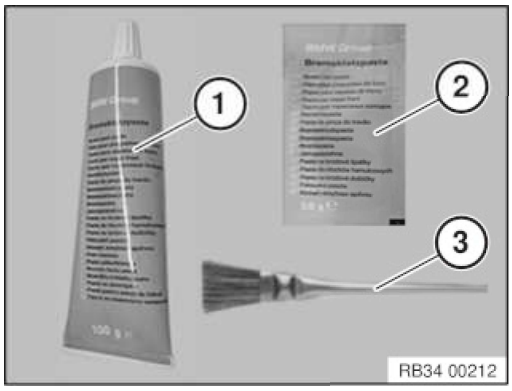
34 00 x01 Guideline for applying brake pad paste on brake pads and caliper carrier

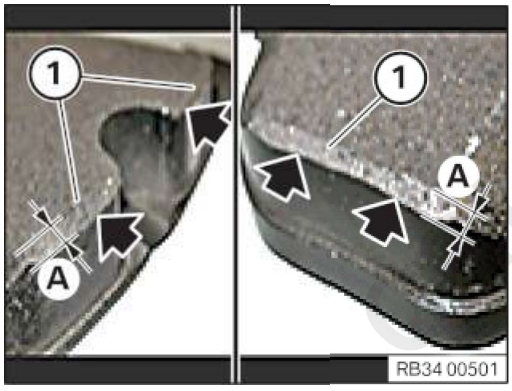
Attention!

So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces for the brake pads on the brake caliper mounting bracket, but rather clean with brake cleaner BMW TI. Clean number 83 19 2 154 780 and apply a thin coating of BMW TI break pad paste. Coat number 83 19 2 158 851 (3 gr.) or 83 19 2 158 852 (100 gr.).

Spread brake pad paste onto the marked surfaces using a brush!



- (1) Brake pad paste 100 gr. BMW TI. Number 83 19 2 158 852
- (2) Brake pad paste 3 gr. BMW TI. Number 83 19 2 158 851
- (3) Brush for spreading brake pad paste over the marked areas.



Attention!

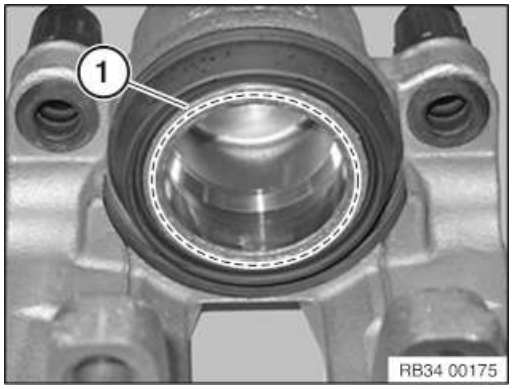
If new brake pads are mounted on a brake disc, the following must be observed:

- Bevel edges in the area (1) slightly (dimension A must not exceed maximum 1 mm).

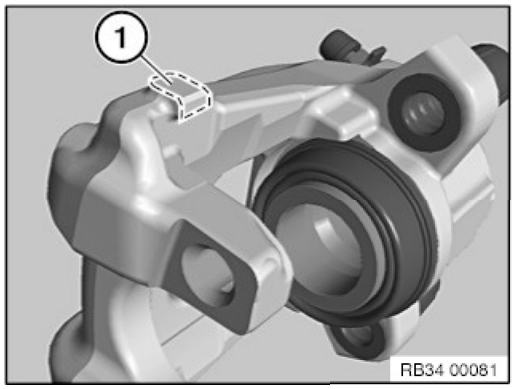
These procedures applies for all the following described brake systems.

IPS brake (made by CBI), 1-piston floating caliper brake (model ranges: 1-Series, 3-Series, 4-Series, X3)

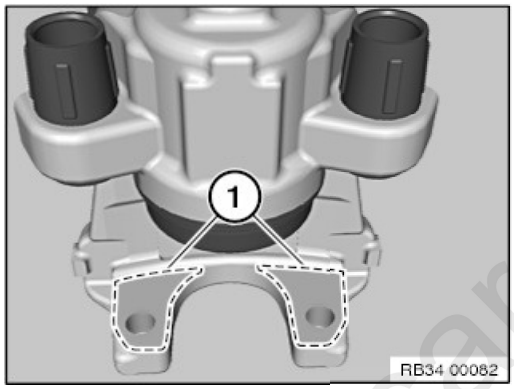
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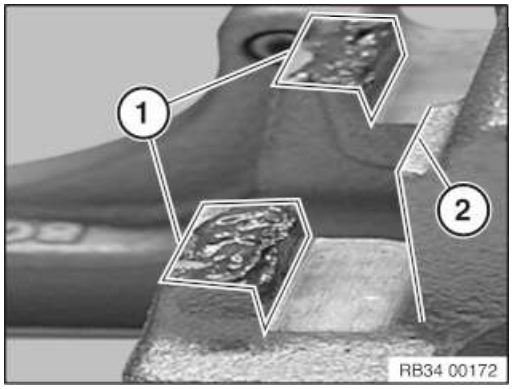
Clean contact surface (1) of brake piston with brake cleaner and apply a thin coating of brake pad paste.



Clean contact surfaces (1) of T-heads/brake calliper housing with brake cleaner and apply a thin coating of brake pad paste.

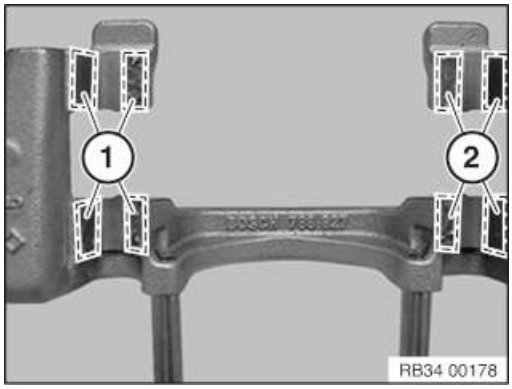


Clean contact surface (1) of brake caliper with brake cleaner and apply a thin coating of brake pad paste.

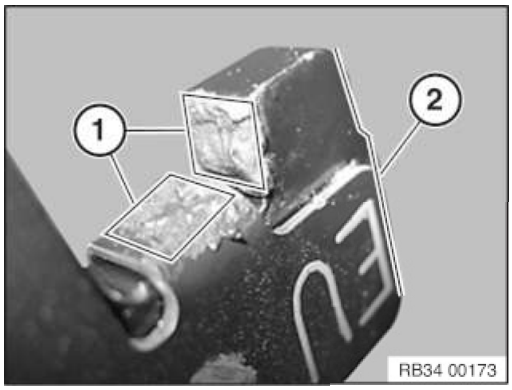


So as not to damage the surface coating, <u>if possible do not mechanically clean</u> the guide surfaces (1) for the brake pads on the brake caliper mounting bracket. Clean guide surfaces (1 and 2) with brake cleaner and apply a thin coating of brake pad paste.

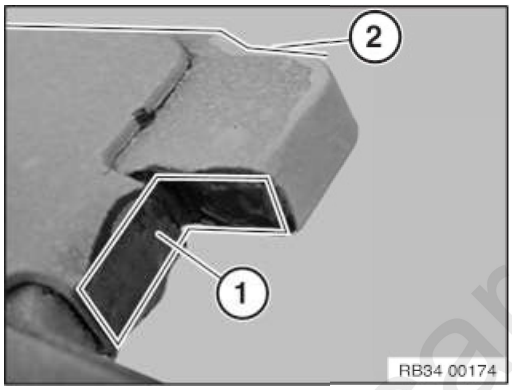
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So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces (1 and 2) for the brake pads on the brake calliper mounting bracket. Clean guide surfaces (1 and 2) with brake cleaner and apply a thin coating of brake pad paste.

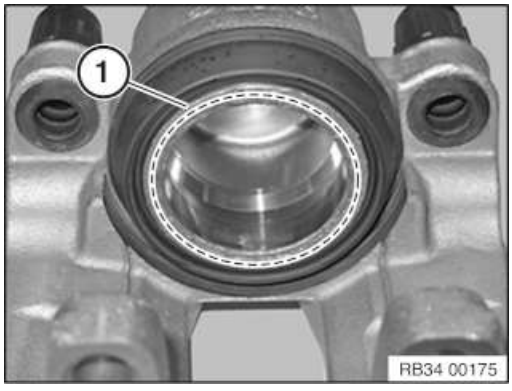


Apply a thin coating of brake pad paste to T-head of inner brake pad in area (1) and (2).



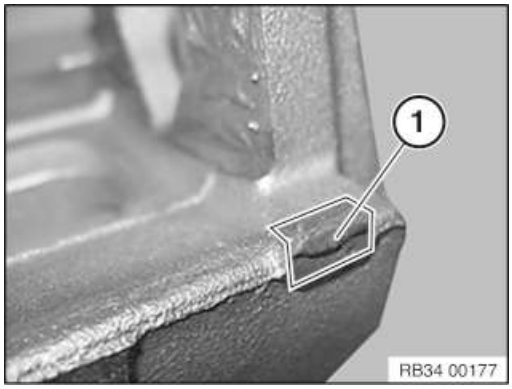
Apply a thin coating of brake pad paste to T-head of outer brake pad in area (1) and (2).

FN brake (made by Continental Teves), 1-piston floating caliper brake (model ranges: 5-Series, 6-Series, 7-Series, 8-Series, X1, X3, X5, Z4, Rolls-Royce)

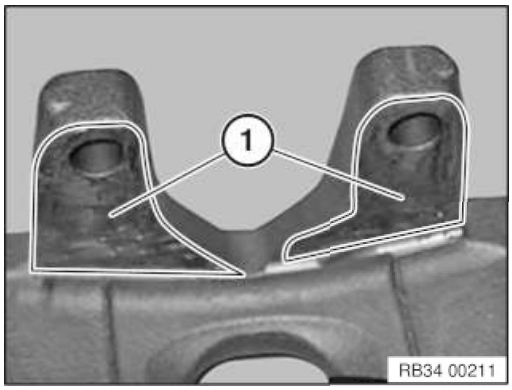


Clean contact surface (1) of brake piston with brake cleaner and apply a thin coating of brake pad paste.

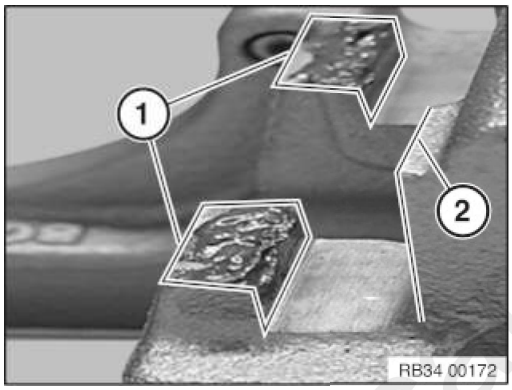
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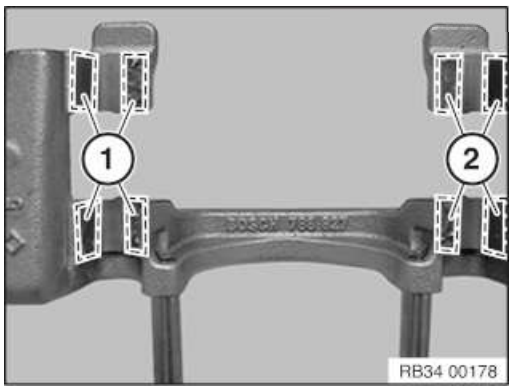
Clean contact surfaces (1) of T-heads/brake calliper housing with brake cleaner and apply a thin coating of brake pad paste.



Clean contact surface (1) of brake caliper with brake cleaner and apply a thin coating of brake pad paste.

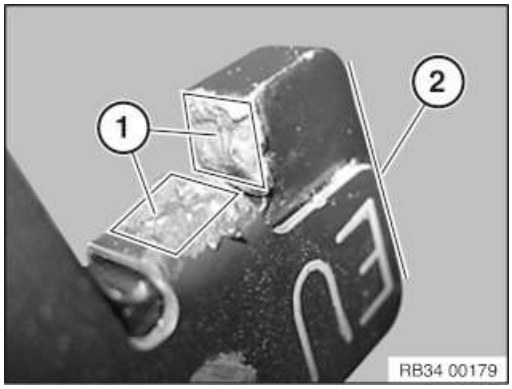


So as not to damage the surface coating, <u>if possible do not mechanically clean</u> the guide surfaces (1) for the brake pads on the brake caliper mounting bracket. Clean guide surfaces (1) with brake cleaner and apply a thin coating of brake pad paste.

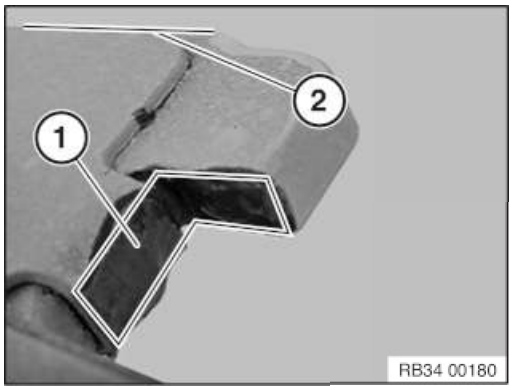


So as not to damage the surface coating, <u>if possible do not mechanically clean</u> the guide surfaces (1 and 2) for the brake pads on the brake calliper mounting bracket. Clean guide surfaces (1 and 2) with brake cleaner and apply a thin coating of brake pad paste.

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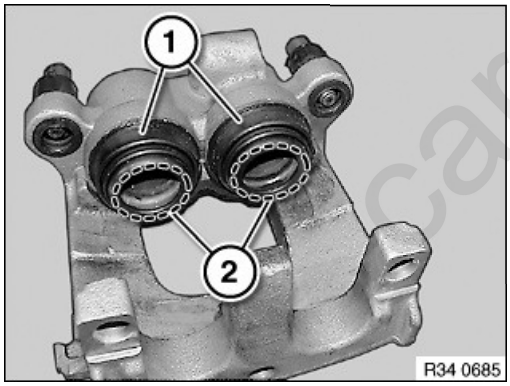


Lightly coat the T-head of the inner brake pad with brake pad paste in area (1 and 2).

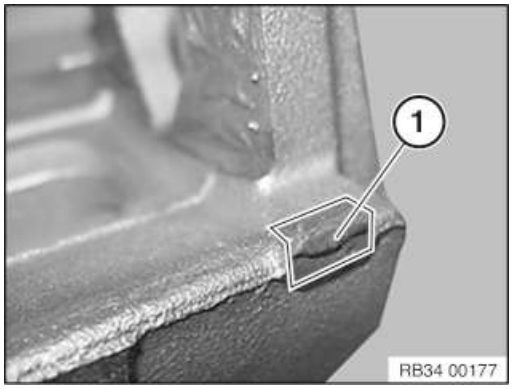


Lightly coat the T-head of the outer brake pad with brake pad paste in area (1 and 2).

FN brake (made by Continental Teves), 2-piston floating caliper brake (model ranges: 5-Series, 6-Series, 7-Series, 8-Series, X5, Rolls-Royce)

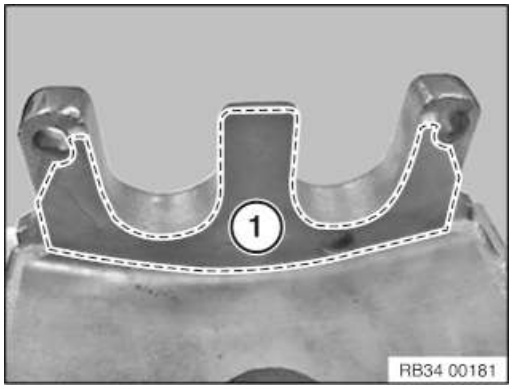


Clean contact surface (2) of brake piston with brake cleaner and apply a thin coating of brake pad paste.

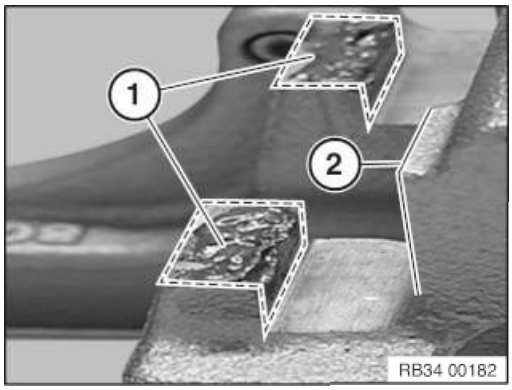


Clean contact surfaces (1) of T-heads/brake calliper housing with brake cleaner and apply a thin coating of brake pad paste.

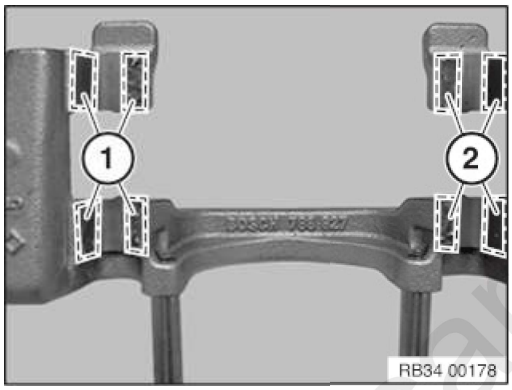
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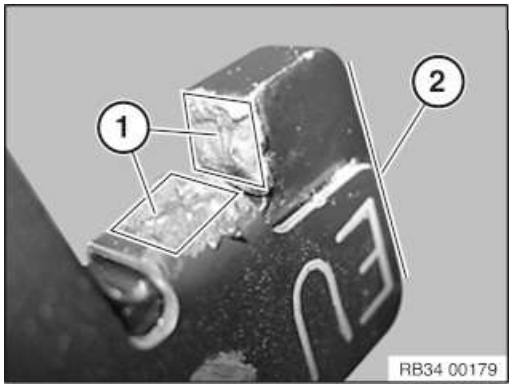
Clean contact surface (1) and brake caliper with brake cleaner and apply a thin coating of brake pad paste.



So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces (1 and 2) for the brake pads on the brake calliper mounting bracket. Clean guide surfaces (1 and 2) with brake cleaner and apply a thin coating of brake pad paste.

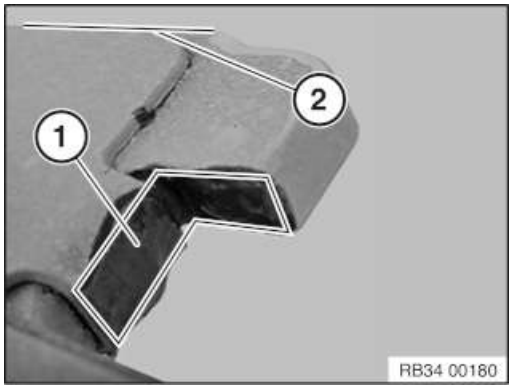


So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces (1 and 2) for the brake pads on the brake calliper mounting bracket. Clean guide surfaces (1 and 2) with brake cleaner and apply a thin coating of brake pad paste.



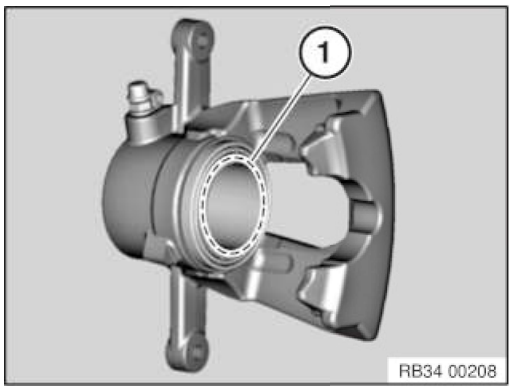
Lightly coat the T-head of the inner brake pad with brake pad paste in area (1 and 2).

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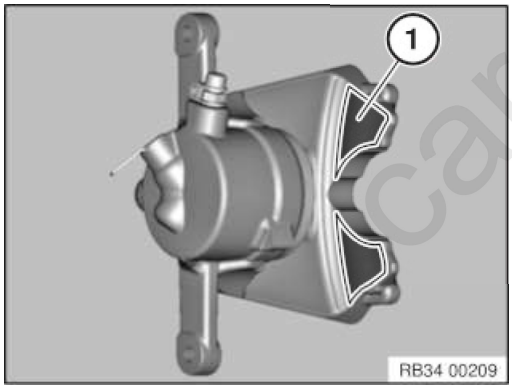


Lightly coat the T-head of the outer brake pad with brake pad paste in area (1 and 2).

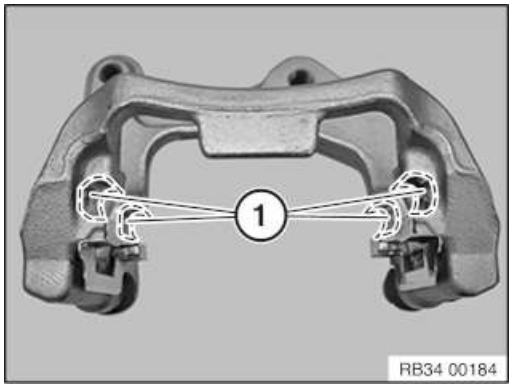
Collette brake (made by TRW), 1-piston brake caliper (model ranges: MINI, 1-Series, 5-Series, 6-Series, Z4)



Clean contact surface (1) of brake piston with brake cleaner and apply a thin coating of brake pad paste.

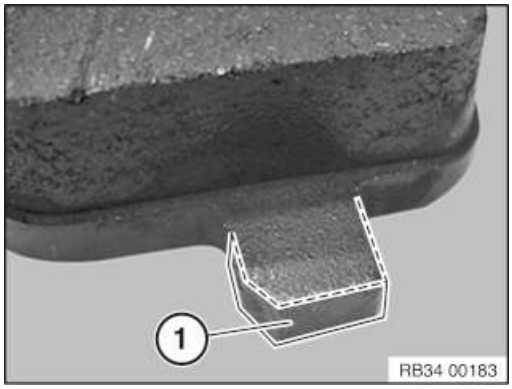


Clean contact surface (1) of brake caliper with brake cleaner and apply a thin coating of brake pad paste.



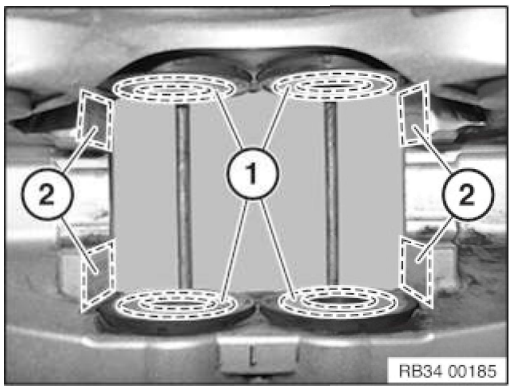
So as not to damage the surface coating, if possible do not mechanically clean the guide surface (1) for the brake pads on the brake caliper mounting bracket. Clean guide surface (1) with brake cleaner and apply a thin coating of brake pad paste.

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Apply a thin coating of brake pad paste to both sides of T-head of brake pad in area (1).

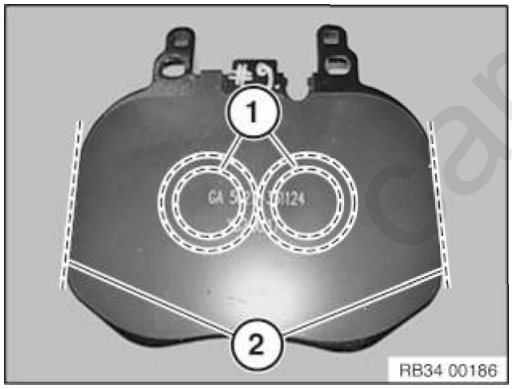
P 4.40 brake (made by Brembo), 4-piston fixed caliper brake (model ranges: MINI, 1-Series, 3-Series, 4-Series, 5-Series, 6-Series, 7-Series, 8-Series, X5, Rolls-Royce)



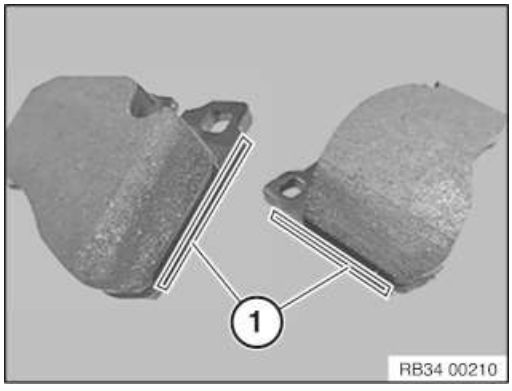
Clean contact surface (1) of brake piston with brake cleaner and apply a thin coating of brake pad paste.

So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces (2) for the brake pads on the brake calliper mounting bracket. Clean guide surface (2) with brake cleaner and apply a thin coating of brake pad paste.

Clean both inner and outer guide surfaces (2) and apply a thin coating of brake pad paste.



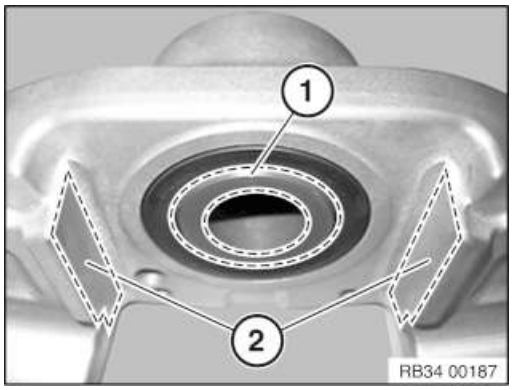
Lightly coat both sides of the contact surface in area (1 and 2) with brake pad paste.



Lightly coat the brake pad contact surface on both sides in area (1) with brake pad paste.

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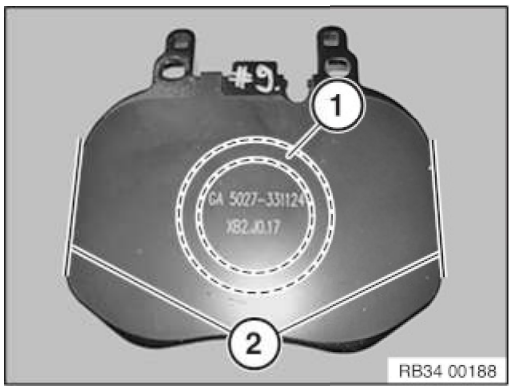
P 4.40 brake (made by Brembo), 2-piston fixed caliper brake (model ranges: 1 Series, 2 Series, 3 Series; does not apply to M2 F87)



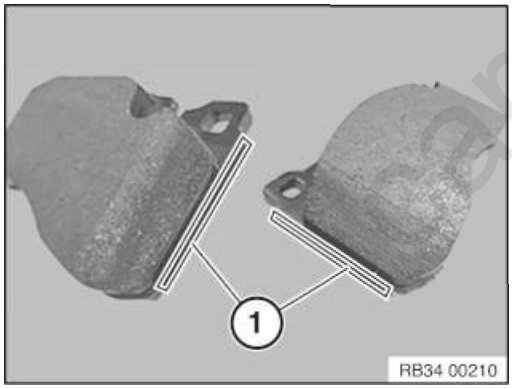
Clean contact surface (1) of brake piston with brake cleaner and apply a thin coating of brake pad paste.

So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces (2) for the brake pads on the brake calliper mounting bracket. Clean guide surface (2) with brake cleaner and apply a thin coating of brake pad paste.

Clean both inner and outer guide surfaces (2) and apply a thin coating of brake pad paste.



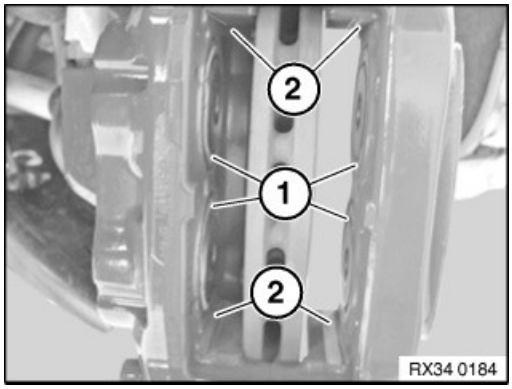
Lightly coat both sides of the contact surface in area (1 and 2) with brake pad paste.



Lightly coat the brake pad contact surface on both sides in area (1) with brake pad paste.

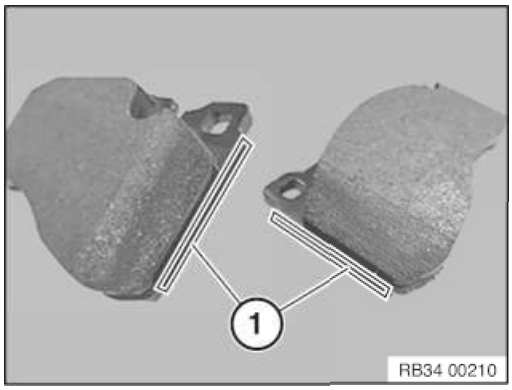
Brake (made by Brembo), 4-piston fixed caliper brake (model ranges: MINI F5x sport brake)

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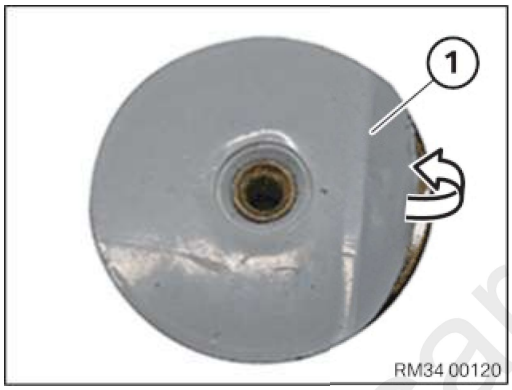
Check dust boot (1) for damage and replace if necessary.

Clean brake caliper compartments (2) and apply a thin coating of brake pad paste.



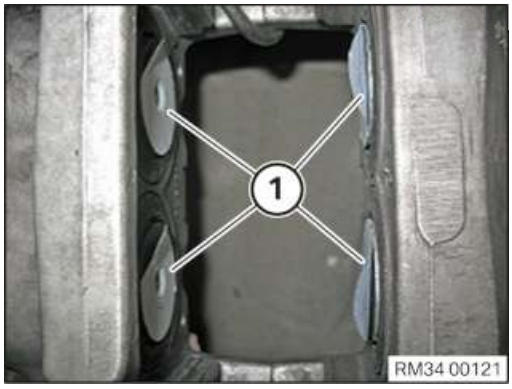
Lightly coat the brake pad contact surface on both sides in area (1) with brake pad paste.

Do not grease the brake lining backplate and thoroughly clean it with brake cleaner!



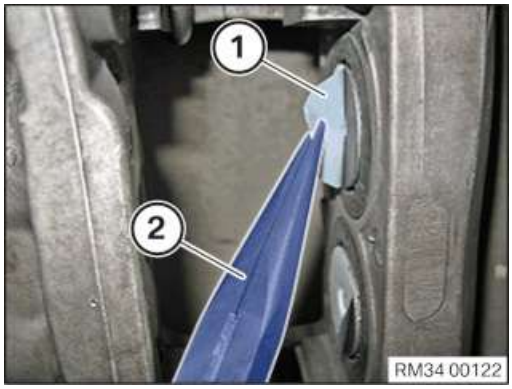
Only use new claw plates!

Slightly raise the protective film (1) at a place.

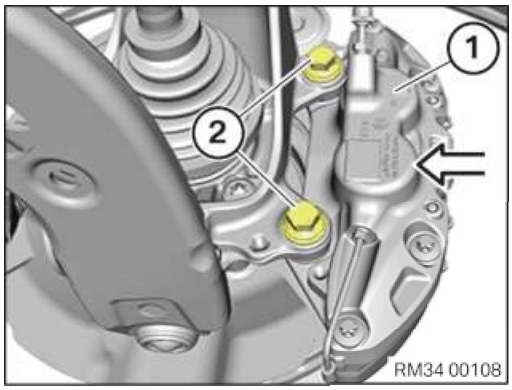


Insert the claw plates (1) into the brake pistons.

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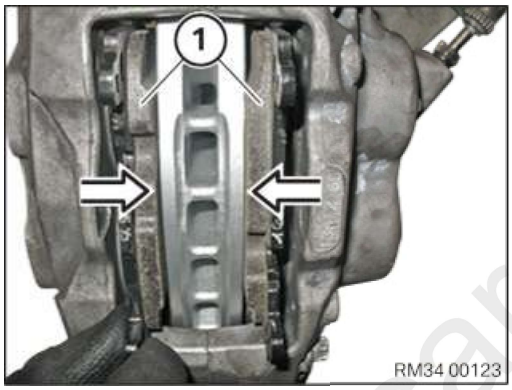
Pull off the protective film (1) with long-nose pliers (2).**Attention!**
The bonding surface of the claw plates must not be touched!



Install the brake caliper (1) in direction of arrow.

Parts: Replace screws (2).

Insert screws (2) and tighten.



Install the brake pad (1).**Attention!**
The brake pads must not touch the bonding surface of the claw plates when inserting!

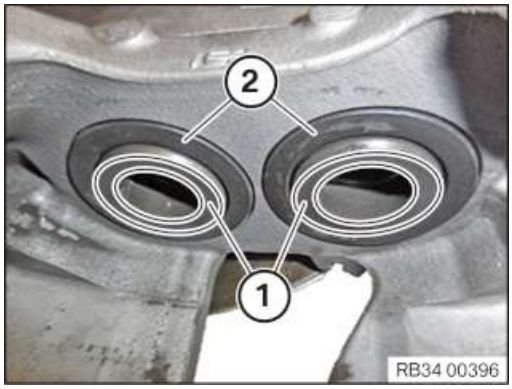
Apply the brake pads to the brake disc and insert.

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In order to ensure a complete bonding of the claw plates with the brake pads, the following instruction must be strictly adhered to:

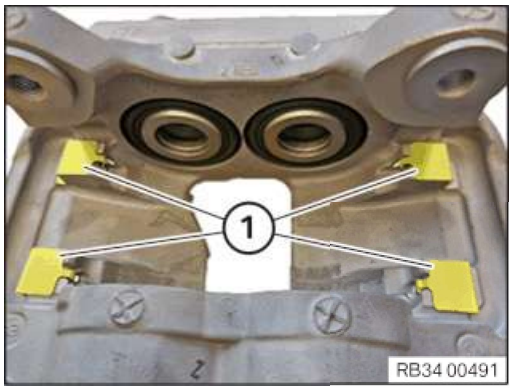
Strongly press the brake pedal and hold it for at least 1 min!

Brake (made by Continental), 4-piston fixed caliper brake (model ranges: 7-Series (G11, G12)



Clean the contact surface (1) of the brake piston (4 pieces) with brake cleaner.

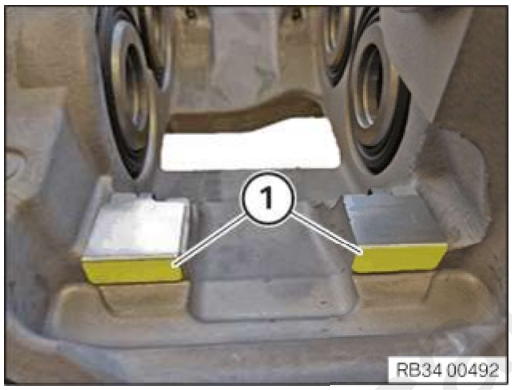
Check the dust boots (2) and renew as necessary.



Always renew retaining plates 1!

Mount retaining plate 1.

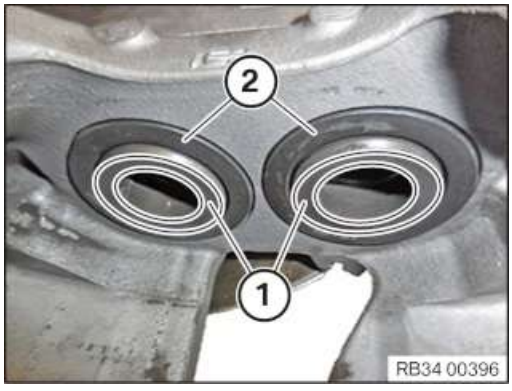
It is paramount that the slide panels are correctly positioned in the guides!



So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces for the brake pads on the brake caliper mounting bracket.

Apply a thin layer of brake pad paste to the surfaces of the sliding plates (1).

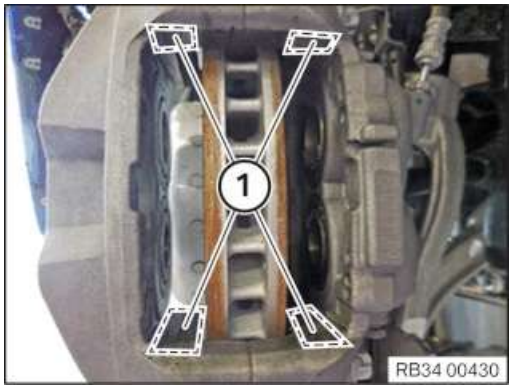
Brake (made by Brembo), 4-piston fixed caliper brake (model ranges: 7-Series (G11, G12)



Clean the contact surface (1) of the brake piston (4 pieces) with brake cleaner.

Adhesive residues must be completely removed.

Check the dust boots (2) and renew as necessary.



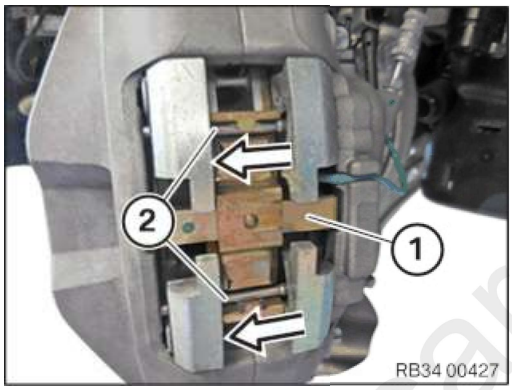
To prevent damage to the surface coating, do not clean the guide surfaces (1) for the brake pads on the brake calliper mechanically, if possible.

Clean guide surfaces (1) with brake cleaner and apply a thin coating of brake pad paste.



Remove the protective film of the adhesive layer (1) from the brake pads.

Do not touch the adhesive layer!



Insert brake pads in the brake caliper, making sure the adhesive layer does not touch the brake pistons.

Fit retaining clip (1).

Drive in the locking pins (2) in the direction of the arrow.

Attention!

After the brake pads have been installed they must immediately be bonded to the brake pistons:

- Step on the brake pedal to the floor and hold the pressure for one minute. This causes the brake pads to adhere to the brake pistons.

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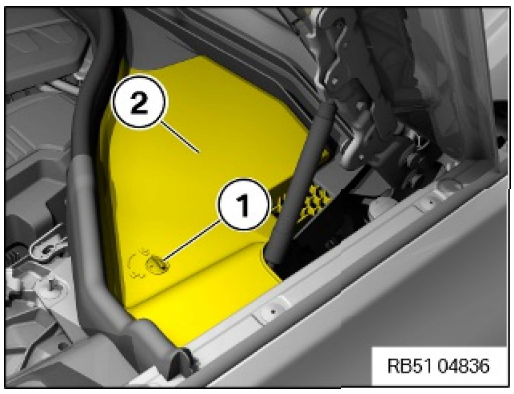
34 00 027 Replacing fluid in brake system

TECHNICAL INFORMATION

Use only BMW-approved brake fluids.
For additional information see: SBS-ANL-SBS1996-340396150...

PRELIMINARY WORK

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



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

2 – Connect bleeder unit for brake fluid





- To guarantee correct bleeding of the brake system, it is essential to adhere to the following procedure!
- Fill new brake fluid in the expansion tank up to the lower edge of thread (1).
- Bleed the hose of the bleeder unit before connecting.

TECHNICAL INFORMATION

Use only BMW-approved brake fluids, see operating fluids.

RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.

- Connect the bleeder unit (1) to the brake fluid expansion tank and switch it on.

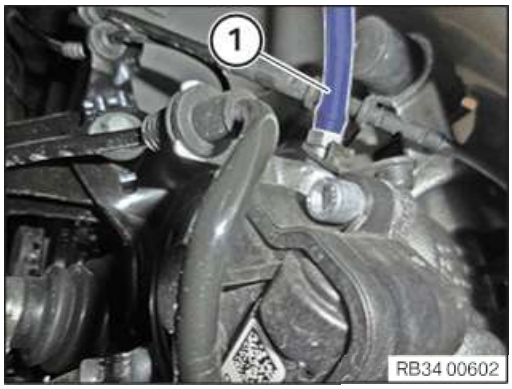
  Observe the operating instructions of the corresponding equipment manufacturer.

- **Do not exceed the filling pressure of** 2 bar**.**

3 – Rinsing and bleeding the rear axle brake circuit

NOTICE

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



- **Start flushing at the rear right.**
- Connect the vent hose with the collecting vessel to the vent valve (1) on rear right brake caliper.
- Open the vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve.

Vent valve

		Tightening torque	10 Nm

- Carry out the same procedure on the rear left wheel brake.

4 – Flushing and bleeding the front axle brake circuit

NOTICE

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



- **Start flushing at the front right.**
- Connect the vent hose with the collecting vessel to the vent valve (1) on front right interior brake calliper.
- Open the vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve (1).

Vent valve

		Tightening torque	10 Nm

5 – Close bleeder unit for brake fluid

RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.

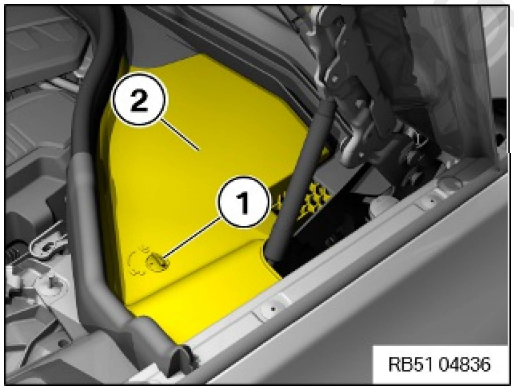


- Switch off bleeder unit (1) and remove from brake fluid expansion tank .
- Check the brake fluid level; if necessary, adjust to maximum mark.



- Check the seal (1) on the sealing cap, renew if necessary.
- Mount the sealing cap on the brake fluid expansion tank.

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



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

Additional Information

Overview of Tightening Torques

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		Tightening torque	10 Nm

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34 00 027 Replacing fluid in brake system

Prerequisite

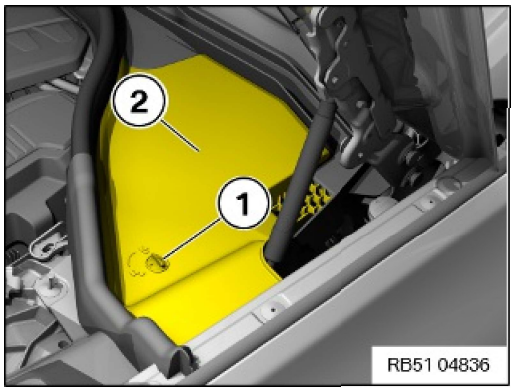
- Vehicles with High brake.

TECHNICAL INFORMATION

Use only BMW-approved brake fluids.
For additional information see: SBS-ANL-SBS1996-340396150...

PRELIMINARY WORK

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



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

2 – Connect bleeder unit for brake fluid



- To guarantee correct bleeding of the brake system, it is essential to adhere to the following procedure!
- Fill new brake fluid in the expansion tank up to the lower edge of thread (1).
- Bleed the hose of the bleeder unit before connecting.



TECHNICAL INFORMATION

Use only BMW-approved brake fluids, see operating fluids.

RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.

- Connect the bleeder unit (1) to the brake fluid expansion tank and switch it on.

  Observe the operating instructions of the corresponding equipment manufacturer.

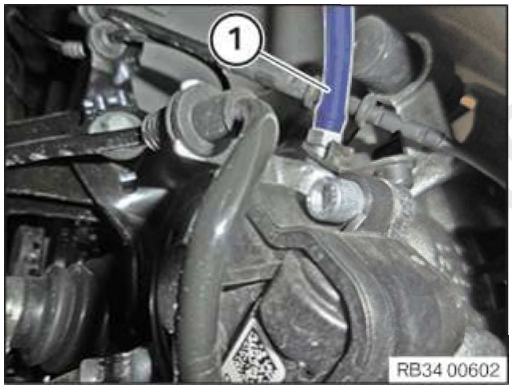
- **Do not exceed the filling pressure of** 2 bar**.**

MAIN WORK

3 – Rinsing and bleeding the rear axle brake circuit

NOTICE

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



- **Start flushing at the rear right.**
- Connect the vent hose with the collecting vessel to the vent valve (1) on rear right brake caliper.
- Open the vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve.

Vent valve

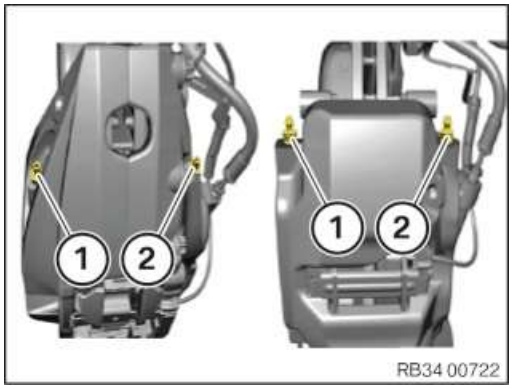
		Tightening torque	10 Nm

- Carry out the same procedure on the rear left wheel brake.

4 – Flush and bleed the front axle brake circuit (brake, high)

NOTICE

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



- Two fixed brake callipers are fitted!
- For both variants, first outer (1) must be bled. The bleed inner (2).



- **Start flushing at the front right.**
- Connect the vent hose with the collecting vessel to the vent valve (1) on the front right brake caliper.
- Open the vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve (1).

Front ventilation valve Brake calliper manufacturer Brembo

Vent valve		Tightening torque	18 Nm

Front ventilation valve fixed brake calliper Brake calliper manufacturer Continental

Vent valve		Tightening torque	15 Nm



- Connect the vent hose with the collecting vessel to the vent valve (1) on front right brake caliper.
- Open vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve (1).

Front ventilation valve Brake calliper manufacturer Brembo

Vent valve		Tightening torque	18 Nm

Front ventilation valve fixed brake calliper Brake calliper manufacturer Continental

Vent valve		Tightening torque	15 Nm

- Carry out the same procedure on the front left wheel brake.

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5 – Close bleeder unit for brake fluid

RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.

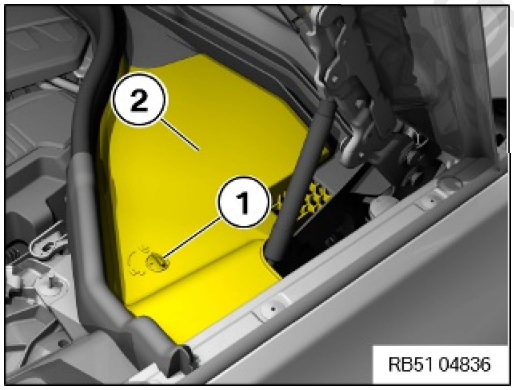


- Switch off bleeder unit (1) and remove from brake fluid expansion tank .
- Check the brake fluid level; if necessary, adjust to maximum mark.



- Check the seal (1) on the sealing cap, renew if necessary.
- Mount the sealing cap on the brake fluid expansion tank.

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



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

Additional Information

Overview of Tightening Torques

Vent valve Used in step 3

		Tightening torque	10 Nm

Front ventilation valve Brake calliper manufacturer Brembo Used in step 4

Vent valve		Tightening torque	18 Nm

Front ventilation valve fixed brake calliper Brake calliper manufacturer Continental Used in step 4

Vent valve		Tightening torque	15 Nm

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

Warning!

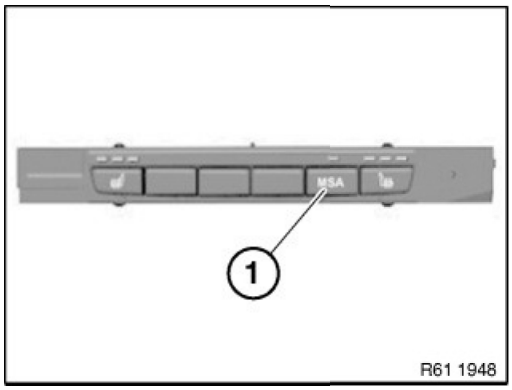
If the engine hood/bonnet contact is pulled upwards (workshop mode), the information "switch closed" is output. The automatic engine start-stop function is active.

An automatic engine start is possible.

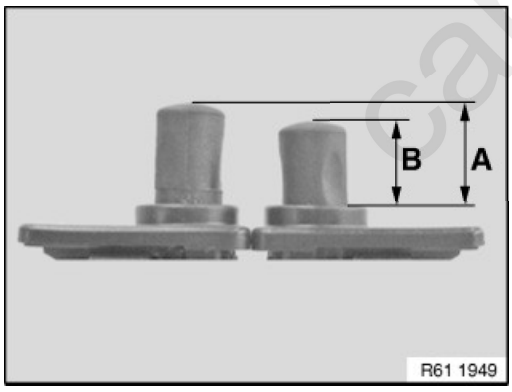
Observe safety precautions when working on MSA vehicles.

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

MSA function is deactivated by:



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



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

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

    B = 7 mm

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

When working with diagnosis tools:

- Observe instructions in diagnosis tool

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

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

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34 11 552 Reconditioning front left or right brake caliper

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.

TECHNICAL INFORMATION

General information on changing the brake pads:

For vehicles older than 48 months it is recommended to replace the retaining spring or expanding spring.

The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

A CBS reset must be done after every brake pad exchange:

A CBS reset in the vehicle is possible in the event of a **partially ground down** brake pad wear sensor. The CBS display in the Central Information Display (CID) is active.

In the event of a brake pad wear sensor that is **not partially ground down**, a CBS reset is only possible with the diagnosis system. No CBS display in the Central Information Display (CID).

If bonded brake pads are installed, the brake pads must be renewed after releasing the adhesive strip.

TECHNICAL INFORMATION

To prevent damage to the surface coating: With floating callipers on the brake caliper mounting bracket or with fixed callipers in the brake caliper housing, do not clean the contact surfaces for the brake pads to the extent that it is possible.

Clean the contact surfaces with brake cleaner (BMW part number 83 19 2 154 780). Next, apply a thin coat of brake pad paste (BMW part number 83 19 2 158 851 for 3 g) or 83 19 2 158 852 fr 100 g).

Spread brake pad paste on the marked surfaces with a brush.

For additional information see: 34 00 ... brake pad paste

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PRELIMINARY WORK

1 – Removing both front wheels

▸ **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 .

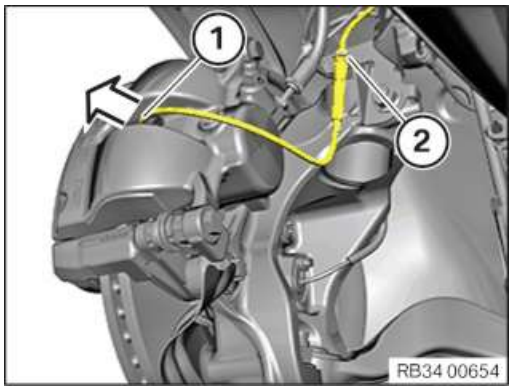
2 – Removing front brake pad wear sensor

TECHNICAL INFORMATION

The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

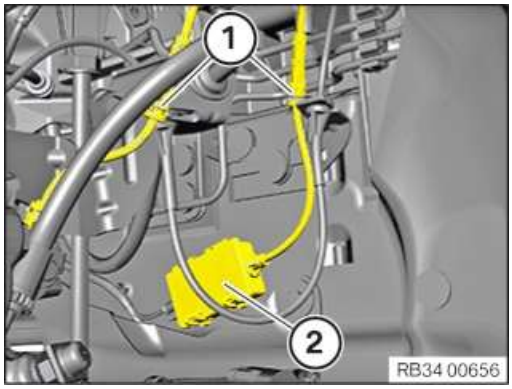
If a brake pad wear sensor that has already been ground has to be replaced even though the minimum brake pad thickness has not yet been reached, you must observe the following:

The new sliding contact must be filed down with a file to the same length as the sanded sliding contact.



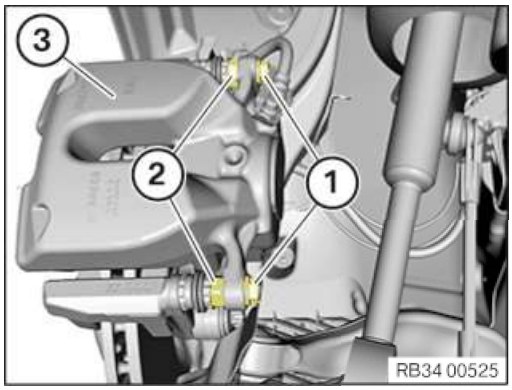
- Remove brake pad wear sensor (1) out of the brake pad in the direction of the arrow.
- Detach the brake pad wear sensor cable from the bracket (2).

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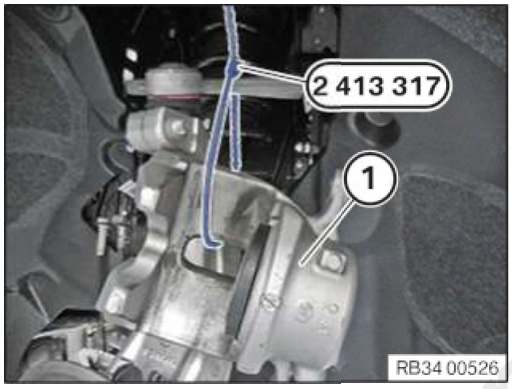


- Detach the brake pad wear sensor from the brackets (1).
- Open sealing cap (2) and disconnect the plug connection.

3 – Remove front brake pads

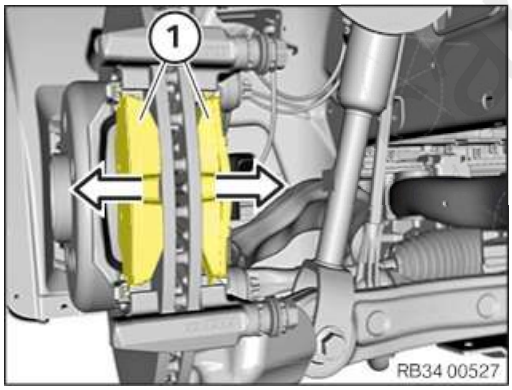


- Release the screws (1); if necessary use the hexagon head (2) for counter support.
- Remove the brake caliper (3).



- Tie up the brake caliper (1) using the special tool (cable strap) 2 413 317.

  The brake caliper must not hang on the brake hose.



- Remove the brake pads (1) in the direction of arrow.
- Mark any worn brake pads.

  If the brake pad wear exists on one side, they must not be mixed up.



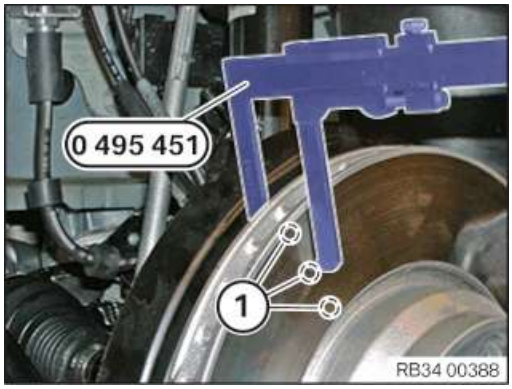
TECHNICAL INFORMATION

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

Overflowing brake fluid will damage the paintwork.

- Push the brake pistons (1) back with the special tool 2 352 960.

4 – Measure minimum brake disc thickness (front brake)



- Check minimum brake disc thickness:

  Place the special tool at three measuring points in area (1) and measure.

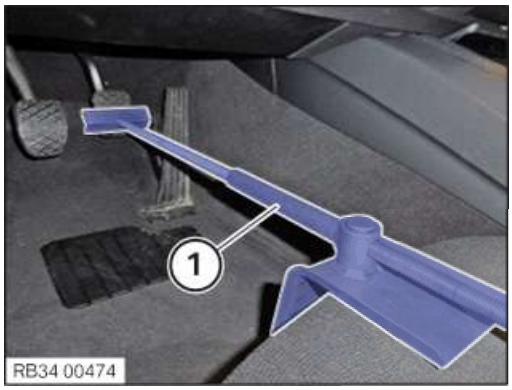
  Compare measuring result and lowest value with setpoint value.

  New brake pads must only be installed if the brake disk thickness is greater than the minimum brake disc thickness.

Minimum brake disc thickness (nominal dimension 330x24)

Minimum brake disc thickness (brake disc 330x24)	22,4 mm

5 – Install brake pedal tensioner



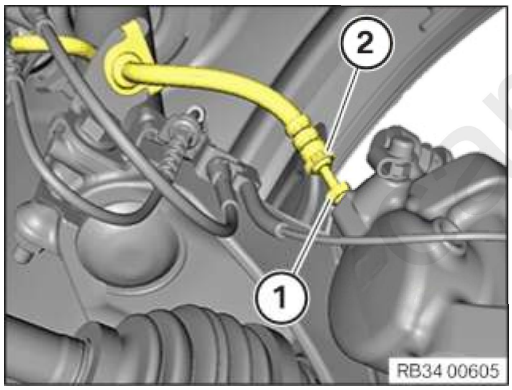
- Press the brake pedal to the floor and fix the brake pedal tensioner (1).

  Do not release the brake pedal tensioner (1) until the brake lines have been reconnected. This prevents brake fluid from emerging from the expansion tank when the brake lines are opened.

6 – Removing the front brake caliper

NOTICE

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



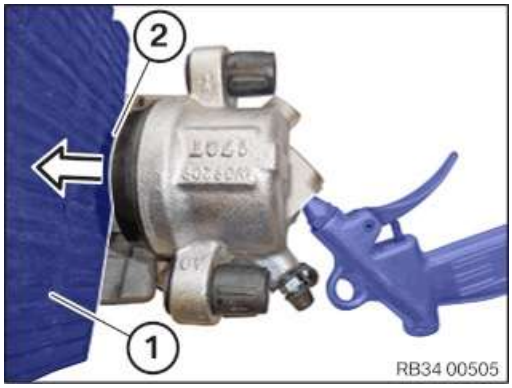
- Detach brake hose (1) from brake caliper.

  If necessary, grip at knurling (2).

- Remove the brake caliper .

MAIN WORK

7 – Reconditioning the front brake caliper

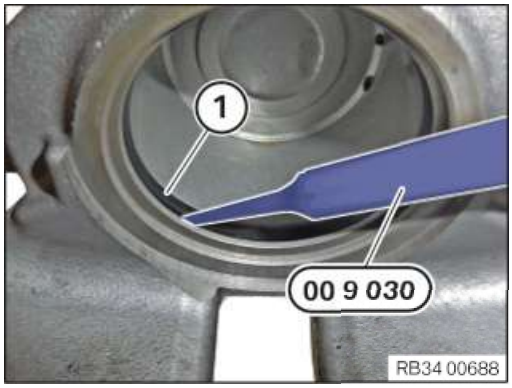


- Do not grip **brake piston**(2) **with fingers - pinch hazard!**
- Carefully push out the brake piston (2) through the connecting bore using compressed air.
- Insert a protective plate (1) (e.g. made of hardwood or a rubber part) into the brake caliper housing to protect the brake piston.

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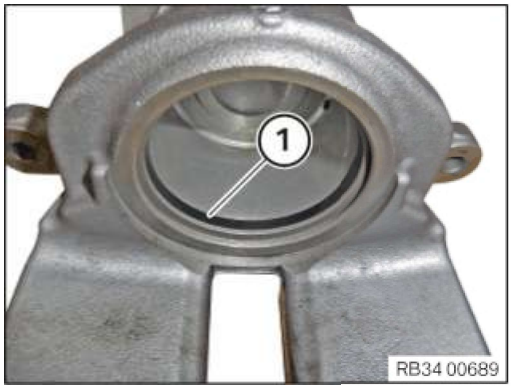


- Push off the dust boot (1).



- Carefully remove the sealing ring (1) using plastic wedge 0 496 714 (00 9 030).
- Clean the cylinder of the brake caliper housing and the brake piston and dry with compressed air.
- Check the cylinder of the brake caliper housing, the brake piston and the flange surface for damage, if necessary, renew the brake caliper.

  Do not remove material from cylinders and brake pistons during processing.

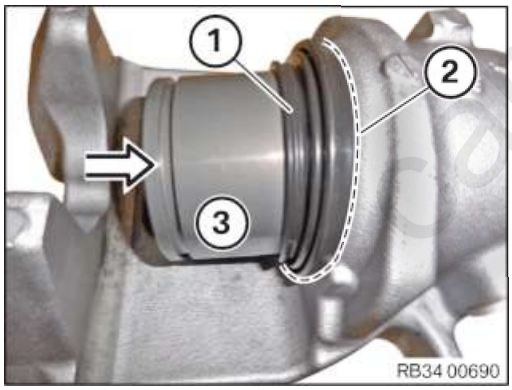


- Insert the sealing ring (1).
- Lightly coat the cylinder of the brake caliper housing, the brake piston and the sealing ring with lubricating grease.

Expendable materials

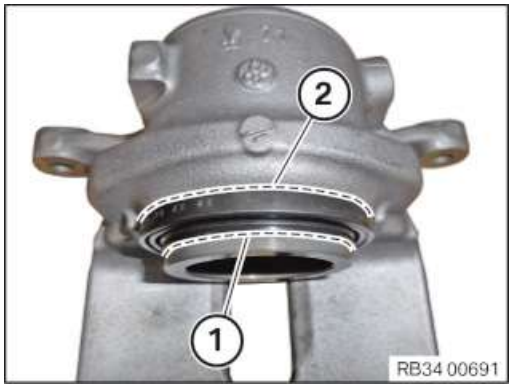
Lubricating grease SYNTHESO GLEP 1	100 g, Tube	83299407778

Overview of consumables (Electronic Parts Catalogue)



- Slide the dust boots (1) onto the brake piston (3).
- Insert the dust boot (1)in the area of annular groove (2).
- Press in the brake piston (3) into the cylinder of the brake caliper housing.
- Press down the brake piston (3) until the dust boot (1) feeds into the outer annular groove.
- To guarantee that the dust boot fits perfectly: Keep the area between the dust boot and the brake caliper housing dry.

  The area between the dust boot and the brake caliper housing must not come in contact with the lubricating grease or brake fluid.

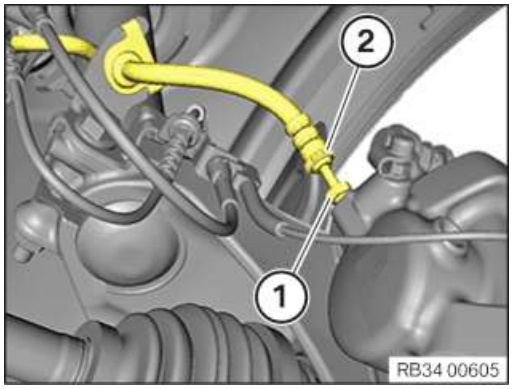


- Make sure that the dust boot in both the annular grooves (1) and (2) is positioned correctly.

POSTPROCESSES

8 – Install front brake calliper

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- Fit and tighten brake hose (1) on brake caliper.

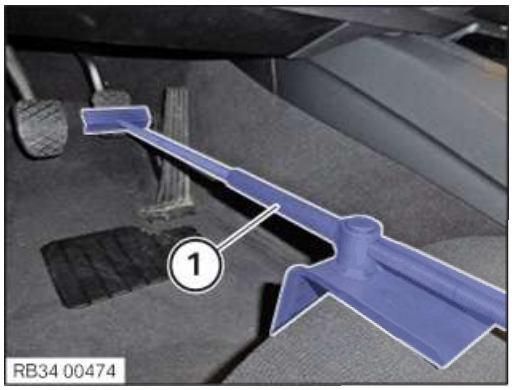
  If necessary, grip at knurling (2).

Brake hose to brake caliper, front

	Tightening torque	17 Nm

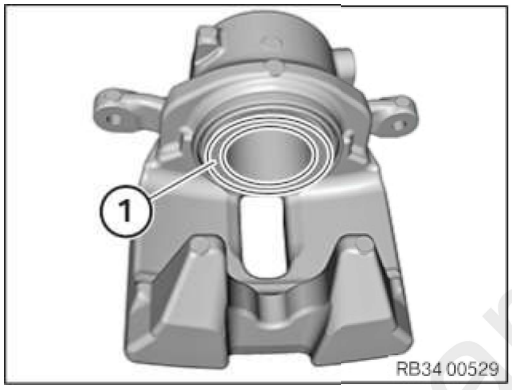
- Make sure that the brake hose is **not** twisted and does not rest against the components fixed to the body.

9 – Remove the brake pedal tensioner



- Remove the brake pedal tensioner (1).

10 – Grease the brake pads, caliper carriers and brake calipers with brake pad paste (17-inch brake)

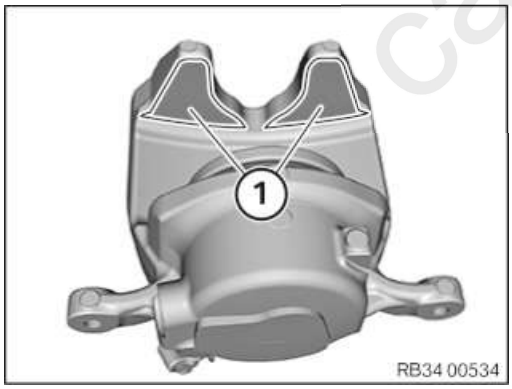


- Clean the contact surfaces (1) of the brake piston using brake cleaner.

Expendable materials

Brake cleaner2.0	500 ml, Spray can	83192365214
	20 , Canister	83192365215

- Check dust boots for damage; renew if necessary.

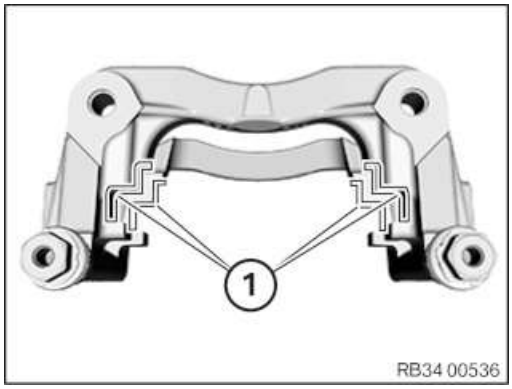


- Clean contact surfaces (1) of the brake caliper with brake cleaner and apply a thin layer of brake pad paste.

Expendable materials

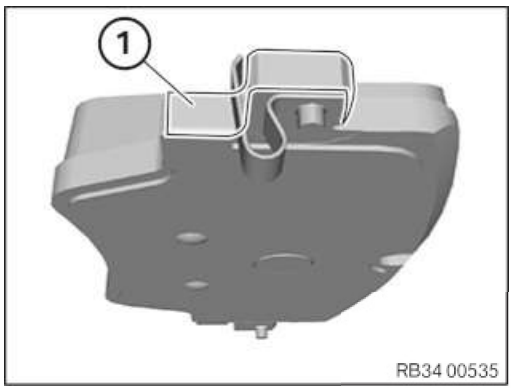
Brake block paste * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233

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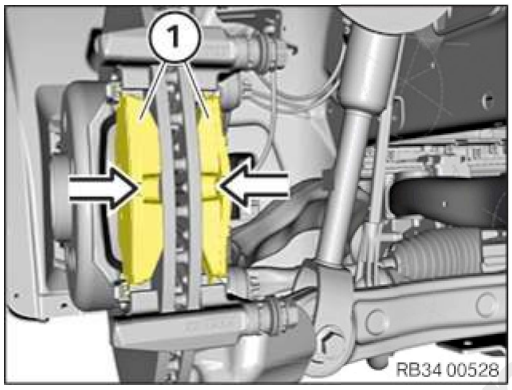
- Clean contact surfaces with brake cleaner.

  The contact surfaces (1) for the brake pads should not be cleaned mechanically if possible in order to avoid damaging the surface coating.
- Carefully clean highly contaminated contact surfaces (1) using a suitable tool (e.g. brass wire brush, nylon brush).
- Coat contact surfaces (1) thinly with brake pad paste.



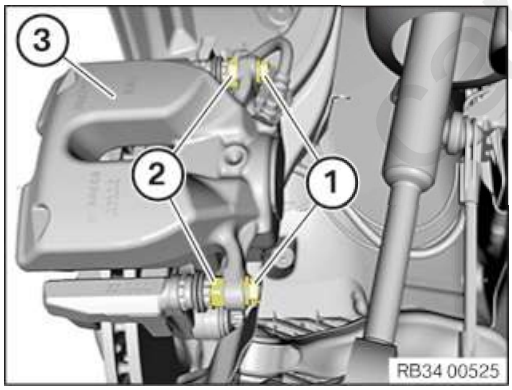
- Apply a thin coating of brake pad paste to both sides of the T-head of the brake pad in area (1).

11 – Installing the front brake pads



- If applicable, observe the identification of the removed brake pads.

  If the brake pads are worn on one side, they must not be mixed up.
- Install the brake pads (1) in the brake calliper in the direction of the arrow.



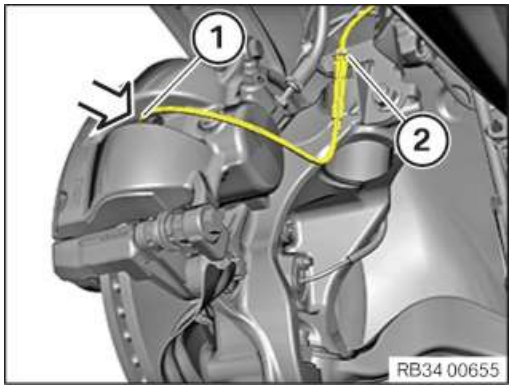
- Remove the special tool (cable strap) 2 413 317.
- Install the brake caliper (3).
- Renew screws.

  Parts: Bolts
- Tighten the screws (1), if applicable, hold against the hexagon head (2).

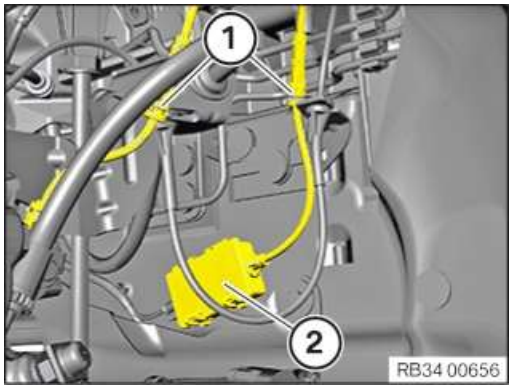
Guide bolt (brake caliper on caliper carrier)

M8	Renew screws.		35 Nm

12 – Installing front brake pad wear sensor



- Attach the brake pad wear sensor to the bracket (2).
- Install the brake pad wear sensor (1) in the brake pad in the direction of the arrow.
- Make sure the brake pad wear sensor is fitted correctly in the brake pad.



- Attach cable of brake pad wear sensor in brackets (1).
- Connect the plug connection .
- Close sealing cap (2).

13 – Installing both front wheels

▸ 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.

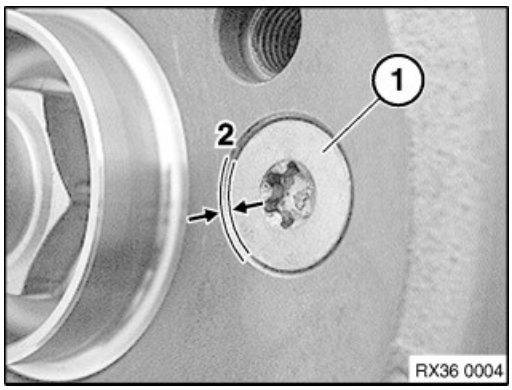
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  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.

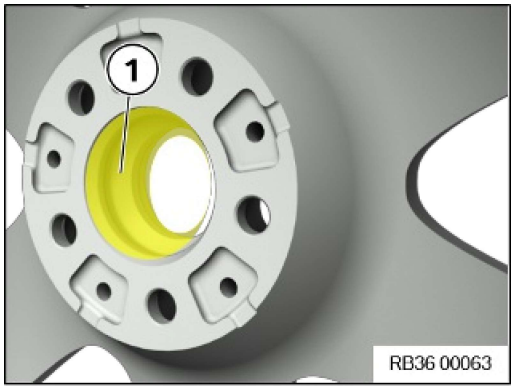
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

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 * 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 * 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.

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TECHNICAL INFORMATION

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

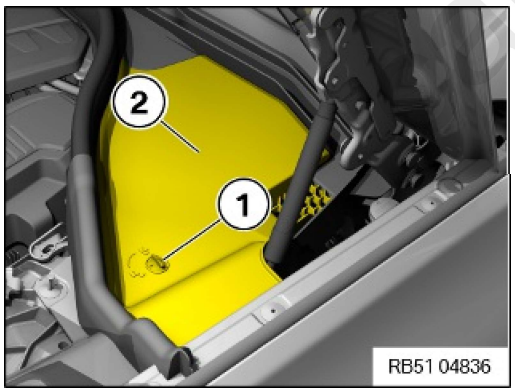
- Renew corroded wheel bolts.

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

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



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

15 – Connect bleeder unit for brake fluid



- To guarantee correct bleeding of the brake system, it is essential to adhere to the following procedure!
- Fill new brake fluid in the expansion tank up to the lower edge of thread (1).
- Bleed the hose of the bleeder unit before connecting.



TECHNICAL INFORMATION

Use only BMW-approved brake fluids, see operating fluids.

RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.

- Connect the bleeder unit (1) to the brake fluid expansion tank and switch it on.

  Observe the operating instructions of the corresponding equipment manufacturer.
- **Do not exceed the filling pressure of** 2 bar**.**

16 – Flushing and bleeding the front axle brake circuit

NOTICE

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



- **Start flushing at the front right.**
- Connect the vent hose with the collecting vessel to the vent valve (1) on front right interior brake calliper.
- Open the vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve (1).

Vent valve

		Tightening torque	10 Nm

17 – Close bleeder unit for brake fluid

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RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.

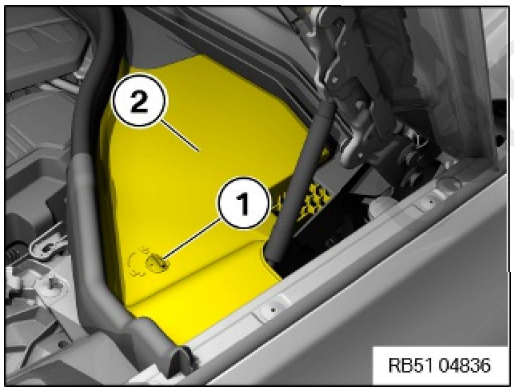


- Switch off bleeder unit (1) and remove from brake fluid expansion tank .
- Check the brake fluid level; if necessary, adjust to maximum mark.



- Check the seal (1) on the sealing cap, renew if necessary.
- Mount the sealing cap on the brake fluid expansion tank.

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



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

19 – Commissioning/bedding in new brake pads and brake discs

TECHNICAL INFORMATION

When exchanging brake pads, reset the CBS display in accordance with factory specification (CBS reset).

Carry out test braking while driving at low speed because the effectiveness of the brakes may be reduced during the initial braking operations.

Exaggerated emergency and continuous braking operations for faster bedding-in are not permitted.

Advise the customer not to perform intentional emergency braking operations for the first 200 km after the brakes have been replaced.

- Fully depress brake pedal several times so that brake pads contact brake discs.
- Adjust the brake fluid level to the maximum mark.
- Perform a functional check on the brake test stand to ensure compliance of the brake system with statutory guidelines.
- Attach mirror tag to inside mirror.

Additional Information

Overview of Tightening Torques

Brake hose to brake caliper, front — Used in step 8

		Tightening torque	17 Nm

Guide bolt (brake caliper on caliper carrier) — Used in step 11

M8	Renew screws.		35 Nm

Brake disc to front wheel hub — Used in step 13

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 13

M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 13

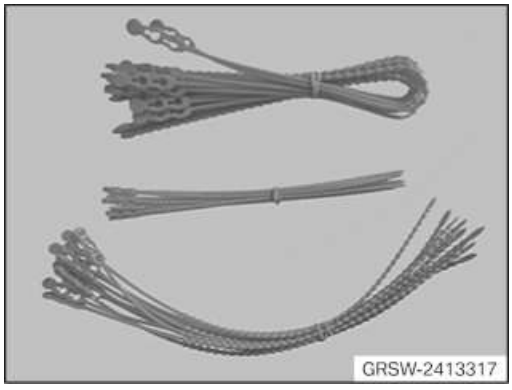
M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim. Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. Check all the wheel bolts in the same order or retighten to the prescribed tightening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

Vent valve — Used in step 16

		Tightening torque	10 Nm

Overview of Special Tools

2 413 317 Cable strap

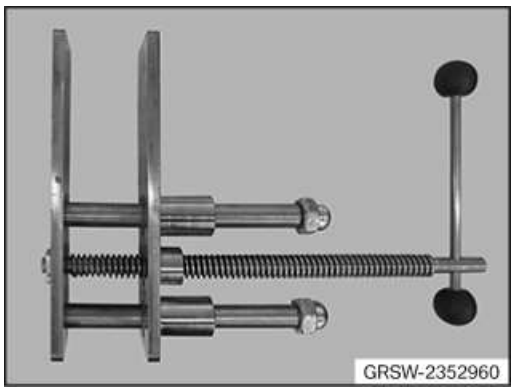


Common — Used in step 311

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)

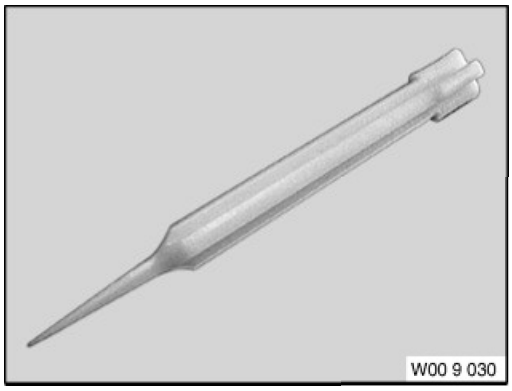
carmagn.com

2 352 960 Reset



Common	Used in step 3
Usage	Set back to brake piston. Replacement for 34 1 050 (83300492455).
Included in the tool or work	
Storage location	Individual
Replaced by	
In connection with	
SI-Number	

0 496 714 (00 9 030) Wedge



Common	Used in step 7
Usage	For dismantling O-rings, gaskets and trim panels. This special tool replaces special tool 00 9 316.
Included in the tool or work	
Storage location	A50
Replaced by	
In connection with	
SI-Number	01 20 09 (581)

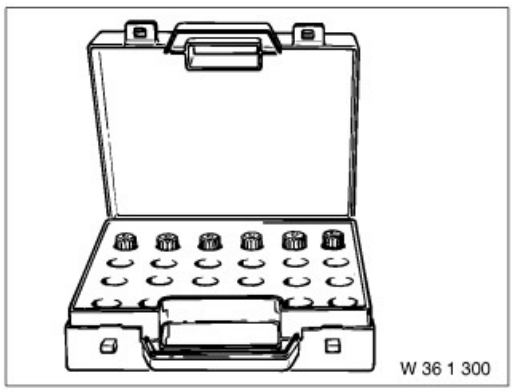
2 344 011 Tool



Common	Used in step 13
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	

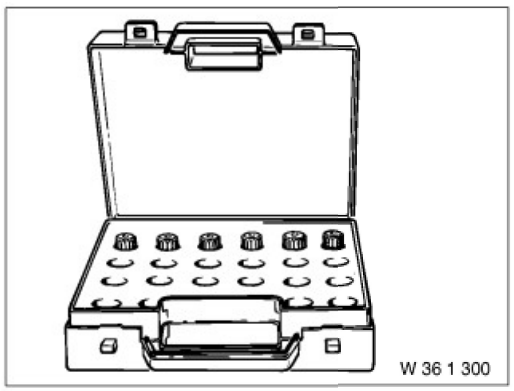
arriagn.com

0 495 224 (36 1 326) Wheel stud



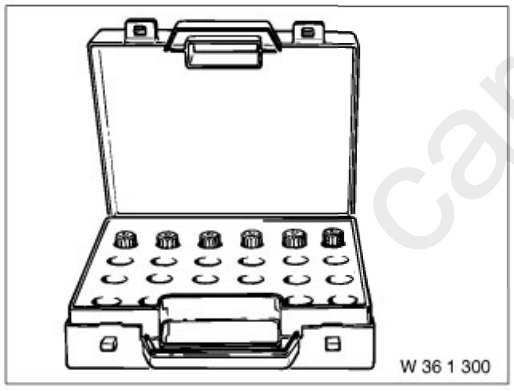
Common	Used in step 1
Usage	(Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 225 (36 1 327) Wheel stud



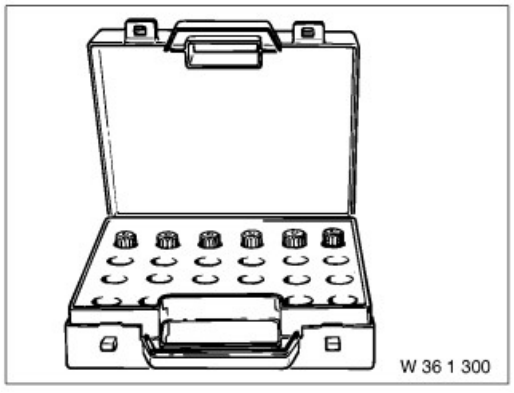
Common	Used in step 1
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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	

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	

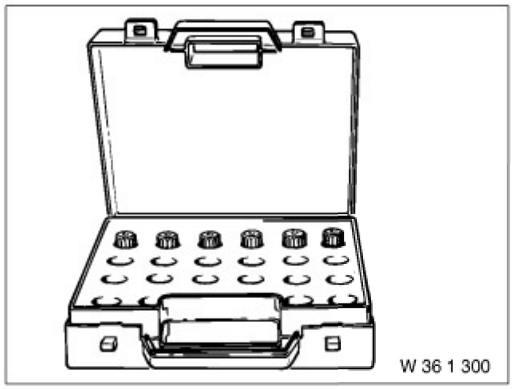
cardiagn.com

0 495 228 (36 1 331) Wheel stud



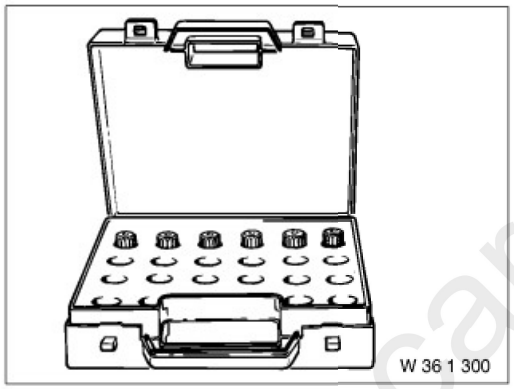
Common	Used in step 1
Usage	(Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 229 (36 1 332) Wheel stud



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

0 495 230 (36 1 333) Wheel stud



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

Overview Technical Data

Minimum brake disc thickness (nominal dimension 330x24)	Used in step 4
Minimum brake disc thickness (brake disc 330x24)	22,4 mm

Links

General repair instructions	Used in step

Repair instructions	Used in step
34 00 x01 Guideline for applying brake pad paste on brake pads and caliper carrier	

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34 11 552 Reconditioning front left or right brake caliper

Prerequisite

- **Vehicles with High brake.**

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.

TECHNICAL INFORMATION

General information on changing the brake pads:

For vehicles older than 48 months it is recommended to replace the retaining spring or expanding spring.

The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

A CBS reset must be done after every brake pad exchange:

A CBS reset in the vehicle is possible in the event of a **partially ground down** brake pad wear sensor. The CBS display in the Central Information Display (CID) is active.

In the event of a brake pad wear sensor that is **not partially ground down**, a CBS reset is only possible with the diagnosis system. No CBS display in the Central Information Display (CID).

If bonded brake pads are installed, the brake pads must be renewed after releasing the adhesive strip.

TECHNICAL INFORMATION

To prevent damage to the surface coating: With floating callipers on the brake caliper mounting bracket or with fixed callipers in the brake caliper housing, do not clean the contact surfaces for the brake pads to the extent that it is possible.

Clean the contact surfaces with brake cleaner (BMW part number 83 19 2 154 780). Next, apply a thin coat of brake pad paste (BMW part number 83 19 2 158 851 for 3 g) or 83 19 2 158 852 fr 100 g).

Spread brake pad paste on the marked surfaces with a brush.

For additional information see: 34 00 ... brake pad paste

PRELIMINARY WORK

1 – Removing both front wheels

▸ **Removing the wheel**

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- 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 .

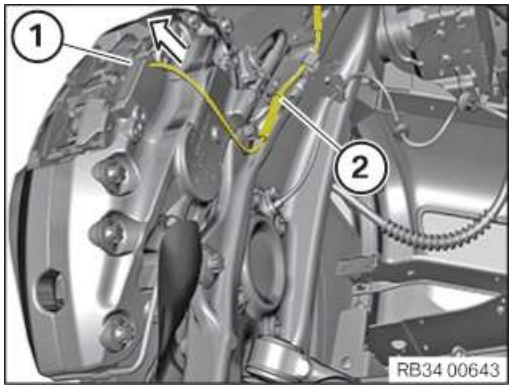
2 – Removing the front brake pad set (brake, high)

TECHNICAL INFORMATION

The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

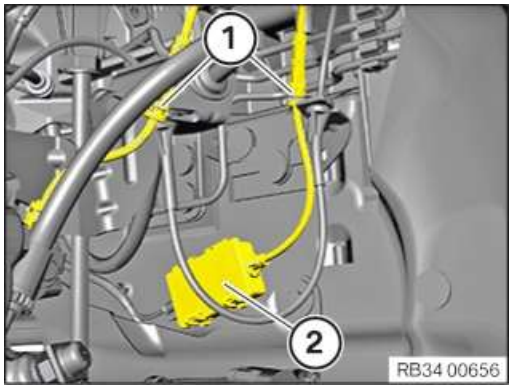
If a brake pad wear sensor that has already been ground has to be replaced even though the minimum brake pad thickness has not yet been reached, you must observe the following:

The new sliding contact must be filed down with a file to the same length as the sanded sliding contact.



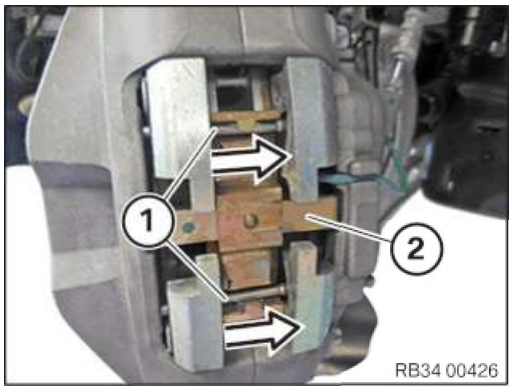
- Remove brake pad wear sensor (1) out of the brake pad in the direction of the arrow.
- Detach the cable of the brake pad wear sensor (1) from the bracket (2).

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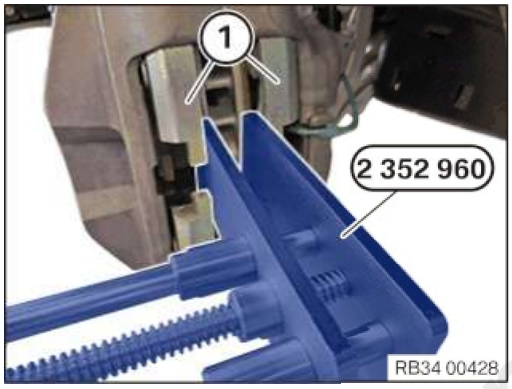


- Detach the brake pad wear sensor from the brackets (1).
- Open sealing cap (2) and disconnect the plug connection.

3 – Removing the front brake pads (brake high)



- Drive out locking pins (1) in direction of arrow.
- Take off the retaining clip (2).



TECHNICAL INFORMATION

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

Overflowing brake fluid will damage the paintwork.

- Press back the brake piston against the weights (1) with special tool 2 352 960.
- Press back the brake piston up to the limit position.

TECHNICAL INFORMATION

Note the following for the removal of the brake pads:

To prevent damage to the paintwork of the brake callipers: Do not remove the brake pads from the brake piston with a hammer or screwdriver.

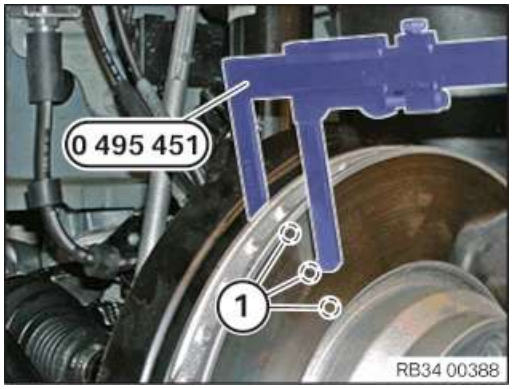
Use plastic wedges to remove the brake pads.

- Remove brake pad from the brake caliper.
- **Do not re-use brake pads.**

  Once the brake pads have been released from the brake piston, the brake pads must not be reused.

4 – Measure minimum brake disc thickness (front brake)

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- Check minimum brake disc thickness:

  Place the special tool at three measuring points in area (1) and measure.

  Compare measuring result and lowest value with setpoint value.

  New brake pads must only be installed if the brake disk thickness is greater than the minimum brake disc thickness.

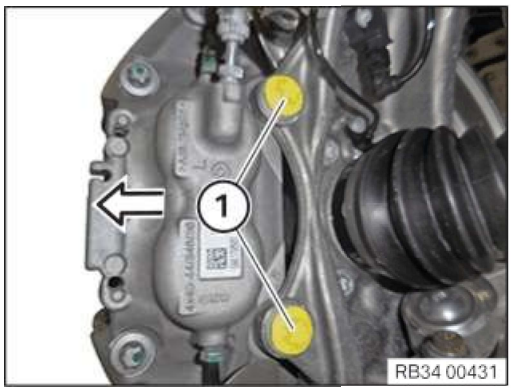
Minimum brake disc thickness (nominal dimension 330x24)

Minimum brake disc thickness (brake disc 330x24)	22,4 mm

5 – Remove front brake caliper (Brake caliper remains closed)

NOTICE

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

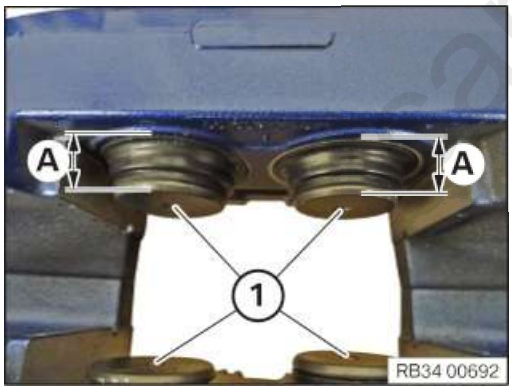


- Loosen screws (1).
- Detach the brake caliper in the direction of the arrow.
- Tie up the brake caliper .

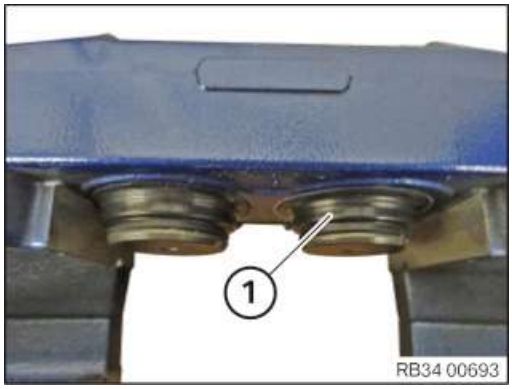
  The brake caliper must not hang on the brake hose.

MAIN WORK

6 – Reconditioning the front brake caliper



- **Do not hold down brake piston** (2) **with your fingers - pinch hazard!**
- Press out all brake pistons (1) to dimension A= 20 mm .
- Insert a protective plate (1) (e.g. made of hardwood or a rubber part) into the brake caliper housing to protect the brake piston.

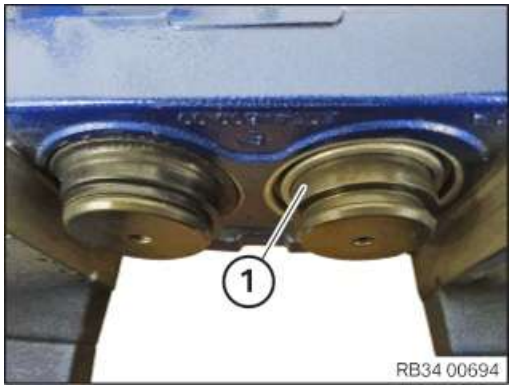


NOTICE

The description is for one component only. The procedure is identical for all further components.

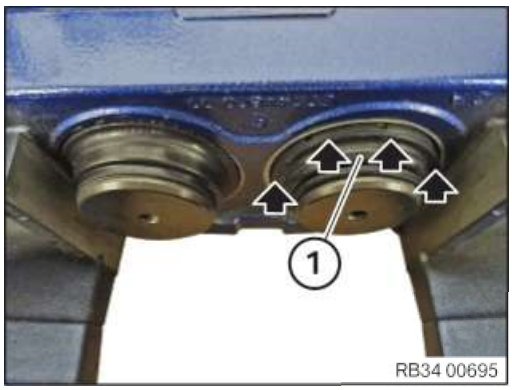
- Push off the dust boot (1).

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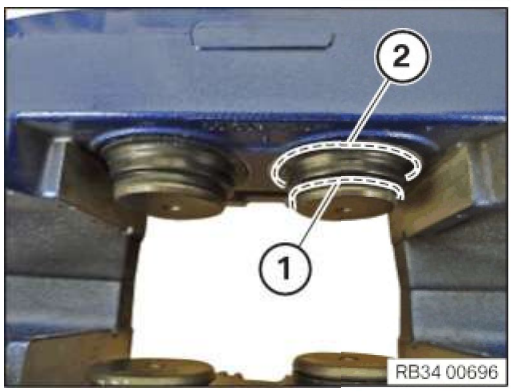
- Clean brake piston (1) and dry it with compressed air.
- Check brake piston (1) and the flange surfaces for damage and, if necessary, renew the brake calliper.

  Do not remove material from cylinders and brake pistons during processing.



- Place dust boot (1) on brake piston (3).
- Press dust boot (1) evenly into the brake calliper housing in the direction of the arrow.
- To guarantee that the dust boot fits perfectly: Keep the area between the dust boot and the brake caliper housing dry.

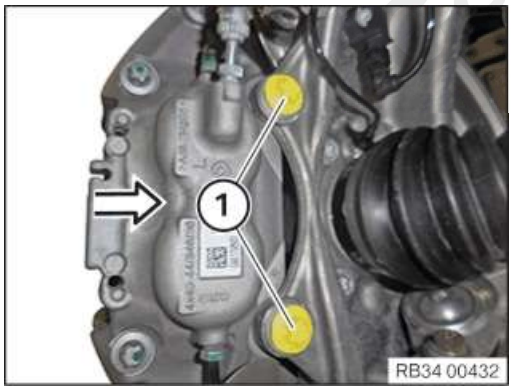
  The area between the dust boot and the brake caliper housing must not come in contact with the lubricating grease or brake fluid.



- Ensure that the dust boot is inserted correctly in the annular groove (1) and in brake calliper housing (2).

POSTPROCESSES

7 – Install front brake caliper (Brake caliper remains closed)



- Install brake caliper in direction of arrow.
- Renew screws (1).

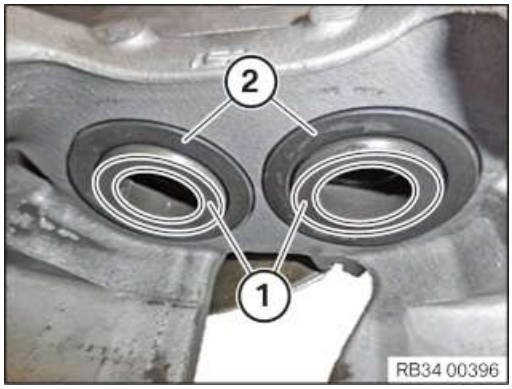
  Parts: Bolts
- Tighten the screws (1).

Brake caliper / caliper carrier at front swivel bearing

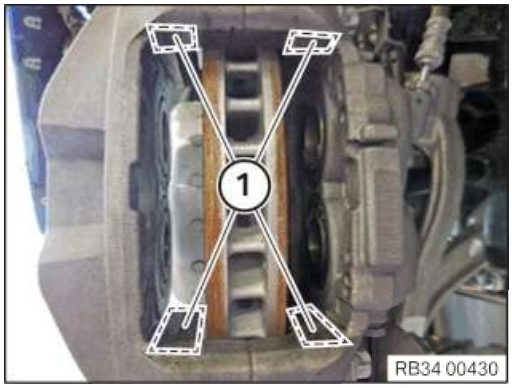
M12	Renew screw.	Tightening torque	110 Nm

8 – Grease brake pads, caliper carrier and brake caliper with brake pad paste (brake, high)

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- Clean the contact surfaces (1) of the brake pistons (4 pieces) with brake cleaner.
- Completely remove the adhesive residue.
- Check the dust boots (2) for damage and renew if necessary.



- Clean the contact surfaces (1) for the brake pads on the brake caliper with brake cleaner.

  If possible, do not close the contact surfaces mechanically to prevent damage to the surface coating.
- Apply a thin coat of the brake pad paste to the contact surfaces (1).

Expendable materials

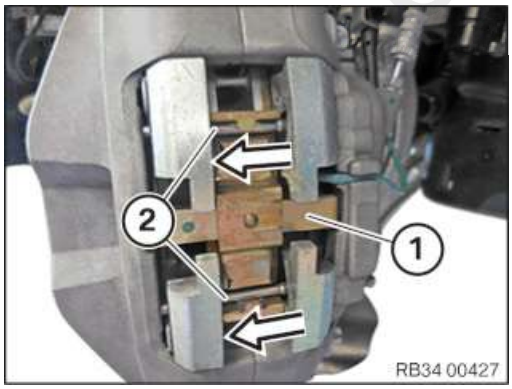
Brake block paste * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233

9 – Installing the front brake pads (High brake)



- Remove the protective film of the adhesive layer(1) at the brake pads.

  The adhesive layer (1)must not be touched.



- Insert brake pads into the brake caliper.

  The adhesive layer must not touch the brake piston.
- Position the retaining clip (1).
- Drive in locking pins (2) in the direction of the arrow.

10 – Bonding the brake pads to the brake pistons

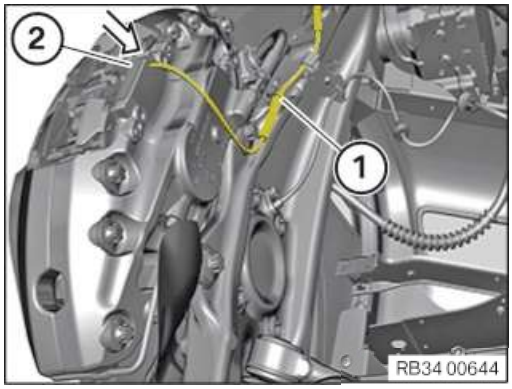
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TECHNICAL INFORMATION

The brake pads must be bonded with the brake calliper **immediately** following the installation:

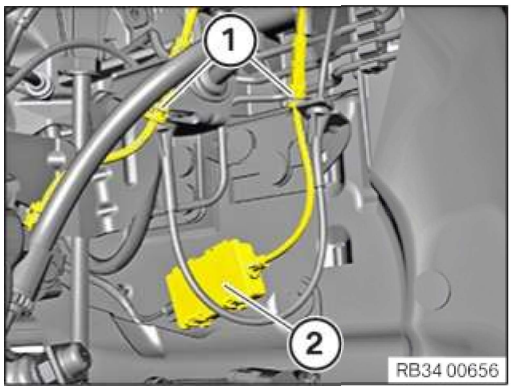
Step on the brake pedal to the floor and hold the pressure for one minute. This causes the brake pads to adhere to the brake pistons.

11 – Install the front brake pad sensor (brake high)



- Attach the cable of the brake pad wear sensor in the bracket (1).
- Install the brake pad wear sensor (2) in the brake pad in the direction of the arrow.

  Ensure brake pad wear sensor fits correctly in brake pad.



- Attach cable of brake pad wear sensor in brackets (1).
- Connect the plug connection .
- Close sealing cap (2).

12 – Installing both front wheels

▸ **Mounting the wheel**



TECHNICAL INFORMATION

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

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

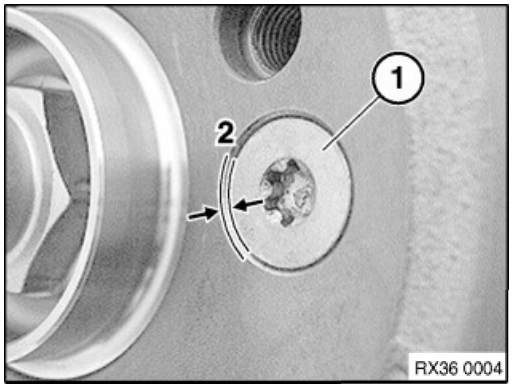
  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.

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

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).



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

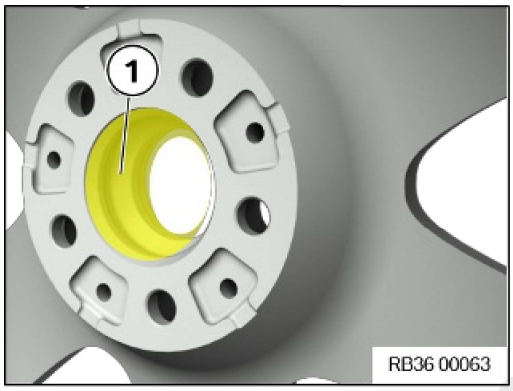
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

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

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

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TECHNICAL INFORMATION

When exchanging brake pads, reset the CBS display in accordance with factory specification (CBS reset).

Carry out test braking while driving at low speed because the effectiveness of the brakes may be reduced during the initial braking operations.

Exaggerated emergency and continuous braking operations for faster bedding-in are not permitted.

Advise the customer not to perform intentional emergency braking operations for the first 200 km after the brakes have been replaced.

- Fully depress brake pedal several times so that brake pads contact brake discs.
- Adjust the brake fluid level to the maximum mark.
- Perform a functional check on the brake test stand to ensure compliance of the brake system with statutory guidelines.
- Attach mirror tag to inside mirror.

Additional Information

Overview of Tightening Torques

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

M12	Renew screw.	Tightening torque	110 Nm

Brake disc to front wheel hub — Used in step 12

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 12

M8	Renew screw.	Tightening torque	16 Nm

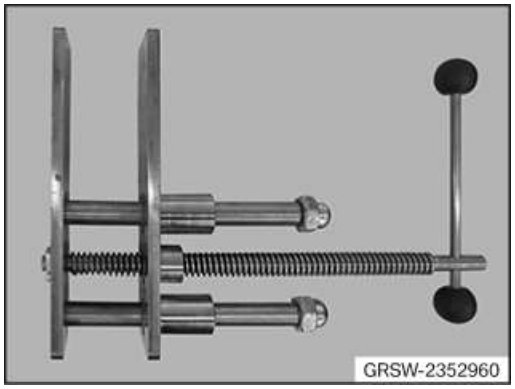
Wheel bolts — Used in step 12

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

Overview of Special Tools

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2 352 960 Reset



Common	Used in step 3
Usage	Set back to brake piston. Replacement for 34 1 050 (83300492455).
Included in the tool or work	
Storage location	Individual
Replaced by	
In connection with	
SI-Number	

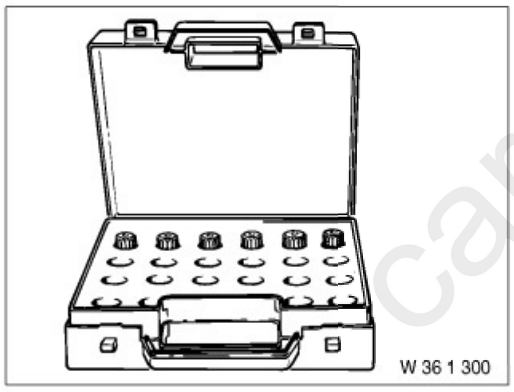
2 344 011 Tool



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

Replacement tools:

0 495 221 (36 1 323) Wheel stud



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

0 495 224 (36 1 326) Wheel stud



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

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0 495 225 (36 1 327) Wheel stud



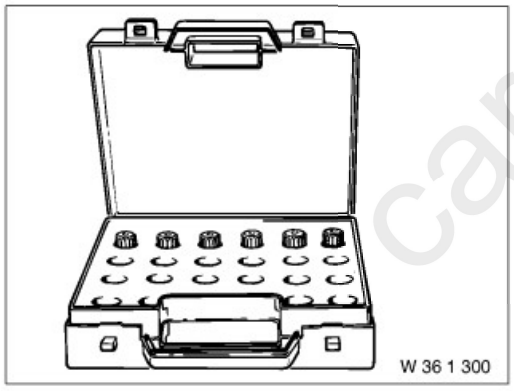
Common	Used in step 1
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 226 (36 1 328) Wheel stud



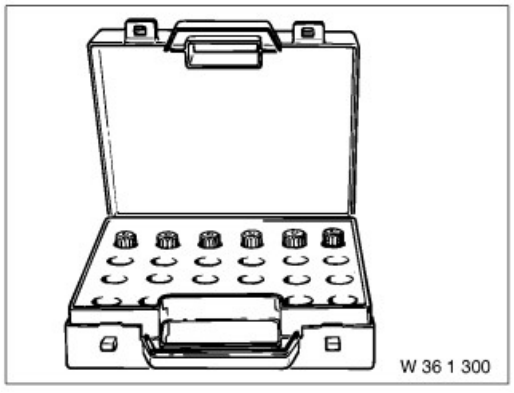
Common	Used in step 1
Usage	(Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 227 (36 1 329) Wheel stud



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

0 495 228 (36 1 331) Wheel stud



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

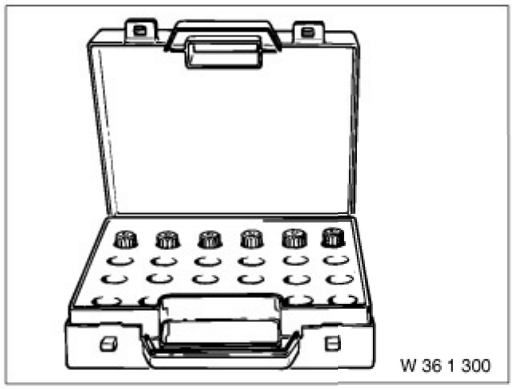
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0 495 229 (36 1 332) Wheel stud



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

0 495 230 (36 1 333) Wheel stud



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

Overview Technical Data

Minimum brake disc thickness (nominal dimension 330x24)	Used in step 4
Minimum brake disc thickness (brake disc 330x24)	22,4 mm

Links

Repair instructions	Used in step
34 00 x01 Guideline for applying brake pad paste on brake pads and caliper carrier	

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34 11 000 Removing and installing/renewing brake pads on both front disc brakes

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.

TECHNICAL INFORMATION

General information on changing the brake pads:

For vehicles older than 48 months it is recommended to replace the retaining spring or expanding spring.

The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

A CBS reset must be done after every brake pad exchange:

A CBS reset in the vehicle is possible in the event of a **partially ground down** brake pad wear sensor. The CBS display in the Central Information Display (CID) is active.

In the event of a brake pad wear sensor that is **not partially ground down**, a CBS reset is only possible with the diagnosis system. No CBS display in the Central Information Display (CID).

If bonded brake pads are installed, the brake pads must be renewed after releasing the adhesive strip.

TECHNICAL INFORMATION

To prevent damage to the surface coating: With floating callipers on the brake caliper mounting bracket or with fixed callipers in the brake caliper housing, do not clean the contact surfaces for the brake pads to the extent that it is possible.

Clean the contact surfaces with brake cleaner (BMW part number 83 19 2 154 780). Next, apply a thin coat of brake pad paste (BMW part number 83 19 2 158 851 for 3 g) or 83 19 2 158 852 fr 100 g).

Spread brake pad paste on the marked surfaces with a brush.

For additional information see: 34 00 ... brake pad paste

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PRELIMINARY WORK

1 – Removing both front wheels

▸ **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 .

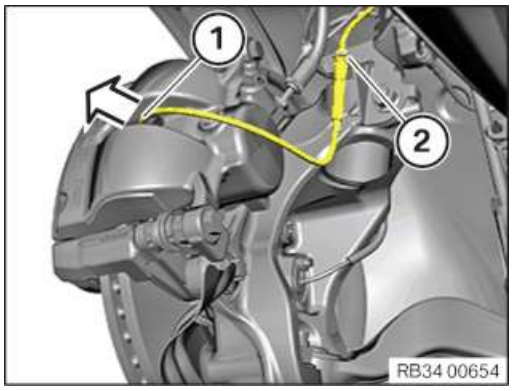
2 – Removing front brake pad wear sensor

TECHNICAL INFORMATION

The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

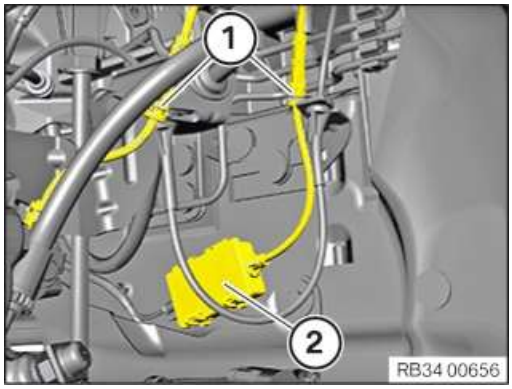
If a brake pad wear sensor that has already been ground has to be replaced even though the minimum brake pad thickness has not yet been reached, you must observe the following:

The new sliding contact must be filed down with a file to the same length as the sanded sliding contact.



- Remove brake pad wear sensor (1) out of the brake pad in the direction of the arrow.
- Detach the brake pad wear sensor cable from the bracket (2).

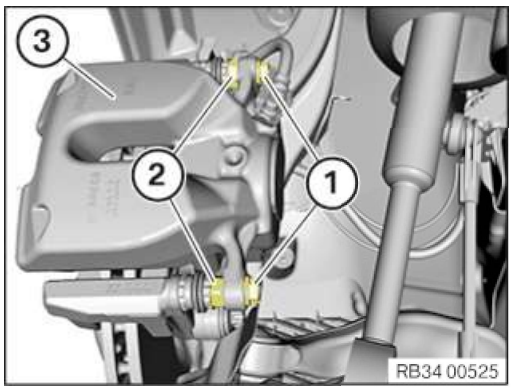
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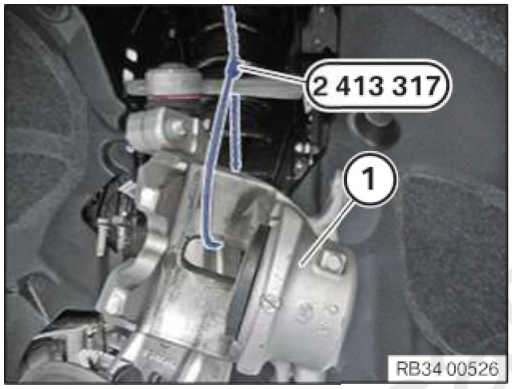
- Detach the brake pad wear sensor from the brackets (1).
- Open sealing cap (2) and disconnect the plug connection.

MAIN WORK

3 – Remove front brake pads

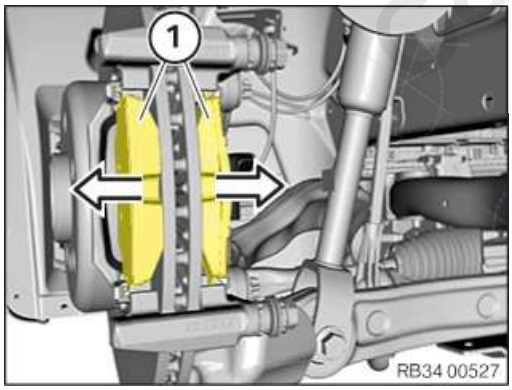


- Release the screws (1); if necessary use the hexagon head (2) for counter support.
- Remove the brake caliper (3).



- Tie up the brake caliper (1) using the special tool (cable strap) 2 413 317.

  The brake caliper must not hang on the brake hose.



- Remove the brake pads (1) in the direction of arrow.
- Mark any worn brake pads.

  If the brake pad wear exists on one side, they must not be mixed up.



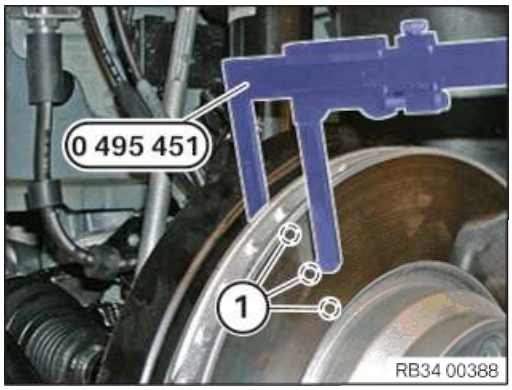
TECHNICAL INFORMATION

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

Overflowing brake fluid will damage the paintwork.

- Push the brake pistons (1) back with the special tool 2 352 960.

4 – Measure minimum brake disc thickness (front brake)



- Check minimum brake disc thickness:

  Place the special tool at three measuring points in area (1) and measure.

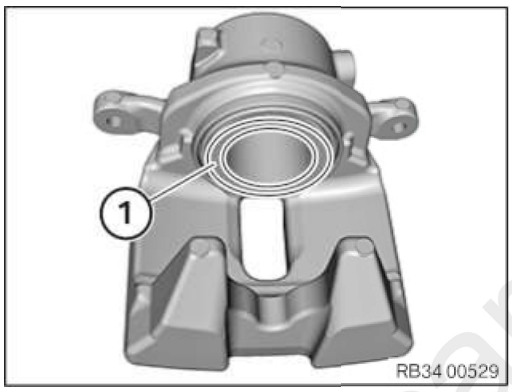
  Compare measuring result and lowest value with setpoint value.

  New brake pads must only be installed if the brake disk thickness is greater than the minimum brake disc thickness.

Minimum brake disc thickness (nominal dimension 330x24)

Minimum brake disc thickness (brake disc 330x24)	22,4 mm

5 – Grease the brake pads, caliper carriers and brake calipers with brake pad paste (17-inch brake)

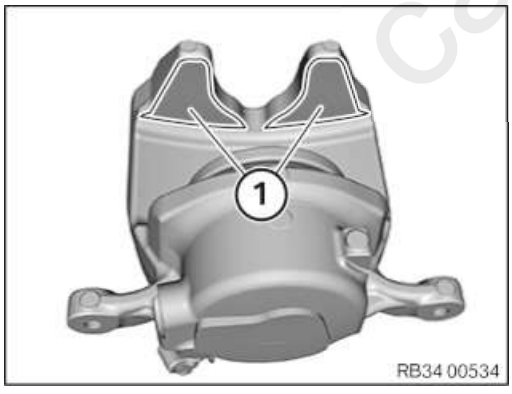


- Clean the contact surfaces (1) of the brake piston using brake cleaner.

Expendable materials

Brake cleaner2.0	500 ml, Spray can	83192365214
	20 , Canister	83192365215

- Check dust boots for damage; renew if necessary.

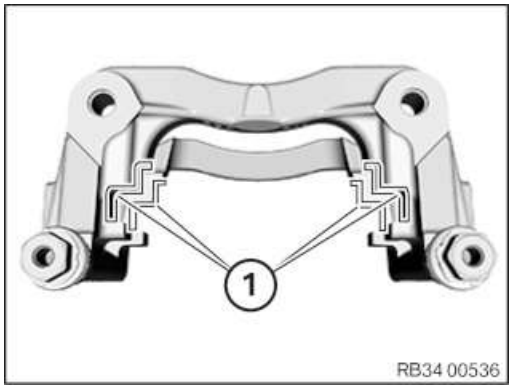


- Clean contact surfaces (1) of the brake caliper with brake cleaner and apply a thin layer of brake pad paste.

Expendable materials

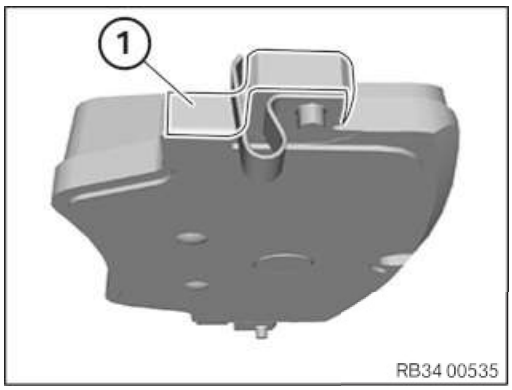
Brake block paste * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233

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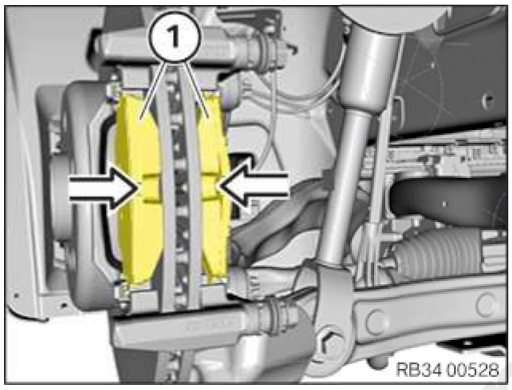
- Clean contact surfaces with brake cleaner.

  The contact surfaces (1) for the brake pads should not be cleaned mechanically if possible in order to avoid damaging the surface coating.
- Carefully clean highly contaminated contact surfaces (1) using a suitable tool (e.g. brass wire brush, nylon brush).
- Coat contact surfaces (1) thinly with brake pad paste.



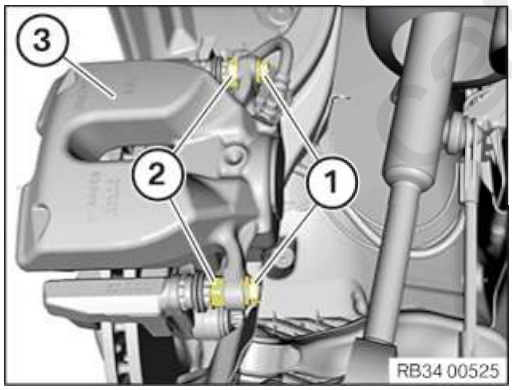
- Apply a thin coating of brake pad paste to both sides of the T-head of the brake pad in area (1).

6 – Installing the front brake pads



- If applicable, observe the identification of the removed brake pads.

  If the brake pads are worn on one side, they must not be mixed up.
- Install the brake pads (1) in the brake calliper in the direction of the arrow.



- Remove the special tool (cable strap) 2 413 317.
- Install the brake caliper (3).
- Renew screws.

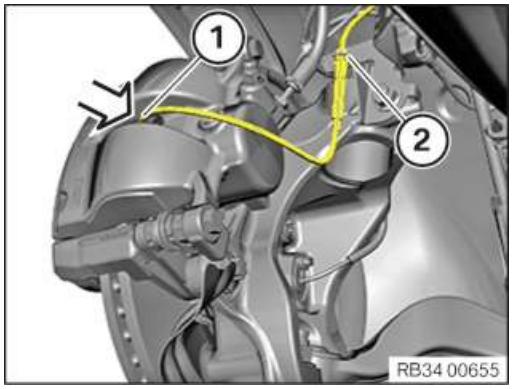
  Parts: Bolts
- Tighten the screws (1), if applicable, hold against the hexagon head (2).

Guide bolt (brake caliper on caliper carrier)

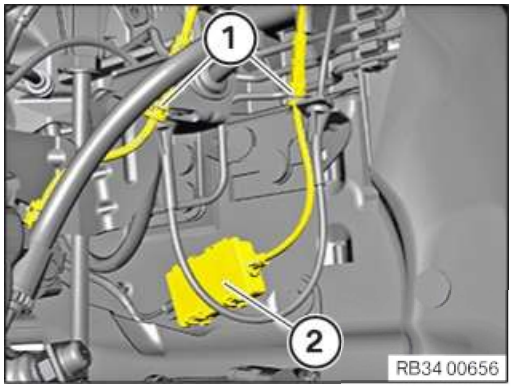
M8	Renew screws.		35 Nm

POSTPROCESSES

7 – Installing front brake pad wear sensor



- Attach the brake pad wear sensor to the bracket (2).
- Install the brake pad wear sensor (1) in the brake pad in the direction of the arrow.
- Make sure the brake pad wear sensor is fitted correctly in the brake pad.



- Attach cable of brake pad wear sensor in brackets (1).
- Connect the plug connection .
- Close sealing cap (2).

8 – Installing both front wheels

▸ **Mounting the wheel**



TECHNICAL INFORMATION

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

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

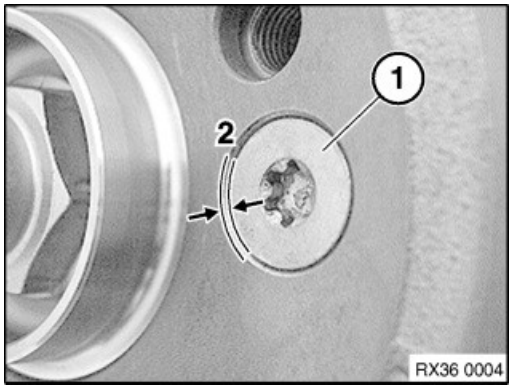
  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.



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

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).

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

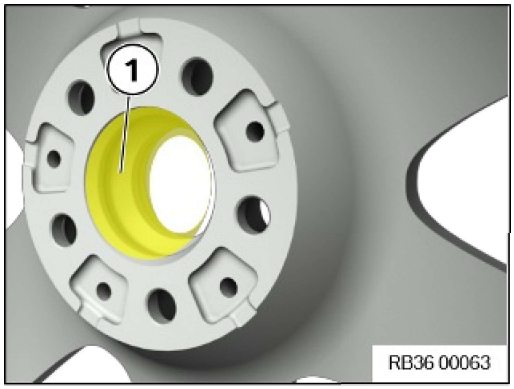
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

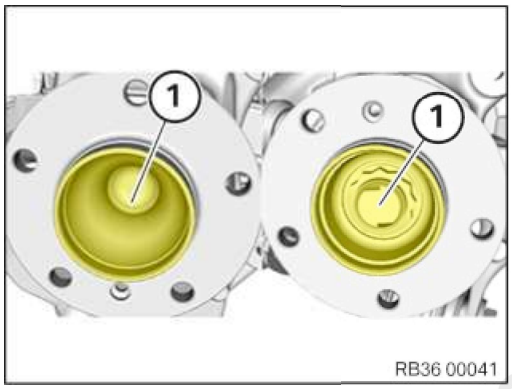
M8	Renew screw.	Tightening torque	16 Nm



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

Expendable materials

Brake block paste * 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 * 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.

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TECHNICAL INFORMATION

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

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

9 – Commissioning/bedding in new brake pads and brake discs

TECHNICAL INFORMATION

When exchanging brake pads, reset the CBS display in accordance with factory specification (CBS reset).

Carry out test braking while driving at low speed because the effectiveness of the brakes may be reduced during the initial braking operations.

Exaggerated emergency and continuous braking operations for faster bedding-in are not permitted.

Advise the customer not to perform intentional emergency braking operations for the first 200 km after the brakes have been replaced.

- Fully depress brake pedal several times so that brake pads contact brake discs.
- Adjust the brake fluid level to the maximum mark.
- Perform a functional check on the brake test stand to ensure compliance of the brake system with statutory guidelines.
- Attach mirror tag to inside mirror.

Additional Information

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Overview of Tightening Torques

Guide bolt (brake caliper on caliper carrier) — Used in step 6

M8	Renew screws.		35 Nm

Brake disc to front wheel hub — Used in step 8

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 8

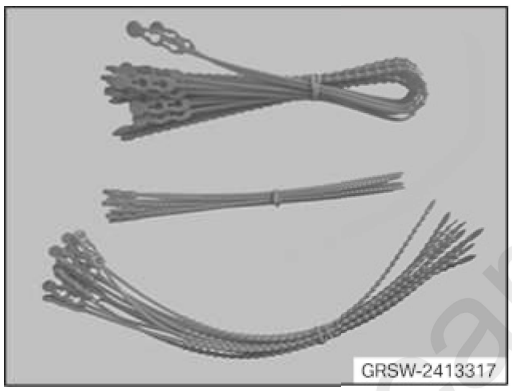
M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 8

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

Overview of Special Tools

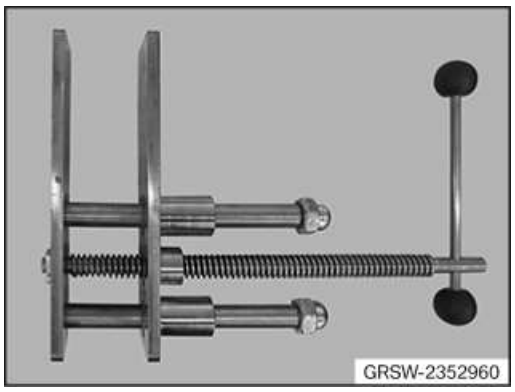
2 413 317 Cable strap



Common — Used in step 36

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)

2 352 960 Reset



Common — Used in step 3

Usage	Set back to brake piston. Replacement for 34 1 050 (83300492455).
Included in the tool or work	
Storage location	Individual
Replaced by	
In connection with	
SI-Number	

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2 344 011 Tool



Common	Used in step 8
Usage	Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	08 08 12 (872)

Replacement tools:

0 495 221 (36 1 323) Wheel stud



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

0 495 224 (36 1 326) Wheel stud



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

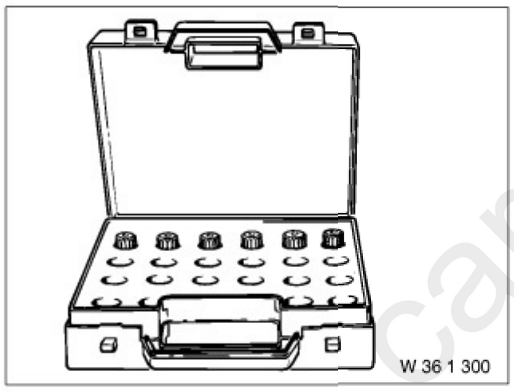
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0 495 225 (36 1 327) Wheel stud



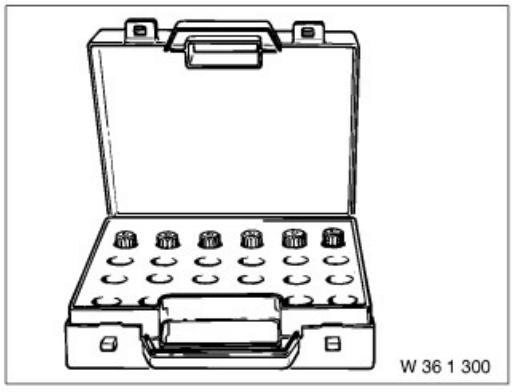
Common	Used in step 1
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 226 (36 1 328) Wheel stud



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

0 495 227 (36 1 329) Wheel stud



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

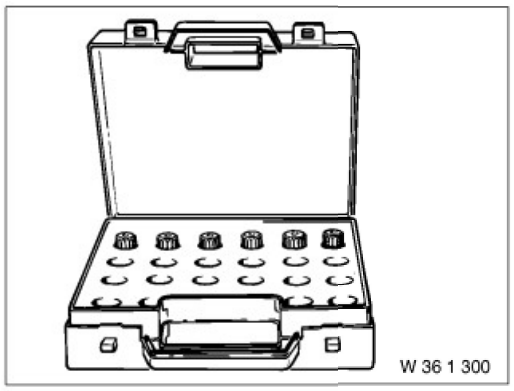
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0 495 228 (36 1 331) Wheel stud



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

0 495 229 (36 1 332) Wheel stud



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

0 495 230 (36 1 333) Wheel stud



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

Overview Technical Data

Minimum brake disc thickness (nominal dimension 330x24)	Used in step 4
Minimum brake disc thickness (brake disc 330x24)	22,4 mm

Links

Repair instructions	Used in step
34 00 x01 Guideline for applying brake pad paste on brake pads and caliper carrier	

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34 11 000 Removing and installing/renewing brake pads on both front disc brakes

Prerequisite

- **Vehicles with brake, high.**

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.

TECHNICAL INFORMATION

General information on changing the brake pads:

For vehicles older than 48 months it is recommended to replace the retaining spring or expanding spring.

The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

A CBS reset must be done after every brake pad exchange:

A CBS reset in the vehicle is possible in the event of a **partially ground down** brake pad wear sensor. The CBS display in the Central Information Display (CID) is active.

In the event of a brake pad wear sensor that is **not partially ground down**, a CBS reset is only possible with the diagnosis system. No CBS display in the Central Information Display (CID).

If bonded brake pads are installed, the brake pads must be renewed after releasing the adhesive strip.

TECHNICAL INFORMATION

To prevent damage to the surface coating: With floating callipers on the brake caliper mounting bracket or with fixed callipers in the brake caliper housing, do not clean the contact surfaces for the brake pads to the extent that it is possible.

Clean the contact surfaces with brake cleaner (BMW part number 83 19 2 154 780). Next, apply a thin coat of brake pad paste (BMW part number 83 19 2 158 851 for 3 g) or 83 19 2 158 852 fr 100 g).

Spread brake pad paste on the marked surfaces with a brush.

For additional information see: 34 00 ... brake pad paste

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PRELIMINARY WORK

1 – Removing both front wheels

▸ **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 .

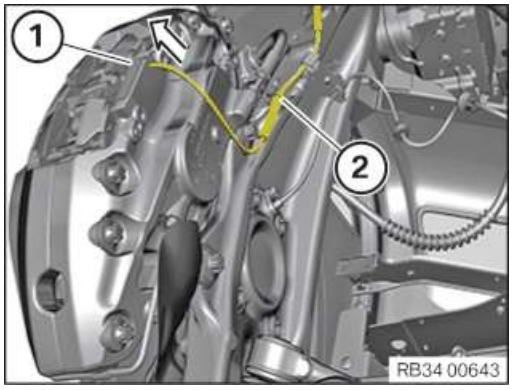
2 – Removing the front brake pad set (brake, high)

TECHNICAL INFORMATION

The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

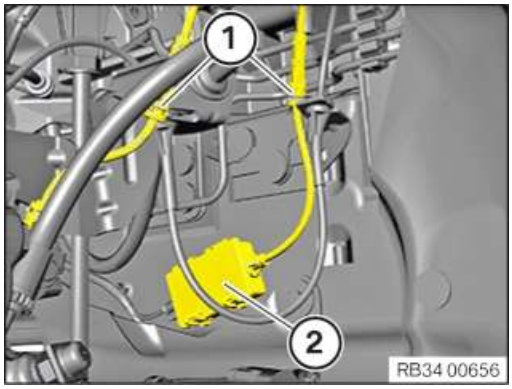
If a brake pad wear sensor that has already been ground has to be replaced even though the minimum brake pad thickness has not yet been reached, you must observe the following:

The new sliding contact must be filed down with a file to the same length as the sanded sliding contact.



- Remove brake pad wear sensor (1) out of the brake pad in the direction of the arrow.
- Detach the cable of the brake pad wear sensor (1) from the bracket (2).

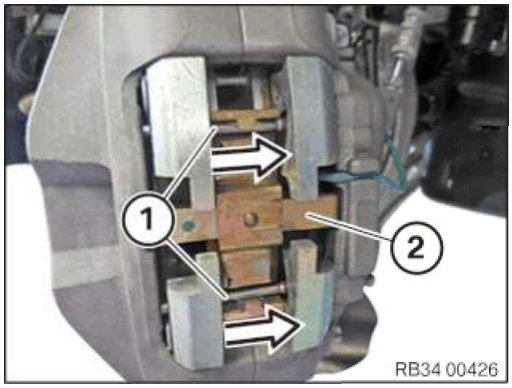
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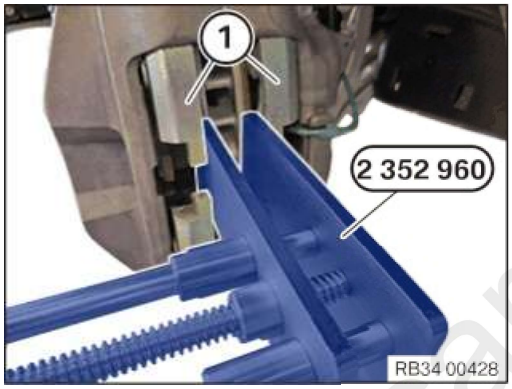
- Detach the brake pad wear sensor from the brackets (1).
- Open sealing cap (2) and disconnect the plug connection.

MAIN WORK

3 – Removing the front brake pads (brake high)



- Drive out locking pins (1) in direction of arrow.
- Take off the retaining clip (2).



TECHNICAL INFORMATION

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

Overflowing brake fluid will damage the paintwork.

- Press back the brake piston against the weights (1) with special tool 2 352 960.
- Press back the brake piston up to the limit position.

TECHNICAL INFORMATION

Note the following for the removal of the brake pads:

To prevent damage to the paintwork of the brake callipers: Do not remove the brake pads from the brake piston with a hammer or screwdriver.

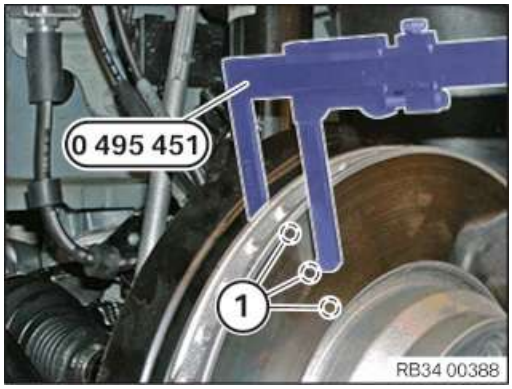
Use plastic wedges to remove the brake pads.

- Remove brake pad from the brake caliper.
- **Do not re-use brake pads.**

  Once the brake pads have been released from the brake piston, the brake pads must not be reused.

4 – Measure minimum brake disc thickness (front brake)

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- Check minimum brake disc thickness:

  Place the special tool at three measuring points in area (1) and measure.

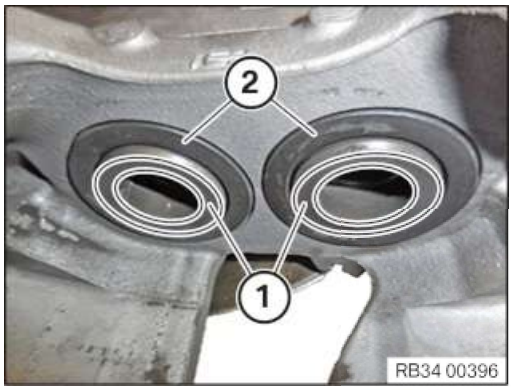
  Compare measuring result and lowest value with setpoint value.

  New brake pads must only be installed if the brake disk thickness is greater than the minimum brake disc thickness.

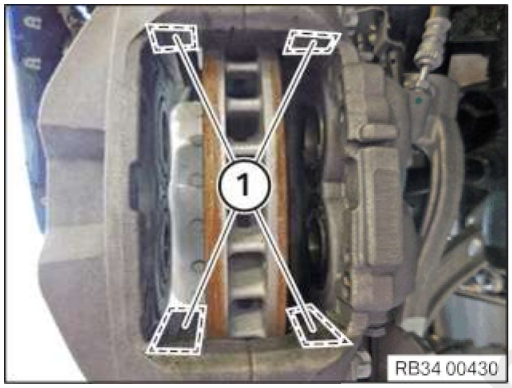
Minimum brake disc thickness (nominal dimension 330x24)

Minimum brake disc thickness (brake disc 330x24)	22,4 mm

5 – Grease brake pads, caliper carrier and brake caliper with brake pad paste (brake, high)



- Clean the contact surfaces (1) of the brake pistons (4 pieces) with brake cleaner.
- Completely remove the adhesive residue.
- Check the dust boots (2) for damage and renew if necessary.



- Clean the contact surfaces (1) for the brake pads on the brake caliper with brake cleaner.

  If possible, do not close the contact surfaces mechanically to prevent damage to the surface coating.
- Apply a thin coat of the brake pad paste to the contact surfaces (1).

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

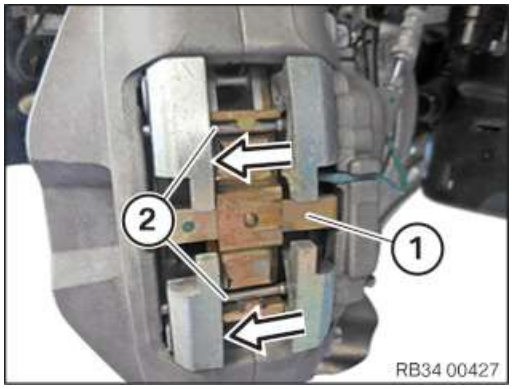
6 – Installing the front brake pads (High brake)



- Remove the protective film of the adhesive layer(1) at the brake pads.

  The adhesive layer (1)must not be touched.

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- Insert brake pads into the brake caliper.

  The adhesive layer must not touch the brake piston.
- Position the retaining clip (1).
- Drive in locking pins (2) in the direction of the arrow.

7 – Bonding the brake pads to the brake pistons

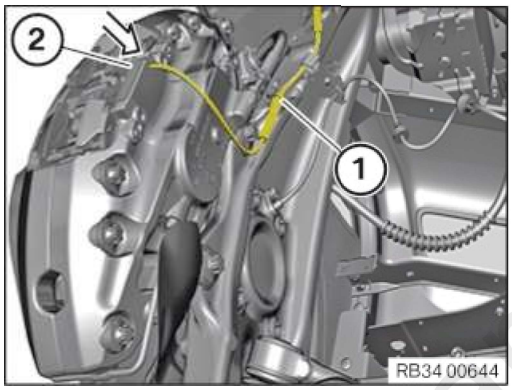
TECHNICAL INFORMATION

The brake pads must be bonded with the brake calliper **immediately** following the installation:

Step on the brake pedal to the floor and hold the pressure for one minute. This causes the brake pads to adhere to the brake pistons.

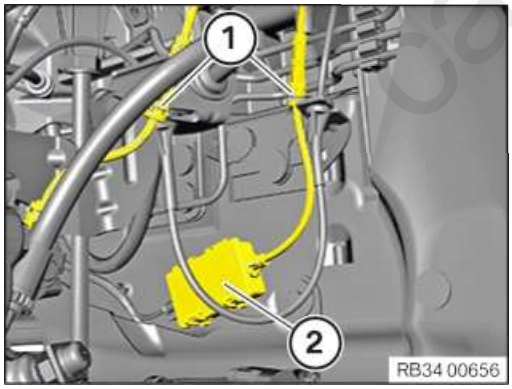
POSTPROCESSES

8 – Install the front brake pad sensor (brake high)



- Attach the cable of the brake pad wear sensor in the bracket (1).
- Install the brake pad wear sensor (2) in the brake pad in the direction of the arrow.

  Ensure brake pad wear sensor fits correctly in brake pad.



- Attach cable of brake pad wear sensor in brackets (1).
- Connect the plug connection .
- Close sealing cap (2).

9 – Installing both front wheels

▸ **Mounting the wheel**

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TECHNICAL INFORMATION

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

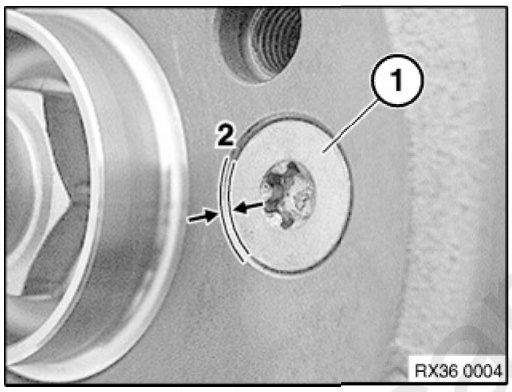
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

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



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

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).



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

  The mounting bolt (1) for the brake disc may not protrude 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 * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233

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



- 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.

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TECHNICAL INFORMATION

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

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

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10 – Start-up or bed in of new brake pads and discs (brake, high)

TECHNICAL INFORMATION

When exchanging brake pads, reset the CBS display in accordance with factory specification (CBS reset).

Carry out test braking while driving at low speed because the effectiveness of the brakes may be reduced during the initial braking operations.

Exaggerated emergency and continuous braking operations for faster bedding-in are not permitted.

Advise the customer not to perform intentional emergency braking operations for the first 200 km after the brakes have been replaced.

- Fully depress brake pedal several times so that brake pads contact brake discs.
- Adjust the brake fluid level to the maximum mark.
- Perform a functional check on the brake test stand to ensure compliance of the brake system with statutory guidelines.
- Attach mirror tag to inside mirror.

Additional Information

Overview of Tightening Torques

Brake disc to front wheel hub — Used in step 9

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 9

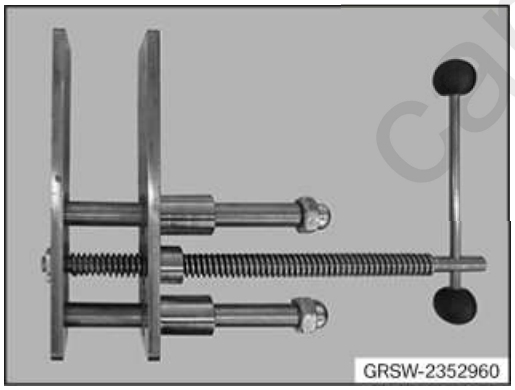
M8	Renew screw.	Tightening torque	16 Nm

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

Overview of Special Tools

2 352 960 Reset



Common — Used in step 3

Usage	Set back to brake piston. Replacement for 34 1 050 (83300492455).
Included in the tool or work	
Storage location	Individual
Replaced by	
In connection with	
SI-Number	

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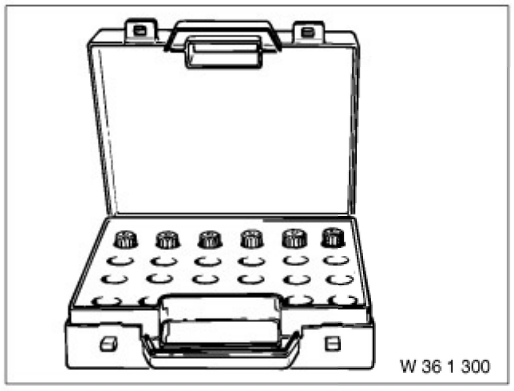
2 344 011 Tool



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)

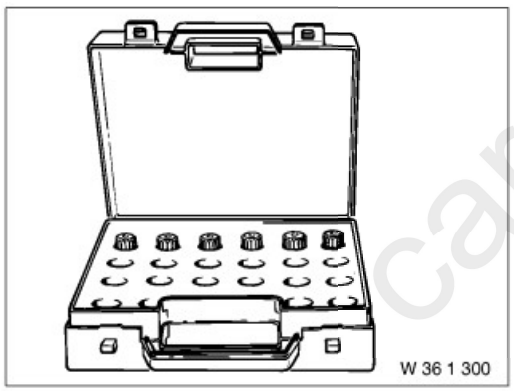
Replacement tools:

0 495 221 (36 1 323) Wheel stud



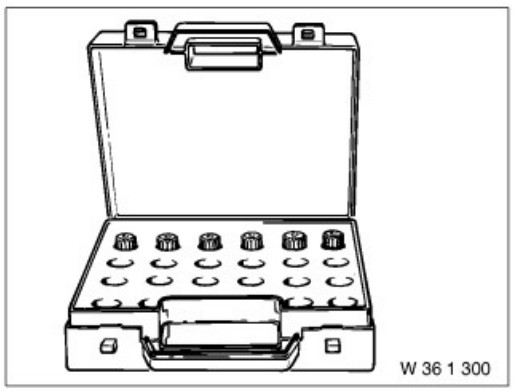
Common	Used in step 1
Usage	(Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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	

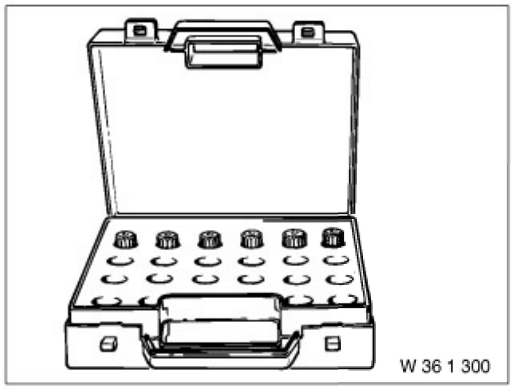
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0 495 226 (36 1 328) Wheel stud



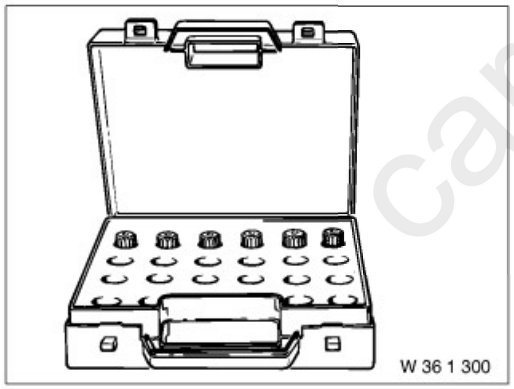
Common	Used in step 1
Usage	(Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 227 (36 1 329) Wheel stud



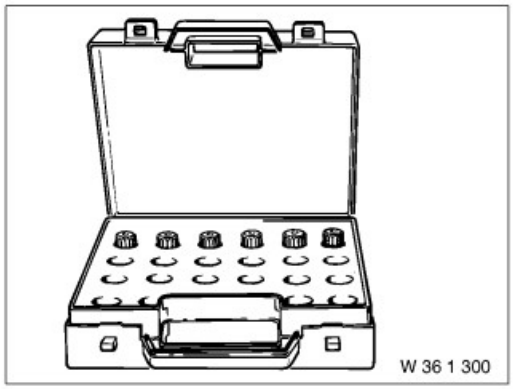
Common	Used in step 1
Usage	(Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 228 (36 1 331) Wheel stud



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

0 495 229 (36 1 332) Wheel stud



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

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0 495 230 (36 1 333) Wheel stud



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

Overview Technical Data

Minimum brake disc thickness (nominal dimension 330x24)	Used in step 4
Minimum brake disc thickness (brake disc 330x24)	22,4 mm

Links

Repair instructions	**Used in step**
34 00 x01 Guideline for applying brake pad paste on brake pads and caliper carrier	

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34 11 220 Removing and installing/replacing both front brake discs

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.

TECHNICAL INFORMATION

General information on changing the brake pads:

For vehicles older than 48 months it is recommended to replace the retaining spring or expanding spring.

The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

A CBS reset must be done after every brake pad exchange:

A CBS reset in the vehicle is possible in the event of a **partially ground down** brake pad wear sensor. The CBS display in the Central Information Display (CID) is active.

In the event of a brake pad wear sensor that is **not partially ground down**, a CBS reset is only possible with the diagnosis system. No CBS display in the Central Information Display (CID).

If bonded brake pads are installed, the brake pads must be renewed after releasing the adhesive strip.

TECHNICAL INFORMATION

To prevent damage to the surface coating: With floating callipers on the brake caliper mounting bracket or with fixed callipers in the brake caliper housing, do not clean the contact surfaces for the brake pads to the extent that it is possible.

Clean the contact surfaces with brake cleaner (BMW part number 83 19 2 154 780). Next, apply a thin coat of brake pad paste (BMW part number 83 19 2 158 851 for 3 g) or 83 19 2 158 852 fr 100 g).

Spread brake pad paste on the marked surfaces with a brush.

For additional information see: 34 00 ... brake pad paste

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PRELIMINARY WORK

1 – Removing both front wheels

▸ **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 .

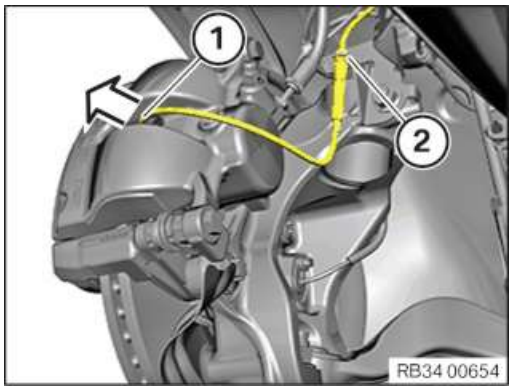
2 – Removing front brake pad wear sensor

TECHNICAL INFORMATION

The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

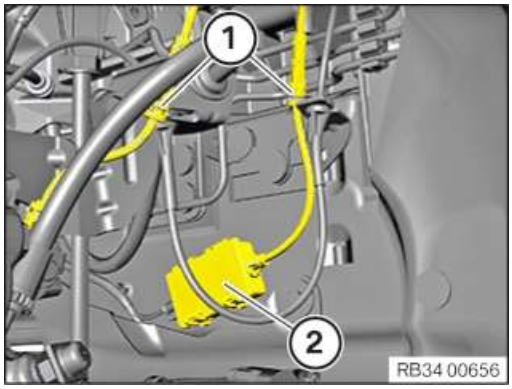
If a brake pad wear sensor that has already been ground has to be replaced even though the minimum brake pad thickness has not yet been reached, you must observe the following:

The new sliding contact must be filed down with a file to the same length as the sanded sliding contact.



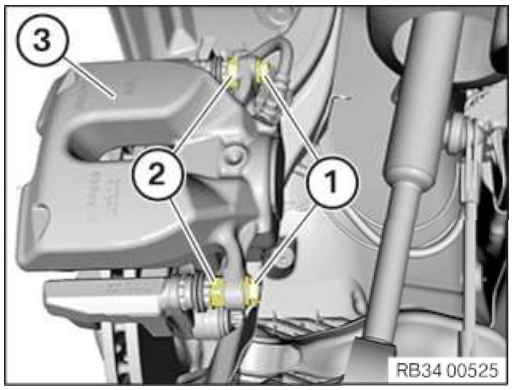
- Remove brake pad wear sensor (1) out of the brake pad in the direction of the arrow.
- Detach the brake pad wear sensor cable from the bracket (2).

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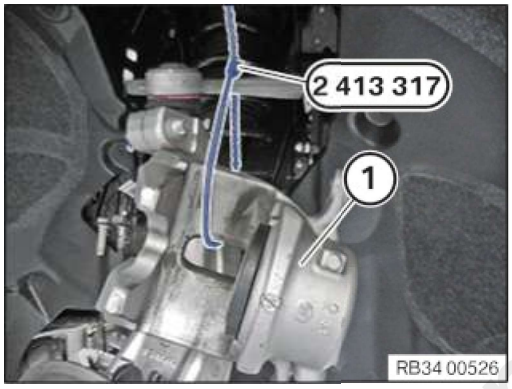


- Detach the brake pad wear sensor from the brackets (1).
- Open sealing cap (2) and disconnect the plug connection.

3 – Remove front brake pads

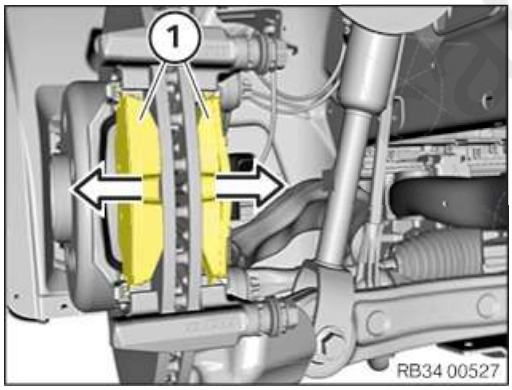


- Release the screws (1); if necessary use the hexagon head (2) for counter support.
- Remove the brake caliper (3).



- Tie up the brake caliper (1) using the special tool (cable strap) 2 413 317.

  The brake caliper must not hang on the brake hose.



- Remove the brake pads (1) in the direction of arrow.
- Mark any worn brake pads.

  If the brake pad wear exists on one side, they must not be mixed up.



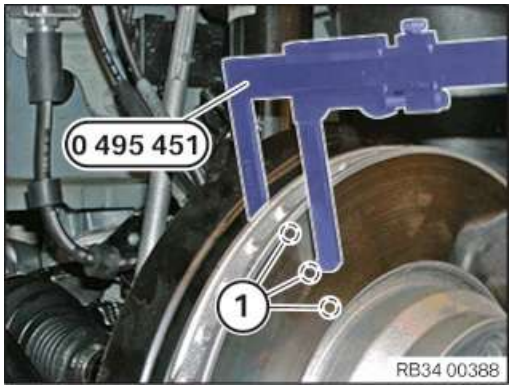
TECHNICAL INFORMATION

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

Overflowing brake fluid will damage the paintwork.

- Push the brake pistons (1) back with the special tool 2 352 960.

4 – Measure minimum brake disc thickness (front brake)



- Check minimum brake disc thickness:

  Place the special tool at three measuring points in area (1) and measure.

  Compare measuring result and lowest value with setpoint value.

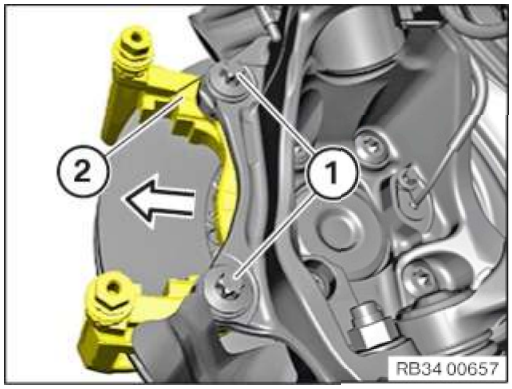
  New brake pads must only be installed if the brake disk thickness is greater than the minimum brake disc thickness.

Minimum brake disc thickness (nominal dimension 330x24)

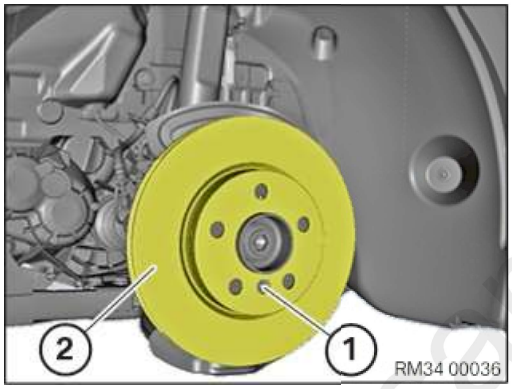
Minimum brake disc thickness (brake disc 330x24)	22,4 mm

MAIN WORK

5 – Remove front brake discs



- Loosen screws (1).
- Remove the caliper carrier (2) in the direction of the arrow.



- 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).

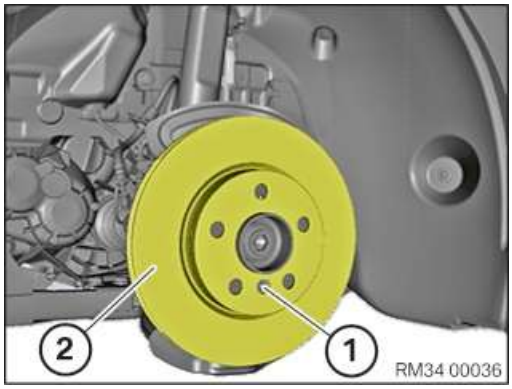
6 – Installing the front brake discs

TECHNICAL INFORMATION

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

Fit new brake discs only together with new brake pads.

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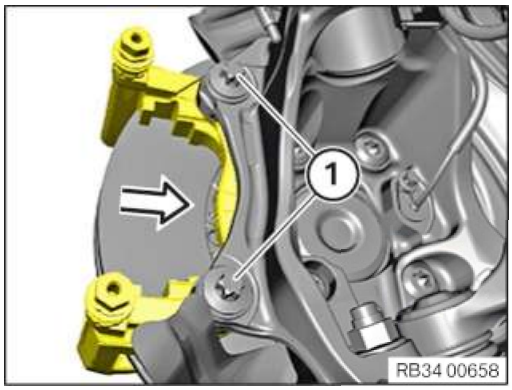
- Clean contact surface of wheel hub thoroughly and remove any traces of rust if necessary.

  Irregularities in the contact surface can cause distortion in the brake disc!
- Mount brake disc (2).
- Position and tighten the screw (1).
- Renew screw.

  Parts: Screw

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm



- Install the caliper carrier (2) in the direction of the arrow.
- Renew screws.

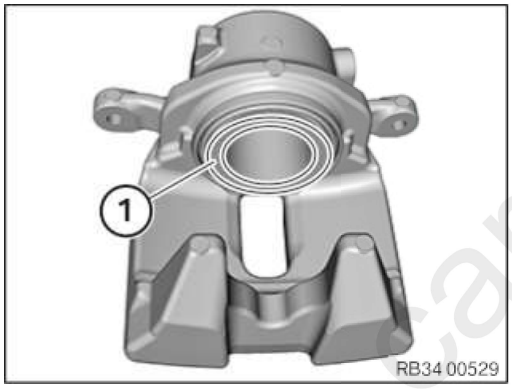
  Parts: Bolts
- Insert screws (1) and tighten.

Brake caliper / caliper carrier at front swivel bearing

M12	Renew screw.	Tightening torque	110 Nm

POSTPROCESSES

7 – Grease the brake pads, caliper carriers and brake calipers with brake pad paste (17-inch brake)

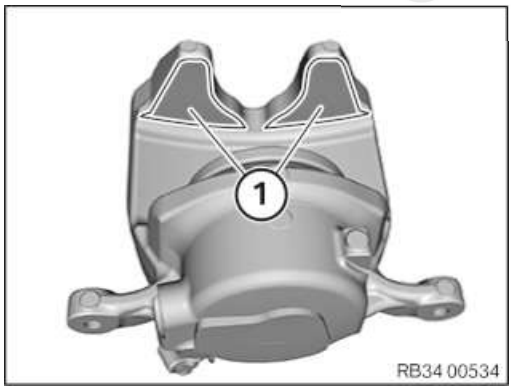


- Clean the contact surfaces (1) of the brake piston using brake cleaner.

Expendable materials

Brake cleaner2.0	500 ml, Spray can	83192365214
	20 , Canister	83192365215

- Check dust boots for damage; renew if necessary.

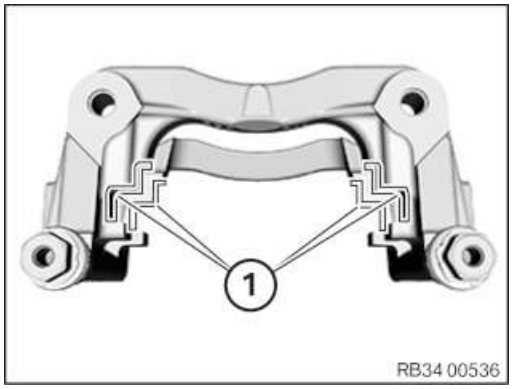


- Clean contact surfaces (1) of the brake caliper with brake cleaner and apply a thin layer of brake pad paste.

Expendable materials

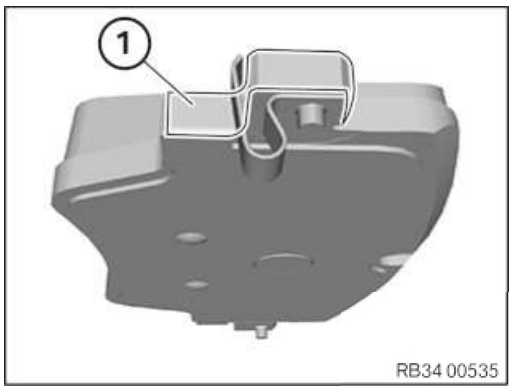
Brake block paste * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233

carmanuals.com



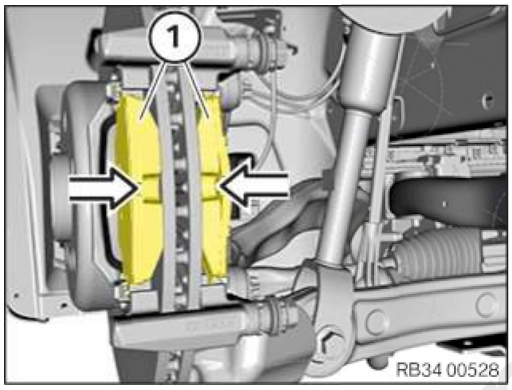
- Clean contact surfaces with brake cleaner.

  The contact surfaces (1) for the brake pads should not be cleaned mechanically if possible in order to avoid damaging the surface coating.
- Carefully clean highly contaminated contact surfaces (1) using a suitable tool (e.g. brass wire brush, nylon brush).
- Coat contact surfaces (1) thinly with brake pad paste.



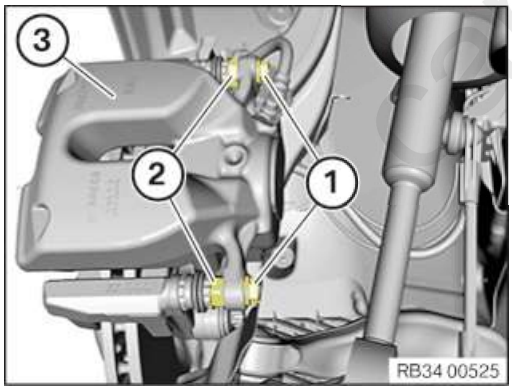
- Apply a thin coating of brake pad paste to both sides of the T-head of the brake pad in area (1).

8 – Installing the front brake pads



- If applicable, observe the identification of the removed brake pads.

  If the brake pads are worn on one side, they must not be mixed up.
- Install the brake pads (1) in the brake calliper in the direction of the arrow.



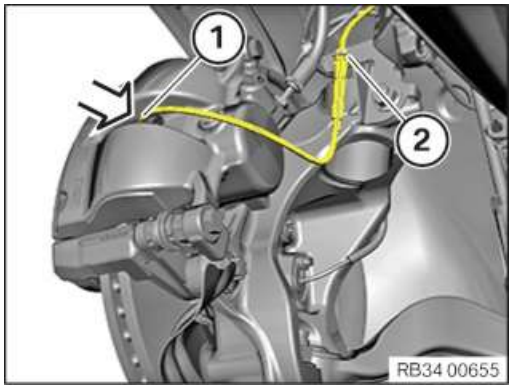
- Remove the special tool (cable strap) 2 413 317.
- Install the brake caliper (3).
- Renew screws.

  Parts: Bolts
- Tighten the screws (1), if applicable, hold against the hexagon head (2).

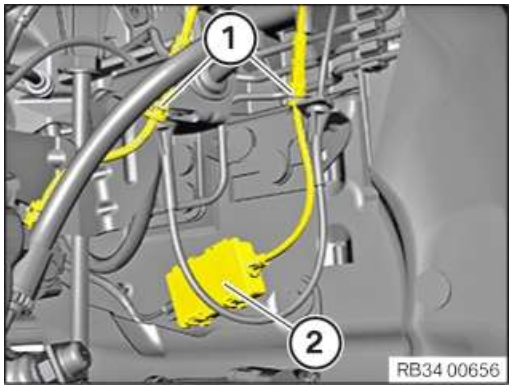
Guide bolt (brake caliper on caliper carrier)

M8	Renew screws.		35 Nm

9 – Installing front brake pad wear sensor



- Attach the brake pad wear sensor to the bracket (2).
- Install the brake pad wear sensor (1) in the brake pad in the direction of the arrow.
- Make sure the brake pad wear sensor is fitted correctly in the brake pad.



- Attach cable of brake pad wear sensor in brackets (1).
- Connect the plug connection .
- Close sealing cap (2).

10 – Installing both front wheels

▸ 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.

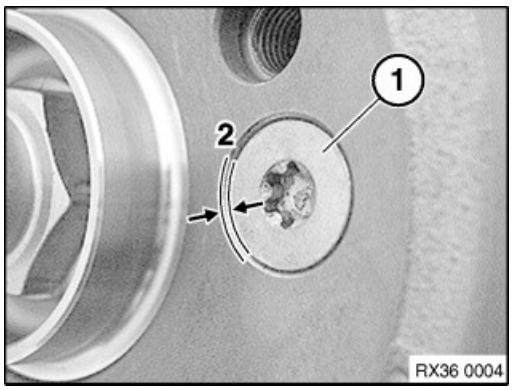
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  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.

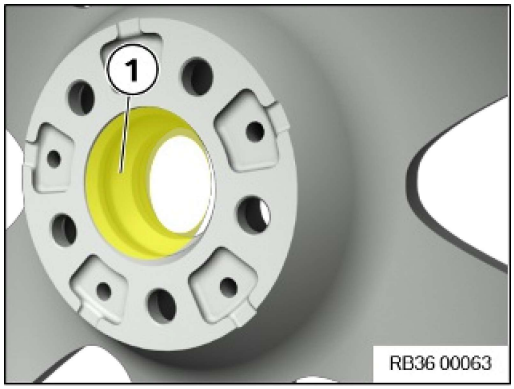
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

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 * 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 * 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.

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TECHNICAL INFORMATION

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

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

11 – Commissioning/bedding in new brake pads and brake discs

TECHNICAL INFORMATION

When exchanging brake pads, reset the CBS display in accordance with factory specification (CBS reset).

Carry out test braking while driving at low speed because the effectiveness of the brakes may be reduced during the initial braking operations.

Exaggerated emergency and continuous braking operations for faster bedding-in are not permitted.

Advise the customer not to perform intentional emergency braking operations for the first 200 km after the brakes have been replaced.

- Fully depress brake pedal several times so that brake pads contact brake discs.
- Adjust the brake fluid level to the maximum mark.
- Perform a functional check on the brake test stand to ensure compliance of the brake system with statutory guidelines.
- Attach mirror tag to inside mirror.

Additional Information

Overview of Tightening Torques

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Brake disc to front wheel hub — Used in step 610

M8	Renew screw.	Tightening torque	16 Nm

Brake caliper / caliper carrier at front swivel bearing — Used in step 6

M12	Renew screw.	Tightening torque	110 Nm

Guide bolt (brake caliper on caliper carrier) — Used in step 8

M8	Renew screws.		35 Nm

Brake disc to rear wheel hub — Used in step 10

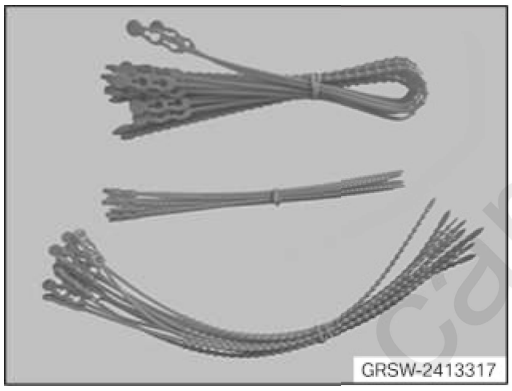
M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 10

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

Overview of Special Tools

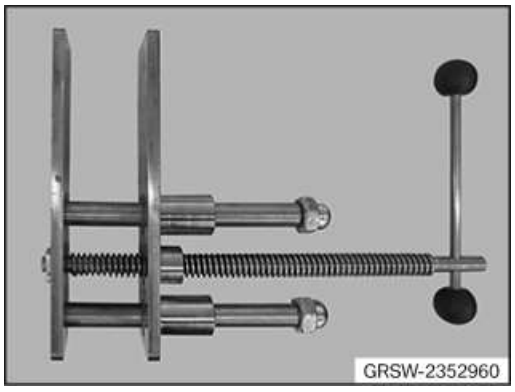
2 413 317 Cable strap



Common — Used in step 38

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)

2 352 960 Reset



Common — Used in step 3

Usage	Set back to brake piston. Replacement for 34 1 050 (83300492455).
Included in the tool or work	
Storage location	Individual
Replaced by	
In connection with	
SI-Number	

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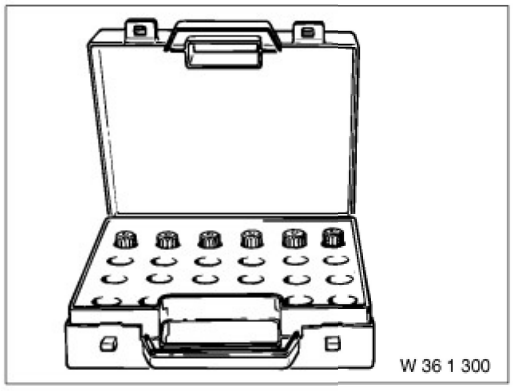
2 344 011 Tool



Common	Used in step 10
Usage	Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	08 08 12 (872)

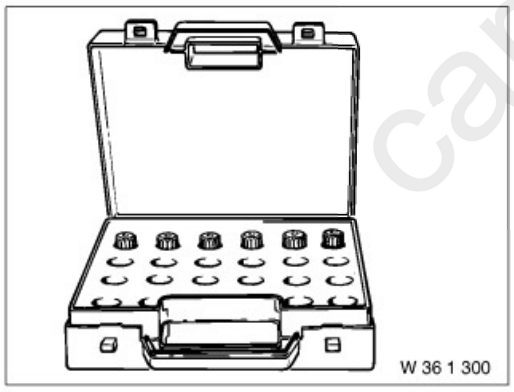
Replacement tools:

0 495 221 (36 1 323) Wheel stud



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

0 495 224 (36 1 326) Wheel stud



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

0 495 225 (36 1 327) Wheel stud



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

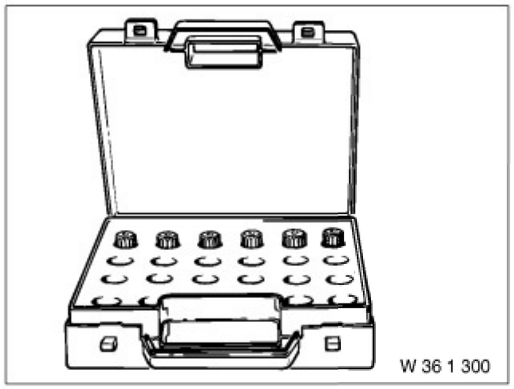
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0 495 226 (36 1 328) Wheel stud



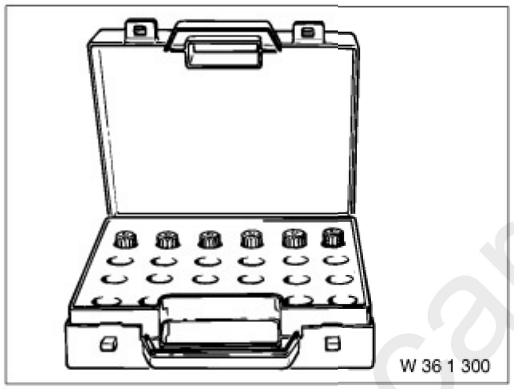
Common	Used in step 1
Usage	(Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 227 (36 1 329) Wheel stud



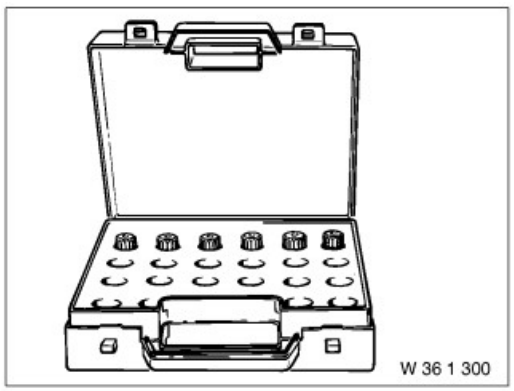
Common	Used in step 1
Usage	(Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 228 (36 1 331) Wheel stud



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

0 495 229 (36 1 332) Wheel stud



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

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0 495 230 (36 1 333) Wheel stud



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

Overview Technical Data

Minimum brake disc thickness (nominal dimension 330x24)	Used in step 4
Minimum brake disc thickness (brake disc 330x24)	22,4 mm

Links

Repair instructions	Used in step
34 00 x01 Guideline for applying brake pad paste on brake pads and caliper carrier	

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34 11 220 Removing and installing/replacing both front brake discs

Prerequisite

- **Vehicles with brake, high.**

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.

TECHNICAL INFORMATION

General information on changing the brake pads:

For vehicles older than 48 months it is recommended to replace the retaining spring or expanding spring.

The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

A CBS reset must be done after every brake pad exchange:

A CBS reset in the vehicle is possible in the event of a **partially ground down** brake pad wear sensor. The CBS display in the Central Information Display (CID) is active.

In the event of a brake pad wear sensor that is **not partially ground down**, a CBS reset is only possible with the diagnosis system. No CBS display in the Central Information Display (CID).

If bonded brake pads are installed, the brake pads must be renewed after releasing the adhesive strip.

TECHNICAL INFORMATION

To prevent damage to the surface coating: With floating callipers on the brake caliper mounting bracket or with fixed callipers in the brake caliper housing, do not clean the contact surfaces for the brake pads to the extent that it is possible.

Clean the contact surfaces with brake cleaner (BMW part number 83 19 2 154 780). Next, apply a thin coat of brake pad paste (BMW part number 83 19 2 158 851 for 3 g) or 83 19 2 158 852 fr 100 g).

Spread brake pad paste on the marked surfaces with a brush.

For additional information see: 34 00 ... brake pad paste

PRELIMINARY WORK

1 – Removing both front wheels

▸ **Removing the wheel**

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- 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 .

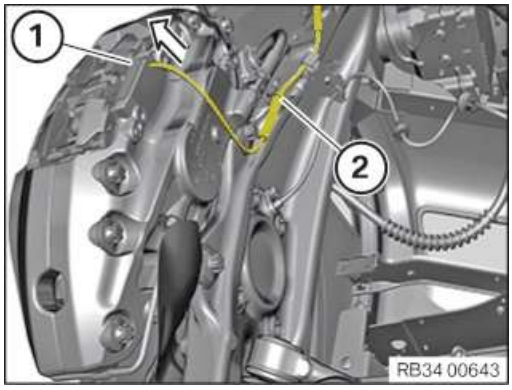
2 – Removing the front brake pad set (brake, high)

TECHNICAL INFORMATION

The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

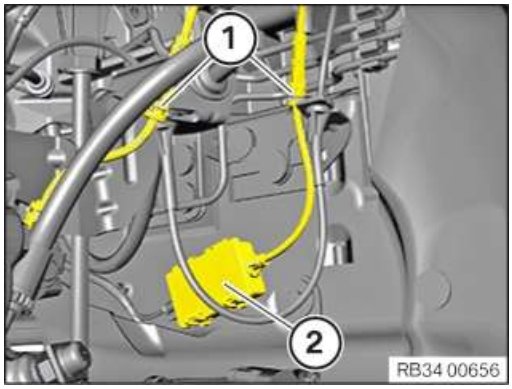
If a brake pad wear sensor that has already been ground has to be replaced even though the minimum brake pad thickness has not yet been reached, you must observe the following:

The new sliding contact must be filed down with a file to the same length as the sanded sliding contact.



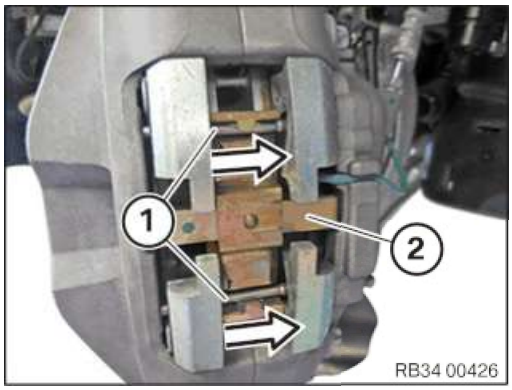
- Remove brake pad wear sensor (1) out of the brake pad in the direction of the arrow.
- Detach the cable of the brake pad wear sensor (1) from the bracket (2).

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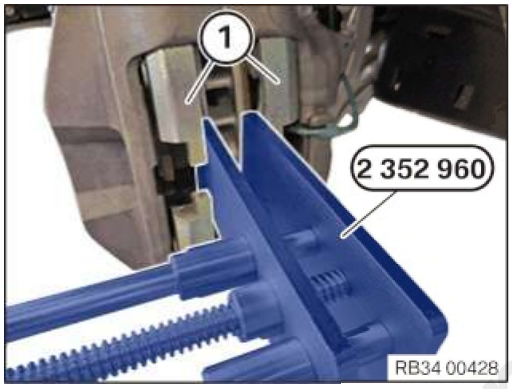


- Detach the brake pad wear sensor from the brackets (1).
- Open sealing cap (2) and disconnect the plug connection.

3 – Removing the front brake pads (brake high)



- Drive out locking pins (1) in direction of arrow.
- Take off the retaining clip (2).



TECHNICAL INFORMATION

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

Overflowing brake fluid will damage the paintwork.

- Press back the brake piston against the weights (1) with special tool 2 352 960.
- Press back the brake piston up to the limit position.

TECHNICAL INFORMATION

Note the following for the removal of the brake pads:

To prevent damage to the paintwork of the brake callipers: Do not remove the brake pads from the brake piston with a hammer or screwdriver.

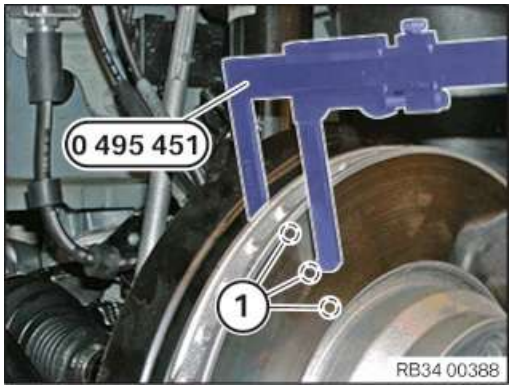
Use plastic wedges to remove the brake pads.

- Remove brake pad from the brake caliper.
- **Do not re-use brake pads.**

  Once the brake pads have been released from the brake piston, the brake pads must not be reused.

4 – Measure minimum brake disc thickness (front brake)

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- Check minimum brake disc thickness:

  Place the special tool at three measuring points in area (1) and measure.

  Compare measuring result and lowest value with setpoint value.

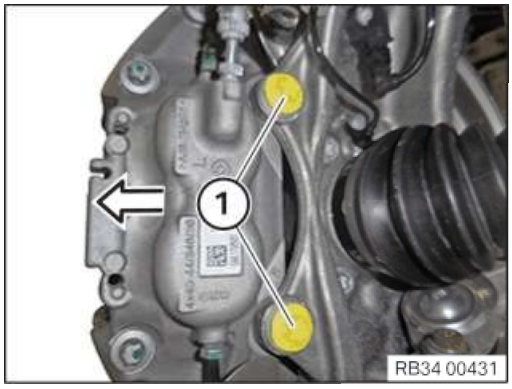
  New brake pads must only be installed if the brake disk thickness is greater than the minimum brake disc thickness.

Minimum brake disc thickness (nominal dimension 330x24)

Minimum brake disc thickness (brake disc 330x24)	22,4 mm

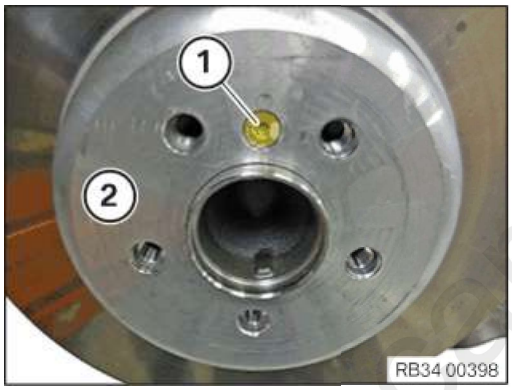
MAIN WORK

5 – Remove the front brake disc (brake high)



- Unscrew the bolts (1)and remove brake caliper in the direction of the arrow.
- Tie up the brake caliper .

  The brake caliper must not hang on the brake hose.



- 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 – Install the front brake disc (brake high)

TECHNICAL INFORMATION

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

Fit new brake discs only together with new brake pads.



- If an arrow 1 is stamped on the brake disc, it must point in the direction of travel.

  In this case, the brake discs are different on the left and right.



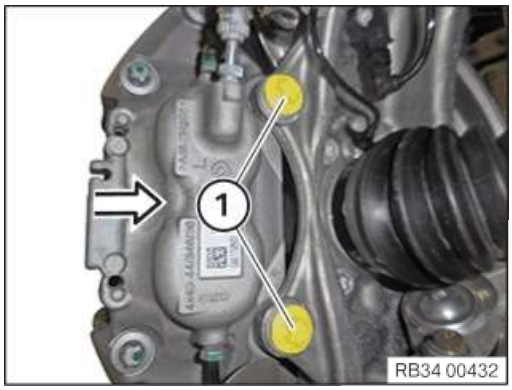
- Clean contact surface of wheel hub thoroughly and remove any traces of rust if necessary.

  Irregularities in the contact surface can cause distortion in the brake disc!
- Mount brake disc (2).
- Position and tighten the screw (1).
- Renew the screw (1).

  Parts: Screw

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm



- Install the brake calliper in the direction of the arrow.
- Insert screws (1) and tighten.
- Renew screws (1).

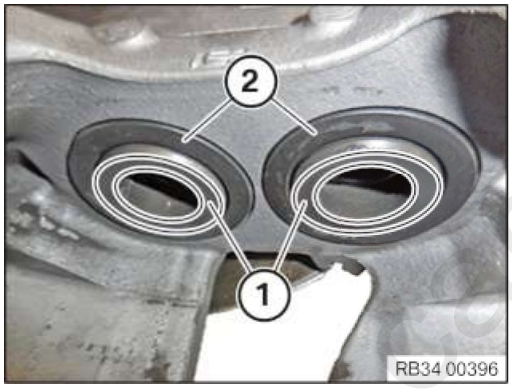
  Parts: Bolts

Brake caliper / caliper carrier at front swivel bearing

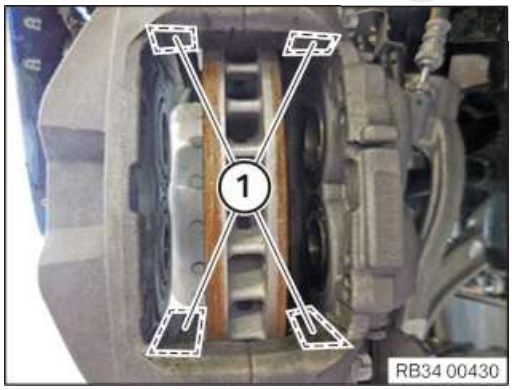
M12	Renew screw.	Tightening torque	110 Nm

POSTPROCESSES

7 – Grease brake pads, caliper carrier and brake caliper with brake pad paste (brake, high)



- Clean the contact surfaces (1) of the brake pistons (4 pieces) with brake cleaner.
- Completely remove the adhesive residue.
- Check the dust boots (2) for damage and renew if necessary.



- Clean the contact surfaces (1) for the brake pads on the brake caliper with brake cleaner.

  If possible, do not close the contact surfaces mechanically to prevent damage to the surface coating.
- Apply a thin coat of the brake pad paste to the contact surfaces (1).

Expendable materials

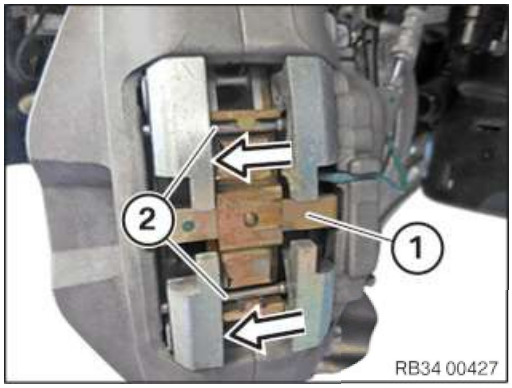
Brake block paste * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233

8 – Installing the front brake pads (High brake)



- Remove the protective film of the adhesive layer(1) at the brake pads.

  The adhesive layer (1)must not be touched.



- Insert brake pads into the brake caliper.

  The adhesive layer must not touch the brake piston.
- Position the retaining clip (1).
- Drive in locking pins (2) in the direction of the arrow.

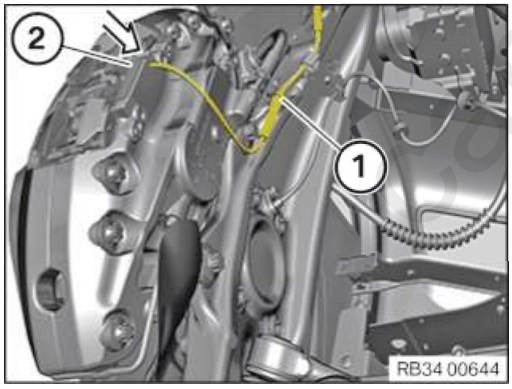
9 – Bonding the brake pads to the brake pistons

TECHNICAL INFORMATION

The brake pads must be bonded with the brake calliper **immediately** following the installation:

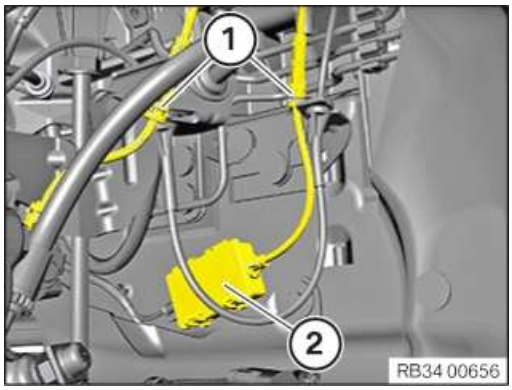
Step on the brake pedal to the floor and hold the pressure for one minute. This causes the brake pads to adhere to the brake pistons.

10 – Install the front brake pad sensor (brake high)



- Attach the cable of the brake pad wear sensor in the bracket (1).
- Install the brake pad wear sensor (2) in the brake pad in the direction of the arrow.

  Ensure brake pad wear sensor fits correctly in brake pad.



- Attach cable of brake pad wear sensor in brackets (1).
- Connect the plug connection .
- Close sealing cap (2).

11 – Installing both front wheels

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▸ **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.

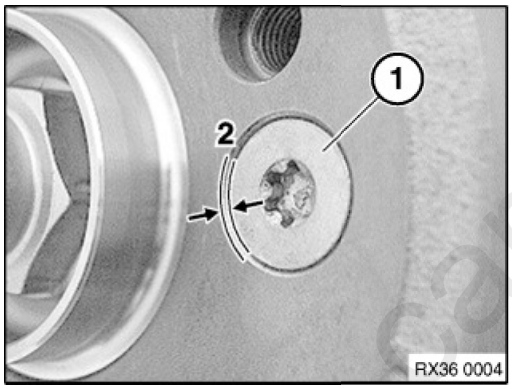
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  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.

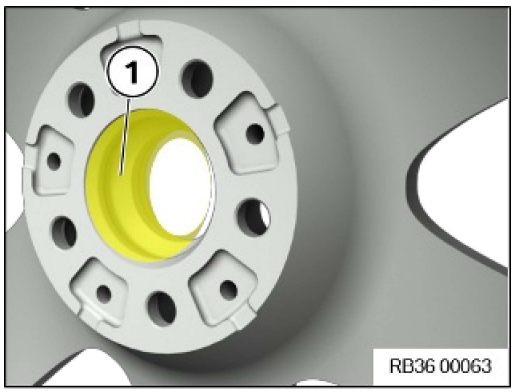
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

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

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



- 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.

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TECHNICAL INFORMATION

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

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

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12 – Start-up or bed in of new brake pads and discs (brake, high)

TECHNICAL INFORMATION

When exchanging brake pads, reset the CBS display in accordance with factory specification (CBS reset).

Carry out test braking while driving at low speed because the effectiveness of the brakes may be reduced during the initial braking operations.

Exaggerated emergency and continuous braking operations for faster bedding-in are not permitted.

Advise the customer not to perform intentional emergency braking operations for the first 200 km after the brakes have been replaced.

- Fully depress brake pedal several times so that brake pads contact brake discs.
- Adjust the brake fluid level to the maximum mark.
- Perform a functional check on the brake test stand to ensure compliance of the brake system with statutory guidelines.
- Attach mirror tag to inside mirror.

Additional Information

Overview of Tightening Torques

Brake disc to front wheel hub — Used in step 611

M8	Renew screw.	Tightening torque	16 Nm

Brake caliper / caliper carrier at front swivel bearing — Used in step 6

M12	Renew screw.	Tightening torque	110 Nm

Brake disc to rear wheel hub — Used in step 11

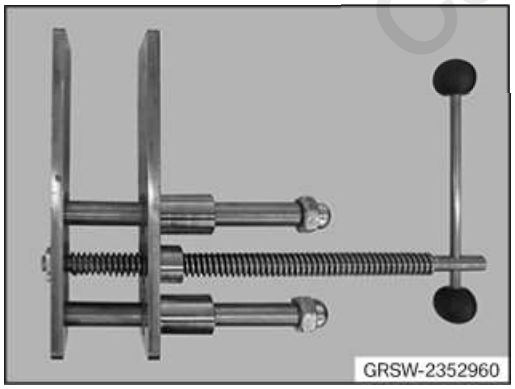
M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 11

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

Overview of Special Tools

2 352 960 Reset



Common — Used in step 3

Usage	Set back to brake piston. Replacement for 34 1 050 (83300492455).
Included in the tool or work	
Storage location	Individual
Replaced by	
In connection with	
SI-Number	

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2 344 011 Tool

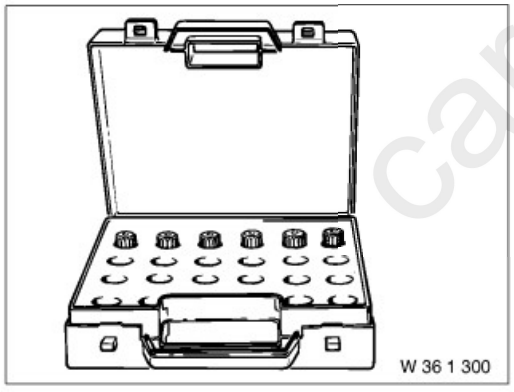


Common	Used in step 11
Usage	Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	08 08 12 (872)

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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



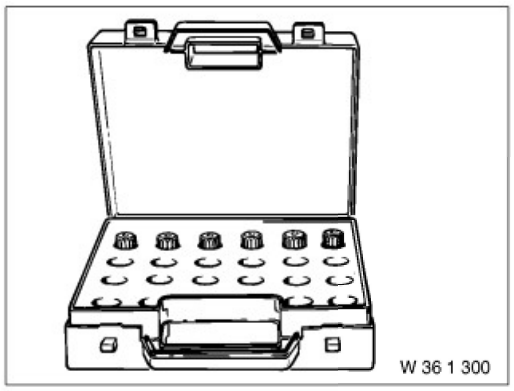
Common	Used in step 1
Usage	(Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 225 (36 1 327) Wheel stud



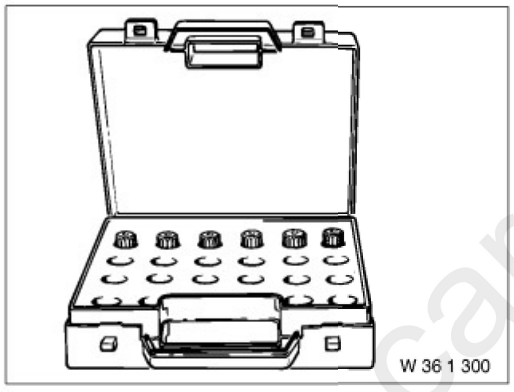
Common	Used in step 1
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 226 (36 1 328) Wheel stud



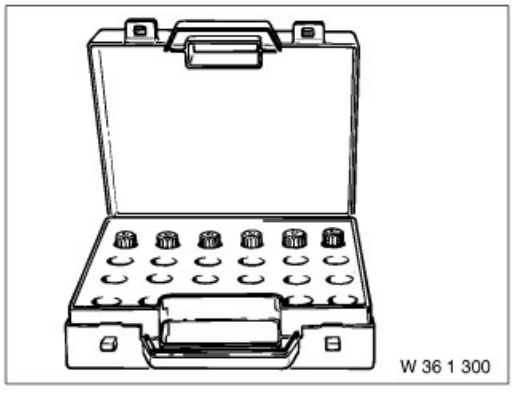
Common	Used in step 1
Usage	(Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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	

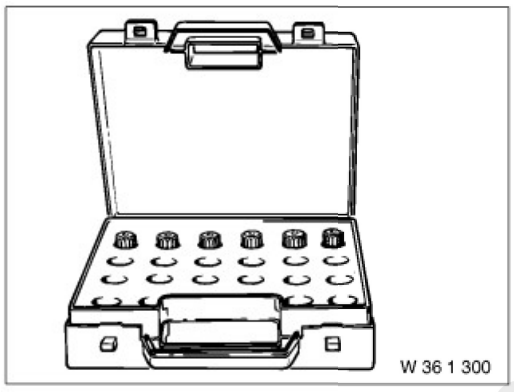
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0 495 229 (36 1 332) Wheel stud



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

0 495 230 (36 1 333) Wheel stud



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

Overview Technical Data

Minimum brake disc thickness (nominal dimension 330x24)	Used in step 4
Minimum brake disc thickness (brake disc 330x24)	22,4 mm

Links

Repair instructions	Used in step
34 00 x01 Guideline for applying brake pad paste on brake pads and caliper carrier	

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34 11 519 Removing and installing/replacing left or right front brake caliper

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.

TECHNICAL INFORMATION

General information on changing the brake pads:

For vehicles older than 48 months it is recommended to replace the retaining spring or expanding spring.

The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

A CBS reset must be done after every brake pad exchange:

A CBS reset in the vehicle is possible in the event of a **partially ground down** brake pad wear sensor. The CBS display in the Central Information Display (CID) is active.

In the event of a brake pad wear sensor that is **not partially ground down**, a CBS reset is only possible with the diagnosis system. No CBS display in the Central Information Display (CID).

If bonded brake pads are installed, the brake pads must be renewed after releasing the adhesive strip.

TECHNICAL INFORMATION

To prevent damage to the surface coating: With floating callipers on the brake caliper mounting bracket or with fixed callipers in the brake caliper housing, do not clean the contact surfaces for the brake pads to the extent that it is possible.

Clean the contact surfaces with brake cleaner (BMW part number 83 19 2 154 780). Next, apply a thin coat of brake pad paste (BMW part number 83 19 2 158 851 for 3 g) or 83 19 2 158 852 fr 100 g).

Spread brake pad paste on the marked surfaces with a brush.

For additional information see: 34 00 ... brake pad paste

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PRELIMINARY WORK

1 – Removing both front wheels

▸ **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 .

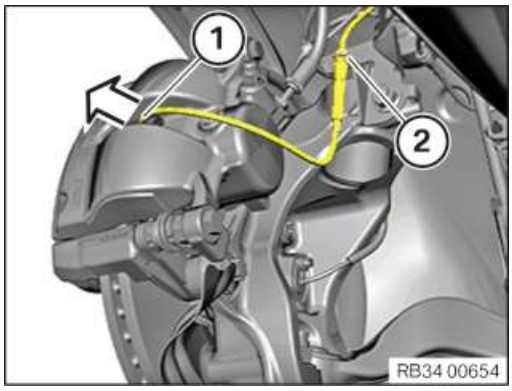
2 – Removing front brake pad wear sensor

TECHNICAL INFORMATION

The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

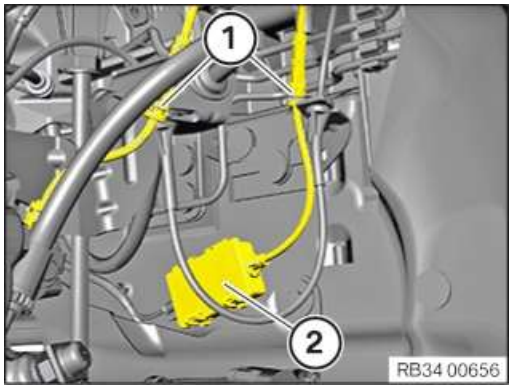
If a brake pad wear sensor that has already been ground has to be replaced even though the minimum brake pad thickness has not yet been reached, you must observe the following:

The new sliding contact must be filed down with a file to the same length as the sanded sliding contact.



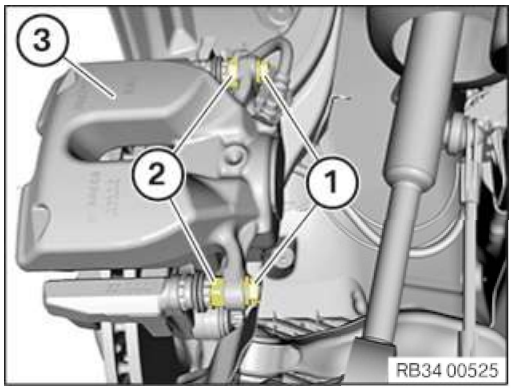
- Remove brake pad wear sensor (1) out of the brake pad in the direction of the arrow.
- Detach the brake pad wear sensor cable from the bracket (2).

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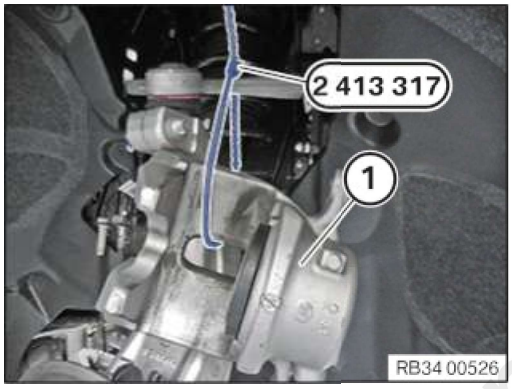


- Detach the brake pad wear sensor from the brackets (1).
- Open sealing cap (2) and disconnect the plug connection.

3 – Remove front brake pads

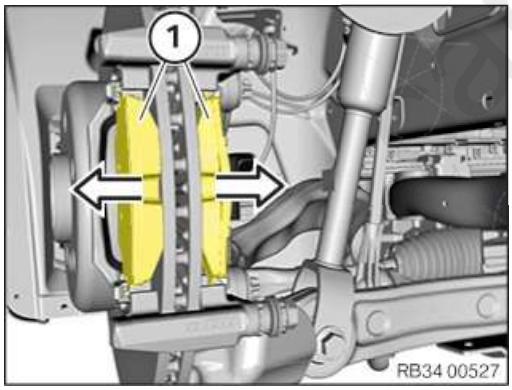


- Release the screws (1); if necessary use the hexagon head (2) for counter support.
- Remove the brake caliper (3).



- Tie up the brake caliper (1) using the special tool (cable strap) 2 413 317.

  The brake caliper must not hang on the brake hose.



- Remove the brake pads (1) in the direction of arrow.
- Mark any worn brake pads.

  If the brake pad wear exists on one side, they must not be mixed up.



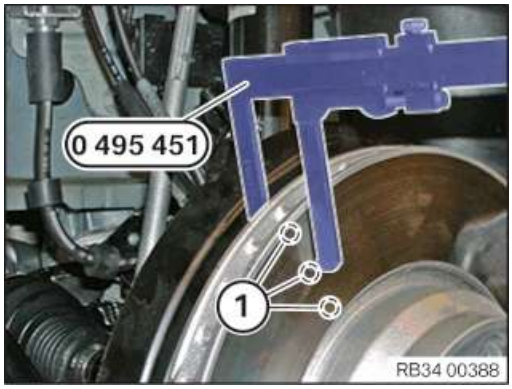
TECHNICAL INFORMATION

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

Overflowing brake fluid will damage the paintwork.

- Push the brake pistons (1) back with the special tool 2 352 960.

4 – Measure minimum brake disc thickness (front brake)



- Check minimum brake disc thickness:

  Place the special tool at three measuring points in area (1) and measure.

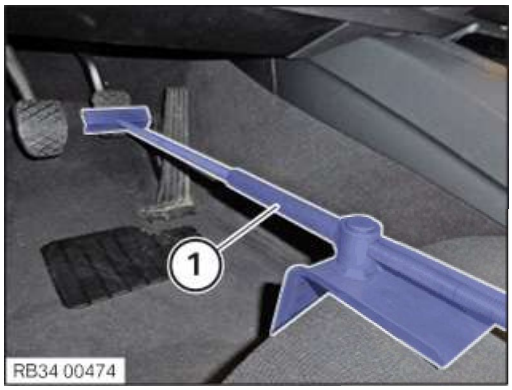
  Compare measuring result and lowest value with setpoint value.

  New brake pads must only be installed if the brake disk thickness is greater than the minimum brake disc thickness.

Minimum brake disc thickness (nominal dimension 330x24)

Minimum brake disc thickness (brake disc 330x24)	22,4 mm

5 – Install brake pedal tensioner



- Press the brake pedal to the floor and fix the brake pedal tensioner (1).

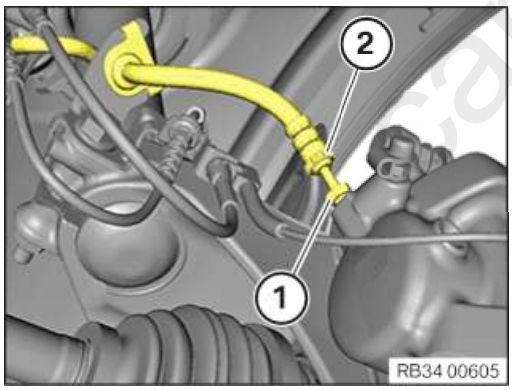
  Do not release the brake pedal tensioner (1) until the brake lines have been reconnected. This prevents brake fluid from emerging from the expansion tank when the brake lines are opened.

MAIN WORK

6 – Removing the front brake caliper

NOTICE

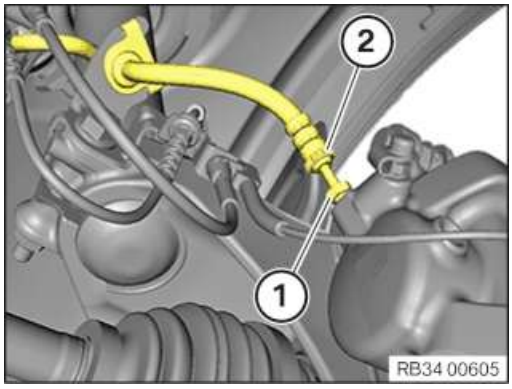
Description is for left component only. Procedure on the right side is identical.



- Detach brake hose (1) from brake caliper.

  If necessary, grip at knurling (2).
- Remove the brake caliper .

7 – Install front brake calliper



- Fit and tighten brake hose (1) on brake caliper.

  If necessary, grip at knurling (2).

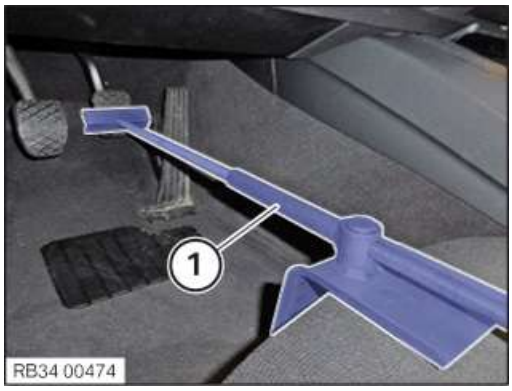
Brake hose to brake caliper, front

	Tightening torque	17 Nm

- Make sure that the brake hose is **not** twisted and does not rest against the components fixed to the body.

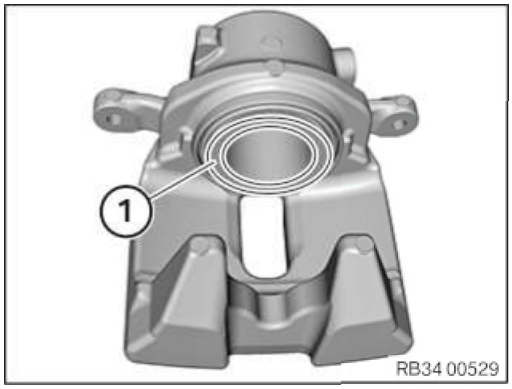
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8 – Remove the brake pedal tensioner



- Remove the brake pedal tensioner (1).

9 – Grease the brake pads, caliper carriers and brake calipers with brake pad paste (17-inch brake)

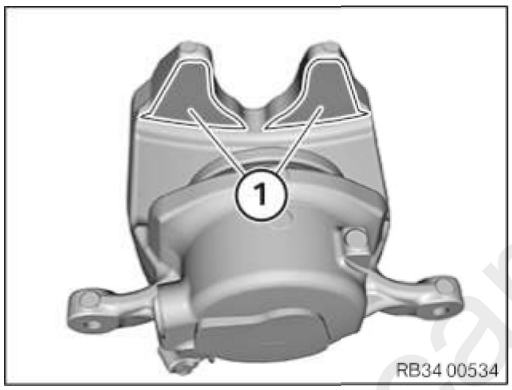


- Clean the contact surfaces (1) of the brake piston using brake cleaner.

Expendable materials

Brake cleaner2.0	500 ml, Spray can	83192365214
	20 , Canister	83192365215

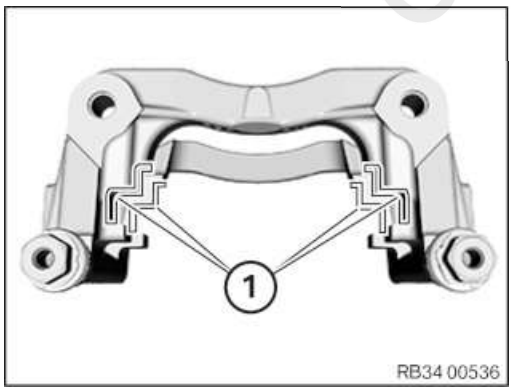
- Check dust boots for damage; renew if necessary.



- Clean contact surfaces (1) of the brake caliper with brake cleaner and apply a thin layer of brake pad paste.

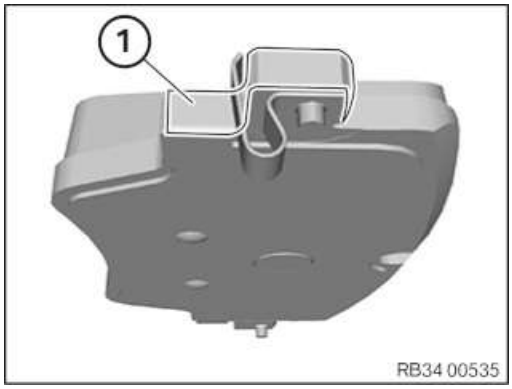
Expendable materials

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



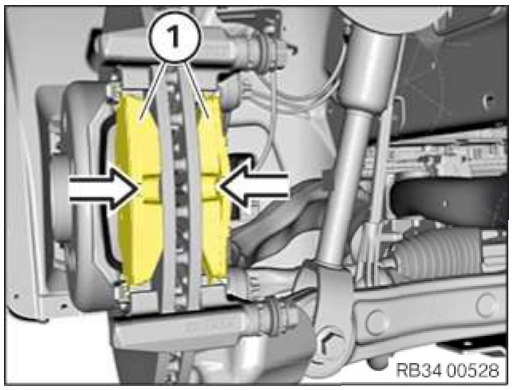
- Clean contact surfaces with brake cleaner.

  The contact surfaces (1) for the brake pads should not be cleaned mechanically if possible in order to avoid damaging the surface coating.
- Carefully clean highly contaminated contact surfaces (1) using a suitable tool (e.g. brass wire brush, nylon brush).
- Coat contact surfaces (1) thinly with brake pad paste.



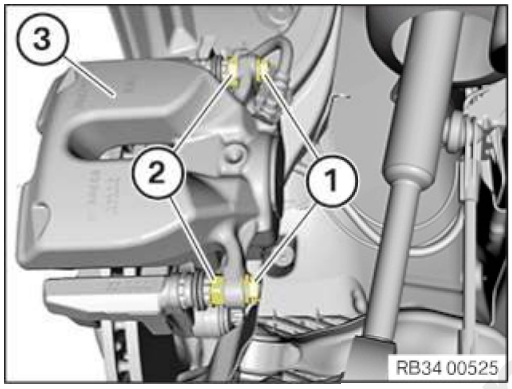
- Apply a thin coating of brake pad paste to both sides of the T-head of the brake pad in area (1).

10 – Installing the front brake pads



- If applicable, observe the identification of the removed brake pads.

  If the brake pads are worn on one side, they must not be mixed up.
- Install the brake pads (1) in the brake calliper in the direction of the arrow.



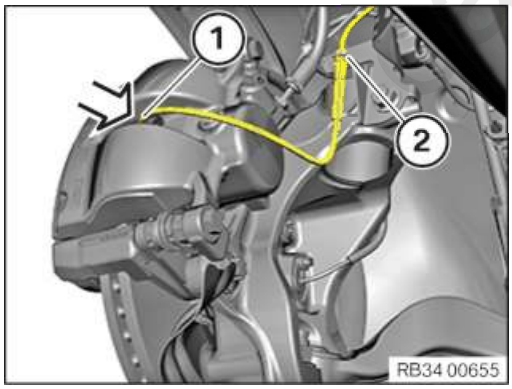
- Remove the special tool (cable strap) 2 413 317.
- Install the brake caliper (3).
- Renew screws.

  Parts: Bolts
- Tighten the screws (1), if applicable, hold against the hexagon head (2).

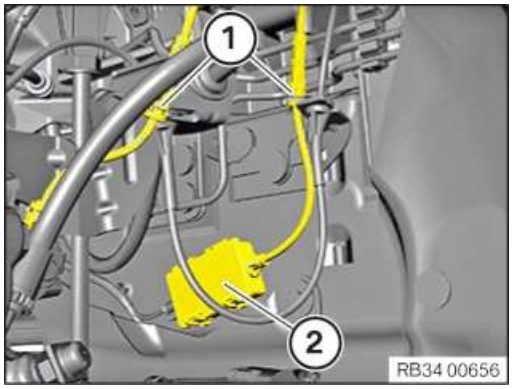
Guide bolt (brake caliper on caliper carrier)

M8	Renew screws.		35 Nm

11 – Installing front brake pad wear sensor



- Attach the brake pad wear sensor to the bracket (2).
- Install the brake pad wear sensor (1) in the brake pad in the direction of the arrow.
- Make sure the brake pad wear sensor is fitted correctly in the brake pad.



- Attach cable of brake pad wear sensor in brackets (1).
- Connect the plug connection .
- Close sealing cap (2).

▸ 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.

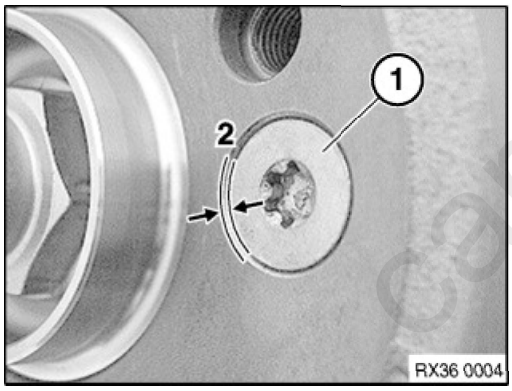
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  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.

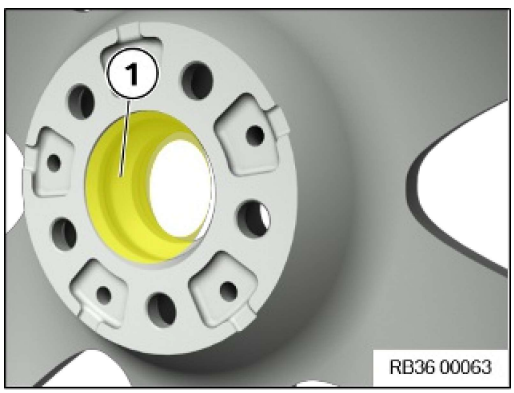
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

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

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



- 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.

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TECHNICAL INFORMATION

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

- Renew corroded wheel bolts.

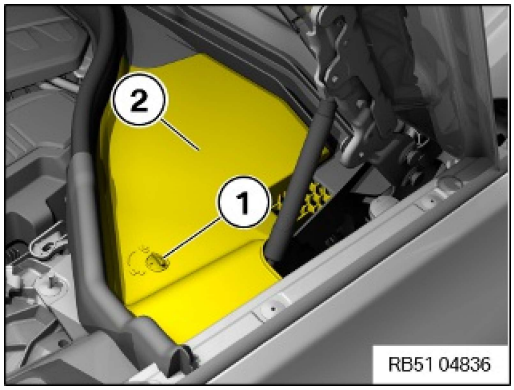
  Parts: Wheel bolts
- Clean the wheel bolts.
- Check wheel bolts and threads for damage, renew the wheel bolts if necessary.
- Join and tighten the wheel bolts (arrows).

Wheel bolts

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

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



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

14 – Connect bleeder unit for brake fluid



- To guarantee correct bleeding of the brake system, it is essential to adhere to the following procedure!
- Fill new brake fluid in the expansion tank up to the lower edge of thread (1).
- Bleed the hose of the bleeder unit before connecting.



TECHNICAL INFORMATION

Use only BMW-approved brake fluids, see operating fluids.

RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.

- Connect the bleeder unit (1) to the brake fluid expansion tank and switch it on.

  Observe the operating instructions of the corresponding equipment manufacturer.
- **Do not exceed the filling pressure of** 2 bar**.**

15 – Flushing and bleeding the front axle brake circuit

NOTICE

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



- **Start flushing at the front right.**
- Connect the vent hose with the collecting vessel to the vent valve (1) on front right interior brake calliper.
- Open the vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve (1).

Vent valve

		Tightening torque	10 Nm

16 – Close bleeder unit for brake fluid

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RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.

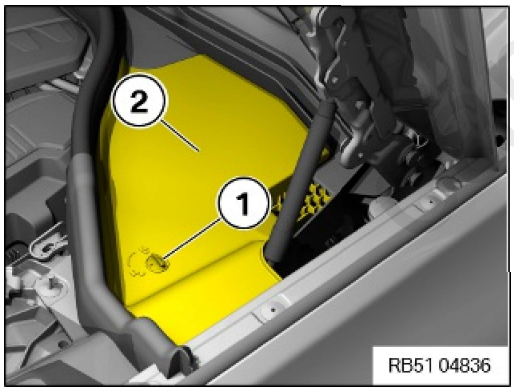


- Switch off bleeder unit (1) and remove from brake fluid expansion tank .
- Check the brake fluid level; if necessary, adjust to maximum mark.



- Check the seal (1) on the sealing cap, renew if necessary.
- Mount the sealing cap on the brake fluid expansion tank.

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



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

18 – Commissioning/bedding in new brake pads and brake discs

TECHNICAL INFORMATION

When exchanging brake pads, reset the CBS display in accordance with factory specification (CBS reset).

Carry out test braking while driving at low speed because the effectiveness of the brakes may be reduced during the initial braking operations.

Exaggerated emergency and continuous braking operations for faster bedding-in are not permitted.

Advise the customer not to perform intentional emergency braking operations for the first 200 km after the brakes have been replaced.

- Fully depress brake pedal several times so that brake pads contact brake discs.
- Adjust the brake fluid level to the maximum mark.
- Perform a functional check on the brake test stand to ensure compliance of the brake system with statutory guidelines.
- Attach mirror tag to inside mirror.

Additional Information

Overview of Tightening Torques

Brake hose to brake caliper, front — Used in step 7

		Tightening torque	17 Nm

Guide bolt (brake caliper on caliper carrier) — Used in step 10

M8	Renew screws.		35 Nm

Brake disc to front wheel hub — Used in step 12

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 12

M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 12

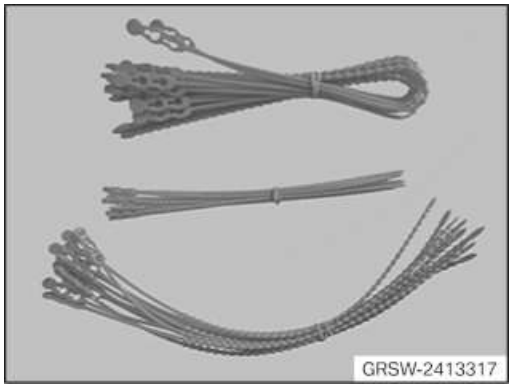
M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim. Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. Check all the wheel bolts in the same order or retighten to the prescribed tightening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

Vent valve — Used in step 15

		Tightening torque	10 Nm

Overview of Special Tools

2 413 317 Cable strap

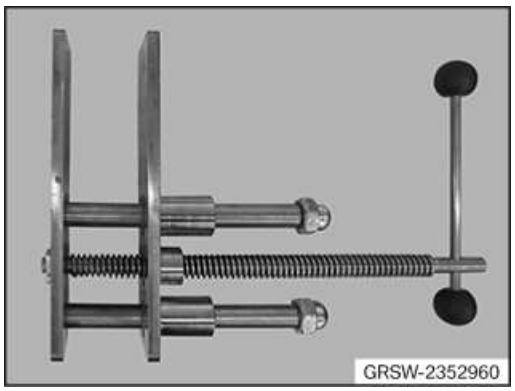


Common — Used in step 310

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

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2 352 960 Reset



Common	Used in step 3
Usage	Set back to brake piston. Replacement for 34 1 050 (83300492455).
Included in the tool or work	
Storage location	Individual
Replaced by	
In connection with	
SI-Number	

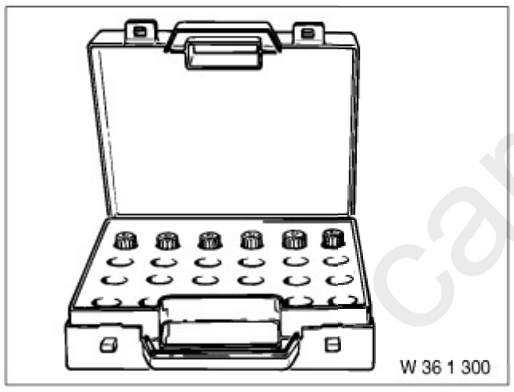
2 344 011 Tool



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

Replacement tools:

0 495 221 (36 1 323) Wheel stud



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

0 495 224 (36 1 326) Wheel stud



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

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0 495 225 (36 1 327) Wheel stud



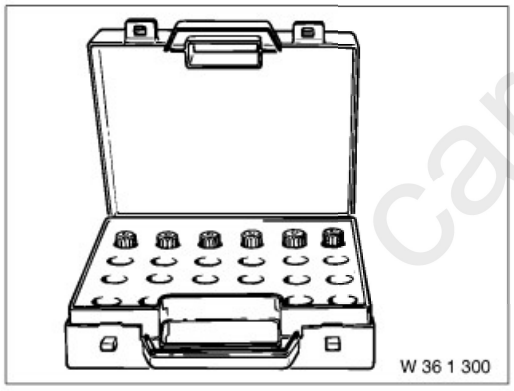
Common	Used in step 1
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 226 (36 1 328) Wheel stud



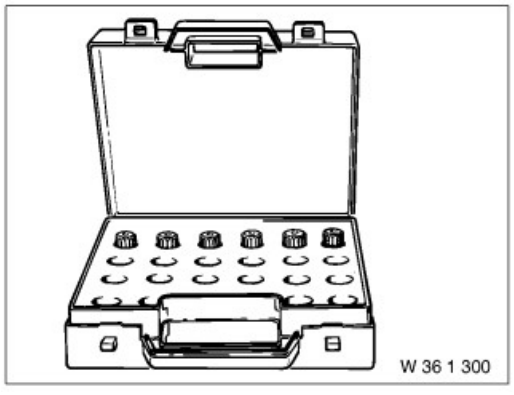
Common	Used in step 1
Usage	(Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 227 (36 1 329) Wheel stud



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

0 495 228 (36 1 331) Wheel stud



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

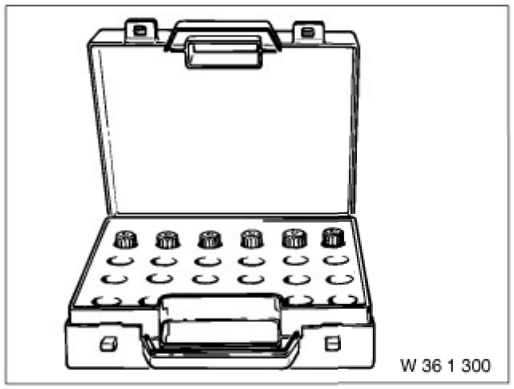
cardiagn.com

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	

Overview Technical Data

Minimum brake disc thickness (nominal dimension 330x24)	Used in step 4
Minimum brake disc thickness (brake disc 330x24)	22,4 mm

Links

Repair instructions	Used in step
34 00 x01 Guideline for applying brake pad paste on brake pads and caliper carrier	

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34 11 519 Removing and installing/replacing left or right front brake caliper

Prerequisite

- **Vehicles with High brake.**

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.

TECHNICAL INFORMATION

General information on changing the brake pads:

For vehicles older than 48 months it is recommended to replace the retaining spring or expanding spring.

The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

A CBS reset must be done after every brake pad exchange:

A CBS reset in the vehicle is possible in the event of a **partially ground down** brake pad wear sensor. The CBS display in the Central Information Display (CID) is active.

In the event of a brake pad wear sensor that is **not partially ground down**, a CBS reset is only possible with the diagnosis system. No CBS display in the Central Information Display (CID).

If bonded brake pads are installed, the brake pads must be renewed after releasing the adhesive strip.

TECHNICAL INFORMATION

To prevent damage to the surface coating: With floating callipers on the brake caliper mounting bracket or with fixed callipers in the brake caliper housing, do not clean the contact surfaces for the brake pads to the extent that it is possible.

Clean the contact surfaces with brake cleaner (BMW part number 83 19 2 154 780). Next, apply a thin coat of brake pad paste (BMW part number 83 19 2 158 851 for 3 g) or 83 19 2 158 852 fr 100 g).

Spread brake pad paste on the marked surfaces with a brush.

For additional information see: 34 00 ... brake pad paste

PRELIMINARY WORK

1 – Removing both front wheels

▸ **Removing the wheel**

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- 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 .

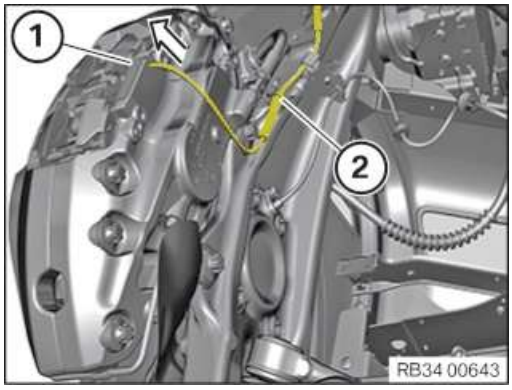
2 – Removing the front brake pad set (brake, high)

TECHNICAL INFORMATION

The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

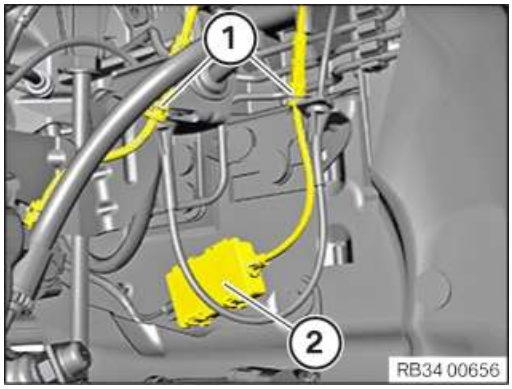
If a brake pad wear sensor that has already been ground has to be replaced even though the minimum brake pad thickness has not yet been reached, you must observe the following:

The new sliding contact must be filed down with a file to the same length as the sanded sliding contact.



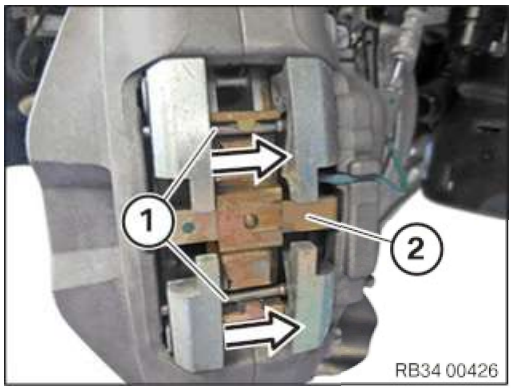
- Remove brake pad wear sensor (1) out of the brake pad in the direction of the arrow.
- Detach the cable of the brake pad wear sensor (1) from the bracket (2).

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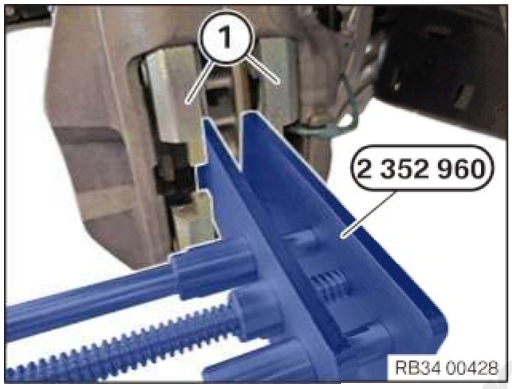


- Detach the brake pad wear sensor from the brackets (1).
- Open sealing cap (2) and disconnect the plug connection.

3 – Removing the front brake pads (brake high)



- Drive out locking pins (1) in direction of arrow.
- Take off the retaining clip (2).



TECHNICAL INFORMATION

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

Overflowing brake fluid will damage the paintwork.

- Press back the brake piston against the weights (1) with special tool 2 352 960.
- Press back the brake piston up to the limit position.

TECHNICAL INFORMATION

Note the following for the removal of the brake pads:

To prevent damage to the paintwork of the brake callipers: Do not remove the brake pads from the brake piston with a hammer or screwdriver.

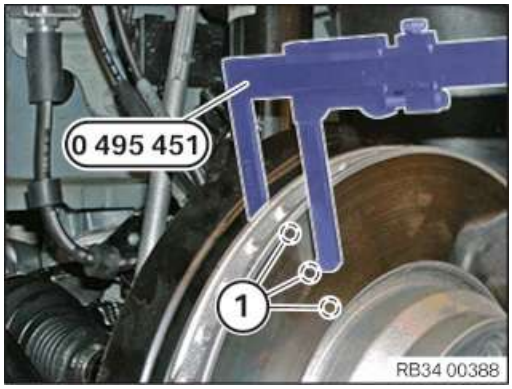
Use plastic wedges to remove the brake pads.

- Remove brake pad from the brake caliper.
- **Do not re-use brake pads.**

  Once the brake pads have been released from the brake piston, the brake pads must not be reused.

4 – Measure minimum brake disc thickness (front brake)

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- Check minimum brake disc thickness:

  Place the special tool at three measuring points in area (1) and measure.

  Compare measuring result and lowest value with setpoint value.

  New brake pads must only be installed if the brake disk thickness is greater than the minimum brake disc thickness.

Minimum brake disc thickness (nominal dimension 330x24)

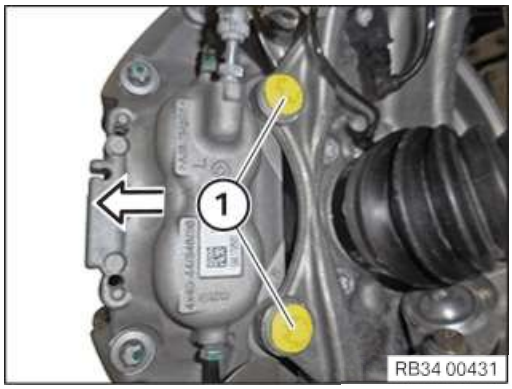
Minimum brake disc thickness (brake disc 330x24)	22,4 mm

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5 – Removing the front brake callipers (brake high)

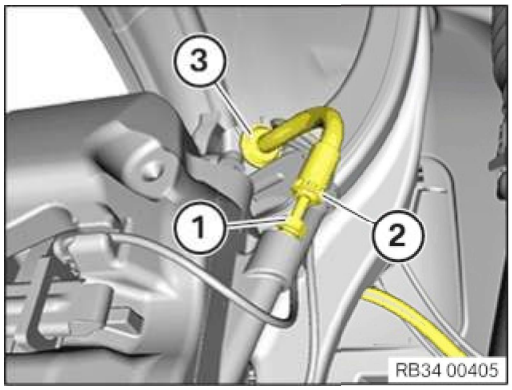
NOTICE

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



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

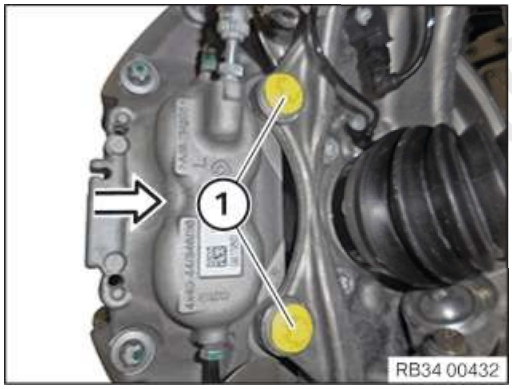
  The brake caliper must not hang on the brake hose.



- Detach brake hose (1) from brake caliper.

  If necessary, grip at knurling (2).
- If necessary, detach brake hose from the bracket (3).

6 – Install the front brake calliper (brake high)

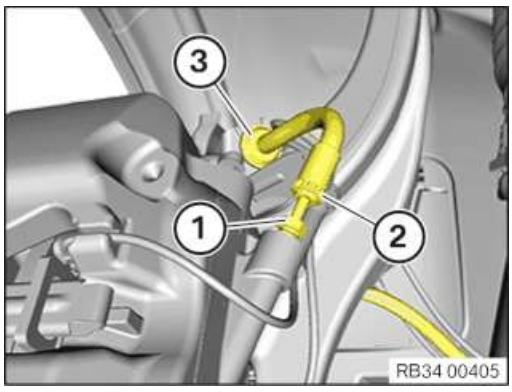


- Install brake caliper in direction of arrow.
- Renew screws (1).

  Parts: Bolts
- Tighten the screws (1).

Brake caliper / caliper carrier at front swivel bearing

M12	Renew screw.	Tightening torque	110 Nm



- Fit and tighten brake hose (1) on brake caliper.

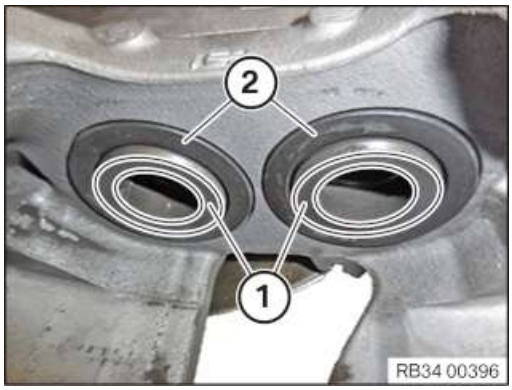
  If necessary, grip at knurling (2).

Brake hose to brake caliper, front

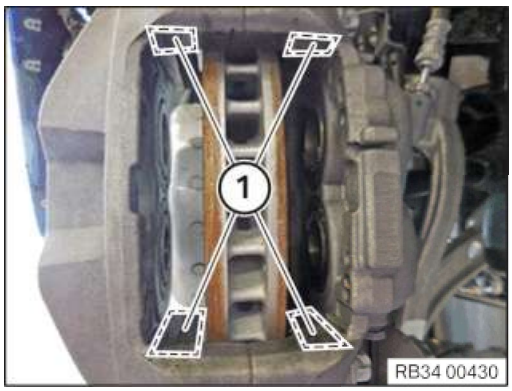
		Tightening torque	17 Nm

- Make sure that the brake hose is **not** twisted and does not rest against the components fixed to the body.
- If required, attach brake hose to the bracket (3).

7 – Grease brake pads, caliper carrier and brake caliper with brake pad paste (brake, high)



- Clean the contact surfaces (1) of the brake pistons (4 pieces) with brake cleaner.
- Completely remove the adhesive residue.
- Check the dust boots (2) for damage and renew if necessary.



- Clean the contact surfaces (1) for the brake pads on the brake caliper with brake cleaner.

  If possible, do not close the contact surfaces mechanically to prevent damage to the surface coating.
- Apply a thin coat of the brake pad paste to the contact surfaces (1).

Expendable materials

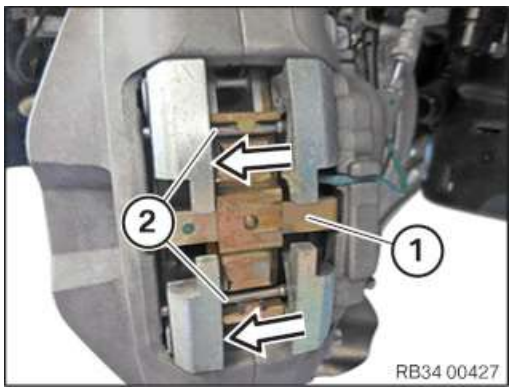
Brake block paste * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233

8 – Installing the front brake pads (High brake)



- Remove the protective film of the adhesive layer(1) at the brake pads.

  The adhesive layer (1)must not be touched.



- Insert brake pads into the brake caliper.

  The adhesive layer must not touch the brake piston.
- Position the retaining clip (1).
- Drive in locking pins (2) in the direction of the arrow.

9 – Bonding the brake pads to the brake pistons

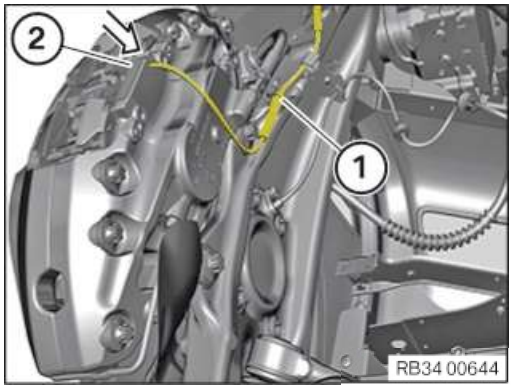
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TECHNICAL INFORMATION

The brake pads must be bonded with the brake calliper **immediately** following the installation:

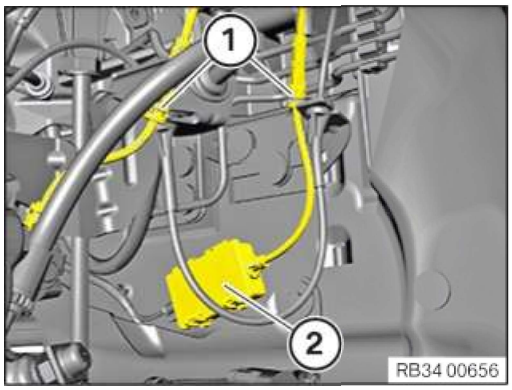
Step on the brake pedal to the floor and hold the pressure for one minute. This causes the brake pads to adhere to the brake pistons.

10 – Install the front brake pad sensor (brake high)



- Attach the cable of the brake pad wear sensor in the bracket (1).
- Install the brake pad wear sensor (2) in the brake pad in the direction of the arrow.

  Ensure brake pad wear sensor fits correctly in brake pad.



- Attach cable of brake pad wear sensor in brackets (1).
- Connect the plug connection .
- Close sealing cap (2).

11 – Installing both front wheels

▸ **Mounting the wheel**



TECHNICAL INFORMATION

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

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

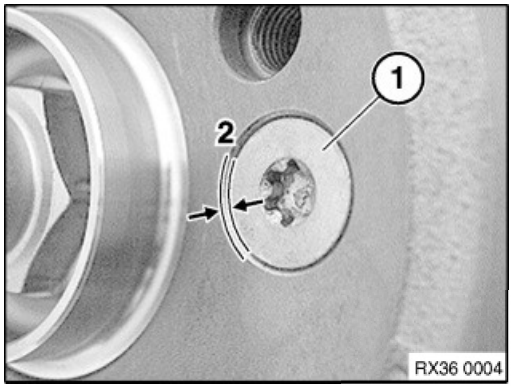
  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.

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

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).



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

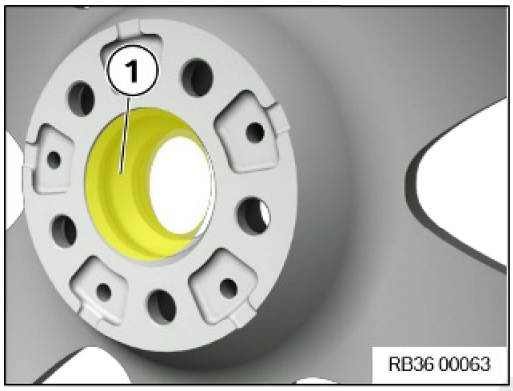
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

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

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- 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.

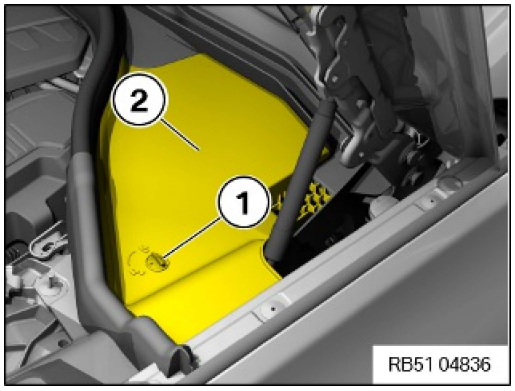
  Parts: Wheel bolts
- Clean the wheel bolts.
- Check wheel bolts and threads for damage, renew the wheel bolts if necessary.
- Join and tighten the wheel bolts (arrows).

Wheel bolts

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

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

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

13 – Connect bleeder unit for brake fluid





- To guarantee correct bleeding of the brake system, it is essential to adhere to the following procedure!
- Fill new brake fluid in the expansion tank up to the lower edge of thread (1).
- Bleed the hose of the bleeder unit before connecting.

TECHNICAL INFORMATION

Use only BMW-approved brake fluids, see operating fluids.

RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.

- Connect the bleeder unit (1) to the brake fluid expansion tank and switch it on.

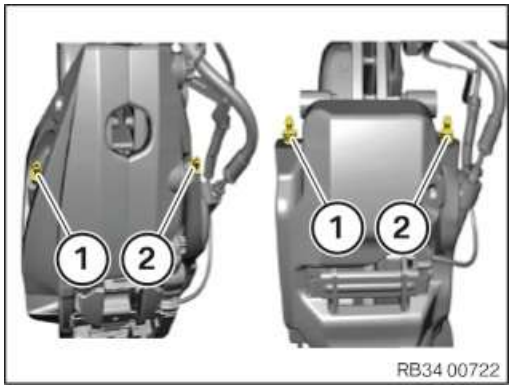
  Observe the operating instructions of the corresponding equipment manufacturer.
- **Do not exceed the filling pressure of** 2 bar**.**

14 – Flush and bleed the front axle brake circuit (brake, high)

NOTICE

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

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- Two fixed brake callipers are fitted!
- For both variants, first outer (1) must be bled. The bleed inner (2).



- **Start flushing at the front right.**
- Connect the vent hose with the collecting vessel to the vent valve (1) on the front right brake caliper.
- Open the vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve (1).

Front ventilation valve Brake calliper manufacturer Brembo

Vent valve		Tightening torque	18 Nm

Front ventilation valve fixed brake calliper Brake calliper manufacturer Continental

Vent valve		Tightening torque	15 Nm



- Connect the vent hose with the collecting vessel to the vent valve (1) on front right brake caliper.
- Open vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve (1).

Front ventilation valve Brake calliper manufacturer Brembo

Vent valve		Tightening torque	18 Nm

Front ventilation valve fixed brake calliper Brake calliper manufacturer Continental

Vent valve		Tightening torque	15 Nm

- Carry out the same procedure on the front left wheel brake.

15 – Close bleeder unit for brake fluid

RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.

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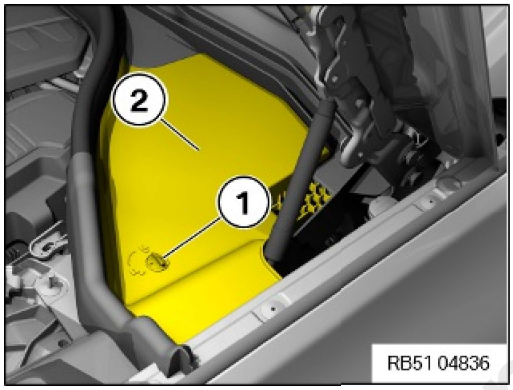


- Switch off bleeder unit (1) and remove from brake fluid expansion tank .
- Check the brake fluid level; if necessary, adjust to maximum mark.



- Check the seal (1) on the sealing cap, renew if necessary.
- Mount the sealing cap on the brake fluid expansion tank.

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



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

17 – Start-up or bed in of new brake pads and discs (brake, high)

TECHNICAL INFORMATION

When exchanging brake pads, reset the CBS display in accordance with factory specification (CBS reset).

Carry out test braking while driving at low speed because the effectiveness of the brakes may be reduced during the initial braking operations.

Exaggerated emergency and continuous braking operations for faster bedding-in are not permitted.

Advise the customer not to perform intentional emergency braking operations for the first 200 km after the brakes have been replaced.

- Fully depress brake pedal several times so that brake pads contact brake discs.
- Adjust the brake fluid level to the maximum mark.
- Perform a functional check on the brake test stand to ensure compliance of the brake system with statutory guidelines.
- Attach mirror tag to inside mirror.

Additional Information

Overview of Tightening Torques

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Overview of Tightening Torques

Brake caliper / caliper carrier at front swivel bearing — Used in step 6

M12	Renew screw.	Tightening torque	110 Nm

Brake hose to brake caliper, front — Used in step 6

		Tightening torque	17 Nm

Brake disc to front wheel hub — Used in step 11

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 11

M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 11

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

Front ventilation valve Brake calliper manufacturer Brembo — Used in step 14

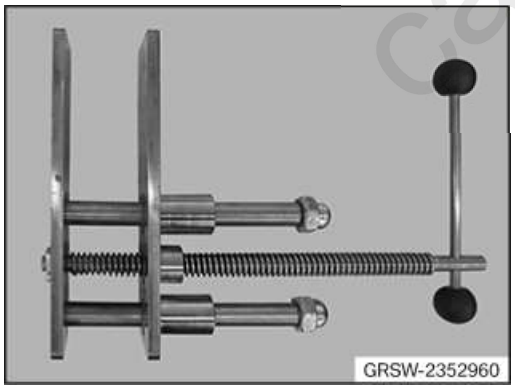
Vent valve		Tightening torque	18 Nm

Front ventilation valve fixed brake calliper Brake calliper manufacturer Continental — Used in step 14

Vent valve		Tightening torque	15 Nm

Overview of Special Tools

2 352 960 Reset



Common — Used in step 3

Usage	Set back to brake piston. Replacement for 34 1 050 (83300492455).
Included in the tool or work	
Storage location	Individual
Replaced by	
In connection with	
SI-Number	

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2 344 011 Tool



Common	Used in step 11
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)

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Replacement tools:

0 495 221 (36 1 323) Wheel stud



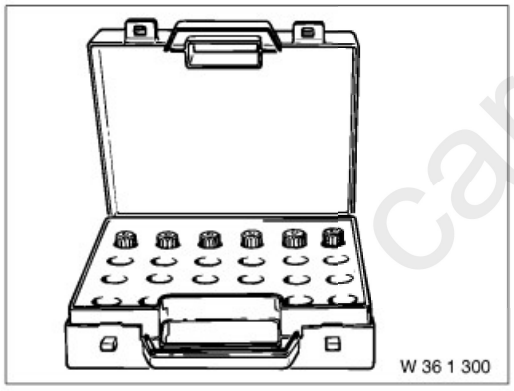
Common	Used in step 1
Usage	(Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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	

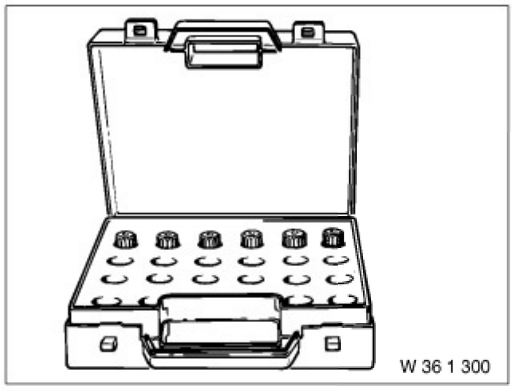
cardiagn.com

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



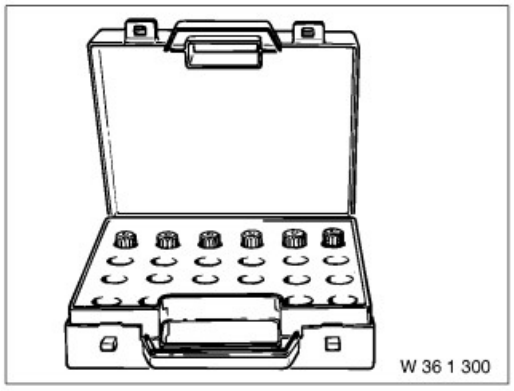
Common	Used in step 1
Usage	(Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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	

0 495 230 (36 1 333) Wheel stud



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

Overview Technical Data

Minimum brake disc thickness (nominal dimension 330x24) Used in step 4

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Minimum brake disc thickness (brake disc 330x24)	22,4 mm

Links

Repair instructions	Used in step
34 00 x01 Guideline for applying brake pad paste on brake pads and caliper carrier	

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34 11 250 Replacing front left or right caliper carrier/guard plate

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.

TECHNICAL INFORMATION

General information on changing the brake pads:

For vehicles older than 48 months it is recommended to replace the retaining spring or expanding spring.

The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

A CBS reset must be done after every brake pad exchange:

A CBS reset in the vehicle is possible in the event of a **partially ground down** brake pad wear sensor. The CBS display in the Central Information Display (CID) is active.

In the event of a brake pad wear sensor that is **not partially ground down**, a CBS reset is only possible with the diagnosis system. No CBS display in the Central Information Display (CID).

If bonded brake pads are installed, the brake pads must be renewed after releasing the adhesive strip.

TECHNICAL INFORMATION

To prevent damage to the surface coating: With floating callipers on the brake caliper mounting bracket or with fixed callipers in the brake caliper housing, do not clean the contact surfaces for the brake pads to the extent that it is possible.

Clean the contact surfaces with brake cleaner (BMW part number 83 19 2 154 780). Next, apply a thin coat of brake pad paste (BMW part number 83 19 2 158 851 for 3 g) or 83 19 2 158 852 fr 100 g).

Spread brake pad paste on the marked surfaces with a brush.

For additional information see: 34 00 ... brake pad paste

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PRELIMINARY WORK

1 – Removing both front wheels

▸ **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 .

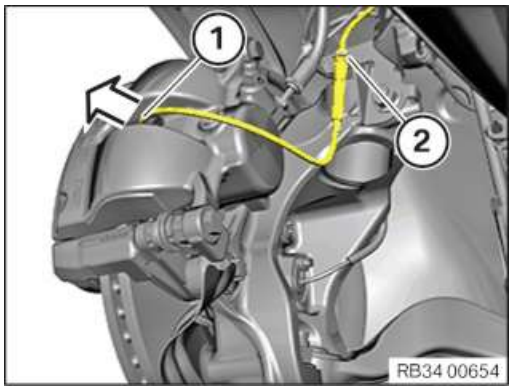
2 – Removing front brake pad wear sensor

TECHNICAL INFORMATION

The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

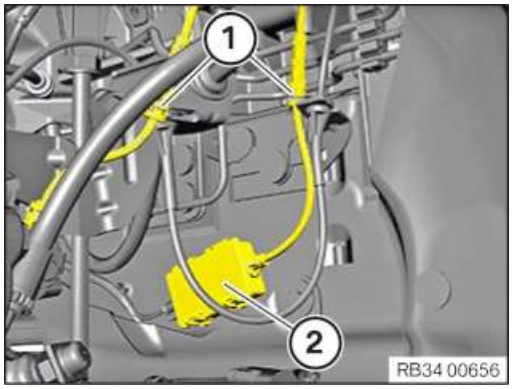
If a brake pad wear sensor that has already been ground has to be replaced even though the minimum brake pad thickness has not yet been reached, you must observe the following:

The new sliding contact must be filed down with a file to the same length as the sanded sliding contact.



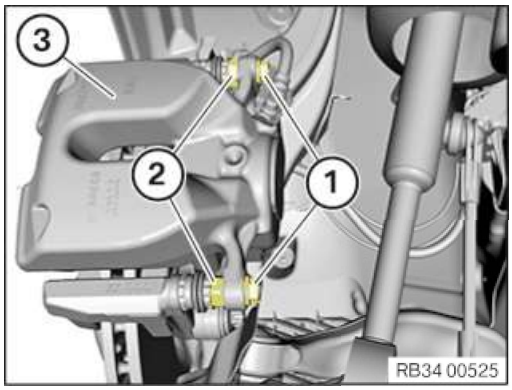
- Remove brake pad wear sensor (1) out of the brake pad in the direction of the arrow.
- Detach the brake pad wear sensor cable from the bracket (2).

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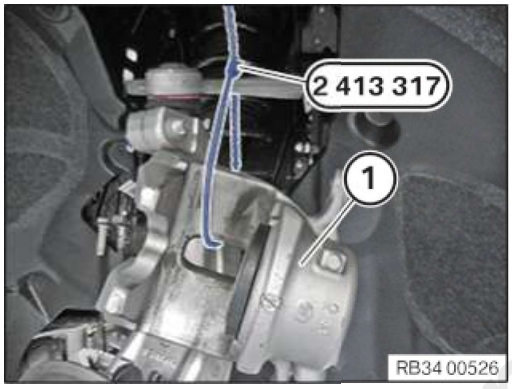


- Detach the brake pad wear sensor from the brackets (1).
- Open sealing cap (2) and disconnect the plug connection.

3 – Remove front brake pads

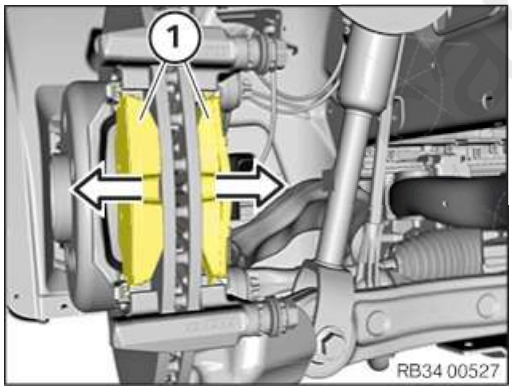


- Release the screws (1); if necessary use the hexagon head (2) for counter support.
- Remove the brake caliper (3).



- Tie up the brake caliper (1) using the special tool (cable strap) 2 413 317.

  The brake caliper must not hang on the brake hose.



- Remove the brake pads (1) in the direction of arrow.
- Mark any worn brake pads.

  If the brake pad wear exists on one side, they must not be mixed up.



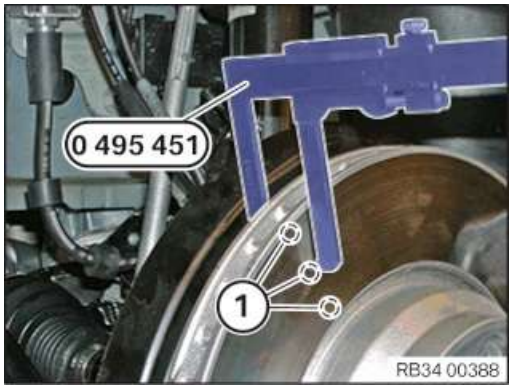
TECHNICAL INFORMATION

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

Overflowing brake fluid will damage the paintwork.

- Push the brake pistons (1) back with the special tool 2 352 960.

4 – Measure minimum brake disc thickness (front brake)



- Check minimum brake disc thickness:

  Place the special tool at three measuring points in area (1) and measure.

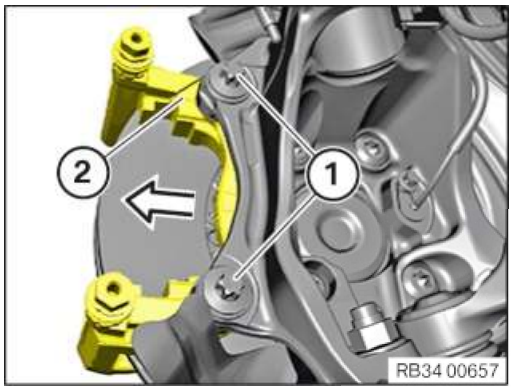
  Compare measuring result and lowest value with setpoint value.

  New brake pads must only be installed if the brake disk thickness is greater than the minimum brake disc thickness.

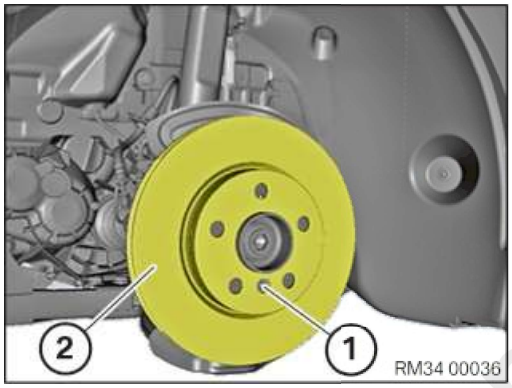
Minimum brake disc thickness (nominal dimension 330x24)

Minimum brake disc thickness (brake disc 330x24)	22,4 mm

5 – Remove front brake discs



- Loosen screws (1).
- Remove the caliper carrier (2) in the direction of the arrow.



- Loosen screw (1).

TECHNICAL INFORMATION

Note the following for the removal of the brake disc:

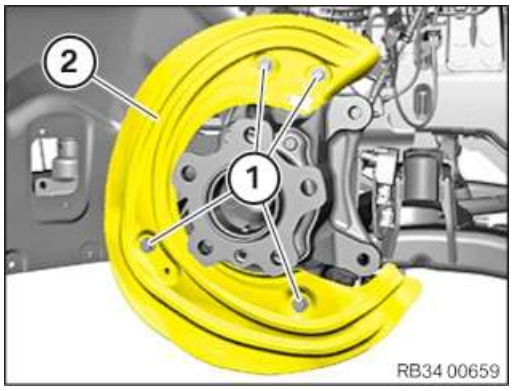
Do not under any circumstances strike the friction ring with a hammer or similar tool. If necessary, carefully tap with a rubber mallet against the brake disc chamber.

- Remove brake disc (2).

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MAIN WORK

6 – Remove brake guard plate, front



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

7 – Install brake guard plate, front



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

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

Brake guard plate at front swivel bearing

M6x12	Renew screw.	Tightening torque	8 Nm

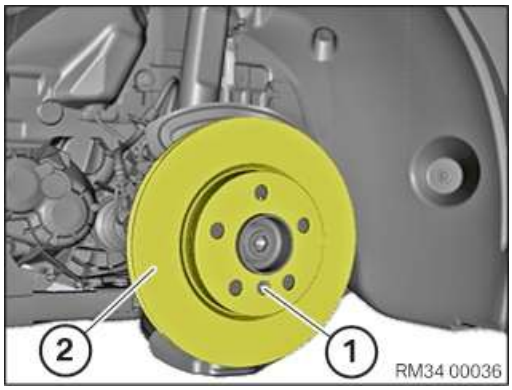
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POSTPROCESSES

8 – Installing the front brake discs

TECHNICAL INFORMATION

Brake discs must only be replaced in pairs (per axle).
Fit new brake discs only together with new brake pads.



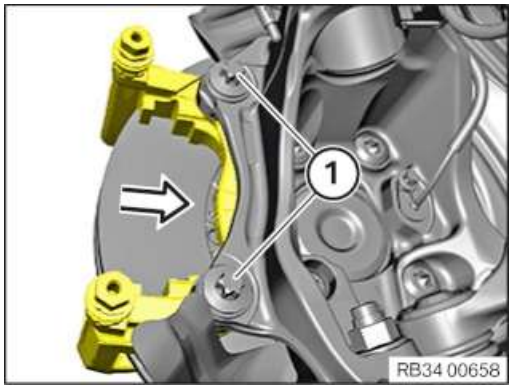
- Clean contact surface of wheel hub thoroughly and remove any traces of rust if necessary.

  Irregularities in the contact surface can cause distortion in the brake disc!
- Mount brake disc (2).
- Position and tighten the screw (1).
- Renew screw.

  Parts: Screw

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm



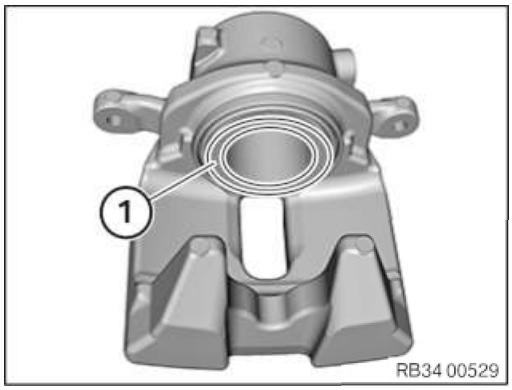
- Install the caliper carrier (2) in the direction of the arrow.
- Renew screws.

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

Brake caliper / caliper carrier at front swivel bearing

M12	Renew screw.	Tightening torque	110 Nm

9 – Grease the brake pads, caliper carriers and brake calipers with brake pad paste (17-inch brake)

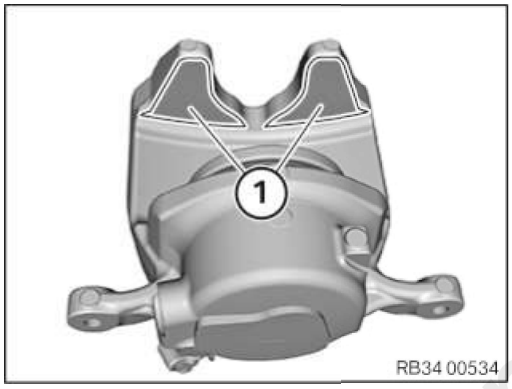


- Clean the contact surfaces (1) of the brake piston using brake cleaner.

Expendable materials

Brake cleaner2.0	500 ml, Spray can	83192365214
	20 , Canister	83192365215

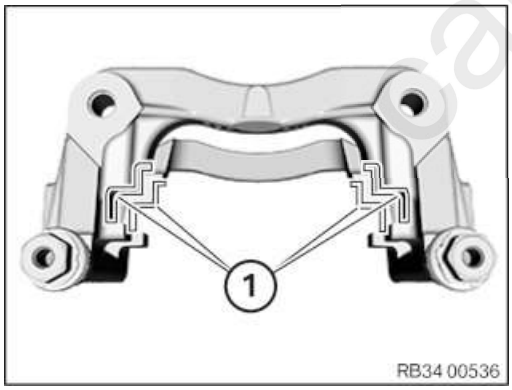
- Check dust boots for damage; renew if necessary.



- Clean contact surfaces (1) of the brake caliper with brake cleaner and apply a thin layer of brake pad paste.

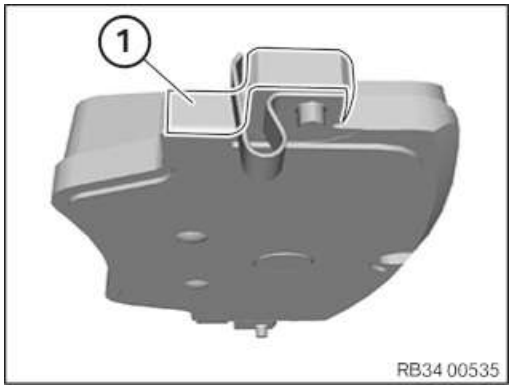
Expendable materials

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



- Clean contact surfaces with brake cleaner.

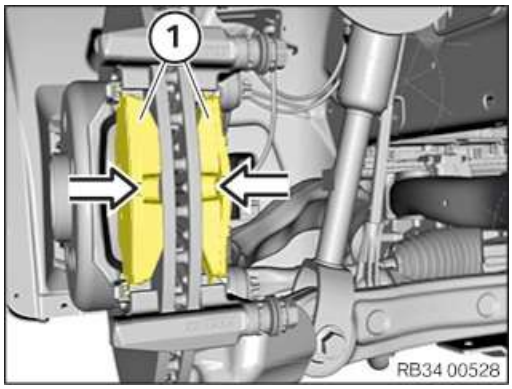
  The contact surfaces (1) for the brake pads should not be cleaned mechanically if possible in order to avoid damaging the surface coating.
- Carefully clean highly contaminated contact surfaces (1) using a suitable tool (e.g. brass wire brush, nylon brush).
- Coat contact surfaces (1) thinly with brake pad paste.



- Apply a thin coating of brake pad paste to both sides of the T-head of the brake pad in area (1).

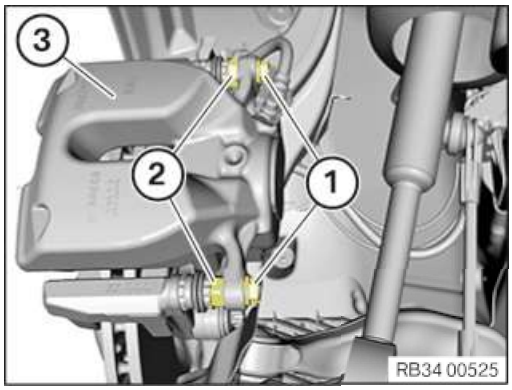
10 – Installing the front brake pads

10 – Installing the front brake pads



- If applicable, observe the identification of the removed brake pads.

  If the brake pads are worn on one side, they must not be mixed up.
- Install the brake pads (1) in the brake calliper in the direction of the arrow.



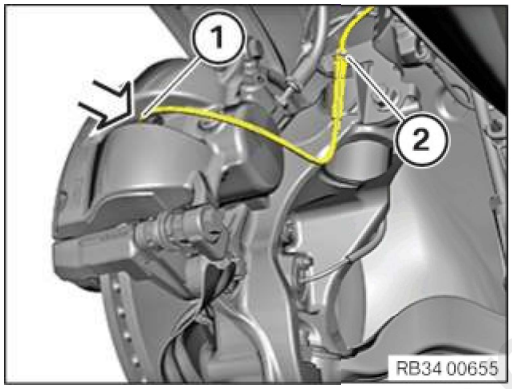
- Remove the special tool (cable strap) 2 413 317.
- Install the brake caliper (3).
- Renew screws.

  Parts: Bolts
- Tighten the screws (1), if applicable, hold against the hexagon head (2).

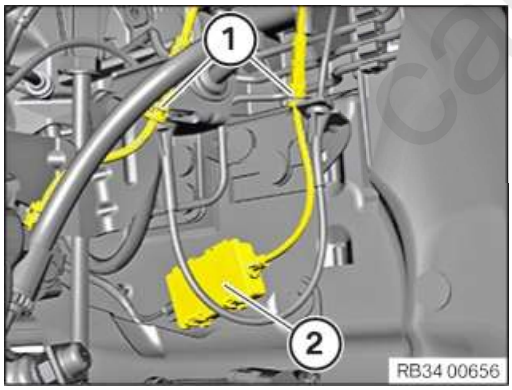
Guide bolt (brake caliper on caliper carrier)

M8	Renew screws.		35 Nm

11 – Installing front brake pad wear sensor



- Attach the brake pad wear sensor to the bracket (2).
- Install the brake pad wear sensor (1) in the brake pad in the direction of the arrow.
- Make sure the brake pad wear sensor is fitted correctly in the brake pad.



- Attach cable of brake pad wear sensor in brackets (1).
- Connect the plug connection .
- Close sealing cap (2).

12 – Installing both front wheels

▸ **Mounting the wheel**

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TECHNICAL INFORMATION

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

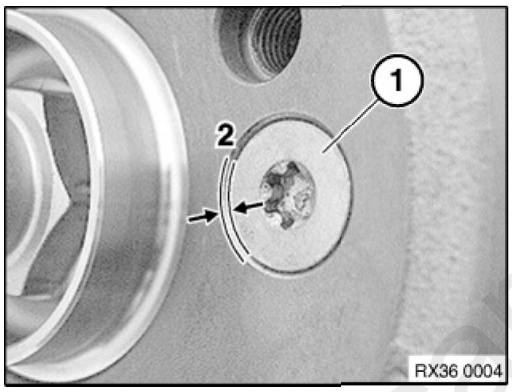
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

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



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

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).



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

  The mounting bolt (1) for the brake disc may not protrude 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 * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233

catalagn.com



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



- 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.

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TECHNICAL INFORMATION

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

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

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13 – Commissioning/bedding in new brake pads and brake discs

TECHNICAL INFORMATION

When exchanging brake pads, reset the CBS display in accordance with factory specification (CBS reset).

Carry out test braking while driving at low speed because the effectiveness of the brakes may be reduced during the initial braking operations.

Exaggerated emergency and continuous braking operations for faster bedding-in are not permitted.

Advise the customer not to perform intentional emergency braking operations for the first 200 km after the brakes have been replaced.

- Fully depress brake pedal several times so that brake pads contact brake discs.
- Adjust the brake fluid level to the maximum mark.
- Perform a functional check on the brake test stand to ensure compliance of the brake system with statutory guidelines.
- Attach mirror tag to inside mirror.

Additional Information

Overview of Tightening Torques

Brake guard plate at front swivel bearing — Used in step 7

M6x12	Renew screw.	Tightening torque	8 Nm

Brake disc to front wheel hub — Used in step 812

M8	Renew screw.	Tightening torque	16 Nm

Brake caliper / caliper carrier at front swivel bearing — Used in step 8

M12	Renew screw.	Tightening torque	110 Nm

Guide bolt (brake caliper on caliper carrier) — Used in step 10

M8	Renew screws.		35 Nm

Brake disc to rear wheel hub — Used in step 12

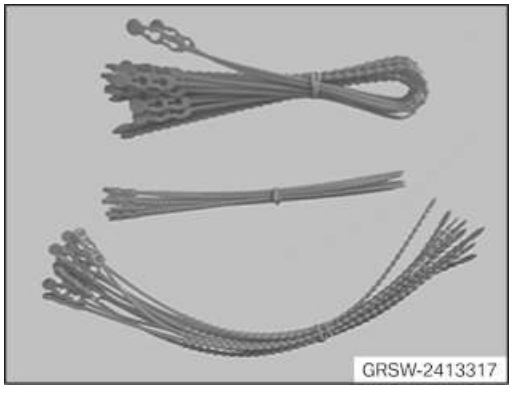
M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 12

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

Overview of Special Tools

2 413 317 Cable strap

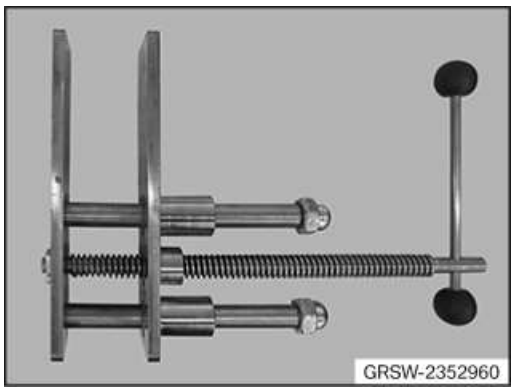


Common — Used in step 310

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

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2 352 960 Reset



Common	Used in step 3
Usage	Set back to brake piston. Replacement for 34 1 050 (83300492455).
Included in the tool or work	
Storage location	Individual
Replaced by	
In connection with	
SI-Number	

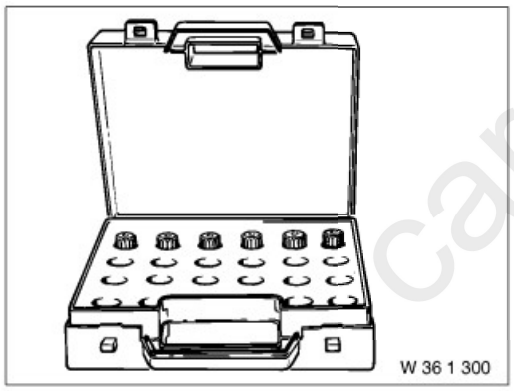
2 344 011 Tool



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

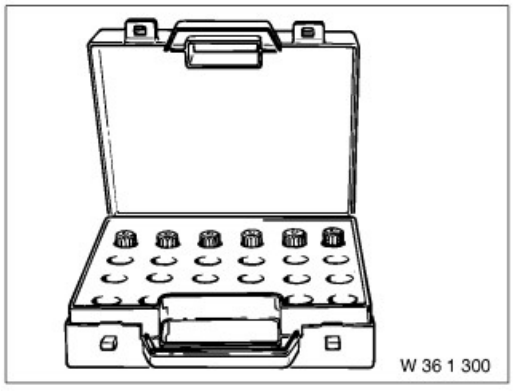
Replacement tools:

0 495 221 (36 1 323) Wheel stud



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

0 495 224 (36 1 326) Wheel stud



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

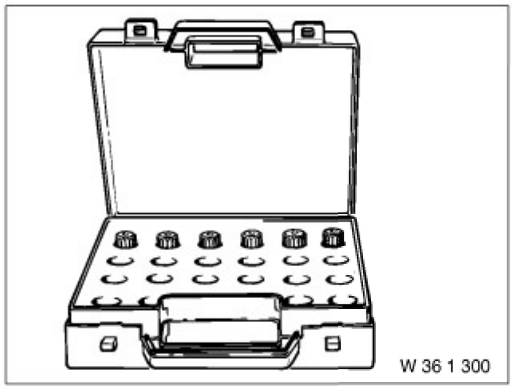
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0 495 225 (36 1 327) Wheel stud



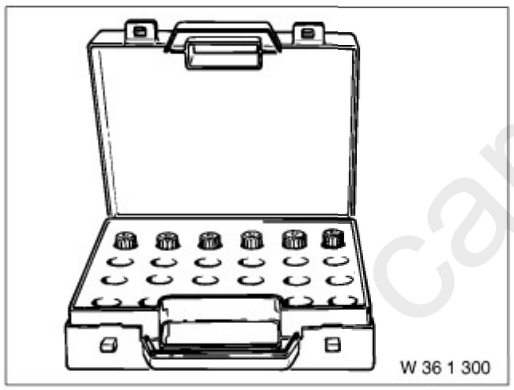
Common	Used in step 1
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 226 (36 1 328) Wheel stud



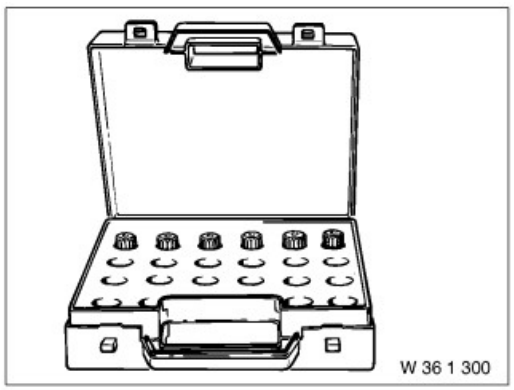
Common	Used in step 1
Usage	(Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 227 (36 1 329) Wheel stud



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

0 495 228 (36 1 331) Wheel stud



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

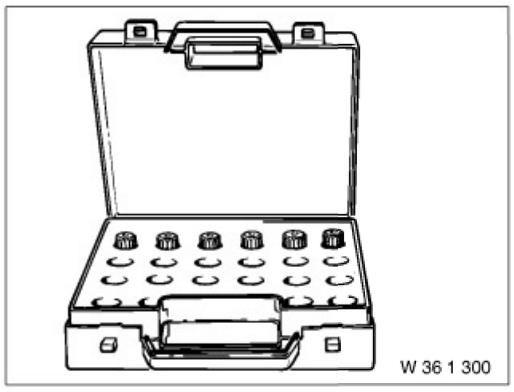
cardiagn.com

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	

Overview Technical Data

Minimum brake disc thickness (nominal dimension 330x24)	Used in step 4
Minimum brake disc thickness (brake disc 330x24)	22,4 mm

Links

Repair instructions	Used in step
34 00 x01 Guideline for applying brake pad paste on brake pads and caliper carrier	

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34 11 250 Replacing front left or right caliper carrier/guard plate

Prerequisite

- **Vehicles with brake, high.**

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.

TECHNICAL INFORMATION

General information on changing the brake pads:

For vehicles older than 48 months it is recommended to replace the retaining spring or expanding spring.

The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

A CBS reset must be done after every brake pad exchange:

A CBS reset in the vehicle is possible in the event of a **partially ground down** brake pad wear sensor. The CBS display in the Central Information Display (CID) is active.

In the event of a brake pad wear sensor that is **not partially ground down**, a CBS reset is only possible with the diagnosis system. No CBS display in the Central Information Display (CID).

If bonded brake pads are installed, the brake pads must be renewed after releasing the adhesive strip.

TECHNICAL INFORMATION

To prevent damage to the surface coating: With floating callipers on the brake caliper mounting bracket or with fixed callipers in the brake caliper housing, do not clean the contact surfaces for the brake pads to the extent that it is possible.

Clean the contact surfaces with brake cleaner (BMW part number 83 19 2 154 780). Next, apply a thin coat of brake pad paste (BMW part number 83 19 2 158 851 for 3 g) or 83 19 2 158 852 fr 100 g).

Spread brake pad paste on the marked surfaces with a brush.

For additional information see: 34 00 ... brake pad paste

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PRELIMINARY WORK

1 – Removing both front wheels

▸ **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 .

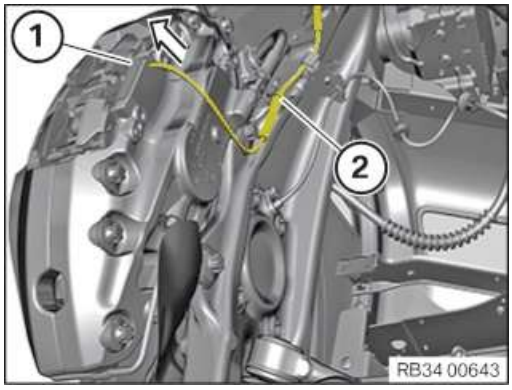
2 – Removing the front brake pad set (brake, high)

TECHNICAL INFORMATION

The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

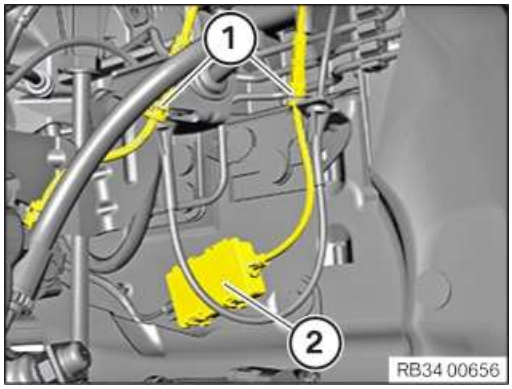
If a brake pad wear sensor that has already been ground has to be replaced even though the minimum brake pad thickness has not yet been reached, you must observe the following:

The new sliding contact must be filed down with a file to the same length as the sanded sliding contact.



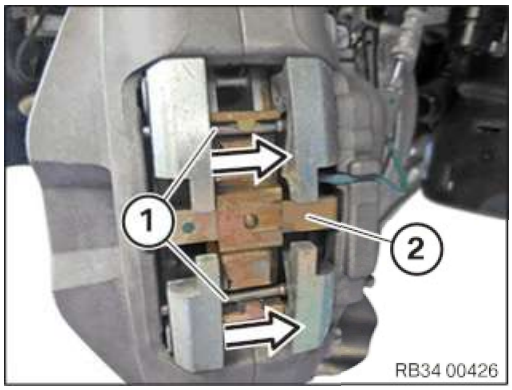
- Remove brake pad wear sensor (1) out of the brake pad in the direction of the arrow.
- Detach the cable of the brake pad wear sensor (1) from the bracket (2).

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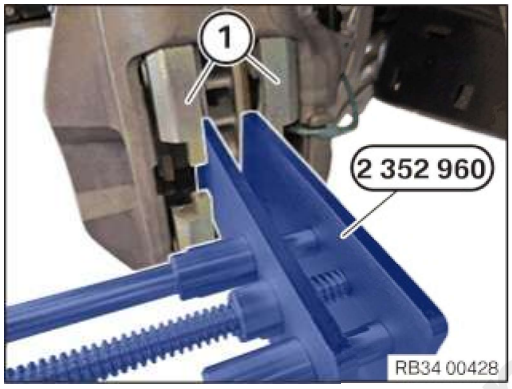


- Detach the brake pad wear sensor from the brackets (1).
- Open sealing cap (2) and disconnect the plug connection.

3 – Removing the front brake pads (brake high)



- Drive out locking pins (1) in direction of arrow.
- Take off the retaining clip (2).



TECHNICAL INFORMATION

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

Overflowing brake fluid will damage the paintwork.

- Press back the brake piston against the weights (1) with special tool 2 352 960.
- Press back the brake piston up to the limit position.

TECHNICAL INFORMATION

Note the following for the removal of the brake pads:

To prevent damage to the paintwork of the brake callipers: Do not remove the brake pads from the brake piston with a hammer or screwdriver.

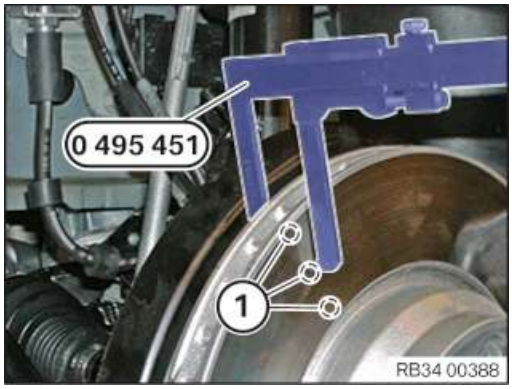
Use plastic wedges to remove the brake pads.

- Remove brake pad from the brake caliper.
- **Do not re-use brake pads.**

  Once the brake pads have been released from the brake piston, the brake pads must not be reused.

4 – Measure minimum brake disc thickness (front brake)

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- Check minimum brake disc thickness:

  Place the special tool at three measuring points in area (1) and measure.

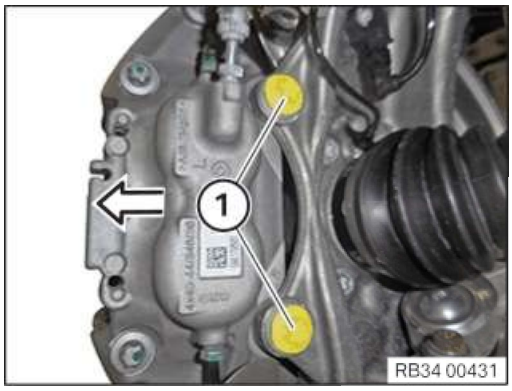
  Compare measuring result and lowest value with setpoint value.

  New brake pads must only be installed if the brake disk thickness is greater than the minimum brake disc thickness.

Minimum brake disc thickness (nominal dimension 330x24)

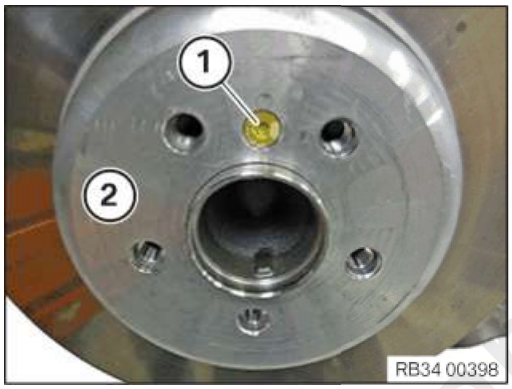
Minimum brake disc thickness (brake disc 330x24)	22,4 mm

5 – Remove the front brake disc (brake high)



- Unscrew the bolts (1)and remove brake caliper in the direction of the arrow.
- Tie up the brake caliper .

  The brake caliper must not hang on the brake hose.



- Loosen screw (1).

TECHNICAL INFORMATION

Note the following for the removal of the brake disc:

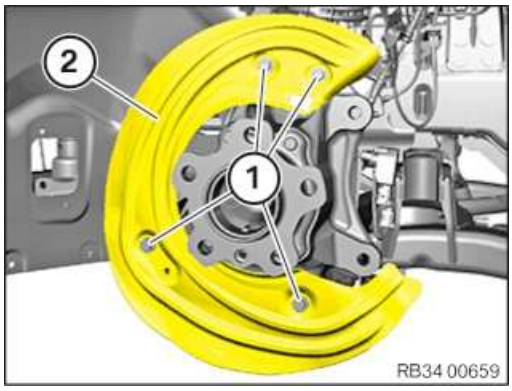
Do not under any circumstances strike the friction ring with a hammer or similar tool. If necessary, carefully tap with a rubber mallet against the brake disc chamber.

- Remove brake disc (2).

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MAIN WORK

6 – Remove brake guard plate, front



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

7 – Install brake guard plate, front



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

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

Brake guard plate at front swivel bearing

M6x12	Renew screw.	Tightening torque	8 Nm

POSTPROCESSES

8 – Install the front brake disc (brake high)

TECHNICAL INFORMATION

Brake discs must only be replaced in pairs (per axle).
Fit new brake discs only together with new brake pads.



- If an arrow 1 is stamped on the brake disc, it must point in the direction of travel.

  In this case, the brake discs are different on the left and right.

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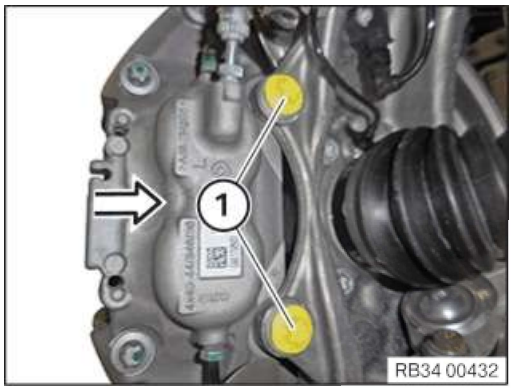
- Clean contact surface of wheel hub thoroughly and remove any traces of rust if necessary.

  Irregularities in the contact surface can cause distortion in the brake disc!
- Mount brake disc (2).
- Position and tighten the screw (1).
- Renew the screw (1).

  Parts: Screw

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm



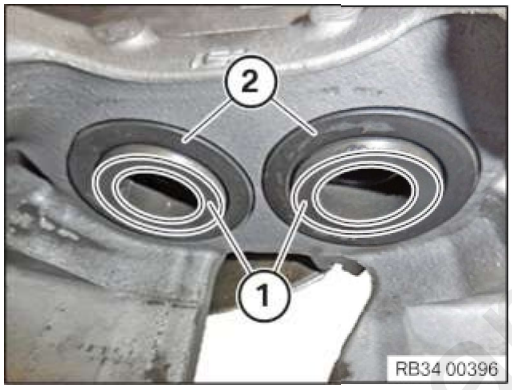
- Install the brake calliper in the direction of the arrow.
- Insert screws (1) and tighten.
- Renew screws (1).

  Parts: Bolts

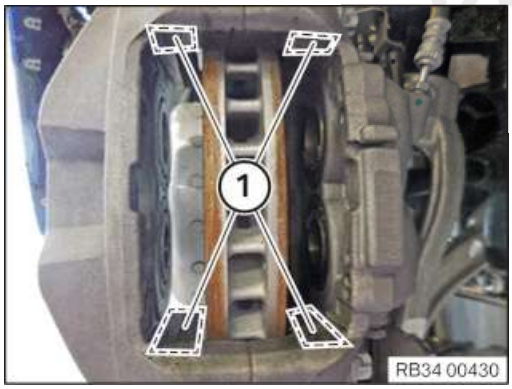
Brake caliper / caliper carrier at front swivel bearing

M12	Renew screw.	Tightening torque	110 Nm

9 – Grease brake pads, caliper carrier and brake caliper with brake pad paste (brake, high)



- Clean the contact surfaces (1) of the brake pistons (4 pieces) with brake cleaner.
- Completely remove the adhesive residue.
- Check the dust boots (2) for damage and renew if necessary.



- Clean the contact surfaces (1) for the brake pads on the brake caliper with brake cleaner.

  If possible, do not close the contact surfaces mechanically to prevent damage to the surface coating.
- Apply a thin coat of the brake pad paste to the contact surfaces (1).

Expendable materials

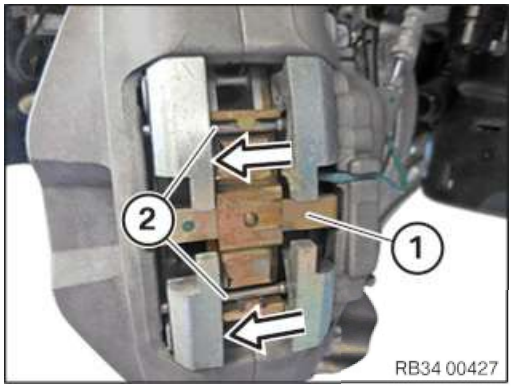
Brake block paste * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233

10 – Installing the front brake pads (High brake)



- Remove the protective film of the adhesive layer(1) at the brake pads.

  The adhesive layer (1)must not be touched.



- Insert brake pads into the brake caliper.

  The adhesive layer must not touch the brake piston.
- Position the retaining clip (1).
- Drive in locking pins (2) in the direction of the arrow.

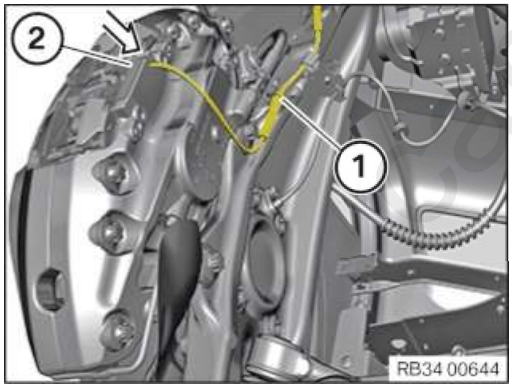
11 – Bonding the brake pads to the brake pistons

TECHNICAL INFORMATION

The brake pads must be bonded with the brake calliper **immediately** following the installation:

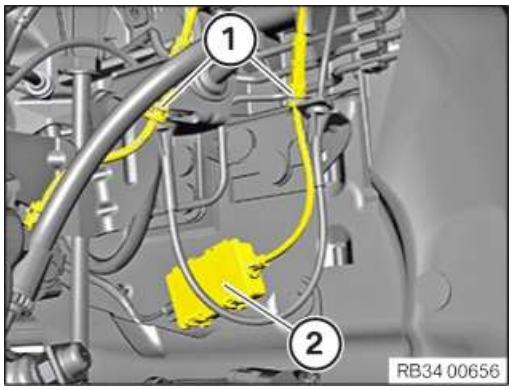
Step on the brake pedal to the floor and hold the pressure for one minute. This causes the brake pads to adhere to the brake pistons.

12 – Install the front brake pad sensor (brake high)



- Attach the cable of the brake pad wear sensor in the bracket (1).
- Install the brake pad wear sensor (2) in the brake pad in the direction of the arrow.

  Ensure brake pad wear sensor fits correctly in brake pad.



- Attach cable of brake pad wear sensor in brackets (1).
- Connect the plug connection .
- Close sealing cap (2).

13 – Installing both front wheels

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▸ **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.

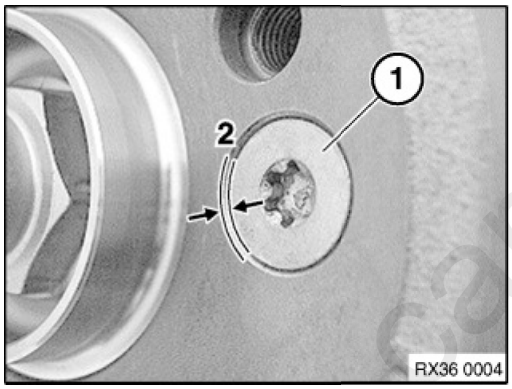
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  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.

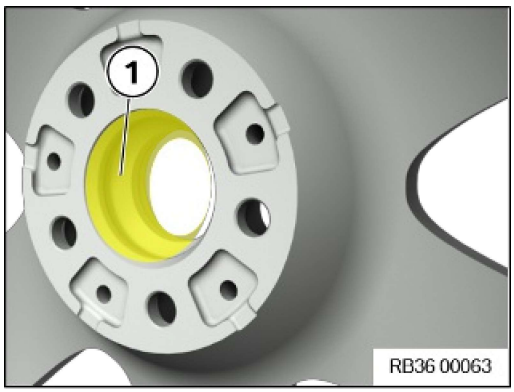
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

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

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



- 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.

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TECHNICAL INFORMATION

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

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

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14 – Start-up or bed in of new brake pads and discs (brake, high)

TECHNICAL INFORMATION

When exchanging brake pads, reset the CBS display in accordance with factory specification (CBS reset).

Carry out test braking while driving at low speed because the effectiveness of the brakes may be reduced during the initial braking operations.

Exaggerated emergency and continuous braking operations for faster bedding-in are not permitted.

Advise the customer not to perform intentional emergency braking operations for the first 200 km after the brakes have been replaced.

- Fully depress brake pedal several times so that brake pads contact brake discs.
- Adjust the brake fluid level to the maximum mark.
- Perform a functional check on the brake test stand to ensure compliance of the brake system with statutory guidelines.
- Attach mirror tag to inside mirror.

Additional Information

Overview of Tightening Torques

Brake guard plate at front swivel bearing — Used in step 7

M6x12	Renew screw.	Tightening torque	8 Nm

Brake disc to front wheel hub — Used in step 813

M8	Renew screw.	Tightening torque	16 Nm

Brake caliper / caliper carrier at front swivel bearing — Used in step 8

M12	Renew screw.	Tightening torque	110 Nm

Brake disc to rear wheel hub — Used in step 13

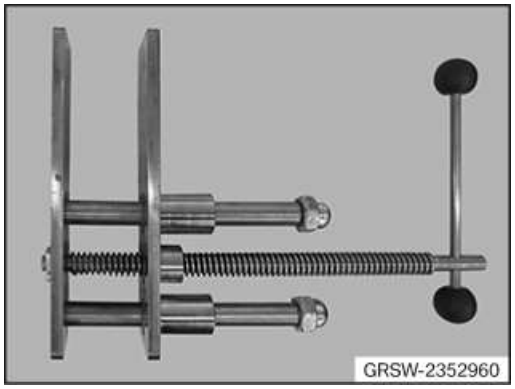
M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 13

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

Overview of Special Tools

2 352 960 Reset



Common — Used in step 3

Usage	Set back to brake piston. Replacement for 34 1 050 (83300492455).
Included in the tool or work	
Storage location	Individual
Replaced by	
In connection with	
SI-Number	

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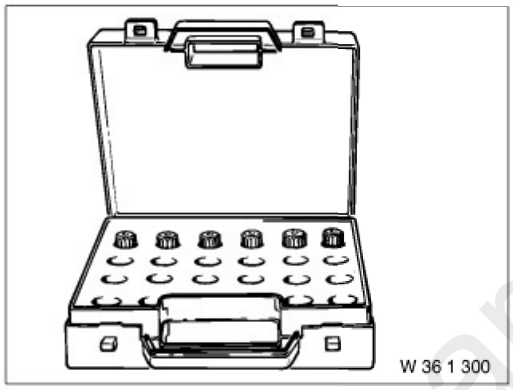
2 344 011 Tool



Common	Used in step 13
Usage	Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	08 08 12 (872)

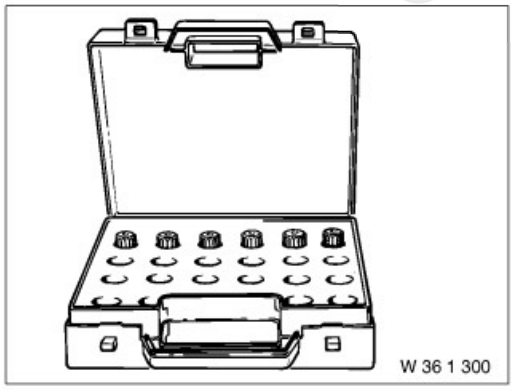
Replacement tools:

0 495 221 (36 1 323) Wheel stud



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

0 495 224 (36 1 326) Wheel stud



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

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0 495 225 (36 1 327) Wheel stud



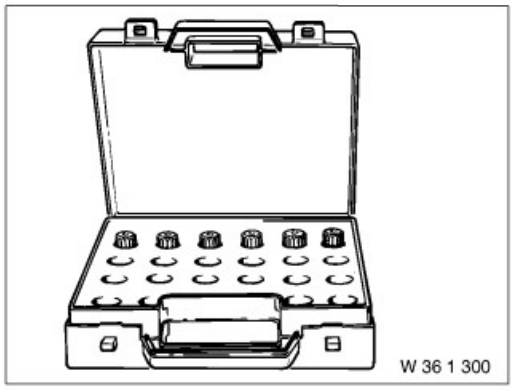
Common	Used in step 1
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 226 (36 1 328) Wheel stud



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

0 495 227 (36 1 329) Wheel stud



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

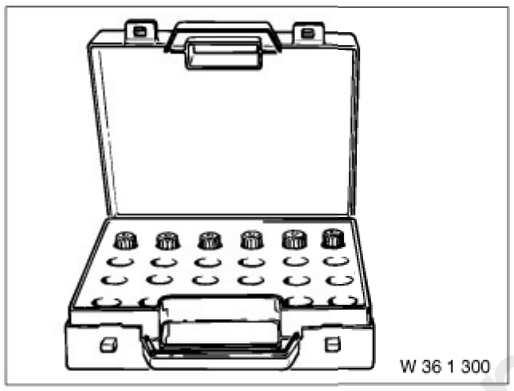
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0 495 228 (36 1 331) Wheel stud



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

0 495 229 (36 1 332) Wheel stud



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

0 495 230 (36 1 333) Wheel stud



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

Overview Technical Data

Minimum brake disc thickness (nominal dimension 330x24)	Used in step 4
Minimum brake disc thickness (brake disc 330x24)	22,4 mm

Links

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Repair instructions	Used in step
34 00 x01 Guideline for applying brake pad paste on brake pads and caliper carrier	

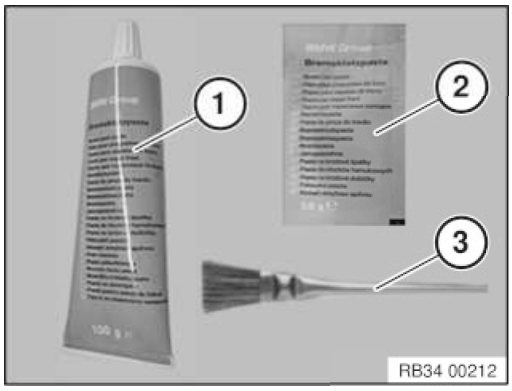
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34 00 x01 Guideline for applying brake pad paste on brake pads and caliper carrier

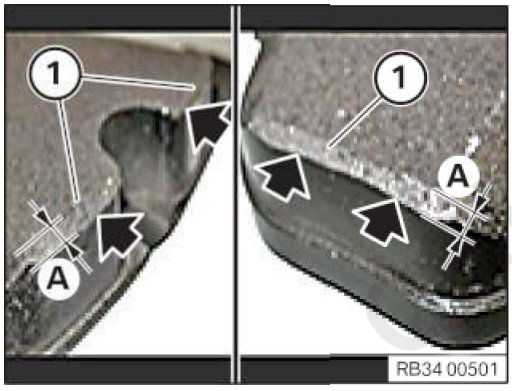
Attention!

So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces for the brake pads on the brake caliper mounting bracket, but rather clean with brake cleaner BMW TI. Clean number 83 19 2 154 780 and apply a thin coating of BMW TI break pad paste. Coat number 83 19 2 158 851 (3 gr.) or 83 19 2 158 852 (100 gr.).

Spread brake pad paste onto the marked surfaces using a brush!



- (1) Brake pad paste 100 gr. BMW TI. Number 83 19 2 158 852
- (2) Brake pad paste 3 gr. BMW TI. Number 83 19 2 158 851
- (3) Brush for spreading brake pad paste over the marked areas.



Attention!

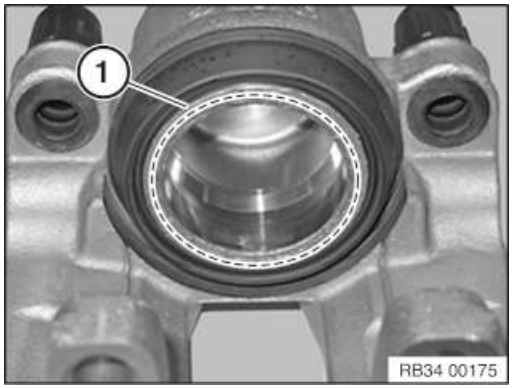
If new brake pads are mounted on a brake disc, the following must be observed:

- Bevel edges in the area (1) slightly (dimension A must not exceed maximum 1 mm).

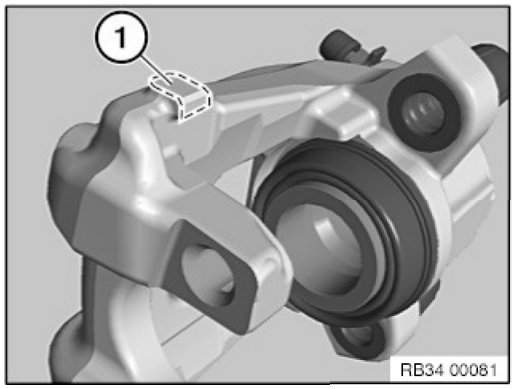
These procedures applies for all the following described brake systems.

IPS brake (made by CBI), 1-piston floating caliper brake (model ranges: 1-Series, 3-Series, 4-Series, X3)

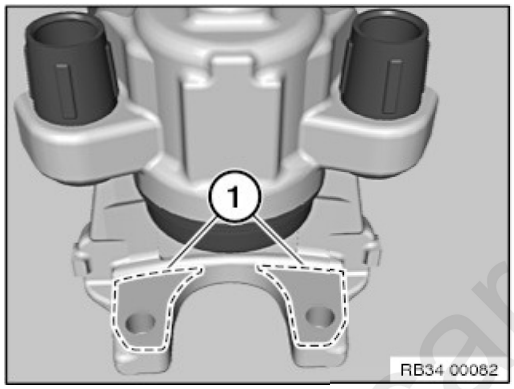
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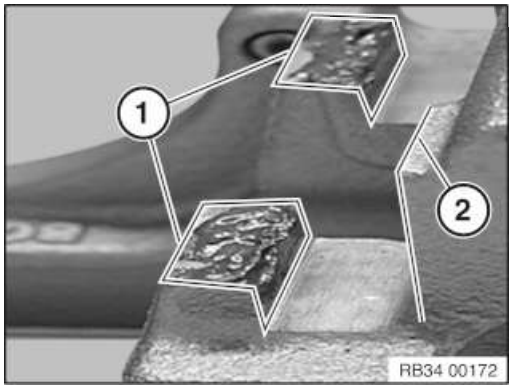
Clean contact surface (1) of brake piston with brake cleaner and apply a thin coating of brake pad paste.



Clean contact surfaces (1) of T-heads/brake calliper housing with brake cleaner and apply a thin coating of brake pad paste.

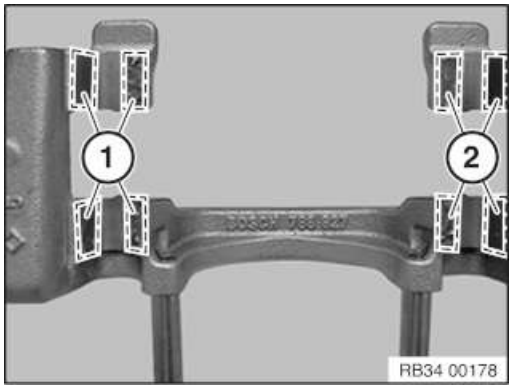


Clean contact surface (1) of brake caliper with brake cleaner and apply a thin coating of brake pad paste.

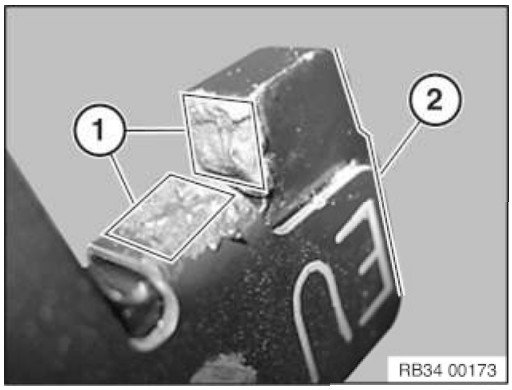


So as not to damage the surface coating, <u>if possible do not mechanically clean</u> the guide surfaces (1) for the brake pads on the brake caliper mounting bracket. Clean guide surfaces (1 and 2) with brake cleaner and apply a thin coating of brake pad paste.

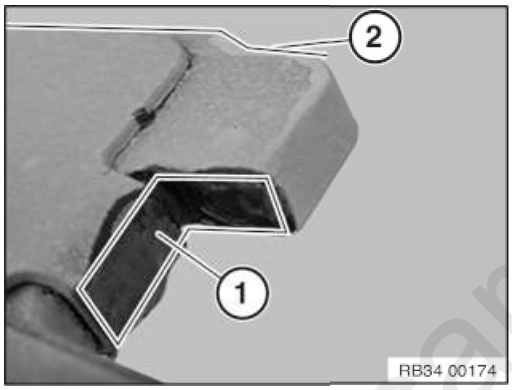
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So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces (1 and 2) for the brake pads on the brake calliper mounting bracket. Clean guide surfaces (1 and 2) with brake cleaner and apply a thin coating of brake pad paste.

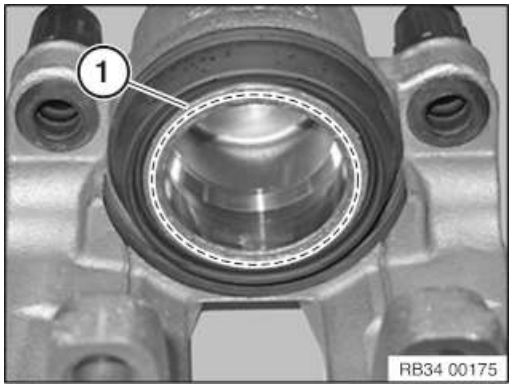


Apply a thin coating of brake pad paste to T-head of inner brake pad in area (1) and (2).



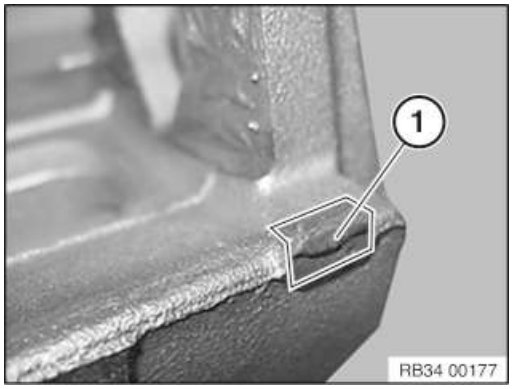
Apply a thin coating of brake pad paste to T-head of outer brake pad in area (1) and (2).

FN brake (made by Continental Teves), 1-piston floating caliper brake (model ranges: 5-Series, 6-Series, 7-Series, 8-Series, X1, X3, X5, Z4, Rolls-Royce)

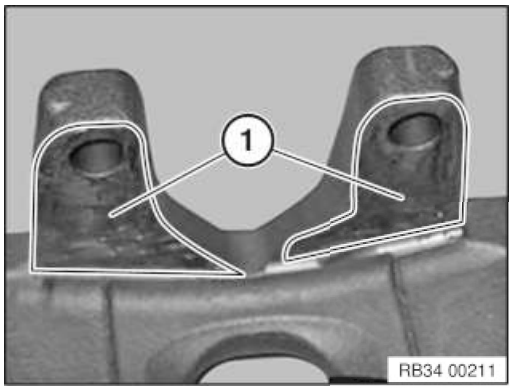


Clean contact surface (1) of brake piston with brake cleaner and apply a thin coating of brake pad paste.

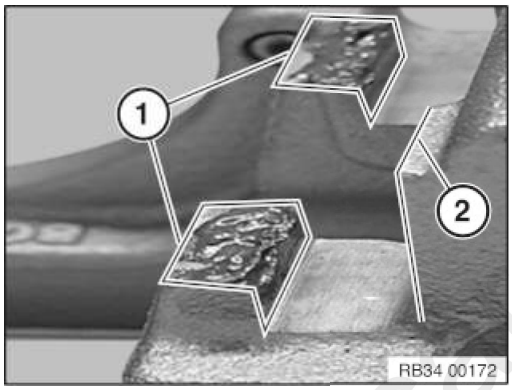
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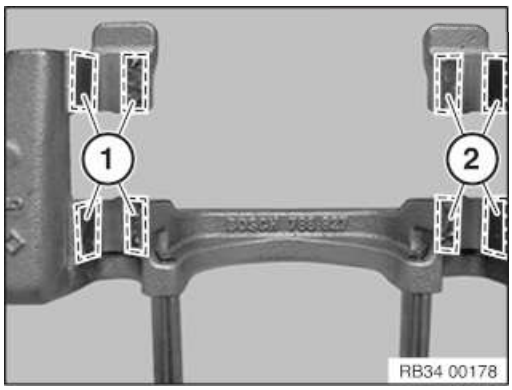
Clean contact surfaces (1) of T-heads/brake calliper housing with brake cleaner and apply a thin coating of brake pad paste.



Clean contact surface (1) of brake caliper with brake cleaner and apply a thin coating of brake pad paste.

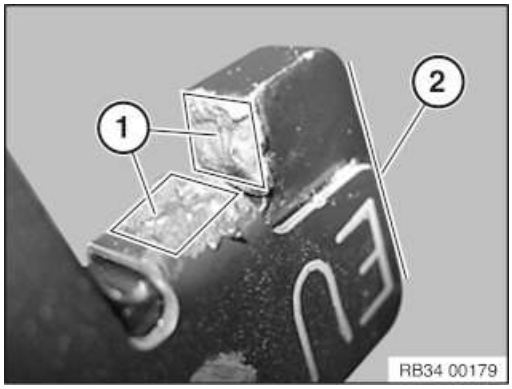


So as not to damage the surface coating, <u>if possible do not mechanically clean</u> the guide surfaces (1) for the brake pads on the brake caliper mounting bracket. Clean guide surfaces (1) with brake cleaner and apply a thin coating of brake pad paste.

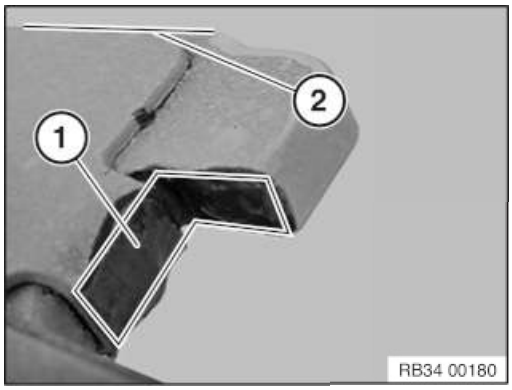


So as not to damage the surface coating, <u>if possible do not mechanically clean</u> the guide surfaces (1 and 2) for the brake pads on the brake calliper mounting bracket. Clean guide surfaces (1 and 2) with brake cleaner and apply a thin coating of brake pad paste.

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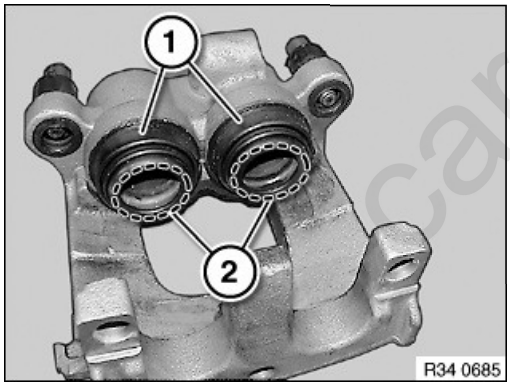


Lightly coat the T-head of the inner brake pad with brake pad paste in area (1 and 2).

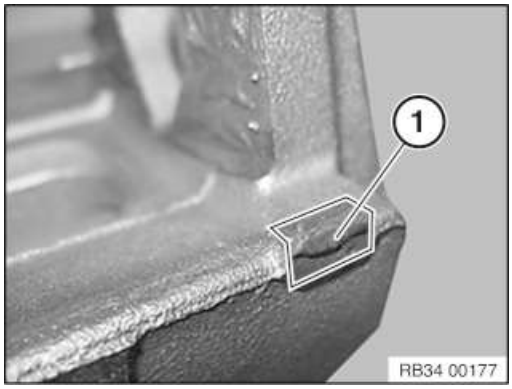


Lightly coat the T-head of the outer brake pad with brake pad paste in area (1 and 2).

FN brake (made by Continental Teves), 2-piston floating caliper brake (model ranges: 5-Series, 6-Series, 7-Series, 8-Series, X5, Rolls-Royce)

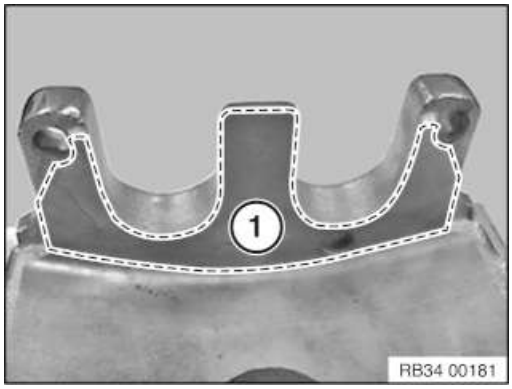


Clean contact surface (2) of brake piston with brake cleaner and apply a thin coating of brake pad paste.

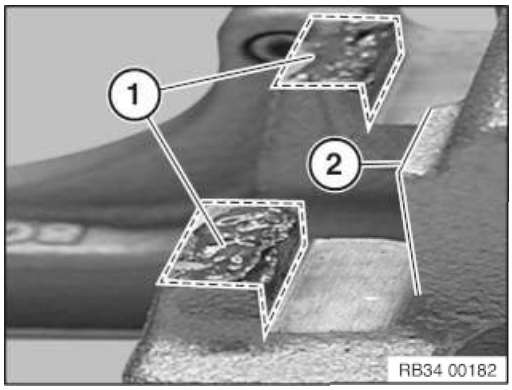


Clean contact surfaces (1) of T-heads/brake calliper housing with brake cleaner and apply a thin coating of brake pad paste.

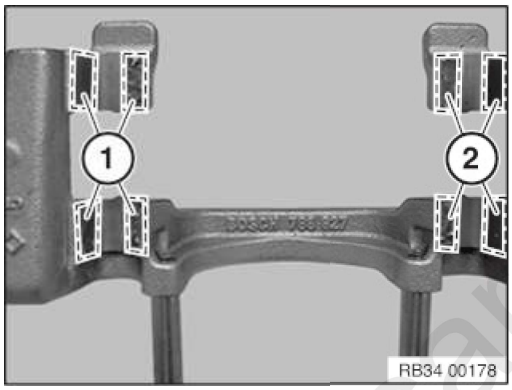
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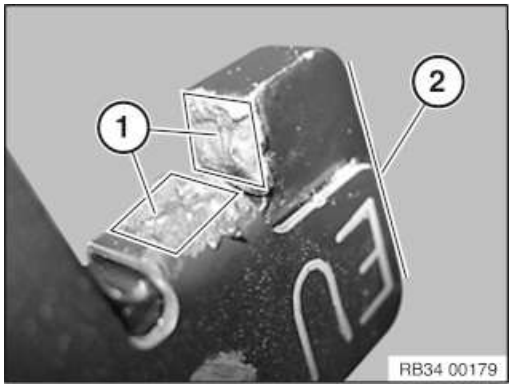
Clean contact surface (1) and brake caliper with brake cleaner and apply a thin coating of brake pad paste.



So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces (1 and 2) for the brake pads on the brake calliper mounting bracket. Clean guide surfaces (1 and 2) with brake cleaner and apply a thin coating of brake pad paste.

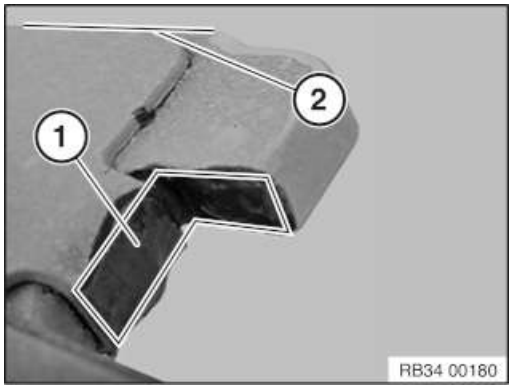


So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces (1 and 2) for the brake pads on the brake calliper mounting bracket. Clean guide surfaces (1 and 2) with brake cleaner and apply a thin coating of brake pad paste.



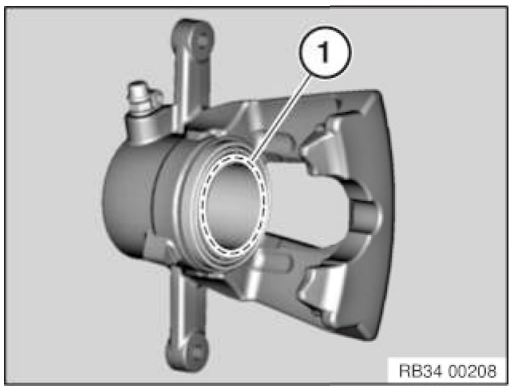
Lightly coat the T-head of the inner brake pad with brake pad paste in area (1 and 2).

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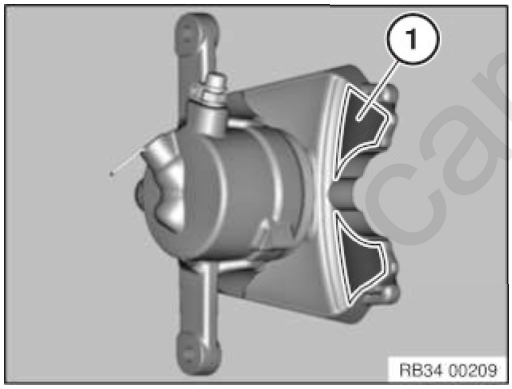


Lightly coat the T-head of the outer brake pad with brake pad paste in area (1 and 2).

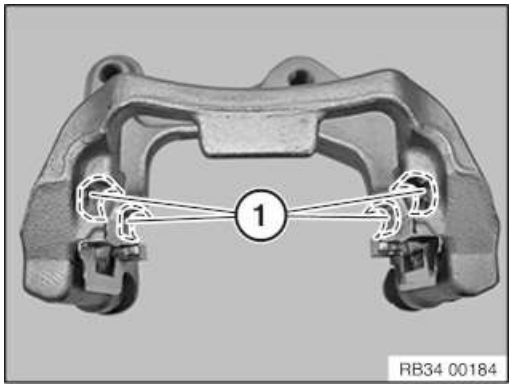
Collette brake (made by TRW), 1-piston brake caliper (model ranges: MINI, 1-Series, 5-Series, 6-Series, Z4)



Clean contact surface (1) of brake piston with brake cleaner and apply a thin coating of brake pad paste.

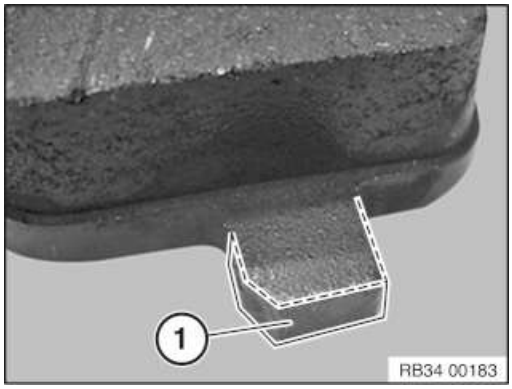


Clean contact surface (1) of brake caliper with brake cleaner and apply a thin coating of brake pad paste.



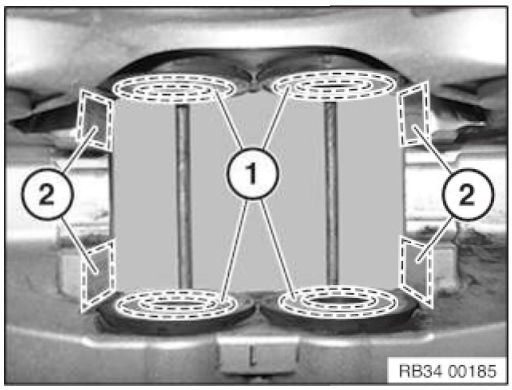
So as not to damage the surface coating, if possible do not mechanically clean the guide surface (1) for the brake pads on the brake caliper mounting bracket. Clean guide surface (1) with brake cleaner and apply a thin coating of brake pad paste.

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Apply a thin coating of brake pad paste to both sides of T-head of brake pad in area (1).

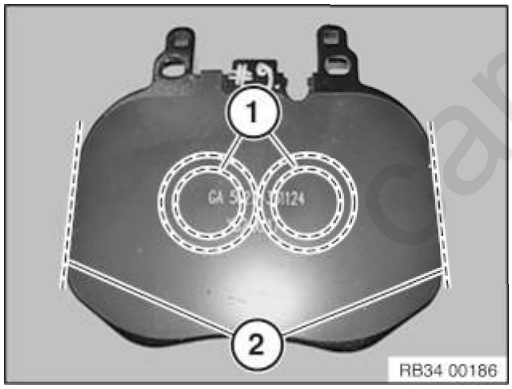
P 4.40 brake (made by Brembo), 4-piston fixed caliper brake (model ranges: MINI, 1-Series, 3-Series, 4-Series, 5-Series, 6-Series, 7-Series, 8-Series, X5, Rolls-Royce)



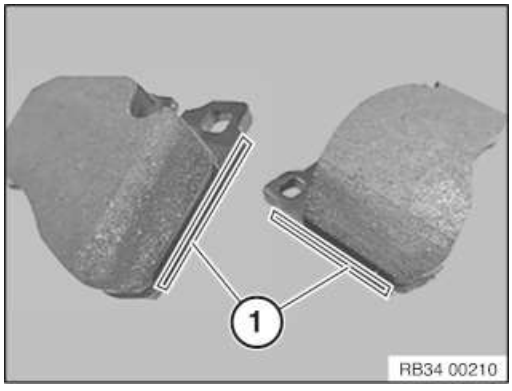
Clean contact surface (1) of brake piston with brake cleaner and apply a thin coating of brake pad paste.

So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces (2) for the brake pads on the brake calliper mounting bracket. Clean guide surface (2) with brake cleaner and apply a thin coating of brake pad paste.

Clean both inner and outer guide surfaces (2) and apply a thin coating of brake pad paste.



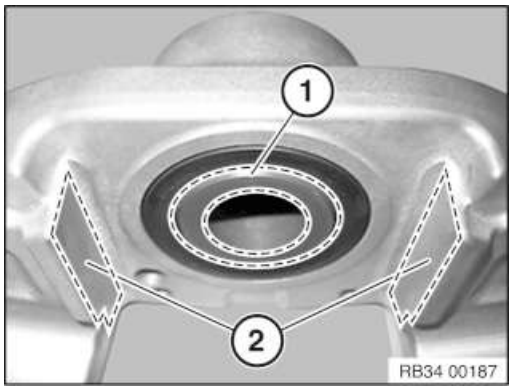
Lightly coat both sides of the contact surface in area (1 and 2) with brake pad paste.



Lightly coat the brake pad contact surface on both sides in area (1) with brake pad paste.

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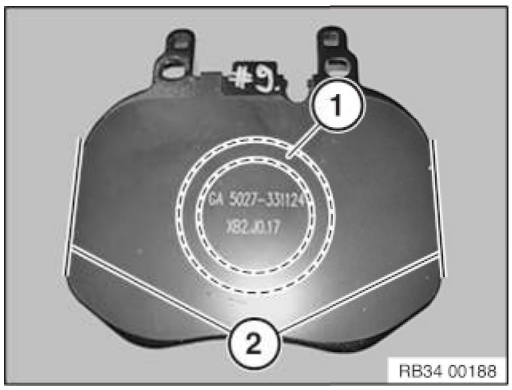
P 4.40 brake (made by Brembo), 2-piston fixed caliper brake (model ranges: 1 Series, 2 Series, 3 Series; does not apply to M2 F87)



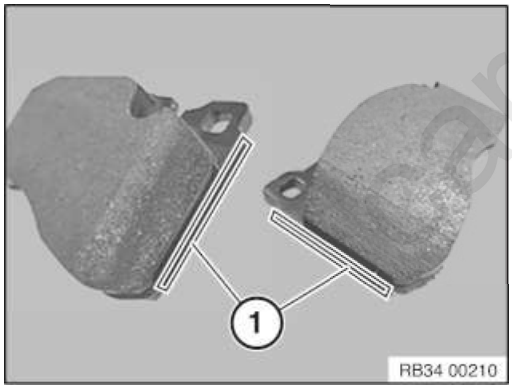
Clean contact surface (1) of brake piston with brake cleaner and apply a thin coating of brake pad paste.

So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces (2) for the brake pads on the brake calliper mounting bracket. Clean guide surface (2) with brake cleaner and apply a thin coating of brake pad paste.

Clean both inner and outer guide surfaces (2) and apply a thin coating of brake pad paste.



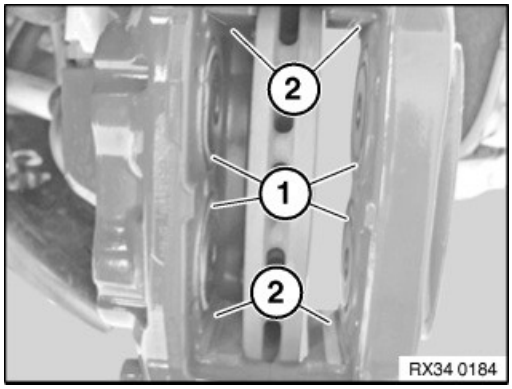
Lightly coat both sides of the contact surface in area (1 and 2) with brake pad paste.



Lightly coat the brake pad contact surface on both sides in area (1) with brake pad paste.

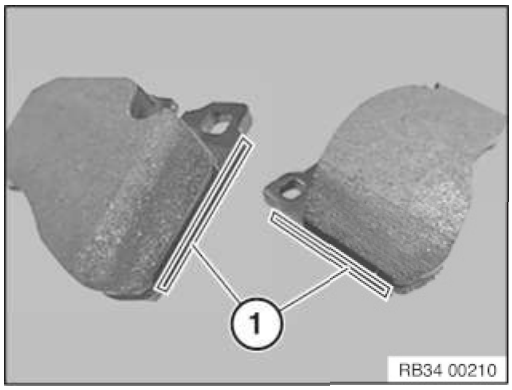
Brake (made by Brembo), 4-piston fixed caliper brake (model ranges: MINI F5x sport brake)

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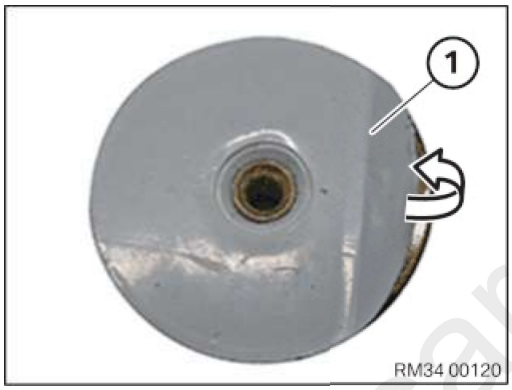
Check dust boot (1) for damage and replace if necessary.

Clean brake caliper compartments (2) and apply a thin coating of brake pad paste.



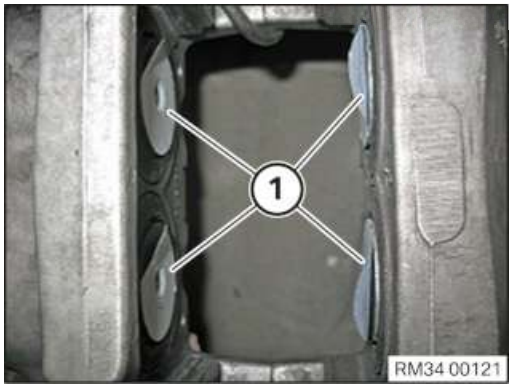
Lightly coat the brake pad contact surface on both sides in area (1) with brake pad paste.

Do not grease the brake lining backplate and thoroughly clean it with brake cleaner!



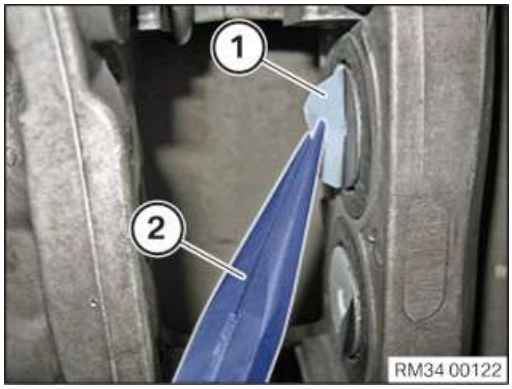
Only use new claw plates!

Slightly raise the protective film (1) at a place.

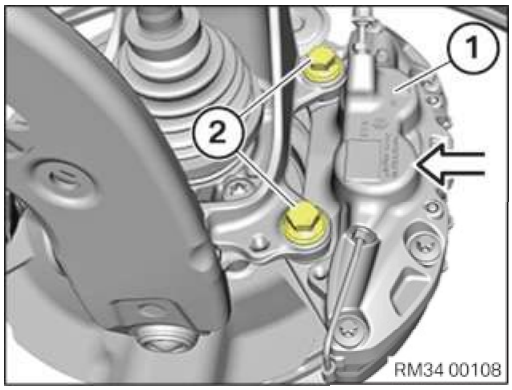


Insert the claw plates (1) into the brake pistons.

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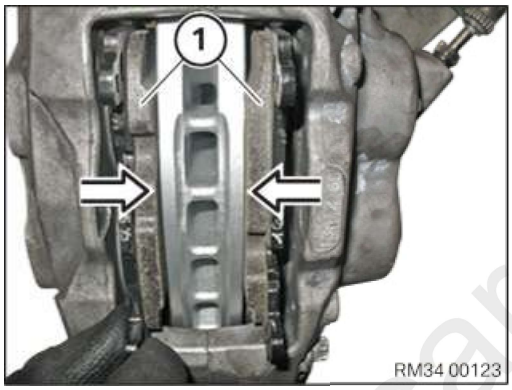
Pull off the protective film (1) with long-nose pliers (2).**Attention!**
The bonding surface of the claw plates must not be touched!



Install the brake caliper (1) in direction of arrow.

Parts: Replace screws (2).

Insert screws (2) and tighten.



Install the brake pad (1).**Attention!**
The brake pads must not touch the bonding surface of the claw plates when inserting!

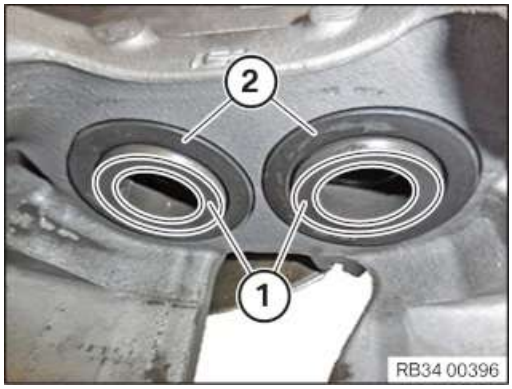
Apply the brake pads to the brake disc and insert.

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In order to ensure a complete bonding of the claw plates with the brake pads, the following instruction must be strictly adhered to:

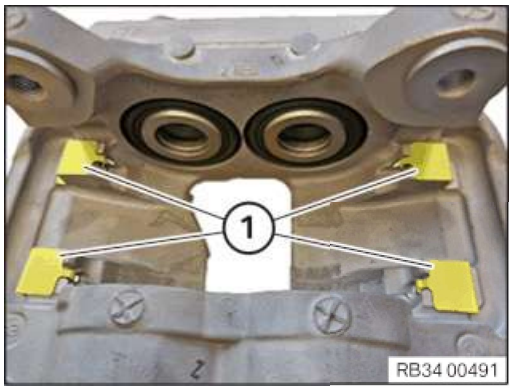
Strongly press the brake pedal and hold it for at least 1 min!

Brake (made by Continental), 4-piston fixed caliper brake (model ranges: 7-Series (G11, G12)



Clean the contact surface (1) of the brake piston (4 pieces) with brake cleaner.

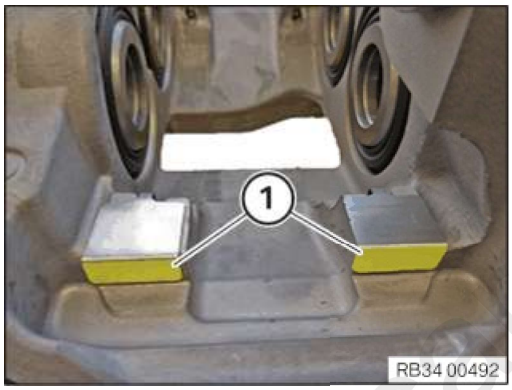
Check the dust boots (2) and renew as necessary.



Always renew retaining plates 1!

Mount retaining plate 1.

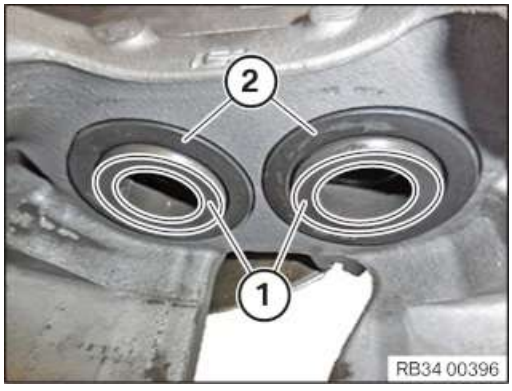
It is paramount that the slide panels are correctly positioned in the guides!



So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces for the brake pads on the brake caliper mounting bracket.

Apply a thin layer of brake pad paste to the surfaces of the sliding plates (1).

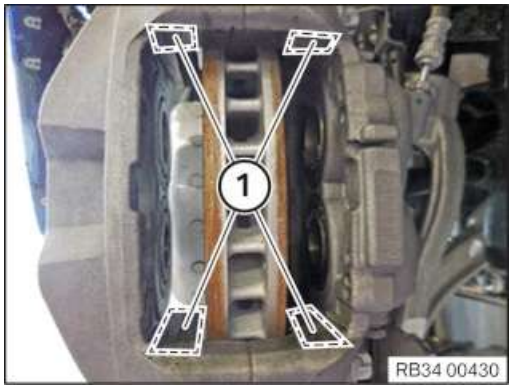
Brake (made by Brembo), 4-piston fixed caliper brake (model ranges: 7-Series (G11, G12)



Clean the contact surface (1) of the brake piston (4 pieces) with brake cleaner.

Adhesive residues must be completely removed.

Check the dust boots (2) and renew as necessary.



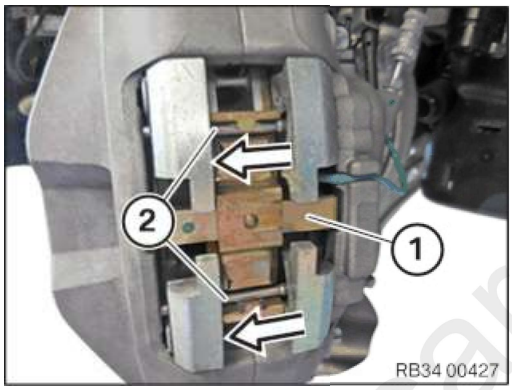
To prevent damage to the surface coating, do not clean the guide surfaces (1) for the brake pads on the brake calliper mechanically, if possible.

Clean guide surfaces (1) with brake cleaner and apply a thin coating of brake pad paste.



Remove the protective film of the adhesive layer (1) from the brake pads.

Do not touch the adhesive layer!



Insert brake pads in the brake caliper, making sure the adhesive layer does not touch the brake pistons.

Fit retaining clip (1).

Drive in the locking pins (2) in the direction of the arrow.

Attention!

After the brake pads have been installed they must immediately be bonded to the brake pistons:

- Step on the brake pedal to the floor and hold the pressure for one minute. This causes the brake pads to adhere to the brake pistons.

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34 21 282 Remove and install/replace rear right protective plate

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.

CAUTION

Effects on other persons.

Danger of injury! Risk of damage!

- Make sure that no other persons are in or around the vehicle.

TECHNICAL INFORMATION

During work on the rear brake, it must be ensured that the button for the electromechanical parking brake cannot be pressed.

TECHNICAL INFORMATION

General information on changing the brake pads:

For vehicles older than 48 months it is recommended to replace the retaining spring or expanding spring.

The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

A CBS reset must be done after every brake pad exchange:

A CBS reset in the vehicle is possible in the event of a **partially ground down** brake pad wear sensor. The CBS display in the Central Information Display (CID) is active.

In the event of a brake pad wear sensor that is **not partially ground down**, a CBS reset is only possible with the diagnosis system. No CBS display in the Central Information Display (CID).

If bonded brake pads are installed, the brake pads must be renewed after releasing the adhesive strip.

TECHNICAL INFORMATION

To prevent damage to the surface coating: With floating callipers on the brake caliper mounting bracket or with fixed callipers in the brake caliper housing, do not clean the contact surfaces for the brake pads to the extent that it is possible.

Clean the contact surfaces with brake cleaner (BMW part number 83 19 2 154 780). Next, apply a thin coat of brake pad paste (BMW part number 83 19 2 158 851 for 3 g) or 83 19 2 158 852 fr 100 g).

Spread brake pad paste on the marked surfaces with a brush.

For additional information see: 34 00 ... brake pad paste

PRELIMINARY WORK

1 – Removing both rear wheels

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1 – Removing both rear wheels

▸ **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 .

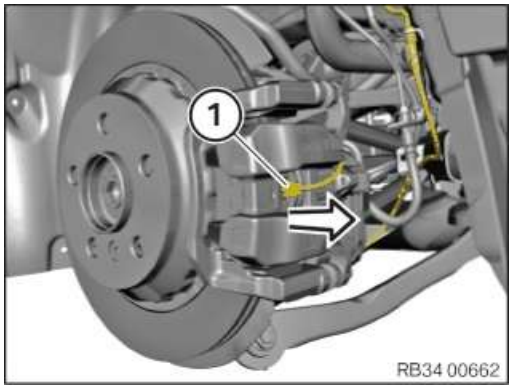
2 – Removing the brake pad wear sensor, rear

TECHNICAL INFORMATION

The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

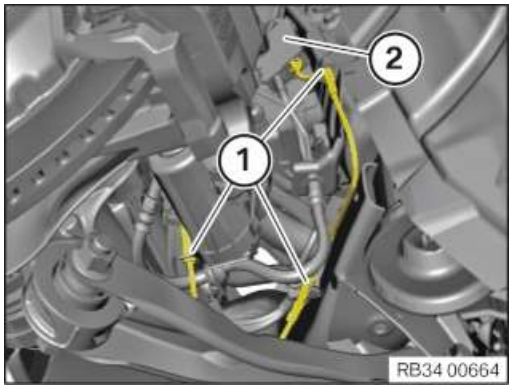
If a brake pad wear sensor that has already been ground has to be replaced even though the minimum brake pad thickness has not yet been reached, you must observe the following:

The new sliding contact must be filed down with a file to the same length as the sanded sliding contact.



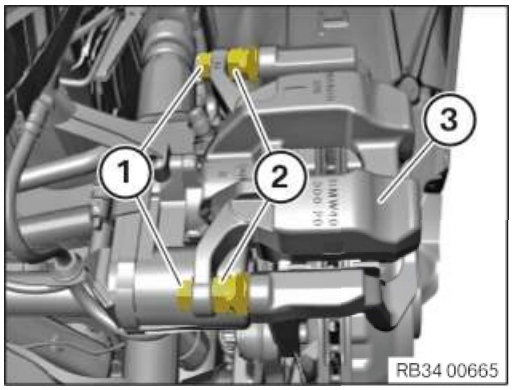
- Remove the brake pad wear sensor (1) from the brake pad.

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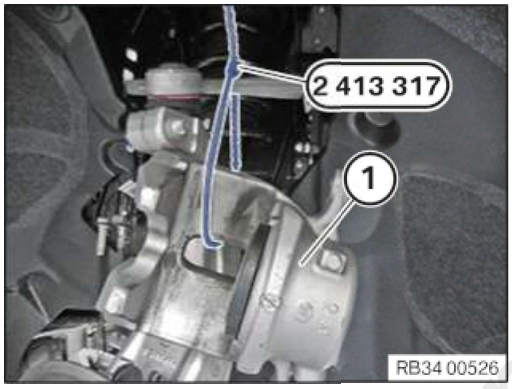


- Detach the brake pad wear sensor from the brackets (1).
- Open cover (2) and disconnect the plug connection.

3 – Remove rear brake pads

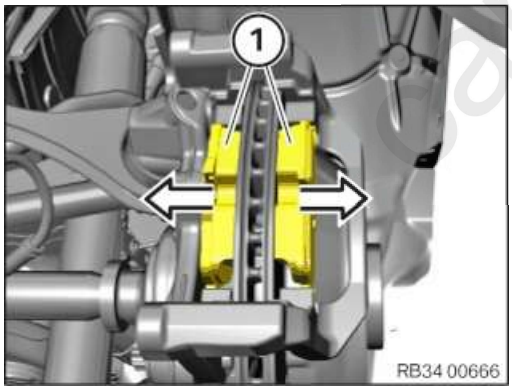


- Release the screws (1); if necessary use the hexagon head (2) for counter support.
- Remove brake caliper (3).



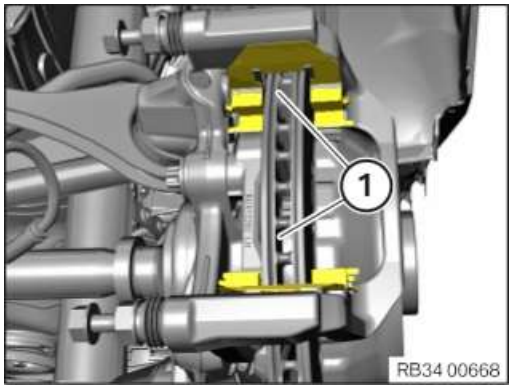
- Tie up brake calliper (1) using special tool (cable strap) 2 413 317.

  The brake caliper must not hang on the brake hose.



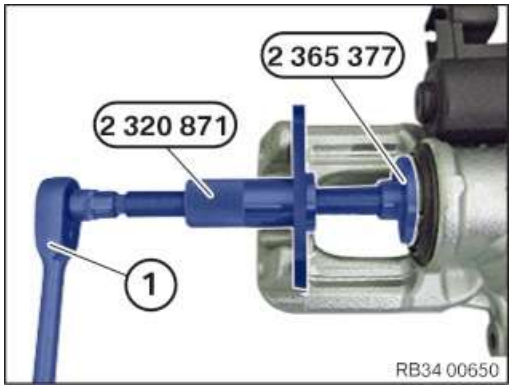
- Remove the brake pads (1) from the brake caliper in direction of arrow.
- Mark any worn brake pads.

  If the brake pad wear exists on one side, they must not be mixed up.



- Remove the sliding plates (1).

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TECHNICAL INFORMATION

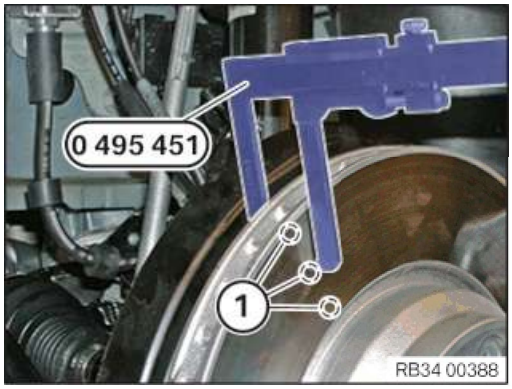
When pressing the brake piston back, note the brake fluid level in the expansion tank.

Overflowing brake fluid will damage the paintwork.

- Press back the brake piston using the special tools and .
- Use the reversible ratchet (1) to turn the brake piston back to the first end stop.

  Avoid turning the actuator!

4 – Measure minimum brake disc thickness (rear brake)



- Check minimum brake disc thickness:

  Place the special tool at three measuring points in area (1) and measure.

  Compare measuring result and lowest value with setpoint value.

  New brake pads may only be installed if the brake disk thickness is greater than the minimum brake disc thickness.

Minimum brake disc thickness (nominal dimension 330x20)

Minimum brake disc thickness (brake disc 330x20)	18,4 mm

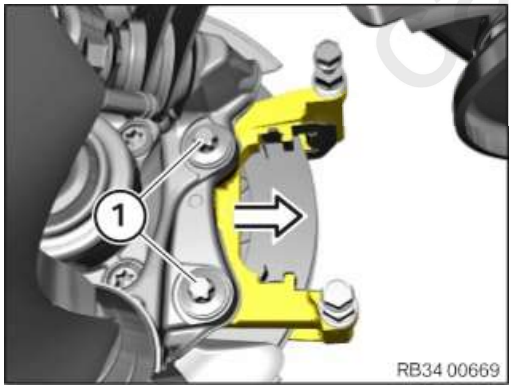
Minimum brake disc thickness (nominal dimension 345x24)

Minimum brake disc thickness (brake disc 345x24)	22,4 mm

Minimum brake disc thickness (nominal dimension 370x24)

Minimum brake disc thickness (brake disc 370x24)	22,4 mm

5 – Remove rear brake disc



- Loosen the screws (1) and remove the caliper carrier.

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- Loosen screw (1).

TECHNICAL INFORMATION

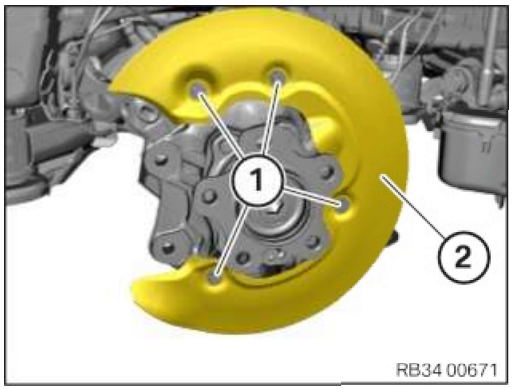
Note the following for the removal of the brake disc:

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).

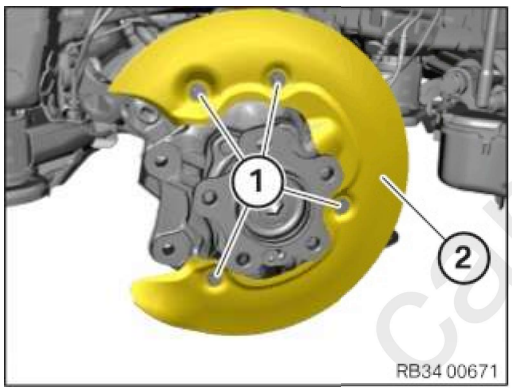
MAIN WORK

6 – Remove rear brake guard plate



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

7 – Mount rear brake guard plate



- Install brake guard plate (2).
- Insert screws (1) and tighten.

Brake protection plate on the rear wheel carrier

M6x12	Renew screw.	Tightening torque	8 Nm

POSTPROCESSES

8 – Installing the rear brake disc

TECHNICAL INFORMATION

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

Fit new brake discs only together with new brake pads.

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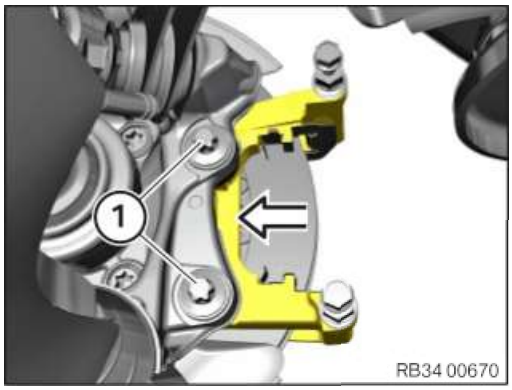
- Thoroughly clean the contact surface of the wheel hub and remove traces of corrosion if necessary.

  Irregularities in the contact surface can cause distortion in the brake disc!
- Mount brake disc (2).
- Position and tighten the screw (1).
- Renew screw.

  Parts: Screw

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm



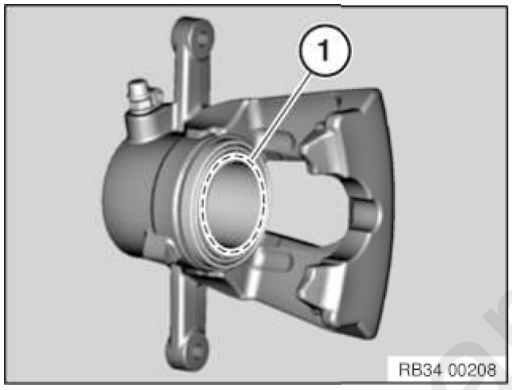
- Mount caliper carrier.
- Insert screws (1) and tighten.
- Renew screws.

  Parts: Bolts

Brake caliper to wheel carrier, rear

	Renew screw.	Tightening torque	110 Nm

9 – Grease brake pads, caliper carrier and brake caliper with brake pad paste

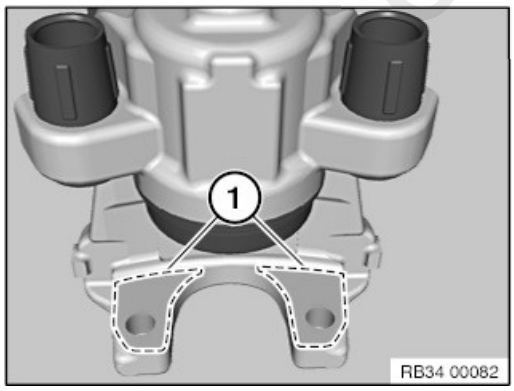


- Clean contact surface (1) of the brake piston with brake cleaner and apply a thin coat of brake pad paste.

Expendable materials

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

- Check dust boots for damage; renew if necessary.

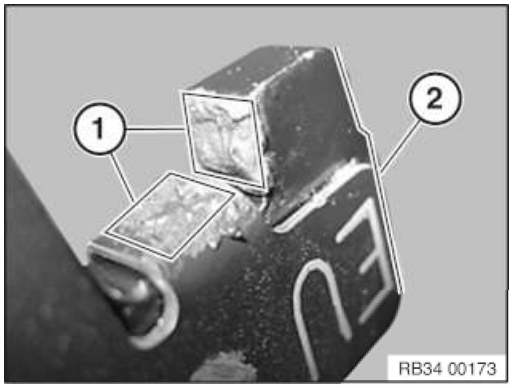


- Clean contact surface (1) of the brake piston with brake cleaner and apply a thin coat of brake pad paste.

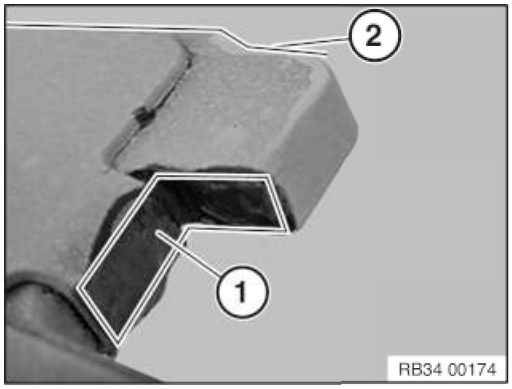
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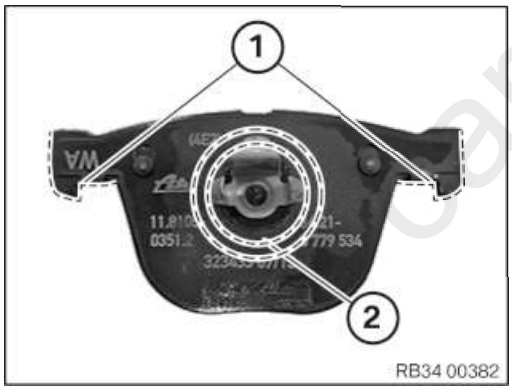
- Mount the sliding plates (1).



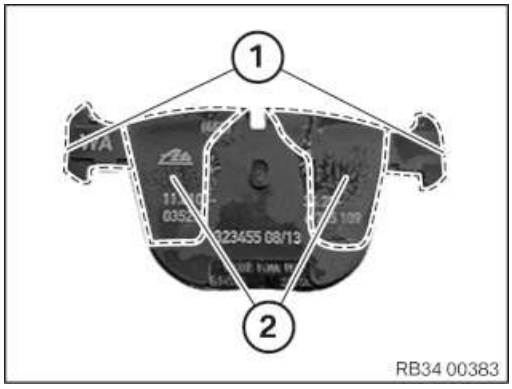
- Apply a thin coat of brake pad paste to the T-head of the inner brake pad in the areas (1) and (2).



- Apply a thin coat of brake pad paste to the T-head of the inner brake pad in the areas (1) and (2).



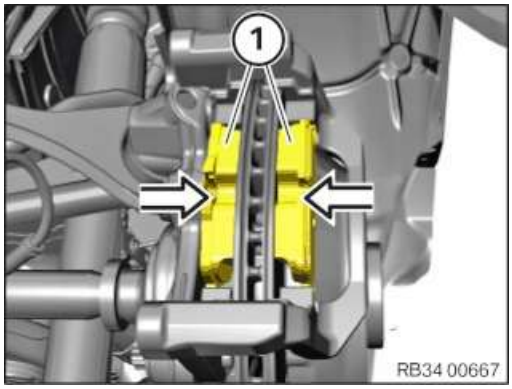
- Apply a thin coat of brake pad paste to the contact surface in the areas (1) and (2).



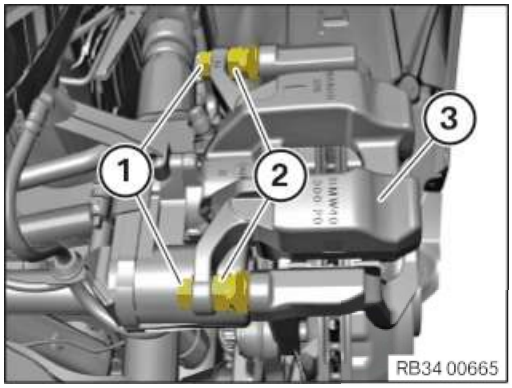
- Apply a thin coat of brake pad paste to the contact surface in the areas (1) and (2).

10 – Install rear brake pads

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- Install the brake pads (1) in the direction of the arrow.



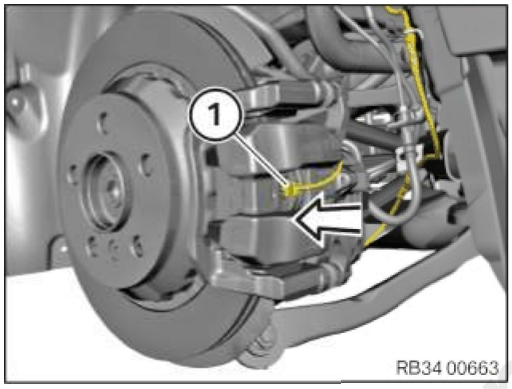
- Remove the special tool (cable strap) 2 413 317.
- Mount brake caliper (3).
- Renew screws (1).

  Parts: Bolts
- Tighten the screws (1), if applicable, hold against the hexagon head (2).

Guide bolt (brake caliper on caliper carrier)

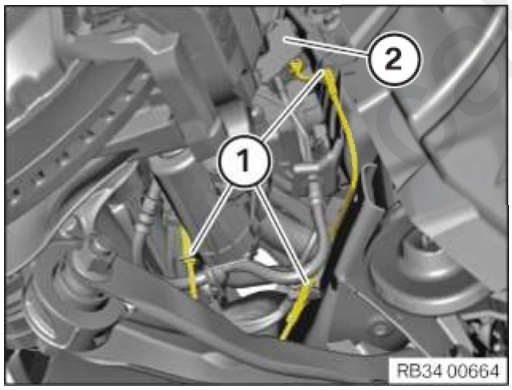
M8			35 Nm

11 – Install rear brake pad sensor



- Install the brake pad wear sensor (2) in the brake pad in the direction of the arrow.

  Ensure brake pad wear sensor fits correctly in brake pad.



- Attach cable of brake pad wear sensor in brackets (1).
- Connect the plug connection and close the cover (2).

12 – Installing both rear wheels

► **Mounting the wheel**

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TECHNICAL INFORMATION

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

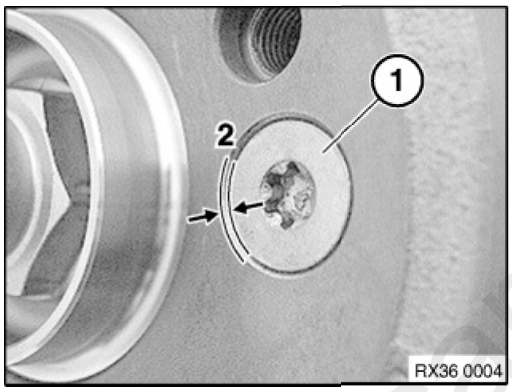
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

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



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

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).



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

  The mounting bolt (1) for the brake disc may not protrude 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 * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233

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



- 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.

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TECHNICAL INFORMATION

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

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

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13 – Start-up or bedding-in of new brake pads and discs (rear brake)

TECHNICAL INFORMATION

When exchanging brake pads, reset the CBS display in accordance with factory specification (CBS reset).

Carry out test braking while driving at low speed because the effectiveness of the brakes may be reduced during the initial braking operations.

Exaggerated emergency and continuous braking operations for faster bedding-in are not permitted.

Advise the customer not to perform intentional emergency braking operations for the first 200 km after the brakes have been replaced.

- Fully depress brake pedal several times so that brake pads contact brake discs.
- Switch the ignition on.

  Use the parking brake button to open, close and open the parking brake again.
- Switch off ignition.
- Adjust the brake fluid level to the maximum mark.
- Perform a functional check on the brake test stand to ensure compliance of the brake system with statutory guidelines.
- Attach mirror tag to inside mirror.

Additional Information

Overview of Tightening Torques

Brake protection plate on the rear wheel carrier — Used in step 7

M6x12	Renew screw.	Tightening torque	8 Nm

Brake disc to rear wheel hub — Used in step 812

M8	Renew screw.	Tightening torque	16 Nm

Brake caliper to wheel carrier, rear — Used in step 8

	Renew screw.	Tightening torque	110 Nm

Guide bolt (brake caliper on caliper carrier) — Used in step 10

M8			35 Nm

Brake disc to front wheel hub — Used in step 12

M8	Renew screw.	Tightening torque	16 Nm

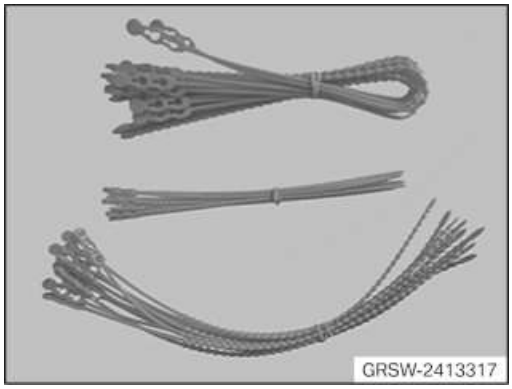
Wheel bolts — Used in step 12

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

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2 413 317 Cable strap



Common	Used in step 310
Usage	The "Cable ties" parts set consists of 3 items as follows: ABV232 Length: 320 mm colour: RedABV250 Length: 500 mm colour: RedABVS270 Length: 665 mm colour: Red
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	01 47 15 (332)

2 344 011 Tool



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

Replacement tools:

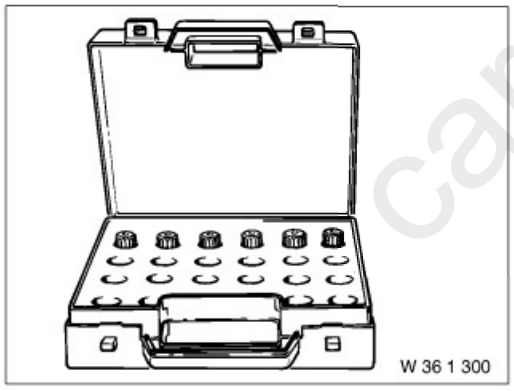
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0 495 221 (36 1 323) Wheel stud



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

0 495 224 (36 1 326) Wheel stud



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

0 495 225 (36 1 327) Wheel stud



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

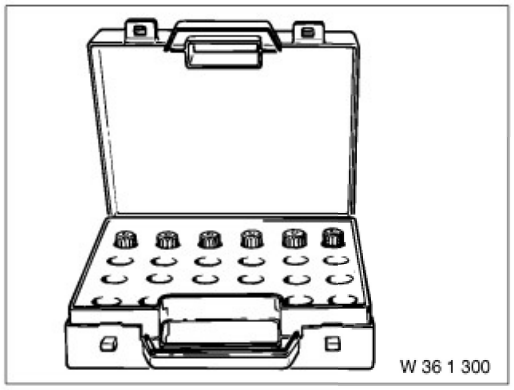
cardiagn.com

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



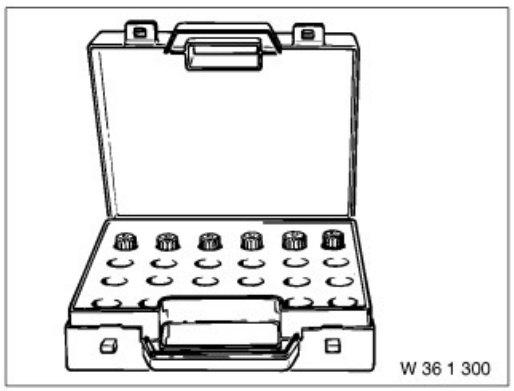
Common	Used in step 1
Usage	(Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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	

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	

cartagn.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	

Overview Technical Data

Minimum brake disc thickness (nominal dimension 330x20)	Used in step 4
Minimum brake disc thickness (brake disc 330x20)	18,4 mm

Minimum brake disc thickness (nominal dimension 345x24)	Used in step 4
Minimum brake disc thickness (brake disc 345x24)	22,4 mm

Minimum brake disc thickness (nominal dimension 370x24)	Used in step 4
Minimum brake disc thickness (brake disc 370x24)	22,4 mm

Links

Repair instructions	Used in step
34 00 x01 Guideline for applying brake pad paste on brake pads and caliper carrier	

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34 21 320 Removing and installing/renewing both brake discs

WARNING

Accidental application of the parking brakes

Danger of injury!

- For vehicles with "Remote Engine Start" (SA1CR):
- Compulsorily prevent the engine from starting while working on the brake system. The parking brakes are applied automatically while starting the engine via "Remote Engine Start".
- Deactivate the function "Remote Engine Start".
- Open the front flap before working on the brake system. In this manner the engine cannot be started.

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.

CAUTION

Effects on other persons.

Danger of injury! Risk of damage!

- Make sure that no other persons are in or around the vehicle.

TECHNICAL INFORMATION

During work on the rear brake, it must be ensured that the button for the electromechanical parking brake cannot be pressed.

TECHNICAL INFORMATION

General information on changing the brake pads:

For vehicles older than 48 months it is recommended to replace the retaining spring or expanding spring.

The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

A CBS reset must be done after every brake pad exchange:

A CBS reset in the vehicle is possible in the event of a **partially ground down** brake pad wear sensor. The CBS display in the Central Information Display (CID) is active.

In the event of a brake pad wear sensor that is **not partially ground down**, a CBS reset is only possible with the diagnosis system. No CBS display in the Central Information Display (CID).

If bonded brake pads are installed, the brake pads must be renewed after releasing the adhesive strip.

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TECHNICAL INFORMATION

To prevent damage to the surface coating: With floating callipers on the brake caliper mounting bracket or with fixed callipers in the brake caliper housing, do not clean the contact surfaces for the brake pads to the extent that it is possible.

Clean the contact surfaces with brake cleaner (BMW part number 83 19 2 154 780). Next, apply a thin coat of brake pad paste (BMW part number 83 19 2 158 851 for 3 g) or 83 19 2 158 852 fr 100 g).

Spread brake pad paste on the marked surfaces with a brush.

For additional information see: 34 00 ... brake pad paste

PRELIMINARY WORK

1 – Removing both rear wheels

▸ **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 – Removing the brake pad wear sensor, rear

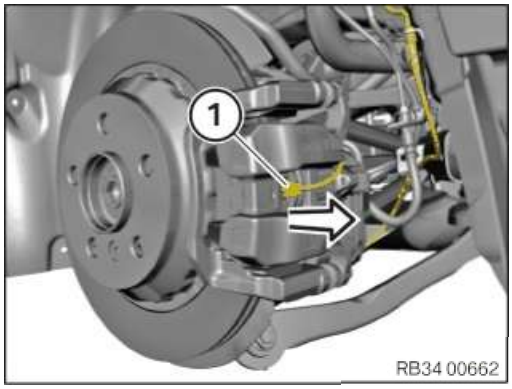
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TECHNICAL INFORMATION

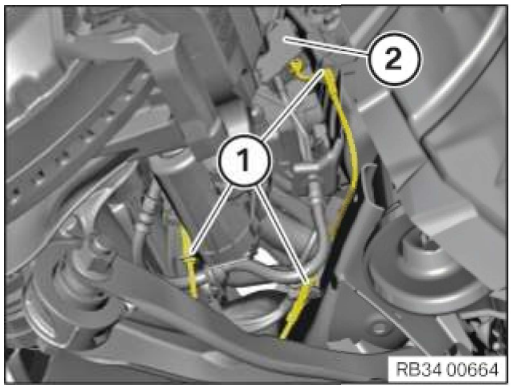
The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

If a brake pad wear sensor that has already been ground has to be replaced even though the minimum brake pad thickness has not yet been reached, you must observe the following:

The new sliding contact must be filed down with a file to the same length as the sanded sliding contact.

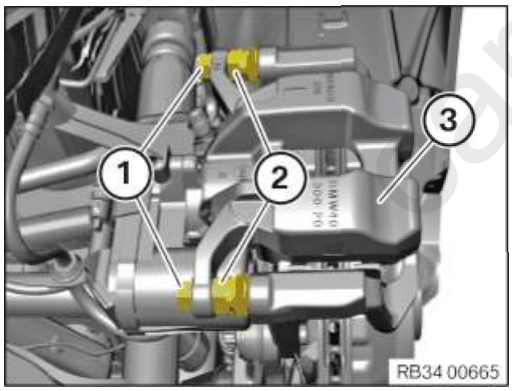


- Remove the brake pad wear sensor (1) from the brake pad.

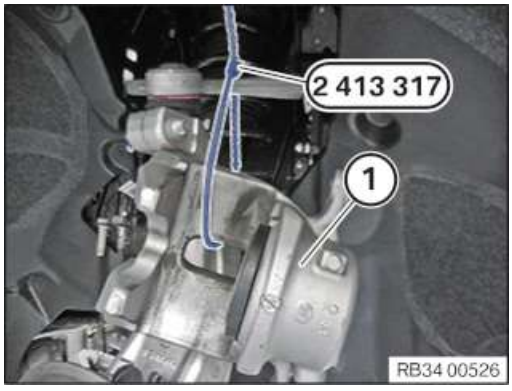


- Detach the brake pad wear sensor from the brackets (1).
- Open cover (2) and disconnect the plug connection.

3 – Remove rear brake pads



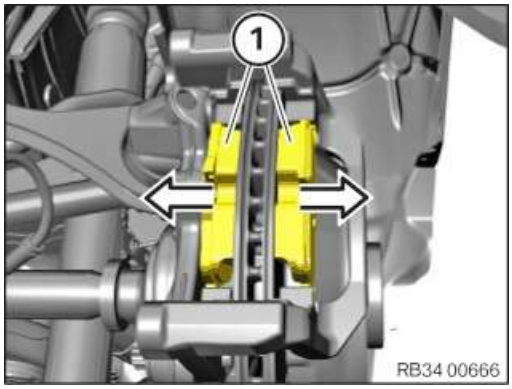
- Release the screws (1); if necessary use the hexagon head (2) for counter support.
- Remove brake caliper (3).



- Tie up brake calliper (1) using special tool (cable strap) 2 413 317.

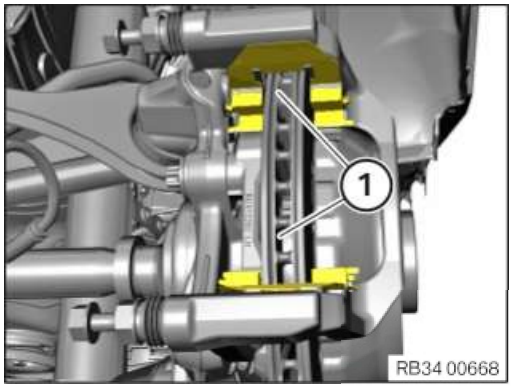
  The brake caliper must not hang on the brake hose.

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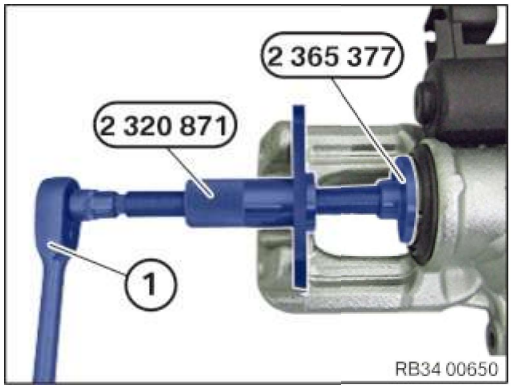


- Remove the brake pads (1) from the brake caliper in direction of arrow.
- Mark any worn brake pads.

  If the brake pad wear exists on one side, they must not be mixed up.



- Remove the sliding plates (1).



TECHNICAL INFORMATION

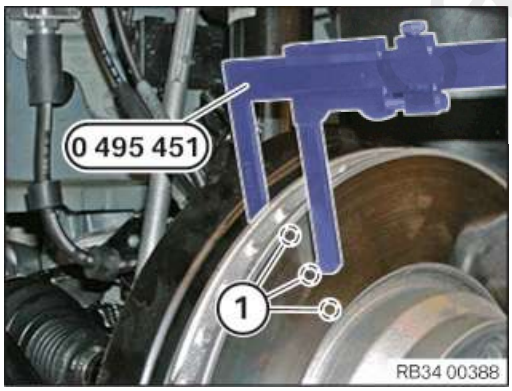
When pressing the brake piston back, note the brake fluid level in the expansion tank.

Overflowing brake fluid will damage the paintwork.

- Press back the brake piston using the special tools and .
- Use the reversible ratchet (1) to turn the brake piston back to the first end stop.

  Avoid turning the actuator!

4 – Measure minimum brake disc thickness (rear brake)



- Check minimum brake disc thickness:

  Place the special tool at three measuring points in area (1) and measure.

  Compare measuring result and lowest value with setpoint value.

  New brake pads may only be installed if the brake disk thickness is greater than the minimum brake disc thickness.

Minimum brake disc thickness (nominal dimension 330x20)

Minimum brake disc thickness (brake disc 330x20)	18,4 mm

Minimum brake disc thickness (nominal dimension 345x24)

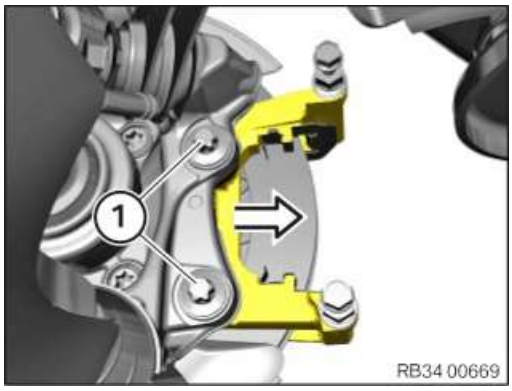
Minimum brake disc thickness (brake disc 345x24)	22,4 mm

Minimum brake disc thickness (nominal dimension 370x24)

Minimum brake disc thickness (brake disc 370x24)	22,4 mm

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5 – Remove rear brake disc



- Loosen the screws (1) and remove the caliper carrier.



- 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 – Installing the rear brake disc

TECHNICAL INFORMATION

Brake discs must only be replaced in pairs (per axle).
Fit new brake discs only together with new brake pads.



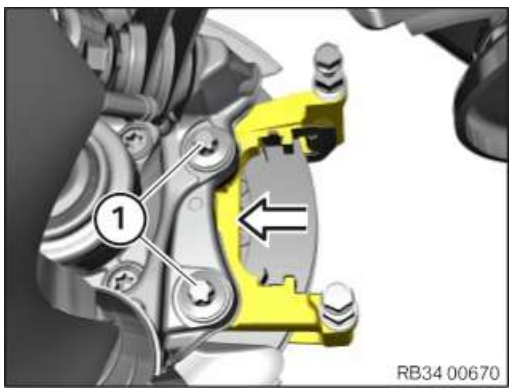
- Thoroughly clean the contact surface of the wheel hub and remove traces of corrosion if necessary.

  Irregularities in the contact surface can cause distortion in the brake disc!
- Mount brake disc (2).
- Position and tighten the screw (1).
- Renew screw.

  Parts: Screw

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm



- Mount caliper carrier.
- Insert screws (1) and tighten.
- Renew screws.

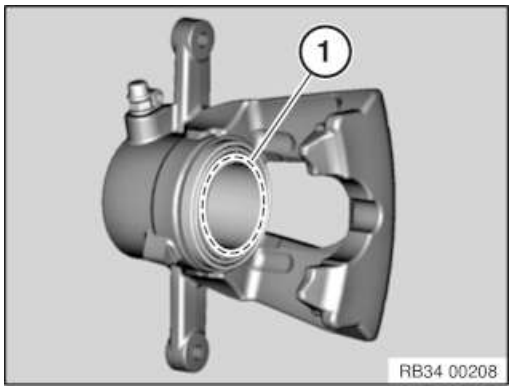
  Parts: Bolts

Brake caliper to wheel carrier, rear

	Renew screw.	Tightening torque	110 Nm

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7 – Grease brake pads, caliper carrier and brake caliper with brake pad paste

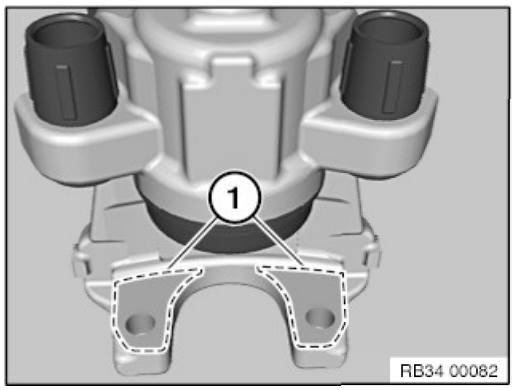


- Clean contact surface (1) of the brake piston with brake cleaner and apply a thin coat of brake pad paste.

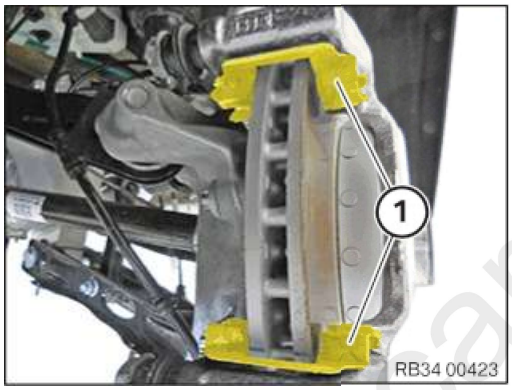
Expendable materials

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

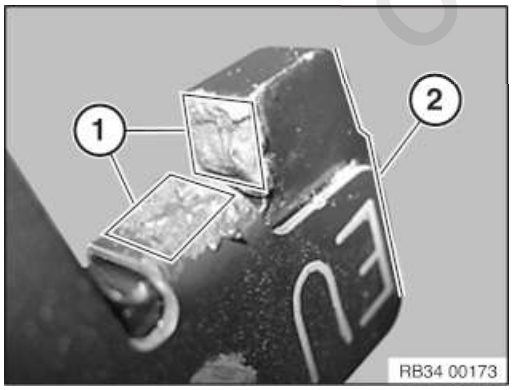
- Check dust boots for damage; renew if necessary.



- Clean contact surface (1) of the brake piston with brake cleaner and apply a thin coat of brake pad paste.

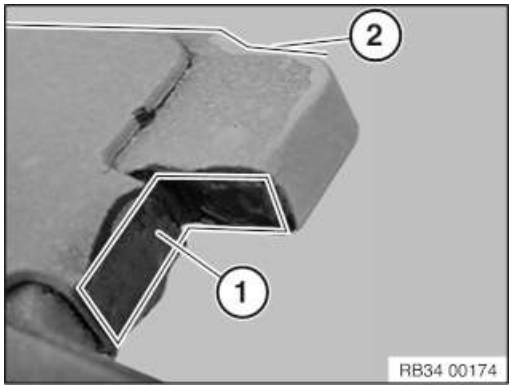


- Mount the sliding plates (1).

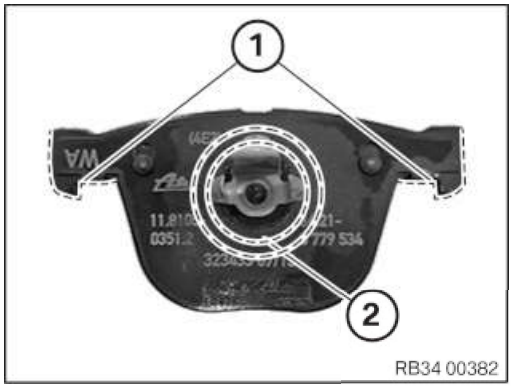


- Apply a thin coat of brake pad paste to the T-head of the inner brake pad in the areas (1) and (2).

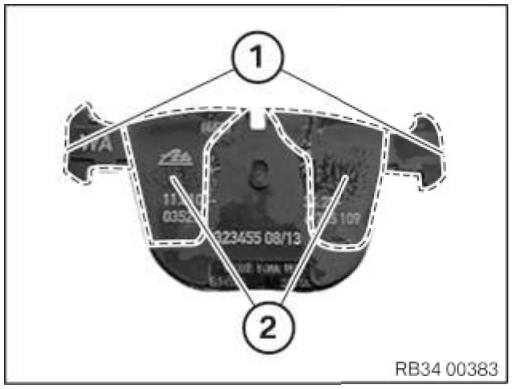
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- Apply a thin coat of brake pad paste to the T-head of the inner brake pad in the areas (1) and (2).

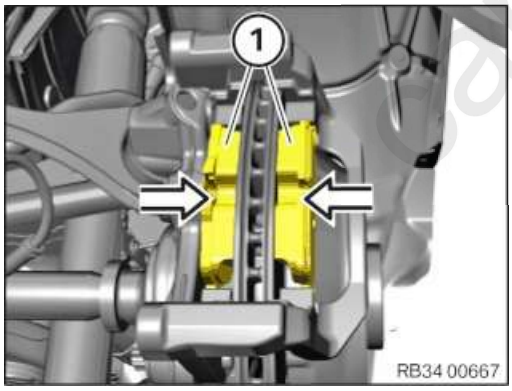


- Apply a thin coat of brake pad paste to the contact surface in the areas (1) and (2).

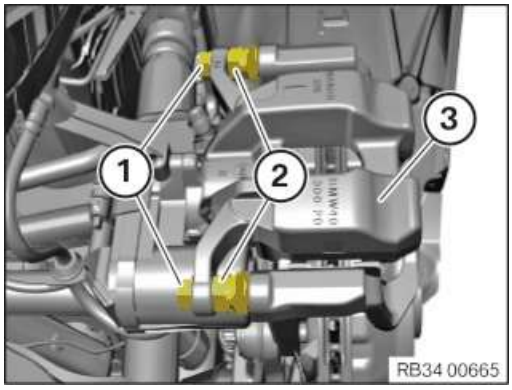


- Apply a thin coat of brake pad paste to the contact surface in the areas (1) and (2).

8 – Install rear brake pads



- Install the brake pads (1) in the direction of the arrow.



- Remove the special tool (cable strap) 2 413 317.
- Mount brake caliper (3).
- Renew screws (1).

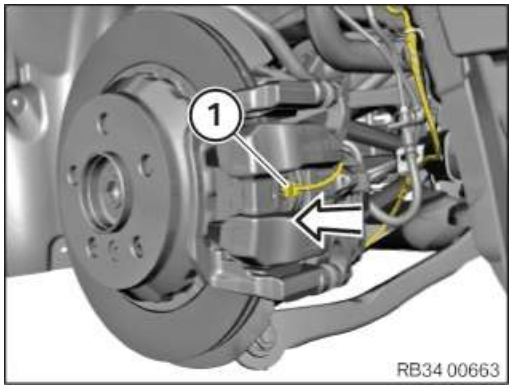
  Parts: Bolts
- Tighten the screws (1), if applicable, hold against the hexagon head (2).

Guide bolt (brake caliper on caliper carrier)

M8			35 Nm

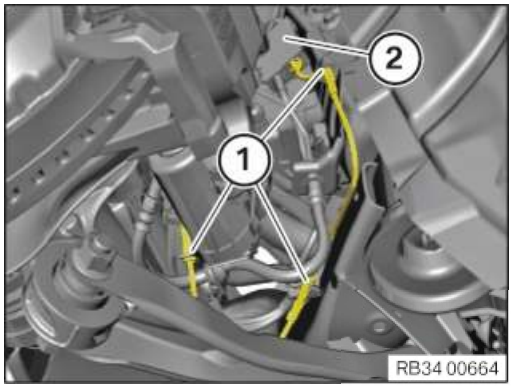
9 – Install rear brake pad sensor

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- Install the brake pad wear sensor (2) in the brake pad in the direction of the arrow.

  Ensure brake pad wear sensor fits correctly in brake pad.



- Attach cable of brake pad wear sensor in brackets (1).
- Connect the plug connection and close the cover (2).

10 – Installing both rear wheels

▸ **Mounting the wheel**



TECHNICAL INFORMATION

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

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

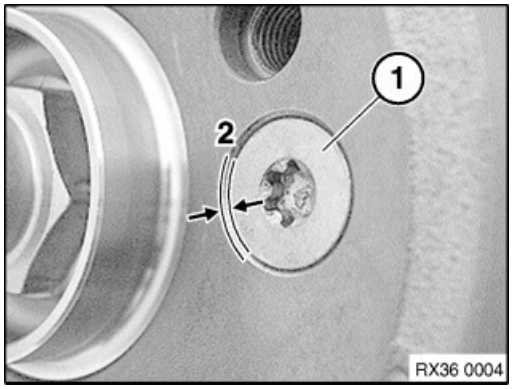
  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.



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

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).

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

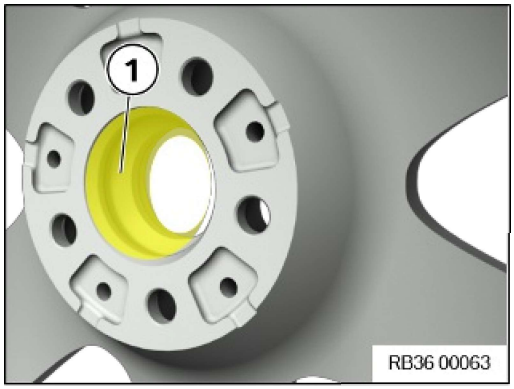
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

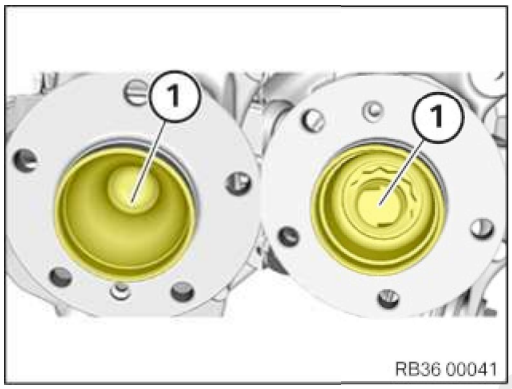
M8	Renew screw.	Tightening torque	16 Nm



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

Expendable materials

Brake block paste * 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 * 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.

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TECHNICAL INFORMATION

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

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

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11 – Start-up or bedding-in of new brake pads and discs (rear brake)

TECHNICAL INFORMATION

When exchanging brake pads, reset the CBS display in accordance with factory specification (CBS reset).

Carry out test braking while driving at low speed because the effectiveness of the brakes may be reduced during the initial braking operations.

Exaggerated emergency and continuous braking operations for faster bedding-in are not permitted.

Advise the customer not to perform intentional emergency braking operations for the first 200 km after the brakes have been replaced.

- Fully depress brake pedal several times so that brake pads contact brake discs.
- Switch the ignition on.

  Use the parking brake button to open, close and open the parking brake again.
- Switch off ignition.
- Adjust the brake fluid level to the maximum mark.
- Perform a functional check on the brake test stand to ensure compliance of the brake system with statutory guidelines.
- Attach mirror tag to inside mirror.

Additional Information

Overview of Tightening Torques

Brake disc to rear wheel hub — Used in step 610

M8	Renew screw.	Tightening torque	16 Nm

Brake caliper to wheel carrier, rear — Used in step 6

	Renew screw.	Tightening torque	110 Nm

Guide bolt (brake caliper on caliper carrier) — Used in step 8

M8			35 Nm

Brake disc to front wheel hub — Used in step 10

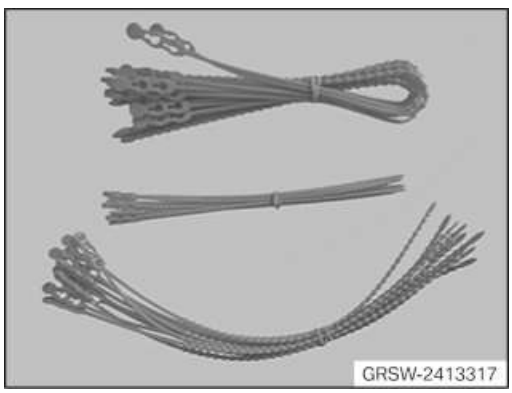
M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 10

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

Overview of Special Tools

2 413 317 Cable strap



Common — Used in step 38

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

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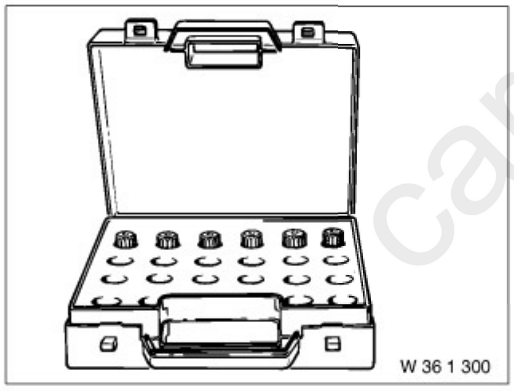
2 344 011 Tool



Common	Used in step 10
Usage	Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	08 08 12 (872)

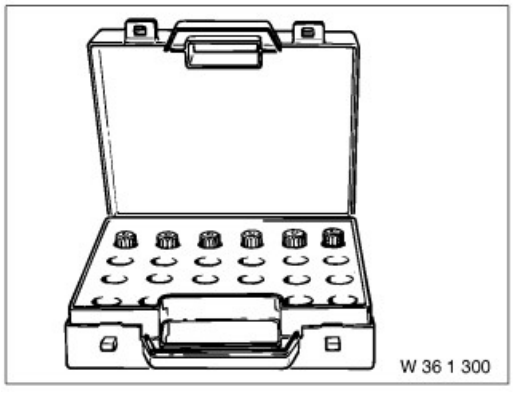
Replacement tools:

0 495 221 (36 1 323) Wheel stud



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

0 495 224 (36 1 326) Wheel stud



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

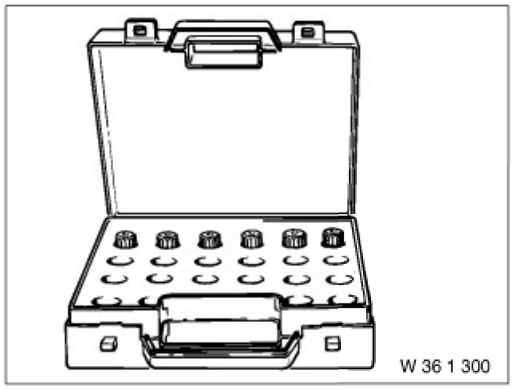
cardiagn.com

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



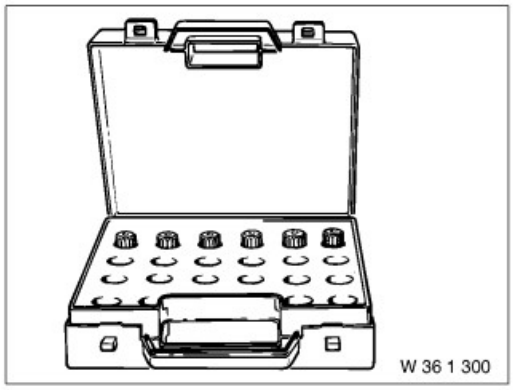
Common	Used in step 1
Usage	(Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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	

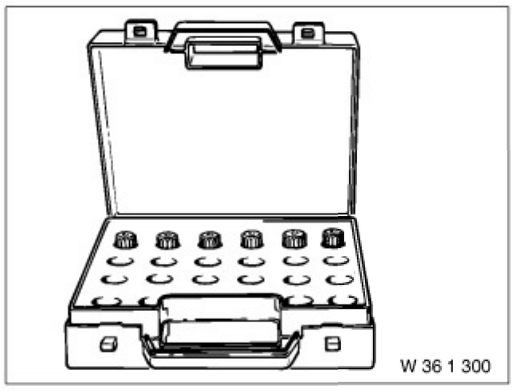
cardiagn.com

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	

Overview Technical Data

Minimum brake disc thickness (nominal dimension 330x20)	Used in step 4
Minimum brake disc thickness (brake disc 330x20)	18,4 mm

Minimum brake disc thickness (nominal dimension 345x24)	Used in step 4
Minimum brake disc thickness (brake disc 345x24)	22,4 mm

Minimum brake disc thickness (nominal dimension 370x24)	Used in step 4
Minimum brake disc thickness (brake disc 370x24)	22,4 mm

Links

Repair instructions	Used in step
34 00 x01 Guideline for applying brake pad paste on brake pads and caliper carrier	

catdiagn.com

34 21 200 Removing and installing/replacing both rear brake pads of disc brake

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.

CAUTION

Effects on other persons.

Danger of injury! Risk of damage!

- Make sure that no other persons are in or around the vehicle.

TECHNICAL INFORMATION

During work on the rear brake, it must be ensured that the button for the electromechanical parking brake cannot be pressed.

TECHNICAL INFORMATION

General information on changing the brake pads:

For vehicles older than 48 months it is recommended to replace the retaining spring or expanding spring.

The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

A CBS reset must be done after every brake pad exchange:

A CBS reset in the vehicle is possible in the event of a **partially ground down** brake pad wear sensor. The CBS display in the Central Information Display (CID) is active.

In the event of a brake pad wear sensor that is **not partially ground down**, a CBS reset is only possible with the diagnosis system. No CBS display in the Central Information Display (CID).

If bonded brake pads are installed, the brake pads must be renewed after releasing the adhesive strip.

TECHNICAL INFORMATION

To prevent damage to the surface coating: With floating callipers on the brake caliper mounting bracket or with fixed callipers in the brake caliper housing, do not clean the contact surfaces for the brake pads to the extent that it is possible.

Clean the contact surfaces with brake cleaner (BMW part number 83 19 2 154 780). Next, apply a thin coat of brake pad paste (BMW part number 83 19 2 158 851 for 3 g) or 83 19 2 158 852 fr 100 g).

Spread brake pad paste on the marked surfaces with a brush.

For additional information see: 34 00 ... brake pad paste

PRELIMINARY WORK

carmanuals.com

1 – Removing both rear wheels

▶ **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 .

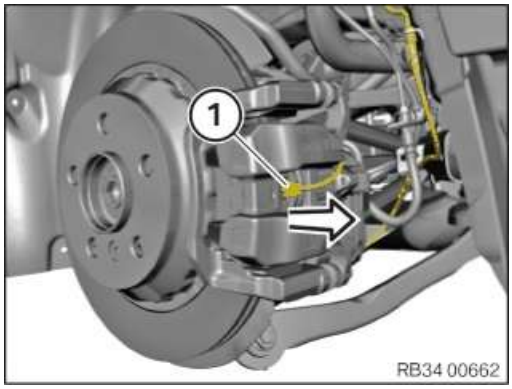
2 – Removing the brake pad wear sensor, rear

TECHNICAL INFORMATION

The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

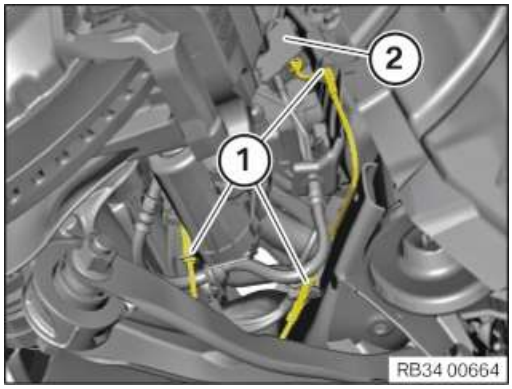
If a brake pad wear sensor that has already been ground has to be replaced even though the minimum brake pad thickness has not yet been reached, you must observe the following:

The new sliding contact must be filed down with a file to the same length as the sanded sliding contact.



- Remove the brake pad wear sensor (1) from the brake pad.

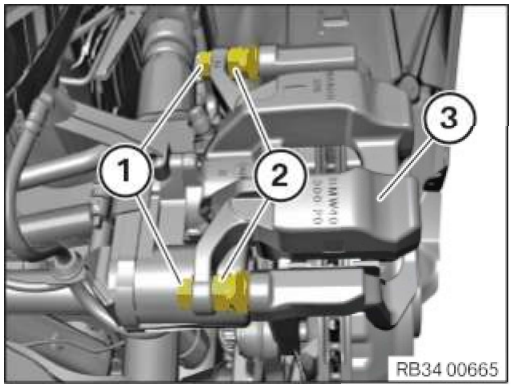
cardiagn.com



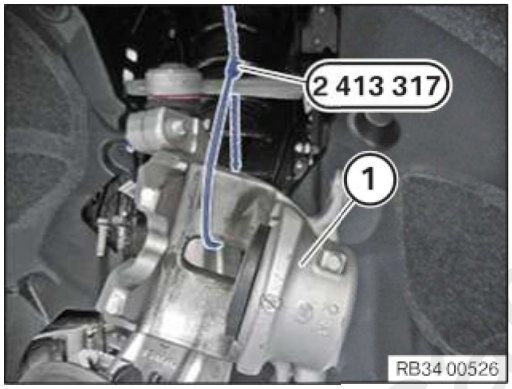
- Detach the brake pad wear sensor from the brackets (1).
- Open cover (2) and disconnect the plug connection.

MAIN WORK

3 – Remove rear brake pads

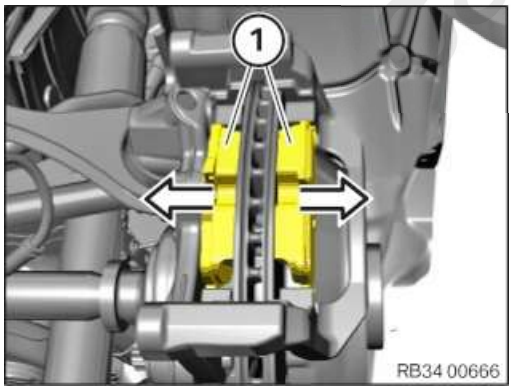


- Release the screws (1); if necessary use the hexagon head (2) for counter support.
- Remove brake caliper (3).



- Tie up brake calliper (1) using special tool (cable strap) 2 413 317.

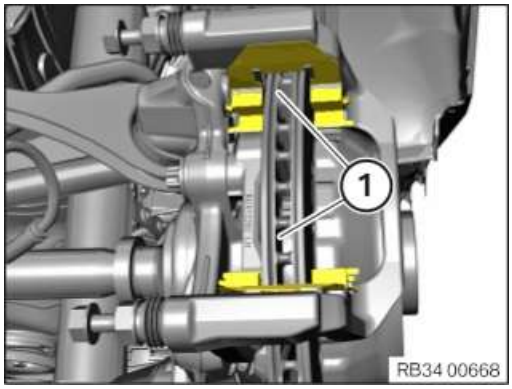
  The brake caliper must not hang on the brake hose.



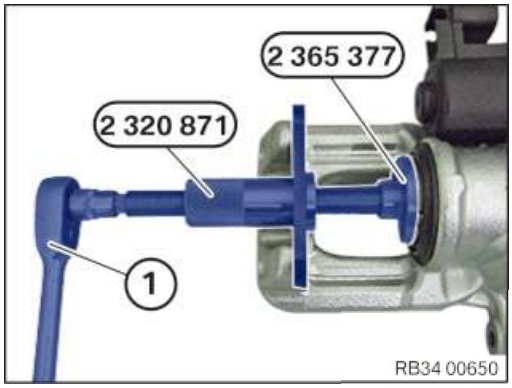
- Remove the brake pads (1) from the brake caliper in direction of arrow.
- Mark any worn brake pads.

  If the brake pad wear exists on one side, they must not be mixed up.

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- Remove the sliding plates (1).



TECHNICAL INFORMATION

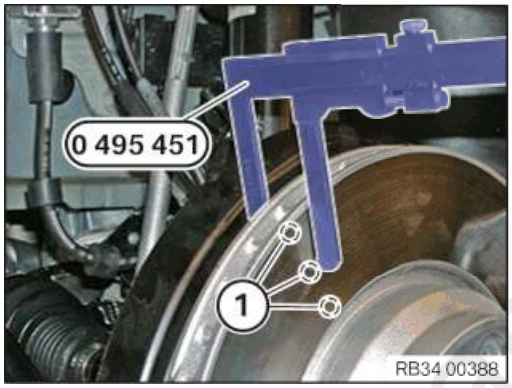
When pressing the brake piston back, note the brake fluid level in the expansion tank.

Overflowing brake fluid will damage the paintwork.

- Press back the brake piston using the special tools and .
- Use the reversible ratchet (1) to turn the brake piston back to the first end stop.

  Avoid turning the actuator!

4 – Measure minimum brake disc thickness (rear brake)



- Check minimum brake disc thickness:

  Place the special tool at three measuring points in area (1) and measure.

  Compare measuring result and lowest value with setpoint value.

  New brake pads may only be installed if the brake disk thickness is greater than the minimum brake disc thickness.

Minimum brake disc thickness (nominal dimension 330x20)

Minimum brake disc thickness (brake disc 330x20)	18,4 mm

Minimum brake disc thickness (nominal dimension 345x24)

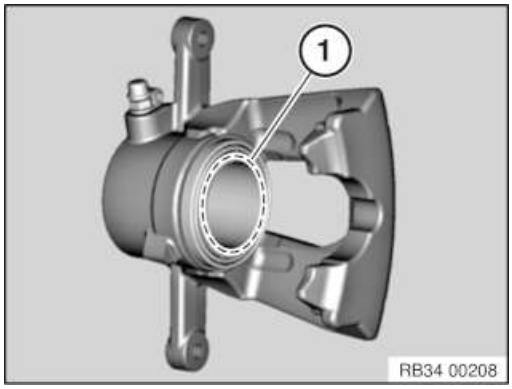
Minimum brake disc thickness (brake disc 345x24)	22,4 mm

Minimum brake disc thickness (nominal dimension 370x24)

Minimum brake disc thickness (brake disc 370x24)	22,4 mm

5 – Grease brake pads, caliper carrier and brake caliper with brake pad paste

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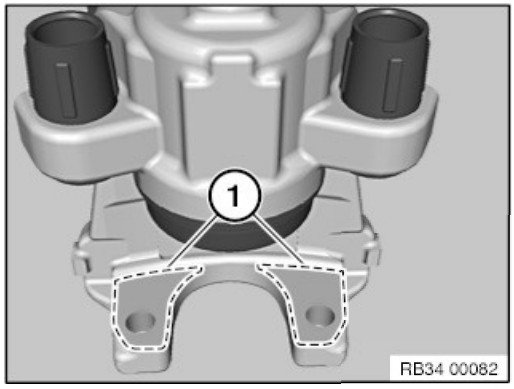


- Clean contact surface (1) of the brake piston with brake cleaner and apply a thin coat of brake pad paste.

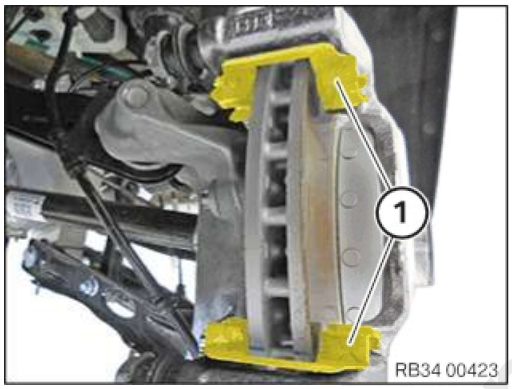
Expendable materials

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

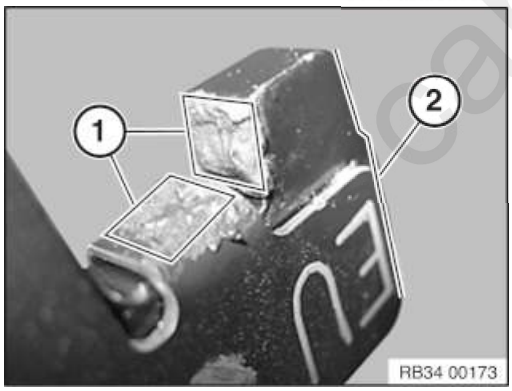
- Check dust boots for damage; renew if necessary.



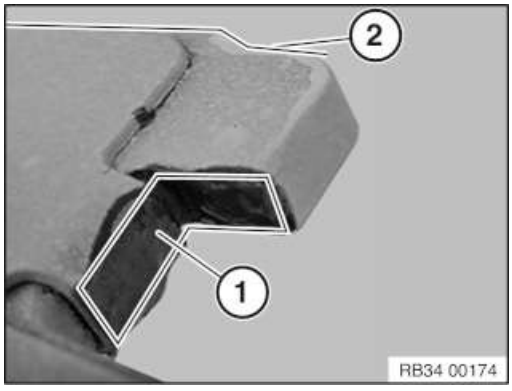
- Clean contact surface (1) of the brake piston with brake cleaner and apply a thin coat of brake pad paste.



- Mount the sliding plates (1).

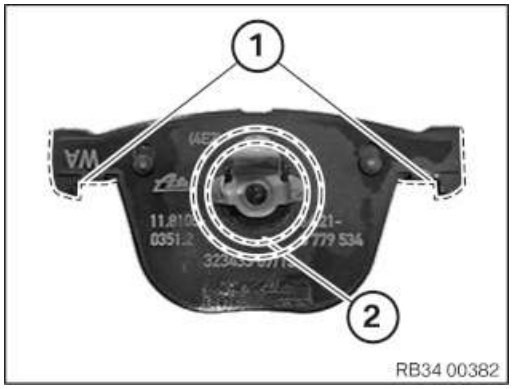


- Apply a thin coat of brake pad paste to the T-head of the inner brake pad in the areas (1) and (2).

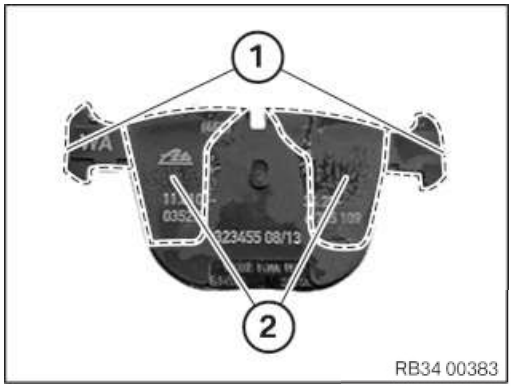


- Apply a thin coat of brake pad paste to the T-head of the inner brake pad in the areas (1) and (2).

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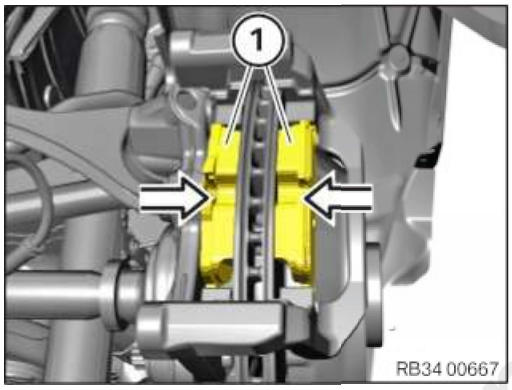


- Apply a thin coat of brake pad paste to the contact surface in the areas (1) and (2).

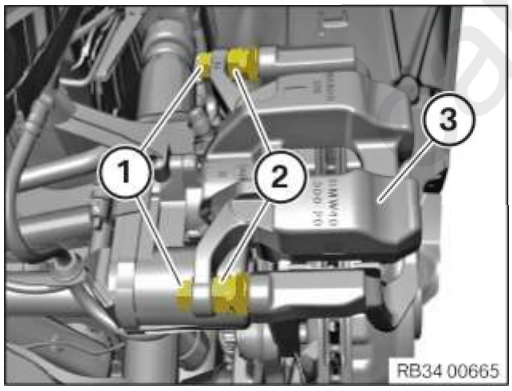


- Apply a thin coat of brake pad paste to the contact surface in the areas (1) and (2).

6 – Install rear brake pads



- Install the brake pads (1) in the direction of the arrow.



- Remove the special tool (cable strap) 2 413 317.
- Mount brake caliper (3).
- Renew screws (1).

  Parts: Bolts

- Tighten the screws (1), if applicable, hold against the hexagon head (2).

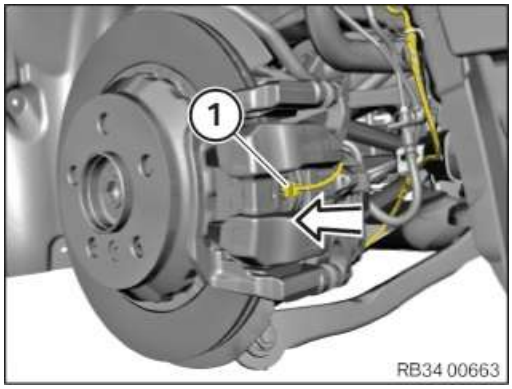
Guide bolt (brake caliper on caliper carrier)

M8			35 Nm

POSTPROCESSES

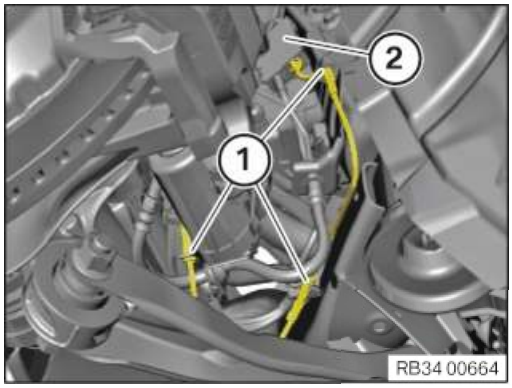
7 – Install rear brake pad sensor

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- Install the brake pad wear sensor (2) in the brake pad in the direction of the arrow.

  Ensure brake pad wear sensor fits correctly in brake pad.



- Attach cable of brake pad wear sensor in brackets (1).
- Connect the plug connection and close the cover (2).

8 – Installing both rear wheels

▸ **Mounting the wheel**



TECHNICAL INFORMATION

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

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

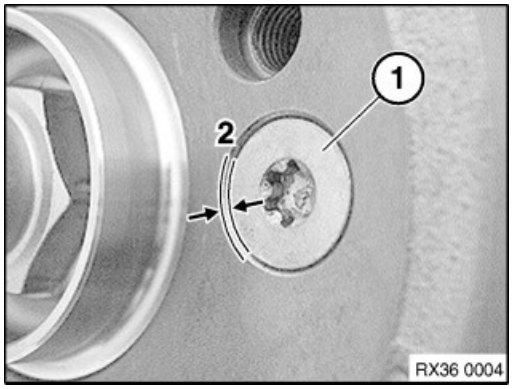
  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.



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

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).

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

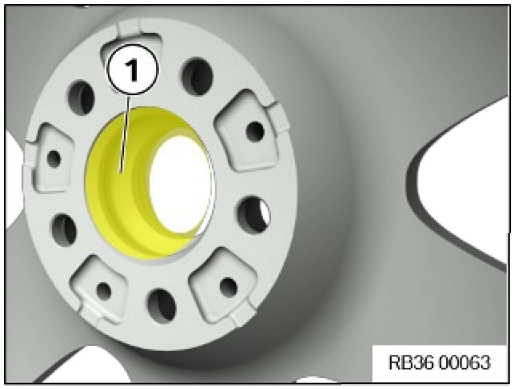
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

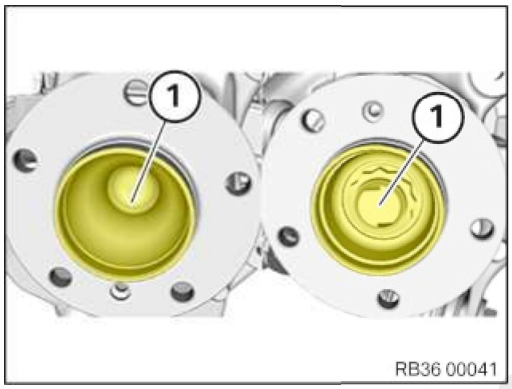
M8	Renew screw.	Tightening torque	16 Nm



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

Expendable materials

Brake block paste * 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 * 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.

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TECHNICAL INFORMATION

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

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

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9 – Start-up or bedding-in of new brake pads and discs (rear brake)

TECHNICAL INFORMATION

When exchanging brake pads, reset the CBS display in accordance with factory specification (CBS reset).

Carry out test braking while driving at low speed because the effectiveness of the brakes may be reduced during the initial braking operations.

Exaggerated emergency and continuous braking operations for faster bedding-in are not permitted.

Advise the customer not to perform intentional emergency braking operations for the first 200 km after the brakes have been replaced.

- Fully depress brake pedal several times so that brake pads contact brake discs.
- Switch the ignition on.

  Use the parking brake button to open, close and open the parking brake again.
- Switch off ignition.
- Adjust the brake fluid level to the maximum mark.
- Perform a functional check on the brake test stand to ensure compliance of the brake system with statutory guidelines.
- Attach mirror tag to inside mirror.

Additional Information

Overview of Tightening Torques

Guide bolt (brake caliper on caliper carrier) — Used in step 6

M8			35 Nm

Brake disc to front wheel hub — Used in step 8

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 8

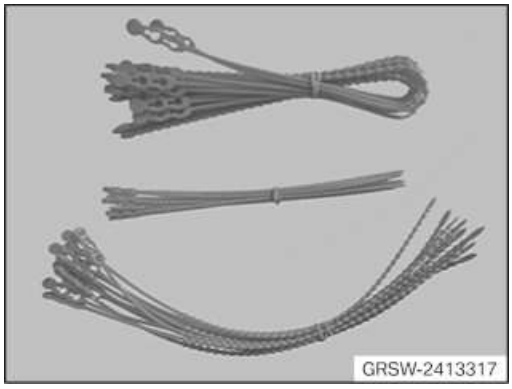
M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 8

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 36

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

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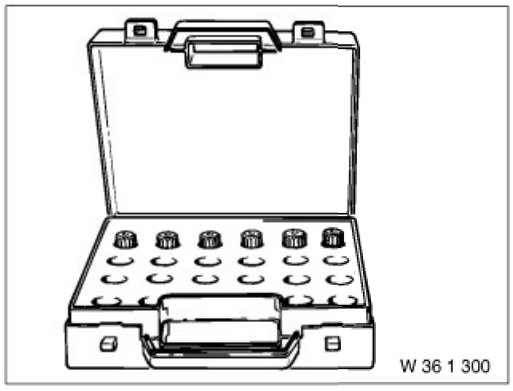
2 344 011 Tool



Common	Used in step 8
Usage	Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	08 08 12 (872)

Replacement tools:

0 495 221 (36 1 323) Wheel stud



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

0 495 224 (36 1 326) Wheel stud



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

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0 495 225 (36 1 327) Wheel stud



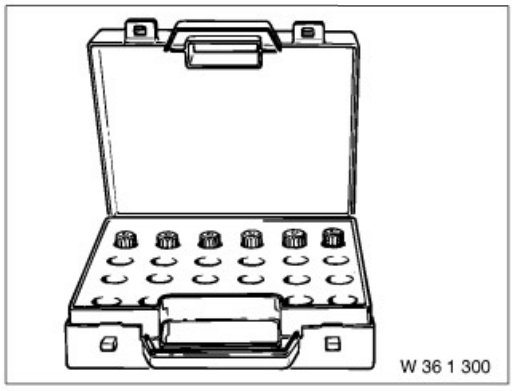
Common	Used in step 1
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 226 (36 1 328) Wheel stud



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

0 495 227 (36 1 329) Wheel stud



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

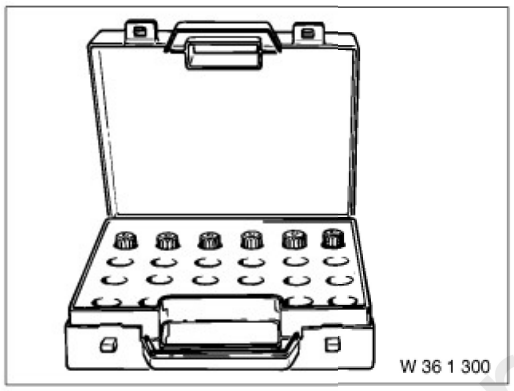
cardiagn.com

0 495 228 (36 1 331) Wheel stud



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

0 495 229 (36 1 332) Wheel stud



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

0 495 230 (36 1 333) Wheel stud



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

Overview Technical Data

Minimum brake disc thickness (nominal dimension 330x20)	Used in step 4
Minimum brake disc thickness (brake disc 330x20)	18,4 mm

Minimum brake disc thickness (nominal dimension 345x24)	Used in step 4
Minimum brake disc thickness (brake disc 345x24)	22,4 mm

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Minimum brake disc thickness (nominal dimension 370x24)	Used in step 4
Minimum brake disc thickness (brake disc 370x24)	22,4 mm

Links

Repair instructions	Used in step
34 00 x01 Guideline for applying brake pad paste on brake pads and caliper carrier	

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34 21 280 Removing and installing/replacing rear left protective plate

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.

CAUTION

Effects on other persons.

Danger of injury! Risk of damage!

- Make sure that no other persons are in or around the vehicle.

TECHNICAL INFORMATION

During work on the rear brake, it must be ensured that the button for the electromechanical parking brake cannot be pressed.

TECHNICAL INFORMATION

General information on changing the brake pads:

For vehicles older than 48 months it is recommended to replace the retaining spring or expanding spring.

The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

A CBS reset must be done after every brake pad exchange:

A CBS reset in the vehicle is possible in the event of a **partially ground down** brake pad wear sensor. The CBS display in the Central Information Display (CID) is active.

In the event of a brake pad wear sensor that is **not partially ground down**, a CBS reset is only possible with the diagnosis system. No CBS display in the Central Information Display (CID).

If bonded brake pads are installed, the brake pads must be renewed after releasing the adhesive strip.

TECHNICAL INFORMATION

To prevent damage to the surface coating: With floating callipers on the brake caliper mounting bracket or with fixed callipers in the brake caliper housing, do not clean the contact surfaces for the brake pads to the extent that it is possible.

Clean the contact surfaces with brake cleaner (BMW part number 83 19 2 154 780). Next, apply a thin coat of brake pad paste (BMW part number 83 19 2 158 851 for 3 g) or 83 19 2 158 852 fr 100 g).

Spread brake pad paste on the marked surfaces with a brush.

For additional information see: 34 00 ... brake pad paste

PRELIMINARY WORK

1 – Removing both rear wheels

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1 – Removing both rear wheels

▸ **Removing the wheel**



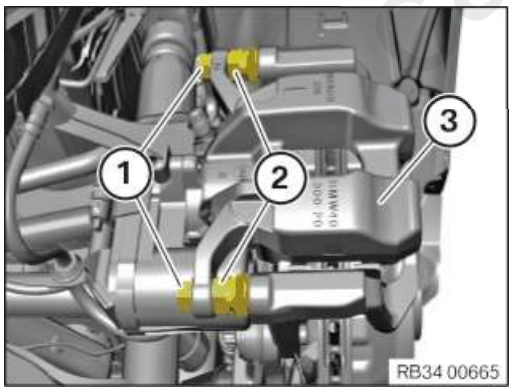
- In vehicles with M Carbon ceramic brake: The wheel assembly jack must be used to remove the wheel (see workshop equipment).

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



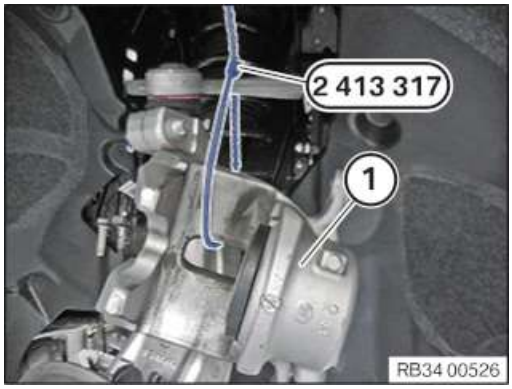
- If several wheels are removed simultaneously: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Release the wheel bolts (arrows) crosswise and remove the wheel.
- To release and tighten wheel bolts with a security code: Use a suitable adapter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

2 – Remove rear brake pads



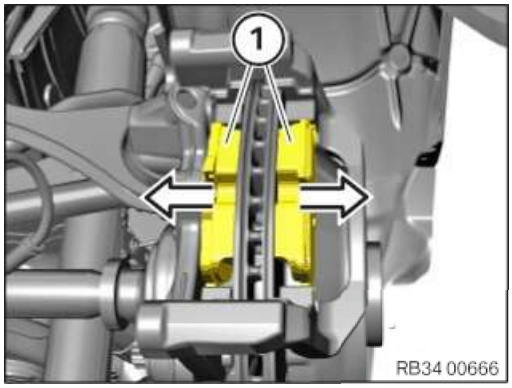
- Release the screws (1); if necessary use the hexagon head (2) for counter support.
- Remove brake caliper (3).

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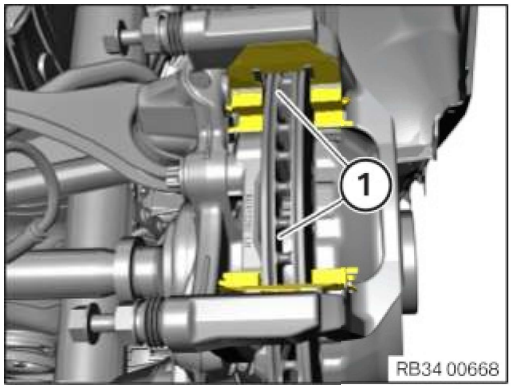
- Tie up brake calliper (1) using special tool (cable strap) 2 413 317.

  The brake caliper must not hang on the brake hose.

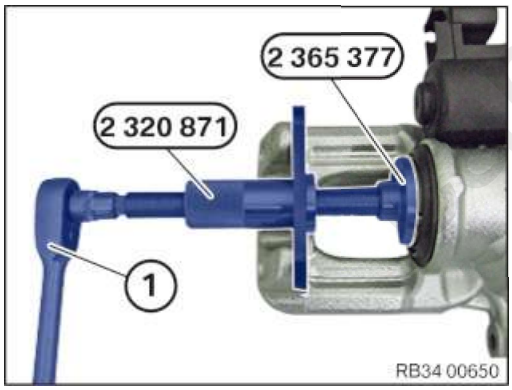


- Remove the brake pads (1) from the brake caliper in direction of arrow.
- Mark any worn brake pads.

  If the brake pad wear exists on one side, they must not be mixed up.



- Remove the sliding plates (1).



TECHNICAL INFORMATION

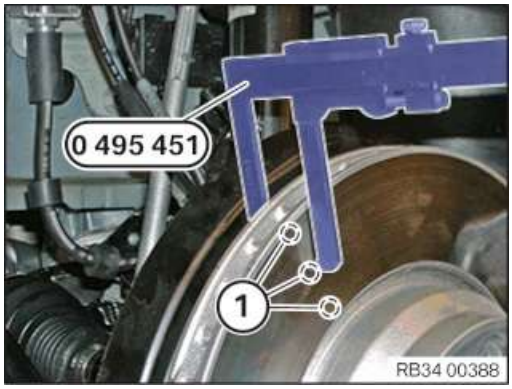
When pressing the brake piston back, note the brake fluid level in the expansion tank.

Overflowing brake fluid will damage the paintwork.

- Press back the brake piston using the special tools and .
- Use the reversible ratchet (1) to turn the brake piston back to the first end stop.

  Avoid turning the actuator!

3 – Measure minimum brake disc thickness (rear brake)



- Check minimum brake disc thickness:

  Place the special tool at three measuring points in area (1) and measure.

  Compare measuring result and lowest value with setpoint value.

  New brake pads may only be installed if the brake disk thickness is greater than the minimum brake disc thickness.

Minimum brake disc thickness (nominal dimension 330x20)

Minimum brake disc thickness (brake disc 330x20)	18,4 mm

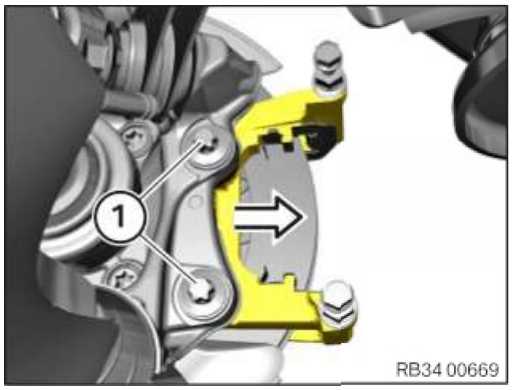
Minimum brake disc thickness (nominal dimension 345x24)

Minimum brake disc thickness (brake disc 345x24)	22,4 mm

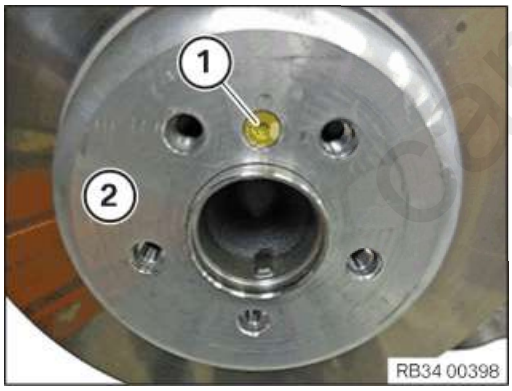
Minimum brake disc thickness (nominal dimension 370x24)

Minimum brake disc thickness (brake disc 370x24)	22,4 mm

4 – Remove rear brake disc



- Loosen the screws (1) and remove the caliper carrier.



- Loosen screw (1).

TECHNICAL INFORMATION

Note the following for the removal of the brake disc:

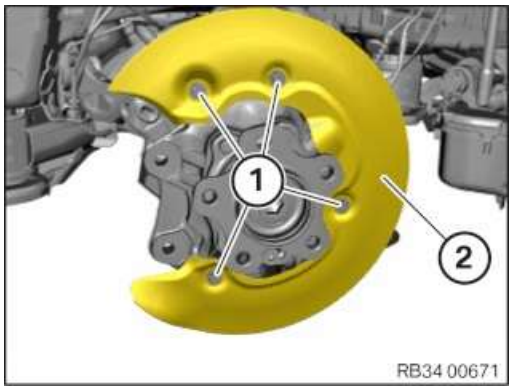
Do not under any circumstances strike the friction ring with a hammer or similar tool. If necessary, carefully tap with a rubber mallet against the brake disc chamber.

- Remove brake disc(2).

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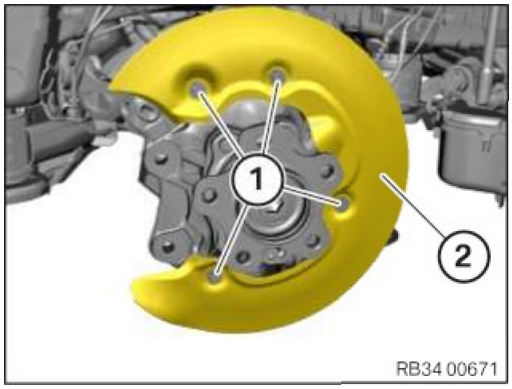
MAIN WORK

5 – Remove rear brake guard plate



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

6 – Mount rear brake guard plate



- Install brake guard plate (2).
- Insert screws (1) and tighten.

Brake protection plate on the rear wheel carrier

M6x12	Renew screw.	Tightening torque	8 Nm

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POSTPROCESSES

7 – Installing the rear brake disc

TECHNICAL INFORMATION

Brake discs must only be replaced in pairs (per axle).
Fit new brake discs only together with new brake pads.



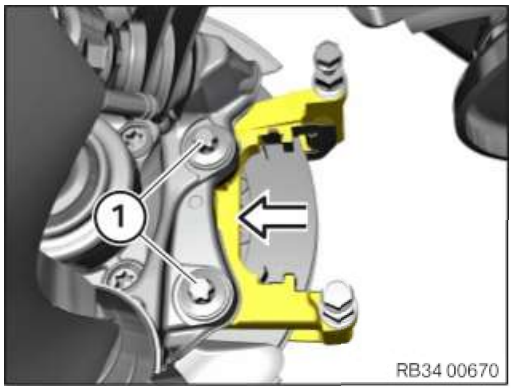
- Thoroughly clean the contact surface of the wheel hub and remove traces of corrosion if necessary.

  Irregularities in the contact surface can cause distortion in the brake disc!
- Mount brake disc (2).
- Position and tighten the screw (1).
- Renew screw.

  Parts: Screw

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm



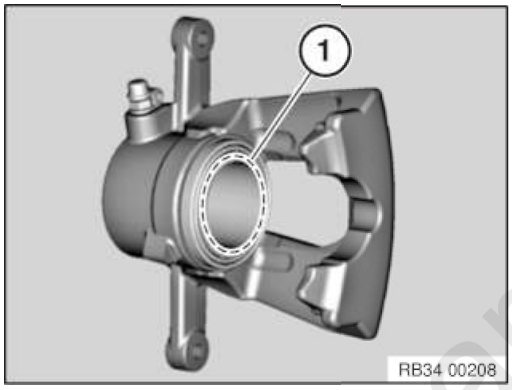
- Mount caliper carrier.
- Insert screws (1) and tighten.
- Renew screws.

  Parts: Bolts

Brake caliper to wheel carrier, rear

	Renew screw.	Tightening torque	110 Nm

8 – Grease brake pads, caliper carrier and brake caliper with brake pad paste

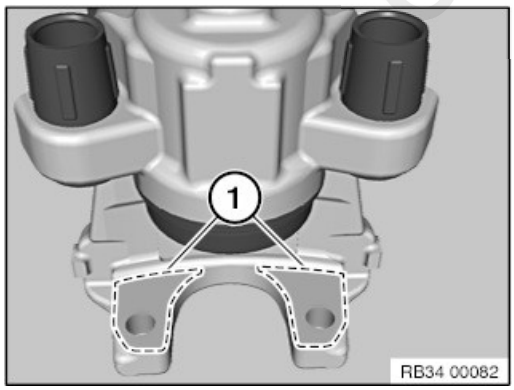


- Clean contact surface (1) of the brake piston with brake cleaner and apply a thin coat of brake pad paste.

Expendable materials

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

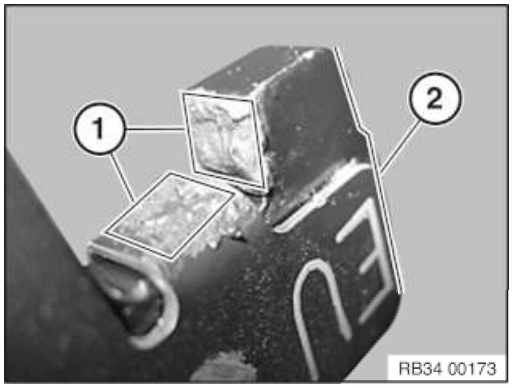
- Check dust boots for damage; renew if necessary.



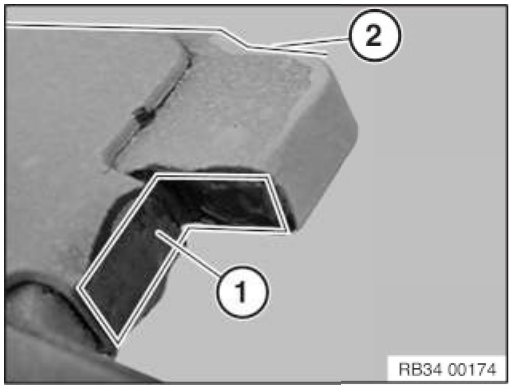
- Clean contact surface (1) of the brake piston with brake cleaner and apply a thin coat of brake pad paste.



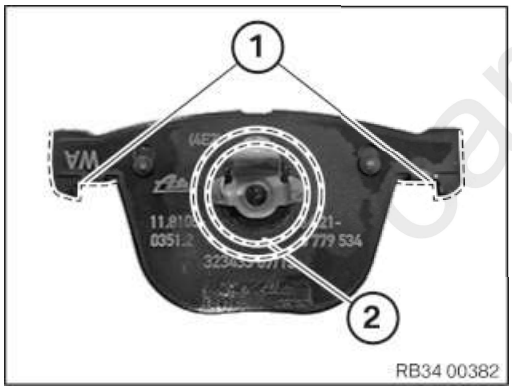
- Mount the sliding plates (1).



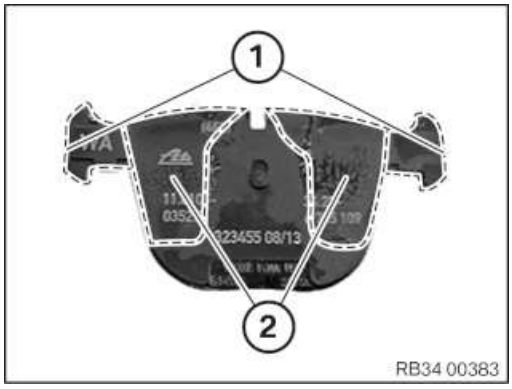
- Apply a thin coat of brake pad paste to the T-head of the inner brake pad in the areas (1) and (2).



- Apply a thin coat of brake pad paste to the T-head of the inner brake pad in the areas (1) and (2).



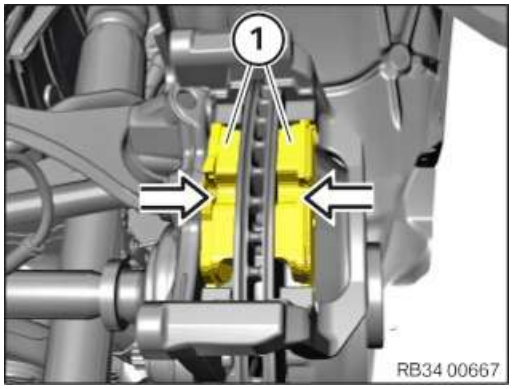
- Apply a thin coat of brake pad paste to the contact surface in the areas (1) and (2).



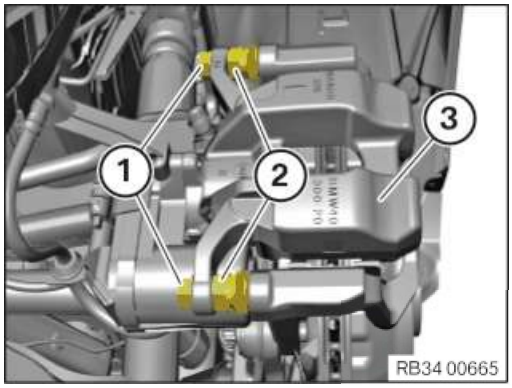
- Apply a thin coat of brake pad paste to the contact surface in the areas (1) and (2).

9 – Install rear brake pads

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- Install the brake pads (1) in the direction of the arrow.



- Remove the special tool (cable strap) 2 413 317.
- Mount brake caliper (3).
- Renew screws (1).

  Parts: Bolts
- Tighten the screws (1), if applicable, hold against the hexagon head (2).

Guide bolt (brake caliper on caliper carrier)

M8			35 Nm

10 – Installing both rear wheels

▸ Mounting the wheel



TECHNICAL INFORMATION

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

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

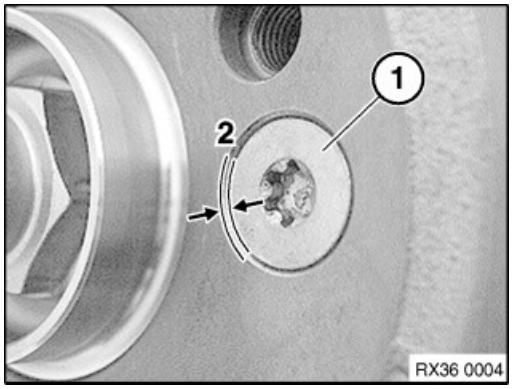
  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.



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

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).

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

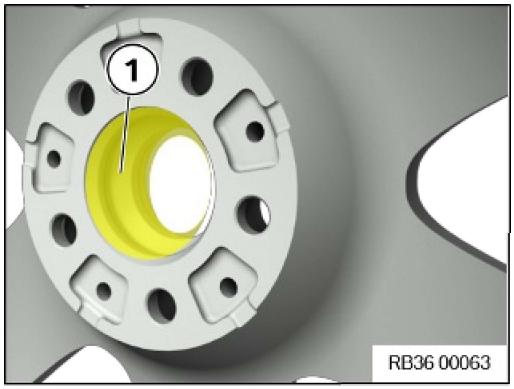
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

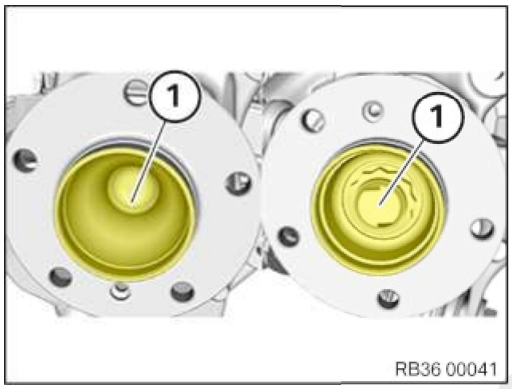
M8	Renew screw.	Tightening torque	16 Nm



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

Expendable materials

Brake block paste * 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 * 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.

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TECHNICAL INFORMATION

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

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

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11 – Start-up or bedding-in of new brake pads and discs (rear brake)

TECHNICAL INFORMATION

When exchanging brake pads, reset the CBS display in accordance with factory specification (CBS reset).

Carry out test braking while driving at low speed because the effectiveness of the brakes may be reduced during the initial braking operations.

Exaggerated emergency and continuous braking operations for faster bedding-in are not permitted.

Advise the customer not to perform intentional emergency braking operations for the first 200 km after the brakes have been replaced.

- Fully depress brake pedal several times so that brake pads contact brake discs.
- Switch the ignition on.

  Use the parking brake button to open, close and open the parking brake again.
- Switch off ignition.
- Adjust the brake fluid level to the maximum mark.
- Perform a functional check on the brake test stand to ensure compliance of the brake system with statutory guidelines.
- Attach mirror tag to inside mirror.

Additional Information

Overview of Tightening Torques

Brake protection plate on the rear wheel carrier — Used in step 6

M6x12	Renew screw.	Tightening torque	8 Nm

Brake disc to rear wheel hub — Used in step 710

M8	Renew screw.	Tightening torque	16 Nm

Brake caliper to wheel carrier, rear — Used in step 7

	Renew screw.	Tightening torque	110 Nm

Guide bolt (brake caliper on caliper carrier) — Used in step 9

M8			35 Nm

Brake disc to front wheel hub — Used in step 10

M8	Renew screw.	Tightening torque	16 Nm

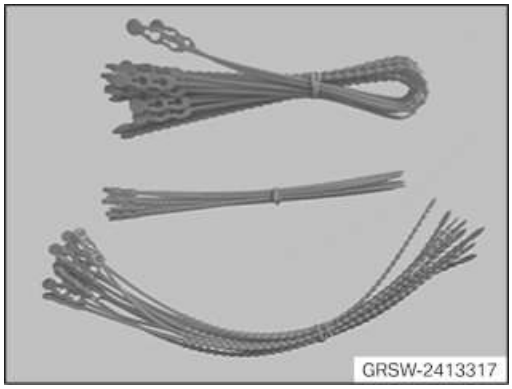
Wheel bolts — Used in step 10

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

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2 413 317 Cable strap



Common	Used in step 29
Usage	The "Cable ties" parts set consists of 3 items as follows: ABV232 Length: 320 mm colour: RedABV250 Length: 500 mm colour: RedABVS270 Length: 665 mm colour: Red
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	01 47 15 (332)

2 344 011 Tool



Common	Used in step 10
Usage	Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	08 08 12 (872)

Replacement tools:

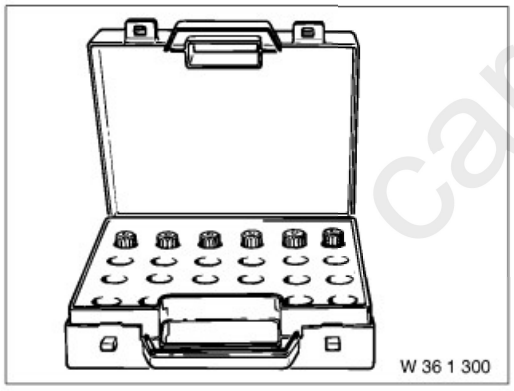
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0 495 221 (36 1 323) Wheel stud



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

0 495 224 (36 1 326) Wheel stud



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

0 495 225 (36 1 327) Wheel stud



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

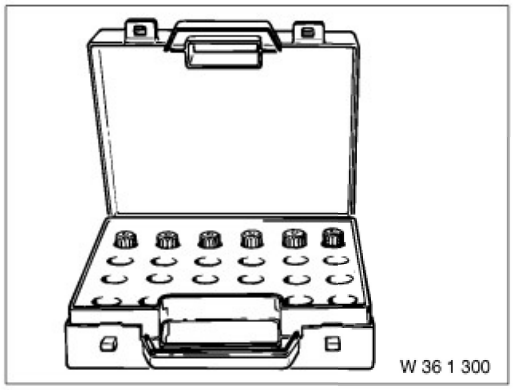
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0 495 226 (36 1 328) Wheel stud



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

0 495 227 (36 1 329) Wheel stud



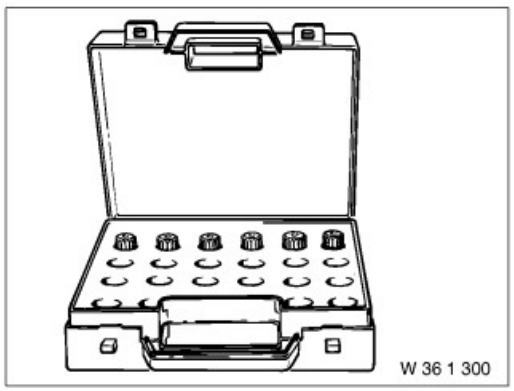
Common	Used in step 1
Usage	(Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 228 (36 1 331) Wheel stud



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

0 495 229 (36 1 332) Wheel stud



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

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0 495 230 (36 1 333) Wheel stud



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

Overview Technical Data

Minimum brake disc thickness (nominal dimension 330x20)	Used in step 3
Minimum brake disc thickness (brake disc 330x20)	18,4 mm

Minimum brake disc thickness (nominal dimension 345x24)	Used in step 3
Minimum brake disc thickness (brake disc 345x24)	22,4 mm

Minimum brake disc thickness (nominal dimension 370x24)	Used in step 3
Minimum brake disc thickness (brake disc 370x24)	22,4 mm

Links

Repair instructions	**Used in step**
34 00 x01 Guideline for applying brake pad paste on brake pads and caliper carrier	

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34 21 175 Replacing rear right brake pad

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.

CAUTION

Effects on other persons.

Danger of injury! Risk of damage!

- Make sure that no other persons are in or around the vehicle.

TECHNICAL INFORMATION

During work on the rear brake, it must be ensured that the button for the electromechanical parking brake cannot be pressed.

TECHNICAL INFORMATION

General information on changing the brake pads:

For vehicles older than 48 months it is recommended to replace the retaining spring or expanding spring.

The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

A CBS reset must be done after every brake pad exchange:

A CBS reset in the vehicle is possible in the event of a **partially ground down** brake pad wear sensor. The CBS display in the Central Information Display (CID) is active.

In the event of a brake pad wear sensor that is **not partially ground down**, a CBS reset is only possible with the diagnosis system. No CBS display in the Central Information Display (CID).

If bonded brake pads are installed, the brake pads must be renewed after releasing the adhesive strip.

TECHNICAL INFORMATION

To prevent damage to the surface coating: With floating callipers on the brake caliper mounting bracket or with fixed callipers in the brake caliper housing, do not clean the contact surfaces for the brake pads to the extent that it is possible.

Clean the contact surfaces with brake cleaner (BMW part number 83 19 2 154 780). Next, apply a thin coat of brake pad paste (BMW part number 83 19 2 158 851 for 3 g) or 83 19 2 158 852 fr 100 g).

Spread brake pad paste on the marked surfaces with a brush.

For additional information see: 34 00 ... brake pad paste

PRELIMINARY WORK

1 – Removing both rear wheels

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1 – Removing both rear wheels

▸ **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 .

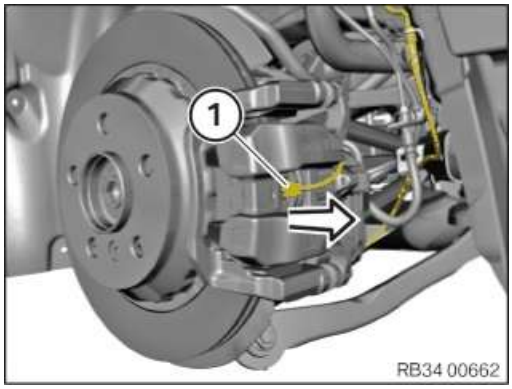
2 – Removing the brake pad wear sensor, rear

TECHNICAL INFORMATION

The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

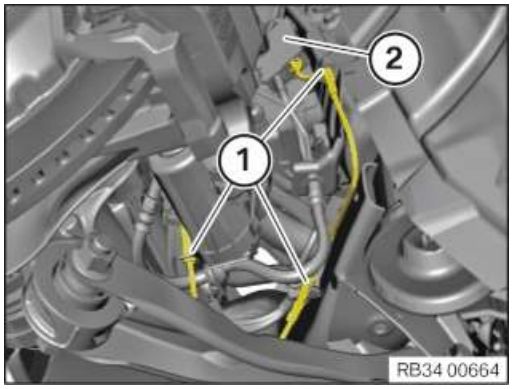
If a brake pad wear sensor that has already been ground has to be replaced even though the minimum brake pad thickness has not yet been reached, you must observe the following:

The new sliding contact must be filed down with a file to the same length as the sanded sliding contact.



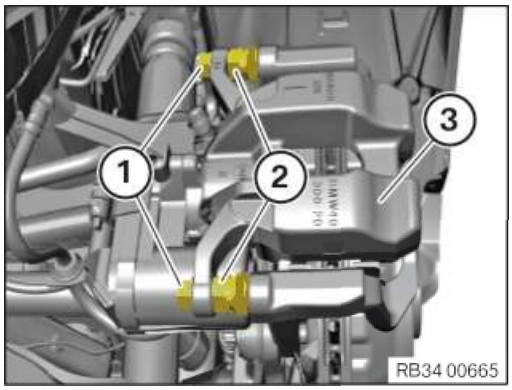
- Remove the brake pad wear sensor (1) from the brake pad.

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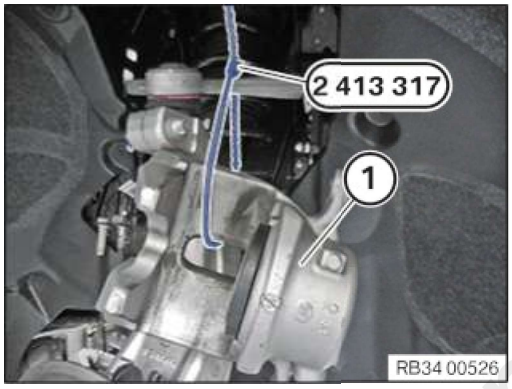


- Detach the brake pad wear sensor from the brackets (1).
- Open cover (2) and disconnect the plug connection.

3 – Remove rear brake pads

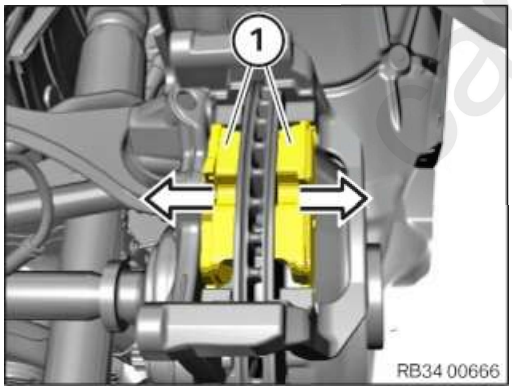


- Release the screws (1); if necessary use the hexagon head (2) for counter support.
- Remove brake caliper (3).



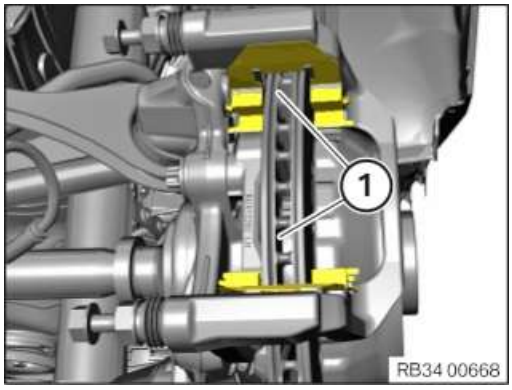
- Tie up brake calliper (1) using special tool (cable strap) 2 413 317.

  The brake caliper must not hang on the brake hose.



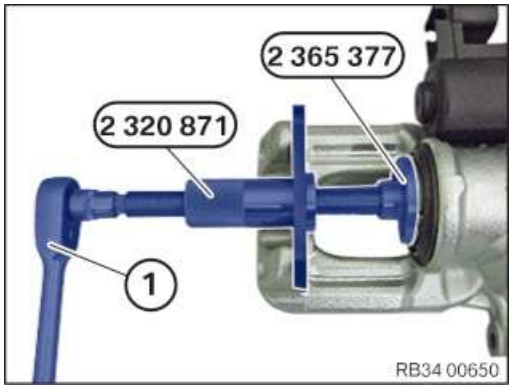
- Remove the brake pads (1) from the brake caliper in direction of arrow.
- Mark any worn brake pads.

  If the brake pad wear exists on one side, they must not be mixed up.



- Remove the sliding plates (1).

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TECHNICAL INFORMATION

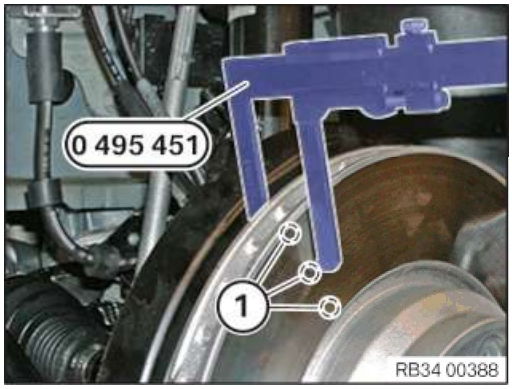
When pressing the brake piston back, note the brake fluid level in the expansion tank.

Overflowing brake fluid will damage the paintwork.

- Press back the brake piston using the special tools and .
- Use the reversible ratchet (1) to turn the brake piston back to the first end stop.

  Avoid turning the actuator!

4 – Measure minimum brake disc thickness (rear brake)



- Check minimum brake disc thickness:

  Place the special tool at three measuring points in area (1) and measure.

  Compare measuring result and lowest value with setpoint value.

  New brake pads may only be installed if the brake disk thickness is greater than the minimum brake disc thickness.

Minimum brake disc thickness (nominal dimension 330x20)

Minimum brake disc thickness (brake disc 330x20)	18,4 mm

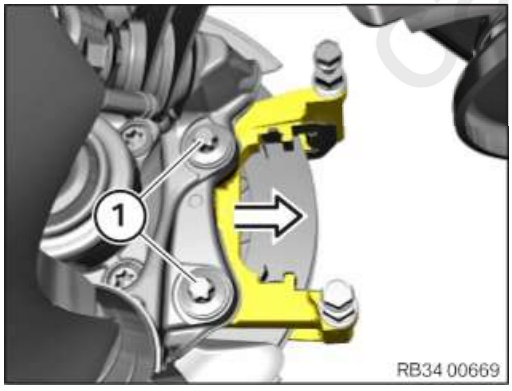
Minimum brake disc thickness (nominal dimension 345x24)

Minimum brake disc thickness (brake disc 345x24)	22,4 mm

Minimum brake disc thickness (nominal dimension 370x24)

Minimum brake disc thickness (brake disc 370x24)	22,4 mm

5 – Remove rear brake disc



- Loosen the screws (1) and remove the caliper carrier.

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- Loosen screw (1).

TECHNICAL INFORMATION

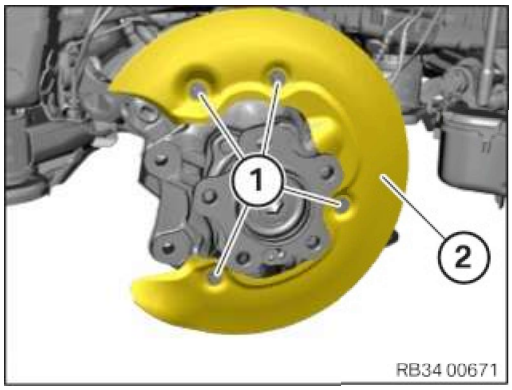
Note the following for the removal of the brake disc:

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).

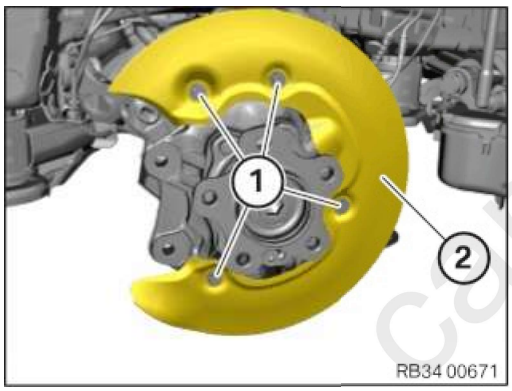
MAIN WORK

6 – Remove rear brake guard plate



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

7 – Mount rear brake guard plate



- Install brake guard plate (2).
- Insert screws (1) and tighten.

Brake protection plate on the rear wheel carrier

M6x12	Renew screw.	Tightening torque	8 Nm

POSTPROCESSES

8 – Installing the rear brake disc

TECHNICAL INFORMATION

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

Fit new brake discs only together with new brake pads.

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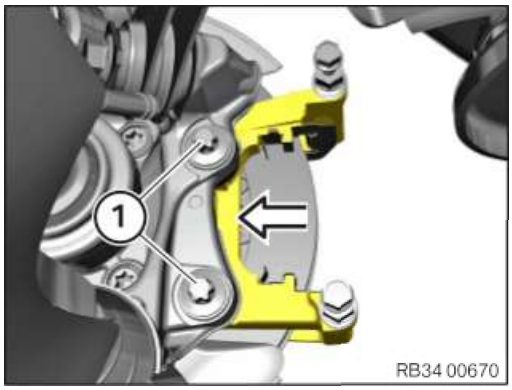
- Thoroughly clean the contact surface of the wheel hub and remove traces of corrosion if necessary.

  Irregularities in the contact surface can cause distortion in the brake disc!
- Mount brake disc (2).
- Position and tighten the screw (1).
- Renew screw.

  Parts: Screw

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm



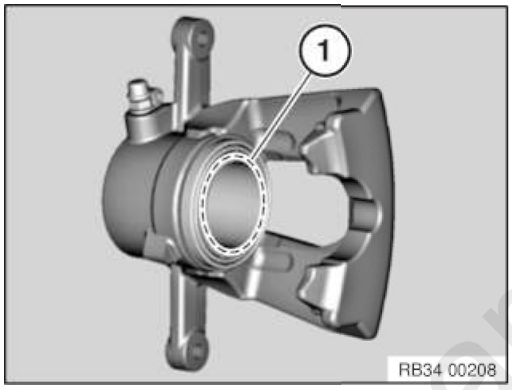
- Mount caliper carrier.
- Insert screws (1) and tighten.
- Renew screws.

  Parts: Bolts

Brake caliper to wheel carrier, rear

	Renew screw.	Tightening torque	110 Nm

9 – Grease brake pads, caliper carrier and brake caliper with brake pad paste

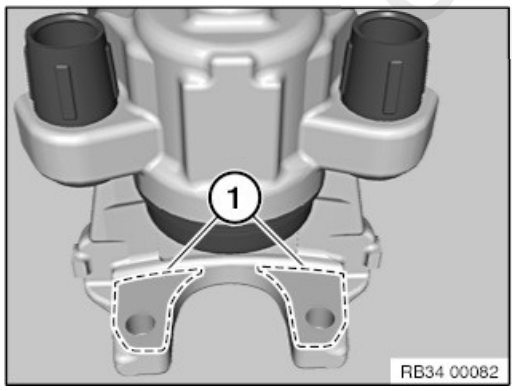


- Clean contact surface (1) of the brake piston with brake cleaner and apply a thin coat of brake pad paste.

Expendable materials

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

- Check dust boots for damage; renew if necessary.

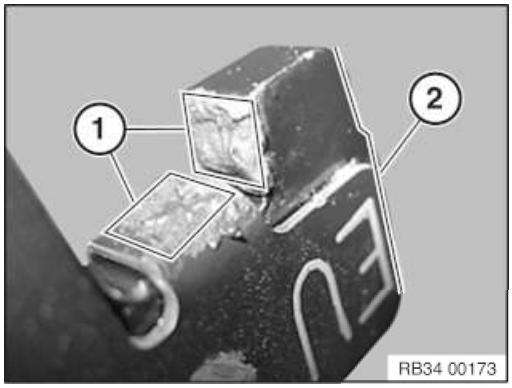


- Clean contact surface (1) of the brake piston with brake cleaner and apply a thin coat of brake pad paste.

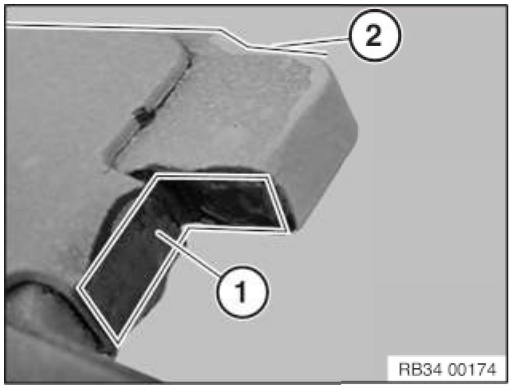
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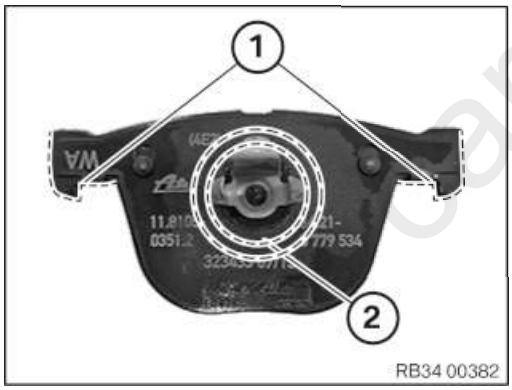
- Mount the sliding plates (1).



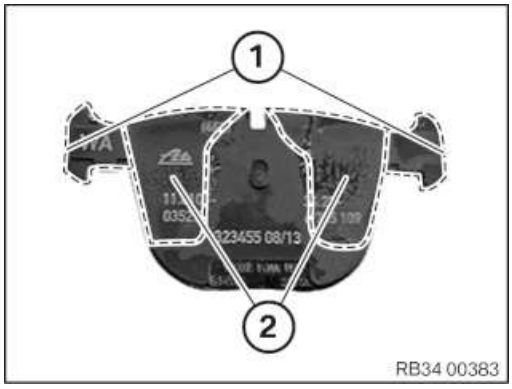
- Apply a thin coat of brake pad paste to the T-head of the inner brake pad in the areas (1) and (2).



- Apply a thin coat of brake pad paste to the T-head of the inner brake pad in the areas (1) and (2).



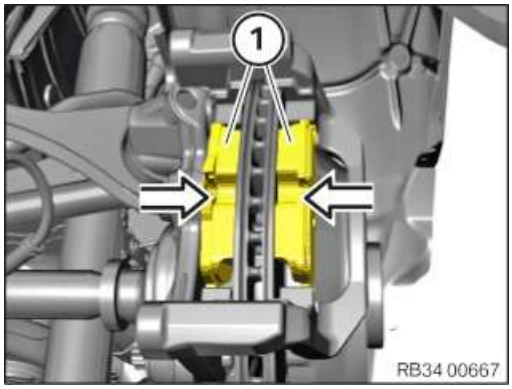
- Apply a thin coat of brake pad paste to the contact surface in the areas (1) and (2).



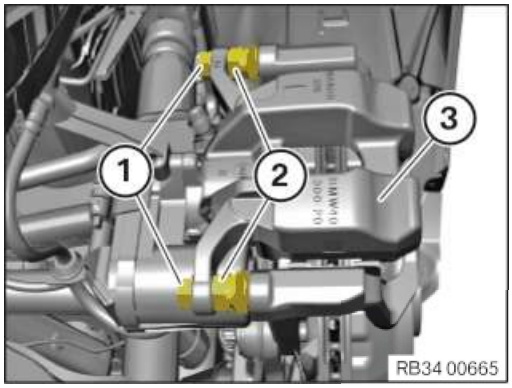
- Apply a thin coat of brake pad paste to the contact surface in the areas (1) and (2).

10 – Install rear brake pads

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- Install the brake pads (1) in the direction of the arrow.



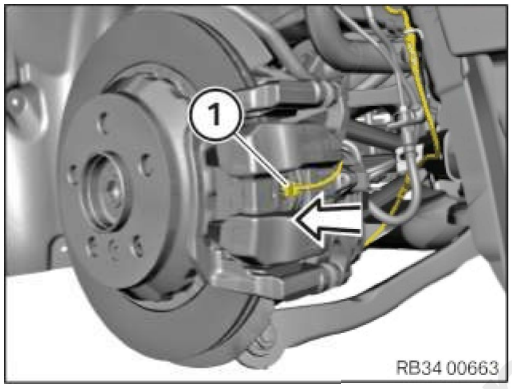
- Remove the special tool (cable strap) 2 413 317.
- Mount brake caliper (3).
- Renew screws (1).

  Parts: Bolts
- Tighten the screws (1), if applicable, hold against the hexagon head (2).

Guide bolt (brake caliper on caliper carrier)

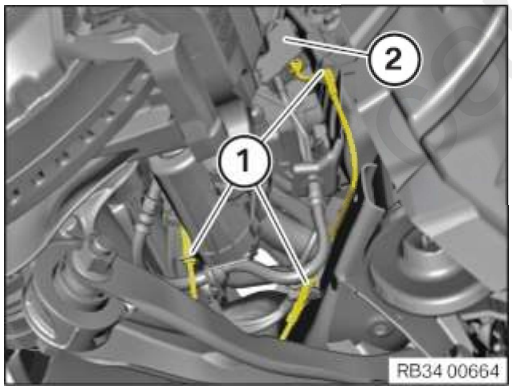
M8			35 Nm

11 – Install rear brake pad sensor



- Install the brake pad wear sensor (2) in the brake pad in the direction of the arrow.

  Ensure brake pad wear sensor fits correctly in brake pad.



- Attach cable of brake pad wear sensor in brackets (1).
- Connect the plug connection and close the cover (2).

12 – Installing both rear wheels

► **Mounting the wheel**

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TECHNICAL INFORMATION

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

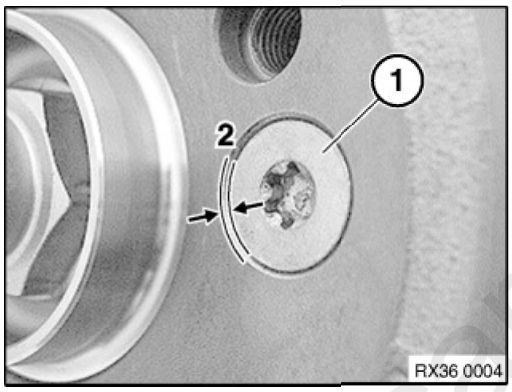
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

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



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

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).



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

  The mounting bolt (1) for the brake disc may not protrude 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 * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233

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



- 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.

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TECHNICAL INFORMATION

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

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

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13 – Start-up or bedding-in of new brake pads and discs (rear brake)

TECHNICAL INFORMATION

When exchanging brake pads, reset the CBS display in accordance with factory specification (CBS reset).

Carry out test braking while driving at low speed because the effectiveness of the brakes may be reduced during the initial braking operations.

Exaggerated emergency and continuous braking operations for faster bedding-in are not permitted.

Advise the customer not to perform intentional emergency braking operations for the first 200 km after the brakes have been replaced.

- Fully depress brake pedal several times so that brake pads contact brake discs.
- Switch the ignition on.

  Use the parking brake button to open, close and open the parking brake again.
- Switch off ignition.
- Adjust the brake fluid level to the maximum mark.
- Perform a functional check on the brake test stand to ensure compliance of the brake system with statutory guidelines.
- Attach mirror tag to inside mirror.

Additional Information

Overview of Tightening Torques

Brake protection plate on the rear wheel carrier — Used in step 7

M6x12	Renew screw.	Tightening torque	8 Nm

Brake disc to rear wheel hub — Used in step 812

M8	Renew screw.	Tightening torque	16 Nm

Brake caliper to wheel carrier, rear — Used in step 8

	Renew screw.	Tightening torque	110 Nm

Guide bolt (brake caliper on caliper carrier) — Used in step 10

M8			35 Nm

Brake disc to front wheel hub — Used in step 12

M8	Renew screw.	Tightening torque	16 Nm

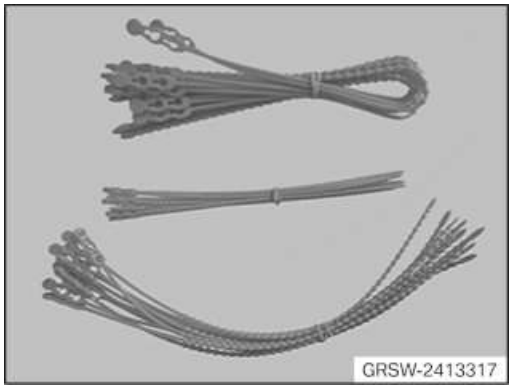
Wheel bolts — Used in step 12

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

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2 413 317 Cable strap



Common	Used in step 310
Usage	The "Cable ties" parts set consists of 3 items as follows: ABV232 Length: 320 mm colour: RedABV250 Length: 500 mm colour: RedABVS270 Length: 665 mm colour: Red
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	01 47 15 (332)

2 344 011 Tool



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

Replacement tools:

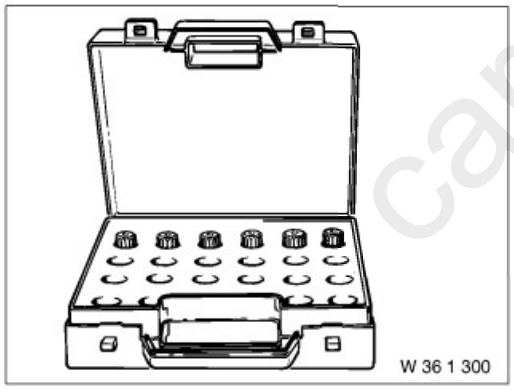
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0 495 221 (36 1 323) Wheel stud



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

0 495 224 (36 1 326) Wheel stud



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

0 495 225 (36 1 327) Wheel stud



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

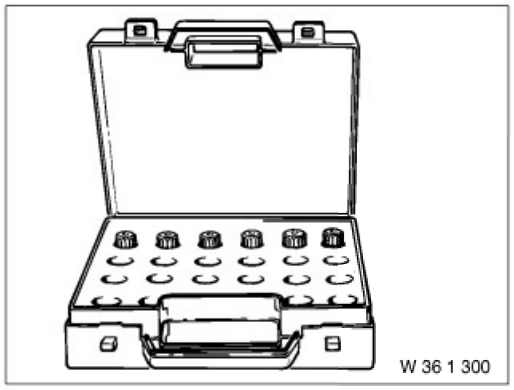
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0 495 226 (36 1 328) Wheel stud



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

0 495 227 (36 1 329) Wheel stud



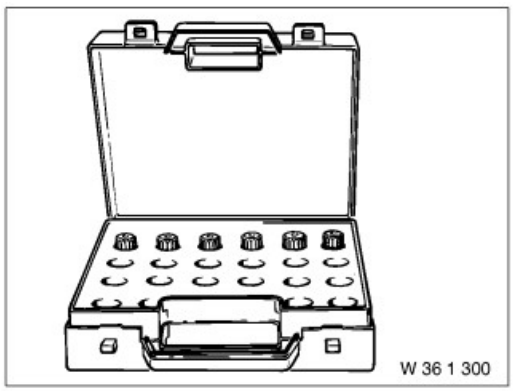
Common	Used in step 1
Usage	(Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 228 (36 1 331) Wheel stud



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

0 495 229 (36 1 332) Wheel stud



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

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0 495 230 (36 1 333) Wheel stud



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

Overview Technical Data

Minimum brake disc thickness (nominal dimension 330x20)	Used in step 4
Minimum brake disc thickness (brake disc 330x20)	18,4 mm

Minimum brake disc thickness (nominal dimension 345x24)	Used in step 4
Minimum brake disc thickness (brake disc 345x24)	22,4 mm

Minimum brake disc thickness (nominal dimension 370x24)	Used in step 4
Minimum brake disc thickness (brake disc 370x24)	22,4 mm

Links

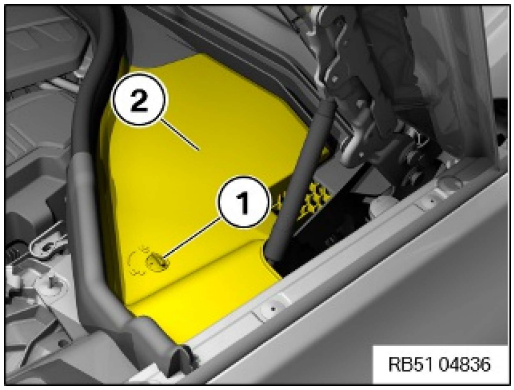
Repair instructions	Used in step
34 00 x01 Guideline for applying brake pad paste on brake pads and caliper carrier	

cardiagn.com

34 31 505 Removing and installing/replacing tandem brake master cylinder

PRELIMINARY WORK

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

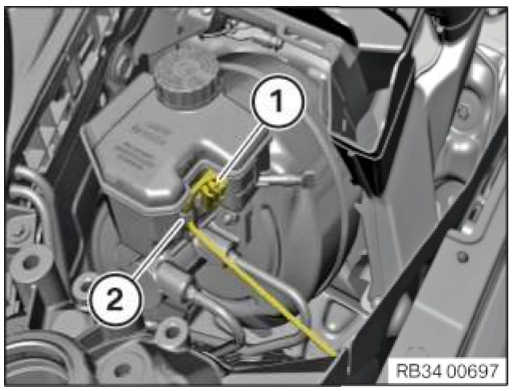


- Loosen the lock (1).
- Remove rear left cover of engine compartment (2).

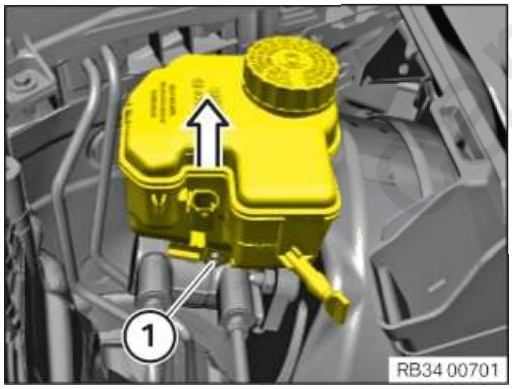
2 – Remove the expansion tank (vehicle with automatic transmission)

Prerequisite

Brake fluid has been drawn off.



- Disconnect plug connection (1).
- Detach the cable from the bracket (2).

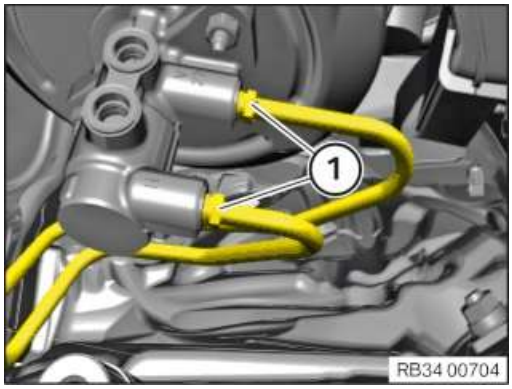


- Loosen screw (1).
- Remove expansion tank upwards.

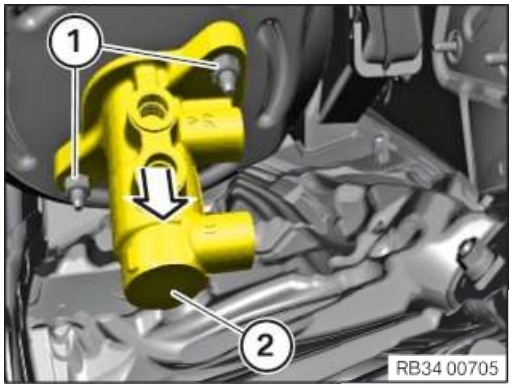
MAIN WORK

3 – Remove the tandem brake master cylinder.

mydiagn.com

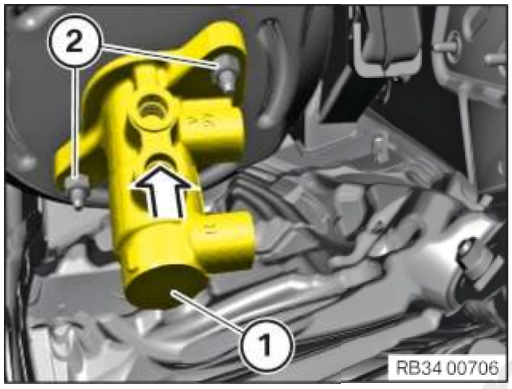


- (1)Unfasten brake lines.



- Release nuts (1) and remove tandem brake master cylinder (2).

4 – Install tandem brake master cylinder.



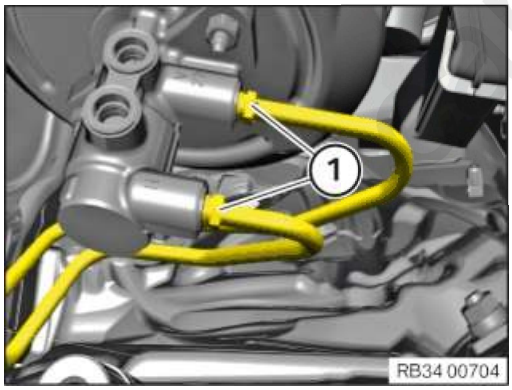
- Introduce tandem brake master cylinder (1) in the brake booster.
- Renew nuts (2).

  Parts: Nuts
- Place and tighten nuts (2).

Tandem brake master cylinder in the brake booster

Replace nuts.

M8		23 Nm



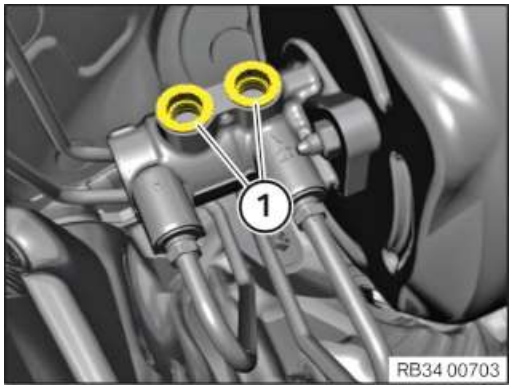
- (1)Fit brake lines () and tighten.

Brake pipe screw connection / Union screws

	Tightening torque	17 Nm

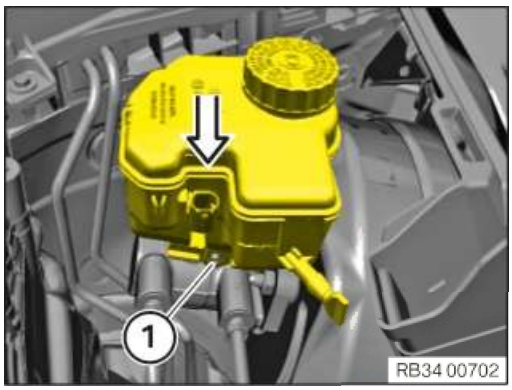
POSTPROCESSES

5 – Installing the expansion tank (vehicles with automatic transmission)



- Renew rubber plugs(1).

  Parts: Rubber plug

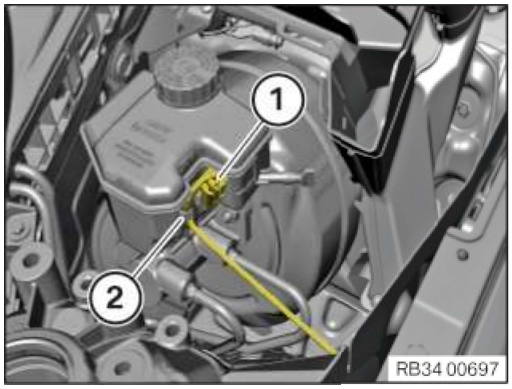


- Connect expansion tank to the tandem brake master cylinder.
- Renew retaining screw (1).

  Parts: Retaining screw
- Fit and tighten retaining screw (1).

Retaining screw, expansion tank to tandem brake master cylinder

	Renew screw.	4 Nm



- Connect the plug connection (1).
- Attach cable to the bracket (2).

6 – Connect bleeder unit for brake fluid



- To guarantee correct bleeding of the brake system, it is essential to adhere to the following procedure!
- Fill new brake fluid in the expansion tank up to the lower edge of thread (1).
- Bleed the hose of the bleeder unit before connecting.

erdiagn.com



TECHNICAL INFORMATION

Use only BMW-approved brake fluids, see operating fluids.

RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.

- Connect the bleeder unit (1) to the brake fluid expansion tank and switch it on.

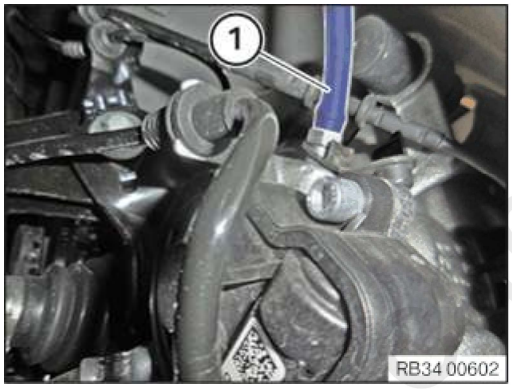
  Observe the operating instructions of the corresponding equipment manufacturer.

- **Do not exceed the filling pressure of** 2 bar**.**

7 – Rinsing and bleeding the rear axle brake circuit

NOTICE

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



- **Start flushing at the rear right.**
- Connect the vent hose with the collecting vessel to the vent valve (1) on rear right brake caliper.
- Open the vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve.

Vent valve

		Tightening torque	10 Nm

- Carry out the same procedure on the rear left wheel brake.

8 – Flushing and bleeding the front axle brake circuit

NOTICE

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



- **Start flushing at the front right.**
- Connect the vent hose with the collecting vessel to the vent valve (1) on front right interior brake calliper.
- Open the vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve (1).

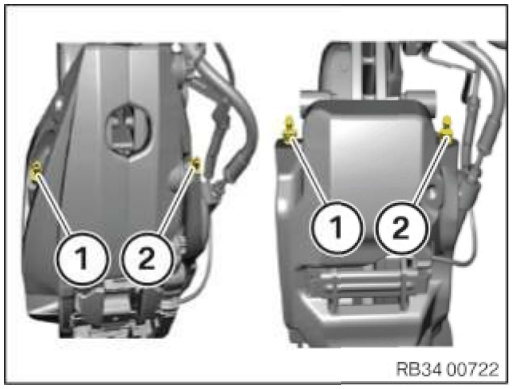
Vent valve

		Tightening torque	10 Nm

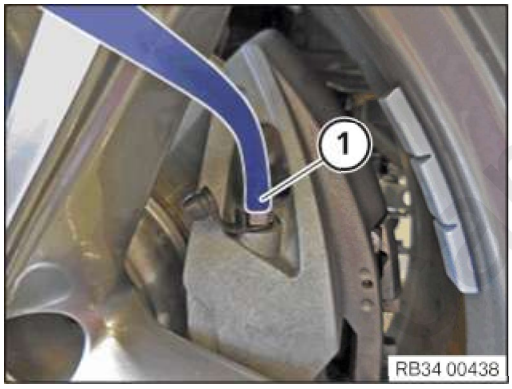
9 – Flush and bleed the front axle brake circuit (brake, high)

NOTICE

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



- Two fixed brake callipers are fitted!
- For both variants, first outer (1) must be bled. The bleed inner (2).



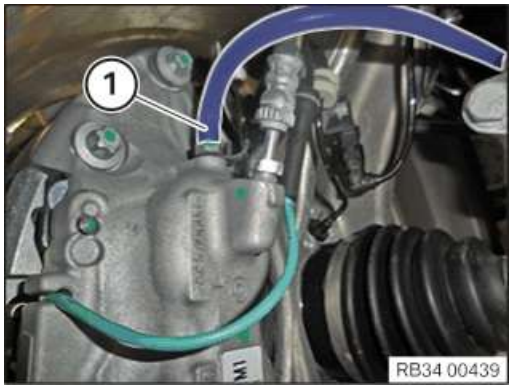
- **Start flushing at the front right.**
- Connect the vent hose with the collecting vessel to the vent valve (1) on the front right brake caliper.
- Open the vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve (1).

Front ventilation valve Brake calliper manufacturer Brembo

Vent valve		Tightening torque	18 Nm

Front ventilation valve fixed brake calliper Brake calliper manufacturer Continental

Vent valve		Tightening torque	15 Nm



- Connect the vent hose with the collecting vessel to the vent valve (1) on front right brake caliper.
- Open vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve (1).

Front ventilation valve Brake calliper manufacturer Brembo

Vent valve		Tightening torque	18 Nm

Front ventilation valve fixed brake calliper Brake calliper manufacturer Continental

Vent valve		Tightening torque	15 Nm

- Carry out the same procedure on the front left wheel brake.

10 – Close bleeder unit for brake fluid

RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.

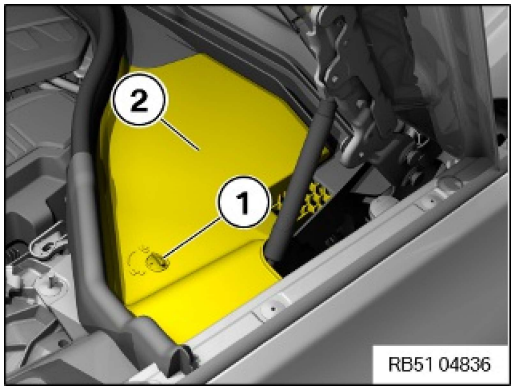


- Switch off bleeder unit (1) and remove from brake fluid expansion tank .
- Check the brake fluid level; if necessary, adjust to maximum mark.



- Check the seal (1) on the sealing cap, renew if necessary.
- Mount the sealing cap on the brake fluid expansion tank.

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



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

Additional Information

Overview of Tightening Torques

Tandem brake master cylinder in the brake booster			Used in step 4
Replace nuts.			
M8			23 Nm

Brake pipe screw connection / Union screws			Used in step 4
		Tightening torque	17 Nm

Retaining screw, expansion tank to tandem brake master cylinder			Used in step 5
	Renew screw.		4 Nm

Vent valve			Used in step 78
		Tightening torque	10 Nm

Front ventilation valve Brake calliper manufacturer Brembo			Used in step 9
Vent valve		Tightening torque	18 Nm

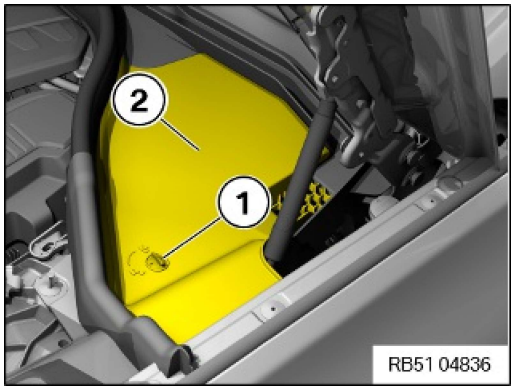
Front ventilation valve fixed brake calliper Brake calliper manufacturer Continental			Used in step 9
Vent valve		Tightening torque	15 Nm

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34 31 170 Replacing brake fluid level switch

PRELIMINARY WORK

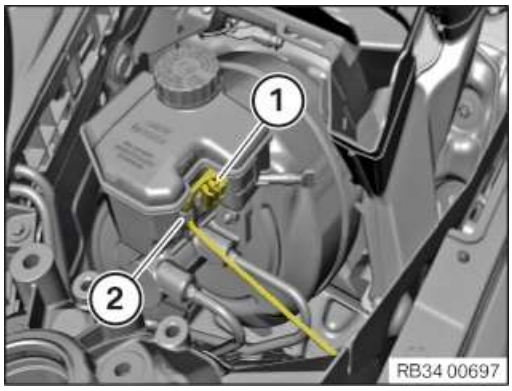
1 – Remove the cover of the engine compartment at the rear left



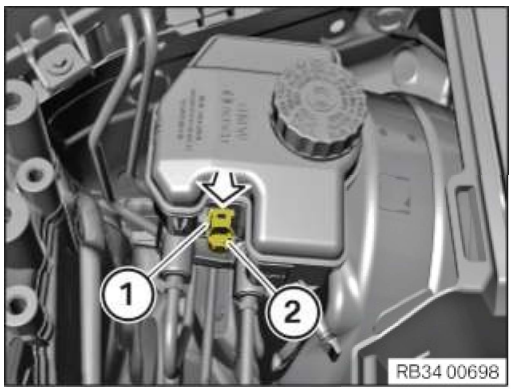
- Loosen the lock (1).
- Remove rear left cover of engine compartment (2).

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2 – Removing the brake fluid level switch

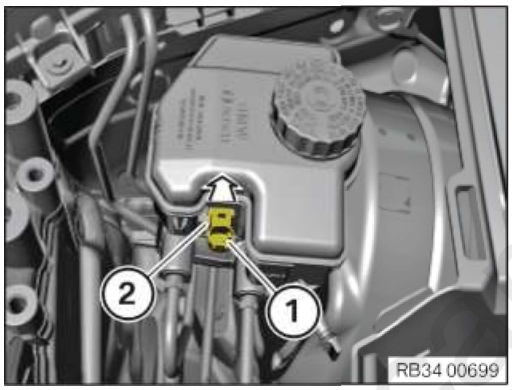


- Disconnect plug connection (1).
- Detach the cable from the bracket (2).



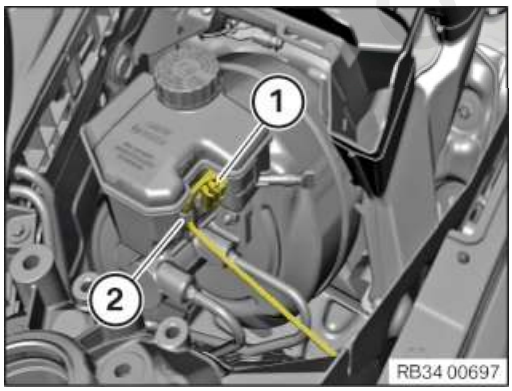
- Press the retaining lug (1) and remove the brake fluid level switch (2) in the direction of the arrow.

3 – Installing the brake fluid level switch



- Install the brake fluid level switch (1) into the expansion tank in direction of arrow.

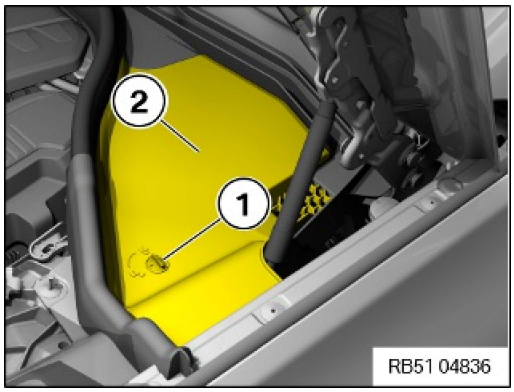
  The retaining lug (2) must lock correctly.



- Connect the plug connection (1).
- Attach cable to the bracket (2).

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



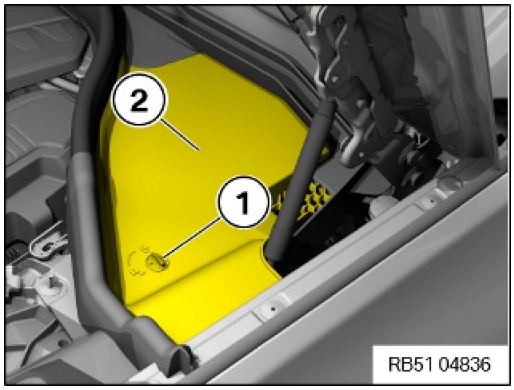
- Position the engine compartment cover at the rear left (2) .
- Close lock (1).

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34 31 181 Replacing expansion tank for hydraulic brake actuation

PRELIMINARY WORK

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



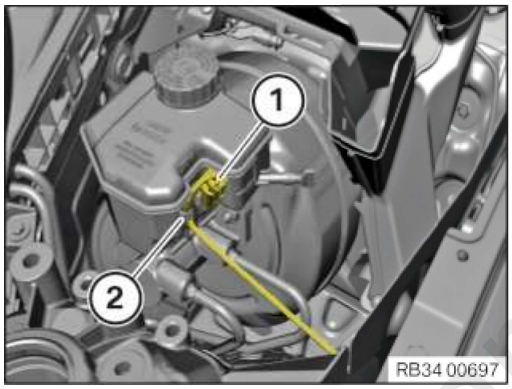
- Loosen the lock (1).
- Remove rear left cover of engine compartment (2).

MAIN WORK

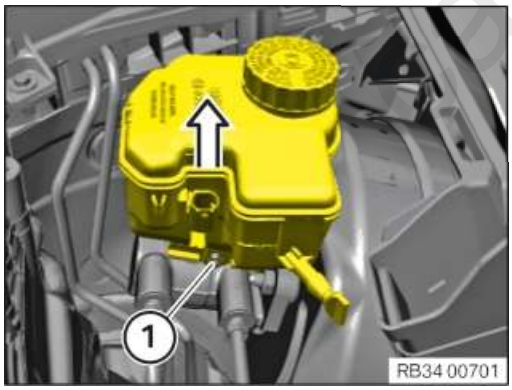
2 – Remove the expansion tank (vehicle with automatic transmission)

Prerequisite

Brake fluid has been drawn off.

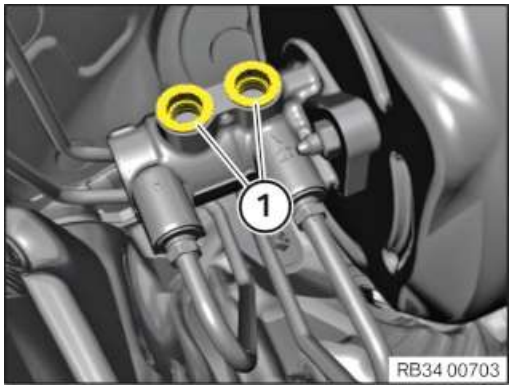


- Disconnect plug connection (1).
- Detach the cable from the bracket (2).



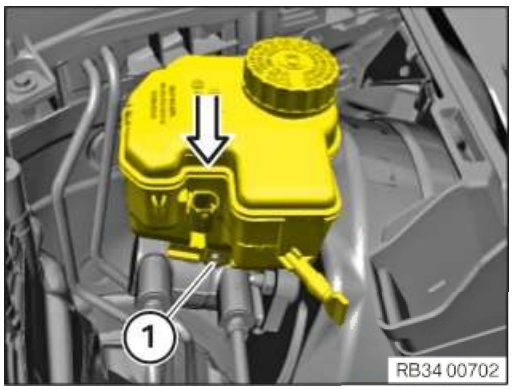
- Loosen screw (1).
- Remove expansion tank upwards.

3 – Installing the expansion tank (vehicles with automatic transmission)



- Renew rubber plugs(1).

  Parts: Rubber plug

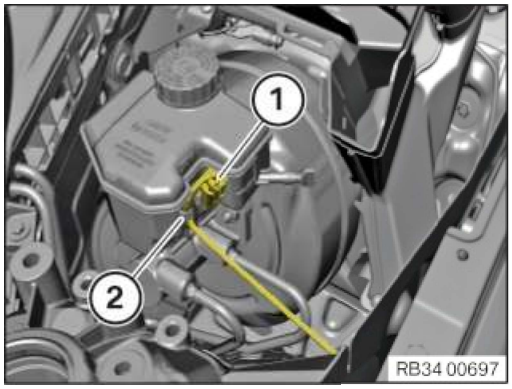


- Connect expansion tank to the tandem brake master cylinder.
- Renew retaining screw (1).

  Parts: Retaining screw
- Fit and tighten retaining screw (1).

Retaining screw, expansion tank to tandem brake master cylinder

	Renew screw.	4 Nm



- Connect the plug connection (1).
- Attach cable to the bracket (2).

POSTPROCESSES

4 – Connecting the bleeder unit for the brake fluid (after repair, topping up brake fluid)

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TECHNICAL INFORMATION

Use only BMW-approved brake fluids, see operating fluids.

RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.

- Connect the bleeder unit (1) to the brake fluid expansion tank and switch it on.

  Observe the operating instructions of the corresponding equipment manufacturer.
- Top up brake fluid up to the maximum mark.

  The filling pressure must not exceed 2 bar.

5 – Close bleeder unit for brake fluid

RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.



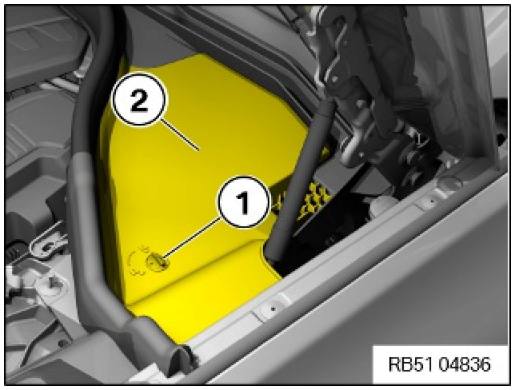
- Switch off bleeder unit (1) and remove from brake fluid expansion tank .
- Check the brake fluid level; if necessary, adjust to maximum mark.



- Check the seal (1) on the sealing cap, renew if necessary.
- Mount the sealing cap on the brake fluid expansion tank.

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

ndiagn.com



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

Additional Information

Overview of Tightening Torques

Retaining screw, expansion tank to tandem brake master cylinder Used in step 3

	Renew screw.	4 Nm

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34 32 881 Replacing front left or right brake hose

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.

TECHNICAL INFORMATION

Use only BMW-approved brake fluids.
For additional information see: SBS-ANL-SBS1996-340396150...

NOTICE

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

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1 – Removing the front left wheel

▶ **Removing the wheel**



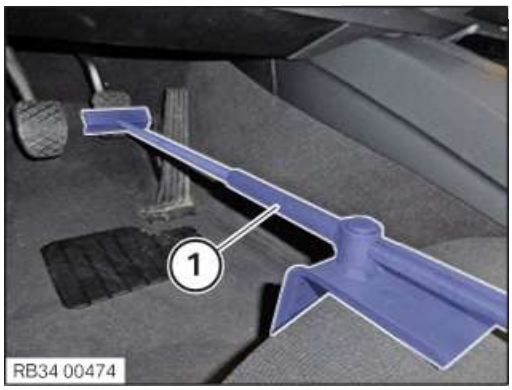
- In vehicles with M Carbon ceramic brake: The wheel assembly jack must be used to remove the wheel (see workshop equipment).

  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 – Install brake pedal tensioner



- Press the brake pedal to the floor and fix the brake pedal tensioner (1).

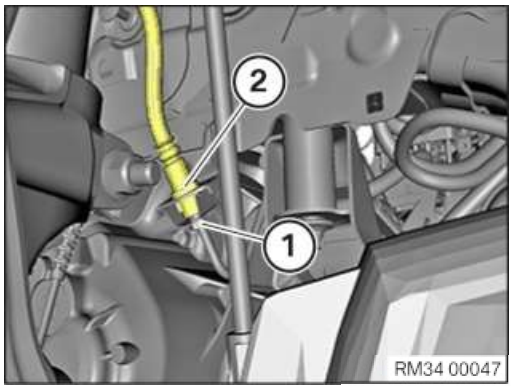
  Do not release the brake pedal tensioner (1) until the brake lines have been reconnected. This prevents brake fluid from emerging from the expansion tank when the brake lines are opened.

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3 – Remove front brake hose

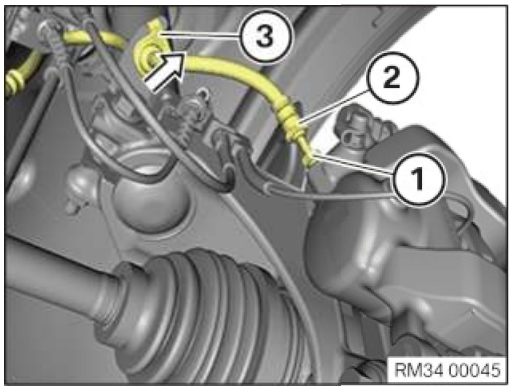
NOTICE

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



- Release union screw (1).

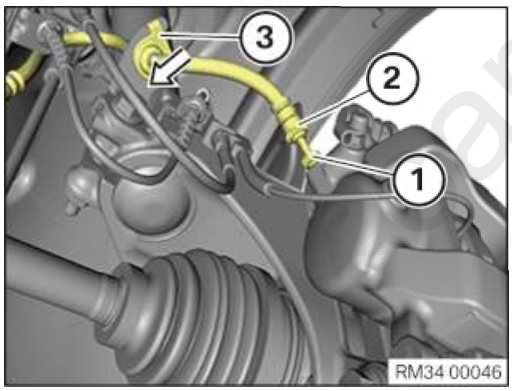
  Hold on to square shaft, if necessary (2).



- Detach brake hose (1) from brake caliper.

  If necessary, grip at knurling (2).
- Detach the brake hose from the bracket (3).
- Remove the brake hose.

4 – Install front brake hose



- Fit and tighten brake hose (1) on brake caliper.

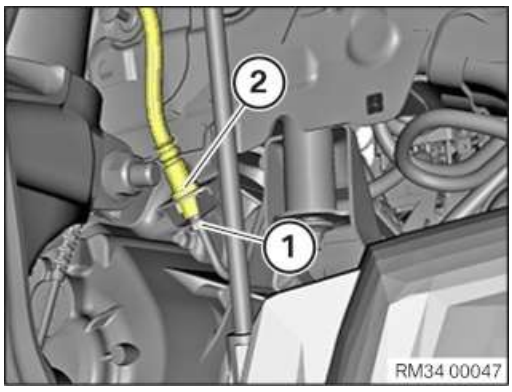
  If necessary, grip at knurling (2).

  Never twist brake hose and avoid all contact with components attached rigidly to the body.

Brake hose to brake caliper, front

	Tightening torque	17 Nm

- Attach the brake hose in the brackets (3).



- Attach and tighten union screw (1).

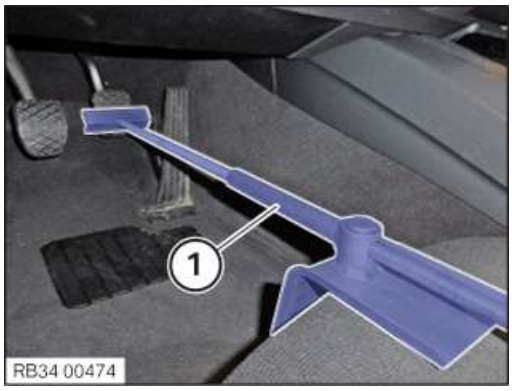
  Hold on to square shaft, if necessary (2).

Brake pipe screw connection / Union screws

	Tightening torque	17 Nm

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5 – Remove the brake pedal tensioner



- Remove the brake pedal tensioner (1).

6 – Attaching the front left wheel

▸ **Mounting the wheel**



TECHNICAL INFORMATION

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

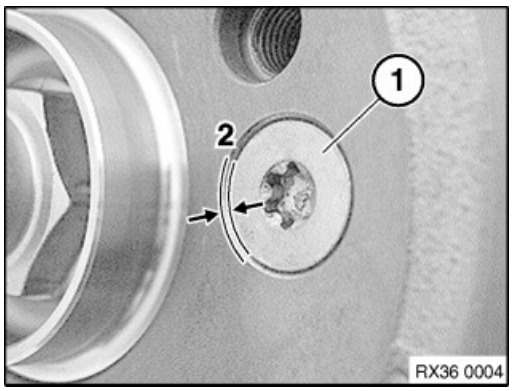
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

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



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

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).



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

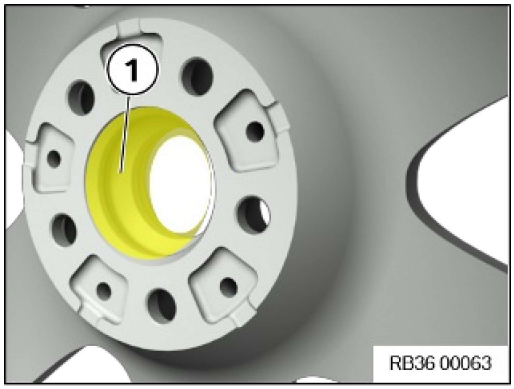
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

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 * 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 * 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.

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TECHNICAL INFORMATION

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

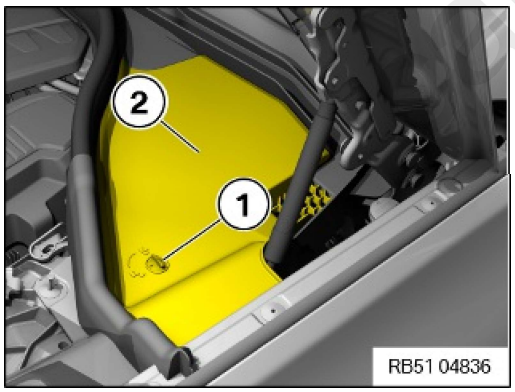
- Renew corroded wheel bolts.

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

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



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

8 – Connect bleeder unit for brake fluid



- To guarantee correct bleeding of the brake system, it is essential to adhere to the following procedure!
- Fill new brake fluid in the expansion tank up to the lower edge of thread (1).
- Bleed the hose of the bleeder unit before connecting.



TECHNICAL INFORMATION

Use only BMW-approved brake fluids, see operating fluids.

RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.

- Connect the bleeder unit (1) to the brake fluid expansion tank and switch it on.

  Observe the operating instructions of the corresponding equipment manufacturer.
- **Do not exceed the filling pressure of** 2 bar**.**

9 – Flushing and bleeding the front axle brake circuit

NOTICE

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



- **Start flushing at the front right.**
- Connect the vent hose with the collecting vessel to the vent valve (1) on front right interior brake calliper.
- Open the vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve (1).

Vent valve

		Tightening torque	10 Nm

10 – Close bleeder unit for brake fluid

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RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.

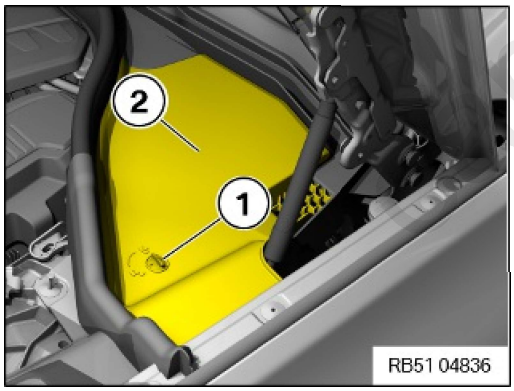


- Switch off bleeder unit (1) and remove from brake fluid expansion tank .
- Check the brake fluid level; if necessary, adjust to maximum mark.



- Check the seal (1) on the sealing cap, renew if necessary.
- Mount the sealing cap on the brake fluid expansion tank.

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



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

Additional Information

Overview of Tightening Torques

Brake hose to brake caliper, front Used in step 4

	Tightening torque	17 Nm

Brake pipe screw connection / Union screws Used in step 4

	Tightening torque	17 Nm

Brake disc to front wheel hub — Used in step 6

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 6

M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 6

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

Vent valve — Used in step 9

		Tightening torque	10 Nm

Overview of Special Tools

2 344 011 Tool

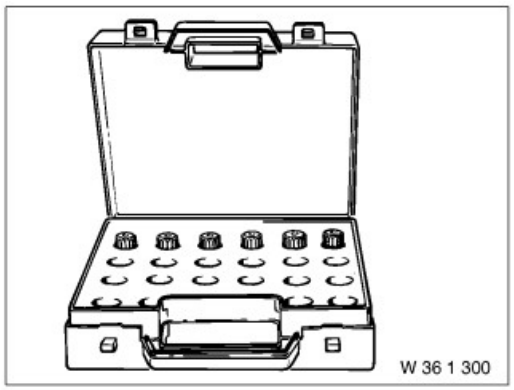


Common — Used in step 6

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	

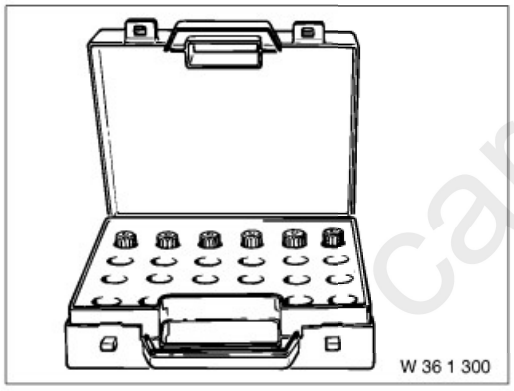
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0 495 224 (36 1 326) Wheel stud



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

0 495 225 (36 1 327) Wheel stud



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

0 495 226 (36 1 328) Wheel stud



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

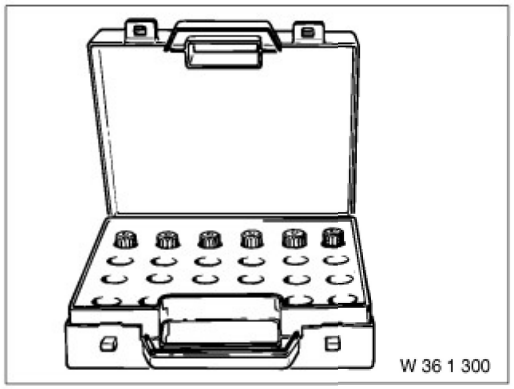
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0 495 227 (36 1 329) Wheel stud



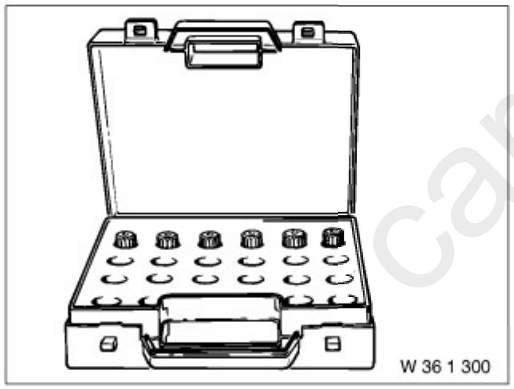
Common	Used in step 1
Usage	(Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 228 (36 1 331) Wheel stud



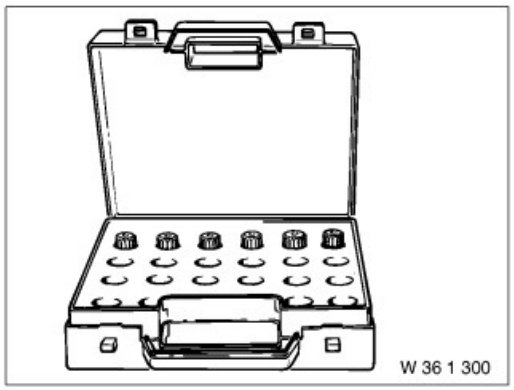
Common	Used in step 1
Usage	(Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 229 (36 1 332) Wheel stud



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

0 495 230 (36 1 333) Wheel stud



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

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34 32 881 Replacing front left or right brake hose

Prerequisite

- **Vehicles with High brake.**

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.

TECHNICAL INFORMATION

Use only BMW-approved brake fluids.
For additional information see: SBS-ANL-SBS1996-340396150...

NOTICE

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

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1 – Removing the front left wheel

▶ **Removing the wheel**



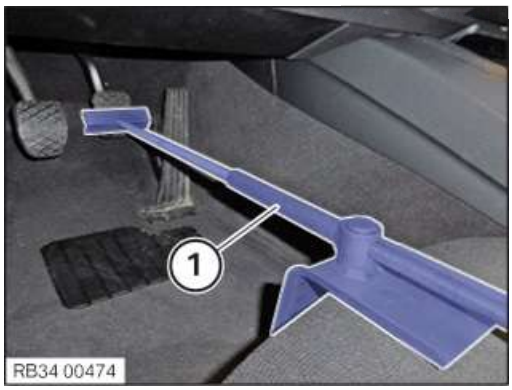
- In vehicles with M Carbon ceramic brake: The wheel assembly jack must be used to remove the wheel (see workshop equipment).

  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 – Install brake pedal tensioner



- Press the brake pedal to the floor and fix the brake pedal tensioner (1).

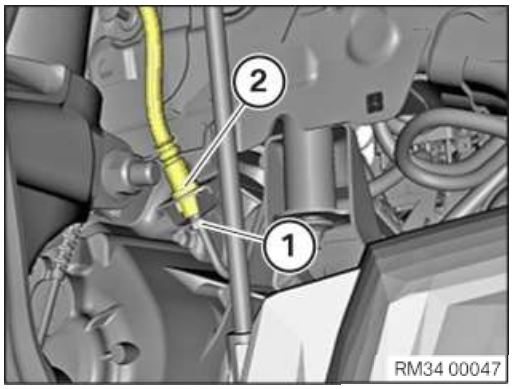
  Do not release the brake pedal tensioner (1) until the brake lines have been reconnected. This prevents brake fluid from emerging from the expansion tank when the brake lines are opened.

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3 – Removing the front brake hose (brake high)

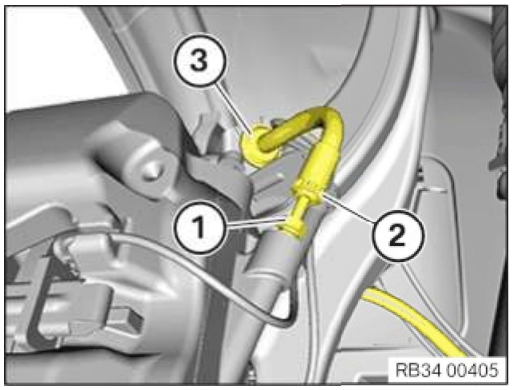
NOTICE

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



- Release union screw (1).

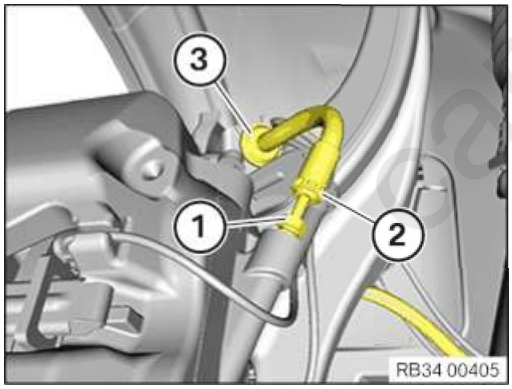
  Hold on to square shaft, if necessary (2).



- Detach brake hose (1) from brake caliper.

  If necessary, grip at knurling (2).
- If necessary, detach brake hose from the bracket (3).

4 – Install the front brake hose (brake high)



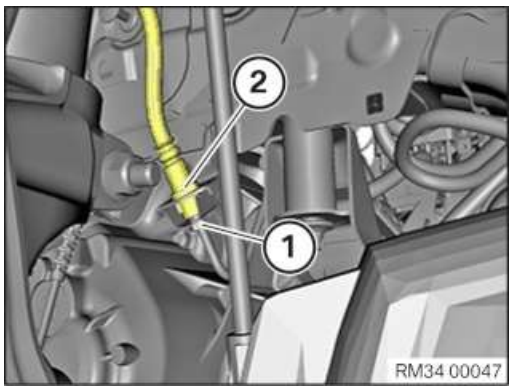
- Fit and tighten brake hose (1) on brake caliper.

  If necessary, grip at knurling (2).

Brake hose to brake caliper, front

	Tightening torque	17 Nm

- Make sure that the brake hose is **not** twisted and does not rest against the components fixed to the body.
- Attach cable to the bracket (3).



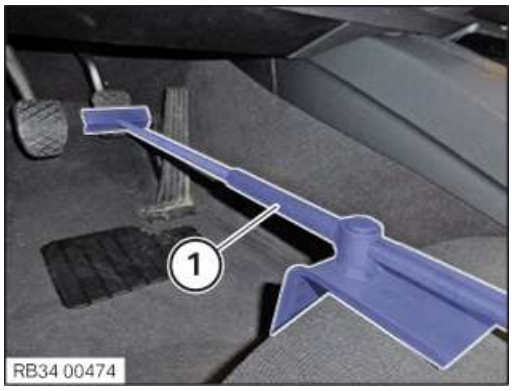
- Attach and tighten union screw (1).

  Hold on to square shaft, if necessary (2).

Brake pipe screw connection / Union screws

	Tightening torque	17 Nm

5 – Remove the brake pedal tensioner



- Remove the brake pedal tensioner (1).

6 – Attaching the front left wheel

▸ **Mounting the wheel**



TECHNICAL INFORMATION

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

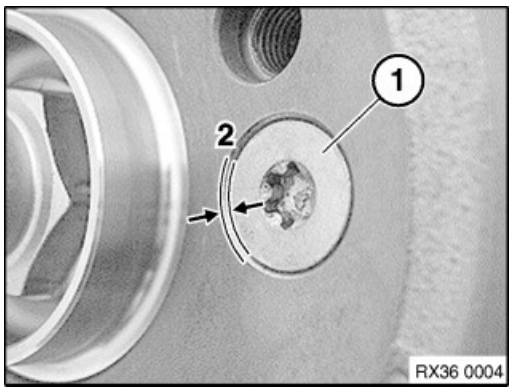
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

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



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

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).



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

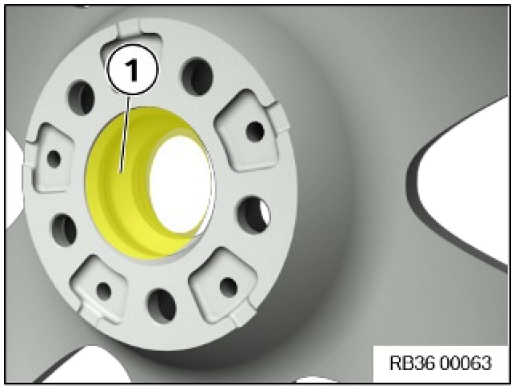
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

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 * 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 * 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.

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TECHNICAL INFORMATION

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

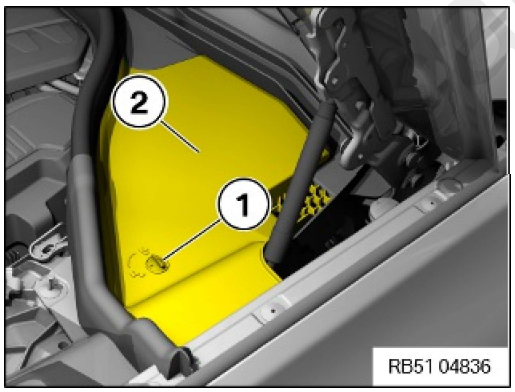
- Renew corroded wheel bolts.

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

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



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

8 – Connect bleeder unit for brake fluid



- To guarantee correct bleeding of the brake system, it is essential to adhere to the following procedure!
- Fill new brake fluid in the expansion tank up to the lower edge of thread (1).
- Bleed the hose of the bleeder unit before connecting.



TECHNICAL INFORMATION

Use only BMW-approved brake fluids, see operating fluids.

RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.

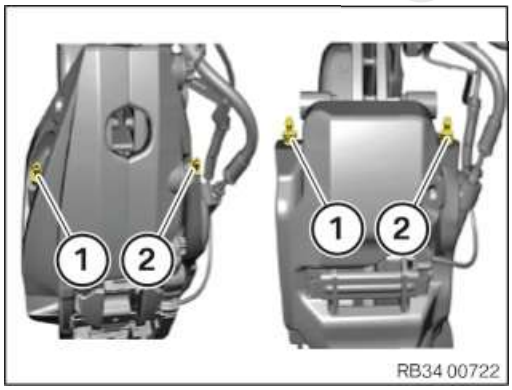
- Connect the bleeder unit (1) to the brake fluid expansion tank and switch it on.

  Observe the operating instructions of the corresponding equipment manufacturer.
- **Do not exceed the filling pressure of** 2 bar**.**

9 – Flush and bleed the front axle brake circuit (brake, high)

NOTICE

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



- Two fixed brake callipers are fitted!
- For both variants, first outer (1) must be bled. The bleed inner (2).

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- **Start flushing at the front right.**
- Connect the vent hose with the collecting vessel to the vent valve (1) on the front right brake caliper.
- Open the vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve (1).

Front ventilation valve Brake calliper manufacturer Brembo

Vent valve		Tightening torque	18 Nm

Front ventilation valve fixed brake calliper Brake calliper manufacturer Continental

Vent valve		Tightening torque	15 Nm



- Connect the vent hose with the collecting vessel to the vent valve (1) on front right brake caliper.
- Open vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve (1).

Front ventilation valve Brake calliper manufacturer Brembo

Vent valve		Tightening torque	18 Nm

Front ventilation valve fixed brake calliper Brake calliper manufacturer Continental

Vent valve		Tightening torque	15 Nm

- Carry out the same procedure on the front left wheel brake.

10 – Close bleeder unit for brake fluid

RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.



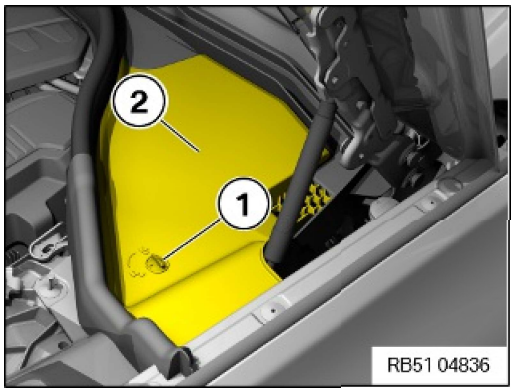
- Switch off bleeder unit (1) and remove from brake fluid expansion tank .
- Check the brake fluid level; if necessary, adjust to maximum mark.

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- Check the seal (1) on the sealing cap, renew if necessary.
- Mount the sealing cap on the brake fluid expansion tank.

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



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

Additional Information

Overview of Tightening Torques

Brake hose to brake caliper, front — Used in step 4

		Tightening torque	17 Nm

Brake pipe screw connection / Union screws — Used in step 4

		Tightening torque	17 Nm

Brake disc to front wheel hub — Used in step 6

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 6

M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 6

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

Front ventilation valve Brake calliper manufacturer Brembo — Used in step 9

Vent valve		Tightening torque	18 Nm

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Front ventilation valve fixed brake calliper Brake calliper manufacturer Continental			Used in step 9
Vent valve		Tightening torque	15 Nm

Overview of Special Tools

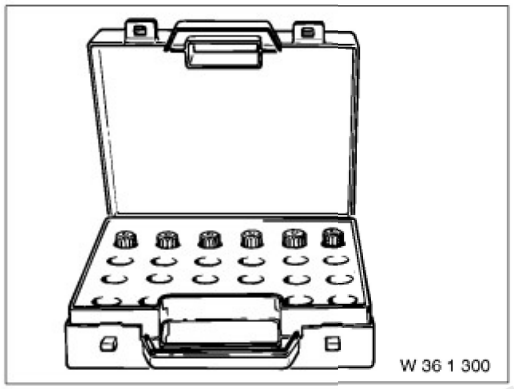
2 344 011 Tool



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	

0 495 224 (36 1 326) Wheel stud



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

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0 495 225 (36 1 327) Wheel stud



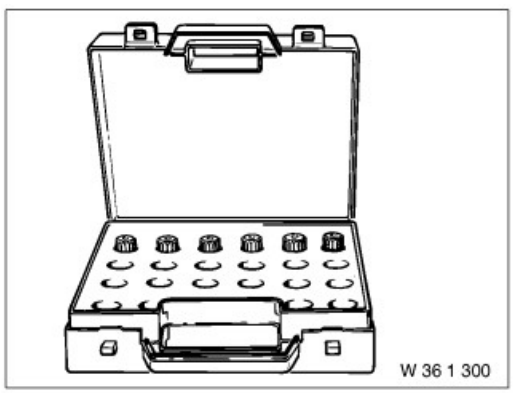
Common	Used in step 1
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 226 (36 1 328) Wheel stud



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

0 495 227 (36 1 329) Wheel stud



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

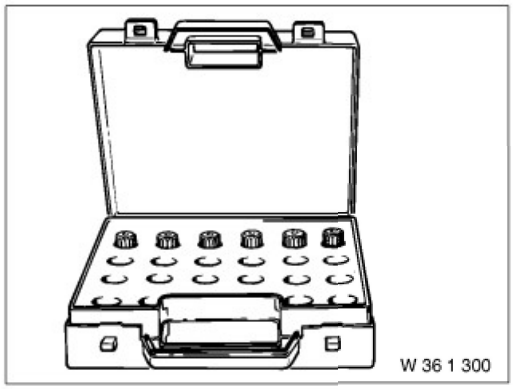
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0 495 228 (36 1 331) Wheel stud



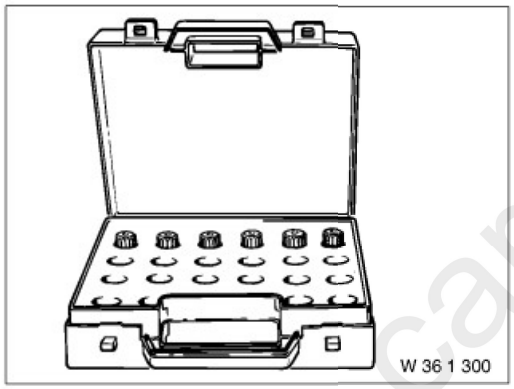
Common	Used in step 1
Usage	(Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 229 (36 1 332) Wheel stud



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

0 495 230 (36 1 333) Wheel stud



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

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34 32 451 Replacing rear left or right brake hose

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.

TECHNICAL INFORMATION

Use only BMW-approved brake fluids.
For additional information see: SBS-ANL-SBS1996-340396150...

NOTICE

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

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1 – Removing both rear wheels

▶ **Removing the wheel**



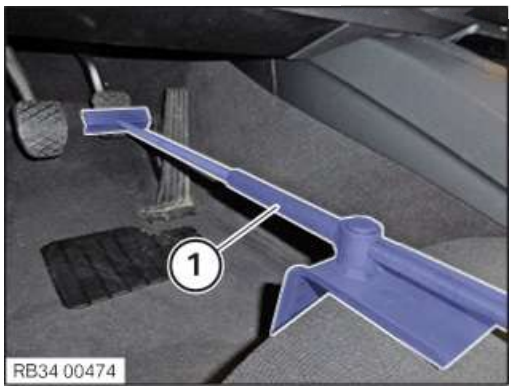
- In vehicles with M Carbon ceramic brake: The wheel assembly jack must be used to remove the wheel (see workshop equipment).

  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 – Install brake pedal tensioner



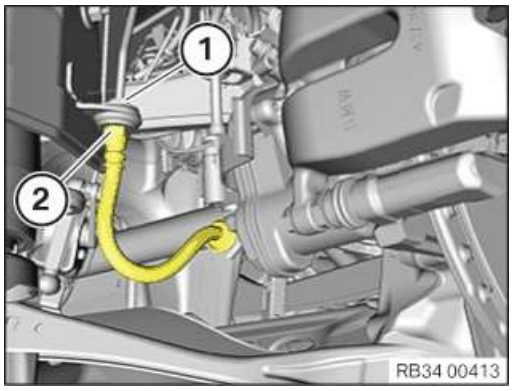
- Press the brake pedal to the floor and fix the brake pedal tensioner (1).

  Do not release the brake pedal tensioner (1) until the brake lines have been reconnected. This prevents brake fluid from emerging from the expansion tank when the brake lines are opened.

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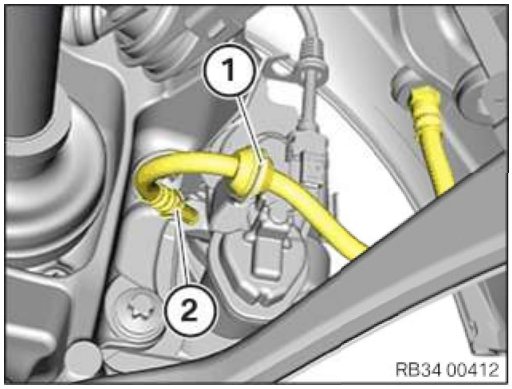
MAIN WORK

3 – Brake hose, rear



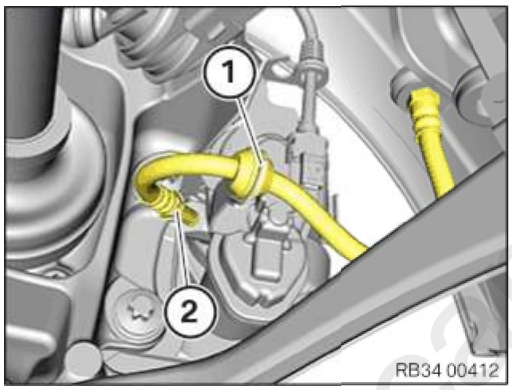
- Release union screw (1).

  Hold on to square shaft, if necessary (2).



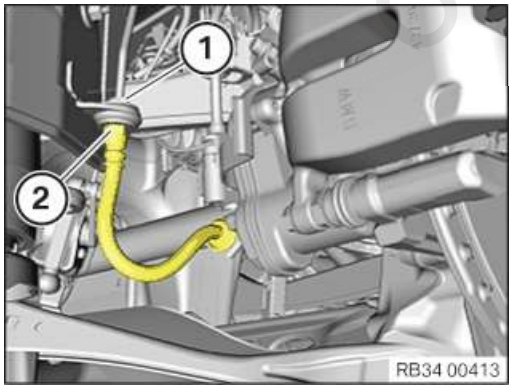
- Detach brake hose from bracket (1).
- Release brake hose (2) from brake caliper.

4 – Installing rear brake hose



- Attach cable to the bracket (1).
- Attach and tighten brake hose (2) on brake caliper.

  Never twist brake hose and avoid all contact with components attached rigidly to the body.



- Attach and tighten union screw (1).

  Hold on to square shaft, if necessary (2).

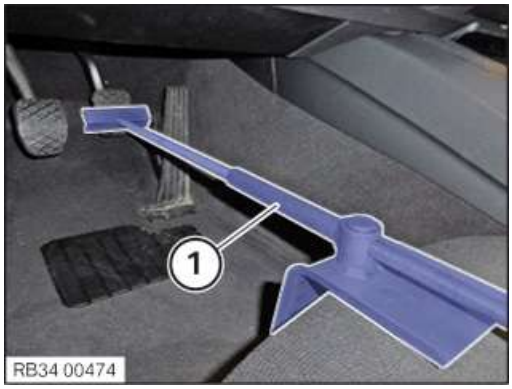
Brake pipe screw connection / Union screws

	Tightening torque	17 Nm

POSTPROCESSES

5 – Remove the brake pedal tensioner

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- Remove the brake pedal tensioner (1).

6 – Installing both rear wheels

▸ 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.

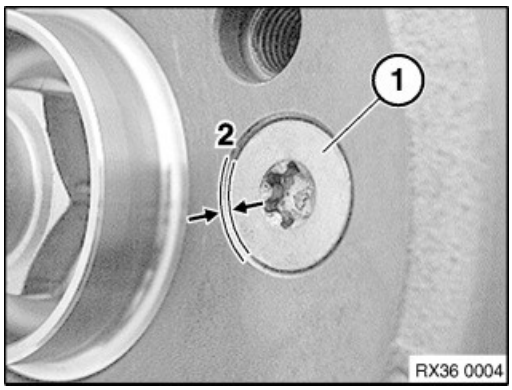
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  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.

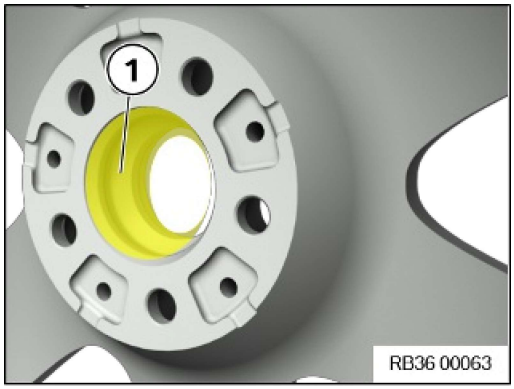
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

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 * 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 * 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.

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TECHNICAL INFORMATION

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

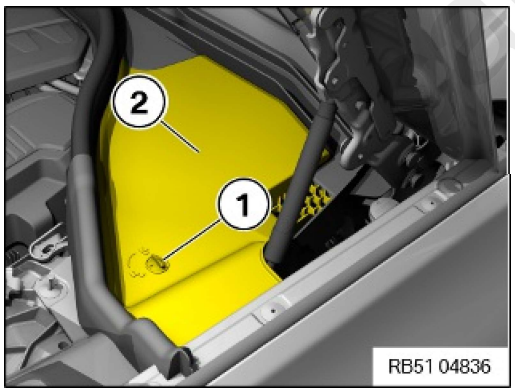
- Renew corroded wheel bolts.

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

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



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

8 – Connect bleeder unit for brake fluid



- To guarantee correct bleeding of the brake system, it is essential to adhere to the following procedure!
- Fill new brake fluid in the expansion tank up to the lower edge of thread (1).
- Bleed the hose of the bleeder unit before connecting.



TECHNICAL INFORMATION

Use only BMW-approved brake fluids, see operating fluids.

RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.

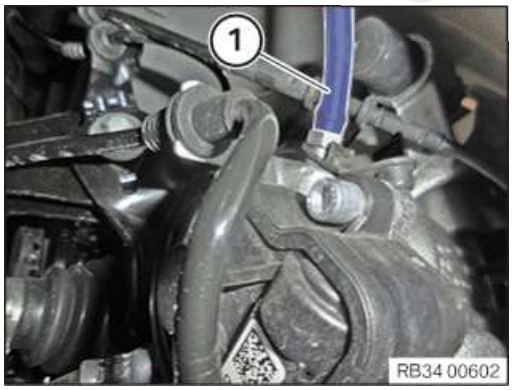
- Connect the bleeder unit (1) to the brake fluid expansion tank and switch it on.

  Observe the operating instructions of the corresponding equipment manufacturer.
- **Do not exceed the filling pressure of** 2 bar**.**

9 – Rinsing and bleeding the rear axle brake circuit

NOTICE

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



- **Start flushing at the rear right.**
- Connect the vent hose with the collecting vessel to the vent valve (1) on rear right brake caliper.
- Open the vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve.

Vent valve

		Tightening torque	10 Nm

- Carry out the same procedure on the rear left wheel brake.

10 – Close bleeder unit for brake fluid

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RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.

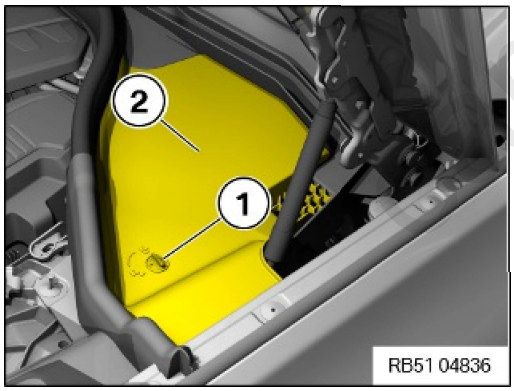


- Switch off bleeder unit (1) and remove from brake fluid expansion tank .
- Check the brake fluid level; if necessary, adjust to maximum mark.



- Check the seal (1) on the sealing cap, renew if necessary.
- Mount the sealing cap on the brake fluid expansion tank.

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



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

Additional Information

Overview of Tightening Torques

Brake pipe screw connection / Union screws Used in step 4

		Tightening torque	17 Nm

Brake disc to front wheel hub Used in step 6

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 6

M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 6

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

Vent valve — Used in step 9

		Tightening torque	10 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	

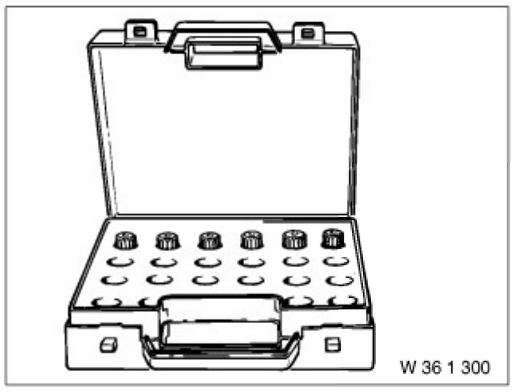
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0 495 224 (36 1 326) Wheel stud



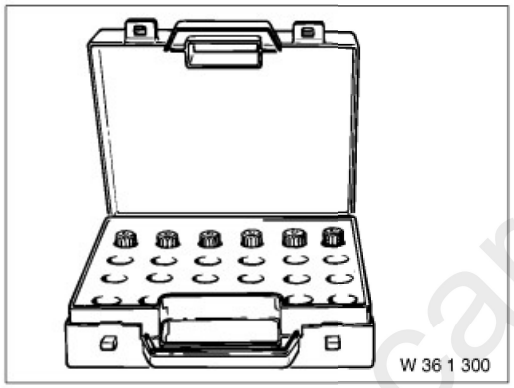
Common	Used in step 1
Usage	(Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 225 (36 1 327) Wheel stud



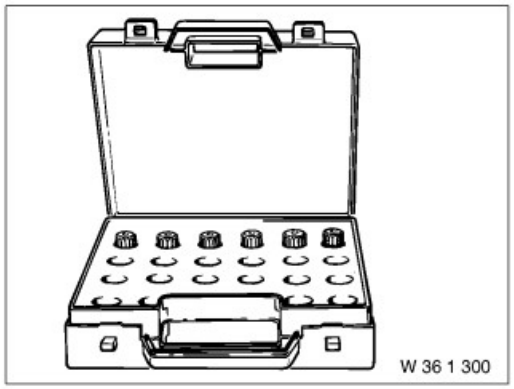
Common	Used in step 1
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 226 (36 1 328) Wheel stud



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

0 495 227 (36 1 329) Wheel stud



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

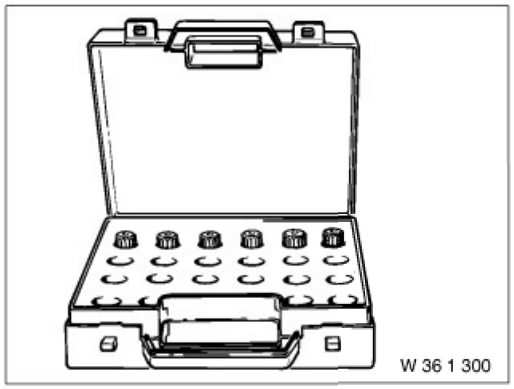
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0 495 228 (36 1 331) Wheel stud



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

0 495 229 (36 1 332) Wheel stud



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

0 495 230 (36 1 333) Wheel stud



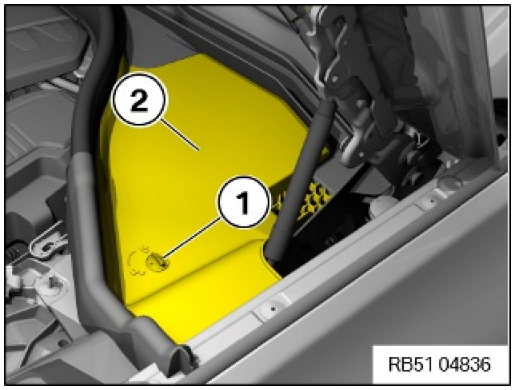
Common	Used in step 1
Usage	(Code 40) With centring bore available separately (see EPC) under 36 13 6 762 344
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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34 33 000 Removing and installing/replacing brake booster

PRELIMINARY WORK

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

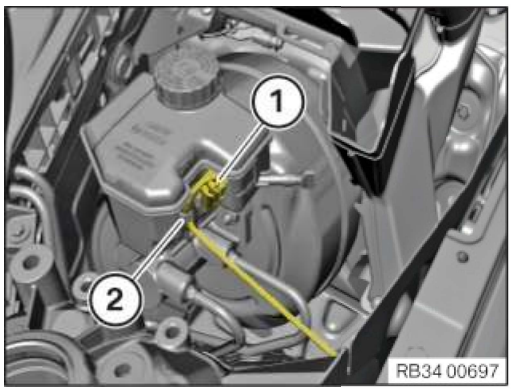


- Loosen the lock (1).
- Remove rear left cover of engine compartment (2).

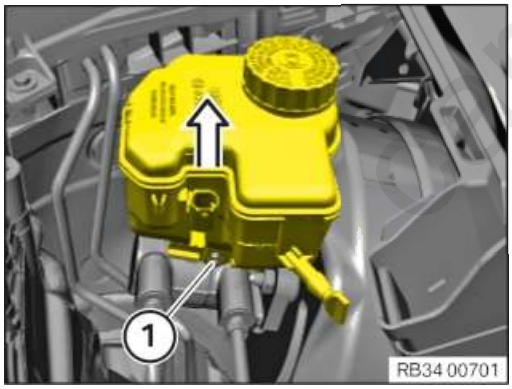
2 – Remove the expansion tank (vehicle with automatic transmission)

Prerequisite

Brake fluid has been drawn off.

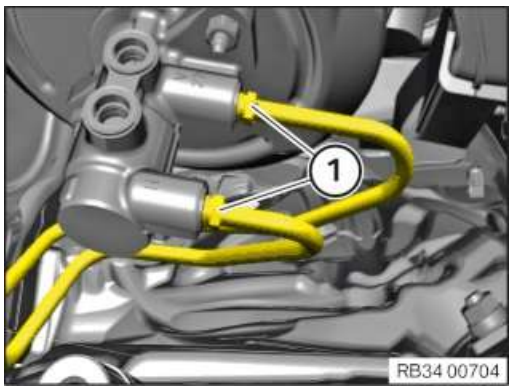


- Disconnect plug connection (1).
- Detach the cable from the bracket (2).



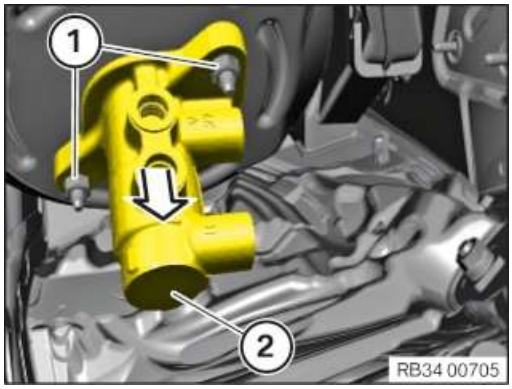
- Loosen screw (1).
- Remove expansion tank upwards.

3 – Remove the tandem brake master cylinder.



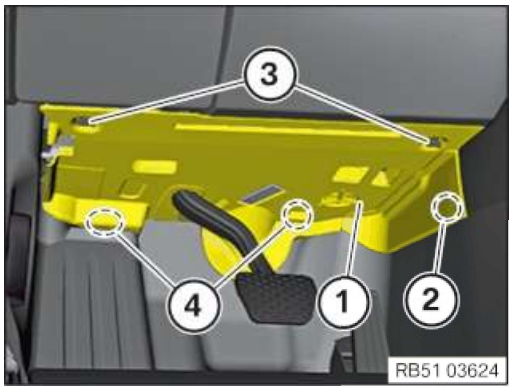
- (1)Unfasten brake lines.

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- Release nuts (1) and remove tandem brake master cylinder (2).

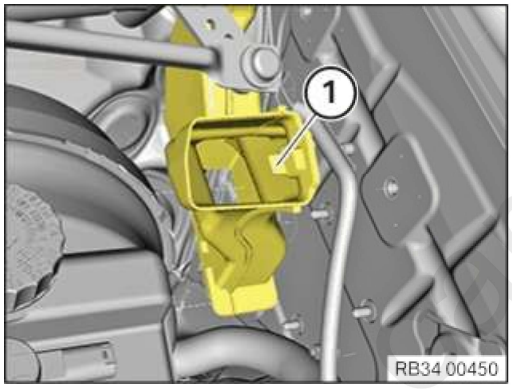
4 – Removing the trim panel for pedal mechanism



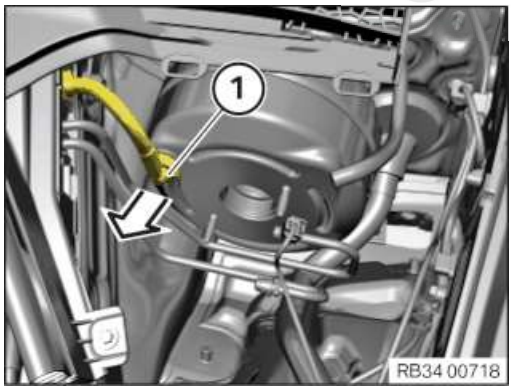
- Unclip the trim panel for the pedal mechanism (1) towards the inside in this area (2).
- Turn the locks (3) by 90°.
- Detach the trim panel for the pedal mechanism (1) inwards out of the guides (4).
- Unlock associated plug connection and disconnect.

MAIN WORK

5 – Remove brake booster



- Remove the air duct (1).



- Remove non-return valve (1) from brake booster in the direction of the arrow.

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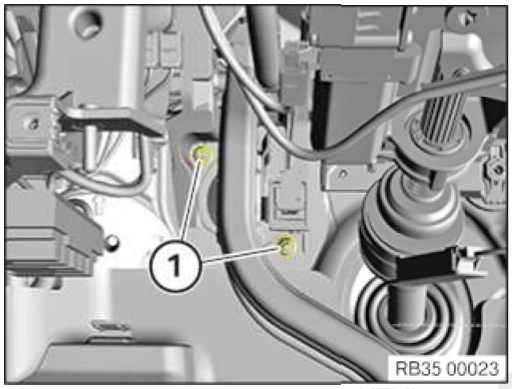


- Retract release tool between brake pedal and brake booster.
- Apply support (1) of the release tool on the bearing support. If necessary position the support fixed by rotating the screw on the release tool.



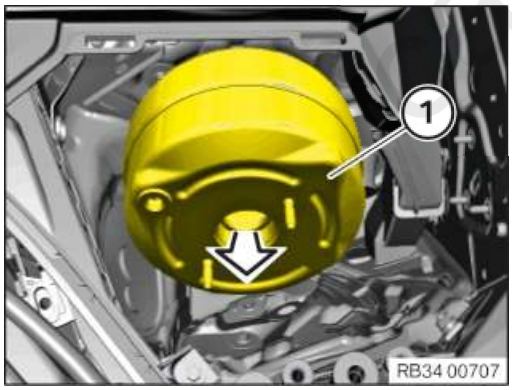
- Press the release tool in direction of arrow and lever out brake pedal from the brake booster.

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- Loosen nuts (1).

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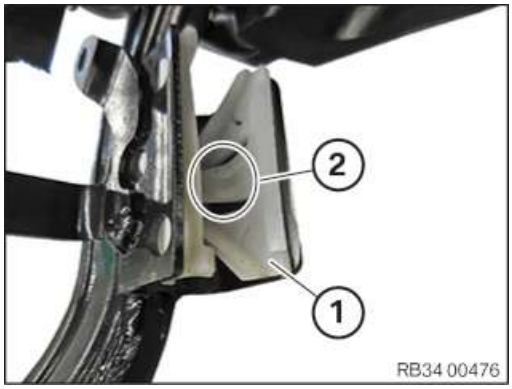


- Unscrew the brake booster (1) from the bulkhead.

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6 – Prepare for the installation of the brake booster

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- Check the retaining lugs of the holding clip (1) in the marked area (2) for damage and renew the holding clip where required.



- Replace the gasket (1) on the brake booster.

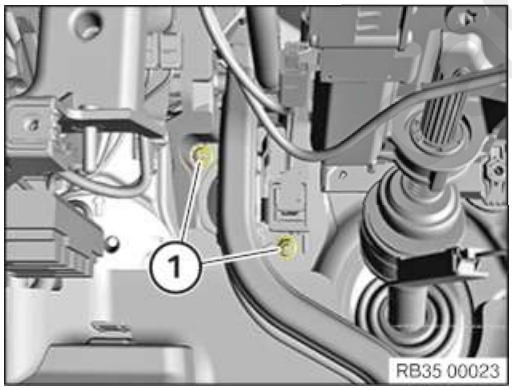
  Parts: Gasket

- Thoroughly clean the sealing surfaces on the brake booster and on the bulkhead.

7 – Install brake booster

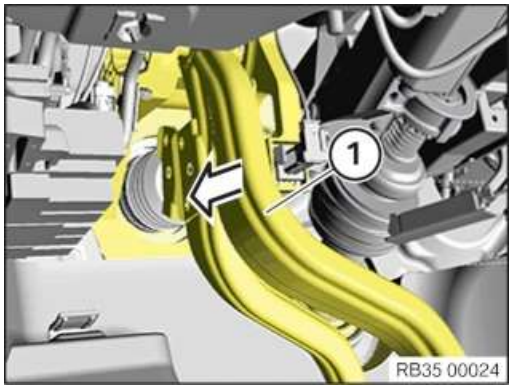


- Screw in the brake booster (1) in the bulkhead.



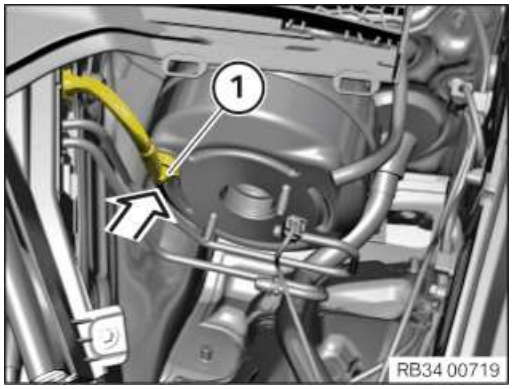
- Place and tighten nuts (1).
- Replace nuts.

  Parts: Nuts

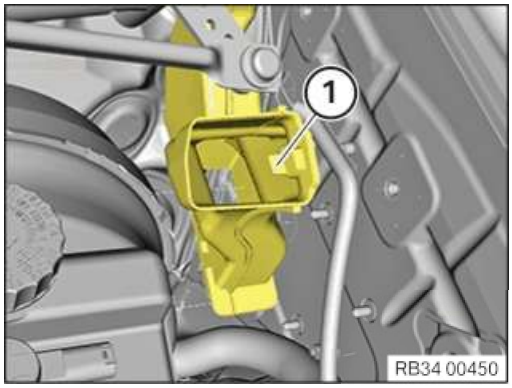


- Lock the brake pedal (1) in direction of arrow with the brake booster.

  Ensure that the brake pedal is completely locked with the brake booster!



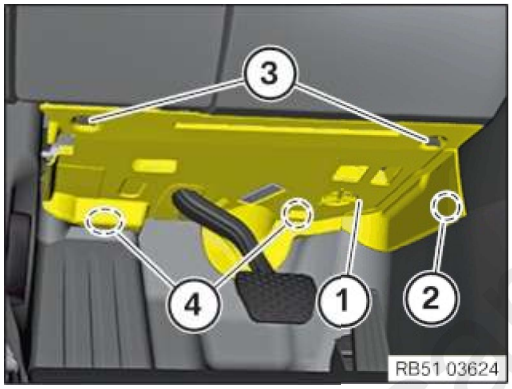
- Install non-return valve (1) in direction of arrow into brake booster.



- Install air duct (1).

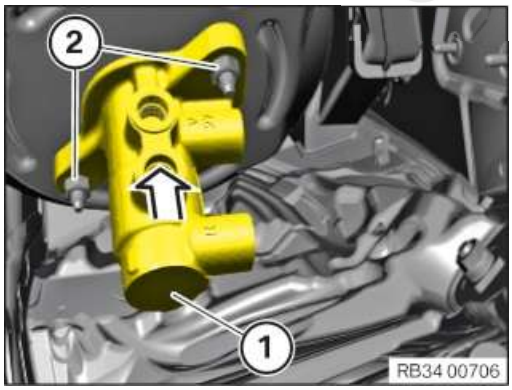
POSTPROCESSES

8 – 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°.

9 – Install tandem brake master cylinder.



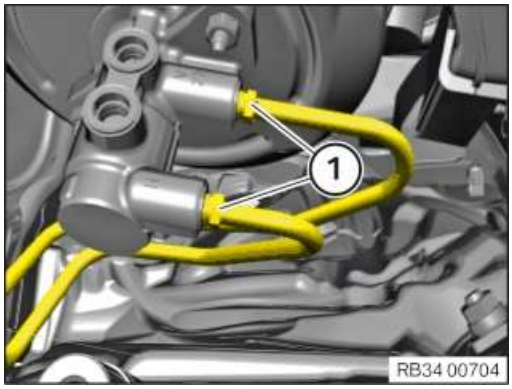
- Introduce tandem brake master cylinder (1) in the brake booster.
- Renew nuts (2).

  Parts: Nuts
- Place and tighten nuts (2).

Tandem brake master cylinder in the brake booster

Replace nuts.		
M8		23 Nm

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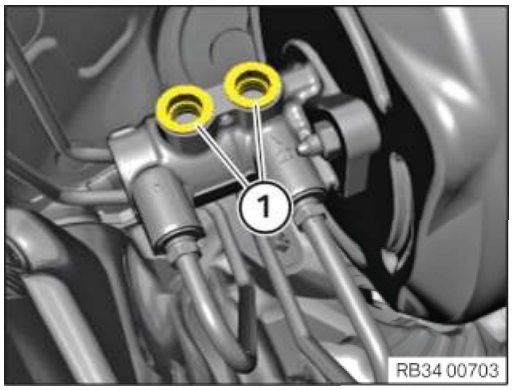


- (1)Fit brake lines () and tighten.

Brake pipe screw connection / Union screws

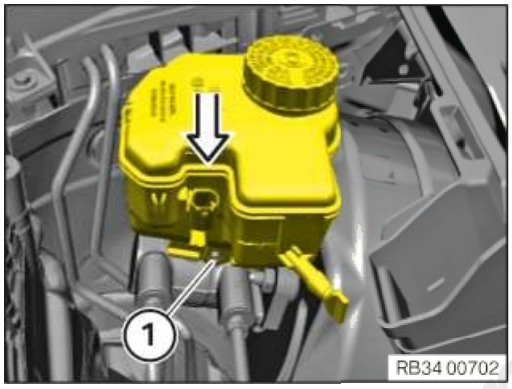
	Tightening torque	17 Nm

10 – Installing the expansion tank (vehicles with automatic transmission)



- Renew rubber plugs(1).

  Parts: Rubber plug

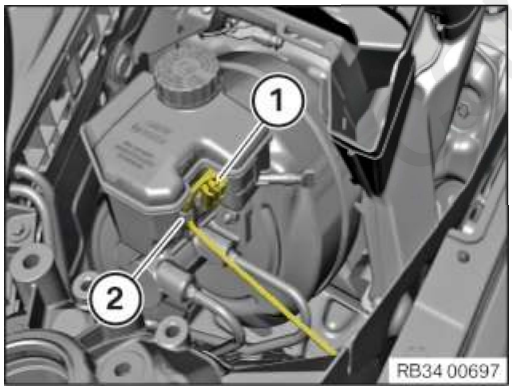


- Connect expansion tank to the tandem brake master cylinder.
- Renew retaining screw (1).

  Parts: Retaining screw
- Fit and tighten retaining screw (1).

Retaining screw, expansion tank to tandem brake master cylinder

	Renew screw.	4 Nm



- Connect the plug connection (1).
- Attach cable to the bracket (2).

11 – Connect bleeder unit for brake fluid



- To guarantee correct bleeding of the brake system, it is essential to adhere to the following procedure!
- Fill new brake fluid in the expansion tank up to the lower edge of thread (1).
- Bleed the hose of the bleeder unit before connecting.

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TECHNICAL INFORMATION

Use only BMW-approved brake fluids, see operating fluids.

RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.

- Connect the bleeder unit (1) to the brake fluid expansion tank and switch it on.

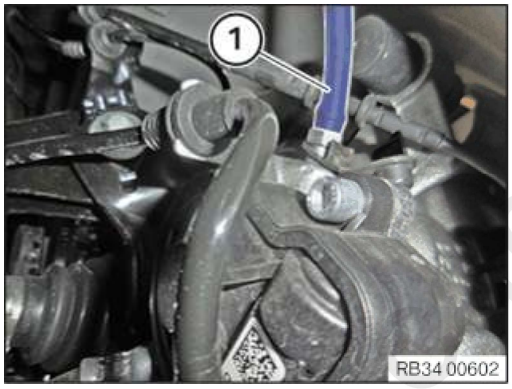
  Observe the operating instructions of the corresponding equipment manufacturer.

- **Do not exceed the filling pressure of** 2 bar**.**

12 – Rinsing and bleeding the rear axle brake circuit

NOTICE

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



- **Start flushing at the rear right.**
- Connect the vent hose with the collecting vessel to the vent valve (1) on rear right brake caliper.
- Open the vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve.

Vent valve

		Tightening torque	10 Nm

- Carry out the same procedure on the rear left wheel brake.

13 – Flushing and bleeding the front axle brake circuit

NOTICE

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



- **Start flushing at the front right.**
- Connect the vent hose with the collecting vessel to the vent valve (1) on front right interior brake calliper.
- Open the vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve (1).

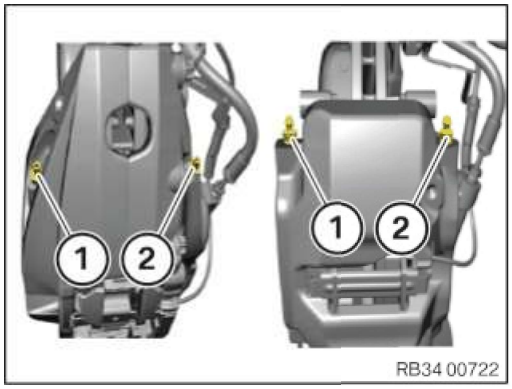
Vent valve

		Tightening torque	10 Nm

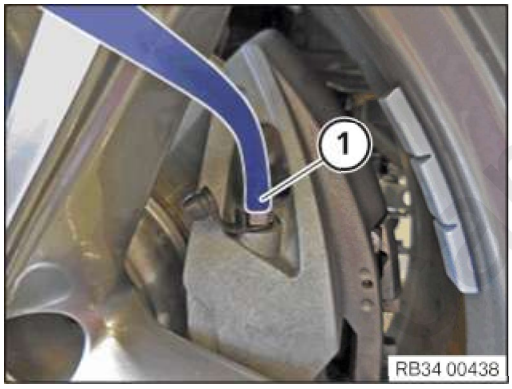
14 – Flush and bleed the front axle brake circuit (brake, high)

NOTICE

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



- Two fixed brake callipers are fitted!
- For both variants, first outer (1) must be bled. The bleed inner (2).



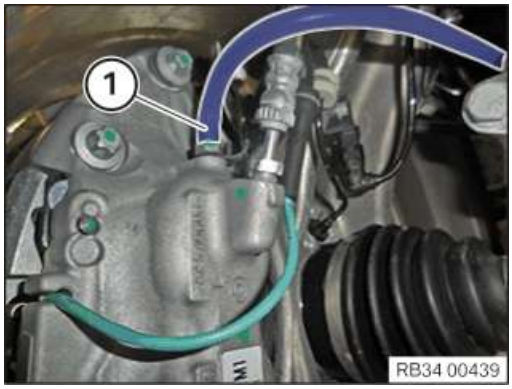
- **Start flushing at the front right.**
- Connect the vent hose with the collecting vessel to the vent valve (1) on the front right brake caliper.
- Open the vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve (1).

Front ventilation valve Brake calliper manufacturer Brembo

Vent valve		Tightening torque	18 Nm

Front ventilation valve fixed brake calliper Brake calliper manufacturer Continental

Vent valve		Tightening torque	15 Nm



- Connect the vent hose with the collecting vessel to the vent valve (1) on front right brake caliper.
- Open vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve (1).

Front ventilation valve Brake calliper manufacturer Brembo

Vent valve		Tightening torque	18 Nm

Front ventilation valve fixed brake calliper Brake calliper manufacturer Continental

Vent valve		Tightening torque	15 Nm

- Carry out the same procedure on the front left wheel brake.

15 – Close bleeder unit for brake fluid

RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.

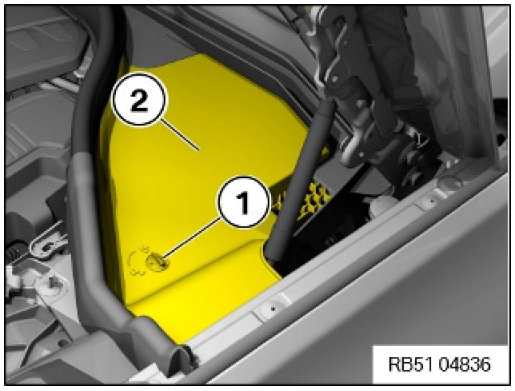


- Switch off bleeder unit (1) and remove from brake fluid expansion tank .
- Check the brake fluid level; if necessary, adjust to maximum mark.



- Check the seal (1) on the sealing cap, renew if necessary.
- Mount the sealing cap on the brake fluid expansion tank.

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



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

Additional Information

Overview of Tightening Torques

Tandem brake master cylinder in the brake booster			Used in step 9
Replace nuts.			
M8			23 Nm

Brake pipe screw connection / Union screws			Used in step 9
		Tightening torque	17 Nm

Retaining screw, expansion tank to tandem brake master cylinder			Used in step 10
	Renew screw.		4 Nm

Vent valve			Used in step 1213
		Tightening torque	10 Nm

Front ventilation valve Brake calliper manufacturer Brembo			Used in step 14
Vent valve		Tightening torque	18 Nm

Front ventilation valve fixed brake calliper Brake calliper manufacturer Continental			Used in step 14
Vent valve		Tightening torque	15 Nm

Overview of Special Tools

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34 35 001 Replacing one brake pad wear sensor

PRELIMINARY WORK

1 – Removing the front left 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 .

MAIN WORK

2 – Removing front brake pad wear sensor

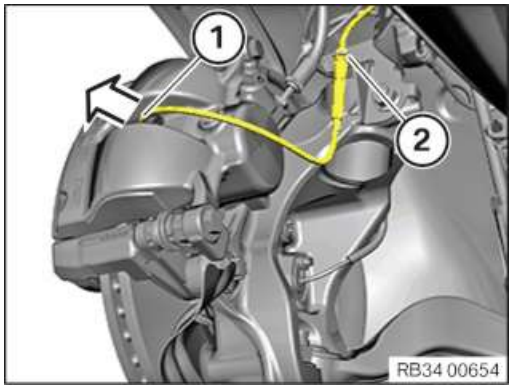
TECHNICAL INFORMATION

The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

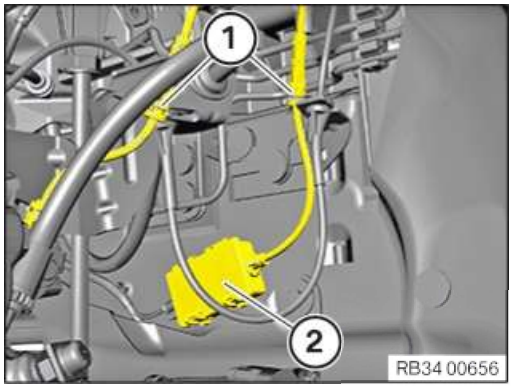
If a brake pad wear sensor that has already been ground has to be replaced even though the minimum brake pad thickness has not yet been reached, you must observe the following:

The new sliding contact must be filed down with a file to the same length as the sanded sliding contact.

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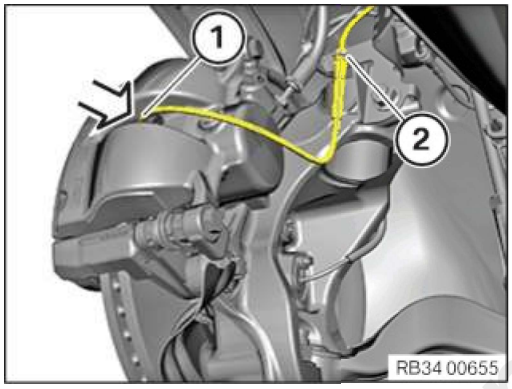


- Remove brake pad wear sensor (1) out of the brake pad in the direction of the arrow.
- Detach the brake pad wear sensor cable from the bracket (2).

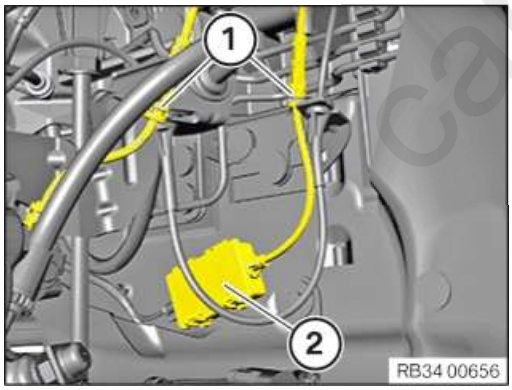


- Detach the brake pad wear sensor from the brackets (1).
- Open sealing cap (2) and disconnect the plug connection.

3 – Installing front brake pad wear sensor



- Attach the brake pad wear sensor to the bracket (2).
- Install the brake pad wear sensor (1) in the brake pad in the direction of the arrow.
- Make sure the brake pad wear sensor is fitted correctly in the brake pad.



- Attach cable of brake pad wear sensor in brackets (1).
- Connect the plug connection .
- Close sealing cap (2).

POSTPROCESSES

4 – Attaching the front left wheel

► **Mounting the wheel**

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TECHNICAL INFORMATION

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

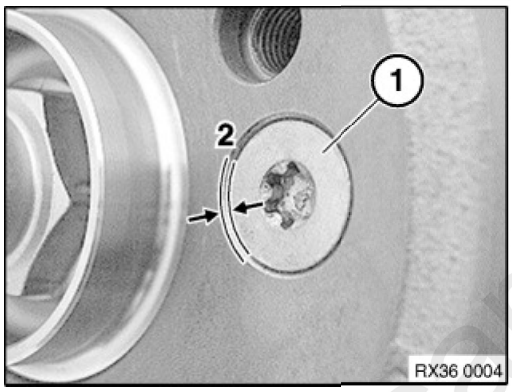
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

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



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

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).



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

  The mounting bolt (1) for the brake disc may not protrude 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 * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233

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



- 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.

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TECHNICAL INFORMATION

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

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

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Additional Information

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

Overview of Special Tools

2 344 011 Tool

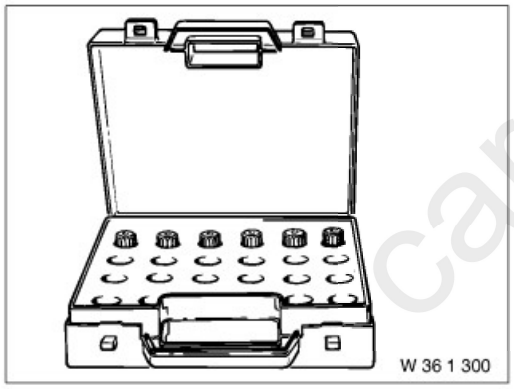


Common Used in step 4

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

Replacement tools:

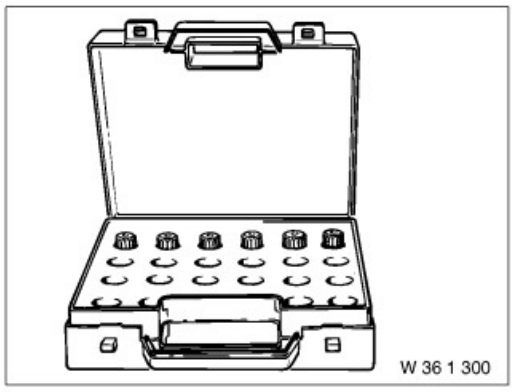
0 495 221 (36 1 323) Wheel stud



Common Used in step 1

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

0 495 224 (36 1 326) Wheel stud



Common Used in step 1

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

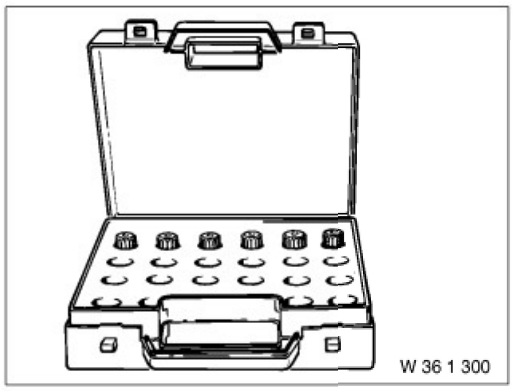
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0 495 225 (36 1 327) Wheel stud



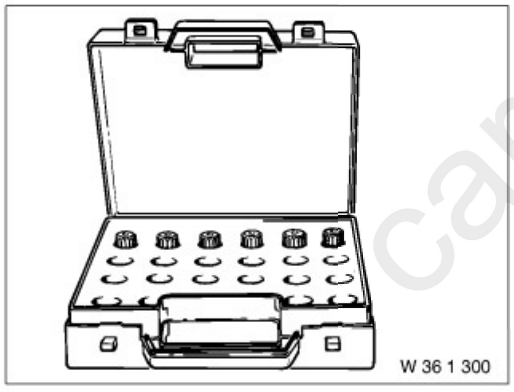
Common	Used in step 1
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 226 (36 1 328) Wheel stud



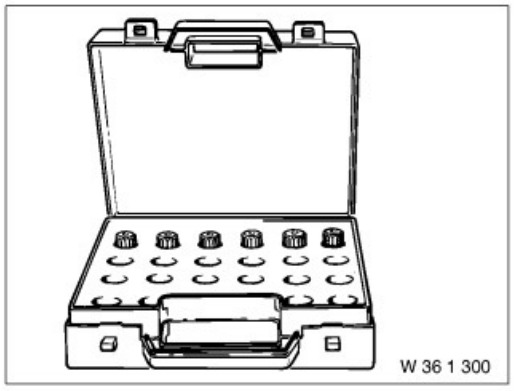
Common	Used in step 1
Usage	(Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 227 (36 1 329) Wheel stud



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

0 495 228 (36 1 331) Wheel stud



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

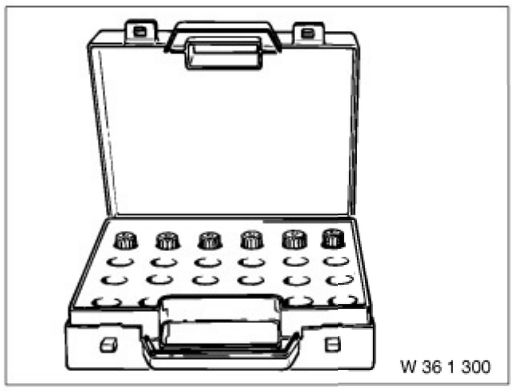
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0 495 229 (36 1 332) Wheel stud



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

0 495 230 (36 1 333) Wheel stud



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

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34 35 001 Replacing one brake pad wear sensor

Prerequisite

- **Vehicles with brake, high.**

PRELIMINARY WORK

1 – Removing the front left 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 .

MAIN WORK

2 – Removing the front brake pad set (brake, high)

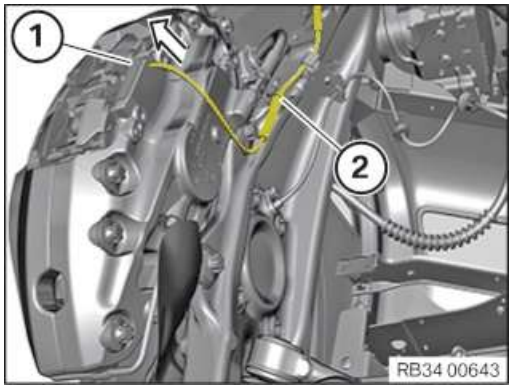
TECHNICAL INFORMATION

The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

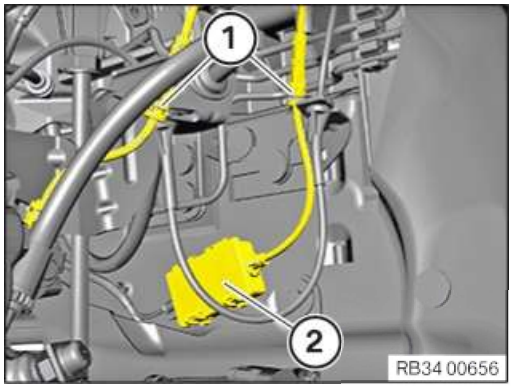
If a brake pad wear sensor that has already been ground has to be replaced even though the minimum brake pad thickness has not yet been reached, you must observe the following:

The new sliding contact must be filed down with a file to the same length as the sanded sliding contact.

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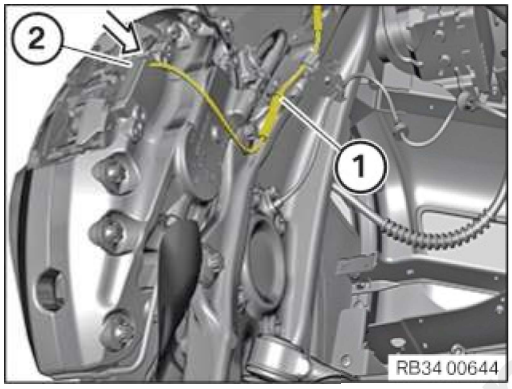


- Remove brake pad wear sensor (1) out of the brake pad in the direction of the arrow.
- Detach the cable of the brake pad wear sensor (1) from the bracket (2).



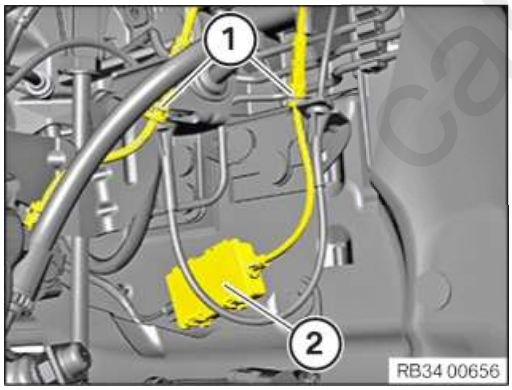
- Detach the brake pad wear sensor from the brackets (1).
- Open sealing cap (2) and disconnect the plug connection.

3 – Install the front brake pad sensor (brake high)



- Attach the cable of the brake pad wear sensor in the bracket (1).
- Install the brake pad wear sensor (2) in the brake pad in the direction of the arrow.

  Ensure brake pad wear sensor fits correctly in brake pad.



- Attach cable of brake pad wear sensor in brackets (1).
- Connect the plug connection .
- Close sealing cap (2).

POSTPROCESSES

4 – Attaching the front left wheel

► **Mounting the wheel**

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TECHNICAL INFORMATION

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

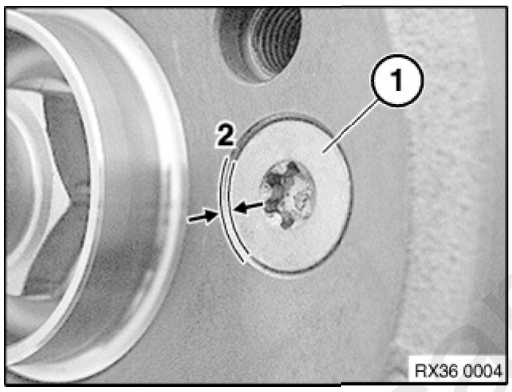
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

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



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

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).



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

  The mounting bolt (1) for the brake disc may not protrude 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 * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233

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



- 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.

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TECHNICAL INFORMATION

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

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

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Additional Information

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

Overview of Special Tools

2 344 011 Tool

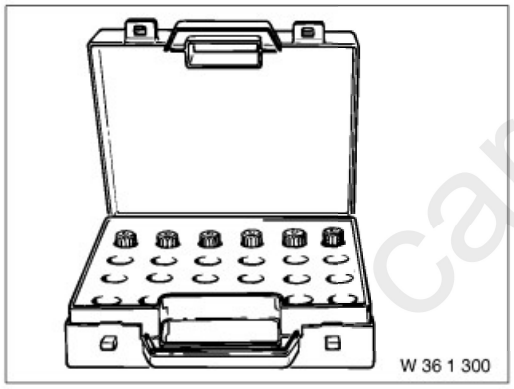


Common Used in step 4

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

Replacement tools:

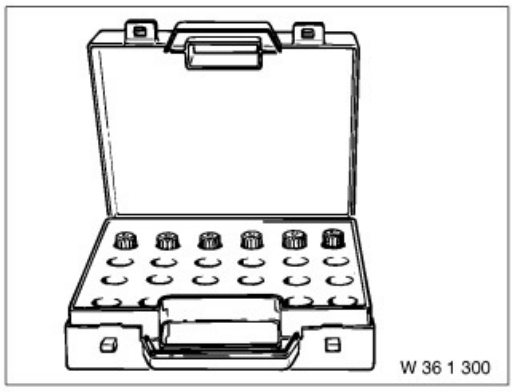
0 495 221 (36 1 323) Wheel stud



Common Used in step 1

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

0 495 224 (36 1 326) Wheel stud



Common Used in step 1

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

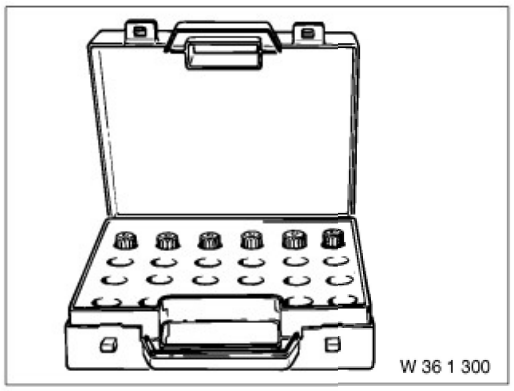
cardiagn.com

0 495 225 (36 1 327) Wheel stud



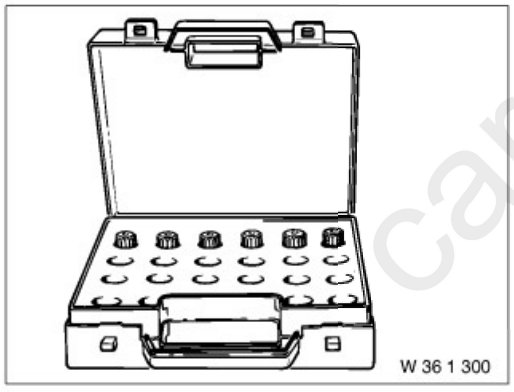
Common	Used in step 1
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 226 (36 1 328) Wheel stud



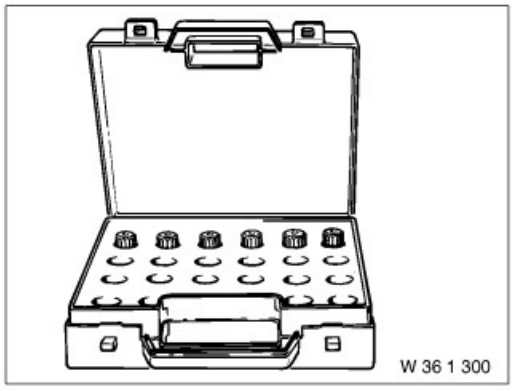
Common	Used in step 1
Usage	(Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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	

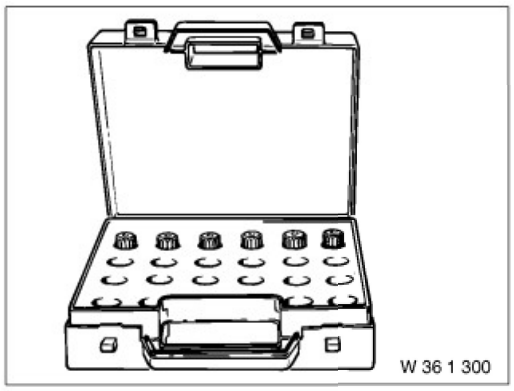
cardiagn.com

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	

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34 35 003 Replacing one brake pad wear sensor

PRELIMINARY WORK

1 – Removing the rear 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 .

MAIN WORK

2 – Removing the brake pad wear sensor, rear

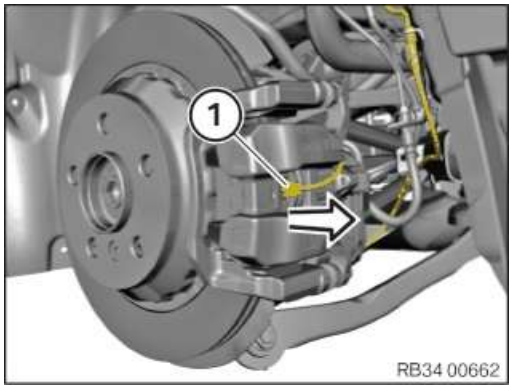
TECHNICAL INFORMATION

The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

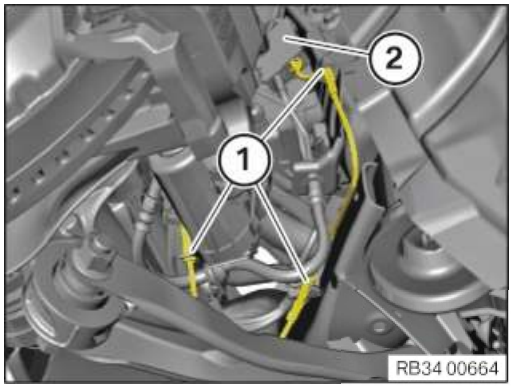
If a brake pad wear sensor that has already been ground has to be replaced even though the minimum brake pad thickness has not yet been reached, you must observe the following:

The new sliding contact must be filed down with a file to the same length as the sanded sliding contact.

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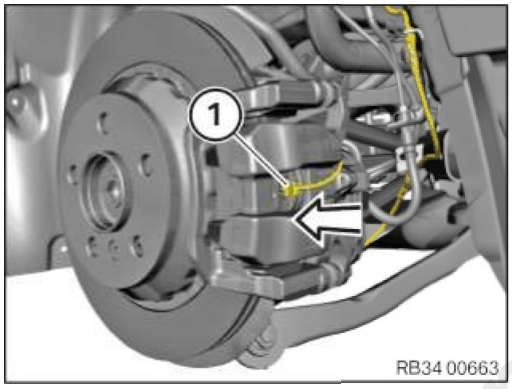


- Remove the brake pad wear sensor (1) from the brake pad.



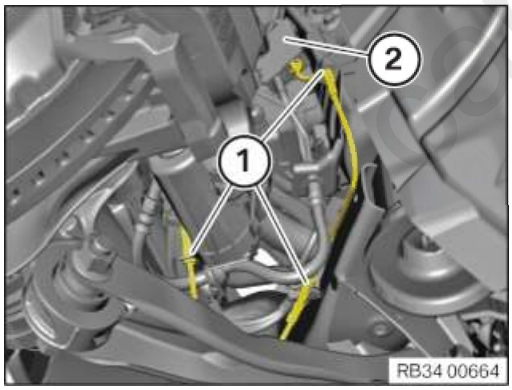
- Detach the brake pad wear sensor from the brackets (1).
- Open cover (2) and disconnect the plug connection.

3 – Install rear brake pad sensor



- Install the brake pad wear sensor (2) in the brake pad in the direction of the arrow.

  Ensure brake pad wear sensor fits correctly in brake pad.



- Attach cable of brake pad wear sensor in brackets (1).
- Connect the plug connection and close the cover (2).

POSTPROCESSES

4 – Mounting the rear 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.

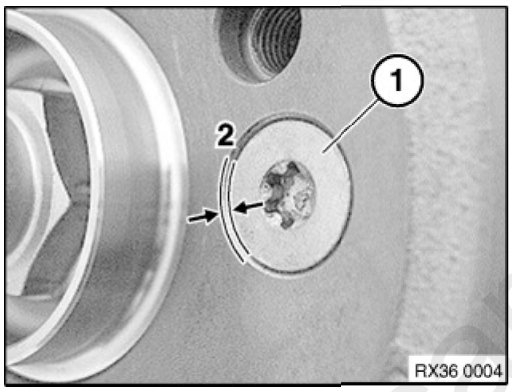
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

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

catalagn.com



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



- 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.

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TECHNICAL INFORMATION

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

The wheel rim must rest uniformly against the brake disc.

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

Do not apply oil to new wheel bolts.

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

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Additional Information

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

Overview of Special Tools

2 344 011 Tool

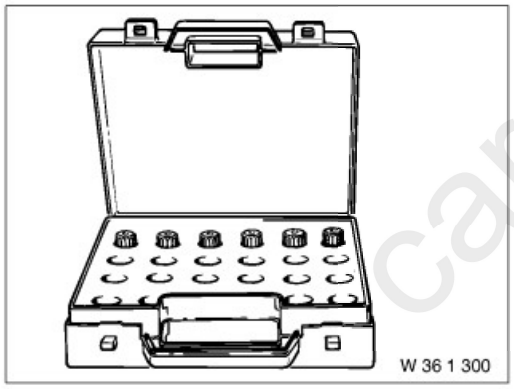


Common Used in step 4

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

Replacement tools:

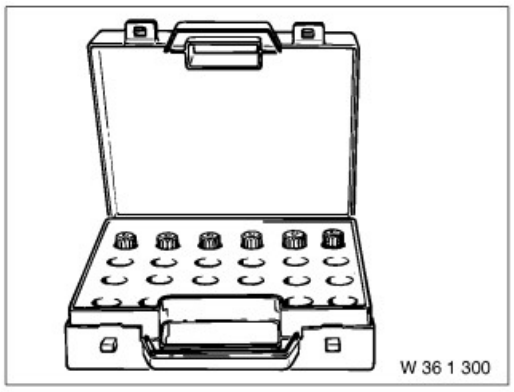
0 495 221 (36 1 323) Wheel stud



Common Used in step 1

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

0 495 224 (36 1 326) Wheel stud



Common Used in step 1

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

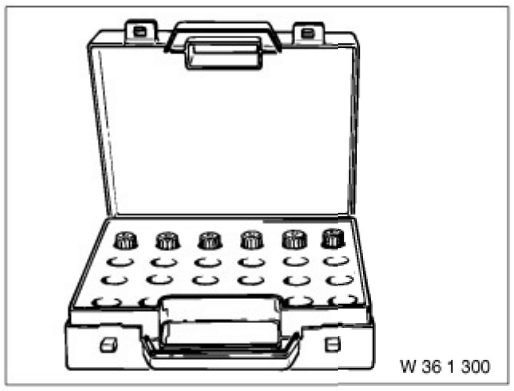
cardiagn.com

0 495 225 (36 1 327) Wheel stud



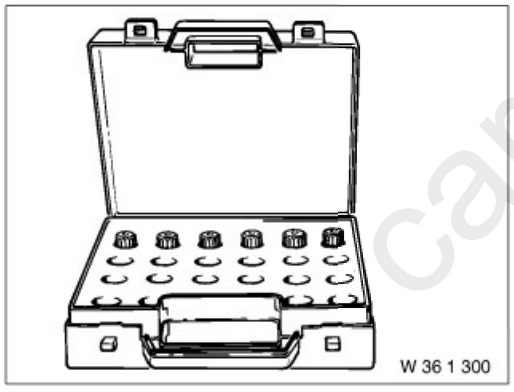
Common	Used in step 1
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 226 (36 1 328) Wheel stud



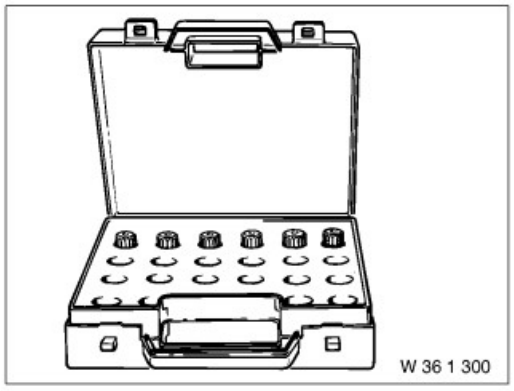
Common	Used in step 1
Usage	(Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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	

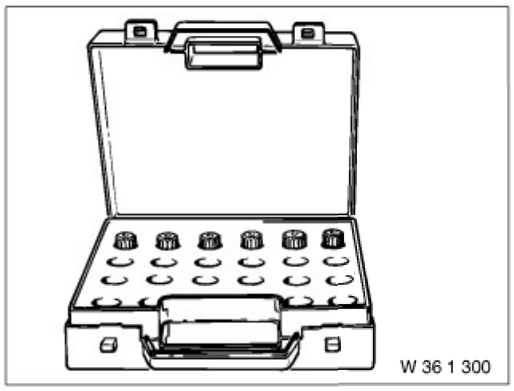
cardiagn.com

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	

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34 41 690 EMF parking brake - use emergency release

NOTICE

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

PRELIMINARY WORK

1 – Prepare the removal of the EMF actuator

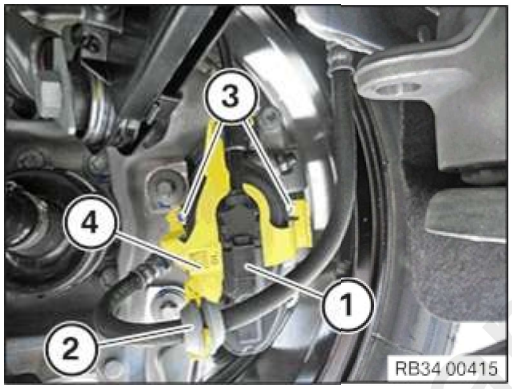
- Release parking brake.
- Switch off ignition.

TECHNICAL INFORMATION

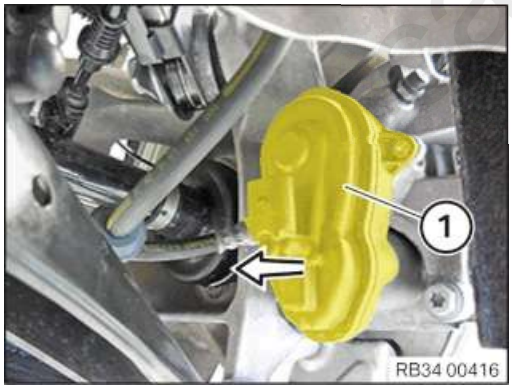
The ignition must be switched off for at least 30 s before the plug connection is disconnected.

- Disconnect plug connection.

2 – Detach EMF actuator



- Disconnect plug connection (1).
- Detach the brake hose (2) from the holder.
- Release screws (3) and remove the holder (4).



- Remove the EMF actuator (1) from the brake caliper in the direction of the arrow.

carsdiagn.com

3 – Electromechanical parking brake - emergency release

NOTICE

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

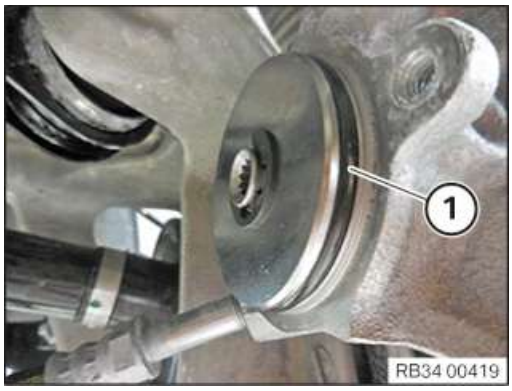


- Be sure that the spindle does not turn to the end stop!
- Turn the spindle back until the wheel can turn freely.
- Turn back the spindle of the brake caliper in clockwise direction using the AF 7 hexagon socket wrench (1).

  A fault code is set upon reaching the end stop. It deactivates the system! Delete the fault memory when deactivating the system.

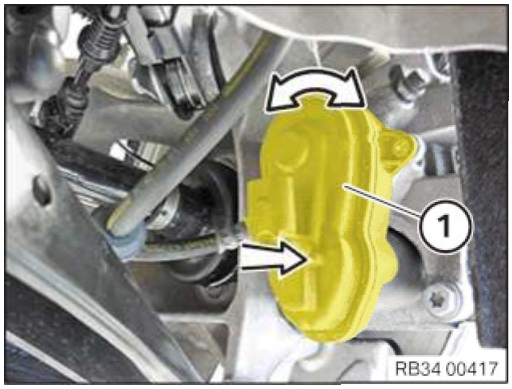
cardiagn.com

4 – Checking sealing ring on the EMF actuator

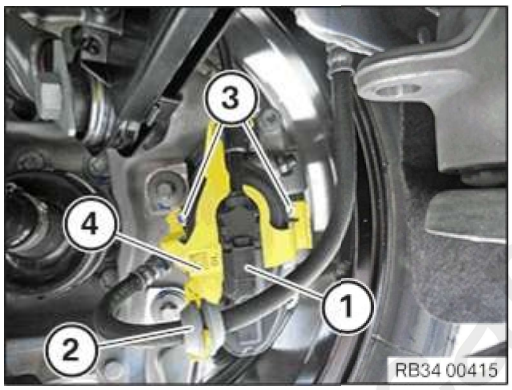


- Check the sealing ring (1) for damage and renew where required.
- Apply a light coating of brake fluid on the sealing ring (1) before fitting.

5 – Install EMF actuator



- Carefully fit the EMF actuator (1) until the gearing engages and the EMF actuator rests flush against the brake caliper.
- If necessary, turn the EMF actuator slightly until the bore hole and the screw thread are aligned.



- Attach the holder (4) and position and tighten the bolts (3).

EMF actuator to brake caliper

	Renew screws.	Tightening torque	12 Nm

- Connect connector (1).
- Attach the brake hose (2) in the holder.

6 – After replacing the EMF actuator: Putting electromechanical holding brake into operation

TECHNICAL INFORMATION

After completing repair work:

Switch the ignition on. Use the parking brake button to open, close and open the parking brake again.

- Put electromechanical holding brake into operation.

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Additional Information

Overview of Tightening Torques

EMF actuator to brake caliper Used in step 5

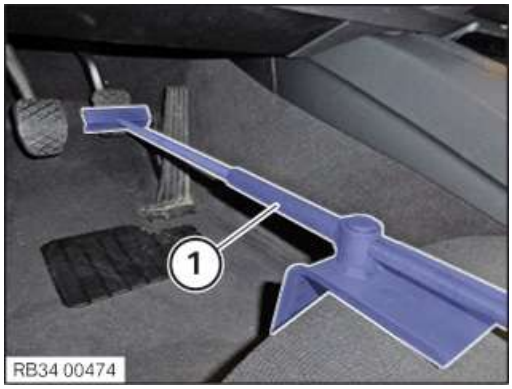
	Renew screws.	Tightening torque	12 Nm

cardiagn.com

34 41 798 Replacing the control unit for parking brake

PRELIMINARY WORK

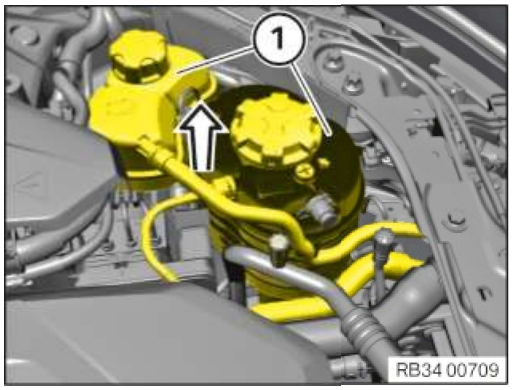
1 – Install brake pedal tensioner



- Press the brake pedal to the floor and fix the brake pedal tensioner (1).

  Do not release the brake pedal tensioner (1) until the brake lines have been reconnected. This prevents brake fluid from emerging from the expansion tank when the brake lines are opened.

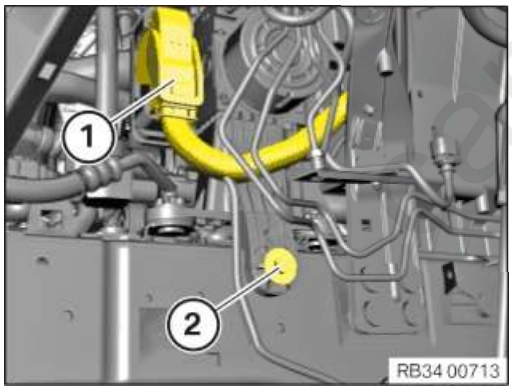
2 – Detach the engine coolant expansion tank



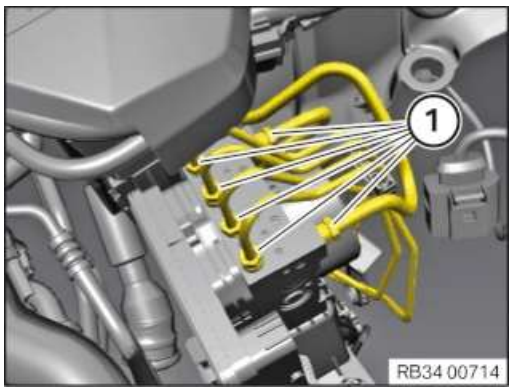
- Detach both the engine coolant expansion tanks (1) in upward direction.

  Coolant circuit remains closed.

3 – Remove hydraulic unit



- Disconnect plug connection (1).
- Loosen screw (1).



TECHNICAL INFORMATION

Do not interchange brake lines. If necessary, mark the brake lines before disassembly.

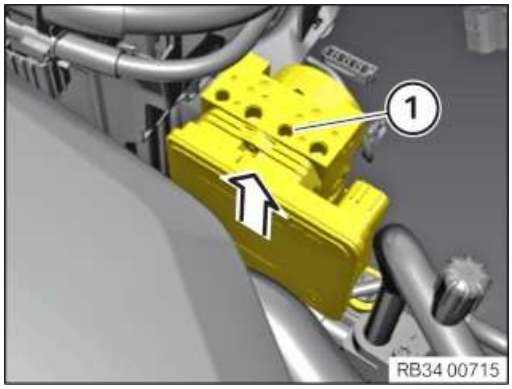
Note various equipment specifications with different line seizure.

Do not bend brake lines.

Close off connecting bores with seal plugs.

- (1)Unfasten brake lines.

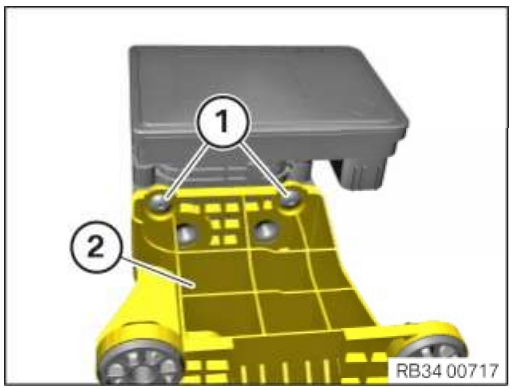
erdiagn.com



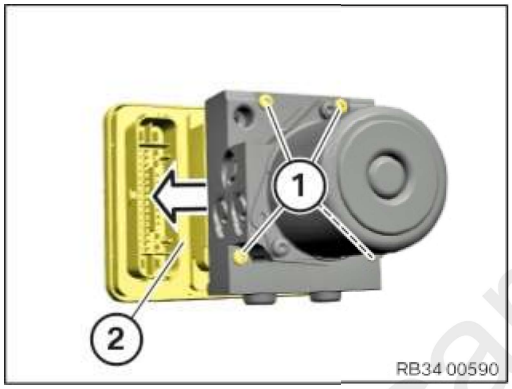
- Remove the hydraulic unit (1).

MAIN WORK

4 – Remove the DSC control unit



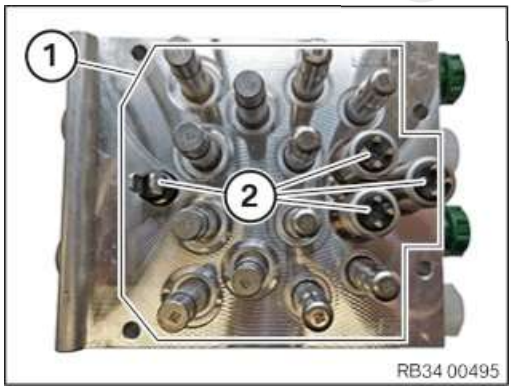
- Release screws (1) and remove the holder (2).



- Loosen screws (1).
- Remove DSC control unit (2) carefully.

  When removing the DSC control unit, no contacts must be bent!

5 – Prepare for the installation of the DSC control unit



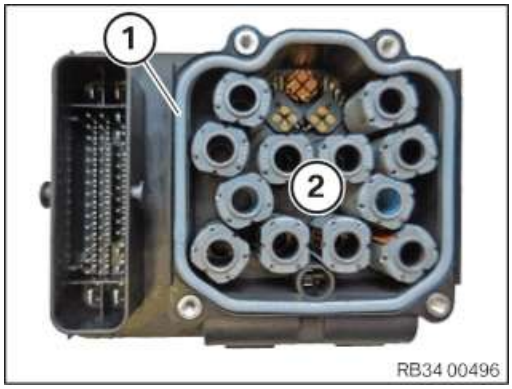
TECHNICAL INFORMATION

Do not clean the sealing surface with compressed air, chemical solvents or sharp-edged objects.

Do not touch or clean the pressure sensor contacts with your fingers.

- Clean the sealing surface (1) if necessary, with plastic scraper or a lint-free cloth.
- Ensure that the contacts (2) are not damaged.

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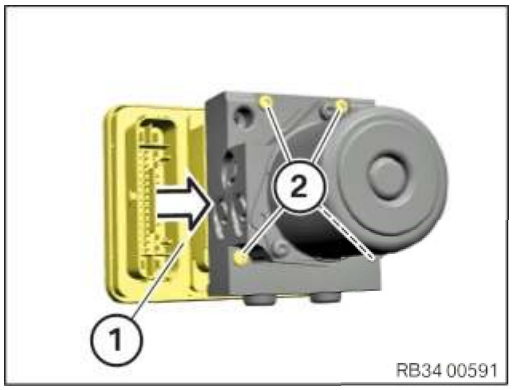


- For renewed use of the hydraulic unit (valve block), an add-on control unit repair kit is required.

  The repair kit contains a new silicone seal (1) and bolts.
- Make sure that the valve coils (2) are not damaged.

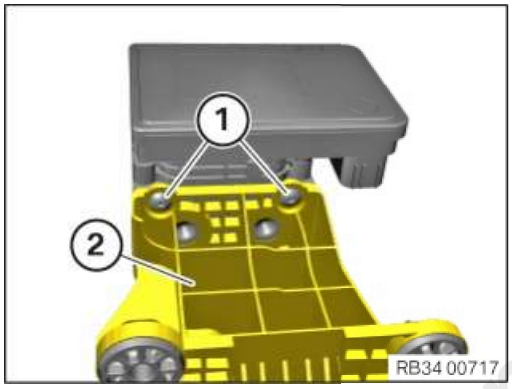
  Do not clean, readjust or touch the valve coils with your fingers.

6 – Install the DSC control unit



- Connect DSC control unit (5) carefully to hydraulic unit.
- Renew screws (1) to (4).

  Parts: Bolts
- Tighten screws (1) to (4) in this order in stages.



- Install holder (2).
- Renew screws (1).

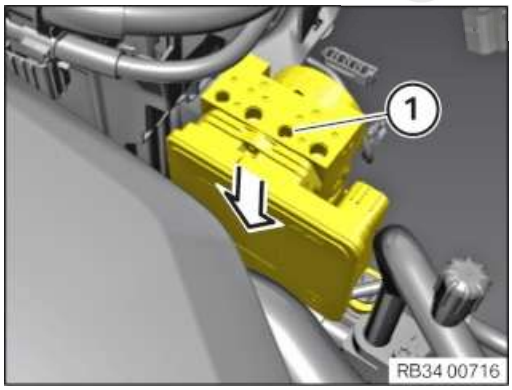
  Parts: Bolts
- Insert screws (1) and tighten.

Hydraulic control unit to holder

M6	Renew screws.	8 Nm

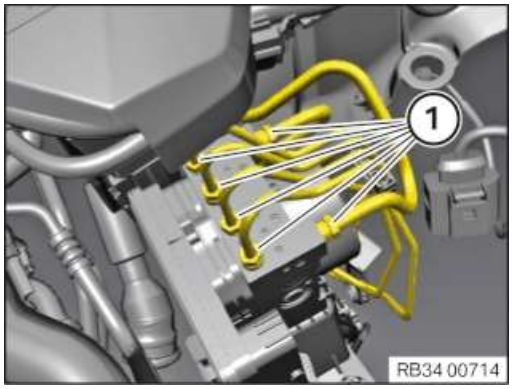
POSTPROCESSES

7 – Install hydraulic unit



- Position hydraulic unit (1).

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TECHNICAL INFORMATION

Do not interchange brake lines. If necessary, mark the brake lines before disassembly.

Note various equipment specifications with different line seizure.

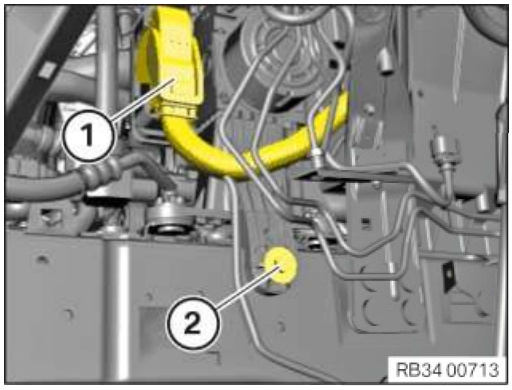
Do not bend brake lines.

Close off connecting bores with seal plugs.

- (1)Fit brake lines () and tighten.

Brake pipe screw connection / Union screws

	Tightening torque	17 Nm



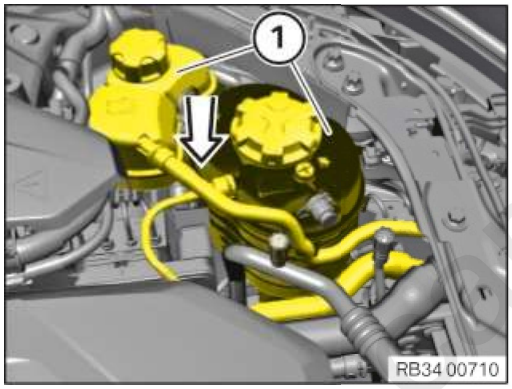
- Connect the plug connection (1).
- Renew the screw (2).

  Parts: Screw.
- Position and tighten the screw (2).

Hydraulic unit with holder on body

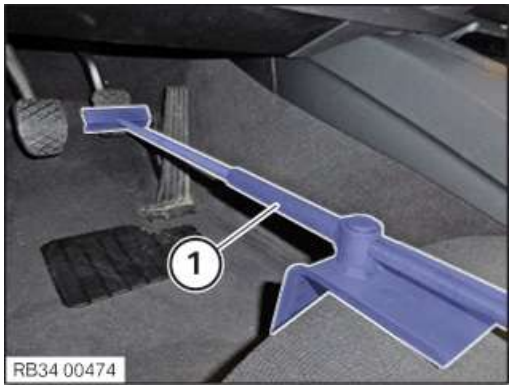
	Renew screws.	8 Nm

8 – Installing coolant expansion tank



- Clip in both coolant expansion tanks (1) together into the brackets.

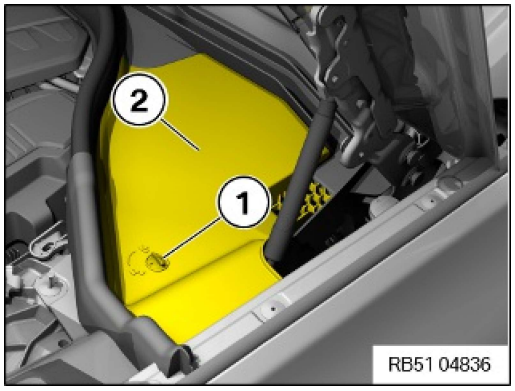
9 – Remove the brake pedal tensioner



- Remove the brake pedal tensioner (1).

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

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

11 – Connect bleeder unit for brake fluid





- To guarantee correct bleeding of the brake system, it is essential to adhere to the following procedure!
- Fill new brake fluid in the expansion tank up to the lower edge of thread (1).
- Bleed the hose of the bleeder unit before connecting.

TECHNICAL INFORMATION

Use only BMW-approved brake fluids, see operating fluids.

RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.

- Connect the bleeder unit (1) to the brake fluid expansion tank and switch it on.

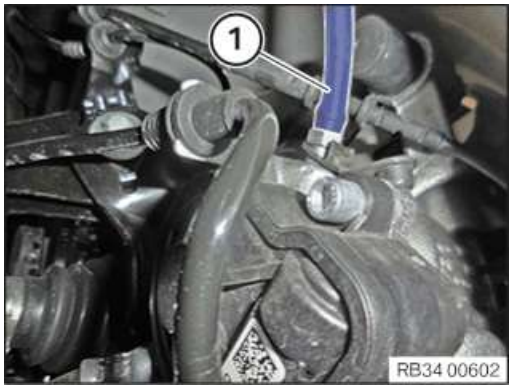
  Observe the operating instructions of the corresponding equipment manufacturer.
- **Do not exceed the filling pressure of** 2 bar**.**

12 – Rinsing and bleeding the rear axle brake circuit

NOTICE

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

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- **Start flushing at the rear right.**
- Connect the vent hose with the collecting vessel to the vent valve (1) on rear right brake caliper.
- Open the vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve.

Vent valve

		Tightening torque	10 Nm

- Carry out the same procedure on the rear left wheel brake.

13 – Flushing and bleeding the front axle brake circuit

NOTICE

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



- **Start flushing at the front right.**
- Connect the vent hose with the collecting vessel to the vent valve (1) on front right interior brake calliper.
- Open the vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve (1).

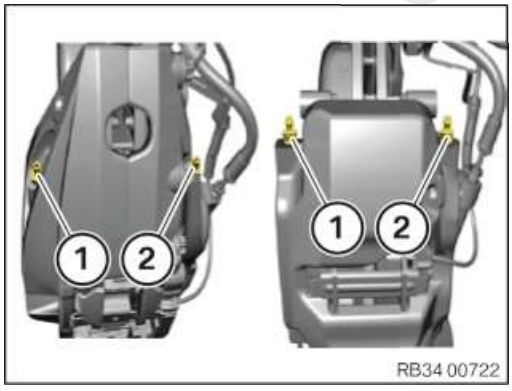
Vent valve

		Tightening torque	10 Nm

14 – Flush and bleed the front axle brake circuit (brake, high)

NOTICE

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



- Two fixed brake callipers are fitted!
- For both variants, first outer (1) must be bled. The bleed inner (2).

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- **Start flushing at the front right.**
- Connect the vent hose with the collecting vessel to the vent valve (1) on the front right brake caliper.
- Open the vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve (1).

Front ventilation valve Brake calliper manufacturer Brembo

Vent valve		Tightening torque	18 Nm

Front ventilation valve fixed brake calliper Brake calliper manufacturer Continental

Vent valve		Tightening torque	15 Nm



- Connect the vent hose with the collecting vessel to the vent valve (1) on front right brake caliper.
- Open vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve (1).

Front ventilation valve Brake calliper manufacturer Brembo

Vent valve		Tightening torque	18 Nm

Front ventilation valve fixed brake calliper Brake calliper manufacturer Continental

Vent valve		Tightening torque	15 Nm

- Carry out the same procedure on the front left wheel brake.

15 – Close bleeder unit for brake fluid

RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.



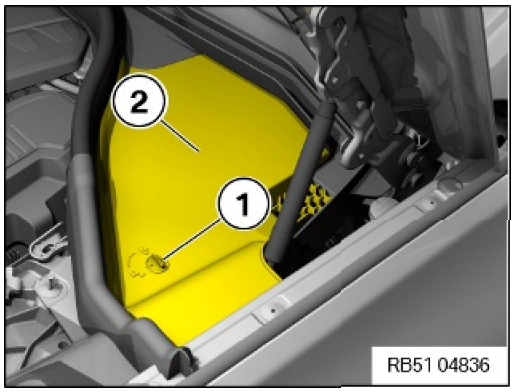
- Switch off bleeder unit (1) and remove from brake fluid expansion tank .
- Check the brake fluid level; if necessary, adjust to maximum mark.

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- Check the seal (1) on the sealing cap, renew if necessary.
- Mount the sealing cap on the brake fluid expansion tank.

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



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

17 – DSC unit start-up/driving dynamics sensor adjustment/programming the 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.

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- 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.



- Connect diagnosis system:
  - Carry out the DSC unit start-up service function
  - Carry out the driving dynamics sensor adjustment service function
  - Perform the service function for the brake line mix-up test

Additional Information

Overview of Tightening Torques

Hydraulic control unit to holder — Used in step 6

M6	Renew screws.		8 Nm

Brake pipe screw connection / Union screws — Used in step 7

		Tightening torque	17 Nm

Hydraulic unit with holder on body — Used in step 7

	Renew screws.		8 Nm

Vent valve — Used in step 1213

		Tightening torque	10 Nm

Front ventilation valve Brake calliper manufacturer Brembo — Used in step 14

Vent valve		Tightening torque	18 Nm

Front ventilation valve fixed brake calliper Brake calliper manufacturer Continental — Used in step 14

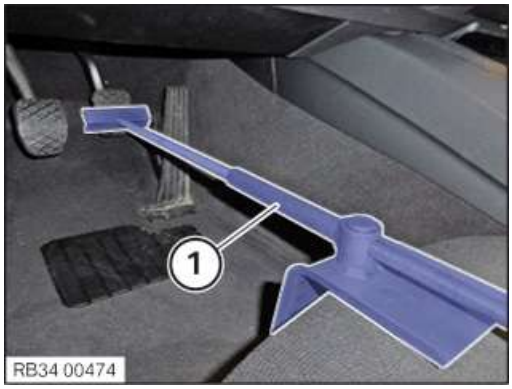
Vent valve		Tightening torque	15 Nm

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34 51 100 Removing and installing the hydraulic unit

PRELIMINARY WORK

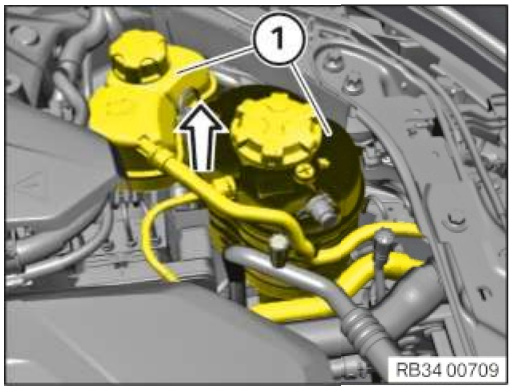
1 – Install brake pedal tensioner



- Press the brake pedal to the floor and fix the brake pedal tensioner (1).

  Do not release the brake pedal tensioner (1) until the brake lines have been reconnected. This prevents brake fluid from emerging from the expansion tank when the brake lines are opened.

2 – Detach the engine coolant expansion tank

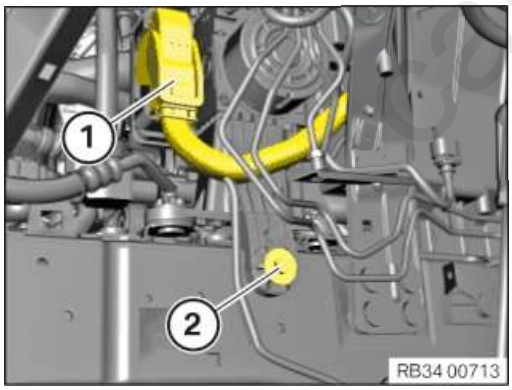


- Detach both the engine coolant expansion tanks (1) in upward direction.

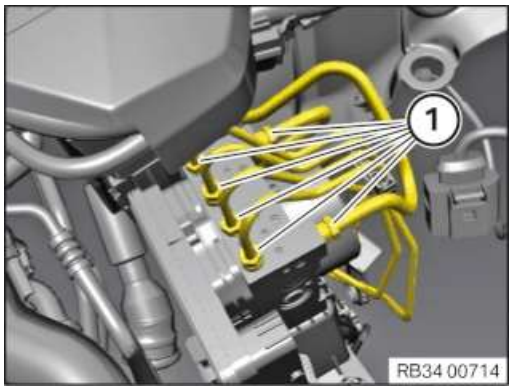
  Coolant circuit remains closed.

MAIN WORK

3 – Remove hydraulic unit



- Disconnect plug connection (1).
- Loosen screw (1).



TECHNICAL INFORMATION

Do not interchange brake lines. If necessary, mark the brake lines before disassembly.

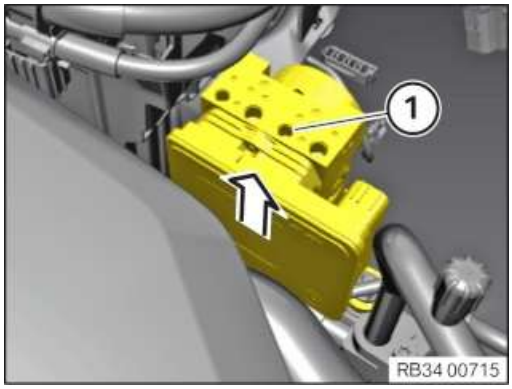
Note various equipment specifications with different line seizure.

Do not bend brake lines.

Close off connecting bores with seal plugs.

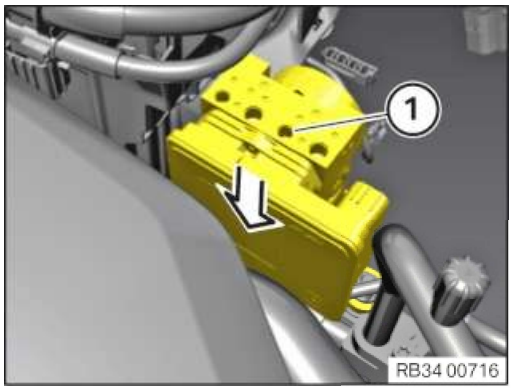
- (1)Unfasten brake lines.

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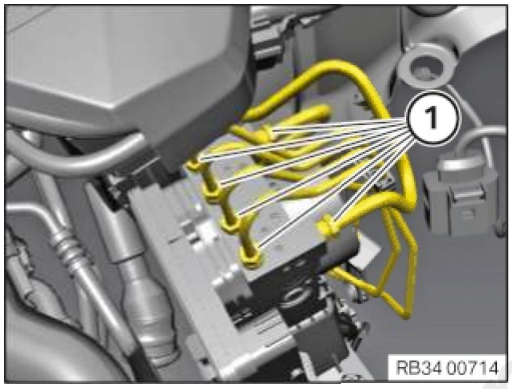


- Remove the hydraulic unit (1).

4 – Install hydraulic unit



- Position hydraulic unit (1).



TECHNICAL INFORMATION

Do not interchange brake lines. If necessary, mark the brake lines before disassembly.

Note various equipment specifications with different line seizure.

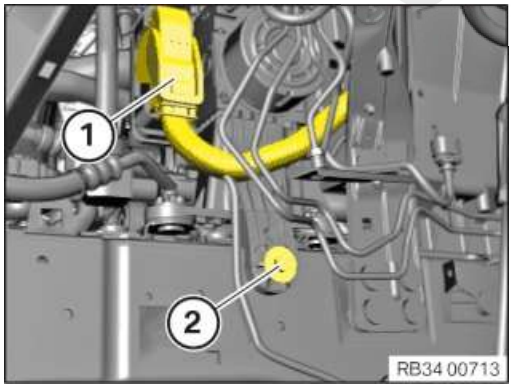
Do not bend brake lines.

Close off connecting bores with seal plugs.

- (1)Fit brake lines () and tighten.

Brake pipe screw connection / Union screws

	Tightening torque	17 Nm



- Connect the plug connection (1).
- Renew the screw (2).

  Parts: Screw.
- Position and tighten the screw (2).

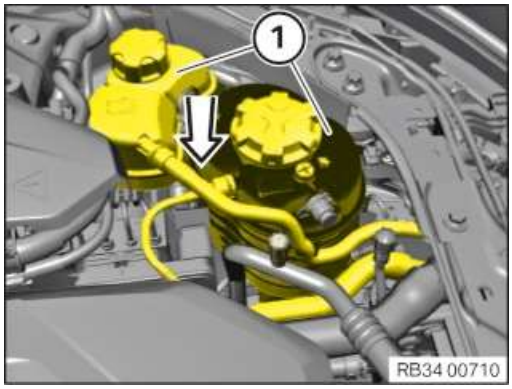
Hydraulic unit with holder on body

	Renew screws.	8 Nm

POSTPROCESSES

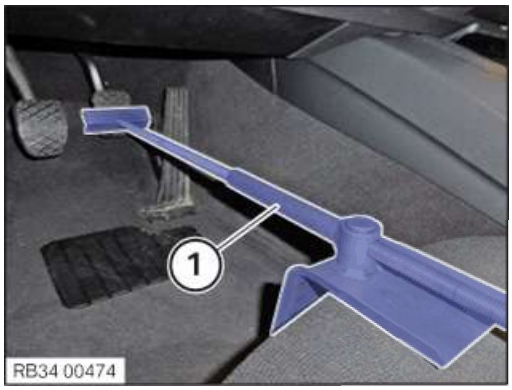
5 – Installing coolant expansion tank

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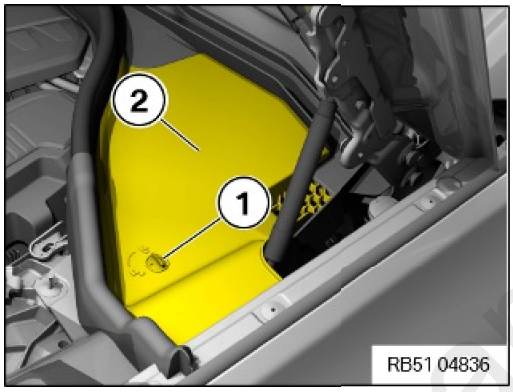
- Clip in both coolant expansion tanks (1) together into the brackets.

6 – Remove the brake pedal tensioner



- Remove the brake pedal tensioner (1).

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



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

8 – Connect bleeder unit for brake fluid



- To guarantee correct bleeding of the brake system, it is essential to adhere to the following procedure!
- Fill new brake fluid in the expansion tank up to the lower edge of thread (1).
- Bleed the hose of the bleeder unit before connecting.

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TECHNICAL INFORMATION

Use only BMW-approved brake fluids, see operating fluids.

RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.

- Connect the bleeder unit (1) to the brake fluid expansion tank and switch it on.

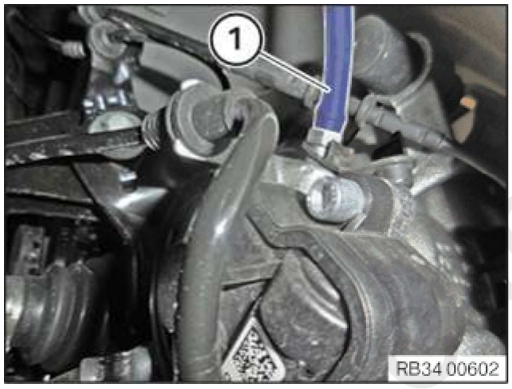
  Observe the operating instructions of the corresponding equipment manufacturer.

- **Do not exceed the filling pressure of** 2 bar**.**

9 – Rinsing and bleeding the rear axle brake circuit

NOTICE

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



- **Start flushing at the rear right.**
- Connect the vent hose with the collecting vessel to the vent valve (1) on rear right brake caliper.
- Open the vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve.

Vent valve

		Tightening torque	10 Nm

- Carry out the same procedure on the rear left wheel brake.

10 – Flushing and bleeding the front axle brake circuit

NOTICE

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



- **Start flushing at the front right.**
- Connect the vent hose with the collecting vessel to the vent valve (1) on front right interior brake calliper.
- Open the vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve (1).

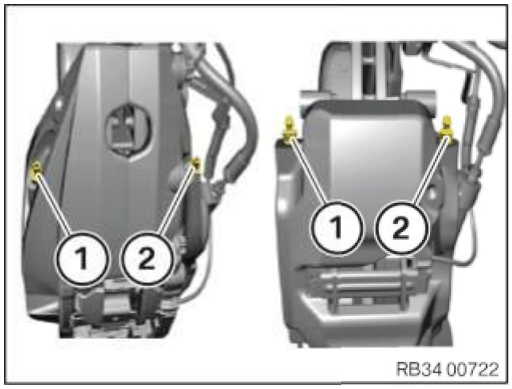
Vent valve

		Tightening torque	10 Nm

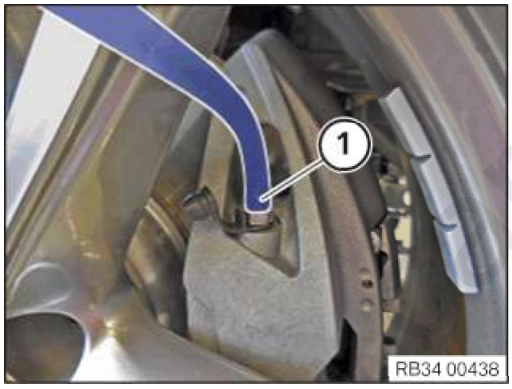
11 – Flush and bleed the front axle brake circuit (brake, high)

NOTICE

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



- Two fixed brake callipers are fitted!
- For both variants, first outer (1) must be bled. The bleed inner (2).



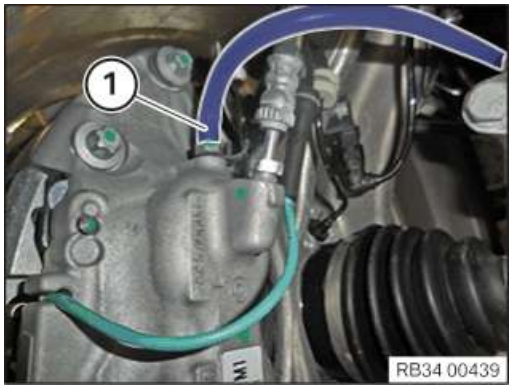
- **Start flushing at the front right.**
- Connect the vent hose with the collecting vessel to the vent valve (1) on the front right brake caliper.
- Open the vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve (1).

Front ventilation valve Brake calliper manufacturer Brembo

Vent valve		Tightening torque	18 Nm

Front ventilation valve fixed brake calliper Brake calliper manufacturer Continental

Vent valve		Tightening torque	15 Nm



- Connect the vent hose with the collecting vessel to the vent valve (1) on front right brake caliper.
- Open vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve (1).

Front ventilation valve Brake calliper manufacturer Brembo

Vent valve		Tightening torque	18 Nm

Front ventilation valve fixed brake calliper Brake calliper manufacturer Continental

Vent valve		Tightening torque	15 Nm

- Carry out the same procedure on the front left wheel brake.

12 – Close bleeder unit for brake fluid

RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.

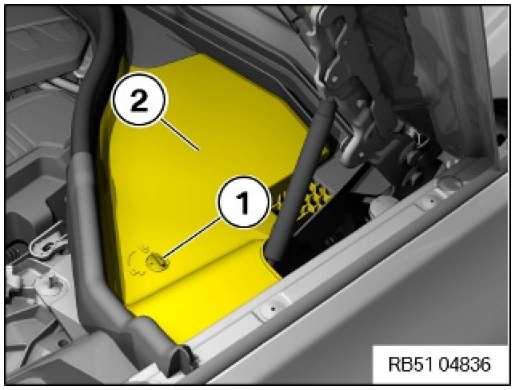


- Switch off bleeder unit (1) and remove from brake fluid expansion tank .
- Check the brake fluid level; if necessary, adjust to maximum mark.



- Check the seal (1) on the sealing cap, renew if necessary.
- Mount the sealing cap on the brake fluid expansion tank.

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



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

14 – DSC unit start-up/driving dynamics sensor adjustment



- Connect diagnosis system:
  - Carry out the DSC unit start-up service function
  - Carry out the driving dynamics sensor adjustment service function
  - Perform the service function for the brake line mix-up test

Additional Information

Overview of Tightening Torques

Brake pipe screw connection / Union screws			Used in step 4
		Tightening torque	17 Nm

Hydraulic unit with holder on body			Used in step 4
	Renew screws.		8 Nm

Vent valve			Used in step 910
		Tightening torque	10 Nm

Front ventilation valve Brake calliper manufacturer Brembo			Used in step 11
Vent valve		Tightening torque	18 Nm

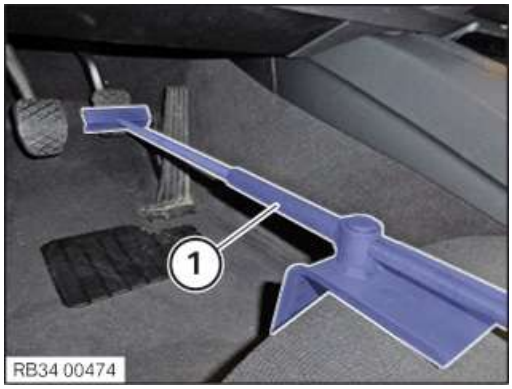
Front ventilation valve fixed brake calliper Brake calliper manufacturer Continental			Used in step 11
Vent valve		Tightening torque	15 Nm

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34 51 601 Replacing the hydraulic unit

PRELIMINARY WORK

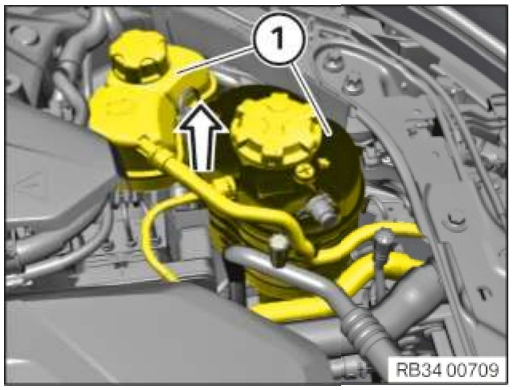
1 – Install brake pedal tensioner



- Press the brake pedal to the floor and fix the brake pedal tensioner (1).

  Do not release the brake pedal tensioner (1) until the brake lines have been reconnected. This prevents brake fluid from emerging from the expansion tank when the brake lines are opened.

2 – Detach the engine coolant expansion tank

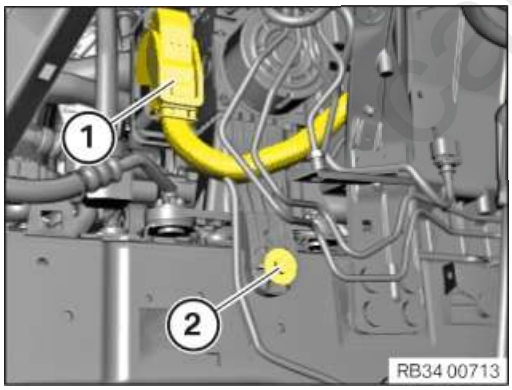


- Detach both the engine coolant expansion tanks (1) in upward direction.

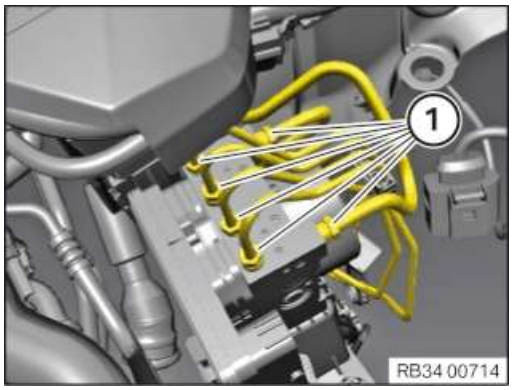
  Coolant circuit remains closed.

MAIN WORK

3 – Remove hydraulic unit



- Disconnect plug connection (1).
- Loosen screw (1).



TECHNICAL INFORMATION

Do not interchange brake lines. If necessary, mark the brake lines before disassembly.

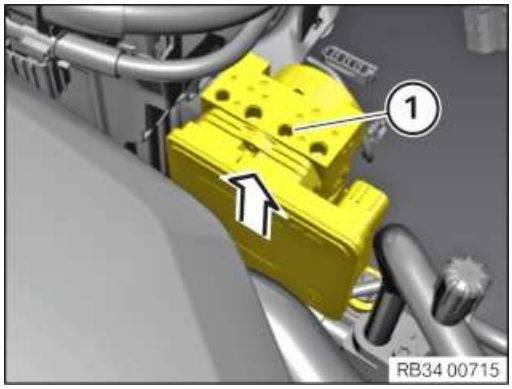
Note various equipment specifications with different line seizure.

Do not bend brake lines.

Close off connecting bores with seal plugs.

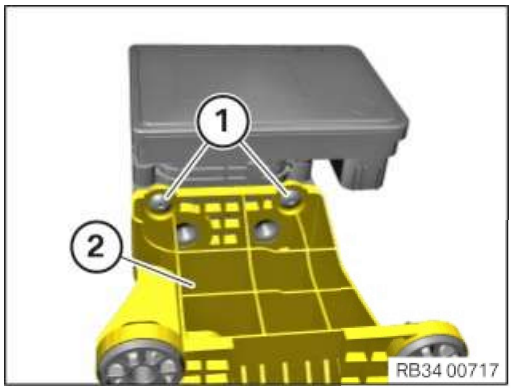
- (1)Unfasten brake lines.

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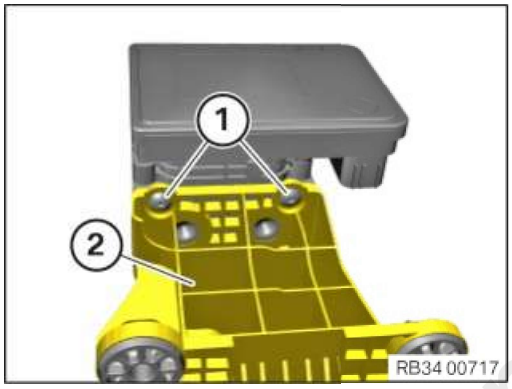


- Remove the hydraulic unit (1).

4 – Remount hydraulic unit holder



- Release screws (1) and remove the holder (2).



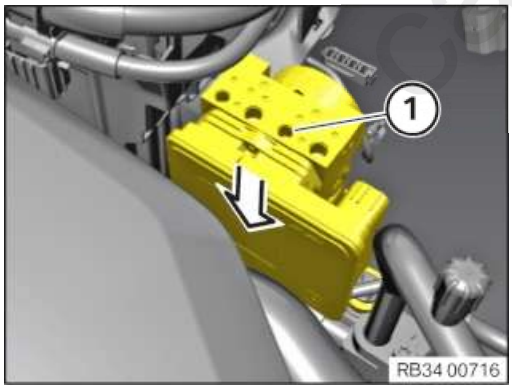
- Install holder (2).
- Renew screws (1).

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

Hydraulic control unit to holder

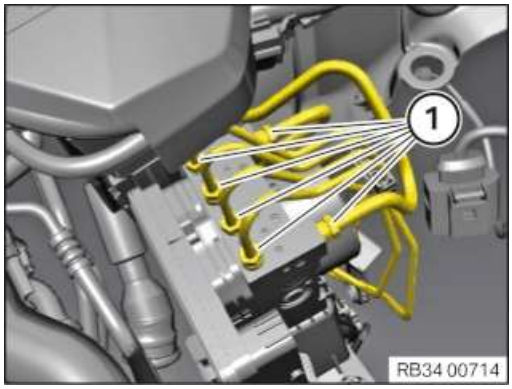
M6	Renew screws.	8 Nm

5 – Install hydraulic unit



- Position hydraulic unit (1).

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TECHNICAL INFORMATION

Do not interchange brake lines. If necessary, mark the brake lines before disassembly.

Note various equipment specifications with different line seizure.

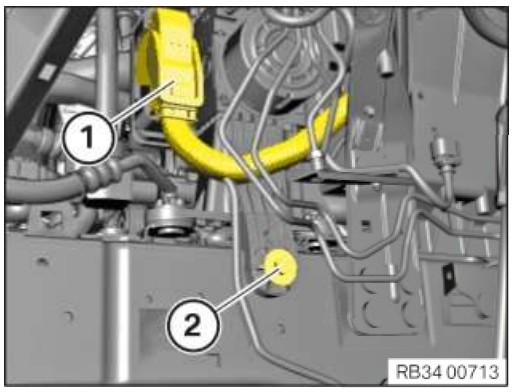
Do not bend brake lines.

Close off connecting bores with seal plugs.

- (1)Fit brake lines () and tighten.

Brake pipe screw connection / Union screws

	Tightening torque	17 Nm



- Connect the plug connection (1).
- Renew the screw (2).

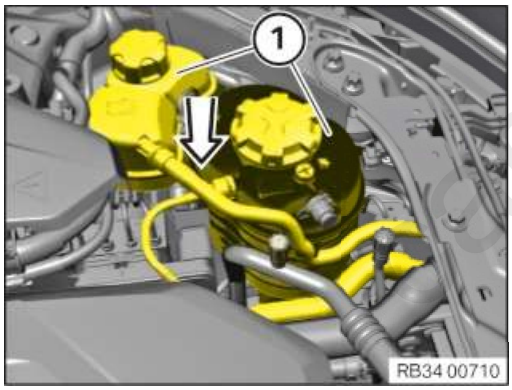
  Parts: Screw.
- Position and tighten the screw (2).

Hydraulic unit with holder on body

	Renew screws.	8 Nm

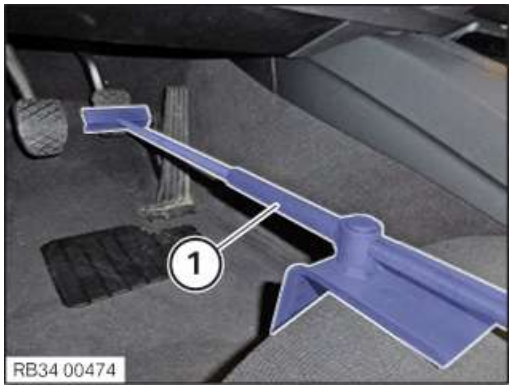
POSTPROCESSES

6 – Installing coolant expansion tank



- Clip in both coolant expansion tanks (1) together into the brackets.

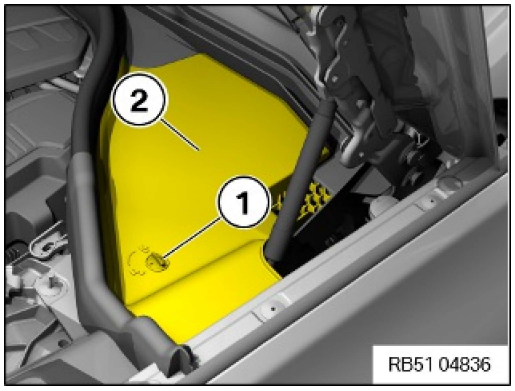
7 – Remove the brake pedal tensioner



- Remove the brake pedal tensioner (1).

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

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

9 – Connect bleeder unit for brake fluid





- To guarantee correct bleeding of the brake system, it is essential to adhere to the following procedure!
- Fill new brake fluid in the expansion tank up to the lower edge of thread (1).
- Bleed the hose of the bleeder unit before connecting.

TECHNICAL INFORMATION

Use only BMW-approved brake fluids, see operating fluids.

RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.

- Connect the bleeder unit (1) to the brake fluid expansion tank and switch it on.

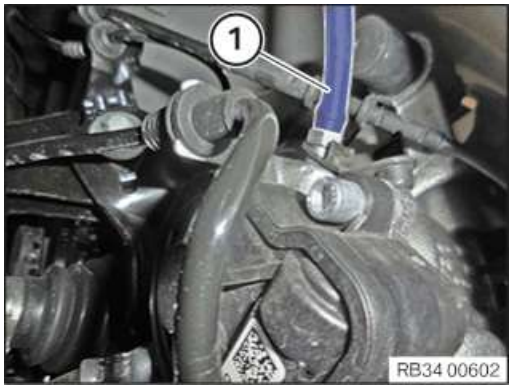
  Observe the operating instructions of the corresponding equipment manufacturer.
- **Do not exceed the filling pressure of** 2 bar**.**

10 – Rinsing and bleeding the rear axle brake circuit

NOTICE

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

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- **Start flushing at the rear right.**
- Connect the vent hose with the collecting vessel to the vent valve (1) on rear right brake caliper.
- Open the vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve.

Vent valve

		Tightening torque	10 Nm

- Carry out the same procedure on the rear left wheel brake.

11 – Flushing and bleeding the front axle brake circuit

NOTICE

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



- **Start flushing at the front right.**
- Connect the vent hose with the collecting vessel to the vent valve (1) on front right interior brake calliper.
- Open the vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve (1).

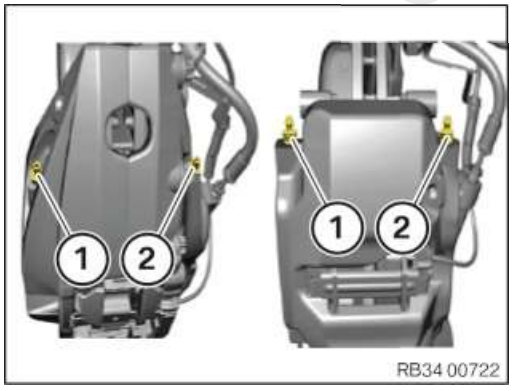
Vent valve

		Tightening torque	10 Nm

12 – Flush and bleed the front axle brake circuit (brake, high)

NOTICE

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



- Two fixed brake callipers are fitted!
- For both variants, first outer (1) must be bled. The bleed inner (2).

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- **Start flushing at the front right.**
- Connect the vent hose with the collecting vessel to the vent valve (1) on the front right brake caliper.
- Open the vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve (1).

Front ventilation valve Brake calliper manufacturer Brembo

Vent valve		Tightening torque	18 Nm

Front ventilation valve fixed brake calliper Brake calliper manufacturer Continental

Vent valve		Tightening torque	15 Nm



- Connect the vent hose with the collecting vessel to the vent valve (1) on front right brake caliper.
- Open vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve (1).

Front ventilation valve Brake calliper manufacturer Brembo

Vent valve		Tightening torque	18 Nm

Front ventilation valve fixed brake calliper Brake calliper manufacturer Continental

Vent valve		Tightening torque	15 Nm

- Carry out the same procedure on the front left wheel brake.

13 – Close bleeder unit for brake fluid

RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.



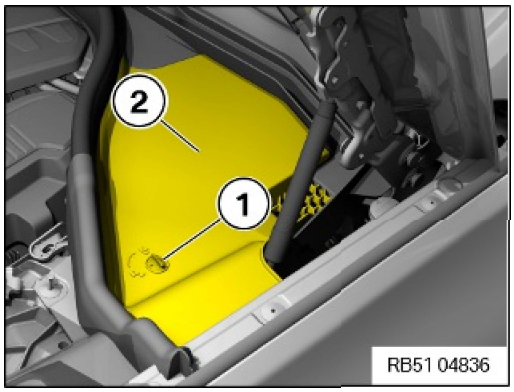
- Switch off bleeder unit (1) and remove from brake fluid expansion tank .
- Check the brake fluid level; if necessary, adjust to maximum mark.

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- Check the seal (1) on the sealing cap, renew if necessary.
- Mount the sealing cap on the brake fluid expansion tank.

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



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

15 – DSC unit start-up/driving dynamics sensor adjustment/programming the 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.

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- 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.



- Connect diagnosis system:
  - Carry out the DSC unit start-up service function
  - Carry out the driving dynamics sensor adjustment service function
  - Perform the service function for the brake line mix-up test

Additional Information

Overview of Tightening Torques

Hydraulic control unit to holder — Used in step 4

M6	Renew screws.		8 Nm

Brake pipe screw connection / Union screws — Used in step 5

		Tightening torque	17 Nm

Hydraulic unit with holder on body — Used in step 5

	Renew screws.		8 Nm

Vent valve — Used in step 1011

		Tightening torque	10 Nm

Front ventilation valve Brake calliper manufacturer Brembo — Used in step 12

Vent valve		Tightening torque	18 Nm

Front ventilation valve fixed brake calliper Brake calliper manufacturer Continental — Used in step 12

Vent valve		Tightening torque	15 Nm

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34 52 162 Removing and installing/replacing EMF actuator

NOTICE

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

PRELIMINARY WORK

1 – Prepare the removal of the EMF actuator

- Release parking brake.
- Switch off ignition.

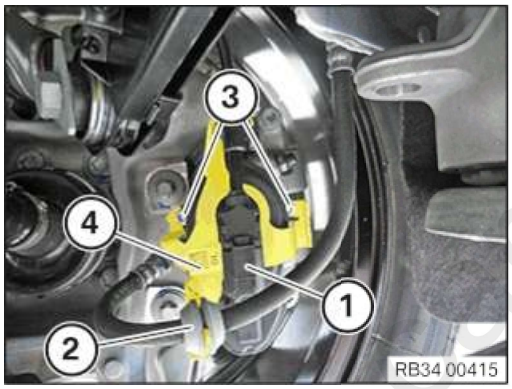
TECHNICAL INFORMATION

The ignition must be switched off for at least 30 s before the plug connection is disconnected.

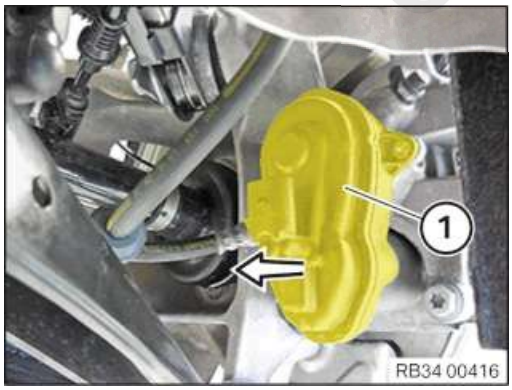
- Disconnect plug connection.

MAIN WORK

2 – Detach EMF actuator



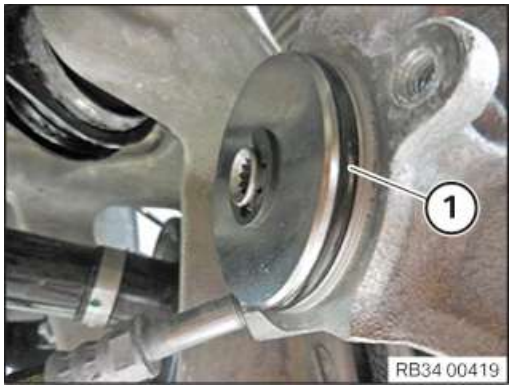
- Disconnect plug connection (1).
- Detach the brake hose (2) from the holder.
- Release screws (3) and remove the holder (4).



- Remove the EMF actuator (1) from the brake caliper in the direction of the arrow.

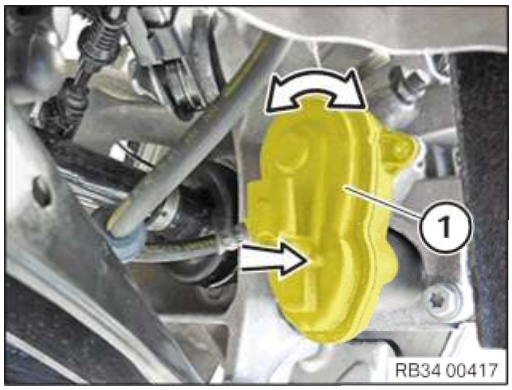
3 – Checking sealing ring on the EMF actuator

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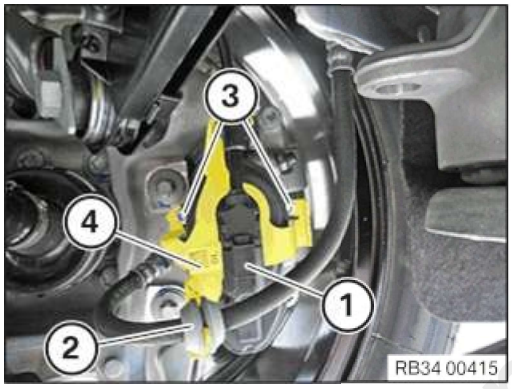


- Check the sealing ring (1) for damage and renew where required.
- Apply a light coating of brake fluid on the sealing ring (1) before fitting.

4 – Install EMF actuator



- Carefully fit the EMF actuator (1) until the gearing engages and the EMF actuator rests flush against the brake caliper.
- If necessary, turn the EMF actuator slightly until the bore hole and the screw thread are aligned.



- Attach the holder (4) and position and tighten the bolts (3).

EMF actuator to brake caliper

	Renew screws.	Tightening torque	12 Nm

- Connect connector (1).
- Attach the brake hose (2) in the holder.

POSTPROCESSES

5 – After replacing the EMF actuator: Putting electromechanical holding brake into operation

TECHNICAL INFORMATION

After completing repair work:
Switch the ignition on. Use the parking brake button to open, close and open the parking brake again.

- Put electromechanical holding brake into operation.

Additional Information

Overview of Tightening Torques

EMF actuator to brake caliper Used in step 4

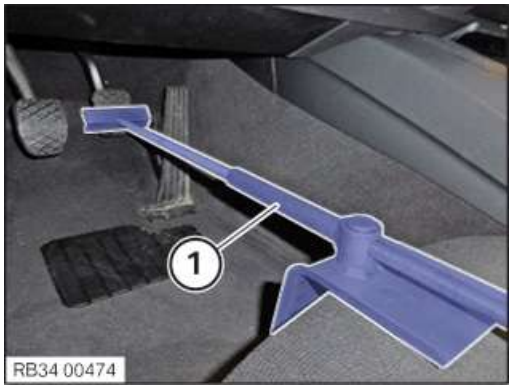
	Renew screws.	Tightening torque	12 Nm

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34 52 519 Replacing DSC control unit

PRELIMINARY WORK

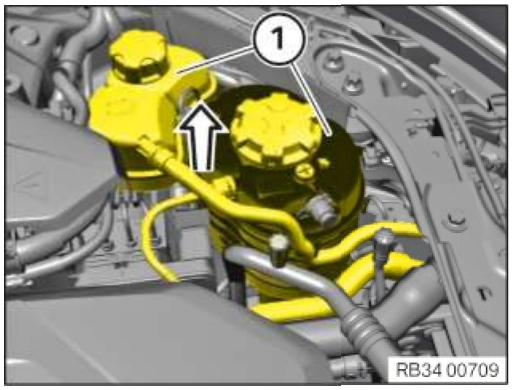
1 – Install brake pedal tensioner



- Press the brake pedal to the floor and fix the brake pedal tensioner (1).

  Do not release the brake pedal tensioner (1) until the brake lines have been reconnected. This prevents brake fluid from emerging from the expansion tank when the brake lines are opened.

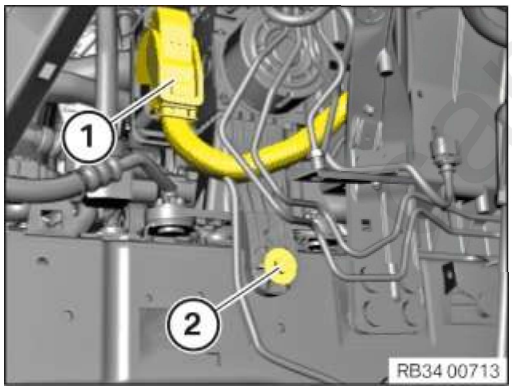
2 – Detach the engine coolant expansion tank



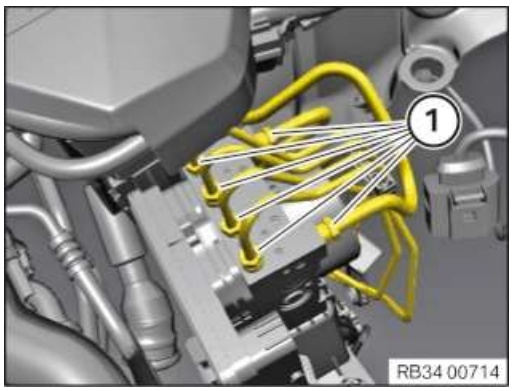
- Detach both the engine coolant expansion tanks (1) in upward direction.

  Coolant circuit remains closed.

3 – Remove hydraulic unit



- Disconnect plug connection (1).
- Loosen screw (1).



TECHNICAL INFORMATION

Do not interchange brake lines. If necessary, mark the brake lines before disassembly.

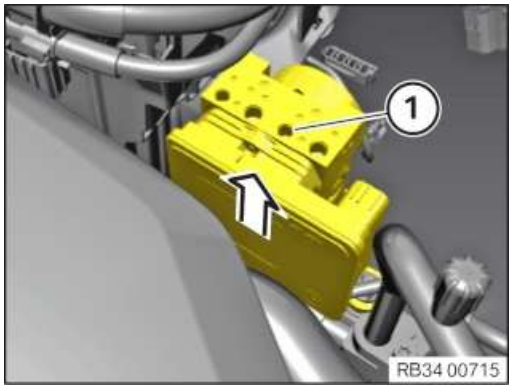
Note various equipment specifications with different line seizure.

Do not bend brake lines.

Close off connecting bores with seal plugs.

- (1)Unfasten brake lines.

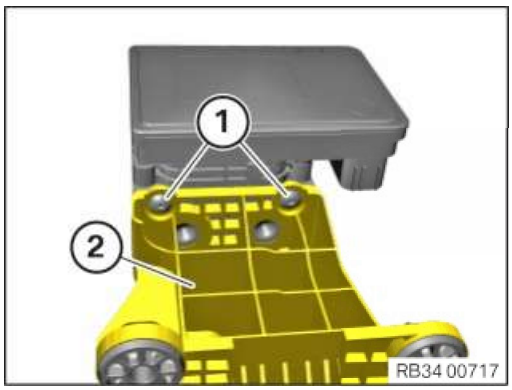
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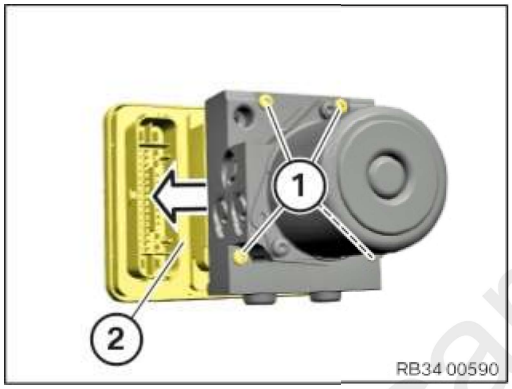
- Remove the hydraulic unit (1).

MAIN WORK

4 – Remove the DSC control unit



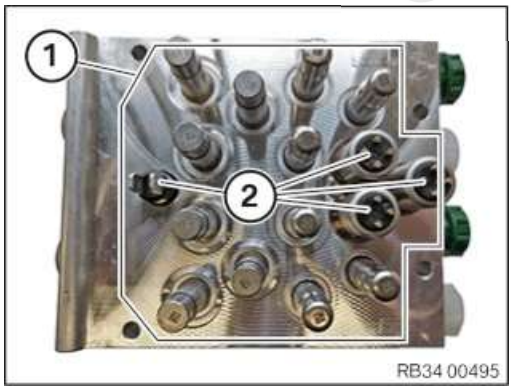
- Release screws (1) and remove the holder (2).



- Loosen screws (1).
- Remove DSC control unit (2) carefully.

  When removing the DSC control unit, no contacts must be bent!

5 – Prepare for the installation of the DSC control unit



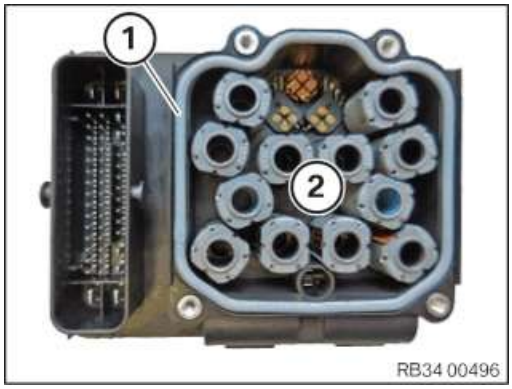
TECHNICAL INFORMATION

Do not clean the sealing surface with compressed air, chemical solvents or sharp-edged objects.

Do not touch or clean the pressure sensor contacts with your fingers.

- Clean the sealing surface (1) if necessary, with plastic scraper or a lint-free cloth.
- Ensure that the contacts (2) are not damaged.

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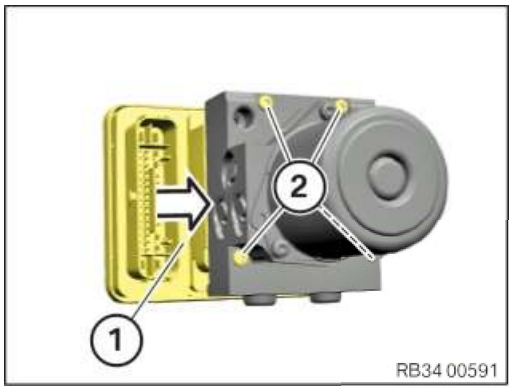


- For renewed use of the hydraulic unit (valve block), an add-on control unit repair kit is required.

  The repair kit contains a new silicone seal (1) and bolts.
- Make sure that the valve coils (2) are not damaged.

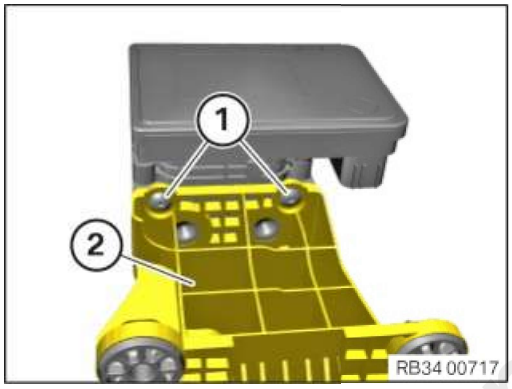
  Do not clean, readjust or touch the valve coils with your fingers.

6 – Install the DSC control unit



- Connect DSC control unit (5) carefully to hydraulic unit.
- Renew screws (1) to (4).

  Parts: Bolts
- Tighten screws (1) to (4) in this order in stages.



- Install holder (2).
- Renew screws (1).

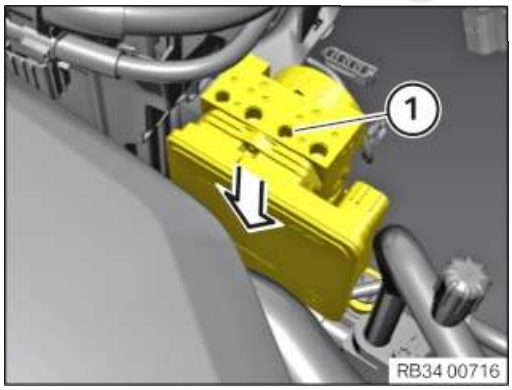
  Parts: Bolts
- Insert screws (1) and tighten.

Hydraulic control unit to holder

M6	Renew screws.	8 Nm

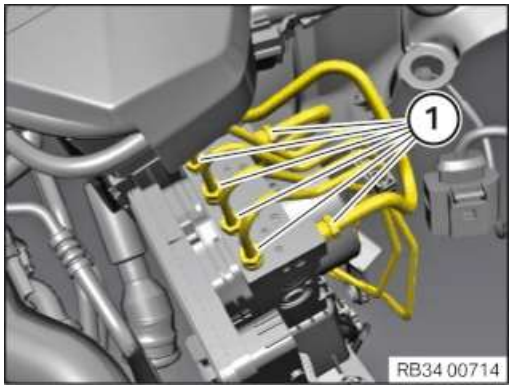
POSTPROCESSES

7 – Install hydraulic unit



- Position hydraulic unit (1).

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TECHNICAL INFORMATION

Do not interchange brake lines. If necessary, mark the brake lines before disassembly.

Note various equipment specifications with different line seizure.

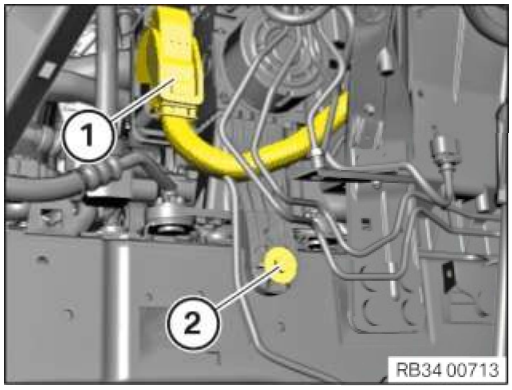
Do not bend brake lines.

Close off connecting bores with seal plugs.

- (1)Fit brake lines () and tighten.

Brake pipe screw connection / Union screws

	Tightening torque	17 Nm



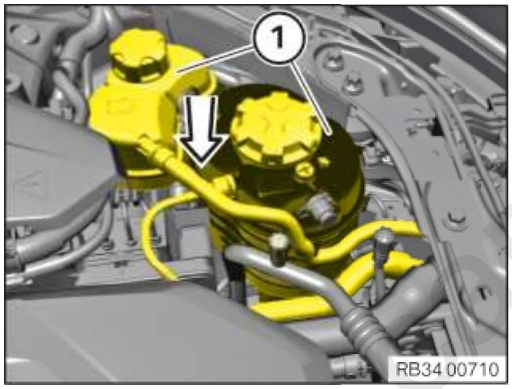
- Connect the plug connection (1).
- Renew the screw (2).

  Parts: Screw.
- Position and tighten the screw (2).

Hydraulic unit with holder on body

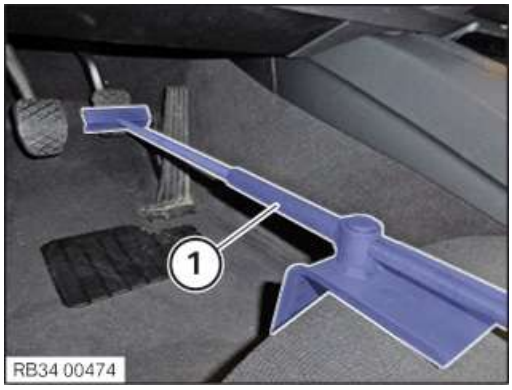
	Renew screws.	8 Nm

8 – Installing coolant expansion tank



- Clip in both coolant expansion tanks (1) together into the brackets.

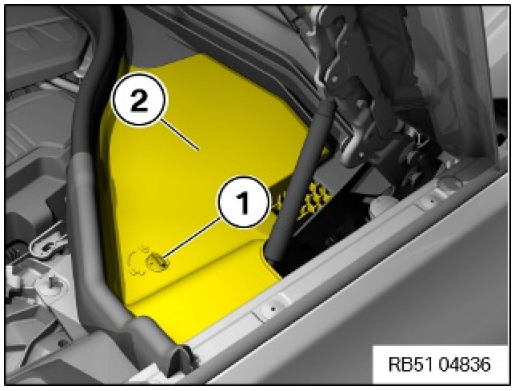
9 – Remove the brake pedal tensioner



- Remove the brake pedal tensioner (1).

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

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

11 – Connect bleeder unit for brake fluid





- To guarantee correct bleeding of the brake system, it is essential to adhere to the following procedure!
- Fill new brake fluid in the expansion tank up to the lower edge of thread (1).
- Bleed the hose of the bleeder unit before connecting.

TECHNICAL INFORMATION

Use only BMW-approved brake fluids, see operating fluids.

RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.

- Connect the bleeder unit (1) to the brake fluid expansion tank and switch it on.

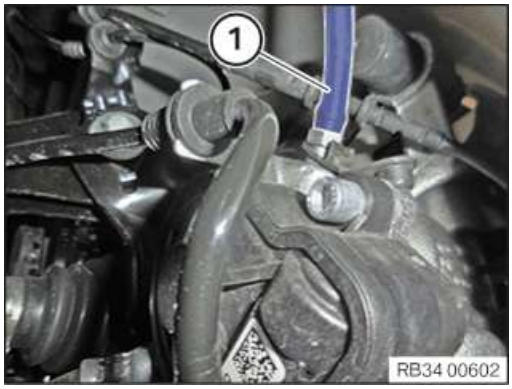
  Observe the operating instructions of the corresponding equipment manufacturer.
- **Do not exceed the filling pressure of** 2 bar**.**

12 – Rinsing and bleeding the rear axle brake circuit

NOTICE

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

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- **Start flushing at the rear right.**
- Connect the vent hose with the collecting vessel to the vent valve (1) on rear right brake caliper.
- Open the vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve.

Vent valve

		Tightening torque	10 Nm

- Carry out the same procedure on the rear left wheel brake.

13 – Flushing and bleeding the front axle brake circuit

NOTICE

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



- **Start flushing at the front right.**
- Connect the vent hose with the collecting vessel to the vent valve (1) on front right interior brake calliper.
- Open the vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve (1).

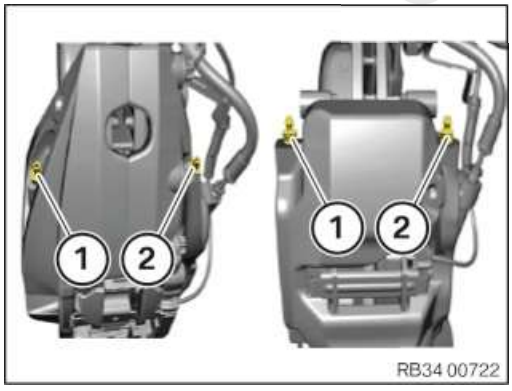
Vent valve

		Tightening torque	10 Nm

14 – Flush and bleed the front axle brake circuit (brake, high)

NOTICE

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



- Two fixed brake callipers are fitted!
- For both variants, first outer (1) must be bled. The bleed inner (2).

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- **Start flushing at the front right.**
- Connect the vent hose with the collecting vessel to the vent valve (1) on the front right brake caliper.
- Open the vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve (1).

Front ventilation valve Brake calliper manufacturer Brembo

Vent valve		Tightening torque	18 Nm

Front ventilation valve fixed brake calliper Brake calliper manufacturer Continental

Vent valve		Tightening torque	15 Nm



- Connect the vent hose with the collecting vessel to the vent valve (1) on front right brake caliper.
- Open vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve (1).

Front ventilation valve Brake calliper manufacturer Brembo

Vent valve		Tightening torque	18 Nm

Front ventilation valve fixed brake calliper Brake calliper manufacturer Continental

Vent valve		Tightening torque	15 Nm

- Carry out the same procedure on the front left wheel brake.

15 – Close bleeder unit for brake fluid

RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.



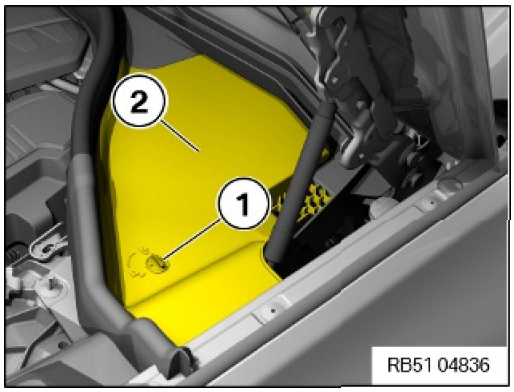
- Switch off bleeder unit (1) and remove from brake fluid expansion tank .
- Check the brake fluid level; if necessary, adjust to maximum mark.

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- Check the seal (1) on the sealing cap, renew if necessary.
- Mount the sealing cap on the brake fluid expansion tank.

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



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

17 – DSC unit start-up/driving dynamics sensor adjustment/programming the 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.

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- 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.



- Connect diagnosis system:
  - Carry out the DSC unit start-up service function
  - Carry out the driving dynamics sensor adjustment service function
  - Perform the service function for the brake line mix-up test

Additional Information

Overview of Tightening Torques

Hydraulic control unit to holder — Used in step 6

M6	Renew screws.		8 Nm

Brake pipe screw connection / Union screws — Used in step 7

		Tightening torque	17 Nm

Hydraulic unit with holder on body — Used in step 7

	Renew screws.		8 Nm

Vent valve — Used in step 1213

		Tightening torque	10 Nm

Front ventilation valve Brake calliper manufacturer Brembo — Used in step 14

Vent valve		Tightening torque	18 Nm

Front ventilation valve fixed brake calliper Brake calliper manufacturer Continental — Used in step 14

Vent valve		Tightening torque	15 Nm

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64 00 ... Information on using cleaning agent/paints (personal protection equipment)



Warning!

Use of cleaning agents/paints not compliant with instructions can cause serious injuries or burns!

Handling cleaning agents/paints can trigger allergic skin and respiratory reactions!



Important!

Observe following instructions:

- Store cleaning agents/paints only in a secure cabinet.
- Keep cleaning agents/paints away from naked flames and other sources of ignition.
- Protect cleaning agents/paints from high temperatures and direct sunlight.
- Always keep an eye douche on hand, change the water regularly (once a month).



Important!

Observe following instructions before use:

- Manufacturer's instructions (on container/packaging)
- Hazard warnings (on container/packaging)
- Manufacturer's instructions on package insert
- Material safety data sheet of manufacturer
- Product information in EPC
- National market regulations



Important!

Observe following instructions during use:

- Do not eat, drink or smoke while working with these products.
- Avoid direct contact with skin and eyes.
- Wear personal protective clothing/equipment.
- Ensure that all enclosed areas are well ventilated or extract fumes directly.
- Immediately change working clothes soiled with cleaning agent/paint.
- After finishing work, wash your hands and apply protective skin cream.



Important!

Follow hazard warnings and wear personal protection equipment!

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First Aid:

- If product comes in contact with eyes, immediately flush with running water for about 10 - 15 minutes. Seek the advice of eye specialist.
- In the event of skin contact and where applicable an allergic skin reaction, clean the affected areas immediately with soap and water and then apply silicone-free skin cream. Seek advice of physician.
- If an adhesive product is swallowed, rinse mouth/parts of mouth thoroughly with running water. Drink 1-2 glasses of water. Do not induce vomiting. Consult a doctor.
- After inhaling vapours ensure ample supply of fresh air. Keep calm, keep respiratory tracks clear and call doctor.



Recycling:

Dispose of cleaning agents/paints in a professional manner!

Observe national/country-specific disposal regulations.

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00 00 ... Microencapsulated screws



Screw securing adhesive is a means of preventing a screwed connection from being loosened by external influences.

Once the screw has been coated with adhesive, the adhesive remains inactive until such time that it is activated by the encapsulation breaking when the screw is inserted and then cures (hardens) at room temperature.



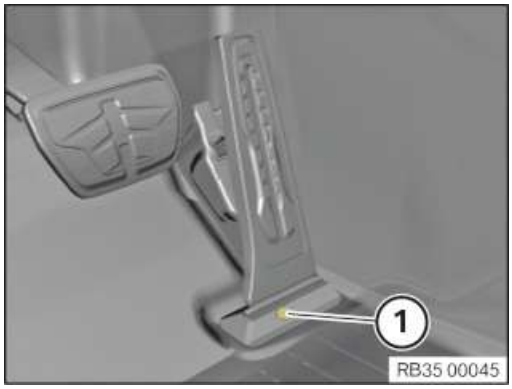
Installation note:

- Screw connection must be completed within 20 mins. (start of curing)
- Microencapsulated screws must not be retightened
- Thread of nut must be cleaned beforehand in event of repeated use

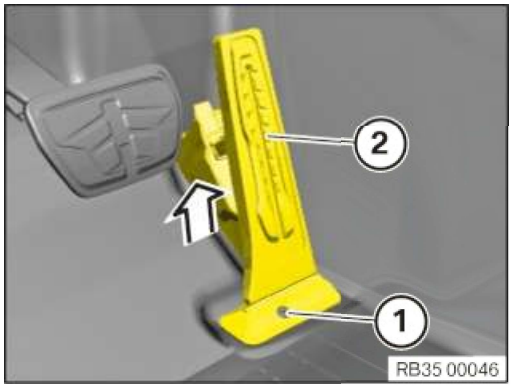
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35 40 001 Removing and installing or replacing accelerator pedal module

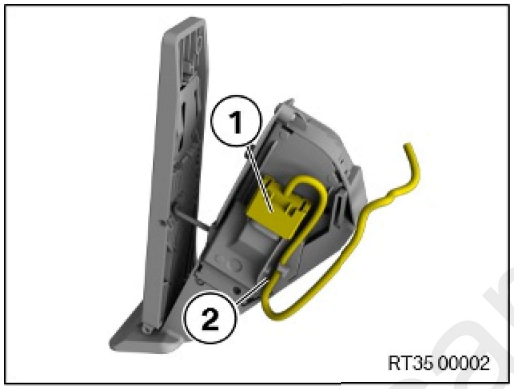
1 – Remove accelerator pedal module



- Lever out cover (1) towards the top.

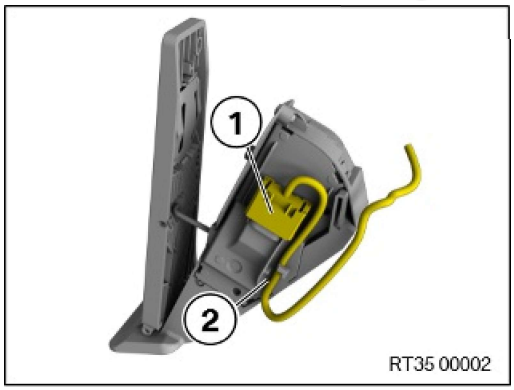


- Release the hexagon socket screw (1).
- Feed out accelerator pedal module (2) towards the top.



- Unlock plug connection (1) and disconnect.
- Feed the wiring harness out of the holder (2).

2 – Install accelerator pedal module



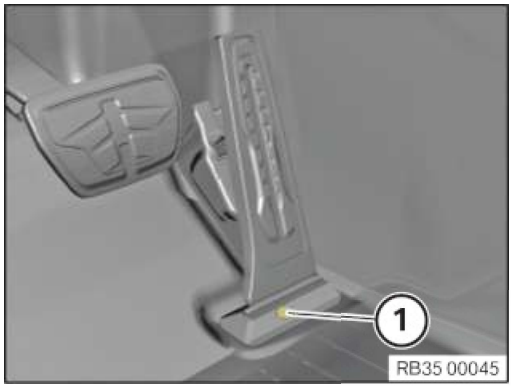
- Connect connectors (1) and lock.
- Feed the wiring harness into the holder (2).

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- Feed in accelerator pedal module (2) from above.
- Renew the hexagon socket screw (1).

  Parts: Hexagon socket screw
- Fit the hexagon socket screw (1) and tighten.



- Clip in the cover (1).

Additional Information

Overview of Tightening Torques

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