34 00 046 Bleeding the brake system (after part exchange in the brake system)

TECHNICAL INFORMATION

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

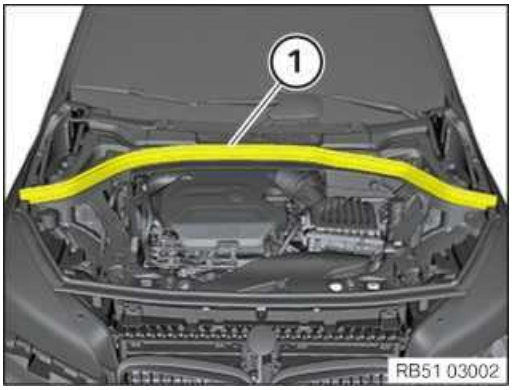
PRELIMINARY WORK

1 – Connect bleeder unit for brake fluid

▸ **Remove the seal for the rear bonnet**

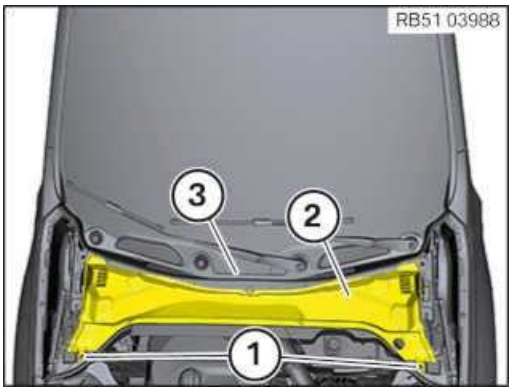
NOTICE

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



- Pull off rear bonnet seal (1) towards the top and remove.

▸ **Removing front cowl panel cover**



- Loosen the expanding rivet (1).
- Feed out and remove front cowl panel cover (2) from the rear cowl panel cover(3).



- 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 **.**

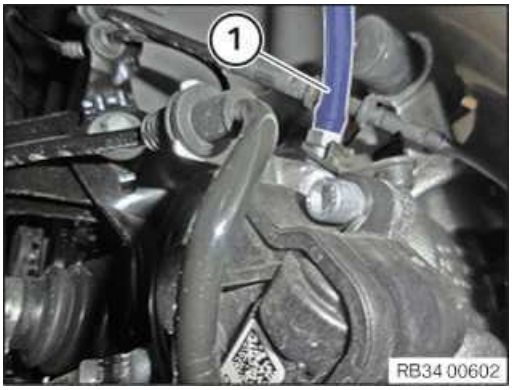
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MAIN WORK

2 – 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.

3 – 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

POSTPROCESSES

4 – 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.

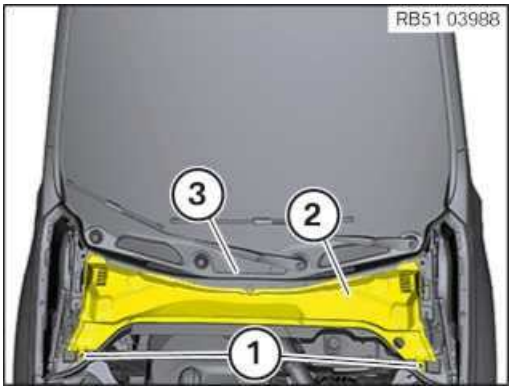


- Switch off bleeder unit (1) and remove from brake fluid expansion tank .
- Check the brake fluid level; if necessary, adjust to maximum mark.



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

▸ **Installing front cowl panel cover**



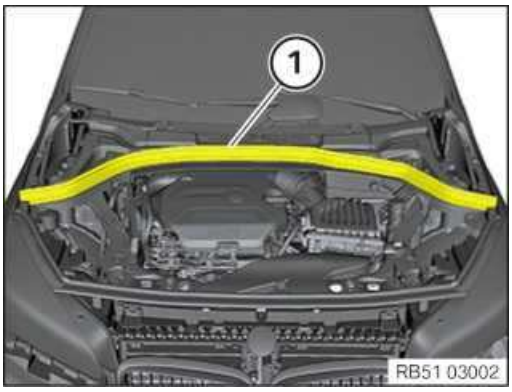
- Insert and install cowl panel cover at front (2) into cowl panel cover at rear (3).
- Check cowl panel cover at front is correctly seated (2).
- Secure expanding rivet (1).

▸ **Install the seal for the bonnet**

NOTICE

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

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- Install bonnet seal at rear (1).
- Ensure that the rear bonnet seal (1) is fitted correctly.

Additional Information

Overview of Tightening Torques

Vent valve Used in step 2 3

		Tightening torque	10 Nm

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34 00 017 Checking brake booster (vacuum test)

Special tools required:

- 34 3 100

Necessary preliminary work:

- If necessary, expose the brake booster



- Pull off the vacuum hose on the brake booster. Install vacuum tester 34 3 100 between the brake booster and the vacuum hose of the non-return valve.
- Start the engine.
- Check the vacuum build-up.
- Switch off engine.
- Adjust the vacuum to no more than 0.8 bar by pressing the brake pedal and wait until the value stabilises.
- If the brake pedal is not pressed, the vacuum must reduce by maximum 0.06 bar during a test period of 1 minute.

If the required values are not reached:

- Change the non-return valve
- Check that the sealing between the brake servo and the tandem brake master cylinder (sealing ring) is in proper condition and fits correctly.
- If necessary, check the tightness of the brake booster with a smoke tester
- If the setpoint values are not reached during the repeat check, the brake booster must be changed.

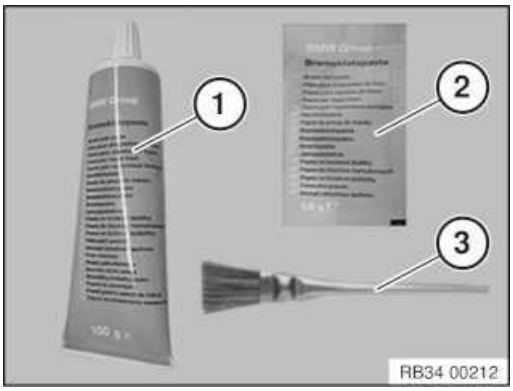
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34 00 x01 Guideline for applying brake pad paste on brake pads and caliper carrier

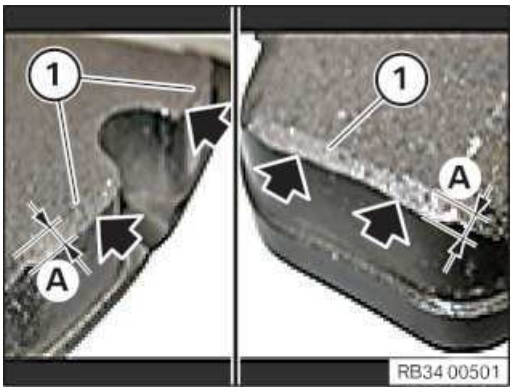
Attention!

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.



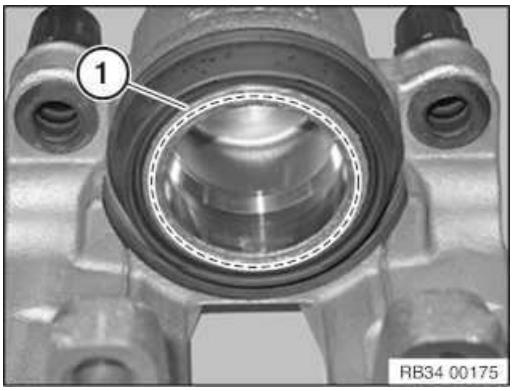
Attention!

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).

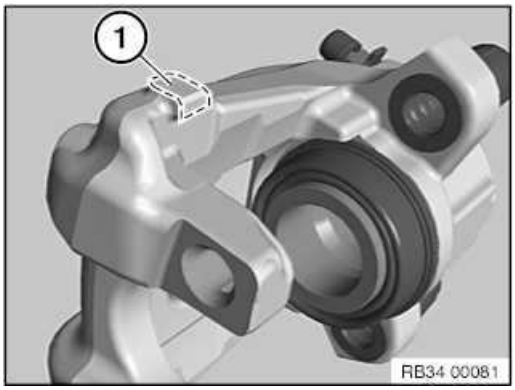
These procedures applies for all the following described brake systems.

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

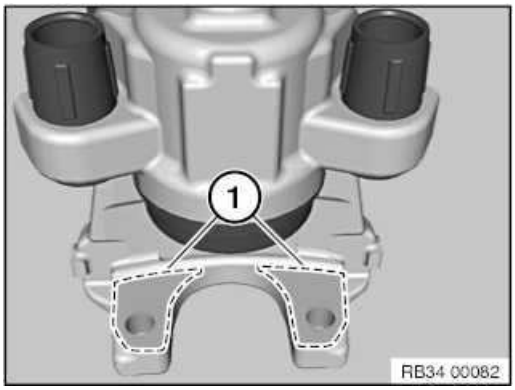


Clean contact surface (1) of brake piston with brake cleaner and apply a thin coating of brake pad paste.

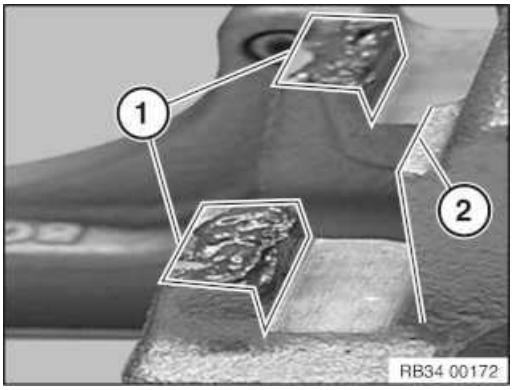
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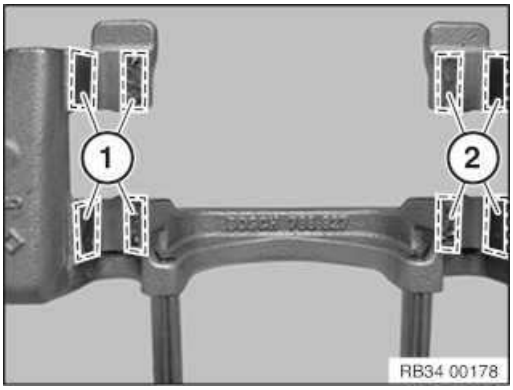
Clean contact surfaces (1) of T-heads/brake calliper housing with brake cleaner and apply a thin coating of brake pad paste.



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

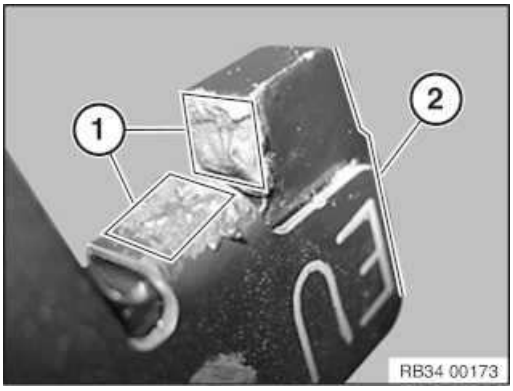


So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces (1) for the brake pads on the brake caliper mounting bracket. Clean guide surfaces (1 and 2) with brake cleaner and apply a thin coating of brake pad paste.

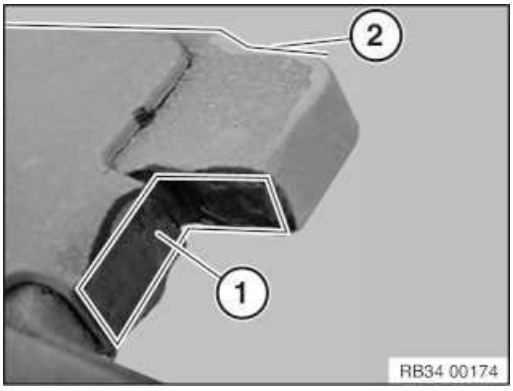


So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces (1 and 2) for the brake pads on the brake calliper mounting bracket. Clean guide surfaces (1 and 2) with brake cleaner and apply a thin coating of brake pad paste.

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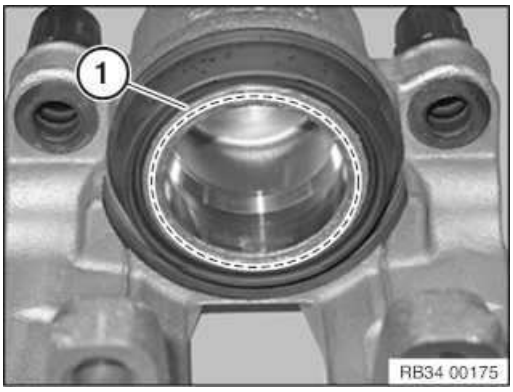


Apply a thin coating of brake pad paste to T-head of inner brake pad in area (1) and (2).

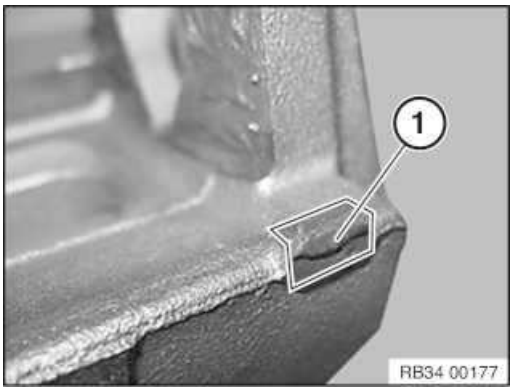


Apply a thin coating of brake pad paste to T-head of outer brake pad in area (1) and (2).

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)

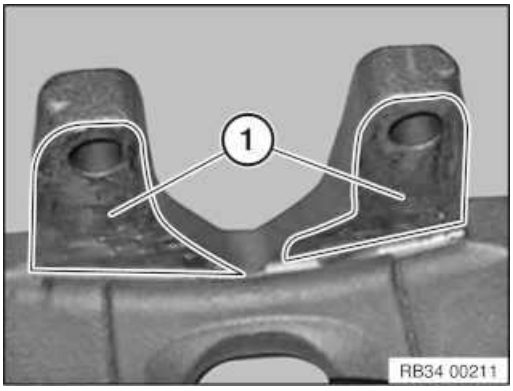


Clean contact surface (1) of brake piston with brake cleaner and apply a thin coating of brake pad paste.

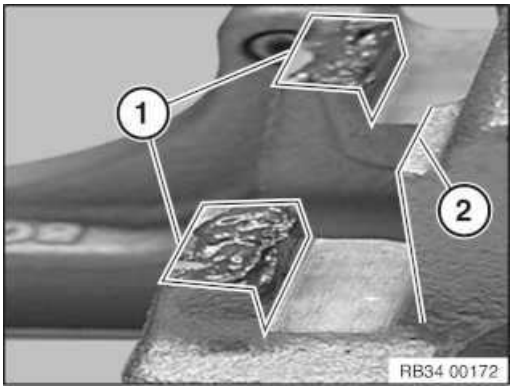


Clean contact surfaces (1) of T-heads/brake calliper housing with brake cleaner and apply a thin coating of brake pad paste.

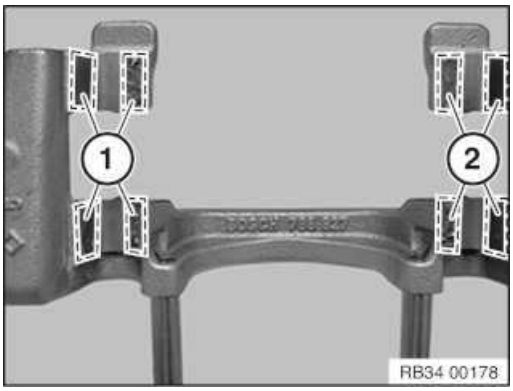
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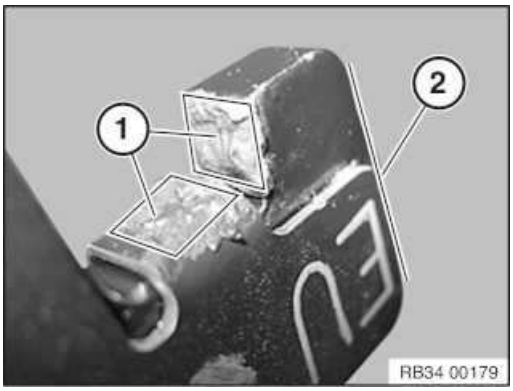
Clean contact surface (1) of brake caliper with brake cleaner and apply a thin coating of brake pad paste.



So as not to damage the surface coating, if possible do not mechanically clean the guide 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.

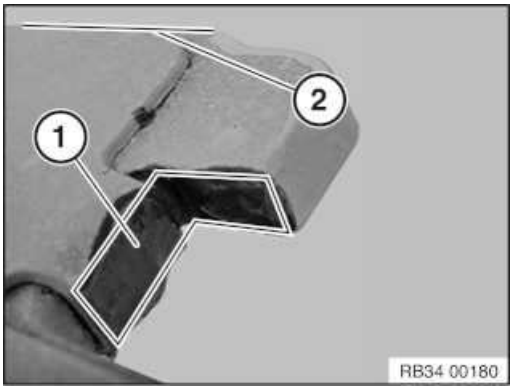


So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces (1 and 2) for the brake pads on the brake calliper mounting bracket. Clean guide surfaces (1 and 2) with brake cleaner and apply a thin coating of brake pad paste.



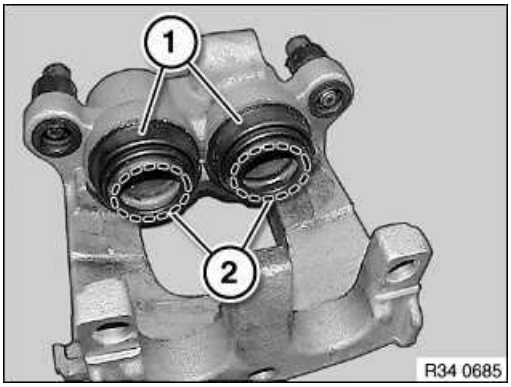
Lightly coat the T-head of the inner brake pad with brake pad paste in area (1 and 2).

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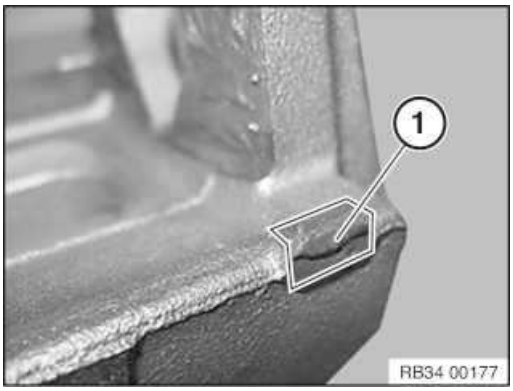


Lightly coat the T-head of the outer brake pad with brake pad paste in area (1 and 2).

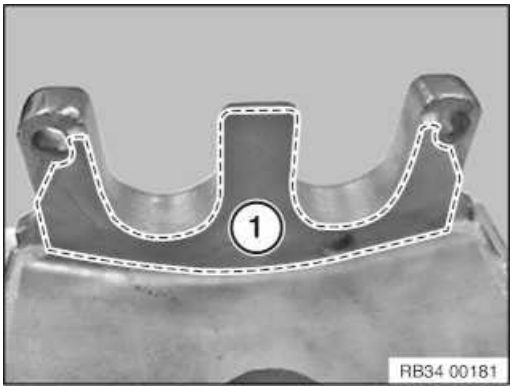
FN brake (made by Continental Teves), 2-piston floating caliper brake (model ranges: 5-Series, 6-Series, 7-Series, 8-Series, X5, Rolls-Royce)



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

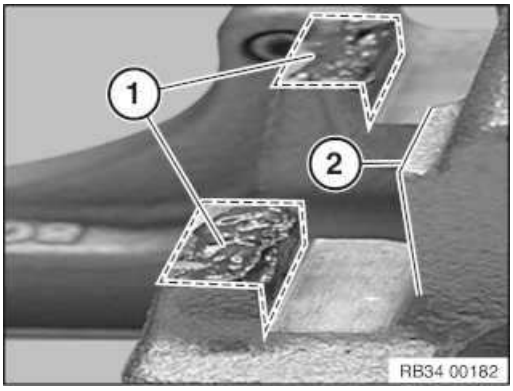


Clean contact surfaces (1) of T-heads/brake calliper housing with brake cleaner and apply a thin coating of brake pad paste.

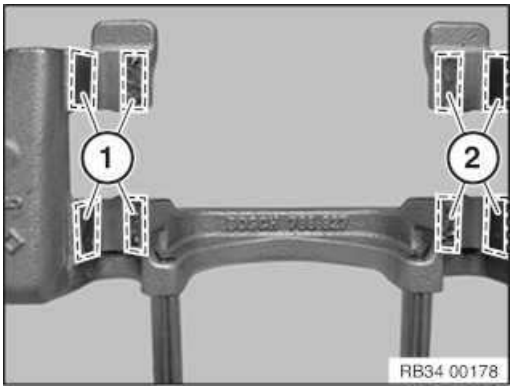


Clean contact surface (1) and brake caliper with brake cleaner and apply a thin coating of brake pad paste.

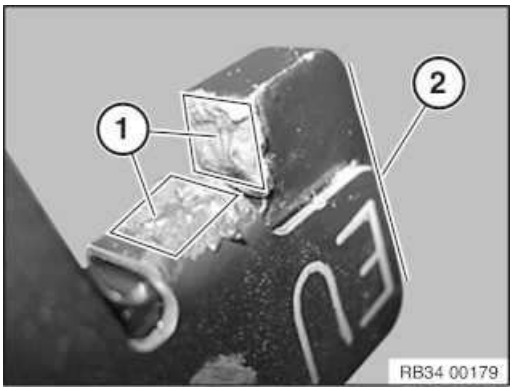
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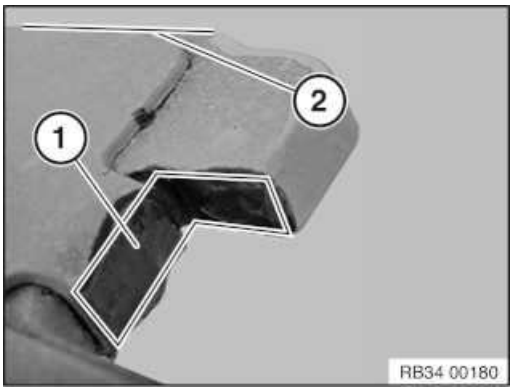
So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces (1 and 2) for the brake pads on the brake calliper mounting bracket. Clean guide surfaces (1 and 2) with brake cleaner and apply a thin coating of brake pad paste.



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.



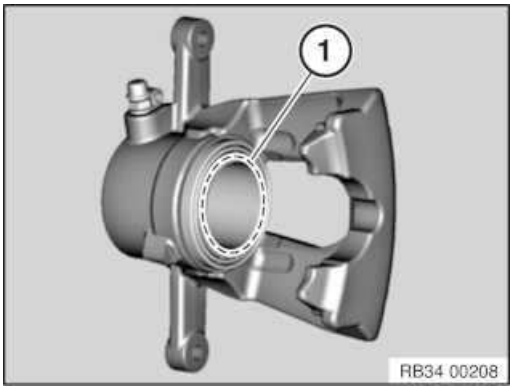
Lightly coat the T-head of the inner brake pad with brake pad paste in area (1 and 2).



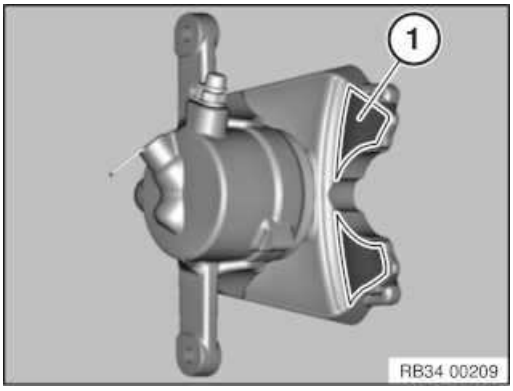
Lightly coat the T-head of the outer brake pad with brake pad paste in area (1 and 2).

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

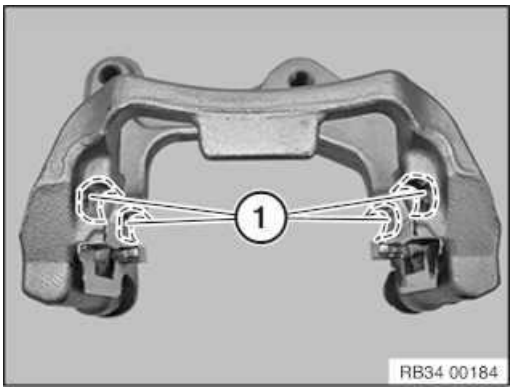
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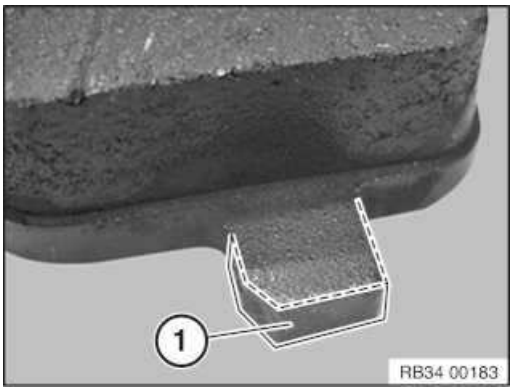
Clean contact surface (1) of brake piston with brake cleaner and apply a thin coating of brake pad paste.



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



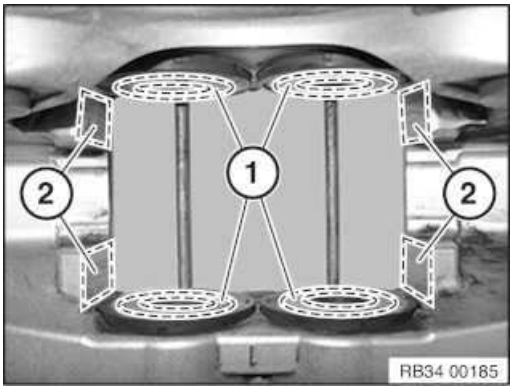
So as not to damage the surface coating, if possible do not mechanically clean the guide surface (1) for the brake pads on the brake caliper mounting bracket. Clean guide surface (1) with brake cleaner and apply a thin coating of brake pad paste.



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)

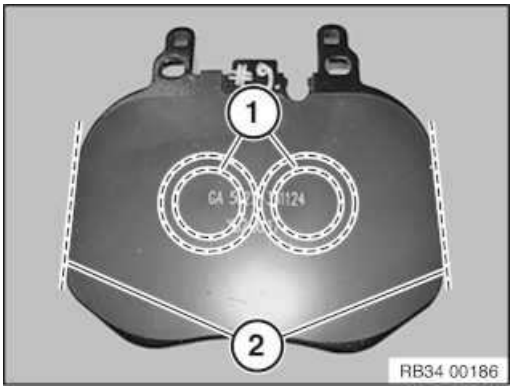
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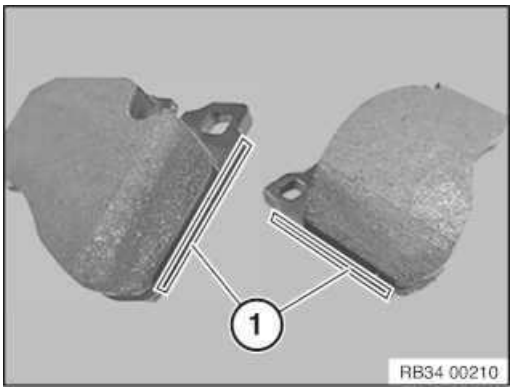
Clean contact surface (1) of brake piston with brake cleaner and apply a thin coating of brake pad paste.

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.

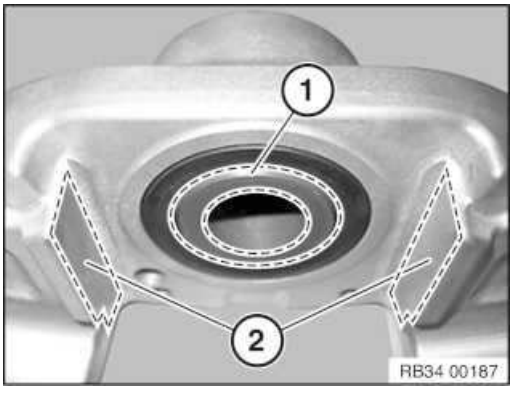


Lightly coat both sides of the contact surface in area (1 and 2) with brake pad paste.



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

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)

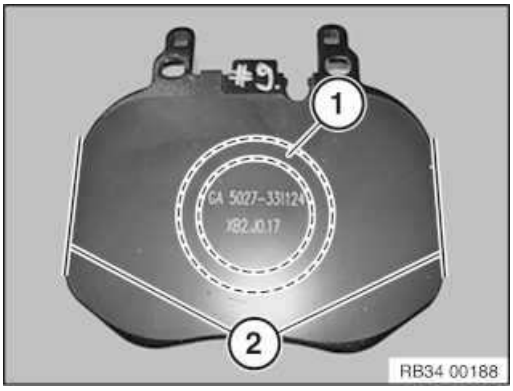


Clean contact surface (1) of brake piston with brake cleaner and apply a thin coating of brake pad paste.

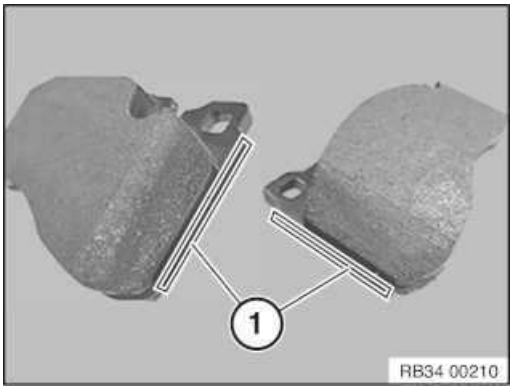
So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces (2) for the brake pads on the brake calliper mounting bracket. Clean guide surface (2) with brake cleaner and apply a thin coating of brake pad paste.

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

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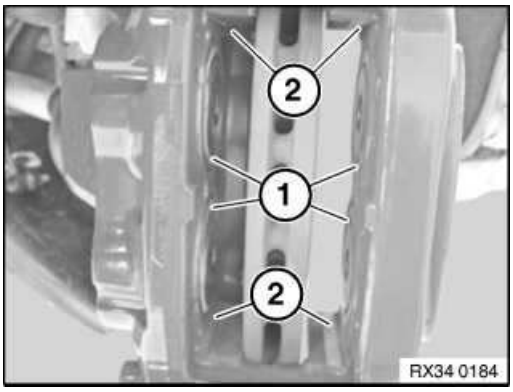


Lightly coat both sides of the contact surface in area (1 and 2) with brake pad paste.



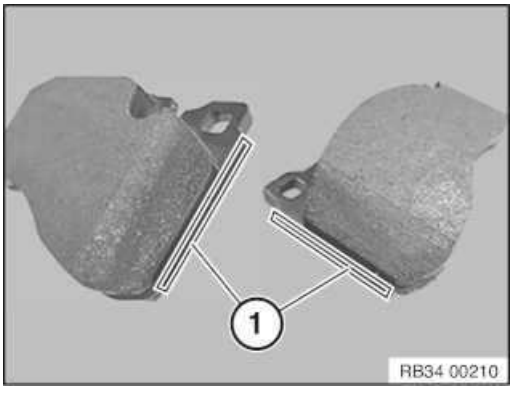
Lightly coat the brake pad contact surface on both sides in area (1) with brake pad paste.

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



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

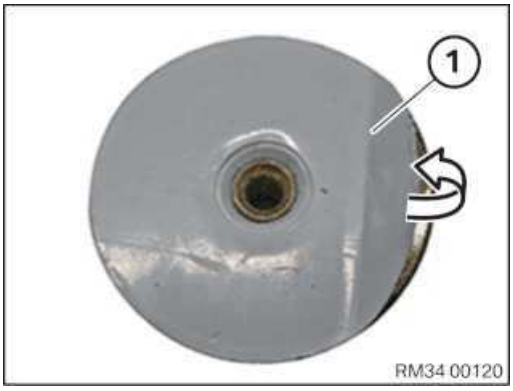
Clean brake caliper compartments (2) and apply a thin coating of brake pad paste.



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

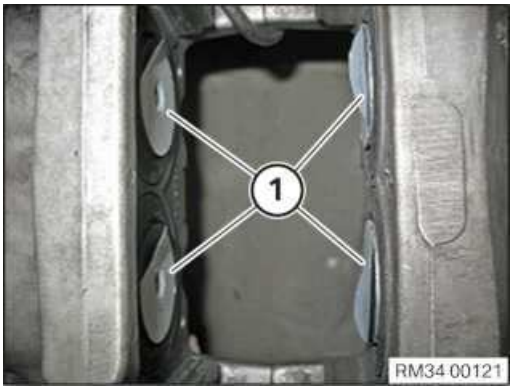
Do not grease the brake lining backplate and thoroughly clean it with brake cleaner!

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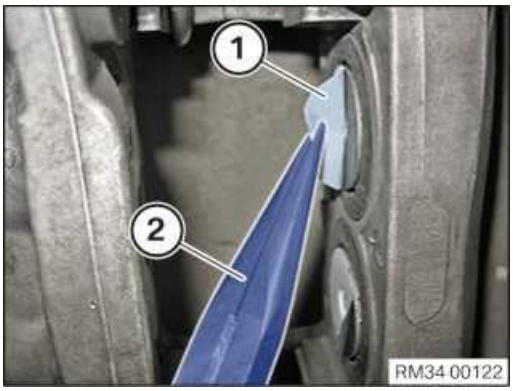


Only use new claw plates!

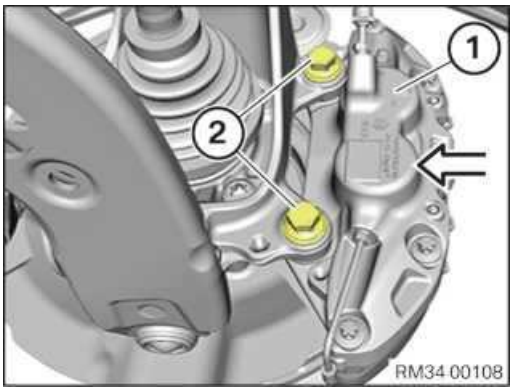
Slightly raise the protective film (1) at a place.



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



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

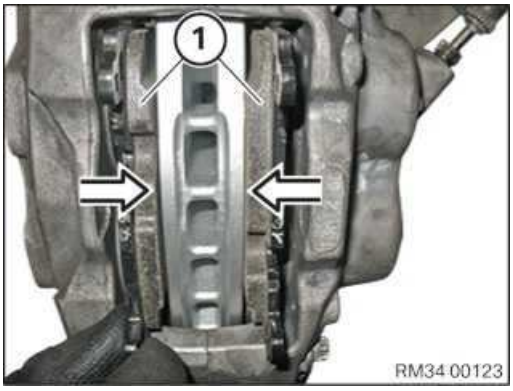


Install the brake caliper (1) in direction of arrow.

Parts: Replace screws (2).

Insert screws (2) and tighten.

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Install the brake pad (1).**Attention!**

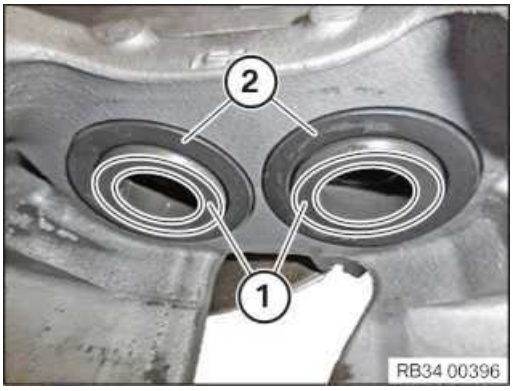
The brake pads must not touch the bonding surface of the claw plates when inserting!

Apply the brake pads to the brake disc and insert.

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

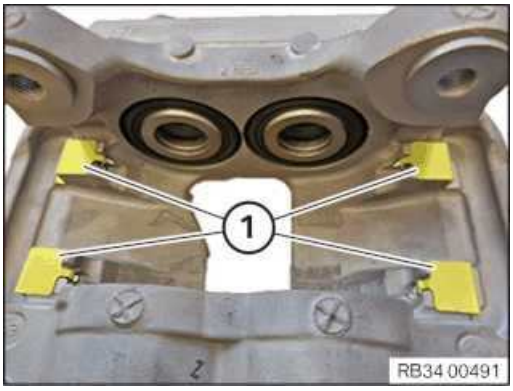
Strongly press the brake pedal and hold it for at least 1 min!

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.

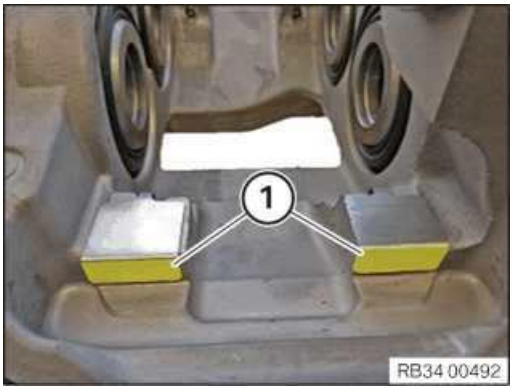


Always renew retaining plates 1!

Mount retaining plate 1.

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

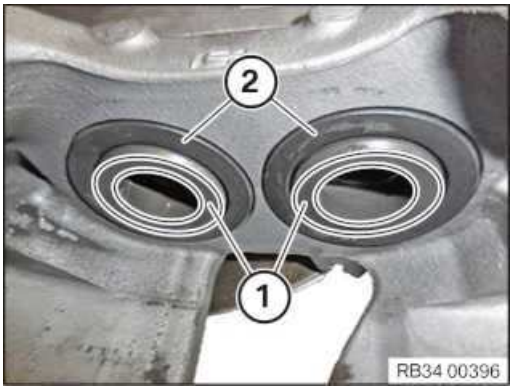
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So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces for the brake pads on the brake caliper mounting bracket.

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

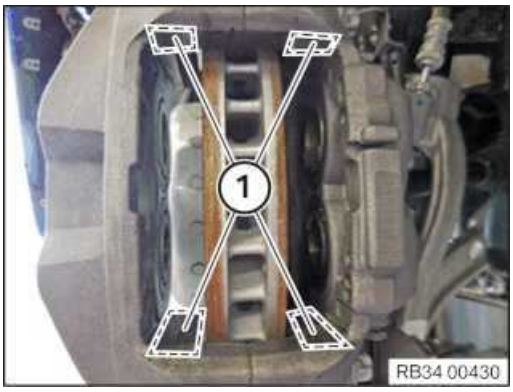
Brake (made by Brembo), 4-piston fixed caliper brake (model ranges: 7-Series (G11, G12)



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.

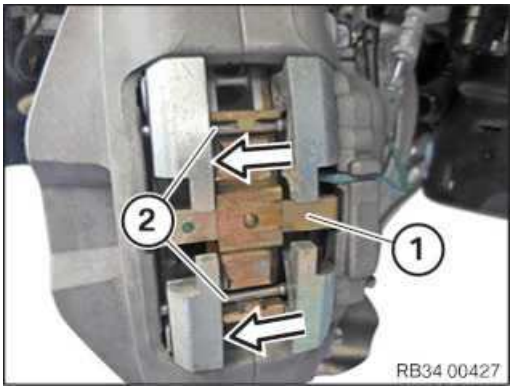
Clean guide surfaces (1) with brake cleaner and apply a thin coating of brake pad paste.



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

Do not touch the adhesive layer!

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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 00 009 Perform brake test on test stand

TECHNICAL INFORMATION

Only brake test stands with test speeds between 2.5 km/h and 6 km/h may be used.

PRELIMINARY WORK

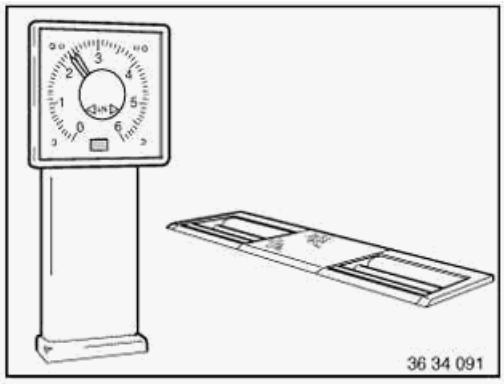
1 – Preparing the brake test

- Check tyres for damage.
- Check tyre tread.
- Check the tyre pressure.
- Ensure the brake discs are dry and preheat them slightly by braking a few times.

  The brakes must be at normal operating temperature.

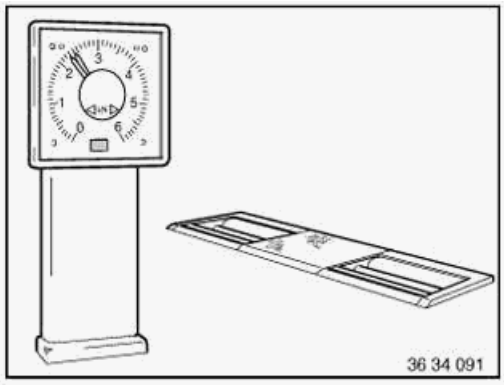
MAIN WORK

2 – Brake test on the front axle on the brake test stand



- Drive the front wheels of the vehicle onto the brake test stand.
- Position the selector lever in selector lever position N (neutral).
- The brake test stand starts automatically.
- Press brake pedal.
- Read the maximum brake forces on the left and right.

3 – Brake test on the rear axle on the brake test stand



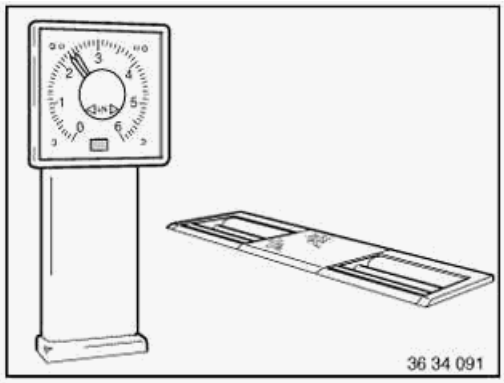
- Position the vehicle with its rear axle on the brake test stand.
- Position the selector lever in selector lever position N (neutral).
- The brake test stand starts automatically.

  The control unit runs a plausibility check (comparison of wheel speed) to identify within a few seconds that a vehicle is on the brake test stand and changes to brake test stand mode.

  If brake test stand mode has been activated and the EMF actuators are open, the indicator light for the electromechanical parking brake (EMF) flashes slowly.
- Press brake pedal.
- Read the maximum brake forces on the left and right.

4 – Brake test of the parking brake on the brake test stand

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- Position the vehicle with its rear axle on the brake test stand.
- Position the selector lever in selector lever position N (neutral).
- The brake test stand starts automatically.

  The control unit runs a plausibility check (comparison of wheel speed) to identify within a few seconds that a vehicle is on the brake test stand and changes to brake test stand mode.

  If brake test stand mode has been activated and the EMF actuators are open, the indicator light for the electromechanical parking brake (EMF) flashes slowly.
- Operate the parking brake button: apply brake pads

  When brake test stand mode is active and the EMF actuators have been partly applied, the indicator light for the electromechanical parking brake (EMF) flashes quickly.
- Operate the parking brake button: brake test with test force 1
- Operate the parking brake button: brake test with test force 2
- Operate the parking brake button: brake test with test force 3
- Read the maximum brake forces on the left and right.
- Release the parking brake button (1).

  This releases the parking brake.
- Move the vehicle from the brake test stand.

  Brake test stand mode is automatically quit upon driving off the brake test stand.
- **After having completed the brake tests: Perform terminal change.**

  All indicator lights go out after having completed the terminal change.

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34 00 027 Renewing fluid in brake system (vehicles with automatic transmission)

TECHNICAL INFORMATION

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

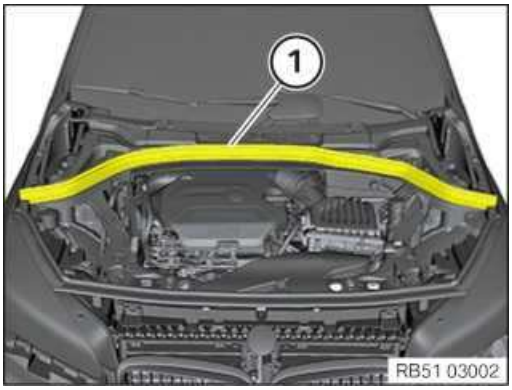
PRELIMINARY WORK

1 – Connect bleeder unit for brake fluid

▸ **Remove the seal for the rear bonnet**

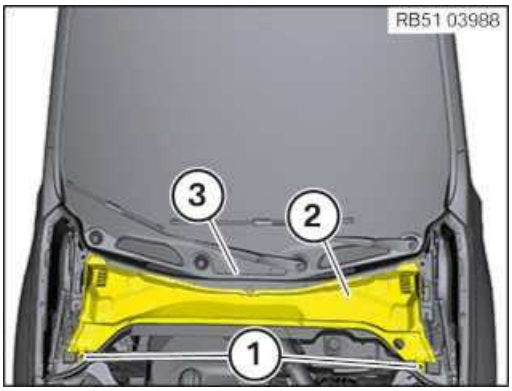
NOTICE

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



- Pull off rear bonnet seal (1) towards the top and remove.

▸ **Removing front cowl panel cover**



- Loosen the expanding rivet (1).
- Feed out and remove front cowl panel cover (2) from the rear cowl panel cover(3).



- 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 **.**

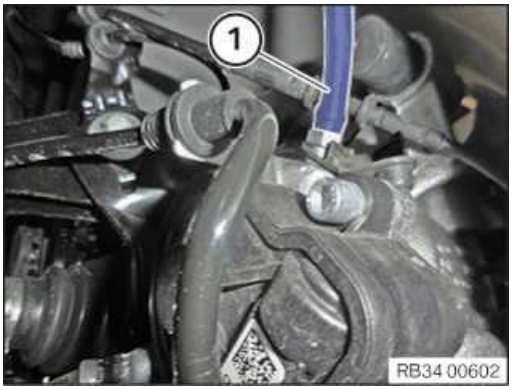
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MAIN WORK

2 – 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.

3 – 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

POSTPROCESSES

4 – 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.

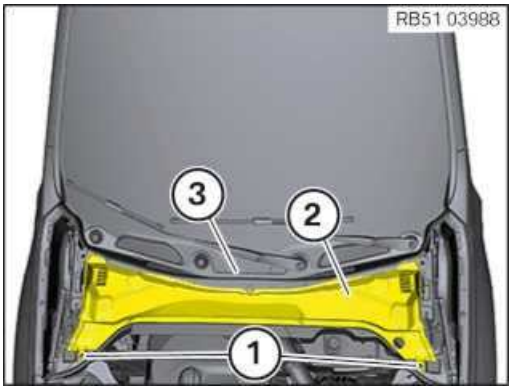


- Switch off bleeder unit (1) and remove from brake fluid expansion tank .
- Check the brake fluid level; if necessary, adjust to maximum mark.



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

▸ **Installing front cowl panel cover**



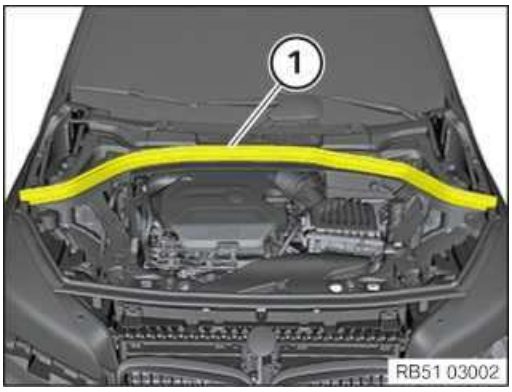
- Insert and install cowl panel cover at front (2) into cowl panel cover at rear (3).
- Check cowl panel cover at front is correctly seated (2).
- Secure expanding rivet (1).

▸ **Install the seal for the bonnet**

NOTICE

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

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- Install bonnet seal at rear (1).
- Ensure that the rear bonnet seal (1) is fitted correctly.

Additional Information

Overview of Tightening Torques

Vent valve Used in step 2 3

		Tightening torque	10 Nm

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34 00 027 Renewing fluid in brake system (vehicles with manual gearbox)

TECHNICAL INFORMATION

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

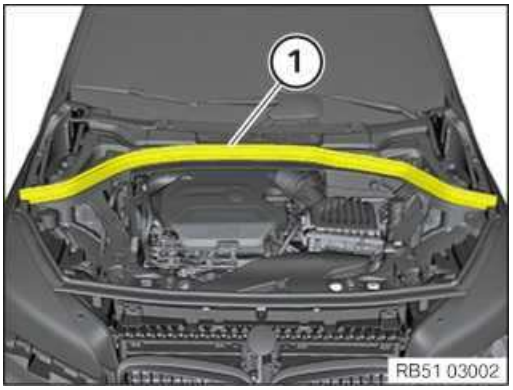
PRELIMINARY WORK

1 – Connect bleeder unit for brake fluid

▸ **Remove the seal for the rear bonnet**

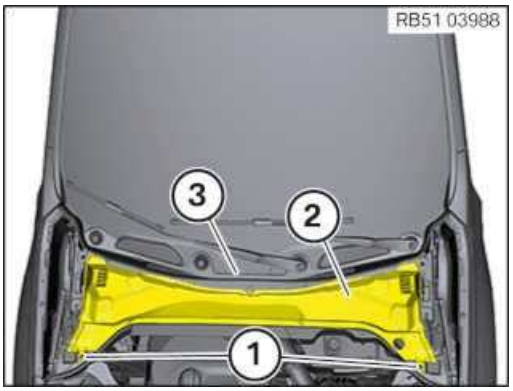
NOTICE

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



- Pull off rear bonnet seal (1) towards the top and remove.

▸ **Removing front cowl panel cover**



- Loosen the expanding rivet (1).
- Feed out and remove front cowl panel cover (2) from the rear cowl panel cover(3).



- 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.

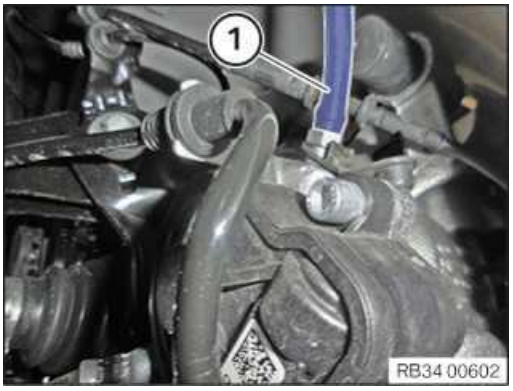
- **Do not exceed the filling pressure of** 2 bar **.**

MAIN WORK

2 – 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.

3 – Flushing and bleeding the front axle brake circuit

NOTICE

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

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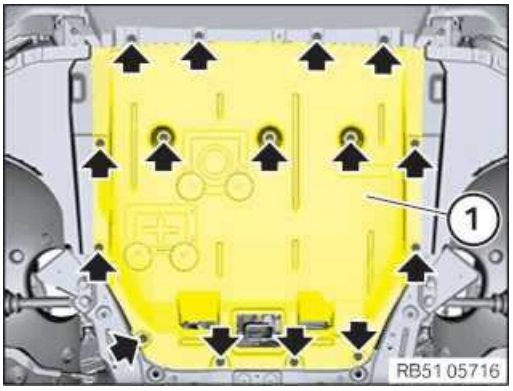
- **Start flushing at the front right.**
- Connect the vent hose with the collecting vessel to the vent valve (1) on front right interior brake calliper.
- Open the vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve (1).

Vent valve

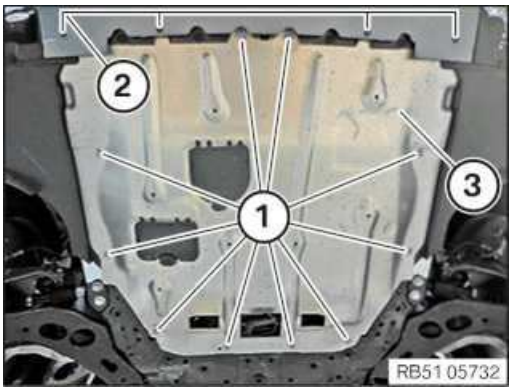
		Tightening torque	10 Nm

4 – Flushing and bleeding the clutch hydraulic system

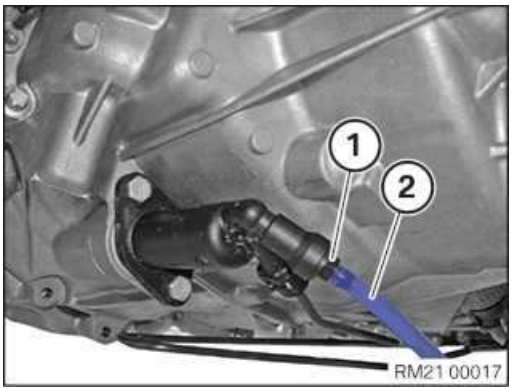
▸ **Removing the front underbody protection**



- Remove screws (arrows).
- Thread out and remove the front underbody protection (1) from the bumper panel.



- **Equipment specification with metal underride protection:**
- Loosen screws (1) and (2).
- Thread out and remove the underride protection (3).



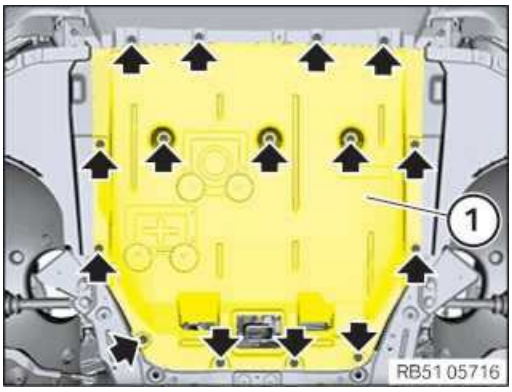
- Remove the dust cap from the vent valve (1).
- Connect the vent hose (2) with the collecting vessel to the vent valve (1) on the clutch slave cylinder.
- Open the vent valve (1) and purge it until clear, bubble-free brake fluid emerges.
- Close vent valve (1).

Clutch slave cylinder vent valve

		Tightening torque	6 Nm

▸ **Installing the front underbody protection**

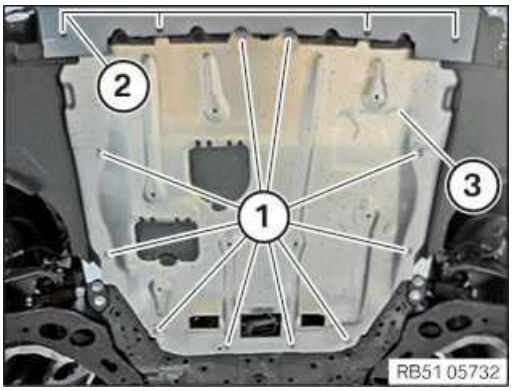
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- Guide the front underbody protection (1) in under the bumper panel and position it at the screw points.
- Tighten screws (arrows).

Underbody protection front

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



- **Equipment specification with metal underride guard:**
- Guide in and attach the underride guard (3).
- Tighten down screws (1) and (2).

Underbody protection front

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

POSTPROCESSES

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.



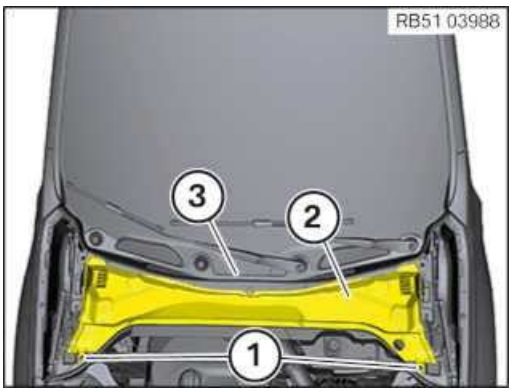
- Switch off bleeder unit (1) and remove from brake fluid expansion tank .
- Check the brake fluid level; if necessary, adjust to maximum mark.



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

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▶ **Installing front cowl panel cover**

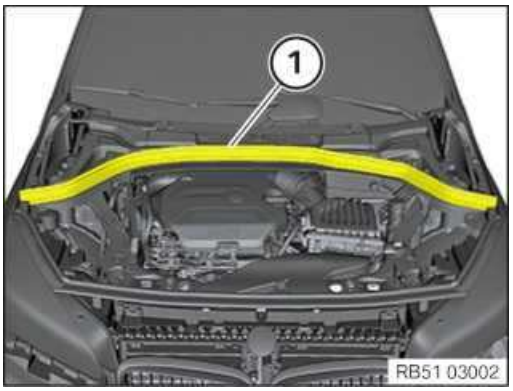


- Insert and install cowl panel cover at front (2) into cowl panel cover at rear (3).
- Check cowl panel cover at front is correctly seated (2).
- Secure expanding rivet (1).

▶ **Install the seal for the bonnet**

NOTICE

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



- Install bonnet seal at rear (1).
- Ensure that the rear bonnet seal (1) is fitted correctly.

Additional Information

Overview of Tightening Torques

Vent valve — Used in step 2 3

		Tightening torque	10 Nm

Clutch slave cylinder vent valve — Used in step 4

		Tightening torque	6 Nm

Underbody protection front — Used in step 4

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

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



Warning!

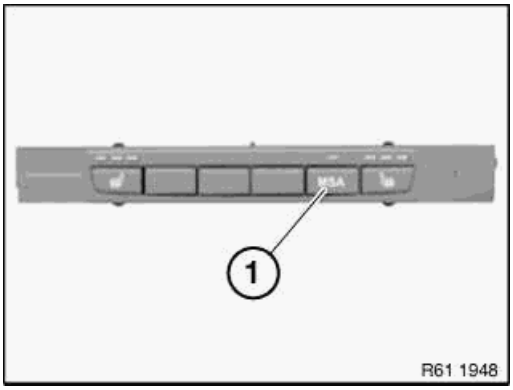
If the engine hood/bonnet contact is pulled upwards (workshop mode), the information "switch closed" is output. The automatic engine start-stop function is active.

An automatic engine start is possible.

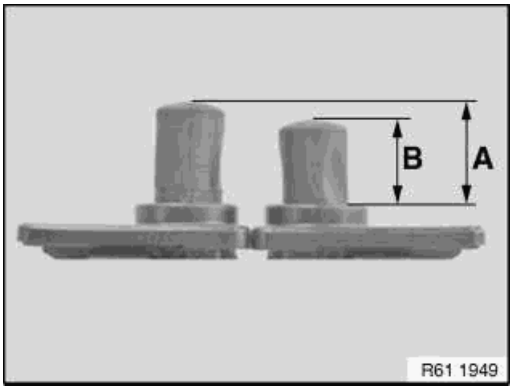
Observe safety precautions when working on MSA vehicles.

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 11 667 Precision-turning both front brake discs on both sides

Attention!

Always precision-turn both sides of both brake discs on one axle.

Maximum machining dimension per friction ring side is 0.8Â mm!

Minimum brake disc thickness (MIN TH)

Brake discs of M models (Compound brake discs) must **not** be machined!

Only one brake pad set may be used up on brake discs which have been lathe-turned to minimum thickness (MIN TH).



Mobile brake disc lathe:

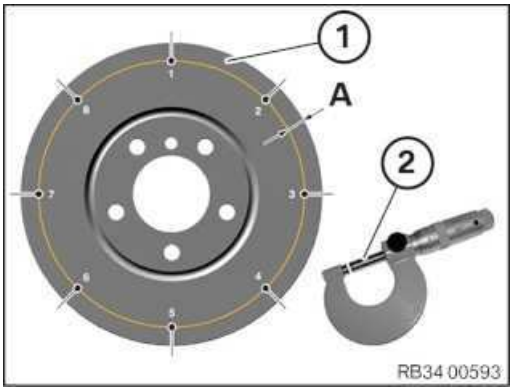
Attention!

Only BMW-approved brake disc lathes may be used!

In the case of mobile brake disc lathes, the brake caliper and the caliper carrier must be removed.

The brake discs remain on the vehicle.

Please refer to the equipment manufacturer's operating instructions for the exact procedure.



After the precision turn of the brake disc, the difference in thickness must be measured at 8 different points (1) approx. 10 mm (dimension A) from the outer edge of the disc using a caliper gauge (2)!

Permissible thickness difference: see Technical Data!

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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**

- 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.
- Unscrew the wheel bolts (arrows) and remove the wheel.

  Use the matching adapter from tool set (wheel bolt adapter set) to loosen and tighten down the wheel bolt with security code.

2 – Removing front brake pad wear sensor

TECHNICAL INFORMATION

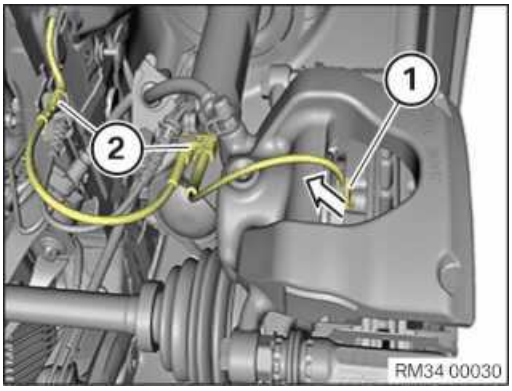
The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

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:

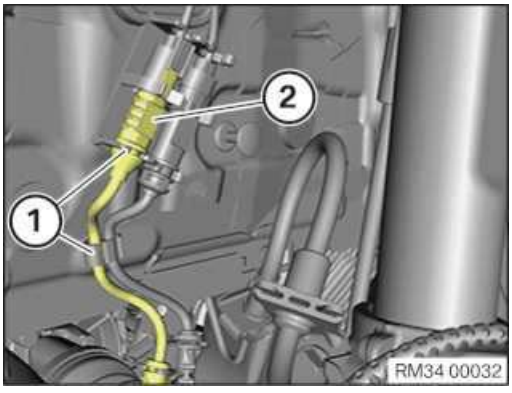
The new sliding contact must be filed down with a file to the same length as the sanded sliding contact.

When renewing the brake pad wear sensor, a CBS reset must be carried out.

If a brake pad wear sensor was renewed without renewing the brake pads, you must observe the following: Carry out "CBS vehicle data correction" service function via diagnosis system and information system.



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

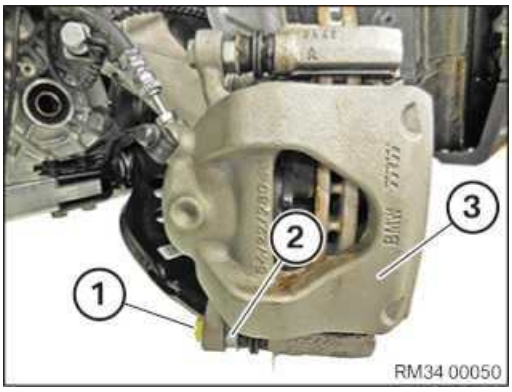


- Detach the brake pad wear sensor from the brackets (1).
- Disconnect plug connection (2).

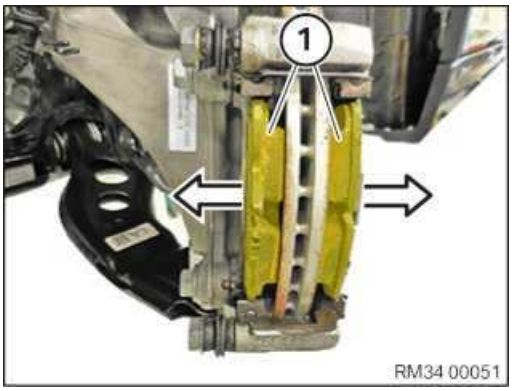
MAIN WORK

3 – Remove front brake pads

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- Release the bolt (1) and if necessary counter support at the hexagon head (2).
- Fold up the brake caliper (3).



- 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.



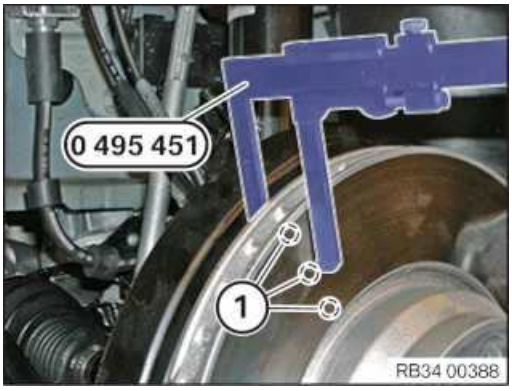
TECHNICAL INFORMATION

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.

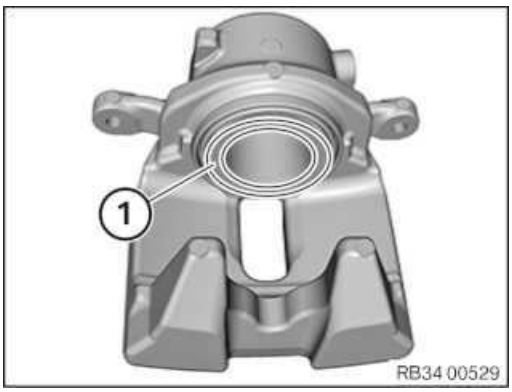
  Compare measuring result and lowest value with setpoint value.

  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)



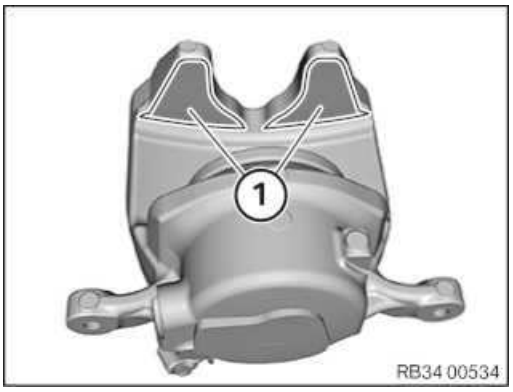
- Clean the contact surfaces (1) of the brake piston using brake cleaner.

Expendable materials

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

- Check dust boots for damage; renew if necessary.

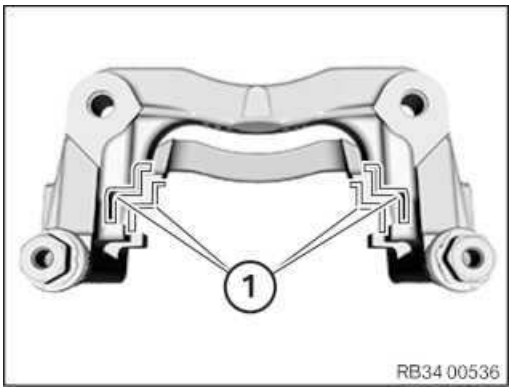
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- Clean contact surfaces (1) of the brake caliper with brake cleaner and apply a thin layer of brake pad paste.

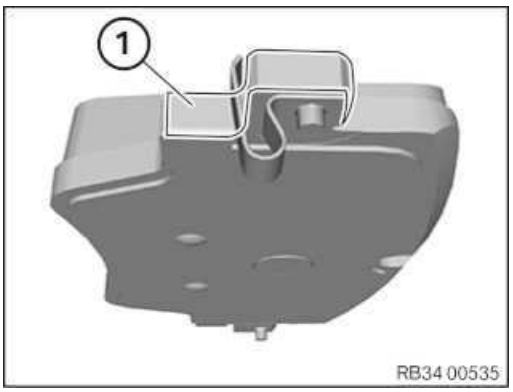
Expendable materials

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



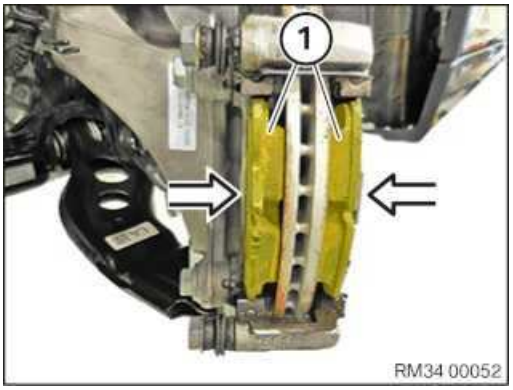
- Clean contact surfaces with brake cleaner.

  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.



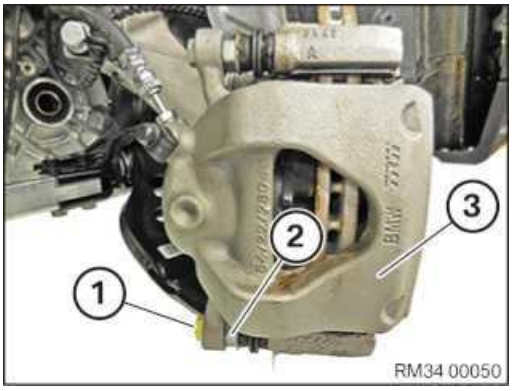
- Apply a thin coating of brake pad paste to both sides of the T-head of the brake pad in area (1).

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.



- Position the brake caliper (3).
- Renew screws (1).

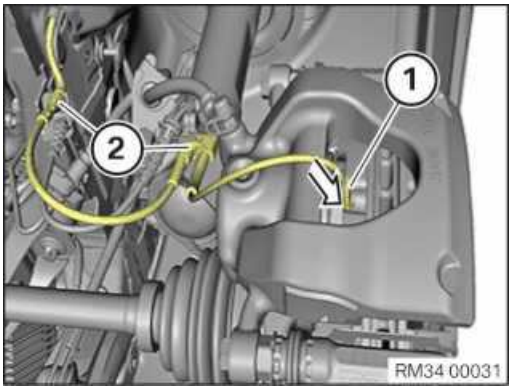
  Parts: Bolts
- Tighten the screws (1), if applicable, hold against the hexagon head (2).

Guide bolt (brake caliper on caliper carrier)

M8	Renew screws.	Tightening torque	35 Nm

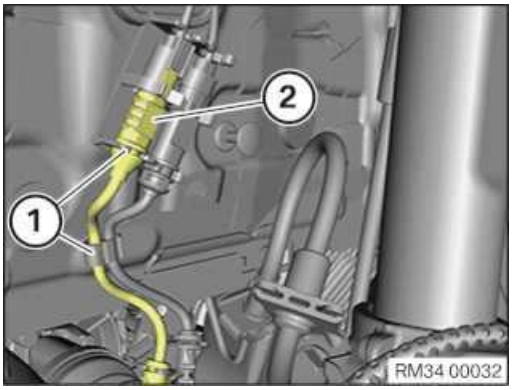
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7 – Installing front brake pad wear sensor



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

  Ensure brake pad wear sensor fits correctly in brake pad.



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

8 – Installing both front wheels

▶ **Mounting the wheel**

▷ **Clean the contact surfaces between the brake disc and the wheel rim**



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**.

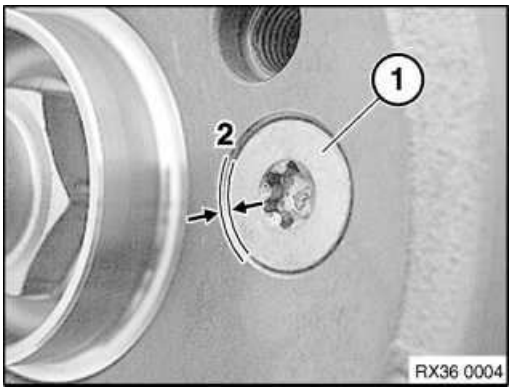
  Do not operate special tool **2 344 011** with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.



- 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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- Renew mounting bolt (1).

  Parts: Mounting bolt

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

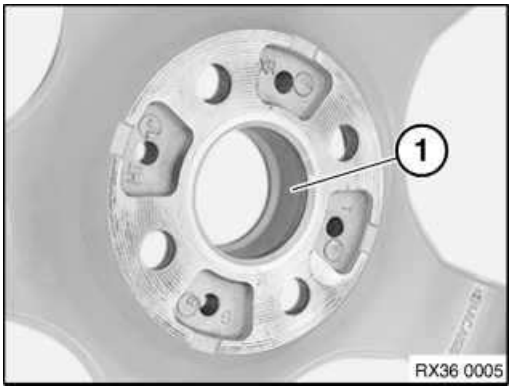
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm



- Lightly grease the wheel centring (1) in the wheel rim; refer to additional information for grease for the wheel centring (1).

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

Wheel bolts

M 14/AF 17	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 – 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

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

M8	Renew screws.	Tightening torque	35 Nm

Brake disc to rear wheel hub — Used in step 8

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to front wheel hub — Used in step 8

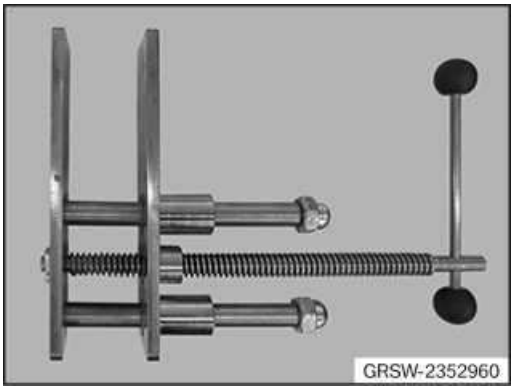
M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 8

M 14/AF 17	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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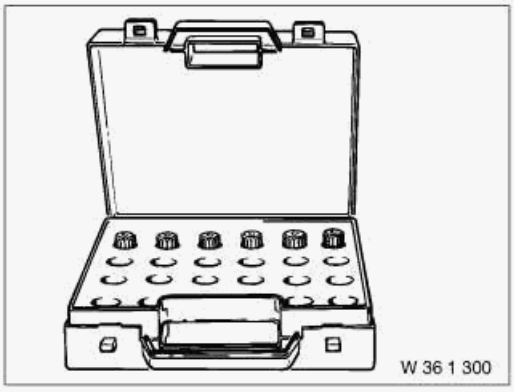
2 344 011 Tool



Common	Used in step 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	

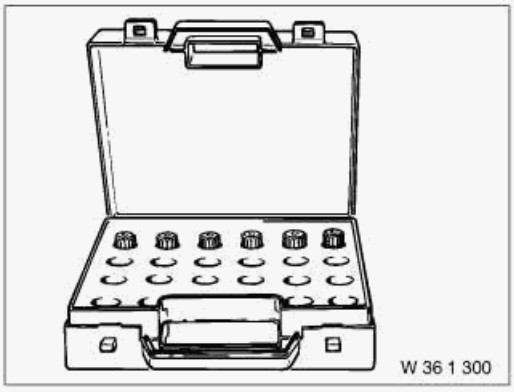
0 495 224 (36 1 326) Wheel stud



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	

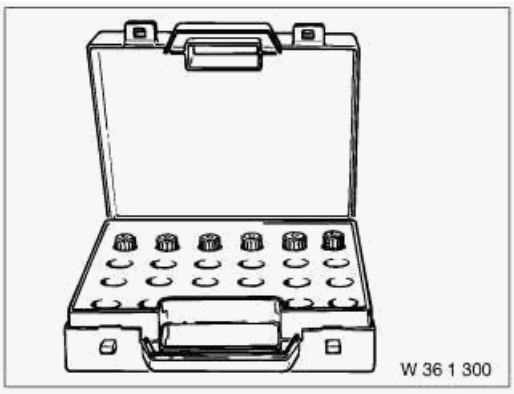
0 495 228 (36 1 331) Wheel stud



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	

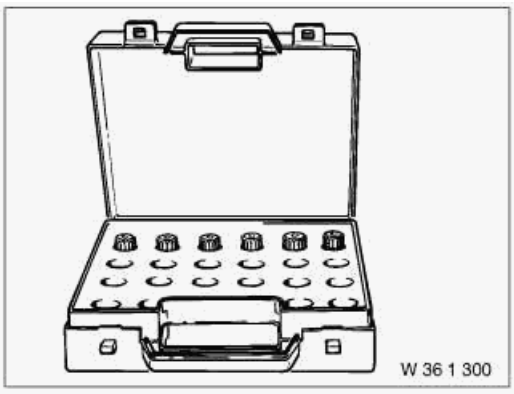
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0 495 229 (36 1 332) Wheel stud



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	

Operating materials	Used in step
2.0 Grease for wheel centring	8

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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

PRELIMINARY WORK

1 – Removing both front wheels



▸ **Removing the wheel**

- 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.
- Unscrew the wheel bolts (arrows) and remove the wheel.

  Use the matching adapter from tool set (wheel bolt adapter set) to loosen and tighten down the wheel bolt with security code.

2 – Removing front brake pad wear sensor

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TECHNICAL INFORMATION

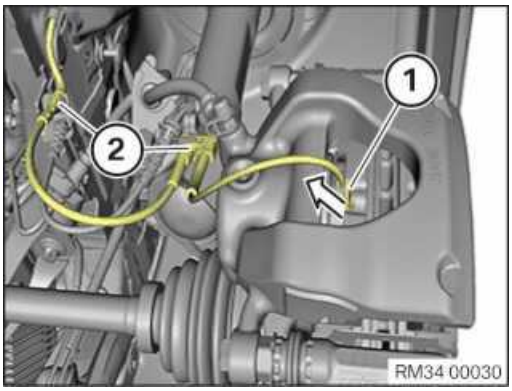
The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

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:

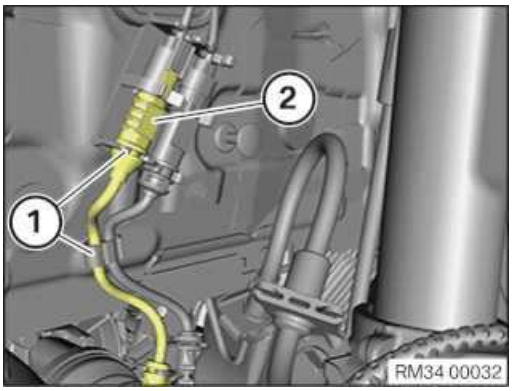
The new sliding contact must be filed down with a file to the same length as the sanded sliding contact.

When renewing the brake pad wear sensor, a CBS reset must be carried out.

If a brake pad wear sensor was renewed without renewing the brake pads, you must observe the following: Carry out "CBS vehicle data correction" service function via diagnosis system and information system.

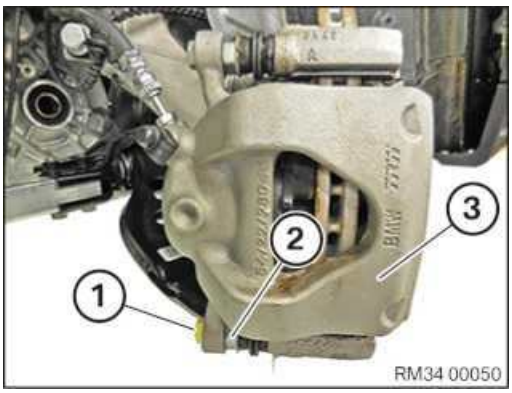


- Remove brake pad wear sensor (1) out of the brake pad in the direction of the arrow.
- Detach the brake pad wear sensor (1) cable from the brackets (2).



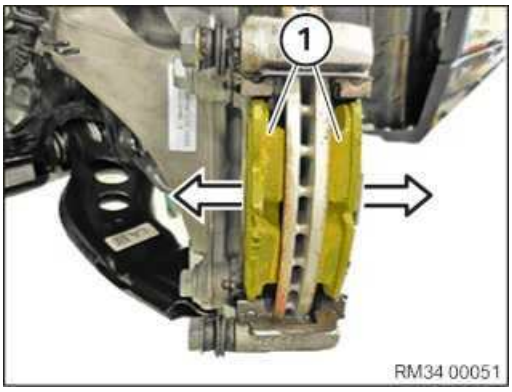
- Detach the brake pad wear sensor from the brackets (1).
- Disconnect plug connection (2).

3 – Remove front brake pads



- Release the bolt (1) and if necessary counter support at the hexagon head (2).
- Fold up the brake caliper (3).

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- 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.

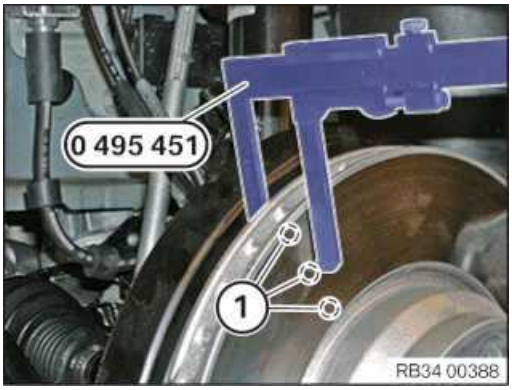


TECHNICAL INFORMATION

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.

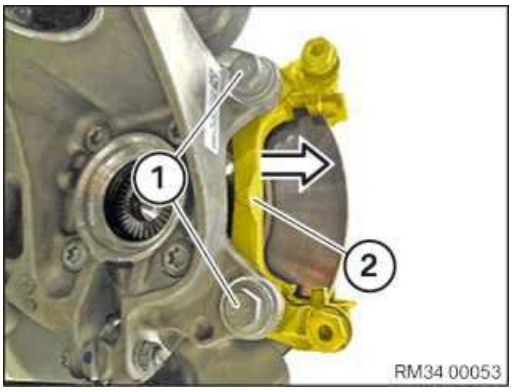
  New brake pads must only be installed if the brake disk thickness is greater than the minimum brake disc thickness.

Minimum brake disc thickness (nominal dimension 330x24)

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

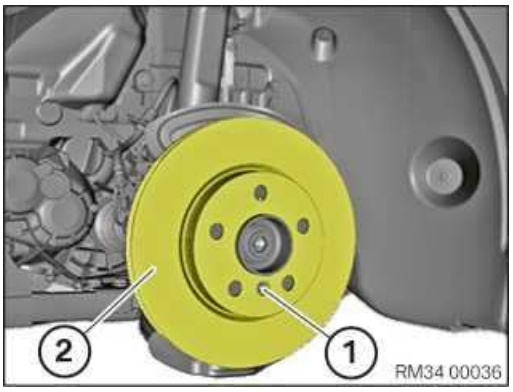
MAIN WORK

5 – Remove front brake discs



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

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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.

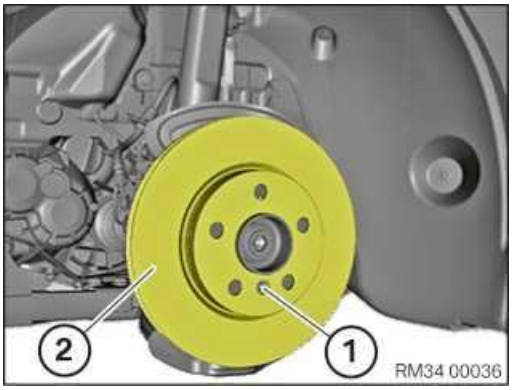
- Remove brake disc (2).

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.



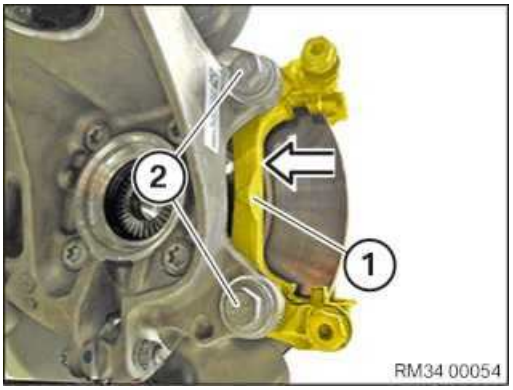
- Clean contact surface of wheel hub thoroughly and remove any traces of rust if necessary.

  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 them.

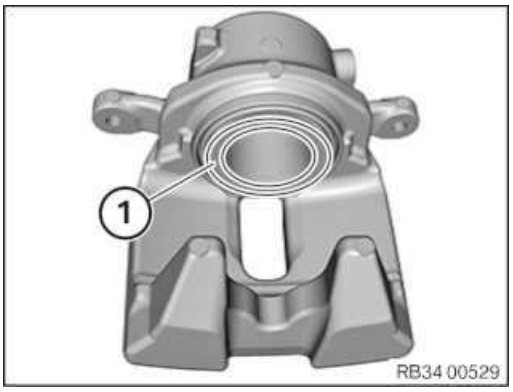
Brake caliper / caliper carrier at front swivel bearing

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)

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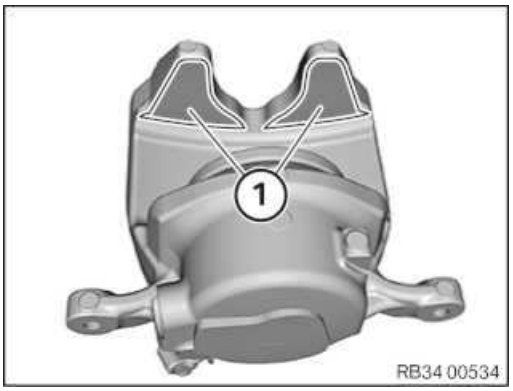


- Clean the contact surfaces (1) of the brake piston using brake cleaner.

Expendable materials

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

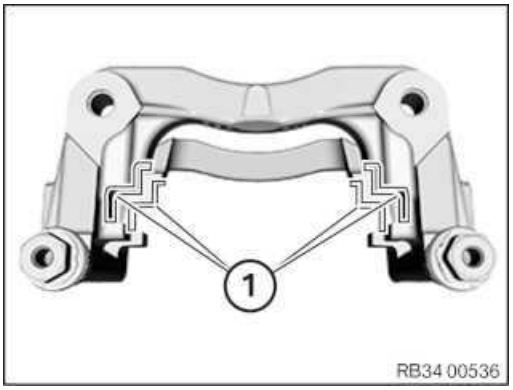
- Check dust boots for damage; renew if necessary.



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

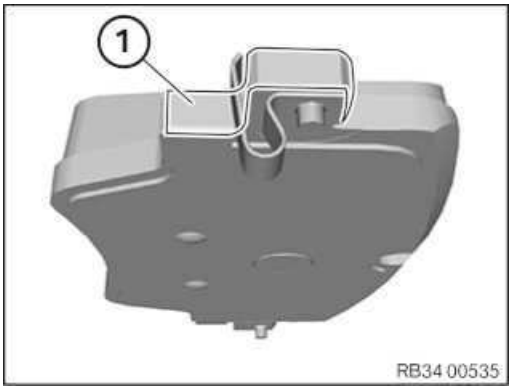
Expendable materials

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



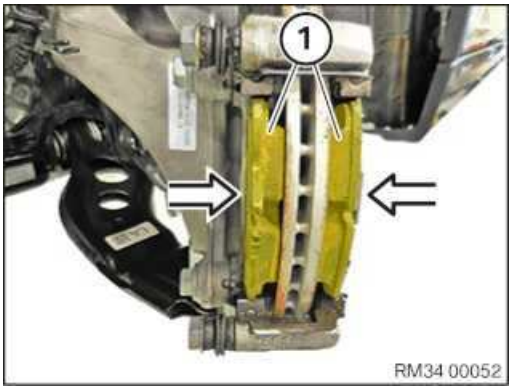
- Clean contact surfaces with brake cleaner.

  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).

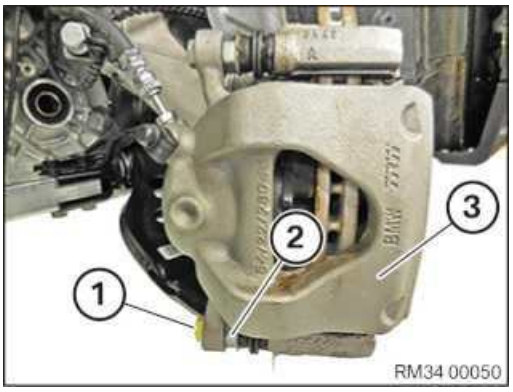
8 – Installing the front brake pads



- 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.

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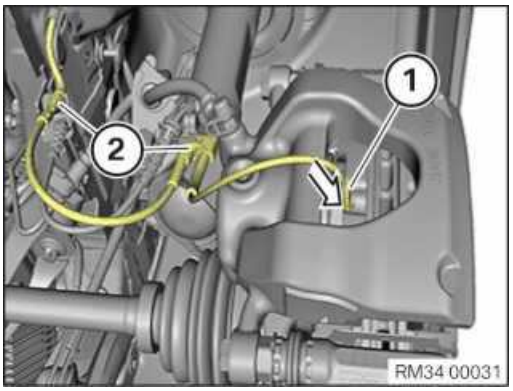
- Position the brake caliper (3).
- Renew screws (1).

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

Guide bolt (brake caliper on caliper carrier)

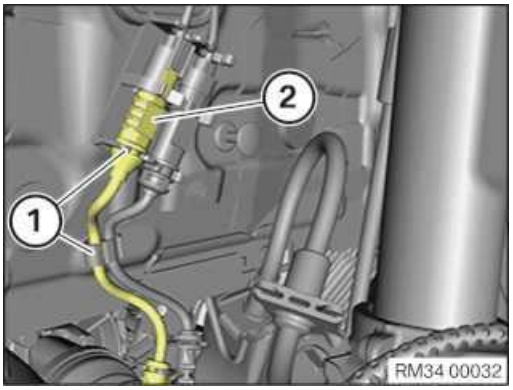
M8	Renew screws.	Tightening torque	35 Nm

9 – Installing front brake pad wear sensor



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

  Ensure brake pad wear sensor fits correctly in brake pad.



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

10 – Installing both front wheels

▶ **Mounting the wheel**

▷ **Clean the contact surfaces between the brake disc and the wheel rim**



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.

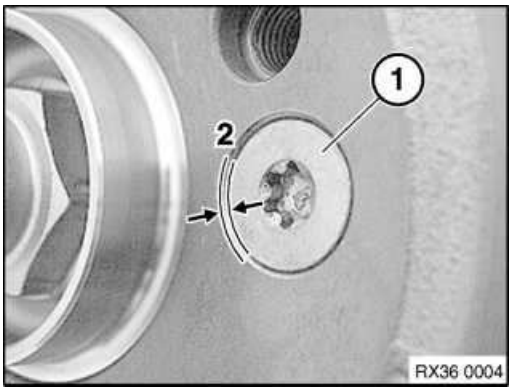
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- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool **2 344 011**.

  Do not operate special tool **2 344 011** with an impact screwdriver.

- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).



- Renew mounting bolt (1).

  Parts: Mounting bolt

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

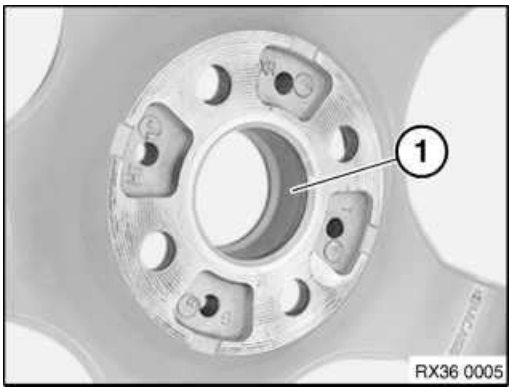
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm



- Lightly grease the wheel centring (1) in the wheel rim; refer to additional information for grease for the wheel centring (1).

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

Wheel bolts

M 14/AF 17	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 6

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.	Tightening torque	35 Nm

Brake disc to rear wheel hub — Used in step 10

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to front wheel hub — Used in step 10

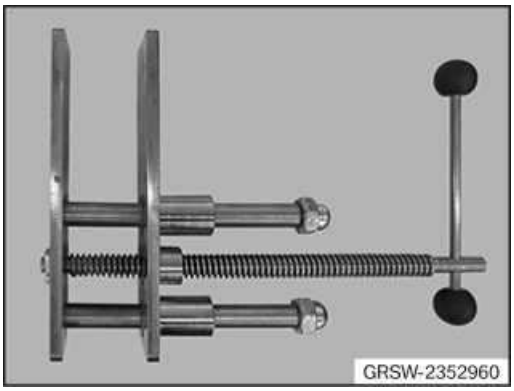
M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 10

M 14/AF 17	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	

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)

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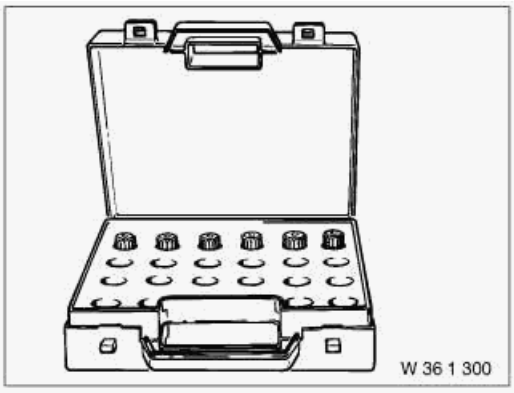
Replacement tools:

0 495 221 (36 1 323) Wheel stud



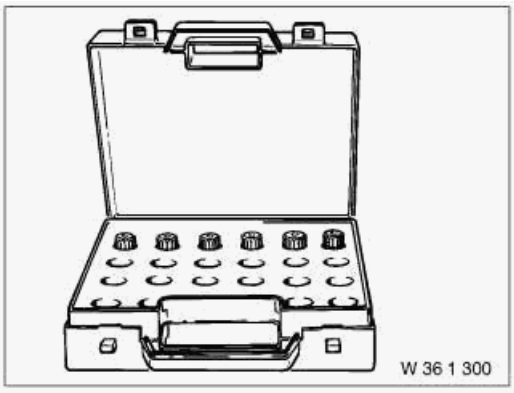
Common	Used in step 1
Usage	(Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 224 (36 1 326) Wheel stud



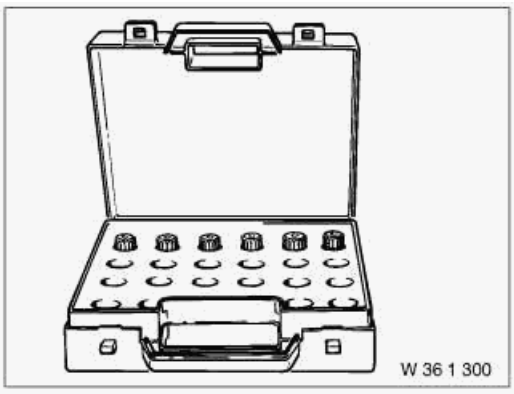
Common	Used in step 1
Usage	(Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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	

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0 495 227 (36 1 329) Wheel stud



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

0 495 228 (36 1 331) Wheel stud



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

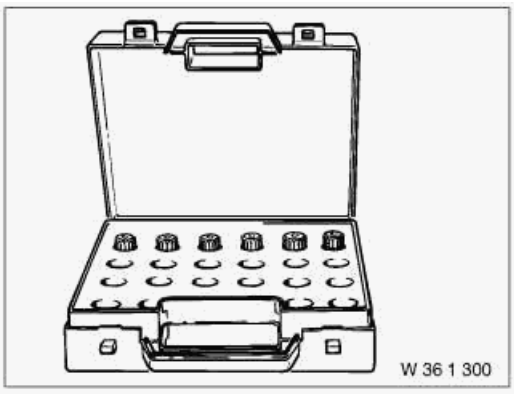
0 495 229 (36 1 332) Wheel stud



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

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0 495 230 (36 1 333) Wheel stud



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

Overview Technical Data

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	

Operating materials	Used in step
2.0 Grease for wheel centring	10

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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

PRELIMINARY WORK

1 – Remove front left or right wheel



▸ **Removing the wheel**

- 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.
- Unscrew the wheel bolts (arrows) and remove the wheel.

  Use the matching adapter from tool set (wheel bolt adapter set) to loosen and tighten down the wheel bolt with security code.

2 – Removing front brake pad wear sensor

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TECHNICAL INFORMATION

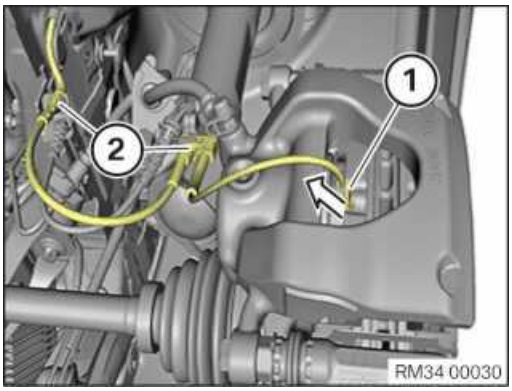
The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

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:

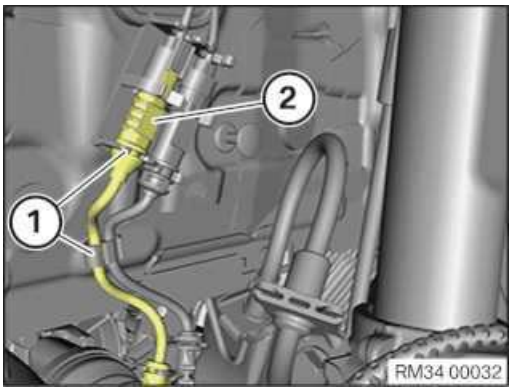
The new sliding contact must be filed down with a file to the same length as the sanded sliding contact.

When renewing the brake pad wear sensor, a CBS reset must be carried out.

If a brake pad wear sensor was renewed without renewing the brake pads, you must observe the following: Carry out "CBS vehicle data correction" service function via diagnosis system and information system.

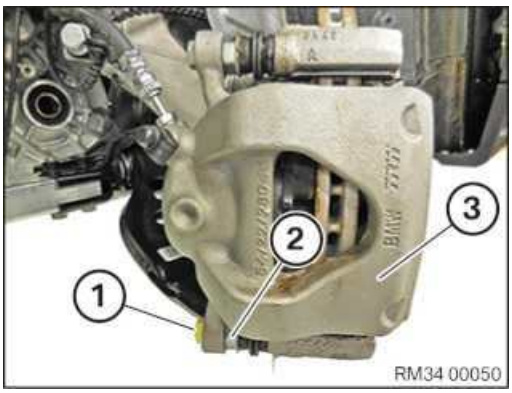


- Remove brake pad wear sensor (1) out of the brake pad in the direction of the arrow.
- Detach the brake pad wear sensor (1) cable from the brackets (2).



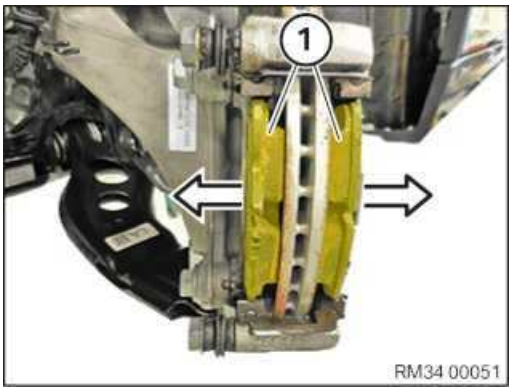
- Detach the brake pad wear sensor from the brackets (1).
- Disconnect plug connection (2).

3 – Remove front brake pads



- Release the bolt (1) and if necessary counter support at the hexagon head (2).
- Fold up the brake caliper (3).

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- 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.



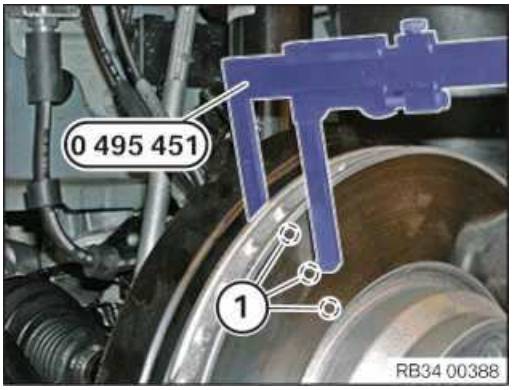
TECHNICAL INFORMATION

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.

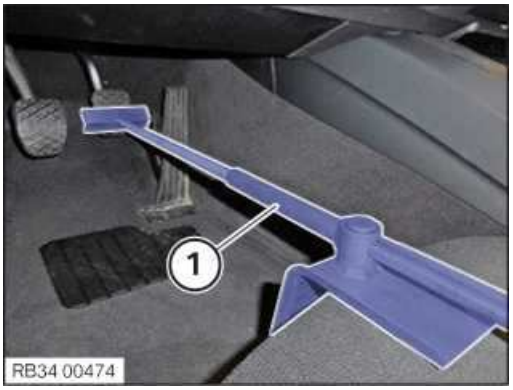
  Compare measuring result and lowest value with setpoint value.

  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.

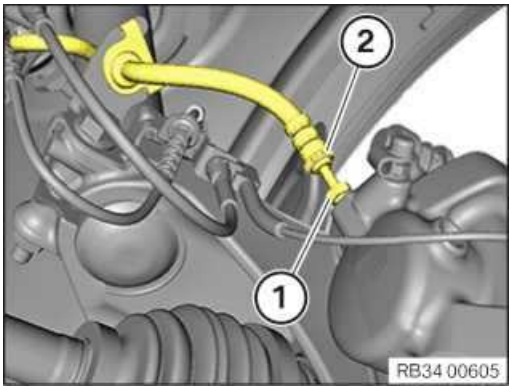
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MAIN WORK

6 – Removing the front brake caliper

NOTICE

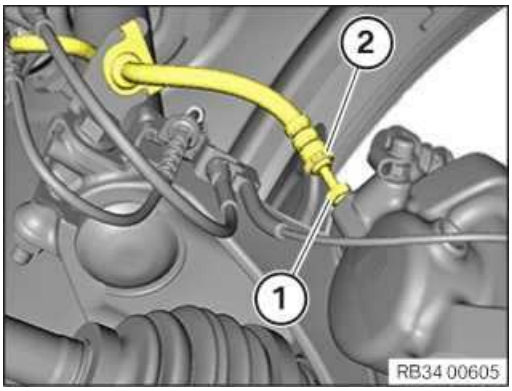
Description is for left component only. Procedure on the right side is identical.



- 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).

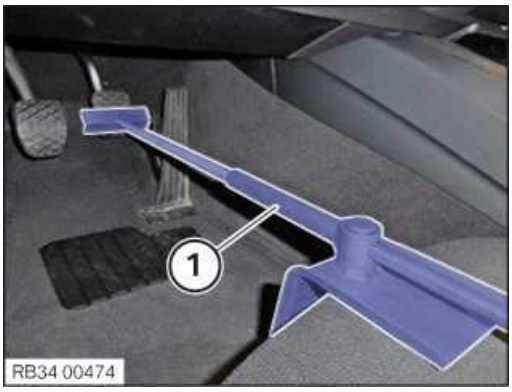
Brake hose to brake caliper, front

	24 Nm

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

POSTPROCESSES

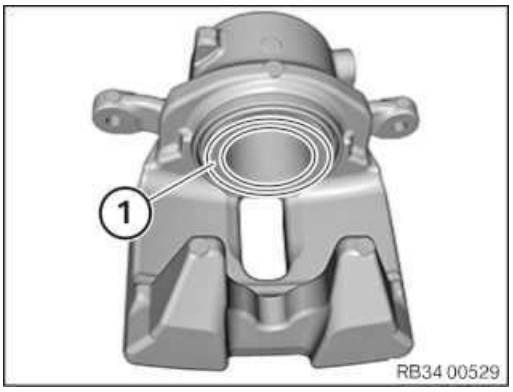
8 – Remove the brake pedal tensioner



- Remove the brake pedal tensioner (1).

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

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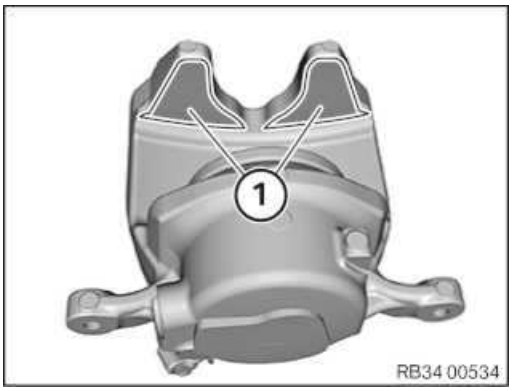


- Clean the contact surfaces (1) of the brake piston using brake cleaner.

Expendable materials

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

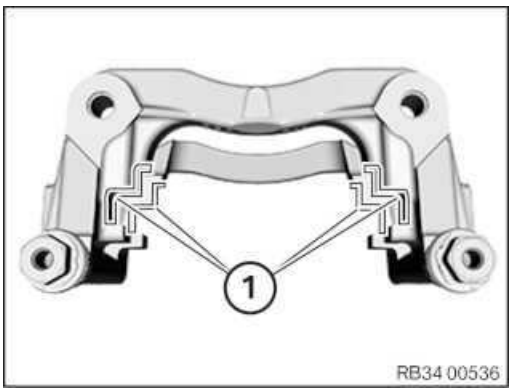
- Check dust boots for damage; renew if necessary.



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

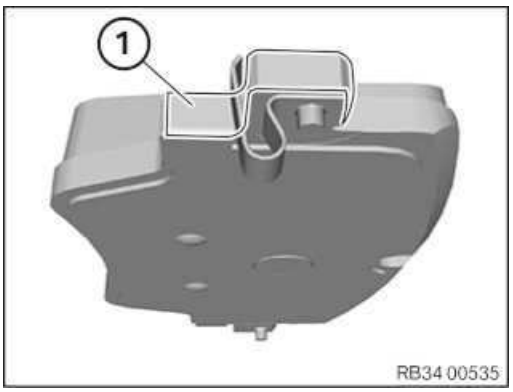
Expendable materials

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



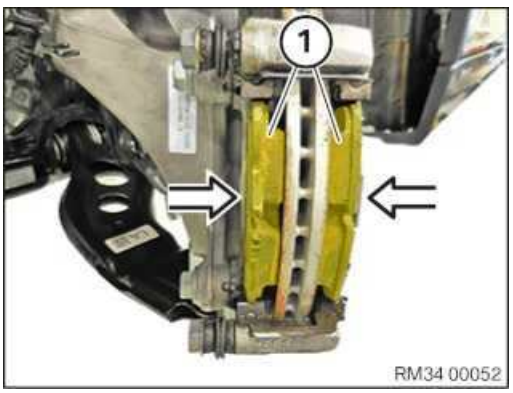
- Clean contact surfaces with brake cleaner.

  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).

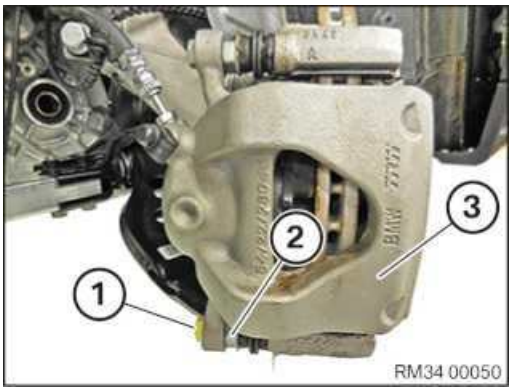
10 – Installing the front brake pads



- 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.

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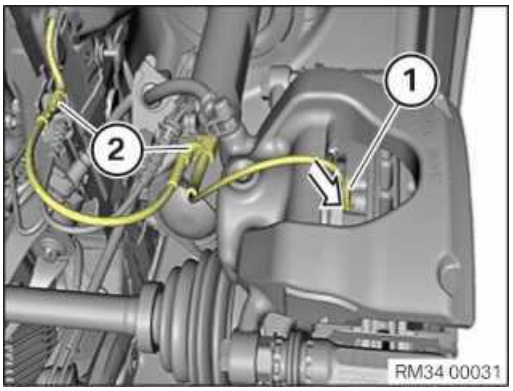
- Position the brake caliper (3).
- Renew screws (1).

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

Guide bolt (brake caliper on caliper carrier)

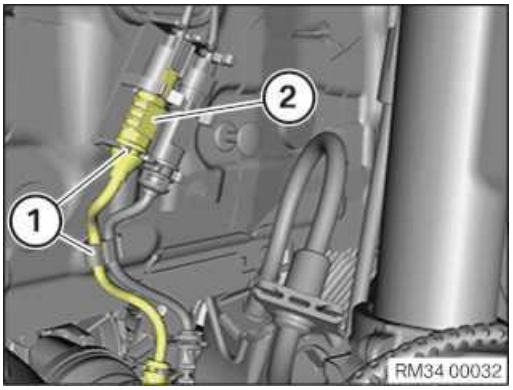
M8	Renew screws.	Tightening torque	35 Nm

11 – Installing front brake pad wear sensor



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

  Ensure brake pad wear sensor fits correctly in brake pad.



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

12 – Installing front left or right wheel

▸ **Mounting the wheel**

▹ **Clean the contact surfaces between the brake disc and the wheel rim**



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.

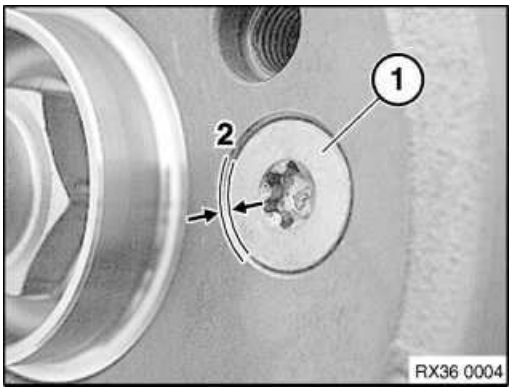
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- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool **2 344 011**.

  Do not operate special tool **2 344 011** with an impact screwdriver.

- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).



- Renew mounting bolt (1).

  Parts: Mounting bolt

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

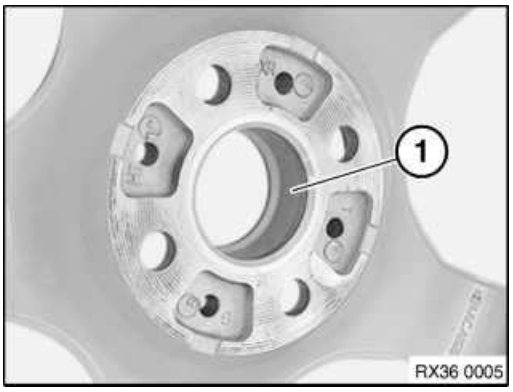
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm



- Lightly grease the wheel centring (1) in the wheel rim; refer to additional information for grease for the wheel centring (1).

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

Wheel bolts

M 14/AF 17	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

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.

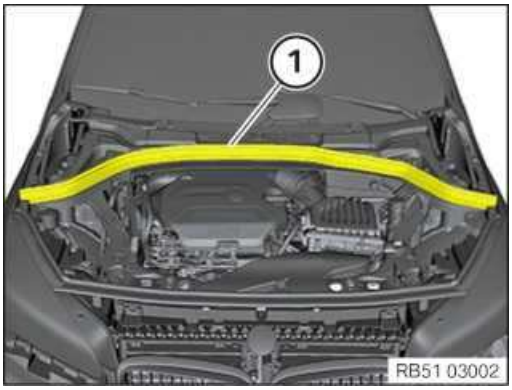
14 – Connect bleeder unit for brake fluid

▸ **Remove the seal for the rear bonnet**

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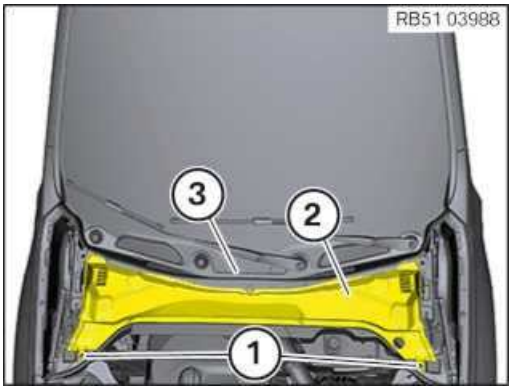
NOTICE

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



- Pull off rear bonnet seal (1) towards the top and remove.

▶ **Removing front cowl panel cover**



- Loosen the expanding rivet (1).
- Feed out and remove front cowl panel cover (2) from the rear cowl panel cover(3).



- 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 **.**

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

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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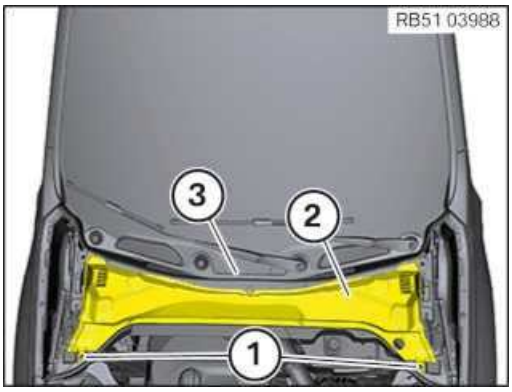


- Switch off bleeder unit (1) and remove from brake fluid expansion tank .
- Check the brake fluid level; if necessary, adjust to maximum mark.



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

▸ **Installing front cowl panel cover**

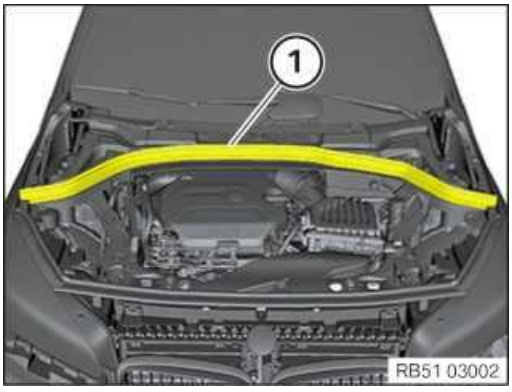


- Insert and install cowl panel cover at front (2) into cowl panel cover at rear (3).
- Check cowl panel cover at front is correctly seated (2).
- Secure expanding rivet (1).

▸ **Install the seal for the bonnet**

NOTICE

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



- Install bonnet seal at rear (1).
- Ensure that the rear bonnet seal (1) is fitted correctly.

Additional Information

Overview of Tightening Torques

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Brake hose to brake caliper, front

Used in step 7

			24 Nm

Guide bolt (brake caliper on caliper carrier)

Used in step 10

M8	Renew screws.	Tightening torque	35 Nm

Brake disc to rear wheel hub

Used in step 12

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to front wheel hub

Used in step 12

M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts

Used in step 12

M 14/AF 17	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

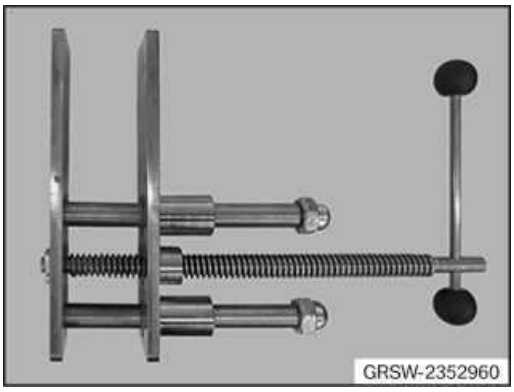
Vent valve

Used in step 15

		Tightening torque	10 Nm

Overview of Special Tools

2 352 960 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)

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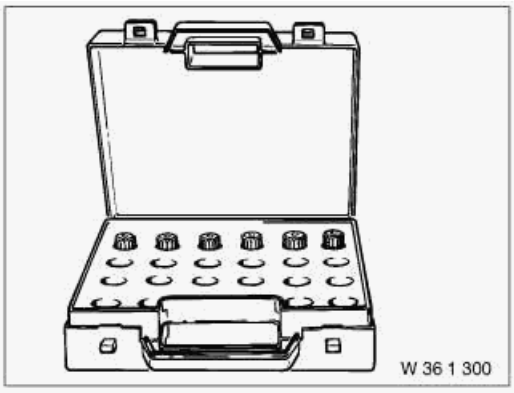
Replacement tools:

0 495 221 (36 1 323) Wheel stud



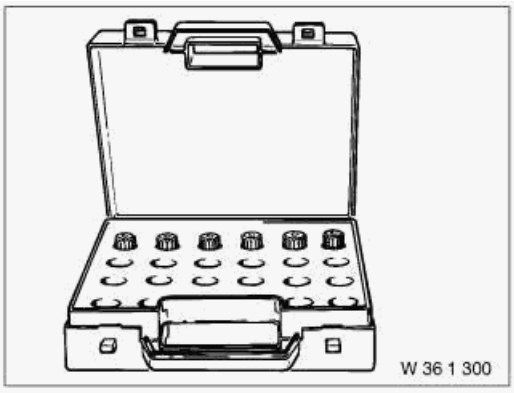
Common	Used in step 1
Usage	(Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 224 (36 1 326) Wheel stud



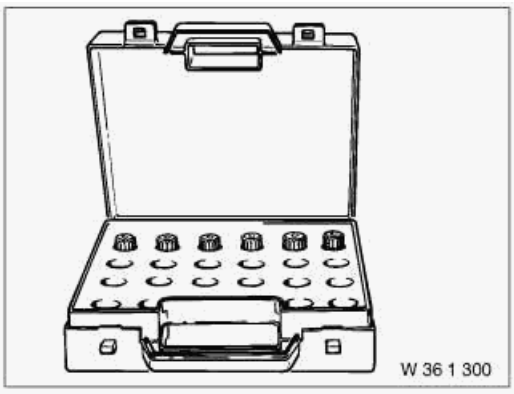
Common	Used in step 1
Usage	(Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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	

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0 495 227 (36 1 329) Wheel stud



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

0 495 228 (36 1 331) Wheel stud



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

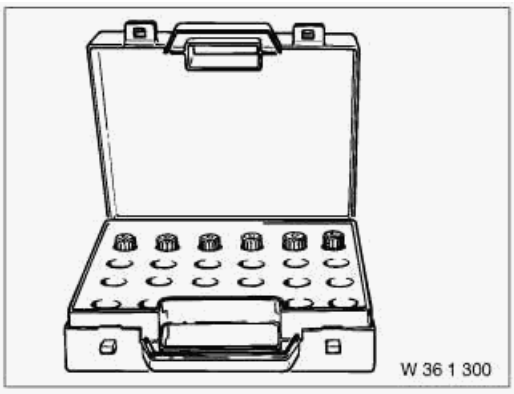
0 495 229 (36 1 332) Wheel stud



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

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0 495 230 (36 1 333) Wheel stud



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

Overview Technical Data

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	

Operating materials	Used in step
2.0 Grease for wheel centring	12

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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

PRELIMINARY WORK

1 – Removing both front wheels



▸ **Removing the wheel**

- 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.
- Unscrew the wheel bolts (arrows) and remove the wheel.

  Use the matching adapter from tool set (wheel bolt adapter set) to loosen and tighten down the wheel bolt with security code.

2 – Removing front brake pad wear sensor

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TECHNICAL INFORMATION

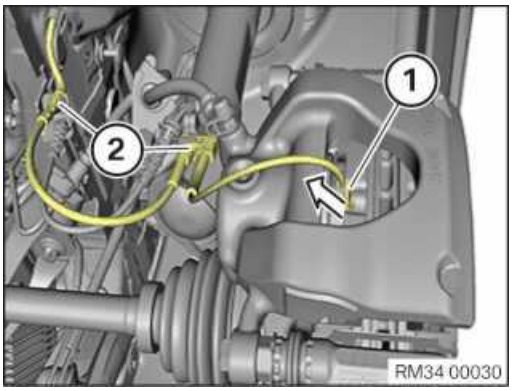
The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

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:

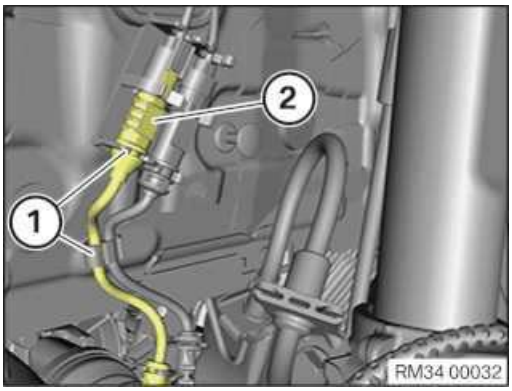
The new sliding contact must be filed down with a file to the same length as the sanded sliding contact.

When renewing the brake pad wear sensor, a CBS reset must be carried out.

If a brake pad wear sensor was renewed without renewing the brake pads, you must observe the following: Carry out "CBS vehicle data correction" service function via diagnosis system and information system.

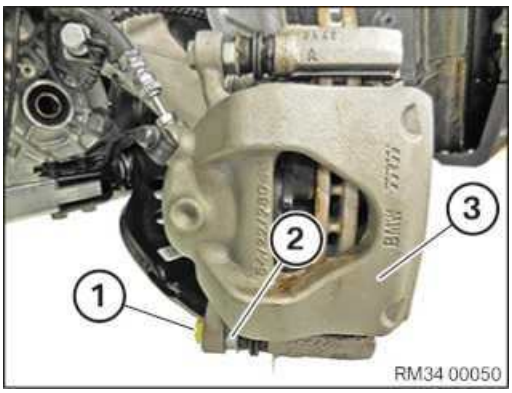


- Remove brake pad wear sensor (1) out of the brake pad in the direction of the arrow.
- Detach the brake pad wear sensor (1) cable from the brackets (2).



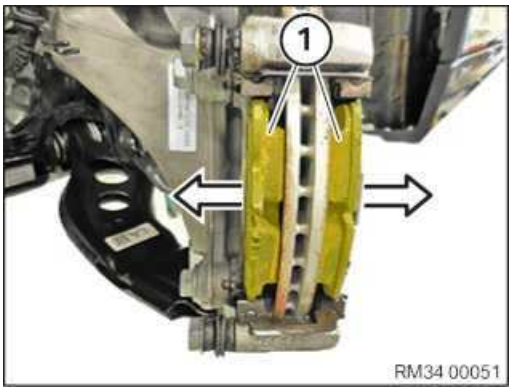
- Detach the brake pad wear sensor from the brackets (1).
- Disconnect plug connection (2).

3 – Remove front brake pads



- Release the bolt (1) and if necessary counter support at the hexagon head (2).
- Fold up the brake caliper (3).

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- 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.

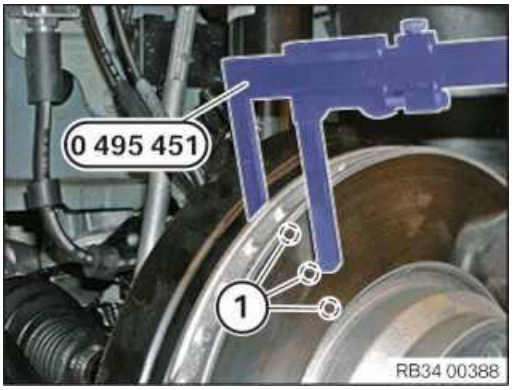


TECHNICAL INFORMATION

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.

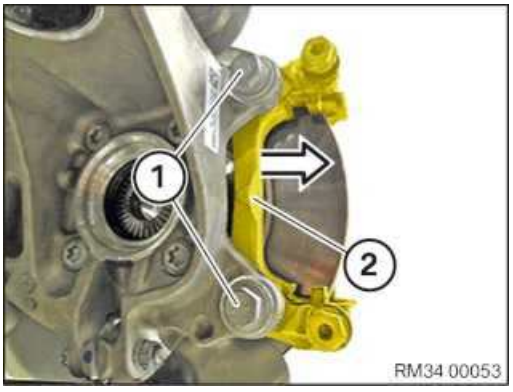
  Compare measuring result and lowest value with setpoint value.

  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)

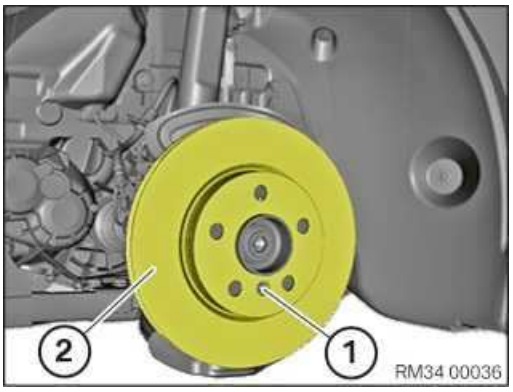
Minimum brake disc thickness (brake disc 330x24)	22,4 mm

5 – Remove front brake discs



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

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- Loosen screw (1).

TECHNICAL INFORMATION

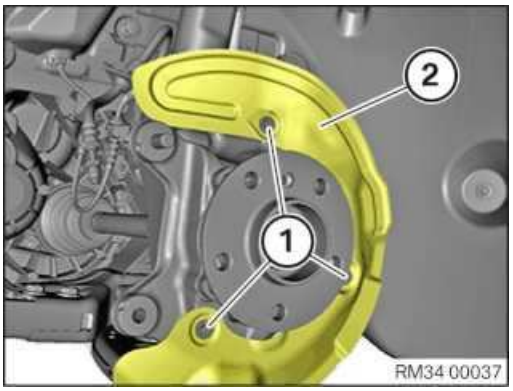
Note the following for the removal of the brake disc:

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).

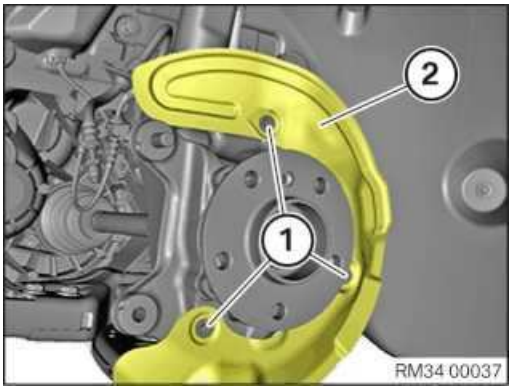
MAIN WORK

6 – Remove 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 them.

Brake guard plate at front swivel bearing

M6x12	Renew screw.	Tightening torque	8 Nm

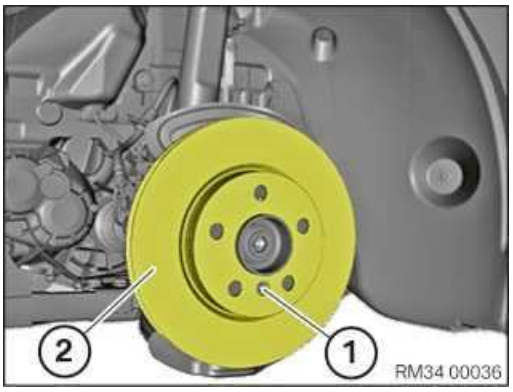
POSTPROCESSES

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.

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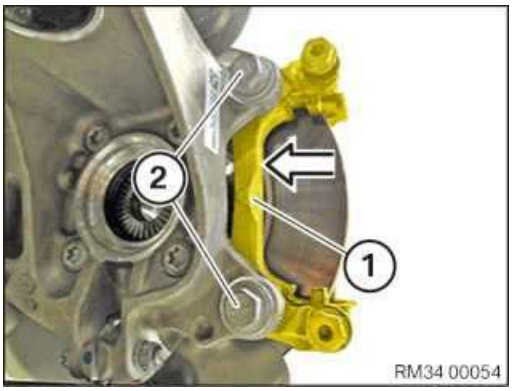
- Clean contact surface of wheel hub thoroughly and remove any traces of rust if necessary.

  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



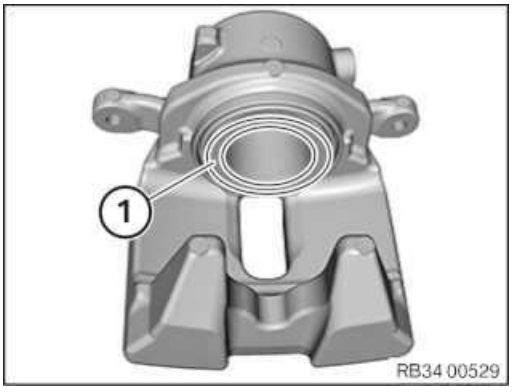
- Install the caliper carrier (2) in the direction of the arrow.
- Renew screws.

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

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)

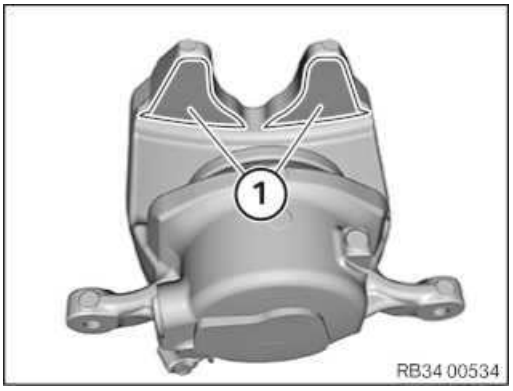


- Clean the contact surfaces (1) of the brake piston using brake cleaner.

Expendable materials

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

- Check dust boots for damage; renew if necessary.

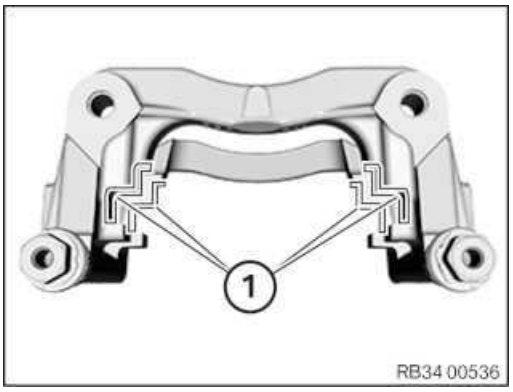


- Clean contact surfaces (1) of the brake caliper with brake cleaner and apply a thin layer of brake pad paste.

Expendable materials

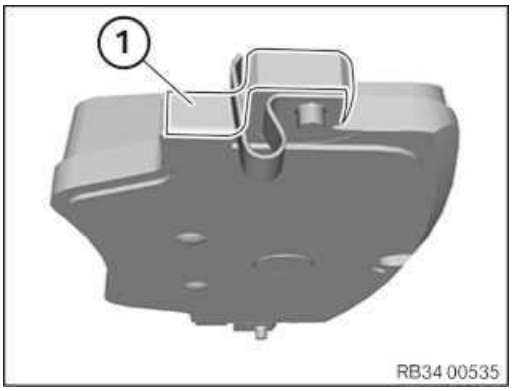
Brake block paste * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233

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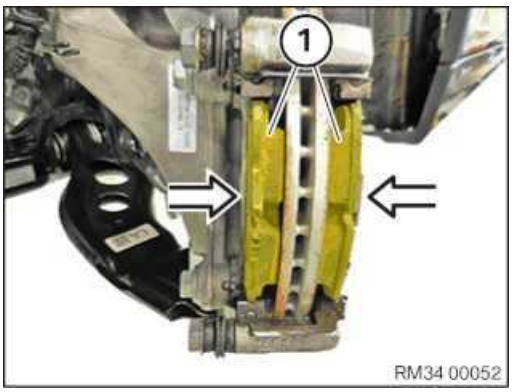
- Clean contact surfaces with brake cleaner.

  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.



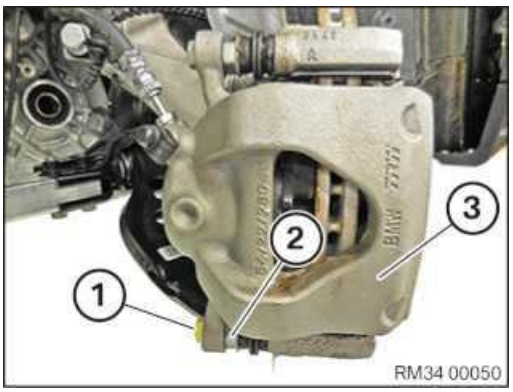
- Apply a thin coating of brake pad paste to both sides of the T-head of the brake pad in area (1).

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.



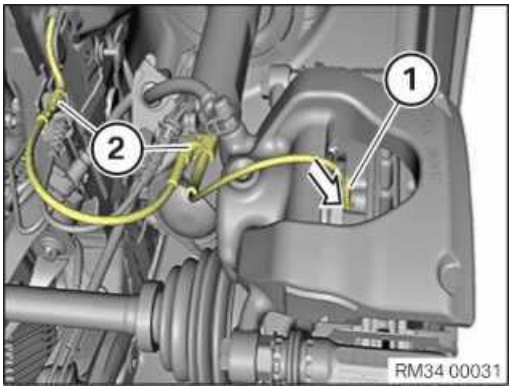
- Position the brake caliper (3).
- Renew screws (1).

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

Guide bolt (brake caliper on caliper carrier)

M8	Renew screws.	Tightening torque	35 Nm

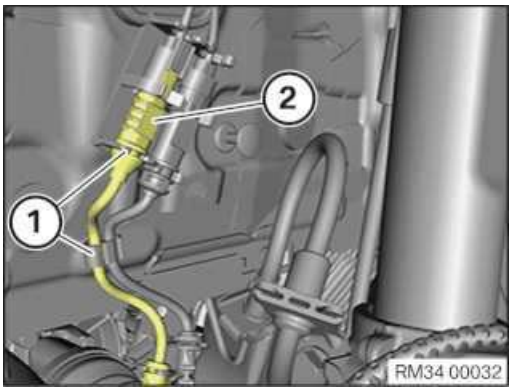
11 – Installing front brake pad wear sensor



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

  Ensure brake pad wear sensor fits correctly in brake pad.

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

12 – Installing both front wheels

▶ **Mounting the wheel**

▷ **Clean the contact surfaces between the brake disc and the wheel rim**



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**.

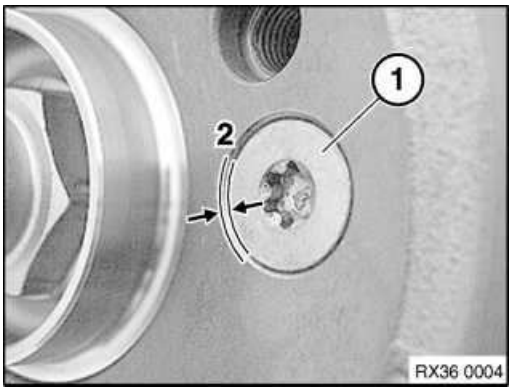
  Do not operate special tool **2 344 011** with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.



- 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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- Renew mounting bolt (1).

  Parts: Mounting bolt

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

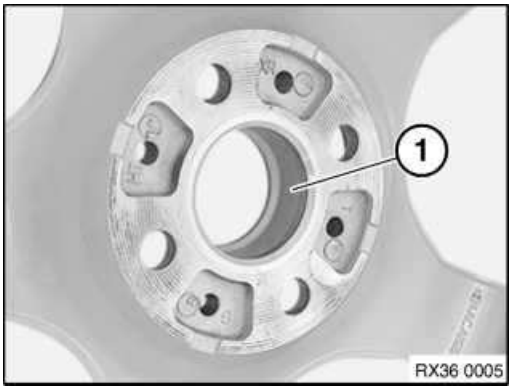
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm



- Lightly grease the wheel centring (1) in the wheel rim; refer to additional information for grease for the wheel centring (1).

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

Wheel bolts

M 14/AF 17	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

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

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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 8

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.	Tightening torque	35 Nm

Brake disc to rear wheel hub — Used in step 12

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to front wheel hub — Used in step 12

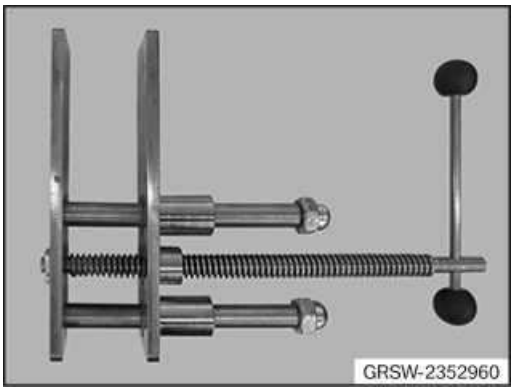
M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 12

M 14/AF 17	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 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:

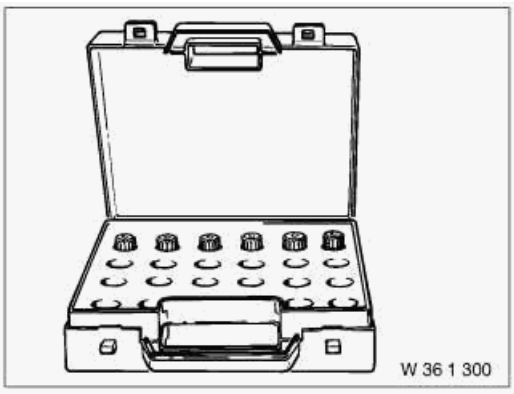
0 495 221 (36 1 323) Wheel stud



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	

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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	

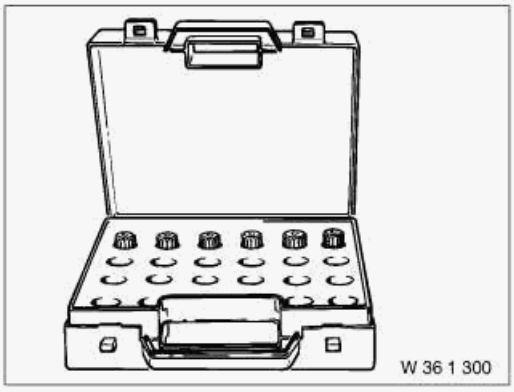
0 495 225 (36 1 327) Wheel stud



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	

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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	

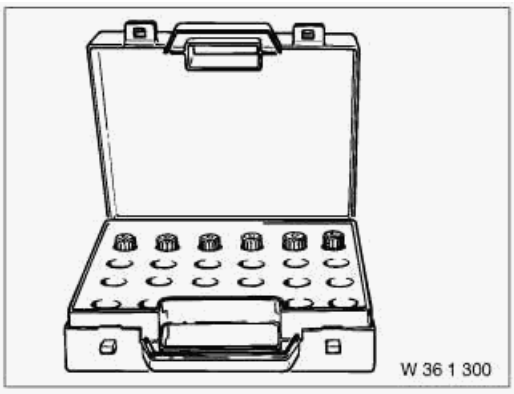
0 495 228 (36 1 331) Wheel stud



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	

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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	

Operating materials	Used in step
2.0 Grease for wheel centring	12

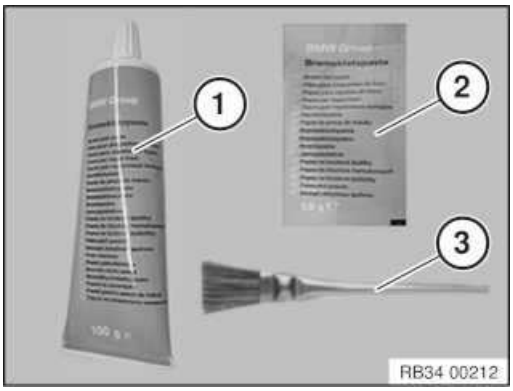
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34 00 x01 Guideline for applying brake pad paste on brake pads and caliper carrier

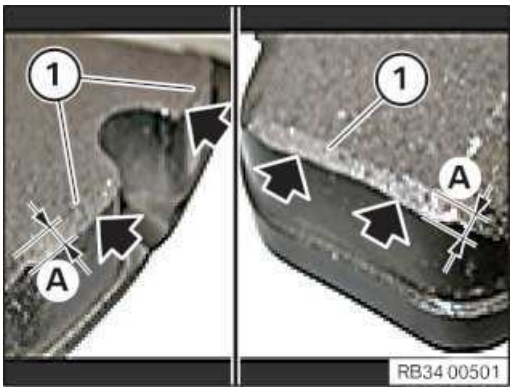
Attention!

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.



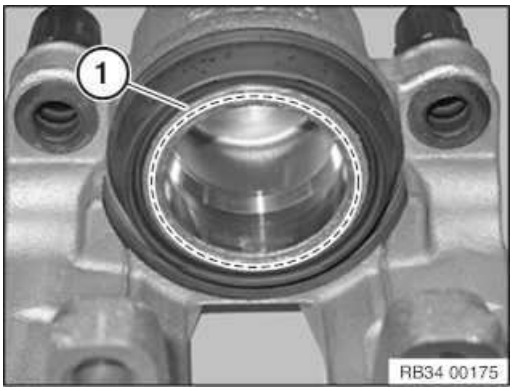
Attention!

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).

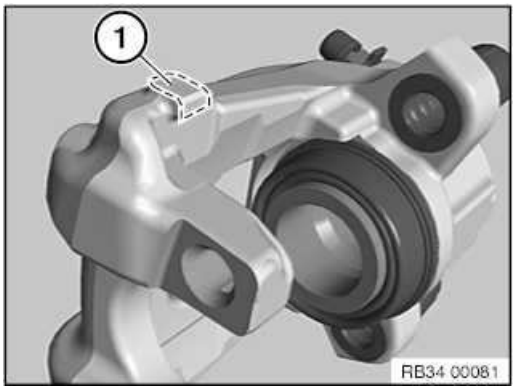
These procedures applies for all the following described brake systems.

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

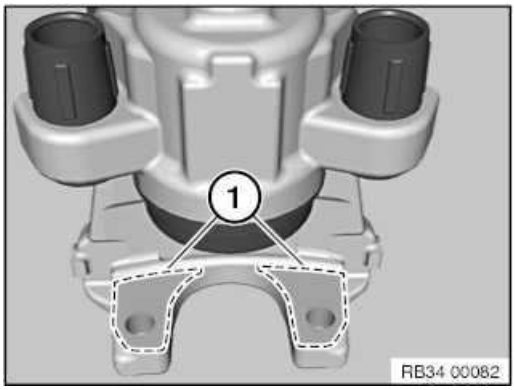


Clean contact surface (1) of brake piston with brake cleaner and apply a thin coating of brake pad paste.

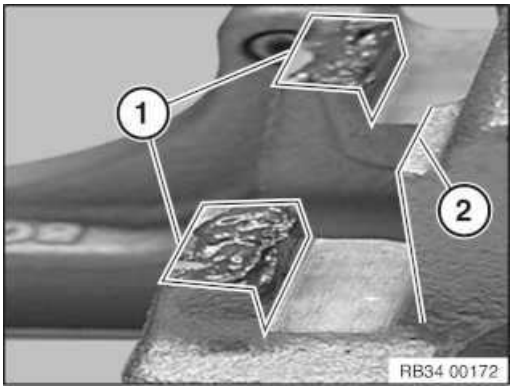
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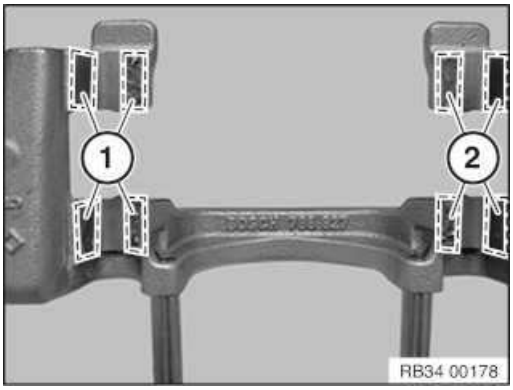
Clean contact surfaces (1) of T-heads/brake calliper housing with brake cleaner and apply a thin coating of brake pad paste.



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

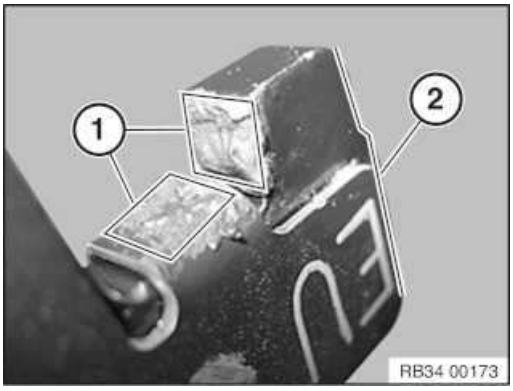


So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces (1) for the brake pads on the brake caliper mounting bracket. Clean guide surfaces (1 and 2) with brake cleaner and apply a thin coating of brake pad paste.

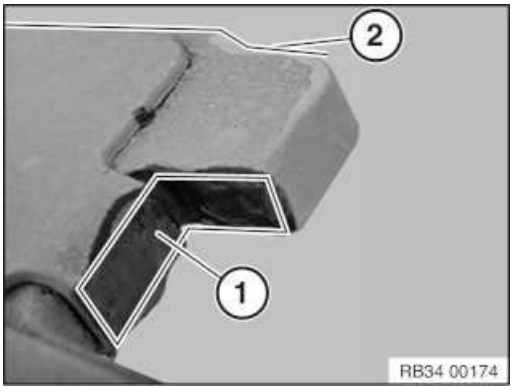


So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces (1 and 2) for the brake pads on the brake calliper mounting bracket. Clean guide surfaces (1 and 2) with brake cleaner and apply a thin coating of brake pad paste.

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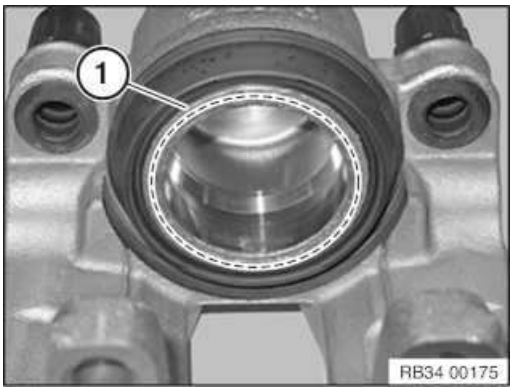


Apply a thin coating of brake pad paste to T-head of inner brake pad in area (1) and (2).

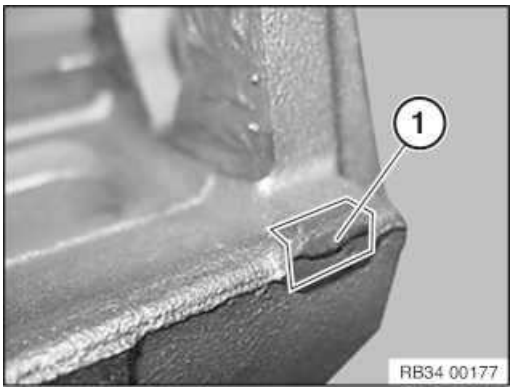


Apply a thin coating of brake pad paste to T-head of outer brake pad in area (1) and (2).

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)

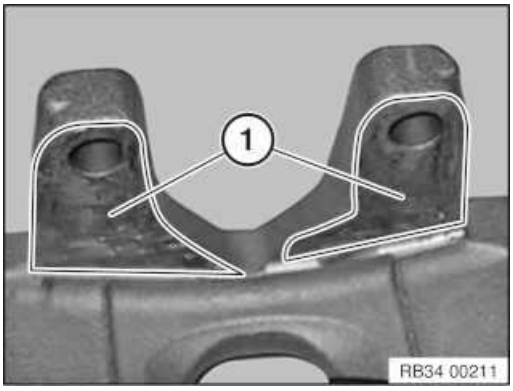


Clean contact surface (1) of brake piston with brake cleaner and apply a thin coating of brake pad paste.

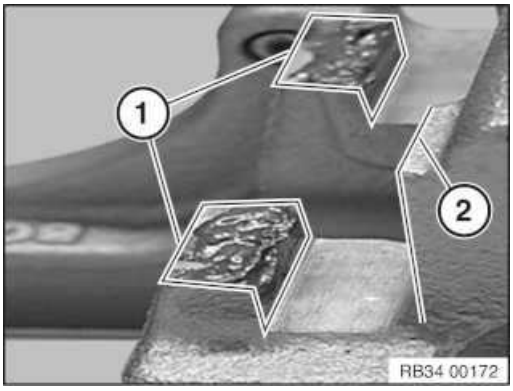


Clean contact surfaces (1) of T-heads/brake calliper housing with brake cleaner and apply a thin coating of brake pad paste.

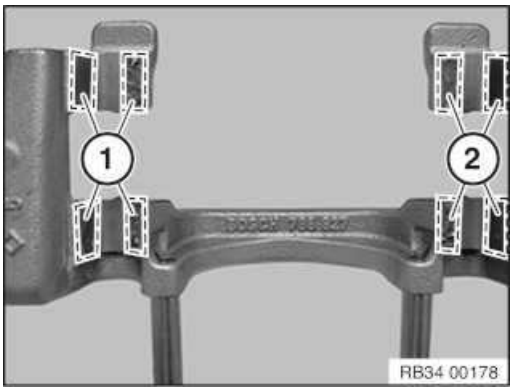
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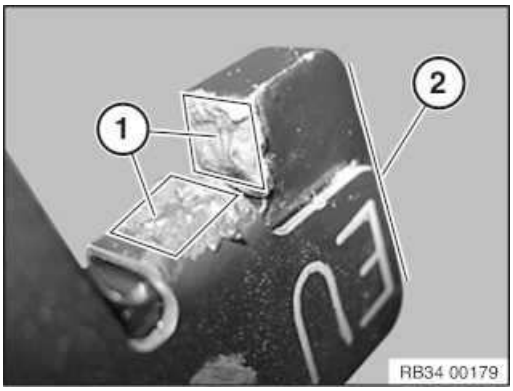
Clean contact surface (1) of brake caliper with brake cleaner and apply a thin coating of brake pad paste.



So as not to damage the surface coating, if possible do not mechanically clean the guide 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.

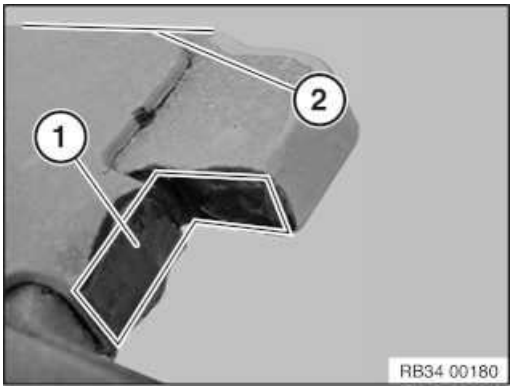


So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces (1 and 2) for the brake pads on the brake calliper mounting bracket. Clean guide surfaces (1 and 2) with brake cleaner and apply a thin coating of brake pad paste.



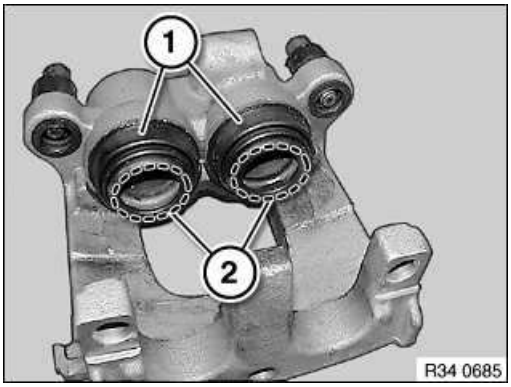
Lightly coat the T-head of the inner brake pad with brake pad paste in area (1 and 2).

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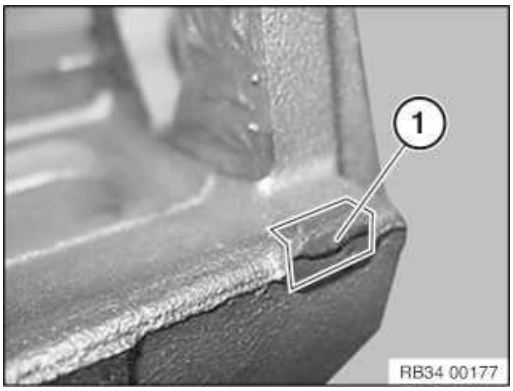


Lightly coat the T-head of the outer brake pad with brake pad paste in area (1 and 2).

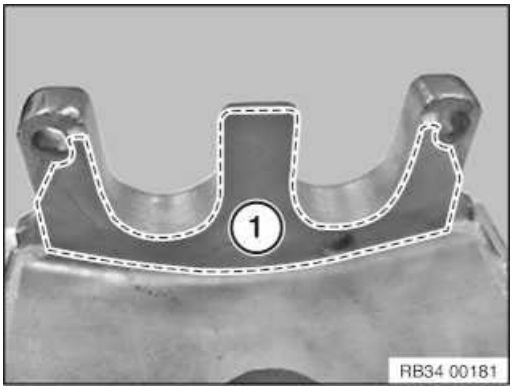
FN brake (made by Continental Teves), 2-piston floating caliper brake (model ranges: 5-Series, 6-Series, 7-Series, 8-Series, X5, Rolls-Royce)



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

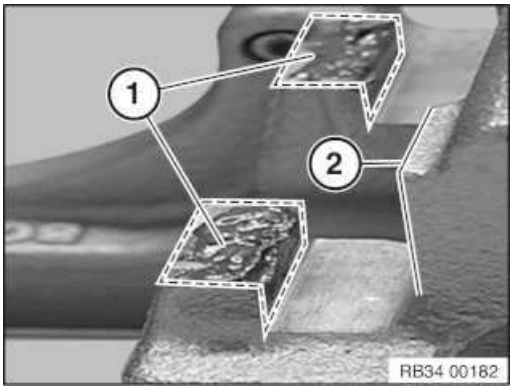


Clean contact surfaces (1) of T-heads/brake calliper housing with brake cleaner and apply a thin coating of brake pad paste.

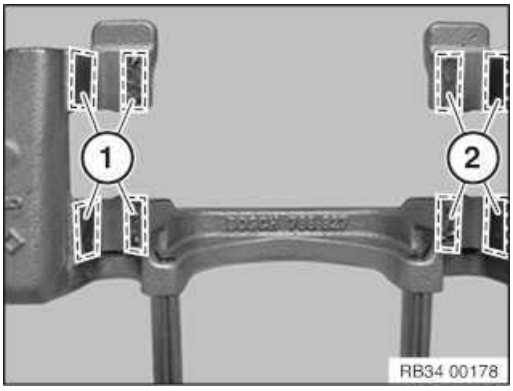


Clean contact surface (1) and brake caliper with brake cleaner and apply a thin coating of brake pad paste.

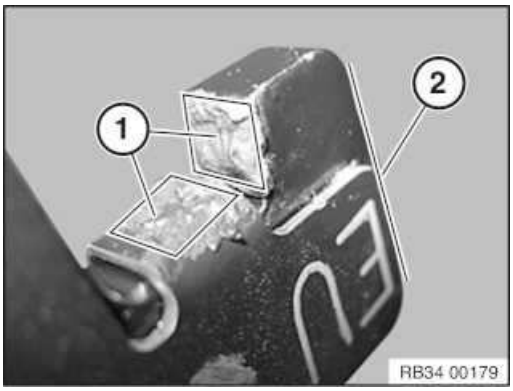
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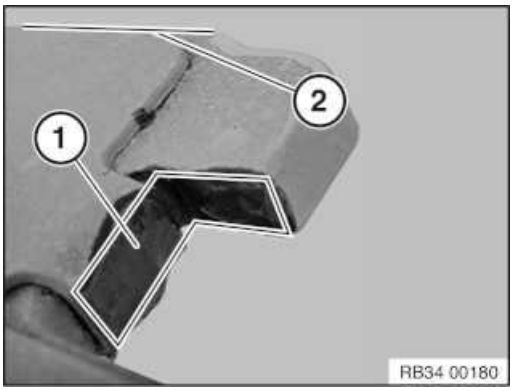
So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces (1 and 2) for the brake pads on the brake calliper mounting bracket. Clean guide surfaces (1 and 2) with brake cleaner and apply a thin coating of brake pad paste.



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.



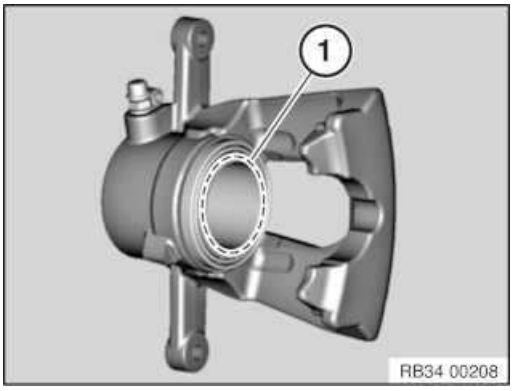
Lightly coat the T-head of the inner brake pad with brake pad paste in area (1 and 2).



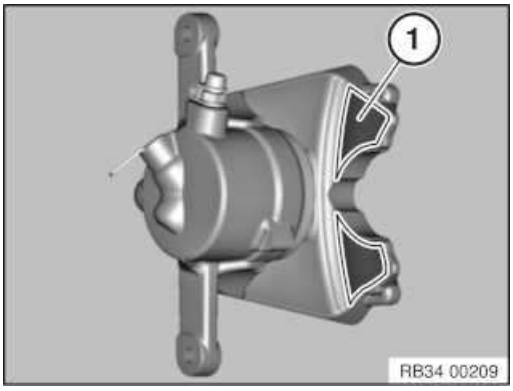
Lightly coat the T-head of the outer brake pad with brake pad paste in area (1 and 2).

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

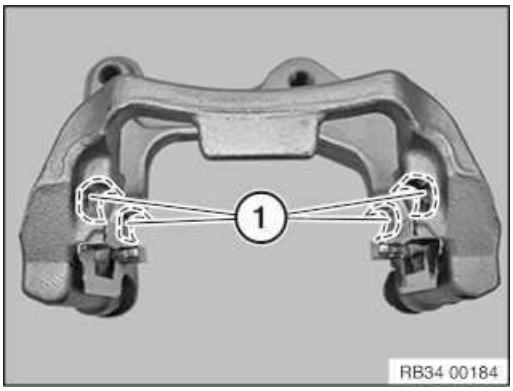
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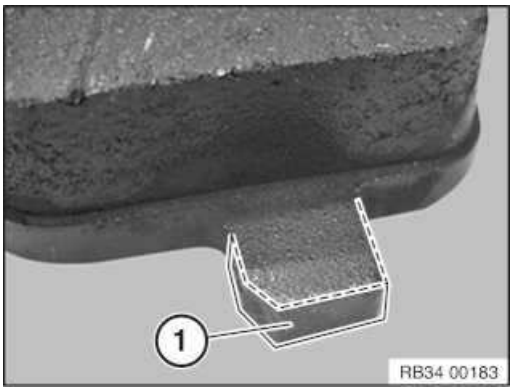
Clean contact surface (1) of brake piston with brake cleaner and apply a thin coating of brake pad paste.



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



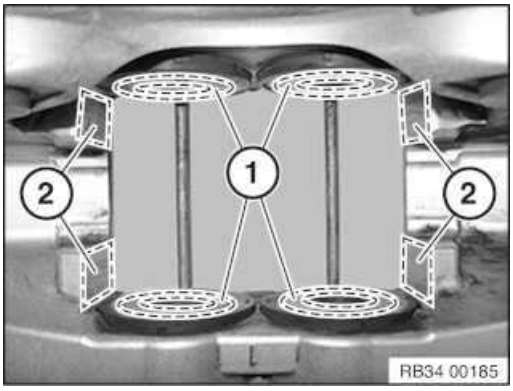
So as not to damage the surface coating, if possible do not mechanically clean the guide surface (1) for the brake pads on the brake caliper mounting bracket. Clean guide surface (1) with brake cleaner and apply a thin coating of brake pad paste.



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)

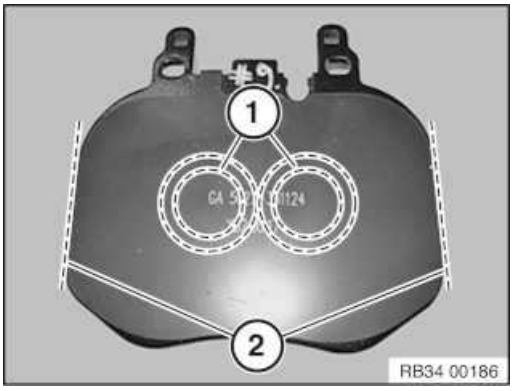
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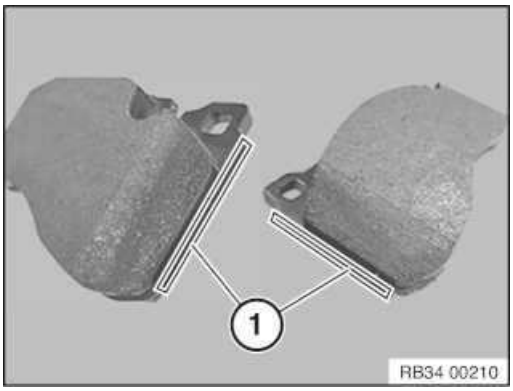
Clean contact surface (1) of brake piston with brake cleaner and apply a thin coating of brake pad paste.

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.

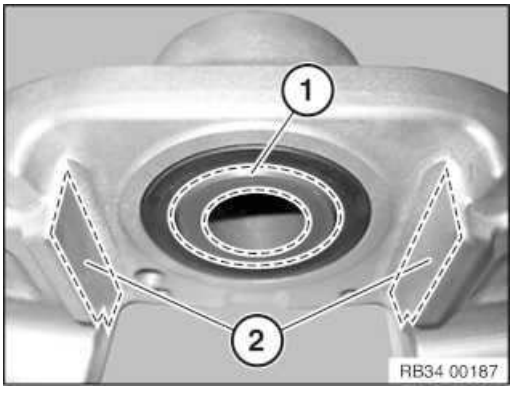


Lightly coat both sides of the contact surface in area (1 and 2) with brake pad paste.



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

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)

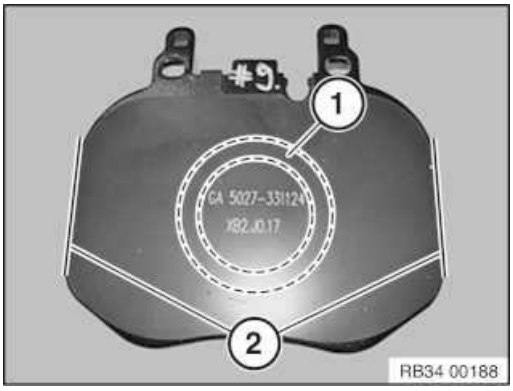


Clean contact surface (1) of brake piston with brake cleaner and apply a thin coating of brake pad paste.

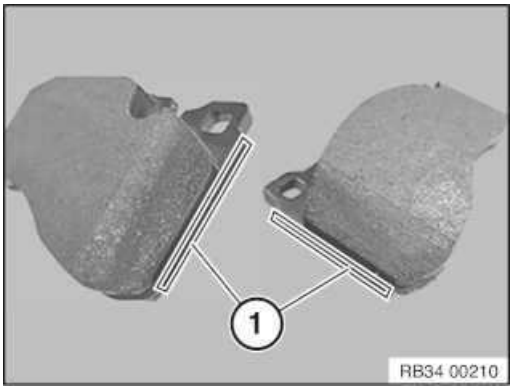
So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces (2) for the brake pads on the brake calliper mounting bracket. Clean guide surface (2) with brake cleaner and apply a thin coating of brake pad paste.

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

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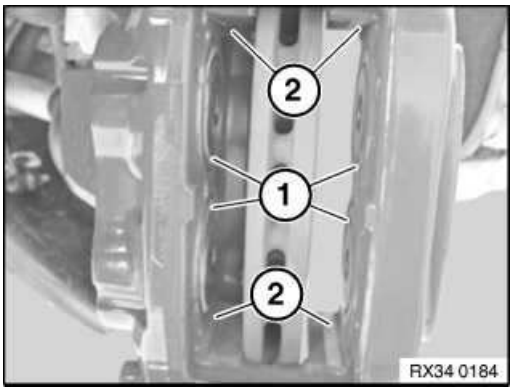


Lightly coat both sides of the contact surface in area (1 and 2) with brake pad paste.



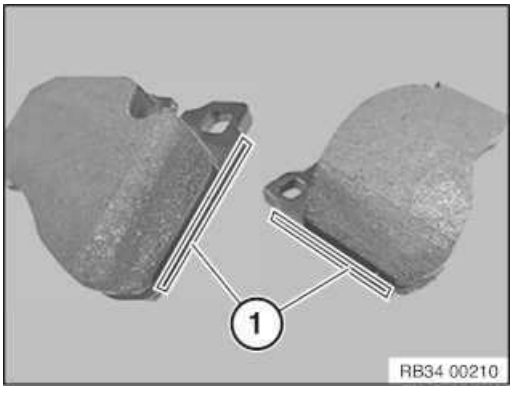
Lightly coat the brake pad contact surface on both sides in area (1) with brake pad paste.

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



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

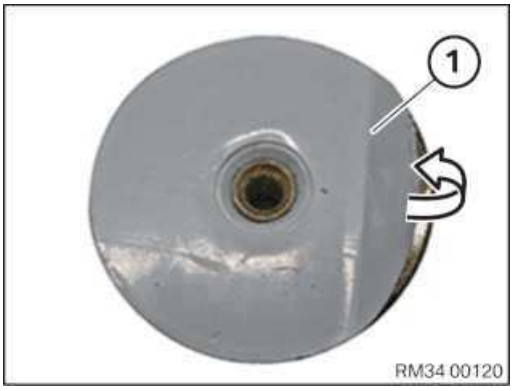
Clean brake caliper compartments (2) and apply a thin coating of brake pad paste.



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

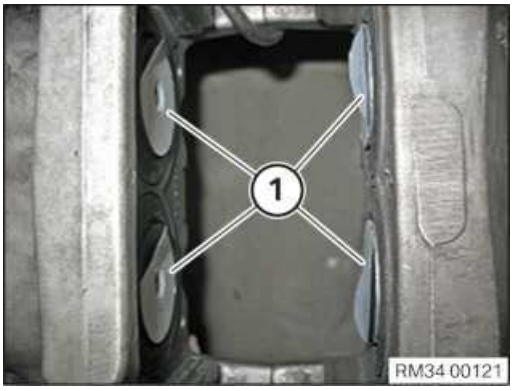
Do not grease the brake lining backplate and thoroughly clean it with brake cleaner!

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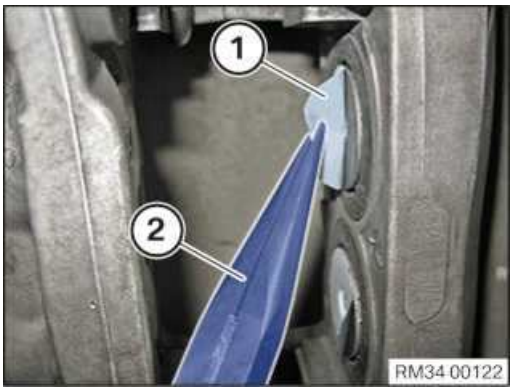


Only use new claw plates!

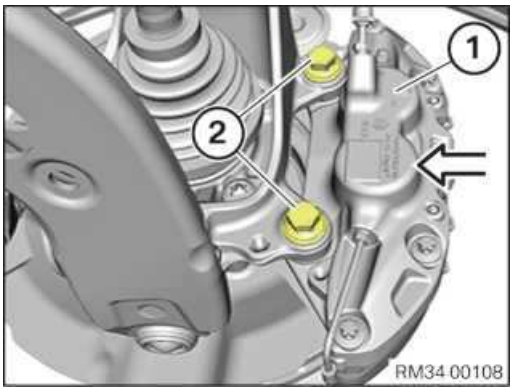
Slightly raise the protective film (1) at a place.



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



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

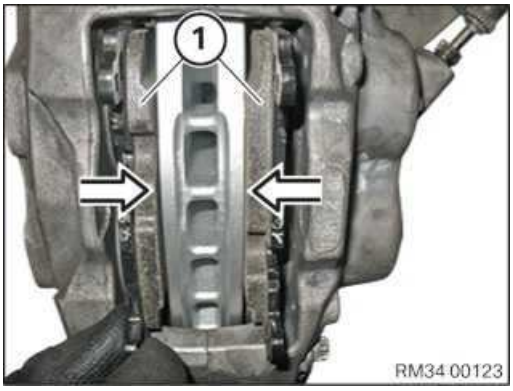


Install the brake caliper (1) in direction of arrow.

Parts: Replace screws (2).

Insert screws (2) and tighten.

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Install the brake pad (1).**Attention!**

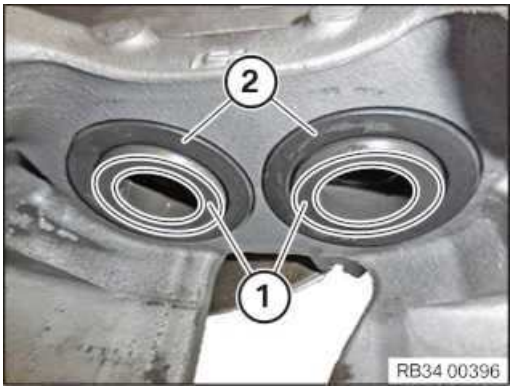
The brake pads must not touch the bonding surface of the claw plates when inserting!

Apply the brake pads to the brake disc and insert.

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

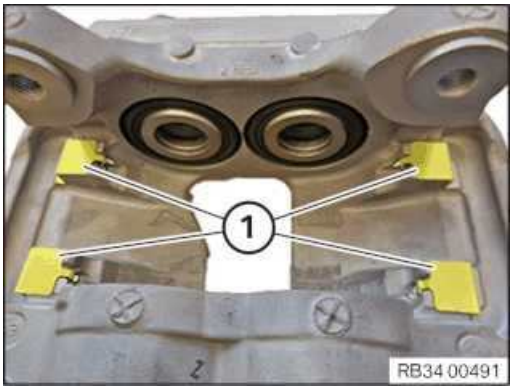
Strongly press the brake pedal and hold it for at least 1 min!

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.

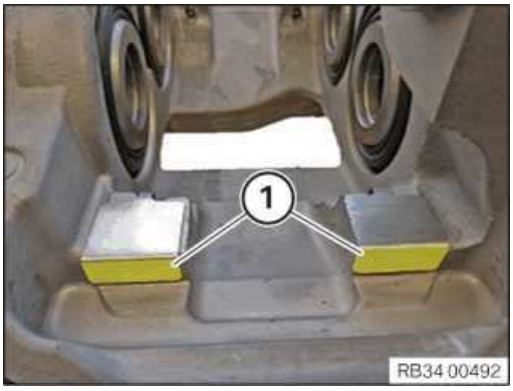


Always renew retaining plates 1!

Mount retaining plate 1.

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

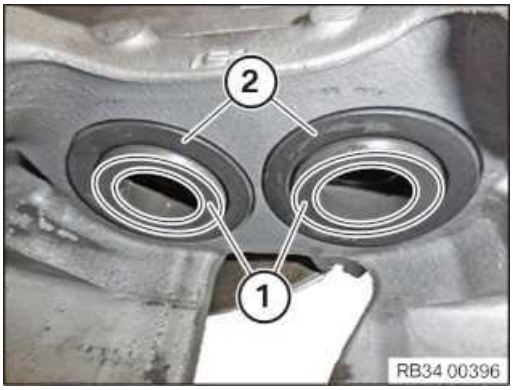
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So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces for the brake pads on the brake caliper mounting bracket.

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

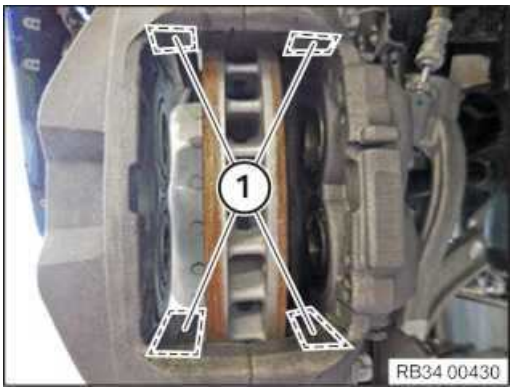
Brake (made by Brembo), 4-piston fixed caliper brake (model ranges: 7-Series (G11, G12)



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.

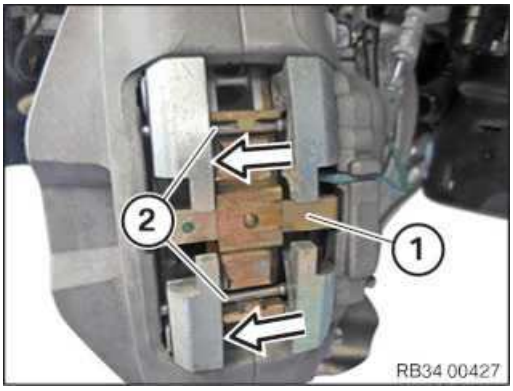
Clean guide surfaces (1) with brake cleaner and apply a thin coating of brake pad paste.



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

Do not touch the adhesive layer!

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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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▶ **Removing the wheel**



- 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.
- Unscrew the wheel bolts (arrows) and remove the wheel.

  Use the matching adapter from tool set (wheel bolt adapter set) to loosen and tighten down the wheel bolt with security code.

2 – Removing the brake pad wear sensor, rear

TECHNICAL INFORMATION

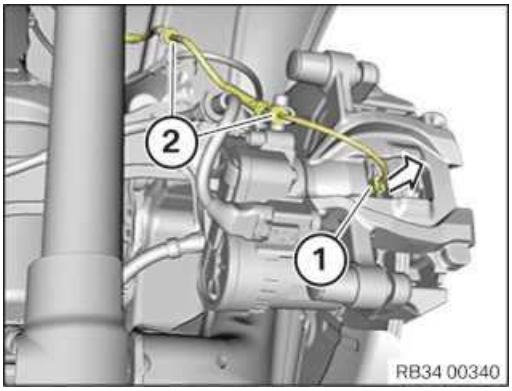
The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

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:

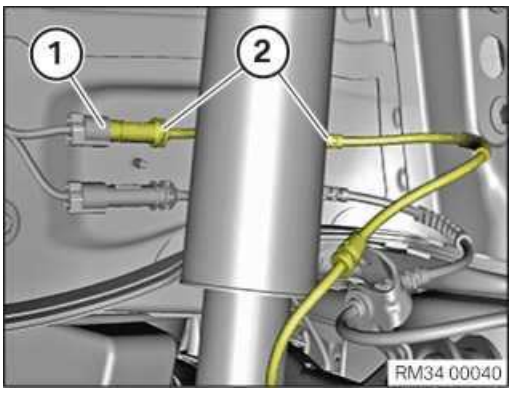
The new sliding contact must be filed down with a file to the same length as the sanded sliding contact.

When renewing the brake pad wear sensor, a CBS reset must be carried out.

If a brake pad wear sensor was renewed without renewing the brake pads, you must observe the following: Carry out "CBS vehicle data correction" service function via diagnosis system and information system.



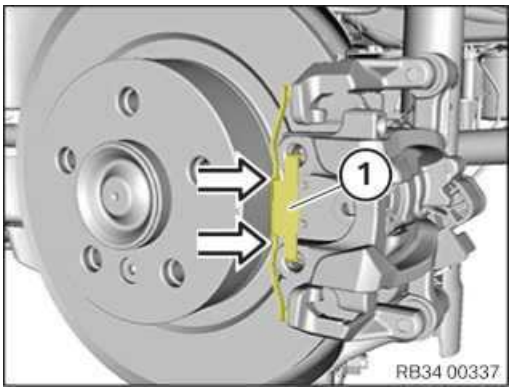
- Remove the brake pad wear sensor (1) from the brake pad.
- Detach the cable of the brake pad wear sensor from the bracket (2).



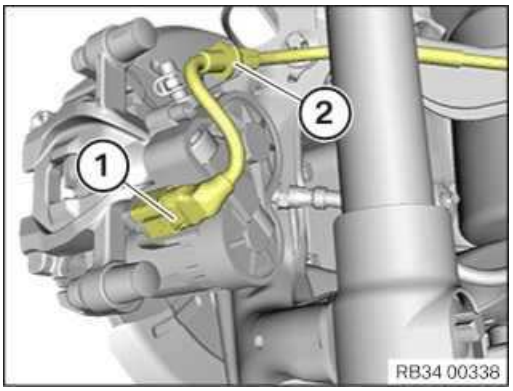
- Disconnect plug connection (1).
- Detach the brake pad wear sensor from the bracket (2).

3 – Remove rear brake pads

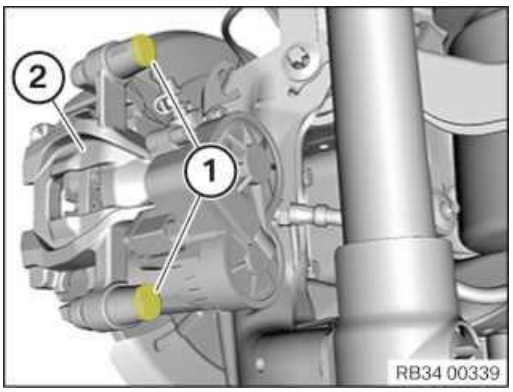
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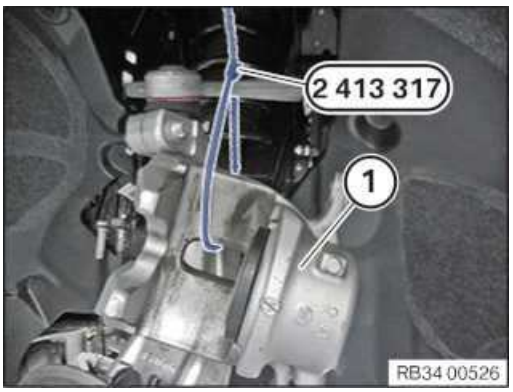
- Lift retaining spring (1).



- Disconnect plug connection (1).
- Detach cable from bracket (2).



- Remove cover plug (1).
- Release guide screws.
- Pull off brake caliper (2).



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

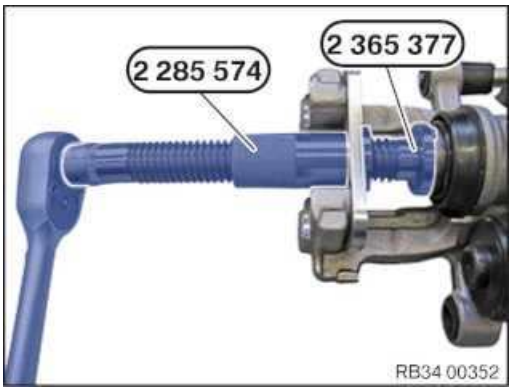
  Do not hang the brake caliper from the brake hose.



- Remove brake pads (1).
- Mark any worn brake pads.

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

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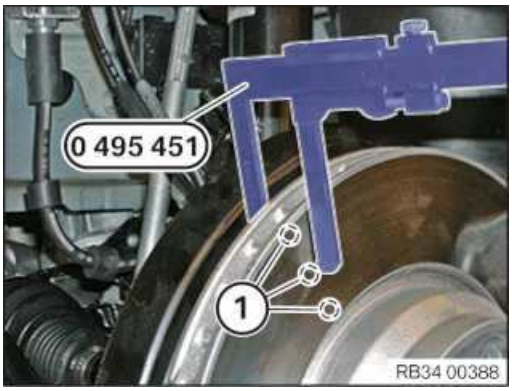
TECHNICAL INFORMATION

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 reversible ratchet to turn back brake piston up to limit position.

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.

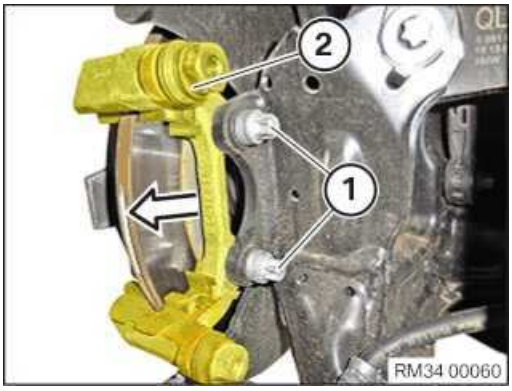
  Compare measuring result and lowest value with setpoint value.

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

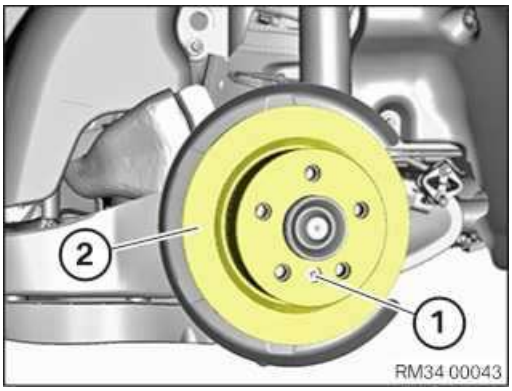
Minimum brake disc thickness (nominal dimension 300x20)

Minimum brake disc thickness (brake disc 300x20)	18,4 mm

5 – Remove rear brake disc



- Loosen screws (1) and remove the caliper carrier (2).



- Loosen screw (1).

TECHNICAL INFORMATION

Note the following for the removal of the brake disc:

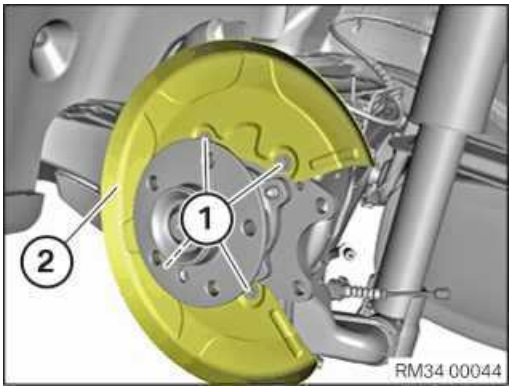
Do not under any circumstances strike the friction ring with a hammer or similar tool. If necessary, carefully tap with a rubber mallet against the brake disc chamber.

- Remove brake disc(2).

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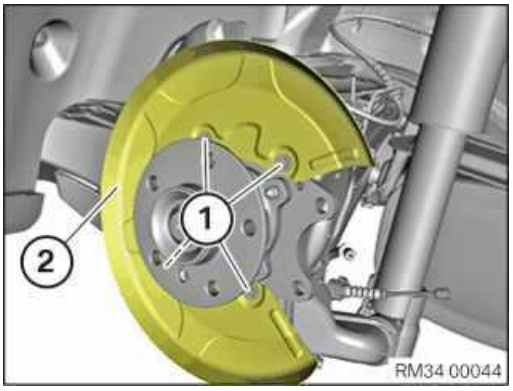
MAIN WORK

6 – Remove 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).
- Renew screws.

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

Brake protection plate on the rear wheel carrier

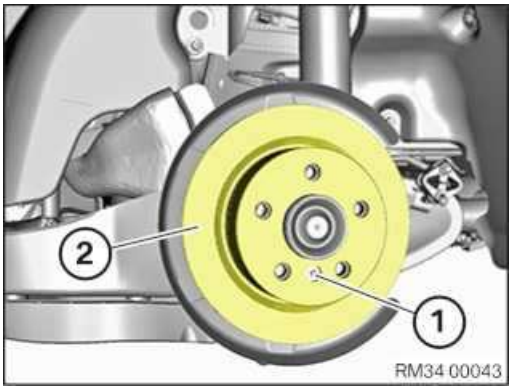
M6x12	Renew screw.	Tightening torque	8 Nm

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.



- Thoroughly clean the contact surface of the wheel hub and remove traces of corrosion if necessary.

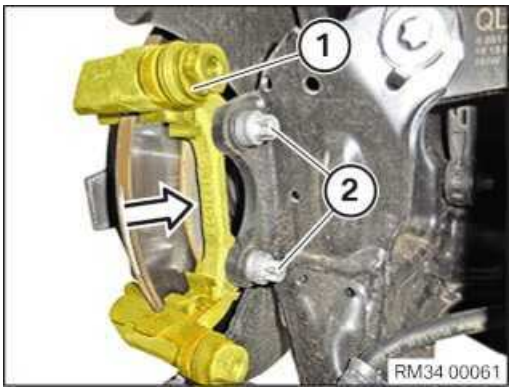
  Irregularities in the contact surface can cause distortion in the brake disc!
- Mount brake disc (2).
- Position and tighten the screw (1).
- Renew screw.

  Parts: Screw

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm

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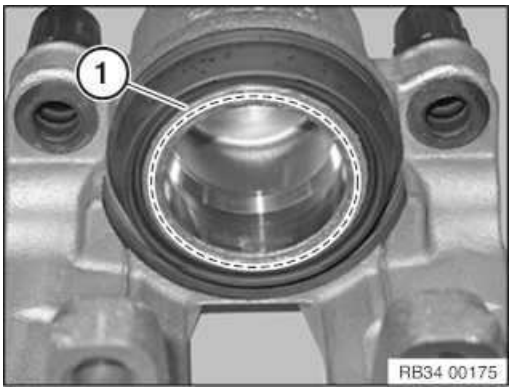
- Mount the caliper carrier (1).
- Renew screws.

  Parts: Bolts
- Insert screws (2) and tighten.

Caliper carrier to rear wheel carrier

M12	Renew screw.	Jointing torque	30 Nm
		Angle of rotation	90 °

9 – Grease brake pads, caliper carrier and brake caliper with brake pad paste

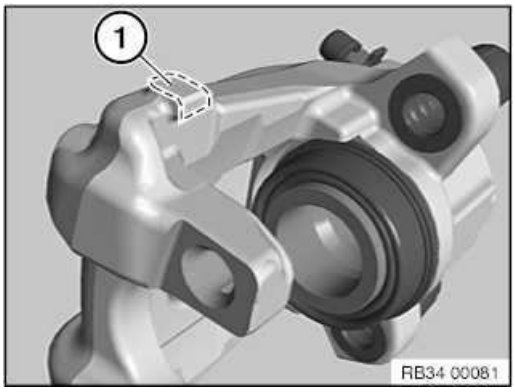


- Clean contact surface (1) of the brake piston with brake cleaner and apply a thin coat of brake pad paste.

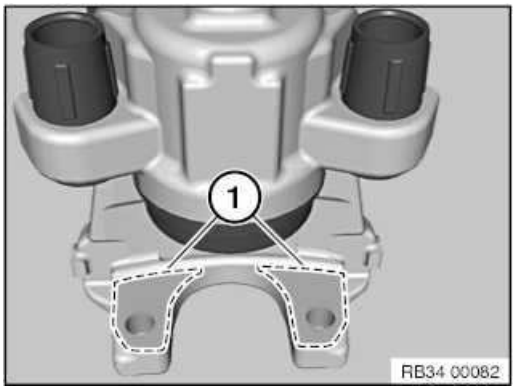
Expendable materials

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

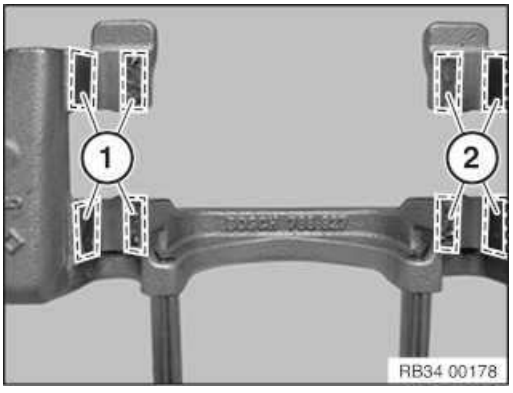
- Check dust boots for damage; renew if necessary.



- Clean the contact surfaces (1) of the T-head/brake caliper housing using brake cleaner and apply a thin coat of brake pad paste.

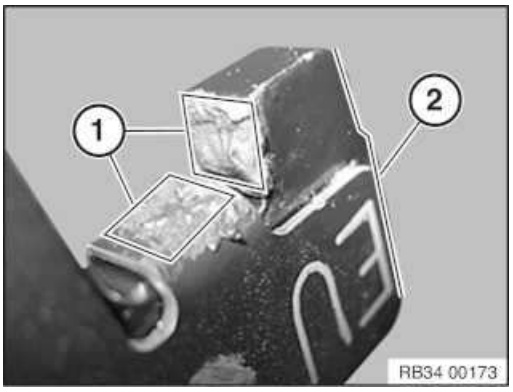


- Clean contact surface (1) of the brake piston with brake cleaner and apply a thin coat of brake pad paste.

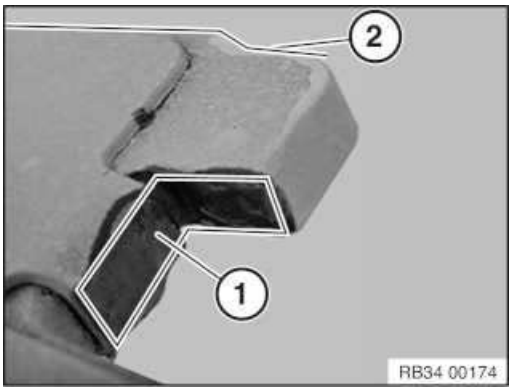


- If possible do not apply mechanical force to clean the guide surfaces for the brake pads on the brake caliper mounting bracket (1) and (2) to not damage the surface coating.
- Clean the guide surfaces (1) and (2) using brake cleaner and apply a thin coat of brake pad paste.

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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).



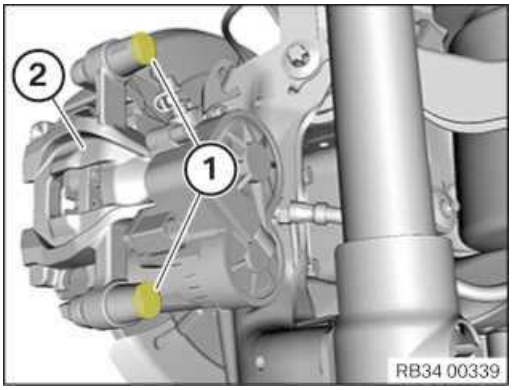
- Apply a thin coat of brake pad paste to the T-head of the inner brake pad in the areas (1) and (2).

10 – Install rear brake pads



- Mount brake pads (1).

  Brake pad with retaining springs (2) must be installed on the piston side.

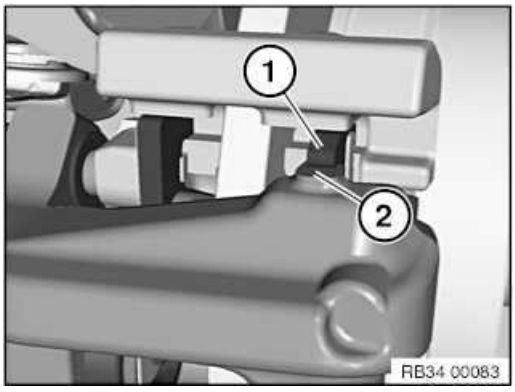


- Remove the special tool (cable strap) **2 413 317**.
- Mount brake caliper (2).
- Insert guide bolts and tighten.

Guide bolt (brake caliper on caliper carrier)

M8		Tightening torque	30 Nm

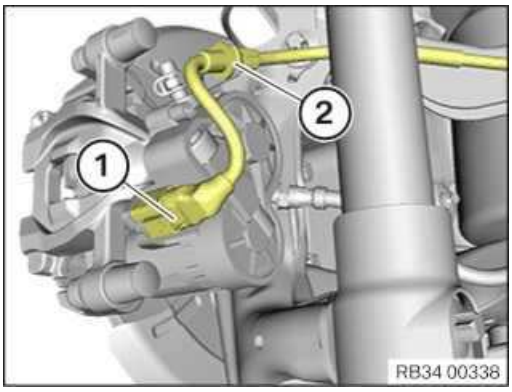
- Mount cover plug (1).



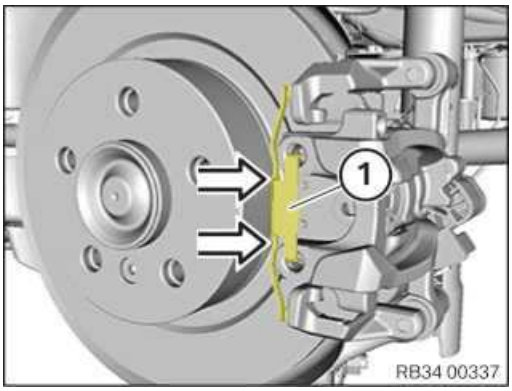
- When putting on the brake caliper, it is absolutely necessary to make sure that the T-head (1) of the outer brake pad is seated correctly on the contact surface (2).

  Above all, ensure the installation position of the outer brake pad to the contact surface (2) in brake pads that have worn out partially!

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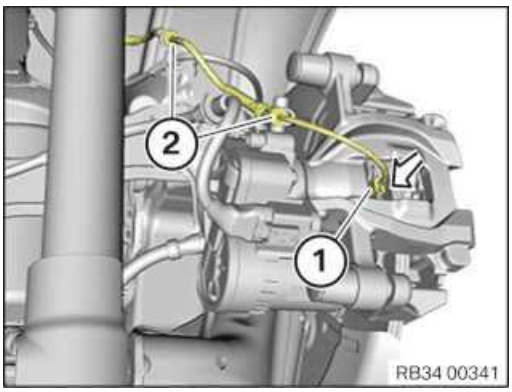
- Attach cable to the bracket (2).
- Position and lock the plug connection (1).



- Mount retaining spring (1).

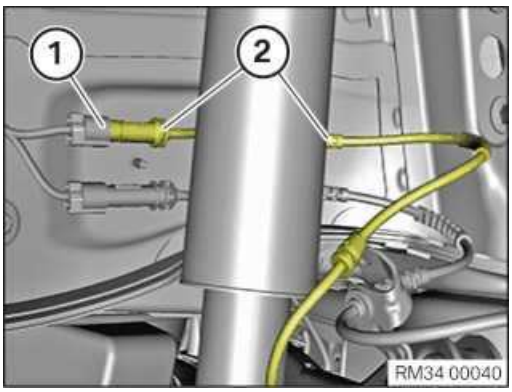
  Ensure the retaining spring is fits securely.

11 – Install rear brake pad sensor



- Install brake pad wear sensor (1) 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 sensor in brackets (2).



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

12 – Installing both rear wheels

▶ **Mounting the wheel**

▷ **Clean the contact surfaces between the brake disc and the wheel rim**

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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.

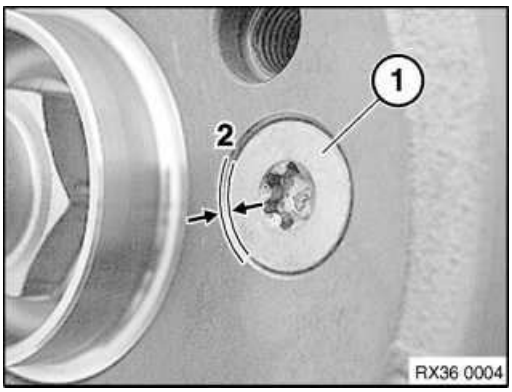
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool **2 344 011**.

  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).



- Renew mounting bolt (1).

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

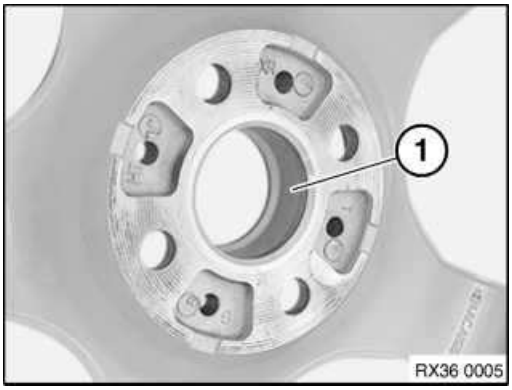
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm



- Lightly grease the wheel centring (1) in the wheel rim; refer to additional information for grease for the wheel centring (1).

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

Wheel bolts

M 14/AF 17	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

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.

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- 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 8

M8	Renew screw.	Tightening torque	16 Nm

Caliper carrier to rear wheel carrier — Used in step 8

M12	Renew screw.	Jointing torque	30 Nm
		Angle of rotation	90 °

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

M8		Tightening torque	30 Nm

Brake disc to rear wheel hub — Used in step 12

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to front wheel hub — Used in step 12

M8	Renew screw.	Tightening torque	16 Nm

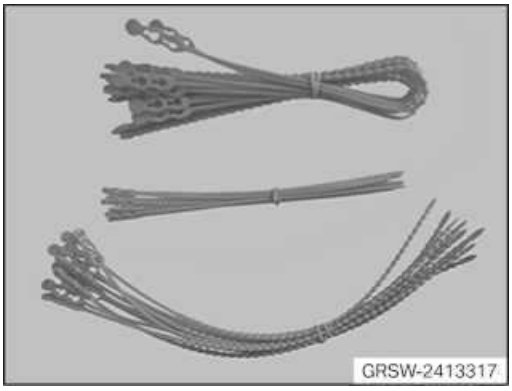
Wheel bolts — Used in step 12

M 14/AF 17	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 3 10

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:

0 495 221 (36 1 323) Wheel stud

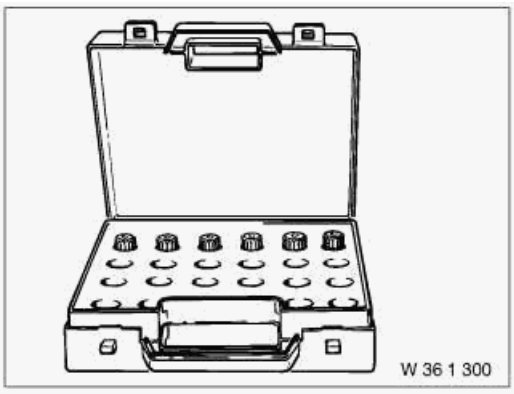


Common Used in step 1

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

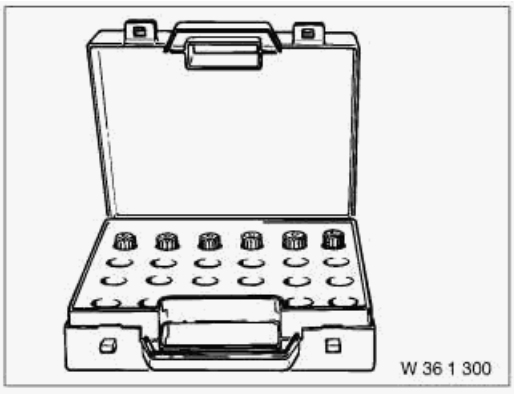
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0 495 224 (36 1 326) Wheel stud



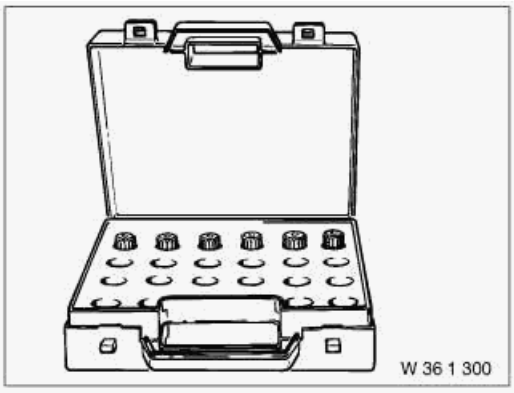
Common	Used in step 1
Usage	(Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 225 (36 1 327) Wheel stud



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

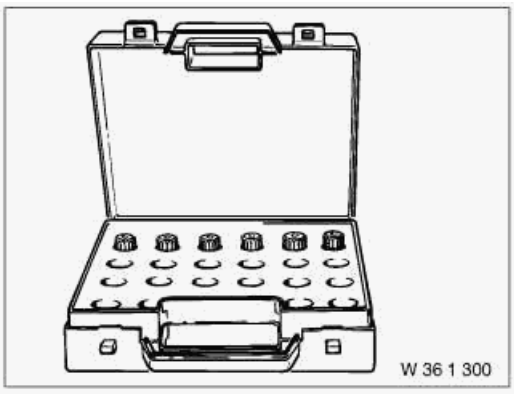
0 495 226 (36 1 328) Wheel stud



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

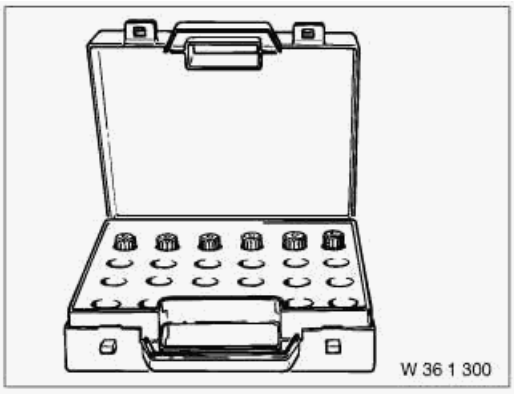
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0 495 227 (36 1 329) Wheel stud



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

0 495 228 (36 1 331) Wheel stud



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

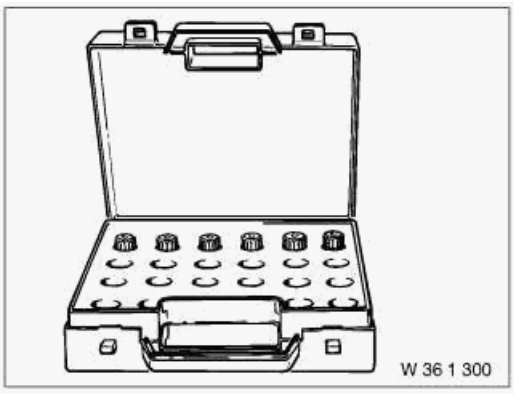
0 495 229 (36 1 332) Wheel stud



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

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0 495 230 (36 1 333) Wheel stud



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

Overview Technical Data

Minimum brake disc thickness (nominal dimension 300x20)	Used in step 4
Minimum brake disc thickness (brake disc 300x20)	18,4 mm

Links

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

Operating materials	Used in step
2.0 Grease for wheel centring	12

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34 21 220 Removing and installing or replacing 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.

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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▶ **Removing the wheel**



- 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.
- Unscrew the wheel bolts (arrows) and remove the wheel.

  Use the matching adapter from tool set (wheel bolt adapter set) to loosen and tighten down the wheel bolt with security code.

2 – Removing the brake pad wear sensor, rear

TECHNICAL INFORMATION

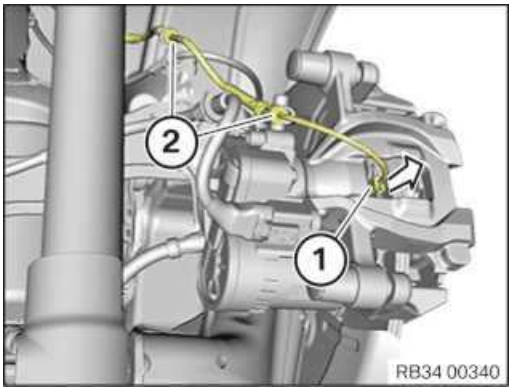
The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

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:

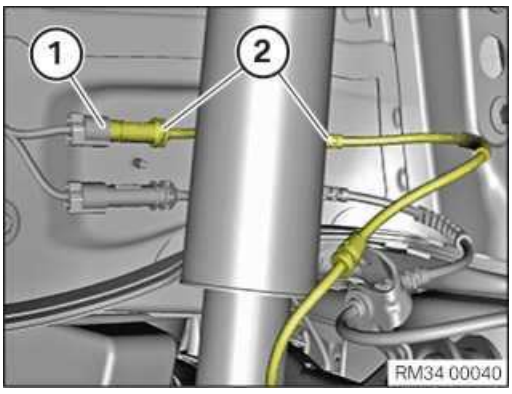
The new sliding contact must be filed down with a file to the same length as the sanded sliding contact.

When renewing the brake pad wear sensor, a CBS reset must be carried out.

If a brake pad wear sensor was renewed without renewing the brake pads, you must observe the following: Carry out "CBS vehicle data correction" service function via diagnosis system and information system.



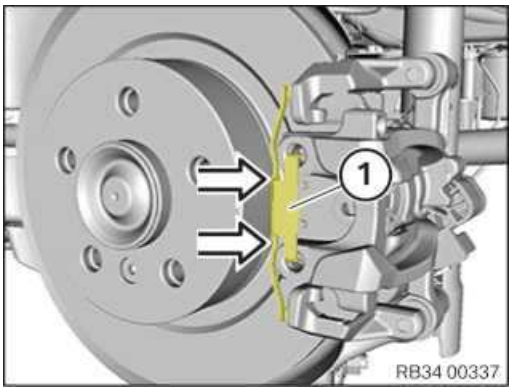
- Remove the brake pad wear sensor (1) from the brake pad.
- Detach the cable of the brake pad wear sensor from the bracket (2).



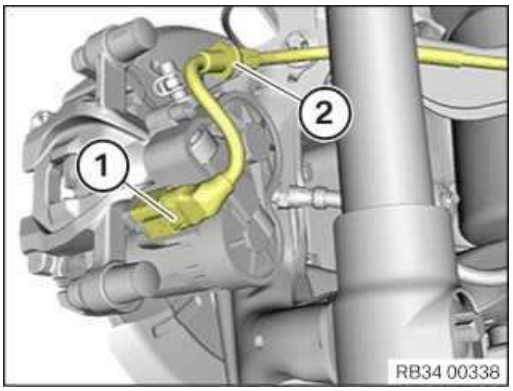
- Disconnect plug connection (1).
- Detach the brake pad wear sensor from the bracket (2).

3 – Remove rear brake pads

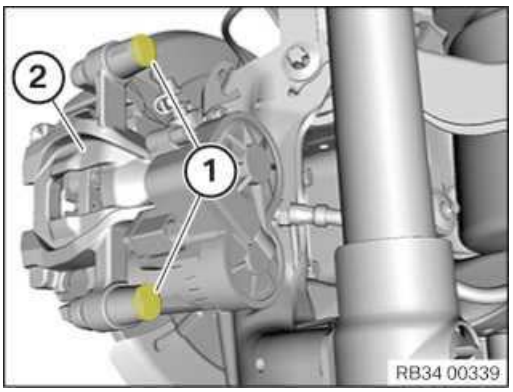
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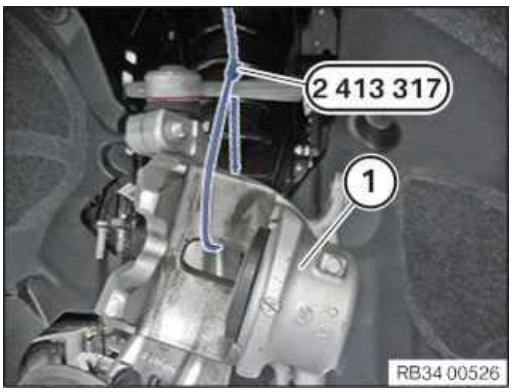
- Lift retaining spring (1).



- Disconnect plug connection (1).
- Detach cable from bracket (2).



- Remove cover plug (1).
- Release guide screws.
- Pull off brake caliper (2).



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

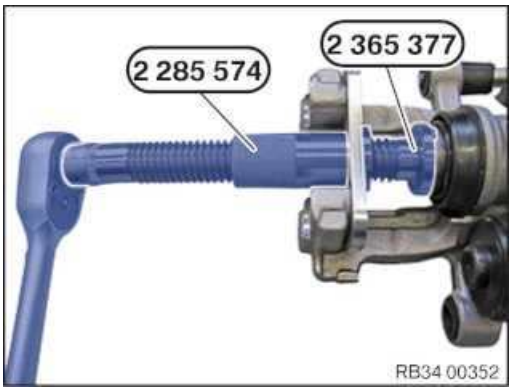
  Do not hang the brake caliper from the brake hose.



- Remove brake pads (1).
- Mark any worn brake pads.

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

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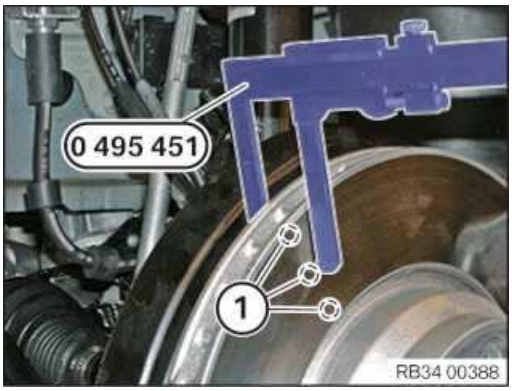
TECHNICAL INFORMATION

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 reversible ratchet to turn back brake piston up to limit position.

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.

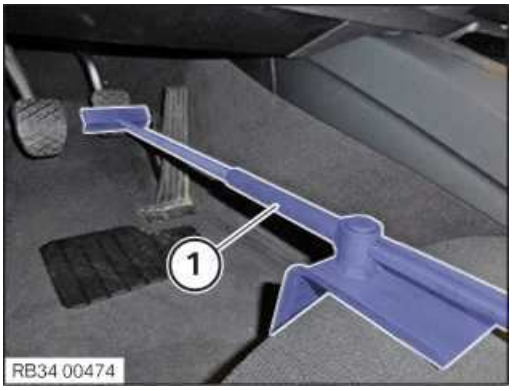
  Compare measuring result and lowest value with setpoint value.

  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 300x20)

Minimum brake disc thickness (brake disc 300x20)	18,4 mm

5 – Install brake pedal tensioner



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

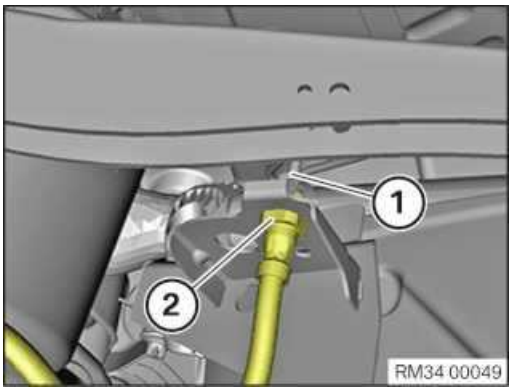
  Do not release the brake pedal tensioner (1) until the brake lines have been reconnected. This prevents brake fluid from emerging from the expansion tank when the brake lines are opened.

MAIN WORK

6 – Remove brake caliper to the rear

NOTICE

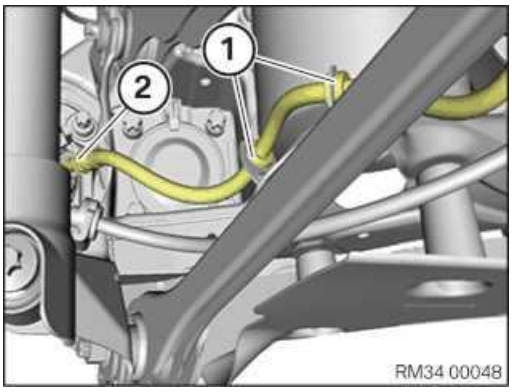
Description is for left component only. Procedure on the right side is identical.



- Release union screw (1).

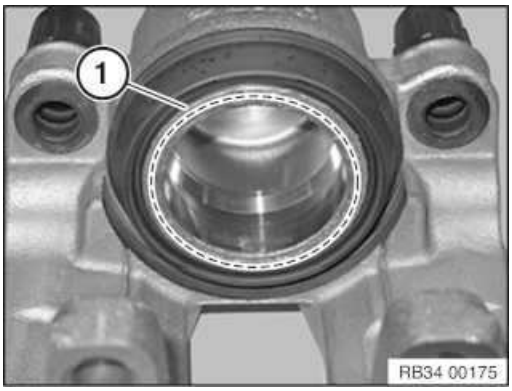
  Hold on to square shaft, if necessary (2).

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- If necessary, detach the brake hose from the brackets (1).
- Release brake hose (2) from brake caliper.
- Remove the brake caliper .

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

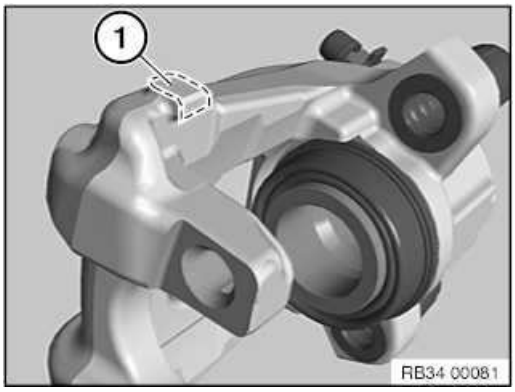


- Clean contact surface (1) of the brake piston with brake cleaner and apply a thin coat of brake pad paste.

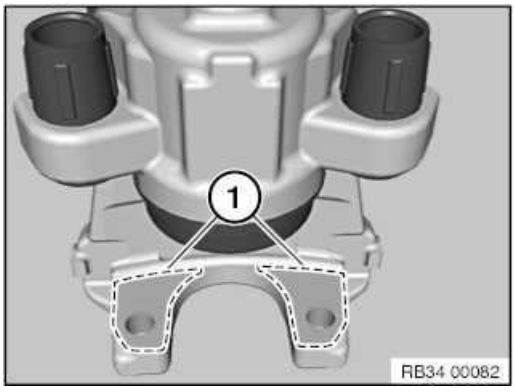
Expendable materials

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

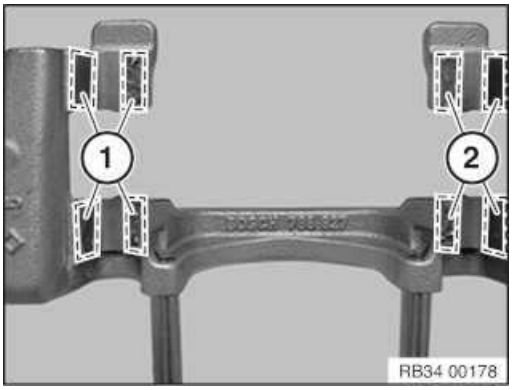
- Check dust boots for damage; renew if necessary.



- Clean the contact surfaces (1) of the T-head/brake caliper housing using brake cleaner and apply a thin coat of brake pad paste.

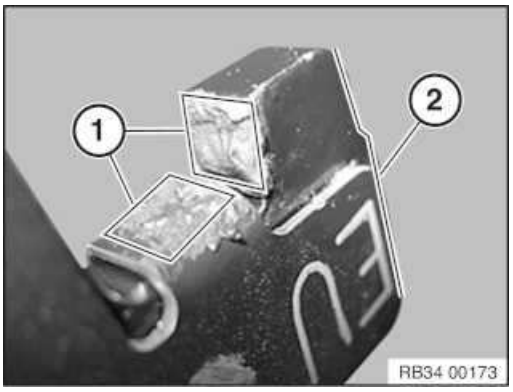


- Clean contact surface (1) of the brake piston with brake cleaner and apply a thin coat of brake pad paste.

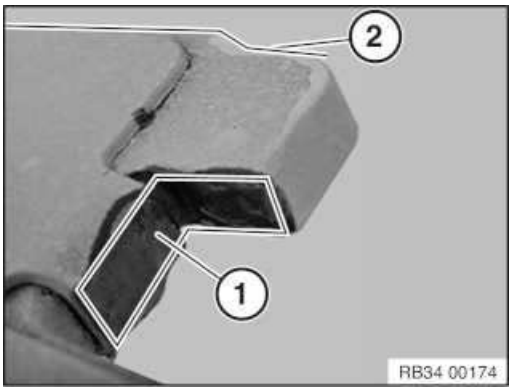


- If possible do not apply mechanical force to clean the guide surfaces for the brake pads on the brake caliper mounting bracket (1) and (2) to not damage the surface coating.
- Clean the guide surfaces (1) and (2) using brake cleaner and apply a thin coat of brake pad paste.

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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).



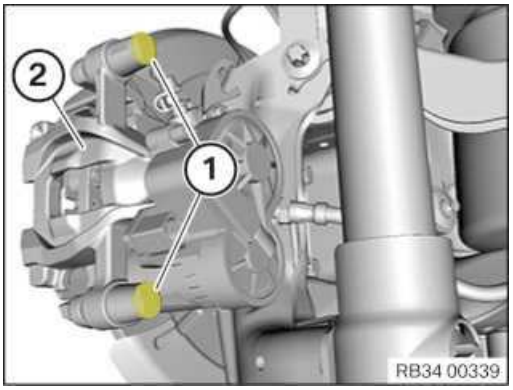
- Apply a thin coat of brake pad paste to the T-head of the inner brake pad in the areas (1) and (2).

8 – Install rear brake pads



- Mount brake pads (1).

  Brake pad with retaining springs (2) must be installed on the piston side.

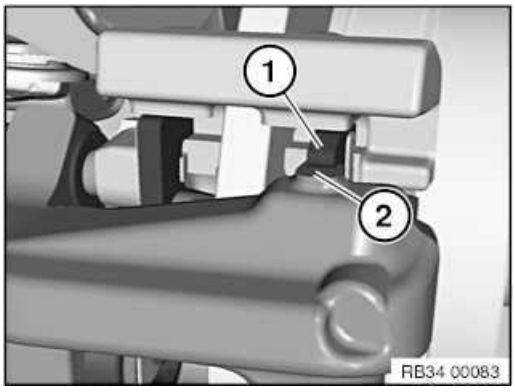


- Remove the special tool (cable strap) **2 413 317**.
- Mount brake caliper (2).
- Insert guide bolts and tighten.

Guide bolt (brake caliper on caliper carrier)

M8		Tightening torque	30 Nm

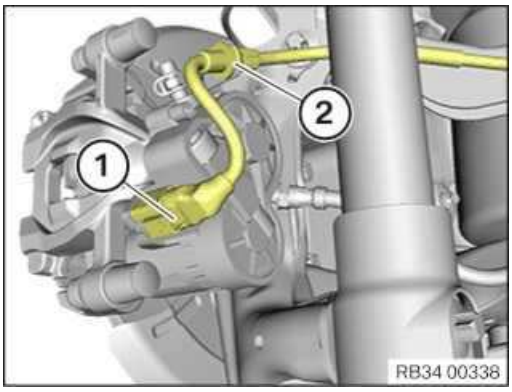
- Mount cover plug (1).



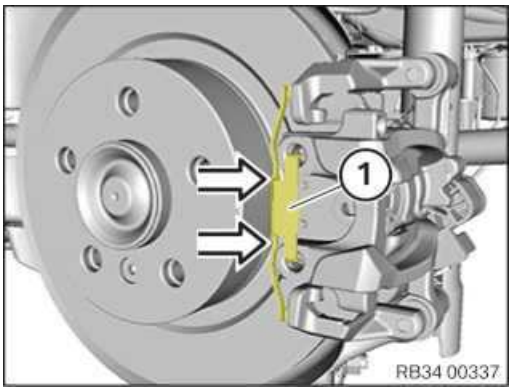
- When putting on the brake caliper, it is absolutely necessary to make sure that the T-head (1) of the outer brake pad is seated correctly on the contact surface (2).

  Above all, ensure the installation position of the outer brake pad to the contact surface (2) in brake pads that have worn out partially!

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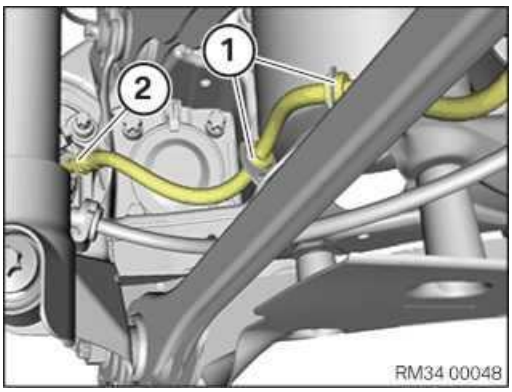
- Attach cable to the bracket (2).
- Position and lock the plug connection (1).



- Mount retaining spring (1).

  Ensure the retaining spring is fits securely.

9 – Install brake caliper in the rear

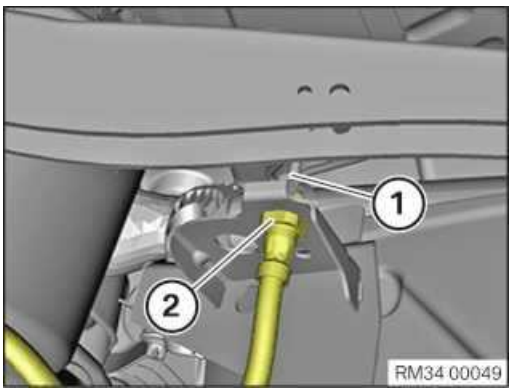


- Attach and tighten brake hose (2) on brake caliper.

Brake hose to brake caliper, rear

	24 Nm

- Ensure that the brake hose is not twisted and does not rest against the components fixed to the body.
- Attach the brake hose in the brackets (1).



- Attach and tighten union screw (1).

  Hold on to square shaft, if necessary (2).

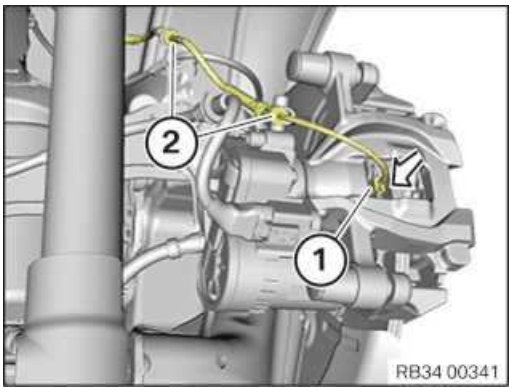
Brake pipe screw connection / Union screws

	17 Nm

POSTPROCESSES

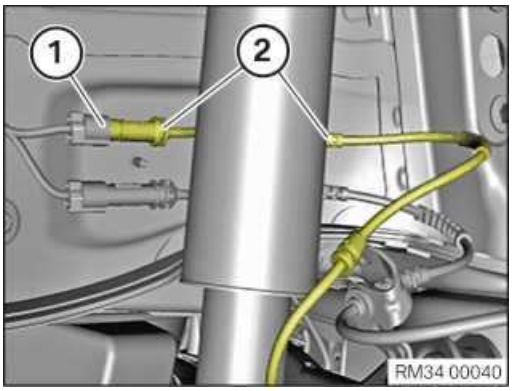
10 – Install rear brake pad sensor

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- Install brake pad wear sensor (1) 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 sensor in brackets (2).



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

11 – Installing both rear wheels

▶ **Mounting the wheel**

▷ **Clean the contact surfaces between the brake disc and the wheel rim**



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**.

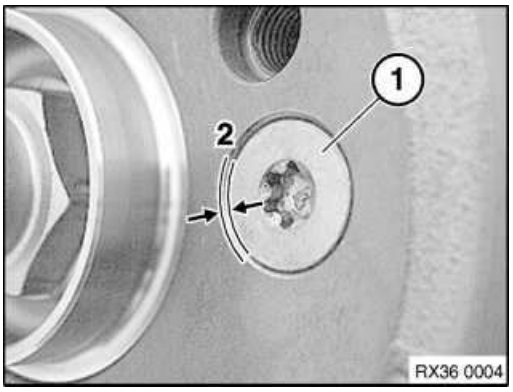
  Do not operate special tool **2 344 011** with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.



- 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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- Renew mounting bolt (1).

  Parts: Mounting bolt

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

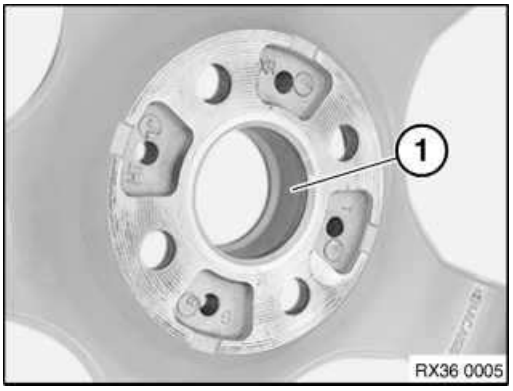
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm



- Lightly grease the wheel centring (1) in the wheel rim; refer to additional information for grease for the wheel centring (1).

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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.

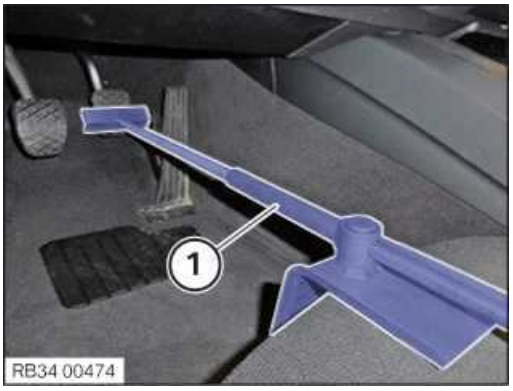
  Parts: Wheel bolts
- Clean the wheel bolts.
- Check the wheel bolts and threads for damage, renew the wheel bolts if necessary.
- Join and tighten the wheel bolts (arrows).

Wheel bolts

M 14/AF 17	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 – Remove the brake pedal tensioner



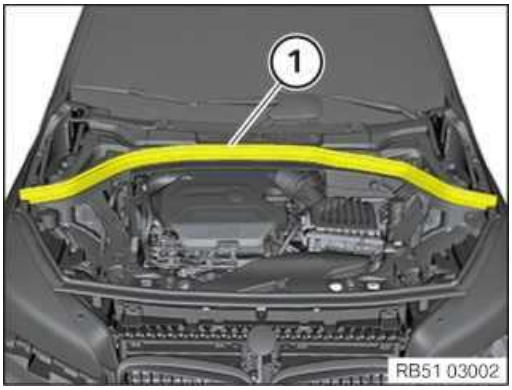
- Remove the brake pedal tensioner (1).

13 – Connect bleeder unit for brake fluid

▶ **Remove the seal for the rear bonnet**

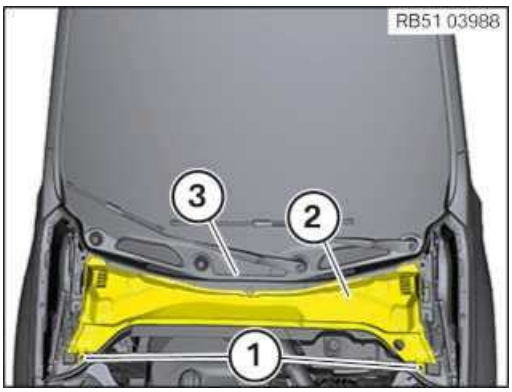
NOTICE

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



- Pull off rear bonnet seal (1) towards the top and remove.

▶ **Removing front cowl panel cover**



- Loosen the expanding rivet (1).
- Feed out and remove front cowl panel cover (2) from the rear cowl panel cover(3).



- 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.

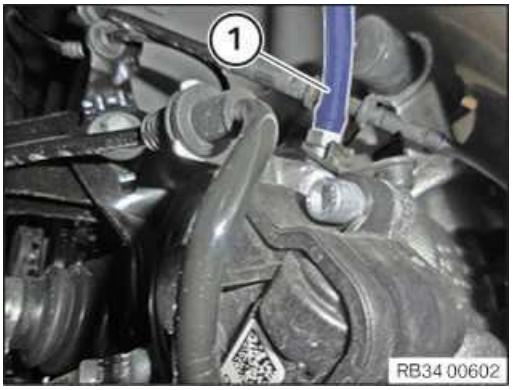
  Observe the operating instructions of the corresponding equipment manufacturer.

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

14 – 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.

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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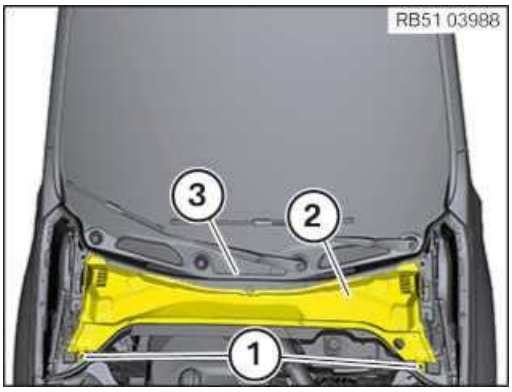


- Switch off bleeder unit (1) and remove from brake fluid expansion tank .
- Check the brake fluid level; if necessary, adjust to maximum mark.



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

▸ **Installing front cowl panel cover**

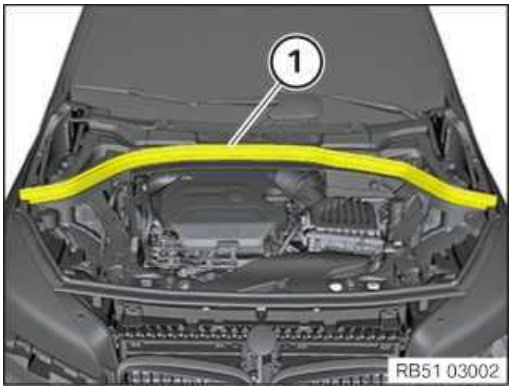


- Insert and install cowl panel cover at front (2) into cowl panel cover at rear (3).
- Check cowl panel cover at front is correctly seated (2).
- Secure expanding rivet (1).

▸ **Install the seal for the bonnet**

NOTICE

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



- Install bonnet seal at rear (1).
- Ensure that the rear bonnet seal (1) is fitted correctly.

16 – Start-up or bedding-in of new brake pads and discs (rear brake)

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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.
- 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 8

M8		Tightening torque	30 Nm

Brake hose to brake caliper, rear — Used in step 9

			24 Nm

Brake pipe screw connection / Union screws — Used in step 9

			17 Nm

Brake disc to rear wheel hub — Used in step 11

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to front wheel hub — Used in step 11

M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 11

M 14/AF 17	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

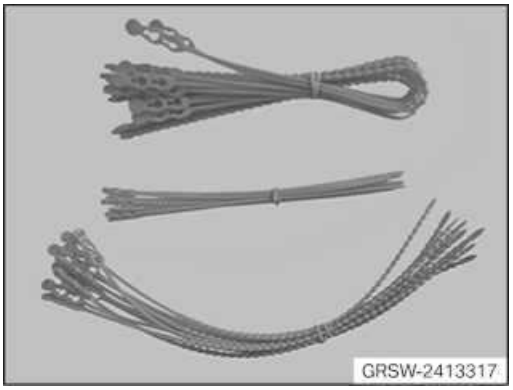
Vent valve — Used in step 14

		Tightening torque	10 Nm

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Overview of Special Tools

2 413 317 Cable strap



Common	Used in step 3 8
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 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)

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	

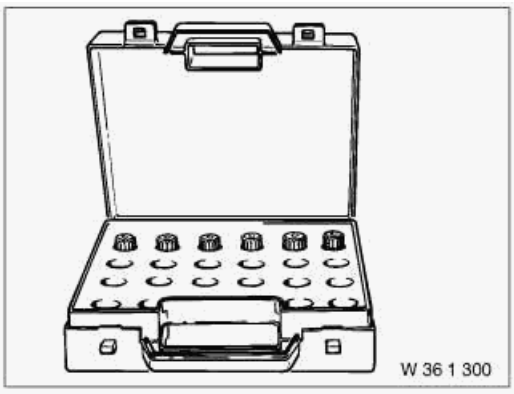
0 495 224 (36 1 326) Wheel stud



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	

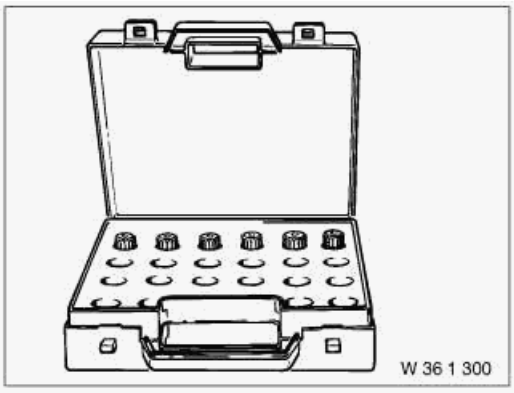
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0 495 225 (36 1 327) Wheel stud



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	

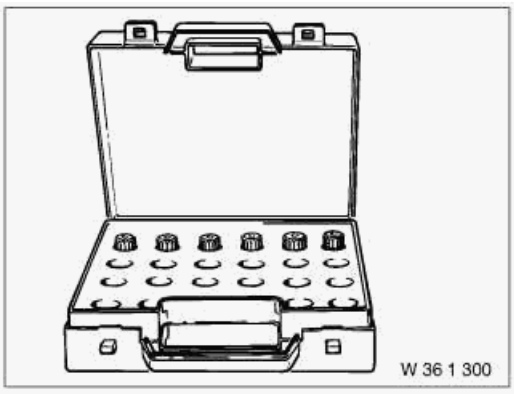
0 495 228 (36 1 331) Wheel stud



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 300x20)	Used in step 4
Minimum brake disc thickness (brake disc 300x20)	18,4 mm

Links

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

Operating materials	Used in step
2.0 Grease for wheel centring	11

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34 21 320 Removing and installing/renewing both 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.

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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▶ **Removing the wheel**



- 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.
- Unscrew the wheel bolts (arrows) and remove the wheel.

  Use the matching adapter from tool set (wheel bolt adapter set) to loosen and tighten down the wheel bolt with security code.

2 – Removing the brake pad wear sensor, rear

TECHNICAL INFORMATION

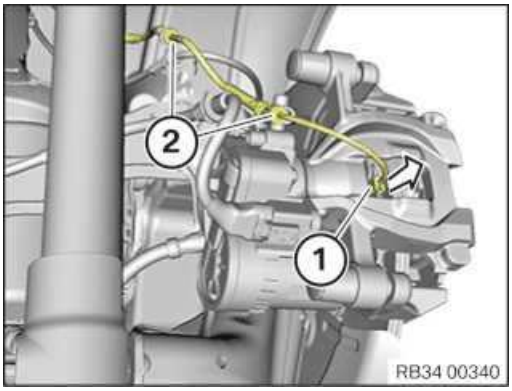
The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

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:

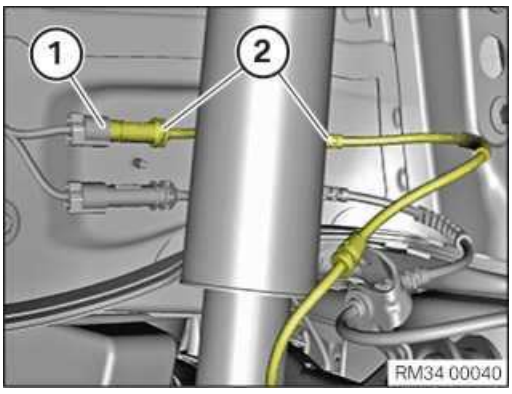
The new sliding contact must be filed down with a file to the same length as the sanded sliding contact.

When renewing the brake pad wear sensor, a CBS reset must be carried out.

If a brake pad wear sensor was renewed without renewing the brake pads, you must observe the following: Carry out "CBS vehicle data correction" service function via diagnosis system and information system.



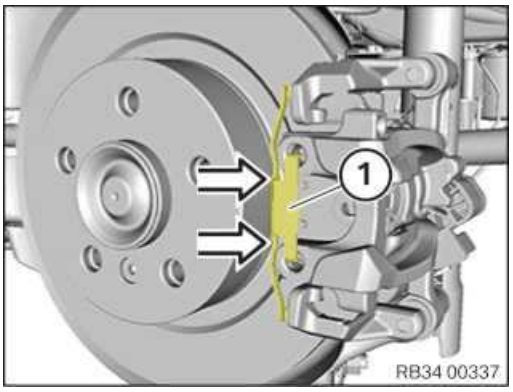
- Remove the brake pad wear sensor (1) from the brake pad.
- Detach the cable of the brake pad wear sensor from the bracket (2).



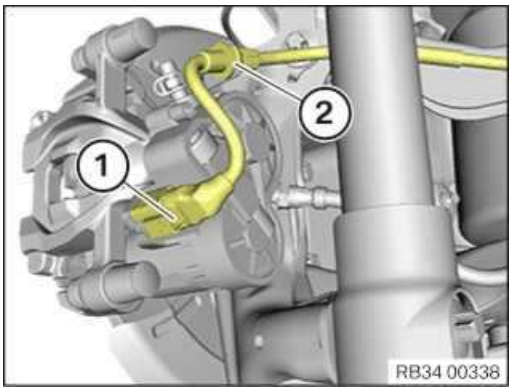
- Disconnect plug connection (1).
- Detach the brake pad wear sensor from the bracket (2).

3 – Remove rear brake pads

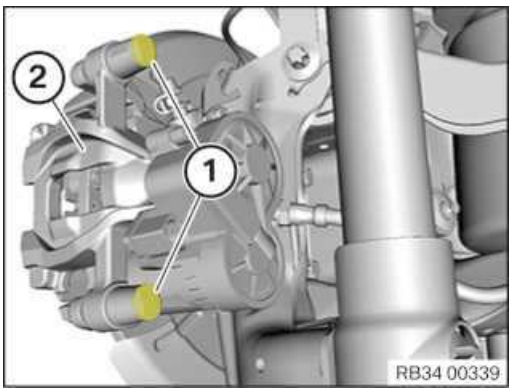
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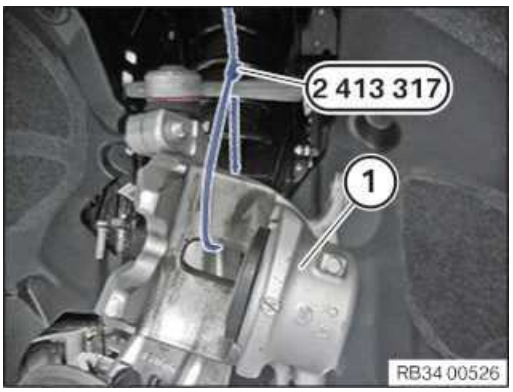
- Lift retaining spring (1).



- Disconnect plug connection (1).
- Detach cable from bracket (2).



- Remove cover plug (1).
- Release guide screws.
- Pull off brake caliper (2).



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

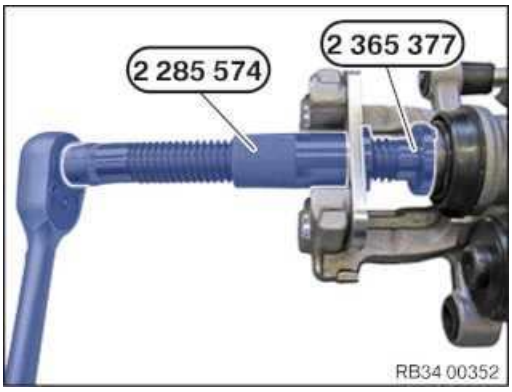
  Do not hang the brake caliper from the brake hose.



- Remove brake pads (1).
- Mark any worn brake pads.

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

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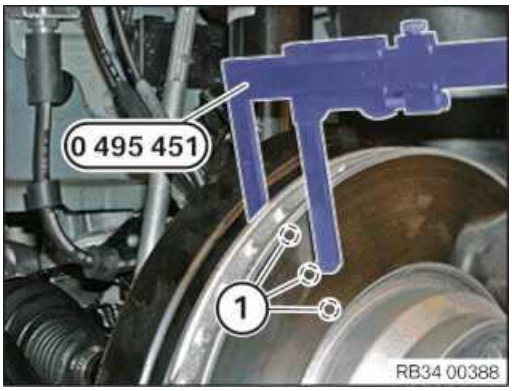
TECHNICAL INFORMATION

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 reversible ratchet to turn back brake piston up to limit position.

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.

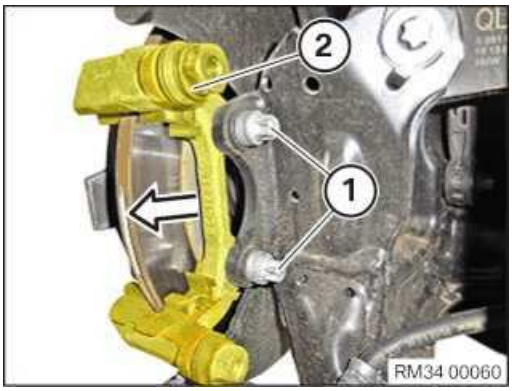
  New brake pads may only be installed if the brake disk thickness is greater than the minimum brake disc thickness.

Minimum brake disc thickness (nominal dimension 300x20)

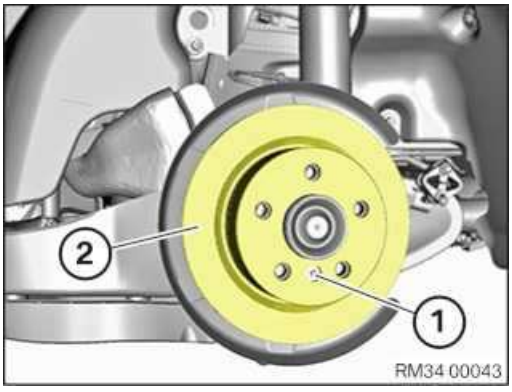
Minimum brake disc thickness (brake disc 300x20)	18,4 mm

MAIN WORK

5 – Remove rear brake disc



- Loosen screws (1) and remove the caliper carrier (2).



- 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.

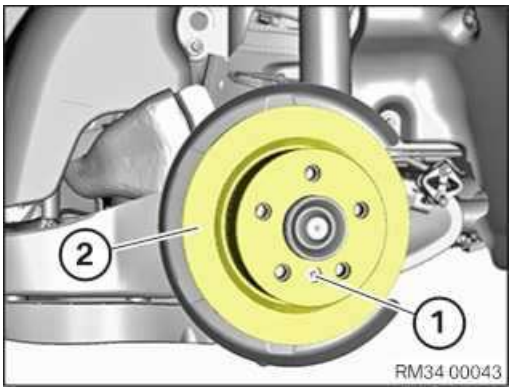
- Remove brake disc(2).

6 – Installing the rear brake disc

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TECHNICAL INFORMATION

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



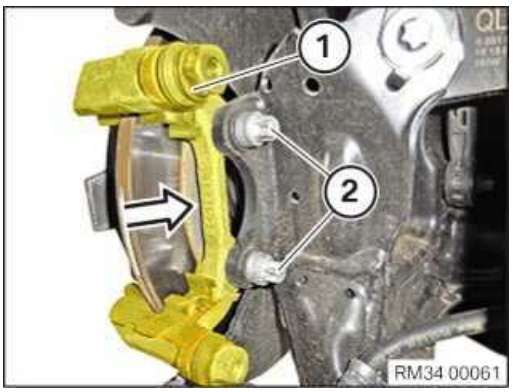
- Thoroughly clean the contact surface of the wheel hub and remove traces of corrosion if necessary.

  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 the caliper carrier (1).
- Renew screws.

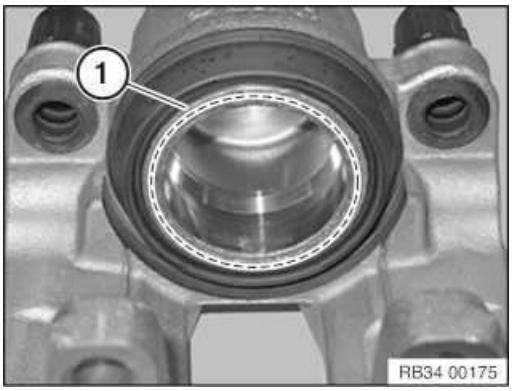
  Parts: Bolts
- Insert screws (2) and tighten.

Caliper carrier to rear wheel carrier

M12	Renew screw.	Jointing torque Angle of rotation	30 Nm 90 °

POSTPROCESSES

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



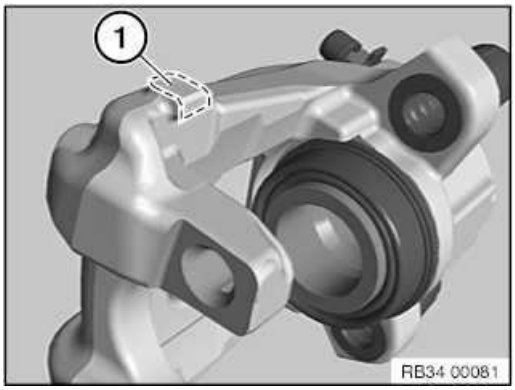
- Clean contact surface (1) of the brake piston with brake cleaner and apply a thin coat of brake pad paste.

Expendable materials

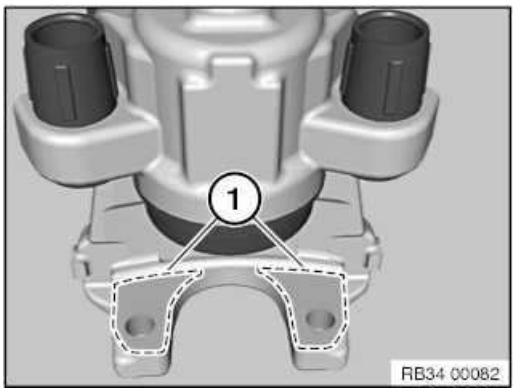
Brake block paste * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233

- Check dust boots for damage; renew if necessary.

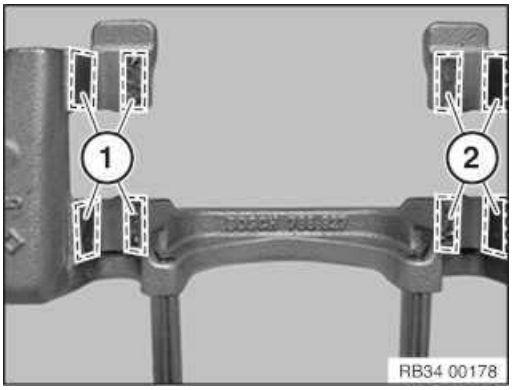
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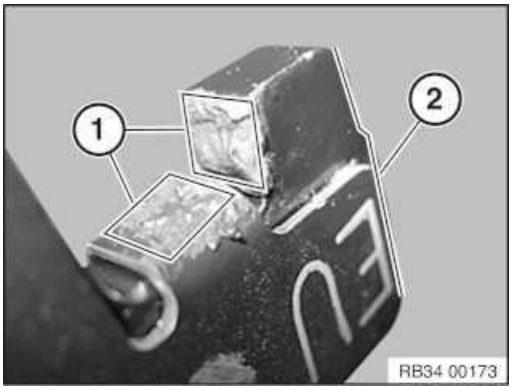
- Clean the contact surfaces (1) of the T-head/brake caliper housing using brake cleaner and apply a thin coat of brake pad paste.



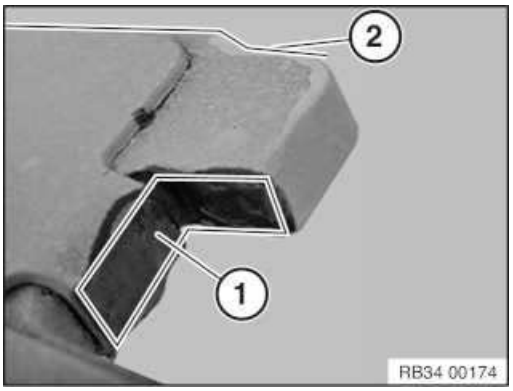
- Clean contact surface (1) of the brake piston with brake cleaner and apply a thin coat of brake pad paste.



- If possible do not apply mechanical force to clean the guide surfaces for the brake pads on the brake caliper mounting bracket (1) and (2) to not damage the surface coating.
- Clean the guide surfaces (1) and (2) using brake cleaner and apply a thin coat of brake pad paste.



- 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).

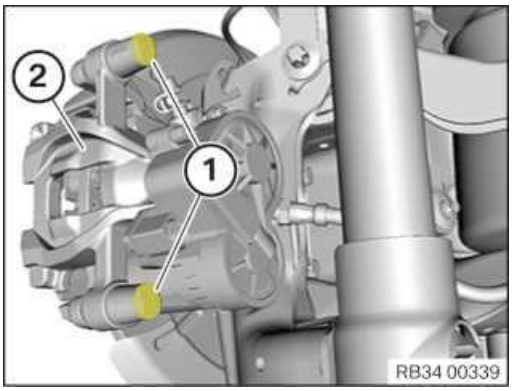
8 – Install rear brake pads

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- Mount brake pads (1).

  Brake pad with retaining springs (2) must be installed on the piston side.

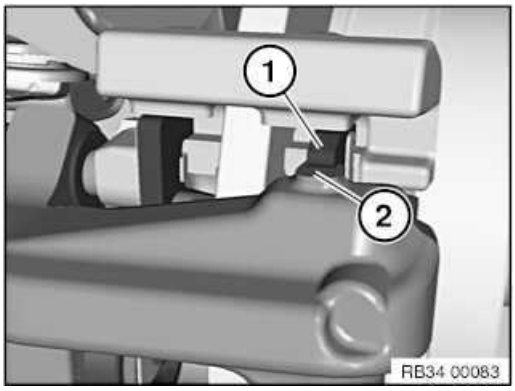


- Remove the special tool (cable strap) **2 413 317**.
- Mount brake caliper (2).
- Insert guide bolts and tighten.

Guide bolt (brake caliper on caliper carrier)

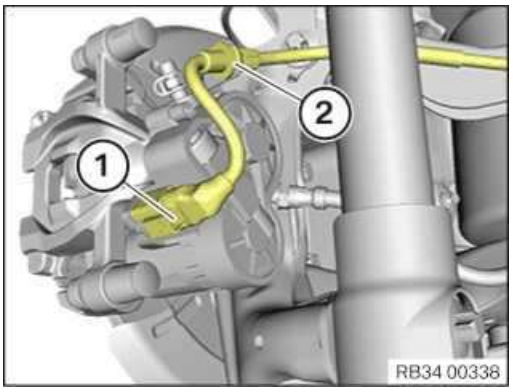
M8		Tightening torque	30 Nm

- Mount cover plug (1).

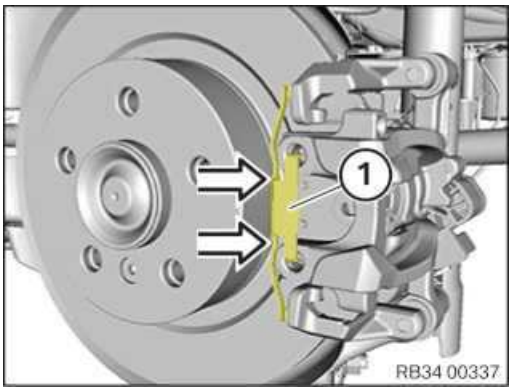


- When putting on the brake caliper, it is absolutely necessary to make sure that the T-head (1) of the outer brake pad is seated correctly on the contact surface (2).

  Above all, ensure the installation position of the outer brake pad to the contact surface (2) in brake pads that have worn out partially!



- Attach cable to the bracket (2).
- Position and lock the plug connection (1).

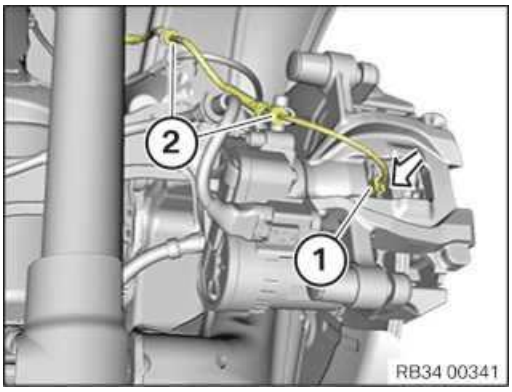


- Mount retaining spring (1).

  Ensure the retaining spring is fits securely.

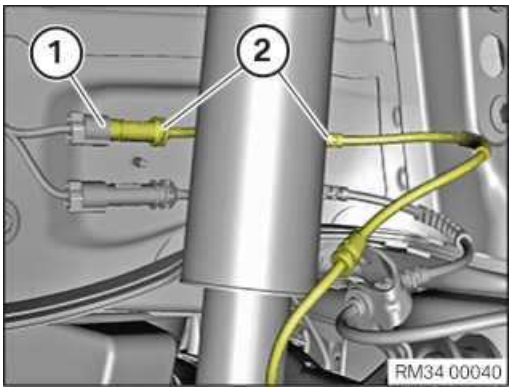
9 – Install rear brake pad sensor

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- Install brake pad wear sensor (1) 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 sensor in brackets (2).



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

10 – Installing both rear wheels

▶ Mounting the wheel

▷ Clean the contact surfaces between the brake disc and the wheel rim



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**.

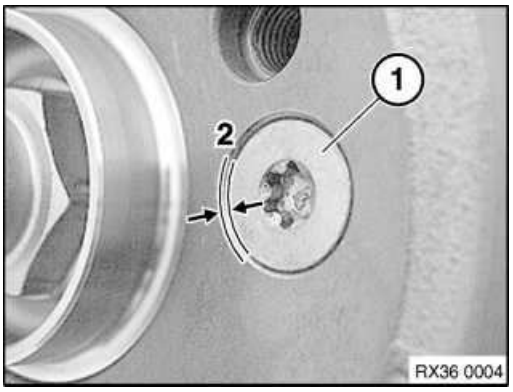
  Do not operate special tool **2 344 011** with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.



- 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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- Renew mounting bolt (1).

  Parts: Mounting bolt

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

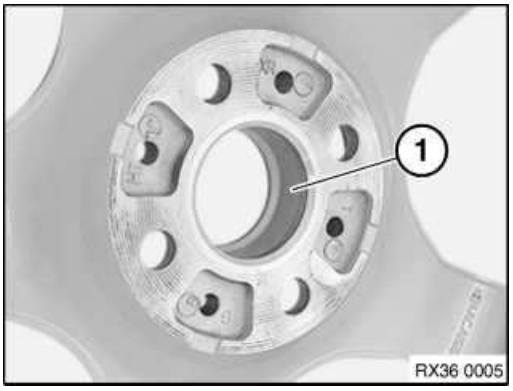
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm



- Lightly grease the wheel centring (1) in the wheel rim; refer to additional information for grease for the wheel centring (1).

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

Wheel bolts

M 14/AF 17	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 6

M8	Renew screw.	Tightening torque	16 Nm

Caliper carrier to rear wheel carrier — Used in step 6

M12	Renew screw.	Jointing torque	30 Nm
		Angle of rotation	90 °

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

M8		Tightening torque	30 Nm

Brake disc to rear wheel hub — Used in step 10

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to front wheel hub — Used in step 10

M8	Renew screw.	Tightening torque	16 Nm

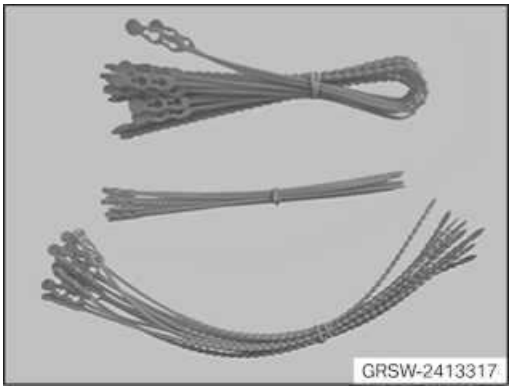
Wheel bolts — Used in step 10

M 14/AF 17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim. Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.	Tightening torque Check	140 Nm 140 Nm

Overview of Special Tools

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2 413 317 Cable strap



Common	Used in step 3 8
Usage	The "Cable ties" parts set consists of 3 items as follows: ABV232 Length: 320 mm colour: RedABV250 Length: 500 mm colour: RedABVS270 Length: 665 mm colour: Red
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	01 47 15 (332)

2 344 011 Tool



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

Replacement tools:

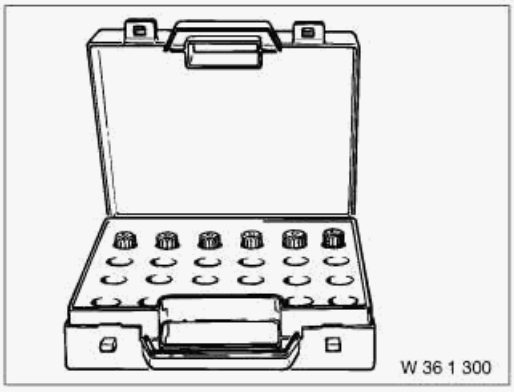
0 495 221 (36 1 323) Wheel stud



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

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0 495 224 (36 1 326) Wheel stud



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

0 495 225 (36 1 327) Wheel stud



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

0 495 226 (36 1 328) Wheel stud



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

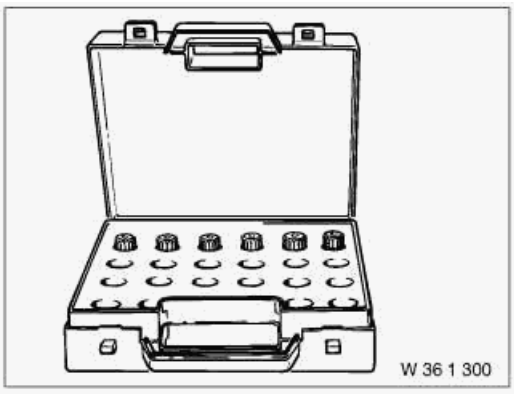
0 495 227 (36 1 329) Wheel stud



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 300x20)	Used in step 4
Minimum brake disc thickness (brake disc 300x20)	18,4 mm

Links

Repair instructions	Used in step

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

Operating materials	Used in step
2.0 Grease for wheel centring	10

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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

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PRELIMINARY WORK

1 – Removing both rear wheels



▸ **Removing the wheel**

- 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.
- Unscrew the wheel bolts (arrows) and remove the wheel.

  Use the matching adapter from tool set (wheel bolt adapter set) to loosen and tighten down the wheel bolt with security code.

2 – Removing the brake pad wear sensor, rear

TECHNICAL INFORMATION

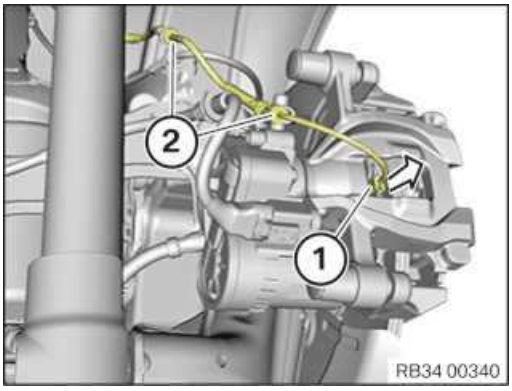
The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

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:

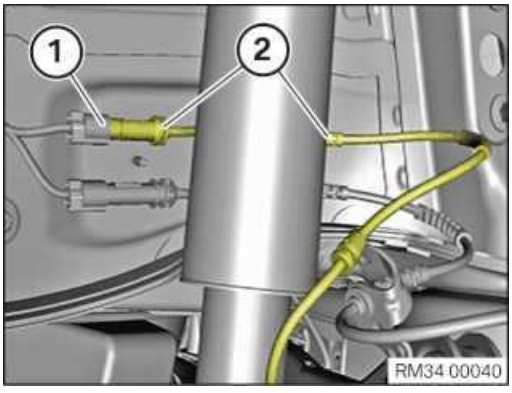
The new sliding contact must be filed down with a file to the same length as the sanded sliding contact.

When renewing the brake pad wear sensor, a CBS reset must be carried out.

If a brake pad wear sensor was renewed without renewing the brake pads, you must observe the following: Carry out "CBS vehicle data correction" service function via diagnosis system and information system.



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

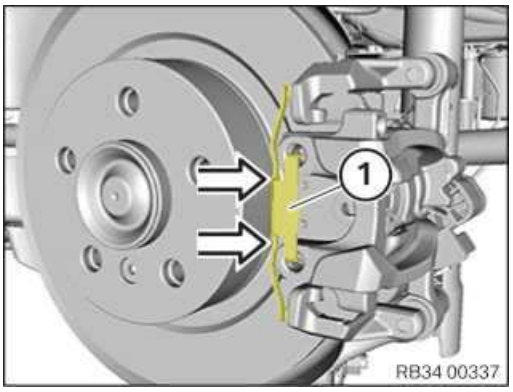


- Disconnect plug connection (1).
- Detach the brake pad wear sensor from the bracket (2).

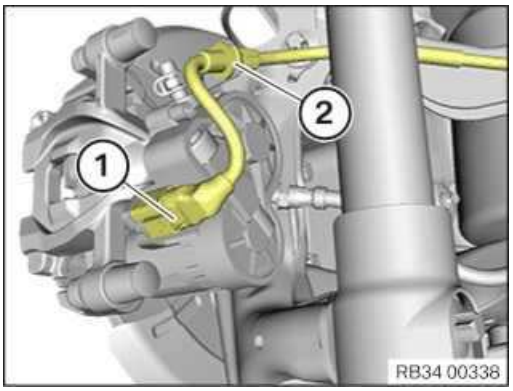
MAIN WORK

3 – Remove rear brake pads

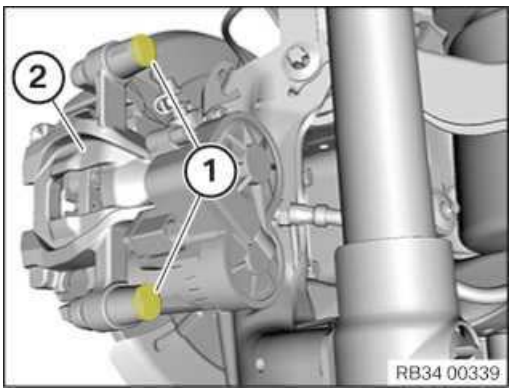
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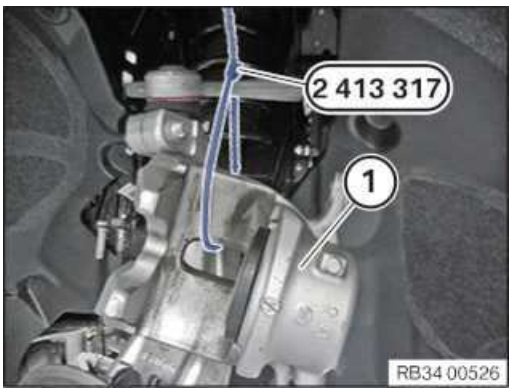
- Lift retaining spring (1).



- Disconnect plug connection (1).
- Detach cable from bracket (2).



- Remove cover plug (1).
- Release guide screws.
- Pull off brake caliper (2).



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

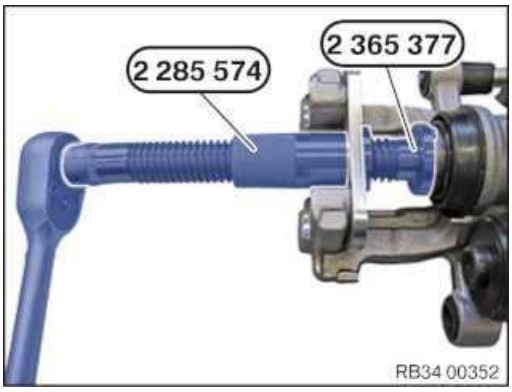
  Do not hang the brake caliper from the brake hose.



- Remove brake pads (1).
- Mark any worn brake pads.

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

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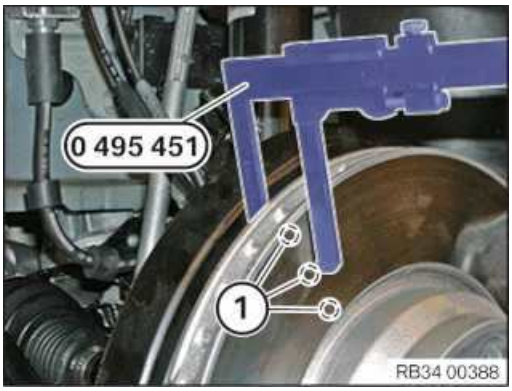
TECHNICAL INFORMATION

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 reversible ratchet to turn back brake piston up to limit position.

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.

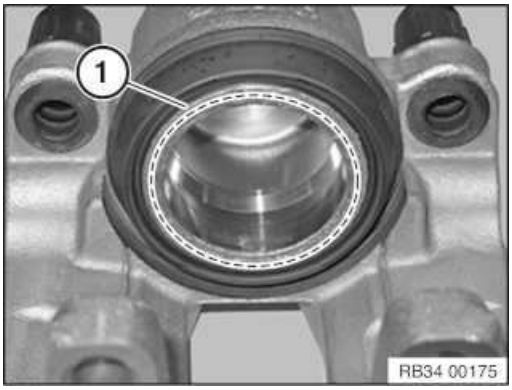
  Compare measuring result and lowest value with setpoint value.

  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 300x20)

Minimum brake disc thickness (brake disc 300x20)	18,4 mm

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

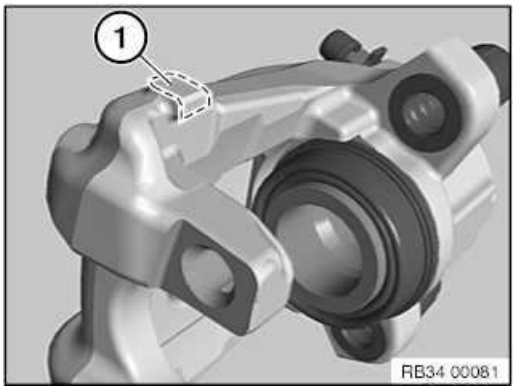


- Clean contact surface (1) of the brake piston with brake cleaner and apply a thin coat of brake pad paste.

Expendable materials

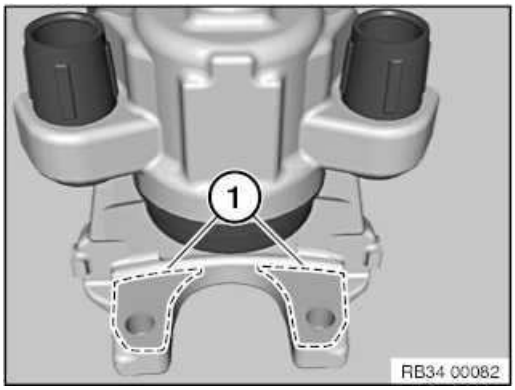
Brake block paste * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233

- Check dust boots for damage; renew if necessary.

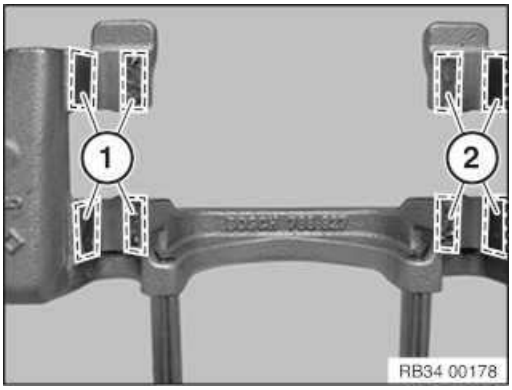


- Clean the contact surfaces (1) of the T-head/brake caliper housing using brake cleaner and apply a thin coat of brake pad paste.

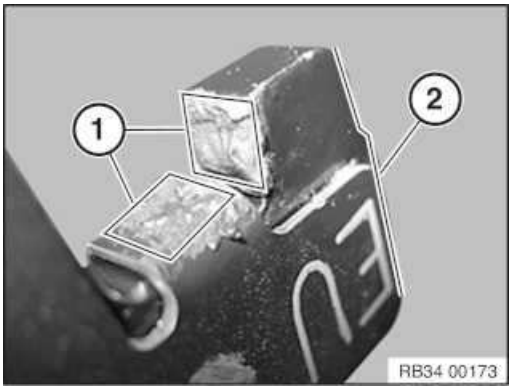
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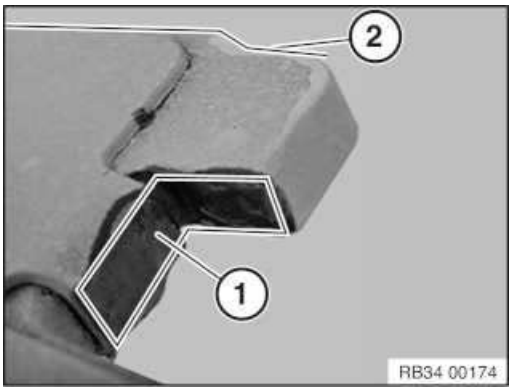
- Clean contact surface (1) of the brake piston with brake cleaner and apply a thin coat of brake pad paste.



- If possible do not apply mechanical force to clean the guide surfaces for the brake pads on the brake caliper mounting bracket (1) and (2) to not damage the surface coating.
- Clean the guide surfaces (1) and (2) using brake cleaner and apply a thin coat of brake pad paste.



- 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).

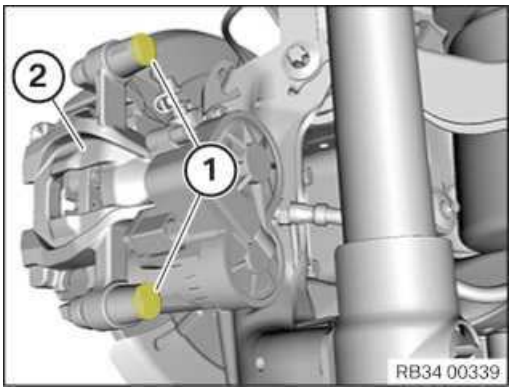
6 – Install rear brake pads



- Mount brake pads (1).

  Brake pad with retaining springs (2) must be installed on the piston side.

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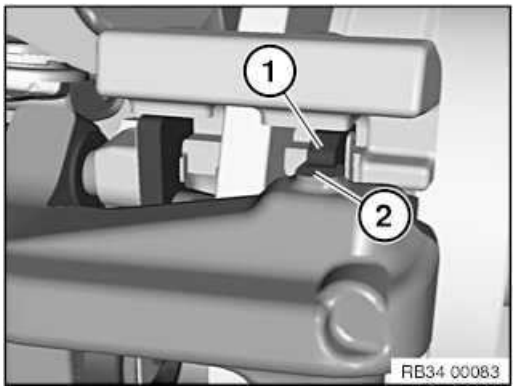


- Remove the special tool (cable strap) **2 413 317**.
- Mount brake caliper (2).
- Insert guide bolts and tighten.

Guide bolt (brake caliper on caliper carrier)

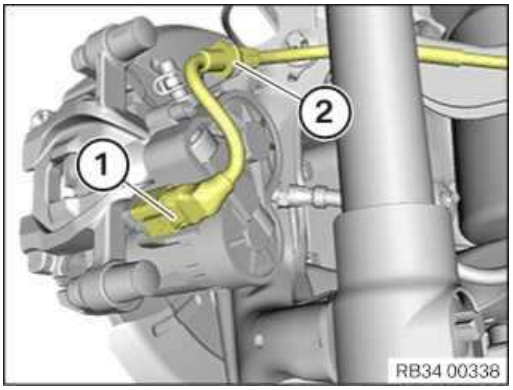
M8		Tightening torque	30 Nm

- Mount cover plug (1).

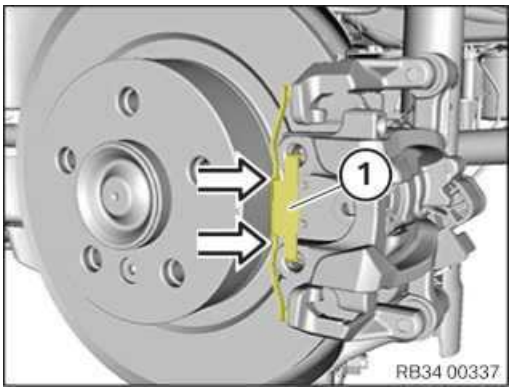


- When putting on the brake caliper, it is absolutely necessary to make sure that the T-head (1) of the outer brake pad is seated correctly on the contact surface (2).

  Above all, ensure the installation position of the outer brake pad to the contact surface (2) in brake pads that have worn out partially!



- Attach cable to the bracket (2).
- Position and lock the plug connection (1).



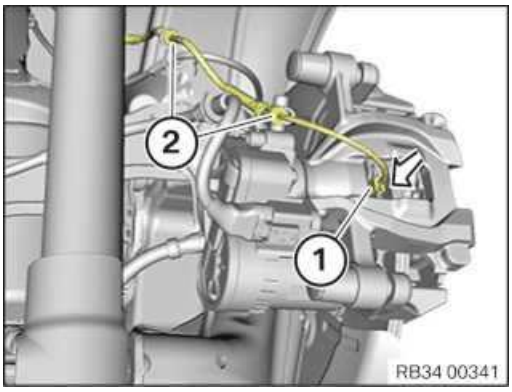
- Mount retaining spring (1).

  Ensure the retaining spring is fits securely.

POSTPROCESSES

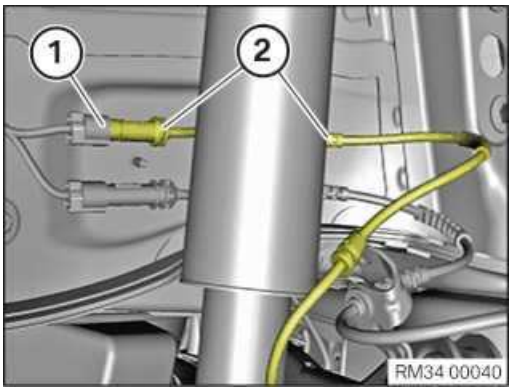
7 – Install rear brake pad sensor

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- Install brake pad wear sensor (1) 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 sensor in brackets (2).



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

8 – Installing both rear wheels

▶ Mounting the wheel

▷ Clean the contact surfaces between the brake disc and the wheel rim



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**.

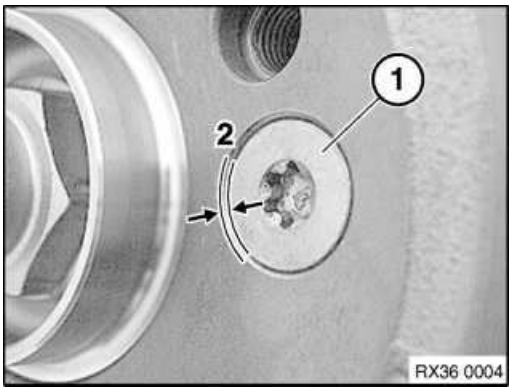
  Do not operate special tool **2 344 011** with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.



- 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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- Renew mounting bolt (1).

  Parts: Mounting bolt

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

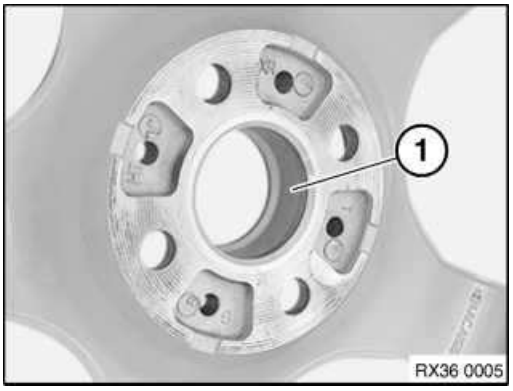
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm



- Lightly grease the wheel centring (1) in the wheel rim; refer to additional information for grease for the wheel centring (1).

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

Wheel bolts

M 14/AF 17	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		Tightening torque	30 Nm

Brake disc to rear wheel hub — Used in step 8

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to front wheel hub — Used in step 8

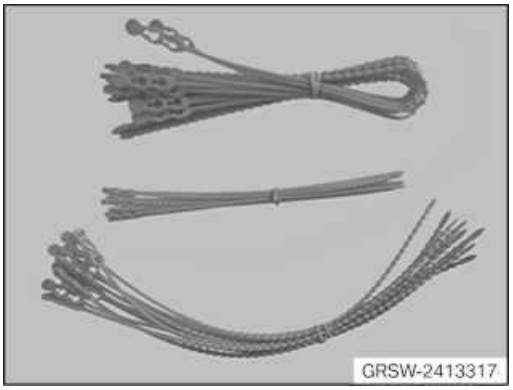
M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 8

M 14/AF 17	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 3 6

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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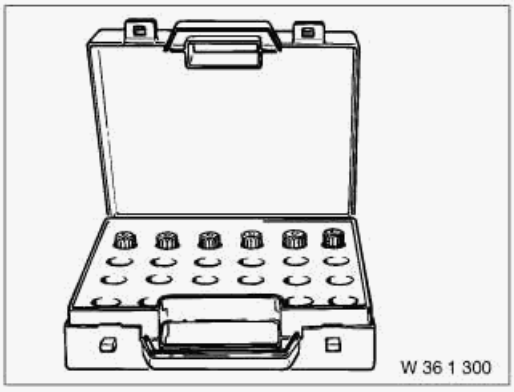
2 344 011 Tool



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)

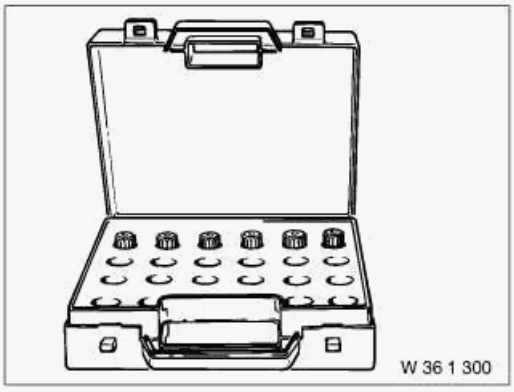
Replacement tools:

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	

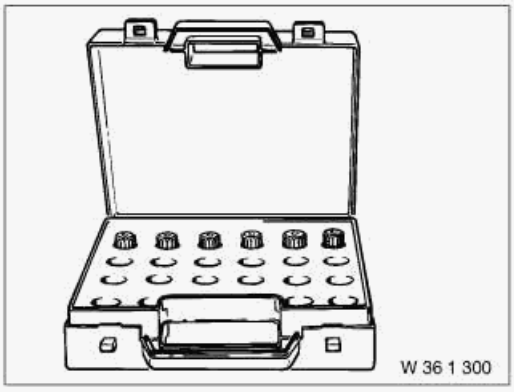
0 495 225 (36 1 327) Wheel stud



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	

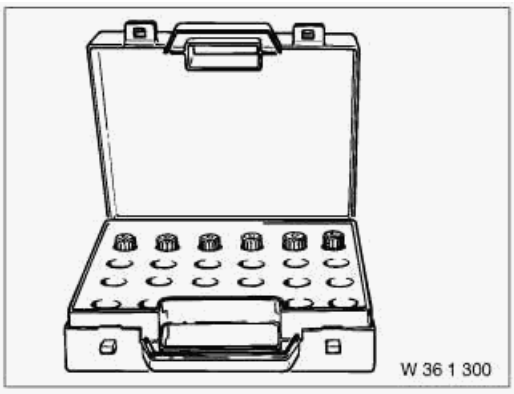
0 495 229 (36 1 332) Wheel stud



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 300x20)	Used in step 4
Minimum brake disc thickness (brake disc 300x20)	18,4 mm

Links

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

Operating materials	Used in step
2.0 Grease for wheel centring	8

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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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▶ **Removing the wheel**



- 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.
- Unscrew the wheel bolts (arrows) and remove the wheel.

  Use the matching adapter from tool set (wheel bolt adapter set) to loosen and tighten down the wheel bolt with security code.

2 – Removing the brake pad wear sensor, rear

TECHNICAL INFORMATION

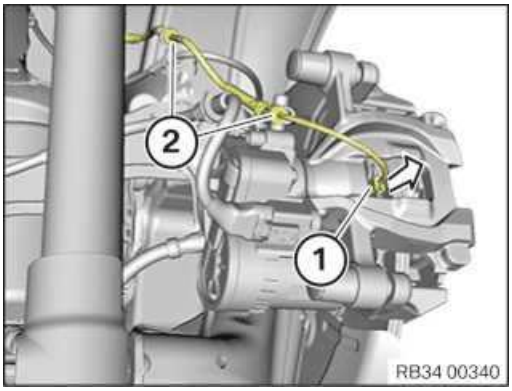
The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

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:

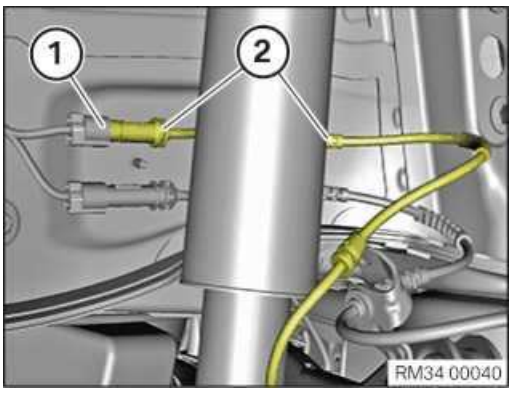
The new sliding contact must be filed down with a file to the same length as the sanded sliding contact.

When renewing the brake pad wear sensor, a CBS reset must be carried out.

If a brake pad wear sensor was renewed without renewing the brake pads, you must observe the following: Carry out "CBS vehicle data correction" service function via diagnosis system and information system.



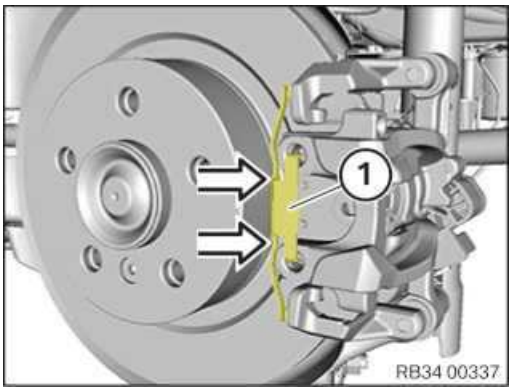
- Remove the brake pad wear sensor (1) from the brake pad.
- Detach the cable of the brake pad wear sensor from the bracket (2).



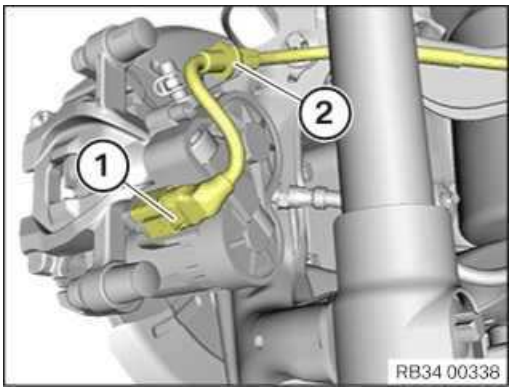
- Disconnect plug connection (1).
- Detach the brake pad wear sensor from the bracket (2).

3 – Remove rear brake pads

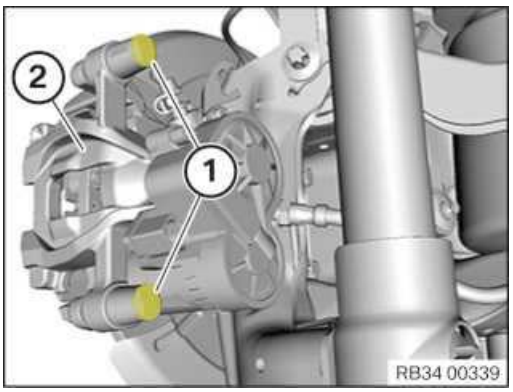
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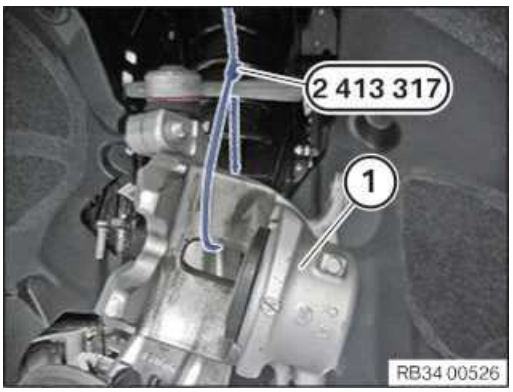
- Lift retaining spring (1).



- Disconnect plug connection (1).
- Detach cable from bracket (2).



- Remove cover plug (1).
- Release guide screws.
- Pull off brake caliper (2).



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

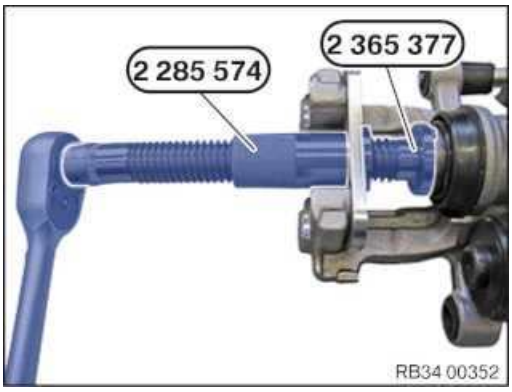
  Do not hang the brake caliper from the brake hose.



- Remove brake pads (1).
- Mark any worn brake pads.

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

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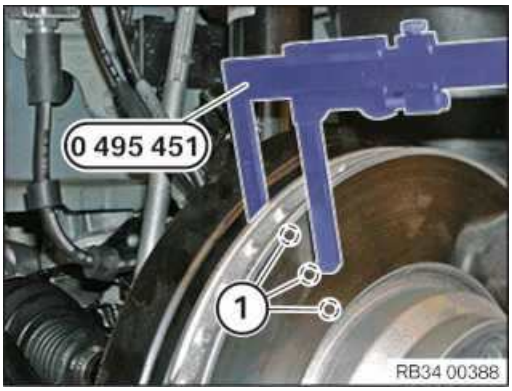
TECHNICAL INFORMATION

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 reversible ratchet to turn back brake piston up to limit position.

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.

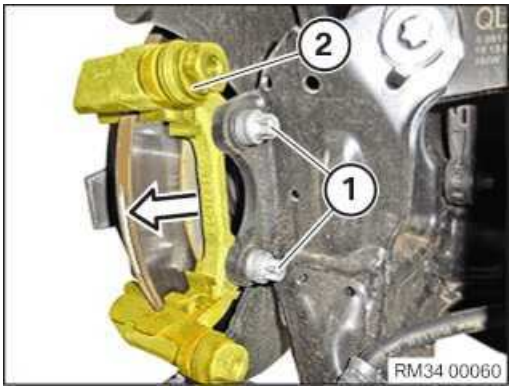
  Compare measuring result and lowest value with setpoint value.

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

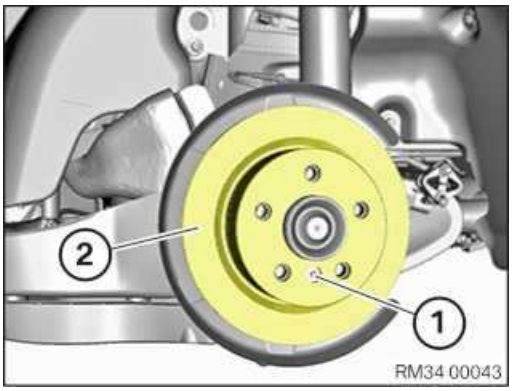
Minimum brake disc thickness (nominal dimension 300x20)

Minimum brake disc thickness (brake disc 300x20)	18,4 mm

5 – Remove rear brake disc



- Loosen screws (1) and remove the caliper carrier (2).



- Loosen screw (1).

TECHNICAL INFORMATION

Note the following for the removal of the brake disc:

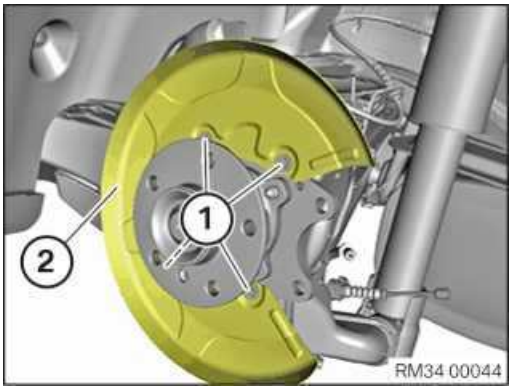
Do not under any circumstances strike the friction ring with a hammer or similar tool. If necessary, carefully tap with a rubber mallet against the brake disc chamber.

- Remove brake disc(2).

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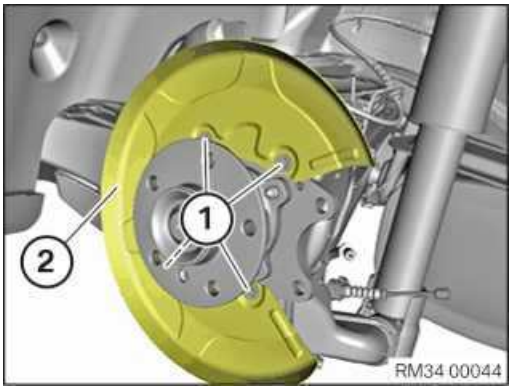
MAIN WORK

6 – Remove 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).
- Renew screws.

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

Brake protection plate on the rear wheel carrier

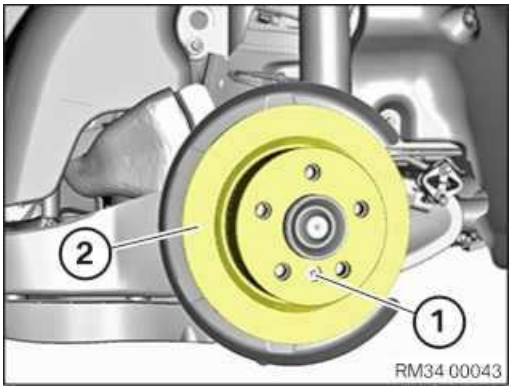
M6x12	Renew screw.	Tightening torque	8 Nm

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.



- Thoroughly clean the contact surface of the wheel hub and remove traces of corrosion if necessary.

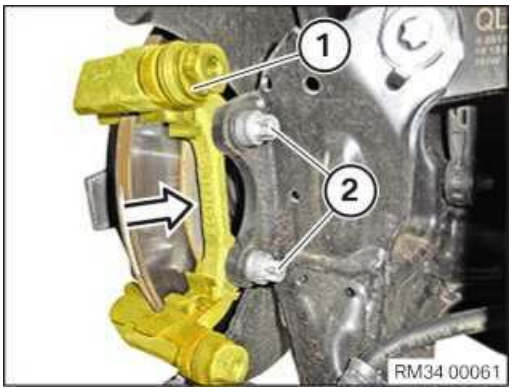
  Irregularities in the contact surface can cause distortion in the brake disc!
- Mount brake disc (2).
- Position and tighten the screw (1).
- Renew screw.

  Parts: Screw

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm

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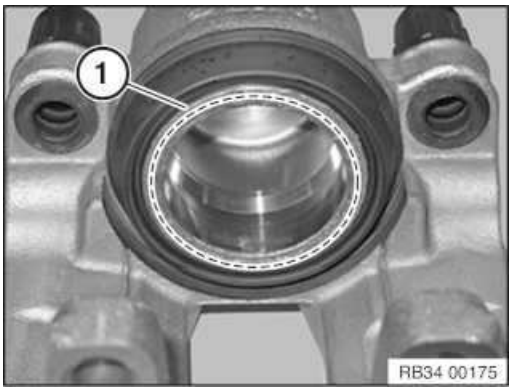
- Mount the caliper carrier (1).
- Renew screws.

  Parts: Bolts
- Insert screws (2) and tighten.

Caliper carrier to rear wheel carrier

M12	Renew screw.	Jointing torque	30 Nm
		Angle of rotation	90 °

9 – Grease brake pads, caliper carrier and brake caliper with brake pad paste

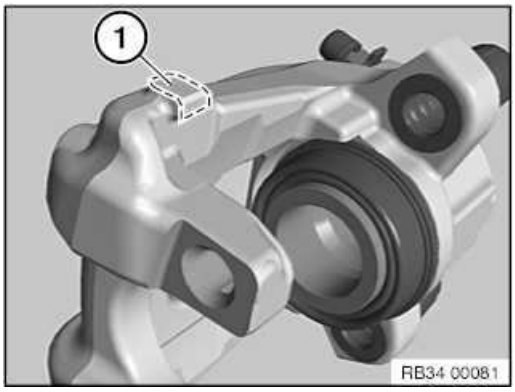


- Clean contact surface (1) of the brake piston with brake cleaner and apply a thin coat of brake pad paste.

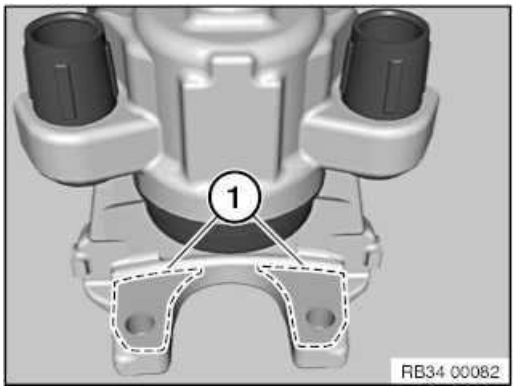
Expendable materials

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

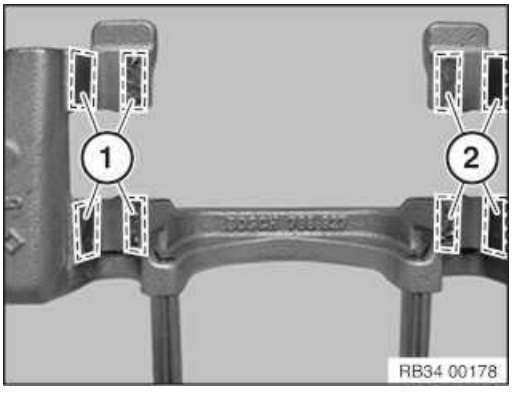
- Check dust boots for damage; renew if necessary.



- Clean the contact surfaces (1) of the T-head/brake caliper housing using brake cleaner and apply a thin coat of brake pad paste.

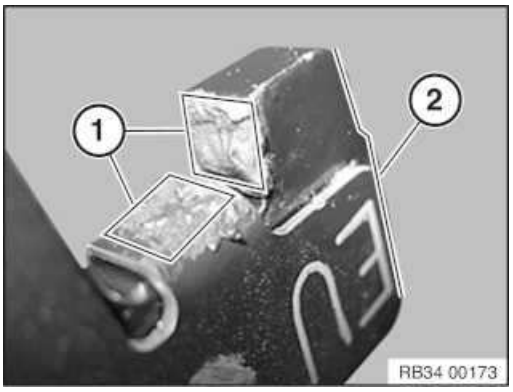


- Clean contact surface (1) of the brake piston with brake cleaner and apply a thin coat of brake pad paste.

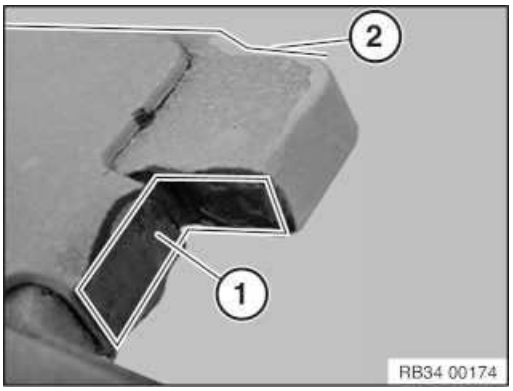


- If possible do not apply mechanical force to clean the guide surfaces for the brake pads on the brake caliper mounting bracket (1) and (2) to not damage the surface coating.
- Clean the guide surfaces (1) and (2) using brake cleaner and apply a thin coat of brake pad paste.

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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).



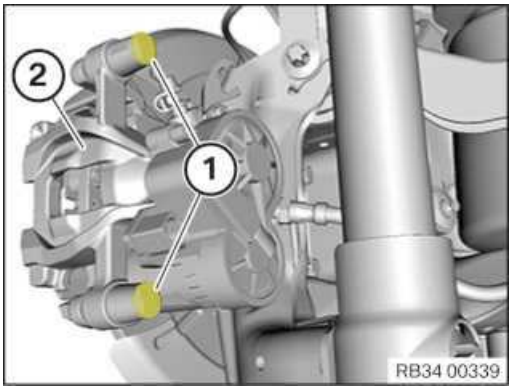
- Apply a thin coat of brake pad paste to the T-head of the inner brake pad in the areas (1) and (2).

10 – Install rear brake pads



- Mount brake pads (1).

  Brake pad with retaining springs (2) must be installed on the piston side.

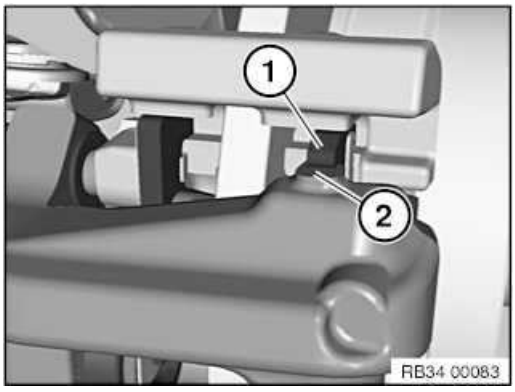


- Remove the special tool (cable strap) **2 413 317**.
- Mount brake caliper (2).
- Insert guide bolts and tighten.

Guide bolt (brake caliper on caliper carrier)

M8		Tightening torque	30 Nm

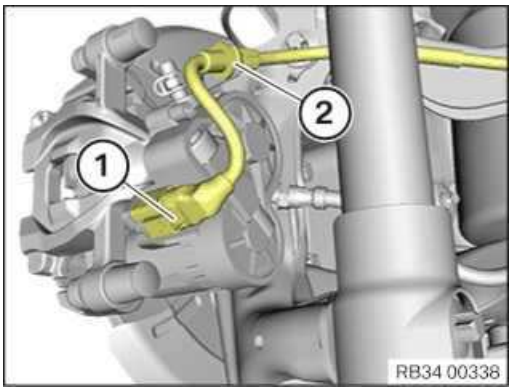
- Mount cover plug (1).



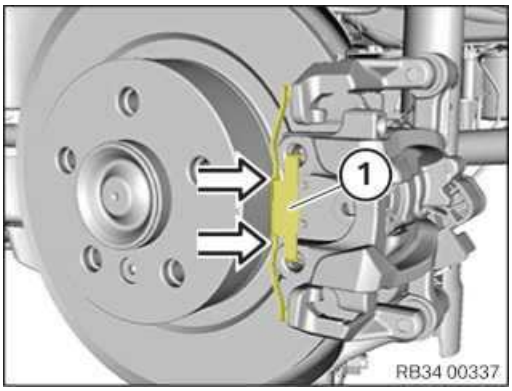
- When putting on the brake caliper, it is absolutely necessary to make sure that the T-head (1) of the outer brake pad is seated correctly on the contact surface (2).

  Above all, ensure the installation position of the outer brake pad to the contact surface (2) in brake pads that have worn out partially!

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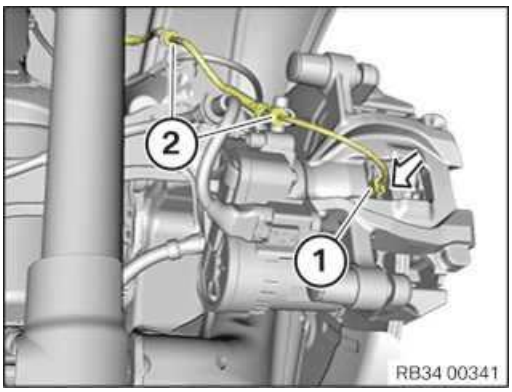
- Attach cable to the bracket (2).
- Position and lock the plug connection (1).



- Mount retaining spring (1).

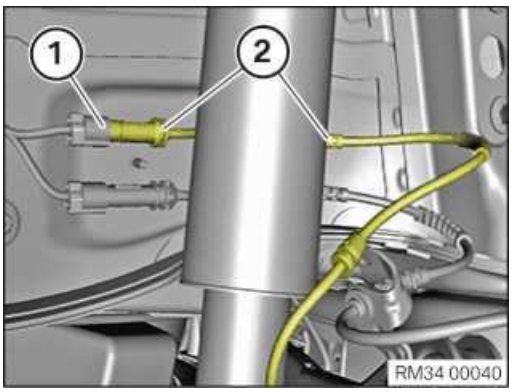
  Ensure the retaining spring is fits securely.

11 – Install rear brake pad sensor



- Install brake pad wear sensor (1) 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 sensor in brackets (2).



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

12 – Installing both rear wheels

▶ **Mounting the wheel**

▷ **Clean the contact surfaces between the brake disc and the wheel rim**

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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.

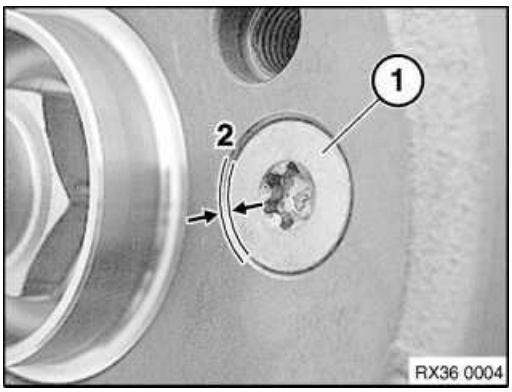
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool **2 344 011**.

  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).



- Renew mounting bolt (1).

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

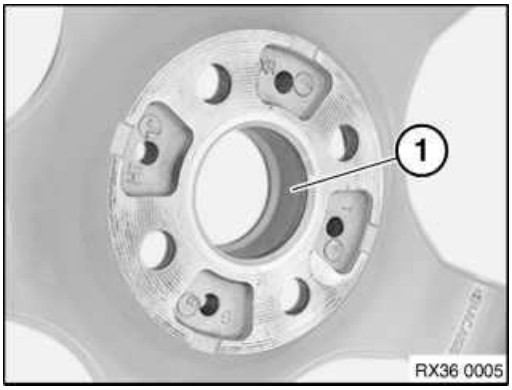
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm



- Lightly grease the wheel centring (1) in the wheel rim; refer to additional information for grease for the wheel centring (1).

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

Wheel bolts

M 14/AF 17	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

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.

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- 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 8

M8	Renew screw.	Tightening torque	16 Nm

Caliper carrier to rear wheel carrier — Used in step 8

M12	Renew screw.	Jointing torque	30 Nm
		Angle of rotation	90 °

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

M8		Tightening torque	30 Nm

Brake disc to rear wheel hub — Used in step 12

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to front wheel hub — Used in step 12

M8	Renew screw.	Tightening torque	16 Nm

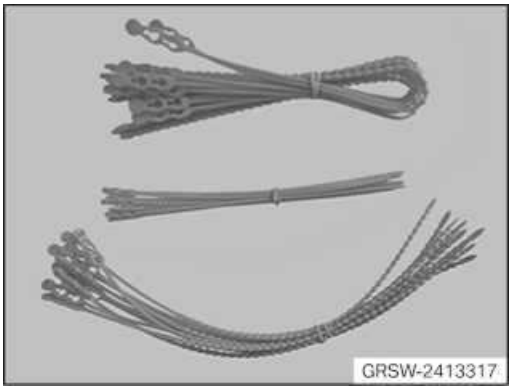
Wheel bolts — Used in step 12

M 14/AF 17	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 3 10

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:

0 495 221 (36 1 323) Wheel stud

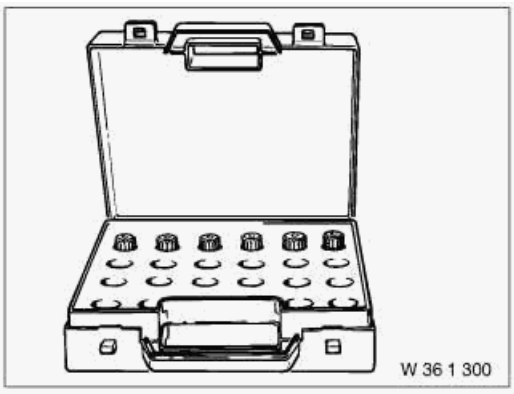


Common Used in step 1

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

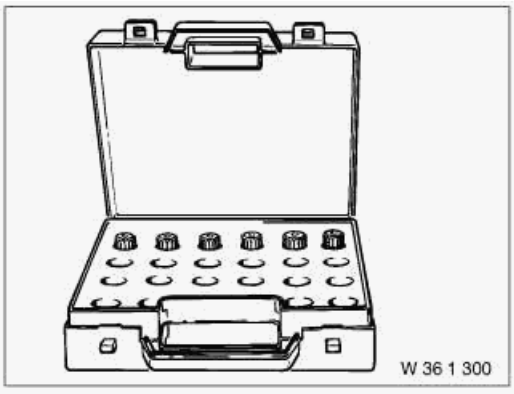
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0 495 224 (36 1 326) Wheel stud



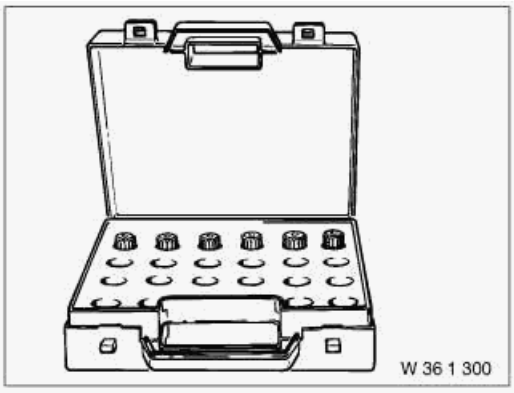
Common	Used in step 1
Usage	(Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 225 (36 1 327) Wheel stud



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

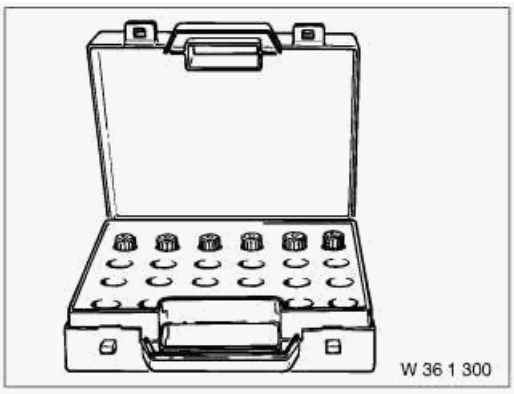
0 495 226 (36 1 328) Wheel stud



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

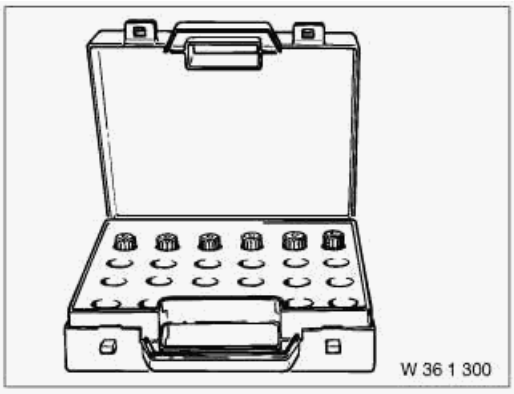
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0 495 227 (36 1 329) Wheel stud



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

0 495 228 (36 1 331) Wheel stud



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

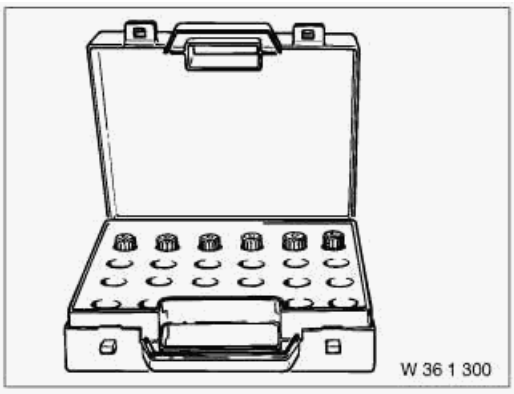
0 495 229 (36 1 332) Wheel stud



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

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0 495 230 (36 1 333) Wheel stud



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

Overview Technical Data

Minimum brake disc thickness (nominal dimension 300x20)	Used in step 4
Minimum brake disc thickness (brake disc 300x20)	18,4 mm

Links

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

Operating materials	Used in step
2.0 Grease for wheel centring	12

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34 21 295 Replacing rear left or right dust boot on 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.

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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▶ **Removing the wheel**



- 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.
- Unscrew the wheel bolts (arrows) and remove the wheel.

  Use the matching adapter from tool set (wheel bolt adapter set) to loosen and tighten down the wheel bolt with security code.

2 – Removing the brake pad wear sensor, rear

TECHNICAL INFORMATION

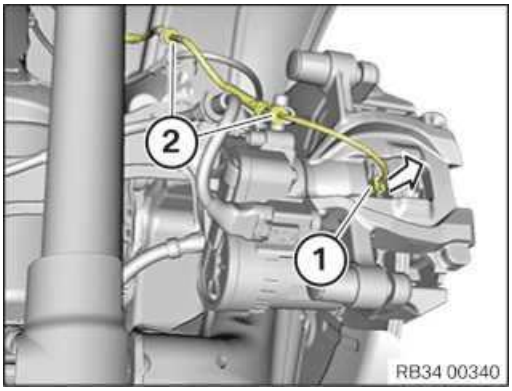
The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

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:

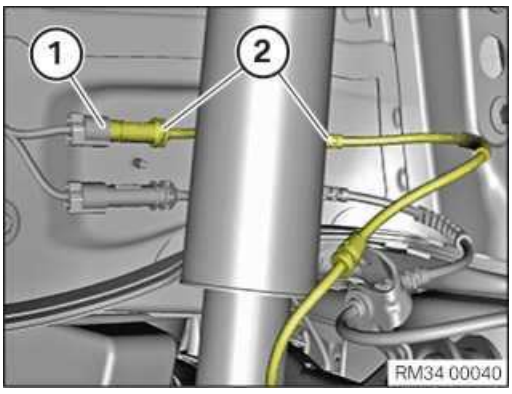
The new sliding contact must be filed down with a file to the same length as the sanded sliding contact.

When renewing the brake pad wear sensor, a CBS reset must be carried out.

If a brake pad wear sensor was renewed without renewing the brake pads, you must observe the following: Carry out "CBS vehicle data correction" service function via diagnosis system and information system.



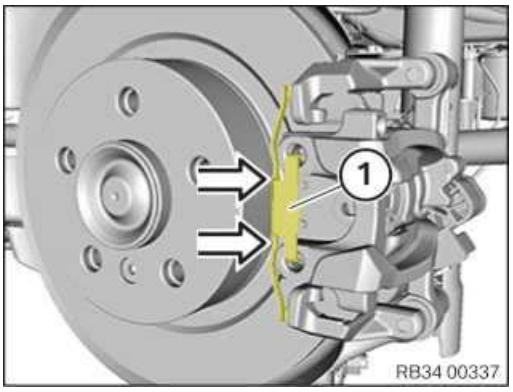
- Remove the brake pad wear sensor (1) from the brake pad.
- Detach the cable of the brake pad wear sensor from the bracket (2).



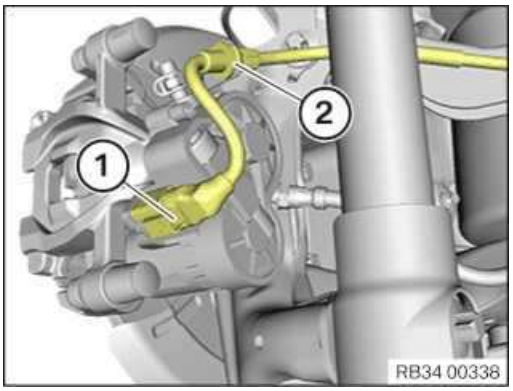
- Disconnect plug connection (1).
- Detach the brake pad wear sensor from the bracket (2).

3 – Remove rear brake pads

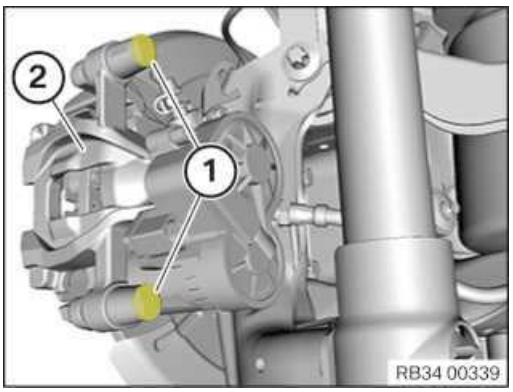
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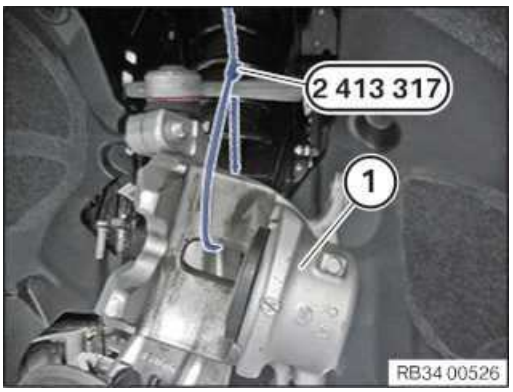
- Lift retaining spring (1).



- Disconnect plug connection (1).
- Detach cable from bracket (2).



- Remove cover plug (1).
- Release guide screws.
- Pull off brake caliper (2).



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

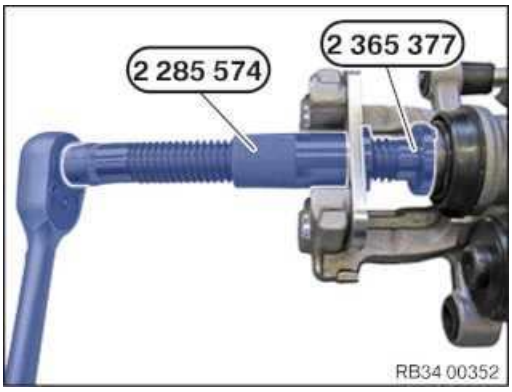
  Do not hang the brake caliper from the brake hose.



- Remove brake pads (1).
- Mark any worn brake pads.

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

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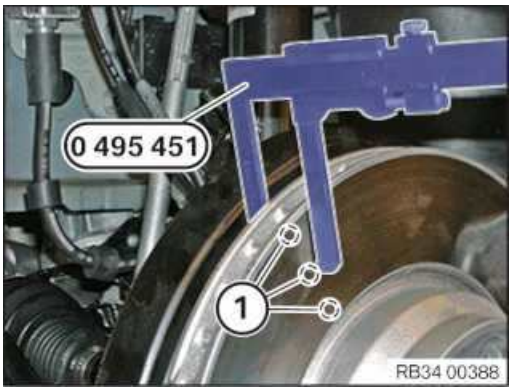
TECHNICAL INFORMATION

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 reversible ratchet to turn back brake piston up to limit position.

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.

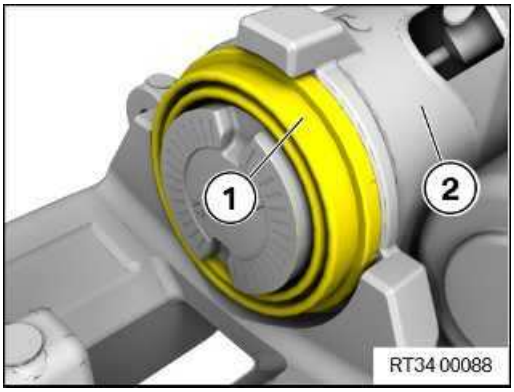
  New brake pads may only be installed if the brake disk thickness is greater than the minimum brake disc thickness.

Minimum brake disc thickness (nominal dimension 300x20)

Minimum brake disc thickness (brake disc 300x20)	18,4 mm

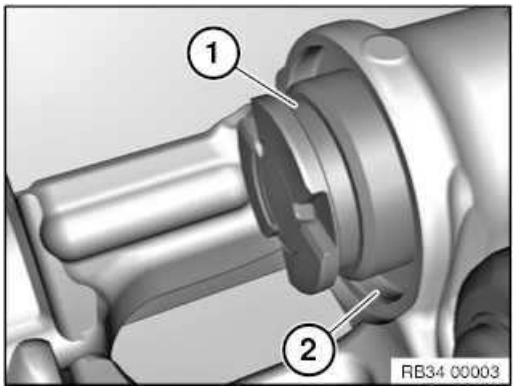
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5 – Replacing the dust boot on the rear brake caliper



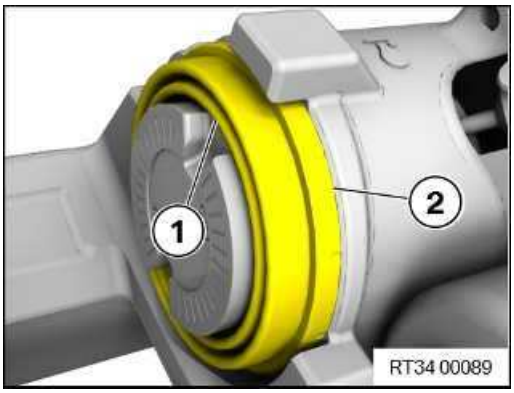
- Detach the dust boot (1) from the brake caliper (2) using a suitable tool and dispose of it.

  The dust boot must not be re-used.



- Clean the contact surface of the dust boot on the brake caliper housing (1) and on the annular groove (2) of the brake piston using a lint-free cloth.
- Carefully check the cylinder of the brake caliper housing and the brake piston for damage.

  Corroded or damaged components must be renewed.
- To guarantee that the dust boot fits perfectly: Keep the area between the dust boot and the brake caliper housing dry.



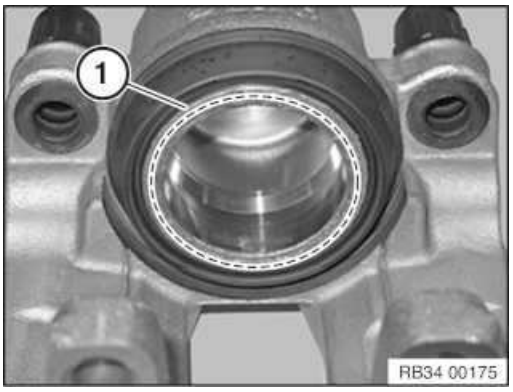
- Pull the sealing lip (1) of the dust boot (2) over the brake piston until the dust boot (2) is completely fitted into the annular groove of the brake piston.
- Position the dust boot (2) evenly on the contact surface of the brake caliper housing and push in evenly.

  The dust boot must fit correctly around the entire circumference of the brake caliper housing and on the annular groove of the brake piston.

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POSTPROCESSES

6 – Grease brake pads, caliper carrier and brake caliper with brake pad paste

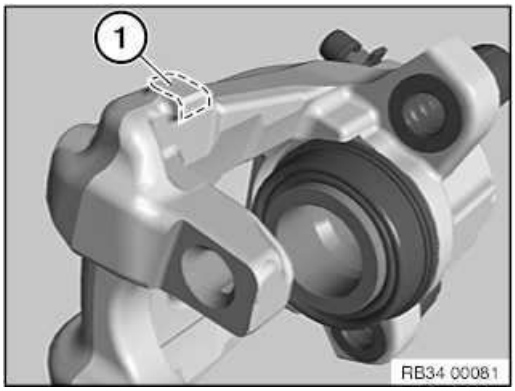


- Clean contact surface (1) of the brake piston with brake cleaner and apply a thin coat of brake pad paste.

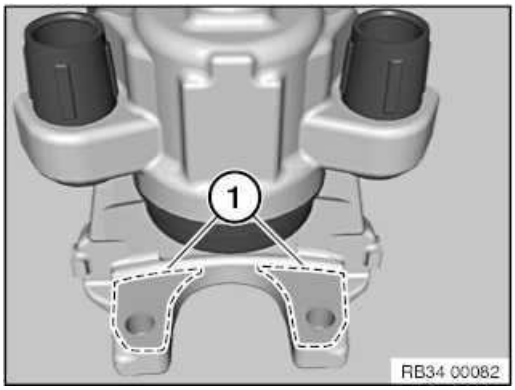
Expendable materials

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

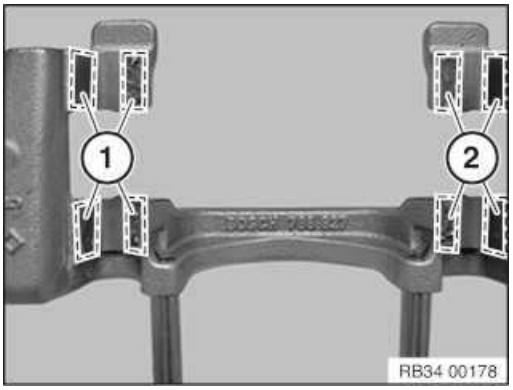
- Check dust boots for damage; renew if necessary.



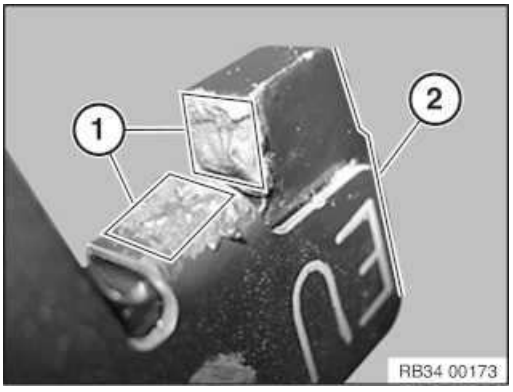
- Clean the contact surfaces (1) of the T-head/brake caliper housing using brake cleaner and apply a thin coat of brake pad paste.



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

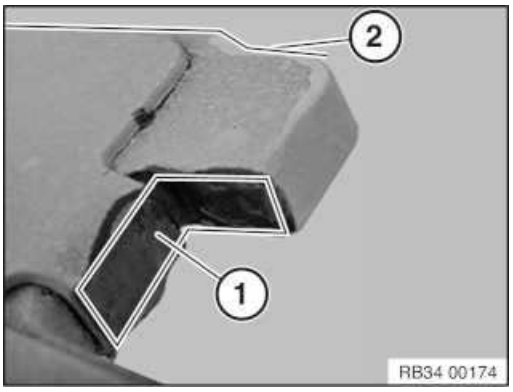


- If possible do not apply mechanical force to clean the guide surfaces for the brake pads on the brake caliper mounting bracket (1) and (2) to not damage the surface coating.
- Clean the guide surfaces (1) and (2) using brake cleaner and apply a thin coat of brake pad paste.



- 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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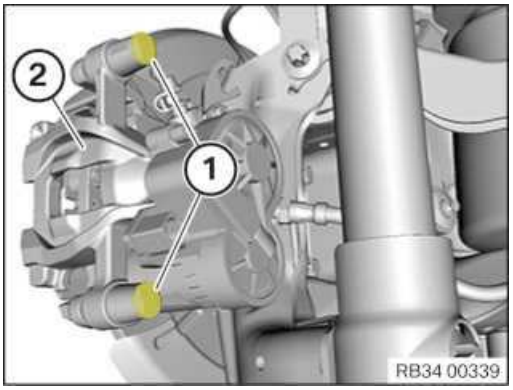
- Apply a thin coat of brake pad paste to the T-head of the inner brake pad in the areas (1) and (2).

7 – Install rear brake pads



- Mount brake pads (1).

  Brake pad with retaining springs (2) must be installed on the piston side.

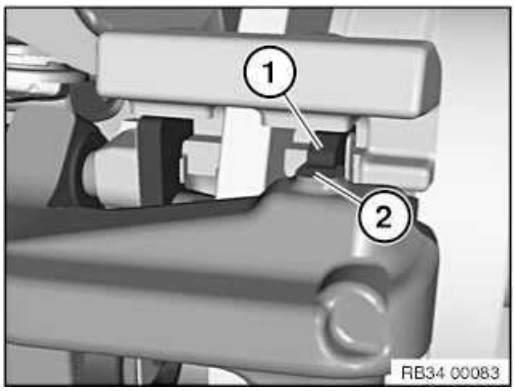


- Remove the special tool (cable strap) **2 413 317**.
- Mount brake caliper (2).
- Insert guide bolts and tighten.

Guide bolt (brake caliper on caliper carrier)

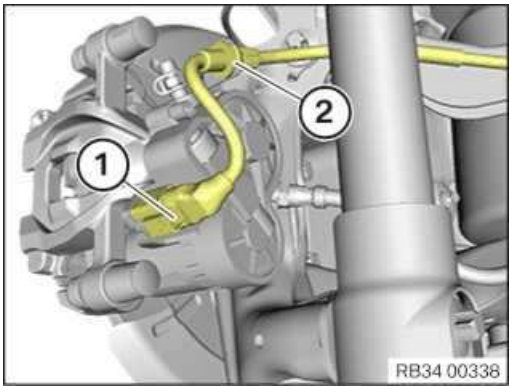
M8		Tightening torque	30 Nm

- Mount cover plug (1).



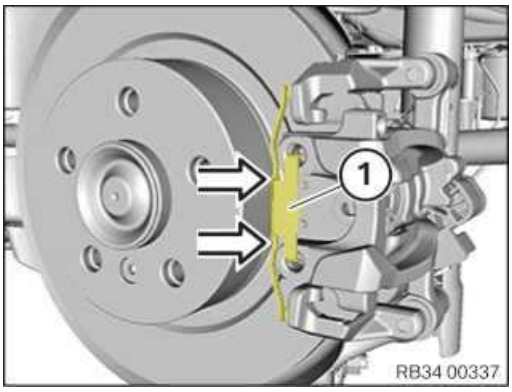
- When putting on the brake caliper, it is absolutely necessary to make sure that the T-head (1) of the outer brake pad is seated correctly on the contact surface (2).

  Above all, ensure the installation position of the outer brake pad to the contact surface (2) in brake pads that have worn out partially!



- Attach cable to the bracket (2).
- Position and lock the plug connection (1).

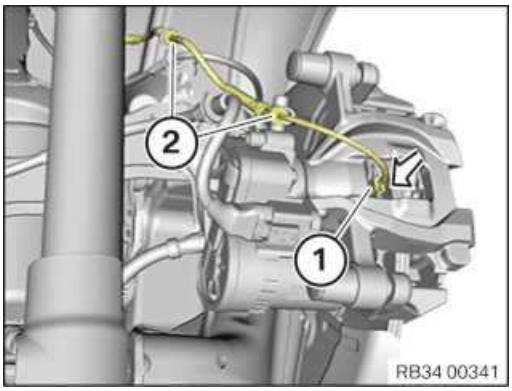
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- Mount retaining spring (1).

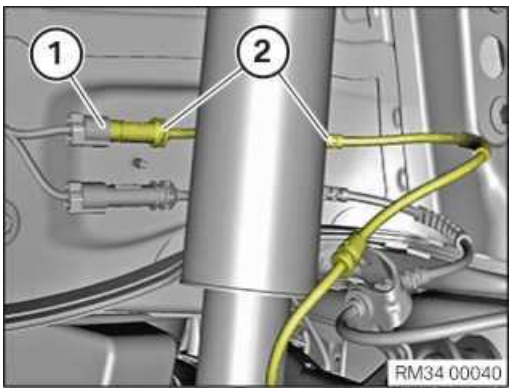
  Ensure the retaining spring is fits securely.

8 – Install rear brake pad sensor



- Install brake pad wear sensor (1) 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 sensor in brackets (2).



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

9 – Installing both rear wheels

▶ **Mounting the wheel**

▷ **Clean the contact surfaces between the brake disc and the wheel rim**



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.

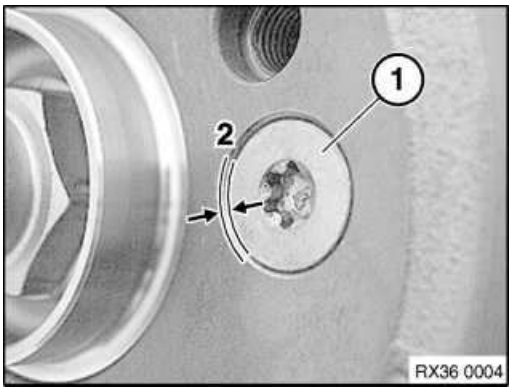
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- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool **2 344 011**.

  Do not operate special tool **2 344 011** with an impact screwdriver.

- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).



- Renew mounting bolt (1).

  Parts: Mounting bolt

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

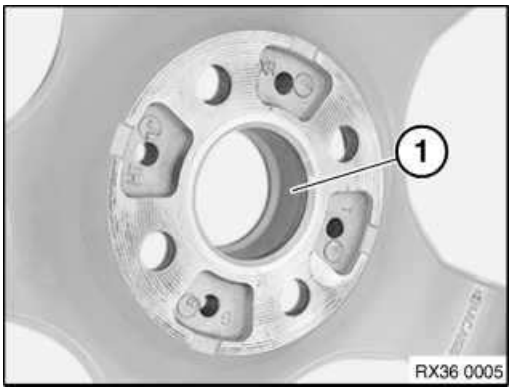
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm



- Lightly grease the wheel centring (1) in the wheel rim; refer to additional information for grease for the wheel centring (1).

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

Wheel bolts

M 14/AF 17	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

10 – 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.

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Additional Information

Overview of Tightening Torques

Guide bolt (brake caliper on caliper carrier)

Used in step 7

M8		Tightening torque	30 Nm

Brake disc to rear wheel hub

Used in step 9

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to front wheel hub

Used in step 9

M8	Renew screw.	Tightening torque	16 Nm

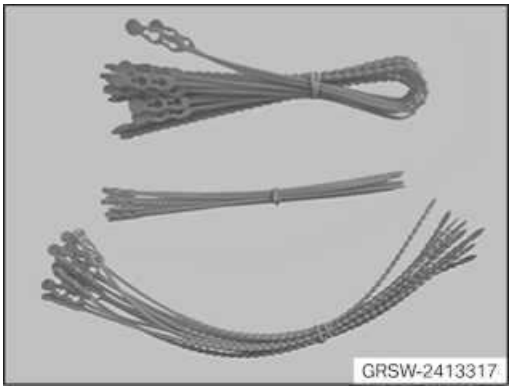
Wheel bolts

Used in step 9

M 14/AF 17	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 3 7

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

2 344 011 Tool



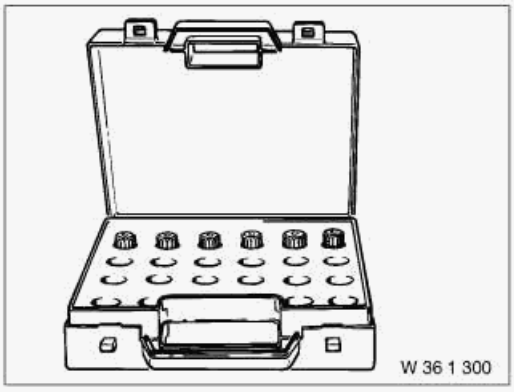
Common Used in step 9

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:

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0 495 221 (36 1 323) Wheel stud



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

0 495 224 (36 1 326) Wheel stud



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

0 495 225 (36 1 327) Wheel stud



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

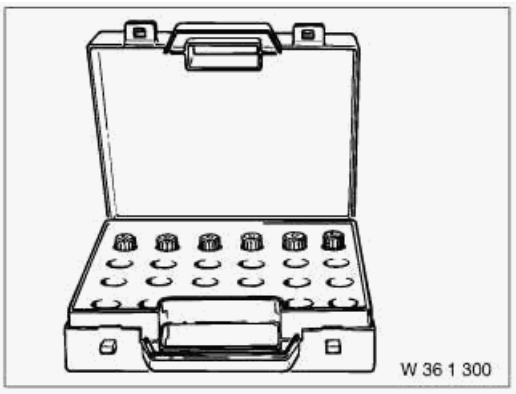
0 495 226 (36 1 328) Wheel stud



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

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0 495 227 (36 1 329) Wheel stud



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

0 495 228 (36 1 331) Wheel stud



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

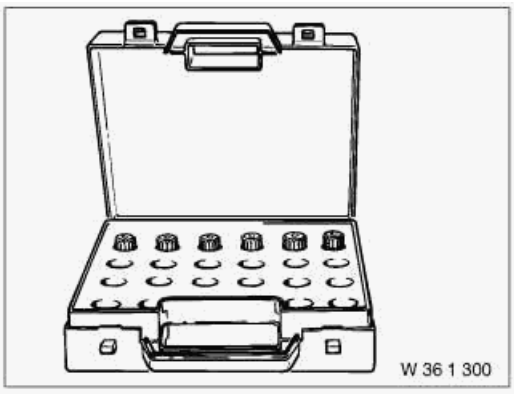
0 495 229 (36 1 332) Wheel stud



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

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0 495 230 (36 1 333) Wheel stud



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

Overview Technical Data

Minimum brake disc thickness (nominal dimension 300x20)	Used in step 4
Minimum brake disc thickness (brake disc 300x20)	18,4 mm

Links

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

Operating materials	Used in step
2.0 Grease for wheel centring	9

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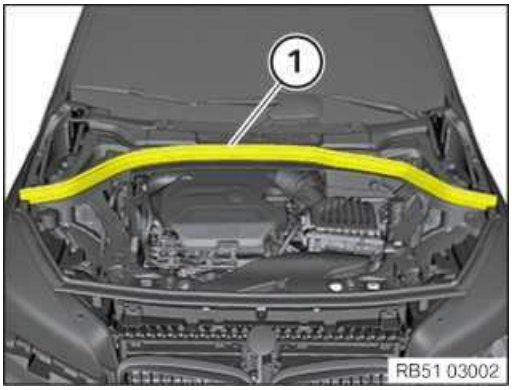
34 31 505 Removing and installing/replacing the tandem brake master cylinder (motor vehicles with AT)

PRELIMINARY WORK

1 – Remove the seal for the rear bonnet

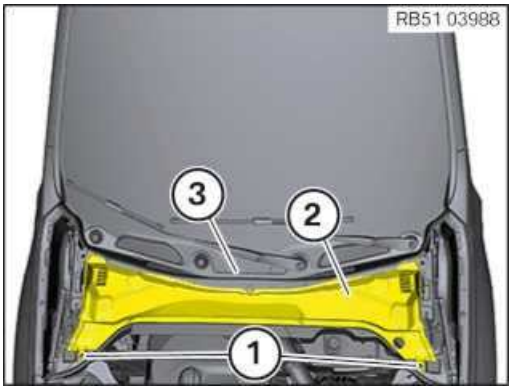
NOTICE

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



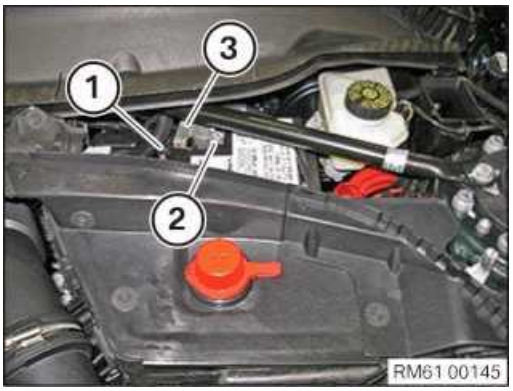
- Pull off rear bonnet seal (1) towards the top and remove.

2 – Removing front cowl panel cover



- Loosen the expanding rivet (1).
- Feed out and remove front cowl panel cover (2) from the rear cowl panel cover(3).

3 – Disconnecting the battery earth lead



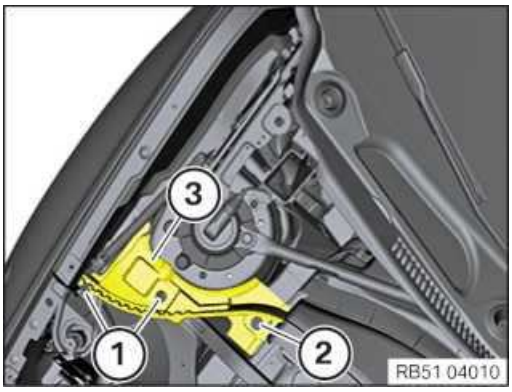
- Unlock plug connection (1) and disconnect.
- Unfasten nut (2).
- Remove the battery earth lead (3) and secure to one side.

4 – Remove suspension cross-brace

TECHNICAL INFORMATION

Driving without the strut brace/front end or tension strut is not permitted.

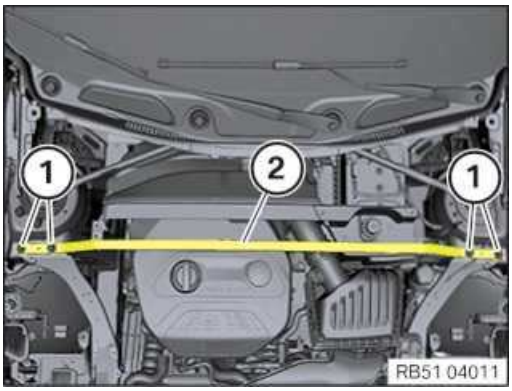
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NOTICE

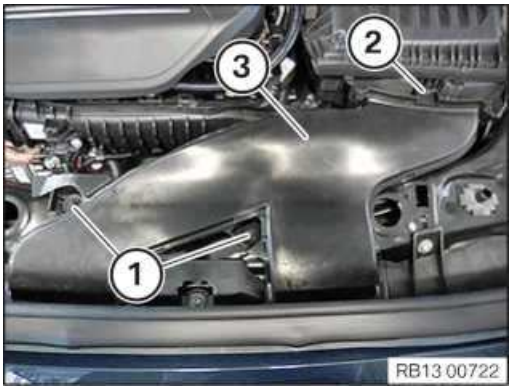
Description is for right component only. The procedure on the left side is identical.

- Loosen expanding rivet (1).
- Loosen screw (2).
- Remove the cover (3).



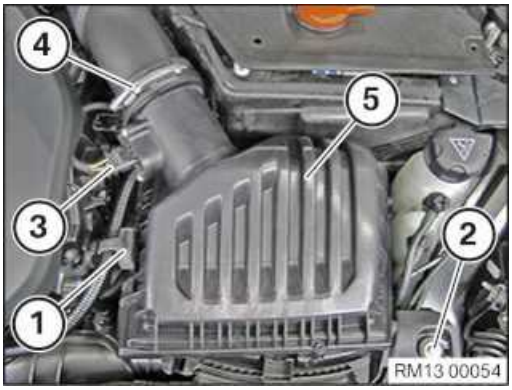
- Loosen screws (1).
- Remove strut brace (2).

5 – Remove the intake neck for intake silencer housing



- Loosen nuts (1).
- Loosen the lock (2).
- Guide the intake neck (3) out and remove it.

6 – Removing intake silencer housing



- Loosen the holder (1).
- Loosen screw (2).
- Unlock and loosen connector (3).
- Unfasten clamp (4).
- Pull out and remove the intake silencer housing (5) from the rubber mounts towards the top.

7 – Remove vehicle battery

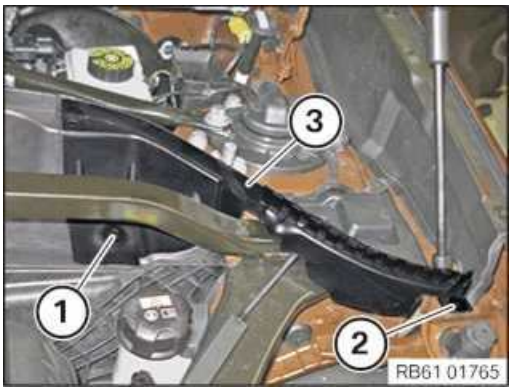
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WARNING

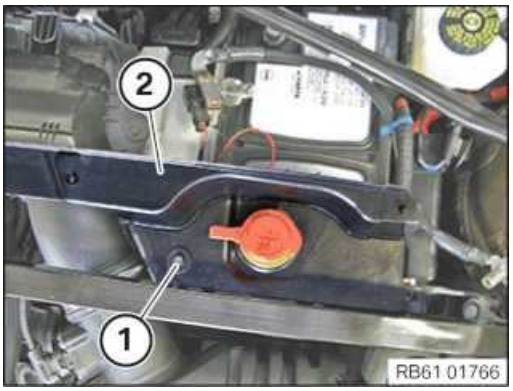
Working on 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

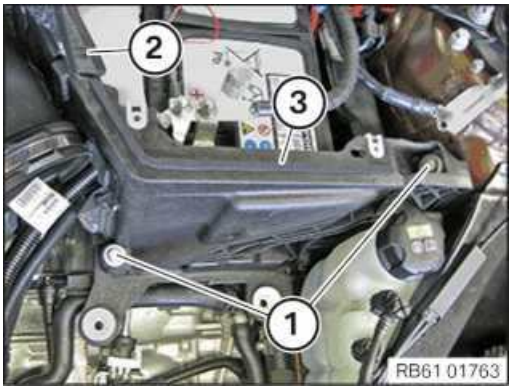
- Detach battery earth lead from battery.
- For additional batteries: Detach all battery earth leads from additional batteries.



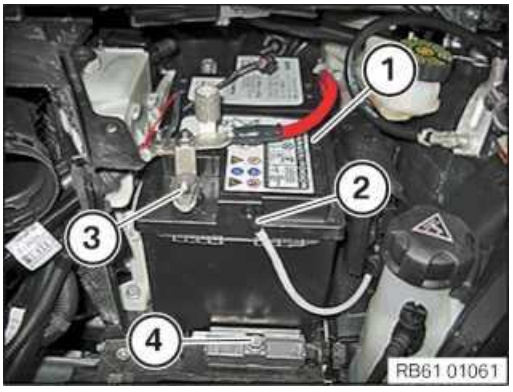
- Release the screw (1) and the expanding rivet (2).
- Remove the fixture for the gasket (3).



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



- Loosen screws (1).
- Unscrew the bolt (2) and guide the tension strut (3) out.



- Pull off the vent hose (2).
- Slacken the nut (3) on the positive battery terminal and remove the positive battery terminal.

WARNING

Unprotected battery terminals.

Risk of short circuits! Risk of fire!

- Cover the vehicle battery.

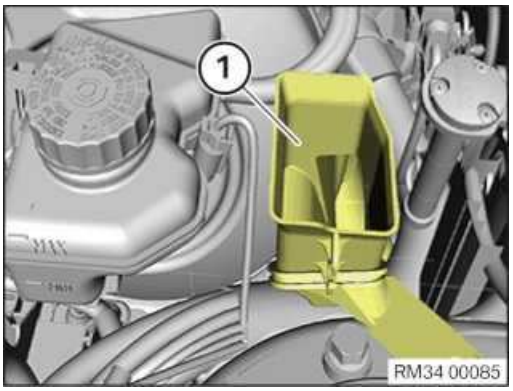
- Loosen the screw (4) and remove the holder.
- Remove vehicle battery (1).

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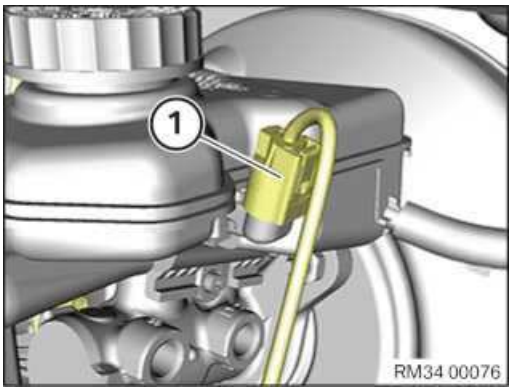
8 – Remove the expansion tank (vehicle with automatic transmission)

Prerequisite

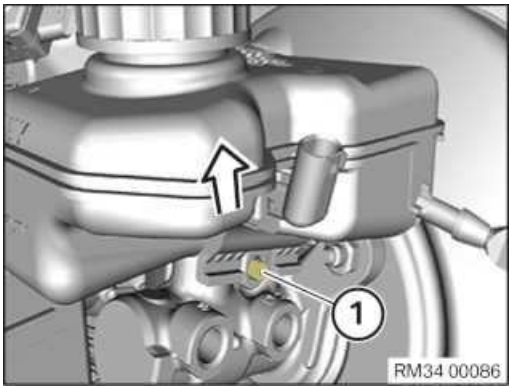
Brake fluid has been drawn off.



- Remove the water drain channel (1).



- Disconnect plug connection (1).

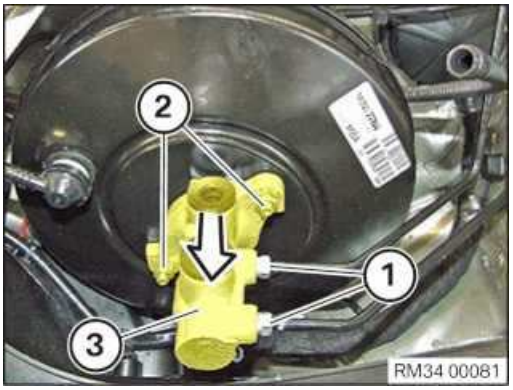


- Loosen screw (1).
- Remove expansion tank upwards.

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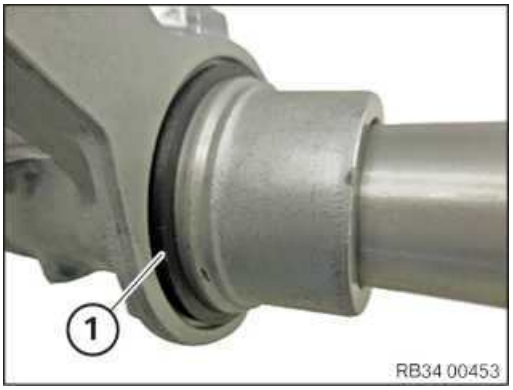
MAIN WORK

9 – Remove the tandem brake master cylinder.



- (1)Unfasten brake lines.
- Loosen nuts (2) and remove tandem brake master cylinder (3).

10 – Preparations for installing the tandem brake master cylinder



- Renew sealing ring (1).

  Parts: Sealing ring

11 – 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

- (3)Fit brake lines () and tighten.

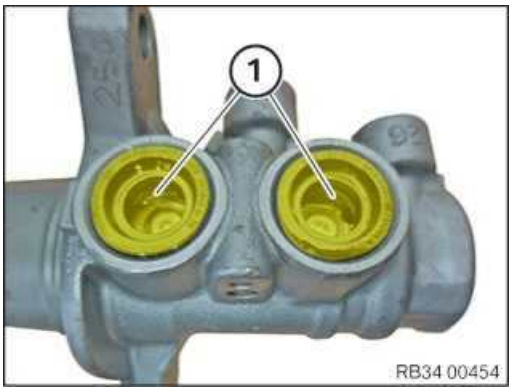
Brake pipe screw connection / Union screws

	17 Nm

POSTPROCESSES

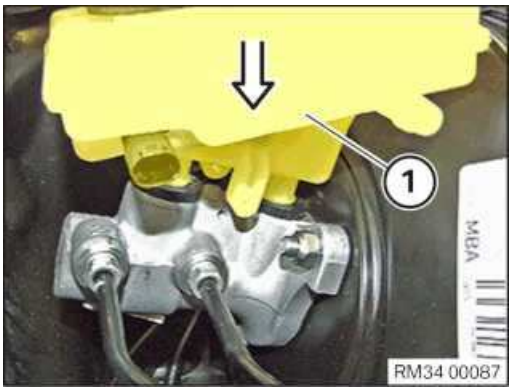
12 – Installing the expansion tank (vehicles with automatic transmission)

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- Renew rubber plugs(1).

  Parts: Rubber plug

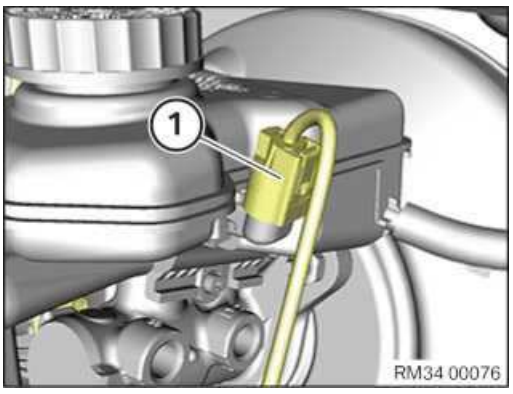


- Connect expansion tank (1) to the tandem brake master cylinder.
- Renew the retaining screw.

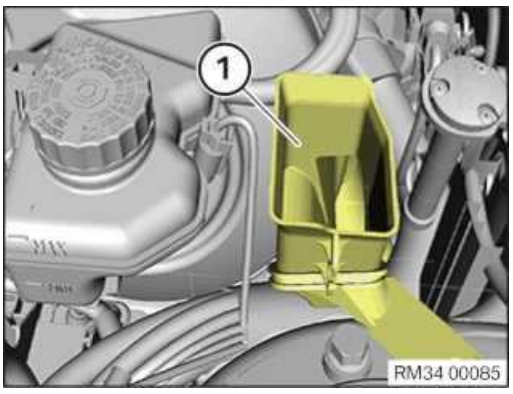
  Parts: Retaining screw
- Attach retaining screw and tighten.

Retaining screw, expansion tank to tandem brake master cylinder

	Renew screw.	4 Nm

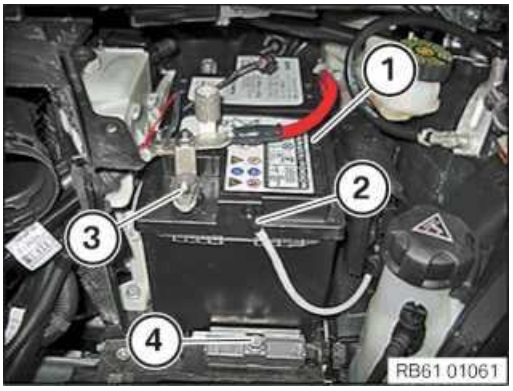


- Connect the plug connection (1).



- Install the water drain channel (1).

13 – Install vehicle battery



- Install vehicle battery (1).
- Position the bracket and tighten with the screw (4) .

Battery terminal rail to battery tray

M8		19 Nm

- Position the vent hose (2) and clip it in.
- Position the positive battery terminal and tighten with the nut (3) .

Battery terminal with IBS positive battery terminal / negative battery terminal

NutM6		5 Nm

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▸ **Check the vent holes of the battery**

WARNING

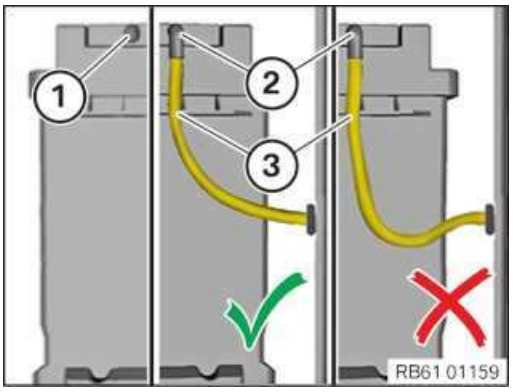
Gas emission.

Danger of injury! Danger of explosion!

- Assign the vent holes correctly.
- Route the vent hose correctly.

TECHNICAL INFORMATION

The battery has two vent holes, opposite:
One vent hole (1) must be closed correctly with a dummy plug.
The vent hose (3) must be correctly connected and routed at the other vent hole (2).



Check

- Check if the vent hole (1) is correctly closed with a dummy plug.

Result

» No dummy plug.

Measure

- Close the vent hole (1) correctly with a dummy plug.

Check

- Check if the vent hole (2) has a correctly connected vent hose (3).

Result

» The vent hose (3) is not correctly connected.

Measure

- At the vent hole (2), connect the vent hose (3) correctly.

Check

- Check if the vent hose (3) is routed to the outside with a downhill gradient (**no siphon formation!**).

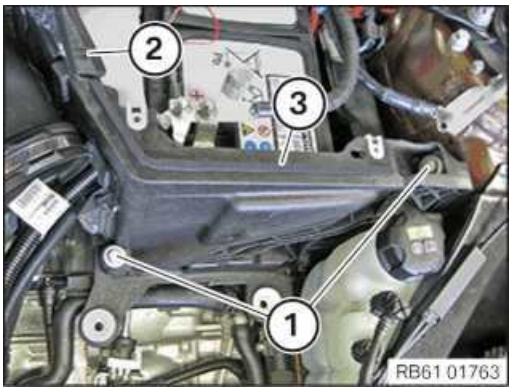
Result

» The vent hose (3) is not correctly routed as shown in the image on the right.

Measure

- Route the vent hose (3) correctly as shown in the centre image.

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- Insert tension strut (3) and tighten with screws (1).

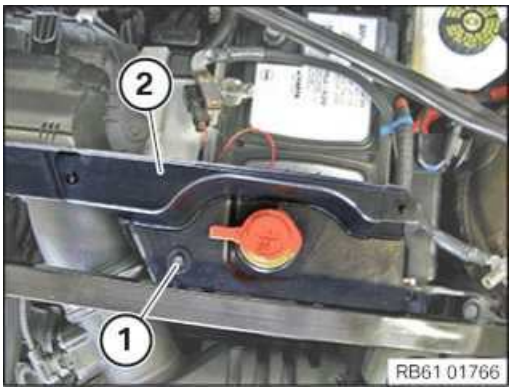
Trailing link

M8		Tightening torque	19 Nm

- Tighten down screw (2).

Battery cover

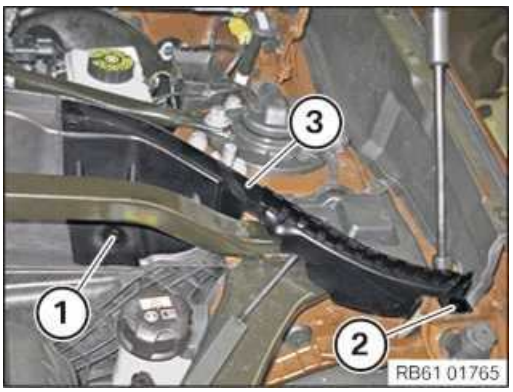
M8		2,8 Nm



- Position the cover (2).
- Tighten down screw (1).

Battery cover

M8		2,8 Nm

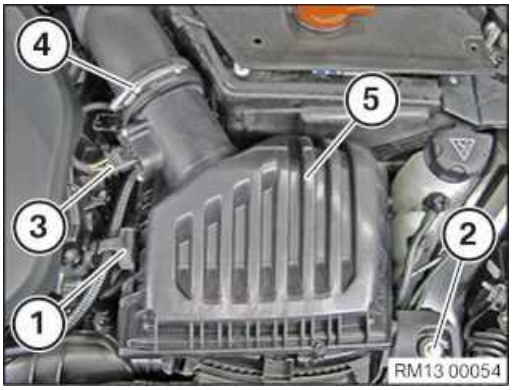


- Position the fixture for the gasket (3) and secure with the expanding rivet (2).
- Tighten down screw (1).

Battery cover

M8		2,8 Nm

14 – Installing intake silencer housing



- Insert the intake silencer housing (5) into the rubber mounts and install it.

  Intake filter housing (5) must engage audibly.
- Tighten down screw (2).

Intake silencer housing to lock bridge

M6X30		Tightening torque	8 Nm

- Tighten clamp (4).

Clean air pipe to intake silencer housing

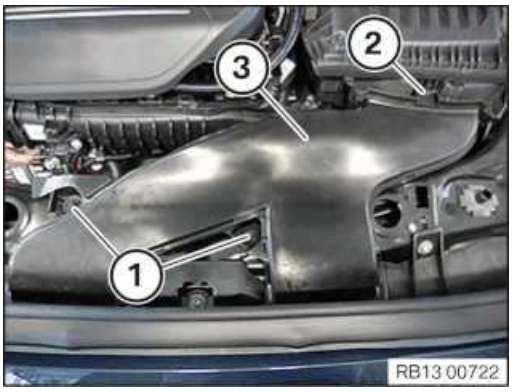
Clamp		Tightening torque	3 Nm

- Connect and lock the connector (3).

  The connector (3) must engage audibly.
- Insert and install the holder (1).

15 – Install the intake neck for the intake filter housing

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- Insert and install the intake neck (3).

  The lock (2) must audibly engage.
- Tighten nuts (1).

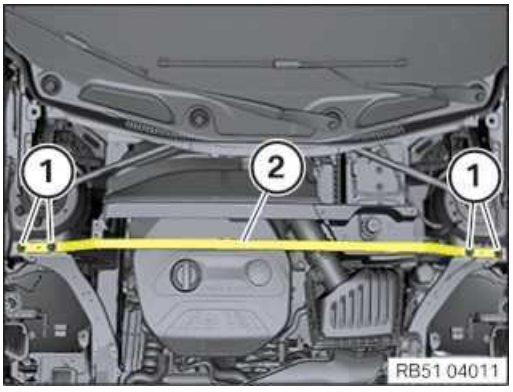
Intake neck to cross connection

M6		Tightening torque	8 Nm

16 – Install strut brace

TECHNICAL INFORMATION

Driving without the strut brace/front end or tension strut is not permitted.

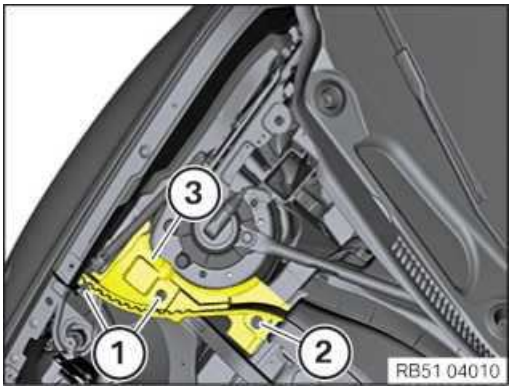


- Install the strut brace (2).
- Renew screws (1).

  Parts: Bolts
- Tighten the screws (1).

Cross-brace to spring strut dome

	Renew screw.	Jointing torque	28 Nm
		Angle of rotation	180 °



NOTICE

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

- Install the cover (3).
- Tighten down screw (2).

Cover on body

Hexagon screw		Tightening torque	3 Nm

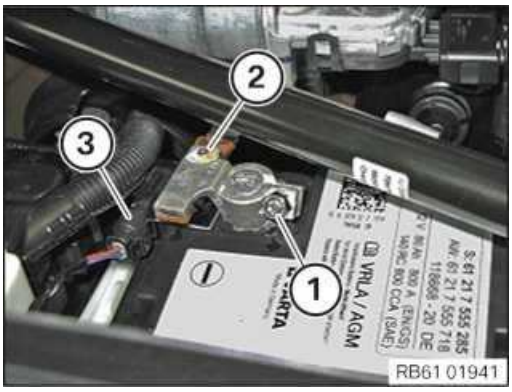
- Install the expanding rivet (1).

17 – Connecting the battery earth lead

TECHNICAL INFORMATION

For additional information see:
61 00 ... Safety information on handling the vehicle battery
61 00 / 12 00 ... Notes on disconnecting and connecting the vehicle battery
61 12 ... Notes on the intelligent battery sensor (IBS)

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- Remove the protective cover of the positive battery terminal.
- Position the battery earth lead (2).
- Tighten nut (1).

Battery terminal with IBS positive battery terminal / negative battery terminal

NutM6		5 Nm

- If required, connect the connector (3).

18 – Connect the bleeder unit for brake fluid (following repair)





- 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.

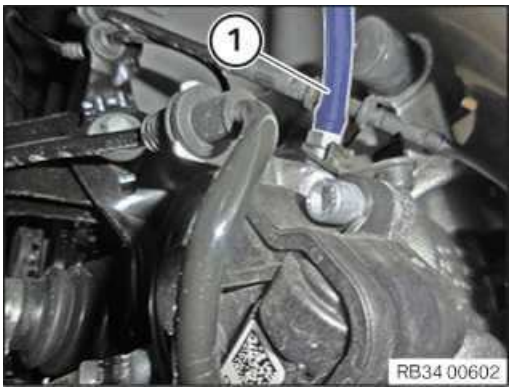
  Observe the operating instructions of the corresponding equipment manufacturer.
- **Do not exceed the filling pressure of** 2 bar**.**

19 – 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.

20 – 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

21 – Finalize the bleeder unit for brake fluid (following repair)

RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.



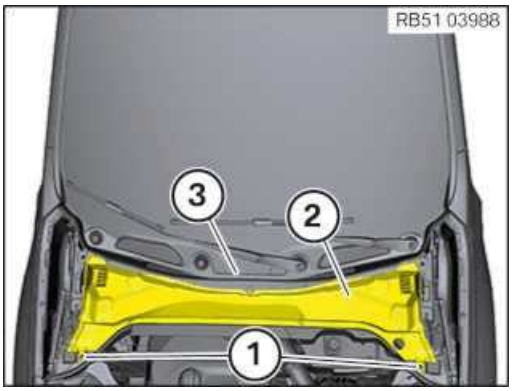
- Switch off bleeder unit (1) and remove from brake fluid expansion tank .
- Check the brake fluid level; if necessary, adjust to maximum mark.

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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.

22 – Installing front cowl panel cover

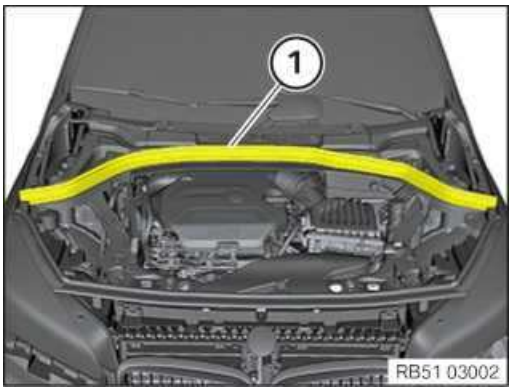


- Insert and install cowl panel cover at front (2) into cowl panel cover at rear (3).
- Check cowl panel cover at front is correctly seated (2).
- Secure expanding rivet (1).

23 – Install the seal for the bonnet

NOTICE

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



- Install bonnet seal at rear (1).
- Ensure that the rear bonnet seal (1) is fitted correctly.

Additional Information

Overview of Tightening Torques

Tandem brake master cylinder in the brake booster — Used in step 11

Replace nuts.

M8		23 Nm

Brake pipe screw connection / Union screws — Used in step 11

		17 Nm

Retaining screw, expansion tank to tandem brake master cylinder — Used in step 12

	Renew screw.	4 Nm

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Battery terminal rail to battery tray — Used in step 13

M8			19 Nm

Battery terminal with IBS positive battery terminal / negative battery terminal — Used in step 13 17

NutM6			5 Nm

Trailing link — Used in step 13

M8		Tightening torque	19 Nm

Battery cover — Used in step 13

M8			2,8 Nm

Intake silencer housing to lock bridge — Used in step 14

M6X30		Tightening torque	8 Nm

Clean air pipe to intake silencer housing — Used in step 14

Clamp		Tightening torque	3 Nm

Intake neck to cross connection — Used in step 15

M6		Tightening torque	8 Nm

Cross-brace to spring strut dome — Used in step 16

	Renew screw.	Jointing torque	28 Nm
		Angle of rotation	180 °

Cover on body — Used in step 16

Hexagon screw		Tightening torque	3 Nm

Vent valve — Used in step 19 20

		Tightening torque	10 Nm

Links

General repair instructions	Used in step
61 20 ... Notes on AGM battery	17
61 12 ... Notes on intelligent battery sensor (IBS)	17
61 00 ... Notes for disconnecting and connecting battery	17
61 00 ... Safety information for handling vehicle battery	

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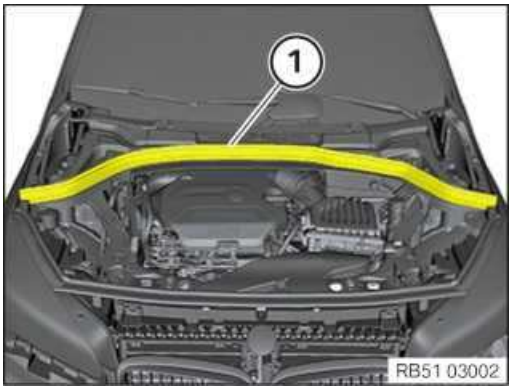
34 31 505 Removing and installing/replacing the tandem brake master cylinder (vehicles with manual gearbox)

PRELIMINARY WORK

1 – Remove the seal for the rear bonnet

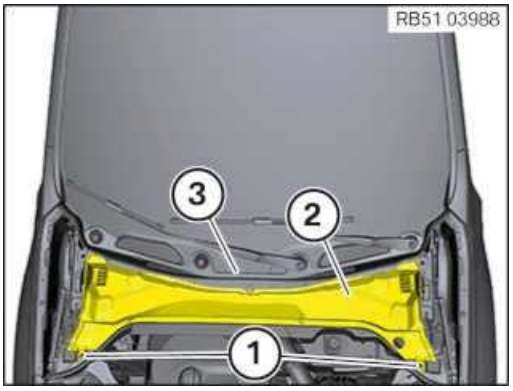
NOTICE

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



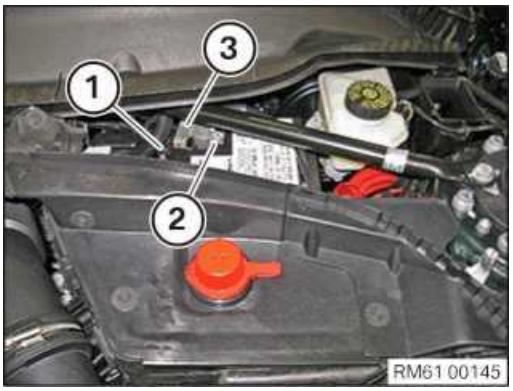
- Pull off rear bonnet seal (1) towards the top and remove.

2 – Removing front cowl panel cover



- Loosen the expanding rivet (1).
- Feed out and remove front cowl panel cover (2) from the rear cowl panel cover(3).

3 – Disconnecting the battery earth lead



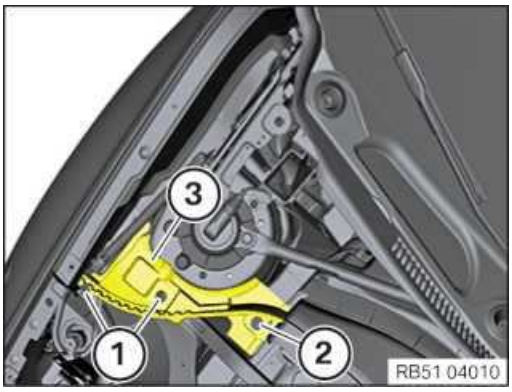
- Unlock plug connection (1) and disconnect.
- Unfasten nut (2).
- Remove the battery earth lead (3) and secure to one side.

4 – Remove suspension cross-brace

TECHNICAL INFORMATION

Driving without the strut brace/front end or tension strut is not permitted.

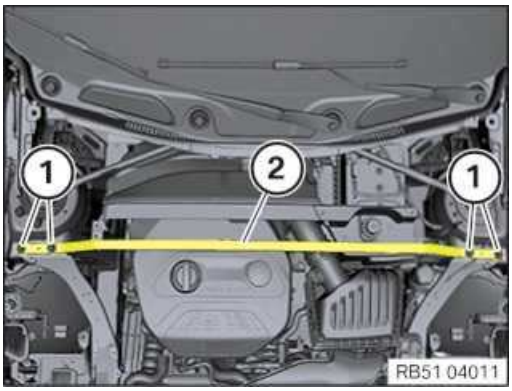
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NOTICE

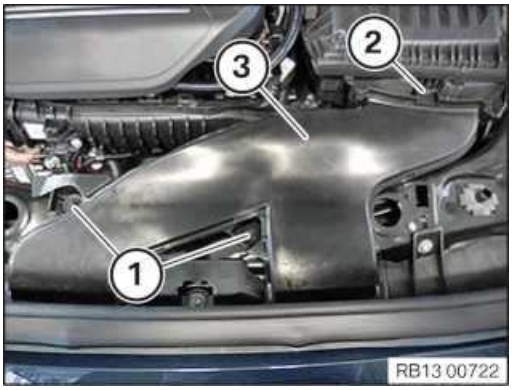
Description is for right component only. The procedure on the left side is identical.

- Loosen expanding rivet (1).
- Loosen screw (2).
- Remove the cover (3).



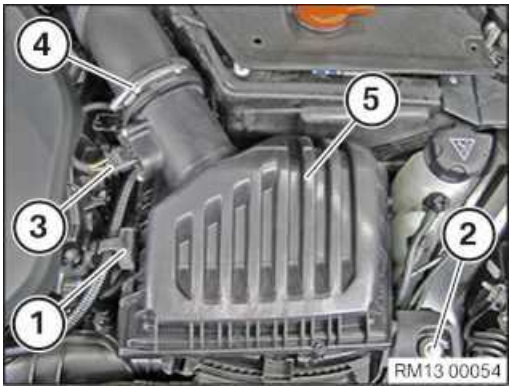
- Loosen screws (1).
- Remove strut brace (2).

5 – Remove the intake neck for intake silencer housing



- Loosen nuts (1).
- Loosen the lock (2).
- Guide the intake neck (3) out and remove it.

6 – Removing intake silencer housing



- Loosen the holder (1).
- Loosen screw (2).
- Unlock and loosen connector (3).
- Unfasten clamp (4).
- Pull out and remove the intake silencer housing (5) from the rubber mounts towards the top.

7 – Remove vehicle battery

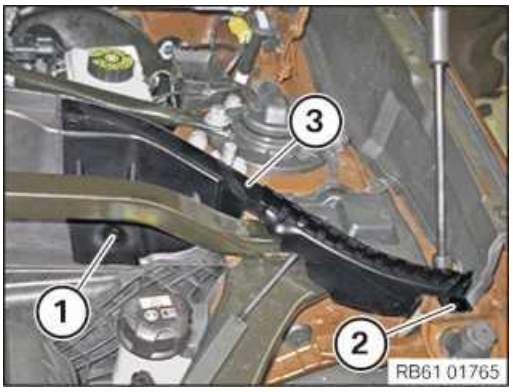
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WARNING

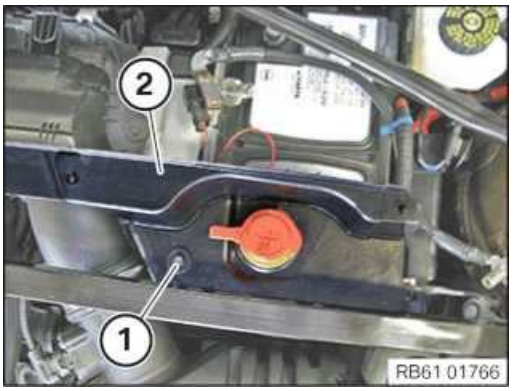
Working on 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

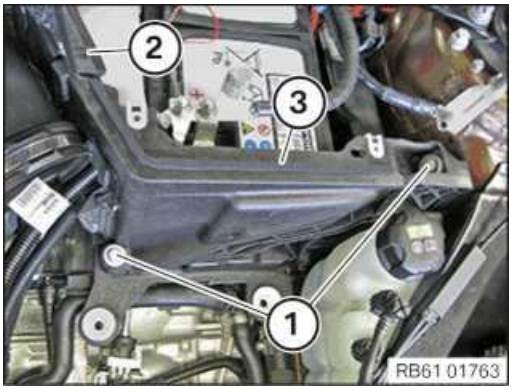
- Detach battery earth lead from battery.
- For additional batteries: Detach all battery earth leads from additional batteries.



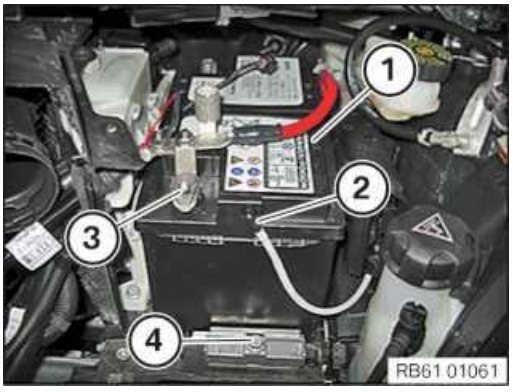
- Release the screw (1) and the expanding rivet (2).
- Remove the fixture for the gasket (3).



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



- Loosen screws (1).
- Unscrew the bolt (2) and guide the tension strut (3) out.



- Pull off the vent hose (2).
- Slacken the nut (3) on the positive battery terminal and remove the positive battery terminal.

WARNING

Unprotected battery terminals.

Risk of short circuits! Risk of fire!

- Cover the vehicle battery.

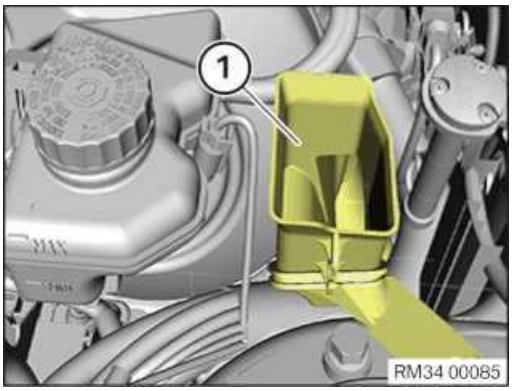
- Loosen the screw (4) and remove the holder.
- Remove vehicle battery (1).

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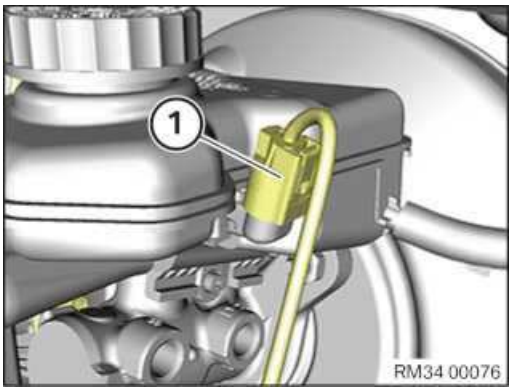
8 – Removing expansion tank (vehicles with manual gearbox)

Prerequisite

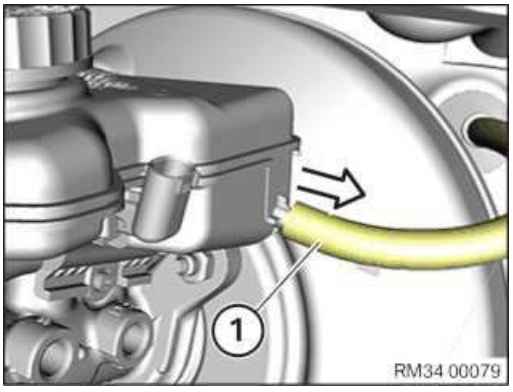
Brake fluid has been drawn off.



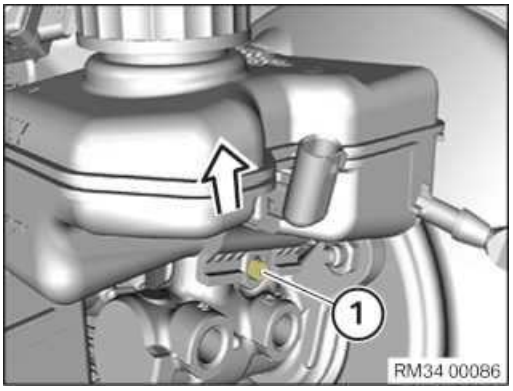
- Remove the water drain channel (1).



- Disconnect plug connection (1).



- Pull off feed line (1) for the clutch hydraulic system in the direction of arrow.

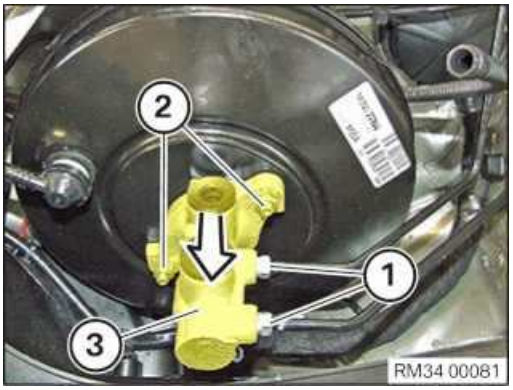


- Loosen screw (1).
- Remove expansion tank upwards.

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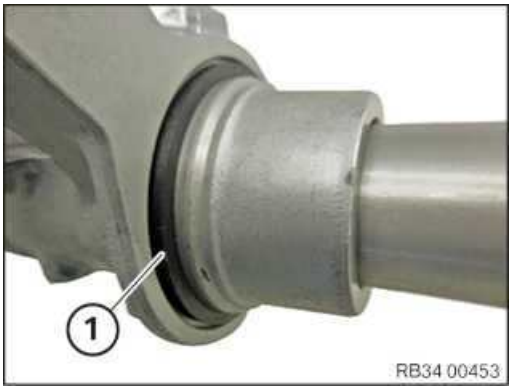
MAIN WORK

9 – Remove the tandem brake master cylinder.



- (1)Unfasten brake lines.
- Loosen nuts (2) and remove tandem brake master cylinder (3).

10 – Preparations for installing the tandem brake master cylinder



- Renew sealing ring (1).

  Parts: Sealing ring

11 – 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

- (3)Fit brake lines () and tighten.

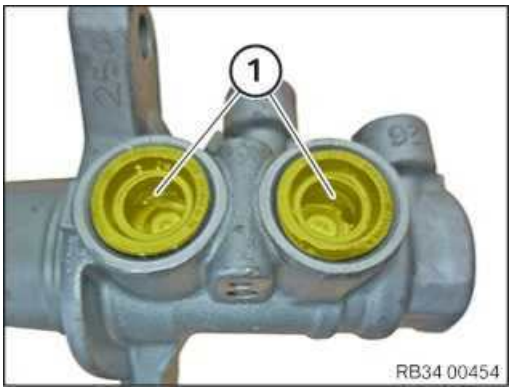
Brake pipe screw connection / Union screws

	17 Nm

POSTPROCESSES

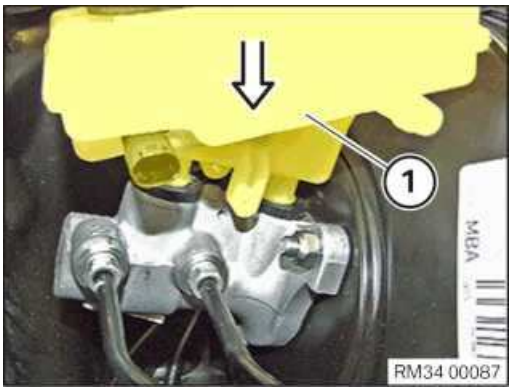
12 – Installing the expansion tank (vehicles with manual gearbox)

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- Renew rubber plugs(1).

  Parts: Rubber plug

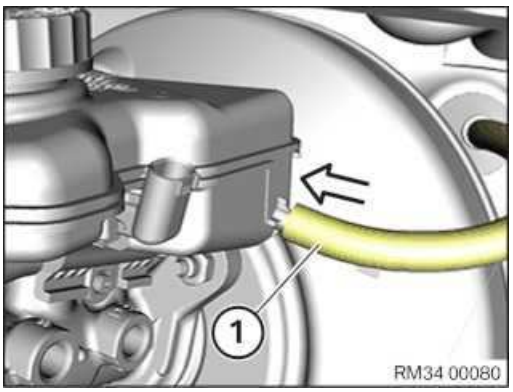


- Connect expansion tank (1) to the tandem brake master cylinder.
- Renew the retaining screw.

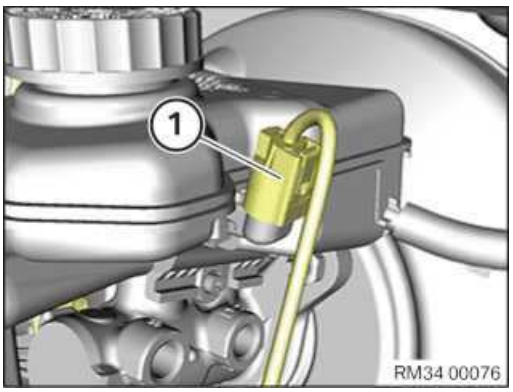
  Parts: Retaining screw
- Attach retaining screw and tighten.

Retaining screw, expansion tank to tandem brake master cylinder

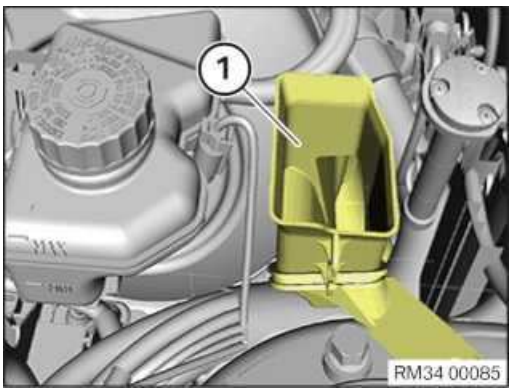
	Renew screw.	4 Nm



- Connect the feed line (1) for the clutch hydraulic system in the direction of arrow.



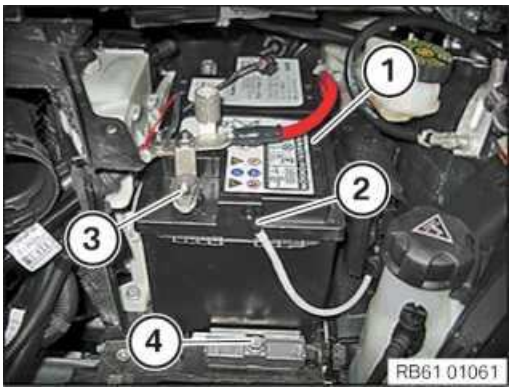
- Connect the plug connection (1).



- Install the water drain channel (1).

13 – Install vehicle battery

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- Install vehicle battery (1).
- Position the bracket and tighten with the screw (4) .

Battery terminal rail to battery tray

M8		19 Nm

- Position the vent hose (2) and clip it in.
- Position the positive battery terminal and tighten with the nut (3) .

Battery terminal with IBS positive battery terminal / negative battery terminal

NutM6		5 Nm

▸ **Check the vent holes of the battery**

WARNING

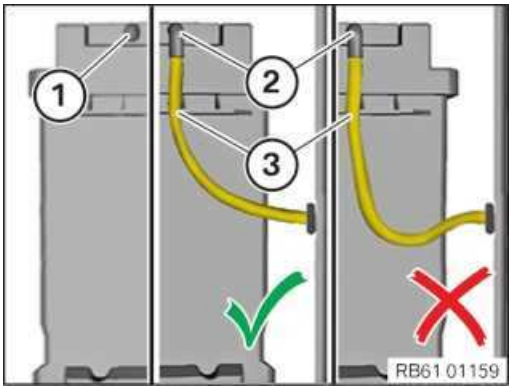
Gas emission.

Danger of injury! Danger of explosion!

- Assign the vent holes correctly.
- Route the vent hose correctly.

TECHNICAL INFORMATION

The battery has two vent holes, opposite:
One vent hole (1) must be closed correctly with a dummy plug.
The vent hose (3) must be correctly connected and routed at the other vent hole (2).



Check

- Check if the vent hole (1) is correctly closed with a dummy plug.

Result

» No dummy plug.

Measure

- Close the vent hole (1) correctly with a dummy plug.

Check

- Check if the vent hole (2) has a correctly connected vent hose (3).

Result

» The vent hose (3) is not correctly connected.

Measure

- At the vent hole (2), connect the vent hose (3) correctly.

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Check

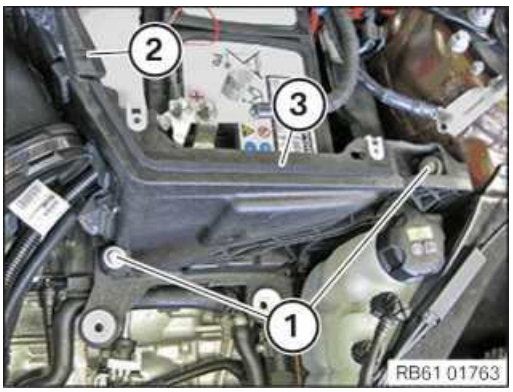
- Check if the vent hose (3) is routed to the outside with a downhill gradient (**no siphon formation!**).

Result

» The vent hose (3) is not correctly routed as shown in the image on the right.

Measure

- Route the vent hose (3) correctly as shown in the centre image.



- Insert tension strut (3) and tighten with screws (1).

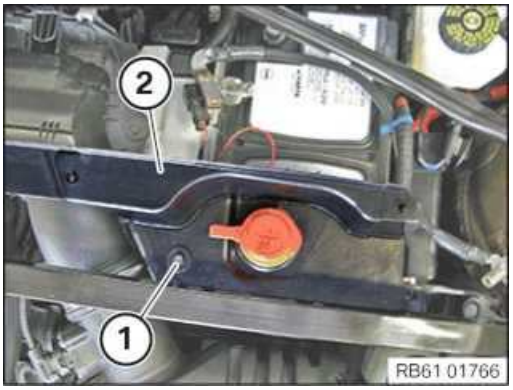
Trailing link

M8		Tightening torque	19 Nm

- Tighten down screw (2).

Battery cover

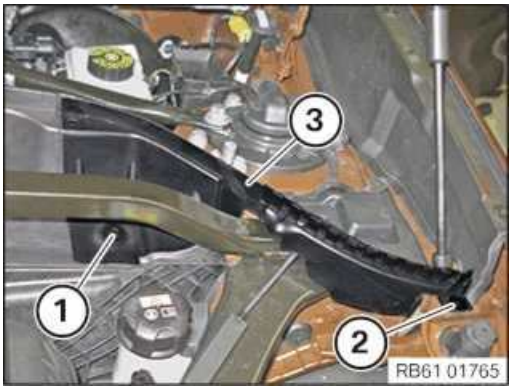
M8		2,8 Nm



- Position the cover (2).
- Tighten down screw (1).

Battery cover

M8		2,8 Nm



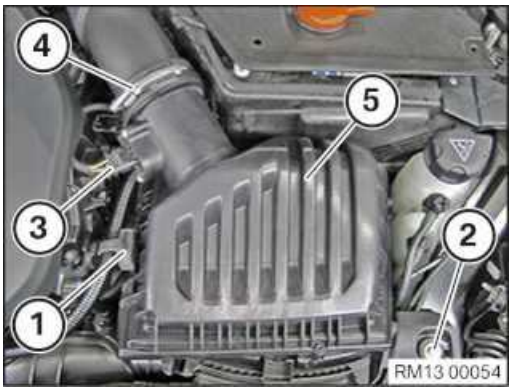
- Position the fixture for the gasket (3) and secure with the expanding rivet (2).
- Tighten down screw (1).

Battery cover

M8		2,8 Nm

14 – Installing intake silencer housing

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- Insert the intake silencer housing (5) into the rubber mounts and install it.
  Intake filter housing (5) must engage audibly.
- Tighten down screw (2).

Intake silencer housing to lock bridge

M6X30		Tightening torque	8 Nm

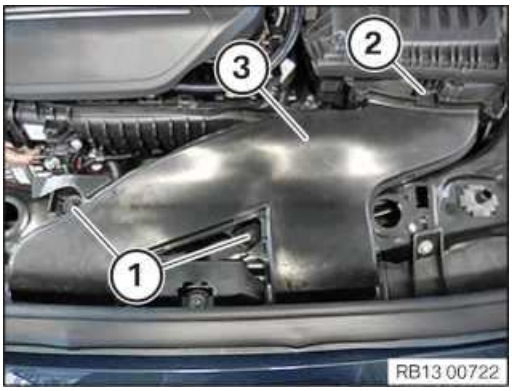
- Tighten clamp (4).

Clean air pipe to intake silencer housing

Clamp		Tightening torque	3 Nm

- Connect and lock the connector (3).
  The connector (3) must engage audibly.
- Insert and install the holder (1).

15 – Install the intake neck for the intake filter housing



- Insert and install the intake neck (3).
  The lock (2) must audibly engage.
- Tighten nuts (1).

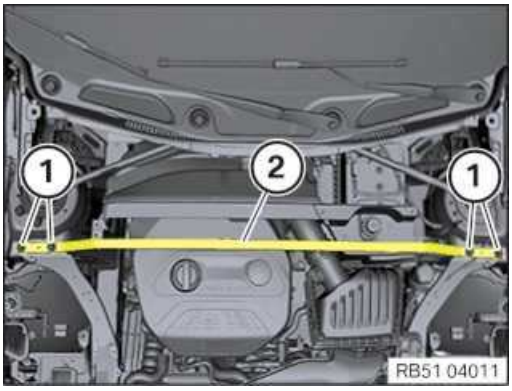
Intake neck to cross connection

M6		Tightening torque	8 Nm

16 – Install strut brace

TECHNICAL INFORMATION

Driving without the strut brace/front end or tension strut is not permitted.

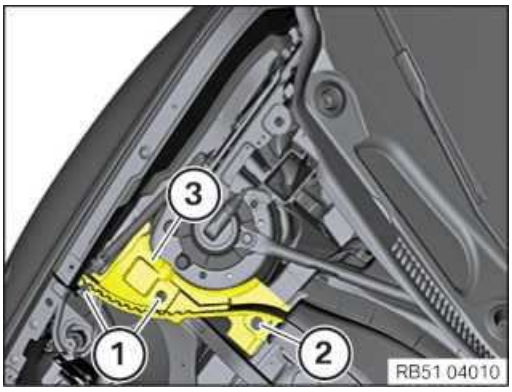


- Install the strut brace (2).
- Renew screws (1).
  Parts: Bolts
- Tighten the screws (1).

Cross-brace to spring strut dome

	Renew screw.	Jointing torque	28 Nm
		Angle of rotation	180 °

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NOTICE

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

- Install the cover (3).
- Tighten down screw (2).

Cover on body

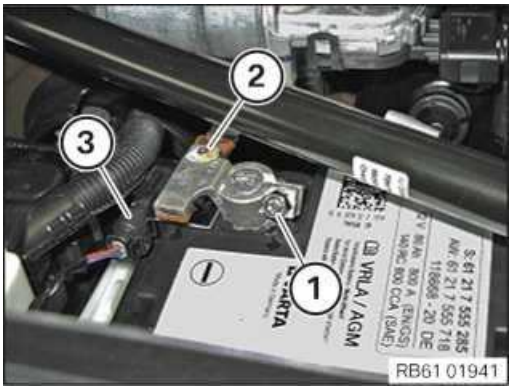
Hexagon screw		Tightening torque	3 Nm

- Install the expanding rivet (1).

17 – Connecting the battery earth lead

TECHNICAL INFORMATION

For additional information see:
61 00 ... Safety information on handling the vehicle battery
61 00 / 12 00 ... Notes on disconnecting and connecting the vehicle battery
61 12 ... Notes on the intelligent battery sensor (IBS)



- Remove the protective cover of the positive battery terminal.
- Position the battery earth lead (2).
- Tighten nut (1).

Battery terminal with IBS positive battery terminal / negative battery terminal

NutM6			5 Nm

- If required, connect the connector (3).

18 – Connect the bleeder unit for brake fluid (following repair)



- 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.

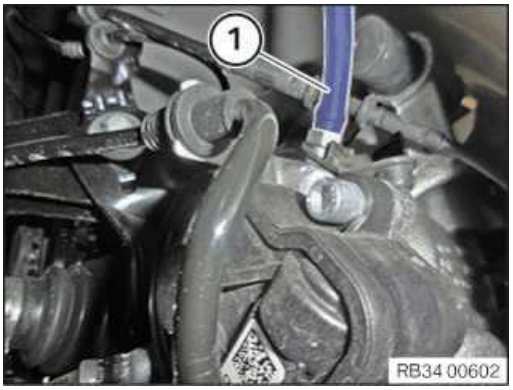
  Observe the operating instructions of the corresponding equipment manufacturer.

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

19 – 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.

20 – Flushing and bleeding the front 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 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

21 – Finalize the bleeder unit for brake fluid (following repair)

RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.

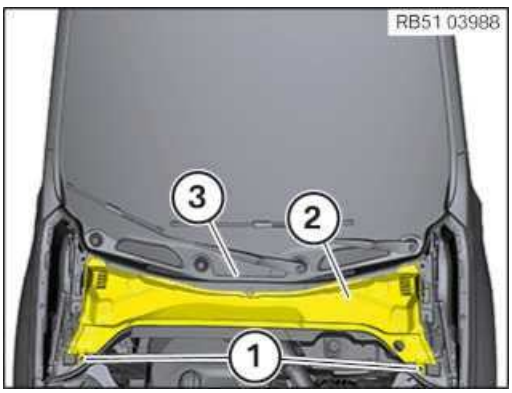


- Switch off bleeder unit (1) and remove from brake fluid expansion tank .
- Check the brake fluid level; if necessary, adjust to maximum mark.



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

22 – Installing front cowl panel cover



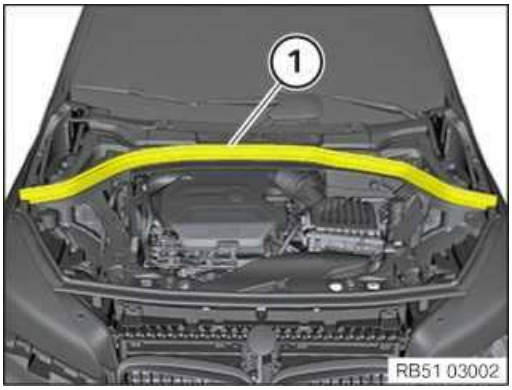
- Insert and install cowl panel cover at front (2) into cowl panel cover at rear (3).
- Check cowl panel cover at front is correctly seated (2).
- Secure expanding rivet (1).

23 – Install the seal for the bonnet

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NOTICE

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



- Install bonnet seal at rear (1).
- Ensure that the rear bonnet seal (1) is fitted correctly.

Additional Information

Overview of Tightening Torques

Tandem brake master cylinder in the brake booster — Used in step 11

Replace nuts.

M8		23 Nm

Brake pipe screw connection / Union screws — Used in step 11

		17 Nm

Retaining screw, expansion tank to tandem brake master cylinder — Used in step 12

	Renew screw.	4 Nm

Battery terminal rail to battery tray — Used in step 13

M8		19 Nm

Battery terminal with IBS positive battery terminal / negative battery terminal — Used in step 13 17

NutM6		5 Nm

Trailing link — Used in step 13

M8		Tightening torque	19 Nm

Battery cover — Used in step 13

M8		2,8 Nm

Intake silencer housing to lock bridge — Used in step 14

M6X30		Tightening torque	8 Nm

Clean air pipe to intake silencer housing — Used in step 14

Clamp		Tightening torque	3 Nm

Intake neck to cross connection — Used in step 15

M6		Tightening torque	8 Nm

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Cross-brace to spring strut dome Used in step 16

	Renew screw.	Jointing torque	28 Nm
		Angle of rotation	180 °

Cover on body Used in step 16

Hexagon screw		Tightening torque	3 Nm

Vent valve Used in step 19 20

		Tightening torque	10 Nm

Links

General repair instructions	Used in step
61 20 ... Notes on AGM battery	17
61 12 ... Notes on intelligent battery sensor (IBS)	17
61 00 ... Notes for disconnecting and connecting battery	17
61 00 ... Safety information for handling vehicle battery	

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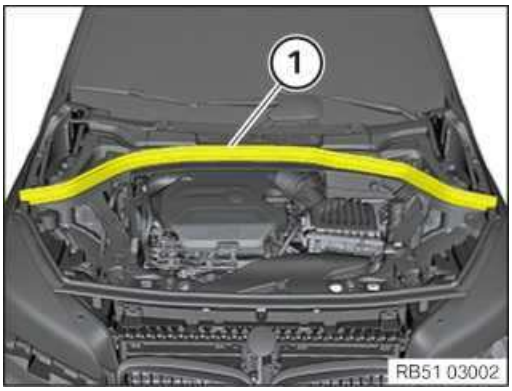
34 31 170 Replacing brake fluid level switch

PRELIMINARY WORK

1 – Remove the seal for the rear bonnet

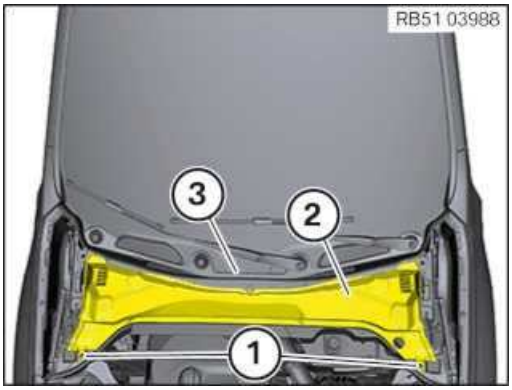
NOTICE

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



- Pull off rear bonnet seal (1) towards the top and remove.

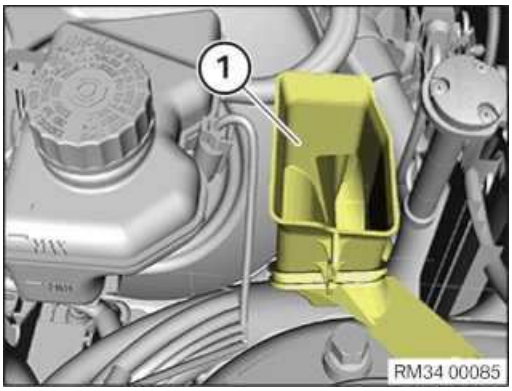
2 – Removing front cowl panel cover



- Loosen the expanding rivet (1).
- Feed out and remove front cowl panel cover (2) from the rear cowl panel cover(3).

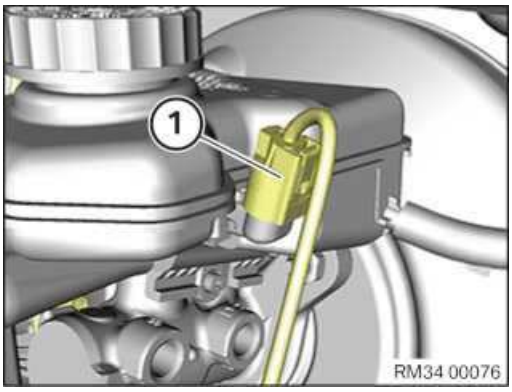
MAIN WORK

3 – Removing the brake fluid level switch

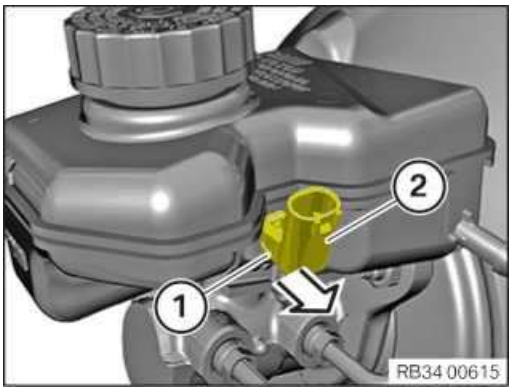


- Remove the water drain channel (1).

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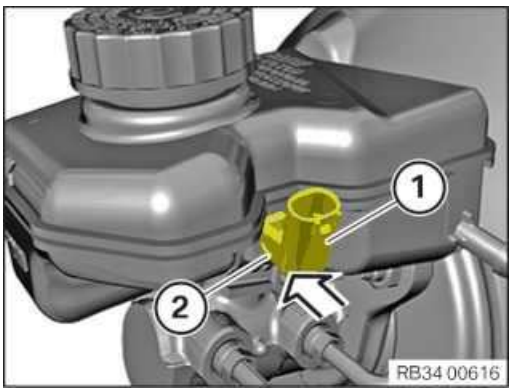


- Disconnect plug connection (1).



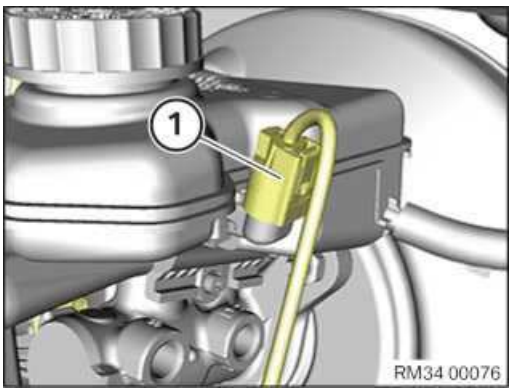
- Press the retaining lug (1) and remove the brake fluid level switch (2) in the direction of the arrow.

4 – Installing the brake fluid level switch

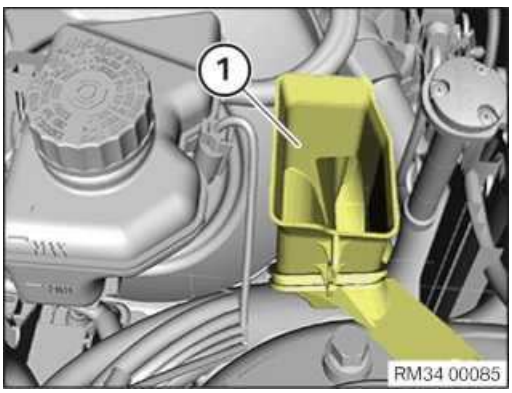


- Install the brake fluid level switch (1) into the expansion tank in direction of arrow.

  The retaining lug (2) must lock correctly.



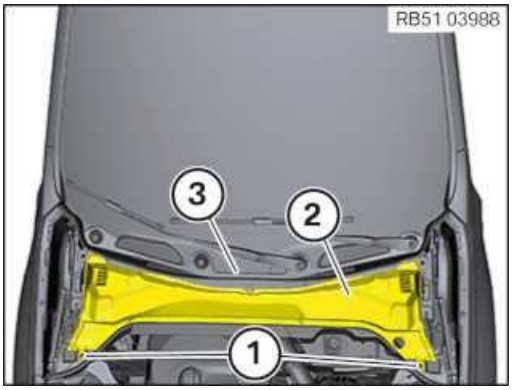
- Connect the plug connection (1).



- Install the water drain channel (1).

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5 – Installing front cowl panel cover

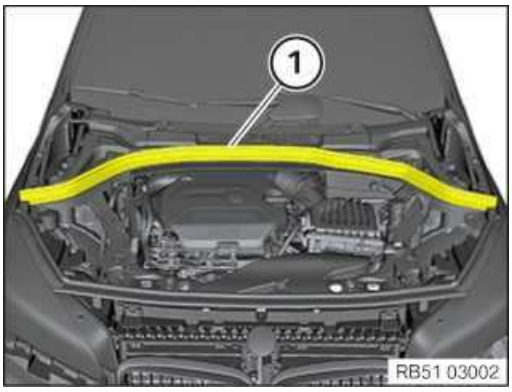


- Insert and install cowl panel cover at front (2) into cowl panel cover at rear (3).
- Check cowl panel cover at front is correctly seated (2).
- Secure expanding rivet (1).

6 – Install the seal for the bonnet

NOTICE

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



- Install bonnet seal at rear (1).
- Ensure that the rear bonnet seal (1) is fitted correctly.

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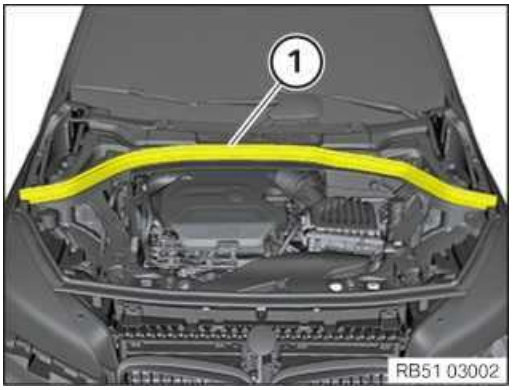
34 31 181 Replacing the expansion tank for hydraulic brake actuation (vehicles with automatic transmission)

PRELIMINARY WORK

1 – Remove the seal for the rear bonnet

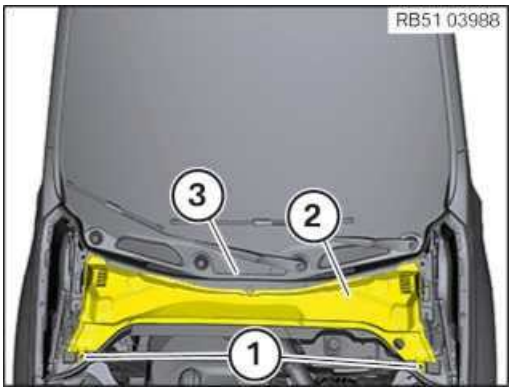
NOTICE

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



- Pull off rear bonnet seal (1) towards the top and remove.

2 – Removing front cowl panel cover



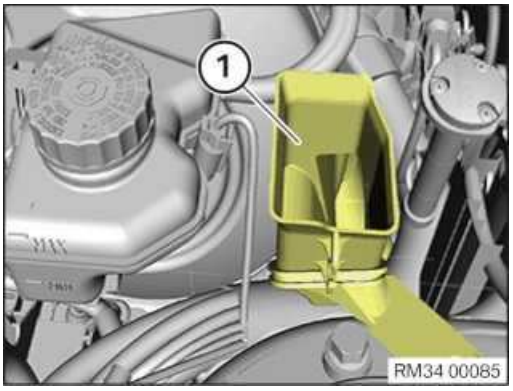
- Loosen the expanding rivet (1).
- Feed out and remove front cowl panel cover (2) from the rear cowl panel cover(3).

MAIN WORK

3 – Remove the expansion tank (vehicle with automatic transmission)

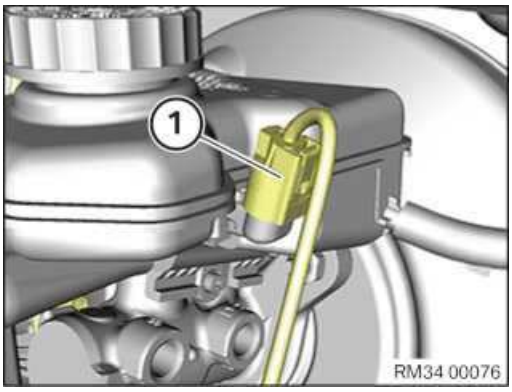
Prerequisite

Brake fluid has been drawn off.

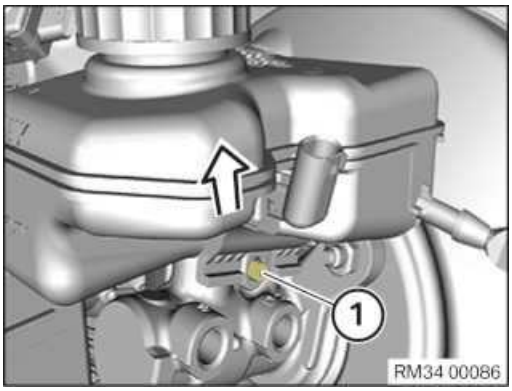


- Remove the water drain channel (1).

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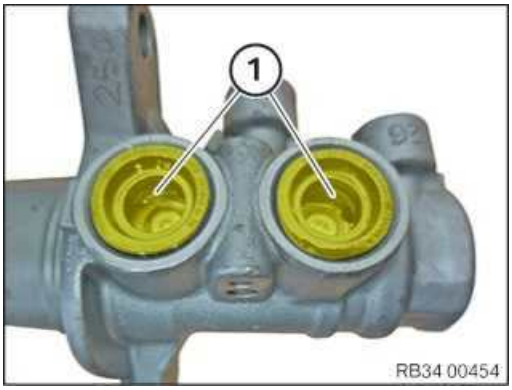


- Disconnect plug connection (1).



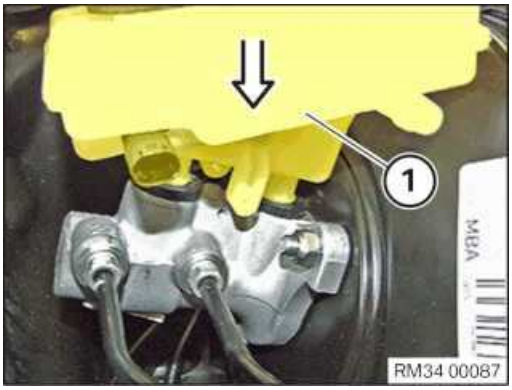
- Loosen screw (1).
- Remove expansion tank upwards.

4 – Installing the expansion tank (vehicles with automatic transmission)



- Renew rubber plugs(1).

  Parts: Rubber plug

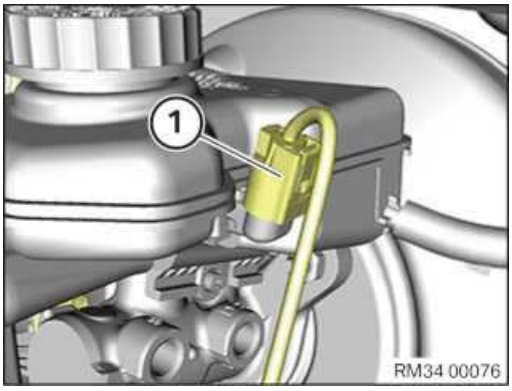


- Connect expansion tank (1) to the tandem brake master cylinder.
- Renew the retaining screw.

  Parts: Retaining screw
- Attach retaining screw and tighten.

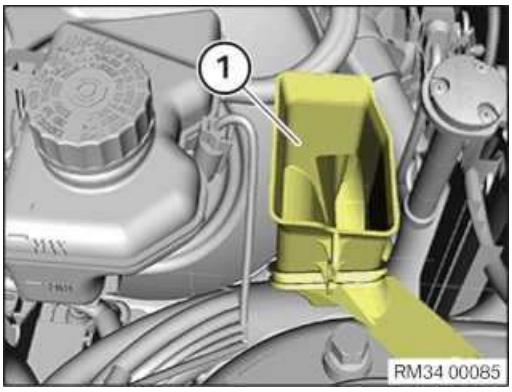
Retaining screw, expansion tank to tandem brake master cylinder

	Renew screw.	4 Nm



- Connect the plug connection (1).

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- Install the water drain channel (1).

POSTPROCESSES

5 – Connecting the bleeder unit for the brake fluid (after repair, topping up 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.

- Top up brake fluid up to the maximum mark.

  The filling pressure must not exceed 2 bar.

6 – Finalize the bleeder unit for brake fluid (following repair)

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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.

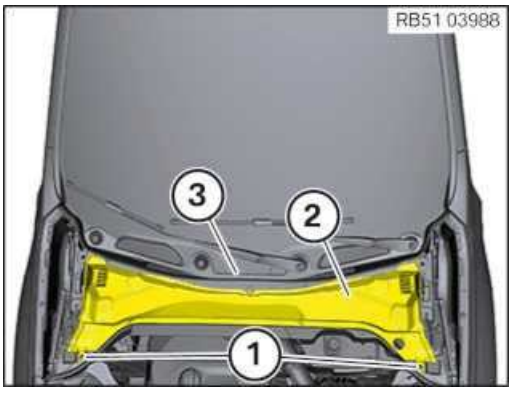


- Switch off bleeder unit (1) and remove from brake fluid expansion tank .
- Check the brake fluid level; if necessary, adjust to maximum mark.



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

7 – Installing front cowl panel cover



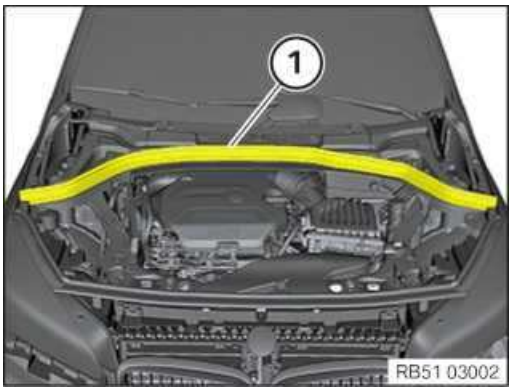
- Insert and install cowl panel cover at front (2) into cowl panel cover at rear (3).
- Check cowl panel cover at front is correctly seated (2).
- Secure expanding rivet (1).

8 – Install the seal for the bonnet

NOTICE

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

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- Install bonnet seal at rear (1).
- Ensure that the rear bonnet seal (1) is fitted correctly.

Additional Information

Overview of Tightening Torques

Retaining screw, expansion tank to tandem brake master cylinder Used in step 4

	Renew screw.	4 Nm

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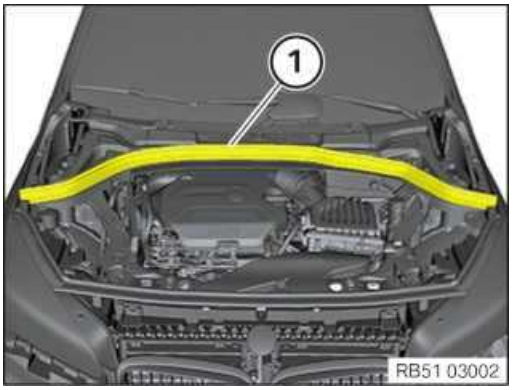
34 31 181 Replacing the expansion tank for the hydraulic brake actuation (motor vehicles with manual gearbox)

PRELIMINARY WORK

1 – Remove the seal for the rear bonnet

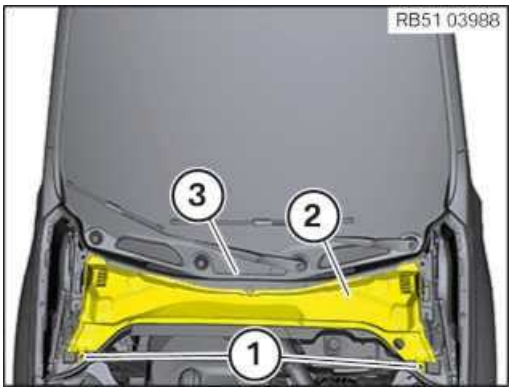
NOTICE

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



- Pull off rear bonnet seal (1) towards the top and remove.

2 – Removing front cowl panel cover



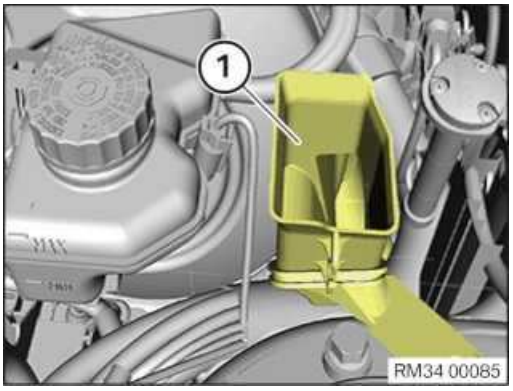
- Loosen the expanding rivet (1).
- Feed out and remove front cowl panel cover (2) from the rear cowl panel cover(3).

MAIN WORK

3 – Removing expansion tank (vehicles with manual gearbox)

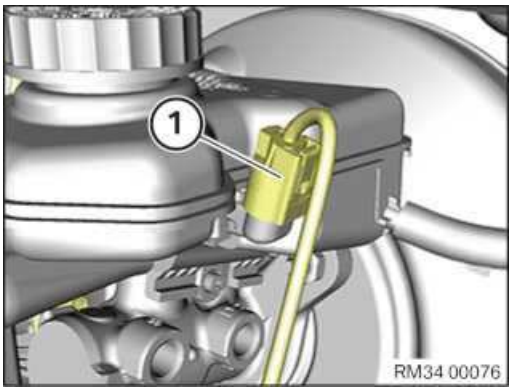
Prerequisite

Brake fluid has been drawn off.

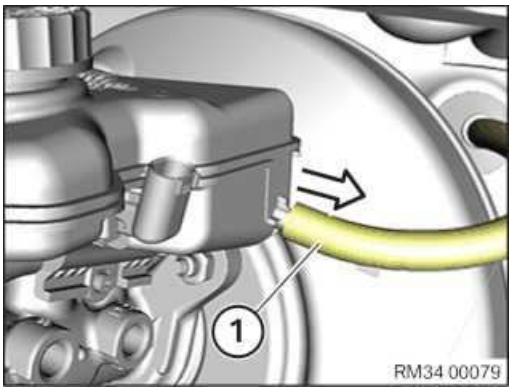


- Remove the water drain channel (1).

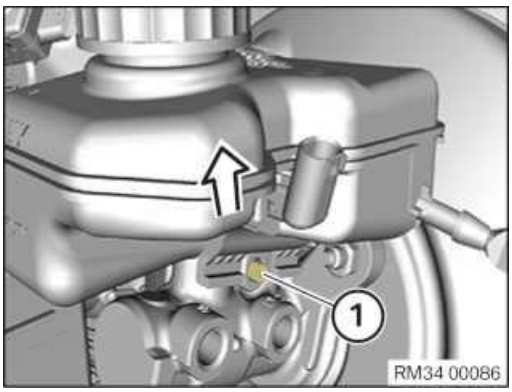
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- Disconnect plug connection (1).

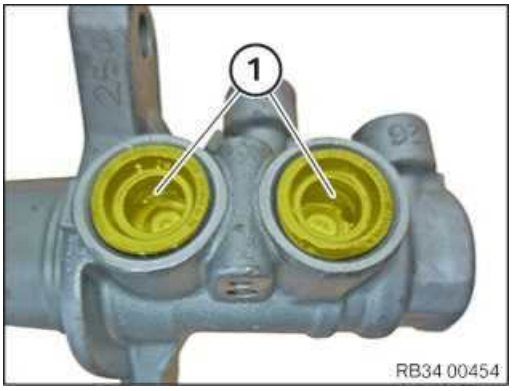


- Pull off feed line (1) for the clutch hydraulic system in the direction of arrow.



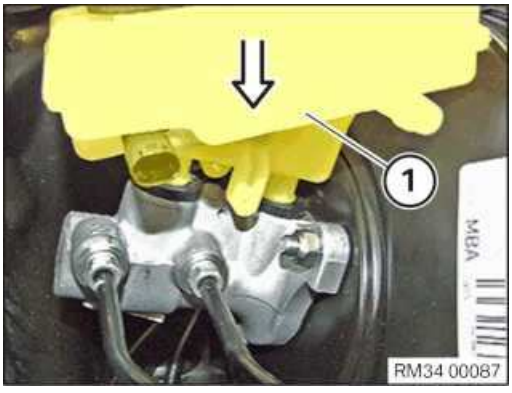
- Loosen screw (1).
- Remove expansion tank upwards.

4 – Installing the expansion tank (vehicles with manual gearbox)



- Renew rubber plugs(1).

  Parts: Rubber plug



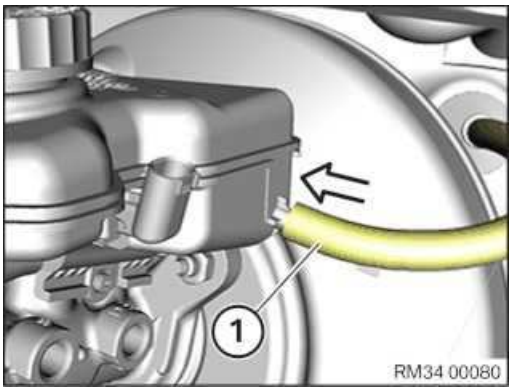
- Connect expansion tank (1) to the tandem brake master cylinder.
- Renew the retaining screw.

  Parts: Retaining screw
- Attach retaining screw and tighten.

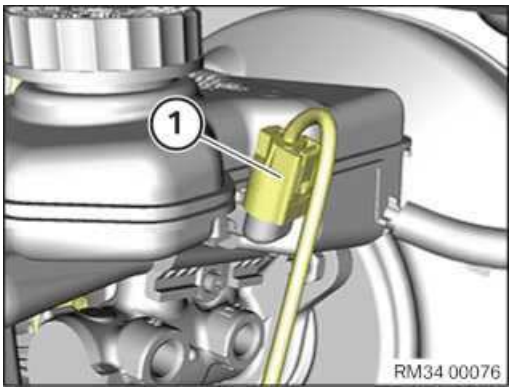
Retaining screw, expansion tank to tandem brake master cylinder

	Renew screw.	4 Nm

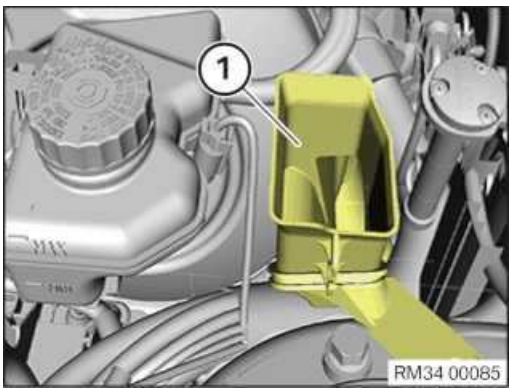
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- Connect the feed line (1) for the clutch hydraulic system in the direction of arrow.



- Connect the plug connection (1).



- Install the water drain channel (1).

POSTPROCESSES

5 – Connecting the bleeder unit for the brake fluid (after repair, topping up 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.
- Top up brake fluid up to the maximum mark.

  The filling pressure must not exceed 2 bar.

6 – Finalize the bleeder unit for brake fluid (following repair)

RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.



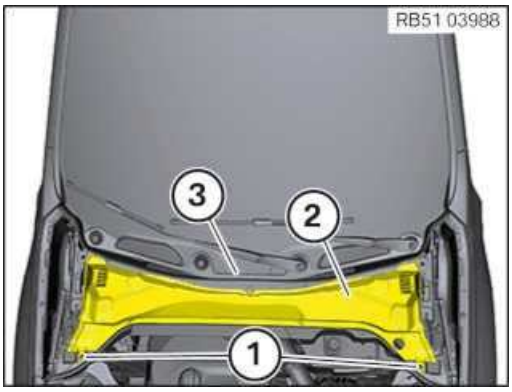
- Switch off bleeder unit (1) and remove from brake fluid expansion tank .
- Check the brake fluid level; if necessary, adjust to maximum mark.



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

7 – Installing front cowl panel cover

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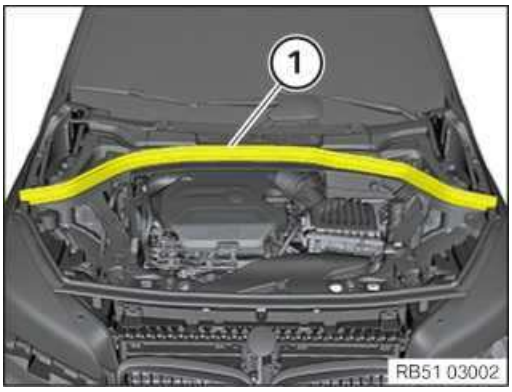


- Insert and install cowl panel cover at front (2) into cowl panel cover at rear (3).
- Check cowl panel cover at front is correctly seated (2).
- Secure expanding rivet (1).

8 – Install the seal for the bonnet

NOTICE

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



- Install bonnet seal at rear (1).
- Ensure that the rear bonnet seal (1) is fitted correctly.

Additional Information

Overview of Tightening Torques

Retaining screw, expansion tank to tandem brake master cylinder Used in step 4

	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.

CAUTION

Effects on other persons.

Danger of injury! Risk of damage!

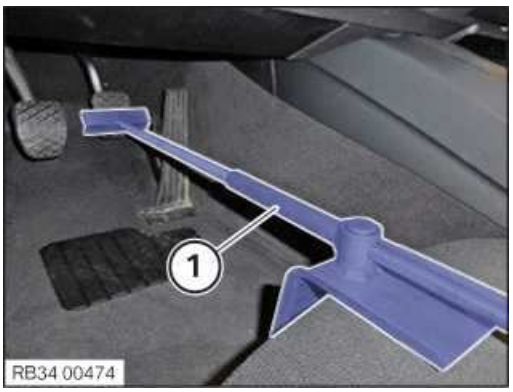
- Make sure that no other persons are in or around the vehicle.

TECHNICAL INFORMATION

During work on the rear brake, it must be ensured that the button for the electromechanical parking brake cannot be pressed.

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.

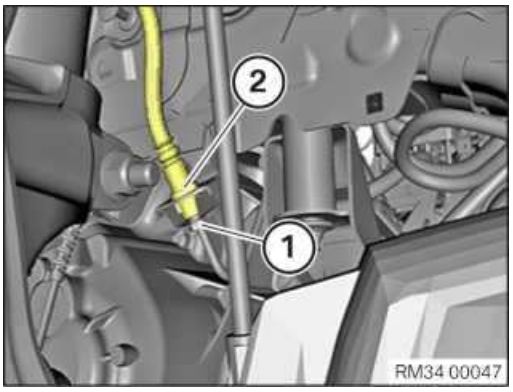
MAIN WORK

2 – Remove front brake hose

NOTICE

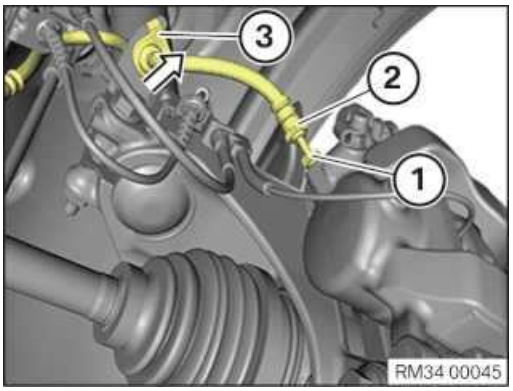
Description is for left component only. Procedure on the right side is identical.

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- Release union screw (1).

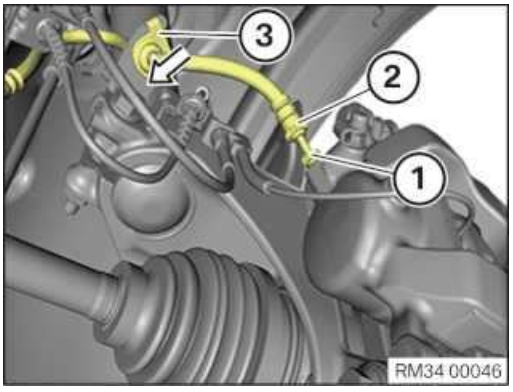
  Hold on to square shaft, if necessary (2).



- 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.

3 – Install front brake hose



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

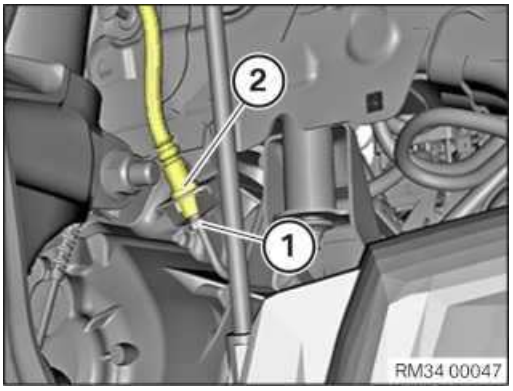
  If necessary, grip at knurling (2).

  Never twist brake hose and avoid all contact with components attached rigidly to the body!

Brake hose to brake caliper, front

	24 Nm

- Attach the brake hose in the brackets (3).



- Attach and tighten union screw (1).

  Hold on to square shaft, if necessary (2).

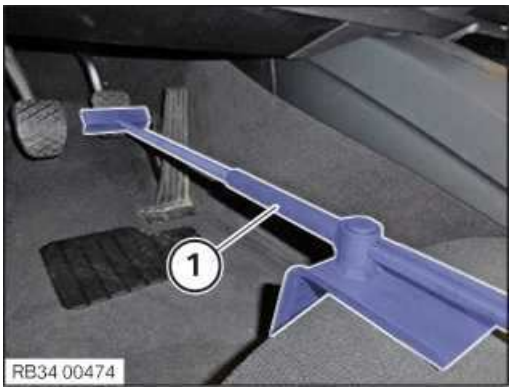
Brake pipe screw connection / Union screws

	17 Nm

POSTPROCESSES

4 – Remove the brake pedal tensioner

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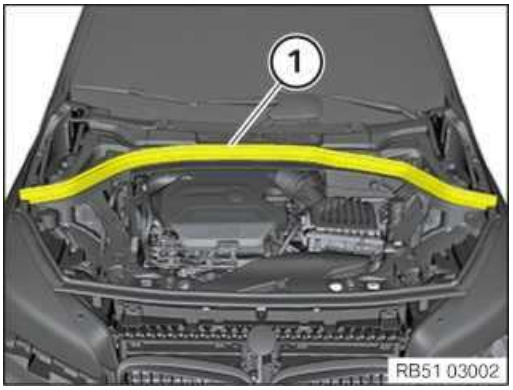
- Remove the brake pedal tensioner (1).

5 – Connect bleeder unit for brake fluid

▸ **Remove the seal for the rear bonnet**

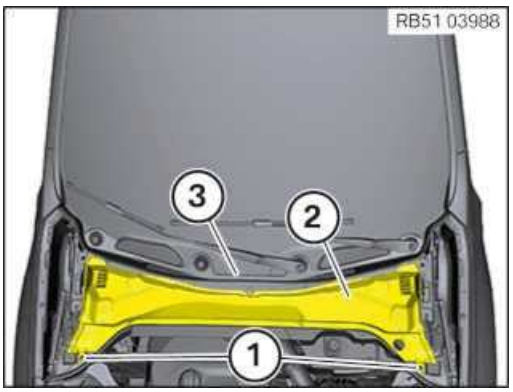
NOTICE

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



- Pull off rear bonnet seal (1) towards the top and remove.

▸ **Removing front cowl panel cover**



- Loosen the expanding rivet (1).
- Feed out and remove front cowl panel cover (2) from the rear cowl panel cover(3).



- 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 **.**

6 – 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

7 – 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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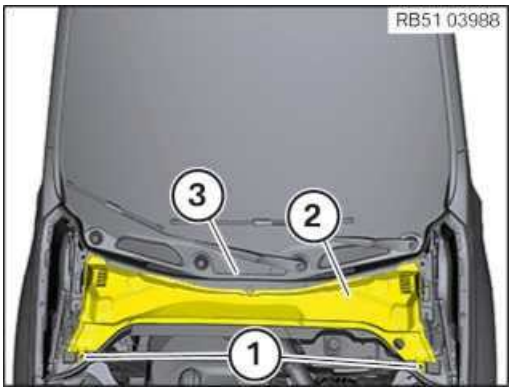


- Switch off bleeder unit (1) and remove from brake fluid expansion tank .
- Check the brake fluid level; if necessary, adjust to maximum mark.



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

▸ **Installing front cowl panel cover**

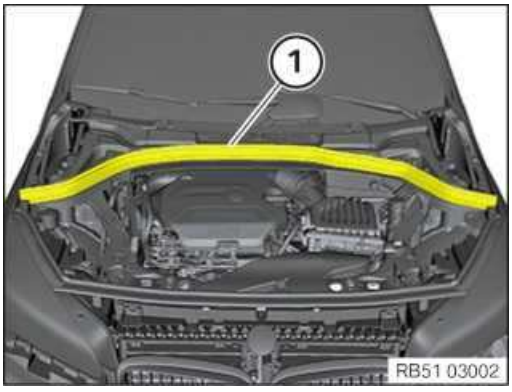


- Insert and install cowl panel cover at front (2) into cowl panel cover at rear (3).
- Check cowl panel cover at front is correctly seated (2).
- Secure expanding rivet (1).

▸ **Install the seal for the bonnet**

NOTICE

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



- Install bonnet seal at rear (1).
- Ensure that the rear bonnet seal (1) is fitted correctly.

Additional Information

Overview of Tightening Torques

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Brake hose to brake caliper, front

Used in step 3

	24 Nm

Brake pipe screw connection / Union screws

Used in step 3

	17 Nm

Vent valve

Used in step 6

		Tightening torque	10 Nm

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34 32 980 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.

CAUTION

Effects on other persons.

Danger of injury! Risk of damage!

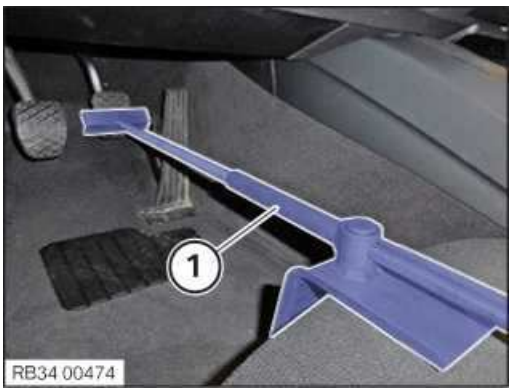
- Make sure that no other persons are in or around the vehicle.

TECHNICAL INFORMATION

During work on the rear brake, it must be ensured that the button for the electromechanical parking brake cannot be pressed.

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.

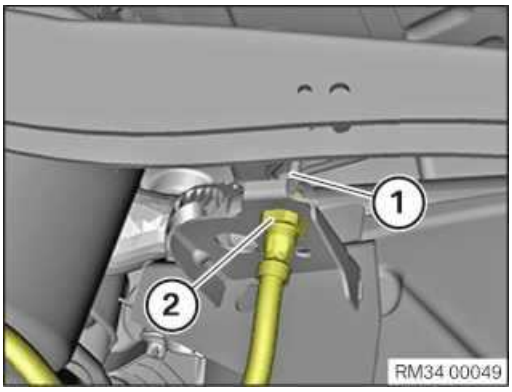
MAIN WORK

2 – Brake hose, rear

NOTICE

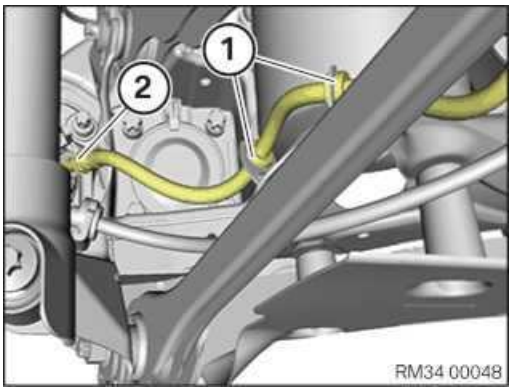
Description is for left component only. Procedure on the right side is identical.

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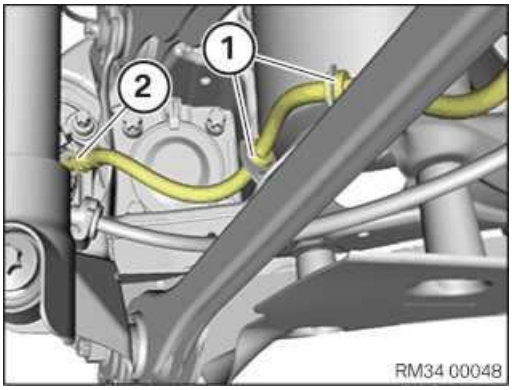
- Slacken union screw (1).

  Hold on to square shaft, if necessary (2).



- Detach the brake hose from the brackets (1).
- Release brake hose (2) from brake caliper.
- Remove the brake hose.

3 – Installing rear brake hose



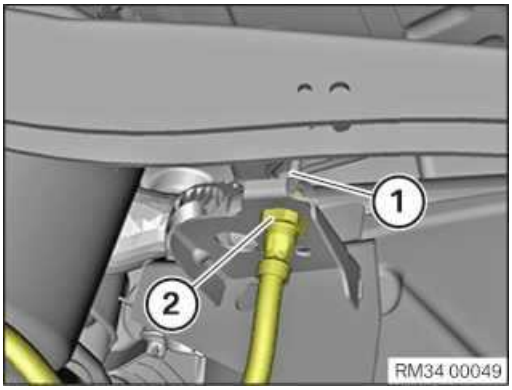
- Attach and tighten brake hose (2) on brake caliper.

  Never twist brake hose and avoid all contact with components attached rigidly to the body!

Brake hose to brake caliper, rear

	24 Nm

- Attach the brake hose in the brackets (1).



- Attach and tighten union screw (1).

  Hold on to square shaft, if necessary (2).

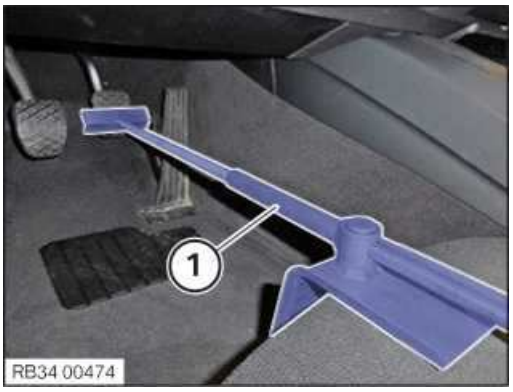
Brake pipe screw connection / Union screws

	17 Nm

POSTPROCESSES

4 – Remove the brake pedal tensioner

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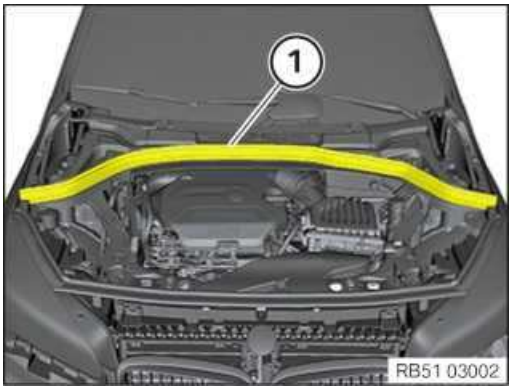
- Remove the brake pedal tensioner (1).

5 – Connect bleeder unit for brake fluid

▸ **Remove the seal for the rear bonnet**

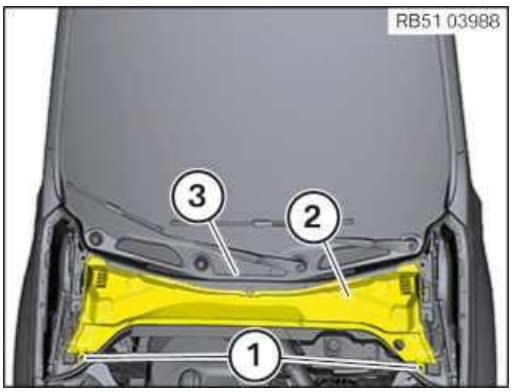
NOTICE

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



- Pull off rear bonnet seal (1) towards the top and remove.

▸ **Removing front cowl panel cover**



- Loosen the expanding rivet (1).
- Feed out and remove front cowl panel cover (2) from the rear cowl panel cover(3).



- 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.

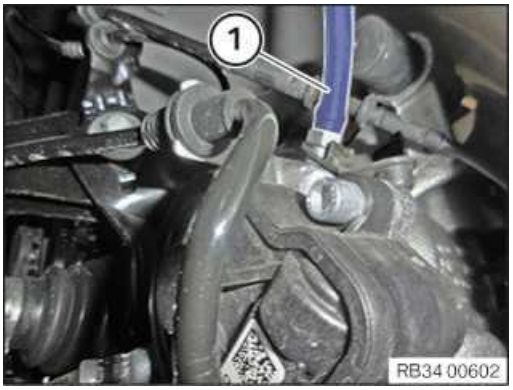
- Connect the bleeder unit (1) to the brake fluid expansion tank and switch it on.

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

6 – 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.

7 – 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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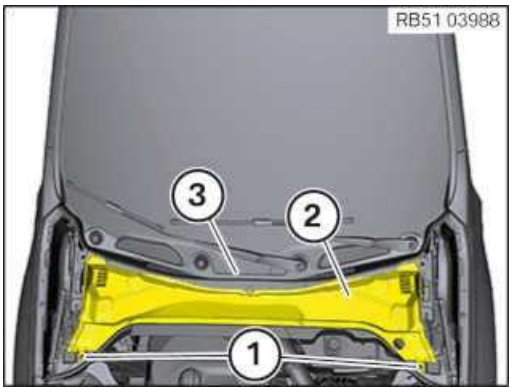


- Switch off bleeder unit (1) and remove from brake fluid expansion tank .
- Check the brake fluid level; if necessary, adjust to maximum mark.



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

▸ **Installing front cowl panel cover**

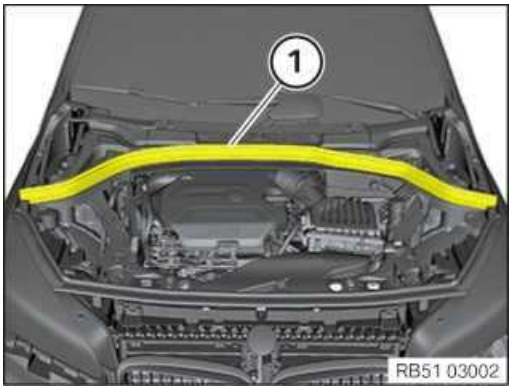


- Insert and install cowl panel cover at front (2) into cowl panel cover at rear (3).
- Check cowl panel cover at front is correctly seated (2).
- Secure expanding rivet (1).

▸ **Install the seal for the bonnet**

NOTICE

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



- Install bonnet seal at rear (1).
- Ensure that the rear bonnet seal (1) is fitted correctly.

Additional Information

Overview of Tightening Torques

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Brake hose to brake caliper, rear

Used in step 3

	24 Nm

Brake pipe screw connection / Union screws

Used in step 3

	17 Nm

Vent valve

Used in step 6

		Tightening torque	10 Nm

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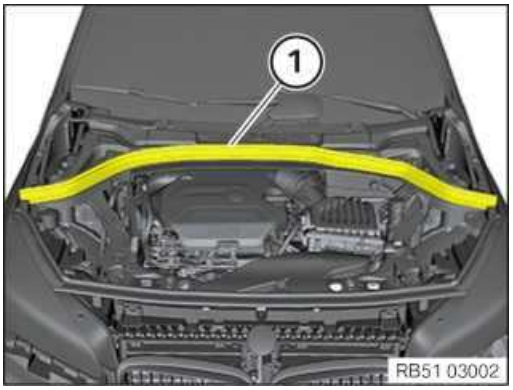
34 33 000 Removing and installing/replacing brake booster (motor vehicles with manual gearbox)

PRELIMINARY WORK

1 – Remove the seal for the rear bonnet

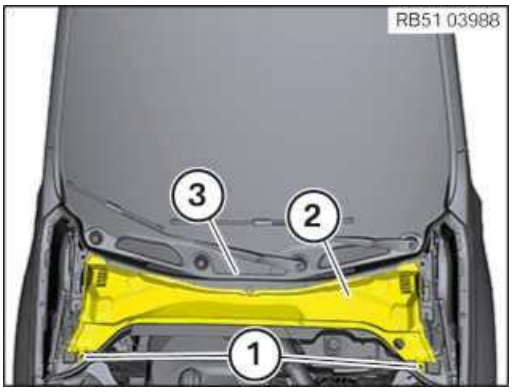
NOTICE

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



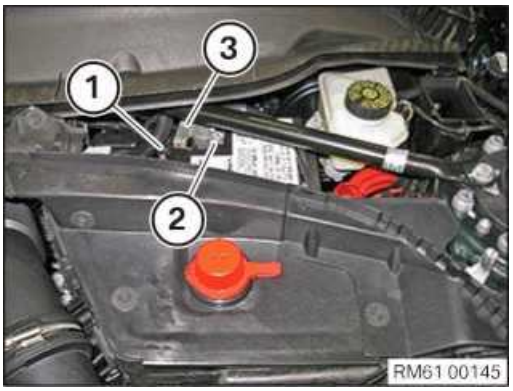
- Pull off rear bonnet seal (1) towards the top and remove.

2 – Removing front cowl panel cover



- Loosen the expanding rivet (1).
- Feed out and remove front cowl panel cover (2) from the rear cowl panel cover(3).

3 – Disconnecting the battery earth lead



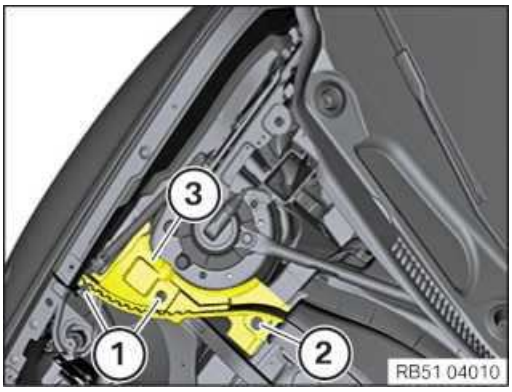
- Unlock plug connection (1) and disconnect.
- Unfasten nut (2).
- Remove the battery earth lead (3) and secure to one side.

4 – Remove suspension cross-brace

TECHNICAL INFORMATION

Driving without the strut brace/front end or tension strut is not permitted.

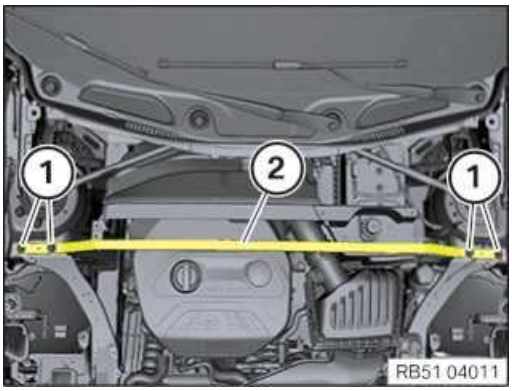
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NOTICE

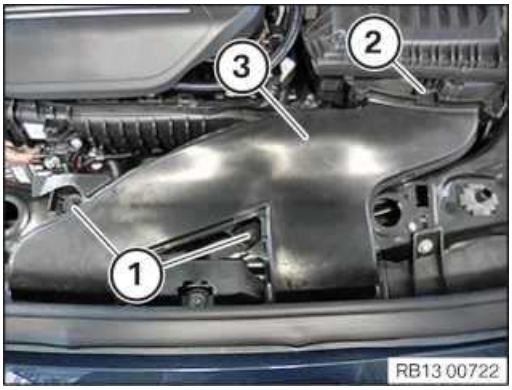
Description is for right component only. The procedure on the left side is identical.

- Loosen expanding rivet (1).
- Loosen screw (2).
- Remove the cover (3).



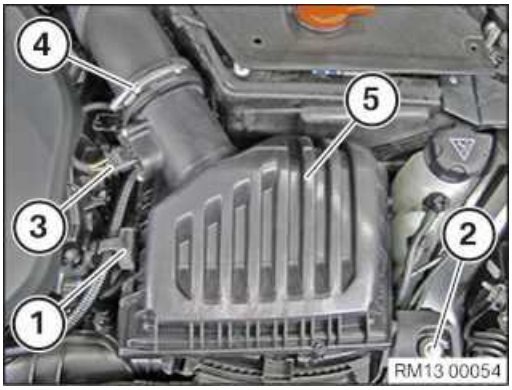
- Loosen screws (1).
- Remove strut brace (2).

5 – Remove the intake neck for intake silencer housing



- Loosen nuts (1).
- Loosen the lock (2).
- Guide the intake neck (3) out and remove it.

6 – Removing intake silencer housing



- Loosen the holder (1).
- Loosen screw (2).
- Unlock and loosen connector (3).
- Unfasten clamp (4).
- Pull out and remove the intake silencer housing (5) from the rubber mounts towards the top.

7 – Remove vehicle battery

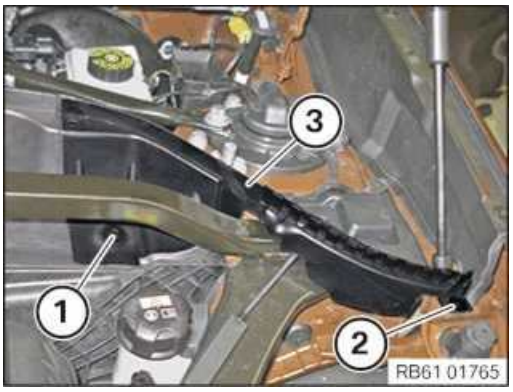
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WARNING

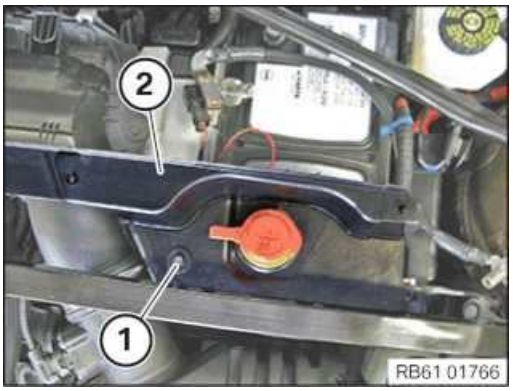
Working on 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

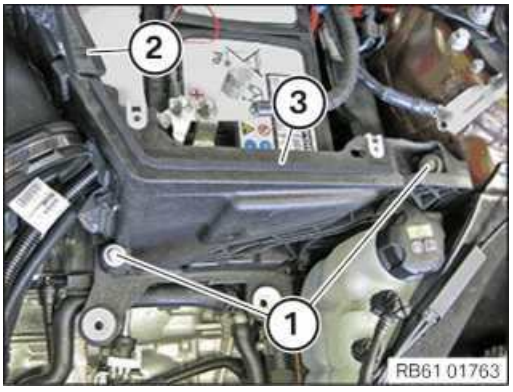
- Detach battery earth lead from battery.
- For additional batteries: Detach all battery earth leads from additional batteries.



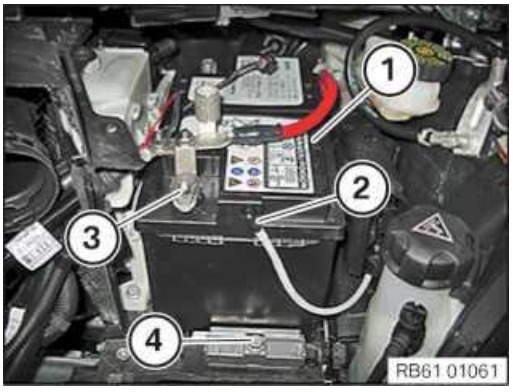
- Release the screw (1) and the expanding rivet (2).
- Remove the fixture for the gasket (3).



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



- Loosen screws (1).
- Unscrew the bolt (2) and guide the tension strut (3) out.



- Pull off the vent hose (2).
- Slacken the nut (3) on the positive battery terminal and remove the positive battery terminal.

WARNING

Unprotected battery terminals.

Risk of short circuits! Risk of fire!

- Cover the vehicle battery.

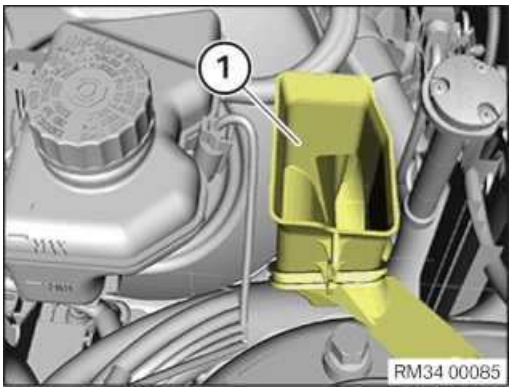
- Loosen the screw (4) and remove the holder.
- Remove vehicle battery (1).

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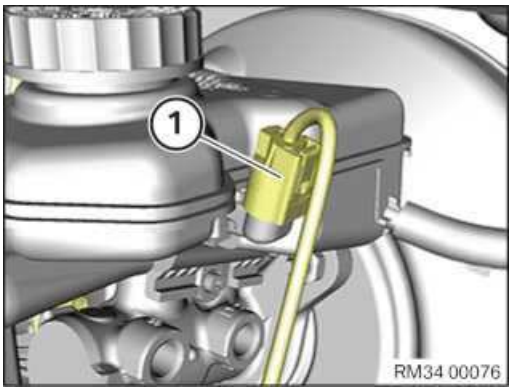
8 – Removing expansion tank (vehicles with manual gearbox)

Prerequisite

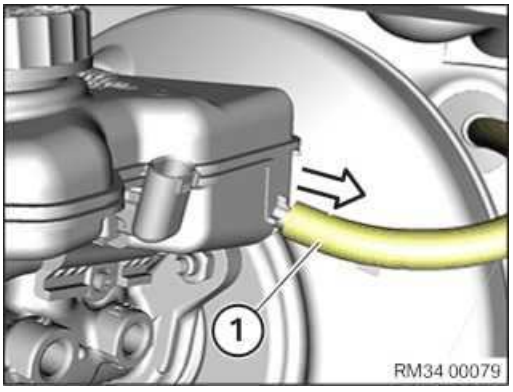
Brake fluid has been drawn off.



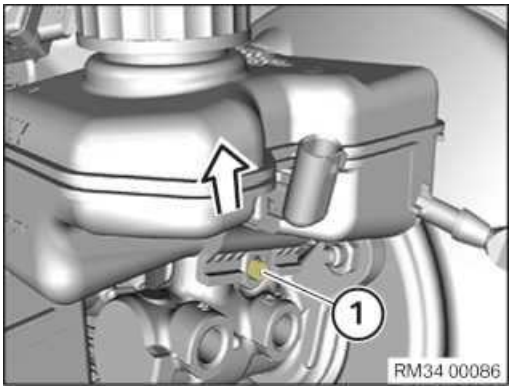
- Remove the water drain channel (1).



- Disconnect plug connection (1).



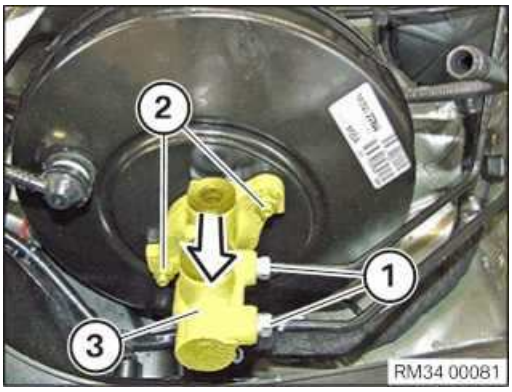
- Pull off feed line (1) for the clutch hydraulic system in the direction of arrow.



- Loosen screw (1).
- Remove expansion tank upwards.

9 – Remove the tandem brake master cylinder.

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- (1)Unfasten brake lines.
- Loosen nuts (2) and remove tandem brake master cylinder (3).

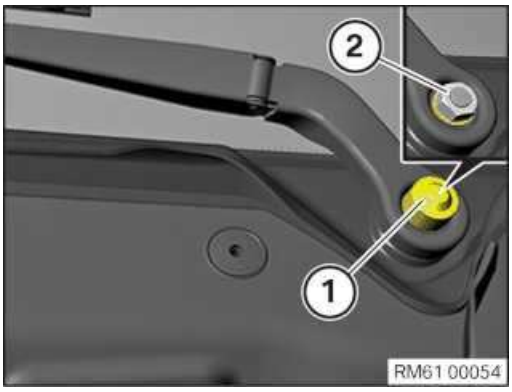
10 – Remove left and right wiper arm

RISK OF DAMAGE

Damage to wiper console

While removing the wiper arms without using special tool, the wiper console can break.

- Removing the wiper arms must be carried out only using the prescribed special tool.
- Do not lift off wiper arm, else the wiper console may break on the predetermined breaking point for the pedestrian protection.



- Pull off the protective cap (1) and release the nut (2) below it.



- Pull off windscreen wiper arm (1)with special tool .

11 – Remove the gutter strip on the windscreen on the left and right

NOTICE

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

▸ **Remove the gutter strip on the windscreen**

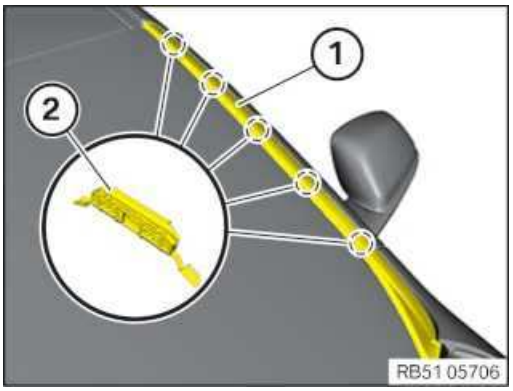
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RISK OF DAMAGE

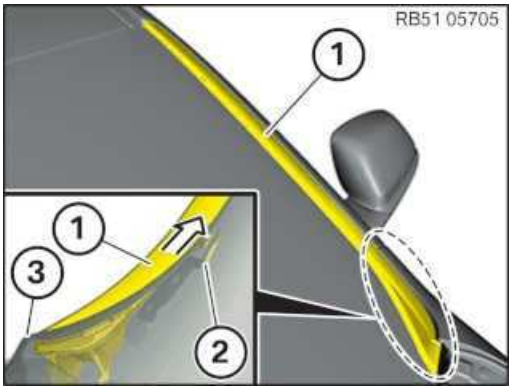
Scratches.

Tools and sharp-edged components can cause scratches.

- Protect working area.
- Handle tools and components carefully.



- Unclip the gutter strip (1) from the clamps (2) beginning at the roof to the top.



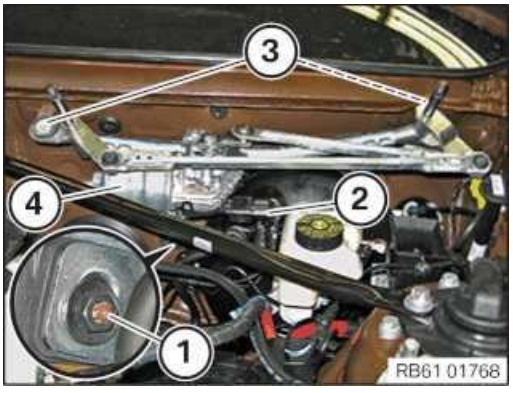
- Pull out the gutter strip (1) from the guide (2) in direction of arrow and carefully feed out at the side panel (3).

12 – Remove the rear cowl panel



- Pull off the cowl panel cover (1) towards the top, starting from the side and feed out.

13 – Removing the console for the windscreen wiper system complete with motor



- Unfasten nut (1).
- Loosen screws (3).
- Unlock connector (2) and disconnect (see next figure).
- Remove the console for the windscreen wiper system (4).

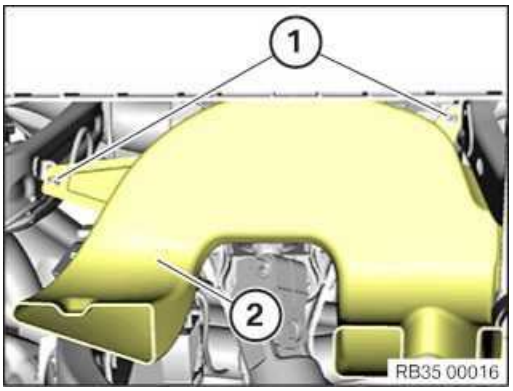
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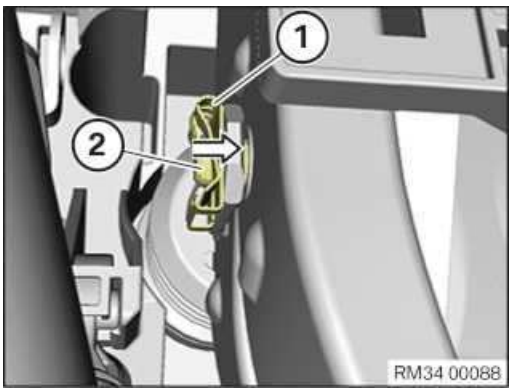
- Press lock on the connector underside and pull out the connector.

MAIN WORK

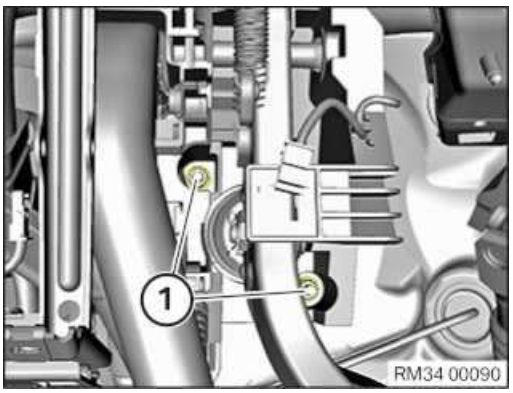
14 – Remove brake booster



- Remove air duct (1).

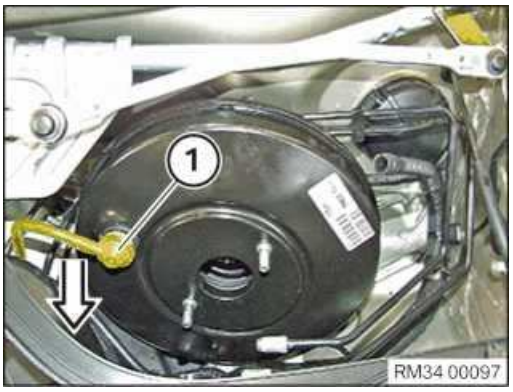


- Pull off the retaining clip (1) on the brake pedal, detach the retaining bolt (2) and pull out.



- Loosen nuts (1).

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- Remove non-return valve (1) from brake booster in the direction of the arrow.



- Unscrew the brake booster (1) from the bulkhead.

15 – Prepare for the installation of the brake booster



- Replace the gasket (1) on the brake booster.

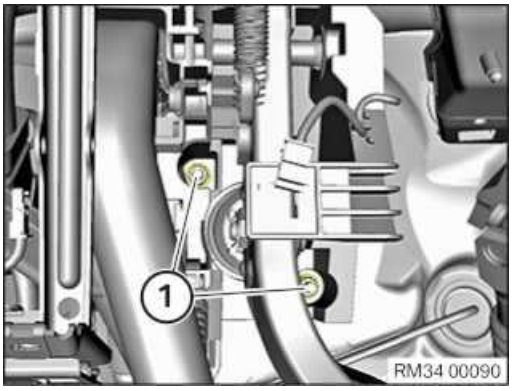
  Parts: Gasket

- Thoroughly clean the sealing surfaces on the brake booster and on the bulkhead.

16 – Install brake booster



- Screw in the brake booster (1) in the bulkhead.



- Renew nuts (1).

  Parts: Nuts

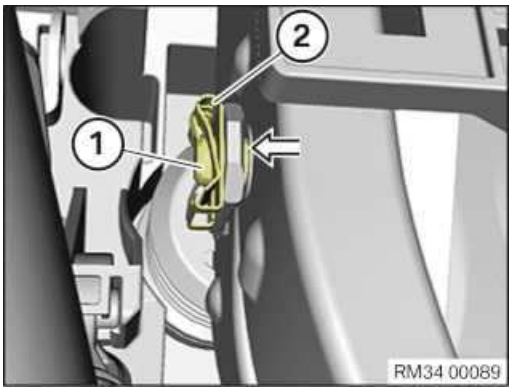
- Install the nuts (1) and tighten.

Brake booster to pedal assembly console

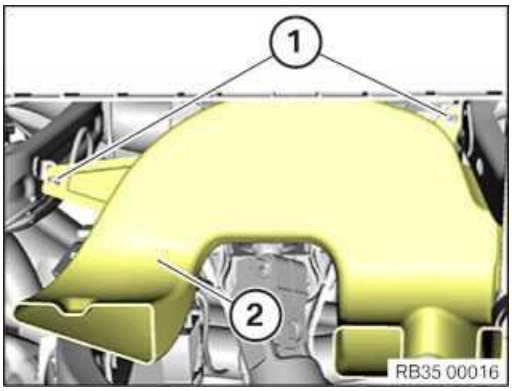
Replace nuts.

M8	Replace nuts.	24 Nm

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- Install the retaining bolt (1) through the brake pedal.
  Lightly grease the retaining bolts (1).
- Renew the retaining clip (2).
  Parts: Retaining clip
- Mount the retaining clip (2) at the retaining bolt.



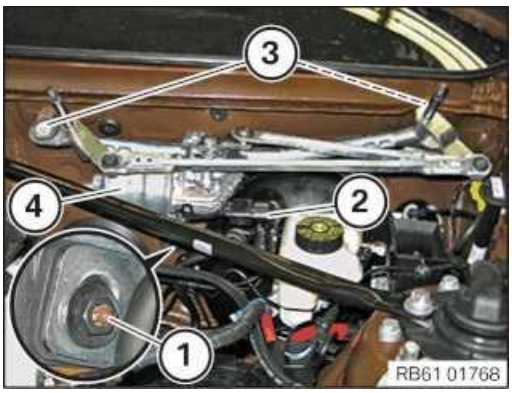
- Install air duct (1).



- Install non-return valve (1) in direction of arrow into brake booster.

POSTPROCESSES

17 – Installing console for windscreen wiper system complete with engine



- Feed in console for windscreen wiper system (4).
- Tighten down screws (3).

Wiper console to body

M6x30		Tightening torque	10 Nm

- Tighten nut (1).

Wiper console to retaining bracket

M6		Tightening torque	10 Nm

- Connect connector (2).

18 – Install the rear cowl panel

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- Insert the cowl panel cover (1) and press it into the latch mechanism on the windscreen starting at the side.

19 – Install the gutter strip on the windscreen on the left and right

NOTICE

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

▸ **Install the gutter strip on the windscreen**

RISK OF DAMAGE

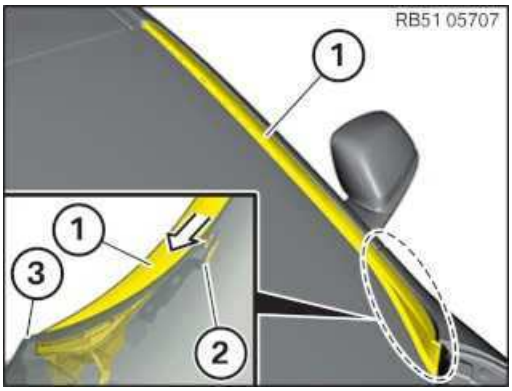
Scratches.

Tools and sharp-edged components can cause scratches.

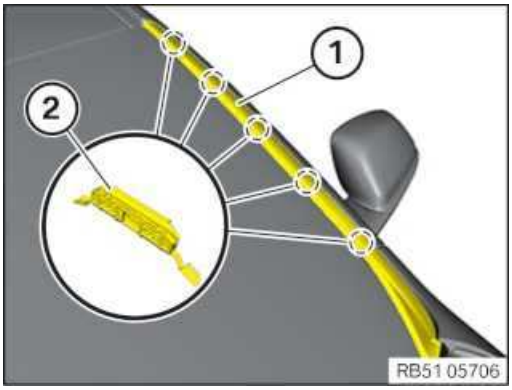
- Protect working area.
- Handle tools and components carefully.

TECHNICAL INFORMATION

Latch mechanisms, guides and mounting elements must not be damaged or missing.



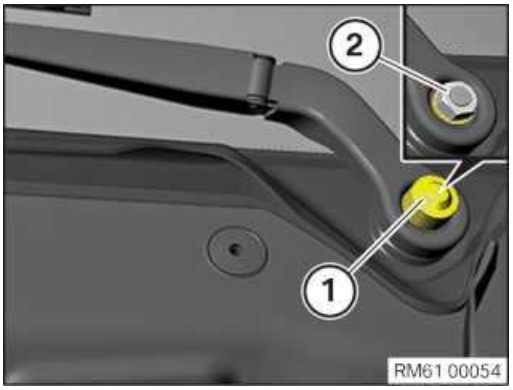
- Carefully feed in the gutter strip (1) at the side panel (3) and simultaneously feed into the guide (2) in direction of arrow.



- Clip in the gutter strip (1) at the bottom starting at the clamps (2).

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20 – Install left and right wiper arm



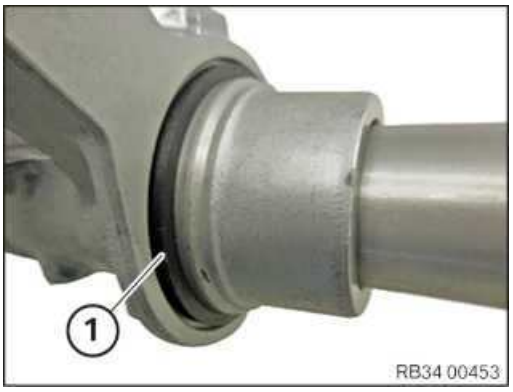
- Join wiper arm and tighten with nut (2).

Windscreen wiper arm

Combination hexagon nut		Tightening torque	35 Nm

- Join the protective cap (1).

21 – Preparations for installing the tandem brake master cylinder



- Renew sealing ring (1).

  Parts: Sealing ring

22 – 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.

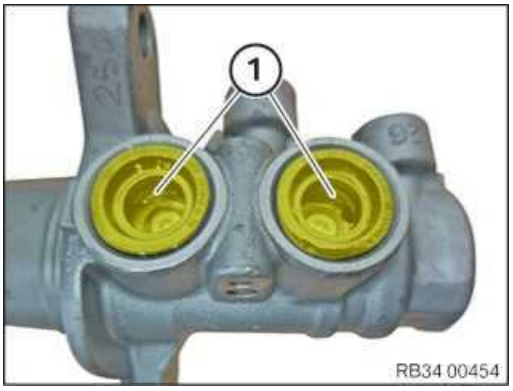
M8		23 Nm

- (3)Fit brake lines () and tighten.

Brake pipe screw connection / Union screws

	17 Nm

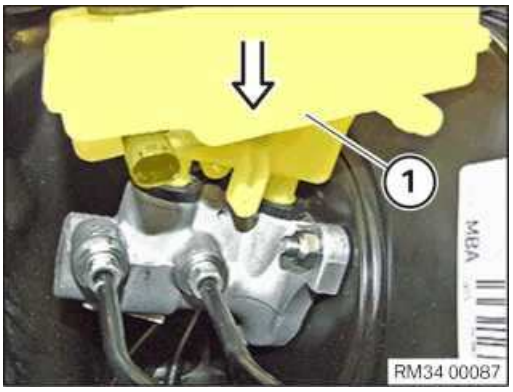
23 – Installing the expansion tank (vehicles with manual gearbox)



- Renew rubber plugs(1).

  Parts: Rubber plug

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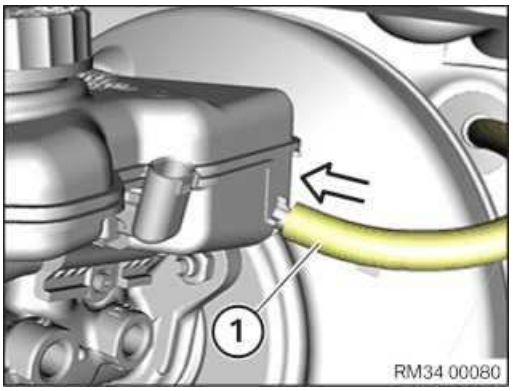


- Connect expansion tank (1) to the tandem brake master cylinder.
- Renew the retaining screw.

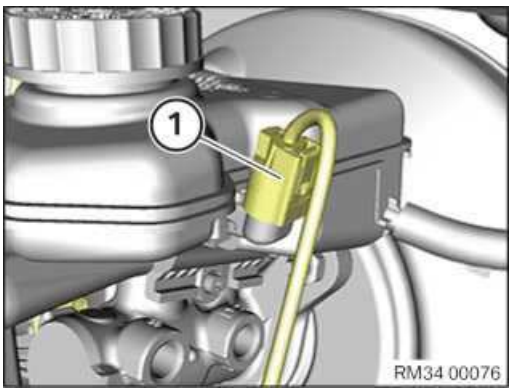
  Parts: Retaining screw
- Attach retaining screw and tighten.

Retaining screw, expansion tank to tandem brake master cylinder

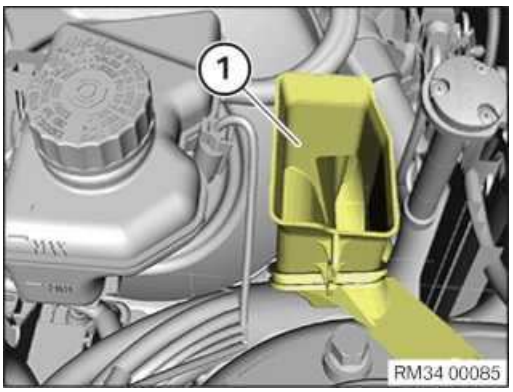
	Renew screw.	4 Nm



- Connect the feed line (1) for the clutch hydraulic system in the direction of arrow.

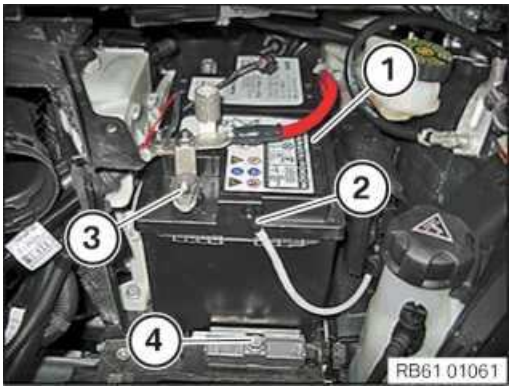


- Connect the plug connection (1).



- Install the water drain channel (1).

24 – Install vehicle battery



- Install vehicle battery (1).
- Position the bracket and tighten with the screw (4) .

Battery terminal rail to battery tray

M8		19 Nm

- Position the vent hose (2) and clip it in.
- Position the positive battery terminal and tighten with the nut (3) .

Battery terminal with IBS positive battery terminal / negative battery terminal

NutM6		5 Nm

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▸ **Check the vent holes of the battery**

WARNING

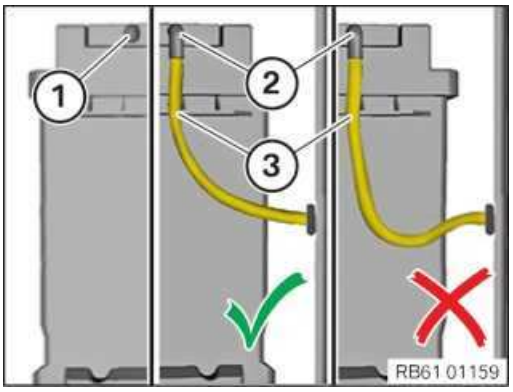
Gas emission.

Danger of injury! Danger of explosion!

- Assign the vent holes correctly.
- Route the vent hose correctly.

TECHNICAL INFORMATION

The battery has two vent holes, opposite:
One vent hole (1) must be closed correctly with a dummy plug.
The vent hose (3) must be correctly connected and routed at the other vent hole (2).



Check

- Check if the vent hole (1) is correctly closed with a dummy plug.

Result

» No dummy plug.

Measure

- Close the vent hole (1) correctly with a dummy plug.

Check

- Check if the vent hole (2) has a correctly connected vent hose (3).

Result

» The vent hose (3) is not correctly connected.

Measure

- At the vent hole (2), connect the vent hose (3) correctly.

Check

- Check if the vent hose (3) is routed to the outside with a downhill gradient (**no siphon formation!**).

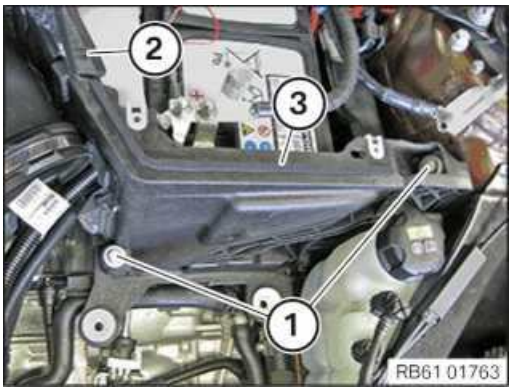
Result

» The vent hose (3) is not correctly routed as shown in the image on the right.

Measure

- Route the vent hose (3) correctly as shown in the centre image.

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- Insert tension strut (3) and tighten with screws (1).

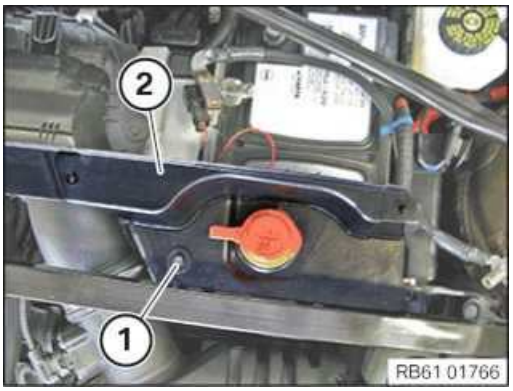
Trailing link

M8		Tightening torque	19 Nm

- Tighten down screw (2).

Battery cover

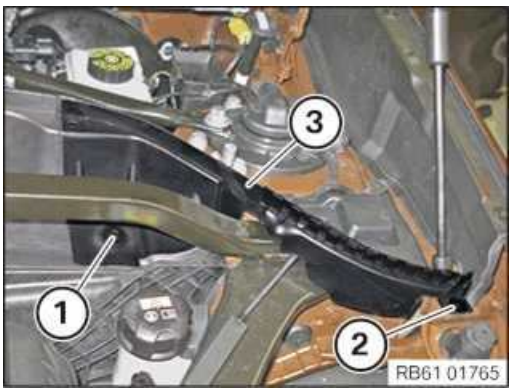
M8		2,8 Nm



- Position the cover (2).
- Tighten down screw (1).

Battery cover

M8		2,8 Nm

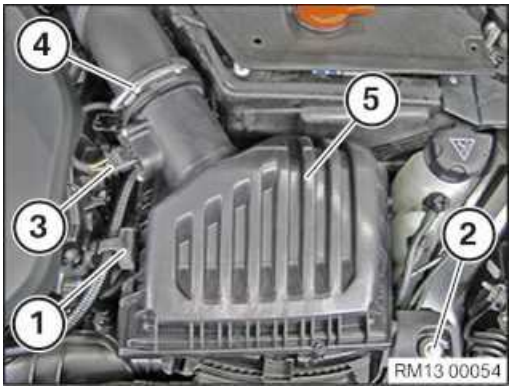


- Position the fixture for the gasket (3) and secure with the expanding rivet (2).
- Tighten down screw (1).

Battery cover

M8		2,8 Nm

25 – Installing intake silencer housing



- Insert the intake silencer housing (5) into the rubber mounts and install it.

  Intake filter housing (5) must engage audibly.
- Tighten down screw (2).

Intake silencer housing to lock bridge

M6X30		Tightening torque	8 Nm

- Tighten clamp (4).

Clean air pipe to intake silencer housing

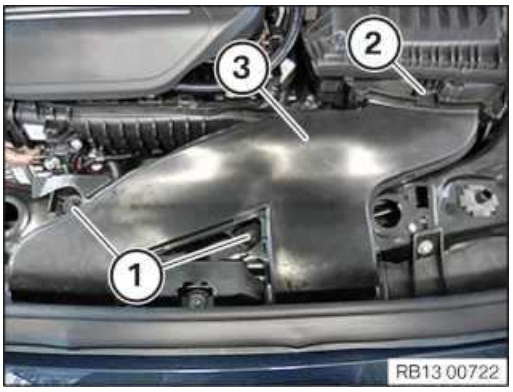
Clamp		Tightening torque	3 Nm

- Connect and lock the connector (3).

  The connector (3) must engage audibly.
- Insert and install the holder (1).

26 – Install the intake neck for the intake filter housing

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- Insert and install the intake neck (3).

  The lock (2) must audibly engage.
- Tighten nuts (1).

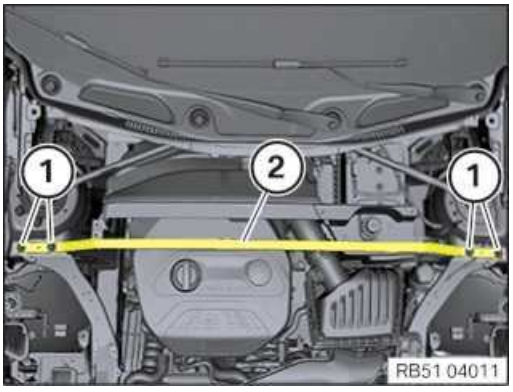
Intake neck to cross connection

M6		Tightening torque	8 Nm

27 – Install strut brace

TECHNICAL INFORMATION

Driving without the strut brace/front end or tension strut is not permitted.

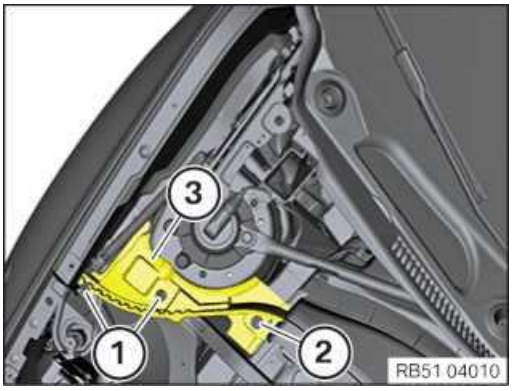


- Install the strut brace (2).
- Renew screws (1).

  Parts: Bolts
- Tighten the screws (1).

Cross-brace to spring strut dome

	Renew screw.	Jointing torque	28 Nm
		Angle of rotation	180 °



NOTICE

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

- Install the cover (3).
- Tighten down screw (2).

Cover on body

Hexagon screw		Tightening torque	3 Nm

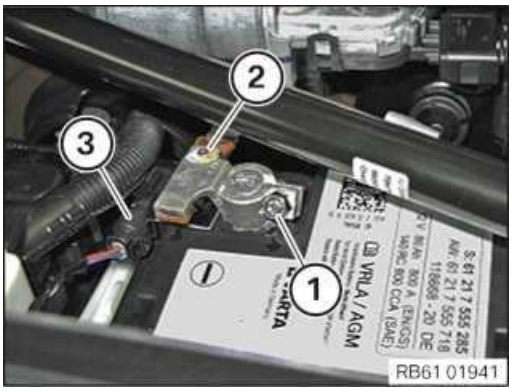
- Install the expanding rivet (1).

28 – Connecting the battery earth lead

TECHNICAL INFORMATION

For additional information see:
61 00 ... Safety information on handling the vehicle battery
61 00 / 12 00 ... Notes on disconnecting and connecting the vehicle battery
61 12 ... Notes on the intelligent battery sensor (IBS)

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- Remove the protective cover of the positive battery terminal.
- Position the battery earth lead (2).
- Tighten nut (1).

Battery terminal with IBS positive battery terminal / negative battery terminal

NutM6		5 Nm

- If required, connect the connector (3).

29 – Connect the bleeder unit for brake fluid (following repair)





- 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.

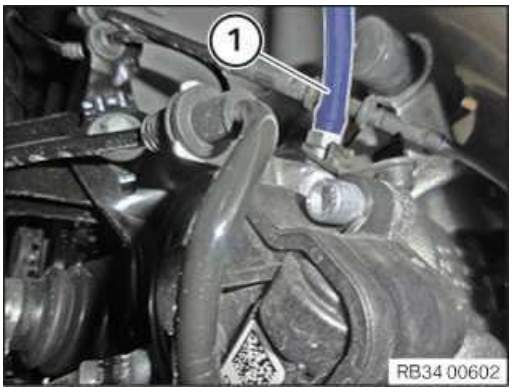
  Observe the operating instructions of the corresponding equipment manufacturer.
- **Do not exceed the filling pressure of** 2 bar**.**

30 – 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.

31 – 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

32 – Finalize the bleeder unit for brake fluid (following repair)

RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.



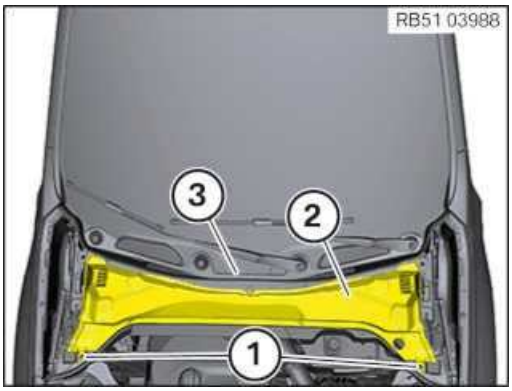
- Switch off bleeder unit (1) and remove from brake fluid expansion tank .
- Check the brake fluid level; if necessary, adjust to maximum mark.

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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.

33 – Installing front cowl panel cover

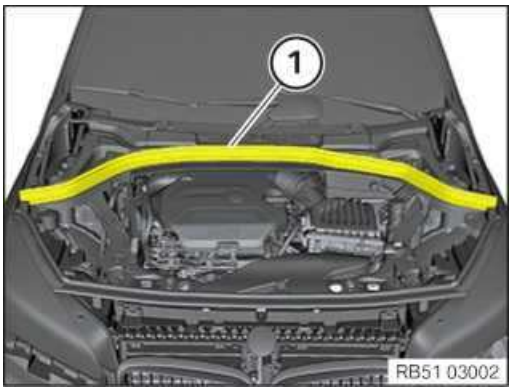


- Insert and install cowl panel cover at front (2) into cowl panel cover at rear (3).
- Check cowl panel cover at front is correctly seated (2).
- Secure expanding rivet (1).

34 – Install the seal for the bonnet

NOTICE

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



- Install bonnet seal at rear (1).
- Ensure that the rear bonnet seal (1) is fitted correctly.

Additional Information

Overview of Tightening Torques

Brake booster to pedal assembly console Used in step 16

Replace nuts.

M8	Replace nuts.	24 Nm

Wiper console to body Used in step 17

M6x30		Tightening torque	10 Nm

Wiper console to retaining bracket Used in step 17

M6		Tightening torque	10 Nm

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Windscreen wiper arm — Used in step 20

Combination hexagon nut		Tightening torque	35 Nm

Tandem brake master cylinder in the brake booster — Used in step 22

Replace nuts.

M8			23 Nm

Brake pipe screw connection / Union screws — Used in step 22

			17 Nm

Retaining screw, expansion tank to tandem brake master cylinder — Used in step 23

	Renew screw.		4 Nm

Battery terminal rail to battery tray — Used in step 24

M8			19 Nm

Battery terminal with IBS positive battery terminal / negative battery terminal — Used in step 24 28

NutM6			5 Nm

Trailing link — Used in step 24

M8		Tightening torque	19 Nm

Battery cover — Used in step 24

M8			2,8 Nm

Intake silencer housing to lock bridge — Used in step 25

M6X30		Tightening torque	8 Nm

Clean air pipe to intake silencer housing — Used in step 25

Clamp		Tightening torque	3 Nm

Intake neck to cross connection — Used in step 26

M6		Tightening torque	8 Nm

Cross-brace to spring strut dome — Used in step 27

	Renew screw.	Jointing torque	28 Nm
		Angle of rotation	180 °

Cover on body — Used in step 27

Hexagon screw		Tightening torque	3 Nm

Vent valve — Used in step 30 31

		Tightening torque	10 Nm

Overview of Special Tools

Links

General repair instructions	Used in step
61 20 ... Notes on AGM battery	28

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61 12 ... Notes on intelligent battery sensor (IBS) 28
61 00 ... Notes for disconnecting and connecting battery 28
61 00 ... Safety information for handling vehicle battery

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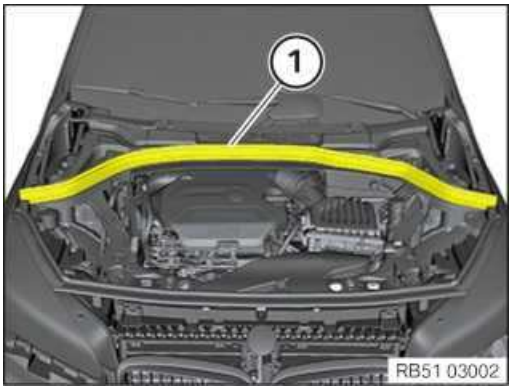
34 33 000 Removing and installing/replacing the brake booster (motor vehicles with AT)

PRELIMINARY WORK

1 – Remove the seal for the rear bonnet

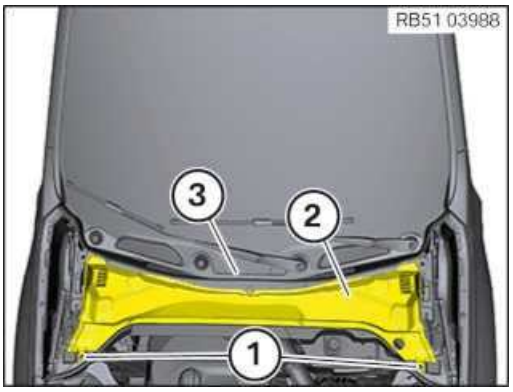
NOTICE

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



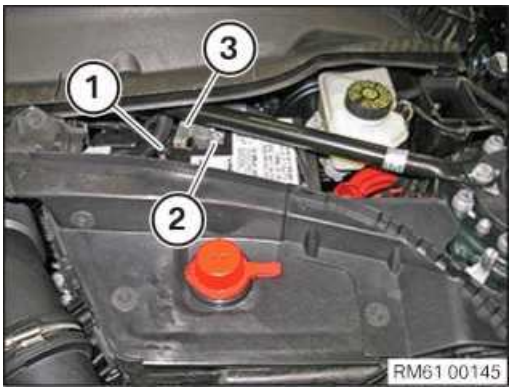
- Pull off rear bonnet seal (1) towards the top and remove.

2 – Removing front cowl panel cover



- Loosen the expanding rivet (1).
- Feed out and remove front cowl panel cover (2) from the rear cowl panel cover(3).

3 – Disconnecting the battery earth lead



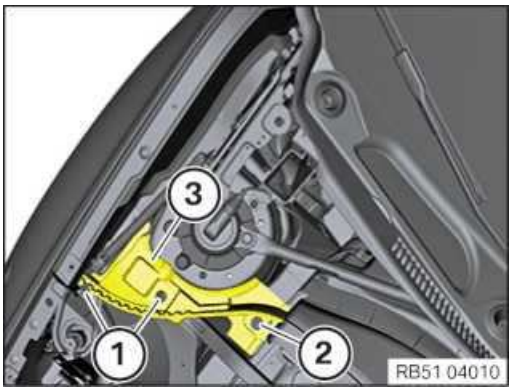
- Unlock plug connection (1) and disconnect.
- Unfasten nut (2).
- Remove the battery earth lead (3) and secure to one side.

4 – Remove suspension cross-brace

TECHNICAL INFORMATION

Driving without the strut brace/front end or tension strut is not permitted.

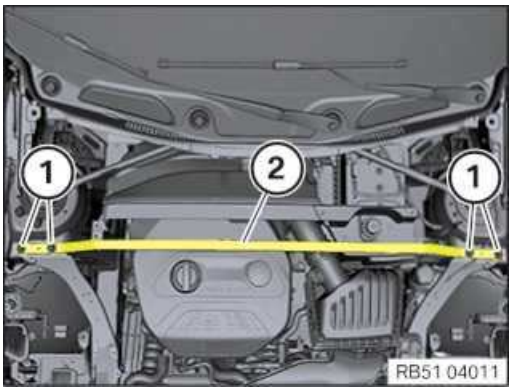
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NOTICE

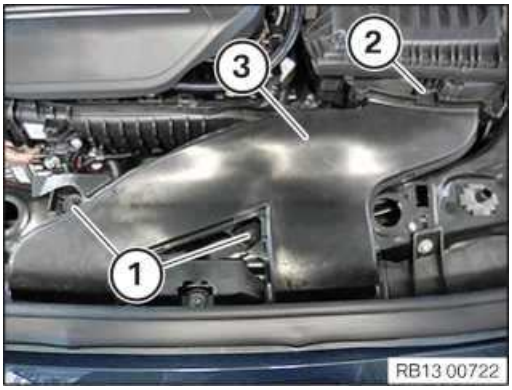
Description is for right component only. The procedure on the left side is identical.

- Loosen expanding rivet (1).
- Loosen screw (2).
- Remove the cover (3).



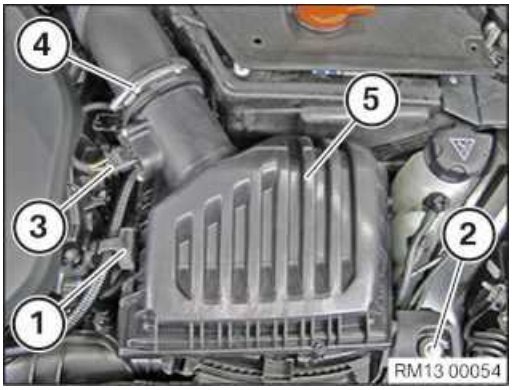
- Loosen screws (1).
- Remove strut brace (2).

5 – Remove the intake neck for intake silencer housing



- Loosen nuts (1).
- Loosen the lock (2).
- Guide the intake neck (3) out and remove it.

6 – Removing intake silencer housing



- Loosen the holder (1).
- Loosen screw (2).
- Unlock and loosen connector (3).
- Unfasten clamp (4).
- Pull out and remove the intake silencer housing (5) from the rubber mounts towards the top.

7 – Remove vehicle battery

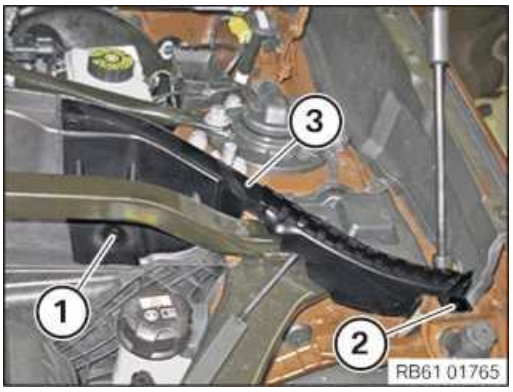
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WARNING

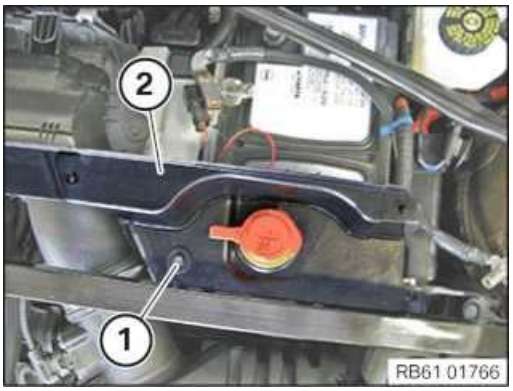
Working on 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

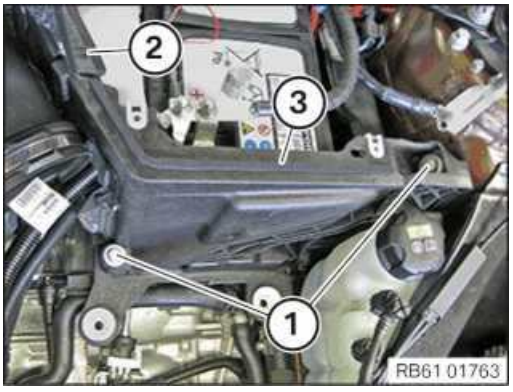
- Detach battery earth lead from battery.
- For additional batteries: Detach all battery earth leads from additional batteries.



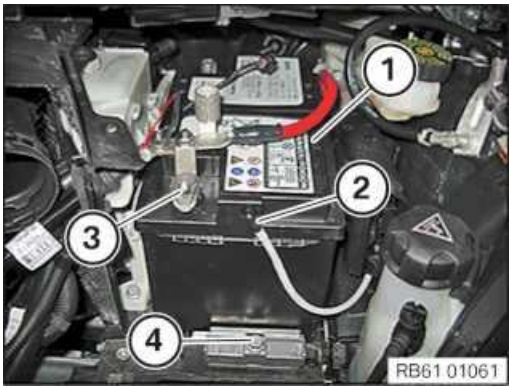
- Release the screw (1) and the expanding rivet (2).
- Remove the fixture for the gasket (3).



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



- Loosen screws (1).
- Unscrew the bolt (2) and guide the tension strut (3) out.



- Pull off the vent hose (2).
- Slacken the nut (3) on the positive battery terminal and remove the positive battery terminal.

WARNING

Unprotected battery terminals.

Risk of short circuits! Risk of fire!

- Cover the vehicle battery.

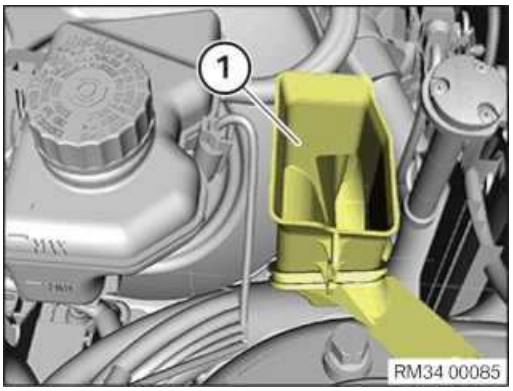
- Loosen the screw (4) and remove the holder.
- Remove vehicle battery (1).

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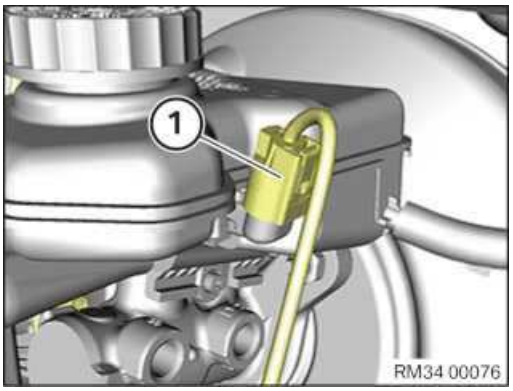
8 – Remove the expansion tank (vehicle with automatic transmission)

Prerequisite

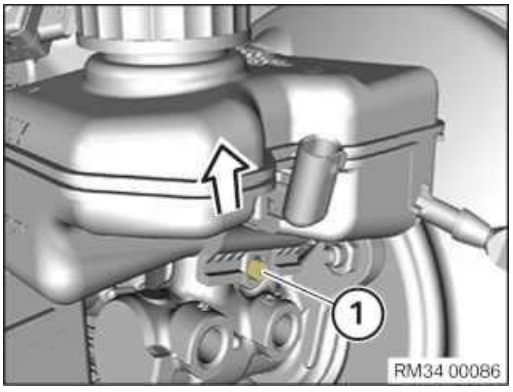
Brake fluid has been drawn off.



- Remove the water drain channel (1).

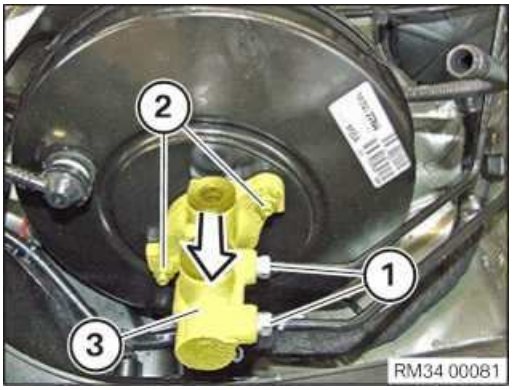


- Disconnect plug connection (1).



- Loosen screw (1).
- Remove expansion tank upwards.

9 – Remove the tandem brake master cylinder.



- (1)Unfasten brake lines.
- Loosen nuts (2) and remove tandem brake master cylinder (3).

10 – Remove left and right wiper arm

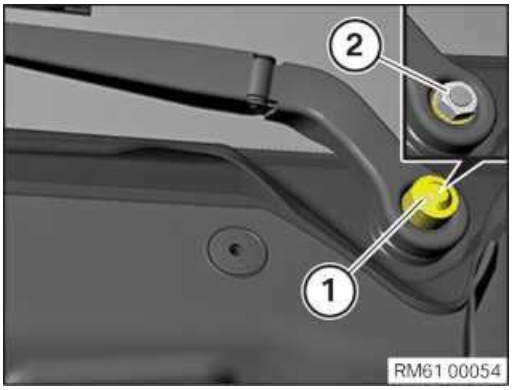
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RISK OF DAMAGE

Damage to wiper console

While removing the wiper arms without using special tool, the wiper console can break.

- Removing the wiper arms must be carried out only using the prescribed special tool.
- Do not lift off wiper arm, else the wiper console may break on the predetermined breaking point for the pedestrian protection.



- Pull off the protective cap (1) and release the nut (2) below it.



- Pull off windscreen wiper arm (1)with special tool .

11 – Remove the gutter strip on the windscreen on the left and right

NOTICE

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

▸ **Remove the gutter strip on the windscreen**

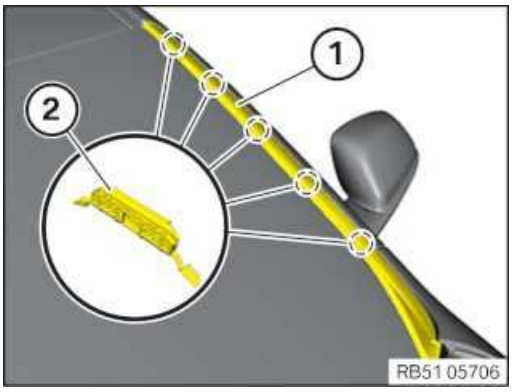
RISK OF DAMAGE

Scratches.

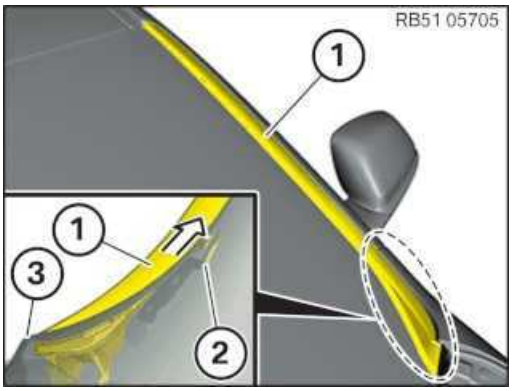
Tools and sharp-edged components can cause scratches.

- Protect working area.
- Handle tools and components carefully.

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- Unclip the gutter strip (1) from the clamps (2) beginning at the roof to the top.



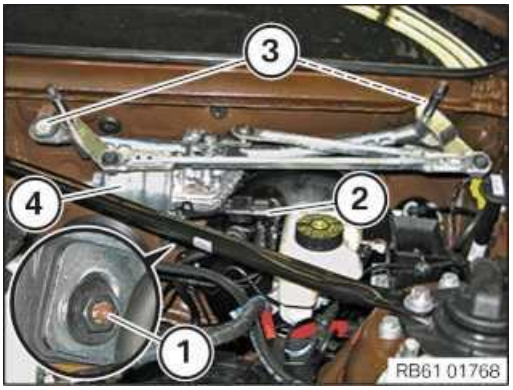
- Pull out the gutter strip (1) from the guide (2) in direction of arrow and carefully feed out at the side panel (3).

12 – Remove the rear cowl panel



- Pull off the cowl panel cover (1) towards the top, starting from the side and feed out.

13 – Removing the console for the windscreen wiper system complete with motor



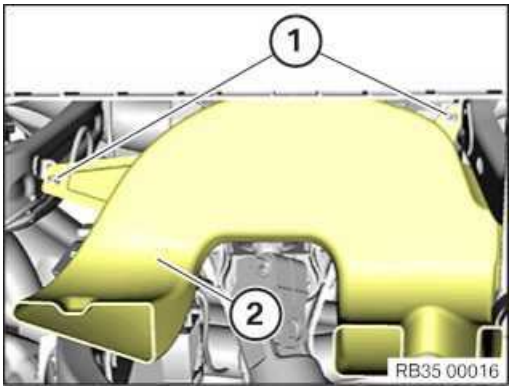
- Unfasten nut (1).
- Loosen screws (3).
- Unlock connector (2) and disconnect (see next figure).
- Remove the console for the windscreen wiper system (4).



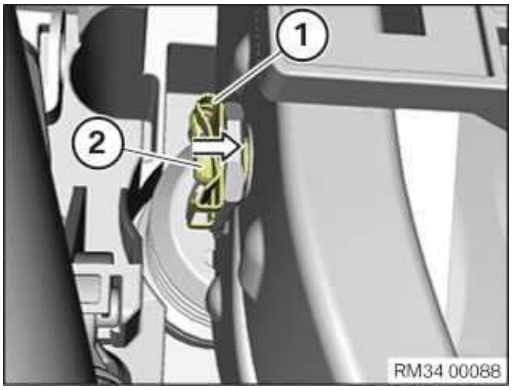
- Press lock on the connector underside and pull out the connector.

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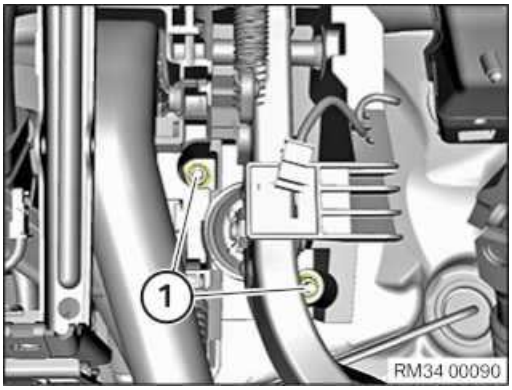
14 – Remove brake booster



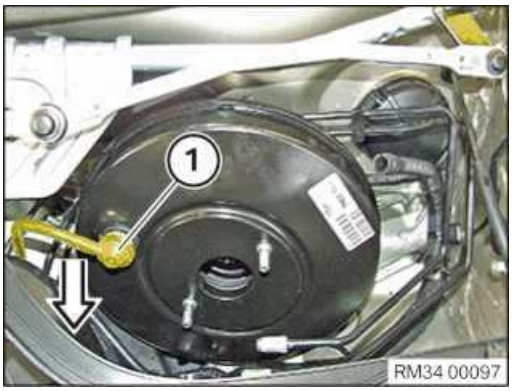
- Remove air duct (1).



- Pull off the retaining clip (1) on the brake pedal, detach the retaining bolt (2) and pull out.



- Loosen nuts (1).



- Remove non-return valve (1) from brake booster in the direction of the arrow.



- Unscrew the brake booster (1) from the bulkhead.

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15 – Prepare for the installation of the brake booster



- Replace the gasket (1) on the brake booster.

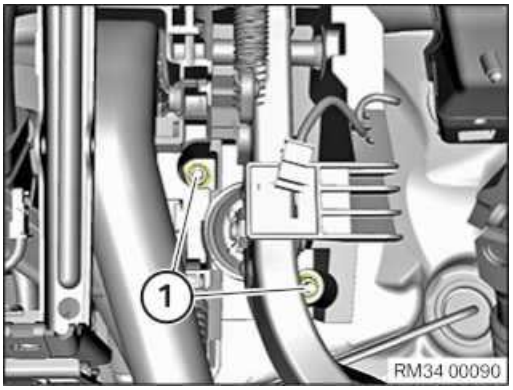
  Parts: Gasket

- Thoroughly clean the sealing surfaces on the brake booster and on the bulkhead.

16 – Install brake booster



- Screw in the brake booster (1) in the bulkhead.



- Renew nuts (1).

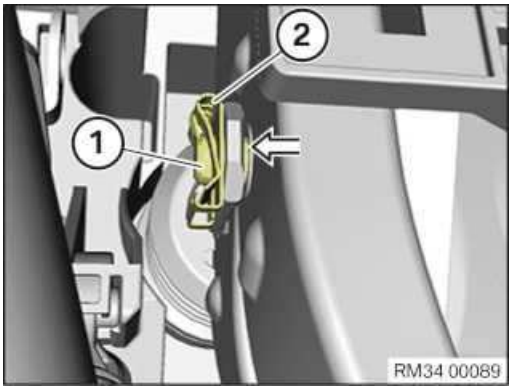
  Parts: Nuts

- Install the nuts (1) and tighten.

Brake booster to pedal assembly console

Replace nuts.

M8	Replace nuts.	24 Nm



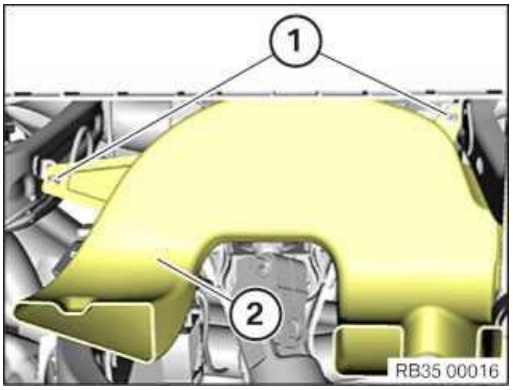
- Install the retaining bolt (1) through the brake pedal.

  Lightly grease the retaining bolts (1).

- Renew the retaining clip (2).

  Parts: Retaining clip

- Mount the retaining clip (2) at the retaining bolt.



- Install air duct (1).

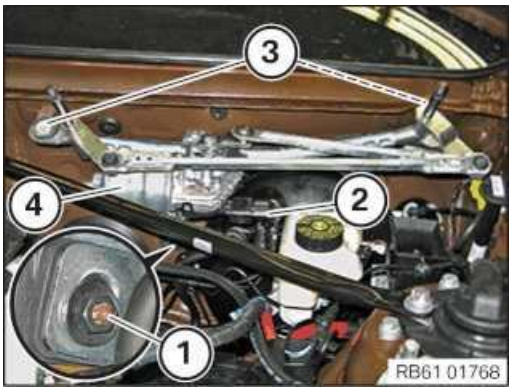
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- Install non-return valve (1) in direction of arrow into brake booster.

POSTPROCESSES

17 – Installing console for windscreen wiper system complete with engine



- Feed in console for windscreen wiper system (4).
- Tighten down screws (3).

Wiper console to body

M6x30		Tightening torque	10 Nm

- Tighten nut (1).

Wiper console to retaining bracket

M6		Tightening torque	10 Nm

- Connect connector (2).

18 – Install the rear cowl panel



- Insert the cowl panel cover (1) and press it into the latch mechanism on the windscreen starting at the side.

19 – Install the gutter strip on the windscreen on the left and right

NOTICE

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

▸ **Install the gutter strip on the windscreen**

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RISK OF DAMAGE

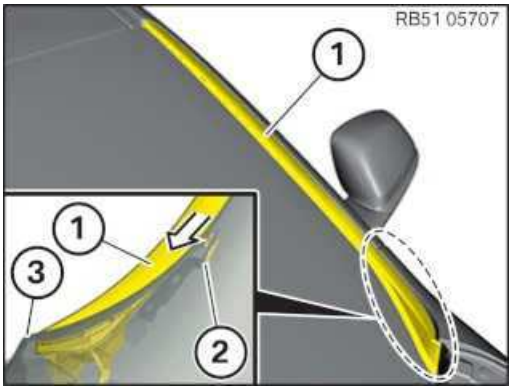
Scratches.

Tools and sharp-edged components can cause scratches.

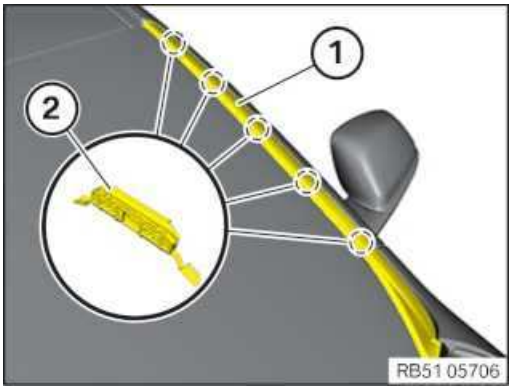
- Protect working area.
- Handle tools and components carefully.

TECHNICAL INFORMATION

Latch mechanisms, guides and mounting elements must not be damaged or missing.

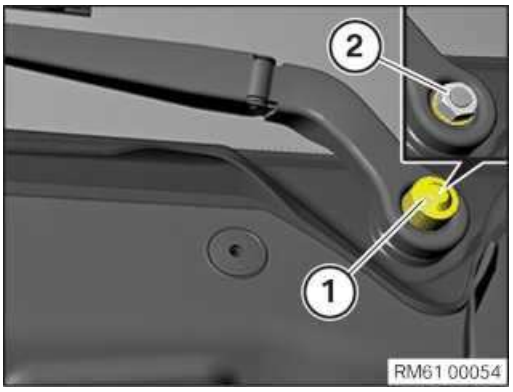


- Carefully feed in the gutter strip (1) at the side panel (3) and simultaneously feed into the guide (2) in direction of arrow.



- Clip in the gutter strip (1) at the bottom starting at the clamps (2).

20 – Install left and right wiper arm



- Join wiper arm and tighten with nut (2).

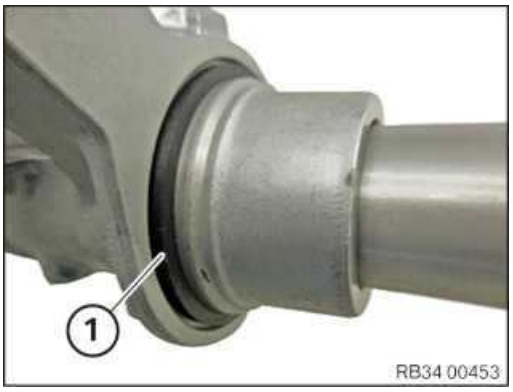
Windscreen wiper arm

Combination hexagon nut		Tightening torque	35 Nm

- Join the protective cap (1).

21 – Preparations for installing the tandem brake master cylinder

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- Renew sealing ring (1).

  Parts: Sealing ring

22 – 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

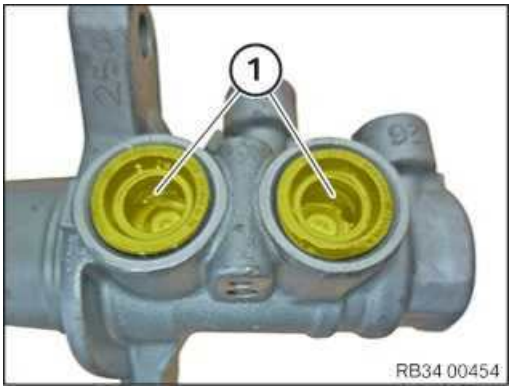
Replace nuts.		
M8		23 Nm

- (3)Fit brake lines () and tighten.

Brake pipe screw connection / Union screws

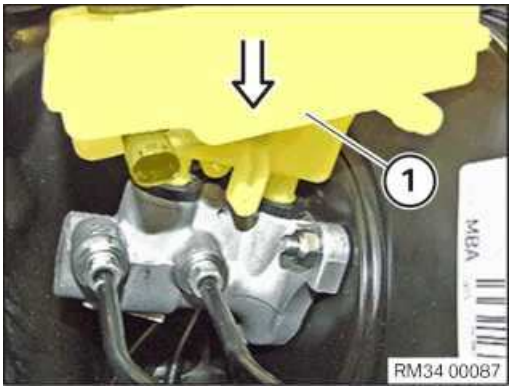
		17 Nm

23 – Installing the expansion tank (vehicles with automatic transmission)



- Renew rubber plugs(1).

  Parts: Rubber plug



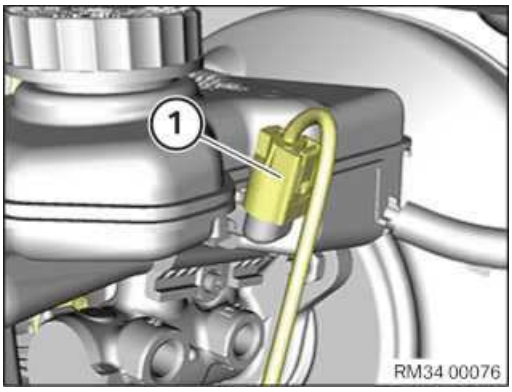
- Connect expansion tank (1) to the tandem brake master cylinder.
- Renew the retaining screw.

  Parts: Retaining screw
- Attach retaining screw and tighten.

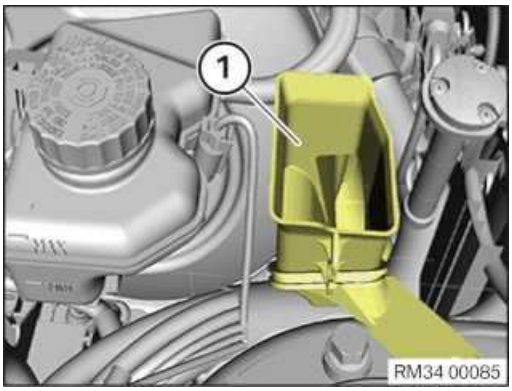
Retaining screw, expansion tank to tandem brake master cylinder

	Renew screw.	4 Nm

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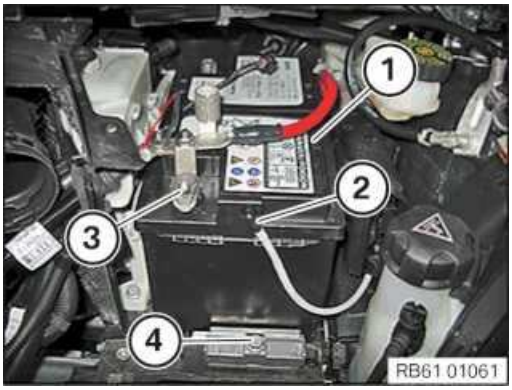


- Connect the plug connection (1).



- Install the water drain channel (1).

24 – Install vehicle battery



- Install vehicle battery (1).
- Position the bracket and tighten with the screw (4) .

Battery terminal rail to battery tray

M8		19 Nm

- Position the vent hose (2) and clip it in.
- Position the positive battery terminal and tighten with the nut (3) .

Battery terminal with IBS positive battery terminal / negative battery terminal

NutM6		5 Nm

▸ **Check the vent holes of the battery**

WARNING

Gas emission.

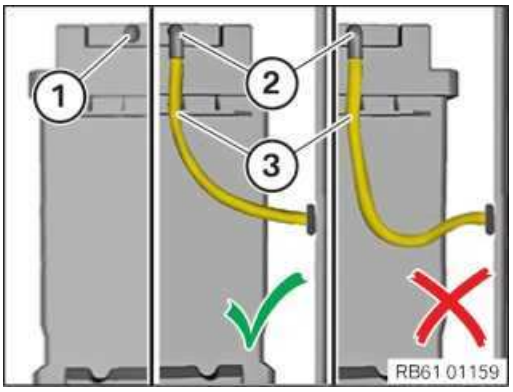
Danger of injury! Danger of explosion!

- Assign the vent holes correctly.
- Route the vent hose correctly.

TECHNICAL INFORMATION

The battery has two vent holes, opposite:
One vent hole (1) must be closed correctly with a dummy plug.
The vent hose (3) must be correctly connected and routed at the other vent hole (2).

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Check

- Check if the vent hole (1) is correctly closed with a dummy plug.

Result

» No dummy plug.

Measure

- Close the vent hole (1) correctly with a dummy plug.

Check

- Check if the vent hole (2) has a correctly connected vent hose (3).

Result

» The vent hose (3) is not correctly connected.

Measure

- At the vent hole (2), connect the vent hose (3) correctly.

Check

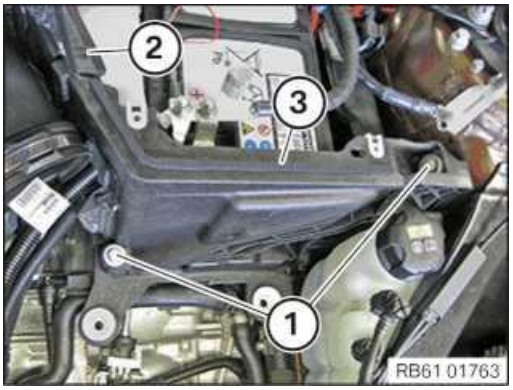
- Check if the vent hose (3) is routed to the outside with a downhill gradient (**no siphon formation!**).

Result

» The vent hose (3) is not correctly routed as shown in the image on the right.

Measure

- Route the vent hose (3) correctly as shown in the centre image.



- Insert tension strut (3) and tighten with screws (1).

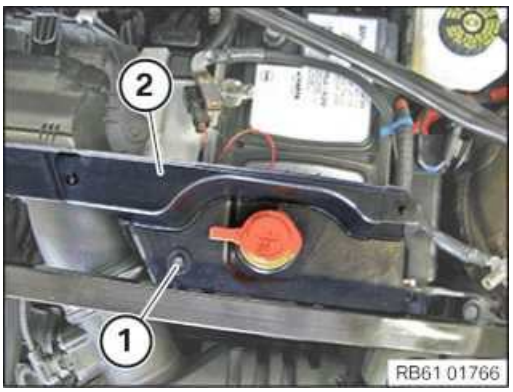
Trailing link

M8		Tightening torque	19 Nm

- Tighten down screw (2).

Battery cover

M8		2,8 Nm

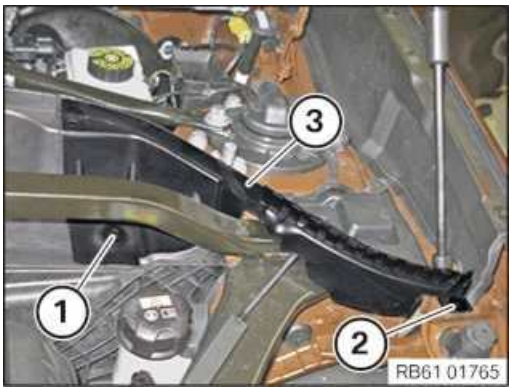


- Position the cover (2).
- Tighten down screw (1).

Battery cover

M8		2,8 Nm

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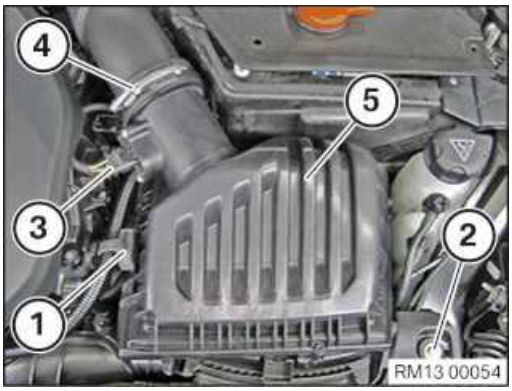


- Position the fixture for the gasket (3) and secure with the expanding rivet (2).
- Tighten down screw (1).

Battery cover

M8		2,8 Nm

25 – Installing intake silencer housing



- Insert the intake silencer housing (5) into the rubber mounts and install it.

  Intake filter housing (5) must engage audibly.
- Tighten down screw (2).

Intake silencer housing to lock bridge

M6X30		Tightening torque	8 Nm

- Tighten clamp (4).

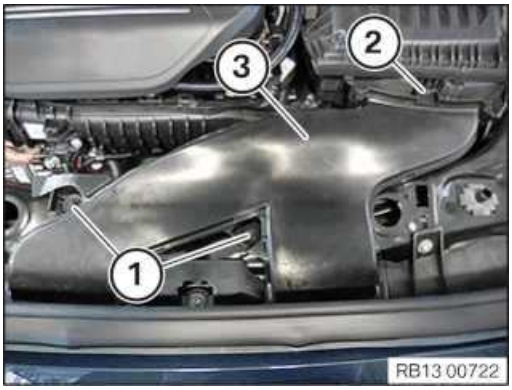
Clean air pipe to intake silencer housing

Clamp		Tightening torque	3 Nm

- Connect and lock the connector (3).

  The connector (3) must engage audibly.
- Insert and install the holder (1).

26 – Install the intake neck for the intake filter housing



- Insert and install the intake neck (3).

  The lock (2) must audibly engage.
- Tighten nuts (1).

Intake neck to cross connection

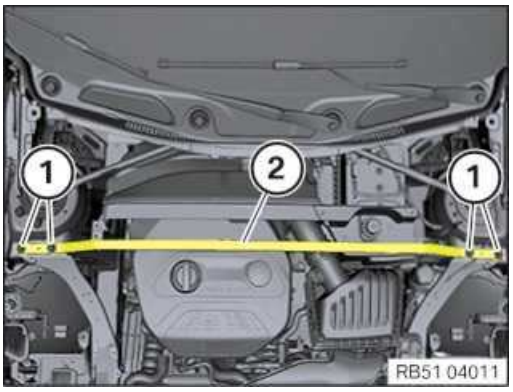
M6		Tightening torque	8 Nm

27 – Install strut brace

TECHNICAL INFORMATION

Driving without the strut brace/front end or tension strut is not permitted.

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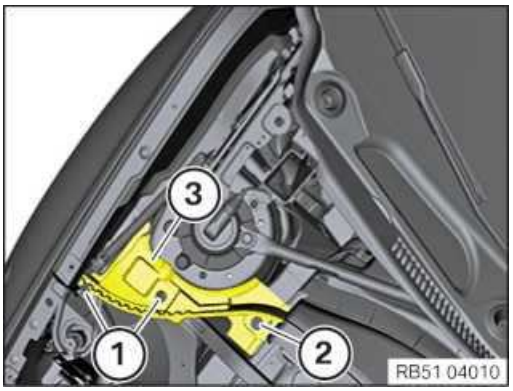


- Install the strut brace (2).
- Renew screws (1).

  Parts: Bolts
- Tighten the screws (1).

Cross-brace to spring strut dome

	Renew screw.	Jointing torque	28 Nm
		Angle of rotation	180 °



NOTICE

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

- Install the cover (3).
- Tighten down screw (2).

Cover on body

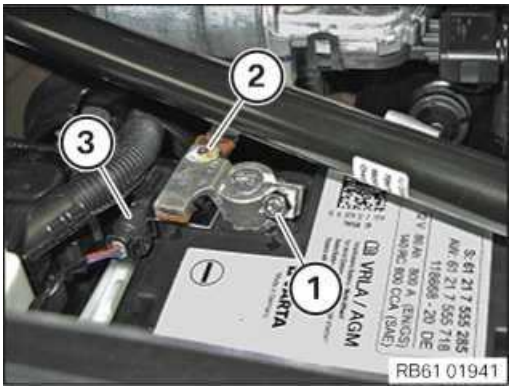
Hexagon screw		Tightening torque	3 Nm

- Install the expanding rivet (1).

28 – Connecting the battery earth lead

TECHNICAL INFORMATION

For additional information see:
61 00 ... Safety information on handling the vehicle battery
61 00 / 12 00 ... Notes on disconnecting and connecting the vehicle battery
61 12 ... Notes on the intelligent battery sensor (IBS)



- Remove the protective cover of the positive battery terminal.
- Position the battery earth lead (2).
- Tighten nut (1).

Battery terminal with IBS positive battery terminal / negative battery terminal

NutM6		5 Nm

- If required, connect the connector (3).

29 – Connect the bleeder unit for brake fluid (following repair)

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- 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.

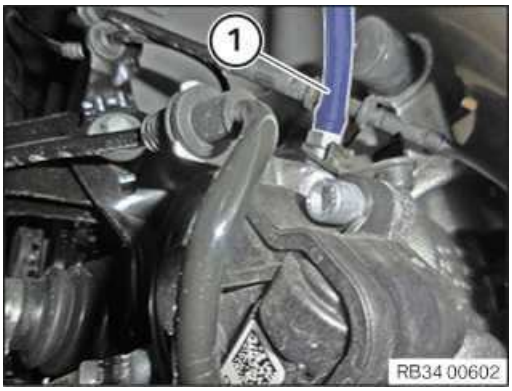
- Connect the bleeder unit (1) to the brake fluid expansion tank and switch it on.

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

30 – 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.

31 – Flushing and bleeding the front axle brake circuit

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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

32 – Finalize the bleeder unit for brake fluid (following repair)

RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.



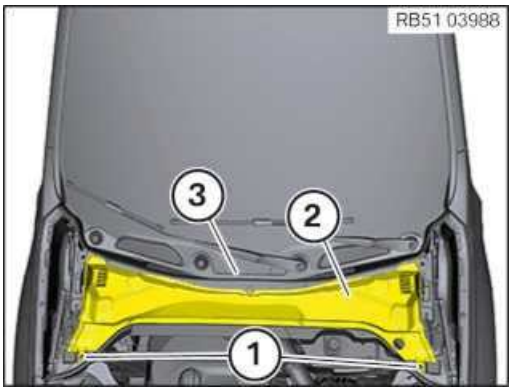
- Switch off bleeder unit (1) and remove from brake fluid expansion tank .
- Check the brake fluid level; if necessary, adjust to maximum mark.



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

33 – Installing front cowl panel cover

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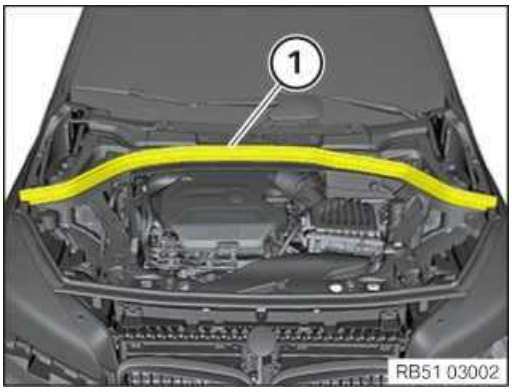


- Insert and install cowl panel cover at front (2) into cowl panel cover at rear (3).
- Check cowl panel cover at front is correctly seated (2).
- Secure expanding rivet (1).

34 – Install the seal for the bonnet

NOTICE

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



- Install bonnet seal at rear (1).
- Ensure that the rear bonnet seal (1) is fitted correctly.

Additional Information

Overview of Tightening Torques

Brake booster to pedal assembly console — Used in step 16

Replace nuts.

M8	Replace nuts.		24 Nm

Wiper console to body — Used in step 17

M6x30		Tightening torque	10 Nm

Wiper console to retaining bracket — Used in step 17

M6		Tightening torque	10 Nm

Windscreen wiper arm — Used in step 20

Combination hexagon nut		Tightening torque	35 Nm

Tandem brake master cylinder in the brake booster — Used in step 22

Replace nuts.

M8			23 Nm

Brake pipe screw connection / Union screws — Used in step 22

			17 Nm

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Retaining screw, expansion tank to tandem brake master cylinder			Used in step 23
	Renew screw.		4 Nm

Battery terminal rail to battery tray			Used in step 24
M8			19 Nm

Battery terminal with IBS positive battery terminal / negative battery terminal			Used in step 24 28
NutM6			5 Nm

Trailing link			Used in step 24
M8		Tightening torque	19 Nm

Battery cover			Used in step 24
M8			2,8 Nm

Intake silencer housing to lock bridge			Used in step 25
M6X30		Tightening torque	8 Nm

Clean air pipe to intake silencer housing			Used in step 25
Clamp		Tightening torque	3 Nm

Intake neck to cross connection			Used in step 26
M6		Tightening torque	8 Nm

Cross-brace to spring strut dome			Used in step 27
	Renew screw.	Jointing torque	28 Nm
		Angle of rotation	180 °

Cover on body			Used in step 27
Hexagon screw		Tightening torque	3 Nm

Vent valve			Used in step 30 31
		Tightening torque	10 Nm

Overview of Special Tools

Links

General repair instructions	Used in step
61 20 ... Notes on AGM battery	28
61 12 ... Notes on intelligent battery sensor (IBS)	28
61 00 ... Notes for disconnecting and connecting battery	28
61 00 ... Safety information for handling vehicle battery	

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34 35 001 Replacing a brake pad wear sensor (front)

PRELIMINARY WORK

1 – Removing the front left wheel

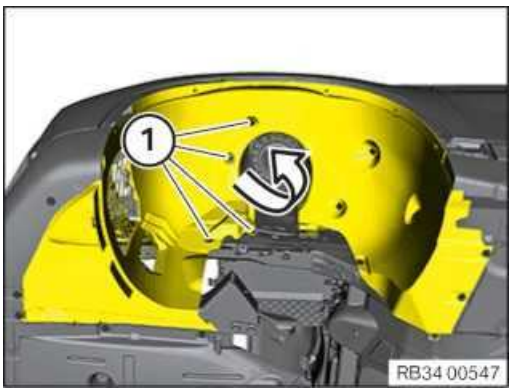


▸ **Removing the wheel**

- 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.
- Unscrew the wheel bolts (arrows) and remove the wheel.

  Use the matching adapter from tool set (wheel bolt adapter set) to loosen and tighten down the wheel bolt with security code.

2 – Partially detach front wheel arch cover



- Loosen screws (1).
- Lift the wheel arch cover.

MAIN WORK

3 – 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.

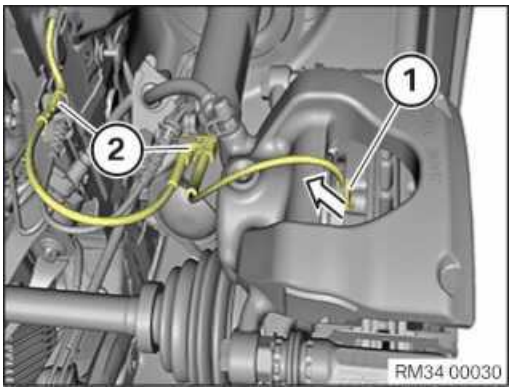
If a brake pad wear sensor that has already been ground has to be replaced even though the minimum brake pad thickness has not yet been reached, you must observe the following:

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

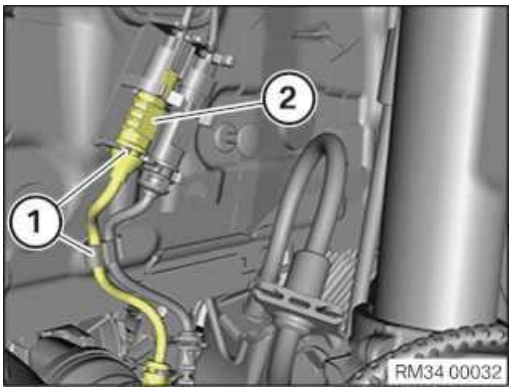
When renewing the brake pad wear sensor, a CBS reset must be carried out.

If a brake pad wear sensor was renewed without renewing the brake pads, you must observe the following: Carry out "CBS vehicle data correction" service function via diagnosis system and information system.

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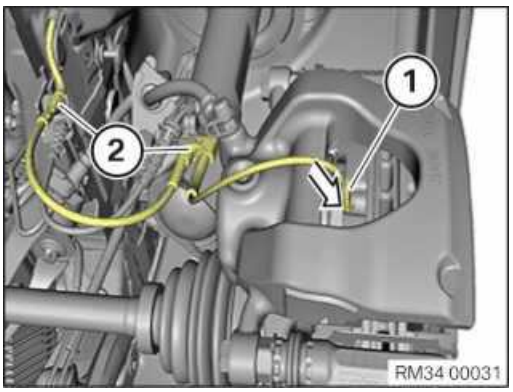


- Remove brake pad wear sensor (1) out of the brake pad in the direction of the arrow.
- Detach the brake pad wear sensor (1) cable from the brackets (2).



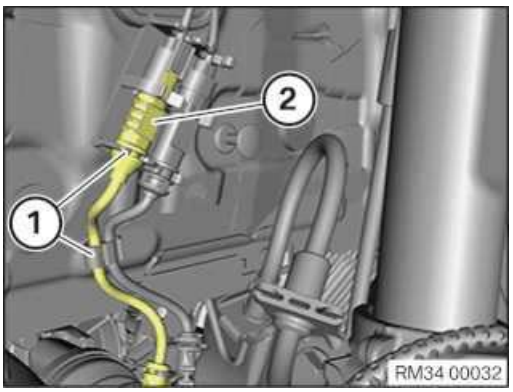
- Detach the brake pad wear sensor from the brackets (1).
- Disconnect plug connection (2).

4 – Installing front brake pad wear sensor



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

  Ensure brake pad wear sensor fits correctly in brake pad.

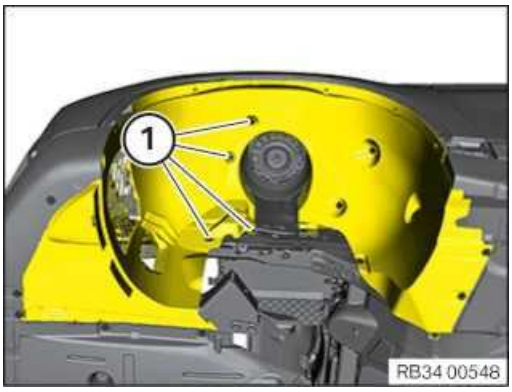


- Connect the plug connection (2).
- Attach cable of brake pad wear sensor in brackets (1).

POSTPROCESSES

5 – Installing the front wheel arch cover

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- Position wheel arch cover.
- Insert screws (1) and tighten them.

Wheel arch cover to body

Screw		Tightening torque	2,5 Nm

6 – Attaching the front left wheel

▶ **Mounting the wheel**

▷ **Clean the contact surfaces between the brake disc and the wheel rim**



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**.

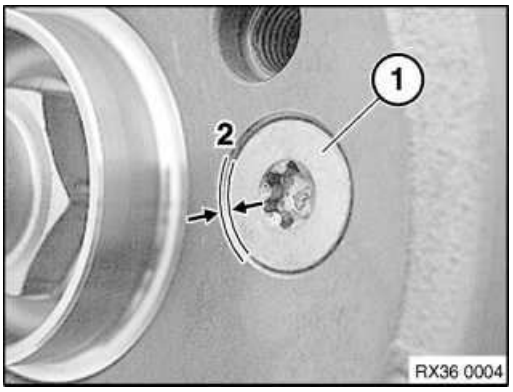
  Do not operate special tool **2 344 011** with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.



- 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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- Renew mounting bolt (1).

  Parts: Mounting bolt

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

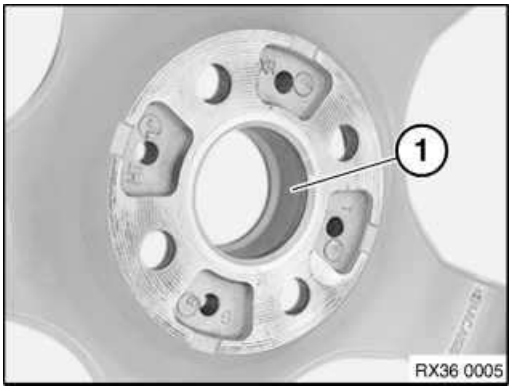
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm



- Lightly grease the wheel centring (1) in the wheel rim; refer to additional information for grease for the wheel centring (1).

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

Wheel bolts

M 14/AF 17	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

Additional Information

Overview of Tightening Torques

Wheel arch cover to body Used in step 5

Screw		Tightening torque	2,5 Nm

Brake disc to rear wheel hub Used in step 6

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to front wheel hub Used in step 6

M8	Renew screw.	Tightening torque	16 Nm

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Wheel bolts			Used in step 6
M 14/AF 17	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

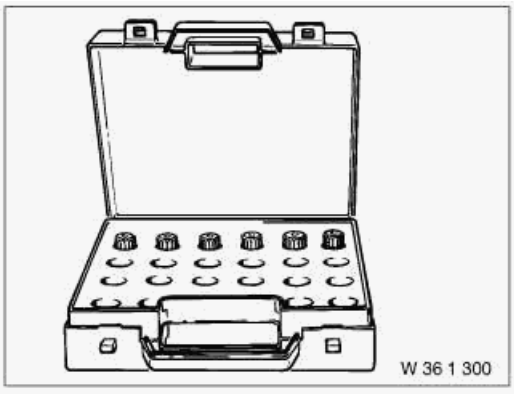
2 344 011 Tool



Common	Used in step 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)

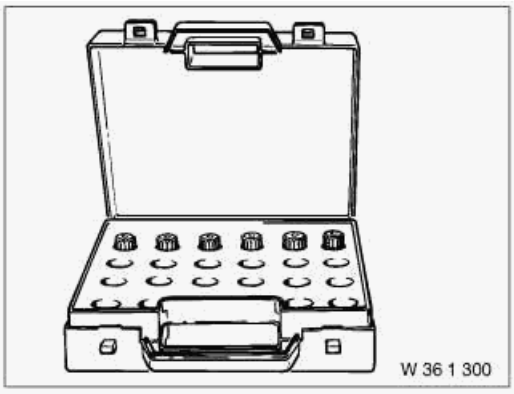
Replacement tools:

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	

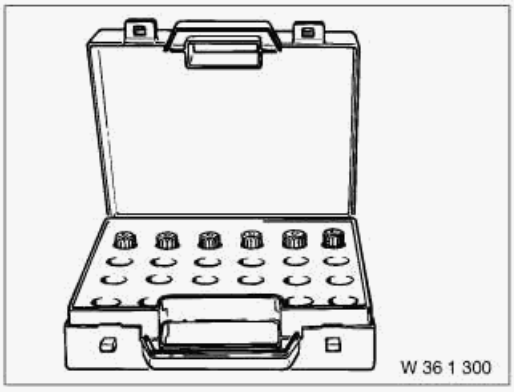
0 495 224 (36 1 326) Wheel stud



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	

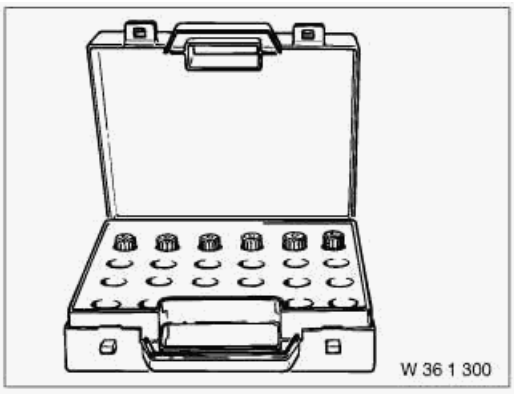
0 495 228 (36 1 331) Wheel stud



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

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0 495 229 (36 1 332) Wheel stud



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

0 495 230 (36 1 333) Wheel stud



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

Links

Operating materials	Used in step
2.0 Grease for wheel centring	6

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34 35 003 Replacing one brake pad wear sensor (rear)

PRELIMINARY WORK

1 – Removing the rear right wheel



▸ **Removing the wheel**

- 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.
- Unscrew the wheel bolts (arrows) and remove the wheel.

  Use the matching adapter from tool set (wheel bolt adapter set) to loosen and tighten down the wheel bolt with security code.

MAIN WORK

2 – Removing the brake pad wear sensor, rear

TECHNICAL INFORMATION

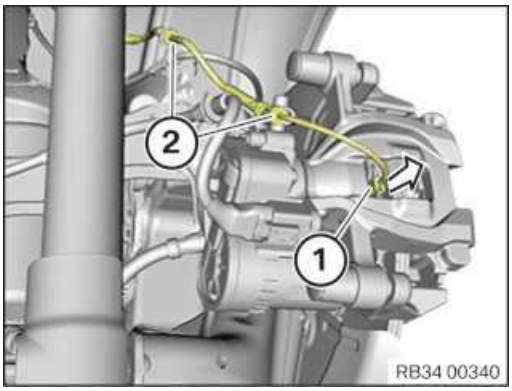
The brake pad wear sensor must be replaced once it has been removed because the brake pad wear sensor loses its retention capability in the brake pad.

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.

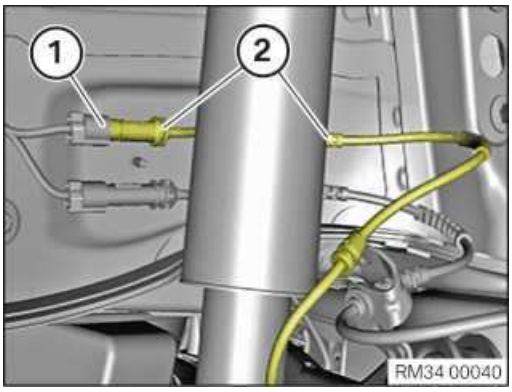
When renewing the brake pad wear sensor, a CBS reset must be carried out.

If a brake pad wear sensor was renewed without renewing the brake pads, you must observe the following: Carry out "CBS vehicle data correction" service function via diagnosis system and information system.



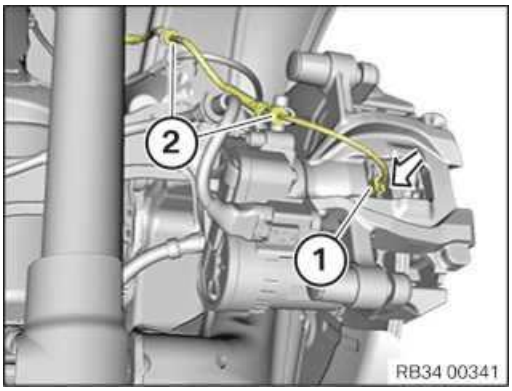
- Remove the brake pad wear sensor (1) from the brake pad.
- Detach the cable of the brake pad wear sensor from the bracket (2).

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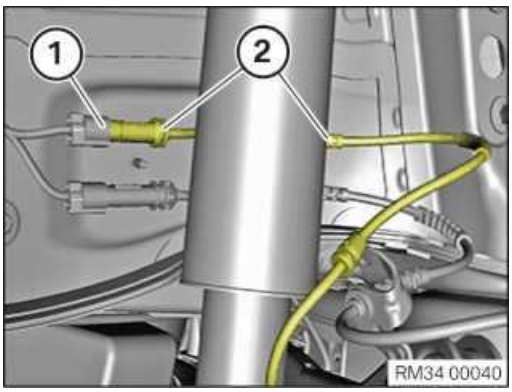
- Disconnect plug connection (1).
- Detach the brake pad wear sensor from the bracket (2).

3 – Install rear brake pad sensor



- Install brake pad wear sensor (1) 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 sensor in brackets (2).



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

POSTPROCESSES

4 – Installing rear right wheel

▶ **Mounting the wheel**

▷ **Clean the contact surfaces between the brake disc and the wheel rim**

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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.

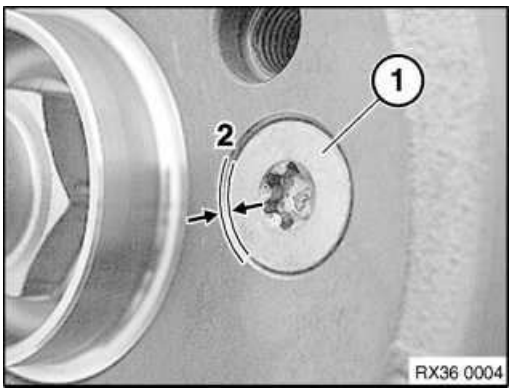
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool **2 344 011**.

  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).



- Renew mounting bolt (1).

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

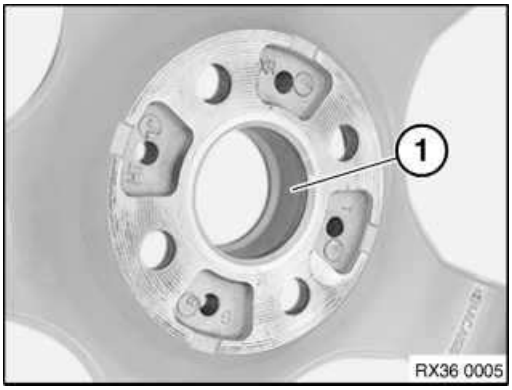
  The mounting bolt (1) for the brake disc may not protrude under any circumstances on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm



- Lightly grease the wheel centring (1) in the wheel rim; refer to additional information for grease for the wheel centring (1).

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

Wheel bolts

M 14/AF 17	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

Additional Information

Overview of Tightening Torques

Brake disc to rear wheel hub Used in step 4

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to front wheel hub Used in step 4

M8	Renew screw.	Tightening torque	16 Nm

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Wheel bolts			Used in step 4
M 14/AF 17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim. Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.	Tightening torque Check	140 Nm 140 Nm

Overview of Special Tools

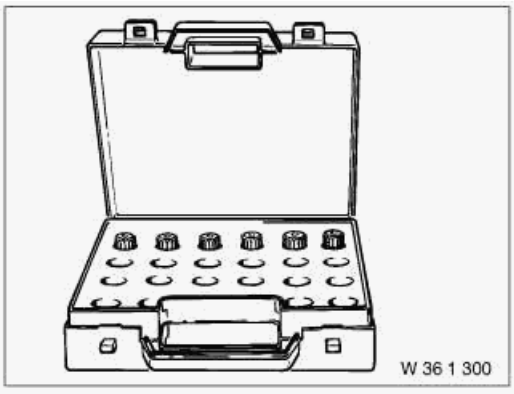
2 344 011 Tool



Common	Used in step 4
Usage	Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	08 08 12 (872)

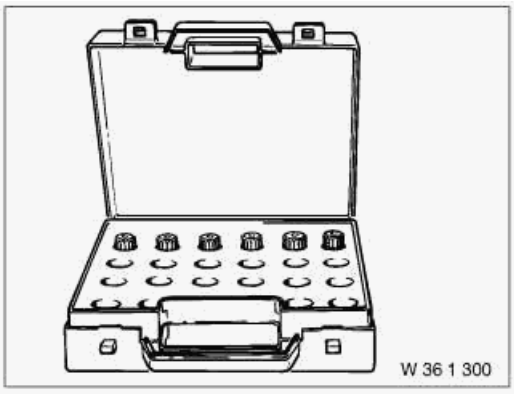
Replacement tools:

0 495 221 (36 1 323) Wheel stud



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

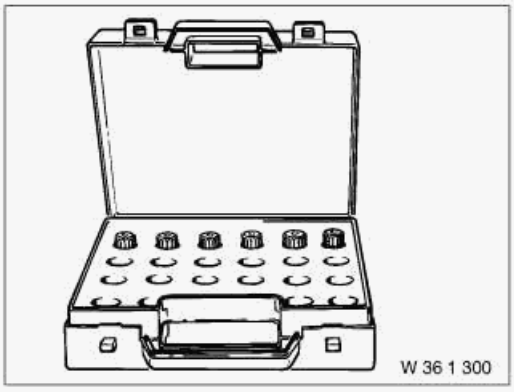
0 495 224 (36 1 326) Wheel stud



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

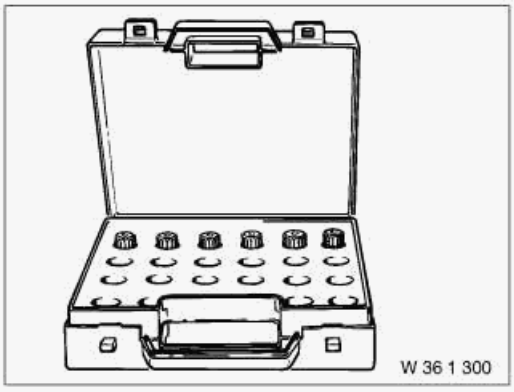
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0 495 225 (36 1 327) Wheel stud



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

0 495 226 (36 1 328) Wheel stud



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

0 495 227 (36 1 329) Wheel stud



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

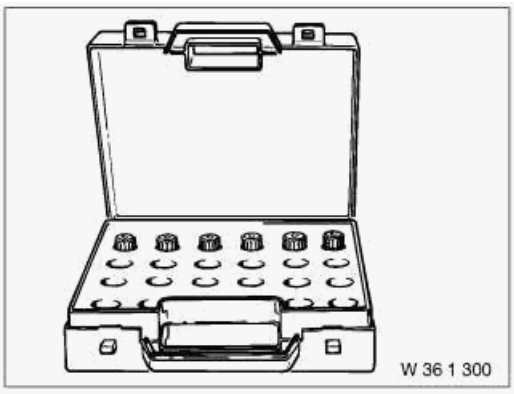
0 495 228 (36 1 331) Wheel stud



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

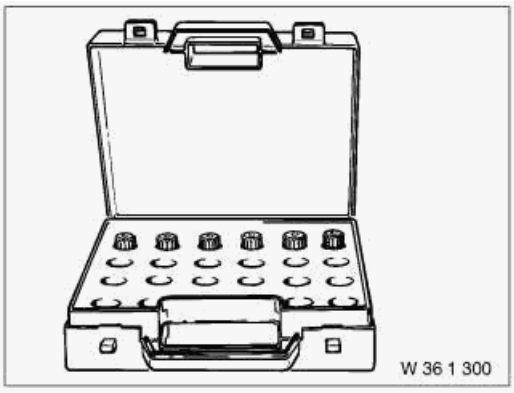
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0 495 229 (36 1 332) Wheel stud



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

0 495 230 (36 1 333) Wheel stud



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

Links

Operating materials	Used in step
2.0 Grease for wheel centring	4

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34 41 071 Electromechanical parking brake - emergency release

CAUTION

Vehicle rolls away.

Danger of injury! Risk of damage!

- Secure the vehicle against rolling away before unlocking the parking lock.

PRELIMINARY WORK

MAIN WORK

POSTPROCESSES

1 â€“ Electromechanical parking brake start-up after emergency release

TECHNICAL INFORMATION

Start-up after open circuit:
Switch the ignition on.
Press brake button with brake pedal pressed.
The indicator light in the instrument panel goes out as soon as the parking brake is released.

Additional Information

Overview of Tightening Torques

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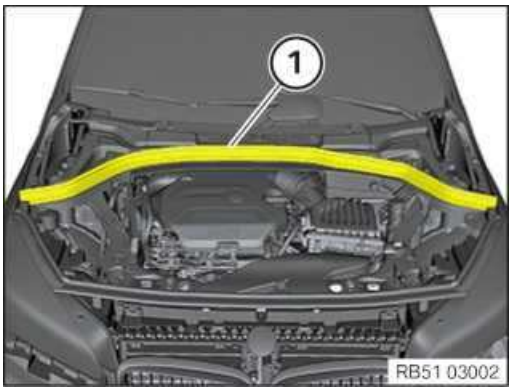
34 51 100 Removing and installing the hydraulic unit

PRELIMINARY WORK

1 – Remove the seal for the rear bonnet

NOTICE

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



- Pull off rear bonnet seal (1) towards the top and remove.

2 – Remove the gutter strip on the windscreen on the left and right

NOTICE

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

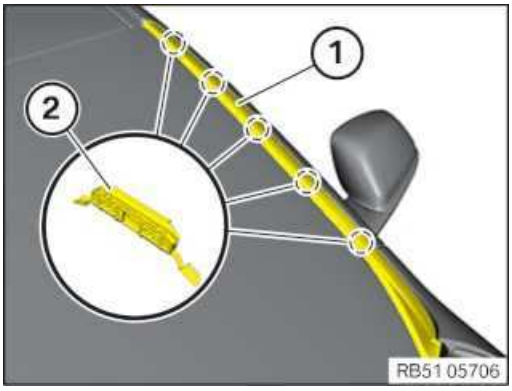
▸ **Remove the gutter strip on the windscreen**

RISK OF DAMAGE

Scratches.

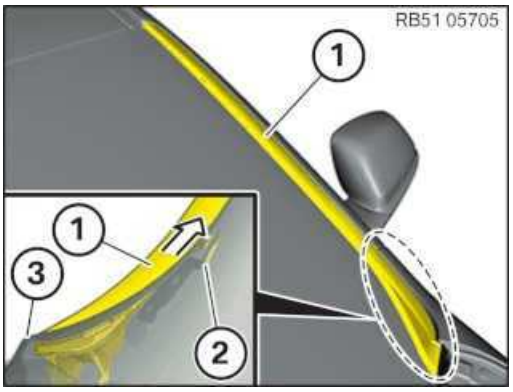
Tools and sharp-edged components can cause scratches.

- Protect working area.
- Handle tools and components carefully.



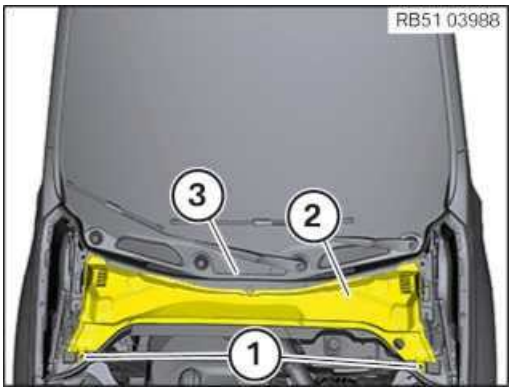
- Unclip the gutter strip (1) from the clamps (2) beginning at the roof to the top.

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- Pull out the gutter strip (1) from the guide (2) in direction of arrow and carefully feed out at the side panel (3).

3 – Removing front cowl panel cover



- Loosen the expanding rivet (1).
- Feed out and remove front cowl panel cover (2) from the rear cowl panel cover(3).

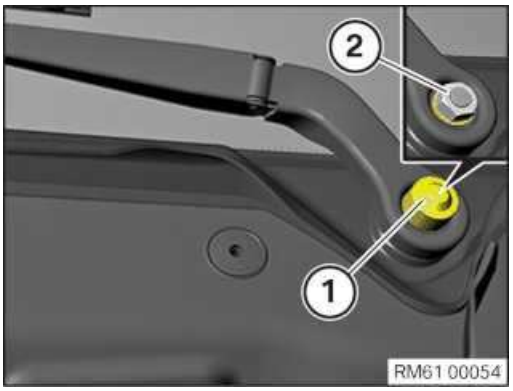
4 – Remove left and right wiper arm

RISK OF DAMAGE

Damage to wiper console

While removing the wiper arms without using special tool, the wiper console can break.

- Removing the wiper arms must be carried out only using the prescribed special tool.
- Do not lift off wiper arm, else the wiper console may break on the predetermined breaking point for the pedestrian protection.



- Pull off the protective cap (1) and release the nut (2) below it.



- Pull off windscreen wiper arm (1)with special tool .

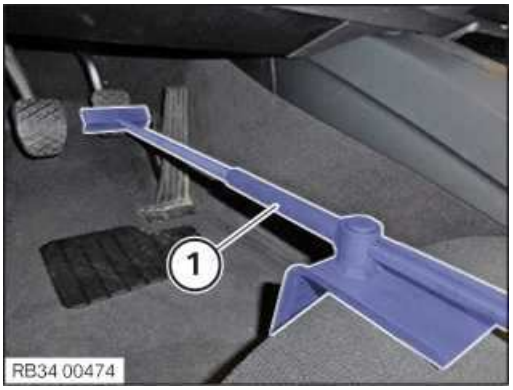
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5 – Remove the rear cowl panel



- Pull off the cowl panel cover (1) towards the top, starting from the side and feed out.

6 – Install brake pedal tensioner

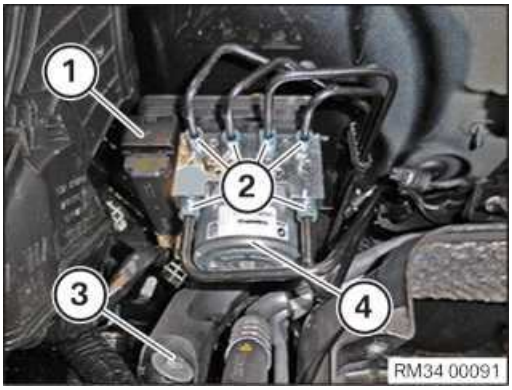


- Press the brake pedal to the floor and fix the brake pedal tensioner (1).

  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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7 – Remove hydraulic unit



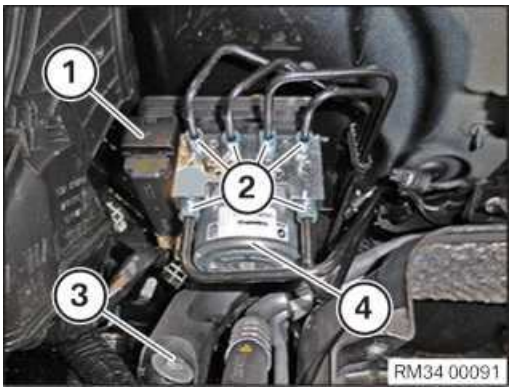
- Disconnect plug connection (1).

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.

- (2)Unfasten brake lines.
- Release the screw (3) and remove the hydraulic unit (4).

8 – Install hydraulic unit



- Position hydraulic unit (4).
- Renew the screw (3).

  Parts: Screw.
- Position and tighten the screw (3).

Hydraulic unit with holder on body

	Renew screws.	8 Nm

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.

- (2)Fit brake lines () and tighten.

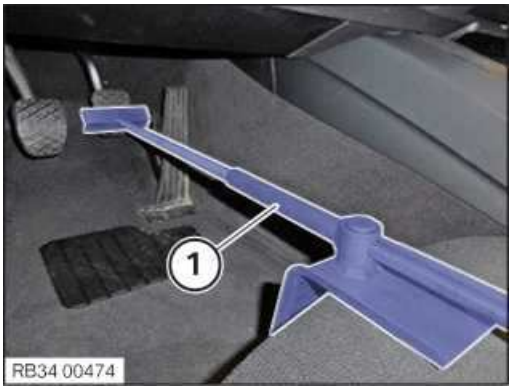
Brake pipe screw connection / Union screws

	17 Nm

- Connect the plug connection (1).

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9 – Remove the brake pedal tensioner



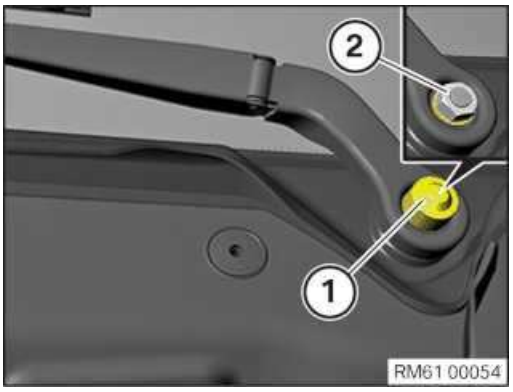
- Remove the brake pedal tensioner (1).

10 – Install the rear cowl panel



- Insert the cowl panel cover (1) and press it into the latch mechanism on the windscreen starting at the side.

11 – Install left and right wiper arm



- Join wiper arm and tighten with nut (2).

Windscreen wiper arm

Combination hexagon nut		Tightening torque	35 Nm

- Join the protective cap (1).

12 – Connect the bleeder unit for brake fluid (following repair)



- 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.

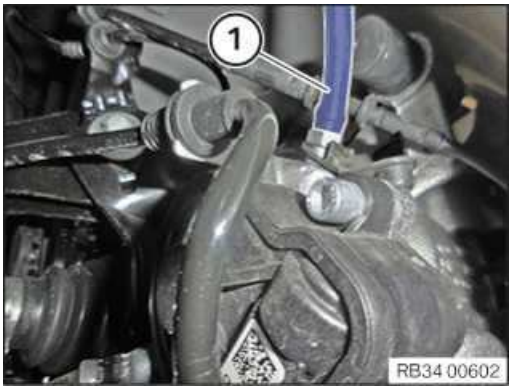
  Observe the operating instructions of the corresponding equipment manufacturer.

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

13 – 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.

14 – Flushing and bleeding the front 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 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

15 – Finalize the bleeder unit for brake fluid (following repair)

RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.

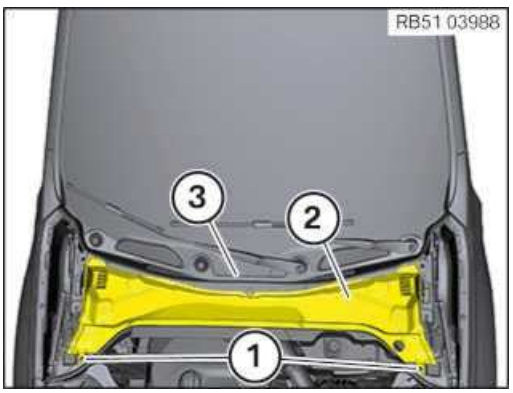


- Switch off bleeder unit (1) and remove from brake fluid expansion tank .
- Check the brake fluid level; if necessary, adjust to maximum mark.



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

16 – Installing front cowl panel cover



- Insert and install cowl panel cover at front (2) into cowl panel cover at rear (3).
- Check cowl panel cover at front is correctly seated (2).
- Secure expanding rivet (1).

17 – Install the gutter strip on the windscreen on the left and right

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NOTICE

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

▸ **Install the gutter strip on the windscreen**

RISK OF DAMAGE

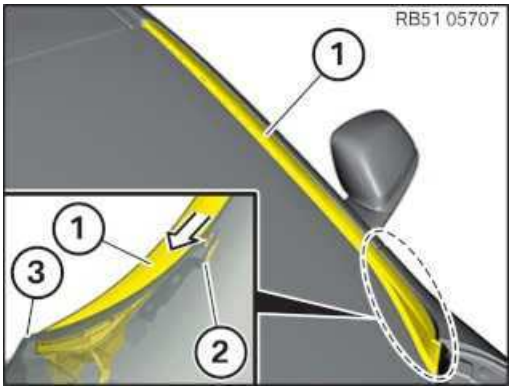
Scratches.

Tools and sharp-edged components can cause scratches.

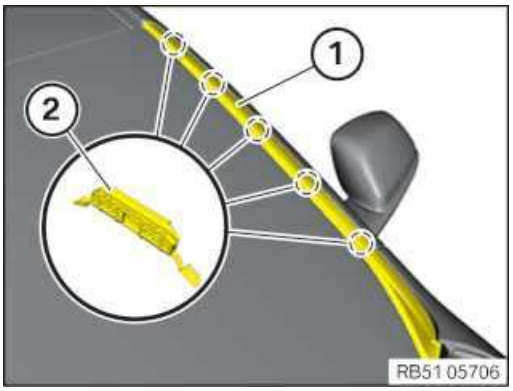
- Protect working area.
- Handle tools and components carefully.

TECHNICAL INFORMATION

Latch mechanisms, guides and mounting elements must not be damaged or missing.



- Carefully feed in the gutter strip (1) at the side panel (3) and simultaneously feed into the guide (2) in direction of arrow.



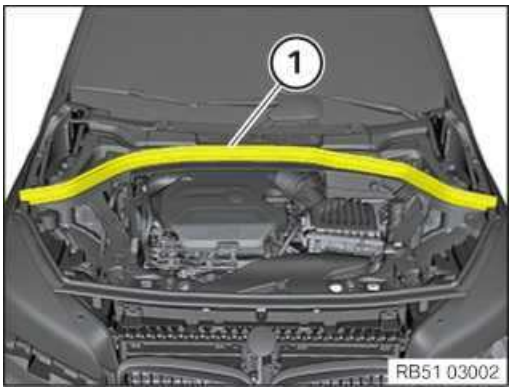
- Clip in the gutter strip (1) at the bottom starting at the clamps (2).

18 – Install the seal for the bonnet

NOTICE

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

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- Install bonnet seal at rear (1).
- Ensure that the rear bonnet seal (1) is fitted correctly.

19 – 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

Hydraulic unit with holder on body — Used in step 8

	Renew screws.	8 Nm

Brake pipe screw connection / Union screws — Used in step 8

		17 Nm

Windscreen wiper arm — Used in step 11

Combination hexagon nut		Tightening torque	35 Nm

Vent valve — Used in step 13 14

		Tightening torque	10 Nm

Overview of Special Tools

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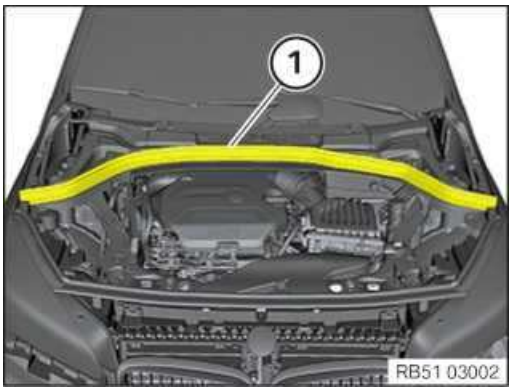
34 51 601 Replacing the hydraulic unit

PRELIMINARY WORK

1 – Remove the seal for the rear bonnet

NOTICE

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



- Pull off rear bonnet seal (1) towards the top and remove.

2 – Remove the gutter strip on the windscreen on the left and right

NOTICE

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

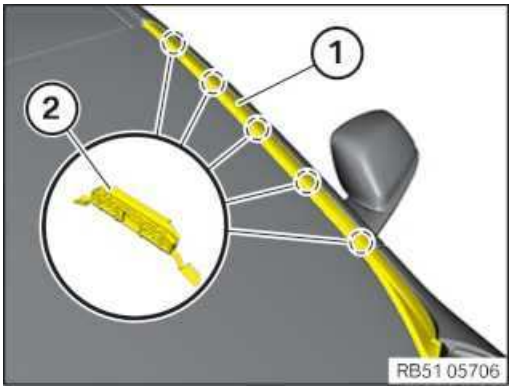
▸ **Remove the gutter strip on the windscreen**

RISK OF DAMAGE

Scratches.

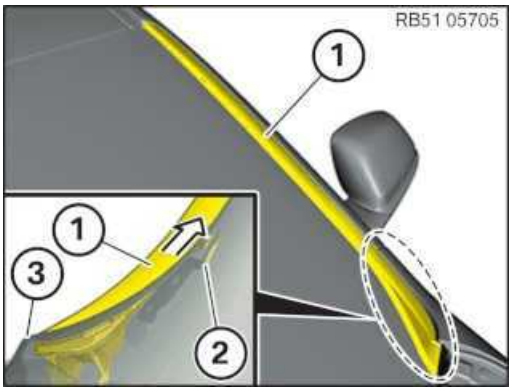
Tools and sharp-edged components can cause scratches.

- Protect working area.
- Handle tools and components carefully.



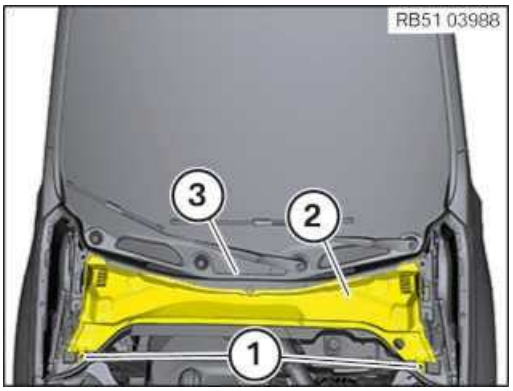
- Unclip the gutter strip (1) from the clamps (2) beginning at the roof to the top.

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- Pull out the gutter strip (1) from the guide (2) in direction of arrow and carefully feed out at the side panel (3).

3 – Removing front cowl panel cover



- Loosen the expanding rivet (1).
- Feed out and remove front cowl panel cover (2) from the rear cowl panel cover(3).

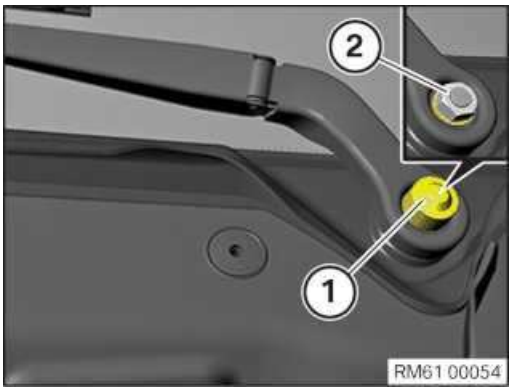
4 – Remove left and right wiper arm

RISK OF DAMAGE

Damage to wiper console

While removing the wiper arms without using special tool, the wiper console can break.

- Removing the wiper arms must be carried out only using the prescribed special tool.
- Do not lift off wiper arm, else the wiper console may break on the predetermined breaking point for the pedestrian protection.



- Pull off the protective cap (1) and release the nut (2) below it.



- Pull off windscreen wiper arm (1)with special tool .

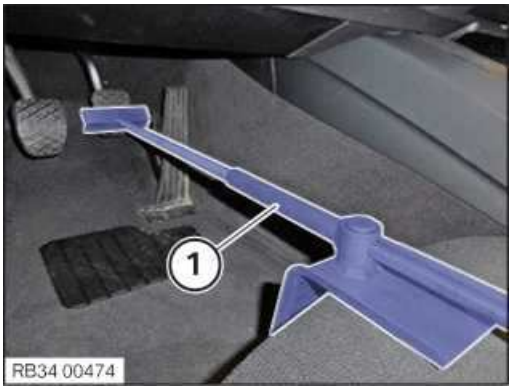
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5 – Remove the rear cowl panel



- Pull off the cowl panel cover (1) towards the top, starting from the side and feed out.

6 – Install brake pedal tensioner

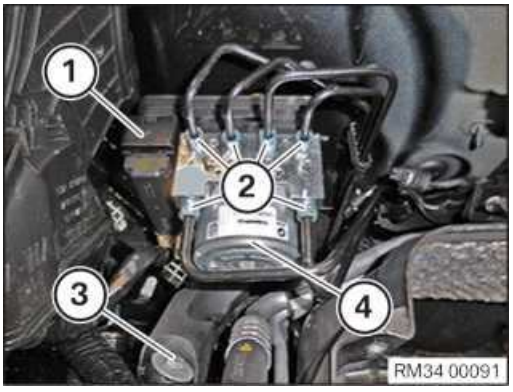


- Press the brake pedal to the floor and fix the brake pedal tensioner (1).

  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

7 – Remove hydraulic unit



- Disconnect plug connection (1).

TECHNICAL INFORMATION

Do not interchange brake lines. If necessary, mark the brake lines before disassembly.

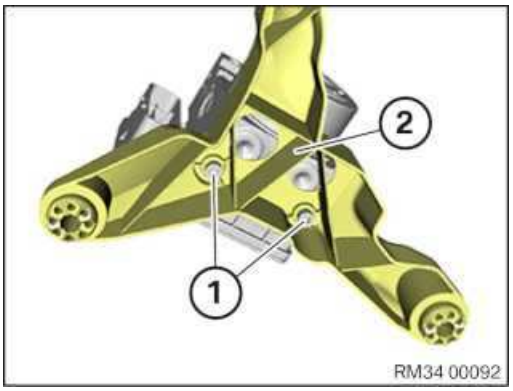
Note various equipment specifications with different line seizure.

Do not bend brake lines.

Close off connecting bores with seal plugs.

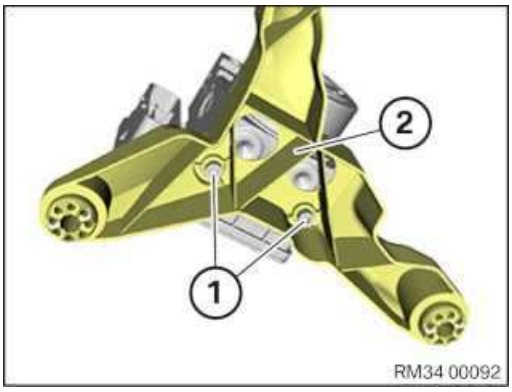
- (2)Unfasten brake lines.
- Release the screw (3) and remove the hydraulic unit (4).

8 – Remount hydraulic unit holder



- Release screws (1) and remove the holder (2).

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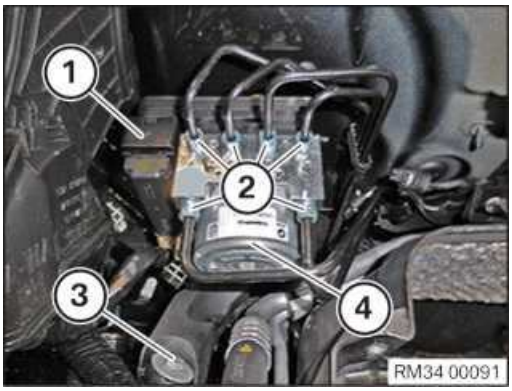
- Install holder (2).
- Renew screws 1.

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

Hydraulic control unit to holder

M6	Renew screws.	8 Nm

9 – Install hydraulic unit



- Position hydraulic unit (4).
- Renew the screw (3).

  Parts: Screw.
- Position and tighten the screw (3).

Hydraulic unit with holder on body

	Renew screws.	8 Nm

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.

- (2)Fit brake lines () and tighten.

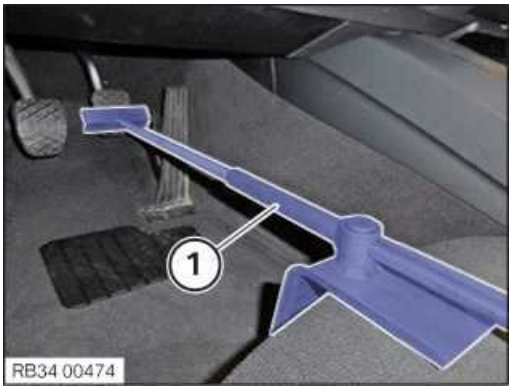
Brake pipe screw connection / Union screws

	17 Nm

- Connect the plug connection (1).

POSTPROCESSES

10 – Remove the brake pedal tensioner



- Remove the brake pedal tensioner (1).

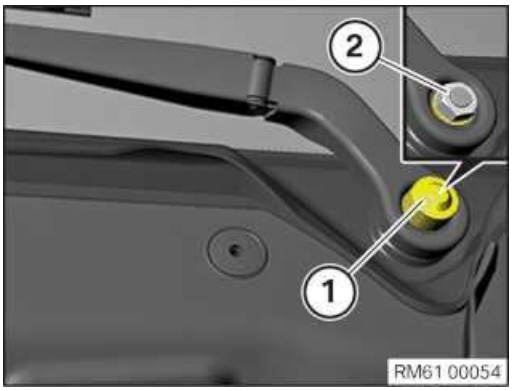
11 – Install the rear cowl panel

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- Insert the cowl panel cover (1) and press it into the latch mechanism on the windscreen starting at the side.

12 – Install left and right wiper arm



- Join wiper arm and tighten with nut (2).

Windscreen wiper arm

Combination hexagon nut		Tightening torque	35 Nm

- Join the protective cap (1).

13 – Connect the bleeder unit for brake fluid (following repair)





- 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.

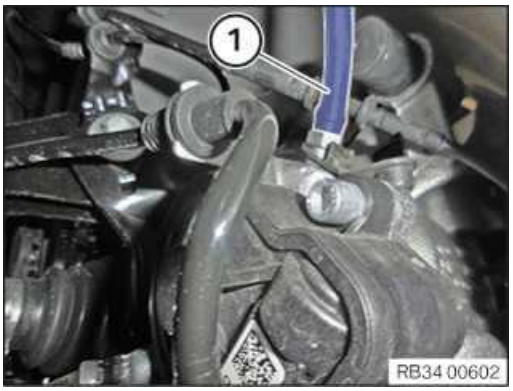
- **Do not exceed the filling pressure of** 2 bar**.**

14 – Rinsing and bleeding the rear axle brake circuit

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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.

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 – Finalize the bleeder unit for brake fluid (following repair)

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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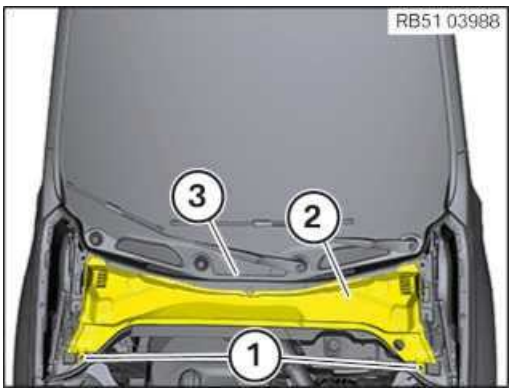


- Switch off bleeder unit (1) and remove from brake fluid expansion tank .
- Check the brake fluid level; if necessary, adjust to maximum mark.



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

17 – Installing front cowl panel cover



- Insert and install cowl panel cover at front (2) into cowl panel cover at rear (3).
- Check cowl panel cover at front is correctly seated (2).
- Secure expanding rivet (1).

18 – Install the gutter strip on the windscreen on the left and right

NOTICE

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

▶ **Install the gutter strip on the windscreen**

RISK OF DAMAGE

Scratches.

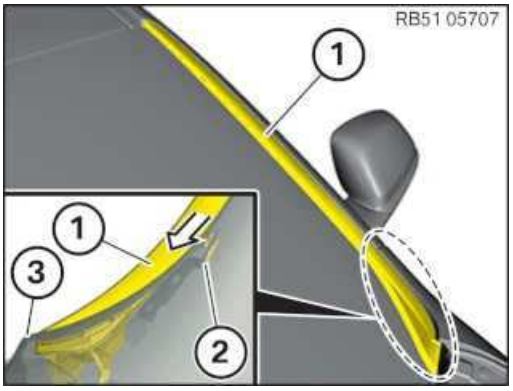
Tools and sharp-edged components can cause scratches.

- Protect working area.
- Handle tools and components carefully.

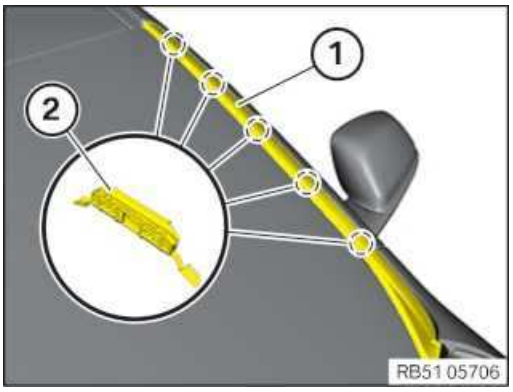
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TECHNICAL INFORMATION

Latch mechanisms, guides and mounting elements must not be damaged or missing.



- Carefully feed in the gutter strip (1) at the side panel (3) and simultaneously feed into the guide (2) in direction of arrow.

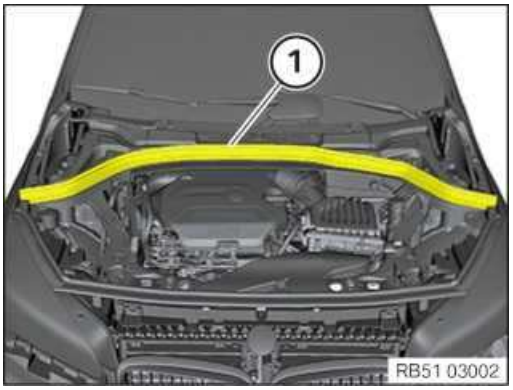


- Clip in the gutter strip (1) at the bottom starting at the clamps (2).

19 – Install the seal for the bonnet

NOTICE

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



- Install bonnet seal at rear (1).
- Ensure that the rear bonnet seal (1) is fitted correctly.

20 – DSC unit start-up/driving dynamics sensor adjustment/programming the control unit



- 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

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Hydraulic control unit to holder — Used in step 8

M6	Renew screws.	8 Nm

Hydraulic unit with holder on body — Used in step 9

	Renew screws.	8 Nm

Brake pipe screw connection / Union screws — Used in step 9

		17 Nm

Windscreen wiper arm — Used in step 12

Combination hexagon nut		Tightening torque	35 Nm

Vent valve — Used in step 14 15

		Tightening torque	10 Nm

Overview of Special Tools

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34 52 250 Remove and install the control unit of the optional equipment system (SAS)

RISK OF DAMAGE

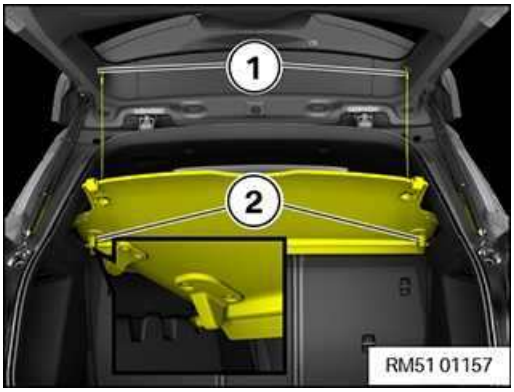
Electrostatic discharge.

Damage to or destruction of electrical components.

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

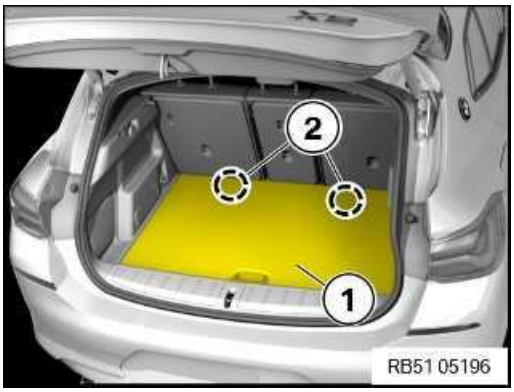
PRELIMINARY WORK

1 – Remove trim panel for storage shelf (parcel shelf)



- Release the left and right retaining straps (1).
- Pull out and set aside the trim panel for the storage shelf from the guides (2).

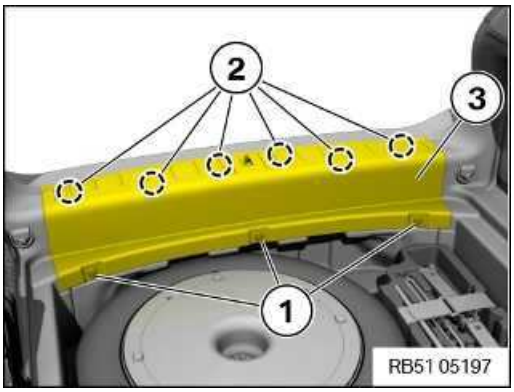
2 – Removing the luggage compartment removable panel



- Raise the luggage compartment removable panel (1) slightly at the handle, detach it from the latch mechanisms (2) and remove it toward the back.

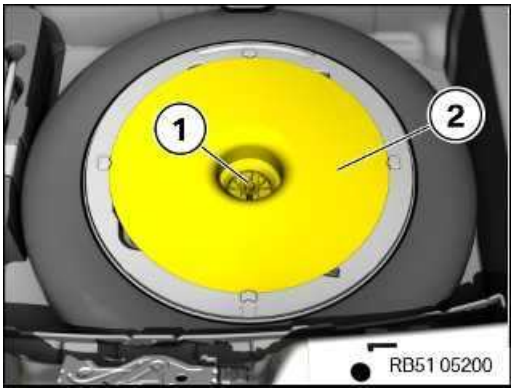
3 – Removing the loading edge trim

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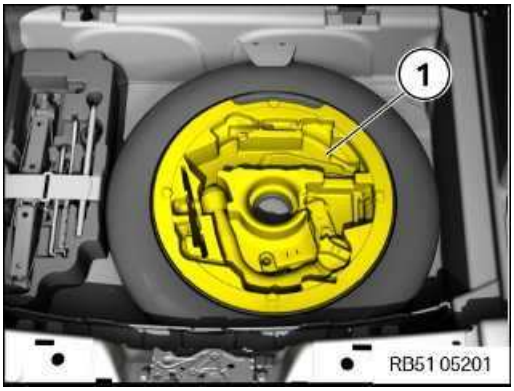


- Loosen the expanding rivet (1).
- Unclip the loading edge trim (3) from the clamps (2) toward the top and remove.

4 – Removing the compact spare wheel



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

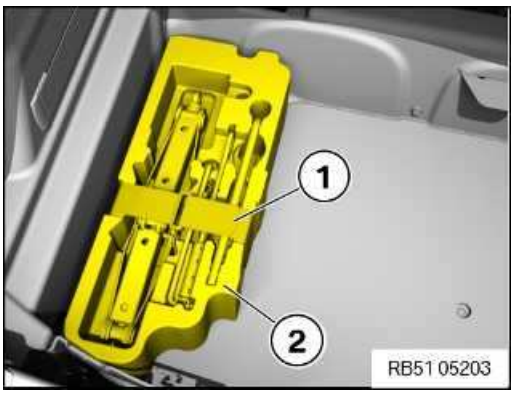


- Remove the oddments tray from the emergency wheel (1).



- Remove the emergency wheel (1).

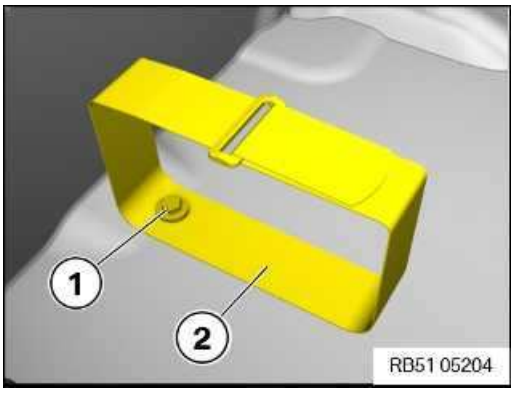
5 – Remove the tool kit



- Open the hook and loop tape (1).
- Remove the tool kit (2).

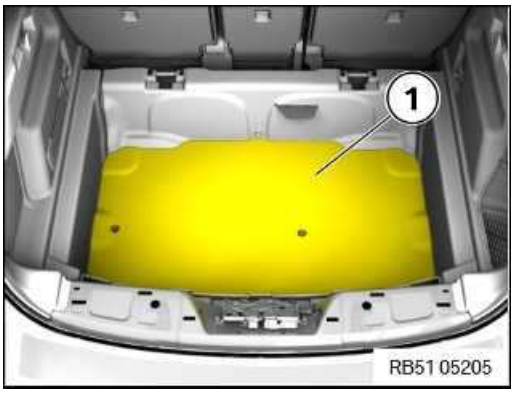
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6 – Remove the hook and loop tape for the tool kit



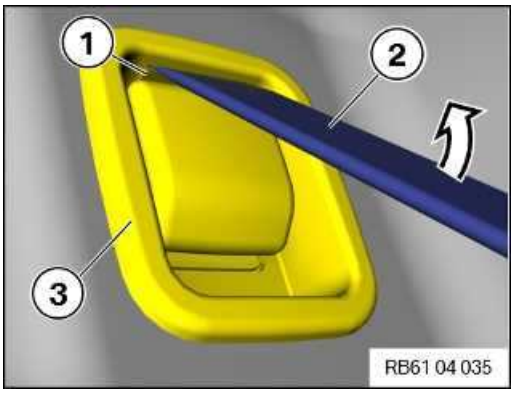
- Loosen screw (1).
- Remove the hook and loop tape (2).

7 – Removing the luggage compartment floor trim panel

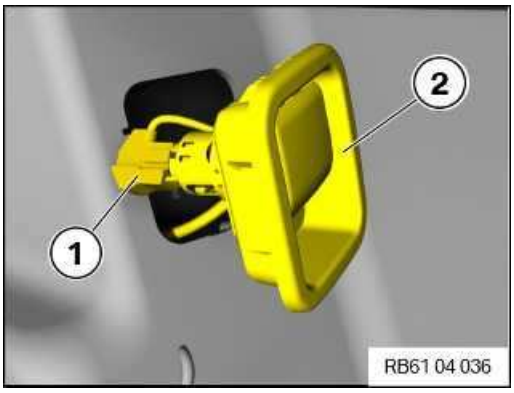


- Remove the luggage compartment floor trim panel (1) upwards.

8 – Remove the fixture of the 12 V power socket



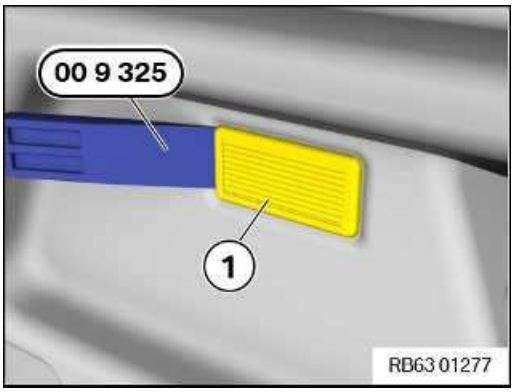
- Push the lock on top (1) with a suitable tool (2) in the direction of the arrow and unlock.
- Remove the fixture (3) of the 12 V power socket in the rear from the luggage compartment wheel arch trim panel.



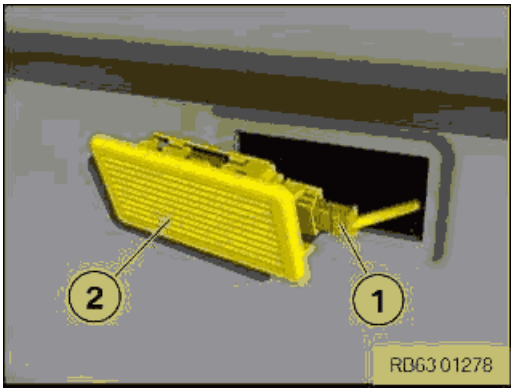
- Unlock the plug connection (1), disconnect it and remove the fixture (2) of the 12 V power socket.

9 – Removing the luggage compartment light

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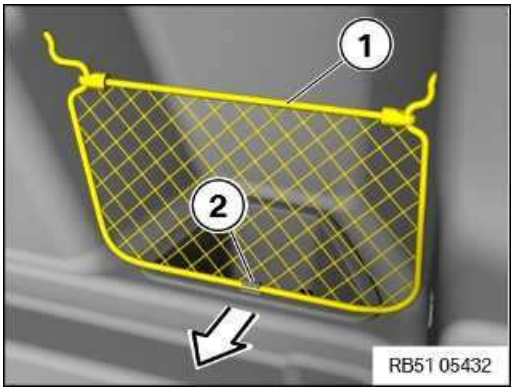


- Lever out the luggage compartment light (1) with the special tool **0 496 569 (00 9 325)**.

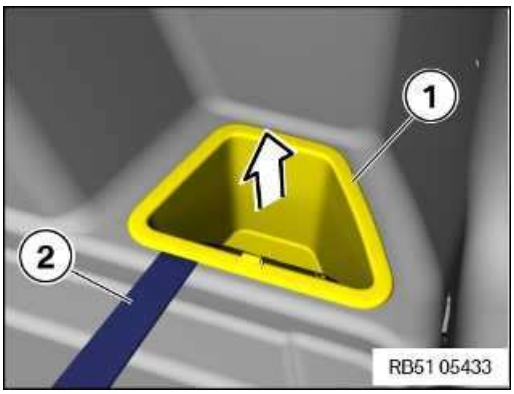


- Disconnect plug connection (1) and remove luggage compartment light (2).

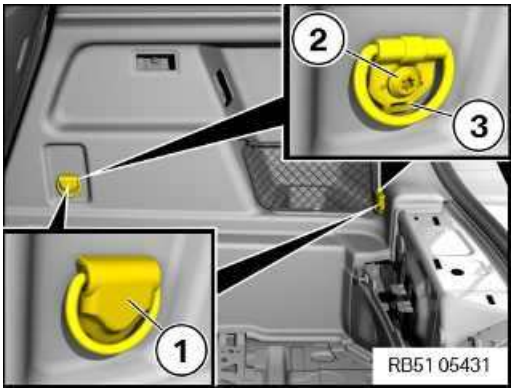
10 – Removing right luggage compartment wheel arch trim panel



- Release the storage net (1) from the latch mechanism (2) in the direction of arrow and fold up.

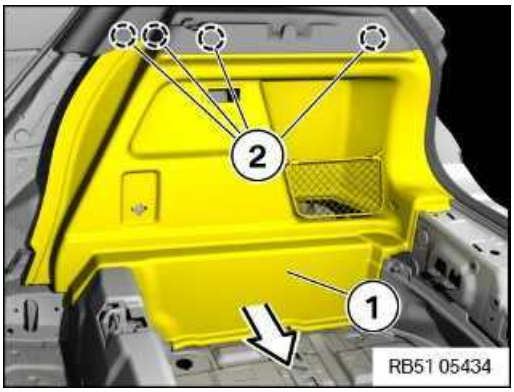


- Remove storage compartment (1) out of the luggage compartment wheel arch trim panel in the direction of arrow using a suitable tool (2).



- Unclip covers (1).
- Unscrew the bolts (2) and remove the lashing points (3).

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NOTICE

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

- Pull the luggage compartment wheel arch trim panel (1) on the bottom in the direction of the arrow and guide it out of the guides (2) and the C-pillar trim panel and remove.

MAIN WORK

11 – Remove the optional equipment system (SAS)



- Disconnect plug connection (1).
- Release the nuts (2) and remove the optional equipment system (SAS) (3).

12 – Install the optional equipment system (SAS)



- Install the optional equipment system (SAS) (3).
- Renew screws (2).

  Parts: Bolts
- Insert screws (2) and tighten.

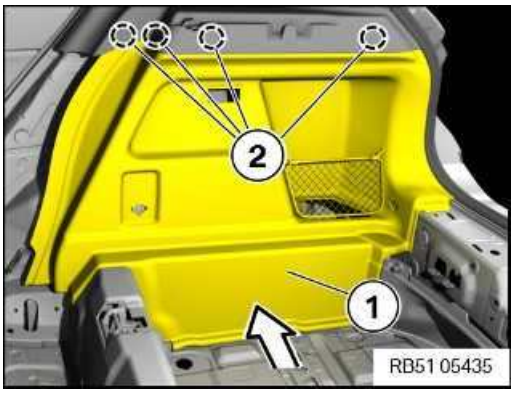
Optional equipment system (SAS) to body

Renew screws.		8 Nm

- Connect the plug connection (1).

POSTPROCESSES

13 – Installing the luggage compartment wheel arch trim panel on the right

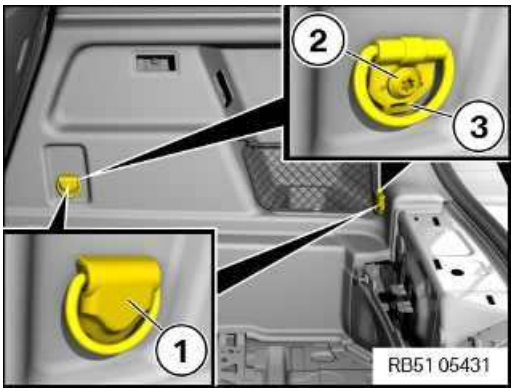


NOTICE

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

- Press luggage compartment wheel arch trim panel (1) down in direction of arrow and feed into the guides (2) and under the bottom C-pillar trim panel.

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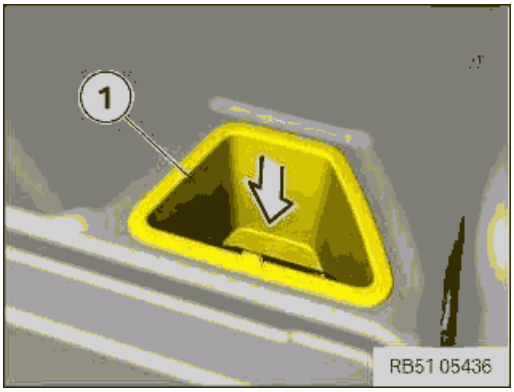


- Position the lashing eyes (3) and tighten the screws (2).

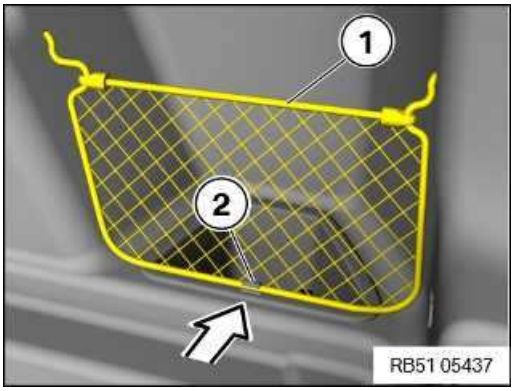
Lashing eye in luggage compartment

Bolt M8 x 22		Tightening torque	21 Nm

- Clip in the covers (1).

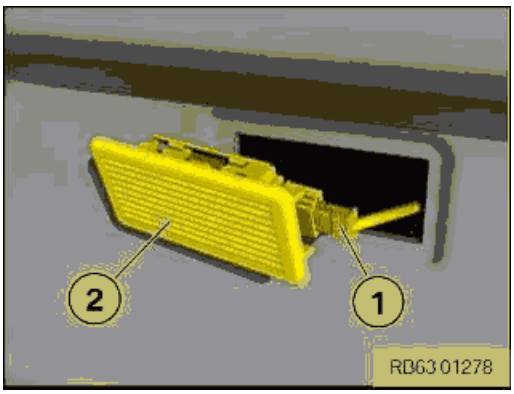


- Install the storage compartment (1) in the luggage compartment wheel arch trim panel in direction of arrow.

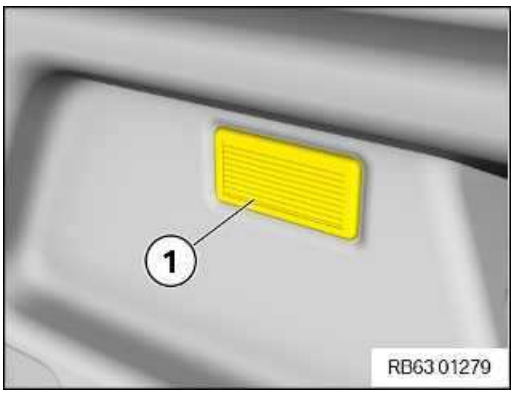


- Clip storage net (1) into latch mechanisms (2) in direction of arrow.

14 – Installing the luggage compartment light



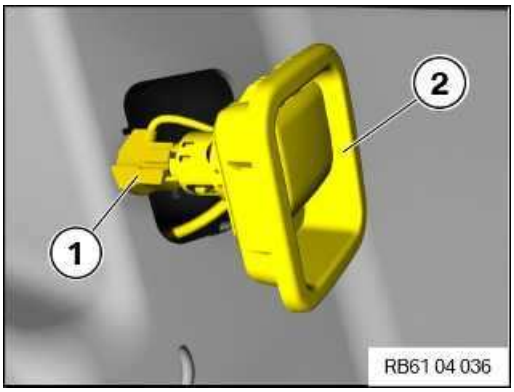
- Connect the connector (1) to the luggage compartment light (2).



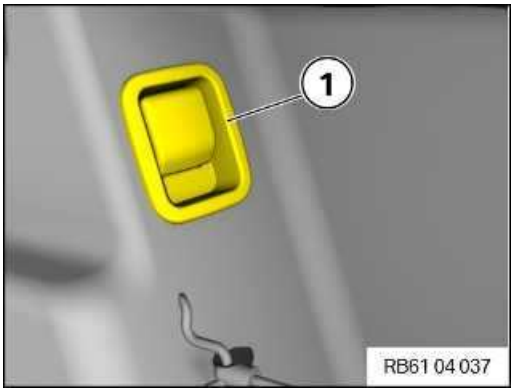
- Install the luggage compartment light (1).

15 – Install the fixture of the 12 V power socket

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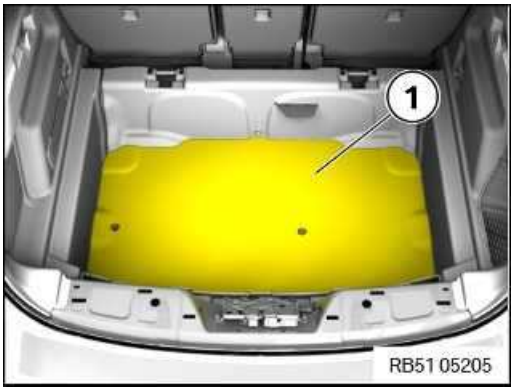


- Connect the connector (1) to the fixture (2) of the 12 V power socket and lock.



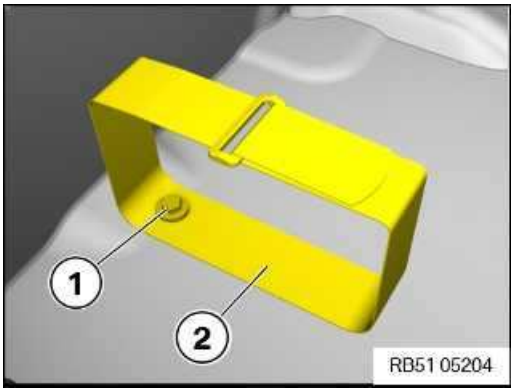
- Insert the fixture (1) of the 12 V power socket in the luggage compartment wheel arch trim panel and engage.

16 – Installing the luggage compartment floor trim panel



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

17 – Inserting the Velcro fastener for the toolkit



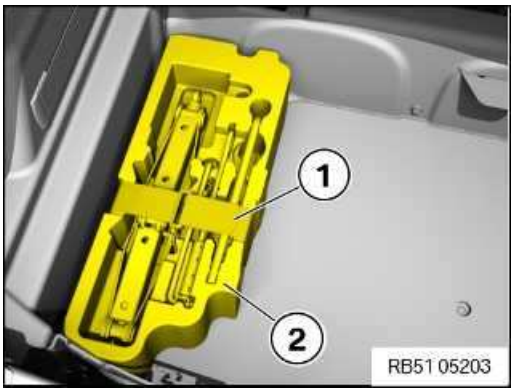
- Insert Velcro fastener (2).
- Tighten down screw (1).

Toolkit hook and loop tape to body

Bolt M6 x 20		Tightening torque	4 Nm

18 – Install the tool kit

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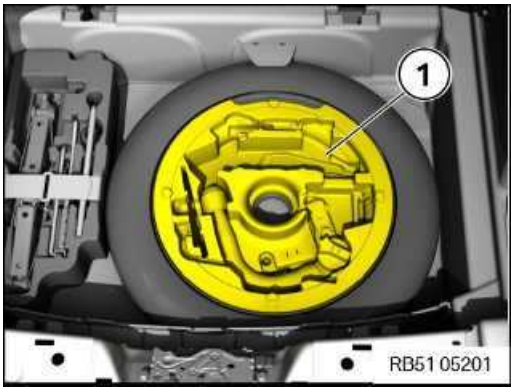


- Install the tool kit (2).
- Close the hook and loop tape (1).

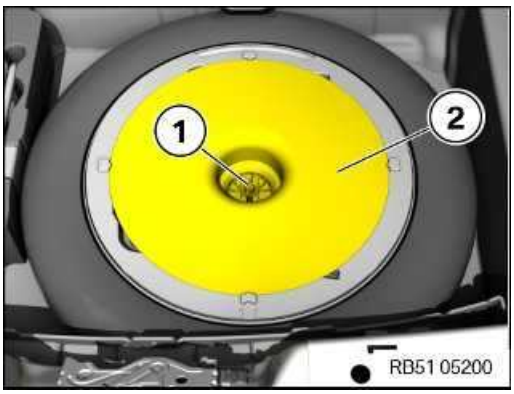
19 – Install the emergency wheel



- Insert compact spare wheel(1).

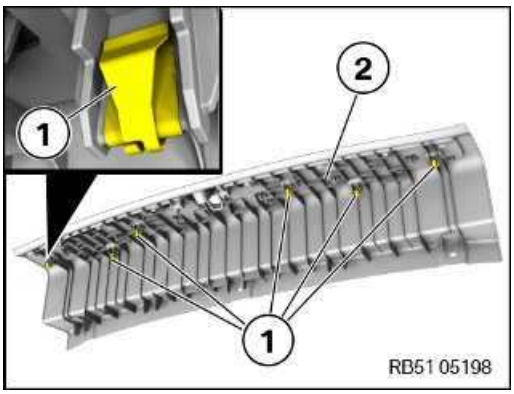


- Insert oddments tray into the compact spare wheel (1).



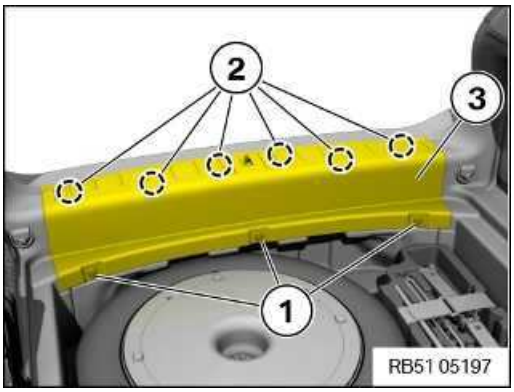
- Insert the lid (2).
- Hand-tighten the bolt (1).

20 – Installing loading edge trim



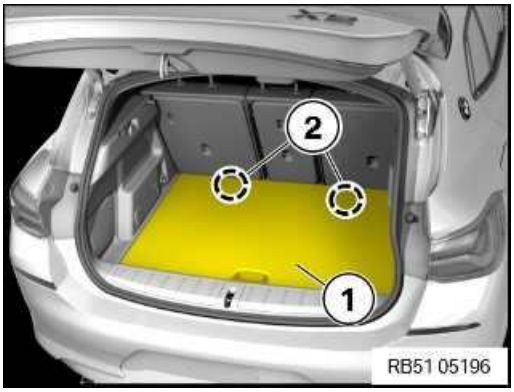
- Check the clamps (1) at the loading edge trim (2) for damage and renew if necessary.

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- Insert the loading edge trim (3) in the area of the expanding rivets (1) into the underlying rear luggage compartment trim panel.
- Guide in the loading edge trim (3) under the sealing lip of the seal for the tailgate and clip it in with the clamps (2).
- Secure expanding rivet (1).

21 – Installing the luggage compartment removable panel



- Clip luggage compartment removable panel (1) into latch mechanisms (2) and set down.

22 – Install trim panel for storage shelf (parcel shelf)



- Insert the trim panel for the storage shelf into the guides (2).
- Attach the left and right retaining straps (1).

23 – Program/encode the optional equipment system (SAS)

▸ **Encode/program control unit(s)**

Prerequisite

Replacement of the control unit.

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.

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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.
Exception:
BMW I01: Note Product and Measures Management Aftersales measure 55176388.

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

Additional Information

Overview of Tightening Torques

Optional equipment system (SAS) to body — Used in step 12

Renew screws.		8 Nm

Lashing eye in luggage compartment — Used in step 13

Bolt M8 x 22		Tightening torque	21 Nm

Toolkit hook and loop tape to body — Used in step 17

Bolt M6 x 20		Tightening torque	4 Nm

Overview of Special Tools

0 496 569 (00 9 325) Wedge



Common — Used in step 9

Usage	(Panel wedge) From 11/2008 this special tool replaces panel wedge 00 9 317 (different material)
Included in the tool or work	0 490 527
Storage location	Individual
Replaced by	
In connection with	
SI-Number	41 01 09 (507)

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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.

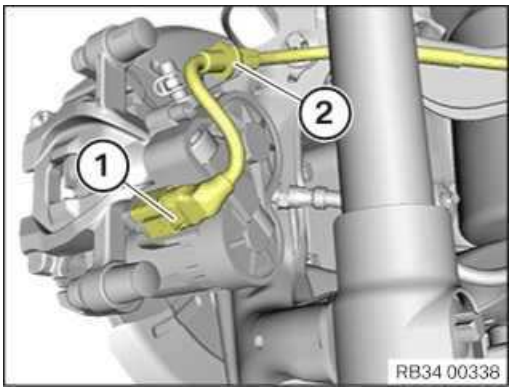
TECHNICAL INFORMATION

The ignition must be switched off for at least 30 s before the plug connection is disconnected.

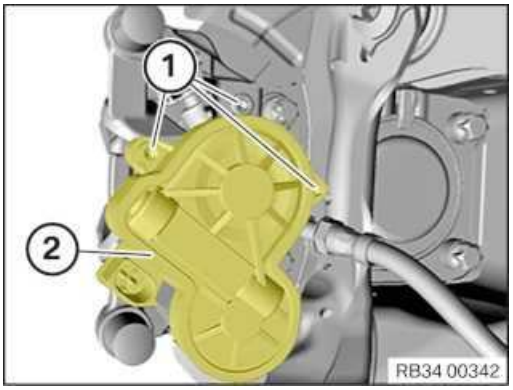
- Disconnect plug connection.

MAIN WORK

2 – Detach EMF actuator



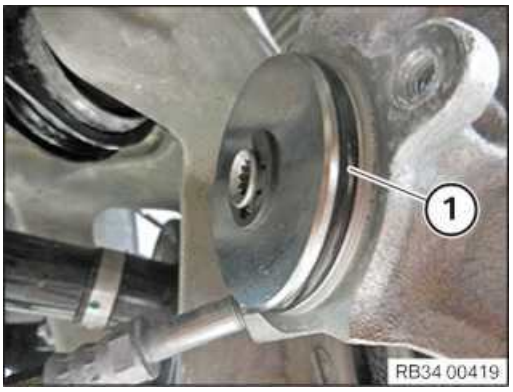
- Disconnect plug connection (1).
- Detach the cable (2) from the bracket.
- Release screws (3) and remove the holder (4).



- Release screws (1) and remove the EMF actuator (2).

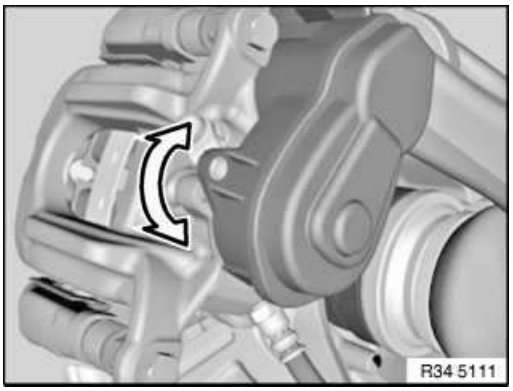
3 – Checking sealing ring on the EMF actuator

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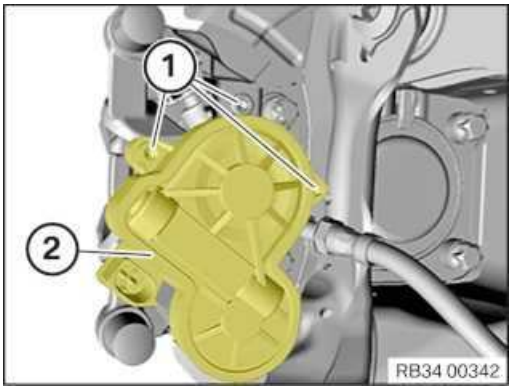


- Check the sealing ring (1) for damage and renew where required.
- Apply a light coating of brake fluid on the sealing ring (1) before fitting.

4 – Install EMF actuator



- Carefully fit the EMF actuator 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.

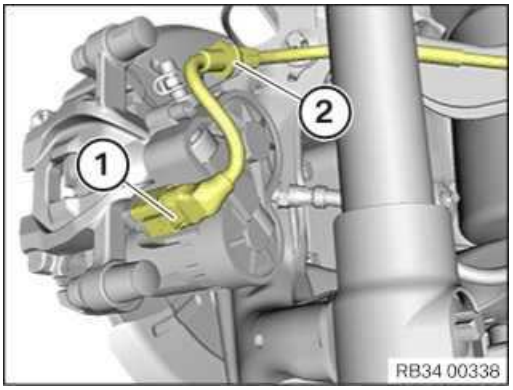


- Renew screws 1.

  Parts: Bolts
- Position and tighten the screws (1) at the EMF actuator (2).

EMF actuator to brake caliper

	Renew screws.	8 Nm



- Connect connector (1).
- Attach the cable (2) to the bracket.

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.

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Additional Information

Overview of Tightening Torques

EMF actuator to brake caliper

Used in step 4

	Renew screws.	8 Nm

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34 52 516 Removing and installing/replacing the DSC control unit

RISK OF DAMAGE

Electrostatic discharge.

Damage to or destruction of electrical components.

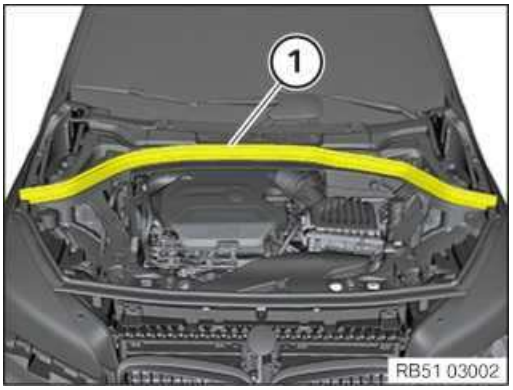
- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the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

PRELIMINARY WORK

1 – Remove the seal for the rear bonnet

NOTICE

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



- Pull off rear bonnet seal (1) towards the top and remove.

2 – Remove the gutter strip on the windscreen on the left and right

NOTICE

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

▸ **Remove the gutter strip on the windscreen**

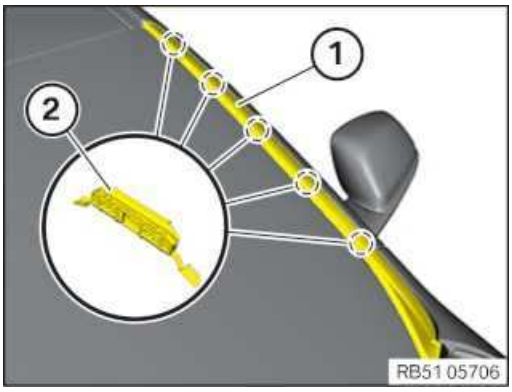
RISK OF DAMAGE

Scratches.

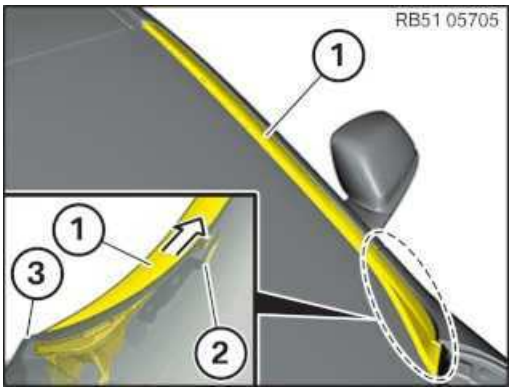
Tools and sharp-edged components can cause scratches.

- Protect working area.
- Handle tools and components carefully.

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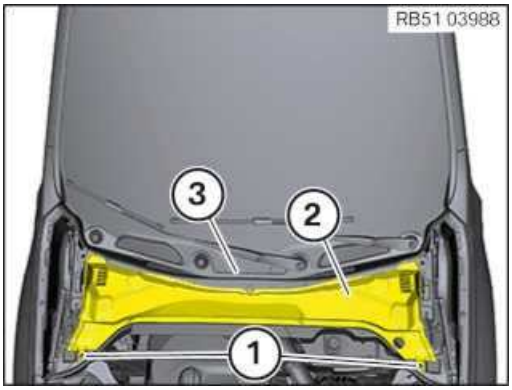


- Unclip the gutter strip (1) from the clamps (2) beginning at the roof to the top.



- Pull out the gutter strip (1) from the guide (2) in direction of arrow and carefully feed out at the side panel (3).

3 – Removing front cowl panel cover



- Loosen the expanding rivet (1).
- Feed out and remove front cowl panel cover (2) from the rear cowl panel cover(3).

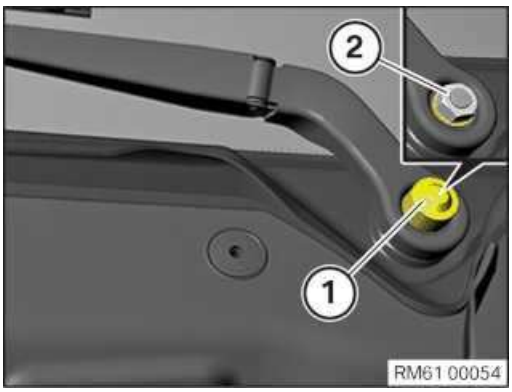
4 – Remove left and right wiper arm

RISK OF DAMAGE

Damage to wiper console

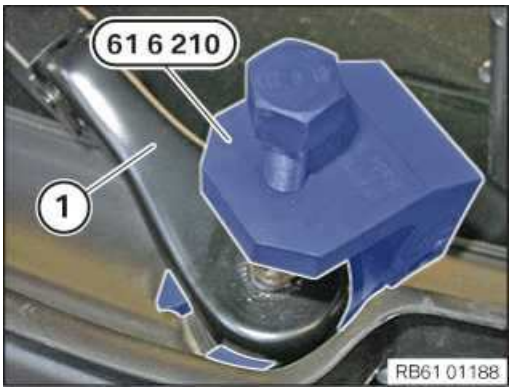
While removing the wiper arms without using special tool, the wiper console can break.

- Removing the wiper arms must be carried out only using the prescribed special tool.
- Do not lift off wiper arm, else the wiper console may break on the predetermined breaking point for the pedestrian protection.



- Pull off the protective cap (1) and release the nut (2) below it.

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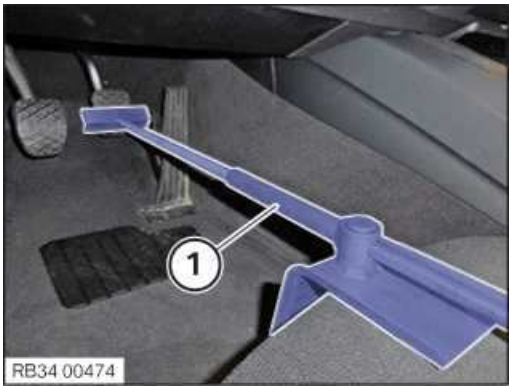
- Pull off windscreen wiper arm (1)with special tool .

5 – Remove the rear cowl panel



- Pull off the cowl panel cover (1) towards the top, starting from the side and feed out.

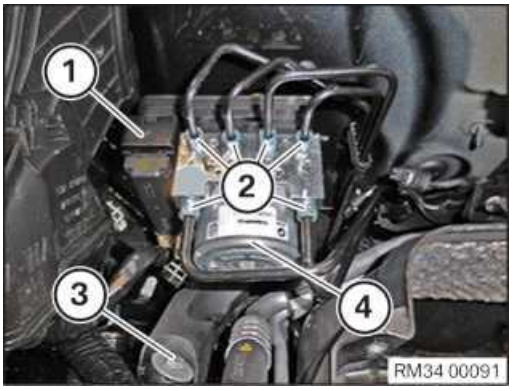
6 – Install brake pedal tensioner



- 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.

7 – Remove hydraulic unit



- Disconnect plug connection (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.

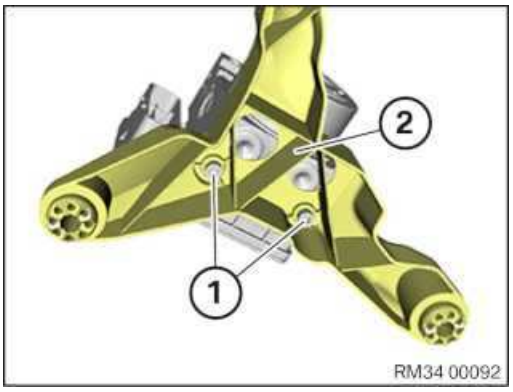
Close off connecting bores with seal plugs.

- (2)Unfasten brake lines.
- Release the screw (3) and remove the hydraulic unit (4).

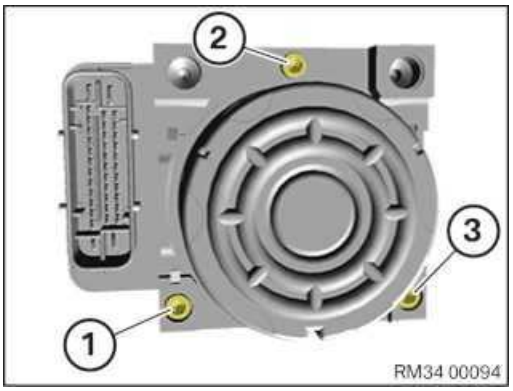
MAIN WORK

8 – Remove the DSC control unit

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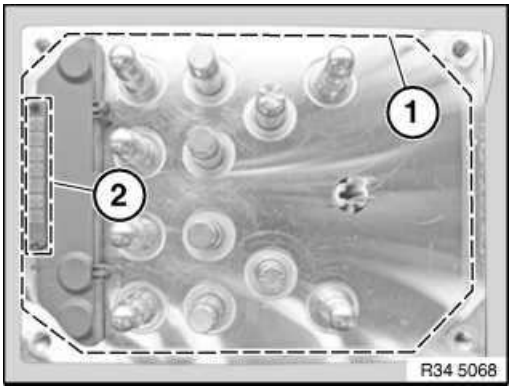
- Release screws (1) and remove the holder (2).



- Loosen screws (1).
- Remove DSC control unit (2) carefully.

  When removing the DSC control unit, no contacts must be bent!

9 – Prepare for the installation of the DSC control unit

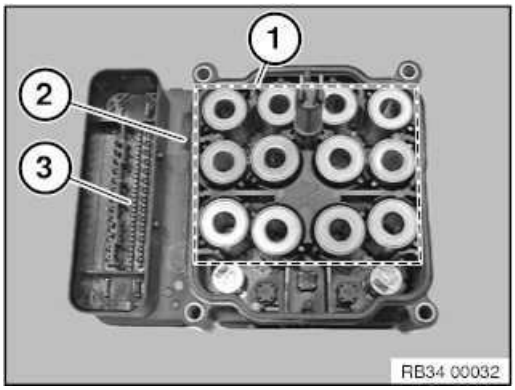


TECHNICAL INFORMATION

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.



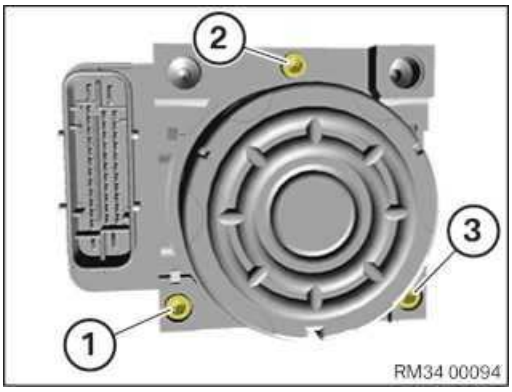
- For renewed use of the hydraulic unit (valve block), an add-on control unit repair kit is required.

  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.
- If damaged, replace the DSC control unit (3) .

10 – Install the DSC control unit

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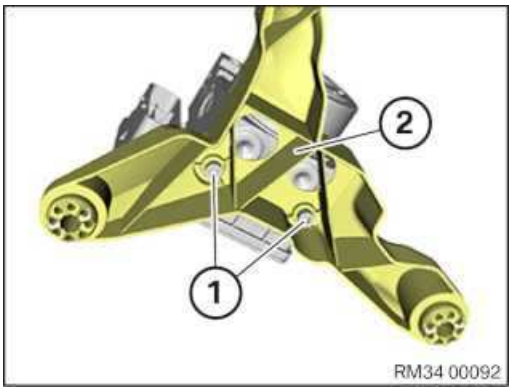


- Connect DSC control unit carefully to hydraulic unit.
- Renew screws (1) to (3).

  Parts: Bolts
- Tighten screws (1) to (3) in this order in stages.

DSC control unit on hydraulic unit

Screw	Renew screws. *Screw in screws and evenly tighten crosswise.*	Tightening torque	5,5 Nm



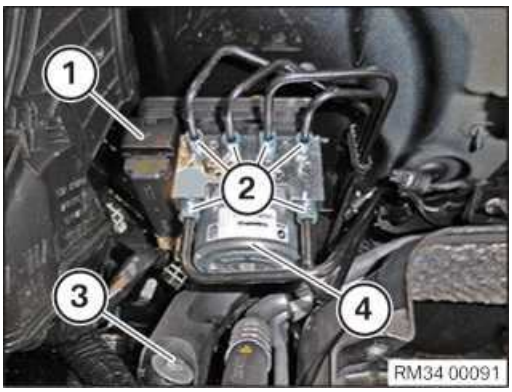
- Install holder (2).
- Insert screws (1) and tighten them.

Hydraulic control unit to holder

M6	Renew screws.	8 Nm

POSTPROCESSES

11 – Install hydraulic unit



- Position hydraulic unit (4).
- Renew the screw (3).

  Parts: Screw.
- Position and tighten the screw (3).

Hydraulic unit with holder on body

	Renew screws.	8 Nm

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.

- (2)Fit brake lines () and tighten.

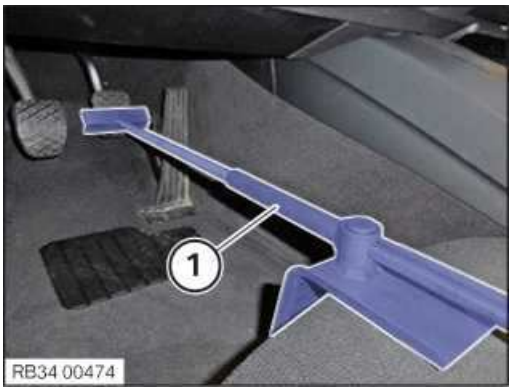
Brake pipe screw connection / Union screws

	17 Nm

- Connect the plug connection (1).

12 – Remove the brake pedal tensioner

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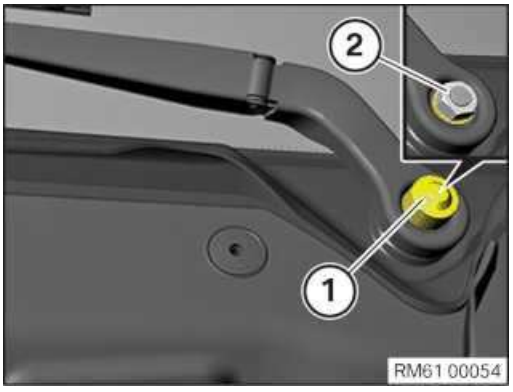
- Remove the brake pedal tensioner (1).

13 – Install the rear cowl panel



- Insert the cowl panel cover (1) and press it into the latch mechanism on the windscreen starting at the side.

14 – Install left and right wiper arm



- Join wiper arm and tighten with nut (2).

Windscreen wiper arm

Combination hexagon nut		Tightening torque	35 Nm

- Join the protective cap (1).

15 – Connect the bleeder unit for brake fluid (following repair)



- 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.

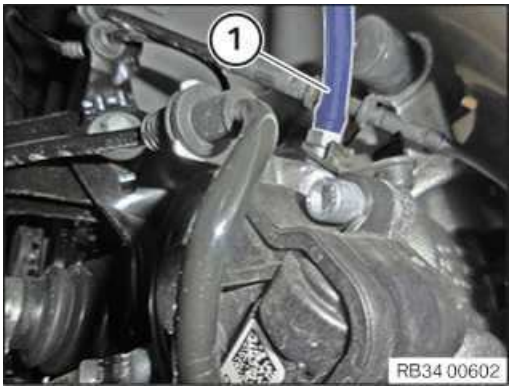
  Observe the operating instructions of the corresponding equipment manufacturer.

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

16 – 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.

17 – Flushing and bleeding the front 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 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

18 – Finalize the bleeder unit for brake fluid (following repair)

RISK OF DAMAGE

Paint damage.

Mechanical or chemical action may lead to paint damage.

- Cover up working area with specified covering material only.

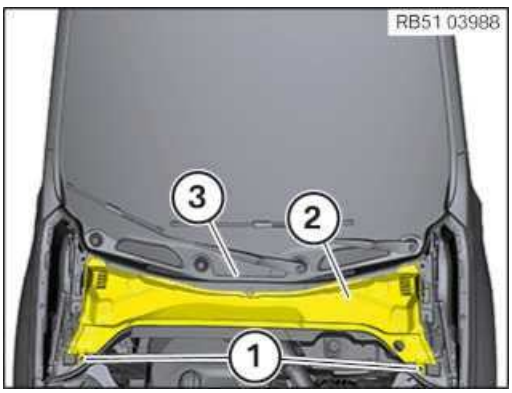


- Switch off bleeder unit (1) and remove from brake fluid expansion tank .
- Check the brake fluid level; if necessary, adjust to maximum mark.



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

19 – Installing front cowl panel cover



- Insert and install cowl panel cover at front (2) into cowl panel cover at rear (3).
- Check cowl panel cover at front is correctly seated (2).
- Secure expanding rivet (1).

20 – Install the gutter strip on the windscreen on the left and right

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NOTICE

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

▸ **Install the gutter strip on the windscreen**

RISK OF DAMAGE

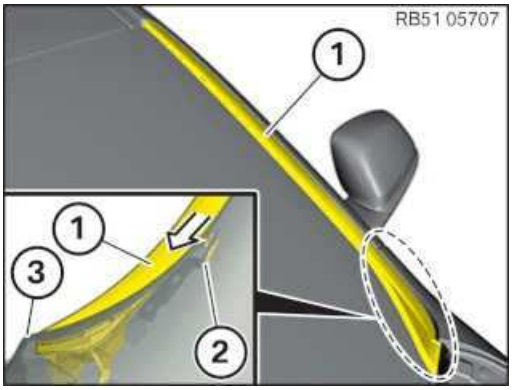
Scratches.

Tools and sharp-edged components can cause scratches.

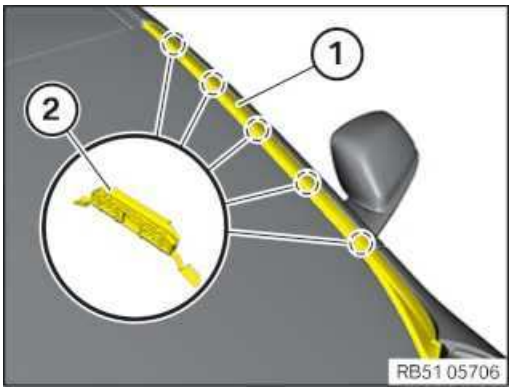
- Protect working area.
- Handle tools and components carefully.

TECHNICAL INFORMATION

Latch mechanisms, guides and mounting elements must not be damaged or missing.



- Carefully feed in the gutter strip (1) at the side panel (3) and simultaneously feed into the guide (2) in direction of arrow.



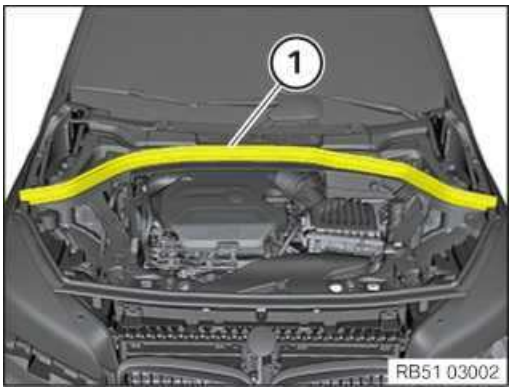
- Clip in the gutter strip (1) at the bottom starting at the clamps (2).

21 – Install the seal for the bonnet

NOTICE

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

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- Install bonnet seal at rear (1).
- Ensure that the rear bonnet seal (1) is fitted correctly.

22 – DSC unit start-up/driving dynamics sensor adjustment/programming the control unit



- 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

DSC control unit on hydraulic unit — Used in step 10

Screw	Renew screws. *Screwin screws and evenly tighten crosswise.*	Tightening torque	5,5 Nm

Hydraulic control unit to holder — Used in step 10

M6	Renew screws.		8 Nm

Hydraulic unit with holder on body — Used in step 11

	Renew screws.		8 Nm

Brake pipe screw connection / Union screws — Used in step 11

			17 Nm

Windscreen wiper arm — Used in step 14

Combination hexagon nut		Tightening torque	35 Nm

Vent valve — Used in step 16 17

		Tightening torque	10 Nm

Overview of Special Tools

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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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