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Repair Manual

Jetta 2011 ➤
Jetta 2013 ➤

Suspension, Wheels, Steering									
Engine ID	CNLA	CPKA	CPRA	CJAA	CBPA	CBFA	CCTA	CPLA	CPPA
	CBTA	CBUA							

Edition 08.2015

List of Workshop Manual Repair Groups

Repair Group

00 - General, Technical Data
40 - Front Suspension
42 - Rear Suspension
44 - Wheels, Tires, Wheel Alignment
48 - Steering

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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 – General, Technical Data

1 Check List, Assessing the Suspension on Vehicles Involved in a Collision

(Edition 08.2015)

When servicing load-bearing or wheel-supporting components on vehicles involved in a collision, damages on the suspension could remain undiscovered. These undiscovered damages may lead to severe damage in continued vehicle operation. Therefore, on vehicles involved in a collision, the listed components must be checked in the described manner and sequence and done independently from the vehicle alignment to be performed. If no deviations from the specified values were determined during the vehicle alignment, then there are no deformations on the suspension.

Visual Inspection and Function Check of the Steering System

- Visual inspection for deformations and cracks
- Check for play in tie rod joints and steering gear
- Visual inspection for faulty boots and grease boots
- Check electric and hydraulic lines and hoses for chafe marks, cuts and kinks.
- Check hydraulic lines, threaded connections and steering gear for leaks
- Make sure the steering gear and lines are securely fastened.
- Check for correct function over the entire steering angle by turning the steering wheel from stop to stop. Steering wheel must be able to rotate an even force without getting caught.

Visual and Function Test for the Suspension

- The sequence of the following test steps must be upheld.
- Check all components shown in the overviews for deformation, cracks and other damage.
- Replace the damaged components
- Perform a vehicle alignment on a Volkswagen AG approved alignment rack.

Visual and Function Test for Wheels and Tires

- Check for run-out and imbalance. Refer to ⇒ “12 Wheel/Tire Vibration, Causes and Solution”, page 281 .
- Check tires for cuts and impact damage in the tread and on the sidewalls. Refer to ⇒ “12 Wheel/Tire Vibration, Causes and Solution”, page 281 .
- Check tire inflation pressure; see the tire pressure label in the fuel filler door for the inflation pressure.

Replace the tire if the rim and/or the tire are damaged. This also applies when the crash details and damage to the vehicle point to possible non-visible damages.

Another deciding factor is the age of the tires: the tires must not be older than 6 years.

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If in Doubt

- As soon as a safety risk cannot be ruled out, the tire(s) must be replaced.

Entire Vehicle

Check other vehicle systems, for example:

- Brake system including ABS
- Exhaust system and passenger protection by visual and function test

Test values, adjustment values and notes can be found in respective repair manuals/ELSA.

This test is for checking the suspension on a vehicle that has been in a collision. The test does not cover the entire vehicle.

Electronic Vehicle Systems

Safety related systems, such as ABS/EDS; airbags; electronically controlled suspension systems; Electromechanical; electro-hydraulic steering and other driver assist systems, must be checked for possible stored fault messages using the Vehicle Diagnostic Tester . If faults were stored in the DTC memory for the system mentioned, then these systems must be serviced according to the specifications in the repair manual/ELSA. After performing repairs, check the DTC memory entries of the affected system again to make sure that proper function can be guaranteed.

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2 General Information

Information on Wheels, Tires and Snow Chains Can Be Found in the“Wheel and Tire Guide”. Refer to ⇒ Wheels, Tires, Wheel Alignment; Rep. Gr. 44 .

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40 – Front Suspension

1 Vehicles Involved in Collisions, Evaluating

For a check list for assessing the suspension on vehicles involved in a collision. Refer to
⇒ “1 Check List, Assessing the Suspension on Vehicles Involved in a Collision”, page 1 .

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2 Wheel Bearing, Lifting to Curb Weight Position

Special tools and workshop equipment required

- Engine and Gearbox Jack - VAS6931-
- Tensioning Strap - T10038-
- Engine/Gearbox Jack Adapter - Wheel Hub Support - T10149-

Caution

All bolts on suspension components with bonded rubber bushings must always be tightened in curb weight position (unloaded condition).

Bonded rubber bushings have a limited range of motion.

Axle components with bonded rubber bushings must be brought into the position they will be in when driving before they are tightened (curb weight position).

Otherwise, the bonded rubber bushing will have tension, which will reduce the service life.

By raising appropriate suspension using Engine and Gearbox Jack - VAS6931- and Engine/Gearbox Jack Adapter - Wheel Hub Support - T10149- , this position can be simulated on the hoist.

Before Appropriate Suspension Is Raised, Vehicle Must Be Strapped to the Hoist Lifting Arms Using Tensioning Straps - T10038- .

WARNING

The vehicle could fall off the hoist if it is not secured.

– Turn the wheel hub until one of the holes for the wheel bolts is on top.

– Install the Engine/Gearbox Jack Adapter - Wheel Hub Support - T10149- with wheel bolt on wheel hub.

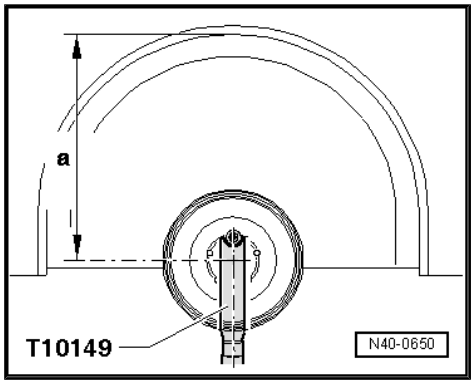
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The Applicable Bolts/Nuts Must Only Be Tightened When Dimension -a- Is between the Center of the Wheel Hub and the Lower Edge of the Wheel Housing Has Been Reached.

The dimension -a- is dependent on the height of the installed suspension:

Chassis 1)	Height -a- in mm
Basic suspension (2UA)	379 ± 10 mm
Sport suspension Mexico (2UC)	379 ± 10 mm
Sport suspension with 18" wheels (2UC+1JE/1JK)	364 ± 10 mm
Sport suspension with 18" wheels (2UC+1JS)	379 ± 10 mm
Sport suspension NAR/EU/ Rest of World (2UC+1JC/1JL)	364 ± 10 mm
Comfort suspension (2UD)	389 ± 10 mm
Heavy duty suspension (2UB)	399 ± 10 mm
Comfort suspension India (2UB +0N4)	389 ± 10 mm

1) The type of vehicle suspension is indicated on the vehicle data label. The suspension is indicated by a PR number. Allocation of the PR number according to the suspension. Refer to ⇒ “8.18 Vehicle Data Label”, page 275 .



– Lift the wheel bearing housing using the Engine and Gearbox Jack - VAS6931- until dimension -a- is reached.

WARNING

- *Do not lift or lower the vehicle when the Engine and Gearbox Jack - VAS6931- is under the vehicle.*
- *Do not leave the Engine and Gearbox Jack - VAS6931- under the vehicle any longer than necessary.*

– Tighten the applicable bolts and nuts.

– Lower the wheel bearing housing.

– Remove the Engine and Gearbox Jack - VAS6931- from under the vehicle.

– Remove the Engine/Gearbox Jack Adapter - Wheel Hub Support - T10149- .

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3 Overview - Front Axle

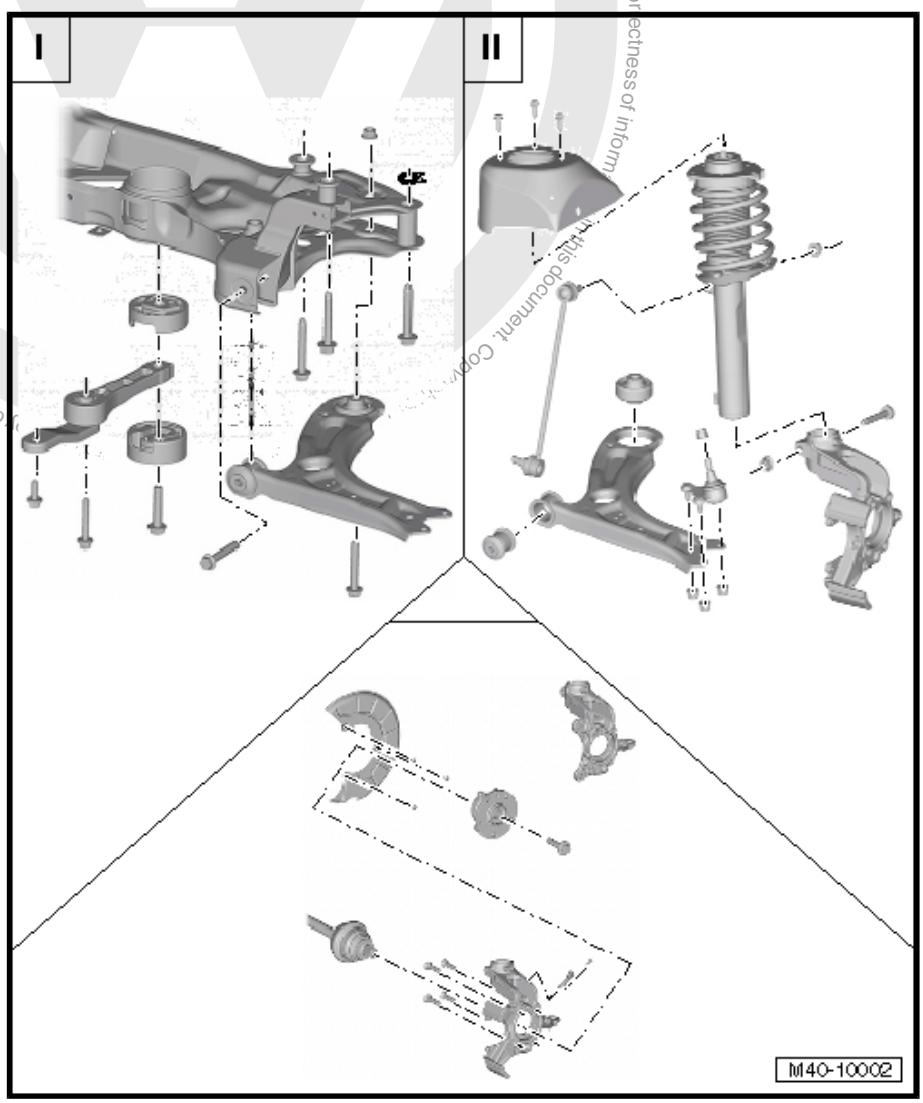
Note

- *Welding and alignment work on supporting or wheel carrying suspension components is not permitted.*
- *Always replace self-locking nuts.*
- *Always replace corroded bolts/nuts.*
- *Bonded rubber bushings have a limited range of motion. Therefore, only tighten the threaded connections on the components with bonded rubber bushings when the wheel bearing housing is lifted (curb weight position). Refer to ⇒ "2 Wheel Bearing, Lifting to Curb Weight Position", page 5 .*

I - Overview - Subframe. Refer to ⇒ "4 Subframe", page 9 .

II - Overview - Front Suspension and Control Arm. Refer to ⇒ "5 Front Suspension and Control Arm", page 37 .

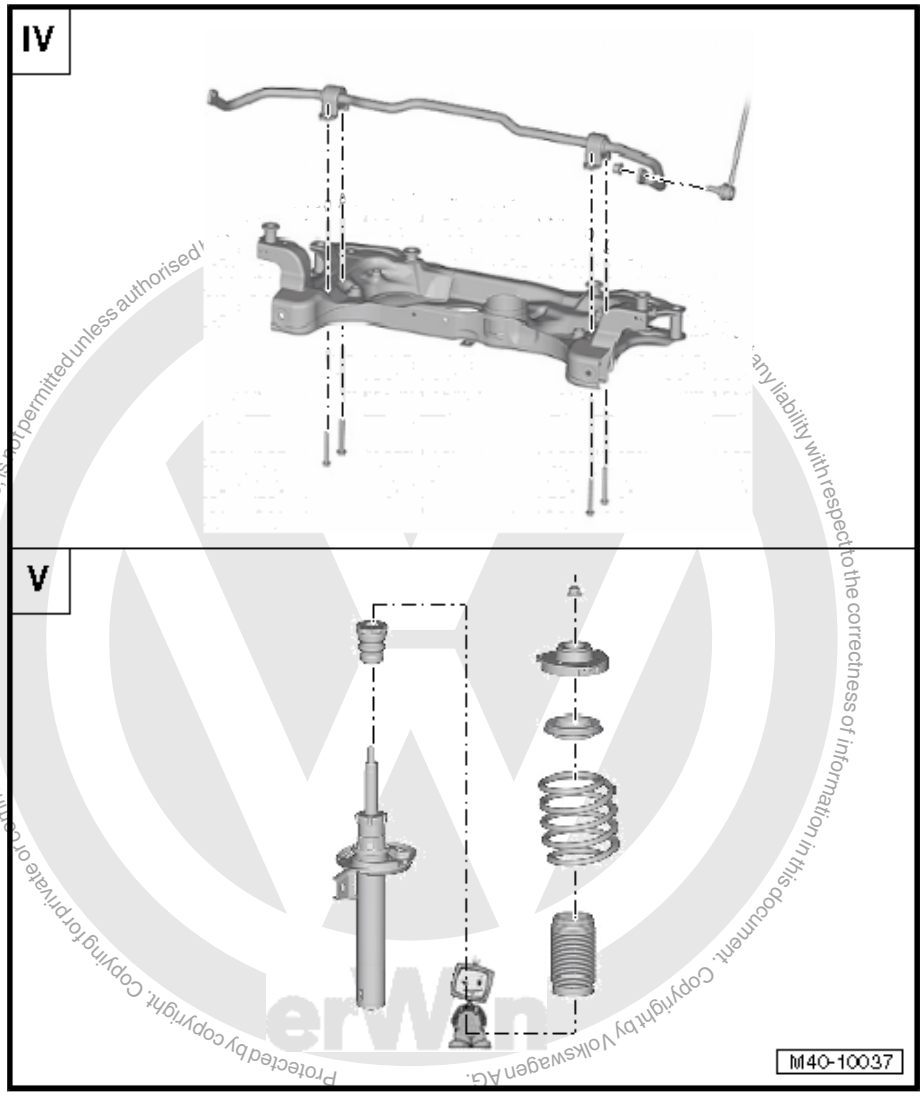
III - Overview - Wheel Bearing. Refer to ⇒ "6 Wheel Bearing", page 52 .



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IV - Overview - Stabilizer Bar. Refer to
⇒ “7 Stabilizer Bar”, page 64 .

V - Overview - Suspension Strut. Refer to
⇒ “8 Suspension Strut”, page 68 .



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Refer to
⇒ “9.3 Drive Axle with CV Joint, Removing and Installing”, page 80 for the “Drive Axles, Removing and Installing” chapter.

Refer to ⇒ “10 Drive Axles, Overview and Servicing”, page 97 for the “Drive Axles, Servicing” chapter.

4 Subframe

⇒ “4.1 Overview - Subframe”, page 9

⇒ “4.2 Thread in Longitudinal Member, Servicing”, page 11

⇒ “4.3 Subframe, Securing”, page 11

⇒ “4.4 Subframe, Lowering”, page 14

⇒ “4.5 Subframe without Steering Gear, Removing and Installing”, page 17

⇒ “4.6 Subframe with Hydraulic Steering Gear, Removing and Installing”, page 20

⇒ “4.7 Subframe with Electromechanical Steering Gear, Removing and Installing”, page 26

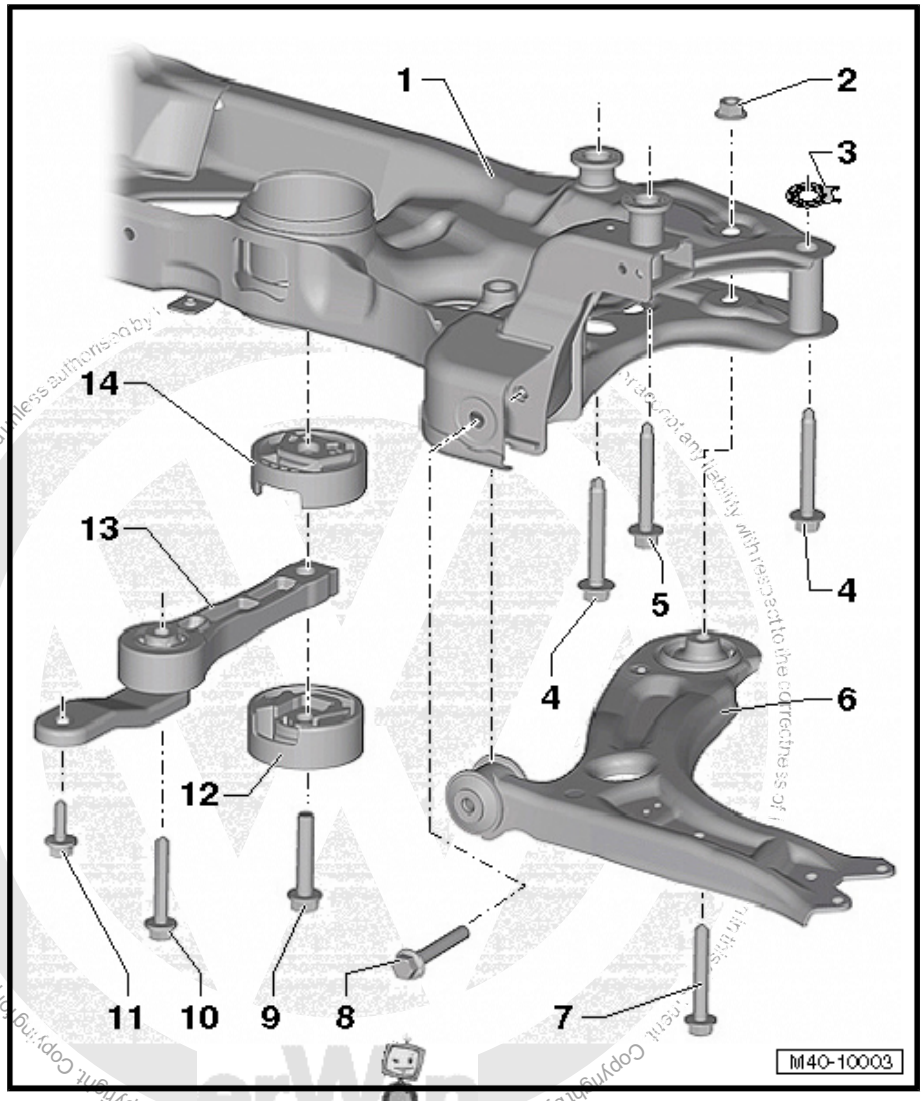
⇒ “4.8 Subframe, Servicing”, page 30

4.1 Overview - Subframe

Note

- *Welding and alignment work on supporting or wheel carrying suspension components is not permitted.*
- *Always replace self-locking nuts.*
- *Always replace corroded bolts/nuts.*
- *Bonded rubber bushings have a limited range of motion. Therefore, only tighten the threaded connections on the components with bonded rubber bushings when the wheel bearing housing is lifted (curb weight position). Refer to ⇒ “2 Wheel Bearing, Lifting to Curb Weight Position”, page 5 .*

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1 - Subframe

- ❑ Securing. Refer to ⇒ “4.3 Subframe, Securing”, page 11 .
- ❑ Removing and installing, without steering gear. Refer to ⇒ “4.5 Subframe without Steering Gear, Removing and Installing”, page 17 .
- ❑ Removing and installing, with hydraulic steering gear. Refer to ⇒ “4.6 Subframe with Hydraulic Steering Gear, Removing and Installing”, page 20 .
- ❑ Removing and installing, with Electromechanical steering gear. Refer to ⇒ “4.7 Subframe with Electromechanical Steering Gear, Removing and Installing”, page 26 .
- ❑ Servicing. Refer to ⇒ “4.8 Subframe, Servicing”, page 30 .
- ❑ Allocation. Refer to the Parts Catalog.

2 - Nut

3 - Intermediate Plate

- ❑ Always replace if removed
- ❑ Installation position. Refer to ⇒ Fig. ““Intermediate Plate Installation Position”“ , page 11

4 - Bolt

- ❑ 70 Nm + 180° turn
- ❑ Always replace if removed
- ❑ M12 x 1.5 x 100

5 - Bolt

- ❑ 70 Nm + 180° turn
- ❑ Always replace if removed
- ❑ M12 x 1.5 x 90

6 - Control Arm

- ❑ Replace with the ball joint if damaged.
- ❑ Removing and installing. Refer to ⇒ “5.4 Control Arm, Removing and Installing”, page 43 .
- ❑ Removing and installing (left side of the vehicle with a DSG® transmission or automatic transmission). Refer to ⇒ “5.5 Control Arm, Removing and Installing, Left Side of Vehicle with DSG® or Automatic Transmission”, page 44 .

7 - Bolt

- ❑ 70 Nm + 180° turn
- ❑ Always replace if removed
- ❑ M12 x 1.5 x 80

8 - Bolt

- ❑ 70 Nm + 180° turn
- ❑ Always replace if removed
- ❑ M12 x 1.5 x 80

9 - Bolt

- ❑ 100 Nm + 90° turn
- ❑ Always replace if removed
- ❑ Tighten only when the pendulum support is bolted to the transmission
- ❑ M14 x 1.5 x 70

10 - Bolt

- ❑ 50 Nm + 90° turn
- ❑ Always replace if removed
- ❑ M10 x 75

11 - Bolt

- ❑ 50 Nm + 90° turn
- ❑ Always replace if removed
- ❑ M10 x 35

12 - Lower Bonded Rubber Bushing for Pendulum Support

- ❑ Removing and installing. Refer to ⇒ “4.8 Subframe, Servicing”, page 30 .

13 - Pendulum Support

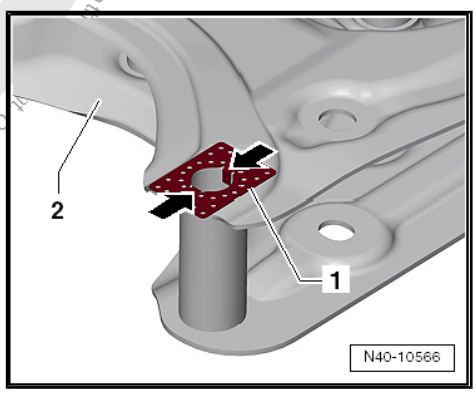
- ❑ Bolt first to the transmission, then to subframe
- ❑ There are different versions.
- ❑ Allocation. Refer to the Parts Catalog.

14 - Upper Bonded Rubber Bushing for Pendulum Support

- ❑ Removing and installing. Refer to ⇒ “4.8 Subframe, Servicing”, page 30 .

Intermediate Plate Installation Position

Insert the long side of the intermediate plate -1- so that it is perpendicular to the direction of travel. The tabs -arrows- must lock into the subframe -2-.



4.2 Thread in Longitudinal Member, Servicing

Servicing the weld nut threads in the longitudinal member is possible under certain conditions. Refer to ⇒ Body Repair; Rep. Gr. 50 .

4.3 Subframe, Securing

Special tools and workshop equipment required

- ♦ Engine and Gearbox Jack - VAS6931-
- ♦ Locating Pins - T10096-
- ♦ Subframe Locking Pin (2 pc.) - T10452-

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Perform the Following

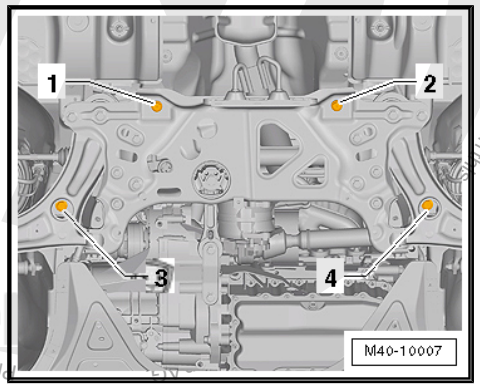
Caution

The Locating Pins - T10096- and Subframe Locking Pin (2 pc.) - T10452- have different diameters.

The color differentiates them:

- *Locating Pins - T10096- are BLACK.*
- *The Subframe Locking Pin (2 pc.) - T10452- are SILVER.*

To secure the subframe, the Subframe Locking Pin (2 pc.) - T10452- must be screwed in at positions -3 and 4-.



Note

The Subframe Locking Pin (2 pc.) - T10452- may only be tightened to a maximum of 20 Nm, otherwise the threads on the locating pins will be damaged.

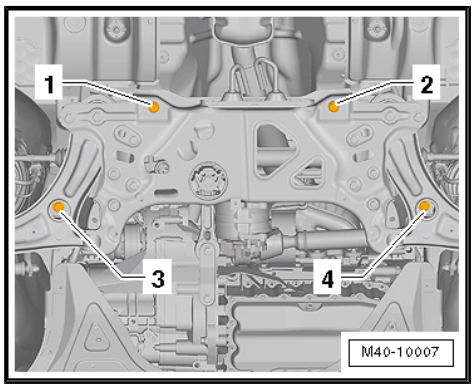
The Locating Pins - T10096- must be screwed in one after the other at positions -1 and 2-.

Note

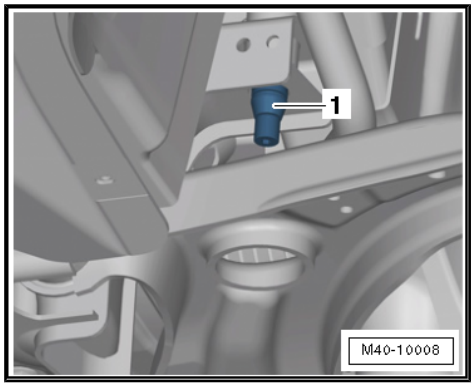
Locating Pins - T10096- may only be tightened to a maximum of 20 Nm, otherwise the threads on the locating pins will be damaged.

Subframe Locking Pin (2 pc.) - T10452- , Installing

– Remove the front bolt -3-.



– Insert the Subframe Locking Pin (2 pc.) - T10452- -1- and tighten it to 20 Nm.



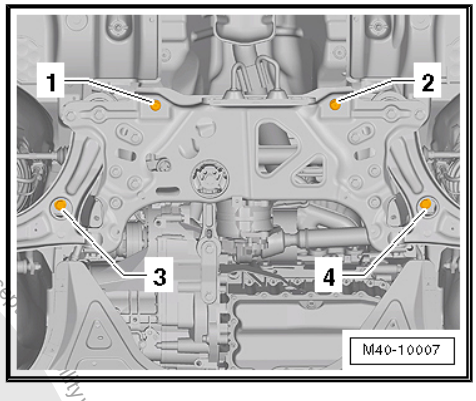
Caution

The Subframe Locking Pin (2 pc.) - T10452- are SILVER.

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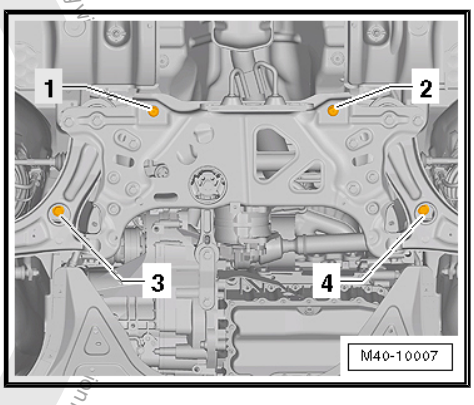
– Remove the front bolt -4-.

– Insert the Subframe Locking Pin (2 pc.) - T10452- and tighten it to 20 Nm.



Locating Pins - T10096- , Installing

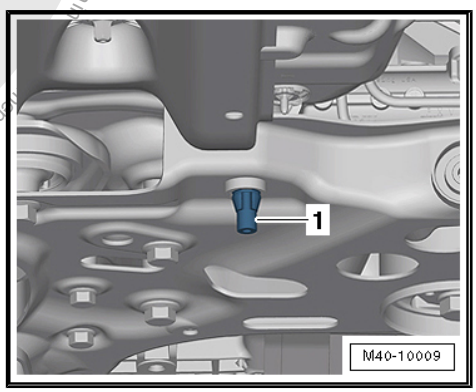
– Remove the rear bolt -1-.



– Insert the Locating Pins - T10096- -1- and tighten it to 20 Nm.

Caution

Locating Pins - T10096- are BLACK.



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– Remove the rear bolt -2-.

– Insert the Locating Pins - T10096- and tighten to 20 Nm.

Position of front axle is now secured.

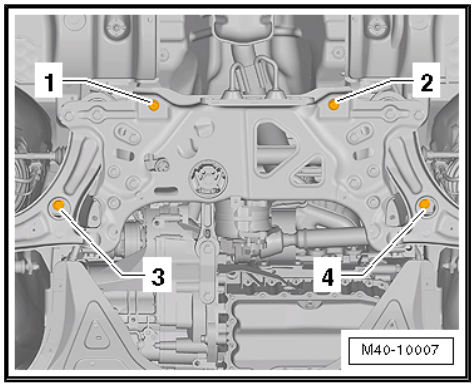
Continue with removing the subframe without the steering gear. Refer to ⇒ page 18 .

Continue with removing the subframe with the hydraulic steering gear. Refer to ⇒ page 23 .

Continue with removing the subframe with the Electromechanical steering gear. Refer to ⇒ page 29 .

Continue with removing the stabilizer bar. Refer to ⇒ page 65 .

Continue with power steering gear, removing and installing. Refer to
⇒ “9.2 Power Steering Gear, Removing and Installing”, page 344 .



Remove the Locating Pins - T10096- and the Subframe Locking Pin (2 pc.) - T10452- .

Remove the Locating Pins - T10096- and Subframe Locking Pin (2 pc.) - T10452- in reverse order of installation.

Tightening Specifications

Component	Tightening Specification
Subframe to body ♦ Use new bolts.	70 Nm + 180° additional turn

4.4 Subframe, Lowering

Special tools and workshop equipment required

♦ Engine and Gearbox Jack - VAS6931-

Perform the Following

Removing

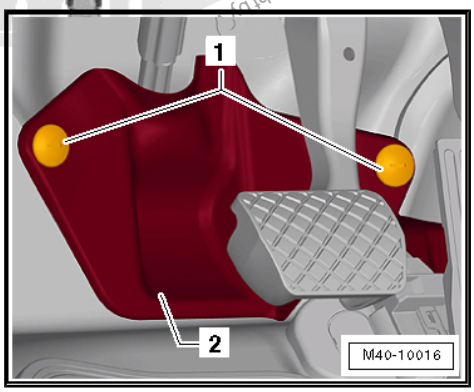
– Turn the steering wheel in the straight position and remove the ignition key so that the steering wheel lock engages.

Vehicles with “Keyless Access” Keyless Locking and Starting System

– Switch the ignition off and open the driver door so the steering wheel lock engages.

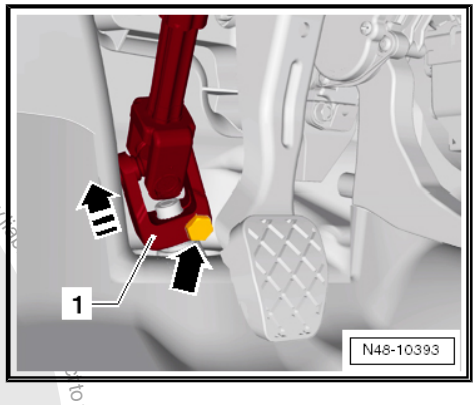
Continuation for All Vehicles

– Remove the bolts -1- and remove the footwell trim panel -2-.



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– Remove the bolt -arrow- from the universal joint -1-, and then remove the universal joint in the direction of -arrow-.



Caution

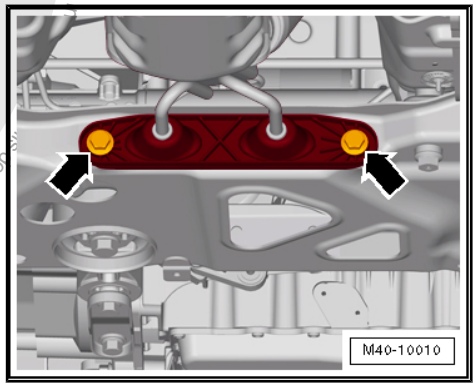
If the universal joint is separated from the Electromechanical steering gear, the following work cannot be performed:

- ***Switching on the ignition***
- ***Turning the steering gear***
- ***Turning the steering column.***

These points must be observed since performing these actions could cause irreparable damage.

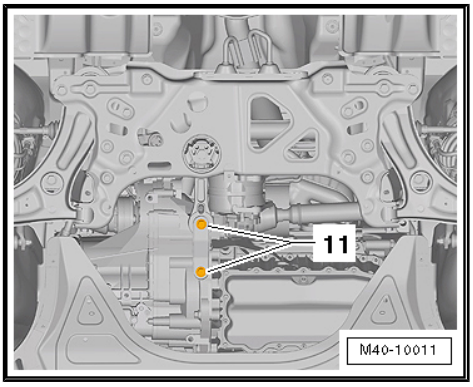
– Remove the lower noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Noise Insulation .

– Remove the exhaust system bracket from the subframe -arrows-.



– Remove the bolts -11- and then remove the pendulum support from the transmission.

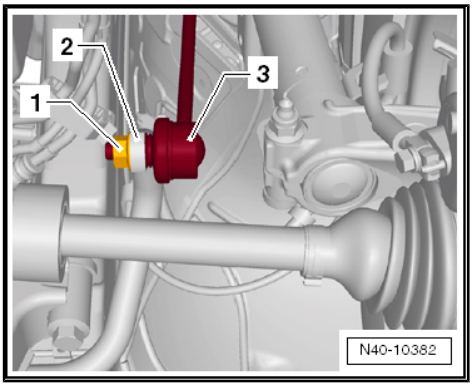
– Loosen the double clamp for the exhaust system.



– Remove the hex nut -1- from the right and left coupling rod -3-.

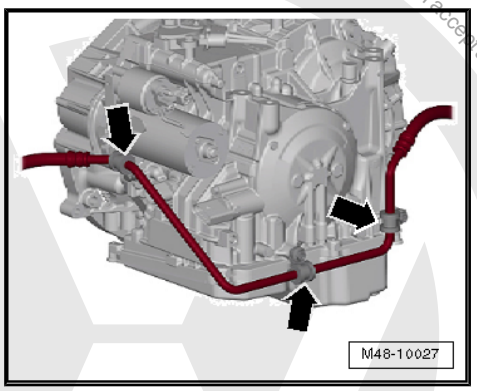
– Remove the coupling rod -3- from the stabilizer bar -2- on the left and right sides.

Vehicles with Power Steering



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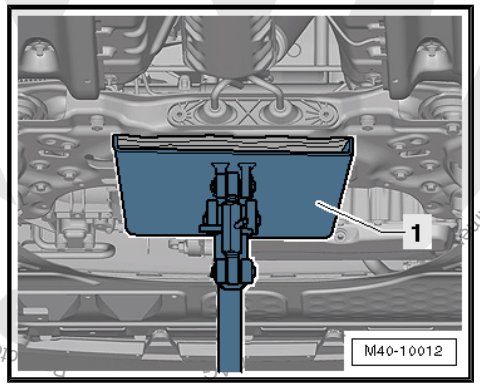
– Remove the power steering gear pressure line from the transmission -arrows-.



Continuation for All Vehicles

– Secure the subframe. Refer to ⇒ “4.3 Subframe, Securing”, page 11 .

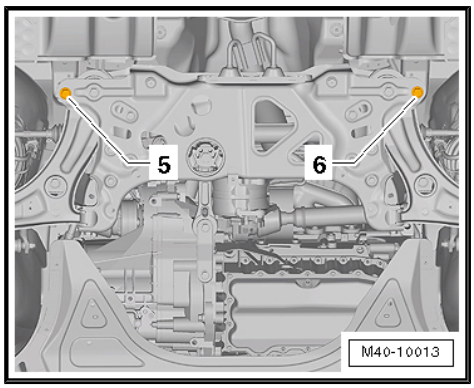
– Place the Engine and Gearbox Jack - VAS6931- -1- under the subframe.



– Remove the bolts -5 and 6- and lower the subframe maximum 10 cm.

Installing

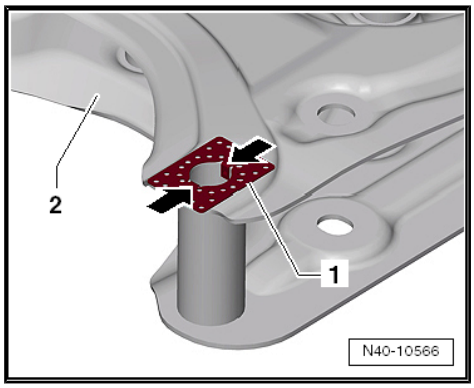
Install in reverse order of removal.



– If applicable, always make sure the intermediate plate -1- is installed between the subframe -2- and the body.

Insert the long side of the intermediate plate -1- so that it is perpendicular to the direction of travel. The tabs -arrows- must lock into the subframe -2-.

– Install the lower noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Noise Insulation .



Note

Make sure the ball joint boot is not damaged or twisted.

Tightening Specifications

Component	Tightening Specification
Subframe to body ♦ Use new bolts.	70 Nm + 180° turn

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Component	Tightening Specification
Stabilizer bar to coupling rod ♦ Use new nut ♦ Counterhold at joint pin inner multi-point fitting	65 Nm
Universal joint to steering gear ♦ Use a new bolt	30 Nm
Exhaust system bracket to subframe. Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 26 .	

Tightening Specification, Pendulum Support to the Transmission

Bolt	Tightening Specification
M10 x 35 ♦ Use a new bolt	50 Nm + 90° turn
M10 x 75 ♦ Use a new bolt	50 Nm + 90° turn

4.5 Subframe without Steering Gear, Removing and Installing

Special tools and workshop equipment required

- ♦ Torque Wrench 1332 40-200Nm - VAG1332-
- ♦ Engine and Gearbox Jack - VAS6931-

Perform the Following

Removing

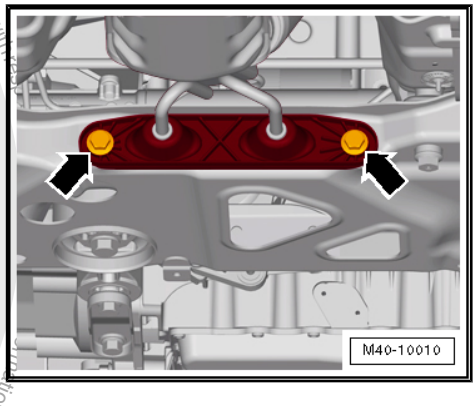
– Loosen the wheel bolts.

– Raise the vehicle.

– Remove the wheels.

– Remove the lower noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Noise Insulation .

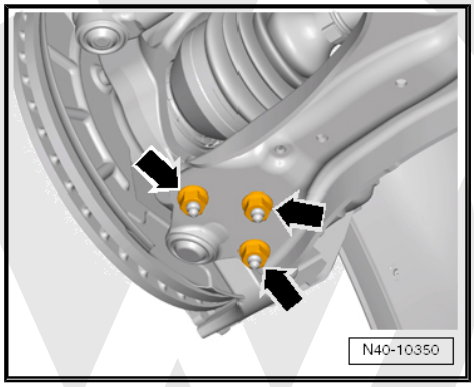
– Remove the exhaust system bracket from the subframe -arrows-.



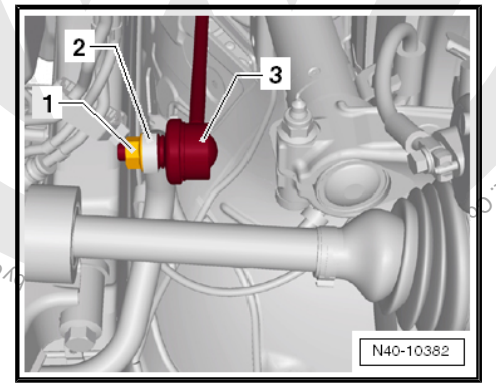
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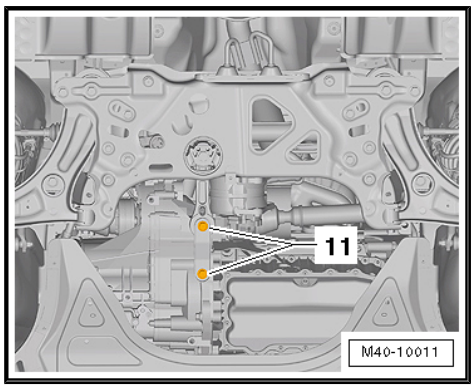
– Remove the nuts -arrows- on the left and right side of the vehicle.
– Loosen the double clamp for the exhaust system.
– Remove the control arm from the ball joint.



– Remove the hex nut -1- from the right and left coupling rod -3-.
– Remove the coupling rod -3- from the stabilizer bar -2- on the left and right sides.

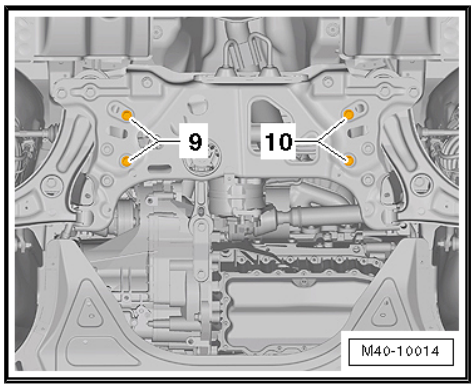


– Remove the bolts -11- and then remove the pendulum support from the transmission.
– Secure the subframe. Refer to ⇒ “4.3 Subframe, Securing”, page 11 .



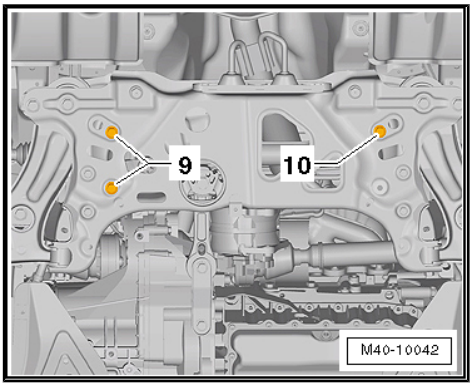
Vehicles with Hydraulic Power Steering Gear

– Remove the steering gear bolts -9 and 10-.



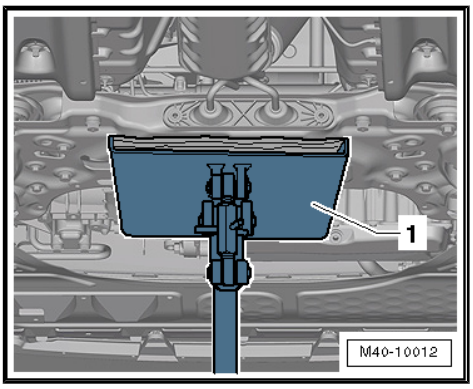
Vehicles with Electromechanical Steering Gear

– Remove the steering gear bolts -9 and 10-.



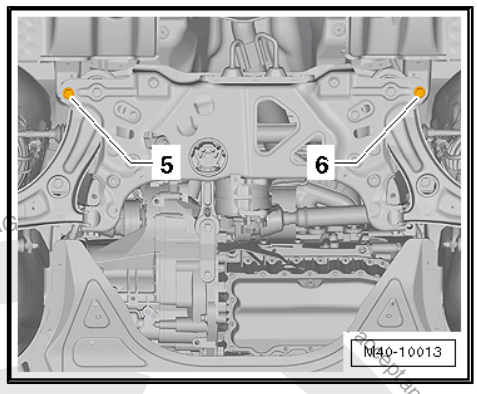
Continuation for All Vehicles

– Place the Engine and Gearbox Jack - VAS6931- -1- under the subframe.



– Remove the bolts -5 and 6- and lower the subframe using the Engine and Gearbox Jack - VAS6931- .

– Secure the steering gear on the body.

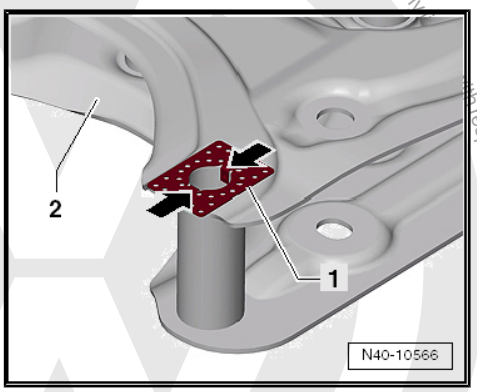


Installing

Install in reverse order of removal. Note the following:

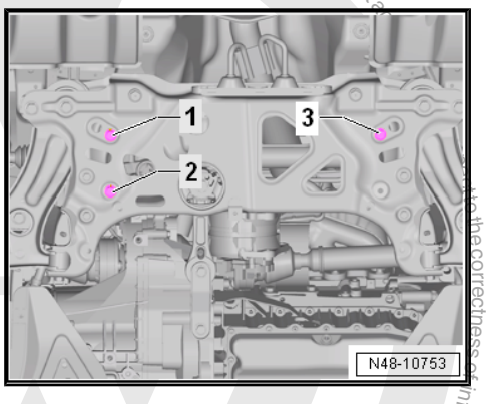
– If applicable, always make sure the intermediate plate -1- is inserted between the subframe -2- and the body.

Insert the long side of the intermediate plate -1- so that it is perpendicular to the direction of travel. The tabs -arrows- must lock into the subframe -2-.



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Note the Tightening Sequence for the Steering Gear on Vehicles with Electromechanical Steering Gear:



- ♦ Thread the bolts -1, 2 and 3- on one after the other by hand.
- ♦ Pre-tighten the bolts -1 and 2- one after the other to 10 Nm.
- ♦ Tighten the bolts -1, 2 and 3- one after the other to the tightening specification.
- – Install and tighten the noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Noise Insulation for the tightening specifications.
- – Install the front wheels and tighten. Refer to ⇒ “2 Wheel Installation Tightening Specifications”, page 237 .

Tightening Specifications

Component	Tightening Specification
Ball joint to control arm ♦ Use new nuts ♦ Tighten only in curb weight position. Refer to ⇒ “2 Rear Axle Curb Weight (Twist Beam Rear Suspension)”, page 146 .	100 Nm
Subframe to body ♦ Use new bolts.	70 Nm + 180° turn
Stabilizer bar to coupling rod ♦ Use new nut ♦ Counterhold at joint pin inner multi-point fitting	65 Nm
Steering gear to subframe ♦ Use new bolts.	50 Nm + 90° turn
Exhaust system bracket to subframe. Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 26 .	

Tightening Specification, Pendulum Support to the Transmission

Bolt	Tightening Specification
M10 x 35 ♦ Use a new bolt	50 Nm + 90° turn
M10 x 75 ♦ Use a new bolt	50 Nm + 90° turn

4.6 Subframe with Hydraulic Steering Gear, Removing and Installing

Special tools and workshop equipment required

- ♦ Hose Clamps - Up To 25mm - 3094-
- ♦ Puller - Ball Joint - T10187-
- ♦ Torque Wrench 1331 5-50Nm - VAG1331-
- ♦ Torque Wrench 1332 40-200Nm - VAG1332-
- ♦ Engine and Gearbox Jack - VAS6931-

♦ Shop Crane - Drip Tray - VAS6208-

Perform the Following

Removing

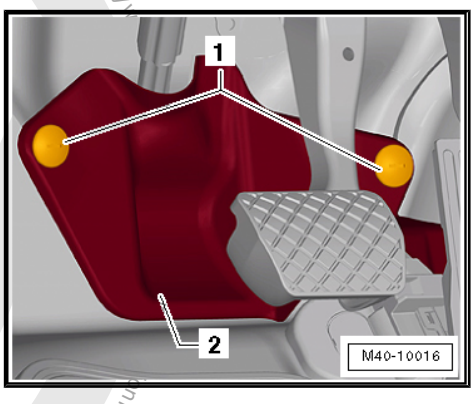
– Turn the steering wheel in the straight position and remove the ignition key so that the steering wheel lock engages.

Vehicles with "Keyless Access" Keyless Locking and Starting System

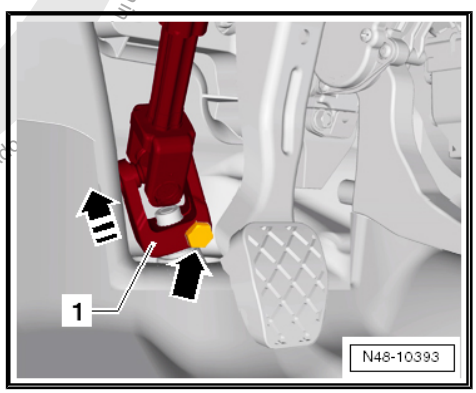
– Switch the ignition off and open the driver door so the steering wheel lock engages.

Continuation for All Vehicles

– Remove the bolts -1- and remove the footwell trim panel -2-.



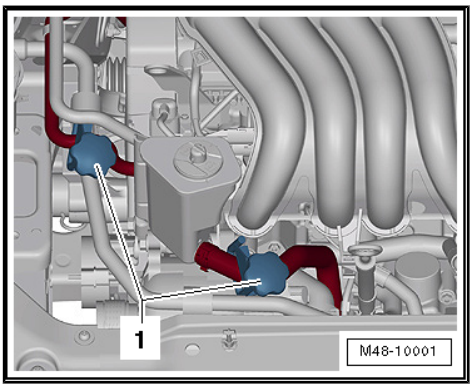
– Remove the bolt -arrow- from the universal joint -1-, and then remove the universal joint in the direction of -arrow-.



Vehicles with a 2.0L Engine

– Clamp off suction and return hose on the power steering fluid reservoir.

1 - Hose Clamps - Up To 25mm - 3094-

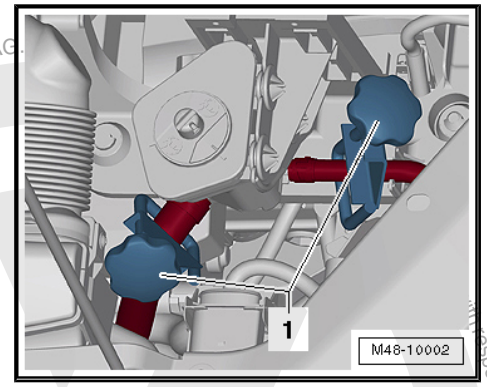


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Vehicles with a 2.5L Engine

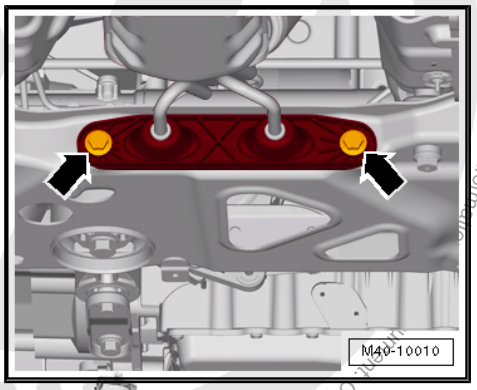
– Clamp off suction and return hose on the power steering fluid reservoir.

1 - Hose Clamps - Up To 25mm - 3094-

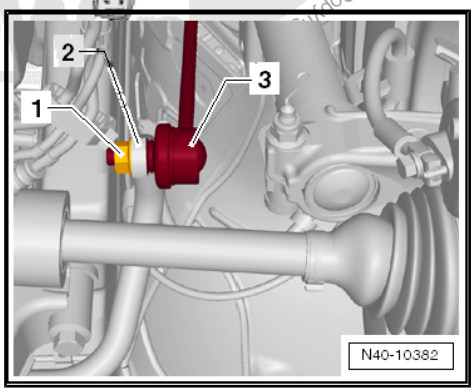


Continuation for All Vehicles

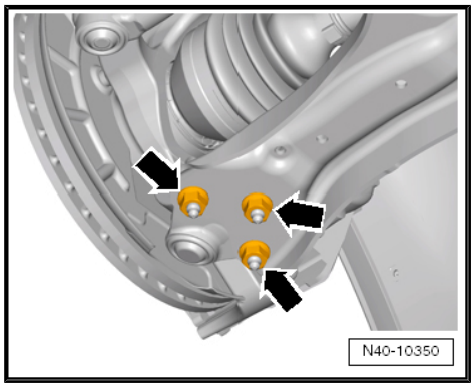
– Loosen the wheel bolts.
– Raise the vehicle.
– Remove the front wheels.
– Remove the lower noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Noise Insulation .
– Remove the exhaust system bracket from the subframe -arrows-.
– Loosen the double clamp for the exhaust system.



– Remove the hex nut -1- from the right and left coupling rod -3-.
– Remove the coupling rod -3- from the stabilizer bar -2- on the left and right sides.



– Remove the nuts -arrows- on the left and right side of the vehicle.
– Remove the control arm from the ball joint.



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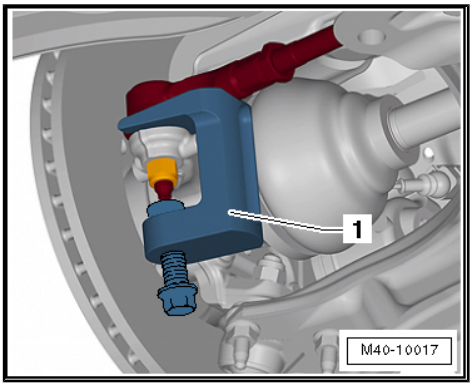
– Loosen the nut from the tie rod end, but do not unscrew yet.

Caution

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

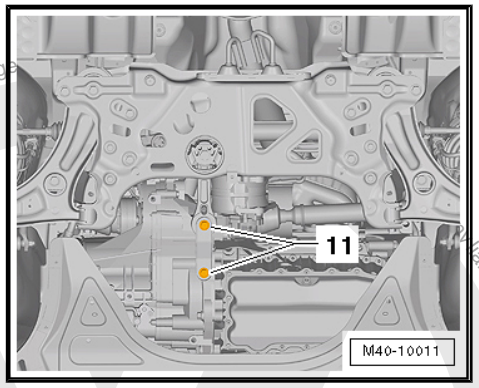
– Remove the tie rod end from the wheel bearing housing and remove the nut.

1 - Puller - Ball Joint - T10187-

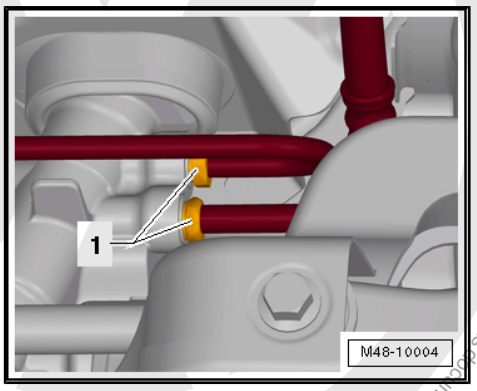


– Remove the bolts -11- and then remove the pendulum support from the transmission.

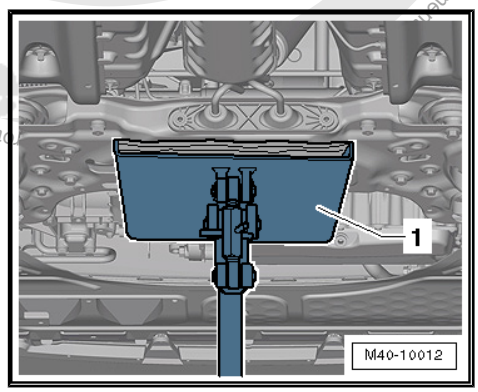
– Secure the subframe. Refer to ⇒ “4.3 Subframe, Securing”, page 11 .



– Remove the pressure line and return line -1- from the steering gear.

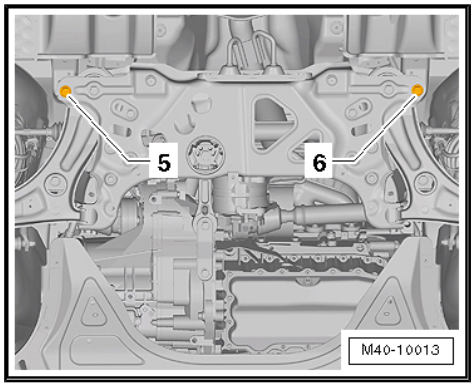


– Place the Engine and Gearbox Jack - VAS6931- -1- under the subframe.

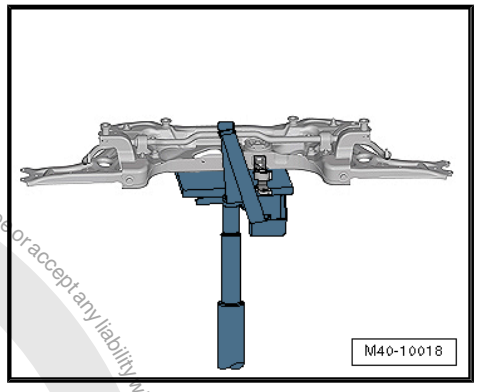


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– Remove the bolts -5 and 6- and lower the subframe using the Engine and Gearbox Jack - VAS6931- .



– Secure the subframe to the Engine and Gearbox Jack - VAS6931- with the accompanying strap.



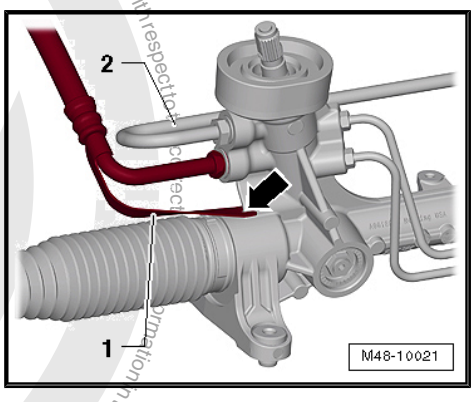
Installing

Install in reverse order of removal. Note the following:

Pay Attention to the Installation Position for the Hydraulic Lines on the Steering Gear

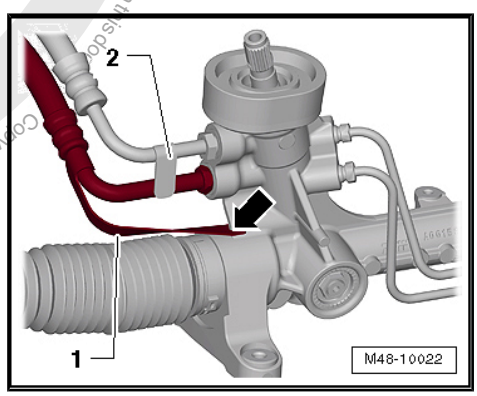
Extension Hose with Strap, Vehicles with 2.0L Engine

- The strap recess -1- on the expansion hose must be supported by the steering gear -arrow-.
- Then install the return hose -2-.



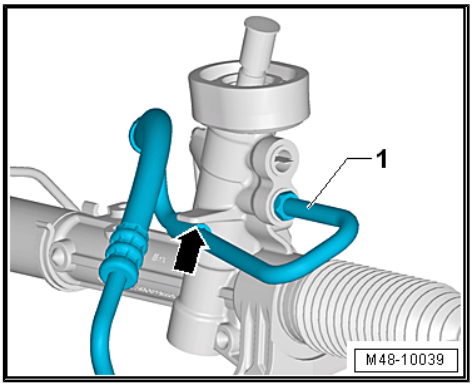
Expansion Hose with Strap, Vehicles with 2.5L Engine

- The strap recess -1- on the expansion hose must be supported by the steering gear -arrow-.
- The strap -2- on the return hose must be supported on the expansion hose.

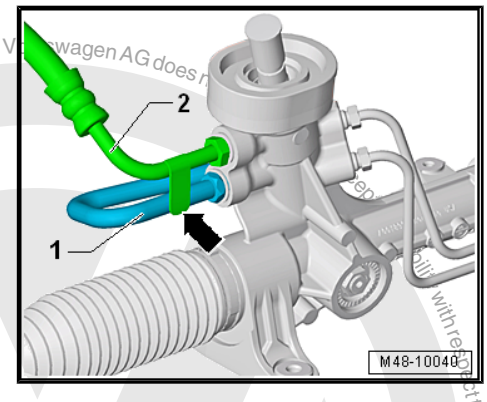


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Expansion Hose without Strap, All Engines

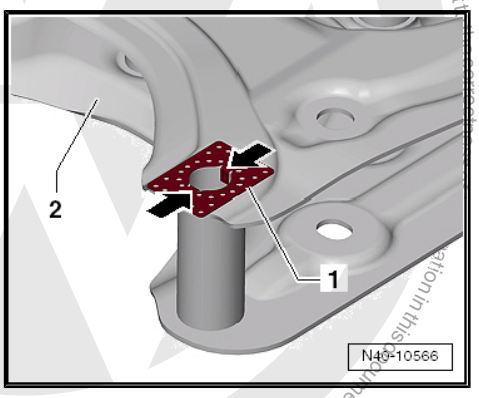


- The expansion hose -1- must be supported by the steering gear -arrow-.
- The strap -arrow- on the return hose -2- must be supported by the expansion hose -1-.



– If applicable, always make sure the intermediate plate -1- is installed between the subframe -2- and the body.

Insert the long side of the intermediate plate -1- so that it is perpendicular to the direction of travel. The tabs -arrows- must lock into the subframe -2-.



– Install and tighten the noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Noise Insulation for the tightening specifications.

– Install the front wheels and tighten. Refer to ⇒ “2 Wheel Installation Tightening Specifications”, page 237 .

Tightening Specifications

Component	Tightening Specification
Ball joint to control arm ♦ Use new nuts ♦ Tighten only in curb weight position. Refer to ⇒ “2 Rear Axle Curb Weight (Twist Beam Rear Suspension)”, page 146 .	100 Nm
Subframe to body ♦ Use new bolts.	70 Nm + 180° turn
Stabilizer bar to coupling rod ♦ Use new nut ♦ Counterhold at joint pin inner multi-point fitting	65 Nm
Tie rod end to wheel bearing housing ♦ Use new nut	20 Nm + 90° turn
Universal joint to steering gear ♦ Use a new bolt	30 Nm

Component	Tightening Specification
Union nut, pressure/return line to the steering gear	32 Nm
Exhaust system bracket to subframe. Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 26 .	

Tightening Specification, Pendulum Support to the Transmission

Bolt	Tightening Specification
M10 x 35 ♦ Use a new bolt	50 Nm + 90° turn
M10 x 75 ♦ Use a new bolt	50 Nm + 90° turn

4.7 Subframe with Electromechanical Steering Gear, Removing and Installing

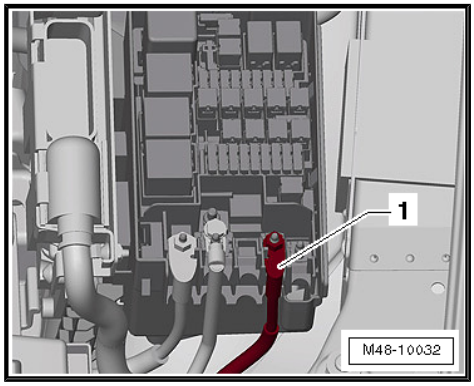
Special tools and workshop equipment required

- ♦ Puller - Ball Joint - T10187-
- ♦ Torque Wrench 1332 40-200Nm - VAG1332-

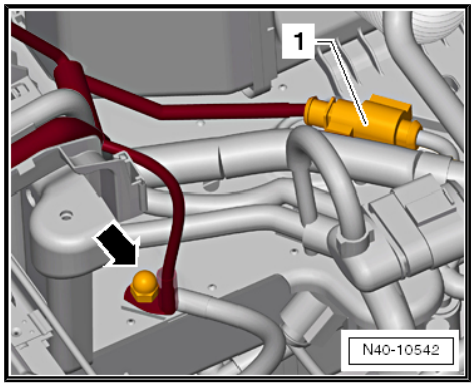
Perform the Following

Removing

– Disconnect the cable -1- from the E-box.



– Disconnect the connector -1-.



– Remove the cap nut -arrow- and disconnect the ground wire.
– Remove the wiring harness from the bracket on the longitudinal member so that it can be removed together with the steering gear.
– Turn the steering wheel in the straight position and remove the ignition key so that the steering wheel lock engages.

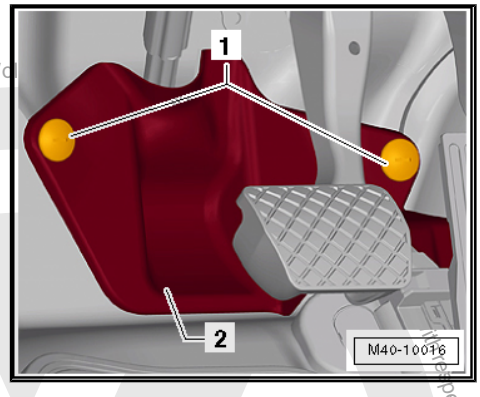
Vehicles with “Keyless Access” Keyless Locking and Starting System

– Switch the ignition off and open the driver door so the steering wheel lock engages.

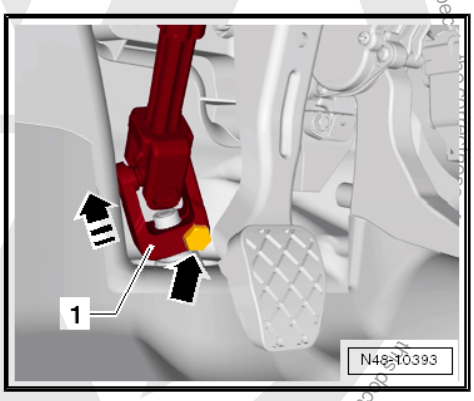
Continuation for All Vehicles

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– Remove the bolts -1- and remove the footwell trim panel -2-.



– Remove the bolt -arrow- from the universal joint -1-, and then remove the universal joint in the direction of -arrow-.



Caution

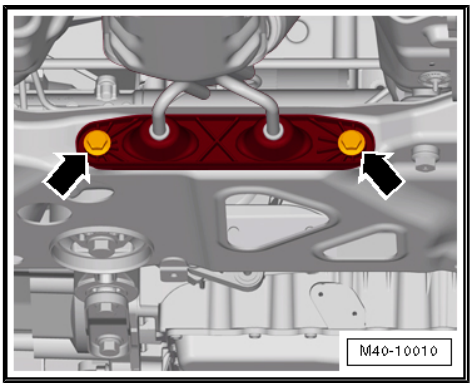
If the universal joint is separated from the Electromechanical steering gear, the following work cannot be performed:

- ***Switching on the ignition***
- ***Turning the steering gear***
- ***Turning the steering column.***

These points must be observed since performing these actions could cause irreparable damage.

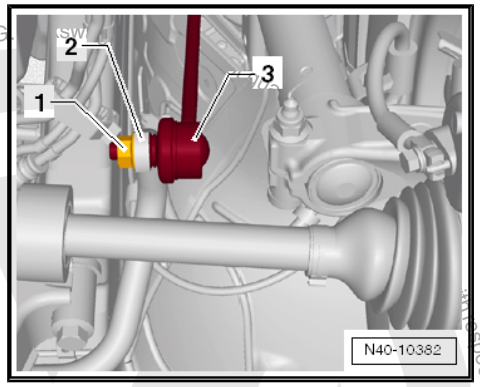
– Loosen the wheel bolts.
– Raise the vehicle.
– Remove the front wheels.
– Remove the lower noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Noise Insulation .

– Remove the exhaust system bracket from the subframe -arrows-.
– Loosen the double clamp for the exhaust system.

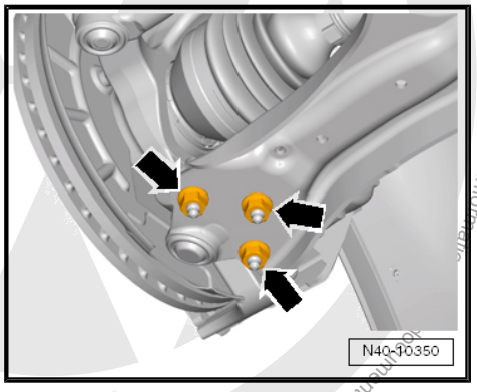


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– Remove the hex nut -1- from the right and left coupling rod -3-.
– Remove the coupling rod -3- from the stabilizer bar -2- on the left and right sides.



– Remove the nuts -arrows- on the left and right side of the vehicle.
– Remove the control arm from the ball joint.



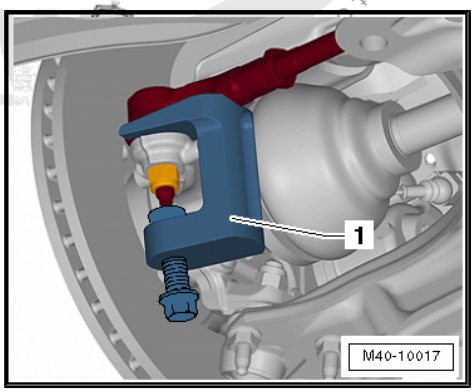
– Loosen the nut from the tie rod end, but do not unscrew yet.

Caution

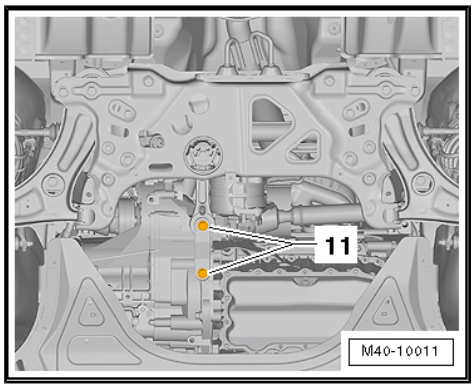
To protect the thread, screw the nut on the pin a few turns.

– Remove the tie rod end from the wheel bearing housing and remove the nut.

1 - Puller - Ball Joint - T10187-

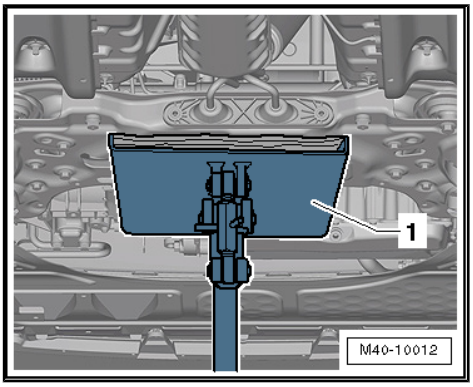


– Remove the bolts -11- and then remove the pendulum support from the transmission.
– Secure the subframe. Refer to ⇒ “4.3 Subframe, Securing”, page 11 .

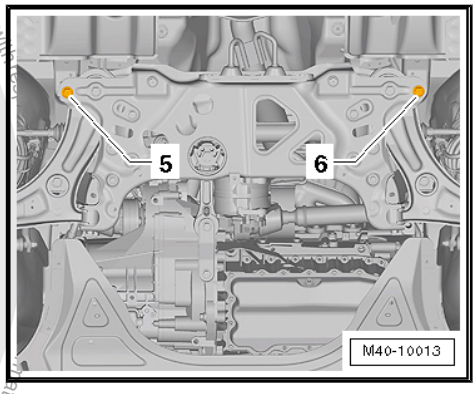


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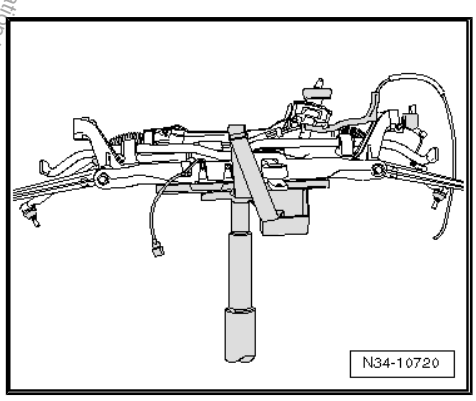
– Place the Engine and Gearbox Jack - VAS6931- -1- under the subframe.



– Remove the bolts -5 and 6- and lower the subframe using the Engine and Gearbox Jack - VAS6931- .



– Secure the subframe to the Engine and Gearbox Jack - VAS6931- with the accompanying strap.

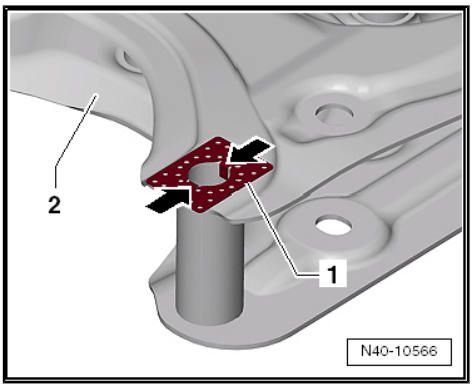


Installing

Install in reverse order of removal. Note the following:

– If applicable, always make sure the intermediate plate -1- is installed between the subframe -2- and the body.

Insert the long side of the intermediate plate -1- so that it is perpendicular to the direction of travel. The tabs -arrows- must lock into the subframe -2-.



– Install and tighten the noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Noise Insulation for the tightening specifications.

– Install the front wheels and tighten. Refer to ⇒ “2 Wheel Installation Tightening Specifications”, page 237 .

Tightening Specifications

Component	Tightening Specification
Ball joint to control arm ♦ Use new nuts ♦ Tighten only in curb weight position. Refer to ⇒ “2 Rear Axle Curb Weight (Twist Beam Rear Suspension)”, page 146 .	100 Nm

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Component	Tightening Specification
Subframe to body ♦ Use new bolts.	70 Nm + 180° turn
Stabilizer bar to coupling rod ♦ Use new nut ♦ Counterhold at joint pin inner multi-point fitting	65 Nm
Tie rod end to wheel bearing housing ♦ Use new nut	20 Nm + 90° turn
Universal joint to steering gear ♦ Use a new bolt	30 Nm
Exhaust system bracket to subframe . Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 26 .	

Tightening Specification, Pendulum Support to the Transmission

Bolt	Tightening Specification
M10 x 35 ♦ Use a new bolt	50 Nm + 90° turn
M10 x 75 ♦ Use a new bolt	50 Nm + 90° turn

4.8 Subframe, Servicing

Special tools and workshop equipment required

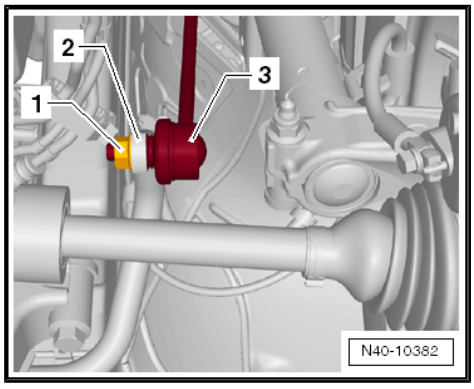
- ♦ Bearing Installer - Wheel Hub/Bearing Kit - T10205-
- ♦ Torque Wrench 1332 40-200Nm - VAG1332-
- ♦ Hydraulic Press - VAS6178-
- ♦ Pneumatic/Hydraulic Foot Pump - VAS6179-
- ♦ Rubber Bushing Assembly Device Kit - VAS6779A-
- ♦ Press Plate - VW401-
- ♦ Press Piece - Multiple Use - VW412-

Replacing the Bonded Rubber Bushing for the Pendulum Support.

– Remove the front noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Noise Insulation .

– Remove the hex nut -1- from the right and left coupling rod -3-.

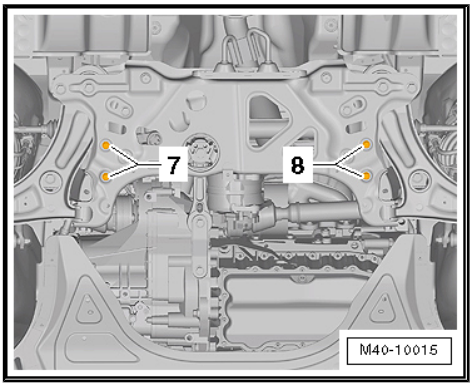
– Remove the coupling rod -3- from the stabilizer bar -2- on the left and right sides.



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– Remove the stabilizer bar bolts -7 and 8-.

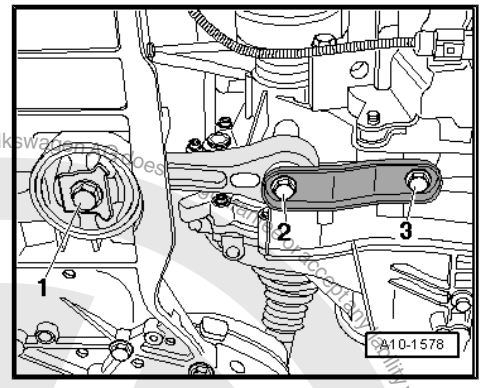
• Leave the stabilizer bar in the installation position on the vehicle.



– Remove the bolt -1-.

– Remove the bolts -2 and 3-.

– Remove the pendulum support.

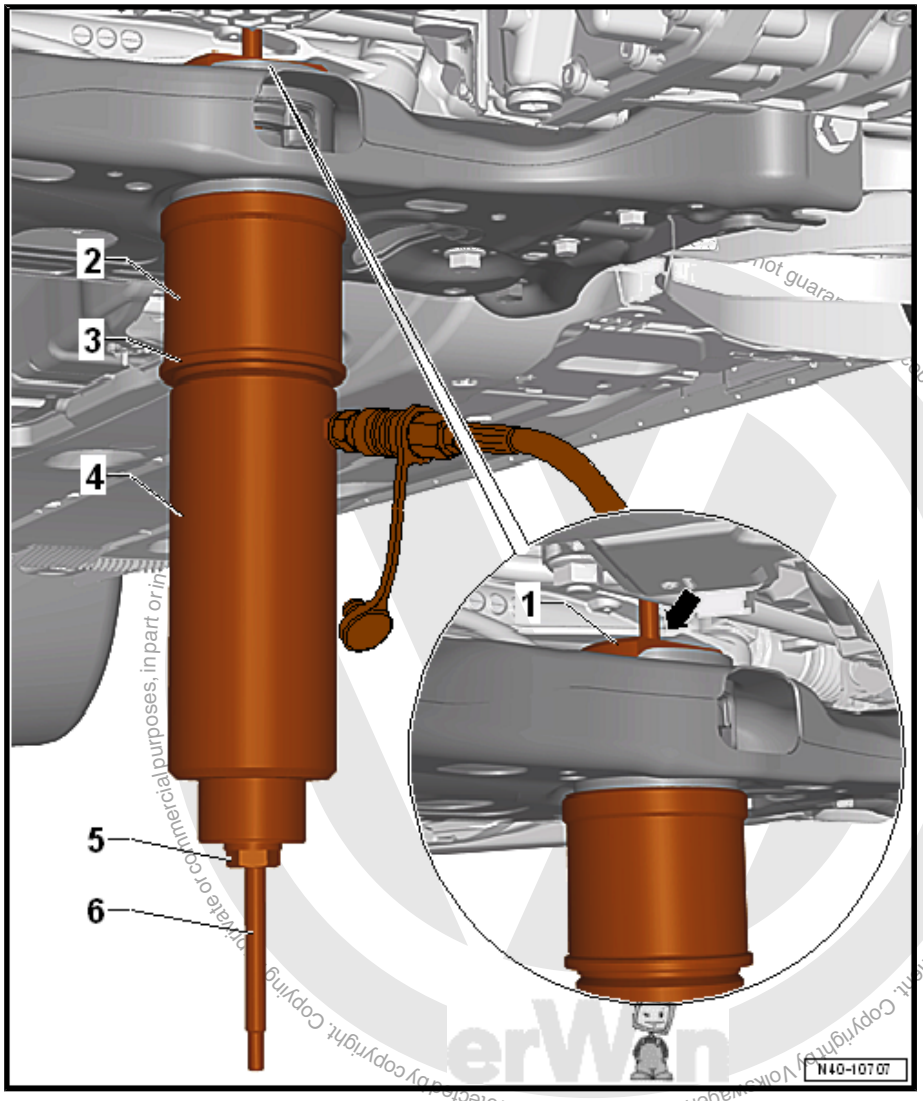


Pressing Out the Bonded Rubber Bushing

– Install the Rubber Bushing Assembly Device Kit - VAS6779A- on the subframe as shown.

– Position the Rubber Bushing Assembly Device Kit - Thrust Piece - VAS6779/1- -1- with the flat side -arrow- on the bonded rubber bushing in the direction of travel.

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1 - Rubber Bushing Assembly Device Kit - Thrust Piece - VAS6779/1-

2 - Rubber Bushing Assembly Device Kit -Tube - VAS6779/4- , with the large outer diameter to the subframe.

3 - Rubber Bushing Assembly Device Kit -Thrust Piece - VAS6779/5-

4 - Hydraulic Press - VAS6178- with Bearing Installer - Wheel Hub/Bearing Kit - Pressure Head - T10205/13-

5 - Rubber Bushing Assembly Device Kit - Hexagon Nut - VAS6779/3-

6 - Rubber Bushing Assembly Device Kit -Threaded Rod - VAS6779/2-

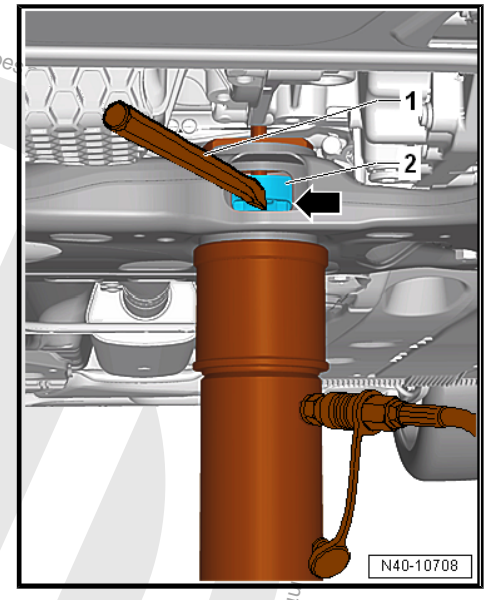
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– Press out both bonded rubber bushings until the upper bonded rubber bushing -2- is visible in the pendulum support opening -arrow- in the subframe.

– Perform a visual inspection of the upper bonded rubber bushing outer race -2-.

• If the upper bonded rubber bushing outer race -2- is deformed, it must be destroyed through the opening for the pendulum support -arrow- in the subframe.

– Using a chisel or similar tool -1-, make a break in the upper bonded rubber bushing outer race -2-.



Note

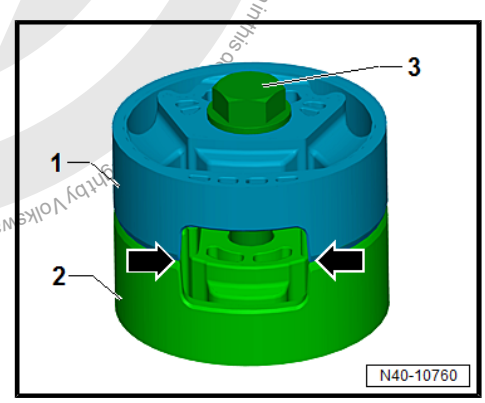
This work sequence is necessary to prevent tilting of the bonded rubber bushing outer race in the area of the pendulum support opening in the subframe.

– Completely press out both bonded rubber bushings at the same time.

Preparing Bonded Rubber Bushings Before Pressing In

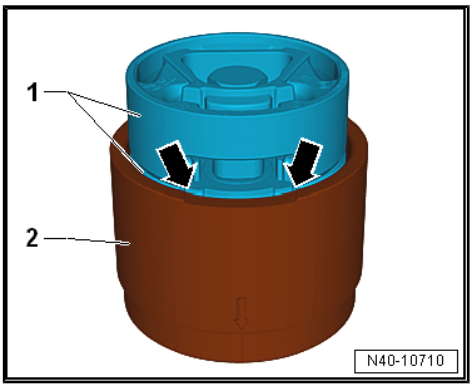
– Place the bonded rubber bushings -1 and 2- on top of each other so the openings -arrows- lay directly over each other.

– Tighten the bonded rubber bushings -1 and 2- using the original bolt -3- hand tight.



– Place the bonded rubber bushing -1- with the bolt head facing up in the larger diameter of the Hydraulic Press - Bushing Tool Kit - Funnel - VAS6779/6- -2-.

– Align the bonded rubber bushing -1- in the Hydraulic Press - Bushing Tool Kit - Funnel - VAS6779/6- -2-. The opening in the bonded rubber bushing must directly face the recess -arrows- in the Hydraulic Press - Bushing Tool Kit - Funnel - VAS6779/6- -2-.



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– Press the bonded rubber bushing -3- in the Hydraulic Press - Bushing Tool Kit - Funnel - VAS6779/6- until it stops as shown in the illustration.

1 - Press Piece - Multiple Use - VW412-

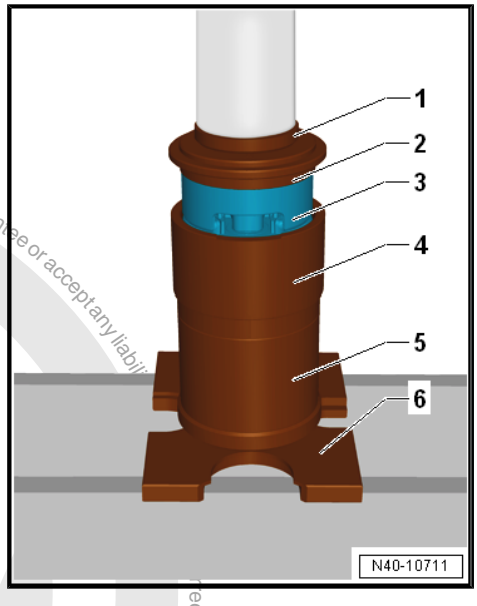
2 - Rubber Bushing Assembly Device Kit -Thrust Piece - VAS6779/5- , the side with the letter »A« points up

3 - Bonded rubber bushing

4 - Hydraulic Press - Bushing Tool Kit - Funnel - VAS6779/6-

5 - Rubber Bushing Assembly Device Kit - Tube - VAS6779/4-

6 - Press Plate - VW401-



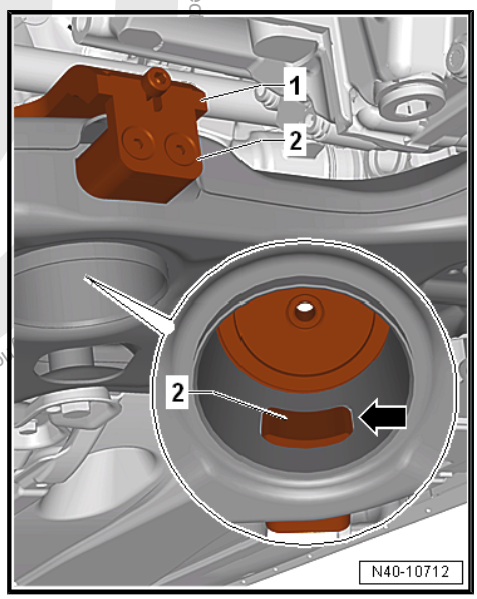
– Remove the bolt from the bonded rubber bushing.

– Insert the Hydraulic Press - Bushing Tool Kit - Counterhold - VAS6779/7- -1- into the subframe.

– Insert the Hydraulic Press - Bushing Tool Kit - Insert - VAS6779/7-1A- -2- into the pendulum support opening in the subframe.

– Fasten the Hydraulic Press - Bushing Tool Kit - Insert - VAS6779/7-1A- onto the Hydraulic Press - Bushing Tool Kit - Counterhold - VAS6779/7- -1-.

– Make sure that the Hydraulic Press - Bushing Tool Kit - Insert - VAS6779/7-1A- -2- is seated correctly in the subframe opening -arrow-.

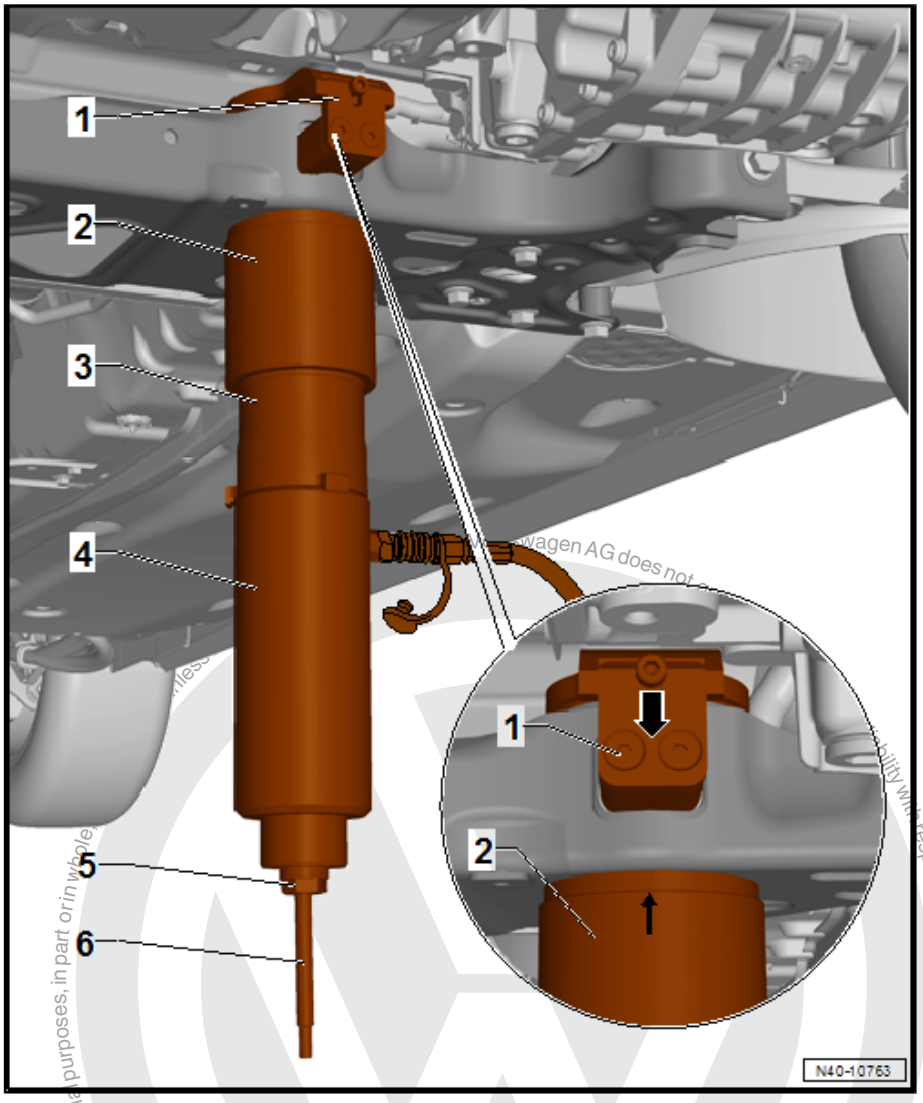


Installing the Bonded Rubber Bushings

– Screw the Rubber Bushing Assembly Device Kit -Threaded Rod - VAS6779/2- -7- into the Hydraulic Press - Bushing Tool Kit - Counterhold - VAS6779/7- -1-.

– Attach the Rubber Bushing Assembly Device Kit - Assembly Tool - VAS6779A- to the subframe as shown.

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1 - Hydraulic Press - Bushing Tool Kit - Counterhold - VAS6779/7-

2 - Hydraulic Press - Bushing Tool Kit - Funnel - VAS6779/6- , -arrow marking- on the Hydraulic Press - Bushing Tool Kit - Funnel - VAS6779/6- must align in the center of both bolts -arrow-.

3 - Hydraulic Press - Bushing Tool Kit - Thrust Piece - VAS6779/9-

4- Hydraulic Press - VAS6178- with Bearing Installer - Wheel Hub/ Bearing Kit - Pressure Head - T10205/13-

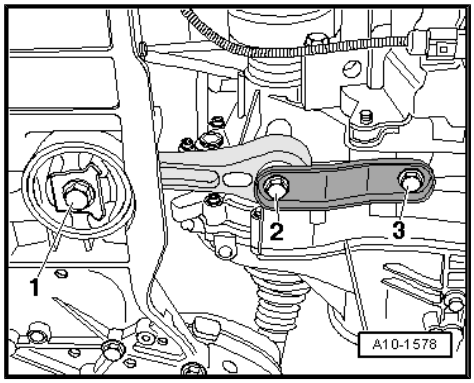
5- Hydraulic Press - Bushing Tool Kit -Hexagon Nut - VAS6779/3-

6- Hydraulic Press - Bushing Tool Kit -Threaded Rod - VAS6779/2-

– Press in both bonded rubber bushings at the same time.
– Remove the Hydraulic Press - Bushing Tool Kit - VAS6779- from the subframe and check the position of the pressed in bonded rubber bushing.
– Fasten the stabilizer bar with the subframe and the coupling rod.

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– Insert the pendulum support.
– Install the bolts -2 and 3- and tighten.
– Install the bolt -1- and tighten.
– Install the front noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Noise Insulation .



Tightening Specifications

Bolt	Tightening Specification
Pendulum support to the transmission M10 x 35 ◆ Use a new bolt	50 Nm + 90° turn
Pendulum support to the transmission M10 x 75 ◆ Use a new bolt	50 Nm + 90° turn
Pendulum support to the subframe M14 x 1.5 x 70 ◆ Use a new bolt ◆ Only tighten when pendulum support is bolted to transmission	100 Nm + 90° turn
Stabilizer bar to coupling rod ◆ Use new nut ◆ Counterhold at joint pin inner multi-point fitting	65 Nm
Stabilizer bar to subframe ◆ Use new bolts.	20 Nm + 90° turn

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5 Front Suspension and Control Arm

⇒ “5.1 Overview - Front Suspension and Control Arm”, page 37

⇒ “5.2 Ball Joint, Checking”, page 39

⇒ “5.3 Ball Joint, Removing and Installing”, page 39

⇒ “5.4 Control Arm, Removing and Installing”, page 43

⇒ “5.5 Control Arm, Removing and Installing, Left Side of Vehicle with DSG® or Automatic Transmission”, page 44

⇒ “5.6 Control Arm Front Bonded Rubber Bushing, Replacing”, page 48

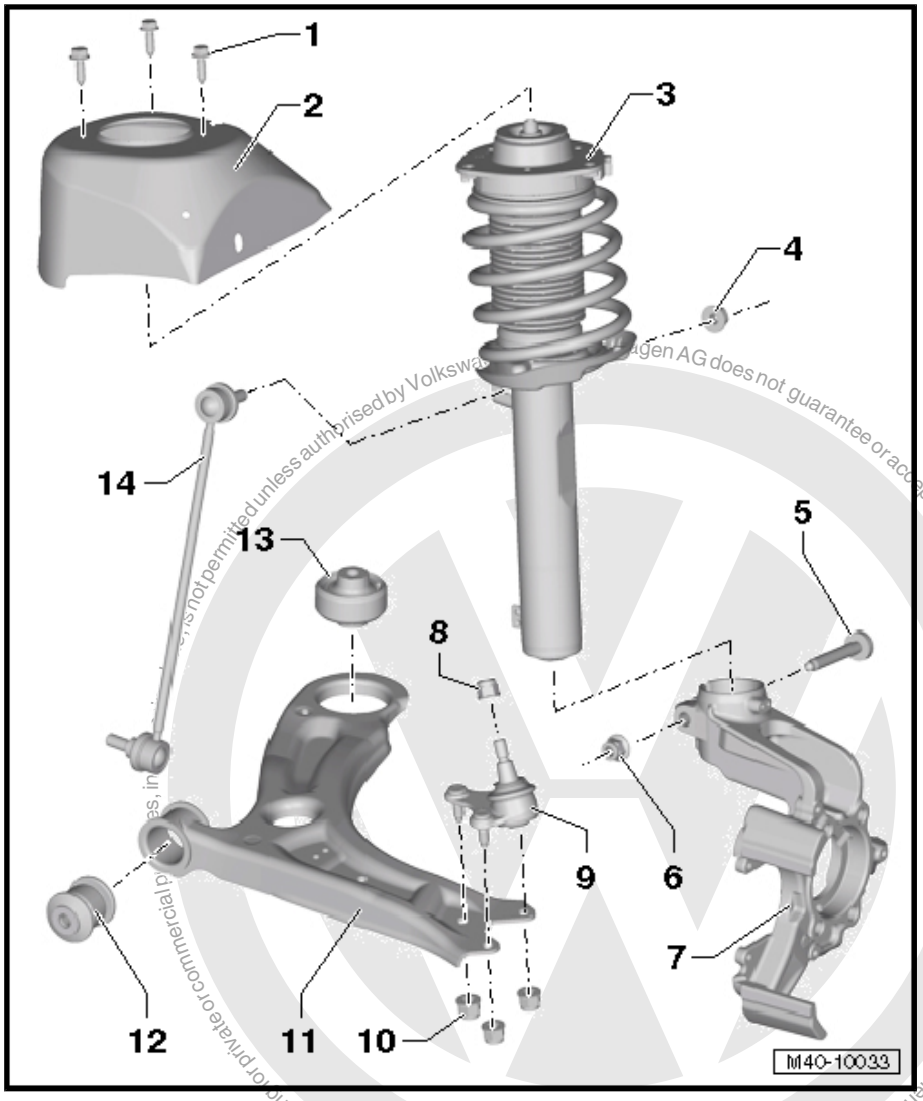
⇒ “5.7 Control Arm Rear Bonded Rubber Bushing, Replacing”, page 50

5.1 Overview - Front Suspension and Control Arm

Note

- *Welding and alignment work on supporting or wheel carrying suspension components is not permitted.*
- *Always replace self-locking nuts.*
- *Always replace corroded bolts/nuts.*
- *Bonded rubber bushings have a limited range of motion. Therefore, only tighten the threaded connections on the components with bonded rubber bushings when the wheel bearing housing is lifted (curb weight position). Refer to ⇒ “2 Wheel Bearing, Lifting to Curb Weight Position”, page 5 .*

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1 - Bolts

- ❑ 15 Nm + 90° turn
- ❑ Always replace if removed

2 - Front Body

3 - Suspension Strut

- ❑ Removing and installing. Refer to ⇒ “8.2 Suspension Strut, Removing and Installing”, page 68 .

4 - Nut

- ❑ 65 Nm

5 - Internal Multi-Point Bolt

- ❑ Bolt point must face the direction of travel

6 - Nut

- ❑ 70 Nm + 90° turn
- ❑ Always replace if removed

7 - Wheel Bearing Housing

- ❑ Removing and installing. Refer to ⇒ “6.3 Wheel Bearing Housing, Removing and Installing”, page 58 .
- ❑ If the wheel bearing housing is replaced, the alignment must be checked afterwards. Refer to ⇒ “8 Wheel Alignment”, page 256 .
- ❑ There are different versions.
- ❑ Allocation. Refer to the Parts Catalog.

8 - Nut

- ❑ 60 Nm

9 - Ball Joint

- ❑ Checking. Refer to ⇒ “5.2 Ball Joint, Checking”, page 39 .
- ❑ Removing and installing. Refer to ⇒ “5.3 Ball Joint, Removing and Installing”, page 39 .
- ❑ Replace with the control arm if damaged.

10 - Nut

- ❑ 100 Nm
- ❑ Always replace if removed
- ❑ Tighten only in curb weight position. Refer to ⇒ “2 Rear Axle Curb Weight (Twist Beam Rear Suspension)”, page 146 .

11 - Control Arm

- ❑ Replace with the ball joint if damaged.
- ❑ Removing and installing. Refer to ⇒ “5.4 Control Arm, Removing and Installing”, page 43 .
- ❑ Removing and installing (left side of the vehicle with a DSG® transmission or automatic transmission). Refer to ⇒ “5.5 Control Arm, Removing and Installing, Left Side of Vehicle with DSG® or Automatic Transmission”, page 44 .

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12 - Front Bonded Rubber Bushing

❑ Removing and installing. Refer to
⇒ “5.6 Control Arm Front Bonded Rubber Bushing, Replacing”, page 48 .

13 - Rear Bonded Rubber Bushing

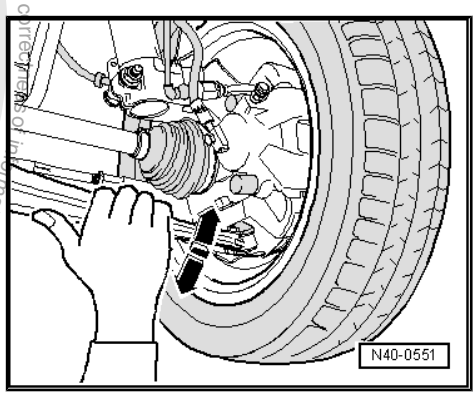
❑ Removing and installing. Refer to
⇒ “5.7 Control Arm Rear Bonded Rubber Bushing, Replacing”, page 50 .

14 - Coupling Rod

5.2 Ball Joint, Checking

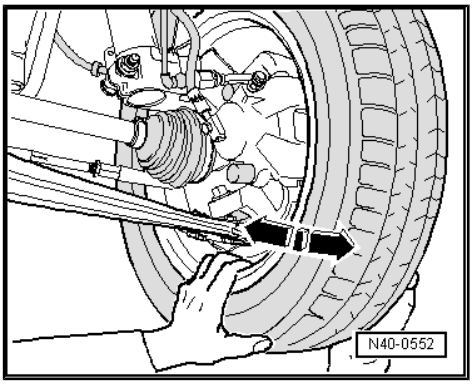
Axial Play, Checking

– Forcefully pull the control arm down in the direction of -arrow- and press it up again.



Radial Clearance, Checking

– Forcefully push the lower part of wheel inward and outward in the direction of -arrow-.



Note

- *There should not be any noticeable or visible “play” in either of the two checks.*
- *Pay attention to the ball joint while performing checks.*
- *Make allowance for any wheel bearing play or “play” in the upper strut mount*
- *Check the rubber boot for damage and replace the lower ball joint, if necessary.*

5.3 Ball Joint, Removing and Installing

Special tools and workshop equipment required

- Puller - Ball Joint - 3287A-
- Torque Wrench 1332 40-200Nm - VAG1332-
- Engine and Gearbox Jack - VAS6931-
- Digital Torque Wrench - VAG1756A-
- Drive Shaft Remover - T10520-

Removing

- Twelve-point bolt with ribs. Refer to
⇒ “9.1 Twelve-Point Bolt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection”, page 77 .
- Twelve-point bolt without ribs. Refer to
⇒ “9.2 Twelve-Point Bolt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection”, page 78 .

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Caution

The wheel bearing must not be under load when the drive axle threaded connection on the wheel side is loose.

If the wheel bearings are under the load of the vehicle weight, the wheel bearing will be damaged. This reduces the service life of the wheel bearings.

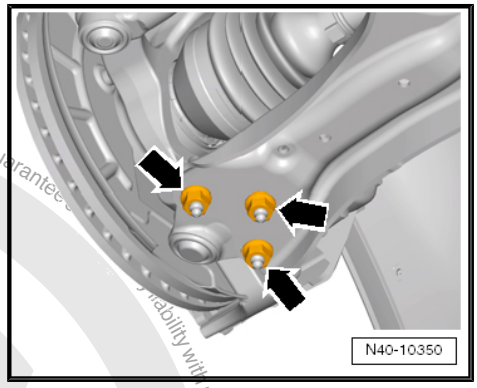
The drive axle bolt may be loosened maximum 90° when the vehicle is standing on its wheels.

Vehicles without a drive axle must not be moved, otherwise the wheel bearing will be damaged. If a vehicle must be moved, be sure to note the following:

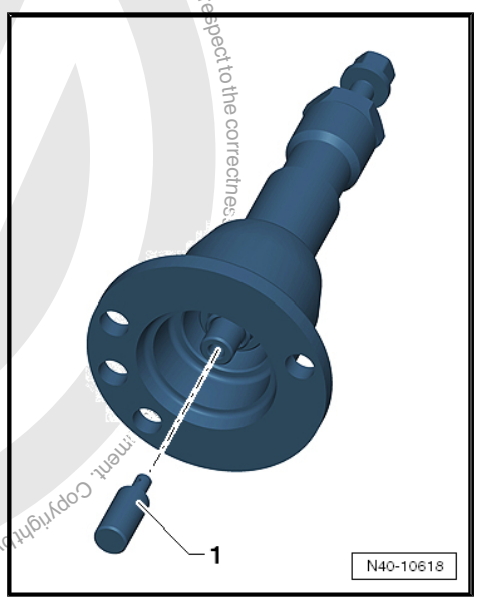
- *Install an outer joint in place of the drive axle.*
- *Tighten the outer joint to 120 Nm.*

– Loosen the wheel bolts.
– Raise the vehicle.
– Remove the wheel.
– Remove the nuts -arrows-.
– Pull the drive axle slightly off the wheel hub.

If the drive axle cannot be pulled out of the wheel bearing, then the drive axle can be pushed out of the wheel bearing using the Drive Shaft Remover - T10520- .

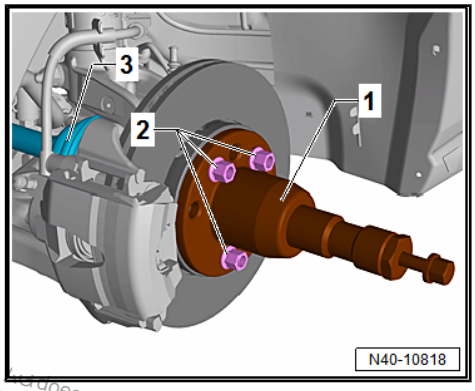


Before using the Drive Shaft Remover - T10520- , make sure that the thrust piece -1- is installed.



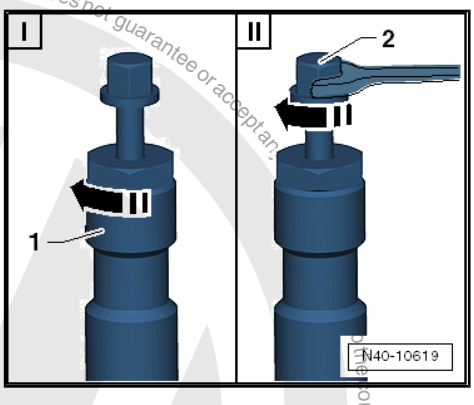
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Using the Drive Shaft Remover - T10520- :



– Secure the Drive Shaft Remover - T10520- -1- with three wheel bolts -2- on the wheel hub, so that the drive axle -3- can be pressed out.

– Follow the specified sequence exactly.



I - Tighten the knurled nut -1- hand-tight.

II - Only turn the bolt -2- using a wrench and press out the drive axle using the Drive Shaft Remover - T10520- .

Note

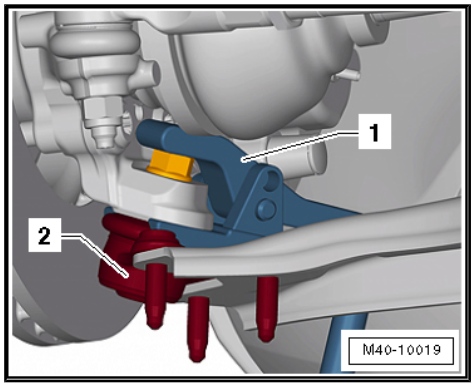
At the end of the tasks or to set back, the spindles must be brought back into the original position so that the hydraulic operation can be used.

– Remove the control arm from the ball joint.

– Move the control arm downward as much as needed.

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– Loosen the nut on the ball joint -2- but do not remove it.



Caution

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

– Remove the ball joint from the wheel bearing housing. Then remove the nut and the ball joint -2-.

1 - Puller - Ball Joint - 3287A-

Installing

Install in reverse order of removal. Note the following:

Note

Make sure the ball joint boot is not damaged or twisted.

– Tighten the drive axle bolt to the wheel hub:

- Twelve-point bolt with ribs. Refer to ⇒ “9.1 Twelve-Point Bolt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection”, page 77 .
- Twelve-point bolt without ribs. Refer to ⇒ “9.2 Twelve-Point Bolt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection”, page 78 .

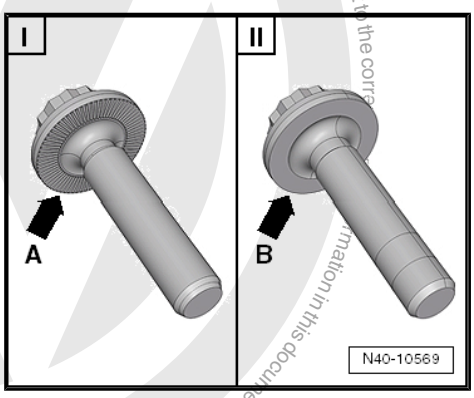
Caution

The vehicle must not be resting on the wheels when doing so.

When the bolt is loose, the wheel bearing can be damaged by the weight of the vehicle.

Difference between A Twelve-Point Bolt with Ribs and A Twelve-Point Bolt without Ribs

The contact surfaces -arrow A- and -arrow B- are different on the two-point bolts.



I - Twelve-point bolt with ribs -arrow A-

II - Twelve-point bolt without ribs -arrow B-

– Install the wheel and tighten. Refer to ⇒ “2 Wheel Installation Tightening Specifications”, page 237 .

Tightening Specifications

Component	Tightening Specification
Ball joint to control arm ♦ Use new nuts ♦ Tighten only in curb weight position. Refer to ⇒ “2 Rear Axle Curb Weight (Twist Beam Rear Suspension)”, page 146 .	100 Nm
Ball joint to wheel bearing housing ♦ Use new nut	60 Nm

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Component	Tightening Specification
Drive Axle to wheel hub “twelve-point bolt with ribs” ♦ Use a new bolt	70 Nm + 90°
Drive Axle to wheel hub “twelve-point bolt without ribs” ♦ Use a new bolt	200 Nm +180°

5.4 Control Arm, Removing and Installing

Special tools and workshop equipment required

♦ Torque Wrench 1332 40-200Nm - VAG1332-

Perform the Following

Removing

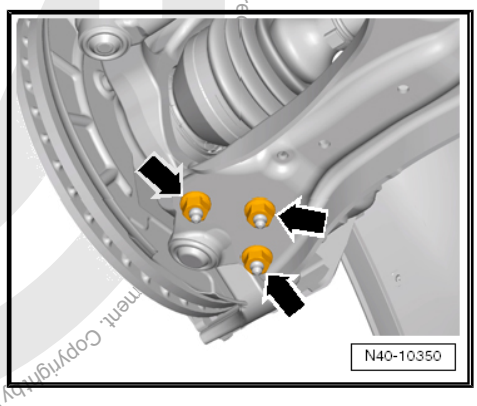
– Loosen the wheel bolts.

– Raise the vehicle.

– Remove the wheel.

– Remove the nuts -arrows-.

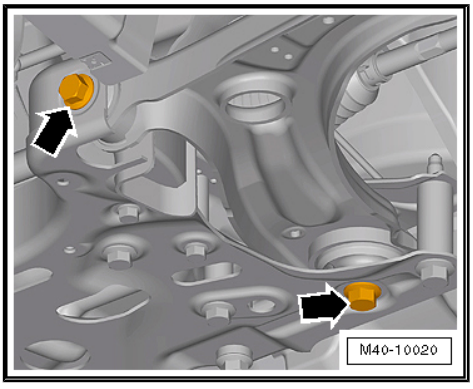
– Remove the control arm from the ball joint and then turn the wheel bearing housing toward the outside to take the load off the control arm.



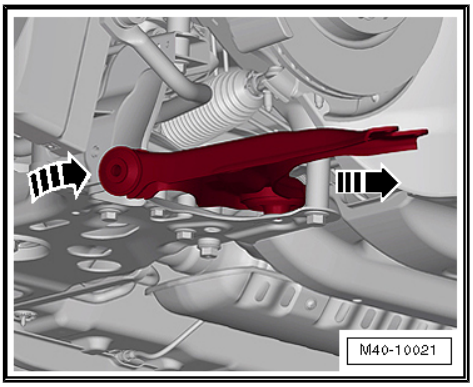
– Remove the bolts -arrows-.

Note

The rear bolt is attached with a nut. Counterhold the nut when loosening.



– Tilt the control arm toward the rear and then remove it from the subframe in the direction of -arrow-.

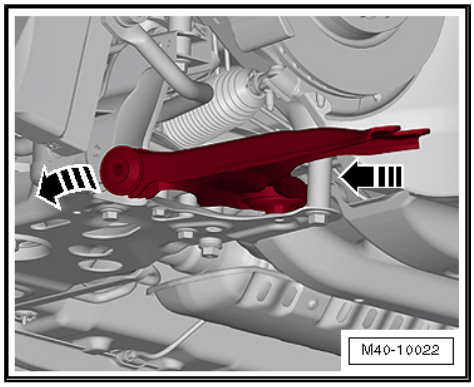


Installing

Install in reverse order of removal. Note the following:

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– Insert the rear control arm into the subframe in the direction of the -arrow- and swivel it forward.



Note

The rear bolt must be attached with a new nut. Counterhold the nut when tightening.

– Install the front wheel and tighten. Refer to ⇒ “2 Wheel Installation Tightening Specifications”, page 237 .

Tightening Specifications

Component	Tightening Specification
Control arm to subframe ♦ Use new bolts. ♦ Tighten bolts in curb weight position.	70 Nm + 90° turn
Ball joint to control arm ♦ Use new bolts. ♦ Tighten only in curb weight position. Refer to ⇒ “2 Rear Axle Curb Weight (Twist Beam Rear Suspension)”, page 146 .	100 Nm

5.5 Control Arm, Removing and Installing, Left Side of Vehicle with DSG® or Automatic Transmission

Special tools and workshop equipment required

♦ Engine and Gearbox Jack - VAS6931-

♦ Torque Wrench 1332 40-200Nm - VAG1332-

Perform the Following

Removing

– Turn the steering wheel in the straight position and remove the ignition key so that the steering wheel lock engages.

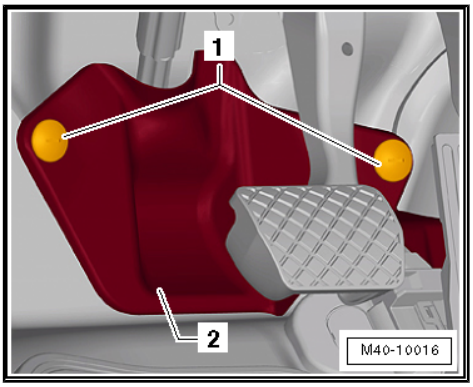
Vehicles with “Keyless Access” Keyless Locking and Starting System

– Switch the ignition off and open the driver door so the steering wheel lock engages.

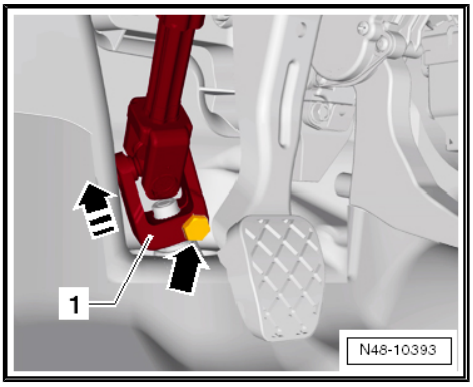
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Continuation for All Vehicles

– Remove the bolts -1- and remove the footwell trim panel -2-.



– Remove the bolt -arrow- from the universal joint -1-, and then remove the universal joint in the direction of the -arrow-.



Caution

If the universal joint is separated from the Electromechanical steering gear, the following work cannot be performed:

- ***Switching on the ignition***
- ***Turning the steering gear***
- ***Turning the steering column.***

These points must be observed since performing these actions could cause irreparable damage.

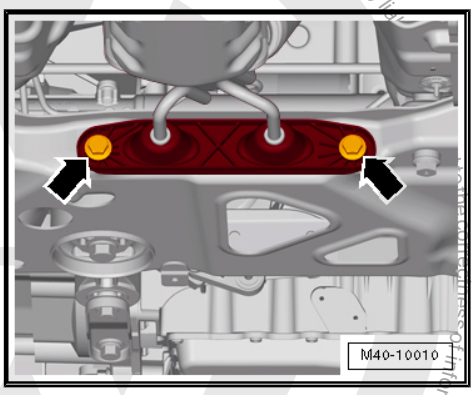
– Loosen the wheel bolts.

– Raise the vehicle.

– Remove the wheel.

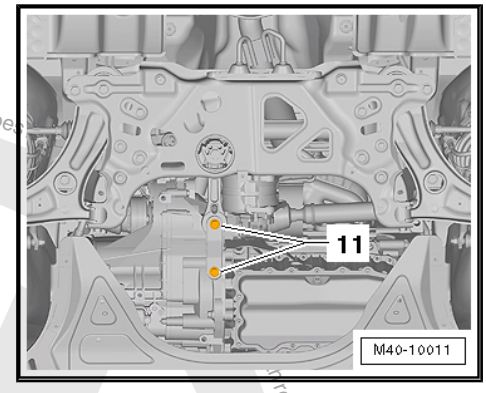
– Remove the lower noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Noise Insulation .

– Remove the exhaust system bracket from the subframe -arrows-.



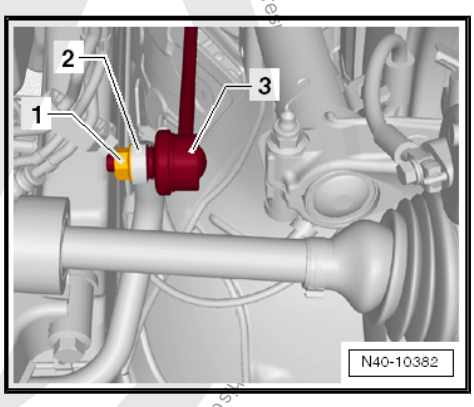
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– Remove the bolts -11- and then remove the pendulum support from the transmission.
– Loosen the double clamp for the exhaust system.



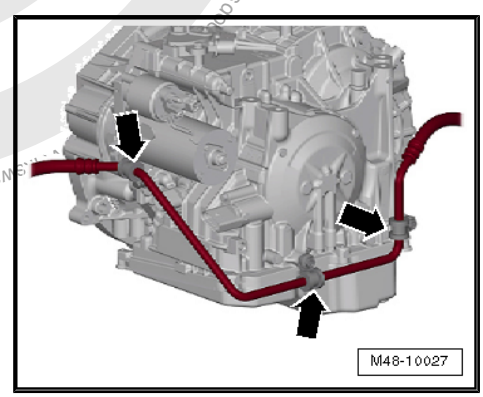
– Remove the hex nut -1- from the right and left coupling rod -3-.
– Remove the coupling rod -3- from the stabilizer bar -2- on the left and right sides.

Vehicles with Power Steering

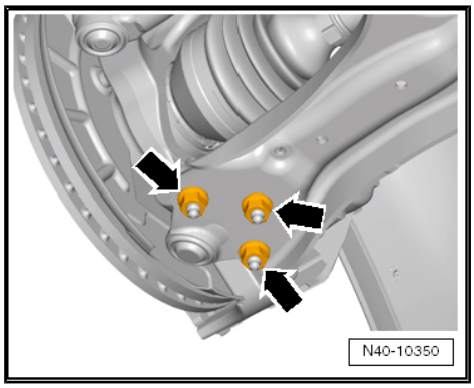


– Remove the power steering gear pressure line from the transmission -arrows-.

Continuation for All Vehicles

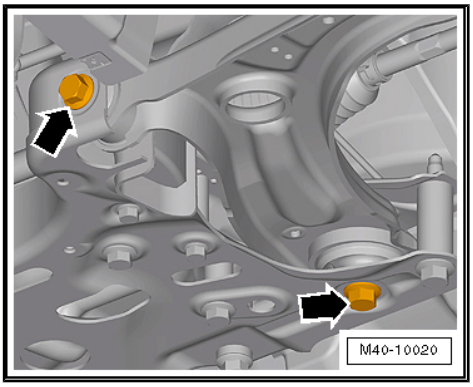


– Remove the nuts -arrows-.
– Remove the control arm from the ball joint and then turn the wheel bearing housing toward the outside to take the load off the control arm.



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– Remove the bolts -arrows-.

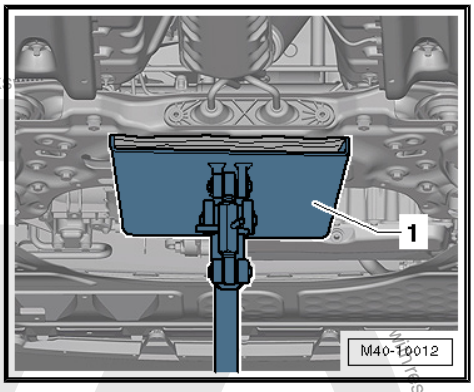


Note

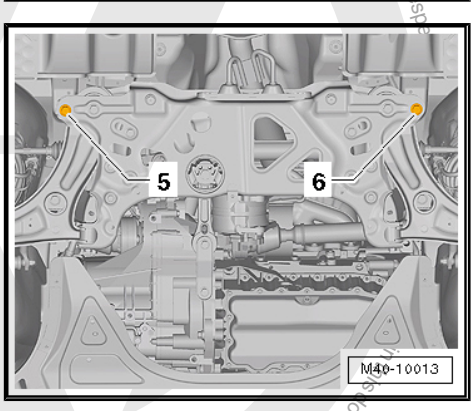
The rear bolt is attached with a nut. Counterhold the nut when loosening.

– Secure the subframe. Refer to
⇒ “4.3 Subframe, Securing”, page 11 .

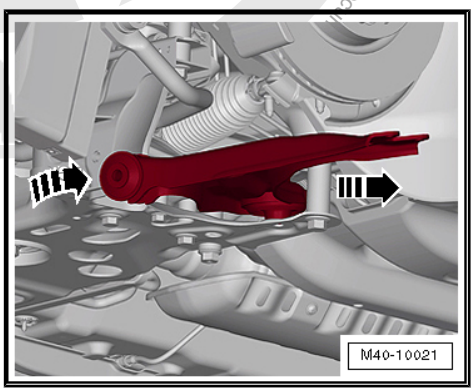
– Place the Engine and Gearbox Jack - VAS6931- -1- under the subframe.



– Remove the bolts -5 and 6- and lower the subframe maximum 10 cm.



– Tilt the control arm toward the rear and then remove it from the subframe in the direction of -arrow-.

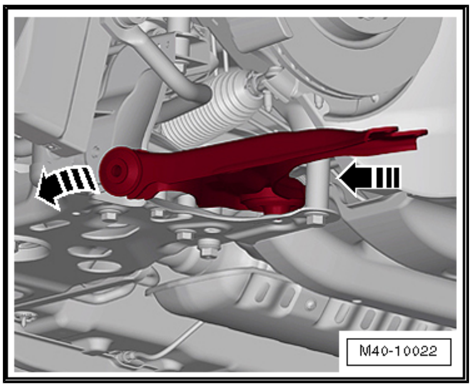


Installing

Install in reverse order of removal. Note the following:

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– Insert the rear control arm into the subframe in the direction of -arrow- and swivel it forward.



Note

- *The rear bolt must be attached with a new nut. Counterhold the nut when tightening.*
- *Make sure the ball joint boot is not damaged or twisted.*

– Install the lower noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Noise Insulation .

– Install the front wheel and tighten. Refer to ⇒ “2 Wheel Installation Tightening Specifications”, page 237 .

Tightening Specifications

Component	Tightening Specification
Subframe to body ♦ Use new bolts.	70 Nm + 180° turn
Ball joint to control arm ♦ Use new nuts ♦ Tighten only in curb weight position. Refer to ⇒ “2 Rear Axle Curb Weight (Twist Beam Rear Suspension)”, page 146 .	100 Nm
Control arm to subframe ♦ Use new bolts. ♦ Tighten bolts in curb weight position.	70 Nm + 90° turn
Stabilizer bar to coupling rod ♦ Use new nut ♦ Counterhold at joint pin inner multi-point fitting	65 Nm
Universal joint to steering gear ♦ Use a new bolt	30 Nm
Exhaust system bracket to subframe. Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 26 .	

Tightening Specification, Pendulum Support to the Transmission

Bolt	Tightening Specification
M10 x 35 ♦ Use a new bolt	50 Nm + 90° turn
M10 x 75 ♦ Use a new bolt	50 Nm + 90° turn

5.6 Control Arm Front Bonded Rubber Bushing, Replacing

Special tools and workshop equipment required

- Wishbone Rubber Mount Assembly Tool - T10219-

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- Press Plate - VW402-
- Press Piece - Rod - VW411-
- Press Piece - Multiple Use - VW412-

Perform the Following

– Remove the control arm. Refer to
⇒ “5.4 Control Arm, Removing and Installing”, page 43 .

– Remove the control arm (left side of the vehicle with DSG® or automatic transmission). Refer to
⇒ “5.5 Control Arm, Removing and Installing, Left Side of Vehicle with DSG® or Automatic Transmission”, page 44 .

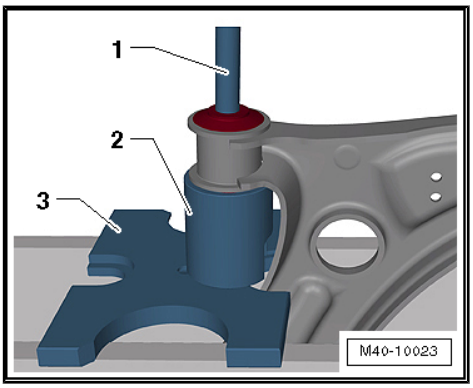
Pressing Out the Bonded Rubber Bushing

– Press out the bonded rubber bushings as shown.

1 - Press Piece - Rod - VW411-

2 - Wishbone Rubber Mount Assembly Tool - Tube - T10219/1- (the opening must face the control arm)

3 - Press Plate - VW402-



Installing the Bonded Rubber Bushings

– Apply Installation Lubricant - G 294 421 A1- onto the outside of the bonded rubber bushing.

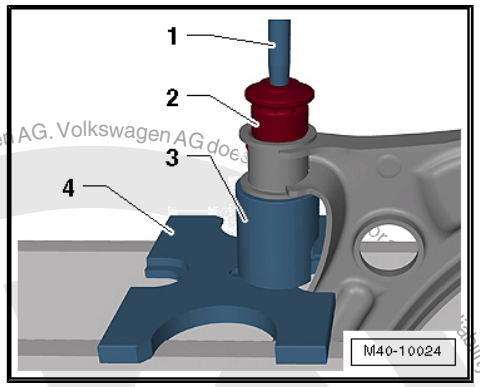
– Install the bonded rubber bushing as shown.

1 - Wishbone Rubber Mount Assembly Tool-Drift - T10219/2-

2 - Bonded rubber bushing

3 - Wishbone Rubber Mount Assembly Tool - Tube - T10219/1- (the opening must face the control arm)

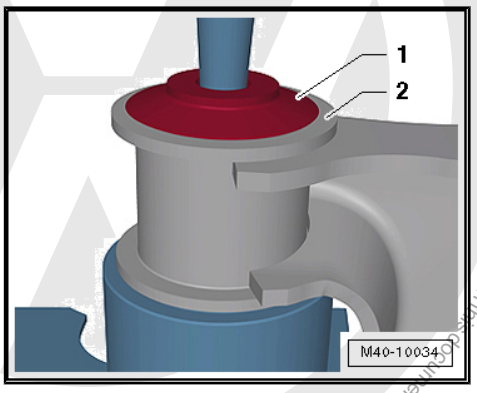
4 - Press Plate - VW402-



Note

The bonded rubber bushing will be crooked for a short time at the beginning of the installation. Later it will straighten out. It will not be necessary to guide it.

– Install the bonded rubber bushing until the core -1- and the control arm hole -2- are at the same height.



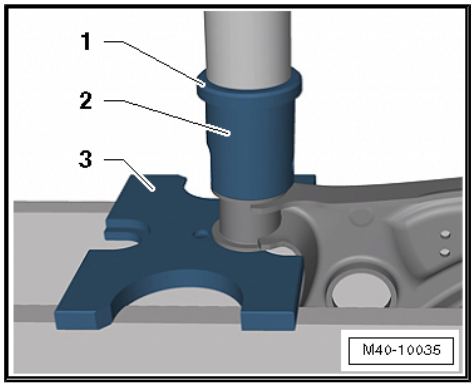
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– Press the bushing back slightly in the control arm.

1 - Press Piece - Multiple Use - VW412-

2 - Wishbone Rubber Mount Assembly Tool -Tube - T10219/1-

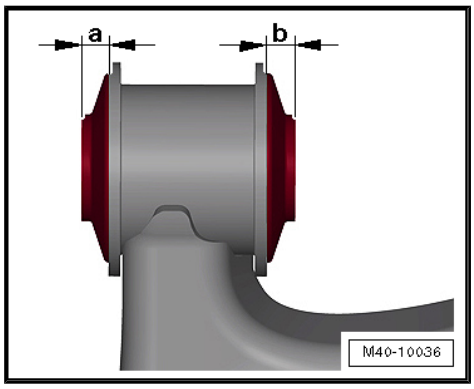
3 - Press Plate - VW402-



Dimensions -a and b- must be identical.

– Install the control arm. Refer to ⇒ page 43 .

– Install the control arm (left side of the vehicle with DSG® or automatic transmission). Refer to ⇒ page 47 .



5.7 Control Arm Rear Bonded Rubber Bushing, Replacing

Special tools and workshop equipment required

- Bearing Installer - Front Wheel Bearing - 2039-
- Front Subframe Mount Kit - 3372-
- Press Plate - VW401-
- Press Piece - Rod - VW407-
- Press Piece - Multiple Use - VW412-
- Hydraulic Press - Bushing Assembly Tool Kit - T10230-
- Press Piece - Rear Track Control Arm - T10453-

Perform the Following

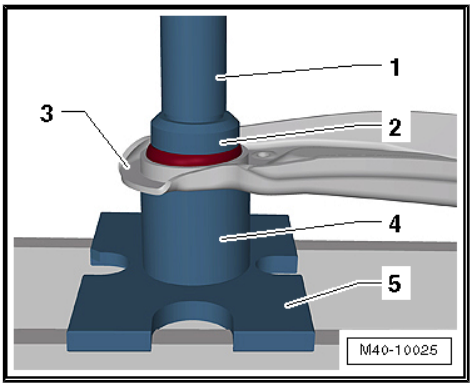
– Remove the control arm. Refer to ⇒ “5.4 Control Arm, Removing and Installing”, page 43 .

– Remove the control arm (left side of the vehicle with DSG or automatic transmission). Refer to ⇒ “5.5 Control Arm, Removing and Installing, Left Side of Vehicle with DSG® or Automatic Transmission”, page 44 .

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Pressing Out the Bonded Rubber Bushing

– Press out the bonded rubber bushings as shown.



1 - Press Piece - Rod - VW407-

2 - Hydraulic Press - Bushing Assembly Tool Kit - Thrust Piece - T10230/8-

3 - Control arm - the opening in the control arm must face upward

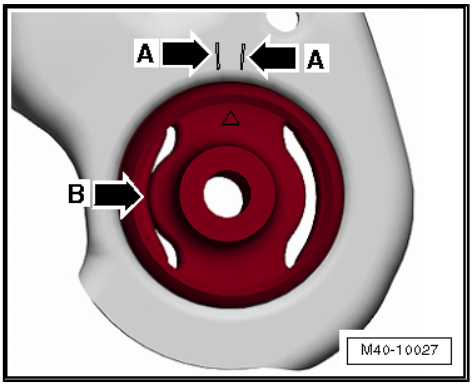
4 - Bearing Installer - Front Wheel Bearing - 2039-

5 - Press Plate - VW402-

Installation Position for the Rear Bearing In the Control Arm

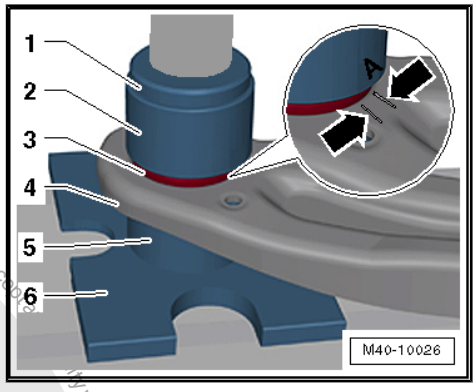
One of the stamped arrows points between the markings -A arrows- in the control arm.

The cam -arrow B- must always point to the outside of the vehicle.



Installing the Bonded Rubber Bushings

– Install the bonded rubber bushing as shown.



1 - Press Piece - Multiple Use - VW412-

2 - Press Piece - Rear Track Control Arm - T10453- - the -A- on the thrust piece must face the markings -arrows- on the control arm.

3 - Bonded rubber bushing

4 - Control arm - the opening in the control arm must face downward

5 - Front Subframe Mount Kit - 3372-

6 - Press Plate - VW402-

Note

Install the bonded rubber bushing far enough until the Press Piece - Rear Track Control Arm - T10453- contacts the control arm.

– Install the control arm. Refer to ⇒ page 43 .

– Install the control arm (left side of the vehicle with DSG® or automatic transmission). Refer to ⇒ page 47 .

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6 Wheel Bearing

⇒ “6.1 Overview - Wheel Bearing”, page 52

⇒ “6.2 Wheel Bearing Unit, Removing and Installing”, page 54

⇒ “6.3 Wheel Bearing Housing, Removing and Installing”, page 58

6.1 Overview - Wheel Bearing

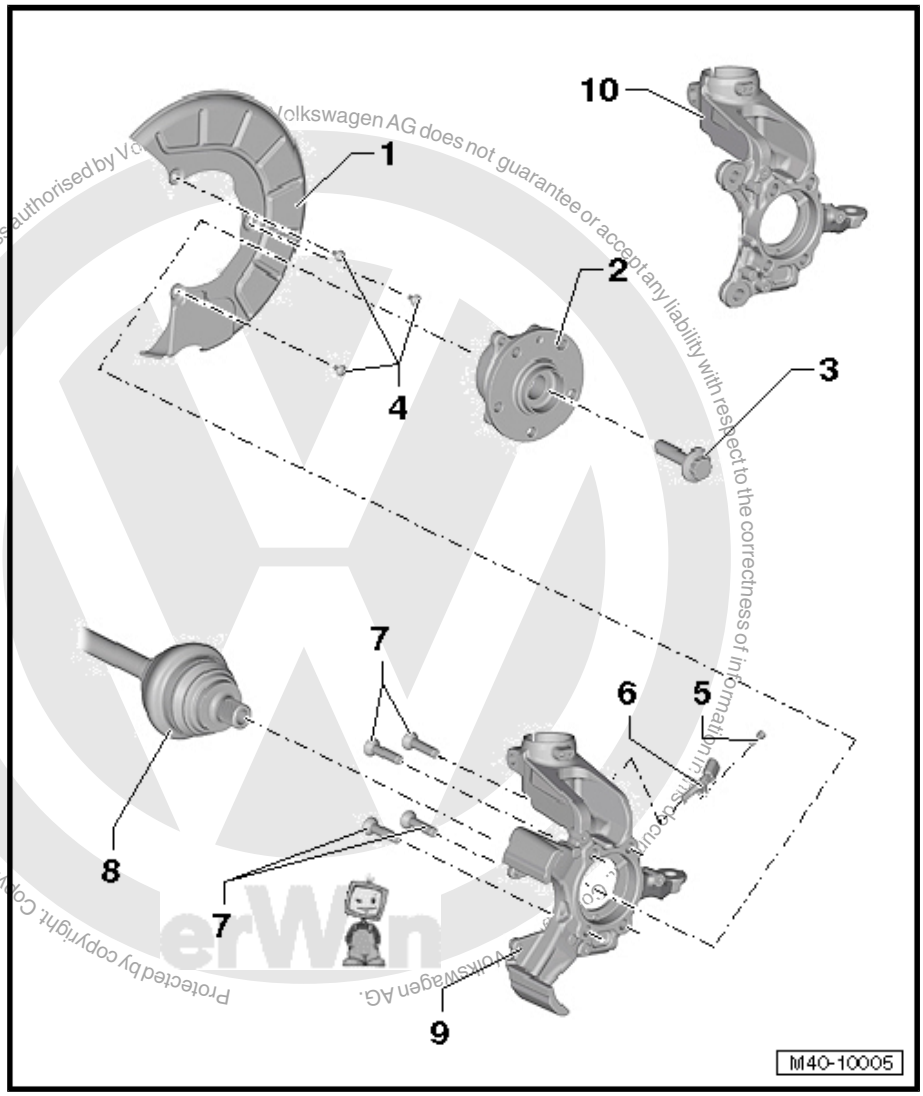
1 - Cover Plate

2 - Wheel Hub with Wheel Bearing

- ❑ Removing and installing. Refer to ⇒ “6.2 Wheel Bearing Unit, Removing and Installing”, page 54 .
- ❑ The ABS sensor ring is installed in the wheel hub
- ❑ There are different versions.
- ❑ Allocation. Refer to the Parts Catalog.

3 - Bolt

- ❑ There are different versions.
- ❑ Allocation. Refer to the Parts Catalog.



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WARNING

There are two types of twelve-point bolts, with and without ribs. Distinguishing characteristics. Refer to ⇒ Fig. ""Difference Between A Twelve-Point Bolt with Ribs and A Twelve-Point Bolt without Ribs"" , page 54

When installing a twelve-point bolt, always check what type of twelve-point bolt is to be used.

Use the correct tightening specification for the specific bolt.

The tightening specification for a twelve-point bolt »with« ribs is 70 Nm + 90°. Refer to ⇒ "9.1 Twelve-Point Bolt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection", page 77 for loosening and tightening specifications.

The tightening specification for a twelve-point bolt »without« ribs is 200 Nm + 180°. Refer to ⇒ "9.2 Twelve-Point Bolt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection", page 78 for loosening and tightening specifications.

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- ❑ Always replace if removed

4 - Bolt

- ❑ 12 Nm

5 - Hex Socket Bolt

- ❑ 8 Nm

6 - Left Front ABS Wheel Speed Sensor - G47- / Right Front ABS Wheel Speed Sensor - G45-

- ❑ Before inserting the wheel speed sensor, clean the inner surface of the hole and coat with Securing Grease - G 000 650- .

7 - Bolt

- ❑ 70 Nm + 90° turn
- ❑ Always replace if removed

The vehicle must not be resting on its wheels when tightening or loosening.

8 - Drive Axle

- ❑ Removing and installing. Refer to ⇒ "9.3 Drive Axle with CV Joint, Removing and Installing", page 80 .

9 - Wheel Bearing Housing

- ❑ Removing and installing. Refer to ⇒ “6.3 Wheel Bearing Housing, Removing and Installing”, page 58 .
- ❑ With integrated brake carrier
- ❑ If the wheel bearing housing is replaced, the alignment must be checked afterwards. Refer to ⇒ “8 Wheel Alignment”, page 256 .
- ❑ Allocation. Refer to the Parts Catalog.

10 - Wheel Bearing Housing

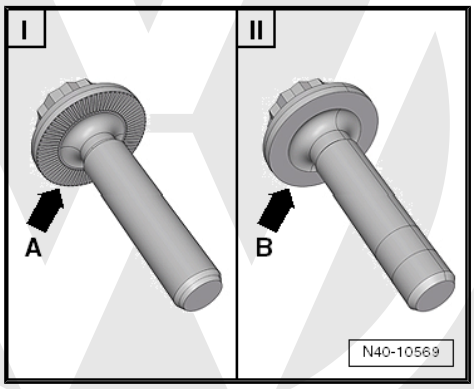
- ❑ Removing and installing. Refer to ⇒ “6.3 Wheel Bearing Housing, Removing and Installing”, page 58 .
- ❑ With brake carrier bolted on
- ❑ If the wheel bearing housing is replaced, the alignment must be checked afterwards. Refer to ⇒ “8 Wheel Alignment”, page 256 .
- ❑ Allocation. Refer to the Parts Catalog.

Difference Between A Twelve-Point Bolt with Ribs and A Twelve-Point Bolt without Ribs

The contact surfaces -arrow A- and -arrow B- are different on the two-point bolts.

I - Twelve-point bolt with ribs -arrow A-

II - Twelve-point bolt without ribs -arrow B-



6.2 Wheel Bearing Unit, Removing and Installing

Special tools and workshop equipment required

- ♦ Torque Wrench 1332 40-200Nm - VAG1332-

Perform the Following

Removing

- ♦ Twelve-point bolt with ribs. Refer to ⇒ “9.1 Twelve-Point Bolt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection”, page 77 .
- ♦ Twelve-point bolt without ribs. Refer to ⇒ “9.2 Twelve-Point Bolt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection”, page 78 .

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Caution

The wheel bearing must not be under load when the drive axle threaded connection on the wheel side is loose.

If the wheel bearings are under the load of the vehicle weight, the wheel bearing will be damaged. This reduces the service life of the wheel bearings.

The drive axle bolt may be loosened maximum 90° when the vehicle is standing on its wheels.

Vehicles without a drive axle must not be moved, otherwise the wheel bearing will be damaged. If a vehicle must be moved, be sure to note the following:

- ***Install an outer joint in place of the drive axle.***
- ***Tighten the outer joint to 120 Nm.***

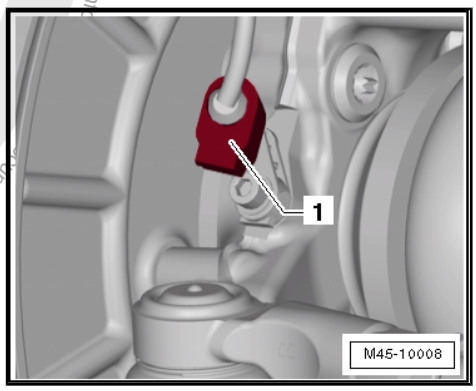
– Loosen the wheel bolts.

– Raise the vehicle.

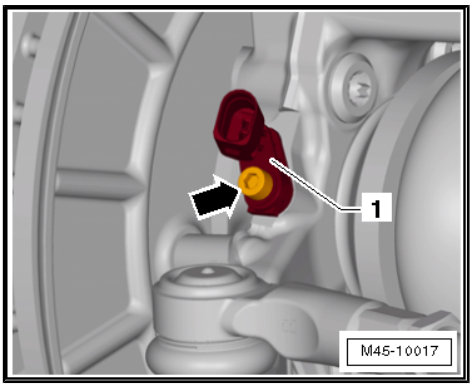
– Remove the wheel.

– Remove the brake caliper and attach to the body with wire. Refer to ⇒ Brake System; Rep. Gr. 46 ; Front Brakes; Brake Caliper, Removing and Installing .

– Disconnect the connector -1- from the ABS speed sensor.

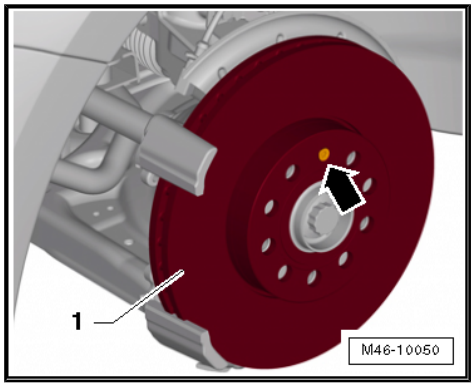


– Remove the bolt -arrow- and the ABS speed sensor -1-.



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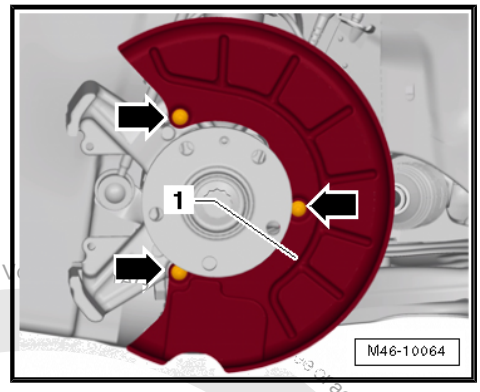
– Remove the brake rotor -1- -arrow-.



– Remove the cover plate -1- from the wheel bearing housing -arrow-.

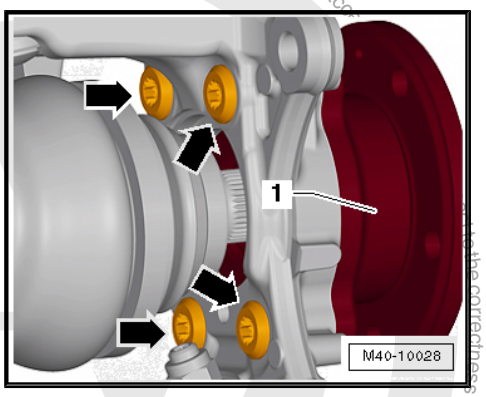
Only Vehicles with a Drive Axle VL 100

– Press the drive axle out of the wheel hub as far as possible (in the direction of the transmission).

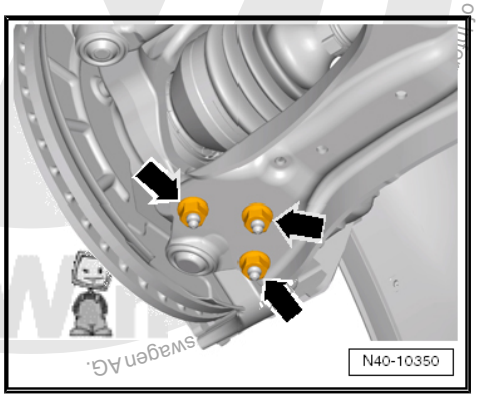


– Remove the bolts -arrows-.
– Remove the wheel bearing unit -1- from the wheel bearing housing.

Continuation for All Vehicles



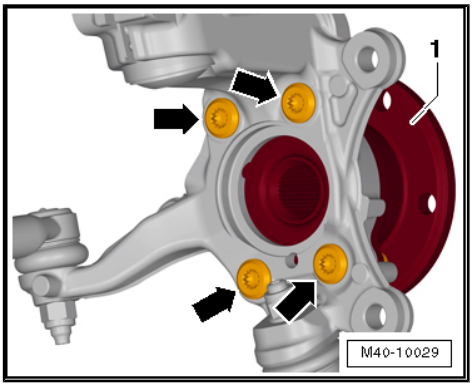
– Remove the nuts -arrows-.
– Remove the control arm from the ball joint.
– Pull the drive axle out of the wheel hub.



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– Remove the bolts -arrows-.

– Remove the wheel bearing unit -1- from the wheel bearing housing.



Installing

Install in reverse order of removal. Note the following:

– Install the brake caliper. Refer to ⇒ Brake System; Rep. Gr. 46 ; Front Brakes; Brake Caliper, Removing and Installing .

– Tighten the drive axle bolt to the wheel hub:

♦ Twelve-point bolt with ribs. Refer to ⇒ “9.1 Twelve-Point Bolt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection”, page 77 .

♦ Twelve-point bolt without ribs. Refer to ⇒ “9.2 Twelve-Point Bolt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection”, page 78 .

Caution

The vehicle must not be resting on the wheels when doing so.

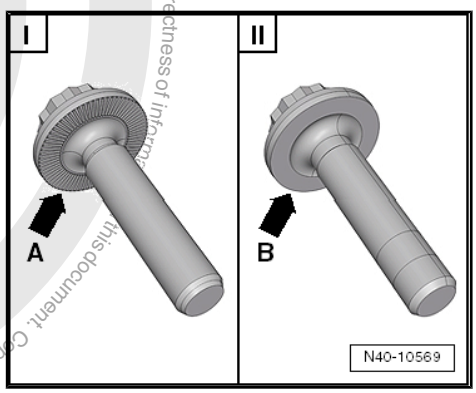
When the bolt is loose, the wheel bearing can be damaged by the weight of the vehicle.

Difference Between A Twelve-Point Bolt With Ribs and A Twelve-Point Bolt without Ribs

The contact surfaces -arrow A- and -arrow B- are different on the two-point bolts.

I - Twelve-point bolt with ribs -arrow A-

II - Twelve-point bolt without ribs -arrow B-



– Install the ABS speed sensor. Refer to ⇒ Brake System; Rep. Gr. 45 .

– Install the front wheel and tighten. Refer to ⇒ “2 Wheel Installation Tightening Specifications”, page 237 .

Tightening Specifications

Component	Tightening Specification
Drive axle to wheel hub “twelve-point bolt with ribs” ♦ Use a new bolt	70 Nm + 90°
Drive axle to wheel hub “twelve-point bolt without ribs” ♦ Use a new bolt	200 Nm +180°
Wheel hub with wheel bearing to wheel bearing housing ♦ Use new bolts.	70 Nm + 90° turn
Ball joint to control arm ♦ Use new nuts ♦ Tighten only in curb weight position. Refer to ⇒ “2 Rear Axle Curb Weight (Twist Beam Rear Suspension)”, page 146 .	100 Nm

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6.3 Wheel Bearing Housing, Removing and Installing

Special tools and workshop equipment required

- Puller - Ball Joint - 3287A-
- Spreader Tool - 3424-
- Puller - Ball Joint - T10187-
- Torque Wrench 1332 40-200Nm - VAG1332-
- Engine and Gearbox Jack - VAS6931-
- Digital Torque Wrench - VAG1756A-
- Drive Shaft Remover - T10520-

Removing

- Twelve-point bolt with ribs. Refer to ⇒ "9.1 Twelve-Point Bolt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection", page 77 .
- Twelve-point bolt without ribs. Refer to ⇒ "9.2 Twelve-Point Bolt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection", page 78 .

Caution

The wheel bearing must not be under load when the drive axle threaded connection on the wheel side is loose.

If the wheel bearings are under the load of the vehicle weight, the wheel bearing will be damaged. This reduces the service life of the wheel bearings.

The drive axle bolt may be loosened maximum 90° when the vehicle is standing on its wheels.

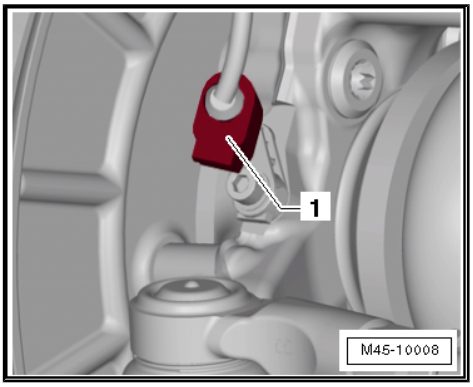
Vehicles without a drive axle must not be moved, otherwise the wheel bearing will be damaged. If a vehicle must be moved, be sure to note the following:

- *Install an outer joint in place of the drive axle.*
- *Tighten the outer joint to 120 Nm.*

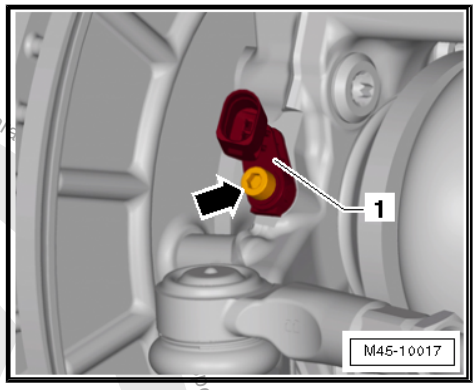
– Loosen the wheel bolts.
– Raise the vehicle.
– Remove the wheel.
– Remove the brake caliper and attach to the body with wire. Refer to ⇒ Brake System; Rep. Gr. 46 ; Front Brakes; Brake Caliper, Removing and Installing .

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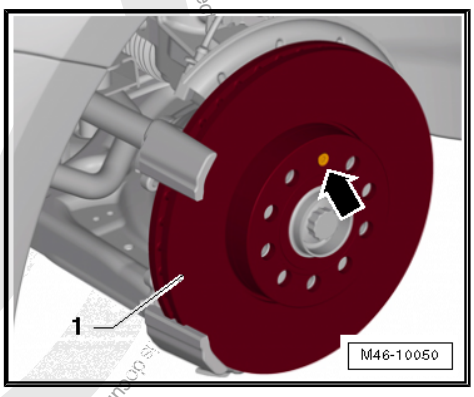
– Disconnect the connector -1- from the ABS speed sensor.



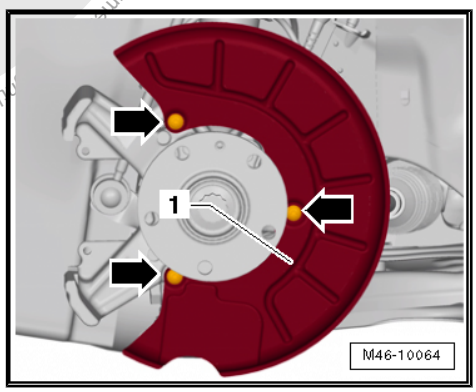
– Remove the bolt -arrow- and the ABS speed sensor -1-.



– Remove the brake rotor -1- -arrow-.



– Remove the cover plate -1- from the wheel bearing housing -arrow-.

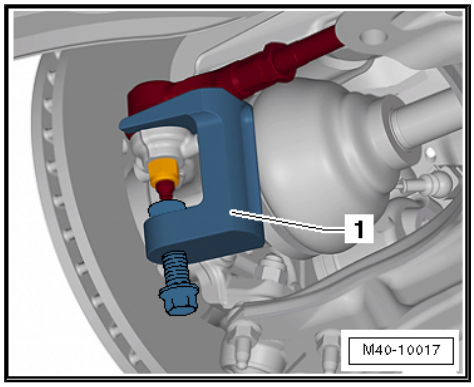


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– Loosen the nut from the tie rod end, but do not unscrew yet.

Caution

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



– Remove the tie rod from the wheel bearing housing and remove the nut.

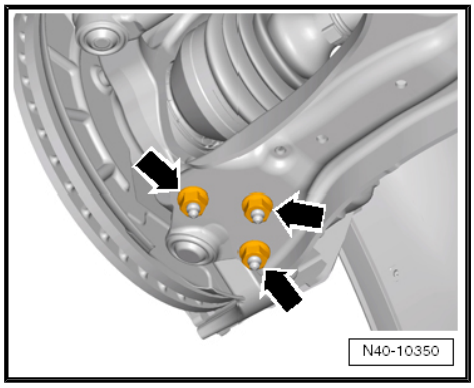
1 - Puller - Ball Joint - T10187-

– Loosen the nuts -arrows-.

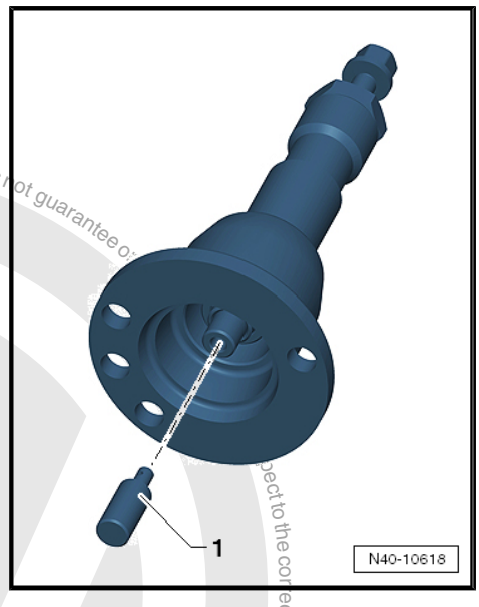
– Remove the control arm from the ball joint.

– Remove the drive axle outer joint from the wheel hub.

If the drive axle cannot be pulled out of the wheel bearing, then the drive axle can be pushed out of the wheel bearing using the Drive Shaft Remover - T10520- .

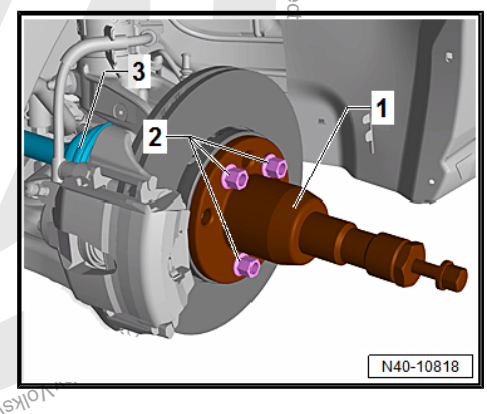


Before using the Drive Shaft Remover - T10520- , make sure that the thrust piece -1- is installed.



Using the Drive Shaft Remover - T10520- :

– Secure the Drive Shaft Remover - T10520- -1- with three wheel bolts -2- on the wheel hub, so that the drive axle -3- can be pressed out.

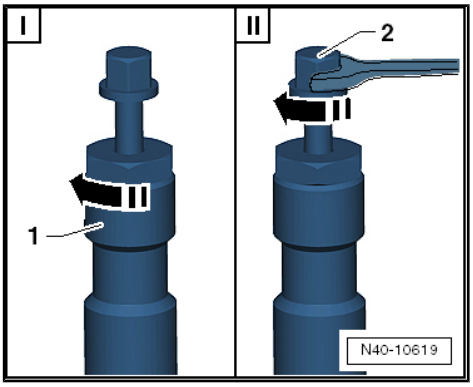


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– Follow the specified sequence exactly.

I - Tighten the knurled nut -1- hand-tight.

II - Only turn the bolt -2- using a wrench and press out the drive axle using the Drive Shaft Remover - T10520- .



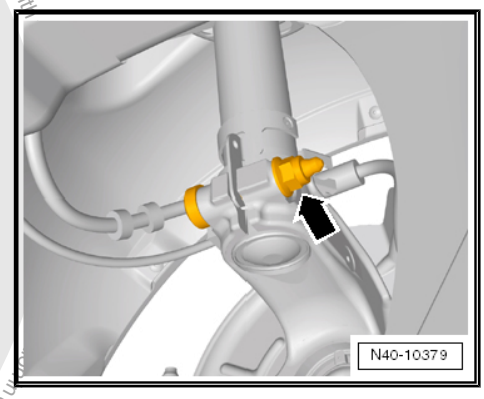
Note

At the end of the tasks or to set back, the spindles must be brought back into the original position so that the hydraulic operation can be used.

– Secure the drive axle to the body using wire.

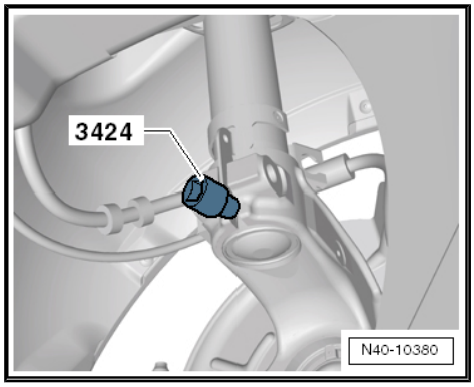
– Place the Engine and Gearbox Jack - VAS6931- under the wheel bearing housing.

– Remove the threaded connection on the wheel bearing housing/suspension strut -arrow-.



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– Insert Spreader Tool - 3424- into wheel bearing housing slot.
– Turn the ratchet 90° and remove it from the Spreader Tool - 3424- .
– Remove the wheel bearing housing from the suspension strut.



Note

If the wheel bearing housing is being replaced, then the ball joint must also be replaced. New nuts must be used.

Installing

Install in reverse order of removal. Note the following:

– Install the brake caliper. Refer to ⇒ Brake System; Rep. Gr. 46 ; Front Brakes; Brake Caliper, Removing and Installing .
– Tighten the drive axle bolt to the wheel hub:

♦ Twelve-point bolt with ribs. Refer to ⇒ “9.1 Twelve-Point Bolt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection”, page 77 .
♦ Twelve-point bolt without ribs. Refer to ⇒ “9.2 Twelve-Point Bolt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection”, page 78 .

Caution

The vehicle must not be resting on the wheels when doing so.

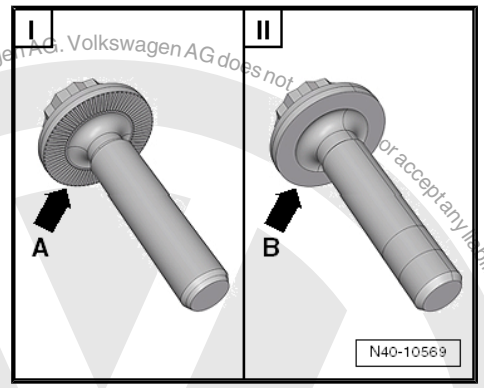
When the bolt is loose, the wheel bearing can be damaged by the weight of the vehicle.

Difference between A Twelve-Point Bolt With Ribs and A Twelve-Point Bolt without Ribs

The contact surfaces -arrow A- and -arrow B- are different on the two-point bolts.

I - Twelve-point bolt with ribs -arrow A-

II - Twelve-point bolt without ribs -arrow B-



– Install the ABS speed sensor. Refer to ⇒ Brake System; Rep. Gr. 46 ; Sensors .

If the wheel bearing housing was replaced, the vehicle must be aligned. Refer to ⇒ “8 Wheel Alignment”, page 256 .

– Install the front wheel and tighten. Refer to ⇒ “2 Wheel Installation Tightening Specifications”, page 237 .

Tightening Specifications

Component	Tightening Specification
Suspension strut to wheel bearing housing ♦ Use new nut ♦ Bolt point must face the direction of travel	70 Nm + 90° turn

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Component	Tightening Specification
Ball joint to control arm ♦ Use new nuts ♦ Tighten only in curb weight position. Refer to ⇒ “2 Rear Axle Curb Weight (Twist Beam Rear Suspension)”, page 146 .	100 Nm
Tie rod end to wheel bearing housing ♦ Use new nut	20 Nm + 90° turn
Drive axle to wheel hub “twelve-point bolt with ribs” ♦ Use a new bolt	70 Nm + 90°
Drive axle to wheel hub “twelve-point bolt without ribs” ♦ Use a new bolt	200 Nm +180°

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7 Stabilizer Bar

⇒ “7.1 Overview - Stabilizer Bar”, page 64

⇒ “7.2 Stabilizer Bar, Removing and Installing”, page 64

7.1 Overview - Stabilizer Bar

1 - Stabilizer Bar

- ❑ There are different versions.
- ❑ Allocation. Refer to the Parts Catalog.
- ❑ Removing and installing. Refer to ⇒ “7.2 Stabilizer Bar, Removing and Installing”, page 64 .

2 - Coupling Rod

- ❑ Stabilizer bar connection to the suspension strut

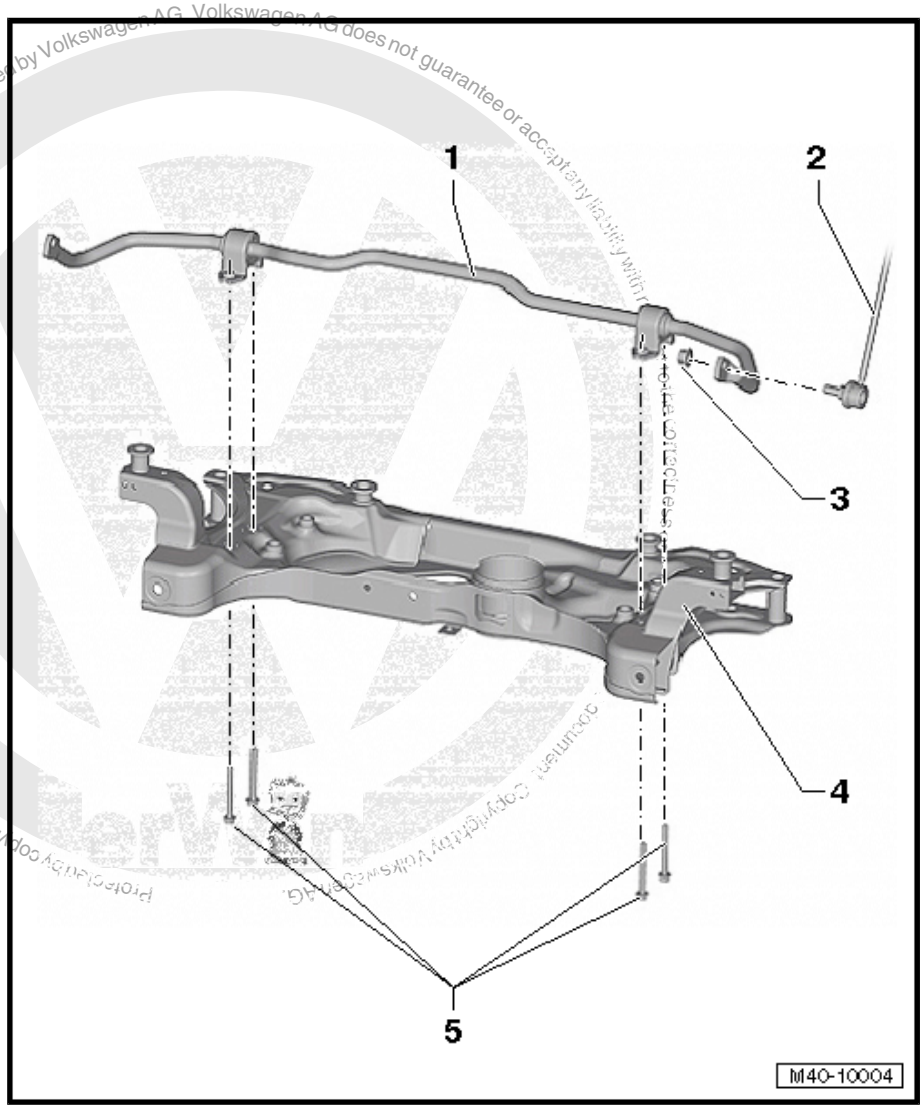
3 - Nut

- ❑ 65 Nm

4 - Subframe

5 - Bolt

- ❑ 20 Nm + 90° turn
- ❑ Always replace if removed



7.2 Stabilizer Bar, Removing and Installing

Special tools and workshop equipment required

- ♦ Torque Wrench 1332 40-200Nm - VAG1332-
- ♦ Engine and Gearbox Jack - VAS6931-

Perform the Following

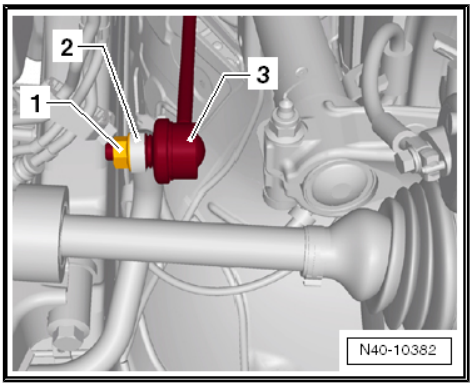
Removing

– Loosen the wheel bolts.

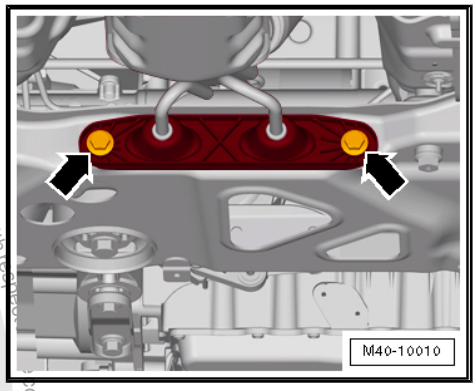
– Raise the vehicle.

– Remove the front wheels.

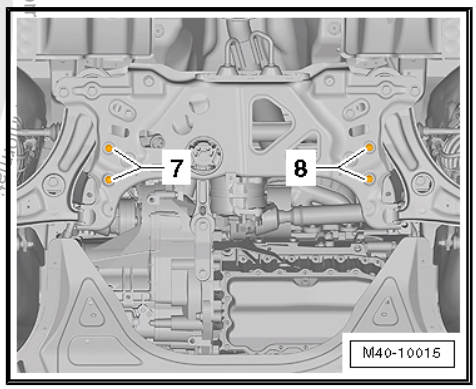
– Remove the lower noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Noise Insulation .
– Remove the right and left nuts -1- from the coupling rods -3-.
– Remove the right and left coupling rods -3- from the stabilizer bar -2-.



– Remove the exhaust system bracket from the subframe -arrows-.
– Loosen the double clamp for the exhaust system.

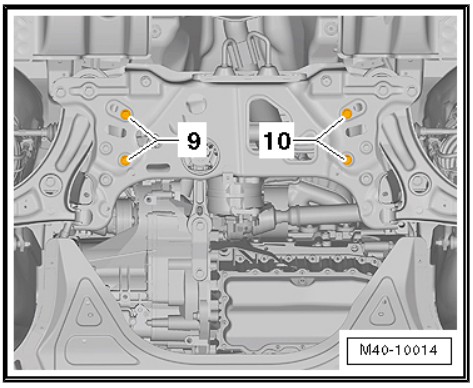


– Remove the stabilizer bar from the subframe -7 and 8-.



Vehicles with Hydraulic Power Steering Gear

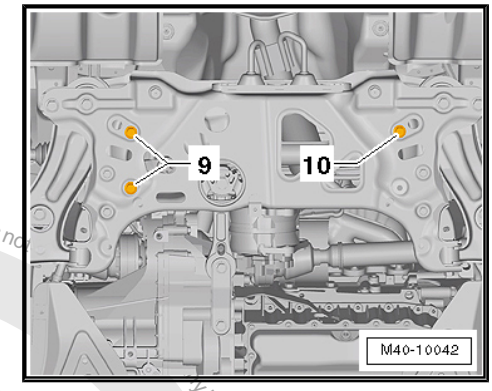
– Remove the steering gear bolts -9 and 10-.



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Vehicles with Electromechanical Steering Gear

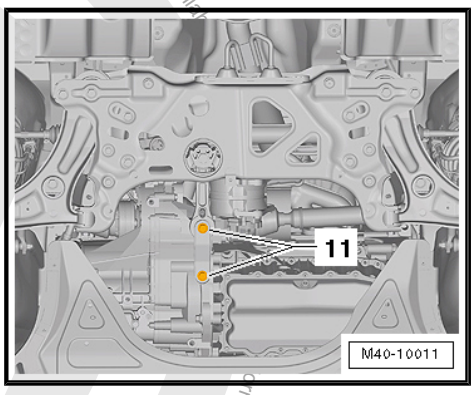
– Remove the steering gear bolts -9 and 10-.



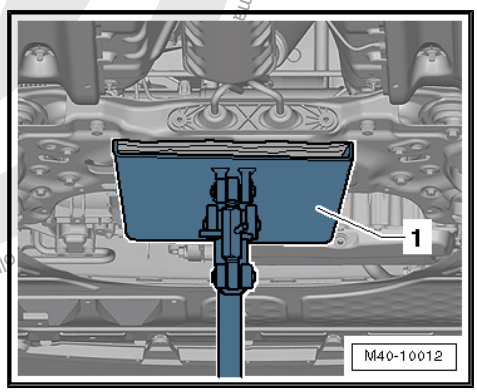
Continuation for All Vehicles

– Remove the bolts -11- and then remove the pendulum support from the transmission.

– Secure the subframe. Refer to ⇒ “4.3 Subframe, Securing”, page 11 .

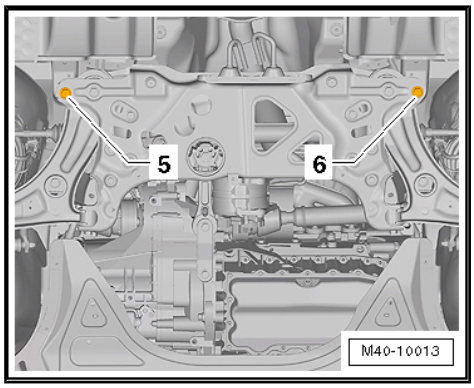


– Place the Engine and Gearbox Jack - VAS6931- -1- under the subframe.



– Remove the bolts -5 and 6- and lower the subframe maximum 10 cm.

– Remove the stabilizer bar to the rear.



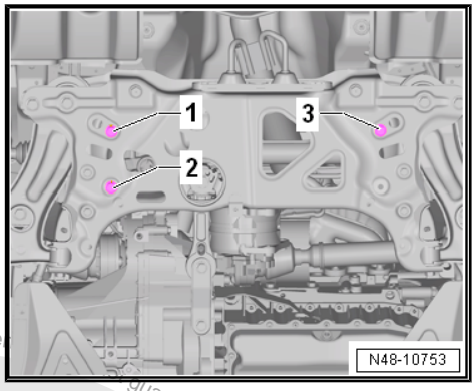
Installing

Install in reverse order of removal. Note the following:

The steering gear threaded sleeves must be positioned in the holes on the left side of the subframe.

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Note the Tightening Sequence for the Steering Gear on Vehicles with Electromechanical Steering Gear:



- ♦ Thread the bolts -1, 2 and 3- on one after the other by hand.
- ♦ Pre-tighten the bolts -1 and 2- one after the other to 10 Nm.
- ♦ Tighten the bolts -1, 2 and 3- one after the other to the tightening specification.
- – Install the lower noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Noise Insulation .
- – Install the front wheels and tighten. Refer to ⇒ "2 Wheel Installation Tightening Specifications", page 237 .

Tightening Specifications

Component	Tightening Specification
Subframe to body ♦ Use new bolts.	70 Nm + 180° turn
Subframe to console ♦ Use new bolts.	70 Nm + 90° turn
Ball joint to control arm ♦ Use new nuts ♦ Tighten only in curb weight position. Refer to ⇒ "2 Rear Axle Curb Weight (Twist Beam Rear Suspension)", page 146 .	100 Nm
Stabilizer bar to coupling rod ♦ Use new nut ♦ Counterhold at joint pin inner multi-point fitting	65 Nm
Stabilizer bar to subframe ♦ Use new bolts.	20 Nm + 90° turn
Steering gear to subframe ♦ Use new bolts.	50 Nm + 90° turn

Tightening Specification, Pendulum Support to the Transmission

Bolt	Tightening Specification
M10 x 35 ♦ Use a new bolt	50 Nm + 90° turn
M10 x 75 ♦ Use a new bolt	50 Nm + 90° turn

- – After installing, perform the basic setting on the Steering Angle Sensor - G85- using the Vehicle Diagnostic Tester .

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8 Suspension Strut

⇒ “8.1 Overview - Suspension Strut”, page 68

⇒ “8.2 Suspension Strut, Removing and Installing”, page 68

⇒ “8.3 Suspension Strut, Servicing”, page 74

8.1 Overview - Suspension Strut

1 - Nut

- ❑ 60 Nm
- ❑ Self-locking
- ❑ Always replace if removed

2 - Strut Mount

- ❑ Note the installation position. Refer to ⇒ page 72 .

3 - Deep-Groove Ball Bearing

4 - Coil Spring

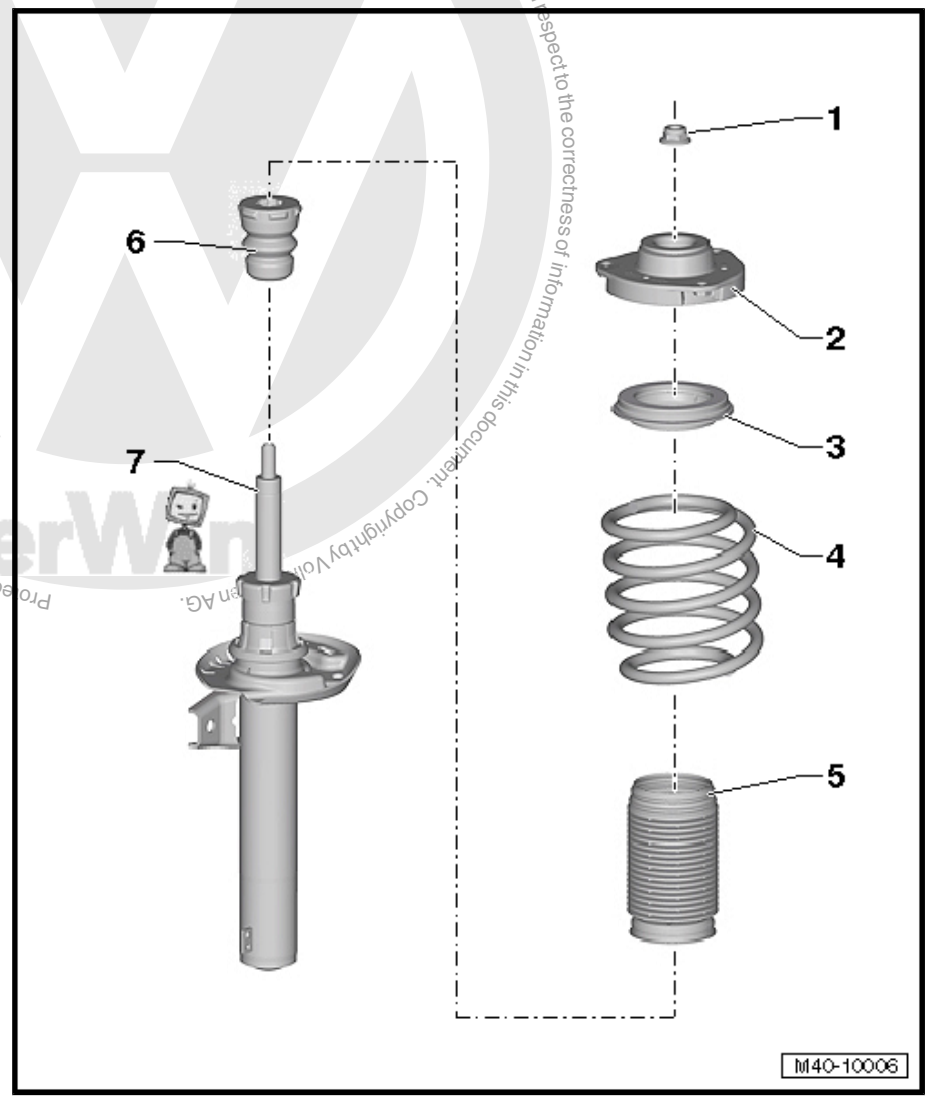
- ❑ Removing and installing. Refer to ⇒ page 75 .
- ❑ Note the color code
- ❑ Allocation. Refer to the Parts Catalog.
- ❑ Surface of spring coil may not be damaged

5 - Protective Cover

6 - Stop Buffer

7 - Shock Absorber

- ❑ Can be replaced individually
- ❑ Allocation. Refer to the Parts Catalog.



8.2 Suspension Strut, Removing and Installing

Special tools and workshop equipment required

- ♦ Torque Wrench 1332 40-200Nm - VAG1332-
- ♦ Spreader Tool - 3424-
- ♦ Engine and Gearbox Jack - VAS6931-
- ♦ Engine/Gearbox Jack Adapter - Wheel Hub Support - T10149-
- ♦ Drive Shaft Remover - T10520-

Perform the Following

Removing

– Loosen the drive axle bolt on the wheel hub:

- Twelve-point bolt with ribs. Refer to ⇒ “9.1 Twelve-Point Bolt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection”, page 77 .
- Twelve-point bolt without ribs. Refer to ⇒ “9.2 Twelve-Point Bolt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection”, page 78 .

Caution

The wheel bearing must not be under load when the drive axle threaded connection on the wheel side is loose.

If the wheel bearings are under the load of the vehicle weight, the wheel bearing will be damaged. This reduces the service life of the wheel bearings.

The drive axle bolt may be loosened maximum 90° when the vehicle is standing on its wheels.

Vehicles without a drive axle must not be moved, otherwise the wheel bearing will be damaged. If a vehicle must be moved, be sure to note the following:

- ***Install an outer joint in place of the drive axle.***
- ***Tighten the outer joint to 120 Nm.***

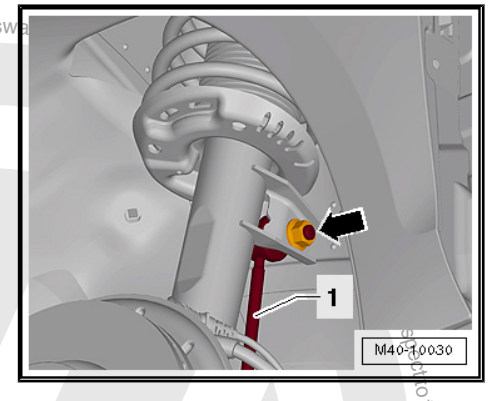
– Loosen the wheel bolts.

– Raise the vehicle.

– Remove the wheel.

– Remove the nut -arrow- and the coupling rod -1- from the suspension strut.

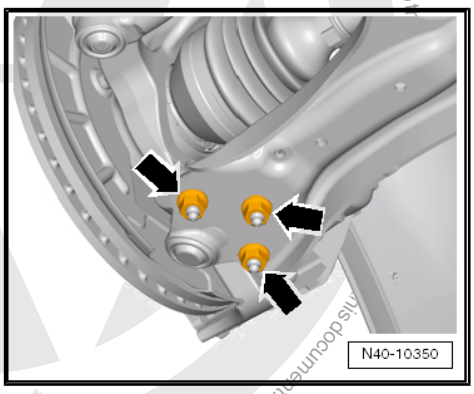
– Disengage the wire for the ABS speed sensor from the suspension strut.



– Remove the nuts -arrows-.

– Remove the wheel bearing housing with the ball joint from the control arm.

– Remove the drive axle outer joint from the wheel hub.

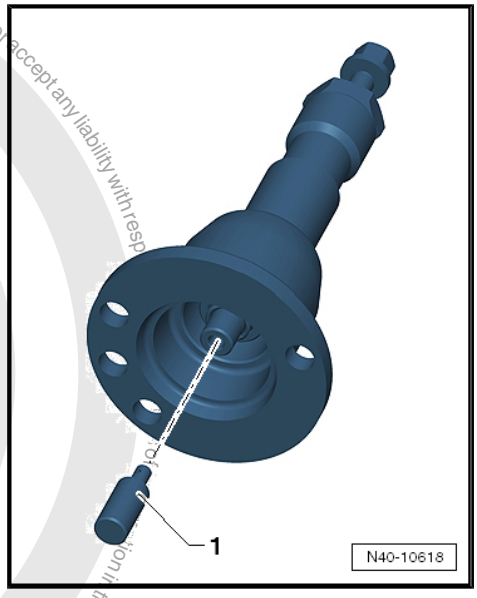


If the Drive Axle Cannot Be Pulled out of the Wheel Bearing, Then the Drive Axle Can Be Pushed out of the Wheel Bearing Using the Drive Shaft Remover - T10520- .

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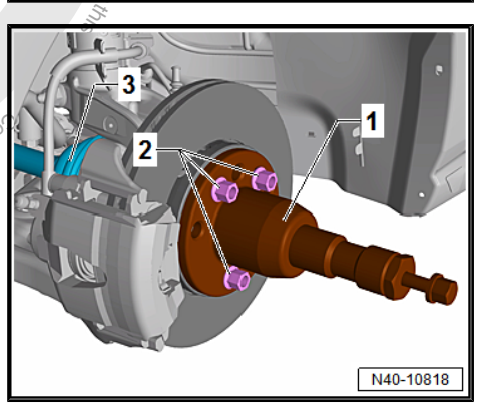
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Before using the Drive Shaft Remover - T10520- , make sure that the thrust piece -1- is installed.



Using the Drive Shaft Remover - T10520- :

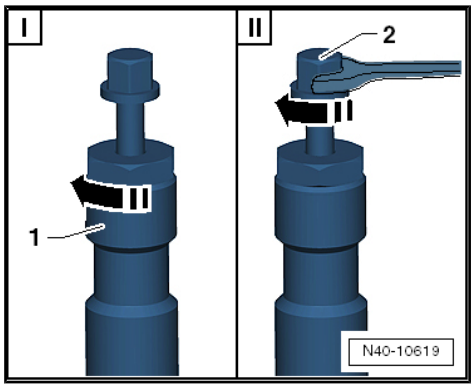
– Secure the Drive Shaft Remover - T10520- -1- with three wheel bolts -2- on the wheel hub, so that the drive axle -3- can be pressed out.



– Follow the specified sequence exactly.

I - Tighten the knurled nut -1- hand-tight.

II - Only turn the bolt -2- using a wrench and press out the drive axle using the Drive Shaft Remover - T10520- .



Note

At the end of the tasks or to set back, the spindles must be brought back into the original position so that the hydraulic operation can be used.

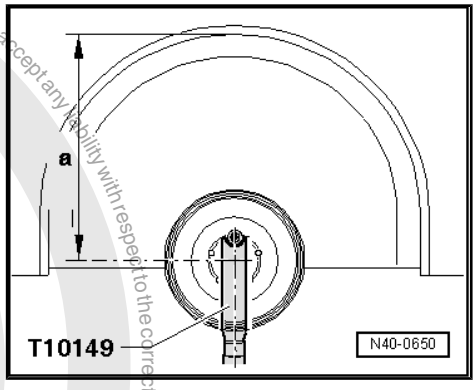
– Secure the drive axle to the body using wire.

Caution

The drive axle must not hang down, otherwise the inner joint will be damaged by over bending.

– Bolt the ball joint to the control arm again.

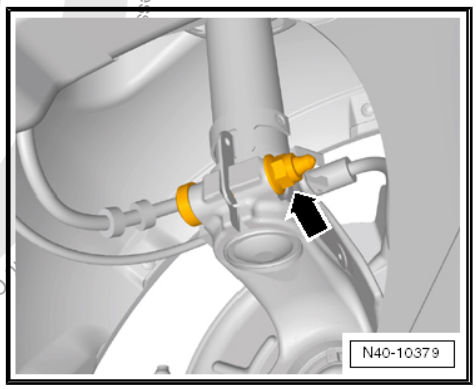
– Secure the Engine and Gearbox Jack - VAS6931- using the Engine/Gearbox Jack Adapter - Wheel Hub Support - T10149- to the wheel hub with a wheel bolt.



WARNING

- *Do not lift or lower the vehicle when the Engine and Gearbox Jack - VAS6931- is under the vehicle. The vehicle could slip off the hoist.*
- *Do not leave the Engine and Gearbox Jack - VAS6931- under the vehicle any longer than necessary.*

– Disconnect the threaded connection for the wheel bearing housing/suspension strut -arrow-.

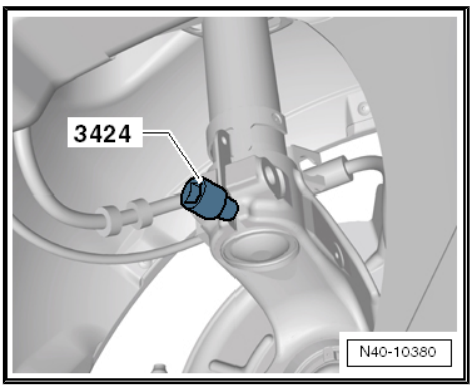


– Insert Spreader Tool - 3424- into wheel bearing housing slot.

– Turn the ratchet 90° and remove it from the Spreader Tool - 3424- .

– Press the brake rotor toward the suspension strut by hand.

Otherwise the shock absorber tube could tilt in the wheel bearing housing hole.



– Pull off the wheel bearing housing downward from the shock absorber tube and lower using the Engine and Gearbox Jack - VAS6931- until the shock absorber tube hangs freely.

– Tie the wheel bearing housing to the subframe.

– Remove the Engine and Gearbox Jack - VAS6931- from under the wheel bearing housing.

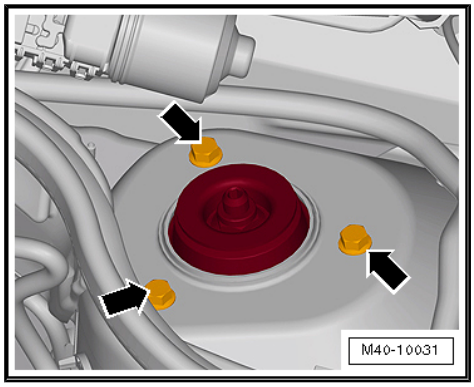
WARNING

- *Do not leave the Engine and Gearbox Jack - VAS6931- under the vehicle any longer than necessary.*

– Remove the plenum chamber cover. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Plenum Chamber Cover .

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– Remove the hex bolts -arrows- for the upper strut mount and remove the suspension strut.



Installing

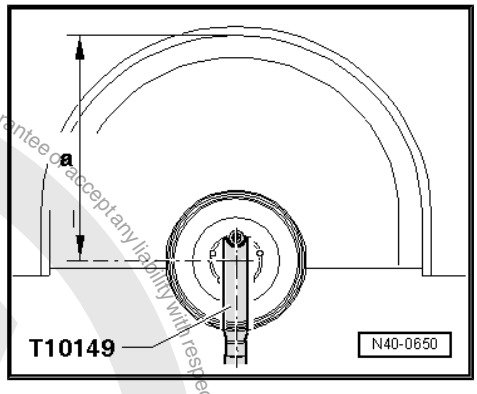
Install in reverse order of removal. Note the following:

– Secure the Engine and Gearbox Jack - VAS6931- using the Engine/Gearbox Jack Adapter - Wheel Hub Support - T10149- to the wheel hub with a wheel bolt.

– Position the suspension strut on the wheel bearing housing and secure it with the internal multi-point bolt and a new nut.

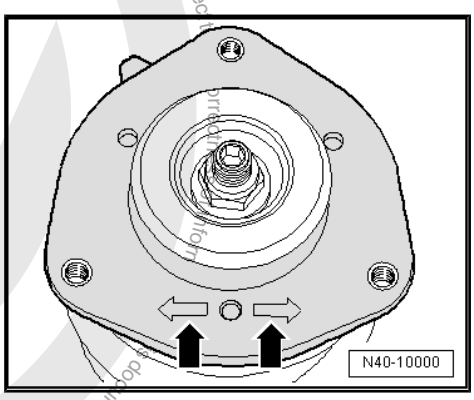
The point of the internal multi-point bolt must face the direction of travel

– Remove the Spreader Tool - 3424- .



One of two markings -arrows- on the spring plate must point in the direction of travel.

– Untie the wheel bearing housing from the subframe.

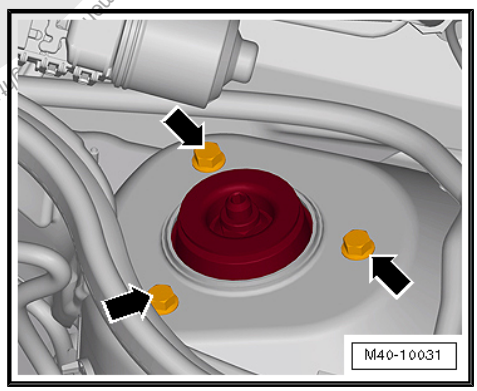


– Carefully lift the wheel bearing housing with the transmission jack far enough until it is possible to install the bolts that connect the suspension strut to the suspension strut tower -arrow-.

If necessary, use a ladder, for example the Step Ladder - VAS5085- to install the bolts.

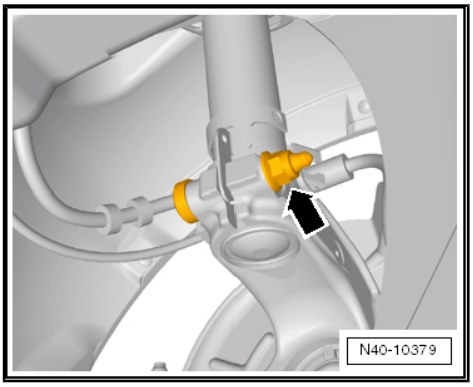
– Tighten the hex bolts for the upper strut mount -arrows-.

– Remove the Engine/Gearbox Jack Adapter - Wheel Hub Support - T10149- .

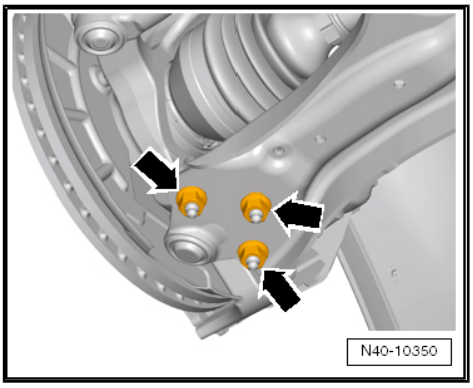


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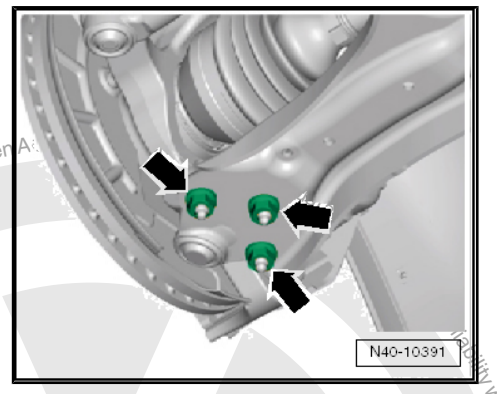
– Tighten the threaded connection on the wheel bearing housing/suspension strut -arrow-.



– Remove the nuts -arrows-.
– Insert the drive axle into the wheel hub.
– Insert the wheel bearing housing with the ball joint into the control arm.



– Attach the ball joint to the control arm -arrows-.



Note

Make sure the ball joint boot is not damaged or twisted.

– Tighten the drive axle bolt to the wheel hub:

♦ Twelve-point bolt with ribs. Refer to ⇒ “9.1 Twelve-Point Bolt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection”, page 77 .

♦ Twelve-point bolt without ribs. Refer to ⇒ “9.2 Twelve-Point Bolt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection”, page 78 .

Caution

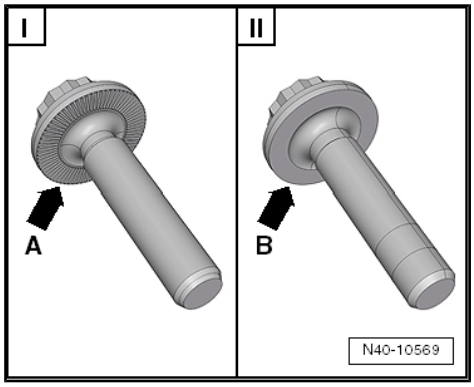
The vehicle must not be resting on the wheels when doing so.

When the bolt is loose, the wheel bearing can be damaged by the weight of the vehicle.

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Difference between A Twelve-Point Bolt with Ribs and A Twelve-Point Bolt without Ribs

The contact surfaces -arrow A- and -arrow B- are different on the two-point bolts.



I - Twelve-point bolt with ribs -arrow A-

II - Twelve-point bolt without ribs -arrow B-

– Install the plenum chamber cover. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Plenum Chamber Cover .

Install in reverse order of removal.

– Install the wheel and tighten. Refer to ⇒ "2 Wheel Installation Tightening Specifications", page 237 .

Tightening Specifications

Component	Tightening Specification
Suspension strut to wheel bearing housing ♦ Use new nut	70 Nm + 90° turn
Suspension strut to body (suspension strut tower) ♦ Use new bolts.	15 Nm + 90° turn
Ball joint to control arm ♦ Use new nuts ♦ Tighten only in curb weight position. Refer to ⇒ "2 Rear Axle Curb Weight (Twist Beam Rear Suspension)", page 146 .	100 Nm
Coupling rod to suspension strut ♦ Use new nut ♦ Counterhold at joint pin inner multi-point fitting	65 Nm
Drive axle to wheel hub "twelve-point bolt with ribs" ♦ Use a new bolt	70 Nm + 90°
Drive axle to wheel hub "twelve-point bolt without ribs" ♦ Use a new bolt	200 Nm +180°

8.3 Suspension Strut, Servicing

Special tools and workshop equipment required

- Torque Wrench 1332 40-200Nm - VAG1332-
- Spring Compressor Kit - Spring Tensioner - VAG1752/1-
- Spring Compressor Kit - Spring Retainer w/Inserts - VAG1752/4-
- Spring Compressor Kit - Strut Clamping Block - VAG1752/20-
- Shock Absorber Set - T10001-
- Ratchet (Commercially Available)

Perform the Following

– Remove the suspension strut. Refer to ⇒ page 69 .

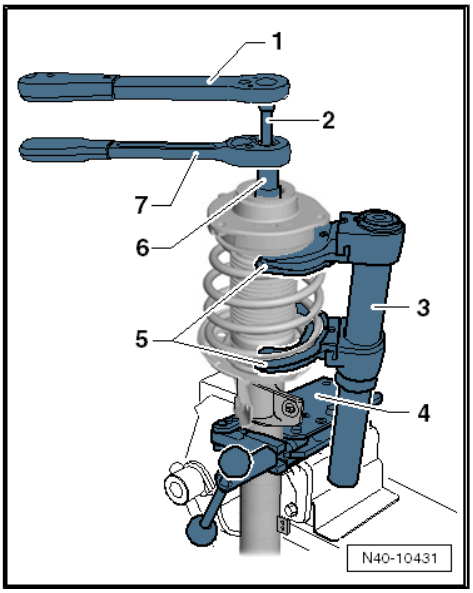
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Coil Spring, Removing

– Clamp the Spring Compressor Kit - Strut Clamping Block - VAG1752/20- -4- in a vise.

– Tighten the suspension strut in the Spring Compressor Kit - Strut Clamping Block - VAG1752/20- -4-.

– Pretension the coil spring using the Spring Compressor Kit - Spring Tensioner - VAG1752/1- until the upper deep-groove ball bearing is free.



1 - Torque Wrench 1332 40-200Nm - VAG1332-

2 - Shock Absorber Set - Extension SW7 - T10001/8-

3 - Spring Compressor Kit - Spring Tensioner - VAG1752/1-

4 - Spring Compressor Kit - Strut Clamping Block - VAG1752/20-

5 - Spring Compressor Kit - Spring Retainer w/Inserts - VAG1752/4-

6 - Shock Absorber Set - Socket - T10001/5-

7 - Shock Absorber Set - Reversible Ratchet - T10001/11-

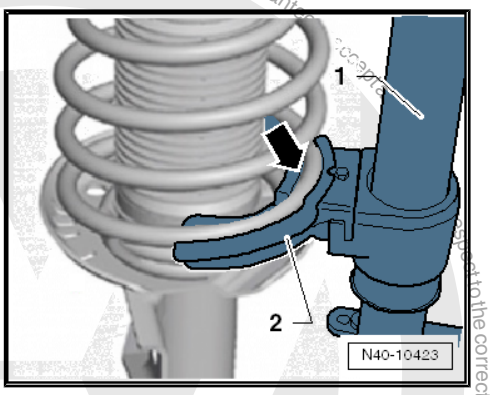
WARNING

First preload the spring enough so that tension is relieved on upper spring plate.

– Make sure the coil spring fits correctly inside the Spring Compressor Kit - Spring Retainer with Inserts - VAG1752/4- -arrow-.

– Remove the hex nut from the piston rod.

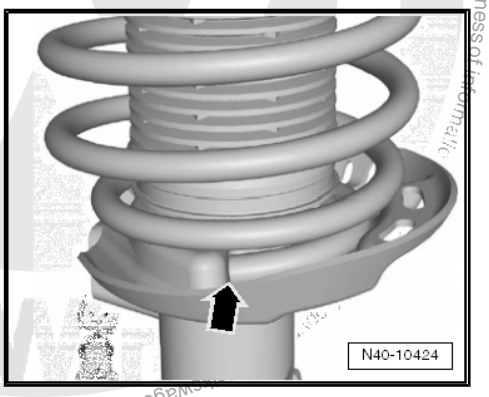
– Remove the individual components of the suspension strut and coil spring with the Spring Compressor Kit - Spring Tensioner - VAG1752/1- .



Coil Spring, Installing

– Place the coil spring with Spring Compressor Kit - Spring Tensioner - VAG1752/1- on lower spring washer.

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



– Tighten the new hex nut to the piston rod.

– Relieve the tension on the Spring Compressor Kit - Spring Tensioner - VAG1752/1- and remove it from the coil spring.

– Install the suspension strut. Refer to ⇒ page 72 .

Tightening Specifications

Component	Tightening Specification
Suspension strut mount to damper ♦ Use new nut	60 Nm

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9 Drive Axles, Removing and Installing

⇒ “9.1 Twelve-Point Bolt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection”, page 77 .

⇒ “9.2 Twelve-Point Bolt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection”, page 78 .

⇒ “9.3 Drive Axle with CV Joint, Removing and Installing”, page 80 .

⇒ “9.4 Right Axle Shaft with Mounted CV Joint, Removing and Installing”, page 83 .

⇒ “9.5 Drive Axles with Triple Roller Joint AAR2600i, Removing and Installing”, page 88 .

⇒ “9.6 Drive Axles with Triple Roller Joint AAR3300i, Removing and Installing”, page 92 .

9.1 Twelve-Point Bolt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection

Special tools and workshop equipment required

- Socket AF 24 mm - T10361A-
- Digital Torque Wrench - VAG1756A-

WARNING

When disassembling and performing repairs on a vehicle, the drive axles must not hang down loosely and contact the stops in the joint by over bending.

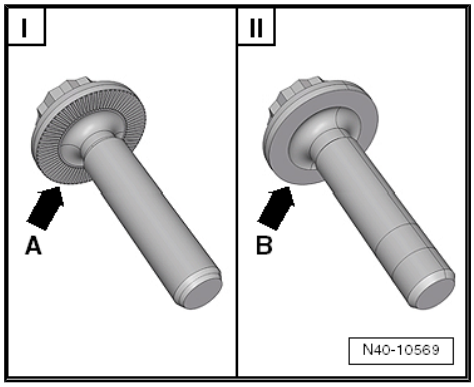
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Difference Between A Twelve-Point Bolt with Ribs and A Twelve-Point Bolt without Ribs

The contact surfaces -arrow A- and -arrow B- are different on the two-point bolts.

I - Twelve-point bolt with ribs -arrow A-

II - Twelve-point bolt without ribs -arrow B-



Caution

The wheel bearing must not be under load when the drive axle threaded connection on the wheel side is loose.

If the wheel bearings are under the load of the vehicle weight, the wheel bearing will be damaged. This reduces the service life of the wheel bearings.

The drive axle bolt may be loosened maximum 90° when the vehicle is standing on its wheels.

Vehicles without a drive axle must not be moved, otherwise the wheel bearing will be damaged. If a vehicle must be moved, be sure to note the following:

- *Install an outer joint in place of the drive axle.*
- *Tighten the outer joint to 120 Nm.*

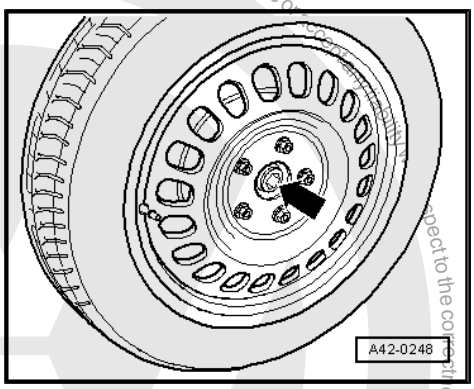
Twelve-Point Bolt, Loosening

– With vehicle still resting on wheels, loosen 12-point bolt with Socket - 24mm - T10361- maximum 90°, otherwise, wheel bearing will be damaged.

– Raise vehicle enough that wheels hang freely.

– Apply the brakes (second technician required).

– Remove the twelve-point bolt -arrow-.



Twelve-Point Bolt, Installing

– Replace the 12-point bolt.

Note

Wheels must not yet touch the ground when tightening the drive axle or the wheel bearing can be damaged.

– Apply the brakes (second technician required).

– Tighten the twelve-point bolt to 70 Nm.

– Lower the vehicle onto its wheels.

– Tighten the twelve-point bolt an additional 90°.

9.2 Twelve-Point Bolt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection

Special tools and workshop equipment required

- Socket AF 24 mm - T10361A-
- Digital Torque Wrench - VAG1756A-

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WARNING

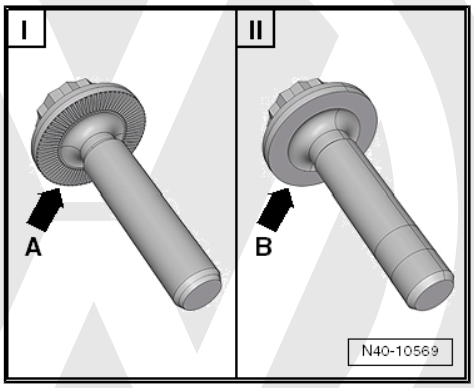
When disassembling and performing repairs on a vehicle, the drive axles must not hang down loosely and contact the stops in the joint by over bending.

Difference Between A Twelve-Point Bolt with Ribs and A Twelve-Point Bolt without Ribs

The contact surfaces -arrow A- and -arrow B- are different on the two-point bolts.

I - Twelve-point bolt with ribs -arrow A-

II - Twelve-point bolt without ribs -arrow B-



Caution

The wheel bearing must not be under load when the drive axle threaded connection on the wheel side is loose.

If the wheel bearings are under the load of the vehicle weight, the wheel bearing will be damaged. This reduces the service life of the wheel bearings.

The drive axle bolt may be loosened maximum 90° when the vehicle is standing on its wheels.

Vehicles without a drive axle must not be moved, otherwise the wheel bearing will be damaged. If a vehicle must be moved, be sure to note the following:

- *Install an outer joint in place of the drive axle.*
- *Tighten the outer joint to 120 Nm.*

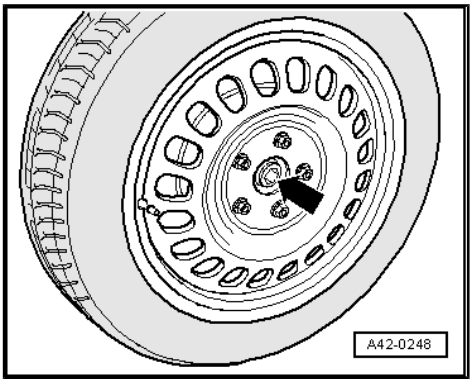
Twelve-Point Bolt, Loosening

– With vehicle still resting on wheels, loosen 12-point bolt with Socket - 24mm - T10361- maximum 90°, otherwise, wheel bearing will be damaged.

– Raise vehicle enough that wheels hang freely.

– Apply the brakes (second technician required).

– Remove the twelve-point bolt -arrow-.



Twelve-Point Bolt, Installing

– Replace the 12-point bolt.

Note

Wheels must not yet touch the ground when tightening the drive axle or the wheel bearing can be damaged.

– Apply the brakes (second technician required).

– Tighten the twelve-point bolt to 200 Nm.

– Lower the vehicle onto its wheels.

– Turn the twelve-point bolt an additional 180°.

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9.3 Drive Axle with CV Joint, Removing and Installing

Special tools and workshop equipment required

- Torque Wrench 1332 40-200Nm - VAG1332-
- Drive Shaft Remover - T10520-

Caution

When disassembling and performing repairs on a vehicle, the drive axles must not hang down loosely and contact the stops in the joint by over bending.

Perform the Following

Removing

- Twelve-point bolt with ribs. Refer to ⇒ "9.1 Twelve-Point Bolt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection", page 77 .
- Twelve-point bolt without ribs. Refer to ⇒ "9.2 Twelve-Point Bolt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection", page 78 .

Caution

The wheel bearing must not be under load when the drive axle threaded connection on the wheel side is loose.

If the wheel bearings are under the load of the vehicle weight, the wheel bearing will be damaged. This reduces the service life of the wheel bearings.

The drive axle bolt may be loosened maximum 90° when the vehicle is standing on its wheels.

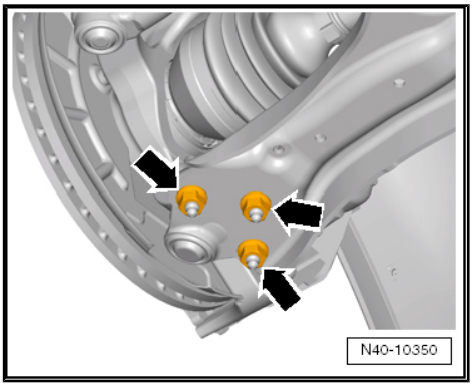
Vehicles without a drive axle must not be moved, otherwise the wheel bearing will be damaged. If a vehicle must be moved, be sure to note the following:

- *Install an outer joint in place of the drive axle.*
- *Tighten the outer joint to 120 Nm.*

– Remove the lower noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Noise Insulation .
– Loosen the wheel bolts.
– Raise the vehicle.
– Remove the wheel.
– Remove the drive axle from the flange shaft/transmission.

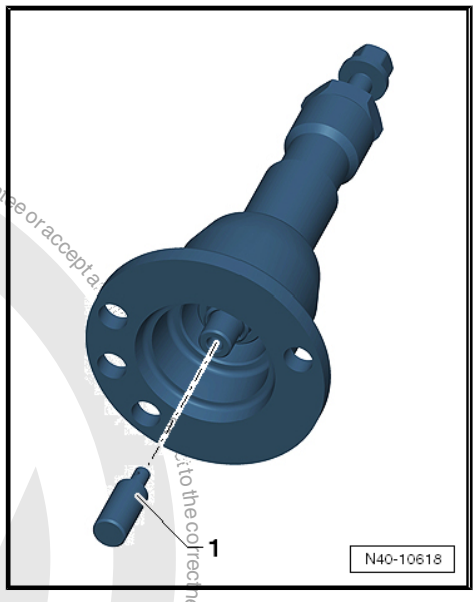
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– Remove the nuts -arrows-.
– Remove the wheel bearing housing with the ball joint from the control arm.
– Remove the drive axle from the wheel hub.



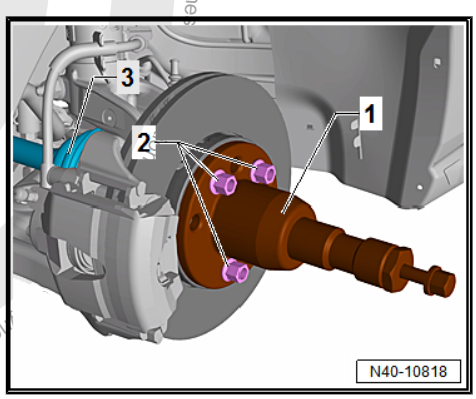
If the Drive Axle Cannot Be Pulled out of the Wheel Bearing, Then the Drive Axle Can Be Pushed out of the Wheel Bearing Using the Drive Shaft Remover - T10520- .

Before using the Drive Shaft Remover - T10520- , make sure that the thrust piece -1- is installed.



Using the Drive Shaft Remover - T10520- :

– Secure the Drive Shaft Remover - T10520- -1- with three wheel bolts -2- on the wheel hub, so that the drive axle -3- can be pressed out.

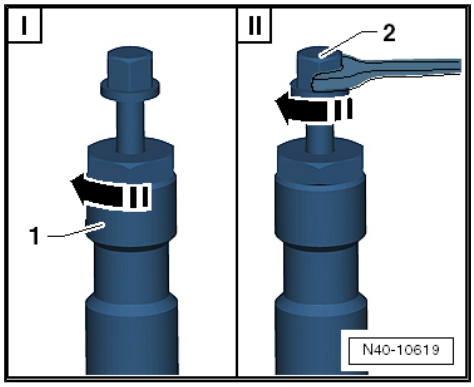


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– Follow the specified sequence exactly.

I - Tighten the knurled nut -1- hand-tight.

II - Only turn the bolt -2- using a wrench and press out the drive axle using the Drive Shaft Remover - T10520- .



Note

At the end of the tasks or to set back, the spindles must be brought back into the original position so that the hydraulic operation can be used.

Installing

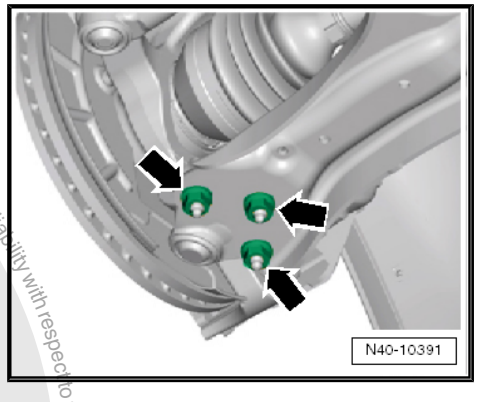
Install in reverse order of removal. Note the following:

Remove any paint residue and/or corrosion on the outer joint threads/splines.

– Insert the drive axle.

– Install the outer joint as far as possible into the wheel hub splines.

– Attach the ball joint to the control arm -arrows-.



Note

Make sure the ball joint boot is not damaged or twisted.

– Position the drive axle inner joint and tighten the bolts in a diagonal sequence to 10 Nm.

– Tighten the internal multi-point bolts diagonally to the tightening specification.

– Install the lower noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Noise Insulation .

– Tighten the drive axle bolt to the wheel hub:

- Twelve-point bolt with ribs. Refer to ⇒ “9.1 Twelve-Point Bolt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection”, page 77 .
- Twelve-point bolt without ribs. Refer to ⇒ “9.2 Twelve-Point Bolt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection”, page 78 .

Caution

The vehicle must not be resting on the wheels when doing so.

When the bolt is loose, the wheel bearing can be damaged by the weight of the vehicle.

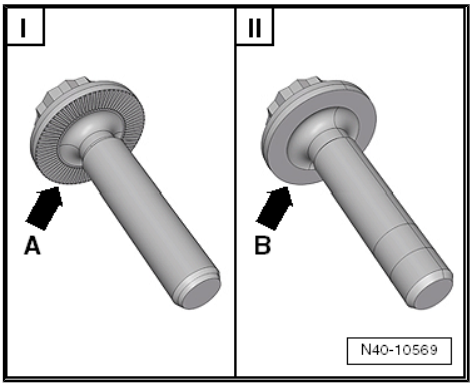
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Difference Between A Twelve-Point Bolt with Ribs and A Twelve-Point Bolt without Ribs

The contact surfaces -arrow A- and -arrow B- are different on the two-point bolts.

I - Twelve-point bolt with ribs -arrow A-

II - Twelve-point bolt without ribs -arrow B-



Note

Vehicle must not be standing on its wheels when doing this, otherwise wheel bearing will be damaged.

– Install the wheel and tighten. Refer to ⇒ “2 Wheel Installation Tightening Specifications”, page 237 .

Tightening Specifications

Component	Tightening Specification
Ball joint to control arm ♦ Use new nuts ♦ Tighten only in curb weight position. Refer to ⇒ “2 Rear Axle Curb Weight (Twist Beam Rear Suspension)”, page 146 .	100 Nm
Drive axle to wheel hub “twelve-point bolt with ribs” ♦ Use a new bolt	70 Nm + 90°
Drive axle to wheel hub “twelve-point bolt without ribs” ♦ Use a new bolt	200 Nm +180°
Drive axle to flange shaft/transmission “Multi-point socket head bolt M8” ♦ Use new bolts. ♦ Use new backing plates	40 Nm ♦ Tighten to 10 Nm in diagonal sequence
Drive axle to flange shaft/transmission “Multi-point socket head bolt M10” ♦ Use new bolts. ♦ Use new backing plates	70 Nm ♦ Tighten to 10 Nm in diagonal sequence

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9.4 Right Axle Shaft with Mounted CV Joint, Removing and Installing

Special tools and workshop equipment required

- Slide Hammer Set - VW771-
- Tensioning Strap - T10038-
- Puller - Drive Axle - T10382-
- Torque Wrench 1332 40-200Nm - VAG1332-
- Digital Torque Wrench - VAG1756A-
- Drive Shaft Remover - T10520-

Caution

When disassembling and performing repairs on a vehicle, the drive axles must not hang down loosely and contact the stops in the joint by over bending.

Removing

– Loosen the drive axle bolt on the wheel hub:

- Twelve-point bolt with ribs. Refer to ⇒ “9.1 Twelve-Point Bolt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection”, page 77 .
- Twelve-point bolt without ribs. Refer to ⇒ “9.2 Twelve-Point Bolt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection”, page 78 .

Caution

The wheel bearing must not be under load when the drive axle threaded connection on the wheel side is loose.

If the wheel bearings are under the load of the vehicle weight, the wheel bearing will be damaged. This reduces the service life of the wheel bearings.

The drive axle bolt may be loosened maximum 90° when the vehicle is standing on its wheels.

Vehicles without a drive axle must not be moved, otherwise the wheel bearing will be damaged. If a vehicle must be moved, be sure to note the following:

- *Install an outer joint in place of the drive axle.*
- *Tighten the outer joint to 120 Nm.*

– Remove the lower noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Noise Insulation .

– Remove the wheel.

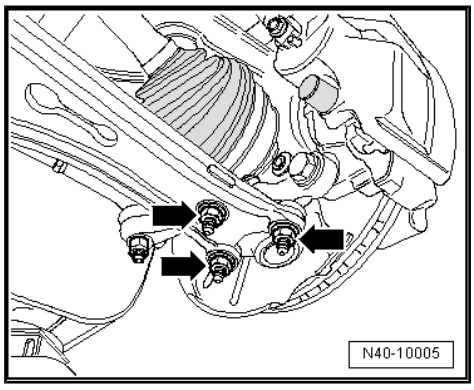
– Remove the nuts -arrows-.

– Remove the wheel bearing housing with the ball joint from the control arm.

– Remove the coupling rod from the stabilizer bar on both sides.

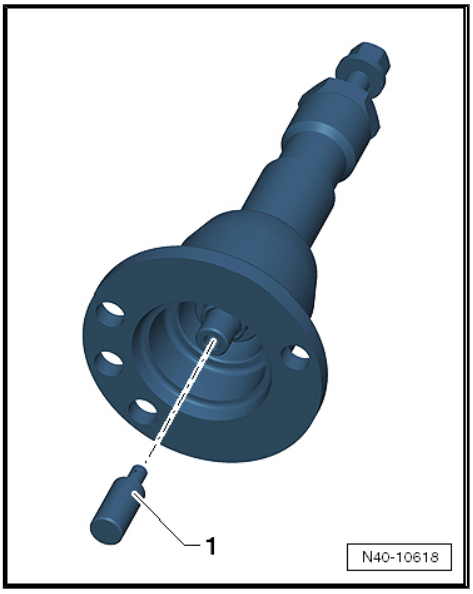
– Remove the drive axle from the wheel hub.

If the drive axle cannot be pulled out of the wheel bearing, then the drive axle can be pushed out of the wheel bearing using the Drive Shaft Remover - T10520- .



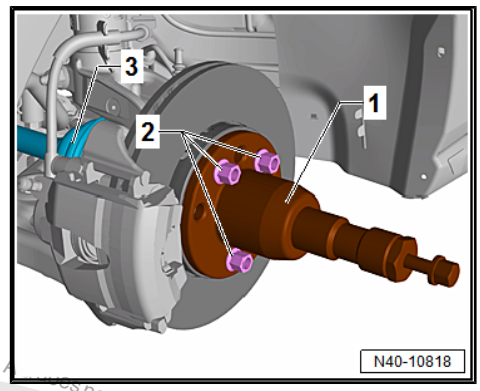
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Before using the Drive Shaft Remover - T10520- , make sure that the thrust piece -1- is installed.



Using the Drive Shaft Remover - T10520- :

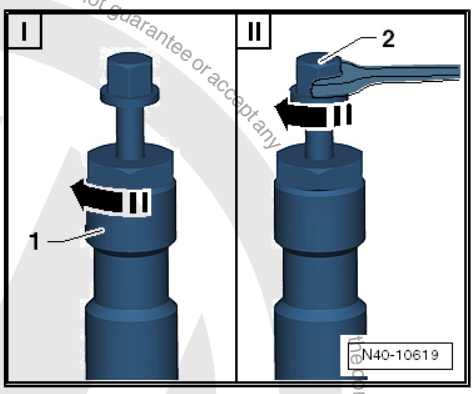
– Secure the Drive Shaft Remover - T10520- -1- with three wheel bolts -2- on the wheel hub, so that the drive axle -3- can be pressed out.



– Follow the specified sequence exactly.

I - Tighten the knurled nut -1- hand-tight.

II - Only turn the bolt -2- using a wrench and press out the drive axle using the Drive Shaft Remover - T10520- .



Note

At the end of the tasks or to set back, the spindles must be brought back into the original position so that the hydraulic operation can be used.

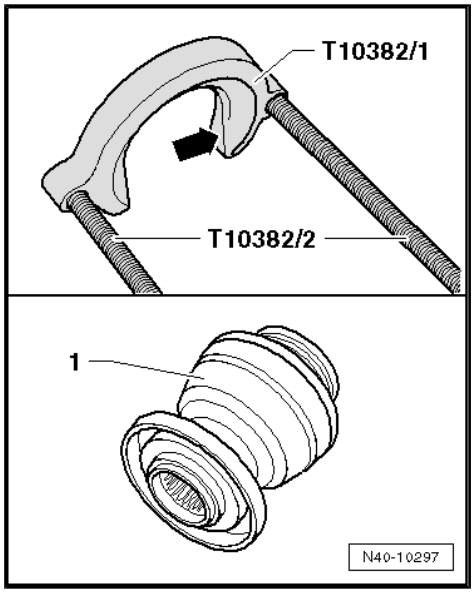
– Secure the drive axle from falling down.

– Align the Puller - Drive Axle - T10382- .

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For the CV joint -1-, the opening -arrow- in the Puller - Drive Axle - Removing Plate - T10382/1- must face the Puller - Drive Axle - Spindles - T10382/2- .

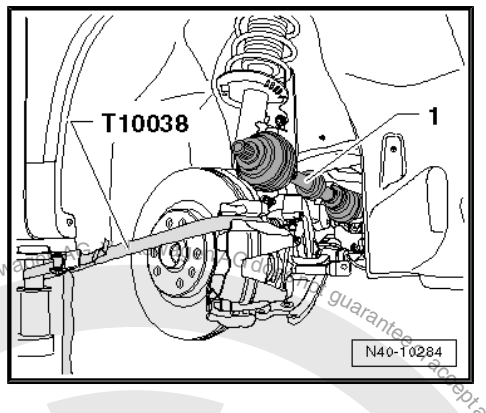
– Attach the Puller - Drive Axle - T10382- to the Slide Hammer Set - VW771- .



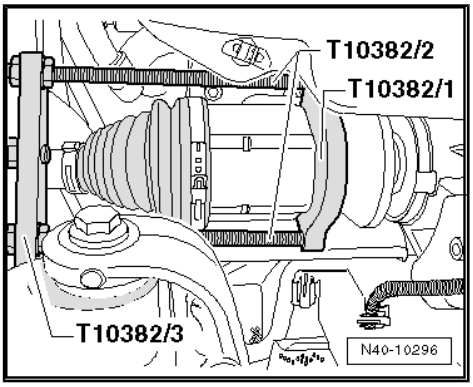
Note

In order to remove the drive axle from the transmission using the Puller - Drive Axle - T10382- , the suspension strut and all its components must be pulled to the back.

– Pull the suspension strut and its components using the Tensioning Strap - T10038- as far as possible to the back, for example on the shop hoist arm, until the Puller - Drive Axle - T10382- can be installed parallel to the drive axle.



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– Insert the Puller - Drive Axle - T10382- .
– Install the Slide Hammer Set - VW771- on the Puller - Drive Axle - Traverse - T10382/3- .
– Remove the drive axle with a few hits on the Slide Hammer Set - VW771- .
– Remove the drive axle from the vehicle.

Installing

Remove any paint residue and/or corrosion in threads/splines of outer joint.

– Install the new circlip into the stub shaft groove on the transmission.
– Lightly grease the stub shaft splines with Universal Grease - G 060 735 A2- .
– Bring outer and inner splines of the transmission and CV joint into engagement.
– Grab the drive axle by hand and push it into the CV joint up to the stop.
– Now push the CV joint with one »jerk« onto the transmission stub shaft.

Note

Do not use a hammer or a knocking tool under any circumstances!

– Make sure the CV joint is securely fitted by pulling the CV joint against the circlip resistance.

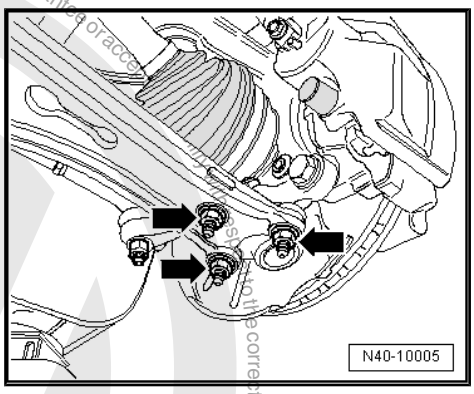
Caution

For this check, do not pull on the drive axle, but rather only on the CV joint.

– Remove the Tensioning Strap - T10038- .
– Insert outer joint as far as possible into wheel hub splines.

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– Attach the ball joint to the control arm -arrows-.



Note

Make sure the ball joint boot is not damaged or twisted.

– Install the lower noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50 - Noise Insulation .

– Tighten the drive axle bolt to the wheel hub:

- Twelve-point bolt with ribs. Refer to ⇒ “9.1 Twelve-Point Bolt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection”, page 77 .
- Twelve-point bolt without ribs. Refer to ⇒ “9.2 Twelve-Point Bolt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection”, page 78 .

Caution

The vehicle must not be resting on the wheels when doing so.

When the bolt is loose, the wheel bearing can be damaged by the weight of the vehicle.

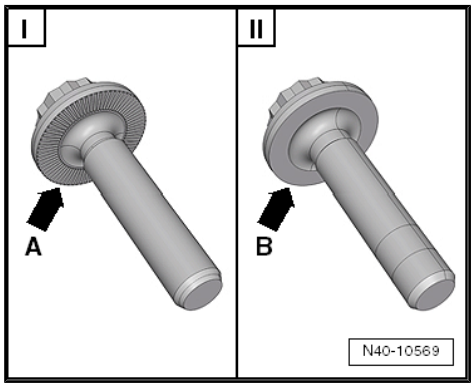


Difference Between A Twelve-Point Bolt with Ribs and A Twelve-Point Bolt without Ribs

The contact surfaces -arrow A- and -arrow B- are different on the two-point bolts.

I - Twelve-point bolt with ribs -arrow A-

II - Twelve-point bolt without ribs -arrow B-



– Install the wheel and tighten. Refer to ⇒ “2 Wheel Installation Tightening Specifications”, page 237 .

Tightening Specifications

Component	Tightening Specification
Ball joint to control arm ♦ Use new nuts ♦ Tighten only in curb weight position. Refer to ⇒ “2 Rear Axle Curb Weight (Twist Beam Rear Suspension)”, page 146 .	100 Nm
Drive axle to wheel hub “twelve-point bolt with ribs” ♦ Use a new bolt	70 Nm + 90°
Drive axle to wheel hub “twelve-point bolt without ribs” ♦ Use a new bolt	200 Nm +180°

9.5 Drive Axles with Triple Roller Joint AAR2600i, Removing and Installing

Special tools and workshop equipment required

- Drive Axle Wedge Tool - T10161-
- Drive Shaft Remover - T10520-
- Torque Wrench 1332 40-200Nm - VAG1332-

WARNING

When disassembling and performing repairs on a vehicle, the drive axles must not hang down loosely and contact the stops in the joint by over bending.

Removing

- Twelve-point bolt with ribs. Refer to ⇒ "9.1 Twelve-Point Bolt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection", page 77 .
- Twelve-point bolt without ribs. Refer to ⇒ "9.2 Twelve-Point Bolt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection", page 78 .

Caution

The wheel bearing must not be under load when the drive axle threaded connection on the wheel side is loose.

If the wheel bearings are under the load of the vehicle weight, the wheel bearing will be damaged. This reduces the service life of the wheel bearings.

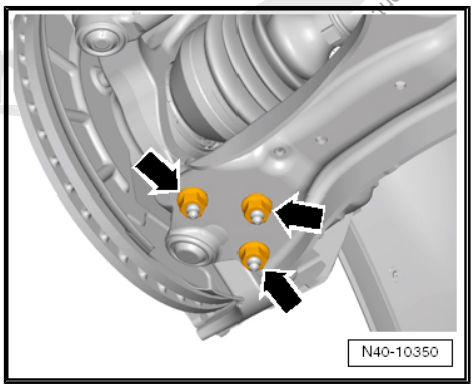
The drive axle bolt may be loosened maximum 90° when the vehicle is standing on its wheels.

Vehicles without a drive axle must not be moved, otherwise the wheel bearing will be damaged. If a vehicle must be moved, be sure to note the following:

- ***Install an outer joint in place of the drive axle.***
- ***Tighten the outer joint to 120 Nm.***

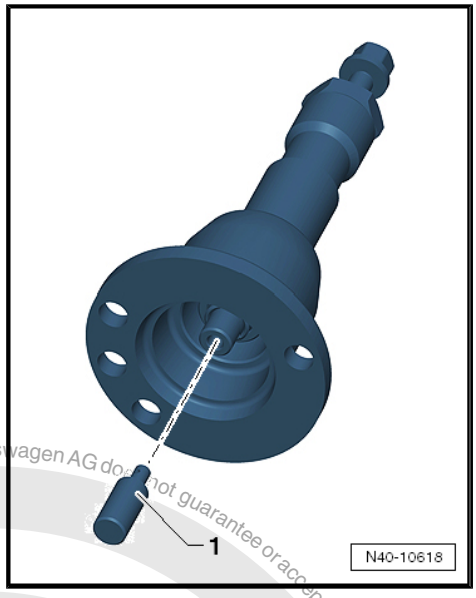
– Loosen the wheel bolts.
– Raise the vehicle.
– Remove the wheel.
– Remove the lower noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Noise Insulation .
– Remove the nuts -arrows-.
– Remove the wheel bearing housing with the ball joint from the control arm.
– Pull the drive axle out of the wheel hub and tie it securely to the body.

If the drive axle cannot be pulled out of the wheel bearing, then the drive axle can be pushed out of the wheel bearing using the Drive Shaft Remover - T10520- .



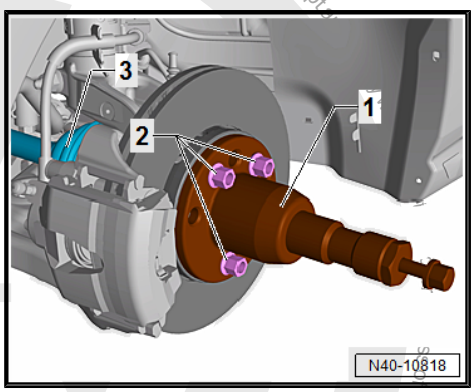
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Before using the Drive Shaft Remover - T10520- , make sure that the thrust piece -1- is installed.



Using the Drive Shaft Remover - T10520- :

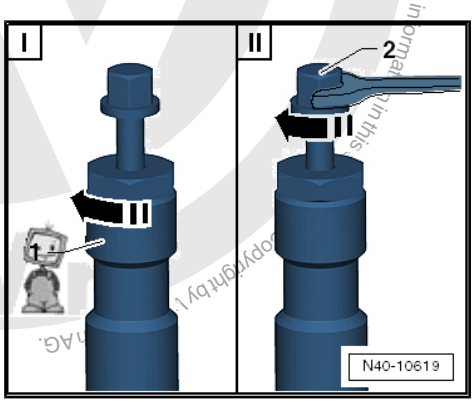
– Secure the Drive Shaft Remover - T10520- -1- with three wheel bolts -2- on the wheel hub, so that the drive axle -3- can be pressed out.



– Follow the specified sequence exactly.

I - Tighten the knurled nut -1- hand-tight.

II - Only turn the bolt -2- using a wrench and press out the drive axle using the Drive Shaft Remover - T10520- .

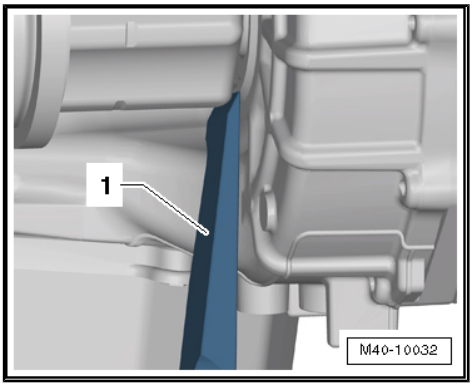


Note

At the end of the tasks or to set back, the spindles must be brought back into the original position so that the hydraulic operation can be used.

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– Place the Drive Axle Wedge Tool - T10161- -1- between the transmission housing and the triple roller joint.
– Using a rubber hammer, hit the inner joint on the Drive Axle Wedge Tool - T10161- and remove it from the transmission.
– Remove the drive axle.



Installing

Install in reverse order of removal. Note the following:

– Install new circlip into the groove on the joint pin.
– Engage the outer and inner splines of joint and transmission.
– Grab the drive axle by hand and push it into the joint up to the stop.
– Now slide the joint into the transmission with a »jerk«.

The sliding part inside the joint can be used for this »jerk«. When doing this, do not pull the drive axle too far out of the joint.

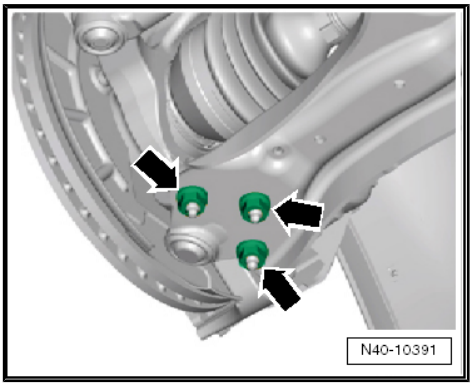
Caution

Never use a hammer or mallet!

– Make sure the drive axle fits securely inside the transmission. The joint pulls against the resistance of the circlip.

When checking, only pull on the joint piece and not on the drive axle.

– Install the outer joint as far as possible into the wheel hub splines.
– Install the lower noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Noise Insulation .
– Attach the ball joint to the control arm -arrows-.



Note

Make sure the ball joint boot is not damaged or twisted.

- Twelve-point bolt with ribs. Refer to ⇒ “9.1 Twelve-Point Bolt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection”, page 77 .
- Twelve-point bolt without ribs. Refer to ⇒ “9.2 Twelve-Point Bolt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection”, page 78 .

Caution

The vehicle must not be resting on the wheels when doing so.

When the bolt is loose, the wheel bearing can be damaged by the weight of the vehicle.

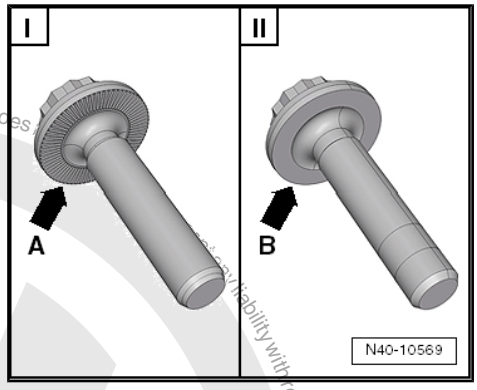
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Difference Between A Twelve-Point Bolt with Ribs and A Twelve-Point Bolt without Ribs

The contact surfaces -arrow A- and -arrow B- are different on the two-point bolts.

I - Twelve-point bolt with ribs -arrow A-

II - Twelve-point bolt without ribs -arrow B-



Note

Vehicle must not be standing on its wheels when doing this, otherwise wheel bearing will be damaged.

– Install the wheel and tighten. Refer to ⇒ “2 Wheel Installation Tightening Specifications”, page 237 .

Tightening Specifications

Component	Tightening Specification
Ball joint to control arm ♦ Use new nuts ♦ Tighten only in curb weight position. Refer to ⇒ “2 Rear Axle Curb Weight (Twist Beam Rear Suspension)”, page 146 .	100 Nm
Drive axle to wheel hub “twelve-point bolt with ribs” ♦ Use a new bolt	70 Nm + 90°
Drive axle to wheel hub “twelve-point bolt without ribs” ♦ Use a new bolt	200 Nm +180°

9.6 Drive Axles with Triple Roller Joint AAR3300i, Removing and Installing

Special tools and workshop equipment required

♦ Torque Wrench 1332 40-200Nm - VAG1332-

♦ Drive Shaft Remover - T10520-

Caution

When disassembling and performing repairs on a vehicle, the drive axles must not hang down loosely and contact the stops in the joint by over bending.

Perform the Following

Removing

– Loosen the drive axle bolt on the wheel hub:

♦ Twelve-point bolt with ribs. Refer to ⇒ “9.1 Twelve-Point Bolt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection”, page 77 .

♦ Twelve-point bolt without ribs. Refer to ⇒ “9.2 Twelve-Point Bolt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection”, page 78 .

Caution

The wheel bearing must not be under load when the drive axle threaded connection on the wheel side is loose.

If the wheel bearings are under the load of the vehicle weight, the wheel bearing will be damaged. This reduces the service life of the wheel bearings.

The drive axle bolt may be loosened maximum 90° when the vehicle is standing on its wheels.

Vehicles without a drive axle must not be moved, otherwise the wheel bearing will be damaged. If a vehicle must be moved, be sure to note the following:

- *Install an outer joint in place of the drive axle.*
- *Tighten the outer joint to 120 Nm.*

– Remove the lower noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Noise Insulation .

– Loosen the wheel bolts.

– Raise the vehicle.

– Remove the wheel.

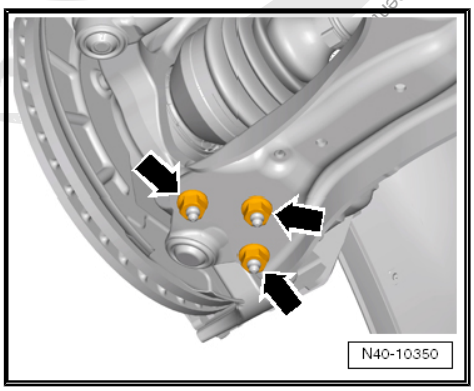
– Remove the drive axle from the flange shaft/transmission.

– Remove the nuts -arrows-.

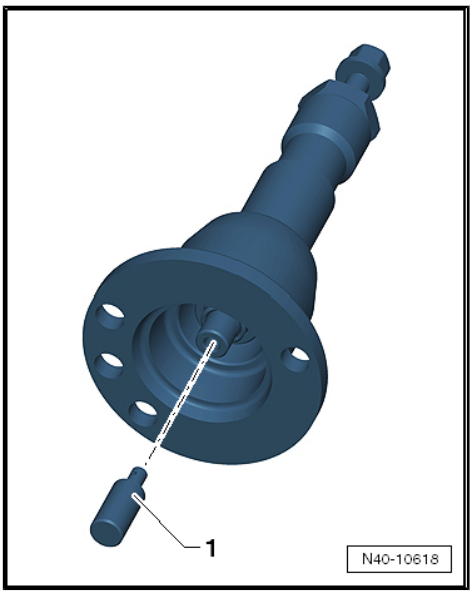
– Remove the wheel bearing housing with the ball joint from the control arm.

– Remove the drive axle from the wheel hub.

If the drive axle cannot be pulled out of the wheel bearing, then the drive axle can be pushed out of the wheel bearing using the Drive Shaft Remover - T10520- .



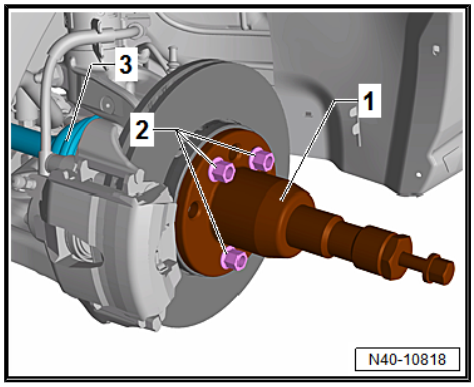
Before using the Drive Shaft Remover - T10520- , make sure that the thrust piece -1- is installed.



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Using the Drive Shaft Remover - T10520- :

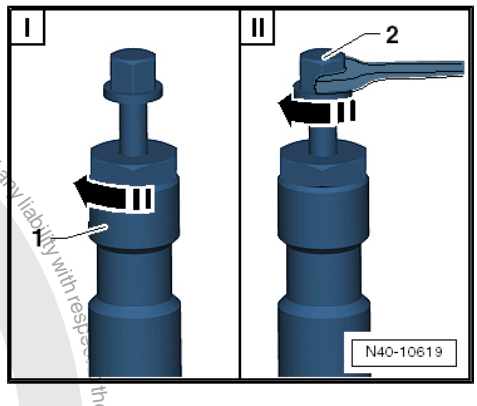
– Secure the Drive Shaft Remover - T10520- -1- with three wheel bolts -2- on the wheel hub, so that the drive axle -3- can be pressed out.



– Follow the specified sequence exactly.

I - Tighten the knurled nut -1- hand-tight.

II - Only turn the bolt -2- using a wrench and press out the drive axle using the Drive Shaft Remover - T10520- .



Note

At the end of the tasks or to set back, the spindles must be brought back into the original position so that the hydraulic operation can be used.

Installing

Install in reverse order of removal. Note the following:

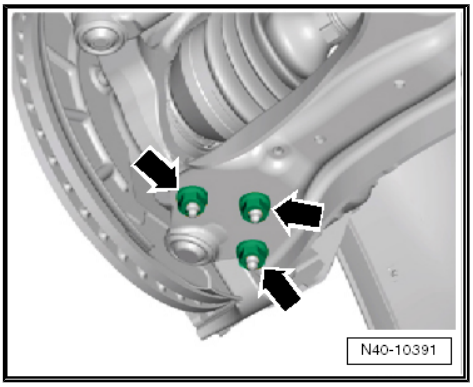
Remove any paint residue and/or corrosion on the outer joint threads/splines.

– Insert the drive axle.

– Install the outer joint as far as possible into the wheel hub splines.

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– Attach the ball joint to the control arm -arrows-.



Note

Make sure the ball joint boot is not damaged or twisted.

– Position the drive axle inner joint and tighten the bolts in a diagonal sequence to 10 Nm.

– Tighten the internal multi-point bolts diagonally to the tightening specification.

– Install the lower noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Noise Insulation .

– Tighten the drive axle bolt to the wheel hub:

♦ Twelve-point bolt with ribs. Refer to ⇒ “9.1 Twelve-Point Bolt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection”, page 77 .

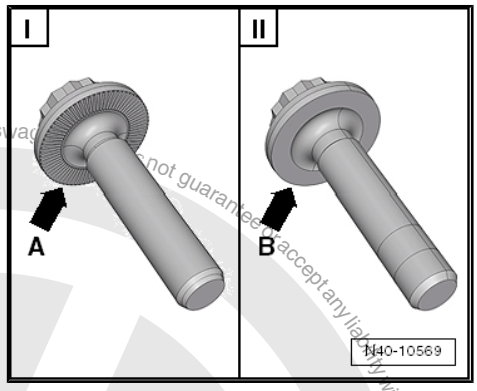
♦ Twelve-point bolt without ribs. Refer to ⇒ “9.2 Twelve-Point Bolt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection”, page 78 .

Caution

The vehicle must not be resting on the wheels when doing so.

When the bolt is loose, the wheel bearing can be damaged by the weight of the vehicle.

Difference Between A Twelve-Point Bolt with Ribs and A Twelve-Point Bolt without Ribs



The contact surfaces -arrow A- and -arrow B- are different on the two-point bolts.

I - Twelve-point bolt with ribs -arrow A-

II - Twelve-point bolt without ribs -arrow B-

Note

Vehicle must not be standing on its wheels when doing this, otherwise wheel bearing will be damaged.

– Install the wheel and tighten. Refer to ⇒ “2 Wheel Installation Tightening Specifications”, page 237 .

Tightening Specifications

Component	Tightening Specification
Ball joint to control arm ♦ Use new nuts ♦ Tighten only in curb weight position. Refer to ⇒ “2 Rear Axle Curb Weight (Twist Beam Rear Suspension)”, page 146 .	100 Nm
Drive axle to wheel hub “twelve-point bolt with ribs” ♦ Use a new bolt	70 Nm + 90°

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Component	Tightening Specification
Drive axle to wheel hub “twelve-point bolt without ribs” ♦ Use a new bolt	200 Nm +180°
Drive axle to flange shaft/transmission “Multi-point socket head bolt M10” ♦ Use new bolts.	70 Nm ♦ Tighten to 10 Nm in diagonal sequence

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10 Drive Axles, Overview and Servicing

⇒ “10.1 Overview - Drive Axles”, page 97

⇒ “10.2 Drive Axle Heat Shield”, page 98

10.1 Overview - Drive Axles

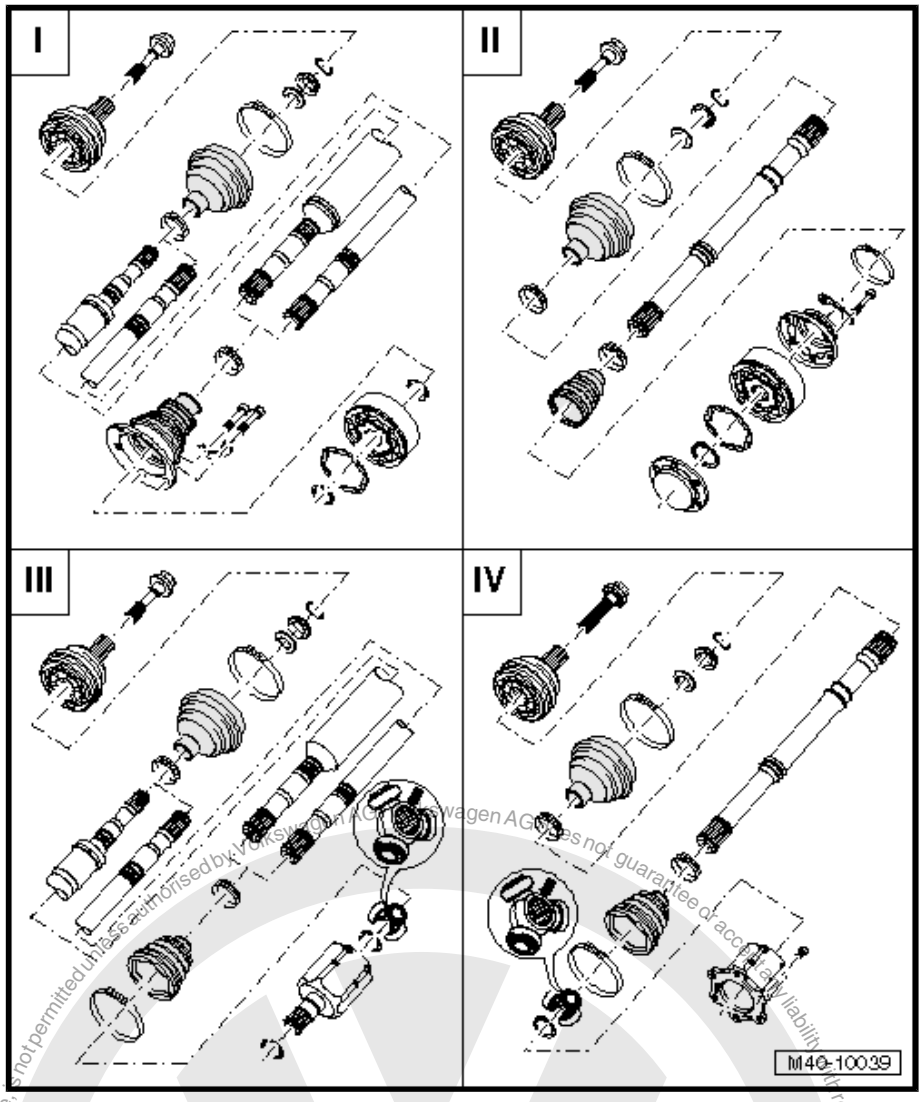
I - Overview - Drive Axle with CV Joint VL 100. Refer to ⇒ “11 Drive Axle with CV Joint VL 100”, page 99 .

II - Overview - Drive Axle with CV Joint VL 107. Refer to ⇒ “12 Drive Axle with CV Joint VL 107”, page 108 .

II - Overview - Drive Axle with CV Joint VL 107 (attached). Refer to ⇒ “13 Drive Axle with CV Joint VL107 (attached)”, page 115 .

III - Overview - Drive Axle with Triple Roller Joint AAR2600i. Refer to ⇒ “14 Drive Axle with Triple Roller Joint AAR2600i”, page 120 .

IV - Overview - Drive Axle with Triple Roller Joint AAR3300i. Refer to ⇒ “15 Drive Axle with Triple Roller Joint AAR3300i”, page 126 .

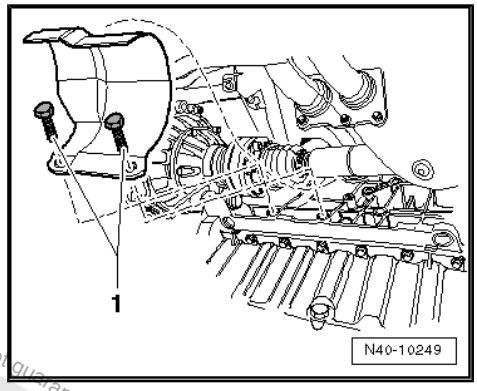


Difference of Drive Axle in Installed Condition

	VL100	VL107	AAR2600i	AAR3300i
Diameter of inner joint in mm	100	107	-	-
Cover between inner joint and flange shaft	-	X	-	-
Inner joint inserted into transmission (automatic transmission only)	-	-	X	-

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10.2 Drive Axle Heat Shield



Front Wheel Drive

Component	Tightening Specification
Hex bolt -1-	25 Nm

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11 Drive Axle with CV Joint VL 100

⇒ “11.1 Overview - Drive Axle with CV Joint VL 100”, page 99

⇒ “11.2 Drive Axle with CV Joint VL100, Disassembling and Assembling”, page 102

⇒ “11.3 Outer CV Joint, Checking”, page 105

⇒ “11.4 Inner CV Joint, Checking”, page 105

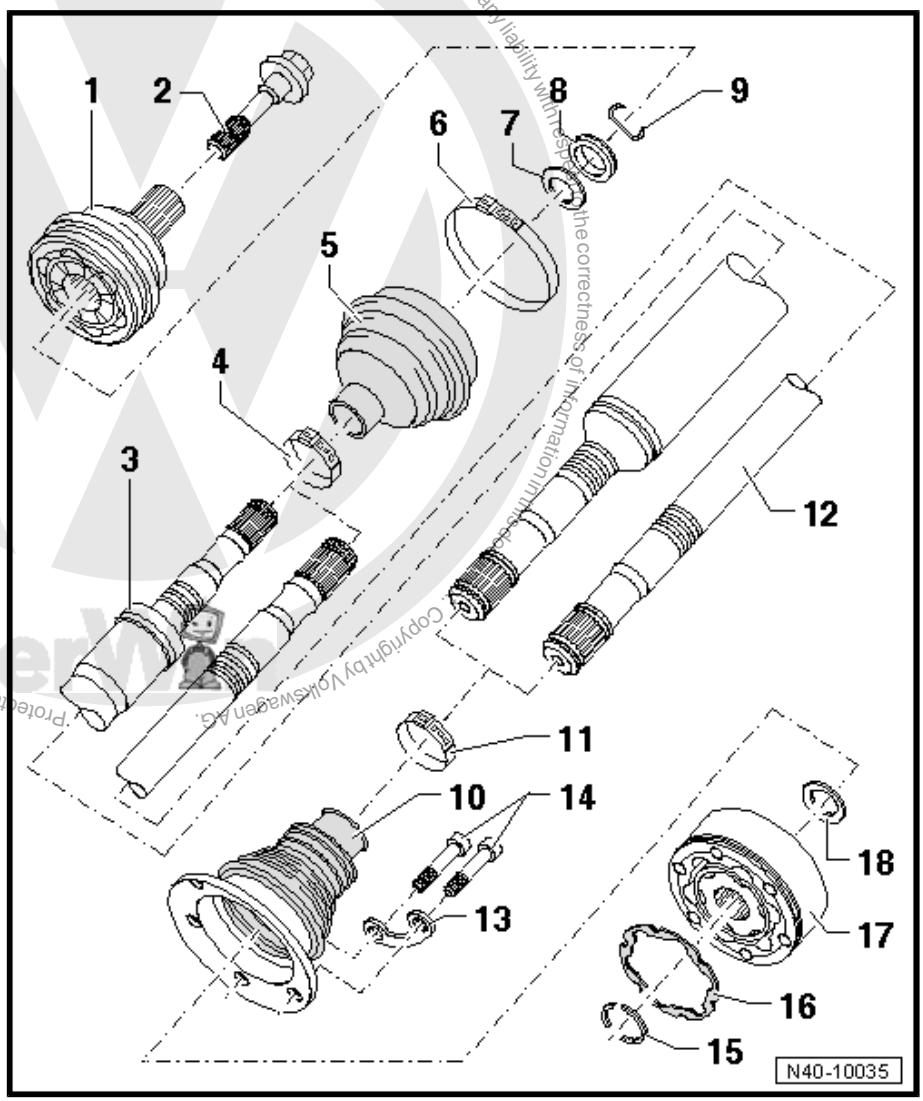
11.1 Overview - Drive Axle with CV Joint VL 100

1 - Outer CV Joint

- ❑ Replace only as a complete unit.
- ❑ Removing. Refer to ⇒ page 102 .
- ❑ Installing: Using a plastic hammer, drive onto the shaft as far as the stop
- ❑ Checking. Refer to ⇒ “11.3 Outer CV Joint, Checking”, page 105 .

2 - Bolt

- ❑ There are different versions.
- ❑ Allocation. Refer to the Parts Catalog.



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WARNING

There are two types of twelve-point bolts, with and without ribs. Distinguishing characteristics. Refer to ⇒ Fig. ""Difference Between A Twelve-Point Bolt with Ribs and A Twelve-Point Bolt without Ribs"", page 101

When installing a twelve-point bolt, always check what type of twelve-point bolt is to be used.

Use the correct tightening specification for the specific bolt.

The tightening specification for a twelve-point bolt »with« ribs is 70 Nm + 90°. Refer to ⇒ "9.1 Twelve-Point Bolt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection", page 77 for loosening and tightening specifications.

The tightening specification for a twelve-point bolt »without« ribs is 200 Nm + 180°. Refer to ⇒ "9.2 Twelve-Point Bolt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection", page 78 for loosening and tightening specifications.

- ❑ Always replace if removed

3 - Right Drive Axle

4 - Clamp

- ❑ Always replace if removed
- ❑ Tensioning. Refer to ⇒ Fig. ""Tensioning Clamp on Small Diameter"" , page 104 .

5 - CV Boot

- ❑ Check for tears and scuffing
- ❑ Material: Hytrel polyelastomer

6 - Clamp

- ❑ Always replace if removed
- ❑ Tensioning. Refer to ⇒ Fig. ""Tightening Clamp on Outer Joint"" , page 104 .

7 - Plate Spring

- ❑ Installation position. Refer to ⇒ Fig. ""Installed Location of Spring Washer and Thrust Washer on Outer Joint"" , page 103

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8 - Thrust Ring

- ❑ Installation position. Refer to ⇒ Fig. ""Installed Location of Spring Washer and Thrust Washer on Outer Joint"" , page 103

9 - Circlip

- ❑ Always replace if removed
- ❑ Insert in shaft groove

10 - CV Boot for CV Joint

- ❑ Material: Hytrel polyelastomer
- ❑ Without vent hole
- ❑ Check for tears and scuffing
- ❑ Drive off CV joint using drift
- ❑ Coat the sealing surface with -D 454 300 A2- before installing it on the CV joint

11 - Clamp

- ❑ Always replace if removed
- ❑ Tensioning. Refer to ⇒ Fig. ""Tightening Clamp on Outer Joint"" , page 104 .

12 - Left Drive Axle

13 - Backing Plate

14 - Internal Multi-Point Bolt

- ❑ First tighten diagonally to 10 Nm, then tighten diagonally again to the tightening specification

  M8 bolt = 40 Nm

  M10 bolt = 70 Nm

- ❑ After disassembly, always replace bolts

15 - Circlip

- ❑ Remove and install using Circlip Pliers - VW161A-

16 - Seal

- ❑ Bonding surface on CV joint must not have any grease or oil on it.

17 - Inner CV Joint

- ❑ Replace only as a complete unit.
- ❑ Removing. Refer to ⇒ Fig. ""Inner CV Joint, Removing"" , page 103
- ❑ Installing. Refer to ⇒ Fig. ""Pressing on the Inner CV Joint"" , page 104 .
- ❑ Checking. Refer to ⇒ "11.4 Inner CV Joint, Checking", page 105 .

18 - Plate Spring

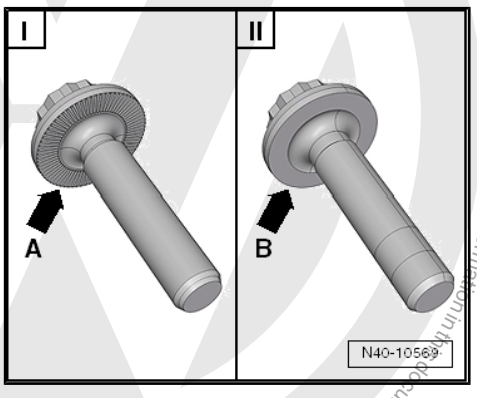
- ❑ Installation position. Refer to ⇒ page 103

Difference Between A Twelve-Point Bolt with Ribs and A Twelve-Point Bolt without Ribs

The contact surfaces -arrow A- and -arrow B- are different on the two-point bolts.

I - Twelve-point bolt with ribs -arrow A-

II - Twelve-point bolt without ribs -arrow B-



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11.2 Drive Axle with CV Joint VL100, Disassembling and Assembling

Special tools and workshop equipment required

- Press Plate - VW401-
- Press Plate - VW402-
- Press Piece - Rod - VW408A-
- Press Piece - Rod - VW411-
- Press Piece - 37mm - VW416B-
- Press Piece - Multiple Use - VW447H-
- Circlip Pliers - VW161A-
- Torque Wrench 1331 5-50Nm - VAG1331-
- Torque Wrench 1332 40-200Nm - VAG1332-
- Clamping Pliers - VAG1682A-
- Tripod Joint Tool - T10065-
- Slide Hammer Set - VW771-
- Puller - Drive Axle - T10382-

Perform the Following

Removing the Outer CV joint

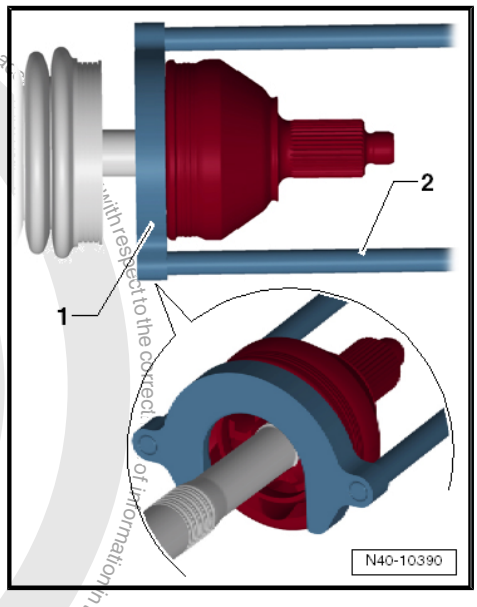
– Clamp the drive axle with protective jaws in a vise clamp.

– Fold back boot.

– Align the Puller - Drive Axle - T10382- so that the flat side of the Puller - Drive Axle - T10382/1- faces the Puller - Drive Axle - Spindles - T10382/2- .

– Attach the Puller - Drive Axle - T10382- to the Slide Hammer Set - VW771- .

– Remove the CV joint from the drive axle using the Puller - Drive Axle - T10382- and Slide Hammer Set - VW771- .



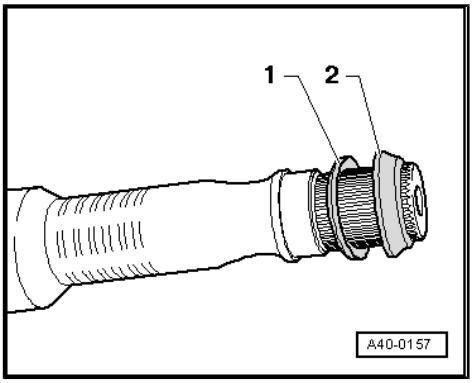
1 - Puller - Drive Axle - Removing Plate - T10382/1-

2 - Puller - Drive Axle - Spindles - T10382/2-

Installing the Outer CV Joint

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Installed Location of Spring Washer and Thrust Washer on Outer Joint



1 - Plate Spring

2 - Thrust Ring

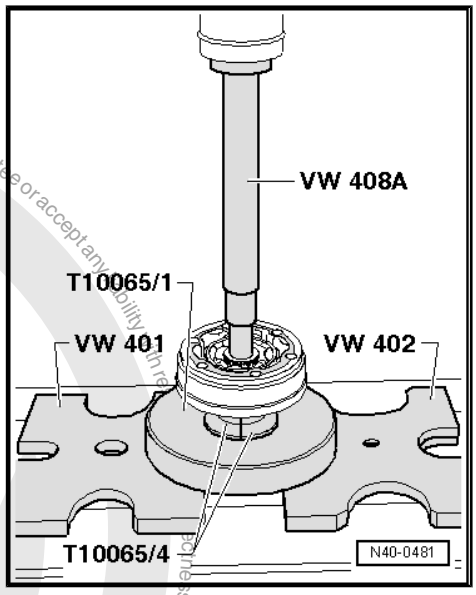
– Install the new circlips.

– Slide the new CV boot onto the drive axle if necessary.

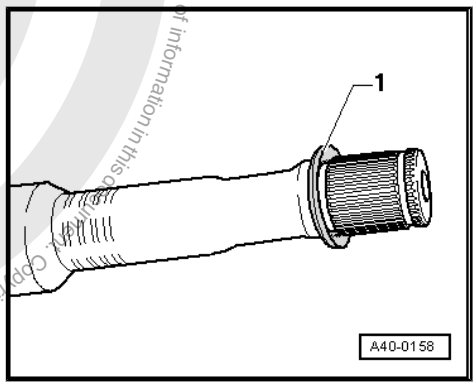
– Use a plastic hammer to install it on the shaft until the locking ring locks secure.

Inner CV Joint, Removing

Assembling



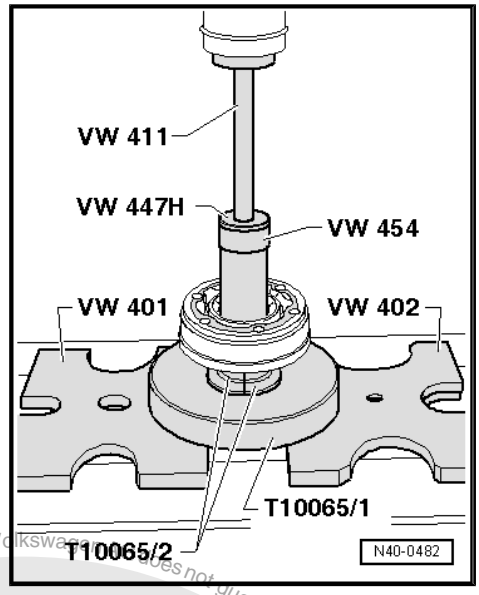
Installed Location of the Plate Spring on Inner Joint



1 - Plate Spring

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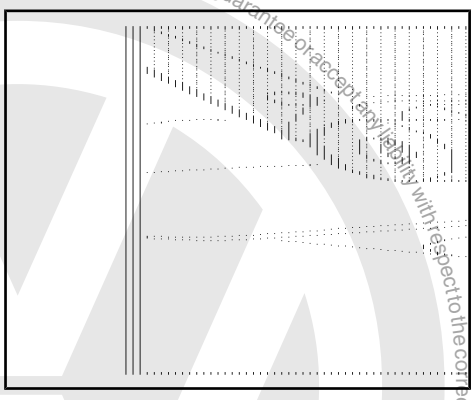
Pressing on the Inner CV Joint



Note

Chamfer on inner diameter of ball hub (splines) must face the contact shoulder on the drive axle.

Tightening Clamp on Outer Joint



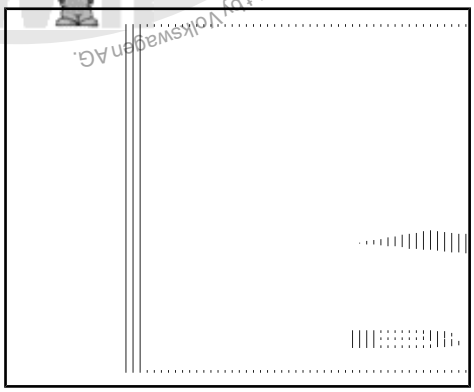
– Attach the Clamping Pliers - VAG1682A- as illustrated. When doing this, make sure that edges of clamping pliers are seated in corners -arrows B- of clamp.

– Tension clamp by turning spindle with a torque wrench (do not tilt clamp tool).

Note

- *The hard material of the CV boot (compared to rubber) makes it necessary to use a stainless steel hose clamp. It is only possible to tighten the hose clamp with Clamping Pliers - VAG1682A- .*
- *Tightening specification: 25 Nm.*
- *Use the torque wrench -C- with adjustment range 5 to 50 Nm (for example, Torque Wrench 1331 5-50Nm - VAG1331-).*
- *Make sure the threads on the spindle -A- on the pliers move easily. Lubricate with MOS 2 grease, if necessary.*
- *If difficult to tighten, for example because of dirty threads, the proper clamping force of the clamping sleeve will not be reached even when tightened to the specification.*

Tensioning Clamp on Small Diameter



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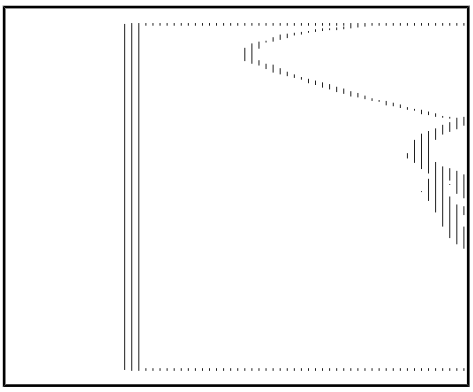
11.3 Outer CV Joint, Checking

It is necessary to disassemble the joint whenever replacing the grease or if the ball surfaces show wear or damage.

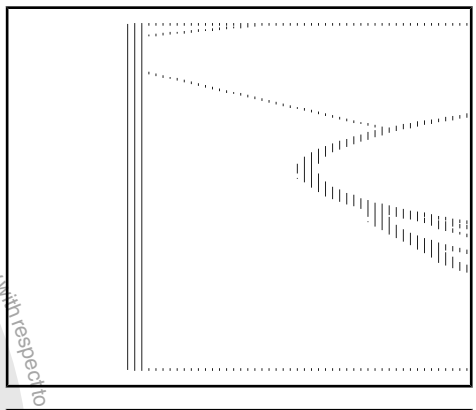
Perform the following:

Removing

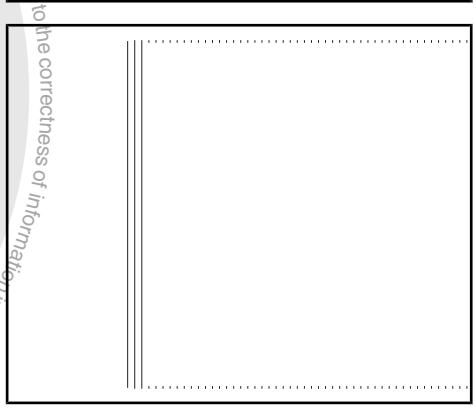
- Mark position of ball hub to ball cage and to housing before disassembling, using an electric engraver or grindstone.
- Swivel the ball hub and ball bearing cage.
- Remove the balls one after the other.



- Turn cage until the two rectangular windows -arrow- are aligned with the joint housing.
- Lift out cage with hub.



- Swing segment of hub into rectangular window of cage.
- Fold hub out from cage.



6 balls for each joint belong to a tolerance group. Check stub axle, hub, cage and balls for small depressions (pitting build-up) and chafing. Excessive circumferential backlash in joint makes itself noticed via tip-in shock, in such cases joint should be replaced. Flattening and running marks of balls are no reason to replace joint.

Installing

- Press in half of the total grease amount (40 grams) into joint body.
- Insert cage with hub into joint body.
- Press in opposing balls in sequence, during this, previous position of ball hub to ball cage and to joint body must be established again.
- Install new circlip into the hub.
- Distribute remaining grease in the joint boot.

11.4 Inner CV Joint, Checking

Perform the following:

Removing

The joint must be disassembled for the following work:

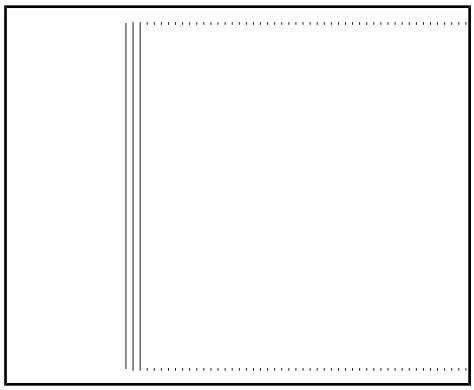
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- ♦ Replace the grease if it is very dirty
- ♦ For checking the contact surfaces for wear
- ♦ For checking the bearings for wear

– Swivel the ball hub and ball bearing cage.

– Remove the joint in the direction of the arrow.

– Remove the balls from the cage.



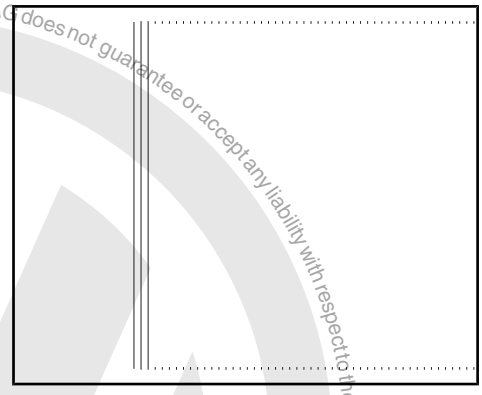
Note

Ball hub and joint piece are paired. Do not interchange.

– Flip out ball hub from ball cage via running path of ball -arrows-.

– Check joint piece, ball hub, ball cage and balls for small broken off depressions (pitting build-up) and chafing.

Excessive circumferential backlash in joint makes itself noticed via tip-in shock. Joint must be replaced in such cases. Flattening and running marks of balls are no reason to replace joint.

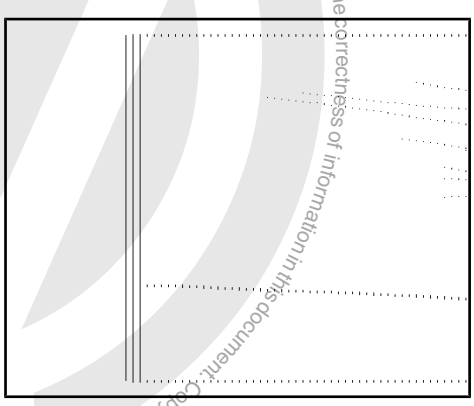


Installing

– Insert ball hub into ball cage via two chamfers. The installation position is at random. Press balls into cage.

Ball hub has 2 different distances between ball tracks, a larger and a smaller.

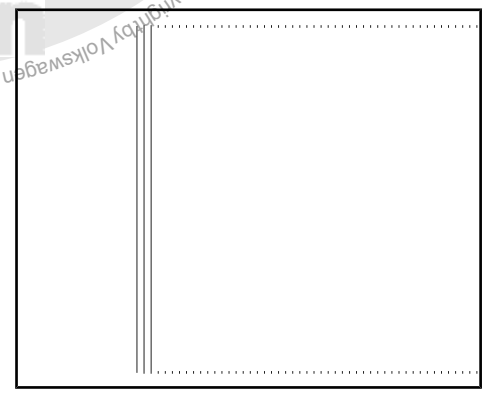
– Insert hub with cage and balls upright into joint piece.



When inserting, make sure that in each case the wide gap -a- at joint piece contacts narrow gap -b- at hub after swinging in.

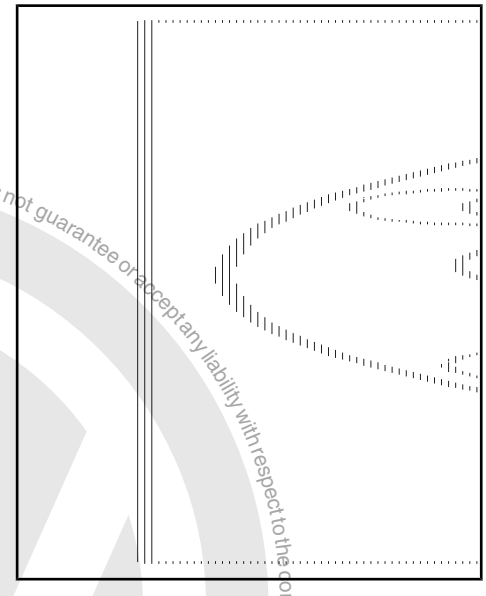
Chamfer on inner diameter of ball hub (splines) must face large diameter of joint piece.

– Pay attention to the bevel on the inner diameter of the ball hub. It must be visible.

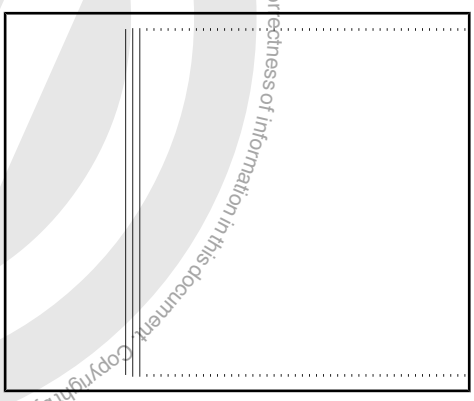


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– Swing in ball hub, to do so swing out hub far enough from cage -arrows- so that the balls have the distance of the running paths.



– Swing in hub with balls by pressing forcefully onto cage -arrow-.



CV Joint, Checking for Function

CV joint is properly assembled, if ball hub can be slid back and forth by hand over whole compensation length.

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12 Drive Axle with CV Joint VL 107

⇒ “12.1 Overview - Drive Axle with CV Joint VL 107”, page 108

⇒ “12.2 Drive Axle with CV Joint VL107, Disassembling and Assembling”, page 111

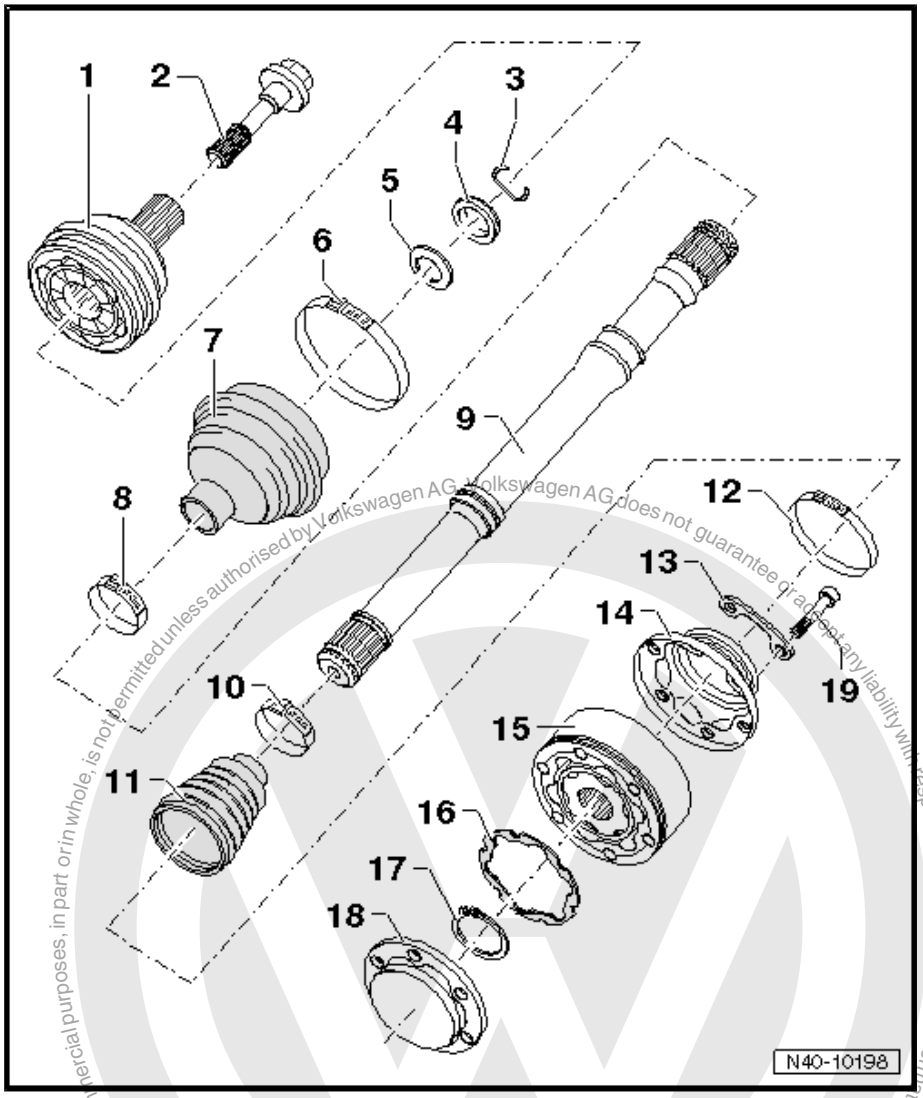
12.1 Overview - Drive Axle with CV Joint VL 107

1 - Outer CV Joint

- ❑ Replace only as a complete unit.
- ❑ Removing. Refer to ⇒ page 111 .
- ❑ Installing: Using a plastic hammer, drive onto the shaft as far as the stop
- ❑ Checking. Refer to ⇒ “11.3 Outer CV Joint, Checking”, page 105 .

2 - Bolt

- ❑ There are different versions.
- ❑ Allocation. Refer to the Parts Catalog.



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WARNING

There are two types of twelve-point bolts, with and without ribs. Distinguishing characteristics ⇒ Fig. ""Difference Between A Twelve-Point Bolt with Ribs and A Twelve-Point Bolt without Ribs"" , page 111

When installing a twelve-point bolt, always check what type of twelve-point bolt is to be used.

Use the correct tightening specification for the specific bolt.

The tightening specification for a twelve-point bolt »with« ribs is 70 Nm + 90°. Refer to ⇒ "9.1 Twelve-Point Bolt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection", page 77 for loosening and tightening specifications.

The tightening specification for a twelve-point bolt »without« ribs is 200 Nm + 180°. Refer to ⇒ "9.2 Twelve-Point Bolt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection", page 78 for loosening and tightening specifications.

- ❑ Always replace if removed

3 - Circlip

- ❑ Always replace if removed
- ❑ Insert in shaft groove

4 - Thrust Ring

- ❑ Installation position. Refer to ⇒ Fig. ""Installed Location of Spring Washer and Thrust Washer On Outer Joint"" , page 112

5 - Plate Spring

- ❑ Installation position. Refer to ⇒ Fig. ""Installed Location of Spring Washer and Thrust Washer On Outer Joint"" , page 112

6 - Clamp

- ❑ Always replace if removed
- ❑ Tensioning. Refer to ⇒ Fig. ""Tightening Clamp On Outer Joint"" , page 113

7 - CV Boot

- ❑ Check for tears and scuffing
- ❑ Material: Hytrel polyelastomer

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8 - Clamp

- ❑ Always replace if removed
- ❑ Tensioning. Refer to ⇒ Fig. ““Tensioning Clamp On Small Diameter”“ , page 114 .

9 - Drive Axle

10 - Clamp

- ❑ Always replace if removed
- ❑ Tensioning. Refer to ⇒ Fig. ““Tensioning Clamp On Small Diameter”“ , page 114 .

11 - CV Boot for CV Joint

- ❑ Material: Hytrel polyelastomer
- ❑ Without vent hole
- ❑ Check for tears and scuffing
- ❑ Drive off CV joint using drift
- ❑ Coat the sealing surface with -D 454 300 A2- before installing it on the CV joint

12 - Clamp

- ❑ Always replace if removed

13 - Backing Plate

14 - Cap

- ❑ Carefully drive off using a drift
- ❑ Coat the sealing surface with -D 454 300 A2- before installing it on the CV joint
- ❑ Adhesive surface must be free of oil and grease

15 - Inner CV Joint

- ❑ Replace only as a complete unit.
- ❑ Removing. Refer to ⇒ Fig. ““Inner CV Joint, Removing”“ , page 112
- ❑ Installing. Refer to ⇒ Fig. ““Pressing On the Inner CV Joint”“ , page 112 .
- ❑ Checking. Refer to ⇒ “11.4 Inner CV Joint, Checking”, page 105 .

16 - Seal

- ❑ Bonding surface on CV joint must not have any grease or oil on it.

17 - Circlip

- ❑ Remove and install using Circlip Pliers - VW161A-

18 - Cover

- ❑ Always replace if removed
- ❑ Always replace
- ❑ Removing. Refer to ⇒ Fig. ““Drive Off Cover for Inner Joint”“ , page 112

19 - Internal Multi-Point Bolt

- ❑ First tighten diagonally to 10 Nm, then tighten diagonally again to the tightening specification
- ❑ 70 Nm
- ❑ After disassembly, always replace bolts
- ❑ M10 x 52

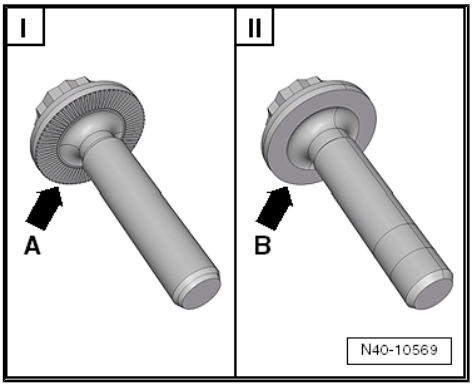
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Difference Between A Twelve-Point Bolt with Ribs and A Twelve-Point Bolt without Ribs

The contact surfaces -arrow A- and -arrow B- are different on the two-point bolts.

I - Twelve-point bolt with ribs -arrow A-

II - Twelve-point bolt without ribs -arrow B-



12.2 Drive Axle with CV Joint VL107, Disassembling and Assembling

Special tools and workshop equipment required

- Press Plate - VW401-
- Press Plate - VW402-
- Press Piece - Rod - VW408A-
- CV Joint Press Sleeve - VW522-
- Press Block - 40-204A-
- Clamping Pliers - VAG1682A-
- Slide Hammer Set - VW771-
- Puller - Drive Axle - T10382-

Perform the Following

Removing the Outer CV Joint

– Clamp the drive axle with protective jaws in a vise clamp.

– Fold back boot.

– Align the Puller - Drive Axle - T10382- so that the flat side of the Puller - Drive Axle - T10382/1- faces the Puller - Drive Axle - Spindles - T10382/2- .

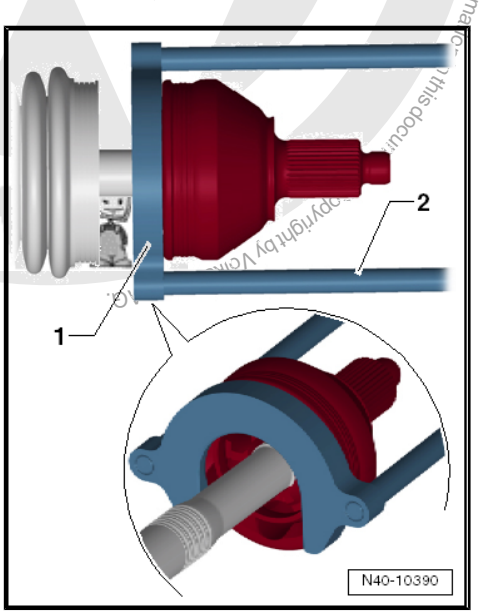
– Attach the Puller - Drive Axle - T10382- to the Slide Hammer Set - VW771- .

– Remove the CV joint from the drive axle using the Puller - Drive Axle - T10382- and Slide Hammer Set - VW771- .

1 - Puller - Drive Axle - Removing Plate - T10382/1-

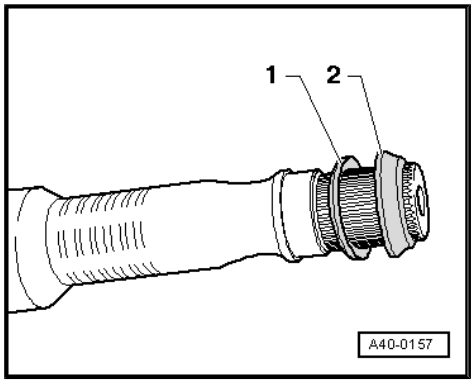
2 - Puller - Drive Axle - Spindles - T10382/2-

Installing the Outer CV Joint



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Installed Location of Spring Washer and Thrust Washer On Outer Joint



1 - Plate Spring

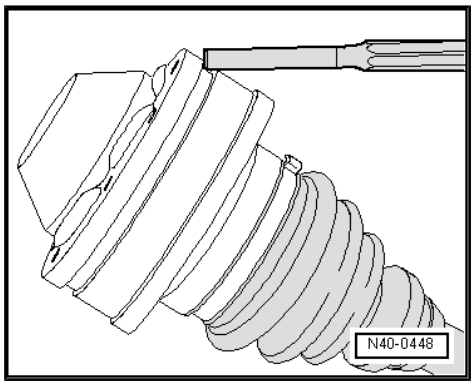
2 - Thrust Ring

– Install the new circlips.

– Slide the new CV boot onto the drive axle if necessary.

– Use a plastic hammer to install it on the shaft until the locking ring locks secure.

Drive Off Cover for Inner Joint



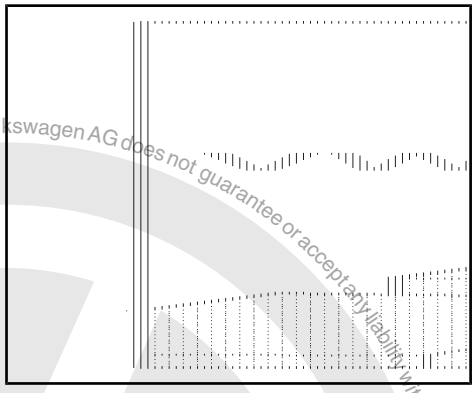
– Remove the circlip.

– Remove both clamps, and push the CV boot toward outer joint.

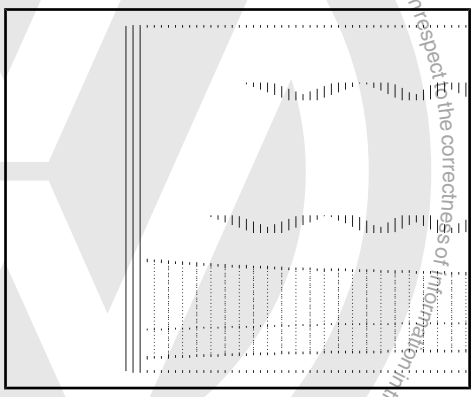
– Drive off protective boot with drift.

Inner CV Joint, Removing

Assembling



Pressing On the Inner CV Joint

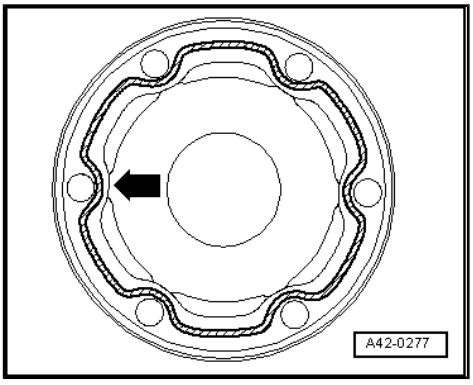


– Press on joint until stop.

– Install the circlip.

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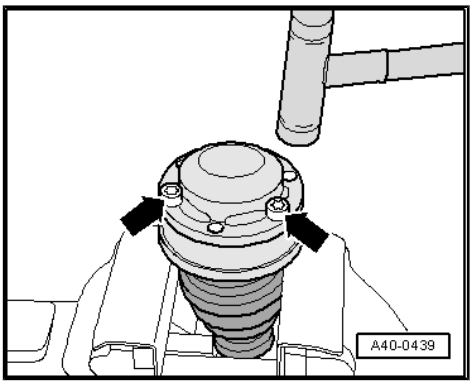
– Coat the cover sealing surface with -D 454 300 A2- .
– Apply a continuous sealant bead with a 2 to 3 mm diameter in the area of the inner holes -arrow- on the clean surface of the cover.



– Align new cover with bolts -arrows- to bolt holes.

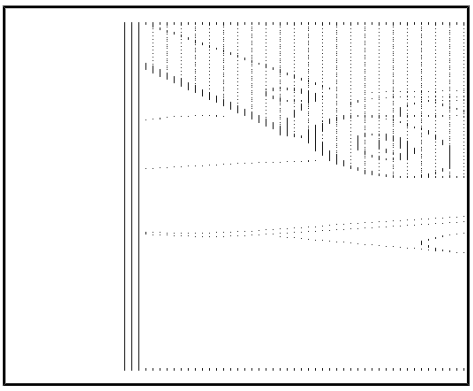
It Must Be Aligned Exactly Because It Cannot Be Aligned after Driving On.

– Drive cover on with a plastic hammer.
– Wipe away any sealant leaking out.



Tightening Clamp On Outer Joint

– Attach the Clamping Pliers - VAG1682A- as illustrated. When doing this, make sure that edges of clamping pliers are seated in corners -arrows B- of clamp.
– Tension clamp by turning spindle with a torque wrench (do not tilt clamp tool).

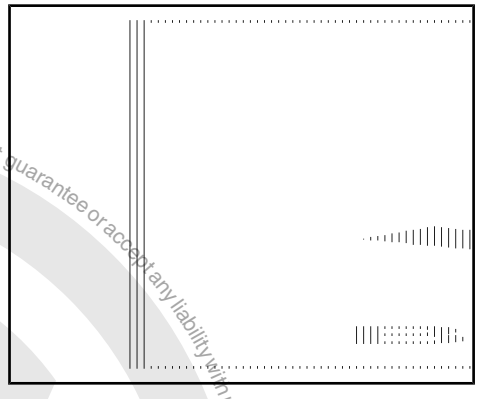


Note

- *The hard material of the CV boot (compared to rubber) makes it necessary to use a stainless steel hose clamp. It is only possible to tighten the hose clamp with Clamping Pliers - VAG1682A- .*
- *Tightening specification: 25 Nm.*
- *Use the torque wrench -C- with adjustment range 5 - 50 Nm (for example, Torque Wrench 1331 5-50Nm - VAG1331-).*
- *Make sure the threads on the spindle -A- on the pliers move easily. Lubricate with MOS 2 grease, if necessary.*
- *If difficult to tighten, for example because of dirty threads, the proper clamping force of the clamping sleeve will not be reached even when tightened to the specification.*

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Tensioning Clamp On Small Diameter



Outer CV joint, checking. Refer to
⇒ “11.3 Outer CV Joint, Checking”, page 105 .

Inner CV joint, checking. Refer to
⇒ “11.4 Inner CV Joint, Checking”, page 105 .

CV joint, checking function. Refer to ⇒ page 107 .

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13 Drive Axle with CV Joint VL107 (attached)

⇒ “13.1 Overview - Drive Axle with CV Joint VL107 (attached)”, page 115

⇒ “13.2 Drive Axle with CV Joint VL107 Attached, Disassembling and Assembling”, page 117

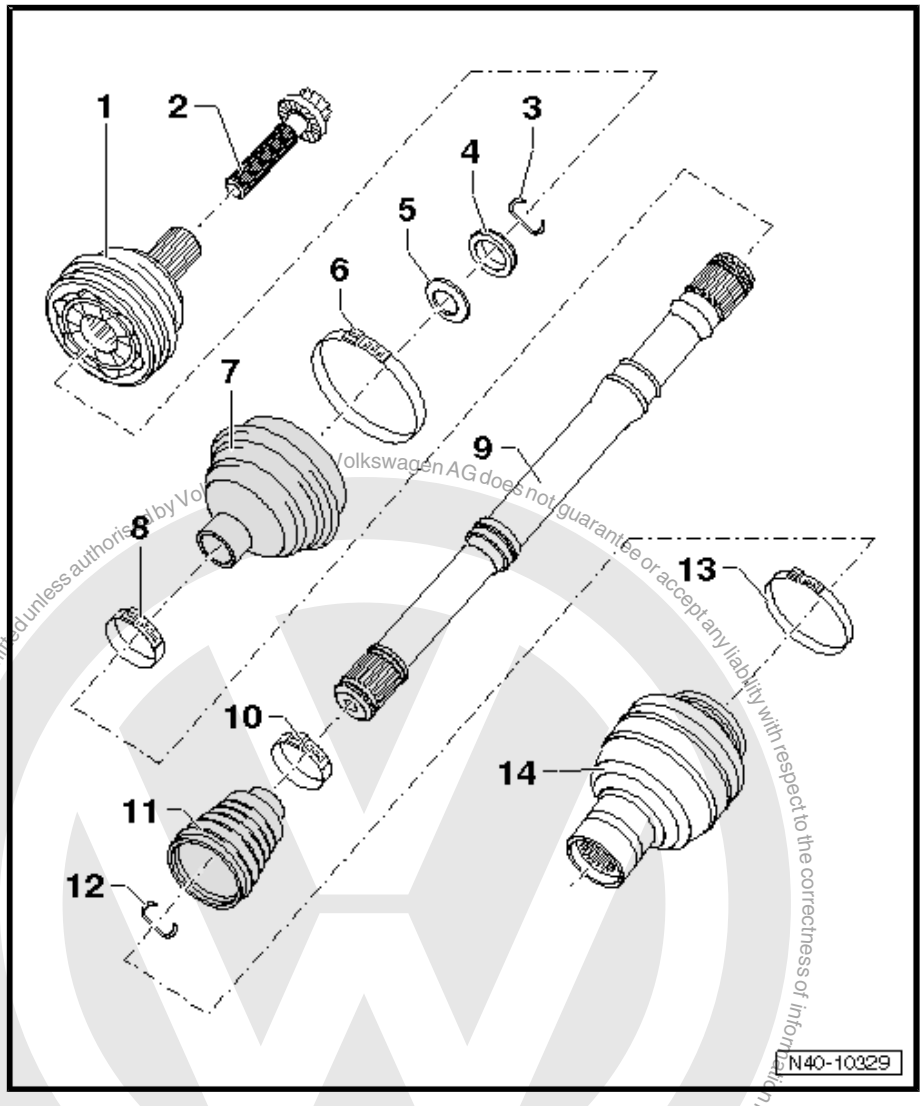
13.1 Overview - Drive Axle with CV Joint VL107 (attached)

1 - Outer CV Joint

- ❑ Replace only as a complete unit.
- ❑ Removing. Refer to ⇒ page 117 .
- ❑ Installing: Using a plastic hammer, drive onto the shaft as far as the stop
- ❑ Checking. Refer to ⇒ “11.3 Outer CV Joint, Checking”, page 105 .

2 - Bolt

- ❑ There are different versions.
- ❑ Allocation. Refer to the Parts Catalog.



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WARNING

There are two types of twelve-point bolts, with and without ribs. Distinguishing characteristics ⇒ Fig. ""Difference Between A Twelve-Point Bolt with Ribs and A Twelve-Point Bolt without Ribs"", page 117

When installing a twelve-point bolt, always check what type of twelve-point bolt is to be used.

Use the correct tightening specification for the specific bolt.

The tightening specification for a twelve-point bolt »with« ribs is 70 Nm + 90°. Refer to ⇒ "9.1 Twelve-Point Bolt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection", page 77 for loosening and tightening specifications.

The tightening specification for a twelve-point bolt »without« ribs is 200 Nm + 180°. Refer to ⇒ "9.2 Twelve-Point Bolt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection", page 78 for loosening and tightening specifications.

- ❑ Always replace if removed

3 - Circlip

- ❑ Always replace if removed
- ❑ Insert in shaft groove

4 - Thrust Ring

- ❑ Installation position. Refer to ⇒ Fig. ""Installed Location of Spring Washer and Thrust Washer on Outer Joint"", page 118

5 - Plate Spring

- ❑ Installation position. Refer to ⇒ Fig. ""Installed Location of Spring Washer and Thrust Washer on Outer Joint"", page 118

6 - Clamp

- ❑ Always replace if removed
- ❑ Tensioning. Refer to ⇒ Fig. ""Tightening Clamp on Outer Joint"", page 119 .

7 - CV Boot

- ❑ Check for tears and scuffing
- ❑ Material: Hytrel polyelastomer

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8 - Clamp

- ❑ Always replace if removed
- ❑ Tensioning. Refer to ⇒ Fig. ""Tensioning Clamp on Small Diameter"" , page 119 .

9 - Drive Axle

10 - Clamp

- ❑ Always replace if removed
- ❑ Tensioning. Refer to ⇒ Fig. ""Tensioning Clamp on Small Diameter"" , page 119 .

11 - CV Boot for CV Joint

- ❑ Material: Hytrel polyelastomer
- ❑ Without vent hole
- ❑ Check for tears and scuffing

12 - Circlip

- ❑ Always replace if removed
- ❑ Insert in shaft groove

13 - Clamp

- ❑ Always replace if removed
- ❑ Tensioning. Refer to ⇒ Fig. ""Tightening Clamp on Outer Joint"" , page 119 .

14 - CV Joint

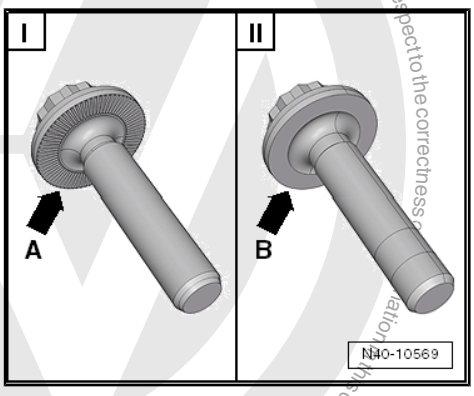
- ❑ Replace only as a complete unit.
- ❑ Removing. Refer to ⇒ page 118 .
- ❑ Installing: Using a plastic hammer, drive onto the shaft as far as the stop

Difference Between A Twelve-Point Bolt with Ribs and A Twelve-Point Bolt without Ribs

The contact surfaces -arrow A- and -arrow B- are different on the two-point bolts.

I - Twelve-point bolt with ribs -arrow A-

II - Twelve-point bolt without ribs -arrow B-



13.2 Drive Axle with CV Joint VL107 Attached, Disassembling and Assembling

Special tools and workshop equipment required

- ♦ Slide Hammer Set - VW771-
- ♦ Puller - Drive Axle - T10382-

Removing the Outer CV Joint

– Clamp the drive axle with protective jaws in a vise clamp.

– Fold back boot.

– Align the Puller - Drive Axle - T10382- so that the flat side of the Puller - Drive Axle - T10382/1- faces the Spindles - T10382/2- .

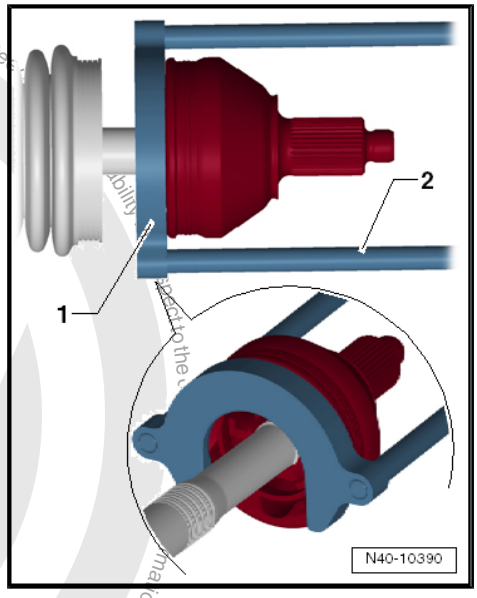
– Attach the Puller - Drive Axle - T10382- to the Slide Hammer Set - VW771- .

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– Remove the CV joint from the drive axle using the Puller - Drive Axle - T10382- and Slide Hammer Set - VW771- .

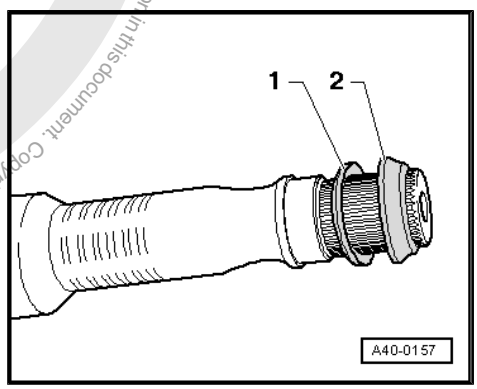
1 - Puller - Drive Axle - Removing Plate - T10382/1-

2 - Puller - Drive Axle - Spindles - T10382/2-



Installing the Outer CV Joint

Installed Location of Spring Washer and Thrust Washer on Outer Joint



1 - Plate Spring

2 - Thrust Ring

– Install the new circlips.

– Slide the new CV boot onto the drive axle if necessary.

– Use a plastic hammer to install it on the shaft until the locking ring locks secure.

Inner CV Joint, Removing

– Clamp the drive axle with protective jaws in a vise clamp.

– Fold back boot.

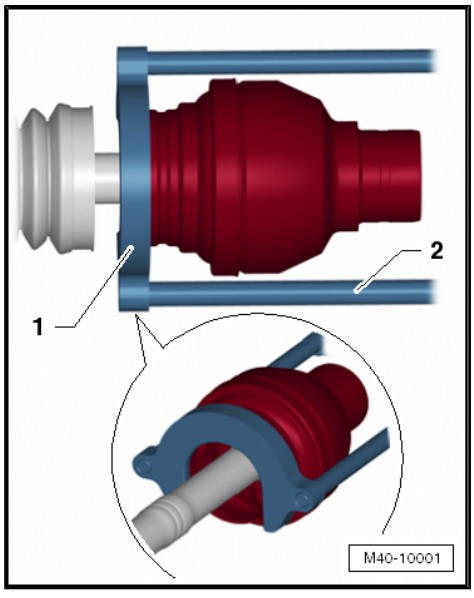
– Align the Puller - Drive Axle - T10382- so that the flat side of the Puller - Drive Axle - T10382/1- faces the Puller - Drive Axle - Spindles - T10382/2- .

– Attach the Puller - Drive Axle - T10382- to the Slide Hammer Set - VW771- .

– Remove the CV joint from the drive axle using the Puller - Drive Axle - T10382- and Slide Hammer Set - VW771- .

1 - Puller - Drive Axle - Removing Plate - T10382/1-

2 - Puller - Drive Axle - Spindles - T10382/2-



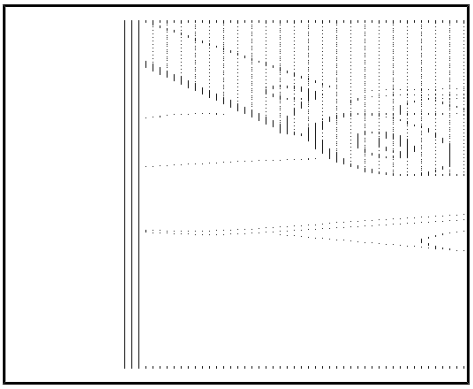
Installing the Inner CV Joint

– Install the new circlips.

– Slide the new CV boot onto the drive axle if necessary.

– Use a plastic hammer to install it on the shaft until the locking ring locks secure.

Tightening Clamp on Outer Joint



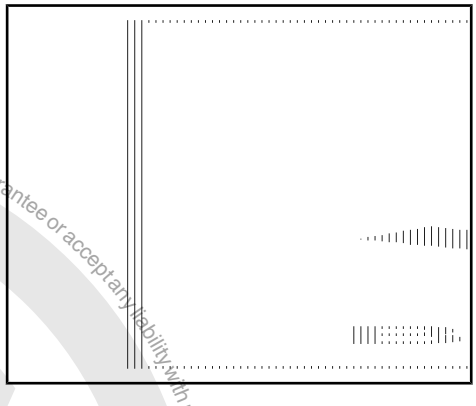
– Attach the CV Joint Boot Clamp Tool - VAG1682- as illustrated. Be sure that edges of clamping pliers are seated in corners -arrows B- of hose clamp.

– Tension clamp by turning spindle with a torque wrench (do not tilt clamp tool).

Note

- *The hard material of the CV boot (compared to rubber) makes it necessary to use a stainless steel hose clamp. It is only possible to tighten the hose clamp with Clamping Pliers - VAG1682A- .*
- *Tightening specification: 25 Nm*
- *Use torque wrench -C- with adjustment range 5 to 50 Nm (for example Torque Wrench 5-50Nm - VAG1331-).*
- *Make sure the threads on the spindle -A- on the pliers move easily. Lubricate with MOS 2 grease, if necessary.*
- *If it does not move freely, for example due to dirt in thread, the required clamp tension will not be achieved at the specified torque.*

Tensioning Clamp on Small Diameter



Outer CV joint, checking. Refer to
⇒ “11.3 Outer CV Joint, Checking”, page 105 .

Inner CV joint, checking. Refer to
⇒ “11.4 Inner CV Joint, Checking”, page 105 .

CV joint, checking function ⇒ page 107 .

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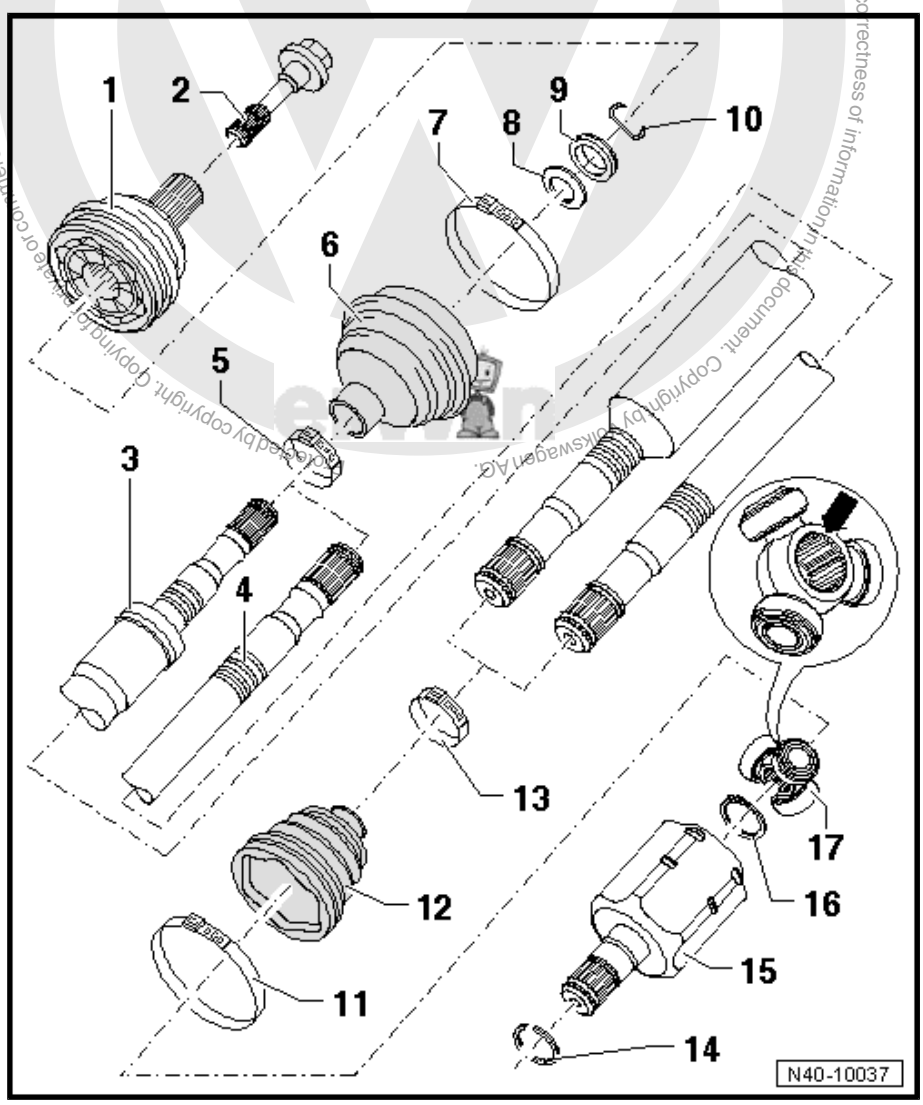
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14 Drive Axle with Triple Roller Joint AAR2600i

⇒ “14.1 Overview - Drive Axle with Triple Roller Joint AAR2600i”, page 120

⇒ “14.2 Drive Axle with Triple Roller Joint AAR2600i, Disassembling and Assembling”, page 122

14.1 Overview - Drive Axle with Triple Roller Joint AAR2600i



1 - Outer CV joint

- ❑ Replace only as a complete unit.
- ❑ Removing. Refer to ⇒ page 123 .
- ❑ Installing: Drive onto shaft with plastic hammer until compressed circlip seats.
- ❑ Checking. Refer to ⇒ “11.3 Outer CV Joint, Checking”, page 105 .

2 - Bolt

- ❑ There are different versions.
- ❑ Allocation. Refer to the Parts Catalog.

WARNING

There are two types of twelve-point bolts, with and without ribs. Distinguishing characteristics ⇒ Fig. ""Difference Between A Twelve-Point Bolt with Ribs and A Twelve-Point Bolt without Ribs"" , page 122

When installing a twelve-point bolt, always check what type of twelve-point bolt is to be used.

Use the correct tightening specification for the specific bolt.

The tightening specification for a twelve-point bolt »with« ribs is 70 Nm + 90°. Refer to ⇒ "9.1 Twelve-Point Bolt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection", page 77 for loosening and tightening specifications.

The tightening specification for a twelve-point bolt »without« ribs is 200 Nm + 180°. Refer to ⇒ "9.2 Twelve-Point Bolt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection", page 78 for loosening and tightening specifications.

3 - Right Drive Axle

4 - Left Drive Axle

5 - Clamp

- ❑ Always replace if removed
- ❑ Tensioning. Refer to ⇒ Fig. ""Tensioning Clamp On Small Diameter"" , page 114 .

6 - CV Boot for CV Joint

- ❑ Check for tears and scuffing
- ❑ Material: Hytrel polyelastomer

7 - Clamp

- ❑ Always replace if removed
- ❑ Tensioning. Refer to ⇒ Fig. ""Tightening Clamp On Outer Joint"" , page 113 .

8 - Plate Spring

- ❑ Installation position. Refer to ⇒ Fig. ""Installed Location of Spring Washer and Thrust Washer on Outer Joint"" , page 123

9 - Thrust Ring

- ❑ Installation position. Refer to ⇒ Fig. ""Installed Location of Spring Washer and Thrust Washer on Outer Joint"" , page 123

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10 - Circlip

- ❑ Always replace if removed
- ❑ Insert in shaft groove

11 - Clamp

- ❑ Always replace if removed
- ❑ Tension using Hose Clip Pliers - VAG1275A-

12 - CV Boot for Triple Roller Joint

- ❑ Check for tears and scuffing

13 - Clamp

- ❑ Always replace if removed
- ❑ Tension using Hose Clip Pliers - VAG1275A-

14 - Circlip

- ❑ Always replace if removed

15 - Joint

16 - Circlip

- ❑ Always replace if removed
- ❑ Insert into shaft groove using Circlip Pliers - VW161A-

17 - Triple Roller Star with Rollers

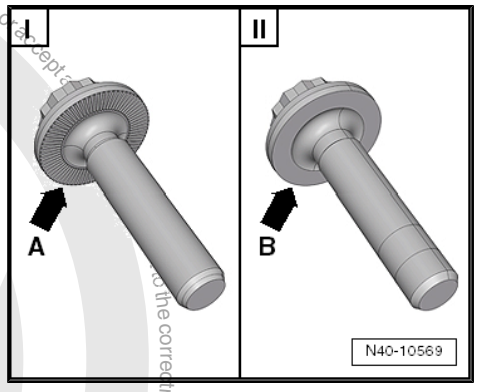
The chamfer -arrow- faces the drive axle splines.

Difference Between A Twelve-Point Bolt with Ribs and A Twelve-Point Bolt without Ribs

The contact surfaces -arrow A- and -arrow B- are different on the two-point bolts.

I - Twelve-point bolt with ribs -arrow A-

II - Twelve-point bolt without ribs -arrow B-



14.2 Drive Axle with Triple Roller Joint AAR2600i, Disassembling and Assembling

Special tools and workshop equipment required

- ♦ Press Plate - VW401-
- ♦ Press Plate - VW402-
- ♦ Press Piece - Rod - VW408A-
- ♦ Press Piece - Rod - VW411-
- ♦ Press Piece - 37mm - VW416B-
- ♦ Press Piece - Multiple Use - VW447H-
- ♦ Hose Clip Pliers - VAG1275A-
- ♦ Torque Wrench 1331 5-50Nm - VAG1331-
- ♦ Torque Wrench 1332 40-200Nm - VAG1332-
- ♦ Clamping Pliers - VAG1682A-

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- Tripod Joint Tool - T10065-
- Slide Hammer Set - VW771-
- Puller - Drive Axle - T10382-

Perform the Following

Removing the Outer CV Joint

– Clamp the drive axle with protective jaws in a vise clamp.

– Fold back boot.

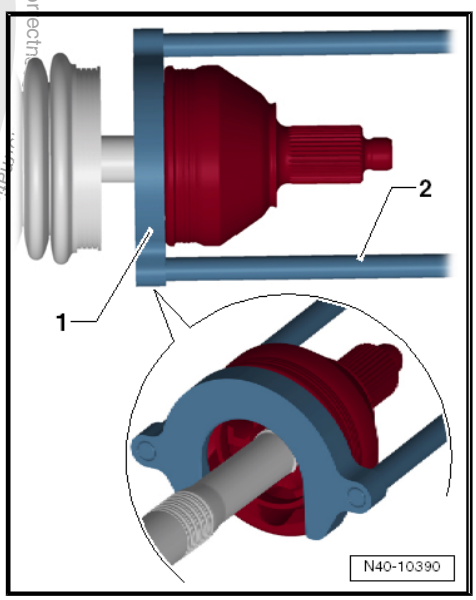
– Align the Puller - Drive Axle - T10382- so that the flat side of the Puller - Drive Axle - T10382/1- faces the Puller - Drive Axle - Spindles - T10382/2- .

– Attach the Puller - Drive Axle - T10382- to the Slide Hammer Set - VW771- .

– Remove the CV joint from the drive axle using the Puller - Drive Axle - T10382- and Slide Hammer Set - VW771- .

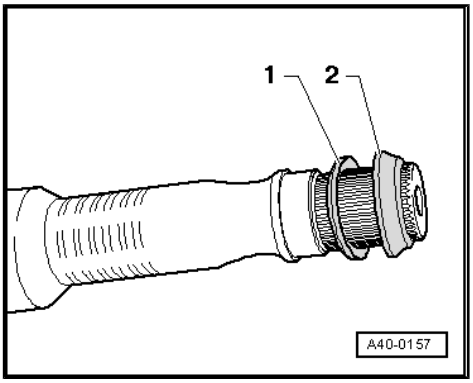
1 - Puller - Drive Axle - Removing Plate - T10382/1-

2 - Puller - Drive Axle - Spindles - T10382/2-



Installing the Outer CV Joint

Installed Location of Spring Washer and Thrust Washer on Outer Joint



1 - Plate Spring

2 - Thrust Ring

– Install the new circlips.

– Slide the new CV boot onto the drive axle if necessary.

– Use a plastic hammer to install it on the shaft until the locking ring locks secure.

Disassembling

– Open both clamps at inner joint and slide back CV boot.

– Remove joint from drive axle.

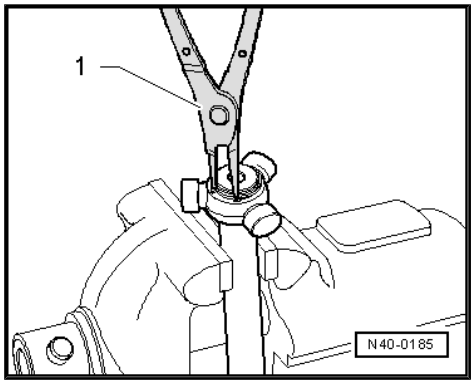
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– Remove the circlip.

1 - Pliers (commercially available)

- or Circlip Pliers - VW161A-

– Insert the drive axle into the press.



– Press the triple roller star off the drive axle.

– Pull off CV boot from shaft.

– Clean shaft, joint and groove for oil seal.

Assembling

– Slide small clamp for joint protective boot onto shaft.

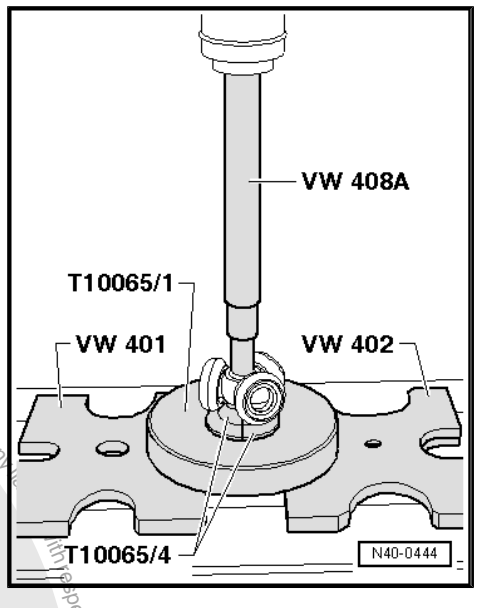
– Slide CV boot onto shaft.

– Slide joint piece onto shaft.

Triple Roller Star, Mounting

Conical Drive Axle Version

The chamfer on triple roller star faces toward shaft, this is used as an assembly aid.



– Connect triple roller star on shaft and press on up to stop.

– Make sure the pressure does not increase above 3.0 t.

– If necessary, coat the splines of the drive axle and triple roller star with Lubricant - G 052 142 A2- .

– Insert the circlip while making sure it sits properly.

– Press half of the joint grease from the repair set into the triple roller joint.

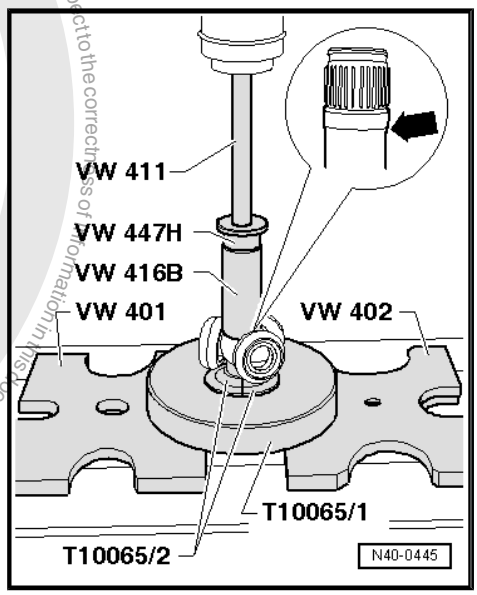
– Slide joint piece over rollers and secure.

– Press the other half of the drive axle grease from the repair kit into the rear side of the triple roller joint.

– Install CV boot.

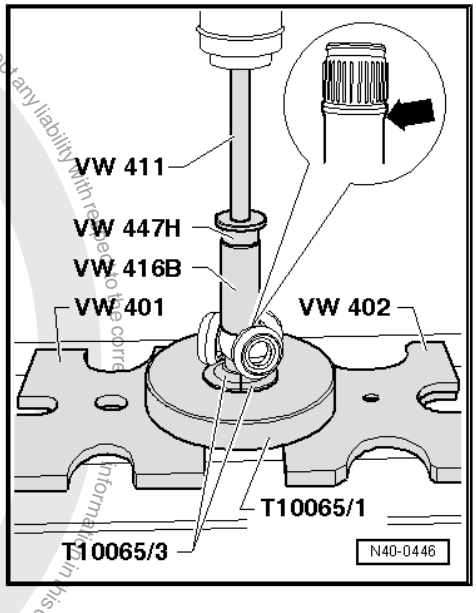
Triple Roller Star, Mounting

Cylindrical-Type Drive Axle



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- Connect triple roller star on shaft and press on up to stop.
- Make sure the pressure does not increase above 3.0 t.
- If necessary, coat the splines of the drive axle and triple roller star with Lubricant - G 052 142 A2- .
- Insert the circlip while making sure it sits properly.
- Press half of the joint grease from the repair set into the triple roller joint.
- Slide joint piece over rollers and secure.
- Press the other half of the drive axle grease from the repair kit into the rear side of the triple roller joint.
- Install CV boot.
- Push the protective boot onto the joint and mount the clamp ⇒ Fig. ""Tightening Clamp On Outer Joint"" , page 113



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15 Drive Axle with Triple Roller Joint AAR3300i

⇒ “15.1 Overview - Drive Axle with Triple Roller Joint AAR3300i”, page 126

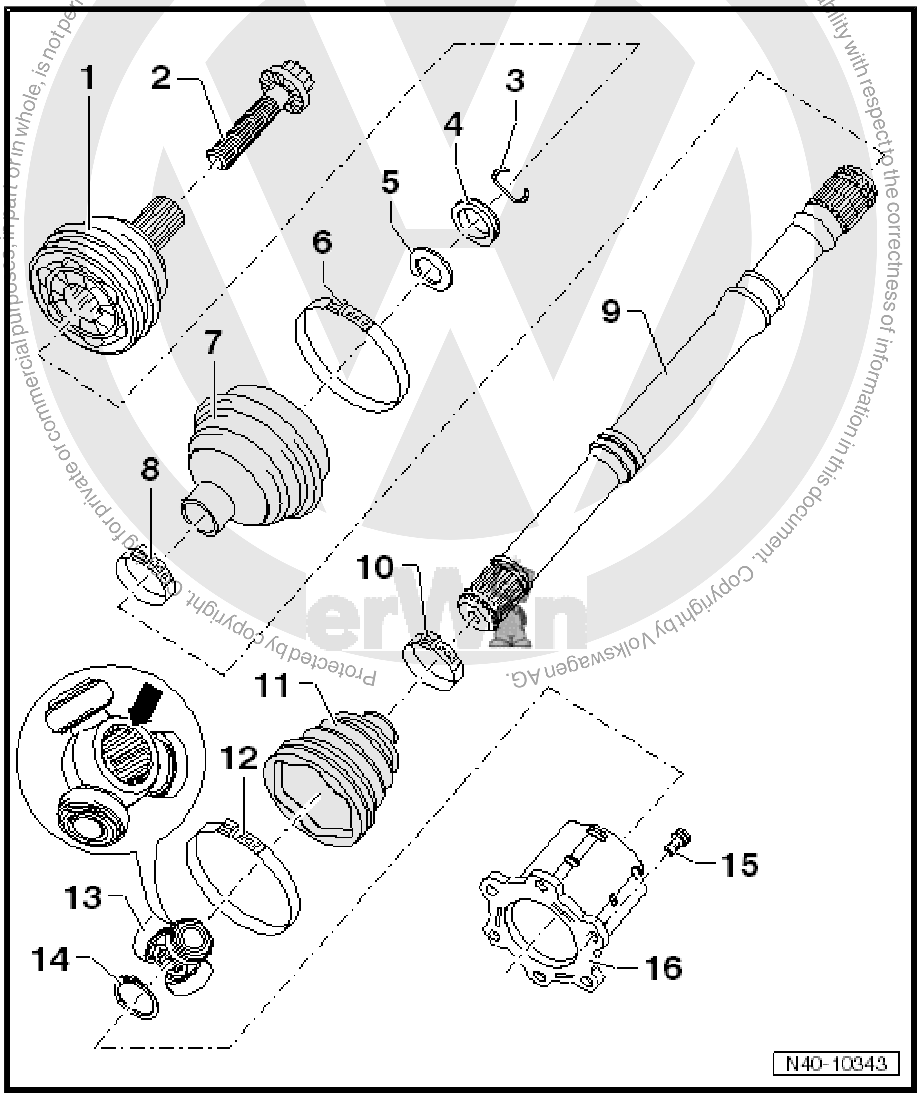
⇒ “15.2 Drive Axle with Triple Roller Joint AAR3300i, Disassembling and Assembling”, page 128

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15.1 Overview - Drive Axle with Triple Roller Joint AAR3300i

1 - Outer CV Joint
- ❑ Replace only as a complete unit.
- ❑ Removing. Refer to ⇒ page 129 .
- ❑ Installing: Drive onto shaft with plastic hammer until compressed circlip seats.
- ❑ Checking. Refer to ⇒ “11.3 Outer CV Joint, Checking”, page 105 .

2 - Bolt
- ❑ There are different versions.
- ❑ Allocation. Refer to the Parts Catalog.



WARNING

There are two types of twelve-point bolts, with and without ribs. Distinguishing characteristics ⇒ Fig. ""Difference Between A Twelve-Point Bolt with Ribs and A Twelve-Point Bolt without Ribs"" , page 128

When installing a twelve-point bolt, always check what type of twelve-point bolt is to be used.

Use the correct tightening specification for the specific bolt.

The tightening specification for a twelve-point bolt »with« ribs is 70 Nm + 90°. Refer to ⇒ "9.1 Twelve-Point Bolt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection", page 77 for loosening and tightening specifications.

The tightening specification for a twelve-point bolt »without« ribs is 200 Nm + 180°. Refer to ⇒ "9.2 Twelve-Point Bolt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection", page 78 for loosening and tightening specifications.

- ❑ Always replace if removed

3 - Circlip

- ❑ Always replace if removed
- ❑ Insert in shaft groove

4 - Thrust Ring

- ❑ Installation position. Refer to ⇒ Fig. ""Installed Location of Spring Washer and Thrust Washer on Outer Joint"" , page 129

5 - Plate Spring

- ❑ Installation position. Refer to ⇒ Fig. ""Installed Location of Spring Washer and Thrust Washer on Outer Joint"" , page 129

6 - Clamp

- ❑ Always replace if removed
- ❑ Tensioning. Refer to ⇒ Fig. ""Tightening Clamp on Outer Joint"" , page 132 .

7 - CV Boot for CV Joint

- ❑ Check for tears and scuffing
- ❑ Material: Hytrel polyelastomer

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8 - Clamp

- ❑ Always replace if removed
- ❑ Tensioning. Refer to
⇒ Fig. ""Tightening the Tensioning Clamp on the Smaller Diameter on the Inner/Outer Joint"" , page 132

9 - Drive Axle

10 - Clamp

- ❑ Always replace if removed
- ❑ Tensioning. Refer to
⇒ Fig. ""Tightening the Tensioning Clamp on the Smaller Diameter on the Inner/Outer Joint"" , page 132

11 - CV Boot for Triple Roller Joint

- ❑ Check for tears and scuffing

12 - Clamp

- ❑ Always replace if removed
- ❑ Tensioning. Refer to
⇒ Fig. ""Tightening the Tensioning Clamps on the Larger Diameter on the Inner Joint."" , page 131 .

13 - Triple Roller Star with Rollers

The chamfer -arrow- faces the drive axle splines.

14 - Circlip

- ❑ Always replace if removed
- ❑ Insert in shaft groove

15 - Internal Multi-Point Bolt

- ❑ First tighten diagonally to 10 Nm, then tighten diagonally again to the tightening specification
- ❑ 70 Nm
- ❑ M10 x 23

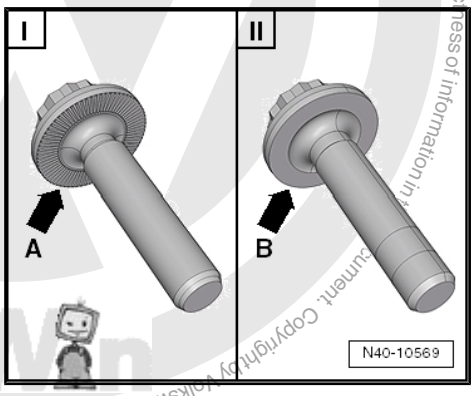
16 - Joint

Difference Between A Twelve-Point Bolt with Ribs and A Twelve-Point Bolt without Ribs

The contact surfaces -arrow A- and -arrow B- are different on the two-point bolts.

I - Twelve-point bolt with ribs -arrow A-

II - Twelve-point bolt without ribs -arrow B-



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15.2 Drive Axle with Triple Roller Joint AAR3300i, Disassembling and Assembling

Special tools and workshop equipment required

- ♦ Press Plate - VW401-
- ♦ Press Plate - VW402-
- ♦ Press Piece - Rod - VW408A-
- ♦ Press Piece - Rod - VW411-

- Press Piece - 37mm - VW416B-
- Press Piece - Multiple Use - VW447H-
- Hose Clip Pliers - VAG1275A-
- Torque Wrench 1331 5-50Nm - VAG1331-
- Torque Wrench 1332 40-200Nm - VAG1332-
- Clamping Pliers - VAG1682A-
- Tripod Joint Tool - T10065-
- Slide Hammer Set - VW771-
- Puller - Drive Axle - T10382-

Removing the Outer CV Joint

– Clamp the drive axle with protective jaws in a vise clamp.

– Fold back boot.

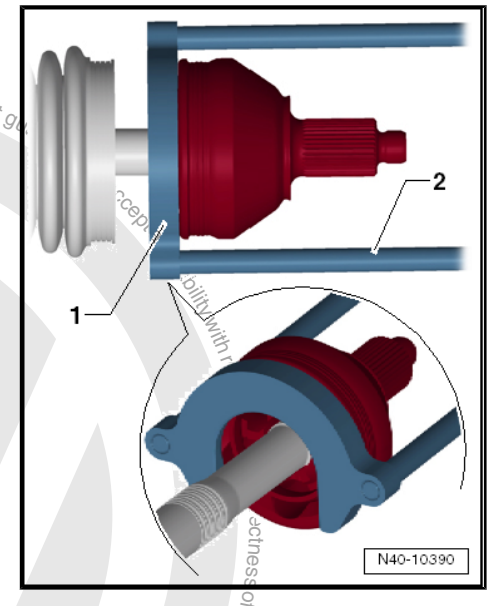
– Align the Puller - Drive Axle - T10382- so that the flat side of the Puller - Drive Axle - T10382/1- faces the Puller - Drive Axle - Spindles - T10382/2- .

– Attach the Puller - Drive Axle - T10382- to the Slide Hammer Set - VW771- .

– Remove the CV joint from the drive axle using the Puller - Drive Axle - T10382- and Slide Hammer Set - VW771- .

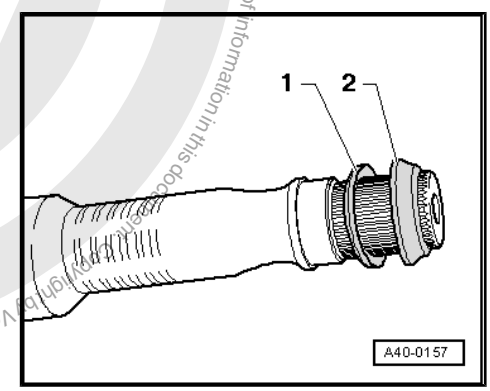
1 - Puller - Drive Axle - Removing Plate - T10382/1-

2 - Puller - Drive Axle - Spindles - T10382/2-



Installing the Outer CV Joint

Installed Location of Spring Washer and Thrust Washer on Outer Joint



1 - Plate Spring

2 - Thrust Ring

– Install the new circlips.

– Slide the new CV boot onto the drive axle if necessary.

– Use a plastic hammer to install it on the shaft until the locking ring locks secure.

Disassembling

– Open both clamps at inner joint and slide back CV boot.

– Remove joint from drive axle.

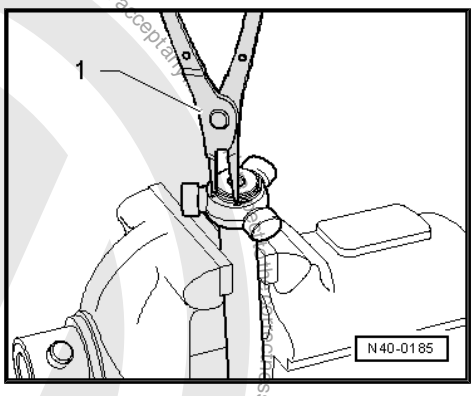
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– Remove the circlip.

1 - Pliers (commercially available)

- or Circlip Pliers - VW161A-

– Insert the drive axle into the press.



– Press the triple roller star off the drive axle.

– Pull off CV boot from shaft.

– Clean shaft, joint and groove for oil seal.

Assembling

– Slide small clamp for joint protective boot onto shaft.

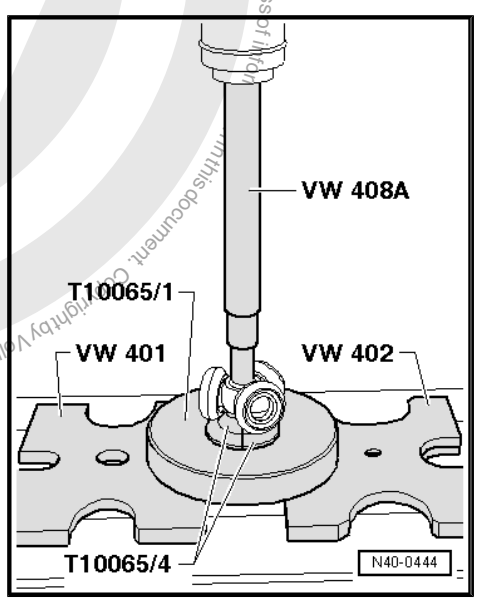
– Slide CV boot onto shaft.

– Slide joint piece onto shaft.

Triple Roller Star, Mounting

Conical Drive Axle Version

The chamfer on triple roller star faces toward shaft, this is used as an assembly aid.



– Connect triple roller star on shaft and press on up to stop.

– Make sure the pressure does not increase above 3.0 t.

– If necessary, coat the splines of the drive axle and triple roller star with Lubricant - G 052 142 A2- .

– Insert the circlip while making sure it sits properly.

– Press half of the joint grease from the repair set into the triple roller joint.

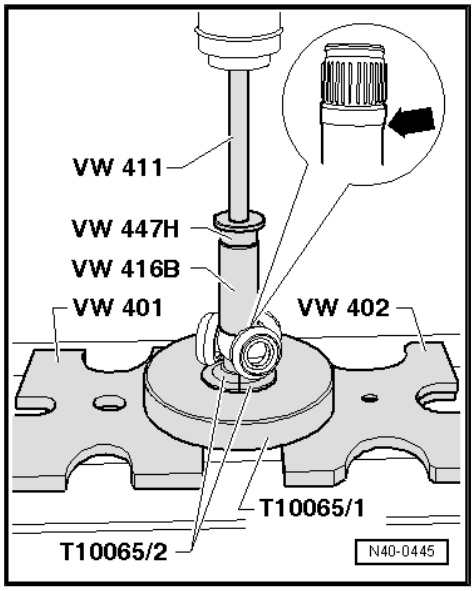
– Slide joint piece over rollers and secure.

– Press the other half of the drive axle grease from the repair kit into the rear side of the triple roller joint.

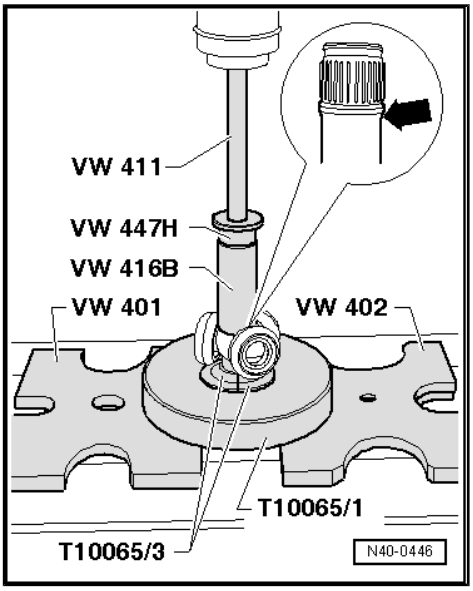
– Install CV boot.

Triple Roller Star, Mounting

Cylindrical-Type Drive Axle



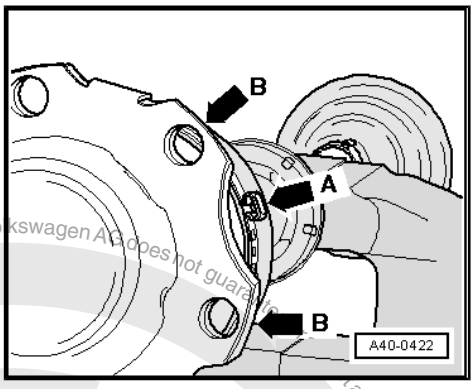
– Connect triple roller star on shaft and press on up to stop.
– Make sure the pressure does not increase above 3.0 t.
– If necessary, coat the splines of the drive axle and triple roller star with Lubricant - G 052 142 A2- .
– Insert the circlip while making sure it sits properly.
– Press half of the joint grease from the repair set into the triple roller joint.
– Slide joint piece over rollers and secure.
– Press the other half of the drive axle grease from the repair kit into the rear side of the triple roller joint.
– Install CV boot.
– Push the protective boot onto the joint and mount the clamp ⇒ Fig. ""Tightening Clamp On Outer Joint"" , page 113



– Install clamp.

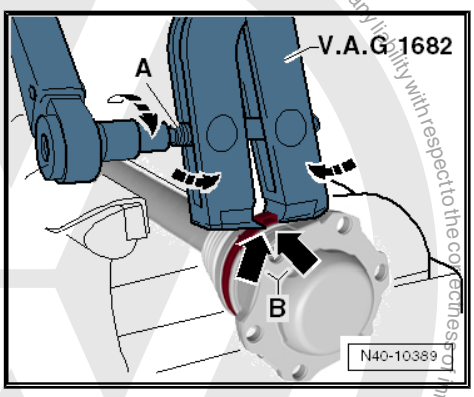
Note

For a better alignment of the multi-point socket head bolts when mounting the axle shaft, it is necessary that the clamping ear of the clamp in direction of -arrow A- is placed between the fixing flanges from the joint -arrows B-.



Tightening the Tensioning Clamps on the Larger Diameter on the Inner Joint.

– Attach the Clamping Pliers - VAG1682A- as illustrated. When doing this, make sure that edges of clamping pliers are seated in corners -arrows B- of clamp.
– Tension clamp by turning spindle with a torque wrench (do not tilt clamp tool).

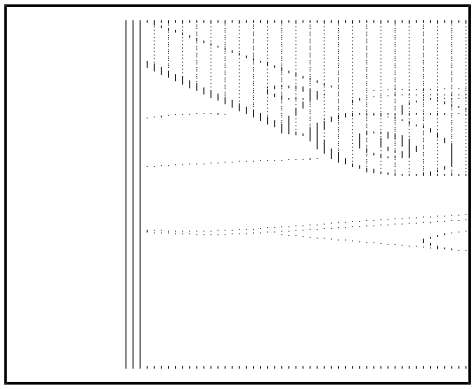


Note

- *The hard material of the CV boot (compared to rubber) makes it necessary to use a stainless steel hose clamp. It is only possible to tighten the hose clamp with Clamping Pliers - VAG1682A- .*
- *Tightening specification: 25 Nm.*
- *Use torque wrench -C- with adjustment range 5 to 50 Nm (for example Torque Wrench 5-50Nm - VAG1331-).*
- *Make sure the threads on the spindle -A- on the pliers move easily. Lubricate with MOS 2 grease, if necessary.*
- *If difficult to tighten, for example because of dirty threads, the proper clamping force of the clamping sleeve will not be reached even when tightened to the specification.*

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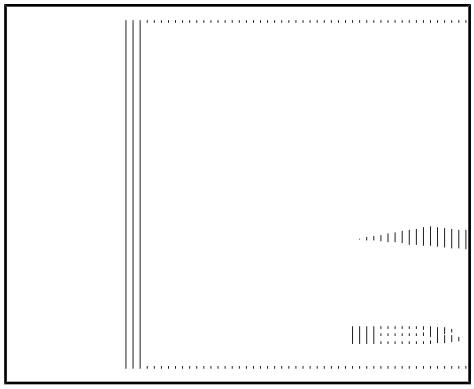
Tightening Clamp on Outer Joint



– Attach the CV Joint Boot Clamp Tool - VAG1682- as illustrated. When doing this, make sure that edges of clamping pliers are seated in corners -arrows B- of clamp.

– Tension clamp by turning spindle with a torque wrench (do not tilt clamp tool).

Tightening the Tensioning Clamp on the Smaller Diameter on the Inner/Outer Joint

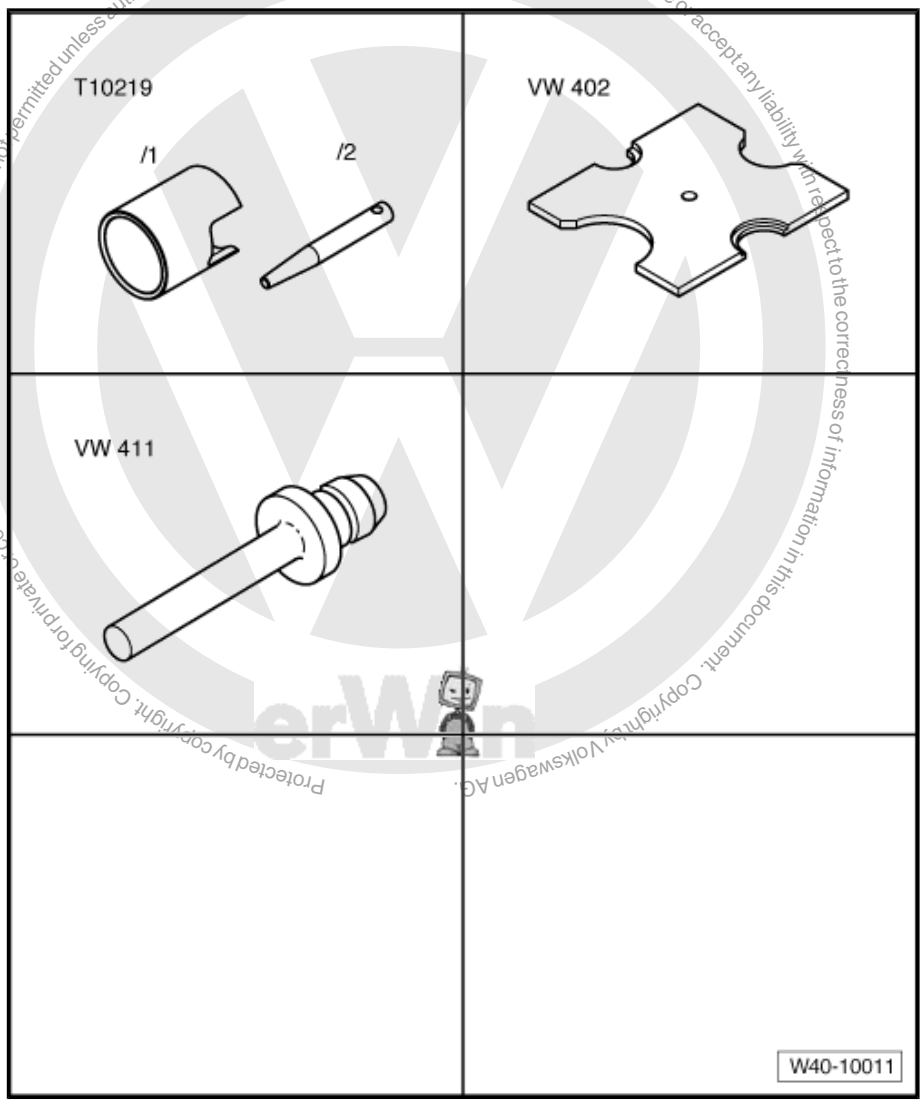


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16 Special Tools

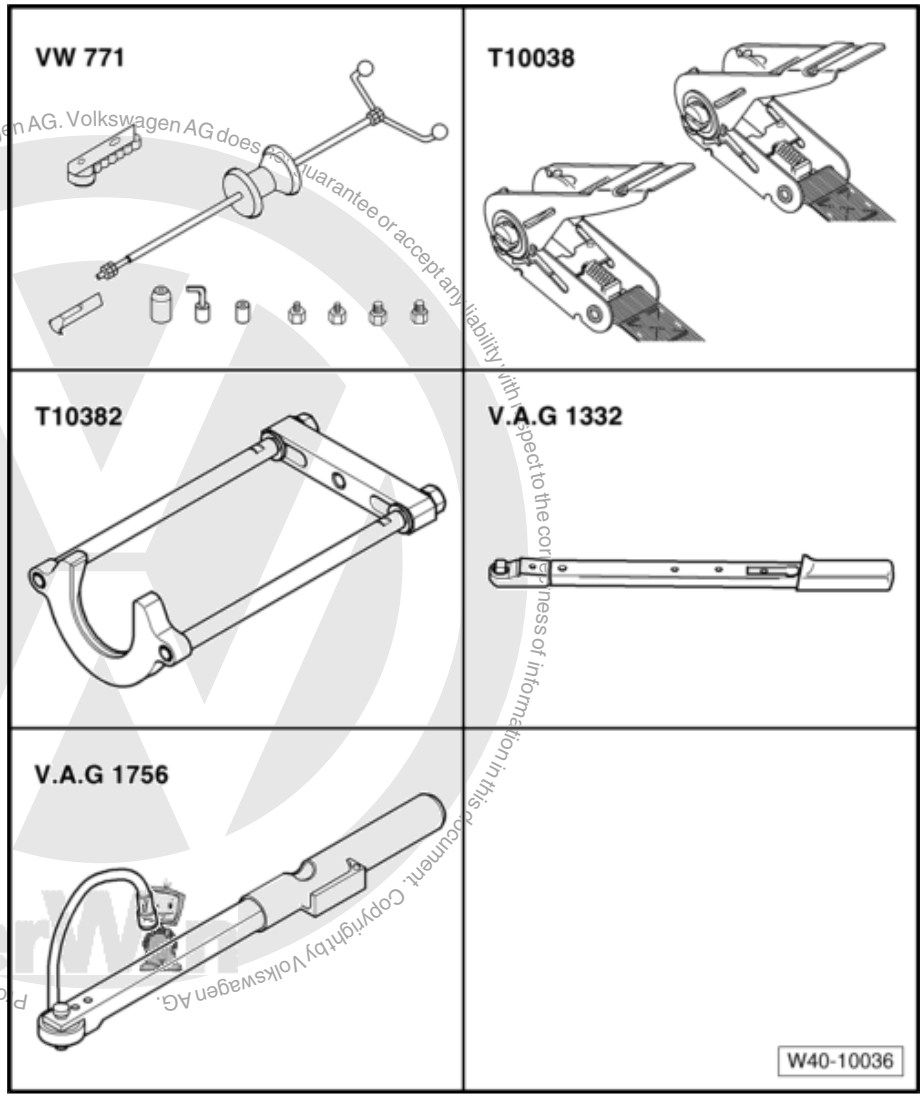
Special tools and workshop equipment required

- Wishbone Rubber Mount Assembly Tool - T10219-
- Press Plate - VW402-
- Press Piece - Rod - VW411-



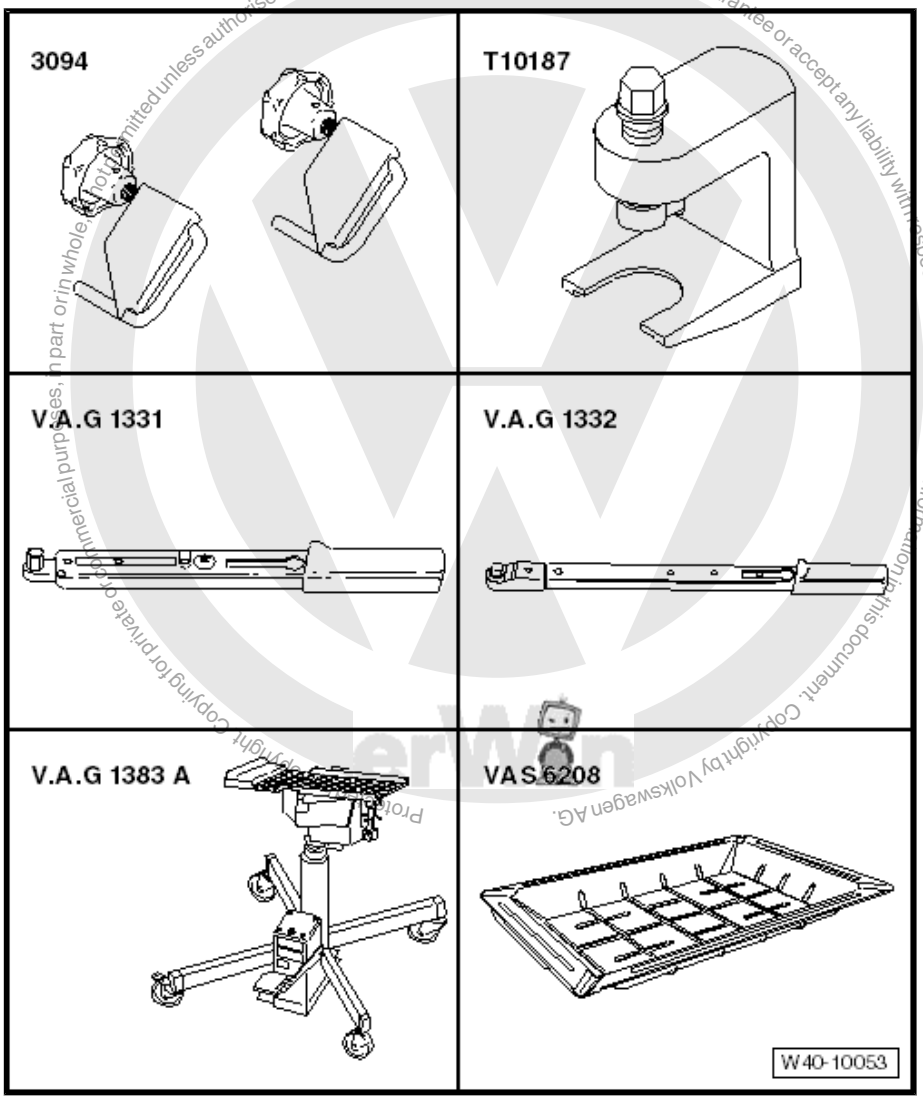
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- Slide Hammer Set - VW771-
- Tensioning Strap - T10038-
- Puller - Drive Axle - T10382-
- Torque Wrench 1332 40-200Nm - VAG1332-
- Digital Torque Wrench - VAG1756A-



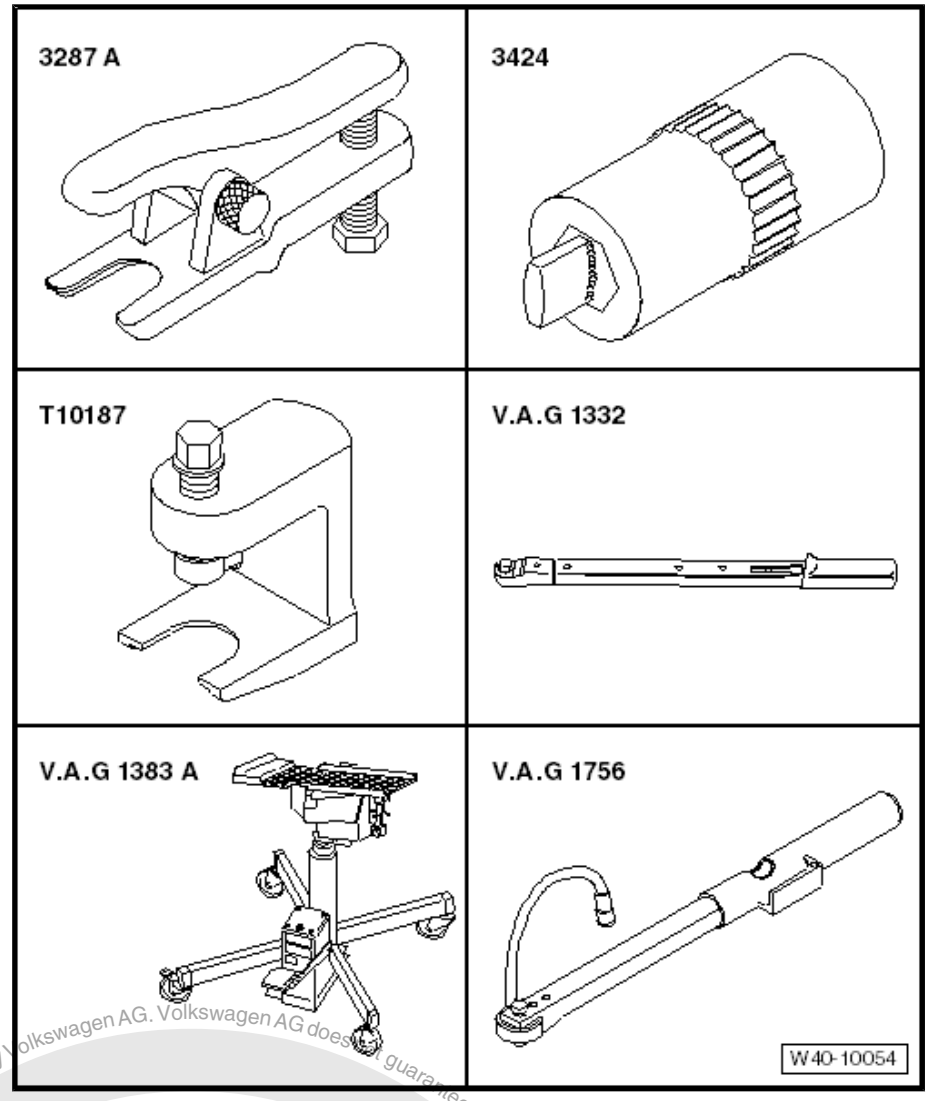
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- Hose Clamps - Up To 25mm - 3094-
- Puller - Ball Joint - T10187-
- Torque Wrench 1331 5-50Nm - VAG1331-
- Torque Wrench 1332 40-200Nm - VAG1332-
- Engine and Gearbox Jack - VAS6931-
- Shop Crane - Drip Tray - VAS6208-



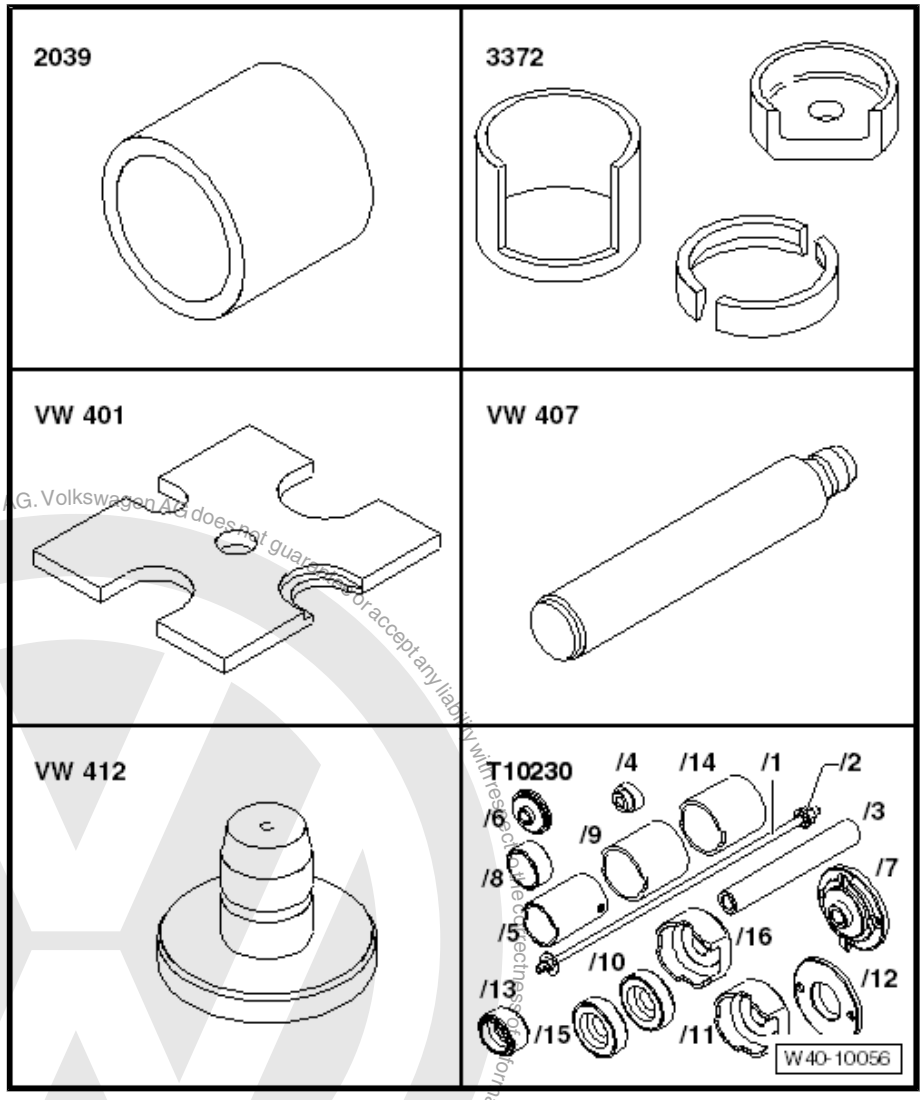
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- Puller - Ball Joint - 3287A-
- Spreader Tool - 3424-
- Puller - Ball Joint - T10187-
- Torque Wrench 1332 40-200Nm - VAG1332-
- Engine and Gearbox Jack - VAS6931-
- Digital Torque Wrench - VAG1756A-



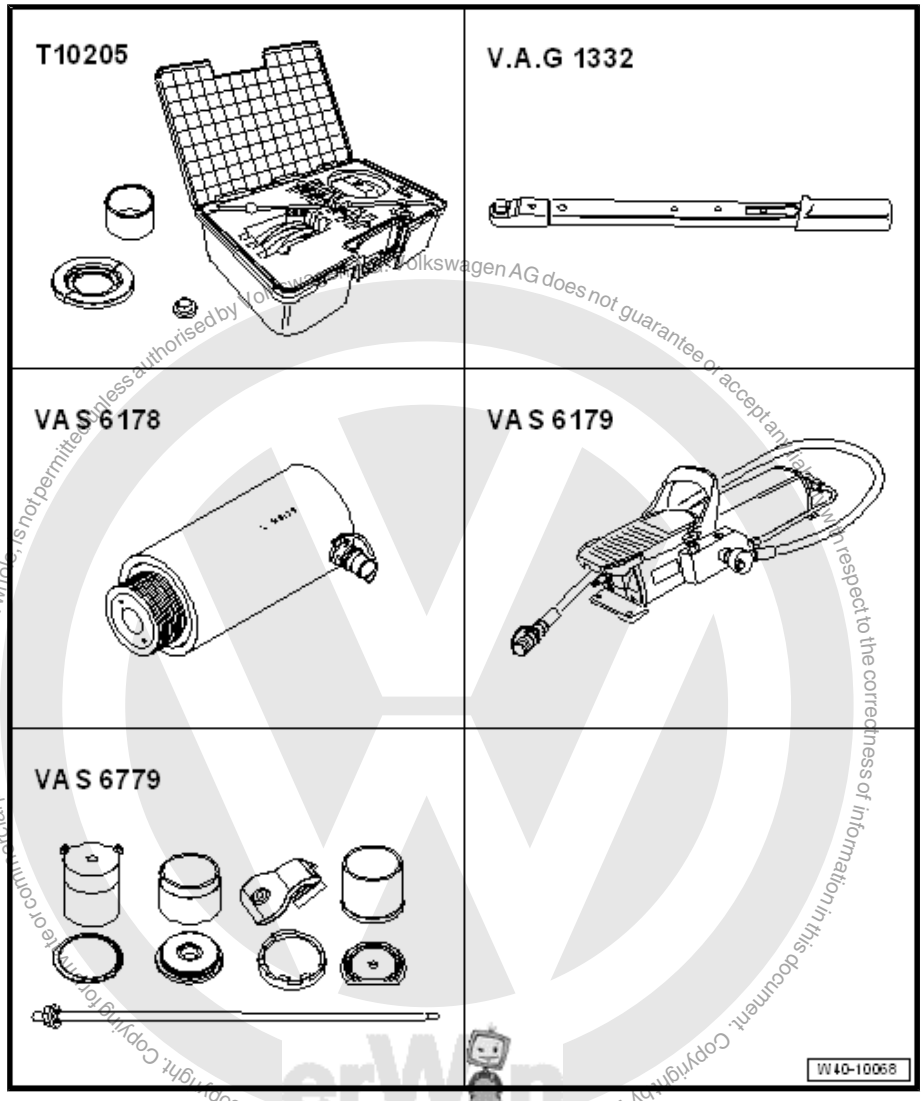
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- Bearing Installer - Front Wheel Bearing - 2039-
- Front Subframe Mount Kit - 3372-
- Press Plate - VW401-
- Press Piece - Rod - VW407-
- Press Piece - Multiple Use - VW412-
- Hydraulic Press - Bushing Assembly Tool Kit - T10230-
- Press Piece - Rear Track Control Arm - T10453-



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- Bearing Installer - Wheel Hub/Bearing Kit - T10205-
- Torque Wrench 1332 40-200Nm - VAG1332-
- Hydraulic Press - VAS6178-
- Pneumatic/Hydraulic Foot Pump - VAS6179-
- Rubber Bushing Assembly Device Kit - VAS6779A-



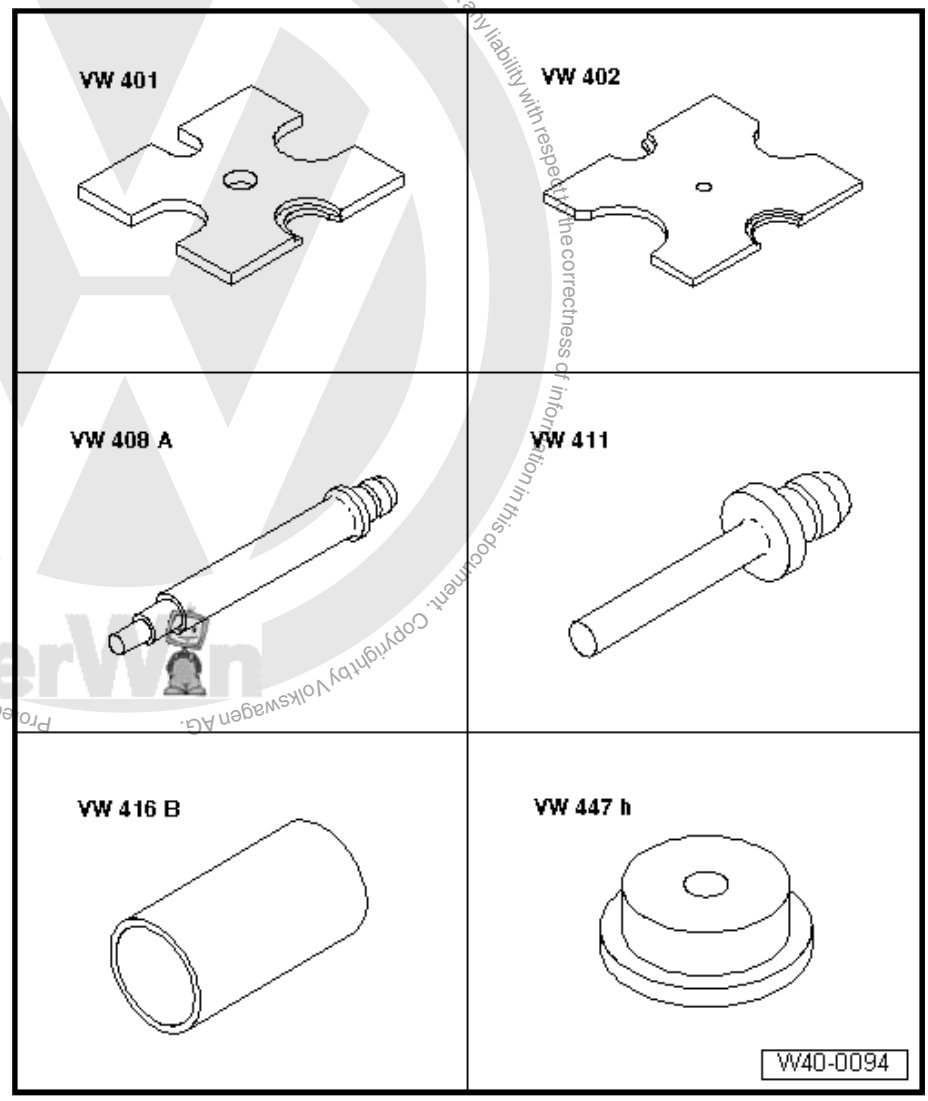
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- Drive Axle Wedge Tool - T10161-
- Drive Shaft Remover - T10520-
- Torque Wrench 1332 40-200Nm - VAG1332-



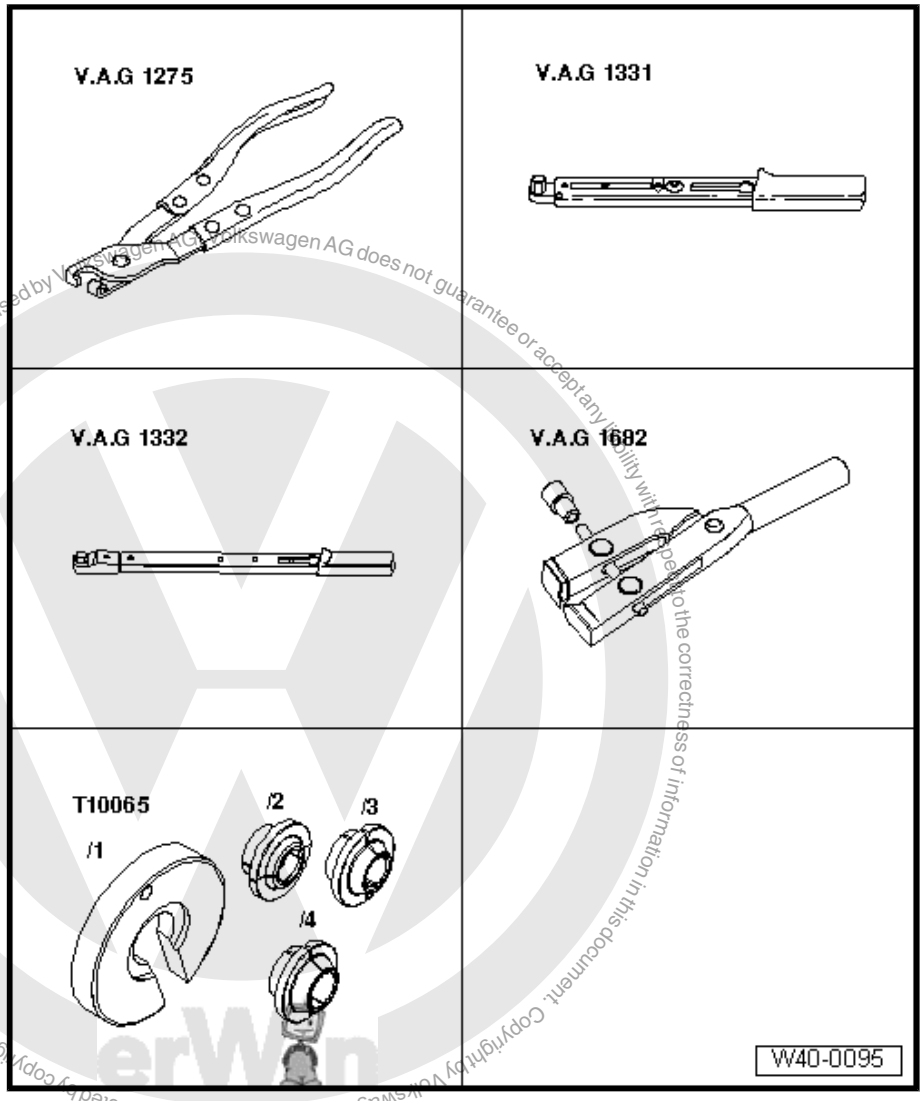
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- Press Plate - VW401-
- Press Plate - VW402-
- Press Piece - Rod - VW408A-
- Press Piece - Rod - VW411-
- Press Piece - 37mm - VW416B-
- Press Piece - Multiple Use -VW447H-



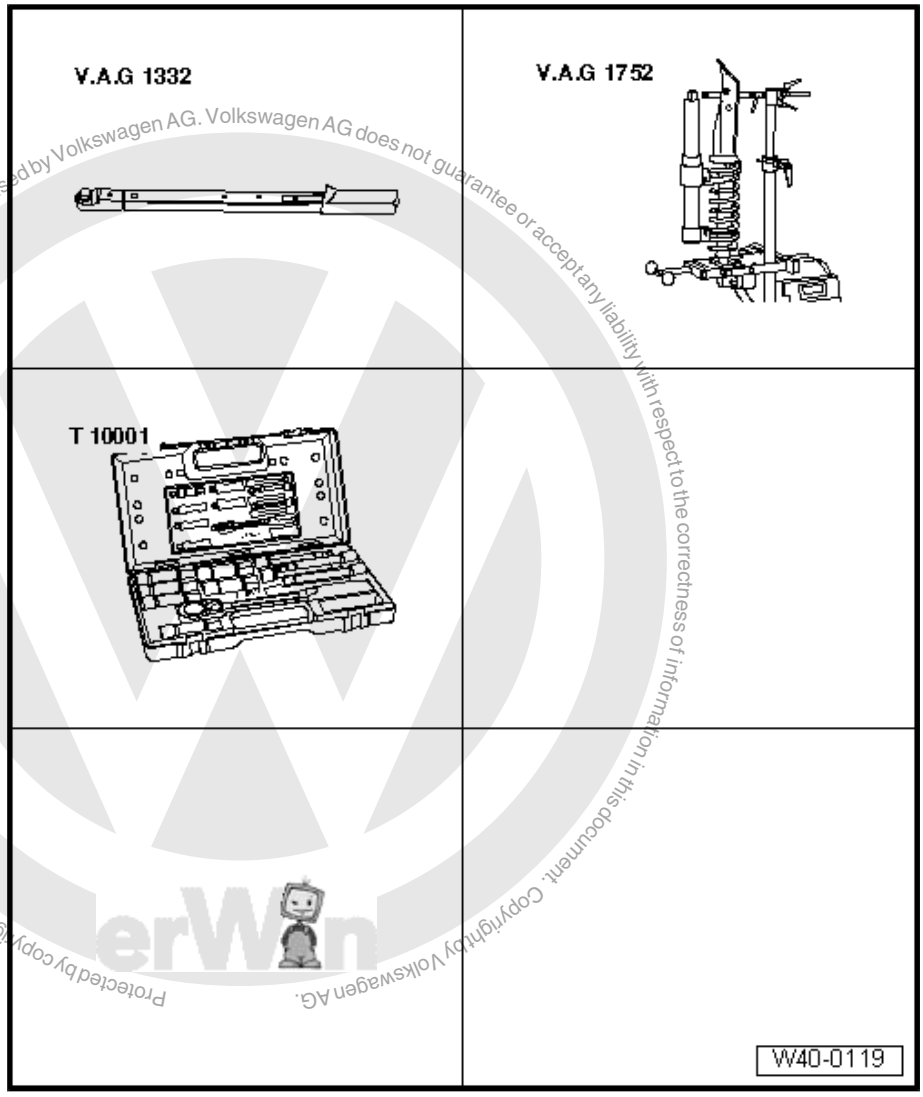
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- Hose Clip Pliers - VAG1275A-
- Torque Wrench 1331 5-50Nm - VAG1331-
- Torque Wrench 1332 40-200Nm - VAG1332-
- Clamping Pliers - VAG1682A-
- Tripod Joint Tool - T10065-



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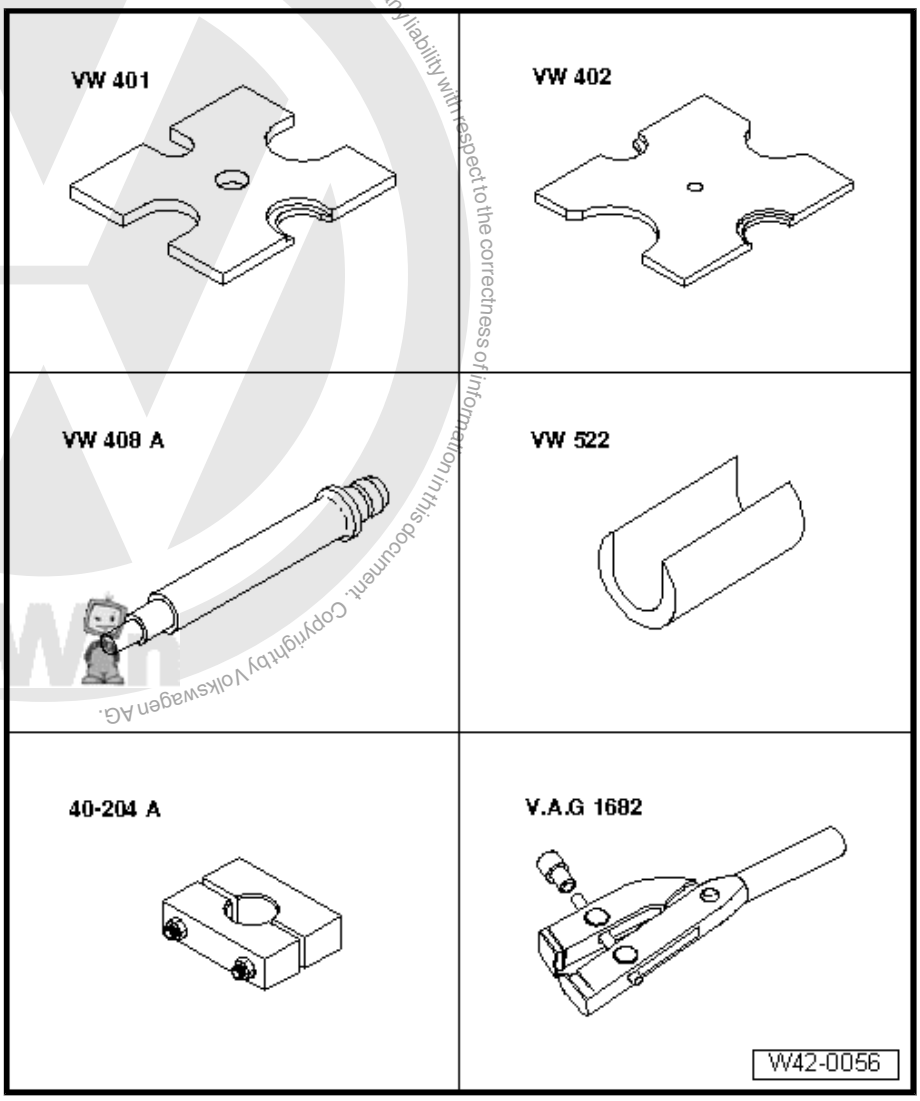
- Torque Wrench 1332 40-200Nm - VAG1332-
- Spring Compressor Kit - Spring Tensioner - VAG1752/1-
- Spring Compressor Kit - Spring Retainer w/Inserts - VAG1752/4-
- Spring Compressor Kit - Strut Clamping Block - VAG1752/20-
- Shock Absorber Set - T10001-
- Ratchet (Commercially Available)



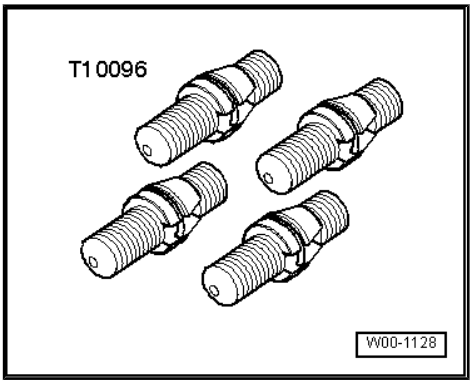
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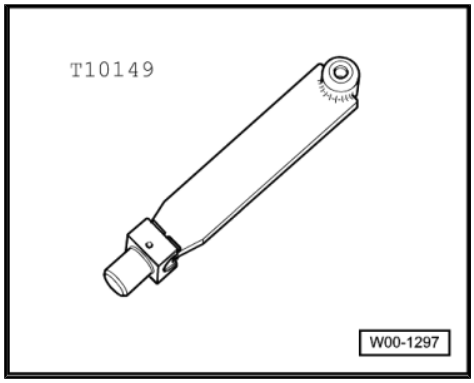
- Press Plate - VW401-
- Press Plate - VW402-
- Press Piece - Rod - VW408A-
- CV Joint Press Sleeve - VW522-
- Press Block - 40-204A-
- Clamping Pliers - VAG1682A-



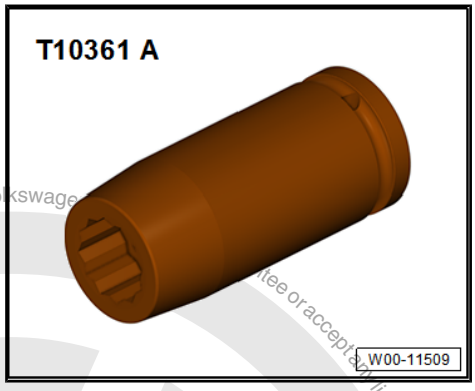
- Locating Pins - T10096-



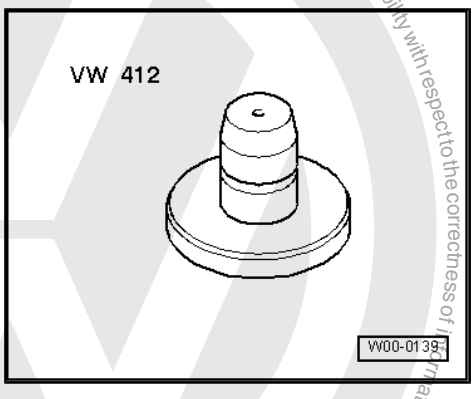
- Engine/Gearbox Jack Adapter - Wheel Hub Support - T10149-



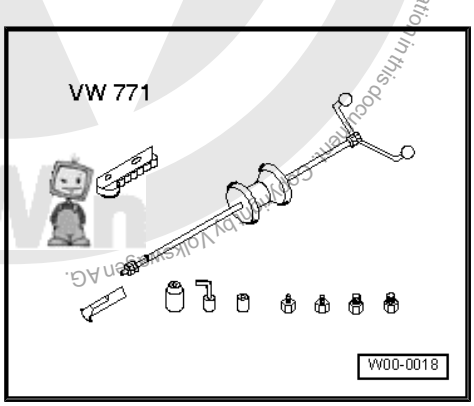
- Socket AF 24 mm - T10361A-



- Press Piece - Multiple Use - VW412-



- Slide Hammer Set - VW771-



- Subframe Locking Pin (2 pc.) - T10452-
- Drive Shaft Remover - T10520-

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42 – Rear Suspension

1 Vehicles Involved in Collisions, Evaluating

For a check list for assessing the suspension on vehicles involved in a collision. Refer to
⇒ “1 Check List, Assessing the Suspension on Vehicles Involved in a Collision”, page 1 .

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2 Rear Axle Curb Weight (Twist Beam Rear Suspension)

Special tools and workshop equipment required

- Engine and Gearbox Jack - VAS6931-
- Tensioning Strap - T10038-
- Engine/Gearbox Jack Adapter - Wheel Hub Support - T10149-

Caution

All bolts on suspension components with bonded rubber bushings must always be tightened in curb weight position (unloaded condition).

Bonded rubber bushings have a limited range of motion.

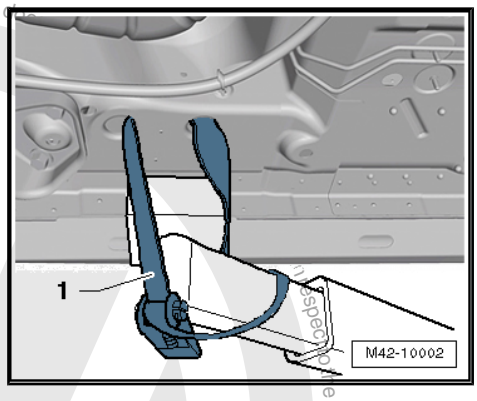
Axle components with bonded rubber bushings must be brought into the position they will be in when driving before they are tightened (curb weight position).

Otherwise, the bonded rubber bushing will have tension, which will reduce the service life.

By raising axle on one side using the Engine and Gearbox Jack - VAS6931- and Engine/Gearbox Jack Adapter - Wheel Hub Support - T10149- , this position can be simulated on the hoist.

Before lifting the axle on one side, the vehicle must be secured on both sides to the hoist lifting arms using Tensioning Strap - T10038- .

1 - Tensioning Strap - T10038-



WARNING

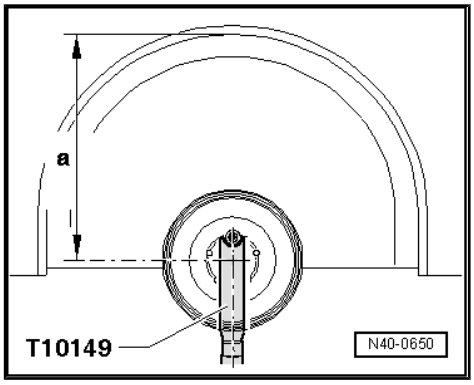
The vehicle could fall off the hoist if it is not secured.

– Turn the wheel hub until one of the holes for the wheel bolts is on top.

– Install the Engine/Gearbox Jack Adapter - Wheel Hub Support - T10149- with the wheel bolt.

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The applicable bolts/nuts must only be tightened when dimension -a- is between the center of the wheel hub and the lower edge of the wheel housing has been reached.



The dimension -a- is dependent on the height of the installed suspension:

Chassis [1]	Height -a- in mm
Basic suspension (2UA)	379 ± 10 mm
Sport suspension NAR/EU/ Rest of World (2UC)	364 ± 10 mm
Sport suspension Mexico (2UC)	379 ± 10 mm
Comfort suspension (2UD)	389 ± 10 mm
Heavy duty suspension (2UB)	399 ± 10 mm

[1] The type of vehicle suspension is indicated on the vehicle data label. The suspension is indicated by a PR number. Allocation of the PR number according to the suspension. Refer to ⇒ page 275 .

– Lift the wheel bearing housing using the Engine and Gearbox Jack - VAS6931- until dimension -a- is reached.

WARNING

- *Do not lift or lower the vehicle when the Engine and Gearbox Jack - VAS6931- is under the vehicle.*
- *Do not leave the Engine and Gearbox Jack - VAS6931- under the vehicle any longer than necessary.*

– Tighten the applicable bolts and nuts.

– Lower the wheel bearing housing.

– Remove the Engine and Gearbox Jack - VAS6931- from under the vehicle.

Remove the Engine/Gearbox Jack Adapter - Wheel Hub Support - T10149-

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3 Overview - Rear Axle (Torsion Beam)

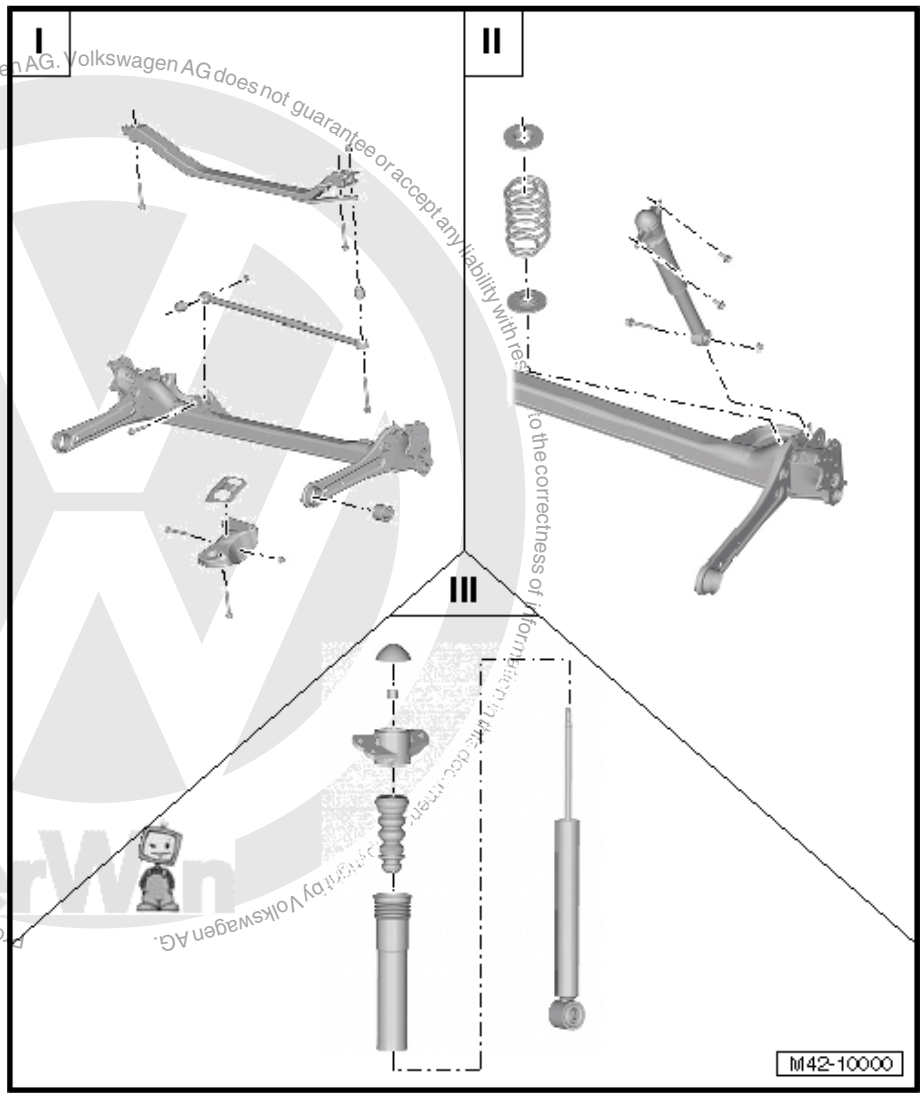
Note

- *Welding and alignment work on supporting or wheel carrying suspension components is not permitted.*
- *Always replace self-locking nuts.*
- *Always replace corroded bolts/nuts.*
- *Bonded rubber bushings have a limited range of motion. Therefore, only tighten the threaded connections on the components with bonded rubber bushings when the wheel bearing housing is lifted (curb weight position). Refer to ⇒ "2 Rear Axle Curb Weight (Twist Beam Rear Suspension)", page 146 .*

I - Overview - Axle Beam, Subframe, Crossbrace (Torsion Beam). Refer to ⇒ "4 Axle Beam, Subframe, Crossbrace (Torsion Beam)", page 150 .

II - Overview - Suspension (Torsion Beam). Refer to ⇒ "6 Suspension (Torsion Beam)", page 168 .

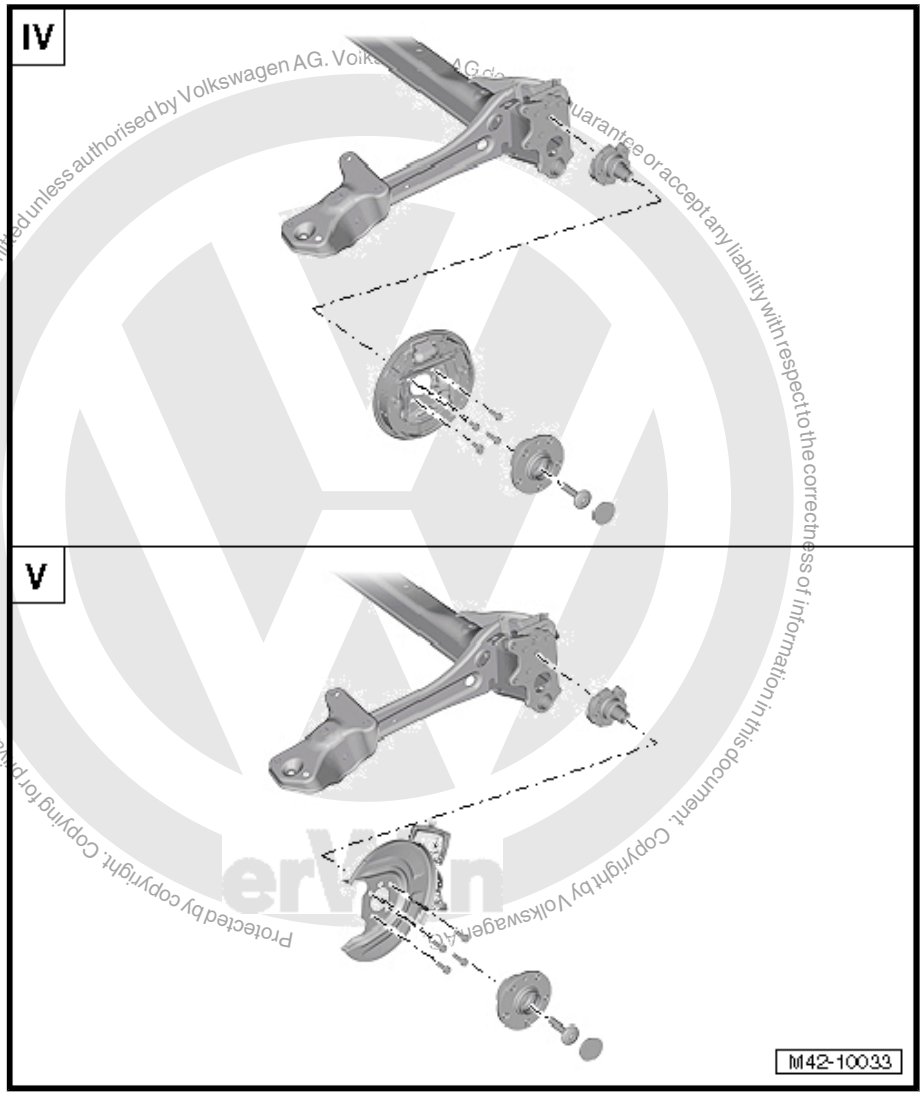
III - Overview - Shock Absorber (Torsion Beam). Refer to ⇒ "7 Shock Absorber (Torsion Beam)", page 171 .



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IV - Overview - Wheel Bearing, Drum Brake (Torsion Beam). Refer to
⇒ “8 Wheel Bearing, Drum Brake (Torsion Beam)”, page 174 .

V - Overview - Wheel Bearing, Disc Brake (Torsion Beam). Refer to
⇒ “9 Wheel Bearing, Disc Brake (Torsion Beam)”, page 178 .



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4 Axle Beam, Subframe, Crossbrace (Torsion Beam)

⇒ “4.1 Overview - Axle Beam, Subframe, Crossbrace (Torsion Beam)”, page 150

⇒ “4.2 Axle Beam, Removing and Installing”, page 152

⇒ “4.3 Axle Beam Bonded Rubber Bushing, Removing and Installing”, page 155

⇒ “4.4 Crossbrace, Removing and Installing”, page 158

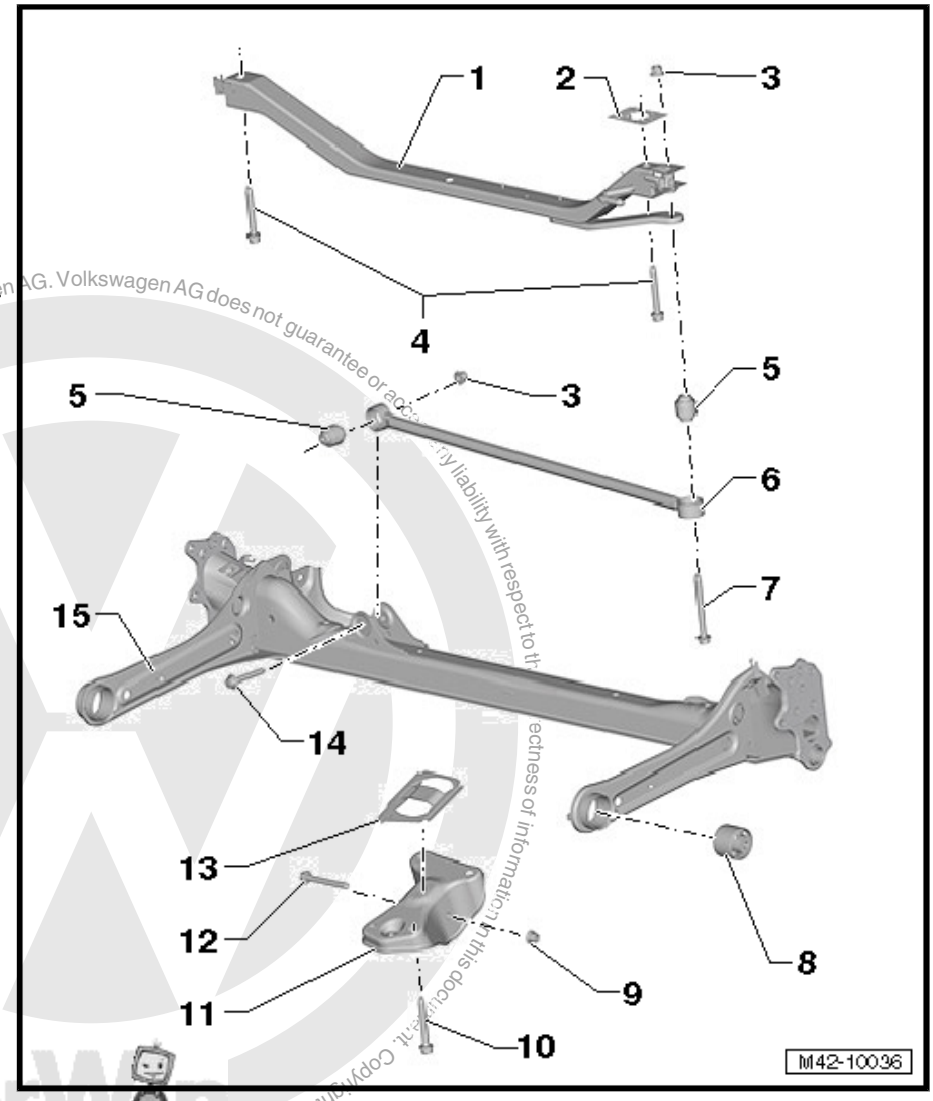
⇒ “4.5 Crossbrace Bonded Rubber Bushing, Removing and Installing”, page 159

4.1 Overview - Axle Beam, Subframe, Crossbrace (Torsion Beam)

Note

- *Welding and alignment work on supporting or wheel carrying suspension components is not permitted.*
- *Always replace self-locking nuts.*
- *Always replace corroded bolts/nuts.*
- *Bonded rubber bushings have a limited range of motion. Therefore, only tighten the threaded connections on the components with bonded rubber bushings when the wheel bearing housing is lifted (curb weight position). Refer to ⇒ “2 Rear Axle Curb Weight (Twist Beam Rear Suspension)”, page 146 .*

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1 - Subframe

2 - Intermediate Plate

3 - Nut

- ❑ 70 Nm + 90° turn
- ❑ Always replace if removed

4 - Bolt

- ❑ Follow the tightening sequence:

- ♦ 1. 90 Nm +90° turn
- ♦ 2. Loosen 360°
- ♦ 3. 90 Nm + 180° turn

- ❑ Always replace if removed

5 - Bonded Rubber Bushing

- ❑ Removing and installing. Refer to ⇒ “4.5 Crossbrace Bonded Rubber Bushing, Removing and Installing”, page 159 .

6 - Crossbrace

- ❑ Removing and installing. Refer to ⇒ “4.4 Crossbrace, Removing and Installing”, page 158 .
- ❑ Servicing. Refer to ⇒“4.5 Crossbrace Bonded Rubber Bushing, Removing and Installing”, page 159 .

7 - Bolt

- ❑ Always replace if removed

8 - Bonded Rubber Bushing

- ❑ Removing and installing. Refer to ⇒ “4.3 Axle Beam Bonded Rubber Bushing, Removing and Installing”, page 155 .

9 - Nut

- ❑ 70 Nm + 90° turn
- ❑ Always replace if removed

10 - Bolt

- ❑ 50 Nm + 45° turn
- ❑ Always replace if removed

11 - Mounting Bracket

12 - Bolt

- ❑ Always replace if removed

13 - Cover

14 - Bolt

- ❑ Always replace if removed

15 - Axle Beam

- ❑ No paint or dirt on contact surface and threaded hole for the axle stub

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- ❑ Removing and installing. Refer to ⇒ “4.2 Axle Beam, Removing and Installing”, page 152 .
- ❑ Pay attention to the following note with installing a new axle beam. Refer to ⇒ page 155 .

4.2 Axle Beam, Removing and Installing

Special tools and workshop equipment required

- ♦ Torque Wrench 1332 40-200Nm - VAG1332-
- ♦ Engine and Gearbox Jack - VAS6931-
- ♦ Spring Compressor Kit - VAG1752-
- ♦ Brake Pedal Actuator - VAG1869/2- .
- ♦ Tensioning Strap - T10038-

Perform the Following

Removing

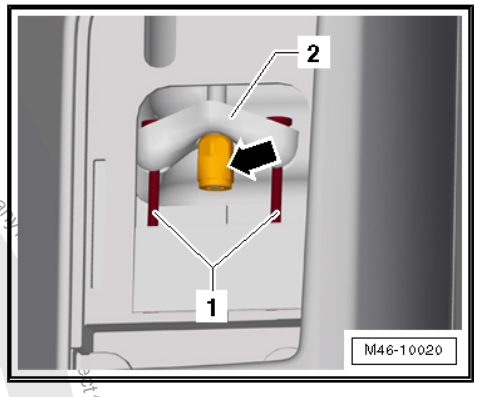
– Release parking brake.

Vehicles with the Highline Center Console

– Open the cover on the rear storage compartment.

– Remove the mat from the storage compartment.

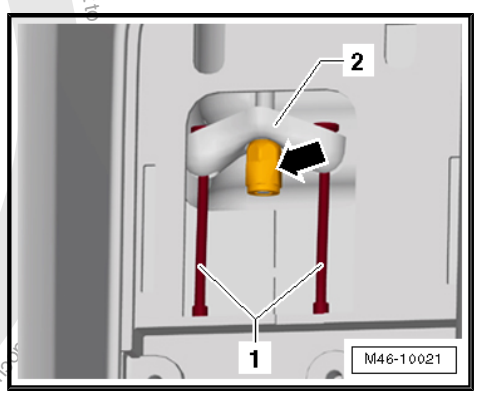
– Loosen the adjusting nut -arrow- until it is possible to disengage the parking brake cable -1- from the compensator bracket -2-.



Vehicles with the Basis Center Console

– Remove the mat from the rear storage compartment.

– Loosen the adjusting nut -arrow- until it is possible to disengage the parking brake cable -1- from the compensator bracket -2-.



Continuation for All Vehicles

– Install the Brake Pedal Actuator - VAG1869/2- .

This Prevents the Brake Lines and the ABS Hydraulic Unit from Running Empty.

– Loosen the wheel bolts.

– Raise the vehicle.

– Remove the wheels.

Secure Vehicle to Lifting Platform

Vehicle must be secured to lift arms of lifting platform before rear axle is removed.

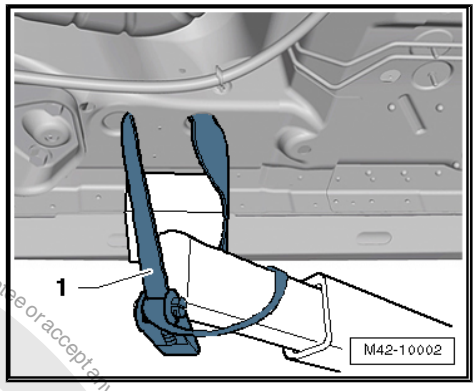
The Vehicle Could Fall Off the Hoist If It Is Not Secured.

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– Remove the plug from the longitudinal member and install the Tensioning Strap - T10038- .

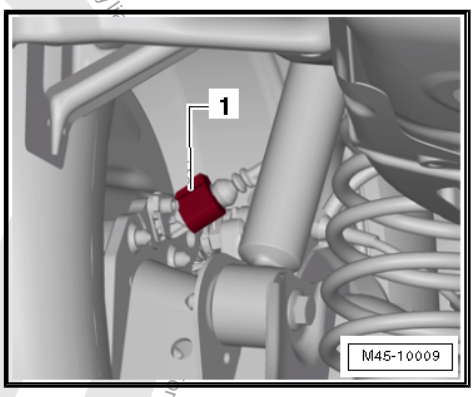
1 - Tensioning Strap - T10038-

The vehicle must be tied down on both the left and right sides using the Tensioning Strap - T10038- .



– Check the axle beam trailing arm. Refer to
⇒ “8.4 Axle Beam Trailing Arm (Torsion Beam), Checking with Measuring Square VAS241001 ”, page 260 or
⇒ “8.5 Axle Beam Trailing Arm (Torsion Beam), Checking with Crankshaft Holding Fixture VW801 ”, page 263

– Disconnect the connector -1- from the speed sensor.



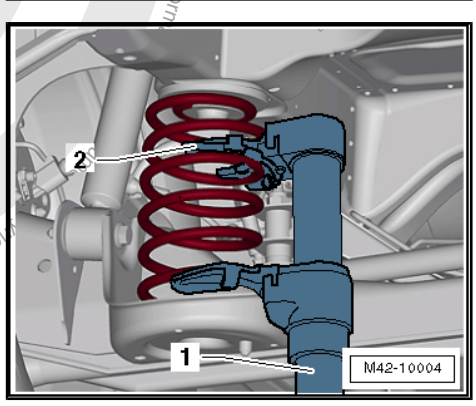
– Insert the Spring Compressor Kit - Spring Tensioner - VAG1752/1- -1-.

1 - Spring Compressor Kit - Spring Tensioner - VAG1752/1-

2 - Spring Compressor Kit - Spring Retainer with Inserts - VAG1752/3A-

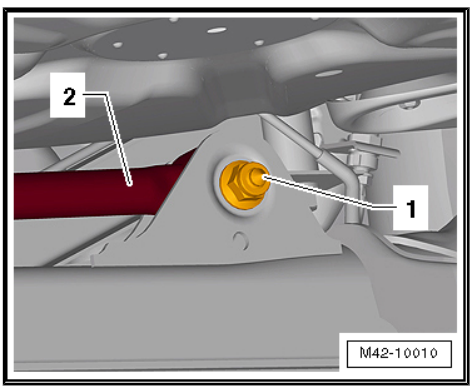
– Tension the coil spring and remove it.

– Place the Engine and Gearbox Jack - VAS6931- under the axle beam.



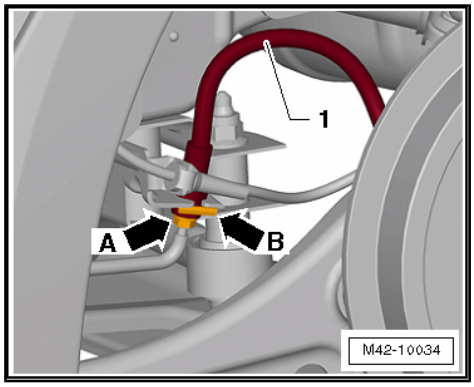
– Push the axle beam up until the crossbrace -2- is horizontal.

– Remove the threaded connection -1-.

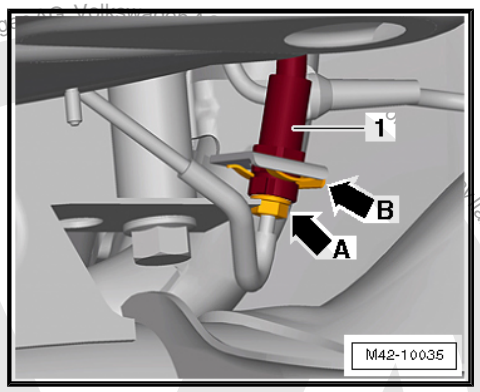


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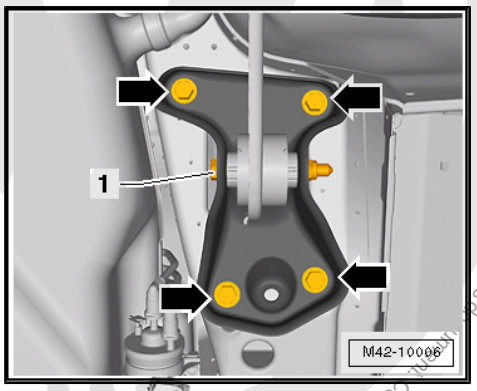
– Disconnect the left brake line -arrow A- and remove the clamp -arrow B-.
– Remove the left brake hose -1-.



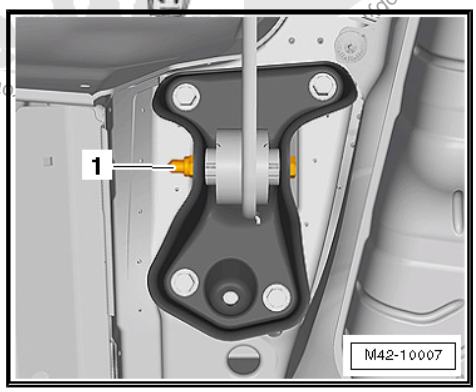
– Disconnect the right brake line -arrow A- and remove the clamp -arrow B-.
– Remove the right brake hose -1- from the axle beam.
– Remove the parking brake cable from the guide tubes.
– Place the Engine and Gearbox Jack - VAS6931- underneath.
– Secure the rear axle with a strap or something similar when lowering or removing it.



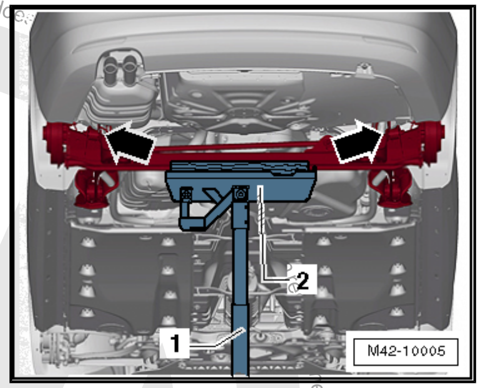
– Mark the position of the bolts -arrows- on the bracket on the right side of the vehicle.
– Remove the bolts -arrows-.



– Remove the bolt -1- from the axle beam on the left side of the vehicle.



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– Remove the rear axle from the shock absorbers -arrows-.

– Lower the rear axle using Engine and Gearbox Jack - VAS6931- -1-.

1 - Engine and Gearbox Jack - VAS6931-

2 - Universal Support Plate - VAG1359/2-

Installing

Install in reverse order of removal. Note the following:

> ⚠ **Caution**
>
> *When installing a new rear axle the axle beam plate must also be installed. Refer to ⇒ “5.3 Axle Beam Plate, Installing”, page 162 .*

– Tighten the rear axle in its curb weight position. Refer to ⇒ “2 Rear Axle Curb Weight (Twist Beam Rear Suspension)”, page 146 .

– Bleed the brake system. Refer to ⇒ Brake System; Rep. Gr. 47 ; Hydraulic System .

– Adjust the parking brake. Refer to ⇒ Brake System; Rep. Gr. 46 ; Parking Brake; Parking Brake, Adjusting .

– Install wheels and tighten. Refer to ⇒ “2 Wheel Installation Tightening Specifications”, page 237 .

Tightening Specifications

Component	Tightening Specification
Axle beam to bracket ♦ Always use new nuts and bolts. ♦ Tighten bolts/nuts in curb weight position.	70 Nm + 90° turn
Bracket to body ♦ Use new bolts.	50 Nm + 45° turn
Shock absorber to axle beam ♦ Always use new nuts and bolts.	40 Nm + 90° turn
Crossbrace to axle beam ♦ Always use new nuts and bolts.	70 Nm + 90° turn
Brake lines to brake hose	14 Nm

4.3 Axle Beam Bonded Rubber Bushing, Removing and Installing

Special tools and workshop equipment required

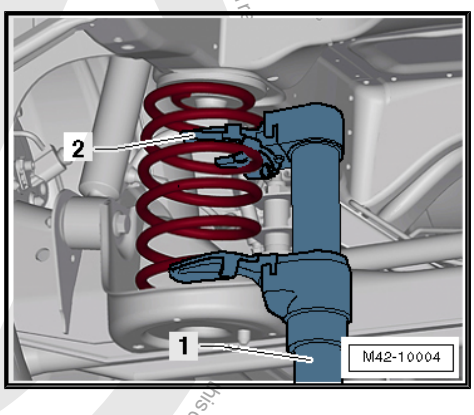
- ♦ Bearing Installer - Wheel Hub/Bearing Kit - T10205-
- ♦ Hydraulic Press - Bushing Assembly Tool Kit - T10230-
- ♦ Hydraulic Press - Ball Joint Assembly Tools - T10254-
- ♦ Torque Wrench 1332 40-200Nm - VAG1332-
- ♦ Engine and Gearbox Jack - VAS6931-

- Spring Compressor Kit - VAG1752-
- Spring Compressor Kit - Spring Retainer with Inserts - VAG1752/3A-
- Hydraulic Press - VAS6178-
- Pneumatic/Hydraulic Foot Pump - VAS6179-

Perform the Following

Removing

– Install the Spring Compressor Kit - Spring Tensioner - VAG1752/1- -1-.



1 - Spring Compressor Kit - Spring Tensioner - VAG1752/1-

2 - Spring Compressor Kit - Spring Retainer with Inserts - VAG1752/3A-

WARNING

Make sure the coil spring is seated correctly in the Spring Compressor Kit - Spring Retainer with Inserts - VAG1752/3A- -2- (danger of accident).

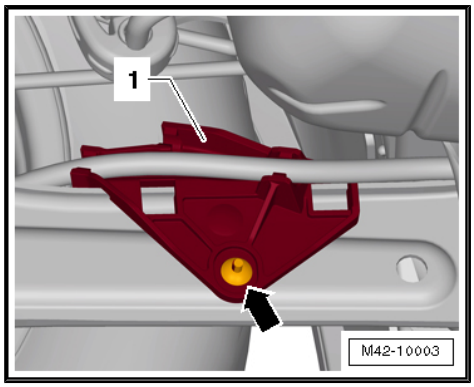
– Tension the coil spring -2- and remove it.

Note

Use a wrench or a reversible ratchet to tighten the spring compressor.

– Place the Engine and Gearbox Jack - VAS6931- under the axle beam.
– Raise the vehicle to the installation height.
– Remove the wheels.

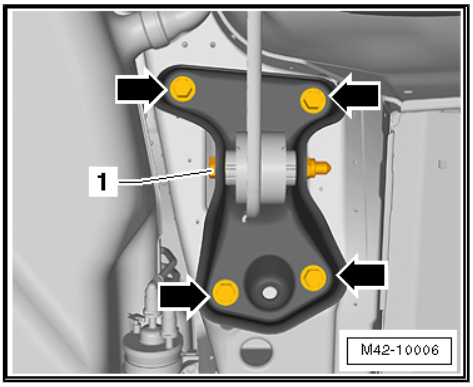
– Remove the rivet inner pin -arrow- and remove the bracket -1-.



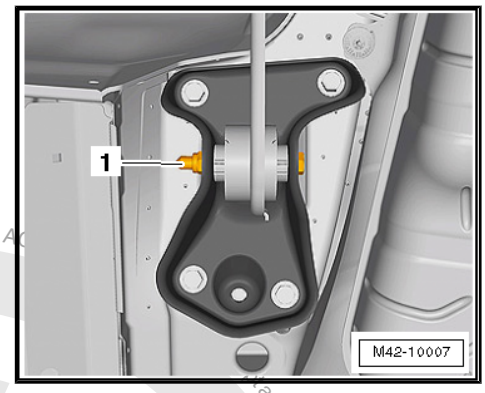
– Place the Engine and Gearbox Jack - VAS6931- underneath.
– Secure the rear axle with a strap or something similar when lowering or removing it.

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– Mark the position of the bolts -arrows- on the bracket on the right side of the vehicle.
– Loosen the threaded connection -1-.
– Remove the bolts -arrows-.
– Lower the axle beam and remove the bolt -1- and the bracket.

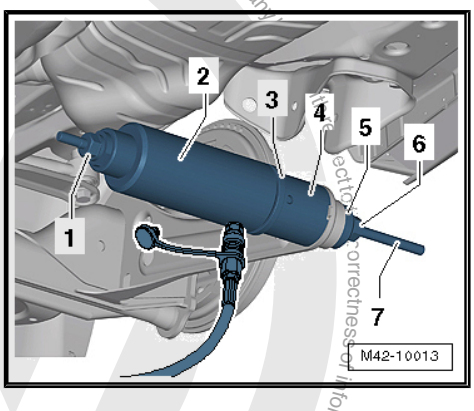


– Remove the bolt -1- from the axle beam on the left side of the vehicle.
– Lower the rear axle using Engine and Gearbox Jack - VAS6931- .



– Mount the special tools as illustrated.

1 - Hydraulic Press - Ball Joint Assembly Tools - Nut - T10254/4-
2 - Hydraulic Press - VAS6178- with Bearing Installer - Wheel Hub/Bearing Kit - Pressure Head - T10205/13-
3 - Bearing Installer - Wheel Hub/Bearing Kit - Gripping Device (Set = 2 Pcs.) - T10205/1-
4 - Hydraulic Press - Bushing Assembly Tool Kit - Tube - T10230/9-
5 - Hydraulic Press - Bushing Assembly Tool Kit - Press Piece - T10230/10-
6 - Hydraulic Press - Ball Joint Assembly Tools - Nut - T10254/4-
7 - Hydraulic Press - Ball Joint Assembly Tools - T10254/5-

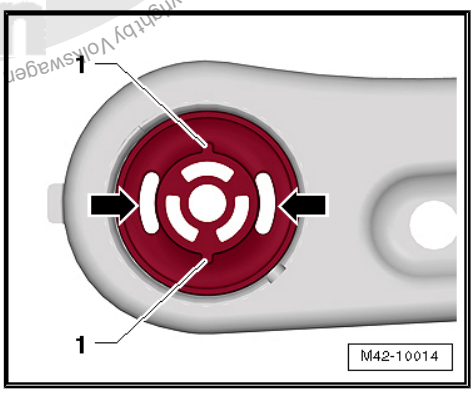


– Activate the pump and remove the bonded rubber bushing.

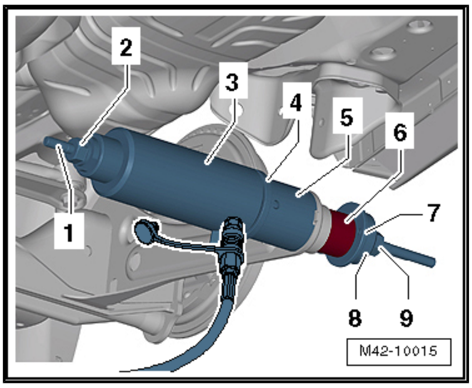
Installing

Installation position of bonded rubber mounting inside the axle beam.

- The tabs -1- on the bonded rubber bushing must vertically point up or down.
- The openings -arrows- must be aligned longitudinally with the vehicle.



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– Mount the bonded rubber bushing and the special tools on the rear axle.

1 - Hydraulic Press - Ball Joint Assembly Tools - T10254/5-

2 - Hydraulic Press - Ball Joint Assembly Tools - Nut - T10254/4-

3 - Hydraulic Press - VAS6178- with Bearing Installer - Wheel Hub/Bearing Kit - Pressure Head - T10205/13-

4 - Bearing Installer - Wheel Hub/Bearing Kit - Gripping Device (Set = 2 Pcs.) - T10205/1-

5 - Hydraulic Press - Bushing Assembly Tool Kit - Tube - T10230/9-

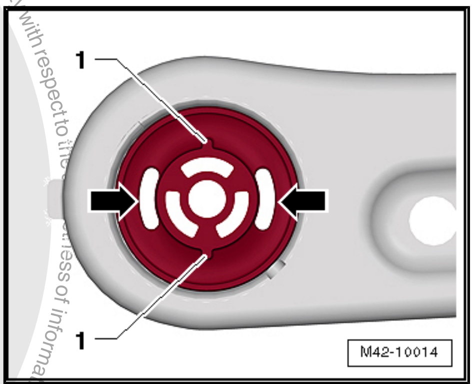
6 - Bonded Rubber Bushing

7 - Hydraulic Press - Bushing Assembly Tool Kit - Thrust Plate - T10230/12-

8 - Hydraulic Press - Bushing Assembly Tool Kit - Press Piece - T10230/10-

9 - Hydraulic Press - Ball Joint Assembly Tools - Nut - T10254/4-

– Install the bonded rubber bushing.



– Check the installed position of the bonded rubber bushing.

• The tabs -1- on the bonded rubber bushing must vertically point up or down.

• The openings -arrows- must be aligned longitudinally with the vehicle.

– Tighten the rear axle in its curb weight position. Refer to ⇒ “2 Rear Axle Curb Weight (Twist Beam Rear Suspension)”, page 146 .

Install in reverse order of removal.

– Install wheels and tighten. Refer to ⇒ “2 Wheel Installation Tightening Specifications”, page 237 .

Tightening Specifications

Component	Tightening Specification
Axle beam to bracket ♦ Always use new nuts and bolts. ♦ Tighten bolts/nuts in curb weight position	70 Nm + 90° turn
Bracket to body ♦ Use new bolts.	50 Nm + 45° turn

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4.4 Crossbrace, Removing and Installing

Special tools and workshop equipment required

♦ Tensioning Strap - T10038-

♦ Torque Wrench 1332 40-200Nm - VAG1332-

♦ Engine and Gearbox Jack - VAS6931-

♦ Spring Compressor Kit - VAG1752-

Perform the Following

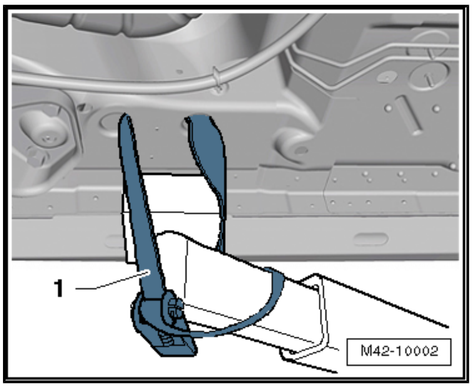
Removing

– Raise the vehicle.

Secure Vehicle to Lifting Platform

1 - Tensioning Strap - T10038-

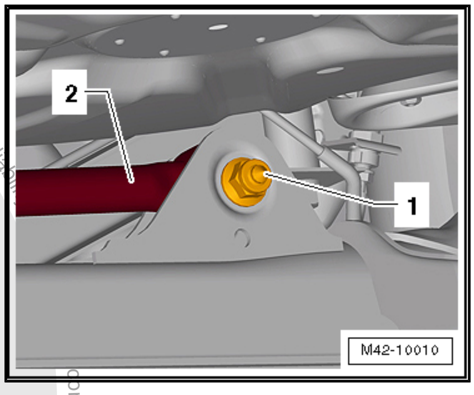
The Vehicle Could Fall Off the Hoist If It Is Not Secured.



– Remove the plug from the longitudinal member and install the Tensioning Strap - T10038- .

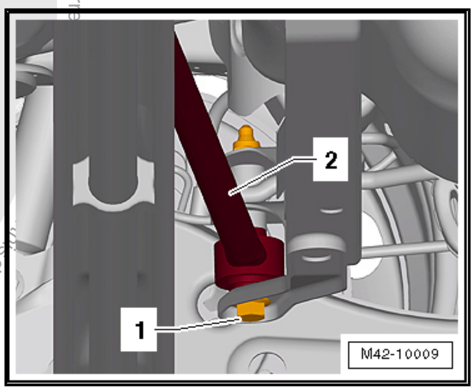
– Remove the coil spring. Refer to ⇒ “6.2 Coil Spring, Removing and Installing”, page 169 .

– Place the Engine and Gearbox Jack - VAS6931- under the axle beam.



– Push the axle beam up until the crossbrace -2- is horizontal.

– Remove the threaded connection -1-.



– Remove the threaded connection -1- and the crossbrace -2-.

Installing

Install in reverse order of removal. Note the following:

– Install the coil spring. Refer to ⇒ “6.2 Coil Spring, Removing and Installing”, page 169 .

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Tightening Specifications

Component	Tightening Specification
Crossbrace to axle beam ♦ Always use new nuts and bolts.	70 Nm + 90° turn
Crossbrace to subframe ♦ Always use new nuts and bolts.	70 Nm + 90° turn

4.5 Crossbrace Bonded Rubber Bushing, Removing and Installing

Special tools and workshop equipment required

♦ Press Piece - Front Control Arm - 2040-

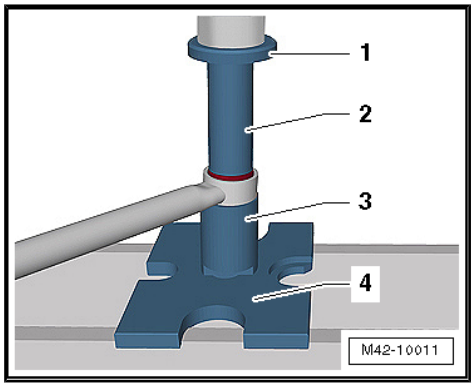
- Bearing Installer - Carrier Bearing - 3350-
- Press Plate - VW401-
- Press Piece - Multiple Use - VW412-
- Press Piece - 37mm - VW416B-

Perform the Following

– Remove the crossbrace. Refer to
⇒ “4.4 Crossbrace, Removing and Installing”, page 158 .

Removing

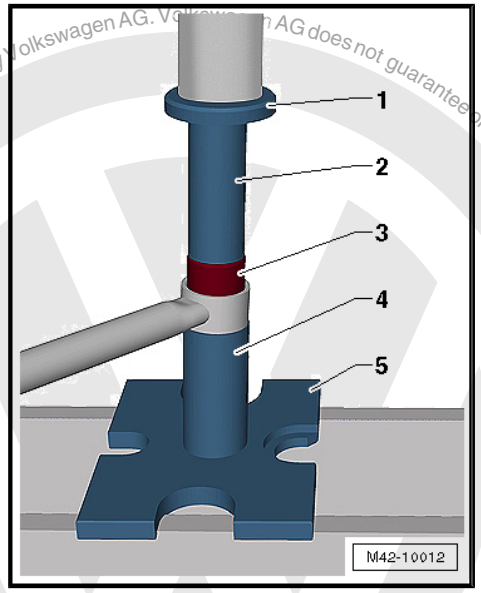
– Mount the special tools as illustrated and remove the bonded rubber bushing.



1 - Press Piece - Multiple Use - VW412-
2 - Press Piece - 37mm - VW416B-
3 - Bearing Installer - Carrier Bearing - 3350-
4 - Press Plate - VW401-

Installing

– Install the special tools as illustrated and install the bonded rubber bushing.



1 - Press Piece - Multiple Use - VW412-
2 - Press Piece - 37mm - VW416B-
3 - Bonded rubber bushing
4 - Press Piece - Front Control Arm - 2040-
5 - Press Plate - VW401-

– Install the crossbrace. Refer to
⇒ “4.4 Crossbrace, Removing and Installing”, page 158 .

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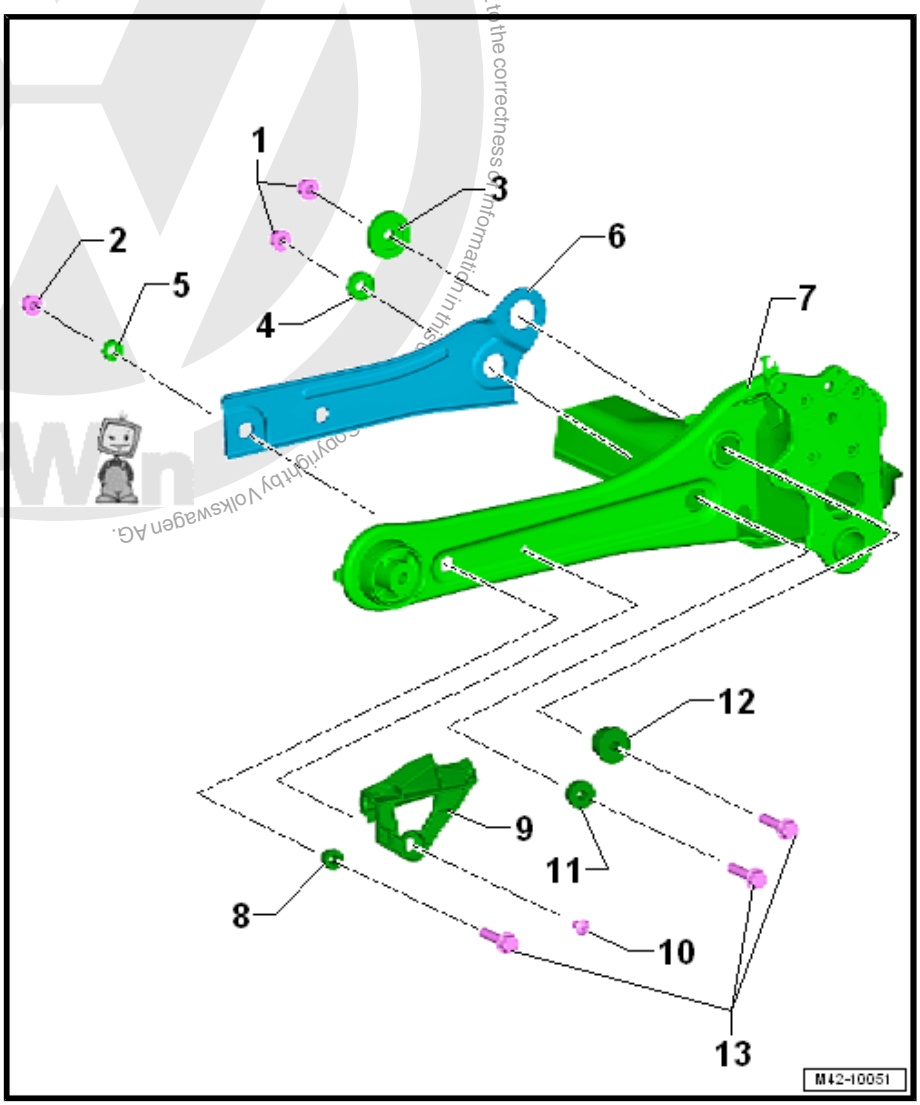
5 Axle Beam Plate (Torsion Beam)

⇒ “5.1 Overview - Axle Beam Plate (Torsion Beam)”, page 161

⇒ “5.2 Axle Beam Plate, Removing”, page 162

⇒ “5.3 Axle Beam Plate, Installing”, page 162

5.1 Overview - Axle Beam Plate (Torsion Beam)



1 - Nut

- ❑ 50 Nm + 90° turn
- ❑ Always replace if removed
- ❑ Quantity: 2

2 - Nut

- ❑ 50 Nm
- ❑ Always replace if removed

3 - Spacer Ring

- ❑ 30 mm diameter

4 - Spacer Ring

- ❑ 25 mm diameter

5 - Spacer Ring

- ❑ 16 mm diameter

6 - Plate

- ❑ Removing. Refer to ⇒ “5.2 Axle Beam Plate, Removing”, page 162 .
- ❑ Installing. Refer to ⇒ “5.3 Axle Beam Plate, Installing”, page 162 .

7 - Axle Beam

- ❑ Check the axle beam trailing arm. Refer to ⇒ “8.4 Axle Beam Trailing Arm (Torsion Beam), Checking with Measuring Square VAS241001 ”, page 260 or ⇒ “8.5 Axle Beam Trailing Arm (Torsion Beam), Checking with Crankshaft Holding Fixture VW801 ”, page 263

8 - Spacer

- ❑ 16 mm diameter

9 - Bracket

- ❑ For parking cable

10 - Expanding Rivet

- ❑ Always replace if removed

11 - Spacer

- ❑ 25 mm diameter

12 - Spacer

- ❑ 30 mm diameter

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13 - Bolt

- ❑ Quantity: 3
- ❑ Always replace if removed

5.2 Axle Beam Plate, Removing

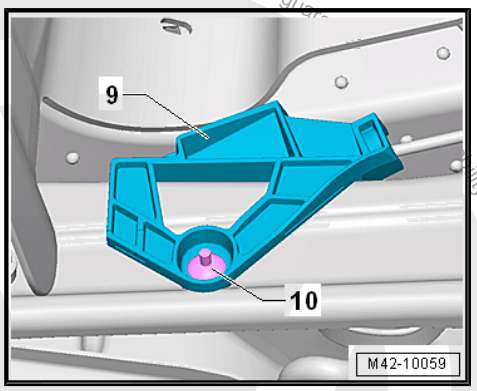
Note

The plates must only be removed if a new axle beam is installed and plates are not yet installed on the axle beam.

- Axle beam removed

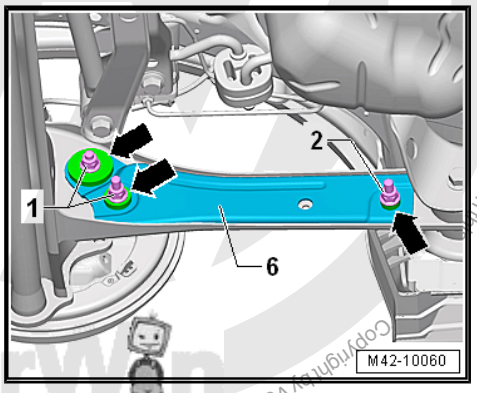
Removing

– Remove the parking brake cable bracket -9- by pressing out the inner pin on the expanding rivet -10-.



– Remove the nuts -1 and 2- and remove the bolts.

– Remove the installation components -arrows- and remove the plate -6-.



5.3 Axle Beam Plate, Installing

Special tools and workshop equipment required

- ♦ Torque Wrench 1332 40-200Nm - VAG1332-

Caution

- ♦ *The axle beam trailing arm must always be checked before beginning the procedure. Refer to ⇒ "8.4 Axle Beam Trailing Arm (Torsion Beam), Checking with Measuring Square VAS241001 ", page 260 or ⇒ "8.5 Axle Beam Trailing Arm (Torsion Beam), Checking with Crankshaft Holding Fixture VW801 ", page 263 .*
- ♦ *The plates may only be installed on trailing arms that were checked and are OK.*

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Removing

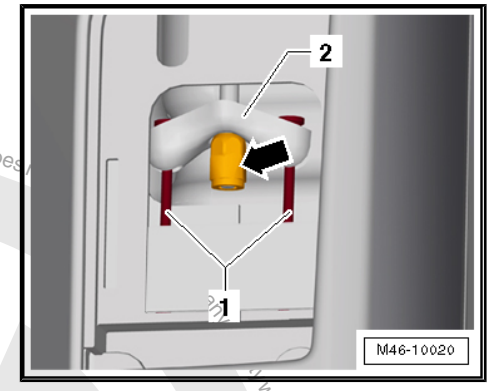
– Release parking brake.

Vehicles with the Highline Center Console

– Open the cover on the rear storage compartment.

– Remove the mat from the storage compartment.

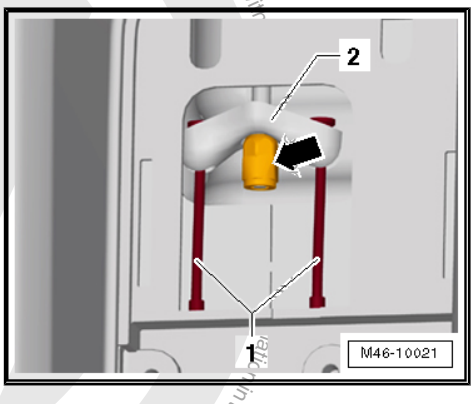
– Loosen the adjusting nut -arrow- until it is possible to disengage the parking brake cable -1- from the compensator bracket -2-.



Vehicles with the Basis Center Console

– Remove the mat from the rear storage compartment.

– Loosen the adjusting nut -arrow- until it is possible to disengage the parking brake cable -1- from the compensator bracket -2-.



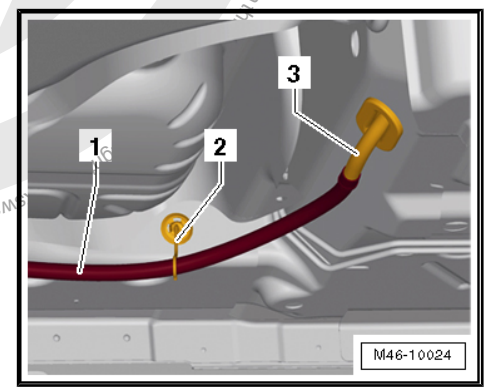
Continuation for All Vehicles

– Loosen the wheel bolts.

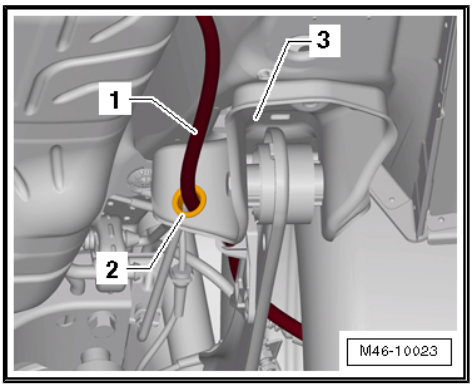
– Raise the vehicle.

– Remove the wheel.

– Disengage the parking brake cable -1- from the bracket -2- and pull it out of the guide tube -3-.

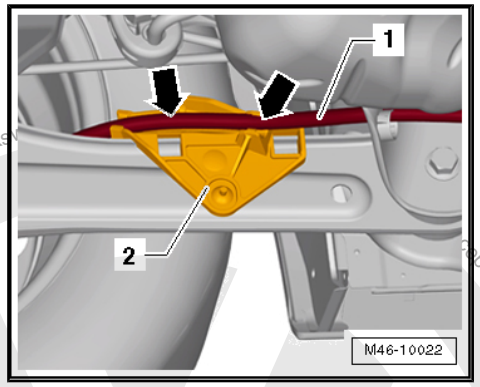


– Remove the parking brake cable -1- bracket -2- on the rear axle -3-.



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– Unclip the parking brake cable -1- from the tabs -arrows- on the bracket -2- on the rear axle.



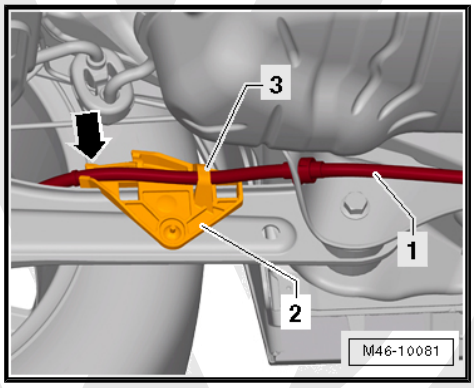
Vehicles with Grommet on Bracket

– Unclip parking brake cable -1- on bracket -2- -arrow-.

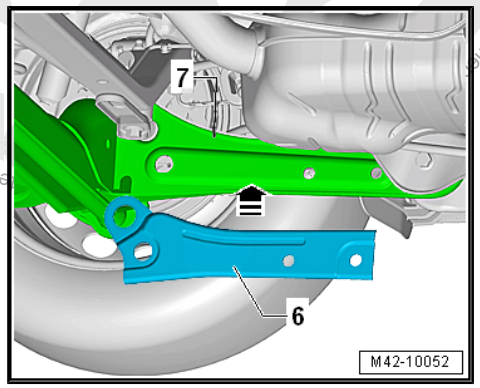
– Pull the parking brake cable -1- out of the guide -3-.

Continuation for All Vehicles

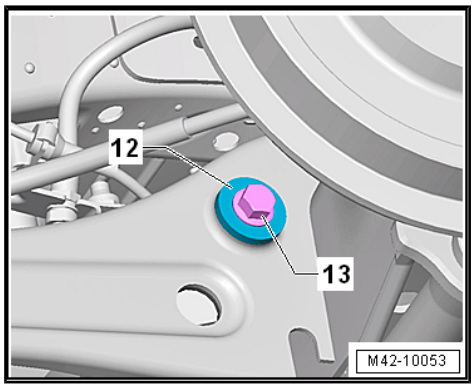
– Remove the parking brake cable bracket -2- by pressing out the inner pin on the expanding rivet.



– Insert the plate -6- into the axle beam trailing arm -7-.

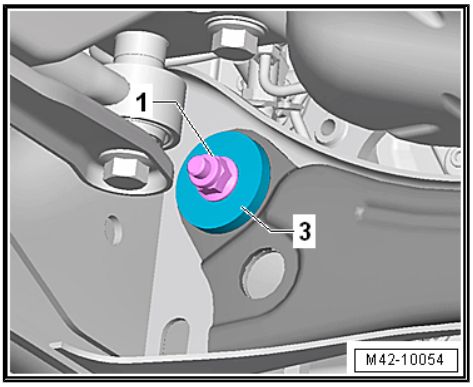


– Insert the spacer with the 30 mm diameter -12- and bolt -13- from the outside into the top hole on the trailing arm.

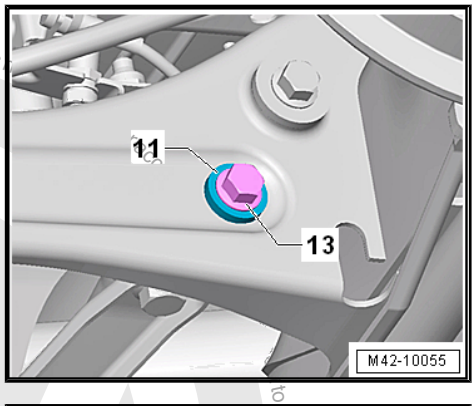


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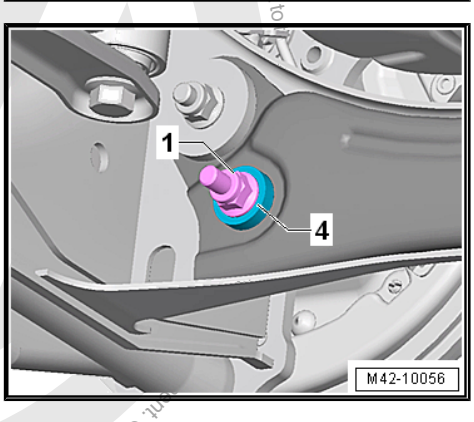
– Position a 30 mm diameter spacer ring -3- with the turned out side to the spacer.
– Tighten the nut -1- hand-tight.



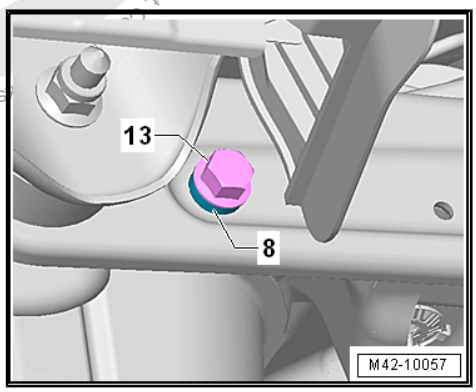
– Insert the spacer with the 25 mm diameter -11- and bolt -13- from the outside into the lower hole on the trailing arm.



– Position a 25 mm diameter spacer ring -4- with the turned out side to the spacer.
– Tighten the nut -1- hand-tight.

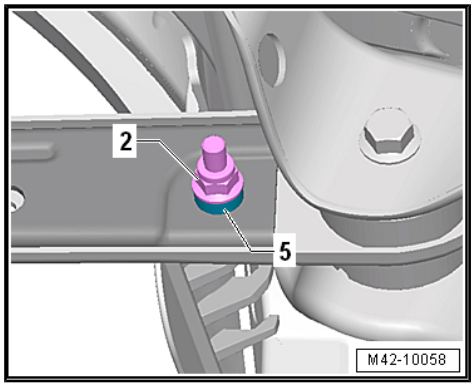


– Insert the spacer with the 16 mm diameter -8- and bolt -13- from the outside into the front hole on the trailing arm.

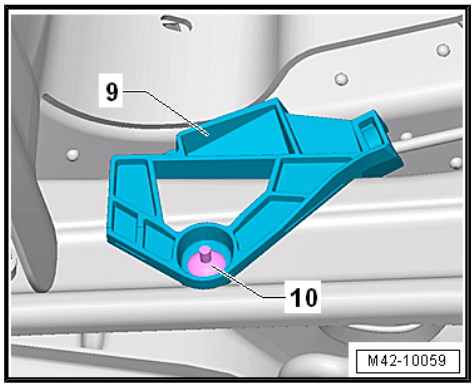


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– Position a 16 mm diameter spacer ring -5- with the turned out side to the spacer.
– Tighten the nut -2- hand-tight.
– Align the spacers and spacer rings and tighten the nuts to the tightening specification.



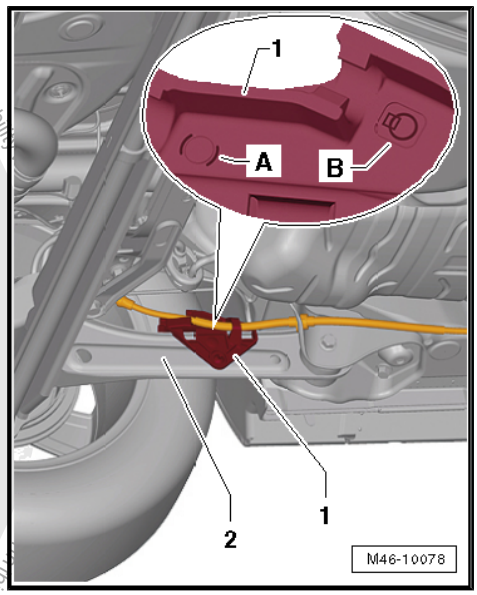
– Mount the parking brake cable bracket -9- and install the new expanding rivet -10-.



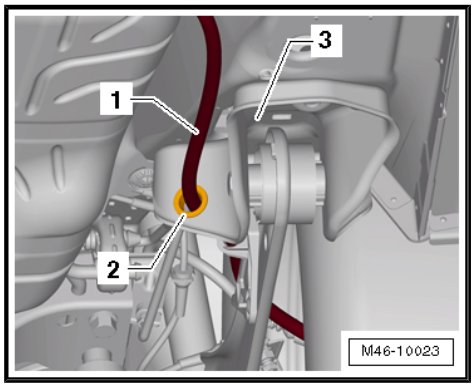
– Guide the parking brake cable through the bracket -1-.
– Pay attention to which rear brakes are installed. The parking brake cable must be routed in the bracket based on this.

A - Drum Brake

B - Disc Brakes

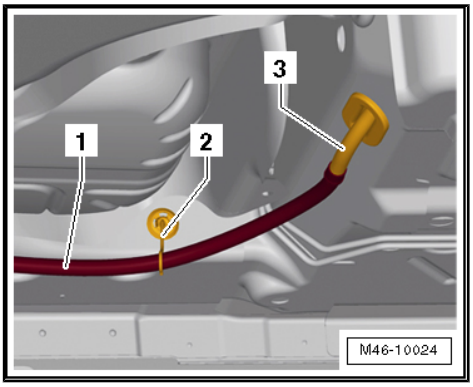


– Slide the parking brake cable -1- through the grommet -2- on the bracket located on the rear axle -3-.



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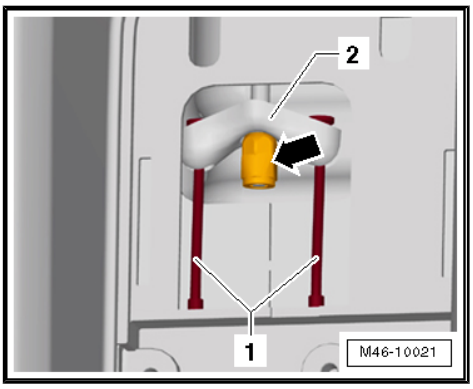
– Slide the parking brake cable -1- into the guide tube -3- and engage it in the bracket -2-.



Note

Attach the parking brake cable to at the marking on the cable.

– Attach parking brake cable -1- to pull-rod -2-.
– Pretension the parking brake cable using the adjustment nut -arrow-.
– Adjust the parking brake. Refer to ⇒ Brake System; Rep. Gr. 46 ; Parking Brake; Parking Brake, Adjusting .
– Install the wheel and tighten. Refer to ⇒ “2 Wheel Installation Tightening Specifications”, page 237 .



Tightening Specifications

Component	Tightening Specification
Plate on rear axle trailing arm; rear bolted connections ◆ Always use new nuts and bolts.	50 Nm + 90° turn
Plate on rear axle trailing arm; front bolted connections ◆ Always use new nuts and bolts.	50 Nm

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6 Suspension (Torsion Beam)

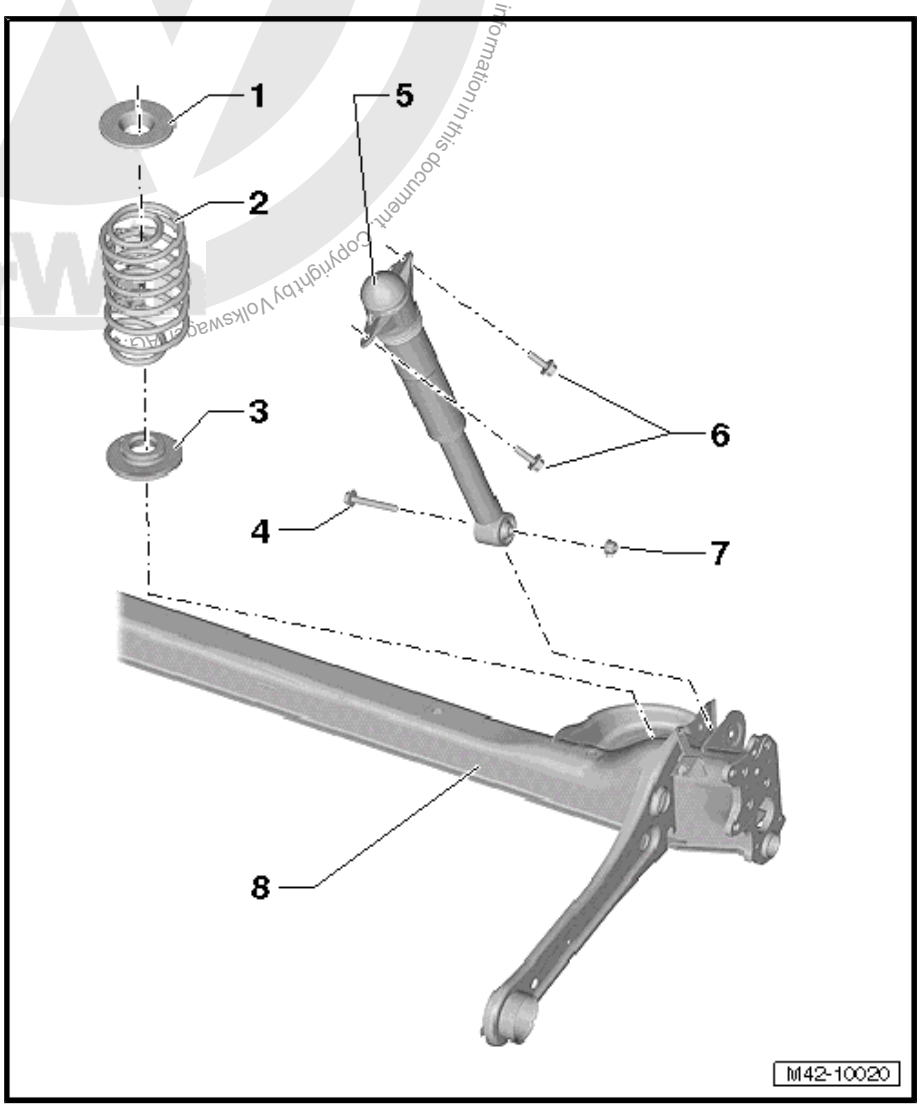
⇒ “6.1 Overview - Suspension (Torsion Beam)”, page 168

⇒ “6.2 Coil Spring, Removing and Installing”, page 169

6.1 Overview - Suspension (Torsion Beam)

Note

- *Welding and alignment work on supporting or wheel carrying suspension components is not permitted.*
- *Always replace self-locking nuts.*
- *Always replace corroded bolts/nuts.*
- *Bonded rubber bushings have a limited range of motion. Therefore, only tighten the threaded connections on the components with bonded rubber bushings when the wheel bearing housing is lifted (curb weight position). Refer to ⇒ “2 Rear Axle Curb Weight (Twist Beam Rear Suspension)”, page 146 .*



1 - Spring Seat

2 - Coil Spring

- ❑ Note the color code
- ❑ Allocation. Refer to the Parts Catalog.
- ❑ There are different versions of the suspension. Refer to ⇒ page 275
- ❑ Surface of spring coil may not be damaged
- ❑ Removing and installing. Refer to ⇒ “6.2 Coil Spring, Removing and Installing”, page 169 .

3 - Backing Plate

- ❑ Check the washer for damage

4 - Bolt

- ❑ 40 Nm + 90° turn
- ❑ Always replace if removed
- ❑ Tighten in the curb weight position. Refer to ⇒ “2 Rear Axle Curb Weight (Twist Beam Rear Suspension)”, page 146 .

5 - Shock Absorber

- ❑ Removing and installing. Refer to ⇒ “7.2 Shock Absorber, Removing and Installing”, page 172 .
- ❑ Allocation. Refer to the Parts Catalog.

6 - Bolt

- ❑ 50 Nm + 45° turn
- ❑ Always replace if removed

7 - Nut

- ❑ Self-locking
- ❑ Always replace if removed

8 - Axle Beam

- ❑ No paint or dirt on contact surface and threaded hole for the axle stub
- ❑ Removing and installing. Refer to ⇒ "4.2 Axle Beam, Removing and Installing", page 152 .

6.2 Coil Spring, Removing and Installing

Special tools and workshop equipment required

- ♦ Spring Compressor Kit - VAG1752-
- ♦ Spring Compressor Kit - Spring Retainer with Inserts - VAG1752/3A-

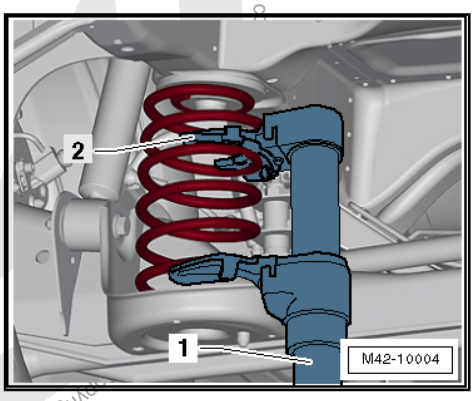
Perform the Following

Removing

– Insert the Spring Compressor Kit - Spring Tensioner - VAG1752/1--1-.

1 - Spring Compressor Kit - Spring Tensioner - VAG1752/1-

2 - Spring Compressor Kit - Spring Retainer with Inserts - VAG1752/3A-



WARNING

Make sure the coil spring is seated correctly in the Spring Compressor Kit - Spring Retainer with Inserts - VAG1752/3A--2- (danger of accident).

– Tension the coil spring and remove it.

Note

Use a wrench or a reversible ratchet to tighten the spring compressor.

Installing

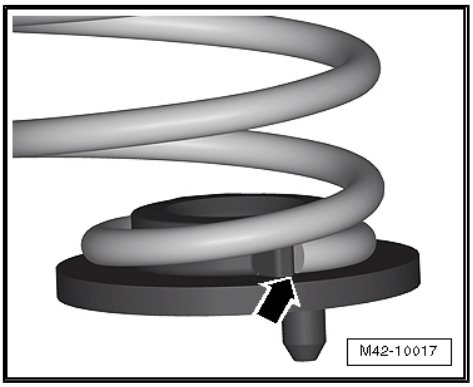
Install in reverse order of removal. Note the following:

– Make sure the washer is not damaged.

– Replace the washer if necessary.

– Install the washer on the coil spring.

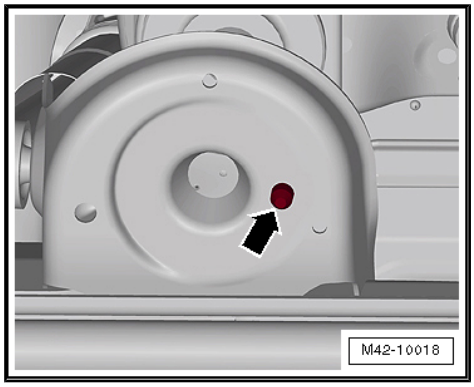
The spring start -arrow- must touch the stop of lower spring support.



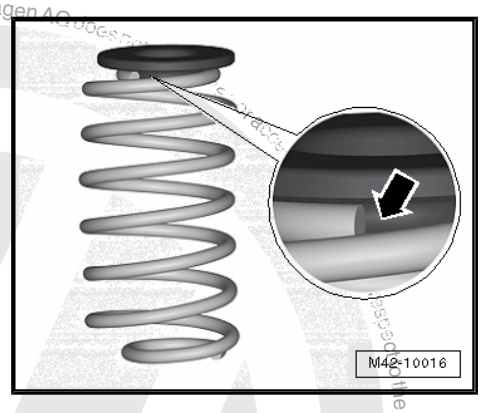
– Install the spring and the spring support.

– Spring seat has a pin on bottom.

– Insert this pin into hole of lower transverse link -arrow-.



– Insert the top of the spring support into the upper spring end.
– The bead on the spring support -arrow- must fit into the coil spring correctly.
– Release the tension on the spring, guiding upper spring support onto tab of body.
– Remove the Spring Compressor .



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7 Shock Absorber (Torsion Beam)

⇒ “7.1 Overview - Shock Absorber (Torsion Beam)”, page 171

⇒ “7.2 Shock Absorber, Removing and Installing”, page 172

7.1 Overview - Shock Absorber (Torsion Beam)

1 - Gas-Filled Strut

- ❑ Can be replaced individually
- ❑ Allocation. Refer to the Parts Catalog.

Function Test

Press shock absorber together by hand. It should be possible to push in piston rod smoothly and with uniform force over its entire travel.

When the shock absorber has sufficient gas pressure the piston rod returns to its original starting position.

If the piston rod does not return to its starting position and there is no loss of oil then the shock absorber is still OK.

2 - Protective Pipe

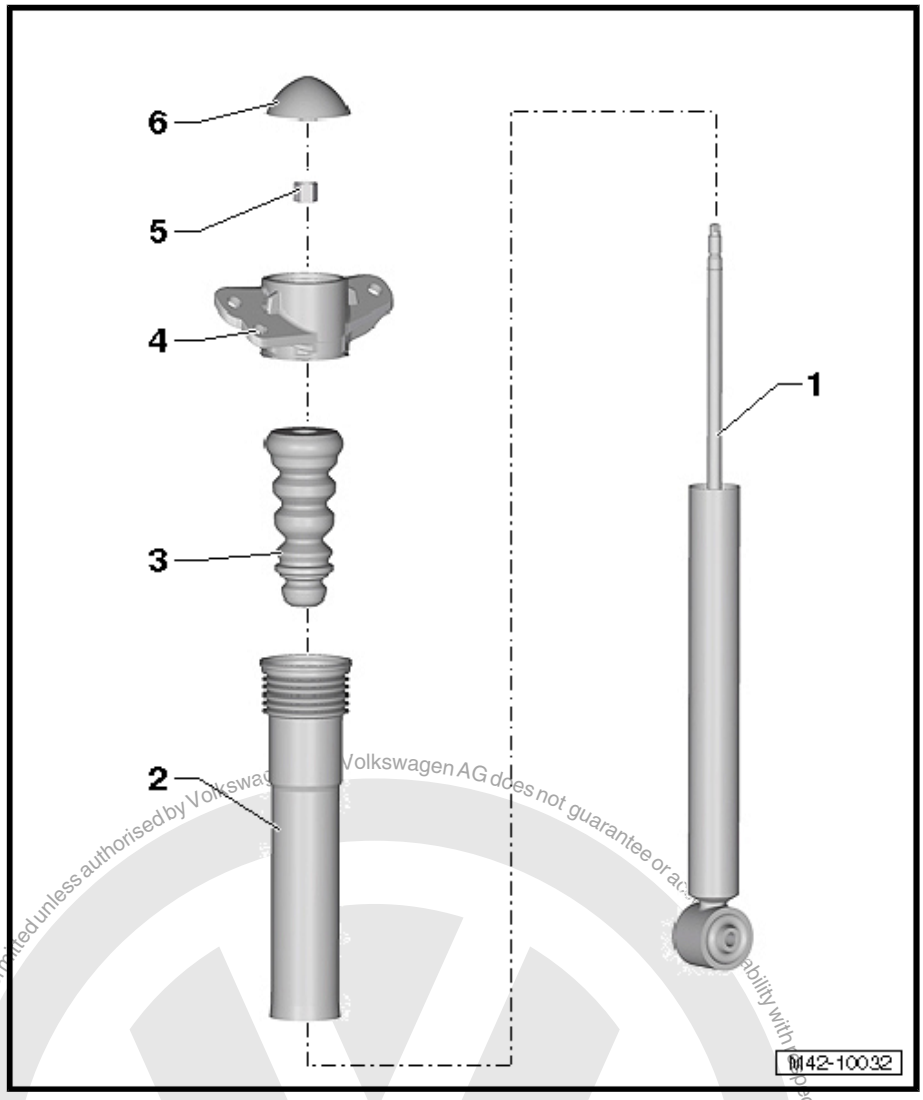
3 - Stop Buffer

4 - Shock Absorber Mount

5 - Nut

- ❑ 25 Nm
- ❑ Self-locking
- ❑ Always replace if removed
- ❑ Removing. Refer to ⇒ Fig. ““Removing Hex Nut from the Gas-Filled Strut”“ , page 172

6 - Cap



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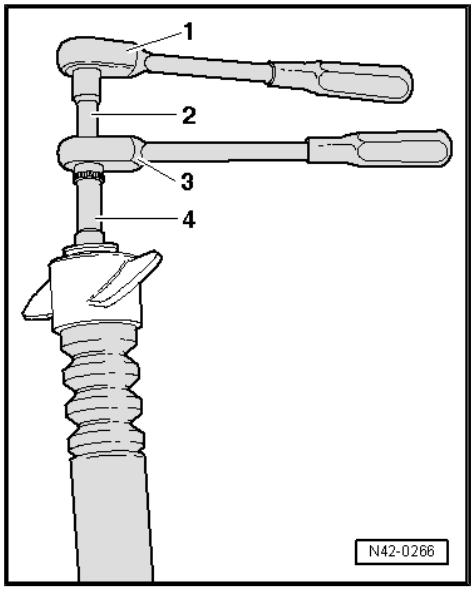
Removing Hex Nut from the Gas-Filled Strut

1 - Ratchet (commercially available)

2 - Shock Absorber Set - Extension with Counter Holder 1 - T10001/9-

3 - Shock Absorber Set - Reversible Ratchet - T10001/11-

4 - Shock Absorber Set - Socket - T10001/1-



7.2 Shock Absorber, Removing and Installing

Special tools and workshop equipment required

- Torque Wrench 1331 5-50Nm - VAG1331-
- Torque Wrench 1332 40-200Nm - VAG1332-

Perform the Following

Removing

– Loosen the wheel bolts.

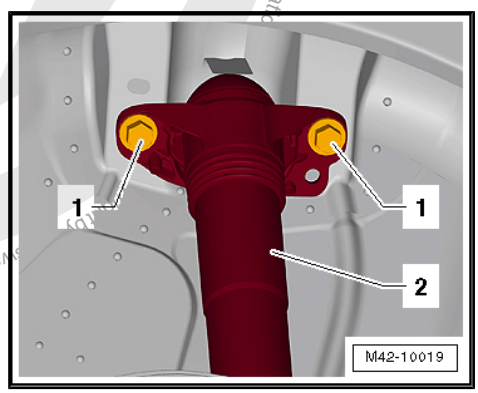
– Raise the vehicle.

– Remove the wheel.

– Remove the rear wheel housing liner. Refer to ⇒ Body Exterior; Rep. Gr. 66 ; Wheel Housing Liner .

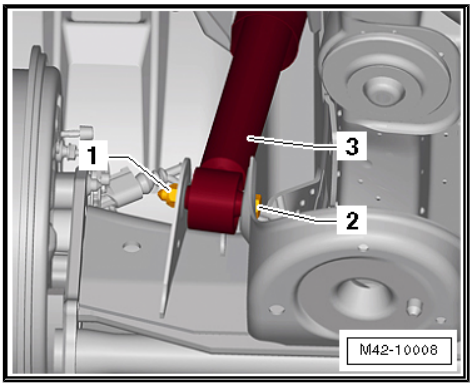
– Remove the coil spring. Refer to ⇒ “6.2 Coil Spring, Removing and Installing”, page 169 .

– Remove the bolts -1- from the shock absorber -2-.



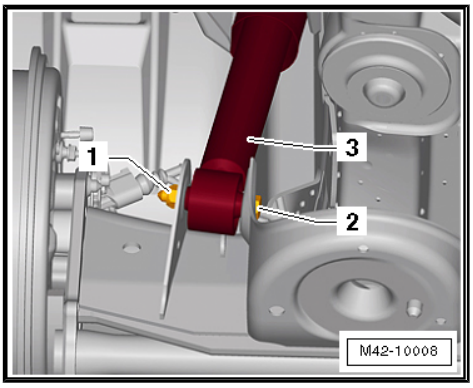
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– Remove the nut -1- and the bolt -2- from the shock absorber -3- on the rear axle.
– Remove the shock absorber.



Shock Absorber, Installing

– Install the shock absorber.
– Install the shock absorber -3- with a new bolt -2- and a new nut -1- with the rear axle.
– Attach the shock absorber to the body.
– Install the coil spring. Refer to ⇒ “6.2 Coil Spring, Removing and Installing”, page 169 .
– Install the rear wheel housing liner. Refer to ⇒ Body Exterior; Rep. Gr. 66 ; Wheel Housing Liner .
– Tighten the bolts in the curb weight position. Refer to ⇒ “2 Rear Axle Curb Weight (Twist Beam Rear Suspension)”, page 146 .



Tightening Specifications

Component	Tightening Specification
Shock absorber to rear axle ♦ Use new bolt/nut	40 Nm + 90° turn
Shock absorber to body ♦ Use new bolts.	50 Nm + 45° turn

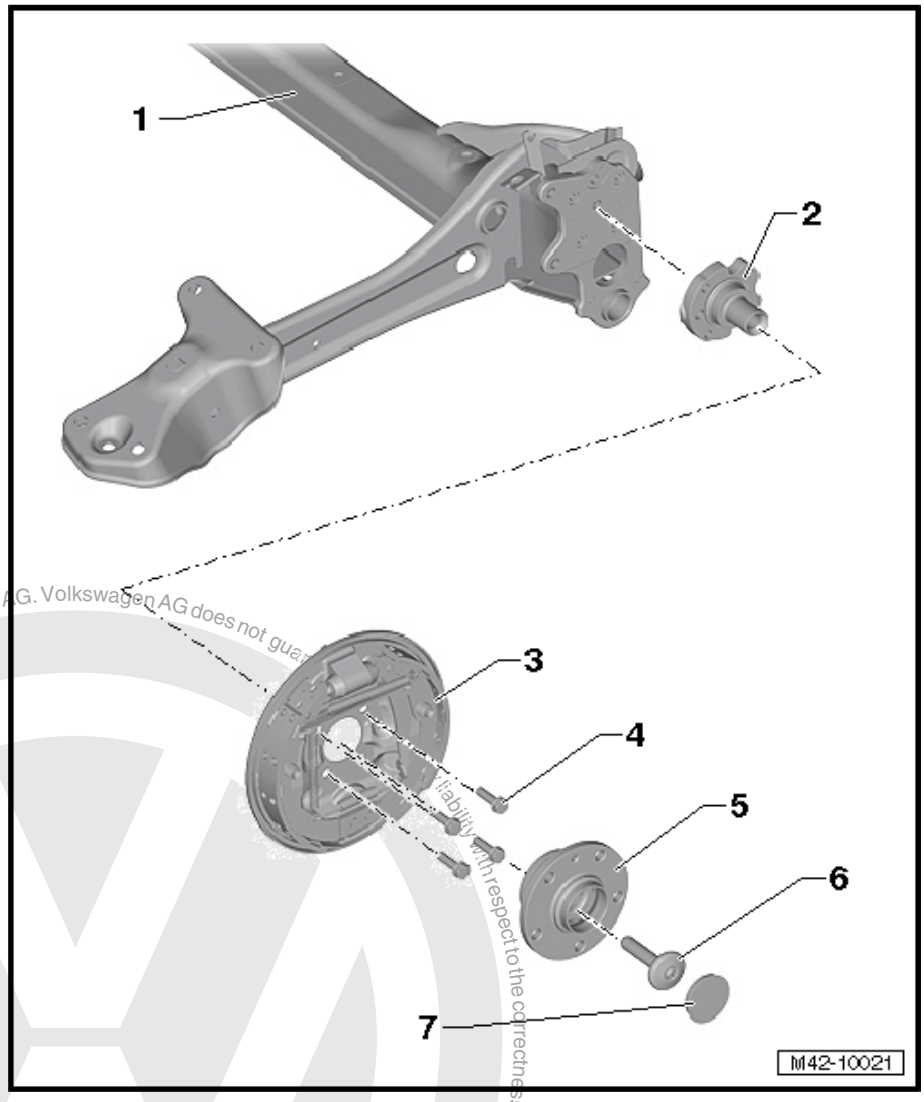
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8 Wheel Bearing, Drum Brake (Torsion Beam)

⇒ “8.1 Overview - Wheel Bearing, Drum Brake (Torsion Beam)”, page 174

⇒ “8.2 Wheel Bearing/Wheel Hub on Vehicles with Drum Brakes, Removing and Installing”, page 175

8.1 Overview - Wheel Bearing, Drum Brake (Torsion Beam)



1 - Axle Beam

- ❑ Removing and installing. Refer to ⇒ “4.2 Axle Beam, Removing and Installing”, page 152 .

2 - Axle Stub

- ❑ Straightening operations are not allowed
- ❑ Recutting the thread is not allowed!

3 - Brake Carrier with Brake Shoes

- ❑ Servicing. Refer to ⇒ Brake System; Rep. Gr. 46 ; Rear Brakes; Brake Carrier, Removing and Installing .

4 - Bolt

- ❑ 30 Nm + 90° turn
- ❑ Always replace if removed

5 - Wheel Hub with Wheel Bearing

- ❑ The ABS sensor ring is installed in the wheel hub
- ❑ Removing and installing. Refer to ⇒ “8.2 Wheel Bearing/Wheel Hub on Vehicles with Drum Brakes, Removing and Installing”, page 175 .

The wheel bearing and wheel hub are in a single housing.

This wheel hub/wheel bearing is maintenance and adjustment free. Adjusting or servicing is not possible!

6 - Bolt

- ❑ 180 Nm + 180° turn
- ❑ Always replace if removed
- ❑ Self-locking

7 - Dust Cap

- ❑ Always replace if removed
- ❑ Removing and installing. Refer to ⇒ “8.2 Wheel Bearing/Wheel Hub on Vehicles with Drum Brakes, Removing and Installing”, page 175 .

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An appropriate seal can only be achieved with a new dust cap.

Only then is an optimum function and long service life of the wheel bearing guaranteed.

8.2 Wheel Bearing/Wheel Hub on Vehicles with Drum Brakes, Removing and Installing

Special tools and workshop equipment required

- Puller - Grease Cap - VW637/2-
- Camshaft Installer Kit - Sleeve - 3241/4-
- Torque Wrench 1332 40-200Nm - VAG1332-
- Torque Wrench - VAG1410-

Perform the Following

Removing

– Loosen the wheel bolts.

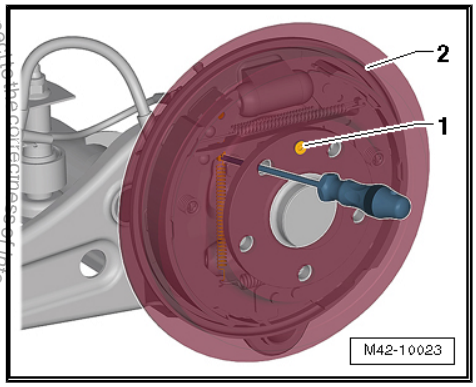
– Raise the vehicle.

– Remove the wheel.

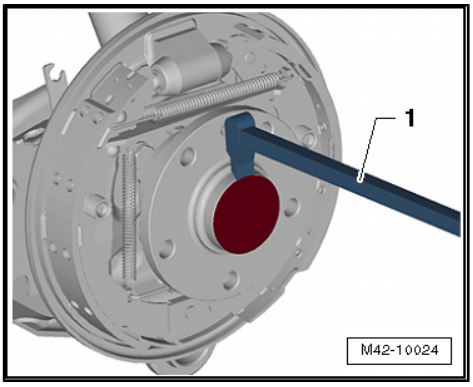
– Reset brake

– To do so, press wedge upward through a hole in brake drum using a screwdriver.

– Remove the bolt -1- and remove the brake drum -2-.



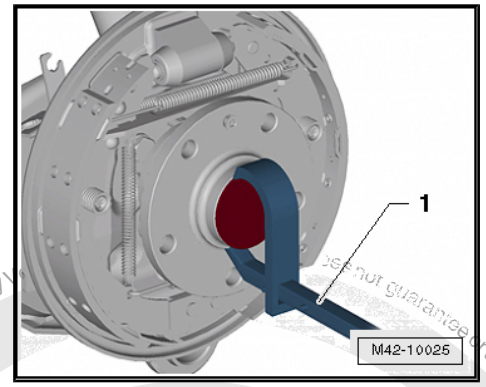
– Loosen dust cap from seat by tapping lightly on claw of Puller - Grease Cap - VW637/2- -1-.



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– Press of dust cap.

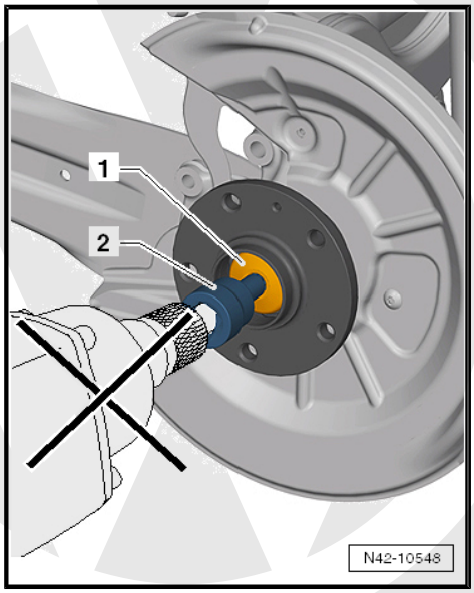
1 - Puller - Grease Cap - VW637/2-



– Remove bolt -1- using Socket - XZN 18mm - T10162A- -2-.

Caution

Never use an impact wrench when removing the bolt -1- using the Socket - XZN 18mm - T10162A- -2-.

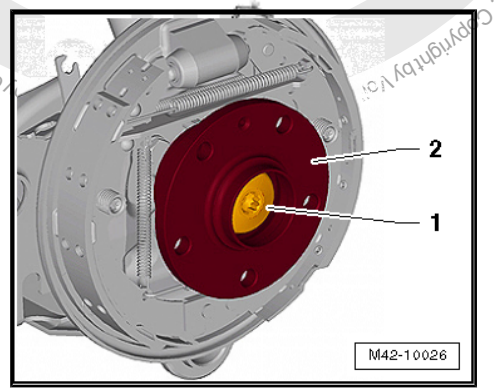


– Remove the bolt -1-.

– Remove the wheel hub/wheel bearing unit from the stub axle.

Installing

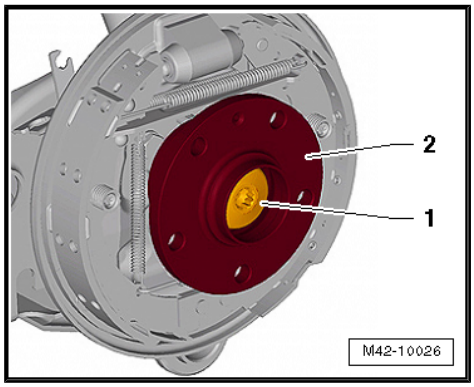
Install in reverse order of removal. Note the following:



– Carefully install the wheel hub/wheel bearing unit -2- onto the stub axle.

Caution

Make sure that the wheel hubs/wheel bearing unit does not tilt!



– Install the new bolt -1- and tighten it to the tightening specification.

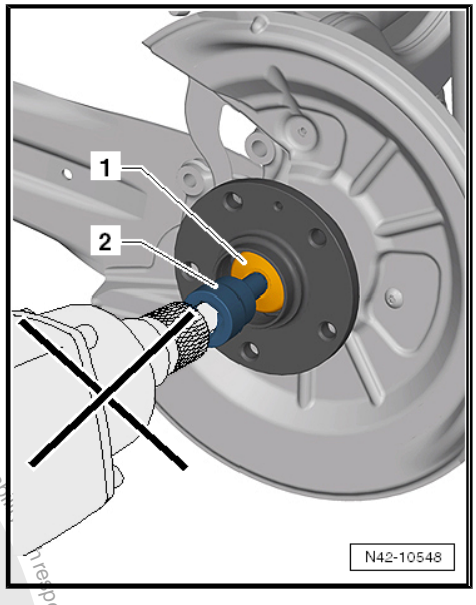
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Note

- *First tighten the bolt to the specification using the torque wrench.*
- *Using a rigid wrench when tightening additionally.*

Caution

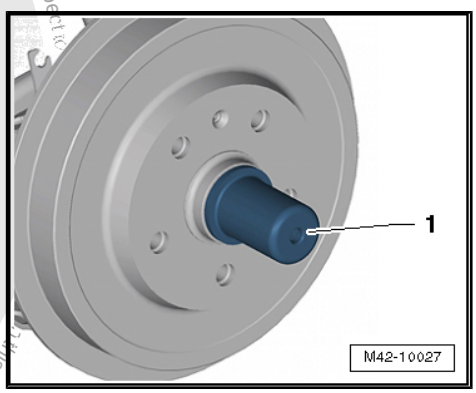
Never use an impact wrench when tightening the bolt -1- using the Socket - XZN 18mm - T10162A- -2-.



– Install the new dust cap -1-.

Always Replace Dust Caps.

Damaged dust caps allow moisture to enter. Therefore, always use the tool shown.



– Install the wheel and tighten. Refer to ⇒ “2 Wheel Installation Tightening Specifications”, page 237 .

Tightening Specifications

Component	Tightening Specification
Bolt for attaching the wheel bearing to the stub axle ♦ Use a new bolt	180 Nm + 180° turn

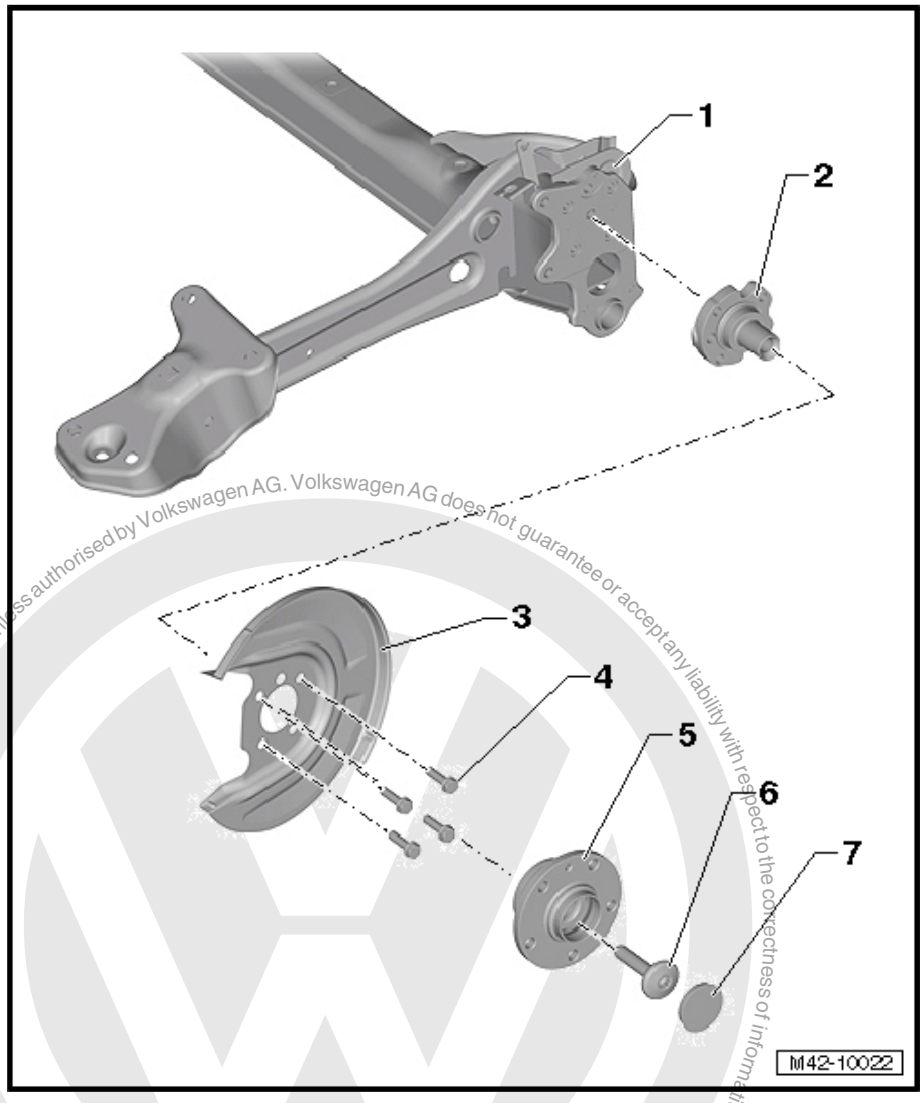
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9 Wheel Bearing, Disc Brake (Torsion Beam)

⇒ “9.1 Overview - Wheel Bearing, Disc Brake (Torsion Beam)”, page 178

⇒ “9.2 Wheel Bearing/Wheel Hub on Vehicles with Disc Brakes, Removing and Installing”, page 179

9.1 Overview - Wheel Bearing, Disc Brake (Torsion Beam)



1 - Axle Beam

- ❑ Removing and installing. Refer to ⇒ “4.2 Axle Beam, Removing and Installing”, page 152 .

2 - Axle Stub

- ❑ Straightening operations are not allowed
- ❑ Recutting the thread is not allowed!

3 - Cover Plate

4 - Bolt

- ❑ 30 Nm + 90° turn
- ❑ Always replace if removed

5 - Wheel Hub with Wheel Bearing

- ❑ The ABS sensor ring is installed in the wheel hub
- ❑ Removing and installing. Refer to ⇒ “9.2 Wheel Bearing/Wheel Hub on Vehicles with Disc Brakes, Removing and Installing”, page 179 .

The wheel bearing and wheel hub are in a single housing.

This wheel hub/wheel bearing is maintenance and adjustment free. Adjusting or servicing is not possible!

6 - Bolt

- ❑ 180 Nm + 180° turn
- ❑ Always replace if removed
- ❑ Self-locking

7 - Dust Cap

- ❑ Always replace if removed
- ❑ Removing and installing. Refer to ⇒ “9.2 Wheel Bearing/Wheel Hub on Vehicles with Disc Brakes, Removing and Installing”, page 179 .

An appropriate seal can only be achieved with a new dust cap.

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Only then is an optimum function and long service life of the wheel bearing guaranteed.

9.2 Wheel Bearing/Wheel Hub on Vehicles with Disc Brakes, Removing and Installing

Special tools and workshop equipment required

- Puller - Grease Cap - VW637/2-
- Camshaft Installer Kit - Sleeve - 3241/4-
- Torque Wrench 1332 40-200Nm - VAG1332-
- Torque Wrench - VAG1410-

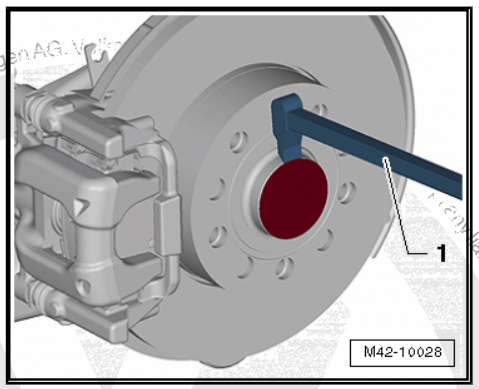
Removing

– Loosen the wheel bolts.

– Raise the vehicle.

– Remove wheel.

– Loosen dust cap from seat by tapping lightly on claw of Puller - Grease Cap - VW637/2- -1-.

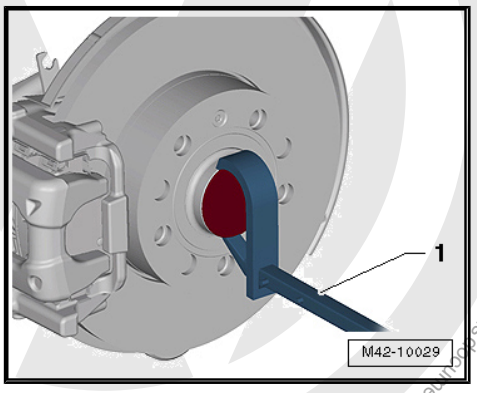


– Press of dust cap.

1 - Puller - Grease Cap - VW637/2-

– Remove the brake caliper and hang it on the vehicle body.

– Remove the brake rotor bolt and the brake rotor.

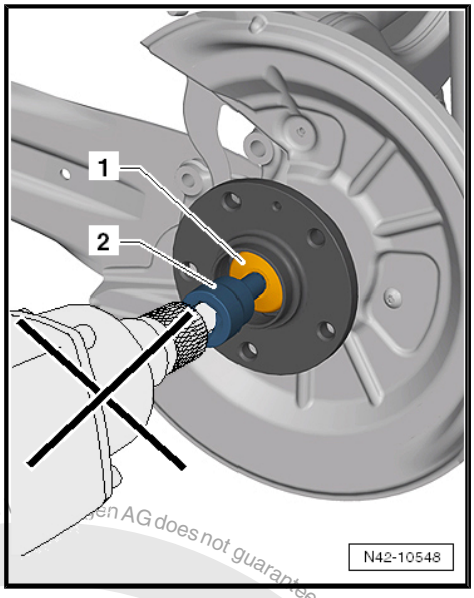


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– Remove bolt -1- using Socket - XZN 18mm - T10162A- -2-.

Caution

Never use an impact wrench when removing the bolt -1- using the Socket - XZN 18mm - T10162A- -2-.

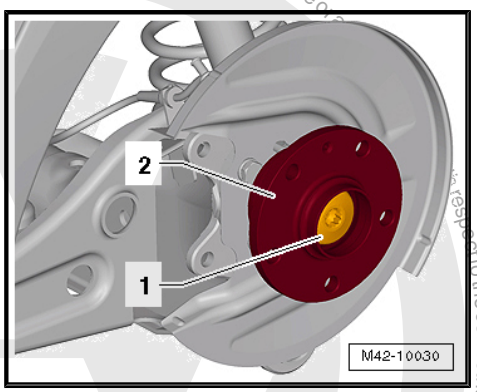


– Remove the bolt -1-.

– Remove the wheel hub/wheel bearing unit from the stub axle.

Installing

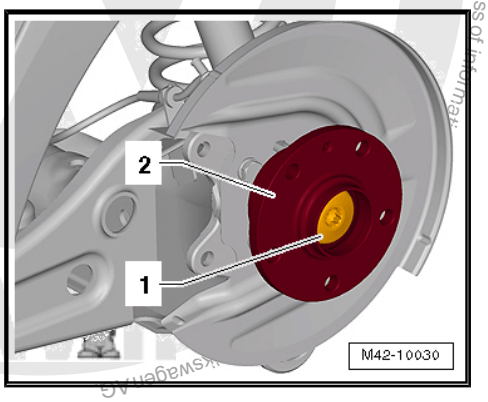
Install in reverse order of removal. Note the following:



– Carefully install the wheel hub/wheel bearing unit -2- onto the stub axle.

Caution

Make sure that the wheel hubs/wheel bearing unit does not tilt!



– Install the new bolt -1- and tighten it to the tightening specification.

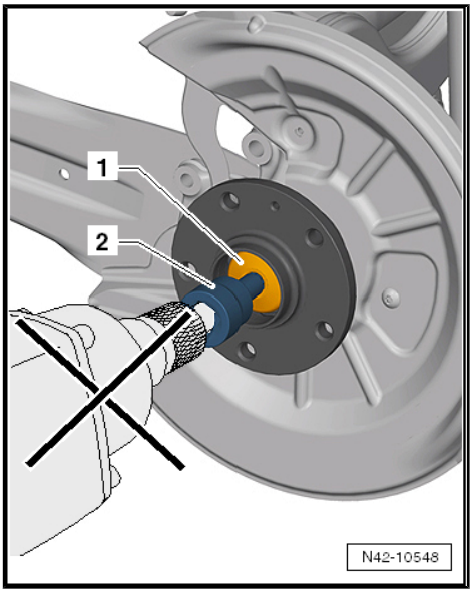
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Note

- *First tighten the bolt to the specification using the torque wrench.*
- *Using a rigid wrench when tightening additionally.*

Caution

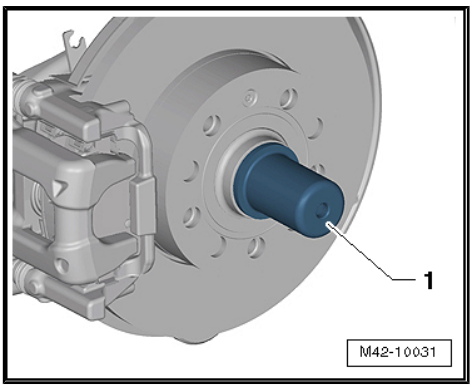
Never use an impact wrench when tightening the bolt -1- using the Socket - XZN 18mm - T10162A- -2-.



– Install the new dust cap -1-.

Always Replace Dust Caps.

Damaged dust caps allow moisture to enter. Therefore, always use the tool shown.



– Install the wheel and tighten. Refer to ⇒ "2 Wheel Installation Tightening Specifications", page 237 .

Tightening Specifications

Component	Tightening Specification
Bolt for attaching the wheel bearing to the stub axle ♦ Use a new bolt	180 Nm + 180° turn

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10 Rear Axle Curb Weight (Multi-link Rear Suspension)

Special tools and workshop equipment required

- Engine and Gearbox Jack - VAS6931-
- Tensioning Strap - T10038-
- Engine/Gearbox Jack Adapter - Wheel Hub Support - T10149-

Caution

All bolts on suspension components with bonded rubber bushings must always be tightened in curb weight position (unloaded condition).

Bonded rubber bushings have a limited range of motion.

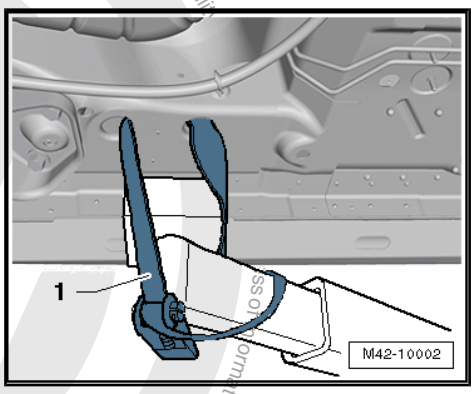
Axle components with bonded rubber bushings must be brought into the position they will be in when driving before they are tightened (curb weight position).

Otherwise, the bonded rubber bushing will have tension, which will reduce the service life.

By raising axle on one side using the Engine and Gearbox Jack - VAS6931- and Engine/Gearbox Jack Adapter - Wheel Hub Support - T10149- , this position can be simulated on the hoist.

Before lifting the axle on one side, the vehicle must be secured on both sides to the hoist lifting arms using Tensioning Strap - T10038- .

1 - Tensioning Strap - T10038-



WARNING

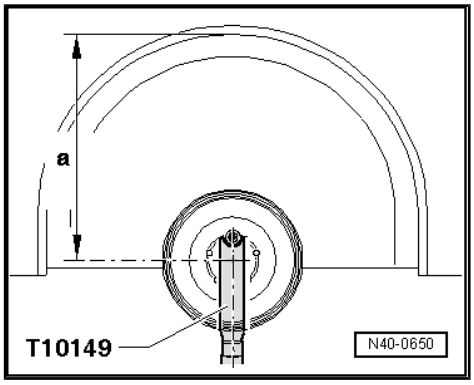
The vehicle could fall off the hoist if it is not secured.

– Turn the wheel hub until one of the holes for the wheel bolts is on top.

– Install the Engine/Gearbox Jack Adapter - Wheel Hub Support - T10149- with the wheel bolt.

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The applicable bolts/nuts must only be tightened when dimension -a- is between the center of the wheel hub and the lower edge of the wheel housing has been reached.



The dimension -a- is dependent on the height of the installed suspension:

Chassis [1]	Height -a- in mm
Basic suspension (2UA)	379 ± 10 mm
Sport suspension except for 18" tires for Mexico (2UC)	379 ± 10 mm
Sport suspension with 18" wheels (2UC+1JE/1JK)	364 ± 10 mm
Sport suspension with 18" wheels (2UC+1JS)	379 ± 10 mm
Sport suspension except for 18" tires for NAR/EU/RdW (2UC)	364 ± 10 mm
Comfort suspension (2UD)	389 ± 10 mm
Heavy duty suspension (2UB)	399 ± 10 mm
Comfort suspension India (2UB +0N4)	389 ± 10 mm

[1] The type of vehicle suspension is indicated on the vehicle data label. The suspension is indicated by a PR number. Allocation of the PR number according to the suspension. Refer to ⇒ page 275 .

– Lift the wheel bearing housing using the engine/gearbox jack until dimension -a- is reached.

WARNING

- *Do not lift or lower the vehicle when the Engine and Gearbox Jack - VAS6931- is under the vehicle.*
- *Do not leave the Engine and Gearbox Jack - VAS6931- under the vehicle any longer than necessary.*

– Tighten the applicable bolts and nuts.

– Lower the wheel bearing housing.

– Remove the Engine and Gearbox Jack - VAS6931- from under the vehicle.

– Remove the Engine/Gearbox Jack Adapter - Wheel Hub Support - T10149-

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11 Overview - Rear Axle, Multi-Link Rear Suspension

Note

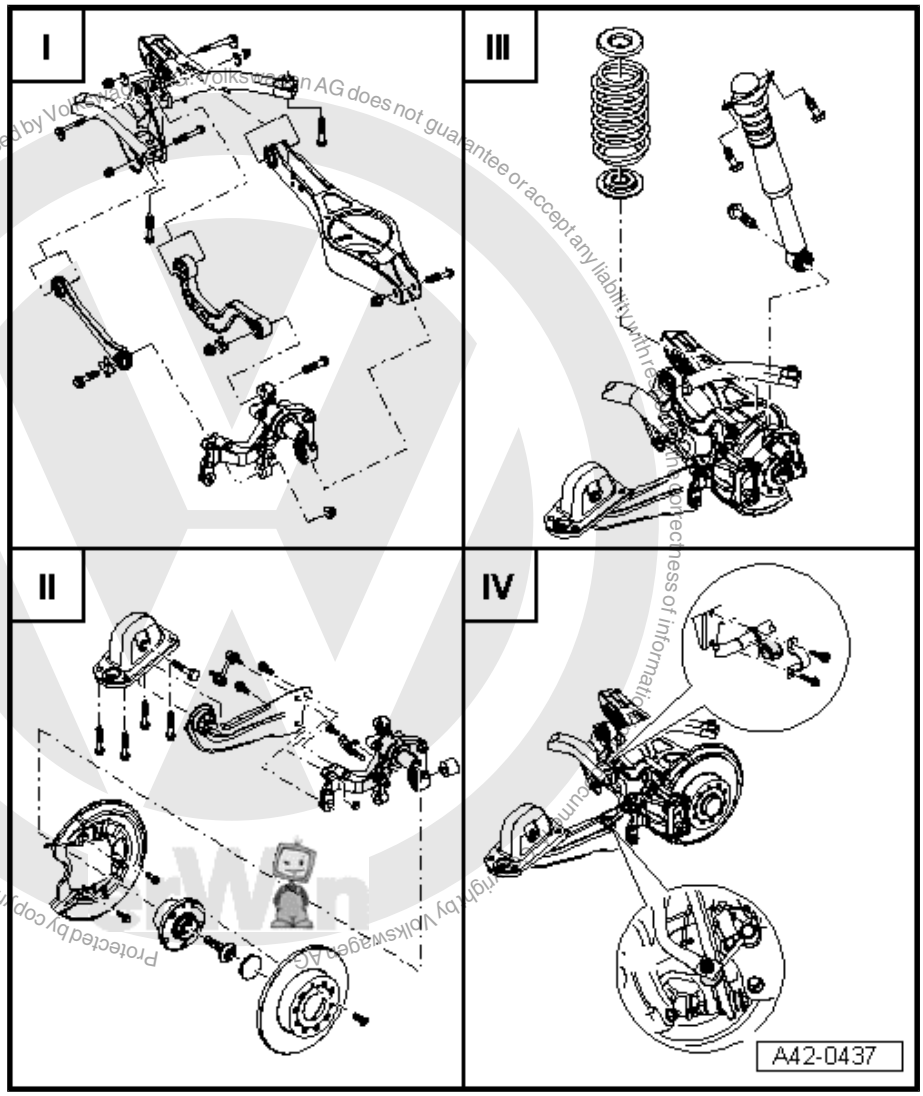
- *Welding and straightening work on supporting or wheel carrying components of suspension is not permitted.*
- *Always replace self-locking nuts.*
- *Always replace corroded bolts/nuts.*
- *Bonded rubber bushings have a limited range of motion. Therefore tighten threaded connections at components with bonded rubber bushings only when wheel bearing housing has been lifted (curb weight position). Refer to ⇒ "10 Rear Axle Curb Weight (Multi-link Rear Suspension)", page 182 .*

I - Overview - Subframe, Transverse Link and Tie Rod (Multi-Link Suspension). Refer to
⇒ "12 Subframe, Transverse Link and Tie Rod (Multi-Link Suspension)", page 185 .

II - Overview - Wheel Bearing Housing and Trailing Arm (Multi-Link Suspension). Refer to
⇒ "13 Wheel Bearing Housing and Trailing Arm (Multi-Link Suspension)", page 201 .

III - Overview - Shock Absorber and Coil Spring (Multi-Link Suspension). Refer to
⇒ "14 Shock Absorber and Coil Spring (Multi-Link Suspension)", page 215 .

IV - Overview - Stabilizer Bar (Multi-Link Suspension). Refer to
⇒ "15 Stabilizer Bar (Multi-Link Suspension)", page 221 .



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12 Subframe, Transverse Link and Tie Rod (Multi-Link Suspension)

⇒ “12.1 Overview - Subframe, Transverse Link and Tie Rod (Multi-Link Suspension)”, page 185

⇒ “12.2 Overview - Left Rear Level Control System Sensor G76 ”, page 188

⇒ “12.3 Left Rear Level Control System Sensor G76 , Removing and Installing”, page 188

⇒ “12.4 Subframe, Securing”, page 189

⇒ “12.5 Rear Axle, Lowering”, page 190

⇒ “12.6 Rear Axle, Removing and Installing”, page 191

⇒ “12.7 Upper Transverse Link, Removing and Installing”, page 194

⇒ “12.8 Lower Transverse Link, Removing and Installing”, page 196

⇒ “12.9 Tie Rod, Removing and Installing”, page 198

12.1 Overview - Subframe, Transverse Link and Tie Rod (Multi-Link Suspension)

1 - Eccentric Bolt

- ❑ For camber setting
- ❑ Perform a vehicle alignment after loosening. Refer to ⇒ “8 Wheel Alignment”, page 256 .

2 - Nut

- ❑ 95 Nm
- ❑ Self-locking
- ❑ Always replace if removed
- ❑ Always tighten the threaded connections in curb weight position. Refer to ⇒ “10 Rear Axle Curb Weight (Multi-link Rear Suspension)”, page 182 .

3 - Eccentric Washer

- ❑ Inner bore with tab

4 - Eccentric Bolt

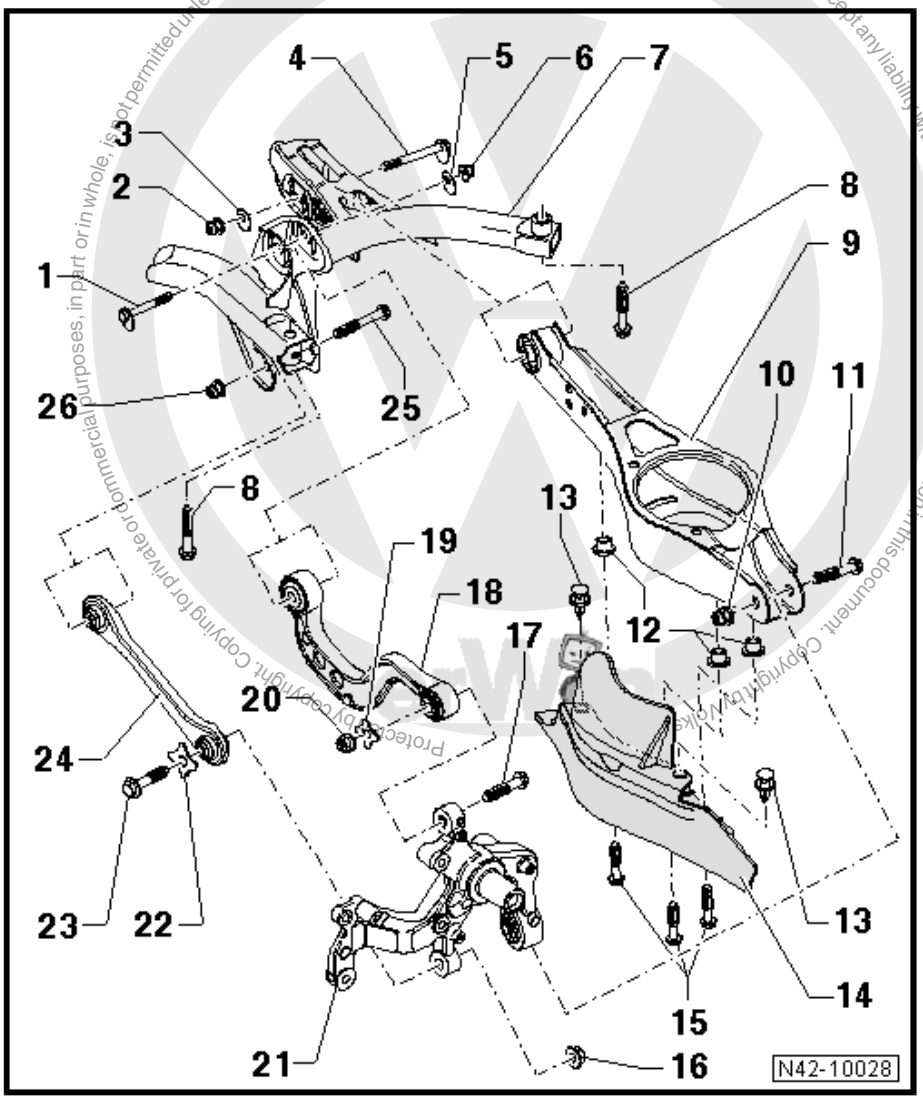
- ❑ For toe setting
- ❑ Perform a vehicle alignment after loosening. Refer to ⇒ “8 Wheel Alignment”, page 256 .

5 - Eccentric Washer

- ❑ Inner bore with tab

6 - Nut

- ❑ 95 Nm



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- ❑ Always replace if removed
- ❑ Self-locking
- ❑ Always tighten the threaded connections in curb weight position. Refer to ⇒ “10 Rear Axle Curb Weight (Multi-link Rear Suspension)”, page 182 .

Note

- ♦ *Adjust the Torque Wrench 1332 40-200Nm - VAG1332- to 80 Nm to tighten the nut.*
- ♦ *This tightening specification only applies in conjunction with Insert Tool - 18mm - T10179- .*

7 - Subframe

8 - Bolt

- ❑ 70 Nm +180° turn
- ❑ Replace after removing

9 - Lower Transverse Link

- ❑ Removing and installing. Refer to ⇒ “12.8 Lower Transverse Link, Removing and Installing”, page 196 .

10 - Nut

- ❑ 70 Nm + 180° turn
- ❑ Always replace if removed
- ❑ Self-locking
- ❑ Always tighten the threaded connections in curb weight position. Refer to ⇒ “10 Rear Axle Curb Weight (Multi-link Rear Suspension)”, page 182 .

11 - Bolt

- ❑ Always replace if removed

12 - Threaded Rivet

- ❑ M6

13 - Expanding Rivet

14 - Stone Chip Protection

- ❑ Allocation. Refer to the Parts Catalog.

15 - Bolt

- ❑ 8 Nm

16 - Nut

- ❑ Self-locking
- ❑ Always replace if removed
- ❑ Always tighten the threaded connections in curb weight position. Refer to ⇒ “10 Rear Axle Curb Weight (Multi-link Rear Suspension)”, page 182 .

17 - Bolt

- ❑ 130 Nm + 90° turn
- ❑ Always replace if removed
- ❑ Always tighten the threaded connections in curb weight position. Refer to ⇒ “10 Rear Axle Curb Weight (Multi-link Rear Suspension)”, page 182 .

18 - Upper Transverse Link

- ❑ Removing and installing. Refer to ⇒ “12.7 Upper Transverse Link, Removing and Installing”, page 194 .

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19 - Washer

20 - Nut

- ❑ Self-locking
- ❑ Always replace if removed
- ❑ Always tighten the threaded connections in curb weight position. Refer to ⇒ “10 Rear Axle Curb Weight (Multi-link Rear Suspension)”, page 182 .

21 - Wheel Bearing Housing

- ❑ Removing and installing. Refer to ⇒ “13.2 Wheel Bearing Housing, Removing and Installing”, page 202 .

22 - Washer

23 - Bolt

- ❑ 130 Nm + 90° turn
- ❑ Always replace if removed
- ❑ Always tighten the threaded connections in curb weight position. Refer to ⇒ “10 Rear Axle Curb Weight (Multi-link Rear Suspension)”, page 182 .

24 - Tie Rod

- ❑ Opened downward (the right and left tie rods are the same)
- ❑ Allocation. Refer to the Parts Catalog.
- ❑ Removing and installing. Refer to ⇒ “12.9 Tie Rod, Removing and Installing”, page 198 .

25 - Bolt

- ❑ Always replace if removed

26 - Nut

- ❑ 70 Nm + 180° turn
- ❑ Self-locking
- ❑ Always replace if removed
- ❑ Always tighten the threaded connections in curb weight position. Refer to ⇒ “10 Rear Axle Curb Weight (Multi-link Rear Suspension)”, page 182 .

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12.2 Overview - Left Rear Level Control System Sensor - G76-

Note

Vehicle level sensor is available as replacement part only complete with coupling rod and upper and lower retaining plates.

1 - Subframe

2 - Lower Transverse Link

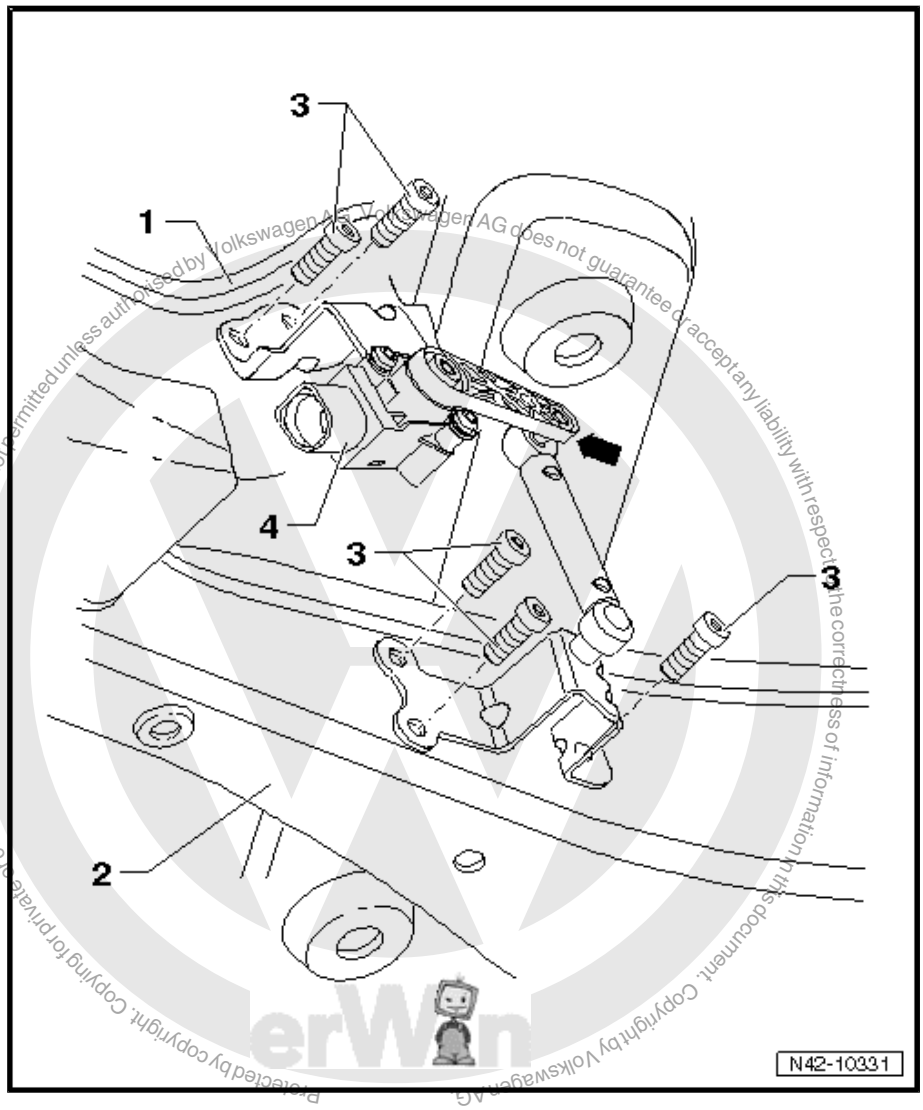
3 - Bolt

- 5 Nm
- M5 x 20

4 - Left Rear Level Control System Sensor - G76-

- Complete with attachments
- Lever -arrow- must point toward vehicle exterior
- Removing and installing. Refer to ⇒ "12.3 Left Rear Level Control System Sensor G76 , Removing and Installing", page 188 .
- After replacing, perform basic setting of the headlamps

Headlamp basic setting: Refer to Vehicle Diagnostic Tester



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12.3 Left Rear Level Control System Sensor - G76- , Removing and Installing

Special tools and workshop equipment required

- Torque Wrench 1783 - 2-10Nm - VAG1783-

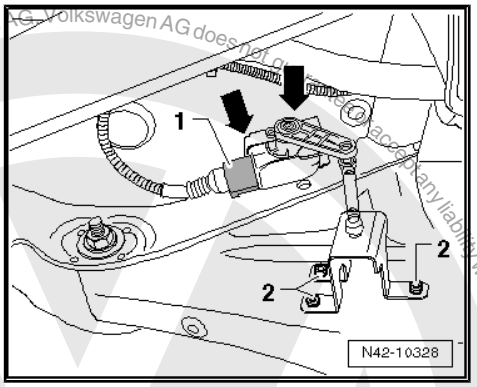
Removing

– Disconnect the connector -1-.

– Remove the bolts -2- from the lower transverse link.

– Remove bolts -arrows- from the subframe.

– Remove Left Rear Level Control System Sensor - G76- .



Installing

Install in reverse order of removal. Note the following:

The Left Rear Level Control System Sensor - G76- lever must point toward the outside of the vehicle.

– Perform a basic setting on the headlamps after replacing them. Refer to ⇒ Vehicle diagnostic tester

Tightening Specifications

Component	Tightening Specification
Left Rear Level Control System Sensor - G76- to lower transverse link and subframe	5 Nm

12.4 Subframe, Securing

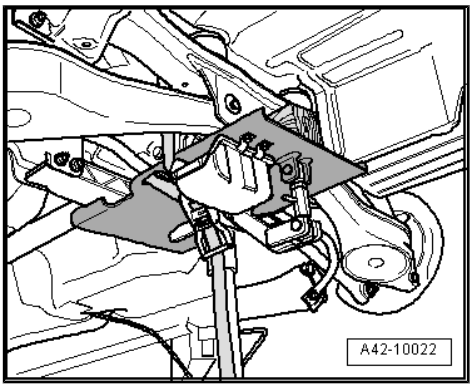
Special tools and workshop equipment required

- Locating Pins - T10096-
- Engine and Gearbox Jack - VAS6931-

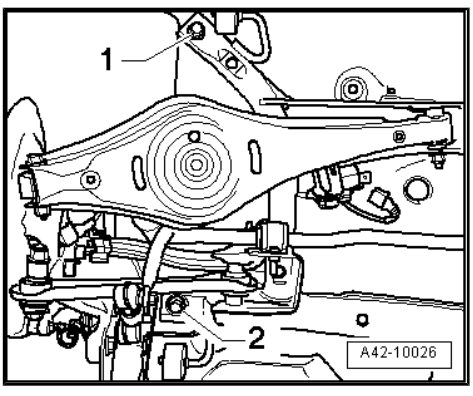
Perform the Following

Locating Pins - T10096- , Installing

– Move the Engine and Gearbox Jack - VAS6931- under the subframe and secure it using the tensioning strap.



– Remove the bolt -1 or 2- on both sides.

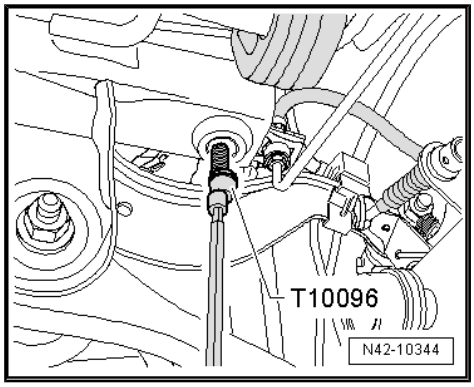


Note

Only the left side of the vehicle is shown in the illustration.

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– Secure the position of the subframes using two Locating Pins - T10096- to 20 Nm.



Note

Locating Pins - T10096- may only be tightened to a maximum of 20 Nm, otherwise the threads on the locating pins will be damaged.

– Replace the bolts on the subframe one after another on both sides with the Locating Pins - T10096- and tighten to 20 Nm.

The subframe position is now secured.

12.5 Rear Axle, Lowering

Special tools and workshop equipment required

- Torque Wrench 1332 40-200Nm - VAG1332-
- Engine and Gearbox Jack - VAS6931-

Perform the Following

Lower the Subframe with Attachments.

– Loosen the wheel bolts.

– Raise the vehicle.

– Remove the wheels.

– Remove the brake calipers on both sides of the vehicle and hang on the body.

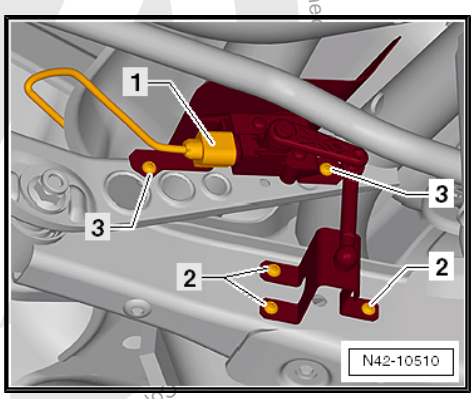
– Remove the coil springs. Refer to ⇒ , page 216 .

– Remove the rear muffler. Refer to ⇒ Rep. Gr. 26 ; Exhaust Pipes/Mufflers; Overview - Muffler .

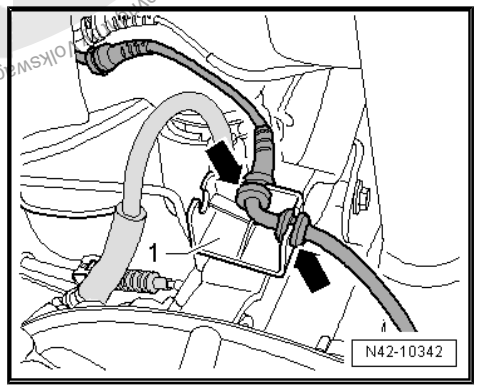
Vehicles with Left Rear Level Control System Sensor - G76-

– Disconnect the connector -1-.

Continuation for All Vehicles

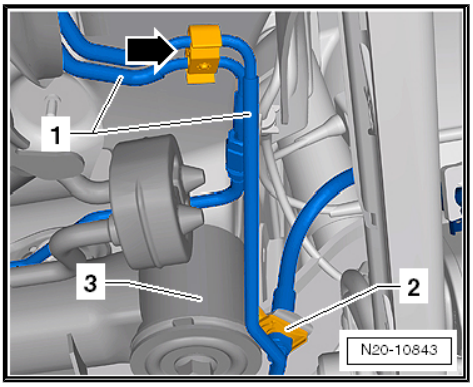


– Unclip the speed sensor wire out of the bracket -1- -arrows-.



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– Unclip the brake lines -1- from the bracket -arrow- on the left side of the body.
– Remove the clip -2- from the subframe -3- and loosen the brake hose from it.

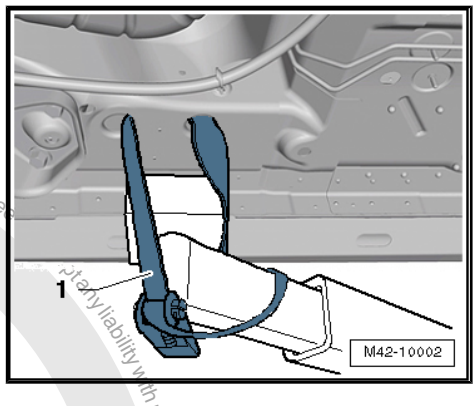


Note

Do not disconnect the brake line.

– Secure both sides of the vehicle on the hoist arms using Tensioning Straps - T10038- .

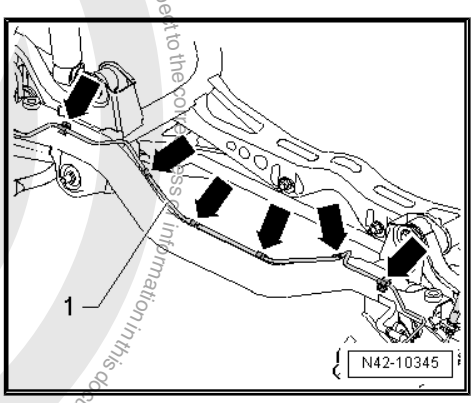
1 - Tensioning Strap - T10038-



WARNING

The vehicle could slide off the hoist if it is not secured.

– Secure the subframe. Refer to ⇒ “12.4 Subframe, Securing”, page 189 .
– Carefully lower the subframe with its attachments approximately 2 cm.
– Remove the brake line -1- from the clips -arrows-.



Note

When doing this, the clips will be destroyed and must be replaced.

– Carefully lower the subframe with its components approximately 140 mm.

Installing the Subframe with Attachments

Install in reverse order of removal. Note the following when doing so:

– Install the wheels and tighten to the tightening specification. Refer to ⇒ “2 Wheel Installation Tightening Specifications”, page 237 .

Tightening Specifications

Component	Tightening Specification
Subframe to body ♦ Use new bolts.	70 Nm + 180° turn

12.6 Rear Axle, Removing and Installing

Special tools and workshop equipment required

♦ Torque Wrench 1332 40-200Nm - VAG1332-
♦ Engine and Gearbox Jack - VAS6931 -
♦ Tensioning Strap - T10038-

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♦ Locating Pins - T10096-

Perform the Following

Removing the Subframe and Its Attachments

– Loosen the wheel bolts.

– Raise the vehicle.

– Remove the wheels.

– Remove the brake calipers on both sides of the vehicle and hang on the body.

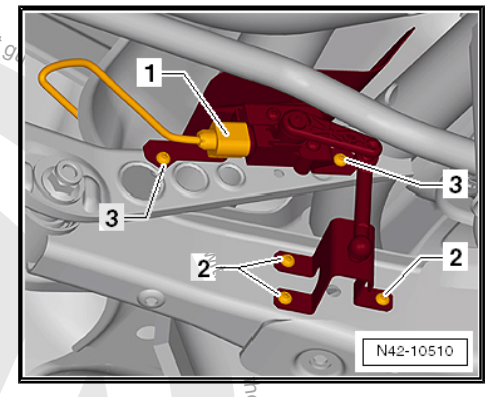
– Remove the coil springs. Refer to ⇒ , page 216 .

– Remove the rear muffler. Refer to ⇒ Engine ⇒ Rep. Gr. 26 .

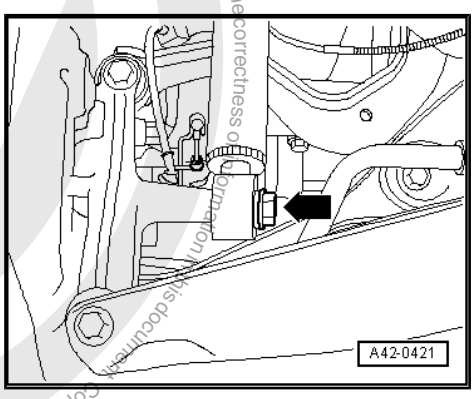
Vehicles with Left Rear Level Control System Sensor - G76-

– Disconnect the connector -1-.

Continuation for All Vehicles



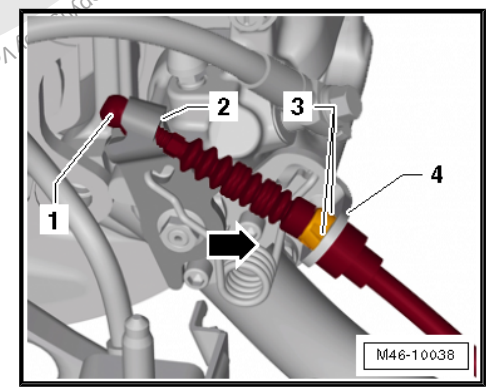
– Remove the bolt -arrow-.



– Push the lever on the brake caliper -2- in the direction of -arrow-.

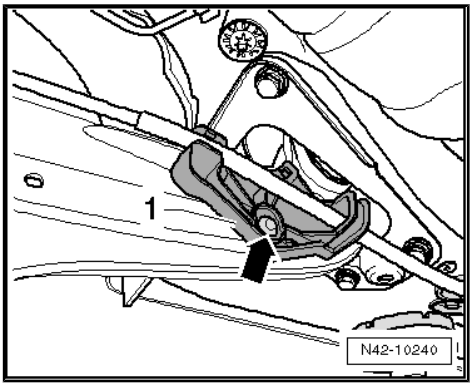
– Disengage the parking brake cable -1- from the lever on the brake caliper -2-.

– Squeeze the tabs -3- and remove the parking brake cable -1- from the bracket -4- on the brake caliper.

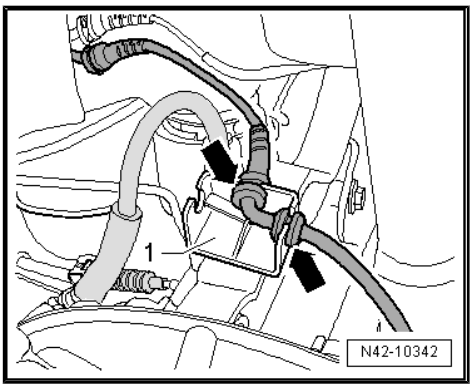


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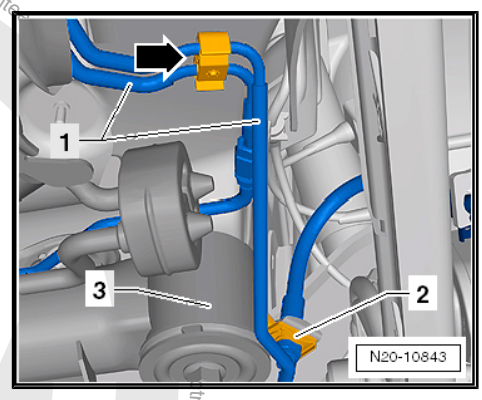
– Remove bracket -1- by pressing out rivet inner pin -arrow-.
– Disconnect the speed sensor connectors.



– Unclip the speed sensor wire out of the bracket -1- -arrows-.



– Unclip the brake lines -1- from the bracket -arrow- on the left side of the body.
– Remove the clip -2- from the subframe -3- and loosen the brake hose from it.

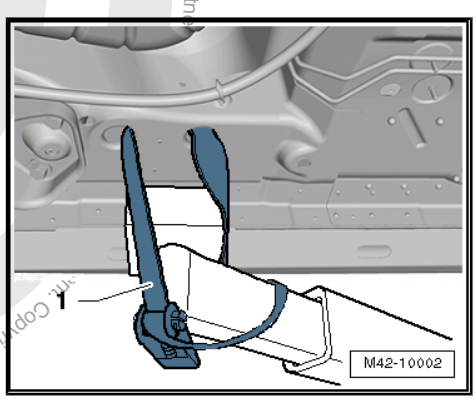


Note

Do not disconnect the brake line.

– Secure both sides of the vehicle on the hoist arms using Tensioning Straps - T10038- .

1 - Tensioning Strap - T10038-



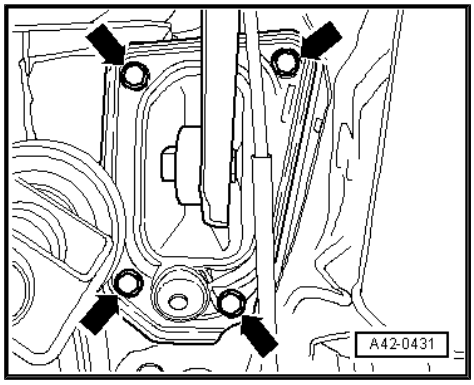
WARNING

The vehicle could slide off the hoist if it is not secured.

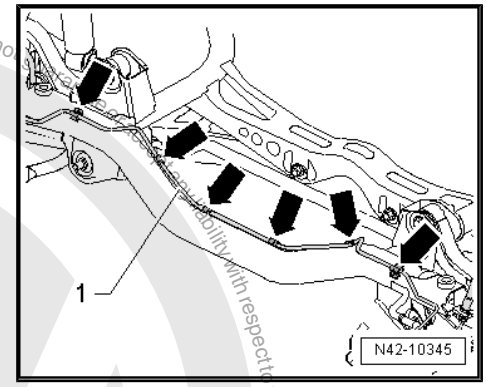
– Secure the subframe. Refer to ⇒ “12.4 Subframe, Securing”, page 189 .

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– Mark the mounting bracket installation location on the body.
– Remove the bolts -arrows-.
– Carefully lower the subframe with its attachments approximately 2 cm.



– Remove the brake line -1- from the clips -arrows-.



Note

- *When doing this, the clips will be destroyed and must be replaced.*
- *For illustrative purposes, the illustration shows the subframe removed and from the top.*

– Lower subframe with attachments.

Installing the Subframe with Attachments

Installation is performed in the reverse order of removal. Note the following:

– Perform a vehicle alignment. Refer to ⇒ “8 Wheel Alignment”, page 256 .

Tightening Specifications

Component	Tightening Specification
Subframe to body ◆ Use new bolts.	70 Nm + 180° turn
Shock absorber to wheel bearing housing.	180 Nm
Mounting bracket to body ◆ Use new bolts.	50 Nm + 45° turn
Parking brake cable to trailing arm Refer to ⇒ Brake Systems; Rep. Gr. 46 .	

12.7 Upper Transverse Link, Removing and Installing

Special tools and workshop equipment required

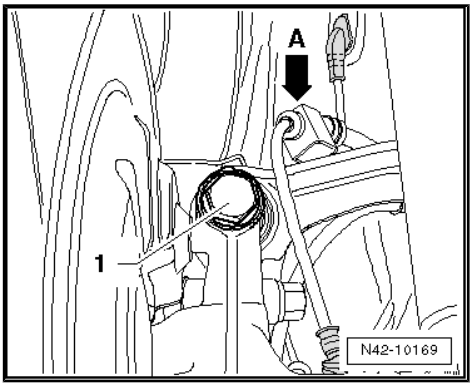
- Torque Wrench 1332 40-200Nm - VAG1332-

Perform the Following

Removing

– Loosen the wheel bolts.
– Raise the vehicle.
– Remove the wheel.
– Remove the coil spring. Refer to ⇒ “14.2 Coil Spring, Removing and Installing”, page 215 .

– Disengage the speed sensor wire -arrow A- on top of the transverse link.
– Remove the bolt -1-.

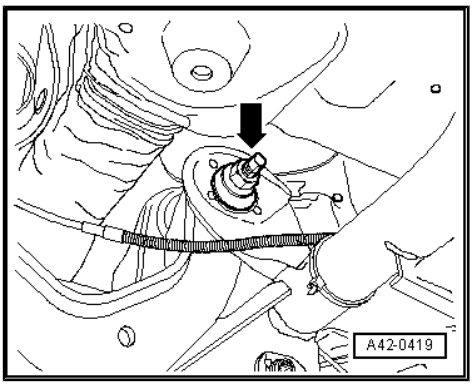


– Mark the location of the centering bolt -arrow- in relation to the subframe, for example using a felt-tip pen.
– Remove the bolt -arrow-.
– Remove upper transverse link.

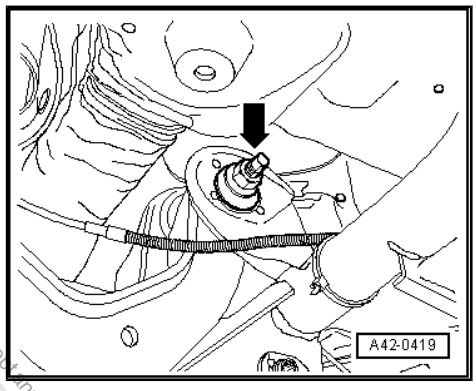
Installing

– Insert the upper transverse link in the vehicle and tighten the bolts by hand.

Only Bolt on Transverse Link if Dimension “a” is Reached.



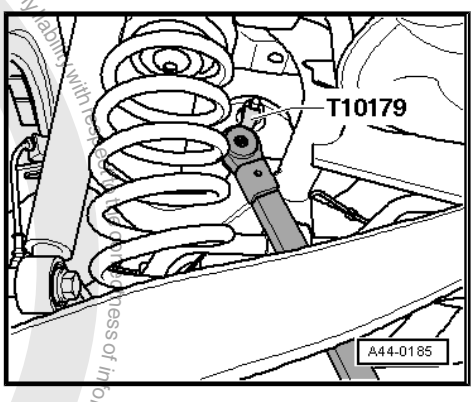
– Tighten the new nut -arrow- to the specification.



– Use the Insert Tool - 18mm - T10179- for this.

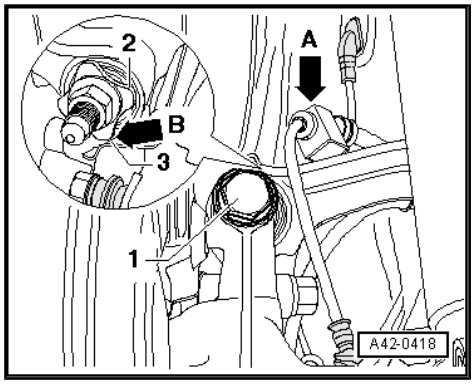
Tighten the nut to 80 Nm using the Insert Tool - 18mm - T10179- .

– Observe the mark made to indicate the location of the centering bolt in relation to the subframe.



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– Tighten the bolt -1- on the upper transverse link.



Note

Washer -2- must be installed so that there is a gap -arrow B- between washer and cover plate -3-.

– Engage the speed sensor wire -arrow A- on top of the transverse link.
– Install coil spring. Refer to ⇒ “14.2 Coil Spring, Removing and Installing”, page 215 .
– Install the wheel and tighten. Refer to ⇒ “2 Wheel Installation Tightening Specifications”, page 237 .
– Perform vehicle alignment. Refer to ⇒ “8 Wheel Alignment”, page 256 .

Tightening Specifications

Component	Tightening Specification
Upper transverse link to wheel bearing housing ♦ Use a new bolt and nut ♦ Tighten bolts in curb weight position	130 Nm + 90° turn
Upper transverse link to subframe ♦ Use new nut ♦ Tighten bolts in curb weight position	95 Nm ♦ Adjust the Torque Wrench 40-200Nm - VAG1332- to 80 Nm when tightening the nut. ♦ Only applies in conjunction with Insert Tool - 18mm - T10179-

12.8 Lower Transverse Link, Removing and Installing

Special tools and workshop equipment required

♦ Torque Wrench 1332 40-200Nm - VAG1332-

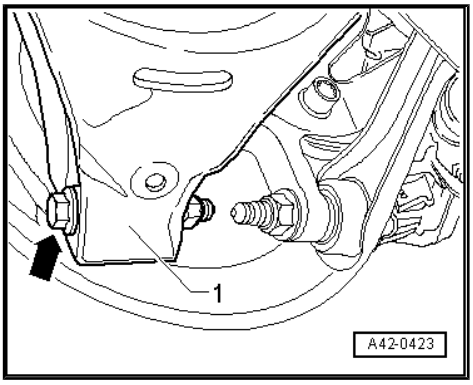
Perform the Following

Removing

– Loosen the wheel bolts.
– Raise the vehicle.
– Remove the wheel.
– Remove the coil spring. Refer to ⇒ “14.2 Coil Spring, Removing and Installing”, page 215 .

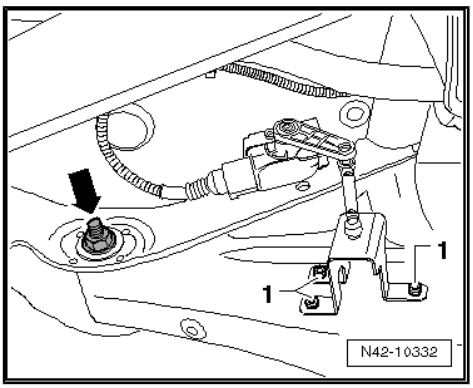
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– Remove bolt -arrow- for lower transverse link -1-.



Vehicles with Automatic Headlamp Range Control

– Remove the bolts -1- from the lower transverse link.



Continuation for All Vehicles

– Mark the location of the centering bolt -arrow- in relation to the subframe, for example using a felt-tip pen.

– Remove the bolt -arrow-.

– Remove lower transverse link.

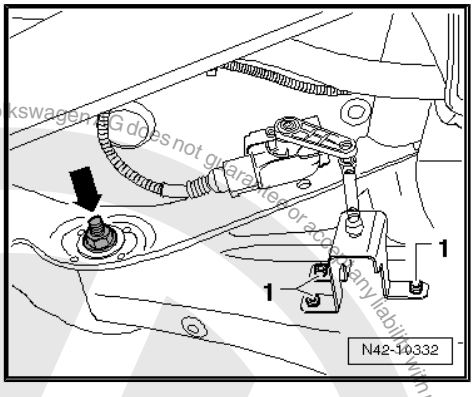
Installing

– Insert the lower transverse link in the vehicle and tighten the bolts by hand.

Only Bolt on Transverse Link if Dimension “a” is Reached. Refer to
⇒ “2 Rear Axle Curb Weight (Twist Beam Rear Suspension)”, page 146 **!**

– Connect the upper transverse link to the subframe and tighten the new nut -arrow- to the tightening specification only.

– Observe the mark made -arrow- to indicate the location of the centering bolt in relation to the subframe.

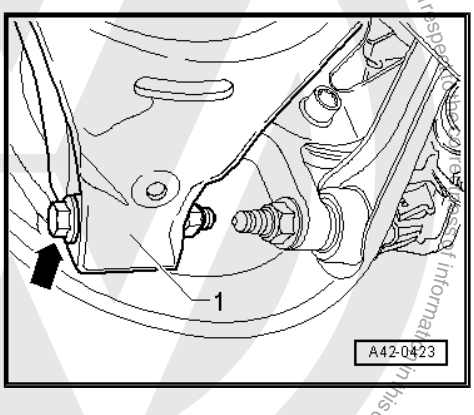


Vehicles with Automatic Headlamp Range Control

– Install the bolts -1- to the lower transverse link.

Continuation for All Vehicles

– Tighten bolt -arrow- for lower transverse link -1-.



– Install the coil spring. Refer to
⇒ “14.2 Coil Spring, Removing and Installing”, page 215 .

– Install the wheel and tighten. Refer to
⇒ “2 Wheel Installation Tightening Specifications”, page 237 .

– Perform vehicle alignment. Refer to
⇒ “8 Wheel Alignment”, page 256 .

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Tightening Specifications

Component	Tightening Specification
Lower transverse link to wheel bearing housing ♦ Use a new bolt and nut ♦ Tighten bolts in curb weight position	90 Nm +90° turn
Lower transverse link to subframe ♦ Use new nut ♦ Tighten bolts in curb weight position	95 Nm
Left Rear Level Control System Sensor - G76- to lower transverse link	5 Nm

12.9 Tie Rod, Removing and Installing

Special tools and workshop equipment required

- ♦ Torque Wrench 1331 5-50Nm - VAG1331-
- ♦ Torque Wrench 1332 40-200Nm - VAG1332-

Perform the Following

Removing

– Loosen the wheel bolts.

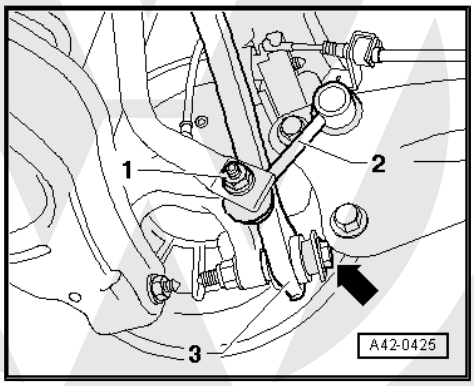
– Raise the vehicle.

– Remove the wheel.

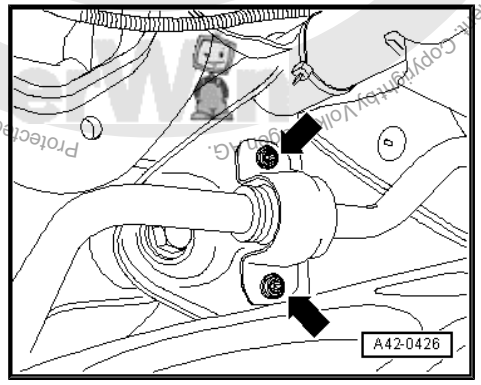
– Remove the coil spring. Refer to ⇒ , page 216 .

– Remove the nut -1- and pull the coupling rod -2- out of the stabilizer bar.

– Remove bolt -arrow- for tie rod -3-.



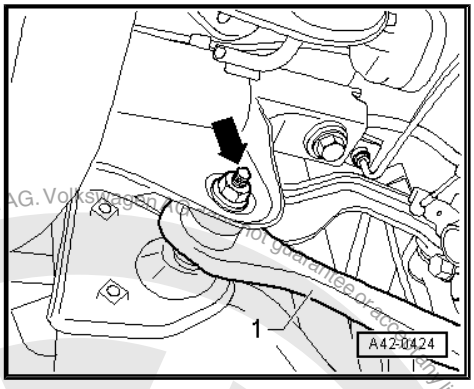
– Remove the bolts -arrows- for the stabilizer bar clamp.



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– Remove the nut -arrow- and remove bolt toward rear.

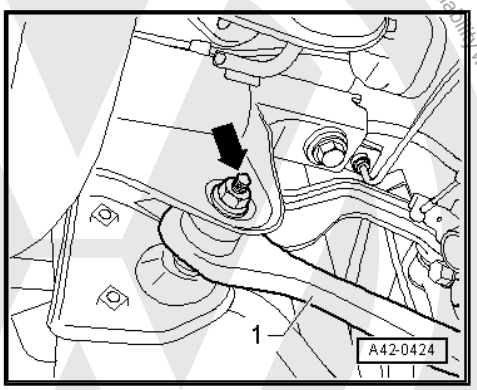
– Remove tie rod.



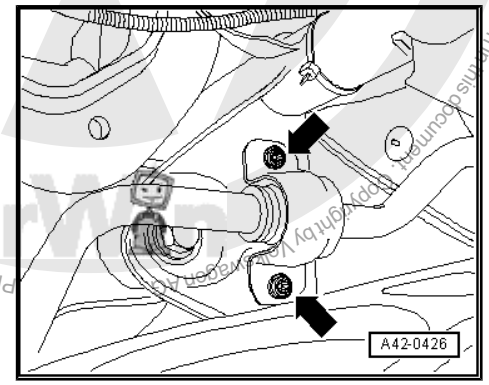
Installing

– Insert the tie rod -1- in the vehicle and tighten the bolts by hand.

The bolted connections of the tie rod must only be fastened when the dimension "a" is achieved. Refer to ⇒ "2 Rear Axle Curb Weight (Twist Beam Rear Suspension)", page 146 !



– Tighten bolts -arrows- for stabilizer clamp.



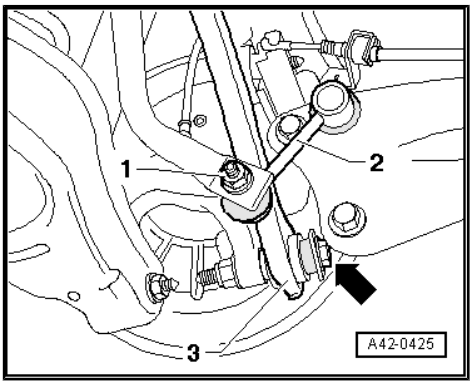
– Tighten bolt -arrow- for tie rod -3-.

– Insert coupling rod -2- into stabilizer and tighten nut -1-.

– Install the coil spring. Refer to ⇒ , page 216 .

– Install the wheel and tighten. Refer to ⇒ "2 Wheel Installation Tightening Specifications", page 237 .

– Perform vehicle alignment. Refer to ⇒ "8 Wheel Alignment", page 256 .



Tightening Specifications

Component	Tightening Specification
Tie rod to steering knuckle ♦ Use a new bolt and nut ♦ Tighten bolts in curb weight position	130 Nm + 90° turn

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Component	Tightening Specification
Tie rod to subframe ♦ Use a new bolt and nut	90 Nm +90° turn
Stabilizer bar to subframe ♦ Use new bolts. ♦ Tighten bolts in curb weight position	25 Nm + 45° turn
Stabilizer bar to coupling rod ♦ Use new nut	45 Nm

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13 Wheel Bearing Housing and Trailing Arm (Multi-Link Suspension)

⇒ “13.1 Overview - Wheel Bearing Housing and Trailing Arm (Multi-Link Suspension)”, page 201

⇒ “13.2 Wheel Bearing Housing, Removing and Installing”, page 202

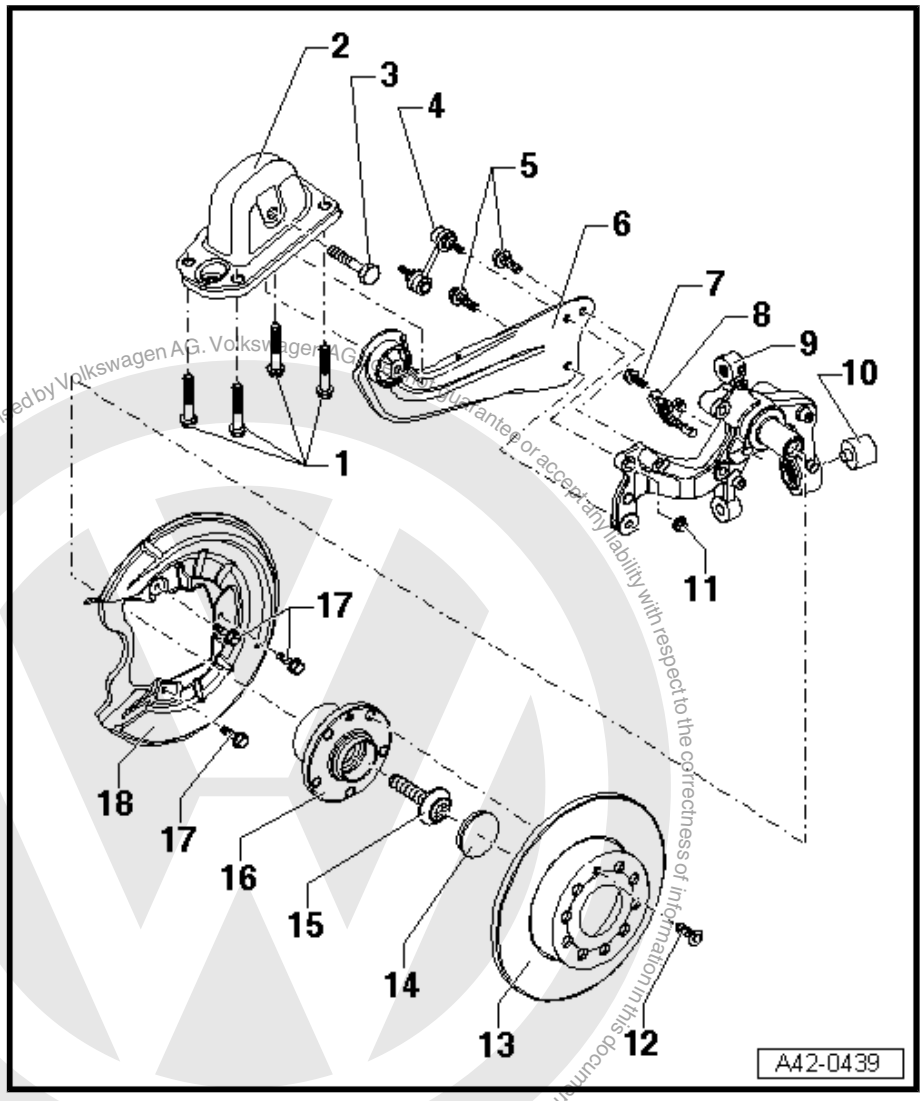
⇒ “13.3 Wheel Bearing Housing Bonded Rubber Bushing, Replacing”, page 205

⇒ “13.4 Wheel Bearing and Wheel Hub, Removing and Installing”, page 207

⇒ “13.5 Trailing Arm with Mounting Bracket, Removing and Installing”, page 210

⇒ “13.6 Trailing Arm, Servicing”, page 213

13.1 Overview - Wheel Bearing Housing and Trailing Arm (Multi-Link Suspension)



1 - Bolt

- ❑ 50 Nm + 45° turn
- ❑ Always replace if removed

2 - Mounting Bracket

3 - Bolt

- ❑ 90 Nm +90° turn
- ❑ Always replace if removed

4 - Coupling Rod

- ❑ Connects stabilizer to trailing link/wheel bearing housing

5 - Bolt

- ❑ 90 Nm + 45° turn
- ❑ Always replace if removed
- ❑ Observe the tightening sequence. Refer to ⇒ , page 211 .

6 - Trailing Arm

- ❑ Removing and installing. Refer to ⇒ “13.5 Trailing Arm with Mounting Bracket, Removing and Installing”, page 210 .
- ❑ Servicing. Refer to ⇒ “13.6 Trailing Arm, Servicing”, page 213 .

7 - Bolt

- ❑ 8 Nm

8 - Right Rear ABS Wheel Speed Sensor - G44- / Left Rear ABS Wheel Speed Sensor - G46-

- ❑ Can be checked in Guided Fault Finding using the Vehicle Diagnostic Tester .
- ❑ Before inserting the sensor, clean the inner surface of the hole and coat with Grease - G 000 650- .

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9 - Wheel Bearing Housing

- ❑ Removing and installing. Refer to ⇒ “13.2 Wheel Bearing Housing, Removing and Installing”, page 202 .

10 - Bonded Rubber Bushing

- ❑ Replacing. Refer to ⇒ “13.3 Wheel Bearing Housing Bonded Rubber Bushing, Replacing”, page 205 .

11 - Nut

- ❑ 45 Nm
- ❑ Always replace if removed

12 - Bolt

- ❑ 4 Nm

13 - Brake Rotor

14 - Dust Cap

- ❑ Always replace if removed
- ❑ Removing and installing. Refer to ⇒ “13.4 Wheel Bearing and Wheel Hub, Removing and Installing”, page 207 .

An appropriate seal can only be achieved with a new dust cap.

15 - Bolt

- ❑ 200 Nm + 90° turn
- ❑ Always replace if removed
- ❑ Loosen and tighten using Socket - Xzn 18mm - T10162A-

16 - Wheel Hub with Wheel Bearing

- ❑ The ABS sensor ring is installed in the wheel bearing
- ❑ Removing and installing. Refer to ⇒ “13.4 Wheel Bearing and Wheel Hub, Removing and Installing”, page 207 .

The wheel bearing and wheel hub are installed together in a housing.

This wheel bearing/hub unit is maintenance and adjustment free. Adjusting or servicing is not possible!

17 - Bolt

- ❑ 12 Nm

18 - Cover Plate

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13.2 Wheel Bearing Housing, Removing and Installing

Special tools and workshop equipment required

- ♦ Torque Wrench 1332 40-200Nm - VAG1332-

Perform the Following

Removing

– Loosen the wheel bolts.

– Raise the vehicle.

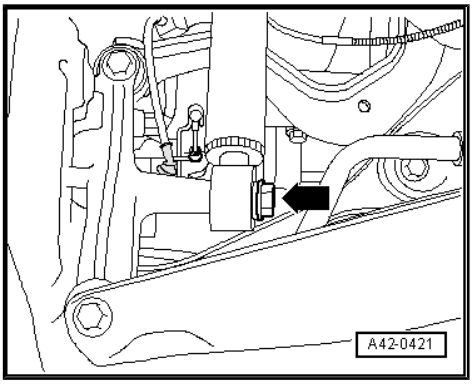
– Remove the wheel.

– Remove the coil spring. Refer to ⇒ “14.2 Coil Spring, Removing and Installing”, page 215 .

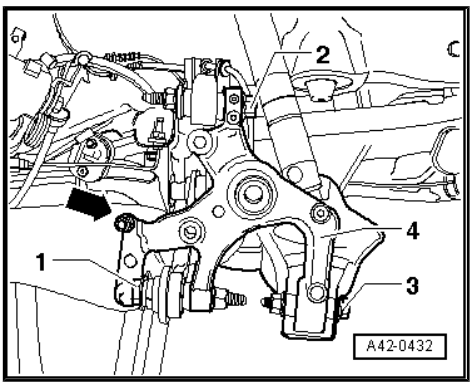
– Remove wheel bearing/wheel hub unit. Refer to ⇒ “13.4 Wheel Bearing and Wheel Hub, Removing and Installing”, page 207 .

– Remove cover plate.

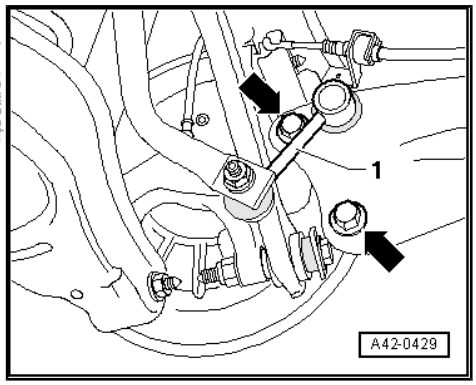
– Remove ABS wheel speed sensor from wheel bearing housing.
– Remove the bolt -arrow-.



– Remove bolt for tie rod -1-, upper transverse link -2- and lower transverse link -3- from wheel bearing housing -4-.
– Remove connecting link -arrow- from the wheel bearing housing.

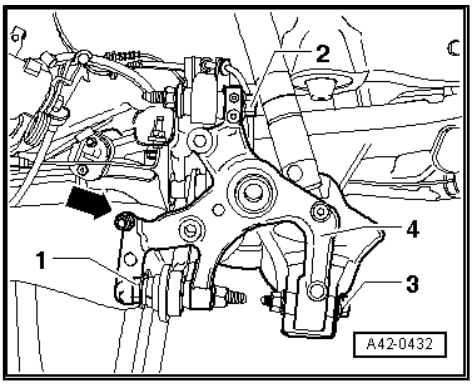


– Hold wheel bearing housing tightly and remove the bolts -arrows-.
– Pull the coupling rod -1- out of the trailing arm.



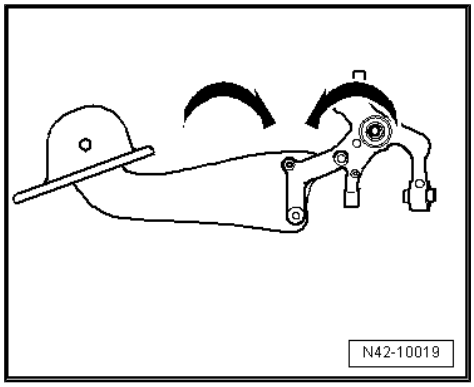
Installing

– Install tie rod bolt -1-, upper transverse link -2- and lower transverse link -3-.
– Screw coupling rod -arrow- on wheel bearing housing hand-tight.



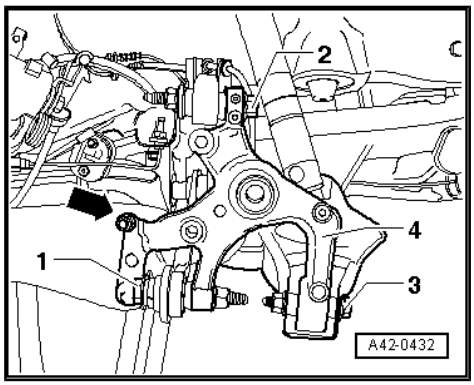
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Threaded connection of trailing link/wheel bearing housing must only be tightened when all other components (spring and strut always) of the respective wheel suspension have been already assembled. To tighten, suspension must be unloaded. Only now do the trailing link and wheel bearing housing move into the position required -arrows-.



Complete the Following Steps in the Exact Order Specified.

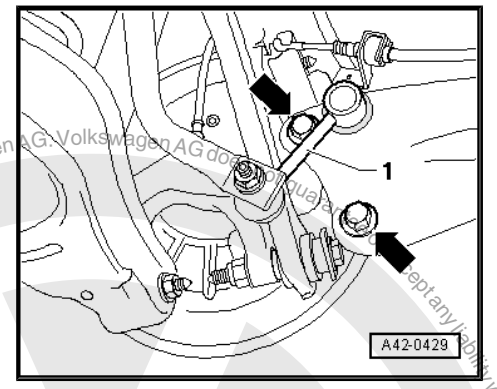
– Install the trailing arm and mounting bracket with bolts -2- on wheel bearing housing but do not yet tighten.



– Install and fasten bolts -arrows-.

– Install the cover plate.

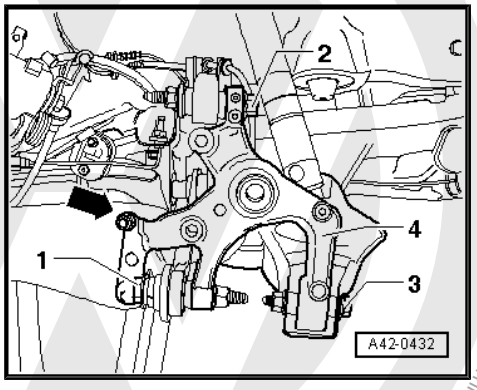
– Install the wheel bearing/wheel hub unit. Refer to ⇒ “13.4 Wheel Bearing and Wheel Hub, Removing and Installing”, page 207 .



Bolting at wheel bearing housing may occur only when the dimension “a” has been obtained. Refer to ⇒ “2 Rear Axle Curb Weight (Twist Beam Rear Suspension)”, page 146 .

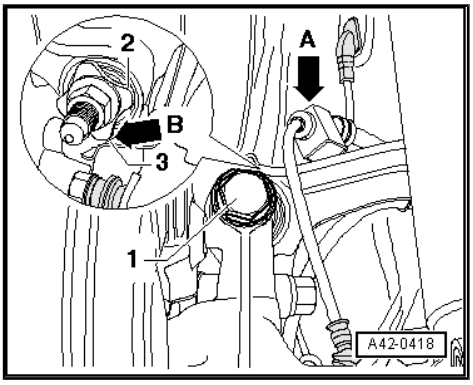
– Tighten bolt for tie rod -1-.

– Tighten lower transverse link bolt -3-.



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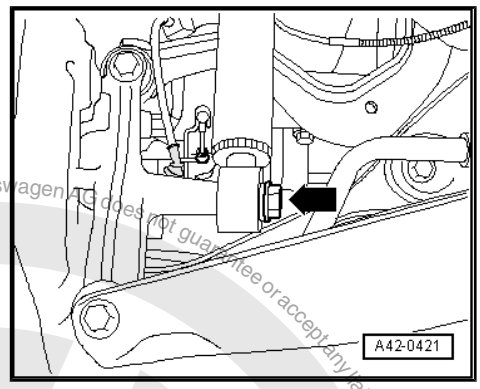
– Tighten the bolt -1- on the upper transverse link.



Note

Washer -2- must be installed so that there is a gap -arrow B- between washer and cover plate -3-.

– Tighten the bolt -arrow-.



– Install the coil spring. Refer to ⇒ , page 216 .
– Install ABS wheel speed sensor in wheel bearing housing.
– Install the brake rotor.
– Install the brake carrier with brake caliper. Refer to ⇒ Brake Systems; Rep. Gr. 46 .
– Install the wheel and tighten. Refer to ⇒ “2 Wheel Installation Tightening Specifications”, page 237 .

Tightening Specifications

Component	Tightening Specification
Wheel bearing housing to upper transverse link ♦ Use a new bolt and nut ♦ Tighten bolts in curb weight position	130 Nm + 90° turn
Wheel bearing housing to lower transverse link ♦ Use a new bolt and nut ♦ Tighten bolts in curb weight position	90 Nm +90° turn
Wheel bearing housing to tie rod ♦ Use a new bolt and nut ♦ Tighten bolts in curb weight position	130 Nm + 90° turn
Trailing arm to wheel bearing housing ♦ Use new bolts.	90 Nm + 45° turn
Connecting link to wheel bearing housing ♦ Use new nut	45 Nm
Cover 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 rotor to wheel bearing housing	4 Nm

13.3 Wheel Bearing Housing Bonded Rubber Bushing, Replacing

Special tools and workshop equipment required

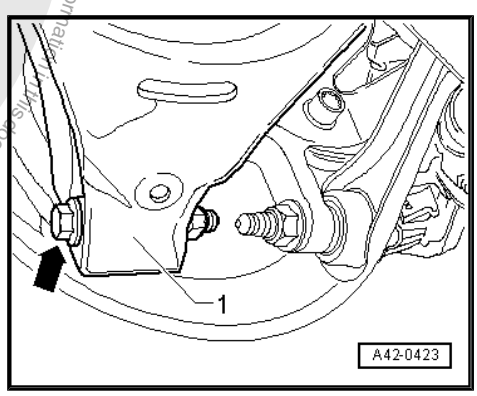
♦ Press Tube - 41-501-

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- Subframe Bushing Tool Kit - 3301-
- Bearing Installer - Control Arm - 3346-
- Bearing Installer - Carrier Bearing - 3350-
- Subframe Bushing Assembly Tool Kit - Thrust Piece - T10356/5-
- Torque Wrench 1332 40-200Nm - VAG1332-

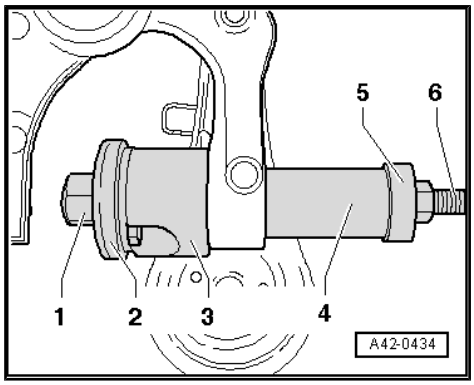
Removing

– Loosen the wheel bolts.
– Raise the vehicle.
– Remove the wheel.
– Remove the coil spring. Refer to ⇒ “14.2 Coil Spring, Removing and Installing”, page 215 .
– Remove bolt -arrow- for lower transverse link -1-.



Pressing Out Bonded Rubber Bushing

– Mount the tools as shown in the illustration.



1 - Control Arm Bearing Installer - Nut - 3346/3-
2 - Subframe Bushing Tool Kit - 3301-
3 - Subframe Bushing Tool Kit - Assembly Tool 3 - 3301/3-
4 - Press Tube - 41-501-
5 - Bearing Installer - Carrier Bearing - Thrust Piece - 3350/1-
6 - Bearing Installer - Component - 3346/2-

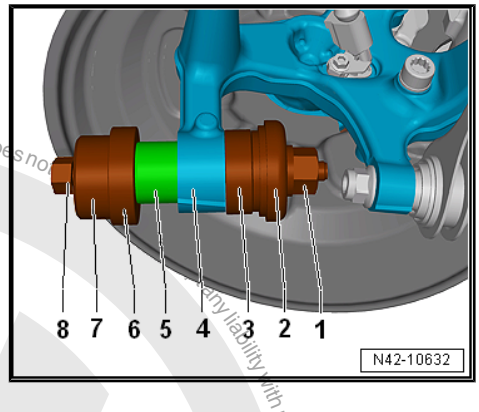
– Rotate the spindle to remove the bonded rubber bushing.

Installing

Installing Bonded Rubber Bushing

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– Mount the tools as shown in the illustration.



1 - Subframe Bushing Tool Kit - Nut - 3301/M-
2 - Subframe Bushing Tool Kit - 3301-
3 - Bearing Installer - Component - 3346/2-
4 - Wheel bearing housing
5 - Bonded rubber bushing
6 - Subframe Bushing Assembly Tool Kit - Thrust Piece - T10356/5-
7 - Subframe Bushing Tool Kit - Thrust Piece - 3301/2-
8 - Subframe Bushing Tool Kit - Bolt - 3301/1-

– Turn the spindle and pull the bonded rubber bushing into the wheel bearing housing -4-.

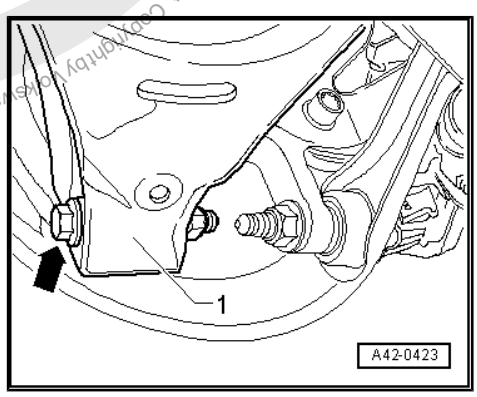
Note

- *Do not use lubricant!*
- *Insert the bearing carefully so that it is not tilted.*

– Install the cover plate.

Bolting at wheel bearing housing may occur only when the dimension “a” has been obtained. Refer to ⇒ “2 Rear Axle Curb Weight (Twist Beam Rear Suspension)”, page 146 .

– Tighten bolt -arrow- for lower transverse link -1-.



– Install the coil spring. Refer to ⇒ “14.2 Coil Spring, Removing and Installing”, page 215 .

– Install the wheel and tighten. Refer to ⇒ “2 Wheel Installation Tightening Specifications”, page 237 .

Tightening Specifications

Component	Tightening Specification
Wheel bearing housing to lower transverse link ♦ Use a new bolt and nut ♦ Tighten bolts in curb weight position	90 Nm +90° turn

13.4 Wheel Bearing and Wheel Hub, Removing and Installing

Special tools and workshop equipment required

- Puller - Grease Cap - VW637/2-
- Seal Installer - Camshaft Installer Kit - 3241-
- Torque Wrench 1332 40-200Nm - VAG1332-

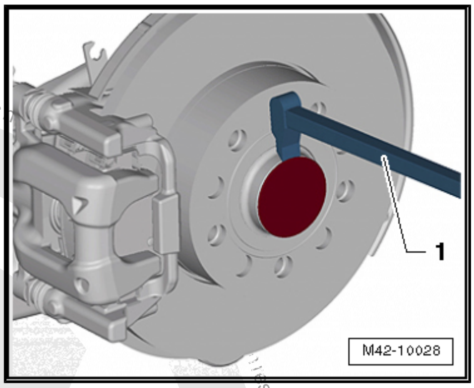
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- ♦ Torque Wrench 1410 - VAG1410-
- ♦ Socket - XZN 18mm - T10162A-

Perform the Following

Removing

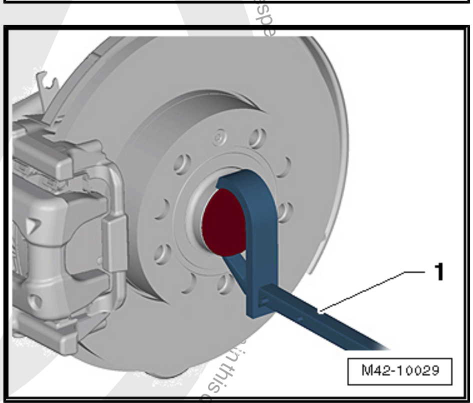
- – Loosen the wheel bolts.
- – Raise the vehicle.
- – Remove wheel.
- – Loosen dust cap from seat by tapping lightly on claw of Puller - Grease Cap - VW637/2- -1-.



- – Press of dust cap.

1 - Puller - Grease Cap - VW637/2-

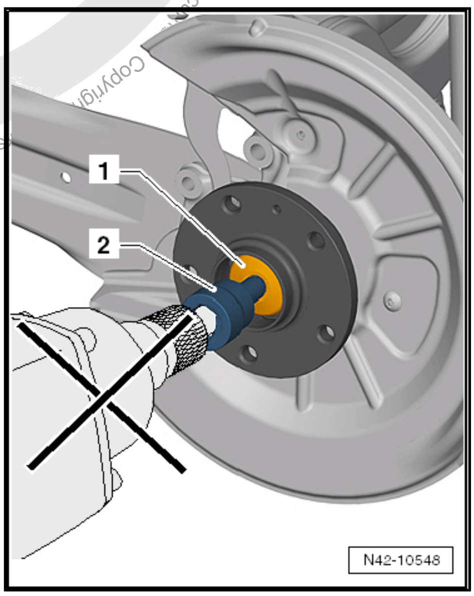
- – Remove brake carrier with brake caliper and hang on body with tie wire. Refer to ⇒ Brake System; Rep. Gr. 46 .



Note

Suspend brake caliper from body.

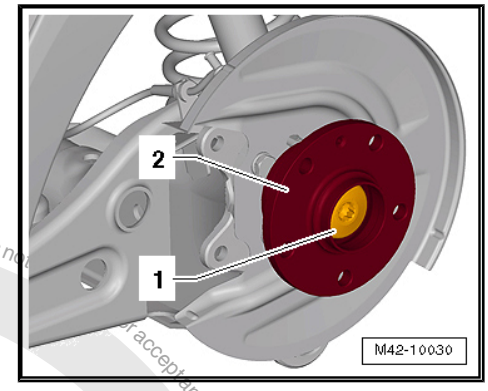
- – Remove the brake rotor bolt and the brake rotor.
- – Remove bolt -1- using Socket - XZN 18mm - T10162A- -2-.



Caution

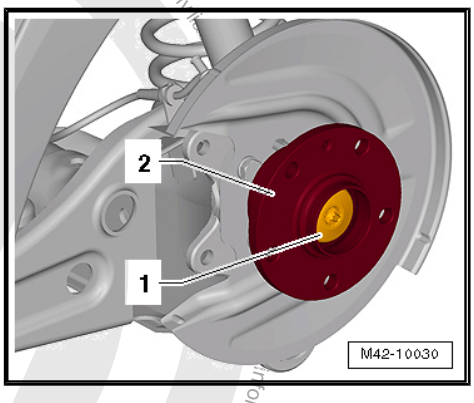
Never use an impact wrench when removing the bolt -1- using the Socket - XZN 18mm - T10162A- -2-.

– Remove the bolt -1- using Socket - Xzn 18mm - T10162A- .
– Remove the wheel hub/wheel bearing unit -2- from the stub axle.



Installing

– Carefully install the wheel hub/wheel bearing unit -2- onto the stub axle.



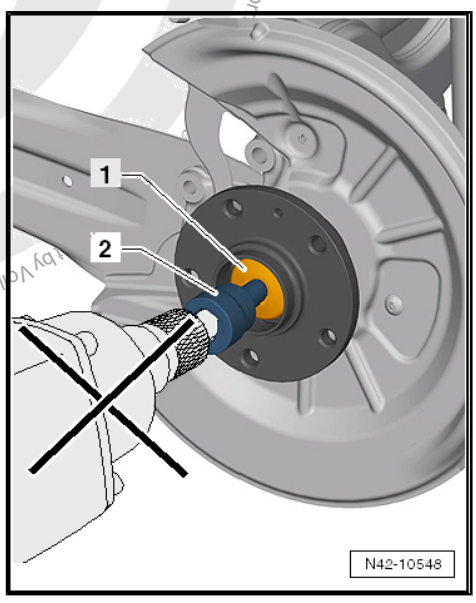
Caution

Make sure that the wheel hubs/wheel bearing unit does not tilt!

– Install the new bolt -1- and tighten it to the tightening specification.

Note

- *First tighten the bolt to the specification using the torque wrench.*
- *Using a rigid wrench when tightening additionally.*



Caution

Never use an impact wrench when tightening the bolt -1- using the Socket - XZN 18mm - T10162A- -2-.

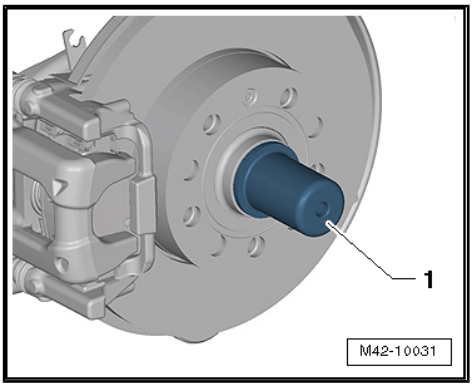
– Install the new dust cap -1-.

Always Replace Dust Caps.

Damaged dust caps allow moisture to enter. Therefore, always use the tool shown.

Install in reverse order of removal.

– Install the wheel and tighten. Refer to ⇒ “2 Wheel Installation Tightening Specifications”, page 237 .



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Tightening Specifications

Component	Tightening Specification
Wheel hub with wheel bearing to wheel bearing housing ♦ Use a new bolt	200 Nm + 90° turn
Brake rotor to wheel bearing housing	4 Nm

13.5 Trailing Arm with Mounting Bracket, Removing and Installing

Special tools and workshop equipment required

- ♦ Torque Wrench 1332 40-200Nm - VAG1332-
- ♦ Engine/Gearbox Jack Adapter - Wheel Hub Support - T10149-

Perform the Following

Removing

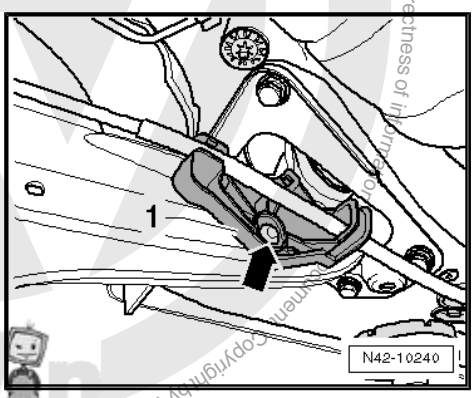
– Loosen the wheel bolts.

– Raise the vehicle.

– Remove wheel.

– Remove the coil spring. Refer to ⇒ “14.2 Coil Spring, Removing and Installing”, page 215 .

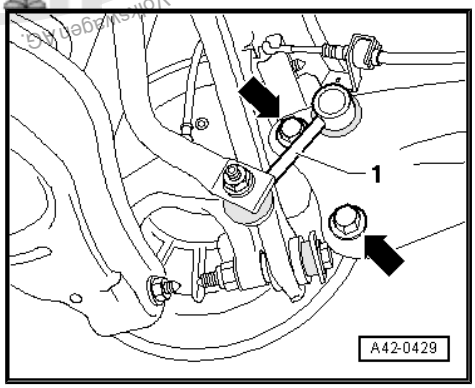
– Remove the rivet inner pin -arrow- and remove the bracket -1-.



– Remove the coupling rod -1- from trailing arm.

– Remove the bolts -arrows-.

– Mark the mounting bracket installation location on the body.



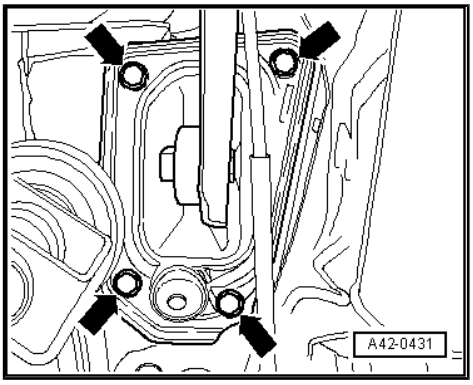
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– Remove the bolts -arrows-.

– Remove the trailing arm with mounting bracket.

If longitudinal control arm is being replaced, mounting bracket must be removed from longitudinal control arm.

Installation position of mounting bracket to trailing link must then be adjusted. Refer to ⇒ , page 211 .



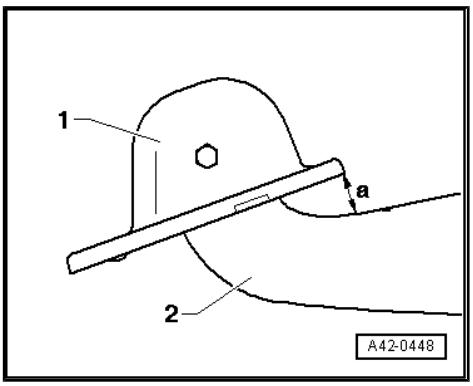
Determining Installation Position of Mounting Bracket Relative to Trailing Arm

Dimension -a-: 34 ± 1 mm.

1 - Mounting bracket

2 - Trailing arm

– When dimension -a- has been adjusted, tighten bolt.

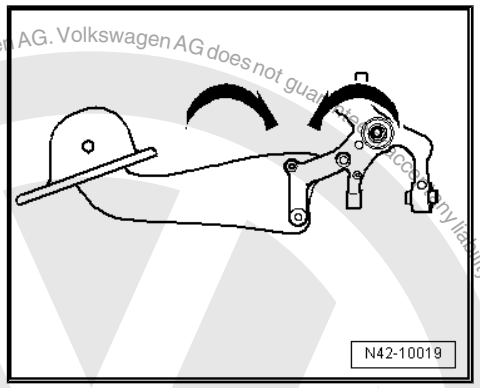


Installing

Threaded connection of trailing link/wheel bearing housing must only be tightened when all other components (spring and strut always) of the respective wheel suspension have been already assembled. To tighten, suspension must be unloaded. Only now do the trailing link and wheel bearing housing move into the position required -arrows-.

Threaded Connector: Trailing Arm/Wheel Bearing Housing

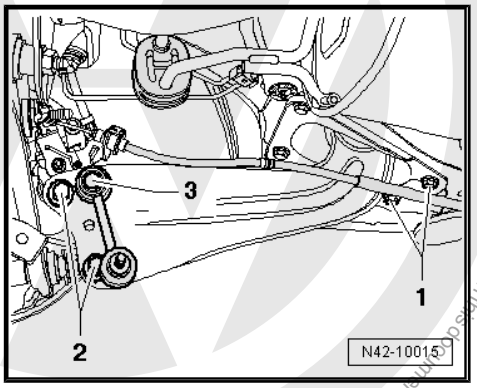
Always Perform the Following Work in the Sequence Given!



– Install the trailing arm and mounting bracket with bolts -2- on wheel bearing housing but do not yet tighten.

– Insert the coupling rod -3- into the trailing arm, do not tighten nut yet.

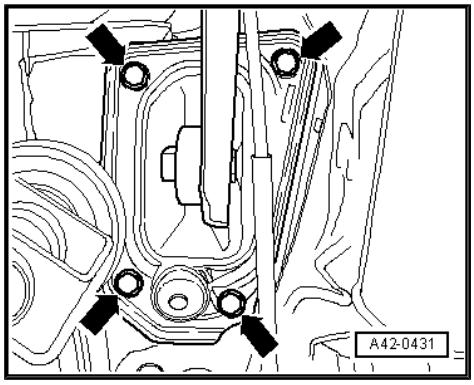
– Raise the suspension using Engine and Gearbox Jack - VAS6931- and Engine/Gearbox Jack Adapter - Wheel Hub Support - T10149- until the mounting bracket contacts the body.



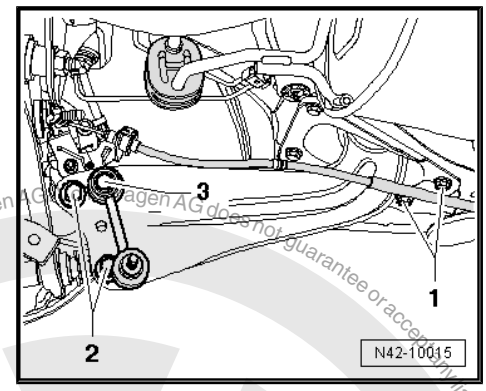
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– Tighten bolts -arrows- on old impression.

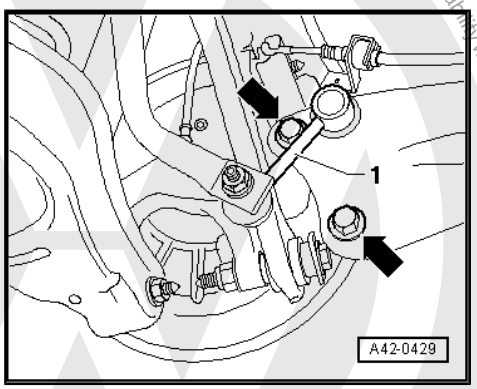
– Lower the suspension again using Engine and Gearbox Jack - VAS6931- and remove Engine/Gearbox Jack Adapter - Wheel Hub Support - T10149- from wheel hub.



– Tighten the trailing arm bolts -2- to the tightening specification while making sure the components are in their correct positions. Refer to
⇒ Fig. ""Threaded Connector: Trailing Arm/Wheel Bearing Housing"" , page 211 .



– Connect the coupling rod -1- to the wheel bearing housing and stabilizer bar.

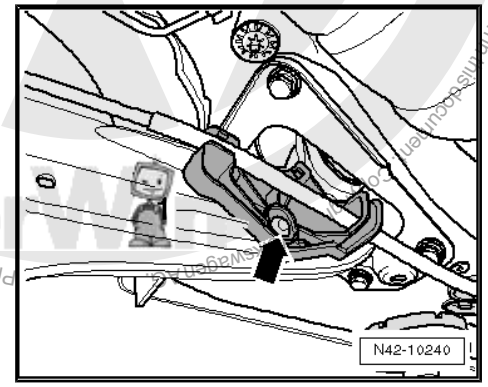


– Install the rivet inner pin -arrow- and install the bracket -1-.

– Install the coil spring. Refer to
⇒ "14.2 Coil Spring, Removing and Installing", page 215 .

– Install the wheel and tighten. Refer to
⇒ "2 Wheel Installation Tightening Specifications", page 237 .

– Perform vehicle alignment. Refer to
⇒ "8 Wheel Alignment", page 256 .



Tightening Specifications

Component	Tightening Specification
Trailing arm to wheel bearing housing ♦ Use new bolts.	90 Nm + 45° turn
Trailing arm to mounting bracket ♦ Use a new bolt	90 Nm +90° turn

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Component	Tightening Specification
Mounting bracket to body ♦ Use new bolts.	50 Nm + 45° turn
Coupling rod to trailing arm ♦ Use new nut	45 Nm
Parking brake cable to trailing arm Refer to ⇒ Brake Systems; Rep. Gr. 46 .	

13.6 Trailing Arm, Servicing

Special tools and workshop equipment required

- ♦ Hydraulic Press - Bushing Assembly Tool Kit - T10230-
- ♦ Front Subframe Mount Kit - 3372-
- ♦ Press Plate - VW401-
- ♦ Press Plate - VW402-

Perform the Following

Pressing Out the Bonded Rubber Bushing

– Remove trailing link. Refer to
⇒ “13.5 Trailing Arm with Mounting Bracket, Removing and Installing”, page 210 .

– Remove the mounting bracket from the trailing arm.

– Mount the tools as illustrated.

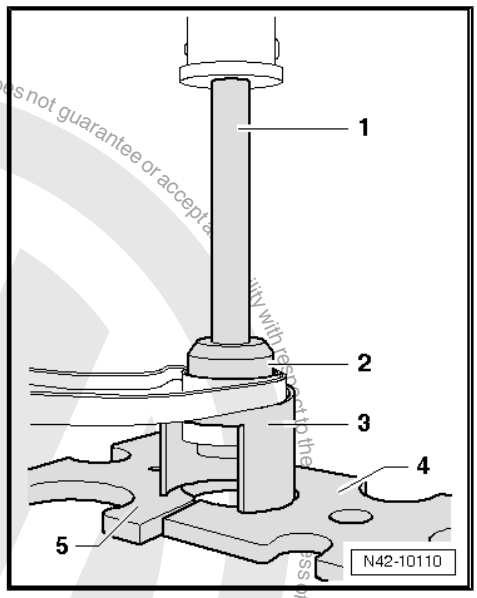
1 - Hydraulic Press - Bushing Assembly Tool Kit - Pipe - T10230/3-

2 - Hydraulic Press - Bushing Assembly Tool Kit - Press Piece - T10230/10-

3 - Front Subframe Mount Kit - 3372-

4 - Press Plate - VW401-

5 - Press Plate - VW402-



– Press out the bonded rubber bushing.

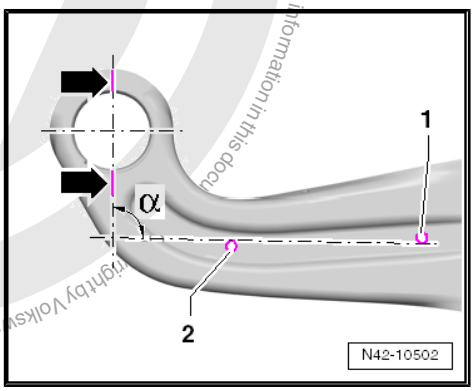
Installing the Bonded Rubber Bushings

– Mark the position of the bonded rubber bushing on the trailing arm with a right angle.

– Place the outer edge of the right angle on the lower -1- and upper radius -2- of the hole.

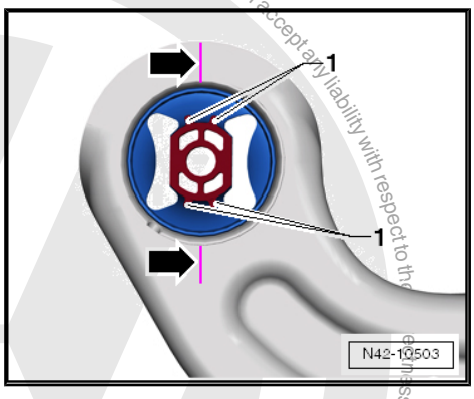
– Make a mark over and under the bushing on the trailing arm -arrows-.

α - 90°



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Position the bonded rubber bushing on the trailing arm so that the marked line -arrows- is between the raised areas -1-.



Note

Make absolutely sure that the bonded rubber bushing is in the correct installation position in relation to the trailing arm socket.

– Mount the tools as illustrated.

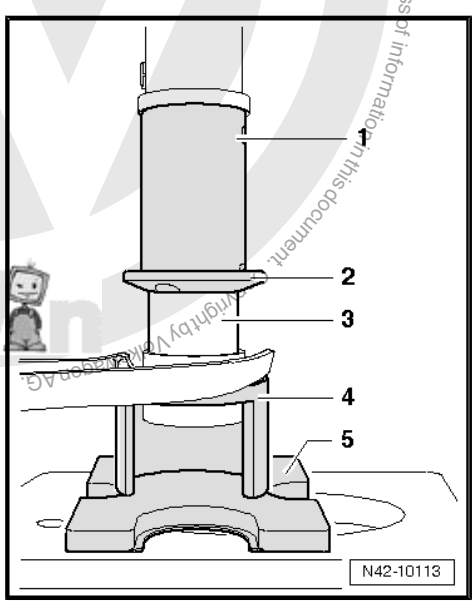
1 - Hydraulic Press - Bushing Assembly Tool Kit - Tube - T10230/5-

2 - Hydraulic Press - Bushing Assembly Tool Kit - Thrust Plate - T10230/12- , the chamfer must face the bonded rubber bushing

3 - Bonded rubber bushing

4 - Front Subframe Mount Kit - 3372-

5 - Press Plate - VW402-



– Press in bonded rubber bushing flush.

– Install the mounting bracket on trailing arm ⇒ , page 211 .

– Install the trailing arm. Refer to ⇒ , page 211 .

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14 Shock Absorber and Coil Spring (Multi-Link Suspension)

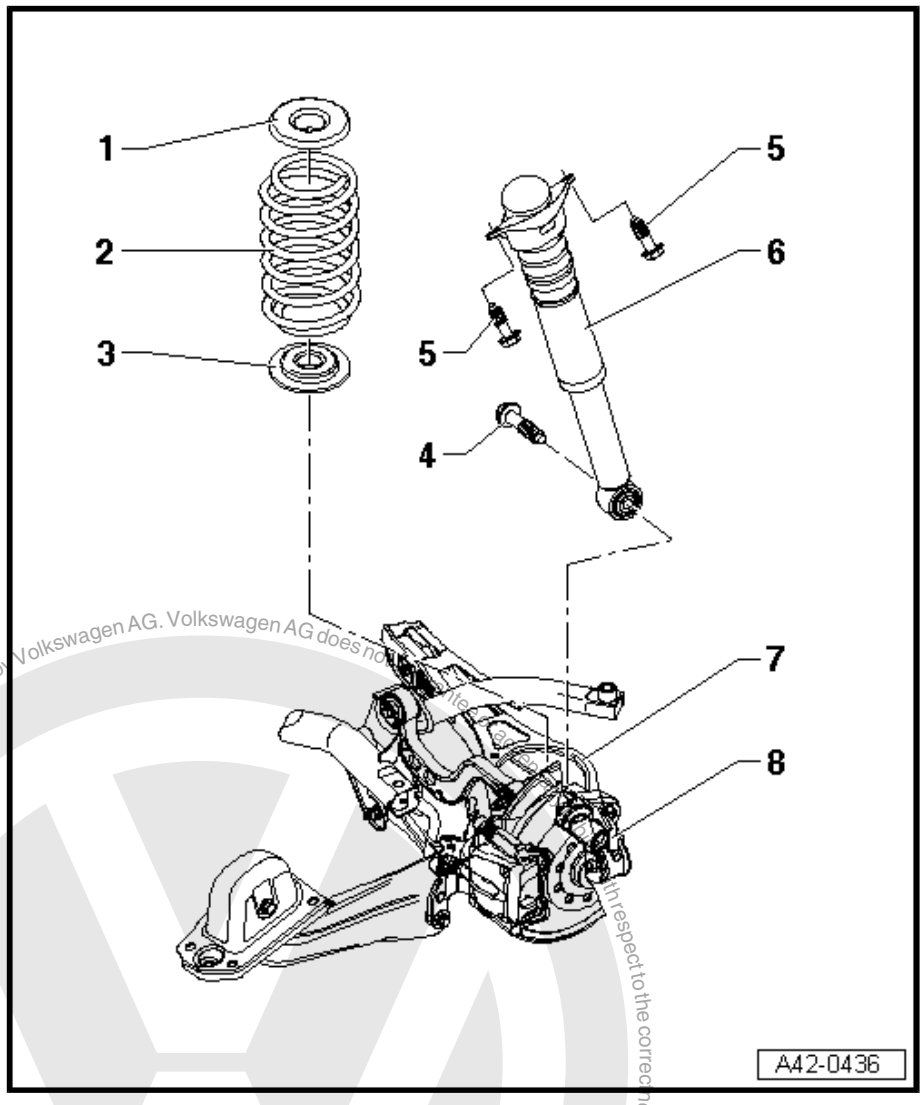
⇒ “14.1 Overview - Shock Absorber and Coil Spring (Multi-Link Suspension)”, page 215

⇒ “14.2 Coil Spring, Removing and Installing”, page 215

⇒ “14.3 Shock Absorber, Removing and Installing”, page 217

⇒ “14.4 Shock Absorber, Servicing”, page 218

14.1 Overview - Shock Absorber and Coil Spring (Multi-Link Suspension)



1 - Upper Spring Support

2 - Coil Spring

- ❑ Note the color code
- ❑ Allocation. Refer to the Parts Catalog.
- ❑ There are different versions of the suspension. Refer to ⇒ page 275
- ❑ Surface of spring coil may not be damaged
- ❑ Removing and installing. Refer to ⇒ “14.2 Coil Spring, Removing and Installing”, page 215 .

3 - Lower Spring Support

- ❑ Spring end rotated up to stop

4 - Bolt

- ❑ 130 Nm +90° turn

5 - Bolt

- ❑ 50 Nm + 45° turn
- ❑ Always replace if removed

6 - Shock Absorber

- ❑ Removing and installing. Refer to ⇒ “14.3 Shock Absorber, Removing and Installing”, page 217 .
- ❑ There are different versions of the suspension. Refer to ⇒ page 275

7 - Lower Transverse Link

- ❑ Removing and installing. Refer to ⇒ “12.8 Lower Transverse Link, Removing and Installing”, page 196 .

8 - Wheel Bearing Housing

- ❑ Removing and installing. Refer to ⇒ “13.2 Wheel Bearing Housing, Removing and Installing”, page 202 .

14.2 Coil Spring, Removing and Installing

Special tools and workshop equipment required

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- Spring Compressor Kit - VAG1752-
- Spring Compressor Kit - Spring Retainer w/Inserts - VAG1752/4-
- Spring Compressor Kit - Adapter Blocks - VAG1752/9- , not illustrated

Perform the Following

Removing

– Loosen the wheel bolts.

– Raise the vehicle.

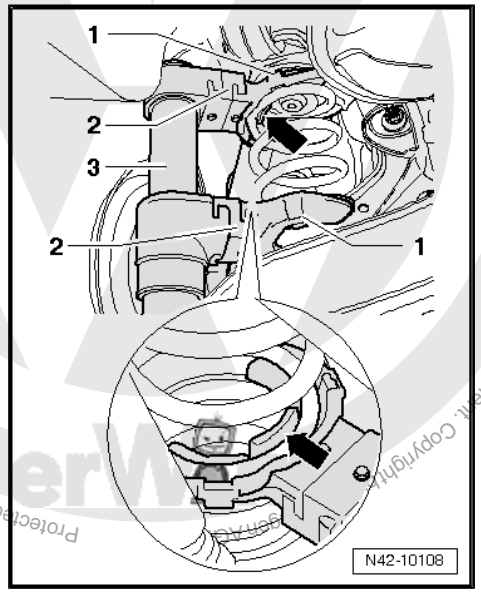
– Remove the wheel.

– Insert the Spring Compressor Kit - Spring Tensioner - VAG1752/1- -3-.

1 - Spring Compressor Kit - Spring Retainer w/Inserts - VAG1752/4-

2 - Spring Compressor Kit - Adapter Blocks - VAG1752/9-

3 - Spring Compressor Kit - Spring Tensioner - VAG1752/1-



WARNING

Make sure the coil spring is seated correctly in the Spring Compressor Kit - Spring Retainer with Inserts - VAG1752/3A- -2- (danger of accident).

– Tension the coil spring and remove it.

Note

Use a wrench or a reversible ratchet to tighten the spring compressor.

Installing

Install in reverse order of removal. Note the following:

– Make sure the washer is not damaged.

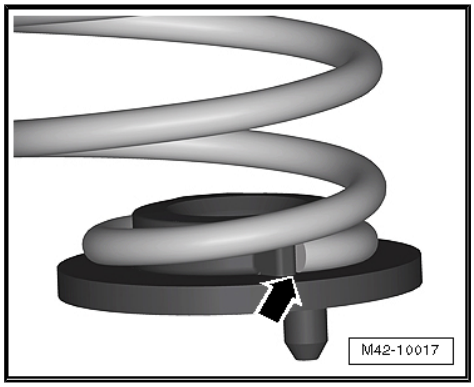
– Replace the washer if necessary.

– Install the washer on the coil spring.

The spring start -arrow- must touch the stop of lower spring support.

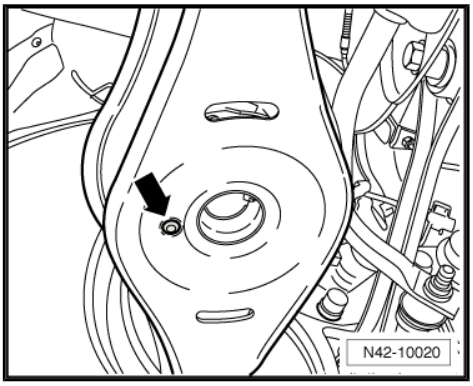
– Install the spring and the spring support.

– Spring seat has a pin on bottom.

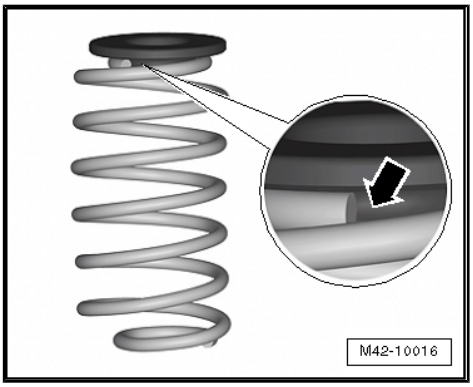


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– Insert this pin into hole of lower transverse link -arrow-.



– Insert the top of the spring support into the upper spring end.
– The bead on the spring support -arrow- must fit into the coil spring correctly.
– Release the tension on the spring, guiding upper spring support onto tab of body.
– Remove the Spring Compressor .
– Install the wheel and tighten. Refer to ⇒ “2 Wheel Installation Tightening Specifications”, page 237 .



14.3 Shock Absorber, Removing and Installing

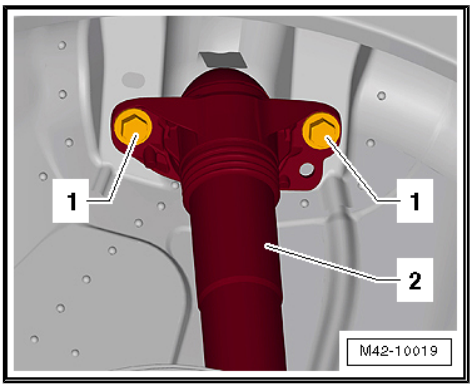
Special tools and workshop equipment required

♦ Torque Wrench 1332 40-200Nm - VAG1332-

Perform the Following

Removing

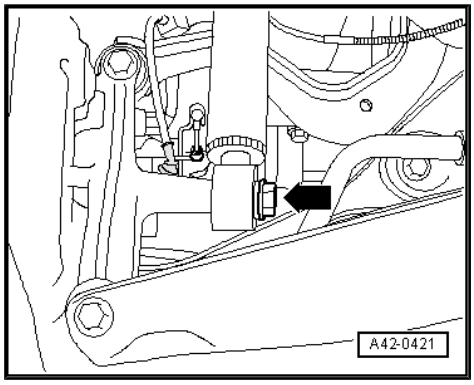
– Loosen the wheel bolts.
– Raise the vehicle.
– Remove the wheel.
– Remove the rear wheel housing liner. Refer to ⇒ Body Exterior; Rep. Gr. 66 .
– Remove the coil spring. Refer to ⇒ “14.2 Coil Spring, Removing and Installing”, page 215 .
– Remove the bolts -1- from the shock absorber -2-.



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– Remove the bolt -arrow-.

– Remove the shock absorber.

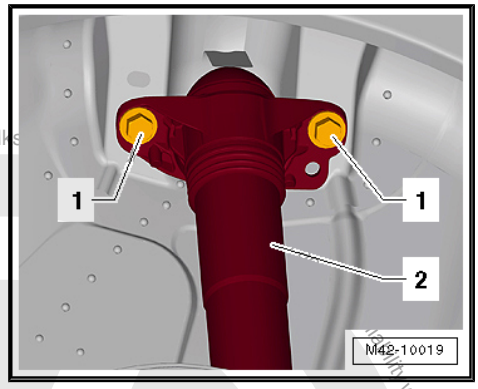


Installing

Install in reverse order of removal. Note the following:

Only bolt the shock absorber to the wheel bearing housing when the dimension “a” is reached. Refer to
⇒ “2 Rear Axle Curb Weight (Twist Beam Rear Suspension)”, page 146 .

– Insert the shock absorber -2- and tighten the bolts -1-.

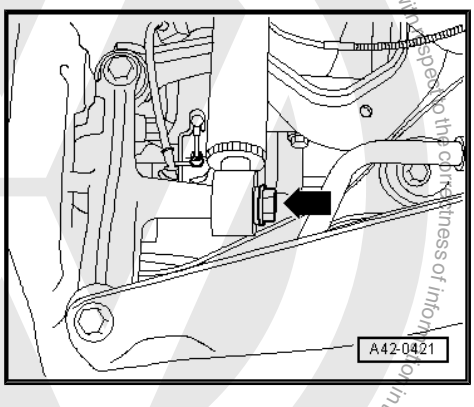


– Tighten the bolt -arrow-.

– Install the coil spring. Refer to
⇒ “14.2 Coil Spring, Removing and Installing”, page 215 .

– Install the rear wheel housing liner. Refer to ⇒ Body Exterior; Rep. Gr. 66 .

– Install the wheel and tighten. Refer to
⇒ “2 Wheel Installation Tightening Specifications”, page 237 .

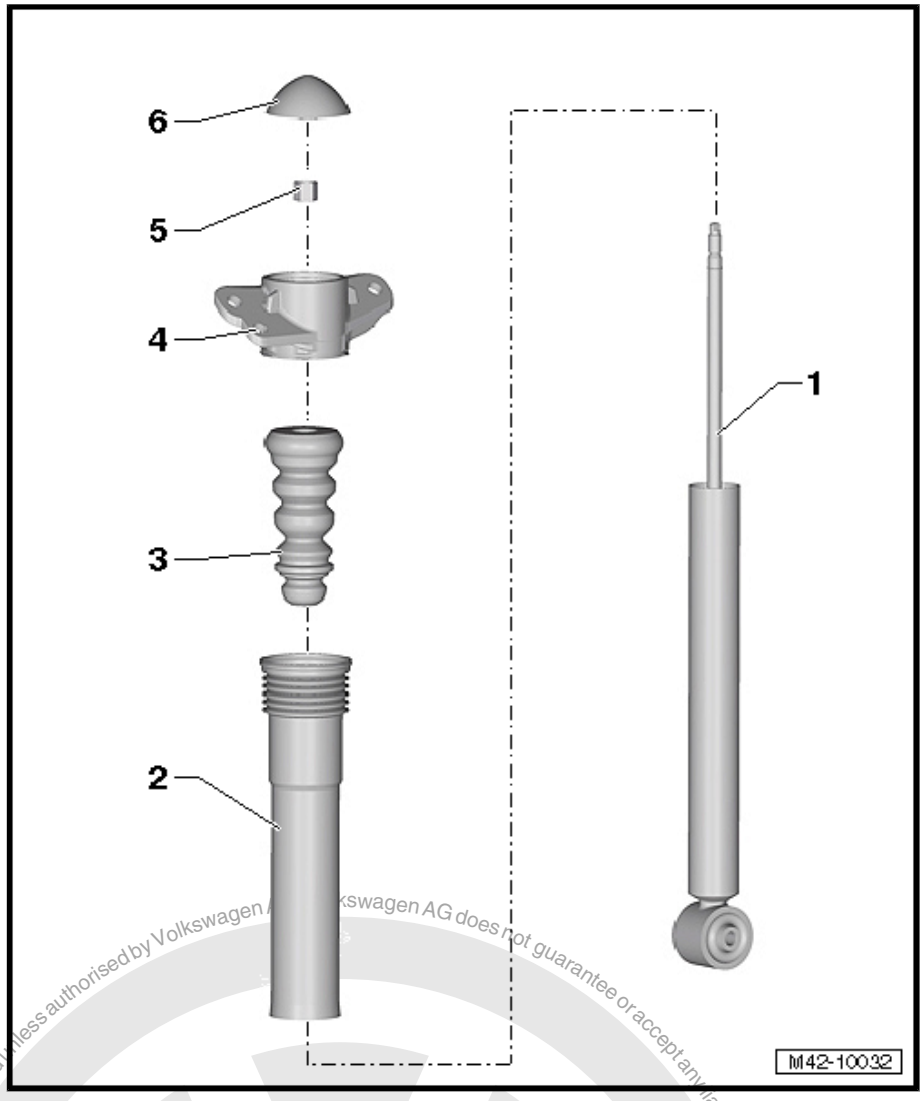


Tightening Specifications

Component	Tightening Specification
Shock absorber to body ♦ Use new bolts.	50 Nm + 45° turn
Shock absorber to wheel bearing housing.	130 Nm + 90° turn

14.4 Shock Absorber, Servicing

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1 - Shock Absorber

- ❑ Removing and installing. Refer to ⇒ “14.3 Shock Absorber, Removing and Installing”, page 217 .
- ❑ Can be replaced individually
- ❑ Allocation. Refer to the Parts Catalog.

Function Test

Press shock absorber together by hand. Itshould be possible to push in piston rod smoothly and with uniform force over its entire travel.

When the shock absorber has sufficient gas pressure the piston rod returns to its original starting position.

If the piston rod does not return to its starting position and there is no loss of oil then the shock absorber is still OK.

2 - Protective Pipe

3 - Stop Buffer

- ❑ Allocation. Refer to the Parts Catalog.

4 - Shock Absorber Mount

- ❑ Allocation. Refer to the Parts Catalog.

5 - Nut

- ❑ 25 Nm
- ❑ Always replace if removed
- ❑ Loosening and tightening. Refer to ⇒ Fig. ““Loosening and Tightening Bolted Connection for Shock Absorber Mount”“ , page 220

6 - Cover

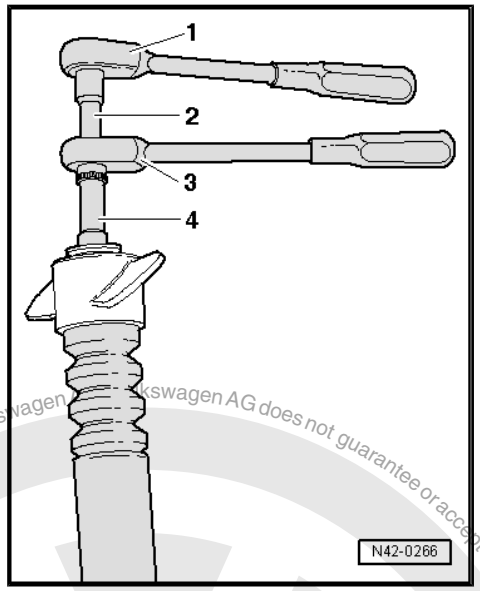
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Shock Absorber, Disassembling and Assembling

Special tools and workshop equipment required

- Torque Wrench 1332 40-200Nm - VAG1332-
- Shock Absorber Set - T10001-

Loosening and Tightening Bolted Connection for Shock Absorber Mount



1 - Ratchet (commercially available)

2 - Shock Absorber Set - Extension with Counter Holder 1 - T10001/9-

3 - Shock Absorber Set - Reversible Ratchet - T10001/11-

4 - Shock Absorber Set - Socket - T10001/1-

Tightening Specification

Component	Tightening Specification
Shock absorber mounting to shock absorber ◆ Use new nut	25 Nm

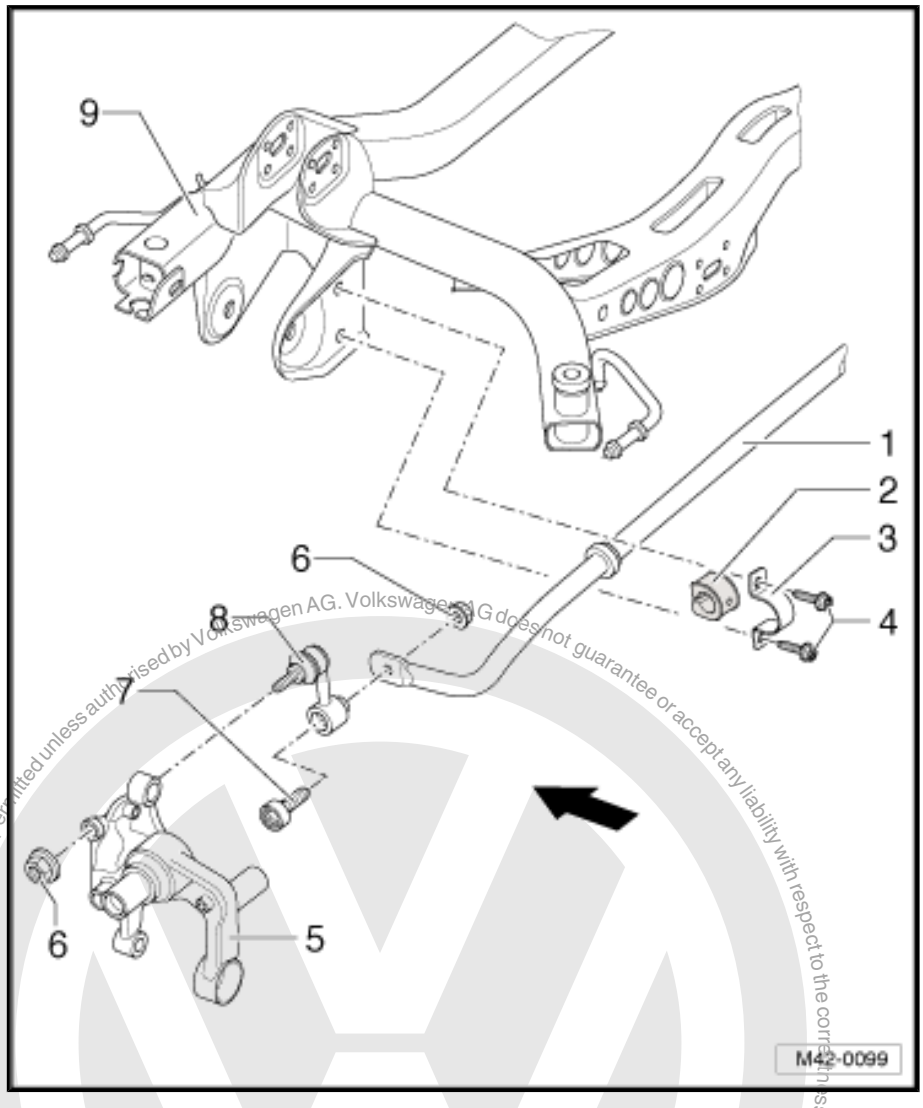
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15 Stabilizer Bar (Multi-Link Suspension)

⇒ “15.1 Overview - Stabilizer Bar (Multi-Link Suspension)”, page 221

⇒ “15.2 Stabilizer Bar, Removing and Installing”, page 221

15.1 Overview - Stabilizer Bar (Multi-Link Suspension)



1 - Stabilizer Bar

- ❑ There are different versions of the suspension. Refer to ⇒ page 275
- ❑ Removing and installing. Refer to ⇒ “15.2 Stabilizer Bar, Removing and Installing”, page 221 .

2 - Bearing

- ❑ Replace bearings always on both sides of vehicle

3 - Clamp

4 - Bolt

- ❑ 20 Nm +90° turn
- ❑ Tighten uniformly
- ❑ Always replace if removed
- ❑ Always tighten the threaded connections in curb weight position. Refer to ⇒ “10 Rear Axle Curb Weight (Multi-link Rear Suspension)”, page 182 .

5 - Wheel Bearing Housing

6 - Nut

- ❑ 45 Nm
- ❑ Always replace if removed
- ❑ Self-locking

7 - Bolt

- ❑ Always replace if removed
- ❑ Self-locking

8 - Coupling Rod

- ❑ Connects stabilizer to trailing link/wheel bearing housing

9 - Subframe

15.2 Stabilizer Bar, Removing and Installing

Special tools and workshop equipment required

- ♦ Torque Wrench 1331 5-50Nm - VAG1331-

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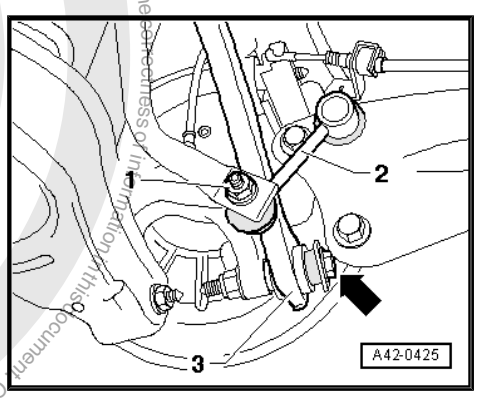
Perform the Following

Removing

Note

The following work steps are described for the left side of the vehicle. These work steps also apply simultaneously for right side of vehicle.

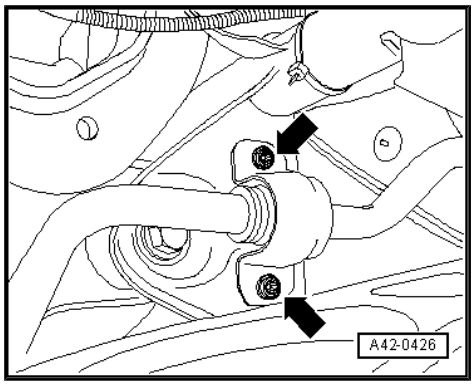
– Remove the nut -1- and pull the coupling rod -2- out of the stabilizer bar.



Note

Do not loosen bolt -arrow- for tie rod -3-.

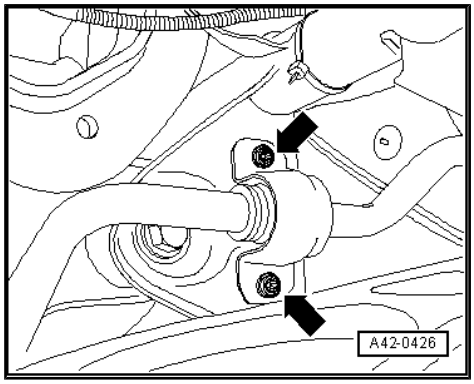
– Remove the bolts -arrows- for the stabilizer bar clamp.
– Remove the stabilizer bar.



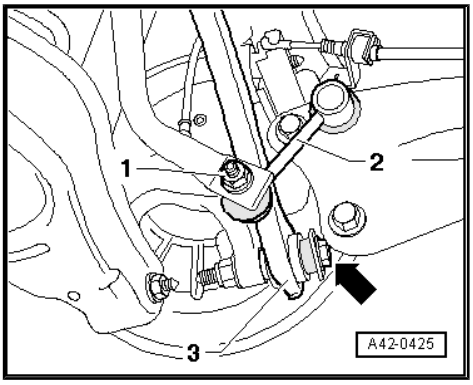
Installing

– Insert the stabilizer bar in the vehicle.

– Tighten the bolts -arrows- for stabilizer clamp uniformly.



– Install the coupling rod -2- in the stabilizer bar and tighten the nut -1-.



Tightening Specifications

Component	Tightening Specification
Stabilizer bar to subframe ♦ Use new bolts. ♦ Tighten bolts in curb weight position	20 Nm + 90° turn
Stabilizer bar to coupling rod ♦ Use new nut	45 Nm

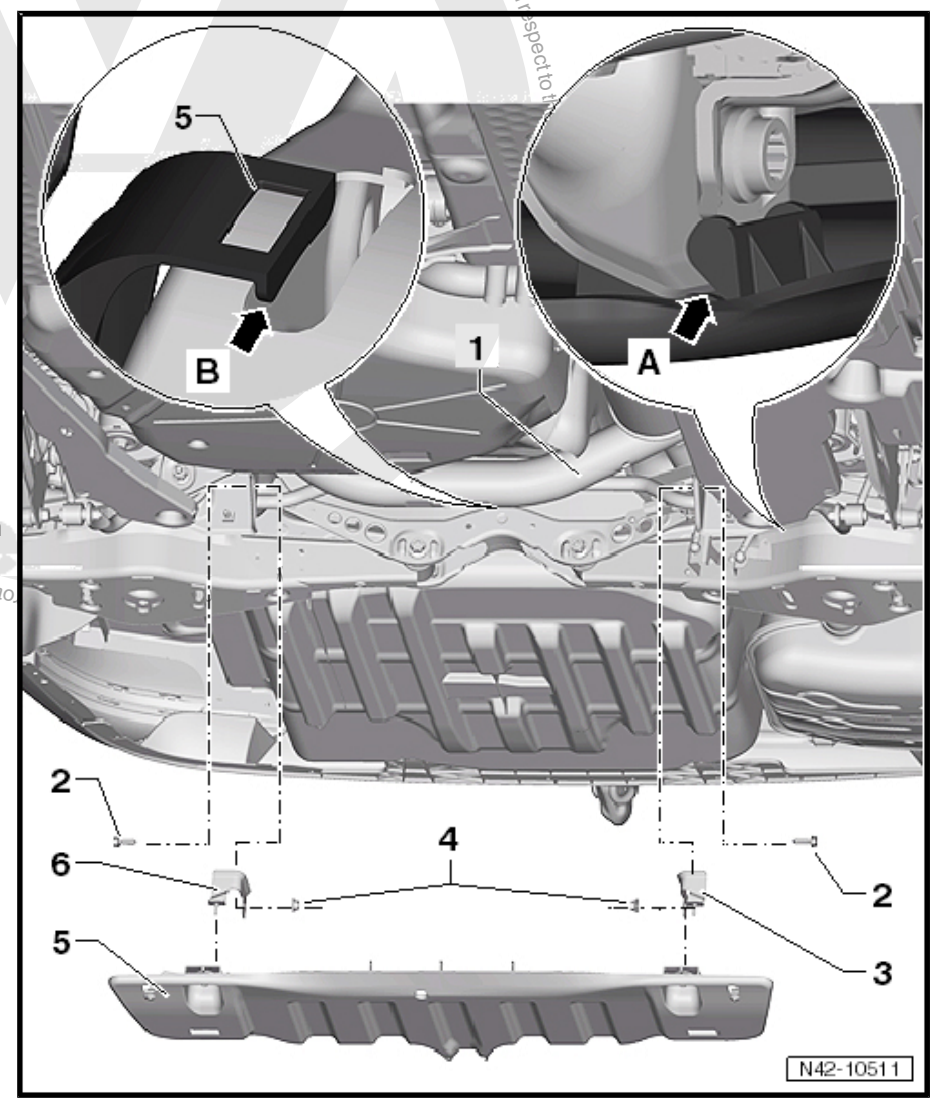
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16 Subframe Attachments, BlueMotion Vehicles

⇒ “16.1 Overview - Subframe Attachments, BlueMotion Vehicles”, page 224

⇒ “16.2 Rear Axle Trim Panel, Removing and Installing”, page 225

16.1 Overview - Subframe Attachments, BlueMotion Vehicles



1 - Subframe

2 - Bolt

3 - Angle Bracket
- ❑ With pop rivet

4 - Nut
- ❑ 20 Nm

5 - Trim panel
- ❑ Tighten the nuts to 2 Nm.
- ❑ Removing and installing. Refer to ⇒ “16.2 Rear Axle Trim Panel, Removing and Installing”, page 225
- ❑ When installing, the trim panel must be attached from underneath to the subframe -item 1- ⇒ Item 1 (page 224) -arrow A- and attached from the top -arrow B-

6 - Angle Bracket
- ❑ With pop rivet

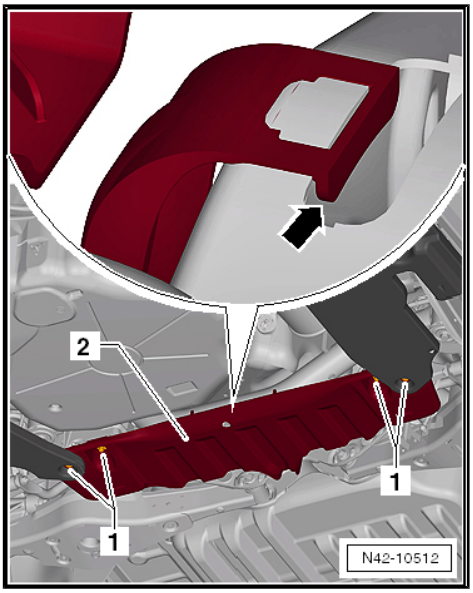
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16.2 Rear Axle Trim Panel, Removing and Installing

Removing

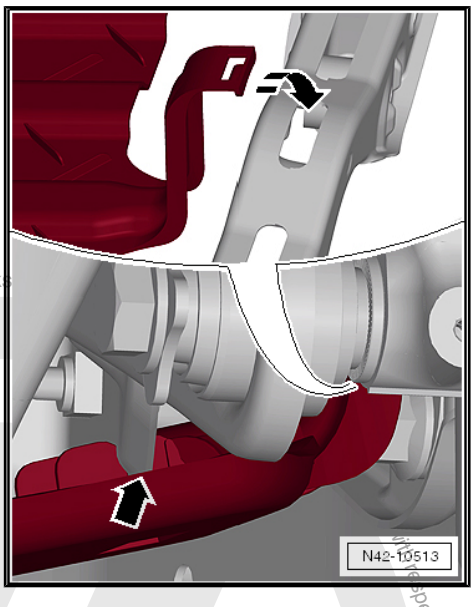
– Remove the nuts/bolts -1-.

– Remove the heat shield -2- downward from the subframe while disengaging it on top of the subframe -arrow-.



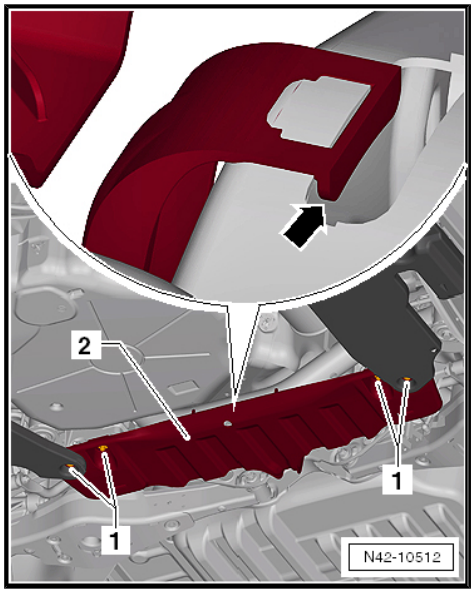
Installing

– Engage the lower shield in the subframe -arrow- and tilt it in the direction of -arrow- so that it engages in the upper subframe.



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– Tighten the nuts/bolts -1-.



Note

After installing the heat shield, make sure the tabs on the trim panel -2- are properly engages in the subframe -arrow-.

Tightening Specifications

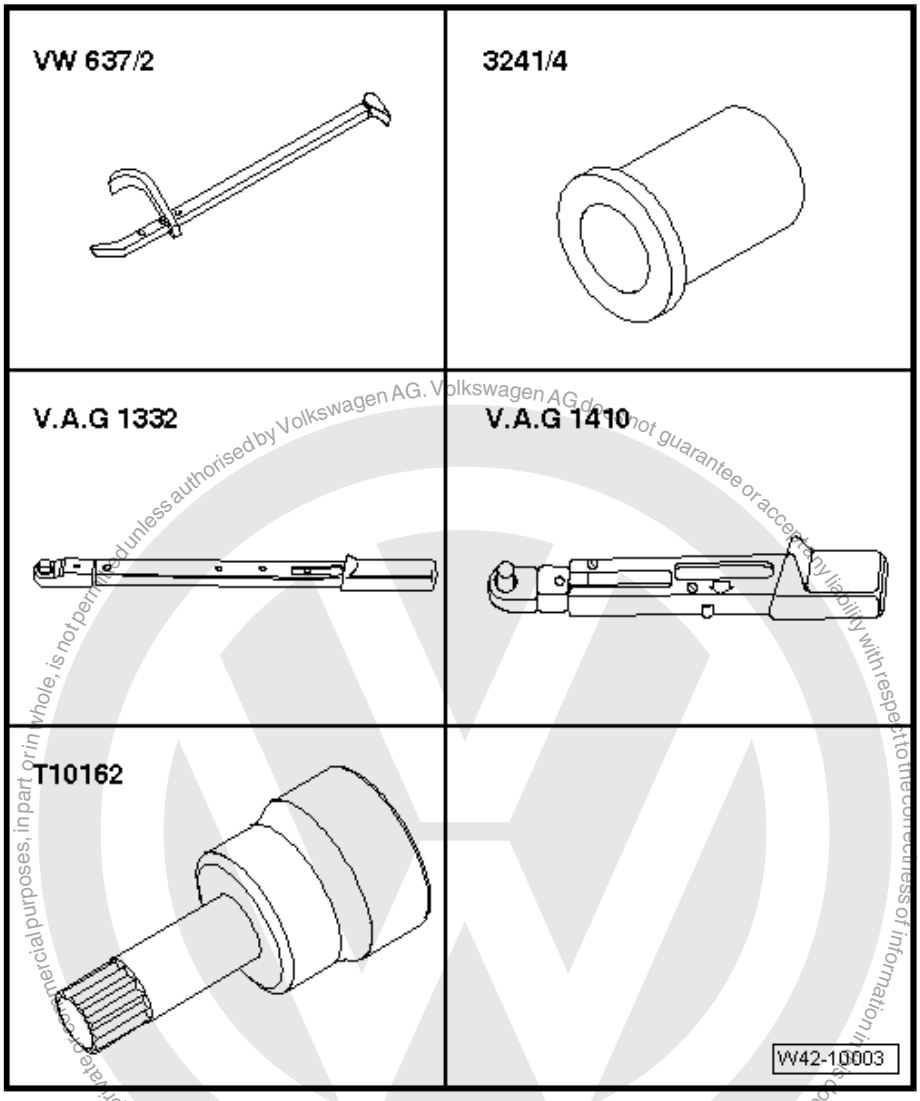
Component	Nm
Heat shield to subframe	2 Nm

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17 Special Tools

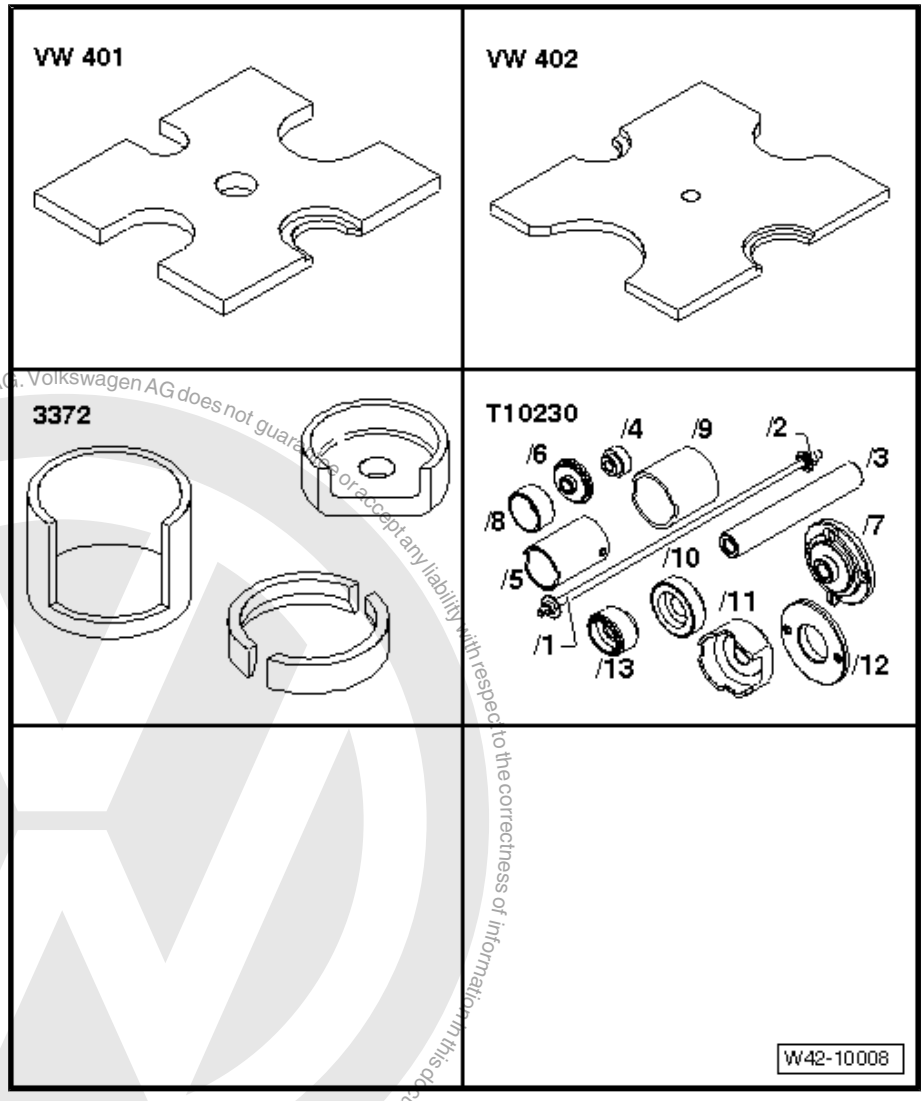
Special tools and workshop equipment required

- Puller - Grease Cap - VW637/2-
- Seal Installer - Camshaft Installer Kit - 3241-
- Torque Wrench 1332 40-200Nm - VAG1332-
- Torque Wrench 1410 - VAG1410-
- Socket - XZN 18mm - T10162A-



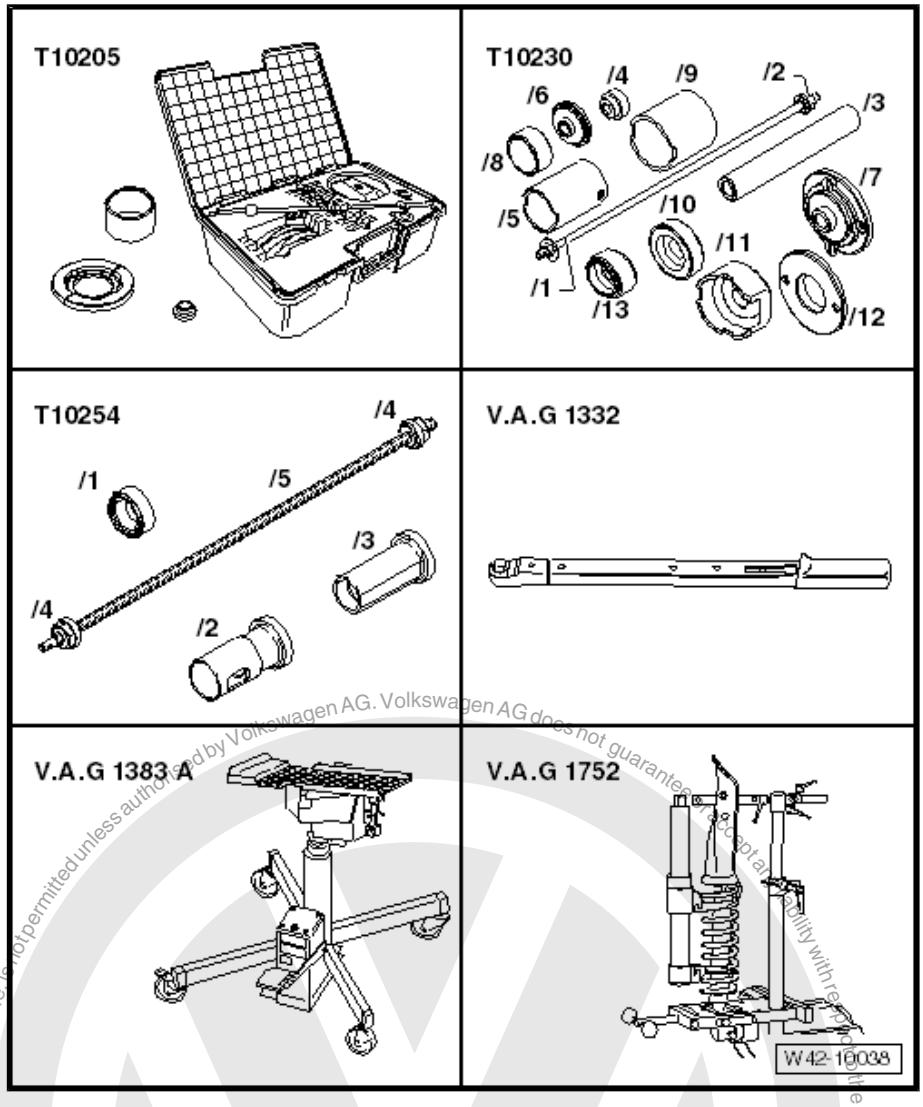
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- Hydraulic Press - Bushing Assembly Tool Kit - T10230-
- Front Subframe Mount Kit - 3372-
- Press Plate - VW401-
- Press Plate - VW402-



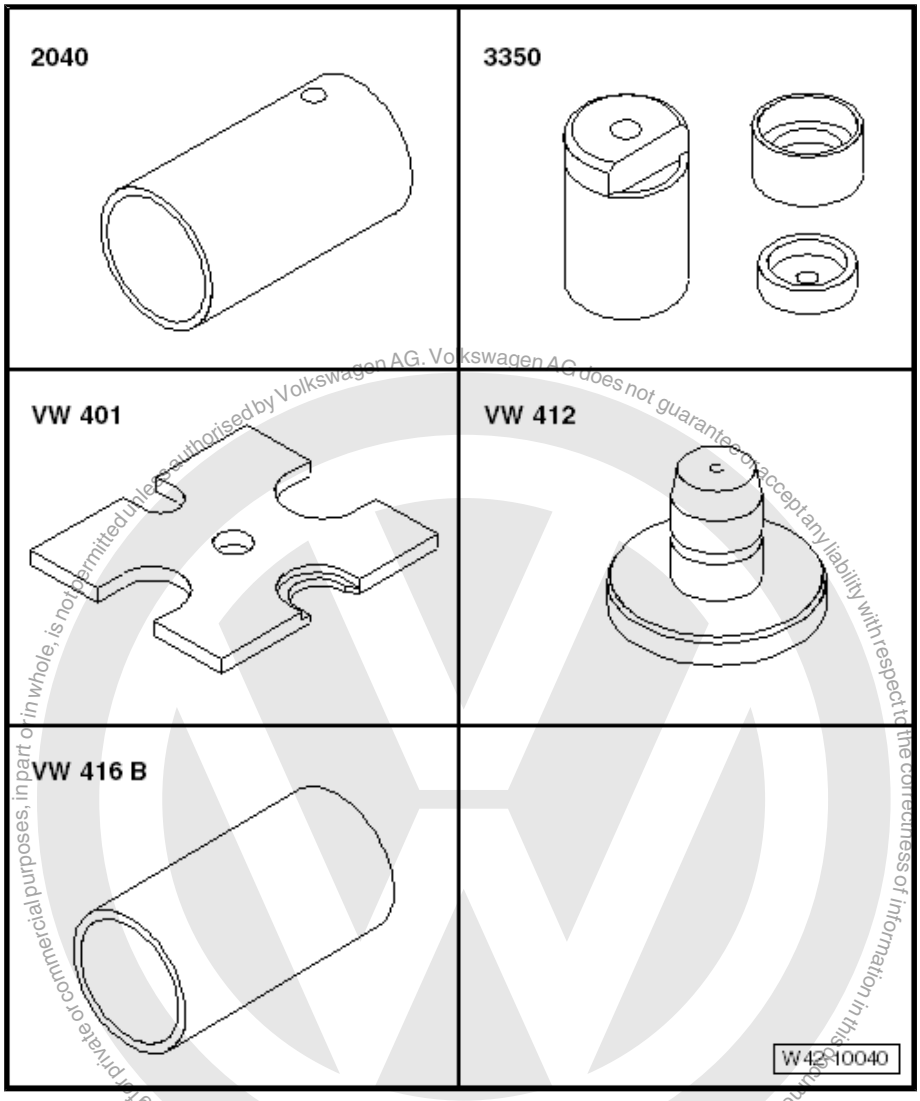
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- Bearing Installer - Wheel Hub/Bearing Kit - T10205-
- Hydraulic Press - Bushing Assembly Tool Kit - T10230-
- Hydraulic Press - Ball Joint Assembly Tools - T10254-
- Torque Wrench 1332 40-200Nm - VAG1332-
- Engine and Gearbox Jack - VAS6931-
- Spring Compressor Kit - VAG1752-
- Spring Compressor Kit - Spring Retainer with Inserts - VAG1752/3A-



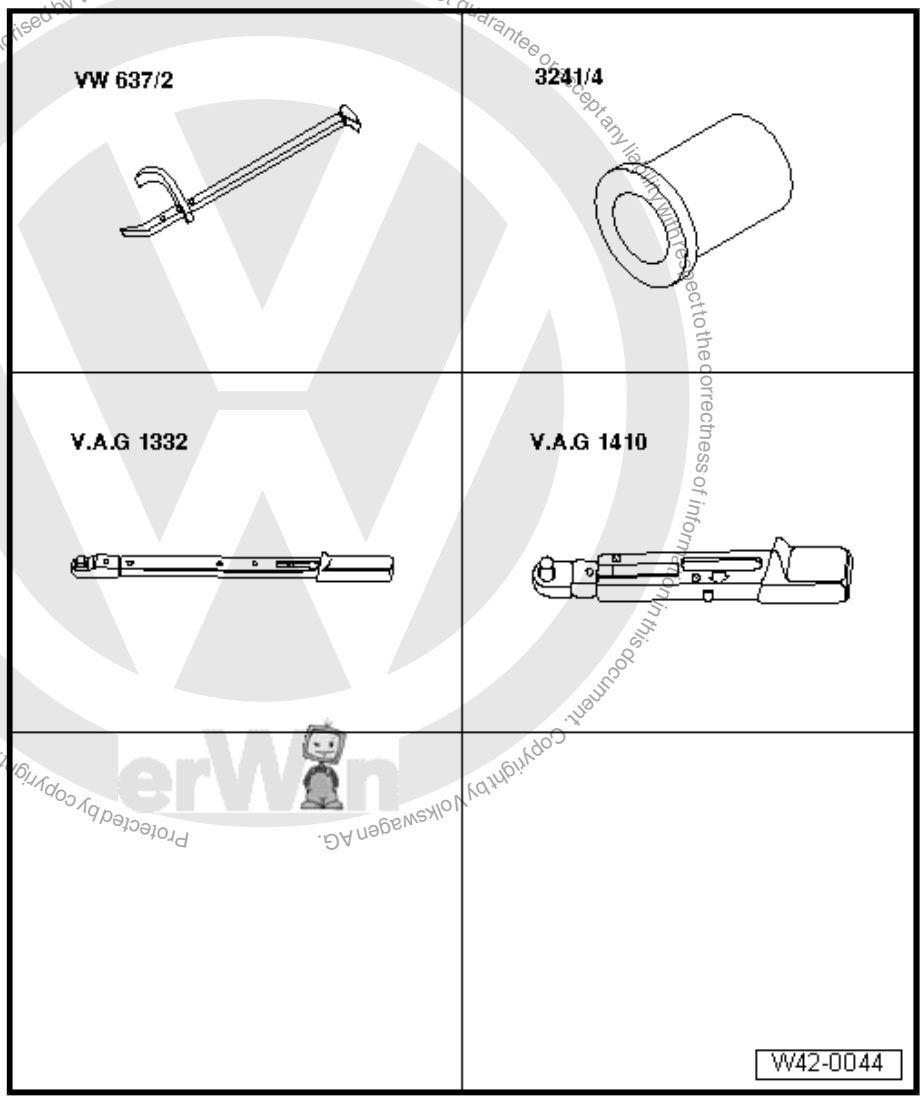
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- Press Piece - Front Control Arm - 2040-
- Bearing Installer - Carrier Bearing - 3350-
- Press Plate - VW401-
- Press Piece - Multiple Use - VW412-
- Press Piece - 37mm - VW416B-



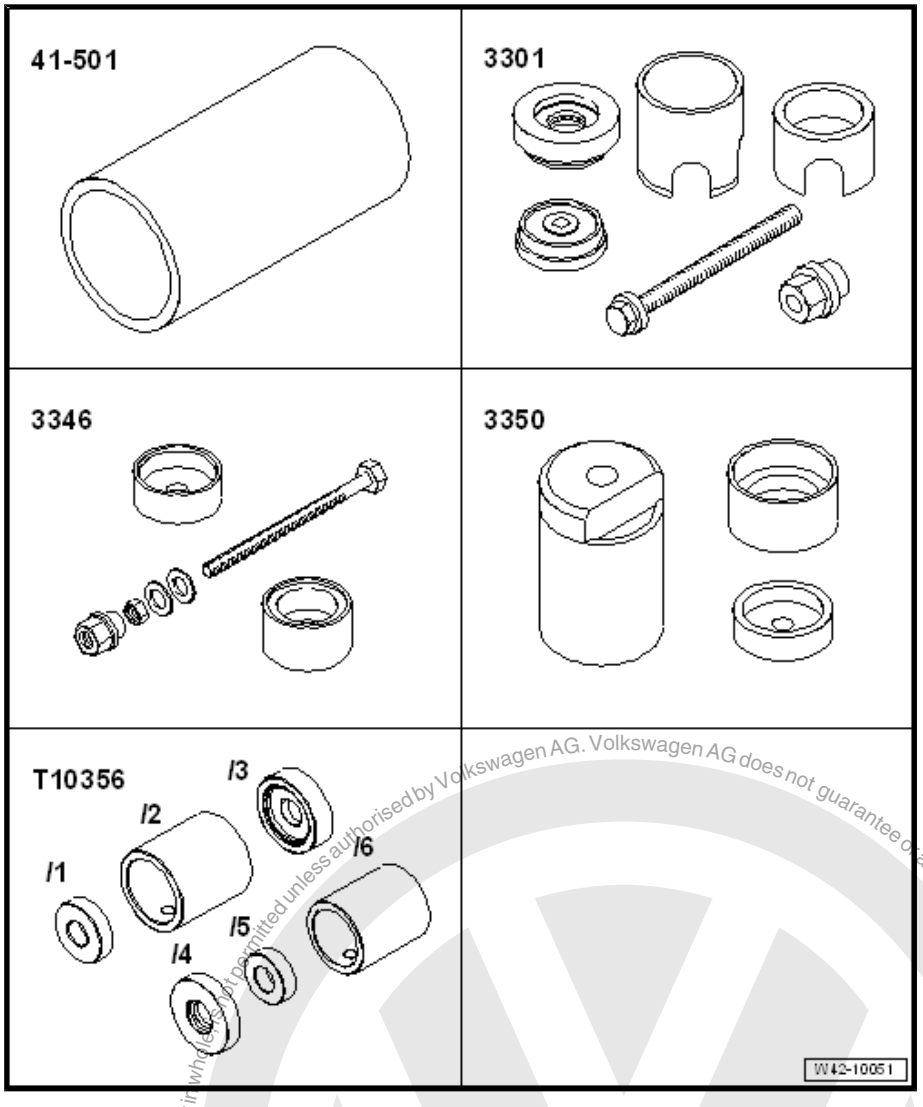
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- Puller - Grease Cap - VW637/2-
- Camshaft Installer Kit - Sleeve - 3241/4-
- Torque Wrench 1332 40-200Nm - VAG1332-
- Torque Wrench - VAG1410-



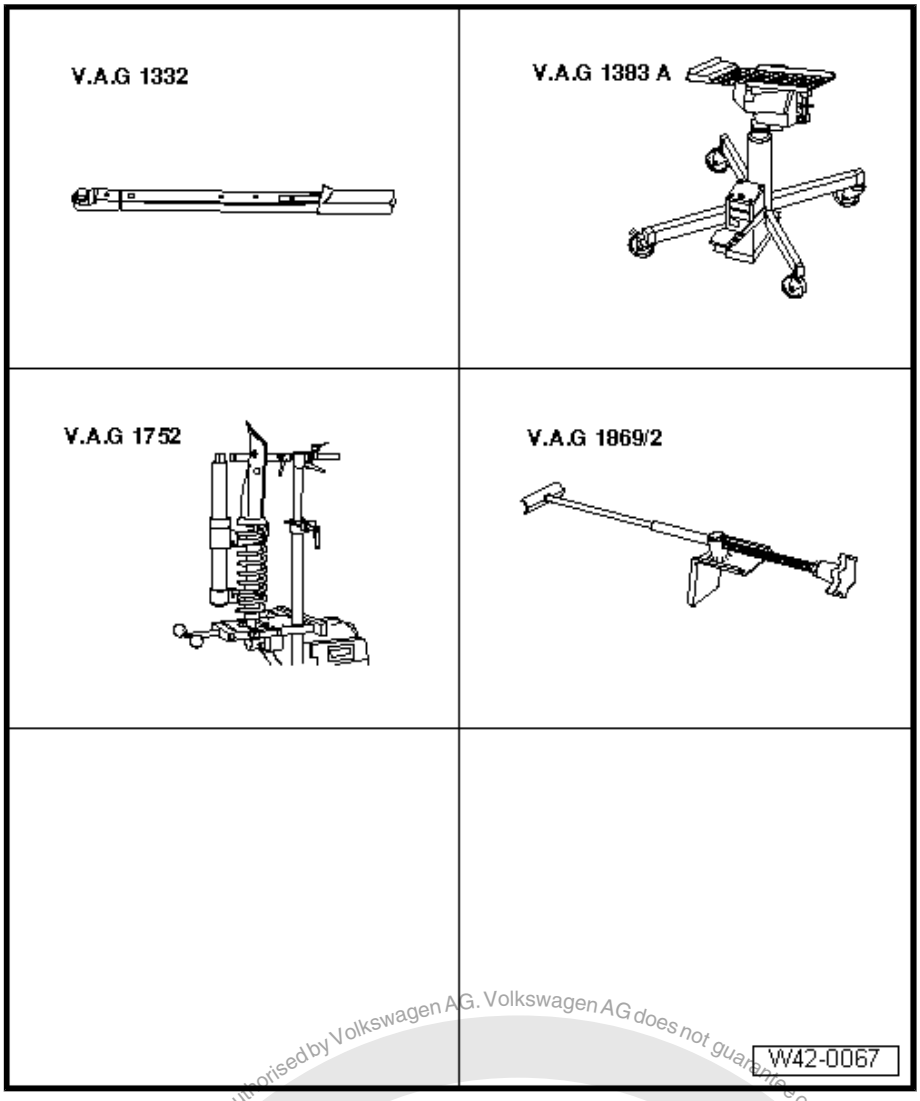
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- Press Tube - 41-501-
- Subframe Bushing Tool Kit - 3301-
- Bearing Installer - Control Arm - 3346-
- Bearing Installer - Carrier Bearing - 3350-
- Subframe Bushing Assembly Tool Kit - Thrust Piece - T10356/5-

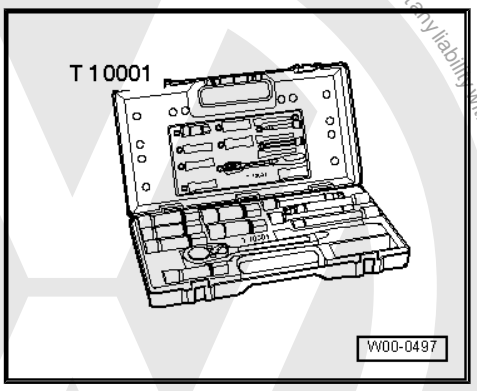


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- Torque Wrench 1332 40-200Nm - VAG1332-
- Engine and Gearbox Jack - VAS6931-
- Spring Compressor Kit - VAG1752-
- Brake Pedal Actuator - VAG1869/2- .

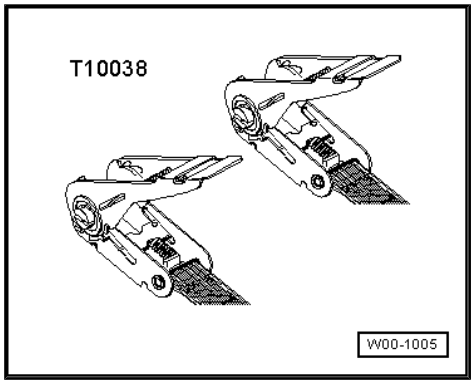


- Shock Absorber Set - T10001-

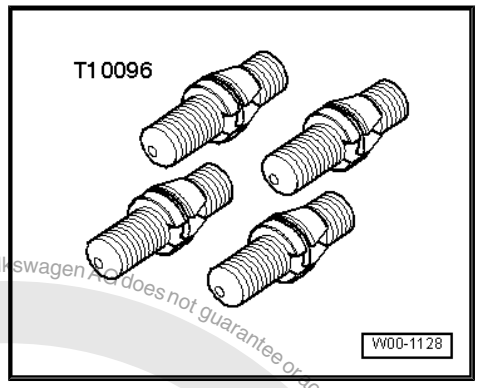


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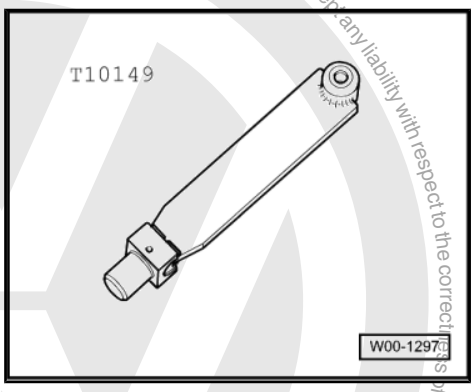
- Tensioning Strap - T10038-



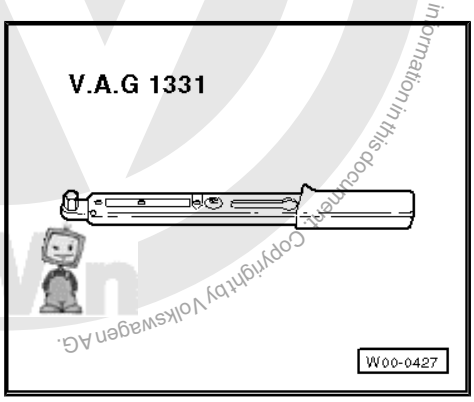
- Locating Pins - T10096-



- Engine/Gearbox Jack Adapter - Wheel Hub Support - T10149-

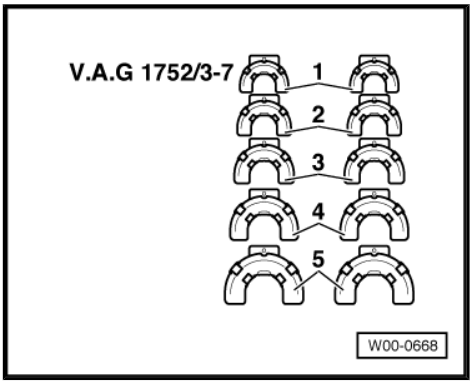


- Torque Wrench 1331 5-50Nm - VAG1331-

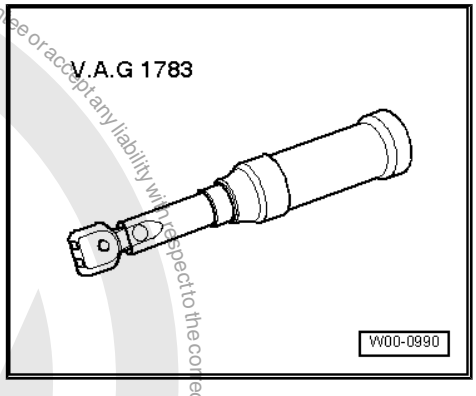


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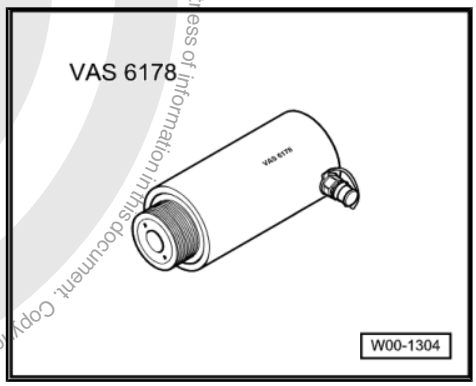
- Spring Compressor Kit - Spring Retainer with Inserts - VAG1752/3A-



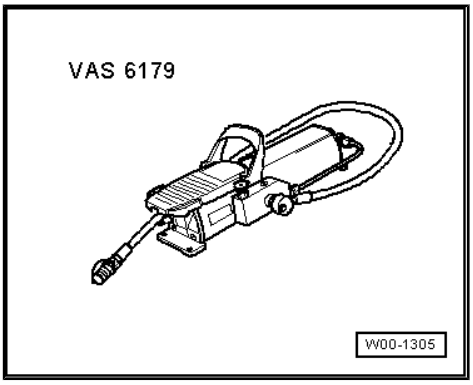
- Spring Compressor Kit - Adapter Blocks - VAG1752/9-
- Torque Wrench 1783 - 2-10Nm - VAG1783-



- Hydraulic Press - VAS6178-



- Pneumatic/Hydraulic Foot Pump - VAS6179-



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44 – Wheels, Tires, Wheel Alignment

1 Vehicles Involved in Collisions, Evaluating

For a check list for assessing the suspension on vehicles involved in a collision. Refer to
⇒ “1 Check List, Assessing the Suspension on Vehicles Involved in a Collision”, page 1 .

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2 Wheel Installation Tightening Specifications

Wheel bolts to wheel hub for all vehicles

Tightening specification: 120 Nm

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3 Wheels and Tires, Mounting

⇒ “3.1 General Information”, page 238

⇒ “3.2 Assembly Requirements”, page 238

3.1 General Information

Since MY 2005, all vehicles have a new disc wheels with revised contour.

When mounting tires, tire dismounting/mounting machine must be equipped with tire mounting fixture intended for these wheels.

WARNING

Otherwise, there is a danger of damaging the disc wheel.

If the tire mounting unit has not been modified, contact the equipment manufacturer.

3.2 Assembly Requirements

Warm up cold tires to the minimum mounting temperature.

Note

This applies also to ultra high performance tires (height- / width ration smaller/same 45% and speed rating symbol larger than/ same as V).

WARNING

The minimum mounting temperature for a tire should be between 15 °C and 30 °C (59 and 86 °F) in the center of the tire.

- For injury-free mounting, the upper sidewall and the upper bead inside must be minimum 15 °C (59 °F).
- The internal temperature is called the core temperature.
- Rubber is a poor heat conductor. For this reason, a cold tire must be exposed to a temperature controlled environment until the inner rubber layers have warmed up to at least 15 °C (59 °F).
- The tire surface temperature during the warm-up phase is not a measure the inside temperature.
- So that the cold tires warm up as quickly as possible, never stack them one on top of the other; store them separated from each other so that the warm air can “circulate” around them.
- Never use a room heater or a hot air gun to warm up tires because the surface temperature will heat up very quickly to a critical temperature.
- To prevent damage, only warm water or warm air (maximum 50 °C (122 °F)) can be used to warm up a tire!
- If cold tires (below 0 °C (32 °F)) are brought into a warm room (above 0 °C (32 °F)), a layer of ice will start to form on the tires. This layer of ice means that humidity in the warm air is condensing on the tire.

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- Once the layer of ice starts to melt, water will start to build. Wipe up the water with a cloth so that the warming process does not slow down.

Warm-Up Time

- Using the example of a room temperature of at least 19 °C (66.2 °F) and a tire temperature of 0 °C (32 °F) or higher, the tires should be stored for at least two hours at minimum 19 ° C (66.2 °F).
- If the room temperature is minimum 19 °C (66.2 °F) and the tire temperature is below 0 °C (32 °F) , then the tires should be stored for at least 2.5 hours at a minimum room temperature of 19 °C (66.2 °F).

Recommendations

- If possible, let the tires stand in the shop for one day before mounting them
- Store the tires as high as possible on an insulated surface, pallet or something similar
- Position the tires so that they can be “surrounded” by the warm air
- Wipe off the sweat
- Never heat the tires with a room heater or a hot air gun!



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4 Tires, Wheels with TPMS, Removing and Installing

⇒ “4.1 Safety Precautions and Conditions for Removing and Installing Tires, Wheels with TPMS”, page 240

⇒ “4.2 Wheel, Changing”, page 240

⇒ “4.3 Assembly Requirements”, page 241

⇒ “4.4 Tires, Dismounting”, page 242

⇒ “4.5 Tires, Dismounting”, page 243

⇒ “4.6 Tires, Mounting”, page 244

4.1 Safety Precautions and Conditions for Removing and Installing Tires, Wheels with TPMS

- Always note the instructions and danger warnings identified in the following description!
- See if the Tire Pressure Monitoring Sensor needs to be replaced using the Vehicle Diagnostic Tester .

Note

- *During removal and mounting work, make sure that no contact is made between tires and Tire Pressure Monitoring Sensor .*
- *When cleaning disc wheel (rim), the Tire Pressure Monitoring Sensor must not come into contact with water or be blown with compressed air.*

4.2 Wheel, Changing

If wheels are changed (for example, change from summer to winter tires), the tire pressure monitoring sensor sends data as soon as speed of new wheels exceeds 25 km/h (15.5 mph). The identification numbers for the new tire pressure monitoring sensors are automatically recognized and read by the control module.

An acceleration data check also occurs with vehicle speed. This process takes about 7 minutes.

The Tire Pressure Monitoring Control Module - J502- must first be in learning mode before it can automatically program the tire pressure monitoring sensors.

Vehicle must stand for 20 minutes for this. This takes 5 minutes after a recognized tire puncture.

If the waiting period is not followed, the control module is not in learning mode so the system recognizes a malfunction. Only after a 20 minute waiting period are the tire pressure monitoring sensors automatically adapted.

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Note

- *When changing wheels, ensure only Volkswagen approved wheel/tires combinations with tire pressure given on fuel filler flap are installed.*
- *If unapproved wheel/tire combinations are installed, these must have a German Technical Inspection Agency certificate for the particular vehicle and a second wheel set must be programmed using the Vehicle Diagnostic Tester . Refer to* *⇒ , page 241 .*
- *An adaptation is also needed if tire pressure deviates from pressures given on fuel filler flap. Refer to* *⇒ , page 241 .*

Wheel Sets with Other Specified Tire Pressures

If a vehicle is equipped with tires which have specified pressures different from those listed on fuel filler flap, these tires (second wheel set) can also be monitored by the Tire Pressure Monitoring System (TPMS).

Specified values for a second wheel set must be entered into the system using the Vehicle Diagnostic Tester .

The tire pressure monitoring sensors on wheels from 2nd set are not automatically recognized and learned by the Tire Pressure Monitoring System (as tire pressure monitoring sensor on Volkswagen approved wheel/tire combination set are).

To change to a second wheel set, the following steps must be carried out:

- Read the identification numbers (IDs) on the tire pressure monitoring sensors before installing.
- Switch the TPMS to wheel set 2.
- Enter needed specified tire pressures and tire pressure monitoring sensor IDs in system.

4.3 Assembly Requirements

Warm Up Cold Tires To the Minimum Mounting Temperature

Note

This applies also to ultra high performance tires (height- / width ration smaller/same 45% and speed rating symbol larger than/ same as V).

WARNING

The minimum mounting temperature for a tire may not be below 15 °C (59 °F) or above 30 °C (86 °F) in the center of the tire.

- For injury-free mounting, the upper sidewall and the upper bead inside must be minimum 15 °C (59 °F).
- The internal temperature is called the core temperature.
- Rubber is a poor heat conductor. For this reason, a cold tire must exposed to a temperature controlled environment until the inner rubber layers have warmed up to at least 15 °C (59 °F).

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- The tire surface temperature during the warm-up phase is not a measure the inside temperature.
- So that the cold tires warm up as quickly as possible, never stack them one on top of the other; store them separated from each other so that the warm air can “circulate” around them.
- Never use a room heater or a hot air gun to warm up tires because the surface temperature will heat up very quickly to a critical temperature.
- To prevent damage, only warm water or warm air (maximum 50 °C) can be used to warm up a tire!
- If cold tires (below 0 °C (32 °F)) are brought into a warm room (above 0 °C (32 °F)), a layer of ice will start to form on the tires. This layer of ice means that humidity in the warm air is condensing on the tire.
- Once the layer of ice starts to melt, water will start to build. Wipe up the water with a cloth so that the warming process does not slow down.

Warm-up time:

- Using the example of a room temperature of at least 19 °C (66.2 °F) and a tire temperature of 0 °C (32 °F) or higher, the tires should be stored for at least two hours at minimum 19 ° C.
- If the room temperature is minimum 19 °C (66.2 °F) and the tire temperature is below 0 °C (32 °F), then the tires should be stored for at least 2.5 hours at a minimum room temperature of 19 °C (66.2 °F).

Recommendations

- If possible, let the tires stand in the shop for one day before mounting them
- Store the tires as high as possible on an insulated surface, pallet or something similar
- Position the tires so that they can be “surrounded” by the warm air
- Wipe off the sweat
- Never heat the tires with a room heater or a hot air gun!

4.4 Tires, Dismounting

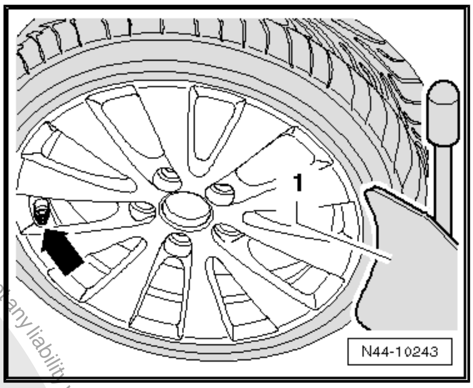
Caution

- *Pay attention to the safety precautions and conditions. Refer to*
  ⇒ "4.1 Safety Precautions and Conditions for Removing and Installing Tires, Wheels with TPMS", page 240 .

– Remove the nickel plated valve insert and let the air out of the tire.

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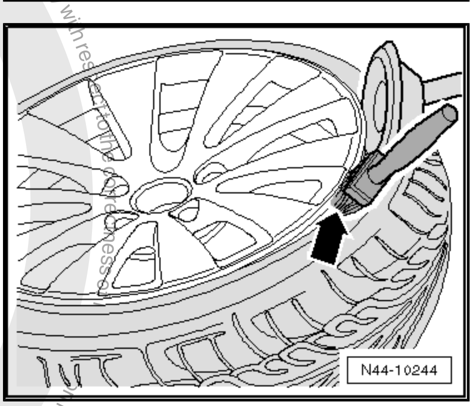
– When pressing off tire on a tire mounting device with press-off blade, always make sure that tire valve/ Tire Pressure Monitoring Sensor -arrow- is located opposite the press-off blade -1-.



Press-off blade must be applied at maximum 2 cm removed from rim flange.

– Remove the balance weight and any dirt from the disc wheel.

– Press off both tire beads all the way around while thoroughly applying tire mounting paste between the tire and rim flange -arrow-.

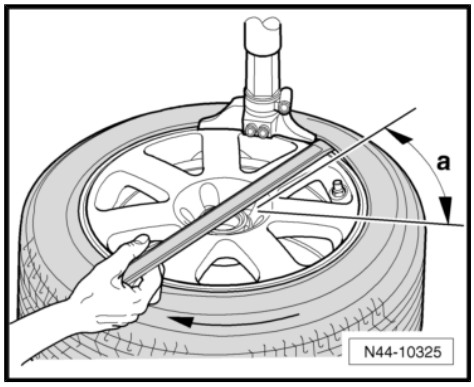


4.5 Tires, Dismounting

⚠ Caution

- *Pay attention to the safety precautions and conditions. Refer to* *⇒ "4.1 Safety Precautions and Conditions for Removing and Installing Tires, Wheels with TPMS", page 240* *.*
- *Mounting head must not be located in area -a- of tire valve/ tire pressure monitoring sensor, otherwise the mounting head will damage the Tire Pressure Monitoring Sensor .*

Removing Tires



- Rotate the wheel on the tire mounting device so that the tire valve/ Tire Pressure Monitoring Sensor is in front of the mounting head.
- Position the mounting head in the vicinity of the tire valve/ Tire Pressure Monitoring Sensor so that the tire iron can be put on approximately 30° next to the tire valve/ Tire Pressure Monitoring Sensor .
- Now pry tire bead over mounting finger on mounting head using tire iron and remove tire iron again.
- Let tire mounting device run clockwise until upper bead lies completely above the rim flange.
- Rotate the wheel on the tire mounting device so that the tire valve/ Tire Pressure Monitoring Sensor is in front of the mounting head.

Note

- *Check the Tire Pressure Monitoring Sensor for loose or damaged parts. If threaded connections are loose, the union nut, valve insert, seal, sealing washer and valve cap must be replaced by new parts from the repair set. Refer to the Parts Catalog.*
- *If Tire Pressure Monitoring Sensor is damaged, then it must be replaced completely. Refer to* *⇒ "7.2 Tire Pressure Monitoring Sensor, Removing and Installing", page 255* .

4.6 Tires, Mounting

Caution

- ***Pay attention to the safety precautions and conditions. Refer to*** ***⇒ "4.1 Safety Precautions and Conditions for Removing and Installing Tires, Wheels with TPMS", page 240*** .

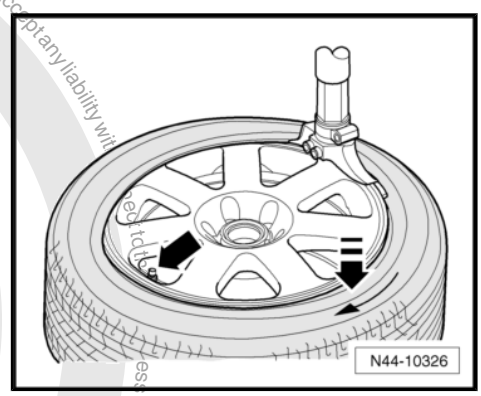
Note

When changing a tire, it is recommended to change the Tire Pressure Monitoring Sensor seals at the same time.

- Coat rim flanges, tire beads and inside of upper tire beads thoroughly with tire mounting paste.

Install the inner side of the tire first.

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– Turn the disc wheel on tire mounting device so that valve/ Tire Pressure Monitoring Sensor -arrow- is opposite to the mounting head.
– Push the tires between the tire valve/ Tire Pressure Monitoring Sensor and the mounting head into the bed in direction of -arrow-.
– Let the tire dismounting/mounting machine run clockwise.
– Mounting of the lower bead ends before the tire valve/ Tire Pressure Monitoring Sensor to prevent damage to Tire Pressure Monitoring Sensor .

Tire bead now slips over the rim flange. The wheel may only be turned so far until the mounting head is located just in front of tire valve/ Tire Pressure Monitoring Sensor .

– Make sure the tire bead sits correctly on the assembly head and let the tire dismounting/mounting machine run clockwise.
– Mounting of the upper bead ends before the tire valve/ Tire Pressure Monitoring Sensor to prevent damage to Tire Pressure Monitoring Sensor .

Tire bead now slips over the rim flange. The wheel may only be turned so far until the mounting head is located just in front of tire valve/ Tire Pressure Monitoring Sensor .

– Inflate the tire to max. 3.3 bar (47.8 psi) (spring pressure).

Caution

If tire beads do not make contact completely on disc wheel edge, pressure must not be increased under any circumstances.

Pre-damage to tire or disc wheel would result.

– If the tire beads do not make contact completely on disc wheel edge, then release air. Press off tire bead once more and thoroughly coat the rim flange again with tire mounting paste.
– Inflate the tire to max. 3.3 bar (47.8 psi) (spring pressure).
– If tire beads make contact on bead seat without problems, then increase tire pressure to 4 bar (58 psi) to »settle« tire.
– Install a new nickel plated valve insert and fill the tire with air to the specified tire pressure.
– Balance the wheel.
– Install the wheel and tighten. Refer to ⇒ “2 Wheel Installation Tightening Specifications”, page 237 .

5 Run-Flat Tires, Removing and Mounting

⇒ “5.1 Safety Precautions”, page 246

⇒ “5.2 Assembly Requirements”, page 246

⇒ “5.3 Tires, Dismounting”, page 248

⇒ “5.4 Tires, Dismounting”, page 248

⇒ “5.5 Tires, Mounting”, page 250

5.1 Safety Precautions

- Work for removing and mounting tires with emergency running characteristics must only be performed by technicians specially trained for it.
- The special tools necessary must be in proper working order and not damaged! Contact the manufacturer of the tire dismounting/mounting machine found in the shop directly for suitable additional tools. Additional tools are offered as recommended accessories for the tire dismounting/mounting machines listed with VAS- numbers.
- If necessary, use a mounting paste recommended by the tire manufacturer.
- The description of work procedure for removing and mounting may vary depending on the device manufacturer and type of device.
- The following work procedure described explains the principal procedure for removing and mounting tires with emergency running characteristics. It is important to recognize run-flat tires before starting the removal and mounting process as it will be different from the process used with standard tires.
- Characteristics: these tires are identified with the following abbreviations: DSST, Euforia, RFT, ROF, RSC, SSR or ZP. These abbreviations are located on the sidewall behind tire designation of the respective tire manufacturer.
- Always note the instructions and danger warnings identified in the following description!

Note

- *During removal and mounting work, make sure that no contact is made between tires and Tire Pressure Monitoring Sensor .*
- *When cleaning disc wheel (rim), the tire pressure monitoring sensor must not come into contact with water or be blown with pressurized air.*

5.2 Assembly Requirements

Warm Up Cold Tires to the Minimum Mounting Temperature

Note

This applies also to ultra high performance tires (height- / width ration smaller/same 45% and speed rating symbol larger than/ same as V).

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WARNING

The minimum mounting temperature for a tire may not be below 15 °C (59 °F) or above 30 °C (86 °F) in the center of the tire.

- For injury-free mounting, the upper sidewall and the upper bead inside must be minimum 15 °C (59 °F).
- The internal temperature is called the core temperature.
- Rubber is a poor heat conductor. For this reason, a cold tire must exposed to a temperature controlled environment until the inner rubber layers have warmed up to at least 15 °C (59 °F).
- The tire surface temperature during the warm-up phase is not a measure the inside temperature.
- So that the cold tires warm up as quickly as possible, never stack them one on top of the other, but rather store them separate from each other. This way, the warm air can “circulate” around the tires.
- Never use a room heater or a hot air gun to warm up tires because the surface temperature will heat up very quickly to a critical temperature.
- Using warm water or warm air (maximum 50 °C (122 °F)) is the only way to warm up a tire without damaging it!
- If cold tires (below 0 °C (32 °F)) are brought into a warm room (above 0 °C (32 °F)), a layer of ice will start to form on the tires. This layer of ice means that humidity in the warm air is condensing on the tire.
- Once the layer of ice starts to melt, wipe up the water with a rag. This way the warming up process will not be slowed down.

Warm-Up Time

- ♦ If the tire temperature is minimum 0 °C (32 °F), then put the tire in a room for at least 2 hours where the temperature is not below 19 °C (66.2 °F).
- ♦ If the tire temperature is below 0 °C (32 °F), then put the tire in a room for at least 2.5 hours where the temperature is not below 19 °C (66.2 °F).

Recommendations

- ♦ If possible, let the tires stand in the shop for 1 day before mounting them
- ♦ Store the tires as high as possible on an insulated surface, pallet or something similar.
- ♦ Position the tires so that they can be “surrounded” by the warm air.
- ♦ Wipe off the sweat.
- ♦ Never heat the tires with a room heater or a hot air gun!

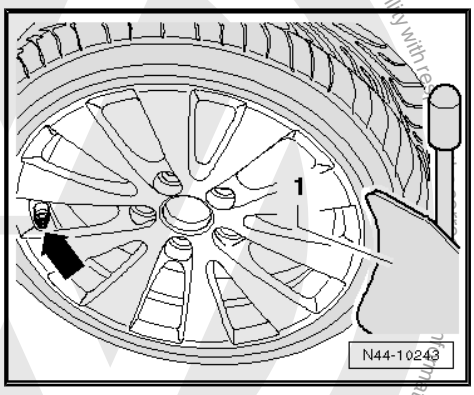
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5.3 Tires, Dismounting

Caution

- *Note the safety precautions. Refer to* ⇒ *"5.1 Safety Precautions", page 246* .

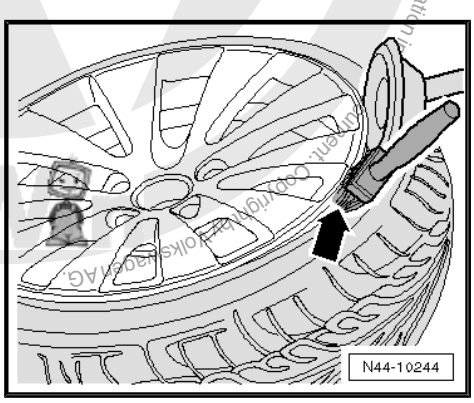
– When pressing off tire on a tire mounting device with press-off blade, always make sure that tire valve/ Tire Pressure Monitoring Sensor -arrow- is located opposite the press-off blade -1-.



Press-off blade must be applied at maximum 2 cm removed from rim flange.

– Remove the balance weight and any dirt from the rim.

– Press off both tire beads all the way around while thoroughly applying tire mounting paste between the tire and rim flange -arrow-.



5.4 Tires, Dismounting

Caution

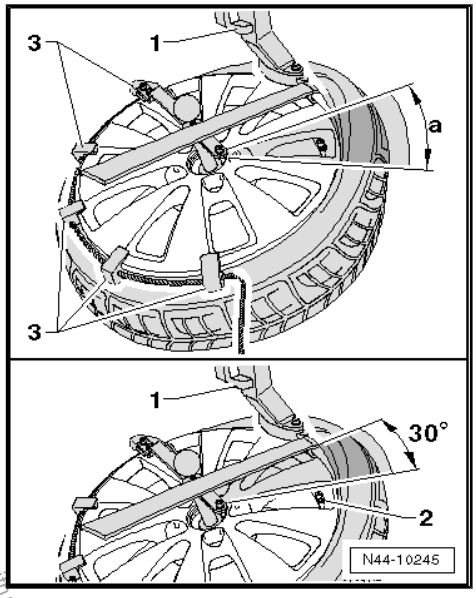
- *Note the safety precautions. Refer to* ⇒ *"5.1 Safety Precautions", page 246* .

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– Turn wheel on tire mounting device so that tire valve/ Tire Pressure Monitoring Sensor -2- stands in front of mounting head -1-.

Caution

Mounting head -1- must not be located in area -a- of tire valve/ tire pressure monitoring sensor, otherwise the mounting head will damage the Tire Pressure Monitoring Sensor .



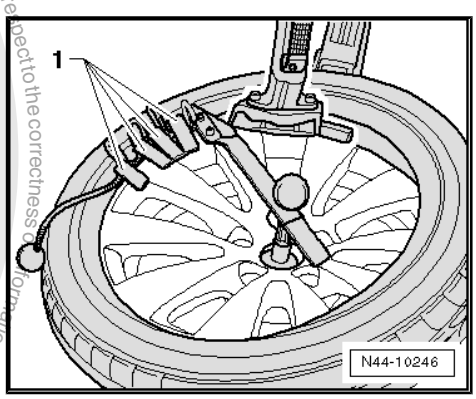
– Position the mounting head -1- in vicinity of tire valve/ Tire Pressure Monitoring Sensor so that tire iron can be put on approximately 30° next to tire valve/ Tire Pressure Monitoring Sensor -2-.

– Install the holders -3- on the wheel rim opposite the mounting head -1-.

– Now pry tire bead over mounting finger on mounting head using tire iron and remove tire iron again.

– Let tire mounting device run clockwise until upper bead lies completely above the rim flange.

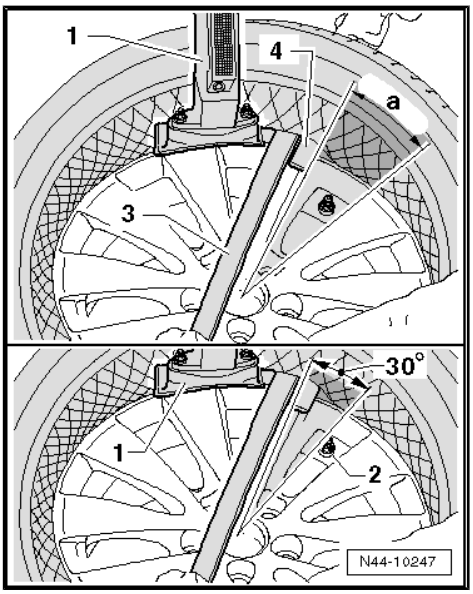
This slides the press holders -1- against the mounting head. This allows them to be removed again easily.



– Turn wheel on tire mounting device so that tire valve/ Tire Pressure Monitoring Sensor -2- stands in front of mounting head -1-.

Caution

Mounting head -1- must not be located in area -a- of tire valve/ tire pressure monitoring sensor, otherwise the mounting head will damage the Tire Pressure Monitoring Sensor .



– Position the mounting head -1- in vicinity of tire valve/ Tire Pressure Monitoring Sensor so that the tire iron can be put on approximately 30° next to tire valve/ Tire Pressure Monitoring Sensor -2-.

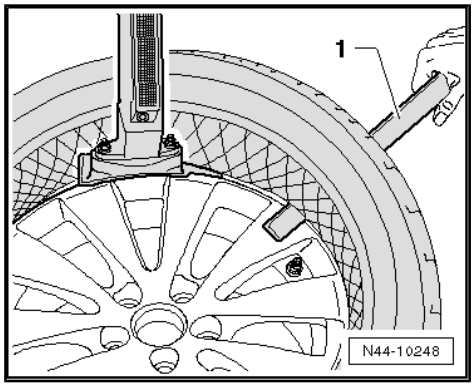
– Now pry tire bead over mounting finger of mounting head using tire iron -3-.

– Install a plastic lever -4-.

– Use tire iron -3-.

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– Using the plastic pry bar -1-, hold the bead firmly from the outside over the rim flange. Let the tire dismounting/mounting machine run clockwise until the tire is completely removed from the rim.



Note

- *Check the Tire Pressure Monitoring Sensor for loose or damaged parts. If threaded connections are loose, the union nut, valve insert, seal, sealing washer and valve cap must be replaced by new parts from the repair set. Refer to the Parts Catalog.*
- *If Tire Pressure Monitoring Sensor is damaged, then it must be replaced completely. Refer to* *⇒ "7.1 Overview - Tire Pressure Monitoring Sensor ", page 254 .*

5.5 Tires, Mounting

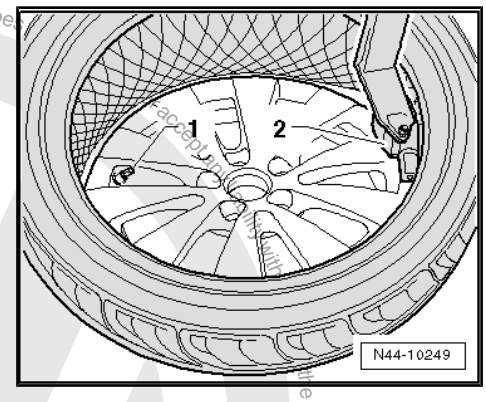
Caution

- ***Pay attention to the instructions for warming-up cold tires to the minimum mounting temperature. Refer to*** ***⇒ "5.2 Assembly Requirements", page 246 .***
- ***Note the safety precautions. Refer to*** ***⇒ "5.1 Safety Precautions", page 246 .***

– Coat rim flanges, tire beads and inside of upper tire beads thoroughly with tire mounting paste.

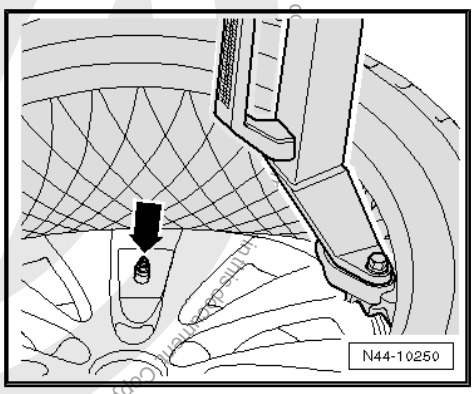
– Turn the wheel rim on tire mounting device so that tire valve/ Tire Pressure Monitoring Sensor -1- stands on opposite side of mounting head -2-.

– Let the tire dismounting/mounting machine run clockwise.



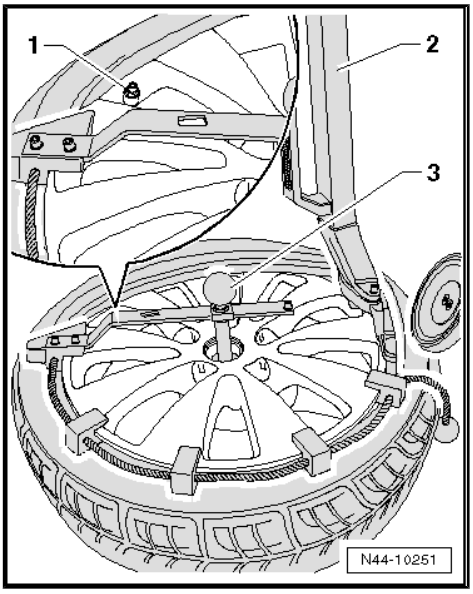
– Mounting of the lower bead ends before the tire valve/ Tire Pressure Monitoring Sensor -arrow- to prevent damage to Tire Pressure Monitoring Sensor .

The tire bead now slips over the rim flange. The wheel may only be turned so far until the mounting head is located just in front of tire valve/ Tire Pressure Monitoring Sensor -arrow-.



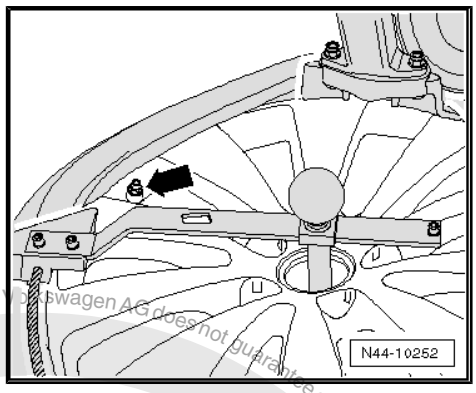
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– Turn the wheel rim on tire mounting device so that tire valve/ Tire Pressure Monitoring Sensor -1- stands on opposite side of mounting head -2-.
– Install the holders -3- on the rim.
– Make sure the tire bead sits correctly on the assembly head and let the tire dismounting/mounting machine run clockwise.



– Mounting of the upper bead ends before the tire valve/ Tire Pressure Monitoring Sensor -arrow- to prevent damage to Tire Pressure Monitoring Sensor .

The tire bead now slips over the rim flange. The wheel may only be turned so far until the mounting head is located just in front of tire valve/ Tire Pressure Monitoring Sensor -arrow-.



– Remove the bracket from the wheel rim flange.
– Inflate the tire to max. 3.3 bar (47.8 psi) (spring pressure).

Caution

If tire beads do not make contact completely on disc wheel edge, pressure must not be increased under any circumstances.

Damage to the tire or wheel rim would result.

– If the tire beads do not make contact completely on the rim edge, then release air. Press off tire bead once more and thoroughly coat the rim flange again with tire mounting paste.
– Inflate the tire to max. 3.3 bar (47.8 psi) (spring pressure).
– If tire beads make contact on bead seat without problems, then increase tire pressure to 4 bar (58 psi) to »settle« tire.
– Install a new nickel plated valve insert and fill the tire with air to the specified tire pressure.
– Balance the wheel.
– Install the wheel and tighten it to the tightening specification. Refer to
⇒ “2 Wheel Installation Tightening Specifications”, page 237 .

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6 Tire Pressure Monitoring System

⇒ “6.1 General Information”, page 252

6.1 General Information

The tire pressure monitoring system is included in the software in the ABS Control Module - J104- . The system will recognize a slow and gradual decrease in tire pressure on a wheel. The DTC memory entries for tire pressure monitoring system are stored in the ABS Control Module - J104- . With the help of the ABS speed sensor, the TPMS compares the speed and rolling circumference of the individuals tires.

After the following work and/or changes and with the ignition switched on, the Tire Pressure Monitoring Display Button - E492- must be pressed until the confirmation chime sounds:

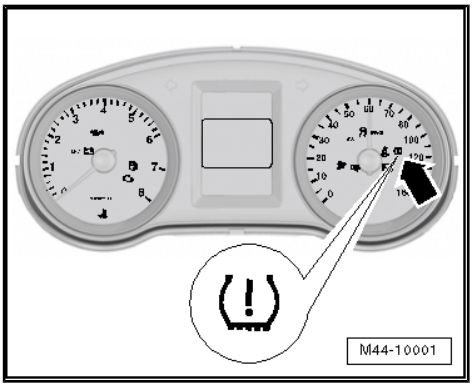
- Tire pressure change
- A change in one or more tires
- Changing a tire, for example, from front to rear

If a tire has changed in circumference, the Tire Pressure Monitoring Display Indicator Lamp - K220- in the instrument cluster will come on. Rolling circumference of a tire may change due to:

- Insufficient tire pressure
- Structural damage on tires
- Vehicle is loaded heavily on one side
- High load on one axle, when towing trailer for example
- When snow chains are used
- Spare wheel is mounted
- One wheel is replaced

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System Malfunction in the ABS



If the ASR/ESP Indicator Lamp - K155- or the Traction Control Indicator Lamp - K86- indicate a malfunction in the ABS system, then the Tire Pressure Monitoring Display Indicator Lamp - K220- -arrow- will also illuminate. A malfunction in the tire pressure monitoring system has not been stored.

Indicator lamp cannot be turned off by pressing Tire Pressure Monitoring Display Button - E492- . In this case, perform the following:

– Connect the Vehicle Diagnostic Tester and select “Guided Fault Finding”:

`Chassis`

`Brake System`

`01-OBD`

`03-Brake System ABS Mark 70` or

`03-Brake System ESP Mark 60`

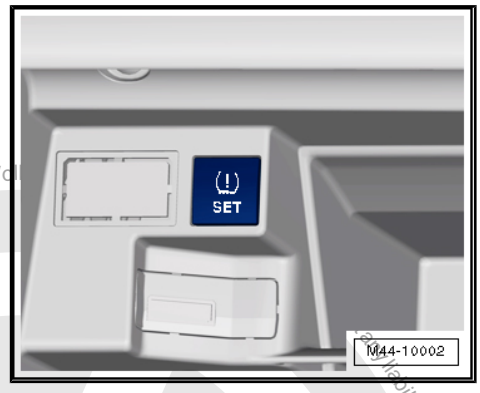
`Functions`

`General Functions`

`Adapt the tire pressure monitoring system`

Follow the instructions on the screen to perform the basic setting.

Basic Setting, Performing



After every change at wheels, the SET button must be pressed with ignition switched on and vehicle standing still until a signal tone sounds. The signal tone confirms the basic setting.

Note

The SET button in inside the glove compartment.

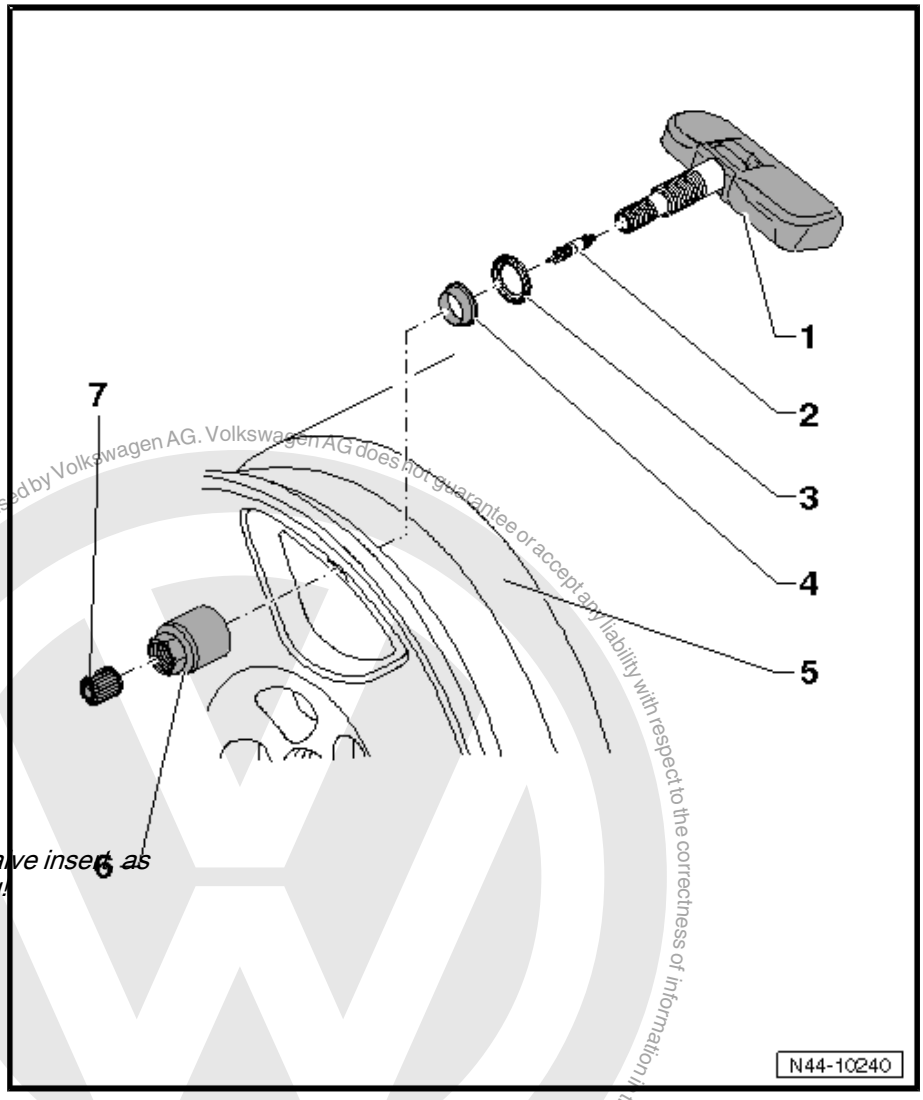
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7 Tire Pressure Monitoring System

⇒ “7.1 Overview - Tire Pressure Monitoring Sensor ”, page 254

⇒ “7.2 Tire Pressure Monitoring Sensor , Removing and Installing”, page 255

7.1 Overview - Tire Pressure Monitoring Sensor



1 - Tire Pressure Monitoring Sensor

- ❑ Supplied complete as a service part
- ❑ Removing and installing. Refer to ⇒ “7.2 Tire Pressure Monitoring Sensor , Removing and Installing”, page 255 .
- ❑ When battery is discharge, the entire Tire Pressure Monitoring Sensor must be replaced
- ❑ After using a wheel repair kit, the bore for the valve and opening of the pressure sensor must be wiped clean.

2 - Valve Insert

- ❑ Allocation. Refer to the Parts Catalog.
- ❑ Replace at every tire change

Note

Only use the original valve insert, as it has a special coating!

3 - Sealing Washer

4 - Seal

5 - Disc Wheel

- ❑ Installing tires (wheels with tire pressure monitoring system). Refer to ⇒ “4 Tires, Wheels with TPMS, Removing and Installing”, page 240 .
- ❑ Mounting tires with emergency running characteristics. Refer to ⇒ “5 Run-Flat Tires, Removing and Mounting”, page 246 .

6 - Union Nut

- ❑ 8 Nm

7 - Valve Cap

- ❑ Use only original valve caps from the repair set. Refer to the Parts Catalog.
- ❑ Do not use comfort valve caps and metal caps

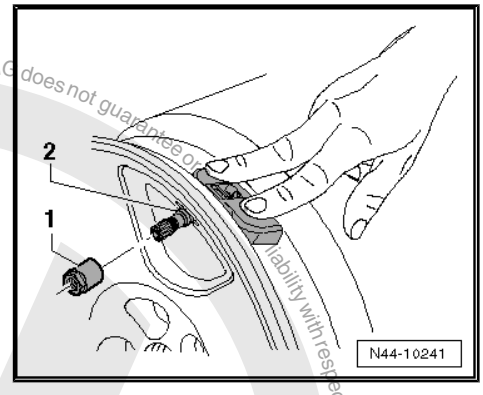
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7.2 Tire Pressure Monitoring Sensor , Removing and Installing

Removing

– Remove the union nut -1-.

– Remove the Tire Pressure Monitoring Sensor -2- from rim well.



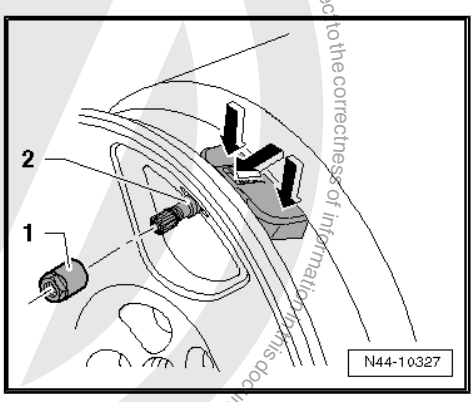
Installing

Caution

Clean the valve opening before installing the Tire Pressure Monitoring Sensor .

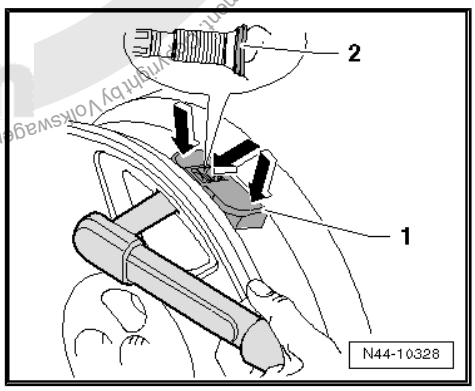
– Insert the Tire Pressure Monitoring Sensor -2- with the new seal and sealing washer. Press the Tire Pressure Monitoring Sensor on the spots marked with the -arrows- into the disc wheel (rim).

– Press the Tire Pressure Monitoring Sensor -2- on the spots marked with the -arrows- into the disc wheel (rim).



Install the union nut -1- on the tire pressure monitoring sensor.

– Install the Tire Pressure Monitoring Sensor -1- on the marked positions -arrows- in the rim and tighten the union nut to 8 Nm.



Caution

- *Tighten the union nut only to the tightening specification.*
- *Sealing washer -2- becomes slightly deformed when doing this.*
- *The sealing washer can be installed one time only. At every installation, replace the sealing washer and rubber seal.*
- *Do not tighten the union nut again. This will damage the seal and it will leak.*

Tightening Specification

Component	Tightening Specification
Union nut to the Tire Pressure Monitoring Sensor	8 Nm

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8 Wheel Alignment

⇒ “8.1 General Information about Vehicles with Torsion Beam Rear Suspension”, page 256

⇒ “8.2 General Information about Vehicles with Multi-Link Rear Suspension”, page 258

⇒ “8.3 Test Prerequisites”, page 259

⇒ “8.4 Axle Beam Trailing Arm (Torsion Beam), Checking with Measuring Square VAS241001 ”, page 260

⇒ “8.5 Axle Beam Trailing Arm (Torsion Beam), Checking with Crankshaft Holding Fixture VW801 ”, page 263

⇒ “8.6 Measure Preparations”, page 265

⇒ “8.7 Alignment Specified Values for Vehicles with Torsion Beam Rear Suspension”, page 265

⇒ “8.8 Alignment Specified Values for Vehicles with Multi-Link Rear Suspension”, page 267

⇒ “8.9 Vehicle Transverse Inclination, Zero Position ”, page 269

⇒ “8.10 Work Procedure Overview for Vehicle Alignment”, page 269

⇒ “8.11 Front Axle Camber, Correcting”, page 270

⇒ “8.12 Rear Torsion Beam Suspension Camber, Checking”, page 272

⇒ “8.13 Multi-Link Suspension Camber, Adjusting”, page 272

⇒ “8.14 Rear Torsion Beam Suspension Toe, Checking”, page 273

⇒ “8.15 Multi-Link Suspension Toe, Adjusting”, page 273

⇒ “8.16 Front Axle Toe, Adjusting”, page 274

⇒ “8.17 Basic Setting for Steering Angle Sensor G85 ”, page 275

⇒ “8.18 Vehicle Data Label”, page 275

8.1 General Information about Vehicles with Torsion Beam Rear Suspension

Special tools and workshop equipment required

- Wheel Alignment Computer - VAG1813F- or VW/Audi approved wheel alignment devices
- Brake Pedal Actuator - VAG1869/2- .
- Insert Tool - 18mm - T10179-
- Shock Absorber Set - T10001-

Wheel alignment must only performed using VW/Audi-approved wheel alignment equipment.

Wheel alignment checks must always include both the front and rear axles.

Otherwise centering of toothed shaft cannot be guaranteed!

– Perform the alignment using the wheel alignment computer.

The wheel alignment computer has all the information for the vehicle alignment.

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Current data »Updates« are stored on VWServiceNet.

Refer to ⇒ VWService Net; Systems; Vehicle Alignment Software; Vehicle Alignment; Beissbarth .

Refer to ⇒ VWService Net; Systems; Vehicle Alignment Software; Vehicle Alignment; Hunter .

Refer to ⇒ VWService Net; Systems; Vehicle Alignment Software; Vehicle Alignment; Corghi .

Refer to ⇒ VWService Net; Systems; Vehicle Alignment Software; Vehicle Alignment; John Bean .

Note

- *An alignment should not be done until the vehicle has been driven 1,000 to 2,000 km (621 to 1242 miles), since it takes this long for the coil springs to settle.*
- *The individual specifications should be followed as exactly as possible when making adjustments.*

When Vehicle Alignment is Necessary

- Vehicle shows handling problems.
- There is an accident damage and components were replaced.
- Axle components have been removed or replaced.
- Tire wear patterns are uneven.

Caution

Before beginning the axle alignment check the axle beam trailing arm. Refer to ⇒ "8.4 Axle Beam Trailing Arm (Torsion Beam), Checking with Measuring Square VAS241001 ", page 260 or ⇒ "8.5 Axle Beam Trailing Arm (Torsion Beam), Checking with Crankshaft Holding Fixture VW801 ", page 263 .

Components Replaced

Front Axle Component Replaced	Wheel Alignment Check Required		Rear Axle Component Replaced	Wheel Alignment Check Required	
	Yes	**No**		**Yes**	**No**
Lower Control Arm		X	Shock Absorber		X
Bonded rubber bushings for control arm		X	Coil Spring		X
Wheel Bearing Housing	X		Axle Beam		X
Tie rod/tie rod end	X		Subframe	X	
Steering Gear	X		Crossbrace		X
Subframe		X			
Suspension Strut		X			
Stabilizer Bar		X [1)]			

[1)] Requirement: Subframe and brackets were secured before removal. Refer to ⇒ "4.3 Subframe, Securing", page 11 .

Components Removed and Installed

Components of Front Axle Removed and Installed	Wheel Alignment Check Required		Components of Rear Axle Removed and Installed	Wheel Alignment Check Required	
	Yes	No		Yes	No
Lower Control Arm		X [1)]	Shock Absorber		X
Wheel Bearing Housing		X	Coil Spring		X
Tie rod/tie rod end	X		Axle Beam		X
Steering Gear	X		Subframe	X	
Subframe		X [1)]	Crossbrace		X
Suspension Strut		X			
Stabilizer Bar		X [1)]			

[1)] Requirement: Subframe and brackets were secured before removal. Refer to ⇒ “4.3 Subframe, Securing”, page 11 .

8.2 General Information about Vehicles with Multi-Link Rear Suspension

Special tools and workshop equipment required

- Wheel Alignment Computer - VAG1813F- or VW/Audi approved wheel alignment devices
- Brake Pedal Actuator - VAG1869/2- .
- Insert Tool - 18mm - T10179-
- Shock Absorber Set - T10001-

Wheel alignment must only performed using VW/Audi-approved wheel alignment equipment.

Wheel alignment checks must always include both the front and rear axles.

Otherwise centering of toothed shaft cannot be guaranteed!

– Perform the alignment using the wheel alignment computer.

The wheel alignment computer has all the information for the vehicle alignment.

Current data »Updates« are stored on VWServiceNet.

Refer to ⇒ VWService Net; Systems; Vehicle Alignment Software; Vehicle Alignment; Beissbarth .

Refer to ⇒ VWService Net; Systems; Vehicle Alignment Software; Vehicle Alignment; Hunter .

Refer to ⇒ VWService Net; Systems; Vehicle Alignment Software; Vehicle Alignment; Corghi .

Refer to ⇒ VWService Net; Systems; Vehicle Alignment Software; Vehicle Alignment; John Bean .

Note

- *An alignment should not be done until the vehicle has been driven 1,000 to 2,000 km (621 to 1242 miles), since it takes this long for the coil springs to settle.*
- *The individual specifications should be followed as exactly as possible when making adjustments.*

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When Vehicle Alignment is Necessary

- Vehicle shows handling problems.
- There is an accident damage and components were replaced.
- Axle components have been removed or replaced.
- Tire wear patterns are uneven.

Components Replaced

Front Axle Component Replaced	Wheel Alignment Check Required		Rear Axle Component Replaced	Wheel Alignment Check Required	
	Yes	No		Yes	No
Lower Control Arm		X	Lower transverse link	X	
Bonded rubber bushings for control arm		X	Upper Transverse Link	X	
Wheel Bearing Housing	X		Tie rod	X	
Tie rod/tie rod end	X		Wheel Bearing Housing	X	
Steering Gear	X		Subframe	X	
Subframe		X	Coil Spring		X
Suspension Strut		X	Shock Absorber		X
Stabilizer Bar		X 1)	Stabilizer Bar		X
			Trailing Arm	X	

1) Requirement: Subframe and brackets were secured before removal. Refer to ⇒ “4.3 Subframe, Securing”, page 11 .

Components Removed and Installed

Components of Front Axle Removed and Installed	Wheel Alignment Check Required		Components of Rear Axle Removed and Installed	Wheel Alignment Check Required	
	Yes	No		Yes	No
Lower Control Arm		X 1)	Lower transverse link	X	
Wheel Bearing Housing		X	Upper Transverse Link	X	
Tie rod/tie rod end	X		Tie rod	X	
Steering Gear	X		Wheel Bearing Housing	X	
Subframe		X 1)	Subframe	X	
Suspension Strut		X	Coil Spring		X
Stabilizer Bar		X 1)	Shock Absorber		X
			Stabilizer Bar		X
			Trailing Arm	X	

1) Requirement: Subframe and brackets were secured before removal. Refer to ⇒ “4.3 Subframe, Securing”, page 11 .

8.3 Test Prerequisites

Special tools and workshop equipment required

- Wheel Alignment Computer - VAG1813F- or VW/Audi approved wheel alignment devices
- Brake Pedal Actuator - VAG1869/2- .
- Insert Tool - 18mm - T10179-

- ♦ Shock Absorber Set - T10001-
- Suspension, wheel bearing, steering and steering linkage checked for excessive play and damage.
- Tread depth difference may be no more than 2 mm on an axle.
- Tires inflated to prescribed pressure
- Vehicle curb weight
- Fuel tank must be full.
- Spare tire and vehicle tools are installed in appropriate position in vehicle.
- The windshield washer fluid reservoir for the windshield washer system/headlamp washer system must be full.
- Make sure that the sliding plate and turntable are not touching the end stop during the measurement.

Caution

Before beginning the axle alignment check the axle beam trailing arm. Refer to ⇒ "8.4 Axle Beam Trailing Arm (Torsion Beam), Checking with Measuring Square VAS241001 ", page 260 or ⇒ "8.5 Axle Beam Trailing Arm (Torsion Beam), Checking with Crankshaft Holding Fixture VW801 ", page 263 .

WARNING

For safety reasons, the steering wheel must be held tightly during the road test.

Note

The test equipment must be properly adjusted and attached to the vehicle; observe device manufacturer operating instructions.

If necessary, contact the manufacturer of the alignment equipment for familiarization with the proper use of the equipment.

After a certain period, wheel alignment platforms and computer equipment can lose their original leveling setting and adjustments.

Wheel alignment platforms and wheel alignment analyzer/computer should be serviced and calibrated at least once a year.

– Handle highly sensitive units with care.

8.4 Axle Beam Trailing Arm (Torsion Beam), Checking with Measuring Square - VAS241001-

Special tools and workshop equipment required

- ♦ Measuring Square - VAS241001-
- ♦ Gauge - Gap Adjustment - 3371-

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Note

- *A traditional test of the rear axle as per the visual inspection/ suspension measurement is not productive here. In order to get a clear finding for the torsion beam trailing arm, the following inspection instructions must be performed.*
- *The test sequence is described for the left rear trailing arm. The test sequence for the right rear trailing arm is identical.*

Test Sequence

– Loosen the wheel bolts.

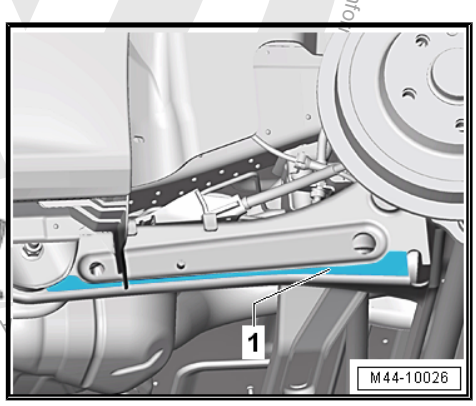
– Raise the vehicle.

– Remove the wheels.

Note

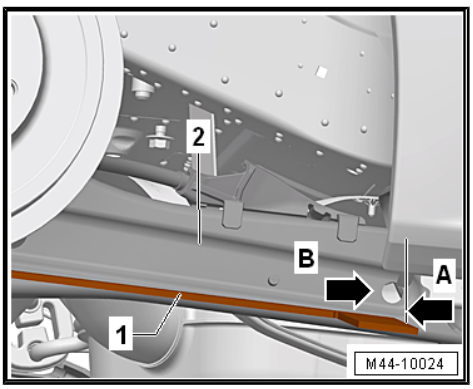
Do not use pointed or sharp tools to clean - there is a risk of corrosion.

– Thoroughly clean the contact surfaces -1- on both trailing arms.



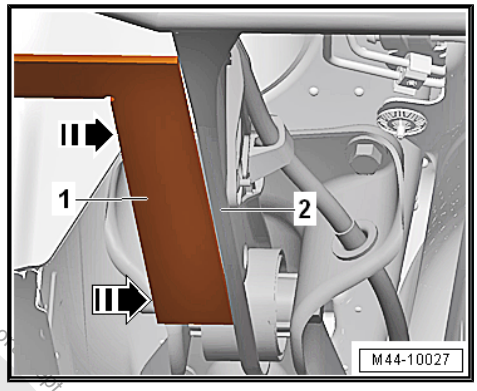
– Place the Measuring Square - VAS241001- -1- on the trailing arm -2- at the bottom.

The outer edge of the Measuring Square - VAS241001- -arrow A- must be placed to the height of the hole -arrow B-.

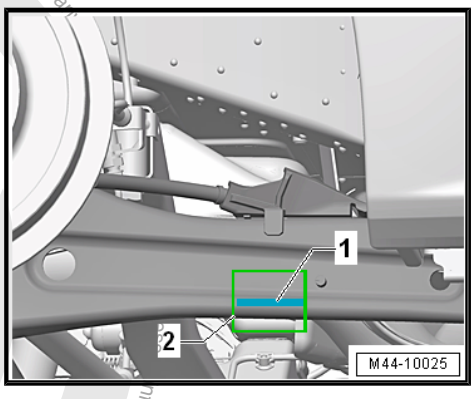


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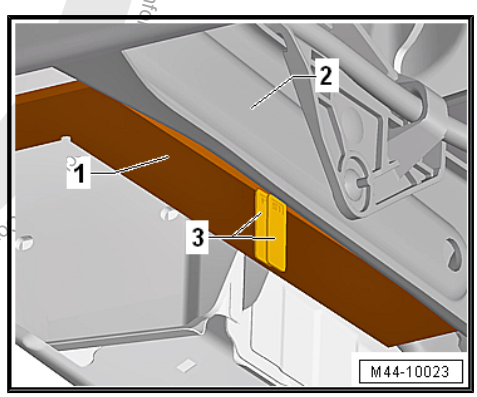
– The Measuring Square - VAS241001- -1- must lie against the bottom of the trailing arm -2- -arrows-.



– The distance measurement between the Measuring Square - VAS241001- and the trailing arm must only take place on the surface -1- of the test area -2-.



– Adjust the Gauge - Gap Adjustment - 3371- -3- to a thickness of 2.25 mm (blue and white plates together).
– Measure the distance between the trailing arm -2- and the Measuring Square - VAS241001- -1- with the Gauge - Gap Adjustment - 3371- -3- in the test area.



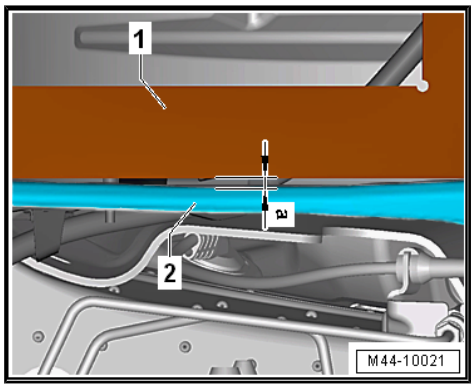
Measures Distance -a- between the Measuring Square - VAS241001- -1- and the Trailing Arm -2- is Larger than 2.25 mm:

The permitted tolerance range is exceeded. The axle beam must be replaced. Refer to
⇒ “4.2 Axle Beam, Removing and Installing”, page 152 .

Measures Distance -a- between the Measuring Square - VAS241001- -1- and the Trailing Arm -2- is Smaller than 2.25 mm:

The permitted tolerance range has not been exceeded. The trailing arm on the axle beam is OK.

– Repeat the test sequence for the right rear trailing arm.
– Install wheels and tighten. Refer to
⇒ “2 Wheel Installation Tightening Specifications”, page 237 .



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8.5 Axle Beam Trailing Arm (Torsion Beam), Checking with Crankshaft Holding Fixture - VW801-

Caution

An inspection using the Crankshaft Holding Fixture - VW 801- is only possible on axle beams without an axle beam plate. If an axle beam plate is already installed, then the inspection must be performed using the Measuring Square - VAS241001- . Refer to *⇒ "8.4 Axle Beam Trailing Arm (Torsion Beam), Checking with Measuring Square VAS241001 ", page 260* .

Note

- *A traditional test of the rear axle as per the visual inspection/ suspension measurement is not productive here. In order to get a clear finding for the torsion beam trailing arm, the following inspection instructions must be performed.*
- *The test sequence is described for the left rear trailing arm. The test sequence for the right rear trailing arm is identical.*

Special tools and workshop equipment required

- Crankshaft Holding Fixture - VW801-
- Gauge - Gap Adjustment - 3371-
- Measuring Square - VAS241001-

Test Sequence

– Loosen the wheel bolts.

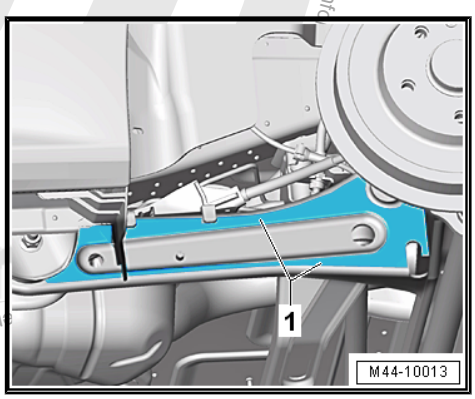
– Raise the vehicle.

– Remove the left rear wheel.

Note

Do not use pointed or sharp tools to clean - there is a risk of corrosion.

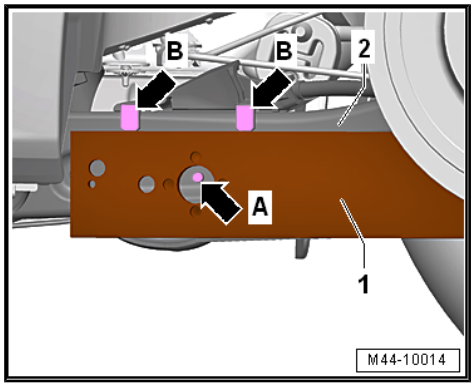
– Thoroughly clean the contact surfaces -1- for the Crankshaft Holding Fixture - VW801- on the trailing arm.



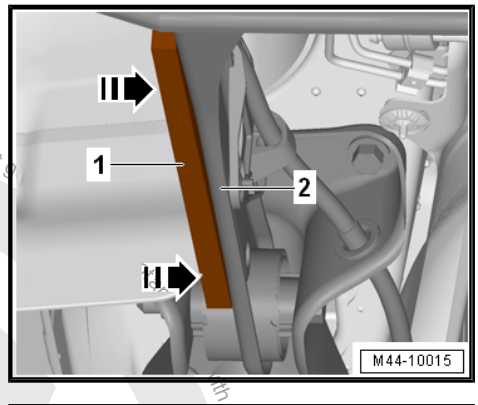
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– Place the Crankshaft Holding Fixture - VW801- -1- on the trailing arm -2-.

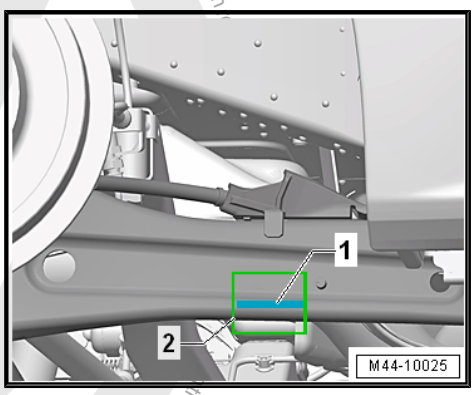
- The rivet for the parking brake cable bracket must fit into the hole -arrow A- on the Crankshaft Holding Fixture - VW801- -1-.
- The Crankshaft Holding Fixture - VW801- -1- must be placed under the parking brake cable bracket -B arrows-.



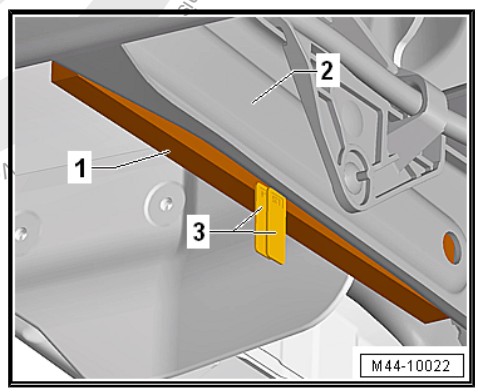
– The Crankshaft Holding Fixture - VW801- -1- must lie on the bottom of the trailing arm -2- -arrows-.



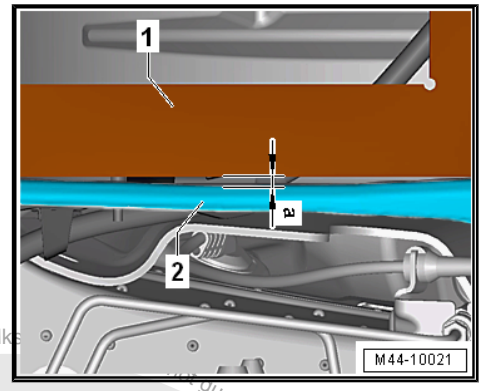
– The distance measurement between the Crankshaft Holding Fixture - VW801- and the trailing arm must only take place on the surface -1- of the test area -2-.



– Adjust the Gauge - Gap Adjustment - 3371- -3- to a thickness of 2.25 mm (blue and white plates together).
– Measure the distance between the trailing arm -2- and the Crankshaft Holding Fixture - VW801- -1- with the Gauge - Gap Adjustment - 3371- -3- in the test area.



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Measures Distance -a- between the Crankshaft Holding Fixture -VW801- -1- and the Trailing Arm -2- is Larger than 2.25 mm:

The permitted tolerance range is exceeded. The axle beam must be replaced. Refer to
⇒ “4.2 Axle Beam, Removing and Installing”, page 152 .

Measures Distance -a- between the Measuring Square -VAS241001- -1- and the Trailing Arm -2- is Smaller than 2.25 mm:

The permitted tolerance range has not been exceeded. The trailing arm on the axle beam is OK.

– Repeat the test sequence for the right rear trailing arm.

– Install wheels and tighten. Refer to
⇒ “2 Wheel Installation Tightening Specifications”, page 237 .

8.6 Measure Preparations

Special tools and workshop equipment required

♦ Brake Pedal Actuator - VAG1869/2- .

The lateral run-out of the wheel must be compensated for. Otherwise, measurement will result in false readings.

A correct toe-in adjustment will not be possible without performing lateral run-out compensation!

Follow the operating instructions provided by the manufacturer of the alignment equipment.

– Perform wheel run-out compensation.

– Install the Brake Pedal Actuator - VAG1869/2- .

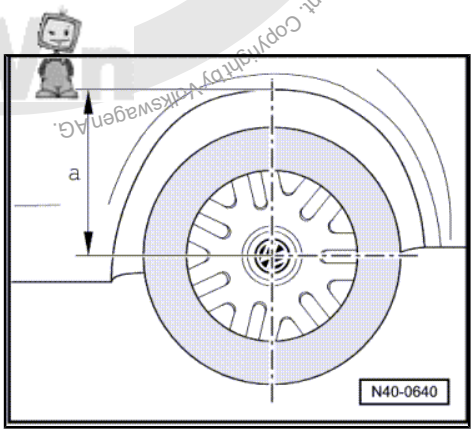
– Actuate the brake pedal using brake pedal actuator.

8.7 Alignment Specified Values for Vehicles with Torsion Beam Rear Suspension

Specified values valid for all engine versions.

♦ PR number explanations. Refer to ⇒ page 275 .

Standing heights listed in the tables refer to dimension -a-.



Caution

Before beginning the axle alignment check the axle beam trailing arm. Refer to ⇒ “8.4 Axle Beam Trailing Arm (Torsion Beam), Checking with Measuring Square VAS241001 ”, page 260 or ⇒ “8.5 Axle Beam Trailing Arm (Torsion Beam), Checking with Crankshaft Holding Fixture VW801 ”, page 263 .

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Front Axle	Basic Suspension	Sport Suspension (NAR/EU/RdW)	Sport Suspension (Mexico)
PR Numbers	**2UA**	**2UC**	**2UC**
Total toe (wheels not pressed)	10′ ± 10′	10′ ± 10′	10′ ± 10′
Camber (in straight-ahead position)	-30′ ± 30′	-40′ ± 30′	-30′ ± 30′
Maximum permissible difference between both sides	maximum 30'	maximum 30'	maximum 30'
Toe-out angle [1] with steering wheel turned 20° to left and right	1°19′ ± 20′	1°31′ ± 20′	1°19′ ± 20′
Caster	7° 37′ ± 30′	7° 53′ ± 30′	7° 37′ ± 30′
Maximum permissible difference between both sides	maximum 30'	maximum 30'	maximum 30'
Standing height	379 ± 10 mm	364 ± 10 mm	379 ± 10 mm

[1] The toe angle difference can also be indicated negatively in alignment computer, depending on manufacturer.

Front Axle	Comfort Suspension	Heavy Duty Suspension	
PR Numbers	**2UD**	**2UB**	
Total toe (wheels not pressed)	10′ ± 10′	10′ ± 10′	
Camber (in straight-ahead position)	-22′ ± 30′	-13′ ± 30′	
Maximum permissible difference between both sides	maximum 30'	maximum 30'	
Toe-out angle [1] with steering wheel turned 20° to left and right	1°12′ ± 20′	1°7′ ± 20′	
Caster	7° 27′ ± 30′	7° 18′ ± 30′	
Maximum permissible difference between both sides	maximum 30'	maximum 30'	
Standing height	389 ± 10 mm	399 ± 10 mm	

[1] The toe angle difference can also be indicated negatively in alignment computer, depending on manufacturer.

Specified values valid for all engine versions.

- For an explanation of the PR number. Refer to ⇒ page 275 .

Rear axle, Front and All Wheel Drive	Basic Suspension	Sport Suspension (NAR/EU/RdW)	Sport Suspension (Mexico)
Camber	-1° ± 30′	-1° ± 30′	-1° ± 30′
Maximum permissible difference between both sides	maximum 30'	maximum 30'	maximum 30'
Total toe (at prescribed camber)	+20′ ± 10′	+20′ ± 10′	+20′ ± 10′
Maximum permissible deviation from direction of rotation	maximum 20′	maximum 20′	maximum 20′
Standing height	379 ± 10 mm	364 ± 10 mm	379 ± 10 mm

Rear Axle, Front and All Wheel Drive	Comfort Suspension	Heavy Duty Suspension	
Camber	-1° ± 30′	-1° ± 30′	

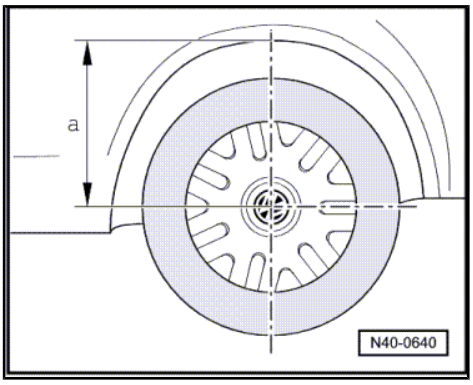
Rear Axle, Front and All Wheel Drive	Comfort Suspension	Heavy Duty Suspension	
Maximum permissible difference between both sides	maximum 30'	maximum 30'	
Total toe (at prescribed camber)	+20′ ± 10′	+20′ ± 10′	
Maximum permissible deviation from direction of rotation	maximum 20′	maximum 20′	
Standing height	389 ± 10 mm	399 ± 10 mm	

8.8 Alignment Specified Values for Vehicles with Multi-Link Rear Suspension

Specified values valid for all engine versions.

- PR number explanations. Refer to ⇒ page 275 .

Standing heights listed in the tables refer to dimension -a-.



Front Axle	Basic Suspension	Sport Suspension except 18" Wheels (Mexico)	Sport Suspension with 18" Wheels	Sport Suspension with 18" Wheels
PR Numbers	**2UA**	**2UC**	**2UC+1JE/1JK**	**2UC+1JS**
Total toe (wheels not pressed)	10′ ± 10′	10′ ± 10′	10′ ± 10′	10′ ± 10′
Camber (in straight-ahead position)	-30′ ± 30′	-30′ ± 30′	-40′ ± 30′	-40′ ± 30′
Maximum permissible difference between both sides	maximum 30'	maximum 30'	maximum 30'	maximum 30'
Toe-out angle [1] with steering wheel turned 20° to left and right	1°19′ ± 20′	1°19′ ± 20′	1°31′ ± 20′	1°19′ ± 20′
Caster	7° 37′ ± 30′	7° 37′ ± 30′	7° 53′ ± 30′	7° 37′ ± 30′
Maximum permissible difference between both sides	maximum 30'	maximum 30'	maximum 30'	maximum 30'
Standing height	379 ± 10 mm	379 ± 10 mm	364 ± 10 mm	379 ± 10 mm

[1] The toe angle difference can also be indicated negatively in alignment computer, depending on manufacturer.

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Front Axle	Sport Suspension except 18" Wheels (NAR/EU/Rest of World)	Comfort Suspension	Heavy Duty Suspension	Comfort Suspension (India)
PR Numbers	**2UC+1JC/1JL**	**2UD**	**2UB**	**2UB+0N4**
Total toe (wheels not pressed)	10′ ± 10′	10′ ± 10′	10′ ± 10′	10′ ± 10′
Camber (in straight-ahead position)	-40′ ± 30′	-22′ ± 30′	-13′ ± 30′	-22′ ± 30′
Maximum permissible difference between both sides	maximum 30'	maximum 30'	maximum 30'	maximum 30'
Toe-out angle [1] with steering wheel turned 20° to left and right	1°31′ ± 20′	1°12′ ± 20′	1°7′ ± 20′	1°12′ ± 20′
Caster	7° 53′ ± 30′	7° 27′ ± 30′	7° 18′ ± 30′	7° 27′ ± 30′
Maximum permissible difference between both sides	maximum 30'	maximum 30'	maximum 30'	maximum 30'
Standing height	364 ± 10 mm	389 ± 10 mm	399 ± 10 mm	389 ± 10 mm

[1] The toe angle difference can also be indicated negatively in alignment computer, depending on manufacturer.

Specified values valid for all engine versions.

◆ For an explanation of the PR number. Refer to ⇒ page 275 .

Rear Axle, FWD	Basic Suspension	Sport Suspension except 18" Wheels (Mexico)	Sport Suspension with 18" Wheels (2UC+1JE/1JK)	Sport Suspension with 18" Wheels (2UC+1JS)
Camber	-1° 20′ ± 30′	-1° 20′ ± 30′	-1°45' ± 30'	-1°45' ± 30'
Maximum permissible difference between both sides	maximum 30'	maximum 30'	maximum 30'	maximum 30'
Total toe (at prescribed camber)	+10′ ± 10′	+10′ ± 10′	+10′ ± 10′	+10′ ± 10′
Maximum permissible deviation from direction of rotation	maximum 20′	maximum 20′	maximum 20′	maximum 20′
Standing height	379 ± 10 mm	379 ± 10 mm	364 ± 10 mm	379 ± 10 mm

Rear axle, FWD	Sport Suspension except 18" Wheels (NAR/EU/Rest of World)	Comfort Suspension	Heavy Duty Suspension	Comfort Suspension (India)
Camber	-1° 20′ ± 30′	-1° 20′ ± 30′	-1° 20′ ± 30′	-1° 20′ ± 30′
Maximum permissible difference between both sides	maximum 30'	maximum 30'	maximum 30'	maximum 30'
Total toe (at prescribed camber)	+10′ ± 10′	+10′ ± 10′	+10′ ± 10′	+10′ ± 10′
Maximum permissible deviation from direction of rotation	maximum 20′	maximum 20′	maximum 20′	maximum 20′
Standing height	364 ± 10 mm	389 ± 10 mm	399 ± 10 mm	389 ± 10 mm

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8.9 Vehicle Transverse Inclination, “Zero Position”

If the measured values are outside the allowed tolerances, the cause may be an incorrect vehicle attitude.

Vehicles with automatic transmission can lean to one side slightly.

This is due to the installation position of the assemblies and the corresponding weight transfer and is normal.

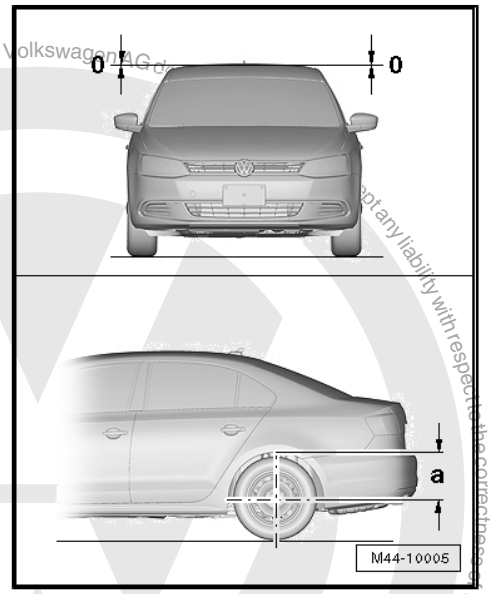
– It is absolutely necessary to measure dimension -a- on left and right sides.

– Correct any differences if necessary.

It is possible to correct trim height imbalance for front axle by adding weight to top of strut tower through the engine compartment.

To correct trim height imbalance for rear axle add weight to top of strut tower through the trunk compartment.

For example, sand bags of approximately 10 kg (22 lb) are suitable as weights.

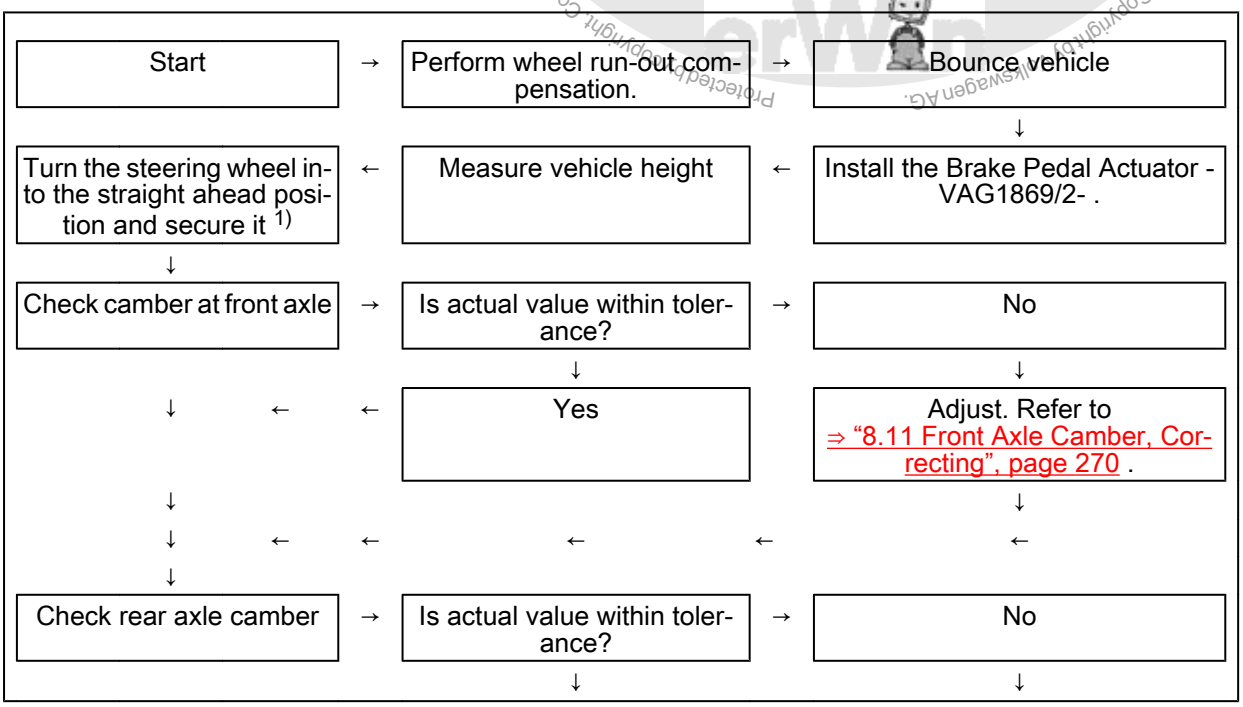


8.10 Work Procedure Overview for Vehicle Alignment

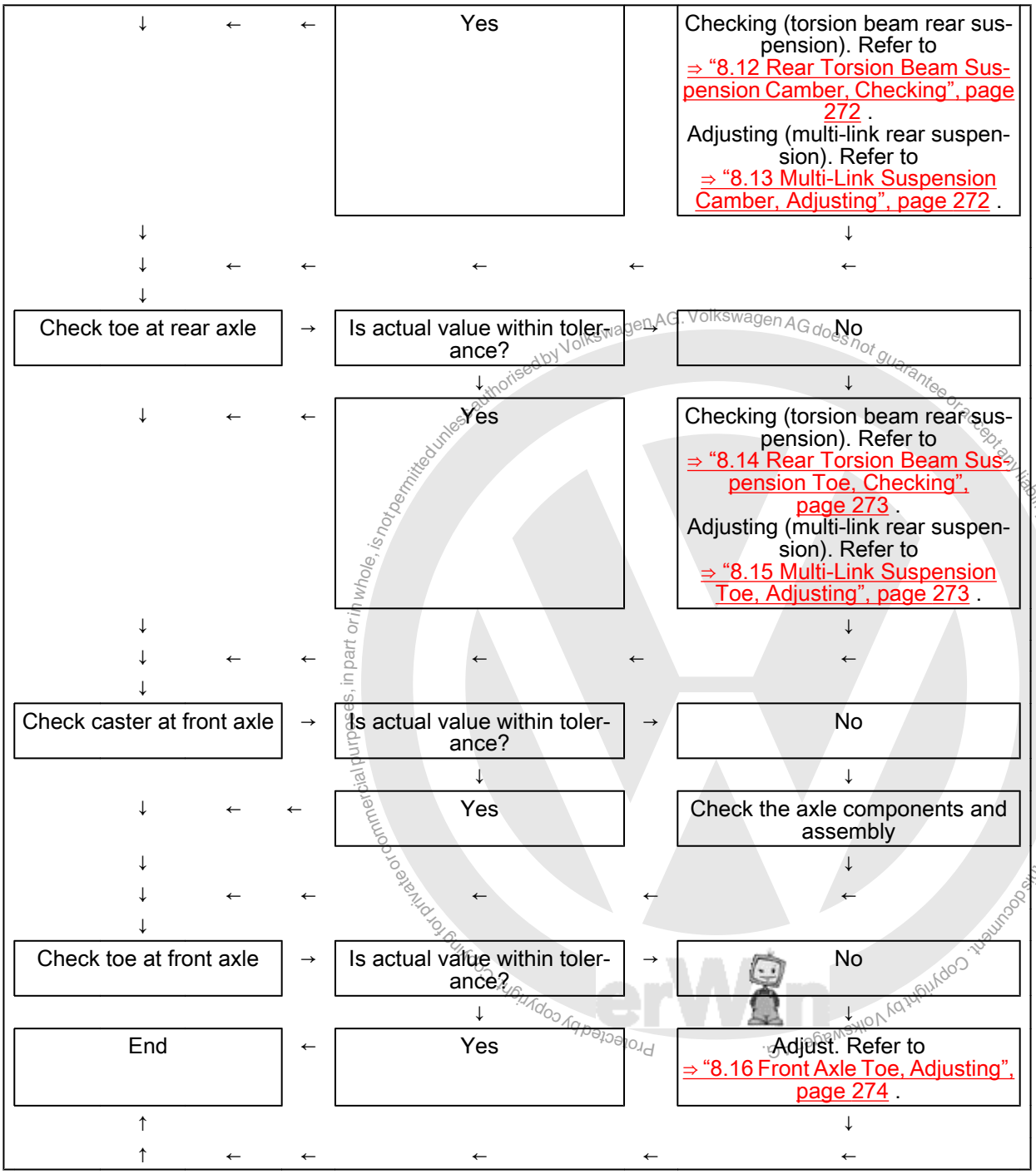
Observe the Following Work Sequence!

– Note the information in the alignment equipment.

Measuring Procedure



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1) If steering wheel is crooked at end of alignment procedure, it must be straightened. Perform a basic setting on the Steering Angle Sensor - G85- using the Vehicle Diagnostic Tester .

8.11 Front Axle Camber, Correcting

Special tools and workshop equipment required

- Torque Wrench 1332 40-200Nm - VAG1332-

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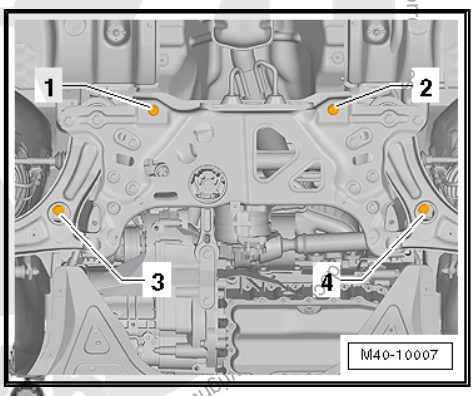
Note

- *Correct the camber according to Body Collision only. Camber corrections are not possible. Moving the subframe can also adjust it.*
- *Slide subframe only toward left or right, under no circumstances in or against direction of travel!*

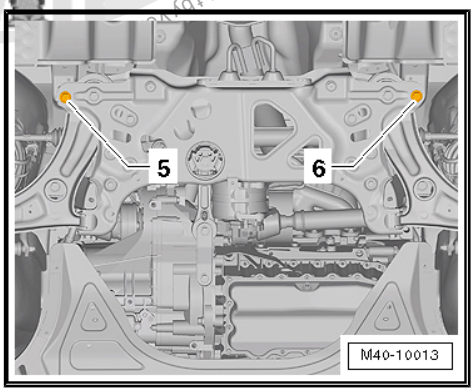
Perform the Following

– Remove the lower noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Noise Insulation .

– Loosen the subframe bolts -1 through 4- on the body.



– Loosen the subframe bolts -5 and 6- on the body.

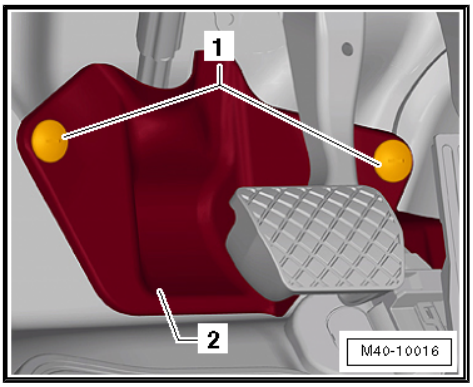


Adjusting the camber is limited by the subframe hole tolerances. If the specified value is not reached by moving the subframe, the subframe and the assembly must be checked. Refer to ⇒ “1 Check List, Assessing the Suspension on Vehicles Involved in a Collision”, page 1 .

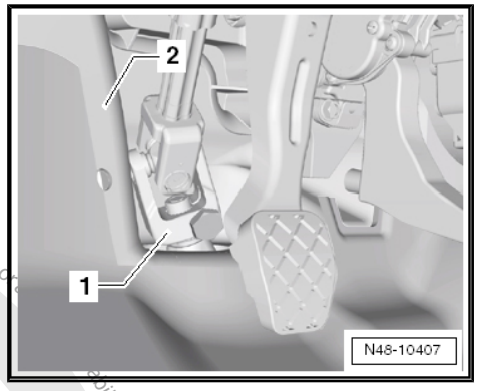
– By moving the subframe, only the specified value of the camber can be adjusted.

– Bolt on subframe to body with additional torque angle using new bolts.

– Remove the bolts -1- and remove the footwell trim panel -2-.



There must be at least 5 mm of free space all around between universal joint -1- and cutout of bulkhead -2-.



Tightening Specifications

Component	Tightening Specification
Subframe to body ◆ Use new bolts.	70 Nm + 180° additional turn

8.12 Rear Torsion Beam Suspension Camber, Checking

Camber cannot be adjusted.

If values are outside tolerance, transverse inclination must be checked first and compensated if necessary. Refer to ⇒ “8.9 Vehicle Transverse Inclination, Zero Position ”, page 269 .

If measured values are still not within specified range, check axle beam for damage and replace if necessary.

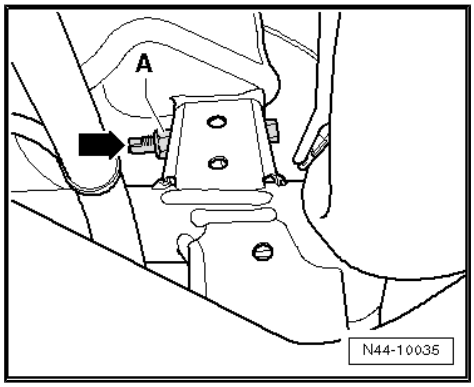
8.13 Multi-Link Suspension Camber, Adjusting

Special tools and workshop equipment required

- ◆ Insert Tool - 18mm - T10179-

– Loosen nut -A- of threaded connection of upper transverse link at subframe.

– Adjust camber by turning hex of eccentric bolt -arrow-.

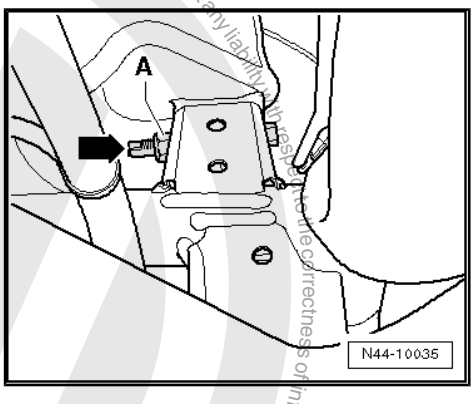


Note

The maximum adjustment range is 90° to left or right of center position.

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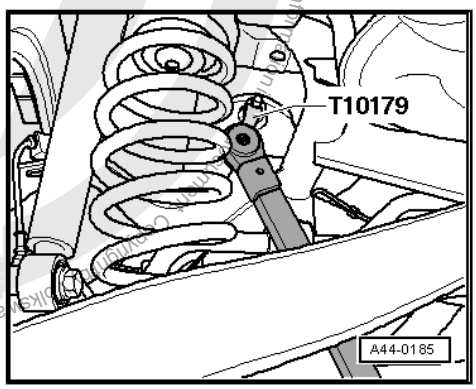
– Tighten the nut -A-.



– Use the Insert Tool - 18mm - T10179- for this.

Tighten the nut to 80 Nm using the Insert Tool - 18mm - T10179- .

– Check the camber value again after tightening the nut -A-.



Tightening Specifications

Component	Tightening Specification
Upper transverse link to subframe (vehicles with front wheel drive) ♦ Use new nut ♦ Tighten bolts in curb weight position	95 Nm ♦ Adjust Torque Wrench 40-200Nm - VAG1332- to 80 Nm when tightening nut. ♦ Only applies in conjunction with Insert Tool - 18mm - T10179- .

8.14 Rear Torsion Beam Suspension Toe, Checking

The toe cannot be adjusted.

If values are outside tolerance, transverse inclination must be checked first and compensated if necessary. Refer to ⇒ “8.9 Vehicle Transverse Inclination, Zero Position ”, page 269 .

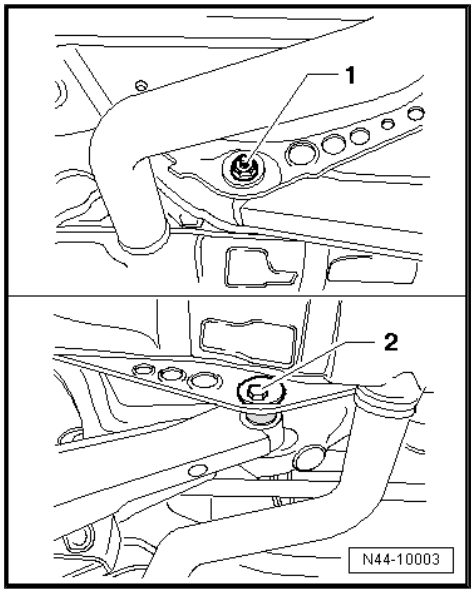
If measured values are still not within specified range, check axle beam for damage and replace if necessary.

8.15 Multi-Link Suspension Toe, Adjusting

Special tools and workshop equipment required

♦ Torque Wrench 1332 40-200Nm - VAG1332-

– Loosen nut -1-.
– Turn eccentric bolt -2- until the specified value has been reached.
– Tighten the nut again.



Tightening Specification

Component	Tightening Specification
Lower transverse link to subframe ♦ Use new nut ♦ Tighten bolts in curb weight position	95 Nm

8.16 Front Axle Toe, Adjusting

Special tools and workshop equipment required

♦ Torque Wrench 1332 40-200Nm - VAG1332-
♦ Open Ring Wrench - 24mm - VAG1332/11-

– Loosen lock nut -1-.
– Adjust the toe by turning the left and/or right tie rod.

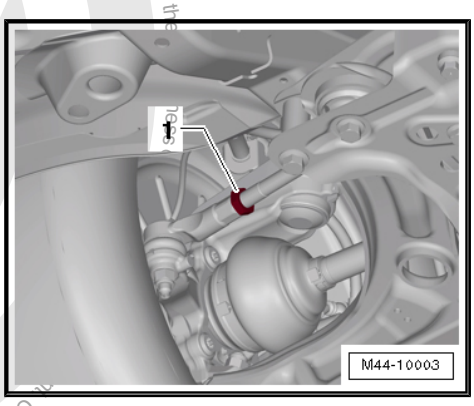
Be Sure That Boots Are Not Twisted After Turning Tie Rods!

Twisted boots wear out quickly.

– Tighten lock nut -1-.
– Check toe value again.

Setting may change slightly after lock nut -1- is tightened.

If the measured toe nevertheless lies within the tolerance, the adjustment is correct.



Tightening Specifications

Component	Tightening Specification
Tie rod end to tie rod	70 Nm

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8.17 Basic Setting for Steering Angle Sensor - G85-

If the steering wheel is crooked, the Steering Angle Sensor - G85- basic setting must be checked using the Vehicle Diagnostic Tester .

8.18 Vehicle Data Label

Explanation “PR number” on the Vehicle Data Label

Depending on engine and equipment, various suspensions are installed. They are identified by the PR numbers.

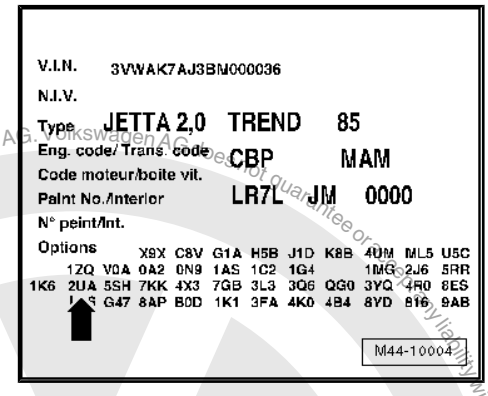
The PR numbers are needed for the allocation of vehicle specified values.

Suspension version installed in vehicle is indicated on vehicle data plate by corresponding PR number for the front axle.

The vehicle data label can be found in the spare wheel well as well as in the Maintenance booklet.

Sample Vehicle Data Label

In this example the vehicle has basic suspension 2UA -arrow- installed.



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9 Wheels and Tires

⇒ “9.1 Vehicles with Tire Mobility Kit”, page 276

⇒ “9.2 Tires, Removing”, page 276

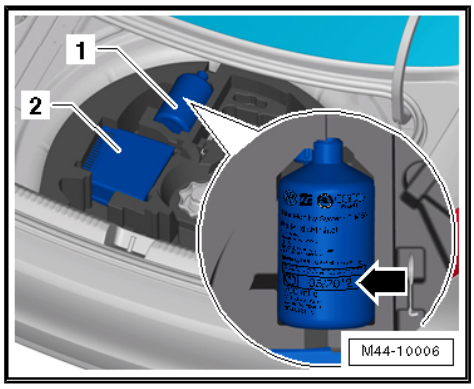
⇒ “9.3 Tires, Mounting”, page 276

⇒ “9.4 Tire Sealant, Disposing”, page 277

9.1 Vehicles with Tire Mobility Kit

Vehicles are equipped with either a spare wheel or a breakdown kit, depending on equipment.

The wheel repair kit is located in the luggage compartment, where the spare tire would be stored if the vehicle was equipped with one. The kit contains a compressor -2- and a bottle of tire sealant -1-.



Tire sealant in the bottle has a limited storage life.

Therefore the minimum shelf life date -arrow- is marked on the bottle -1-.

Replace tire sealant when minimum shelf life date has been reached (tire sealant must not be older than 4 years).

If the bottle was opened, for example, for a punctured tire, it must also be replaced.

Pay attention to the disposal regulations.

9.2 Tires, Removing

Tires which have been filled or sealed with tire sealant, must be drained before removing from wheel.

WARNING

- *Do not let tire sealant come in contact with your eyes or skin.*
- *It is harmful to health, can cause eye irritation and allergies.*
- *Wear safety gloves and protective eyewear.*

– Place the wheel on a flat surface.

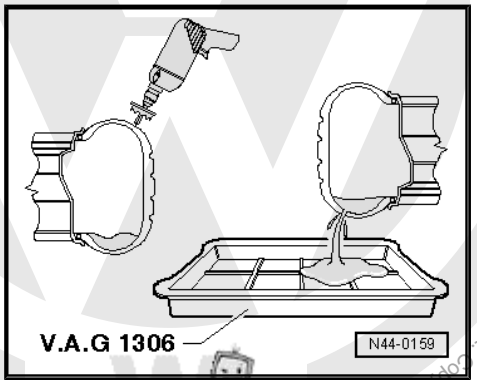
– Remove the valve insert.

– Using a suitable drill bit or cutting bit, carefully drill a hole in the bead seat area of tire.

– Hold the wheel over a catch tray and let the sealant flow out.

– Remove the tire from the rim.

– Clean the rim with a damp cloth.

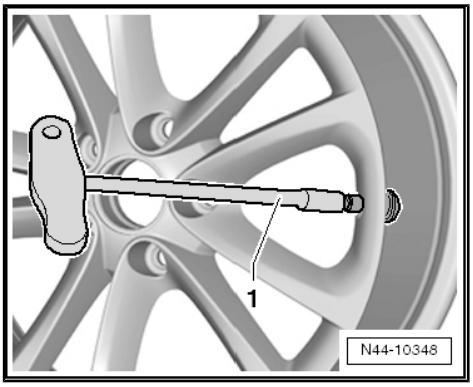


9.3 Tires, Mounting

- Make sure wheel rim is clean.

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– Using the Valve Fitting Tool - VAS6459- -1-, insert a new tire valve.
– Remove the valve insert.
– Inflate the tire to approximately 3-4 bar (43-58 psi). The tire bead must slip audibly over the lip of the rim when doing this.
– Install the valve insert.
– Check the tire pressure.
– Balance the tire.



9.4 Tire Sealant, Disposing

- Tire sealant or residue from it must not be mixed with other wastes/fluids
- Accumulating fluid residue from tire sealant must be collected and placed in a plastic container. The plastic containers can be sent for recycling together with the tire sets (if the expiration date has passed).
- The return or recycling can take place using the existing workshop disposal systems
- Check with the company responsible for trash pickup for the dealership.

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10 Wheel, Changing and Mounting

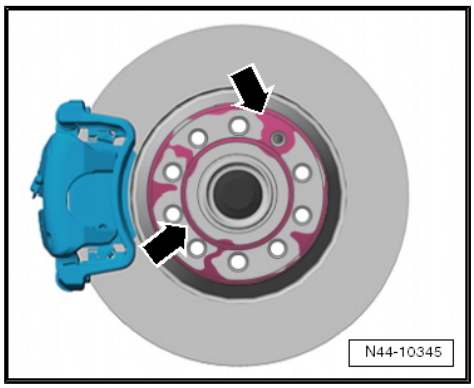
⇒ “10.1 Wheel, Mounting”, page 278

10.1 Wheel, Mounting

WARNING

The secure seating of the wheel bolts and the wheels is only ensured if the instructions and checks below are followed.

– Make sure the contact surfaces -arrows- on the brake rotor are free of corrosion and dirt.

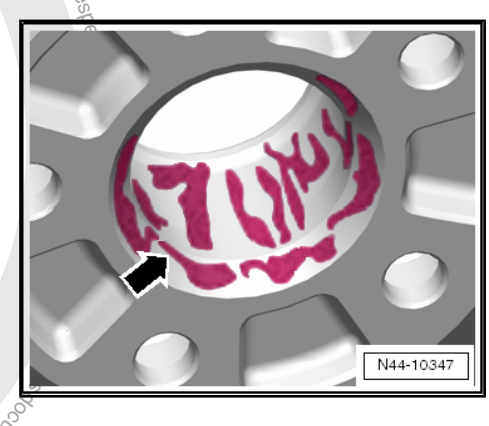


– Make sure the contact surfaces -arrow- on the brake rotor center seat are free of corrosion and dirt.



– Make sure the contact surface -arrow- on the wheel inner side (rim) as well as the central seat in the rim is free of corrosion and dirt.

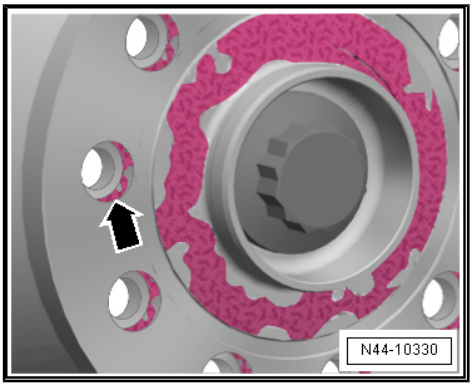
– The spherical caps * in the wheel bolt openings and the wheel bolt threads must likewise be free of corrosion, dirt, oil or grease.



* The spherical cap is the curved surface of a section of a sphere.

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– Check whether the wheel bolts can be easily screwed in by hand. The threads of the wheel bolts must not touch the holes in the brake rotor -arrow-.



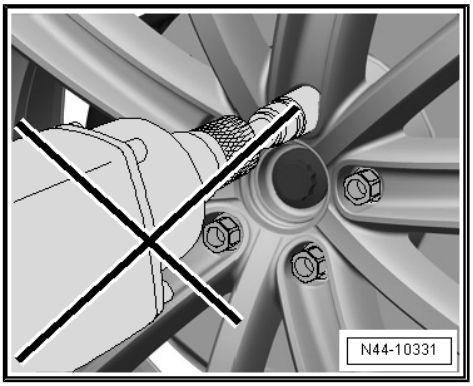
If the thread of the wheel bolt touches the hole -arrow-, turn the brake rotor accordingly.

If necessary, clean any dirt and corrosion, oil or grease off the surfaces and thread in the wheel hub and/or wheel bolts.

WARNING

Heavily corroded, difficult to turn or damaged wheel bolts must be replaced.

– Coat the wheel centering seat with protective material. Refer to ⇒ “11 Wheel Centering Seat, Protecting against Corrosion”, page 280 .



1 - When mounting a wheel, tighten all wheel bolts uniformly by hand.

2 - Tighten the wheel bolts diagonally to approximately 30 Nm.

3 - Lower the vehicle to the ground and tighten all the wheel bolts diagonally to the tightening specification. Refer to ⇒ “2 Wheel Installation Tightening Specifications”, page 237 .

WARNING

Do not use an impact wrench to install the wheel bolts.

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11 Wheel Centering Seat, Protecting against Corrosion

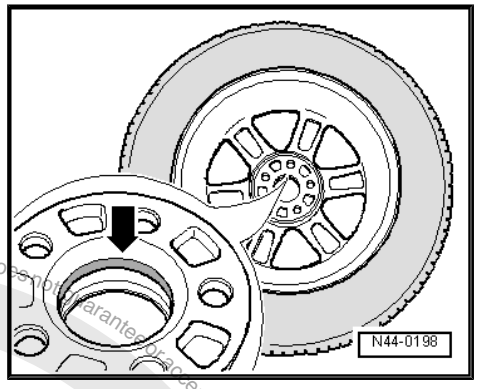
Applies to Light-Alloy and Steel Wheels

When a wheel is changed, the centering seat should be sprayed with Wax Spray to prevent corrosion between the centering seat and the wheel rim. Refer to the Parts Catalog.

– Remove the wheel.

– Thoroughly clean the centering seat on the wheel hub and the centering surface on the rim.

– Apply wax in area of centering -arrow- using a brush.



Always make sure that only centering -arrow- is waxed and not rim contact surfaces. As a consequence, the brakes would become contaminated while driving and thereby result in poor braking.

WARNING

Wheel bolts, contact surfaces of wheel/wheel hub and the threads in the wheel hubs must not have wax applied to them. Never apply lubricants or anti-corrosion treatment to threads in wheel hubs.

– Install the wheel and tighten. Refer to
⇒ “2 Wheel Installation Tightening Specifications”, page 237 .

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12 Wheel/Tire Vibration, Causes and Solution

⇒ “12.1 Vibration Causes”, page 281

⇒ “12.2 Balancing”, page 281

⇒ “12.3 Road Test, Performing Before Balancing”, page 282

⇒ “12.4 Stationary Balancing Machine”, page 282

⇒ “12.5 Hunter RFT33VAG Road Force Touch™ Wheel Balancer VAS6230B4 ”, page 284

⇒ “12.6 Finish Balancer.”, page 284

⇒ “12.7 Tire and Wheel Radial and Lateral Run-Out”, page 285

⇒ “12.8 Wheels and Tires, Checking Radial and Lateral Run-Out with Tire Dial Gauge VAG1435 ”, page 286

⇒ “12.9 Disc Wheel, Checking Radial and Lateral Run Out”, page 286

⇒ “12.10 Matching”, page 287

⇒ “12.11 Flat Spots in Tires From Standing”, page 288

12.1 Vibration Causes

There are many causes for vibration. Vibration can also be caused by tire wear, among other things. Tire wear caused by driving does not always develop evenly over the entire tread. Due to this, a slight imbalance develops which disturbs the smoothness of the formerly accurately balanced wheel.

This slight imbalance cannot yet be felt in the steering wheel, but it is present. It increases the tire wear and consequently reduces the service life of the tire.

Recommendation

In order to guarantee over the entire service life of a tire a

- Optimal safety,
- Optimal smoothness and
- Uniform wear

it is recommended that wheels/tires be balanced at least two times within the tire's service life.

12.2 Balancing

Before beginning balancing, the following requirements must be fulfilled.

- The tire pressure must be OK.
- The tire tread must not be worn down on one side and should be at least 4 mm deep.
- The tires must not have any damage such as cuts, holes, foreign bodies, etc.
- The suspension, steering, tie rods and damper must be in proper working order.
- A road test has been performed.

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12.3 Road Test, Performing Before Balancing

If a vehicle comes to the workshop with the complaint “vibration”, a road test must be performed before balancing the wheels.

- That way, information about the type of vibration can be obtained.
- Observe at which speed range the disturbance takes place.

– Raise the vehicle on the platform immediately after the road test.

– Mark the installation position on the tire.

Component Location of Tire	Identification with ...
Left front tire	LF
Right front tire	RF
Left rear tire	LR
Right rear tire	RR

– Remove the wheels from the vehicle.

– Balance the wheels.

12.4 Stationary Balancing Machine

- Test drive performed. Refer to ⇒ “12.3 Road Test, Performing Before Balancing”, page 282 .

Tension Wheel on Balancing Machine

Note

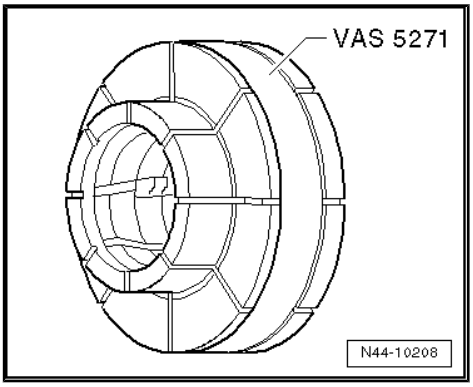
Please keep in mind that cleanliness is extremely important when balancing, as it is when performing any other repair work. Only then can a proper result be obtained!

Dirt and rust in the area of the contact surfaces and centering of the wheel distort the result.

– Clean the contact surfaces, centering seat and wheel disc before tensioning the wheel on the balancing machine.

– Tension the wheel with the tire on the balancing machine.

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Note

- *To mount wheel on wheel balancer, use for example Wheel Centering System Adapter - VAS5271- .*
- *This way a 100% centering of the wheel and gentle mounting is possible!*
- *It is not possible to center it 100% on balancing machine with conical tensioners.*
- *With a deviation of 0.1 mm outside the center, there is an imbalance of 10 grams on the wheel/tire.*

Wheel/Tire Balancing Procedure

– Let the wheel/tire turn on the balancing machine.

– Check the run of the characteristic lines on the sidewall of the tire in the area of the rim flange.

– Check the tire wear pattern while the wheel/tire is turning.

Note

In the event of one-sided wear, flat spots from braking or severe wear spots, smooth running cannot be achieved by balancing. In this case, the tire must be replaced.

– Check the run-out on the wheel/tire. If the wheel with tire runs untrue although there are no flat spots, a radial or lateral run-out may be the cause.

– Check wheel with tire for radial- and lateral run-out. Refer to ⇒ “12.8 Wheels and Tires, Checking Radial and Lateral Run-Out with Tire Dial Gauge VAG1435 ”, page 286 .

– If the radial and lateral run-out are within the specified tolerance, balance the wheel and tire.

Note

- *Do not use more than 60 grams of weight per wheel.*
- *If more weight is necessary, a smoother running can achieved by matched mounting of the tire. Matched mounting of tire: Refer to ⇒ “12.10 Matching”, page 287 .*
- *The display in the balancing machine should show 0 grams.*
- *Hunter RFT33VAG Road Force Touch™ Wheel Balancer - VAS6230B4- can be inserted as an alternative to matching. Refer to ⇒ “12.5 Hunter RFT33VAG Road Force Touch™ Wheel Balancer VAS6230B4 ”, page 284 .*

– Install the wheel on the vehicle.

– First, tighten the lowest wheel bolt by hand to approximately 30 Nm.

– Tighten the remaining wheel bolts diagonally to approximately 30 Nm. This process centers the wheel on the wheel hub.

– Lower vehicle onto its wheels.

– Now use a torque wrench to tighten the wheel bolts diagonally to the specified tightening specification.

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Road Test, Performing

– Perform a road test after balancing wheel/tire.

If a vibration is still detected during the road test, the cause may be due to tolerance in the wheel centering.

The component tolerances of wheels and wheel hubs can be additive in unfavorable cases. Vibration can result from this. This can be eliminated using a finish balancer. Refer to ⇒ “12.6 Finish Balancer ”, page 284 .

12.5 Hunter RFT33VAG Road Force Touch™ Wheel Balancer - VAS6230B4-

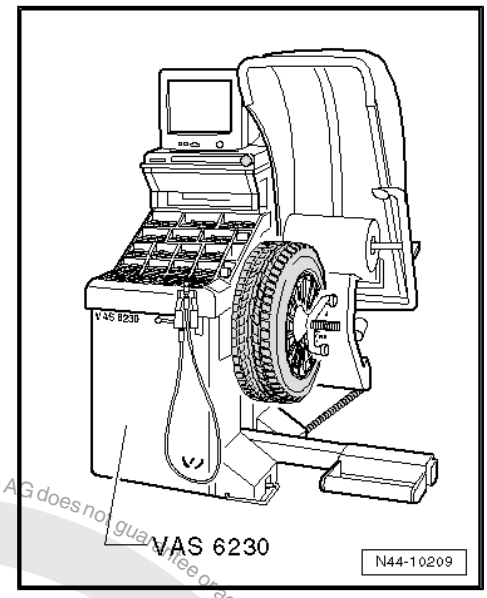
Expanded functions can be performed using Hunter RFT33VAG Road Force Touch™ Wheel Balancer - VAS6230B4- in addition to the previously known balancers.

A special characteristic of this system is testing the radial force of wheel/tire during rolling.

For this purpose, a roller presses a force of approximately 635 kg (1400 lbs) against the wheel. This simulates the tire contact force against the street surface while driving.

Tire contact forces fluctuate due to radial- and lateral run-out and differing rigidity in the tires.

The Hunter RFT33VAG Road Force Touch™ Wheel Balancer - VAS6230B4- detects and stores the position of the maximum measured radial force in the tires. After that, the position of smallest dimension between rim flange and disc wheel center is measured.



12.6 Finish Balancer

Note

- *Working with a Finish Balancer requires instruction from the manufacturer of the balancer.*
- *For the balancing, the wheels of the tractive axle are set upon the turntable sensors, for example, front wheels for Front Wheel Drive (FWD) and all 4 wheels for All Wheel Drive (AWD).*

If it is determined when balancing on the vehicle the remaining imbalance is more than 20 grams, the wheel should be rotated on the wheel hub.

– Mark the point at which the imbalance is indicated.

– Afterwards, unbolt the wheel and rotate its position on the wheel hub so that the marking points downward.

Note

The wheel hub must not turn during this procedure.

– First, tighten the lowest wheel bolt by hand to approximately 30 Nm.

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– Tighten the remaining wheel bolts diagonally to approximately 30 Nm. This process centers the wheel properly on the wheel hub.
– - Check again whether the imbalance is less than 20 grams using the finish balancer.

Note

The imbalance should not be smaller than 20 grams under any circumstances before changing balance weight.

– Loosen the wheel bolts again, if necessary.
– Rotate the wheel relative to the wheel hub once more by one or two wheel bolt holes.
– Tighten the wheels according to the method described above.

Note

The imbalance should only be reduced by changing balance weight if the imbalance is less than 20 grams.

– Balance the wheels until the imbalance is below 5 grams.
– Tighten the wheel bolts to the specified tightening specification if you have not already done so.

WARNING

Always tighten the wheel bolt to the tightening specification and using the torque wrench.

12.7 Tire and Wheel Radial and Lateral Run-Out

Radial and lateral run-out occur when the wheel and tire are not running precisely true.

For technical reasons, 100% true running is not possible.

Therefore the manufacturers of these components allow a precisely specified tolerance.

Mounting the tire in a unfavorable position on the wheel can be the cause for exceeding the maximum allowed tolerance for wheel with tire.

The table shows the maximum permissible tolerance values for the wheel with mounted tire.

Tolerances for Radial and Lateral Run-Out of Disc Wheel with Tire

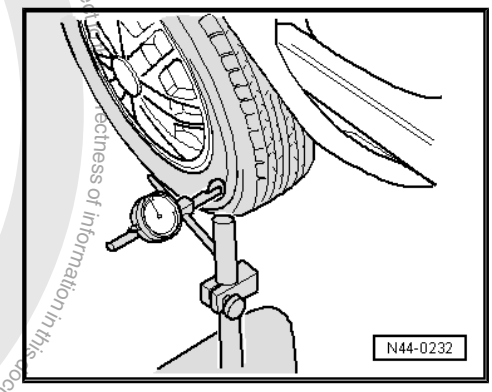
Wheel with Tire	Radial Run-Out (mm)	Lateral Run-Out (mm)
Passenger Vehicle	0.9	1.1 (1.3 near the lettering)

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12.8 Wheels and Tires, Checking Radial and Lateral Run-Out with Tire Dial Gauge - VAG1435-

Checking Lateral Run-Out

– Load the Tire Dial Gauge - VAG1435- approximately 2 mm.
– Position the Tire Dial Gauge - VAG1435- on the side wall of the tire.
– Rotate the wheel slowly.
– Note the smallest and the largest dial readings.



Note

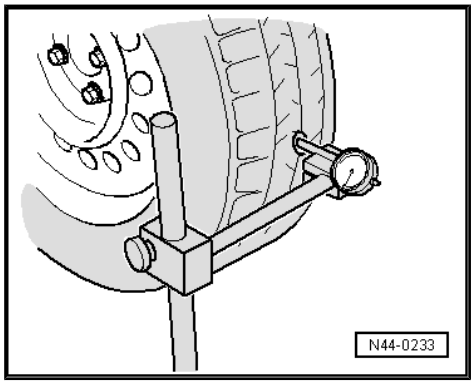
If the difference is greater than 1.3 mm, the lateral run-out is too great.

In this case, lateral run-out can be reduced by matched mounting of the tire. Refer to ⇒ “12.10 Matching”, page 287 .

Peak values on the Tire Dial Gauge - VAG1435- due to small irregularities in the rubber may be disregarded.

Checking Radial Run-Out

– Load the Tire Dial Gauge - VAG1435- approximately 2 mm.
– Position the Tire Dial Gauge - VAG1435- on the tread of the tire.
– Rotate the wheel slowly.
– Note the smallest and the largest dial readings.



Note

If the difference is greater than 1 mm, the radial run-out is too great.

In this case, radial run-out can be reduced by matched mounting of the tire. Refer to ⇒ “12.10 Matching”, page 287 .

12.9 Disc Wheel, Checking Radial and Lateral Run Out

– Tension the disc wheel on the Balancing Machine .
– Use the Wheel Centering System Adapter - VAS5271- .
– Load the Tire Dial Gauge - VAG1435- approximately 2 mm.
– Rotate the disc wheel slowly.

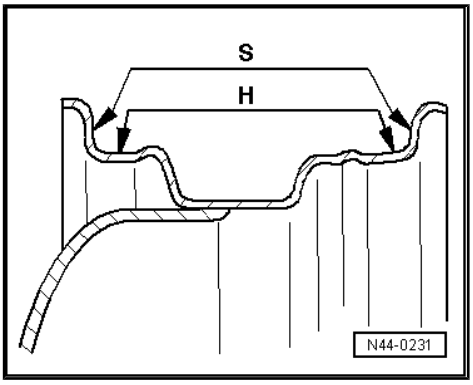
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– Note the smallest and the largest dial readings.

S - Lateral Run-Out

H - Radial Run-Out

– Compare determined value with specifications in the table. Refer to ⇒ page 287 .



Note

Peak values on the Tire Dial Gauge - VAG1435- due to small irregularities may be disregarded.

Specifications for Radial and Lateral Run-Out on Disc Wheel

Disc Wheel	Radial Run-Out (mm)	Lateral Run-Out (mm)
Steel wheel	0.5	0.5
Light alloy wheel	0.5	0.8

Note

If the measured value exceeds the specified value, no acceptable smooth running can be attained.

12.10 Matching

General Information

If radial or lateral run-out from wheel or tire meet each other, the untrue running of the wheel and tire is increased.

For technical reasons, 100% true running is not possible. Refer to
⇒ “12.7 Tire and Wheel Radial and Lateral Run-Out”, page 285 .

Drive the tires until they are warm before matching them to the tires already on the vehicle. This eliminates flat spots from standing which may exist. Refer to
⇒ “12.11 Flat Spots in Tires From Standing”, page 288 .

Work Procedure for Match-Mounting

– Let the air out of the tire.

– Remove the tire bead from the wheel rim flange.

– Coat the tire bead all the way around with Tire Mounting Paste .

– Rotate the tire 180° relative to the disc wheel.

– Inflate the tire to approximately 4 bar (58 psi).

– Tension the wheel with the tire on the balancing machine.

– Check the run-out or the radial and lateral run-out, as necessary.

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Note

- *If the radial and lateral run-out value is not exceeded, the wheel can be balanced to 0 grams. Specifications. Refer to ⇒ page 285 .*
- *If the radial and lateral run-out lies outside the specified values, the tire must be turned again.*

– Let the air out and remove the tire beads from the wheel rim flanges.

– Rotate the tire 90° (one quarter of a turn) relative to the disc wheel

– Inflate the tire to 4 bar again and check the run-out.

Note

- *If the radial and lateral run-out value is not exceeded, the wheel can be balanced to 0 grams.*
- *If the radial and lateral run-out is still outside the specified values, the wheel must be turned again.*

– Press the tire beads off the rim flanges.

– Rotate the tire 180° (half of a turn) relative to the disc wheel

If the values for radial or lateral run-out are still outside the specified values, check the wheel for radial and lateral run-out. Refer to
⇒ “12.9 Disc Wheel, Checking Radial and Lateral Run Out”, page 286 .

If the measured values for radial and lateral run-out of the wheel disc are within the specified values, then the tire has excessive radial or lateral run-out. In this case, the tire must be replaced.

Note

- *Assembly paste from mounting tires is located between tires and rim flanges.*
- *Avoid strong braking or acceleration maneuvers during the first 100 to 200 km (62.1 to 124.2 miles). Otherwise, the tires can rotate on the rims and the work done would then be undone!*

12.11 Flat Spots in Tires From Standing

What is A Flat Spot from Standing?

Terms like flat portion, flattening, are also used as a term for flat spots from standing.

Flat spots from standing cause vibration, like an incorrectly balanced wheel. It is important to recognize a flat spot in the tread from standing as such!

Flat spots from standing cannot be corrected by balancing, and can occur again at any time under various circumstances. Flat spots from standing can be corrected without complicated special tools. Provided that the flat spot was not caused by wheel lock during hard braking. Refer to ⇒ Wheel and Tire Guide General Information; Rep. Gr. 44 ; Tires, Evaluating; Wear Spots .

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Note

Wear spots due to wheel lock are irreparable! Tires with such damage must be replaced.

Causes of Flat Spots from Standing

- The vehicle stands for several weeks in a location without being moved.
- Tire pressure is too low.
- The vehicle was placed in a paint system drying cabinet after painting.
- The vehicle was parked with warm tires in a cold garage or similar for a long time. In this case, a flat spot can develop overnight.

Flat Spots, Correcting

- Flat spots cannot be removed from tires with workshop equipment.
- Such flat spots can be "driven out" only by driving the car until the tires are warm.
- We do not recommend the following method during cold or winter weather.

Requirements/Conditions

– Check the tire pressure and correct, if necessary.

– If possible, drive the vehicle on an expressway.

– If the traffic and road conditions permit, drive at a speed of 120 to 150 km/h (75 to 93 mph) for a distance of 20 to 30 km (12.4 to 18.6 miles).

WARNING

- ***Do not endanger yourself or other persons during this road test.***
- ***Follow all traffic regulations and speed limits when performing the road test.***

– Lift the vehicle immediately after the performing the road test.

– Remove the wheels from the vehicle.

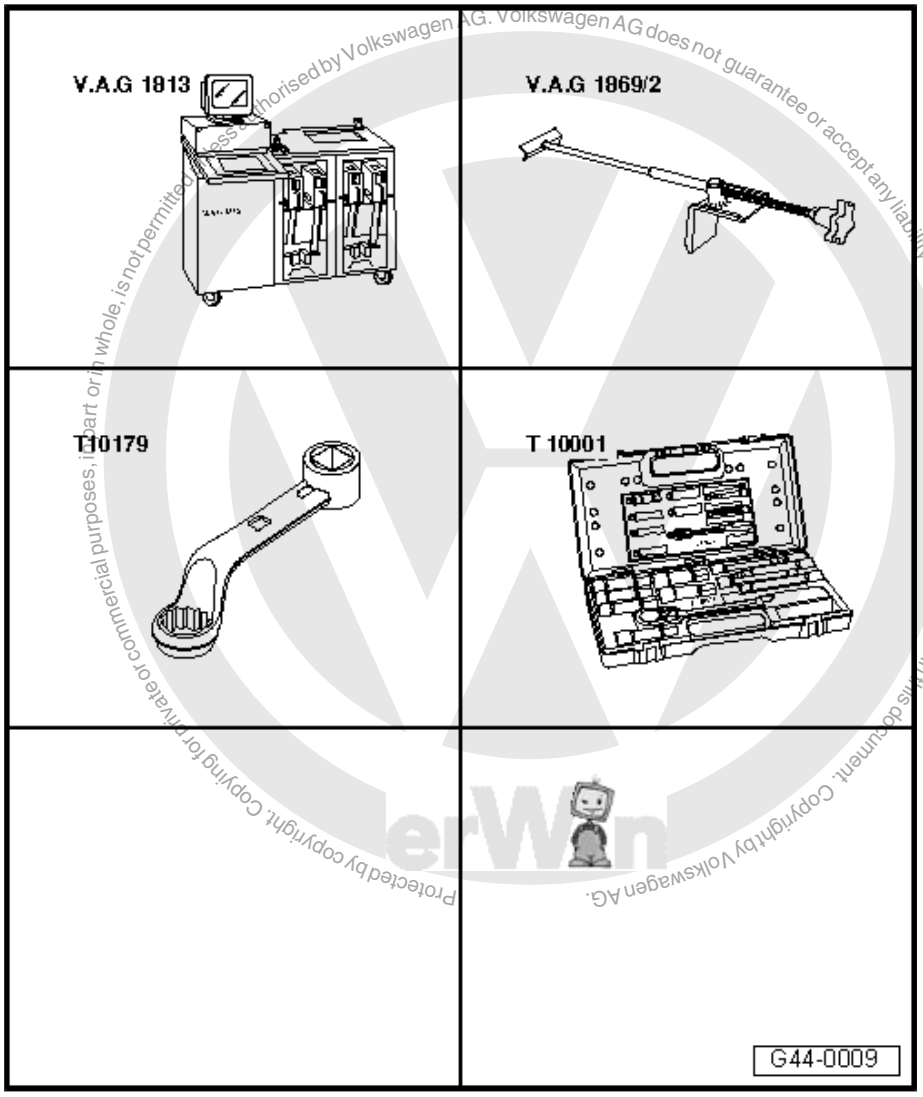
– Balance the wheels on the stationary balancing machine. Refer to ⇒ “12.4 Stationary Balancing Machine”, page 282 .

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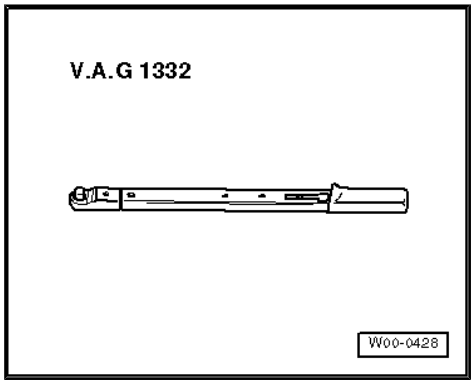
13 Special Tools

Special tools and workshop equipment required

- Wheel Alignment Computer - VAG1813F- or VW/Audi approved wheel alignment devices
- Brake Pedal Actuator - VAG1869/2- .
- Insert Tool - 18mm - T10179-
- Shock Absorber Set - T10001-

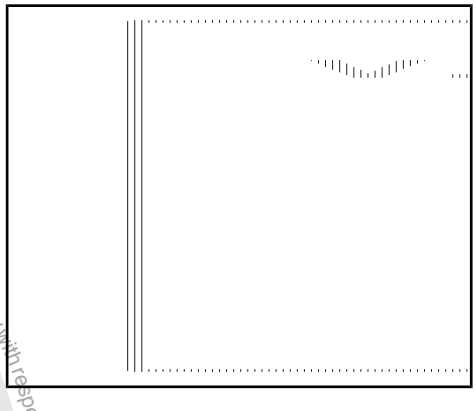


- Torque Wrench 1332 40-200Nm - VAG1332-

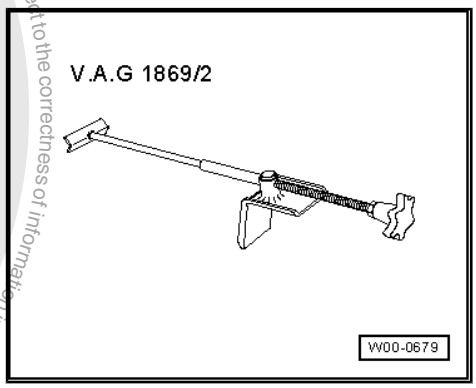


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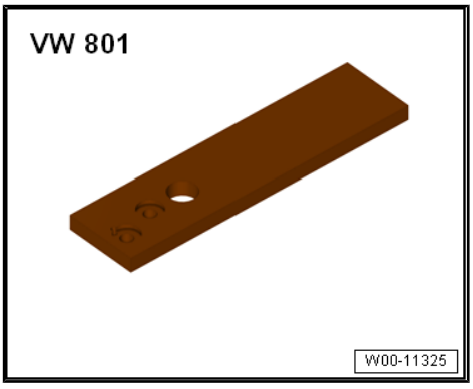
- Open Ring Wrench - 24mm - VAG1332/11-



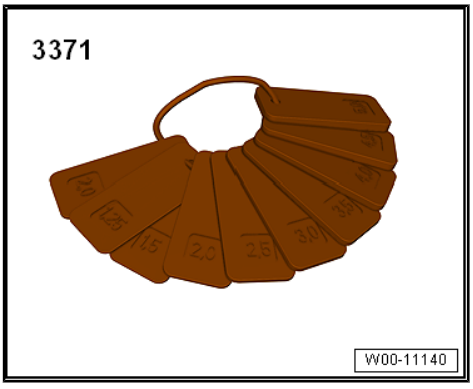
- Brake Pedal Actuator - VAG1869/2- .



- Valve Fitting Tool - VAS6459-
- Measuring Square - VAS241001-
- Crankshaft Holding Fixture - VW801-



- Gauge - Gap Adjustment - 3371-



- Not illustrated:
- Measuring Square - VAS241001-

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48 – Steering

1 Vehicles Involved in Collisions, Evaluating

For a check list for assessing the suspension on vehicles involved in a collision. Refer to
⇒ “1 Check List, Assessing the Suspension on Vehicles Involved in a Collision”, page 1 .

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2 General Repair Information

⇒ “2.1 Preliminary Information”, page 293

⇒ “2.2 Steering Gear”, page 293

⇒ “2.3 Seals and Gaskets”, page 293

⇒ “2.4 Bolts and Nuts”, page 294

⇒ “2.5 Electrical Components”, page 294

⇒ “2.6 Guided Fault Finding, OBD and Test Instruments”, page 294

2.1 Preliminary Information

To perform a problem-free and successful steering gear repair, extreme caution and cleanliness, as well as properly functioning tools are an important requirement. The usual basic safety precautions also, naturally apply when carrying out vehicle repairs.

A number of generally applicable instructions for individual repair operations, which are otherwise mentioned at various points in the Workshop Manual, are summarized here. They apply to this repair manual.

Refer to Self Study Program The 2011 Jetta for a description of the steering.

2.2 Steering Gear

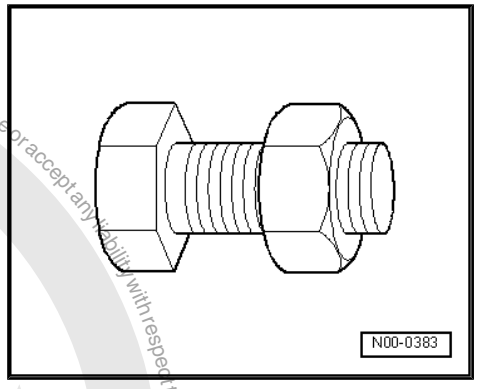
- Thoroughly clean connecting points and their surrounding areas before loosening.
- When installing steering gear, make sure centering sleeves are correctly seated between console and steering gear.
- Place removed parts on a clean surface and cover them so that they do not get dirty. Use foil and paper. Only use lint-free cloths.
- Install only clean parts: remove the replacement parts from their packaging just before installing them.
- Use exclusively lubricants and sealants marked with part numbers.
- Carefully cover or seal opened components if the repair is not performed immediately.

2.3 Seals and Gaskets

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

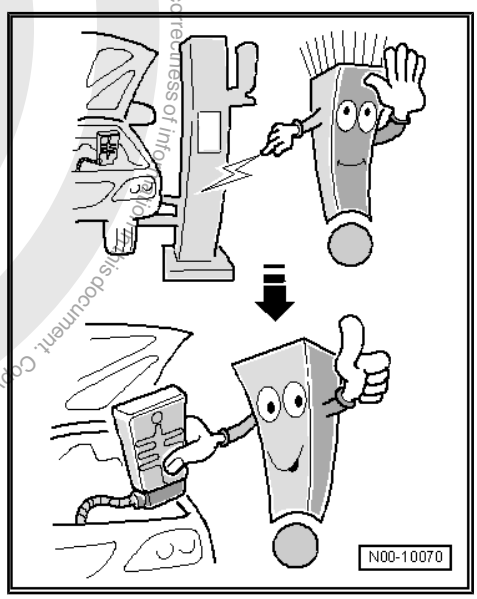
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2.4 Bolts and Nuts



- Loosen and tighten the screw and nut from the covers and housings diagonally.
- Do not cant but loosen and tighten especially sensitive parts in diagonal manner in stages, e.g. servo motor with control module.
- Tightening specifications for non-lubricated bolts and nuts are given.
- Always replace self-locking nuts and bolts.

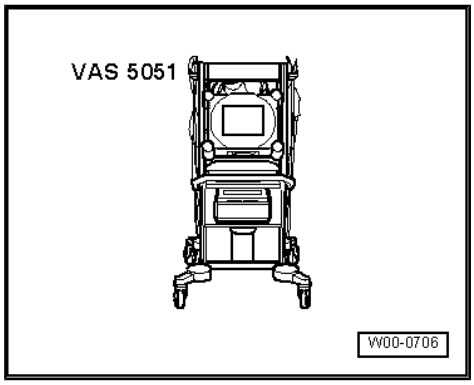
2.5 Electrical Components



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

– Touch a grounded object, for example, a water pipe or a vehicle hoist, before working on electrical components. Do not touch the connector terminals.

2.6 Guided Fault Finding, OBD and Test Instruments



- Before performing repairs on the Electromechanical steering gear, determine the cause of the damage as closely as possible using the Vehicle Diagnostic Tester in the “Guided Fault Finding”, “Vehicle Self-Diagnosis” and “Measurement” modes.

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3 Steering Wheel Airbag

⇒ “3.1 Overview - Steering Wheel Airbag”, page 295

⇒ “3.2 Airbag Steering Wheel, Removing and Installing”, page 295

3.1 Overview - Steering Wheel Airbag

⇒ “3.2 Airbag Steering Wheel, Removing and Installing”, page 295

1 - Steering Column

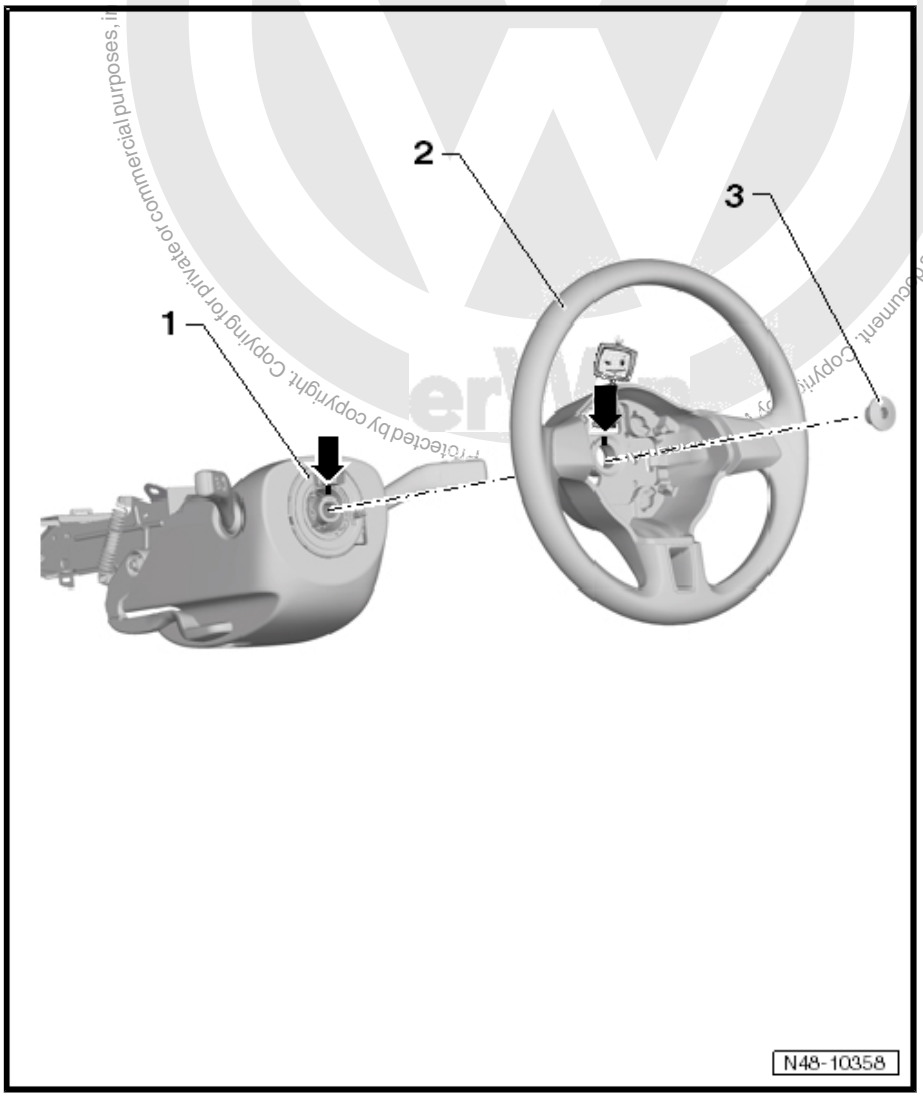
- ❑ Removing and installing. Refer to ⇒ “4.2 Steering Column, Removing and Installing”, page 299 .

2 - Steering Wheel

- ❑ Removing and installing. Refer to ⇒ “3.2 Airbag Steering Wheel, Removing and Installing”, page 295 .
- ❑ There are different versions. Refer to the Parts Catalog for the allocation.

3 - Bolt

- ❑ 30 Nm + 90° turn
- ❑ Always replace if removed



3.2 Airbag Steering Wheel, Removing and Installing

Special tools and workshop equipment required

- ♦ Torque Wrench 1331 5-50Nm - VAG1331-

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Perform the Following

Removing

WARNING

Before performing work on the electrical system and removing the steering wheel, the following conditions must be met:

- ***Remove the battery ground cable. Refer to ⇒ Electrical Equipment; Rep. Gr. 27 ; Battery; Battery, Disconnecting and Connecting .***
- ***The wheels must be in the straight position.***

The airbag system may fail during future operation if these warnings are not followed!

– Move the steering column to the center height position.

– Remove the airbag unit. Refer to ⇒ Body Interior; Rep. Gr. 69 ; Front Passenger Airbag; Front Passenger Airbag Unit with Front Passenger Airbag Igniter 1 - N131- / Front Passenger Airbag Igniter 2 - N132- , Removing and Installing .

– Bring wheels in the straight position.

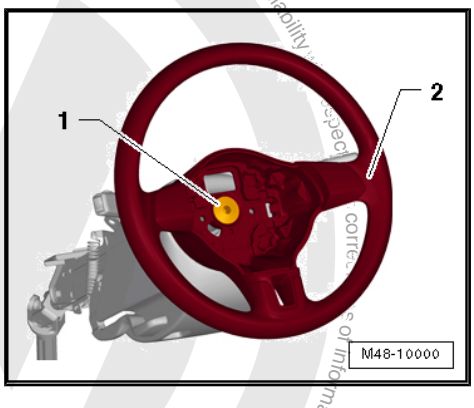
Note

Removal and installation of steering wheel must take place in center position (wheels in straight-ahead position).

– Remove the bolt -1-.

– Mark the position of the steering wheel/steering column.

– Remove the steering wheel -2- from the steering column.



Installing

Install in reverse order of removal. Note the following:

Make sure the wheels are in the straight-ahead position before installing the steering wheel.

– When installing a removed steering wheel, ensure that the markings on the steering column/steering wheel are aligned.

– When installing a new steering wheel (without a marking): mount the steering wheel in its center position (the steering wheel spokes must be horizontal and the wheels must be in the straight-ahead position).

– Install steering wheel.

– Install the airbag unit. Refer to ⇒ Body Interior; Rep. Gr. 69 ; Front Passenger Airbag; Front Passenger Airbag Unit with Front Passenger Airbag Igniter 1 - N131- / Front Passenger Airbag Igniter 2 - N132- , Removing and Installing .

– Perform a road test.

– If steering wheel is crooked, remove it again and rotate it on steering column splines.

Tightening Specification

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Component	Tightening Specification
Steering wheel bolt ♦ Use a new bolt	30 Nm + 90° turn

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4 Steering Column

⇒ “4.1 Overview - Steering Column”, page 298

⇒ “4.2 Steering Column, Removing and Installing”, page 299

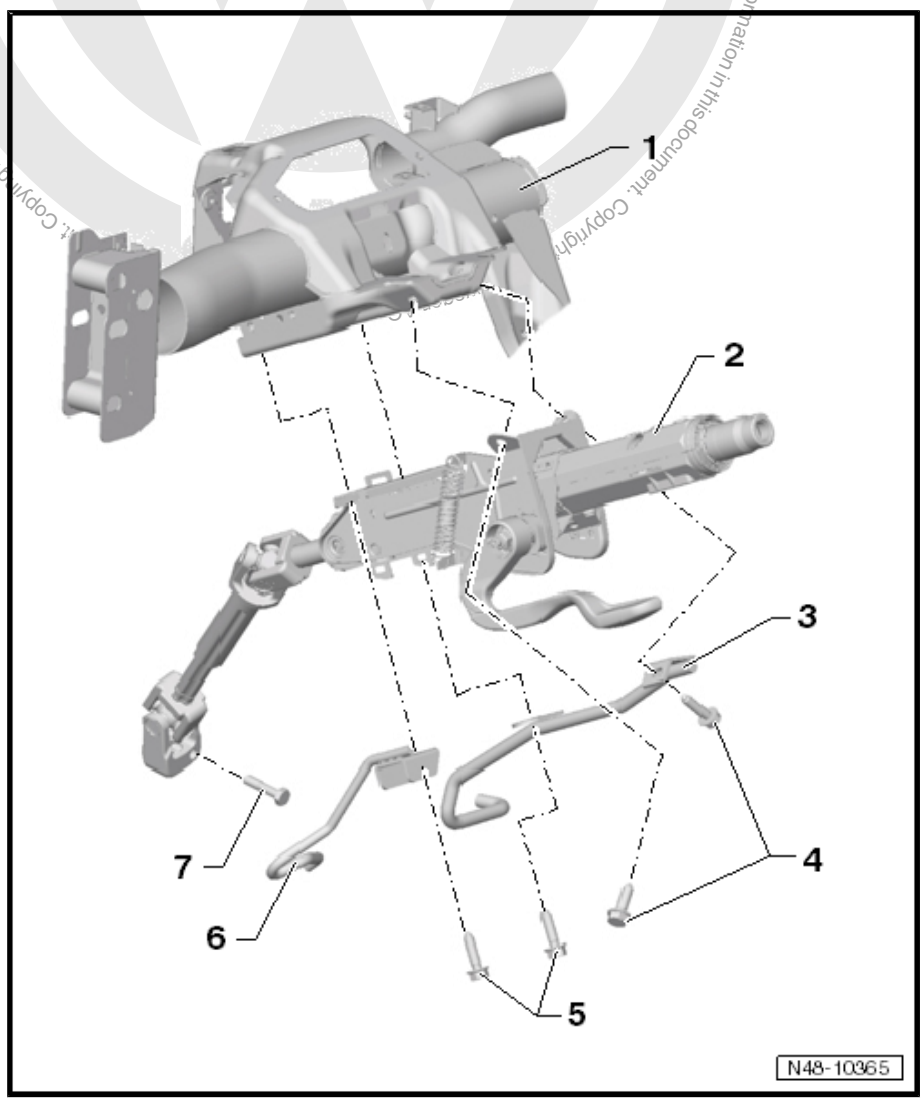
⇒ “4.3 Steering Column, Handling and Transporting”, page 305

⇒ “4.4 Steering Column, Checking for Damage”, page 306

4.1 Overview - Steering Column

Note

- *Welding and alignment work on supporting or wheel carrying suspension components is not permitted.*
- *Always replace self-locking nuts.*
- *Always replace corroded bolts/nuts.*



1 - Assembly Carrier with Bracket

2 - Steering Column

- ❑ Removing and installing. Refer to ⇒ “4.2 Steering Column, Removing and Installing”, page 299 .

3 - Brake Pedal Crash Brace

- ❑ Allocation. Refer to the Parts Catalog.

4 - Bolt

- ❑ 20 Nm
- ❑ Note the tightening sequence. Refer to ⇒ page 304 .

5 - Bolt

- ❑ 20 Nm
- ❑ Note the tightening sequence. Refer to ⇒ page 304 .

6 - Clutch Pedal Crash Brace

- ❑ Allocation. Refer to the Parts Catalog.

7 - Bolt

- ❑ 30 Nm
- ❑ Always replace if removed

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4.2 Steering Column, Removing and Installing

Special tools and workshop equipment required

- Torque Wrench 1331 5-50Nm - VAG1331-
- Torque Wrench 1332 40-200Nm - VAG1332-

Perform the Following

Removing

Note

On vehicles with an Electronic Steering Column Lock Control Module - J764- , it is secured to the steering column with shear bolts. Refer to ⇒ Electrical Equipment; Rep. Gr. 94 ; Steering Column Switch Module; Overview - Steering Column Switch Module .

The steering column is delivered only as a complete replacement part. Servicing is not possible.

The steering lock housing can be replaced. Refer to ⇒ Electrical Equipment; Rep. Gr. 94 ; Steering Column Switch Module; Ignition/Starter Switch - D- , Removing and Installing .

WARNING

Before starting work on electrical equipment and removing steering wheel, the following conditions must be fulfilled:

- ***The technician must discharge themselves of static electricity. This is done by touching grounded metal parts, for example, water lines, heater pipes, metal supports or a workshop hoist. Refer to ⇒ "2.5 Electrical Components", page 294 .***

If this not done, the Electronic Steering Column Lock Control Module - J764- could fail later.

- ***Disconnect the battery ground cable. Refer to ⇒ Electrical Equipment; Rep. Gr. 27 ; Battery; Battery, Disconnecting and Connecting .***
- ***The wheels must be in the straight position.***

The airbag system may fail during future operation if these warnings are not followed!

– Bring wheels in the straight position.

– Pull the lever on the side of the steering column downward.

– Push the steering column as far down as possible and remove it.



– Push the lever on the side of the steering column upward again.

– Remove the airbag unit. Refer to ⇒ Body Interior; Rep. Gr. 69 ; Driver Side Airbag; Airbag Unit with Driver Airbag Igniter - N95- , Removing and Installing .

– Steering wheel, removing. Refer to ⇒ "3.2 Airbag Steering Wheel, Removing and Installing", page 295 .

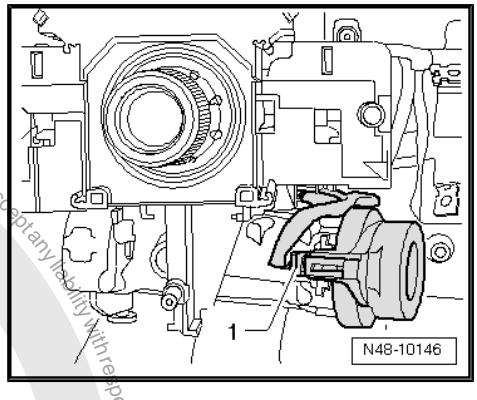
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– Remove the steering column trim. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Storage Compartments and Covers; Steering Column Trim Panel, Removing and Installing .

– Remove steering column switches. Refer to ⇒ Electrical Equipment; Rep. Gr. 94 ; Steering Column Switch Module; Overview - Steering Column Switch Module .

Vehicles with Ignition Switch

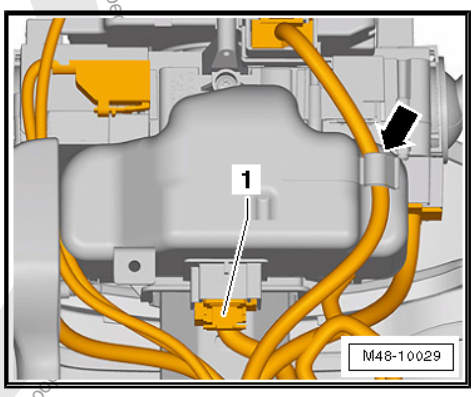
– Disconnect the connector -1-.



Vehicles with “Keyless Access” Keyless Locking and Starting System

– Disconnect the connector -1-.

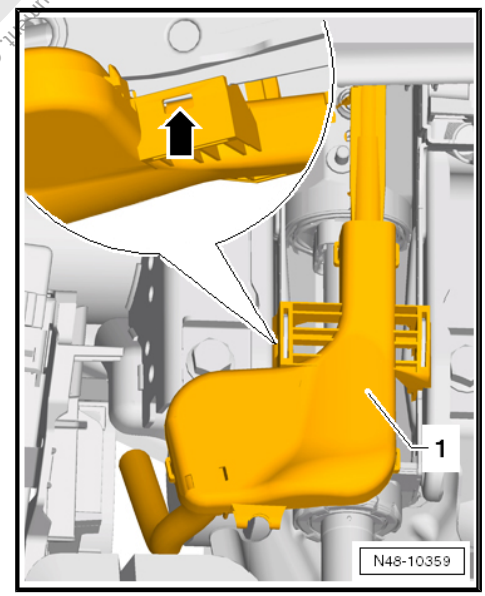
– Unclip the wire from the retainer on the Electronic Steering Column Lock Control Module - J764- -arrow-.



Continuation for All Vehicles

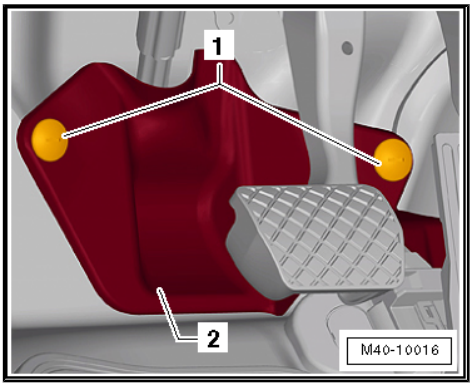
– Press the tabs -arrow- on both sides of the cable guide -1- toward the inside and remove it -1- from the guide on the steering column.

– Remove the ground cable from the steering column.

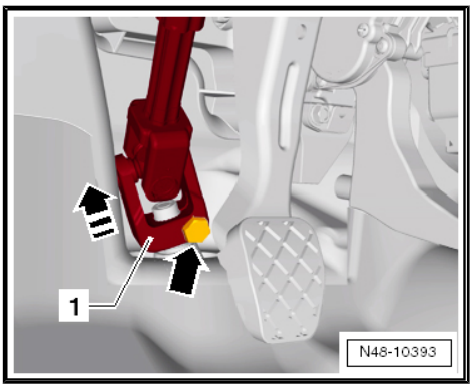


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– Remove the bolts -1- and remove the footwell trim panel -2-.



– Remove the bolt -arrow- from the universal joint -1-, and then remove the universal joint in the direction of -arrow-.



Caution

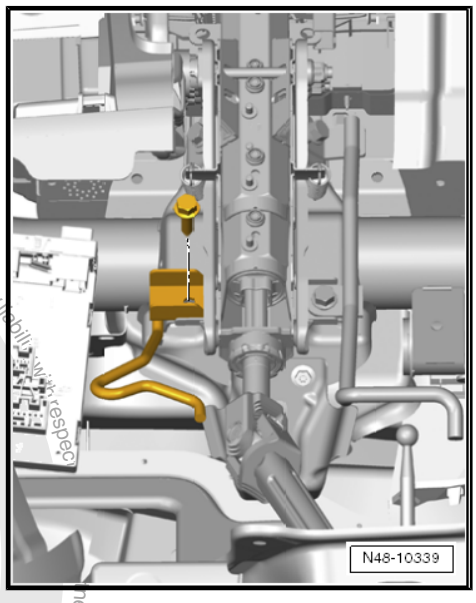
If the universal joint is separated from the Electromechanical steering gear, the following work cannot be performed:

- *Switching on the ignition*
- *Turning the steering gear*
- *Turning the steering column.*

These points must be observed since performing these actions could cause irreparable damage.

Vehicles with Manual Transmission

– Remove the left bolt and remove the clutch pedal crash brace.

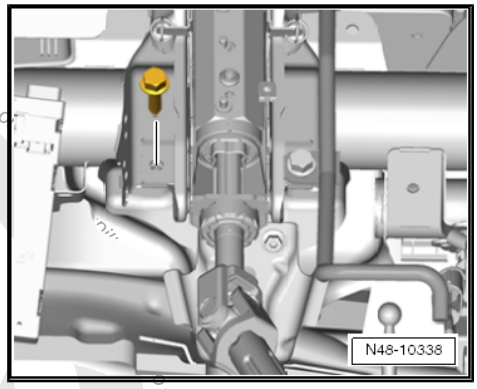


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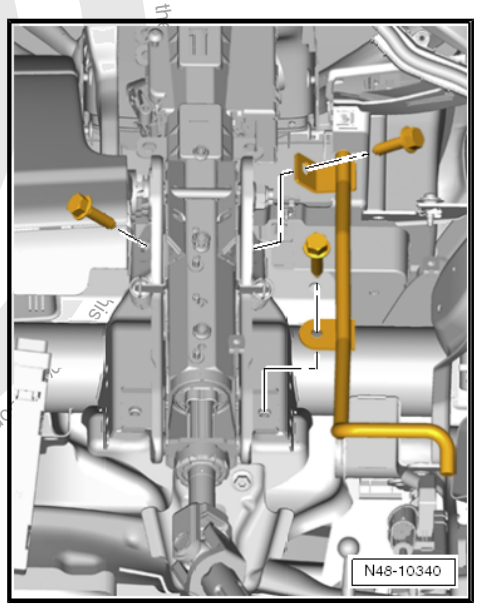
Vehicles with a DSG® Transmission and Automatic Transmission

– Remove the left steering column bolt.

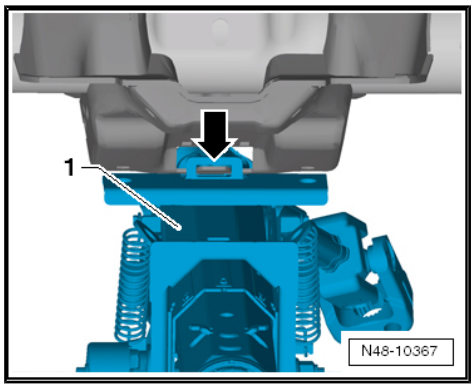
Continuation for All Vehicles



– Remove the bolts, the impact bolster, the brake pedal and hold the steering column secure.



– Lower the steering column -1- and carefully remove it from the guide -arrow-.



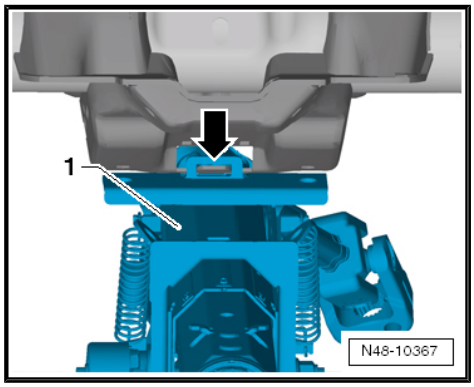
Caution

Pay particular attention to the correct handling and transport of the steering column. Refer to ⇒ "4.3 Steering Column, Handling and Transporting", page 305 .

Installing

– Install the steering column -1- with the opening into the guide -arrow-.

Only in this way is the correct installation position of steering column to mounting bracket guaranteed.

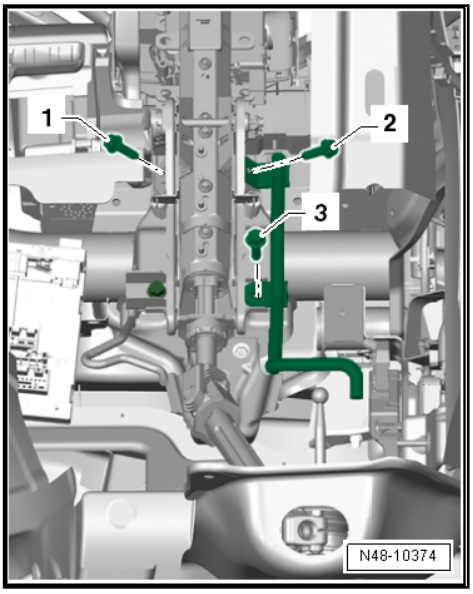


Note

Always follow the bolt installation sequence when installing the steering column.

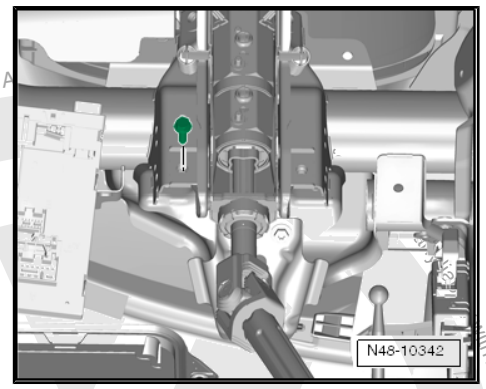
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– Secure the steering column with the bolt -1-.
– Install the impact bolster, the brake pedal and the bolts -2 and 3-.



Vehicles with a DSG® Transmission and Automatic Transmission

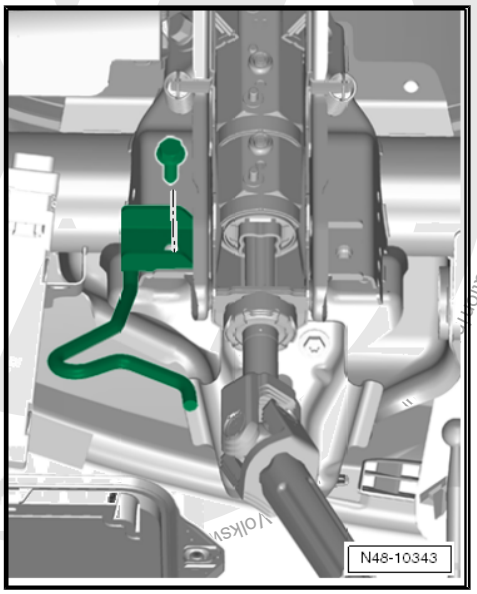
– Secure the steering column with the bolt.



Vehicles with Manual Transmission

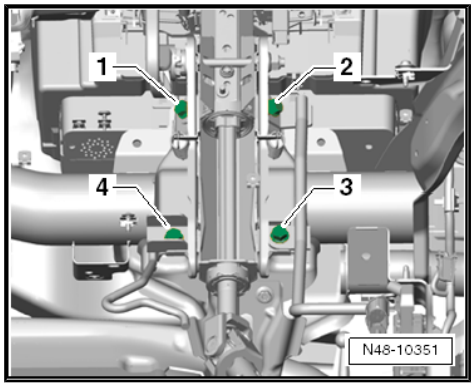
– Install the clutch pedal crash bolster and secure the steering column with the bolt.

Continuation for All Vehicles



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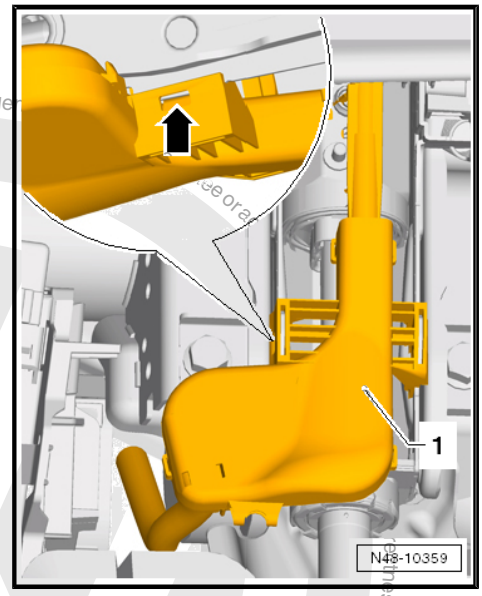
– Tighten the bolts in the shown sequence to the tightening specification.



– Install the cable guide -1- under the steering column.

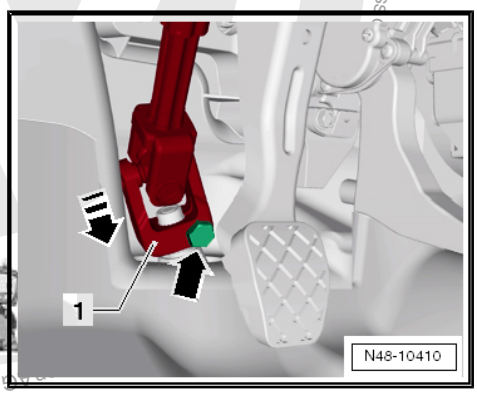
Tabs -arrow- must engage into guide on both sides.

– Attach the ground cable to the steering column.



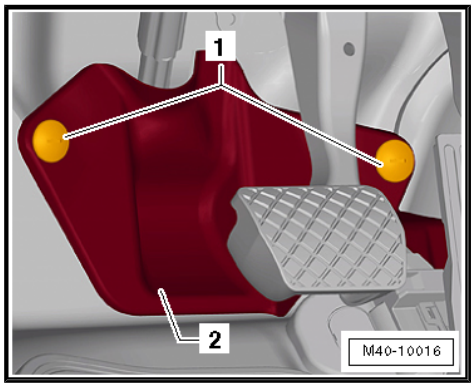
– Install the universal joint -1- on the steering pinion in direction of -arrow-.

– Install and tighten the new bolt -arrow-.



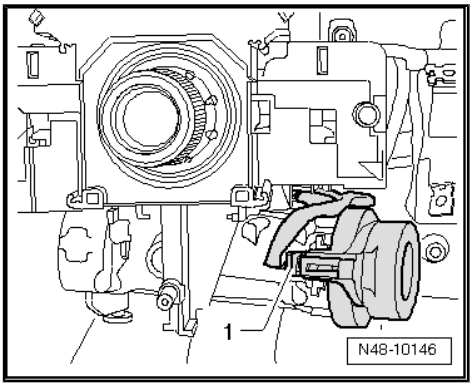
– Install the footwell trim -2- and tighten the nuts -1-.

Vehicles with Ignition Switch



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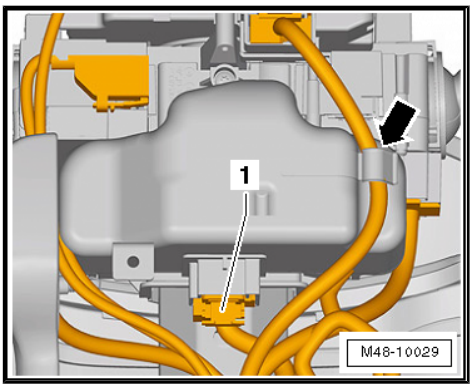
– Connect the connector -1-.



Vehicles with “Keyless Access” Keyless Locking and Starting System

– Connect the connector -1-.

– Clip the wire into the retainer on the Electronic Steering Column Lock Control Module - J764- -arrow-.



Continuation for All Vehicles

– Install the steering column switch. Refer to ⇒ Electrical Equipment; Rep. Gr. 94 ; Steering Column Switch Module; Overview - Steering Column Switch Module .

– Install the steering column trim. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Storage Compartments and Covers; Steering Column Trim Panel, Removing and Installing .

– Install the steering wheel. Refer to ⇒ “3.2 Airbag Steering Wheel, Removing and Installing”, page 295 .

– Install the driver side airbag unit. Refer to ⇒ Body Interior; Rep. Gr. 69 ; Driver Side Airbag; Airbag Unit with Driver Airbag Igniter - N95- , Removing and Installing .

– Perform a basic setting on the Steering Angle Sensor - G85- using the Vehicle Diagnostic Tester .

Tightening Specifications

Component	Tightening Specification
Universal joint to steering gear ◆ Use a new bolt	30 Nm
Steering column to mounting bracket	20 Nm

4.3 Steering Column, Handling and Transporting

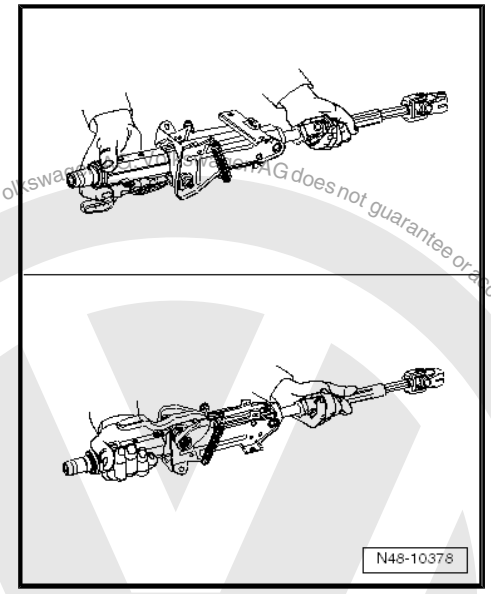
WARNING

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

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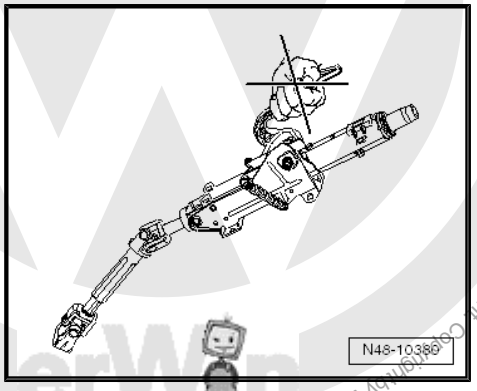
Correct Handling and Transport of Steering Column

- Transport the steering column with two hands.
- Hold the steering column by the upper outer steering column tube and in the area of the upper universal joint.



Incorrect Handling of Steering Column

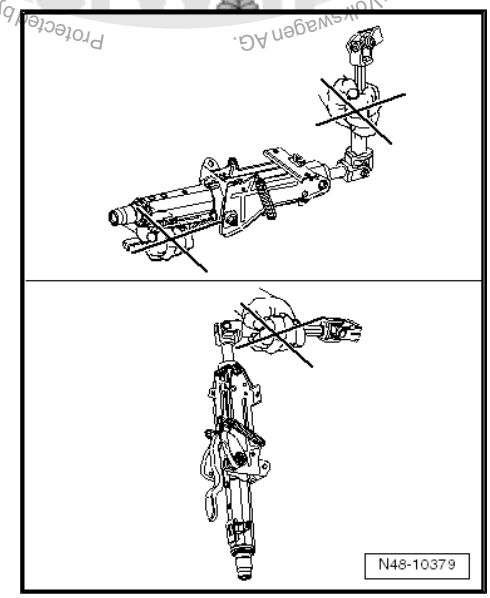
Transporting at the clamping lever leads to pre-damage to the steering column.



Incorrect Handling of Steering Column with Safety Risk

The following handling techniques can lead to damage of the universal joint bushings, the lower steering column bearing and the steering column:

- Transporting steering column with one hand on joint shaft.
- Bending joints more than 90°.



4.4 Steering Column, Checking for Damage

Visual Check

– Check whether steering column parts show signs of damage.

Function Test

– Check that the steering column turns easily without jerking.

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

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5 Overview - Steering Column, RHD

Note

- *Welding and alignment work on supporting or wheel carrying suspension components is not permitted.*
- *Always replace self-locking nuts.*
- *Always replace corroded bolts/nuts.*

1 - Subframe with bracket

2 - Brake Pedal Crash Brace

- ❑ Allocation. Refer to the Parts Catalog.

3 - Bolt

- ❑ 20 Nm
- ❑ Note the tightening sequence ⇒ page 315 .

4 - Bolt

- ❑ 20 Nm
- ❑ Note the tightening sequence ⇒ page 315 .

5 - Steering Column

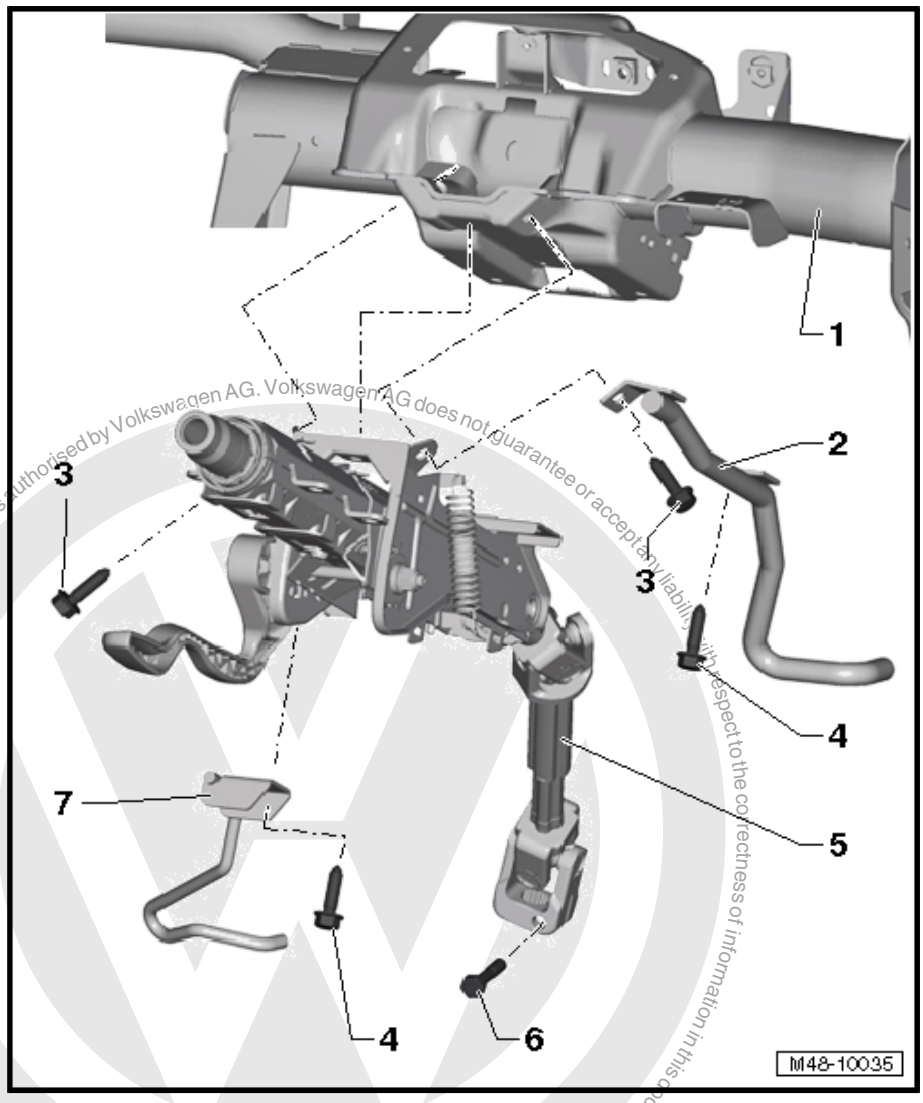
- ❑ Removing and installing. Refer to ⇒ “5.1 Steering Column, Removing and Installing, RHD”, page 308 .

6 - Bolt

- ❑ 30 Nm
- ❑ Always replace if removed

7 - Clutch Pedal Crash Brace

- ❑ Allocation. Refer to the Parts Catalog.

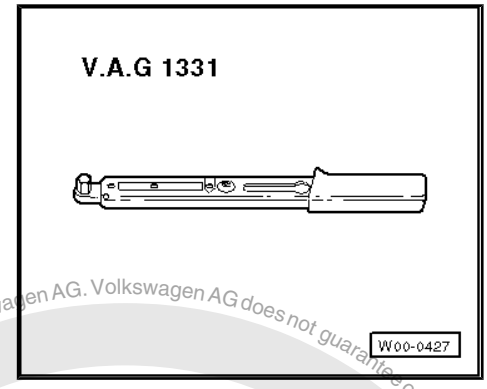


5.1 Steering Column, Removing and Installing, RHD

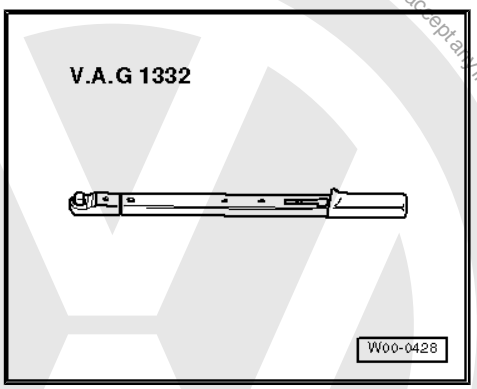
Special tools and workshop equipment required

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- Torque Wrench 1331 5-50Nm - VAG1331-



- Torque Wrench 1332 40-200Nm - VAG1332-



Perform the following:

Removing

Note

On vehicles with an Electronic Steering Column Lock Control Module - J764- , it is secured to the steering column with shear bolts. Refer to ⇒ Electrical Equipment; Rep. Gr. 94 ; Steering Column Switch Module; Overview - Steering Column Switch Module .

The steering column is delivered only as a complete replacement part. Servicing is not possible.

The steering lock housing can be replaced. Refer to ⇒ Electrical Equipment; Rep. Gr. 94 ; Steering Column Switch Module; Ignition/Starter Switch - D- , Removing and Installing .

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> **WARNING**
>
> *Before starting work on electrical equipment and removing steering wheel, the following conditions must be fulfilled:*
>
> - *The technician must discharge themselves of static electricity. This is done by touching grounded metal parts, for example, water lines, heater pipes, metal supports or a workshop hoist. Refer to* *⇒ "2.5 Electrical Components", page 294* *.*
>
> *If this not done, the Electronic Steering Column Lock Control Module - J764- could fail later.*
>
> - *Disconnect the battery ground cable. Refer to ⇒ Electrical Equipment; Rep. Gr. 27 ; Battery; Battery, Disconnecting and Connecting .*
> - *The wheels must be in the straight position.*
>
> *The airbag system may fail during future operation if these warnings are not followed!*

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– Bring wheels in the straight position.

– Pull the lever on the side of the steering column downward.

– Push the steering column as far down as possible and remove it.

– Push the lever on the side of the steering column upward again.

– Remove the airbag unit. Refer to ⇒ Body Interior; Rep. Gr. 69 ; Driver Side Airbag; Airbag Unit with Driver Airbag Igniter - N95- , Removing and Installing .

– Steering Wheel, Removing. Refer to ⇒ "3.2 Airbag Steering Wheel, Removing and Installing", page 295 .

– Remove the steering column trim. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Storage Compartments and Covers; Steering Column Trim Panel, Removing and Installing .

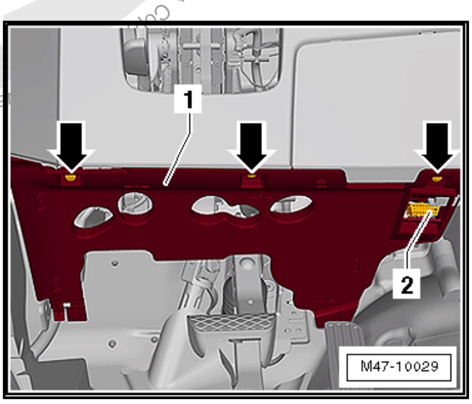
– Remove steering column switches. Refer to ⇒ Electrical Equipment; Rep. Gr. 94 ; Steering Column Switch Module; Overview - Steering Column Switch Module .

– Remove the bolts -arrows-.

– Release and remove the connector -2-.

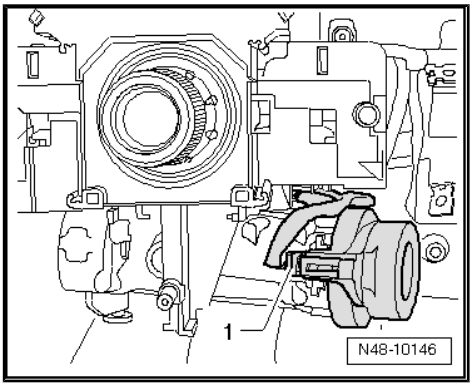
– Remove the trim -1-.

– Remove the footwell air duct. Refer to ⇒ Heating, Ventilation and Air Conditioning; Rep. Gr. 80 ; Heating, Servicing; Vents, Removing, Jetta from MY 2011 .



Vehicles with ignition switch

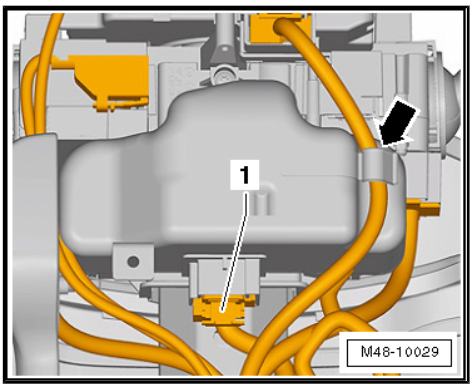
– Disconnect the connector -1-.



Vehicles with “Keyless Access” keyless locking and starting system

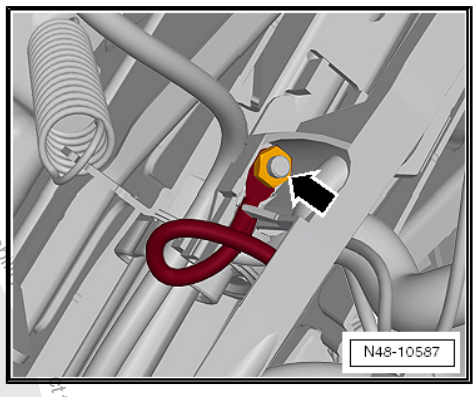
– Disconnect the connector -1-.

– Unclip the wire from the retainer on the Electronic Steering Column Lock Control Module - J764- -arrow-.

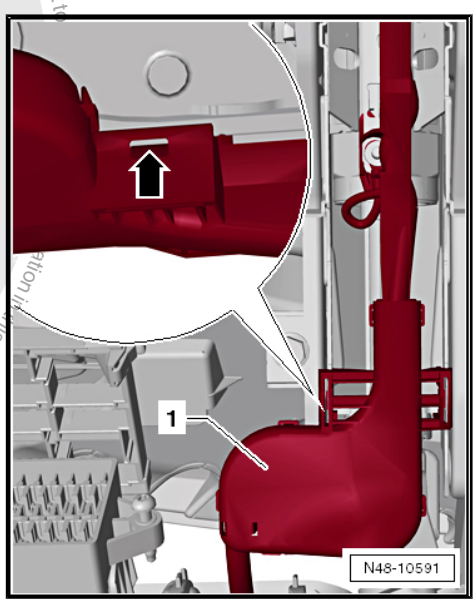


Continuation for All Vehicles

– Remove the nut -arrow- and pull the ground off from the steering column.

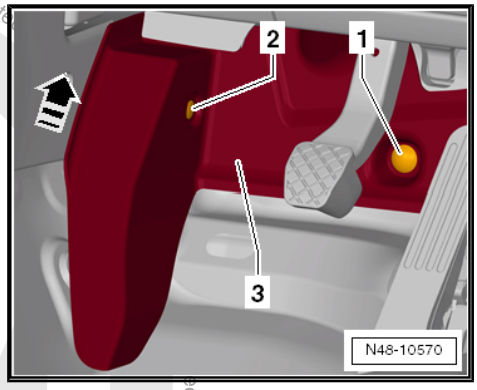


– Press the tabs -arrow- on both sides of the cable guide -1- toward the inside and remove it -1- from the guide on the steering column.

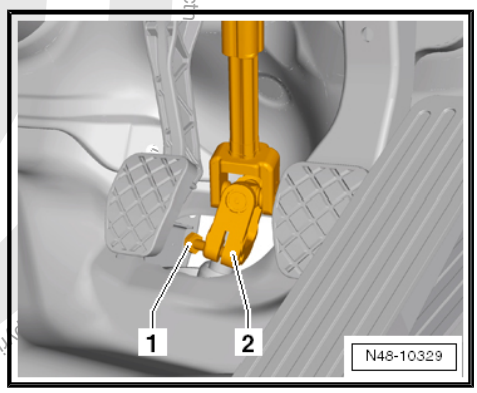


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– Remove the nut -1-.
– Remove the pin -2- and remove the entire clip.



– Remove the bolt -1- and remove the universal joint -2- from the steering gear.



Caution

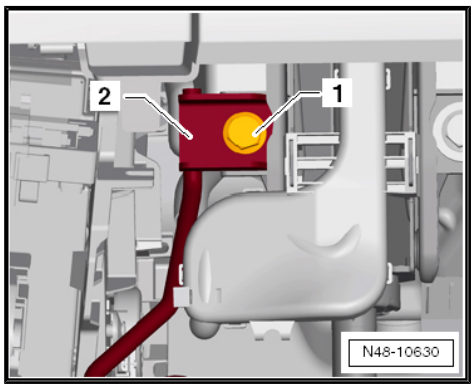
If the universal joint is separated from the Electromechanical steering gear, the following work cannot be performed:

- ***Switching on the ignition***
- ***Turning the steering gear***
- ***Turning the steering column.***

These points must be observed since performing these actions could cause irreparable damage.

Vehicles with manual transmission

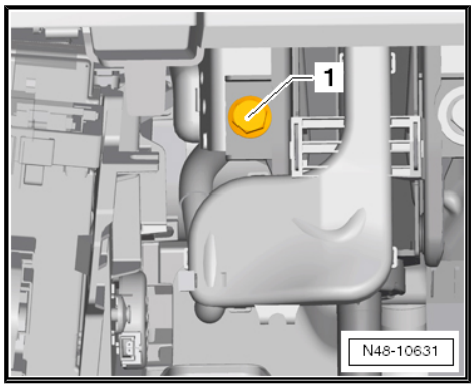
– Remove the left bolt -1- and the clutch pedal crash bolster -2-.



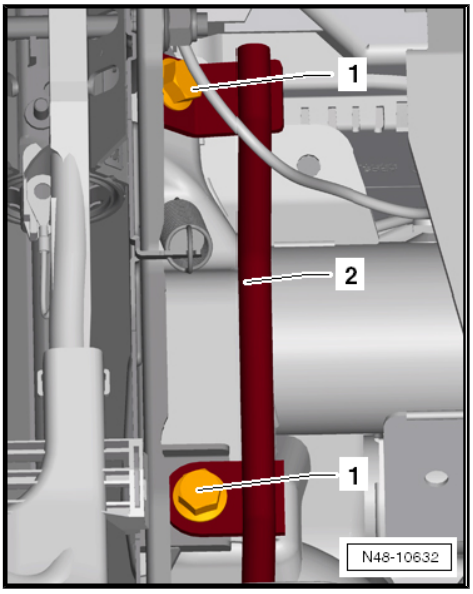
Vehicles with a DSG transmission and automatic transmission

– Remove the left steering column bolt -1-.

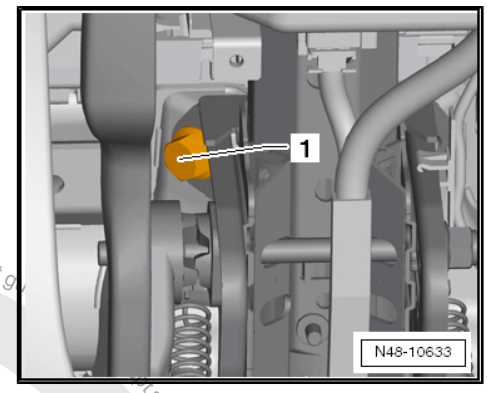
Continuation for All Vehicles



– Remove the right bolt -1- and the brake pedal crash bolster -2-.



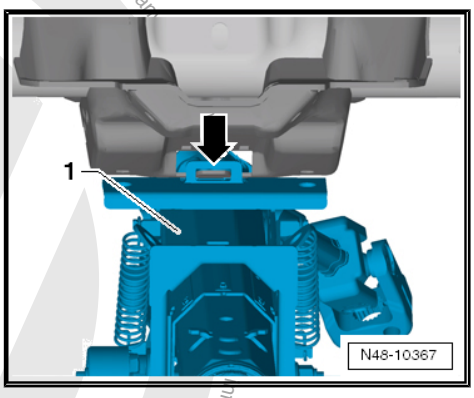
– Remove the bolt on the left side -1- while holding the steering column secure.



– Lower the steering column -1- and carefully remove it from the guide -arrow-.

Caution

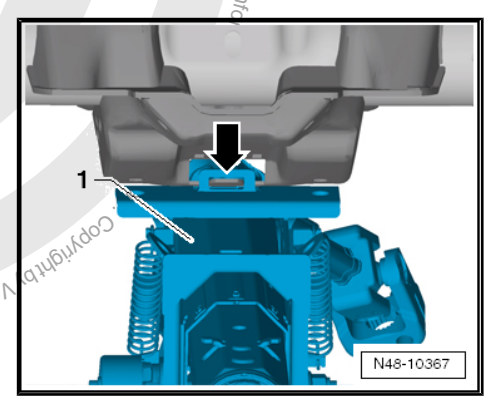
Pay particular attention to the correct handling and transport of the steering column. Refer to ⇒ "5.2 Steering Column, Handling and Transporting", page 317 .



Installing

– Install the steering column -1- with the opening into the guide -arrow-.

Only in this way is the correct installation position of steering column to mounting bracket guaranteed.

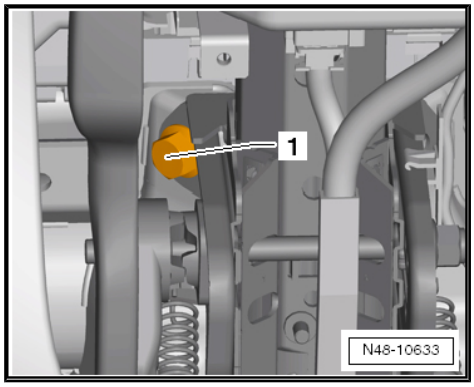


Note

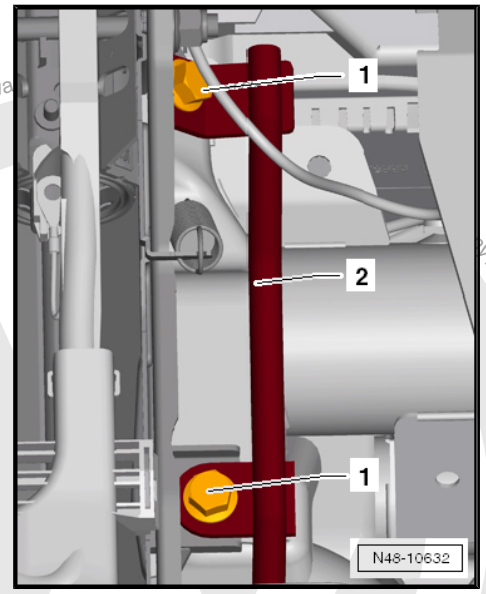
Always follow the bolt installation sequence when installing the steering column.

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– Secure the steering column with the bolt -1-.

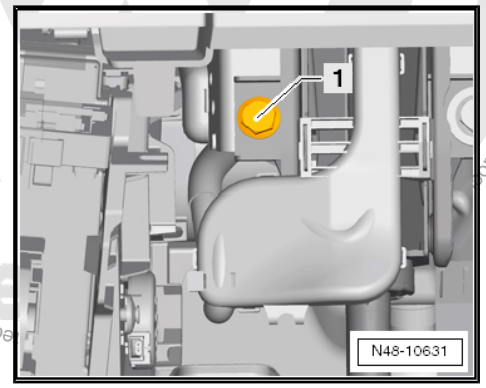


– Install the brake pedal crash bolster -2- and secure it with the bolt -1-.



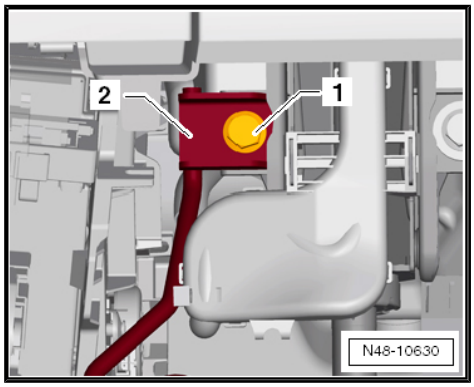
Vehicles with a DSG transmission and automatic transmission

– Secure the steering column with the bolt -1-.



Vehicles with manual transmission

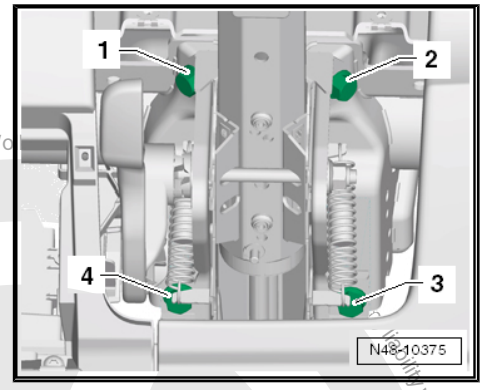
– Install the clutch pedal crash bolster -2- and secure it with the bolt -1-.



Continuation for All Vehicles

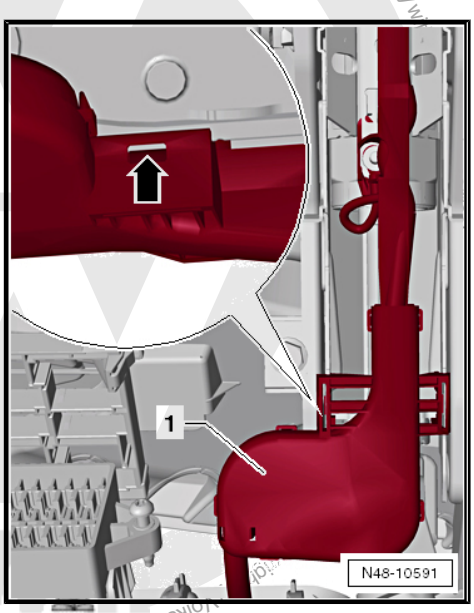
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y liability with respect to the correctness of information in this do

– Tighten the bolts -1-, -2-, -3- and -4- one after the other to the tightening specification.

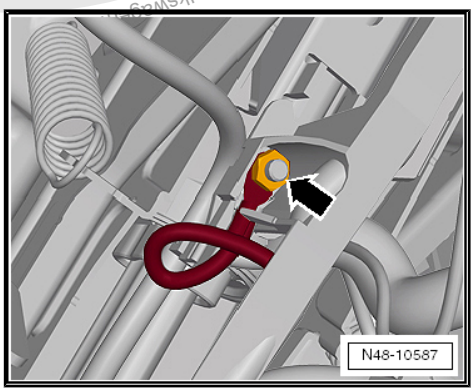


– Install the cable guide -1- under the steering column.

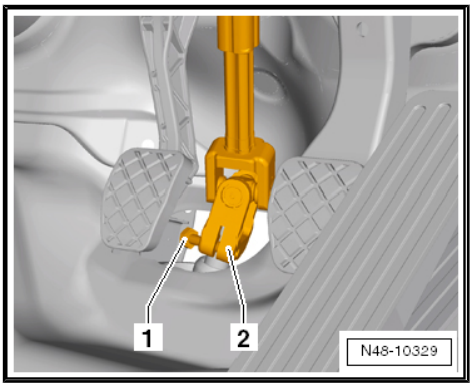
Tabs -arrow- must engage into guide on both sides.



– Attach the ground cable to the steering column -arrow-.

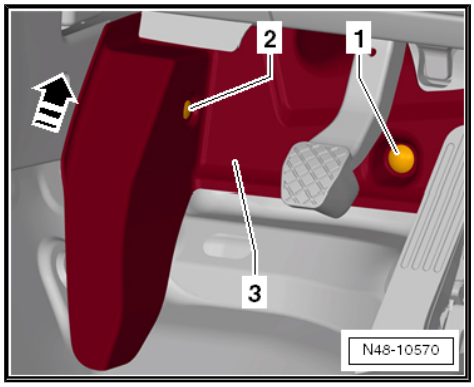


– Install the universal joint -2- on the steering gear pinion gear and tighten the bolt -1-.



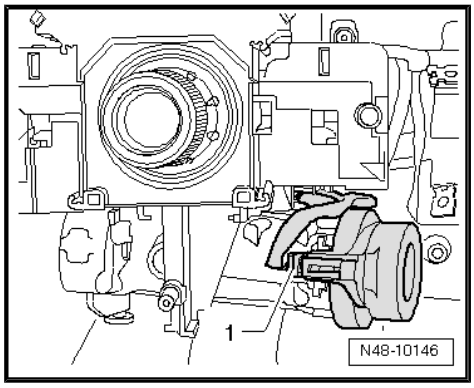
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– Insert the footwell trim panel -3- and push it downward opposite the -direction of the arrow-.
– Attach the nut -1-.
– Insert the entire clip -2- and press the pin all the way in.



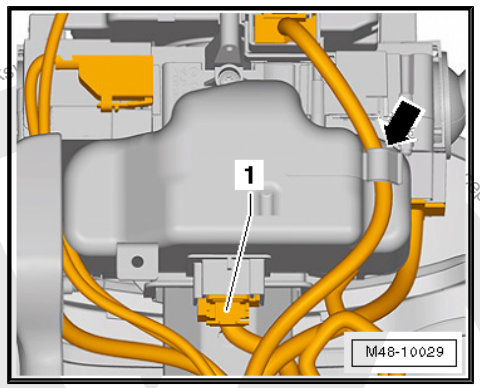
Vehicles with ignition switch

– Connect the connector -1-.



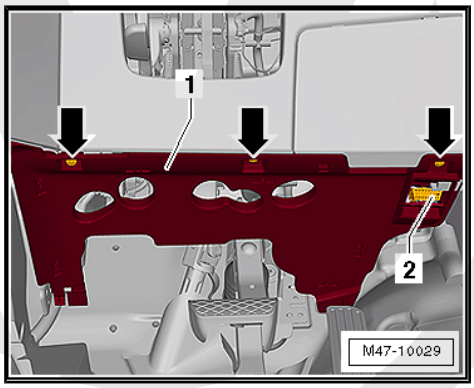
Vehicles with “Keyless Access” keyless locking and starting system

– Connect the connector -1-.
– Clip the wire into the retainer on the Electronic Steering Column Lock Control Module - J764- -arrow-.



Continuation for All Vehicles

– Install the footwell air duct. Refer to ⇒ Heating, Ventilation and Air Conditioning; Rep. Gr. 80 ; Heating, Servicing; Vents, Removing, Jetta from MY 2011 .
– Install the trim -1-.
– Insert the connector -2- until it audibly engages.
– Attach the trim panel -1- with bolts -arrows-.



– Install the steering column switch. Refer to ⇒ Electrical Equipment; Rep. Gr. 94 ; Steering Column Switch Module; Overview - Steering Column Switch Module .
– Install the steering column trim. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Storage Compartments and Covers; Steering Column Trim Panel, Removing and Installing .
– Install the steering wheel. Refer to ⇒ “3.2 Airbag Steering Wheel, Removing and Installing”, page 295 .
– Install the driver side airbag unit. Refer to ⇒ Body Interior; Rep. Gr. 69 ; Driver Side Airbag; Airbag Unit with Driver Airbag Igniter - N95- , Removing and Installing .
– Perform a basic setting on the Steering Angle Sensor - G85- using the ⇒ Vehicle diagnostic tester.

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Tightening Specifications

Component	Tightening Specification
Universal joint to steering gear ♦ Use a new bolt	30 Nm
Steering column to mounting bracket	20 Nm

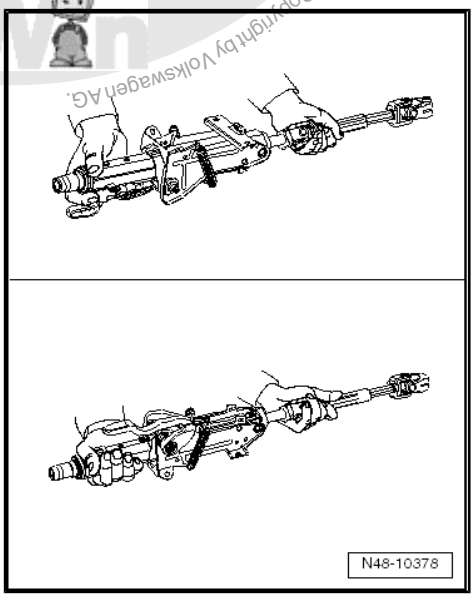
5.2 Steering Column, Handling and Transporting

WARNING

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

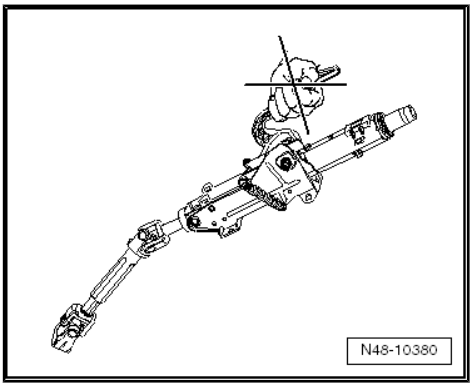
Correct handling and transport of steering column

- Transport the steering column with two hands.
- Hold the steering column by the upper outer steering column tube and in the area of the upper universal joint.



Incorrect handling of steering column

Transporting at the clamping lever leads to pre-damage to the steering column.

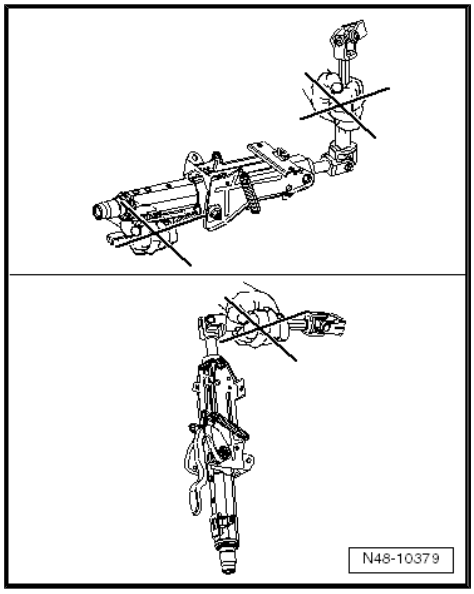


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Incorrect handling of steering column with safety risk

The following handling techniques can lead to damage of the universal joint bushings, the lower steering column bearing and the steering column:

- Transporting steering column with one hand on joint shaft.
- Bending joints more than 90°.



5.3 Steering Column, Checking for Damage

Visual check

– Check whether steering column parts show signs of damage.

Function Test

– Check that the steering column turns easily without jerking.

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

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6 Electromechanical Steering Gear

⇒ “6.1 Overview - Electromechanical Steering Gear”, page 319

⇒ “6.2 Steering Gear, Removing and Installing”, page 320

6.1 Overview - Electromechanical Steering Gear

Caution

If the universal joint is separated from the Electromechanical steering gear, the following work cannot be performed:

These points must be observed since performing these actions could cause irreparable damage.

1 - Wire

2 - Universal Joint

3 - Bolt

- 30 Nm
- Always replace if removed
- M8 x 35

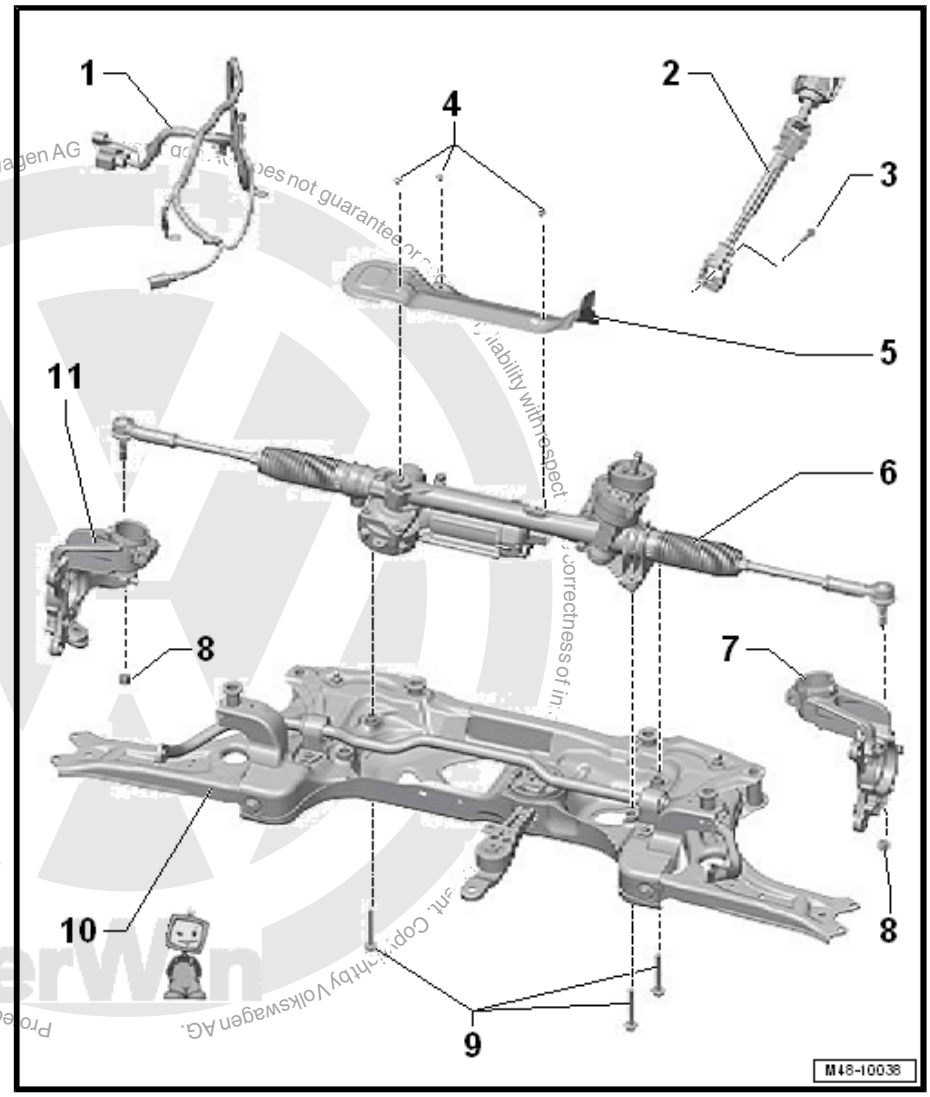
4 - TORX® Bolt

- 6 Nm
- Self-tapping

5 - Heat Shield

6 - Power Steering Gear

- With Power Steering Control Module - J500-
- With Electromechanical Power Steering Motor - V187-
- With Steering Angle Sensor - G85-
- With Steering Torque Sensor - G269-
- Can be checked in Guided Fault Finding using the Vehicle Diagnostic Tester .
- Removing and installing. Refer to ⇒ “6.2 Steering Gear, Removing and Installing”, page 320 .



Note

Correct any faults stored in the DTC memory before replacing the steering gear using the Vehicle Diagnostic Tester .

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7 - Left Wheel Bearing Housing

8 - Nut

- ❑ 20 Nm + 90° turn
- ❑ Always replace if removed
- ❑ M12 x 1.5
- ❑ Self-locking

9 - Bolt

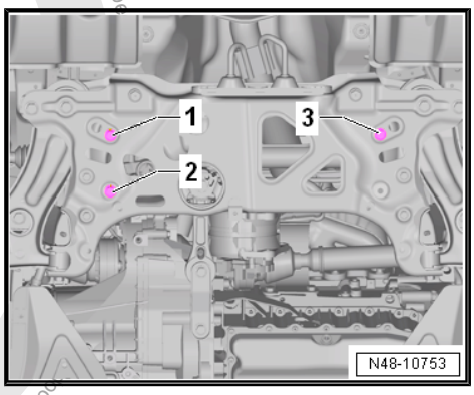
- ❑ 50 Nm + 90° turn
- ❑ Note the tightening sequence ⇒ page 320 .
- ❑ Always replace if removed

10 - Subframe

11 - Right Wheel Bearing Housing

Tightening Sequence for the Steering Gear to the Subframe

- ♦ Thread the bolts -1, 2 and 3- on one after the other by hand.
- ♦ Pre-tighten the bolts -1 and 2- one after the other to 10 Nm.
- ♦ Tighten the bolts -1, 2 and 3- one after the other to the tightening specification.



6.2 Steering Gear, Removing and Installing

Special tools and workshop equipment required

- ♦ Puller - Ball Joint - T10187-
- ♦ Torque Wrench 1331 5-50Nm - VAG1331-
- ♦ Torque Wrench 1332 40-200Nm - VAG1332-
- ♦ Engine and Gearbox Jack - VAS6931-

Perform the Following

Removing

Note

Correct any faults stored in the DTC memory before replacing the steering gear using the Vehicle Diagnostic Tester .

– Connect the Vehicle Diagnostic Tester and start “Guided Fault Finding”.

Follow the instructions on the screen.

– Turn the steering wheel in the straight position and remove the ignition key so that the steering wheel lock engages.

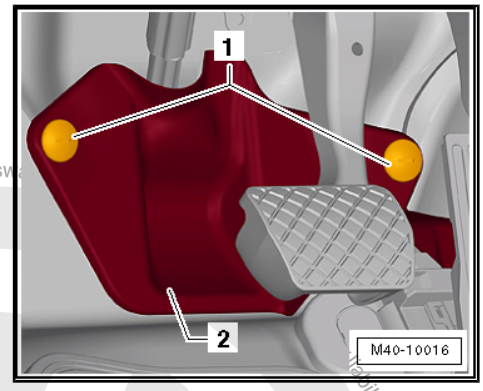
Vehicles with “Keyless Access” Keyless Locking and Starting System

– Switch the ignition off and open the driver door so the steering wheel lock engages.

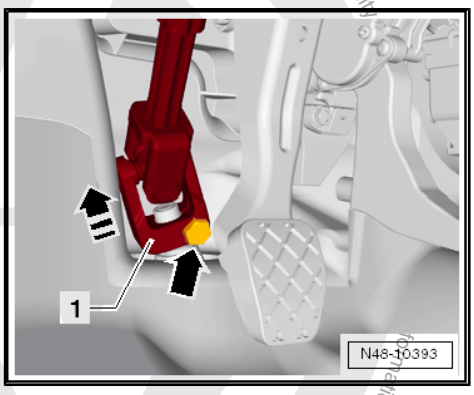
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Continuation for All Vehicles

– Remove the bolts -1- and remove the footwell trim panel -2-.



– Remove the bolt -arrow- from the universal joint -1-, and then remove the universal joint in the direction of -arrow-.



Caution

If the universal joint is separated from the Electromechanical steering gear, the following work cannot be performed:

- ***Switching on the ignition***
- ***Turning the steering gear***
- ***Turning the steering column.***

These points must be observed since performing these actions could cause irreparable damage.

– Loosen the wheel bolts.

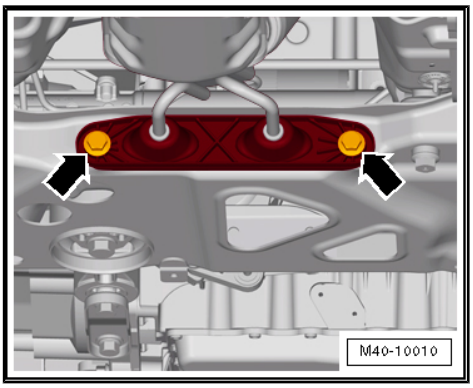
– Raise the vehicle.

– Remove the front wheels.

– Remove the lower noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Noise Insulation .

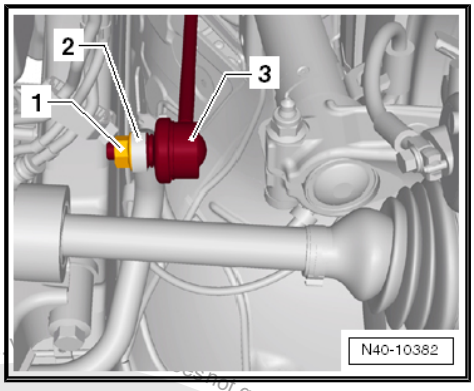
– Remove the exhaust system bracket from the subframe -arrows-.

– Loosen the double clamp for the exhaust system.

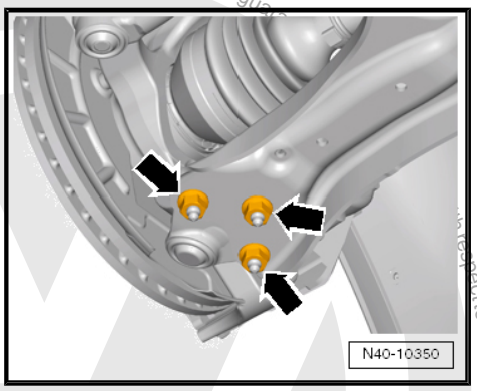


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– Remove the hex nut -1- from the right and left coupling rod -3-.
– Remove the coupling rod -3- from the stabilizer bar -2- on the left and right sides.



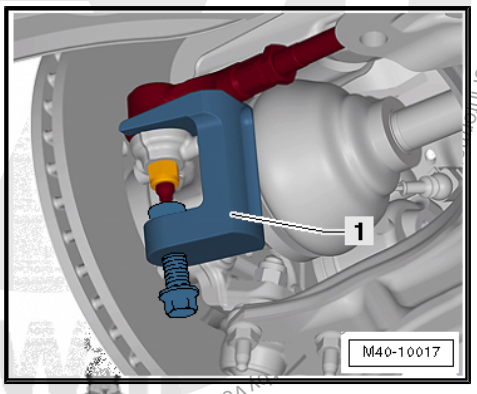
– Remove the nuts -arrows- on the left and right side of the vehicle.
– Remove the control arm from the ball joint.



– Loosen the nut from the tie rod end, but do not unscrew yet.

Caution

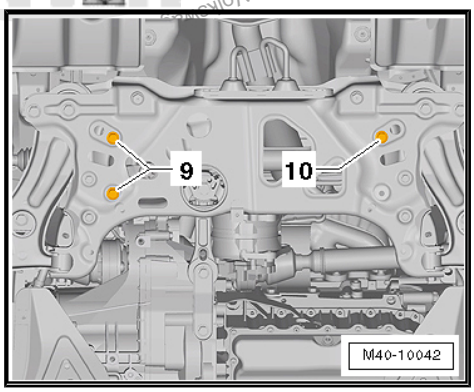
To protect the thread, screw the nut on the pin a few turns.



– Remove the tie rod end from the wheel bearing housing and remove the nut.

1 - Puller - Ball Joint - T10187-

– Remove the steering gear bolts -9 and 10-.

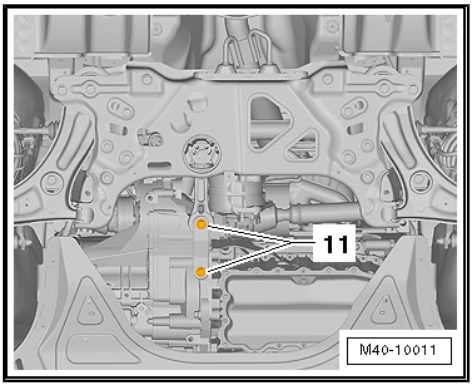


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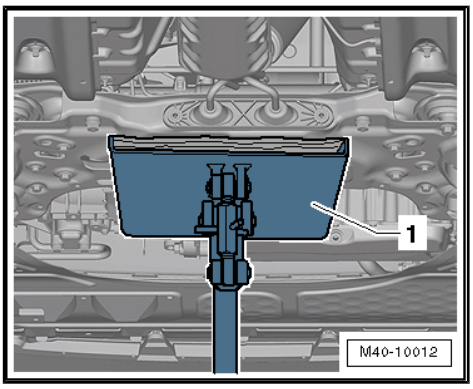
– Remove the bolts -11- and then remove the pendulum support from the transmission.

– Secure the subframe. Refer to ⇒ “4.3 Subframe, Securing”, page 11 .

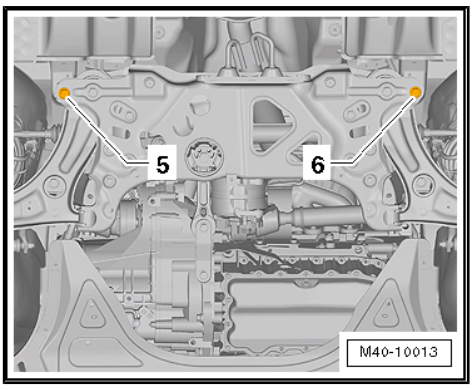
– Disconnect the connector for the service interval extension to the oil pan.



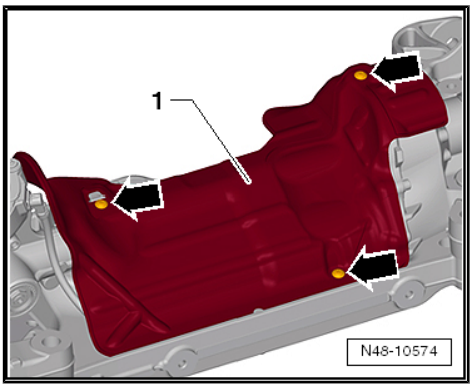
– Place the Engine and Gearbox Jack - VAS6931- -1- under the subframe.



– Remove the bolts -5 and 6- and slightly lower the subframe using the Engine and Gearbox Jack - VAS6931- . Pay attention the electrical wiring while doing this.

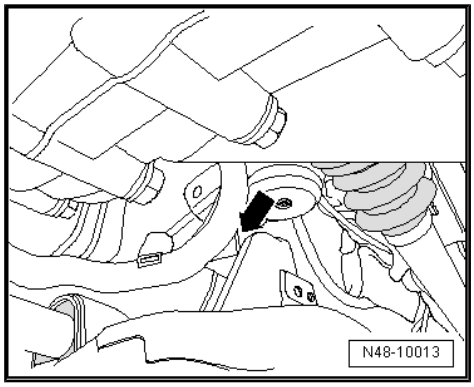


– Remove the bolts -arrows- and the heat shield -1- above the steering gear.

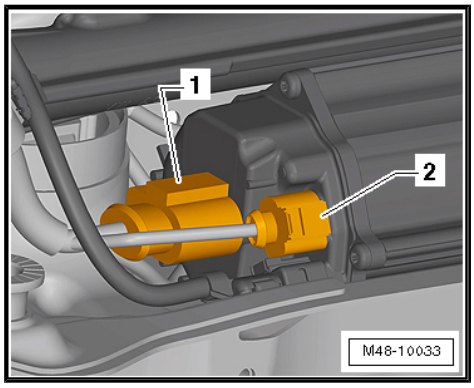


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– Remove cable guide from subframe -arrow-.
– Unclip all other cable mounting points on steering gear.



– Disconnect the connectors -1 and 2- from the steering gear.
– Carefully lower the subframe using Engine and Gearbox Jack - VAS6931- .
– Lift the steering gear off the subframe and remove it downward.

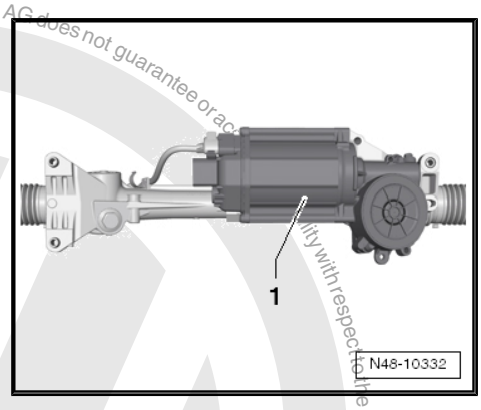


– Set the steering gear down as illustrated.

Avoid damage to the control module -1-.

Steering Gear, Installing

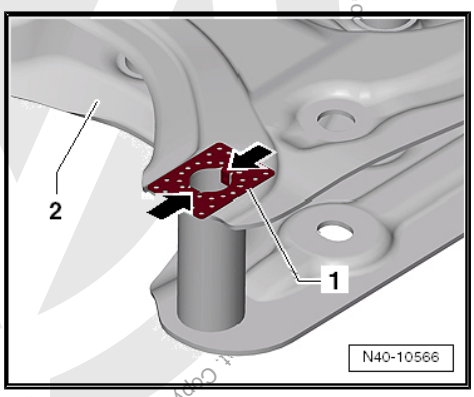
Install in reverse order of removal.



– If applicable, always make sure the intermediate plate -1- is installed between the subframe -2- and the body.

Insert the long side of the intermediate plate -1- so that it is perpendicular to the direction of travel. The tabs -arrows- must lock into the subframe -2-.

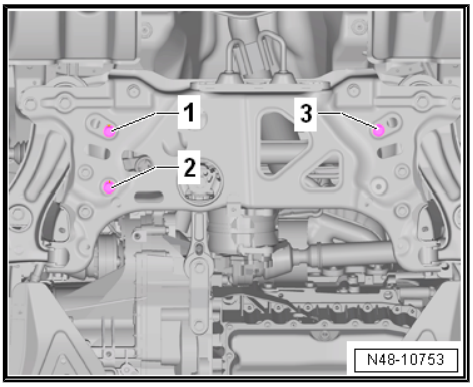
The steering gear threaded sleeves must be seated in the console holes.



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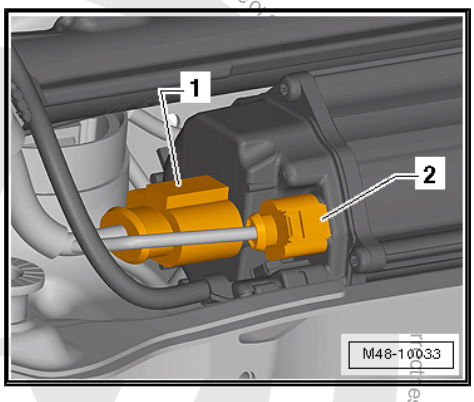
Note the Tightening Sequence for the Steering Gear on Vehicles with Electromechanical Steering Gear:

- Thread the bolts -1, 2 and 3- on one after the other by hand.
- Pre-tighten the bolts -1 and 2- one after the other to 10 Nm.
- Tighten the bolts -1, 2 and 3- one after the other to the tightening specification.



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– Connect the connectors -1 and 2- so that they audibly click into place.



Note

- *Coat the seal on the steering gear with lubricant such as soft soap before installing the steering gear.*
- *After attaching steering gear to drive axle, make sure that seal on steering gear is positioned to mounting plate without kinks and opening to foot well is sealed correctly. Ingress of water and/or noises may be the result.*
- *Make sure sealing surfaces are clean.*

Before fastening the bolts for subframe, position steering gear on subframe and fasten bolts for steering gear and stabilizer.

– Clamp off the electrical connections to the steering gear.

– Install lower noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Noise Insulation .

Note

Make sure the ball joint boot is not damaged or twisted.

– Bolt the universal joint to the steering gear.

– Connect the battery. Refer to ⇒ Rep. Gr. 27 ; Battery; Battery, Disconnecting and Connecting .

– Perform the Steering Angle Sensor - G85- basic setting using the Vehicle Diagnostic Tester .

It is necessary to adapt the Electromechanical steering with Vehicle Diagnostic Tester if new steering gear was installed.

– Adapt the Electromechanical steering with the Vehicle Diagnostic Tester .

`Chassis`

`Electromechanical power steering`

`01 - OBD-capable system`

`Electromechanical power steering`

`Functions`

`Adapting Electromechanical steering`

Follow the instructions on the screen.

After installation, position of steering wheel must be checked with a road test.

If steering wheel is at an angle or a new steering gear was installed, vehicle must be aligned.

– Align vehicle. Refer to ⇒ “8 Wheel Alignment”, page 256

Tightening Specifications

Component	Tightening Specification
Steering gear to subframe ♦ Use new bolts.	50 Nm + 90° additional turn

Component	Tightening Specification
Ball joint to control arm ♦ Use new nuts ♦ Tighten only in curb weight position. Refer to ⇒ "2 Rear Axle Curb Weight (Twist Beam Rear Suspension)", page 146 .	100 Nm
Subframe to body ♦ Use new bolts.	70 Nm + 180° additional turn
Stabilizer bar to coupling rod ♦ Use new nut ♦ Counterhold at joint pin inner multi-point fitting	65 Nm
Tie rod end to wheel bearing housing ♦ Use new nut	20 Nm + 90° additional turn
Universal joint to steering gear ♦ Use a new bolt	30 Nm
Shield to steering gear ♦ M6 bolt is self-tapping	6 Nm
Exhaust system bracket to subframe . Refer to ⇒ Engine; Mechanical, Fuel Injection and Ignition; Rep. Gr. 26 .	

Tightening Specifications, Pendulum Support to the Transmission

Bolt	Tightening Specification
M10 x 35 ♦ Use a new bolt	50 Nm + 90° turn
M10 x 75 ♦ Use a new bolt	50 Nm + 90° turn

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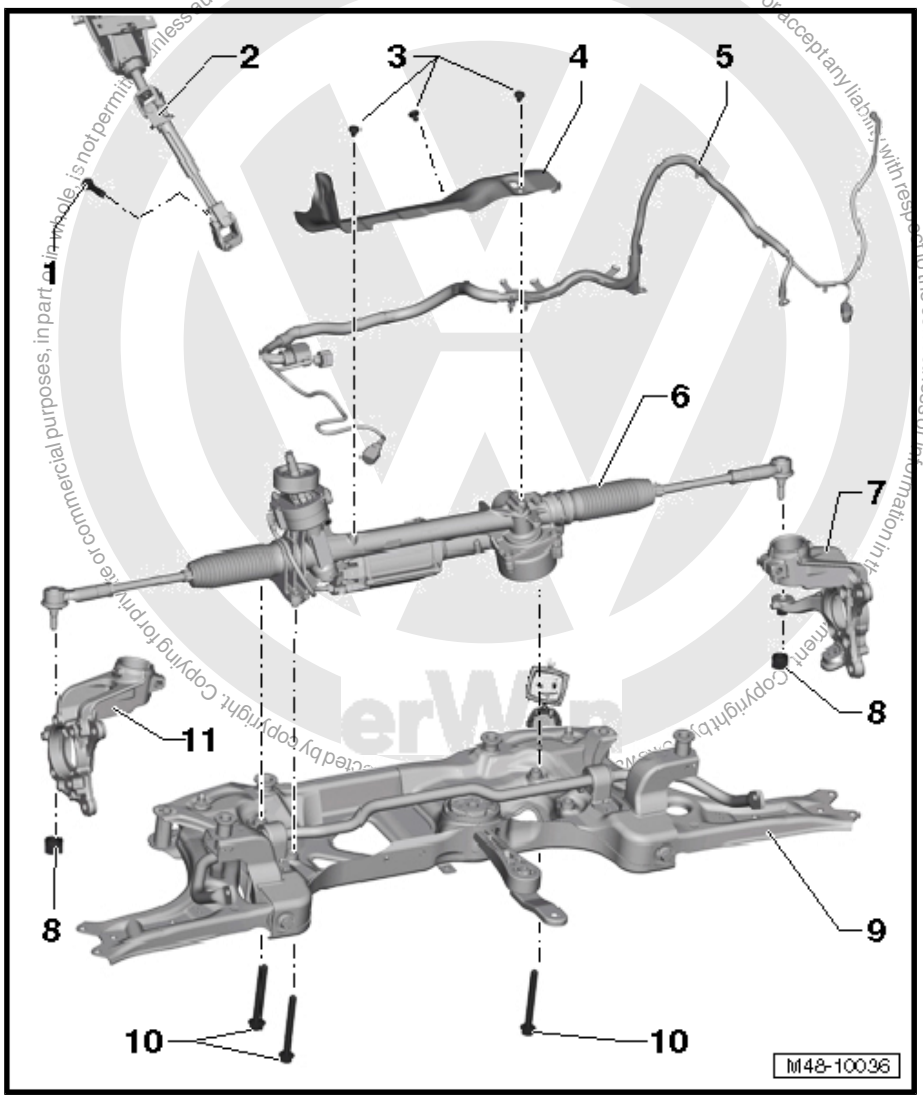
7 Electromechanical Steering Gear, RHD

7.1 Overview - Electromechanical Steering Gear, RHD

Caution

If the universal joint is separated from the Electromechanical steering gear, the following work cannot be performed:

These points must be observed since performing these actions could cause irreparable damage.



1 - Bolt
- ❑ M8 x 35
- ❑ 30 Nm
- ❑ Always replace if removed

2 - Universal Joint

3 - Bolt
- ❑ 6 Nm
- ❑ Self-tapping

4 - Heat Shield

5 - Wire

6 - Power Steering Gear
- ❑ with Power Steering Control Module - J500-
- ❑ with Electromechanical Power Steering Motor - V187-
- ❑ with Steering Torque Sensor - G269-
- ❑ with Steering Angle Sensor - G85-
- ❑ Can be checked in Guided Fault Finding using the Vehicle Diagnostic Tester ⇒ Vehicle diagnostic tester.
- ❑ Removing and installing. Refer to ⇒ “7.2 Steering Gear, Removing and Installing, RHD”, page 329 .

7 - Left Wheel Bearing Housing

8 - Nut
- ❑ M12 x 1.5
- ❑ 20 Nm + 90° additional turn
- ❑ Self-locking
- ❑ Always replace if removed

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9 - Subframe

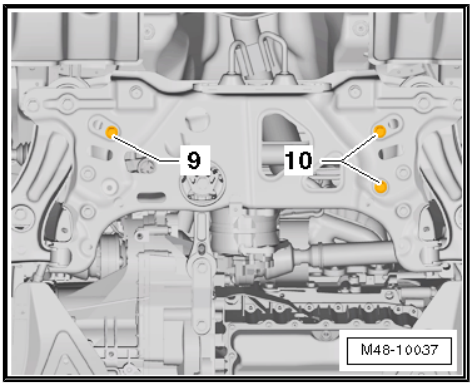
10 - Bolt

- ❑ Note the tightening sequence ⇒ page 329 .
- ❑ 50 Nm + 90° additional turn
- ❑ Always replace if removed

11 - Right Wheel Bearing Housing

Tightening sequence for the steering gear to the subframe

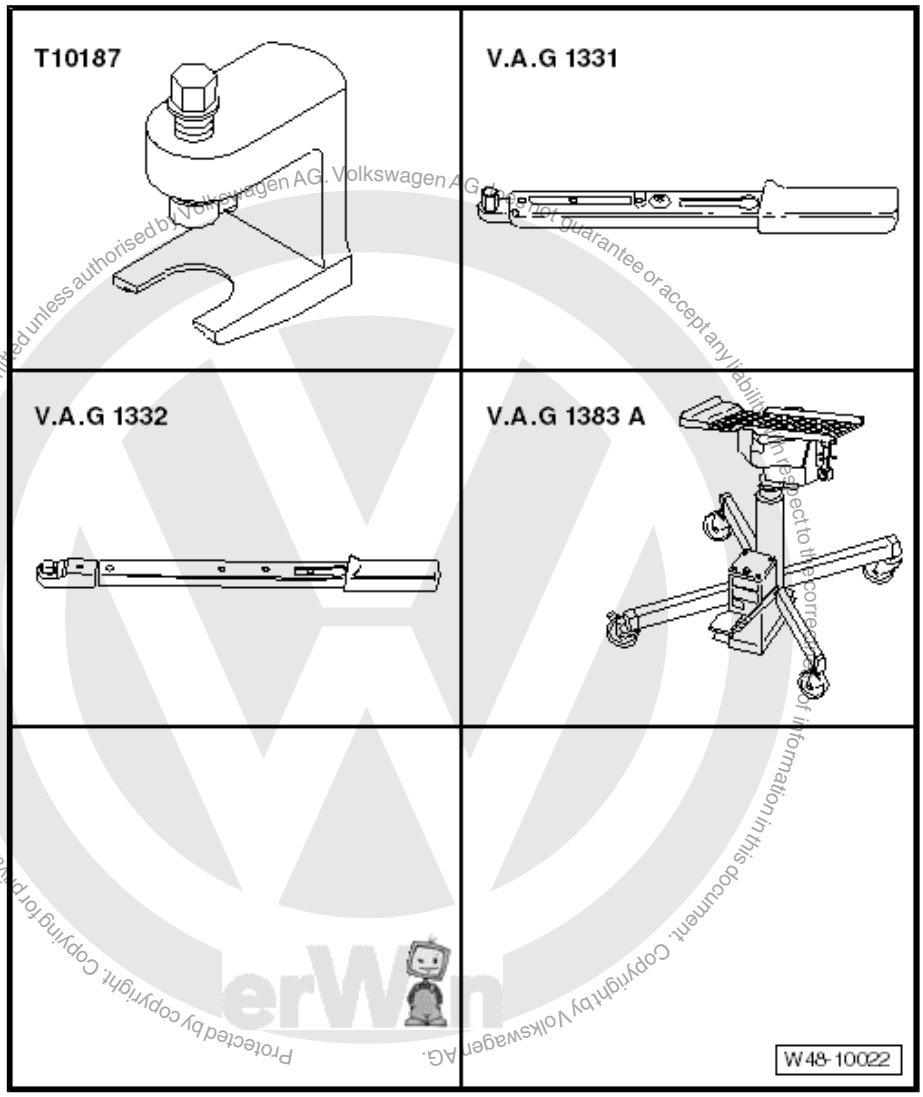
- ♦ Pre tighten the bolts -10- and -9- after each other by hand.
- ♦ Starting from the back at -10-, pre-torque the bolts after each other to 10 Nm.
- ♦ Tighten the bolts -10- and -9- one after the other to the prescribed tightening specification.



7.2 Steering Gear, Removing and Installing, RHD

Special tools and workshop equipment required

- ♦ Puller - Ball Joint - T10187-
- ♦ Torque Wrench 1331 5-50Nm - VAG1331-
- ♦ Torque Wrench 1332 40-200Nm - VAG1332-
- ♦ Engine and Gearbox Jack -

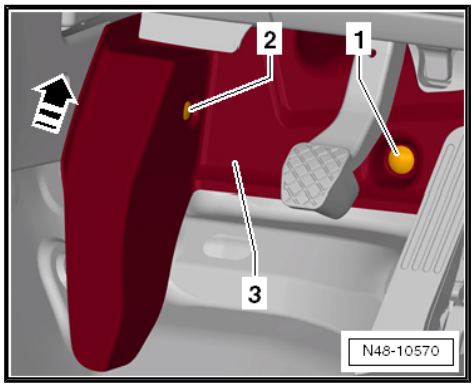


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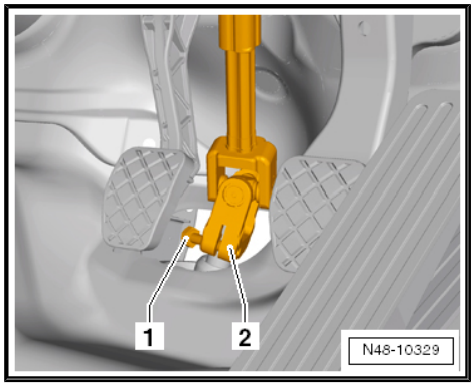
VAS6931-

Removing

– Disconnect the battery. Refer to ⇒ Rep. Gr. 27 ; Battery; Battery, Disconnecting and Connecting .
– Remove the nut -1-.
– Remove the pin -2- and remove the entire clip.
– Move the trim -3- upward in the -direction of the arrow- and remove it.



– Remove the bolt -1- and remove the universal joint -2- from the steering gear.



Caution

If the universal joint is separated from the Electromechanical steering gear, the following work cannot be performed:

- *Switching on the ignition*
- *Turning the steering gear*
- *Turning the steering column.*

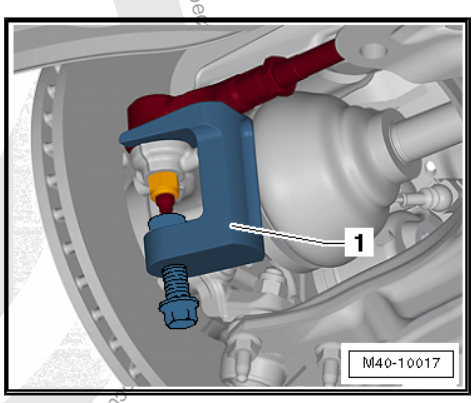
These points must be observed since performing these actions could cause irreparable damage.

– Loosen the wheel bolts.
– Raise the vehicle.
– Remove the front wheels.
– Remove the lower noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Noise Insulation .
– Loosen the nut from the tie rod end, but do not unscrew yet.

Caution

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

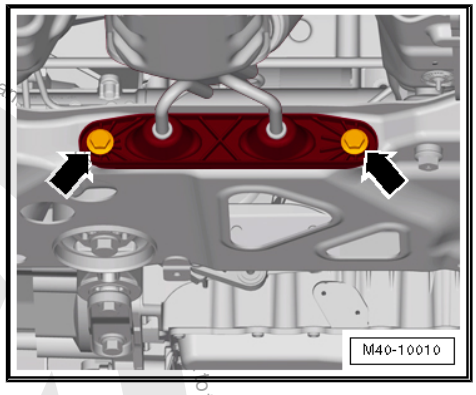
– Remove the tie rod end from the wheel bearing housing and remove the nut.



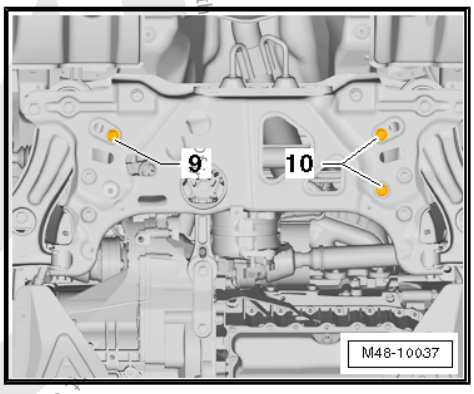
1 - Puller - Ball Joint - T10187-

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– Remove the exhaust system bracket from the subframe -arrows-.



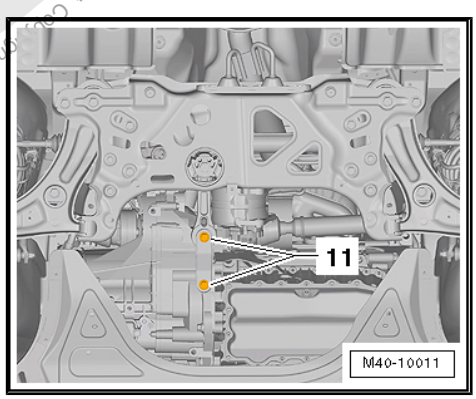
– Remove the steering gear bolts -9- and -10-.



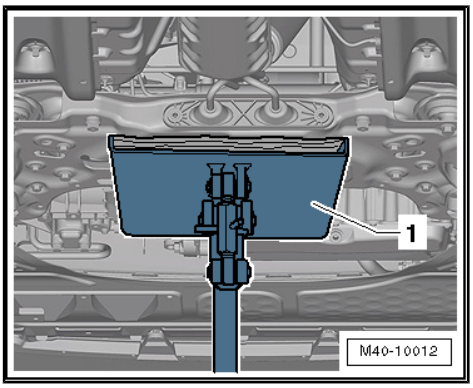
– Remove the bolts -11- and then remove the pendulum support from the transmission.

– Secure the subframe. Refer to ⇒ “4.3 Subframe, Securing”, page 11 .

– Disconnect the connector for the service interval extension to the oil pan.

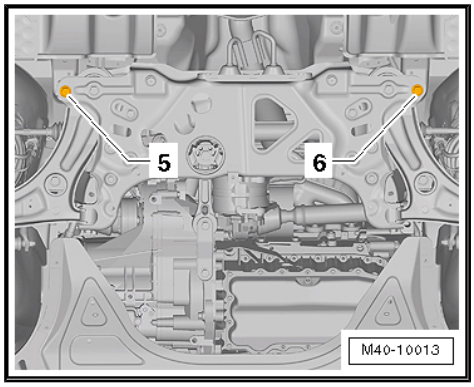


– Place the Engine and Gearbox Jack - VAS6931- -1- under the subframe.

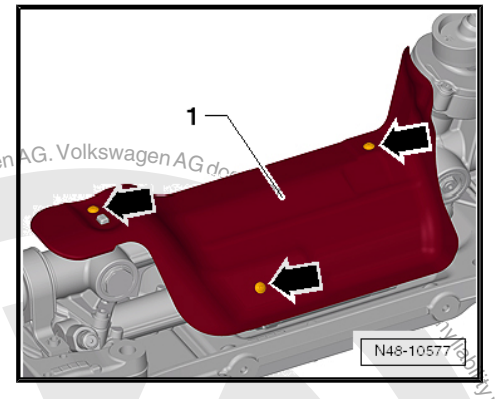


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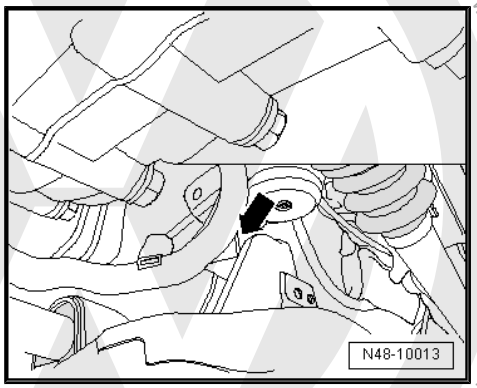
– Remove the bolts -5- and -6- and slightly lower the subframe using the Engine and Gearbox Jack - VAS6931- . Pay attention the electrical wiring while doing this.
– Secure the subframe. Refer to ⇒ “4.3 Subframe, Securing”, page 11 .
– Disconnect the connector for the service interval extension to the oil pan.



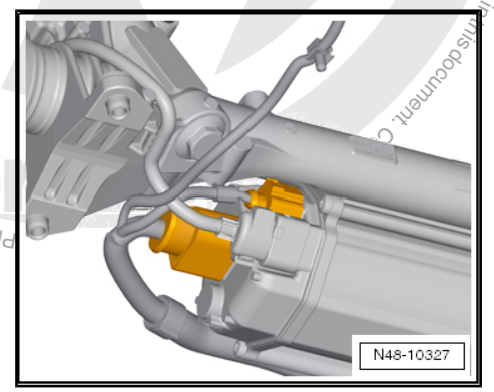
– Remove the bolts -arrows- and the heat shield -1- above the steering gear.



– Remove cable guide from subframe -arrow-.
– Unclip all other cable mounting points on steering gear.



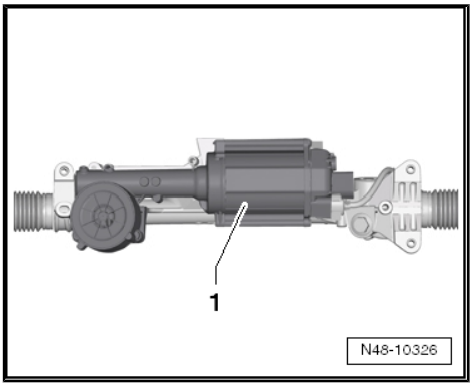
– Disconnect the connectors form the steering gear.
– Carefully lower the subframe using Engine and Gearbox Jack - VAS6931- .
– Lift the steering gear off the subframe and remove it toward the right.



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– Set the steering gear down as illustrated.

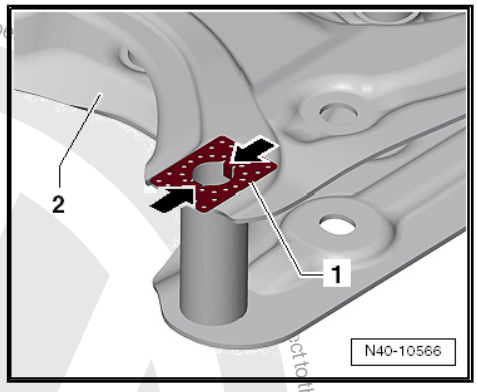
Avoid damage to the control module -1-.



Installing

Install in reverse order of removal.

– If applicable, always make sure the intermediate plate -1- is installed between the subframe -2- and the body.



Insert the long side of the intermediate plate -1- so that it is perpendicular to the direction of travel. The tabs -arrows- must lock into the subframe -2-.

The threaded sleeve must seat in subframe hole.

Note

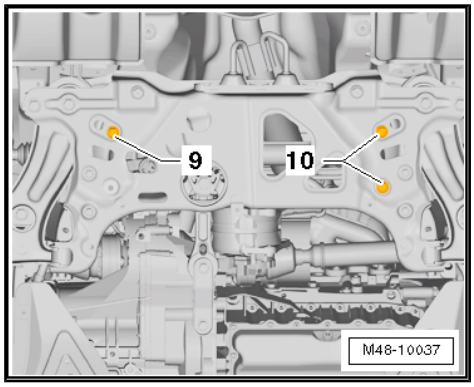
- *Coat the seal on the steering gear with lubricant such as soft soap before installing the steering gear.*
- *After attaching steering gear to the universal joint, make sure that seal on steering gear is positioned on the mounting plate without and kinks and is sealed correctly. The opening to the footwell must seal correctly. Ingress of water and/or noises may be the result.*
- *Make sure sealing surfaces are clean.*

– Position the steering gear on the subframe.

– Attach the bolts for the steering gear and the stabilizer bar.

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Note the tightening sequence for the steering gear on vehicles with Electromechanical steering gear:



- ♦ Pre tighten the bolts -10- and -9- after each other by hand.
- ♦ Starting from the back at -10-, pre-torque the bolts after each other to 10 Nm.
- ♦ Tighten the bolts -10- and -9- one after the other to the prescribed tightening specification.
- – Install the lower noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Noise Insulation .
- – Bolt the universal joint to the steering gear.
- – Connect the battery. Refer to ⇒ Rep. Gr. 27 ; Battery; Battery, Disconnecting and Connecting .
- – Perform Steering Angle Sensor - G85- basic setting with ⇒ Vehicle diagnostic tester.

After installation, position of steering wheel must be checked with a road test.

If steering wheel is at an angle or a new steering gear was installed, vehicle must be aligned.

- – Align vehicle. ⇒ “8 Wheel Alignment”, page 256

It is necessary to adapt the Electromechanical power steering using the Vehicle Diagnostic Tester ⇒ Vehicle diagnostic tester if new steering gear was installed.

- – Adapt the Electromechanical power steering with the ⇒ Vehicle diagnostic tester.

`Chassis`

`Electromechanical power steering`

`01 - OBD-capable system`

`Electromechanical power steering`

`Functions`

`Adapting Electromechanical steering`

Follow the instructions on the screen.

Tightening Specifications

Component	Tightening Specification
Steering gear to subframe ♦ Use new bolts.	50 Nm + 90° additional turn
Ball joint to control arm ♦ Use new nuts ♦ Tighten only in curb weight position. Refer to ⇒ “2 Rear Axle Curb Weight (Twist Beam Rear Suspension)”, page 146 .	100 Nm
Subframe to body ♦ Use new bolts.	70 Nm + 180° additional turn
Stabilizer bar to coupling rod ♦ Use new nut ♦ Counterhold at joint pin inner multi-point fitting	65 Nm

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Component	Tightening Specification
Tie rod end to wheel bearing housing ♦ Use new nut	20 Nm + 90° additional turn
Universal joint to steering gear ♦ Use a new bolt	30 Nm
Heat shield to steering gear ♦ M6 bolt is self-tapping	6 Nm
Exhaust system bracket to subframe . Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 26 .	

Tightening specification, pendulum support to the transmission

Bolt	Tightening Specification
M10 x 35 ♦ Use a new bolt	50 Nm + 90° additional turn
M10 x 75 ♦ Use a new bolt	50 Nm + 90° additional turn

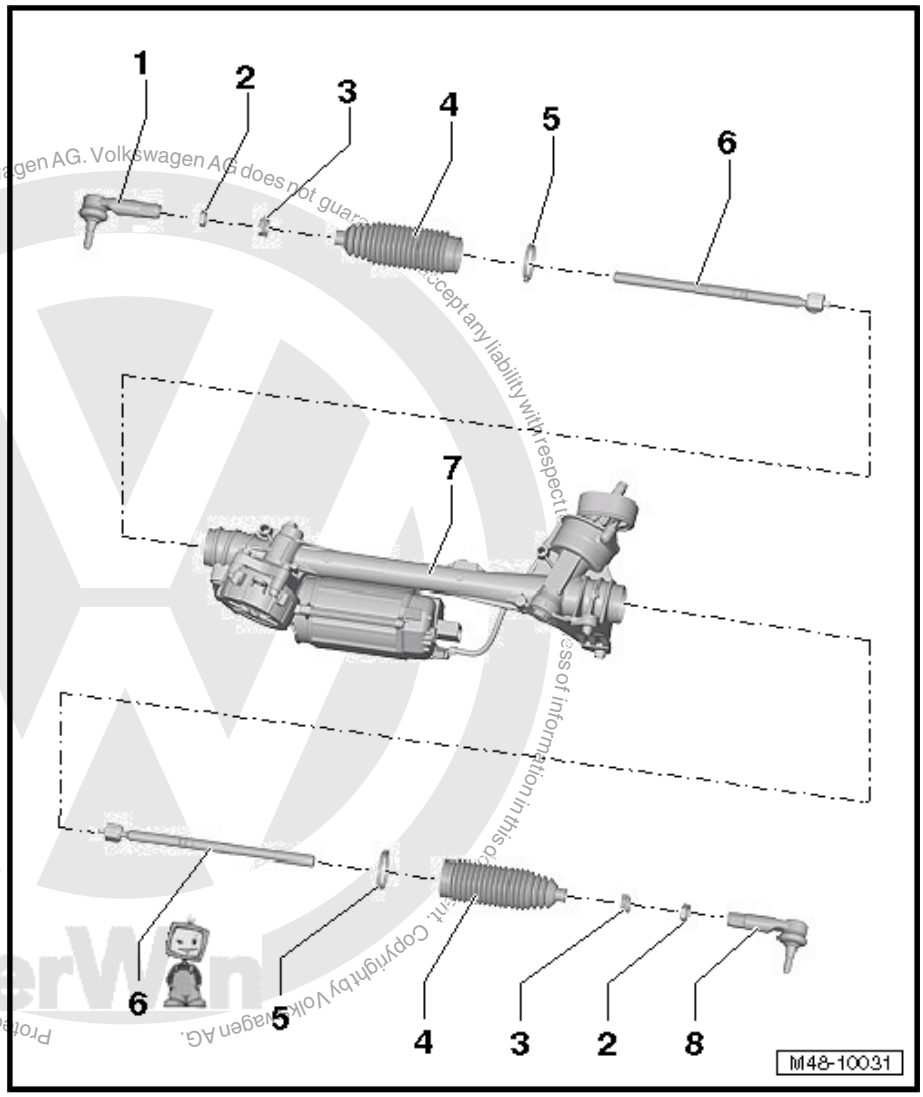
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8 Electromechanical Steering Gear, Servicing

⇒ “8.1 Overview - Electromechanical Steering Gear”, page 336
⇒ “8.2 Tie Rod, Removing and Installing”, page 337
⇒ “8.3 Tie Rod End, Removing and Installing”, page 339
⇒ “8.4 Boot, Removing and Installing”, page 340
⇒ “8.6 Tie Rod Length, Checking and Adjusting”, page 342
⇒ “8.6 Tie Rod Length, Checking and Adjusting”, page 342
⇒ “8.7 Tie Rod End Allocation”, page 343

8.1 Overview - Electromechanical Steering Gear

Currently, there is no service work to be performed on steering gear.



1 - Right Tie Rod End

- ❑ Identified with “A”. Refer to ⇒ page 338
- ❑ Removing and installing. Refer to ⇒ “8.3 Tie Rod End, Removing and Installing”, page 339 .
- ❑ Checking. Refer to ⇒ “8.5 Checking Play, Fastening and Joint Boots of Tie Rod Ends”, page 342 .
- ❑ Installation position. Refer to ⇒ “8.7 Tie Rod End Allocation”, page 343
- ❑ Allocation. Refer to the Parts Catalog.

2 - Nut

- ❑ 70 Nm

3 - Clamp

4 - Boot

- ❑ Must not be twisted after toe is adjusted
- ❑ Removing and installing. Refer to ⇒ “8.4 Boot, Removing and Installing”, page 340 .

5 - Clamp

- ❑ Replacing
- ❑ Tensioning. Refer to ⇒ page 343 .

6 - Tie rod

- ❑ 100 Nm
- ❑ Removing and installing. Refer to ⇒ “8.2 Tie Rod, Removing and Installing”, page 337 .

7 - Power Steering Gear

- ❑ Allocation. Refer to the Parts Catalog.
- ❑ Removing and installing. Refer to ⇒ “6.2 Steering Gear, Removing and Installing”, page 320 .

8 - Left Tie Rod End

- ❑ Identified with “B”. Refer to ⇒ page 338
- ❑ Removing and installing. Refer to ⇒ “8.3 Tie Rod End, Removing and Installing”, page 339 .
- ❑ Checking. Refer to ⇒ “8.5 Checking Play, Fastening and Joint Boots of Tie Rod Ends”, page 342 .
- ❑ Installation position. Refer to ⇒ “8.7 Tie Rod End Allocation”, page 343
- ❑ Allocation. Refer to the Parts Catalog.

8.2 Tie Rod, Removing and Installing

Special tools and workshop equipment required

- ♦ Puller - Ball Joint - 3287A-
- ♦ Hose Clip Pliers - VAG1275A-
- ♦ Torque Wrench 1332 40-200Nm - VAG1332-
- ♦ Torque Wrench Insert - Open Jaw - VAG1923-
- ♦ Locking Pliers - VAS6199-

Perform the Following

Removing

– Turn steering wheel into straight ahead position.

– Loosen the wheel bolts.

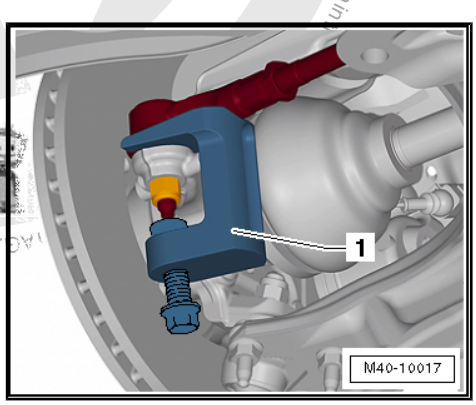
– Raise the vehicle.

– Remove the wheel.

– Clean outside of steering gear in area of the boot.

– Loosen the nut from the tie rod end, but do not unscrew yet.

> **Caution**
>
> *To protect the thread, screw the nut on the pin a few turns.*



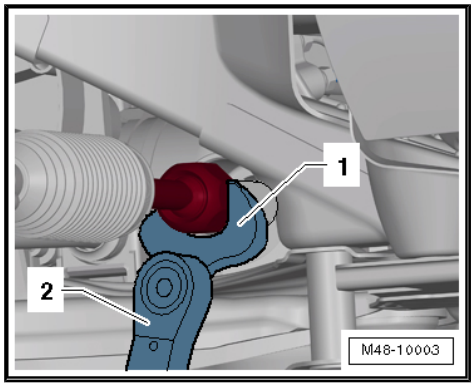
– Open the clamps and push back boot.

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– Remove tie rod.

1 - Torque Wrench Insert - Open Jaw - VAG1923-

2 - Torque Wrench 1332 40-200Nm - VAG1332-



Note

- *If corrosion, damage, wear-out or first signs of soiling on steering rack can be seen, complete steering gear must be replaced.*
- *If no grease film is visible on steering rack, steering gear must also be replaced completely.*

Installing Tie Rod

Install in reverse order of removal. Note the following:

Caution

Do not lubricate the steering rack.

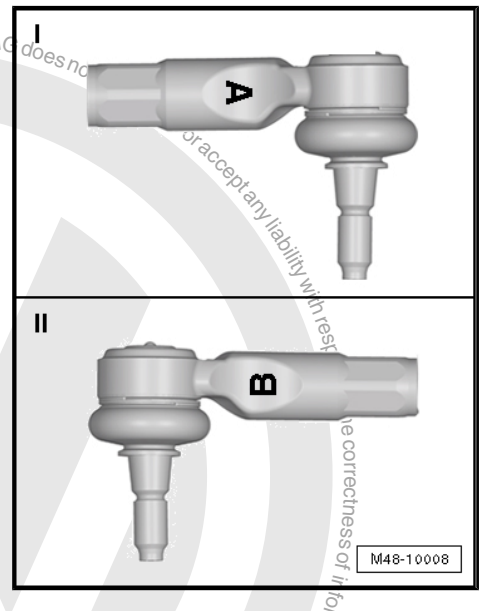
– Make sure the correct tie rod end is installed on each side.

I - Right tie rod end identified with an “A”

II - Left tie rod end identified with a “B”

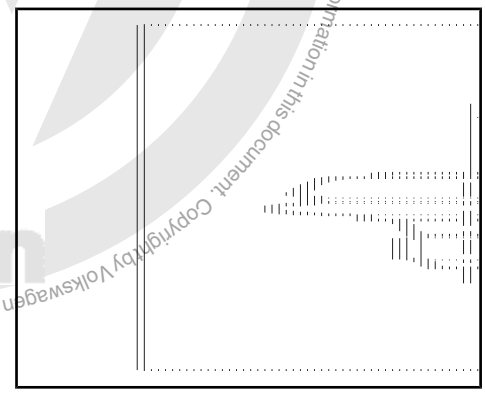
– Turn steering wheel into straight ahead position.

– Guide new clamp and boot onto tie rod.



– Twist tie rod far enough into tie rod end until dimension -a- is obtained.

Dimension -a- = 376.6 ± 1 mm



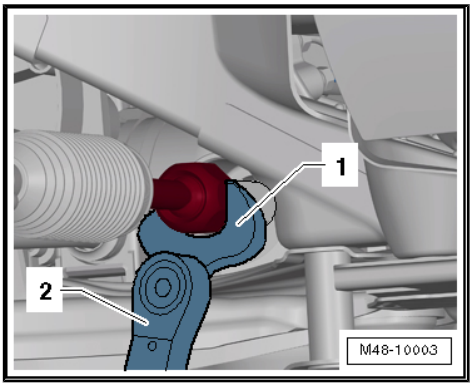
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– Tighten the tie rod.

1 - Torque Wrench Insert - Open Jaw - VAG1923-

2 - Torque Wrench 1332 40-200Nm - VAG1332-

– Slightly grease the sealing surface of the bellow to the tie rod with Grease - G 052 168 A1- (from the repair kit, from Fuchs Renolit JP1619).

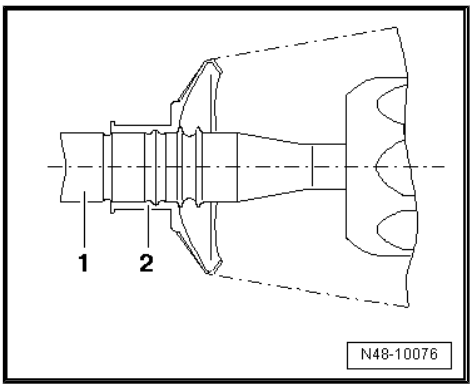


– Slide boot -2- onto tie rod -1-, pay attention to correct position when doing this.

– Secure spring clamp on boot using Hose Clip Pliers - VAG1275A- .

– Slightly grease the sealing surface of the boot to the steering gear housing with Grease - G 052 168 A1- (from the repair kit, from Fuchs Renolit JP1619).

– Push the boot all the way onto the steering gear housing.

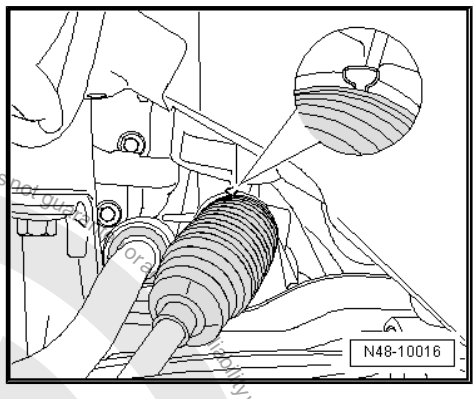


– Tighten new clamp using Locking Pliers - VAS6199- to the extent depicted in the illustration.

– Install the wheel and tighten. Refer to ⇒ “2 Wheel Installation Tightening Specifications”, page 237 .

– Perform a vehicle alignment. Refer to ⇒ “8 Wheel Alignment”, page 256 .

– If both tie rods were replaced, then it is necessary to “adapt the steering end stops basic setting” with the Vehicle Diagnostic Tester .



Tightening Specifications

Component	Tightening Specification
Tie rod to steering rack	100 Nm
Tie rod end to tie rod	70 Nm
Tie rod end to wheel bearing housing ♦ Use new nut	20 Nm + 90° turn

8.3 Tie Rod End, Removing and Installing

Special tools and workshop equipment required

♦ Puller - Ball Joint - T10187-

♦ Torque Wrench 1332 40-200Nm - VAG1332-

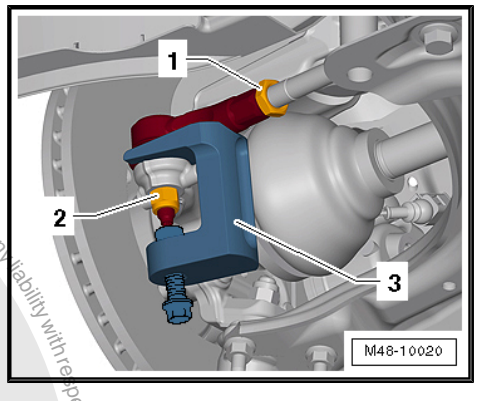
Perform the Following

Removing

– Loosen the wheel bolts.

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– Raise the vehicle.
– Remove the wheel.
– Loosen nut -1-.
– Mark the position of the tie rod end on the tie rod.
– Loosen the nut -2- from the tie rod end, but do not remove it.



Caution

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

– Remove the tie rod from the wheel bearing housing and remove the nut.

1 - Puller - Ball Joint - T10187-

– Remove the tie rod end from the tie rod.

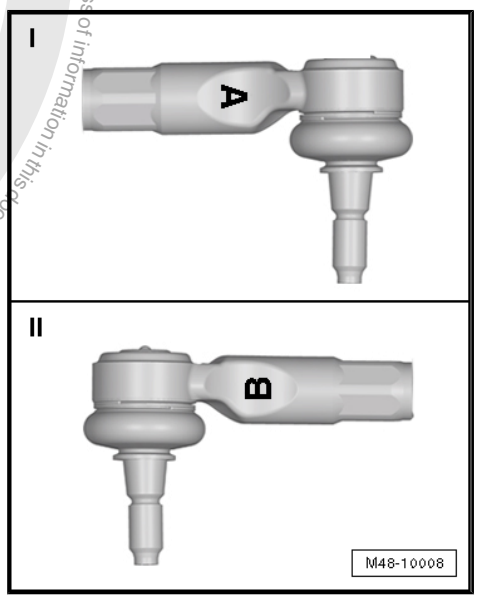
Installing

Install in reverse order of removal. Note the following:

– Make sure the correct tie rod end is installed on each side.

I - Right tie rod end identified with an “A”

II - Left tie rod end identified with a “B”



– Turn the tie rod end to marking made earlier on the tie rod and secure it with a locking nut.
– Install the tie rod end into the wheel bearing housing.
– Install the tie rod end with a new nut.
– Install the front wheel and tighten. Refer to ⇒ “2 Wheel Installation Tightening Specifications”, page 237 .
– Perform a vehicle alignment. Refer to ⇒ “8 Wheel Alignment”, page 256 .

Tightening Specifications

Component	Tightening Specification
Tie rod end to tie rod	70 Nm
Tie rod end to wheel bearing housing ♦ Use new nut	20 Nm + 90° turn

8.4 Boot, Removing and Installing

Special tools and workshop equipment required

♦ Hose Clip Pliers - VAG1275A-
♦ Torque Wrench 1332 40-200Nm - VAG1332-
♦ Open Ring Wrench - 24mm - VAG1332/11-
♦ Locking Pliers - VAS6199-

Perform the Following

Removing

Note

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

– Turn steering wheel into straight ahead position.
– Loosen the wheel bolts.
– Raise the vehicle.
– Remove the wheel.
– Mark the location of the nut on the tie rod.
– Remove the tie rod end. Refer to ⇒ "10.3 Tie Rod End, Removing and Installing", page 354 .
– Clean outside of steering gear in area of the boot.

While Doing This, No Dirt Must Enter the Steering Gear through the Faulty Boot.

– Open the clamps.
– Remove the boot from the steering gear and the tie rod.

Note

- *If corrosion, damage, wear-out or first signs of soiling on steering rack can be seen, complete steering gear must be replaced.*
- *If no grease film is visible on steering rack, steering gear must also be replaced completely.*

Installing

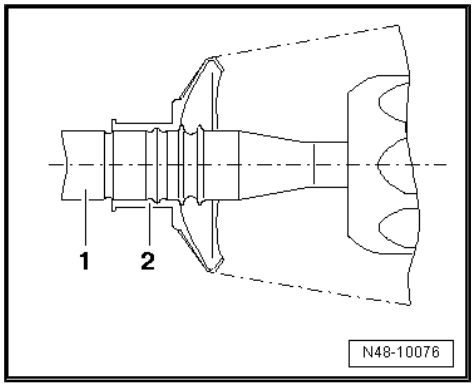
Caution

Do not lubricate the steering rack.

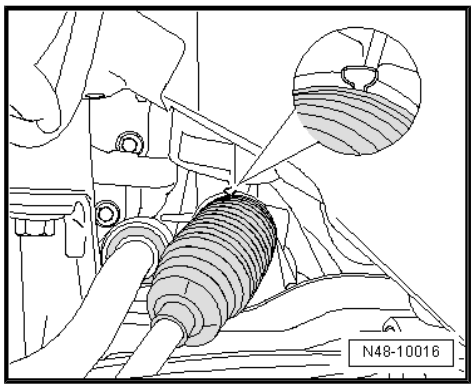
– Turn steering wheel into straight ahead position.
– Guide new clamp and boot onto tie rod.
– Slightly grease the sealing surface of the boot to the tie rod with Grease - G 052 168 A1- (from the repair kit, from Fuchs Renolit JP1619).

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– Slide the boot -2- onto the tie rod -1- as illustrated.
– Secure spring clamp on boot using Hose Clip Pliers - VAG1275A- .
– Slightly grease the sealing surface of the boot to the steering gear housing with Grease - G 052 168 A1- (from the repair kit, from Fuchs Renolit JP1619).
– Push the boot all the way onto the steering gear housing.



– Tighten new clamp using Locking Pliers - VAS6199- to the extent depicted in the illustration.
– Install the tie rod end up to the marking made earlier during the removal. Refer to ⇒ “10.3 Tie Rod End, Removing and Installing”, page 354 .
– Install the front wheel and tighten. Refer to ⇒ “2 Wheel Installation Tightening Specifications”, page 237 .
– Perform a vehicle alignment. Refer to ⇒ “8 Wheel Alignment”, page 256 .
– If both tie rods were replaced, then the basic setting for the Steering Angle Sensor - G85- must be performed using the Vehicle Diagnostic Tester .
– Then perform the basic setting on the steering using the Vehicle Diagnostic Tester .



Tightening Specifications

Component	Tightening Specification
Tie rod end to tie rod	70 Nm

8.5 Checking Play, Fastening and Joint Boots of Tie Rod Ends

– With vehicle raised (wheels hanging free), check play by moving tie rods and wheels. Play: no play
– Check fastening.
– Check boots are not damaged and are seated correctly.

8.6 Tie Rod Length, Checking and Adjusting

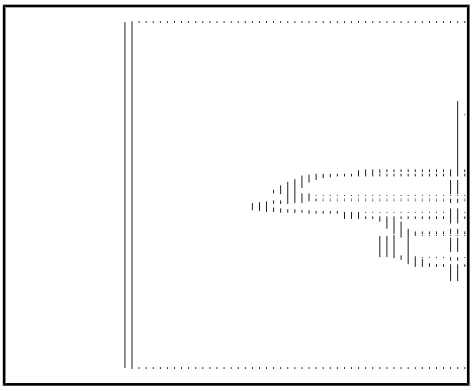
Special tools and workshop equipment required

♦ Hose Clip Pliers - VAG1275A-

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Perform the Following

– Check left tie rod for dimension “a” and adjust if necessary.



Dimension -a- = 376.6 ± 1 mm

Also check new tie rods for dimension “a” before installing and adjust if necessary.

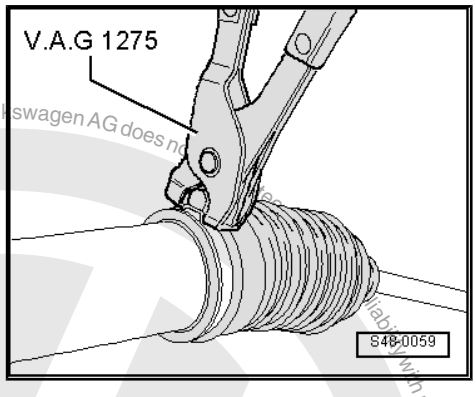
The total toe must be checked on the alignment rack and adjusted if necessary. Refer to ⇒ “8 Wheel Alignment”, page 256

Boot, Mounting

– Check the boot for wear (slits, cracks) and check the sealing surfaces of the boot for dirt.

– Install the boot. Turn the tie rod so that the tie rod ball joint shank is in the installation position.

– Tension the clamp using Hose Clip Pliers - VAG1275A- .



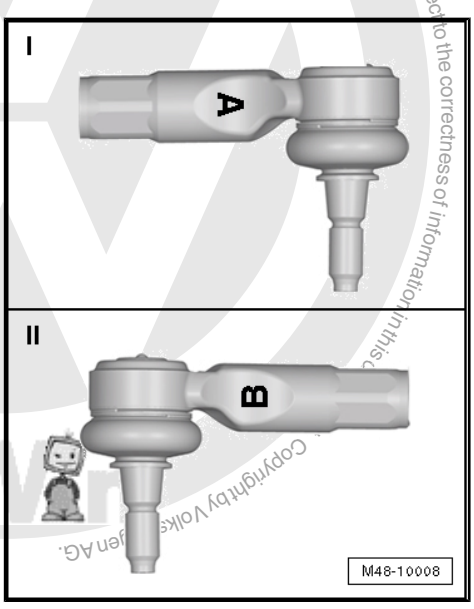
Only use original clamps.

Take care not to twist the boot when installing it.

8.7 Tie Rod End Allocation

I - Right Tie Rod End Is Identified with -A-

II - Left Tie Rod End Is Identified with -B-



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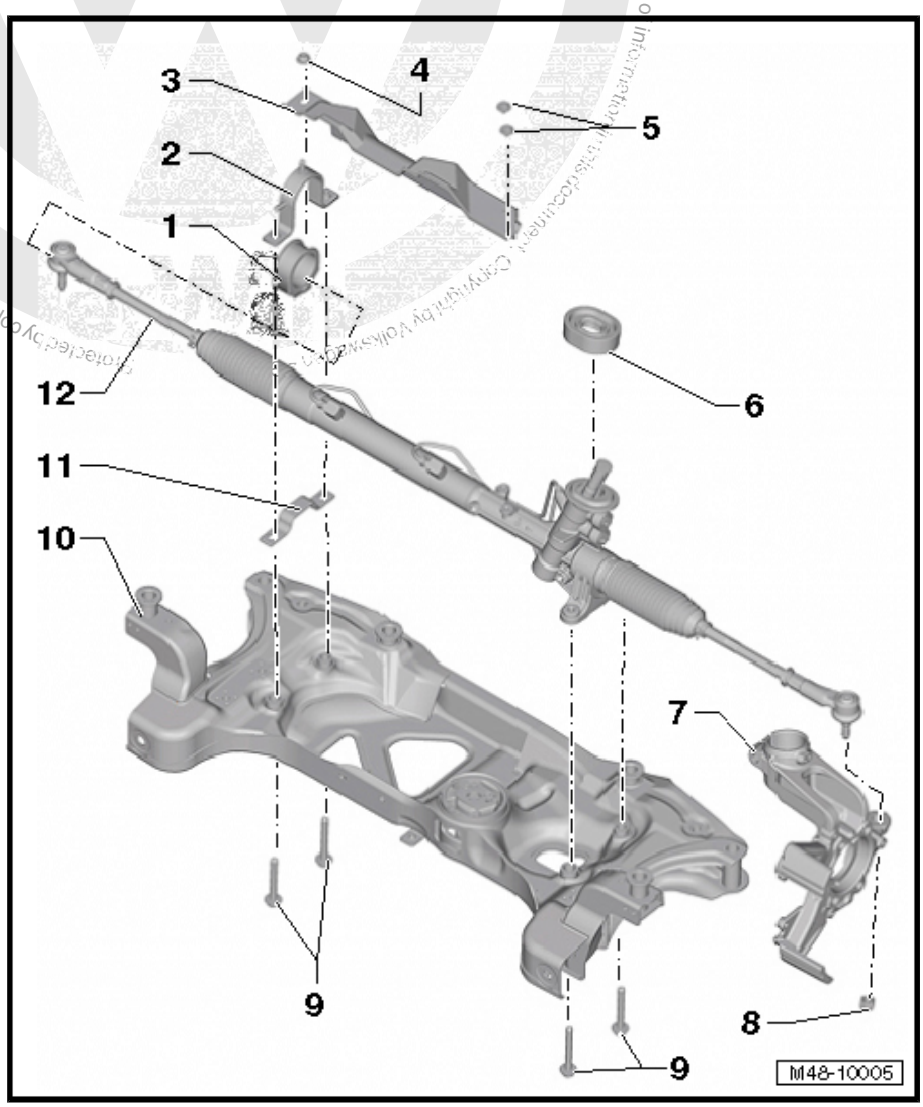
9 Hydraulic Power Steering

⇒ “9.1 Overview - Hydraulic Power Steering”, page 344

⇒ “9.2 Power Steering Gear, Removing and Installing”, page 344

9.1 Overview - Hydraulic Power Steering

⇒ “9.2 Power Steering Gear, Removing and Installing”, page 344



1 - Rubber Bushing

2 - Clamp

- ❑ Always replace if removed

3 - Heat Shield

4 - Nut

- ❑ 6 Nm

5 - Bolt

- ❑ 23 Nm

6 - Seal

7 - Wheel Bearing Housing

8 - Nut

- ❑ 20 Nm and 90° turn

9 - Bolt

- ❑ 50 Nm and 90° turn
- ❑ Always replace if removed

10 - Subframe

11 - Washer

12 - Steering Gear

- ❑ Removing and installing. Refer to ⇒ “9.2 Power Steering Gear, Removing and Installing”, page 344 .

9.2 Power Steering Gear, Removing and Installing

Special tools and workshop equipment required

- ♦ Hose Clamps - Up To 25mm - 3094-
- ♦ Puller - Ball Joint - T10187-
- ♦ Torque Wrench 1331 5-50Nm - VAG1331-
- ♦ Torque Wrench 1332 40-200Nm - VAG1332-
- ♦ Engine and Gearbox Jack - VAS6931-

♦ Shop Crane - Drip Tray - VAS6208-

Perform the Following

Removing

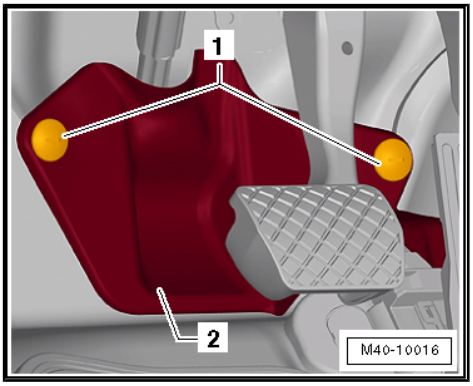
– Turn the steering wheel in the straight position and remove the ignition key so that the steering wheel lock engages.

Vehicles with “Keyless Access” Keyless Locking and Starting System

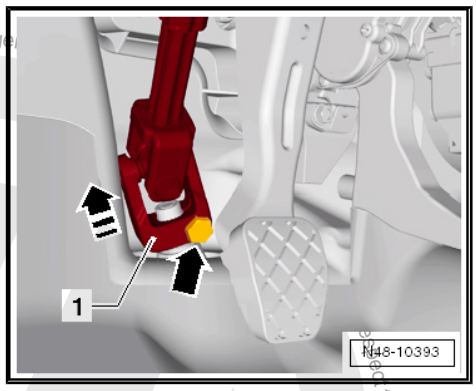
– Switch the ignition off and open the driver door so the steering wheel lock engages.

Continuation for All Vehicles

– Remove the bolts -1- and remove the footwell trim panel -2-.



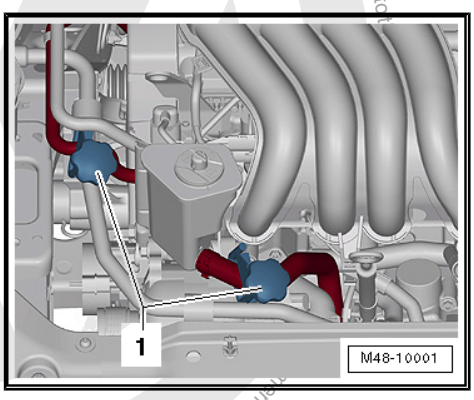
– Remove the bolt -arrow- from the universal joint -1-, and then remove the universal joint in the direction of -arrow-.



Vehicles with a 2.0L Engine

– Clamp off suction and return hose on the power steering fluid reservoir.

1 - Hose Clamps - Up To 25mm - 3094-

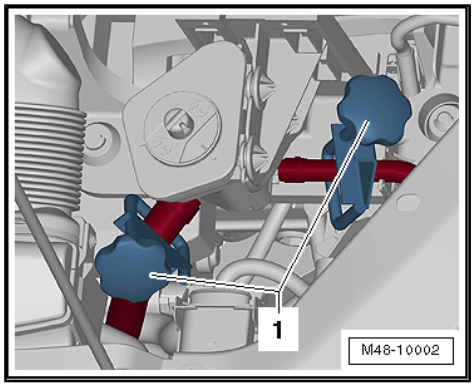


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Vehicles with a 2.5L Engine

– Clamp off suction and return hose on the power steering fluid reservoir.

1 - Hose Clamps - Up To 25mm - 3094-



Continuation for All Vehicles

– Loosen the wheel bolts.

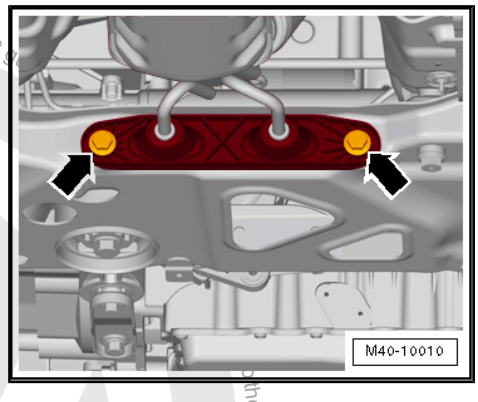
– Raise the vehicle.

– Remove the front wheels.

– Remove the lower noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Noise Insulation .

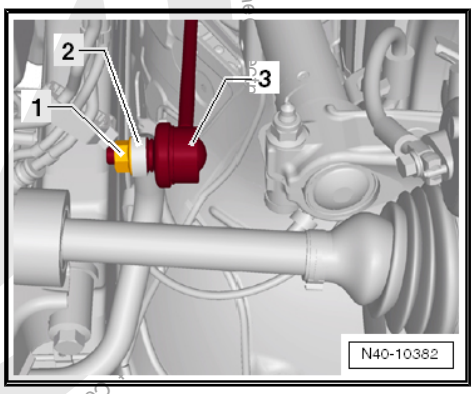
– Remove the exhaust system bracket from the subframe -arrows-.

– Loosen the double clamp for the exhaust system.



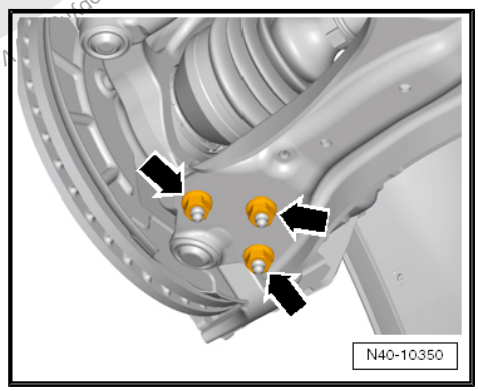
– Remove the hex nut -1- from the right and left coupling rod -3-.

– Remove the coupling rod -3- from the stabilizer bar -2- on the left and right sides.



– Remove the nuts -arrows- on the left and right side of the vehicle.

– Remove the control arm from the ball joint.



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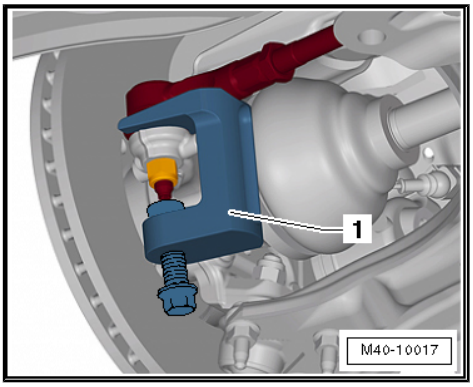
– Loosen the nut from the tie rod end, but do not unscrew yet.

Caution

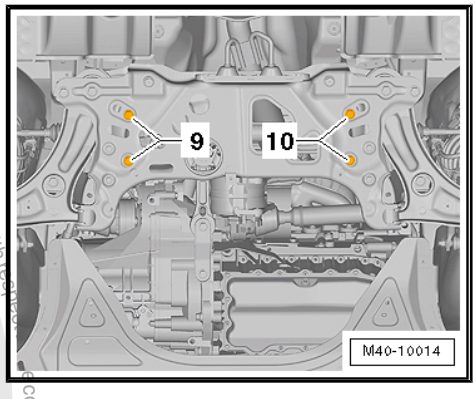
To protect the thread, screw the nut on the pin a few turns.

– Remove the tie rod end from the wheel bearing housing and remove the nut.

1 - Puller - Ball Joint - T10187-

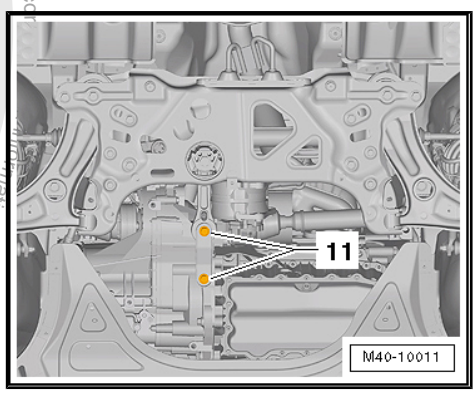


– Remove the steering gear bolts -9 and 10-.

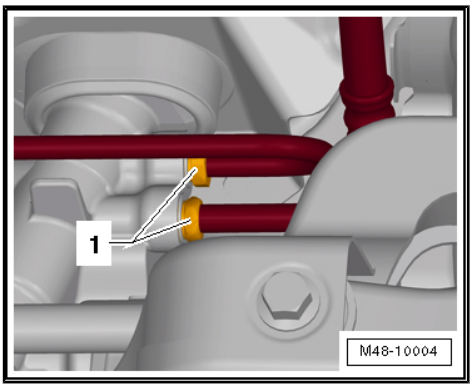


– Remove the bolts -11- and then remove the pendulum support from the transmission.

– Secure the subframe. Refer to ⇒ “4.3 Subframe, Securing”, page 11 .

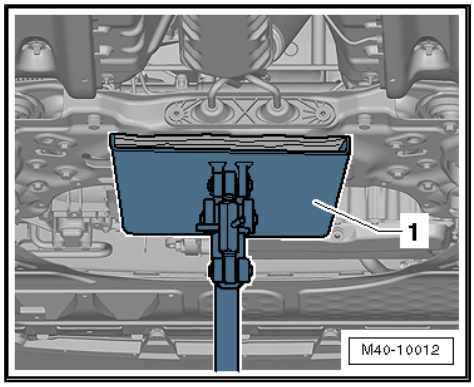


– Remove the pressure line and return line -1- from the steering gear.



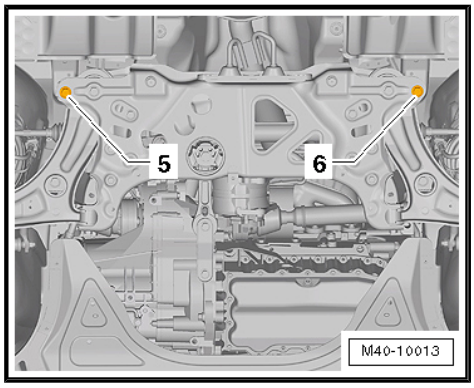
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– Place the Engine and Gearbox Jack - VAS6931- -1- under the subframe.



– Remove the bolts -5 and 6- and lower the subframe using the Engine and Gearbox Jack - VAS6931- .

– Take power steering gear out to the rear.



Installing

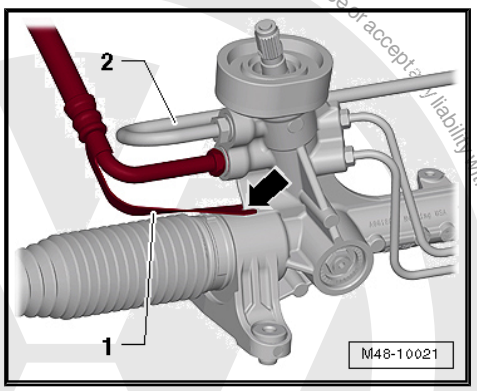
Install in reverse order of removal. Note the following:

- Use new O-rings for hose/line connections.
- Coat the seal on the steering gear with lubricant such as soft soap before installing the steering gear.
- After attaching steering gear to drive axle, make sure that seal on steering gear is positioned on the mounting plate without and kinks and is sealed correctly. The opening to the footwell must seal correctly. Ingress of water and/or noises may be the result.
- Make sure sealing surfaces are clean.
- Replace the tie rod boots when replacing the power steering gear.

Pay attention to the installation position for the hydraulic lines on the steering gear

Extension Hose with Strap, Vehicles with 2.0L Engine

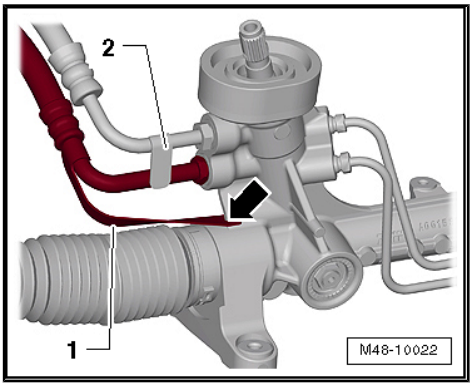
- The strap recess -1- on the expansion hose must be supported by the steering gear -arrow-.
- Then install the return hose -2-.



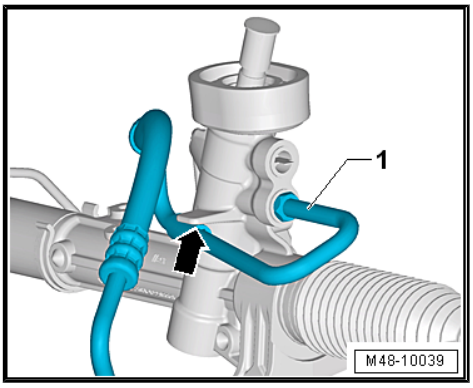
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Expansion Hose with Strap, Vehicles with 2.5L Engine

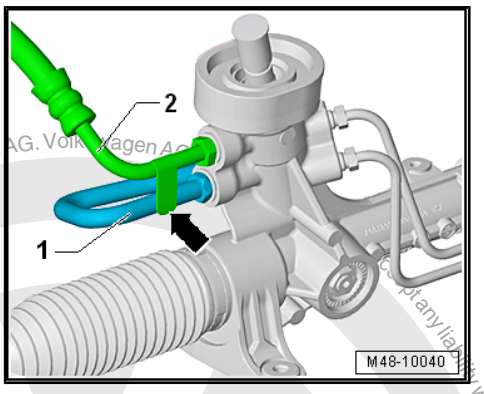
- The strap recess -1- on the expansion hose must be supported by the steering gear -arrow-.
- The strap -2- on the return hose must be supported on the expansion hose.



Expansion Hose without Strap, All Engines



- The expansion hose -1- must be supported by the steering gear -arrow-.
- The strap -arrow- on the return hose -2- must be supported by the expansion hose -1-.



– Install and tighten the noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Noise Insulation for the tightening specifications.

– Install the front wheels and tighten. Refer to ⇒ “2 Wheel Installation Tightening Specifications”, page 237 .

Tightening Specifications

Component	Tightening Specification
Steering gear to subframe ♦ Use new bolts.	50 Nm + 90° turn
Ball joint to control arm ♦ Use new nuts ♦ Tighten only in curb weight position. Refer to ⇒ “2 Rear Axle Curb Weight (Twist Beam Rear Suspension)”, page 146 .	100 Nm
Subframe to body ♦ Use new bolts.	70 Nm + 180° turn
Stabilizer bar to coupling rod ♦ Use new nut ♦ Counterhold at joint pin inner multi-point fitting	65 Nm
Tie rod end to wheel bearing housing ♦ Use new nut	20 Nm + 90° turn

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Component	Tightening Specification
Universal joint to steering gear ♦ Use a new bolt	30 Nm
Union nut, pressure/return line to the steering gear	32 Nm
Exhaust system bracket to subframe . Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 26 .	

Tightening Specification, Pendulum Support to the Transmission

Bolt	Tightening Specification
M10 x 35 ♦ Use a new bolt	50 Nm + 90° turn
M10 x 75 ♦ Use a new bolt	50 Nm + 90° turn

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10 Hydraulic Power Steering Gear, Servicing

⇒ “10.1 Overview - Power Steering Gear”, page 351

⇒ “10.2 Tie Rod, Removing and Installing”, page 352

⇒ “10.3 Tie Rod End, Removing and Installing”, page 354

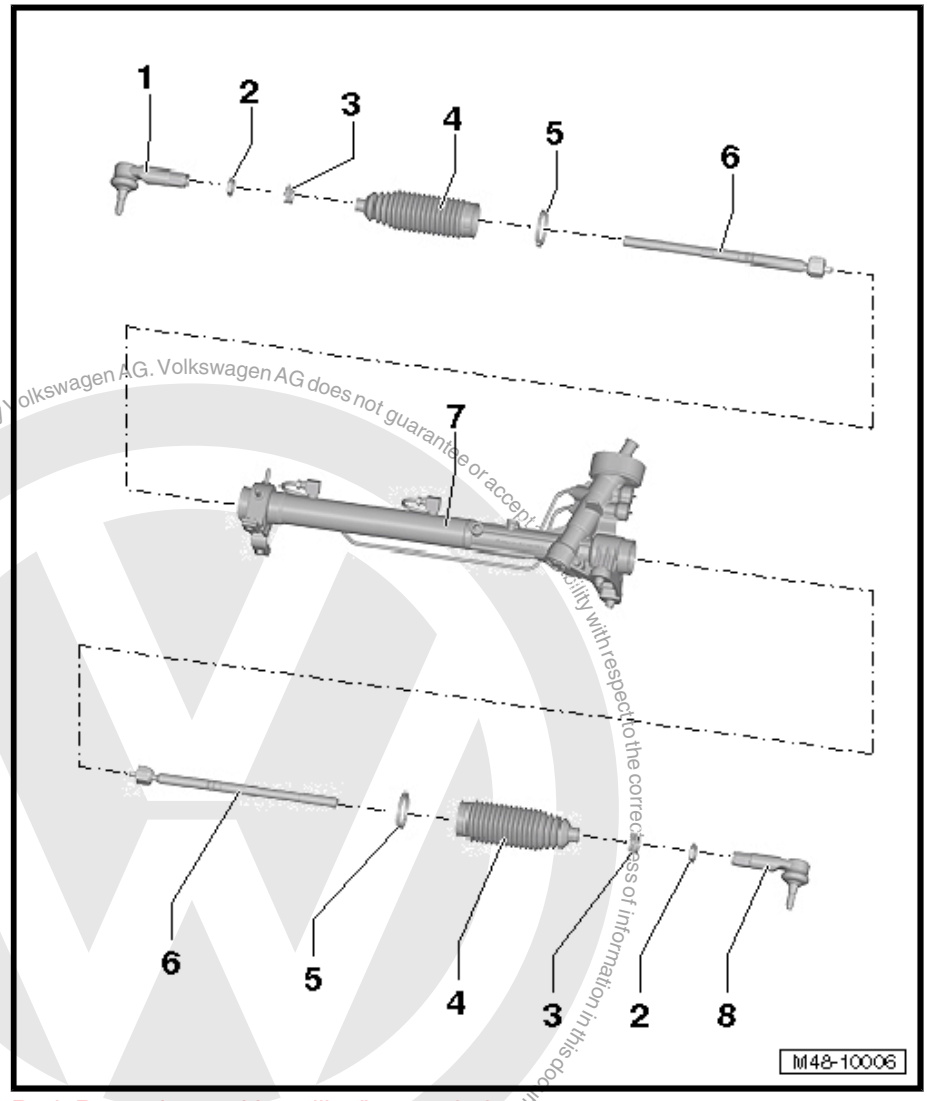
⇒ “10.4 Boot, Removing and Installing”, page 355

⇒ “10.5 Checking Play, Fastening and Joint Boots of Tie Rod Ends”, page 357

⇒ “10.6 Left Tie Rod Length, Checking and Adjusting”, page 357

⇒ “10.7 Tie Rod End Allocation”, page 358

10.1 Overview - Power Steering Gear



1 - Right Tie Rod End

- ❑ Identified with “A”. Refer to ⇒ Fig. “”“” , page 353
- ❑ Removing and installing. Refer to ⇒ “10.3 Tie Rod End, Removing and Installing”, page 354 .
- ❑ Checking. Refer to ⇒ “10.5 Checking Play, Fastening and Joint Boots of Tie Rod Ends”, page 357 .
- ❑ Installation position. Refer to ⇒ “10.7 Tie Rod End Allocation”, page 358

2 - Nut

- ❑ 70 Nm

3 - Clamp

4 - Boot

- ❑ Must not be twisted after toe is adjusted
- ❑ To replace, remove steering gear

5 - Clamp

- ❑ Replacing
- ❑ Tensioning. Refer to ⇒ , page 357 .

6 - Right Tie Rod

- ❑ 100 Nm
- ❑ Removing and installing. Refer to ⇒ “10.2 Tie Rod, Removing and Installing”, page 352 .
- ❑ Is preset when supplied as replacement part

7 - Power Steering Gear

- ❑ Allocation. Refer to the Parts Catalog.
- ❑ Removing and installing. Refer to ⇒ “9.2 Power Steering Gear, Removing and Installing”, page 344 .

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8 - Left Tie Rod End

- ❑ Identified with “B” ⇒ Fig. “”“ , page 353
- ❑ Removing and installing. Refer to ⇒ “10.3 Tie Rod End, Removing and Installing”, page 354 .
- ❑ Checking. Refer to ⇒ “10.5 Checking Play, Fastening and Joint Boots of Tie Rod Ends”, page 357 .
- ❑ Installation position ⇒ “10.7 Tie Rod End Allocation”, page 358

10.2 Tie Rod, Removing and Installing

Special tools and workshop equipment required

- ♦ Torque Wrench 1332 40-200Nm - VAG1332-
- ♦ Torque Wrench Insert - Open Jaw - VAG1923-
- ♦ Puller - Ball Joint - T10187-
- ♦ Locking Pliers - VAS 6199-

Perform the Following

Removing

– Loosen the wheel bolts.

– Raise the vehicle.

– Remove the wheel.

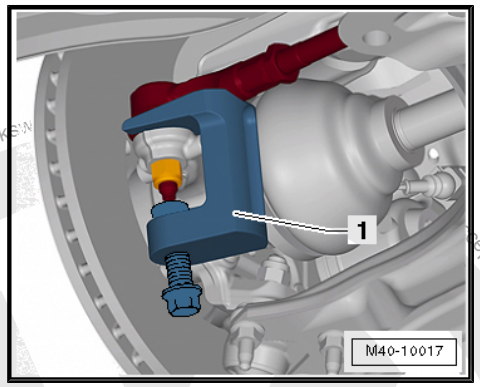
– Loosen the nut from the tie rod end, but do not unscrew yet.

Caution

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

– Remove the tie rod from the wheel bearing housing and remove the nut.

1 - Puller - Ball Joint - T10187-



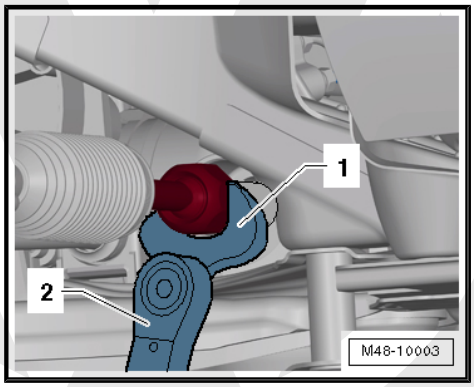
– Clean outside of power steering gear in the area of the boot.

– Open the clamps and push back boot.

– Remove tie rod.

1 - Torque Wrench Insert - Open Jaw - VAG1923-

2 - Torque Wrench 1332 40-200Nm - VAG1332-



Note

- ♦ *If corrosion, damage, wear-out or first signs of soiling on steering rack can be seen, complete steering gear must be replaced.*
- ♦ *If no grease film is visible on steering rack, steering gear must also be replaced completely.*

Installing

Install in reverse order of removal while noting the following:

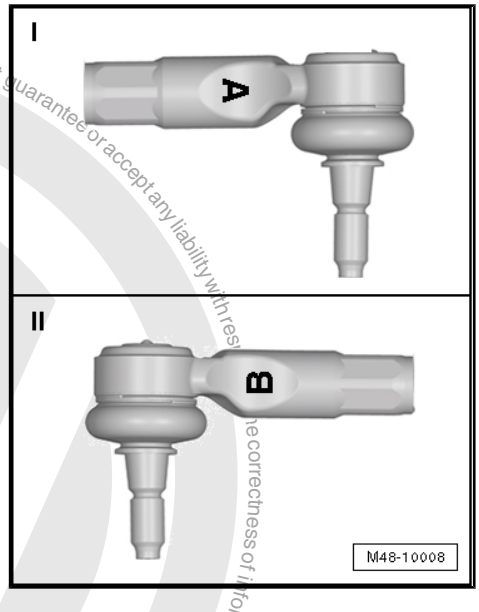
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– Make sure the correct tie rod end is installed on each side.

I - Right tie rod end identified with an “A”

II - Left tie rod end identified with a “B”

Before installing, the steering rack must be coated with the Steering Gear Grease - AOF 063 000 04- supplied in the repair kit.



Caution

Never use any other grease.

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

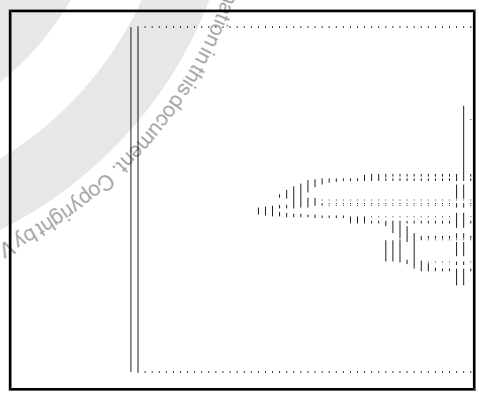
– Grease the steering rack on the toothed side with the Steering Gear Grease - AOF 063 000 04- .

– Turn steering wheel into straight ahead position.

– Guide new clamp and boot onto tie rod.

– Twist tie rod far enough into tie rod end until dimension -a- is obtained.

Dimension -a- = 376.6 ± 1 mm

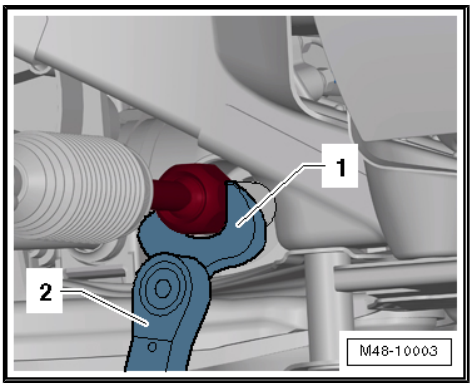


– Tighten the tie rod.

1 - Torque Wrench Insert - Open Jaw - VAG1923-

2 - Torque Wrench 1332 40-200Nm - VAG1332-

– Slightly grease the sealing surface of the boot to the tie rod with Grease - G 052 168 A1- (from the repair kit, from Fuchs Renolit JP1619).

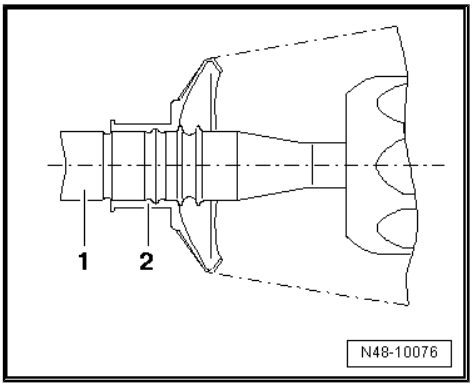


– Position boot -2- on tie rod -1-.

– Secure spring clamp on boot using Hose Clip Pliers - VAG1275A- .

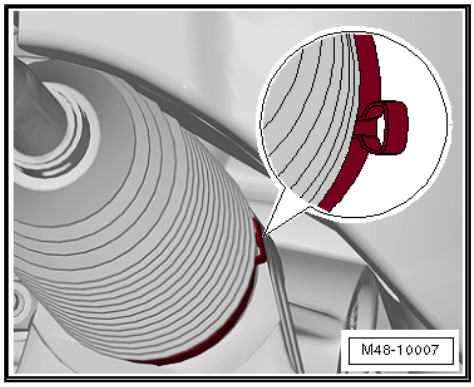
– Slightly grease the sealing surface of the bellow to the steering gear housing with Grease - G 052 168 A1- (from the repair kit, from Fuchs Renolit JP1619).

– Push the boot all the way onto the steering gear housing.



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– Tighten new clamp using Locking Pliers - VAS6199- to the extent depicted in the illustration.
– Install the front wheel and tighten. Refer to ⇒ “2 Wheel Installation Tightening Specifications”, page 237 .
– Perform a vehicle alignment. Refer to ⇒ “8 Wheel Alignment”, page 256 .



Tightening Specifications

Component	Tightening Specification
Tie rod to steering rack	100 Nm
Tie rod end to tie rod	70 Nm
Tie rod end to wheel bearing housing ♦ Use new nut	20 Nm + 90° additional turn

10.3 Tie Rod End, Removing and Installing

Special tools and workshop equipment required

♦ Puller - Ball Joint - T10187-
♦ Torque Wrench 1332 40-200Nm - VAG1332-

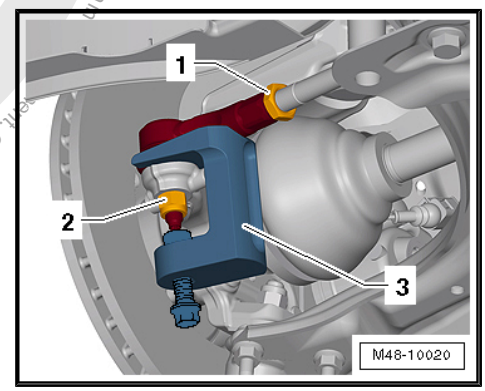
Perform the Following

Removing

– Loosen the wheel bolts.
– Raise the vehicle.
– Remove the wheel.
– Loosen nut -1-.
– Mark the position of the tie rod end on the tie rod.
– Loosen the nut -2- from the tie rod end, but do not remove it.

Caution

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



– Remove the tie rod from the wheel bearing housing and remove the nut.

1 - Puller - Ball Joint - T10187-

– Remove the tie rod end from the tie rod.

Installing

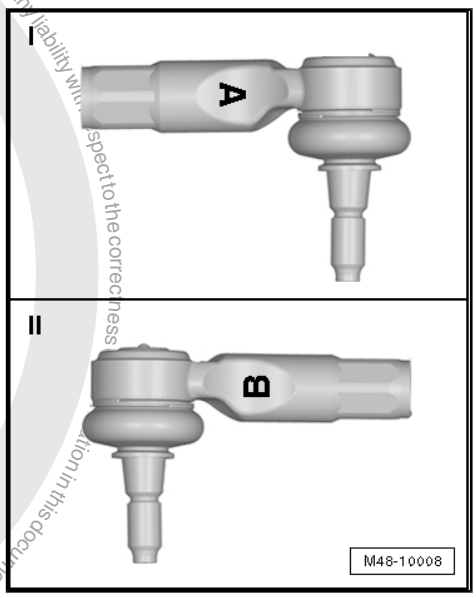
Install in reverse order of removal. Note the following:

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– Make sure the correct tie rod end is installed on each side.

I - Right tie rod end identified with an “A”

II - Left tie rod end identified with a “B”



– Turn the tie rod end to marking made earlier on the tie rod and secure it with a locking nut.
– Install the tie rod end into the wheel bearing housing.
– Install the tie rod end with a new nut.
– Install the wheel and tighten. Refer to ⇒ “2 Wheel Installation Tightening Specifications”, page 237 .
– Perform a vehicle alignment. Refer to ⇒ “8 Wheel Alignment”, page 256 .

Tightening Specifications

Component	Tightening Specification
Tie rod end to tie rod	70 Nm
Tie rod end to wheel bearing housing ♦ Use new nut	20 Nm + 90° additional turn

10.4 Boot, Removing and Installing

Special tools and workshop equipment required

- Hose Clip Pliers - VAG1275A-
- Locking Pliers - VAS6199-

Note

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

Perform the Following

Removing

– Turn steering wheel into straight ahead position.
– Remove the wheel.
– Remove the tie rod end. Refer to ⇒ “10.3 Tie Rod End, Removing and Installing”, page 354 .
– Clean outside of steering gear in area of the boot.

While Doing this, No Dirt Must Enter the Steering Gear through the Faulty Boot.

– Open the clamps.

– Remove the boot from the steering gear and the tie rod.

Note

- *If corrosion, damage, wear-out or first signs of soiling on steering rack can be seen, complete steering gear must be replaced.*
- *If no grease film is visible on steering rack, steering gear must also be replaced completely.*

Installing

Before installing, the steering rack must be coated with the Steering Gear Grease - AOF 063 000 04- supplied in the repair kit.

Caution

Never use any other grease.

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

– Grease the steering rack on the toothed side with the Steering Gear Grease - AOF 063 000 04- .

– Turn steering wheel into straight ahead position.

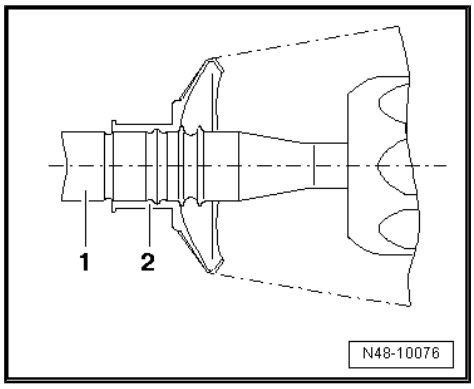
– Guide new clamp and boot onto tie rod.

– Slide the boot -2- onto the tie rod -1- as illustrated.

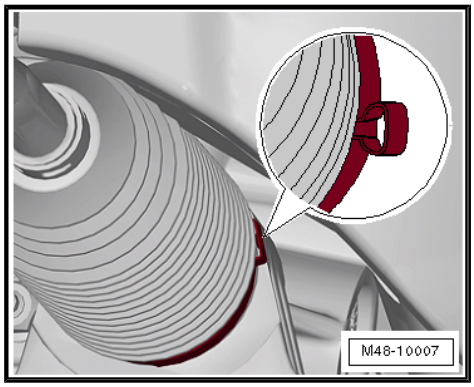
– Secure spring clamp on boot using Hose Clip Pliers - VAG1275A- .

– Slightly grease the sealing surface of the bellow to the steering gear housing with Grease - G 052 168 A1- (from the repair kit, from Fuchs Renolit JP1619).

– Push the boot all the way onto the steering gear housing.



– Tighten new clamp using Locking Pliers - VAS6199- to the extent depicted in the illustration.



– Install the tie rod end. Refer to
⇒ “10.3 Tie Rod End, Removing and Installing”, page 354 .

– Install the front wheel and tighten. Refer to
⇒ “2 Wheel Installation Tightening Specifications”, page 237 .

After the installation the vehicle must be measured.

– Perform a vehicle alignment. Refer to
⇒ “8 Wheel Alignment”, page 256 .

Tightening Specifications

Component	Tightening Specification
Tie rod end to tie rod	70 Nm

10.5 Checking Play, Fastening and Joint Boots of Tie Rod Ends

– With vehicle raised (wheels hanging free), check play by moving tie rods and wheels. Play: no play

– Check fastening.

– Check boots are not damaged and are seated correctly.

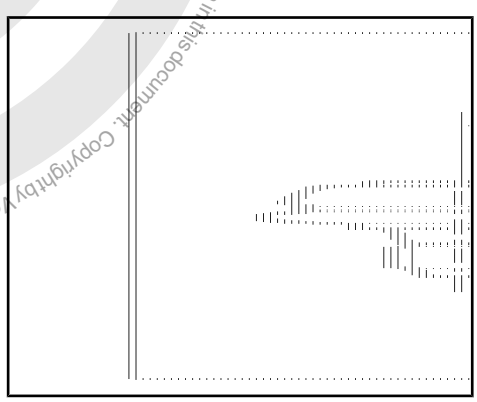
10.6 Left Tie Rod Length, Checking and Adjusting

Special tools and workshop equipment required

♦ Hose Clip Pliers - VAG1275A-

Perform the Following

– Check left tie rod for dimension “a” and adjust if necessary.



Dimension -a- = 376.6 ± 1 mm

Also check new tie rods for dimension “a” before installing and adjust if necessary.

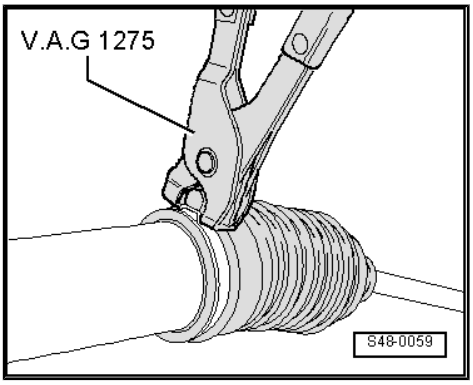
The total toe must be checked on the alignment rack and adjusted if necessary. Refer to ⇒ “8 Wheel Alignment”, page 256

Boot, Mounting

– Check the boot for wear (slits, cracks) and check the sealing surfaces of the boot for dirt.

– Install the boot. Turn the tie rod so that the tie rod ball joint shank is in the installation position.

– Tension the clamp using Hose Clip Pliers - VAG1275A- .



Only Use Original Clamps.

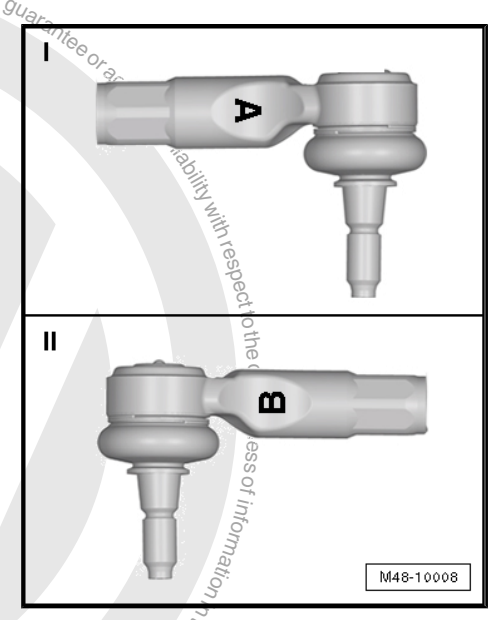
Take care not to twist the boot when installing it.

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10.7 Tie Rod End Allocation

I - Right Tie Rod End Is Identified with -A-

II - Left Tie Rod End Is Identified with -B-



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11 Power Steering Pump, 4-Cylinder Gasoline Engine

⇒ “11.1 Overview - Power Steering Pump ”, page 359

⇒ “11.2 Power Steering Pump, Removing and Installing ”, page 360

11.1 Overview - Power Steering Pump

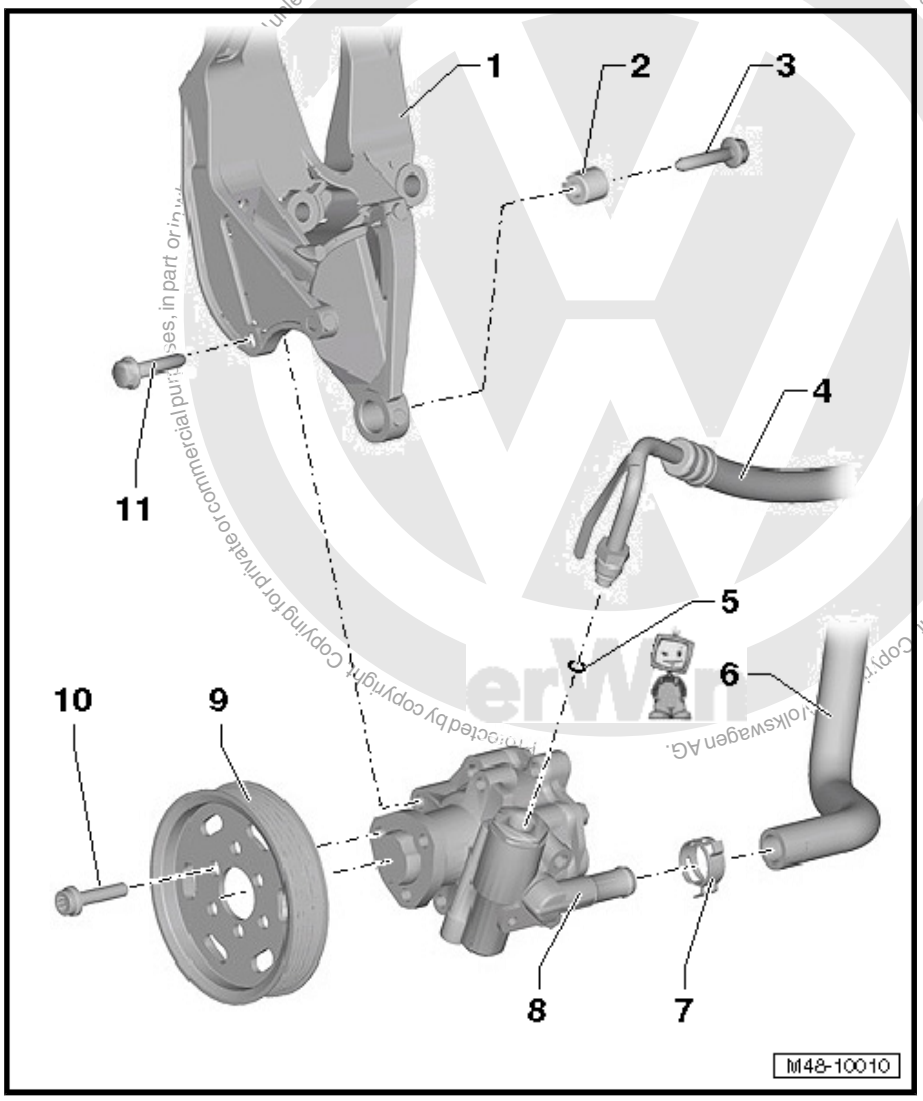
Power steering pump is not designed to be serviced. If there are customer complaints, the cause must be determined using a pressure and leak test. If there is a malfunction, replace the power steering pump.

Note

- *Always replace seals.*
- *Do not reuse fluid you have drained.*
- *If power steering fluid is low in the reservoir, check the steering system for leaks.*
- *If there are leaks in the area of the line connections, the lines/connections must first be inspected for leaks, tightened as necessary and wiped dry.*
- *Replacement power steering pumps from the distribution center do not contain any fluid. Before installing, fill pump with Hydraulic Fluid - G 004 000 M2- and turn pump by hand. Otherwise, the power steering pump may be noisy when operating or may even be damaged.*
- *Fluid type: Hydraulic Fluid - G 004 000 M2-*

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1 - Bracket

2 - Bushing

- ❑ Drive the bushing back slightly to install the power steering pump.

3 - Bolt

- ❑ 22 Nm

4 - Pressure Line

- ❑ 32 Nm

5 - Seal

- ❑ Always replace

6 - Suction Hose

- ❑ Pay attention to the installed position of the power steering pump: the marking on the intake hose must line up with the marking on the power steering pump.

7 - Spring Clamp

- ❑ Install on the marking on the intake hose.

8 - Power Steering Pump

- ❑ Allocation. Refer to the Parts Catalog.
- ❑ Removing and installing. Refer to ⇒ “11.2 Power Steering Pump, Removing and Installing ”, page 360 .
- ❑ Fill with oil prior to installation

9 - Belt Pulley

10 - Bolt

- ❑ 22 Nm

11 - Bolt

- ❑ 22 Nm
- ❑ Quantity: 2

11.2 Power Steering Pump, Removing and Installing

Special tools and workshop equipment required

- ♦ Hose Clamps - Up To 25mm - 3094-
- ♦ Torque Wrench 1331 5-50Nm - VAG1331-

Perform the Following

Removing

WARNING

For all repair work, especially in the engine compartment due to the tight working conditions, observe the following:

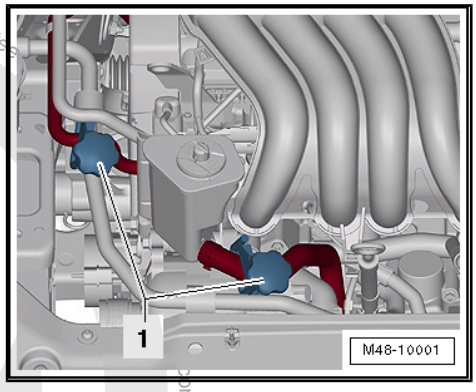
- ***Route lines of all types (for example for fuel, hydraulic, EVAP canister system, coolant and refrigerant, brake fluid, vacuum) correctly. The original path must be followed.***
- ***Make sure that there is sufficient clearance to all moving or hot components.***

– Clamp off suction and return hose on the power steering fluid reservoir.

1 - Hose Clamps - Up To 25mm - 3094-

– Raise the vehicle.

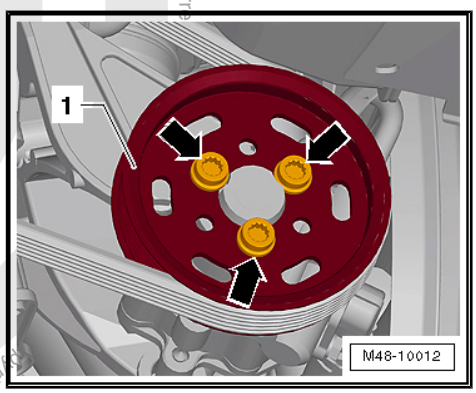
– Remove the lower noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Noise Insulation .



– Loosen the bolts -arrows-.

– Remove the ribbed belt. Refer to ⇒ Rep. Gr. 13 ; Cylinder Block, Belt Pulley Side; Ribbed Belt, Removing and Installing .

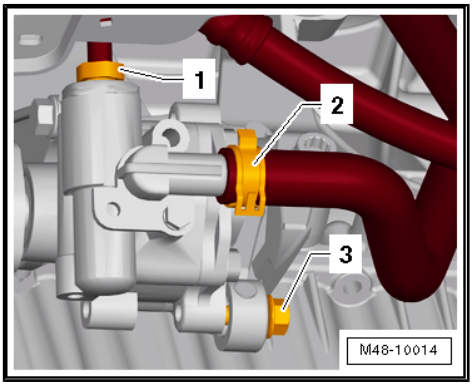
– Remove the bolts -arrows- and the belt pulley -1-.



– Remove the nut -1- and the pressure line from the power steering pump.

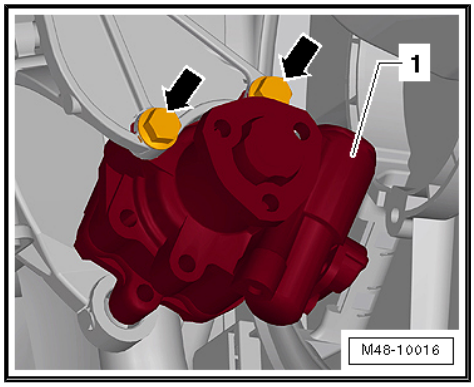
– Open the spring clamp and remove the suction hose -2- from the power steering pump.

– Remove the bolt -3-.



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– Remove bolts -arrows- and remove power steering pump -1- from retainer.



Installing

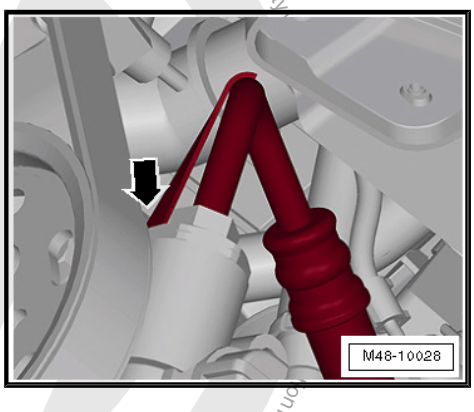
Install in reverse order of removal. Note the following:

Note

- *Replace the gaskets and seals.*
- *Before installing the new power steering pump on the intake side, fill the Hydraulic Fluid and install it by hand until oil drains out on the high pressure side.*
- *Hose supports and hoses must be free of oil and grease before installation.*
- *Secure all hose connections with new hose clamps. Refer to the Parts Catalog.*

– Install the power steering pump, tightening the front bolts first.

– Pay attention to the installed position of the pressure line on the power steering pump.



- The retaining strap -arrow- must be supported on the power steering pump.

– Install the ribbed belt, and then check ribbed belt alignment. Refer to ⇒ Rep. Gr. 13 ; Cylinder Block, Belt Pulley Side; Ribbed Belt, Removing and Installing .

Note

Make sure the ribbed belt fits correctly in the belt pulley.

– Bleed steering system. Refer to ⇒ “18.1 Power Steering System, Bleeding”, page 376 .

– Check the hydraulic fluid level and fill if necessary. Refer to ⇒ Maintenance ; Booklet 20.1 .

– Check the steering system for leaks. Refer to ⇒ “18.2 Steering System, Checking for Leaks”, page 376 .

Tightening Specification

Component	Tightening Specification
Ribbed belt pulley to power steering pump	22 Nm
Pressure line to power steering pump	32 Nm
Power steering pump to bracket	23 Nm

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12 Power Steering Pump, 5-Cylinder Gasoline Engine

⇒ “12.1 Power Steering Pump, Checking Delivery Pressure ”, page 363

⇒ “12.2 Overview - Power Steering Pump ”, page 366

⇒ “12.3 Power Steering Pump, Removing and Installing ”, page 367

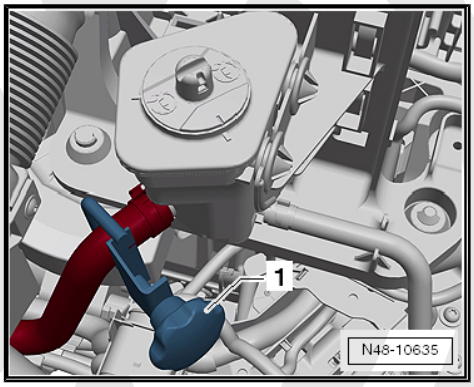
12.1 Power Steering Pump, Checking Delivery Pressure

Special tools and workshop equipment required

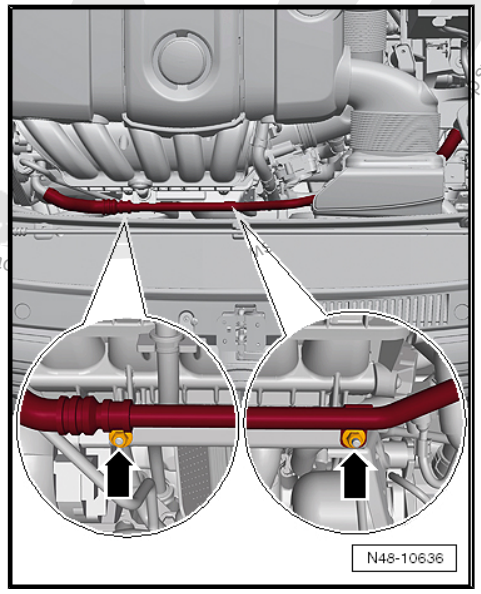
- Hose Clamps - Up To 25mm - 3094-
- Power Steering Test Unit - VAG1402-
- Power Steering Test Unit - Adapter - VAG1402/2-
- Power Steering Test Unit - Adapter Hose - VAG1402/6-
- Power Steering Test Unit - 110 Degree Fitting - VAG1402/1A-

– Disconnect the intake hose from the reservoir.

1 - Hose Clamps - Up To 25mm - 3094-

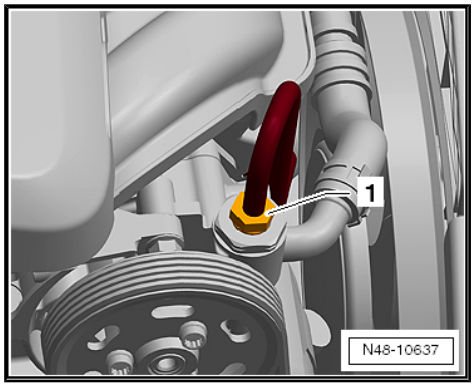


– Remove the nuts -arrows- from the return line.



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– Remove the nut -1- and the pressure line from the power steering pump.



– Mount the Power Steering Test Unit - VAG1402- and the adapters as illustrated.

1 - Power Steering Test Unit - VAG1402-

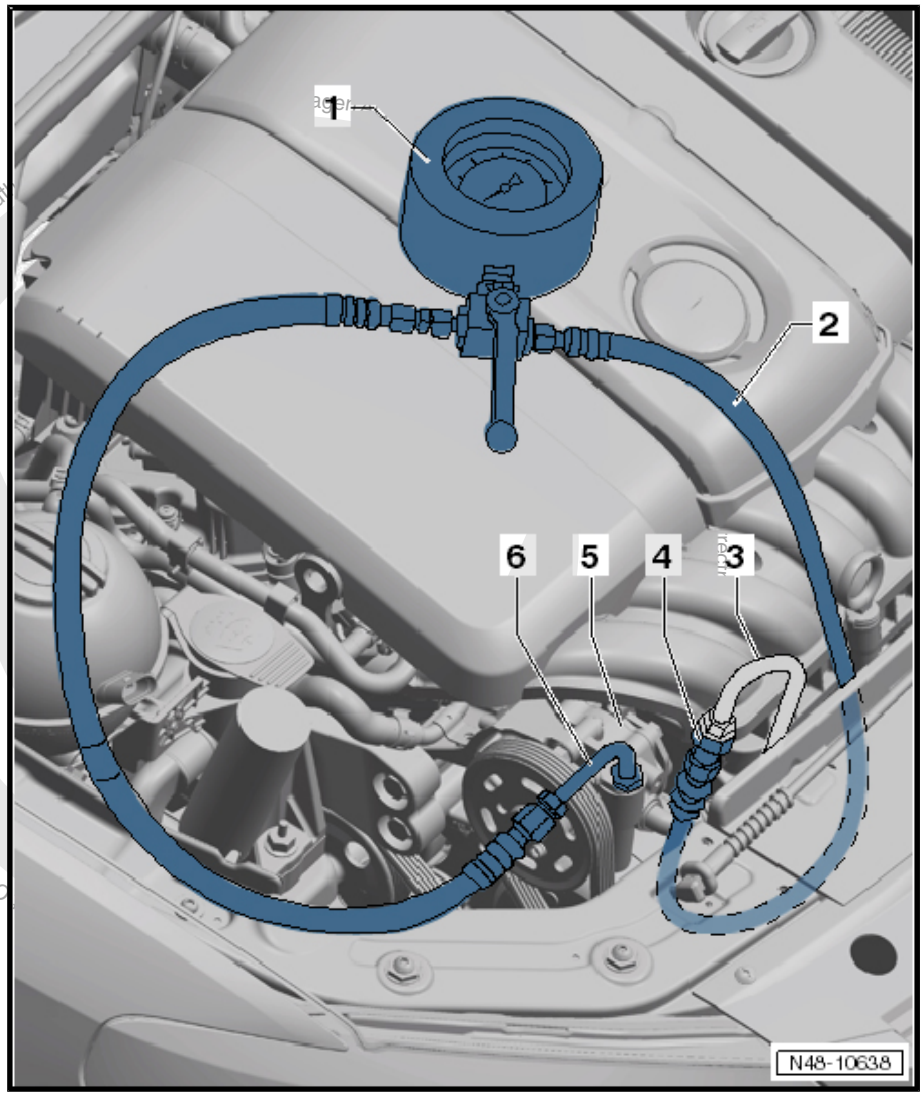
2 - Power Steering Test Unit - Adapter Hose - VAG1402/6-

3 - Pressure Line

4 - Power Steering Test Unit - Adapter - VAG1402/2-

5 - Power Steering Pump

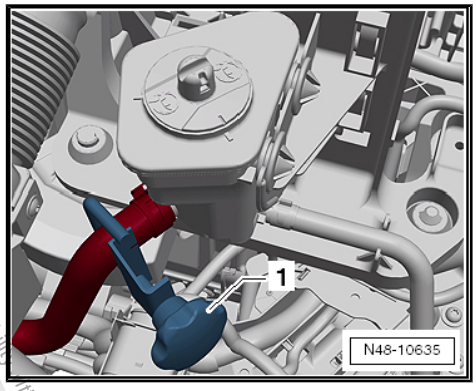
6 - Power Steering Test Unit - 110 Degree Fitting - VAG1402/1A-



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– Remove the Hose Clamps - Up To 25mm - 3094- from the intake hose.

1 - Hose Clamps - Up To 25mm - 3094-

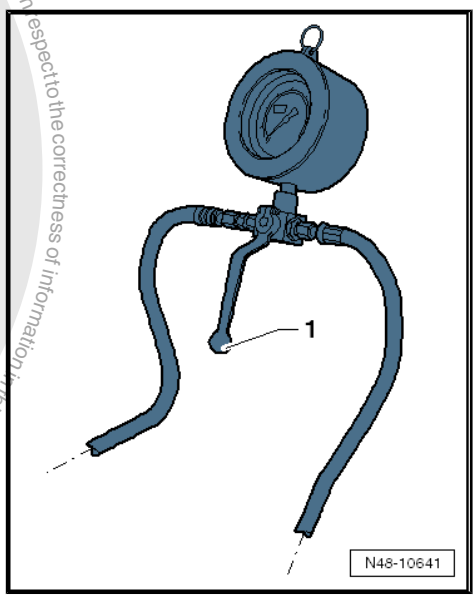


Make sure the lever on the pressure gauge is in position -1-.

– Start engine and fill hydraulic fluid in reservoir if necessary.
– Turn the steering wheel approximately 10 times from stop to stop.
– Check the delivery pressure.

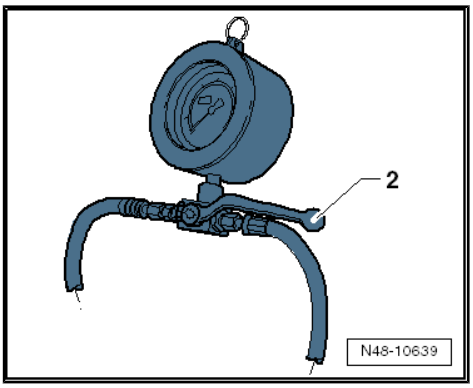
Test Requirement:

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



– Move the shut-off valve lever on the pressure gauge to -2- and read the pressure.

> **Caution**
>
> ***Let the engine run at idle and close the shut-off valve on the pressure gauge for not longer than 5 seconds (position -2-).***



Specification for Delivery Pressure

96 to 104 bar (1392 to 1508 psi)

– If specified value is not obtained, replace power steering pump. Refer to ⇒ “12.3 Power Steering Pump, Removing and Installing ”, page 367 .
– Remove the pressure gauge and adapter.
– Bleed steering system. Refer to ⇒ “18.1 Power Steering System, Bleeding”, page 376 .
– Check hydraulic fluid level and fill, if necessary. Refer to ⇒ “17 Power Steering, Checking Hydraulic Oil Level”, page 375 .
– Check the steering system for leaks. Refer to ⇒ “18.2 Steering System, Checking for Leaks”, page 376 .

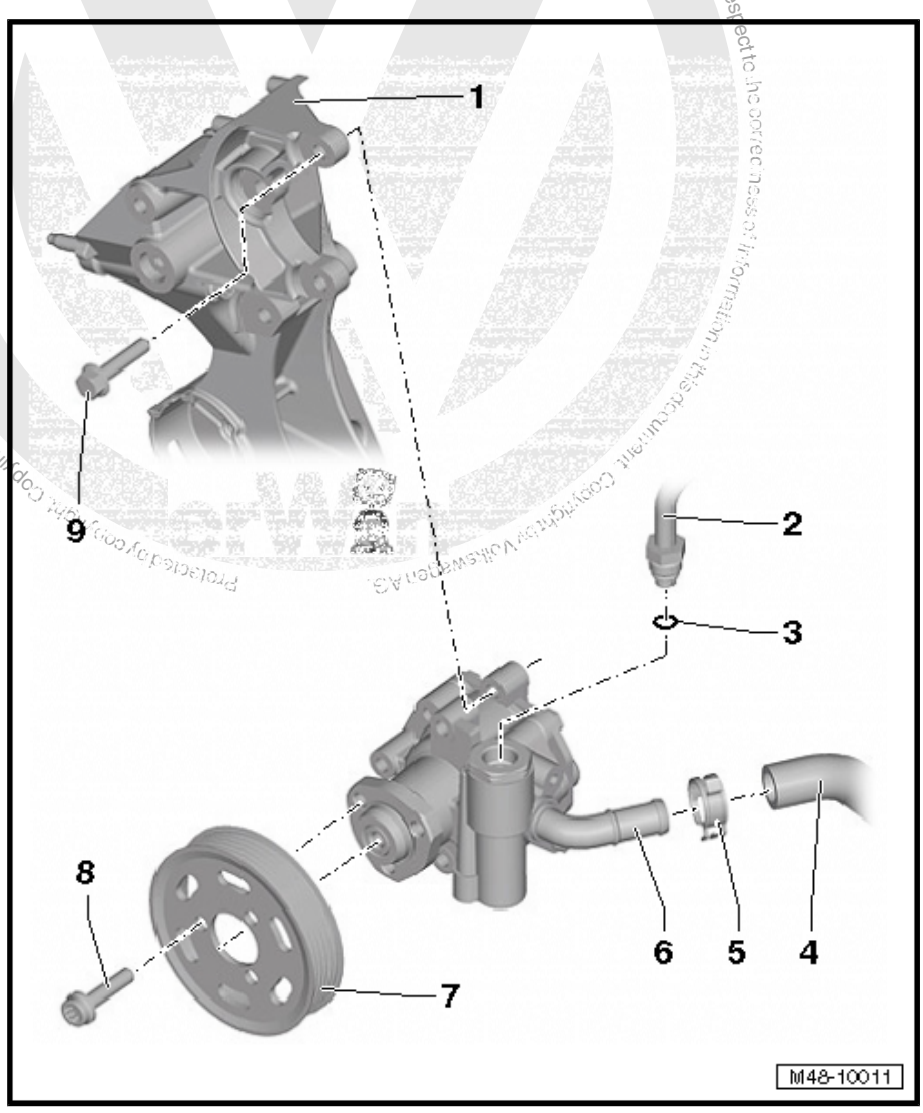
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12.2 Overview - Power Steering Pump

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

Note

- *Always replace seals.*
- *Do not reuse fluid you have drained.*
- *If power steering fluid is low in the reservoir, check the steering system for leaks.*
- *If there are leaks in the area of the line connections, the lines/connections must first be inspected for leaks, tightened as necessary and wiped dry.*
- *Replacement power steering pumps from the distribution center do not contain any fluid. Before installing, fill pump with Hydraulic Fluid - G 004 000 M2- and turn pump by hand. Otherwise, the power steering pump may be noisy when operating or may even be damaged.*
- *Fluid type: Hydraulic Fluid - G 004 000 M2 -*



1 - Bracket

2 - Pressure Line

- ❑ 32 Nm

3 - Seal

- ❑ Always replace

4 - Suction Hose

- ❑ Pay attention to the installed position of the power steering pump: the marking on the intake hose must line up with the marking on the power steering pump.

5 - Spring Clamp

- ❑ Install on the marking on the intake hose.

6 - Power Steering Pump

- ❑ Allocation. Refer to the Parts Catalog.
- ❑ Removing and installing. Refer to ⇒ “12.3 Power Steering Pump, Removing and Installing ”, page 367 .
- ❑ Fill with oil prior to installation

7 - Belt Pulley

8 - Bolt

- ❑ 22 Nm

9 - Bolt

- ❑ 22 Nm
- ❑ Quantity: 3

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12.3 Power Steering Pump, Removing and Installing

Special tools and workshop equipment required

- Hose Clamps - Up To 25mm - 3094-
- Torque Wrench 1331 5-50Nm - VAG1331-

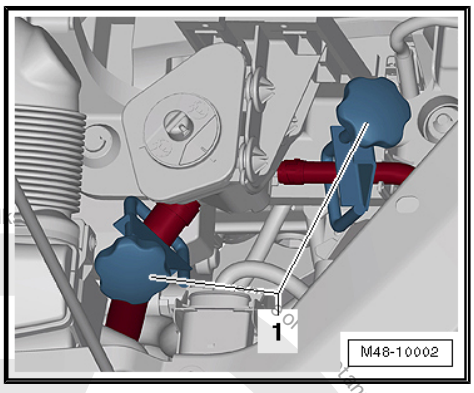
Perform the Following

Removing

> **WARNING**
>
> *For all repair work, especially in the engine compartment due to the tight working conditions, observe the following:*
>
> - *Route lines of all types (for example for fuel, hydraulic, EVAP canister system, coolant and refrigerant, brake fluid, vacuum) correctly. The original path must be followed.*
> - *Make sure that there is sufficient clearance to all moving or hot components.*

– Clamp off suction and return hose on the power steering fluid reservoir.

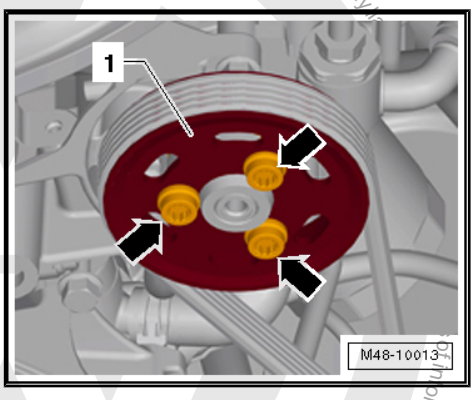
1 - Hose Clamps - Up To 25mm - 3094-



– Loosen the bolts -arrows-.

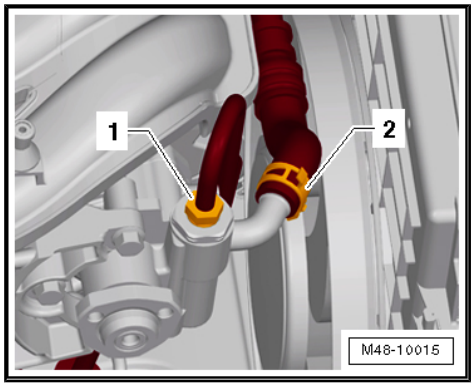
– Remove the ribbed belt. Refer to ⇒ Rep. Gr. 13 ; Cylinder Block, Belt Pulley Side; Ribbed Belt, Removing and Installing .

– Remove the bolts -arrows- and the belt pulley -1-.

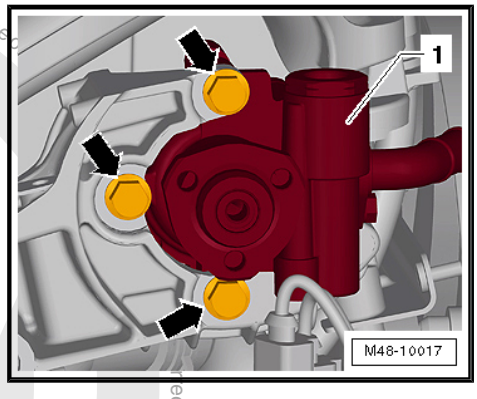


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– Remove the nut -1- and the pressure line from the power steering pump.
– Open the spring clamp and remove the suction hose -2- from the power steering pump.



– Remove bolts -arrows- and remove power steering pump -1- from retainer.



Installing

Install in reverse order of removal. Note the following:

Note

- *Replace the gaskets and seals.*
- *Before installing the new power steering pump on the intake side, fill the Hydraulic Fluid and install it by hand until oil drains out on the high pressure side.*
- *Hose supports and hoses must be free of oil and grease before installation.*
- *Secure all hose connections with new hose clamps. Refer to the Parts Catalog.*

– Install the power steering pump.
– Install the ribbed belt, and then check ribbed belt alignment. Refer to ⇒ Rep. Gr. 13 ; Cylinder Block, Belt Pulley Side; Ribbed Belt, Removing and Installing .

Note

Make sure the ribbed belt fits correctly in the belt pulley.

– Bleed steering system. Refer to ⇒ “18.1 Power Steering System, Bleeding”, page 376 .
– Check the hydraulic fluid level and fill if necessary. Refer to ⇒ Maintenance ; Booklet 20.1 ; Procedure Descriptions .
– Check the steering system for leaks. Refer to ⇒ “18.2 Steering System, Checking for Leaks”, page 376 .

Tightening Specification

Component	Tightening Specification
Ribbed belt pulley to power steering pump	22 Nm
Pressure line to power steering pump	32 Nm
Power steering pump to bracket	23 Nm

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13 Overview - Hydraulic Lines, 4-Cylinder Gasoline Engine

1 - Reservoir

2 - Clamp

3 - Return Hose

4 - Steering Gear

5 - Extension Hose

- ❑ For vehicles with manual transmission
- ❑ Routing the lines on the manual transmission. Refer to ⇒ Fig. ""Expansion Hose Routing on the Manual Transmission -arrows-"" , page 369

6 - Extension Hose

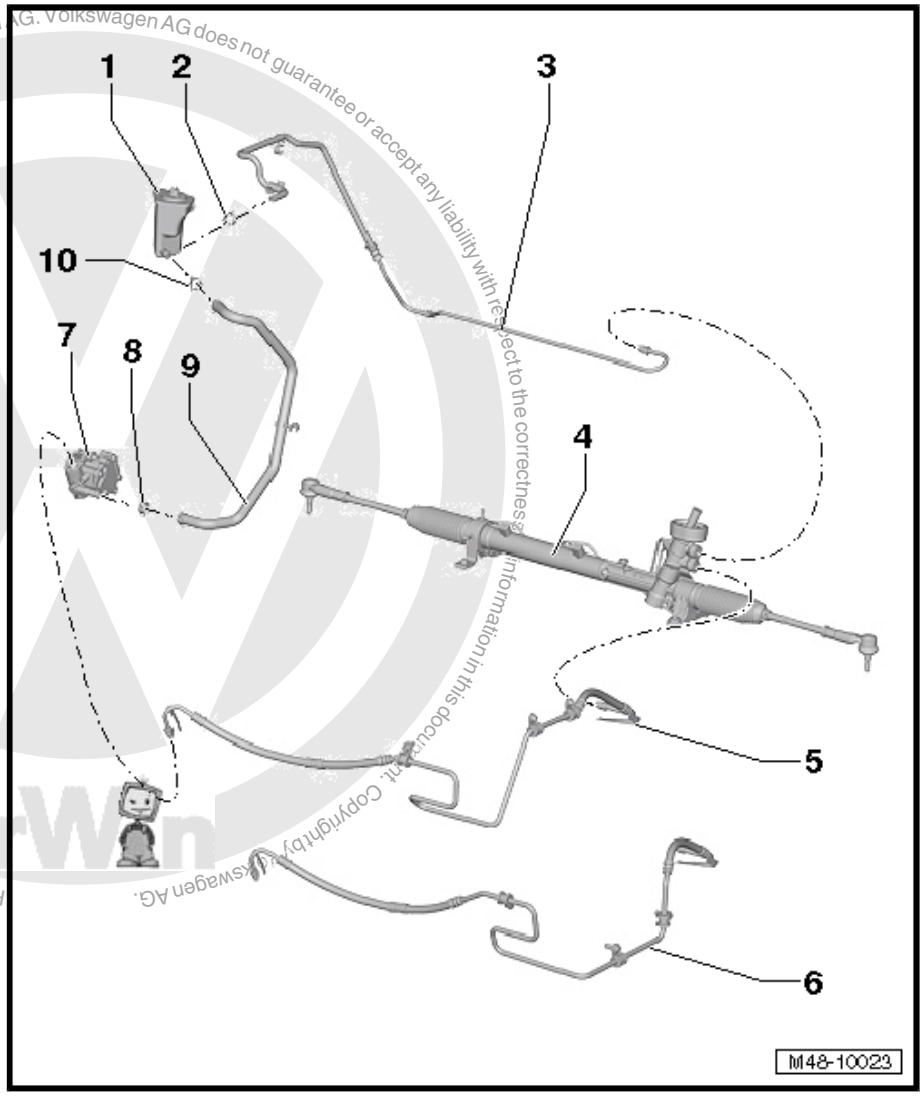
- ❑ For vehicles with an automatic transmission
- ❑ Routing the lines on the automatic transmission. Refer to ⇒ Fig. ""Expansion Hose Routing on the Automatic Transmission -arrows-"" , page 370

7 - Power Steering Pump

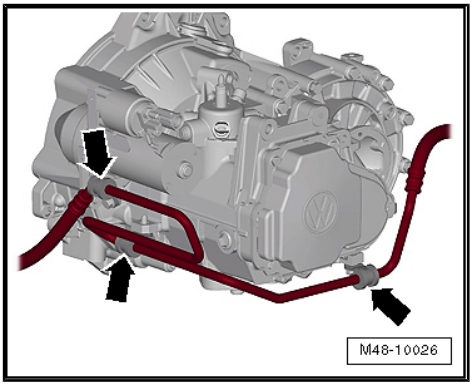
8 - Clamp

9 - Suction Hose

10 - Clamp



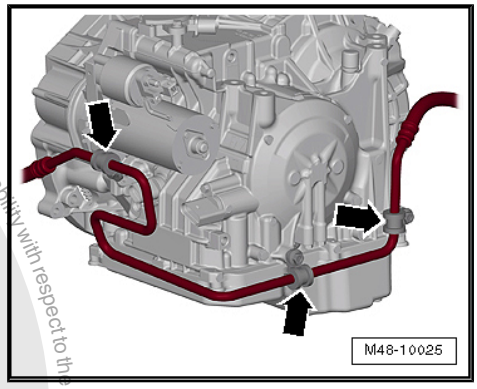
Expansion Hose Routing on the Manual Transmission -arrows-



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Expansion Hose Routing on the Automatic Transmission -arrows-



14 Overview - Hydraulic Lines, 5-Cylinder Gasoline Engine

1 - Power Steering Pump

2 - Clamp

3 - Suction Hose

4 - Clamp

5 - Reservoir

6 - Clamp

7 - Return Hose

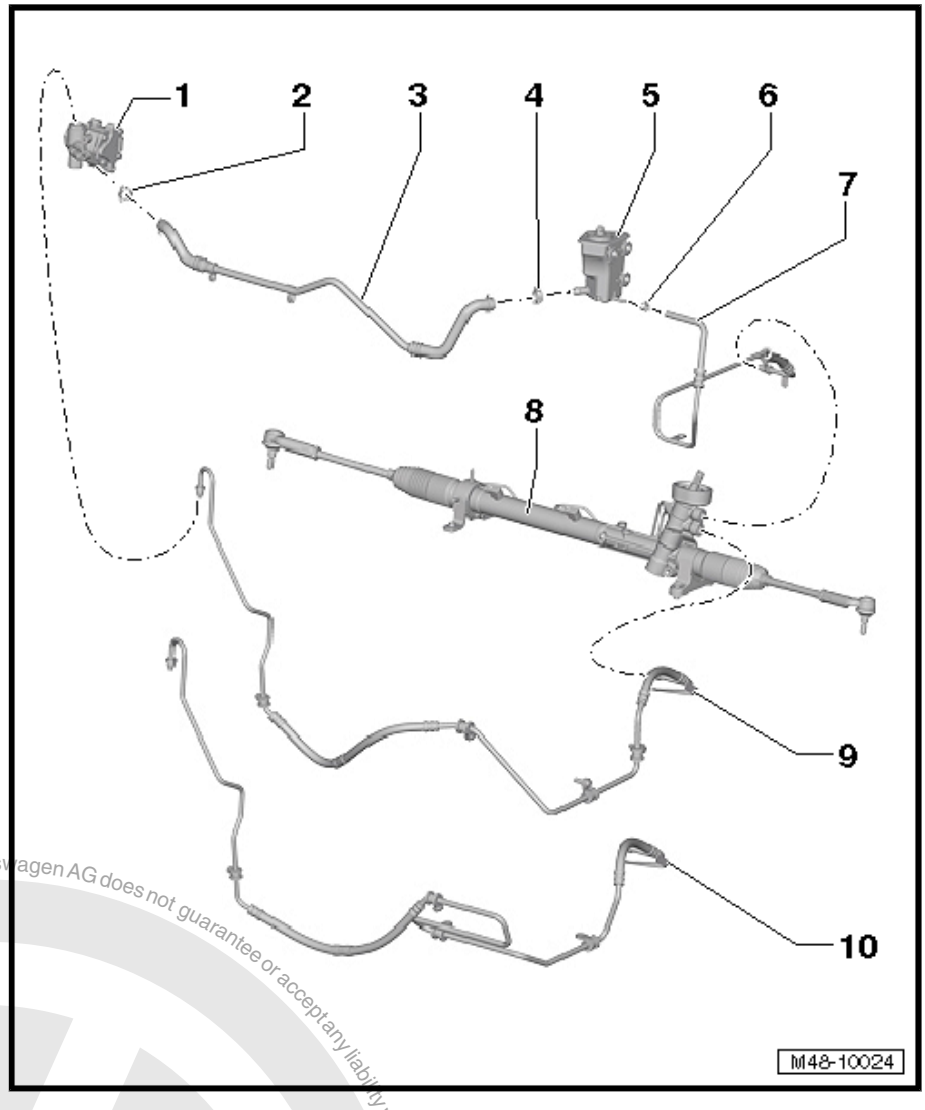
8 - Steering Gear

9 - Extension Hose

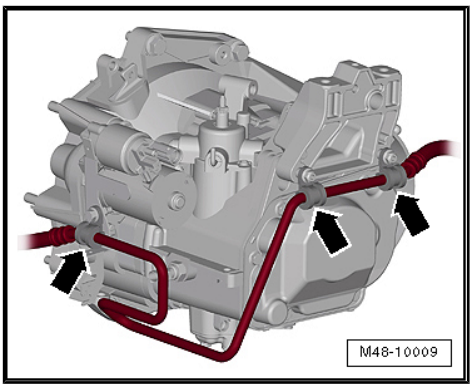
- ❑ For vehicles with an automatic transmission
- ❑ Routing the lines on the automatic transmission. Refer to ⇒ Fig. ""Expansion Hose Routing on the Automatic Transmission -arrows-"" , page 372

10 - Extension Hose

- ❑ For vehicles with manual transmission
- ❑ Routing the lines on the manual transmission. Refer to ⇒ Fig. ""Expansion Hose Routing on the Manual Transmission -arrows-"" , page 371

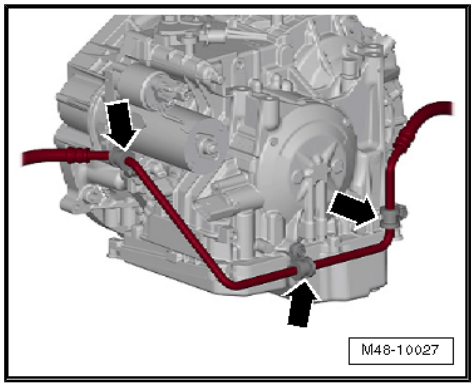


Expansion Hose Routing on the Manual Transmission -arrows-



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Expansion Hose Routing on the Automatic Transmission -arrows-



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15 Overview - Power Steering Fluid Reservoir, 4-Cylinder Gasoline Engine

1 - Cap with Dipstick

- ❑ Power steering, checking fluid level. Refer to ⇒ “17 Power Steering, Checking Hydraulic Oil Level”, page 375 .

2 - Reservoir

3 - Bracket

- ❑ For reservoir

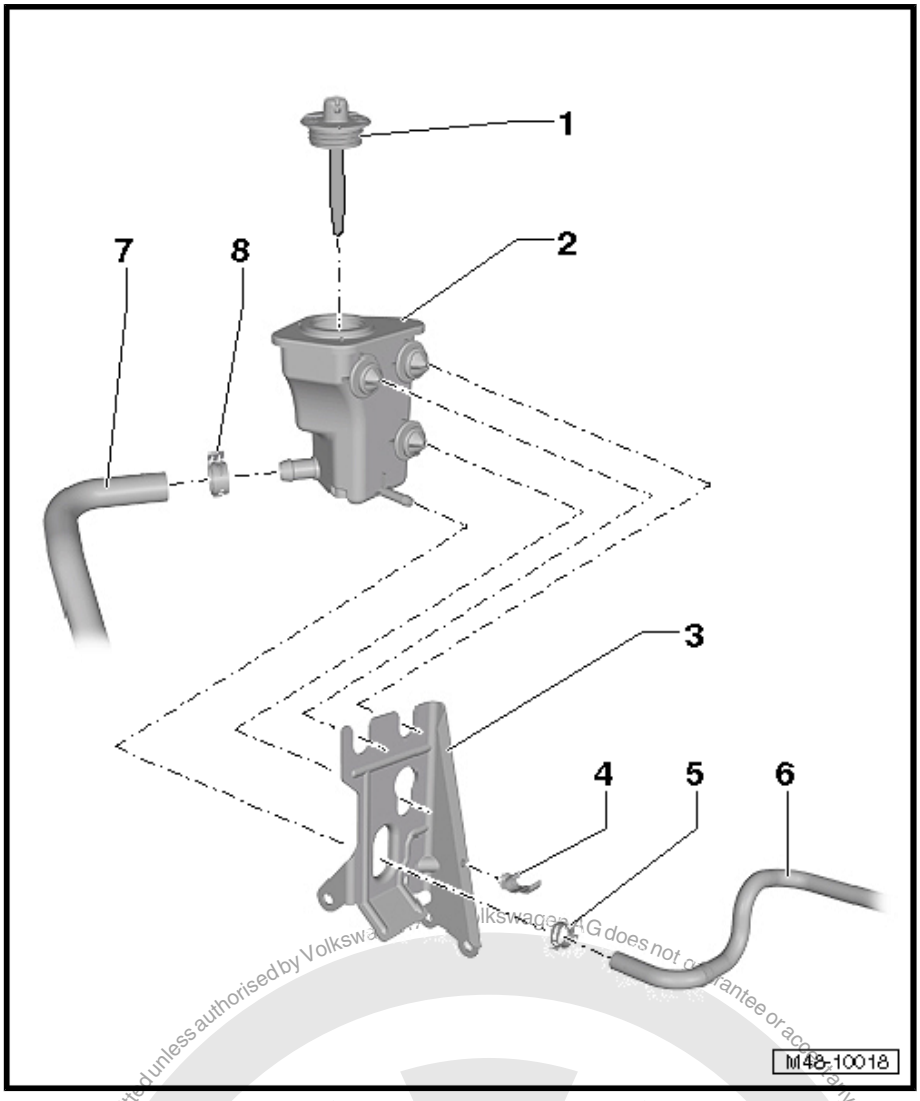
4 - Clip

5 - Clamp

6 - Return Hose

7 - Suction Hose

8 - Clamp



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16 Overview - Power Steering Fluid Reservoir, 5-Cylinder Gasoline Engine

1 - Cap with Dipstick

- ❑ Power steering, checking fluid level. Refer to ⇒ "17 Power Steering, Checking Hydraulic Oil Level", page 375 .

2 - Reservoir

3 - Bracket

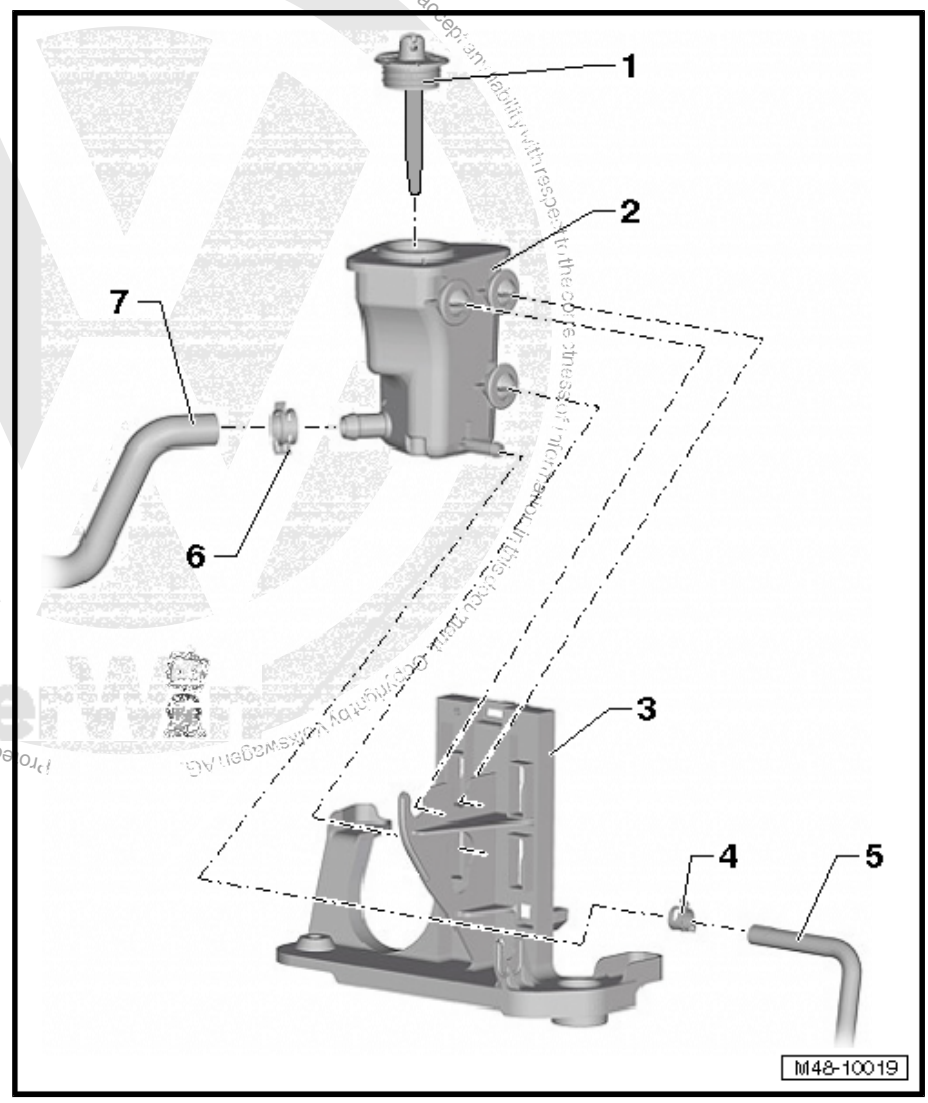
- ❑ For reservoir

4 - Clamp

5 - Return Hose

6 - Suction Hose

7 - Clamp



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17 Power Steering, Checking Hydraulic Oil Level

Perform the Following

– Remove the cap from the reservoir.

– Wipe the dipstick off with a clean cloth.

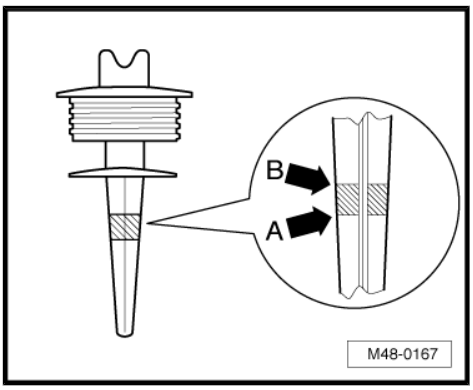
– Install the cap hand-tight, then remove it again and check the fluid level.

Fluid level is only valid if screw cap has been screwed on.

Engine not running and front wheels in straight-ahead position.

– Check the oil level.

Oil level must be located between lowest marking -arrow A- and the highest marking -arrow B- of dipstick.



Note

- *Fluid must be drawn off if the level is above the specified range.*
- *If fluid level is below specified range, the hydraulic system must be checked for leaks. Refer to* ⇒ *"18.2 Steering System, Checking for Leaks", page 376* *. It is not enough to just add fluid.*
- *Do not use drained hydraulic oil.*

– If hydraulic system is properly sealed, fill hydraulic fluid.

– Install the cap on the reservoir hand-tight.

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18 Steering System, Bleeding and Checking for Leaks

⇒ “18.1 Power Steering System, Bleeding”, page 376

⇒ “18.2 Steering System, Checking for Leaks”, page 376

18.1 Power Steering System, Bleeding

– Check the power steering fluid level and add if necessary.

– Raise vehicle until front wheels are off the ground.

– Start engine and let it run at idle for approximately five seconds.

– Turn off the engine and check the hydraulic fluid level.

– Repeat the procedure one more time.

– Start the engine again and turn the steering wheel three times from stop to stop while the engine is idling.

– Turn off the engine and check the hydraulic fluid level. Fill if necessary.

– Repeat the procedure two more times.

To dissipate gas of hydraulic fluid, let engine stand two to three minutes.

– Lower vehicle.

– Now, once more, turn steering wheel 5 times from stop to stop at idle speed.

Steering system has been bled when air bubbles no longer rise to the surface in hydraulic fluid reservoir.

18.2 Steering System, Checking for Leaks

Note

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

– Start the engine.

– Turn steering wheel in both directions to full lock and hold briefly. This builds up the largest possible pressure (at idle only).

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

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

This test can only be performed with boot slid back.

– Open clamp for boot.

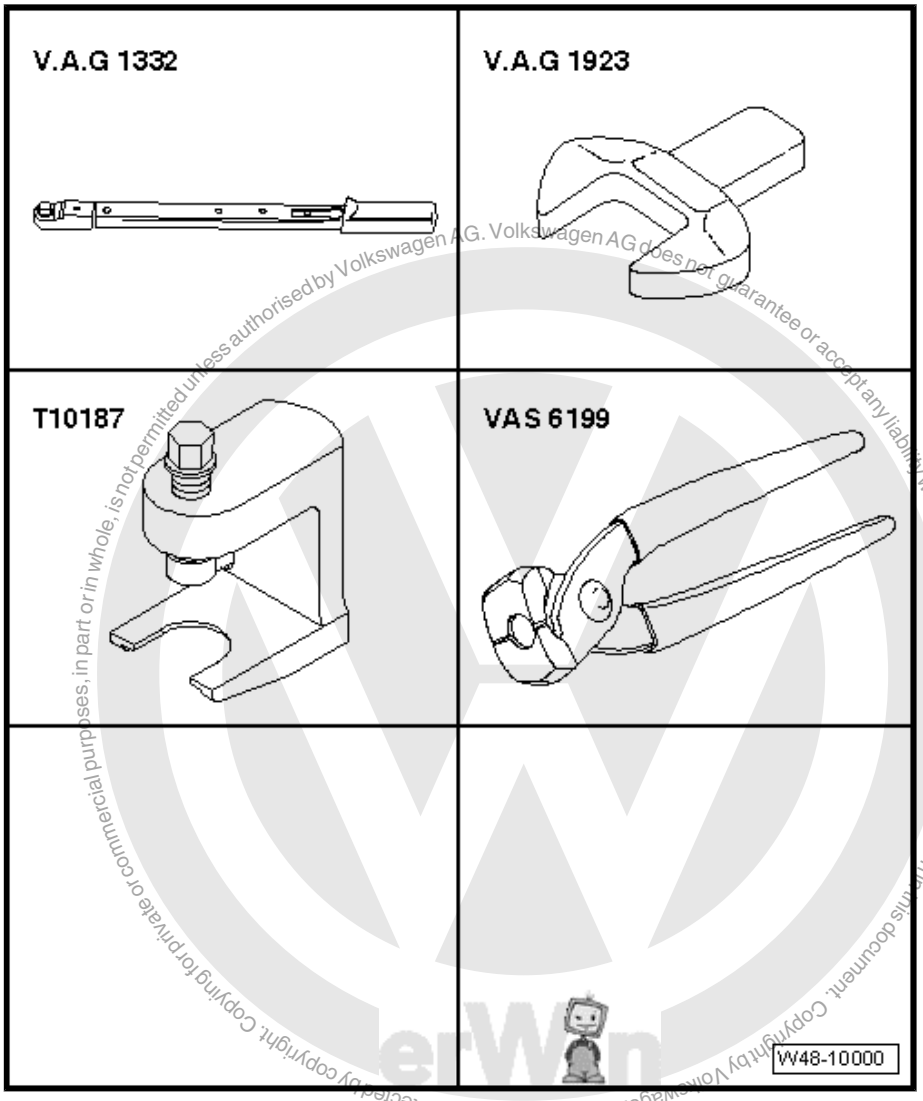
– Push back the boot. If fluid is visible in steering gear housing and/or in bellows, steering gear must be replaced.

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19 Special Tools

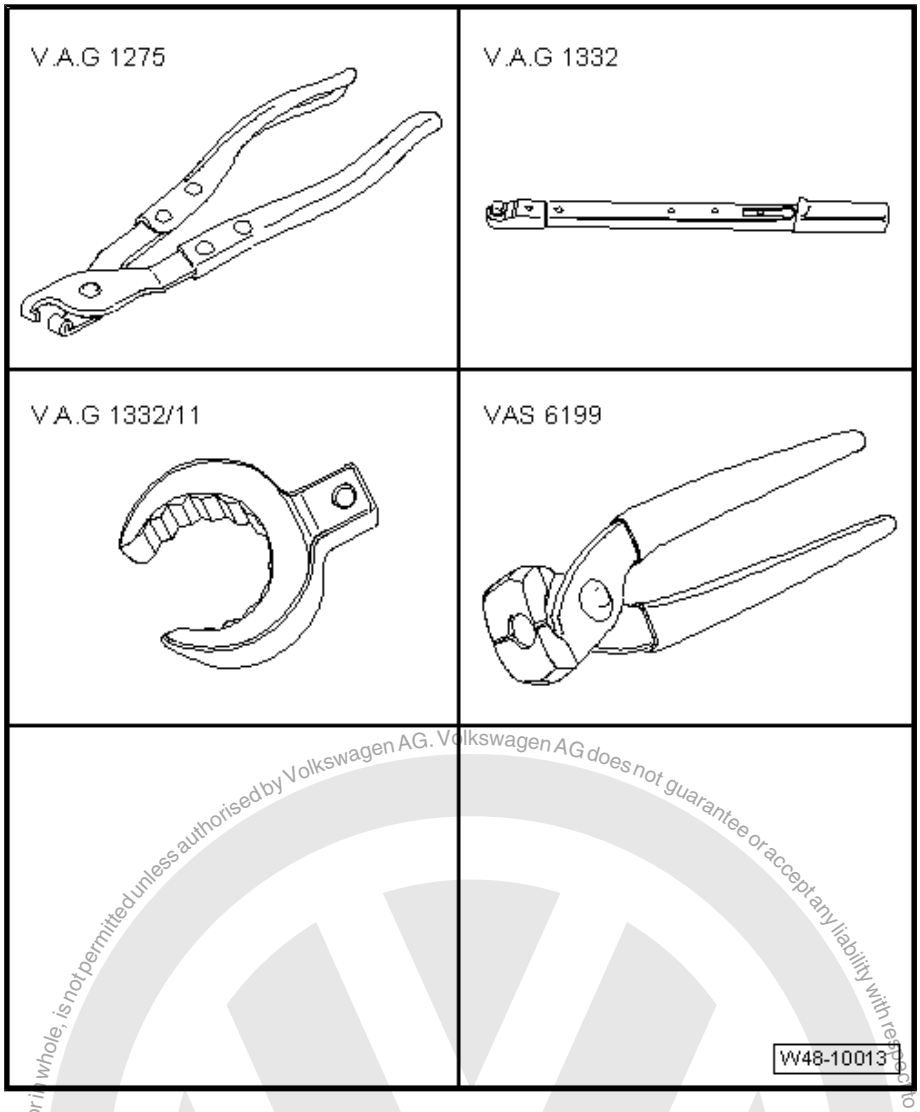
Special tools and workshop equipment required

- Puller - Ball Joint - 3287A-
- Hose Clip Pliers - VAG1275A-
- Torque Wrench 1332 40-200Nm - VAG1332-
- Torque Wrench Insert - Open Jaw - VAG1923-
- Locking Pliers - VAS6199-



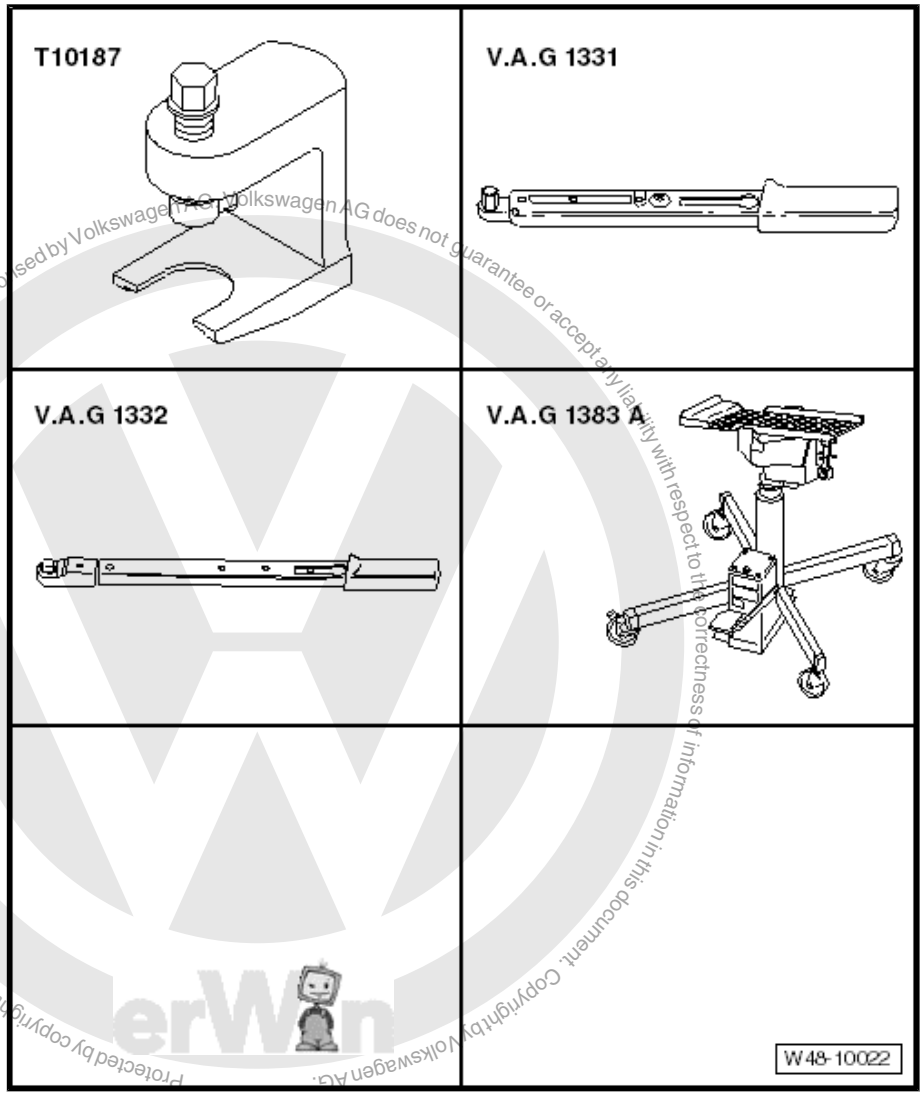
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- Hose Clip Pliers - VAG1275A-
- Torque Wrench 1332 40-200Nm - VAG1332-
- Open Ring Wrench - 24mm - VAG1332/11-
- Locking Pliers - VAS6199-



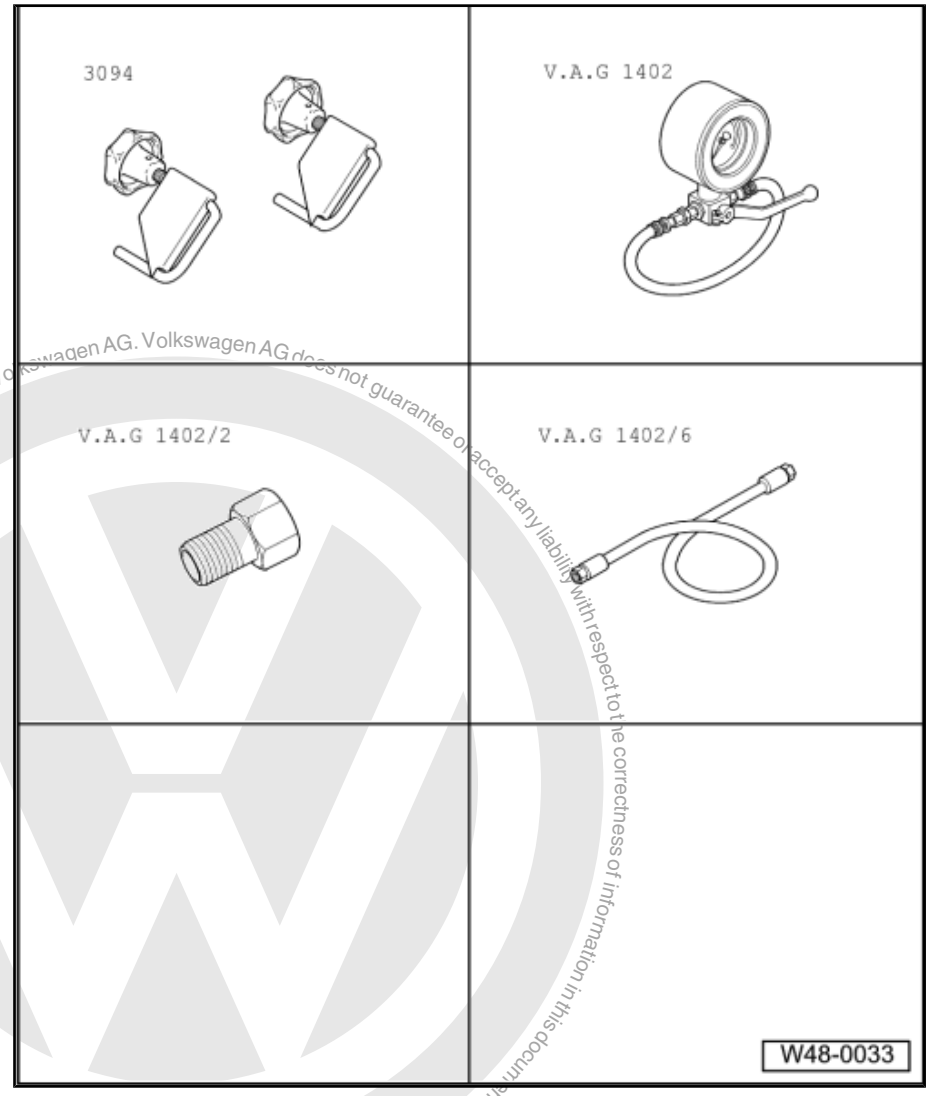
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- Puller - Ball Joint - T10187-
- Torque Wrench 1331 5-50Nm - VAG1331-
- Torque Wrench 1332 40-200Nm - VAG1332-
- Engine and Gearbox Jack - VAS6931-



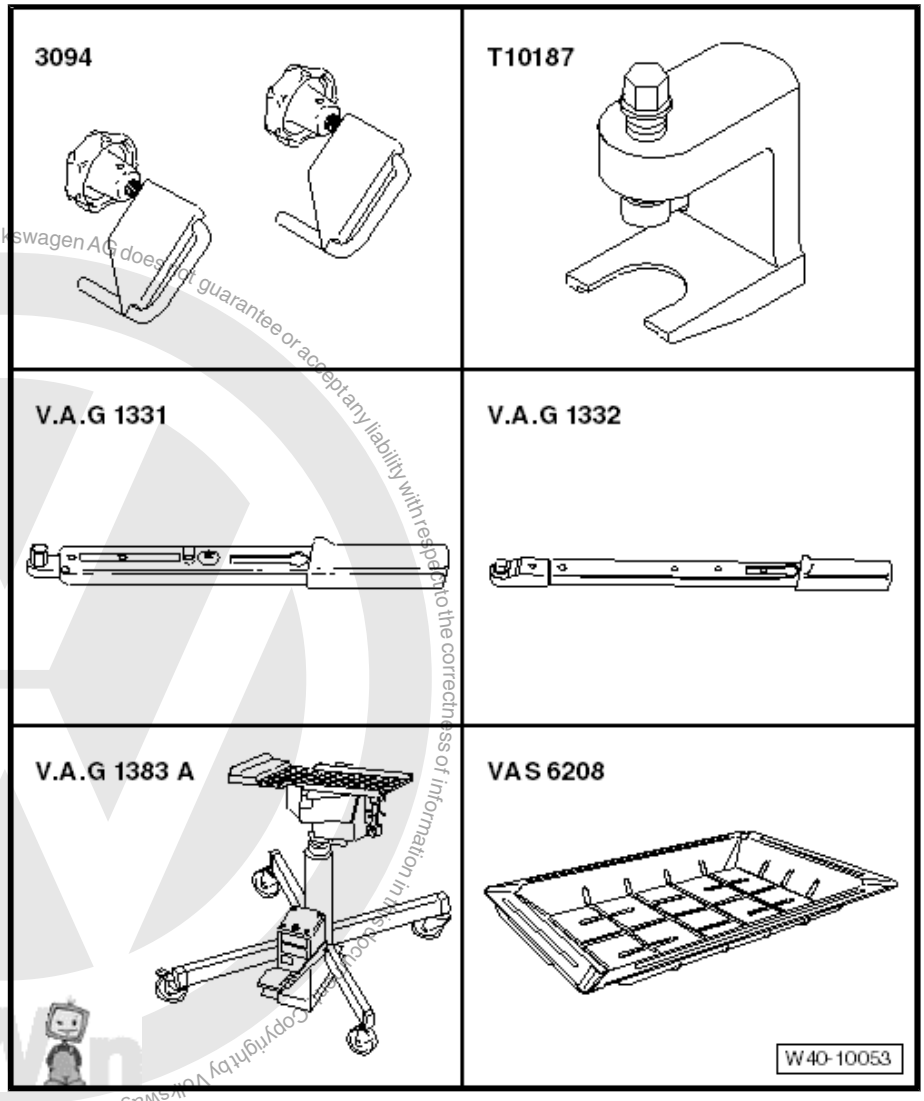
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- Hose Clamps - Up To 25mm - 3094-
- Power Steering Test Unit - VAG1402-
- Power Steering Test Unit - Adapter - VAG1402/2-
- Power Steering Test Unit - Adapter Hose - VAG1402/6-



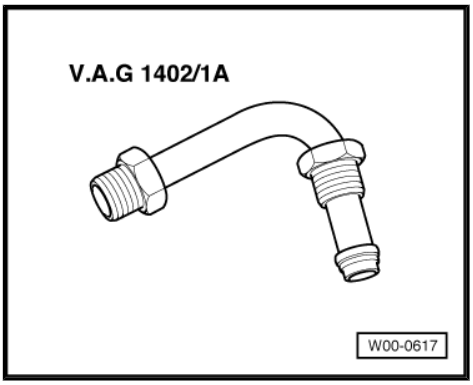
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- Hose Clamps - Up To 25mm - 3094-
- Puller - Ball Joint - T10187-
- Torque Wrench 1331 5-50Nm - VAG1331-
- Torque Wrench 1332 40-200Nm - VAG1332-
- Engine and Gearbox Jack - VAS6931-
- Shop Crane - Drip Tray - VAS6208-



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- Puller - Ball Joint - T10187-
- Power Steering Test Unit - 110 Degree Fitting - VAG1402/1A-



20 Revision History

DRUCK NUMBER: K0059071000

Factory Edition	Edit Edition	Job Type	Feedback	Notes	Quality Checked By
08.2015	10/14/2015	Factory Update	N/A	Added a couple of notes.	Eric P.
05.2015	06/25/2015	Correction	N/A	Fixed linking issues	Eric P.
05.2015	06/17/2015	Factory Update	N/A	Standard factory updates	Tom P.
03.2015	5/18/2015	Factory Update and feedback 1098441	N/A	Edit from scratch, old version 7 h-kaps	Jim H
	02/24/2015	Local, Update	N/A	Create link from rear suspension trailing arm (RG 42) to trailing arm inspection (RG 44).	Tom P.
	01/13/2015	Local Feedback	1070741		Tom P.
	12/9/2014	Factory Update	N/A		Jim H
	11/03/2014	Factory Update	1051524	New procedures added from factory that were previously missing. Trailing arm inspection added per campaign.	Tom P.
	08/29/2014	Correction	N/A	Removed 16 from metadata	Tom P.
	7/9/2014	Factory Update	N/A		Jim H

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Cautions & Warnings

Please read these WARNINGS and CAUTIONS before proceeding with maintenance and repair work. You must answer that you have read and you understand these WARNINGS and CAUTIONS before you will be allowed to view this information.

- If you lack the skills, tools and equipment, or a suitable workshop for any procedure described in this manual, we suggest you leave such repairs to an authorized Volkswagen retailer or other qualified shop. We especially urge you to consult an authorized Volkswagen retailer before beginning repairs on any vehicle that may still be covered wholly or in part by any of the extensive warranties issued by Volkswagen.

- Disconnect the battery negative terminal (ground strap) whenever you work on the fuel system or the electrical system. Do not smoke or work near heaters or other fire hazards. Keep an approved fire extinguisher handy.

- Volkswagen is constantly improving its vehicles and sometimes these changes, both in parts and specifications, are made applicable to earlier models. Therefore, part numbers listed in this manual are for reference only. Always check with your authorized Volkswagen retailer parts department for the latest information.

- Any time the battery has been disconnected on an automatic transmission vehicle, it will be necessary to reestablish Transmission Control Module (TCM) basic settings using the VAG 1551 Scan Tool (ST).

- Never work under a lifted vehicle unless it is solidly supported on stands designed for the purpose. Do not support a vehicle on cinder blocks, hollow tiles or other props that may crumble under continuous load. Never work under a vehicle that is supported solely by a jack. Never work under the vehicle while the engine is running.

- For vehicles equipped with an anti-theft radio, be sure of the correct radio activation code before disconnecting the battery or removing the radio. If the wrong code is entered when the power is restored, the radio may lock up and become inoperable, even if the correct code is used in a later attempt.

- If you are going to work under a vehicle on the ground, make sure that the ground is level. Block the wheels to keep the vehicle from rolling. Disconnect the battery negative terminal (ground strap) to prevent others from starting the vehicle while you are under it.

- Do not attempt to work on your vehicle if you do not feel well. You increase the danger of injury to yourself and others if you are tired, upset or have taken medicine or any other substances that may impair you or keep you from being fully alert.

- Never run the engine unless the work area is well ventilated. Carbon monoxide (CO) kills.

- Always observe good workshop practices. Wear goggles when you operate machine tools or work with acid. Wear goggles, gloves and other protective clothing whenever the job requires working with harmful substances.

- Tie long hair behind your head. Do not wear a necktie, a scarf, loose clothing, or a necklace when you work near machine tools or running engines. If your hair, clothing, or jewelry were to get caught in the machinery, severe injury could result.

- Do not re-use any fasteners that are worn or deformed in normal use. Some fasteners are designed to be used only once and are unreliable and may fail if used a second time. This includes, but is not limited to, nuts, bolts, washers, circlips and cotter pins. Always follow the recommendations in this manual - replace these fasteners with new parts where indicated, and any other time it is deemed necessary by inspection.

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next

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Version 1.0

Cautions & Warnings

- Illuminate the work area adequately but safely. Use a portable safety light for working inside or under the vehicle. Make sure the bulb is enclosed by a wire cage. The hot filament of an accidentally broken bulb can ignite spilled fuel or oil.

- Friction materials such as brake pads and clutch discs may contain asbestos fibers. Do not create dust by grinding, sanding, or by cleaning with compressed air. Avoid breathing asbestos fibers and asbestos dust. Breathing asbestos can cause serious diseases such as asbestosis or cancer, and may result in death.

- Finger rings should be removed so that they cannot cause electrical shorts, get caught in running machinery, or be crushed by heavy parts.

- Before starting a job, make certain that you have all the necessary tools and parts on hand. Read all the instructions thoroughly; do not attempt shortcuts. Use tools that are appropriate to the work and use only replacement parts meeting Volkswagen specifications. Makeshift tools, parts and procedures will not make good repairs.

- Catch draining fuel, oil or brake fluid in suitable containers. Do not use empty food or beverage containers that might mislead someone into drinking from them. Store flammable fluids away from fire hazards. Wipe up spills at once, but do not store the oily rags, which can ignite and burn spontaneously.

- Use pneumatic and electric tools only to loosen threaded parts and fasteners. Never use these tools to tighten fasteners, especially on light alloy parts. Always use a torque wrench to tighten fasteners to the tightening torque listed.

- Keep sparks, lighted matches, and open flame away from the top of the battery. If escaping hydrogen gas is ignited, it will ignite gas trapped in the cells and cause the battery to explode.

- Be mindful of the environment and ecology. Before you drain the crankcase, find out the proper way to dispose of the oil. Do not pour oil onto the ground, down a drain, or into a stream, pond, or lake. Consult local ordinances that govern the disposal of wastes.

- The air-conditioning (A/C) system is filled with a chemical refrigerant that is hazardous. The A/C system should be serviced only by trained automotive service technicians using approved refrigerant recovery/recycling equipment, trained in related safety precautions, and familiar with regulations governing the discharging and disposal of automotive chemical refrigerants.

- Before doing any electrical welding on vehicles equipped with anti-lock brakes (ABS), disconnect the battery negative terminal (ground strap) and the ABS control module connector.

- Do not expose any part of the A/C system to high temperatures such as open flame. Excessive heat will increase system pressure and may cause the system to burst.

- When boost-charging the battery, first remove the fuses for the Engine Control Module (ECM), the Transmission Control Module (TCM), the ABS control module, and the trip computer. In cases where one or more of these components is not separately fused, disconnect the control module connector(s).

- Some of the vehicles covered by this manual are equipped with a supplemental restraint system (SRS), that automatically deploys an airbag in the event of a frontal impact. The airbag is operated by an explosive device. Handled improperly or without adequate safeguards, it can be accidentally activated and cause serious personal injury. To guard against personal injury or airbag system failure, only trained Volkswagen Service technicians should test, disassemble or service the airbag system.

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Cautions & Warnings

- Do not quick-charge the battery (for boost starting) for longer than one minute, and do not exceed 16.5 volts at the battery with the boosting cables attached. Wait at least one minute before boosting the battery a second time.

- Never use a test light to conduct electrical tests of the airbag system. The system must only be tested by trained Volkswagen Service technicians using the VAG 1551 Scan Tool (ST) or an approved equivalent. The airbag unit must never be electrically tested while it is not installed in the vehicle.

- Some aerosol tire inflators are highly flammable. Be extremely cautious when repairing a tire that may have been inflated using an aerosol tire inflator. Keep sparks, open flame or other sources of ignition away from the tire repair area. Inflate and deflate the tire at least four times before breaking the bead from the rim. Completely remove the tire from the rim before attempting any repair.

- When driving or riding in an airbag-equipped vehicle, never hold test equipment in your hands or lap while the vehicle is in motion. Objects between you and the airbag can increase the risk of injury in an accident.

I have read and I understand these Cautions and Warnings.

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