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

Warning!

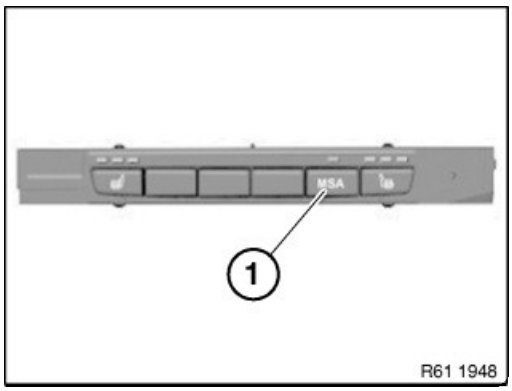
If the engine hood/bonnet contact is pulled upwards (workshop mode), the information "switch closed" is output. The automatic engine start-stop function is active.

An automatic engine start is possible.

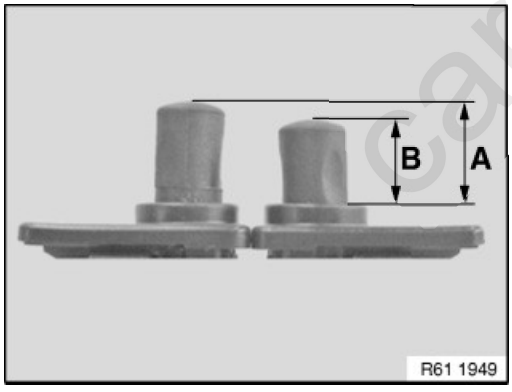
Observe safety precautions when working on MSA vehicles.

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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37 11 030 Removing and installing front left or right spring strut

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.



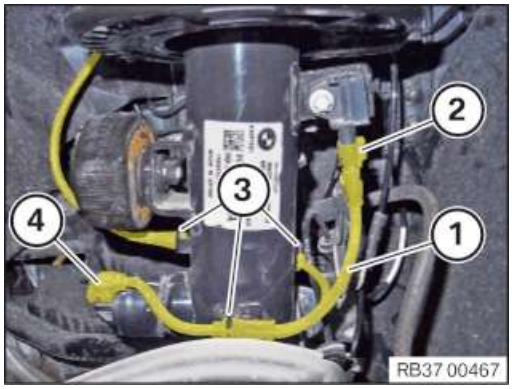
- If several wheels are removed at the same time: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Release the wheel bolts (arrows) crosswise and remove the wheel.
- To release and tighten wheel bolts with a security code: Use the correct adapter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

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

NOTICE

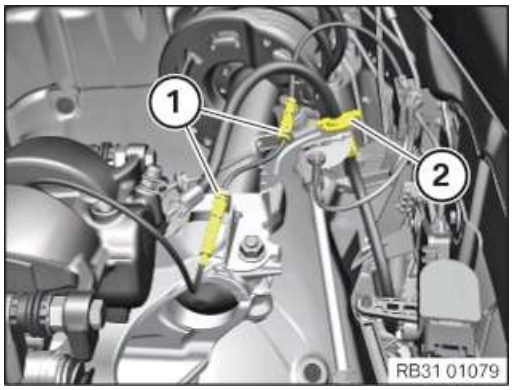
The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

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- 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).

3 – Detaching the front brake hose



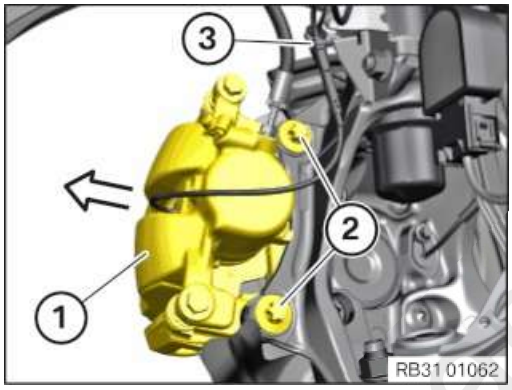
- Detach the brake hose from the holder (2).

NOTICE

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

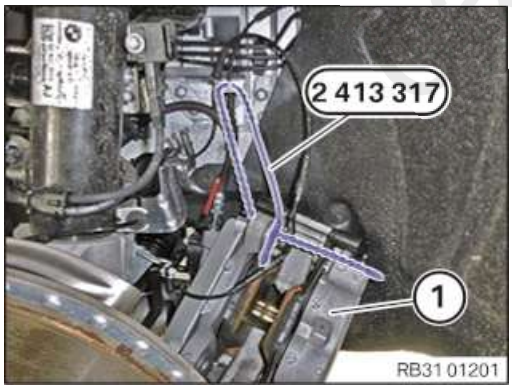
- Detach the cable for the brake pad wear sensor from the holders (1).

4 – 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.

5 – Remove front brake disc

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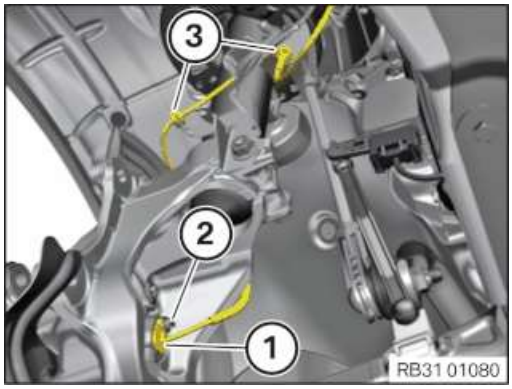
TECHNICAL INFORMATION

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.

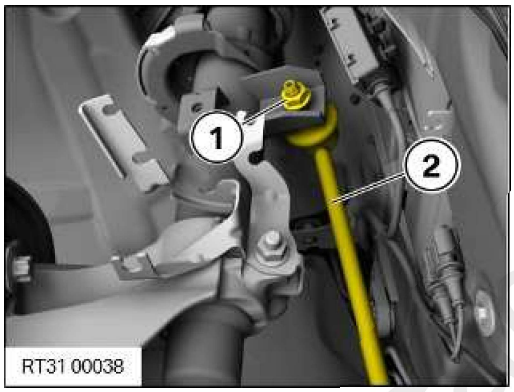
- Loosen screw (1).
- Remove brake disc (2).

6 – Partially removing the front wheel speed sensor



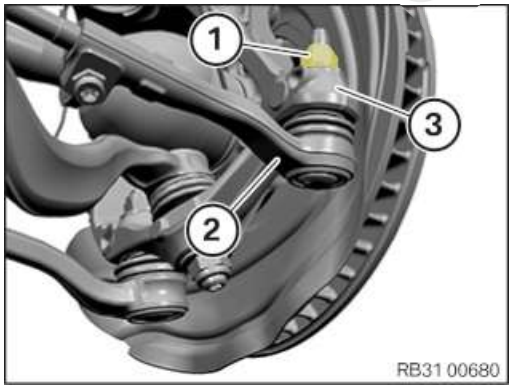
- Loosen screw (2).
- Release the wheel speed sensor (1) from the swivel bearing.
- Detach the wheel speed sensor cable from the brackets (3).
- Remove wheel speed sensor from spring strut.

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.

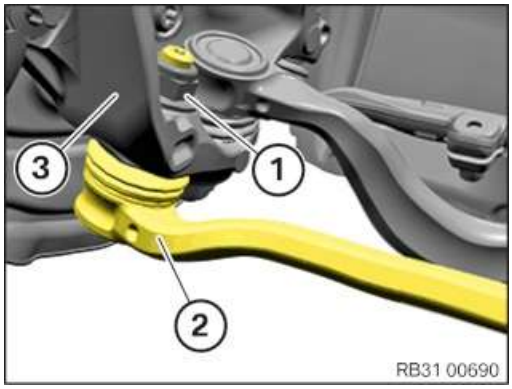
8 – Loosening the track rod from the swivel bearing



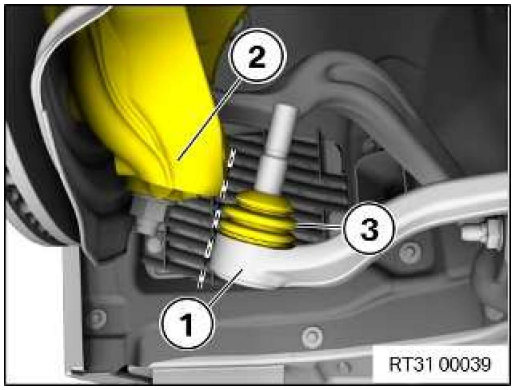
- Release nut (1). If necessary, counter support at the Torx socket.
- Detach the track rod (2) from the swivel bearing (3).

9 – Releasing the wishbone from the swivel bearing

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

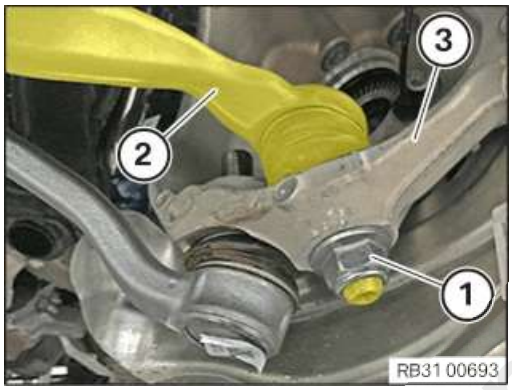


TECHNICAL INFORMATION

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



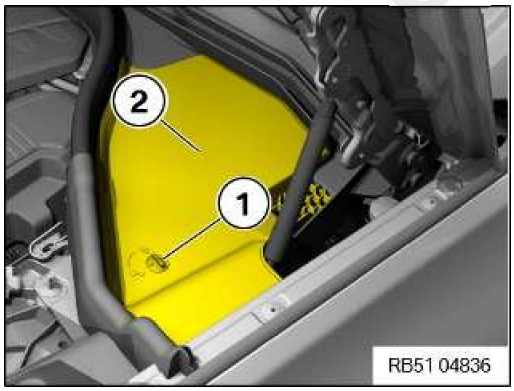
- Unfasten nut (1).

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 on the rear left or right

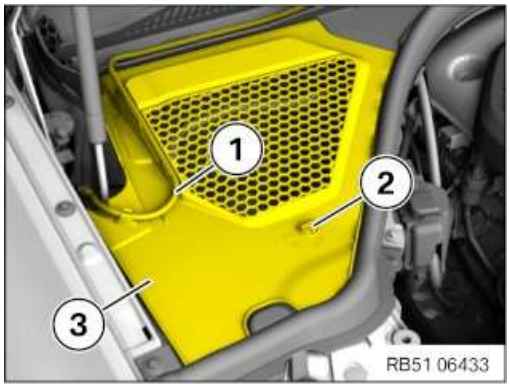
▸ **Remove the cover of the engine compartment at the rear left**



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

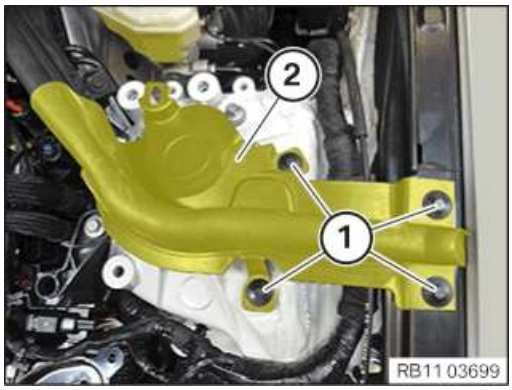
▸ **Remove the cover of the rear right engine compartment**

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

12 – Removing side bonnet seal



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

MAIN WORK

13 – Remove spring strut

TECHNICAL INFORMATION

Secure component against falling.



- Loosen screws (1).



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

14 – 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

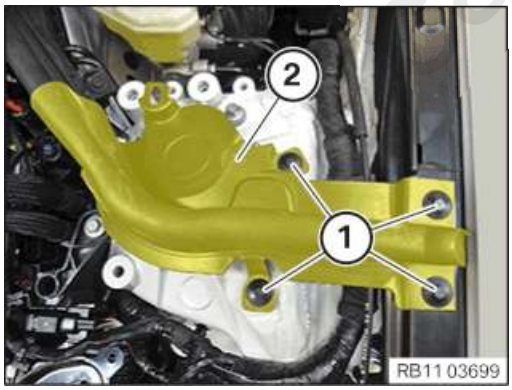
- Tighten the screws (1).

Nut and locknut/self-locking nut

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

POSTPROCESSES

15 – Install the side bonnet seal

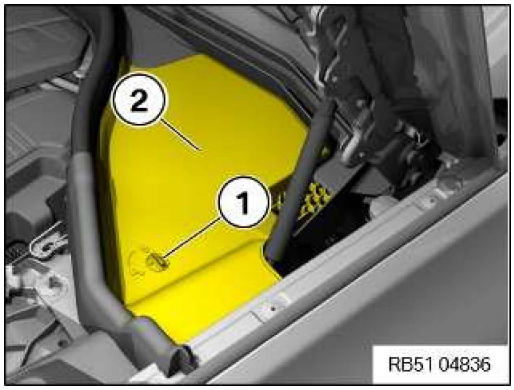


- Position the side bonnet seal (2) on the spring strut dome.
- Secure the rivet (1).

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

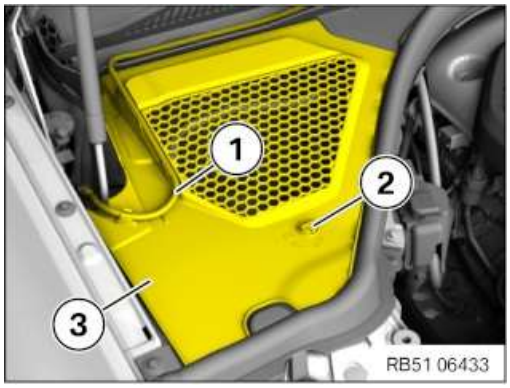
▸ **Install the cover of the engine compartment on the rear left**

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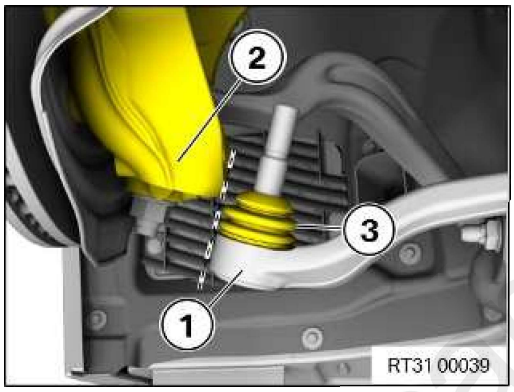
- Position the engine compartment cover at the rear left (2) .
- Close lock (1).

▸ **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.

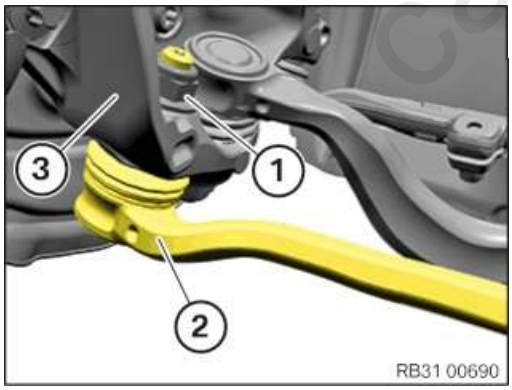
17 – Mounting the wishbone on the swivel bearing



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).



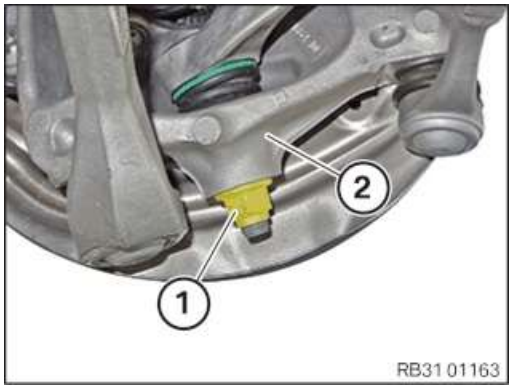
- Position the wishbone (2) on the swivel bearing (3).
- Renew nut (1).

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

Wishbone to swivel bearing

M14	Renew nut.	Tightening torque	175 Nm

18 – Securing tension strut on swivel bearing



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

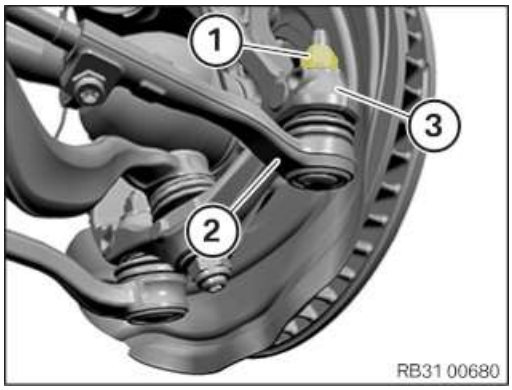
  Parts: Nut
- Tighten nut (1).

Note: Use the Torx socket for counter support.

Tension strut to swivel bearing

M14	Renew nut.	Tightening torque	175 Nm

19 – Securing the track rod on the swivel bearing



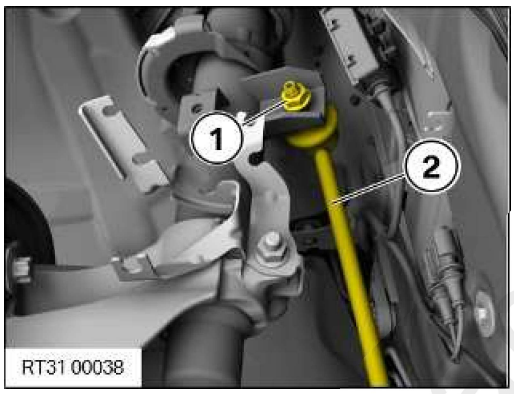
- Position the track rod (2) on the swivel bearing (3).
- Renew nut (1).

  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

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



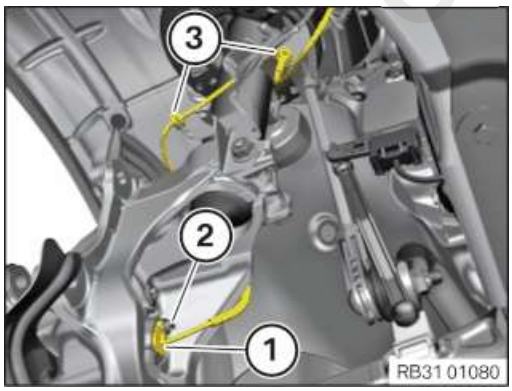
- Position the anti-roll bar link (2) at the spring strut.
- Renew nut (1).

  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

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

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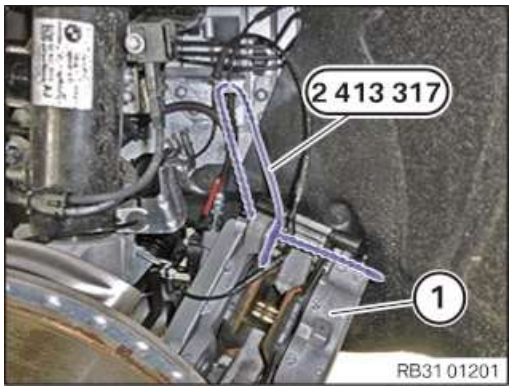
- Position brake disc (2) on wheel hub.
- Renew the screw (1).

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

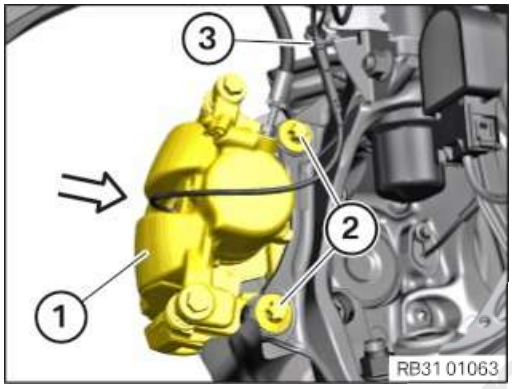
Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

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.



- 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

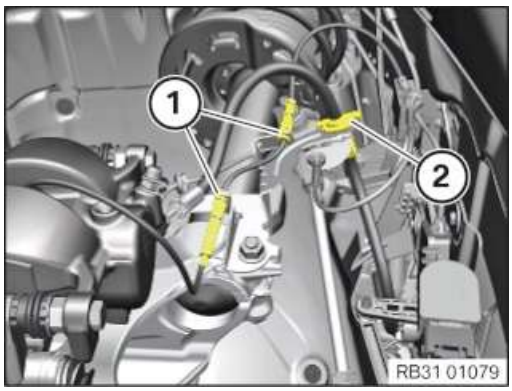
M12	Renew screw.	Tightening torque	110 Nm

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.

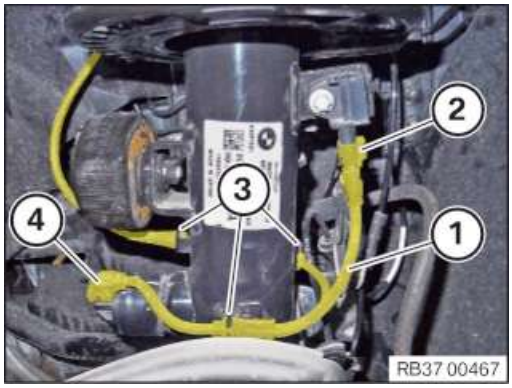
- Hook the cable for the brake pad wear sensor to the holders (1).

25 – Connecting the cable of the vertical dynamic platform (VDP) to 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 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.

26 – 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.

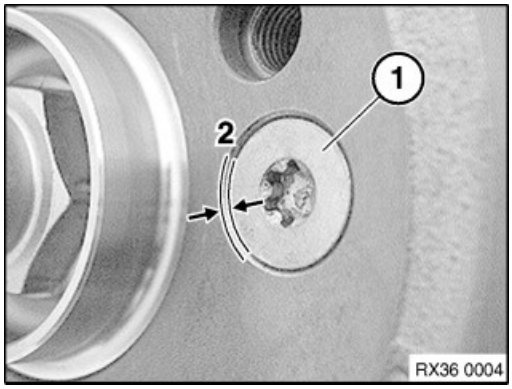
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  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.

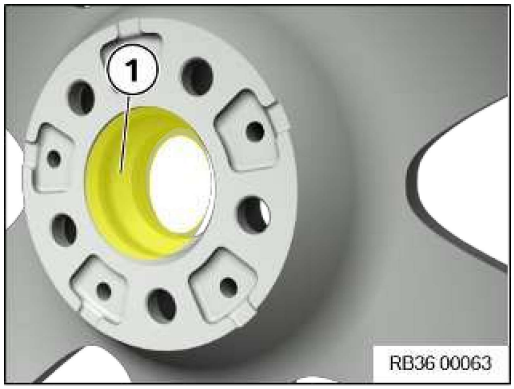
Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm

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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

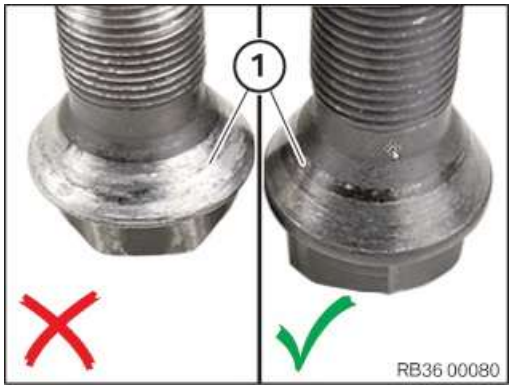
A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

- **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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Nut and locknut/self-locking nut			Used in step 14
M8	Renew screws.	Tightening torque Angle of rotation	28 Nm 90 °

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

Tension strut to swivel bearing			Used in step 18
M14	Renew nut.	Tightening torque	175 Nm

Track rod end to swivel bearing			Used in step 19
M14	Renew nut.	Tightening torque	165 Nm

Front anti-roll bar link to anti-roll bar/spring strut			Used in step 20
M10	Renew nut.	Tightening torque	56 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 2226
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

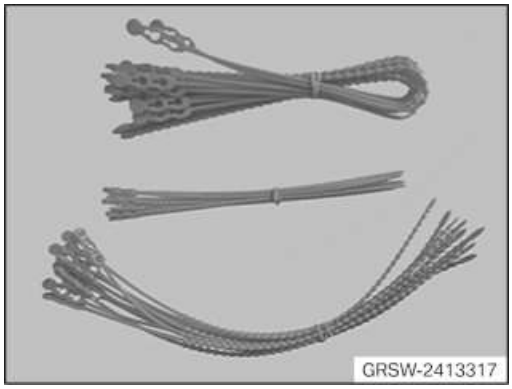
Brake disc to rear wheel hub			Used in step 26
M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts			Used in step 26
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 423
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)

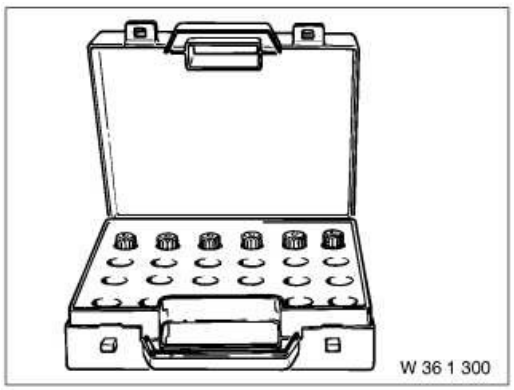
2 344 011 Tool



Common	Used in step 26
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	

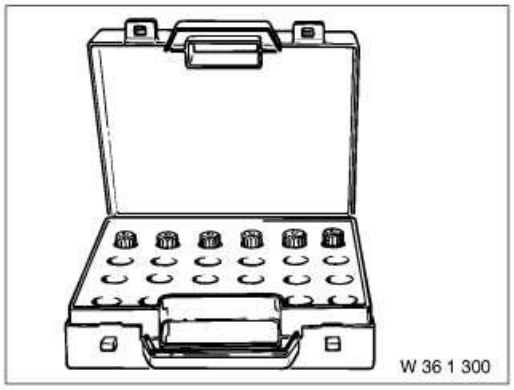
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0 495 224 (36 1 326) Wheel stud



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	

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	

Links

Repair instructions	Used in step
00 02 001 Raising the vehicle using a vehicle lift	126

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37 11 032 Replacing front left or 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.**

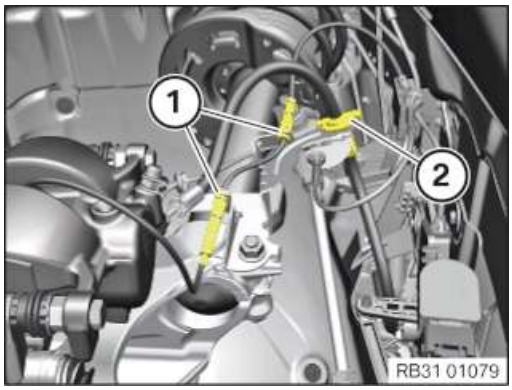
  This process is intended to prevent damage to the brake disc.

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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



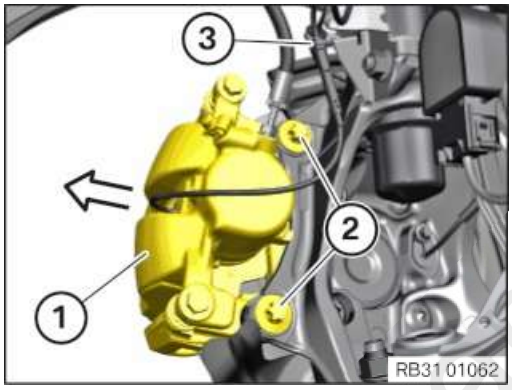
- Detach the brake hose from the holder (2).

NOTICE

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

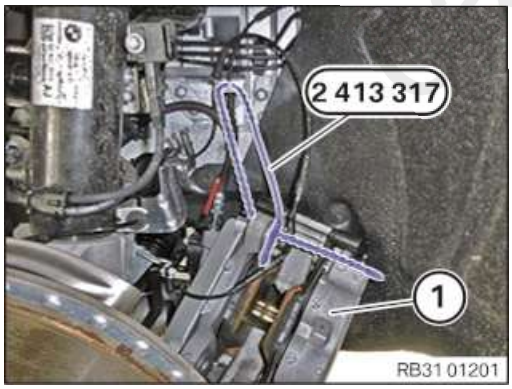
- Detach the cable for the brake pad wear sensor from the holders (1).

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:

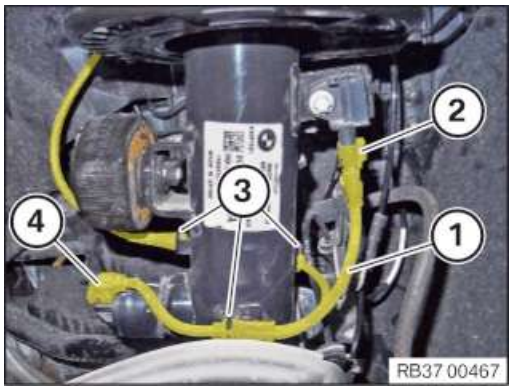
Do not strike the friction ring with a tool under any circumstance (for example, hammer). If required, **carefully** tap with a rubber mallet against the brake disc chamber.

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

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

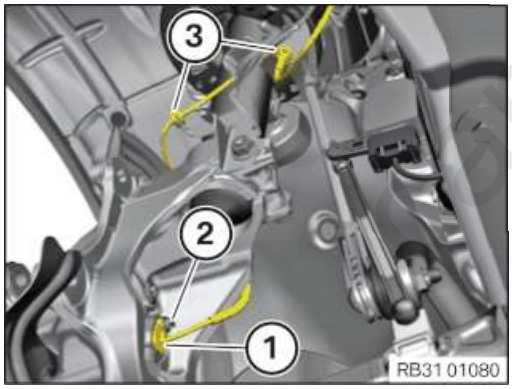
NOTICE

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



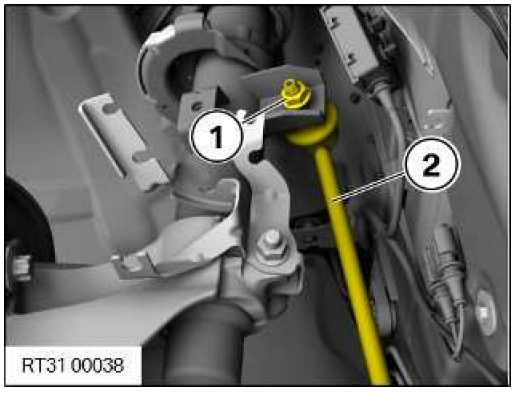
- Unlock and disconnect the plug connection (2) on the vertical acceleration sensor.
- Unlock and disconnect the plug connection (4) on the spring strut.
- Release the cable (1) from the holders (3).

6 – Partially removing the front wheel speed sensor



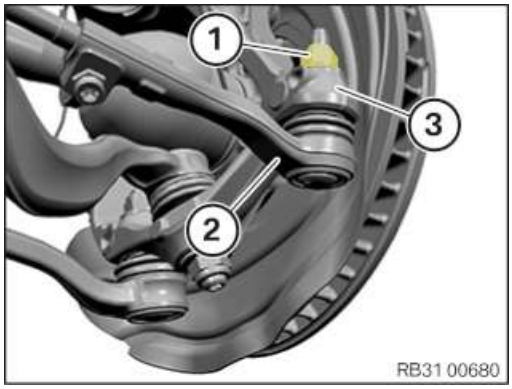
- Loosen screw (2).
- Release the wheel speed sensor (1) from the swivel bearing.
- Detach the wheel speed sensor cable from the brackets (3).
- Remove wheel speed sensor from spring strut.

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

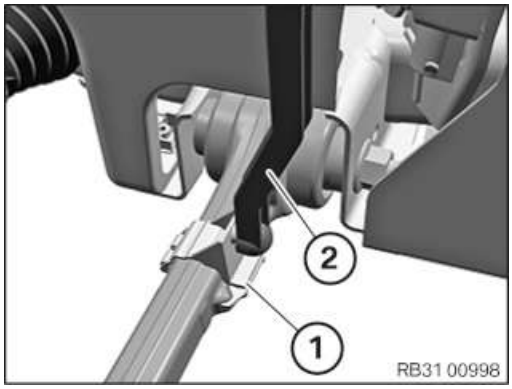


- Release nut (1). If necessary, counter support at the Torx socket.
- Detach the track rod (2) from the swivel bearing (3).

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

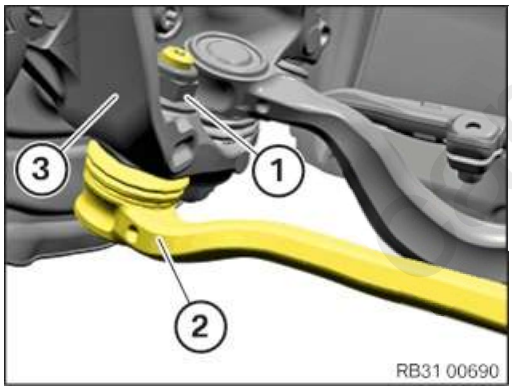
NOTICE

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

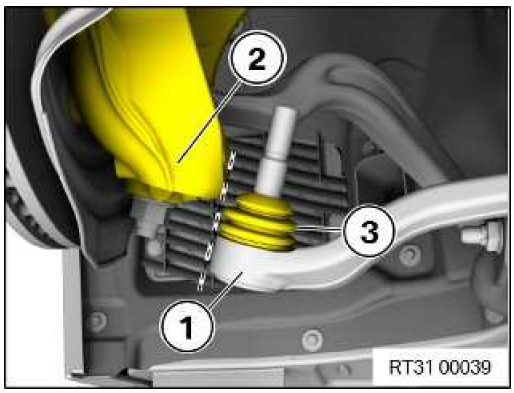


- Unlock holder (1) of attachment rod (2) of ride height sensor and release from lower control arm.

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).



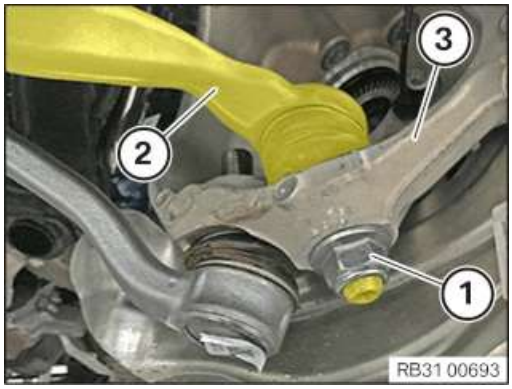
TECHNICAL INFORMATION

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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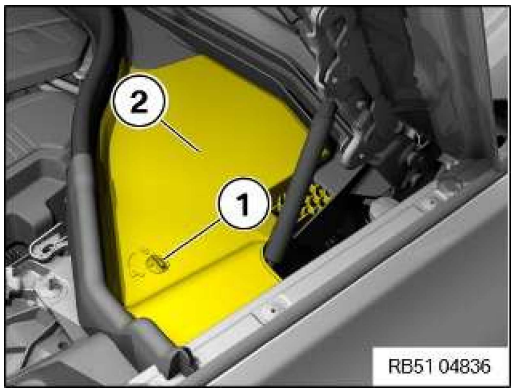


- Unfasten nut (1).

Note: Use the Torx socket for counter support.

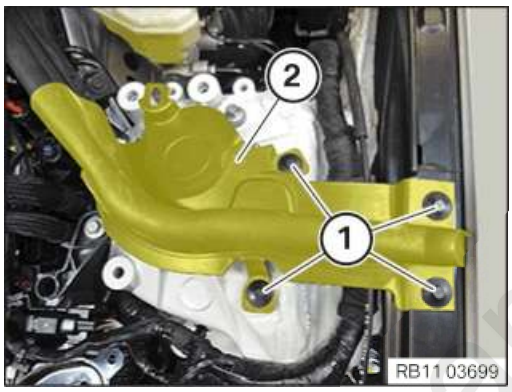
- Release the tension strut (2) from the swivel bearing (3).

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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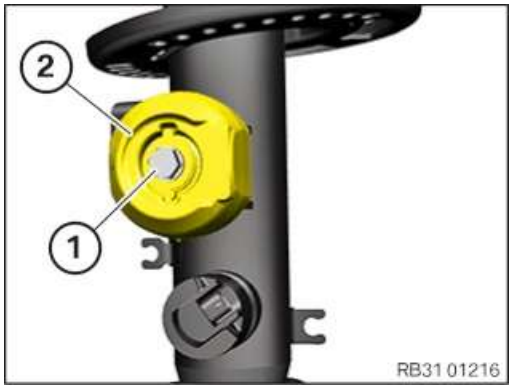


- Remove the spring strut (1) with the swivel bearing.

15 – Removing the absorber weight from suspension strut

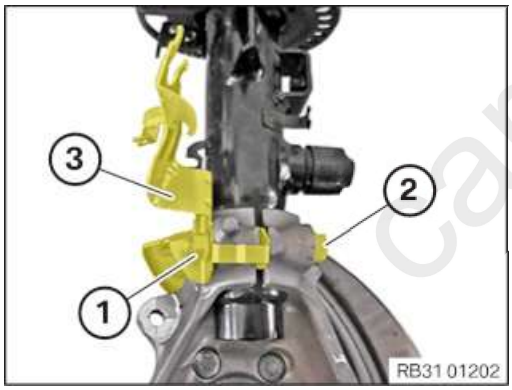
NOTICE

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).

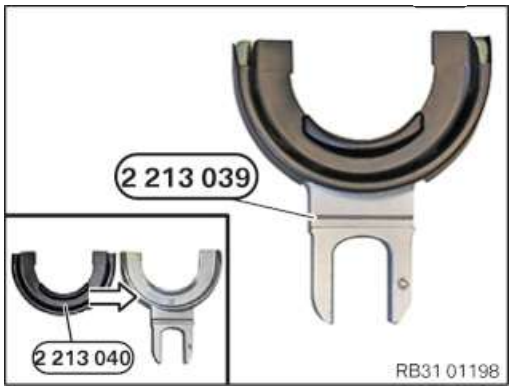
▸ **Preparing the spring tensioner (basic version)**

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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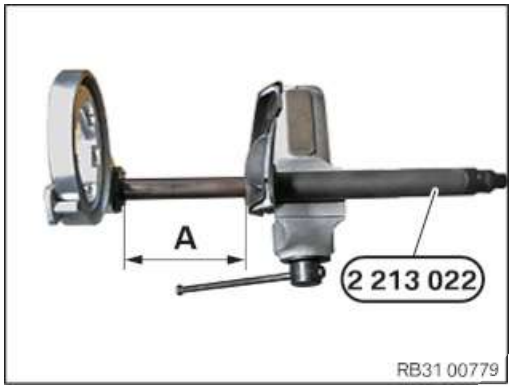


- Clamp special tool in vice.
- Set the special tools and on the special tool from the top, till the retaining bolts (1) engage tangibly and audibly.
- Check and correct the position of the special tools and and correct if required.



- 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.



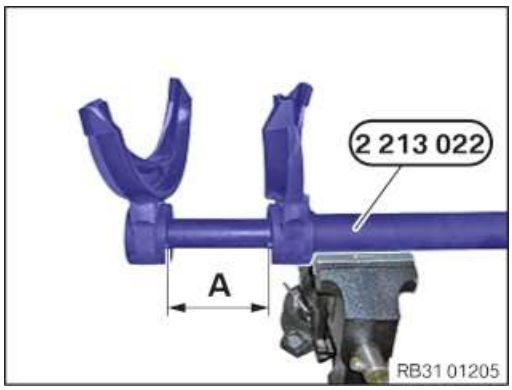
- Mount special tool 2 213 040 (31 3 364) in direction of arrow on special tool .

  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 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 .

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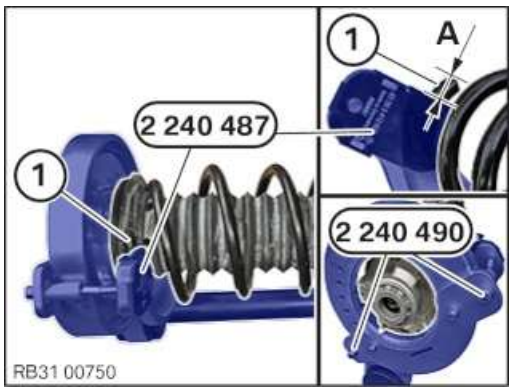
RISK OF DAMAGE

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.

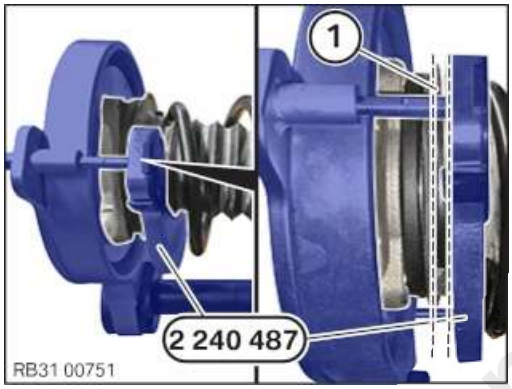
- Position the spring strut in such a way that the coil spring end (1) protrudes with the dimension (A) on the special tool .

  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.



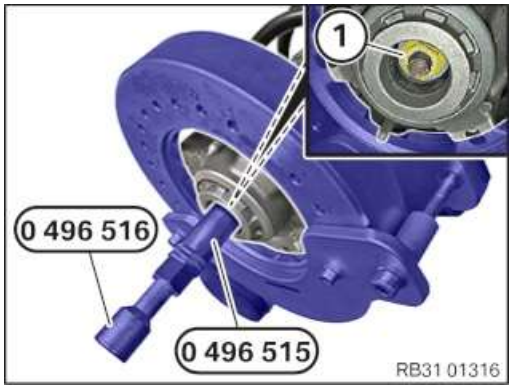
- Tension the coil spring until dimension (A) is reached at the special tool .

  Dimension (A) = 95 mm to 70 mm

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

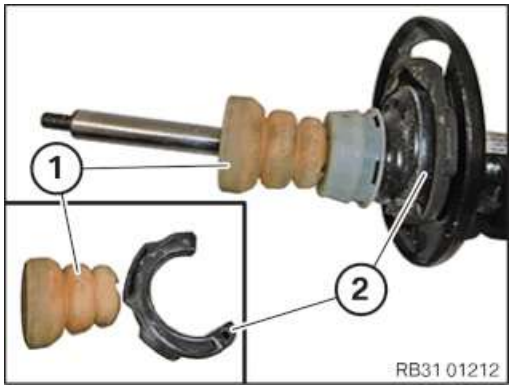
TECHNICAL INFORMATION

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



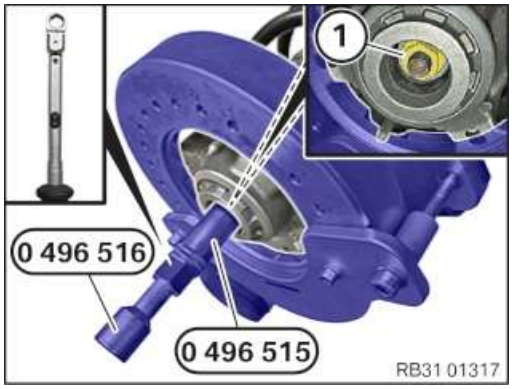
- Unscrew the nut (1) with special tools and .

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- 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.



TECHNICAL INFORMATION

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

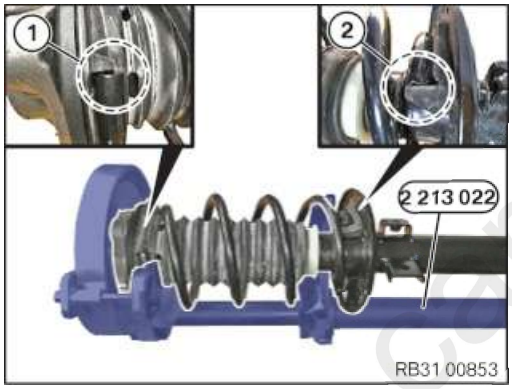
- Renew nut (1).

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

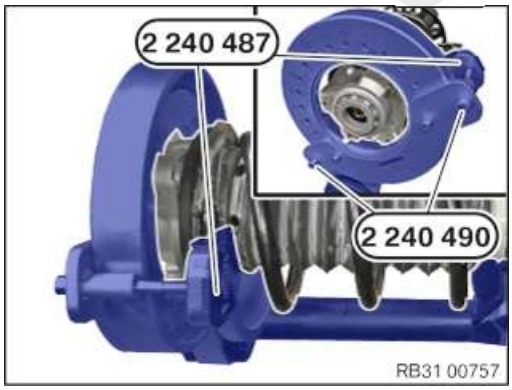
Front spring strut support bearing to spring strut

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 suspension strut (Sport and BMW M Performance Automobile)

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

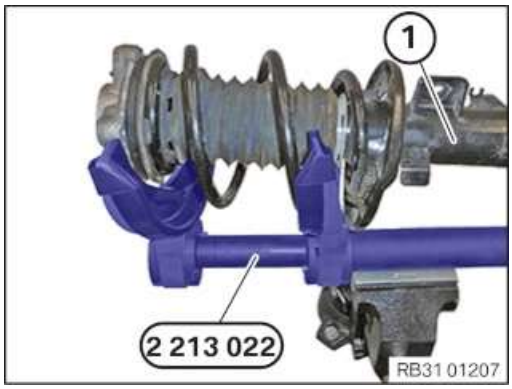
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WARNING

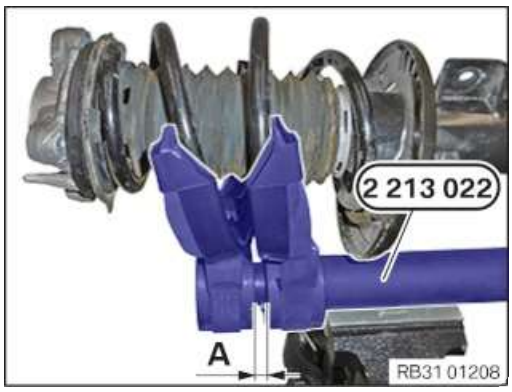
Spring preload.

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

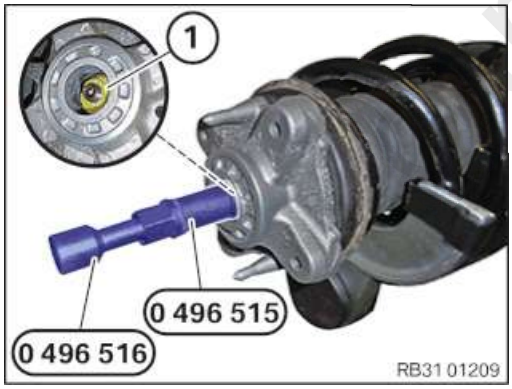
Different variants may be installed depending on the vehicle equipment.

- 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.**

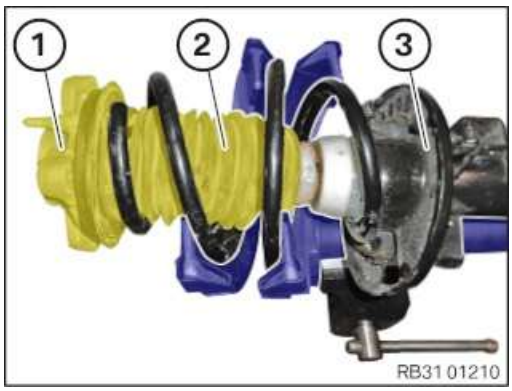
▸ **Remove the spring strut support bearing**



TECHNICAL INFORMATION

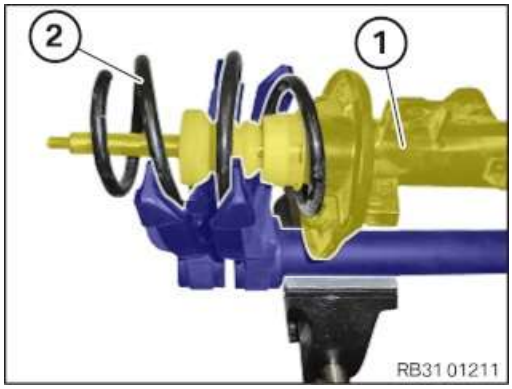
Releasing and tightening the nut on the support bearing or strut mount with an impact screwdriver is prohibited.

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



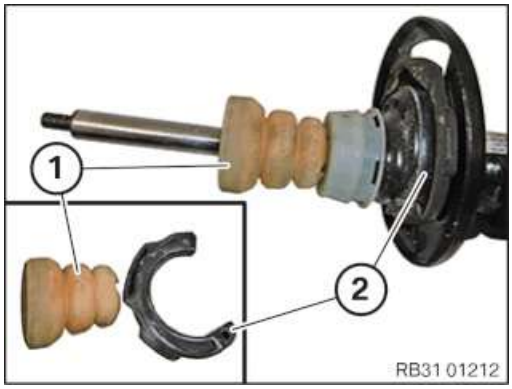
- Pull the spring strut support bearing (1) with the protective tube (2) from the spring strut (3) and remove it.

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

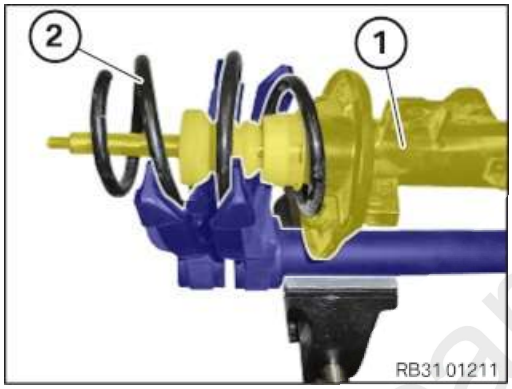
▸ **Replace spring strut**



- 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**

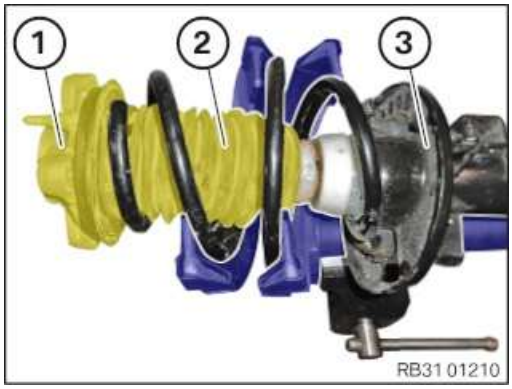


- Slide suspension strut (1) with the spring pad and auxiliary damper into tensioned coil spring (2).

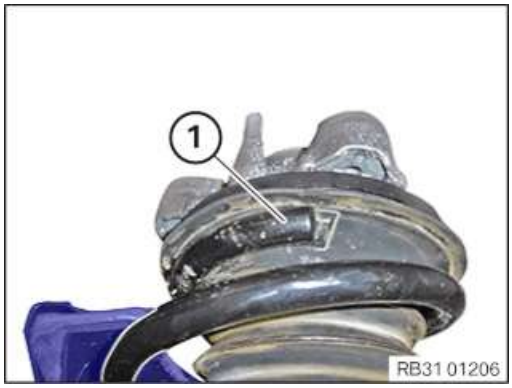


- Align the suspension strut with the spring pad (1) to the bottom coil spring end (2) up to the limit position.

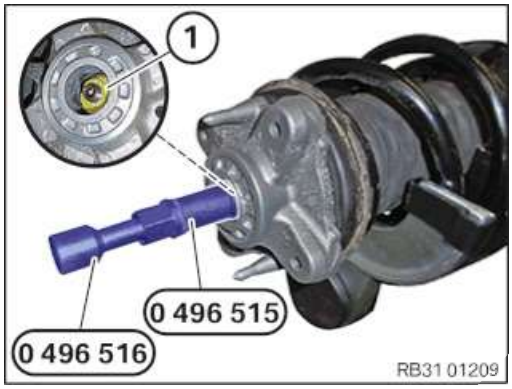
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- Check the strut mount (1) and the protective tube (2) for damage, renew if necessary.
- Slide the strut mount (1) with the protective tube (2) on to the piston rod of the suspension strut (3).



- 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.

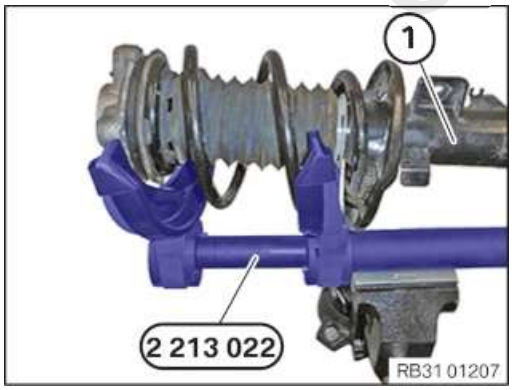
- Renew nut (1).

  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**

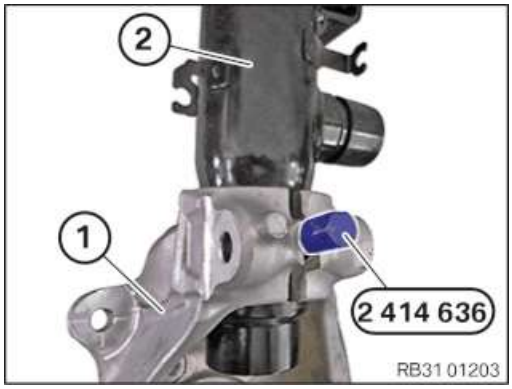


- Release the coil spring with the special tool .
- Make sure that the coil spring ends lie at the top and bottom on the spring pads (correct position if necessary).
- Remove the spring strut (1) from the special tool .

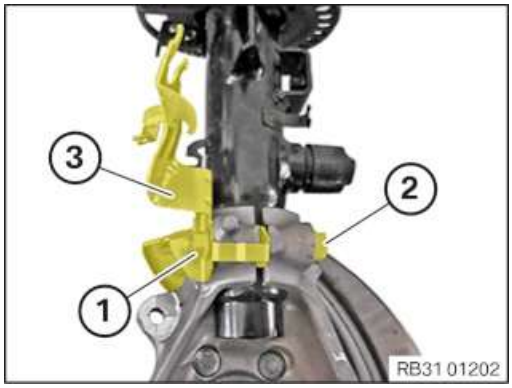
POSTPROCESSES

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).

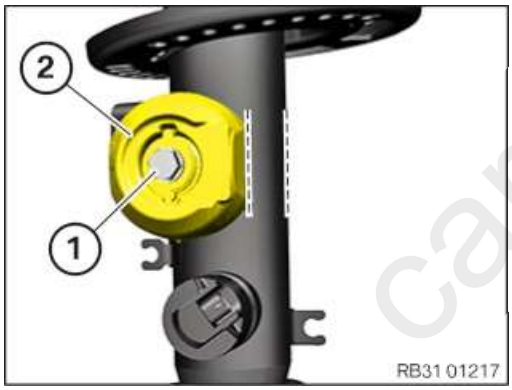
Spring strut shock absorber to swivel bearing

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.



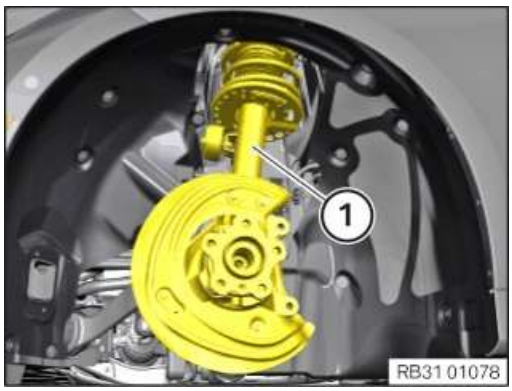
- Position the absorber weight (2) with the flattened side parallel to the spring strut.
- Renew the screw (1).

  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).

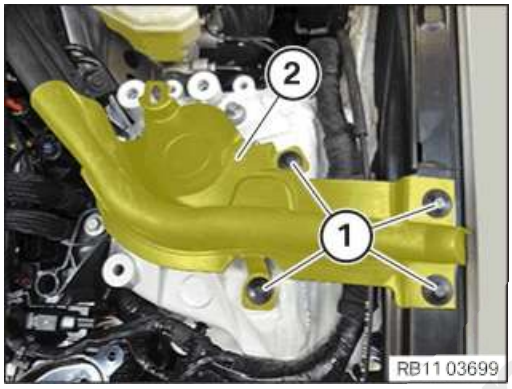
  Parts: Screws

- Tighten the screws (1).

Nut and locknut/self-locking nut

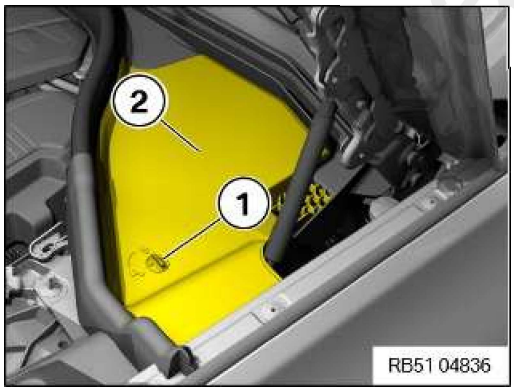
M8	Renew screws.	Tightening torque	28 Nm
		Angle of rotation	90 °

23 – Install the side bonnet seal



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

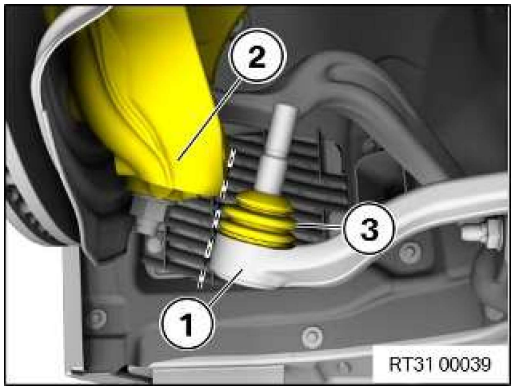
24 – Install the cover of the engine compartment on the rear left



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

25 – Mounting the wishbone on the swivel bearing

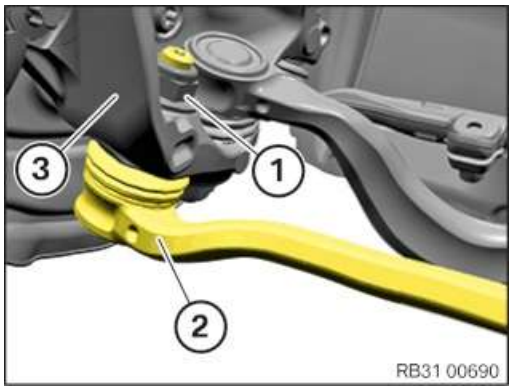
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TECHNICAL INFORMATION

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.

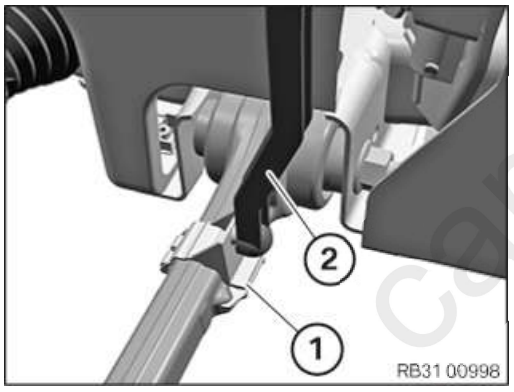
Wishbone to swivel bearing

M14	Renew nut.	Tightening torque	175 Nm

26 – Attach the ride height sensor on the bottom wishbone

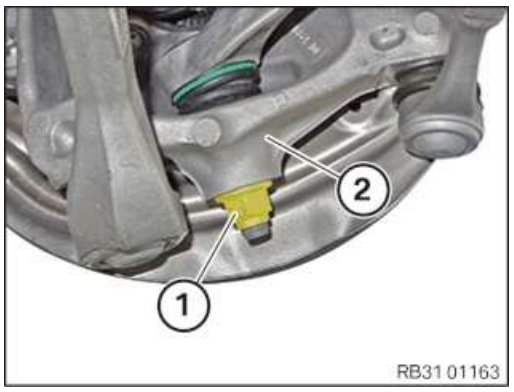
NOTICE

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).

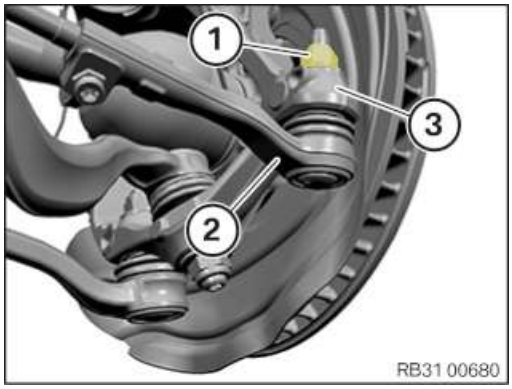
Note: Use the Torx socket for counter support.

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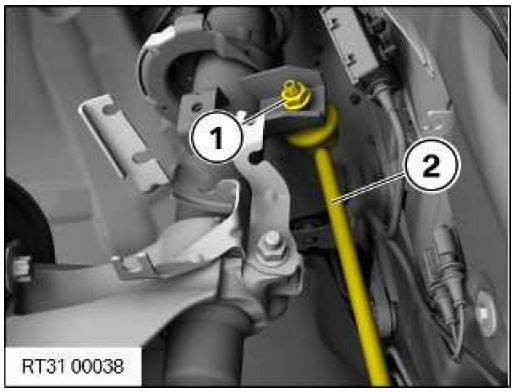
- Position the track rod (2) on the swivel bearing (3).
- Renew nut (1).

  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



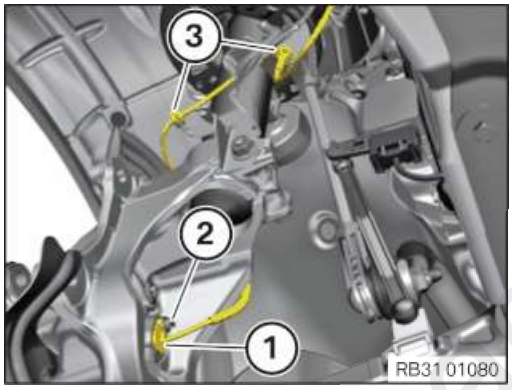
- Position the anti-roll bar link (2) at the spring strut.
- Renew nut (1).

  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).

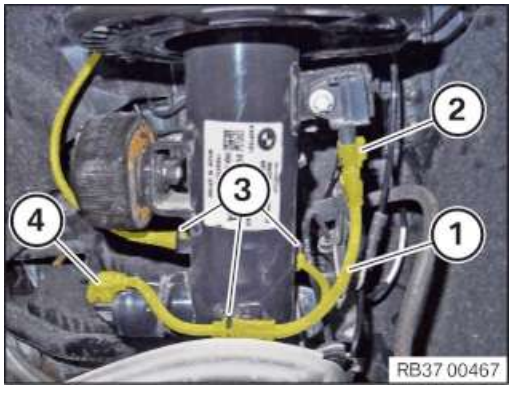
Wheel speed sensor to swivel bearing

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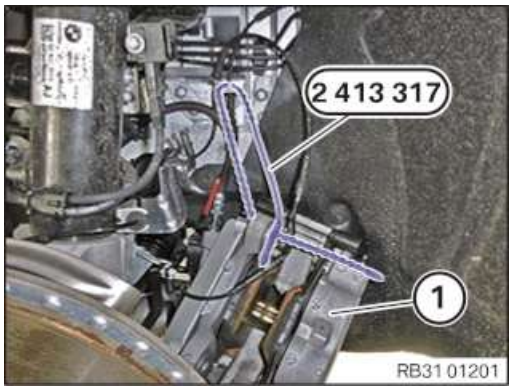
- Position brake disc (2) on wheel hub.
- Renew the screw (1).

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

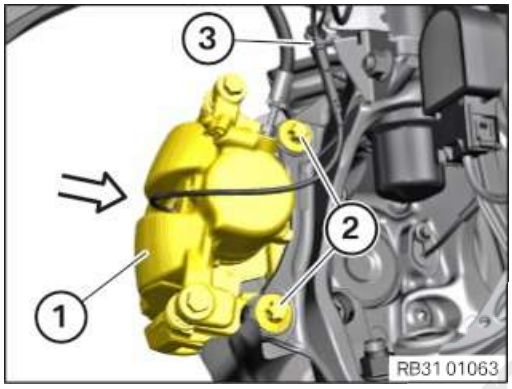
Brake disc to front wheel hub

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

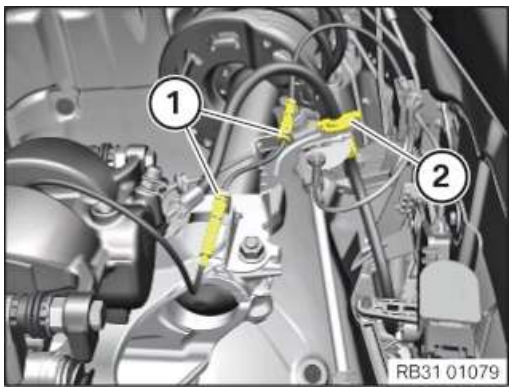
M12	Renew screw.	Tightening torque	110 Nm

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.

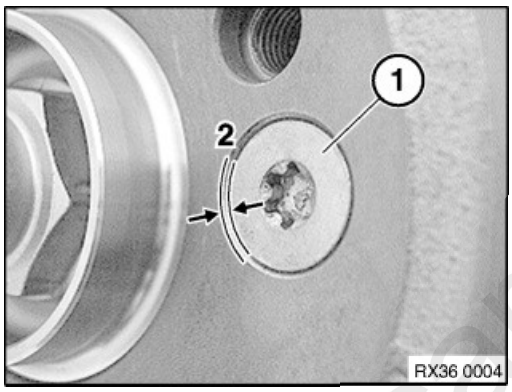
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  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.

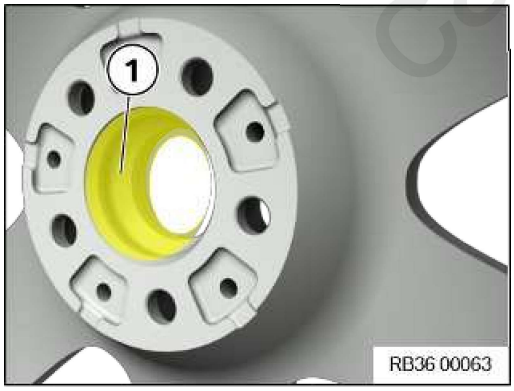
  The mounting bolt (1) for the brake disc **may not** protrude on the contact surface (2) between the brake disc and the wheel rim.

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

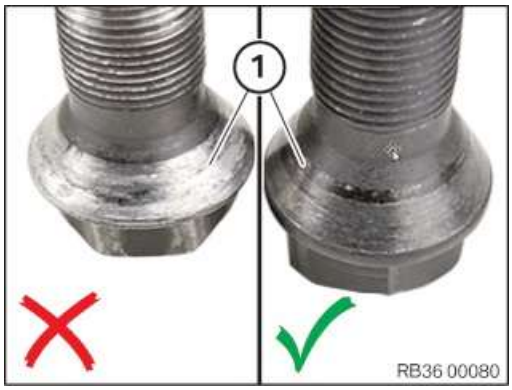
A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

- **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.		

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 °

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Nut and locknut/self-locking nut			Used in step 22
M8	Renew screws.	Tightening torque Angle of rotation	28 Nm 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

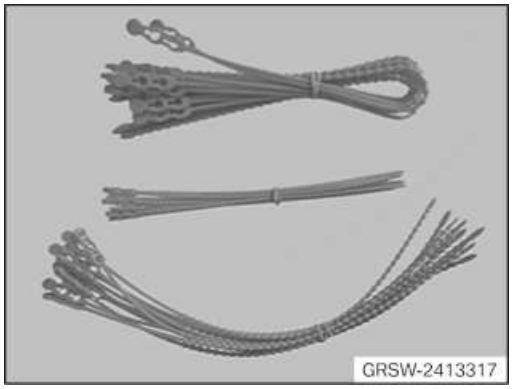
Brake disc to rear wheel hub			Used in step 35
M8	Renew screw.	Tightening torque	16 Nm

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



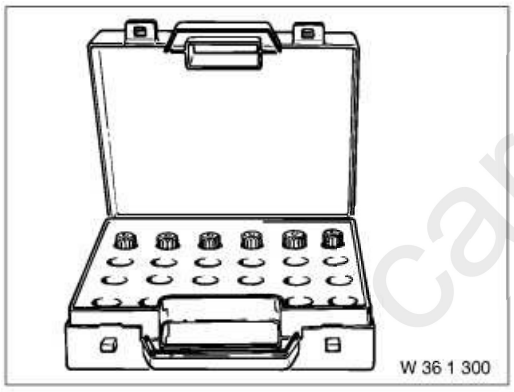
Common	Used in step 1
Usage	(Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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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37 12 012 Carrying out ride height adjustment

TECHNICAL INFORMATION

Ride height adjustment must always be performed after removal or exchange of the ride height sensor or attachment rod of the ride height sensor and after renewing the control unit for the vertical dynamic platform (VDP).

1 – Carrying out ride height adjustment



- Connect diagnosis system.
- Switch the ignition on.
- Carry out ride height calibration.
  - Service function
  - Chassis and suspension
  - VDP
  - Ride height adjustment

2 – Resetting the Tyre Pressure Monitor

TECHNICAL INFORMATION

The Tyre Pressure Monitor checks the tyre inflation pressure in all 4 wheels.

Each tyre incorporates a wheel electronics module, which constantly monitors the tyre pressure.

The system signals when the tyre pressure drops in one or more tyres.

The reset must be carried out in each case immediately after tyre pressure has been corrected, after tyres/wheels have been changed and after repairs to the air spring system.

Please refer to the corresponding motor vehicle's Owner's Handbook for details on the reset procedure.

- Reset the Tyre Pressure Monitor.

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37 12 300 Removing and installing rear left or right shock absorber

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.

PRELIMINARY WORK

1 – Remove rear 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).

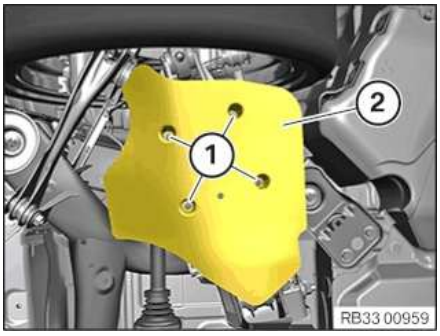
- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to remove the wheel.**

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



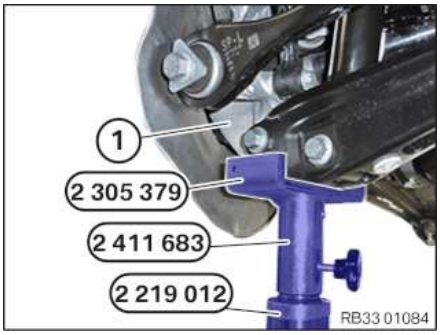
- If several wheels are removed at the same time: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Release the wheel bolts (arrows) crosswise and remove the wheel.
- To release and tighten wheel bolts with a security code: Use the correct adapter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

2 – Removing the cover of camber control arm

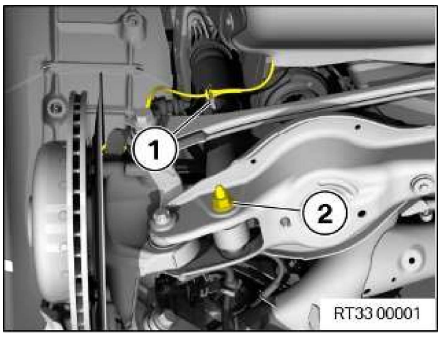


- Loosen nuts (1).
- Remove the cover (2) of camber control arm.

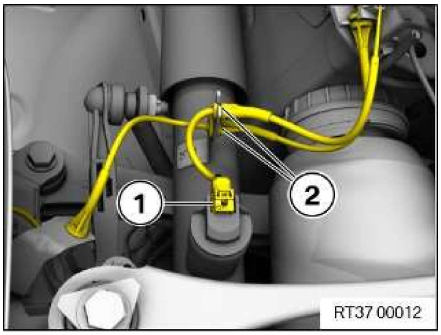
3 – Remove rear shock absorber



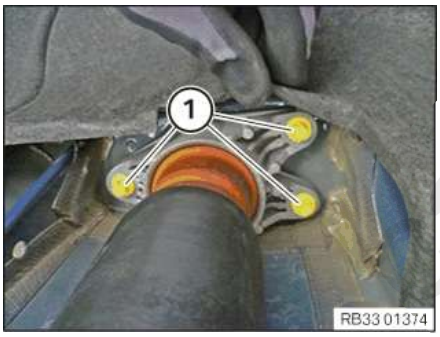
- Position universal jack 2 219 012 with the special tools 2 411 683 and 2 305 379 on the wheel carrier (1).



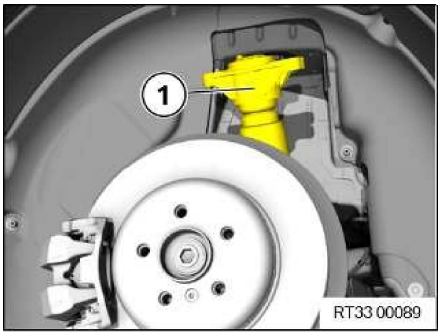
- Unclip the cable from the holder (1).
- Loosen nut (2).
- Lift the wheel carrier slightly with the universal jack and pull out the screw. In doing so, do not press against the spring force of the coil spring!



- Unlock plug connection (1) and disconnect.
- Detach lines (2) from the holder.



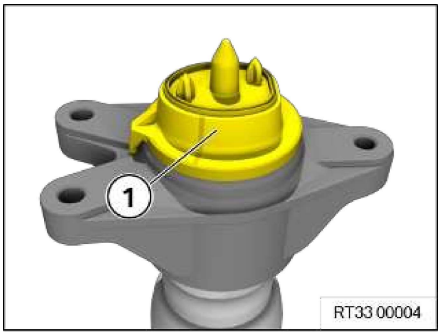
- Loosen screws (1).



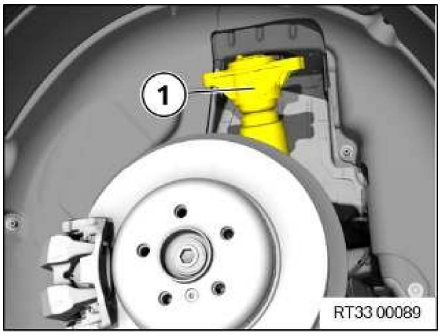
- Press the shock absorbers (1) together and guide upwards out of the wheel arch.

4 – Installing the rear shock absorber

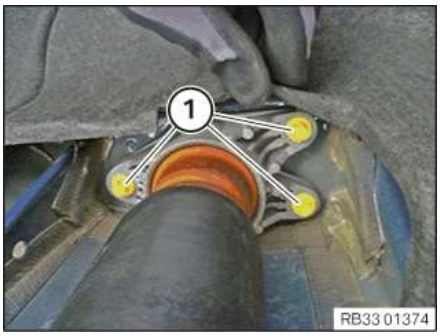
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- Check the sealing caps (1) for damage; renew if necessary.



- Press the shock absorbers (1) together and install downwards into the wheel arch.



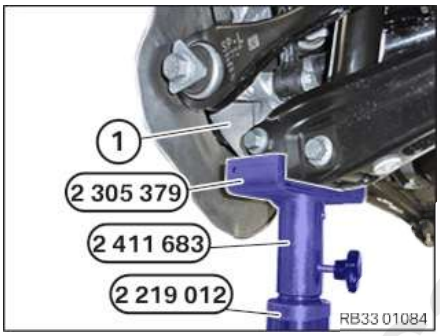
- Renew screws (1).

  Parts: Screws

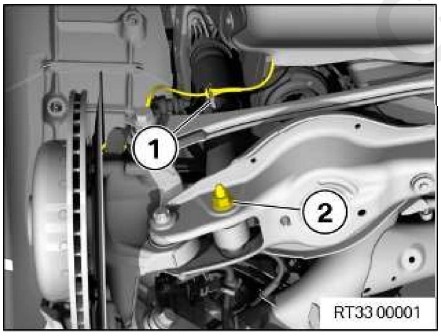
- Tighten the screws (1).

Nut and locknut/self-locking nut

M8x40	Renew screws.	Tightening torque	28 Nm



- Position universal jack 2 219 012 with the special tools 2 411 683 and 2 305 379 on the wheel carrier (1).



TECHNICAL INFORMATION

Tighten down screw connection in normal position.

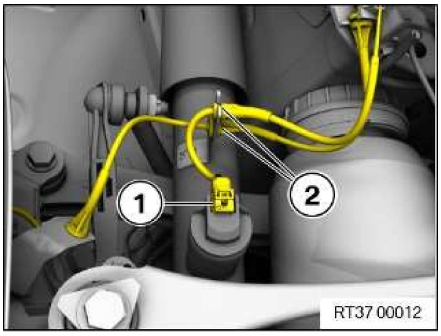
- Clip in cable into the holder (1).
- Position the shock absorbers on the camber control arm.
- Replace the bolt and the nut (2).

  Parts: Bolt, nut

- Lift the wheel carrier slightly with the universal jack and insert the bolt. In doing so, do not press against the spring force of the coil spring!
- Lower the workshop jack and set it aside.
- Tighten the nut (2) hand-tight.

  The screw connection is tightened later in the normal position.

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- Connect connectors (1) and lock.
- Attach the lines (2) to the holder.

POSTPROCESSES

5 – Install rear 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.

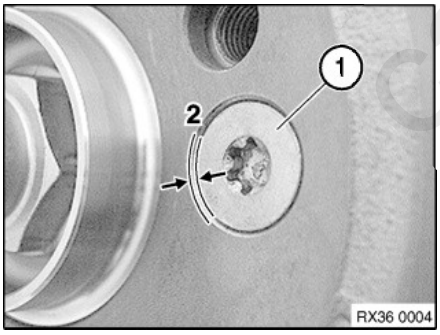
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  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.

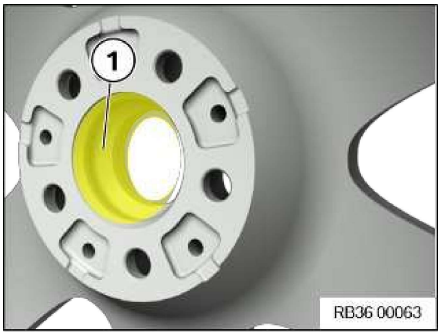
Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm

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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

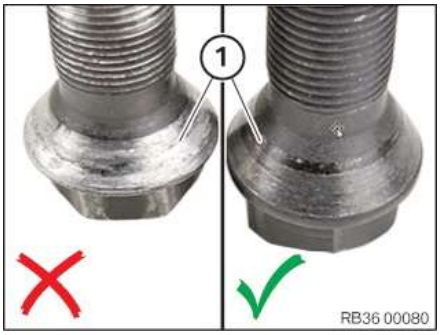
A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

- **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

- **Check wheel bolts for wear.**



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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

6 – Measuring the ride height of rear axle and adjusting the normal position

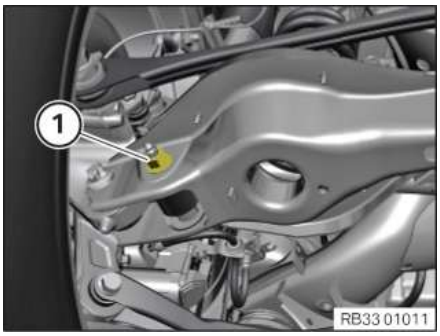


- Set the vehicle down on its wheels (e.g. On an approach ramp).
- Measure the ride height (A).
- Load or unload the vehicle until the ride height (A) is within the tolerance.

G22/G23 Rear-wheel drive, standard suspension/sport suspension settings without low-slung

Measured from centre of wheel hub to lower edge of wheel arch	
Dimension A	357 (347 - 367) mm

7 – Tightening the screw connection of the shock absorber on the camber control arm



TECHNICAL INFORMATION

Tighten down screw connection in normal position.

- Release the nut (1) by one turn and tighten it. In doing so, counter support at the screw.

Shock absorber to camber arm

M12	Renew nut and screw. Tighten in normal position.	Tightening torque Angle of rotation	100 Nm 90 °

8 – Installing the cover of the camber control arm



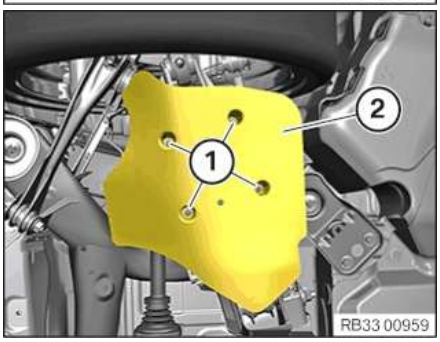
- It is imperative to note the installation location and direction of installation (1).

  Direction of installation (1):

  The arrow on the cover points in the direction of travel.

  Installation location:

  - **L** = left
  - **R** = right



- Position the cover (2) of the camber control arm on the camber control arm.
- Renew nuts (1).

  Parts: Nuts
- Tighten nuts (1).

Cover to camber control arm

M6	Replace nuts.	Tightening torque	6 Nm

Additional Information

Overview of Tightening Torques

Nut and locknut/self-locking nut — Used in step 4

M8x40	Renew screws.	Tightening torque	28 Nm

Brake disc to front wheel hub — Used in step 5

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 5

M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 5

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

Shock absorber to camber arm — Used in step 7

M12	Renew nut and screw. Tighten in normal position.	Tightening torque Angle of rotation	100 Nm 90 °

Cover to camber control arm — Used in step 8

M6	Replace nuts.	Tightening torque	6 Nm

Overview of Special Tools

carsdiagn.com

2 219 012 Hydraulic lifter



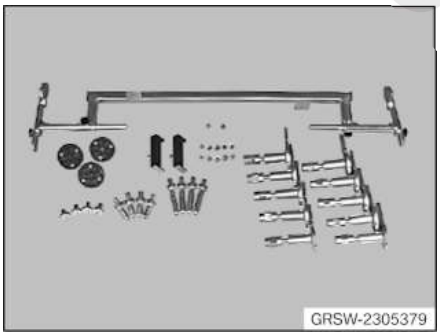
Common	Used in step 34
Usage	For raising and lowering various vehicle components.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	01 05 90 (207)

2 411 683 Adapter



Common	Used in step 34
Usage	Adapter for connecting a mounting plate part number: 2 357 071 on universal hydraulic lifting equipment centrically on piston rod.
Included in the tool or work	
Storage location	B76
Replaced by	
In connection with	
SI-Number	

2 305 379 Accessories



Common	Used in step 34
Usage	Holder set for MHT 1200 major assembly table lift and new generation (from 2020)
Included in the tool or work	
Storage location	Individual
Replaced by	
In connection with	Mobile major assembly table lift MHT 1200 81222184136
SI-Number	06 01 10 (649)

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2 344 011 Tool



Common	Used in step 5
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)

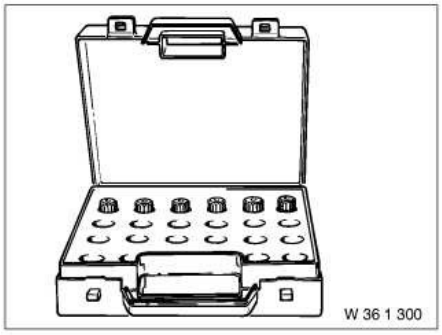
Replacement tools:

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	

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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 without low-slung Used in step 6

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

Dimension A	357 (347 - 367) mm

Links

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Repair instructions	Used in step
00 02 001 Raising the vehicle using a vehicle lift	15

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37 12 310 Replacing rear left or right side shock absorber

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.

PRELIMINARY WORK

1 – Remove rear 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).

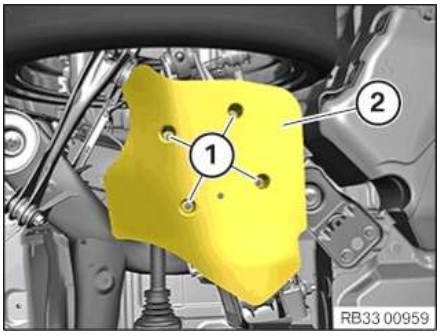
- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to remove the wheel.**

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



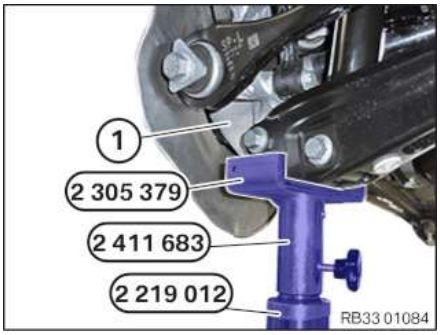
- If several wheels are removed at the same time: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Release the wheel bolts (arrows) crosswise and remove the wheel.
- To release and tighten wheel bolts with a security code: Use the correct adapter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

2 – Removing the cover of camber control arm

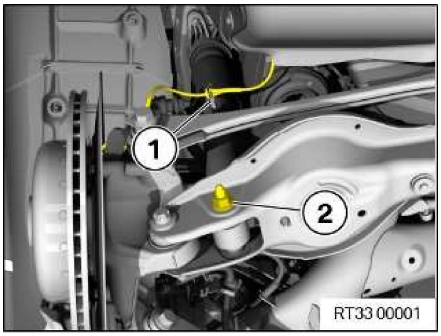


- Loosen nuts (1).
- Remove the cover (2) of camber control arm.

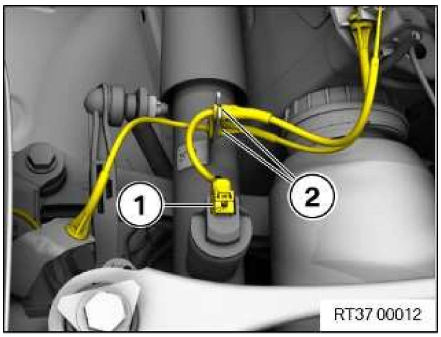
3 – Remove rear shock absorber



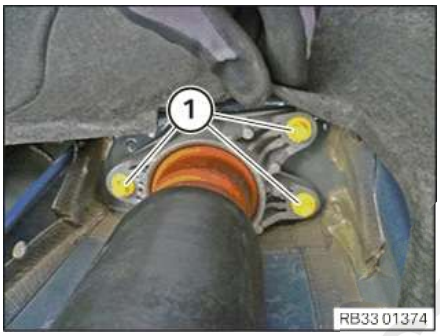
- Position universal jack 2 219 012 with the special tools 2 411 683 and 2 305 379 on the wheel carrier (1).



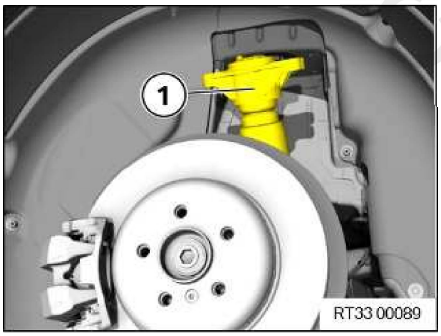
- Unclip the cable from the holder (1).
- Loosen nut (2).
- Lift the wheel carrier slightly with the universal jack and pull out the screw. In doing so, do not press against the spring force of the coil spring!



- Unlock plug connection (1) and disconnect.
- Detach lines (2) from the holder.



- Loosen screws (1).

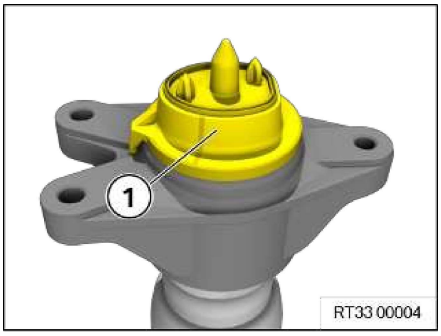


- Press the shock absorbers (1) together and guide upwards out of the wheel arch.

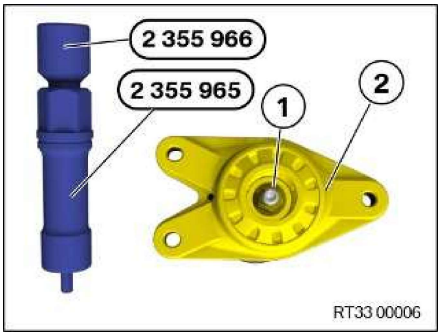
MAIN WORK

4 – Replacing the shock absorber

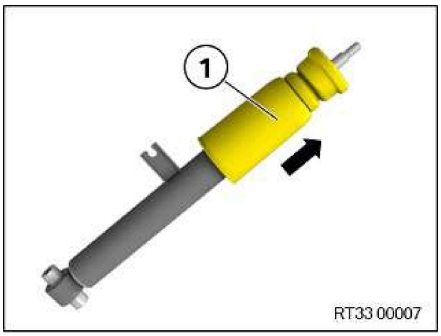
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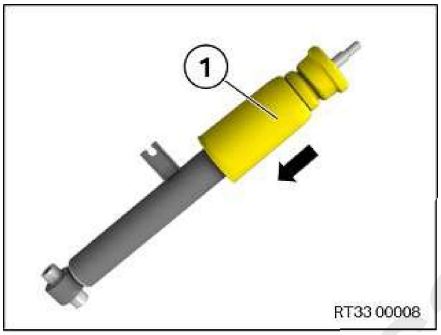
- Remove the centring plate (1).



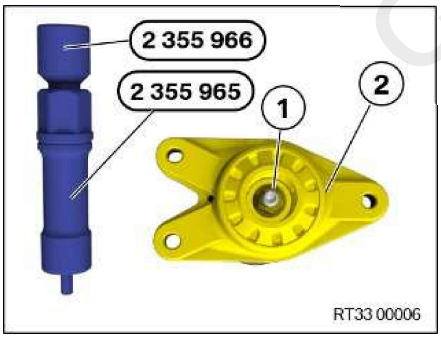
- Release the nut (1) with the special tools and .
- Remove the support bearing (2) from the shock absorber.



- Remove the auxiliary damper (1).



- Check the auxiliary damper (1) for damage and renew if necessary.
- Attach the auxiliary damper (1) to the new shock absorber.

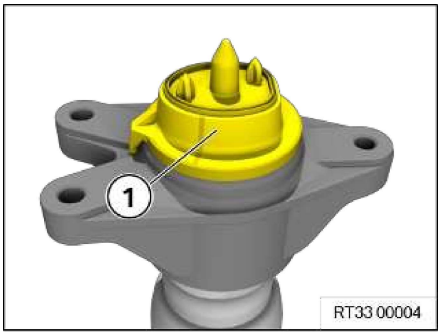


- Attach support bearing (2) to the new shock absorber.
- Renew nut (1).

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

Support bearing on shock absorber

M10	Renew nut.	Tightening torque	41 Nm

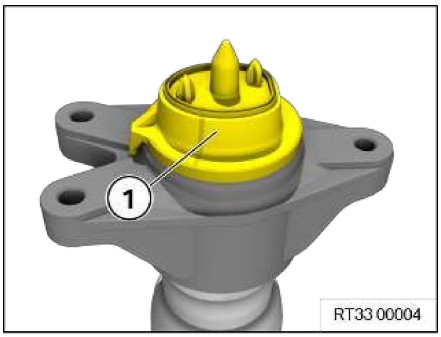


- Check the centering plate (1) for damage and renew if necessary.
- Install the centring plate (1).

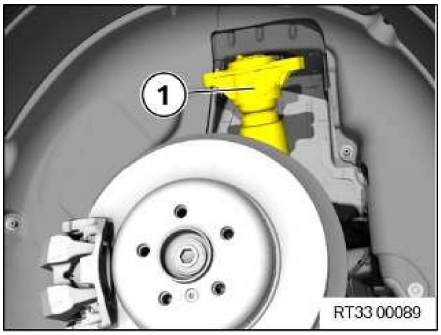
POSTPROCESSES

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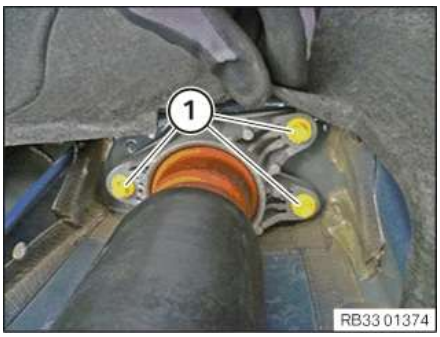
5 – Installing the rear shock absorber



- Check the sealing caps (1) for damage; renew if necessary.



- Press the shock absorbers (1) together and install downwards into the wheel arch.

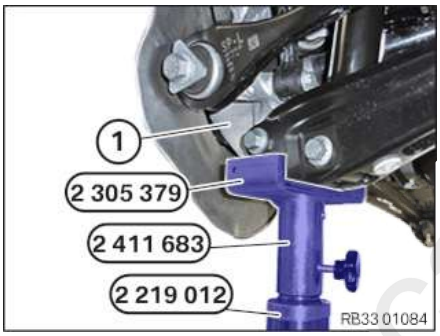


- Renew screws (1).

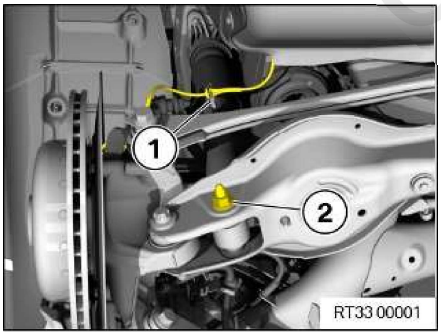
  Parts: Screws
- Tighten the screws (1).

Nut and locknut/self-locking nut

M8x40	Renew screws.	Tightening torque	28 Nm



- Position universal jack 2 219 012 with the special tools 2 411 683 and 2 305 379 on the wheel carrier (1).



TECHNICAL INFORMATION

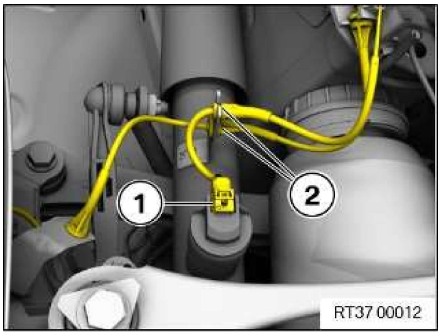
Tighten down screw connection in normal position.

- Clip in cable into the holder (1).
- Position the shock absorbers on the camber control arm.
- Replace the bolt and the nut (2).

  Parts: Bolt, nut
- Lift the wheel carrier slightly with the universal jack and insert the bolt. In doing so, do not press against the spring force of the coil spring!
- Lower the workshop jack and set it aside.
- Tighten the nut (2) hand-tight.

  The screw connection is tightened later in the normal position.

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- Connect connectors (1) and lock.
- Attach the lines (2) to the holder.

6 – Install rear 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.

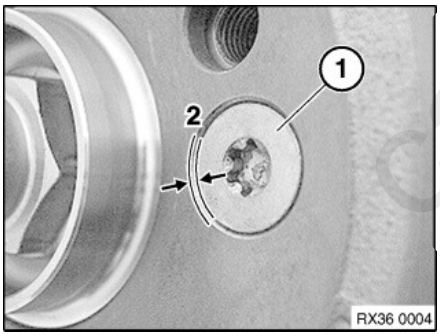
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  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.

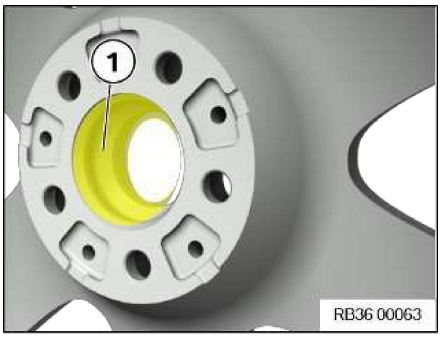
  The mounting bolt (1) for the brake disc **may not** protrude on the contact surface (2) between the brake disc and the wheel rim.

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

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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

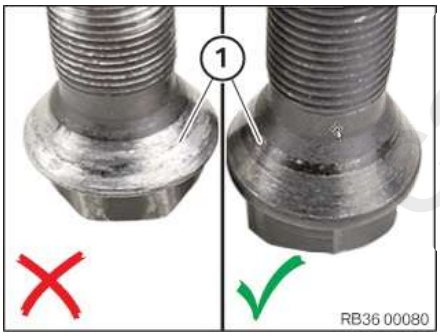
A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

- **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

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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. 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

7 – Measuring the ride height of rear axle and adjusting the normal position

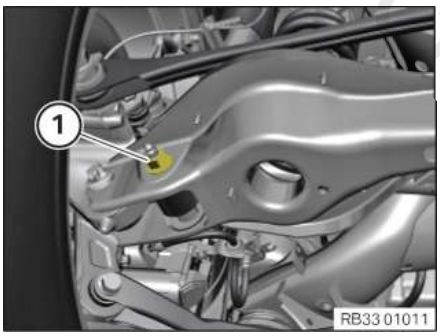


- Set the vehicle down on its wheels (e.g. On an approach ramp).
- Measure the ride height (A).
- Load or unload the vehicle until the ride height (A) is within the tolerance.

G22/G23 Rear-wheel drive, standard suspension/sport suspension settings without low-slung

Measured from centre of wheel hub to lower edge of wheel arch	
Dimension A	357 (347 - 367) mm

8 – Tightening the screw connection of the shock absorber on the camber control arm



TECHNICAL INFORMATION

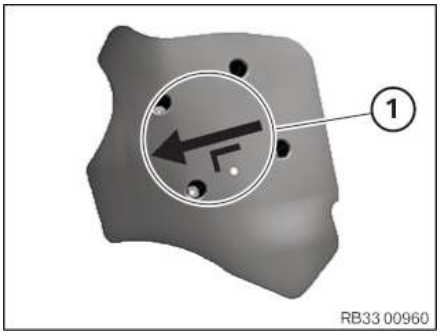
Tighten down screw connection in normal position.

- Release the nut (1) by one turn and tighten it. In doing so, counter support at the screw.

Shock absorber to camber arm

M12	Renew nut and screw. Tighten in normal position.	Tightening torque Angle of rotation	100 Nm 90 °

9 – Installing the cover of the camber control arm



- It is imperative to note the installation location and direction of installation (1).

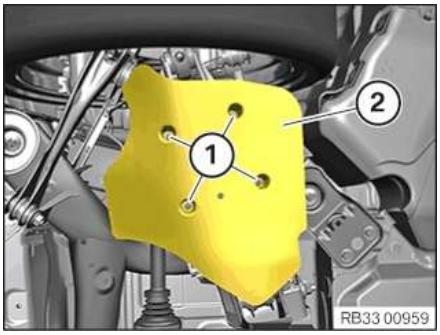
  Direction of installation (1):

  The arrow on the cover points in the direction of travel.

  Installation location:

  - **L** = left
  - **R** = right

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- Position the cover (2) of the camber control arm on the camber control arm.
- Renew nuts (1).

  Parts: Nuts
- Tighten nuts (1).

Cover to camber control arm

M6	Replace nuts.	Tightening torque	6 Nm

Additional Information

Overview of Tightening Torques

Support bearing on shock absorber — Used in step 4

M10	Renew nut.	Tightening torque	41 Nm

Nut and locknut/self-locking nut — Used in step 5

M8x40	Renew screws.	Tightening torque	28 Nm

Brake disc to front wheel hub — Used in step 6

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 6

M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 6

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

Shock absorber to camber arm — Used in step 8

M12	Renew nut and screw. Tighten in normal position.	Tightening torque Angle of rotation	100 Nm 90 °

Cover to camber control arm — Used in step 9

M6	Replace nuts.	Tightening torque	6 Nm

Overview of Special Tools

2 219 012 Hydraulic lifter



Common — Used in step 35

Usage	For raising and lowering various vehicle components.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	01 05 90 (207)

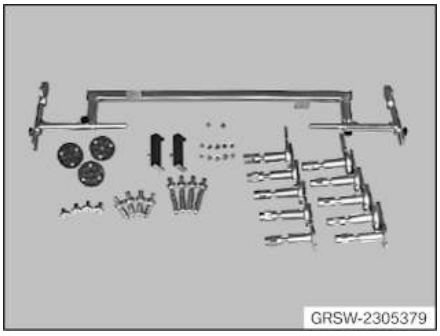
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2 411 683 Adapter



Common	Used in step 35
Usage	Adapter for connecting a mounting plate part number: 2 357 071 on universal hydraulic lifting equipment centrically on piston rod.
Included in the tool or work	
Storage location	B76
Replaced by	
In connection with	
SI-Number	

2 305 379 Accessories



Common	Used in step 35
Usage	Holder set for MHT 1200 major assembly table lift and new generation (from 2020)
Included in the tool or work	
Storage location	Individual
Replaced by	
In connection with	Mobile major assembly table lift MHT 1200 81222184136
SI-Number	06 01 10 (649)

2 344 011 Tool



Common	Used in step 6
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	

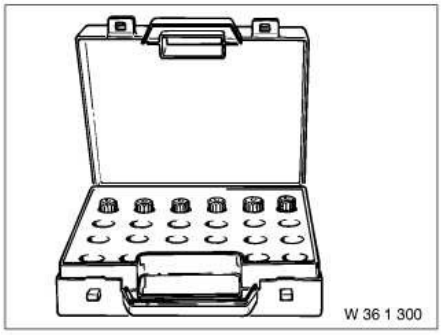
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0 495 224 (36 1 326) Wheel stud



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	

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	

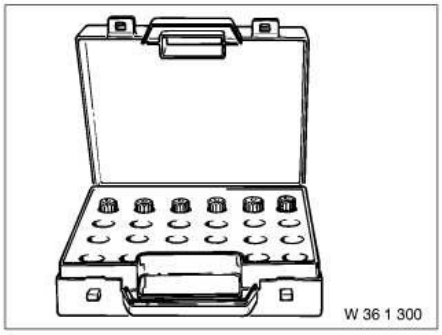
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0 495 228 (36 1 331) Wheel stud



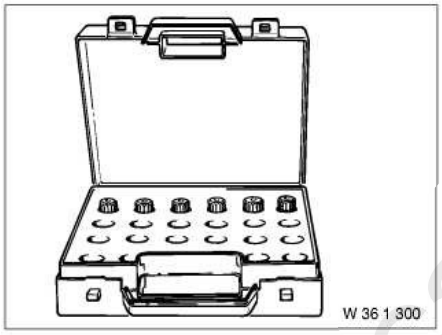
Common	Used in step 1
Usage	(Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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 without low-slung	Used in step 7
Measured from centre of wheel hub to lower edge of wheel arch	
Dimension A	357 (347 - 367) mm

Links

Repair instructions	Used in step
00 02 001 Raising the vehicle using a vehicle lift	16

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37 14 605 Replacing front left or right vertical acceleration sensor

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



Electrostatic discharge.

Damage to or destruction of electrical components.

- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the housings of electrical components. Do not touch pins or multi-pin connectors directly.
- Wear electrically conductive clothing and antistatic shoes (with ESD symbol).
- For additional information see: 61 35 ... Notes for ESD protection (electrostatic discharge)

NOTICE

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

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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.

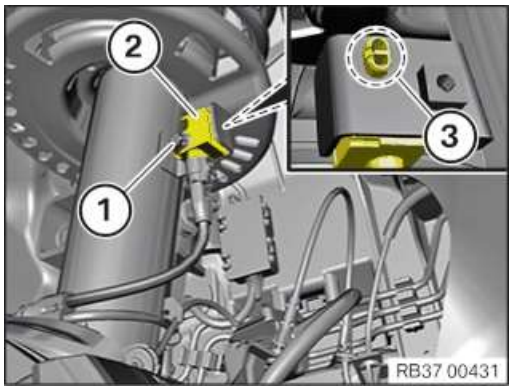


- If several wheels are removed at the same time: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Release the wheel bolts (arrows) crosswise and remove the wheel.
- To release and tighten wheel bolts with a security code: Use the correct adapter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

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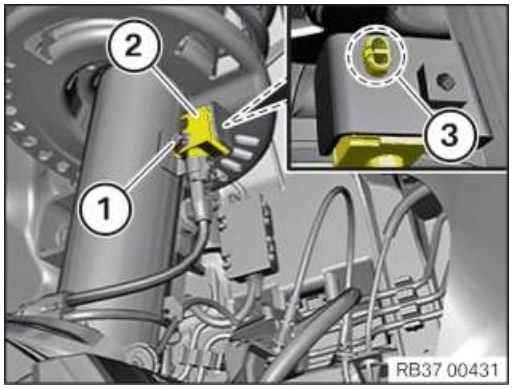
MAIN WORK

2 – Removing the front vertical acceleration sensor



- Unlock and disconnect the plug connection on the vertical acceleration sensor (2).
- Loosen screw (1).
- Release and remove the vertical acceleration sensor (2) from the holder (3).

3 – Install the front vertical acceleration sensor



- Position the vertical acceleration sensor (2) on the holder (3).
- Tighten down screw (1).

Vertical acceleration sensor to spring strut shock absorber

M6		Tightening torque	9 Nm

- Connect and lock the connector on the vertical acceleration sensor (2).

POSTPROCESSES

4 – 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.

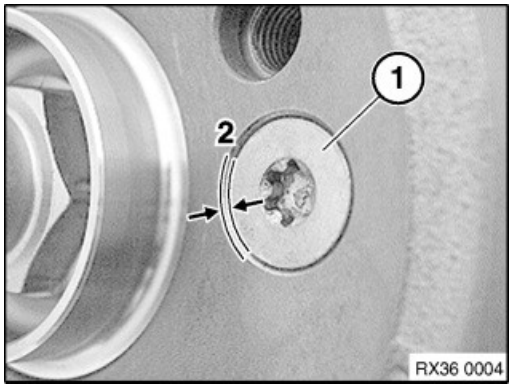
  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.

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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.

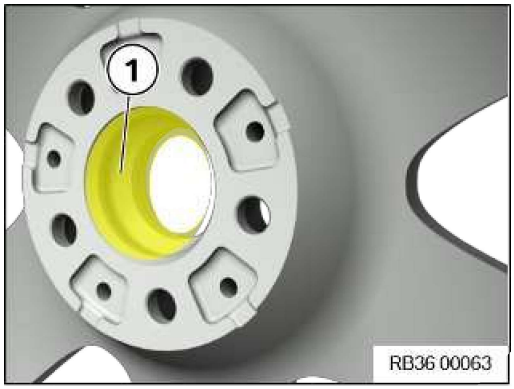
  The mounting bolt (1) for the brake disc **may not** protrude on the contact surface (2) between the brake disc and the wheel rim.

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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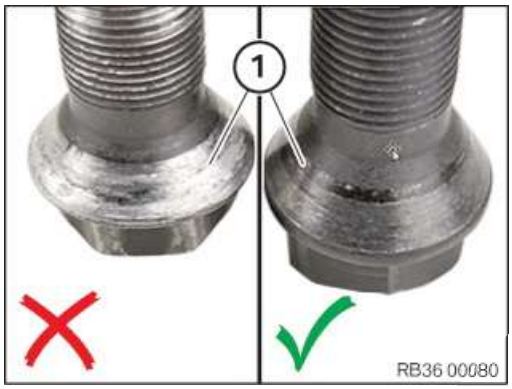


TECHNICAL INFORMATION

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.		

Additional Information

Overview of Tightening Torques

Vertical acceleration sensor to spring strut shock absorber — Used in step 3

M6		Tightening torque	9 Nm

Brake disc to front wheel hub — Used in step 4

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 4

M8	Renew screw.	Tightening torque	16 Nm

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Wheel bolts			Used in step 4
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

2 344 011 Tool



Common	Used in step 4
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	

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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	

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	

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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	

Links

Repair instructions	Used in step
61 35 ... Notes on ESD protection (Electro Static Discharge)	
61 35 ... Notes on ESD protection (Electro Static Discharge)	
00 02 001 Raising the vehicle using a vehicle lift	14

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37 14 511 Replacing front ride height sensor

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

Electrostatic discharge.

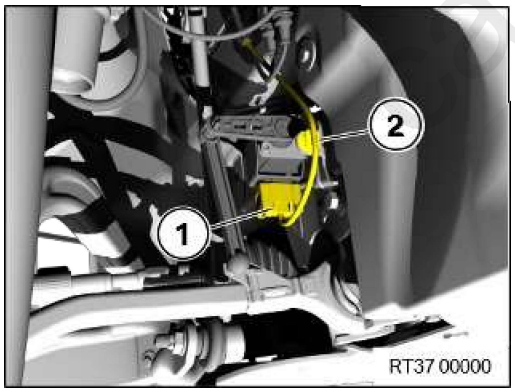
Damage to or destruction of electrical components.

- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the housings of electrical components. Do not touch pins or multi-pin connectors directly.
- Wear electrically conductive clothing and antistatic shoes (with ESD symbol).
- For additional information see: 61 35 ... Notes for ESD protection (electrostatic discharge)

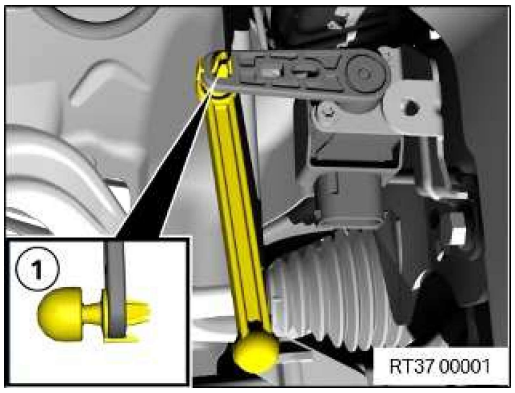
NOTICE

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

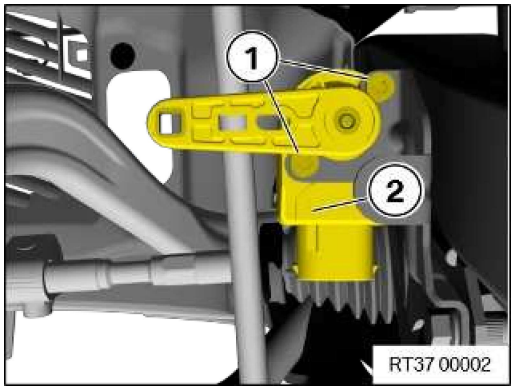
1 – Remove ride height sensor, front



- Unlock plug connection (1) and disconnect.
- Unclip the cable clip (2).

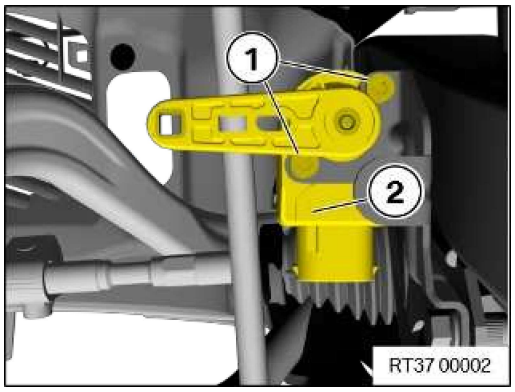


- Unclip the jointed rod (1) at the ride height sensor.



- Loosen screws (1).
- Remove the ride height sensor (2).

2 – Install ride height sensor, front

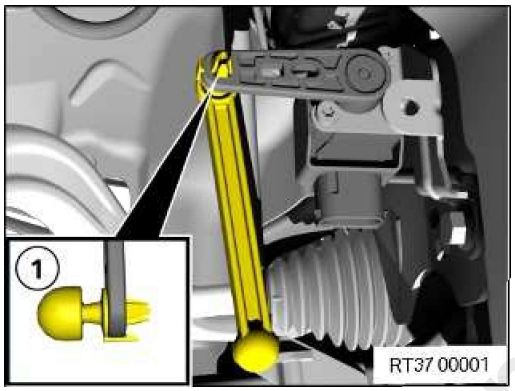


- Install the ride height sensor (2).
- Renew the screw (1).

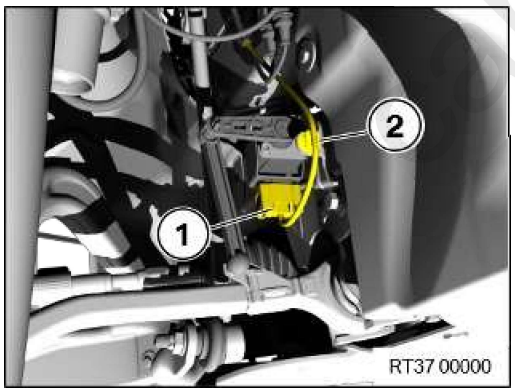
  Parts: Screw
- Tighten the screws (1).

Ride height sensor to holder

M5	Renew screw.	Tightening torque	5 Nm



- Clip the jointed rod (1) in at the ride height sensor.



- Connect connectors (1) and lock.
- Clip in the cable clip (2).

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3 – Carrying out ride height adjustment



- Connect diagnosis system.
- Switch the ignition on.
- Carry out ride height calibration.
  - Service function
  - Chassis and suspension
  - VDP
  - Ride height adjustment

4 – Adjusting headlights

TECHNICAL INFORMATION

Notes on headlight adjustment are a fundamental requirement for these repair instructions and must be complied with at all times.

For additional information see: 6310 ... Test prerequisite for adjusting headlights

NOTICE

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



- If necessary, remove the cover over the adjusting screws for headlight adjustment.
- Adjust the height at the adjusting screw (1).
- **US version:** Set the lateral adjustment only if the plug on the adjusting screw for lateral adjustment is missing or damaged.

  Remove damaged plug if necessary (refer to additional information).
- Turn adjusting screw (2) for a correct lateral adjustment.
- **US version:** If the lateral adjustment has been checked or corrected: Renew plugs and push into the adjusting screw for the lateral adjustment **without damaging it** (see additional information).
- If necessary, fit a cover over the adjusting screws for headlight adjustment.

5 – Resetting the Tyre Pressure Monitor

TECHNICAL INFORMATION

The Tyre Pressure Monitor checks the tyre inflation pressure in all 4 wheels.

Each tyre incorporates a wheel electronics module, which constantly monitors the tyre pressure.

The system signals when the tyre pressure drops in one or more tyres.

The reset must be carried out in each case immediately after tyre pressure has been corrected, after tyres/wheels have been changed and after repairs to the air spring system.

Please refer to the corresponding motor vehicle's Owner's Handbook for details on the reset procedure.

- Reset the Tyre Pressure Monitor.

Additional Information

Overview of Tightening Torques

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Overview of Tightening Torques

Ride height sensor to holder Used in step 2

M5	Renew screw.	Tightening torque	5 Nm

Links

Repair instructions	Used in step
61 35 ... Notes on ESD protection (Electro Static Discharge)	
61 35 ... Notes on ESD protection (Electro Static Discharge)	
63 10 ... Test requirements for headlights vertical aim adjustment	4
00 02 001 Raising the vehicle using a vehicle lift	

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37 14 512 Replacing rear ride height sensor

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

Electrostatic discharge.

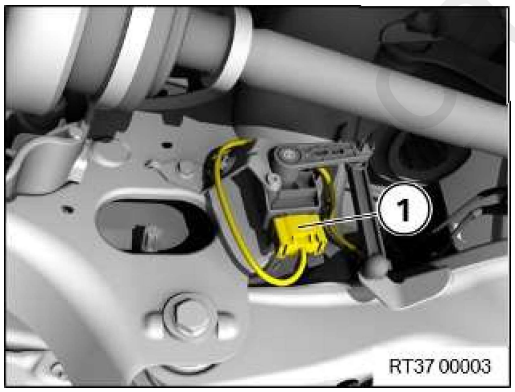
Damage to or destruction of electrical components.

- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the housings of electrical components. Do not touch pins or multi-pin connectors directly.
- Wear electrically conductive clothing and antistatic shoes (with ESD symbol).
- For additional information see: 61 35 ... Notes for ESD protection (electrostatic discharge)

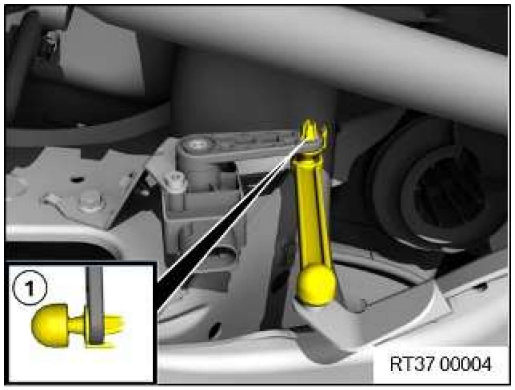
NOTICE

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

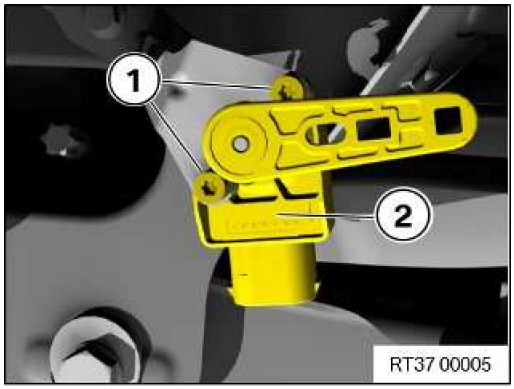
1 – Removing the rear ride height sensor



- Unlock plug connection (1) and disconnect.

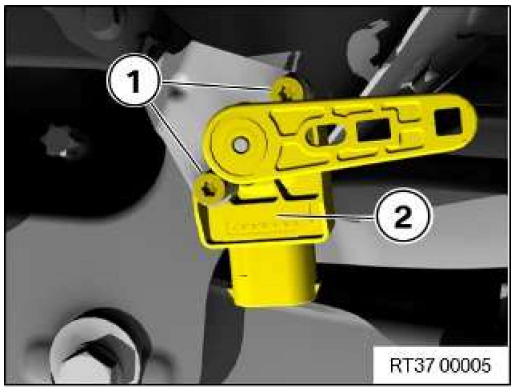


- Unclip the jointed rod (1) at the ride height sensor.



- Loosen screws (1).
- Remove the ride height sensor (2).

2 – Installing the rear ride height sensor

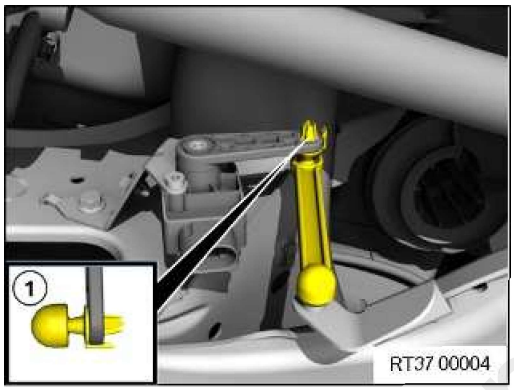


- Install the ride height sensor (2).
- Renew screws (1).

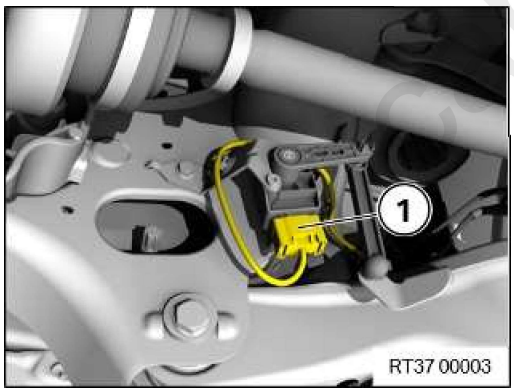
  Parts: Bolts
- Tighten the screws (1).

Ride height sensor to holder

M5	Renew screw.	Tightening torque	5 Nm



- Clip the jointed rod (1) in at the ride height sensor.



- Connect connectors (1) and lock.

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3 – Carrying out ride height adjustment



- Connect diagnosis system.
- Switch the ignition on.
- Carry out ride height calibration.
  - Service function
  - Chassis and suspension
  - VDP
  - Ride height adjustment

4 – Adjusting headlights

TECHNICAL INFORMATION

Notes on headlight adjustment are a fundamental requirement for these repair instructions and must be complied with at all times.

For additional information see: 6310 ... Test prerequisite for adjusting headlights

NOTICE

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- If necessary, remove the cover over the adjusting screws for headlight adjustment.
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5 – Resetting the Tyre Pressure Monitor

TECHNICAL INFORMATION

The Tyre Pressure Monitor checks the tyre inflation pressure in all 4 wheels.

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Please refer to the corresponding motor vehicle's Owner's Handbook for details on the reset procedure.

- Reset the Tyre Pressure Monitor.

Additional Information

Overview of Tightening Torques

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Overview of Tightening Torques

Ride height sensor to holder Used in step 2

M5	Renew screw.	Tightening torque	5 Nm

Links

Repair instructions	Used in step
61 35 ... Notes on ESD protection (Electro Static Discharge)	
61 35 ... Notes on ESD protection (Electro Static Discharge)	
63 10 ... Test requirements for headlights vertical aim adjustment	4
00 02 001 Raising the vehicle using a vehicle lift	

cardiagn.com

37 14 573 Replacing vertical dynamic platform (VDP) control unit (After vehicle diagnosis) (without programming/encoding, see 61 00 ...)

RISK OF DAMAGE



Electrostatic discharge.

Damage to or destruction of electrical components.

- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the housings of electrical components. Do not touch pins or multi-pin connectors directly.
- Wear electrically conductive clothing and antistatic shoes (with ESD symbol).
- For additional information see: 61 35 ... Notes for ESD protection (electrostatic discharge)

TECHNICAL INFORMATION

Ride height adjustment must always be performed after removal or exchange of the ride height sensor or attachment rod of the ride height sensor and after renewing the control unit for the vertical dynamic platform (VDP).

PRELIMINARY WORK

1 – Deactivating the 48 V electrical system

Prerequisite

Ignition is switched off.

WARNING

Deactivation of the 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no battery charger** is connected to the jump start terminal point in the engine compartment.
- For vehicles with additional electrical systems (48 V electrical system, high-voltage vehicle electrical system), it is mandatory to deactivate them **before** disconnecting the vehicle battery.

WARNING

Deactivation of the 48 V electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no charger** is connected to the jump start support point in the engine compartment.

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RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.

TECHNICAL INFORMATION

Follow notes for 48-V battery. See further information 6120 ... Notes on 48-V battery.



- Deactivate the 48V electrical system by opening the bonnet.

  The deactivation takes place automatically.



Check

TECHNICAL INFORMATION

Zero voltage (48V electrical system is switched off) is displayed only in PAD mode.

- Press the START-STOP button quickly 3 times without stepping on the brake pedal to establish the PAD mode.
- Check isolation from the supply in the instrument cluster in PAD mode.

desired state

- The Check Control message "48V electrical system switched off." (1) is displayed.

Result

» **The absence of voltage** cannot be determined by means of the Check Control message "48V electrical system switched off:" (1). Work is not permitted to be started.

Measure

- Carry out the service function "48 V electrical system deactivation".
  - Vehicle management > Service functions > Voltage supply > Deactivate 48 V electrical system

Only when the Check Control message “48 V electrical system switched off.” (1) is displayed in the instrument cluster is it permitted to disconnect the 12 V battery.

If the absence of voltage is not indicated clearly, contact Technical Support.

Result

» The Check Control message signals that the 48V electrical system has been switched off.

Measure

- Exit PAD mode by pressing the START-STOP button once without depressing the brake pedal.

  The work “Disconnecting the negative battery cable of the 48-V battery” can be started.



- Unlock and disconnect plug connection (1) of the CAN bus.
- Release the clip (2).



- Loosen nut (1).
- Pull off negative battery cable (2) of the 48-V battery from the negative battery terminal, set it aside and secure it.



WARNING

Unprotected battery terminals.

Risk of short circuits! Risk of fire!

- Cover the vehicle battery.

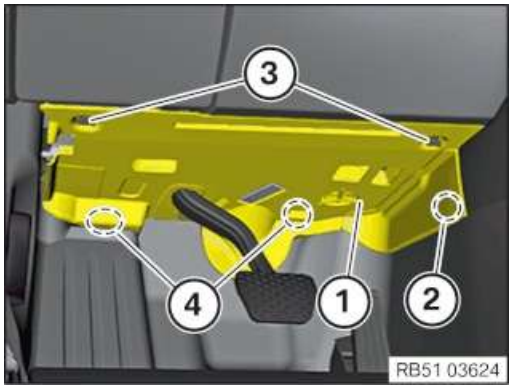
- Cover the vehicle battery with the special tool as shown.
- Position the battery earth lead (1) as shown.

2 – Disconnecting all battery earth leads



- See additional information.

3 – Removing the trim panel for pedal mechanism



- Unclip the trim panel for the pedal mechanism (1) towards the inside in this area (2).
- Turn the locks (3) by 90°.
- Detach the trim panel for the pedal mechanism (1) inwards out of the guides (4).
- Unlock associated plug connection and disconnect.

4 – Removing the inner door sill cover strip

RISK OF DAMAGE

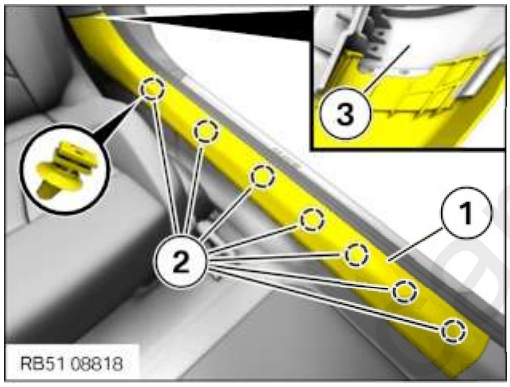
Bending of plastic parts.

Application of too much force can lead to bending of plastic parts.

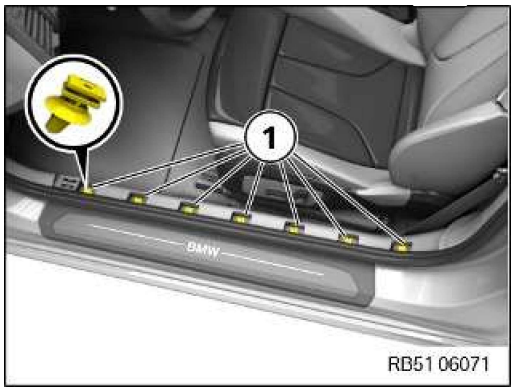
- Place special tool directly beside the mounting clip.
- Continue unclipping the part without using the tool if possible.

NOTICE

Schematic diagram is for example purposes. Some parts may differ in certain details.

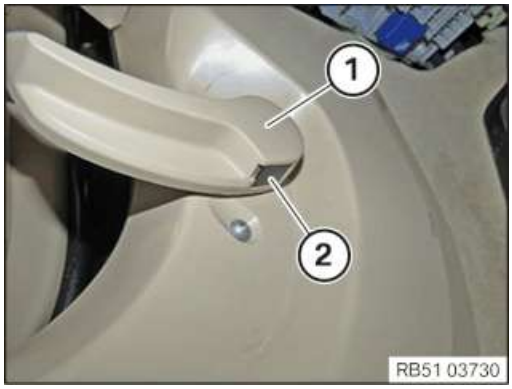


- Release door sill cover strip (1) with clips (2) starting from the front using a suitable special tool from the set of special tools 0 493 752 (00 9 329).
- Guide out and remove door sill cover strip (1) under the rear side trim panel (3) .

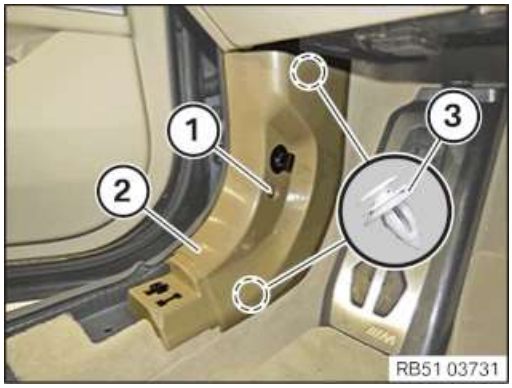


- If necessary, remove clips (1) and connect them to the door sill cover strip.

5 – Remove the side trim panel in the footwell at the left A-pillar



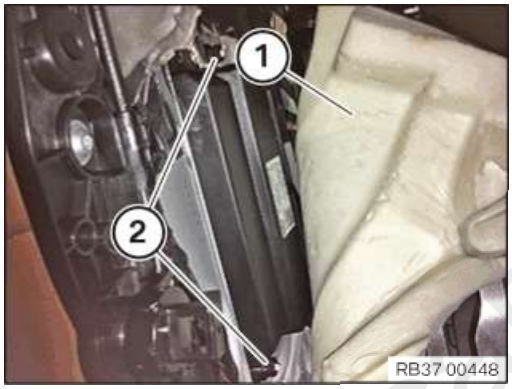
- Pull bonnet release lever (1) towards the rear.
- Lever out the locking wedge (2).
- Remove the bonnet release lever (1) inward.



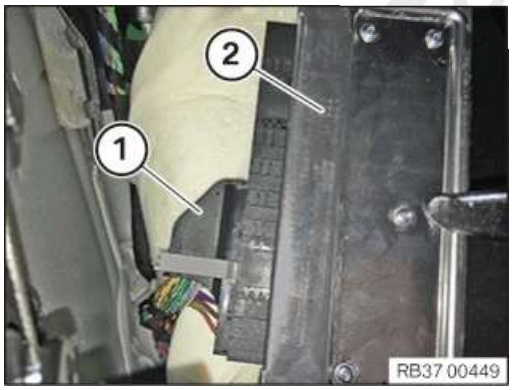
- Loosen screw (1).
- Loosen the side trim panel (2) at the clips (3) and remove it toward the inside.

MAIN WORK

6 – Remove VDP control unit



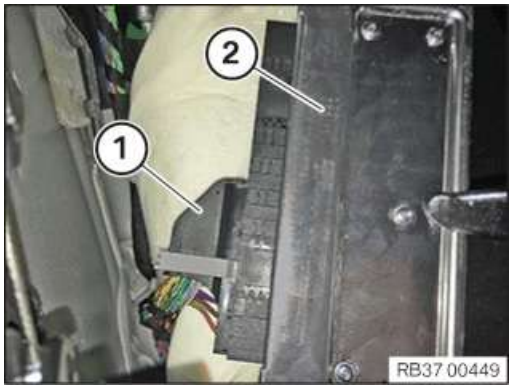
- Fold carpet (1) in the footwell to one side.
- Loosen nuts (2).



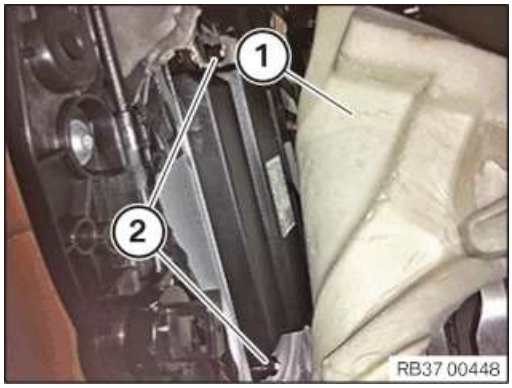
- Unlock and pull off the plug connection (1).
- Remove the VDP control unit (2).

7 – Install VDP control unit

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- Connect the connector (1) to the VDP control unit and lock.



- Tighten nuts (2).

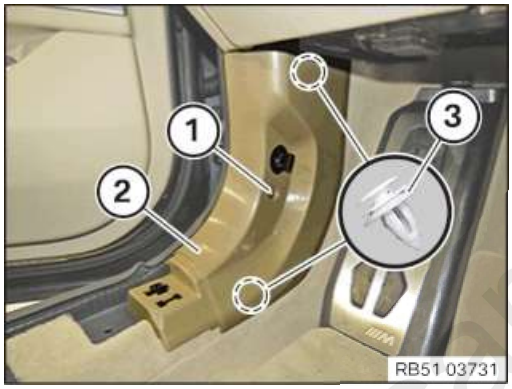
VDP control unit to body

Plastic nut	Renew plastic nut.	Tightening torque	2,6 Nm

- Fold back carpet (1) in the footwell.

POSTPROCESSES

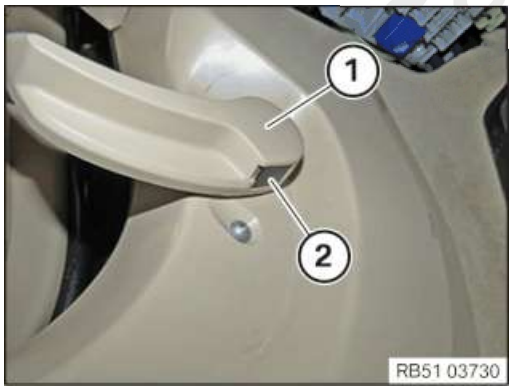
8 – Install the side trim panel in the footwell at the left A-pillar



- Check the clips (3) for damage and renew if necessary.
- Position the side trim panel (2) and engage it in the clips (3).
- Make sure that the side trim panel (2) is correctly fitted against edge protection.
- Tighten down screw (1).

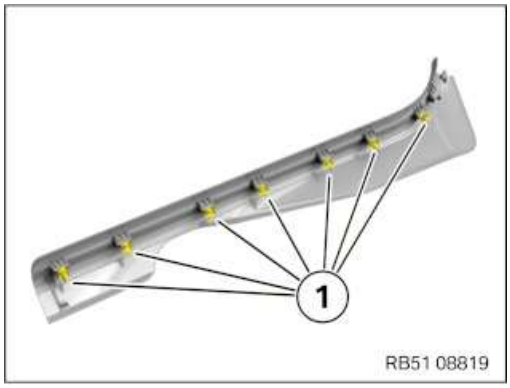
A-pillar footwell side trim panel

Screw		Tightening torque	2,5 Nm



- Install bonnet release lever (1).
- Pull bonnet release lever (1) towards the rear.
- Install locking wedge (2).

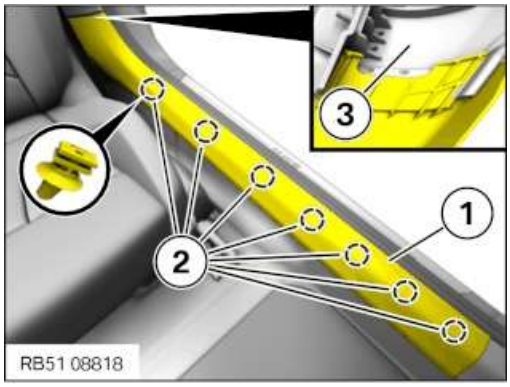
9 – Installing the inner door sill cover strip



NOTICE

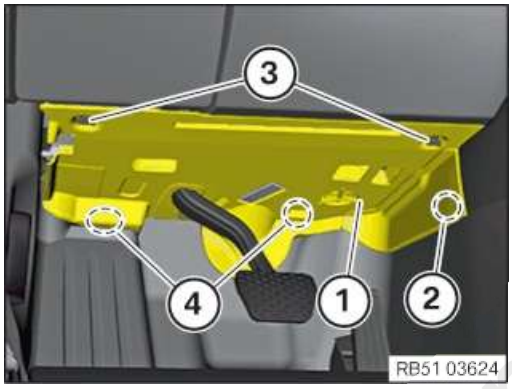
Schematic diagram is for example purposes. Some parts may differ in certain details.

- Check the clips (1) for damage and renew if necessary.



- Insert the door sill cover strip (1) below the rear side trim panel (3).
- Clip the door sill cover strip (1) in with the clips (2).

10 – Installing the trim panel for the pedal mechanism



- Connect associated connector.
- Attach the trim panel for the pedal mechanism (1) in the guides (4) and fold it up.
- Clip the trim panel for the pedal mechanism (1) into the centre console in this area (2).

TECHNICAL INFORMATION

It is **imperative** that the screws caps of the trim panel be correctly locked. This is the only way to ensure that the trim panel does not come loose and potentially tilt into the pedal area.

- Insert screw caps (3) correctly and turn by 90° to lock.

11 – Connecting all battery earth leads



- See additional information.

12 – Activating the 48 V electrical system

Prerequisite

Ignition is switched off.

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RISK OF DAMAGE

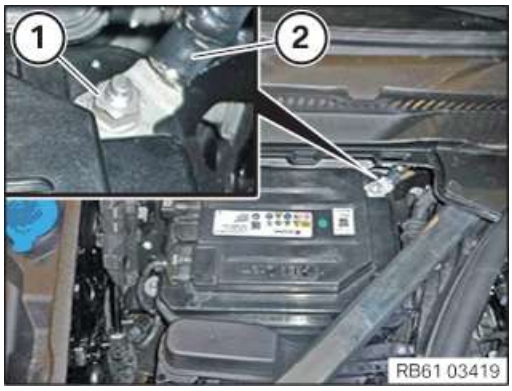
Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.



- Lift battery earth lead (1).
- Remove special tool .



- Release the negative battery cable (2) of the 48-V battery from the mounting.
- Position the negative battery cable (2) of the 48-V battery on the negative battery terminal.
- Tighten nut (1).

Negative battery cable to 48-V battery

Nut M8		Tightening torque	19 Nm



- Connect the connector (1) of the CAN bus and lock it.
- Clip in clip (2).



- Activate the 48V electrical system by closing the bonnet.

  The activation takes place automatically.

13 – Program/encode the VDP control unit

▸ **Encode/program control unit(s)**

Prerequisite

Component has been replaced.

TECHNICAL INFORMATION

Use the most recent software version to prevent faults during programming/encoding.
The battery voltage must not fall below 13.0 V during programming.
Use only chargers for a low volt-vehicle electrical system that are recommended by BMW.

TECHNICAL INFORMATION

No high-voltage switch off is required in electric vehicles or hybrid vehicles for programming/encoding.
The high-voltage system will be automatically switched off by the programming system.

- Connect the battery charger to the vehicle.
- Connect the programming system with the vehicle.
- Determine the action plan.
- Accept and fully process the measures plan.
- If applicable, connect the workshop system to the vehicle, depending on the reworking list.
- Carry out vehicle test.
- Delete the fault memory.
- The information about programming the workshop system and the corresponding notes in the user documentation must be observed.
- Wait until programming/encoding has been completed.
- Disconnect the programming system from the vehicle.
- Disconnect the battery charger from the vehicle.

14 – Carrying out ride height adjustment



- Connect diagnosis system.
- Switch the ignition on.
- Carry out ride height calibration.
  - Service function
  - Chassis and suspension
  - VDP
  - Ride height adjustment

Additional Information

Overview of Tightening Torques

VDP control unit to body — Used in step 7

Plastic nut	Renew plastic nut.	Tightening torque	2,6 Nm

A-pillar footwell side trim panel — Used in step 8

Screw		Tightening torque	2,5 Nm

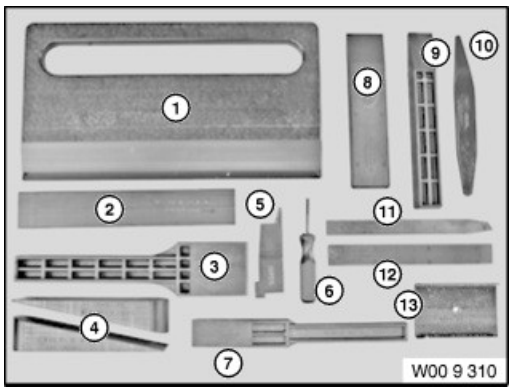
Negative battery cable to 48-V battery — Used in step 12

Nut M8		Tightening torque	19 Nm

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Overview of Special Tools

0 493 752 (00 9 329) Case



Common	Used in step 4
Usage	(Case) with insert without mounting wedges, delivery while stocks last - as of 02/2019.
Included in the tool or work	0 490 527
Storage location	Individual
Replaced by	
In connection with	
SI-Number	01 07 09 (530)

Links

Repair instructions (PRE)	Used in step
Notes on 48-V battery	112

Repair instructions	Used in step
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