BMW Group
Dealer: 32711/06
Model: M2
Development code: G87
Model code: 13DM
Lead type: 13DM

Removing and installing/replacing the coil spring for the spring strut at the front left or right (AW specification without wheel alignment) »

WARNING

Vehicle may slip off the vehicle hoist if the vehicle hoist is handled incorrectly.

Danger! Immobilization period-threatening injuries!

- Observe safety instructions on raising the vehicle using a vehicle hoist.
- For additional information see: 00 ... Raise the vehicle using a vehicle lift.

WARNING

Spring preload.

Danger! Immobilization period-threatening injuries!

- Secure the coil spring with special tool 2 213 022 (31 3 340).
- Use special tool as per Owner's Manual and always observe the safety instructions.

CAUTION

Spring preload.

Injury hazard!

- The use of the specified special tool (tool) is mandatory.
- Carry out the described steps properly.

TECHNICAL INFORMATION

Perform wheel alignment after installation.

Preliminary work

Note the information on the carbon ceramic brake

NOTE

The following step(s) must be performed if the listed component(s) is/are installed.

▶ Preparing work on the carbon ceramic brake

Further information is available.

TECHNICAL INFORMATION

Work on the carbon-ceramic brake disc may be performed exclusively by specially trained service personnel.

The service personnel must have received the proper training.

TECHNICAL INFORMATION

Carbon-ceramic brake discs may not be modified/manipulated.

Retightening or disassembling brake components is not permitted.

Bore holes may not be mechanically processed. Counter-boring is not permitted.

- When working on the brake system, proceed with particular caution and observe all notes.

  The brake system is one of the most important safety systems on any vehicle.

- Only remove and install wheels with the aid of the wheel jack.

  This avoids damage to the carbon ceramic brake disc and brake caliper.

- Ensure that the carbon ceramic brake disc is not subject to any impact stresses or collisions with hard materials.

  This avoids damage to the ceramic surfaces and edges.

i TECHNICAL INFORMATION

For additional information see: 34 00 ... Reference sample catalog for assessing optical quality

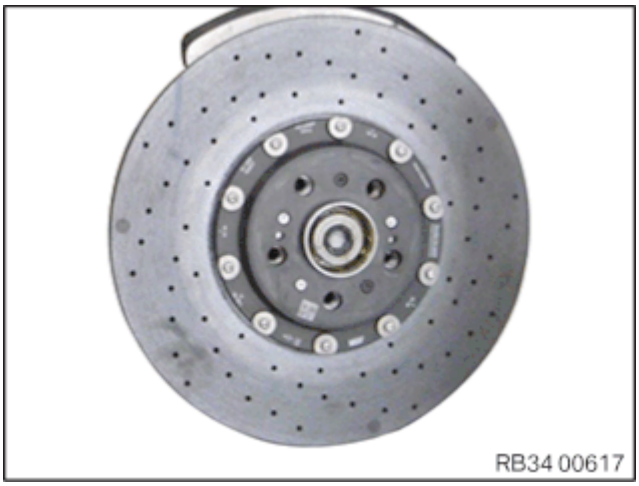
- Ensure that the contact surfaces of the hub and the contact surfaces of the rim are not damaged.

Check

i TECHNICAL INFORMATION

For additional information see: 34 00 ... Assess carbon-ceramic brake discs (CSiC) for wear.

- Check carbon ceramic brake disc for wear.



Result

» Spalling on the edges of the friction ring of the carbon ceramic brake disc exceed permitted amount.

Brake discs which have been subjected to a high impact stress, such as from having fallen, must no longer be used. The brake disc is unusable due to visible and non-visible damage!

Measure

- See additional information: Assess carbon ceramic brake disc for wear.

Check

TECHNICAL INFORMATION

Brake cleaner may **not** be used.

- Check carbon ceramic brake discs for dirt.

Result

» The carbon ceramic brake disc is very dirty.

Measure

- See additional information: Reference sample catalog for assessing visual quality.

Measure

- Only if required: Whilst observing the Safety Instructions, clean carbon ceramic brake disc with a high pressure cleaner.

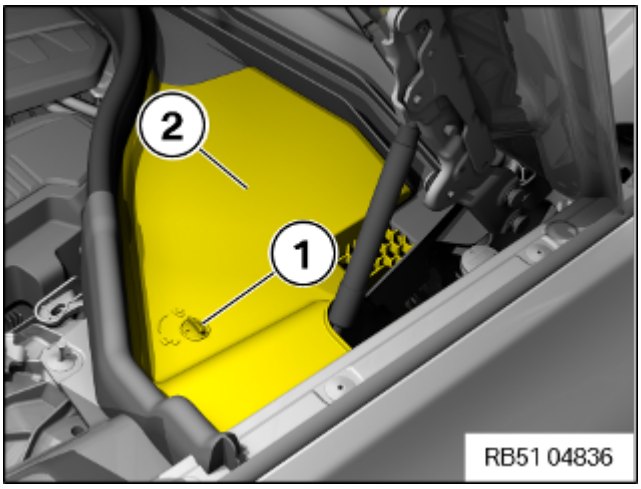
Measure

- For stubborn dirt in the bores: Carefully clean the bores manually with a suitable auxiliary tool (e.g. punch).

◀

Remove the cover of the engine compartment on the rear left or right

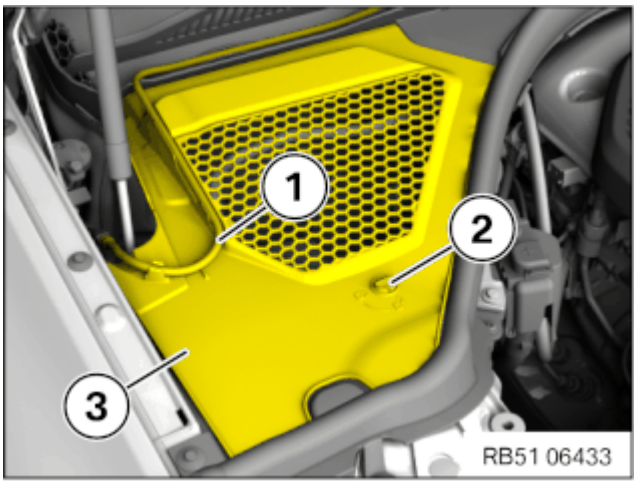
▶ Remove the cover of the engine compartment at the rear left



- Loosen the lock (1).
- Remove the cover (2) of the engine compartment at the rear left.

◀

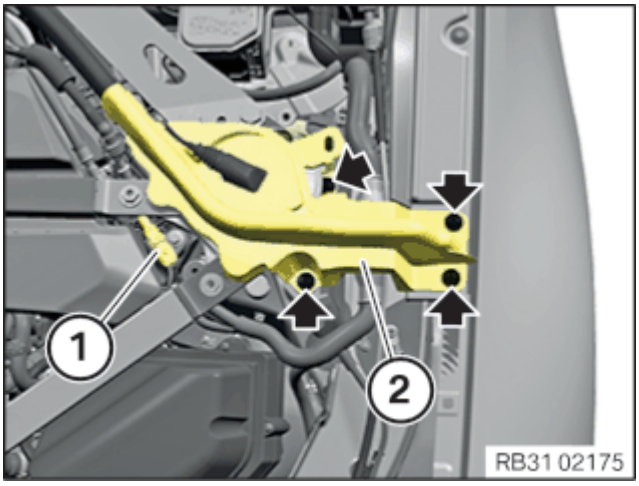
▶ Remove the cover of the rear right engine compartment



- Release the washer fluid hose (1) from the guides.
- Loosen the lock (2).
- Remove the cover (3) of the engine compartment at the right rear.

◀

Removing the side hood seal



- Unlock plug connection (1) and disconnect.
- Unclip the connector from the holder.
- Release the expanding rivets (arrows).
- Remove the hood seal (2) upwards. In this process, remove the cable.

Removing the front left wheel

Further information is available.

▶ Removing the wheel

Further information is available.

TECHNICAL INFORMATION

A wheel lifter is recommended for easier wheel removal and installation without exertion (see Dealer Equipment Catalog).

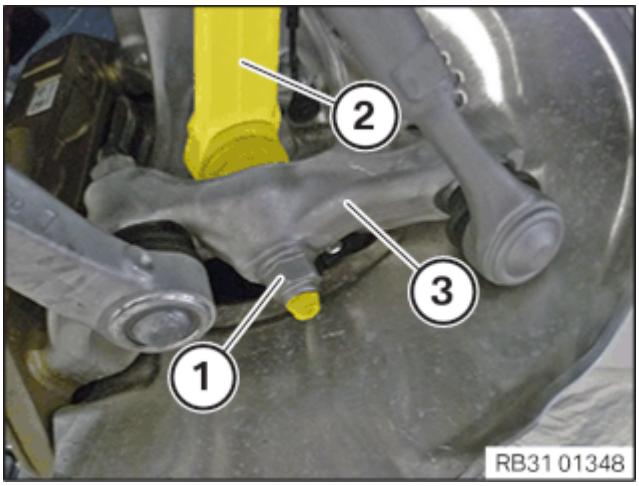
- In vehicles with M Carbon ceramic brake: It is essential to use the wheel lifter to remove the wheel.

  This process is intended to prevent damage to the brake disc.

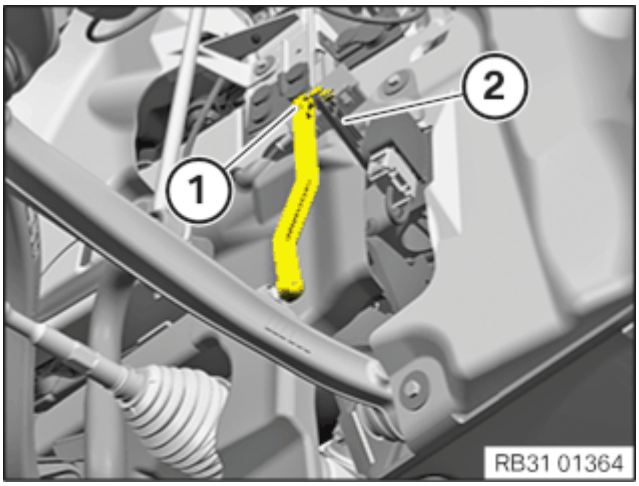
- If several wheels are removed simultaneously: Use a piece of chalk to mark on each tire the axle and side on which the corresponding wheel is fitted.
- Release the lug bolts (arrows) crosswise and remove the wheel.
- For releasing and tightening lug bolts with the security code: Use the correct adapter from the set of special tools 0 492 518 (36 1 300).

◀

Releasing the wishbone, tension strut and tie rod end from the swivel bearing



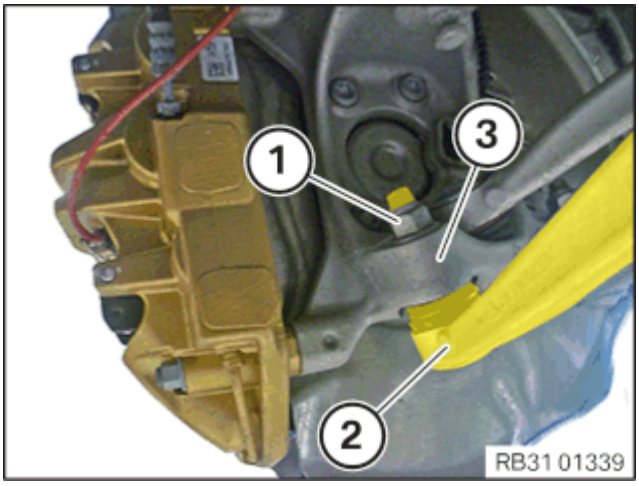
- Release nut (1). If necessary, counter support at the Torx socket.
- Release the tension strut (2) from the swivel bearing (3).



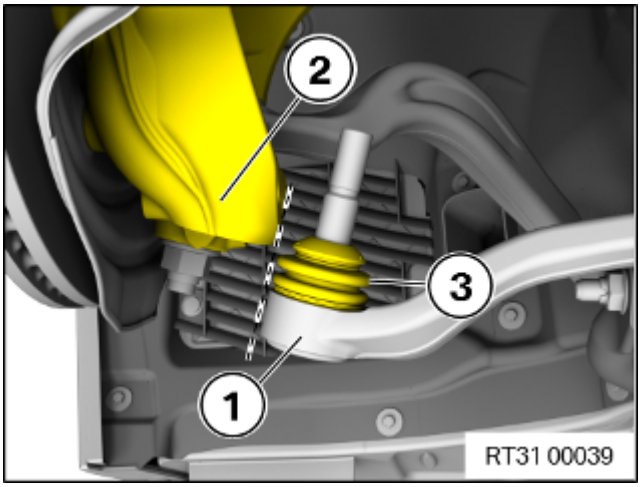
NOTE

Only perform the operation on the left side.

- Release the attachment rod (1) from the ride height sensor (2).



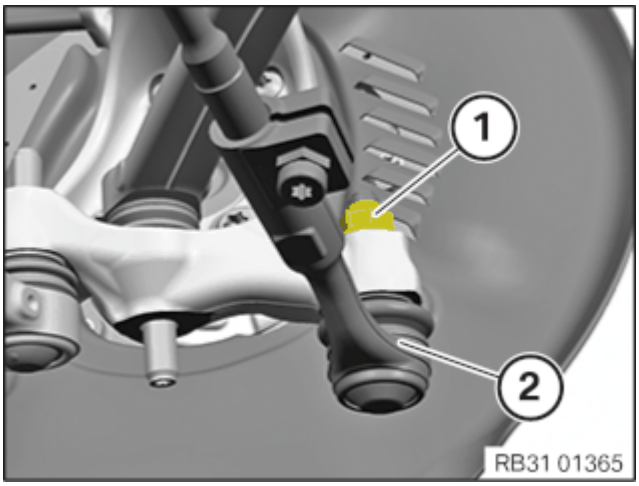
- Release nut (1). If necessary, counter support at the Torx socket.
- Release the wishbone (2) from the swivel bearing (3).



TECHNICAL INFORMATION

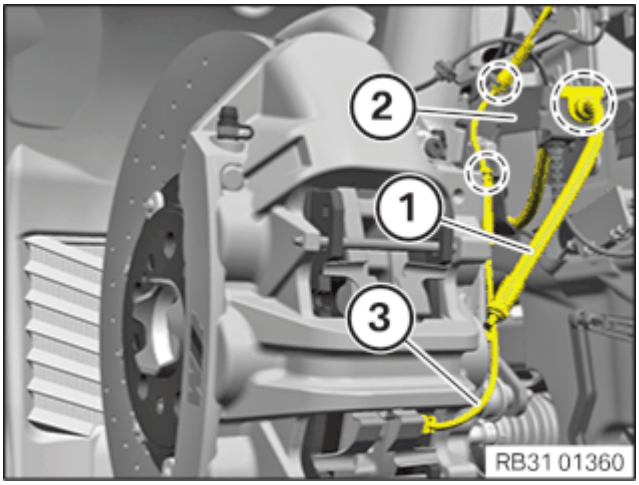
Otherwise, the rubber grommet can be damaged. The components must not be in contact.

- Make sure that the rubber grommet (3) on the bottom wishbone (1) is not damaged by the swivel bearing (2).



- Release nut (1). If necessary, counter support at the Torx socket.
- Release the tie rod end (2) from the swivel bearing.

Releasing the front brake caliper

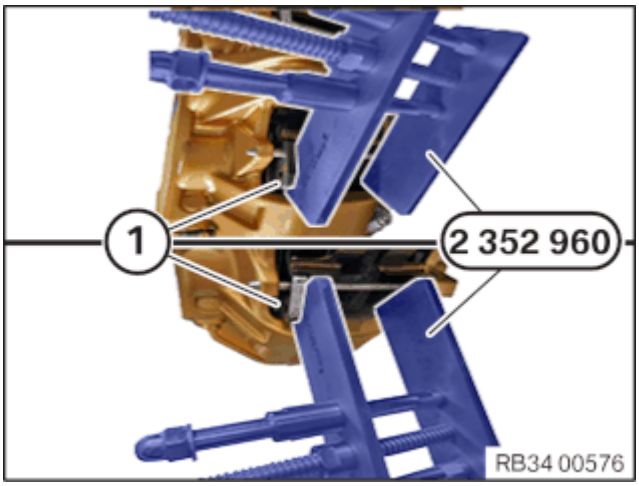


- Release the brake hose (1) from the holder (2).

NOTE

Only perform the operation on the left side.

- Release the cable (3) for the brake pad wear sensor from the holder (2).

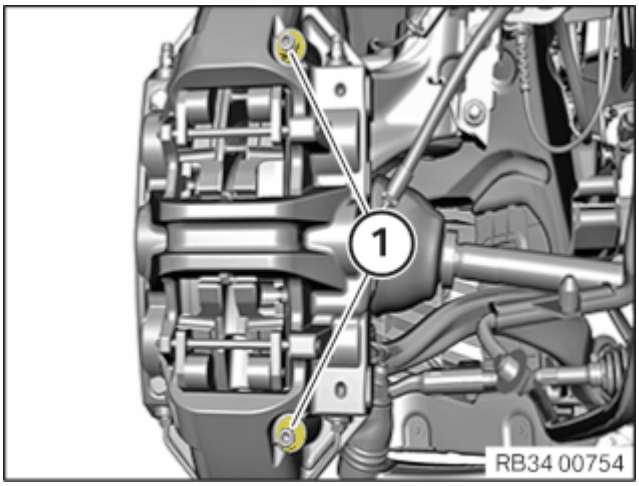


TECHNICAL INFORMATION

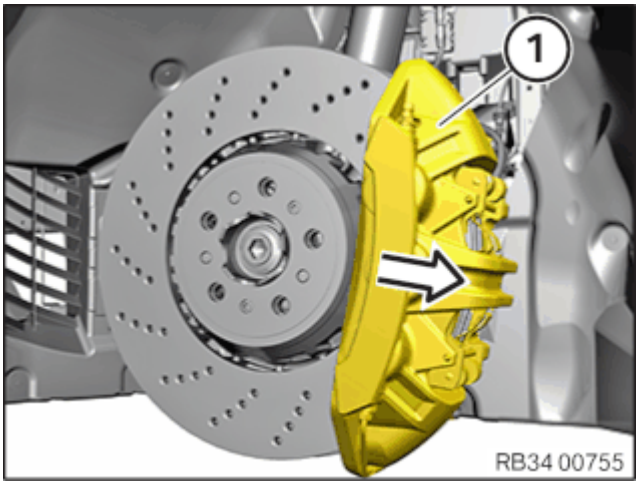
When pressing the brake piston back, note the brake fluid level in the expansion tank.

Overflowing brake fluid will damage the paintwork.

- Press the brake piston on the brake pads (1) back with the special tools 2 352 960 .
- Push the brake pistons alternately up and down to the stop.

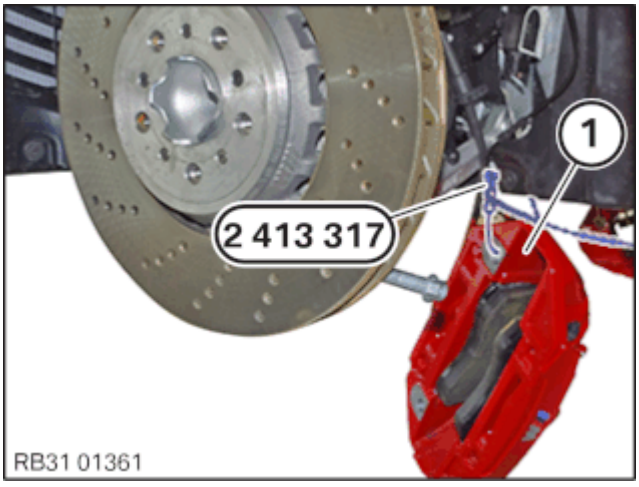


- Release nuts (1).



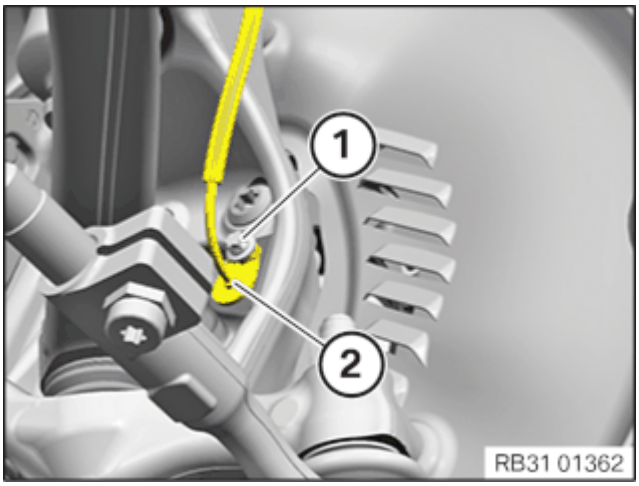
- Remove the brake caliper (1) in arrow direction.

  Do not hang the brake caliper (1) from the brake hose.

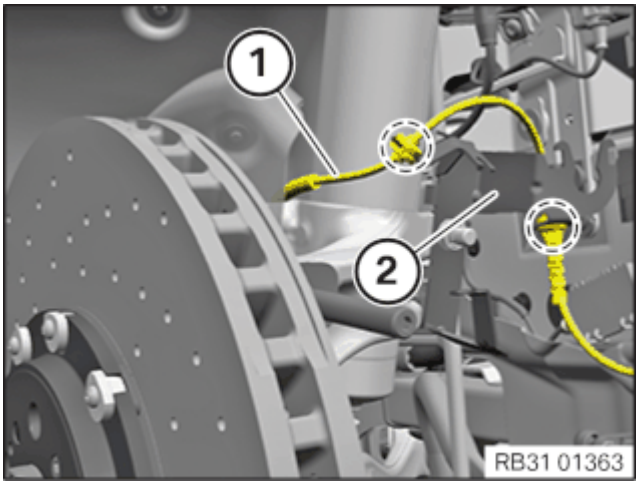


- Tie up the brake caliper (1) with the special tool 2 413 317 .

Releasing the wheel speed sensor from the swivel bearing



- Loosen screw (1).
- Release the wheel speed sensor (2) from the swivel bearing.

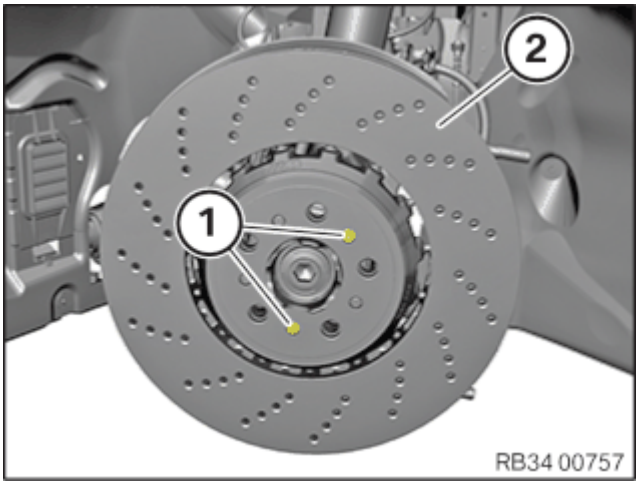


- Release the cable of the wheel speed sensor (1) from the holder (2).

Remove front brake disc

TECHNICAL INFORMATION

Different variants may be installed depending on the vehicle equipment.

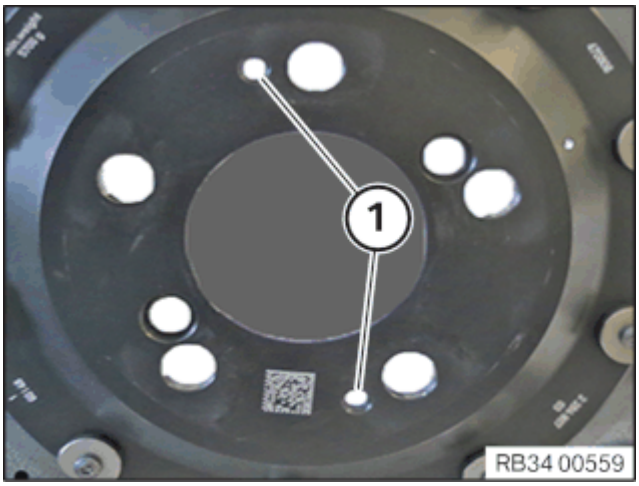


RISK OF DAMAGE

Failure to comply with the specification.
Component damage.

- All specifications **must** be observed and complied with.

- Loosen screws (1).
- Remove the brake disk (2).



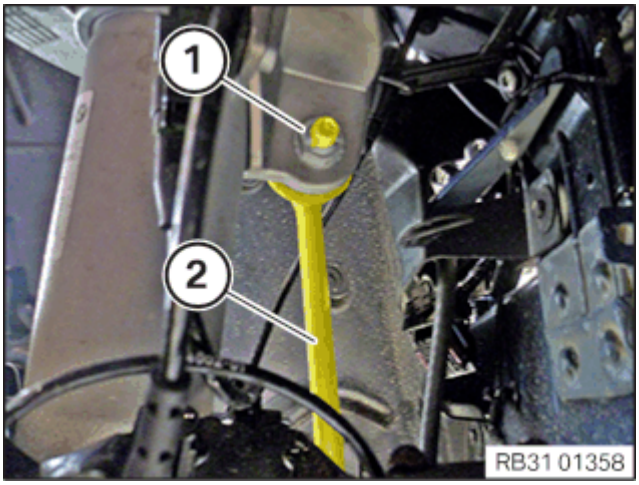
- Variants with carbon ceramic brake:

  Screw in two screws (M8) into the internal thread (1) on the brake disc chamber.

  Press the carbon-ceramic brake disc of the wheel hub shut.

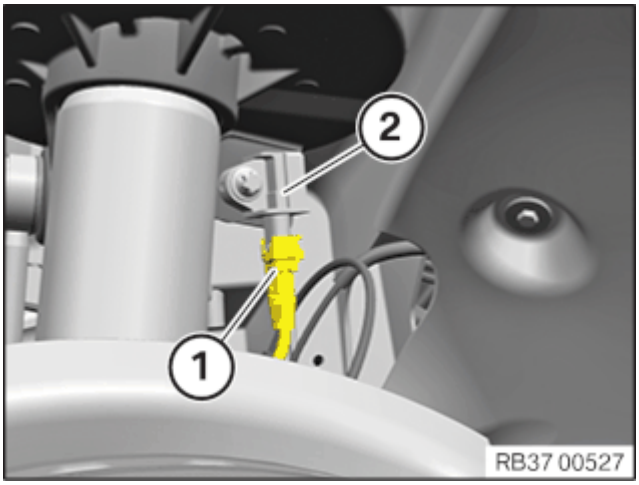
  Screw in screws evenly to avoid distortion of the brake disc chamber during removal.

Detach the anti-roll bar link from the spring strut

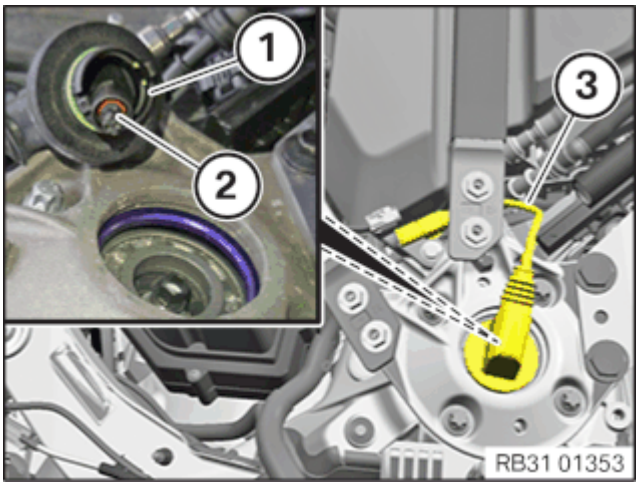


- Release nut (1). If necessary, counter support at the Torx socket.
- Detach the anti-roll bar link (2) from the spring strut.

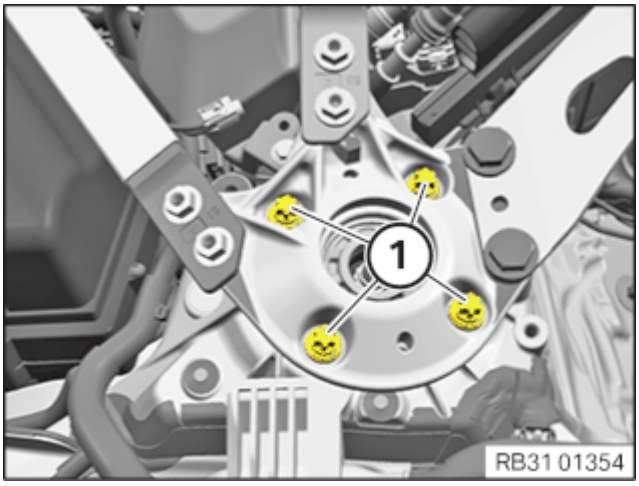
Remove spring strut



- Unlock and disconnect the plug connection (1) on the vertical acceleration sensor (2).



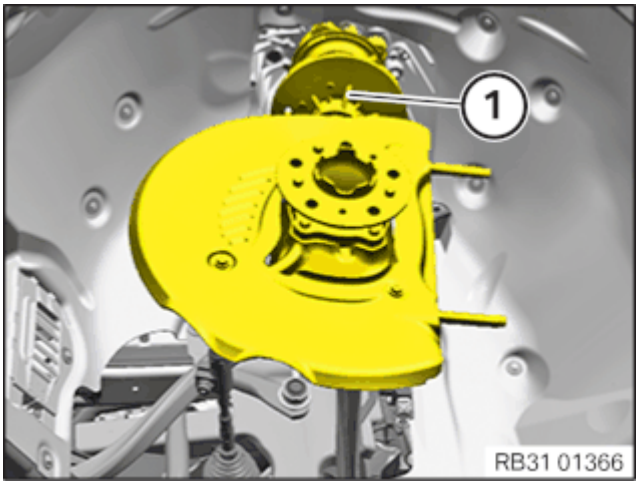
- Detach the rubber grommet with the retaining ring (1) from the spring strut support bearing.
- Detach the connector (2) of the adapter cable (3) .



TECHNICAL INFORMATION

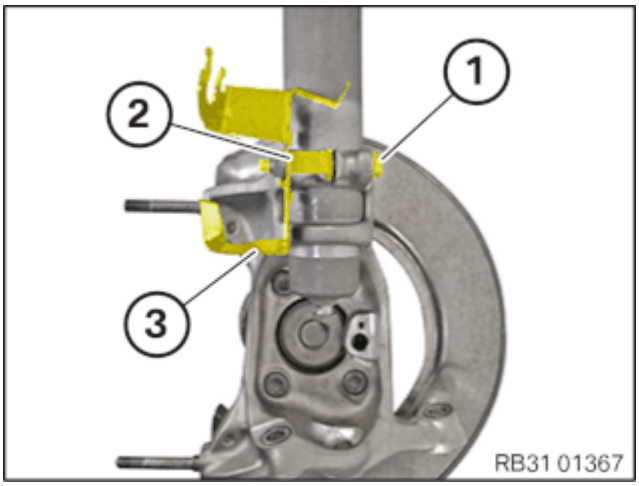
Secure component against falling.

- Loosen screws (1).

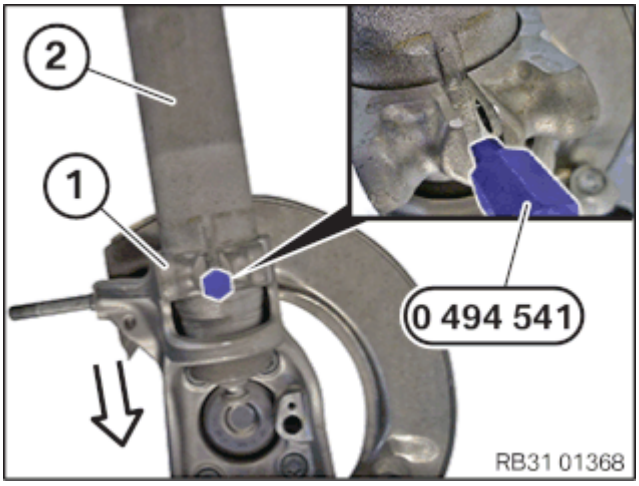


- Remove the spring strut (1).

Remove swivel bearing



- Release the screw (1), counter support at the nut (2) while doing so.
- Remove the holder (3).



- Spread the swivel bearing (1) with the special tool **0 494 541 (31 2 230)** and detach in arrow direction from the shock absorber (2).

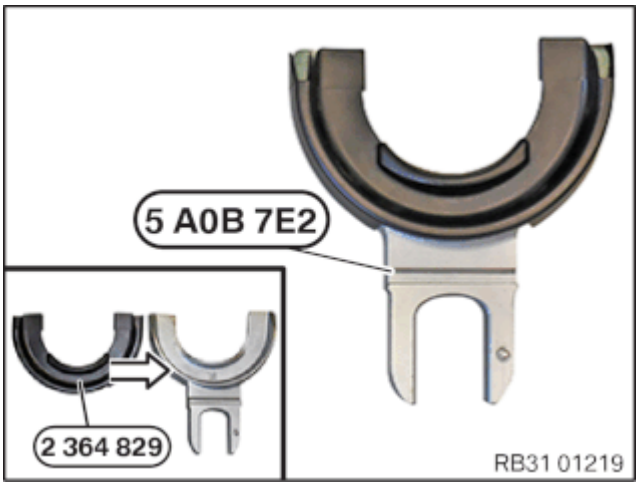
Prepare the spring tensioner

RISK OF DAMAGE

Damage of the coil spring.

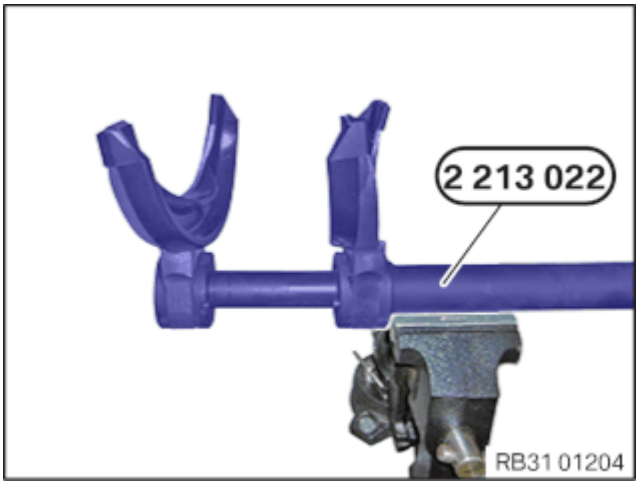
Any use of faulty protective inserts leads to coil spring damage. Faulty protective inserts may lead to a cracked coil spring (corrosion).

- Check the protective insert for wear or damage and if necessary, renew the protective inserts.

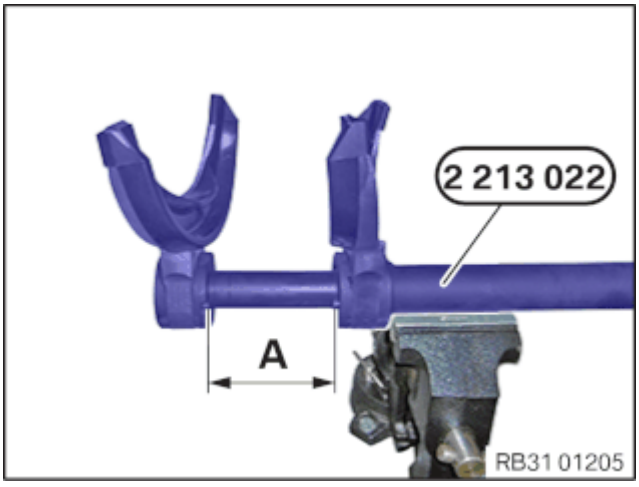


- Mount special tool 2 364 829 on special tool 5 A0B 7E2 .

  Prepare special tool 5 A0B 7E2 twice and use it only with the protective insert!



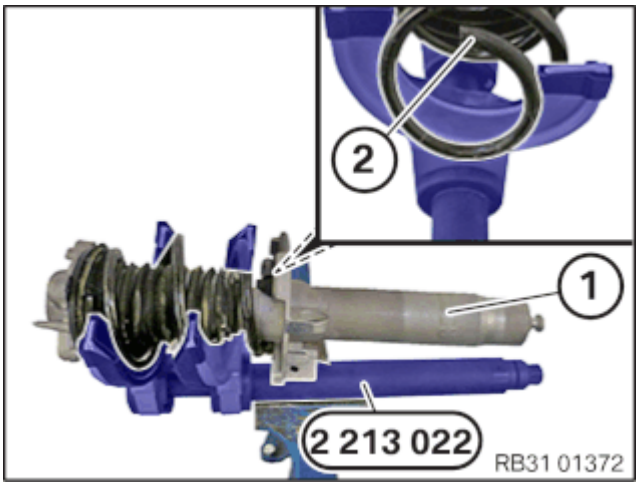
- Clamp special tool 2 213 022 (31 3 340) in the vice.
- Position special tools 5 A0B 7E2 from above on special tool 2 213 022 (31 3 340) until you feel and hear the retaining bolts engage.
- Check the position of special tools 5 A0B 7E2 and, if necessary, correct it.



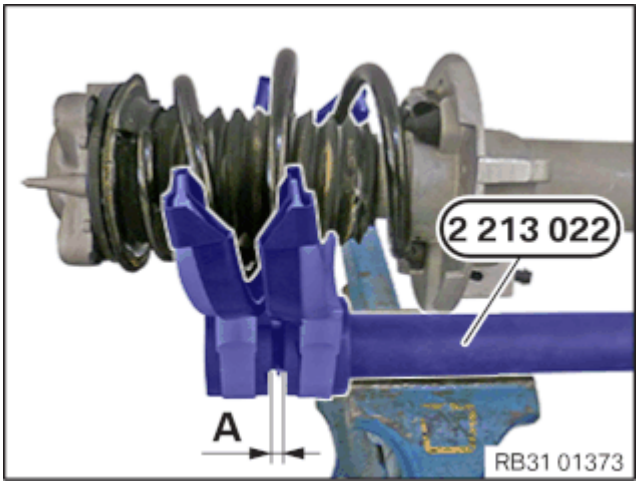
- Adjust the special tool 2 213 022 (31 3 340) to dimension (A).

  Dimension = (A) = 70 – 80 mm

Tensioning the coil spring



- Clean coil spring to remove heavy contamination.
- Attach the spring strut (1) to the coil spring with the special tool 2 213 022 (31 3 340). Align the lower coil spring end (2) vertically in an upwards direction.
- Make sure that the coils of the coil spring lie completely in the recesses of the pressure plates.

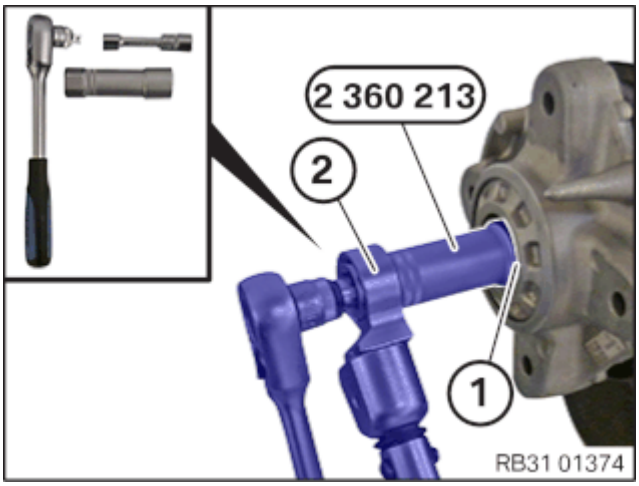


- Tension the coil spring until the dimension (A) is reached at the special tool 2 213 022 (31 3 340).

  Dimension (A) = 5 mm

  Dimension (A) must not fall short.

Remove the spring strut support bearing



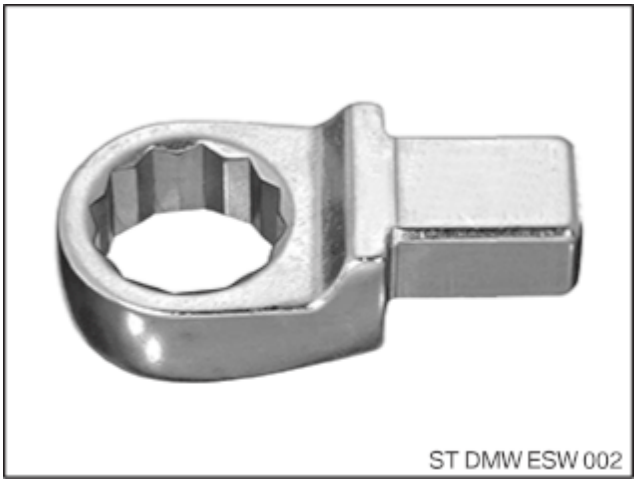
TECHNICAL INFORMATION

Releasing and tightening the nut on the support bearing or spring strut support bearing with an impact screwdriver is prohibited.

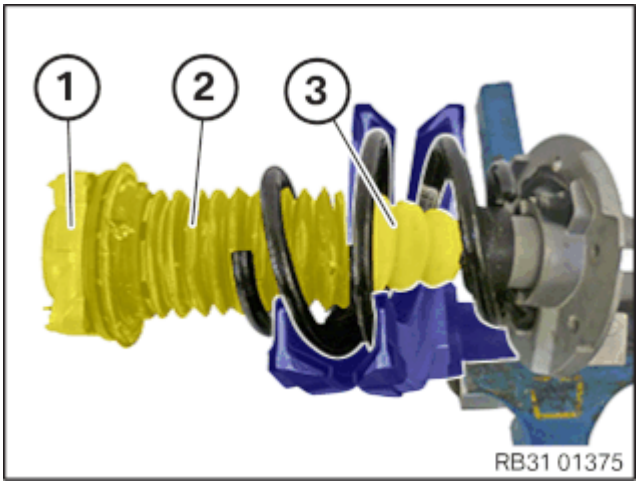
- Release the nut (1) at the spring strut support bearing with the special tool 2 360 213 and the standard tool (2). Counter support at the shock absorber (SW10) while doing so.

Standard tool: Ring insert tool for double hexagon head

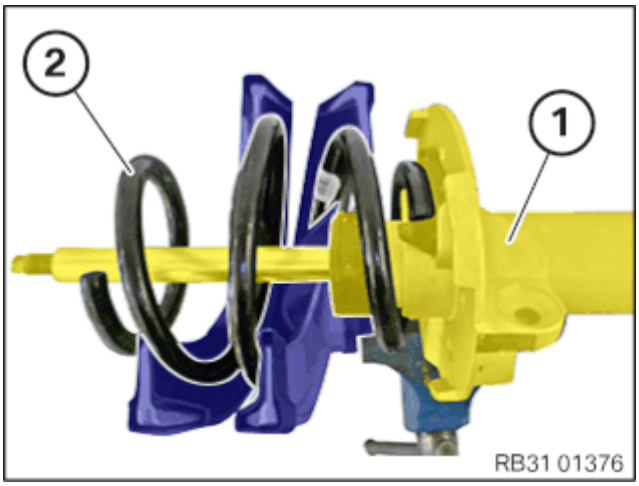
Ring insertion tool for external double hexagon



Ring insertion tool for external double hexagon



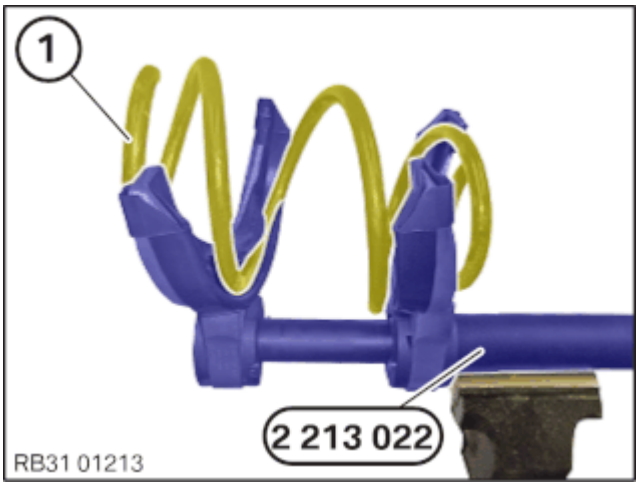
- Pull down the spring strut support bearing (1) with the protective tube (2) and the auxiliary damper (3) from the piston rod of the shock absorber.



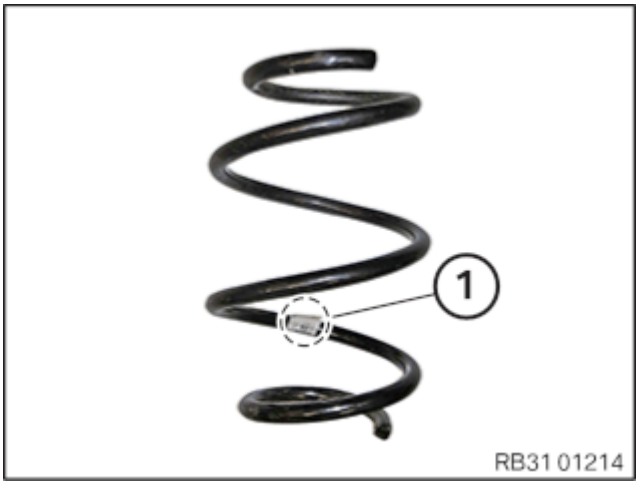
- Remove the shock absorber (1) from the tensioned coil spring (2).

Main Works

Replacing the coil spring



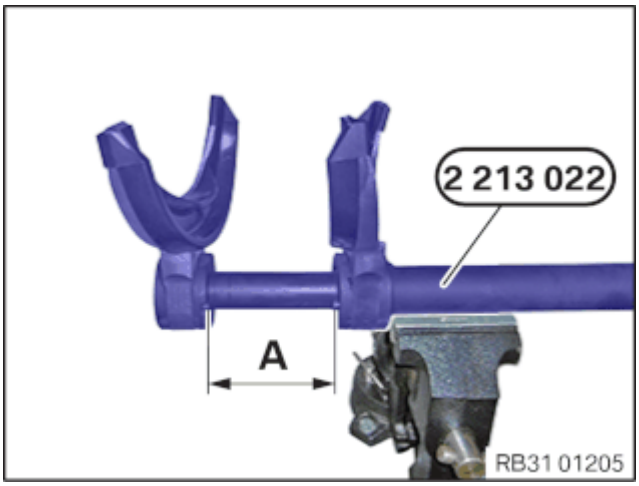
- Relieve the special tool **2 213 022 (31 3 340)** and the coil spring (1).



- Renew the coil spring.

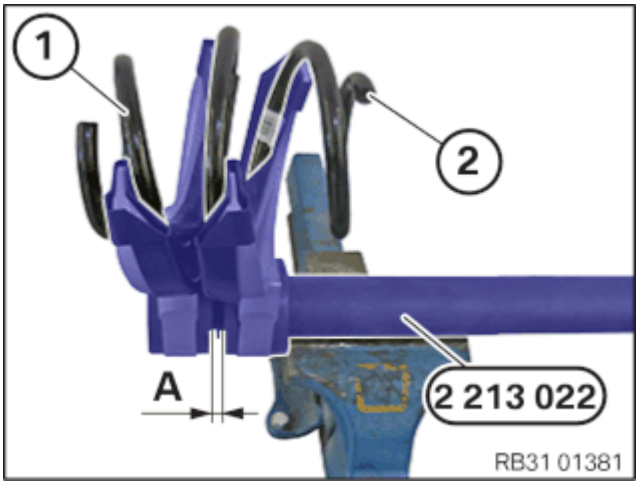
  Parts: Coil spring

  The lower coil spring end is marked with the sticker (1).



- Adjust the special tool 2 213 022 (31 3 340) to dimension (A).

  Dimension (A) = 100 mm



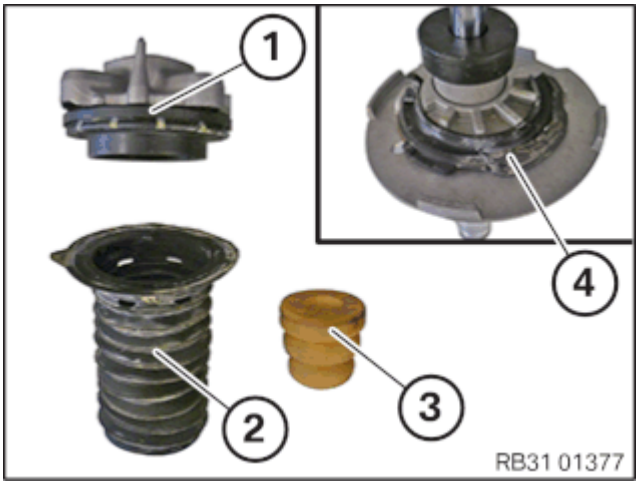
- Pick up the coil spring (1) with the special tool 2 213 022 (31 3 340). Align the lower coil spring end vertically upwards while doing so.

  Make sure that the coils of the coil spring are completely in the recesses of the pressure plates.

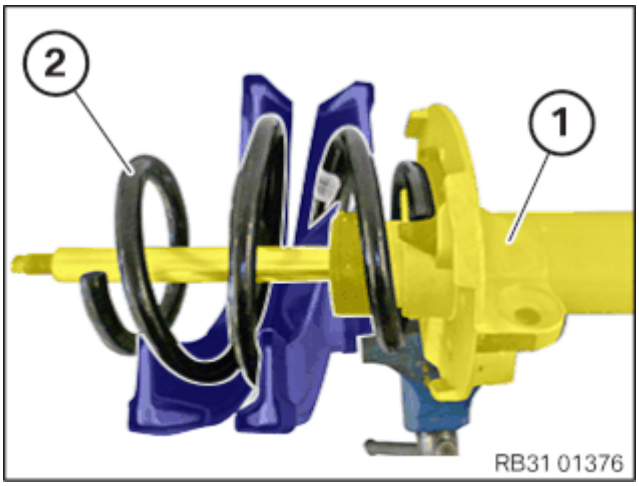
- Tension the coil spring (1) until the dimension (A) is reached at the special tool 2 213 022 (31 3 340).

  Dimension (A) = 5 mm

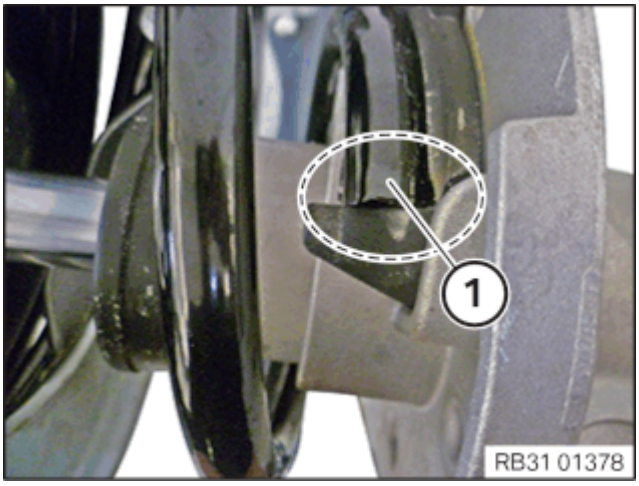
  The dimension (A) must not be undershot.



- Check the spring strut support bearing (1), protective tube (2), auxiliary damper (3) and the spring pad (4) for damage and renew if necessary.



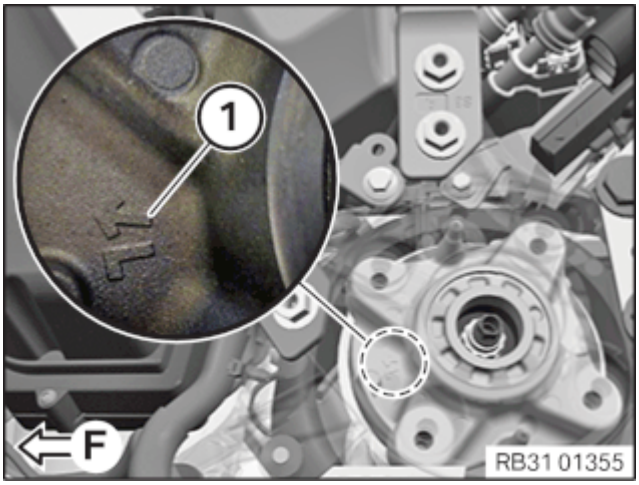
- Position the shock absorber (1) in the tensioned coil spring (2).



- Align the shock absorber with the spring pad with the lower coil spring end (1) up to the stop.

Follow-up works

Installing the spring strut support bearing

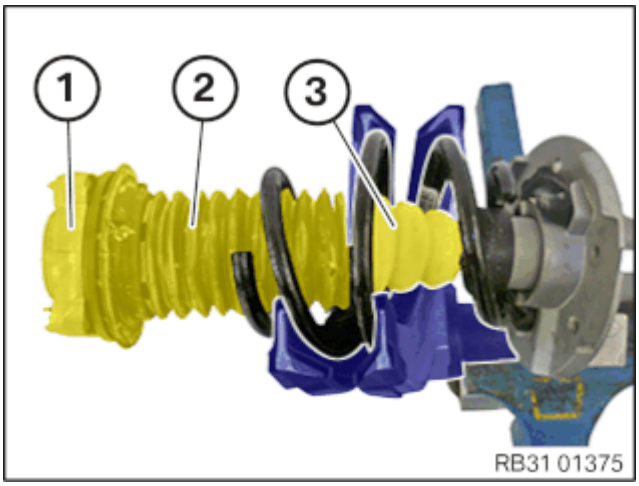


TECHNICAL INFORMATION

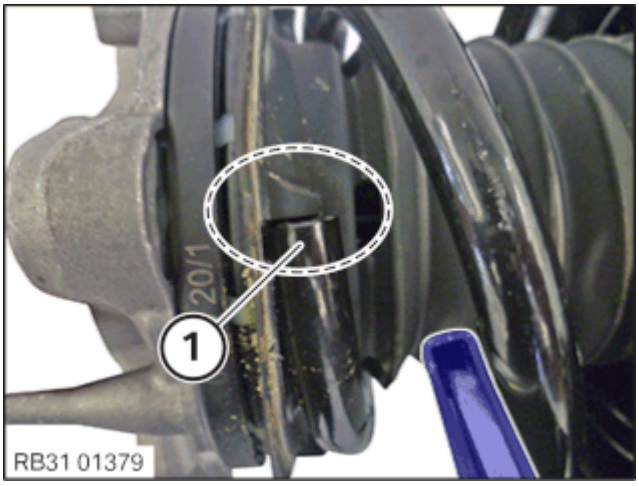
Do not mix up the left and right.

- Note the designation (1) on the spring strut support bearing.
  - L = left
  - R = right

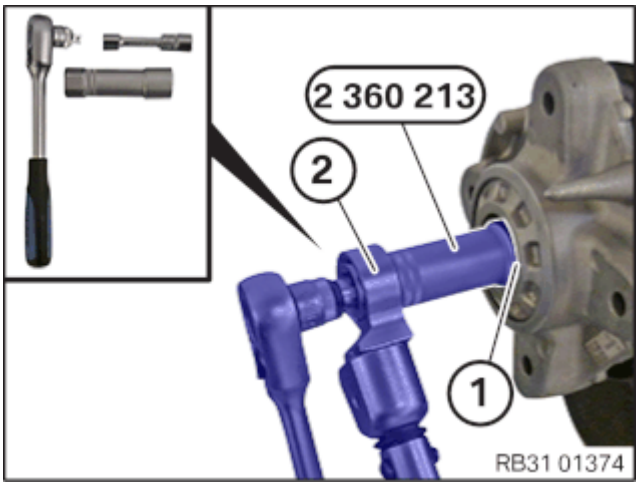
(F) = driving direction



- Slide the spring strut support bearing (1) with the protective tube (2) and the auxiliary damper (3) onto the piston rod of the shock absorber.



- Align the spring strut support bearing with the protective tube for the upper coil spring end (1) up to the stop.



TECHNICAL INFORMATION

Releasing and tightening the nut on the support bearing or spring strut support bearing with an impact screwdriver is prohibited.

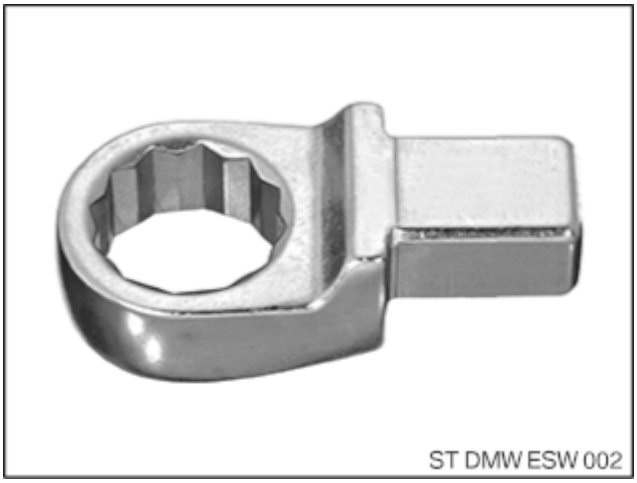
- Renew nut (1).

  Parts: Nut

- Tighten the nut (1) on the spring strut support bearing with the special tool **2 360 213** and the standard tool (2). Counter support at the shock absorber (SW10) while doing so.

  Standard tool: Ring insert tool for double hexagon head

  ## Ring insertion tool for external double hexagon



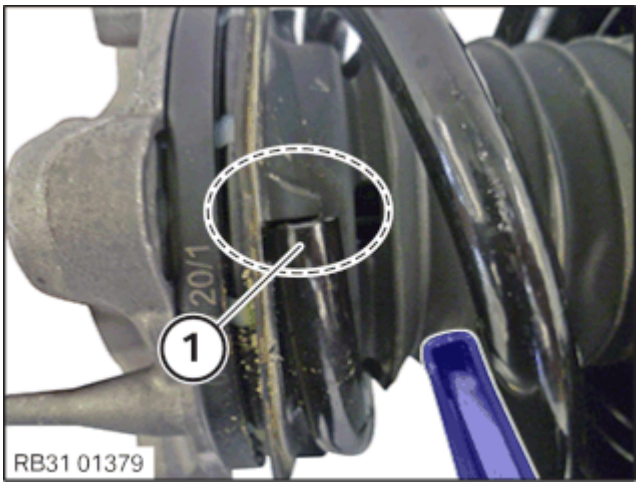
Ring insertion tool for external double hexagon

Tightening torques

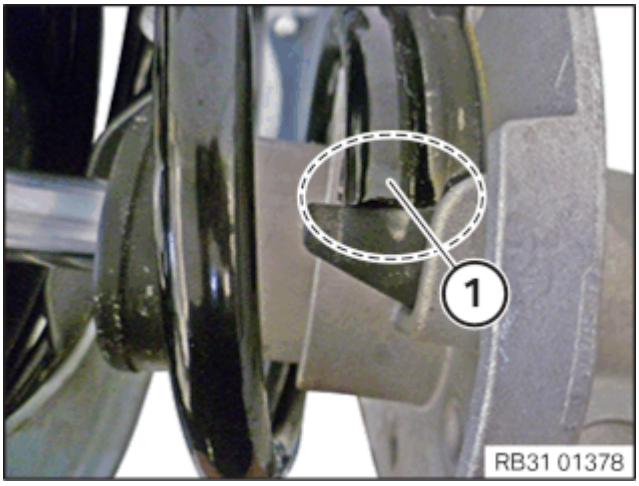
Spring strut support bearing to shock absorber

M14 Renew nut.	71Nm

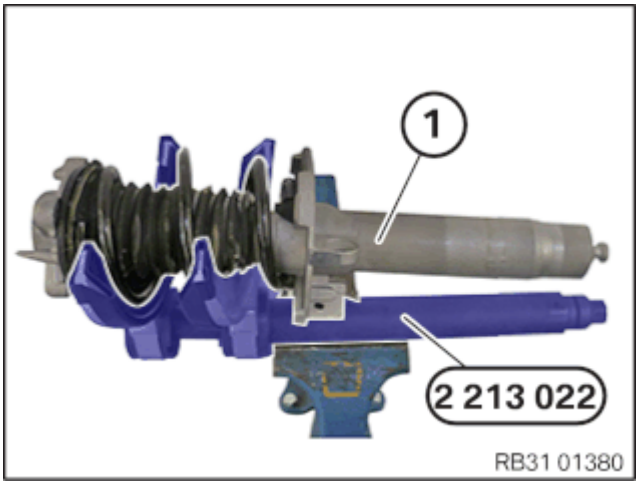
Relieving tension on coil spring



- The upper coil spring end (1) must be in contact with the spring pad when the coil spring is released.



- The lower coil spring end (1) must be in contact with the spring pad when the coil spring is released.

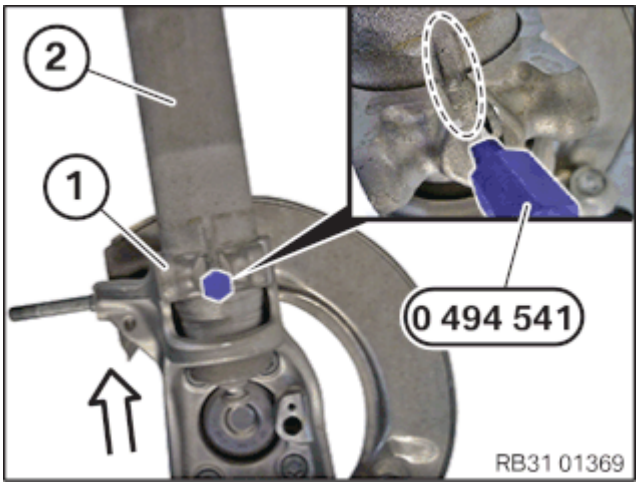


- Release the coil spring using special tool 2 213 022 (31 3 340). Check the position of the coil spring ends and correct if necessary.
- Remove the spring strut (1) from the special tool 2 213 022 (31 3 340).

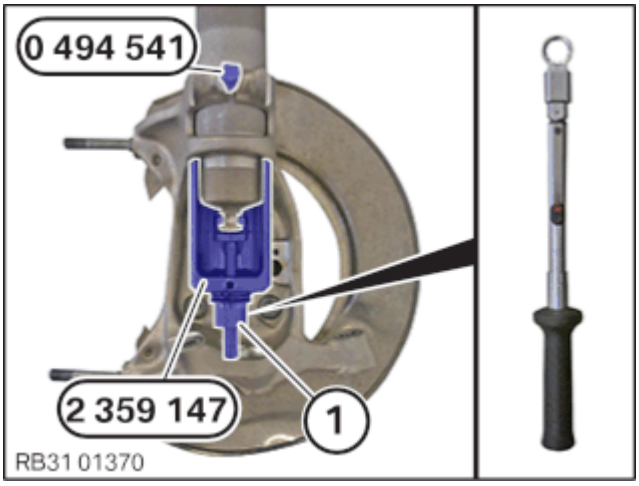
Installing the swivel bearing

i TECHNICAL INFORMATION

Keep the connection between the swivel bearing and the spring strut clean and free of oil and grease.



- Spread the swivel bearing (1) with the special tool 0 494 541 (31 2 230).
- Align the swivel bearing (1) with the gap to the shock absorber (2) and slide it in arrow direction.



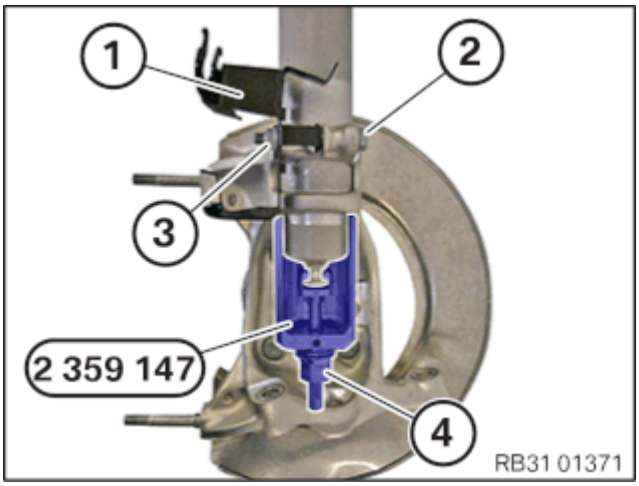
- Position the special tool 2 359 147 .
- Tighten the nut (1) and pull the shock absorber into the swivel bearing.

Tightening torques

Special tool to the swivel bearing	
	Tightening torque 20Nm

- Release and remove the special tool 0 494 541 (31 2 230) .

  The special tool 2 359 147 must be released only after tightening the screw connection.



- Position the holder(1) on the swivel bearing.
- Renew the bolt (2) and the nut (3).

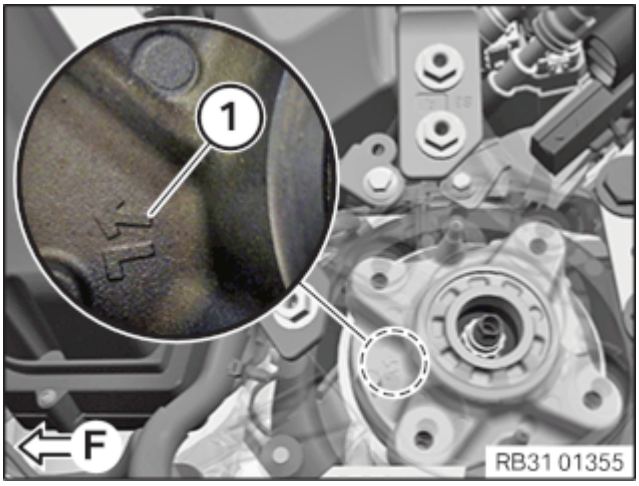
  Parts: Bolt, nut
- Insert and tighten the bolt (2). In doing so, counter support at the nut (3).

Tightening torques

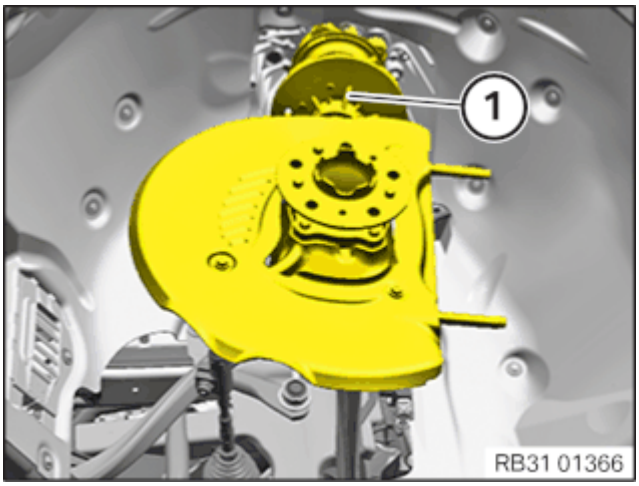
Spring strut to swivel bearing	
M10 Renew screw and nut. Tightening via screw.	Tightening torque 56Nm

- Release the nuts (4) and remove the special tool **2 359 147** .

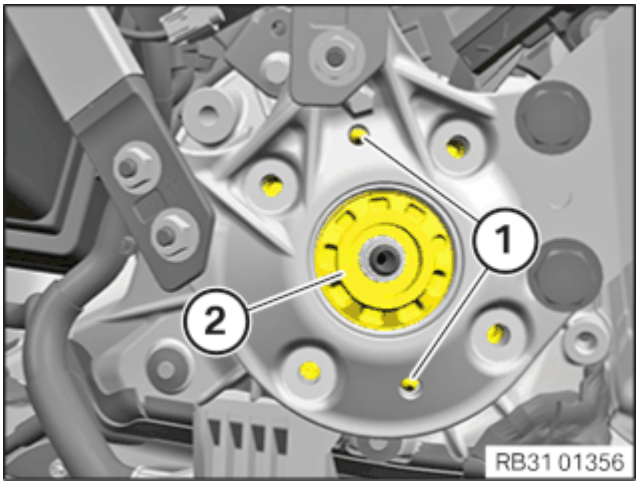
Install the spring strut



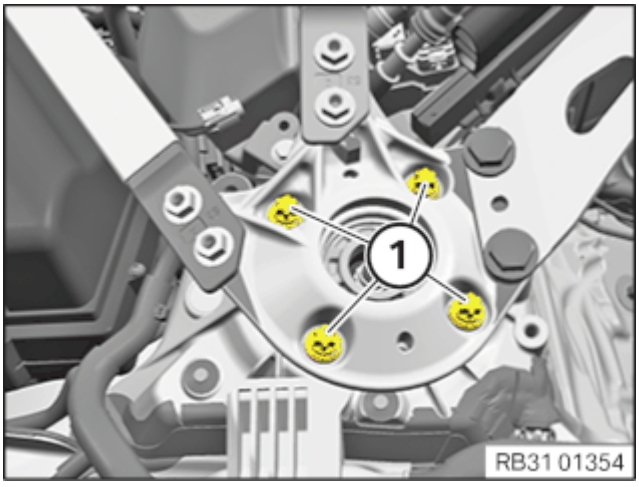
- The arrow (1) on the spring strut support bearing must point in the driving direction (F) during installation.
  - L = left
  - R = right



- Position the spring strut (1) in the wheel well.



- Observe the correct positioning of the tappet (1) of the spring strut support bearing (2) on the shock tower.



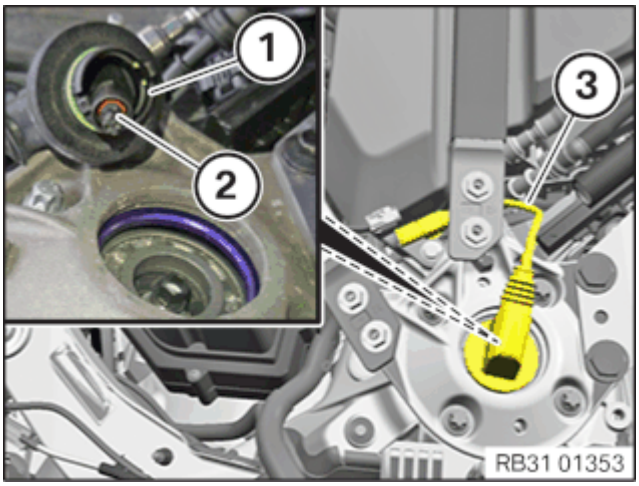
- Renew screws (1).

  Parts: Screws

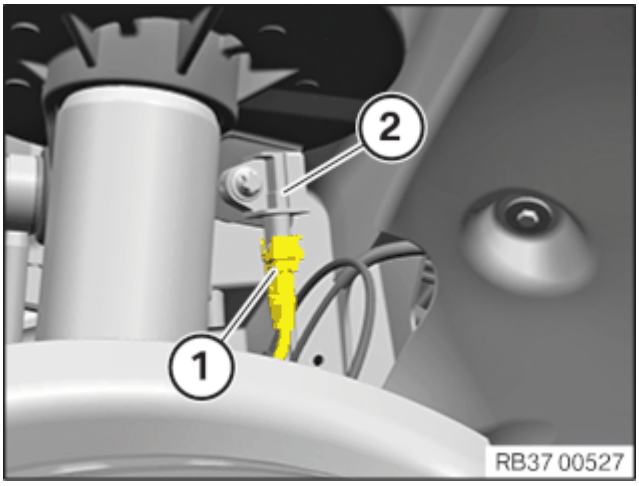
- Tighten down screws (1).

Tightening torques

Spring strut support bearing to body	
M8 Renew screws.	Snug torque 28Nm Angle of rotation 180°

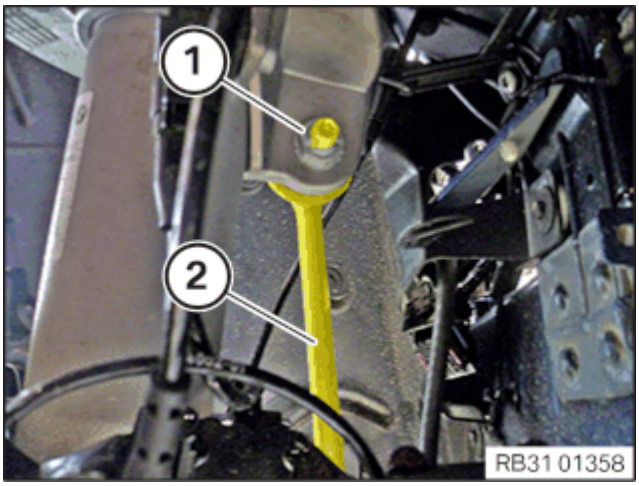


- Insert the connector (2).
- Mount the rubber grommet with the retaining ring (1) of the adapter cable (3) .



- Connect the connector (1) to the vertical acceleration sensor (2) and lock it.

Fasten the anti-roll bar link to the spring strut



- Position the anti-roll bar link (2) on the spring strut.
- Renew nut (1).

  Parts: Nut
- Tighten nut (1). If necessary, counter support at the Torx socket.

Tightening torques

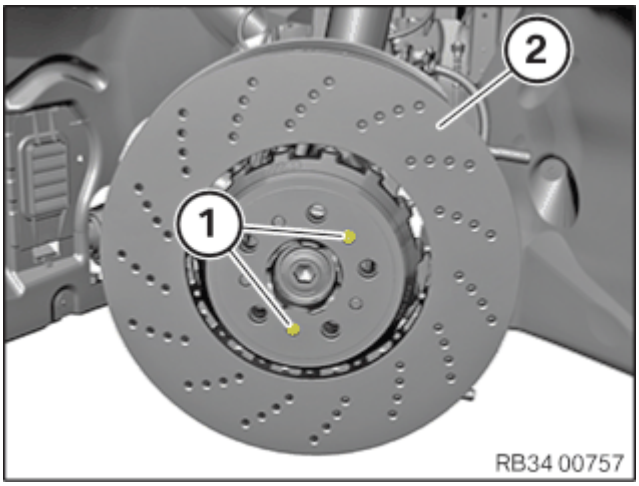
Front anti-roll bar link to anti-roll bar/spring strut	
M10 Renew nut.	tightening torque 56Nm

Installing front brake disk

TECHNICAL INFORMATION

Brake discs must only be replaced in pairs (per axle).

Fit new brake discs only together with new brake pads.



- Thoroughly clean the contact surface of the wheel hub and remove traces of corrosion if necessary.

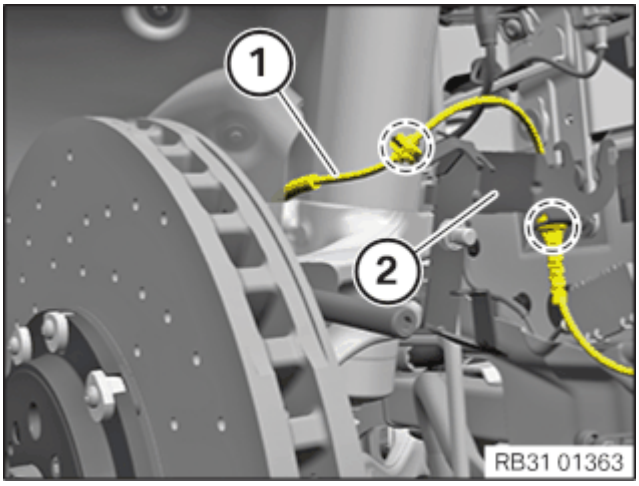
  Unevenness in the contact surface can cause distortion in the brake disk (2)!
- Position the brake disc (2).
- Renew screws (1).

  Parts: Screws
- Tighten the screws (1).

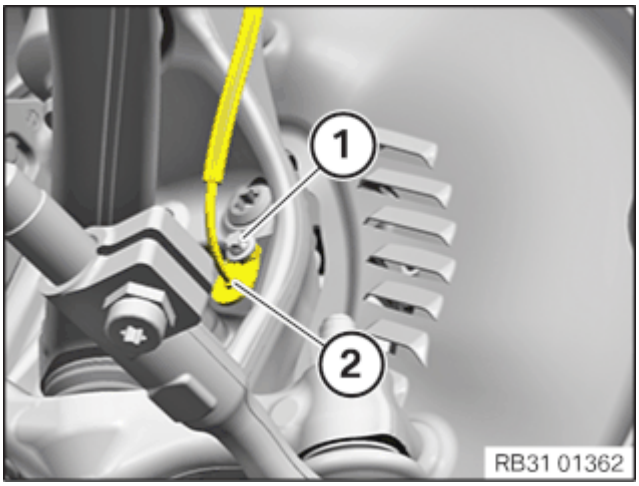
Tightening torques

Brake disc to front wheel hub	
M8 Renew screw.	Tightening torque 16Nm

Fastening the wheel speed sensor on swivel bearing



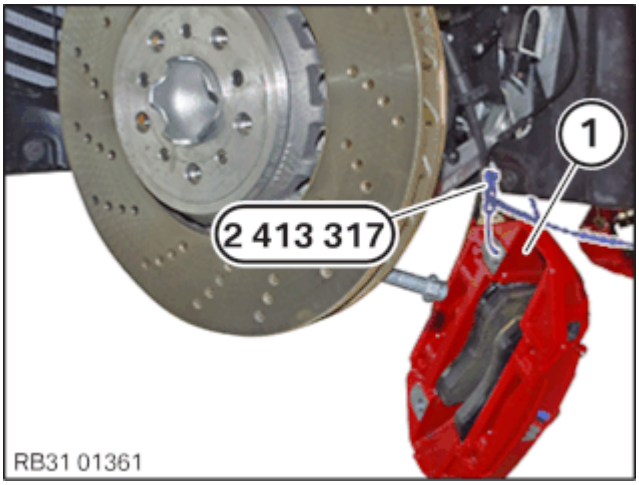
- Secure cable (1) of wheel speed sensor to holder (2).



- Position the wheel speed sensor (2) on the swivel bearing.
- Renew the screw (1).

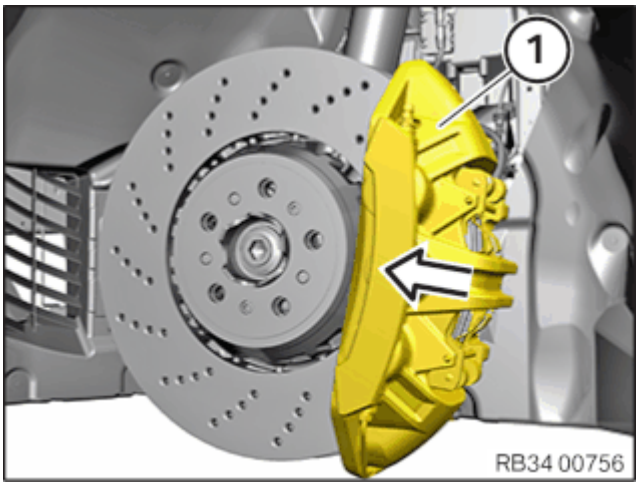
  Parts: Screw
- Tighten down screw (1).

Fastening front brake caliper

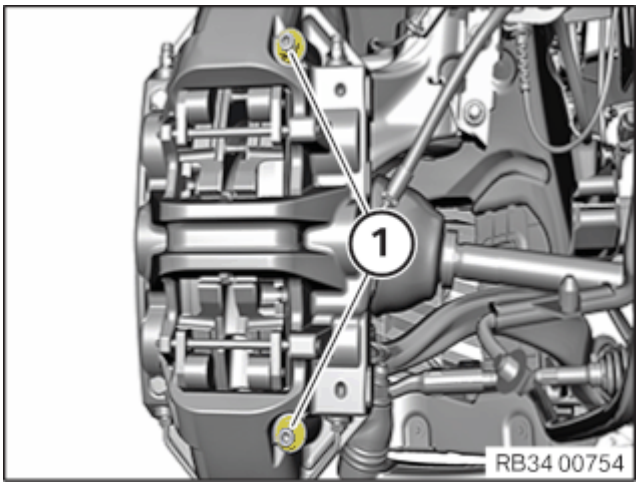


- Release the special tool 2 413 317 from the brake caliper (1) and remove it.

  Do not hang the brake caliper (1) from the brake hose.



- Position the brake caliper (1) in the arrow direction. Do not twist the brake hose in the process.



- Renew nuts (1).

  Parts: Nuts

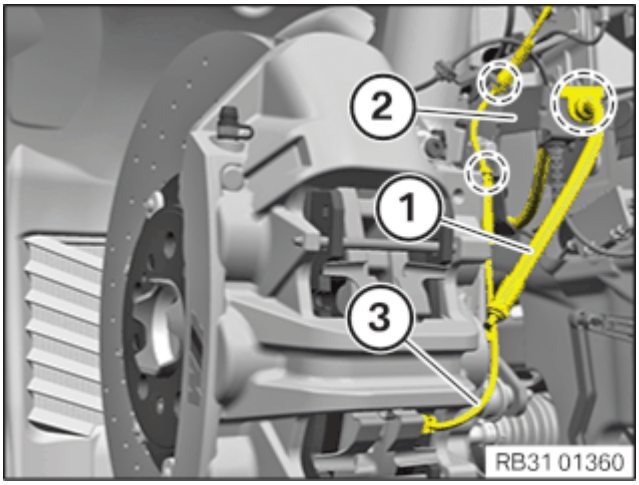
- Tighten nuts (1).

Tightening torques

Brake caliper on stud bolt of the front swivel bearing

M12
Replace nuts.

Tightening torque
95Nm



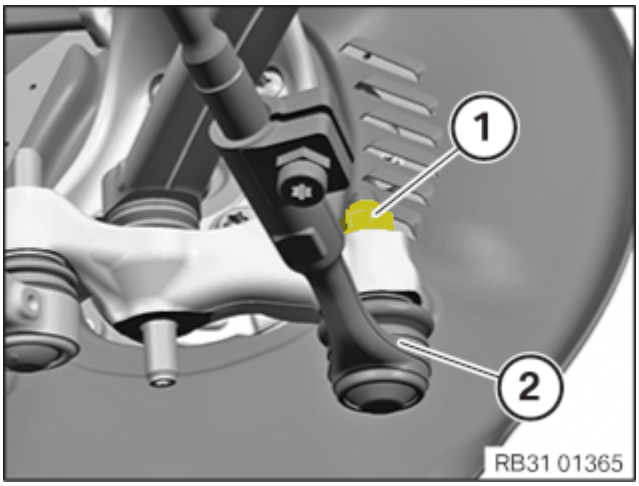
- Fasten the brake hose(1) on the holder(2).

NOTE

Only perform the operation on the left side.

- Fasten the cable (3) for the brake pad wear sensor on to the holder (2).

Attaching the wishbone, tension strut and tie rod end on the swivel bearing



- Position the tie rod end (2) on the swivel bearing.
- Renew nut (1).

  Parts: Nut

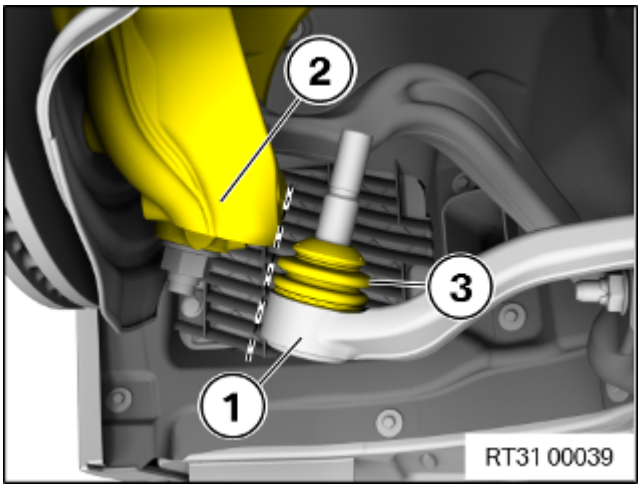
- Tighten nut (1). If necessary, counter support at the Torx socket.

Tightening torques

Tie rod end to swivel bearing

M14
Renew nut.

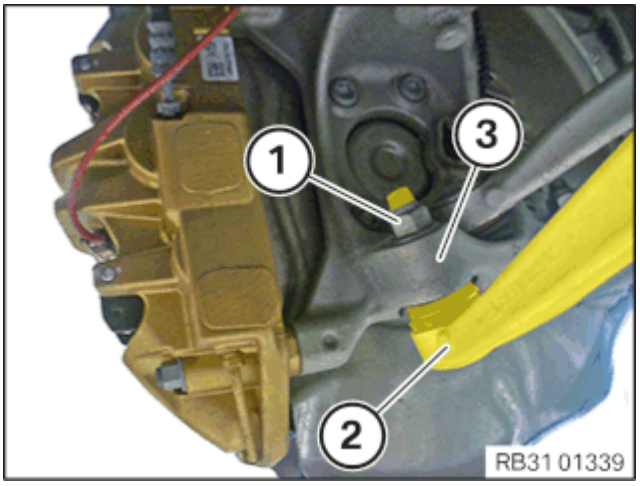
Tightening torque
165Nm



TECHNICAL INFORMATION

Otherwise, the rubber grommet can be damaged. The components must not be in contact.

- Make sure that the rubber grommet (3) on the wishbone (1) is not damaged by the swivel bearing (2).



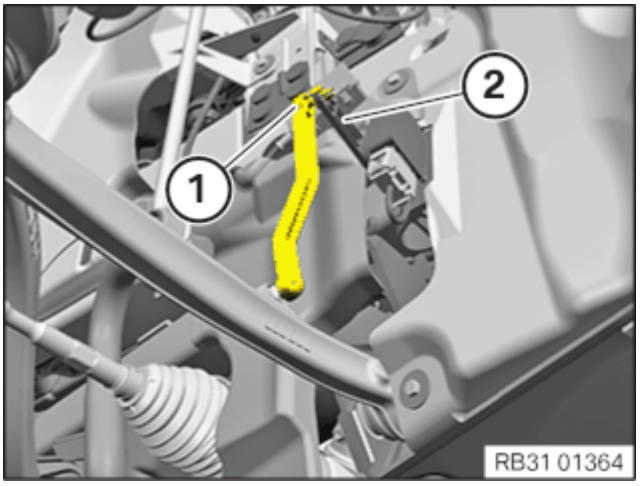
- Position the wishbone (2) on the swivel bearing (3).
- Renew nut (1).

  Parts: Nut

- Tighten nut (1). If necessary, counter support at the Torx socket.

Tightening torques

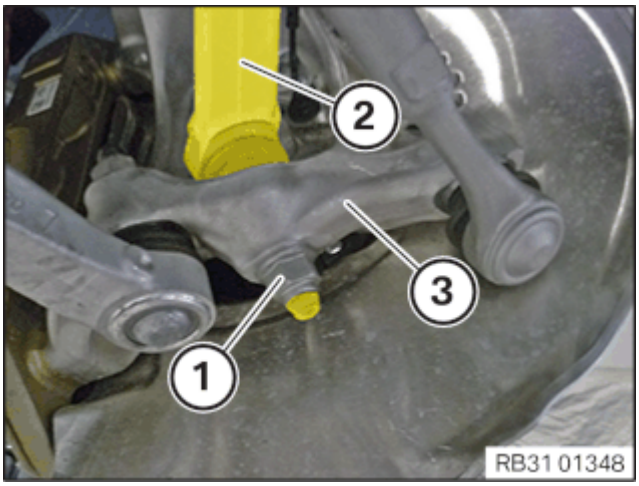
Wishbone to swivel bearing	
M14 Renew nut.	tightening torque 175Nm



NOTE

Only perform the operation on the left side.

- Attach the attachment rod (1) on to the ride height sensor (2).



- Position the tension strut (2) on swivel bearing (3).
- Renew nut (1).

  Parts: Nut
- Tighten nut (1). If necessary, counter support at the Torx socket.

Tightening torques

Tension strut to swivel bearing

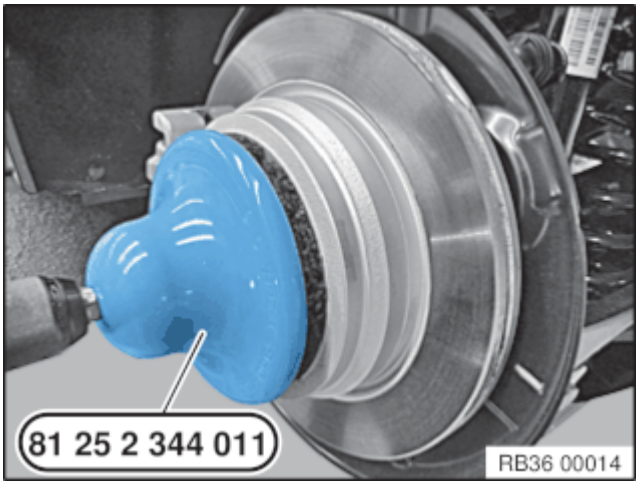
M14 Renew nut.	tightening torque 175Nm

Attaching the front left wheel

Further information is available.

▶ Mounting the wheel

Further information is available.



i TECHNICAL INFORMATION

The contact surface between the brake disc and the wheel rim must be clean and free from oil and grease. There is otherwise a risk of the wheel becoming loose at a later time.

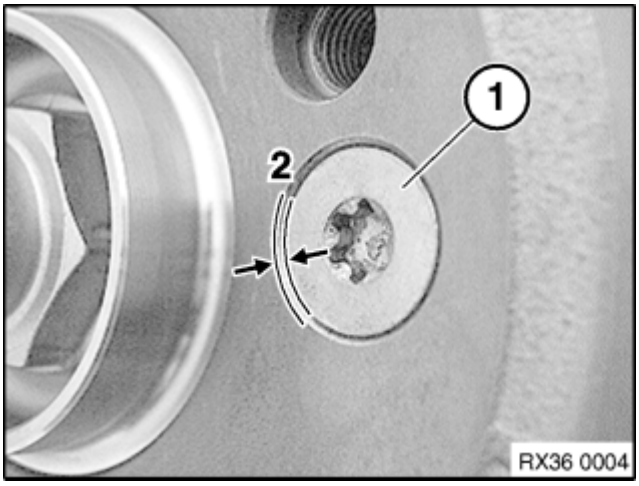
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool **2 344 011** .

  Do not operate special tool **2 344 011** with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residues in the area of the wheel bolt holes, remove and clean the brake disk.

- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011 .

  Do not operate special tool 2 344 011 with an impact screwdriver.

- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).



- Check if the mounting bolt (1) has been fitted correctly for the brake disk.

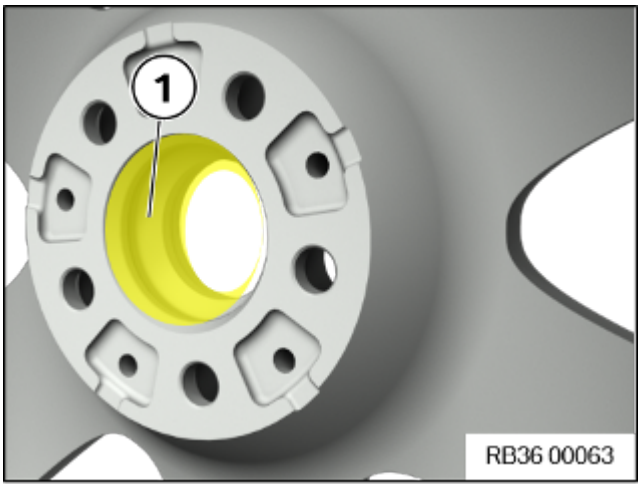
  The mounting bolt (1) for the brake disk **cannot** protrude on the contact surface (2) between the brake disk and the rim.

Tightening torques

Brake disc to front wheel hub	
M8	tightening torque 16Nm

Tightening torques

Brake disc to rear wheel hub	
M8	tightening torque 16Nm



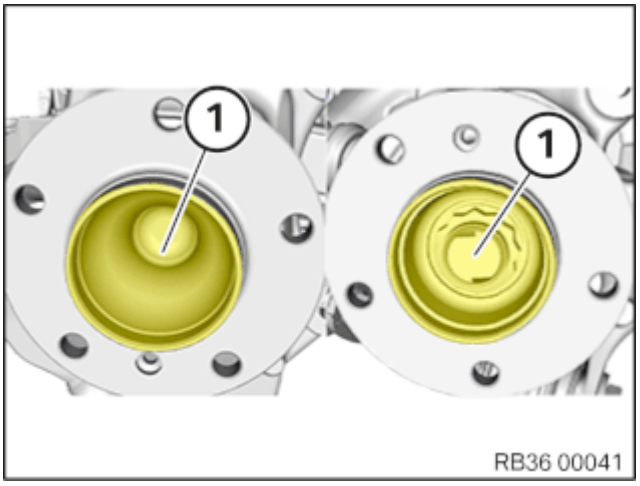
TECHNICAL INFORMATION

Do **not** grease wheel hubs and the wheel centering in G80, G81, G82, G83 and G87 models.

- Lightly grease the wheel centering (1) in the rim.

Consumable

Brake block paste * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233



TECHNICAL INFORMATION

Do **not** grease wheel hubs and the wheel centering in G80, G81, G82, G83 and G87 models.

- Apply a thin layer of grease to the front and rear wheel hubs (1) to protect against corrosion.

Consumable

Brake block paste * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233

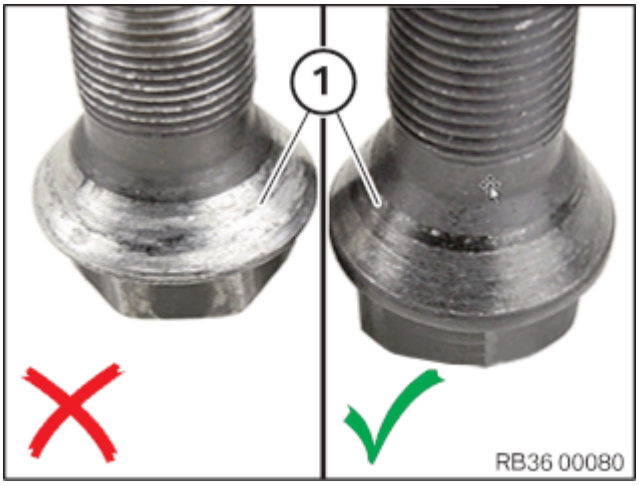
TECHNICAL INFORMATION

A wheel lifter is recommended for easier wheel removal and installation without exertion (see Dealer Equipment Catalog).

- In vehicles with M Carbon ceramic brake: The wheel lifter must be used to install the wheel.

  This process is intended to prevent damage to the brake disc.

Check



- Check lug bolts for wear.

Result

» Spots (> 30%) of the bearing surface (1) of the taper on the screw head show silvery wear.

Measure

- Replace wheel bolts.

TECHNICAL INFORMATION

Never use an impact screwdriver or electric screwdriver to apply and tighten the lug bolts.

The rim must rest evenly against the brake disc.

In the case of non-original BMW lug bolts/wheel rims, it may be necessary to retighten the lug bolts on user account of setting properties (refer to the documentation from the manufacturer).

Do not apply oil to new lug bolts.

- Renew the corroded wheel bolts (arrows).
- Clean wheel bolts (arrows).
- Check lug bolts (arrows) and threads for damage, renew lug bolts (arrows) if necessary.
- Join and tighten the wheel bolts (arrows).

Tightening torques

Lug bolts

M14 / SW17
Screw in lug bolts and evenly tighten crosswise by hand in order to center the wheel rim.

Tighten lug bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.

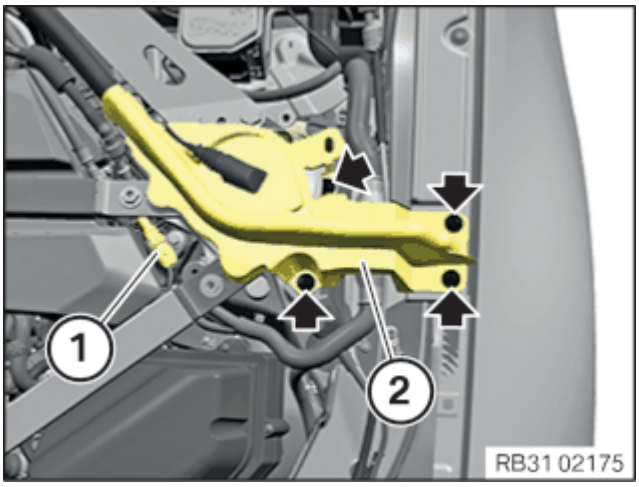
Check all the lug bolts in the same order or retighten to the prescribed tightening torque again.

tightening torque
140Nm

Check 140Nm

◀

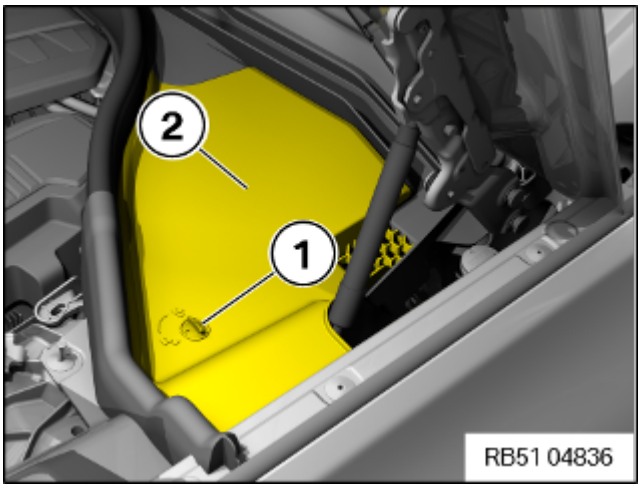
Installing the side hood seal



- Position hood seal (2). While doing so, maneuver the cable.
- Mount the expanding rivets (arrows).
- Connect connectors (1) and lock.
- Clip the plug connection into the wiring harness.

Install the cover of the engine compartment on the rear left or right

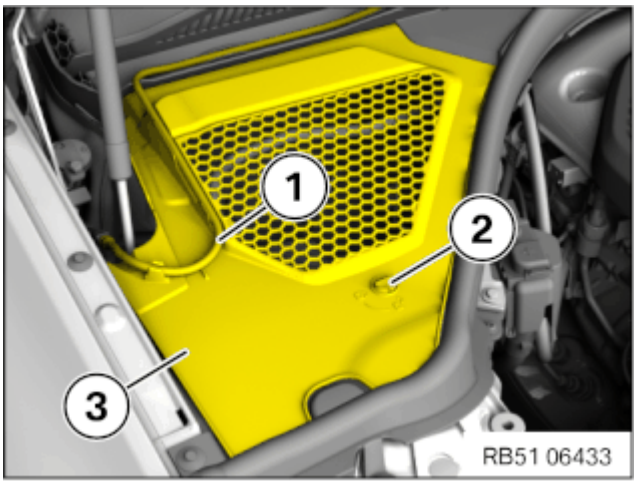
▶ Install the cover of the engine compartment on the rear left



- Position the cover of the engine compartment to the rear left (2).
- Close lock (1).

◀

▶ Install the rear right engine compartment cover



- Position the cover of the right rear engine compartment (3).
- Close lock (2).
- Insert the washer fluid hose (1) into the guides.

◀

Perform chassis alignment check

- Perform the introductory wheel alignment in accordance with equipment manufacturer's instructions.
- If necessary, adjust the front axle and the rear axle.
- Perform the final wheel alignment in accordance with equipment manufacturer's instructions.
- Save and print out test record.