31 00 ... Information on replacing shock absorbers

Situation:

When a shock absorber is faulty on one side (leaking, noises, etc.), often both shock absorbers on the axle in question are replaced.

Effect:

This is not necessary for technical reasons and causes the manufacturer not to recognize the unnecessarily removed shock absorbers as defective parts. Unnecessarily high costs for the customer can be avoided by replacing the shock absorber on one side only.

Procedure:

If one shock absorber is damaged, it is only necessary to replace both shock absorbers when the car has driven in excess of 100 000 km.

Exception: In all models of M GmbH, for example M3, M5, M6, M8, X5M, X6M, both shock absorbers on the corresponding axle must always be replaced even if a limit value is exceeded on one side only (MPA models not included).

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31 00 Mobile table lift

Warning!

Danger of injury!

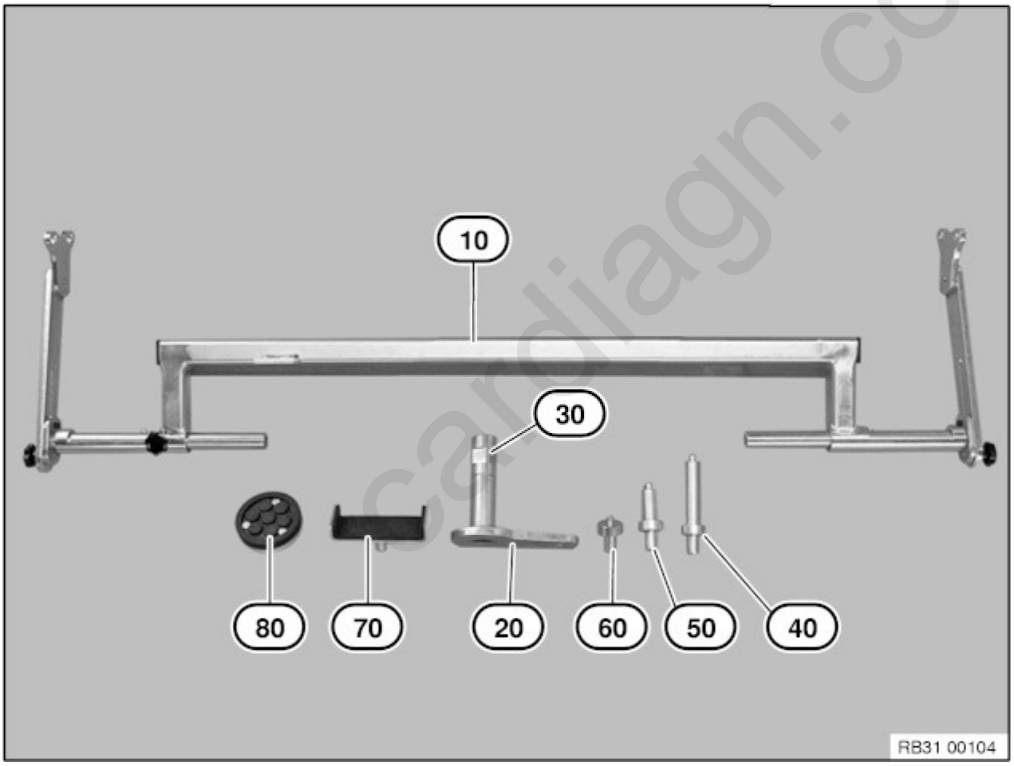
Before beginning work, position table lift with the lower frame securely on the floor.

Danger area around mechanism below platform.

- Do not reach into or step into the danger area.
- Note permissible bearing capacity of table lift.
- Mount load centrally (danger of tipping) and secure against shifting.

Follow the operating instructions from the equipment manufacturer.

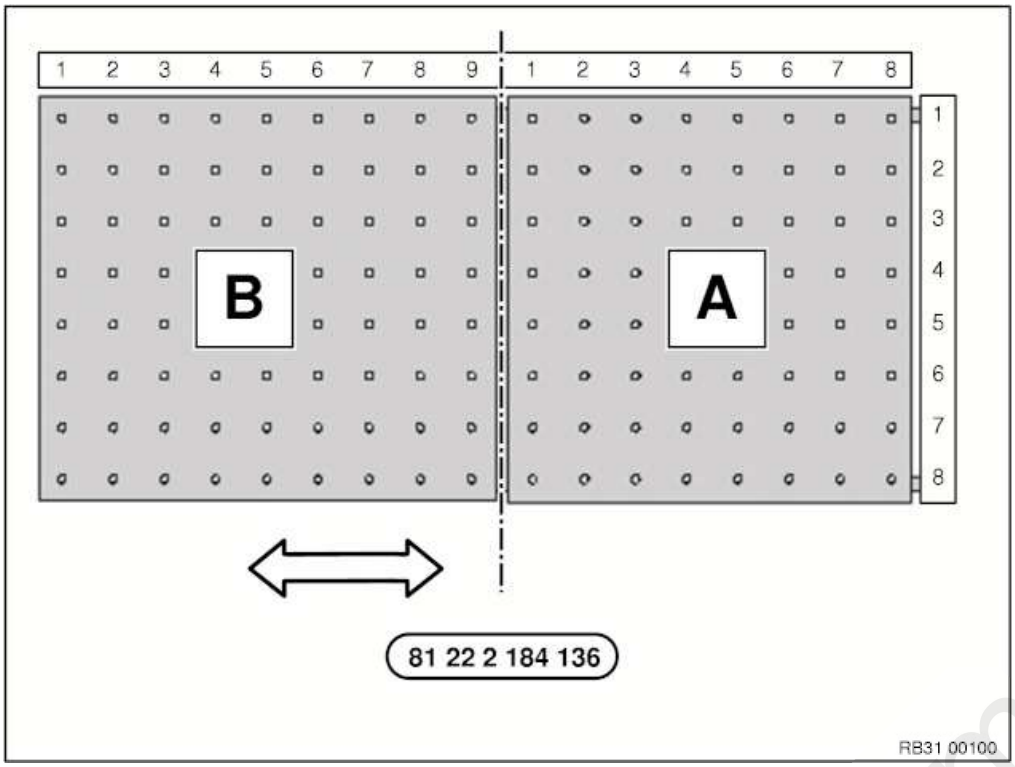
The mobile table lift is used for collision repairs and when removing large engines.



Adaptations for mounting front axle with engine and transmission.

No. 10	For mounting swivel bearing with brake disc
No. 20	Retaining element for adjustable fixture
No. 30	Adjustable fixture
No. 40	Distance pin 40 x 160 mm
No. 50	Distance pin 40 x 110 mm
No. 60	Distance pin 40 x 60 mm
No. 70	Fixture with U-profile
No. 80	Plate fixture Ø=100 mm

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Release star knob screw on working plate (B) of table lift; the working surface (B) can be extended by approx. 310 mm.

Release all push-pull clamps and the working plates can be shifted by approx. 20 mm.

Working plate (A and B) can be raised and lowered by 3° on the long side and by 5° on the transverse side.

Working plate (A and B) is subdivided by a coordinate system and a possible installation position is recommended in the respective repair manual.

Important!

Follow the operating instructions from the equipment manufacturer.

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31 00 ... Notes on wheel bearing replacement following accident damage

Wheel bearing facts:

In the event of accidents or driving conditions similar to accidents, shock-like loads to the wheel bearing units can cause slight damage to the bearing track. Despite initial running without noise, with continued use, this results in later noise generation at the wheel bearing.

Procedure:

The wheel bearing must be replaced on the damaged side of the axle if one or several of the following points apply:

- Visible or noticeable damage to the wheel bearing
- Rolling noises, radial/lateral runout on the wheel bearing
- Permissible tolerance for the wheel alignment is exceeded and no longer adjustable without the exchange of additional components
- Damage, permanent deformation or fractures to:
  - Wheel rims (major damage) and simultaneous negative result for wheel alignment
  - Spring struts, swivel bearings, wheel carriers
  - Wishbones
  - Struts or trailing links or anti-roll bar with this function
  - Body-side screwing/attachment points for wheel guide/control components
  - Track rods
  - Steering box fixtures

This guideline is binding for all accident repairs to BMW, MINI and Rolls-Royce vehicles!

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00 02 001 Raising the vehicle using a vehicle lift



Warning!

Danger to life!

Read and follow operating instructions for vehicle hoist.

Do not exceed approved load-carrying capacity and load distribution of vehicle hoist.

Weight compensation may be necessary due to the loading situation of the vehicle.

This also applies in the event of considerable removal of parts or conversions on the vehicle.

Note:

The vehicle hoist must comply with the relevant statutory/country-specific accident prevention regulations and be serviced according to the regulations.



Caution!

Risk of damage!

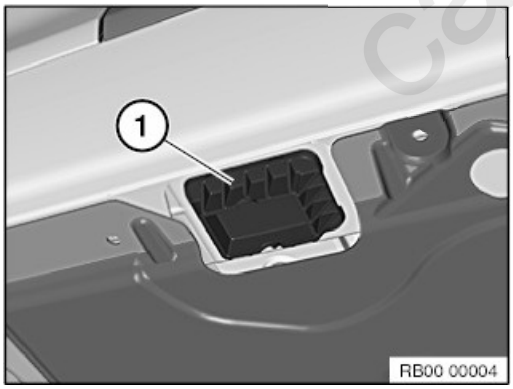
Before driving onto a vehicle hoist, make sure there is sufficient ground clearance between the vehicle hoist and the vehicle.

The vehicle may only be raised with the vehicle hoist at the four jacking points.



Necessary preliminary work:

- For new vehicles: If necessary, remove jacking points from equipment pack and insert from below into openings in front and rear sill areas

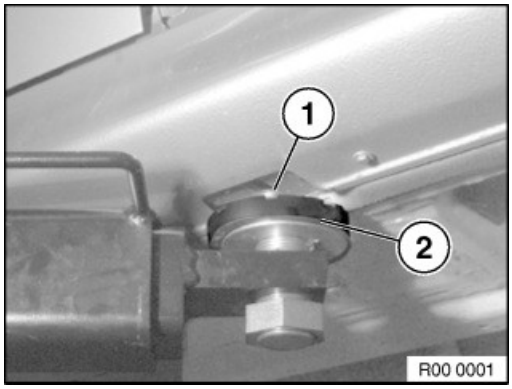


Caution!

All four jacking points (1) must be available!

Never raise the vehicle without the jacking points (1)!

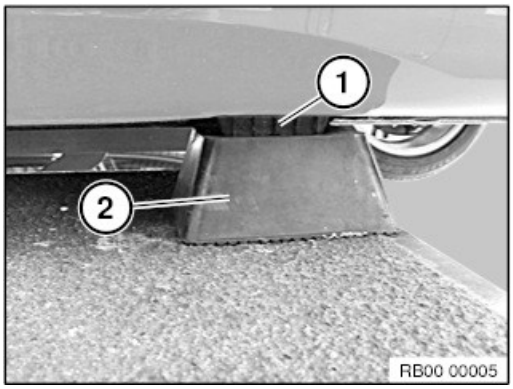
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Caution!

Risk of damage!

Align support plates (2) of lifting platform arms to jacking points (1) in such a way that no adjoining components are touched and thereby damaged.



Caution!

Risk of damage!

Align the rubber block (2) with the jacking points (1) in such a way that no adjoining components are touched and thereby damaged.

Never raise the vehicle without rubber blocks (or rigid foam blocks)!

There is a major risk of damage to the vehicle underbody!

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00 Safety information for working on vehicles with automatic engine start-stop function (MSA)

Warning!

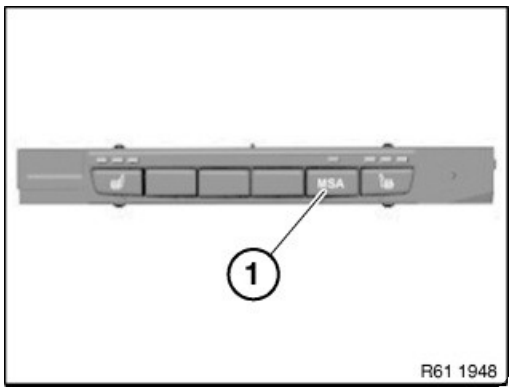
If the engine hood/bonnet contact is pulled upwards (workshop mode), the information "switch closed" is output. The automatic engine start-stop function is active.

An automatic engine start is possible.

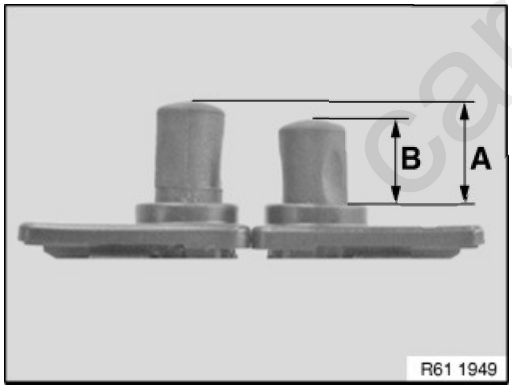
Observe safety precautions when working on MSA vehicles.

Before carrying out practical work on the engine, always ensure that the MSA functionality is deactivated so as to prevent automatic engine starting while work is being carried out in the engine compartment.

MSA function is deactivated by:



- Deactivate MSA by means of button (1) in passenger compartment
- Open seat belt buckle and driver's door



- Open engine bonnet/hood and ensure that engine hood/bonnet contact is not in workshop mode
  - Workshop mode

    A = 10 mm
  - Basic setting (engine hood/bonnet open)

    B = 7 mm

  To make sure that the engine hood/bonnet contact is at the basic setting, if necessary press the hood/bonnet contact up to the limit position before starting work and slowly release.

When working with diagnosis tools:

- Observe instructions in diagnosis tool

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Note:
For further information on automatic engine start-stop function (MSA):

- Refer to the Service Information (bulletin) (for manual transmissions) Service Information (bulletin) 61 01 07 335
- Refer to the Service Information (bulletin) (for automatic transmissions or twin-clutch gearboxes) Service Information (bulletin) 61 01 10 629

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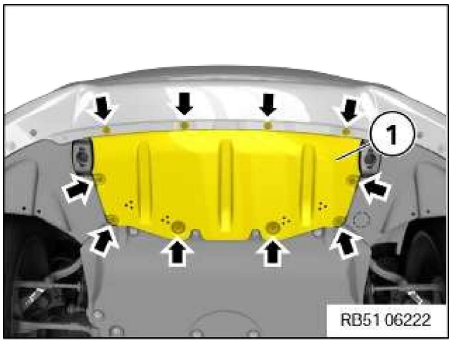
31 10 036 Remove and install/replace the right crash wedge

NOTICE

Description is for left component only. Procedure on the right side is identical.

PRELIMINARY WORK

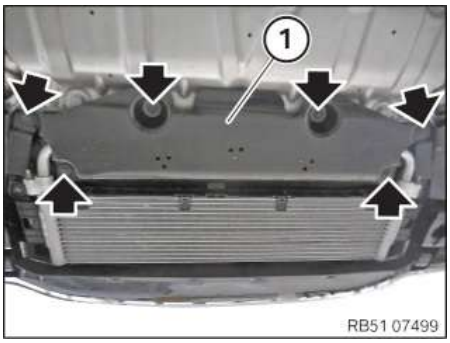
1 – Removing the front underbody protection



- **Version A:**

  Remove screws (arrows).

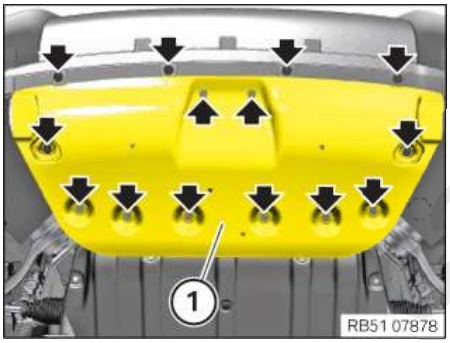
  Feed front underbody protection (1) backwards out of the bumper panel.



- **Version B:**

  Remove screws (arrows).

  Guide out front underbody protection (1) and remove it.



- **Version C:**

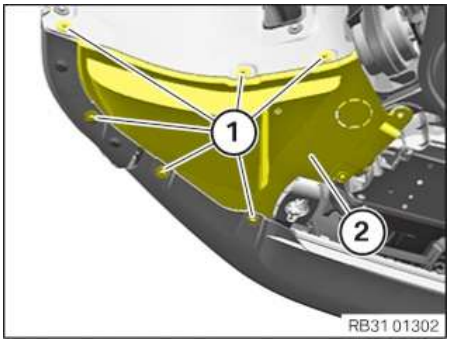
  Remove screws (arrows).

  Guide out front underbody protection (1) and remove it.

2 – Removing the lower front cover at the side

Prerequisite

The front underbody protection is removed.

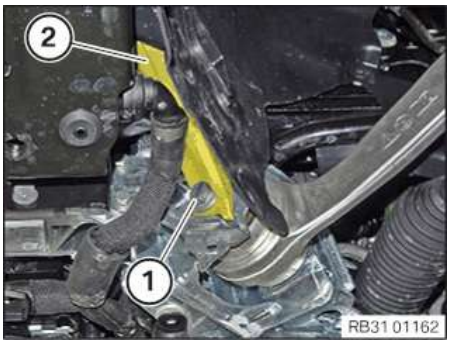


- Loosen screws (1).
- Remove the lower front cover at the side (2).

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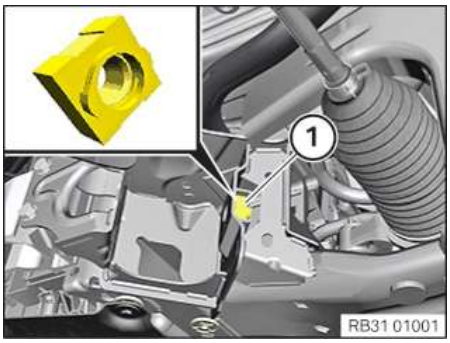
MAIN WORK

3 – Removing the crash lever



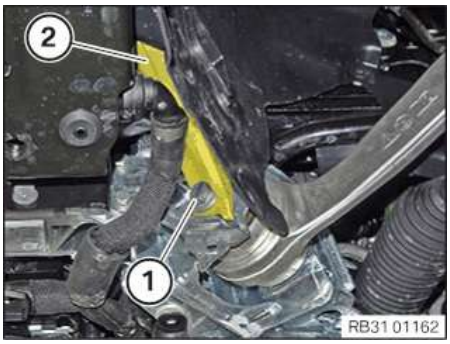
- Release the screw (1).
- Thread out the screw (1) and remove it.
- Feed out the crash lever (2) and remove.

4 – Installing crash lever



- Replace the cage nut (1).

  Parts: Cage nut



TECHNICAL INFORMATION

Tighten down screw connection in normal position.

- Position the tension strut and crash lever (2) on the front axle support.
- Renew the screw (1).

  Parts: Screw
- Feed in screw (1) and tighten hand-tight.

  The screw connection is tightened later in the normal position.

POSTPROCESSES

5 – Measuring the ride height of the front axle and adjusting the normal position



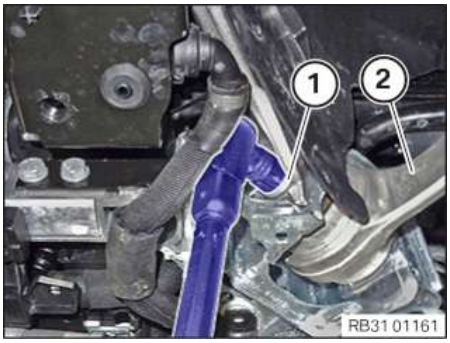
- Set vehicle on its wheels (for example, workshop pit or vehicle lift for Kinematics Diagnosis System).
- Measure the ride height (A).
- Load or unload the vehicle until the ride height (A) is within the tolerance.

G22/G23 Rear-wheel drive, standard suspension/sport suspension settings with low-slung

Measured from centre of wheel hub to lower edge of wheel arch	
Dimension A	361 (351 - 371) mm

6 – Tightening screw connection of tension strut on front axle support

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TECHNICAL INFORMATION

Tighten down screw connection in normal position.

- Slacken screw (1) for tension strut (2) by one turn.
- Tighten down screw (1).

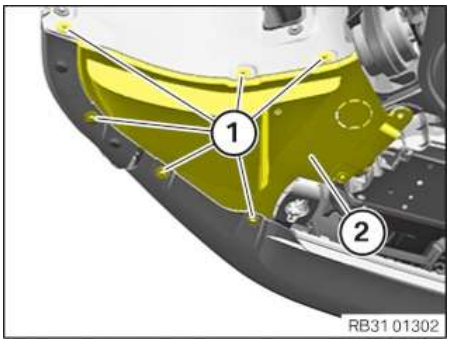
Tension strut to front axle support

M12	Renew bolt and cage nut. Tighten screw connection in normal position.	Jointing torque Angle of rotation	100 Nm 90 °

7 – Install the lower front cover at the side

Prerequisite

The front underbody protection is removed.

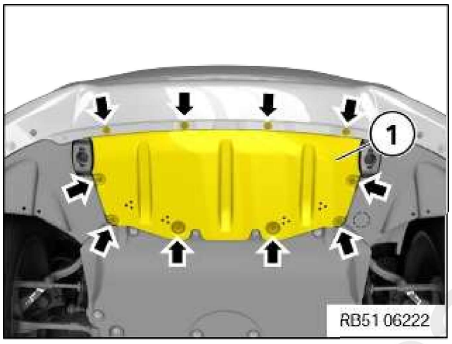


- Position the bottom front cover sideways (2).
- Tighten the screws (1).

Cover, front bottom on side

Hexagon screw for thermoplastic		Tightening torque	3 Nm

8 – Installing the front underbody protection



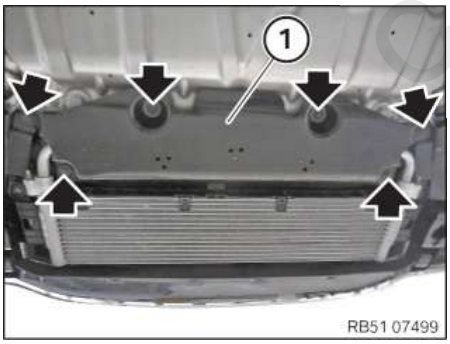
- **Version A:**

  Feed in the front underbody protection (1) towards the front under the bumper panel and position.

  Tighten screws (arrows).

Underbody protection front

Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm



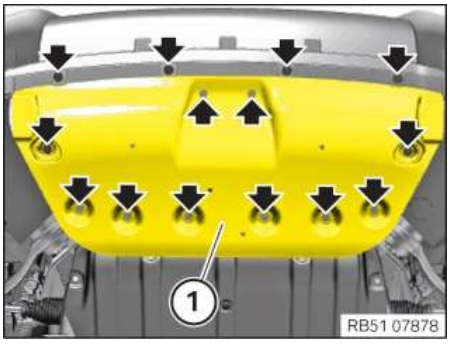
- **Version B:**

  Feed in and position the front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm



- **Version C:**

  Feed in and install front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

Additional Information

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Overview of Tightening Torques

Tension strut to front axle support — Used in step 6

M12	Renew bolt and cage nut. Tighten screw connection in normal position.	Jointing torque Angle of rotation	100 Nm 90 °

Cover, front bottom on side — Used in step 7

Hexagon screw for thermoplastic		Tightening torque	3 Nm

Underbody protection front — Used in step 8

Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

Overview Technical Data

G22/G23 Rear-wheel drive, standard suspension/sport suspension settings with low-slung — Used in step 5

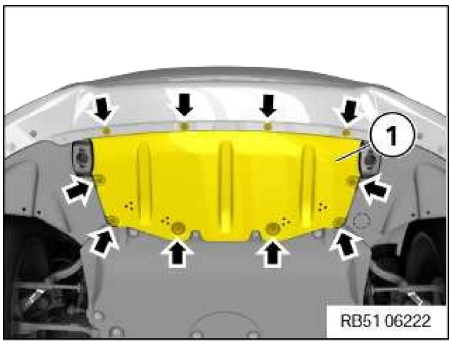
Measured from centre of wheel hub to lower edge of wheel arch	
Dimension A	361 (351 - 371) mm

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31 10 035 Removing and installing/replacing the left crash wedge

PRELIMINARY WORK

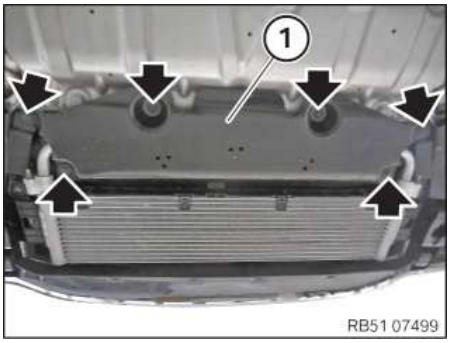
1 – Removing the front underbody protection



- **Version A:**

  Remove screws (arrows).

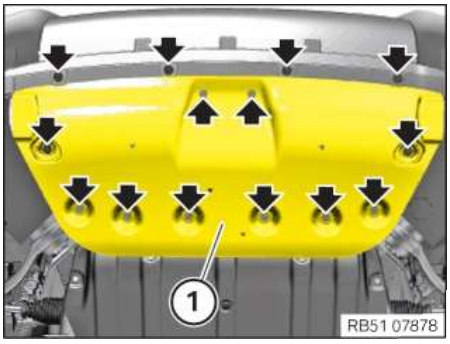
  Feed front underbody protection (1) backwards out of the bumper panel.



- **Version B:**

  Remove screws (arrows).

  Guide out front underbody protection (1) and remove it.



- **Version C:**

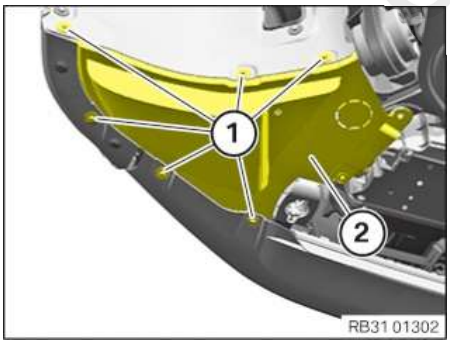
  Remove screws (arrows).

  Guide out front underbody protection (1) and remove it.

2 – Removing the lower front cover at the side

Prerequisite

The front underbody protection is removed.

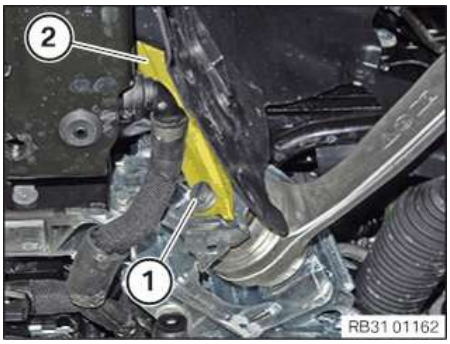


- Loosen screws (1).
- Remove the lower front cover at the side (2).

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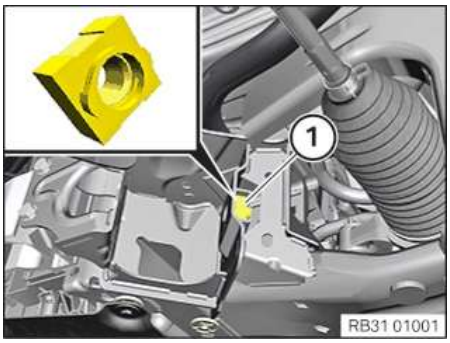
MAIN WORK

3 – Removing the crash lever



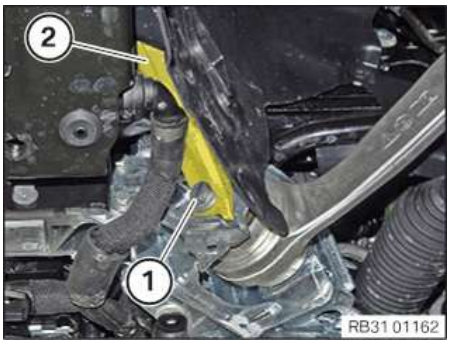
- Release the screw (1).
- Thread out the screw (1) and remove it.
- Feed out the crash lever (2) and remove.

4 – Installing crash lever



- Replace the cage nut (1).

  Parts: Cage nut



TECHNICAL INFORMATION

Tighten down screw connection in normal position.

- Position the tension strut and crash lever (2) on the front axle support.
- Renew the screw (1).

  Parts: Screw
- Feed in screw (1) and tighten hand-tight.

  The screw connection is tightened later in the normal position.

POSTPROCESSES

5 – Measuring the ride height of the front axle and adjusting the normal position



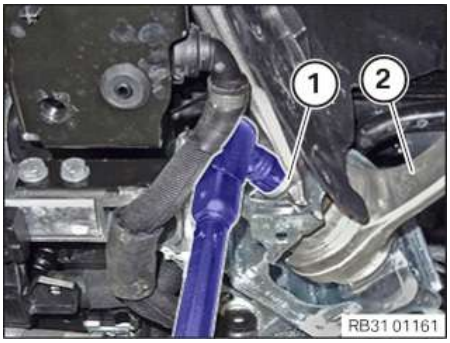
- Set vehicle on its wheels (for example, workshop pit or vehicle lift for Kinematics Diagnosis System).
- Measure the ride height (A).
- Load or unload the vehicle until the ride height (A) is within the tolerance.

G22/G23 Rear-wheel drive, standard suspension/sport suspension settings with low-slung

Measured from centre of wheel hub to lower edge of wheel arch	
Dimension A	361 (351 - 371) mm

6 – Tightening screw connection of tension strut on front axle support

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TECHNICAL INFORMATION

Tighten down screw connection in normal position.

- Slacken screw (1) for tension strut (2) by one turn.
- Tighten down screw (1).

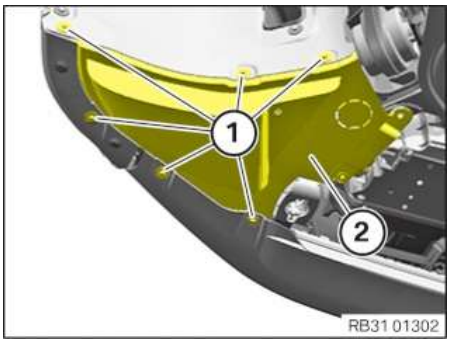
Tension strut to front axle support

M12	Renew bolt and cage nut. Tighten screw connection in normal position.	Jointing torque Angle of rotation	100 Nm 90 °

7 – Install the lower front cover at the side

Prerequisite

The front underbody protection is removed.

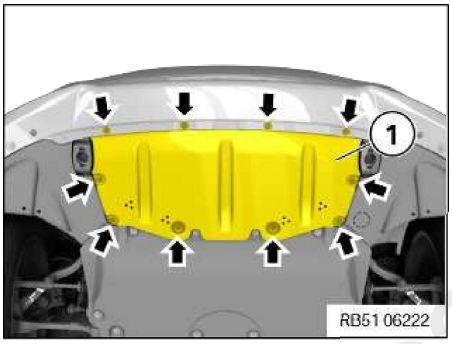


- Position the bottom front cover sideways (2).
- Tighten the screws (1).

Cover, front bottom on side

Hexagon screw for thermoplastic		Tightening torque	3 Nm

8 – Installing the front underbody protection



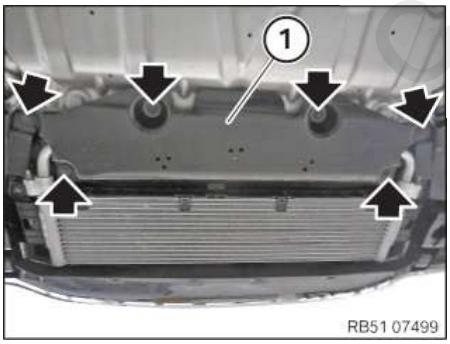
- **Version A:**

  Feed in the front underbody protection (1) towards the front under the bumper panel and position.

  Tighten screws (arrows).

Underbody protection front

Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm



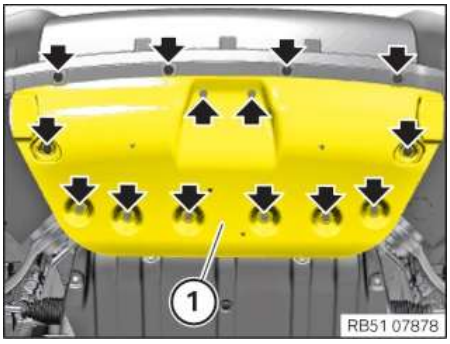
- **Version B:**

  Feed in and position the front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm



- **Version C:**

  Feed in and install front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

Additional Information

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Overview of Tightening Torques

Tension strut to front axle support — Used in step 6

M12	Renew bolt and cage nut. Tighten screw connection in normal position.	Jointing torque Angle of rotation	100 Nm 90 °

Cover, front bottom on side — Used in step 7

Hexagon screw for thermoplastic		Tightening torque	3 Nm

Underbody protection front — Used in step 8

Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

Overview Technical Data

G22/G23 Rear-wheel drive, standard suspension/sport suspension settings with low-slung — Used in step 5

Measured from centre of wheel hub to lower edge of wheel arch	
Dimension A	361 (351 - 371) mm

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31 12 050 Removing and installing/replacing left or right tension strut

WARNING

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

Danger! Life-threatening injuries!

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

NOTICE

Description is for left component only. Procedure on the right side is identical.

PRELIMINARY WORK

1 – Remove front left or right wheel

▸ **Removing the wheel**



TECHNICAL INFORMATION

A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to remove the wheel.**

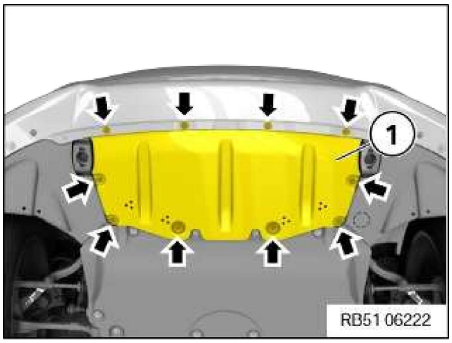
  This process is intended to prevent damage to the brake disc.



- If several wheels are removed at the same time: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Release the wheel bolts (arrows) crosswise and remove the wheel.
- To release and tighten wheel bolts with a security code: Use the correct adapter from the set of special tools .

2 – Removing the front underbody protection

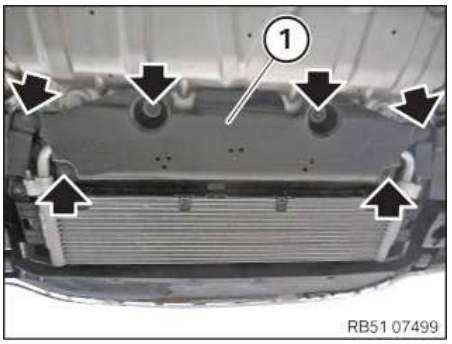
carediagn.com



- **Version A:**

  Remove screws (arrows).

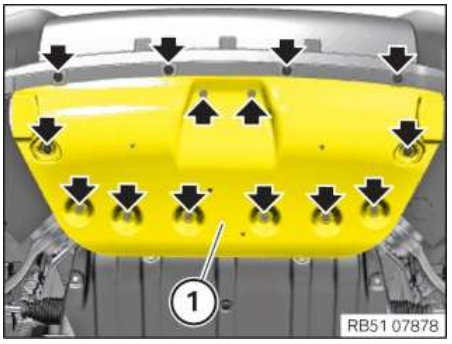
  Feed front underbody protection (1) backwards out of the bumper panel.



- **Version B:**

  Remove screws (arrows).

  Guide out front underbody protection (1) and remove it.

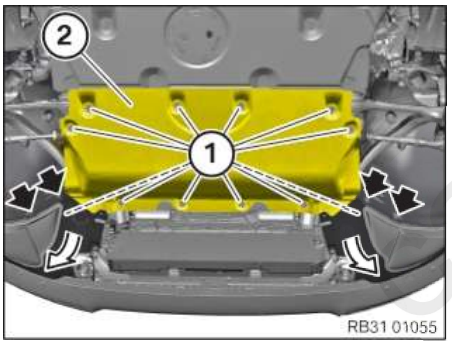


- **Version C:**

  Remove screws (arrows).

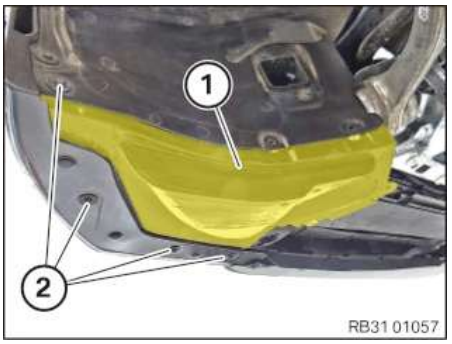
  Guide out front underbody protection (1) and remove it.

3 – Remove the underbody protection of the steering gear



- Unscrew the screws (arrows) of the wheel arch cover on wheel arch cover.
- Fold the bottom wheel arch cover in the direction of arrow to one side.
- Loosen screws (1).
- Remove underbody protection of the steering gear (2).

4 – Removing the wheel arch cover below

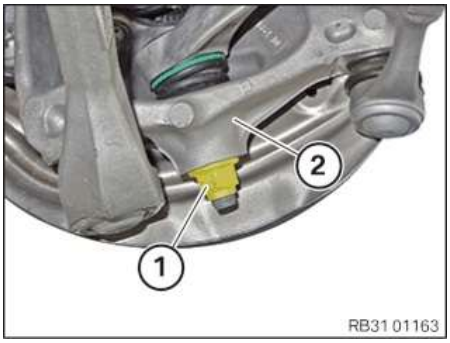


- Loosen screws (2).
- Remove the wheel arch cover below (1).

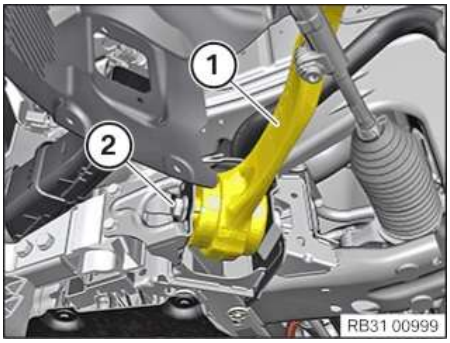
MAIN WORK

5 – Remove trailing link

carmanualsdiagn.com

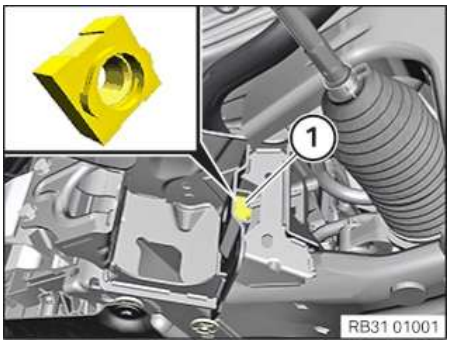


- Release nut (1). In doing so, counter support at the Torx socket.
- Release the tension strut from the swivel bearing (2).



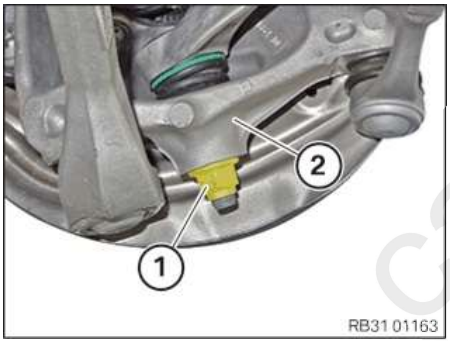
- Release the screw (2).
- Thread out the screw (2) and remove it.
- Feed out tension strut (1) and remove.

6 – Install the tension strut



- Replace the cage nut (1).

  Parts: Cage nut



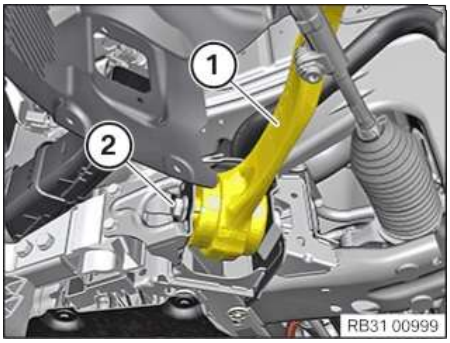
- Insert the tension strut and position at the swivel bearing (2).
- Renew nut (1).

  Parts: Nut
- Tighten nut (1).

Note: Use the Torx socket for counter support.

Tension strut to swivel bearing

M14	Renew nut.	Tightening torque	175 Nm



TECHNICAL INFORMATION

Tighten down screw connection in normal position.

- Position the tension strut (1) on the front axle support.
- Renew the screw (2).

  Parts: Screw
- Insert screw (2) and hand-tighten it.

Note: The screw connection is tightened later in the normal position.

POSTPROCESSES

7 – Install front left or right wheel

▸ **Mounting the wheel**

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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.

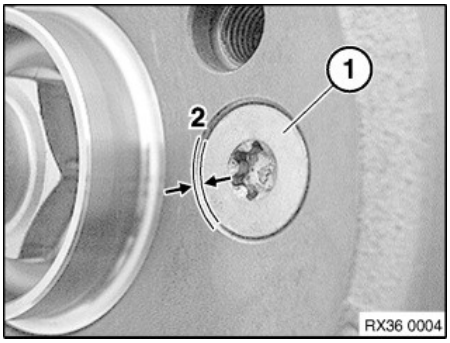
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  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 residue in the area of the wheel bolt holes, remove and clean the brake disc.



- 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 that the mounting bolt (1) for the brake disc is securely seated.

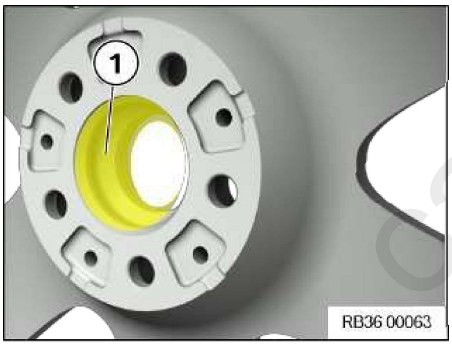
  The mounting bolt (1) for the brake disc **may not** protrude on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm



TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

- Thinly grease the wheel centring (1) in the wheel rim.

Expendable materials

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

carDiagn.com



TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

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

Expendable materials

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

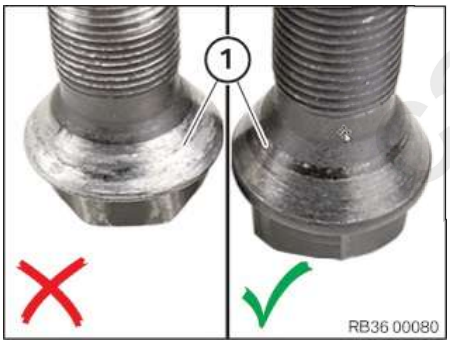
A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

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

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

Check

- **Check wheel bolts for wear.**



Result

» Places (> 30%) of the bearing surfaces (1) of the taper on the screw head show a silver wear.

Measure

- Replace wheel bolts.

  Parts: Wheel bolts

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TECHNICAL INFORMATION

Never use impact screwdrivers or electric screwdrivers to screw in and tighten the wheel bolts.

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

- Renew the corroded wheel bolts (arrows).

  Parts: Wheel bolts
- Clean the wheel bolts (arrows).
- Check the wheel bolts (arrows) and threads for damage, renew the wheel bolts (arrows) if necessary.
- Join and tighten the wheel bolts (arrows).

Wheel bolts

M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim.	Tightening torque	140 Nm
	Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.	Check	140 Nm
	Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.		

8 – Measuring the ride height of the front axle and adjusting the normal position



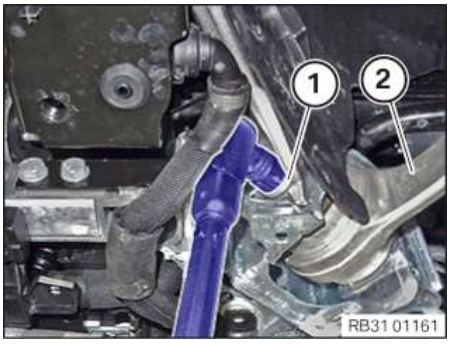
- Set vehicle on its wheels (for example, workshop pit or vehicle lift for Kinematics Diagnosis System).
- Measure the ride height (A).
- Load or unload the vehicle until the ride height (A) is within the tolerance.

G22/G23 Rear-wheel drive, standard suspension/sport suspension settings with low-slung

Measured from centre of wheel hub to lower edge of wheel arch

Dimension A	361 (351 - 371) mm

9 – Tightening screw connection of tension strut on front axle support



TECHNICAL INFORMATION

Tighten down screw connection in normal position.

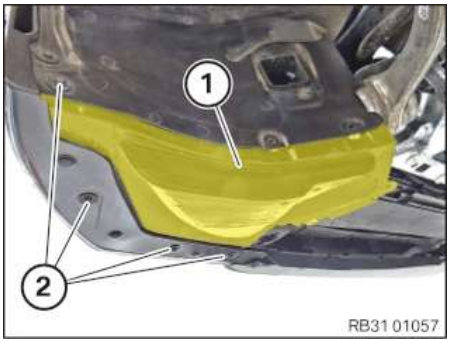
- Slacken screw (1) for tension strut (2) by one turn.
- Tighten down screw (1).

Tension strut to front axle support

M12	Renew bolt and cage nut.	Jointing torque	100 Nm
	Tighten screw connection in normal position.	Angle of rotation	90 °

10 – Installing the wheel arch cover at the bottom

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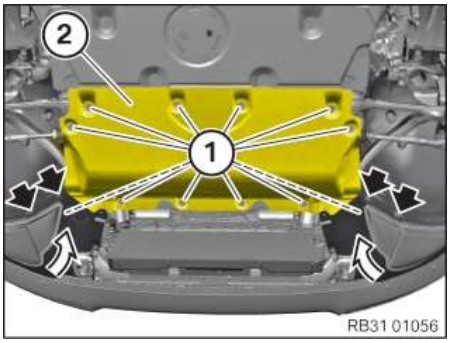


- Position the wheel arch cover at the bottom (1) .
- Tighten the screws (2).

Cover, front bottom on side

Hexagon screw for thermoplastic		Tightening torque	3 Nm

11 – Install the underbody protection of the steering gear



- Position the underbody protection of the steering gear (2).
- Tighten the screws (1).

Underbody protection of the steering gear

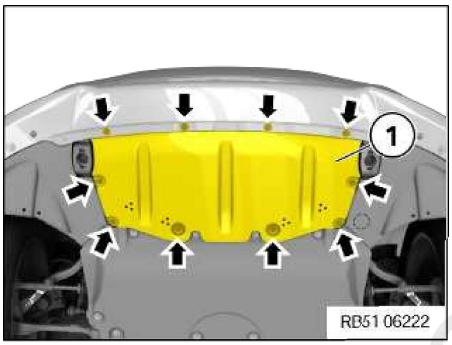
Hexagon screw for thermoplastic		Tightening torque	2.6 Nm
Hexagon bolt M6x20		Tightening torque	8 Nm

- Position the bottom wheel arch cover in the direction of arrow.
- Tighten the screws (arrows) of the bottom wheel arch cover on the wheel arch cover.

Wheel arch trim panel, front

Thermoplastic hexagon screw		Tightening torque	2,6 Nm

12 – Installing the front underbody protection



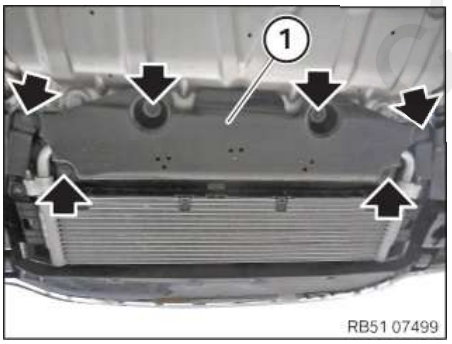
- **Version A:**

  Feed in the front underbody protection (1) towards the front under the bumper panel and position.

  Tighten screws (arrows).

Underbody protection front

Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm



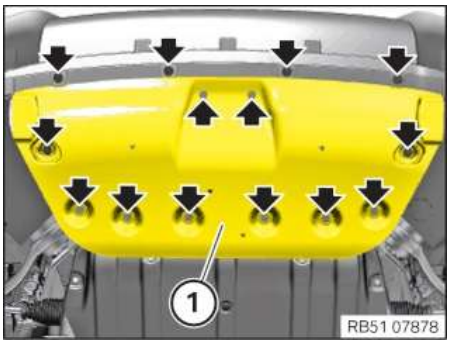
- **Version B:**

  Feed in and position the front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm



- **Version C:**

  Feed in and install front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

Additional Information

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Overview of Tightening Torques

Tension strut to swivel bearing			Used in step 6
M14	Renew nut.	Tightening torque	175 Nm

Brake disc to front wheel hub			Used in step 7
M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub			Used in step 7
M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts			Used in step 7
M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim. Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.	Tightening torque Check	140 Nm 140 Nm

Tension strut to front axle support			Used in step 9
M12	Renew bolt and cage nut. Tighten screw connection in normal position.	Jointing torque Angle of rotation	100 Nm 90 °

Cover, front bottom on side			Used in step 10
Hexagon screw for thermoplastic		Tightening torque	3 Nm

Underbody protection of the steering gear			Used in step 11
Hexagon screw for thermoplastic		Tightening torque	2.6 Nm
Hexagon bolt M6x20		Tightening torque	8 Nm

Wheel arch trim panel, front			Used in step 11
Thermoplastic hexagon screw		Tightening torque	2,6 Nm

Underbody protection front			Used in step 12
Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

Overview of Special Tools

2 344 011 Tool



Common		Used in step 7
Usage	Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.	
Included in the tool or work		
Storage location		
Replaced by		
In connection with		
SI-Number	08 08 12 (872)	

Replacement tools:

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0 495 221 (36 1 323) Wheel stud



Common	Used in step 1
Usage	(Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 224 (36 1 326) Wheel stud



Common	Used in step 1
Usage	(Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 225 (36 1 327) Wheel stud



Common	Used in step 1
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 226 (36 1 328) Wheel stud



Common	Used in step 1
Usage	(Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 227 (36 1 329) Wheel stud



Common	Used in step 1
Usage	(Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 495 228 (36 1 331) Wheel stud



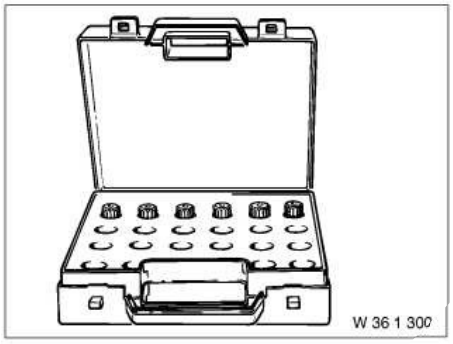
Common	Used in step 1
Usage	(Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 229 (36 1 332) Wheel stud



Common	Used in step 1
Usage	(Code 38) With centring bore available separately (see EPC) under 36 13 6 762 343
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 230 (36 1 333) Wheel stud



Common	Used in step 1
Usage	(Code 40) With centring bore available separately (see EPC) under 36 13 6 762 344
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

Overview Technical Data

G22/G23 Rear-wheel drive, standard suspension/sport suspension settings with low-slung	Used in step 8
Measured from centre of wheel hub to lower edge of wheel arch	
Dimension A	361 (351 - 371) mm

Links

Repair instructions	Used in step
00 02 001 Raising the vehicle using a vehicle lift	17

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31 12 001 Replacing left or right wishbone

WARNING

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

Danger! Life-threatening injuries!

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

TECHNICAL INFORMATION

Perform wheel alignment after installation.

PRELIMINARY WORK

1 – Remove front left or right wheel

▸ **Removing the wheel**



TECHNICAL INFORMATION

A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to remove the wheel.**

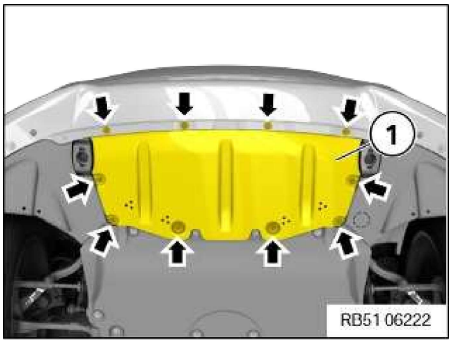
  This process is intended to prevent damage to the brake disc.



- If several wheels are removed at the same time: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Release the wheel bolts (arrows) crosswise and remove the wheel.
- To release and tighten wheel bolts with a security code: Use the correct adapter from the set of special tools .

2 – Removing the front underbody protection

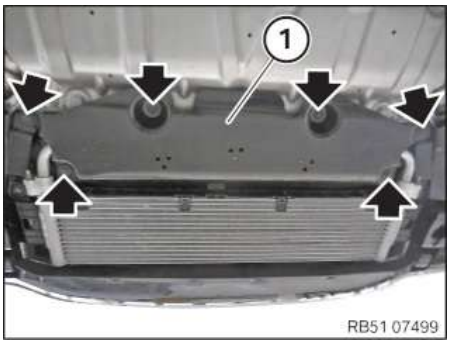
ediag.com



- **Version A:**

  Remove screws (arrows).

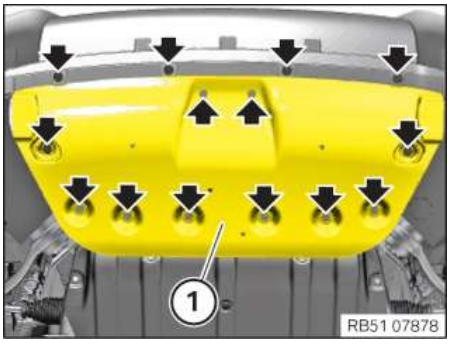
  Feed front underbody protection (1) backwards out of the bumper panel.



- **Version B:**

  Remove screws (arrows).

  Guide out front underbody protection (1) and remove it.

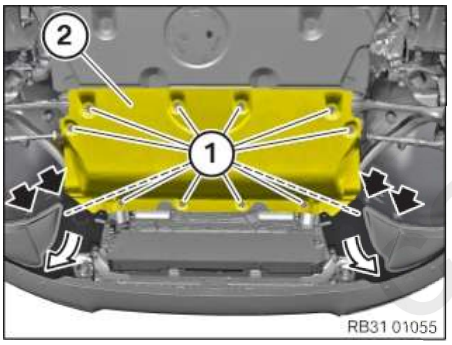


- **Version C:**

  Remove screws (arrows).

  Guide out front underbody protection (1) and remove it.

3 – Remove the underbody protection of the steering gear

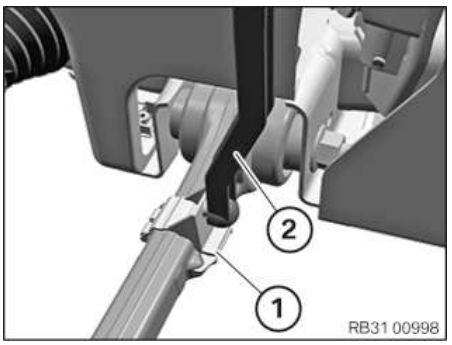


- Unscrew the screws (arrows) of the wheel arch cover on wheel arch cover.
- Fold the bottom wheel arch cover in the direction of arrow to one side.
- Loosen screws (1).
- Remove underbody protection of the steering gear (2).

4 – Release the ride height sensor from the lower control arm

NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.



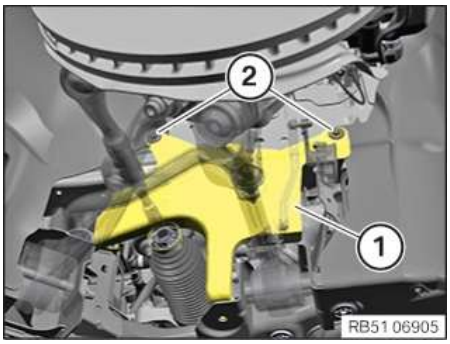
- Unlock holder (1) of attachment rod (2) of ride height sensor and release from lower control arm.

5 – Remove the cover of the steering assembly

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Prerequisite

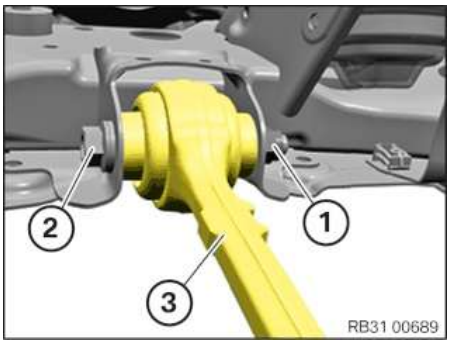
Underbody protection of the steering gear is removed.



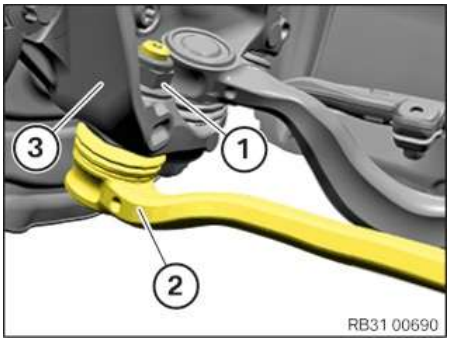
- Loosen screws (2).
- Remove the cover (1).

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6 – Remove control arm

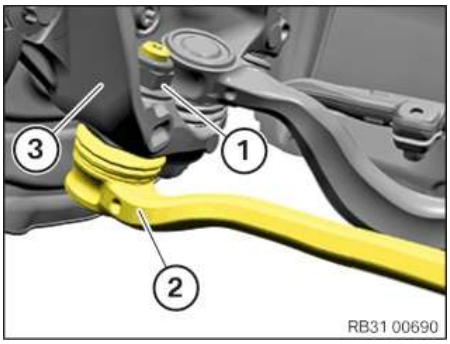


- Release the screw (2). In doing so, counter support at the nut (1).
- Loosen the wishbone (3) from the front axle support.



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

7 – Installing the control arm

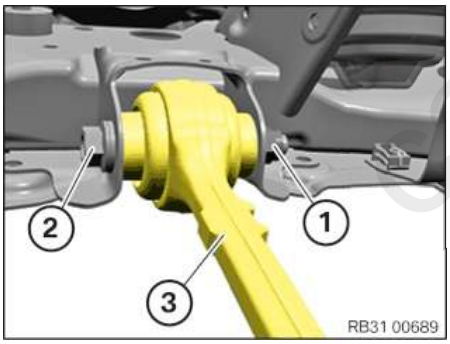


- Position the wishbone (2) on the swivel bearing (3).
- Renew nut (1).

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

Wishbone to swivel bearing

M14	Renew nut.	Tightening torque	175 Nm



TECHNICAL INFORMATION

The screw connections are tightened with the torque wrench later in normal position.

- Position the wishbone (3) on the front axle support.
- Renew screw (2) and nut (1).

  Parts: Bolt, nut
- Insert screw (2) and guide nut (1).
- Tighten screw (2) by hand. In doing so, counter support at the nut (1).

POSTPROCESSES

8 – Install the cover of the steering assembly

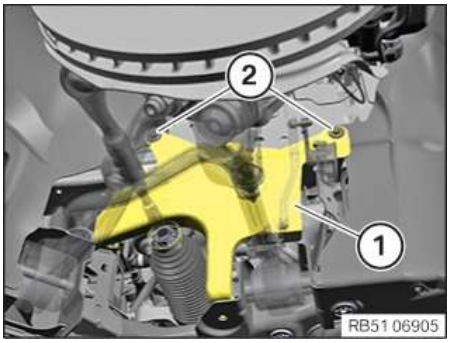
Prerequisite

Underbody protection of the steering gear is removed.

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TECHNICAL INFORMATION

When tightening the screws, the cover can twist and cause chafe marks on the anti-roll bar (risk of corrosion).
Hold the cover while tightening the screws. Then check the position of the cover.



- Position the cover (1).
- Tighten the screws (2).

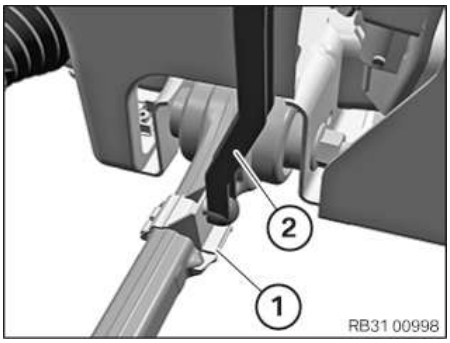
Cover, steering unit

Screw		Tightening torque	3 Nm

9 – Attach the ride height sensor on the bottom wishbone

NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.



- Position and lock the holder (1) of the attachment rod (2) of the ride height sensor on the lower control arm.

10 – Install front left or right wheel

▸ **Mounting the wheel**



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.

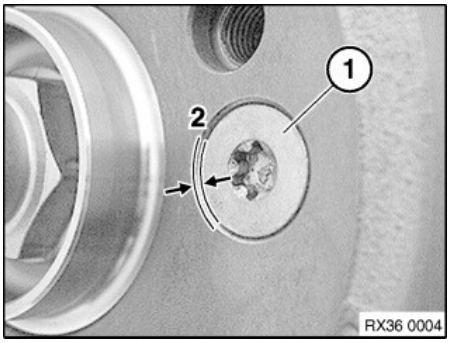
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  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 residue in the area of the wheel bolt holes, remove and clean the brake disc.



- 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 that the mounting bolt (1) for the brake disc is securely seated.

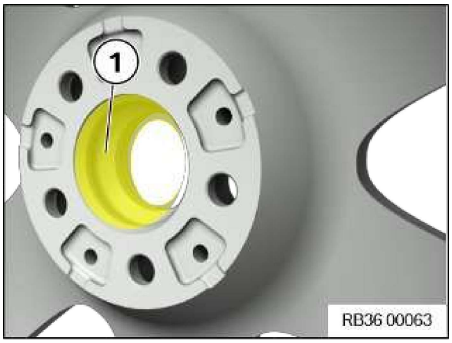
  The mounting bolt (1) for the brake disc **may not** protrude on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm



TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

- Thinly grease the wheel centring (1) in the wheel rim.

Expendable materials

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

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

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

Expendable materials

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



Check

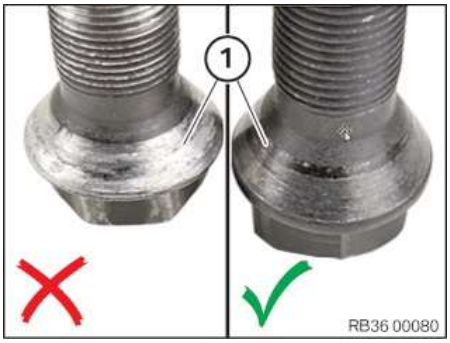
TECHNICAL INFORMATION

A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

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

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

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- **Check wheel bolts for wear.**

Result

» Places (> 30%) of the bearing surfaces (1) of the taper on the screw head show a silver wear.

Measure

- Replace wheel bolts.

  Parts: Wheel bolts



TECHNICAL INFORMATION

Never use impact screwdrivers or electric screwdrivers to screw in and tighten the wheel bolts.

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

- Renew the corroded wheel bolts (arrows).

  Parts: Wheel bolts
- Clean the wheel bolts (arrows).
- Check the wheel bolts (arrows) and threads for damage, renew the wheel bolts (arrows) if necessary.
- Join and tighten the wheel bolts (arrows).

Wheel bolts

M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim. Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.	Tightening torque Check	140 Nm 140 Nm

11 – Measuring the ride height of the front axle and adjusting the normal position



- Set vehicle on its wheels (for example, workshop pit or vehicle lift for Kinematics Diagnosis System).
- Measure the ride height (A).
- Load or unload the vehicle until the ride height (A) is within the tolerance.

G22/G23 Rear-wheel drive, standard suspension/sport suspension settings with low-slung

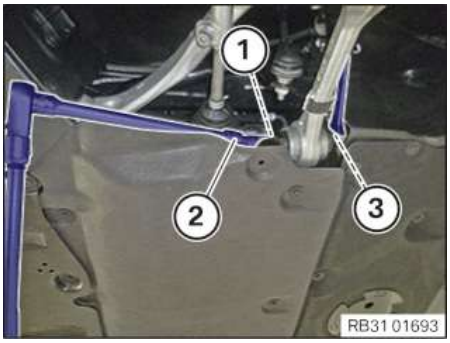
Measured from centre of wheel hub to lower edge of wheel arch	
Dimension A	361 (351 - 371) mm

12 – Tightening the screw connection of control arm on front axle support

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TECHNICAL INFORMATION

Tighten down screw connection in normal position.

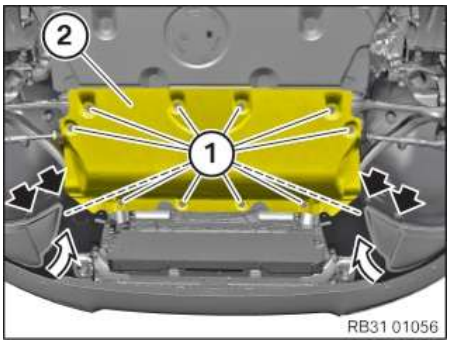


- Slacken the screw (1) with the standard tool (2) by one turn and tighten it. In doing so, counter support at the nut (3).

Wishbone to front axle support

M12	Renew screw and nut. Tighten in normal position! Tightening via screw.	Tightening torque Angle of rotation	68 Nm 180 °

13 – Install the underbody protection of the steering gear



- Position the underbody protection of the steering gear (2).
- Tighten the screws (1).

Underbody protection of the steering gear

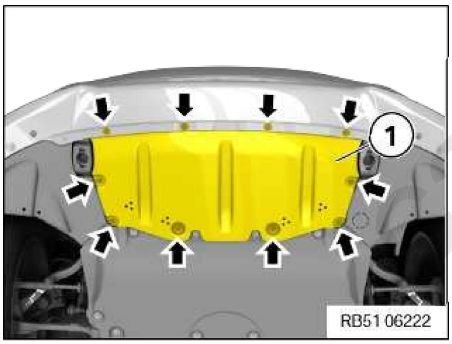
Hexagon screw for thermoplastic		Tightening torque	2.6 Nm
Hexagon bolt M6x20		Tightening torque	8 Nm

- Position the bottom wheel arch cover in the direction of arrow.
- Tighten the screws (arrows) of the bottom wheel arch cover on the wheel arch cover.

Wheel arch trim panel, front

Thermoplastic hexagon screw		Tightening torque	2,6 Nm

14 – Installing the front underbody protection



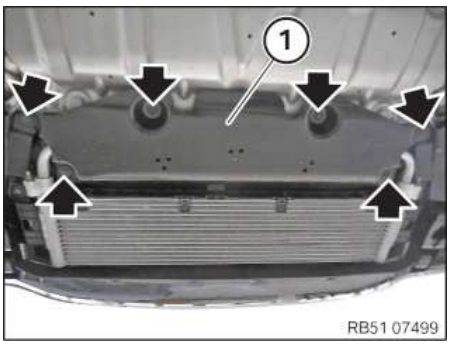
- **Version A:**

  Feed in the front underbody protection (1) towards the front under the bumper panel and position.

  Tighten screws (arrows).

Underbody protection front

Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm



- **Version B:**

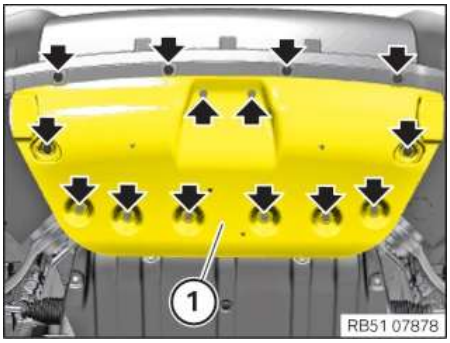
  Feed in and position the front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

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- **Version C:**

  Feed in and install front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

15 – 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.

Additional Information

Overview of Tightening Torques

Wishbone to swivel bearing — Used in step 7

M14	Renew nut.	Tightening torque	175 Nm

Cover, steering unit — Used in step 8

Screw		Tightening torque	3 Nm

Brake disc to front wheel hub — Used in step 10

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 10

M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 10

M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim. Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.	Tightening torque Check	140 Nm 140 Nm

Wishbone to front axle support — Used in step 12

M12	Renew screw and nut. Tighten in normal position! Tightening via screw.	Tightening torque Angle of rotation	68 Nm 180 °

Underbody protection of the steering gear — Used in step 13

Hexagon screw for thermoplastic		Tightening torque	2.6 Nm
Hexagon bolt M6x20		Tightening torque	8 Nm

Wheel arch trim panel, front — Used in step 13

Thermoplastic hexagon screw		Tightening torque	2,6 Nm

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Underbody protection front Used in step 14

Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

Overview of Special Tools

2 344 011 Tool



Common Used in step 10

Usage	Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	08 08 12 (872)

Replacement tools:

0 495 221 (36 1 323) Wheel stud



Common Used in step 1

Usage	(Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 224 (36 1 326) Wheel stud



Common Used in step 1

Usage	(Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 225 (36 1 327) Wheel stud



Common Used in step 1

Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 495 226 (36 1 328) Wheel stud



Common	Used in step 1
Usage	(Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 227 (36 1 329) Wheel stud



Common	Used in step 1
Usage	(Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 228 (36 1 331) Wheel stud



Common	Used in step 1
Usage	(Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 229 (36 1 332) Wheel stud



Common	Used in step 1
Usage	(Code 38) With centring bore available separately (see EPC) under 36 13 6 762 343
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 495 230 (36 1 333) Wheel stud



Common	Used in step 1
Usage	(Code 40) With centring bore available separately (see EPC) under 36 13 6 762 344
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

Overview Technical Data

G22/G23 Rear-wheel drive, standard suspension/sport suspension settings with low-slung	Used in step 11
Measured from centre of wheel hub to lower edge of wheel arch	
Dimension A	361 (351 - 371) mm

Links

Repair instructions	**Used in step**
00 02 001 Raising the vehicle using a vehicle lift	110

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This documentation refers to special tools that were not yet available when going to press.

31 21 090 Replacing left / right swivel bearing

WARNING

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

Danger! Life-threatening injuries!

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

TECHNICAL INFORMATION

Perform wheel alignment after installation.

TECHNICAL INFORMATION

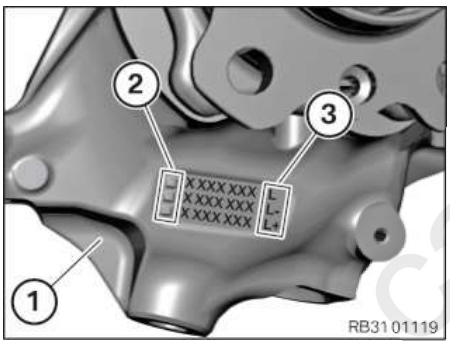
Camber correction swivel bearings are used to correct the camber values by +/-30 minutes. Use is intended only when the camber tolerance values are exceeded or undershot.

PRELIMINARY WORK

1 – Determining the installed version of the swivel bearing

Prerequisite

Brake guard plate is removed.



- **Possible versions of the swivel bearing:**

  The version of the swivel bearing (1) is identified by a punch mark in area (2).
- Note the identification mark in area (3).

  Left swivel bearing:
  - L = swivel bearing (standard part)
  - L- = swivel bearing camber correction MINUS
  - L+ = swivel bearing camber correction PLUS

  Right swivel bearing:
  - R = swivel bearing (standard part)
  - R- = swivel bearing camber correction MINUS
  - R+ = swivel bearing camber correction PLUS

2 – Remove front left or right wheel

▸ **Removing the wheel**

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TECHNICAL INFORMATION

A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

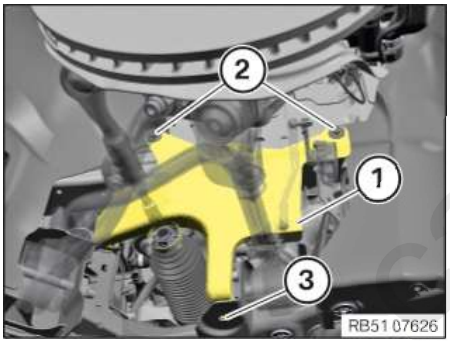
- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to remove the wheel.**

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



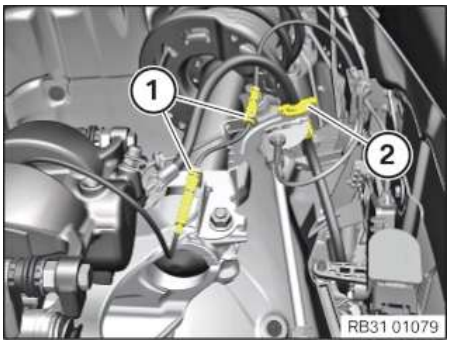
- If several wheels are removed at the same time: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Release the wheel bolts (arrows) crosswise and remove the wheel.
- To release and tighten wheel bolts with a security code: Use the correct adapter from the set of special tools .

3 – Remove the cover of the steering assembly



- Loosen screws (2) and (3).
- Remove the cover (1).

4 – Detaching the front brake hose



- Detach the brake hose from the holder (2).

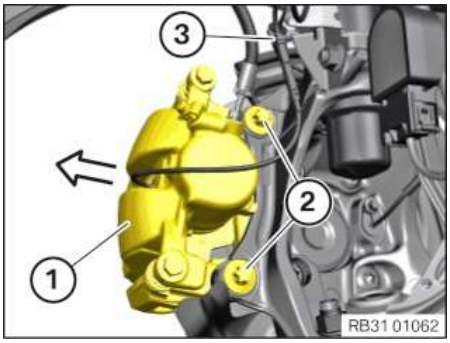
NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Detach the cable for the brake pad wear sensor from the holders (1).

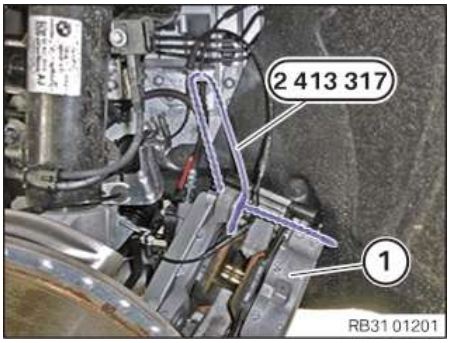
5 – Detach the front brake caliper

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- Release the cable of the brake pad wear sensor from the holder (3).
- Loosen screws (2).
- Remove brake caliper (1) in direction of arrow.

  The brake caliper (1) must not hang on the brake hose.



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

6 – Remove front brake disc



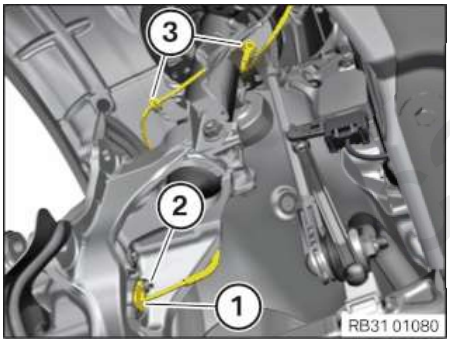
TECHNICAL INFORMATION

Note the following for the removal of the brake disc:

Do not strike the friction ring with a tool under any circumstance (for example, hammer). If required, **carefully** tap with a rubber mallet against the brake disc chamber.

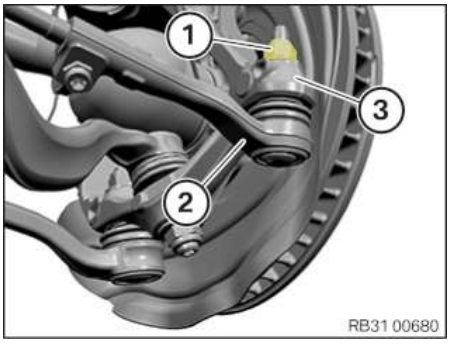
- Loosen screw (1).
- Remove brake disc (2).

7 – Partially removing the front wheel speed sensor



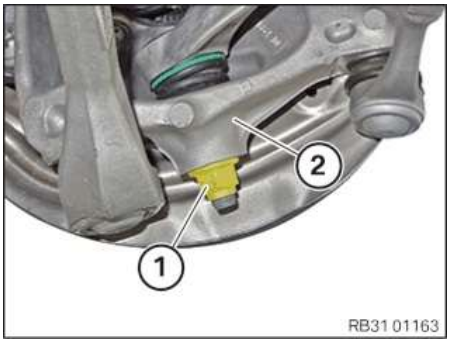
- Loosen screw (2).
- Release the wheel speed sensor (1) from the swivel bearing.
- Detach the wheel speed sensor cable from the brackets (3).
- Remove wheel speed sensor from spring strut.

8 – Loosening the track rod from the swivel bearing



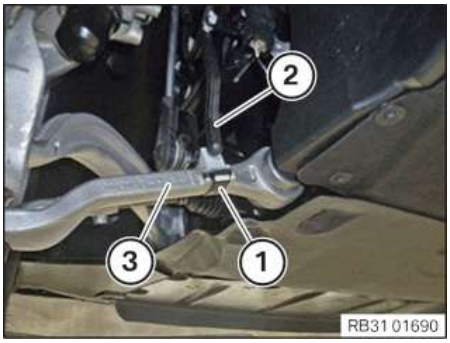
- Release nut (1). If necessary, counter support at the Torx socket.
- Detach the track rod (2) from the swivel bearing (3).

9 – Releasing the tension strut from the swivel bearing



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

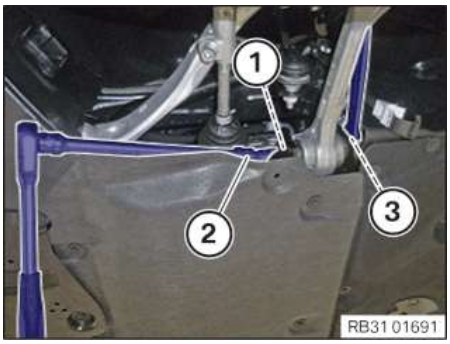
10 – Slackening the control arm on the front axle support



NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

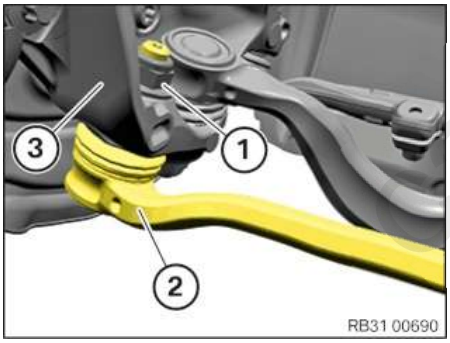
- Unlock the holder (1) of the attachment rod (2) of the ride height sensor and release it from the control arm (3).



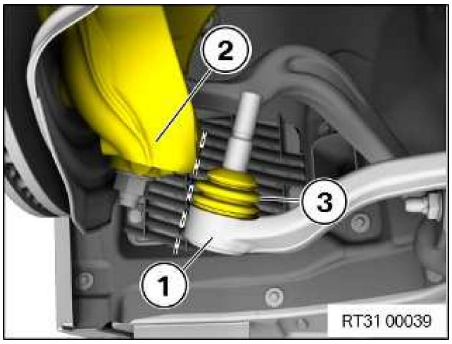
- Slacken the screw (1) with the standard tool (2). In doing so, counter support at the nut (3).

  Standard tool:

11 – Releasing the wishbone from the swivel bearing



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



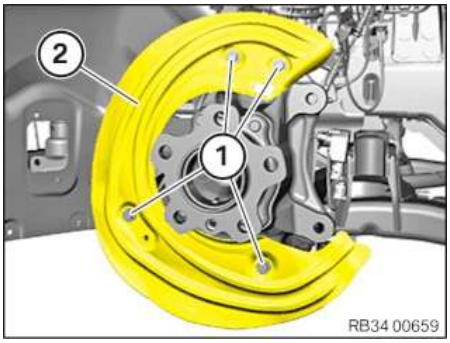
TECHNICAL INFORMATION

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

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

12 – Remove brake guard plate, front

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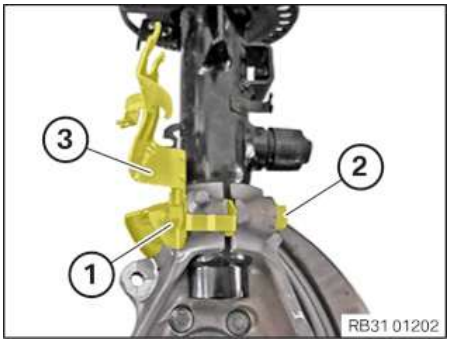
- Unscrew the bolts (1) and remove the brake guard plate (2).

MAIN WORK

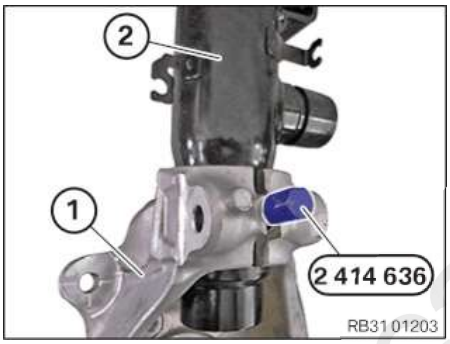
13 – Remove swivel bearing

TECHNICAL INFORMATION

Secure component against falling.



- Release nut (1).
- Pull out bolt (2).
- Remove the holder (3).

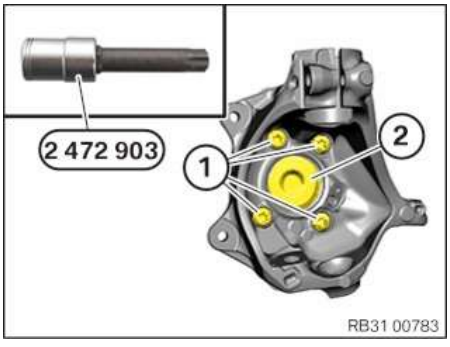


- Spread the swivel bearing (1) with the special tool .
- Pull down and remove the swivel bearing (1) from the spring strut (2).

14 – Replace swivel bearing

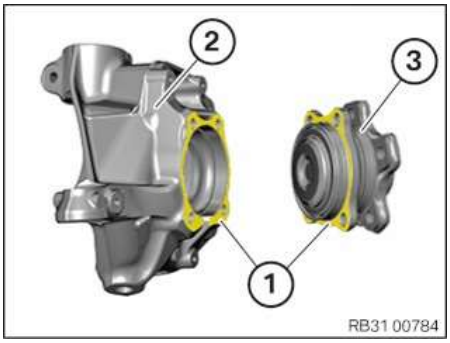


- Use special tool or to loosen and tighten the spherical-collar bolts.



- Loosen spherical-collar bolts (1) with the special tool .
- Remove wheel bearing (1).
- Recut the threads in the wheel bearing (2).

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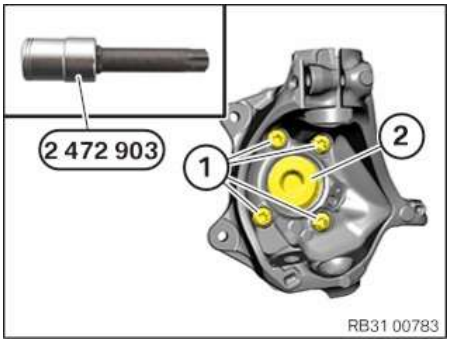


TECHNICAL INFORMATION

Keep the connection of the wheel bearing to the swivel bearing clean and free from oil and grease.

- Renew swivel bearing (2).

  Parts: Swivel bearing
- Clean the contact surfaces (1) on the swivel bearing (2) and on the wheel bearing (3).



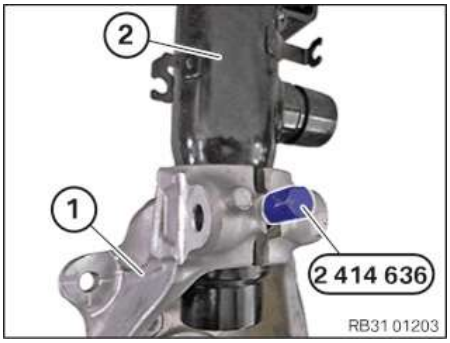
- Position the wheel bearing (2) on the new swivel bearing .
- Renew the spherical-collar bolts (1).

  Parts: Spherical-collar bolt
- Tighten spherical-collar bolts (1) with the special tool cross-wise.

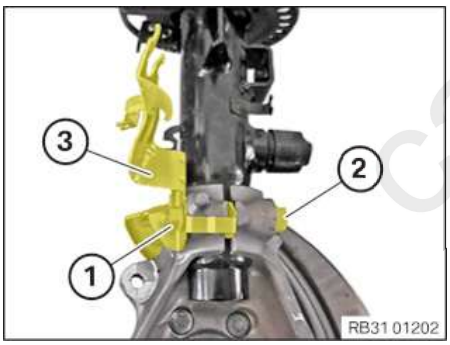
Wheel bearing to swivel bearing

M12	Renew spherical collar screws. **Tighten the spherical-collar bolts crosswise.** *Tightening sequence must be strictly adhered to and carried out on all spherical-collar bolts at the same time!*	Tightening torque Initial torque Unscrew all bolts. Tightening torque Angle of rotation	20 Nm 140 Nm max. 45 ° 120 Nm 90 °

15 – Install swivel bearing



- Spread the swivel bearing (1) with the special tool .
- Correctly align the gap at the swivel bearing (1) with the positioning pin on the spring strut (2).
- Push the swivel bearing (1) in the direction of arrow up to the limit position on the spring strut (2).
- Remove the special tool .



- Position the bracket (3) on the swivel bearing.
- Renew screw (2) and nut (1).

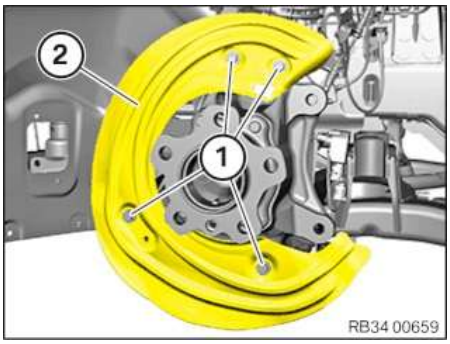
  Parts: Bolt, nut
- Insert screw (2) and guide nut (1).
- Tighten down screw (2).

Spring strut shock absorber to swivel bearing

M10	Renew screw and nut. Tightening via screw.	Tightening torque Angle of rotation	60 Nm 180 °

POSTPROCESSES

16 – Install brake guard plate, front



- Install brake guard plate (2).
- Renew screws (1).

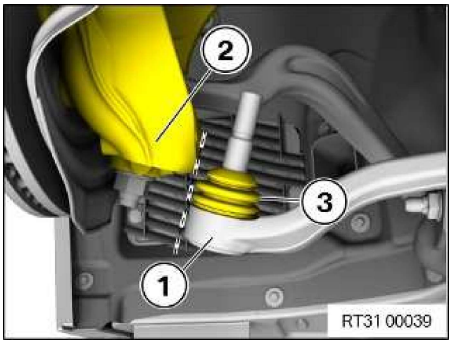
  Parts: Bolts
- Insert screws (1) and tighten.

Brake guard plate at front swivel bearing

M6x12	Renew screw.	Tightening torque	8 Nm

17 – Mounting the wishbone on the swivel bearing

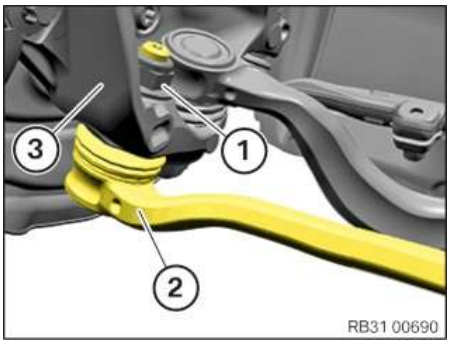
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TECHNICAL INFORMATION

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

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



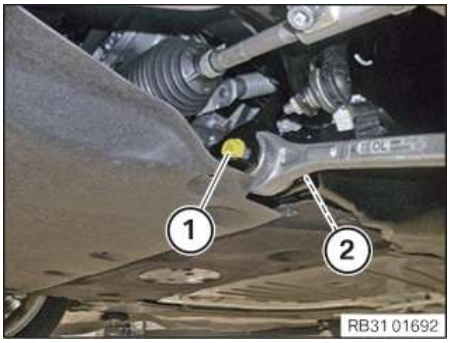
- Position the wishbone (2) on the swivel bearing (3).
- Renew nut (1).

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

Wishbone to swivel bearing

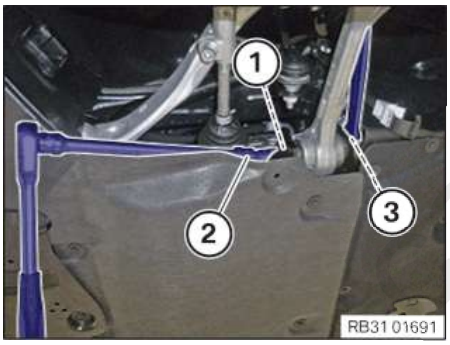
M14	Renew nut.	Tightening torque	175 Nm

18 – Fastening the wishbone on the front axle support



- Loosen screw (1). In doing so, counter support at the nut (2).
- Replace the screw (1) and the nut (2).

  Parts: Bolt, nut
- Insert screw (1) and guide nut (2).

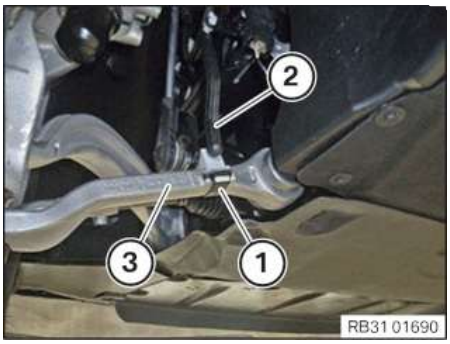


TECHNICAL INFORMATION

The screw connections are tightened with the torque wrench later in normal position.

- Hand-tighten the screw (1) with the standard tool (2). In doing so, counter support at the nut (3).

  Standard tool:

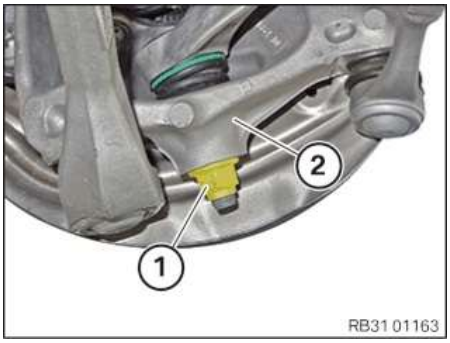


NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Position and lock the holder (1) of the attachment rod (2) for the ride height sensor on the control arm (3).

19 – Securing tension strut on swivel bearing



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

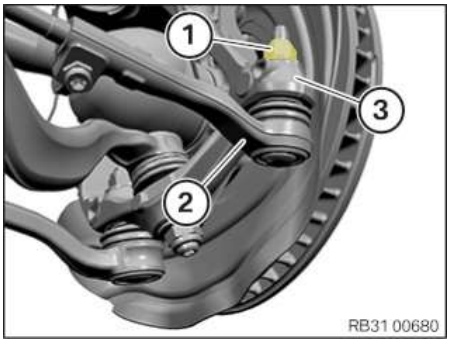
  Parts: Nut
- Tighten nut (1).

Note: Use the Torx socket for counter support.

Tension strut to swivel bearing

M14	Renew nut.	Tightening torque	175 Nm

20 – Securing the track rod on the swivel bearing



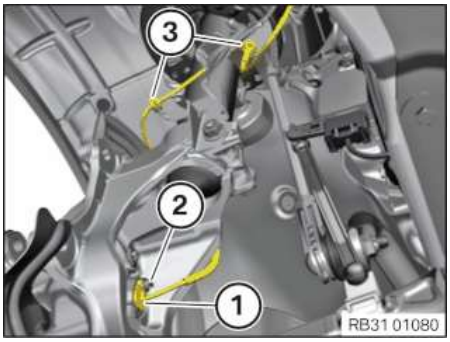
- Position the track rod (2) on the swivel bearing (3).
- Renew nut (1).

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

Track rod end to swivel bearing

M14	Renew nut.	Tightening torque	165 Nm

21 – Installing the front wheel speed sensor partially



- Position the wheel speed sensor on the spring strut.
- Mount the cable of wheel speed sensor on the holders(3).
- Position the wheel speed sensor (1) on the swivel bearing.
- Renew the screw (2).

  Parts: Screw
- Tighten down screw (2).

Wheel speed sensor to swivel bearing

M6	Renew screw.	Tightening torque	12 Nm

22 – Install front brake disc



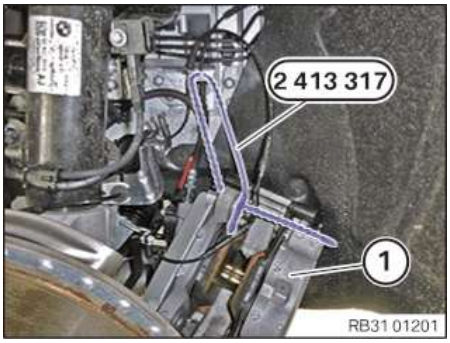
- Position brake disc (2) on wheel hub.
- Renew the screw (1).

  Parts: Screw
- Position and tighten the screw (1).

Brake disc to front wheel hub

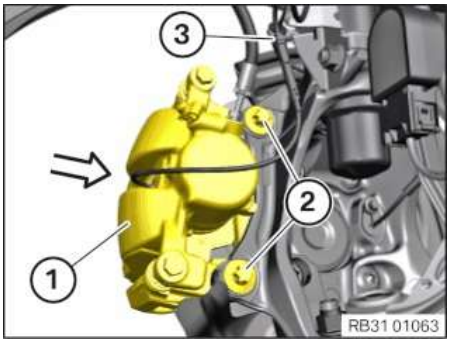
M8	Renew screw.	Tightening torque	16 Nm

23 – Fasten the front brake caliper



- Release the special tool 2 413 317 from the brake caliper (1) and remove.
- The brake caliper (1) must not suspend at the brake hose.

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- Position the brake caliper (1) in direction of arrow on the swivel bearing.
- Renew screws (2).

  Parts: Screws
- Tighten the screws (2).

Brake caliper / caliper carrier at front swivel bearing

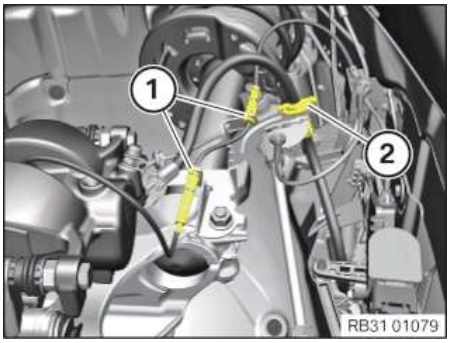
M12	Renew screw.	Tightening torque	110 Nm

NOTICE

Perform this step on the left side only.

- Fasten the cable of the brake pad wear sensor to the holder (3).

24 – Attaching the front brake hose



- Hook the brake hose to the holder (2).

NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Hook the cable for the brake pad wear sensor to the holders (1).

25 – Install front left or right wheel

▸ **Mounting the wheel**



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.

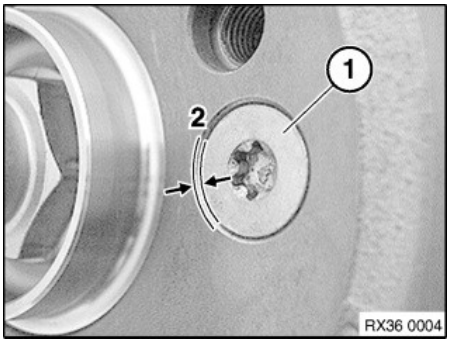
  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.



- 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).

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- Check that the mounting bolt (1) for the brake disc is securely seated.

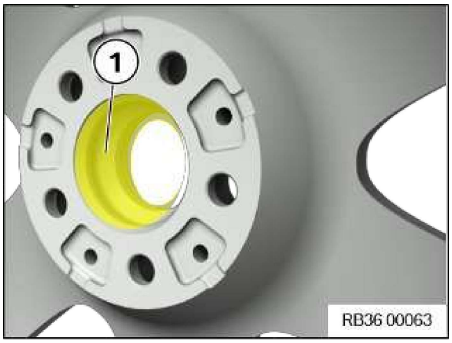
  The mounting bolt (1) for the brake disc **may not** protrude on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm



TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

- Thinly grease the wheel centring (1) in the wheel rim.

Expendable materials

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

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

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

Expendable materials

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



Check

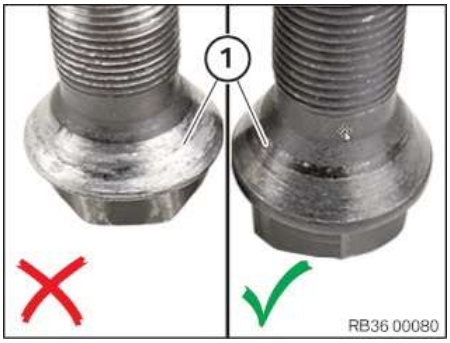
TECHNICAL INFORMATION

A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

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

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

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- **Check wheel bolts for wear.**

Result

» Places (> 30%) of the bearing surfaces (1) of the taper on the screw head show a silver wear.

Measure

- Replace wheel bolts.

  Parts: Wheel bolts



TECHNICAL INFORMATION

Never use impact screwdrivers or electric screwdrivers to screw in and tighten the wheel bolts.

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

- Renew the corroded wheel bolts (arrows).

  Parts: Wheel bolts
- Clean the wheel bolts (arrows).
- Check the wheel bolts (arrows) and threads for damage, renew the wheel bolts (arrows) if necessary.
- Join and tighten the wheel bolts (arrows).

Wheel bolts

M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim.	Tightening torque	140 Nm
	Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.	Check	140 Nm
	Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.		

26 – Measuring the ride height of the front axle and adjusting the normal position



- Set vehicle on its wheels (for example, workshop pit or vehicle lift for Kinematics Diagnosis System).
- Measure the ride height (A).
- Load or unload the vehicle until the ride height (A) is within the tolerance.

G22/G23 Rear-wheel drive, standard suspension/sport suspension settings with low-slung

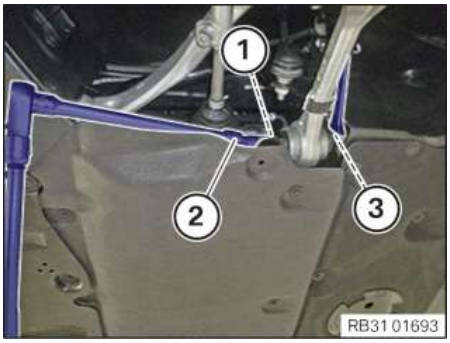
Measured from centre of wheel hub to lower edge of wheel arch	
Dimension A	361 (351 - 371) mm

27 – Tightening the screw connection of control arm on front axle support

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TECHNICAL INFORMATION

Tighten down screw connection in normal position.



- Slacken the screw (1) with the standard tool (2) by one turn and tighten it. In doing so, counter support at the nut (3).

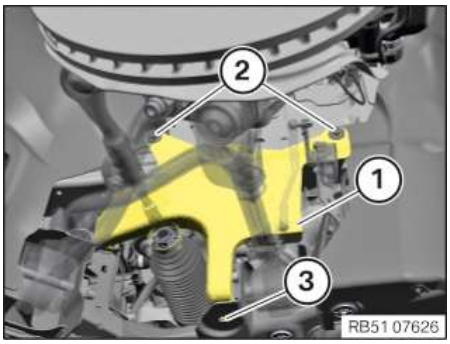
Wishbone to front axle support

M12	Renew screw and nut. Tighten in normal position! Tightening via screw.	Tightening torque Angle of rotation	68 Nm 180 °

28 – Install the cover of the steering assembly

TECHNICAL INFORMATION

When tightening the screws, the cover can twist and cause chafe marks on the anti-roll bar (risk of corrosion).
Hold the cover while tightening the screws. Then check the position of the cover.



- Position the cover (1).
- Tighten down screws (2) and (3).

Cover, steering unit

Screw		Tightening torque	3 Nm

29 – 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.

Additional Information

Overview of Tightening Torques

Wheel bearing to swivel bearing — Used in step 14

M12	Renew spherical collar screws. **Tighten the spherical-collar bolts crosswise.** *Tightening sequence must be strictly adhered to and carried out on all spherical-collar bolts at the same time!*	Tightening torque Initial torque Unscrew all bolts. Tightening torque Angle of rotation	20 Nm 140 Nm max. 45 ° 120 Nm 90 °

Spring strut shock absorber to swivel bearing — Used in step 15

M10	Renew screw and nut. Tightening via screw.	Tightening torque Angle of rotation	60 Nm 180 °

Brake guard plate at front swivel bearing — Used in step 16

M6x12	Renew screw.	Tightening torque	8 Nm

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Wishbone to swivel bearing			Used in step 17
M14	Renew nut.	Tightening torque	175 Nm

Tension strut to swivel bearing			Used in step 19
M14	Renew nut.	Tightening torque	175 Nm

Track rod end to swivel bearing			Used in step 20
M14	Renew nut.	Tightening torque	165 Nm

Wheel speed sensor to swivel bearing			Used in step 21
M6	Renew screw.	Tightening torque	12 Nm

Brake disc to front wheel hub			Used in step 2225
M8	Renew screw.	Tightening torque	16 Nm

Brake caliper / caliper carrier at front swivel bearing			Used in step 23
M12	Renew screw.	Tightening torque	110 Nm

Brake disc to rear wheel hub			Used in step 25
M8	Renew screw.	Tightening torque	16 Nm

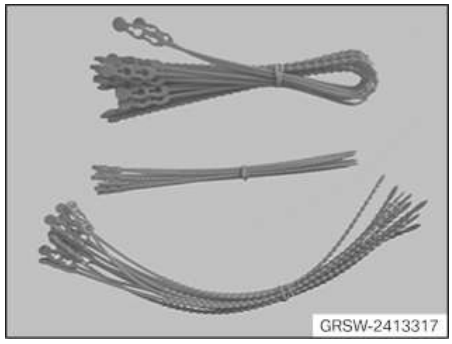
Wheel bolts			Used in step 25
M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim. Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.	Tightening torque Check	140 Nm 140 Nm

Wishbone to front axle support			Used in step 27
M12	Renew screw and nut. Tighten in normal position! Tightening via screw.	Tightening torque Angle of rotation	68 Nm 180 °

Cover, steering unit			Used in step 28
Screw		Tightening torque	3 Nm

Overview of Special Tools

2 413 317 Cable strap



Common	Used in step 523
Usage	The "Cable ties" parts set consists of 3 items as follows: ABV232 Length: 320 mm colour: RedABV250 Length: 500 mm colour: RedABVS270 Length: 665 mm colour: Red
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	01 47 15 (332)

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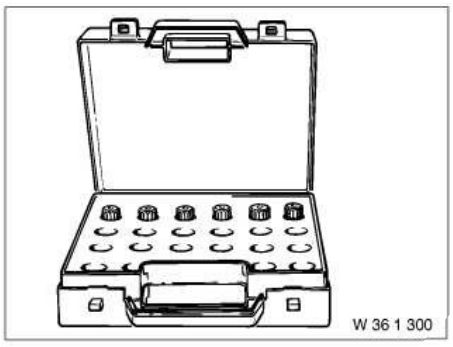
2 344 011 Tool



Common	Used in step 25
Usage	Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	08 08 12 (872)

Replacement tools:

0 495 221 (36 1 323) Wheel stud



Common	Used in step 2
Usage	(Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 224 (36 1 326) Wheel stud



Common	Used in step 2
Usage	(Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 225 (36 1 327) Wheel stud



Common	Used in step 2
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 495 226 (36 1 328) Wheel stud



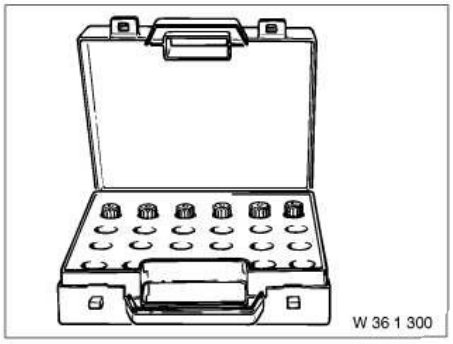
Common	Used in step 2
Usage	(Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 227 (36 1 329) Wheel stud



Common	Used in step 2
Usage	(Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 228 (36 1 331) Wheel stud



Common	Used in step 2
Usage	(Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 229 (36 1 332) Wheel stud



Common	Used in step 2
Usage	(Code 38) With centring bore available separately (see EPC) under 36 13 6 762 343
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 230 (36 1 333) Wheel stud



Common	Used in step 2
Usage	(Code 40) With centring bore available separately (see EPC) under 36 13 6 762 344
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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Overview Technical Data

G22/G23 Rear-wheel drive, standard suspension/sport suspension settings with low-slung	Used in step 26
Measured from centre of wheel hub to lower edge of wheel arch	
Dimension A	361 (351 - 371) mm

Links

Repair instructions	Used in step
00 02 001 Raising the vehicle using a vehicle lift	225

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This documentation refers to special tools that were not yet available when going to press.

31 21 180 Replacing the front wheel bearing

WARNING

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

Danger! Life-threatening injuries!

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

RISK OF DAMAGE

Component damage caused by striking tools.

Brute force can result in component damage.

- Only use those tools intended for the work.

TECHNICAL INFORMATION

Perform wheel alignment after installation.

PRELIMINARY WORK

1 – Remove front left or right wheel

▸ **Removing the wheel**



TECHNICAL INFORMATION

A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to remove the wheel.**

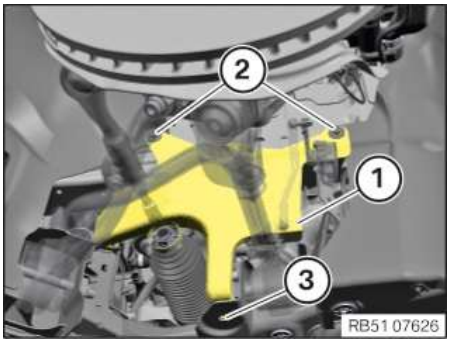
  This process is intended to prevent damage to the brake disc.

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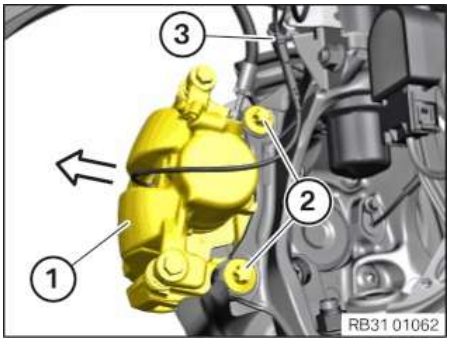
- If several wheels are removed at the same time: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Release the wheel bolts (arrows) crosswise and remove the wheel.
- To release and tighten wheel bolts with a security code: Use the correct adapter from the set of special tools .

2 – Remove the cover of the steering assembly



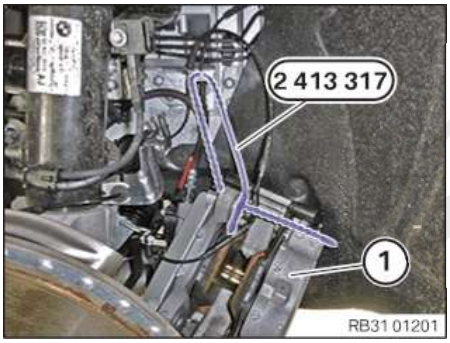
- Loosen screws (2) and (3).
- Remove the cover (1).

3 – Detach the front brake caliper



- Release the cable of the brake pad wear sensor from the holder (3).
- Loosen screws (2).
- Remove brake caliper (1) in direction of arrow.

  The brake caliper (1) must not hang on the brake hose.



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

4 – Remove front brake disc



TECHNICAL INFORMATION

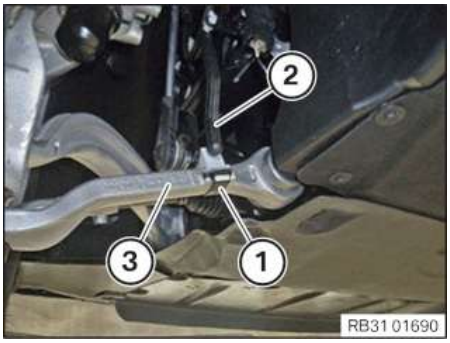
Note the following for the removal of the brake disc:

Do not strike the friction ring with a tool under any circumstance (for example, hammer). If required, **carefully** tap with a rubber mallet against the brake disc chamber.

- Loosen screw (1).
- Remove brake disc (2).

5 – Releasing the swivel bearing from the suspension strut

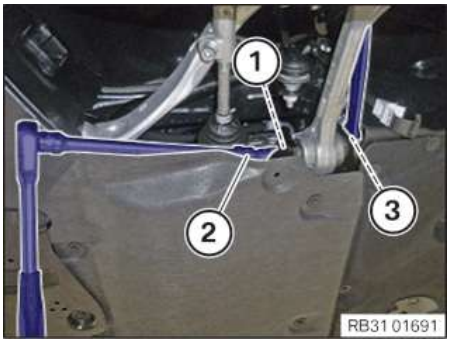
cardiagn.com



NOTICE

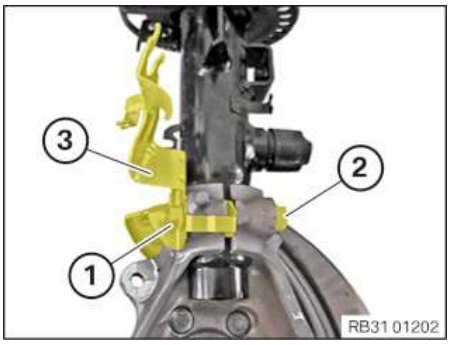
The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Unlock the holder (1) of the attachment rod (2) of the ride height sensor and release it from the control arm (3).

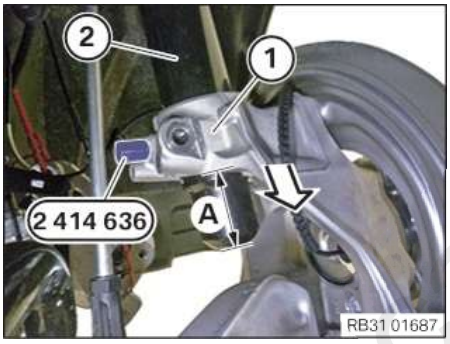


- Slacken the screw (1) with the standard tool (2). In doing so, counter support at the nut (3).

  Standard tool:



- Release nut (1).
- Pull out bolt (2).
- Remove the holder (3).



- Spread the swivel bearing (1) with the special tool .
- Pull down the swivel bearing (1) in the direction of arrow from the suspension strut (2) until the dimension (A) is reached.

  Dimension (A) = 1 cm

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6 – Replace wheel bearings

TECHNICAL INFORMATION

Conduct the following operation with the assistance of a second person.



- Use special tool or to loosen and tighten the spherical-collar bolts.

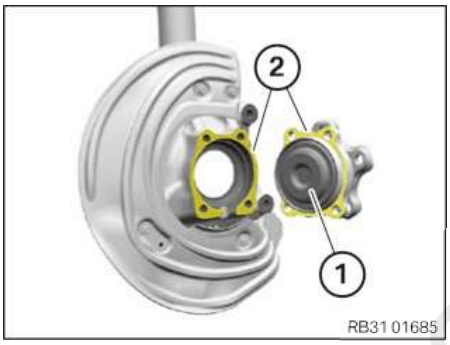


TECHNICAL INFORMATION

Secure component against falling.

- Release the spherical-collar bolts (1).

  In order to reach the spherical-collar bolts (1), turn the swivel bearing inwards or outwards.



TECHNICAL INFORMATION

Keep the connection of the wheel bearing to the swivel bearing clean and free from oil and grease.

- Remove the wheel bearing (1) and renew it.
- **Parts:** Wheel bearing
- Clean contact surfaces (2).
- Position wheel bearing on swivel bearing.
- Renew the spherical-collar bolts (1).

  Parts: Spherical-collar bolt
- Tighten the spherical-collar bolts (1) crosswise.

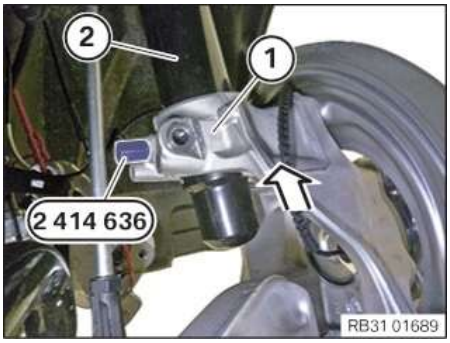
  In order to reach the spherical-collar bolts (1), turn the swivel bearing inwards or outwards.



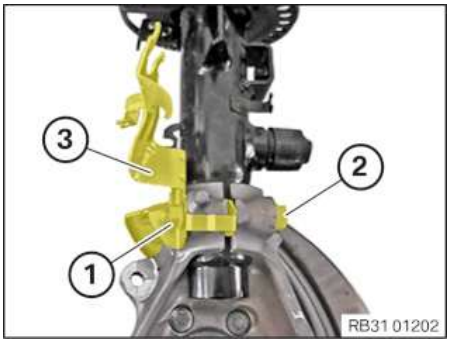
Wheel bearing to swivel bearing

M12	Renew spherical collar screws. **Tighten the spherical-collar bolts crosswise.** *Tightening sequence must be strictly adhered to and carried out on all spherical-collar bolts at the same time!*	Tightening torque Initial torque Unscrew all bolts. Tightening torque Angle of rotation	20 Nm 140 Nm max. 45 ° 120 Nm 90 °

7 – Securing the swivel bearing on to the suspension strut



- Correctly align the gap at the swivel bearing (1) with the positioning pin on the spring strut (2).
- Push the swivel bearing (1) in the direction of arrow up to the limit position on the spring strut (2).
- Remove the special tool .

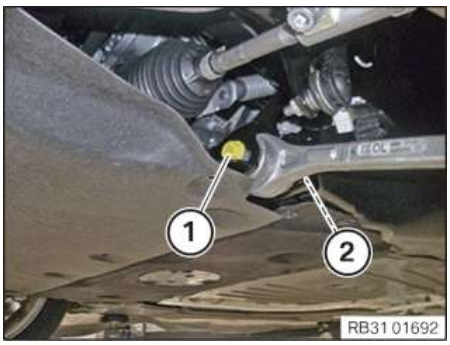


- Position the bracket (3) on the swivel bearing.
- Renew screw (2) and nut (1).

  Parts: Bolt, nut
- Insert screw (2) and guide nut (1).
- Tighten down screw (2).

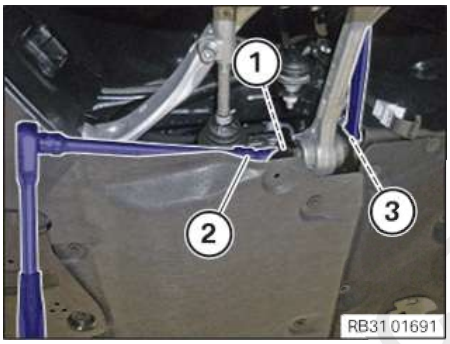
Spring strut shock absorber to swivel bearing

M10	Renew screw and nut. Tightening via screw.	Tightening torque Angle of rotation	60 Nm 180 °



- Loosen screw (1). In doing so, counter support at the nut (2).
- Replace the screw (1) and the nut (2).

  Parts: Bolt, nut
- Insert screw (1) and guide nut (2).

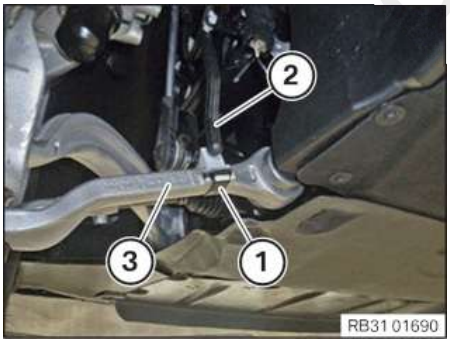


TECHNICAL INFORMATION

The screw connections are tightened with the torque wrench later in normal position.

- Hand-tighten the screw (1) with the standard tool (2). In doing so, counter support at the nut (3).

  Standard tool:



NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Position and lock the holder (1) of the attachment rod (2) for the ride height sensor on the control arm (3).

8 – Install front brake disc



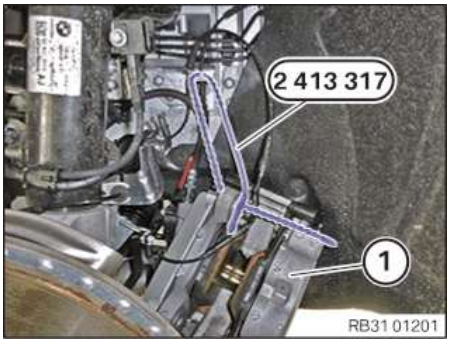
- Position brake disc (2) on wheel hub.
- Renew the screw (1).

  Parts: Screw
- Position and tighten the screw (1).

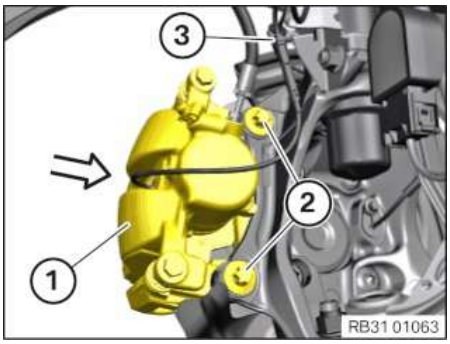
Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

9 – Fasten the front brake caliper



- Release the special tool 2 413 317 from the brake caliper (1) and remove.
- The brake caliper (1) must not suspend at the brake hose.



- Position the brake caliper (1) in direction of arrow on the swivel bearing.
- Renew screws (2).

  Parts: Screws
- Tighten the screws (2).

Brake caliper / caliper carrier at front swivel bearing

M12	Renew screw.	Tightening torque	110 Nm

NOTICE

Perform this step on the left side only.

- Fasten the cable of the brake pad wear sensor to the holder (3).

10 – Install front left or right wheel

▸ **Mounting the wheel**



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.

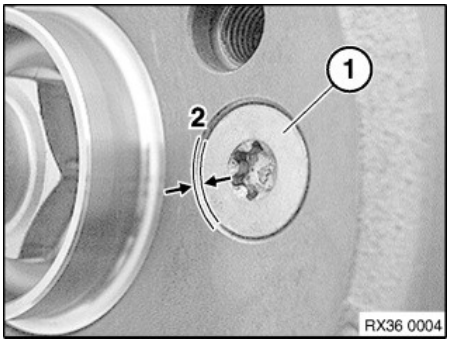
  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.

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- 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 that the mounting bolt (1) for the brake disc is securely seated.

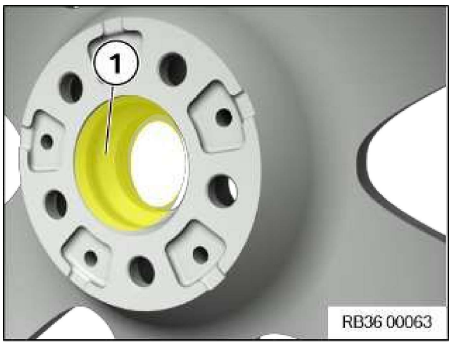
  The mounting bolt (1) for the brake disc **may not** protrude on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm



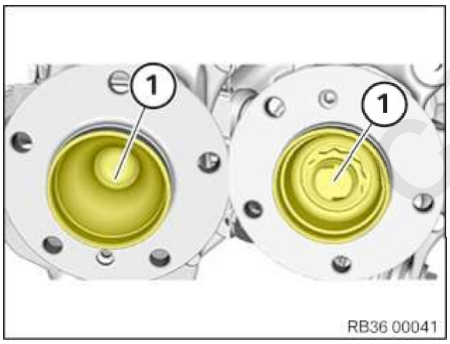
TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

- Thinly grease the wheel centring (1) in the wheel rim.

Expendable materials

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

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

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

Expendable materials

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

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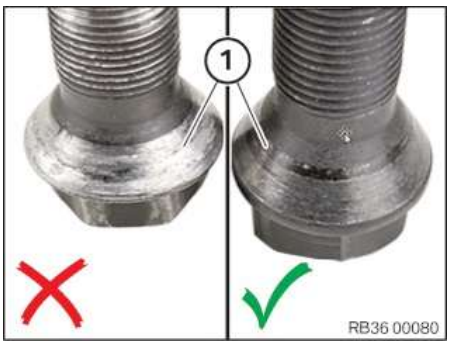


TECHNICAL INFORMATION

A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

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

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



Check

- **Check wheel bolts for wear.**

Result

» Places (> 30%) of the bearing surfaces (1) of the taper on the screw head show a silver wear.

Measure

- Replace wheel bolts.

  Parts: Wheel bolts

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TECHNICAL INFORMATION

Never use impact screwdrivers or electric screwdrivers to screw in and tighten the wheel bolts.

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

- Renew the corroded wheel bolts (arrows).

  Parts: Wheel bolts
- Clean the wheel bolts (arrows).
- Check the wheel bolts (arrows) and threads for damage, renew the wheel bolts (arrows) if necessary.
- Join and tighten the wheel bolts (arrows).

Wheel bolts

M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim.	Tightening torque	140 Nm
	Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.	Check	140 Nm
	Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.		

11 – Measuring the ride height of the front axle and adjusting the normal position



- Set vehicle on its wheels (for example, workshop pit or vehicle lift for Kinematics Diagnosis System).
- Measure the ride height (A).
- Load or unload the vehicle until the ride height (A) is within the tolerance.

G22/G23 Rear-wheel drive, standard suspension/sport suspension settings with low-slung

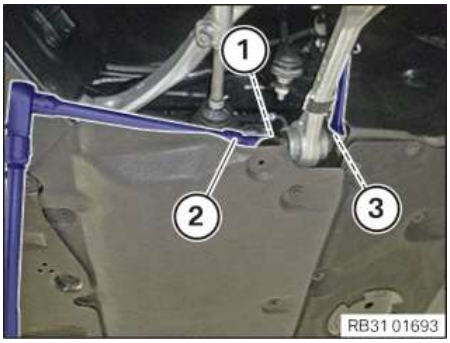
Measured from centre of wheel hub to lower edge of wheel arch

Dimension A	361 (351 - 371) mm

12 – Tightening the screw connection of control arm on front axle support

TECHNICAL INFORMATION

Tighten down screw connection in normal position.



- Slacken the screw (1) with the standard tool (2) by one turn and tighten it. In doing so, counter support at the nut (3).

Wishbone to front axle support

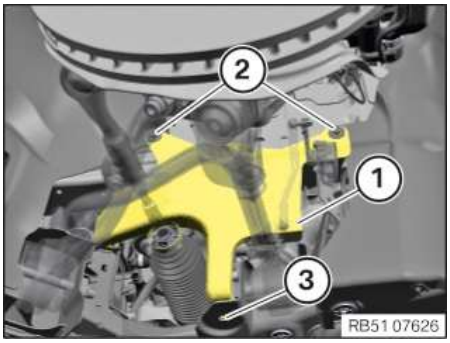
M12	Renew screw and nut.	Tightening torque	68 Nm
	Tighten in normal position!		
	Tightening via screw.	Angle of rotation	180 °

13 – Install the cover of the steering assembly

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TECHNICAL INFORMATION

When tightening the screws, the cover can twist and cause chafe marks on the anti-roll bar (risk of corrosion).
Hold the cover while tightening the screws. Then check the position of the cover.



- Position the cover (1).
- Tighten down screws (2) and (3).

Cover, steering unit

Screw		Tightening torque	3 Nm

14 – 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.

Additional Information

Overview of Tightening Torques

Wheel bearing to swivel bearing — Used in step 6

M12	Renew spherical collar screws. **Tighten the spherical-collar bolts crosswise.** *Tightening sequence must be strictly adhered to and carried out on all spherical-collar bolts at the same time!*	Tightening torque Initial torque Unscrew all bolts. Tightening torque Angle of rotation	20 Nm 140 Nm max. 45 ° 120 Nm 90 °

Spring strut shock absorber to swivel bearing — Used in step 7

M10	Renew screw and nut. Tightening via screw.	Tightening torque Angle of rotation	60 Nm 180 °

Brake disc to front wheel hub — Used in step 810

M8	Renew screw.	Tightening torque	16 Nm

Brake caliper / caliper carrier at front swivel bearing — Used in step 9

M12	Renew screw.	Tightening torque	110 Nm

Brake disc to rear wheel hub — Used in step 10

M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 10

M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim. Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.	Tightening torque Check	140 Nm 140 Nm

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Wishbone to front axle support — Used in step 12

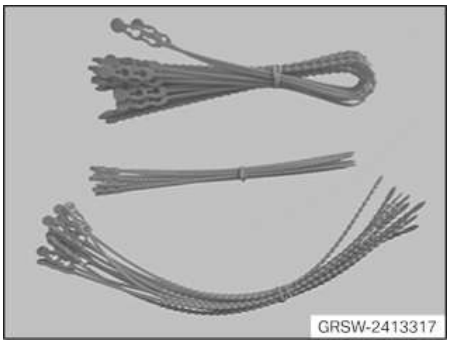
M12	Renew screw and nut. Tighten in normal position! Tightening via screw.	Tightening torque Angle of rotation	68 Nm 180 °

Cover, steering unit — Used in step 13

Screw		Tightening torque	3 Nm

Overview of Special Tools

2 413 317 Cable strap



Common — Used in step 39

Usage	The "Cable ties" parts set consists of 3 items as follows: ABV232 Length: 320 mm colour: RedABV250 Length: 500 mm colour: RedABVS270 Length: 665 mm colour: Red
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	01 47 15 (332)

2 344 011 Tool



Common — Used in step 10

Usage	Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	08 08 12 (872)

Replacement tools:

0 495 221 (36 1 323) Wheel stud



Common — Used in step 1

Usage	(Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 495 224 (36 1 326) Wheel stud



Common	Used in step 1
Usage	(Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 225 (36 1 327) Wheel stud



Common	Used in step 1
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 226 (36 1 328) Wheel stud



Common	Used in step 1
Usage	(Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

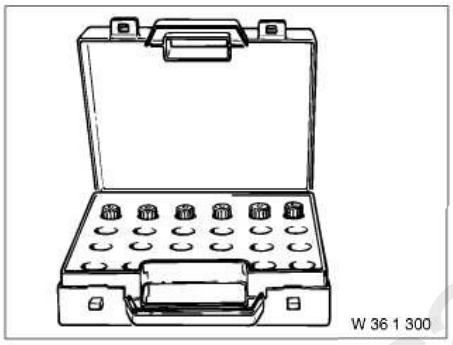
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0 495 227 (36 1 329) Wheel stud



Common	Used in step 1
Usage	(Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 228 (36 1 331) Wheel stud



Common	Used in step 1
Usage	(Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 229 (36 1 332) Wheel stud



Common	Used in step 1
Usage	(Code 38) With centring bore available separately (see EPC) under 36 13 6 762 343
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 495 230 (36 1 333) Wheel stud



Common	Used in step 1
Usage	(Code 40) With centring bore available separately (see EPC) under 36 13 6 762 344
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

Overview Technical Data

G22/G23 Rear-wheel drive, standard suspension/sport suspension settings with low-slung	Used in step 11
Measured from centre of wheel hub to lower edge of wheel arch	
Dimension A	361 (351 - 371) mm

Links

Repair instructions	**Used in step**
00 02 001 Raising the vehicle using a vehicle lift	110

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31 00 ... Information on replacing shock absorbers

Situation:

When a shock absorber is faulty on one side (leaking, noises, etc.), often both shock absorbers on the axle in question are replaced.

Effect:

This is not necessary for technical reasons and causes the manufacturer not to recognize the unnecessarily removed shock absorbers as defective parts. Unnecessarily high costs for the customer can be avoided by replacing the shock absorber on one side only.

Procedure:

If one shock absorber is damaged, it is only necessary to replace both shock absorbers when the car has driven in excess of 100 000 km.

Exception: In all models of M GmbH, for example M3, M5, M6, M8, X5M, X6M, both shock absorbers on the corresponding axle must always be replaced even if a limit value is exceeded on one side only (MPA models not included).

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31 31 000 Removing and installing complete front left or right spring strut shock absorber

PRELIMINARY WORK

1 – Remove front left or right wheel

▸ **Removing the wheel**



TECHNICAL INFORMATION

A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

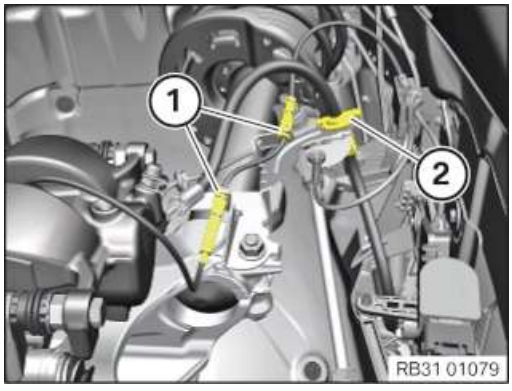
- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to remove the wheel.**

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



- If several wheels are removed at the same time: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Release the wheel bolts (arrows) crosswise and remove the wheel.
- To release and tighten wheel bolts with a security code: Use the correct adapter from the set of special tools .

2 – Detaching the front brake hose



- Detach the brake hose from the holder (2).

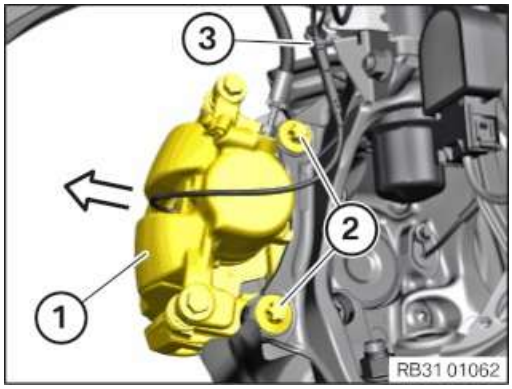
NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Detach the cable for the brake pad wear sensor from the holders (1).

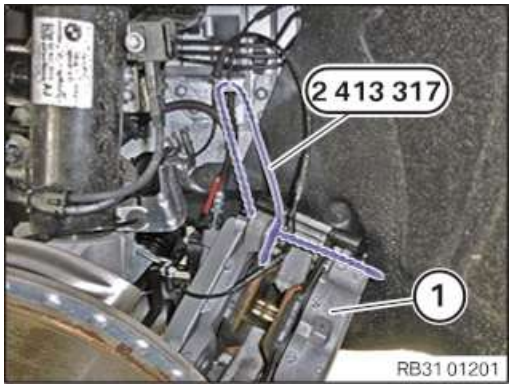
3 – Detach the front brake caliper

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- Release the cable of the brake pad wear sensor from the holder (3).
- Loosen screws (2).
- Remove brake caliper (1) in direction of arrow.

  The brake caliper (1) must not hang on the brake hose.



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

4 – Remove front brake disc



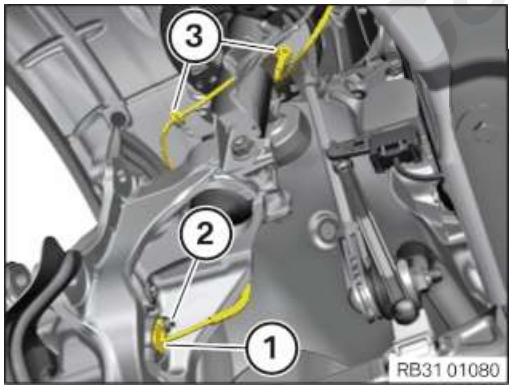
TECHNICAL INFORMATION

Note the following for the removal of the brake disc:

Do not strike the friction ring with a tool under any circumstance (for example, hammer). If required, **carefully** tap with a rubber mallet against the brake disc chamber.

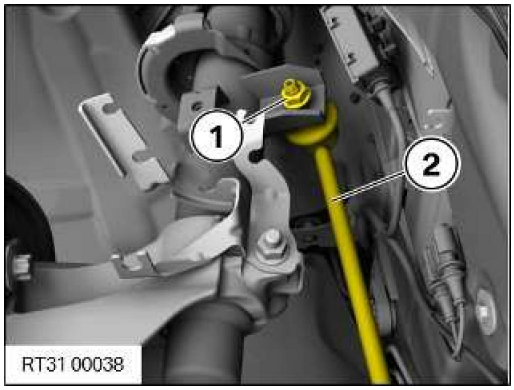
- Loosen screw (1).
- Remove brake disc (2).

5 – Partially removing the front wheel speed sensor



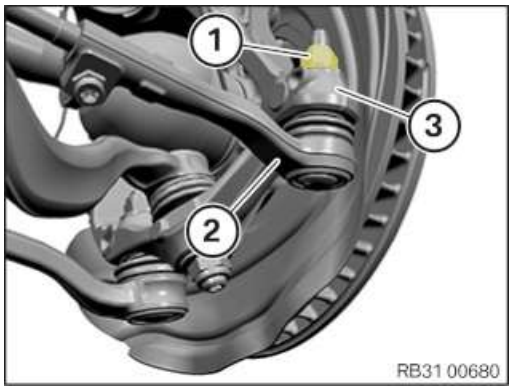
- Loosen screw (2).
- Release the wheel speed sensor (1) from the swivel bearing.
- Detach the wheel speed sensor cable from the brackets (3).
- Remove wheel speed sensor from spring strut.

6 – Releasing the anti-roll bar link from the spring strut



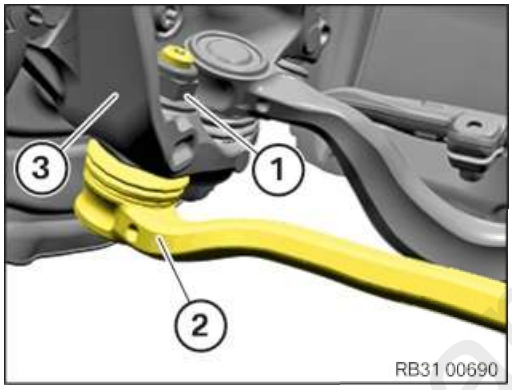
- Loosen the nut (1), if necessary, counter-hold the Torx socket.
- Release the anti-roll bar link (2) from the spring strut.

7 – Loosening the track rod from the swivel bearing

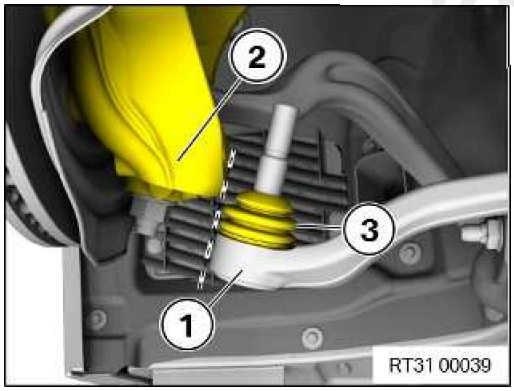


- Release nut (1). If necessary, counter support at the Torx socket.
- Detach the track rod (2) from the swivel bearing (3).

8 – Releasing the wishbone from the swivel bearing



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

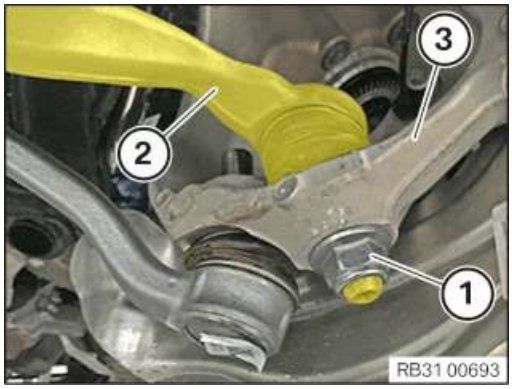


TECHNICAL INFORMATION

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

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

9 – Releasing the tension strut from the swivel bearing



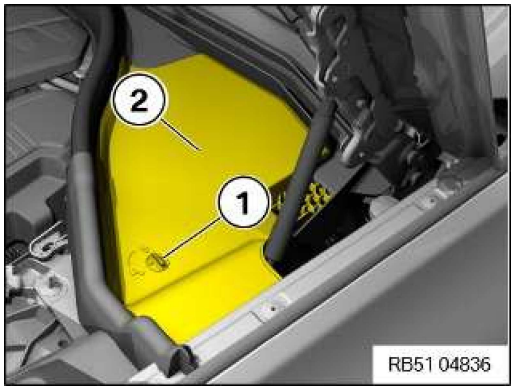
- Unfasten nut (1).

Note: Use the Torx socket for counter support.

- Release the tension strut (2) from the swivel bearing (3).

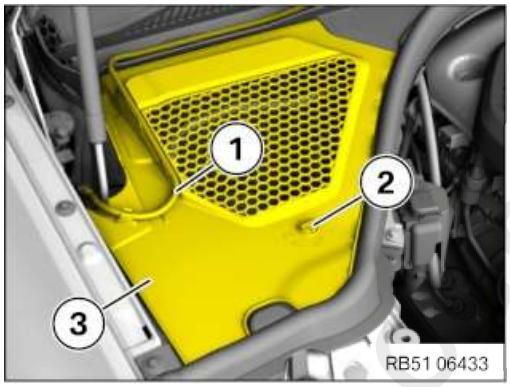
10 – Remove the cover of the engine compartment on the rear left or right

▸ **Remove the cover of the engine compartment at the rear left**



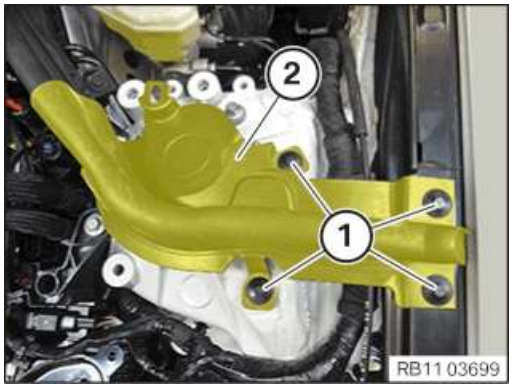
- Loosen the lock (1).
- Remove the cover (2) of the rear left engine compartment.

▸ **Remove the cover of the rear right engine compartment**



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

11 – Removing side bonnet seal



- Loosen the rivet (1).
- Release and remove side bonnet seal (2) from spring strut dome.

MAIN WORK

12 – Remove spring strut

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TECHNICAL INFORMATION

Secure component against falling.



- Loosen screws (1).



- Remove the spring strut (1) with the swivel bearing.

13 – Installing the spring strut



- Position the spring strut (1) with the swivel bearing in the wheel arch.



- Ensure correct positioning of journal (1) of support bearing on the spring strut dome.



- Renew screws (1).

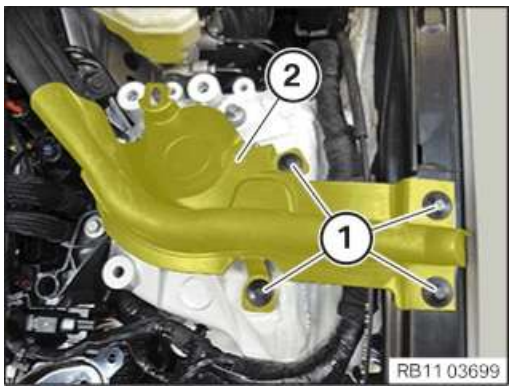
  Parts: Screws
- Tighten the screws (1).

Nut and locknut/self-locking nut

M8	Renew screws.	Tightening torque	28 Nm
		Angle of rotation	90 °

POSTPROCESSES

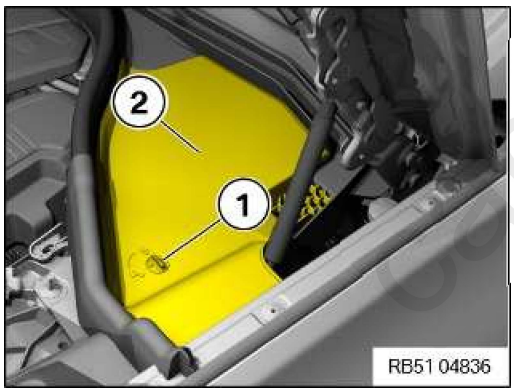
14 – Install the side bonnet seal



- Position the side bonnet seal (2) on the spring strut dome.
- Secure the rivet (1).

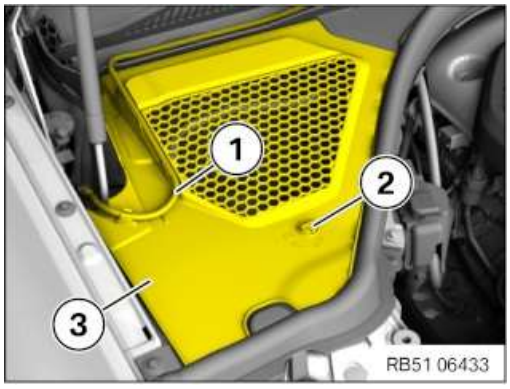
15 – Install the cover of the engine compartment on the rear left or right

▸ **Install the cover of the engine compartment on the rear left**



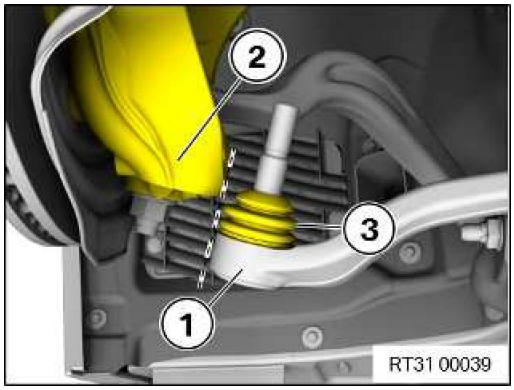
- Position the engine compartment cover at the rear left (2) .
- Close lock (1).

▸ **Install the rear right engine compartment cover**



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

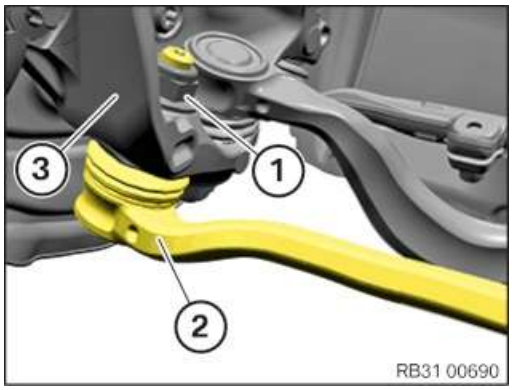
16 – Mounting the wishbone on the swivel bearing



TECHNICAL INFORMATION

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

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



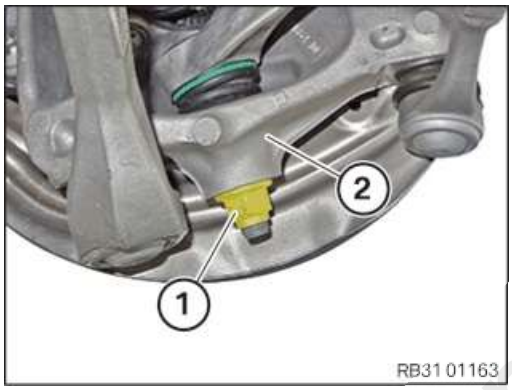
- Position the wishbone (2) on the swivel bearing (3).
- Renew nut (1).

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

Wishbone to swivel bearing

M14	Renew nut.	Tightening torque	175 Nm

17 – Securing tension strut on swivel bearing



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

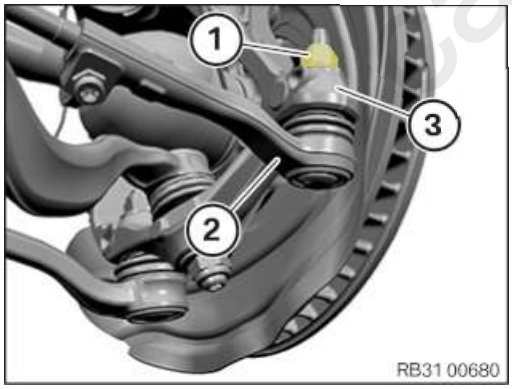
  Parts: Nut
- Tighten nut (1).

Note: Use the Torx socket for counter support.

Tension strut to swivel bearing

M14	Renew nut.	Tightening torque	175 Nm

18 – Securing the track rod on the swivel bearing



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

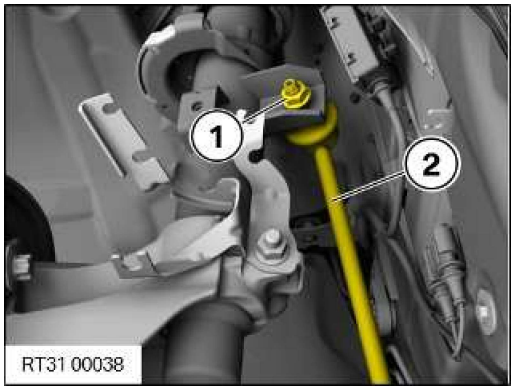
  Parts: Nut
- Tighten nut (1). If necessary, counter support at the Torx socket.

Track rod end to swivel bearing

M14	Renew nut.	Tightening torque	165 Nm

19 – Securing the anti-roll bar link on the spring strut

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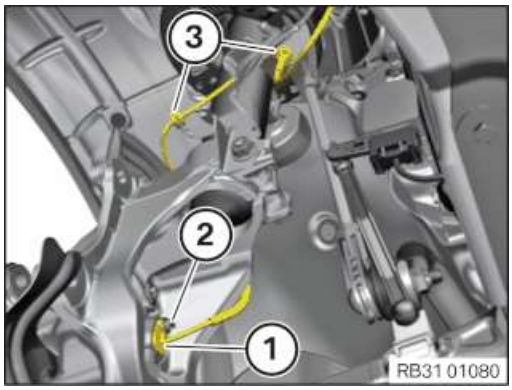
- Position the anti-roll bar link (2) at the spring strut.
- Renew nut (1).

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

Front anti-roll bar link to anti-roll bar/spring strut

M10	Renew nut.	Tightening torque	56 Nm

20 – Installing the front wheel speed sensor partially



- Position the wheel speed sensor on the spring strut.
- Mount the cable of wheel speed sensor on the holders(3).
- Position the wheel speed sensor (1) on the swivel bearing.
- Renew the screw (2).

  Parts: Screw
- Tighten down screw (2).

Wheel speed sensor to swivel bearing

M6	Renew screw.	Tightening torque	12 Nm

21 – Install front brake disc



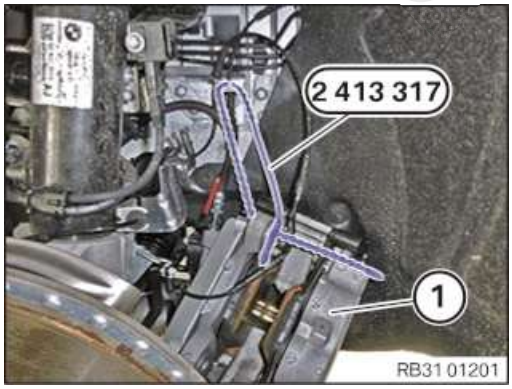
- Position brake disc (2) on wheel hub.
- Renew the screw (1).

  Parts: Screw
- Position and tighten the screw (1).

Brake disc to front wheel hub

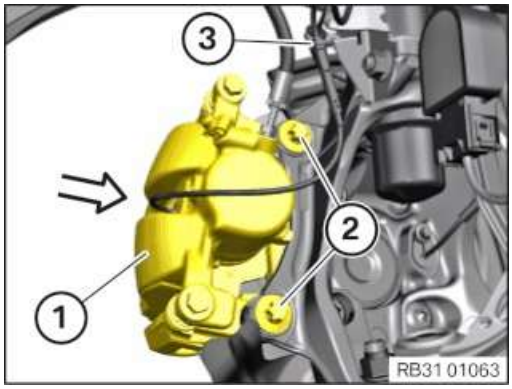
M8	Renew screw.	Tightening torque	16 Nm

22 – Fasten the front brake caliper



- Release the special tool 2 413 317 from the brake caliper (1) and remove.
- The brake caliper (1) must not suspend at the brake hose.

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- Position the brake caliper (1) in direction of arrow on the swivel bearing.
- Renew screws (2).

  Parts: Screws
- Tighten the screws (2).

Brake caliper / caliper carrier at front swivel bearing

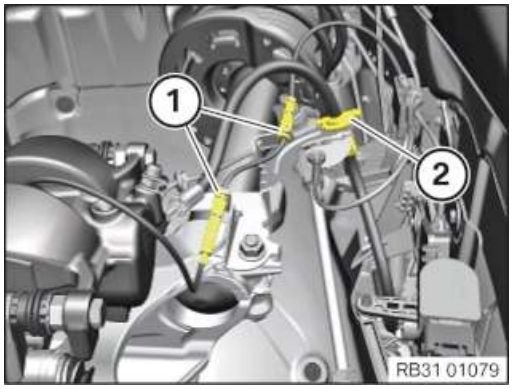
M12	Renew screw.	Tightening torque	110 Nm

NOTICE

Perform this step on the left side only.

- Fasten the cable of the brake pad wear sensor to the holder (3).

23 – Attaching the front brake hose



- Hook the brake hose to the holder (2).

NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Hook the cable for the brake pad wear sensor to the holders (1).

24 – Install front left or right wheel

▸ **Mounting the wheel**



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.

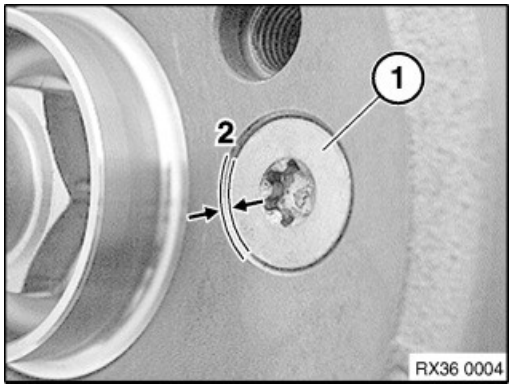
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  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 residue in the area of the wheel bolt holes, remove and clean the brake disc.



- 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 that the mounting bolt (1) for the brake disc is securely seated.

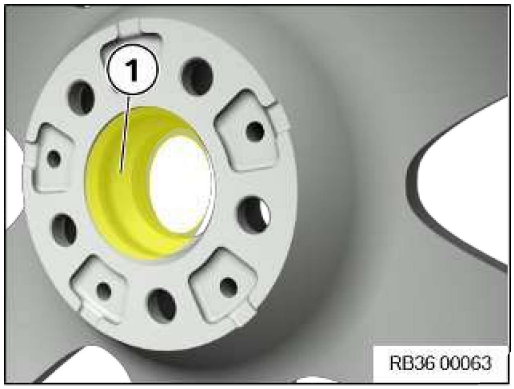
  The mounting bolt (1) for the brake disc **may not** protrude on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm



TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

- Thinly grease the wheel centring (1) in the wheel rim.

Expendable materials

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

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

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

Expendable materials

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

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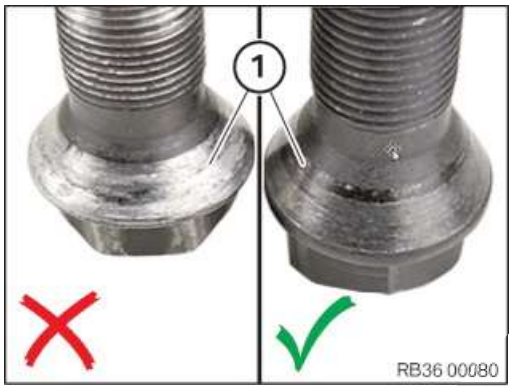


TECHNICAL INFORMATION

A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

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

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



Check

- **Check wheel bolts for wear.**

Result

» Places (> 30%) of the bearing surfaces (1) of the taper on the screw head show a silver wear.

Measure

- Replace wheel bolts.

  Parts: Wheel bolts

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TECHNICAL INFORMATION

Never use impact screwdrivers or electric screwdrivers to screw in and tighten the wheel bolts.

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

- Renew the corroded wheel bolts (arrows).

  Parts: Wheel bolts
- Clean the wheel bolts (arrows).
- Check the wheel bolts (arrows) and threads for damage, renew the wheel bolts (arrows) if necessary.
- Join and tighten the wheel bolts (arrows).

Wheel bolts

M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim.	Tightening torque	140 Nm
	Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.		
	Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.	Check	140 Nm

Additional Information

Overview of Tightening Torques

Nut and locknut/self-locking nut — Used in step 13

M8	Renew screws.	Tightening torque	28 Nm
		Angle of rotation	90 °

Wishbone to swivel bearing — Used in step 16

M14	Renew nut.	Tightening torque	175 Nm

Tension strut to swivel bearing — Used in step 17

M14	Renew nut.	Tightening torque	175 Nm

Track rod end to swivel bearing — Used in step 18

M14	Renew nut.	Tightening torque	165 Nm

Front anti-roll bar link to anti-roll bar/spring strut — Used in step 19

M10	Renew nut.	Tightening torque	56 Nm

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Wheel speed sensor to swivel bearing — Used in step 20

M6	Renew screw.	Tightening torque	12 Nm

Brake disc to front wheel hub — Used in step 2124

M8	Renew screw.	Tightening torque	16 Nm

Brake caliper / caliper carrier at front swivel bearing — Used in step 22

M12	Renew screw.	Tightening torque	110 Nm

Brake disc to rear wheel hub — Used in step 24

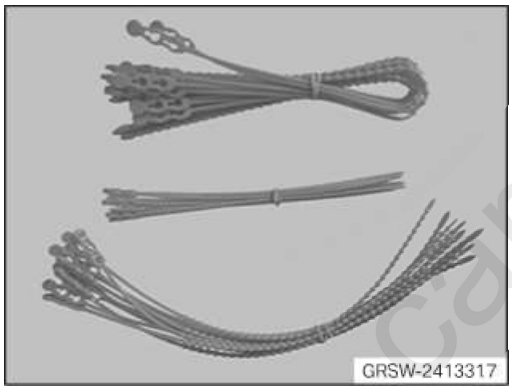
M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 24

M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim. Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.	Tightening torque Check	140 Nm 140 Nm

Overview of Special Tools

2 413 317 Cable strap



Common — Used in step 322

Usage	The "Cable ties" parts set consists of 3 items as follows: ABV232 Length: 320 mm colour: RedABV250 Length: 500 mm colour: RedABVS270 Length: 665 mm colour: Red
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	01 47 15 (332)

2 344 011 Tool



Common — Used in step 24

Usage	Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	08 08 12 (872)

Replacement tools:

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0 495 221 (36 1 323) Wheel stud



Common	Used in step 1
Usage	(Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 224 (36 1 326) Wheel stud



Common	Used in step 1
Usage	(Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 225 (36 1 327) Wheel stud



Common	Used in step 1
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 226 (36 1 328) Wheel stud



Common	Used in step 1
Usage	(Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 495 227 (36 1 329) Wheel stud



Common	Used in step 1
Usage	(Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 228 (36 1 331) Wheel stud



Common	Used in step 1
Usage	(Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 229 (36 1 332) Wheel stud



Common	Used in step 1
Usage	(Code 38) With centring bore available separately (see EPC) under 36 13 6 762 343
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 495 230 (36 1 333) Wheel stud



Common	Used in step 1
Usage	(Code 40) With centring bore available separately (see EPC) under 36 13 6 762 344
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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Links

Repair instructions	Used in step
00 02 001 Raising the vehicle using a vehicle lift	124

31 31 031 Replacing front left or right spring strut shock absorber

WARNING

Spring preload.

Danger! Life-threatening injuries!

- Secure coil spring using special tool **2 213 022 (31 3 340)**.
- Use special tool as per owner's handbook and always observe the safety information.

CAUTION

Spring preload.

Danger of injury!

- The use of the specified special tool (tool) is mandatory.
- The described operation must be carried out properly.

NOTICE

Description is for left component only. Procedure on the right side is identical.

PRELIMINARY WORK

1 – Removing the front left wheel

▸ **Removing the wheel**



TECHNICAL INFORMATION

A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to remove the wheel.**

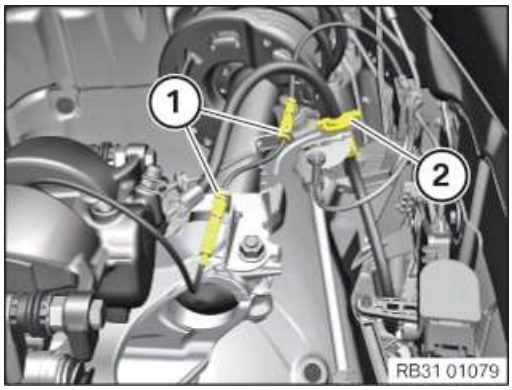
  This process is intended to prevent damage to the brake disc.

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- If several wheels are removed at the same time: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Release the wheel bolts (arrows) crosswise and remove the wheel.
- To release and tighten wheel bolts with a security code: Use the correct adapter from the set of special tools .

2 – Detaching the front brake hose



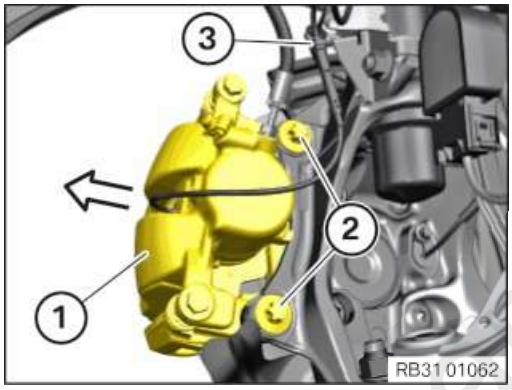
- Detach the brake hose from the holder (2).

NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

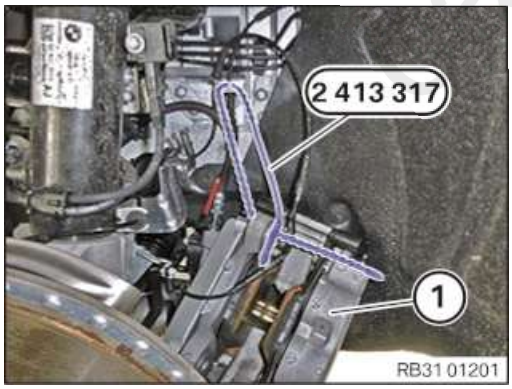
- Detach the cable for the brake pad wear sensor from the holders (1).

3 – Detach the front brake caliper



- Release the cable of the brake pad wear sensor from the holder (3).
- Loosen screws (2).
- Remove brake caliper (1) in direction of arrow.

  The brake caliper (1) must not hang on the brake hose.



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

4 – Remove front brake disc



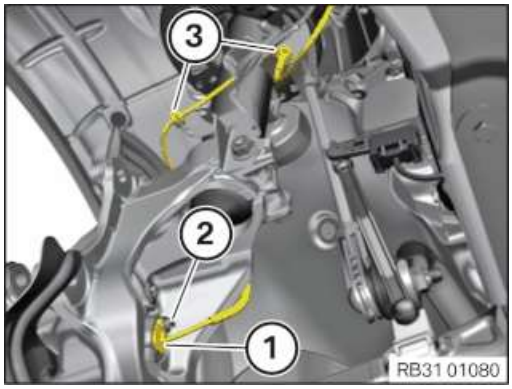
TECHNICAL INFORMATION

Note the following for the removal of the brake disc:

Do not strike the friction ring with a tool under any circumstance (for example, hammer). If required, **carefully** tap with a rubber mallet against the brake disc chamber.

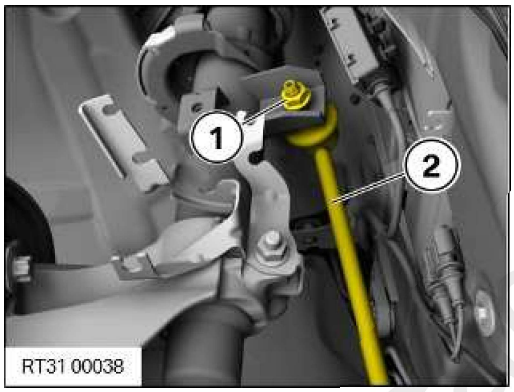
- Loosen screw (1).
- Remove brake disc (2).

5 – Partially removing the front wheel speed sensor



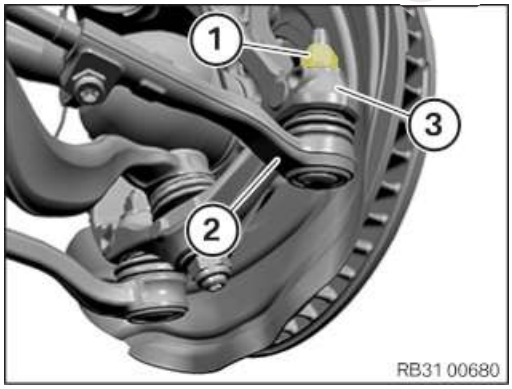
- Loosen screw (2).
- Release the wheel speed sensor (1) from the swivel bearing.
- Detach the wheel speed sensor cable from the brackets (3).
- Remove wheel speed sensor from spring strut.

6 – Releasing the anti-roll bar link from the spring strut



- Loosen the nut (1), if necessary, counter-hold the Torx socket.
- Release the anti-roll bar link (2) from the spring strut.

7 – Loosening the track rod from the swivel bearing



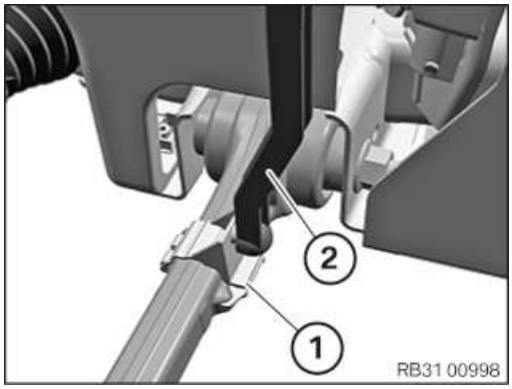
- Release nut (1). If necessary, counter support at the Torx socket.
- Detach the track rod (2) from the swivel bearing (3).

8 – Release the ride height sensor from the lower control arm

NOTICE

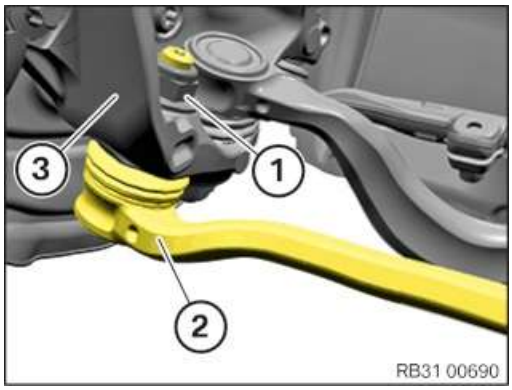
The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

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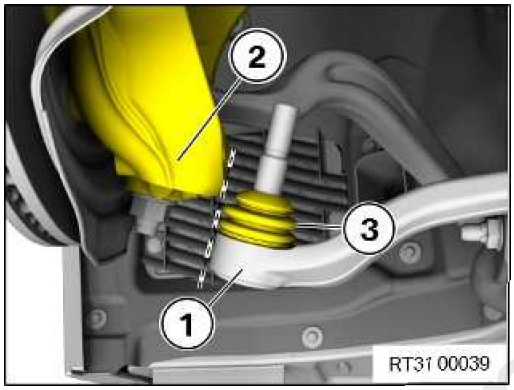


- Unlock holder (1) of attachment rod (2) of ride height sensor and release from lower control arm.

9 – Releasing the wishbone from the swivel bearing



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

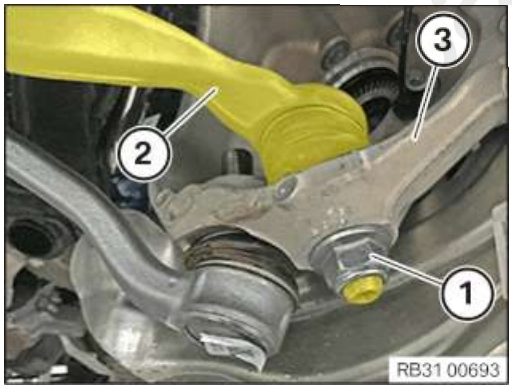


TECHNICAL INFORMATION

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

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

10 – Releasing the tension strut from the swivel bearing

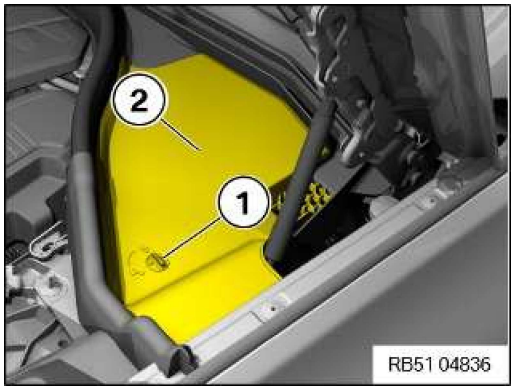


- Unfasten nut (1).

Note: Use the Torx socket for counter support.

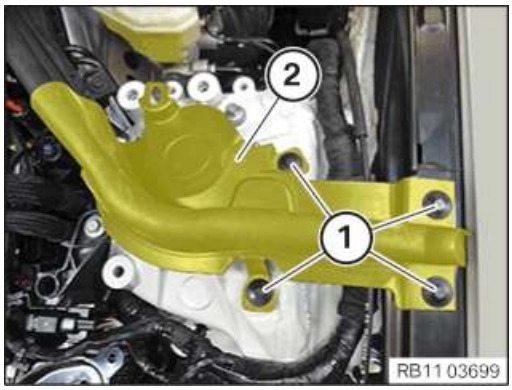
- Release the tension strut (2) from the swivel bearing (3).

11 – Remove the cover of the engine compartment at the rear left



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

12 – Removing side bonnet seal



- Loosen the rivet (1).
- Release and remove side bonnet seal (2) from spring strut dome.

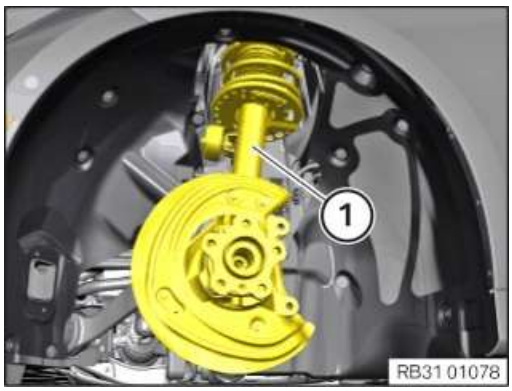
13 – Remove spring strut

TECHNICAL INFORMATION

Secure component against falling.



- Loosen screws (1).

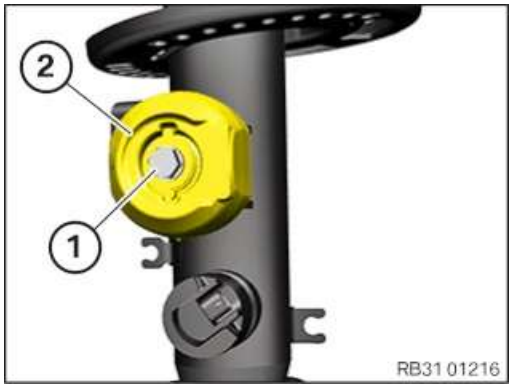


- Remove the spring strut (1) with the swivel bearing.

14 – Removing the absorber weight from suspension strut

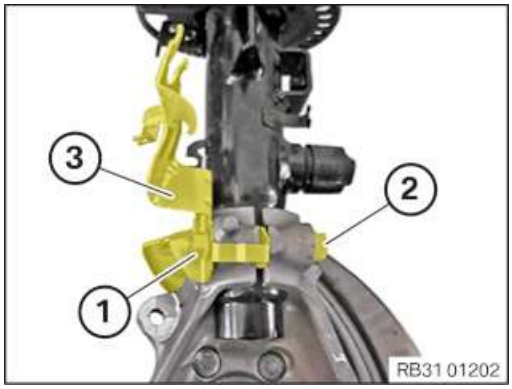
NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

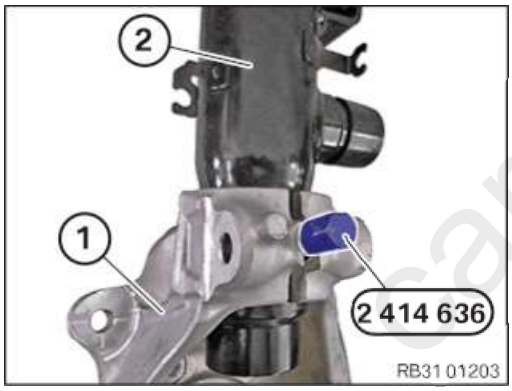


- Loosen screw (1).
- Remove absorber weight (2).

15 – Releasing the spring strut from the swivel bearing



- Unfasten nut (1).
- Pull out bolt (2).
- Remove the holder (3).



- Spread the swivel bearing (1) with the special tool .
- Pull out the spring strut (2) from the swivel bearing (1).

16 – Prepare the spring tensioner

TECHNICAL INFORMATION

Different variants may be installed depending on the vehicle equipment.

cardiagn.com



- **Basic version:**

  Ensure that the coil spring is tensioned with the special tool and a pressure plate (1).



- **Sport and BMW M Performance Automobile version:**

  Ensure that the coil spring is tensioned with two pressure plates (1).

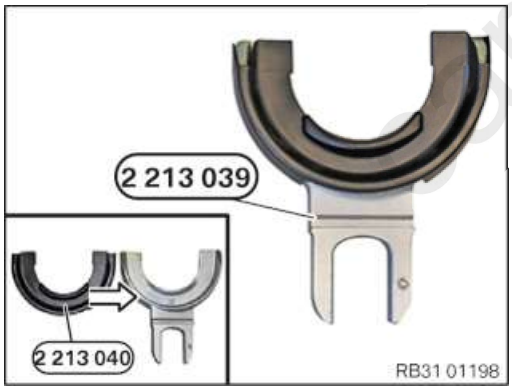
▸ **Preparing the spring tensioner (basic version)**

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 2 213 040 (31 3 364) in direction of arrow on special tool .

  Special tool must be used **without fail** with the protective insert!



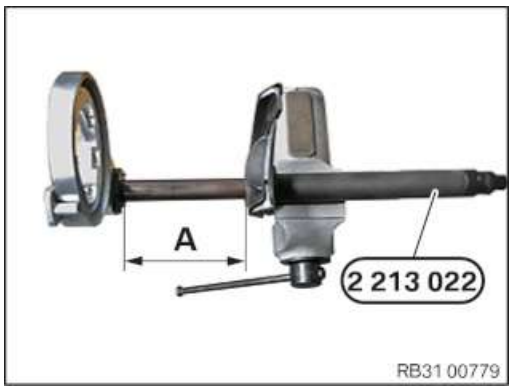
- Clamp special tool in vice.
- Set the special tools and on the special tool from the top, till the retaining bolts (1) engage tangibly and audibly.
- Check and correct the position of the special tools and and correct if required.

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- Position special tool in the mounting plate.
- Position special tool on the mounting plate.

  The screw connection is made by way of bore holes **7** and **15**.
- Turn the special tool until the special tool can be screwed into the prescribed bore holes.
- Tighten screws (1) hand-tight.



- Adjust the special tool on the dimension (A).

  Dimension (A) = 150 mm to 175 mm

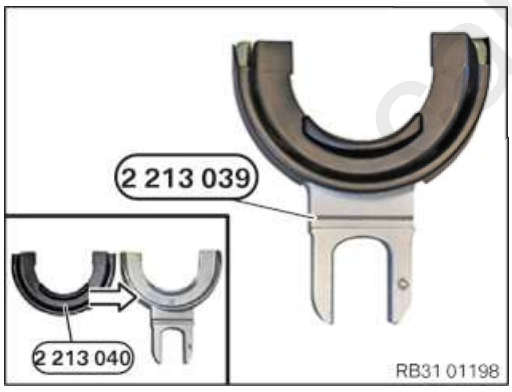
▸ **Preparing spring tensioner (Sport and BMW M Performance Automobile)**

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.



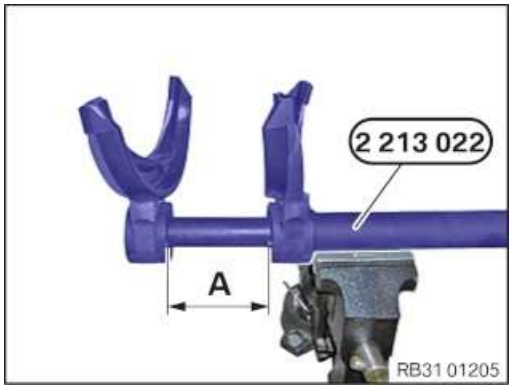
- Mount special tool 2 213 040 (31 3 364) in direction of arrow on special tool .

  Special tool must be prepared twice and used with the protective insert **without fail**.



- Clamp the special tool in the vice.
- Place the pressure plates from the top on to the special tool until you can feel and hear the retaining bolts engage audibly.
- Check the position of the pressure plates, correct if necessary.

ordiagn.com



- Adjust the special tool to dimension (A).

  Dimension (A) = 90 mm - 95 mm

MAIN WORK

17 – Replacing the suspension strut (basic version)

▸ **Tensioning the coil spring (basic version)**

WARNING

Spring preload.

Danger! Life-threatening injuries!

- Secure coil spring using special tool **2 213 022 (31 3 340)**.
- Use special tool as per owner's handbook and always observe the safety information.



- Clean coil spring to remove heavy contamination.
- Insert the suspension strut in the spring tensioner and position the strut mount (1) on the special tool in the direction of arrow.

  Strut mount (1) must lie completely on special tool .

  Bottom coil of coil spring must rest completely in the recess of special tool .



RISK OF DAMAGE

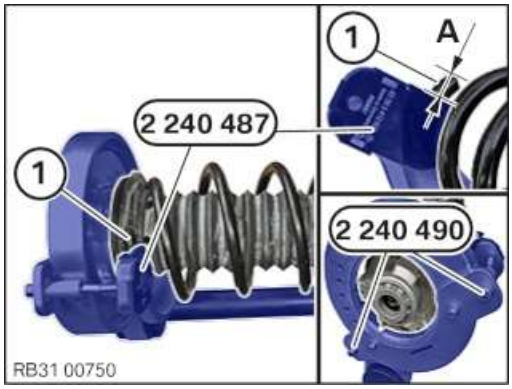
Damage of the coil spring.

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 in direction of arrow on special tool .

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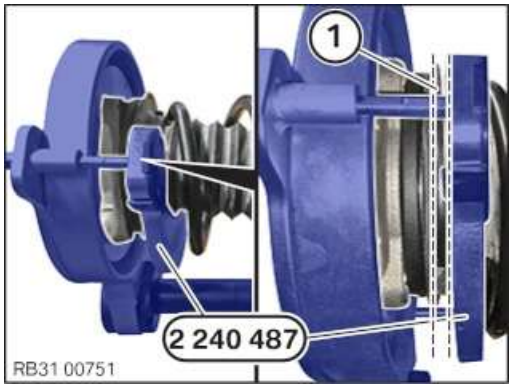
- Position special tool with special tool .

  The rubberised side of special tool must lie on the top coil of the coil spring.
- Position the spring strut in such a way that the coil spring end (1) protrudes with the dimension (A) on the special tool .

  Dimension (A) = 40 mm
- Tighten special tool uniformly.

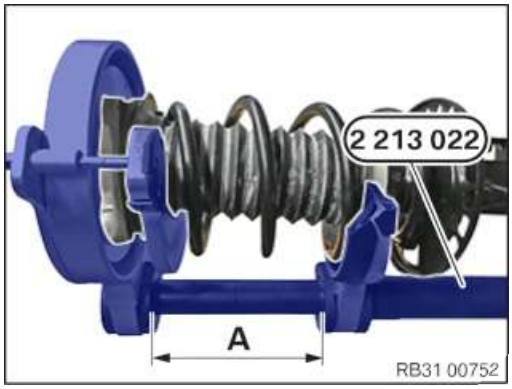
Special tool to pressure plate

	Tightening torque	8 Nm



- Make sure that the special tool lies parallel (1) to the upper coil of the coil spring.

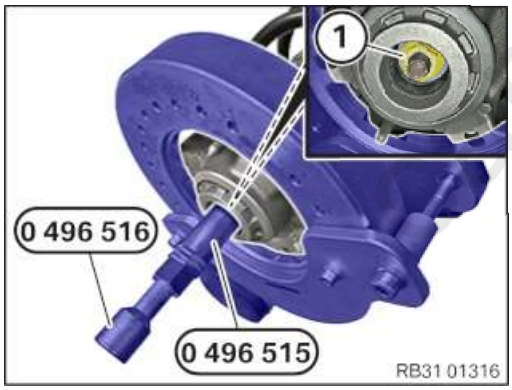
  The tensioning process must be stopped immediately if the coil spring end relative to the special tool starts to twist.
- Check position of the special tool and correct if necessary.



- Tension the coil spring until dimension (A) is reached at the special tool .

  Dimension (A) = 95 mm to 70 mm

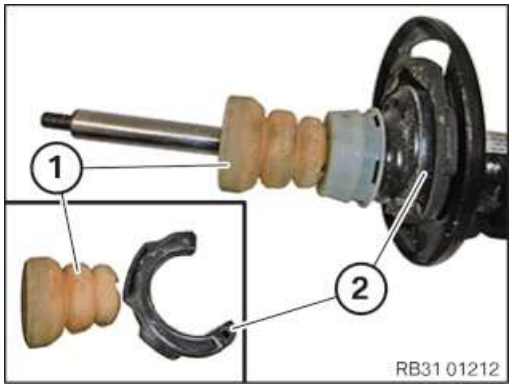
  The dimension (A) **must not be undershot.**



TECHNICAL INFORMATION

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

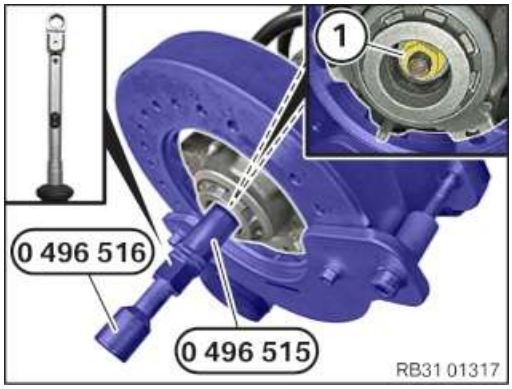
- Unscrew the nut (1) with special tools and .



- Remove suspension strut from tensioned coil springs.
- Remove auxiliary damper (1) and spring pad (2) from suspension strut, check and renew if necessary.
- Renew the spring strut.

  Parts: Spring strut shock absorber
- Mount the auxiliary damper (1) and the spring pad (2) onto the suspension strut .
- Make sure that the position of the spring pad (2) is correct.
- Push in suspension strut with auxiliary damper (1) and spring pad (2) into tensioned coil spring.

autodiagn.com



TECHNICAL INFORMATION

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

- Renew nut (1).

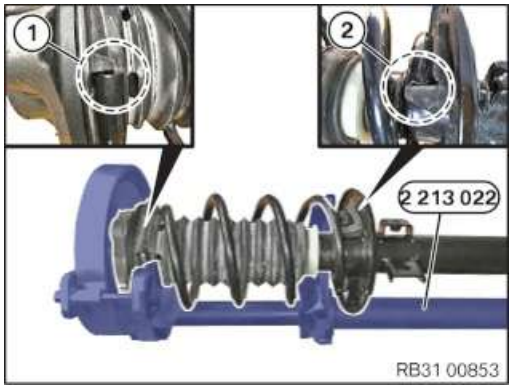
  Parts: Nut

- Tighten the nut (1) with the special tools and .

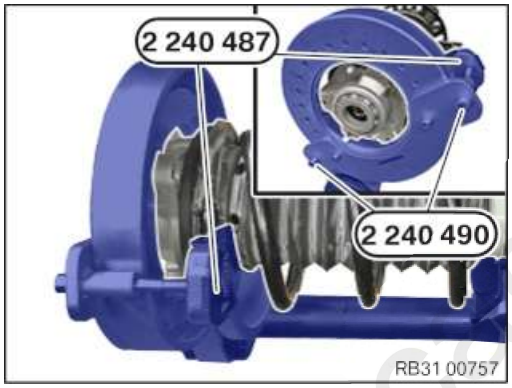
Front spring strut support bearing to spring strut

M12	Renew nut.		71 Nm

▸ **Relieve tension on coil spring**



- Align the spring strut with the spring pad to the bottom coil spring end (2).
- Release coil spring using special tool .
- Check the position on the top coil spring ends (1) and bottom coil spring end (2), correct if necessary.



- Release the special tool .
- Remove special tool .
- Remove spring strut from spring tensioner.

18 – Replacing the suspension strut (Sport and BMW M Performance Automobile)

▸ **Tensioning coil spring (Sport and BMW M Performance Automobile)**

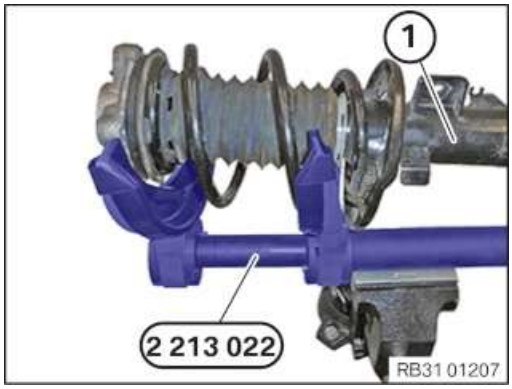
WARNING

Spring preload.

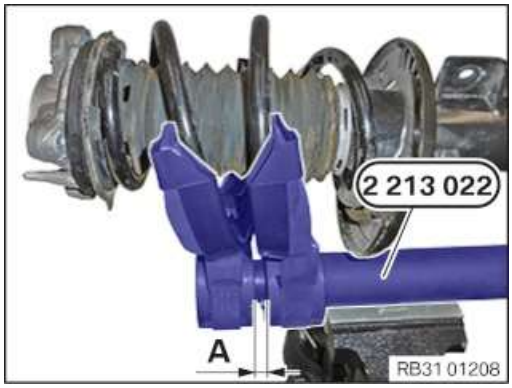
Danger! Life-threatening injuries!

- Secure coil spring using special tool **2 213 022 (31 3 340)**.
- Use special tool as per owner's handbook and always observe the safety information.

carDiag.com



- Clean coil spring to remove heavy contamination.
- Hook the spring strut (1) to the coil spring with the pressure plates.
- Make sure that the coils of the coil spring are completely placed in the slots of the pressure plates.



TECHNICAL INFORMATION

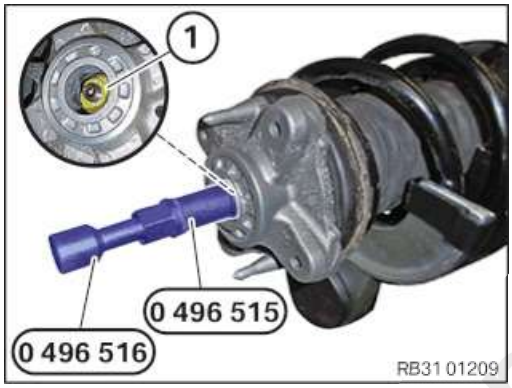
Different variants may be installed depending on the vehicle equipment.

- Tension the coil spring until the dimension (A) is reached at the special tool .

  Dimension (A) = 10 mm

  The dimension (A) **must not be undershot.**

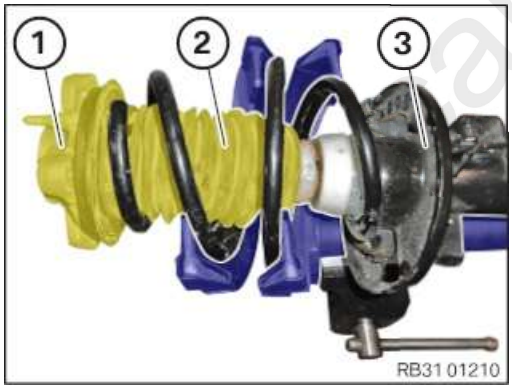
▸ **Remove the spring strut support bearing**



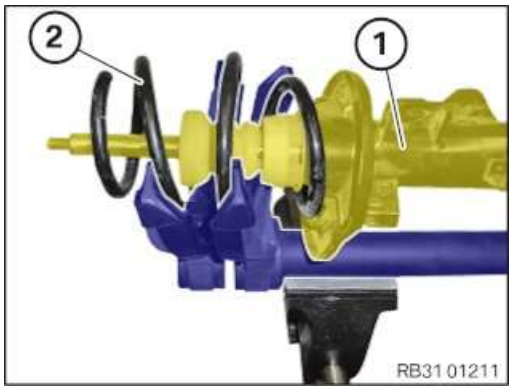
TECHNICAL INFORMATION

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

- Release the nut (1) at the spring strut support bearing with the special tools and .

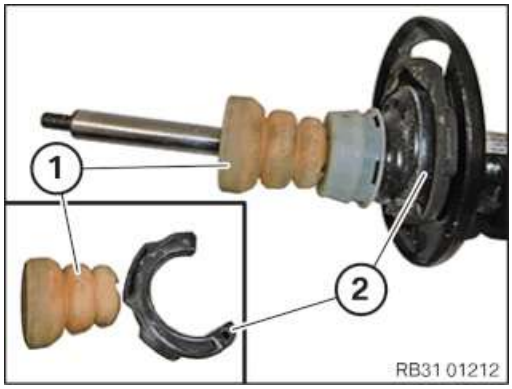


- Pull the spring strut support bearing (1) with the protective tube (2) from the spring strut (3) and remove it.



- Remove the spring strut (1) with the spring pad and the auxiliary damper from the tensioned coil spring (2).

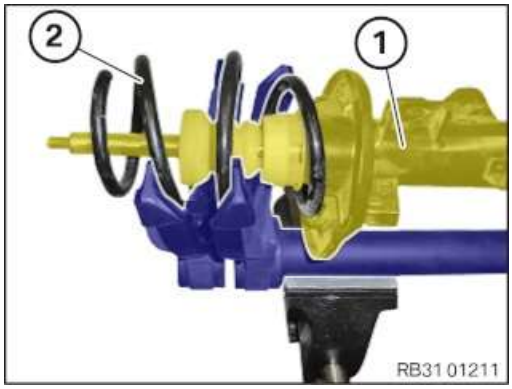
▸ **Replace spring strut**



- Pull down the auxiliary damper (1) and the spring pad (2) from the spring strut.
- Renew the spring strut.

  Parts: Spring strut shock absorber
- Check the auxiliary damper (1) and the spring pad (2) for damage, renew if necessary.
- Position the auxiliary damper (1) and the spring pad (2) on the suspension strut.

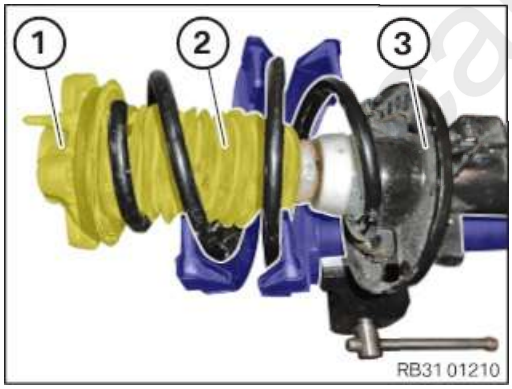
▸ Installing the spring strut support bearing



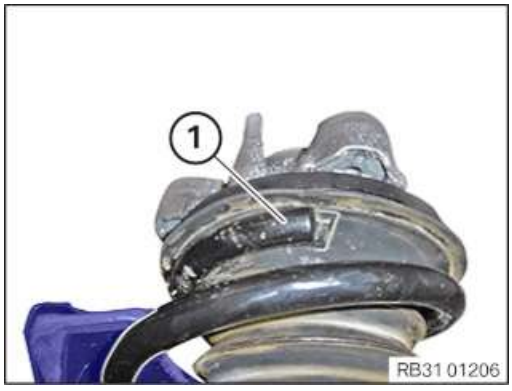
- Slide suspension strut (1) with the spring pad and auxiliary damper into tensioned coil spring (2).



- Align the suspension strut with the spring pad (1) to the bottom coil spring end (2) up to the limit position.

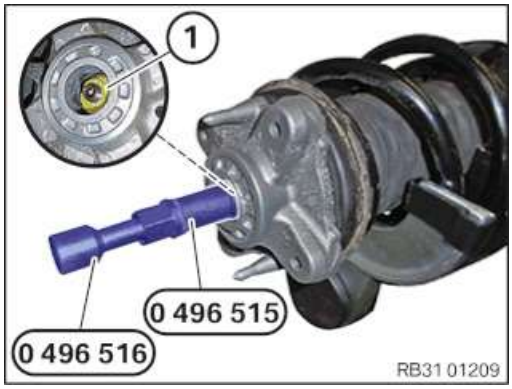


- Check the strut mount (1) and the protective tube (2) for damage, renew if necessary.
- Slide the strut mount (1) with the protective tube (2) on to the piston rod of the suspension strut (3).



- Align the strut mount with the protective tube for the top coil spring end (1) up to the limit position.

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TECHNICAL INFORMATION

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

- Renew nut (1).

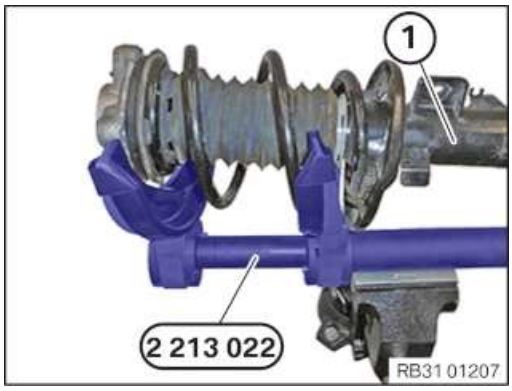
  Parts: Nut

- Tighten the nut (1) at the spring strut support bearing with the special tools and .

Front spring strut support bearing to spring strut

M12	Renew nut.		71 Nm

▸ **Relieve tension on coil spring**



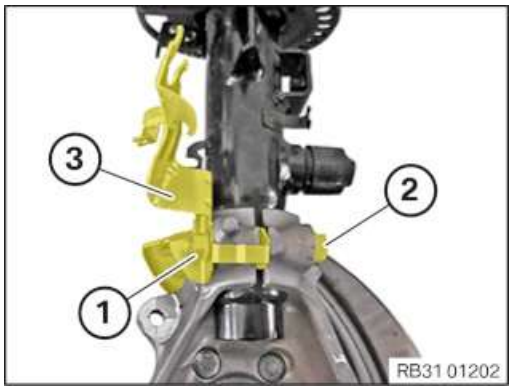
- Release the coil spring with the special tool .
- Make sure that the coil spring ends lie at the top and bottom on the spring pads (correct position if necessary).
- Remove the spring strut (1) from the special tool .

POSTPROCESSES

19 – Fastening the spring strut on to the swivel bearing



- Spread the swivel bearing (1) with the special tool .
- Align the positioning pin on to the spring strut (2) correctly with the gap on the swivel bearing (1).
- Slide in the spring strut (2) up to the limit position in the swivel bearing (1).
- Remove the special tool .



- Position the bracket (3) on the swivel bearing.
- Renew screw (2) and nut (1).

  Parts: Bolt, nut

- Insert screw (2) and guide nut (1).
- Tighten down screw (2).

Spring strut shock absorber to swivel bearing

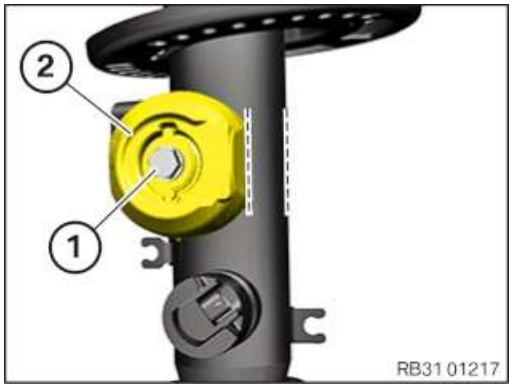
M10	Renew screw and nut. Tightening via screw.	Tightening torque Angle of rotation	60 Nm 180 °

20 – Installing an absorber weight on the spring strut

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NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.



- Position the absorber weight (2) with the flattened side parallel to the spring strut.
- Renew the screw (1).

  Parts: Screw
- Tighten down screw (1).

Absorber weight to spring strut

M8	Renew screw.	Tightening torque	28 Nm
		Angle of rotation	90 °

21 – Installing the spring strut



- Position the spring strut (1) with the swivel bearing in the wheel arch.



- Ensure correct positioning of journal (1) of support bearing on the spring strut dome.



- Renew screws (1).

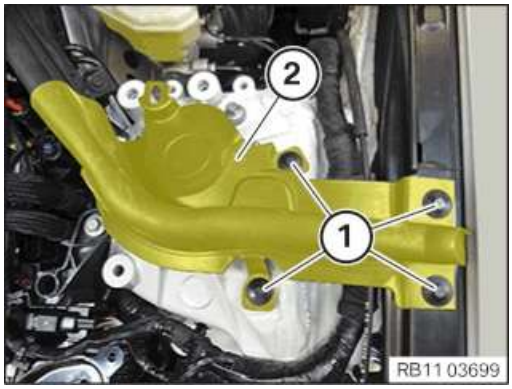
  Parts: Screws
- Tighten the screws (1).

Nut and locknut/self-locking nut

M8	Renew screws.	Tightening torque	28 Nm
		Angle of rotation	90 °

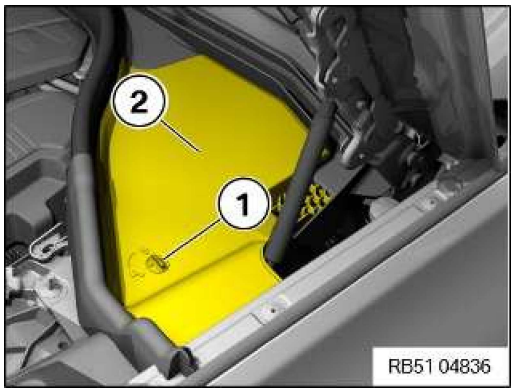
22 – Install the side bonnet seal

autodiagn.com



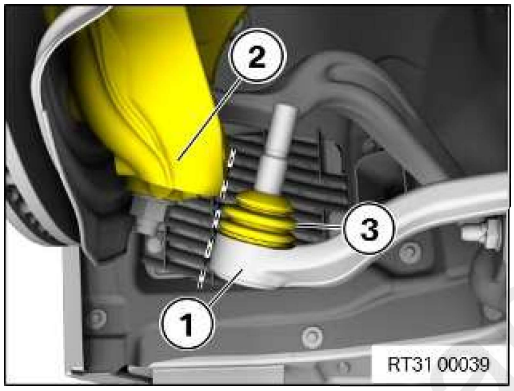
- Position the side bonnet seal (2) on the spring strut dome.
- Secure the rivet (1).

23 – Install the cover of the engine compartment on the rear left



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

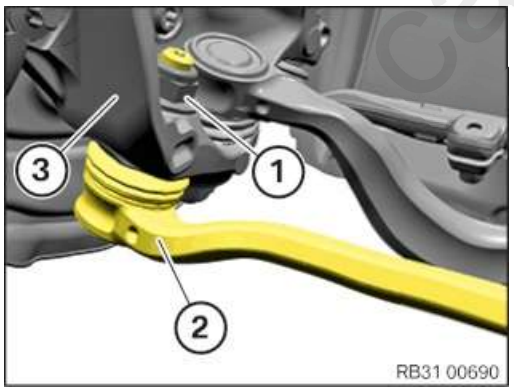
24 – Mounting the wishbone on the swivel bearing



TECHNICAL INFORMATION

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

- Make sure that the rubber grommet (3) on bottom 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.

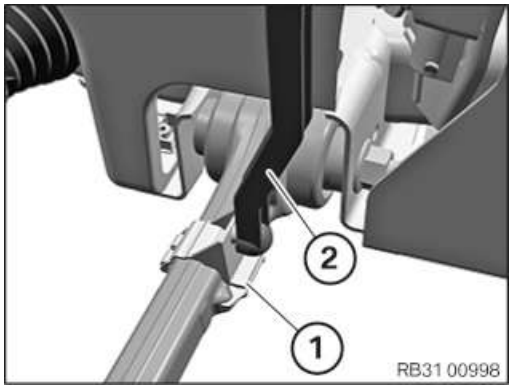
Wishbone to swivel bearing

M14	Renew nut.	Tightening torque	175 Nm

25 – Attach the ride height sensor on the bottom wishbone

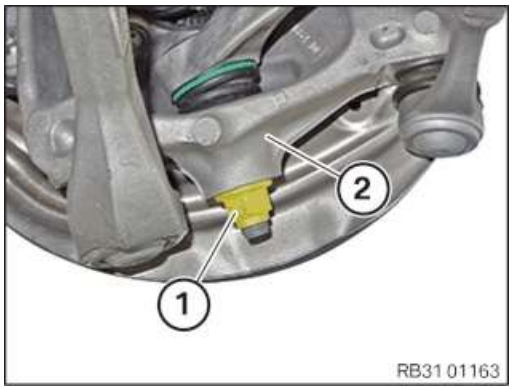
NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.



- Position and lock the holder (1) of the attachment rod (2) of the ride height sensor on the lower control arm.

26 – Securing tension strut on swivel bearing



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

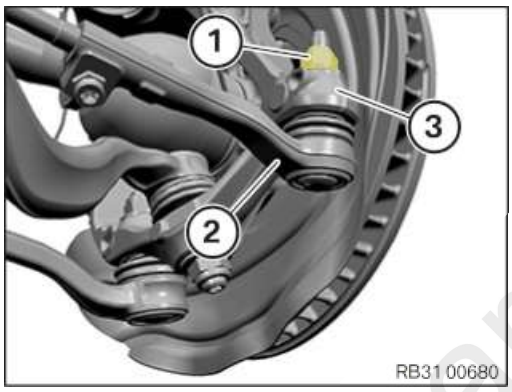
  Parts: Nut
- Tighten nut (1).

Note: Use the Torx socket for counter support.

Tension strut to swivel bearing

M14	Renew nut.	Tightening torque	175 Nm

27 – Securing the track rod on the swivel bearing



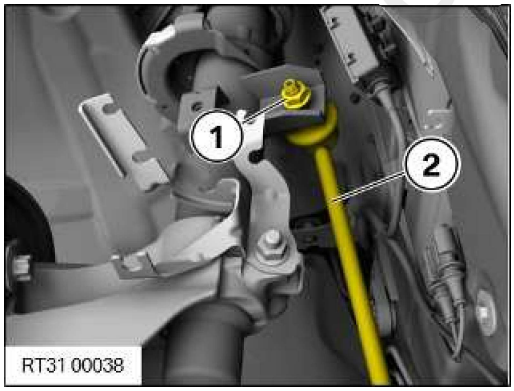
- Position the track rod (2) on the swivel bearing (3).
- Renew nut (1).

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

Track rod end to swivel bearing

M14	Renew nut.	Tightening torque	165 Nm

28 – Securing the anti-roll bar link on the spring strut



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

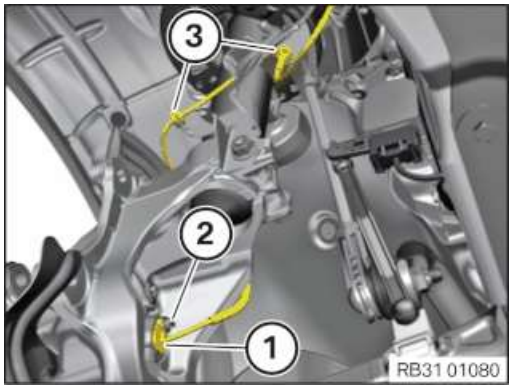
  Parts: Nut
- Tighten the nut (1), if necessary, counter support the Torx socket.

Front anti-roll bar link to anti-roll bar/spring strut

M10	Renew nut.	Tightening torque	56 Nm

29 – Installing the front wheel speed sensor partially

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- Position the wheel speed sensor on the spring strut.
- Mount the cable of wheel speed sensor on the holders(3).
- Position the wheel speed sensor (1) on the swivel bearing.
- Renew the screw (2).

  Parts: Screw
- Tighten down screw (2).

Wheel speed sensor to swivel bearing

M6	Renew screw.	Tightening torque	12 Nm

30 – Install front brake disc



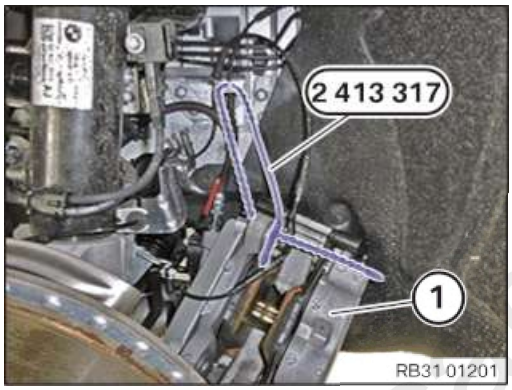
- Position brake disc (2) on wheel hub.
- Renew the screw (1).

  Parts: Screw
- Position and tighten the screw (1).

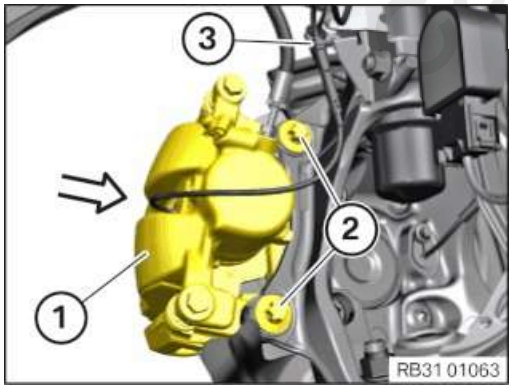
Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

31 – Fasten the front brake caliper



- Release the special tool 2 413 317 from the brake caliper (1) and remove.
- The brake caliper (1) must not suspend at the brake hose.



- Position the brake caliper (1) in direction of arrow on the swivel bearing.
- Renew screws (2).

  Parts: Screws
- Tighten the screws (2).

Brake caliper / caliper carrier at front swivel bearing

M12	Renew screw.	Tightening torque	110 Nm

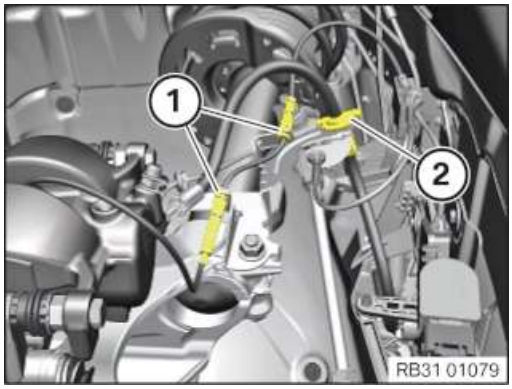
NOTICE

Perform this step on the left side only.

- Fasten the cable of the brake pad wear sensor to the holder (3).

32 – Attaching the front brake hose

partdiagram.com



- Hook the brake hose to the holder (2).

NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Hook the cable for the brake pad wear sensor to the holders (1).

33 – Attaching the front left wheel

▸ **Mounting the wheel**



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.

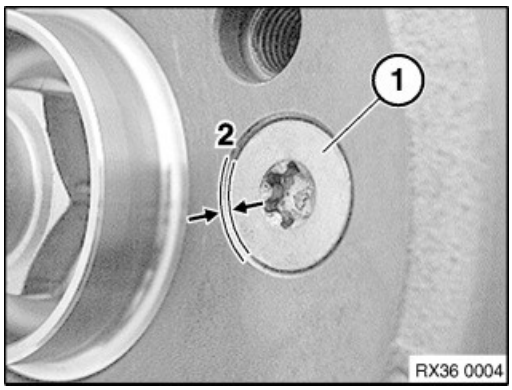
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  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 residue in the area of the wheel bolt holes, remove and clean the brake disc.



- 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 that the mounting bolt (1) for the brake disc is securely seated.

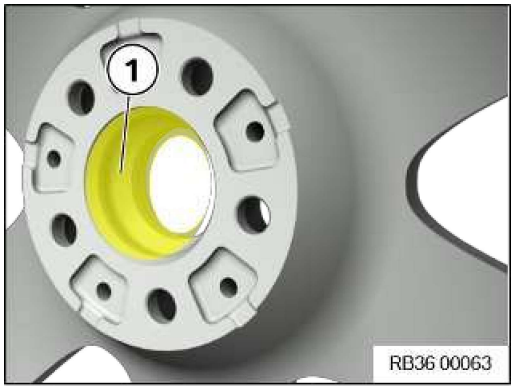
  The mounting bolt (1) for the brake disc **may not** protrude on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm



TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

- Thinly grease the wheel centring (1) in the wheel rim.

Expendable materials

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

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

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

Expendable materials

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

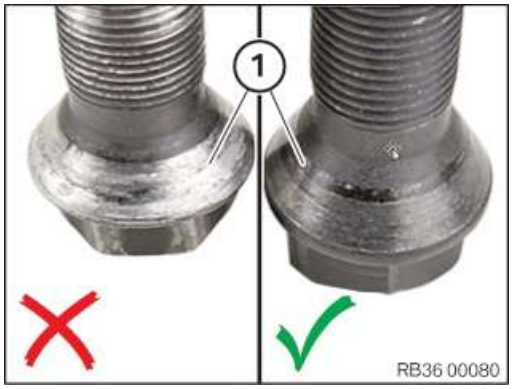
A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

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

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

Check

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- **Check wheel bolts for wear.**

Result

» Places (> 30%) of the bearing surfaces (1) of the taper on the screw head show a silver wear.

Measure

- Replace wheel bolts.

  Parts: Wheel bolts



TECHNICAL INFORMATION

Never use impact screwdrivers or electric screwdrivers to screw in and tighten the wheel bolts.

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

- Renew the corroded wheel bolts (arrows).

  Parts: Wheel bolts

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

Wheel bolts

M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim.	Tightening torque	140 Nm
	Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.	Check	140 Nm
	Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.		

Additional Information

Overview of Tightening Torques

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Special tool to pressure plate — Used in step 17

		Tightening torque	8 Nm

Front spring strut support bearing to spring strut — Used in step 1718

M12	Renew nut.		71 Nm

Spring strut shock absorber to swivel bearing — Used in step 19

M10	Renew screw and nut. Tightening via screw.	Tightening torque Angle of rotation	60 Nm 180 °

Absorber weight to spring strut — Used in step 20

M8	Renew screw.	Tightening torque Angle of rotation	28 Nm 90 °

Nut and locknut/self-locking nut — Used in step 21

M8	Renew screws.	Tightening torque Angle of rotation	28 Nm 90 °

Wishbone to swivel bearing — Used in step 24

M14	Renew nut.	Tightening torque	175 Nm

Tension strut to swivel bearing — Used in step 26

M14	Renew nut.	Tightening torque	175 Nm

Track rod end to swivel bearing — Used in step 27

M14	Renew nut.	Tightening torque	165 Nm

Front anti-roll bar link to anti-roll bar/spring strut — Used in step 28

M10	Renew nut.	Tightening torque	56 Nm

Wheel speed sensor to swivel bearing — Used in step 29

M6	Renew screw.	Tightening torque	12 Nm

Brake disc to front wheel hub — Used in step 3033

M8	Renew screw.	Tightening torque	16 Nm

Brake caliper / caliper carrier at front swivel bearing — Used in step 31

M12	Renew screw.	Tightening torque	110 Nm

Brake disc to rear wheel hub — Used in step 33

M8	Renew screw.	Tightening torque	16 Nm

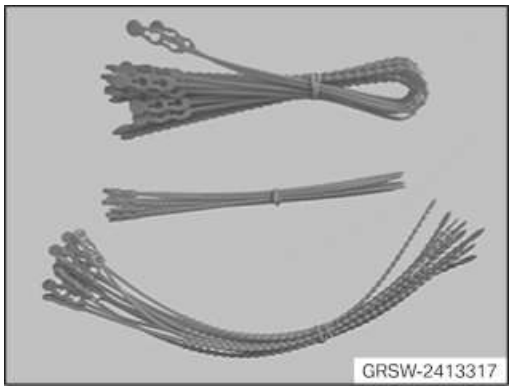
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Wheel bolts Used in step 33

M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim. Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.	Tightening torque Check	140 Nm 140 Nm

Overview of Special Tools

2 413 317 Cable strap



Common Used in step 331

Usage	The "Cable ties" parts set consists of 3 items as follows: ABV232 Length: 320 mm colour: RedABV250 Length: 500 mm colour: RedABVS270 Length: 665 mm colour: Red
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	01 47 15 (332)

2 213 040 (31 3 364) Insert



Common Used in step 16

Usage	Protective insert As of 08/2011, replaces the previous special tool number 31 3 364, see SI 01 16 11 (738). Protective insert suitable for clamping plate 31 3 382 = 83 30 2 213 039.
Included in the tool or work	
Storage location	Individual
Replaced by	
In connection with	
SI-Number	01 16 11 (738)

2 344 011 Tool



Common Used in step 33

Usage	Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	08 08 12 (872)

Replacement tools:

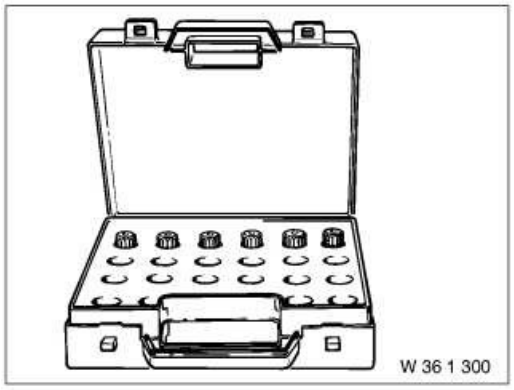
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0 495 221 (36 1 323) Wheel stud



Common	Used in step 1
Usage	(Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 224 (36 1 326) Wheel stud



Common	Used in step 1
Usage	(Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 225 (36 1 327) Wheel stud



Common	Used in step 1
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 226 (36 1 328) Wheel stud



Common	Used in step 1
Usage	(Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 495 227 (36 1 329) Wheel stud



Common	Used in step 1
Usage	(Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 228 (36 1 331) Wheel stud



Common	Used in step 1
Usage	(Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 229 (36 1 332) Wheel stud



Common	Used in step 1
Usage	(Code 38) With centring bore available separately (see EPC) under 36 13 6 762 343
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 495 230 (36 1 333) Wheel stud



Common	Used in step 1
Usage	(Code 40) With centring bore available separately (see EPC) under 36 13 6 762 344
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

Links

Repair instructions	Used in step
00 02 001 Raising the vehicle using a vehicle lift	133

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31 33 100 Removing and installing/replacing coil spring for front left or front right spring strut

WARNING

Spring preload.

Danger! Life-threatening injuries!

- Secure coil spring using special tool **2 213 022 (31 3 340)**.
- Use special tool as per owner's handbook and always observe the safety information.

CAUTION

Spring preload.

Danger of injury!

- The use of the specified special tool (tool) is mandatory.
- The described operation must be carried out properly.

NOTICE

Description is for left component only. Procedure on the right side is identical.

PRELIMINARY WORK

1 – Removing the front left wheel

▸ **Removing the wheel**



TECHNICAL INFORMATION

A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to remove the wheel.**

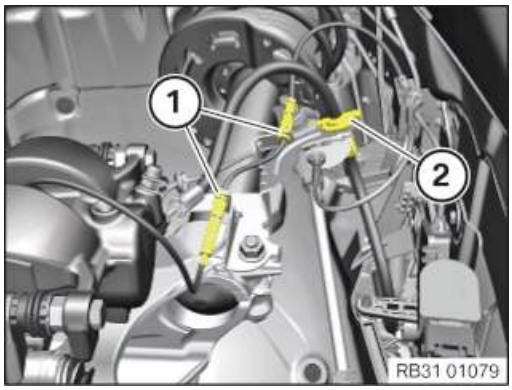
  This process is intended to prevent damage to the brake disc.

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- If several wheels are removed at the same time: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Release the wheel bolts (arrows) crosswise and remove the wheel.
- To release and tighten wheel bolts with a security code: Use the correct adapter from the set of special tools .

2 – Detaching the front brake hose



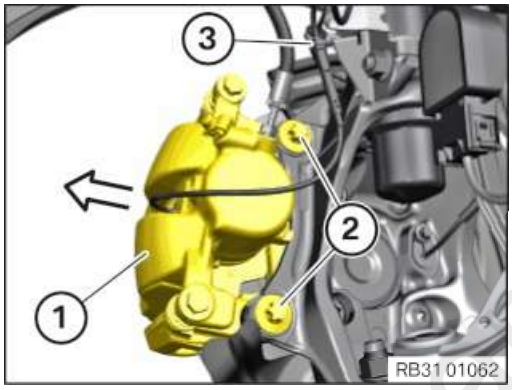
- Detach the brake hose from the holder (2).

NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

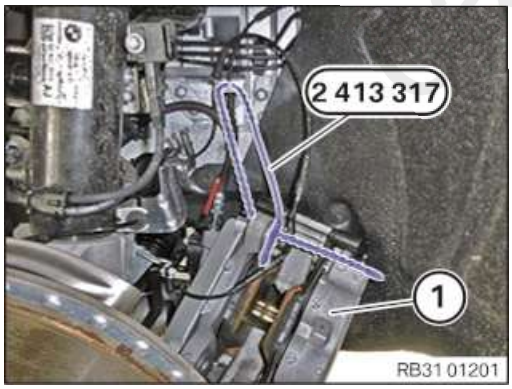
- Detach the cable for the brake pad wear sensor from the holders (1).

3 – Detach the front brake caliper



- Release the cable of the brake pad wear sensor from the holder (3).
- Loosen screws (2).
- Remove brake caliper (1) in direction of arrow.

  The brake caliper (1) must not hang on the brake hose.



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

4 – Remove front brake disc



TECHNICAL INFORMATION

Note the following for the removal of the brake disc:

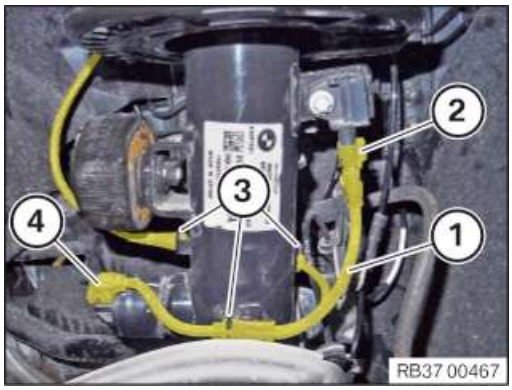
Do not strike the friction ring with a tool under any circumstance (for example, hammer). If required, **carefully** tap with a rubber mallet against the brake disc chamber.

- Loosen screw (1).
- Remove brake disc (2).

5 – Disconnecting the cable of the vertical dynamic platform (VDP) from the spring strut

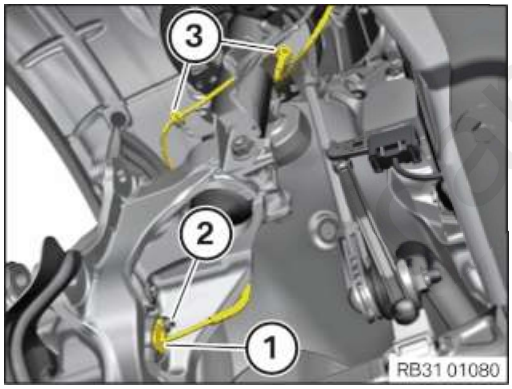
NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.



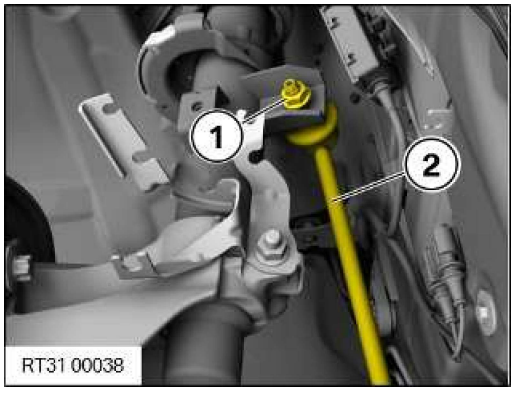
- Unlock and disconnect the plug connection (2) on the vertical acceleration sensor.
- Unlock and disconnect the plug connection (4) on the spring strut.
- Release the cable (1) from the holders (3).

6 – Partially removing the front wheel speed sensor



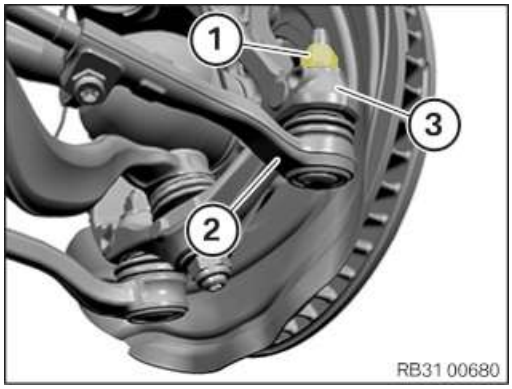
- Loosen screw (2).
- Release the wheel speed sensor (1) from the swivel bearing.
- Detach the wheel speed sensor cable from the brackets (3).
- Remove wheel speed sensor from spring strut.

7 – Releasing the anti-roll bar link from the spring strut



- Loosen the nut (1), if necessary, counter-hold the Torx socket.
- Release the anti-roll bar link (2) from the spring strut.

8 – Loosening the track rod from the swivel bearing

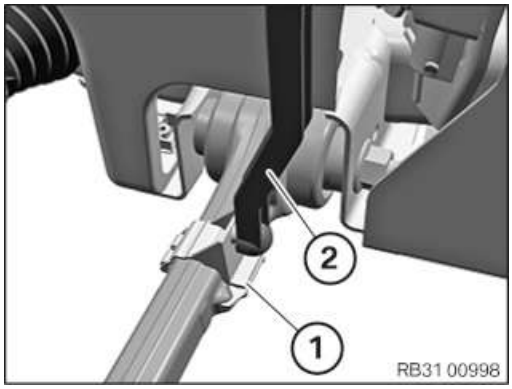


- Release nut (1). If necessary, counter support at the Torx socket.
- Detach the track rod (2) from the swivel bearing (3).

9 – Release the ride height sensor from the lower control arm

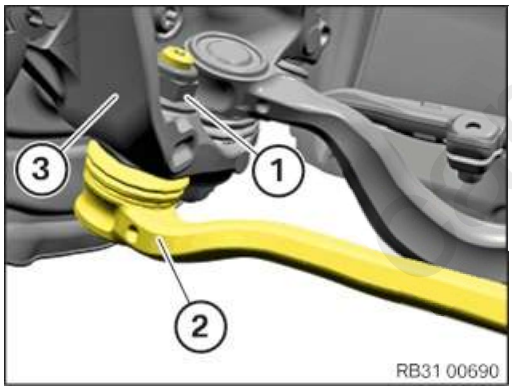
NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

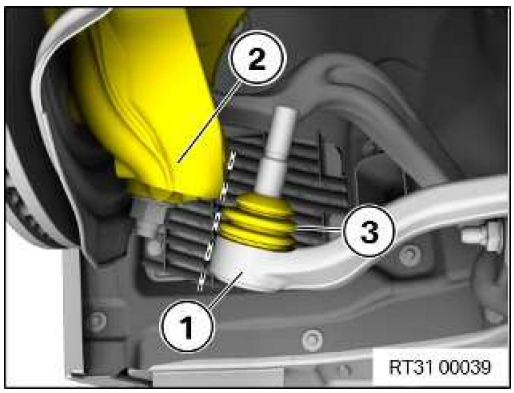


- Unlock holder (1) of attachment rod (2) of ride height sensor and release from lower control arm.

10 – Releasing the wishbone from the swivel bearing



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



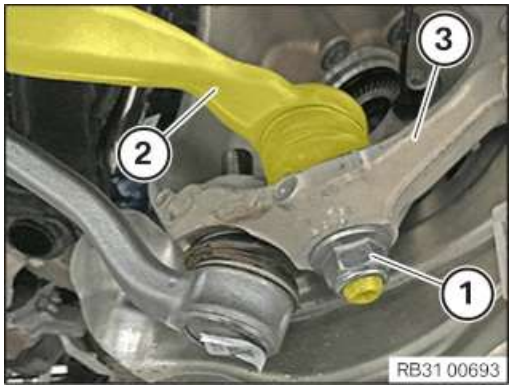
TECHNICAL INFORMATION

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

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

11 – Releasing the tension strut from the swivel bearing

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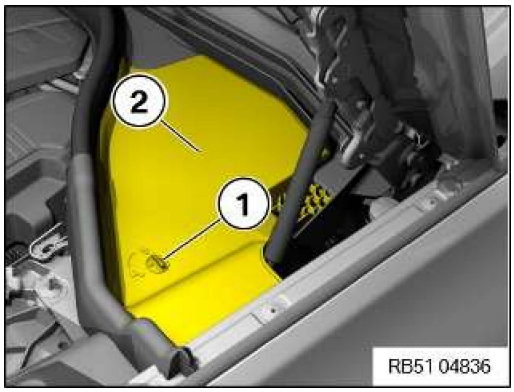


- Unfasten nut (1).

Note: Use the Torx socket for counter support.

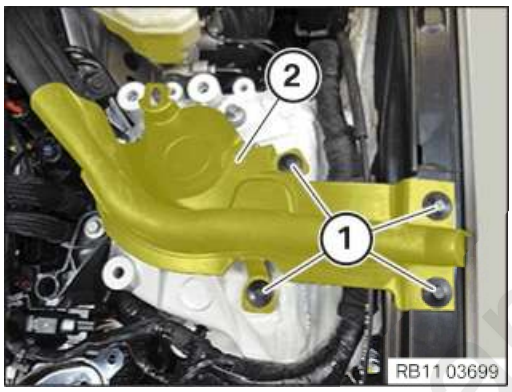
- Release the tension strut (2) from the swivel bearing (3).

12 – Remove the cover of the engine compartment at the rear left



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

13 – Removing side bonnet seal



- Loosen the rivet (1).
- Release and remove side bonnet seal (2) from spring strut dome.

14 – Remove spring strut

TECHNICAL INFORMATION

Secure component against falling.



- Loosen screws (1).

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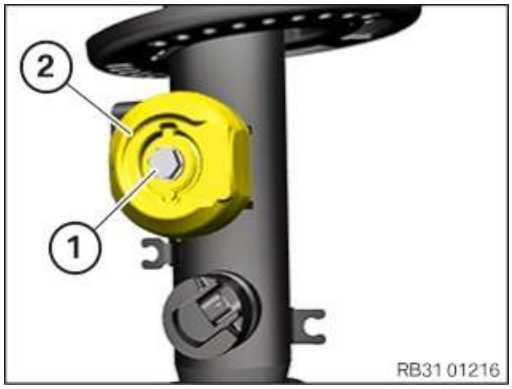


- Remove the spring strut (1) with the swivel bearing.

15 – Removing the absorber weight from suspension strut

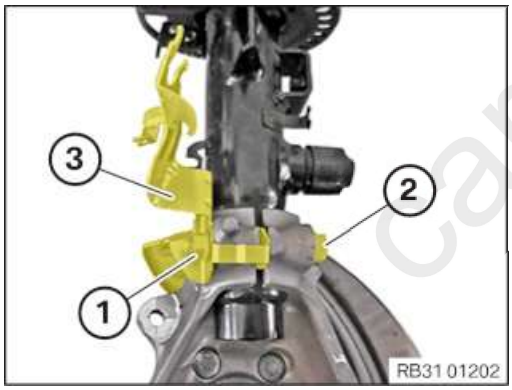
NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.



- Loosen screw (1).
- Remove absorber weight (2).

16 – Releasing the spring strut from the swivel bearing



- Unfasten nut (1).
- Pull out bolt (2).
- Remove the holder (3).



- Spread the swivel bearing (1) with the special tool .
- Pull out the spring strut (2) from the swivel bearing (1).

17 – Prepare the spring tensioner

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TECHNICAL INFORMATION

Different variants may be installed depending on the vehicle equipment.



- **Basic version:**

  Ensure that the coil spring is tensioned with the special tool and a pressure plate (1).



- **Sport and BMW M Performance Automobile version:**

  Ensure that the coil spring is tensioned with two pressure plates (1).

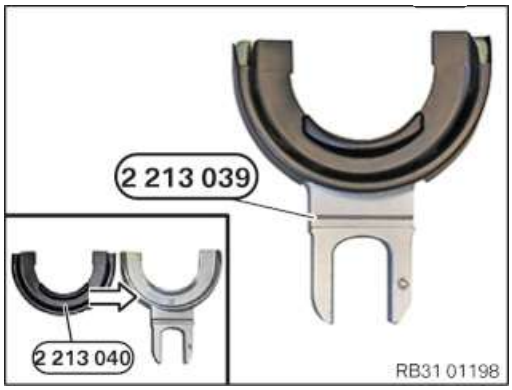
▸ **Preparing the spring tensioner (basic version)**

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 2 213 040 (31 3 364) in direction of arrow on special tool .

  Special tool must be used **without fail** with the protective insert!

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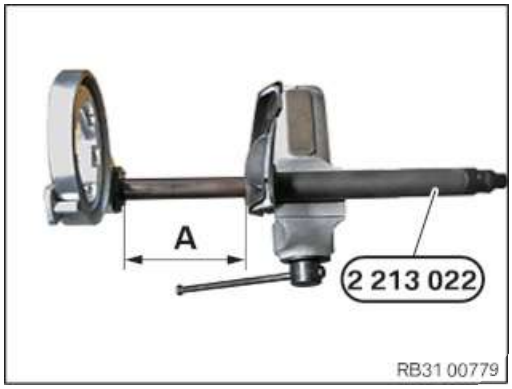


- Clamp special tool in vice.
- Set the special tools and on the special tool from the top, till the retaining bolts (1) engage tangibly and audibly.
- Check and correct the position of the special tools and and correct if required.



- Position special tool in the mounting plate.
- Position special tool on the mounting plate.

  The screw connection is made by way of bore holes **7** and **15**.
- Turn the special tool until the special tool can be screwed into the prescribed bore holes.
- Tighten screws (1) hand-tight.



- Adjust the special tool on the dimension (A).

  Dimension (A) = 150 mm to 175 mm

▸ Preparing spring tensioner (Sport and BMW M Performance Automobile)

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.



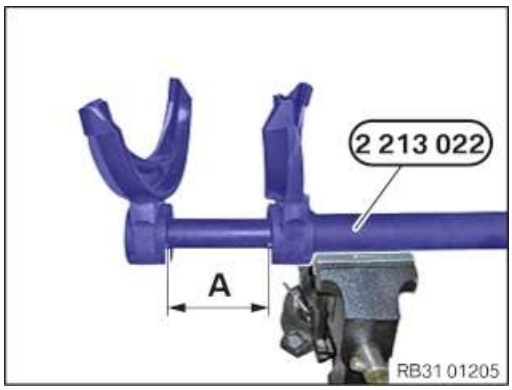
- Mount special tool 2 213 040 (31 3 364) in direction of arrow on special tool .

  Special tool must be prepared twice and used with the protective insert **without fail**.

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- Clamp the special tool in the vice.
- Place the pressure plates from the top on to the special tool until you can feel and hear the retaining bolts engage audibly.
- Check the position of the pressure plates, correct if necessary.



- Adjust the special tool to dimension (A).

  Dimension (A) = 90 mm - 95 mm

MAIN WORK

18 – Replacing the coil spring (basic version)

▸ **Tensioning the coil spring (basic version)**

WARNING

Spring preload.

Danger! Life-threatening injuries!

- Secure coil spring using special tool **2 213 022 (31 3 340)**.
- Use special tool as per owner's handbook and always observe the safety information.



- Clean coil spring to remove heavy contamination.
- Insert the suspension strut in the spring tensioner and position the strut mount (1) on the special tool in the direction of arrow.

  Strut mount (1) must lie completely on special tool .

  Bottom coil of coil spring must rest completely in the recess of special tool .

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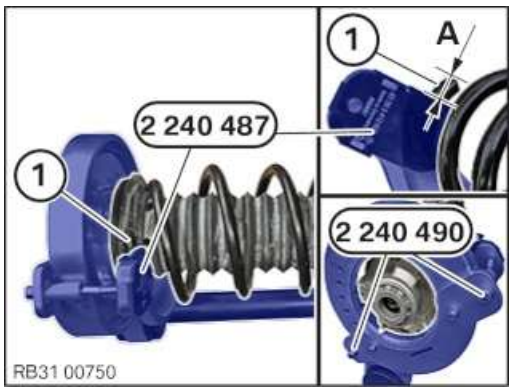
RISK OF DAMAGE

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 in direction of arrow on special tool .



- Position special tool with special tool .

  The rubberised side of special tool must lie on the top coil of the coil spring.

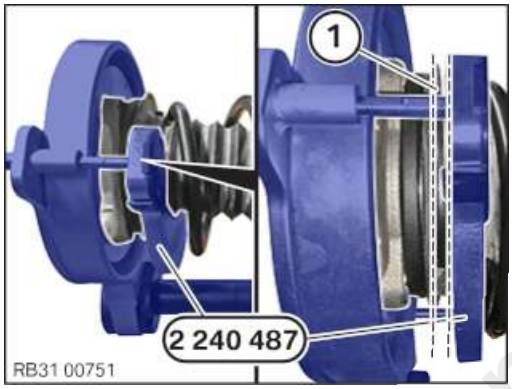
- Position the spring strut in such a way that the coil spring end (1) protrudes with the dimension (A) on the special tool .

  Dimension (A) = 40 mm

- Tighten special tool uniformly.

Special tool to pressure plate

	Tightening torque	8 Nm



- Make sure that the special tool lies parallel (1) to the upper coil of the coil spring.

  The tensioning process must be stopped immediately if the coil spring end relative to the special tool starts to twist.

- Check position of the special tool and correct if necessary.



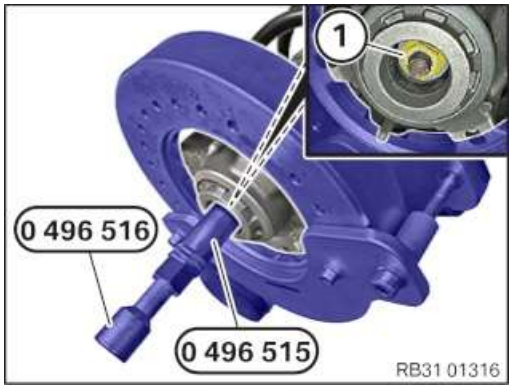
- Tension the coil spring until dimension (A) is reached at the special tool .

  Dimension (A) = 95 mm to 70 mm

  The dimension (A) **must not be undershot.**

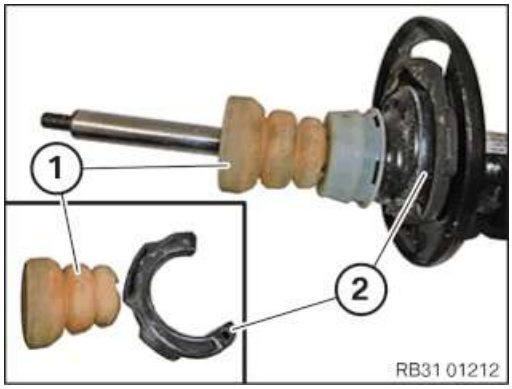
TECHNICAL INFORMATION

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



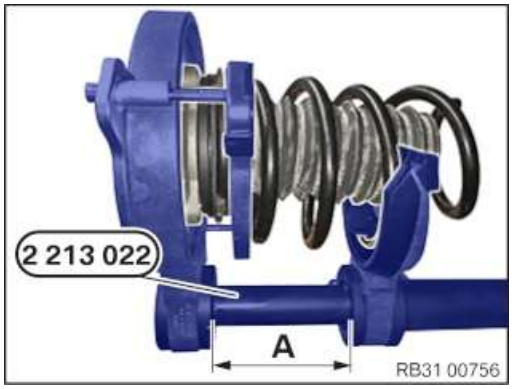
- Unscrew the nut (1) with special tools and .

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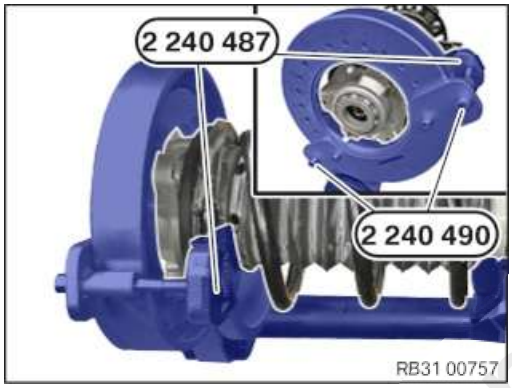
- Pull out the suspension strut including the auxiliary damper (1) and the spring pad (2) from the tensioned coil spring.

▸ Releasing the strut mount from the special tool

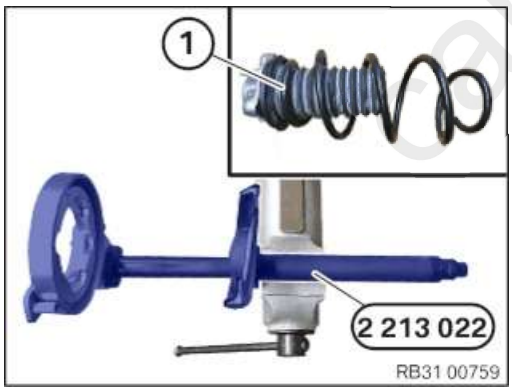


- Release the coil spring until dimension (A) on the special tool is reached.

  Dimension (A) = 190 mm - 225 mm



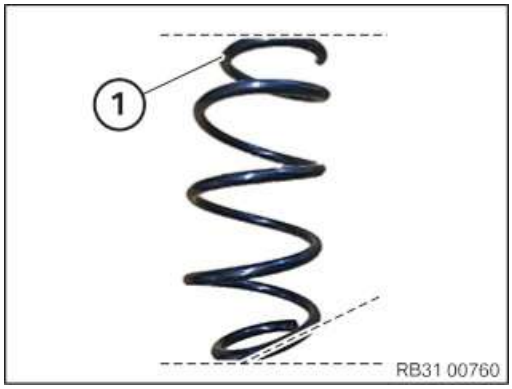
- Release the special tool .
- Remove special tool .



- Remove the spring strut support bearing from the special tool with the protective tube and the coil spring (1).
- Remove the coil spring (1) from the strut mount.

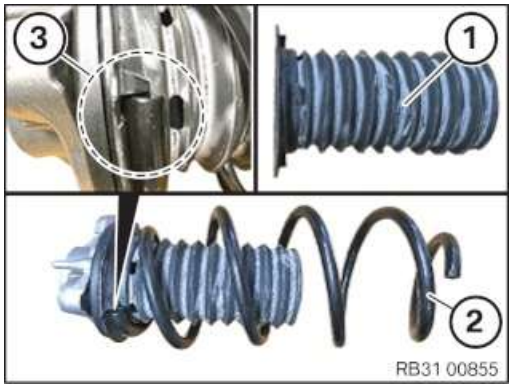
▸ Renewing the coil spring

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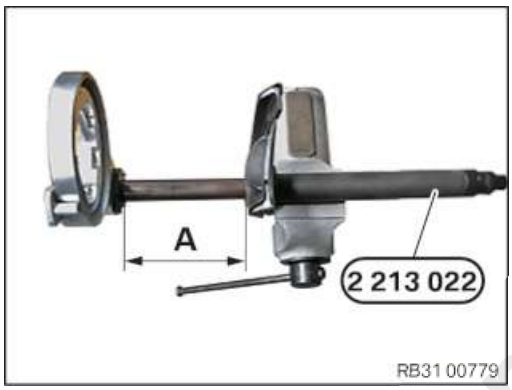
- Renew coil spring.

  Parts: Coil spring
- Position the flattened end (1) of the coil spring on the strut mount.



- Check the protective tube (1) for damage; renew if necessary.
- Position coil spring (2) on the spring pad at the top.
- Align top of the coil spring end (3) to the top of the spring pad.

▸ **Secure strut mounts on special tool**



- Adjust the special tool on the dimension (A).

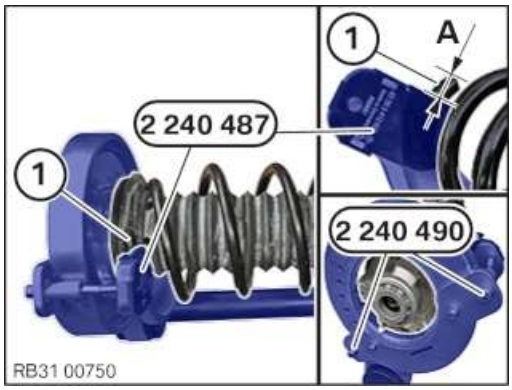
  Dimension (A) = 190 - 225



- Insert the coil spring in the spring tensioner with the protective tube and the strut mount (1) in the direction of arrow.
- Position spring strut support bearing (1) on special tool .

  Spring strut support bearing (1) must lie completely on special tool .

  Bottom coil of coil spring must rest completely in the recess of special tool .



- Position special tool with special tool .

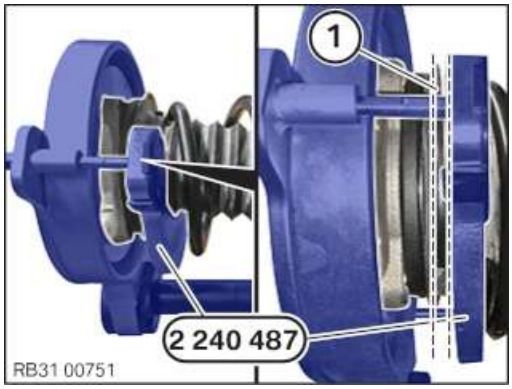
  The rubberised side of special tool must lie on the top coil of the coil spring.
- Position the coil spring in such a way that coil spring end (1) overlaps with dimension (A) on special tool .

  Dimension (A) = 40 mm
- **Ensure that the coil spring end** (1) **rests on the spring pad at the top and, if necessary, correct it.**
- Tighten special tool uniformly.

Special tool to pressure plate

	Tightening torque	8 Nm

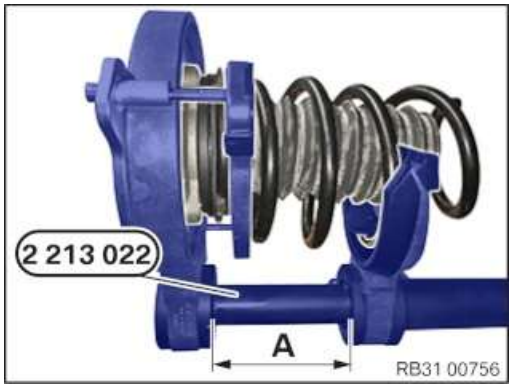
car-diagn.com



- Make sure that the special tool lies parallel (1) to the upper coil of the coil spring.

  The tensioning process must be stopped immediately if the coil spring end relative to the special tool starts to twist.

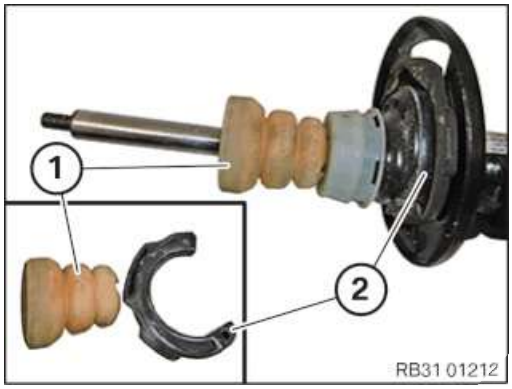
- Check position of the special tool and correct if necessary.



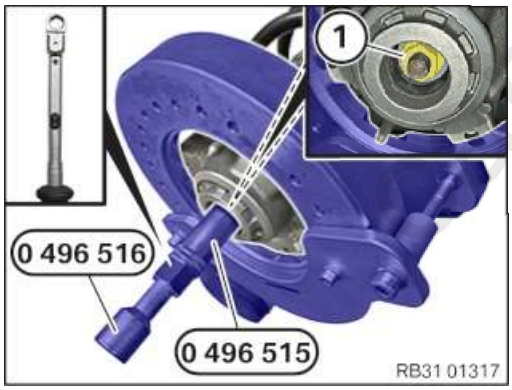
- Tension the coil spring until dimension (A) is reached at the special tool .

  Dimension (A) = 95 mm to 70 mm

  The dimension (A) **must not be undershot.**



- Check the auxiliary damper (1) and the spring pad (2) for damage, renew if necessary.
- Slide in the suspension strut with auxiliary damper (1) and the spring pad (2) into the tensioned coil spring.



TECHNICAL INFORMATION

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

- Renew nut (1).

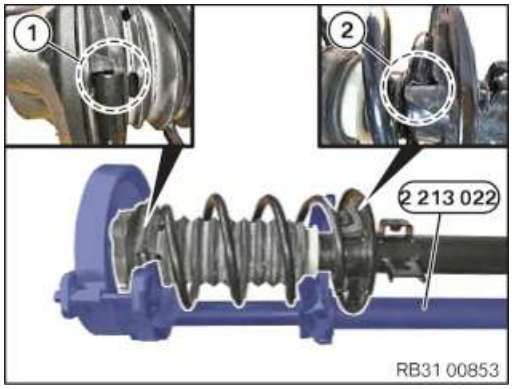
  Parts: Nut

- Tighten the nut (1) with the special tools and .

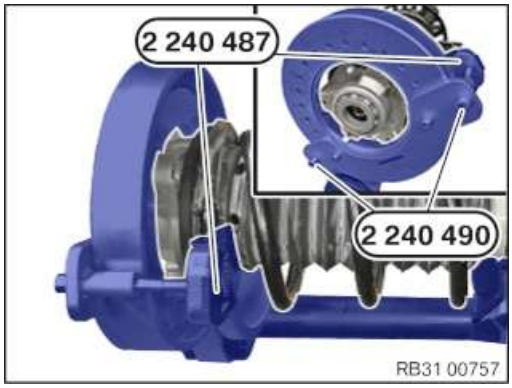
Front spring strut support bearing to spring strut

M12	Renew nut.		71 Nm

▸ **Relieve tension on coil spring**



- Align the spring strut with the spring pad to the bottom coil spring end (2).
- Release coil spring using special tool .
- Check the position on the top coil spring ends (1) and bottom coil spring end (2), correct if necessary.



- Release the special tool .
- Remove special tool .
- Remove spring strut from spring tensioner.

19 – Replacing the coil spring (Sport and BMW M Performance Automobile)

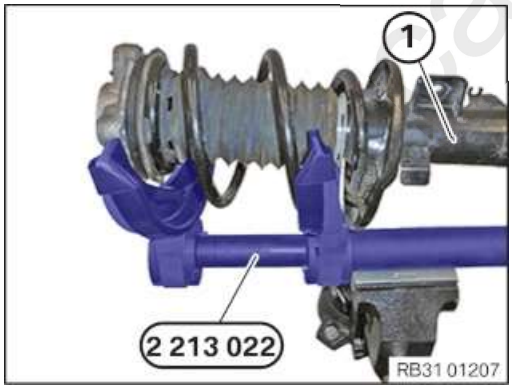
▸ **Tensioning coil spring (Sport and BMW M Performance Automobile)**

WARNING

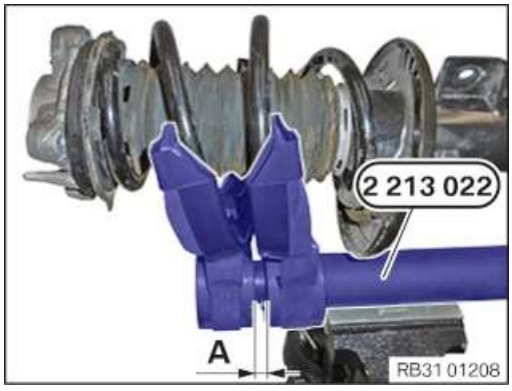
Spring preload.

Danger! Life-threatening injuries!

- Secure coil spring using special tool **2 213 022 (31 3 340)**.
- Use special tool as per owner's handbook and always observe the safety information.



- Clean coil spring to remove heavy contamination.
- Hook the spring strut (1) to the coil spring with the pressure plates.
- Make sure that the coils of the coil spring are completely placed in the slots of the pressure plates.



TECHNICAL INFORMATION

Different variants may be installed depending on the vehicle equipment.

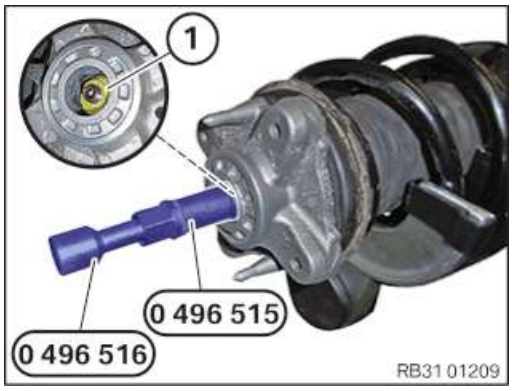
- Tension the coil spring until the dimension (A) is reached at the special tool .

  Dimension (A) **=** 10 mm

  The dimension (A) **must not be undershot.**

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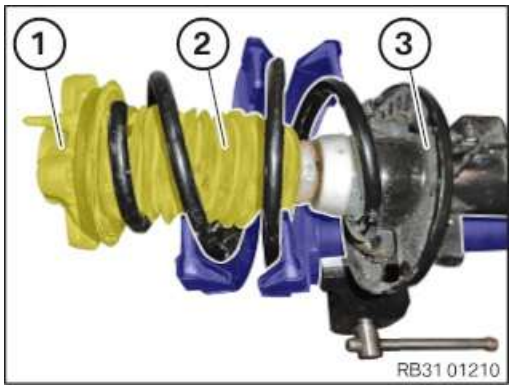
▸ **Remove the spring strut support bearing**



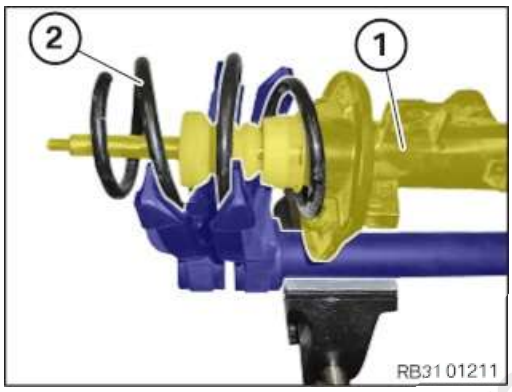
TECHNICAL INFORMATION

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

- Release the nut (1) at the spring strut support bearing with the special tools and .

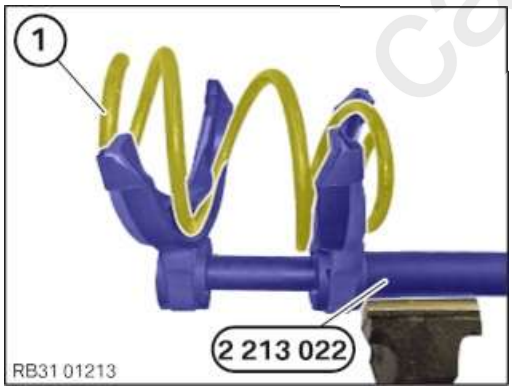


- Pull the spring strut support bearing (1) with the protective tube (2) from the spring strut (3) and remove it.



- Remove the spring strut (1) with the spring pad and the auxiliary damper from the tensioned coil spring (2).

▸ **Renewing the coil spring**



- Slacken the special tool and remove the coil spring (1).

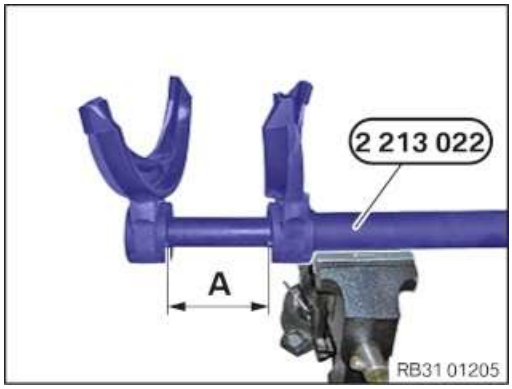


- Renew coil spring.

  Parts: Coil spring

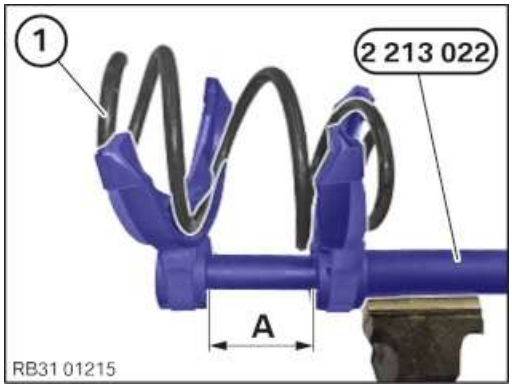
  The lower coil spring end is marked with the label (1).

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- Adjust the special tool on the dimension (A).

  Dimension (A) = 115 mm

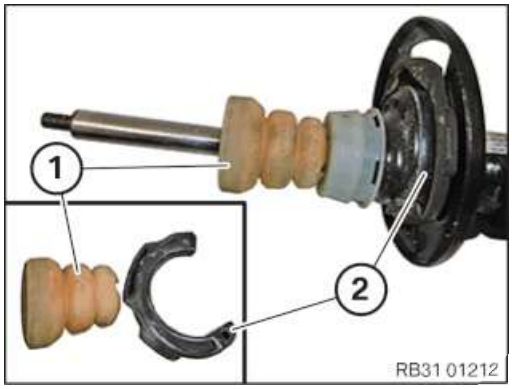


- Mount the coil spring (1) with the pressure plates.

  The coils of the coil springs must be completely inserted in the recesses of the pressure plates.
- Tension the coil spring (1) until the dimension (A) is reached at the special tool .

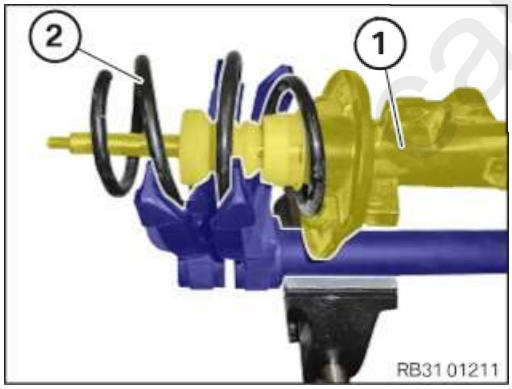
  Dimension (A) **=** 10 mm

  The dimension (A) must **not** be undershot.



- Check the auxiliary damper (1) and the spring pad (2) for damage, renew if necessary.

▸ **Installing the spring strut support bearing**

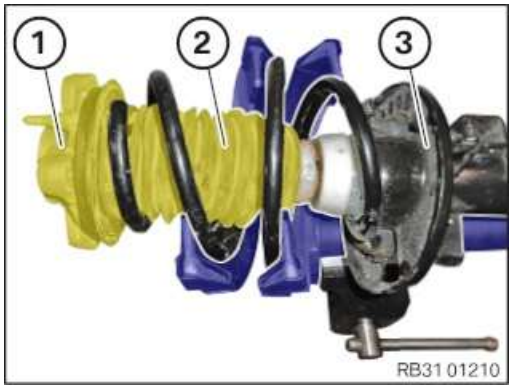


- Slide suspension strut (1) with the spring pad and auxiliary damper into tensioned coil spring (2).

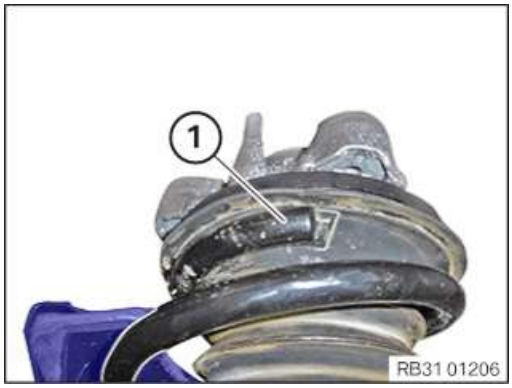


- Align the suspension strut with the spring pad (1) to the bottom coil spring end (2) up to the limit position.

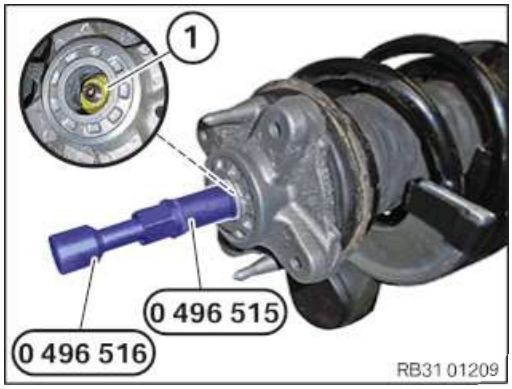
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- Check the strut mount (1) and the protective tube (2) for damage, renew if necessary.
- Slide the strut mount (1) with the protective tube (2) on to the piston rod of the suspension strut (3).



- Align the strut mount with the protective tube for the top coil spring end (1) up to the limit position.



TECHNICAL INFORMATION

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

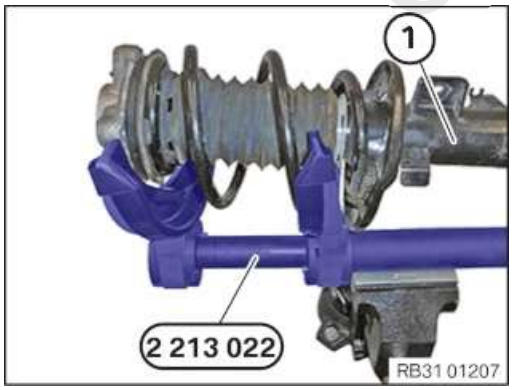
- Renew nut (1).

  Parts: Nut
- Tighten the nut (1) at the spring strut support bearing with the special tools and .

Front spring strut support bearing to spring strut

M12	Renew nut.		71 Nm

▸ **Relieve tension on coil spring**

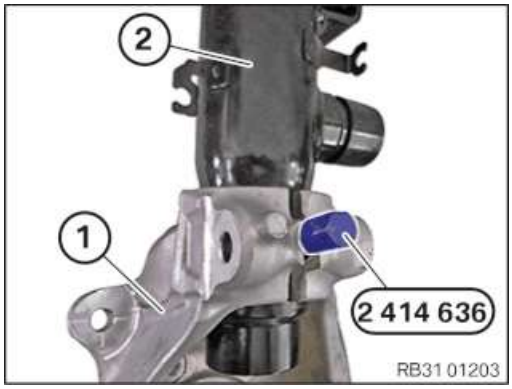


- Release the coil spring with the special tool .
- Make sure that the coil spring ends lie at the top and bottom on the spring pads (correct position if necessary).
- Remove the spring strut (1) from the special tool .

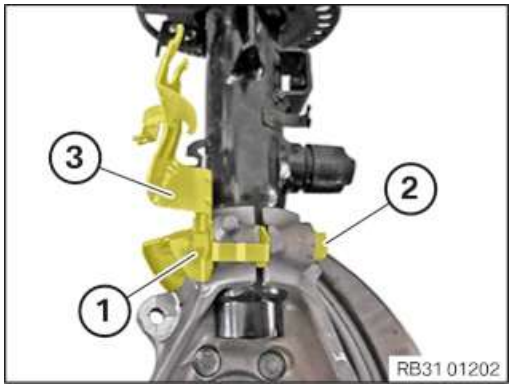
POSTPROCESSES

20 – Fastening the spring strut on to the swivel bearing

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- Spread the swivel bearing (1) with the special tool .
- Align the positioning pin on to the spring strut (2) correctly with the gap on the swivel bearing (1).
- Slide in the spring strut (2) up to the limit position in the swivel bearing (1).
- Remove the special tool .



- Position the bracket (3) on the swivel bearing.
- Renew screw (2) and nut (1).

  Parts: Bolt, nut
- Insert screw (2) and guide nut (1).
- Tighten down screw (2).

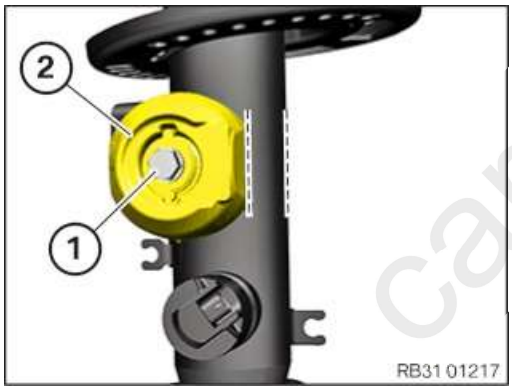
Spring strut shock absorber to swivel bearing

M10	Renew screw and nut. Tightening via screw.	Tightening torque Angle of rotation	60 Nm 180 °

21 – Installing an absorber weight on the spring strut

NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.



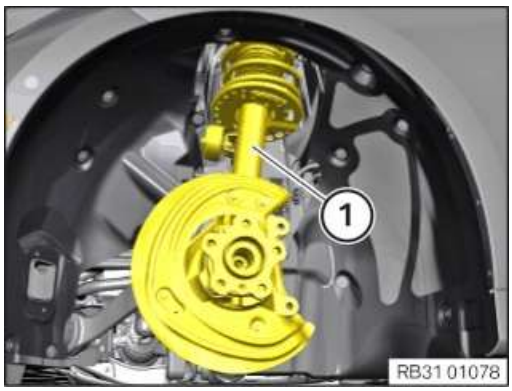
- Position the absorber weight (2) with the flattened side parallel to the spring strut.
- Renew the screw (1).

  Parts: Screw
- Tighten down screw (1).

Absorber weight to spring strut

M8	Renew screw.	Tightening torque Angle of rotation	28 Nm 90 °

22 – Installing the spring strut



- Position the spring strut (1) with the swivel bearing in the wheel arch.

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- Ensure correct positioning of journal (1) of support bearing on the spring strut dome.



- Renew screws (1).

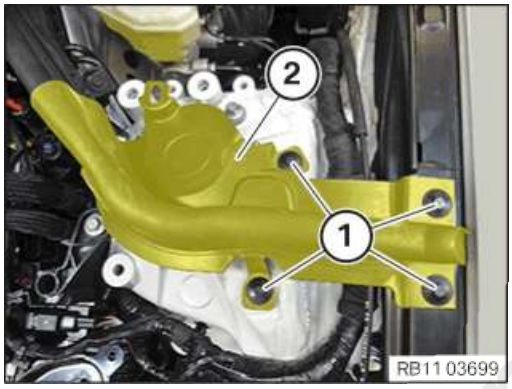
  Parts: Screws

- Tighten the screws (1).

Nut and locknut/self-locking nut

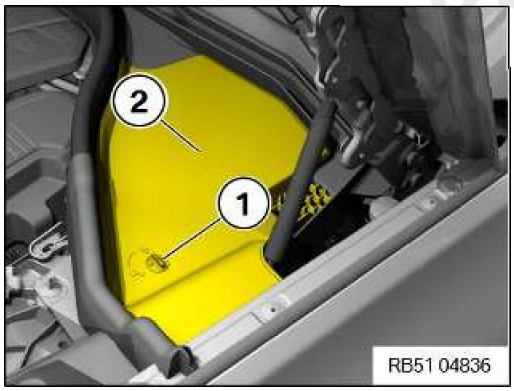
M8	Renew screws.	Tightening torque	28 Nm
		Angle of rotation	90 °

23 – Install the side bonnet seal



- Position the side bonnet seal (2) on the spring strut dome.
- Secure the rivet (1).

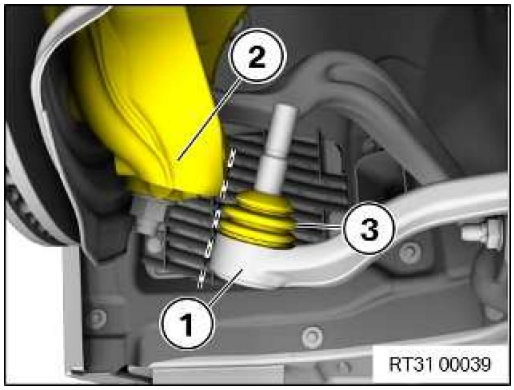
24 – Install the cover of the engine compartment on the rear left



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

25 – Mounting the wishbone on the swivel bearing

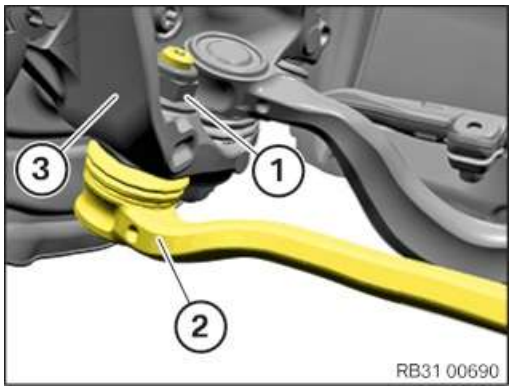
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TECHNICAL INFORMATION

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

- Make sure that the rubber grommet (3) on bottom 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.

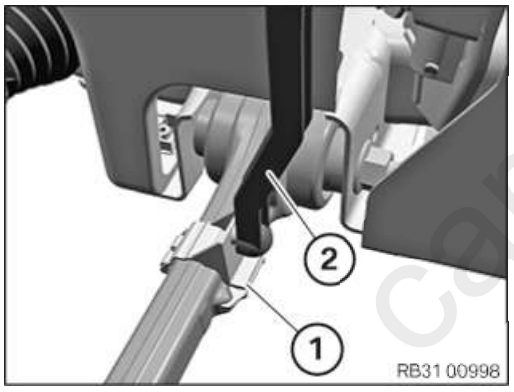
Wishbone to swivel bearing

M14	Renew nut.	Tightening torque	175 Nm

26 – Attach the ride height sensor on the bottom wishbone

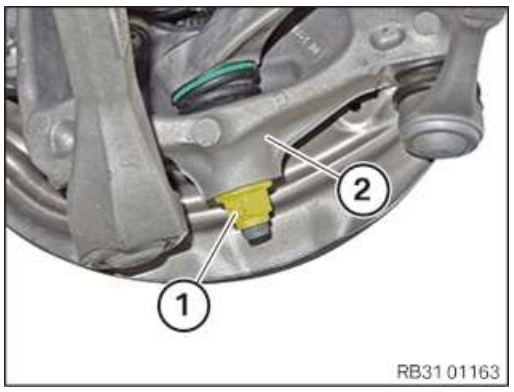
NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.



- Position and lock the holder (1) of the attachment rod (2) of the ride height sensor on the lower control arm.

27 – Securing tension strut on swivel bearing



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

  Parts: Nut
- Tighten nut (1).

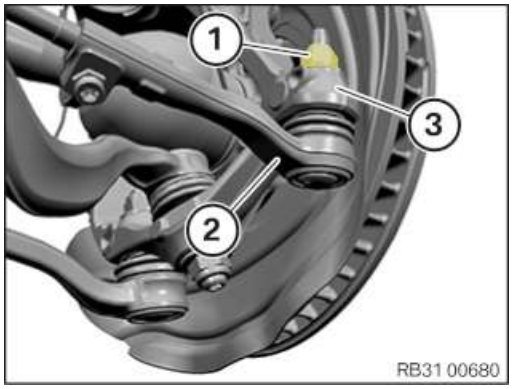
Note: Use the Torx socket for counter support.

Tension strut to swivel bearing

M14	Renew nut.	Tightening torque	175 Nm

28 – Securing the track rod on the swivel bearing

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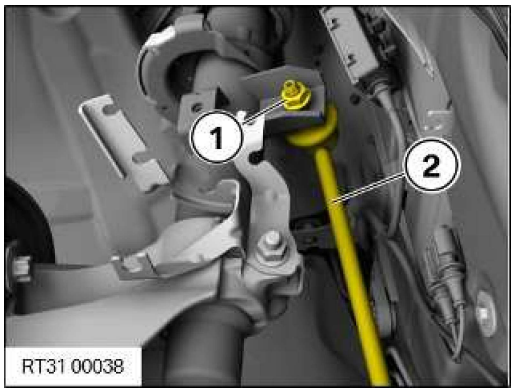
- Position the track rod (2) on the swivel bearing (3).
- Renew nut (1).

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

Track rod end to swivel bearing

M14	Renew nut.	Tightening torque	165 Nm

29 – Securing the anti-roll bar link on the spring strut



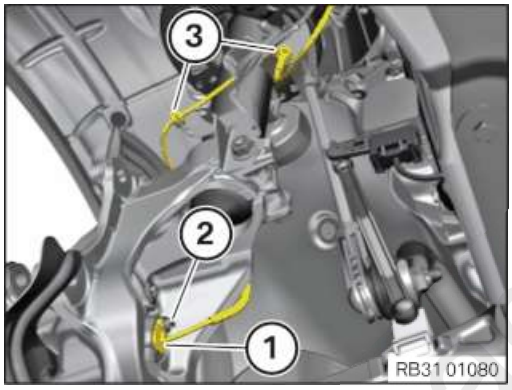
- Position the anti-roll bar link (2) at the spring strut.
- Renew nut (1).

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

Front anti-roll bar link to anti-roll bar/spring strut

M10	Renew nut.	Tightening torque	56 Nm

30 – Installing the front wheel speed sensor partially



- Position the wheel speed sensor on the spring strut.
- Mount the cable of wheel speed sensor on the holders(3).
- Position the wheel speed sensor (1) on the swivel bearing.
- Renew the screw (2).

  Parts: Screw
- Tighten down screw (2).

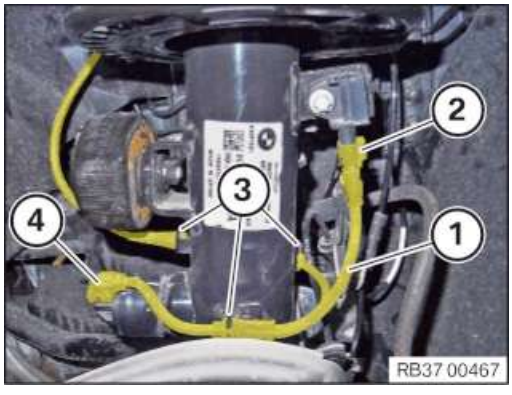
Wheel speed sensor to swivel bearing

M6	Renew screw.	Tightening torque	12 Nm

31 – Connecting the cable of the vertical dynamic platform (VDP) to the spring strut

NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.



- Position the cable (1) and fasten on the holders (3).
- Connect and lock the connector (4) to the spring strut.
- Connect and lock the connector (2) on the vertical acceleration sensor.

32 – Install front brake disc

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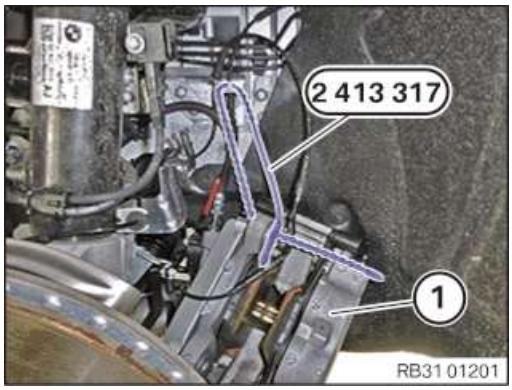
- Position brake disc (2) on wheel hub.
- Renew the screw (1).

  Parts: Screw
- Position and tighten the screw (1).

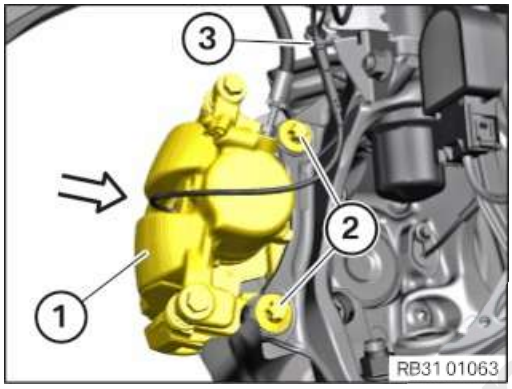
Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

33 – Fasten the front brake caliper



- Release the special tool 2 413 317 from the brake caliper (1) and remove.
- The brake caliper (1) must not suspend at the brake hose.



- Position the brake caliper (1) in direction of arrow on the swivel bearing.
- Renew screws (2).

  Parts: Screws
- Tighten the screws (2).

Brake caliper / caliper carrier at front swivel bearing

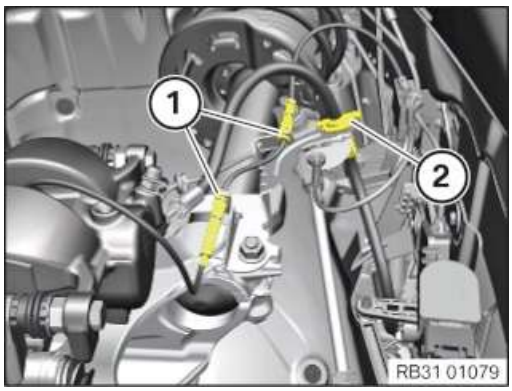
M12	Renew screw.	Tightening torque	110 Nm

NOTICE

Perform this step on the left side only.

- Fasten the cable of the brake pad wear sensor to the holder (3).

34 – Attaching the front brake hose



- Hook the brake hose to the holder (2).

NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Hook the cable for the brake pad wear sensor to the holders (1).

35 – Attaching the front left wheel

▸ **Mounting the wheel**

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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.

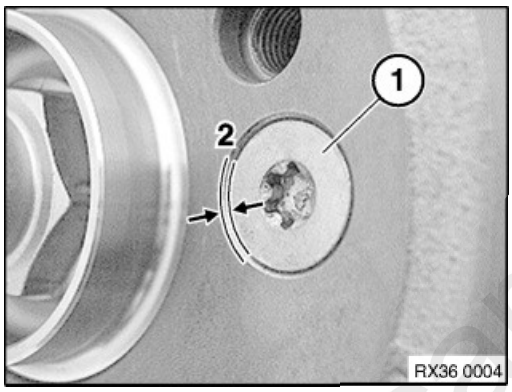
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  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 residue in the area of the wheel bolt holes, remove and clean the brake disc.



- 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 that the mounting bolt (1) for the brake disc is securely seated.

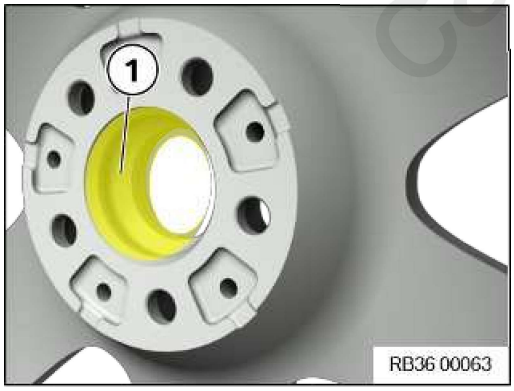
  The mounting bolt (1) for the brake disc **may not** protrude on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm



TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

- Thinly grease the wheel centring (1) in the wheel rim.

Expendable materials

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

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TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

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

Expendable materials

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

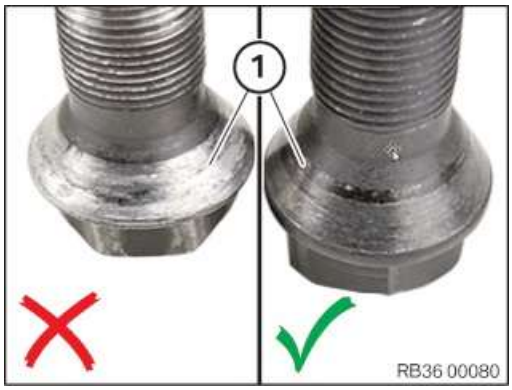
A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

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

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

Check

- **Check wheel bolts for wear.**



Result

» Places (> 30%) of the bearing surfaces (1) of the taper on the screw head show a silver wear.

Measure

- Replace wheel bolts.

  Parts: Wheel bolts



TECHNICAL INFORMATION

Never use impact screwdrivers or electric screwdrivers to screw in and tighten the wheel bolts.

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

- Renew the corroded wheel bolts (arrows).

  Parts: Wheel bolts
- Clean the wheel bolts (arrows).
- Check the wheel bolts (arrows) and threads for damage, renew the wheel bolts (arrows) if necessary.
- Join and tighten the wheel bolts (arrows).

Wheel bolts

M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim.	Tightening torque	140 Nm
	Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.	Check	140 Nm
	Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.		

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Additional Information

Overview of Tightening Torques

Special tool to pressure plate — Used in step 18

	Tightening torque	8 Nm

Front spring strut support bearing to spring strut — Used in step 1819

M12	Renew nut.		71 Nm

Spring strut shock absorber to swivel bearing — Used in step 20

M10	Renew screw and nut. Tightening via screw.	Tightening torque Angle of rotation	60 Nm 180 °

Absorber weight to spring strut — Used in step 21

M8	Renew screw.	Tightening torque Angle of rotation	28 Nm 90 °

Nut and locknut/self-locking nut			Used in step 22
M8	Renew screws.	Tightening torque	28 Nm
		Angle of rotation	90 °

Wishbone to swivel bearing			Used in step 25
M14	Renew nut.	Tightening torque	175 Nm

Tension strut to swivel bearing			Used in step 27
M14	Renew nut.	Tightening torque	175 Nm

Track rod end to swivel bearing			Used in step 28
M14	Renew nut.	Tightening torque	165 Nm

Front anti-roll bar link to anti-roll bar/spring strut			Used in step 29
M10	Renew nut.	Tightening torque	56 Nm

Wheel speed sensor to swivel bearing			Used in step 30
M6	Renew screw.	Tightening torque	12 Nm

Brake disc to front wheel hub			Used in step 3235
M8	Renew screw.	Tightening torque	16 Nm

Brake caliper / caliper carrier at front swivel bearing			Used in step 33
M12	Renew screw.	Tightening torque	110 Nm

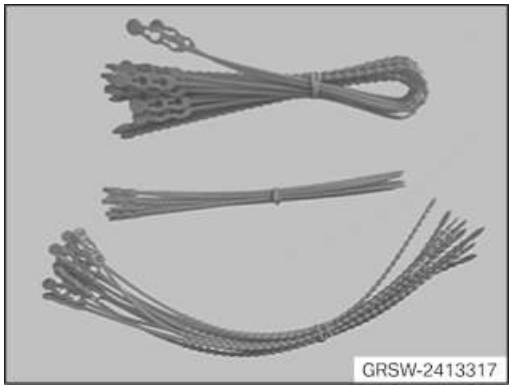
Brake disc to rear wheel hub			Used in step 35
M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts			Used in step 35
M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim. Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.	Tightening torque Check	140 Nm 140 Nm

Overview of Special Tools

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2 413 317 Cable strap



Common	Used in step 333
Usage	The "Cable ties" parts set consists of 3 items as follows: ABV232 Length: 320 mm colour: RedABV250 Length: 500 mm colour: RedABVS270 Length: 665 mm colour: Red
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	01 47 15 (332)

2 213 040 (31 3 364) Insert



Common	Used in step 17
Usage	Protective insert As of 08/2011, replaces the previous special tool number 31 3 364, see SI 01 16 11 (738). Protective insert suitable for clamping plate 31 3 382 = 83 30 2 213 039.
Included in the tool or work	
Storage location	Individual
Replaced by	
In connection with	
SI-Number	01 16 11 (738)

2 344 011 Tool



Common	Used in step 35
Usage	Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	08 08 12 (872)

Replacement tools:

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0 495 221 (36 1 323) Wheel stud



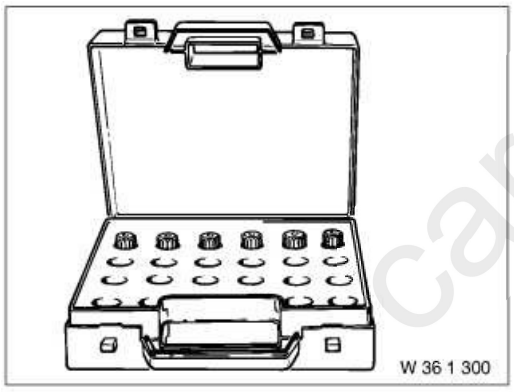
Common	Used in step 1
Usage	(Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 224 (36 1 326) Wheel stud



Common	Used in step 1
Usage	(Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 225 (36 1 327) Wheel stud



Common	Used in step 1
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 226 (36 1 328) Wheel stud



Common	Used in step 1
Usage	(Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 495 227 (36 1 329) Wheel stud



Common	Used in step 1
Usage	(Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 228 (36 1 331) Wheel stud



Common	Used in step 1
Usage	(Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 229 (36 1 332) Wheel stud



Common	Used in step 1
Usage	(Code 38) With centring bore available separately (see EPC) under 36 13 6 762 343
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 230 (36 1 333) Wheel stud



Common	Used in step 1
Usage	(Code 40) With centring bore available separately (see EPC) under 36 13 6 762 344
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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Links

Repair instructions	Used in step
00 02 001 Raising the vehicle using a vehicle lift	135

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31 33 001 Replacing front left or right spring strut support bearing

WARNING

Spring preload.

Danger! Life-threatening injuries!

- Secure coil spring using special tool **2 213 022 (31 3 340)**.
- Use special tool as per owner's handbook and always observe the safety information.

CAUTION

Spring preload.

Danger of injury!

- The use of the specified special tool (tool) is mandatory.
- The described operation must be carried out properly.

NOTICE

Description is for left component only. Procedure on the right side is identical.

PRELIMINARY WORK

1 – Removing the front left wheel

▸ **Removing the wheel**



TECHNICAL INFORMATION

A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to remove the wheel.**

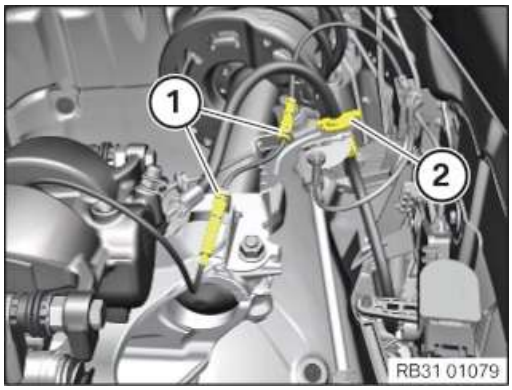
  This process is intended to prevent damage to the brake disc.

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- If several wheels are removed at the same time: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Release the wheel bolts (arrows) crosswise and remove the wheel.
- To release and tighten wheel bolts with a security code: Use the correct adapter from the set of special tools .

2 – Detaching the front brake hose



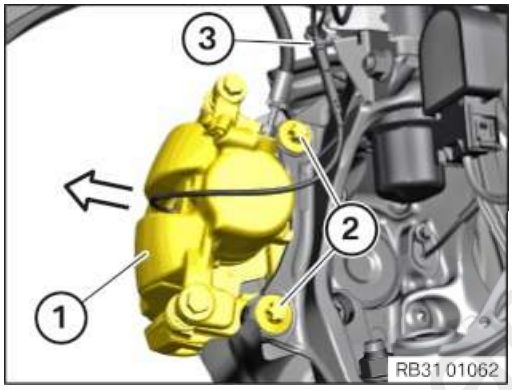
- Detach the brake hose from the holder (2).

NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

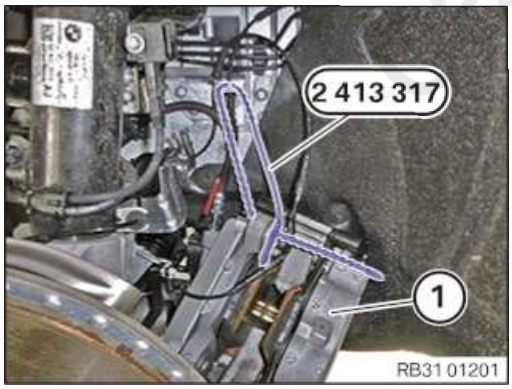
- Detach the cable for the brake pad wear sensor from the holders (1).

3 – Detach the front brake caliper



- Release the cable of the brake pad wear sensor from the holder (3).
- Loosen screws (2).
- Remove brake caliper (1) in direction of arrow.

  The brake caliper (1) must not hang on the brake hose.



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

4 – Remove front brake disc



TECHNICAL INFORMATION

Note the following for the removal of the brake disc:

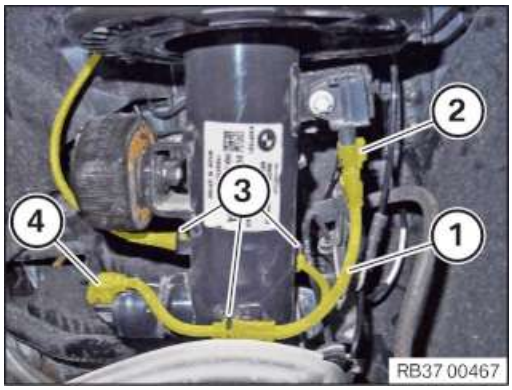
Do not strike the friction ring with a tool under any circumstance (for example, hammer). If required, **carefully** tap with a rubber mallet against the brake disc chamber.

- Loosen screw (1).
- Remove brake disc (2).

5 – Disconnecting the cable of the vertical dynamic platform (VDP) from the spring strut

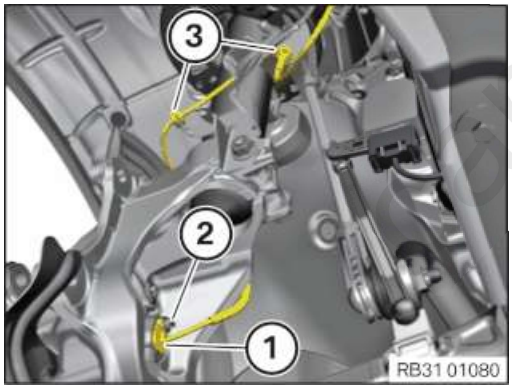
NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.



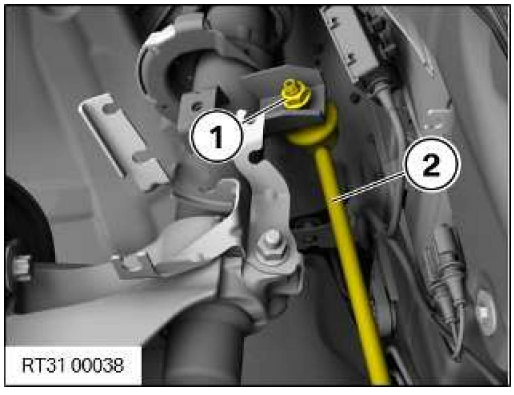
- Unlock and disconnect the plug connection (2) on the vertical acceleration sensor.
- Unlock and disconnect the plug connection (4) on the spring strut.
- Release the cable (1) from the holders (3).

6 – Partially removing the front wheel speed sensor



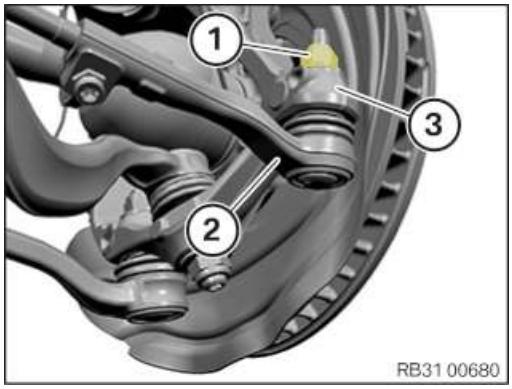
- Loosen screw (2).
- Release the wheel speed sensor (1) from the swivel bearing.
- Detach the wheel speed sensor cable from the brackets (3).
- Remove wheel speed sensor from spring strut.

7 – Releasing the anti-roll bar link from the spring strut



- Loosen the nut (1), if necessary, counter-hold the Torx socket.
- Release the anti-roll bar link (2) from the spring strut.

8 – Loosening the track rod from the swivel bearing

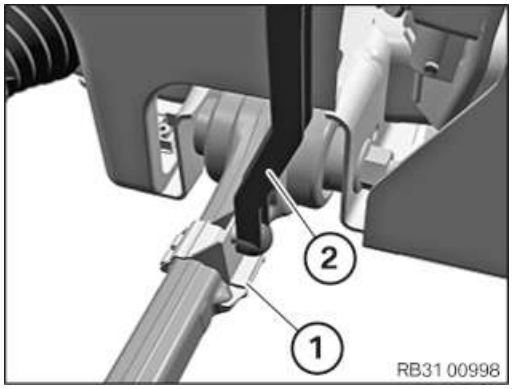


- Release nut (1). If necessary, counter support at the Torx socket.
- Detach the track rod (2) from the swivel bearing (3).

9 – Release the ride height sensor from the lower control arm

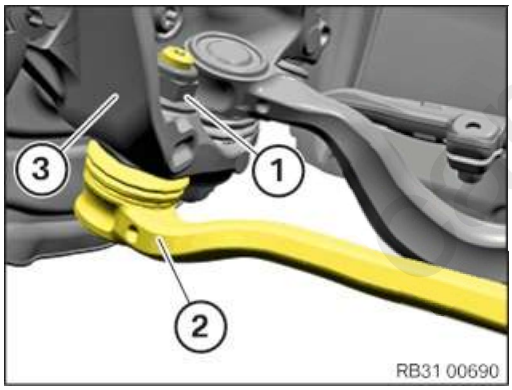
NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

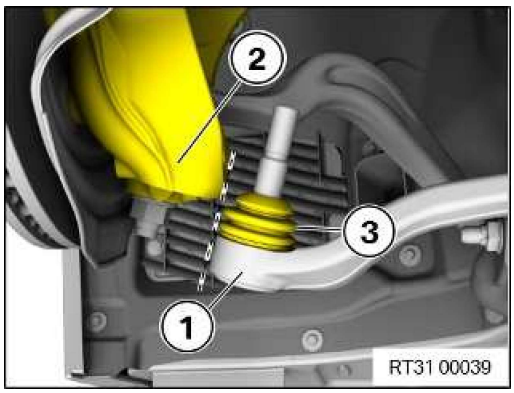


- Unlock holder (1) of attachment rod (2) of ride height sensor and release from lower control arm.

10 – Releasing the wishbone from the swivel bearing



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



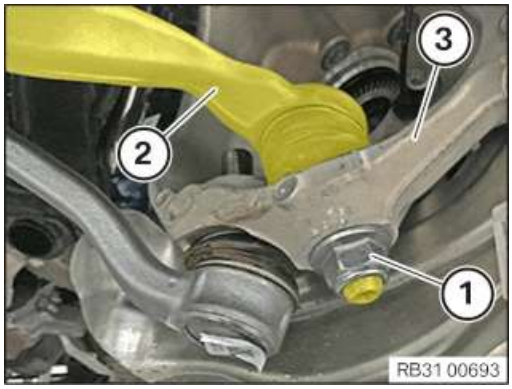
TECHNICAL INFORMATION

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

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

11 – Releasing the tension strut from the swivel bearing

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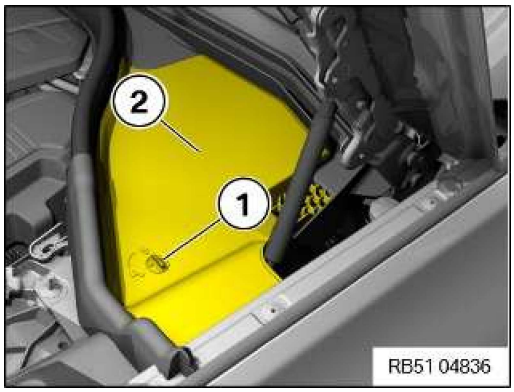


- Unfasten nut (1).

Note: Use the Torx socket for counter support.

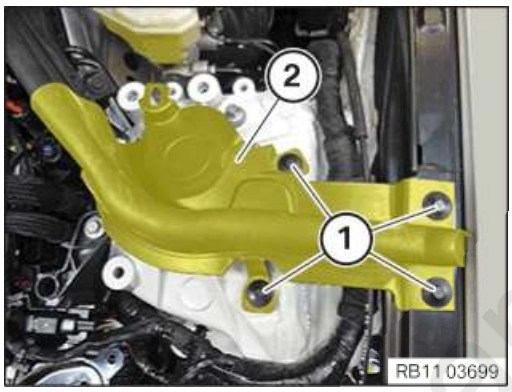
- Release the tension strut (2) from the swivel bearing (3).

12 – Remove the cover of the engine compartment at the rear left



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

13 – Removing side bonnet seal



- Loosen the rivet (1).
- Release and remove side bonnet seal (2) from spring strut dome.

14 – Remove spring strut

TECHNICAL INFORMATION

Secure component against falling.



- Loosen screws (1).

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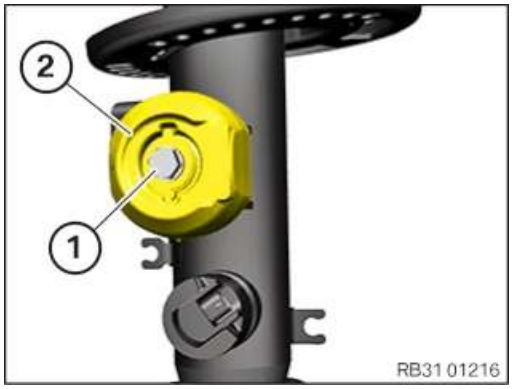


- Remove the spring strut (1) with the swivel bearing.

15 – Removing the absorber weight from suspension strut

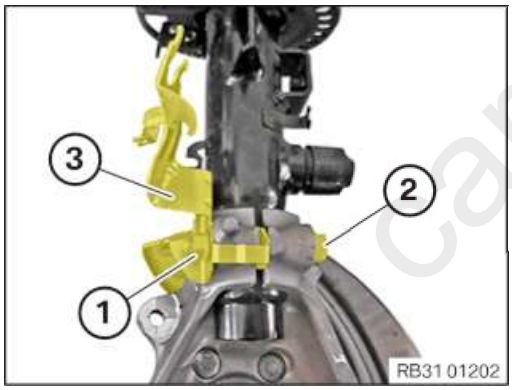
NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.



- Loosen screw (1).
- Remove absorber weight (2).

16 – Releasing the spring strut from the swivel bearing



- Unfasten nut (1).
- Pull out bolt (2).
- Remove the holder (3).



- Spread the swivel bearing (1) with the special tool .
- Pull out the spring strut (2) from the swivel bearing (1).

17 – Prepare the spring tensioner

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TECHNICAL INFORMATION

Different variants may be installed depending on the vehicle equipment.



- **Basic version:**

  Ensure that the coil spring is tensioned with the special tool and a pressure plate (1).



- **Sport and BMW M Performance Automobile version:**

  Ensure that the coil spring is tensioned with two pressure plates (1).

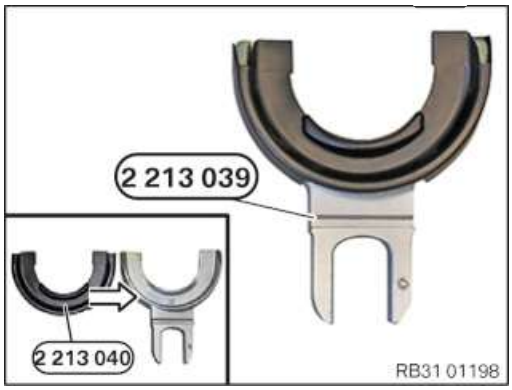
▸ **Preparing the spring tensioner (basic version)**

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 2 213 040 (31 3 364) in direction of arrow on special tool .

  Special tool must be used **without fail** with the protective insert!

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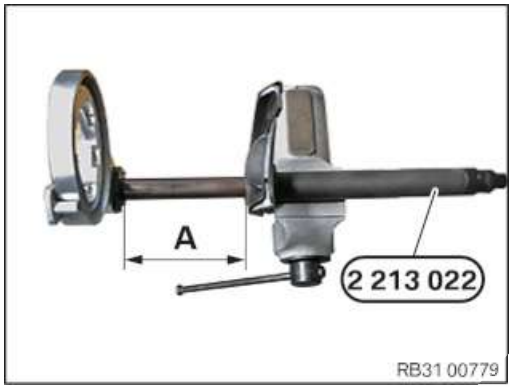


- Clamp special tool in vice.
- Set the special tools and on the special tool from the top, till the retaining bolts (1) engage tangibly and audibly.
- Check and correct the position of the special tools and and correct if required.



- Position special tool in the mounting plate.
- Position special tool on the mounting plate.

  The screw connection is made by way of bore holes **7** and **15**.
- Turn the special tool until the special tool can be screwed into the prescribed bore holes.
- Tighten screws (1) hand-tight.



- Adjust the special tool on the dimension (A).

  Dimension (A) = 150 mm to 175 mm

▸ Preparing spring tensioner (Sport and BMW M Performance Automobile)

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.



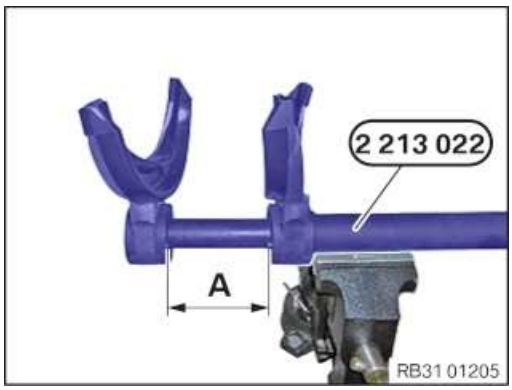
- Mount special tool 2 213 040 (31 3 364) in direction of arrow on special tool .

  Special tool must be prepared twice and used with the protective insert **without fail**.

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- Clamp the special tool in the vice.
- Place the pressure plates from the top on to the special tool until you can feel and hear the retaining bolts engage audibly.
- Check the position of the pressure plates, correct if necessary.



- Adjust the special tool to dimension (A).

  Dimension (A) = 90 mm - 95 mm

MAIN WORK

18 – Replacing the strut mount (basic version)

▸ **Tensioning the coil spring (basic version)**

WARNING

Spring preload.

Danger! Life-threatening injuries!

- Secure coil spring using special tool **2 213 022 (31 3 340)**.
- Use special tool as per owner's handbook and always observe the safety information.



- Clean coil spring to remove heavy contamination.
- Insert the suspension strut in the spring tensioner and position the strut mount (1) on the special tool in the direction of arrow.

  Strut mount (1) must lie completely on special tool .

  Bottom coil of coil spring must rest completely in the recess of special tool .

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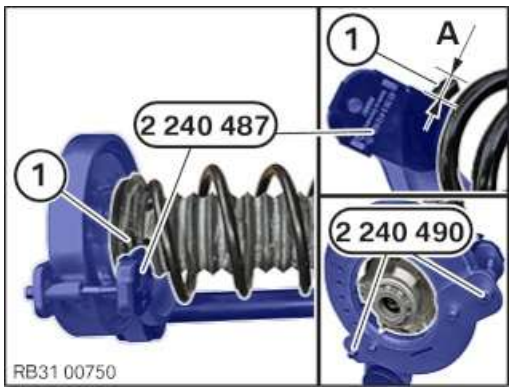
RISK OF DAMAGE

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 in direction of arrow on special tool .



- Position special tool with special tool .

  The rubberised side of special tool must lie on the top coil of the coil spring.

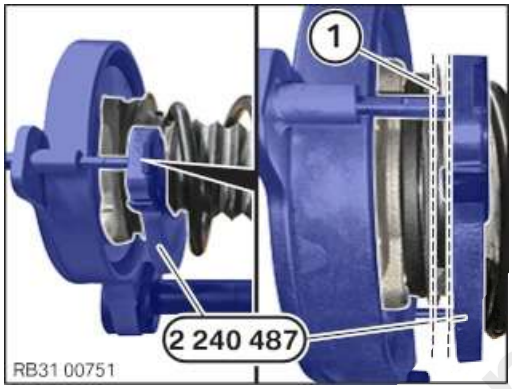
- Position the spring strut in such a way that the coil spring end (1) protrudes with the dimension (A) on the special tool .

  Dimension (A) = 40 mm

- Tighten special tool uniformly.

Special tool to pressure plate

	Tightening torque	8 Nm



- Make sure that the special tool lies parallel (1) to the upper coil of the coil spring.

  The tensioning process must be stopped immediately if the coil spring end relative to the special tool starts to twist.

- Check position of the special tool and correct if necessary.



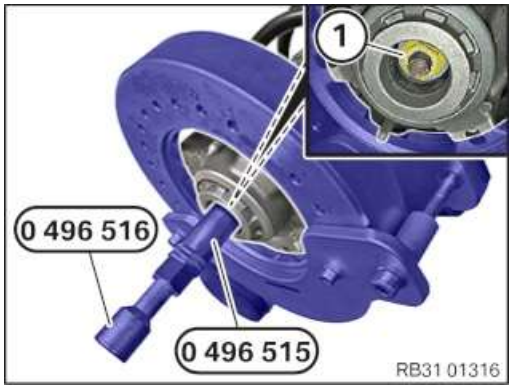
- Tension the coil spring until dimension (A) is reached at the special tool .

  Dimension (A) = 95 mm to 70 mm

  The dimension (A) **must not be undershot.**

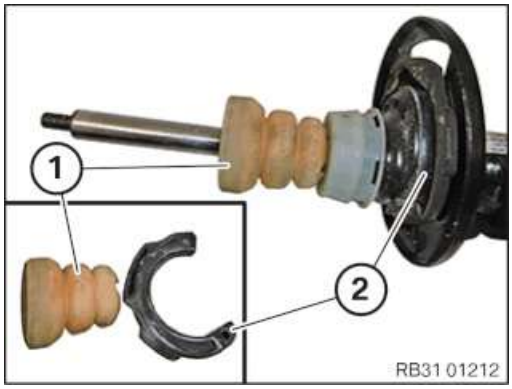
TECHNICAL INFORMATION

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



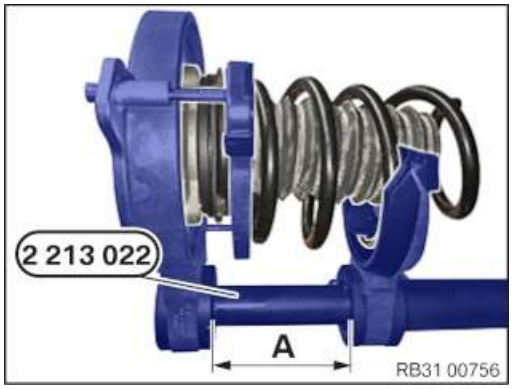
- Unscrew the nut (1) with special tools and .

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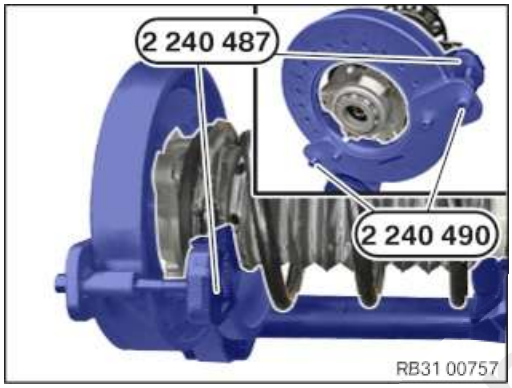
- Pull out the suspension strut including the auxiliary damper (1) and the spring pad (2) from the tensioned coil spring.

▸ **Releasing the strut mount from the special tool**

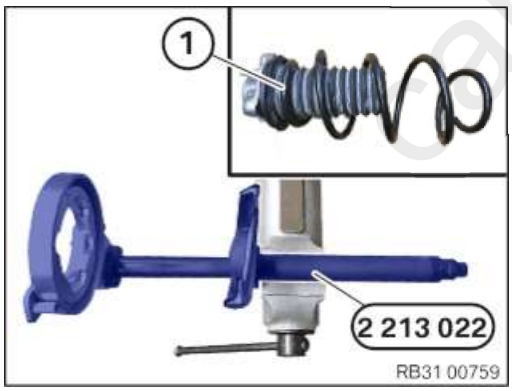


- Release the coil spring until dimension (A) on the special tool is reached.

  Dimension (A) = 190 mm - 225 mm



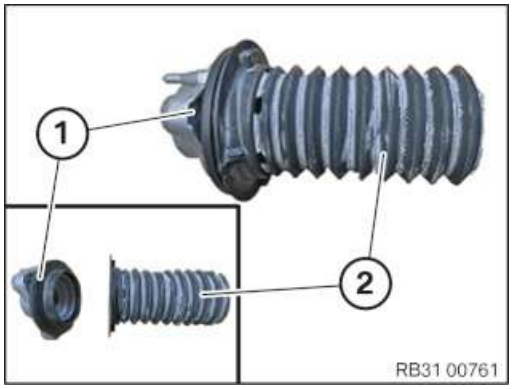
- Release the special tool .
- Remove special tool .



- Remove the spring strut support bearing from the special tool with the protective tube and the coil spring (1).
- Remove the coil spring (1) from the strut mount.

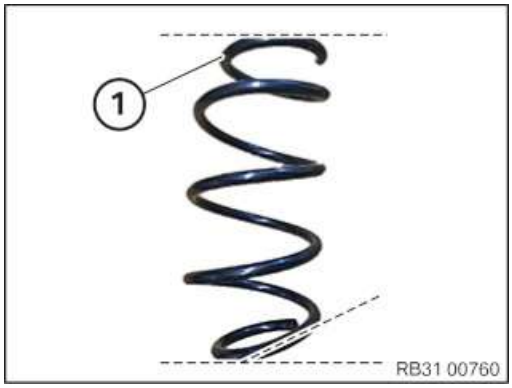
▸ **Replacing spring strut support bearing**

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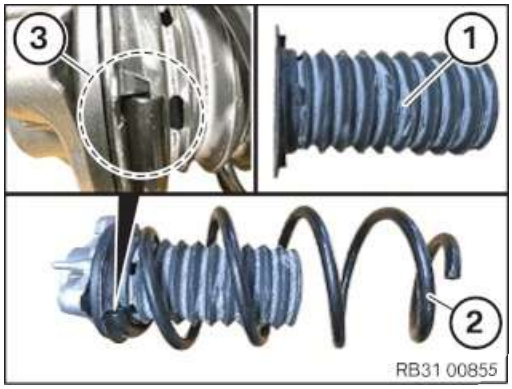


- Pull down and remove spring strut support bearing (1) from the protective tube (2).
- Renew spring strut support bearing (1).

  Parts: Spring strut support bearing



- Position the flattened end (1) of the coil spring on the strut mount.



- Check protective tube (1) and renew if necessary.
- Slide the protective tube (1) onto the strut mount.
- Position coil spring (2) on the spring pad at the top.
- Align top of the coil spring end (3) to the top of the spring pad.

▸ **Secure strut mounts on special tool**



- Adjust the special tool on the dimension (A).

  Dimension (A) = 190 - 225

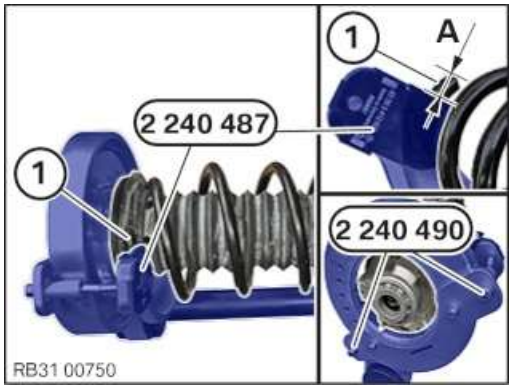


- Insert the coil spring in the spring tensioner with the protective tube and the strut mount (1) in the direction of arrow.
- Position spring strut support bearing (1) on special tool .

  Spring strut support bearing (1) must lie completely on special tool .

  Bottom coil of coil spring must rest completely in the recess of special tool .

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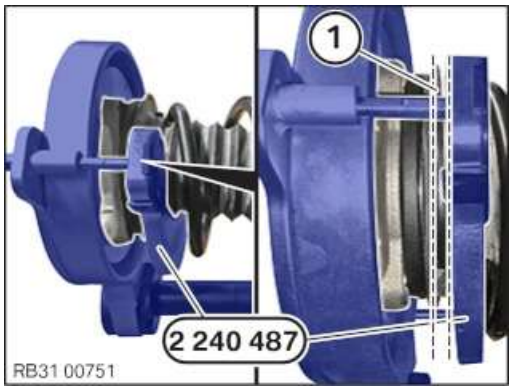
- Position special tool with special tool .

  The rubberised side of special tool must lie on the top coil of the coil spring.
- Position the coil spring in such a way that coil spring end (1) overlaps with dimension (A) on special tool .

  Dimension (A) = 40 mm
- **Ensure that the coil spring end** (1) **rests on the spring pad at the top and, if necessary, correct it.**
- Tighten special tool uniformly.

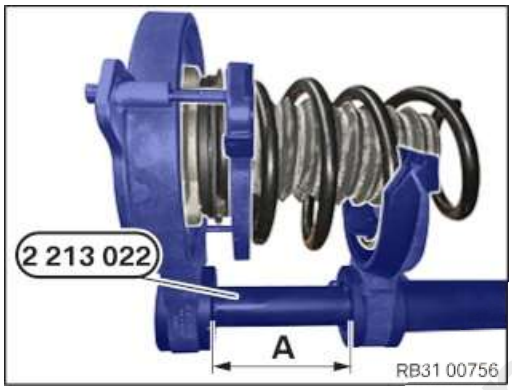
Special tool to pressure plate

	Tightening torque	8 Nm



- Make sure that the special tool lies parallel (1) to the upper coil of the coil spring.

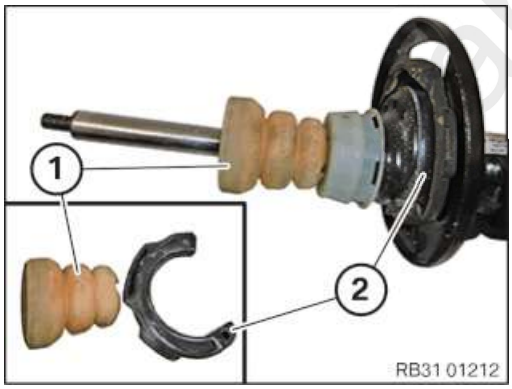
  The tensioning process must be stopped immediately if the coil spring end relative to the special tool starts to twist.
- Check position of the special tool and correct if necessary.



- Tension the coil spring until dimension (A) is reached at the special tool .

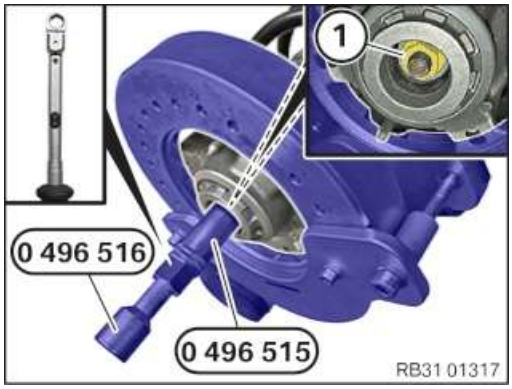
  Dimension (A) = 95 mm to 70 mm

  The dimension (A) **must not be undershot.**



- Check the auxiliary damper (1) and the spring pad (2) for damage, renew if necessary.
- Slide the suspension strut with the auxiliary damper (1) and the spring pad (2) in the tensioned coil spring.

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TECHNICAL INFORMATION

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

- Renew nut (1).

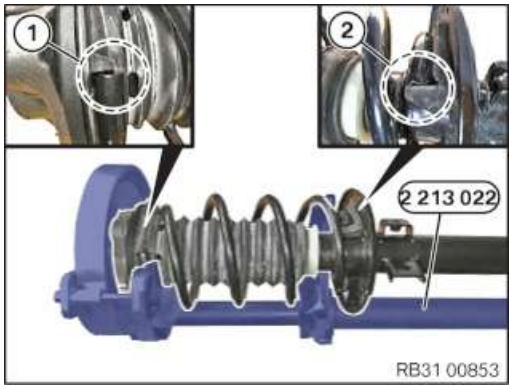
  Parts: Nut

- Tighten the nut (1) with the special tools and .

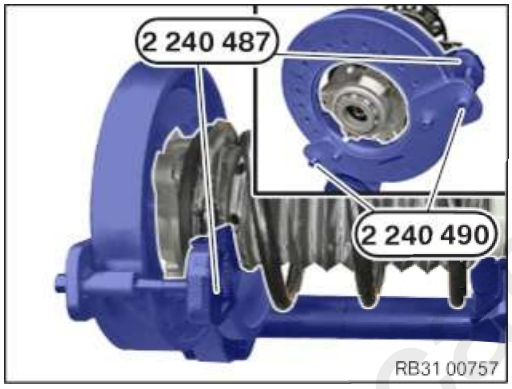
Front spring strut support bearing to spring strut

M12	Renew nut.		71 Nm

▸ **Relieve tension on coil spring**



- Align the spring strut with the spring pad to the bottom coil spring end (2).
- Release coil spring using special tool .
- Check the position on the top coil spring ends (1) and bottom coil spring end (2), correct if necessary.



- Release the special tool .
- Remove special tool .
- Remove spring strut from spring tensioner.

19 – Replacing the strut mount (Sport and BMW M Performance Automobile)

▸ **Tensioning coil spring (Sport and BMW M Performance Automobile)**

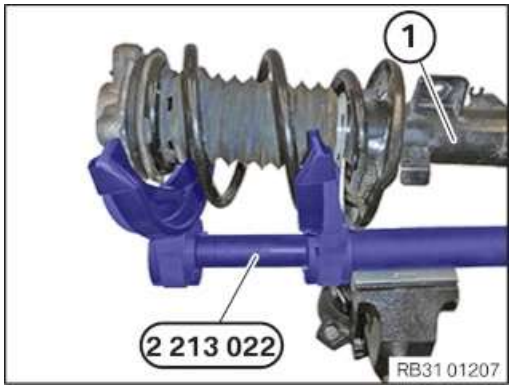
WARNING

Spring preload.

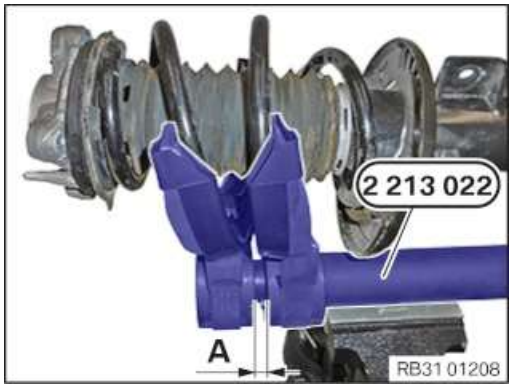
Danger! Life-threatening injuries!

- Secure coil spring using special tool **2 213 022 (31 3 340)**.
- Use special tool as per owner's handbook and always observe the safety information.

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- Clean coil spring to remove heavy contamination.
- Hook the spring strut (1) to the coil spring with the pressure plates.
- Make sure that the coils of the coil spring are completely placed in the slots of the pressure plates.



TECHNICAL INFORMATION

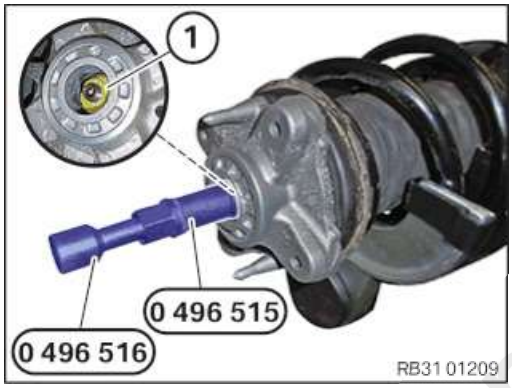
Different variants may be installed depending on the vehicle equipment.

- Tension the coil spring until the dimension (A) is reached at the special tool .

  Dimension (A) = 10 mm

  The dimension (A) **must not be undershot.**

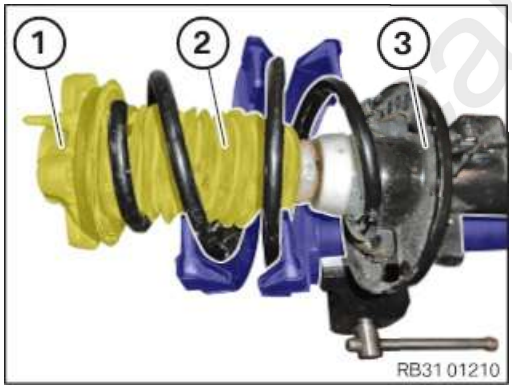
▸ **Remove the spring strut support bearing**



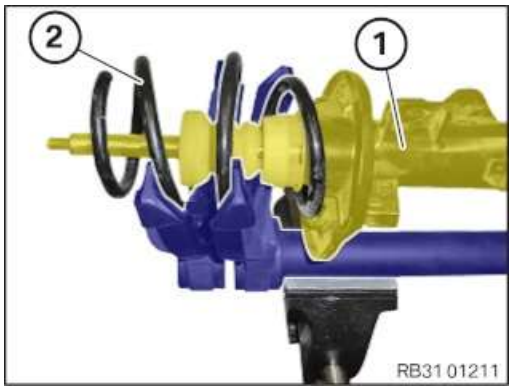
TECHNICAL INFORMATION

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

- Release the nut (1) at the spring strut support bearing with the special tools and .

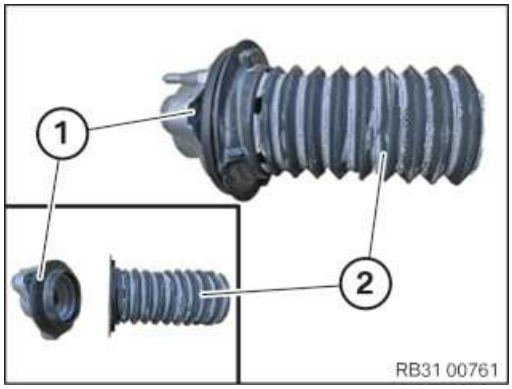


- Pull the spring strut support bearing (1) with the protective tube (2) from the spring strut (3) and remove it.



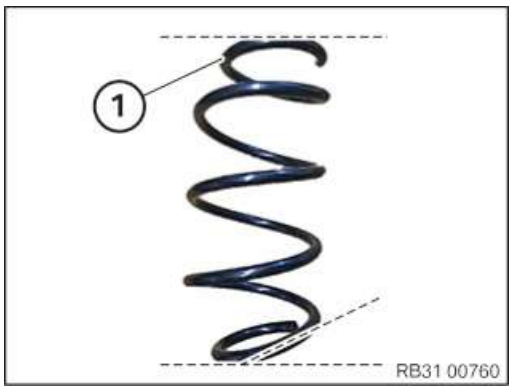
- Remove the spring strut (1) with the spring pad and the auxiliary damper from the tensioned coil spring (2).

▸ **Replacing spring strut support bearing**

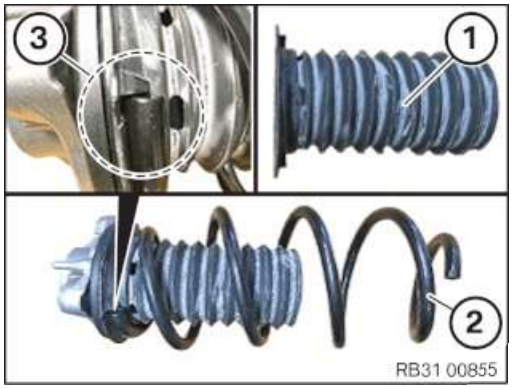


- Pull down and remove spring strut support bearing (1) from the protective tube (2).
- Renew spring strut support bearing (1).

  Parts: Spring strut support bearing

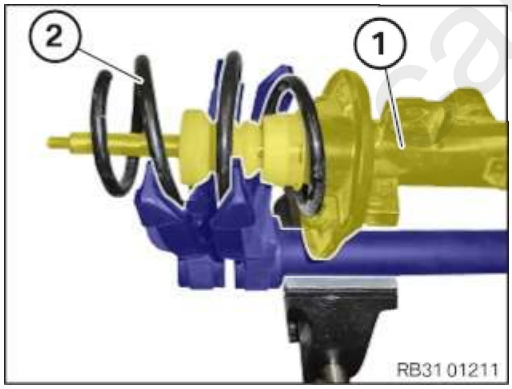


- Position the flattened end (1) of the coil spring on the strut mount.



- Check protective tube (1) and renew if necessary.
- Slide the protective tube (1) onto the strut mount.
- Position coil spring (2) on the spring pad at the top.
- Align top of the coil spring end (3) to the top of the spring pad.

▸ Installing the spring strut support bearing

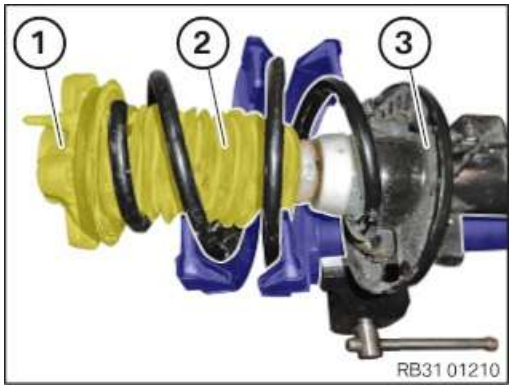


- Slide suspension strut (1) with the spring pad and auxiliary damper into tensioned coil spring (2).

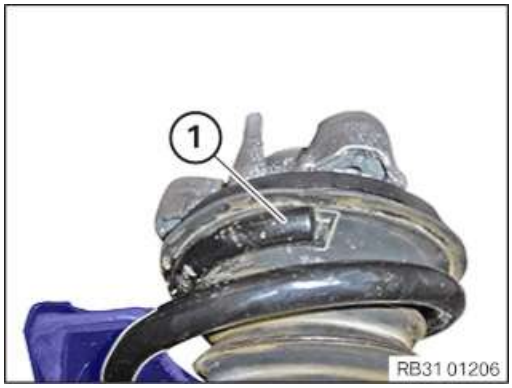


- Align the suspension strut with the spring pad (1) to the bottom coil spring end (2) up to the limit position.

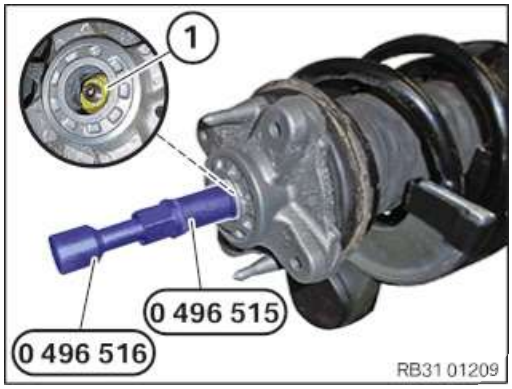
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- Check the strut mount (1) and the protective tube (2) for damage, renew if necessary.
- Slide the strut mount (1) with the protective tube (2) on to the piston rod of the suspension strut (3).



- Align the strut mount with the protective tube for the top coil spring end (1) up to the limit position.



TECHNICAL INFORMATION

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

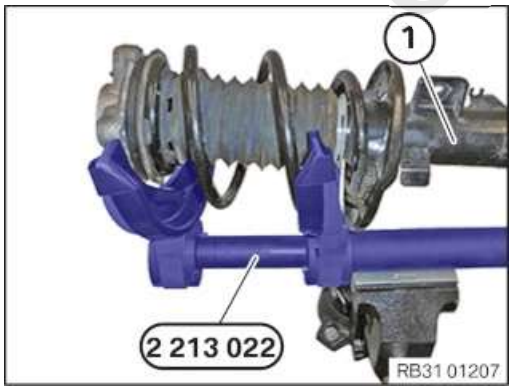
- Renew nut (1).

  Parts: Nut
- Tighten the nut (1) at the spring strut support bearing with the special tools and .

Front spring strut support bearing to spring strut

M12	Renew nut.		71 Nm

▸ **Relieve tension on coil spring**

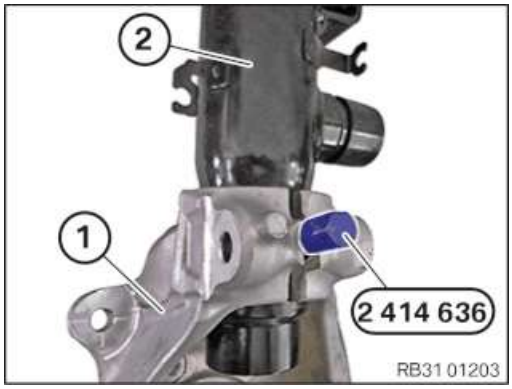


- Release the coil spring with the special tool .
- Make sure that the coil spring ends lie at the top and bottom on the spring pads (correct position if necessary).
- Remove the spring strut (1) from the special tool .

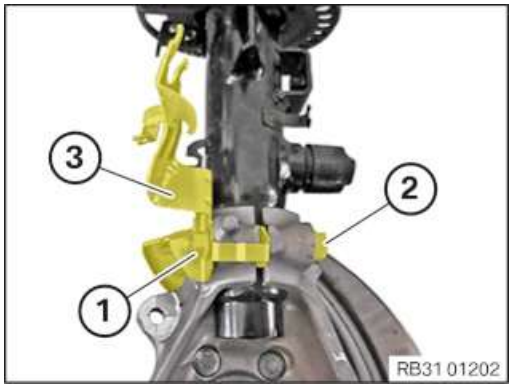
POSTPROCESSES

20 – Fastening the spring strut on to the swivel bearing

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- Spread the swivel bearing (1) with the special tool .
- Align the positioning pin on to the spring strut (2) correctly with the gap on the swivel bearing (1).
- Slide in the spring strut (2) up to the limit position in the swivel bearing (1).
- Remove the special tool .



- Position the bracket (3) on the swivel bearing.
- Renew screw (2) and nut (1).

  Parts: Bolt, nut
- Insert screw (2) and guide nut (1).
- Tighten down screw (2).

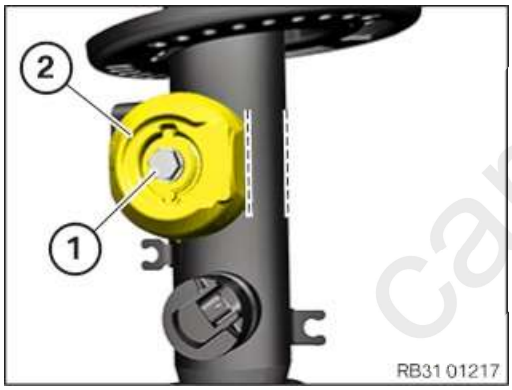
Spring strut shock absorber to swivel bearing

M10	Renew screw and nut. Tightening via screw.	Tightening torque Angle of rotation	60 Nm 180 °

21 – Installing an absorber weight on the spring strut

NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.



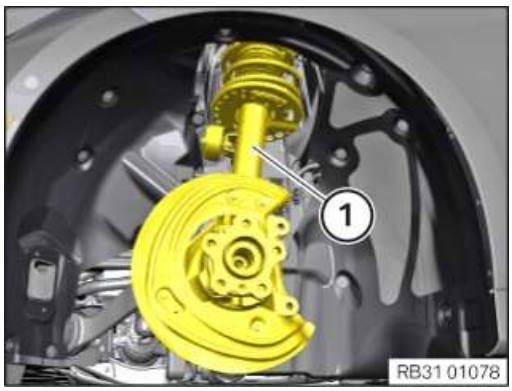
- Position the absorber weight (2) with the flattened side parallel to the spring strut.
- Renew the screw (1).

  Parts: Screw
- Tighten down screw (1).

Absorber weight to spring strut

M8	Renew screw.	Tightening torque Angle of rotation	28 Nm 90 °

22 – Installing the spring strut



- Position the spring strut (1) with the swivel bearing in the wheel arch.

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- Ensure correct positioning of journal (1) of support bearing on the spring strut dome.



- Renew screws (1).

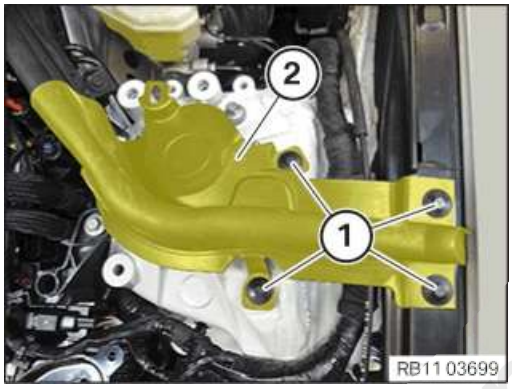
  Parts: Screws

- Tighten the screws (1).

Nut and locknut/self-locking nut

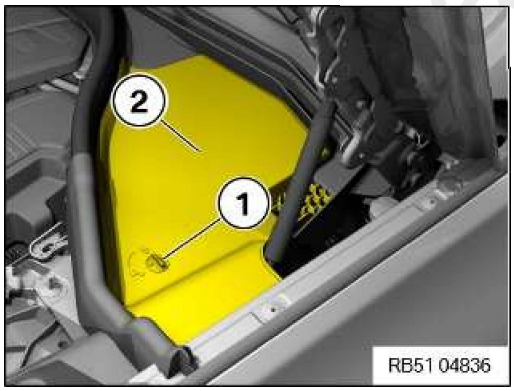
M8	Renew screws.	Tightening torque	28 Nm
		Angle of rotation	90 °

23 – Install the side bonnet seal



- Position the side bonnet seal (2) on the spring strut dome.
- Secure the rivet (1).

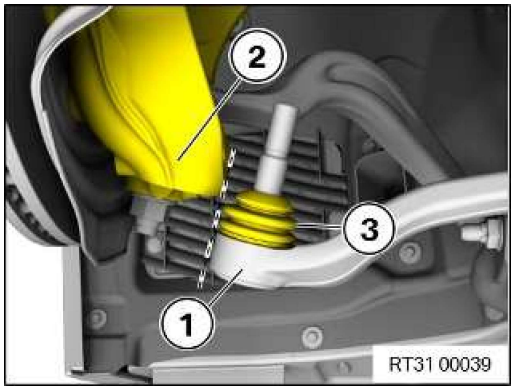
24 – Install the cover of the engine compartment on the rear left



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

25 – Mounting the wishbone on the swivel bearing

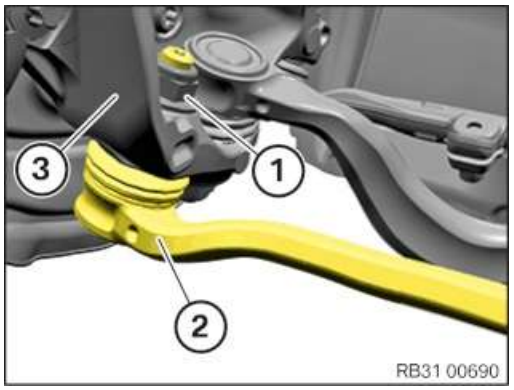
ardiagn.com



TECHNICAL INFORMATION

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

- Make sure that the rubber grommet (3) on bottom 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.

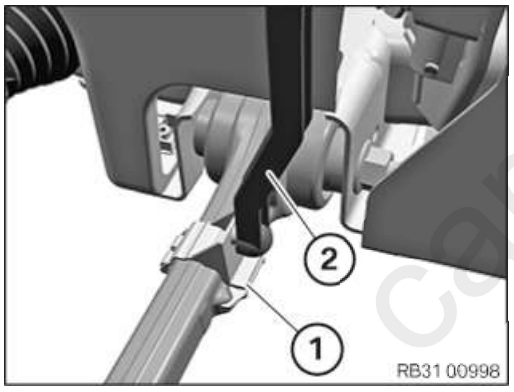
Wishbone to swivel bearing

M14	Renew nut.	Tightening torque	175 Nm

26 – Attach the ride height sensor on the bottom wishbone

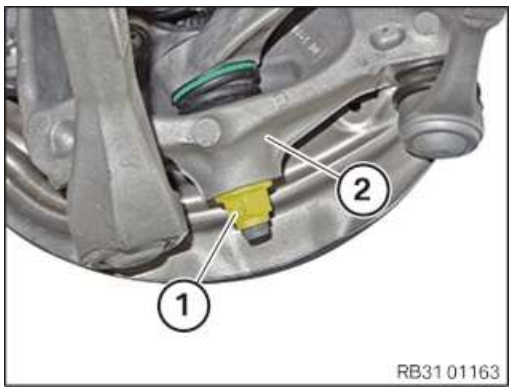
NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.



- Position and lock the holder (1) of the attachment rod (2) of the ride height sensor on the lower control arm.

27 – Securing tension strut on swivel bearing



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

  Parts: Nut
- Tighten nut (1).

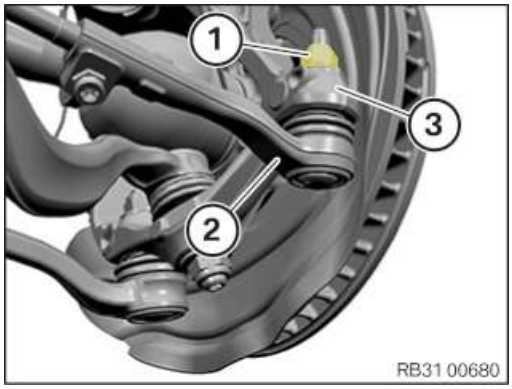
Note: Use the Torx socket for counter support.

Tension strut to swivel bearing

M14	Renew nut.	Tightening torque	175 Nm

28 – Securing the track rod on the swivel bearing

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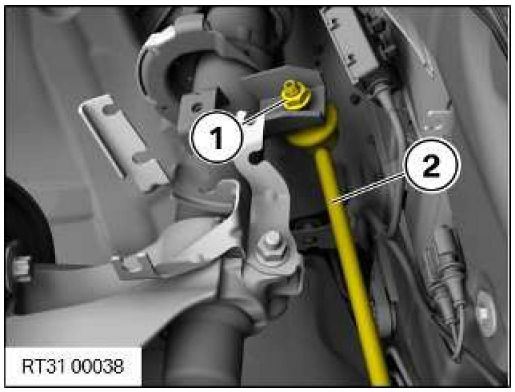
- Position the track rod (2) on the swivel bearing (3).
- Renew nut (1).

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

Track rod end to swivel bearing

M14	Renew nut.	Tightening torque	165 Nm

29 – Securing the anti-roll bar link on the spring strut



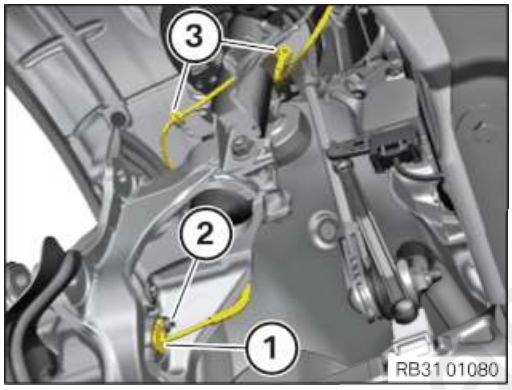
- Position the anti-roll bar link (2) at the spring strut.
- Renew nut (1).

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

Front anti-roll bar link to anti-roll bar/spring strut

M10	Renew nut.	Tightening torque	56 Nm

30 – Installing the front wheel speed sensor partially



- Position the wheel speed sensor on the spring strut.
- Mount the cable of wheel speed sensor on the holders(3).
- Position the wheel speed sensor (1) on the swivel bearing.
- Renew the screw (2).

  Parts: Screw
- Tighten down screw (2).

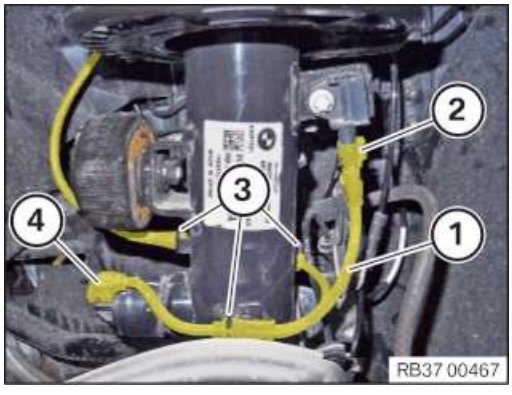
Wheel speed sensor to swivel bearing

M6	Renew screw.	Tightening torque	12 Nm

31 – Connecting the cable of the vertical dynamic platform (VDP) to the spring strut

NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.



- Position the cable (1) and fasten on the holders (3).
- Connect and lock the connector (4) to the spring strut.
- Connect and lock the connector (2) on the vertical acceleration sensor.

32 – Install front brake disc

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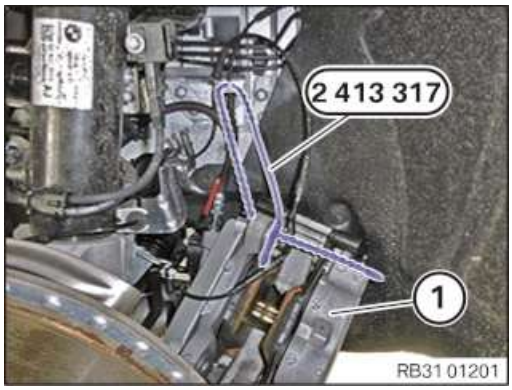
- Position brake disc (2) on wheel hub.
- Renew the screw (1).

  Parts: Screw
- Position and tighten the screw (1).

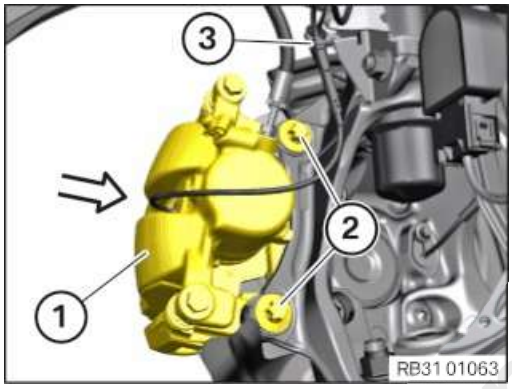
Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

33 – Fasten the front brake caliper



- Release the special tool 2 413 317 from the brake caliper (1) and remove.
- The brake caliper (1) must not suspend at the brake hose.



- Position the brake caliper (1) in direction of arrow on the swivel bearing.
- Renew screws (2).

  Parts: Screws
- Tighten the screws (2).

Brake caliper / caliper carrier at front swivel bearing

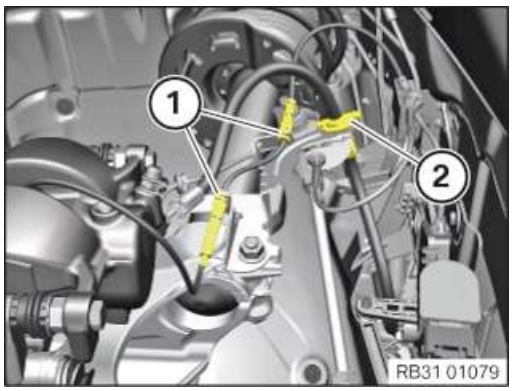
M12	Renew screw.	Tightening torque	110 Nm

NOTICE

Perform this step on the left side only.

- Fasten the cable of the brake pad wear sensor to the holder (3).

34 – Attaching the front brake hose



- Hook the brake hose to the holder (2).

NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Hook the cable for the brake pad wear sensor to the holders (1).

35 – Attaching the front left wheel

▸ **Mounting the wheel**

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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.

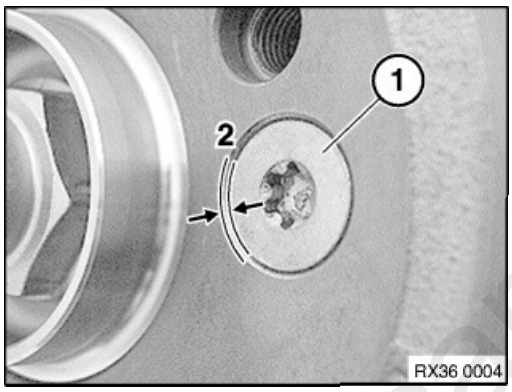
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  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 residue in the area of the wheel bolt holes, remove and clean the brake disc.



- 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 that the mounting bolt (1) for the brake disc is securely seated.

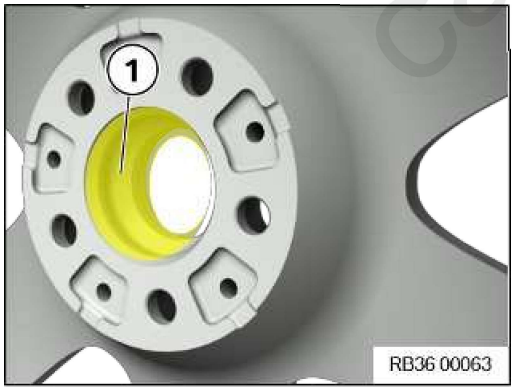
  The mounting bolt (1) for the brake disc **may not** protrude on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm



TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

- Thinly grease the wheel centring (1) in the wheel rim.

Expendable materials

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

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TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

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

Expendable materials

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

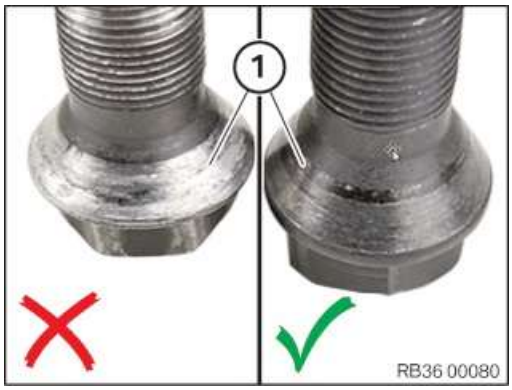
A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

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

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

Check

- **Check wheel bolts for wear.**



Result

» Places (> 30%) of the bearing surfaces (1) of the taper on the screw head show a silver wear.

Measure

- Replace wheel bolts.

  Parts: Wheel bolts



TECHNICAL INFORMATION

Never use impact screwdrivers or electric screwdrivers to screw in and tighten the wheel bolts.

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

- Renew the corroded wheel bolts (arrows).

  Parts: Wheel bolts
- Clean the wheel bolts (arrows).
- Check the wheel bolts (arrows) and threads for damage, renew the wheel bolts (arrows) if necessary.
- Join and tighten the wheel bolts (arrows).

Wheel bolts

M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim.	Tightening torque	140 Nm
	Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.	Check	140 Nm
	Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.		

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Additional Information

Overview of Tightening Torques

Special tool to pressure plate — Used in step 18

	Tightening torque	8 Nm

Front spring strut support bearing to spring strut — Used in step 1819

M12	Renew nut.		71 Nm

Spring strut shock absorber to swivel bearing — Used in step 20

M10	Renew screw and nut. Tightening via screw.	Tightening torque Angle of rotation	60 Nm 180 °

Absorber weight to spring strut — Used in step 21

M8	Renew screw.	Tightening torque Angle of rotation	28 Nm 90 °

Nut and locknut/self-locking nut			Used in step 22
M8	Renew screws.	Tightening torque	28 Nm
		Angle of rotation	90 °

Wishbone to swivel bearing			Used in step 25
M14	Renew nut.	Tightening torque	175 Nm

Tension strut to swivel bearing			Used in step 27
M14	Renew nut.	Tightening torque	175 Nm

Track rod end to swivel bearing			Used in step 28
M14	Renew nut.	Tightening torque	165 Nm

Front anti-roll bar link to anti-roll bar/spring strut			Used in step 29
M10	Renew nut.	Tightening torque	56 Nm

Wheel speed sensor to swivel bearing			Used in step 30
M6	Renew screw.	Tightening torque	12 Nm

Brake disc to front wheel hub			Used in step 3235
M8	Renew screw.	Tightening torque	16 Nm

Brake caliper / caliper carrier at front swivel bearing			Used in step 33
M12	Renew screw.	Tightening torque	110 Nm

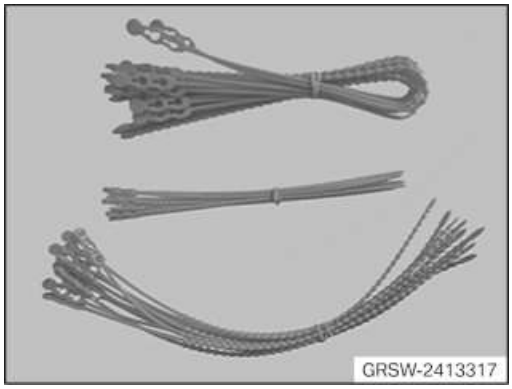
Brake disc to rear wheel hub			Used in step 35
M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts			Used in step 35
M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim. Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.	Tightening torque Check	140 Nm 140 Nm

Overview of Special Tools

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2 413 317 Cable strap



Common	Used in step 333
Usage	The "Cable ties" parts set consists of 3 items as follows: ABV232 Length: 320 mm colour: RedABV250 Length: 500 mm colour: RedABVS270 Length: 665 mm colour: Red
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	01 47 15 (332)

2 213 040 (31 3 364) Insert



Common	Used in step 17
Usage	Protective insert As of 08/2011, replaces the previous special tool number 31 3 364, see SI 01 16 11 (738). Protective insert suitable for clamping plate 31 3 382 = 83 30 2 213 039.
Included in the tool or work	
Storage location	Individual
Replaced by	
In connection with	
SI-Number	01 16 11 (738)

2 344 011 Tool



Common	Used in step 35
Usage	Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	08 08 12 (872)

Replacement tools:

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0 495 221 (36 1 323) Wheel stud



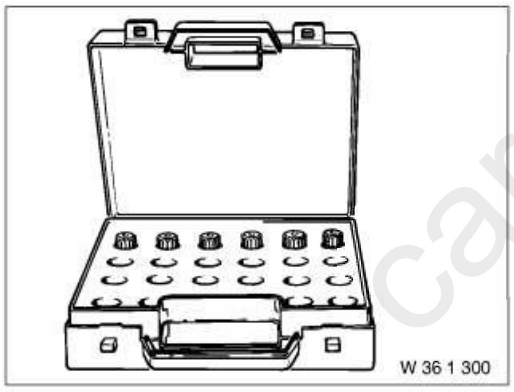
Common	Used in step 1
Usage	(Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 224 (36 1 326) Wheel stud



Common	Used in step 1
Usage	(Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 225 (36 1 327) Wheel stud



Common	Used in step 1
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 226 (36 1 328) Wheel stud



Common	Used in step 1
Usage	(Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 495 227 (36 1 329) Wheel stud



Common	Used in step 1
Usage	(Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 228 (36 1 331) Wheel stud



Common	Used in step 1
Usage	(Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 229 (36 1 332) Wheel stud



Common	Used in step 1
Usage	(Code 38) With centring bore available separately (see EPC) under 36 13 6 762 343
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 230 (36 1 333) Wheel stud



Common	Used in step 1
Usage	(Code 40) With centring bore available separately (see EPC) under 36 13 6 762 344
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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Links

Repair instructions	Used in step
00 02 001 Raising the vehicle using a vehicle lift	135

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31 35 014 Removing and installing / replacing anti-roll bar link, left

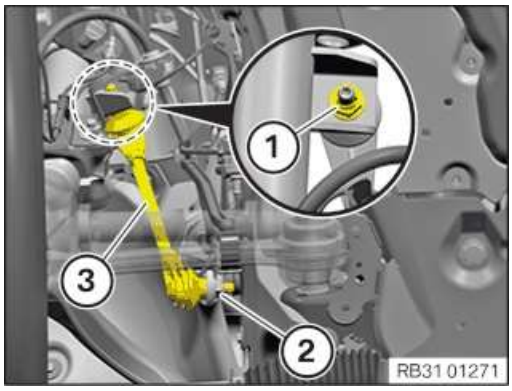
WARNING

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

Danger! Life-threatening injuries!

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

1 – Remove the anti-roll bar link

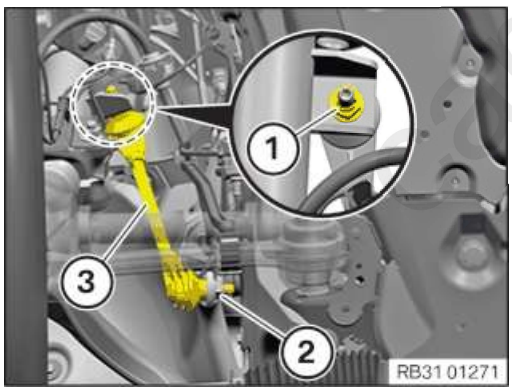


- Release the nuts (1) and (2). If necessary, counter support at the Torx socket.
- Remove the anti-roll bar link (3).

2 – Install the anti-roll bar link

TECHNICAL INFORMATION

Incorrect assembly is possible. Ensure correct installation position.



- Position the anti-roll bar link (3) on the anti-roll bar and the spring strut.
- Renew the nuts (1) and (2).

  Parts: Nuts
- Tighten nuts (1) and (2). If necessary, counter-support at the Torx socket.

Front anti-roll bar link to anti-roll bar/spring strut

M10	Renew nut.	Tightening torque	56 Nm

Additional Information

Overview of Tightening Torques

Front anti-roll bar link to anti-roll bar/spring strut — Used in step 2

M10	Renew nut.	Tightening torque	56 Nm

Links

Repair instructions	Used in step
00 .. ... Raising the vehicle using a vehicle hoist	

carDiagn.com

00 02 001 Raising the vehicle using a vehicle lift

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31 35 015 Removing and installing / replacing anti-roll bar link, right

WARNING

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

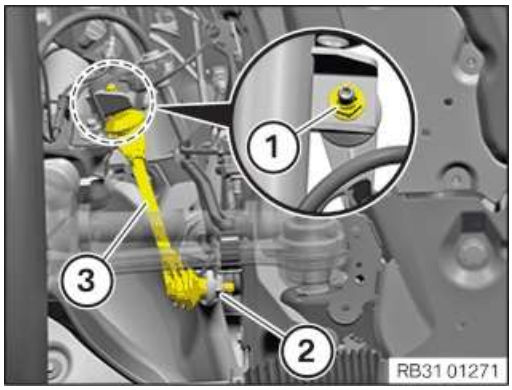
Danger! Life-threatening injuries!

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

NOTICE

Description is for left component only. Procedure on the right side is identical.

1 – Remove the anti-roll bar link

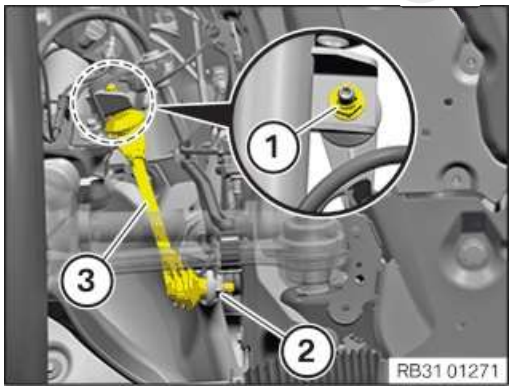


- Release the nuts (1) and (2). If necessary, counter support at the Torx socket.
- Remove the anti-roll bar link (3).

2 – Install the anti-roll bar link

TECHNICAL INFORMATION

Incorrect assembly is possible. Ensure correct installation position.



- Position the anti-roll bar link (3) on the anti-roll bar and the spring strut.
- Renew the nuts (1) and (2).

  Parts: Nuts
- Tighten nuts (1) and (2). If necessary, counter-support at the Torx socket.

Front anti-roll bar link to anti-roll bar/spring strut

M10	Renew nut.	Tightening torque	56 Nm

Additional Information

Overview of Tightening Torques

Front anti-roll bar link to anti-roll bar/spring strut Used in step 2

M10	Renew nut.	Tightening torque	56 Nm

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Links

Repair instructions	Used in step
00 .. ... Raising the vehicle using a vehicle hoist	
00 02 001 Raising the vehicle using a vehicle lift	

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31 60 ... Notes on removing and installing Low Profile band clamps

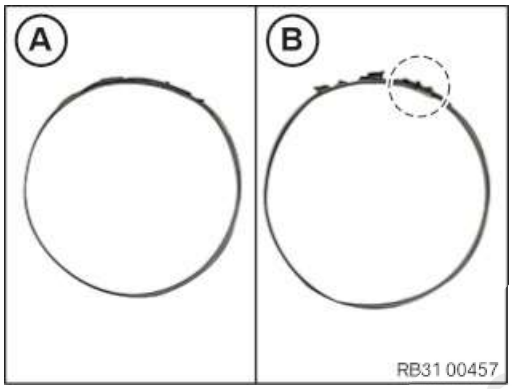
Special tools required:

- 31 5 200
- 2 413 949



Important!

During removal Low Profile band clamp (dotted line) is overstretched and must not be reused!

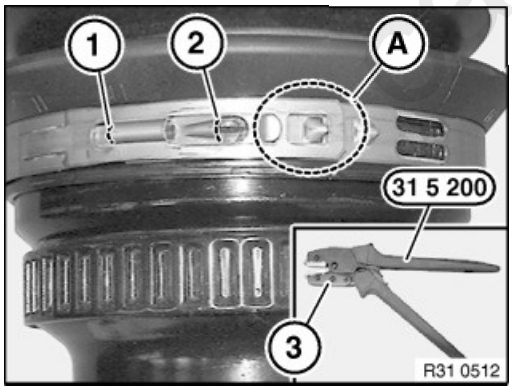


Depending on the design of the Low Profile band clamps, a different special tool (pliers) is needed for installation.

Identify band clamp and find required special tool.

Band clamp type A = pliers 31 5 200

Band clamp type B = pliers 2 413 949

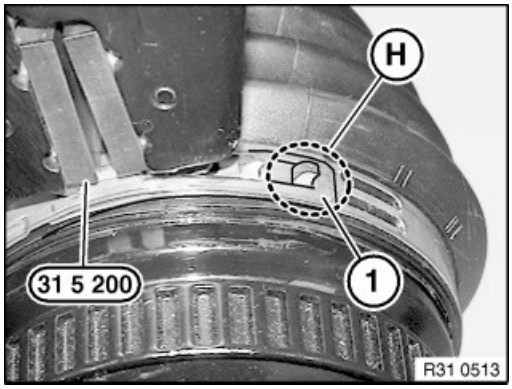


Installation (type A):

Position Low Profile band clamp in installation position (A) on gaiter.

Place special tool 31 5 200 on tabs (1, 2).

Note:
Make sure that the movable leg (3) of the special tool is placed on tab (1).



Check and if necessary correct positions of gaiter and Low Profile band clamp.

Compress Low Profile band clamp with special tool 31 5 200 and press on end of band clamp (1).

Relieve tension on special tool and remove.

Check hook fastener (H); if necessary, repeat operation with new Low Profile band clamp.



Installation (type B):

Position Low Profile band clamp in installation position on gaiter.

Place special tool 2 413 949 on tabs (1).



Check and if necessary correct positions of gaiter and Low Profile band clamp.

Press Low Profile band clamp together with the special tool 2 413 949 until the hook fastener engages.

Relieve tension on special tool and remove.

Check hook fastener; if necessary, repeat operation with new Low Profile band clamp.

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00 00 ... Microencapsulated screws

Screw securing adhesive is a means of preventing a screwed connection from being loosened by external influences.

Once the screw has been coated with adhesive, the adhesive remains inactive until such time that it is activated by the encapsulation breaking when the screw is inserted and then cures (hardens) at room temperature.

Installation note:

- Screw connection must be completed within 20 mins. (start of curing)
- Microencapsulated screws must not be retightened
- Thread of nut must be cleaned beforehand in event of repeated use

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