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

31 21 180 Replacing the front wheel bearing

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

Danger! Life-threatening injuries!

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

Component damage caused by striking tools.

Brute force can result in component damage.

- Only use those tools intended for the work.

PRELIMINARY WORK

1 – Remove front left or right wheel

▶ **Removing the wheel**

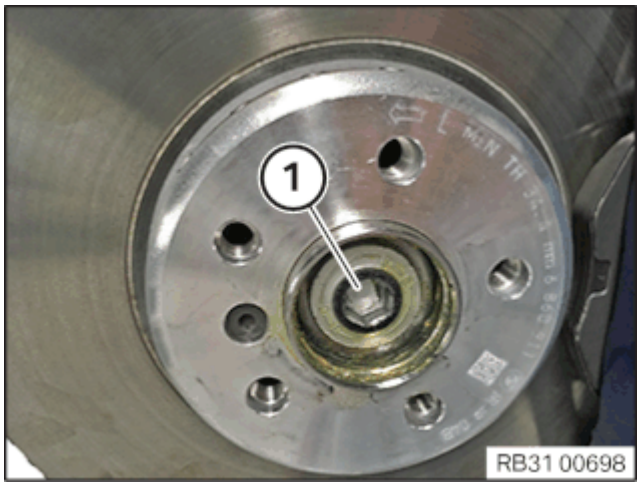
A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

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

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

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

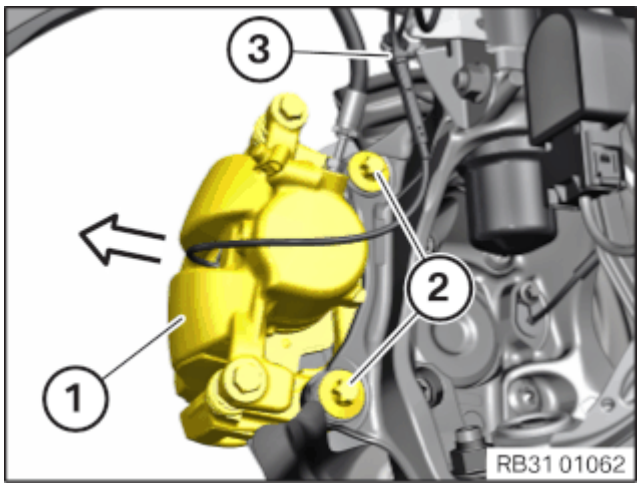
2 – Loosen the output shaft from the wheel bearing



- Press brake pedal.
- Loosen the collar bolt (1).

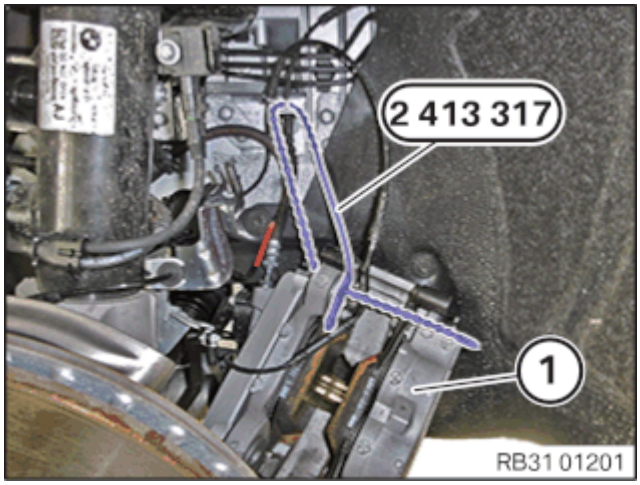
  Do not leave the output shaft hanging on the joint, tie up the output shaft if necessary.

3 – Detach the front brake caliper



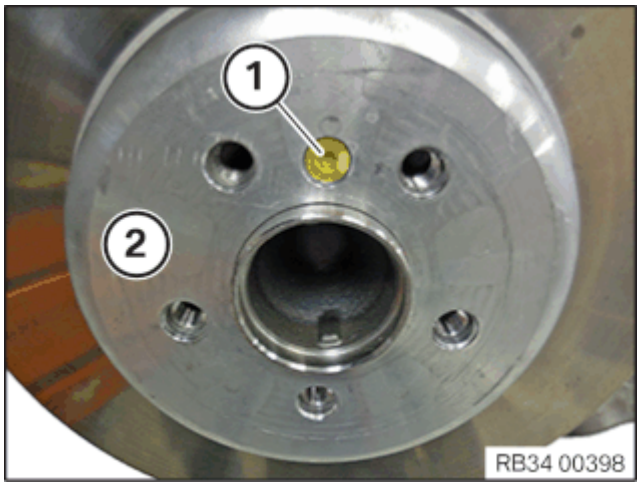
- Release the cable of the brake pad wear sensor from the holder (3).
- Loosen screws (2).
- Remove brake caliper (1) in direction of arrow.

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



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

4 – Remove front brake disc



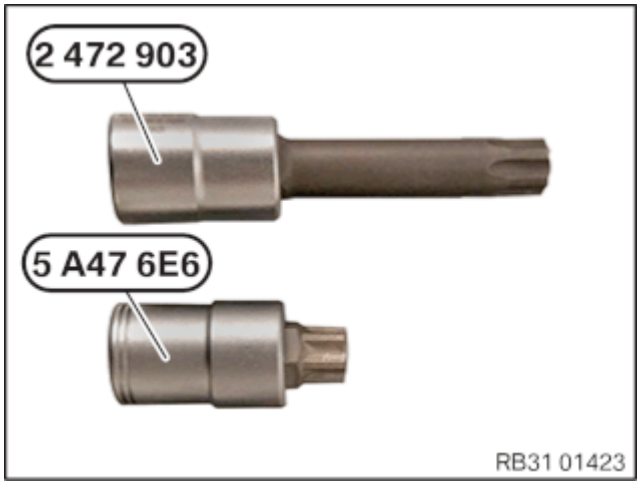
Note the following for the removal of the brake disc:

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

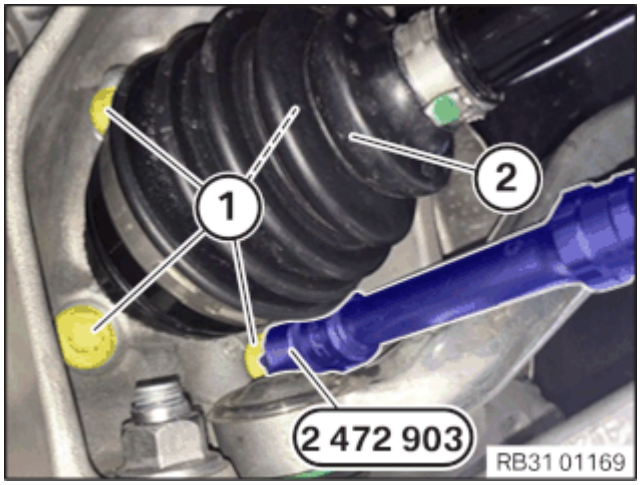
- Loosen screw (1).
- Remove brake disc (2).

MAIN WORK

5 – Replace wheel bearings



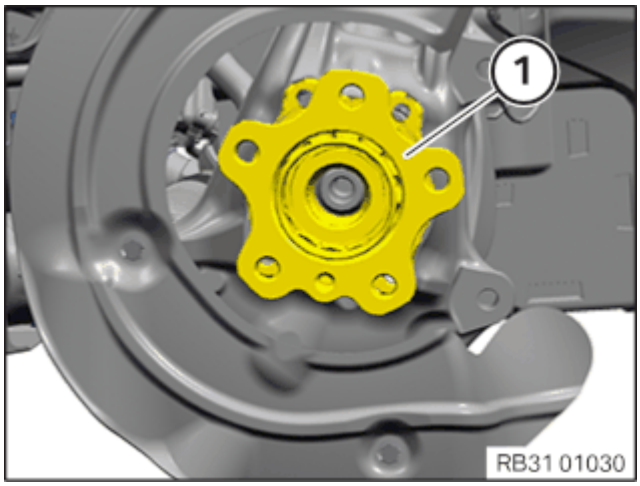
- Use special tool **2 472 903** or to loosen and tighten the spherical-collar bolts.



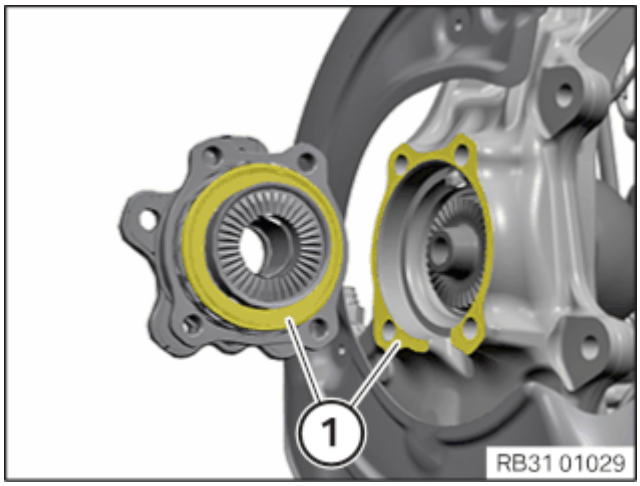
Secure component against falling.

- Loosen spherical-collar bolts (1) with the special tool **2 472 903**.

  In order to reach the spherical-collar bolts (1), press the output shaft (2) slightly to the side.

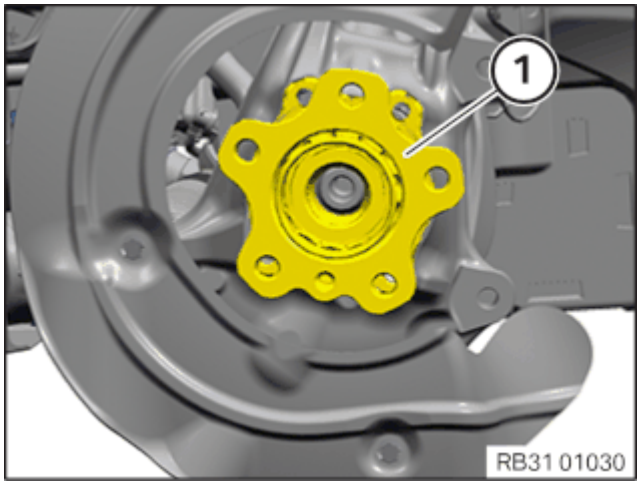


- Remove wheel bearing (1).



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

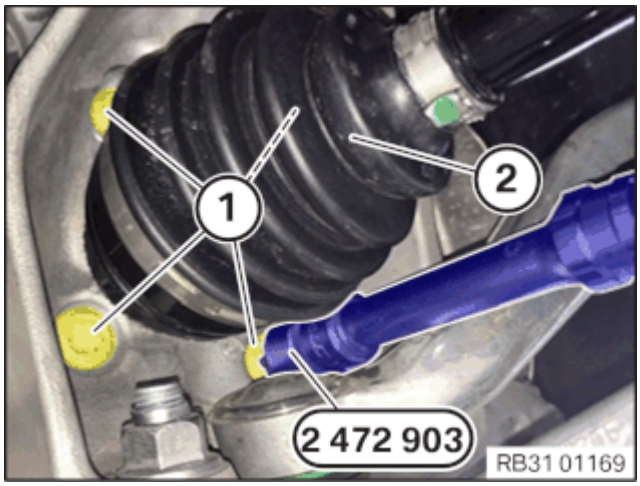
- Clean contact surfaces (1).



- Renew the wheel bearing (1).

  Parts: Wheel bearing

- Position the wheel bearing (1) on the swivel bearing.



- Renew the spherical-collar bolts (1).

  Parts: Spherical-collar bolts

- Tighten spherical-collar bolts (1) with the special tool **2 472 903** cross-wise.

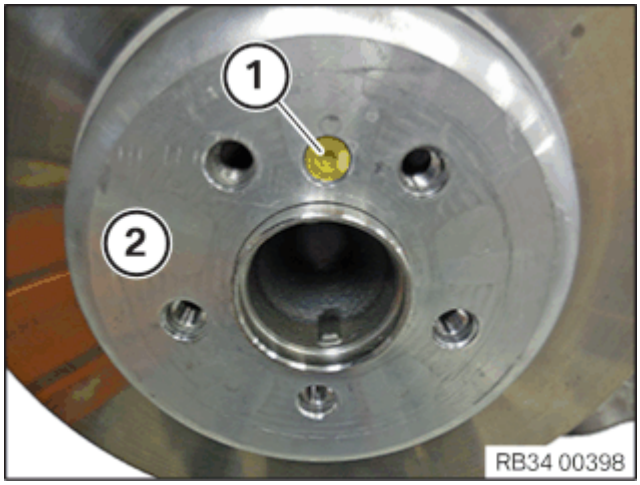
  In order to reach the spherical-collar bolts (1), press the output shaft (2) slightly to the side.

Wheel bearing to swivel bearing

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

POSTPROCESSES

6 – Install front brake disc



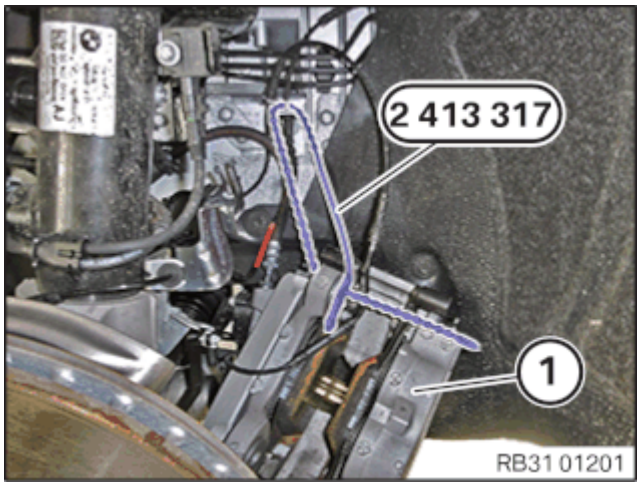
- Position brake disc (2) on wheel hub.
- Renew the screw (1).

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

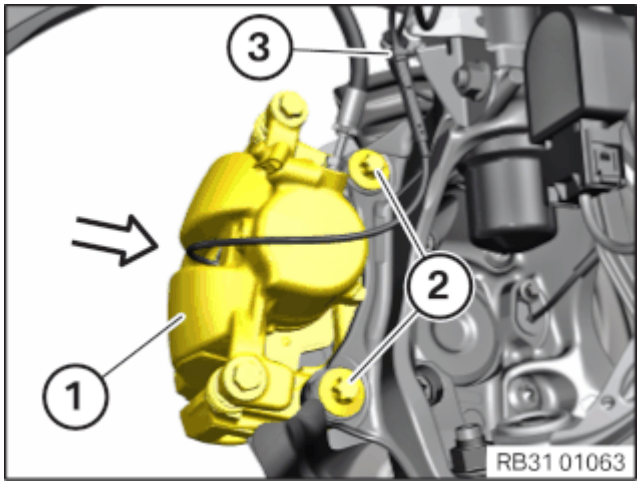
Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

7 – Fasten the front brake caliper



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



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

  Parts: Screws
- Tighten the screws (2).

Brake caliper / caliper carrier at front swivel bearing

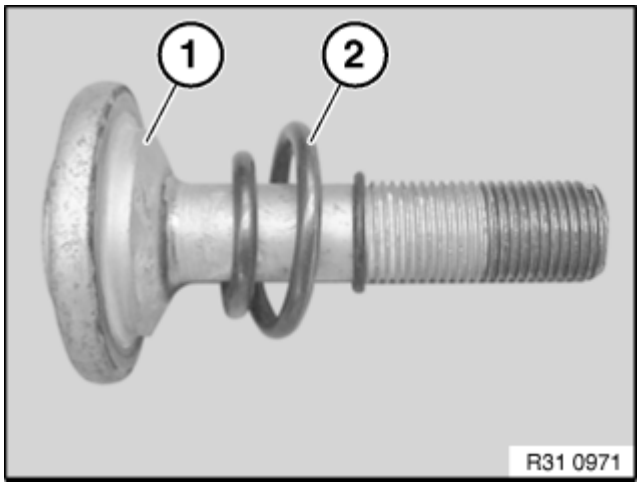
M12	Renew screw.	Tightening torque	110 Nm

Perform this step on the left side only.

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

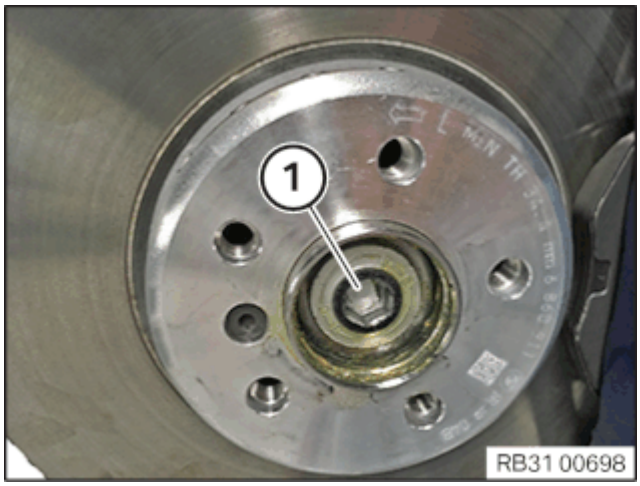
8 – Securing the output shaft on the wheel bearing

The installation note for front gearing must be observed at all times.

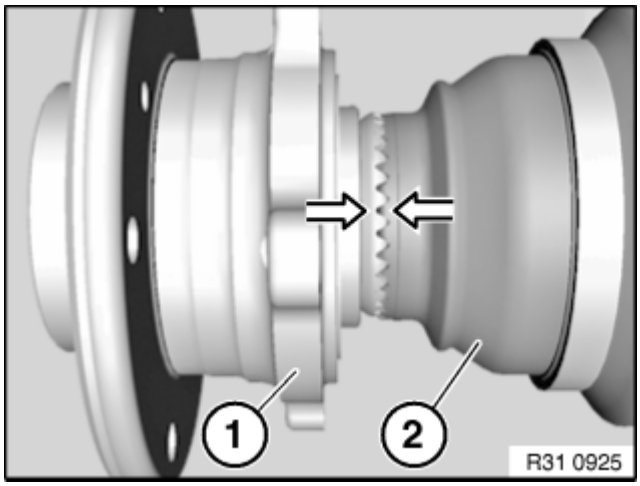


- Renew the collar bolt (1) and the compression spring (2).

  Parts: Collar bolt and compression spring
- Note installation position of compression spring (2).
- Keep the collar bolt (1) and the front gearing of the wheel bearing and the output shaft clean and free of grease.



- Hand-tighten the collar bolt (1) with the compression spring.



The front gearing of the wheel bearing and output shaft must be installed in an interlocking position (tooth-in-tooth).

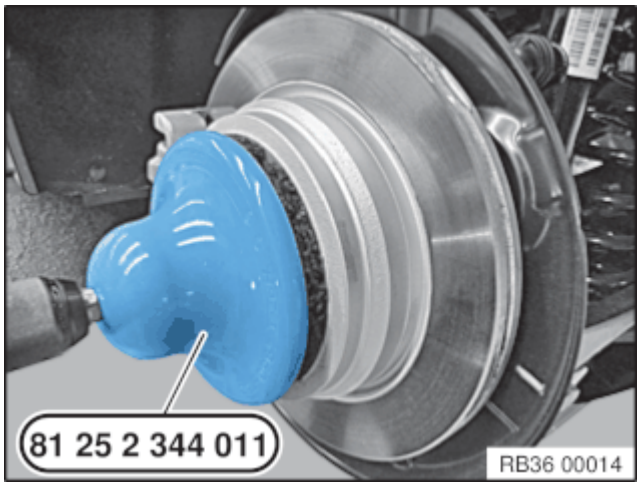
- Ensure positive locking by mutual twisting of the wheel bearing (1) and the output shaft (2).
- Press brake pedal.
- Tighten the collar bolt.

Output shaft to wheel bearing

M16	Replace collar bolt and spring.	Jointing torque	210 Nm
		Angle of rotation	90 °

9 – Install front left or right wheel

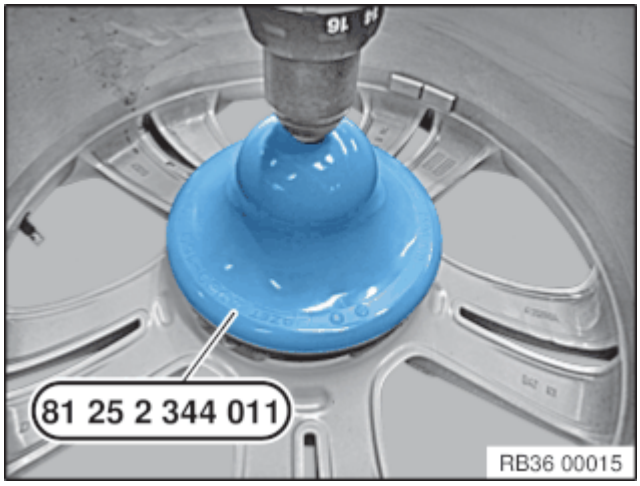
▶ Mounting the wheel



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.
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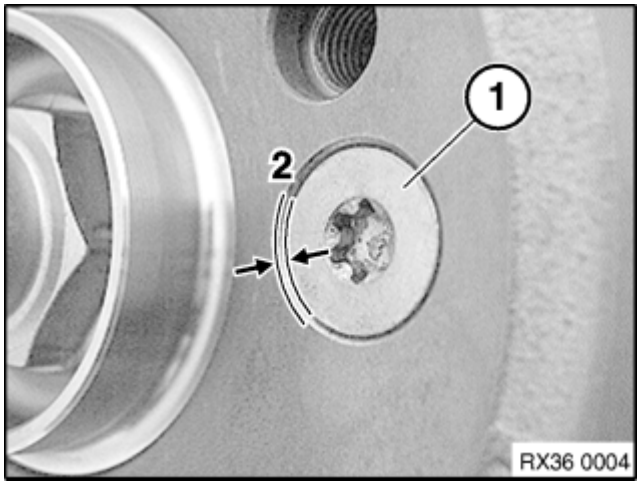


- Check that the mounting bolt (1) for the brake disc is securely seated.

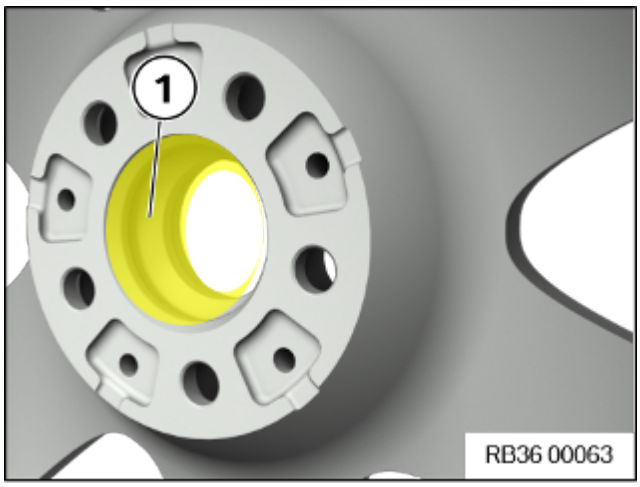
  The mounting bolt (1) for the brake disc **may not** protrude on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm

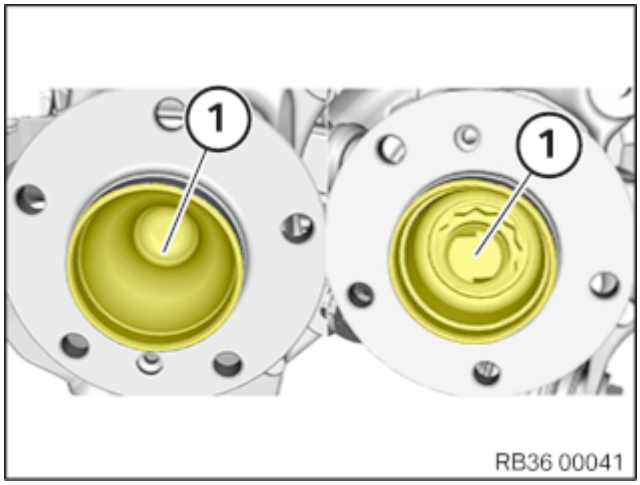


Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

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

Expendable materials

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



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

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

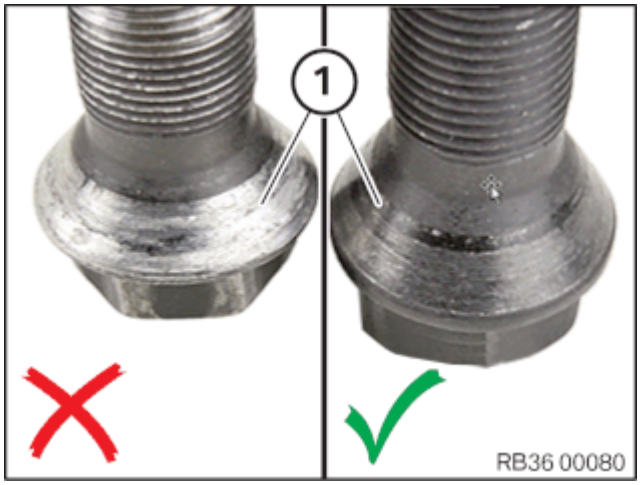
Expendable materials

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

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

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

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



Check

- **Check wheel bolts for wear.**

Result

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

Measure

- Replace wheel bolts.

  Parts: Wheel bolts

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

- Renew the corroded wheel bolts (arrows).

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

Wheel bolts

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

Additional Information

Overview of Tightening Torques

Wheel bearing to swivel bearing Used in step 5

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

Brake disc to front wheel hub Used in step 6 9

M8	Renew screw.	Tightening torque	16 Nm

Brake caliper / caliper carrier at front swivel bearing Used in step 7

M12	Renew screw.	Tightening torque	110 Nm

Output shaft to wheel bearing Used in step 8

M16	Replace collar bolt and spring.	Jointing torque	210 Nm
		Angle of rotation	90 °

Brake disc to rear wheel hub Used in step 9

M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts Used in step 9

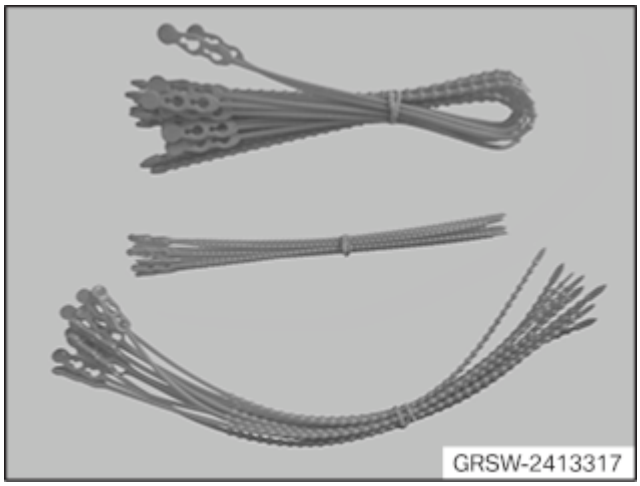
M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim.	Tightening torque	140 Nm
	Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.	Check	140 Nm
	Check all the wheel bolts in the same order or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

Overview of Special Tools

2 413 317 Cable strap

Common Used in step 3 7

Usage	The "Cable ties" parts set consists of 3 items as follows: ABV232 Length: 320 mm colour: RedABV250 Length: 500 mm colour: RedABVS270 Length: 665 mm colour: Red



Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	01 47 15 (332)

2 472 903 Socket wrench

Common Used in step 5

Usage	Socket wrench for disassembling and assembling the wheel bearing screw connection. The silhouette foil is included in the scope of delivery.
Included in the tool or work	
Storage location	B6
Replaced by	
In connection with	
SI-Number	01 15 19 (660)

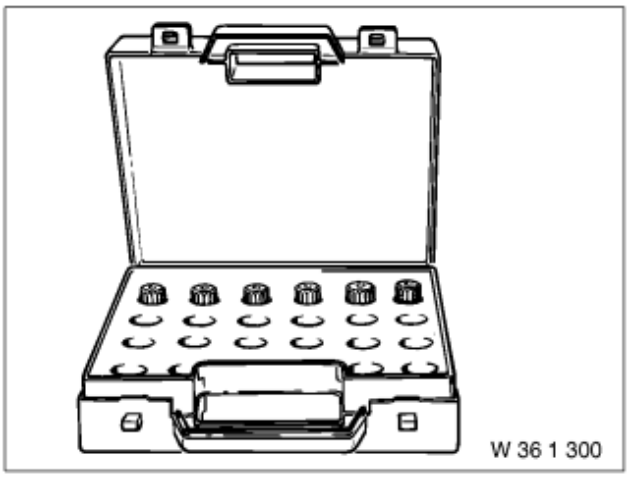
2 344 011 Tool

Common Used in step 9

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)

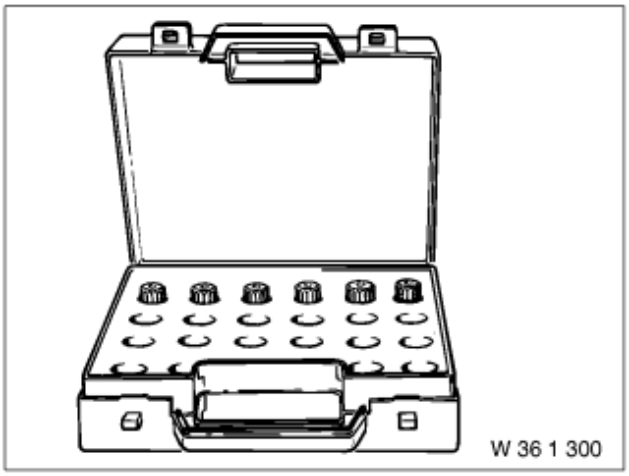
Replacement tools:

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	

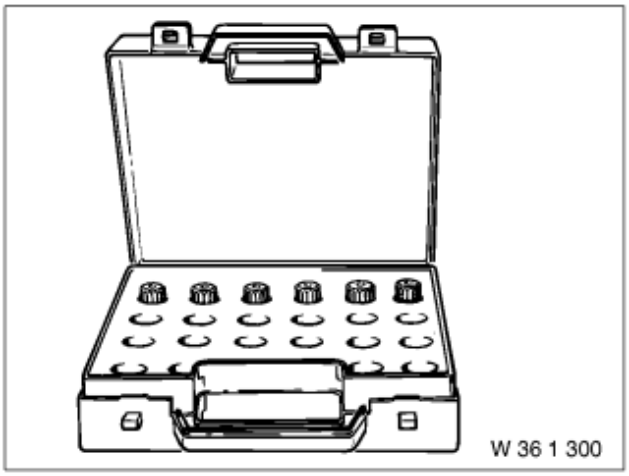
0 495 224 (36 1 326) Wheel stud



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	

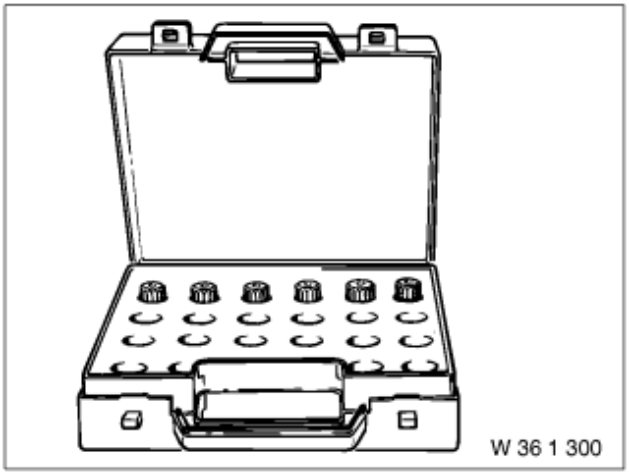


Replaced by

In connection with

SI-Number

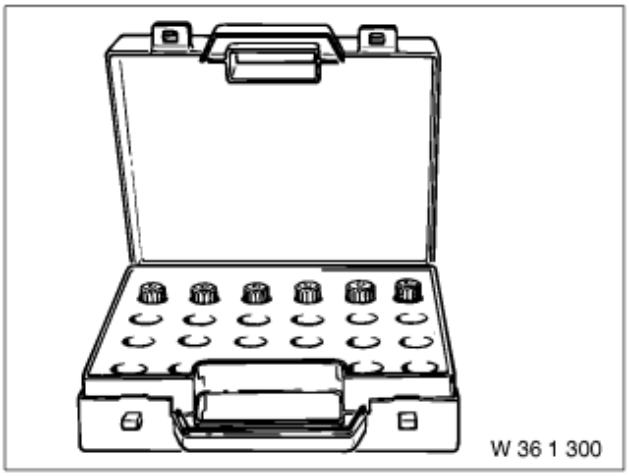
0 495 226 (36 1 328) Wheel stud



Common Used in step 1

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

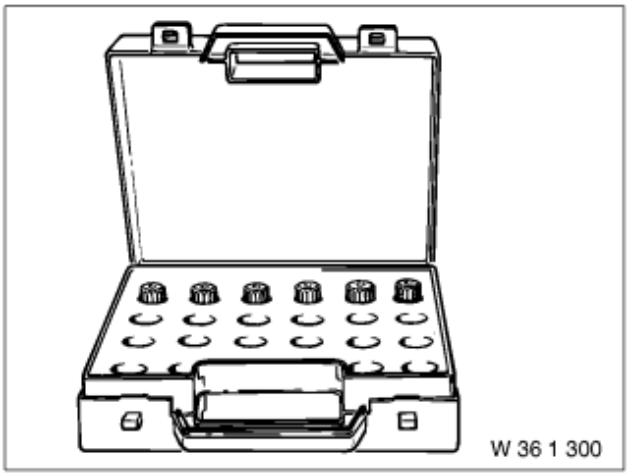
0 495 227 (36 1 329) Wheel stud



Common Used in step 1

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

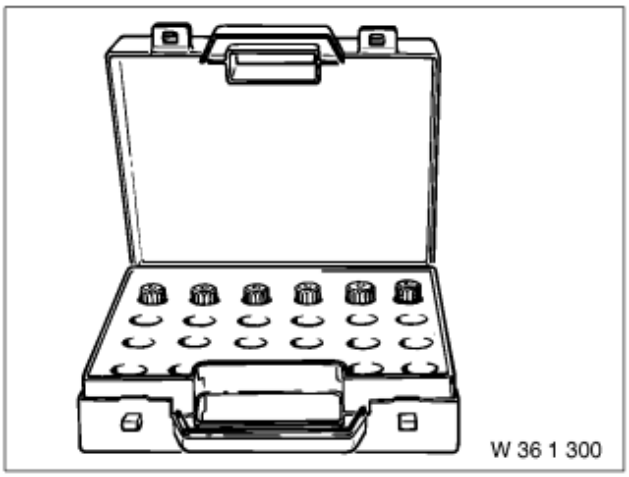
0 495 228 (36 1 331) Wheel stud



Common Used in step 1

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

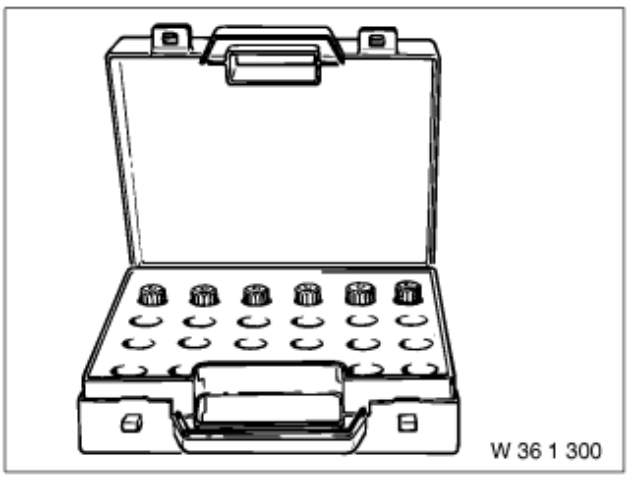
0 495 229 (36 1 332) Wheel stud



Common Used in step 1

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

0 495 230 (36 1 333) Wheel stud



Common Used in step 1

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

with

SI-Number

Links

Repair instructions	Used in step
00 02 001 Raising the vehicle using a vehicle lift	1 9