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




**Warning!**

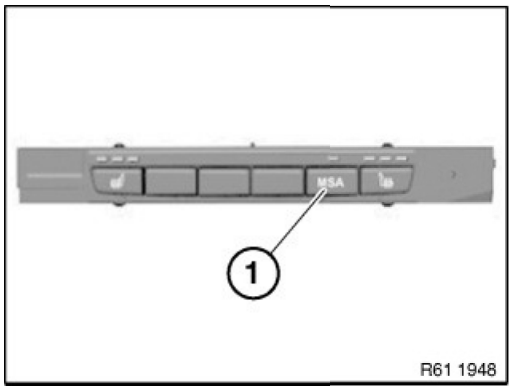
If the engine hood/bonnet contact is pulled upwards (workshop mode), the information "switch closed" is output. The automatic engine start-stop function is active.

An automatic engine start is possible.

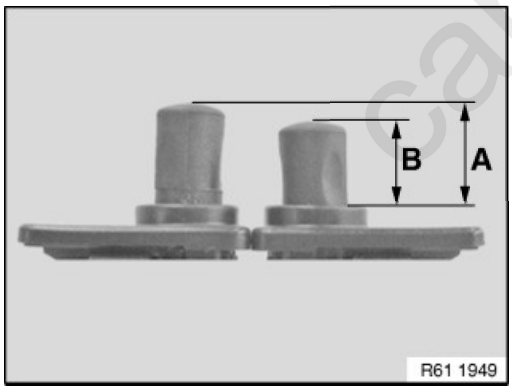
**Observe safety precautions when working on MSA vehicles.**

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

cardiagn.com

*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

cardiagn.com

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

## PRELIMINARY WORK

### 1 – Remove front left or right wheel

▸ **Removing the wheel**



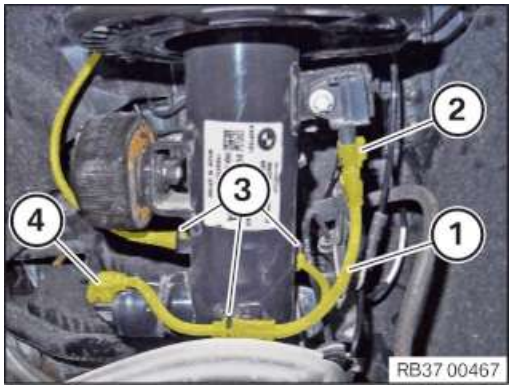

- In vehicles with M Carbon ceramic brake: The wheel assembly jack must be used to remove the wheel (see workshop equipment).

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




- If several wheels are removed simultaneously: Use a piece of chalk to mark on each 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 a suitable adapter from the tool set .

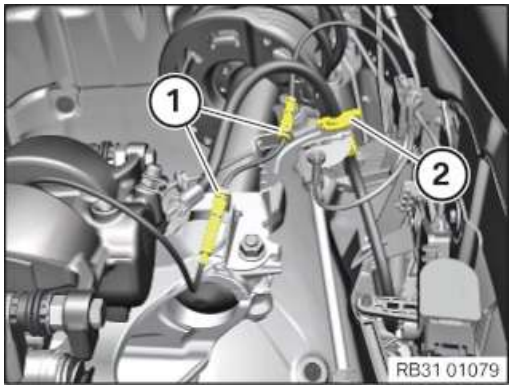
### 2 – Detach the cable of the vertical dynamic platform (VDP)




- Unlock and disconnect the plug connection (2) on the acceleration sensor.
- Unlock and disconnect the plug connection (4) on the vertical dynamic platform valve.
- Detach cable (1) from holders (3).

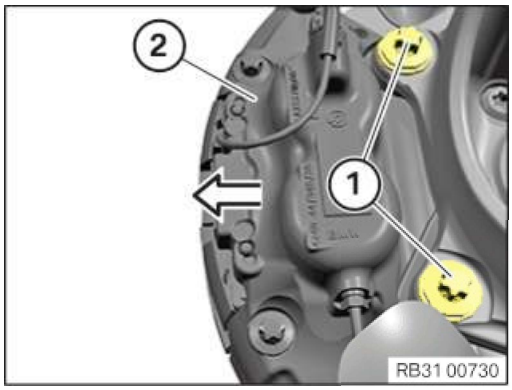
### 3 – Detach the cable of the brake pad sensor and front brake hose

carmagn.com

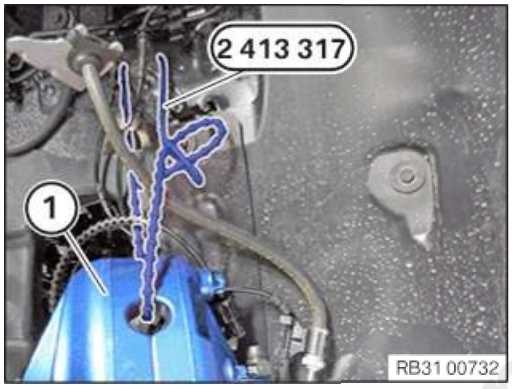



- Detach the brake pad sensor cable from the holders (1).
- Detach brake hose from holder (2).

**4 – Detach the front brake caliper**




- Loosen screws (1).
- Detach the brake caliper (2) in the direction of the arrow.




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

  Do not let the brake caliper (1) down on the brake hose.

**5 – Remove front brake disc**




- Loosen screw (1).

**TECHNICAL INFORMATION**

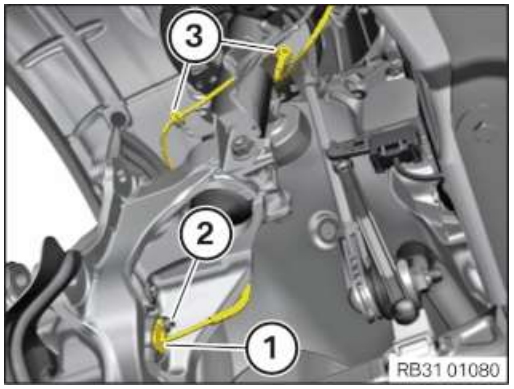
**Note the following for the removal of the brake disc:**

Do not under any circumstances strike the friction ring with a hammer or similar tool. If necessary, carefully tap with a rubber mallet against the brake disc chamber.

- Remove brake disc (2).

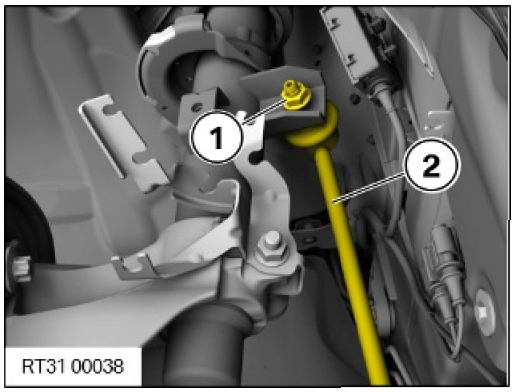
**6 – Partially removing the front wheel speed sensor**

eldiagn.com



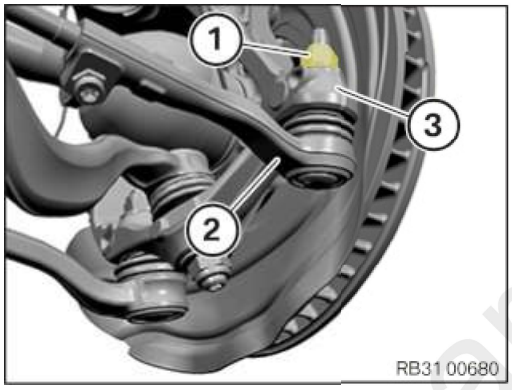

- Loosen screw (2).
- Release the wheel speed sensor (1) from the swivel bearing.
- Detach the wheel speed sensor cable from the brackets (3).
- Remove wheel speed sensor from spring strut.

**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**

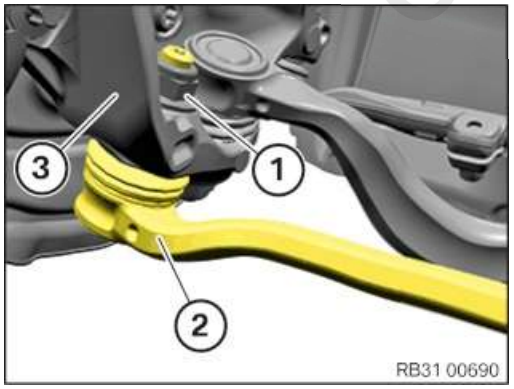



- Loosen nut (1).

**Note:** If necessary, counter-hold at the Torx socket.

- Detach the track rod (2) from the swivel bearing (3).

**9 – Release the wishbone from the swivel bearing**



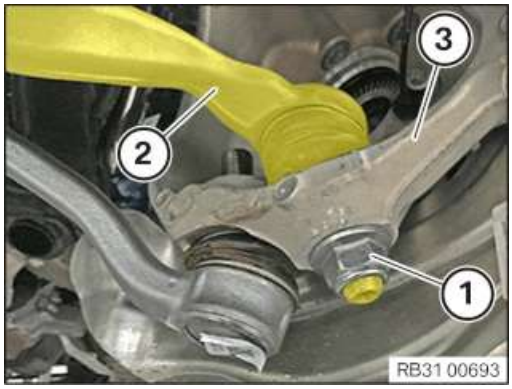

- Loosen nut (1).

**Note:** Use the Torx socket for counter support.

- Release wishbone (2) from swivel bearing (3).

**10 – Releasing the tension strut from the swivel bearing**

cardiagn.com



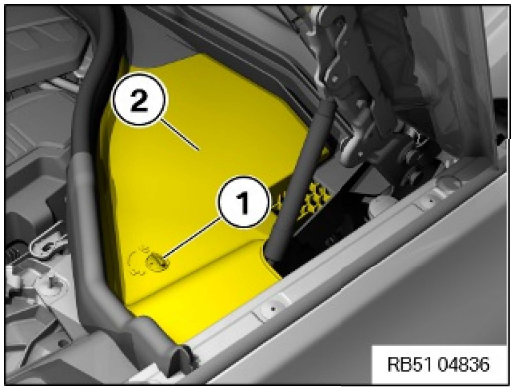

- Unfasten nut (1).

**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**

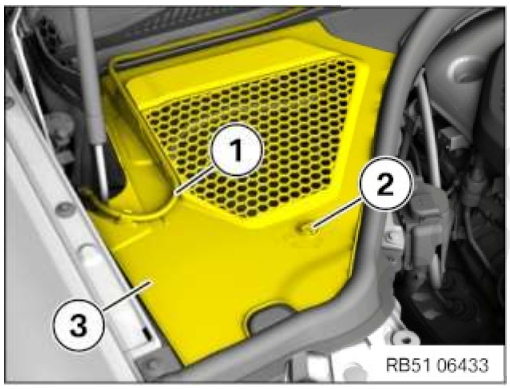
▸ **Remove the cover of the engine compartment at the rear left**




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

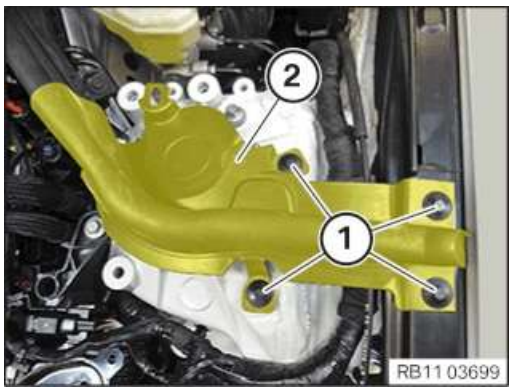
- **or**

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




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

**12 – Removing side bonnet seal**




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

**MAIN WORK**

**13 – Remove front spring strut**

**TECHNICAL INFORMATION**

Secure component against falling.




- Loosen screws (1).




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

**14 – Installing the front spring strut**




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




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

partdiagn.com




- Renew screws (1).

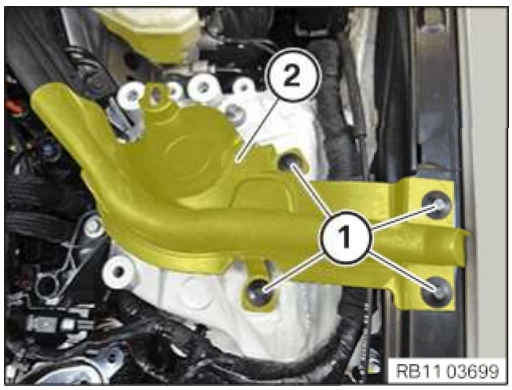
  **Parts:** Bolts
- Tighten the screws (1).

**Nut and locknut/self-locking nut**

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

## POSTPROCESSES

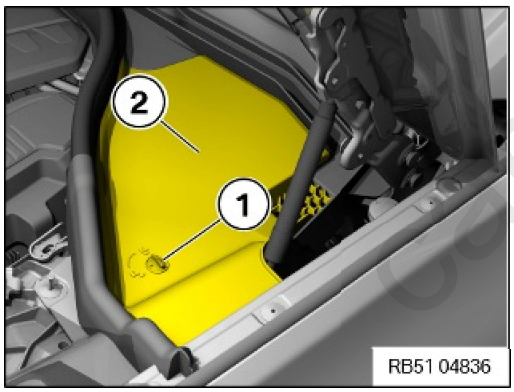
### 15 – Install the side bonnet seal




- 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

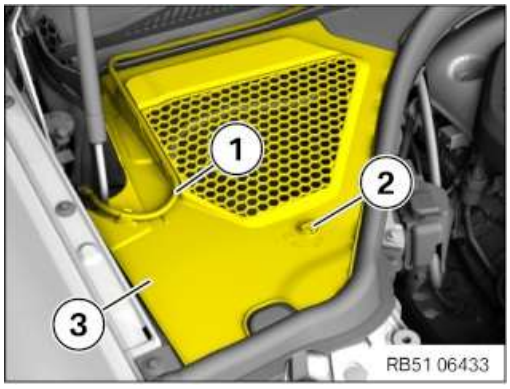
▸ **Install the cover of the engine compartment on the rear left**




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

- **or**

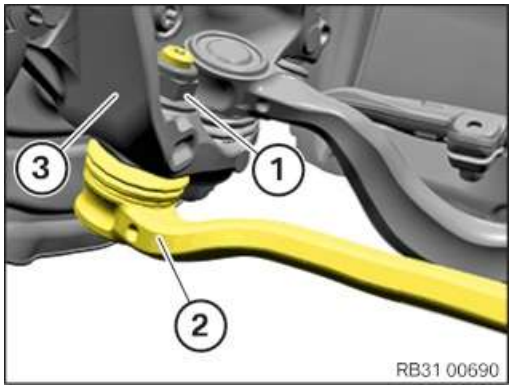
▸ **Install the rear right engine compartment cover**




- 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

carfiagn.com




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

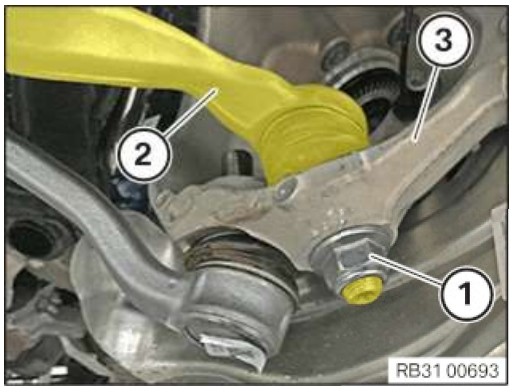
  **Parts:** Nut
- Tighten nut (1).

**Note:** Use the Torx socket for counter support.

**Wishbone to swivel bearing**

| | | | |
|---|---|---|---|
| M14 | Renew nut. | Tightening torque | 175 Nm |

### 18 – Securing tension strut on swivel bearing




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

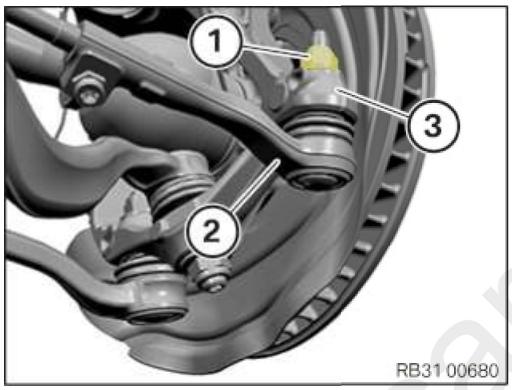
  **Parts:** Nut
- Tighten nut (1).

**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).

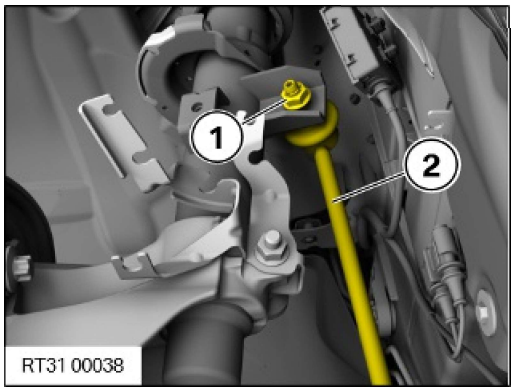
  **Parts:** Nut
- Tighten nut (1).

**Note:** If necessary, counter-hold at the Torx socket.

**Track rod end to swivel bearing**

| | | | |
|---|---|---|---|
| M14 | Renew nut. | Tightening torque | 175 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).

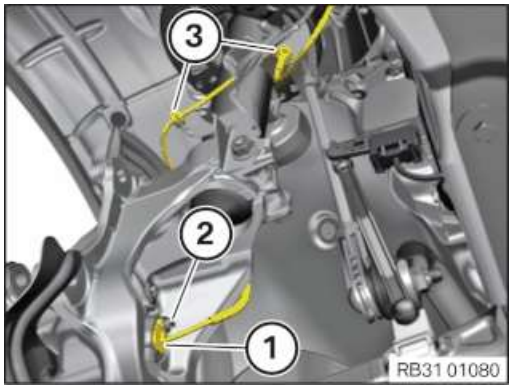
  **Parts:** Nut
- Tighten the nut (1), if necessary, counter support the Torx socket.

**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

carmagn.com



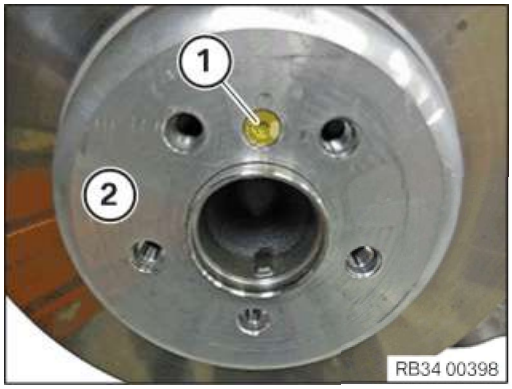

- Position the wheel speed sensor on the spring strut.
- Mount the cable of wheel speed sensor on the holders(3).
- Position the wheel speed sensor (1) on the swivel bearing.
- Renew the screw (2).

  **Parts:** Screw
- Tighten down screw (2).

**Wheel speed sensor to swivel bearing**

| | | | |
|---|---|---|---|
| M6 | Renew screw. | Tightening torque | 8 Nm |

### 22 – Install front brake disc



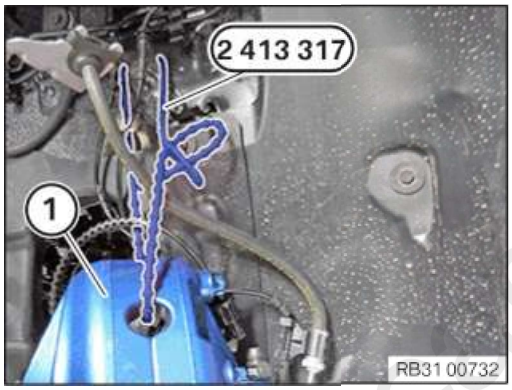

- Position brake disc (2) on wheel hub.
- Renew the screw (1).

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

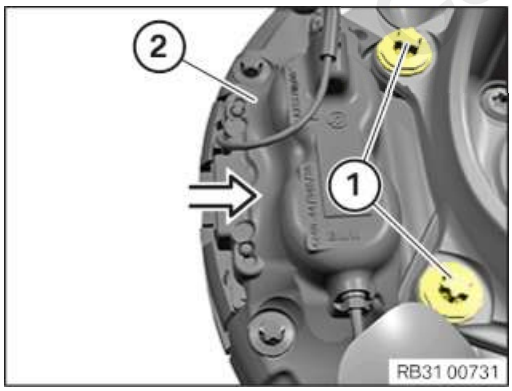
**Brake disc to front wheel hub**

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |

### 23 – Fasten the front brake caliper




- Loosen brake caliper (1) from special tool 2 413 317.
- Remove special tool 2 413 317.




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

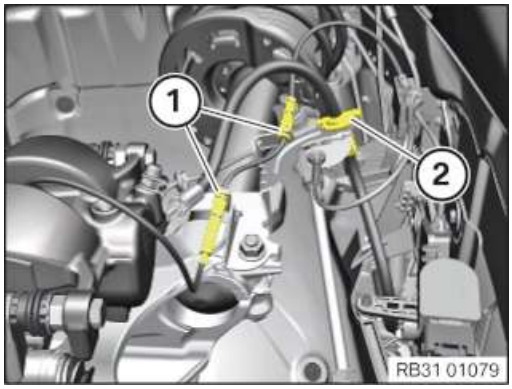
  **Parts:** Bolts
- Tighten the screws (1).

**Brake caliper / caliper carrier at front swivel bearing**

| | | | |
|---|---|---|---|
| M12 | Renew screw. | Tightening torque | 110 Nm |

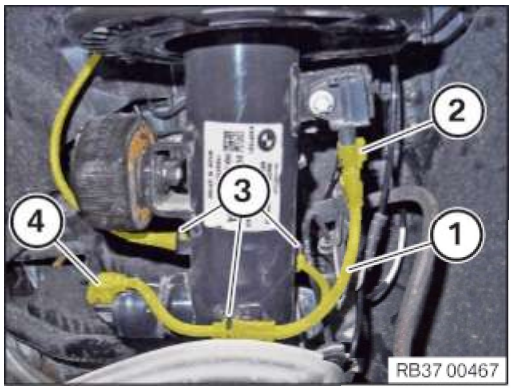
### 24 – Attach the cable of the brake pad sensor and front brake hose

carmanualsdiagn.com




- Attach cable of brake pad sensor in brackets (1).
- Attach the brake hose in the holder (2).

**25 – Mount the cable of the vertical dynamic platform (VDP)**




- Position the cable (1) on the spring strut.
- Mount the cable (1) in the holders (3).
- Connect the connector (4) with the VDP valve and lock.
- Connect the connector (2) with the acceleration sensor and lock.

**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.

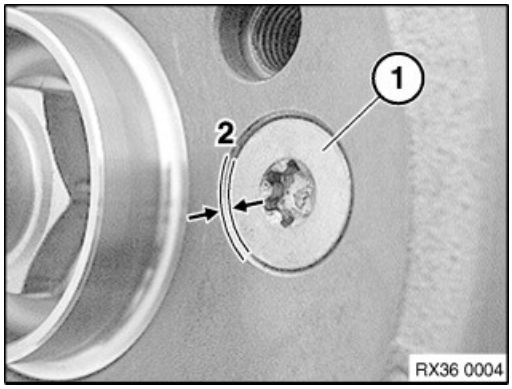
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  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.

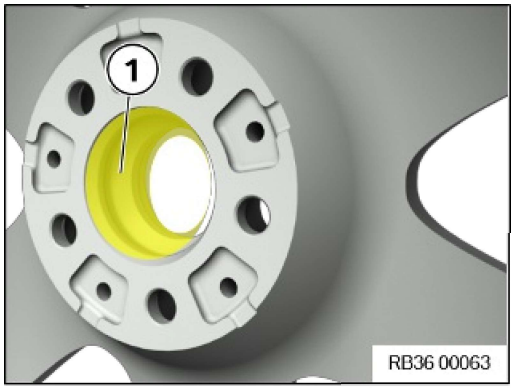
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

**Brake disc to front wheel hub**

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |

**Brake disc to rear wheel hub**

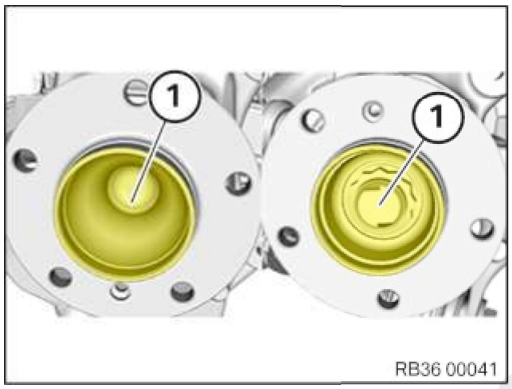
| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |




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

**Expendable materials**

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




- Lightly grease the front and rear wheel hubs in this area (1) to protect from corrosion.

**Expendable materials**

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




- In vehicles with M Carbon ceramic brake: The wheel assembly jack must be used to install the wheel (see workshop equipment).

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

cardiagn.com




**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 corroded wheel bolts.

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

**Wheel bolts**

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

cardiagn.com

## Additional Information

### Overview of Tightening Torques

**Nut and locknut/self-locking nut** — Used in step 14

| | | | |
|---|---|---|---|
| M8 | Renew screws. | Tightening torque | 28 Nm |
| | | Angle of rotation | 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 | 175 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 | 8 Nm |

| Brake disc to front wheel hub | | | Used in step 2226 |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |

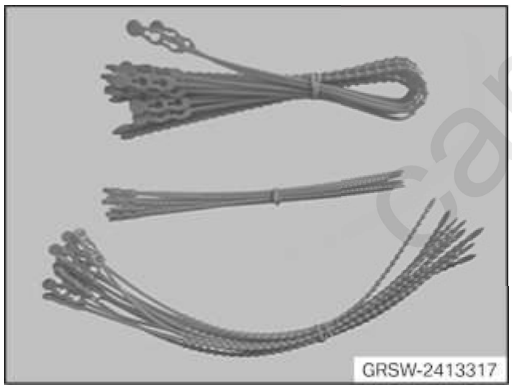
| Brake caliper / caliper carrier at front swivel bearing | | | Used in step 23 |
|---|---|---|---|
| M12 | Renew screw. | Tightening torque | 110 Nm |

| 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.<br>Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.<br>Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again. | Tightening torque<br><br><br><br>Check | 140 Nm<br><br><br><br>140 Nm |

## Overview of Special Tools

### 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) | |

cardiagn.com

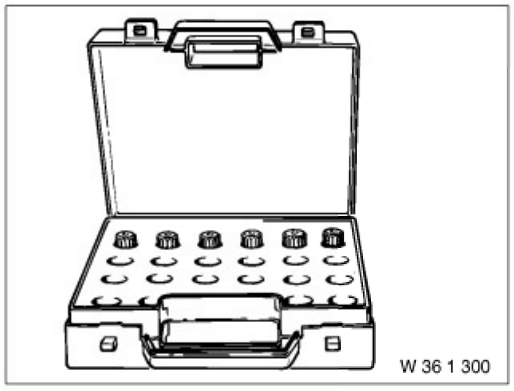
**2 344 011 Tool**




| 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) |

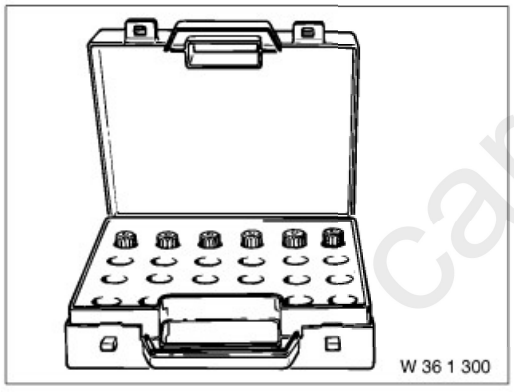
## Replacement tools:

**0 495 221 (36 1 323) Wheel stud**



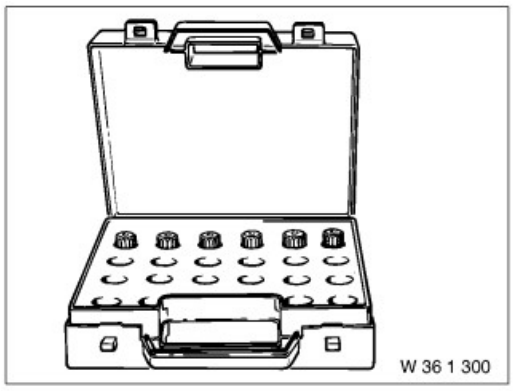

| Common | Used in step 1 |
|---|---|
| Usage | (Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

**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 | |

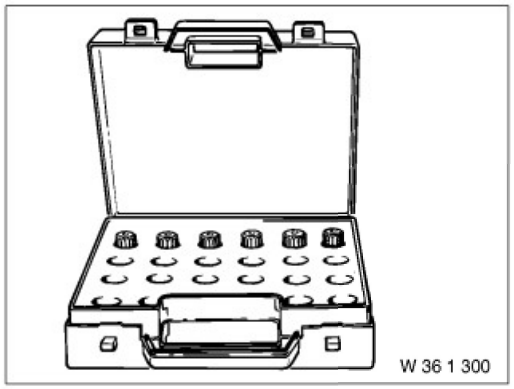
cardiagn.com

**0 495 226 (36 1 328) Wheel stud**



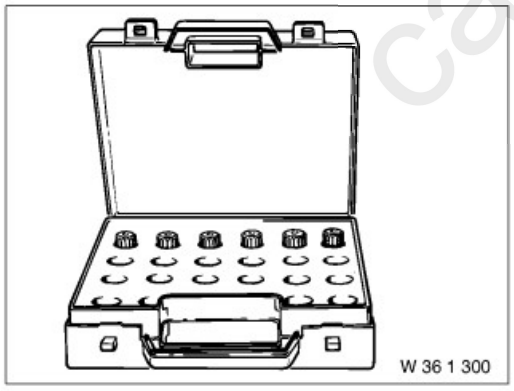

| Common | Used in step 1 |
|---|---|
| Usage | (Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

**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 | |

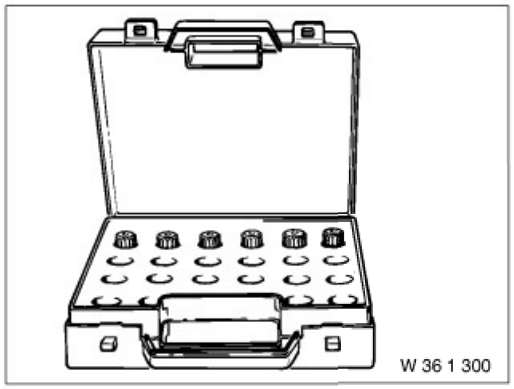
cardiagn.com

**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 | |

cardiagn.com

# 37 11 032 Replacing front left or right spring strut

## PRELIMINARY WORK

### 1 – Remove front left or right wheel

▸ **Removing the wheel**



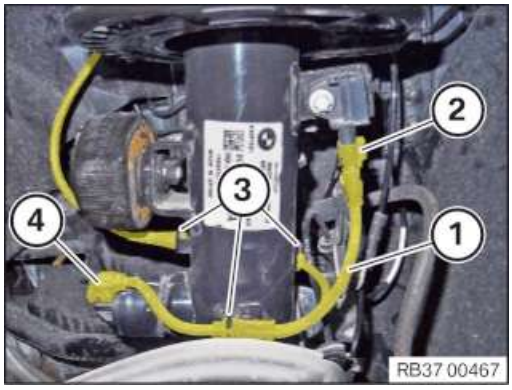

- In vehicles with M Carbon ceramic brake: The wheel assembly jack must be used to remove the wheel (see workshop equipment).

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




- If several wheels are removed simultaneously: Use a piece of chalk to mark on each 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 a suitable adapter from the tool set .

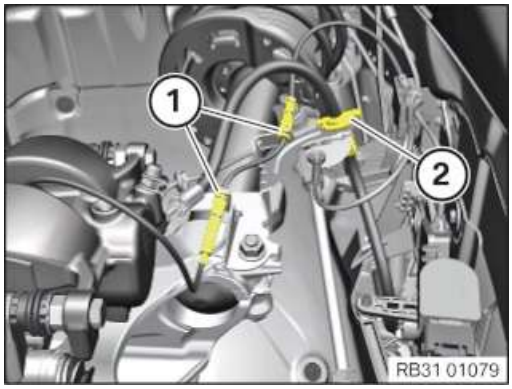
### 2 – Detach the cable of the vertical dynamic platform (VDP)




- Unlock and disconnect the plug connection (2) on the acceleration sensor.
- Unlock and disconnect the plug connection (4) on the vertical dynamic platform valve.
- Detach cable (1) from holders (3).

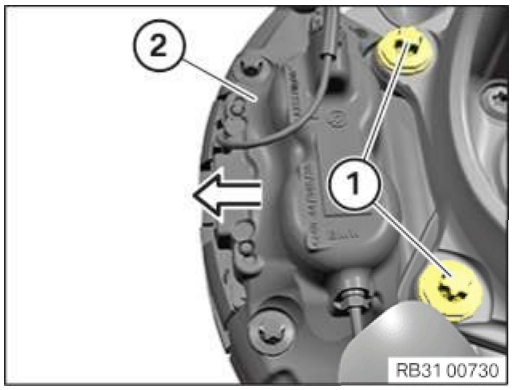
### 3 – Detach the cable of the brake pad sensor and front brake hose

carmagn.com

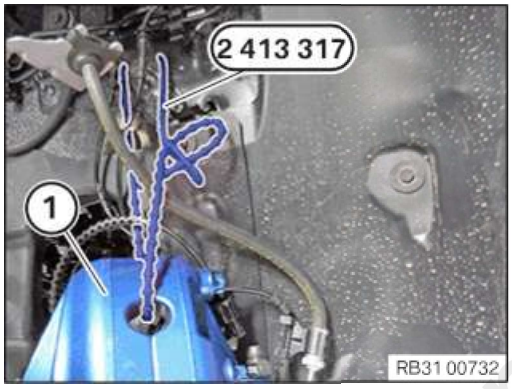



- Detach the brake pad sensor cable from the holders (1).
- Detach brake hose from holder (2).

**4 – Detach the front brake caliper**




- Loosen screws (1).
- Detach the brake caliper (2) in the direction of the arrow.




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

  Do not let the brake caliper (1) down on the brake hose.

**5 – Remove front brake disc**




- Loosen screw (1).

**TECHNICAL INFORMATION**

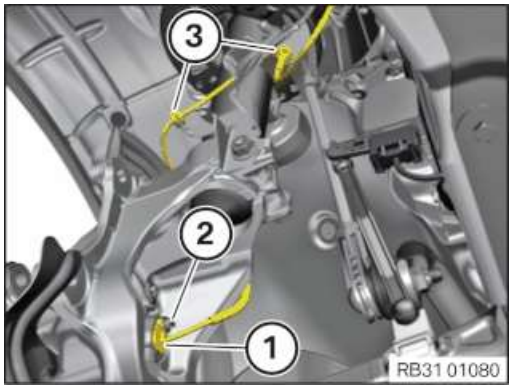
**Note the following for the removal of the brake disc:**

Do not under any circumstances strike the friction ring with a hammer or similar tool. If necessary, carefully tap with a rubber mallet against the brake disc chamber.

- Remove brake disc (2).

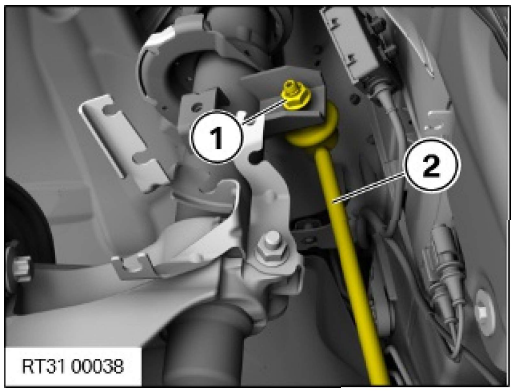
**6 – Partially removing the front wheel speed sensor**

eldiagn.com



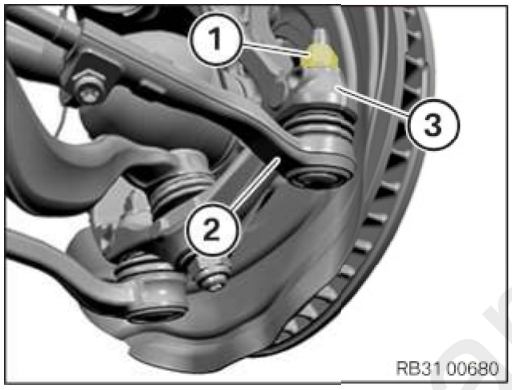

- Loosen screw (2).
- Release the wheel speed sensor (1) from the swivel bearing.
- Detach the wheel speed sensor cable from the brackets (3).
- Remove wheel speed sensor from spring strut.

**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**

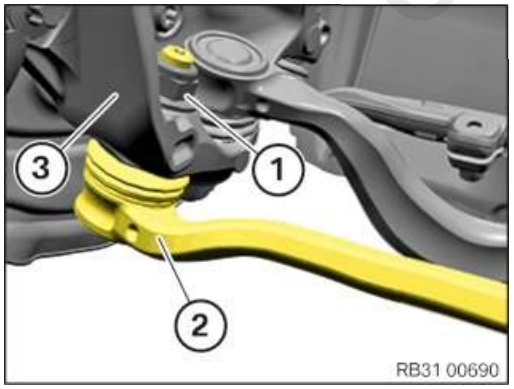



- Loosen nut (1).

**Note:** If necessary, counter-hold at the Torx socket.

- Detach the track rod (2) from the swivel bearing (3).

**9 – Release the wishbone from the swivel bearing**



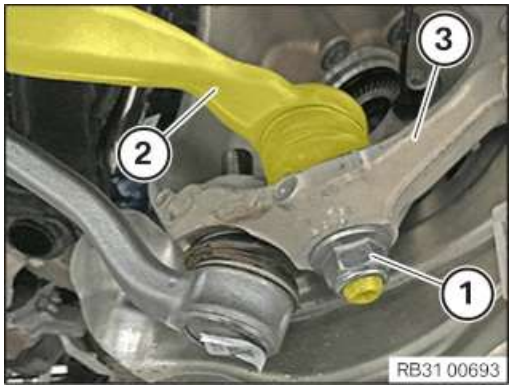

- Loosen nut (1).

**Note:** Use the Torx socket for counter support.

- Release wishbone (2) from swivel bearing (3).

**10 – Releasing the tension strut from the swivel bearing**

cardiagn.com



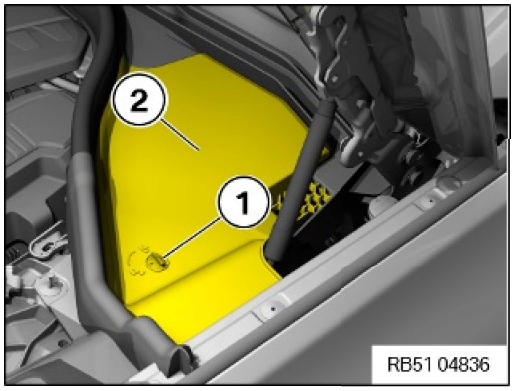

- Unfasten nut (1).

**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**

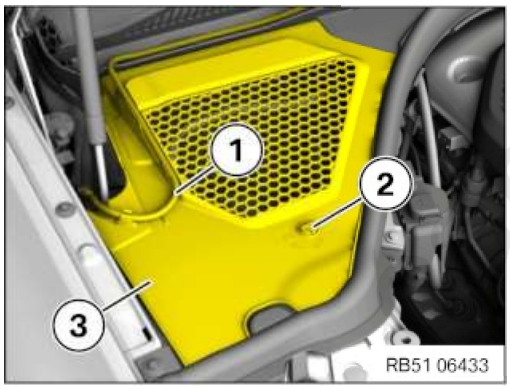
▶ **Remove the cover of the engine compartment at the rear left**




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

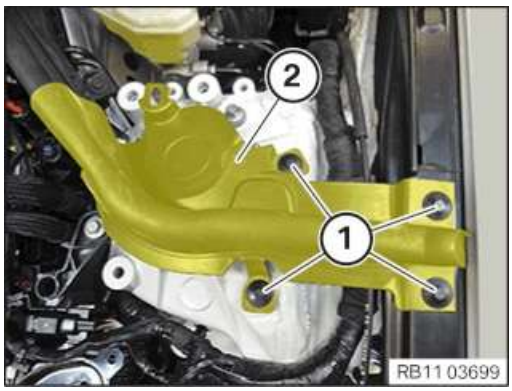
- **or**

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




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

**12 – Removing side bonnet seal**




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

**13 – Remove front spring strut**

**TECHNICAL INFORMATION**

Secure component against falling.




- Loosen screws (1).

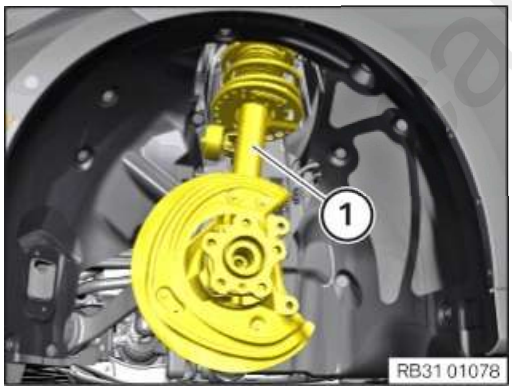



- Remove the front spring strut (1) complete with swivel bearing.

## MAIN WORK

## POSTPROCESSES

### 14 – Installing the front spring strut




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




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

cardiagn.com



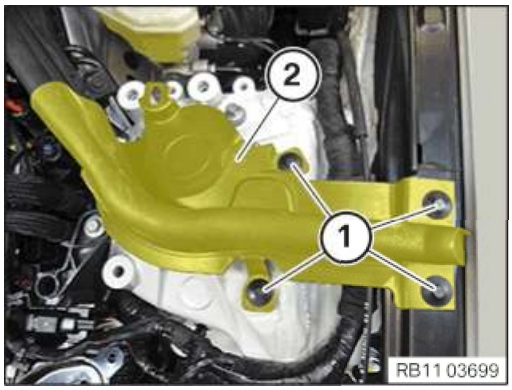

- Renew screws (1).

  **Parts:** Bolts
- Tighten the screws (1).

**Nut and locknut/self-locking nut**

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

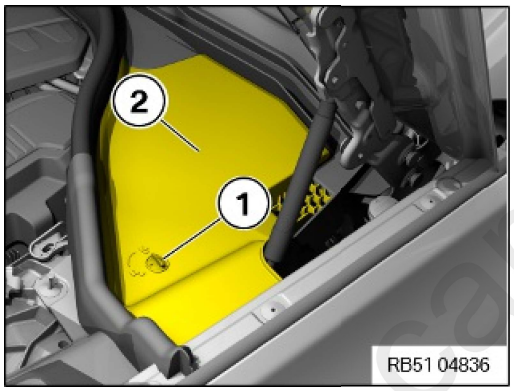
**15 – Install the side bonnet seal**




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

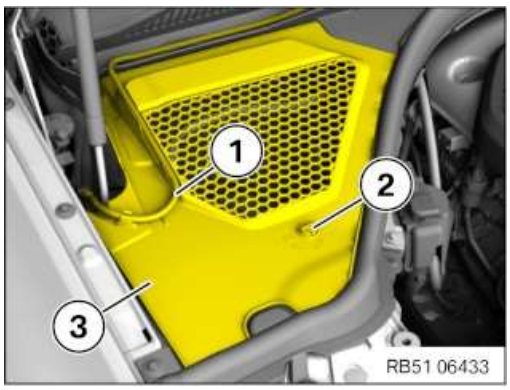
**16 – Install the cover of the engine compartment on the rear left or right**

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




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

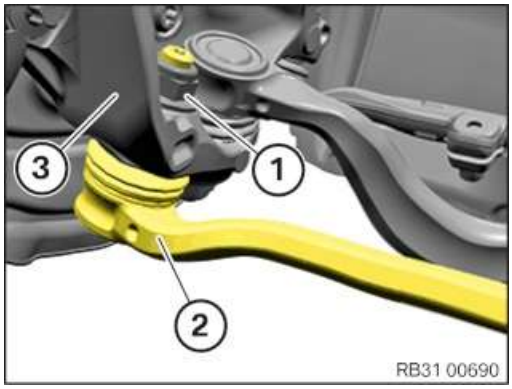
▸ **Install the rear right engine compartment cover**




- 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**

cardiagn.com




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

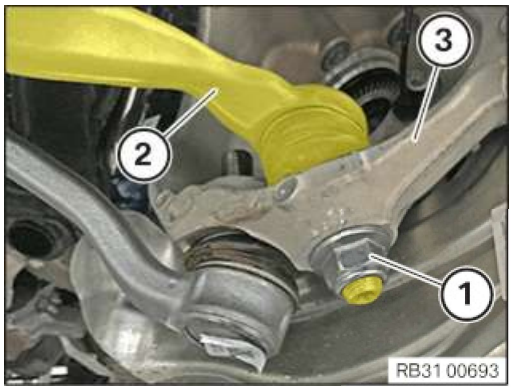
  **Parts:** Nut
- Tighten nut (1).

**Note:** Use the Torx socket for counter support.

**Wishbone to swivel bearing**

| | | | |
|---|---|---|---|
| M14 | Renew nut. | Tightening torque | 175 Nm |

### 18 – Securing tension strut on swivel bearing




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

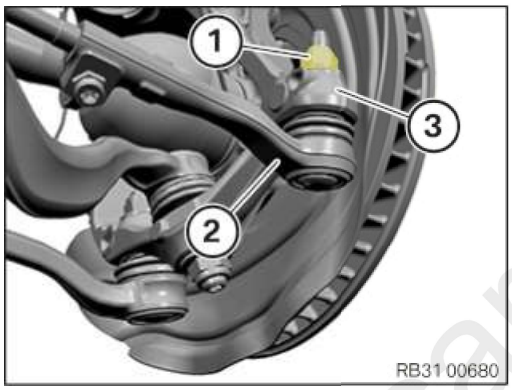
  **Parts:** Nut
- Tighten nut (1).

**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).

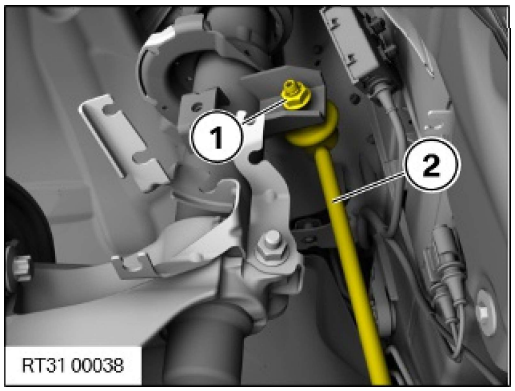
  **Parts:** Nut
- Tighten nut (1).

**Note:** If necessary, counter-hold at the Torx socket.

**Track rod end to swivel bearing**

| | | | |
|---|---|---|---|
| M14 | Renew nut. | Tightening torque | 175 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).

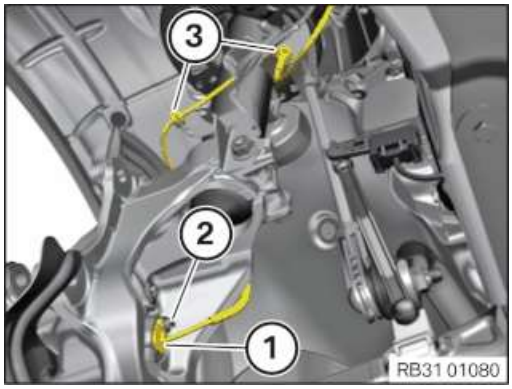
  **Parts:** Nut
- Tighten the nut (1), if necessary, counter support the Torx socket.

**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

carmagn.com



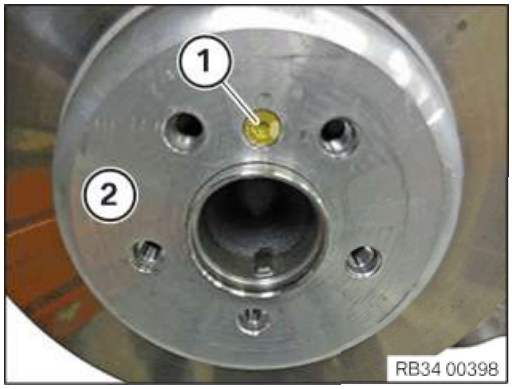

- Position the wheel speed sensor on the spring strut.
- Mount the cable of wheel speed sensor on the holders(3).
- Position the wheel speed sensor (1) on the swivel bearing.
- Renew the screw (2).

  **Parts:** Screw
- Tighten down screw (2).

**Wheel speed sensor to swivel bearing**

| | | | |
|---|---|---|---|
| M6 | Renew screw. | Tightening torque | 8 Nm |

### 22 – Install front brake disc



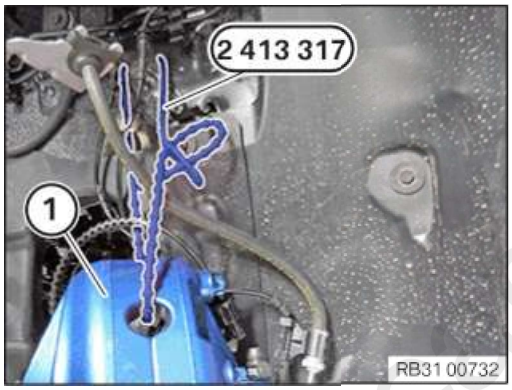

- Position brake disc (2) on wheel hub.
- Renew the screw (1).

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

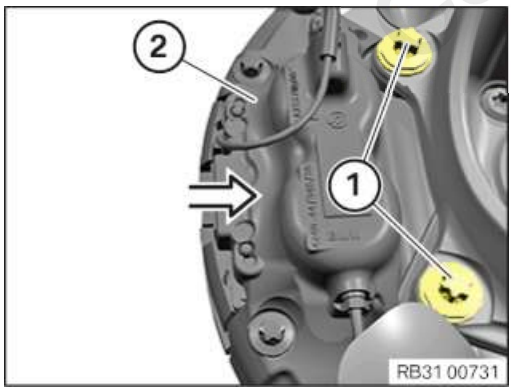
**Brake disc to front wheel hub**

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |

### 23 – Fasten the front brake caliper




- Loosen brake caliper (1) from special tool 2 413 317.
- Remove special tool 2 413 317.




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

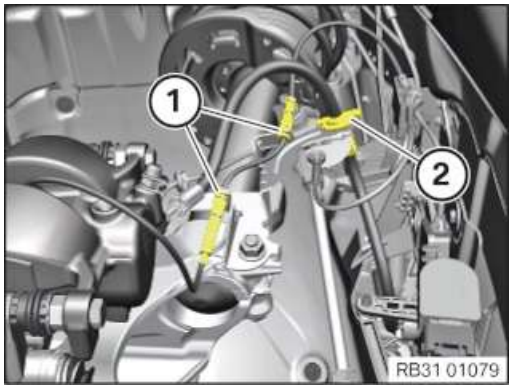
  **Parts:** Bolts
- Tighten the screws (1).

**Brake caliper / caliper carrier at front swivel bearing**

| | | | |
|---|---|---|---|
| M12 | Renew screw. | Tightening torque | 110 Nm |

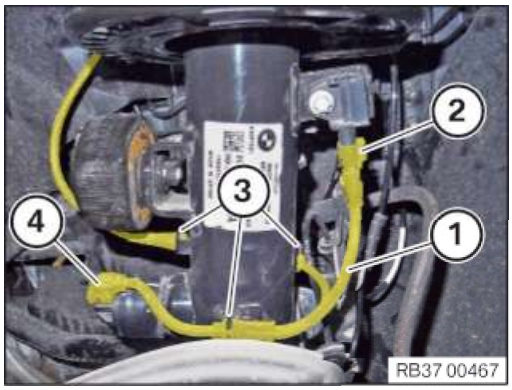
### 24 – Attach the cable of the brake pad sensor and front brake hose

carmanualsdiagn.com




- Attach cable of brake pad sensor in brackets (1).
- Attach the brake hose in the holder (2).

**25 – Mount the cable of the vertical dynamic platform (VDP)**




- Position the cable (1) on the spring strut.
- Mount the cable (1) in the holders (3).
- Connect the connector (4) with the VDP valve and lock.
- Connect the connector (2) with the acceleration sensor and lock.

**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.

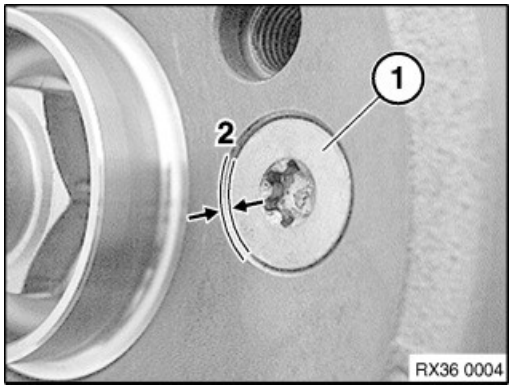
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  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.

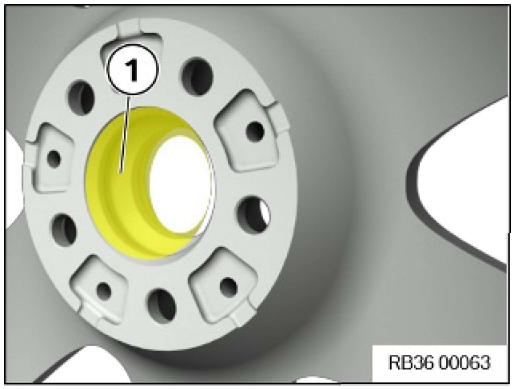
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

**Brake disc to front wheel hub**

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |

**Brake disc to rear wheel hub**

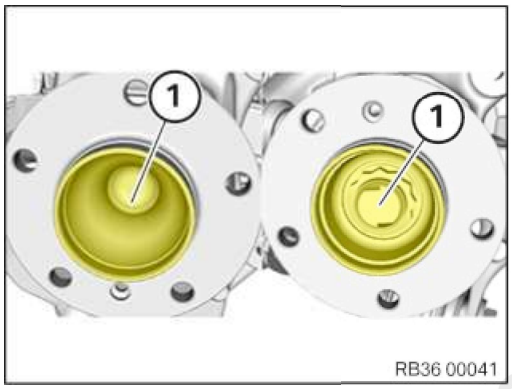
| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |




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

**Expendable materials**

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




- Lightly grease the front and rear wheel hubs in this area (1) to protect from corrosion.

**Expendable materials**

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




- In vehicles with M Carbon ceramic brake: The wheel assembly jack must be used to install the wheel (see workshop equipment).

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

cardiagn.com




**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 corroded wheel bolts.

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

**Wheel bolts**

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

cardiagn.com

## Additional Information

### Overview of Tightening Torques

**Nut and locknut/self-locking nut** — Used in step 14

| | | | |
|---|---|---|---|
| M8 | Renew screws. | Tightening torque | 28 Nm |
| | | Angle of rotation | 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 | 175 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 | 8 Nm |

| Brake disc to front wheel hub | | | Used in step 2226 |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |

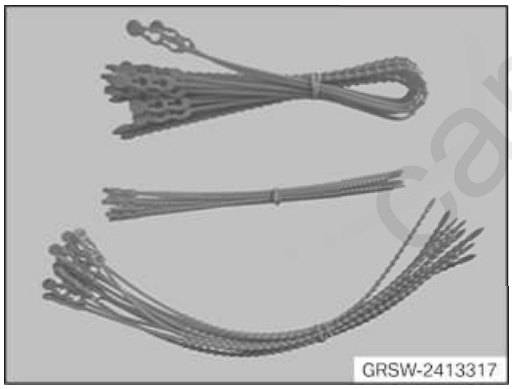
| Brake caliper / caliper carrier at front swivel bearing | | | Used in step 23 |
|---|---|---|---|
| M12 | Renew screw. | Tightening torque | 110 Nm |

| 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.<br>Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.<br>Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again. | Tightening torque<br><br><br><br>Check | 140 Nm<br><br><br><br>140 Nm |

## Overview of Special Tools

### 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) | |

cardiagn.com

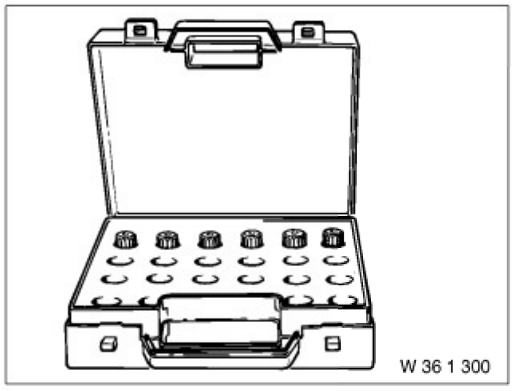
**2 344 011 Tool**




| 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) |

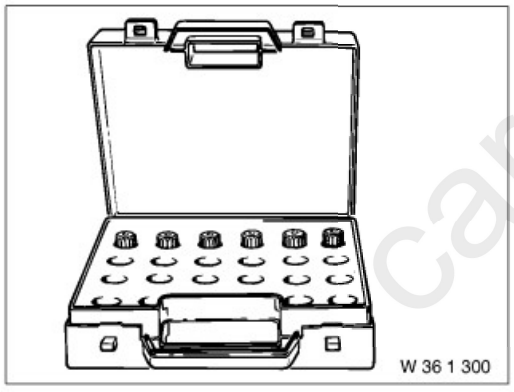
## Replacement tools:

**0 495 221 (36 1 323) Wheel stud**



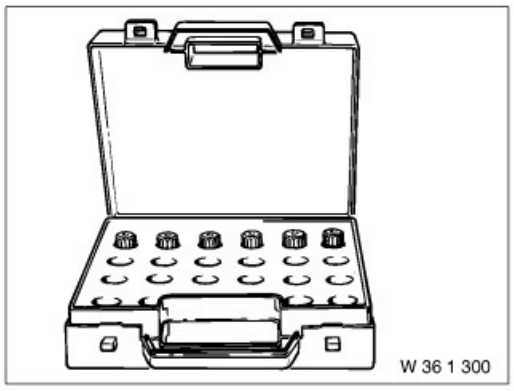

| Common | Used in step 1 |
|---|---|
| Usage | (Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

**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 | |

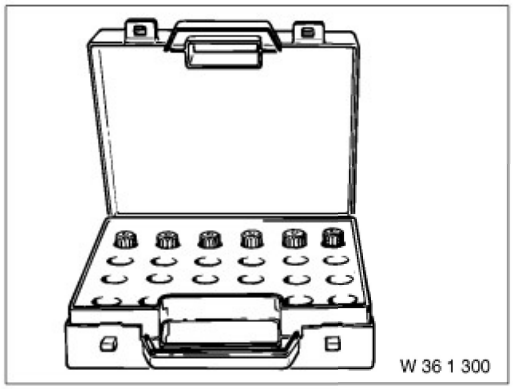
cardiagn.com

**0 495 226 (36 1 328) Wheel stud**



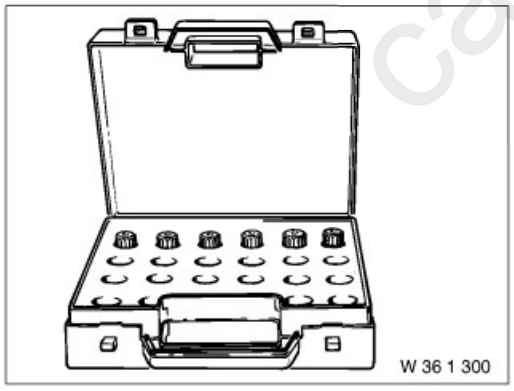

| Common | Used in step 1 |
|---|---|
| Usage | (Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

**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 | |

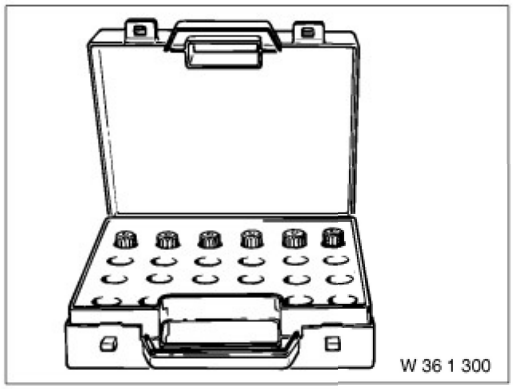
cardiagn.com

**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 | |

cardiagn.com

# 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 RDC

**TECHNICAL INFORMATION**

The tyre pressure control monitors the tyre pressure in all four 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 RDC.

cardiagn.com

# 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 ... Raising the vehicle using a vehicle hoist.

cardiagn.com

## 1 – Remove rear left or right wheel

▶ **Removing the wheel**



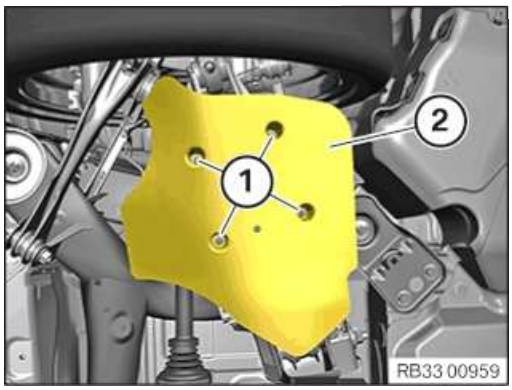

- In vehicles with M Carbon ceramic brake: The wheel assembly jack must be used to remove the wheel (see workshop equipment).

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




- If several wheels are removed simultaneously: Use a piece of chalk to mark on each 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 a suitable adapter from the tool set .

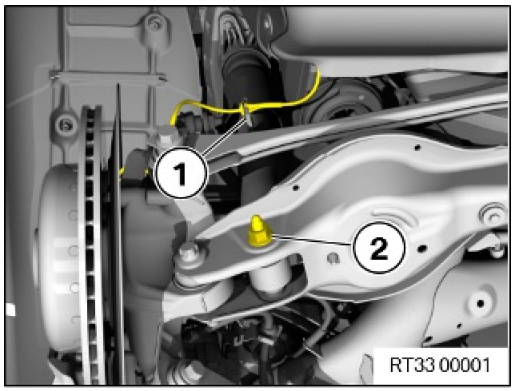
## 2 – Remove the cover of the camber control arm



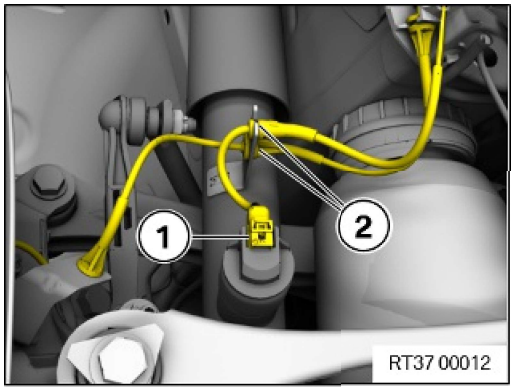

- Loosen nuts (1).
- Remove the cover of the camber control arm (2).

cardiagn.com

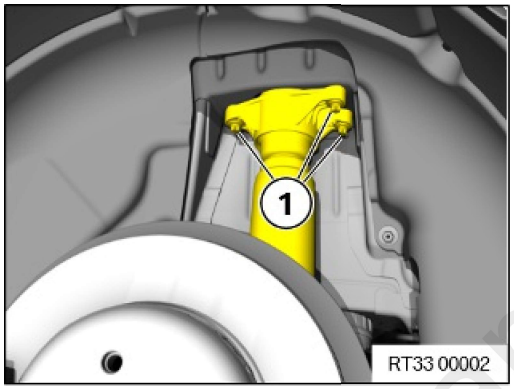
### 3 – Remove rear shock absorber



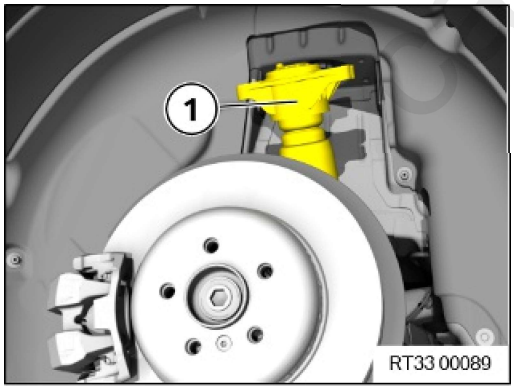

- Unclip the cable from the holder (1).
- Support the wheel carrier with the universal jack.
- Loosen nut (2).
- Lift the wheel carrier with the universal jack to the point where the screw can be removed.
- Slowly lower workshop jack until wheel carrier is freely suspended.
- Remove the universal jack from under the vehicle.




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



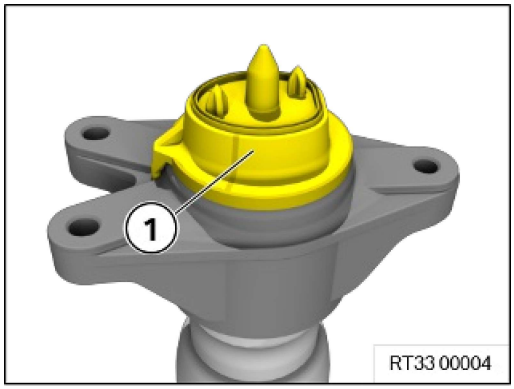

- Loosen screws (1).



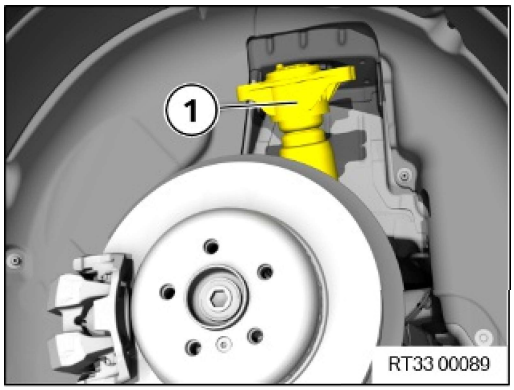

- Press the shock absorbers (1) together and guide upwards out of the wheel arch.

### 4 – Installing the rear shock absorber

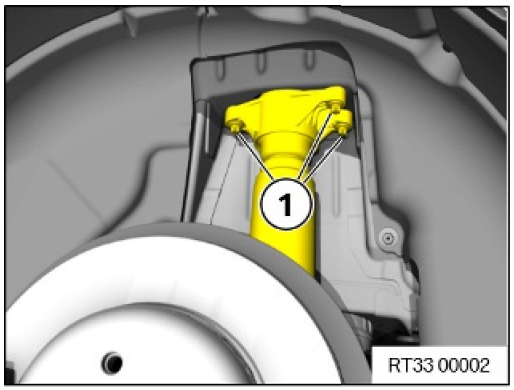
carsdiagn.com




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




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



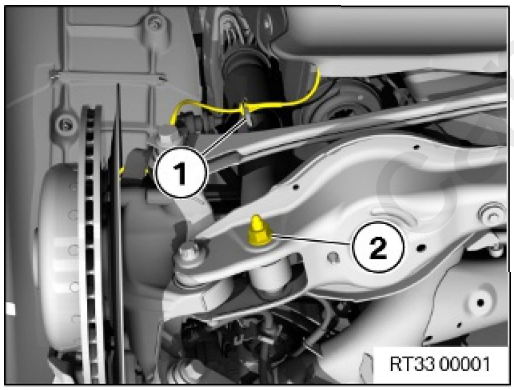

- Renew screws (1).

  **Parts:** Bolts

- Tighten the screws (1).

**Nut and locknut/self-locking nut**

| | | | |
|---|---|---|---|
| M8x40 | Renew screws. | Tightening torque | 28 Nm |




- Clip in cable into the holder (1).
- Support the wheel carrier with the universal jack.
- Lift the wheel carrier with the universal jack to the point where the screw can be inserted.
- Renew screw and nut (2).

  **Parts:** Bolt, nut

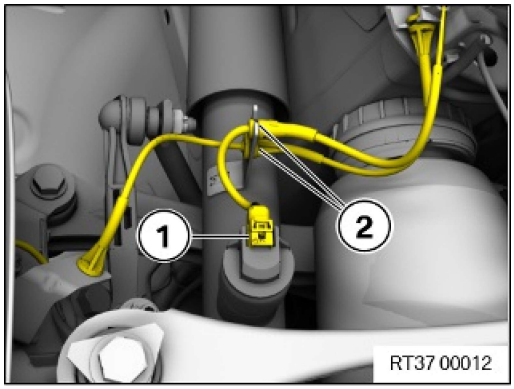
- Install the screw.

**TECHNICAL INFORMATION**

Tighten the screw connection in the normal position.

- Tighten nut (2) hand-tight.
- Remove the universal jack from under the vehicle.

carsdiagn.com




- 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.

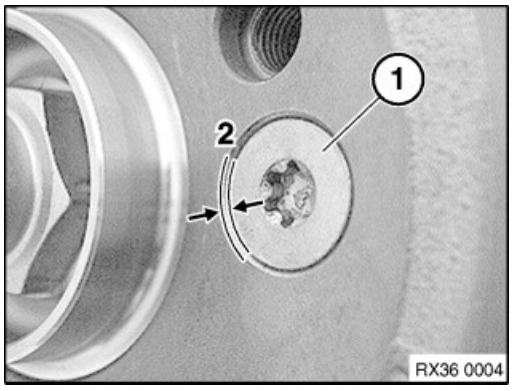
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  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.

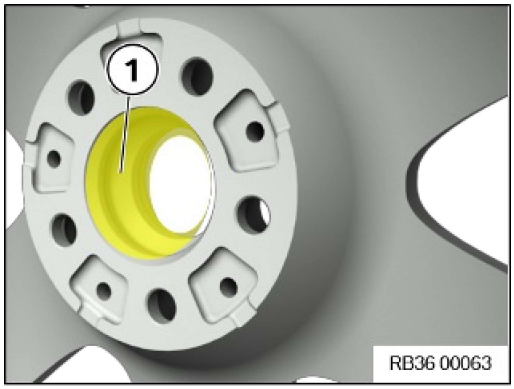
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

**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 |




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

**Expendable materials**

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




- Lightly grease the front and rear wheel hubs in this area (1) to protect from corrosion.

**Expendable materials**

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




- In vehicles with M Carbon ceramic brake: The wheel assembly jack must be used to install the wheel (see workshop equipment).

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

cardiagn.com




**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 corroded wheel bolts.

  **Parts:** Wheel bolts
- Clean the wheel bolts.
- Check wheel bolts and threads for damage, renew the wheel bolts 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.<br>Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.<br>Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again. | Tightening torque<br><br>Check | 140 Nm<br><br>140 Nm |

**6 – Measure ride height of rear axle and adjust to normal position**




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

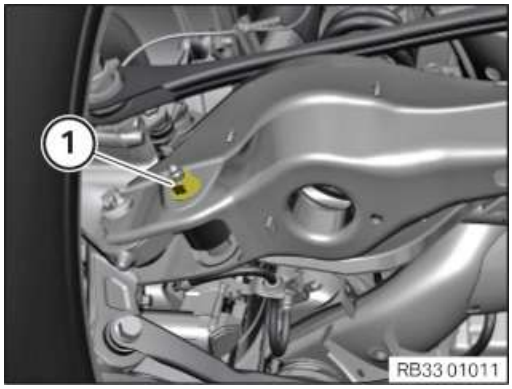
**G20_Hinterradantrieb, Standard suspension**

| *Measured from centre of wheel hub to lower edge of wheel arch* | |
|---|---|
| Dimension A | 363 ( 353 - 373) mm |

**G20_Hinterradantrieb, Sports suspension settings with low-slung**

| *Measured from centre of wheel hub to lower edge of wheel arch* | |
|---|---|
| Dimension A | 353 ( 343 - 363) mm |

**7 – Tighten screw connection on the camber control arm.**




**TECHNICAL INFORMATION**

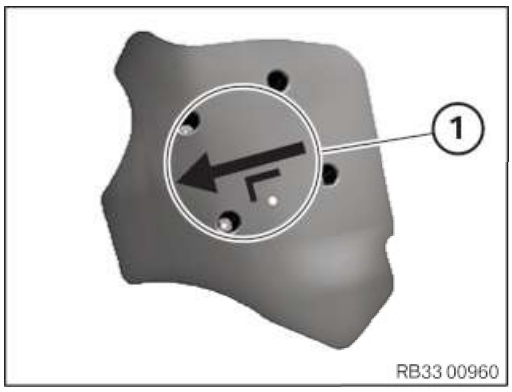
Tighten the screw connection in the normal position.

- Tighten the nut (1) in normal position.

**Shock absorber to camber arm**

| | | | |
|---|---|---|---|
| M12 | Renew nut and screw.<br>Tighten in normal position. | Tightening torque<br>Angle of rotation | 100 Nm<br>90 ° |

### 8 – Installing the cover of the camber control arm



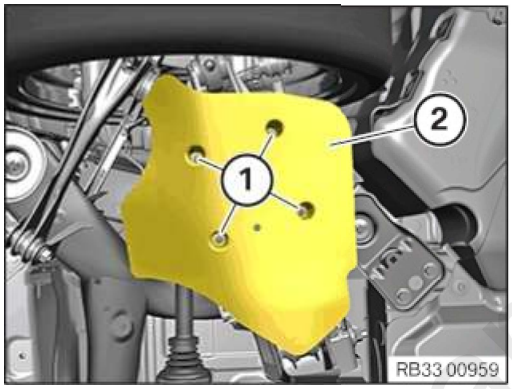

- Note the installation location and direction of installation.

  Direction of installation:

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

  Installation location:

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




- Position the camber control arm cover (2) 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 |

cardiagn.com

**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.<br>Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.<br>Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again. | Tightening torque<br><br>Check | 140 Nm<br><br>140 Nm |

**Shock absorber to camber arm** Used in step 7

| | | | |
|---|---|---|---|
| M12 | Renew nut and screw.<br>Tighten in normal position. | Tightening torque<br>Angle of rotation | 100 Nm<br>90 ° |

**Cover to camber control arm** Used in step 8

| | | | |
|---|---|---|---|
| M6 | Replace nuts. | Tightening torque | 6 Nm |

## Overview of Special Tools

### 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 | |

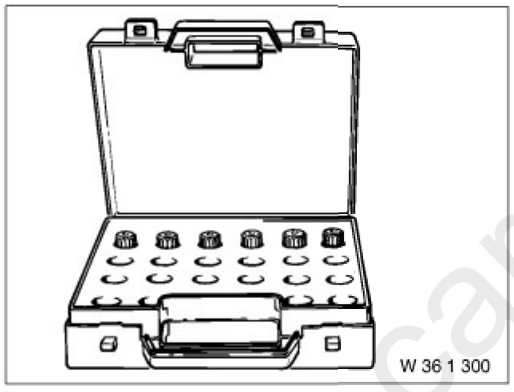
cardiagn.com

**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 | |

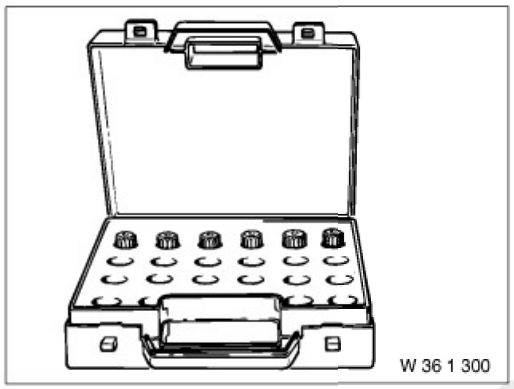
cardiagn.com

**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 | |

cardiagn.com

**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 | |

cardiagn.com

## Overview Technical Data

| G20_Hinterradantrieb, Standard suspension | Used in step 6 |
|---|---|
| *Measured from centre of wheel hub to lower edge of wheel arch* | |
| Dimension A | 363 ( 353 - 373) mm |

| G20_Hinterradantrieb, Sports suspension settings with low-slung | Used in step 6 |
|---|---|
| *Measured from centre of wheel hub to lower edge of wheel arch* | |
| Dimension A | 353 ( 343 - 363) mm |

## Links

| Repair instructions | Used in step |
|---|---|
| 00 .. ... Raising the vehicle using a vehicle hoist | |

# 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 ... Raising the vehicle using a vehicle hoist.

## PRELIMINARY WORK

### 1 – Remove rear left or right wheel

▸ **Removing the wheel**



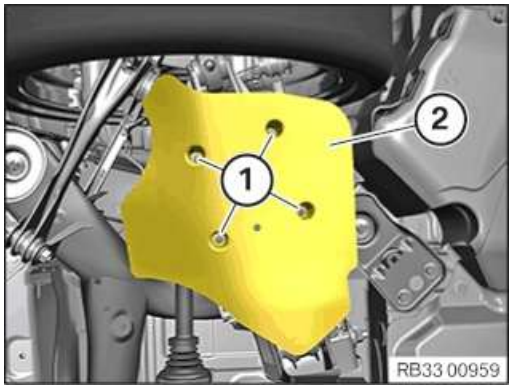

- In vehicles with M Carbon ceramic brake: The wheel assembly jack must be used to remove the wheel (see workshop equipment).

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



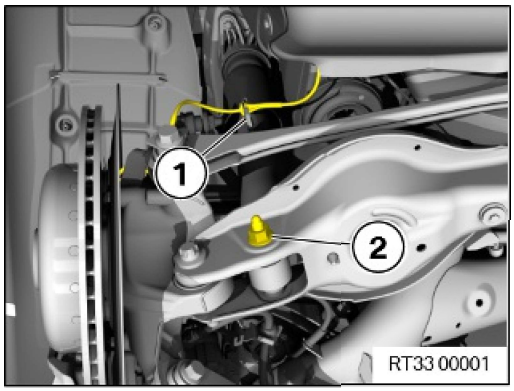

- If several wheels are removed simultaneously: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Release the wheel bolts (arrows) crosswise and remove the wheel.
- To release and tighten wheel bolts with a security code: Use a suitable adapter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

### 2 – Remove the cover of the camber control arm

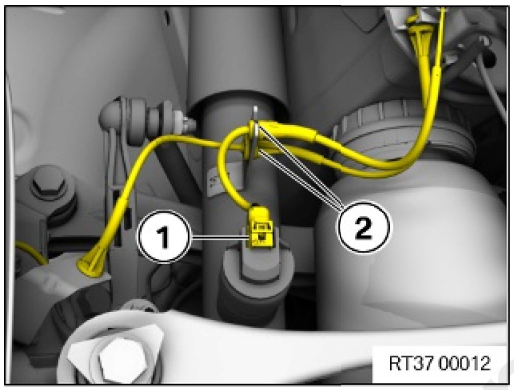



- Loosen nuts (1).
- Remove the cover of the camber control arm (2).

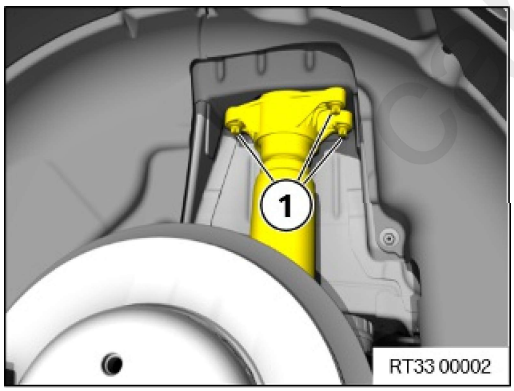
**3 – Remove rear shock absorber**



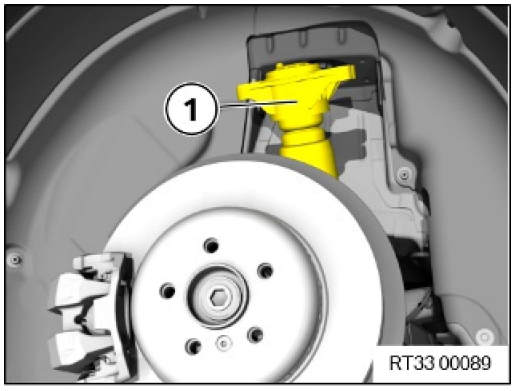

- Unclip the cable from the holder (1).
- Support the wheel carrier with the universal jack.
- Loosen nut (2).
- Lift the wheel carrier with the universal jack to the point where the screw can be removed.
- Slowly lower workshop jack until wheel carrier is freely suspended.
- Remove the universal jack from under the vehicle.




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



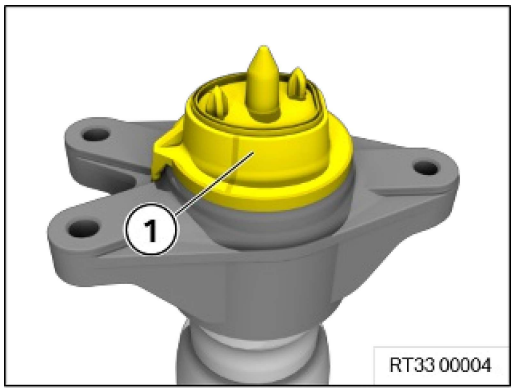

- Loosen screws (1).



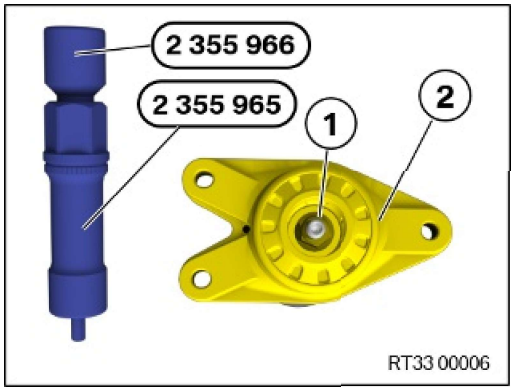

- Press the shock absorbers (1) together and guide upwards out of the wheel arch.

carsdiagn.com

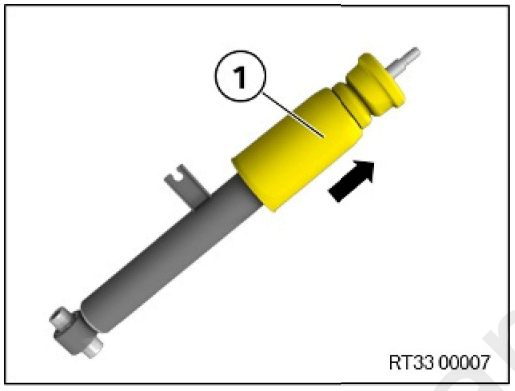
### 4 – Replacing the shock absorber



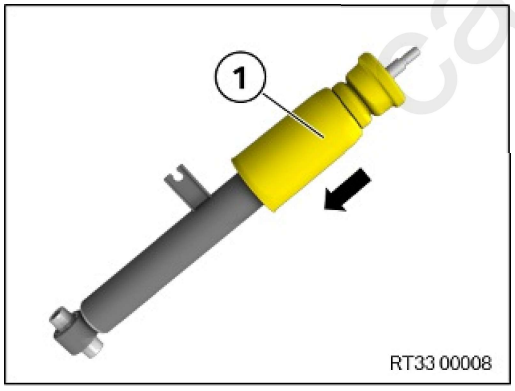

- Remove the centring plate (1).



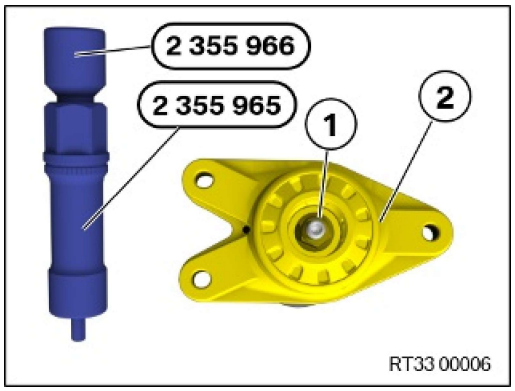

- Release the nut (1) with the special tools  and .
- Remove the support bearing (2) from the shock absorber.




- Remove the auxiliary damper (1).




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



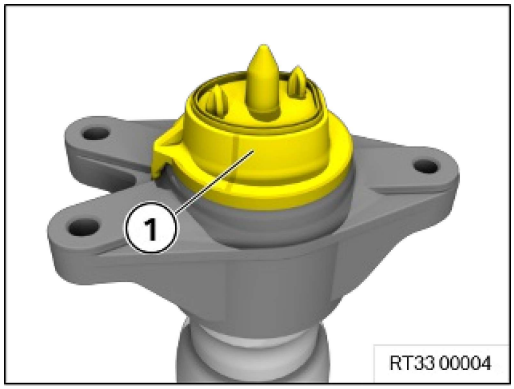

- Attach support bearing (2) to the new shock absorber.
- Renew nut (1).

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

**Support bearing on shock absorber**

| | | | |
|---|---|---|---|
| M10 | Renew nut. | Tightening torque | 41 Nm |

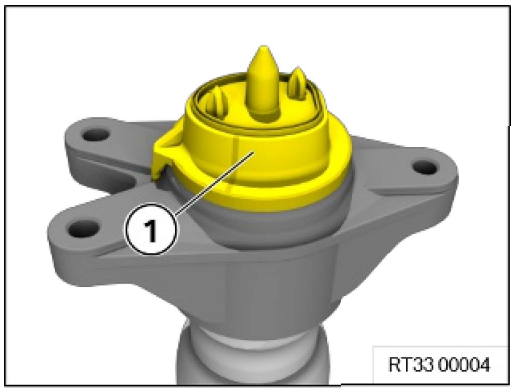
cardiagn.com



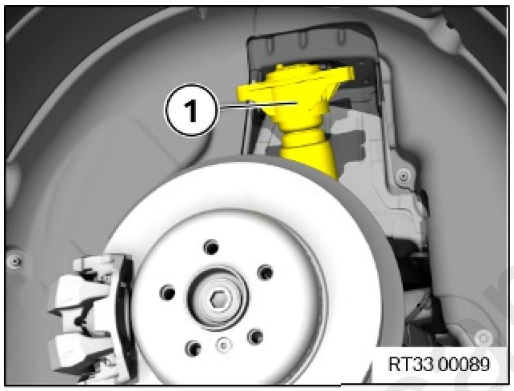

- Check centring plate (1) for damage; replace if necessary.
- Install the centring plate (1).

## POSTPROCESSES

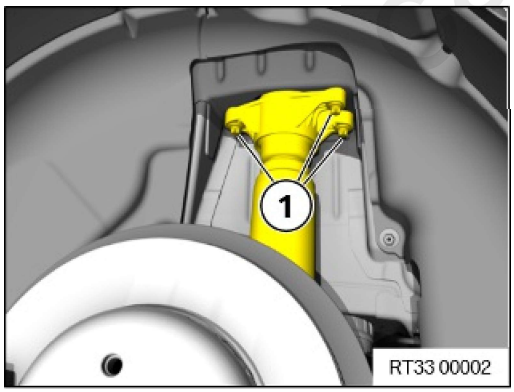
### 5 – Installing the rear shock absorber




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




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

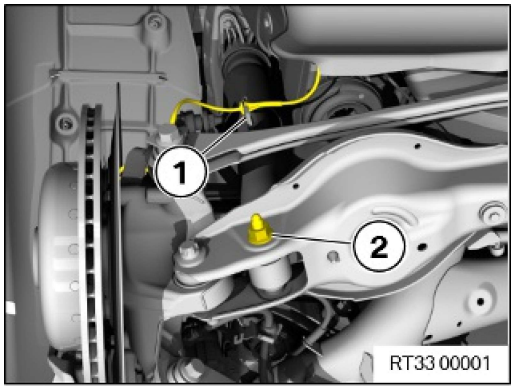



- Renew screws (1).

  **Parts:** Bolts
- Tighten the screws (1).

**Nut and locknut/self-locking nut**

| | | | |
|---|---|---|---|
| M8x40 | Renew screws. | Tightening torque | 28 Nm |



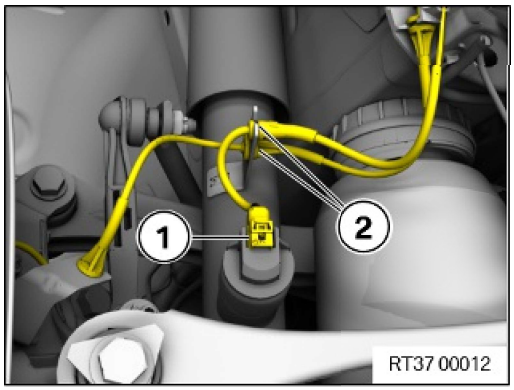

- Clip in cable into the holder (1).
- Support the wheel carrier with the universal jack.
- Lift the wheel carrier with the universal jack to the point where the screw can be inserted.
- Renew screw and nut (2).

  **Parts:** Bolt, nut
- Install the screw.

**TECHNICAL INFORMATION**

Tighten the screw connection in the normal position.

- Tighten nut (2) hand-tight.
- Remove the universal jack from under the vehicle.




- 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.

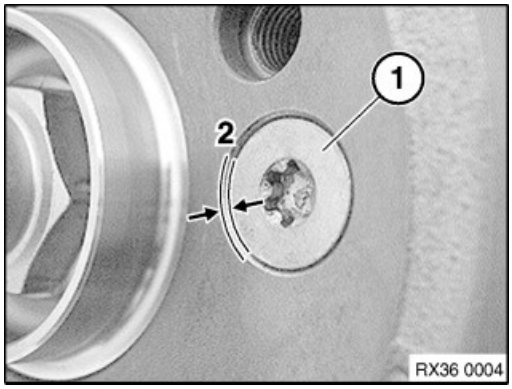
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  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.

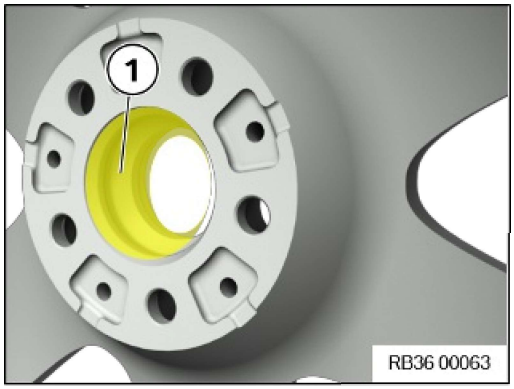
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

**Brake disc to front wheel hub**

| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |

**Brake disc to rear wheel hub**

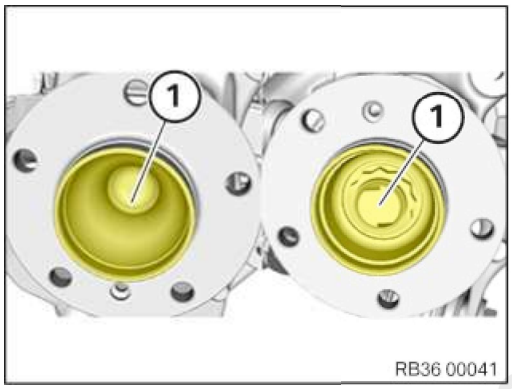
| | | | |
|---|---|---|---|
| M8 | Renew screw. | Tightening torque | 16 Nm |




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

**Expendable materials**

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




- Lightly grease the front and rear wheel hubs in this area (1) to protect from corrosion.

**Expendable materials**

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




- In vehicles with M Carbon ceramic brake: The wheel assembly jack must be used to install the wheel (see workshop equipment).

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

cardiagn.com




**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 corroded wheel bolts.

  **Parts:** Wheel bolts
- Clean the wheel bolts.
- Check wheel bolts and threads for damage, renew the wheel bolts 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.<br>Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.<br>Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again. | Tightening torque<br><br>Check | 140 Nm<br><br>140 Nm |

**7 – Measure ride height of rear axle and adjust to normal position**




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

**G20_Hinterradantrieb, Standard suspension**

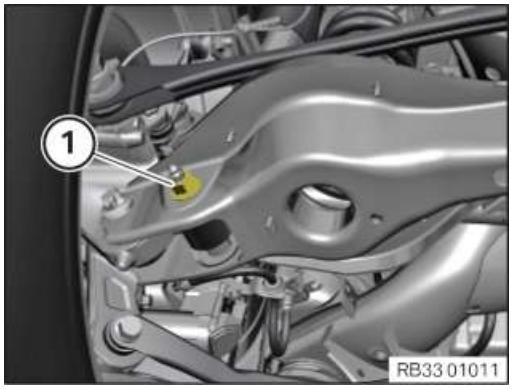
| *Measured from centre of wheel hub to lower edge of wheel arch* | |
|---|---|
| Dimension A | 363 ( 353 - 373) mm |

**G20_Hinterradantrieb, Sports suspension settings with low-slung**

| *Measured from centre of wheel hub to lower edge of wheel arch* | |
|---|---|
| Dimension A | 353 ( 343 - 363) mm |

**8 – Tighten screw connection on the camber control arm.**

cardiagn.com




**TECHNICAL INFORMATION**

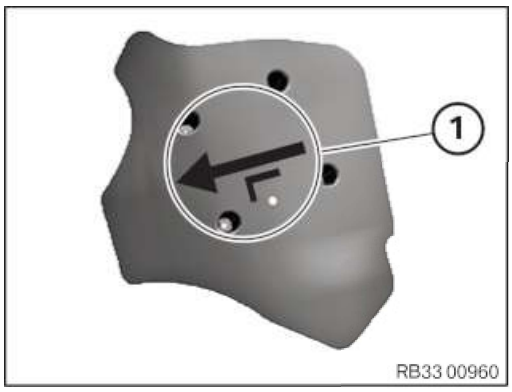
Tighten the screw connection in the normal position.

- Tighten the nut (1) in normal position.

**Shock absorber to camber arm**

| | | | |
|---|---|---|---|
| M12 | Renew nut and screw.<br>Tighten in normal position. | Tightening torque<br>Angle of rotation | 100 Nm<br>90 ° |

### 9 – Installing the cover of the camber control arm



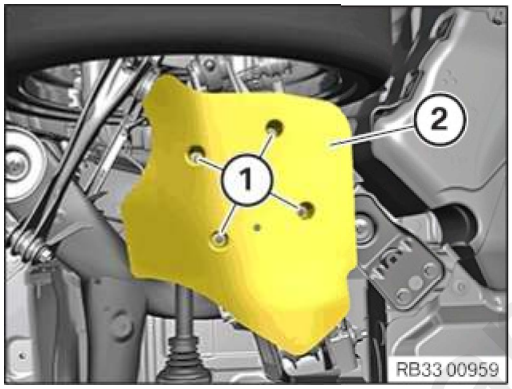

- Note the installation location and direction of installation.

  Direction of installation:

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

  Installation location:

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




- Position the camber control arm cover (2) 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 |

cardiagn.com

**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.<br>Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.<br>Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again. | Tightening torque<br><br>Check | 140 Nm<br><br>140 Nm |

**Shock absorber to camber arm** Used in step 8

| | | | |
|---|---|---|---|
| M12 | Renew nut and screw.<br>Tighten in normal position. | Tightening torque<br>Angle of rotation | 100 Nm<br>90 ° |

**Cover to camber control arm** Used in step 9

| | | | |
|---|---|---|---|
| M6 | Replace nuts. | Tightening torque | 6 Nm |

## Overview of Special Tools

### 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 | |

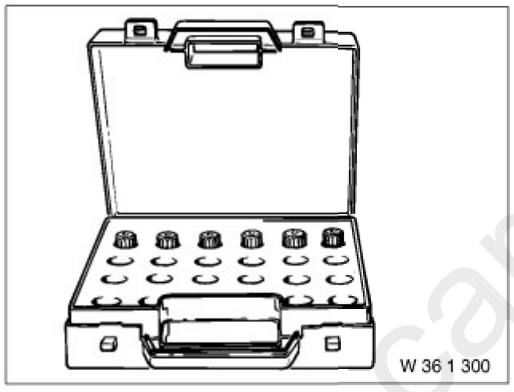
cardiagn.com

**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 | |

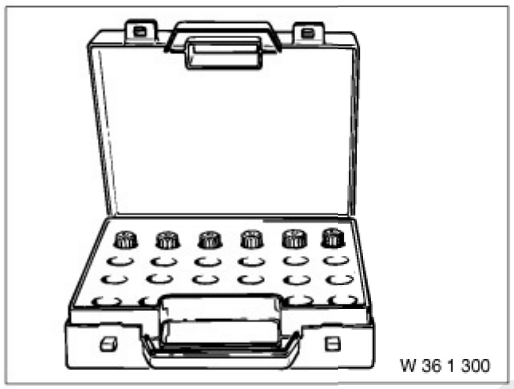
cardiagn.com

**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 | |

cardiagn.com

**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 | |

cardiagn.com

## Overview Technical Data

| G20_Hinterradantrieb, Standard suspension | Used in step 7 |
|---|---|
| *Measured from centre of wheel hub to lower edge of wheel arch* | |
| Dimension A | 363 ( 353 - 373) mm |

| G20_Hinterradantrieb, Sports suspension settings with low-slung | Used in step 7 |
|---|---|
| *Measured from centre of wheel hub to lower edge of wheel arch* | |
| Dimension A | 353 ( 343 - 363) mm |

## Links

| Repair instructions | Used in step |
|---|---|
| 00 .. ... Raising the vehicle using a vehicle hoist | |

# 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 ... Raising the vehicle using a vehicle hoist.

**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 Information on electrostatic discharge (ESD) protection.

**NOTICE**

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

cardiagn.com

## 1 – Remove front left or right wheel

▶ **Removing the wheel**




- In vehicles with M Carbon ceramic brake: The wheel assembly jack must be used to remove the wheel (see workshop equipment).

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

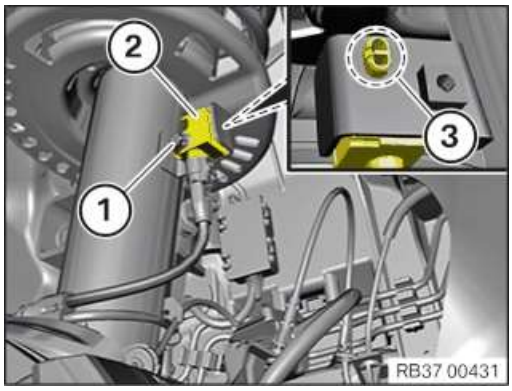



- If several wheels are removed simultaneously: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Release the wheel bolts (arrows) crosswise and remove the wheel.
- To release and tighten wheel bolts with a security code: Use a suitable adapter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

cardiagn.com

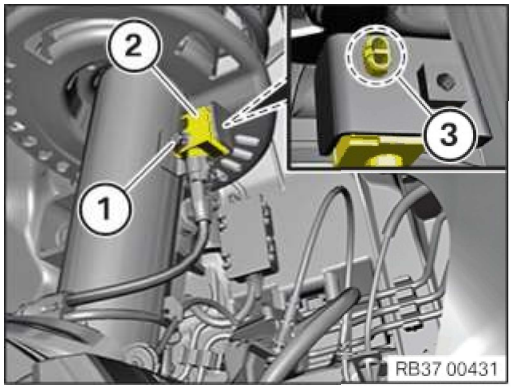
## MAIN WORK

### 2 – Remove the front vertical acceleration sensor




- Unlock and disconnect the plug connection on the vertical acceleration sensor.
- 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).
- Connect and lock the connector on the vertical acceleration sensor.

## 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.

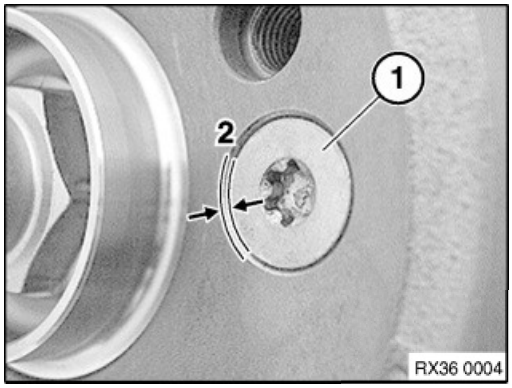
  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.

rdiagn.com




- 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.

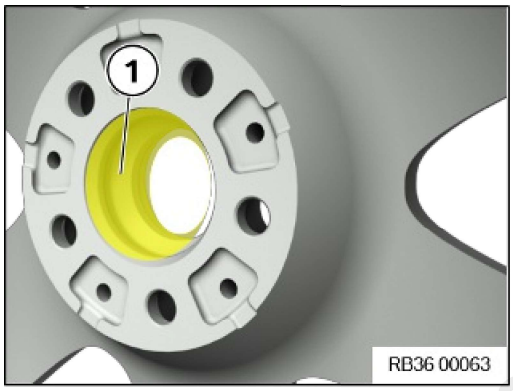
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

**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 |




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

**Expendable materials**

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




- Lightly grease the front and rear wheel hubs in this area (1) to protect from corrosion.

**Expendable materials**

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

cardiagn.com




- In vehicles with M Carbon ceramic brake: The wheel assembly jack must be used to install the wheel (see workshop equipment).

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




**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 corroded wheel bolts.

  **Parts:** Wheel bolts
- Clean the wheel bolts.
- Check wheel bolts and threads for damage, renew the wheel bolts 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.<br>Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.<br>Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again. | Tightening torque<br><br><br><br>Check | 140 Nm<br><br><br><br>140 Nm |

## Additional Information

### Overview of Tightening Torques

cardiagn.com

## Overview of Tightening Torques

**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 |

**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.<br>Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.<br>Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again. | Tightening torque<br><br>Check | 140 Nm<br><br>140 Nm |

## Overview of Special Tools

### 2 344 011 Tool

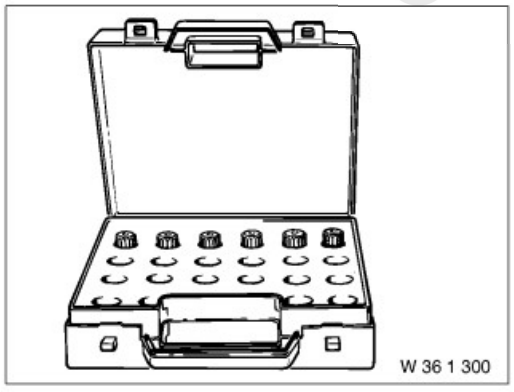



**Common** — Used in step 4

| | |
|---|---|
| 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 | |

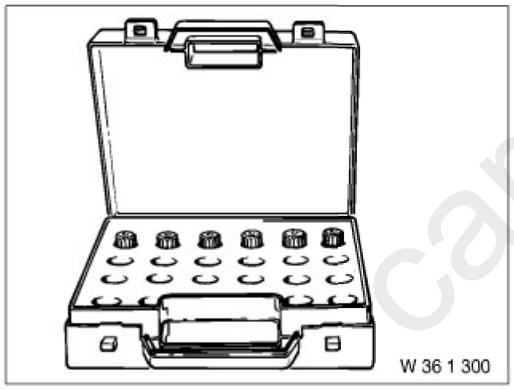
cardiagn.com

**0 495 224 (36 1 326) Wheel stud**



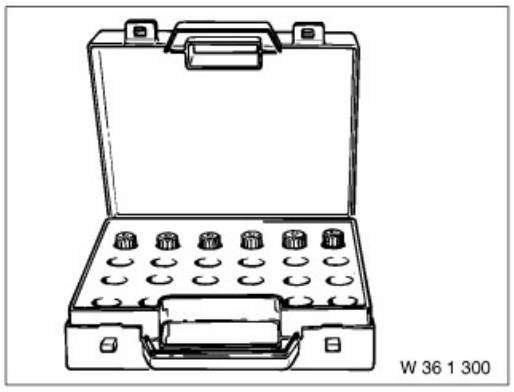

| Common | Used in step 1 |
|---|---|
| Usage | (Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

**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 | |

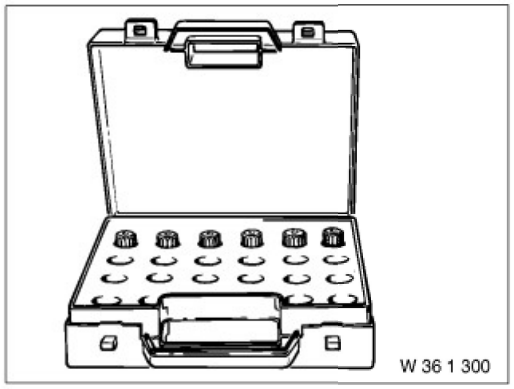
carmagn.com

### 0 495 227 (36 1 329) Wheel stud



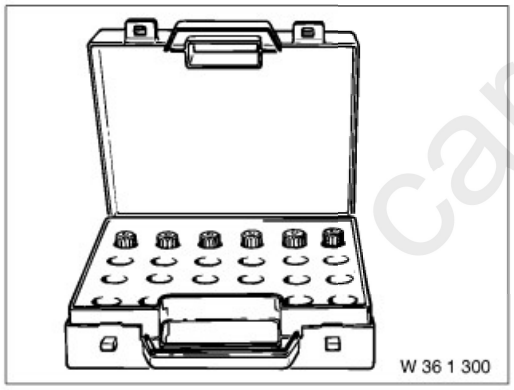

| Common | Used in step 1 |
|---|---|
| Usage | (Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 0 495 228 (36 1 331) Wheel stud



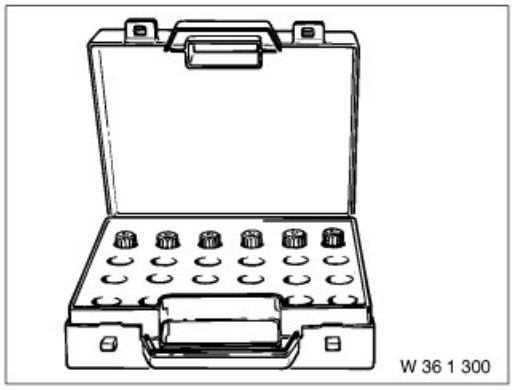

| Common | Used in step 1 |
|---|---|
| Usage | (Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342 |
| Included in the tool or work | 0 492 518 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

### 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 | |

cardiagn.com

## Links

| Repair instructions | Used in step |
| --- | --- |
| 00 .. ... Raising the vehicle using a vehicle hoist | |

cardiagn.com

# 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 ... Raising the vehicle using a vehicle hoist.

**RISK OF DAMAGE**

**Electrostatic discharge.**

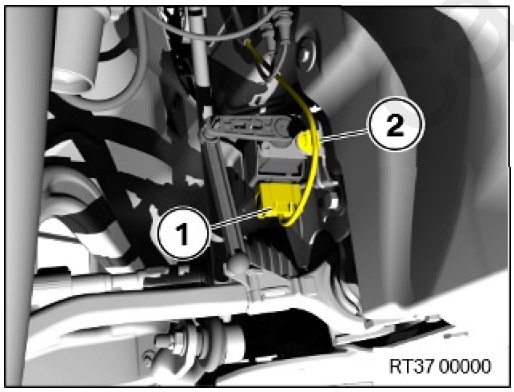
**Damage to or destruction of electrical components.**

- 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 Information on electrostatic discharge (ESD) protection.

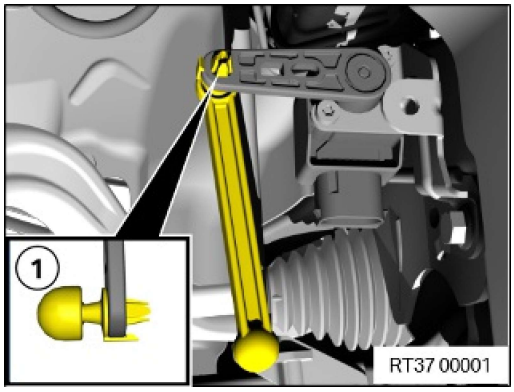
**NOTICE**

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

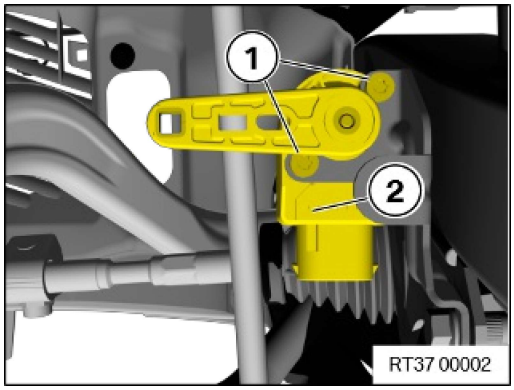
### 1 – Remove ride height sensor, front




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

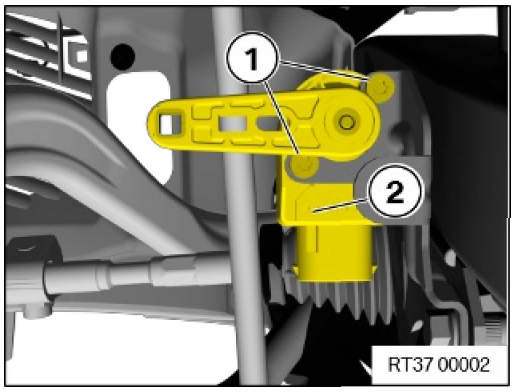



- Unclip the jointed rod (1) at the ride height sensor.



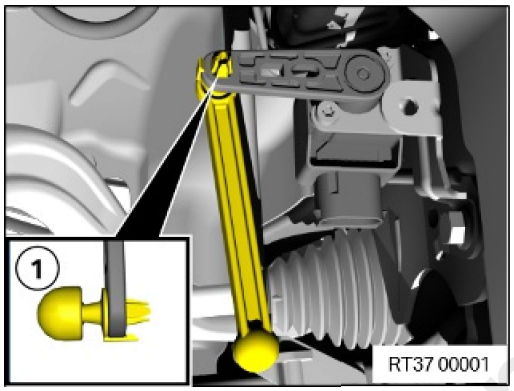

- Loosen screws (1).
- Remove the ride height sensor (2).

**2 – Install ride height sensor, front**

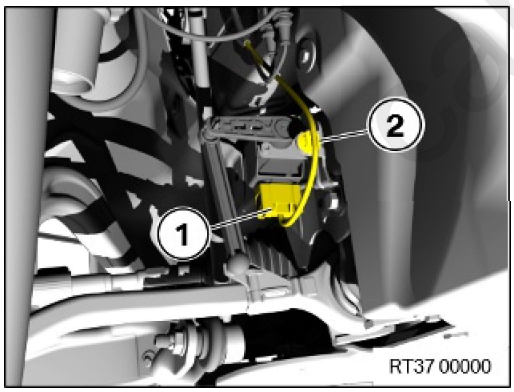



- Install the ride height sensor (2).
- Renew the screw (1).

  **Parts:** Screw
- Tighten the screws (1).




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




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

-diagn.com

### 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 RDC

**TECHNICAL INFORMATION**

The tyre pressure control monitors the tyre pressure in all four 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 RDC.

## Additional Information

carbagn.com

## Overview of Tightening Torques

## Links

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

cardiagn.com

# 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 ... Raising the vehicle using a vehicle hoist.

**RISK OF DAMAGE**

**Electrostatic discharge.**

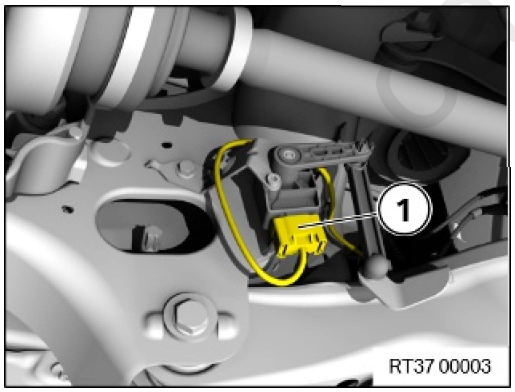
**Damage to or destruction of electrical components.**

- 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 Information on electrostatic discharge (ESD) protection.

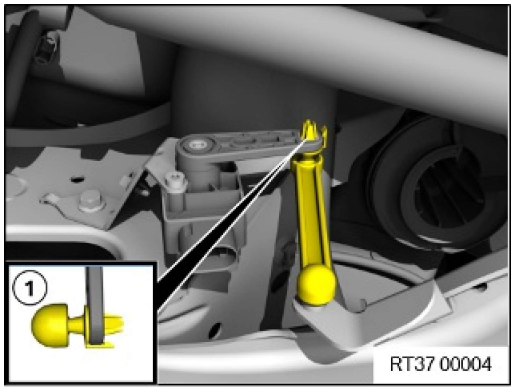
**NOTICE**

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

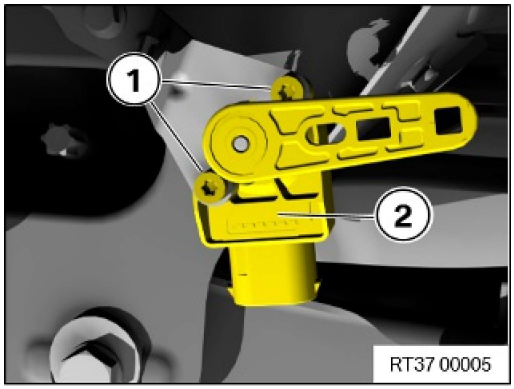
### 1 – Removing the rear ride height sensor




- Unlock plug connection (1) and disconnect.

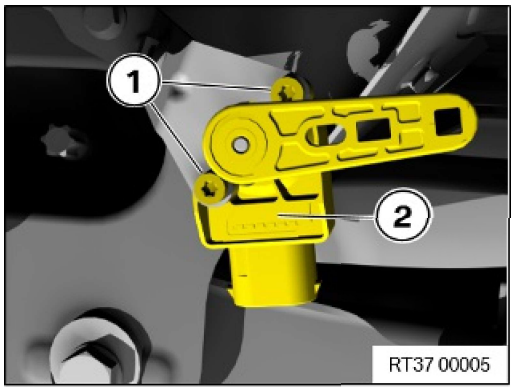



- Unclip the jointed rod (1) at the ride height sensor.




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

**2 – Installing the rear ride height sensor**

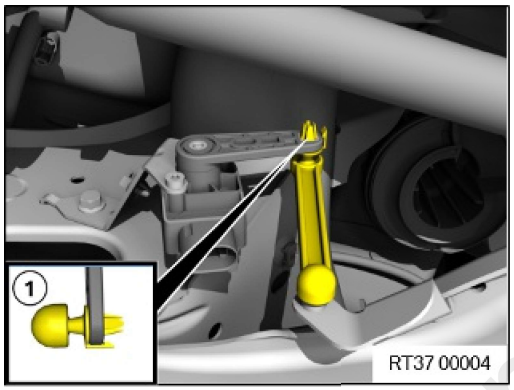



- Install the ride height sensor (2).
- Renew screws (1).

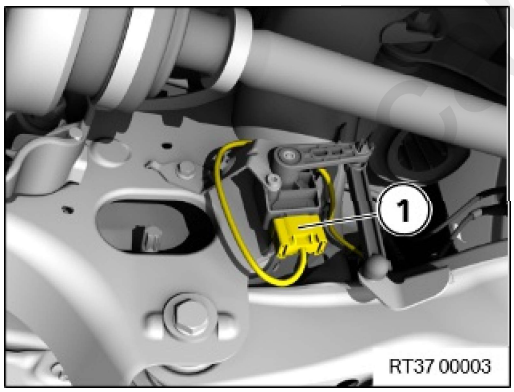
  **Parts:** Bolts
- Tighten the screws (1).

**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.

cardiagn.com

### 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 RDC

**TECHNICAL INFORMATION**

The tyre pressure control monitors the tyre pressure in all four 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 RDC.

## Additional Information

carbagn.com

## 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 |
|---|---|
| 63 10 ... Test requirements for headlights vertical aim adjustment | 4 |
| 61 35 ... Notes on ESD protection (Electro Static Discharge) | |
| 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 ...)

**WARNING**

**Working on 12 V vehicle electrical system.**

**Risk of short circuits! Risk of fire!**

- Detach battery earth lead from battery.
- For additional batteries: Detach all battery earth leads from additional batteries.

**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 Information on electrostatic discharge (ESD) protection.

## PRELIMINARY WORK

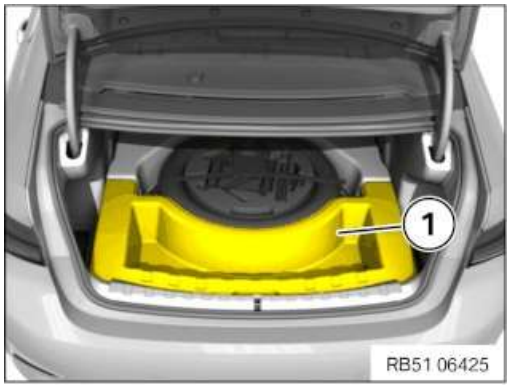
### 1 – Removing the luggage compartment floor trim panel



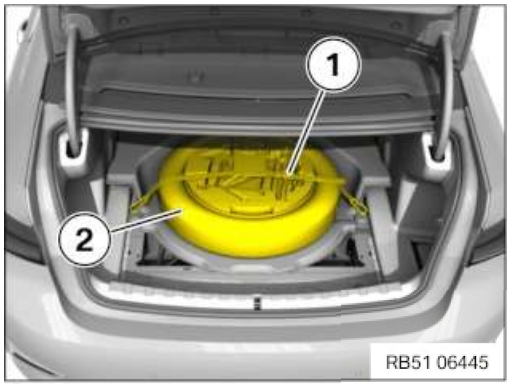

- Remove luggage compartment floor trim panel (1).

### 2 – If installed: Removing the compact spare wheel

▸ **Removing rear luggage compartment well**

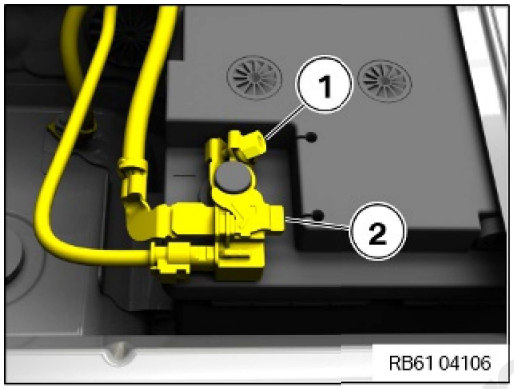



- Remove rear luggage compartment well (1).




- Open buckle on seat belt strap (1) and set it aside.
- Remove emergency wheel (2) with the insert.

### 3 – Disconnecting the negative battery cable of the system battery




**RISK OF DAMAGE**

**Damage to battery terminal, the safety battery terminal or the intelligent battery sensor (IBS).**

**Damaged battery terminals can lead to malfunctions or vehicle electrical system faults.**

- Pull off battery terminal from battery pole by carefully moving to and fro. Do not pry off using a tool.

- Loosen nut (1).
- Remove negative on-board electrical system battery lead (2) from the negative battery terminal, place to one side and secure.

### 4 – Disconnecting the negative auxiliary battery lead in the engine compartment

**Check**

- Check, whether an auxiliary battery is installed in the engine compartment.

**Result**

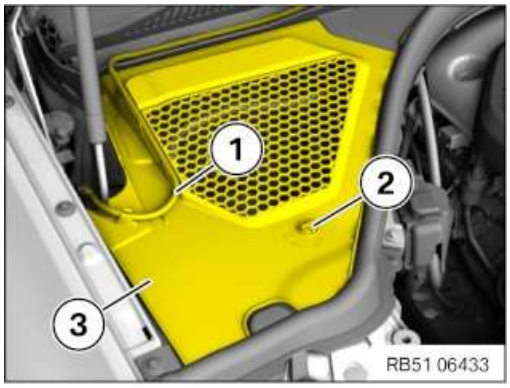
» Auxiliary battery is not installed in the engine compartment

**Measure**

- Install the rear right engine compartment cover

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

cardiag.com




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

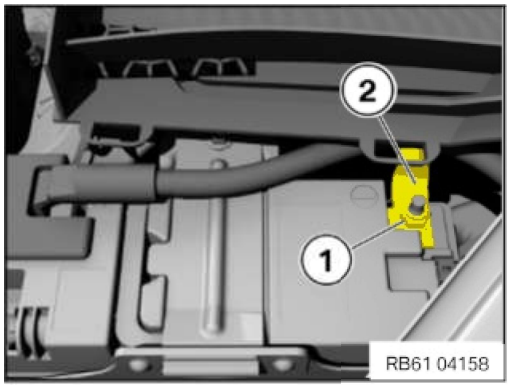
**Result**

» 12-V dual storage system is installed.

**Measure**

- Disconnect the negative battery cable of the 12 V dual storage system

**▸ Disconnect the negative battery cable of the 12V dual storage system**




**TECHNICAL INFORMATION**

Follow notes for 12 V dual storage system.

See additional information 6120 ... Notes on the 12 V dual storage system.

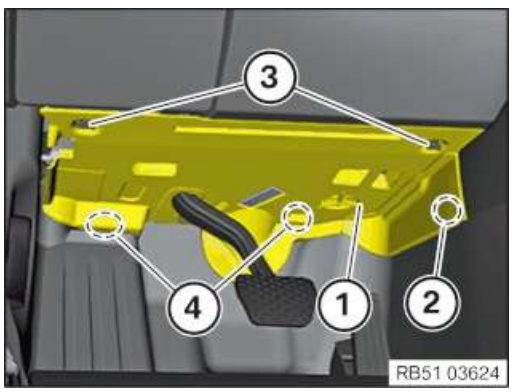
**NOTICE**

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

- Unfasten nut (1).

  The nut (1) is non-detachable and connected with the negative battery cable of the 12-V dual storage battery (2).
- Disconnect negative battery lead of the 12-V dual storage battery (2) from the negative battery terminal, set to one side and secure.

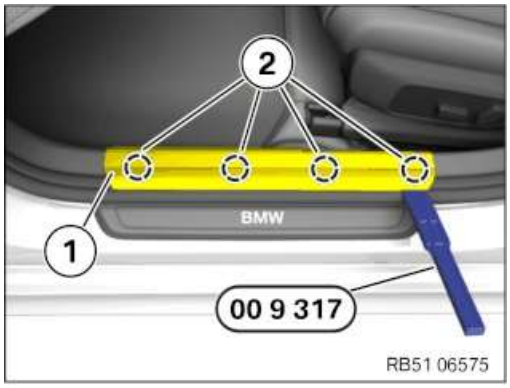
**5 – Removing the trim panel for pedal mechanism**



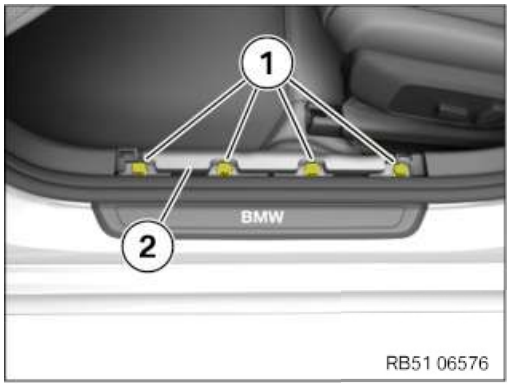

- Unclip the trim panel for the pedal mechanism (1) towards the inside in this area (2).
- Turn the locks (3) by 90°.
- Detach the trim panel for the pedal mechanism (1) inwards out of the guides (4).
- Unlock associated plug connection and disconnect.

**6 – Remove door sill cover strip**

cardiagn.com

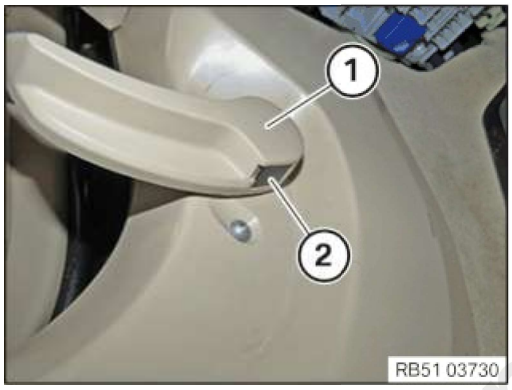



- Detach the door sill cover strip(1) using the special tool 0 490 534 (00 9 317) from the clips (2) in the floor panel.

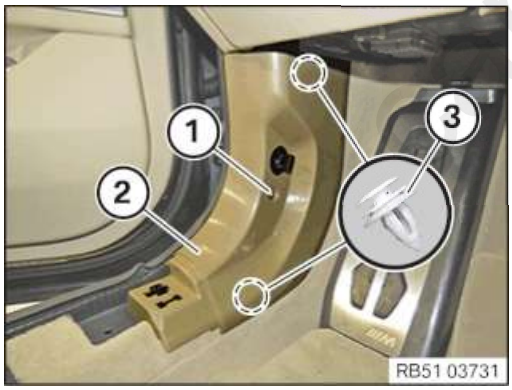



- If necessary, remove the clips (1) from the floor panel (2) and attach to the door sill cover strip.

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



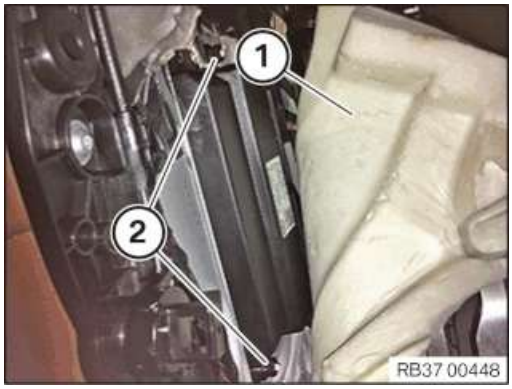

- Pull bonnet release lever (1) towards the rear.
- Lever out the locking wedge (2).
- Remove the bonnet release lever (1) inward.



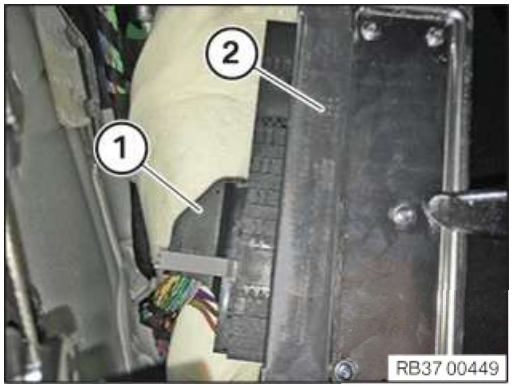

- Loosen screw (1).
- Loosen the side trim panel (2) at the clips (3) and remove it toward the inside.

**MAIN WORK**

**8 – Remove VDP control unit**

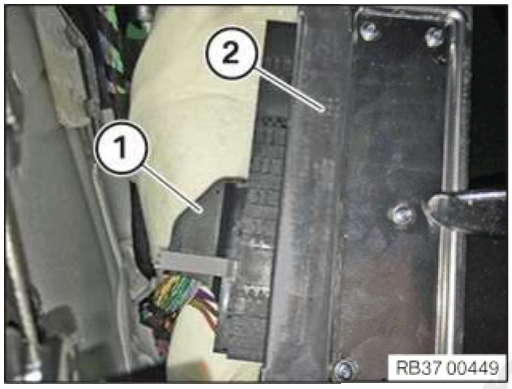



- Fold carpet (1) in the footwell to one side.
- Loosen nuts (2).

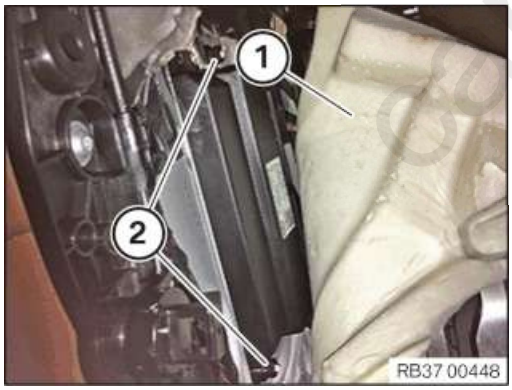



- Unlock connector (1) and pull off.
- Remove the VDP control unit (2).

**9 – Install VDP control unit**




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




- Tighten nuts (2).

**VDP control unit to body**

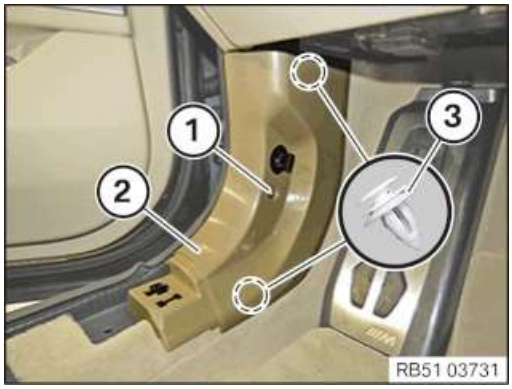
| | | | |
|---|---|---|---|
| Plastic nut | Renew plastic nut. | Tightening torque | 2,6 Nm |

- Fold back carpet (1) in the footwell.

**POSTPROCESSES**

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

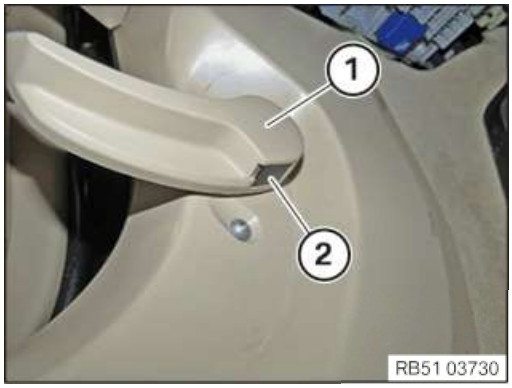
cardiagn.com




- 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).

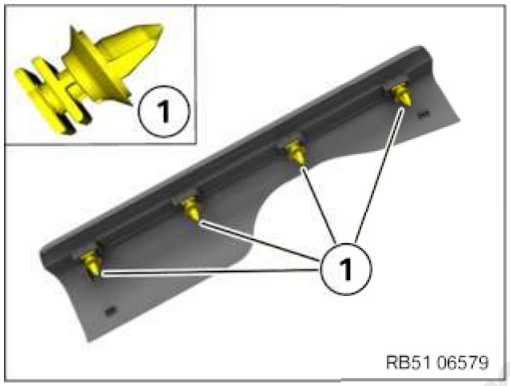
**A-pillar footwell side trim panel**

| | | | |
|---|---|---|---|
| Screw | | Tightening torque | 2,5 Nm |

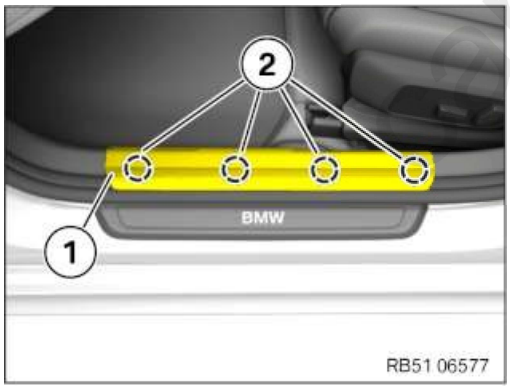



- Install bonnet release lever (1).
- Pull bonnet release lever (1) towards the rear.
- Install locking wedge (2).

### 11 – Install the door sill cover strip

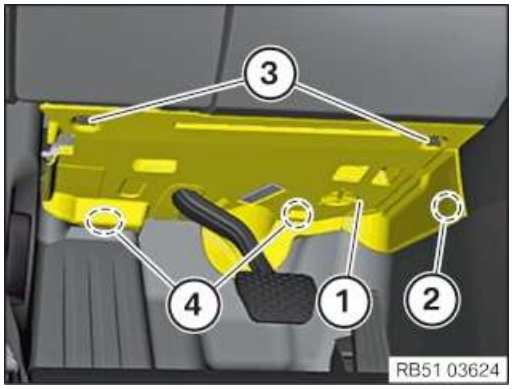



- Check the clips (1) for damage and renew if necessary.




- Clip the door sill cover strip (1) into the floor panel with the clips (2).

### 12 – 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).
- Insert locks (3) correctly and turn 90°.

mdiagn.com

## 13 – Connect the negative battery lead of the auxiliary battery in the engine compartment

**Check**

- Check whether an auxiliary battery is installed in the engine compartment.

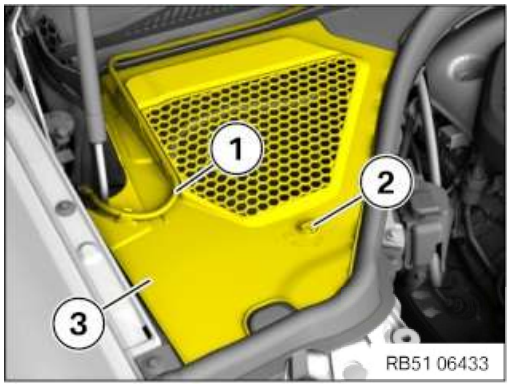
**Result**

» Auxiliary battery is not installed in the engine compartment.

**Measure**

- Install the rear right engine compartment cover.

▸ **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.

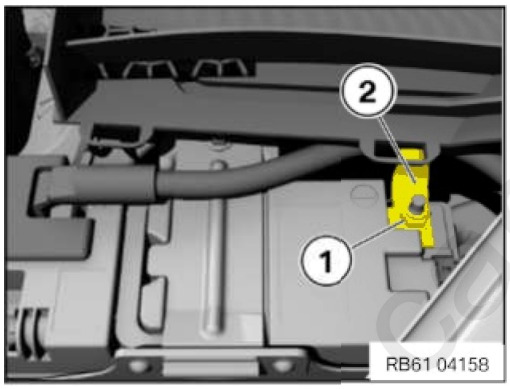
**Result**

» 12 V dual storage system is installed.

**Measure**

- Connecting negative battery cable of 12-V dual storage system

▸ **Connecting negative battery cable of 12-V dual storage system**




**TECHNICAL INFORMATION**

Follow notes for 12 V dual storage system.

See additional information 6120 ... Notes on the 12 V dual storage system.

**NOTICE**

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

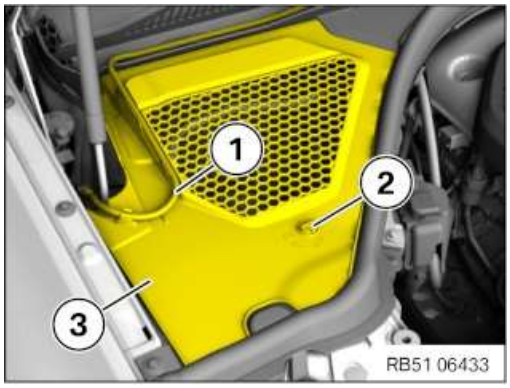
- Release negative battery cable of the 12- V - dual storage system (2) release from the fixture.
- Position the negative battery cable of 12-V dual storage system (2) as shown on the negative battery terminal.

  The nut (1) is connected to the negative battery cable of the dual storage battery (2) in a way that it cannot be lost.
- Tighten nut (1).

**Negative battery terminal 12V dual storage system**

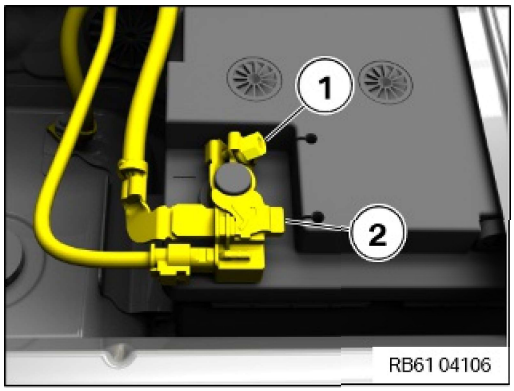
| | | | |
|---|---|---|---|
| Nut | | Tightening torque | 19 Nm |

## 14 – 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.

**15 – Connecting the negative battery cable of the system battery**

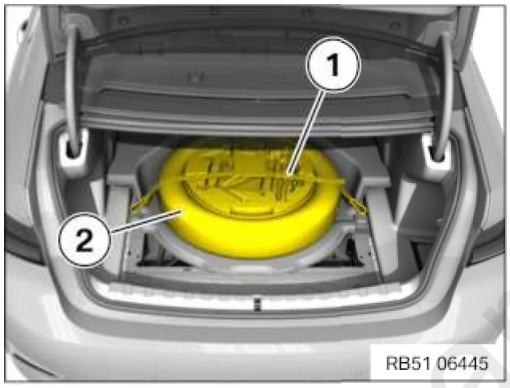



- Position negative battery cable of the system battery (2) on the negative battery terminal as shown.
- Tighten nut (1).

**Negative battery terminal**

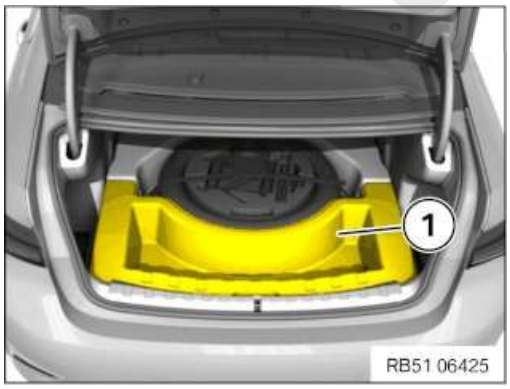
| | | | |
|---|---|---|---|
| Nut | | Tightening torque | 5 Nm |

**16 – If installed: Install the emergency wheel**




- Install the emergency wheel (2) with the insert.
- Position the seat belt strap above the emergency wheel and close the buckle on the seat belt strap (1).

▸ **Installing rear luggage compartment well**




- Install rear luggage compartment well (1).

**17 – Installing the luggage compartment floor trim panel**

cardiagn.com




- Insert the luggage compartment floor trim panel (1).

**18 – Program/encode the VDP control unit**

▸ **Encode/program control unit(s)**

**Prerequisite**

Replacement of component.

**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.

## Additional Information

### Overview of Tightening Torques

**VDP control unit to body** Used in step 9

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

cardiagn.com

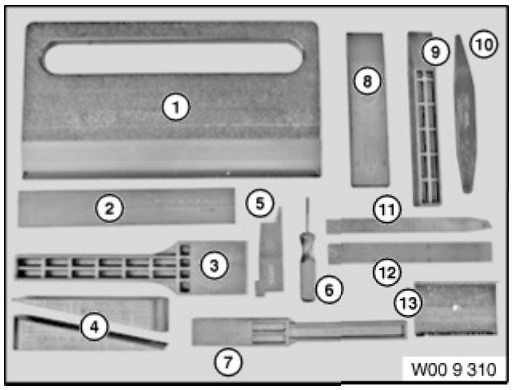
| A-pillar footwell side trim panel | | | Used in step 10 |
|---|---|---|---|
| Screw | | Tightening torque | 2,5 Nm |

| Negative battery terminal 12V dual storage system | | | Used in step 13 |
|---|---|---|---|
| Nut | | Tightening torque | 19 Nm |

| Negative battery terminal | | | Used in step 15 |
|---|---|---|---|
| Nut | | Tightening torque | 5 Nm |

## Overview of Special Tools

**0 490 534 (00 9 317) Wedge**




| Common | Used in step 6 |
|---|---|
| Usage | (Trim wedge) Replaced by special tool 00 9 325 from 11/2008 (quality improvement due to new material) Replaced by 00 9 325 (0 496 569) |
| Included in the tool or work | 0 490 527 |
| Storage location | |
| Replaced by | |
| In connection with | |
| SI-Number | |

## Links

| Repair instructions (PRE) | Used in step |
|---|---|
| Instructions for 12 V dual storage system | 413 |

| Repair instructions | Used in step |
|---|---|
| 61 35 ... Notes on ESD protection (Electro Static Discharge) | |

cardiagn.com