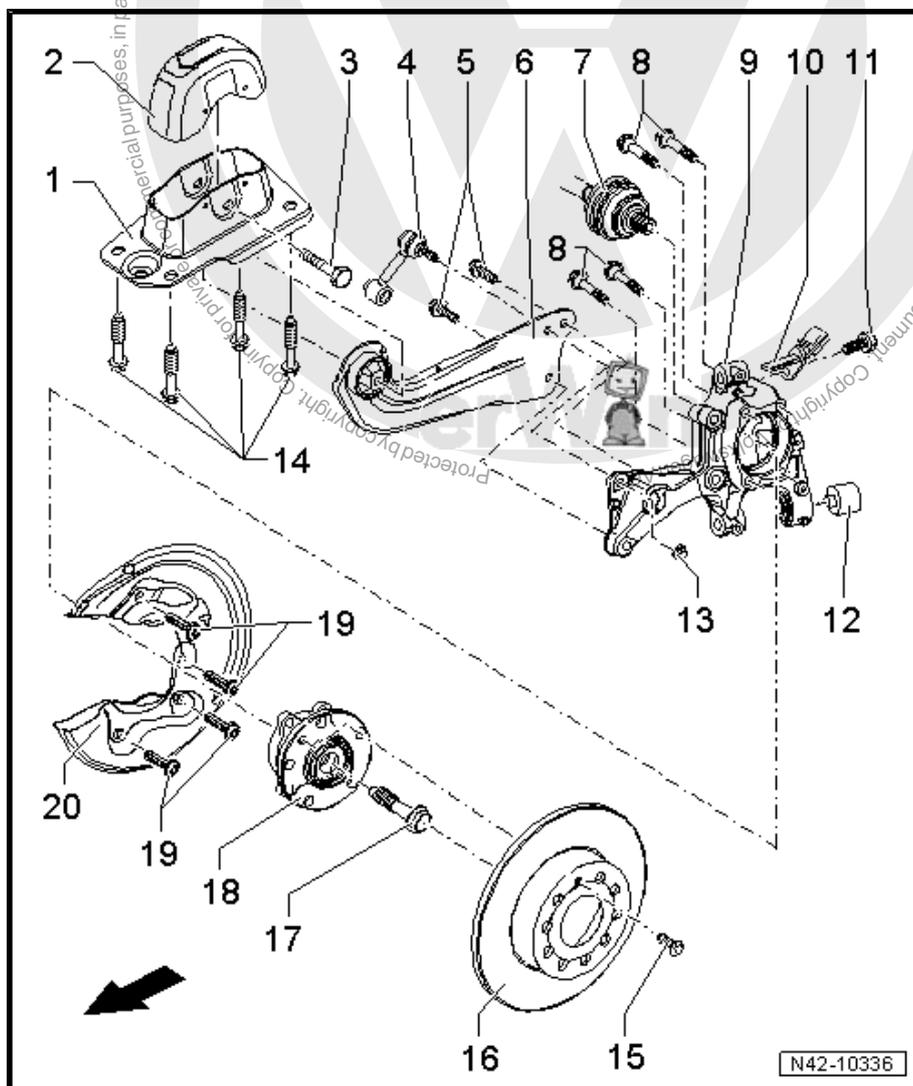
- Removing and installing ⇒ [page 252](#)
- Installing with wheel bearing housings made from cast steel is permissible ⇒ Electronic parts catalogue "ETKA"
- Only wheel bearing housings made from aluminium are available as replacement parts. Therefore, certain parts have to be exchanged and/or installed in addition when replacing ⇒ [page 235](#)

10 - Rear right speed sensor -G44- / rear left speed sensor -G46-

- Can be checked in guided fault finding of the vehicle diagnosis, testing and information system -VAS 5051-
- Before inserting sensor, clean inner surface of hole and coat with lubricating paste -G 000 650- .

11 - Hexagon socket head bolt

- M6 x 16
- 8 Nm





12 - Bonded rubber bush

- Renewing ⇒ [page 240](#)

13 - Nut

- M12 x 25
- 45 Nm
- Self-locking
- Renew each time after removing

14 - Bolt

- M10 x 35
- 50 Nm + 45° further
- Renew each time after removing

15 - Bolt

- 4 Nm

16 - Brake disc

17 - Bolt

- Hexagon bolt, 180 Nm and turn +180° further
- Loosening and tightening hexagon bolt for drive shaft ⇒ [page 274](#)
- 12-point bolt, 70 Nm + 90° further
- Loosening and tightening twelve-point bolt for drive shaft ⇒ [page 275](#)
- Renew each time after removing



Note

18 - Wheel hub with wheel bearing

- ABS sensor ring is installed in wheel bearing.
- Removing and installing ⇒ [page 242](#)

The wheel bearing and wheel hub are assembled one housing.

This wheel bearing/hub unit is maintenance and adjustment free. Adjustments and repairs are not possible!

19 - Bolt

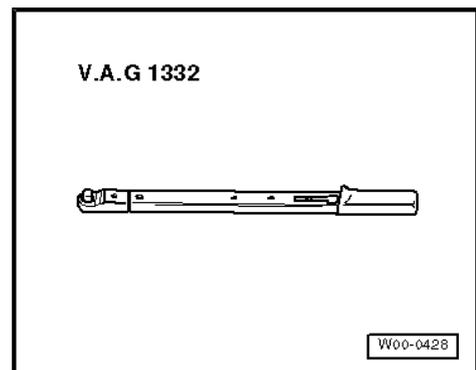
- M6 x 12
- 12 Nm

20 - Backplate

14.1 Removing and installing wheel bearing housing

Special tools and workshop equipment required

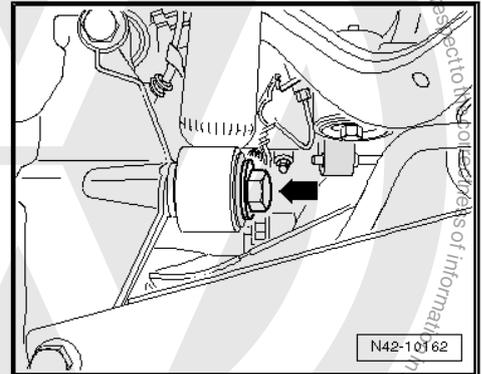
- ◆ Torque wrench -V.A.G 1332-



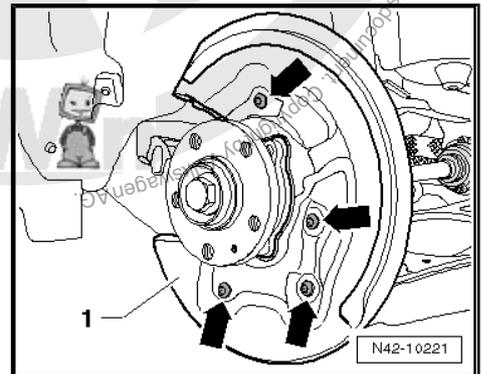


Removing

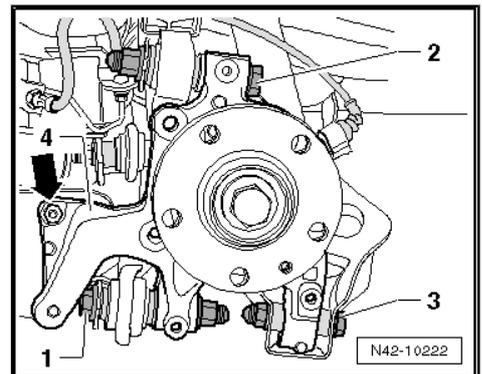
- Remove coil spring ⇒ [page 257](#) .
- Loosen the outer drive shaft threaded connection ⇒ [page 274](#) .
- Remove wheel.
- Remove brake carrier with brake caliper and tie to body with wire ⇒ Rep. Gr. 46 .
- Remove ABS speed sensor from wheel bearing housing.
- Remove bolt -arrow-.



- Unscrew bolts -arrows- and remove splash plate -1-.



- Remove bolt for track rod -1-, upper transverse link -2- and lower transverse link -3- from wheel housing -4-.
- Remove coupling rod from wheel bearing housing -arrow-.





- Remove coupling rod -1- from trailing arm.
- Hold wheel bearing housing and unscrew bolts -arrows-.
- Take out wheel bearing housing.

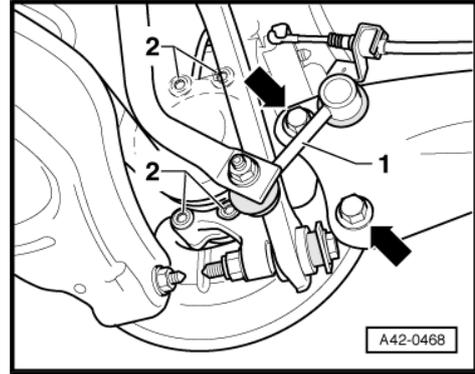
Installing

Carry out installation in the reverse sequence, noting the following:



Note

Ensure that a plate/washer is installed between the track rod, upper control arm, shock absorber and wheel bearing housing respectively.



Position: threaded connection between trailing arm and wheel bearing housing

Threaded connection for trailing arm and wheel bearing housing may be tightened only after all other components (particularly the spring and shock absorber) of respective wheel suspension have been installed. To tighten, wheel suspension must be in extended position. Only then do trailing arm and wheel bearing housing move to the necessary position -arrows-.

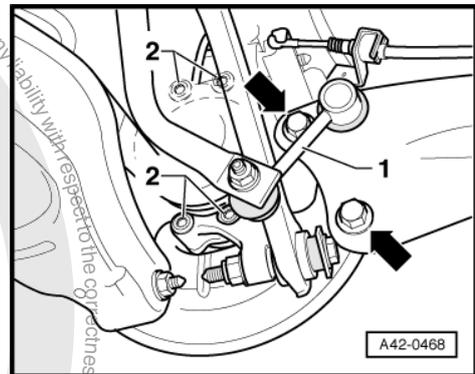
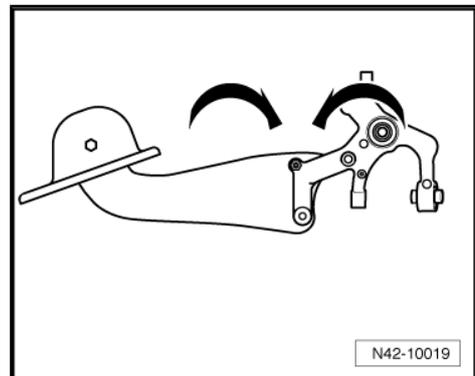
- Install coil spring => [page 257](#)

It is important to keep to the specified sequence for the following operations.

- Fit trailing arm to wheel bearing housing with bolts -arrows- but do not tighten yet.
- Attach coupling rod -1- to trailing arm but do not tighten nut yet.
- Lower wheel suspension again using engine and gearbox jack V.A.G 1383 A- and remove support -T10149- from wheel hub.
- Tighten trailing arm bolts -arrows- to specified torque, ensuring that components are positioned as required => [page 254](#).
- Bolt coupling rod -1- to wheel bearing housing and anti-roll bar.

The threaded connections on the wheel bearing housing may be tightened only when the dimension between the centre of wheel hub and lower edge of wheel housing has been attained => [page 188](#).

- Attach brake carrier with brake caliper => Brake systems; Rep. Gr. 46.
- Install wheel and tighten => [page 288](#).



Specified torques

Component	Specified torque
Upper transverse link to wheel bearing housing ◆ Use new nuts and bolts ◆ Tighten threaded connections only when vehicle is in the normal running position	130 Nm + 90° further



Component	Specified torque
Wheel bearing housing to lower suspension link ♦ Use new nuts and bolts ♦ Tighten threaded connections only when vehicle is in the normal running position	90 Nm + 90° further
Wheel bearing housing to track rod ♦ Use new nuts and bolts ♦ Tighten threaded connections only when vehicle is in the normal running position	130 Nm + 90° further
Trailing arm to wheel bearing housing ♦ Use new bolts!	90 Nm + 45° further
Coupling rod to wheel bearing housing ♦ Use new nut.	45 Nm
Splash plate to wheel bearing housing	12 Nm
ABS speed sensor to wheel bearing housing	8 Nm
Shock absorber to wheel bearing housing	180 Nm
Brake disc to wheel bearing housing.	4 Nm
Drive shaft to wheel hub "hexagon bolt" ♦ Use new bolt	180 Nm +180° further
Drive shaft to wheel hub "12-point bolt" ♦ Use new bolt	70 Nm + 90° further

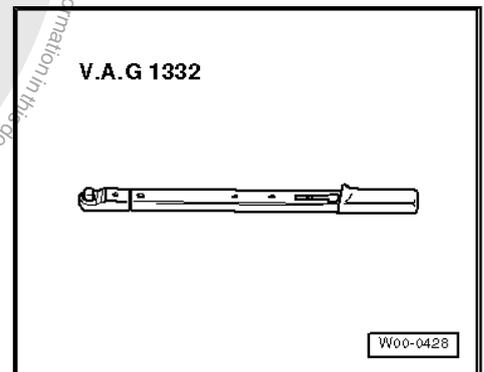
14.2 Renewing bonded rubber bush for wheel bearing housing

[page 240](#)

14.3 Removing and installing wheel bearing/wheel hub unit

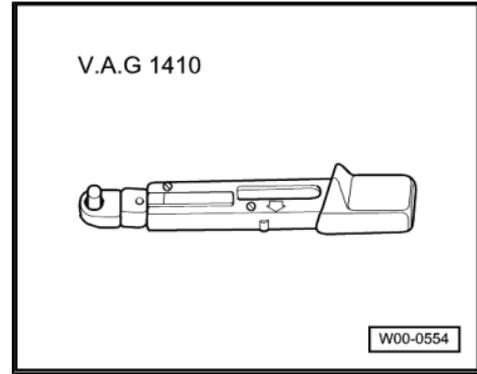
Special tools and workshop equipment required

- ♦ Torque wrench -V.A.G 1332-





- ◆ Torque wrench -V.A.G 1410-



Removing

- Remove coil spring ⇒ [page 257](#) .
- Remove drive shaft ⇒ [page 276](#) .
- Remove brake carrier with brake caliper and tie to body with wire ⇒ Rep. Gr. 46 .



Note

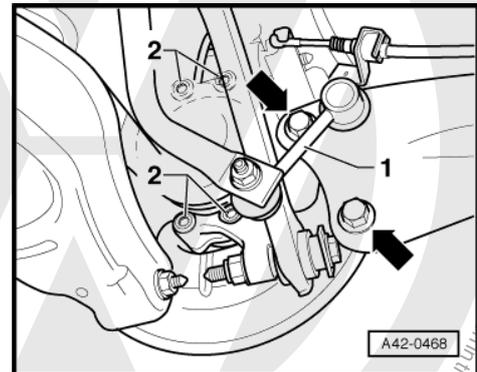
Do not suspend the brake caliper from the brake hose.

- Remove bolt for brake disc and remove brake disc.
- Remove bolts -2-.
- Pull wheel hub/wheel bearing unit out from wheel bearing housing.

Installing

Carry out installation in the reverse sequence, noting the following:

- Use a new hexagon bolt and tighten ⇒ [page 274](#) .



Specified torques

Component	Specified torque
Wheel hub with wheel bearing to wheel bearing housing ◆ Use new bolt	70 Nm + 90° further
Brake disc to wheel bearing housing.	4 Nm



15 Assembly overview - shock absorber, coil spring (four-wheel drive, subframe made from aluminium and wheel bearing housing made from cast steel)

1 - Upper spring seat

2 - Coil spring

- Note different running gear versions
- Removing and installing
 ⇒ [page 257](#)

3 - Lower spring seat

- End of coil spring turned to stop

4 - Bolt

- M14 x 1.5 x 70
- 180 Nm

5 - Bolt

- 50 Nm +45° further

6 - Shock absorber

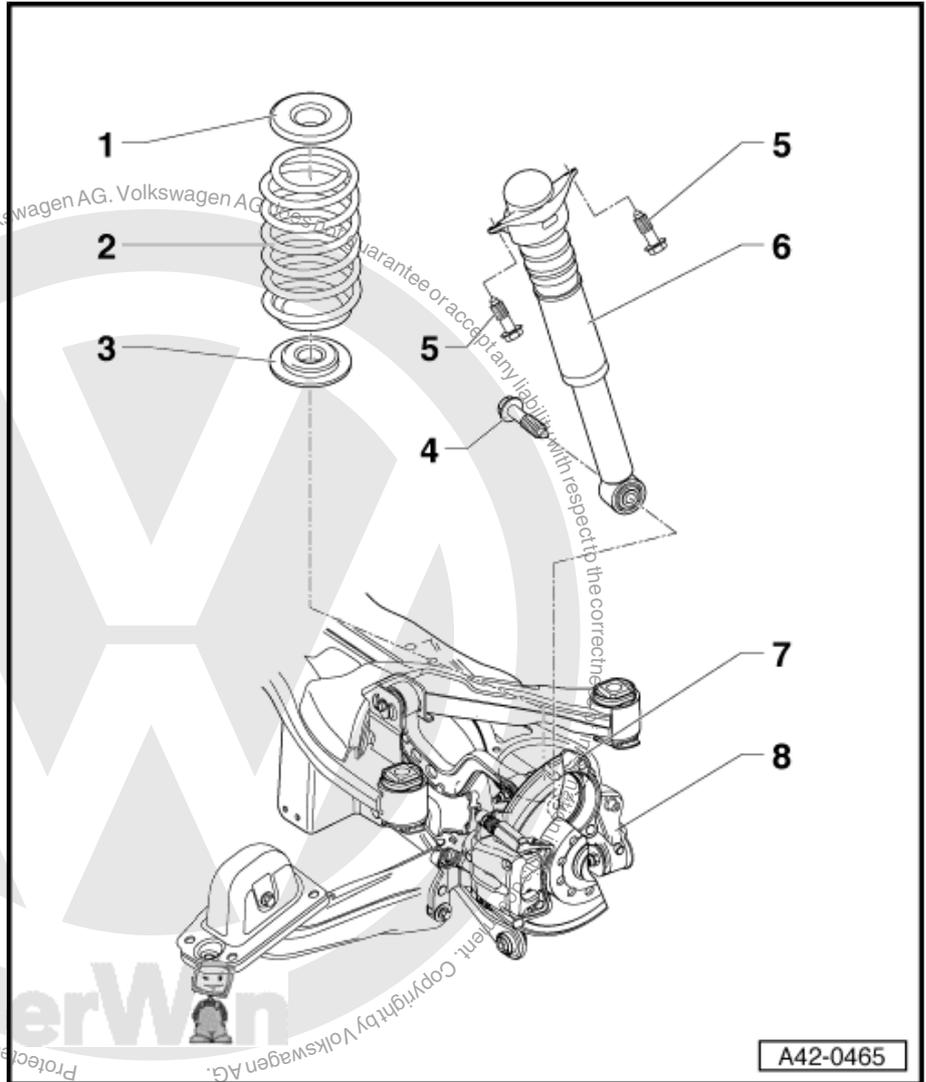
- Removing and installing
 ⇒ [page 259](#)
- Repairing ⇒ [page 260](#)
- Note different versions of running gear
 ⇒ [page 317](#), vehicle data plate

7 - Lower transverse link

- Removing and installing
 ⇒ [page 217](#)

8 - Wheel bearing housing

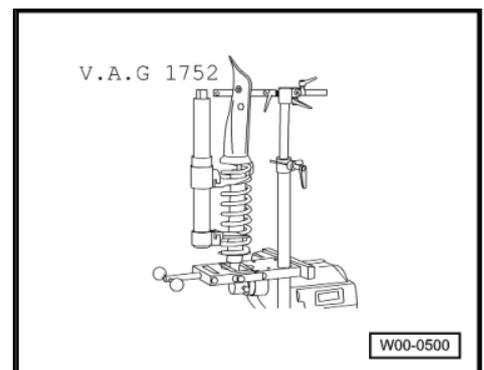
- Removing and installing
 ⇒ [page 236](#)



15.1 Removing and installing coil spring

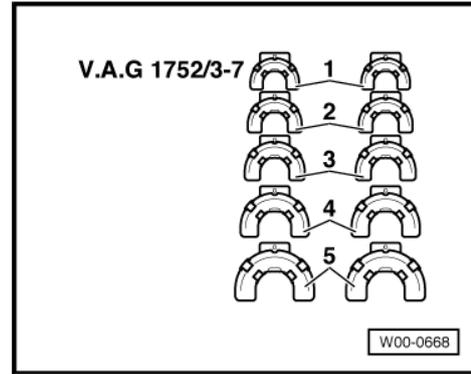
Special tools and workshop equipment required

- ◆ Suspension strut clamp -V.A.G 1752-





◆ Spring retainer -V.A.G 1752/4-



◆ Adapter -V.A.G 1752/9- , not illustrated

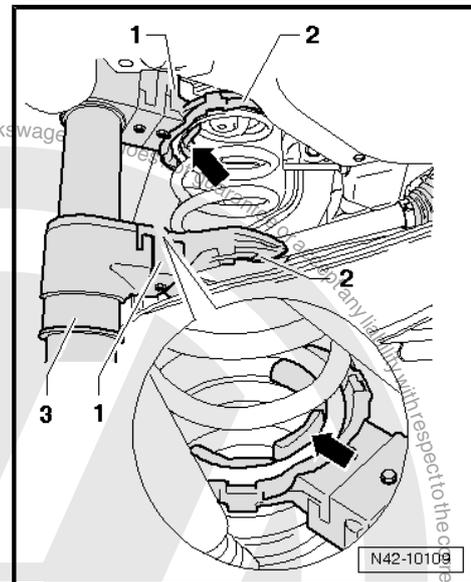
Removing

- Remove wheel.
- Insert spring compressor -3-

WARNING

Make sure coil spring is properly seated in spring retainer - V.A.G 1752/4- (risk of accident).

- Use a spanner or a reversible ratchet handle to compress spring compressor.
 - Compress coil spring until it can be removed.
 - Remove spring.
- 1 - Adapter -V.A.G 1752/9-
 - 2 - Spring retainer -V.A.G 1752/4-
 - 3 - Spring compressor -V.A.G 1752/1-

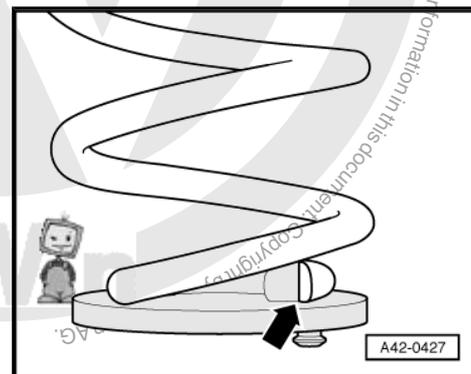


Installing

Carry out installation in the reverse sequence, noting the following:

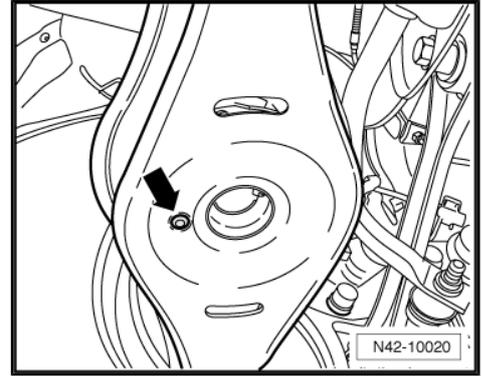
End of spring -arrow- must lie against stop on bottom spring seat.

- Install spring together with spring seat.
- The bottom spring seat has a pin.





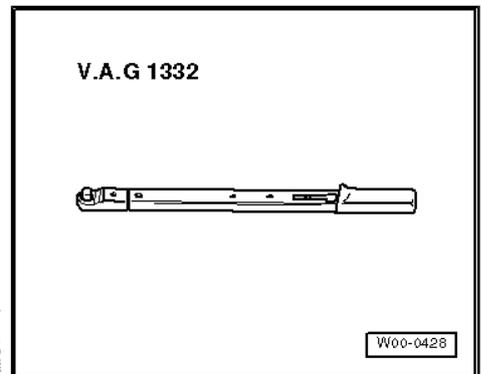
- Insert this pin in holes in lower transverse link -arrows-.
- Then insert top spring seat into upper end of spring.
- Release tension from spring. When doing so, locate upper spring seat onto lug on body.
- Install wheel and tighten ⇒ [page 288](#) .



15.2 Removing and installing shock absorbers

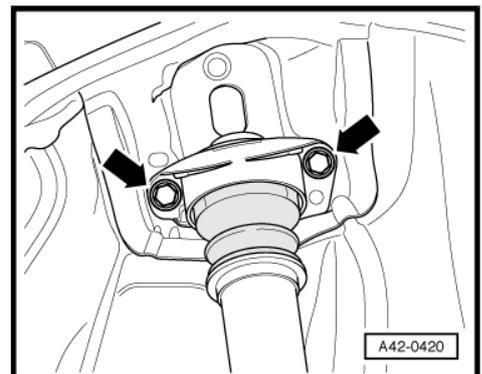
Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1332-



Removing

- Remove wheel.
- Remove wheel housing liner ⇒ Rep. Gr. 66 .
- Remove coil spring ⇒ [page 257](#) .
- Remove bolts -arrows-.





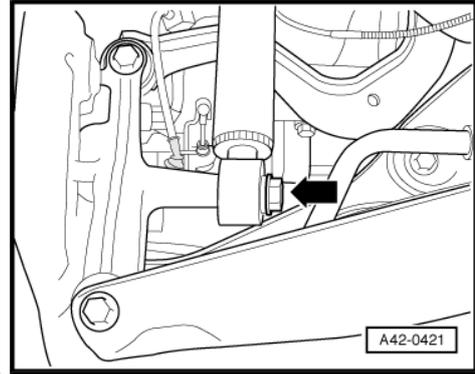
- Remove bolt -arrow-.
- Remove shock absorber.

Installing

Install in reverse order. Note the following points:

- Install wheel and tighten ⇒ [page 288](#) .

The shock absorber may be bolted to the wheel bearing housing only when the dimension measured between the centre of wheel hub and edge of wheel housing before assembly has been attained ⇒ [page 188](#) .



Specified torques

Component	Specified torque
Shock absorber to body ◆ Use new bolts	50 Nm + 45° further
Shock absorber to wheel bearing housing	180 Nm

15.3 Repairing shock absorber

1 - Shock absorber

- Removing and installing ⇒ [page 259](#)
- Note different versions of running gear ⇒ [page 317](#) , vehicle data plate

2 - Protective cap

3 - Protective tube

4 - Support ring

- Allocation ⇒ Electronic parts catalogue "ETKA"

5 - Bump stop

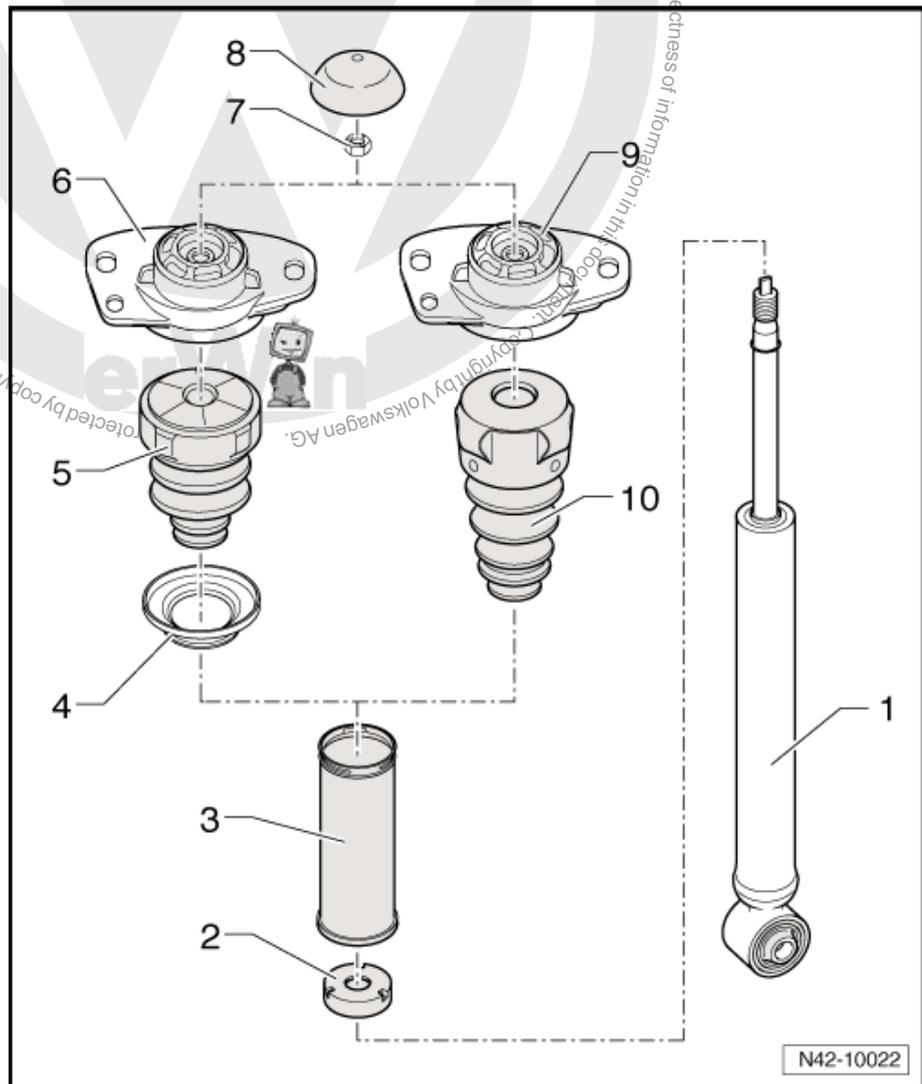
- For shock absorbers with support ring ⇒ [Item 4 \(page 260\)](#)
- Allocation ⇒ Electronic parts catalogue "ETKA"

6 - Shock absorber mounting

- For shock absorbers with support ring ⇒ [Item 4 \(page 177\)](#)
- Allocation ⇒ Electronic parts catalogue "ETKA"

7 - Nut

- M10 x 1.0
- 25 Nm
- Always renew after removing
- Loosening and tightening ⇒ [page 261](#)





8 - Cover

9 - Shock absorber mounting

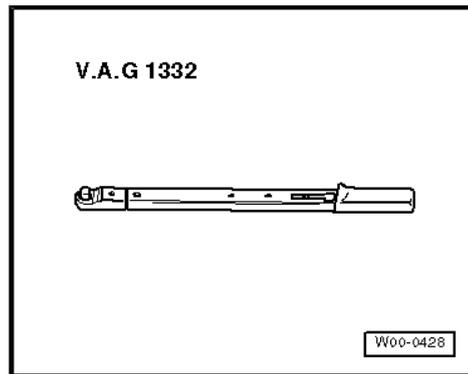
- For shock absorbers without support ring ⇒ [Item 4 \(page 177\)](#)
- Allocation ⇒ Electronic parts catalogue "ETKA"

10 - Bump stop

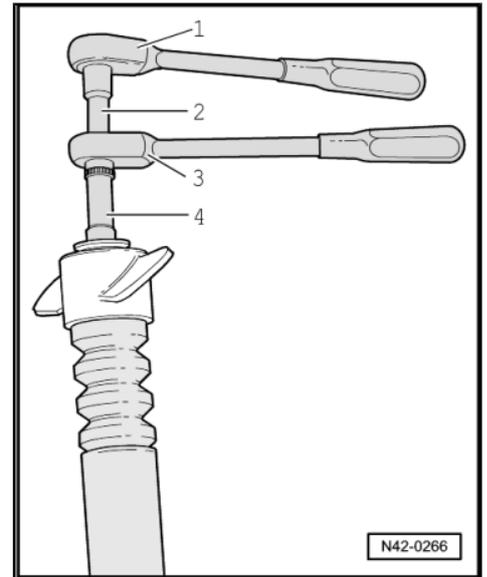
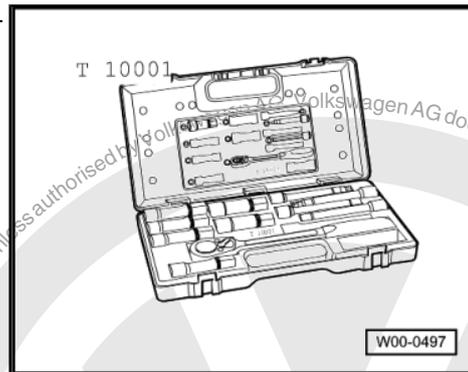
- For shock absorbers without support ring ⇒ [Item 4 \(page 177\)](#)
- Allocation ⇒ Electronic parts catalogue "ETKA"

Special tools and work-shop equipment required

- ◆ Torque wrench - V.A.G 1332-



- ◆ Shock absorber set - T10001-



Loosening and tightening threaded connection for shock absorber mounting

- 1 - Commercially available ratchet handle
- 2 - Socket - T10001/9-
- 3 - Ratchet handle - T10001/11-
- 4 - Socket - T10001/1-



16 Assembly overview - shock absorber, coil spring (four-wheel drive, subframe made from steel and wheel bearing housing made from aluminium)

1 - Lower spring seat

- End of coil spring turned to stop

2 - Assembly aid

- Not necessary to reinstall once removed

3 - Coil spring

- Note different running gear versions; see [⇒ page 317](#), vehicle data sticker
- Removing and installing [⇒ page 257](#)

4 - Upper spring seat

5 - Bolt

- M14 x 1.5 x 70
- 180 Nm

6 - Bolt

- M10 x 35
- 50 Nm + 45° further
- Renew each time after removing

7 - Shock absorber

- Removing and installing [⇒ page 262](#)
- Repairing [⇒ page 260](#)
- Note different running gear versions; see [⇒ page 317](#), vehicle data sticker

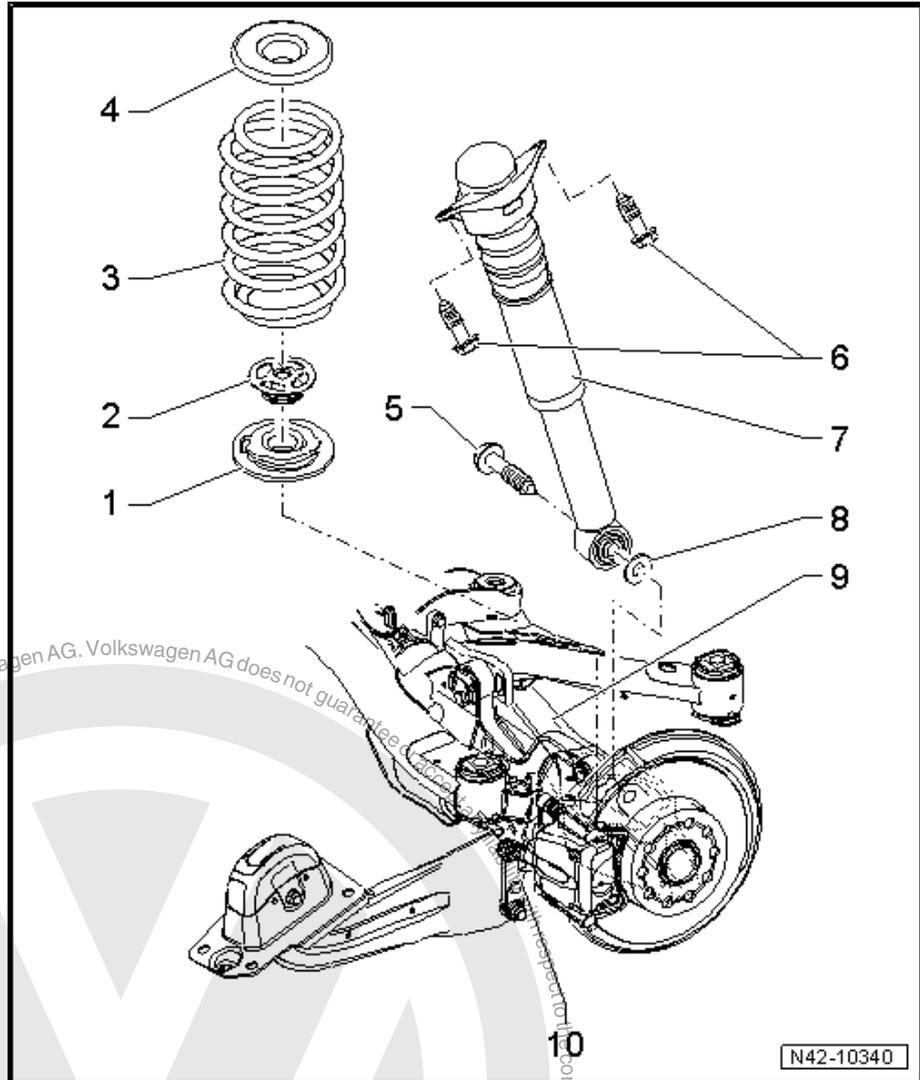
8 - Washer

9 - Lower transverse link

- Removing and installing [⇒ page 217](#)

10 - Wheel bearing housing

- Removing and installing [⇒ page 236](#)



16.1 Removing and installing coil spring

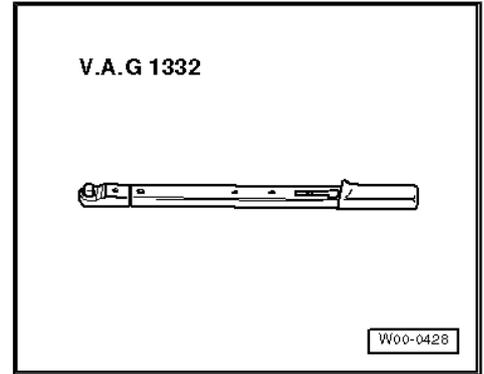
[⇒ page 257](#)

16.2 Removing and installing shock absorbers

Special tools and workshop equipment required

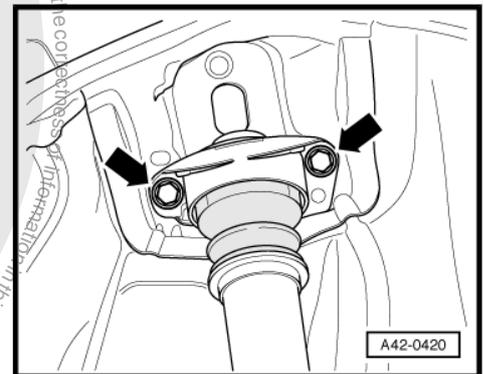


- ◆ Torque wrench -V.A.G 1332-



Removing

- Remove wheel.
- Remove wheel housing liner ⇒ General body repairs, exterior; Rep. Gr. 66 .
- Remove coil spring ⇒ [page 257](#) .
- Remove bolts -arrows-.

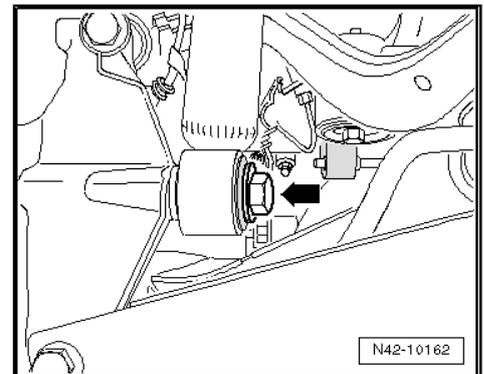


- Remove bolt -arrow-.
- Remove shock absorber.

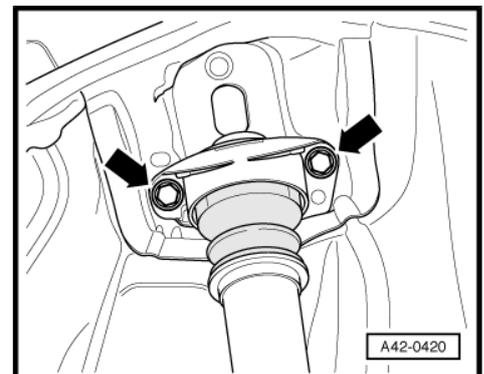
Installing

Install in reverse order. Note the following points:

The shock absorber may only be bolted to the wheel bearing housing when dimension "a" has been attained ⇒ [page 188](#) .



- Install shock absorber and tighten bolts -arrows-.





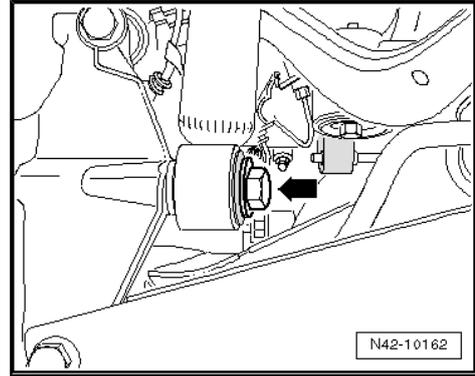
- Tighten bolt -arrow-.



Note

Make sure that the plate between wheel bearing housing and shock absorber is also installed.

- Install coil spring ⇒ [page 257](#) .
- Install wheel housing liner ⇒ General body repairs, exterior; Rep. Gr. 66 .
- Install wheel and tighten ⇒ [page 288](#) .



Specified torques

Component	Specified torque
Shock absorber to body ◆ Use new bolts!	50 Nm + 45° further
Shock absorber to wheel bearing housing	180 Nm

16.3 Repairing shock absorber

⇒ [page 260](#)





17 Assembly overview - anti-roll bar (four-wheel drive, subframe made from aluminium and wheel bearing housing made from cast steel)

-Arrow- indicates direction of travel.

1 - Anti-roll bar

- Note different versions of running gear
 ⇒ [page 317](#) , vehicle data plate
- Removing and installing
 ⇒ [page 265](#)

2 - Bush

- Always renew bushes on both sides of the vehicle.

3 - Clamp

4 - Bolt

- 25 Nm + 90° further
- Tighten evenly.
- Always renew after removing
- Always tighten threaded connections in unladen position ⇒ [page 187](#)

5 - Wheel bearing housing

6 - Nut

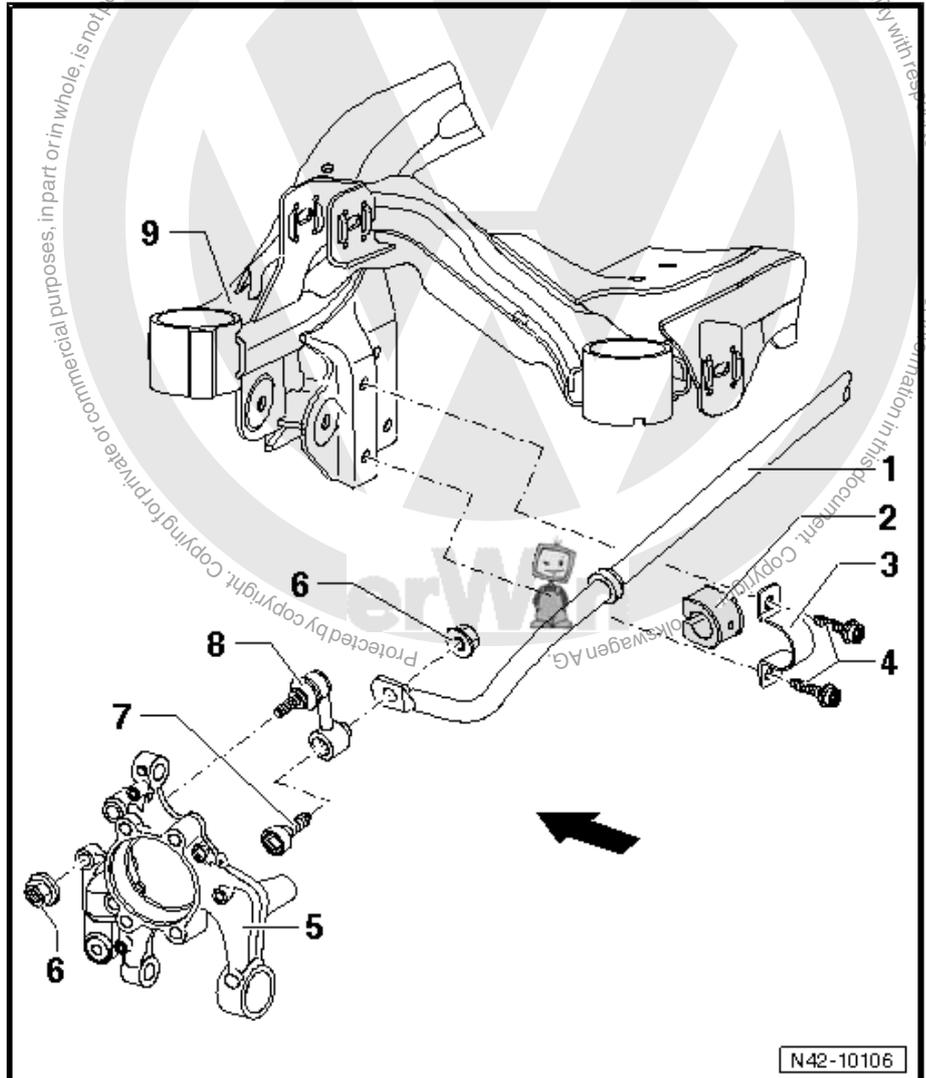
- 45 Nm
- Self-locking
- Always renew after removing
- When tightening, counterhold on multi-point socket head of bolt
 ⇒ [Item 7 \(page 265\)](#) or
 ⇒ [Item 8 \(page 265\)](#)

7 - Bolt

8 - Coupling rod

- Connects anti-roll bar to trailing arm and wheel bearing housing

9 - Subframe

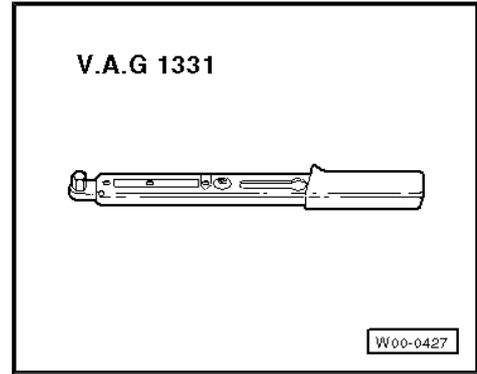


17.1 Removing and installing anti-roll bar

Special tools and workshop equipment required



- ◆ Torque wrench -V.A.G 1331-



Removing

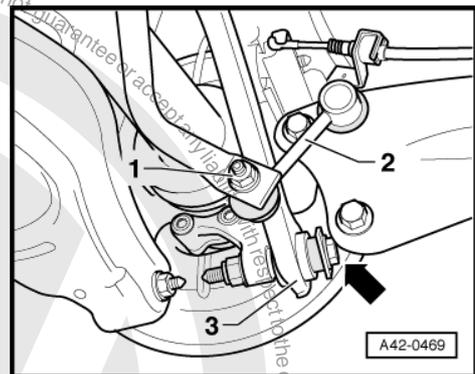
- Remove rear wheels.



Note

The following procedure is for the left side of the vehicle. The procedure for the right side of the vehicle is identical.

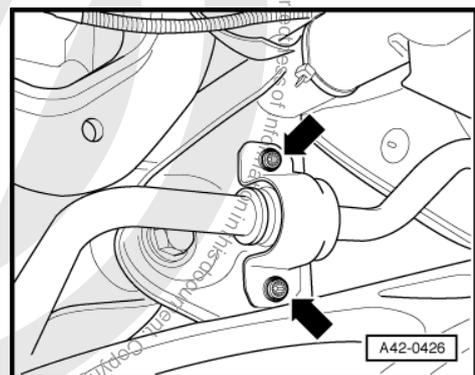
- Remove nut -1- and pull coupling rod -2- out of anti-roll bar.



- Remove bolts, arrows- for anti-roll bar clamp.

If the upper bolt of the anti-roll bar clamp on the right side of the vehicle cannot be removed, then additional work must be performed => [page 266](#).

For the right side of the vehicle only (depending on equipment)

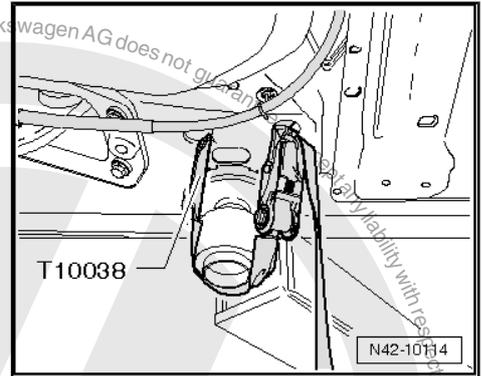




- Now strap vehicle to the lifting platform arms on both sides of the vehicle using tensioning straps -T10038- .

⚠ WARNING

If the vehicle is not strapped down there is a great danger that the vehicle will slip off the lifting platform!



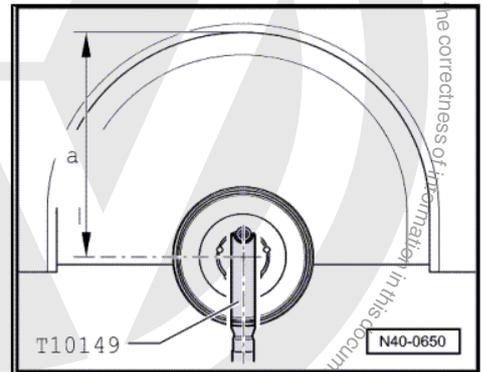
- Attach support -T10149- to wheel hub using wheel bolt.
- Raise wheel hub with support -T10149- and engine and gearbox jack -V.A.G 1383 A- far enough that bolts of right anti-roll bar clamp are accessible.

Continuation for both sides of vehicle:

- Remove anti-roll bar.

Installing

- Install anti-roll bar in vehicle.

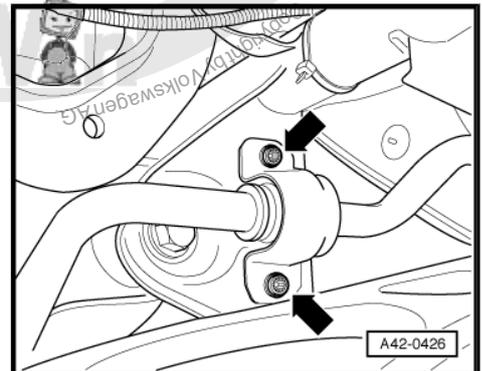


- Evenly tighten bolts -arrows- for anti-roll bar clamp.

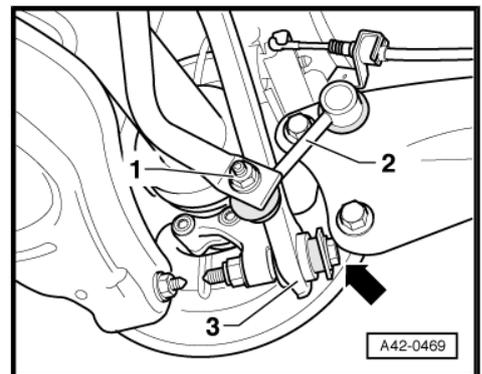
For the right side of the vehicle only (depending on equipment)

- Lower wheel suspension again using engine and gearbox jack -V.A.G 1383 A- and remove support -T10149- from wheel hub.
- Remove tensioning strap -T10038- .

Continuation for both sides of vehicle:



- Connect coupling rod -2- to anti-roll bar and tighten nut -1-.
- Install wheel and tighten. => [page 288](#)



Specified torques

Component	Specified torque
Anti-roll bar to subframe ♦ Use new bolts! ♦ Tighten threaded connections only when vehicle is in the normal running position	25 Nm + 90° further



Component	Specified torque
Anti-roll bar to coupling rod ◆ Use new nut	45 Nm





18 Assembly overview - anti-roll bar (four-wheel drive, subframe made from steel and wheel bearing housing made from aluminium)

-Arrow- indicates direction of travel.

1 - Anti-roll bar

- Note different running gear versions; see [⇒ page 317](#) , vehicle data sticker
- Removing and installing [⇒ page 269](#)

2 - Bearing

- Always renew mountings on both sides of the vehicle.

3 - Clamp

4 - Multi-point socket head bolt

- M8 x 28
- 25 Nm + 45° further
- Renew each time after removing

5 - Wheel bearing housing

6 - Nut

- M10 x 55
- 45 Nm
- Self-locking
- Renew each time after removing

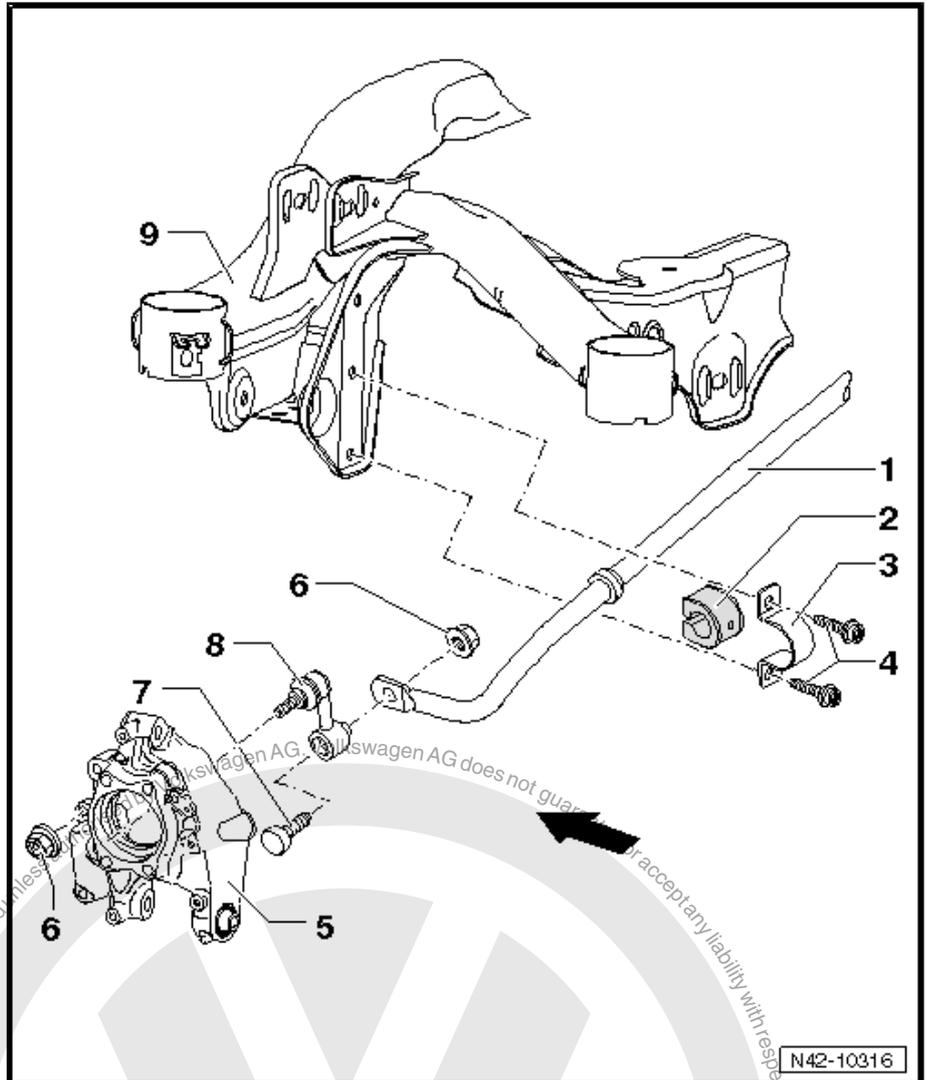
7 - Multi-point socket head bolt

- Renew each time after removing

8 - Coupling rod

- Connects anti-roll bar to trailing arm and wheel bearing housing

9 - Subframe

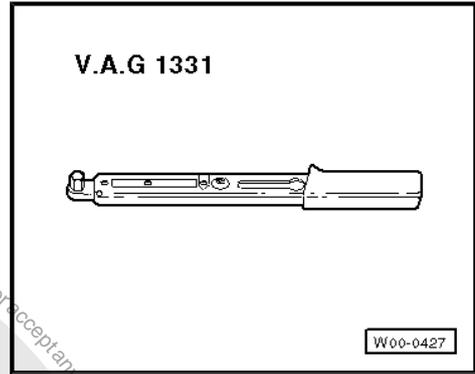


18.1 Removing and installing anti-roll bar

Special tools and workshop equipment required



- ◆ Torque wrench -V.A.G 1331-



Removing

- Remove rear wheels.



Note

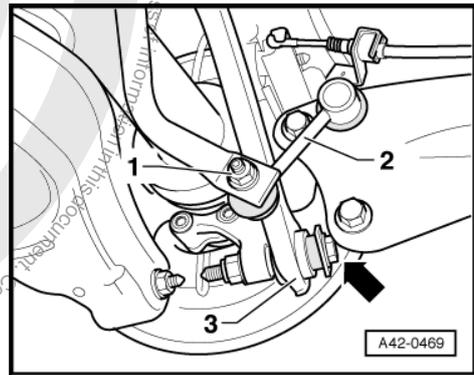
The following procedure is for the left side of the vehicle. The procedure for the right side of the vehicle is identical.

- Remove nut -1- and pull coupling rod -2- out of anti-roll bar.



Note

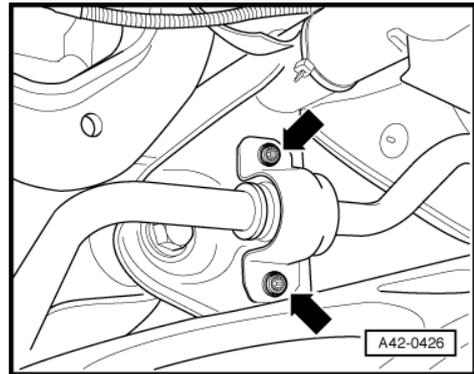
Do not loosen bolt -arrow- for track rod -3-.



- Remove bolts -arrows- for anti-roll bar clamp.

If the upper bolt of the anti-roll bar clamp on the right side of the vehicle cannot be removed, then additional work must be performed ⇒ [page 270](#) .

For the right side of the vehicle only (depending on equipment)

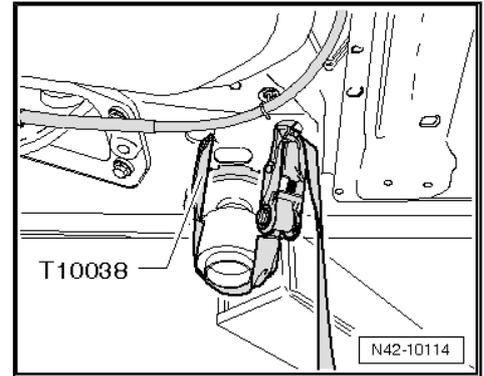




- Now strap vehicle to the lifting platform arms on both sides of the vehicle using tensioning straps -T10038- .

! WARNING

If the vehicle is not strapped down there is a great danger that the vehicle will slip off the lifting platform!



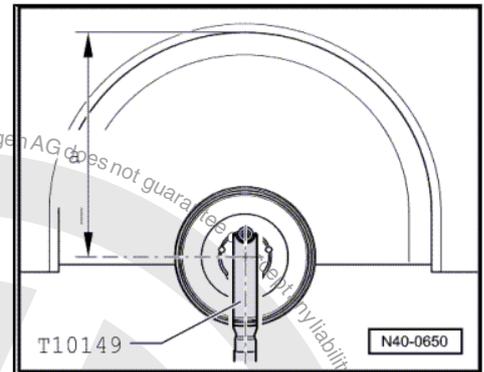
- Attach support -T10149- to wheel hub using wheel bolt.
- Raise wheel hub with support -T10149- and engine and gearbox jack -V.A.G 1383 A- far enough that bolts of right anti-roll bar clamp are accessible.

Continuation for both sides of vehicle:

- Remove anti-roll bar.

Installing

- Install anti-roll bar in vehicle.

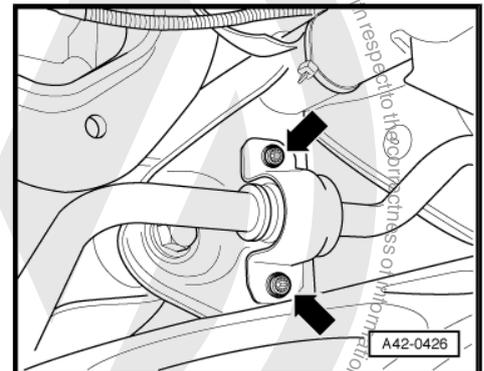


- Evenly tighten bolts -arrows- for anti-roll bar clamp.

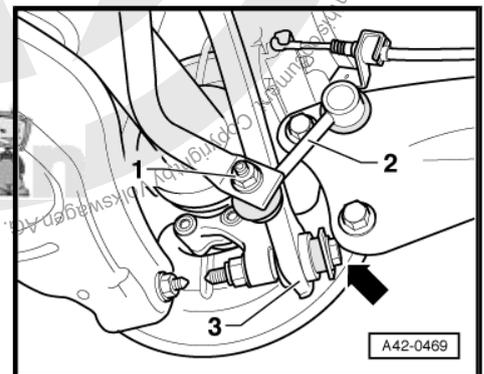
For the right side of the vehicle only (depending on equipment)

- Lower wheel suspension again using engine and gearbox jack -V.A.G 1383 A- and remove support -T10149- from wheel hub.
- Remove tensioning strap -T10038- .

Continuation for both sides of vehicle:



- Connect coupling rod -2- to anti-roll bar and tighten nut -1-.
- Install wheel and tighten. => [page 288](#)



Specified torques

Component	Specified torque
Anti-roll bar to subframe ♦ Use new bolts! ♦ Tighten threaded connections only when vehicle is in the normal running position	25 Nm + 45° further



Component	Specified torque
Anti-roll bar to coupling rod ◆ Use new nut.	45 Nm





19 Assembly overview - drive shaft

1 - Outer constant velocity joint

- Renew only as complete unit
- Removing ⇒ [page 280](#)
- Installing: drive onto shaft to stop using a plastic mallet
- Checking ⇒ [page 283](#)

2 - Bolt

- M16 x 1.5 x 80
- Hexagon bolt, 180 Nm and turn +180° further
- Loosening and tightening hexagon bolt for drive shaft ⇒ [page 274](#)
- 12-point bolt, 70 Nm + 90° further
- Loosening and tightening twelve-point bolt for drive shaft ⇒ [page 275](#)
- Always renew after removing



Note

3 - Drive shaft

- Allocation ⇒ Electronic parts catalogue "ETKA"

4 - Hose clip

- Always renew after removing
- Tightening ⇒ [page 282](#)

5 - Boot

- Check for splits and chafing
- Material: (polyester elastomer).

6 - Hose clip

- Always renew after removing
- Tightening ⇒ [page 282](#)

7 - Dished spring

- Installation position ⇒ [page 280](#)

8 - Thrust washer

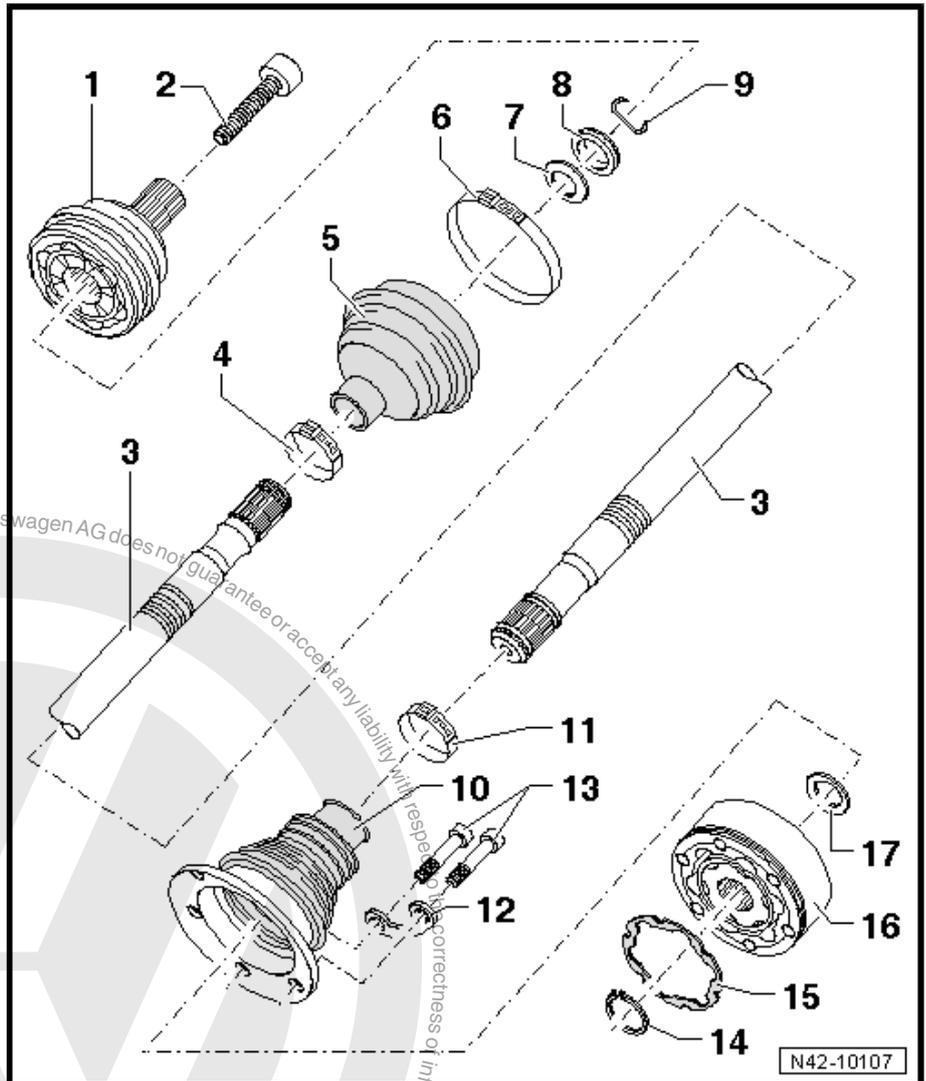
- Installation position ⇒ [page 282](#)

9 - Retaining ring

- Always renew after removing
- Insert in groove in shaft

10 - Boot for constant velocity joint

- Material: Hytrel
- Without breather hole
- Check for splits and chafing





- Drive off constant velocity joint with a drift
- Coat sealing surface of constant velocity joint with -D 454 300 A2- before installing.

11 - Hose clip

- Always renew after removing
- Tightening ⇒ [page 283](#)

12 - Locking plate

- Renew each time after removing

13 - Bolt

- Initially tighten diagonally to 10 Nm and then tighten diagonally to specified torque.
- 40 Nm
- Always renew bolts after removing

14 - Retaining ring

- Always renew after removing
- Remove and install with circlip pliers -VW 161 A-

15 - Seal

- Always renew after removing
- Adhesive surface on constant velocity joint must be free of oil and grease!

16 - Inner constant velocity joint

- Renew only as complete unit
- Pressing off ⇒ [page 281](#)
- Pressing on ⇒ [page 281](#)
- Checking ⇒ [page 284](#)

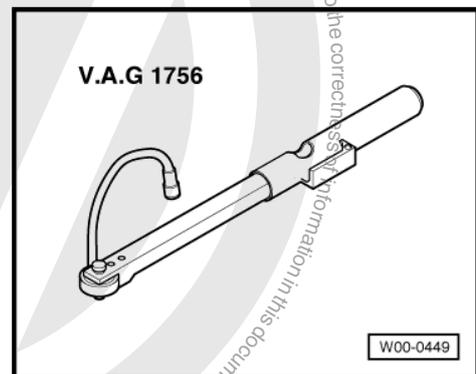
17 - Dished spring

- With inner splines
- Installation position ⇒ [page 281](#)

19.1 Loosening and tightening drive shaft hexagon bolt

Special tools and workshop equipment required

- ◆ Torque/angle wrench -V.A.G 1756-



Wheel bearings must not be subjected to load after bolt securing drive shaft to wheel hub has been loosened.

If wheel bearings are loaded with weight of vehicle, bearing will be damaged. This reduces the service life of the wheel bearing. It is therefore important to note the following:

- ◆ Procedure for loosening hexagon bolt.



Do not attempt to move the vehicle without the drive shafts fitted as this would result in wheel bearing damage. If the vehicle does have to be moved, always note the following points:

- Fit an outer joint in place of drive shaft.
- Tighten outer joint to 120 Nm.

Loosening hexagon bolt

- For vehicles which are still standing on their wheels, loosen the hexagon bolt a maximum of 90°, as the wheel bearing will otherwise be damaged.
- Raise vehicle so that wheels are off the ground.
- Have second mechanic apply brakes.
- Remove hexagon bolt -arrow-.

Tightening hexagon bolt

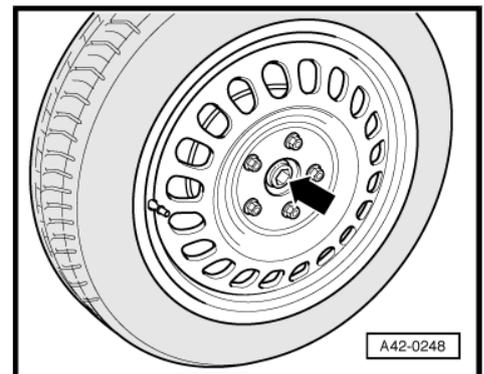
- Renew hexagon bolt.



Note

The wheels must not be in contact with the ground when the drive shaft bolt is tightened; otherwise, the wheel bearing will be damaged.

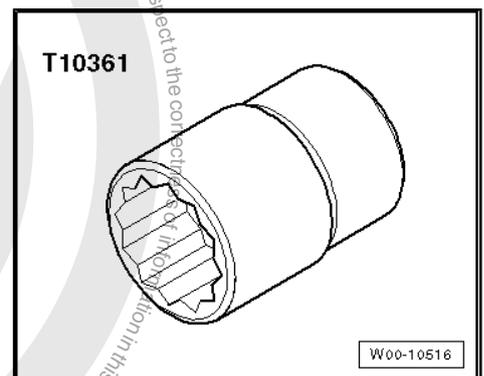
- Have second mechanic apply brakes.
- Tighten hexagon bolt to 180 Nm.
- Lower vehicle onto its wheels.
- Turn hexagon bolt 180° further.



19.2 Loosening and tightening 12-point bolt for drive shaft

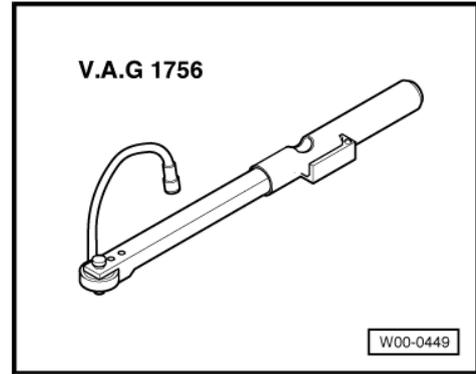
Special tools and workshop equipment required

- ◆ Socket AF 24 -T10361-





- ◆ Torque/angle wrench -V.A.G 1756-



Wheel bearings must not be subjected to load after bolt securing drive shaft to wheel hub has been loosened.

If wheel bearings are loaded with weight of vehicle, bearing will be damaged. This reduces the service life of the wheel bearing. It is therefore important to note the following:

- ◆ Procedure for loosening 12-point flange bolt.

Do not attempt to move the vehicle without the drive shafts fitted as this would damage the wheel bearing. If the vehicle does have to be moved, always note the following points:

- Fit an outer joint in place of the drive shaft.
- Tighten the outer joint to 120 Nm.

Loosening 12-point bolt

- With vehicle still standing on its wheels, loosen the twelve-point bolt a maximum of 90°, as the wheel bearing will otherwise be damaged.
- Raise vehicle so that wheels are off the ground.
- Have second mechanic apply brakes.
- Remove 12-point bolt -arrow-.

Fitting 12-point bolt

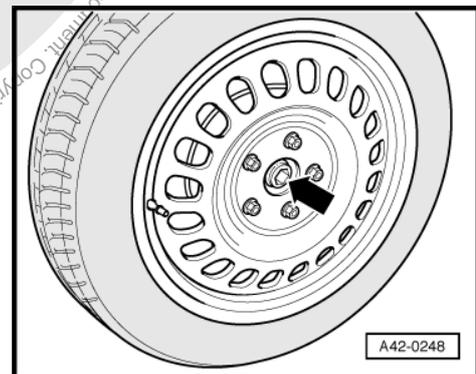
- Renew 12-point bolt.



Note

The wheels must not be in contact with the ground when the drive shaft bolt is tightened; otherwise, the wheel bearing will be damaged.

- Have second mechanic apply brakes.
- Tighten 12-point bolt to 70 Nm.
- Lower vehicle onto its wheels.
- Turn 12-point bolt 90° further.



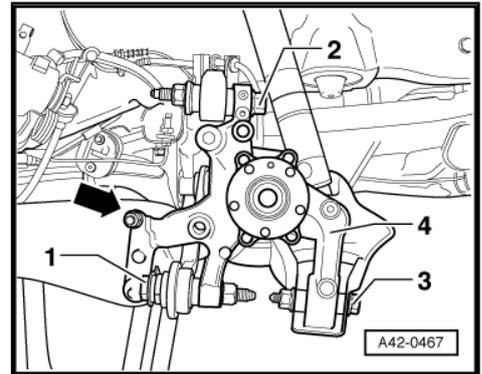
19.3 Removing and installing drive shaft

Removing

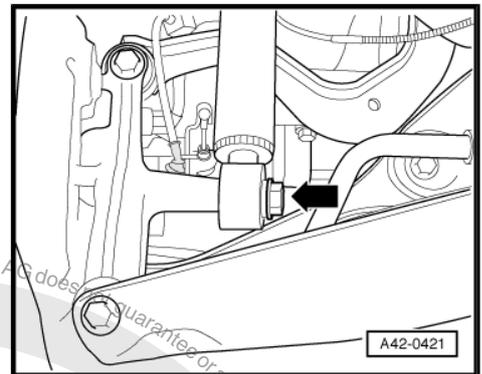
- Loosen drive shaft bolt at wheel hub:
- ◆ Hexagon bolt ⇒ [page 274](#)
- ◆ Twelve-point bolt ⇒ [page 275](#)



- Remove wheel.
- Unscrew bolts securing track rod -1- and lower transverse link -3- from wheel bearing housing -4-.



- Remove bolt -arrow-.
- Loosen drive shaft at gearbox flange.
- Swing wheel bearing housing out and pull drive shaft out of inner splines.
- Remove drive shaft.



Installing

Carry out installation in the reverse sequence, noting the following:

- Install wheel and tighten => [page 288](#).

The threaded connections on the wheel bearing housing may be tightened only when the dimension measured between the centre of wheel hub and lower edge of wheel housing before work was started has been attained => [page 188](#) .

i Note

Ensure that the washer between wheel bearing housing and shock absorber is also installed on vehicles with aluminium wheel bearing housing.

Specified torques

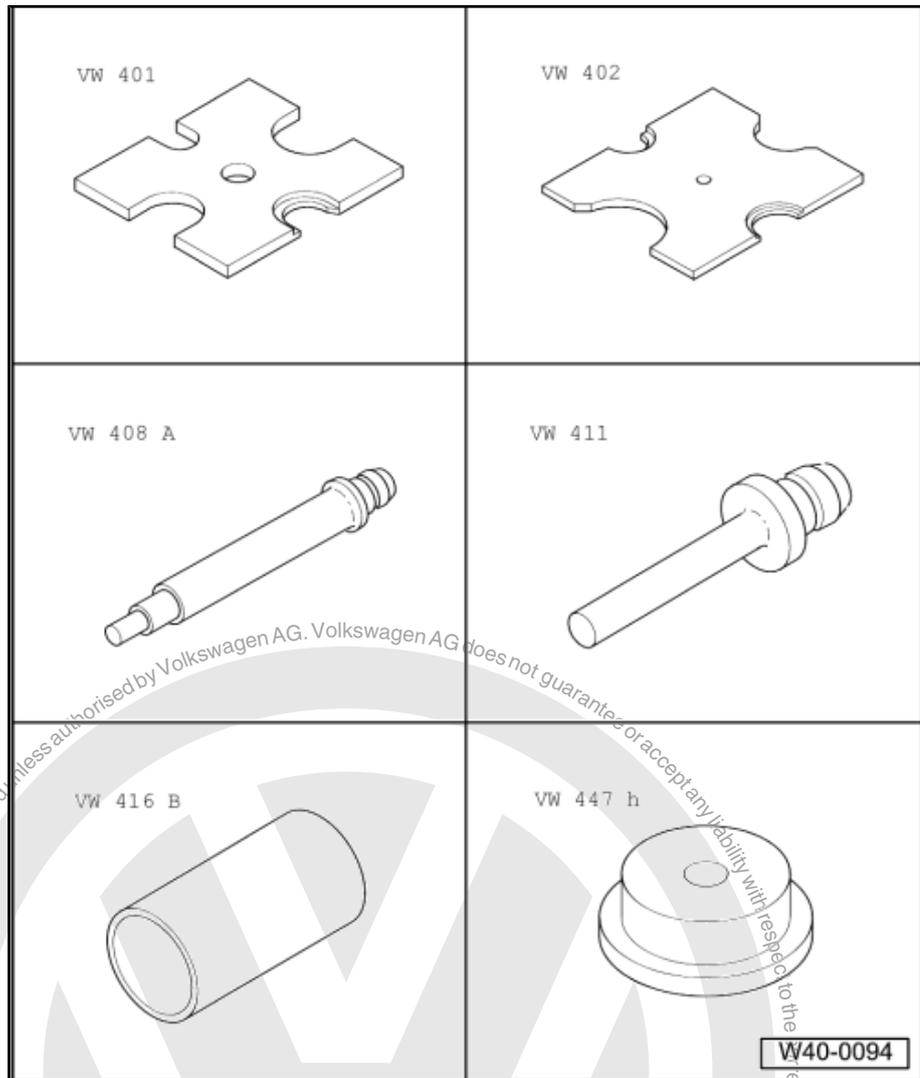
Component	Specified torque
Drive shaft to wheel hub "hexagon bolt" ◆ Use new bolt	180 Nm + 180°
Drive shaft to wheel hub "12-point bolt" ◆ Use new bolt	70 Nm + 90°
Drive shaft to flange shaft/gearbox ◆ Use new bolts! ◆ Use new backing plates	40 Nm ◆ Initially tighten diagonally to 10 Nm



19.4 Dismantling and assembling drive shaft

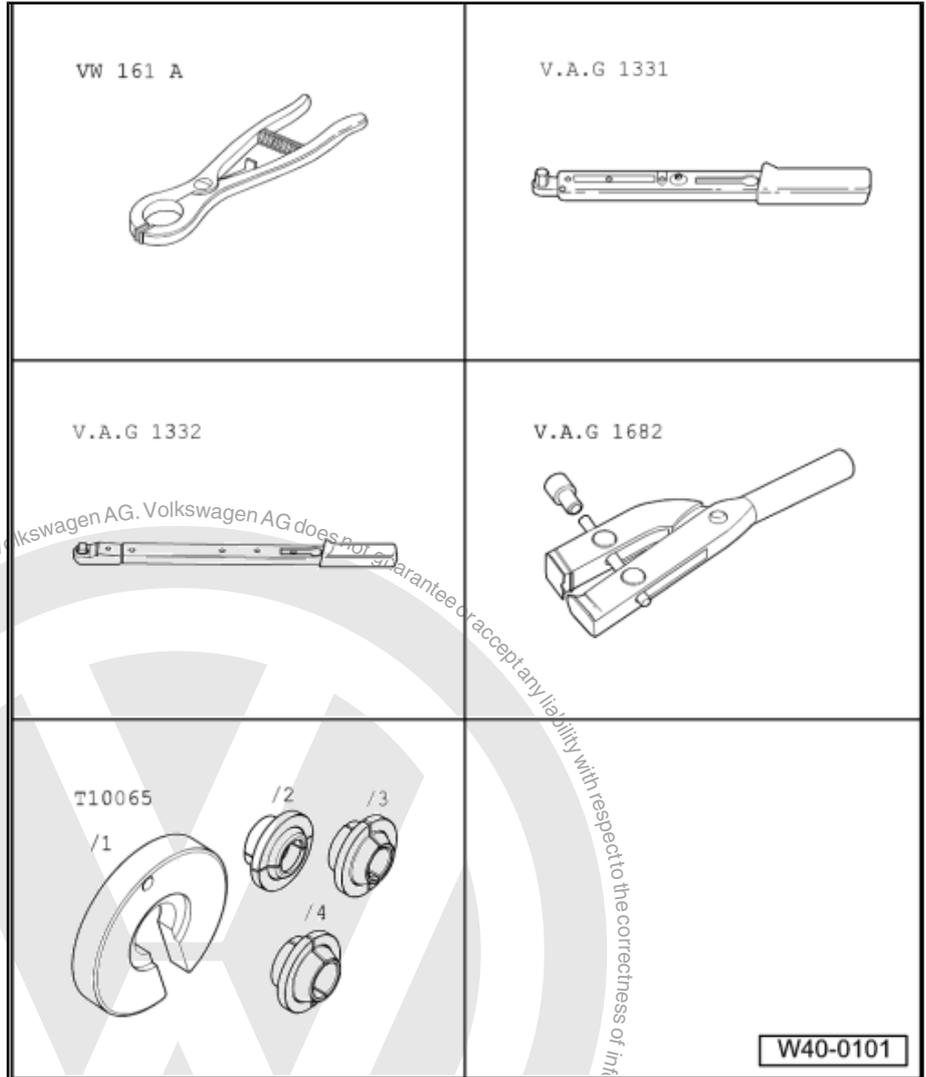
Special tools and workshop equipment required

- ◆ Thrust plate -VW 401-
- ◆ Thrust plate -VW 402-
- ◆ Press tool -VW 408 A-
- ◆ Press tool -VW 411-
- ◆ Tube -VW 416 B-
- ◆ Thrust plate -VW 447 H-

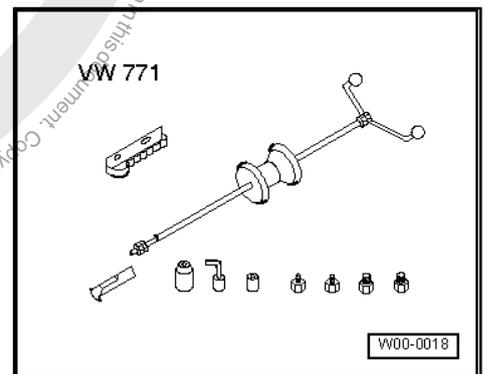




- ◆ Circlip pliers -VW 161 A-
- ◆ Torque wrench -V.A.G 1331-
- ◆ Torque wrench -V.A.G 1332-
- ◆ Special pliers -V.A.G 1682-
- ◆ Assembly tool -T10065-

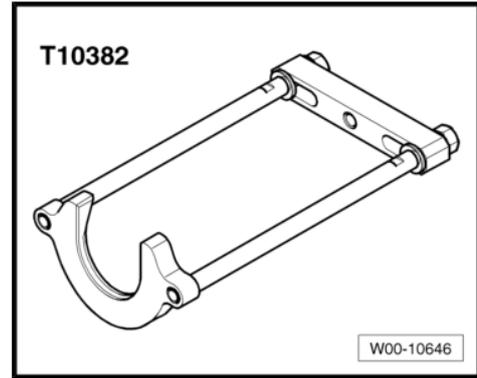


- ◆ Multi-purpose tool -VW 771-





◆ Puller -T10382-

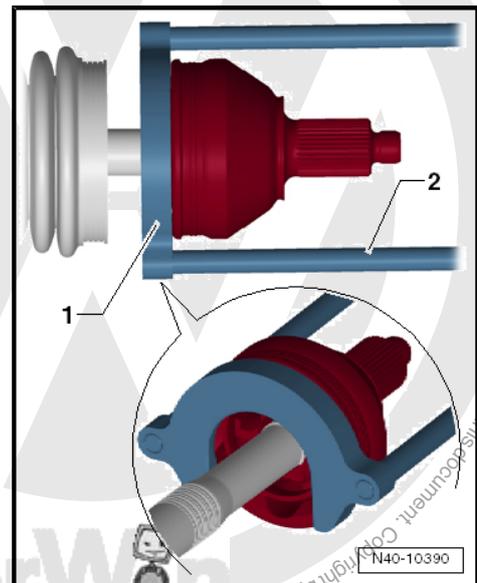


Removing outer constant velocity joint

- Clamp drive shaft in vice using protective jaw covers.
- Fold back boot.
- Set puller -T10382- up so that smooth side of puller plate - T10382/1- points to spindles -T10382/2- .
- Assemble puller -T10382- complete with multi-purpose tool - VW 771- .
- Pull constant velocity joint from drive shaft with puller -T10382- and multi-purpose tool -VW 771- .

- 1 - Puller plate -T10382/1-
- 2 - Spindles -T10382/2-

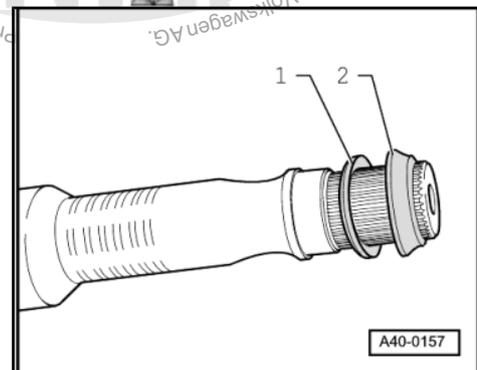
Driving on outer constant velocity joint



Installation position of dished spring and thrust washer on outer joint

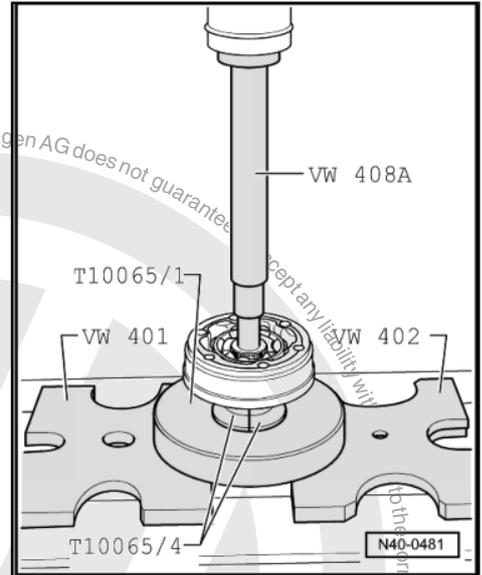
- 1 - Dished spring
 - 2 - Thrust washer
- Install new retaining ring.
 - If necessary, push new joint boot onto drive shaft.
 - Knock onto shaft with plastic hammer until circlip engages.

Dismantling



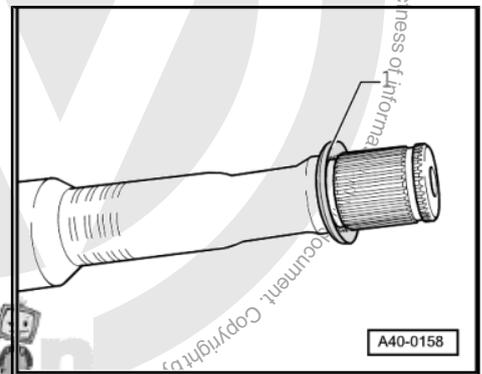


**Pressing off inner constant velocity joint
 Assembling**



Installation position of dished spring at inner joint

- 1 - Dished spring

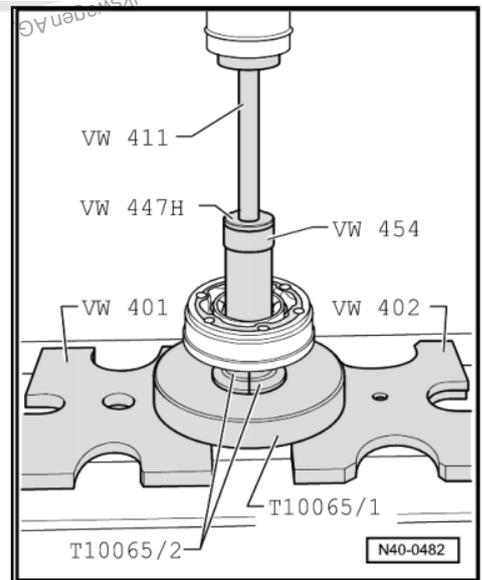


Pressing on inner constant velocity joint

i Note

Chamfer on internal circumference of ball hub (splines) must face contact shoulder on drive shaft.

- Apply special pliers -V.A.G 1682- as shown in diagram. Ensure that the jaws of the pliers seat in the ends of the hose clip -arrows B-.





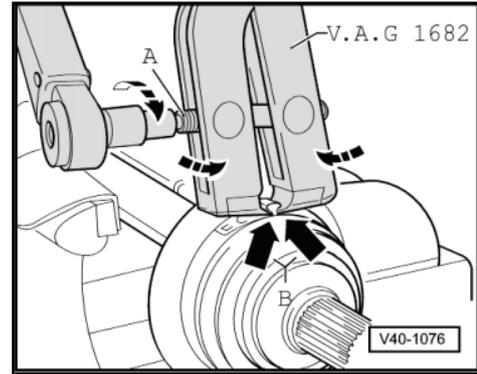
Tighten hose clip on outer joint

- Tighten hose clip by turning spindle with a torque wrench (do not cant pliers).



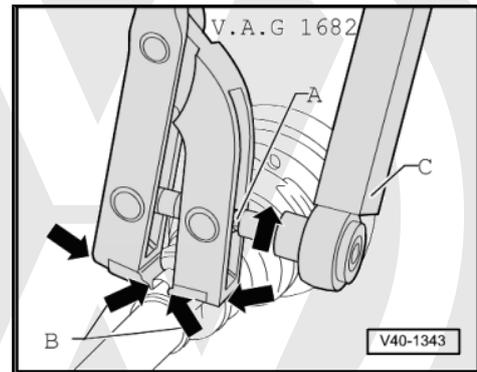
Note

- ◆ Because a stainless steel hose clip is required due to the hard material of the joint boot (compared to rubber), it is possible to tighten the hose clip only with special pliers -V.A.G 1682- .
- ◆ Specified torque: 25 Nm.
- ◆ Use torque wrench -C- with adjustment range 5 ... 50 Nm, (e.g. torque wrench -V.A.G 1331-).
- ◆ Make sure thread of spindle -A- on pliers moves freely. Lubricate with MoS2 grease if necessary.
- ◆ If the thread is tight (e.g. due to dirt), the required clamping force for the clip will not be attained although the correct torque is applied.



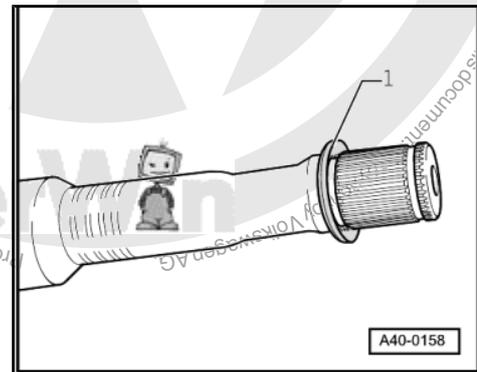
Tightening hose clip on small diameter

Assembling



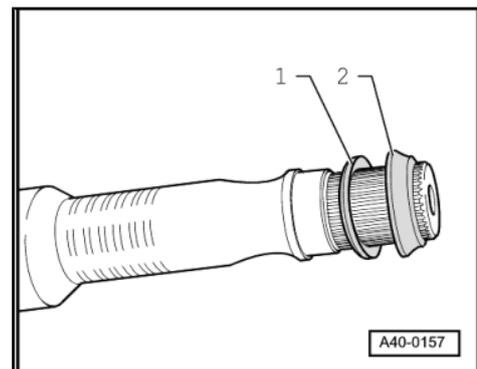
Installation position of dished spring at inner joint

- 1 - Dished spring



Installation position of dished spring 1 and thrust washer 2 on outer joint

- 1 - Dished spring
 - 2 - Thrust washer
- Press joint on to stop.
 - Install retaining ring.



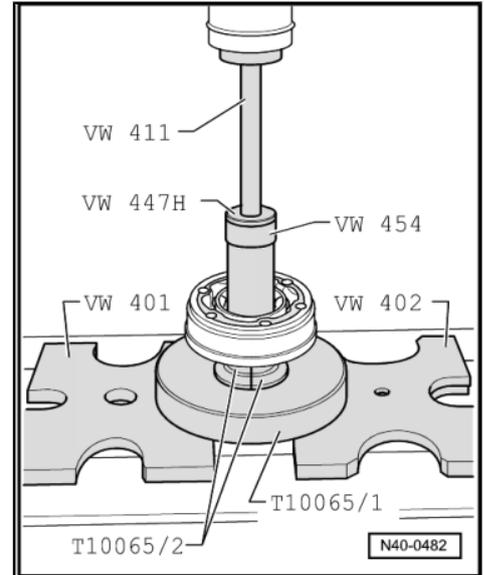


Pressing on inner constant velocity joint

i Note

Chamfer on internal circumference of ball hub (splines) must face contact shoulder on drive shaft.

- Apply special pliers -V.A.G 1682- as shown in diagram. Ensure that the jaws of the pliers seat in the ends of the hose clip -arrows B-.

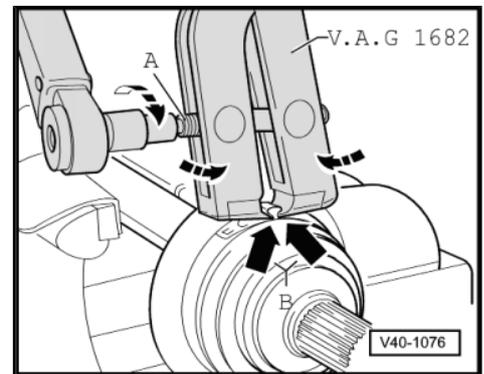


Tighten hose clip on outer joint

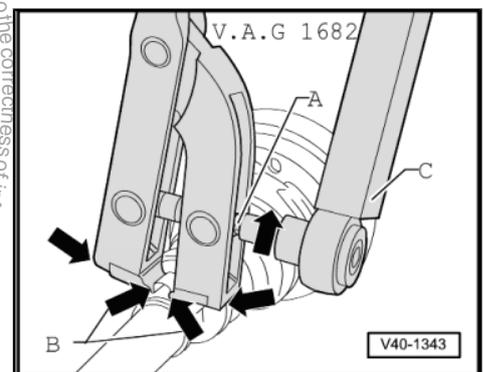
- Tighten hose clip by turning spindle with a torque wrench (do not cant pliers).

i Note

- ◆ Because a stainless steel hose clip is required due to the hard material of the joint boot (compared to rubber), it is possible to tighten the hose clip only with special pliers -V.A.G 1682-.
- ◆ Specified torque: 25 Nm.
- ◆ Use torque wrench -C- with adjustment range 5 ... 50 Nm, (e.g. torque wrench -V.A.G 1331-).
- ◆ Make sure thread of spindle -A- on pliers moves freely. Lubricate with MoS2 grease if necessary.
- ◆ If the thread is tight (e.g. due to dirt), the required clamping force for the clip will not be attained although the correct torque is applied.



Tightening hose clip on small diameter



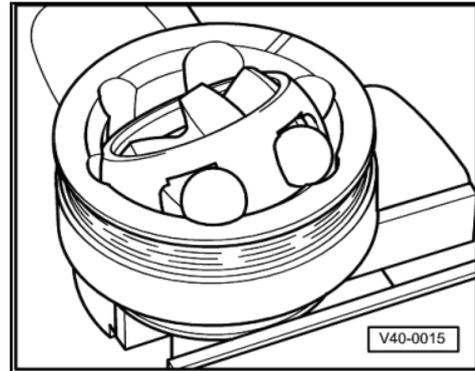
19.5 Checking outer constant velocity joint

The joint is to be dismantled to renew the grease if it is heavily soiled, or to check the running surfaces of the balls for wear and damage.

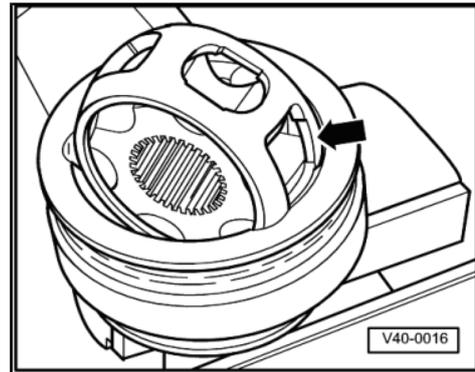


Removing

- Before dismantling, mark position of ball hub in relation to ball cage and joint body with an electric scribe or oil stone.
- Swing ball hub and ball cage.
- Remove balls one at a time.



- Turn cage until the two rectangular windows -arrow- align with joint body.
- Take out cage with hub.



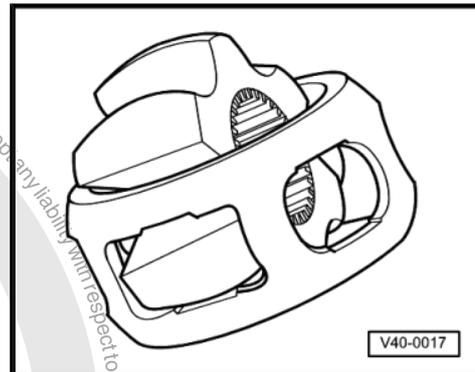
- Swing segment of hub into square cage window
- Tip hub out of cage.

The six balls for each joint belong to a tolerance group. Check stub axle, hub, cage and balls for small indentations (pitting) and traces of seizing. Too much circumferential backlash in the joint becomes noticeable during load change jolts; in such cases, the joint must be renewed. Smoothing and traces of wear of the balls are no reason to change the joint.

Installing

- Pack half of total grease quantity (40 g) into joint body.
- Fit cage with hub into joint body.
- Press in opposing balls one after the other; the original position of the hub relative to the cage and joint body must be restored.
- Fit new retaining ring into hub.
- Distribute remaining grease in boot.
- Checking function of constant velocity joint

The constant velocity joint is correctly assembled if the ball hub can be moved by hand backwards and forwards over its entire range of axial movement.



19.6 Checking inner constant velocity joint

Removing

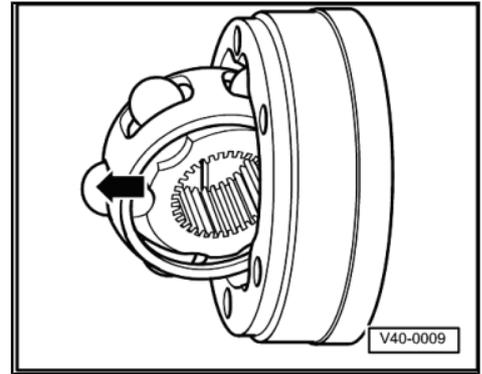
The joint is to be dismantled to renew the grease if it is heavily soiled, and to check the running surfaces and the balls for wear and damage.



- Swing ball hub and ball cage.
- Press out joint body in direction of arrow.
- Press balls out of cage.

i Note

The ball hub and joint body are paired. Do not interchange them.



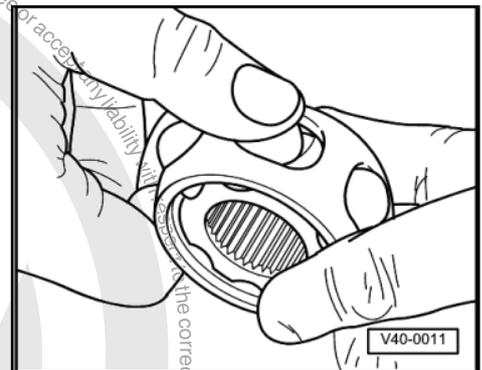
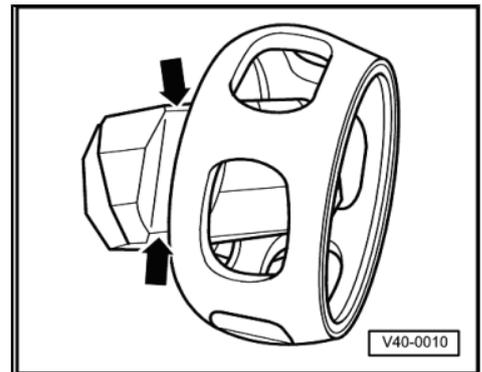
- Tip ball hub out of ball cage via ball track -arrows-.
- Check joint body, ball hub, ball cage and balls for pitting and traces of seizing.

Excessive circumferential backlash in the joint is noticeable during load change jolts. In this case the joint must be replaced. Smoothing and traces of wear of the balls are no reason to renew the joint.

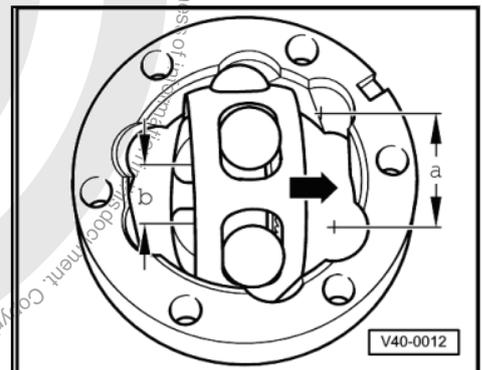
Installing

- Insert hub into cage via the two chamfers. The hub can be installed in any position. Press balls into cage.

The ball hub has two different distances between the ball tracks: a smaller one and a larger one.



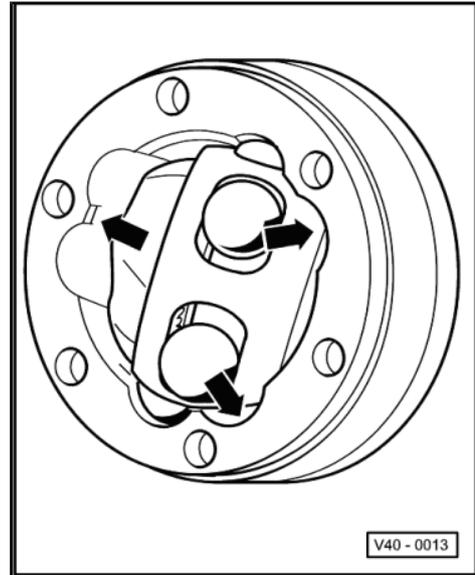
- Insert hub complete with cage and balls into joint body, making sure that a smaller gap -b- faces open side of joint body.
- Also make sure that chamfer on inner circumference of ball hub is visible after swinging it into place.



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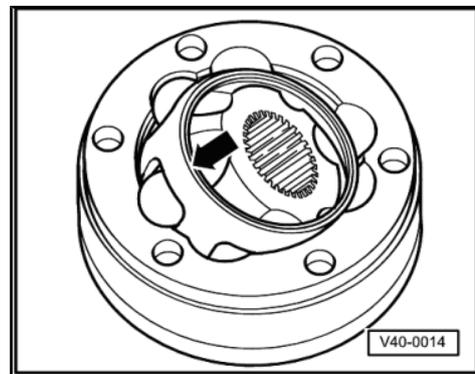


- Swing ball hub into place by swinging hub out of cage as shown in figure -arrows-.



- Swivel in hub with balls by applying firm pressure to cage -arrow-.
- Checking function of constant velocity joint

The constant velocity joint is correctly assembled if the ball hub can be moved by hand backwards and forwards over its entire range of axial movement.





44 – Wheels, tyres, vehicle geometry

1 Appraisal of accident vehicles

A checklist for evaluating running gear of accident vehicles can be found under [⇒ page 1](#) .

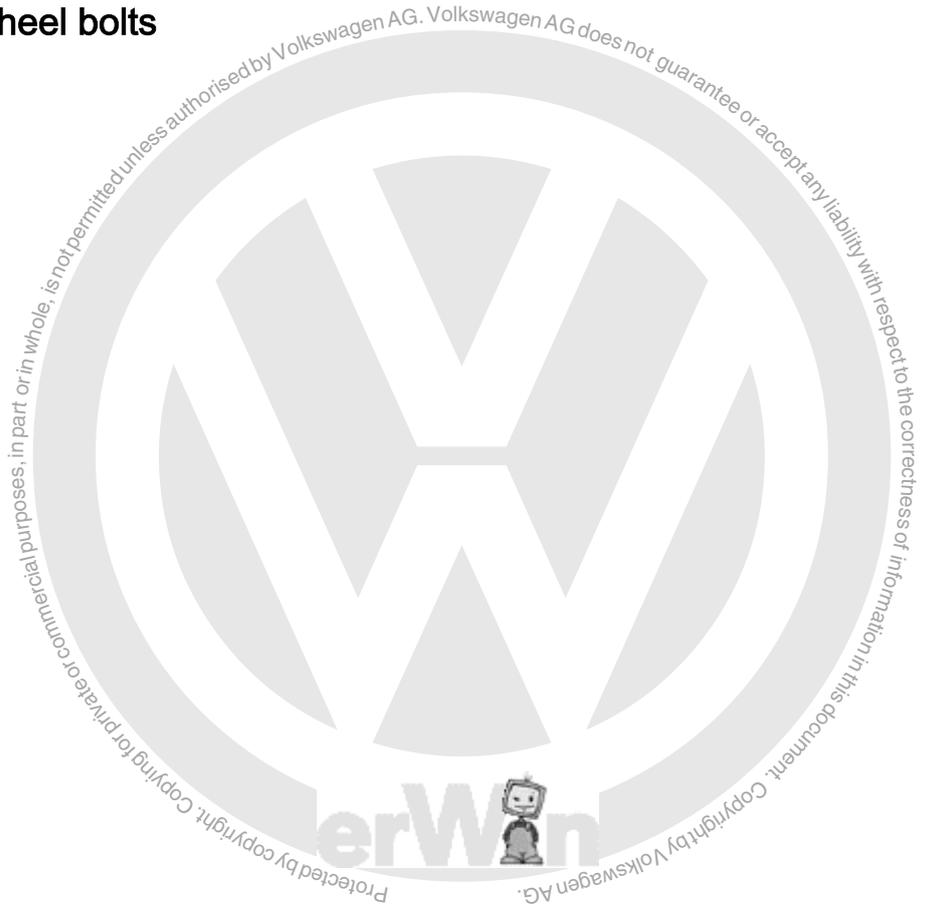




2 Torque settings for wheel bolts

Wheel bolt to wheel hub for all vehicles

Specified torque: 120 Nm.





3 Fitting wheel and tyre

3.1 General information

Since model year 2005, new wheel rims with a modified contour have been used in all vehicles.

The tyre fitting unit must be fitted with the tyre fitting head designed for these wheels.



WARNING

Otherwise there is a danger that the wheel will be damaged.

If the tyre fitting unit has not been modified, please contact the manufacture of the unit.





4 Removing and fitting tyres (wheels with tyre pressure monitoring)

4.1 Notes on safety and conditions for removing and fitting tyres (wheels with tyre pressure monitoring)

- It is extremely important to adhere to the instructions and warnings in the following descriptions.
- Check whether the tyre pressure sensor should also be replaced ⇒ Vehicle diagnosis, testing and information system VAS 5051.



Note

- ◆ *Ensure that the tyre does not contact the tyre pressure sensor during removal or fitting.*
- ◆ *The tyre pressure sensor must not come into contact with water or be blown upon with compressed air when the wheel rim is cleaned.*

4.2 Wheel change

If the wheels are changed (e.g. switch from summer to winter tyres), the wheel electronics transmit data as soon as the speed of the new wheels exceeds 25 km/h. The new wheel electronics' ID numbers are automatically detected and entered by the control unit.

The acceleration data are additionally checked against the vehicle speed. This process takes approx. 7 minutes.

The tyre pressure monitor control unit -J502- must first switch to learning mode before it can automatically learn the wheel electronics.

To do this, the vehicle must remain stationary for 20 minutes. Following the detection of a flat tyre, this time is 5 minutes.

If the stationary time is not maintained and the control unit consequently does not switch to learning mode, the system detects interference in transmission and will learn the wheel electronics automatically only after a stationary period of 20 minutes.



Note

- ◆ *When changing wheels, note that only Volkswagen-approved wheel and tyre combinations with the tyre inflation pressure specified in the tank flap may be installed.*
- ◆ *If unapproved wheel and tyre combinations are installed, they must possess a certificate from the responsible technical inspection authority (in Germany, TÜV) for the respective vehicle, and a second wheel set must be learned via the Vehicle diagnosis, testing and information system -VAS 5051B- ⇒ [page 291](#).*
- ◆ *Learning is also necessary if the tyre inflation pressure deviates from the tyre inflation pressure specified in the tank flap ⇒ [page 291](#).*



Tyre sets with other specified tyre inflation pressures

If a vehicle is fitted with tyres requiring nominal tyre inflation pressures other than those specified on the tank flap sticker, these tyres (second wheel set) can also be monitored with the TPM system.

Nominal tyre inflation pressures for the second wheel set must be specified to the system with the Vehicle diagnosis, testing and information system -VAS 5051B- .

The wheel electronics for the wheels of the second wheel set are not automatically detected and learned by the TPM system (unlike the wheel electronics for the wheel set with Volkswagen-approved wheel and tyre combinations).

The following work has to be performed to switch to the second wheel set:

- ◆ Read ID numbers (IDs) of the wheel electronics (tyre pressure sensors) prior to installation.
- ◆ Switch the TPM to wheel set 2.
- ◆ Enter the necessary nominal tyre pressures and the IDs of the wheel electronics in the system.

4.3 Pressing tyre off wheel rim

 **Caution**

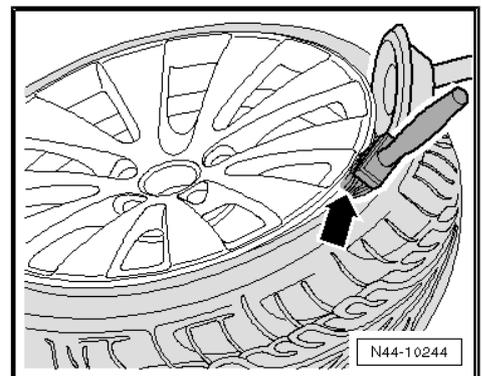
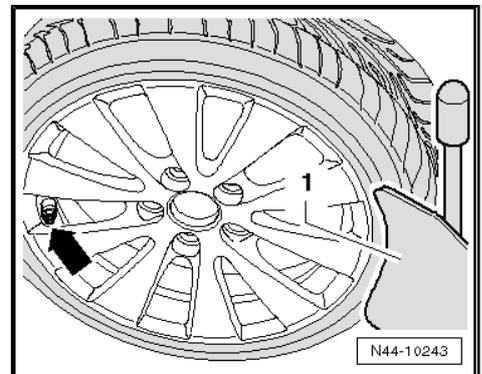
◆ *Comply with the notes on safety and conditions*
⇒ **page 290**

- Deflate tyre by unscrewing nickel-plated valve insert.
- When pressing off a tyre using tyre fitting equipment with a press-off plate, always ensure that the tyre valve/ tyre pressure sensor -arrow- is directly opposite the bead breaker -1-.

The bead breaker must be positioned no more than 2 cm from wheel rim flange.

- Remove balance weights and excessive dirt from wheel.

- Press both tyre beads off all round and liberally coat tyre and wheel rim flange with tyre assembly paste -arrow-.





4.4 Removing tyre from wheel

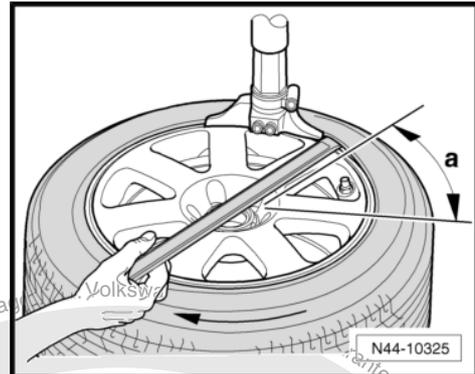


Caution

- ◆ **Comply with the notes on safety and conditions**
⇒ [page 290](#)
- ◆ **The assembly head must never be within area -a- of tyre valve/tyre pressure sensor, or the assembly head will damage the tyre pressure sensor .**

Fitting tyre

- Turn wheel on tyre fitting unit so that tyre valve/ tyre pressure sensor is in front of the assembly head.
- Position assembly head near tyre valve/ tyre pressure sensor so that an assembly lever can be inserted approx. 30° next to the tyre valve/ tyre pressure sensor .
- Now lever tyre bead over assembly finger on assembly head using assembly lever then remove assembly lever.
- Run tyre fitting machine clockwise until upper bead lies completely above wheel rim flange.
- Turn wheel on tyre fitting unit so that tyre valve/ tyre pressure sensor is in front of the assembly head.



Note

- ◆ **Check that the tyre pressure sensor is not loose or damaged.** If the screwed connection is loose, replace the union nut, the valve insert, the seal, the sealing washer and the valve cap with new parts from the repair set ⇒ *Electronic parts catalogue "ETKA"* .
- ◆ **If the tyre pressure sensor is damaged, then replace the complete item** ⇒ [page 304](#) .

4.5 Fitting tyre to wheel rim



Caution

- ◆ **Comply with the notes on safety and conditions**
⇒ [page 290](#)



Note

When a tyre is changed, it is recommended also to change the set of seals for the tyre pressure sensor.

- Coat wheel rim flanges, tyre beads and inside of upper tyre bead generously with tyre assembly paste.
- First fit inner side of tyre.



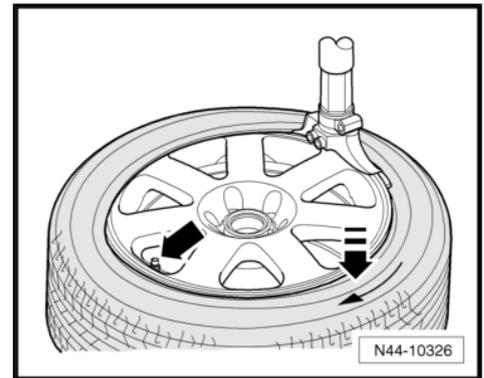
- Turn wheel on tyre fitting unit so that tyre valve/ tyre pressure sensor -arrow- is directly opposite assembly head.
- Press tyre into drop centre in -direction of arrow- between tyre valve with tyre pressure sensor and assembly head.
- Run tyre fitting machine clockwise.
- Stop the fitting of lower bead before reaching tyre valve/ tyre pressure sensor to prevent damage to tyre pressure sensor .

The tyre bead will now slide over the wheel rim flange. The wheel rim may be turned only until the assembly head is just before the tyre valve/ tyre pressure sensor .

- Check to ensure that tyre bead is seated correctly on assembly head and run tyre fitting machine clockwise.
- Stop the fitting of upper bead before reaching tyre valve/ tyre pressure sensor to prevent damage to tyre pressure sensor .

The tyre bead will now slide over the wheel rim flange. The wheel rim may be turned only until the assembly head is just before the tyre valve/ tyre pressure sensor .

- Inflate tyre to a pressure of max. 3.3 bar (bead seating pressure)

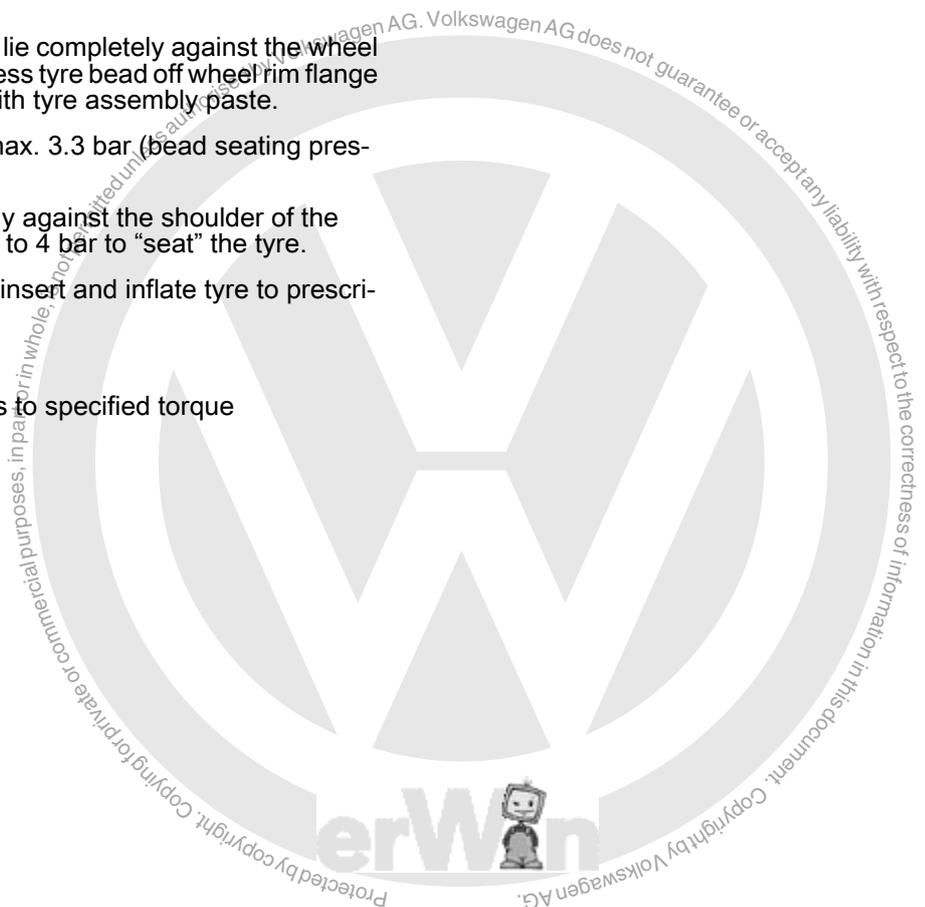


Caution

Never increase the inflation pressure when the tyre bead does not lie completely against the wheel rim flange.

This would lead to damage to the tyre and/or the wheel rim.

- When the tyre bead does not lie completely against the wheel rim flange: deflate the tyre, press tyre bead off wheel rim flange and generously coat again with tyre assembly paste.
- Inflate tyre to a pressure of max. 3.3 bar (bead seating pressure)
- If the tyre beads seat perfectly against the shoulder of the wheel rim, increase pressure to 4 bar to "seat" the tyre.
- Fit a new nickel-plated valve insert and inflate tyre to prescribed inflation pressure.
- Then balance wheel.
- Install wheel and tighten bolts to specified torque
[=> page 288](#) .





5 Removing and fitting tyres with run-flat capability to wheel rims

5.1 Notes on safety

- Only specially trained mechanics may remove or install tyres with run-flat capability.
- The special tools required must be in a perfect condition and must not be damaged. For information about appropriate additional tools, directly contact the manufacture of the tyre fitting equipment in your workshop. The recommended optional additional tools can be located under the VAS number of the listed tyre fitting equipment.
- Use assembly paste recommended by the tyre manufacturer if necessary.
- The procedure for removing and fitting may differ depending on the type of equipment used and the manufacture of the equipment.
- The subsequent procedure describes in general the principles of removing and fitting tyres with run-flat capabilities. It is important that you can identify a "run-flat" tyre before starting to remove or fit a tyre in order to follow the respective procedure.
- Distinguishing features: the tyre can be identified by one of the following abbreviations DSST, Euforia, RFT, ROF, RSC, SSR or ZP. The abbreviation is located on the flank of the tyre following the tyre designation of the respective tyre manufacturer.
- It is extremely important to adhere to the instructions and warnings in the following descriptions.
- Check whether the tyre pressure sensor should also be replaced (if present) ⇒ Vehicle diagnosis, testing and information system VAS 5051.



Note

- ◆ *Ensure that the tyre does not contact the tyre pressure sensor during removal or fitting.*
- ◆ *The tyre pressure sensor must not come into contact with water or be blown upon with compressed air when the wheel rim is cleaned.*

5.2 Installation conditions

Warming cold tyres to minimum installation temperature



Note

This instruction also applies to ultra-high performance tyres (height/width ratio less than or equal to 45 % and speed symbol greater than or equal to V).



WARNING

The minimum installation temperature of a tyre is 15 °C and the temperature in the core of the tyre should not be more than 30 °C.

- To install tyres without damage, it is especially important to warm the upper part of the sidewall and the inside of the upper bead to at least 15 °C.
- This internal temperature is referred to as the core temperature.
- Rubber is a poor conductor of heat, therefore a cold tyre must be left in an area with the correct temperature for a sufficiently long period so the inner rubber layers can warm up to at least 15 °C.
- The surface temperature of the tyre during the warming up phase is no indication of its internal temperature.
- To enable cold tyres to absorb heat from the ambient air as quickly as possible, they should not be stacked on top of one another but instead stored individually in order to allow the warm air to “flow” around them effectively.
- Tyres must never be placed in front of a radiator or hot air blower for warming, since this can very quickly lead to critical surface temperatures.
- Except for warming with warm water or warm ambient air (max. 50 °C), there is no process available for warming tyres without damaging the tyre!
- When cold tyres (below 0 °C) are transferred to a warm environment (above 0 °C), a layer of condensation immediately forms on the surface of the tyre. This layer of condensation indicates that the tyre is intensively absorbing heat from its environment through the process of water vapour in the air condensing out on the tyre surface.
- If the layer of condensation is in liquid form and leads to moisture on the surface, it should be dried off with a cloth otherwise the continuation of the warming process might be curtailed by cold due to evaporation.

Warming times:

- ◆ Assuming a minimum room temperature of 19 °C and a tyre temperature of 0 °C or more, a tyre should be kept at least at 19 °C for at least 2 hours
- ◆ Assuming a minimum room temperature of 19 °C and a tyre temperature of below 0 °C, a tyre should be kept at least at 19 °C for at least 2.5 hours

Warming recommendations:

- ◆ If possible, the tyres should be kept in the workshop for 1 day before installation (preparation for the job).
- ◆ Store on an insulated base, pallet or the like, as high up as possible
- ◆ Position the tyres individually to allow the warm air to “flow” around them effectively
- ◆ Wipe off condensation
- ◆ Never heat with a radiator or hot air blower!



5.3 Pressing tyre off wheel rim



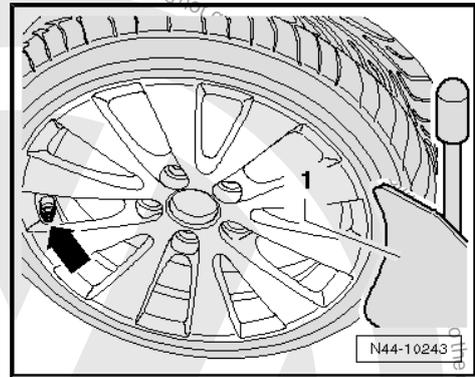
Caution

◆ *Follow the notes on safety ⇒ page 294*

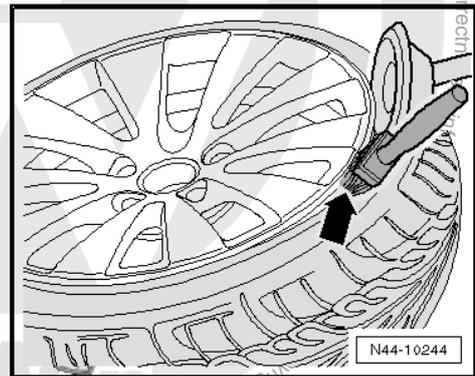
- Deflate tyre by unscrewing nickel-plated valve insert.
- When pressing off a tyre using tyre fitting equipment with a press-off plate, always ensure that the tyre valve/ tyre pressure sensor -arrow- is directly opposite the bead breaker -1-.

The bead breaker must be positioned no more than 2 cm from wheel rim flange.

- Remove balance weights and excessive dirt from wheel.



- Press both tyre beads off all round and liberally coat tyre and wheel rim flange with tyre assembly paste -arrow-.



5.4 Removing tyre from wheel



Caution

◆ *Follow the notes on safety ⇒ page 294*



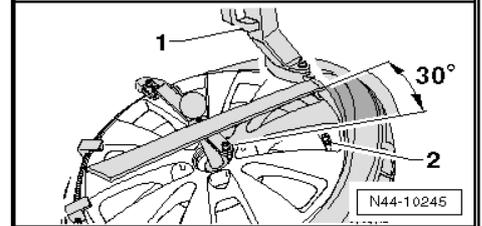
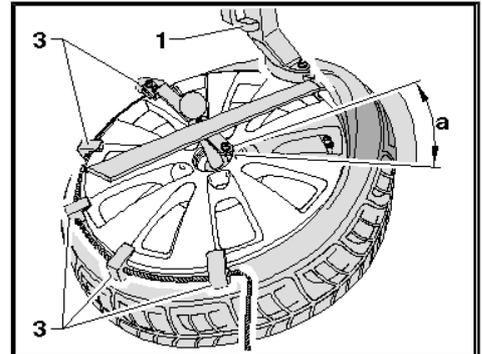
- Turn wheel on tyre fitting unit so that tyre valve/ tyre pressure sensor -2- is directly in front of assembly head -1-.



Caution

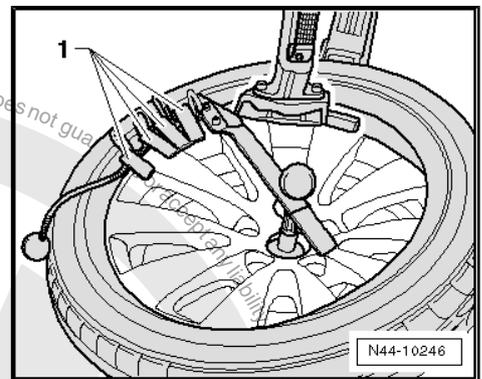
The assembly head -1- must never be within area -a- of tyre valve/tyre pressure sensor, or the assembly head will damage the tyre pressure sensor.

- Position assembly head -1- near tyre valve/ tyre pressure sensor so that an assembly lever can be inserted approx. 30° next to the tyre valve/ tyre pressure sensor -2-.
- Seat depressor -3- on wheel rim opposite assembly head -1-.
- Now lever tyre bead over assembly finger on assembly head using assembly lever then remove assembly lever.



- Run tyre fitting machine clockwise until upper bead lies completely above wheel rim flange.

This action will push the depressor -1- up against the assembly head. This allows it to be removed easily.



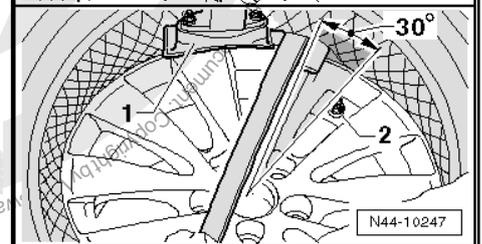
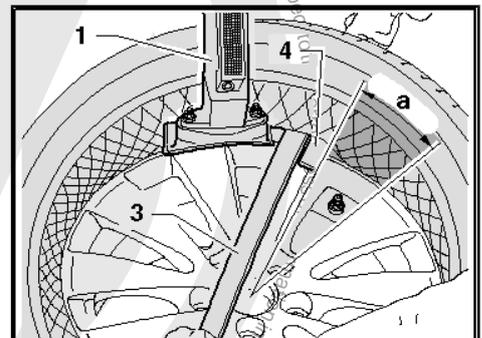
- Turn wheel on tyre fitting unit so that tyre valve/ tyre pressure sensor -2- is directly in front of assembly head -1-.



Caution

The assembly head -1- must never be within area -a- of tyre valve/tyre pressure sensor, or the assembly head will damage the tyre pressure sensor.

- Position assembly head -1- near tyre valve/ tyre pressure sensor so that an assembly lever can be inserted approx. 30° next to the tyre valve/ tyre pressure sensor -2-.
- Now lever tyre bead over assembly finger on assembly head using assembly lever -3-.
- Additionally insert a plastic assembly lever -4-.
- Remove assembly lever -3-.

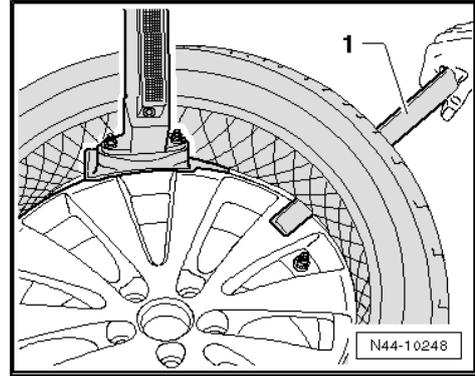




- Hold bead over wheel rim flange from outside using plastic assembly lever -1- and run tyre fitting machine clockwise until tyre is pulled completely off wheel rim.

i Note

- ◆ Check that the tyre pressure sensor is not loose or damaged. If the screwed connection is loose, replace the union nut, the valve insert, the seal, the sealing washer and the valve cap with new parts from the repair set → Electronic parts catalogue "ETKA".
- ◆ If the tyre pressure sensor is damaged, then replace the complete item → [page 304](#).

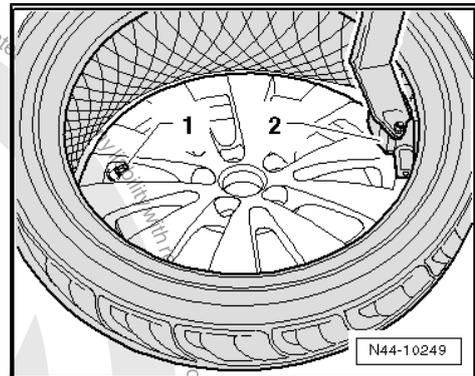


5.5 Fitting tyre to wheel rim

! Caution

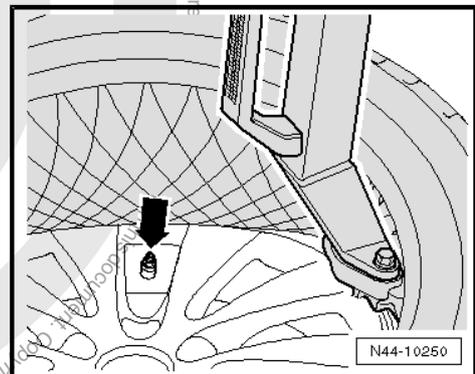
- ◆ Follow the instructions for warming cold tyres to minimum installation temperature → [page 294](#)
- ◆ Follow the notes on safety → [page 294](#)

- Coat wheel rim flanges, tyre beads and inside of upper tyre bead generously with tyre assembly paste.
- Turn wheel rim on tyre fitting unit so that tyre valve/ tyre pressure sensor -1- is directly opposite assembly head -2-.
- Run tyre fitting machine clockwise.



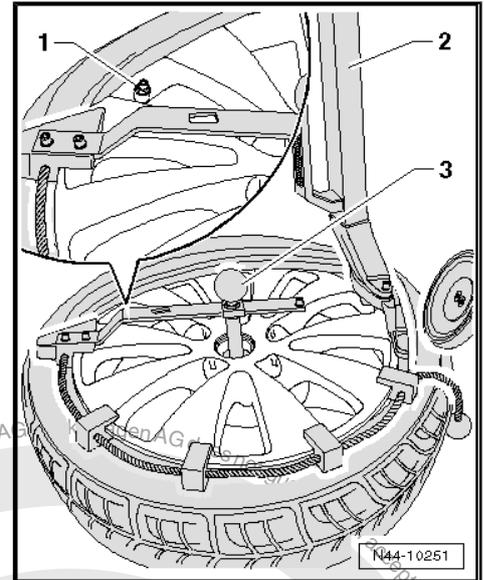
- Stop the fitting of lower bead before reaching tyre valve/ tyre pressure sensor -arrow- to prevent damage to tyre pressure sensor.

The tyre bead will now slide over the wheel rim flange. The wheel rim may only be turned until the assembly head is just before the tyre valve/ tyre pressure sensor -arrow-.





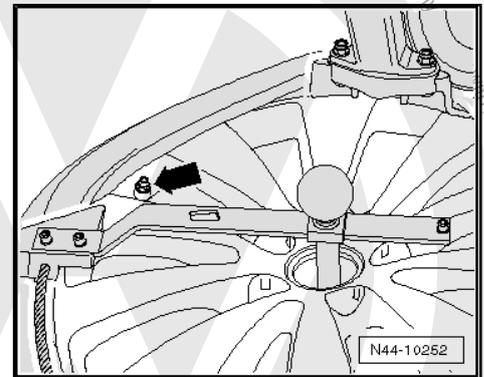
- Turn wheel rim on tyre fitting unit so that tyre valve/ tyre pressure sensor -1- is directly opposite assembly head -2-.
- Fit depressor -3- on wheel rim.
- Check to ensure that tyre bead is seated correctly on assembly head and run tyre fitting machine clockwise.



- Stop the fitting of upper bead before reaching tyre valve/ tyre pressure sensor -arrow- to prevent damage to tyre pressure sensor .

The tyre bead will now slide over the wheel rim flange. The wheel rim may only be turned until the assembly head is just before the tyre valve/ tyre pressure sensor -arrow-.

- Remove depressor from wheel rim.
- Inflate tyre to a pressure of max. 3.3 bar (bead seating pressure)



Caution

Never increase the inflation pressure when the tyre bead does not lie completely against the wheel rim flange.

This would lead to damage to the tyre and/or the wheel rim.

- When the tyre bead does not lie completely against the wheel rim flange: deflate the tyre, press tyre bead off wheel rim flange and generously coat again with tyre assembly paste.
- Inflate tyre to a pressure of max. 3.3 bar (bead seating pressure)
- If the tyre beads seat perfectly against the shoulder of the wheel rim, increase pressure to 4 bar to "seat" the tyre.
- Fit a new nickel-plated valve insert and inflate tyre to prescribed inflation pressure.
- Then balance wheel.
- Install wheel and tighten bolts to specified torque
⇒ [page 288](#) .



6 Tyre monitor display

General notes:

The tyre pressure monitor system is part of the software in the ABS control unit -J104-. The system is used to detect slow tyre pressure loss from a wheel. Fault memory entries for the tyre monitor display are stored in the ABS control unit -J104-. The tyre pressure display compares the wheel speeds and consequently the rolling circumference of the individual wheels via the ABS sensors.

After the following work or modifications, the tyre pressure monitor display button -E492- must be pressed and held until a confirmation is sounded.

- ◆ Change in tyre pressure
- ◆ Changing one or more wheels
- ◆ Interchanging wheels, e.g. from front to rear

A change in the wheel's rolling circumference will be indicated by the TPM warning lamp -K220- lighting up in the instrument cluster. A tyre's rolling circumference may change as a result of:

- ◆ Insufficient tyre inflation pressure.
- ◆ Structural tyre damage.
- ◆ One-sided loading of vehicle.
- ◆ Increased load on one axle, e.g. due to towing a trailer.
- ◆ Use of snow chains.
- ◆ Spare wheel installed.
- ◆ Wheel renewal.

System fault in the ABS system.

If a fault in the ABS is displayed by the ESP and TCS warning lamp -K155- or the traction control system warning lamp -K86-, then the tyre pressure monitor warning lamp -K220- -arrow- will also light up. However, no fault will be stored in the system for the tyre monitor display.

The warning lamp cannot be extinguished by pressing the TPM button -E492-. In this case, please carry out the following steps:

- Connect vehicle diagnosis, testing and information system - VAS 5051- and select "Guided fault finding" => Vehicle diagnosis, testing and information system VAS 5051.

Running gear

Brake system

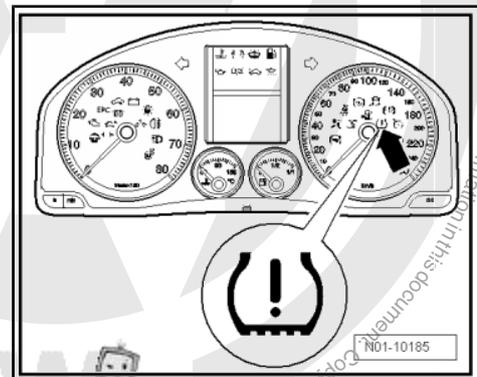
Anti-lock brake system ABS/TCS Mark 70 or anti-lock brake system ABS/EDL/TCS/ESP Mark 60 EC

Functions

Tyre pressure monitor display / Tyre pressure warning

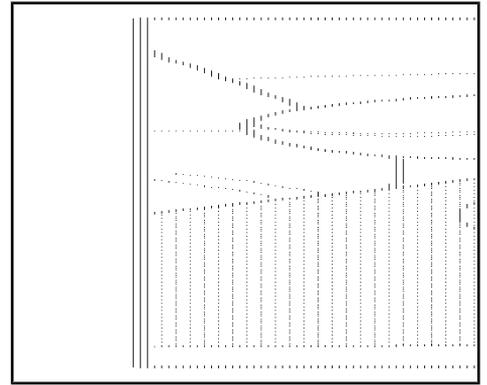
Follow instructions on screen to perform basic setting.

Perform basic setting





Following any change to the wheels, with the ignition switched on and the vehicle stationary, press the **SET** button -2- until an audible signal sounds. The audible signal confirms basic setting.





7 Tyre pressure monitor (TPM)

For detailed information on the tyre pressure monitor (TPM), refer to ⇒ Self-study programme No. 347 ; Tyre Pressure Monitoring Systems .

The tyre pressure monitor system includes wheel electronics mounted on each wheel.

At regular intervals, the wheel electronics transmit data which the central locking and anti-theft alarm system aerial receives and forwards to the tyre pressure monitor control unit -J502- .

This control unit is integrated with its own diagnostic address into the convenience system central control unit -J393- .

The tyre pressure specifications (monitoring air pressures) are set in the control unit as factory defaults.

The pressures, noted on the tank flap sticker, are valid for a set of wheels with the Volkswagen-approved tyres.

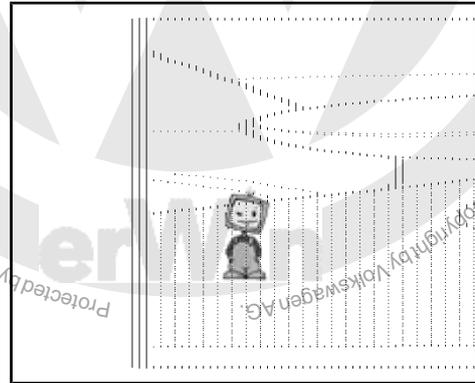
The nominal tyre pressures for this set of wheels are specified for the partially and fully laden vehicle and must not be changed.

The driver can switch between partial and full load, poll the status and switch the TPM system on or off via a **SET** button -2- in the centre console.



Caution

This button is not available for the North American region (NAR). Therefore, the function described above is omitted in this region.



Messages and warnings are indicated via the lamp in the dash panel insert and texts in the dash panel insert display.

7.1 Button behaviour

This table shows the button's behaviour in the case of various states or actions under consideration of different functions.



Caution

This button is not available for the North American region (NAR).

	Time for which the button is pressed			
	Up to 2 seconds	3-7 seconds	8-10 seconds	11-15 seconds
State or action	Actual state	Switch	Confirm	Deactivation
	Messages:	Messages:	Messages:	Messages:
Desired functions:				
Switch from full to partial load	Full tyre load monitored (gong)	Partial tyre load on!	On release: Confirmation of switching via gong	
Switch from partial to full load	Partial tyre load monitored (gong)	Full tyre load on!	On release: Confirmation of switching via gong	
Switching on	TPM off!	Partial tyre load on!	On release: Confirmation of switching via gong	



State or action	Time for which the button is pressed			
	Up to 2 seconds	3-7 seconds	8-10 seconds	11-15 seconds
	Actual state	Switch	Confirm	Deactivation
Deactivation	Full tyre load monitored or Partial tyre load monitored (gong)	Partial tyre load on! or Full tyre load on!		TPM off! (gong)
Status query	For example: TPM off! or Partial tyre load monitored (gong)	After releasing: Press longer to activate! or Press longer to switch or deactivate!		

7.2 Assembly overview - tyre pressure sensor

1 - Tyre pressure sensor

- Supplied complete as spare part.
- Removing and installing ⇒ [page 304](#)
- Replace complete tyre pressure sensor when battery is dead
- After using breakdown set, wipe clean hole for valve and opening for pressure sensor

2 - Valve core

- Allocation ⇒ Electronic parts catalogue "ETKA"
- Always renew when changing tyre



Note

3 - Sealing washer

4 - Sealing ring

- Will be slightly deformed when the union ⇒ [Item 6 \(page 303\)](#) nut is tightened

5 - Wheel

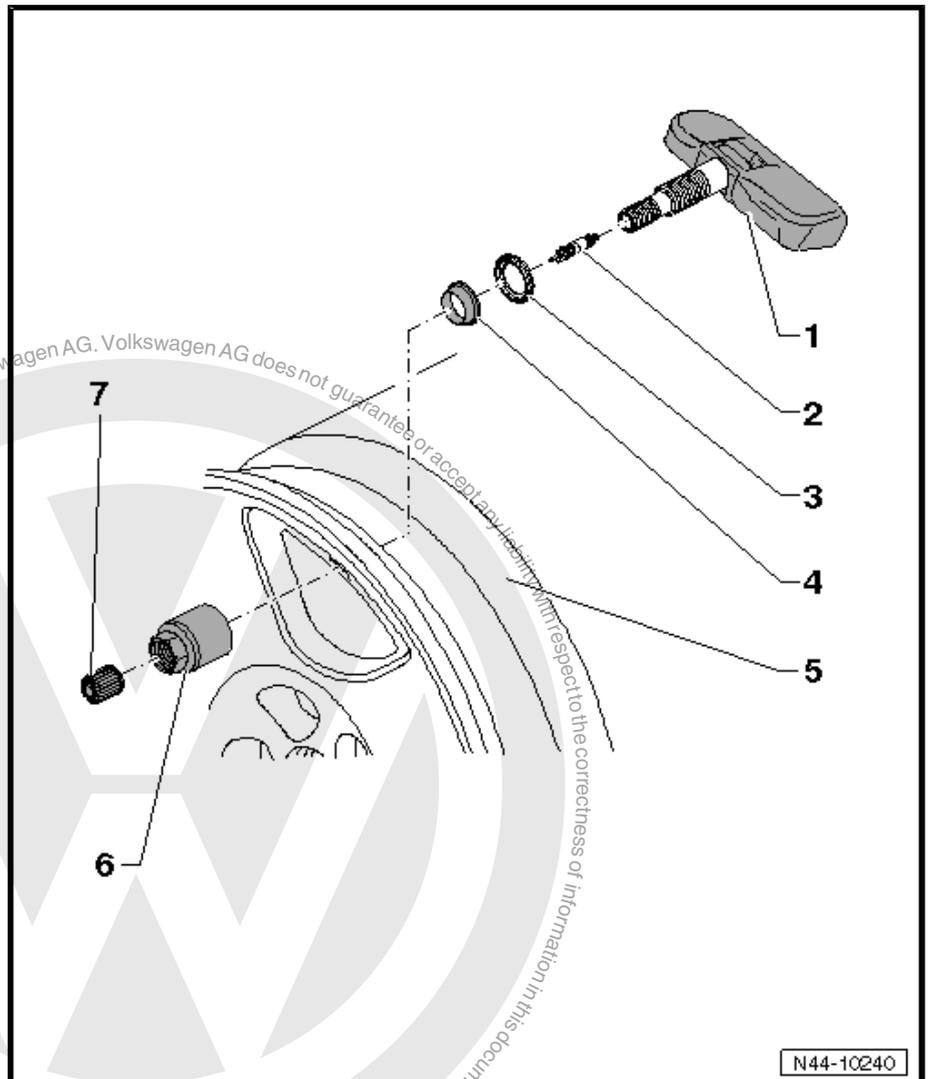
- Fitting tyres of wheels with tyre pressure monitoring ⇒ [page 290](#)
- Fitting tyres with run-flat capabilities ⇒ [page 294](#)

6 - Union nut

- 8 Nm

7 - Valve cap

- Use only genuine valve caps from repair set ⇒ Electronic parts catalogue "ETKA".



N44-10240



- ❑ Do not use convenience valve caps or metal valve caps.

7.3 Removing and installing tyre pressure sensor

Removing

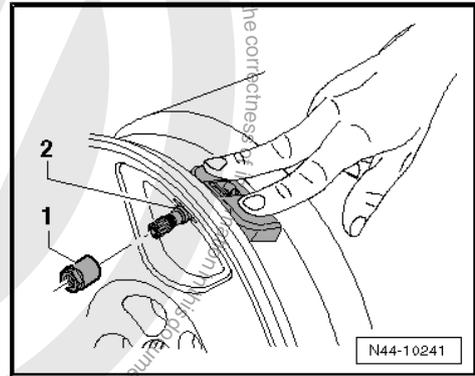
- Unscrew union nut -1-.
- Remove tyre pressure sensor -2- from bed of wheel rim.

Installing



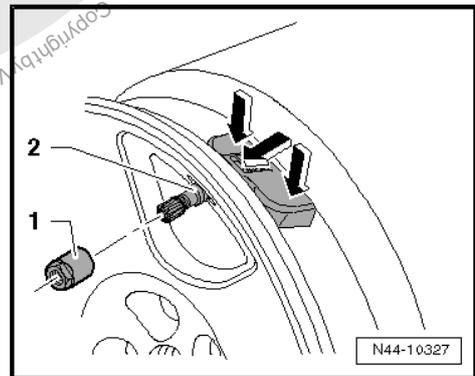
Caution

- ◆ *Before installing tyre pressure sensor , clean valve hole.*



- Install tyre pressure sensor -2- along with a new seal and sealing washer and push it into wheel rim at the points marked by -arrows-.
- Press tyre pressure sensor -2- into the wheel rim at the points marked by -arrows-.

Screw union nut -1- onto tyre pressure sensor from outside.

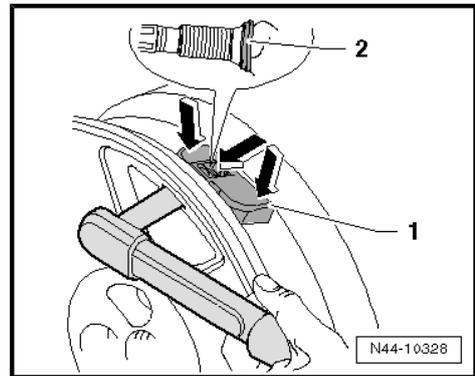


- Press tyre pressure sensor -1- onto bed of rim at the points marked by -arrows- and tighten union nut to 8 Nm.



Caution

- ◆ *Tighten nut only to specified torque.*
- ◆ *The sealing washer -2- will be deformed slightly when tightened.*
- ◆ *The sealing washer may be installed only once. Install a new sealing washer with rubber seal every time the part is fitted.*
- ◆ *Further tightening of the union nut is not permitted because the seal may be damaged, leading to leaks.*



Specified torque

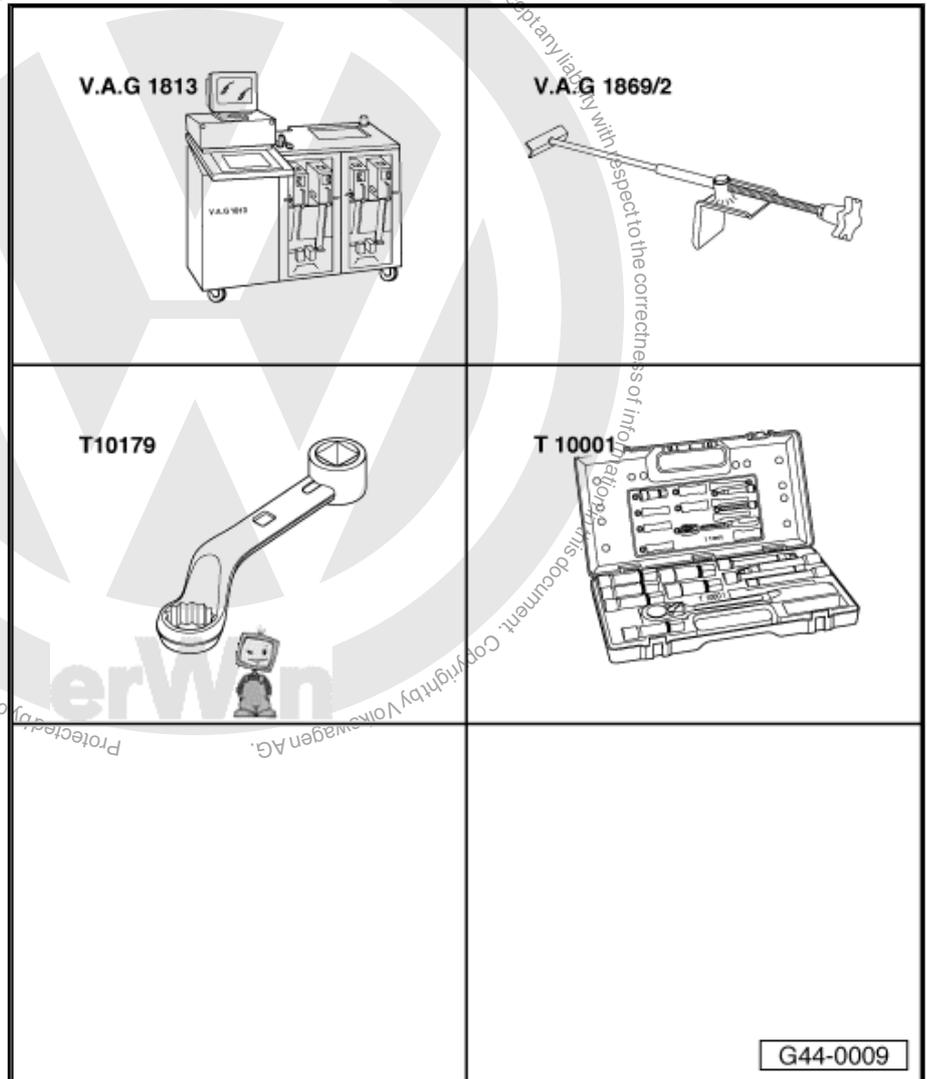
Component	Specified torque
Union nut to tyre pressure sensor	8 Nm



8 Wheel alignment

Special tools and workshop equipment required

- ◆ Wheel alignment computer -V.A.G 1813- or VW/Audi-approved wheel alignment computer
- ◆ Brake pedal actuator - V.A.G 1869/2-
- ◆ Tool insert 18 mm -T10179-
- ◆ Shock absorber set - T10001-



8.1 General

Wheel alignment must always be checked with VW/Audi-approved wheel alignment equipment.

Whenever wheels are aligned, both the front and rear axles must be measured.

Otherwise, the steering rack may not be centred!

- Perform all measurements with wheel alignment computer.

All the information required to perform alignment can be found in the wheel alignment computer.

Current data "updates" are located on VW Service Net.

⇒ VW ServiceNet; Systems; Wheel alignment computer software; Wheel alignment; Beissbarth

⇒ VW ServiceNet; Systems; Wheel alignment computer software; Wheel alignment; Hunter

⇒ VW ServiceNet; Systems; Wheel alignment computer software; Wheel alignment; Corghi



⇒ VW ServiceNet; Systems; Wheel alignment computer software; Wheel alignment; John Bean



Note

- ◆ *Wheel alignment should not be checked before the vehicle has completed 1,000 to 2,000 km because the coil springs must settle.*
- ◆ *When making adjustments, adhere to the relevant specifications as closely as possible.*

Wheel alignment is necessary if:

- ◆ The vehicle does not handle properly.
- ◆ Vehicle has been involved in an accident and components have been renewed.
- ◆ Axle components are removed or renewed.
- ◆ Tyres are worn unevenly.

Components have been renewed.

Front axle component renewed	Alignment necessary		Rear axle component renewed	Alignment necessary	
	Yes	No		Yes	No
Lower suspension link		X	Lower transverse link	X	
Bonded rubber bush for suspension link		X ¹⁾	Upper transverse link	X	
Wheel bearing housing	X		Track rod	X	
Track rod/track rod ball joint	X		Wheel bearing housing	X	
Steering box	X		Subframe	X	
Subframe		X	Coil spring		X
Suspension strut		X	Shock absorber		X
Subframe bracket	X		Anti-roll bar		X
Anti-roll bar		X ¹⁾	Trailing arm	X	

1) Prerequisite: the positions of the subframe and brackets fixed before they were removed ⇒ [page 16](#) .

Components removed and installed

Front axle component removed and reinstalled	Alignment necessary		Front axle component removed and reinstalled	Alignment necessary	
	Yes	No		Yes	No
Lower suspension link		X ¹⁾	Lower transverse link	X	
Wheel bearing housing		X	Upper transverse link	X	
Track rod/track rod ball joint	X		Track rod	X	
Steering box	X		Wheel bearing housing	X	
Subframe		X ¹⁾	Subframe	X	
Suspension strut		X	Coil spring		X
Subframe bracket		X ¹⁾	Shock absorber		X
Anti-roll bar		X ¹⁾	Anti-roll bar		X
			Trailing arm	X	



1) Prerequisite: the positions of the subframe and brackets fixed before they were removed ⇒ [page 16](#) .

8.2 Test prerequisites

- Check suspension, wheel bearing, steering and steering linkage for excessive play and damage.
- Tread depth difference of no more than 2 mm on one axle.
- Tyres inflated to correct pressure.
- Vehicle unladen.
- Fuel tank must be full.
- Spare wheel and vehicle tools are stowed in correct locations.
- The fluid reservoir for the windscreen/headlight washer system must be full.
- When checking wheel alignment, ensure that sliding plates and turn tables are not touching end stop.

Please note!

- The test equipment must be properly adjusted and attached to the vehicle; observe device manufacturer's operating instructions.

If necessary, contact the manufacturer for familiarisation with the proper use of the wheel alignment equipment.

Wheel alignment platforms and wheel alignment units and computers can lose their calibration over a period of time.

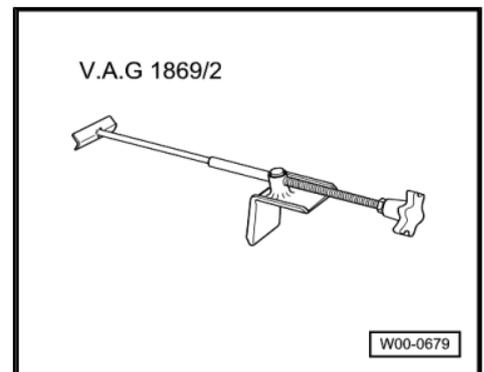
Wheel alignment platforms and alignment units and computers should be checked and adjusted as necessary during inspection and maintenance at least once per year!

- Treat these highly sensitive units carefully and conscientiously!

8.3 Test preparations

Special tools and workshop equipment required

- ◆ Brake pedal actuator -V.A.G 1869/2-



The existing lateral runout of the wheel must be compensated for. Otherwise, the result of the measurement will be incorrect.

If runout compensation is not performed, it is not possible to adjust toe-in correctly!

Observe information provided by the manufacturer of the wheel alignment unit.

- Carry out wheel run-out compensation.



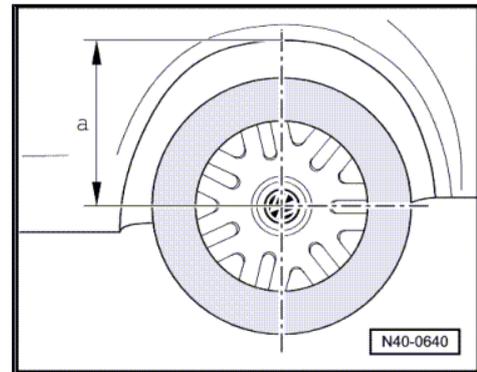
- Fit brake pedal actuator -V.A.G 1869/2- .
- Use brake pedal depressor to depress brake pedal.

8.4 Wheel alignment specifications, Golf

These specifications apply to all engines.

◆ Explanation of PR Nos. can be found here => [page 317](#) .

The ride heights shown in the table refer to dimension -a-.



Front axle	Standard running gear	Sports running gear except 18' wheels	Sports running gear with 18' wheels	Heavy-duty running gear
PR numbers	2UA	2UC	G02, G05, G07, 2UC	2UB
Total toe (without load)	10' ± 10'	10' ± 10'	10' ± 10'	10' ± 10'
Camber (in straight-ahead position)	-30' ± 30'	-41' ± 30'	-41' ± 30'	-14' ± 30'
Maximum permissible difference between sides	max. 30'	max. 30'	max. 30'	max. 30'
Toe-out on turns ¹⁾ at 20° left and right lock	1°38' ± 20'	1°40' ± 20'	1°40' ± 20'	1°38' ± 20'
Caster	7° 34' ± 30'	7° 47' ± 30'	7° 47' ± 30'	7° 17' ± 30'
Maximum permissible difference between sides	max. 30'	max. 30'	max. 30'	max. 30'
Ride height	382 ± 10 mm	367 ± 10 mm	367 ± 10 mm	402 ± 10 mm

¹⁾ Toe-out on turns can be displayed as a negative value on the wheel alignment computer, depending on the manufacturer.

Front axle	Sports running gear GTI	Sports running gear GTI US version	Sports running gear R32	BlueMotion
PR numbers	G08	G11	G09	G04/2UC
Total toe (wheels not pressed)	10' ± 10'	10' ± 10'	10' ± 10'	10' ± 10'
Camber (in straight-ahead position)	-44' ± 30'	-30' ± 30'	-43' ± 30'	-41' ± 30'
Maximum permissible difference between sides	max. 30'	max. 30'	max. 30'	max. 30'
Toe-out on turns ¹⁾ at 20° left and right lock	1°22' ± 20'	1°38' ± 20'	1°20' ± 20'	1°40' ± 20'
Caster	7° 47' ± 30'	7° 34' ± 30'	7° 47' ± 30'	7° 47' ± 30'
Maximum permissible difference between sides	max. 30'	max. 30'	max. 30'	max. 30'



Front axle	Sports running gear GTI	Sports running gear GTI US version	Sports running gear R32	BlueMotion
PR numbers	G08	G11	G09	G04/2UC
Ride height	360 ± 10 mm	382 ± 10 mm	362 ± 10 mm	367 ± 10 mm

1) Toe-out on turns can be displayed as a negative value on the wheel alignment computer, depending on the manufacturer.

These specifications apply to all engines.

◆ Explanation of PR Nos. can be found here ⇒ [page 317](#) .

Rear axle, front-wheel drive and 4WD	Standard running gear	Sports running gear except 18' wheels	Sports running gear with 18' wheels	Heavy-duty running gear
Camber	-1° 20' ± 30'	-1° 20' ± 30'	-1°45' ± 30'	-1°20' ± 30'
Maximum permissible difference between sides	max. 30'	max. 30'	max. 30'	max. 30'
Total toe (at specified camber)	+10' ± 12.5'	+10' ± 12.5'	+10' ± 12.5'	+10' ± 12.5'
Max. permissible deviation from direction of travel	max. 20'	max. 20'	max. 20'	max. 20'
Ride height	380 ± 10 mm	365 ± 10 mm	365 ± 10 mm	400 ± 10 mm

Rear axle, front-wheel drive and 4WD	Sports running gear GTI	Sports running gear GTI US version	Sports running gear R32	BlueMotion
Camber	-1°45' ± 30'	-1° 20' ± 30'	-1°45' ± 30'	-1° 20' ± 30'
Maximum permissible difference between sides	max. 30'	max. 30'	max. 30'	max. 30'
Total toe (at specified camber)	+10' ± 12.5'	+10' ± 12.5'	+10' ± 12.5'	+10' ± 12.5'
Max. permissible deviation from direction of travel	max. 20'	max. 20'	max. 20'	max. 20'
Ride height	365 ± 10 mm	380 ± 10 mm	360 ± 10 mm	365 ± 10 mm

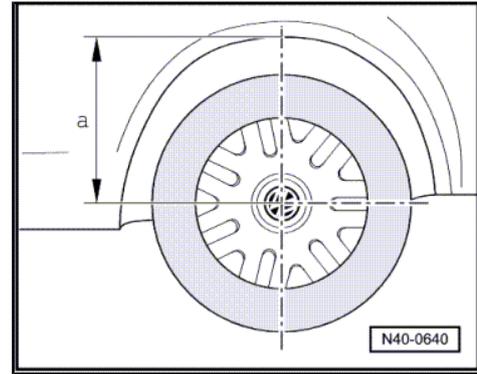
8.5 Wheel alignment specifications, Golf Plus, CrossGolf

These specifications apply to all engines.

◆ Explanation of PR Nos. can be found here ⇒ [page 317](#) .



The ride heights shown in the table refer to dimension -a-.



Front axle	Standard running gear	Sports running gear except 18' wheels	Sports running gear with 18' wheels	Heavy-duty running gear
PR numbers	2UA	2UC	G02, G07, 2UC	2UB
Total toe (without load)	10' ± 10'	10' ± 10'	10' ± 10'	10' ± 10'
Camber (in straight-ahead position)	-30' ± 30'	-41' ± 30'	-41' ± 30'	-14' ± 30'
Maximum permissible difference between sides	max. 30'	max. 30'	max. 30'	max. 30'
Toe-out on turns ¹⁾ at 20° left and right lock	1°38' ± 20'	1°40' ± 20'	1°40' ± 20'	1°38' ± 20'
Caster	7° 34' ± 30'	7° 47' ± 30'	7° 47' ± 30'	7° 17' ± 30'
Maximum permissible difference between sides	max. 30'	max. 30'	max. 30'	max. 30'
Ride height	383 ± 10 mm	368 ± 10 mm	368 ± 10 mm	403 ± 10 mm

¹⁾ Toe-out on turns can be displayed as a negative value on the wheel alignment computer, depending on the manufacturer.

These specifications apply to all engines.

◆ Explanation of PR Nos. can be found here: [⇒ page 317](#) .

Front axle	CrossGolf	Golf Plus BlueMotion
PR numbers	2UB	G06
Total toe (wheels not pressed)	10' ± 10'	10' ± 10'
Camber (in straight-ahead position)	-14' ± 30'	-37' ± 30'
Maximum permissible difference between sides	max. 30'	max. 30'
Toe-out on turns ¹⁾ at 20° left and right lock	1°38' ± 20'	1°27' ± 20'
Caster	7° 17' ± 30'	7° 40' ± 30'
Maximum permissible difference between sides	max. 30'	max. 30'
Ride height	400 ± 10 mm	373 ± 10 mm

¹⁾ Toe-out on turns can be displayed as a negative value on the wheel alignment computer, depending on the manufacturer.

These specifications apply to all engines.

◆ Explanation of PR Nos. can be found here: [⇒ page 317](#) .



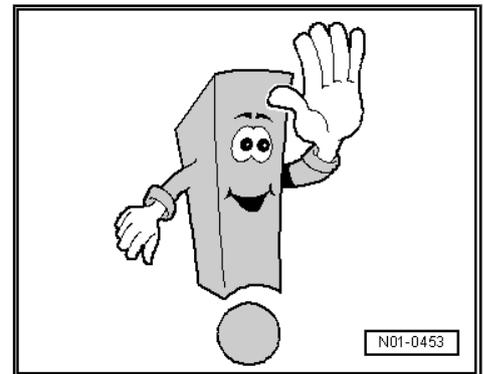
Rear axle, front-wheel drive and 4WD	Standard running gear	Sports running gear except 18" wheels	Sports running gear with 18" wheels	Heavy-duty running gear
Camber	-1° 20' ± 30'	-1° 20' ± 30'	-1° 45' ± 30'	-1° 20' ± 30'
Maximum permissible difference between sides	max. 30'	max. 30'	max. 30'	max. 30'
Total toe (at specified camber)	+10' ± 10'	+10' ± 10'	+10' ± 10'	+10' ± 10'
Max. permissible deviation from direction of travel	max. 20'	max. 20'	max. 20'	max. 20'
Ride height	378 ± 10 mm	363 ± 10 mm	363 ± 10 mm	398 ± 10 mm

Rear axle, front-wheel drive and 4WD	CrossGolf	Golf Plus BlueMotion
Camber	-1° 20' ± 30'	1° 20' ± 30'
Maximum permissible difference between sides	max. 30'	max. 30'
Total toe (at specified camber)	+10' ± 10'	+10' ± 10'
Max. permissible deviation from direction of travel	max. 20'	max. 20'
Ride height	395 ± 10 mm	370 ± 10 mm

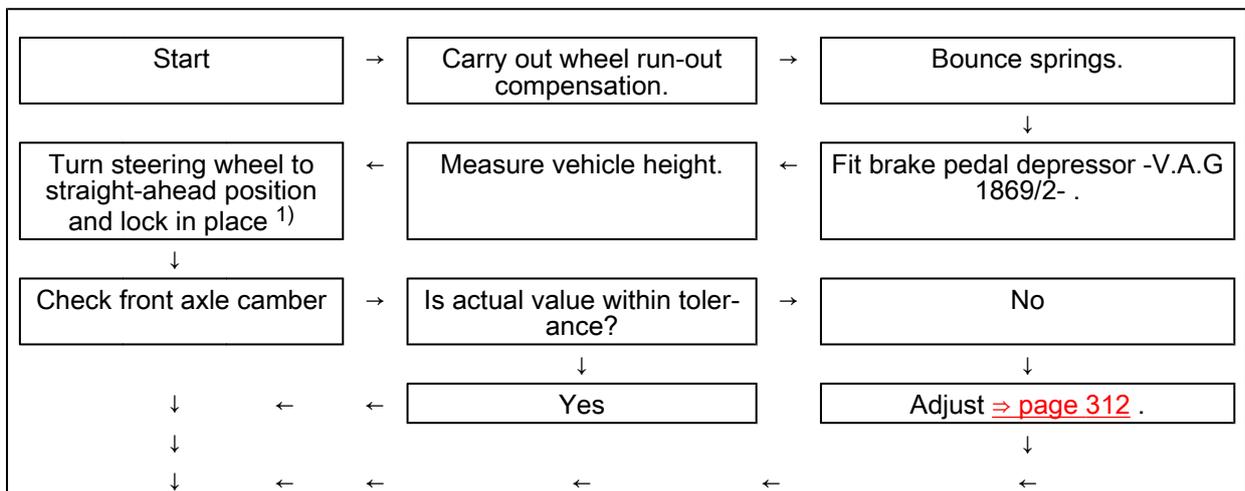
8.6 Overview - wheel alignment procedure

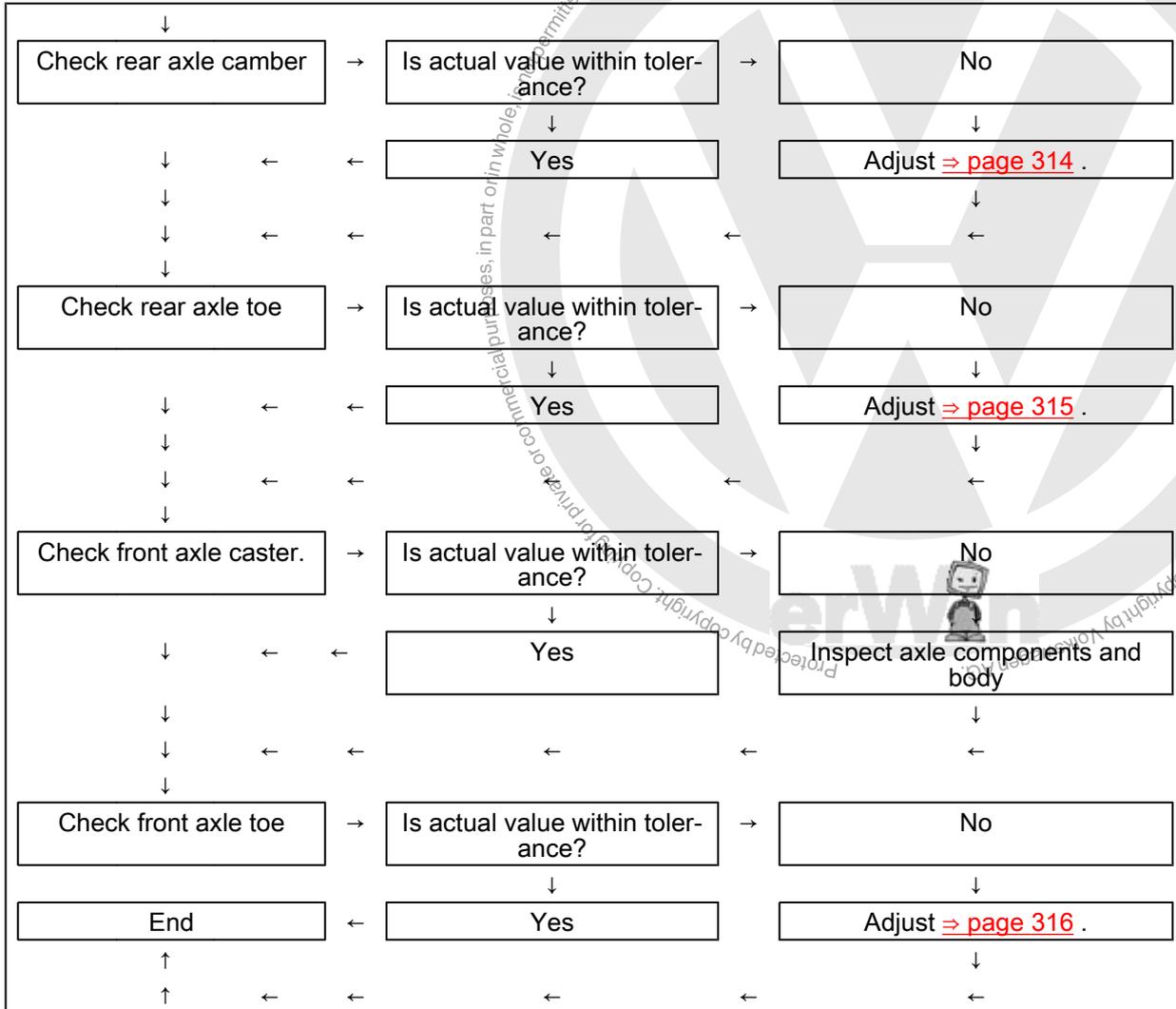
Always adhere to the following procedure!

- Observe instructions on your wheel alignment device.



Alignment procedure



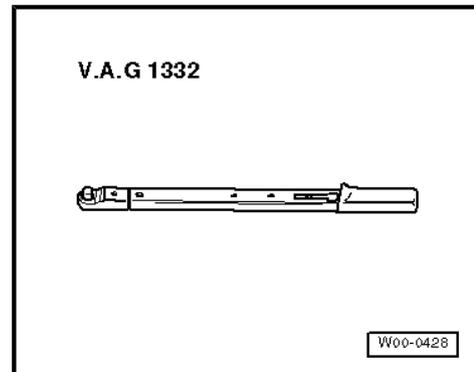


1) If steering wheel is not centred, it must be straightened after wheel alignment is finished. Then perform basic settings for steering angle sensor -G85- using vehicle diagnosis, testing and information system -VAS 5051- .

8.7 Correcting front axle camber

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1332-





i Note

- ◆ *Camber correction is necessary only after body repairs. The camber is not adjustable, but can be equalized by moving the brackets and/or the subframe.*
- ◆ *Move subframe only to left or right, but never in or opposite to direction of normal travel!*

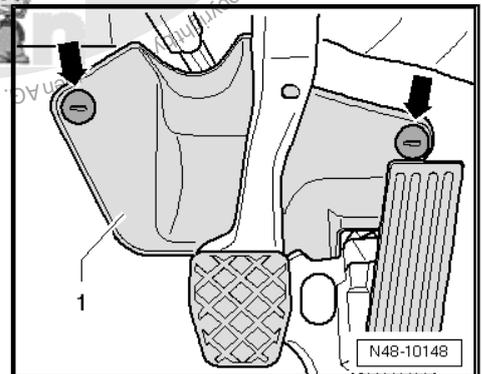
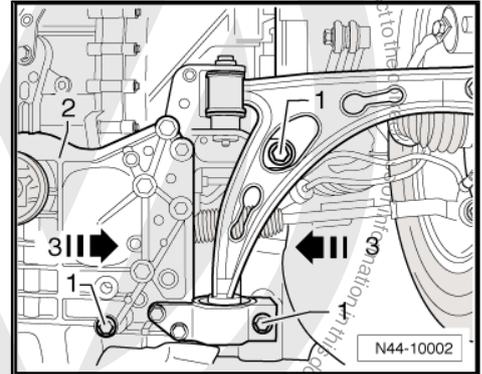
- Remove noise insulation.
- Loosen bolts -1- for bracket attachment and subframe to body on both sides.

The camber adjustment range is limited by the tolerances within the bores in the brackets and the subframe. If the specified value is not reached by moving the components, these and the body must be inspected => [page 1](#).

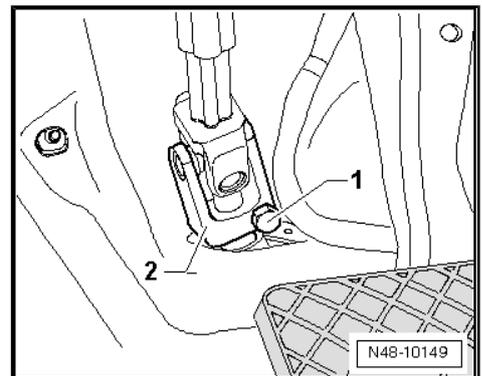
- Specification for camber may be adjusted by moving subframe at brackets.
- Tighten bolts for subframe and brackets to body to specified torque plus extra turn angle.

Following the movement of the subframe and, consequently, the steering box, clearance between the steering column universal joint and the notch in the bulkhead must be checked.

- Remove securing nuts -arrows- and remove footwell trim.



There must be a clearance of 5 mm all round between universal joint -2- and recess in bulkhead.



Specified torques

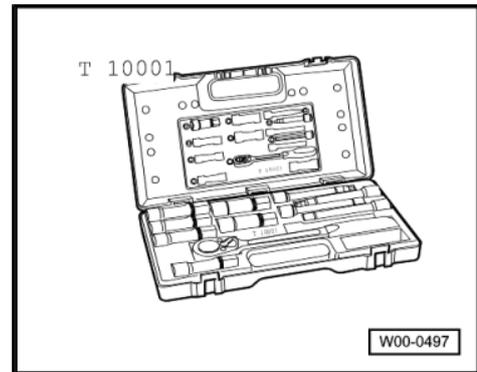
Component	Specified torque
Subframe to body ◆ Use new bolts	70 Nm + 90°
Bracket to body ◆ Use new bolts	70 Nm + 90°



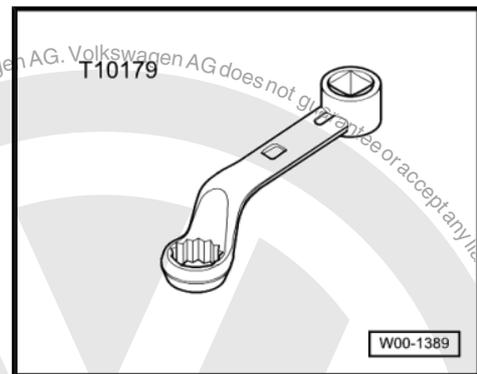
8.8 Adjusting camber on rear axle

Special tools and workshop equipment required

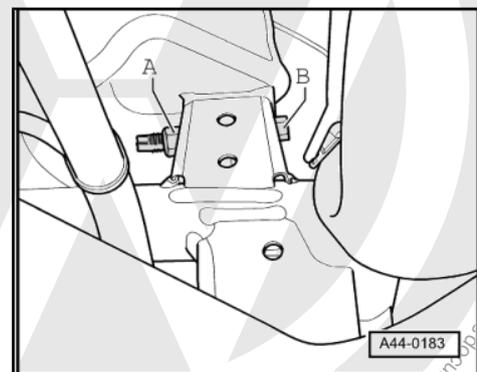
- ◆ Shock absorber set -T10001-



- ◆ Tool insert 18 mm -T10179-



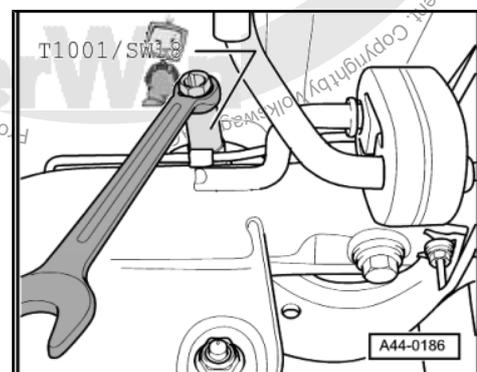
- Loosen upper transverse link nut -A- on subframe.



- Adjust camber by turning eccentric bolt -B- with 18 mm socket -T10001- .

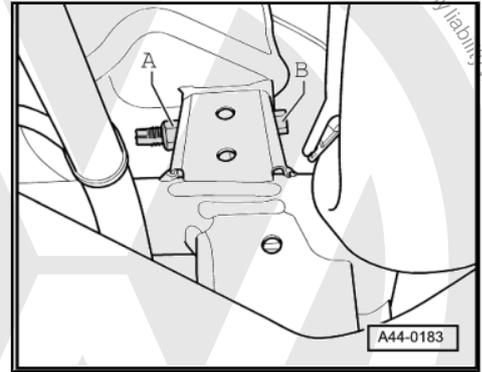
Note

The maximum adjustment range is 90° to the left or right of centre.



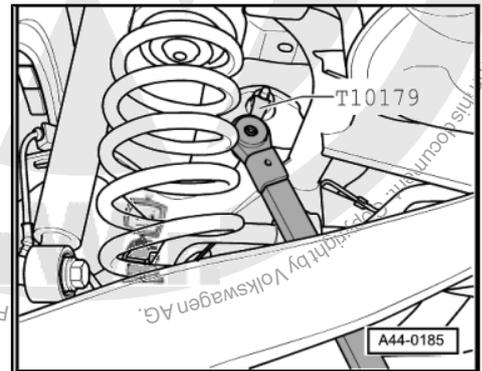


- Tighten nut -A-.



- Use socket (18 mm) -T10179-

- Check camber value again after tightening nut -A-.



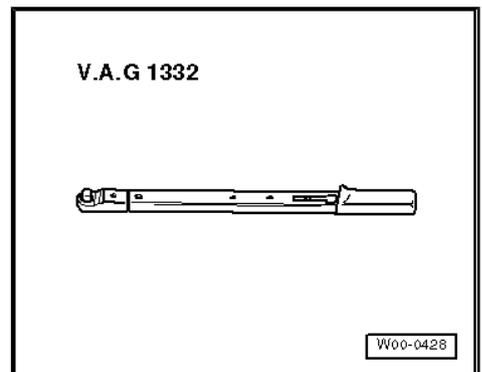
Specified torques

Component	Specified torque
Upper transverse link to subframe (vehicles with front-wheel drive) ◆ Use new nut ◆ Tighten threaded connections only when vehicle is in the normal running position.	95 Nm ◆ To tighten nuts, set torque wrench -V.A.G 1332- to 80 Nm ◆ Applies only in conjunction with insert tool, 18 mm -T10179-
Upper transverse link to subframe (vehicles with front-wheel drive) ◆ Use new nut ◆ Tighten threaded connections only when vehicle is in the normal running position	95 Nm ◆ To tighten nuts, set torque wrench -V.A.G 1332- to 80 Nm ◆ Applies only in conjunction with insert tool, 18 mm -T10179-

8.9 Adjusting toe at rear axle

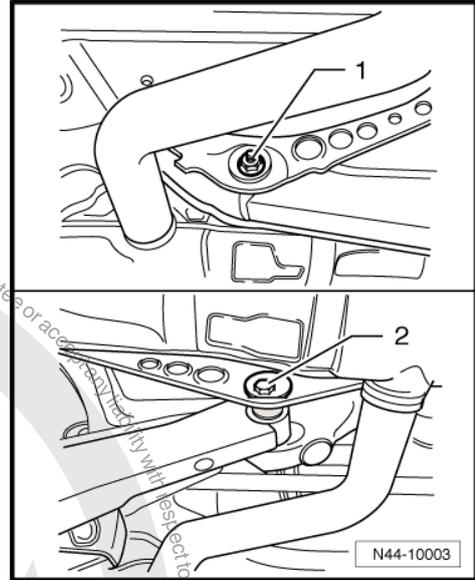
Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1332-





- Loosen nut -1-.
- Turn eccentric bolt -2- until specification is attained.
- Now tighten nut.



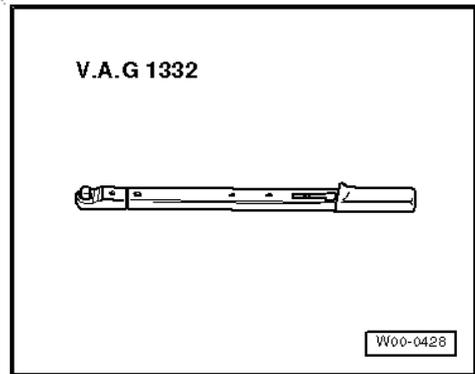
Specified torque

Component	Specified torque
Lower transverse link to subframe ♦ Use new nut ♦ Tighter threaded connections only when vehicle is in the normal running position.	95 Nm

8.10 Adjusting front axle toe

Special tools and workshop equipment required

- ♦ Torque wrench -V.A.G 1332-

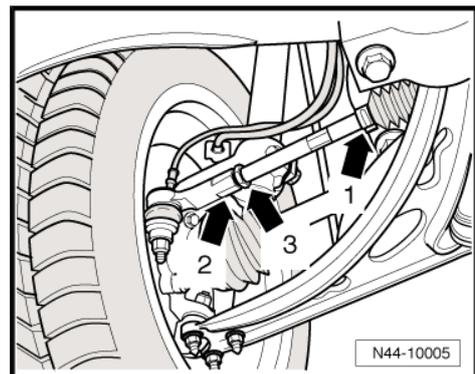


- ♦ Tool insert 24 mm -V.A.G 1332/11-
- Loosen lock nut -3- while counterholding on head of track rod -2-.
- Pull spring-type clip -1- off boot.
- Adjust toe by turning left and/or right track rod.

To do this, use an open jaw spanner on hexagon flats on track rod.

After turning track rods, ensure that boots are not twisted.

Twisted boots wear out quickly.



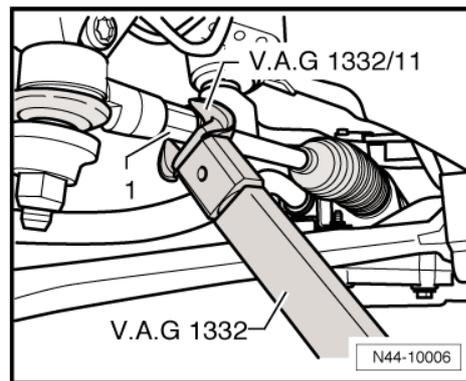


- Tighten lock nut using tool insert 24 mm -V.A.G 1332/11- while counterholding on track rod ball joint -1-.
- Check toe values again.

It is possible that the value will change slightly when lock nut is tightened.

However, if the measured toe value lies within the tolerance, the adjustment is correct.

- Fit spring-type clip to boot.



Specified torques

Component	Specified torque
Track rod ball joint to track rod	50 Nm

8.11 Basic setting for steering angle sender - G85-

If steering wheel was realigned, basic settings for steering angle sensor -G85- must be checked. → Perform basic settings in guided fault finding using vehicle diagnosis, testing and information system -VAS 5051- .

Select "Select function/component" by pressing button.

8.12 Vehicle data sticker

Explanation of "PR numbers" on vehicle data sticker

Various types of running gear are installed depending on engine and equipment level. These are identified by the PR numbers.

The PR numbers are critical in determining the wheel alignment specifications.

The running gear version fitted in the vehicle is indicated on the vehicle data sticker by the PR number for the front axle.

The vehicle data sticker can be found in the spare wheel well and in the service booklet.

Example of a vehicle data sticker

In this example the vehicle is equipped with the standard running gear G02 -arrow-.

134									
wwwzzz 1K z 4B000068									
1 K 1 1 31									
GOLF 1,9 TDI COMFO									
77 5F									
BKC GQQ									
LA7W ---- ---- KG									
0A2	B0A	CM4	G0C	H6L	J1D	D3W	-		
V0A	1AT	1GB	2ZB	1NL	5RQ	58L	T71		
ODE	DAR	3U3	QQ1	-	RA0	SGU	SZH		
-	1KQ	1ZE	3FE	3YR	G02	0GG	-		
-	-	-	4X4	4R4	4	N2N	SMA		
SRW	-	-	0AE	-	-	-	-		
1JC	1	2	-	-	-	-	-		
-	-	-	-	-	-	-	-		
N44-10387									

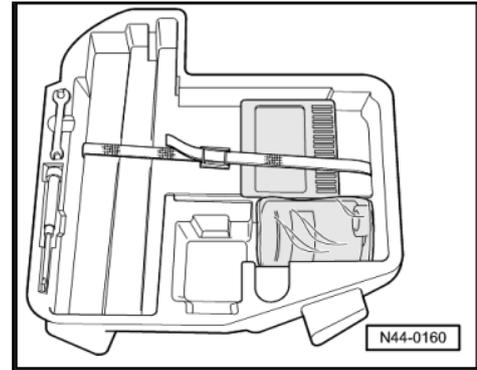


9 Wheels, tyres

9.1 Models with breakdown set

Golf models are equipped with either a spare wheel or a breakdown set.

The breakdown set is located in the luggage compartment where normally the spare wheel would sit. It consists of a compressor and a bottle of tyre sealant.



9.2 Tyre sealant

The tyre sealant in the bottle has a limited shelf-life.

The bottle therefore has an expiry date -arrow-.

In this example, the expiry date of 05/2003 has been exceeded and the bottle must be renewed.

If the bottle has been opened, e.g. to repair a tyre, then it must also be renewed.



9.3 Removing a tyre

Tyres which have been filled or sealed using tyre sealant must be drained before removal.



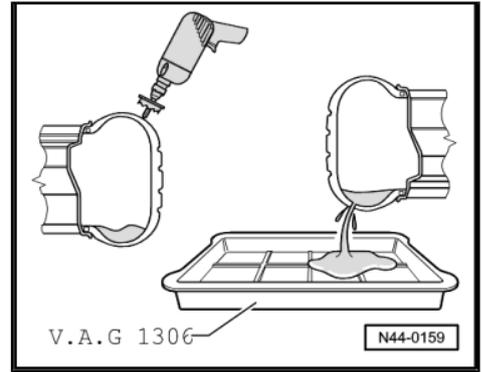
WARNING

- ◆ **Avoid eye and skin contact with tyre sealant.**
- ◆ **It is a health hazard and may cause eye irritation and allergies.**
- ◆ **Wear eye protection and protective gloves whilst working on the tyre.**

- Place wheel on a flat surface.
- Remove valve insert of tyre valve.

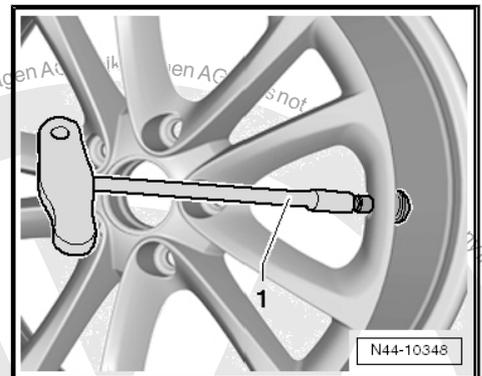


- Use a suitable drill or mill to carefully drill a hole in shoulder area of tyre.
- Hold wheel over a suitable container and drain sealant.
- Remove tyre from wheel rim.
- Clean wheel rim with, for example, a moist cloth.



9.4 Fitting a new tyre

- Ensure that the wheel rim is clean.
- Insert new tyre valve with -VAS 6459- -1-.
- Remove valve insert.
- Inflate tyre to approx. 3 bar . . . 4 bar. The bead of the tyre must slip audibly over the hump of the rim.
- Screw in valve insert.
- Correct inflation pressure to prescribed pressure.
- Balance wheel.



9.5 Tyre sealant disposal

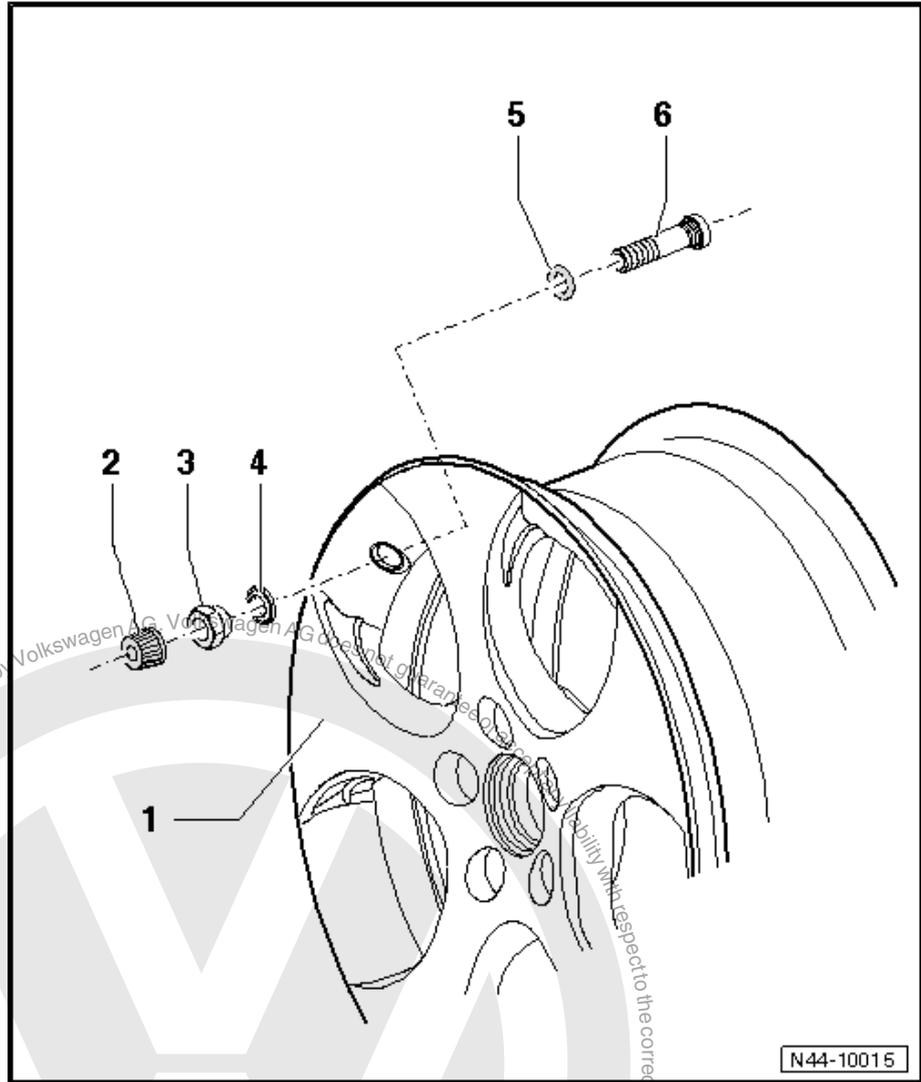
- ◆ Tyre sealant or residue must not be mixed or disposed of with other fluids.
- ◆ Excess tyre sealant must be collected and stored in a plastic container. The plastic container can be disposed of through the disposal system along with the breakdown set (when the expiry date is exceeded).
- ◆ The items can be returned or disposed of through the existing workshop disposal system.
- ◆ Request information through your service provider or the disposal representative at your distribution centre or importer.

9.6 Alloy wheels with metal valves

As of model year 2005, hollow-chamber wheels have been fitted as part of certain equipment variants. These hollow-chamber wheels are fitted with metal valves instead of the usual rubber valves. Metal valves must be renewed completely each time a tyre is changed.



- 1 - Wheel
- 2 - Valve cap
- 3 - Nut
- 4 Nm
- 4 - Washer
- 5 - Sealing ring
- 6 - Metal valve





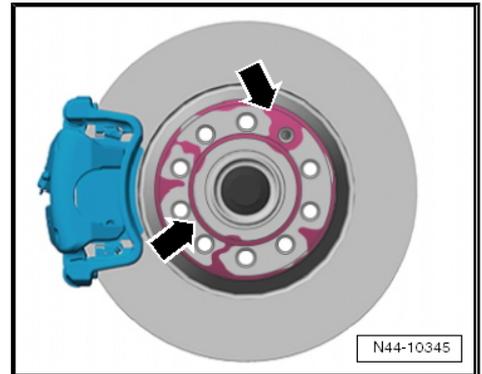
10 Instructions for changing or fitting wheels



WARNING

Perform the checks and follow the instructions listed below. This is important to ensure that the wheel bolts and the wheels are properly secured.

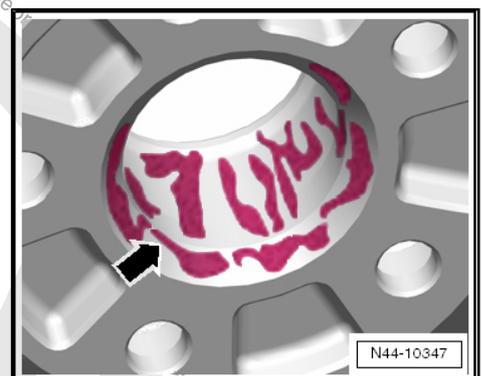
- Check to ensure that contact surfaces -arrows- on brake disc are free of corrosion and dirt.



- Check to ensure that contact surface -arrow- on centring seat of brake disc are free of corrosion and dirt.



- Check to ensure that contact surface -arrow- on inner side of wheel (rim) and also centring seat of rim are free of corrosion and dirt.



- The spherical caps * in the holes for the wheel bolts and the threads of the wheel bolts must also be free of corrosion and dirt, oil or grease.

* A spherical cap is the curved surface of a section of a sphere cut by a plane.



- Check whether the wheel bolts can be easily screwed in by hand. The thread of the wheel bolts must not come into contact the bore in the brake disc -arrow-.

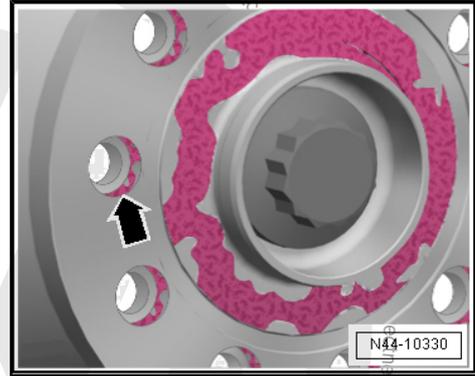
If the thread of the wheel bolt touches the hole -arrow-, turn the brake disc relative to the wheel hub accordingly.

Remove dirt and corrosion, oil or grease from the contact surfaces, threads in the wheel hub and/or wheel bolts as necessary.



WARNING

Damaged, badly corroded or difficult to remove wheel bolts must be renewed.



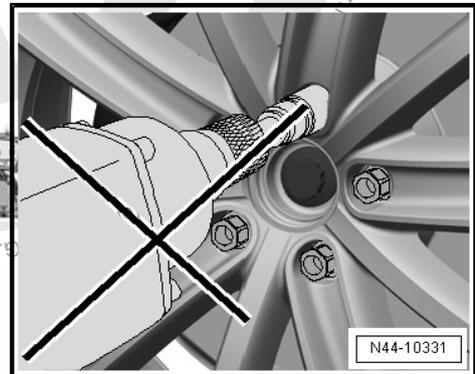
10.1 Fitting wheels

- Preserve wheel centring seat => [page 323](#) .
- 1 - When fitting the wheel, screw in all wheel bolts uniformly by hand.
- 2 - Tighten the wheel bolts in diagonal sequence to approx. 30 Nm.
- 3 - Lower the vehicle to the floor and tighten all wheel bolts diagonally to the specified torque using the torque wrench => [page 288](#) .



WARNING

Do not use an impact driver when screwing in the bolts!





11 Protecting wheel centring seat against corrosion

Valid for light alloy and steel wheels

When a wheel is installed, wheel centring seat should be waxed with

Wax spray -D 322 000 A2-

to prevent corrosion between the wheel centring seat and the wheel rim.

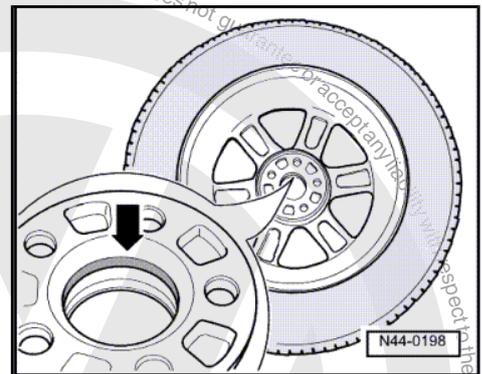
- Remove wheel.
- Clean wheel centring seat of hub and centring ring of wheel rim.
- Apply wax to centring ring -arrow- with a brush.

Ensure that only centring ring -arrow- but not contact surface of wheel rim has been waxed. Otherwise, the brakes will be soiled, which would reduce the braking efficiency.



WARNING

Wheel bolts, contact surfaces of wheel hub and wheel rim and wheel hub threads must not be waxed. Never treat wheel securing bolts with lubricant or corrosion protection materials!



- Install wheel and tighten => [page 288](#) .





12 Rough running due to wheels/tyres - causes and rectification

Causes of rough running ⇒ [page 324](#)

Balancing wheels ⇒ [page 324](#)

Conducting a road test before balancing wheels ⇒ [page 325](#)

Balancing wheels on stationary wheel balancing machine
⇒ [page 325](#)

Vibration control system -VAS 6230- ⇒ [page 327](#)

Finish balancer ⇒ [page 327](#)

Radial and lateral run-out on wheels and tyres ⇒ [page 328](#)

Checking radial and lateral runout on wheels and tyres with tyre gauge -V.A.G 1435- ⇒ [page 328](#)

Checking radial and lateral run-out on wheel rim ⇒ [page 329](#)

Matching ⇒ [page 330](#)

Flat spots caused by storage or handling ⇒ [page 331](#)

12.1 Causes of rough running

Rough running can have a number of different causes. It can also be caused by tyre wear. Tyre wear caused by driving is not always evenly spread across the entire running surface of the tyre. This causes slight imbalances which affect the smooth running of a wheel which was previously exactly balanced.

Minor imbalances will not be felt at the steering wheel, but that does not mean that they are not there. They increase wear on the tyre and thus reduce the tyre service life.

Recommendation

To ensure

- optimal safety,
- smoothest possible running and
- even wear

throughout a tyre's service life, we recommend having the wheels and tyres balanced at least twice during the tyre's service life.

12.2 Balancing wheels

Before you start balancing the wheels, the following requirements must be met.

- The tyre pressure must be OK.
- The tyre tread must not show one-sided wear and should be at least 4 mm deep.
- The tyre must not show any signs of damage, for example cuts, piercing, foreign bodies, etc.
- The wheel suspension, steering and steering linkage, including the shock absorbers, must be in perfect condition.
- You must have conducted a road test.



12.3 Conducting a road test before balancing wheels

If a customer brings a vehicle to the workshop complaining about "vibration", a road test is essential prior to balancing the wheels.

- ◆ This will give you information about the nature of the rough running.
- ◆ You will be able to determine in which speed range the rough running occurs.
- Raise the vehicle on a lifting platform immediately after the road test.
- Mark the positions of the tyres on the vehicle.

Tyre position	Marked with ...
Front left tyre	FL
Front right tyre	FR
Rear left tyre	RL
Rear right tyre	RR

- Remove wheels from vehicle.
- Balance the wheels.

12.4 Balancing wheels on stationary wheel balancing machine

- Road test has been carried out => [page 325](#) .

Clamp wheel into wheel balancing machine



Note

When balancing wheels, please remember that cleanliness is absolutely essential, as indeed it is in the case of any other repair work you carry out. Only then can you attain a flawless result!

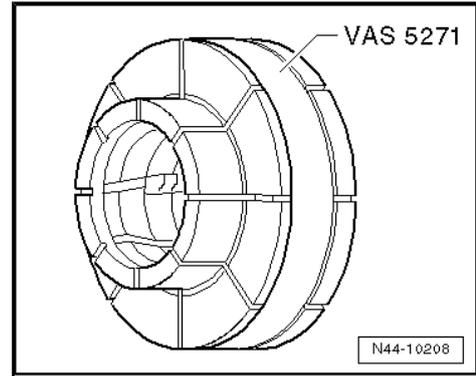
Dirt and rust in the area of the contact surfaces and centre of the wheel distort the result.

- Clean the contact surfaces, the centre of the wheel and the recess on the inside of the wheel before mounting the wheel on the wheel balancer.
- Mount the wheel with tyre on the wheel balancer.



Note

- ◆ To clamp the wheel, use e.g. centring system for wheel balancing machines -VAS 5271- .
- ◆ This ensures that the wheel is 100% centred and that the wheel will be clamped without damage!
- ◆ The wheel cannot be centralised 100% with conical clamping elements on the wheel balancing machine.
- ◆ A deviation of 0.1 mm from the centre results in an imbalance of 10 grams at the wheel/rim.



Procedure for balancing wheels and tyres

- Rotate wheel and tyre on wheel balancer.
- Check that the indicator lines on the sidewall of the tyre near the wheel rim flange run evenly.
- Check that the body of the tyre runs evenly while the wheel and tyre are rotating.



Note

If one-sided wear, flat spots from braking or severely washed out spots are apparent, balancing cannot achieve smooth running. In this case, the tyre must be renewed.

- Check the true running of the wheel and tyre. If the wheel and tyre do not run true although there are no flat spots, radial or lateral runout may be the cause.
- Check the wheel for radial or lateral runout ⇒ [page 328](#) .
- If radial and lateral runout are within the specified tolerance, balance the wheel and tyre.



Note

- ◆ More than 60 grams of weight per tyre should not be used.
- ◆ If more weight is required, you may be able to achieve smoother running by "matching" the tyre and rim. Matching tyres ⇒ [page 330](#) .
- ◆ The wheel balancer display should indicate 0 gram.
- ◆ As an alternative to match mounting, you could use the vibration control system -VAS 6230- ⇒ [page 327](#) .

- Bolt the wheel to the vehicle.
- First hand-tighten the lowest wheel bolt to about 30 Nm.
- Then tighten the remaining wheel bolts diagonally to about 30 Nm. This process centres the wheel on the hub.
- Lower vehicle onto its wheels.
- Now use a torque wrench to tighten the wheel bolts to the specified torque in diagonal sequence.

Carry out road test

- After balancing the wheels and tyres, carry out a road test.



If you detect vibration during the road test, it may be due to tolerance in the wheel centring.

In unfavourable circumstances, the component tolerances of wheels and hubs could cumulate. This too can lead to vibration. This can be alleviated using a finish balancer. => [page 327](#)

12.5 Vibration control system -VAS 6230-

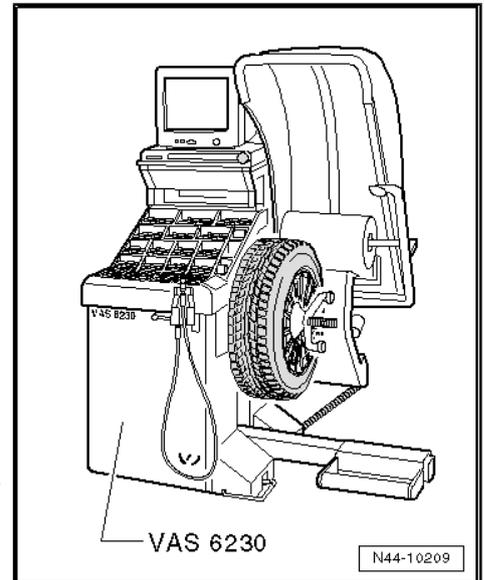
Using the vibration control system -VAS 6230- you can perform more functions than just stationary balancing.

A special feature of this system is the testing of the radial force of the wheel and tyre while rolling.

A roller presses against the wheel with a force of about 635 kg. This simulates the vertical tyre force against the road surface during travel.

Radial and lateral runout in the wheel and tyre and differences in the stiffness of the tyre cause the vertical force of the wheel to vary.

The -VAS 6230- detects and stores the position of the maximum measured radial force in the tyre. Then the position of the smallest distance between the wheel rim flange and the centre of the rim is measured.



12.6 Finish balancer



Note

- ◆ *Before working with a finish balancer, the mechanic needs to have been instructed by the manufacturer of the balancer.*
- ◆ *To balance the wheels, set the wheels of the driven axle on the sensor platforms (only the front wheels of a front-wheel drive vehicle, all four wheels of a four-wheel drive vehicle).*

If you determine a residual imbalance greater than 20 grams when balancing the wheels, you should rotate the mounting position of the wheel on the hub.

- Mark the point at which the imbalance is indicated.
- Unbolt the wheel and rotate its position on the hub so that the marking points downwards.



Note

The hub must not rotate during this procedure.

- First hand-tighten the lowest wheel bolt to about 30 Nm.
- Then tighten the remaining wheel bolts diagonally to about 30 Nm. This process ensures that the wheel is centred properly on the hub.
- Check whether the imbalance is less than 20 grams using the finish balancer.



Note

The imbalance should always be less than 20 grams before you change the balance weight.

- If necessary, remove the wheel bolts again.
- Rotate the wheel relative to the hub once more, turning it one or two wheel bolt holes further.
- Tighten the wheel bolts using the method described above.



Note

Do not try to reduce the imbalance using balance weights until the imbalance is less than 20 grams.

- Balance the wheels until the imbalance is less than 5 grams.
- Tighten wheel bolts to specified torque if you have not already done so.



WARNING

Always tighten wheel bolts to specified torque using a torque wrench!

12.7 Radial and lateral runout of wheels and tyres

Radial and lateral runout occur when the wheel and tyre do not run absolutely true.

For technical reasons, 100% true running is not possible.

Therefore, the manufacturers of these components allow a precisely determined tolerance.

Mounting the tyre in an unfavourable position on the wheel can cause the maximum allowed tolerance for wheel with tyre to be exceeded.

The table shows the maximum permissible tolerances for a wheel with mounted tyre.

Tolerances for radial and lateral runout of wheels with tyres

Wheel with tyre	Radial runout (mm)	Lateral runout (mm)
Passenger cars	0.9	1.1 (1.3 in vicinity of lettering)

12.8 Checking radial and lateral runout on wheels and tyres with tyre gauge -V.A.G 1435-

Checking lateral runout

- Preload tyre gauge about 2 mm.



- Set tyre gauge against sidewall of tyre.
- Slowly rotate the wheel.
- Note the smallest and the largest dial readings.

i Note

If the difference is greater than 1.3 mm, the lateral runout is too great.

In this case, you can reduce lateral runout by match mounting the tyre => [page 330](#) .

Extreme values on the tyre gauge due to small irregularities in the rubber may be disregarded.

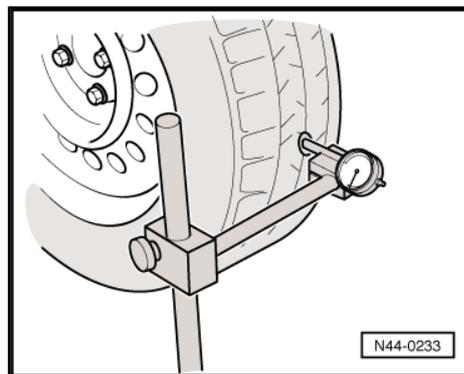
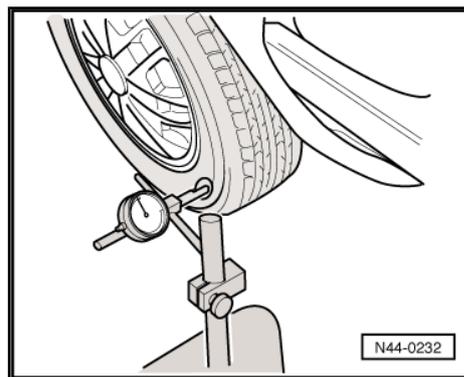
Checking radial runout

- Preload tyre gauge about 2 mm.
- Set the tyre gauge against the tyre tread.
- Slowly rotate the wheel.
- Note the smallest and the largest dial readings.

i Note

If the difference is greater than 1 mm, the radial runout is too great.

In this case, you can reduce radial runout by match mounting the tyre => [page 330](#) .

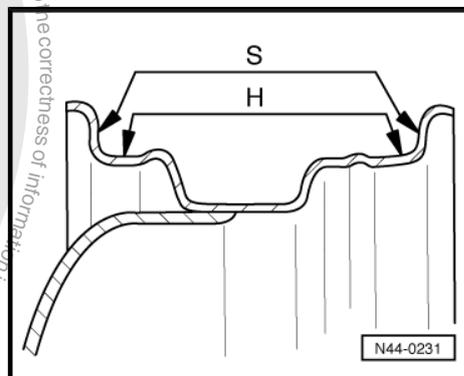


12.9 Checking radial and lateral runout on wheel

- Mount the wheel on the wheel balancer .
 - Use the wheel balancing machine centring system -VAS 5271- .
 - Preload tyre gauge about 2 mm.
 - Slowly rotate the wheel.
 - Note the smallest and the largest dial readings.
- S - Lateral runout
 H - Radial runout
- Compare the measured values with the specifications in the table => [page 329](#) .

i Note

Extreme values on the tyre gauge due to small irregularities may be disregarded.



Specifications for radial and lateral runout on wheel

Wheel	Radial runout (mm)	Lateral runout (mm)
Steel wheel	0.5	0.5



Wheel	Radial runout (mm)	Lateral runout (mm)
Alloy wheel	0.5	0.8



Note

If the measured value exceeds the specification, acceptably smooth running cannot be attained.

12.10 Matching

General

When radial or lateral runout of the wheel and tyre coincide, the imbalance of the wheel is amplified by the tyre.

For technical reasons, 100% true running is not possible
⇒ [page 328](#).

Before match mounting the used wheels which are fitted on the vehicle, run the tyres warm. This will eliminate any flat spots caused by storage or handling, ⇒ [page 331](#).

Procedure for match mounting

- Deflate the tyre.
- Press the tyre beads off the rim flanges.
- Coat the tyre bead all round with tyre fitting paste.
- Rotate the tyre 180° relative to the wheel.
- Inflate the tyre to approx. 4 bar.
- Mount the wheel with tyre on the wheel balancer.
- Check true running, that is, radial and lateral runout.



Note

- ◆ If the specified values for radial and lateral runout are not exceeded, the wheel can be balanced to 0 gram. Specified values appear on ⇒ [page 328](#).
 - ◆ If the radial and lateral runout is not within the specifications, the tyre must be rotated again.
- Deflate the tyre and press off the tyre beads from the rim flanges.
 - Rotate the tyre 90° with respect to the wheel (1/4 of a turn).
 - Inflate the tyre to 4 bar again and check true running.



Note

- ◆ If the specified values for radial and lateral runout are not exceeded, the wheel can be balanced to 0 gram.
 - ◆ If the radial and lateral runout are not within the specified values, the tyre must be rotated again.
- Press the tyre off the rim flanges again as described above.
 - Rotate the tyre 180° with respect to the wheel (1/2 a turn).



If the radial and/or lateral runouts are still not within the specifications, check the radial and/or lateral runouts of the wheel:
⇒ [page 329](#) .

If the measured values for radial and lateral runout of the wheel are within the specified values, the tyre has an impermissibly high radial or lateral runout. In this case, the tyre must be renewed.

 **Note**

- ◆ *After fitting the tyres there will be fitting lubricant between the tyres and the rim flanges.*
- ◆ *Therefore, severe braking and acceleration manoeuvres must be avoided for the first 100 or 200 km driven. The tyres may otherwise rotate on the rims and your work will have been in vain.*

12.11 Flat spots caused by storage or handling

What is a flat spot?

The term flat spot describes a type of wear where one patch or spot of the tyre has become flat.

Flat spots caused by storage or handling also cause vibration in the same way as incorrectly balanced wheels do. It is important that flat spots on the tread are identified as such.

Flat spots caused by storage or handling cannot be balanced and they can reoccur at any time due to various circumstances. Flat spots caused by storage or handling can be eliminated without complicated special tools. Assuming it is not a flat spot caused by full-on braking ⇒ Wheel and Tyre Guide - Series; Rep. Gr. 44 ; Rolling noises due to tyres, locked brake flat spots .

 **Note**

Flat spots caused by hard braking cannot be repaired. Such tyres must be renewed.

Reasons for flat spots caused by storage or handling:

- ◆ The vehicle has been left standing in one place without being moved for several weeks.
- ◆ The tyre inflation pressure is too low.
- ◆ The vehicle was placed in a paint shop drying booth after being painted.
- ◆ The vehicle was parked with warm tyres in a cool garage or similar for a long period of time. In this case, a standing flat spot may even occur overnight.

Eliminating flat spots caused by storage or handling

- ◆ Flat spots caused by storage or handling cannot be eliminated from the tyre using workshop equipment.
- ◆ Flat spots caused by storage or handling can be removed only by running the tyres warm.
- ◆ The method described below is not recommended in cold and wintry weather.

Requirements and conditions:

- Check and, if necessary, correct inflation pressures.



- Drive the car on a motorway where possible.
- Traffic and road conditions permitting, drive a 20 to 30 km stretch at a speed of 120 to 150 km/h.



WARNING

- ◆ *Do not endanger yourself or other road users during this road test.*
- ◆ *Observe the highway code and speed limitations in force when performing the road test.*

- Raise the vehicle immediately following the road test.
- Remove the wheels from the vehicle.
- Balance the wheels on a stationary wheel balancer
⇒ [page 325](#) .





48 – Steering

1 Appraisal of accident vehicles

A checklist for evaluating running gear of accident vehicles can be found under [⇒ page 1](#) .





2 General repair instructions

To achieve the desired results when performing repairs on the steering box it is important to work with the greatest possible care and cleanliness, and to use proper tools in good condition. Also note the basic rules on safety when performing repair procedures.

A number of general notes on the individual repair procedures, which were otherwise repeated in the relevant sections of the manual, are summarised here. They apply for this particular workshop manual.

For a description of the design and function of the steering assembly, see ⇒ Self-study programme No. 317 ; The electromechanical power-assisted steering with double pinion .

2.1 Steering box

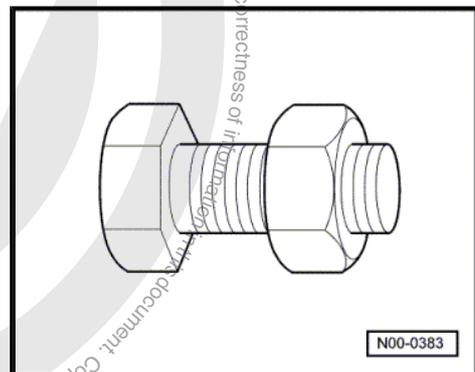
- ◆ Thoroughly clean all unions and the adjacent areas before disconnecting.
- ◆ When installing the steering box, make sure that dowel sleeves between bracket and steering box are seated correctly.
- ◆ Place removed parts on a clean surface and cover them to prevent them from getting dirty. Use sheeting and paper for this purpose. Use only lint-free cloths.
- ◆ Fit only clean parts; remove new parts from their packaging only immediately prior to fitting.
- ◆ Use only the grease and sealants with specified part numbers.
- ◆ If repairs cannot be carried out immediately, carefully cover or seal open components.
- ◆ Two different types of steering boxes were fitted in model year 2004. Notes on identification ⇒ [page 398](#).
- ◆ From model year 2009, a new, 3rd generation, steering box is being used. Notes on differentiating between 2nd and 3rd generations ⇒ [page 399](#).

2.2 Gaskets and seals

- ◆ Always renew gaskets and seals.
- ◆ After removing all seals, inspect the contact faces on housings and shafts for burrs and damage and remove all which are found.
- ◆ Completely remove all residue from liquid sealants from the sealing surfaces, making sure that no residual sealant gets into the steering box housing.

2.3 Nuts and bolts

- ◆ Loosen and tighten bolts and nuts securing covers and housings diagonally.
- ◆ Avoid canting sensitive parts such as servo motor with control unit. Loosen and tighten them diagonally in stages.
- ◆ Specified torques given are for unlubricated nuts, bolts and screws.
- ◆ Always renew self-locking nuts and bolts.

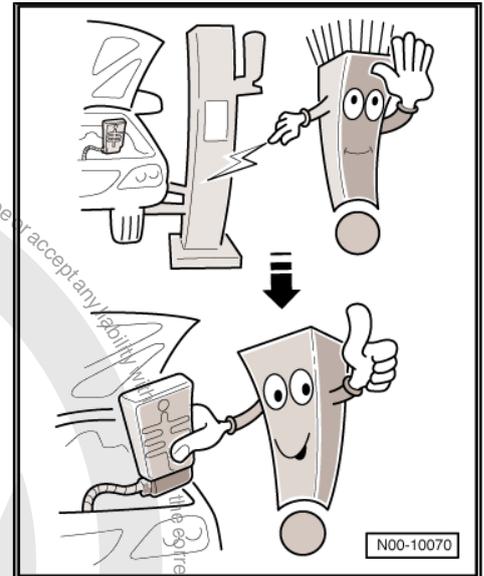




2.4 Electrical components

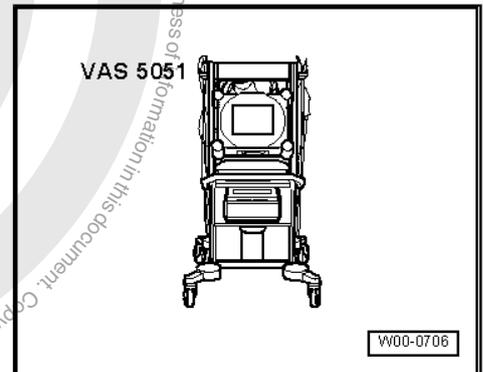
At some point, you have probably received an electric shock when touching a metal object. This is due to the electrostatic charge accumulated by the human body. This charge can cause malfunctions if you touch the electric steering box components.

- Before working on electrical components, touch an earthed object, such as a water pipe or a lifting platform. Do not touch the contact pins of the electrical connectors with bare hands.



2.5 Guided fault-finding, vehicle self-diagnosis and test instruments

- ◆ Before performing repair work on the electromechanical steering box, determine the cause of damage as precisely as possible using the vehicle diagnosis, testing and information system -VAS 5051- in "guided fault finding", "vehicle self-diagnosis" and "test instruments" operating modes.



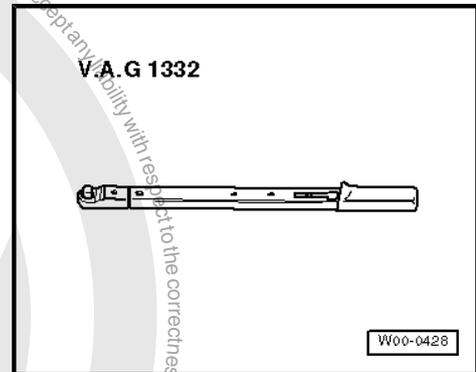


3 Steering wheel

3.1 Removing and installing steering wheel

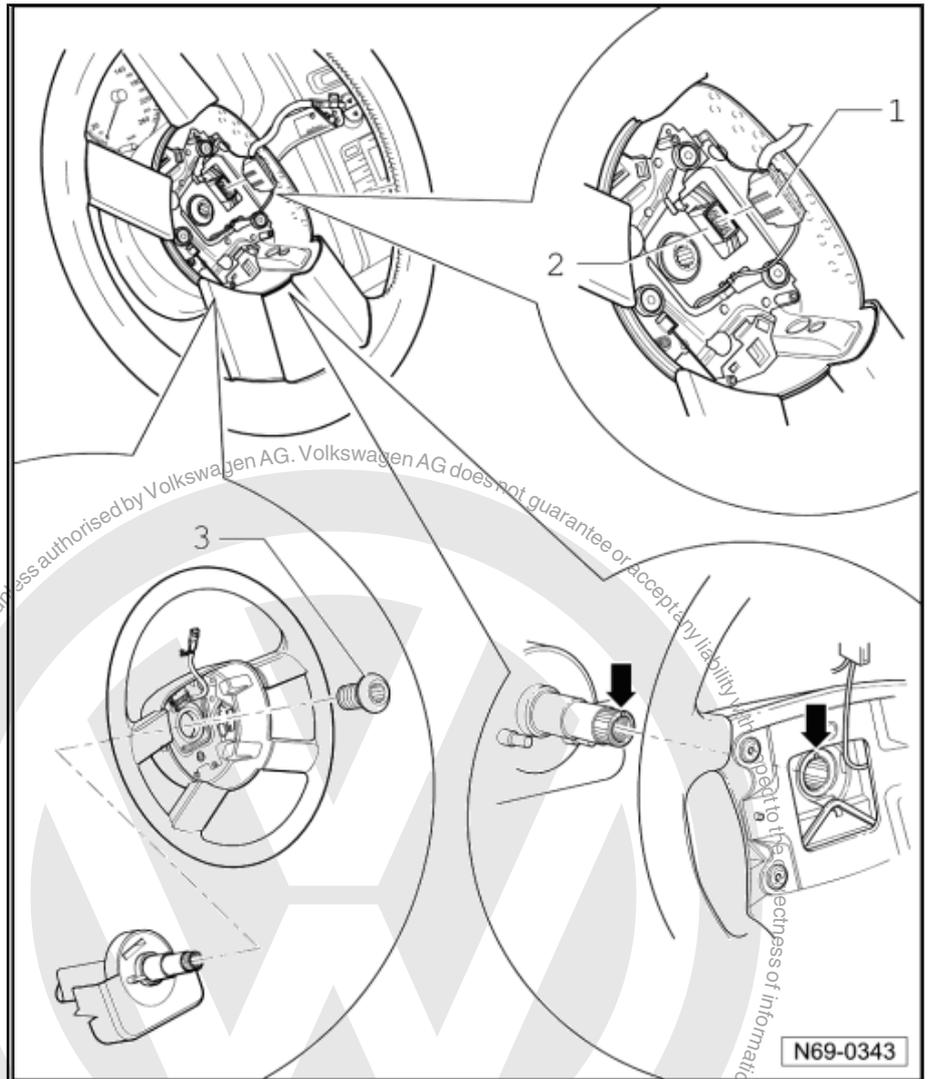
Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1332-



Removing

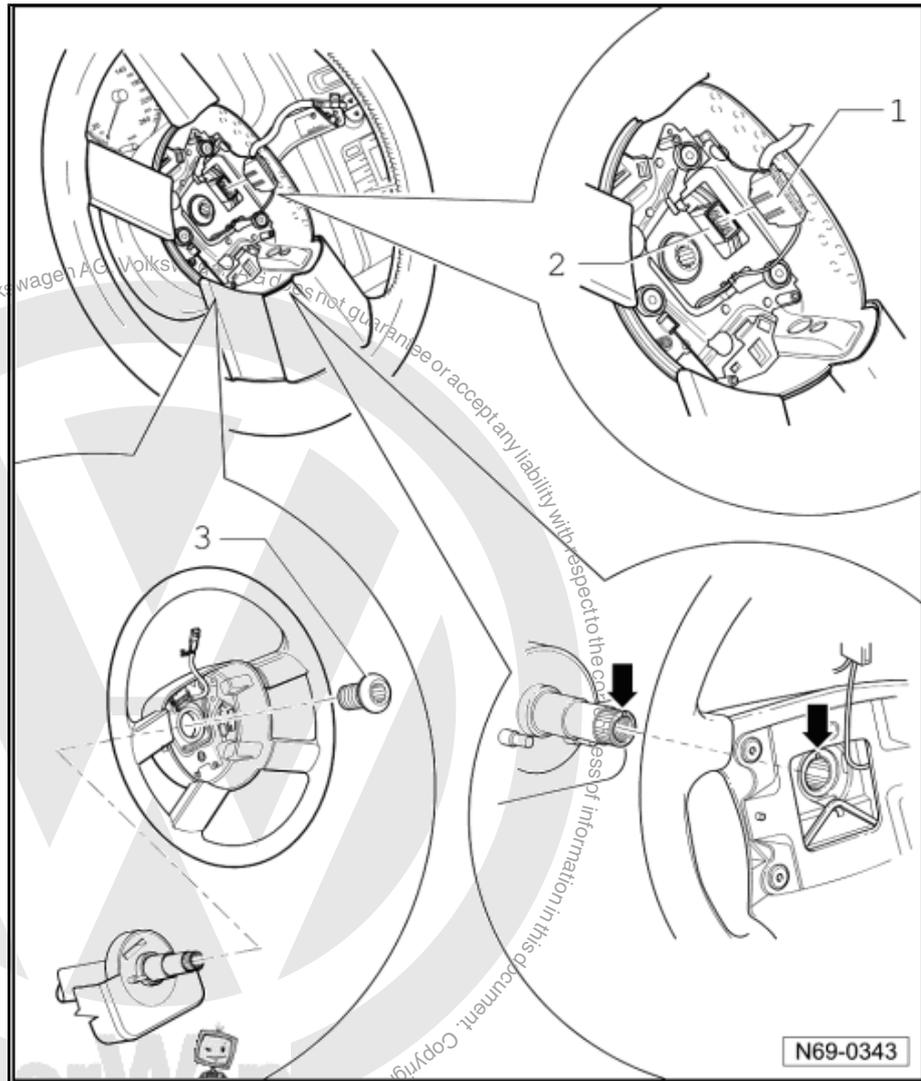
- Remove driver side airbag unit ⇒ Rep. Gr. 69 ; Airbag; Removing and installing driver side airbag unit .
- Separate connections -1 and 2- for coil connector.



- Centre steering wheel (wheels in straight-ahead position).
- Remove bolt -3- and pull steering wheel from steering column.

Installing

- Set steering wheel onto steering column.
- Centre markings of steering wheel and steering column -arrows- must align.



- Guide connector for steering angle sender -G85- into intended opening in the base of steering wheel.
- Join connector -1- with connector -2- of steering angle sender -G85- .
- Secure steering wheel with bolt -3-.

Specified torque

Component	Specified torque
Steering wheel to steering column ◆ Always renew bolt	30 Nm + 90° further



4 Steering column, Golf

4.1 Assembly overview: steering column



Note

- ◆ It is not permitted to weld or straighten load-bearing or wheel-guiding components of the suspension.
- ◆ Always renew self-locking nuts.
- ◆ Always renew corroded nuts and bolts.

1 - Bolt

- 20 Nm

2 - Cross member for steering column

3 - Mounting bracket

- Removing and installing
 ⇒ [page 346](#)

4 - Bolt

- 20 Nm
- Always renew after removing

5 - Steering column

- Removing and installing
 ⇒ [page 339](#)

6 - Handle

7 - Bolt

- 3 Nm

8 - Crash bar for brake pedal

9 - Crash bar for clutch pedal

10 - Bolt

- 30 Nm
- Always renew after removing

11 - Strut

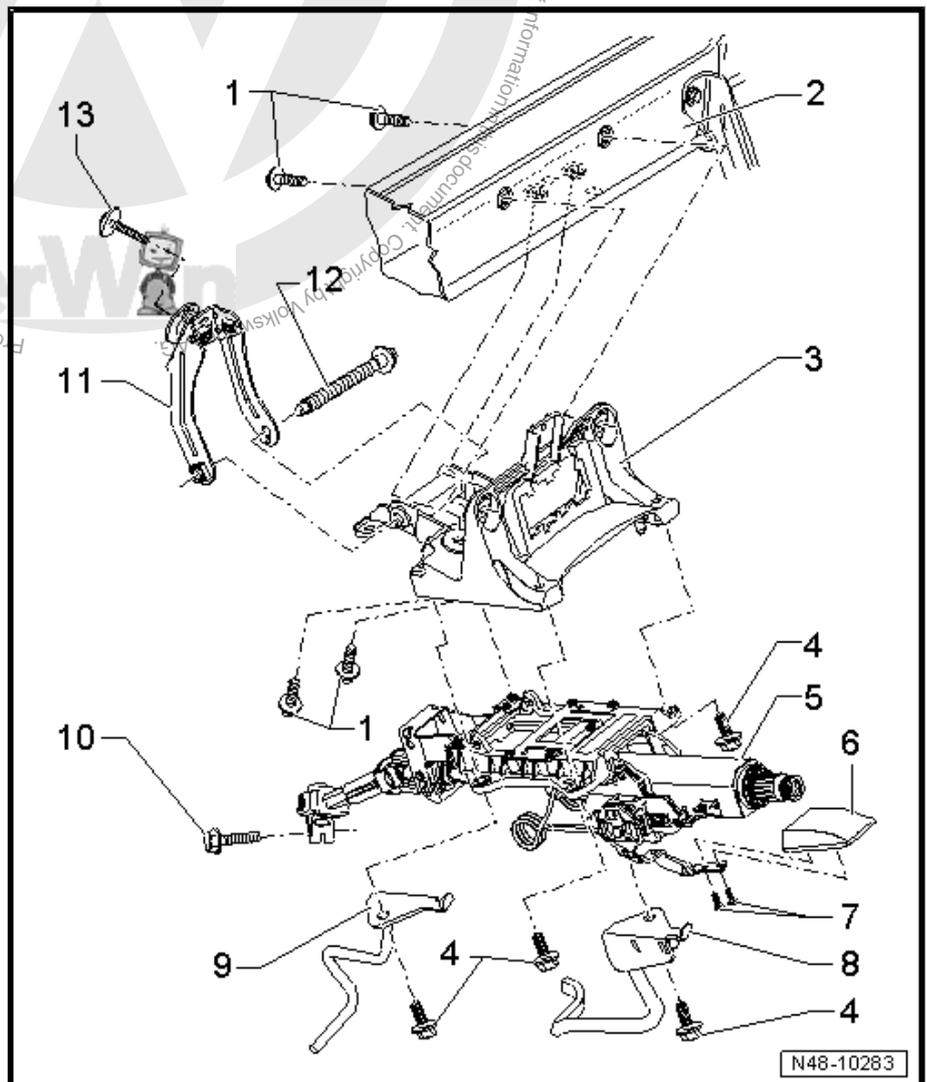
- Removing and installing
 ⇒ [page 348](#)

12 - Bolt

- 20 Nm

13 - Bolt

- 20 Nm

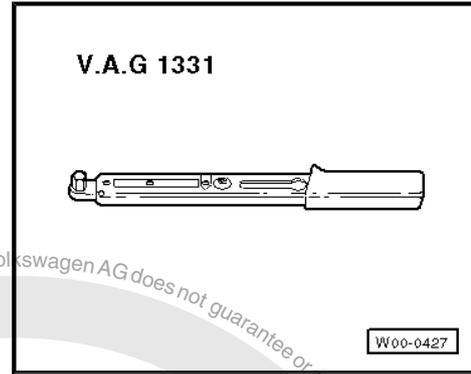


4.2 Removing and installing steering column

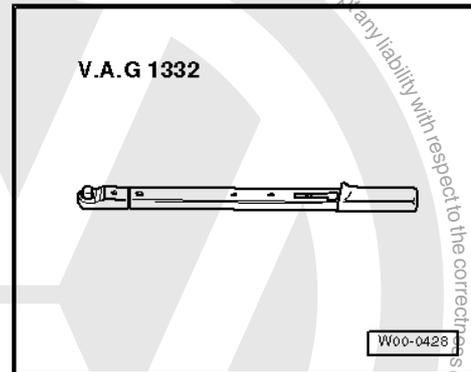
Special tools and workshop equipment required



- ◆ Torque wrench -V.A.G 1331-



- ◆ Torque wrench -V.A.G 1332-



Removing

Only the complete steering column is supplied as a replacement part. Repair is not possible.

The steering lock housing can be transferred ⇒ Electrical system; Rep. Gr. 94 ; Ignition switch and lock cylinder .



WARNING

The following are prerequisites before starting work on the electrical system and removing the steering wheel:

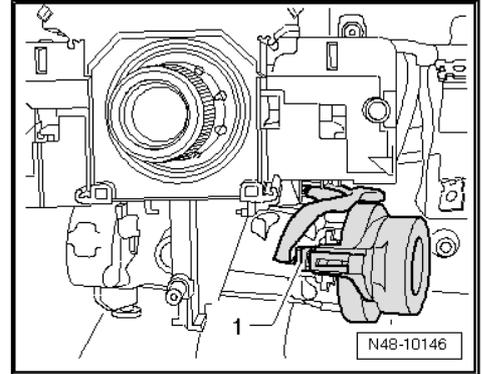
- ◆ **Disconnect earth strap from battery ⇒ Electrical system; Rep. Gr. 27 ; Battery; Disconnecting and reconnecting battery**
- ◆ **Wheels must be in straight-ahead position.**

Failure to comply with these precautions may lead to subsequent failure of the airbag system!

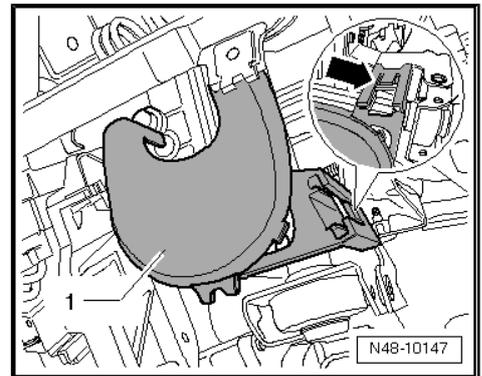
- Turn wheels to straight-ahead position.
- Pull down lever beneath steering column.
- Swing steering column down as far as possible and pull out.
- Press lever under steering column back up.
- Remove airbag in steering wheel ⇒ General body repairs, interior; Rep. Gr. 69 ; Airbag; Removing and installing driver side airbag unit .
- Remove steering wheel ⇒ [page 336](#) .
- Remove steering column switch trim ⇒ General body repairs, interior; Rep. Gr. 68 ; Compartments, covers and trims; Removing and installing steering column trim .



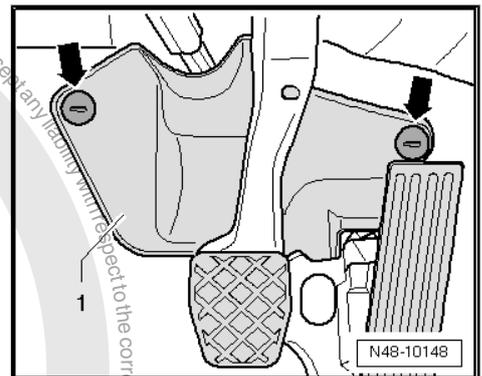
- Remove left trim on driver side ⇒ General body repairs, interior; Rep. Gr. 68 ; Compartments, covers and trims; Removing and installing left driver side trim .
- Remove steering column switch ⇒ Electrical system; Rep. Gr. 94 ; Steering column switch; Removing and installing steering column switch .
- Remove footwell vent below steering column ⇒ Heating, air conditioning; Rep. Gr. 80 ; Repairing heating .
- Separate connection -1-.



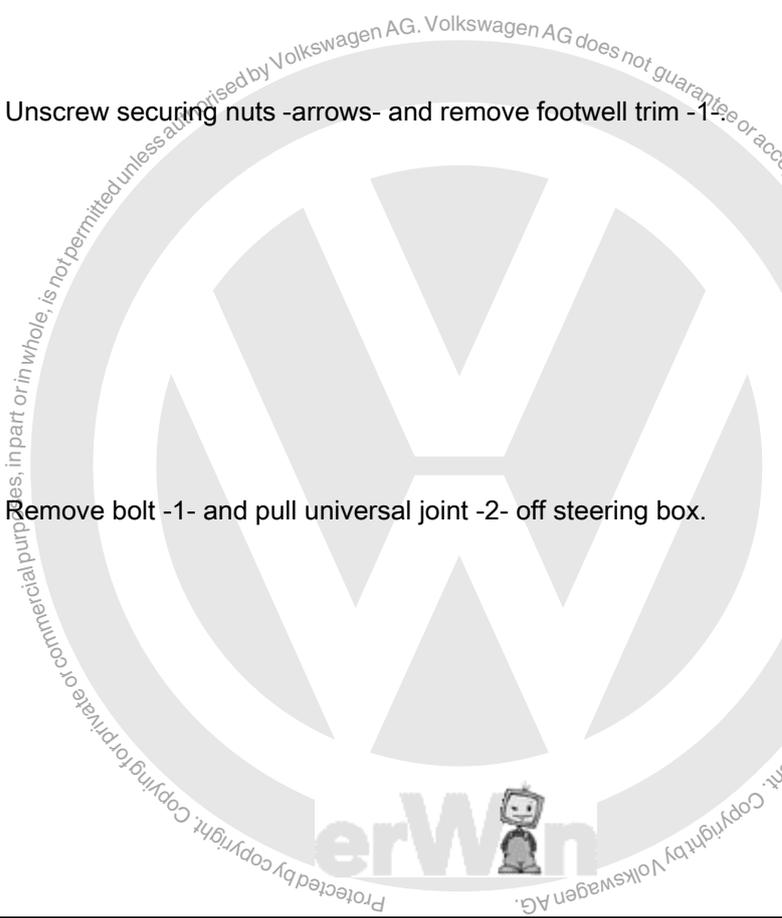
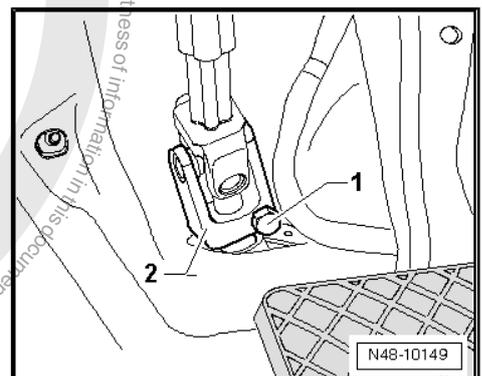
- Remove cable duct -1- below steering column. To do this, raise lugs -arrow- slightly on both sides and pull cable duct out from guide on steering column.



- Unscrew securing nuts -arrows- and remove footwell trim -1-.



- Remove bolt -1- and pull universal joint -2- off steering box.

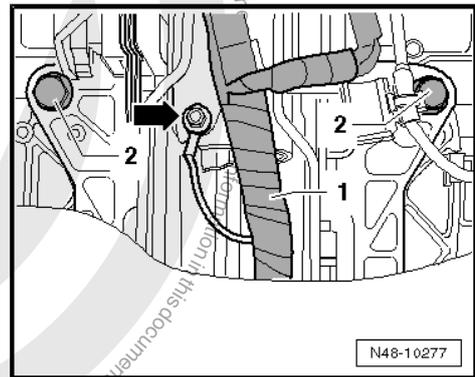
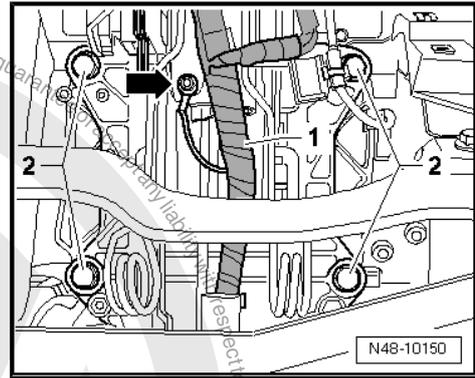




- Remove earth cable -arrow- and cable -1- from steering column.
- Remove bolts -2-.

Vehicles with crash bars

- Remove ground cable -arrow- and cable -1- from steering column.
- Remove bolts -2-.



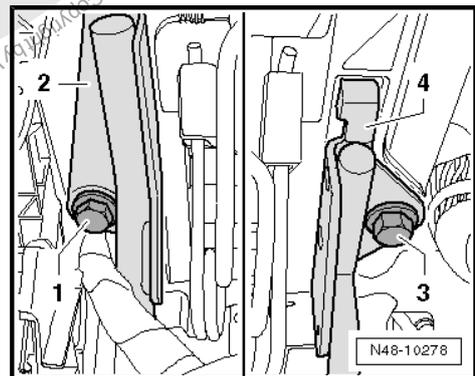
- Remove bolt -1- and remove crash bar for clutch pedal -2-.
- Remove bolt -3- and remove crash bar for brake pedal -4-.

Continuation for all vehicles

- Lower steering column slightly and carefully pull out upwards.

Installing

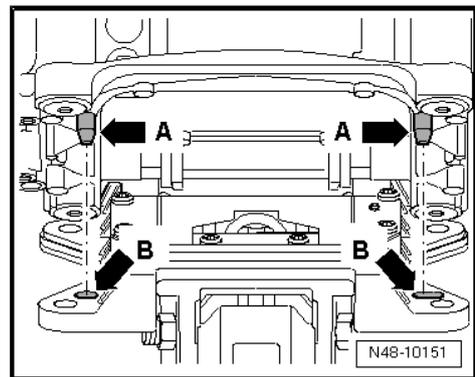
- Hook steering column into installation aid on mounting bracket.



- Align steering column to mounting bracket.

In the process, the pins -arrows A- of mounting bracket must be aligned with and inserted into the holes -arrows B- of the steering column

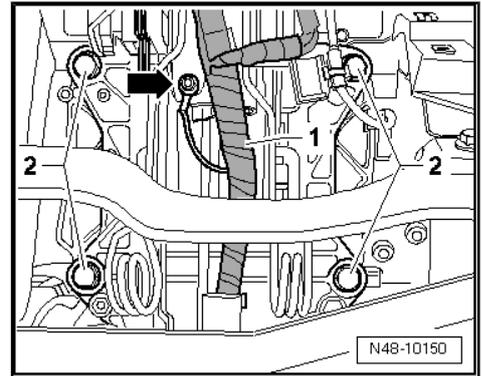
The steering column's correct installation position to the mounting bracket is guaranteed only in this way.



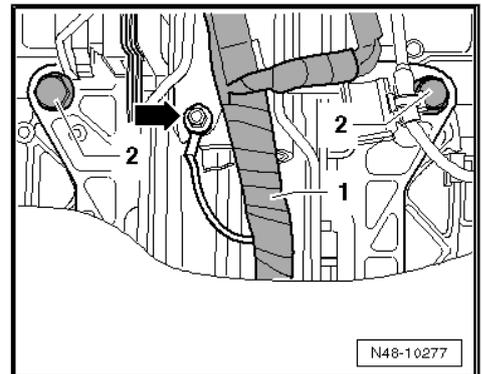


- Tighten steering column bolts -2-.
- Attach earth wire -arrow- and wire -1- to steering column.

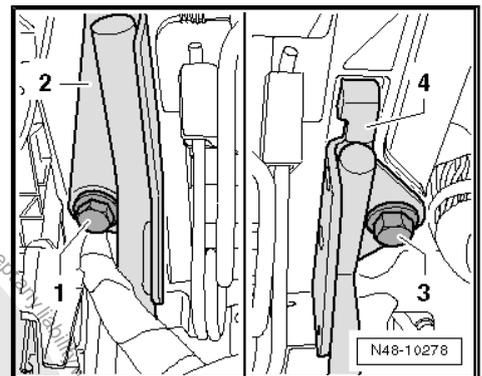
Vehicles with crash bars



- Tighten steering column bolts -2-.

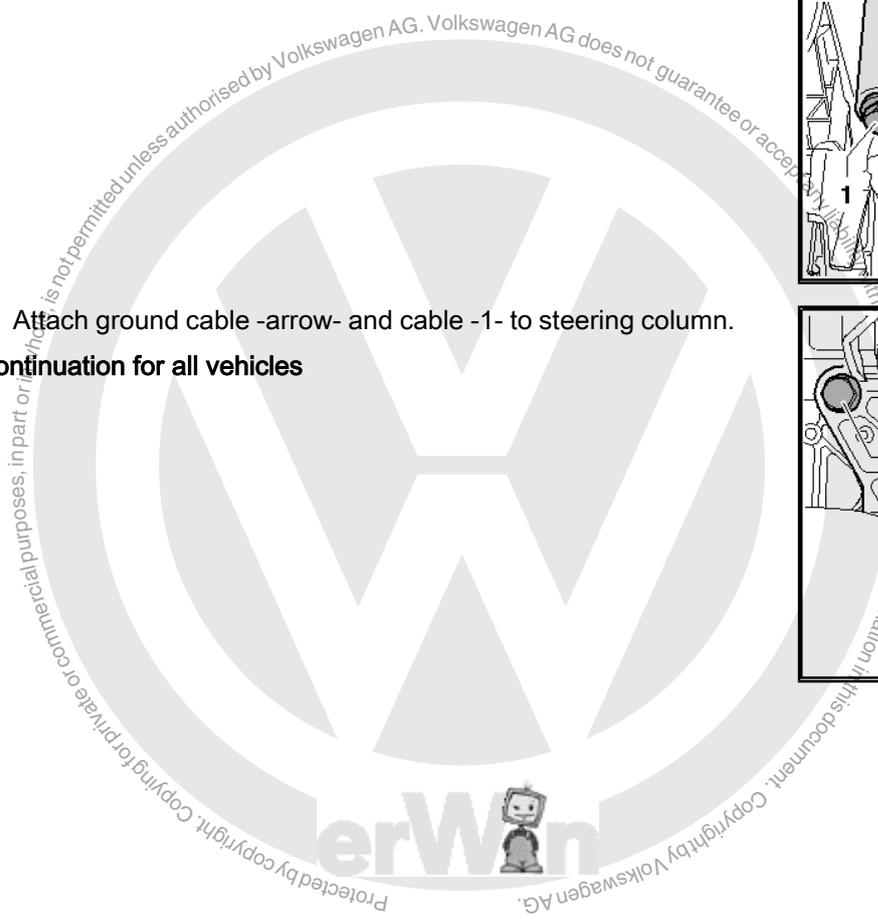
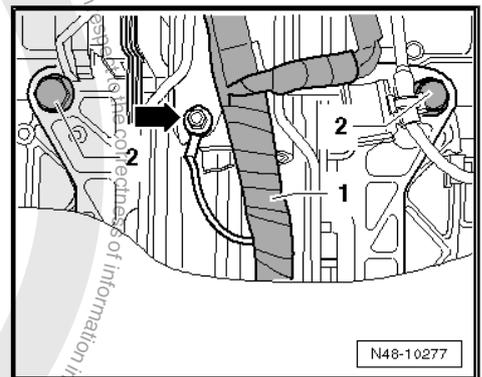


- Fit crash bar for clutch pedal -2- and tighten bolt -1-.
- Fit crash bar for brake pedal -4- and tighten bolt -3-.



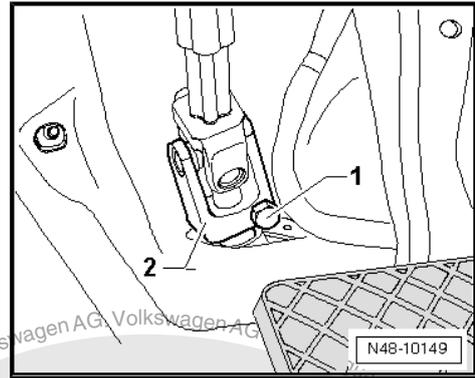
- Attach ground cable -arrow- and cable -1- to steering column.

Continuation for all vehicles

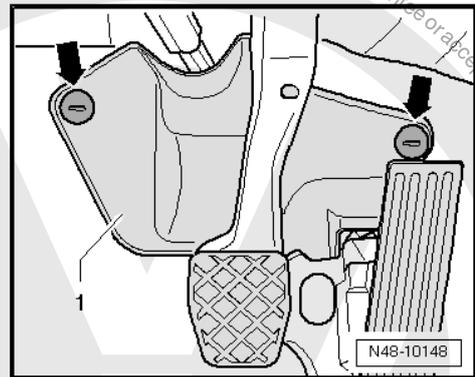




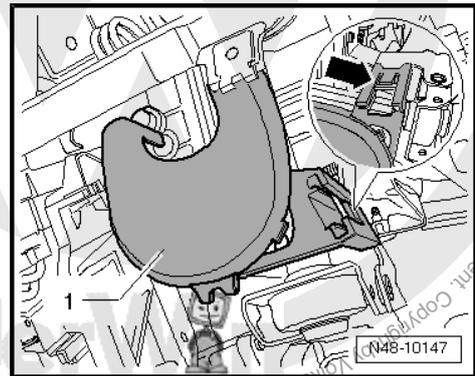
- Fit universal joint -2- onto steering box pinion and tighten bolt -1-.



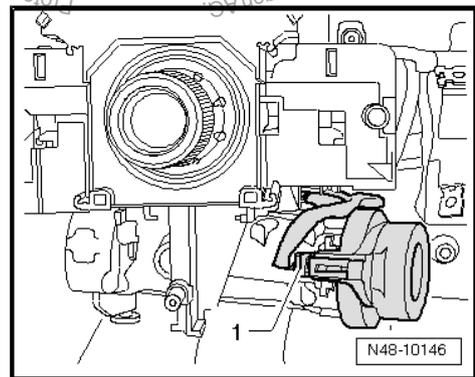
- Install footwell trim -1- and secure with nuts -arrows-.



- Install cable duct -1- below steering column.
The lugs -arrow- must engage in the guide on both sides.



- Join connector -1-.
- Install footwell vent below steering column ⇒ Heating, air conditioning; Rep. Gr. 80 ; Repairing heating .
- Install steering column switch ⇒ Electrical system; Rep. Gr. 94 ; Steering column switch; Removing and installing steering column switch .
- Install steering column switch trim ⇒ General body repairs, interior; Rep. Gr. 68 ; Compartments, covers and trims; Removing and installing steering column trim .
- Install left trim on driver side ⇒ General body repairs, interior; Rep. Gr. 68 ; Compartments, covers and trims; Removing and installing left driver side trim .
- Install steering wheel ⇒ [page 336](#) .
- Install airbag in steering wheel ⇒ General body repairs, interior; Rep. Gr. 69 ; Airbag; Removing and installing driver side airbag unit .
- Perform basic settings for steering angle sensor -G85- using vehicle diagnosis, testing and information system -VAS 5051B- .





Specified torques

Component	Specified torque
Universal joint to steering box ◆ Use new bolt	30 Nm
Steering column to mounting bracket	20 Nm

4.3 Basic setting for steering angle sensor G85 steering angle sender must be checked after the following repair work:

- ◆ When vehicle steering angle sensor -G85- is removed or renewed,
- ◆ If steering column was removed or renewed;
- ◆ If steering lock housing with steering column switch was removed or renewed;
- ◆ If steering box was removed or renewed;
- ◆ If steering wheel was repositioned.

4.4 Handling and transporting steering column

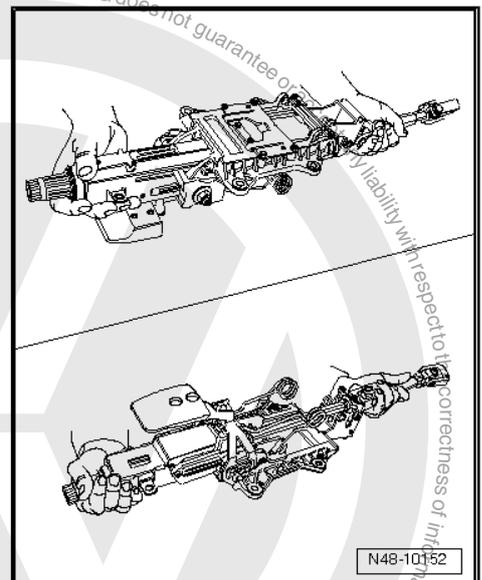


WARNING

- ◆ *Adherence to proper steering column handling is essential.*
- ◆ *Improper handling of steering column may damage the steering column, leading to safety risks.*

Proper steering column handling and transport

- ◆ Use both hands to transport steering column.
- ◆ Hold steering column upper jacket tube and in area of upper universal joint.

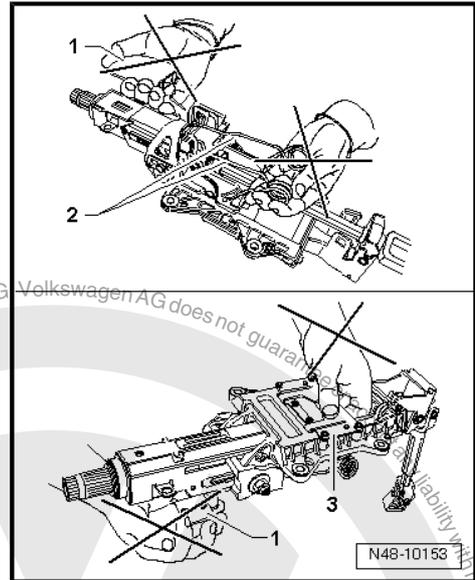




Improper handling of steering column

Transportation using the following parts leads to primary steering column damage:

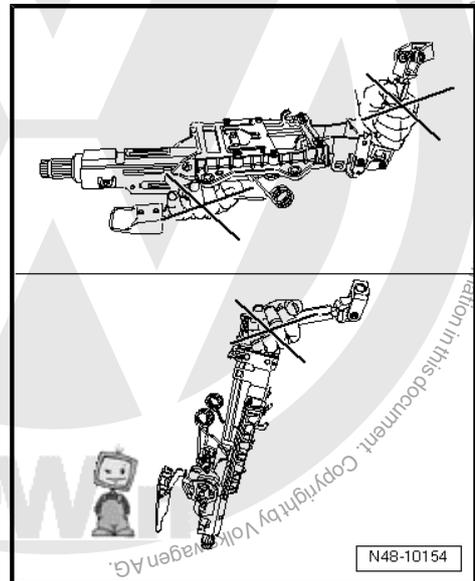
- 1 - Clamping lever
- 2 - Weight compensation springs
- 3 - Deformation element



Improper handling of steering column with safety risks

The following methods of handling will damage the universal joint bushes of the lower steering column bearing:

- ◆ Transporting the steering column with one hand on the jointed shaft.
- ◆ Bending the joints more than 90°



4.5 Checking steering column for damage

Visual check

- Check all steering column parts for damage.

Checking function

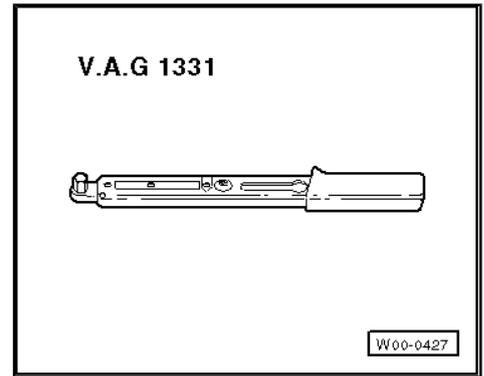
- Check that steering column turns smoothly and easily.
- Check that steering column can be adjusted in reach and height.

4.6 Removing and installing mounting bracket

Special tools and workshop equipment required

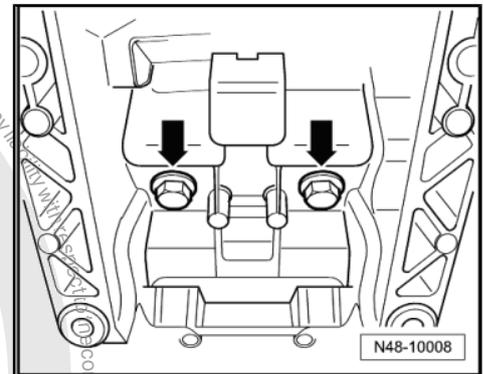


- ◆ Torque wrench -V.A.G 1331-



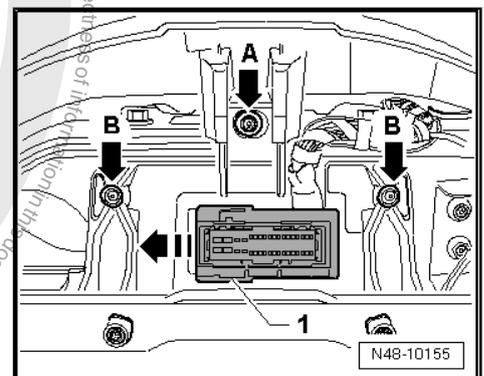
Removing

- Remove steering column ⇒ [page 351](#) .
- Remove dash panel insert ⇒ Electrical system; Rep. Gr. 90 ; Dash panel insert; Removing and installing dash panel insert .
- Remove bolts -arrows- under bracket.



Push connector -1- in -direction of arrow- and remove from support in mounting bracket.

- Unscrew bolt -arrow A-.
- Remove bolts -arrows B- securing bracket to body.

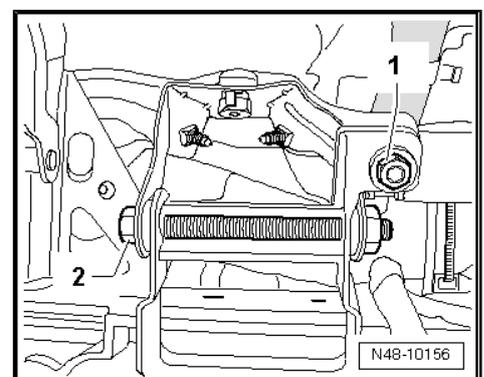


Note

Bolts -arrows B- are screwed in from cross member.

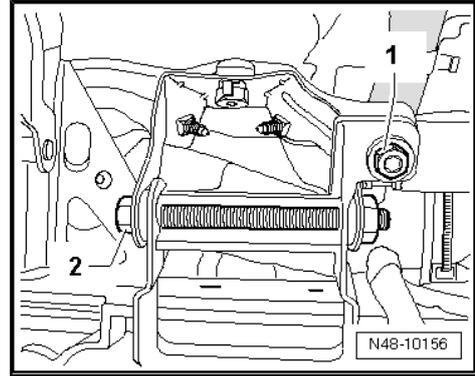
- Unscrew bolts -1- and -2- and remove mounting bracket from body.

Installing





- Insert mounting bracket and screw in bolts -1- and -2-.



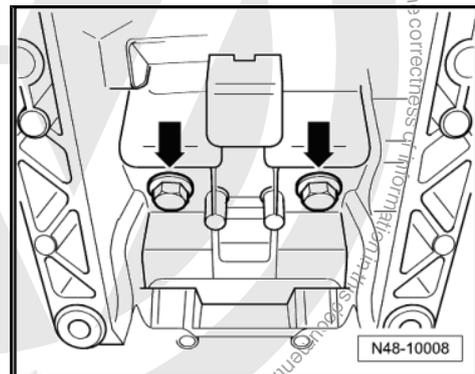
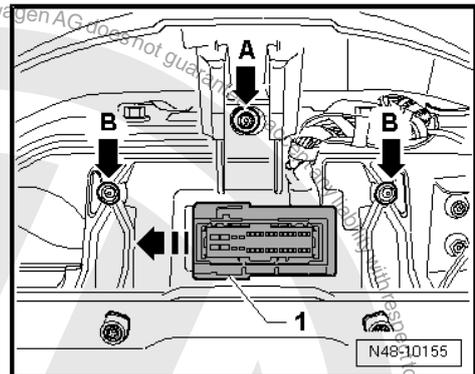
- Install bolts -arrows B-.



Note

Bolts -arrows B- are screwed in from cross member.

- Screw in bolt -arrow A-.
- Insert connector -1- into support in mounting bracket and push to stop opposite -direction of arrow-.
- Install bolts -arrows- under bracket.
- Install steering column => [page 354](#) .
- Install dash panel insert - Electrical system; Rep. Gr. 90 ; Dash panel insert; Removing and installing dash panel insert .
- Perform basic settings for steering angle sensor -G85- using vehicle diagnosis, testing and information system -VAS 5051B- .



Specified torques

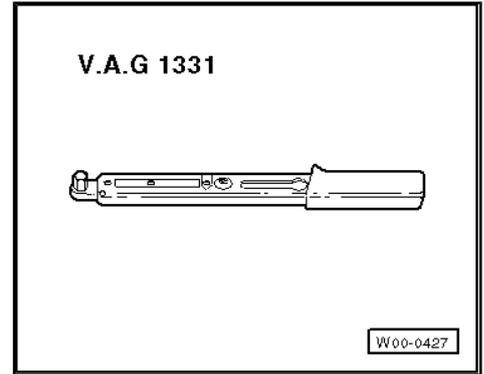
Component	Specified torque
Mounting bracket to body	20 Nm
Strut to mounting bracket	20 Nm
Steering column to mounting bracket	20 Nm

4.7 Removing and installing strut

Special tools and workshop equipment required

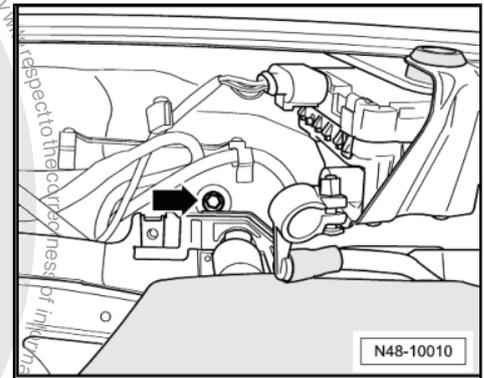


- ◆ Torque wrench -V.A.G 1331-



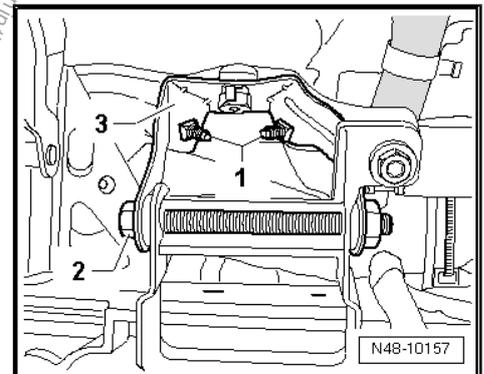
Removing

- Remove plenum chamber bulkhead ⇒ General body repairs exterior; Rep. Gr. 50 ; Assembly overview - plenum chamber bulkhead .
- Remove bolt -arrow- in plenum chamber.
- Remove steering column ⇒ [page 351](#) .

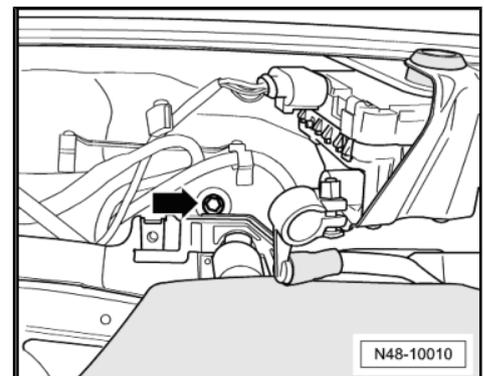


- Remove bolts -1-.
- Remove bolt -2- and remove strut -3-.

Installing

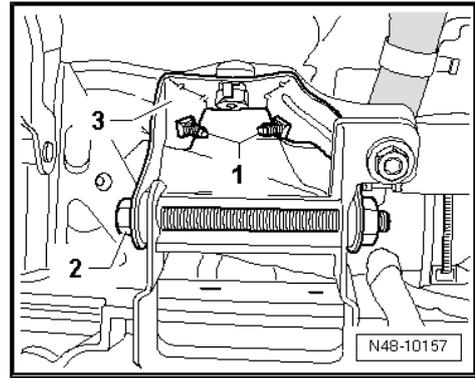


- Secure strut to body by tightening bolt -arrow-.



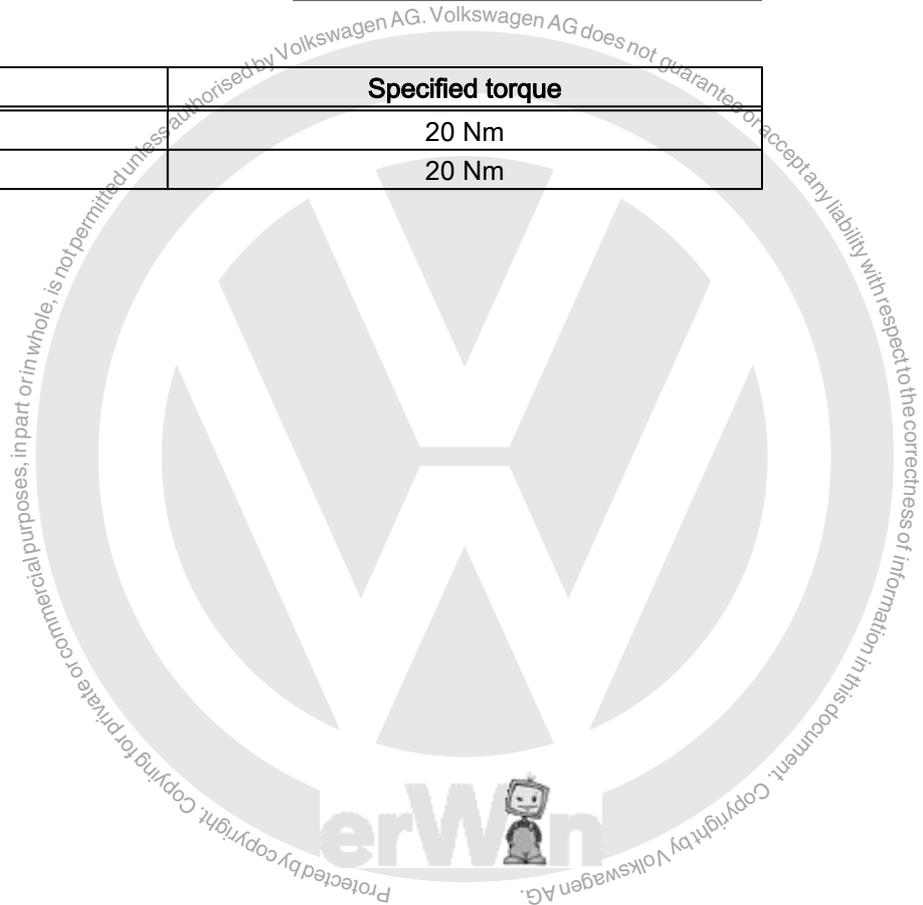


- Install securing bolt -2- and tighten.
- Tighten bolt -1- for strut -3-.
- Install steering column ⇒ [page 354](#) .
- Install plenum chamber bulkhead ⇒ General body repairs, exterior; Rep. Gr. 50 ; Assembly overview - plenum chamber bulkhead .
- Perform basic settings for steering angle sensor -G85- using vehicle diagnosis, testing and information system -VAS 5051B- .



Specified torques

Component	Specified torque
Strut to mounting bracket	20 Nm
Strut to body	20 Nm





5 Steering column, Golf Plus, Cross-Golf

5.1 Assembly overview: steering column



Note

- ◆ *It is not permitted to weld or straighten load-bearing or wheel-guiding components of the suspension.*
- ◆ *Always renew self-locking nuts.*
- ◆ *Always renew corroded nuts and bolts.*

1 - Bolt

- 20 Nm

2 - Cross member for steering column

3 - Mounting bracket

- Removing and installing
 ⇒ [page 358](#)

4 - Bolt

- 20 Nm
- Always renew after removing

5 - Steering column

- Removing and installing
 ⇒ [page 351](#)

6 - Handle

7 - Bolt

- 3 Nm

8 - Crash bar for brake pedal

9 - Crash bar for clutch pedal

10 - Bolt

- 30 Nm
- Always renew after removing

11 - Strut

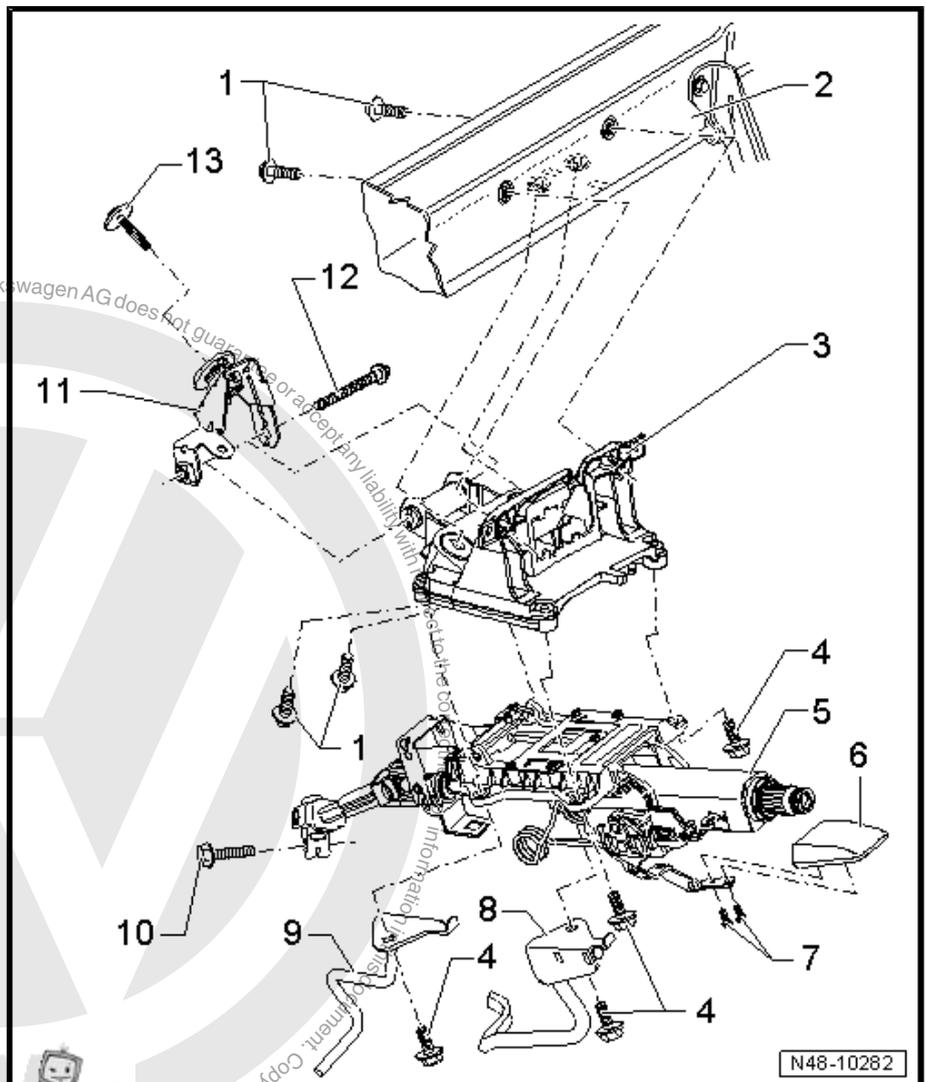
- Removing and installing
 ⇒ [page 360](#)

12 - Bolt

- 20 Nm

13 - Bolt

- 20 Nm

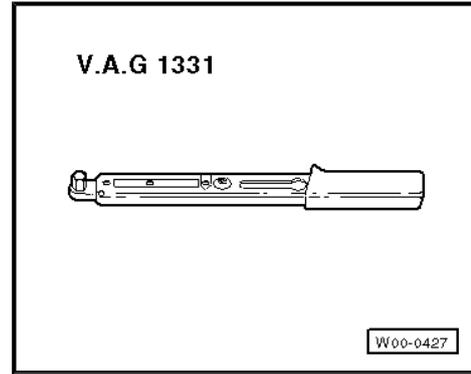


5.2 Removing and installing steering column

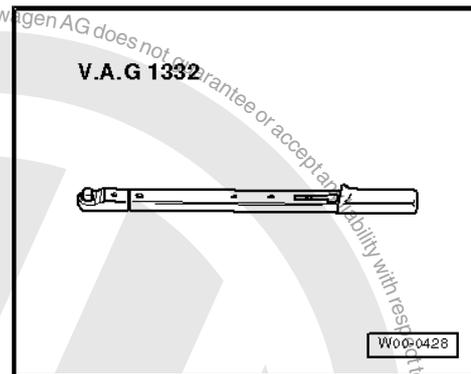
Special tools and workshop equipment required



◆ Torque wrench -V.A.G 1331-



◆ Torque wrench -V.A.G 1332-



Removing

Only the complete steering column is supplied as a replacement part. Repair is not possible.

The steering lock housing can be transferred ⇒ Electrical system; Rep. Gr. 94 ; Ignition switch and lock cylinder .



WARNING

The following are prerequisites before starting work on the electrical system and removing the steering wheel:

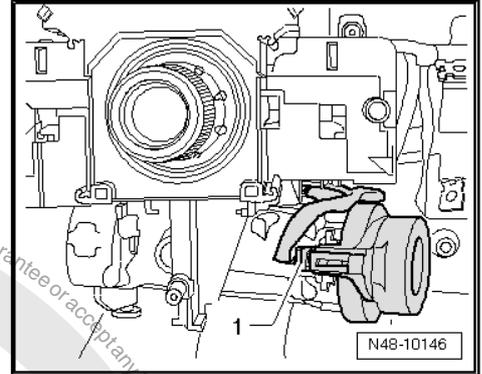
- ◆ *Disconnect earth strap from battery ⇒ Electrical system; Rep. Gr. 27 ; Battery; Disconnecting and reconnecting battery*
- ◆ *Wheels must be in straight-ahead position.*

Failure to comply with these precautions may lead to subsequent failure of the airbag system!

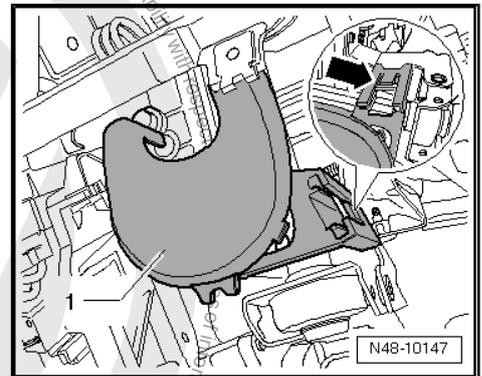
- Turn wheels to straight-ahead position.
- Pull down lever beneath steering column.
- Swing steering column down as far as possible and pull out.
- Press lever under steering column back up.
- Remove airbag in steering wheel ⇒ General body repairs, interior; Rep. Gr. 69 ; Airbag; Removing and installing driver side airbag unit .
- Remove steering wheel ⇒ [page 336](#) .
- Remove steering column switch trim ⇒ General body repairs, interior; Rep. Gr. 68 ; Compartments, covers and trims; Removing and installing steering column trim .



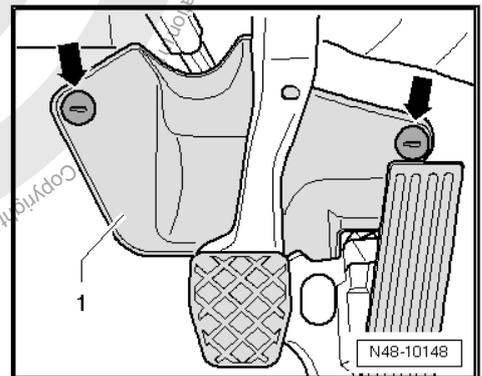
- Remove left trim on driver side ⇒ General body repairs, interior; Rep. Gr. 68 ; Compartments, covers and trims; Removing and installing left driver side trim .
- Remove steering column switch ⇒ Electrical system; Rep. Gr. 94 ; Steering column switch; Removing and installing steering column switch .
- Remove footwell vent below steering column ⇒ Heating, air conditioning; Rep. Gr. 80 ; Repairing heating .
- Separate connection -1-.



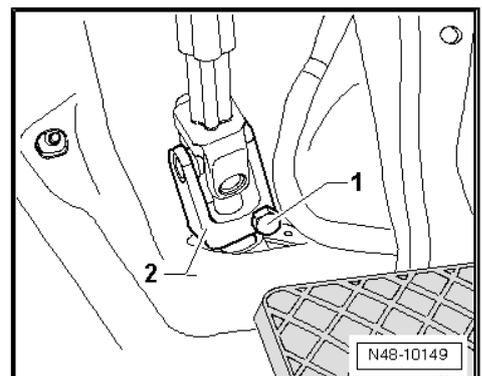
- Remove cable duct -1- below steering column. To do this, raise lugs -arrow- slightly on both sides and pull cable duct out from guide on steering column.



- Unscrew securing nuts -arrows- and remove footwell trim -1-.



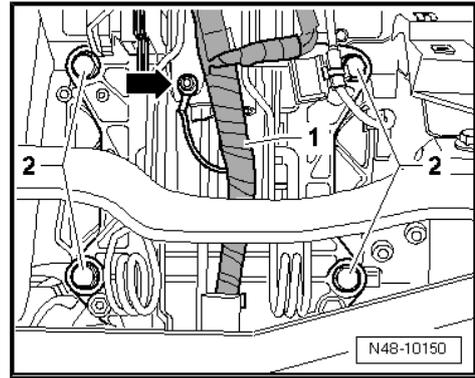
- Remove bolt -1- and pull universal joint -2- off steering box.



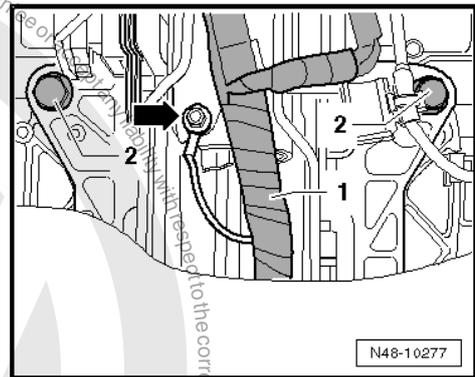


- Remove earth cable -arrow- and cable -1- from steering column.
- Remove bolts -2-.

Vehicles with crash bars



- Remove ground cable -arrow- and cable -1- from steering column.
- Remove bolts -2-.



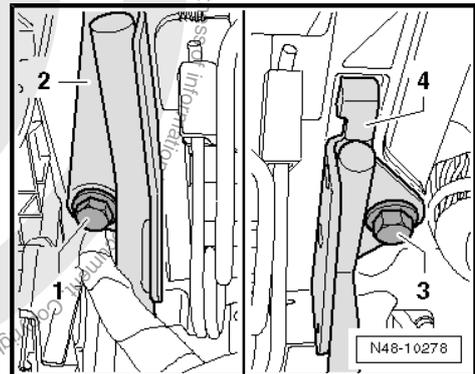
- Remove bolt -1- and remove crash bar for clutch pedal -2-.
- Remove bolt -3- and remove crash bar for brake pedal -4-.

Continuation for all vehicles

- Lower steering column slightly and carefully pull out upwards.

Installing

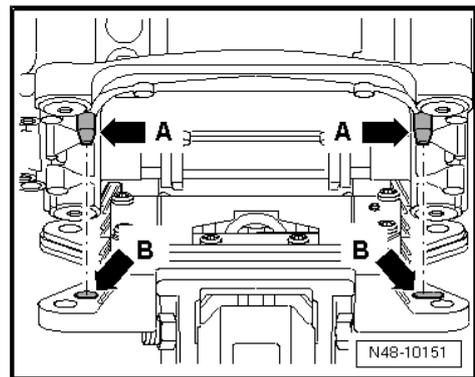
- Hook steering column into installation aid on mounting bracket.



- Align steering column to mounting bracket.

In the process, the pins -arrows A- of mounting bracket must be aligned with and inserted into the holes -arrows B- of the steering column

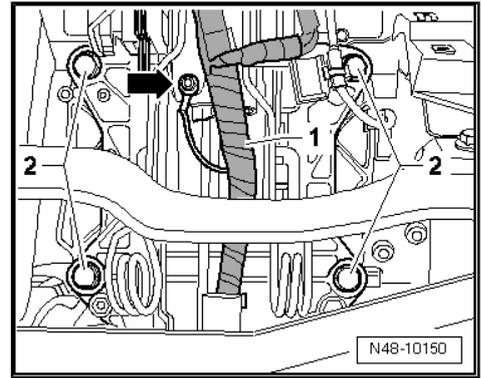
The steering column's correct installation position to the mounting bracket is guaranteed only in this way.



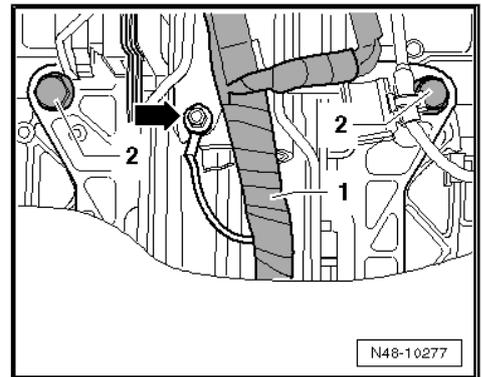


- Tighten steering column bolts -2-.
- Attach earth wire -arrow- and wire -1- to steering column.

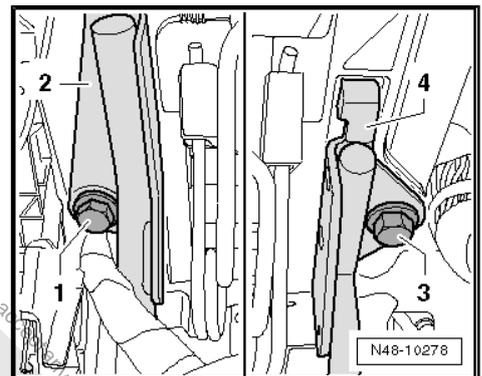
Vehicles with crash bars



- Tighten steering column bolts -2-.

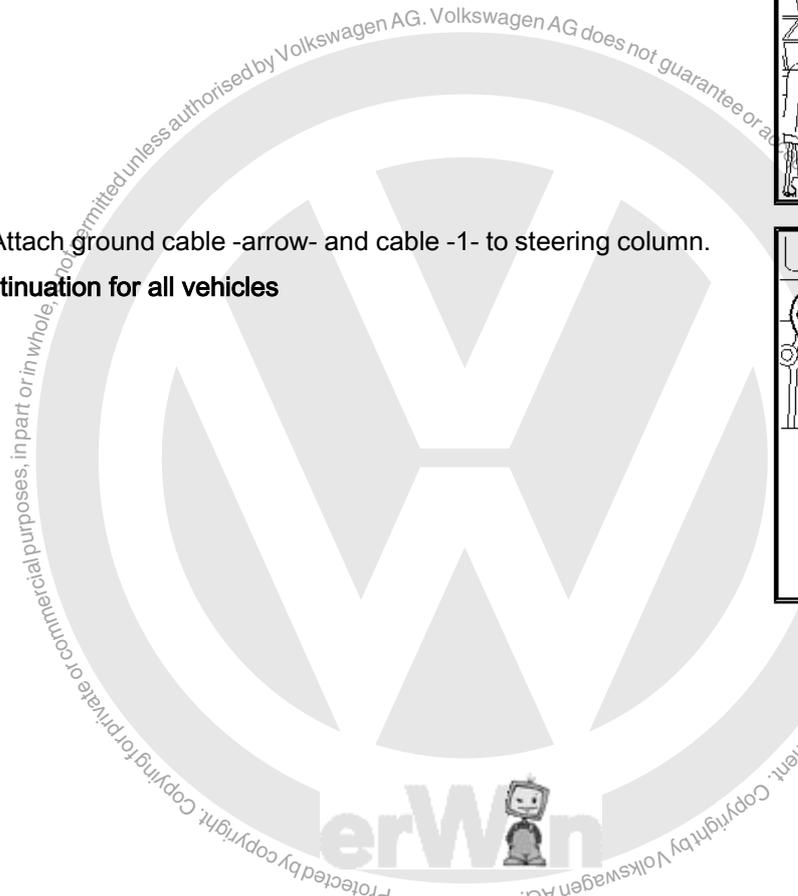
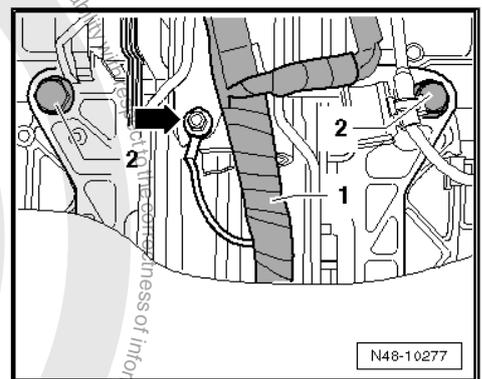


- Fit crash bar for clutch pedal -2- and tighten bolt -1-.
- Fit crash bar for brake pedal -4- and tighten bolt -3-.



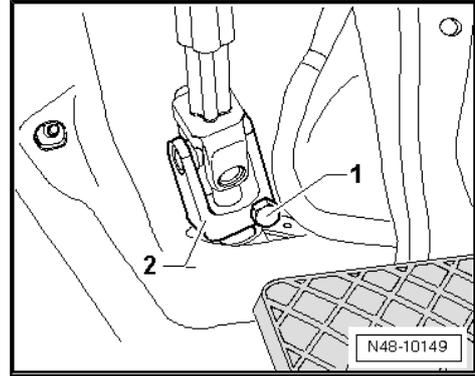
- Attach ground cable -arrow- and cable -1- to steering column.

Continuation for all vehicles

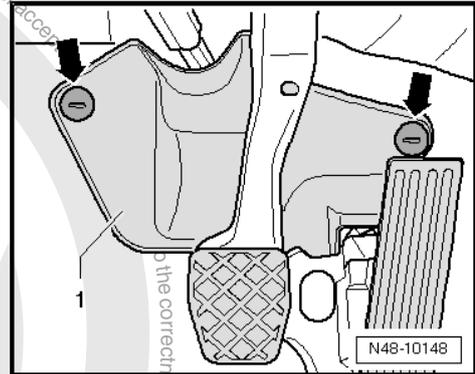




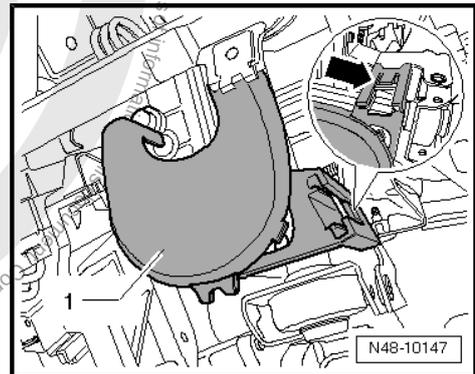
- Fit universal joint -2- onto steering box pinion and tighten bolt -1-.



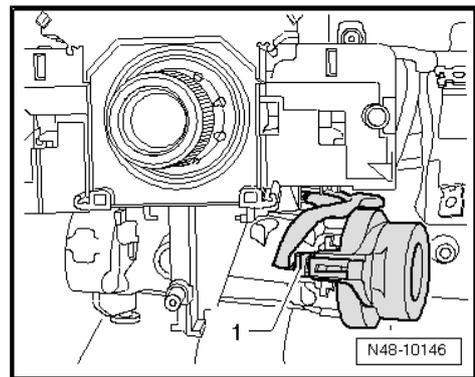
- Install footwell trim -1- and secure with nuts -arrows-.



- Install cable duct -1- below steering column.
The lugs -arrow- must engage in the guide on both sides.



- Join connector -1-.
- Install footwell vent below steering column ⇒ Heating, air conditioning; Rep. Gr. 80 ; Repairing heating .
- Install steering column switch ⇒ Electrical system; Rep. Gr. 94 ; Steering column switch; Removing and installing steering column switch .
- Install steering column switch trim ⇒ General body repairs, interior; Rep. Gr. 68 ; Compartments, covers and trims; Removing and installing steering column trim .
- Install left trim on driver side ⇒ General body repairs, interior; Rep. Gr. 68 ; Compartments, covers and trims; Removing and installing left driver side trim .
- Install steering wheel ⇒ [page 336](#) .
- Install airbag in steering wheel ⇒ General body repairs, interior; Rep. Gr. 69 ; Airbag; Removing and installing driver side airbag unit .
- Perform basic settings for steering angle sensor -G85- using vehicle diagnosis, testing and information system -VAS 5051B- .





Specified torques

Component	Specified torque
Universal joint to steering box ◆ Use new bolt	30 Nm
Steering column to mounting bracket	20 Nm

5.3 Basic setting for steering angle sensor G85 steering angle sender must be checked after the following repair work:

- ◆ When vehicle steering angle sensor -G85- is removed or renewed,
- ◆ If steering column was removed or renewed;
- ◆ If steering lock housing with steering column switch was removed or renewed;
- ◆ If steering box was removed or renewed;
- ◆ If steering wheel was repositioned.

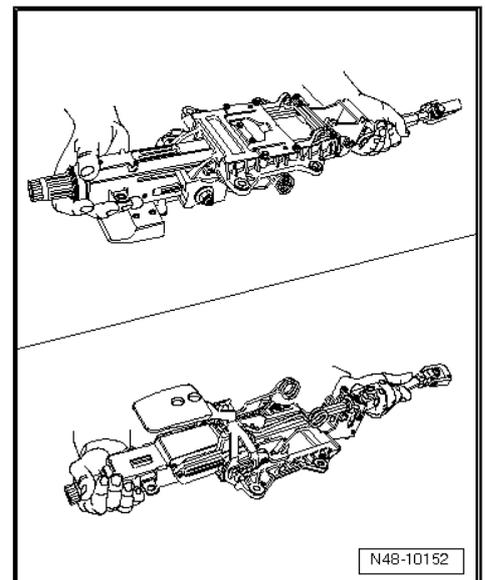
5.4 Handling and transporting steering column

 **WARNING**

- ◆ *Adherence to proper steering column handling is essential.*
- ◆ *Improper handling of steering column may damage the steering column, leading to safety risks.*

Proper steering column handling and transport

- ◆ Use both hands to transport steering column.
- ◆ Hold steering column upper jacket tube and in area of upper universal joint.

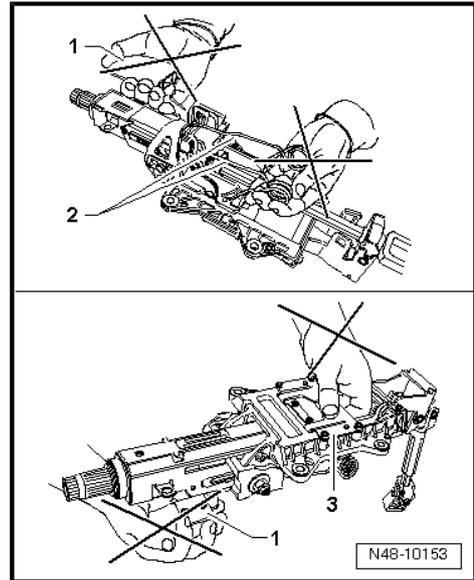




Improper handling of steering column

Transportation using the following parts leads to primary steering column damage:

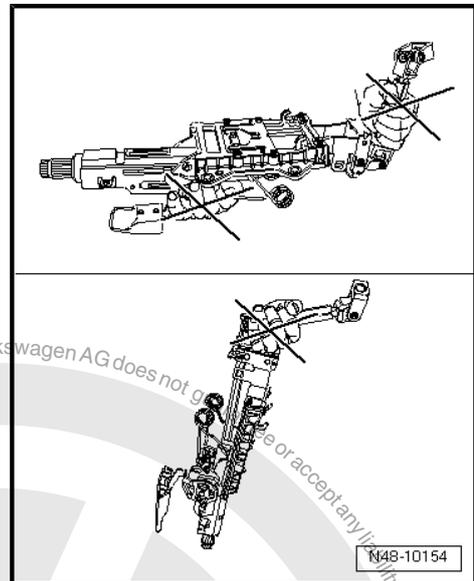
- 1 - Clamping lever
- 2 - Weight compensation springs
- 3 - Deformation element



Improper handling of steering column with safety risks

Following methods of handling will damage universal joint bushes of lower steering column bearing:

- ◆ Transporting steering column with one hand on jointed shaft.
- ◆ Bending joints more than 90°.



5.5 Checking steering column for damage

Visual check

- Check all steering column parts for damage.

Checking function

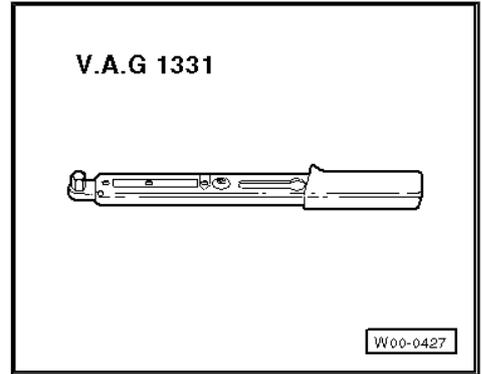
- Check that steering column turns smoothly and easily.
- Check that steering column can be adjusted in reach and height.

5.6 Removing and installing mounting bracket

Special tools and workshop equipment required

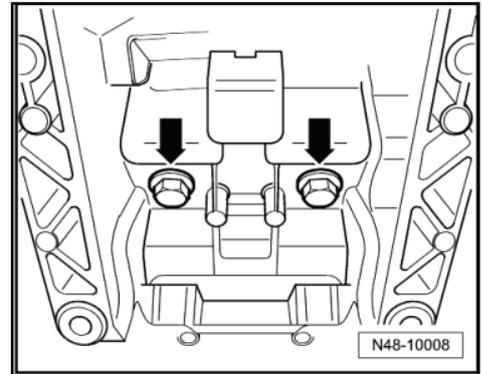


- ◆ Torque wrench -V.A.G 1331-

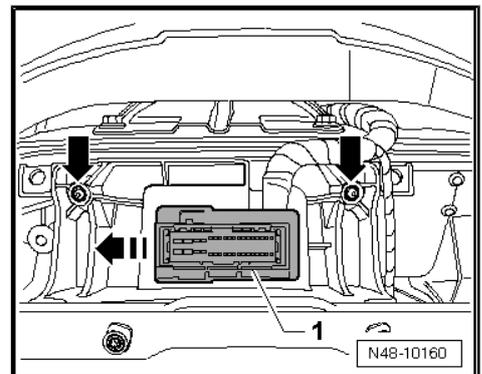


Removing

- Remove steering column ⇒ [page 339](#) .
- Remove dash panel insert ⇒ Electrical system; Rep. Gr. 90 ; Dash panel insert; Removing and installing dash panel insert
- Remove bolts -arrows- under bracket.



- Push connector -1- in -direction of arrow- and remove from support in mounting bracket.
- Remove bolts -arrows- from bracket to body.

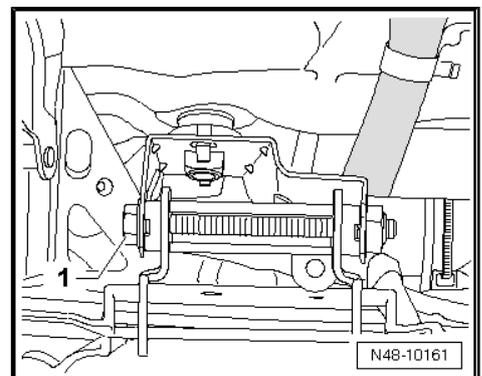


Note

Bolts -arrows- are screwed in from cross member.

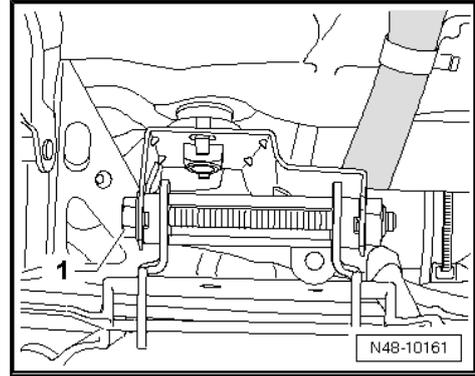
- Unscrew bolt -1- and remove mounting bracket from body.

Installing





- Insert mounting bracket and screw bolt -1- in.

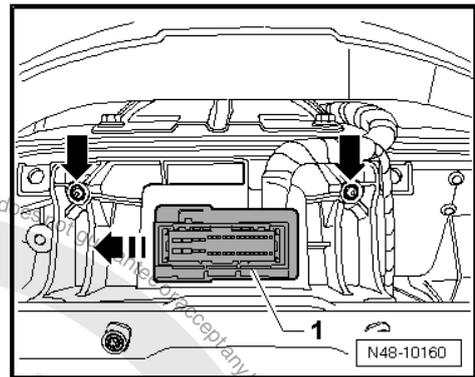


- Install bolts -arrows-.

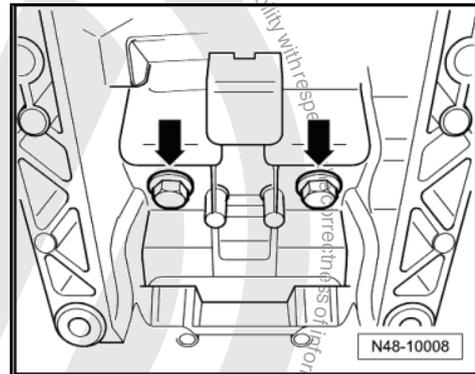
i Note

Bolts -arrows- are screwed in from cross member.

- Insert connector -1- into support in mounting bracket and push to stop opposite -direction of arrow-



- Install bolts -arrows- under bracket.
- Install steering column => [page 342](#) .
- Install dash panel insert => Electrical system; Rep. Gr. 90 ; Dash panel insert; Removing and installing dash panel insert .
- Perform basic settings for steering angle sensor -G85- using vehicle diagnosis testing and information system -VAS 5051B- .



Specified torques

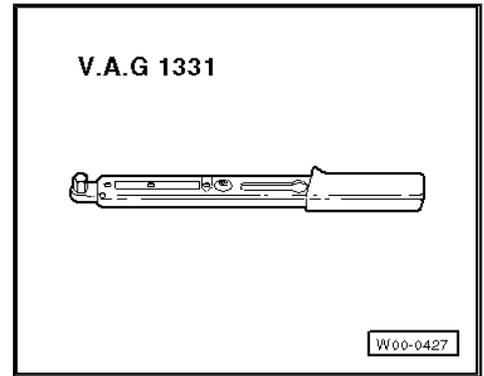
Component	Specified torque
Mounting bracket to body	20 Nm
Strut to mounting bracket	20 Nm
Steering column to mounting bracket	20 Nm

5.7 Removing and installing strut

Special tools and workshop equipment required

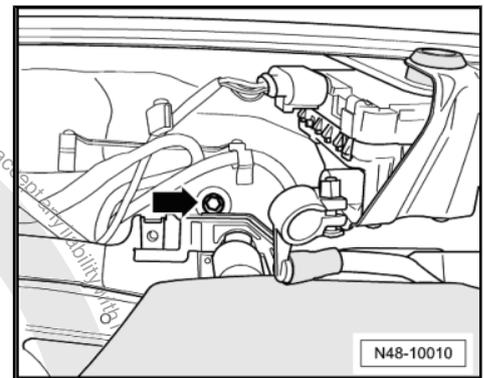


- ◆ Torque wrench -V.A.G 1331-



Removing

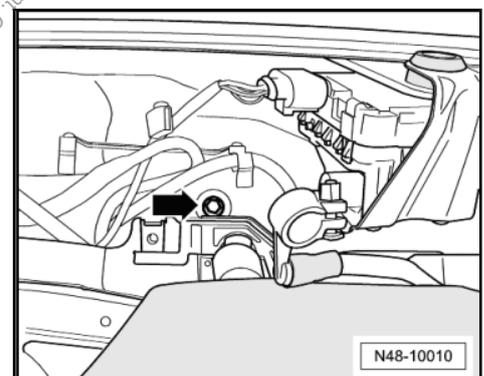
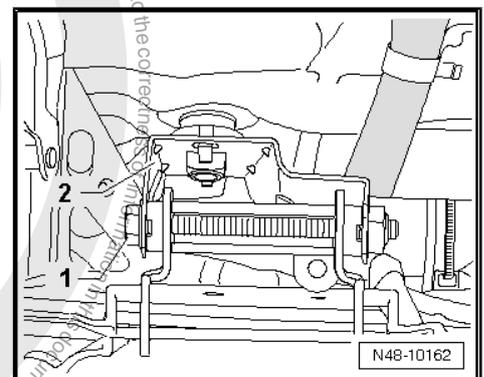
- Remove plenum chamber bulkhead ⇒ General body repairs, exterior; Rep. Gr. 50 ; Assembly overview - plenum chamber bulkhead .
- Remove bolt -arrow- in plenum chamber.
- Remove steering column [page 351](#) .



- Remove bolt -1-.
- Remove strut -2-.

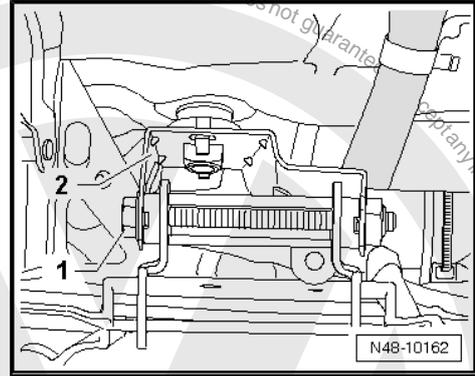
Installing

- Secure strut to body by tightening bolt -arrow-.





- Install securing bolt -1- and tighten.
- Install steering column ⇒ [page 354](#) .
- Install plenum chamber bulkhead ⇒ General body repairs, exterior; Rep. Gr. 50 ; Assembly overview - plenum chamber bulkhead .
- Perform basic settings for steering angle sensor -G85- using vehicle diagnosis, testing and information system -VAS 5051B- .



Specified torques

Component	Specified torque
Strut to mounting bracket	20 Nm
Strut to body	20 Nm



6 Electromechanical steering box up to model year 2008

6.1 Assembly overview - electromechanical steering box, left-hand drive (1st and 2nd generations) up to model year 2008

Note

- ◆ There are no 2nd generation steering boxes available as spare parts.
- ◆ If the steering box has to be replaced, a new 3rd generation steering box will have to be fitted.
- ◆ In addition, the electrical wiring harness from the E-box to the steering box will then also have to be renewed. This is included with the order for the new steering box via the ⇒ Electronic parts catalogue "ETKA".
- ◆ The electrical wiring harness will be delivered with the cable for the service interval display.
- ◆ In vehicles without a service interval display, the unused 3-pin connector must be sealed by a flat contact housing with connector position assurance -1J0 973 803- ⇒ Electronic parts catalogue "ETKA".

1 - Universal joint

2 - Hexagon bolt

- 30 Nm
- Always renew after re-moving

3 - Wiring

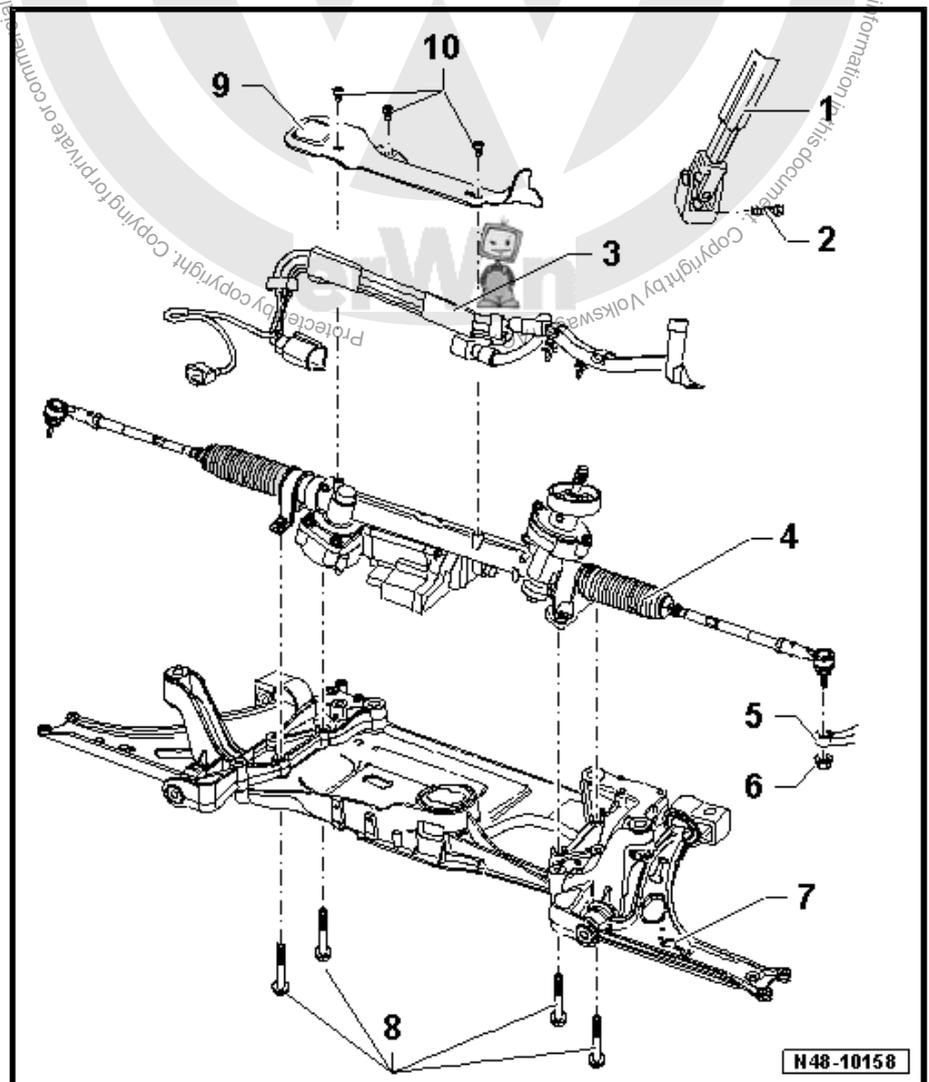
4 - Power steering box

- With power steering control unit -J500-
- With electromechanical power steering motor -V187-
- With steering moment sender -G269-
- Can be checked using guided fault finding with the vehicle diagnosis, testing and information system -VAS 5051/-
- Exchanging 1st generation steering box for 2nd generation steering box ⇒ [page 400](#)
- Removing and installing ⇒ [page 366](#)
- Observe notes ⇒ [page 363](#).

5 - Wheel bearing housing

6 - Nut

- M12 x 1.5
- 20 Nm + 90° further
- Self-locking
- Always renew after re-moving





7 - Subframe with brackets

8 - Bolt

- 50 Nm + 90° further
- Always renew clamp for steering box
- Always renew after removing

9 - Shield

10 - Bolt

- 6 Nm
- Self-locking





6.2 Assembly overview - electromechanical steering box, right-hand drive (2nd generation) up to model year 2008

Note

- ◆ There are no 2nd generation steering boxes available as spare parts.
- ◆ If the steering box has to be replaced, a new 3rd generation steering box will have to be fitted.
- ◆ In addition, the electrical wiring harness from the E-box to the steering box will then also have to be renewed. This is included with the order for the new steering box via the ⇒ Electronic parts catalogue "ETKA".
- ◆ The electrical wiring harness will be delivered with the cable for the service interval display.
- ◆ In vehicles without a service interval display, the unused 3-pin connector must be sealed by a flat contact housing with connector position assurance -1J0 973 803- ⇒ Electronic parts catalogue "ETKA".

1 - Universal joint

2 - Bolt

- M8 x 35
- 30 Nm
- Always renew after removing

3 - Wiring

4 - Shield

5 - Torx bolt

- 6 Nm
- Self-locking

6 - Clamp

- Always renew after removing

7 - Rubber mounting

8 - Power steering box

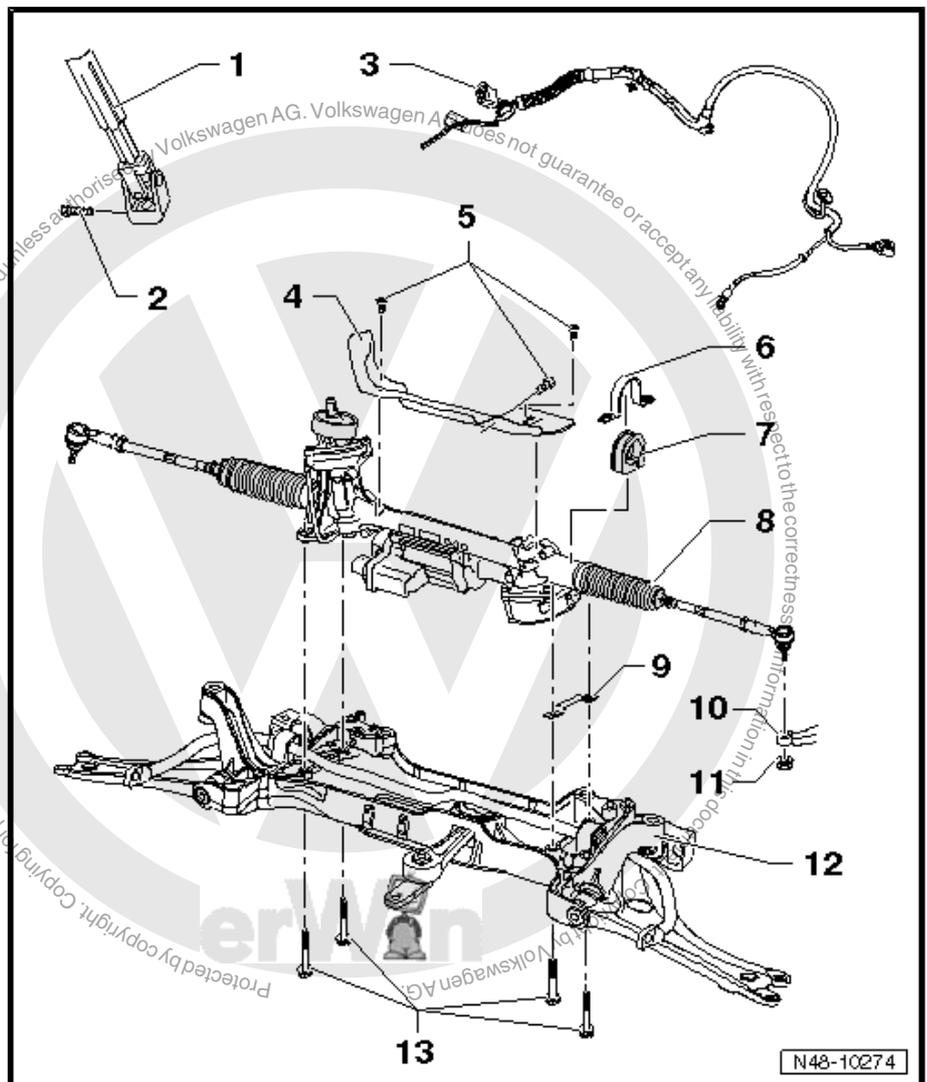
- With power steering control unit -J500-
- With electromechanical power steering motor -V187-
- With steering torque sender -G269-
- Can be checked in guided fault finding of the vehicle diagnosis, testing and information system -VAS 5051B-
- Removing and installing ⇒ [page 374](#)
- Observe notes ⇒ [page 365](#) .

9 - Connecting piece

10 - Wheel bearing housing

11 - Nut

- M12 x 1.5
- 50 Nm





- Self-locking
- Always renew after removing

12 - Subframe

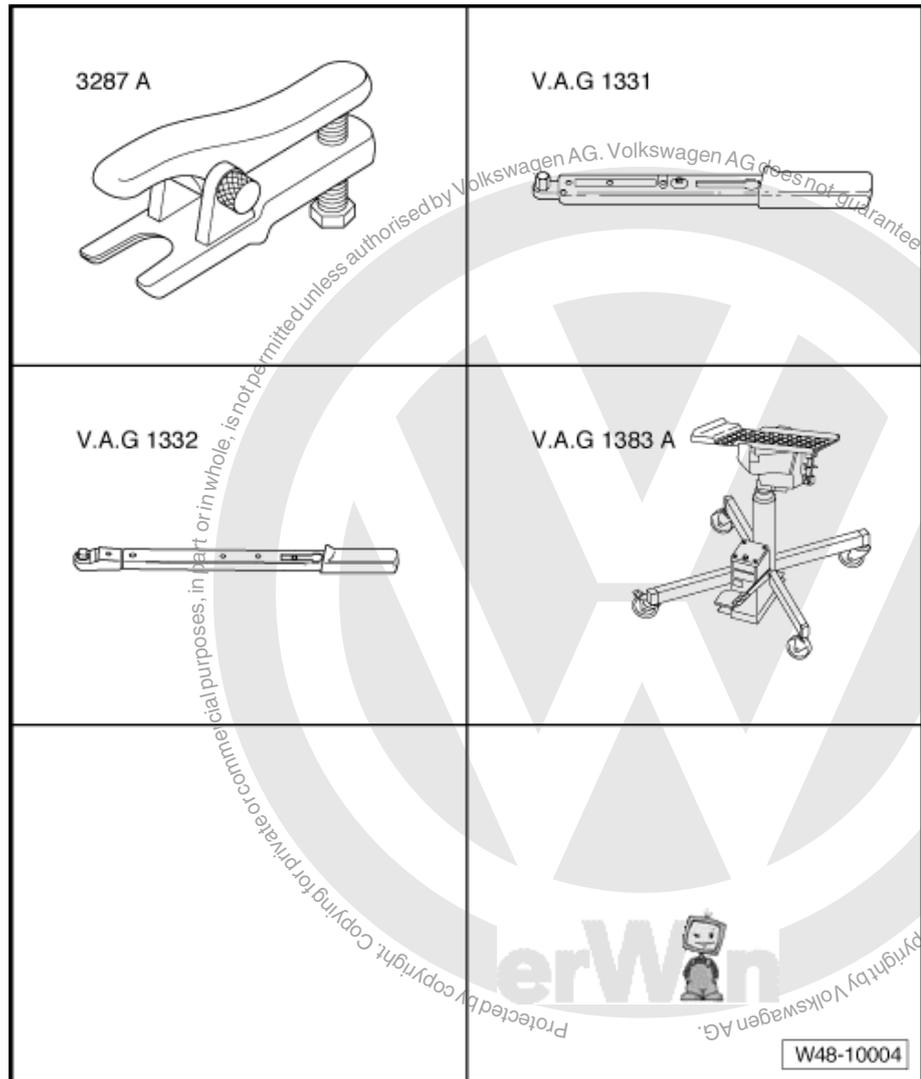
13 - Bolt

- M10 x 70
- 50 Nm + 90° further
- Always renew after removing

6.3 Removing and installing steering box, left-hand drive (1st and 2nd generations) up to model year 2008

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-
- ◆ Torque wrench -V.A.G 1332-
- ◆ Engine and gearbox jack - V.A.G 1383 A-
- ◆ Ball joint puller -3287 A-



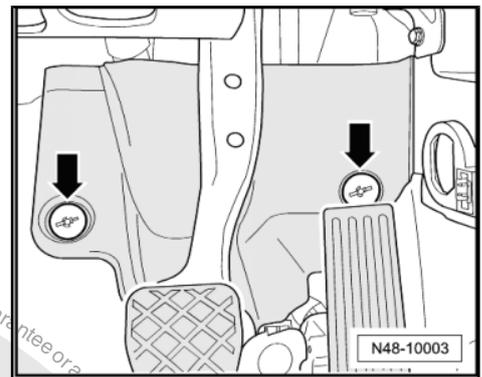


Removing steering box

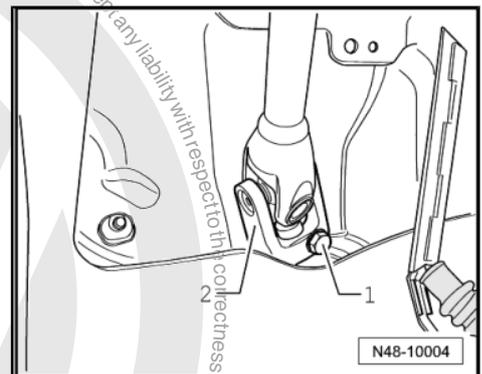


Note

- ◆ *There are no 2nd generation steering boxes available as spare parts.*
 - ◆ *If the steering box has to be replaced, a new 3rd generation steering box will have to be fitted.*
 - ◆ *In addition, the electrical wiring harness from the E-box to the steering box will then also have to be renewed. This is included with the order for the new steering box via the → Electronic parts catalogue "ETKA".*
 - ◆ *The electrical wiring harness will be delivered with the cable for the service interval display.*
 - ◆ *In vehicles without a service interval display, the unused 3-pin connector must be sealed by a flat contact housing with connector position assurance -1J0 973 803- → Electronic parts catalogue "ETKA".*
- Disconnect battery. ⇒ Rep. Gr. 27 ; Battery; Disconnecting and reconnecting battery.
 - Remove footwell trim by removing nuts -arrows-.



- Remove bolt -1- and pull universal joint -2- off steering box.
- Remove front wheels.
- Loosen nut on track rod ball joint but do not remove completely.

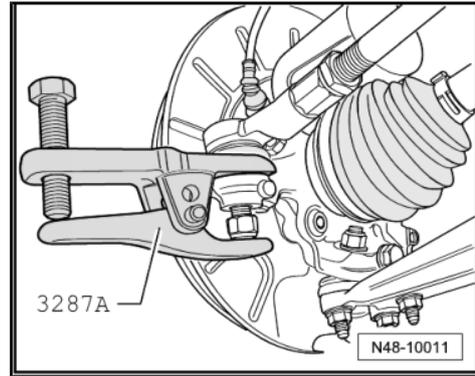


Caution

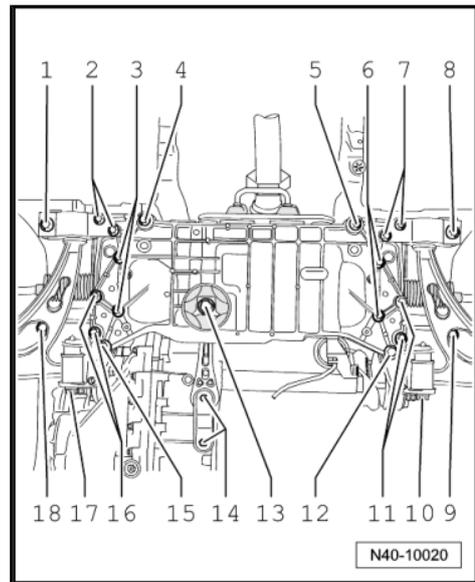
Leave nut screwed on a few turns to protect thread on pin.



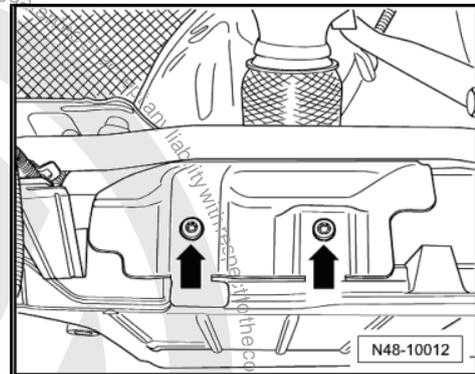
- Press track rod ball joint off wheel bearing housing with -3287A-.
- Remove lower noise insulation ⇒ Rep. Gr. 50 ; Assembly overview - noise insulation .



- Disconnect pendulum support from gearbox by removing bolts -14-.
- Remove exhaust system retainer on subframe.



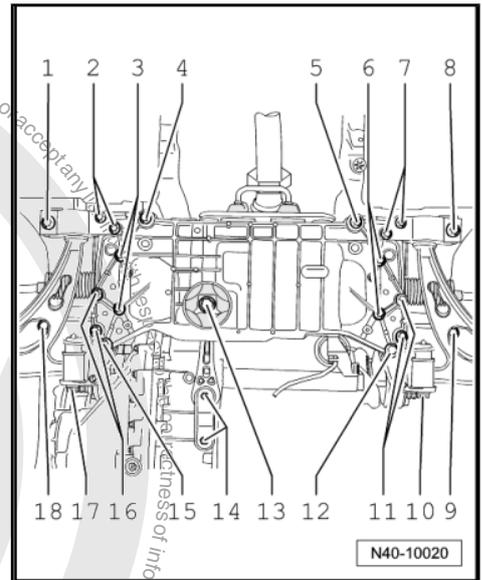
- Remove bolts -arrows- on heat shield.
- Remove heat shield from subframe.



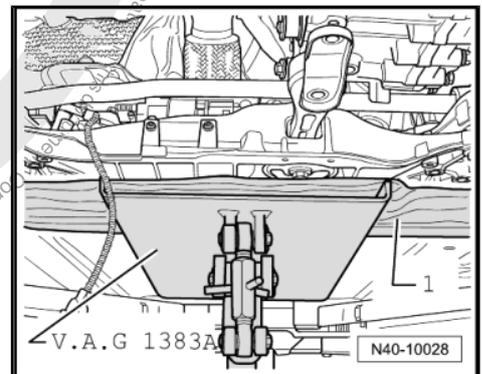
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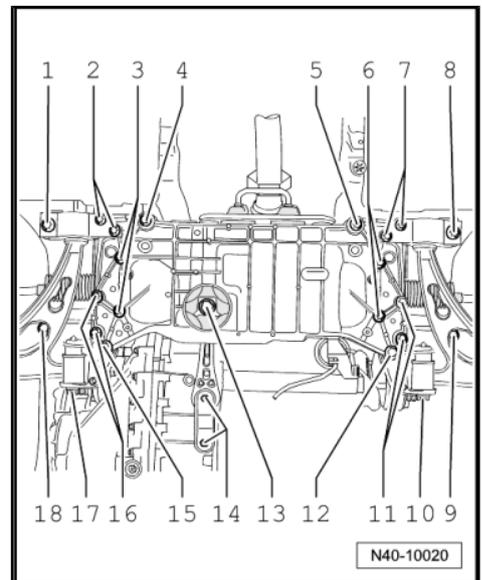
- Now remove bolts -3, 6, 11 and 16- for steering box and anti-roll bar.
- Fix position of subframe and brackets. => [page 16](#)



- Position engine and gearbox jack -V.A.G 1383 A- under subframe.
- Place a wooden block -1- or similar between V.A.G 1383 A and subframe.

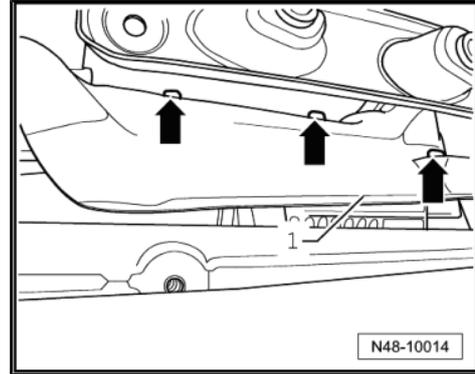


- Remove bolts -4 and 5- and lower subframe with brackets slightly, observing electrical wires.

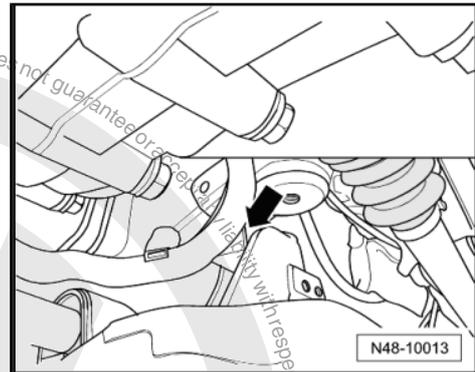




- Remove heat shield -1- over steering box.
- Remove bolts -arrows-.



- Remove cable guide from subframe -arrow-.
- Unclip all remaining cable clips on steering box.
- Disconnect all electrical connections on steering box.
- Lower subframe using engine and gearbox jack -V.A.G 1383 A- far enough that the steering box can be removed.



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- Set steering box down as illustrated.

This prevents damage to the control unit -1-.

Installing steering box

Install in reverse order.

Threaded sleeves of steering box must seat in holes in left bracket.



Note

- ◆ Coat seal on steering box with suitable lubricant, e.g. soft soap, before installing steering box.
- ◆ After fitting the steering box to the jointed shaft, ensure that the seal is not kinked when lying against the assembly plate and that the opening to the footwell is correctly sealed. Otherwise, this can result in water leaks and/or noise.
- ◆ Ensure sealing surfaces are clean.

Before inserting subframe bolts, position steering box on subframe and insert bolts for steering box and anti-roll bar.

- Connect electrical connections to steering box.
- Install lower noise insulation. ⇒ Rep. Gr. 50 ; Assembly overview - noise insulation .



Note

Ensure boot is not damaged or twisted.

- Bolt universal joint to steering box.
- Connect battery. ⇒ Rep. Gr. 27 ; Battery; Disconnecting and reconnecting battery.
- Carry out basic setting for -G85 - steering angle sender- using vehicle diagnosis, testing and information system -VAS 5051- ⇒ Vehicle diagnosis, testing and information system VAS 5051.

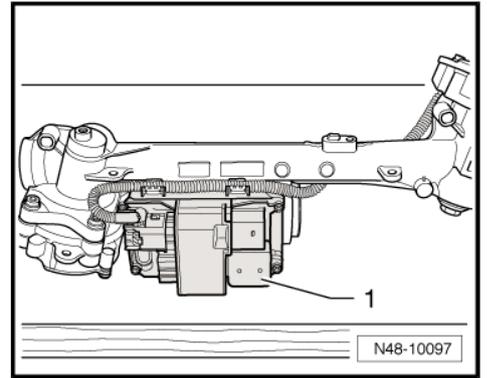
After installation, position of steering wheel must be checked during road test.

If steering wheel is not in straight-ahead position or if a new steering box was installed, front axle tracking must be checked and if necessary adjusted!

- Check wheel alignment. ⇒ [page 305](#)

If new steering box has been installed, adapt power steering control unit -J500- using vehicle diagnostic, testing and information system -VAS 5051- .

- Carry out basic setting for power steering control unit -J500- using vehicle diagnosis, testing and information system -VAS 5051- ⇒ Vehicle diagnosis, testing and information system VAS 5051.



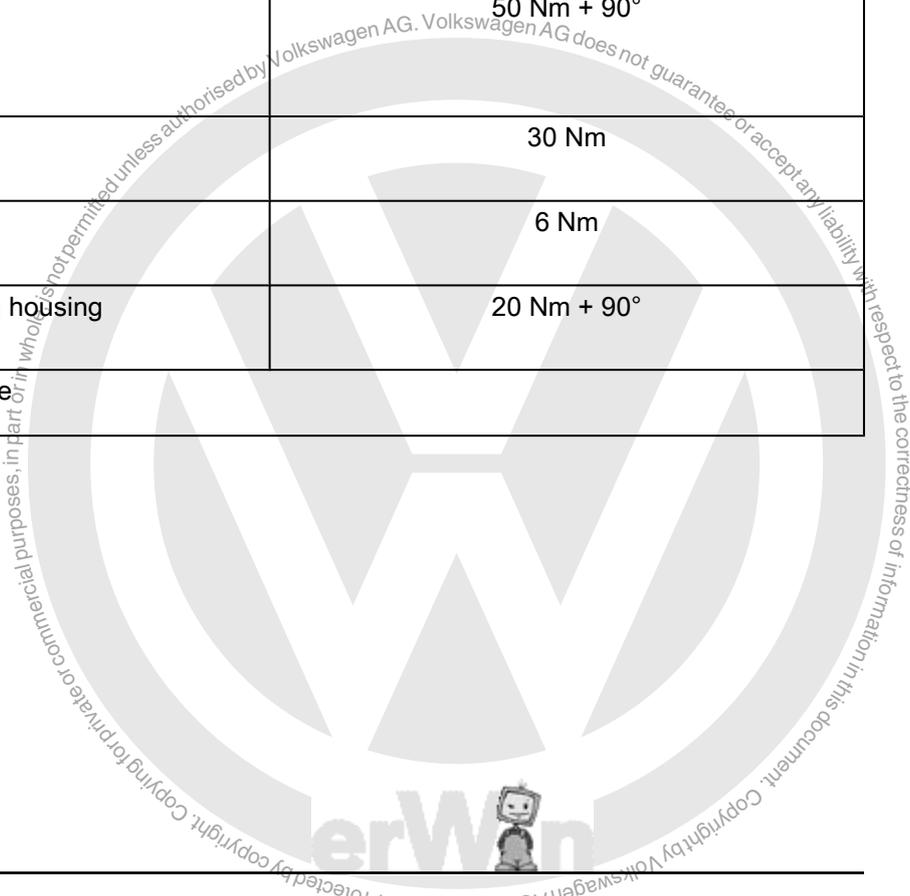


Note

- ◆ *If parking aid 2 is fitted in the vehicle, the power steering control unit -J500- must be recoded following the installation of a new steering box⇒ Vehicle diagnosis, testing and information system VAS 5051.*
- ◆ *Parking aid 2 is fitted only in vehicles having 2nd generation steering boxes.*

Specified torques

Component	Specified torque
Subframe to body ◆ Use new bolts	70 Nm + 90°
Anti-roll bar to subframe ◆ Use new bolts	20 Nm + 90°
Anti-roll bar to coupling rod ◆ Use new nut ◆ Counterhold on multi-point socket of joint pin	65 Nm
Swivel joint to cast steel suspension link ◆ Use new nuts	60 Nm
Swivel joint to sheet steel or forged aluminium suspension link ◆ Use new nuts	100 Nm
Shield to subframe ◆ Bolt M6 is self-locking	6 Nm
Steering box to subframe ◆ Use new bolts ◆ Always renew clamp	50 Nm + 90°
Universal joint to steering box ◆ Use new bolt	30 Nm
Shield to steering box ◆ Bolt M6 is self-locking	6 Nm
Track rod ball joint to wheel bearing housing ◆ Use new nut	20 Nm + 90°
Exhaust system bracket to subframe ⇒ Engine; Rep. Gr. 26	





Specified torques for pendulum support to gearbox

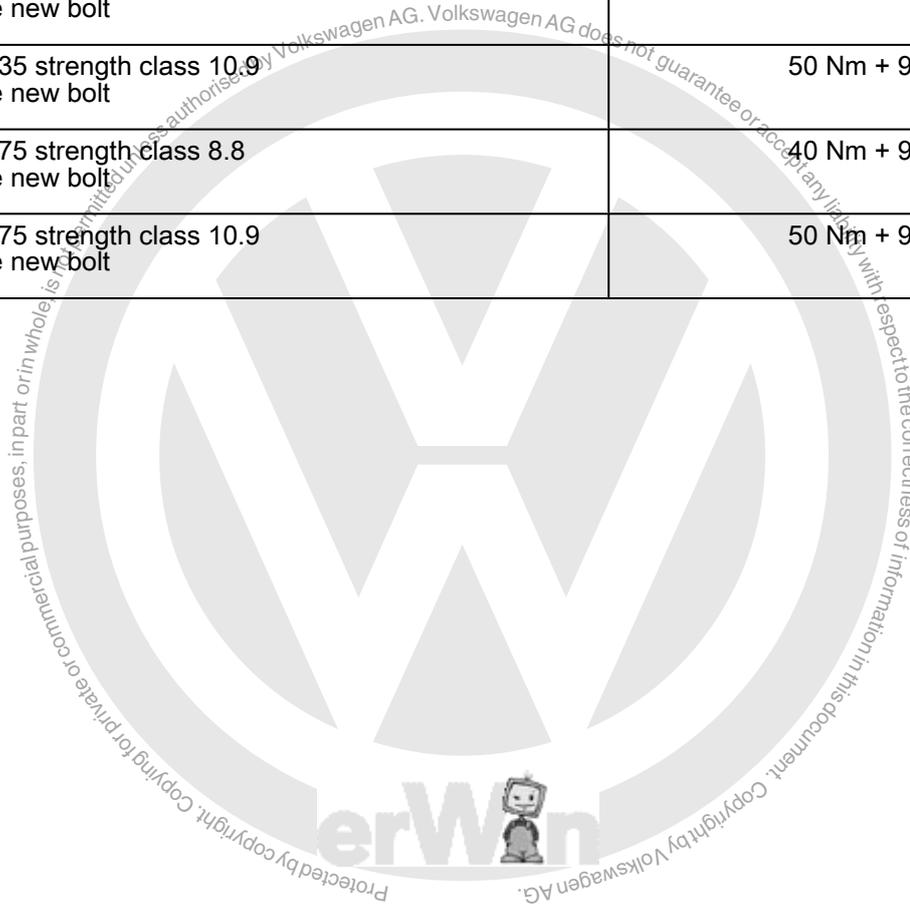
 **Caution**

From model year 08, HeliCoil inserts are installed in the pendulum support connection in the 02Q gearboxes. Identification => Rep. Gr. 34.

Use a bolt with hardness class 10.9 for this and all other gearboxes.

If there is no HeliCoil insert in the 02Q gearbox, use bolts with the strength class 8.8 and the corresponding torque setting.

Bolt	Specified torque
M10 x 35 strength class 8.8 ◆ Use new bolt	40 Nm + 90° further
M10 x 35 strength class 10.9 ◆ Use new bolt	50 Nm + 90° further
M10 x 75 strength class 8.8 ◆ Use new bolt	40 Nm + 90° further
M10 x 75 strength class 10.9 ◆ Use new bolt	50 Nm + 90° further

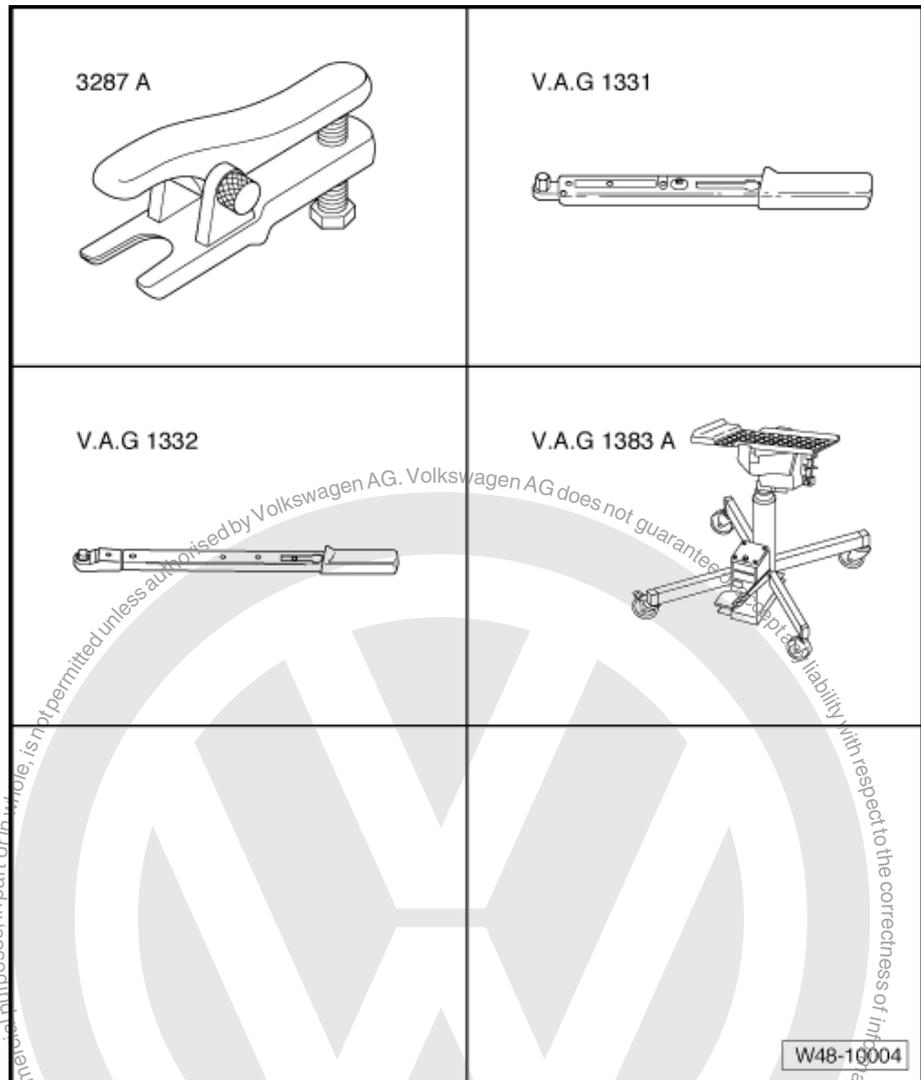




6.4 Removing and installing steering box, right-hand drive (2nd generation) up to model year 2008

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-
- ◆ Torque wrench -V.A.G 1332-
- ◆ Engine and gearbox jack - V.A.G 1383 A-
- ◆ Ball joint puller -3287 A-



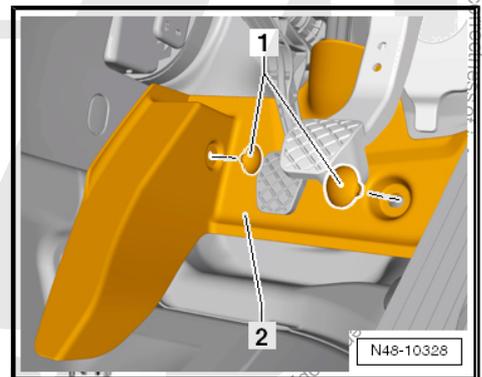


Removing

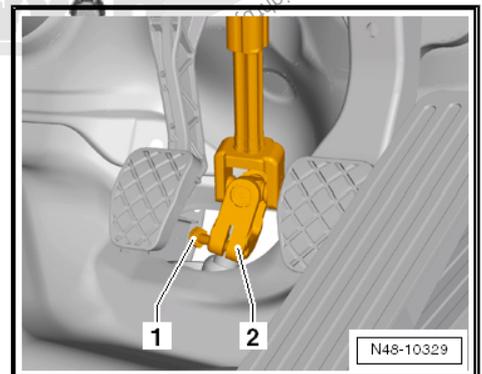


Note

- ◆ *There are no 2nd generation steering boxes available as spare parts.*
 - ◆ *If the steering box has to be replaced, a new 3rd generation steering box will have to be fitted.*
 - ◆ *In addition, the electrical wiring harness from the E-box to the steering box will then also have to be renewed. This is included with the order for the new steering box via the → Electronic parts catalogue "ETKA".*
 - ◆ *The electrical wiring harness will be delivered with the cable for the service interval display.*
 - ◆ *In vehicles without a service interval display, the unused 3-pin connector must be sealed by a flat contact housing with connector position assurance -1J0 973 803- → Electronic parts catalogue "ETKA".*
- Disconnect battery ⇒ Rep. Gr. 27 ; Battery; Disconnecting and reconnecting battery .
 - Remove nuts -1- and remove footwell trim -2-.



- Remove bolt -1- for universal joint and pull universal joint -2- off steering box.
- Remove front wheels.
- Loosen nut on track rod ball joint but do not remove completely.

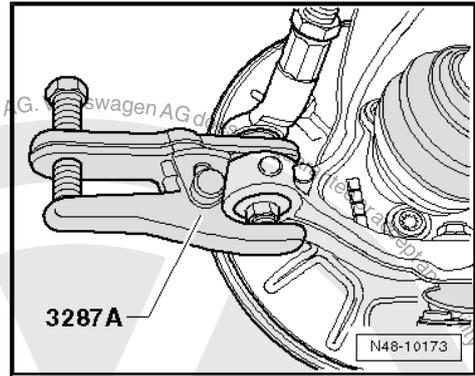


Caution

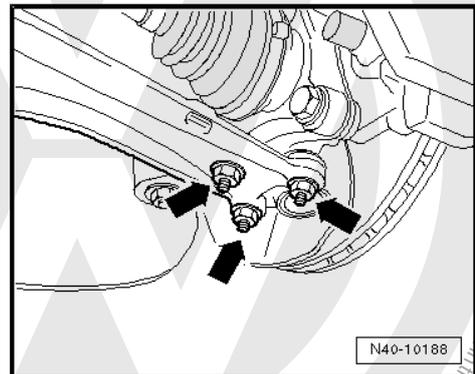
Leave nut screwed a few turns onto pin to protect thread.



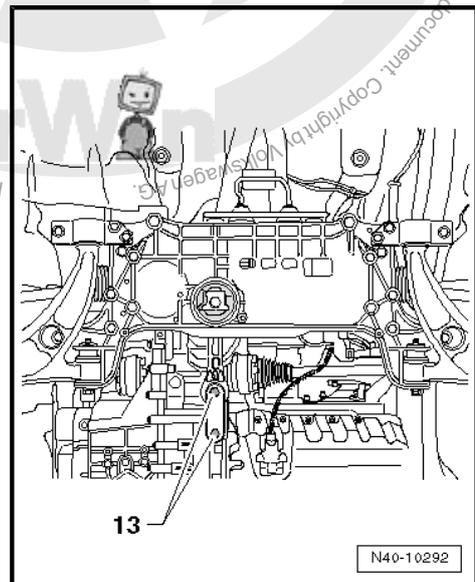
- Press track rod ball joint off wheel bearing housing using ball joint puller -3287A- and remove nut now.
- Remove lower noise insulation => Rep. Gr. 50 ; Assembly overview - noise insulation .
- Remove coupling rod from anti-roll bar.



- Remove nuts -arrows-.

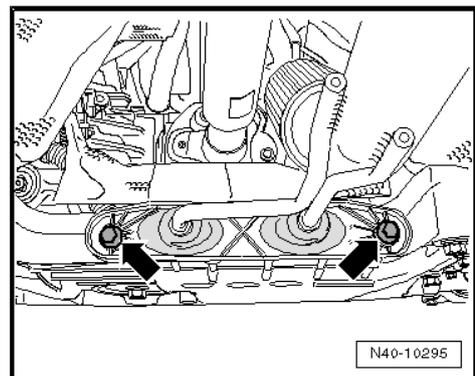


- Disconnect pendulum support from gearbox by removing bolts -13-.



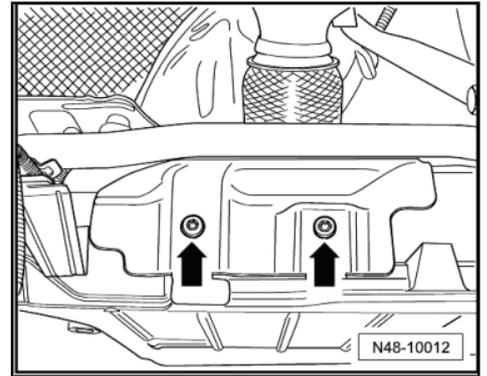
- Detach exhaust system bracket from subframe -arrows-.

Vehicles with front-wheel drive

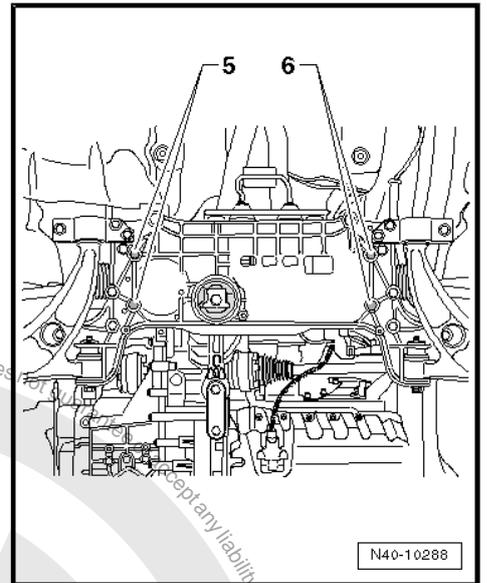




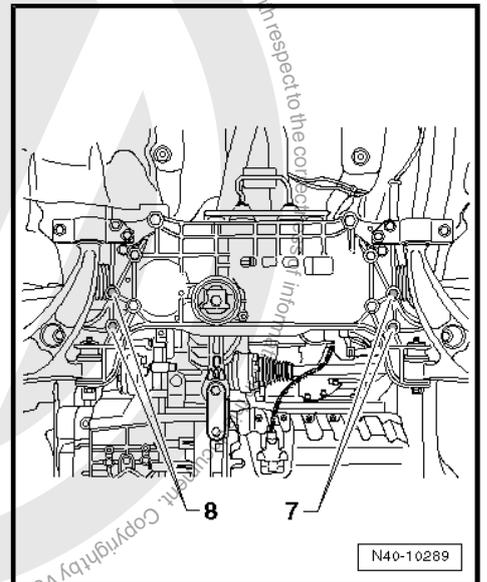
- Remove bolts -arrows- on heat shield.
- Remove heat shield from subframe.



- Remove bolts -5- and -6- for steering box.

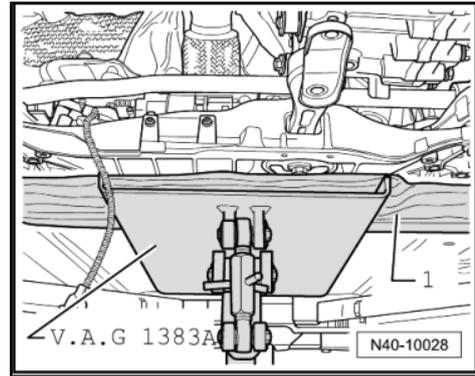


- Remove bolts -7- and -8- for anti-roll bar.
- Fix position of subframe => [page 16](#) .
- Separate connector for extended service intervals on oil sump.

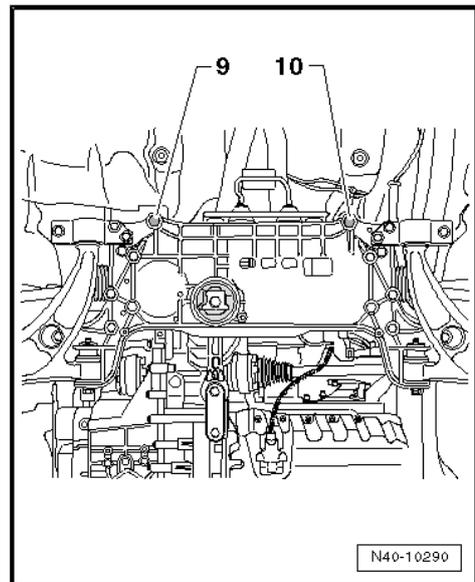




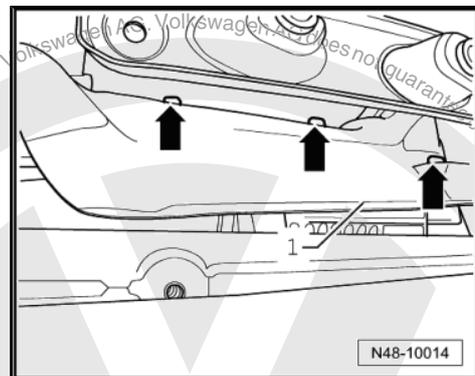
- Position engine and gearbox jack -V.A.G 1383 A- under subframe.
- Place, for example, a wooden block -1- between engine and gearbox jack -V.A.G 1383 A- and subframe.



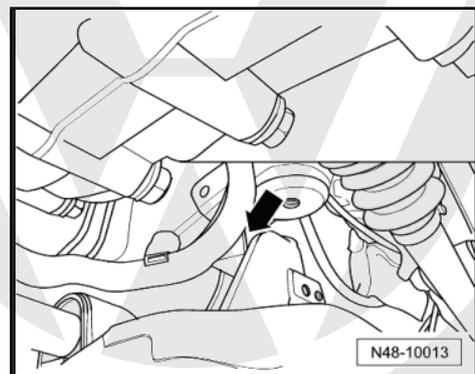
- Remove bolts -9- and -10- and lower subframe slightly. In the process, observe electrical wiring.



- Remove heat shield -1- over steering box.
- Remove bolts -arrows-.



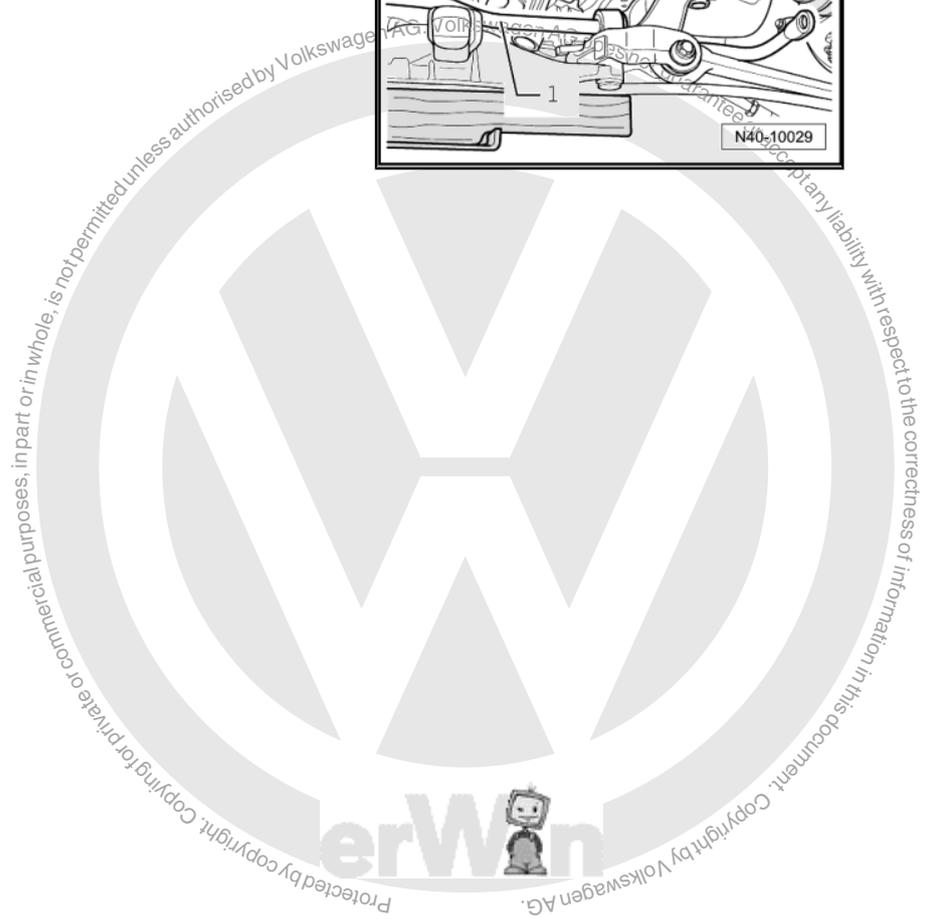
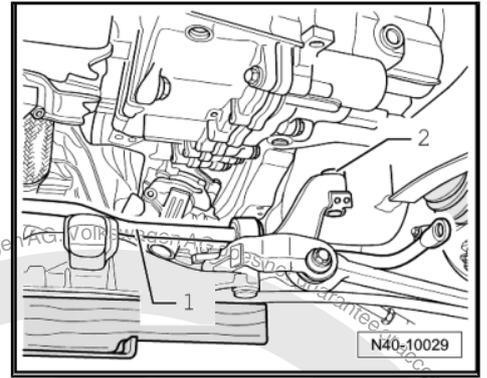
- Remove cable guide from subframe -arrow-
- Unclip all remaining cable clips on steering box.
- Disconnect connectors from steering box.
- Lower subframe carefully with engine/gearbox jack -V.A.G 1383 A- .



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- Now lift anti-roll bar -1- forwards over subframe -2- and down while turning anti-roll bar slightly.
- Unbolt steering box from subframe.





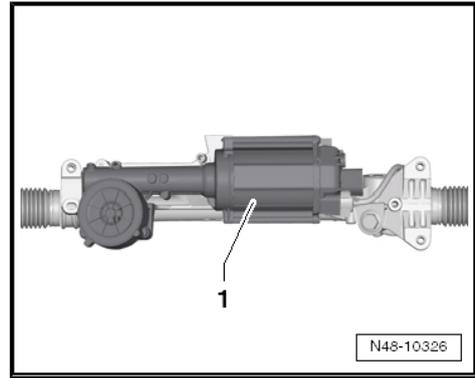
- Set steering box down as illustrated.

This prevents damage to the control unit -1-.

Installing

Install in reverse order.

Threaded sleeve of steering box must be located in subframe hole.



Note

- ◆ Coat seal on steering box with suitable lubricant, e.g. soft soap, before installing steering box.
- ◆ After fitting the steering box to the universal joint, make sure that the seal is not kinked when lying against the assembly plate and that the opening to the footwell is correctly sealed. Otherwise, this can result in water leaks and/or noise.
- ◆ Ensure sealing surfaces are clean.

Before inserting subframe bolts, position steering box on subframe and insert bolts for steering box and anti-roll bar.

- Attach lower noise insulation ⇒ Rep. Gr. 50 ; Assembly overview - noise insulation .
- Bolt universal joint to steering box.
- Connect battery ⇒ Rep. Gr. 27 ; Battery; Disconnecting and reconnecting battery .
- Carry out basic setting for steering angle sender -G85- using vehicle diagnosis, testing and information system -VAS 5051- ⇒ Vehicle diagnosis, testing and information system VAS 5051.

After installation, position of steering wheel must be checked during road test.

If steering wheel is crooked or a new steering box was installed, wheels must be aligned.

- Perform wheel alignment ⇒ [page 305](#)

If new steering box has been installed, adapt power steering control unit -J500- using vehicle diagnosis, testing and information system -VAS 5051- .

- Carry out basic setting for power steering control unit -J500- using vehicle diagnosis, testing and information system -VAS 5051- ⇒ Vehicle diagnosis, testing and information system VAS 5051.

Note

If parking aid 2 is fitted in the vehicle, the power steering control unit -J500- must be recoded ⇒ Vehicle diagnosis, testing and information system VAS 5051.

Specified torques

Component	Specified torque
Subframe to body ◆ Use new bolts	70 Nm + 90°



Component	Specified torque
Anti-roll bar to subframe ◆ Use new bolts	20 Nm + 90°
Anti-roll bar to coupling rod ◆ Use new nut ◆ Counterhold on multi-point socket of joint pin	65 Nm
Swivel joint to cast steel suspension link ◆ Use new nuts	60 Nm
Swivel joint to sheet steel or forged aluminium suspension link ◆ Use new nuts	100 Nm
Shield to subframe ◆ Bolt M6 is self-locking	6 Nm
Steering box to subframe ◆ Use new bolts ◆ Always renew clamp	50 Nm + 90°
Universal joint to steering box ◆ Use new bolt	30 Nm
Shield to steering box ◆ Bolt M6 is self-locking	6 Nm
Track rod ball joint to wheel bearing housing ◆ Use new nut	20 Nm + 90°
Exhaust system bracket to subframe ⇒ Engine; Rep. Gr. 26	

Specified torques for pendulum support to gearbox

 **Caution**

From model year 08, HeliCoil inserts are installed in the pendulum support connection in the 02Q gearboxes. Identification ⇒ Rep. Gr. 34.

Use a bolt with hardness class 10.9 for this and all other gearboxes.

If there is no HeliCoil insert in the 02Q gearbox, use bolts with the strength class 8.8 and the corresponding torque setting.

Bolt	Specified torque
M10 x 35 strength class 8.8 ◆ Use new bolt	40 Nm + 90° further
M10 x 35 strength class 10.9 ◆ Use new bolt	50 Nm + 90° further
M10 x 75 strength class 8.8 ◆ Use new bolt	40 Nm + 90° further
M10 x 75 strength class 10.9 ◆ Use new bolt	50 Nm + 90° further





7 Electromechanical steering box after model year 2009

7.1 Assembly overview - electromechanical steering box, left-hand drive (3rd generation) after model year 2009

1 - Wiring

2 - Universal joint

3 - Bolt

- M8 x 35
- 30 Nm
- Always renew after removing

4 - Torx bolt

- 6 Nm
- Self-locking

5 - Shield

6 - Power steering box

- With power steering control unit -J500-
- With electromechanical power steering motor -V187-
- With steering angle sender -G85-
- With steering torque sender -G269-
- Can be checked in guided fault finding of the vehicle diagnosis, testing and information system -VAS 5051B-
- Removing and installing
 ⇒ [page 385](#)

7 - Wheel bearing housing left

8 - Nut

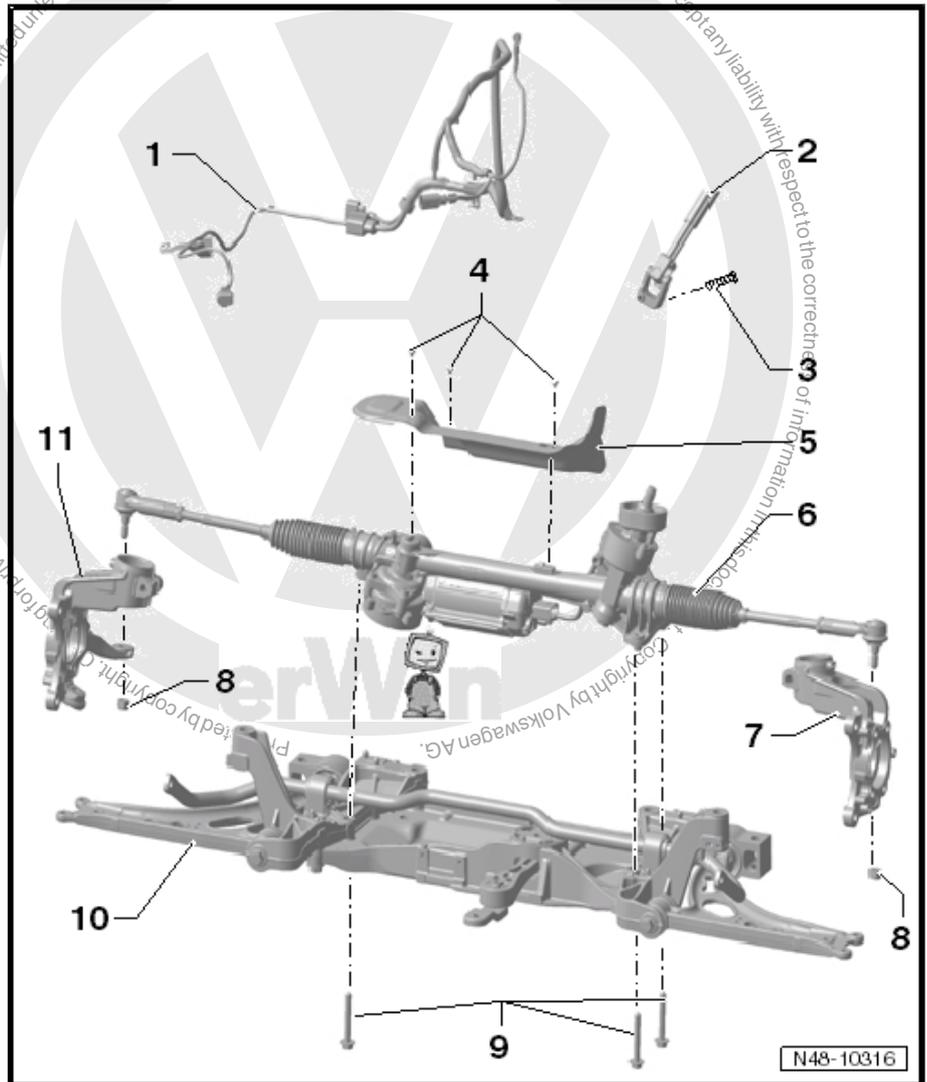
- M12 x 1.5
- 20 Nm + 90° further
- Self-locking
- Always renew after removing

9 - Bolt

- 50 Nm + 90° further
- Always renew after removing

10 - Subframe

11 - Wheel bearing housing right





7.2 Assembly overview - electromechanical steering box, right-hand drive (3rd generation) after model year 2009

1 - Universal joint

2 - Bolt

- M8 x 35
- 30 Nm
- Always renew after removing

3 - Wiring

4 - Shield

5 - Torx bolt

- 6 Nm
- Self-locking

6 - Power steering box

- With power steering control unit -J500-
- With electromechanical power steering motor -V187-
- With steering angle sender -G85-
- With steering torque sender -G269-
- Can be checked in guided fault finding of the vehicle diagnosis, testing and information system -VAS 5051B-
- Removing and installing ⇒ [page 391](#)

7 - Wheel bearing housing left

8 - Nut

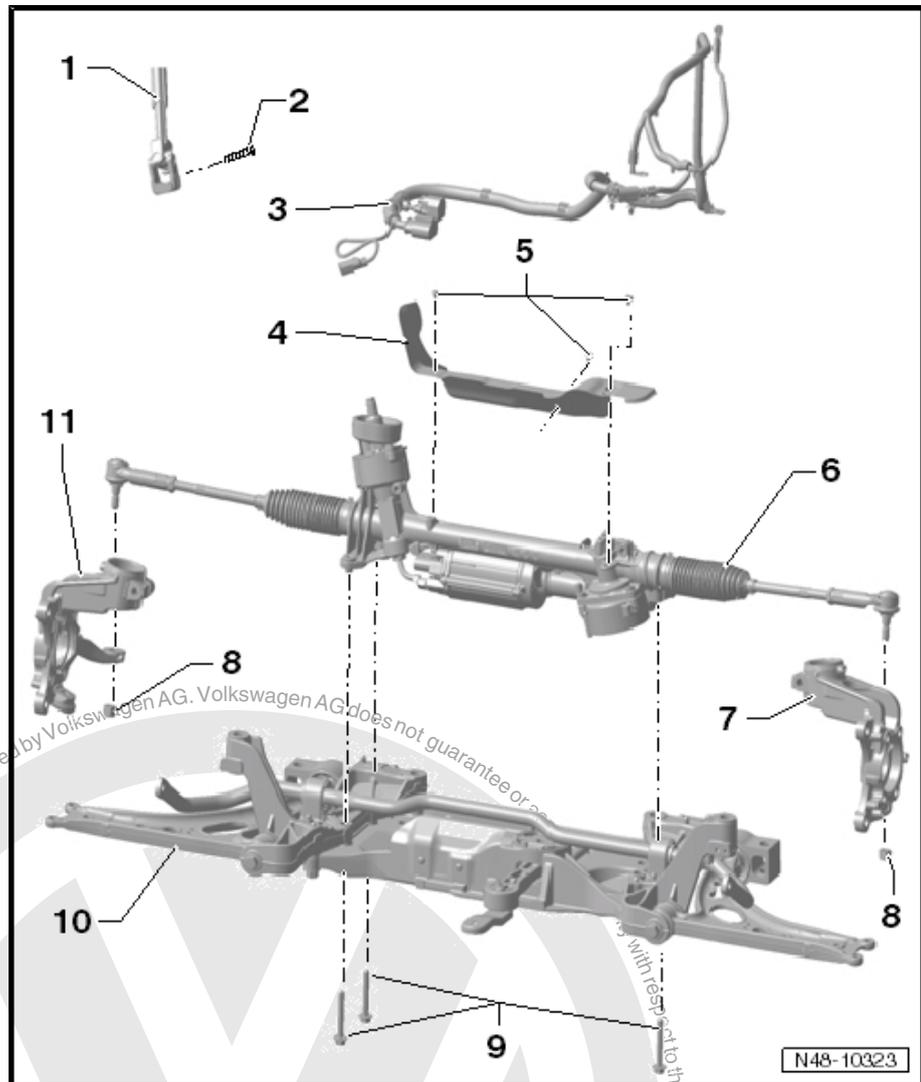
- M12 x 1.5
- 20 Nm + 90° further
- Self-locking
- Always renew after removing

9 - Bolt

- 50 Nm + 90° further
- Always renew after removing

10 - Subframe

11 - Wheel bearing housing right

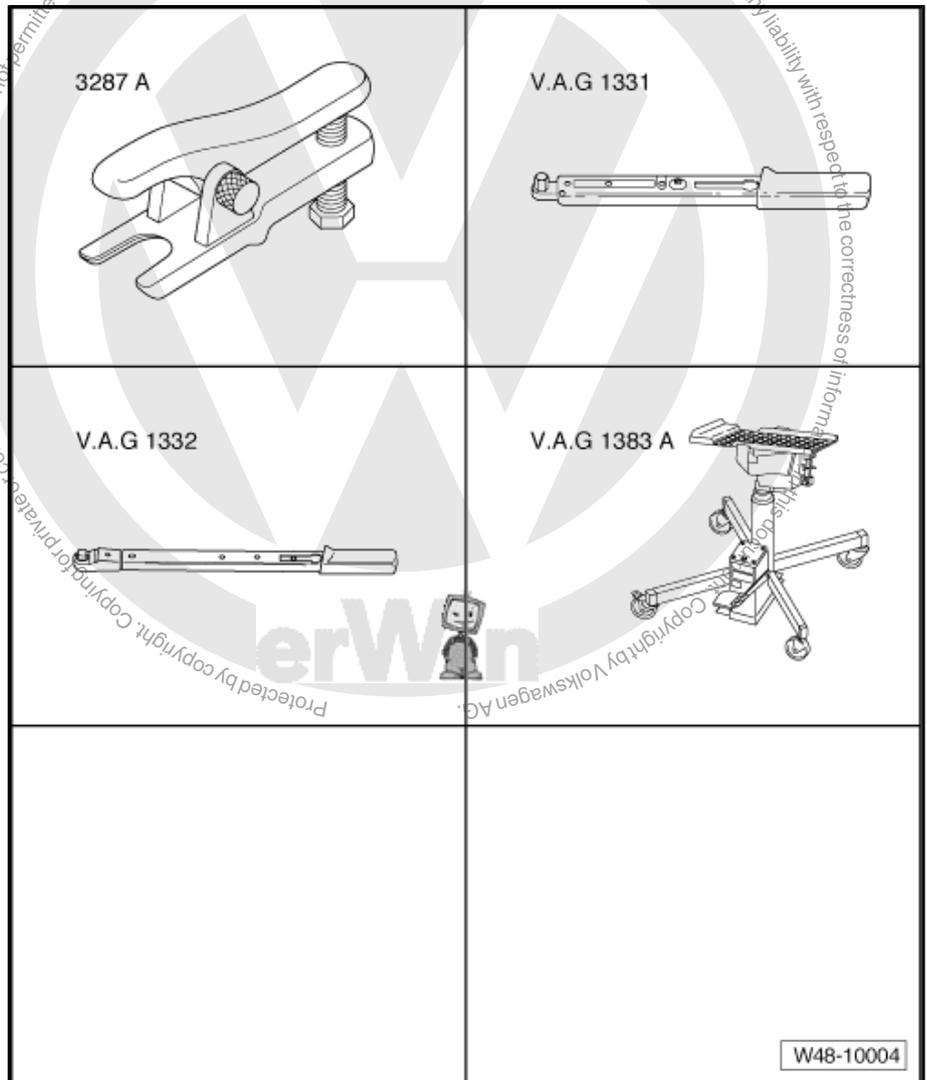




7.3 Removing and installing steering box, left-hand drive (3rd generation) after model year 2009

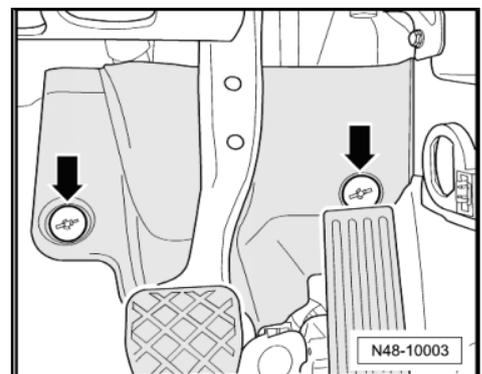
Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-
- ◆ Torque wrench -V.A.G 1332-
- ◆ Engine and gearbox jack -V.A.G 1383 A-
- ◆ Ball joint puller -3287 A-



Removing steering box

- Disconnect battery. ⇒ Rep. Gr. 27 ; Battery; Disconnecting and reconnecting battery.
- Remove footwell trim by removing nuts -arrows-.



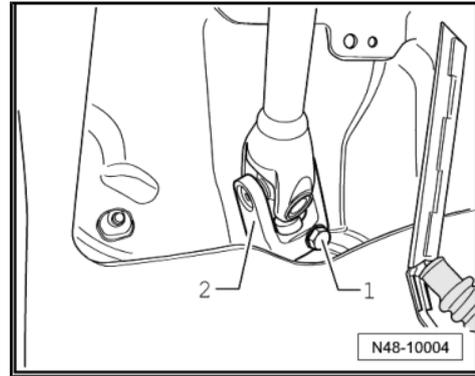


- Remove bolt -1- and pull universal joint -2- off steering box.
- Remove front wheels.
- Loosen nut on track rod ball joint but do not remove completely.

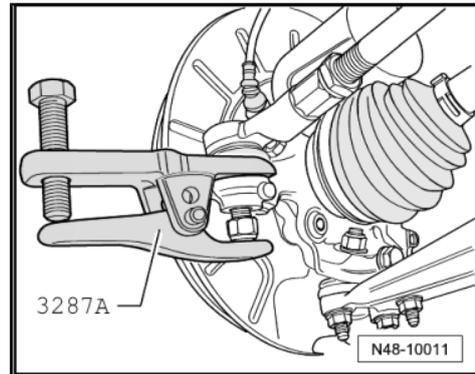


Caution

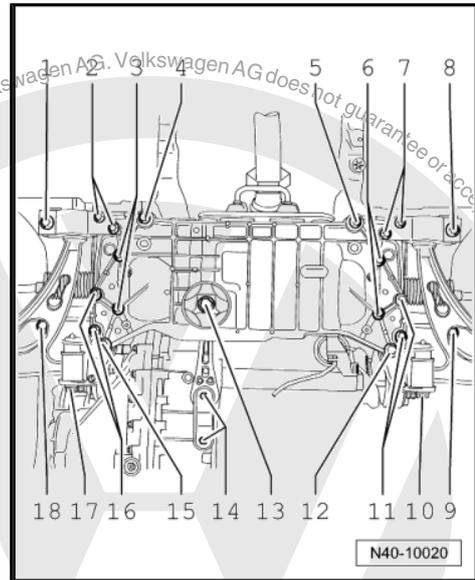
Leave nut screwed a few turns onto pin to protect thread.



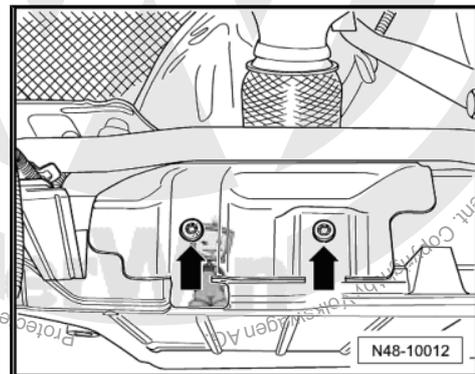
- Press track rod ball joint off wheel bearing housing with -3287A-.
- Remove lower noise insulation ⇒ Rep. Gr. 50 ; Assembly overview - noise insulation .



- Disconnect pendulum support from gearbox by removing bolts -14-.
- Remove exhaust system retainer on subframe.

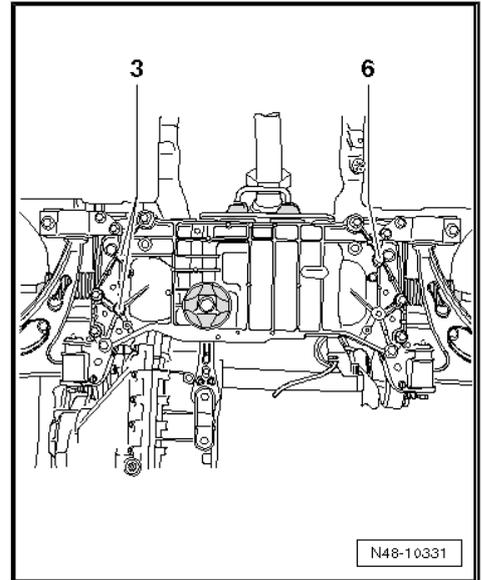


- Remove bolts -arrows- on heat shield.
- Remove heat shield from subframe.

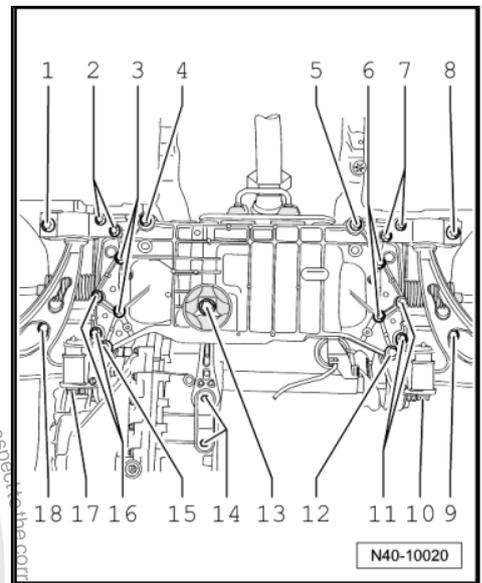




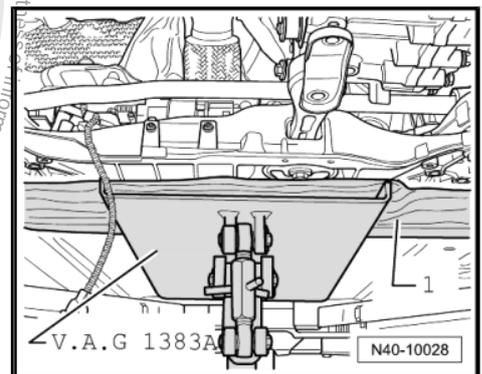
- Remove bolts -3- and -6- for steering box.



- Remove bolts -11- and -16- for anti-roll bar.
- Fix position of subframe and brackets. => [page 16](#)

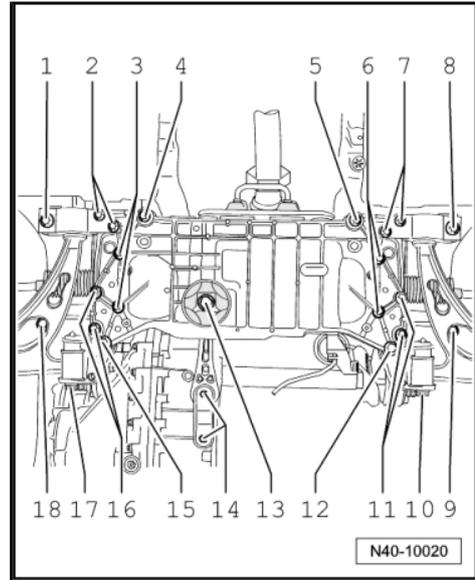


- Position engine and gearbox jack -V.A.G 1383 A- under subframe.
- Place a wooden block -1- or similar between V.A.G 1383 A and subframe.

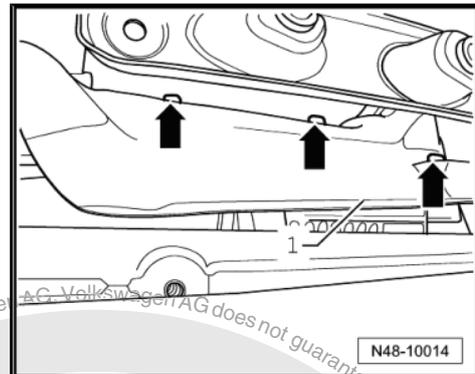




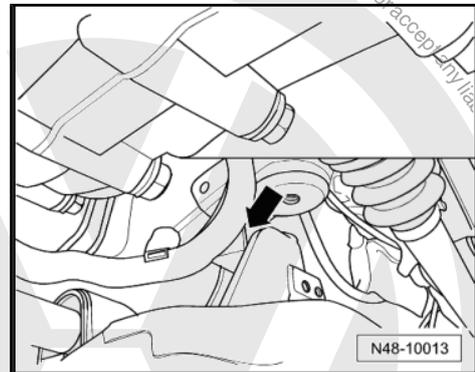
- Remove bolts -4 and 5- and lower subframe with brackets slightly, observing electrical wires.



- Remove heat shield -1- over steering box.
- Remove bolts -arrows-.



- Remove cable guide from subframe -arrow-.
- Unclip all remaining cable clips on steering box.
- Disconnect all electrical connections on steering box.
- Lower subframe using engine and gearbox jack -V.A.G 1383 A- far enough that the steering box can be removed.





- Set steering box down as illustrated.

This prevents damage to the control unit -1-.

Installing steering box

Install in reverse order.

Threaded sleeves of steering box must seat in holes in left bracket.



Note

- ◆ Coat seal on steering box with suitable lubricant, e.g. soft soap, before installing steering box.
- ◆ After fitting the steering box to the jointed shaft, ensure that the seal is not kinked when lying against the assembly plate and that the opening to the footwell is correctly sealed. Otherwise, this can result in water leaks and/or noise.
- ◆ Ensure sealing surfaces are clean.

Before inserting subframe bolts, position steering box on subframe and insert bolts for steering box and anti-roll bar.

- Connect electrical connections to steering box.
- Install lower noise insulation. ⇒ Rep. Gr. 50 ; Assembly overview - noise insulation .



Note

Ensure boot is not damaged or twisted.

- Bolt universal joint to steering box.
- Connect battery. ⇒ Rep. Gr. 27 ; Battery; Disconnecting and reconnecting battery.
- Carry out basic setting for -G85-Geber für Lenkwinkel- using vehicle diagnosis, testing and information system -VAS 5051- ⇒ Vehicle diagnosis, testing and information system VAS 5051.

After installation, position of steering wheel must be checked during road test.

If steering wheel is not in straight-ahead position or if a new steering box was installed, front axle tracking must be checked and if necessary adjusted!

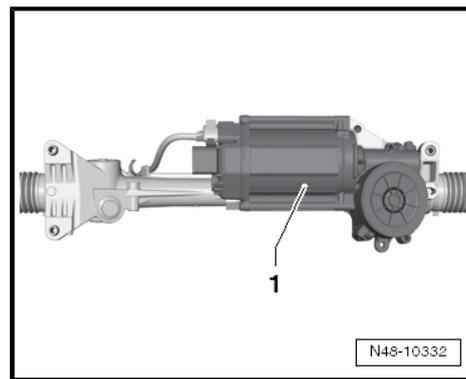
- Check wheel alignment. ⇒ [page 305](#)

If new steering box has been installed, adapt power steering control unit -J500- using vehicle diagnostic, testing and information system -VAS 5051B- .

- Carry out basic setting for power steering control unit -J500- using vehicle diagnosis, testing and information system -VAS 5051B- ⇒ Vehicle diagnosis, testing and information system VAS 5051.

Specified torques

Component	Specified torque
Subframe to body ◆ Use new bolts	70 Nm + 90°





Component	Specified torque
Anti-roll bar to subframe ◆ Use new bolts	20 Nm + 90°
Anti-roll bar to coupling rod ◆ Use new nut ◆ Counterhold on multi-point socket of joint pin	65 Nm
Swivel joint to cast steel suspension link ◆ Use new nuts	60 Nm
Swivel joint to sheet steel or forged aluminium suspension link ◆ Use new nuts	100 Nm
Shield to subframe ◆ Bolt M6 is self-locking	6 Nm
Steering box to subframe ◆ Use new bolts	50 Nm + 90°
Universal joint to steering box ◆ Use new bolt	30 Nm
Shield to steering box ◆ Bolt M6 is self-locking	6 Nm
Track rod ball joint to wheel bearing housing ◆ Use new nut	20 Nm + 90°
Exhaust system bracket to subframe ⇒ Engine; Rep. Gr. 26	

Specified torques for pendulum support to gearbox

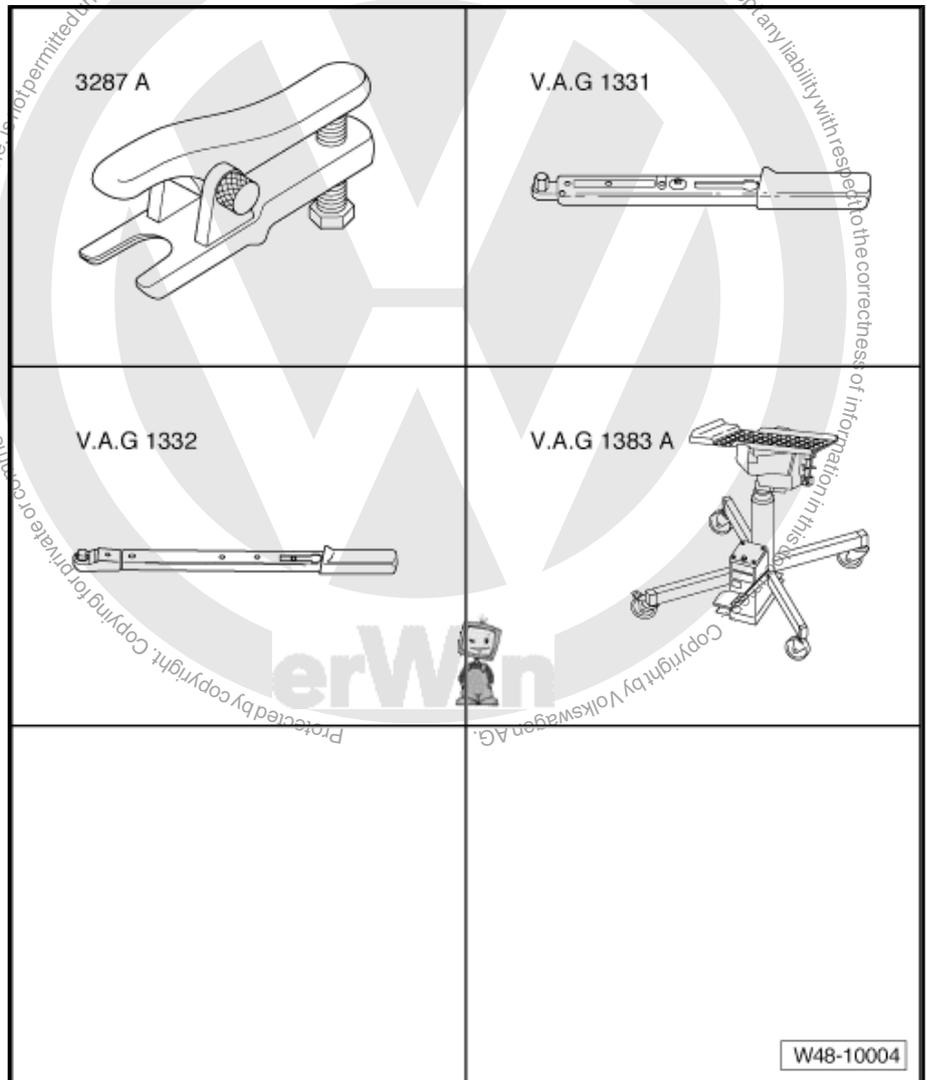
Bolt	Specified torque
M10 x 35 ◆ Use new bolt	50 Nm + 90° further
M10 x 75 ◆ Use new bolt	50 Nm + 90° further



7.4 Removing and installing steering box, right-hand drive (3rd generation) after model year 2009

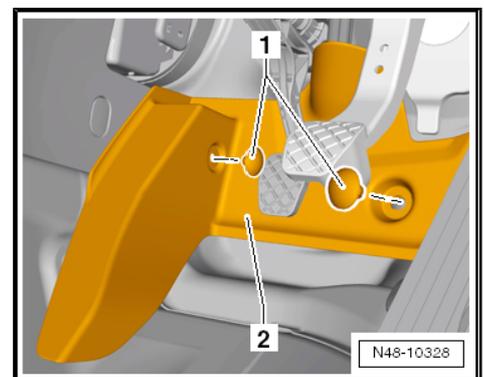
Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-
- ◆ Torque wrench -V.A.G 1332-
- ◆ Engine and gearbox jack V.A.G 1383 A-
- ◆ Ball joint puller -3287 A-



Removing

- Disconnect battery ⇒ Rep. Gr. 27 ; Battery; Disconnecting and reconnecting battery .
- Remove nuts -1- and remove footwell trim -2-.



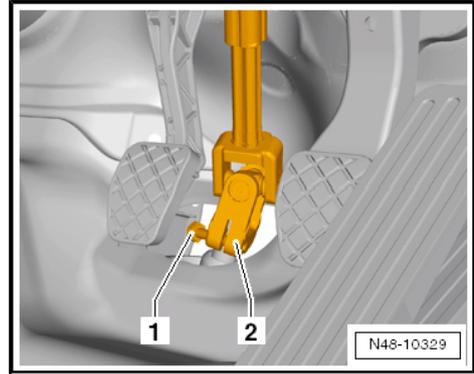


- Remove bolt -1- for universal joint and pull universal joint -2- off steering box.
- Remove front wheels.
- Loosen nut on track rod ball joint but do not remove completely.

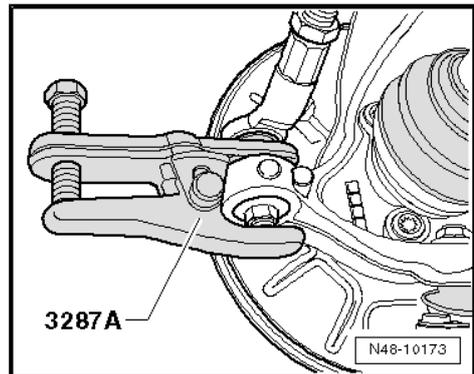


Caution

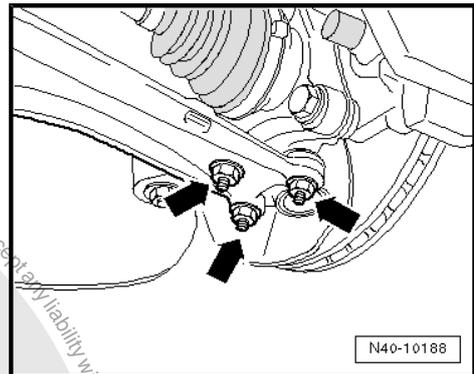
Leave nut screwed a few turns onto pin to protect thread.



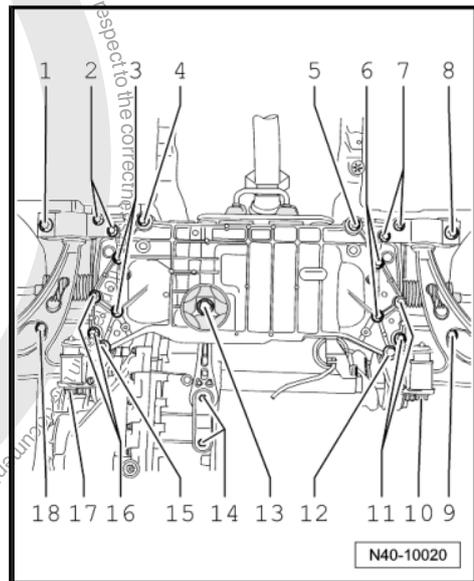
- Press track rod ball joint off wheel bearing housing using ball joint puller -3287A- and remove nut now.
- Remove lower noise insulation => Rep. Gr. 50 ; Assembly overview - noise insulation .
- Remove coupling rod from anti-roll bar.



- Remove nuts -arrows-.



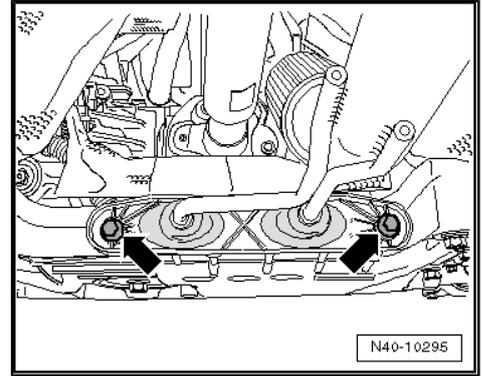
- Disconnect pendulum support from gearbox by removing bolts -14-.





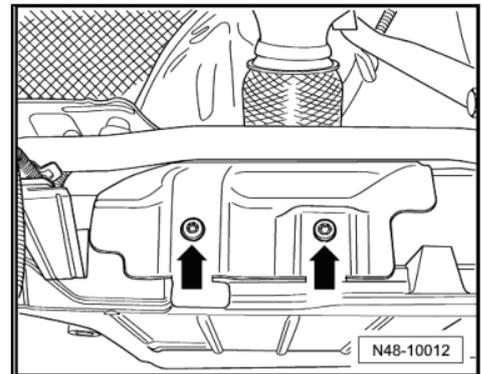
- Detach exhaust system bracket from subframe -arrows-.

Vehicles with front-wheel drive

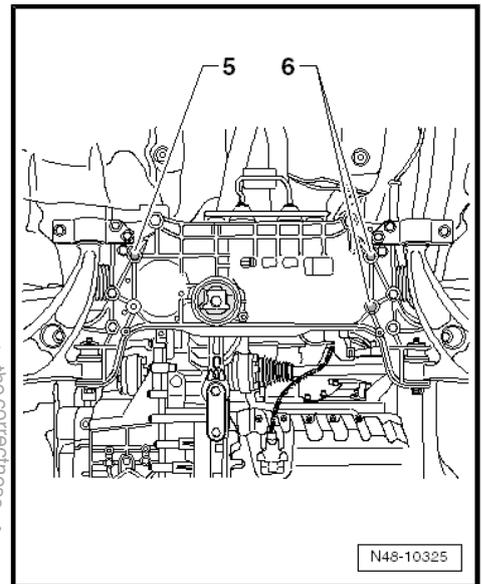


- Remove bolts -arrows- on heat shield.
- Remove heat shield from subframe.

Continuation for all vehicles

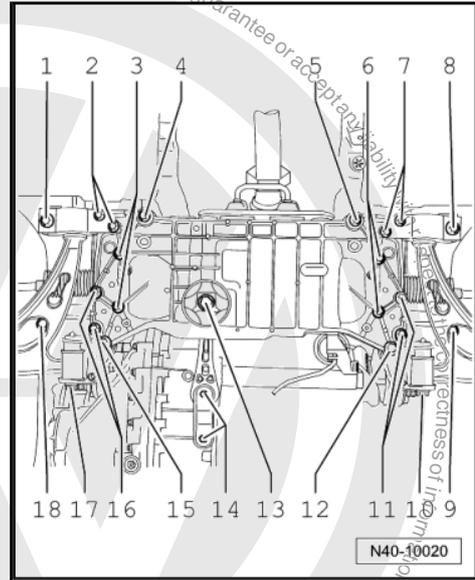


- Remove bolts -5- and -6- for steering box

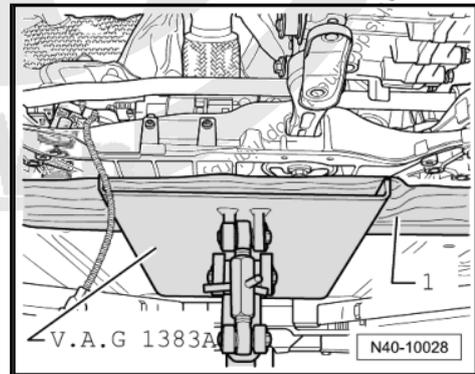




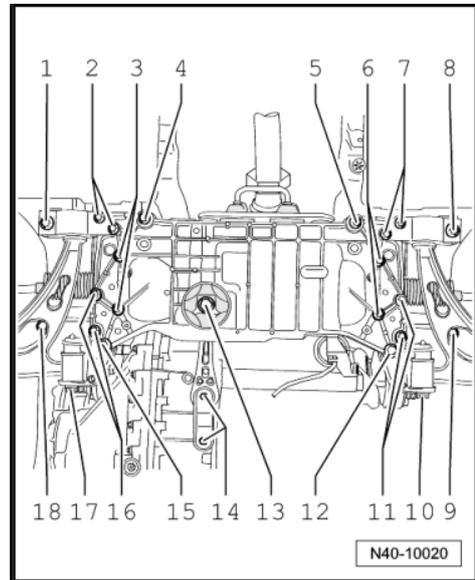
- Remove bolts -11- and -16- for anti-roll bar.
- Fix position of subframe ⇒ [page 16](#) .
- Separate connector for extended service intervals on oil sump.



- Position engine and gearbox jack -V.A.G 1383 A- under subframe.
- Place, for example, a wooden block -1- between engine and gearbox jack -V.A.G 1383 A- and subframe.

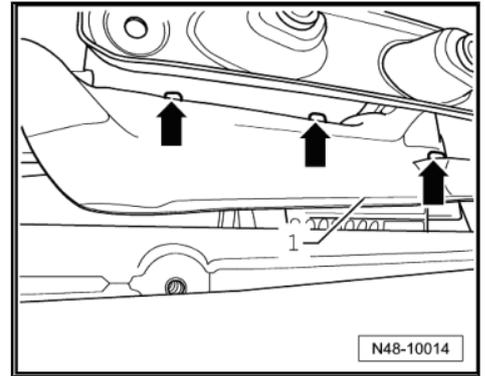


- Remove bolts -4- and -5- and lower subframe slightly. In the process, observe electrical wiring.

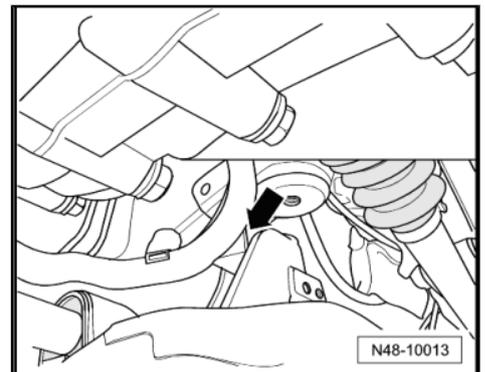




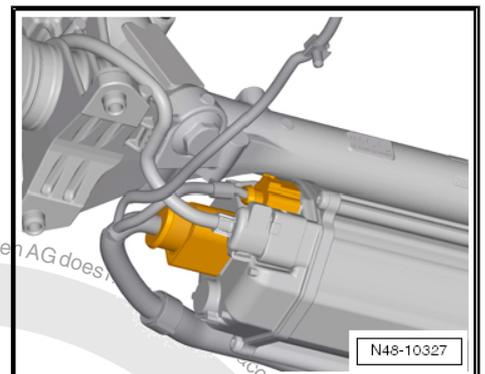
- Remove heat shield -1- over steering box.
- Remove bolts -arrows-.



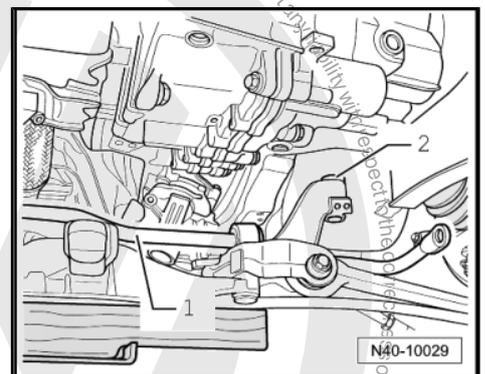
- Remove cable guide from subframe -arrow-.
- Unclip all remaining cable clips on steering box.



- Disconnect connectors from steering box.
- Lower subframe carefully with engine/gearbox jack -V.A.G 1383 A- .



- Now lift anti-roll bar -1- forwards over subframe -2- and down while turning anti-roll bar slightly.
- Unbolt steering box from subframe.





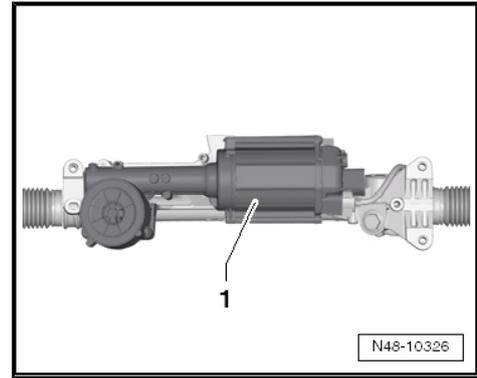
- Set steering box down as illustrated.

This prevents damage to the control unit -1-.

Installing

Install in reverse order.

Threaded sleeve of steering box must be located in subframe hole.



Note

- ◆ Coat seal on steering box with suitable lubricant, e.g. soft soap, before installing steering box.
- ◆ After fitting the steering box to the universal joint, make sure that the seal is not kinked when lying against the assembly plate and that the opening to the footwell is correctly sealed. Otherwise, this can result in water leaks and/or noise.
- ◆ Ensure sealing surfaces are clean.

Before inserting subframe bolts, position steering box on subframe and insert bolts for steering box and anti-roll bar.

- Attach lower noise insulation ⇒ Rep. Gr. 50 ; Assembly overview - noise insulation .
- Bolt universal joint to steering box.
- Connect battery ⇒ Rep. Gr. 27 ; Battery; Disconnecting and reconnecting battery .
- Carry out basic setting for steering angle sender -G85- using vehicle diagnosis, testing and information system -VAS 5051- ⇒ Vehicle diagnosis, testing and information system VAS 5051.

After installation, position of steering wheel must be checked during road test.

If steering wheel is crooked or a new steering box was installed, wheels must be aligned.

- Perform wheel alignment ⇒ [page 305](#) .

If new steering box has been installed, adapt power steering control unit -J500- using vehicle diagnostic, testing and information system -VAS 5051- .

- Carry out basic setting for power steering control unit -J500- using vehicle diagnosis, testing and information system -VAS 5051- ⇒ Vehicle diagnosis, testing and information system VAS 5051.



Note

If parking aid 2 is fitted in the vehicle, the power steering control unit -J500- must be recoded ⇒ Vehicle diagnosis, testing and information system VAS 5051.

Specified torques

Component	Specified torque
Subframe to body ◆ Use new bolts	70 Nm + 90°



Component	Specified torque
Anti-roll bar to subframe ◆ Use new bolts	20 Nm + 90°
Anti-roll bar to coupling rod ◆ Use new nut ◆ Counterhold on multi-point socket of joint pin	65 Nm
Swivel joint to cast steel suspension link ◆ Use new nuts	60 Nm
Swivel joint to sheet steel or forged aluminium suspension link ◆ Use new nuts	100 Nm
Shield to subframe ◆ Bolt M6 is self-locking	6 Nm
Steering box to subframe ◆ Use new bolts	50 Nm + 90°
Universal joint to steering box ◆ Use new bolt	30 Nm
Shield to steering box ◆ Bolt M6 is self-locking	6 Nm
Track rod ball joint to wheel bearing housing ◆ Use new nut	20 Nm + 90°
Exhaust system bracket to subframe ⇒ Engine; Rep. Gr. 26	

Specified torques for pendulum support to gearbox

Bolt	Specified torque
M10 x 35 ◆ Use new bolt	50 Nm + 90° further
M10 x 75 ◆ Use new bolt	50 Nm + 90° further



8 Distinguishing between steering boxes (1st and 2nd generations), Golf

At the start of production of the Golf 2004 ▶ , the 1st generation steering box was fitted. During the 2004 model year, this was replaced with the 2nd generation steering box.

Vehicles fitted with a 1st generation steering box can be retrofitted with a 2nd generation steering box ⇒ [page 400](#) .

To identify the type of steering box while it is fitted, count the number of screws on the steering pinion bearing cover.

Raise vehicle.

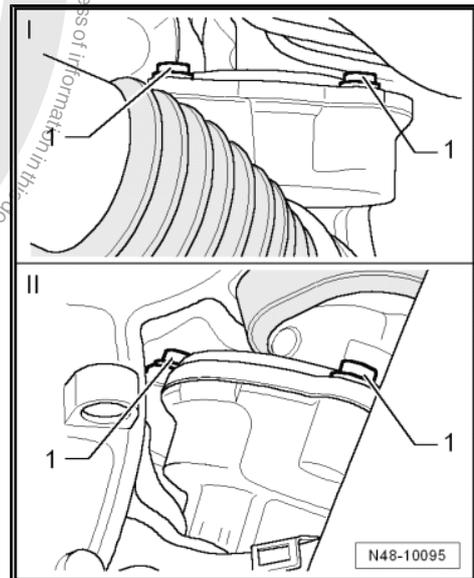
Turn steering in both directions to count the number of screws -1-.

The 1st generation steering box has 4 bolts for the bearing cover and the 2nd generation steering box has 2.

The figure shows a 1st generation steering box.

Continuation with 1st generation steering box ⇒ [page 401](#) .

Continuation with 2nd generation steering box ⇒ [page 406](#) .





9 Differentiating between 2nd and 3rd generation steering boxes

From model year 2009, a new, 3rd generation, steering box is being used. It replaces the 2nd generation steering box.

To identify the type of steering box while it is fitted, count the number of bolts with which the steering box is attached to the subframe.

- Raise vehicle.

The 2nd generation steering box is attached to the subframe with 4 bolts and the 3rd generation steering box is attached with 3.





10 Exchanging 1st generation steering box for 2nd generation steering box, Golf



Note

- ◆ *There are no new 1st generation steering boxes available as parts for renewing 1st generation steering boxes.*
- ◆ *Therefore, 2nd generation steering boxes must be fitted.*
- ◆ *For some vehicles, a few other parts in addition to the steering box must be exchanged. Which vehicles are affected and the procedure to be followed are described below.*

The parts in the following list must be renewed when a 1st generation steering box is exchanged:

- ◆ The wiring harness generally must be exchanged.
- ◆ Subframes from Part No. 1K0.199.369 through and including 1K0.199.369.E. must be exchanged. Subframes from Part No. 1K0.199.369.F need not be exchanged. To order parts via the ⇒ Electronic parts catalogue "ETKA", the assembly 1K0.199.313 must be ordered with the respective index.
- ◆ For left-hand-drive vehicles, the right bracket from Part No. 1K0.199.296 through and including 1K0.199.296.C must be exchanged. Brackets from Part No. 1K0.199.296.D need not be exchanged.
- ◆ For right-hand-drive vehicles, the left bracket from Part No. 1K0.199.295 through and including 1K0.199.295.C must be exchanged. Brackets from Part No. 1K0.199.295.D need not be exchanged.

The allocation of the respective parts can be determined in the ⇒ Electronic parts catalogue "ETKA".



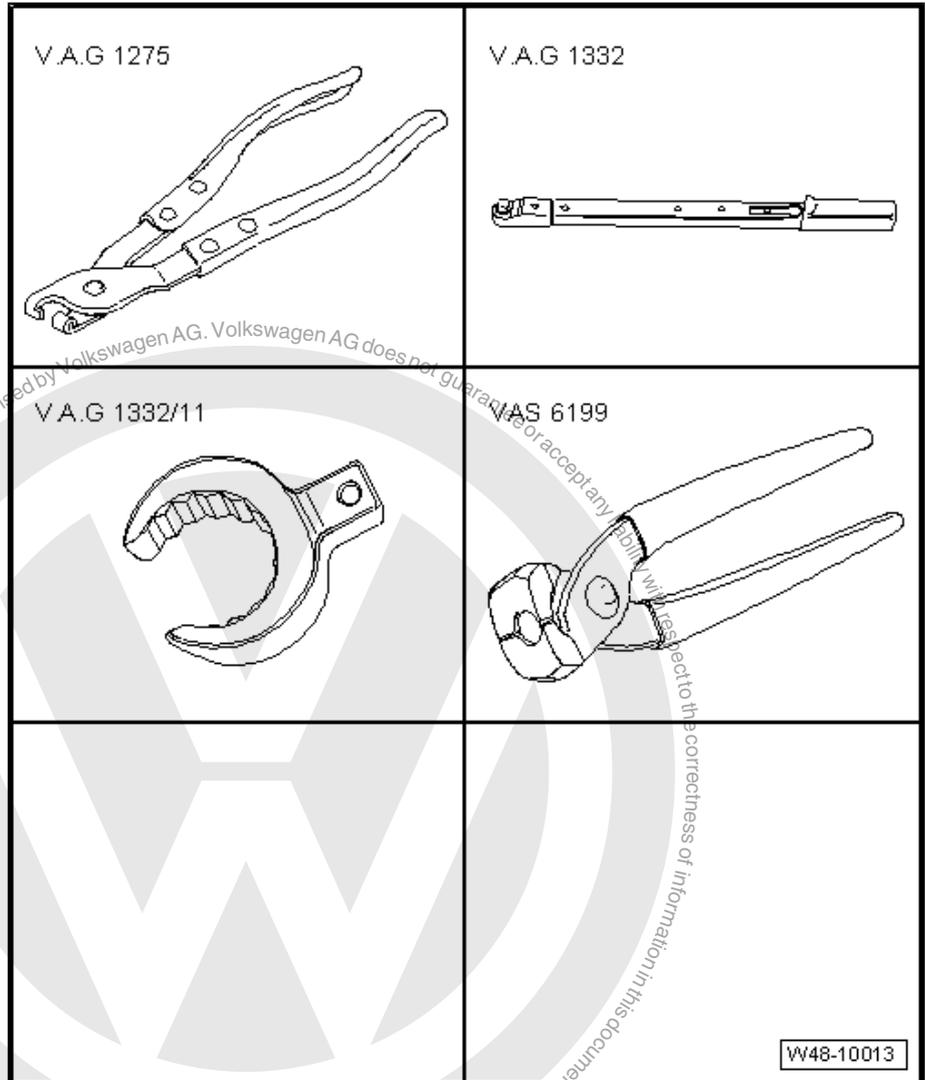
11 Repairing electromechanical steering box (1st generation), Golf

At present, there is no provision for performing repairs on the steering box (1st generation).

11.1 Removing and installing boot

Special tools and workshop equipment required

- ◆ Hose clip pliers -V.A.G 1275-
- ◆ Torque wrench -V.A.G 1332-
- ◆ Tool insert 24 mm -V.A.G 1332/11-
- ◆ Locking pliers for Phaeton steering box -VAS 6199-



Removing



Note

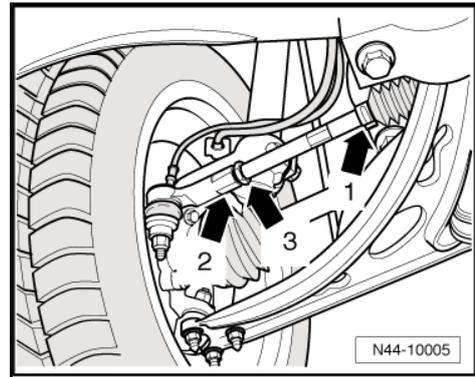
If boot is defective, moisture and dirt will enter steering box. There must be a palpable film of grease in the area of the teeth on the steering rack. If there is no film of grease, the steering box must be renewed. The steering box must also be renewed if corrosion, damage or wear to the steering rack is present.

- Turn steering wheel to straight-ahead position.
- Remove wheel.
- Clean outside of steering box in vicinity of boot.



No dirt must enter the steering box through the damaged boot during this work.

- Mark position of nut -3- on steering rack.
- Loosen nut -3- while counterholding on head of track rod -2-.
- Loosen hose clip -1- from boot using hose clip pliers -V.A.G 1275- and push onto track rod.
- Remove hose clip and pull boot from steering box housing.
- Now turn track rod out of track rod head.
- Pull boot with spring-type clip off track rod.



Note

- ◆ If the steering rack shows signs of corrosion, damage, wear or soiling, renew the complete steering box.
- ◆ Likewise, if there is no film of grease on the steering rack, the steering box must be renewed.

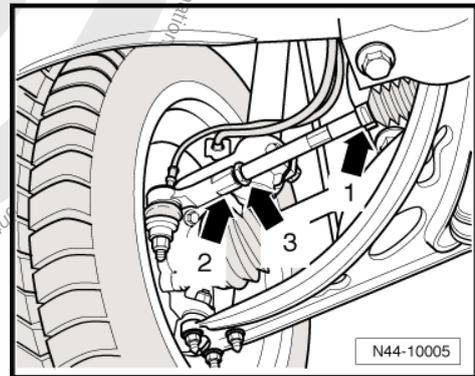
Installing



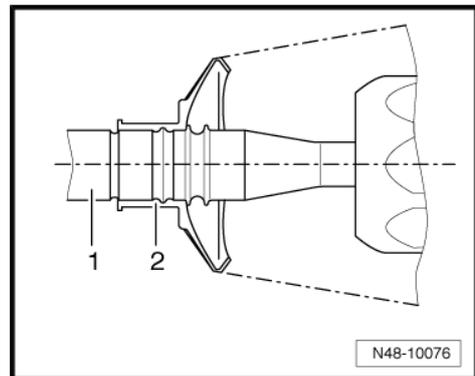
Caution

Do not grease steering rack.

- Turn steering wheel to straight-ahead position.
- Thread new clamps and rubber boot onto track rod.
- Screw in track rod to mark made during removal.
- Tighten lock nut -3- to specified torque while counterholding track rod ball joint -2-.
- Lightly lubricate seal point between boot and track rod with grease -G 052 168 A1- (from repair kit Fuchs Renolit JP1619).



- Push rubber boot -2- onto track rod -1- as shown in figure.
- Secure spring-type clamp on rubber boot using hose clip pliers -V.A.G 1275- .
- Lightly lubricate seal point between boot and steering box with grease -G 052 168 A1- (from repair kit Fuchs Renolit JP1619).
- Push rubber boot onto steering box housing to stop.





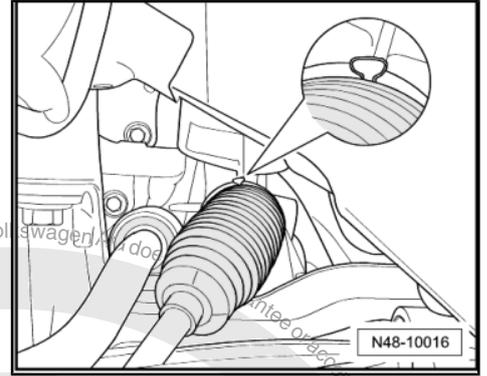
- Install new clamp, as shown in figure, with locking pliers for Phaeton steering box -VAS 6199- .

Continue installation in reverse order.

- Install wheel and tighten. ⇒ [page 288](#) .

Check wheel alignment after completing the installation.

- Check wheel alignment ⇒ [page 305](#) .
- Carry out basic setting for steering angle sender -G85- using ⇒ vehicle diagnostic, testing and information system -VAS 5051B- , “guided fault finding” .
- Then carry out basic setting for steering using ⇒ vehicle diagnostic, testing and information system -VAS 5051B- , “guided fault finding” .



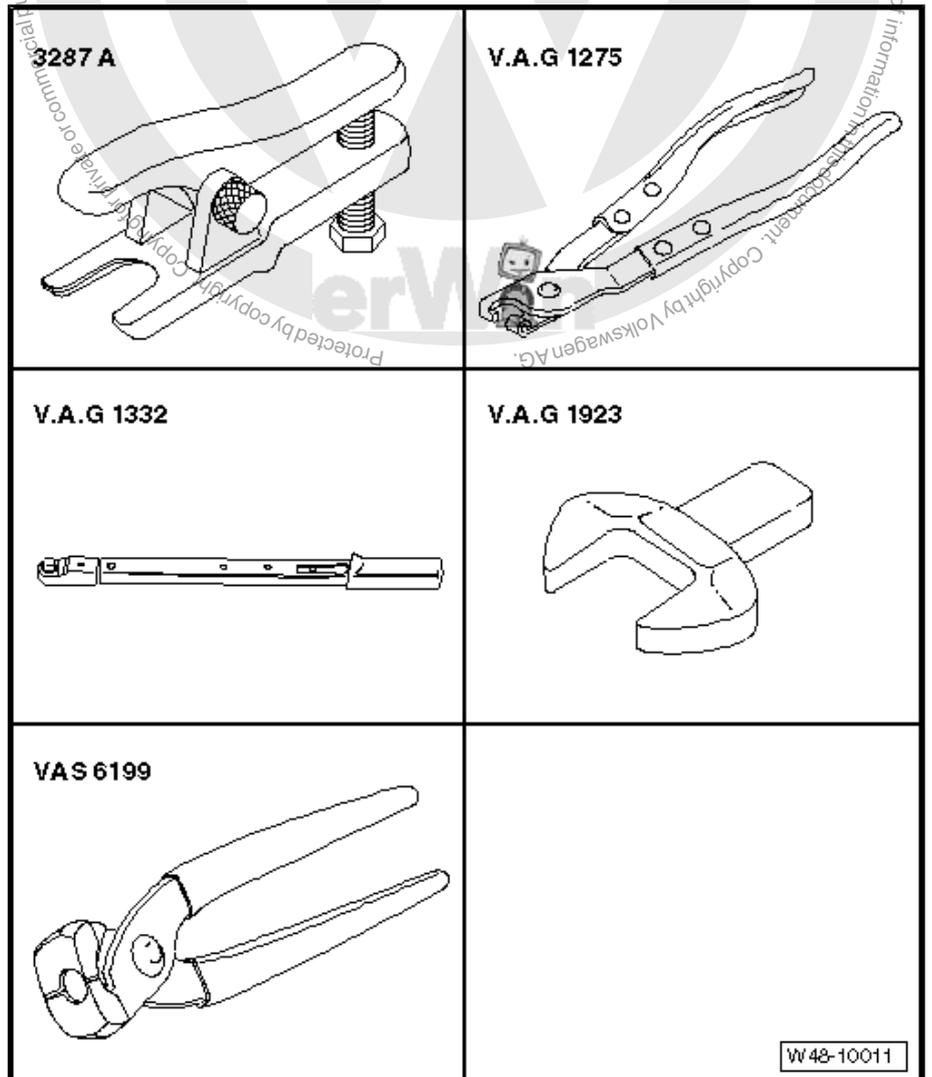
Specified torques

Component	Specified torque
Track rod ball joint to track rod	50 Nm

11.2 Removing and installing track rod

Special tools and workshop equipment required

- ◆ Ball joint puller -3287 A-
- ◆ Hose clip pliers -V.A.G 1275-
- ◆ Torque wrench -V.A.G 1332-
- ◆ Open jaw insert, 38 mm - V.A.G 1923-
- ◆ Locking pliers for Phaeton steering box -VAS 6199-





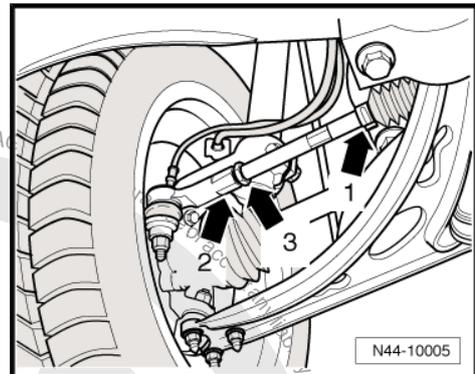
Removing track rod

- Turn steering wheel to straight-ahead position.
- Clean outside of steering box in vicinity of boot.

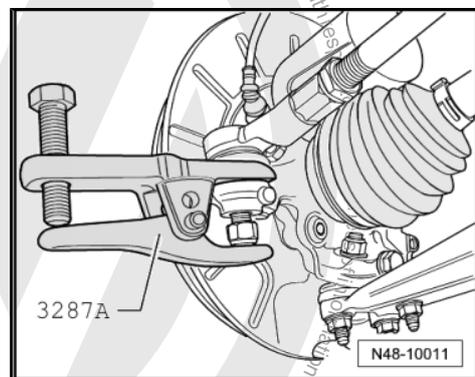
Loosen nut -3-, counterholding on track rod ball joint -2-.

- Remove front wheel.
- Loosen nut on track rod ball joint but do not remove completely.

Leave nut screwed on a few turns to protect thread on pin.



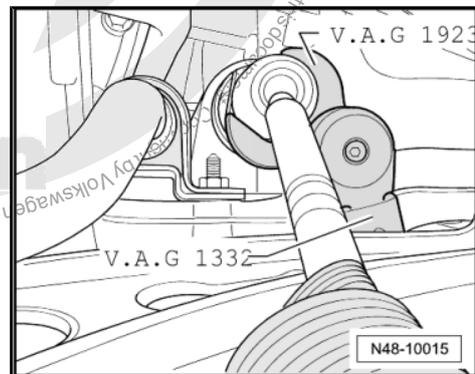
- Press track rod ball joint off wheel bearing housing using ball joint puller -3287 A- and now remove nut.
- Loosen spring-type clamp (item -1- in figure N44-10005 => [page 404](#)) on rubber boot using hose clip pliers -V.A.G 1275- and push onto track rod.
- Remove hose clip and pull boot from steering box housing.



- Unscrew track rod from steering rack using open jaw insert, 38 mm -V.A.G 1923- .

Note

- ◆ *If the steering rack shows signs of corrosion, damage, wear or soiling, renew the complete steering box.*
- ◆ *Likewise, if there is no film of grease on the steering rack, the steering box must be renewed.*



Installing track rod



Caution

Do not grease steering rack.

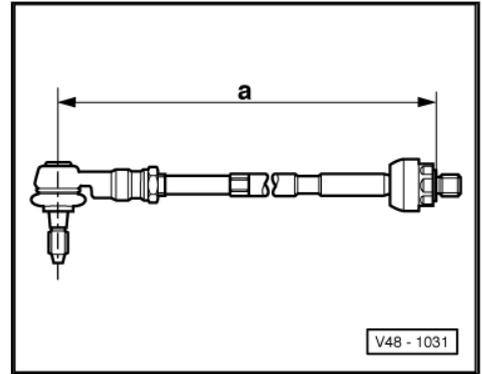
- Turn steering wheel to straight-ahead position.
- Thread new clamps and rubber boot onto track rod.



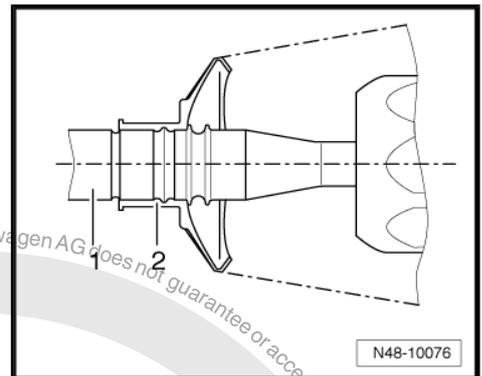
- Screw track rod into track rod ball joint until dimension -a- is attained.

Dimension -a- = 371 ± 1 mm

- Screw track rod into steering rack and tighten.
- Lightly lubricate seal point between boot and track rod with grease -G 052 168 A1- (from repair kit Fuchs Renolit JP1619).



- Push rubber boot -2- onto track rod -1-, making sure that boot is correctly positioned.
- Secure spring-type clip on rubber boot using hose clip pliers - V.A.G 1275- .
- Lightly lubricate seal point between boot and steering box with grease -G 052 168 A1- (from repair kit Fuchs Renolit JP1619).
- Push rubber boot onto steering box housing to stop.



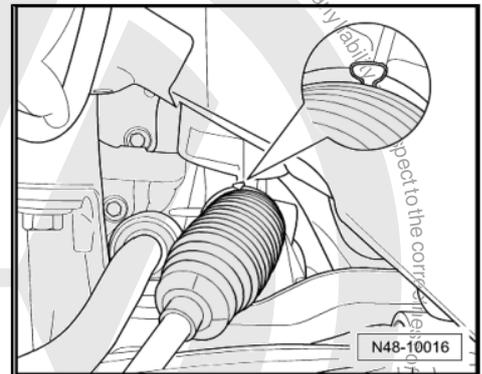
- Install new clamp, as shown in figure, with locking pliers for Phaeton steering box -VAS 6199- .

Continue installation in reverse order.

- Install wheel and tighten. ⇒ [page 288](#) .

Check wheel alignment after completing the installation.

- Check wheel alignment ⇒ [page 305](#) .
- Carry out basic setting for steering angle sender -G85- using ⇒ vehicle diagnostic, testing and information system -VAS 5051B- , “guided fault finding” .
- Then carry out basic setting for steering using ⇒ vehicle diagnostic, testing and information system -VAS 5051B- , “guided fault finding” .



Specified torques

Component	Specified torque
Track rod ball joint to track rod	50 Nm
Track rod ball joint to wheel bearing housing ◆ Use new nut	20 Nm + 90°
Track rod to steering rack in steering box	100 Nm



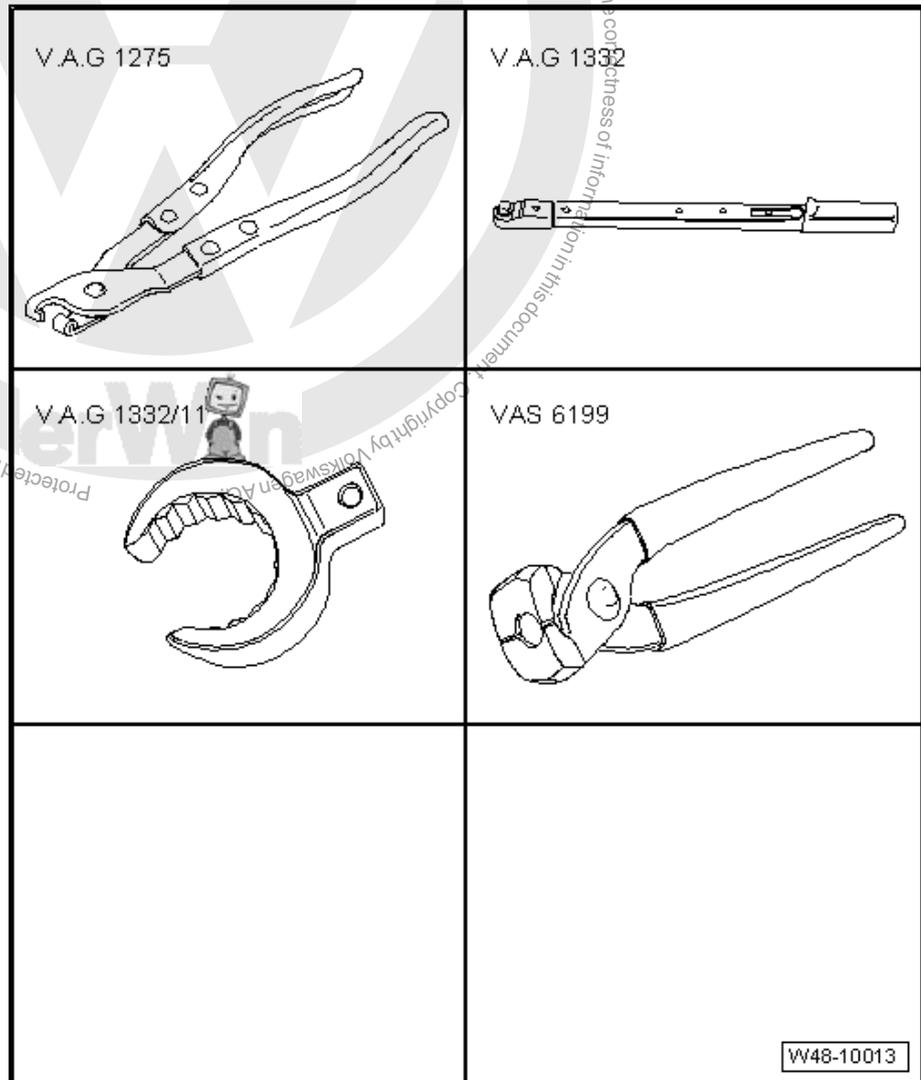
12 Repairing electromechanical steering box (2nd and 3rd generations)

At present, there is no provision for performing repairs on the steering box (2nd and 3rd generations).

12.1 Removing and installing boot

Special tools and workshop equipment required

- ◆ Hose clip pliers -V.A.G 1275-
- ◆ Torque wrench -V.A.G 1332-
- ◆ Tool insert 24 mm -V.A.G 1332/11-
- ◆ Locking pliers for Phaeton steering box -VAS 6199-



Removing boot



Note

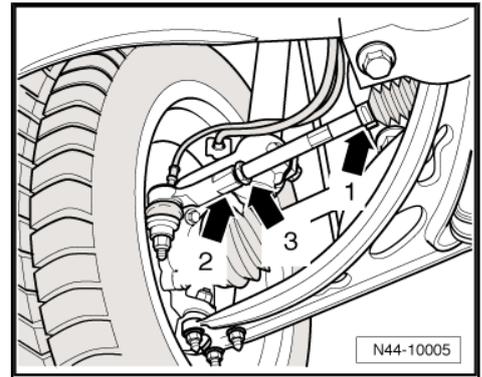
If boot is defective, moisture and dirt will enter steering box. There must be a palpable film of grease in the area of the teeth on the steering rack. If there is no film of grease, the steering box must be renewed. The steering box must also be renewed if corrosion, damage or wear to the steering rack is present.

- Turn steering wheel to straight-ahead position.
- Remove wheel.
- Clean outside of steering box in vicinity of boots.



No dirt must enter the steering box through the damaged boot during this work.

- Mark position of nut -3- on steering rack.
- Loosen nut -3- while counterholding on head of track rod -2-.
- Loosen hose clip -1- from boot using hose clip pliers -V.A.G 1275- and push onto track rod.
- Remove hose clip and pull boot from steering box housing.
- Now turn track rod out of track rod head.
- Pull boot with spring-type clip off track rod.



Note

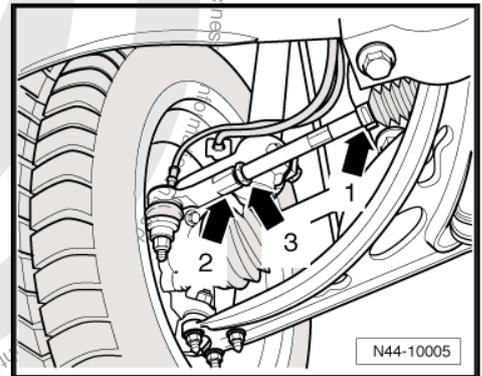
- ◆ If the steering rack shows signs of corrosion, damage, wear or soiling, renew the complete steering box.
- ◆ Likewise, if there is no film of grease on the steering rack, the steering box must be renewed.

Installing boot

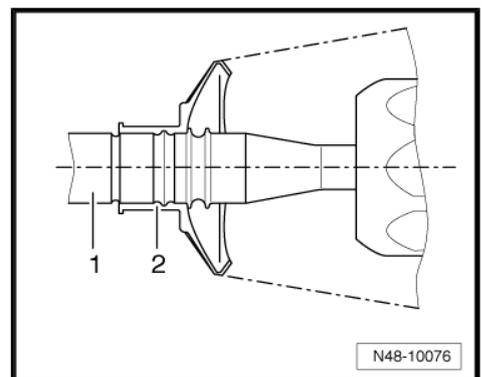


Caution
Do not grease steering rack.

- Turn steering wheel to straight-ahead position.
- Thread new clamps and rubber boot onto track rod.
- Screw in track rod to mark made during removal.
- Tighten lock nut -3- to specified torque while counterholding track rod ball joint -2-.
- Lightly lubricate seal point between boot and track rod with grease -G 052 168 A1- (from repair kit Fuchs Renolit JP1619).



- Push rubber boot -2- onto track rod -1- as shown in figure.
- Secure spring-type clip on rubber boot using hose clip pliers -V.A.G 1275- .
- Lightly lubricate seal point between boot and steering box with grease -G 052 168 A1- (from repair kit Fuchs Renolit JP1619).
- Push rubber boot onto steering box housing to stop.





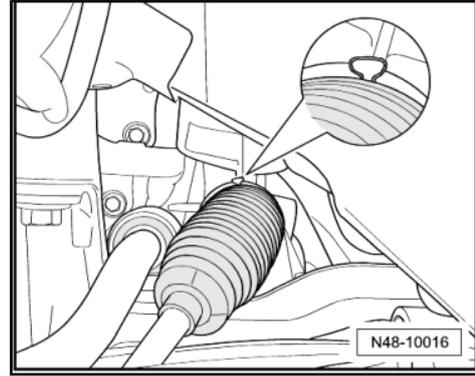
- Install new clamp, as shown in figure, with locking pliers for Phaeton steering box -VAS 6199- .

Continue installation in reverse order.

Specified torque for fitting wheels => [page 288](#) .

Check wheel alignment after completing the installation.

- Check wheel alignment => [page 305](#) .
- Adapt steering angle sender -G85- using => vehicle diagnostic, testing and information system -VAS 5051B- , "guided fault finding" .
- Then adapt steering using => vehicle diagnostic, testing and information system -VAS 5051B- , "guided fault finding" .



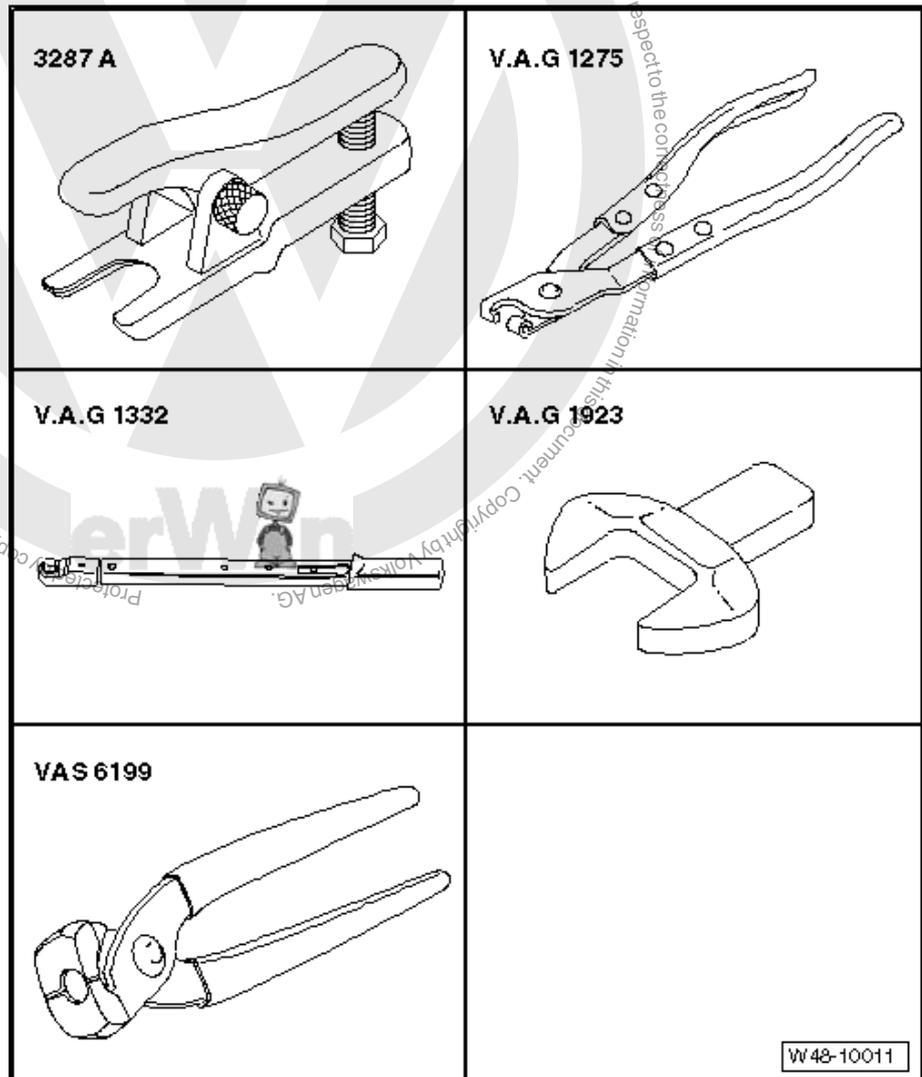
Specified torques

Component	Specified torque
Track rod ball joint to track rod	50 Nm

12.2 Removing and installing track rod

Special tools and workshop equipment required

- ◆ Ball joint puller -3287 A-
- ◆ Hose clip pliers -V.A.G 1275-
- ◆ Torque wrench -V.A.G 1332-
- ◆ Open jaw insert, 38 mm - V.A.G 1923-
- ◆ Locking pliers for Phaeton steering box -VAS 6199-

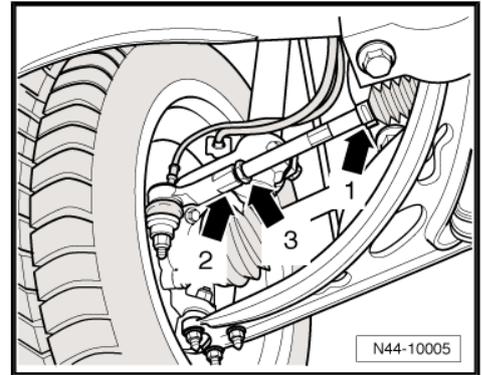




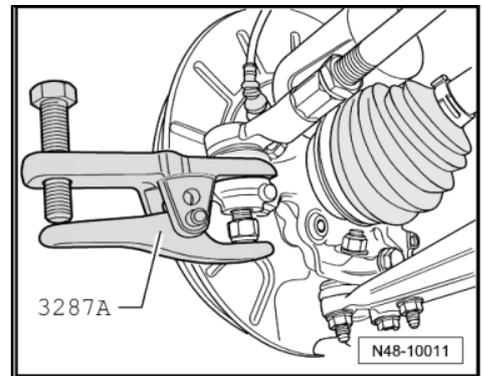
Removing track rod

- Turn steering wheel to straight-ahead position.
- Clean outside of steering box in vicinity of boots.
- Loosen nut -3-, counterholding on track rod ball joint -2-.
- Remove front wheel.
- Loosen nut on track rod ball joint but do not remove completely.

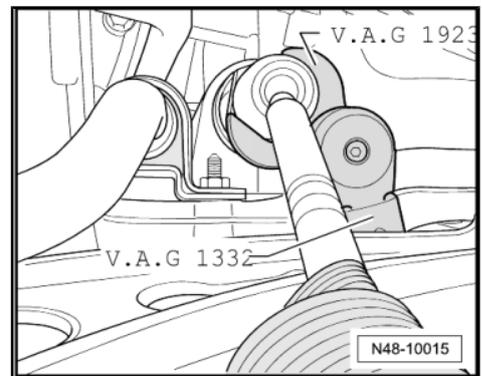
Leave nut screwed on a few turns to protect thread on pin.



- Press track rod ball joint off wheel bearing housing using ball joint puller -3287 A- and now remove nut.
- Loosen spring-type clamp (item -1- in figure N44-10005 => [page 409](#)) on rubber boot using hose clip pliers -V.A.G 1275- and push onto track rod.
- Remove hose clip and pull boot from steering box housing.



- Unscrew track rod from steering rack using open jaw insert, 38 mm -V.A.G 1923- .



Note

- ◆ If the steering rack shows signs of corrosion, damage, wear or soiling, renew the complete steering box.
- ◆ Likewise, if there is no film of grease on the steering rack, the steering box must be renewed.

Installing track rod



Caution

Do not grease steering rack.

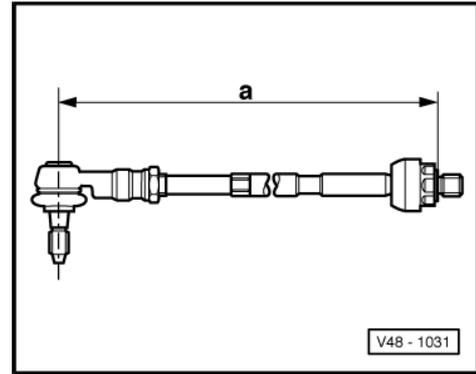
- Turn steering wheel to straight-ahead position.
- Thread new clamps and rubber boot onto track rod.



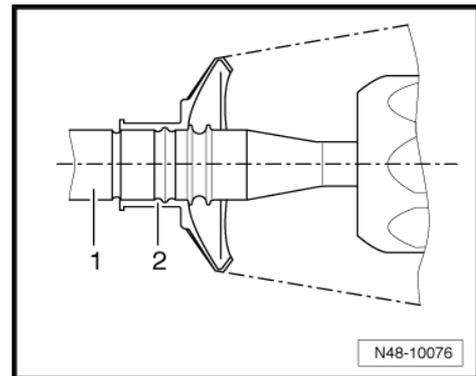
- Screw track rod into track rod ball joint until dimension -a- is attained.

Dimension -a- = 371 ± 1 mm

- Turn track rod into steering rack and tighten to specified torque.
- Lightly lubricate seal point between boot and track rod with grease -G 052 168 A1- (from repair kit Fuchs Renolit JP1619).



- Position boot -2- on track rod -1-.
- Secure spring-type clip on rubber boot using hose clip pliers - V.A.G 1275- .
- Lightly lubricate seal point between boot and steering box with grease -G 052 168 A1- (from repair kit Fuchs Renolit JP1619).
- Push rubber boot onto steering box housing to stop.



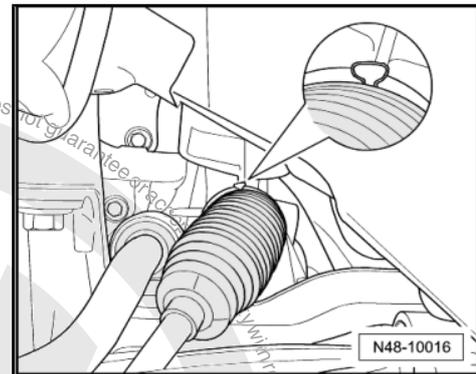
- Install new clamp, as shown in figure, with locking pliers for Phaeton steering box -VAS 6199- .

Continue installation in reverse order.

Specified torque for fitting wheels ⇒ [page 288](#) .

Check wheel alignment after completing the installation.

- Check wheel alignment ⇒ [page 305](#) .
- Adapt steering angle sender -G85- using ⇒ vehicle diagnostic, testing and information system -VAS 5051B- , “guided fault finding” .
- Then adapt steering using ⇒ vehicle diagnostic, testing and information system -VAS 5051B- , “guided fault finding” .



Specified torques

Component	Specified torque
Track rod to steering rack	100 Nm
Track rod ball joint to track rod	50 Nm
Track rod ball joint to wheel bearing housing ◆ Use new nut	20 Nm + 90°