**Necessary preliminary tasks:**

- Read and comply with [General Information](#).

Note:

When replacing or repairing, observe the filling and bleeding instructions for the following parts:

- Tandem brake master cylinder
- Hydraulic unit
- Components and connecting lines which are fitted between these assemblies.

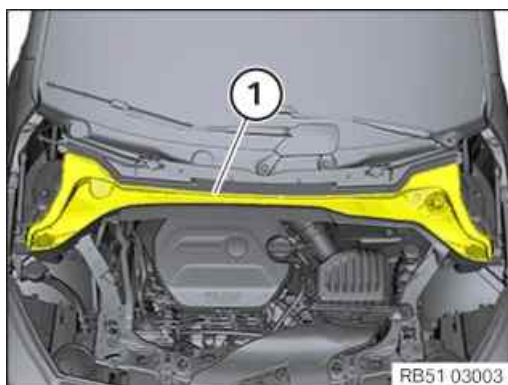
Connect bleeder unit with max. 2 bar filling pressure.

A second person is needed for this repair work.

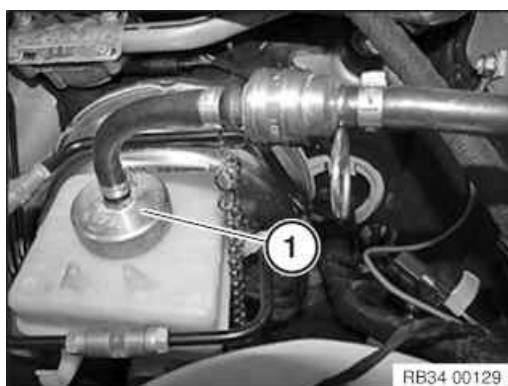
Use only BMW-approved brake fluids, see [BMW operating fluids](#).



Connect Diagnosis and Information System.

**Front cover:**

Lift off cowl panel cover (1) upwards.



Connect bleeder unit to expansion tank (1) and switch on.

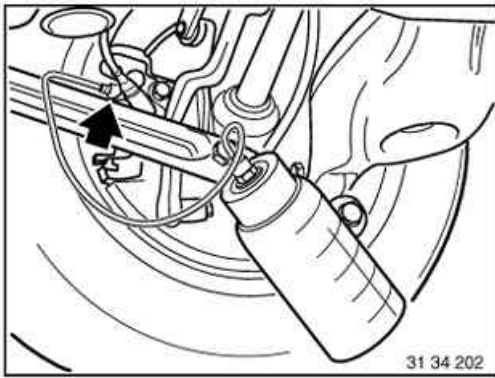
Connect diagnosis and information system.

Select path: Service functions - Chassis and Suspension - Traction control systems - Brake bleeding procedure.

Important!

Please observe Owner's Handbook of the respective equipment manufacturer.

Charging pressure should not exceed 2 bar.



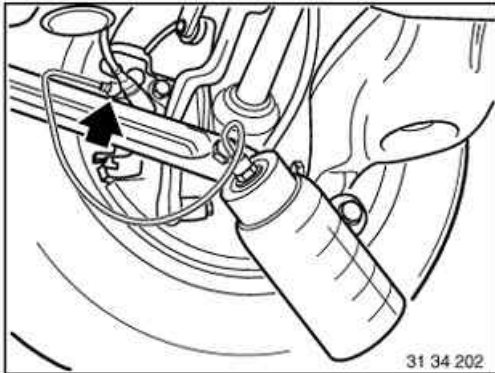
Completely bleed the brake system.

Connect bleeder hose with collecting tray to bleeder valve on rear right brake caliper.

Open vent valve and purge until clear, bubble-free brake fluid emerges.

Close vent valve.

Follow same procedure on rear left, front right and front left wheel brake.



Bleed the rear axle brake circuit.

Connect bleeder hose with collecting tray to bleeder valve on rear right brake caliper.

Open vent valve.

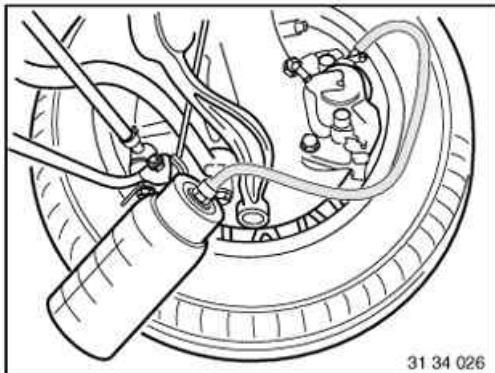
Run brake bleeding procedure using the diagnosis and information system with the vent valve open.

After completing routine, press brake pedal 5 times to floor; clear and bubble-free brake fluid must flow out.

Close vent valve.

Tightening torque: [34 00 1AZ](#).

Repeat procedure at rear left.



Bleed front-axle brake circuit.

Connect bleeder hose with collecting tray to bleeder valve on front right brake caliper.

Open vent valve.

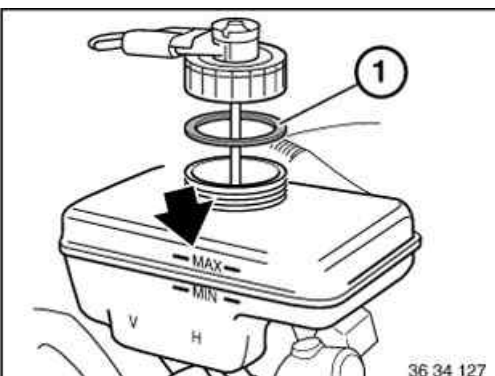
Run brake bleeding procedure using the diagnosis and information system with the vent valve open.

After completing routine, press brake pedal 5 times to floor, clear and bubble-free brake fluid must flow out.

Close vent valve.

Tightening torque: [34 00 1AZ](#).

Repeat procedure at front left.



Switch off bleeder unit and remove from expansion tank.

Check brake fluid level. If necessary, top up/draw off to maximum level.

Close expansion tank.

Note:

Pay attention to rubber seal (1) in sealing cap.



Front cover:

Feed in cowl panel cover (1) to rear.

Note:

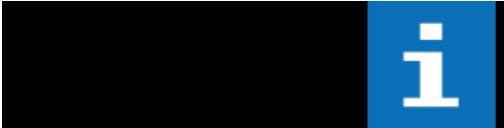
Check front cover is correctly seated relative to rear cover.

34 00 017 Checking brake booster (vacuum test)



Special tools required:

- [34 3 100](#)

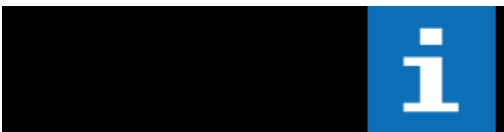


Necessary preliminary work:

- If necessary, expose the brake booster



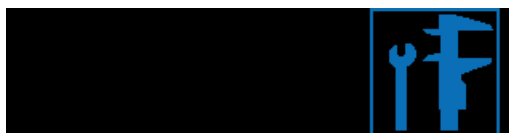
- Pull off the vacuum hose on the brake booster. Install vacuum tester [34 3 100](#) between the brake booster and the vacuum hose of the non-return valve.
- Start the engine.
- Check the vacuum build-up.
- Switch off engine.
- Adjust the vacuum to no more than 0.8 bar by pressing the brake pedal and 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:

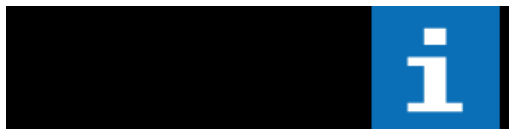
- Change the non-return valve
- Check that the sealing between the brake servo and the tandem brake master cylinder (sealing ring) is in proper condition and fits correctly.
- If necessary, check the tightness of the brake booster with a smoke tester
- If the setpoint values are not reached during the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

34 00 010 Checking thickness of brake pad



Special tools required:

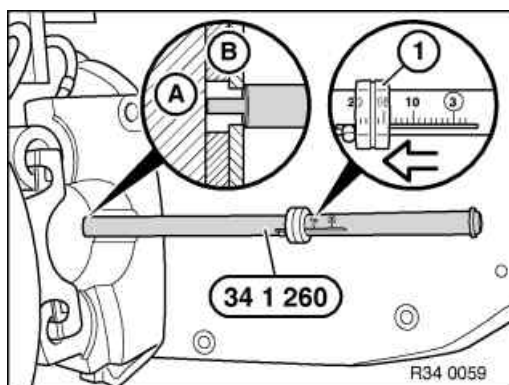
- [34 1 260](#)



Note:

The thickness of the outer brake pads can be determined without removing the wheels.

If necessary, move vehicle until opening for brake pad wear indicator (brake pad) can be seen through rim styling.



Insert special tool [34 1 260](#) wheel rim into opening for brake pad wear indicator.

Press special tool onto brake pad. Slide ring (1) in direction of arrow up to stop and read off measured value.

Note:

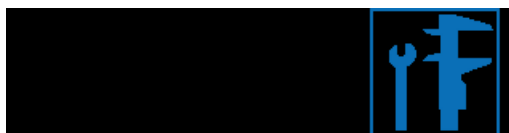
(A) Brake disc

(B) Brake pad with backplate

[Remaining brake pad thickness of front brake.](#)

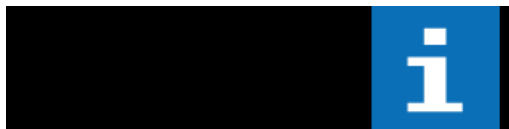
[Remaining brake pad thickness of rear brake.](#)

34 00 010 Checking thickness of brake pad



Special tools required:

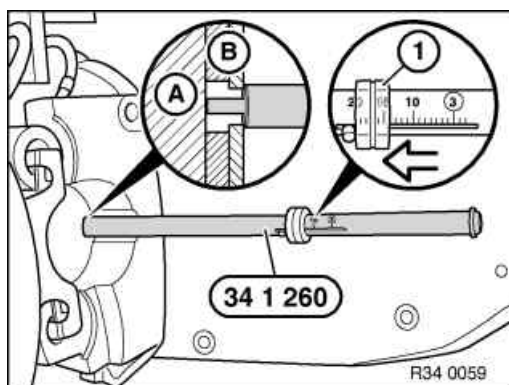
- [34 1 260](#)



Note:

The thickness of the outer brake pads can be determined without removing the wheels.

If necessary, move vehicle until opening for brake pad wear indicator (brake pad) can be seen through rim styling.



Insert special tool [34 1 260](#) wheel rim into opening for brake pad wear indicator.

Press special tool onto brake pad. Slide ring (1) in direction of arrow up to stop and read off measured value.

Note:

(A) Brake disc

(B) Brake pad with backplate

[Remaining brake pad thickness of front brake.](#)

[Remaining brake pad thickness of rear brake.](#)

34 00 ... General Information

The brake system is one of the most important safety systems on any motor vehicle. It is therefore essential to act with utmost care when working on the brake system and to follow the instructions below.

- Ensure cleanliness and only use fluff-free cleaning cloths.
- Wash away or vacuum up brake dust, do not clear it away using compressed air. This dust is a health hazard.
- Ensure that no oils or grease enter the brake system: these substances would cause complete failure of the entire brake system.
- When cleaning brake components with brake cleaner (refer to BMW Parts Department), do not allow brake cleaner to get into the brake system.
- Even the most minute traces of brake cleaner must be avoided.
- Replace brake fluid at least every two years.
- Never reuse drained brake fluid.
- Always use BMW-approved brake fluid, refer to BMW Service Operating Fluids.
- Always dispose of brake fluid in approved receptacles, refer to BMW Service Workshop Planning documentation.
- Do not allow brake fluid to drain into drain pipes, into the outside environment or into unsuitable facilities. This would create the risk of groundwater contamination since brake fluid is classed as a fluid that is hazardous to water.
- Do not allow brake fluid to come into contact with paintwork as this will destroy the paint.
- Brake fluid must not be allowed to remain on bare skin too long in order to avoid skin problems. Wash skin coated with brake fluid with water and soap.
- If brake fluid makes contact with eyes, immediately flush with large quantity of clean water and visit eye doctor.
- Brake pads:

Brake pads must be replaced when the warning threshold value of the [brake pad wear indicator](#) is reached.

Refer to Technical Data.

Brake pads must always be replaced on both sides of any axle.

The friction surfaces of the brake pads must not come into contact with oils or greases. The brake pads must be replaced if they are fouled by such substances.

In the case of rotation-dependent brake pads, make sure the arrow marking points in the direction of rotation of the brake disc for when the vehicle is moving forward. Brake pads with left/right markings must be fitted on the relevant side of the vehicle.

One-sided angled areas on the brake pads must be located on the disc contact side of the brake caliper for when the vehicle is moving forward.

- Brake discs:

Brake discs must not be scored or cracked. Furthermore, [minimum brake disc thickness](#), brake disc runout, parallelism and surface roughness of the friction surfaces must not exceed or drop below the permitted values.

Refer to Technical Data.

Always strip preservative off new parts before installation. With the rear brake discs, also strip preservative off brake drum on parking brake.

- Brake drums:

Brake drums must not be scored or cracked. Furthermore, the maximum drum inside diameter, radial runout and surface roughness of the friction surfaces must not exceed or drop below the permitted values.

Refer to Technical Data.

Always strip preservative off new parts before installation.

- Brake calipers:

Only approved glycol-based assembly pastes may be used for repairs on brake calipers.

All moving parts on the brake caliper must move freely: note grease specifications.

Use only BMW-approved lubricants to grease brake caliper guides (refer to BMW Service Operating Fluids).

- Brake lines and brake hoses must be correctly routed and must not abut with body or components in a way which would cause chafing.
- To prevent damage, release and tighten brake line couplings with a special brake line wrench only.
- The system must be bled each time any brake lines have been detached.
- All connection points must be checked for leaks.
- Only tighten down brake hoses on the front axle when wheels are in straight-ahead driving position.
- Close open connections on brake lines and individual components to prevent dirt from entering the brake system.
- Observe tightening torques when tightening down brake line screw connections.

Tightening torque, [34 32 1AZ](#).

The traction control system is basically maintenance-free.

However, be sure to adhere to the following:

- When carrying out welding work with electric welding equipment, be sure to disconnect the plug from the electronic control unit (ignition turned off).
- During painting work, the control unit may be subjected for brief periods to loads of max. 95 °C and for long periods (approx. 2 hours) to loads of max. 85 °C.
- Tighten down the battery terminals completely.
- The brake lines on the hydraulic unit must not be mixed up; if necessary, mark them before they are removed and after completing repairs perform the mix-up check with the DIS Tester.

**Important!**

After completing work:

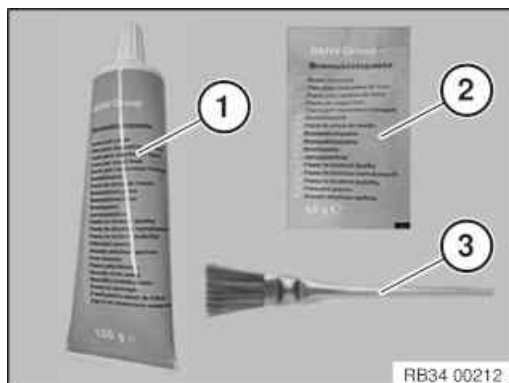
- Carry out function check on brake analyzer (test stand) to ensure that the brakes comply with legal requirements.
- Carry out test braking while driving at low speed; the effectiveness of the brakes may be reduced during the initial braking operations.
- Exaggerated drastic and continuous braking operations for faster braking in are not permitted.
- Advise the customer not to perform any wilful drastic braking in the first 200 km after brake replacement.
- Attach mirror tag to inside mirror.



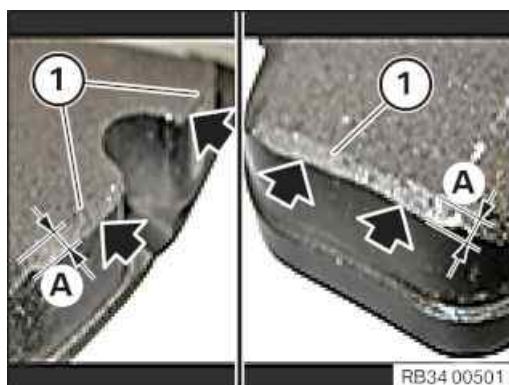
Attention!

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 brake 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.

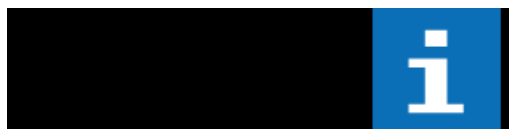


Attention!

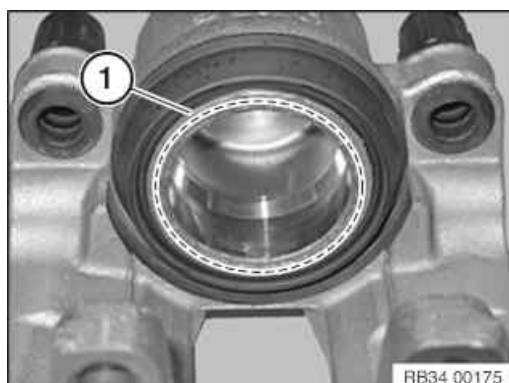
If new brake pads are mounted on a brake disc, the following must be observed:

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

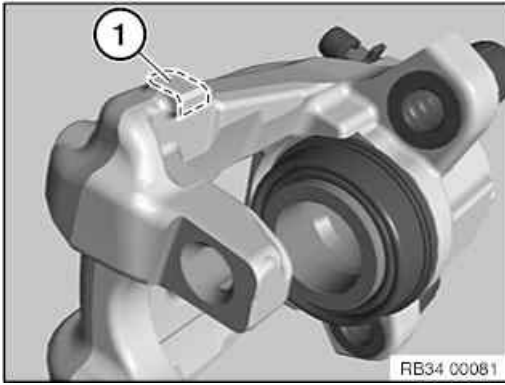
These procedures applies for all the following described brake systems.



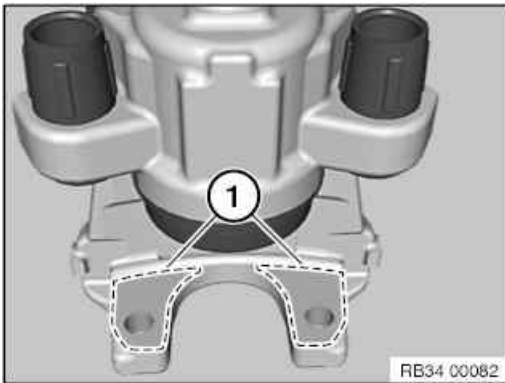
IPS brake (made by CBI), 1-piston floating caliper brake (model ranges: 1-Series, 3-Series, 4-Series, X3)



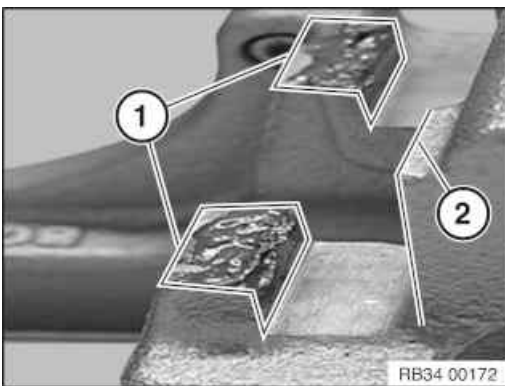
Clean contact surface (1) of brake piston with brake cleaner and apply a thin coating of brake pad paste.



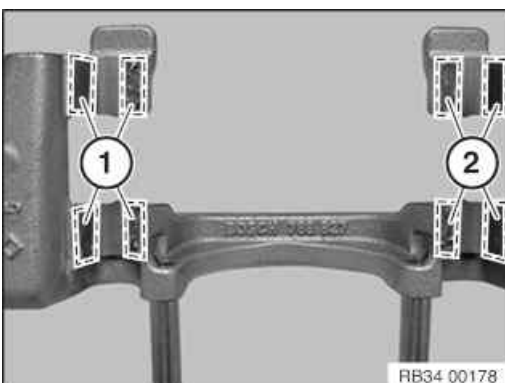
Clean contact surfaces (1) of T-heads/brake calliper housing with brake cleaner and apply a thin coating of brake pad paste.



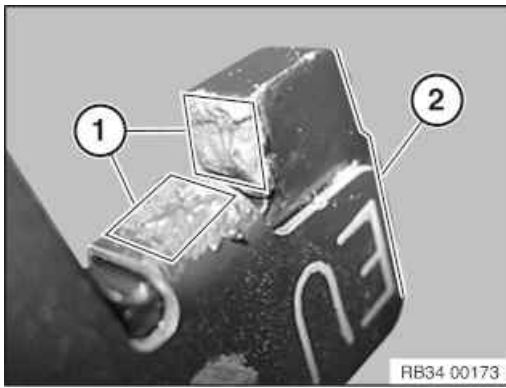
Clean contact surface (1) of brake caliper with brake cleaner and apply a thin coating of brake pad paste.



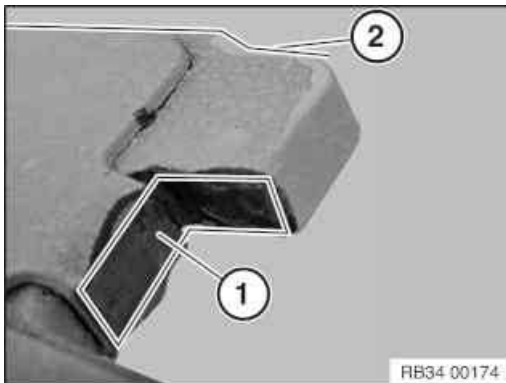
So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces (1) for the brake pads on the brake caliper mounting bracket. Clean guide surfaces (1 and 2) with brake cleaner and apply a thin coating of brake pad paste.



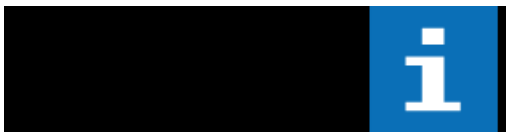
So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces (1 and 2) for the brake pads on the brake calliper mounting bracket. Clean guide surfaces (1 and 2) with brake cleaner and apply a thin coating of brake pad paste.



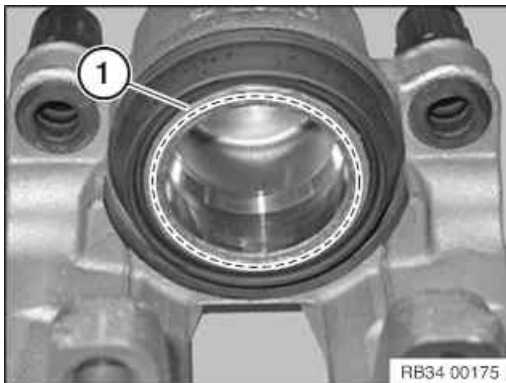
Apply a thin coating of brake pad paste to T-head of inner brake pad in area (1) and (2).



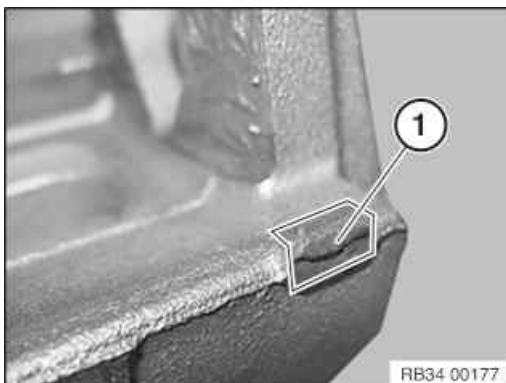
Apply a thin coating of brake pad paste to T-head of outer brake pad in area (1) and (2).



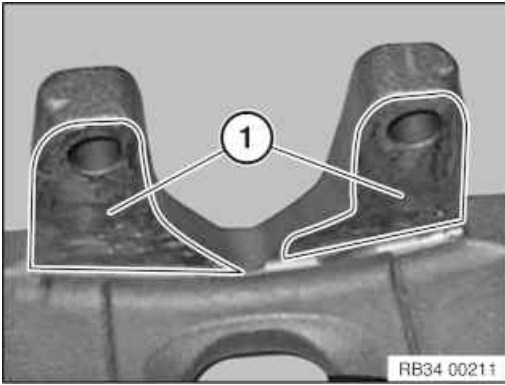
FN brake (made by Continental Teves), 1-piston floating caliper brake (model ranges: 5-Series, 6-Series, 7-Series, 8-Series, X1, X3, X5, Z4, Rolls-Royce)



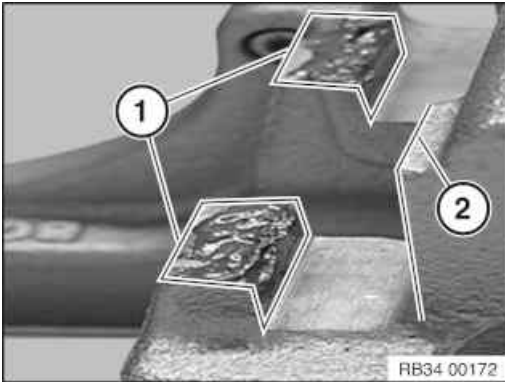
Clean contact surface (1) of brake piston with brake cleaner and apply a thin coating of brake pad paste.



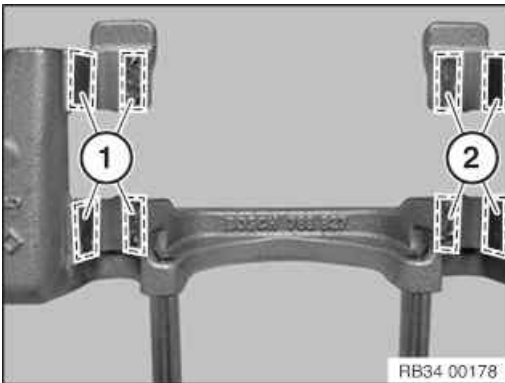
Clean contact surfaces (1) of T-heads/brake calliper housing with brake cleaner and apply a thin coating of brake pad paste.



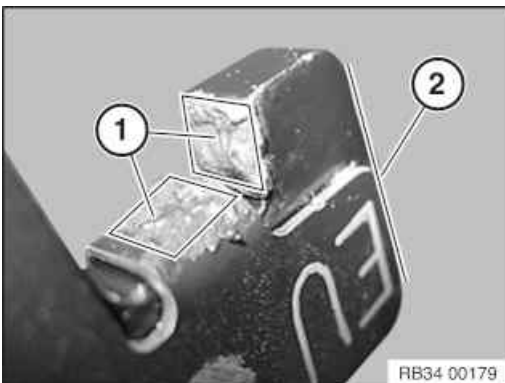
Clean contact surface (1) of brake caliper with brake cleaner and apply a thin coating of brake pad paste.



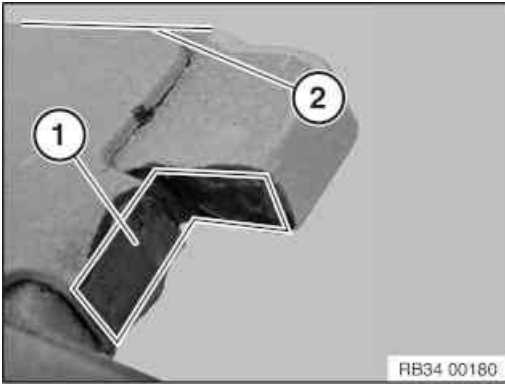
So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces (1) for the brake pads on the brake caliper mounting bracket. Clean guide surfaces (1) with brake cleaner and apply a thin coating of brake pad paste.



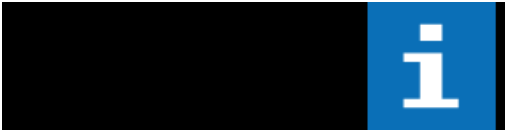
So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces (1 and 2) for the brake pads on the brake calliper mounting bracket. Clean guide surfaces (1 and 2) with brake cleaner and apply a thin coating of brake pad paste.



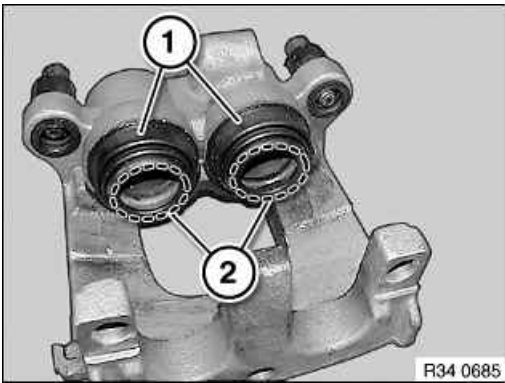
Lightly coat the T-head of the inner brake pad with brake pad paste in area (1 and 2).



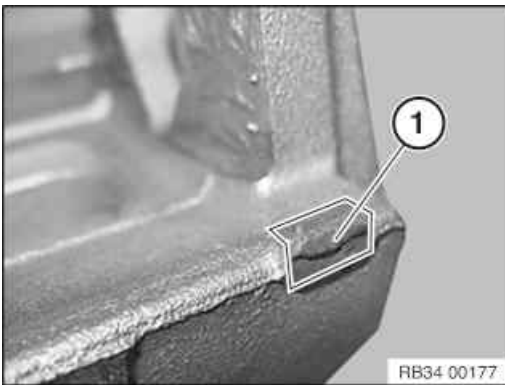
Lightly coat the T-head of the outer brake pad with brake pad paste in area (1 and 2).



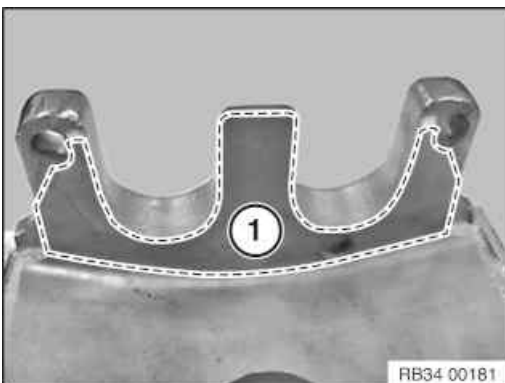
FN brake (made by Continental Teves), 2-piston floating caliper brake (model ranges: 5-Series, 6-Series, 7-Series, 8-Series, X5, Rolls-Royce)



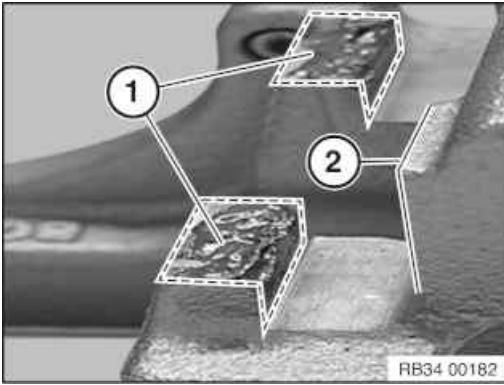
Clean contact surface (2) of brake piston with brake cleaner and apply a thin coating of brake pad paste.



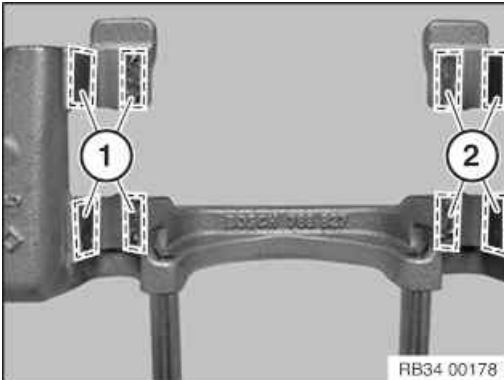
Clean contact surfaces (1) of T-heads/brake calliper housing with brake cleaner and apply a thin coating of brake pad paste.



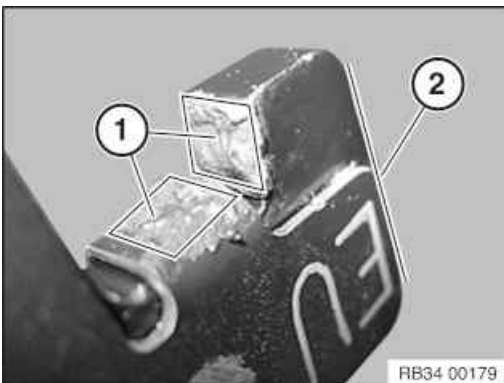
Clean contact surface (1) and brake caliper with brake cleaner and apply a thin coating of brake pad paste.



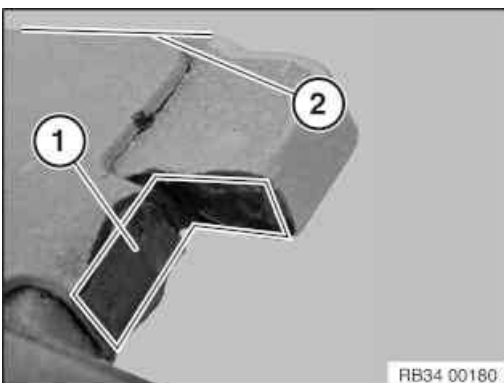
So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces (1 and 2) for the brake pads on the brake calliper mounting bracket. Clean guide surfaces (1 and 2) with brake cleaner and apply a thin coating of brake pad paste.



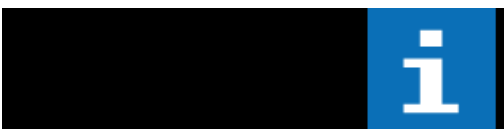
So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces (1 and 2) for the brake pads on the brake calliper mounting bracket. Clean guide surfaces (1 and 2) with brake cleaner and apply a thin coating of brake pad paste.



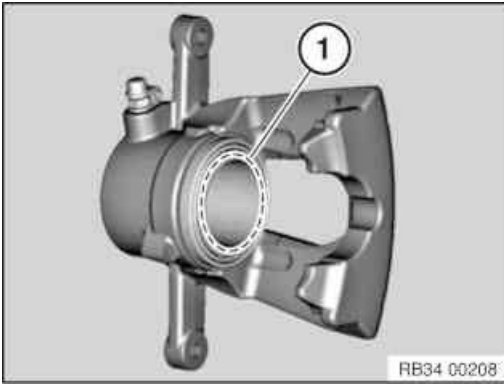
Lightly coat the T-head of the inner brake pad with brake pad paste in area (1 and 2).



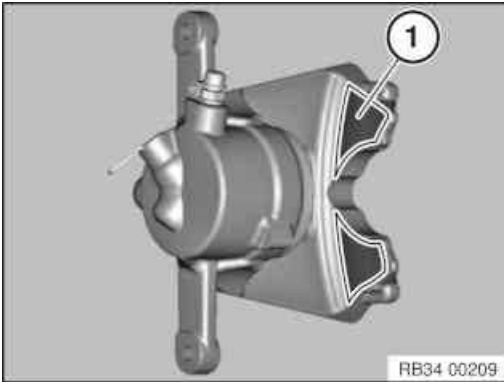
Lightly coat the T-head of the outer brake pad with brake pad paste in area (1 and 2).



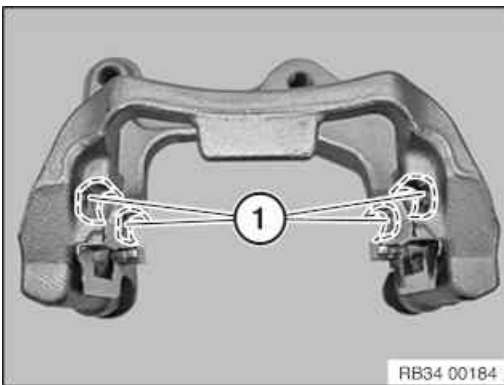
Collette brake (made by TRW), 1-piston brake caliper (model ranges: MINI, 1-Series, 5-Series, 6-Series, Z4)



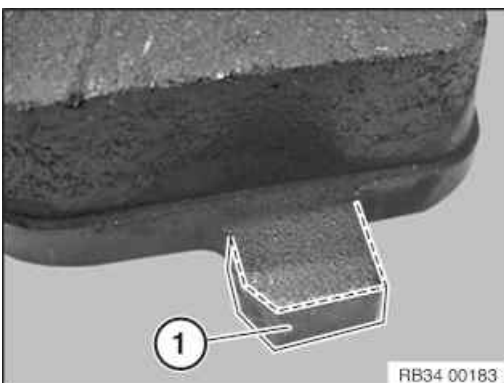
Clean contact surface (1) of brake piston with brake cleaner and apply a thin coating of brake pad paste.



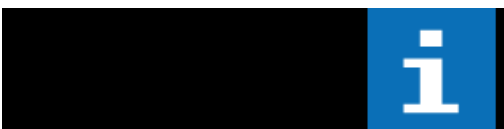
Clean contact surface (1) of brake caliper with brake cleaner and apply a thin coating of brake pad paste.



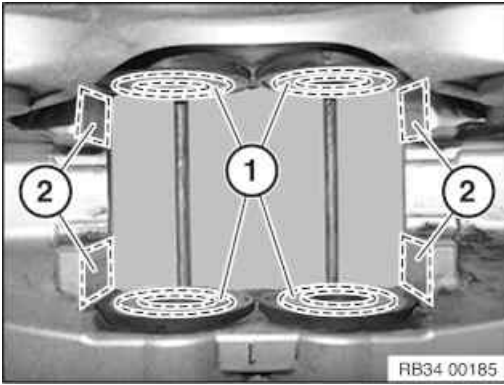
So as not to damage the surface coating, if possible do not mechanically clean the guide surface (1) for the brake pads on the brake caliper mounting bracket. Clean guide surface (1) with brake cleaner and apply a thin coating of brake pad paste.



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



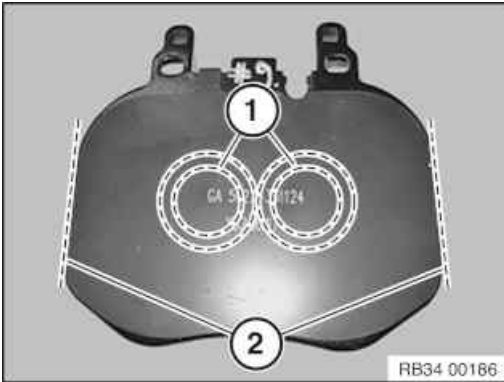
P 4.40 brake (made by Brembo), 4-piston fixed caliper brake (model ranges: MINI, 1-Series, 3-Series, 4-Series, 5-Series, 6-Series, 7-Series, 8-Series, X5, Rolls-Royce)



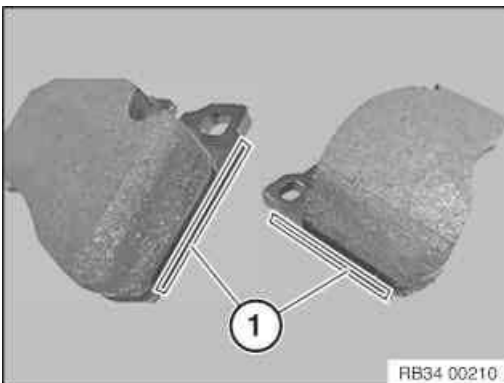
Clean contact surface (1) of brake piston with brake cleaner and apply a thin coating of brake pad paste.

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.

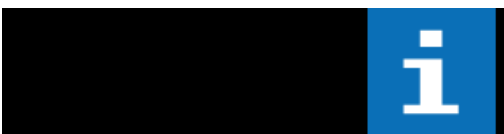
Clean both inner and outer guide surfaces (2) and apply a thin coating of brake pad paste.



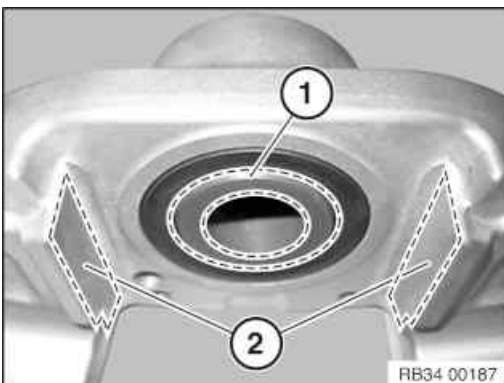
Lightly coat both sides of the contact surface in area (1 and 2) with brake pad paste.



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



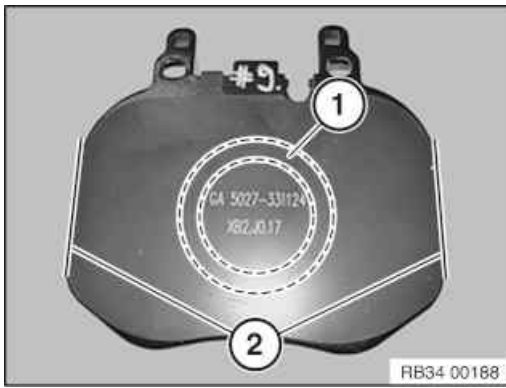
P 4.40 brake (made by Brembo), 2-piston fixed caliper brake (model ranges: 1 Series, 2 Series, 3 Series; does not apply to M2 F87)



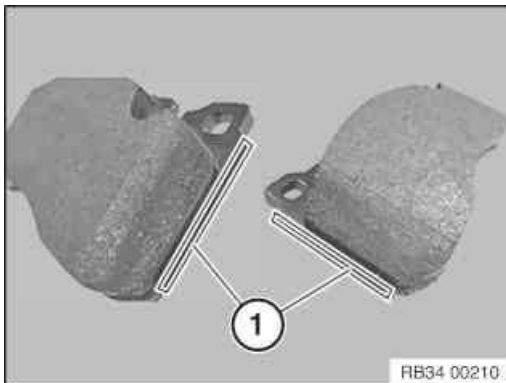
Clean contact surface (1) of brake piston with brake cleaner and apply a thin coating of brake pad paste.

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.

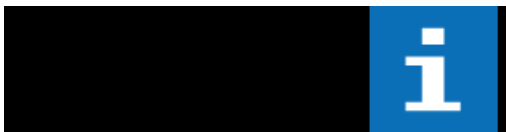
Clean both inner and outer guide surfaces (2) and apply a thin coating of brake pad paste.



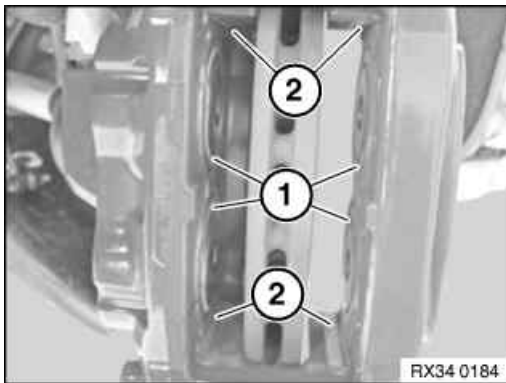
Lightly coat both sides of the contact surface in area (1 and 2) with brake pad paste.



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

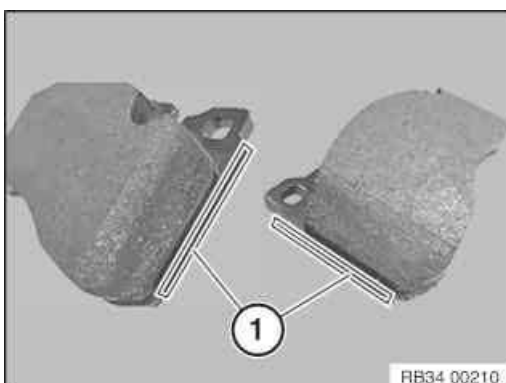


Brake (made by Brembo), 4-piston fixed caliper brake (model ranges: MINI F5x sport brake)



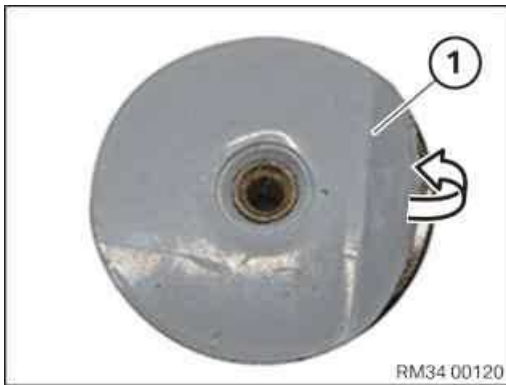
Check dust boot (1) for damage and replace if necessary.

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



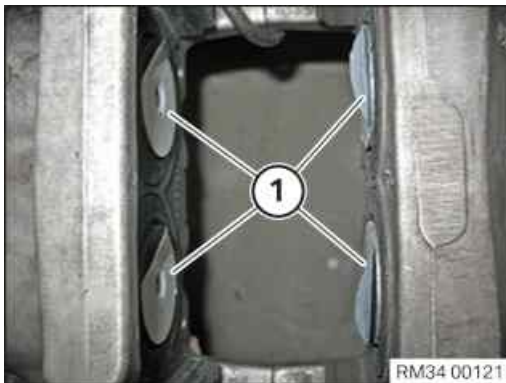
Lightly coat the brake pad contact surface on both sides in area (1) with brake pad paste.

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

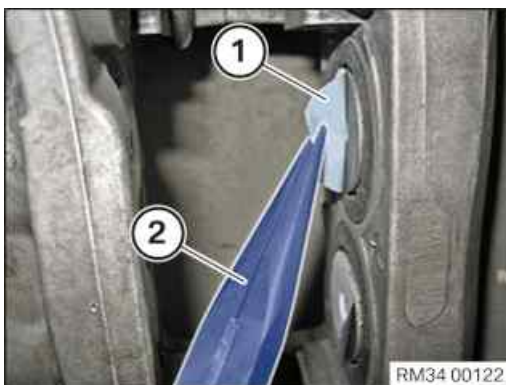


Only use new claw plates!

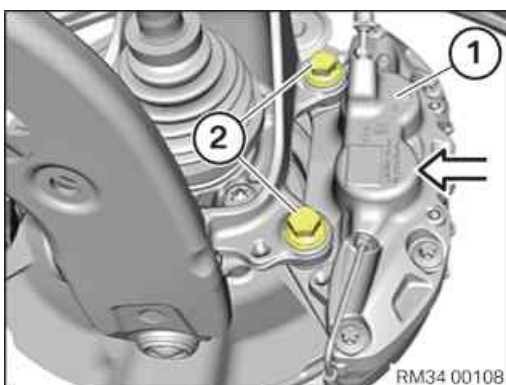
Slightly raise the protective film (1) at a place.



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



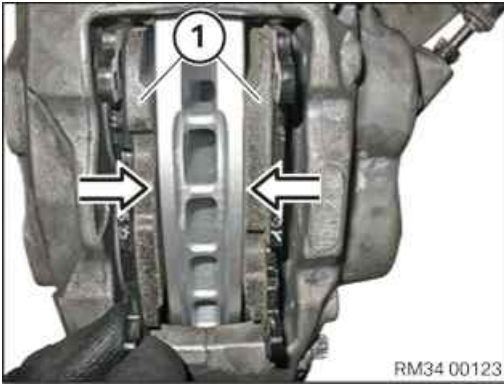
Pull off the protective film (1) with long-nose pliers (2). **Attention!**
The bonding surface of the claw plates must not be touched!



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

Parts: Replace screws (2).

Insert screws (2) and tighten.



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

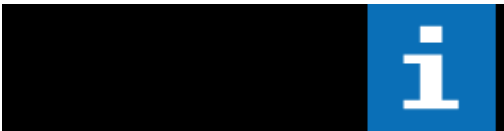
The brake pads must not touch the bonding surface of the claw plates when inserting!

Apply the brake pads to the brake disc and insert.

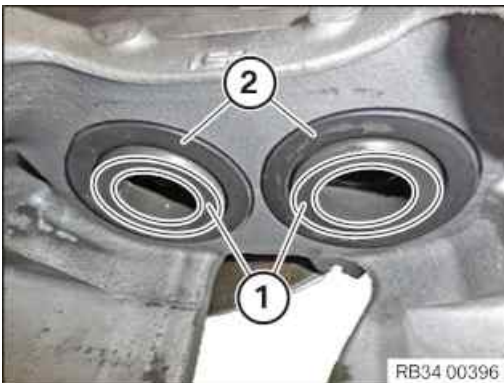


In order to ensure a complete bonding of the claw plates with the brake pads, the following instruction must be strictly adhered to:

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

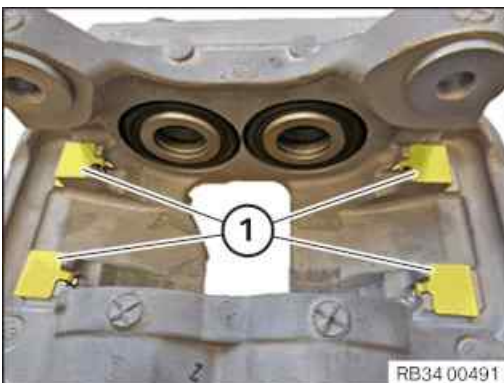


Brake (made by Continental), 4-piston fixed caliper brake (model ranges: 7-Series (G11, G12))



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

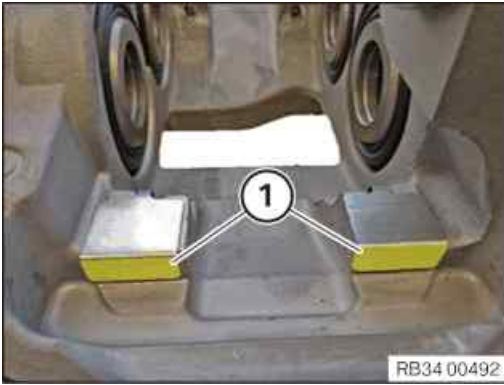
Check the dust boots (2) and renew as necessary.



Always renew retaining plates 1!

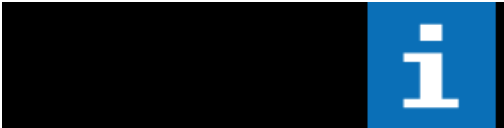
Mount retaining plate 1.

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

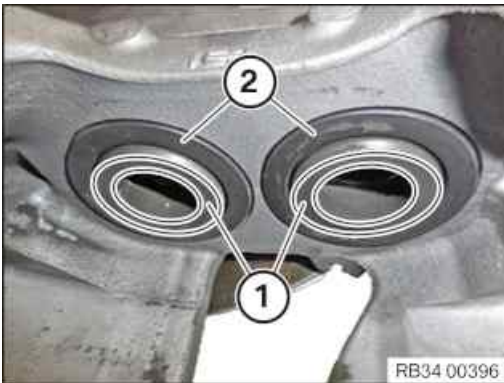


So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces for the brake pads on the brake caliper mounting bracket.

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



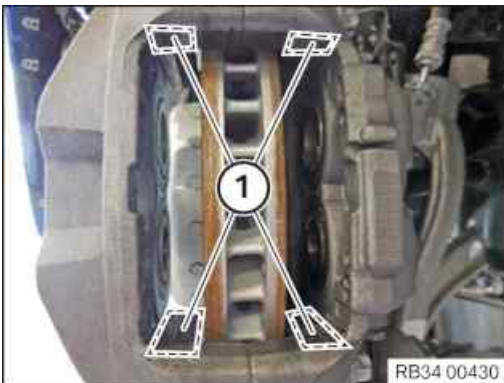
Brake (made by Brembo), 4-piston fixed caliper brake (model ranges: 7-Series (G11, G12))



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

Adhesive residues must be completely removed.

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



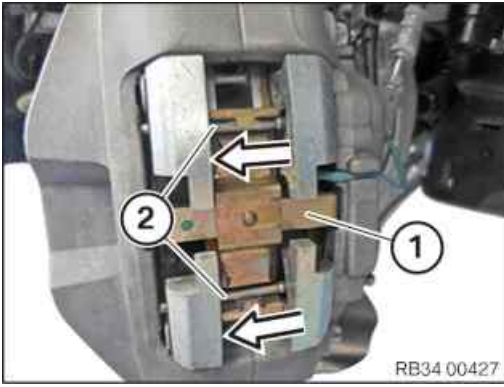
To prevent damage to the surface coating, do not clean the guide surfaces (1) for the brake pads on the brake calliper mechanically, if possible.

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



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

Do not touch the adhesive layer!



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

Fit retaining clip (1).

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

Attention!

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

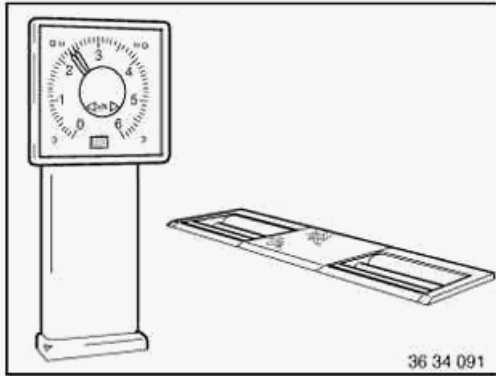
- Step on the brake pedal to the floor and hold the pressure for one minute. This causes the brake pads to adhere to the brake pistons.

34 00 012 Parking brake function check



Attention!

Follow instructions for [Brake testing on test stand](#).



Drive vehicle onto brake test stand

The parking brake control unit utilizes a plausibility check (wheel speed comparison) to detect the brake test stand within a few seconds and switches to brake test stand mode.

The parking brake indicator light flashes slowly when brake test stand mode is activated and EMF actuators are released.

Actuate parking brake switch = application of brake pads.

The parking brake indicator light flashes quickly when brake test stand mode is activated and EMF actuators are partially locked.

Operate electromechanical parking brake-switch = test load 1.

Actuate parking brake switch again = test force 2

Actuate parking brake switch again = test force 3

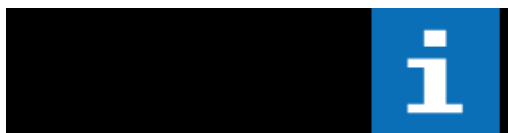
The parking brake is released again when the button is actuated in the Release direction.

The parking brake indicator light is permanently activated when brake test stand mode is not detected and EMF actuators are fully locked.

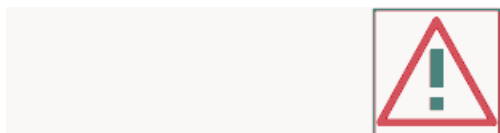
The brake test stand mode is automatically terminated when the vehicle is driven off the brake test stand.

Assessment:

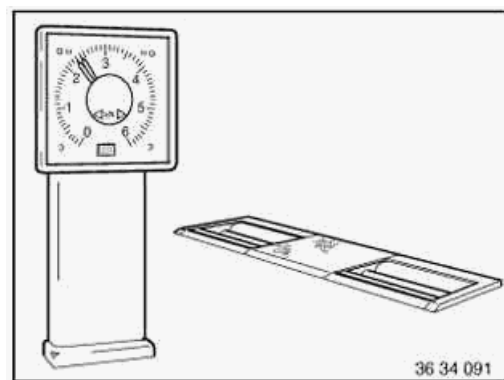
- The sum of both wheel braking forces must be at least 16% of the total weight of the vehicle.
- The maximum permitted brake force differential right/left must not exceed 95% (referencing the greater brake value).

**Necessary preliminary work:**

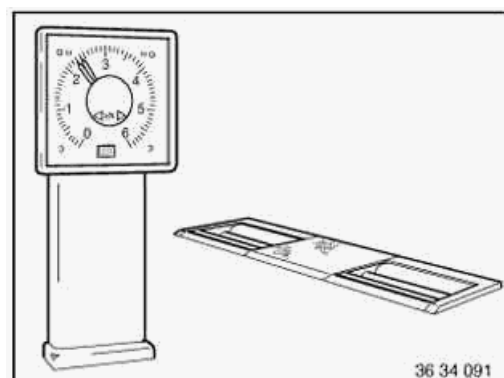
- Check tyres for damage
- Check tyre treads
- Checking tyre pressure
- The brakes must be at normal operating temperature. To that end, warm up and dry off the brake discs by braking the vehicle a few times.

**Caution!**

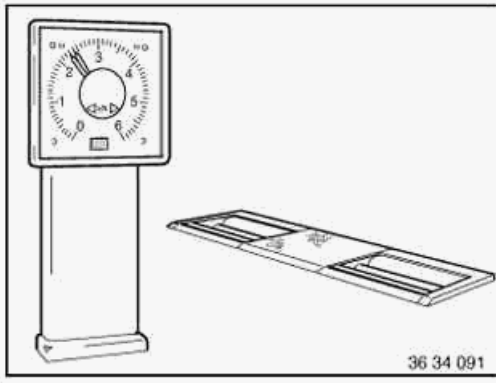
- Only brake test stands with test speeds of 2.5-6 km/h may be used.
- On vehicles equipped with Dynamic Stability Control (DSC), the system needs to be deactivated!
- The warning light for the Dynamic Stability Control (DSC) inside the instrument cluster has to be illuminated!

**Front brakes:**

- Drive the front wheels of the vehicle onto the brake test stand
- Place the selector lever in selector lever position "N"
- Start the brake test stand
- Press service brake pedal
- Read off maximum brake power on left / right

**Rear brakes:**

- Drive the rear wheels of the vehicle onto the brake tester
- Place the selector lever in selector lever position "N"
- The parking brake control unit utilises a plausibility check (wheel speed comparison) to detect the brake test stand within a few seconds and switches to brake test stand mode.
- The parking brake indicator light flashes slowly when brake test stand mode is activated and EMF actuators are released.
- Start the brake test stand
- Press service brake pedal
- Read off maximum brake power on left / right



Parking brake:

- Drive the rear wheels of the vehicle onto the brake tester
- Place the selector lever in selector lever position "N"
- The parking brake control unit utilises a plausibility check (wheel speed comparison) to detect the brake test stand within a few seconds and switches to brake test stand mode.
- The parking brake indicator light flashes slowly when brake test stand mode is activated and EMF actuators are released.
- Start brake test stand.
- Actuate parking brake switch = application of brake pads.
- The parking brake indicator light flashes quickly when brake test stand mode is activated and EMF actuators are partially locked.
- Actuate parking brake switch = test force 1
- Actuate parking brake switch again = test force 2
- Actuate parking brake switch again = test force 3
- Read off maximum brake power on left / right
- The parking brake is released again when the button is actuated in the Release direction.
- The brake test stand mode is automatically terminated when the vehicle is driven off the brake test stand.

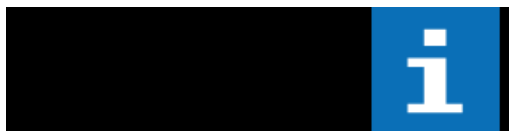


Caution!

A terminal change needs to be carried out after finishing the checks!

After the terminal change, all indicator lights go out!

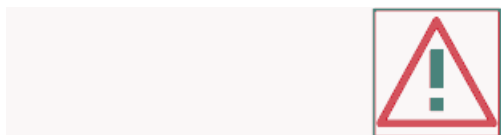
34 00 025 Renew the fluid in the DSC brake system (after part exchange in the brake system)



Necessary preliminary tasks:

- Read and comply with [General Notes](#).

Attention! Do not reuse drawn out brake fluid.



Use only BMW-approved brake fluids, see [BMW operating fluids](#).



Front cover:

Lift off cowl panel cover (1) upwards.



Attention!

To guarantee a correct bleed of the brake system, observe the following:

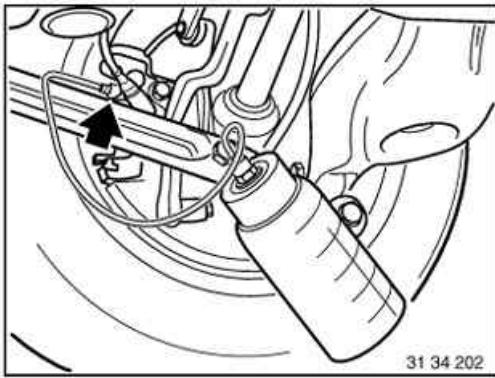
- Top up the brake fluid in the expansion tank to the lower edge of the thread (1) with new brake fluid.
- Bleed the hose of the bleeder unit before connecting.



Connect bleeder unit to expansion tank (1) and switch on. **Attention!**

Check relevant equipment manufacturer's operating instructions for each device.

Charging pressure should not exceed 2 bar.



Fully flush the rear axle brake system.

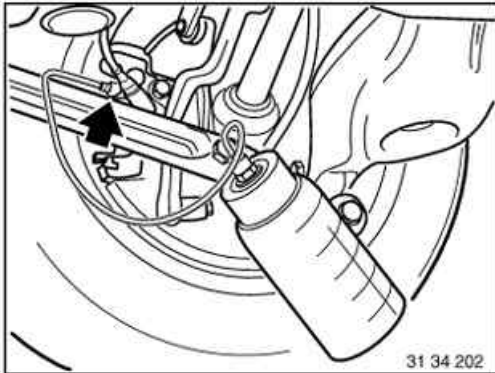
Connect bleeder hose with collecting tray to bleeder valve on rear right brake caliper.

Open bleeder valve and purge until clear, bubble-free brake fluid emerges.

Close vent valve.

Tightening torque: [34 00 1AZ](#).

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



Fully flush the front axle brake system.

Connect bleeder hose with collecting tray to bleeder valve on front right brake caliper.

Open bleeder valve and purge until clear, bubble-free brake fluid emerges.

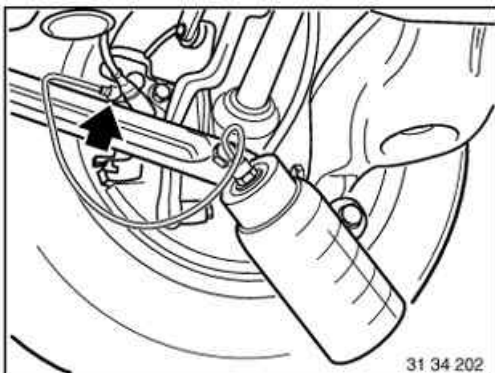
Close vent valve.

Tightening torque: [34 00 1AZ](#).

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



Operate the button for the electric parking brake and release again, then operate again and release again.



Fully flush the rear axle brake system.

Connect bleeder hose with collecting tray to bleeder valve on rear right brake caliper.

Open bleeder valve and purge until clear, bubble-free brake fluid emerges.

Close vent valve.

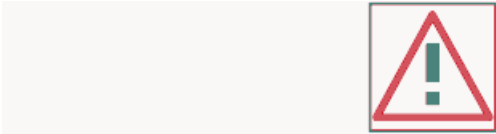
Tightening torque: [34 00 1AZ](#).

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



Note:

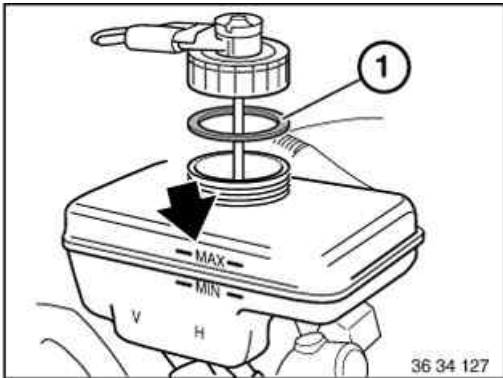
The [clutch slave cylinder](#) must be scavenged in cars with manual transmissions.



Attention!

If after this procedure there is still air present in the brake system (insufficient brake pedal force), the following procedure applies:

- **Perform the brake bleeding routine service function in the BMW diagnosis and information system according to the instructions.**



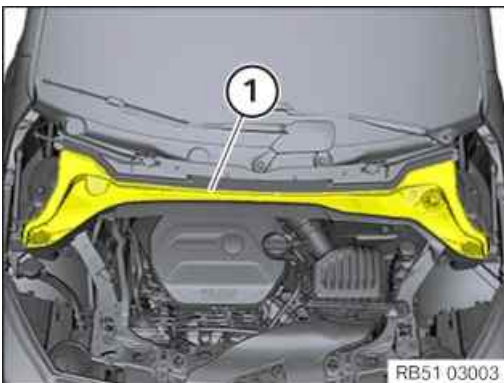
Switch off bleeder unit and remove from expansion tank.

Check brake fluid level. If necessary, top up/draw off to maximum level.

Close expansion tank.

Note:

Pay attention to rubber seal (1) in sealing cap.

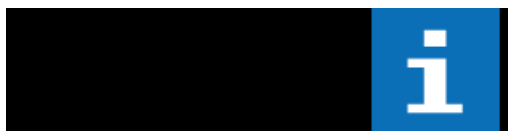


Front cover:

Feed in cowl panel cover (1) to rear.

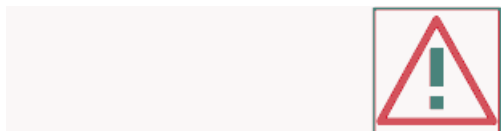
Note:

Check front cover is correctly seated relative to rear cover.

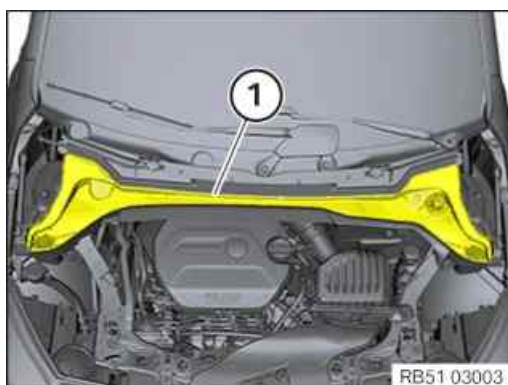
**Necessary preliminary tasks:**

- Read and comply with [General Notes](#).

Attention! Do not reuse drawn out brake fluid.



Use only BMW-approved brake fluids, see [BMW operating fluids](#).

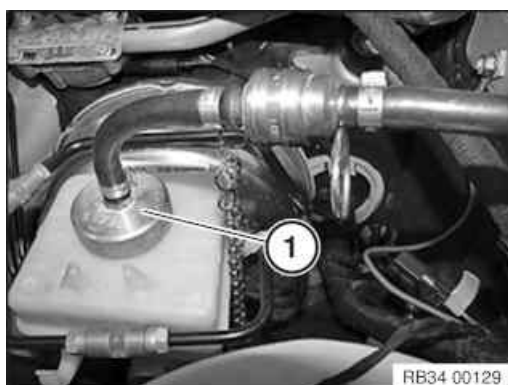
**Front cover:**

Lift off cowl panel cover (1) upwards.

**Attention!**

To guarantee a correct bleed of the brake system, observe the following:

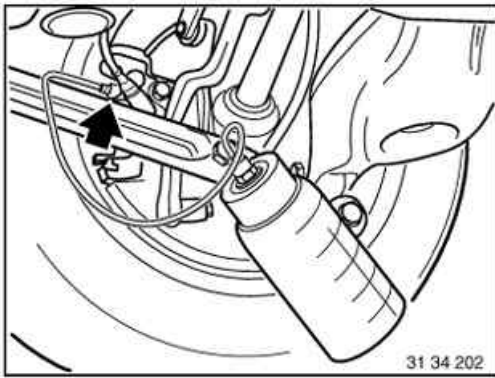
- Top up the brake fluid in the expansion tank to the lower edge of the thread (1) with new brake fluid.
- Bleed the hose of the bleeder unit before connecting.



Connect bleeder unit to expansion tank (1) and switch on. **Attention!**

Check relevant equipment manufacturer's operating instructions for each device.

Charging pressure should not exceed 2 bar.



Fully flush the rear axle brake system.

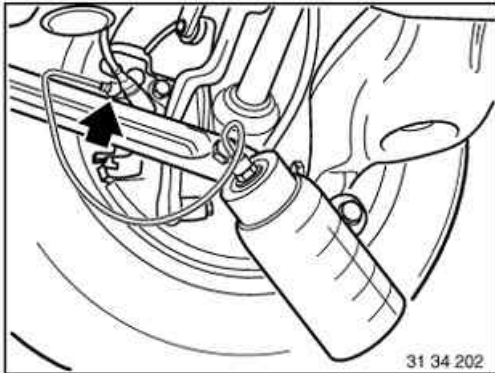
Connect bleeder hose with collecting tray to bleeder valve on rear right brake caliper.

Open bleeder valve and purge until clear, bubble-free brake fluid emerges.

Close vent valve.

Tightening torque: [34 00 1AZ](#).

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



Fully flush the front axle brake system.

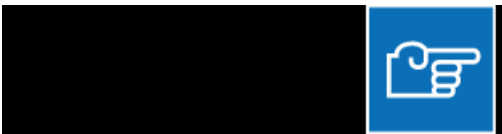
Connect bleeder hose with collecting tray to bleeder valve on front right brake caliper.

Open bleeder valve and purge until clear, bubble-free brake fluid emerges.

Close vent valve.

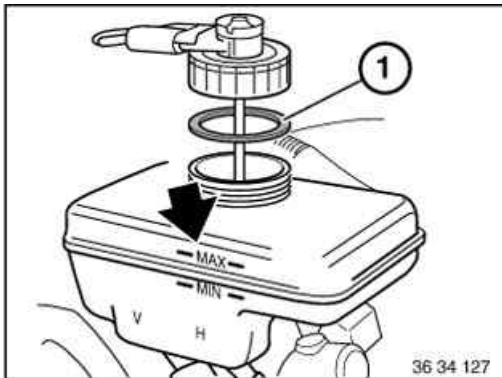
Tightening torque: [34 00 1AZ](#).

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



Note:

The [clutch slave cylinder](#) must be scavenged in cars with manual transmissions.



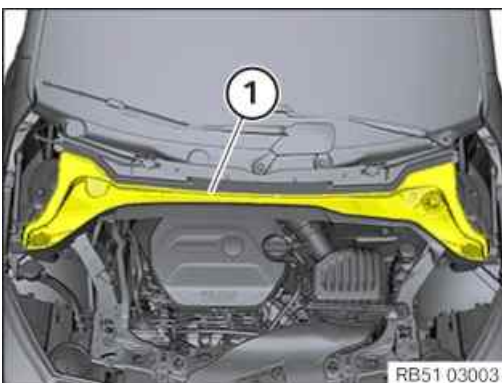
Switch off bleeder unit and remove from expansion tank.

Check brake fluid level. If necessary, top up/draw off to maximum level.

Close expansion tank.

Note:

Pay attention to rubber seal (1) in sealing cap.



Front cover:

Feed in cowl panel cover (1) to rear.

Note:

Check front cover is correctly seated relative to rear cover.

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



Warning!

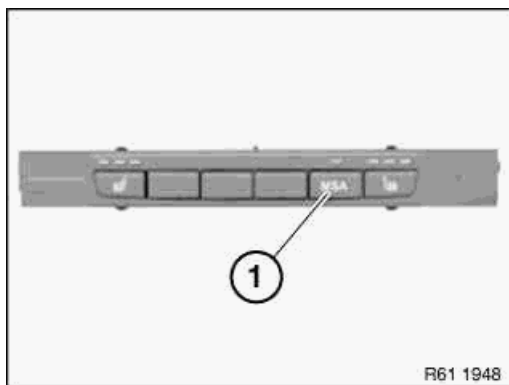
If the engine hood/bonnet contact is pulled upwards (workshop mode), the information "switch closed" is output. The automatic engine start-stop function is active.

An automatic engine start is possible.

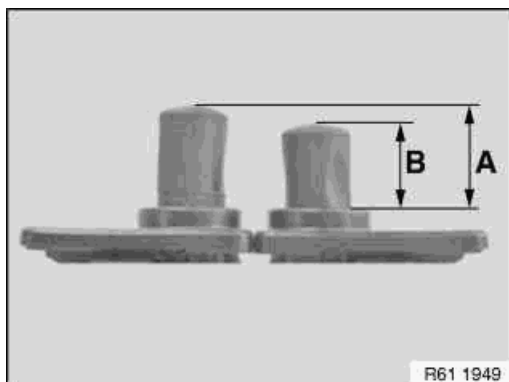
Observe safety precautions when working on MSA vehicles.

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

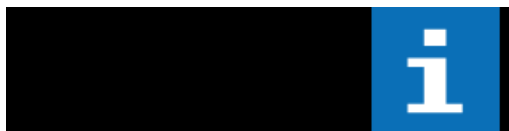




Note:

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](#)



Necessary preliminary tasks:

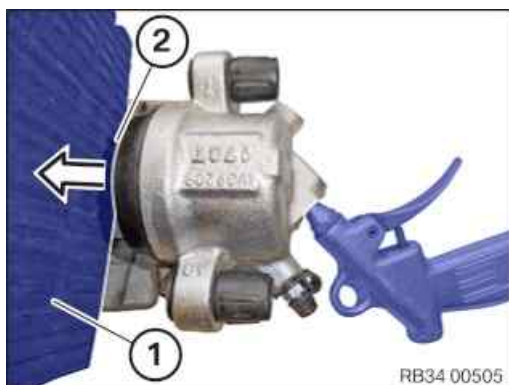
- Remove the [front brake caliper](#).



Warning!

In the following operation, large forces occur at the brake caliper piston.

Danger of injury!



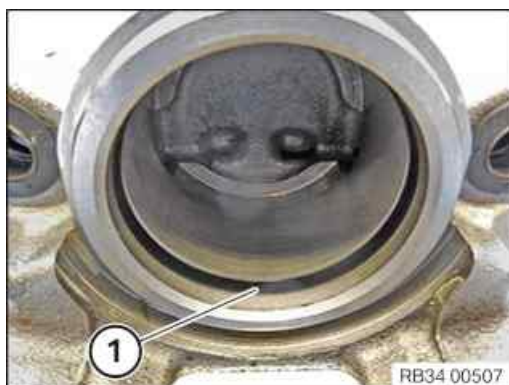
Carefully force piston out through connecting bore with compressed air.

To protect the piston, place a protective plate (e.g. hardwood or rubber plate) in the caliper recess.

Do not grip piston with fingers - pinch hazard!



Press off dust boot (1).



Carefully remove sealing ring (1).

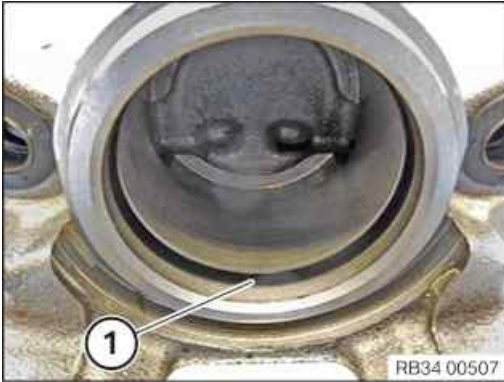
Clean cylinder bores and parts and dry with compressed air.

Thoroughly inspect cylinder bore, piston and flange surfaces for damage.

Material removing rework on cylinders and pistons is not permitted.

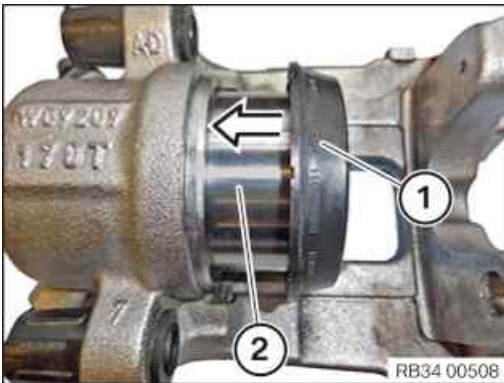


Installation:



Insert sealing ring (1).

Apply a light coat of [ATE brake cylinder paste](#) to cylinder bore, piston and sealing ring,



Fit dust boot (1) in annular groove of piston (2).

Attention!

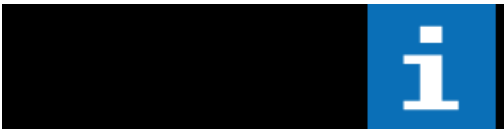
Do not twist brake piston.

Press piston into cylinder bore.

Evenly press dust boot (1) onto brake caliper housing up to limit position.

Note:

The area between the dust boot and the brake caliper housing must be kept dry. It must not come into contact with Ate brake cylinder paste or brake fluid so as to ensure that the dust boot is perfectly fitted.



Required follow-up work:

- Install [front brake caliper](#).

**Attention!**

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

Maximum machining dimension per friction ring side is 0.8 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 \(MIN TH\)](#).

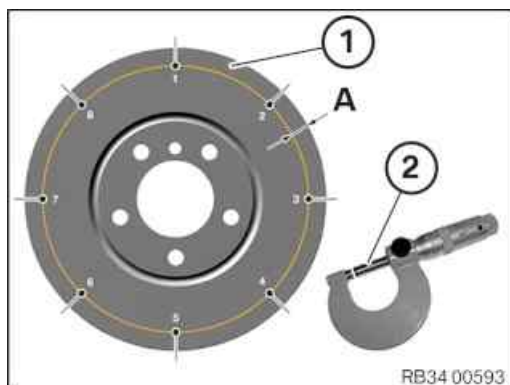
**Mobile brake disc lathe:****Attention!**

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.

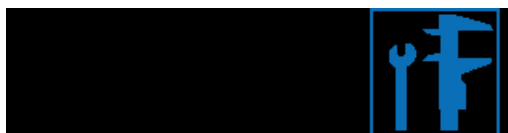
The brake discs remain on the vehicle.

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

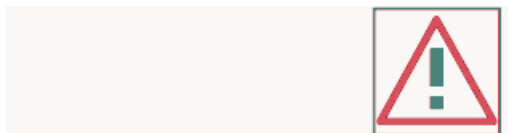


After the precision turn of the brake disc, the [difference in thickness](#) must be measured at 8 different points (1) approx. 10 mm (dimension A) from the outer edge of the disc using a caliper gauge (2)!

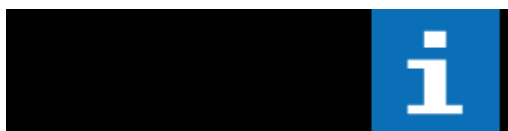
[Permissible thickness difference: see Technical Data!](#)

**Special tools required:**

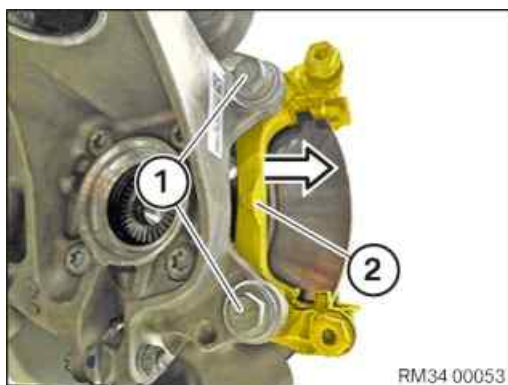
- [34 1 280](#)

**Important!**

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

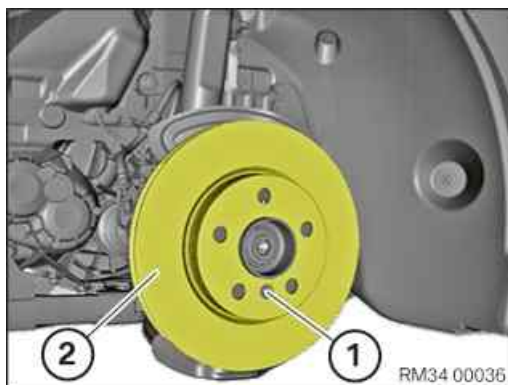
**Necessary preliminary tasks:**

- [Remove front brake pads.](#)

**Removal:**

Release screws (1).

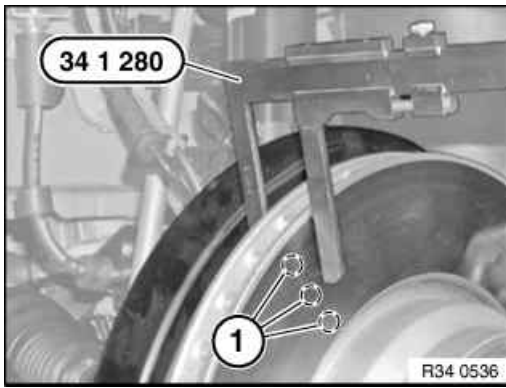
Remove brake anchor plate (2) in direction of arrow and tie up.

**Important!**

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

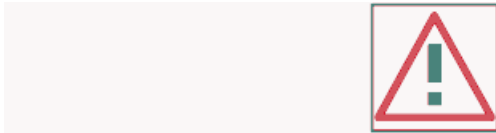
Release screw (1) and remove brake disc (2).

**Installation:**



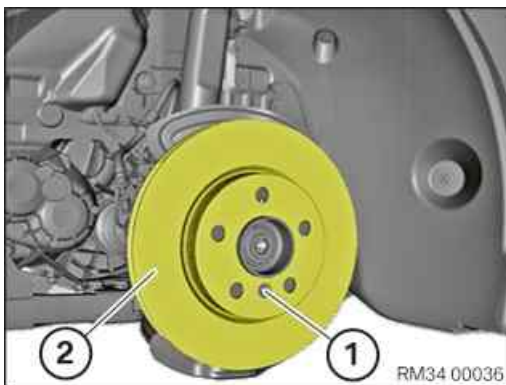
Check minimum brake disc thickness:

- Position special tool [34 1 280](#) at three measuring points in area (1) and measure.
- Compare measuring result and also compare the lowest value.



Important!

New brake pads may only be fitted if the brake disc thickness is greater than the minimum brake disc thickness (MIN TH).



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!

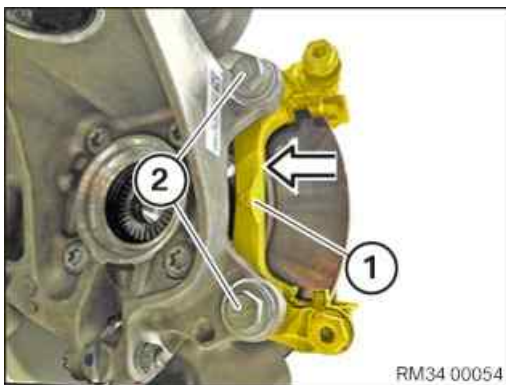
Install brake disc (2).

Insert screw (1) and tighten down.

Tightening torque [34 11 1AZ](#).

Replace screw (1).

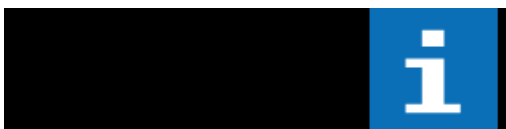
Parts: Screw



Install brake anchor plate (1).

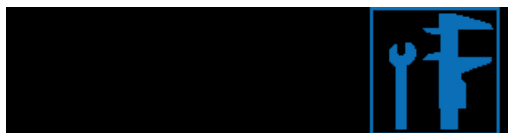
Insert screws (2) and tighten.

Tightening torque [34 11 2AZ](#).



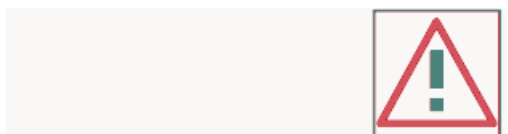
Required follow-up work:

- After completing repair work, read and comply with notes on [braking in new brake discs / brake pads](#).
- Install front [brake pads](#).



Special tools required:

- [34 1 050](#)
- [34 1 280](#)
- [2 352 960](#)



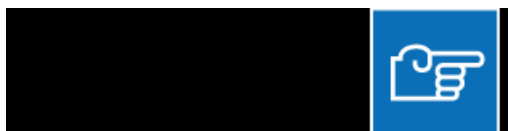
Caution!

- Do not mechanically clean the guide surfaces for brake pads to prevent damage to the surface coating. Clean the guide surfaces using brake cleaner, BMW part number 83 19 2 154 780. Carefully clean highly contaminated guide surfaces with a suitable tool (e.g. brass wire brush, nylon brush). Then thinly coat with brake pad paste BMW part 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!
Observe [regulation on applying brake pad paste to brake pads and brake anchor plates](#)!
- Retaining pin and expanding spring: for vehicles older than 48 months it is recommended to replace the retaining spring!
- Brake pad wear sensor: After removal it must be replaced (brake pad wear sensor loses its retention capability in the break pad).
- A CBS reset must be done after every brake pad exchange.
 - With a sanded brake pad wear sensor (display in CBS menu): CBS reset possible in vehicle.
 - With a **non**-sanded brake pad wear sensor: CBS reset only possible via diagnosis system.

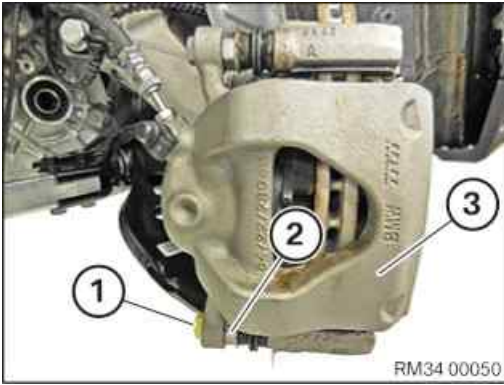


Necessary preliminary work:

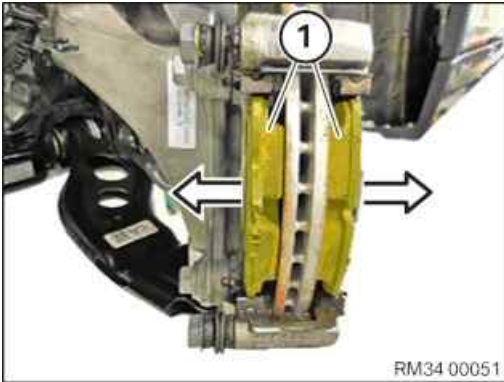
- Remove front [wheels](#).
- Remove [brake pad wear sensor](#).



Removal:



Release guide screw (1).
 If necessary, grip at hexagon head (2).
 Tilt brake caliper (3) upwards.



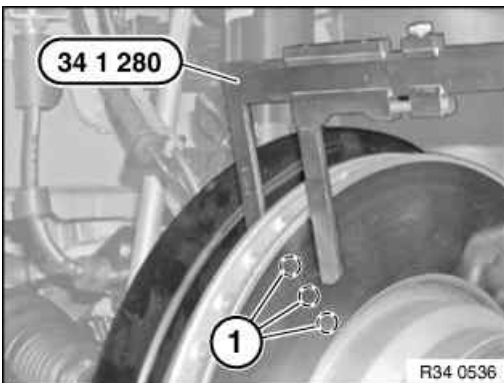
Remove brake pads (1) in direction of arrow from caliper carrier.

Caution!

Mark any worn brake pads.

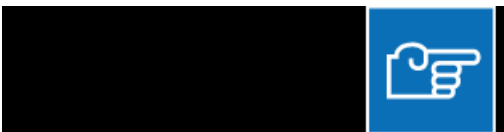
In the event of one-sided brake pad wear, do not change brake pads round.

Observe [minimum thickness of brake pads](#).

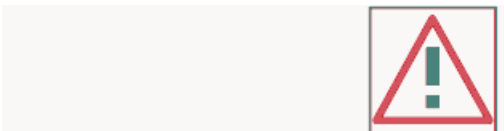


Check minimum brake disc thickness:

- Position special tool [34 1 280](#) at three measuring points in area (1) and measure.
- Compare measuring result and lowest value with [setpoint value](#).



Installation:



Caution!

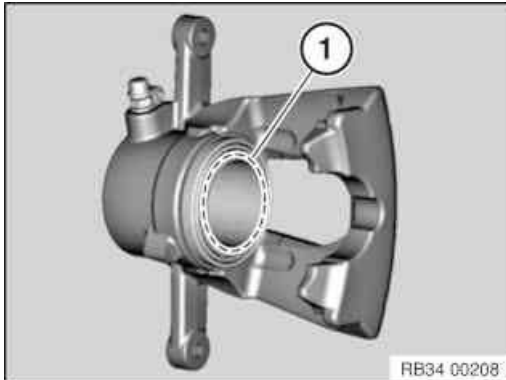
New brake pads may only be installed if the brake disk thickness is greater than the [minimum brake disc thickness](#).



Press back brake pads and piston with special tool [2 352 960](#). **Caution!**

When forcing piston back:

- Pay attention to brake fluid level in expansion tank; brake fluid that spills over will damage paintwork.

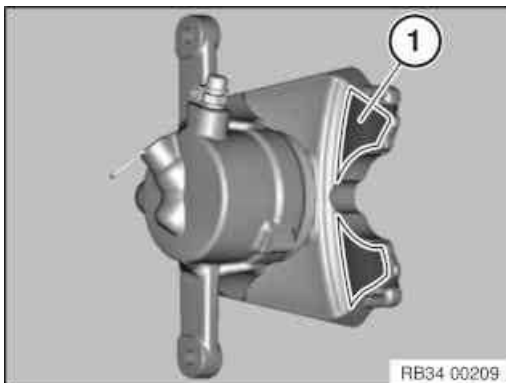


Check dust boot for damage and renew if necessary.

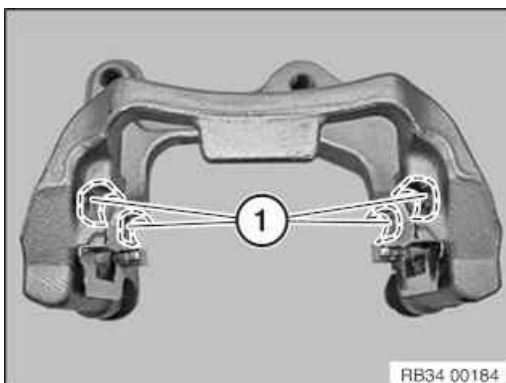
Clean contact surface (1) of brake piston with brake cleaner and apply a thin coating of brake pad paste.

Caution!

Dust boot must not come into contact with brake pad paste as this may cause the dust boot to swell.



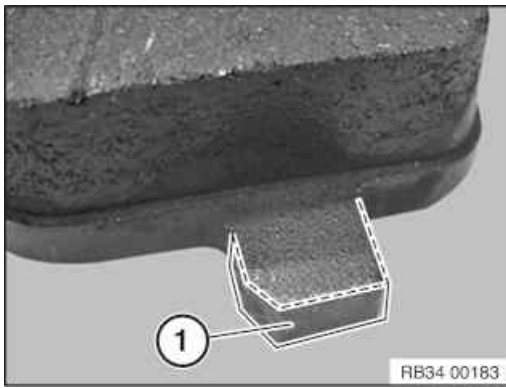
Clean contact surface (1) of brake caliper with brake cleaner and apply a thin coating of brake pad paste.



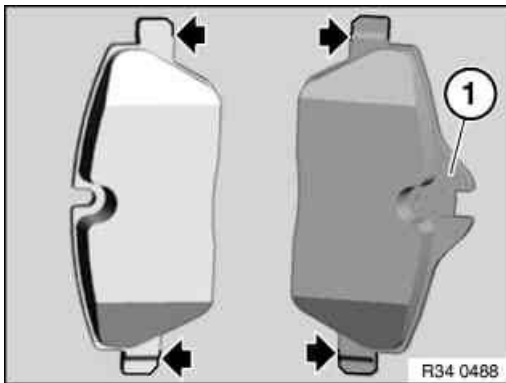
Do not mechanically clean the guide surfaces (1) for brake pads to prevent damage to the surface coating. Clean the guide surfaces using brake cleaner, BMW part number 83 19 2 154 780.

Carefully clean highly contaminated guide surfaces (1) with a suitable tool (e.g. brass wire brush, nylon brush).

Then thinly coat the guide surfaces (1) with brake pad paste, BMW part number 83 19 2 158 851 (3 gr.) or 83 19 2 158 852 (100 gr.).

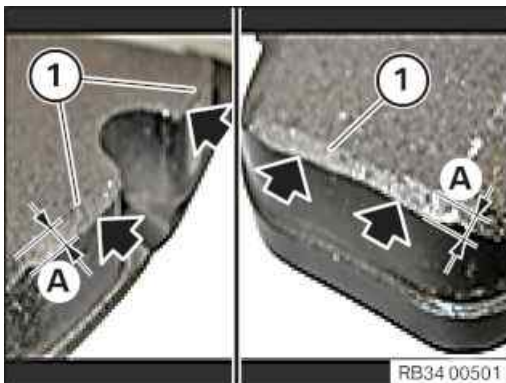


Apply a thin coating of brake pad paste to both sides of T-head of brake pad in area (1).



Caution!

Brake pad with bulge (1) is intended for accommodating the brake pad wear sensor and must be fitted on the piston side.

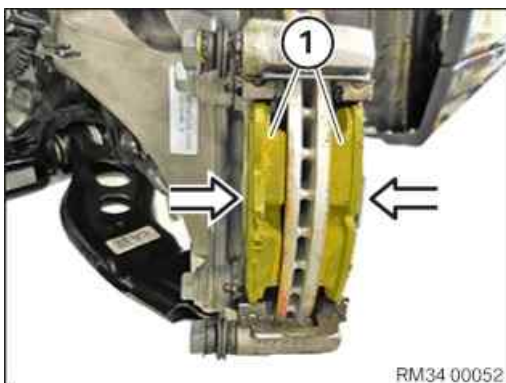


Caution!

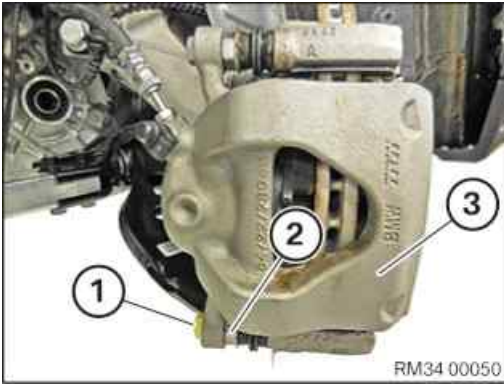
If new brake pads are mounted on a brake disc, the following must be observed:

- 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.



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

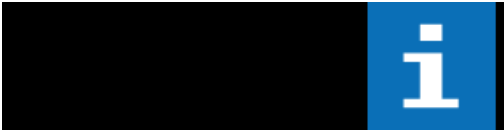


Tilt brake caliper (3) down.
Insert guide bolt (1) and tighten.
If necessary, grip at hexagon head (2).

Installation note:

Replace guide screw.

Tightening torque [34 11 3AZ](#).



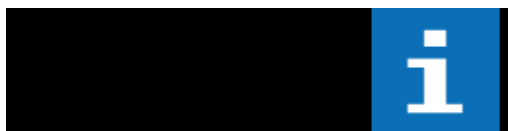
Required follow-up work:

- Installing the [brake pad wear sensor](#).
- Mounting the front [wheels](#).

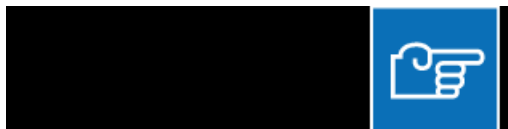
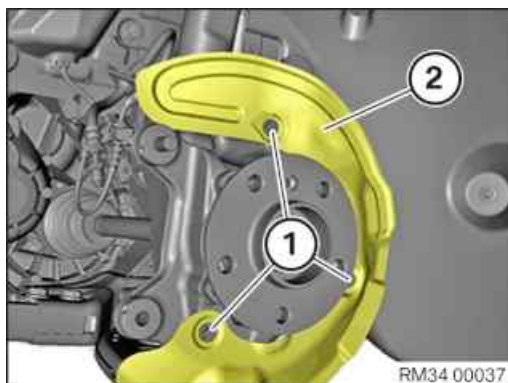
Note:

After completing repair work:

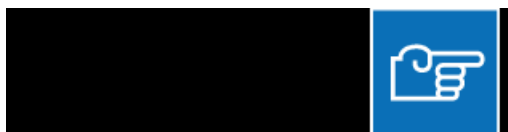
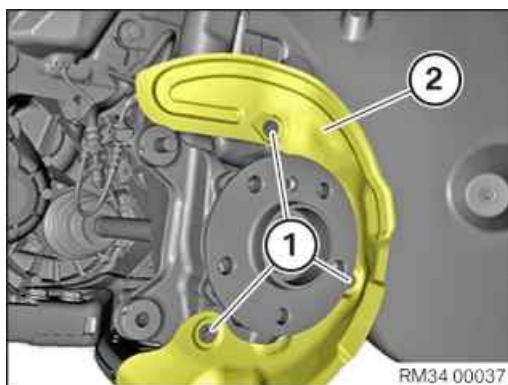
- Fully depress brake pedal several times so that brake pads contact brake discs.
- When installing new brake pads at front and rear axles, the brake fluid level must be brought up to the "maximum" mark.
- Read and comply with notes on [braking in new brake discs / brake pads](#).

**Necessary preliminary tasks:**

- [Remove](#) front brake disc.

**Removal:**

Release screws (1) and remove brake guard plate (2).

**Installation:**

Mounting the brake guard plate (2).

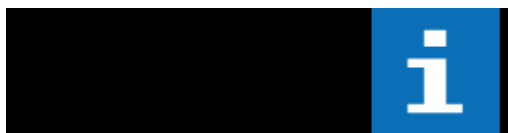
Insert screws (1) and tighten.

Tightening torque [34 11 4AZ](#).

**Required follow-up work:**

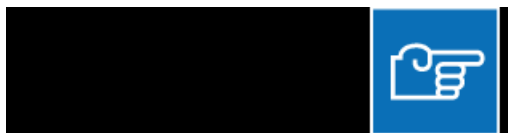
- Installing the front [brake disc](#).

34 11 020 Replacing the brake caliper on the front left or right

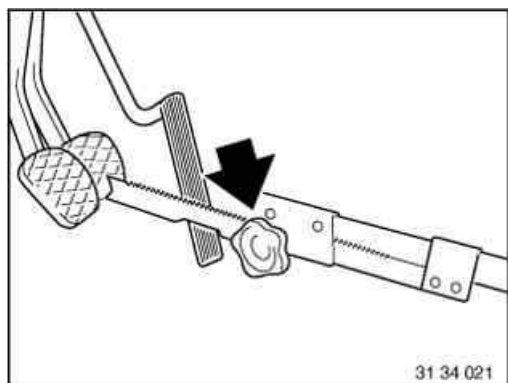


Necessary preliminary tasks:

- Read and comply with [General Information](#).
- Remove [wheel](#).

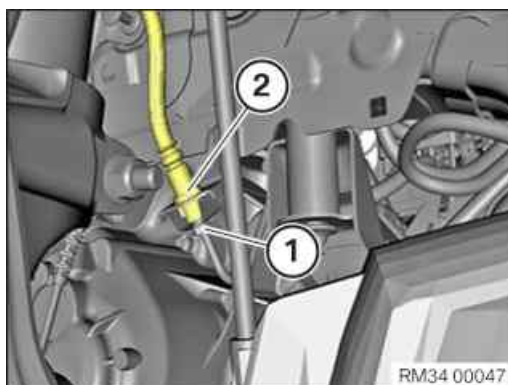


Removal:



Press brake pedal down to floor and secure with pedal support. *Note:* The pedal support may only be released when the brake lines are reconnected.

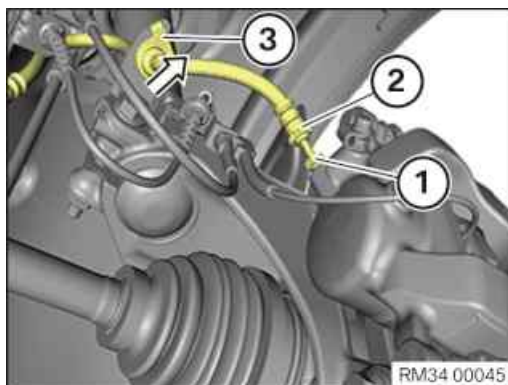
This prevents brake fluid from emerging from the expansion tank and air from entering the system when the brake lines are opened.



Attention!

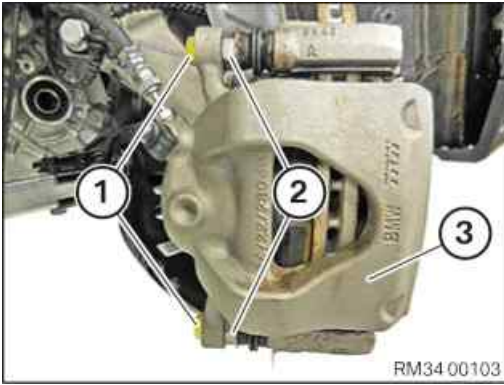
Grip brake hose at square head (2) so that connecting piece cannot rotate in retaining bracket.

Disconnect brake hose from brake line (1).

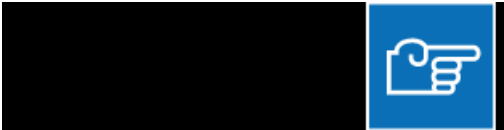


Release brake hose (1) from brake caliper; if necessary, grip at knurled screw (2).

Remove retaining bracket (3) in direction of arrow.



Unscrew guide bolts (1).
If necessary, grip at hexagon head (2).
Remove brake caliper (3).



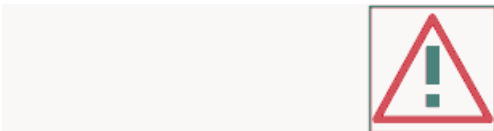
Installation:

Mount brake caliper (3).
Insert guide bolts (1) and tighten down.
If necessary, grip at hexagon head (2).

Installation note:

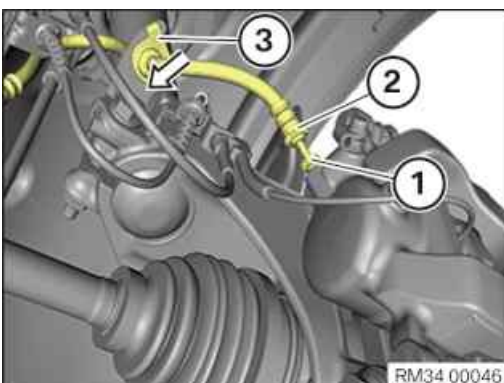
Replace guide screw.

Tightening torque [34 11 3AZ](#).



Attention!

Make sure that the brake hose is routed correctly!



Mount brake hose (1) on brake caliper.

Attention!

First tighten brake hose on brake caliper.

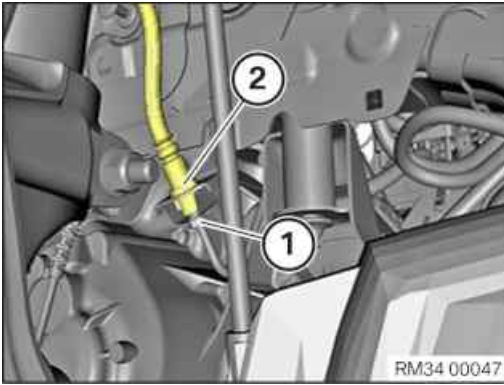
Move wheels into straight-ahead position.

Never twist brake hose when installing it and avoid all contact with parts attached rigidly to the body.

Tighten down brake hose (1); grip at knurled screw (2) for this purpose.

Tightening torque [34 32 2AZ](#).

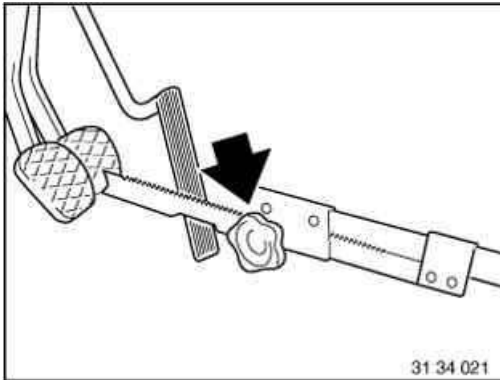
Install retaining bracket (3) in direction of arrow.

**Attention!**

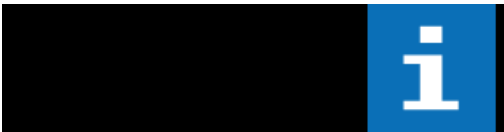
Grip brake hose at square head (2) so that connecting piece cannot rotate in retaining bracket.

Tightening torque [34 32 1AZ](#).

Mount brake hose on brake line (1) and tighten down.



Remove pedal support.

**Required follow-up work:**

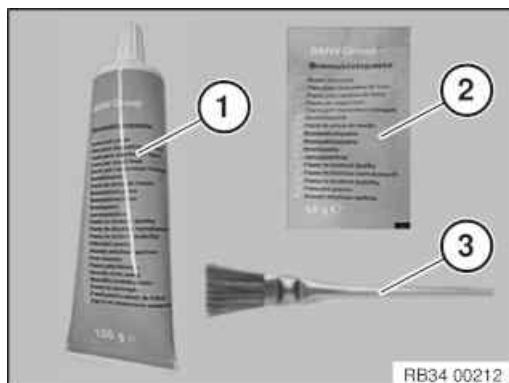
- [Bleed brake system](#).
- Mounting the [wheel](#).



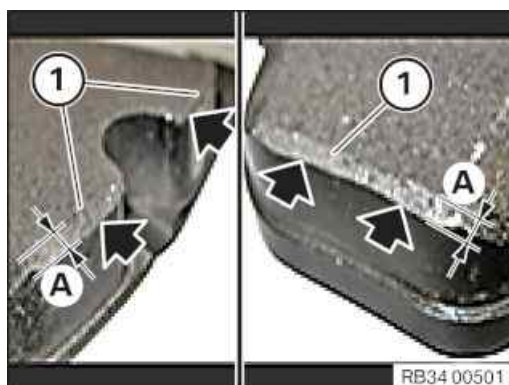
Attention!

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 brake 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.

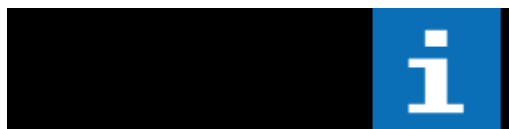


Attention!

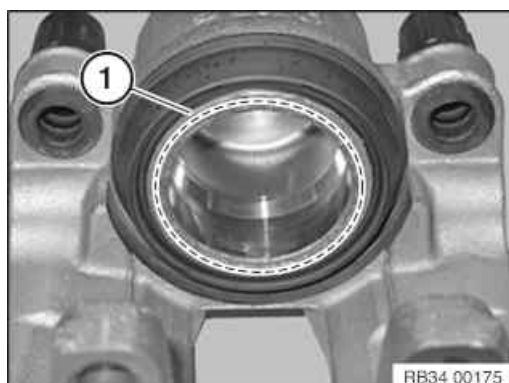
If new brake pads are mounted on a brake disc, the following must be observed:

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

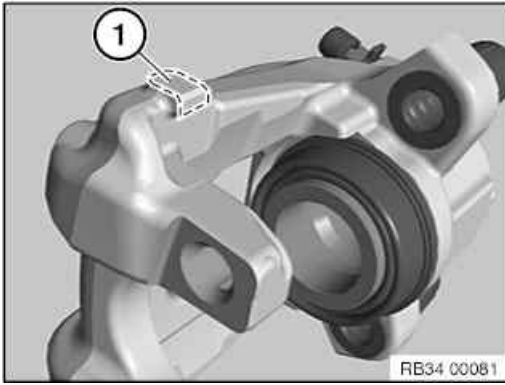
These procedures applies for all the following described brake systems.



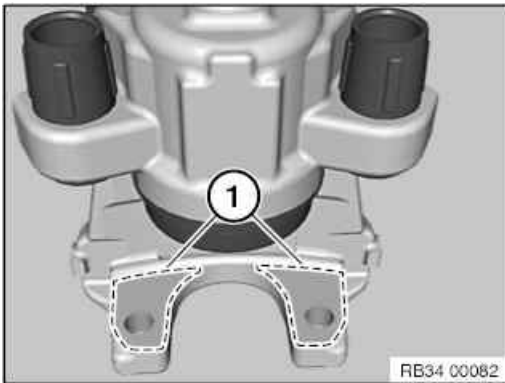
IPS brake (made by CBI), 1-piston floating caliper brake (model ranges: 1-Series, 3-Series, 4-Series, X3)



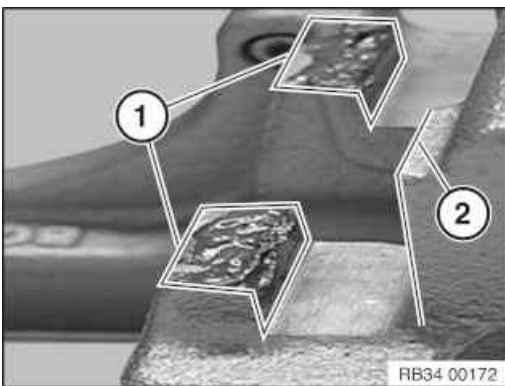
Clean contact surface (1) of brake piston with brake cleaner and apply a thin coating of brake pad paste.



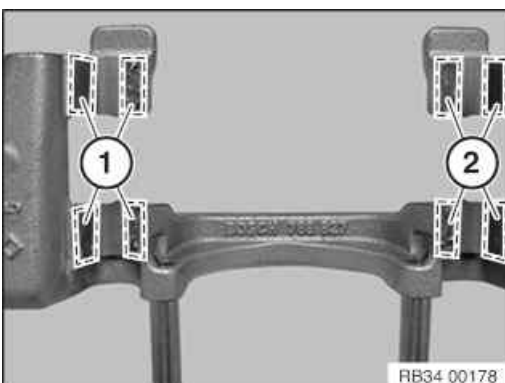
Clean contact surfaces (1) of T-heads/brake calliper housing with brake cleaner and apply a thin coating of brake pad paste.



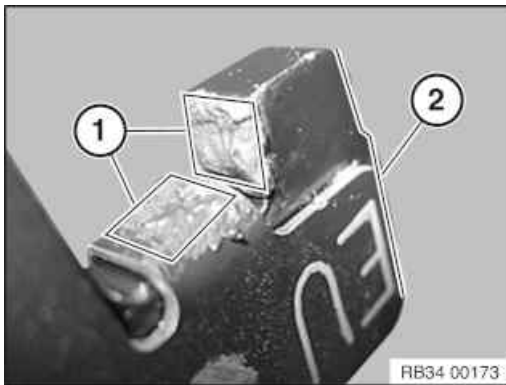
Clean contact surface (1) of brake caliper with brake cleaner and apply a thin coating of brake pad paste.



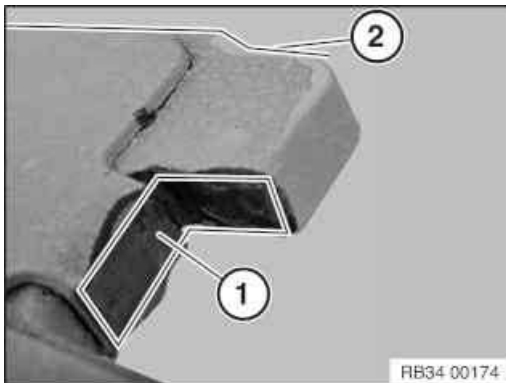
So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces (1) for the brake pads on the brake caliper mounting bracket. Clean guide surfaces (1 and 2) with brake cleaner and apply a thin coating of brake pad paste.



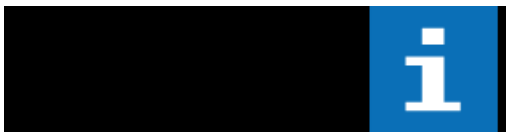
So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces (1 and 2) for the brake pads on the brake calliper mounting bracket. Clean guide surfaces (1 and 2) with brake cleaner and apply a thin coating of brake pad paste.



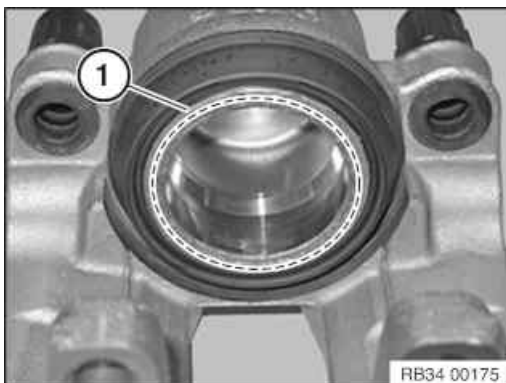
Apply a thin coating of brake pad paste to T-head of inner brake pad in area (1) and (2).



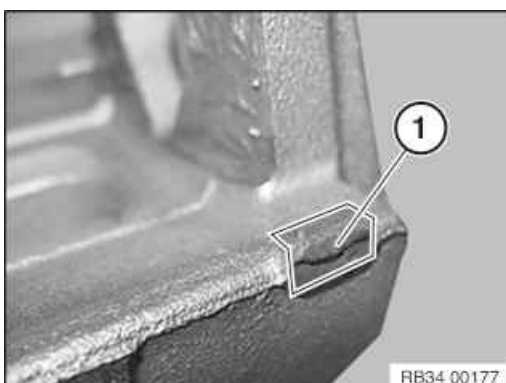
Apply a thin coating of brake pad paste to T-head of outer brake pad in area (1) and (2).



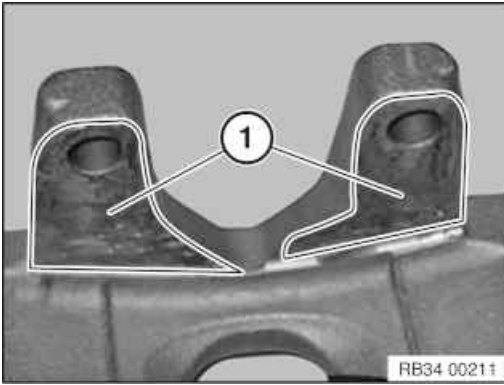
FN brake (made by Continental Teves), 1-piston floating caliper brake (model ranges: 5-Series, 6-Series, 7-Series, 8-Series, X1, X3, X5, Z4, Rolls-Royce)



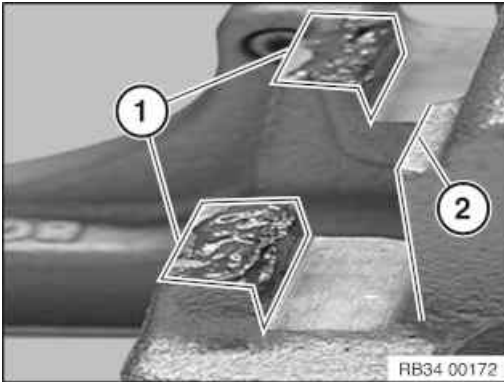
Clean contact surface (1) of brake piston with brake cleaner and apply a thin coating of brake pad paste.



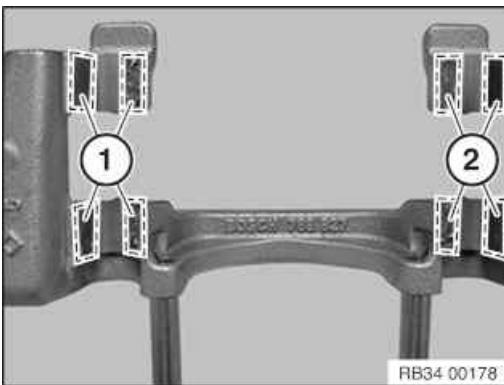
Clean contact surfaces (1) of T-heads/brake calliper housing with brake cleaner and apply a thin coating of brake pad paste.



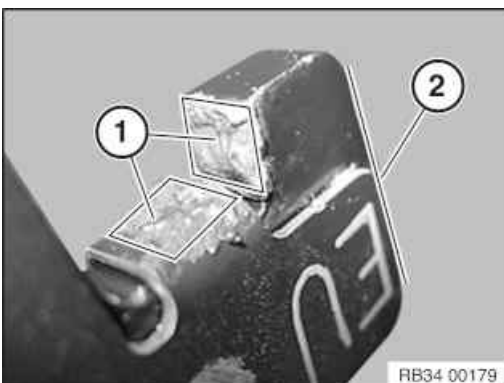
Clean contact surface (1) of brake caliper with brake cleaner and apply a thin coating of brake pad paste.



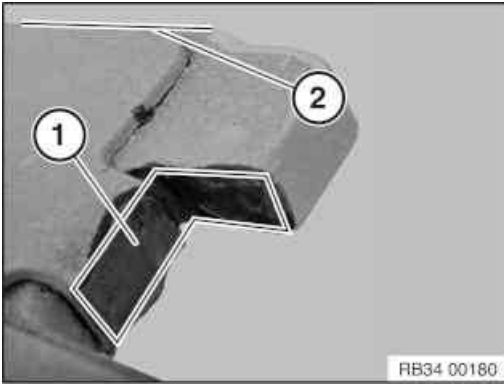
So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces (1) for the brake pads on the brake caliper mounting bracket. Clean guide surfaces (1) with brake cleaner and apply a thin coating of brake pad paste.



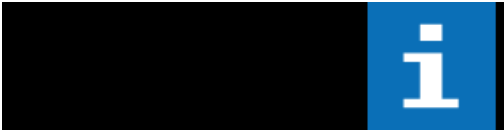
So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces (1 and 2) for the brake pads on the brake calliper mounting bracket. Clean guide surfaces (1 and 2) with brake cleaner and apply a thin coating of brake pad paste.



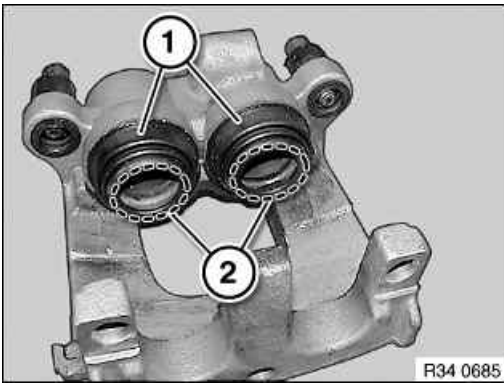
Lightly coat the T-head of the inner brake pad with brake pad paste in area (1 and 2).



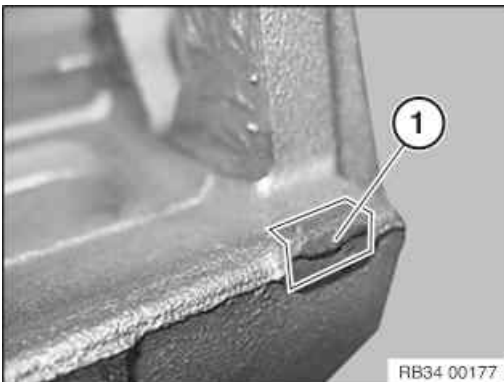
Lightly coat the T-head of the outer brake pad with brake pad paste in area (1 and 2).



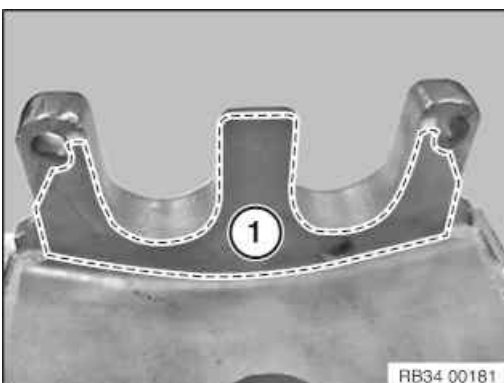
FN brake (made by Continental Teves), 2-piston floating caliper brake (model ranges: 5-Series, 6-Series, 7-Series, 8-Series, X5, Rolls-Royce)



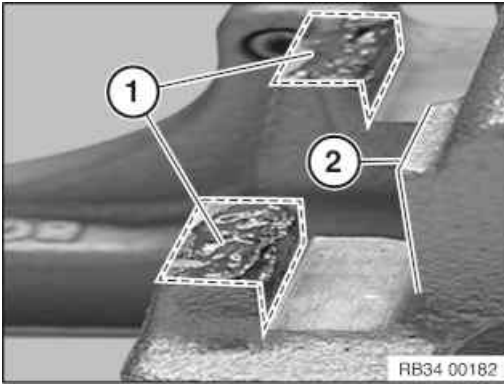
Clean contact surface (2) of brake piston with brake cleaner and apply a thin coating of brake pad paste.



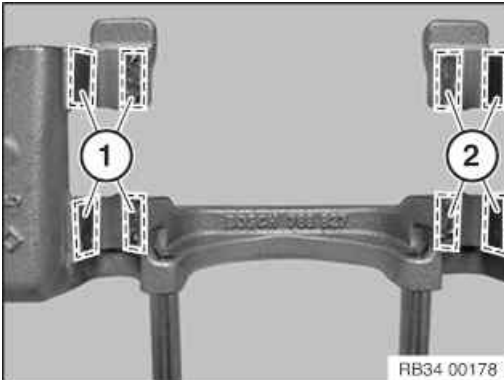
Clean contact surfaces (1) of T-heads/brake calliper housing with brake cleaner and apply a thin coating of brake pad paste.



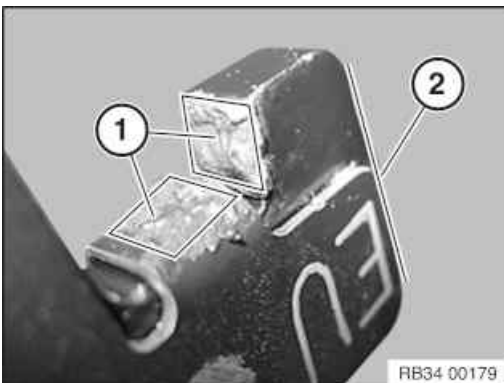
Clean contact surface (1) and brake caliper with brake cleaner and apply a thin coating of brake pad paste.



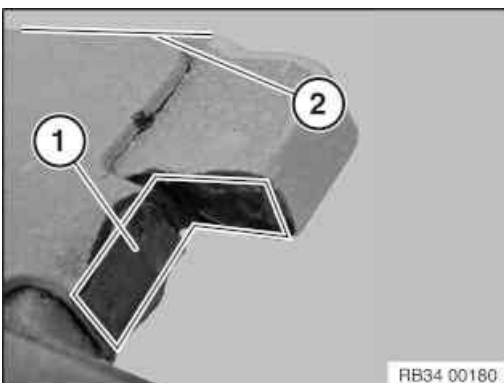
So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces (1 and 2) for the brake pads on the brake calliper mounting bracket. Clean guide surfaces (1 and 2) with brake cleaner and apply a thin coating of brake pad paste.



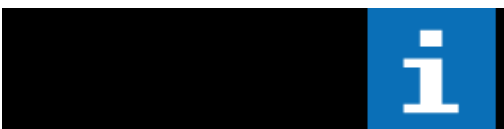
So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces (1 and 2) for the brake pads on the brake calliper mounting bracket. Clean guide surfaces (1 and 2) with brake cleaner and apply a thin coating of brake pad paste.



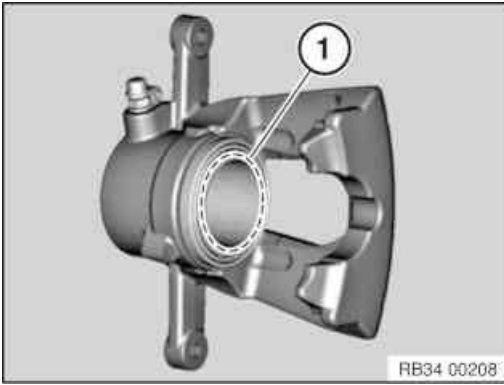
Lightly coat the T-head of the inner brake pad with brake pad paste in area (1 and 2).



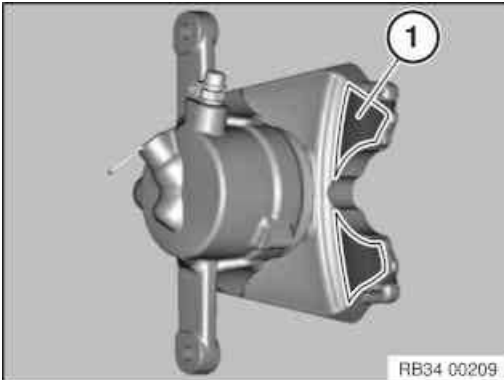
Lightly coat the T-head of the outer brake pad with brake pad paste in area (1 and 2).



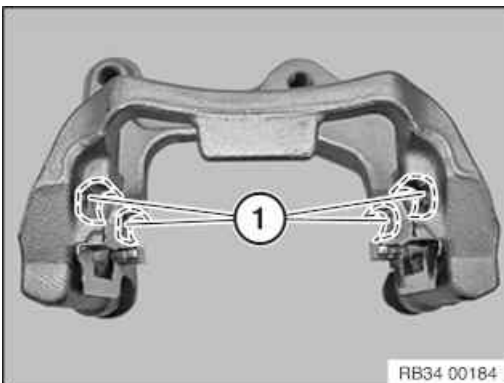
Collette brake (made by TRW), 1-piston brake caliper (model ranges: MINI, 1-Series, 5-Series, 6-Series, Z4)



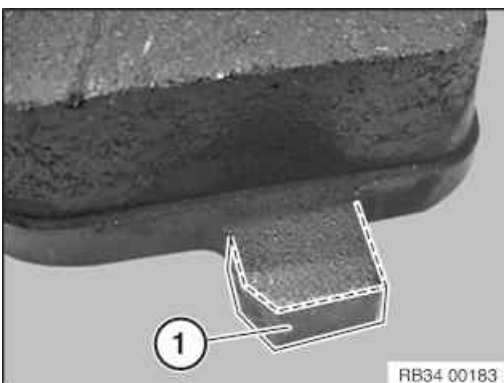
Clean contact surface (1) of brake piston with brake cleaner and apply a thin coating of brake pad paste.



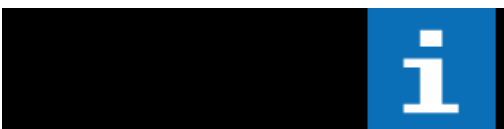
Clean contact surface (1) of brake caliper with brake cleaner and apply a thin coating of brake pad paste.



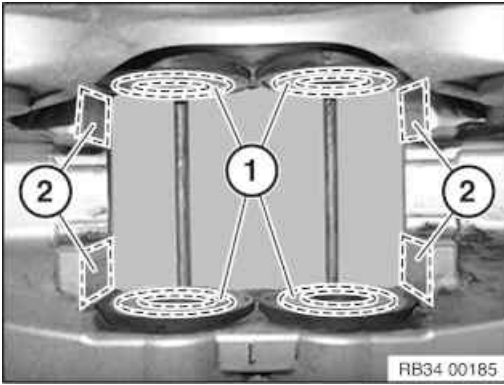
So as not to damage the surface coating, if possible do not mechanically clean the guide surface (1) for the brake pads on the brake caliper mounting bracket. Clean guide surface (1) with brake cleaner and apply a thin coating of brake pad paste.



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



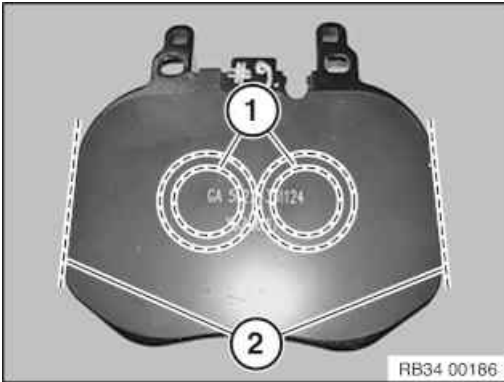
P 4.40 brake (made by Brembo), 4-piston fixed caliper brake (model ranges: MINI, 1-Series, 3-Series, 4-Series, 5-Series, 6-Series, 7-Series, 8-Series, X5, Rolls-Royce)



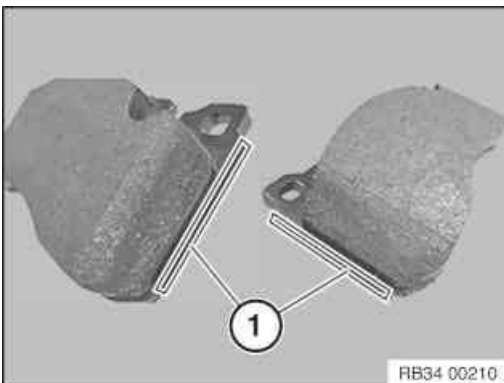
Clean contact surface (1) of brake piston with brake cleaner and apply a thin coating of brake pad paste.

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.

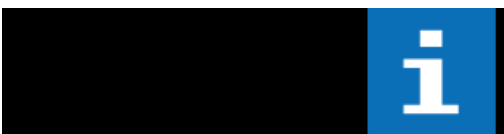
Clean both inner and outer guide surfaces (2) and apply a thin coating of brake pad paste.



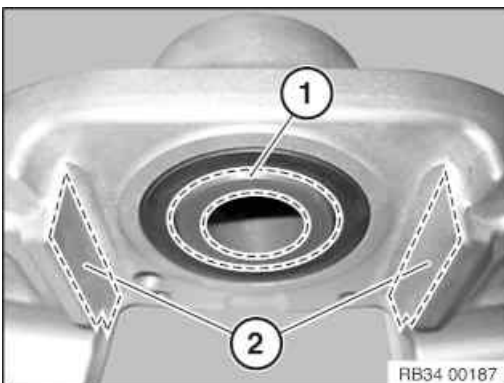
Lightly coat both sides of the contact surface in area (1 and 2) with brake pad paste.



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



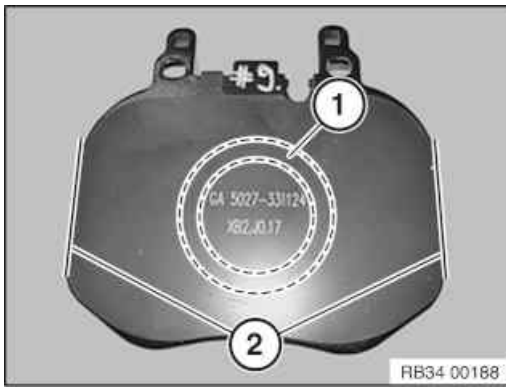
P 4.40 brake (made by Brembo), 2-piston fixed caliper brake (model ranges: 1 Series, 2 Series, 3 Series; does not apply to M2 F87)



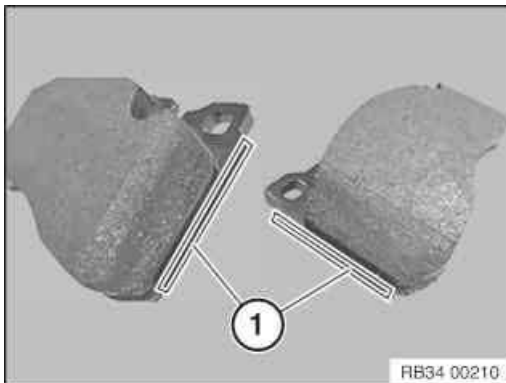
Clean contact surface (1) of brake piston with brake cleaner and apply a thin coating of brake pad paste.

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.

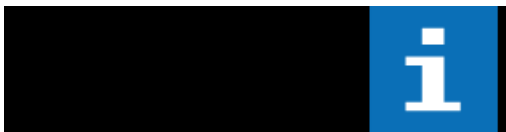
Clean both inner and outer guide surfaces (2) and apply a thin coating of brake pad paste.



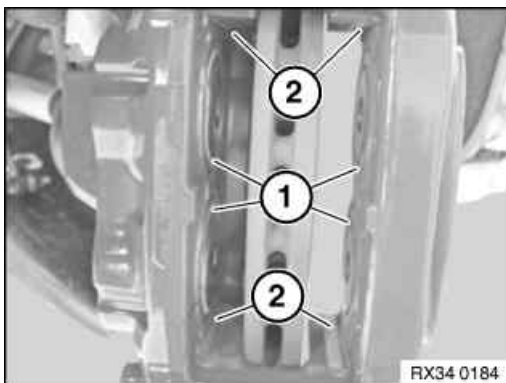
Lightly coat both sides of the contact surface in area (1 and 2) with brake pad paste.



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

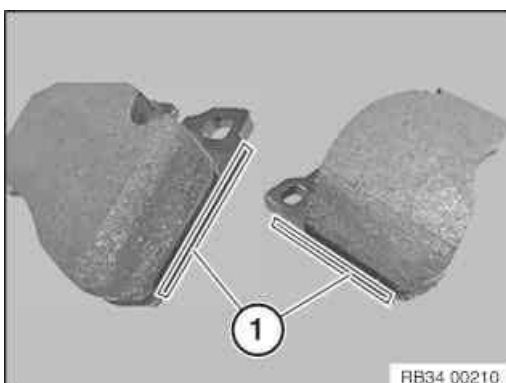


Brake (made by Brembo), 4-piston fixed caliper brake (model ranges: MINI F5x sport brake)



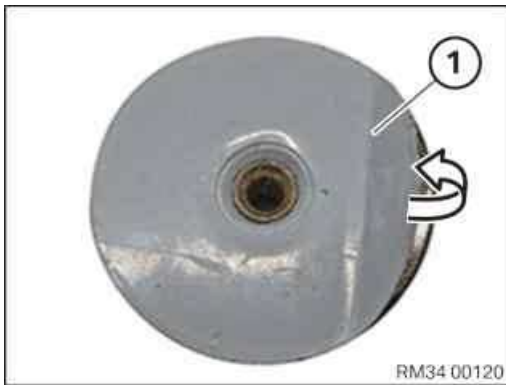
Check dust boot (1) for damage and replace if necessary.

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



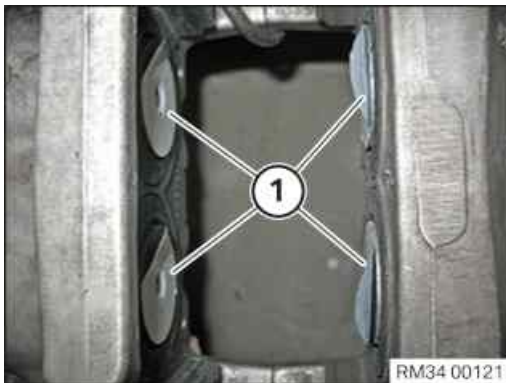
Lightly coat the brake pad contact surface on both sides in area (1) with brake pad paste.

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

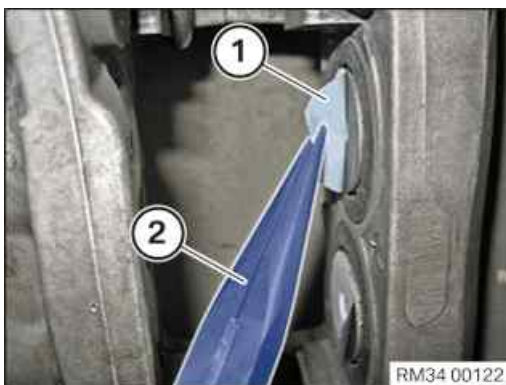


Only use new claw plates!

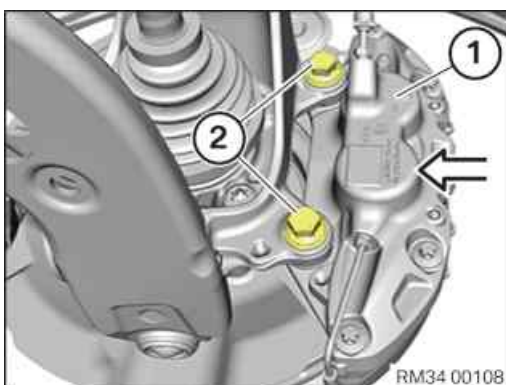
Slightly raise the protective film (1) at a place.



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



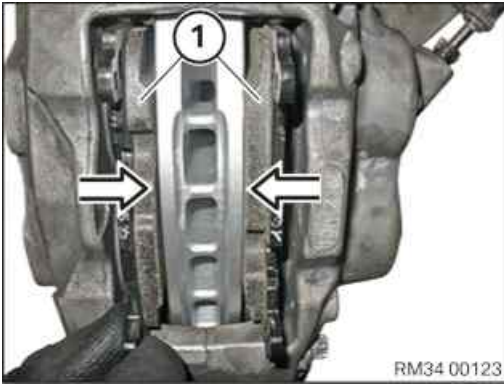
Pull off the protective film (1) with long-nose pliers (2). **Attention!**
The bonding surface of the claw plates must not be touched!



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

Parts: Replace screws (2).

Insert screws (2) and tighten.



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

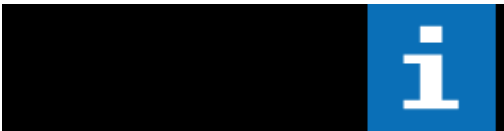
The brake pads must not touch the bonding surface of the claw plates when inserting!

Apply the brake pads to the brake disc and insert.

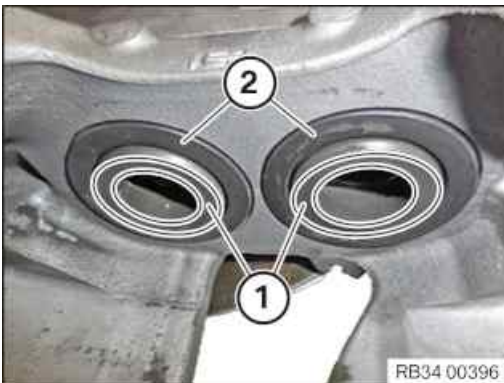


In order to ensure a complete bonding of the claw plates with the brake pads, the following instruction must be strictly adhered to:

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

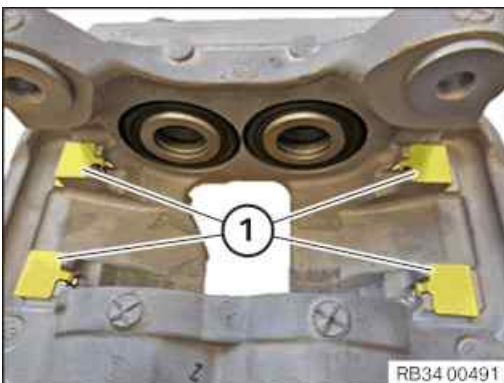


Brake (made by Continental), 4-piston fixed caliper brake (model ranges: 7-Series (G11, G12))



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

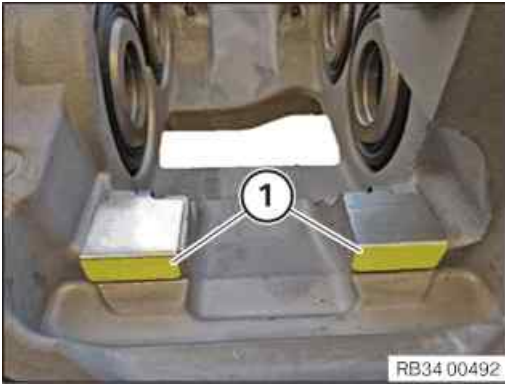
Check the dust boots (2) and renew as necessary.



Always renew retaining plates 1!

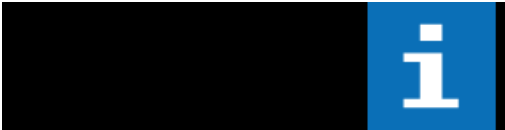
Mount retaining plate 1.

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

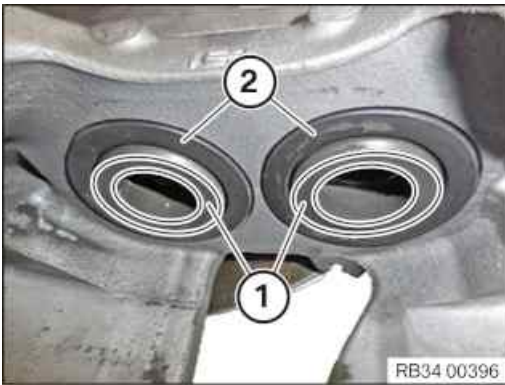


So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces for the brake pads on the brake caliper mounting bracket.

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



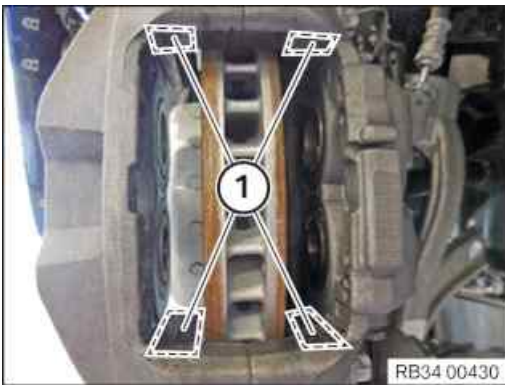
Brake (made by Brembo), 4-piston fixed caliper brake (model ranges: 7-Series (G11, G12))



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

Adhesive residues must be completely removed.

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



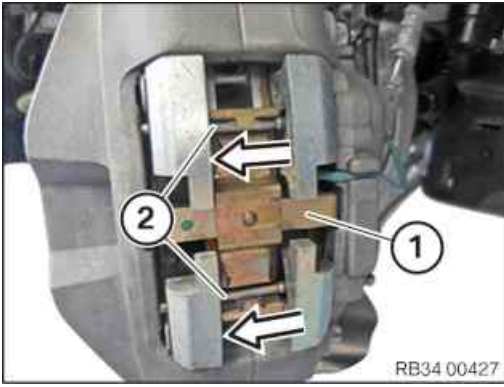
To prevent damage to the surface coating, do not clean the guide surfaces (1) for the brake pads on the brake calliper mechanically, if possible.

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



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

Do not touch the adhesive layer!



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

Fit retaining clip (1).

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

Attention!

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

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

**Attention!**

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

Maximum machining dimension per friction ring side is 0.8 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 \(MIN TH\)](#).

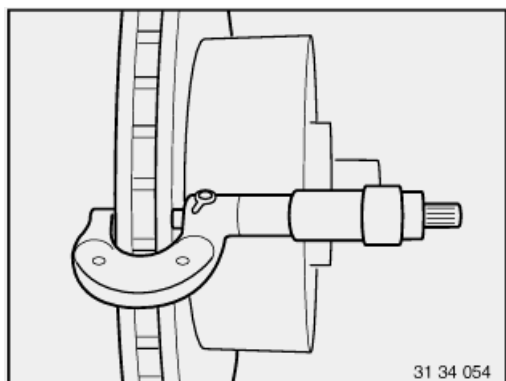
**Mobile brake disc lathe:****Attention!**

Only BMW-approved brake disc lathes may be used!

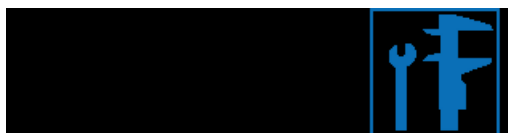
In the case of mobile brake disc lathes, the [brake caliper](#) and the caliper carrier must be removed.

The brake discs remain on the vehicle.

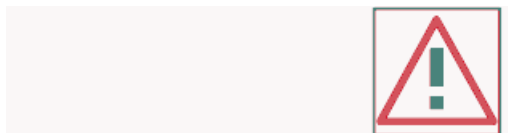
Please refer to the equipment manufacturer's operating instructions for the exact procedure.



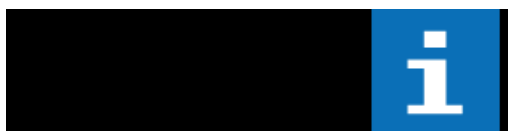
After fine-grinding the brake discs, measure the [thickness difference](#) inside the braking surfaces at 8 points with an caliper gauge.

**Special tools required:**

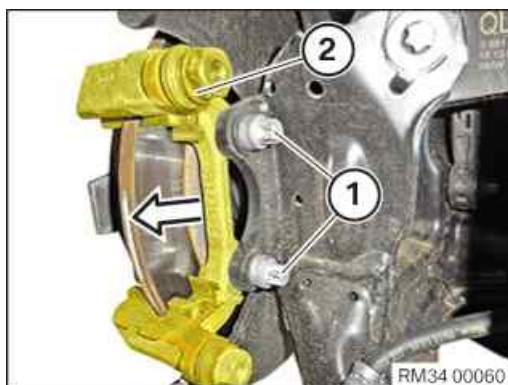
- [34 1 280](#)

**Important!**

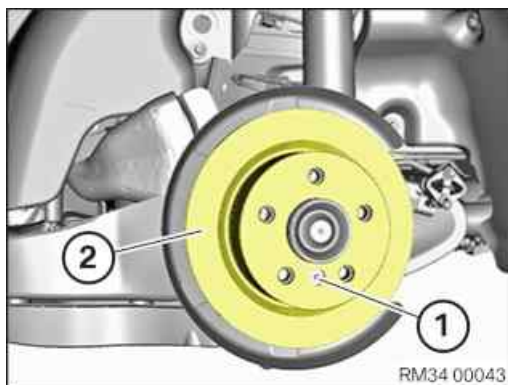
Brake discs must only be replaced in pairs (per axle).
Fit new brake discs only together with new brake pads.

**Necessary preliminary tasks:**

- [Remove](#) rear brake pads.

**Removal:**

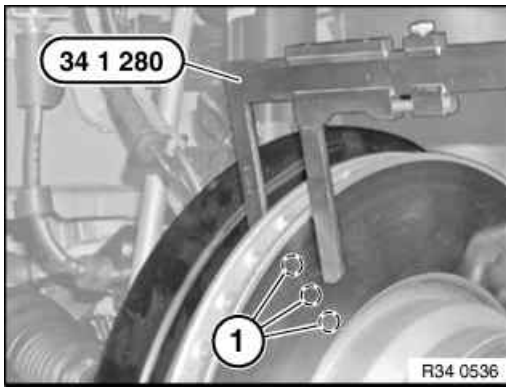
Release screws (1) and remove holder (2).

**Important!**

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

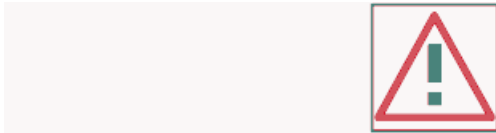
Release screw (1) and remove brake disc (2).

**Installation:**



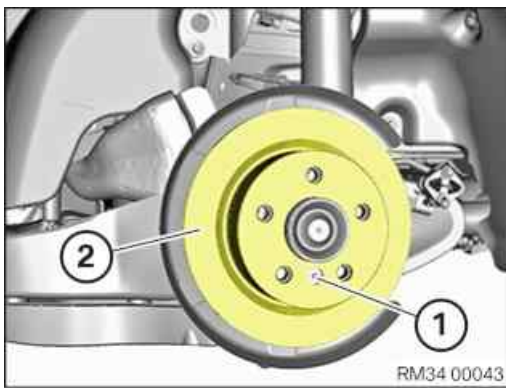
Check minimum brake disc thickness:

- Position special tool [34 1 280](#) at three measuring points in area (1) and measure.
- Compare measuring result and also compare the lowest value.



Important!

New brake pads may only be fitted if the brake disc thickness is greater than the minimum brake disc thickness (MIN TH).



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!

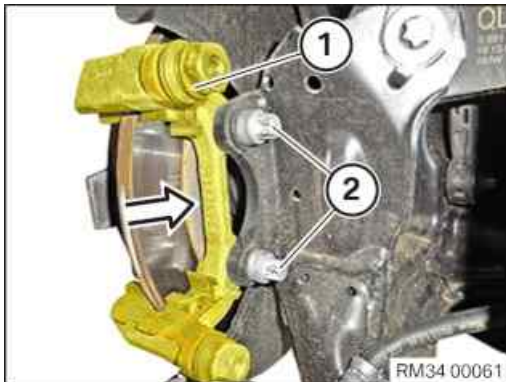
Install brake disc (2).

Insert screw (1) and tighten down.

Tightening torque [34 21 1AZ](#).

Replace screw (1).

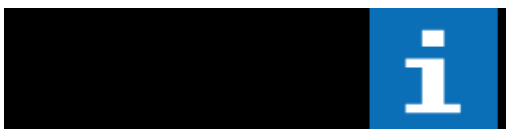
Parts: Screw



Attach holder (2).

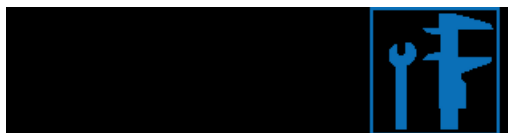
Insert screws (1) and tighten.

Tightening torque [34 21 2AZ](#).



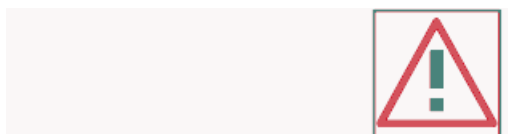
Required follow-up work:

- After completing repair work, read and comply with notes on [braking in new brake discs / brake pads](#).
- Install [rear brake pads](#).



Special tools required:

- [34 1 050](#)
- [34 1 280](#)
- [2 285 574](#)
- [2 365 377](#)



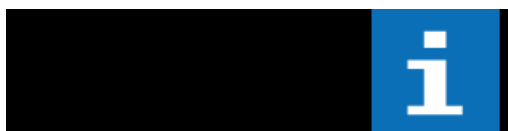
Attention!

- 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. Instead, clean with brake cleaner BMW part number 83 19 2 154 780 and apply a thin coating of brake pad paste BMW part number 83 19 2 158 851 (3 grey) or 83 19 2 158 852 (100 grey).
- Spread brake pad paste onto the marked surfaces using a brush!
- Observe [guideline for applying brake pad paste on brake pads and brake anchor plate!](#)
- Brake pad wear sensor: After removal it must be replaced (brake pad wear sensor loses its retention capability in the break pad).
- Retaining pins and expanding spring: for vehicles older than 48 months it is recommended to replace the retaining spring!
- A CBS reset must be done after every brake pad exchange.
 - With a sanded brake pad wear sensor (display in CBS menu): CBS reset possible in vehicle.
 - With a **non**-sanded brake pad wear sensor: CBS reset only possible via diagnosis system.



Warning!

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

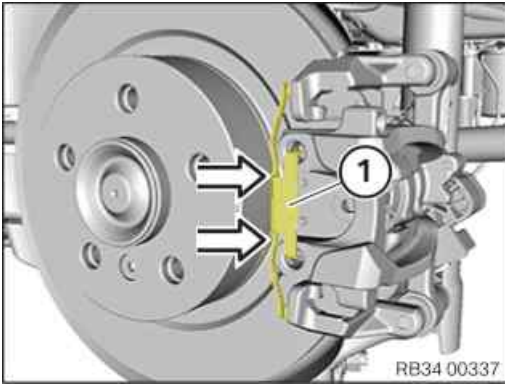


Necessary preliminary work:

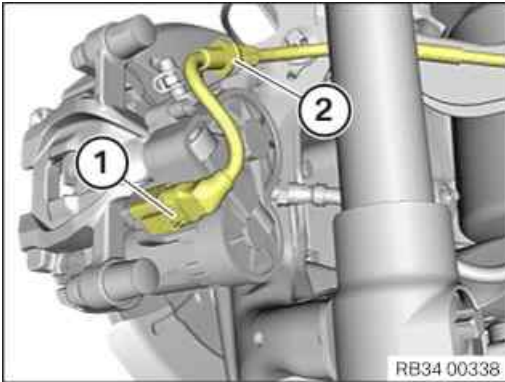
- [Remove wheels.](#)
- Remove [brake pad wear sensor.](#)



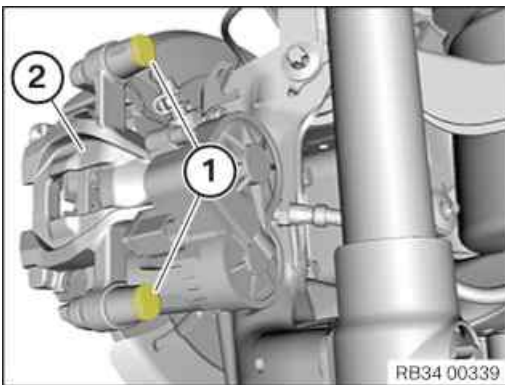
Removal:



Lift out retaining spring (1).



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



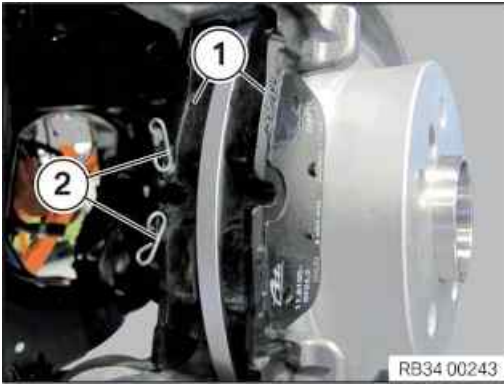
Remove cover plug (1).
Release guide screws.
Pull off brake caliper (2).

Attention!

Tie brake calliper back and do not allow to hang from brake hose.



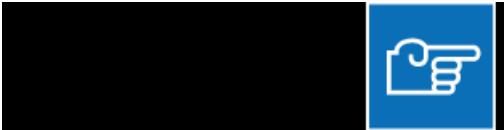
Install the brake caliper (1) with cable strap 2 413 317.
Never leave the brake caliper (1) hanging on the brake caliper.



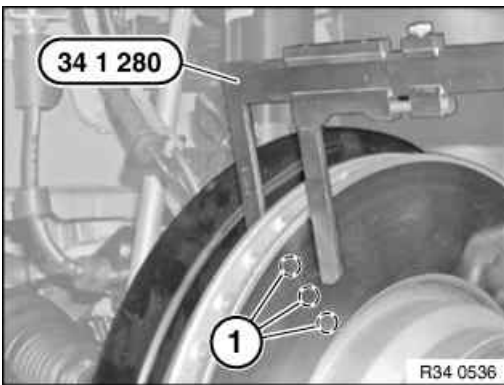
Remove brake pads (1). **Attention!**

Mark any worn brake pads.

In the event of one-sided brake pad wear, do not change brake pads round.

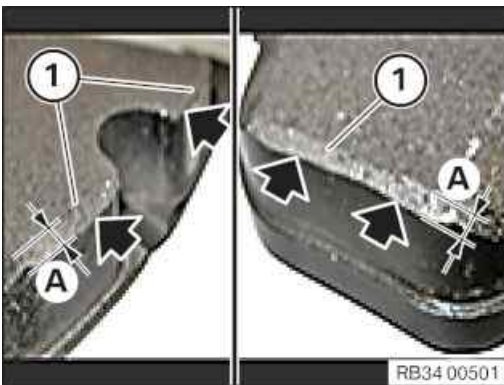


Installation:



Check minimum brake disc thickness:

- Position special tool [34 1 280](#) at three measuring points in area (1) and measure.
- Compare measuring result and lowest value with [setpoint value](#).

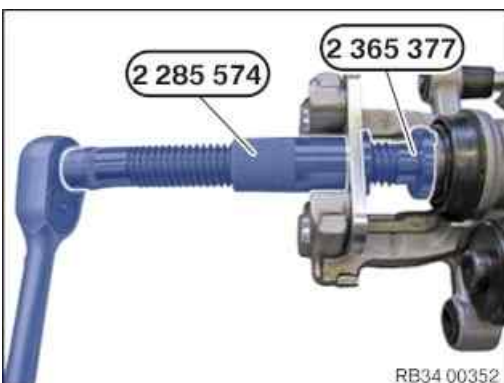


Attention!

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.



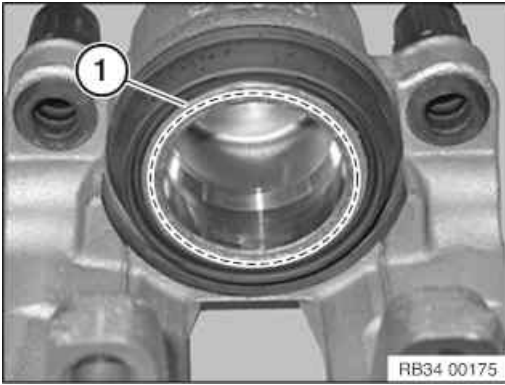
Place special tool [2 285 574](#) , [2 365 377](#) on brake piston.

Use reversible ratchet (1) to turn back brake piston up to limit position.

Attention!

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

Overflowing brake fluid will damage the paintwork.

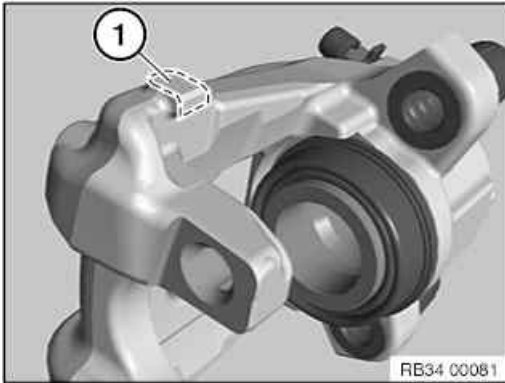


Check dust boot for damage and renew if necessary.

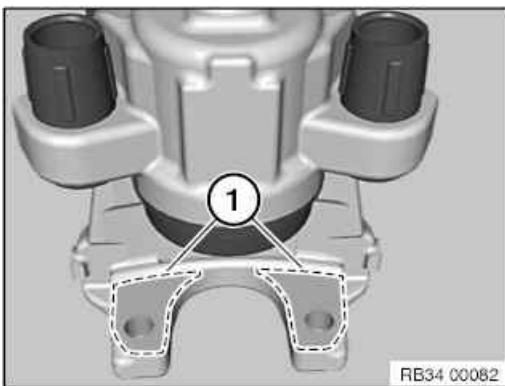
Clean contact surface (1) of brake piston with brake cleaner and apply a thin coating of brake pad paste.

Attention!

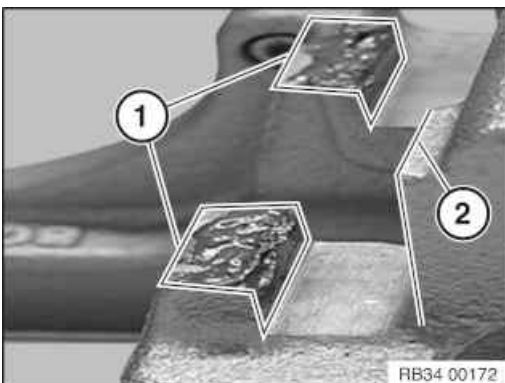
Dust boot must not come into contact with brake pad paste as this may cause the dust boot to swell.



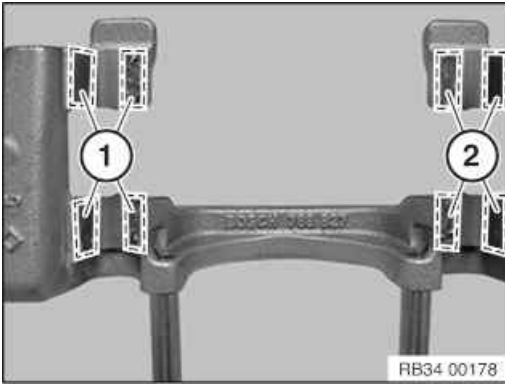
Clean contact surfaces (1) of T-head/brake caliper housing with brake cleaner and apply a thin coating of brake pad paste.



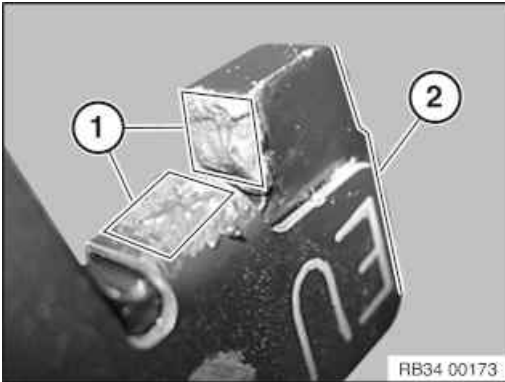
Clean contact surface (1) of brake caliper with brake cleaner and apply a thin coating of brake pad paste.



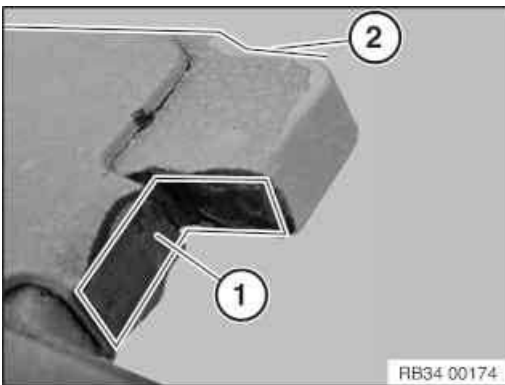
So as not to damage the surface coating, if possible do not mechanically clean the guide surfaces (1) for the brake pads on the brake caliper mounting bracket. Clean guide surfaces (1 and 2) with brake cleaner and apply a thin coating of brake pad paste.



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.



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).

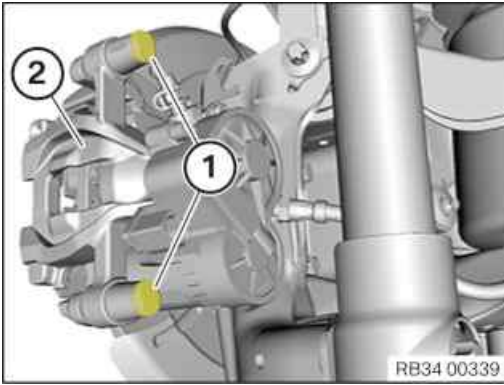


If necessary, clean brake pads.

Install brake pads (1).

Note:

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



Note:

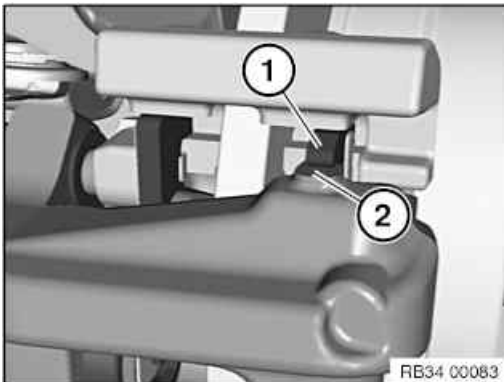
- Clean guide screws only; do not grease.
- Check thread.
- Replace all guide screws which are not in perfect condition.

Mount brake caliper (2).

Insert guide bolts and tighten.

Tightening torque [34 21 3AZ](#).

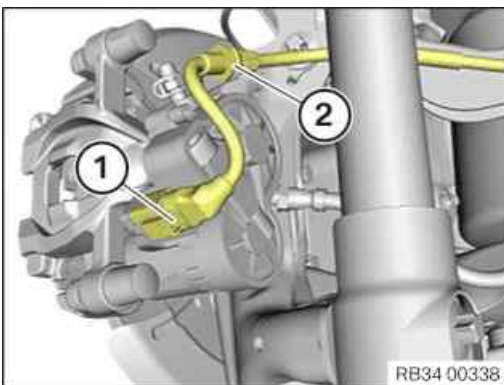
Install cover plug (1).



Attention!

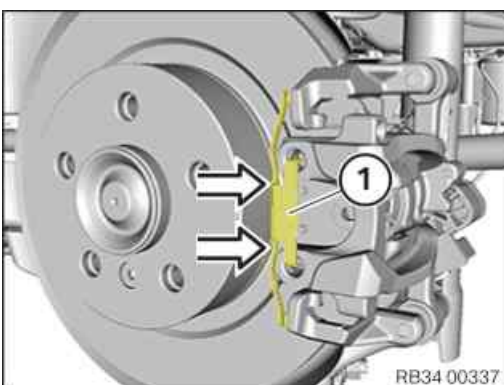
When putting on the brake caliper, it is absolutely necessary to make sure that the T-head (1) of the outer brake pad is seated correctly on the contact surface (2).

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 bracket (2).

Position plug connection (1) and lock.



Install the retaining spring (1) **Attention!**

Ensure the retaining spring is fits securely.

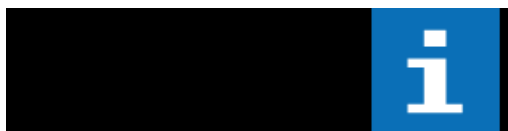
**Required follow-up work:**

- Installing the [brake pad wear sensor](#).
- Install [wheels](#) at the rear.

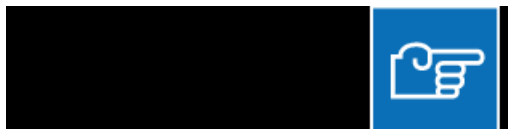
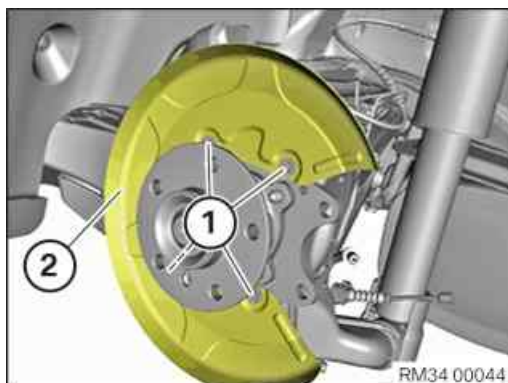
Note:

After completing repair work:

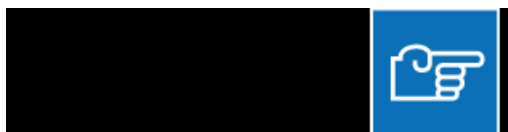
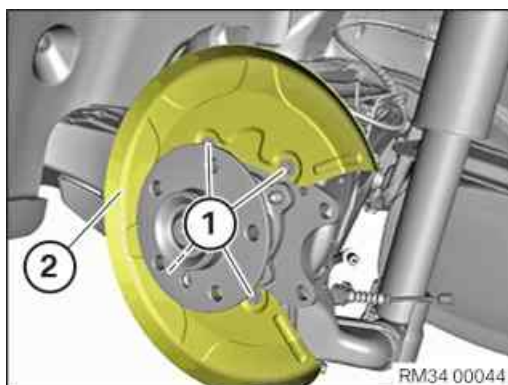
- Fully depress brake pedal several times so that brake pads contact brake discs.
- When installing new brake pads at front and rear axles, the brake fluid level must be brought up to the "maximum" mark.
- Read and comply with notes on [braking in new brake discs / brake pads](#).
- Switch on ignition and, using electrical parking brake operating element, open parking brake once, close once and open again.

**Necessary preliminary tasks:**

- [Remove](#) rear brake disk.

**Removal:**

Release screws (1) and remove brake guard plate (2).

**Installation:**

Mounting the brake guard plate (2).

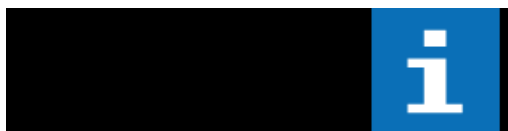
Insert screws (1) and tighten.

Tightening torque [34 21 4AZ](#).

**Required follow-up work:**

- Installing the rear [brake disc](#).

34 21 745 Replacing rear left or right brake caliper

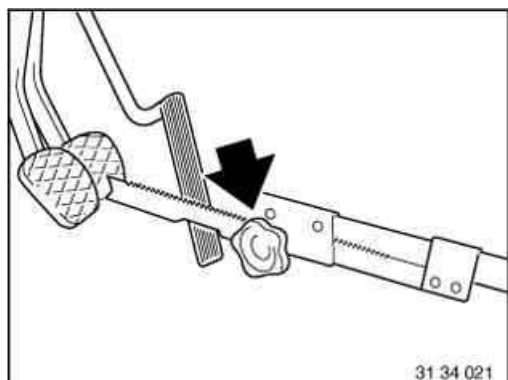


Necessary preliminary tasks:

- Read and comply with [General Information](#).
- Remove [wheel](#).

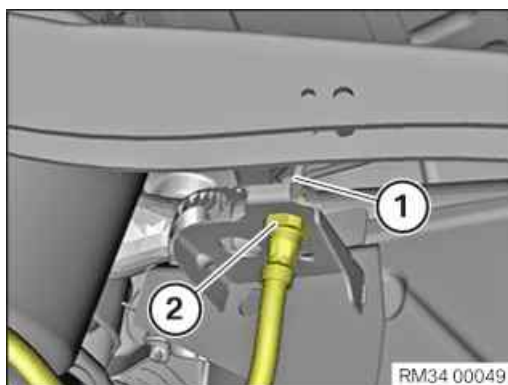


Removal:



Press brake pedal down to floor and secure with pedal support. *Note:* The pedal support may only be released when the brake lines are reconnected.

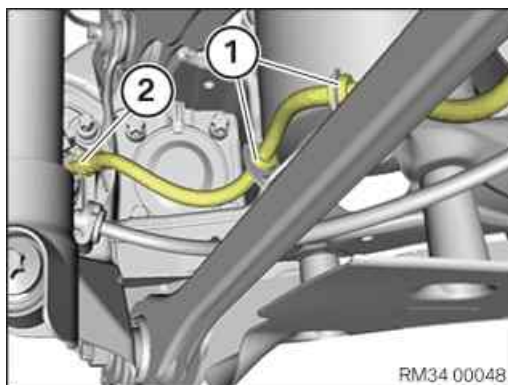
This prevents brake fluid from emerging from the expansion tank and air from entering the system when the brake lines are opened.



Attention!

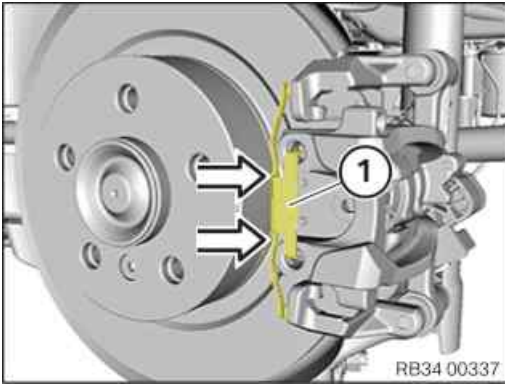
Grip brake hose at square head (2) so that connecting piece cannot rotate in retaining bracket.

Disconnect brake hose from brake line (1).

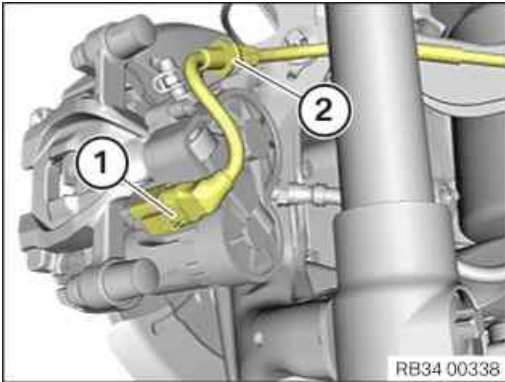


Disengage brake hose from brackets (1).

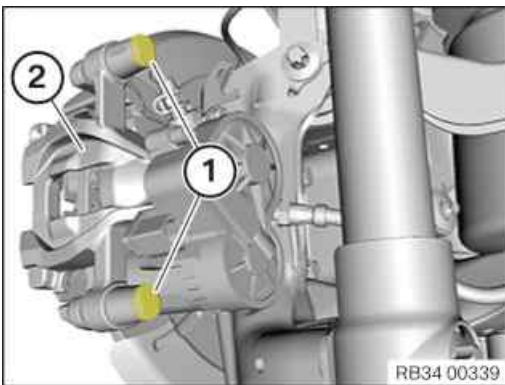
Detach brake hose (2) from brake caliper.



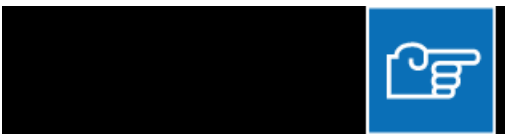
Lift out retaining spring (1).



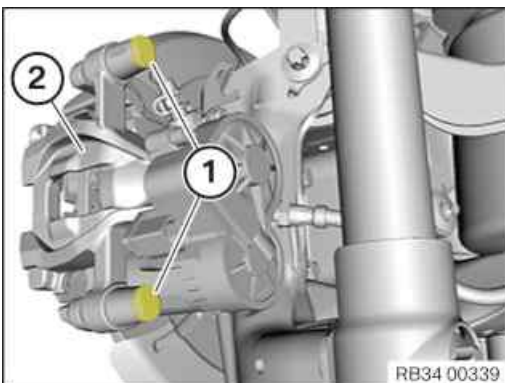
Disconnect plug connection (1).
Detach cable from bracket (2).



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



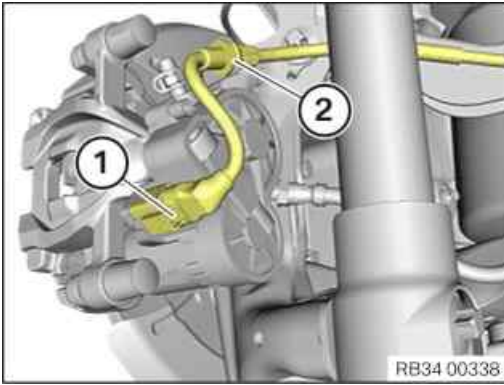
Installation:



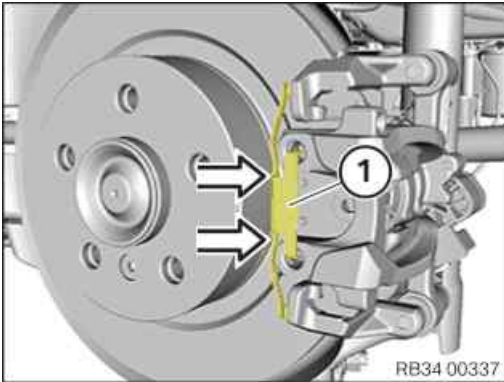
Note:

- Clean guide screws only; do not grease.
- Check thread.
- Replace all guide screws which are not in perfect condition.

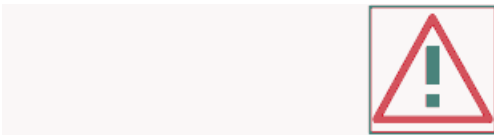
Mount brake caliper (2).
Insert guide bolts and tighten.
Tightening torque [34 21 3AZ](#).
Install cover plug (1).



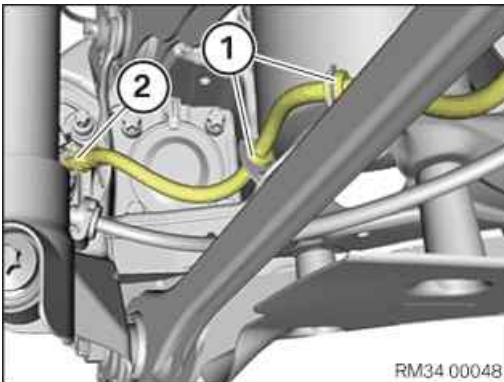
Attach cable to bracket (2).
Position plug connection (1) and lock.



Install the retaining spring (1) **Attention!**
Ensure the retaining spring is fits securely.



Attention!
Make sure that the brake hose is routed correctly!



Mount brake hose (2) on brake caliper.

Attention!

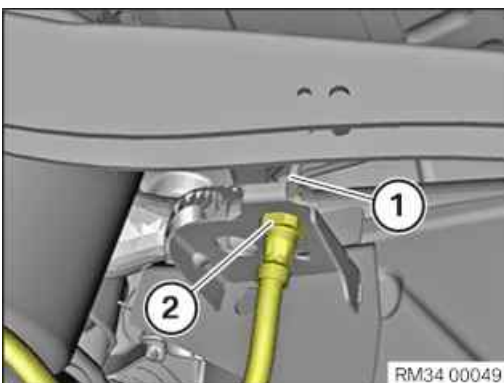
First tighten brake hose on brake caliper.

Never twist brake hose when installing it and avoid all contact with parts attached rigidly to the body.

Tighten down brake hose (2).

Tightening torque [34 32 3AZ](#).

Insert brake hose in brackets (1).

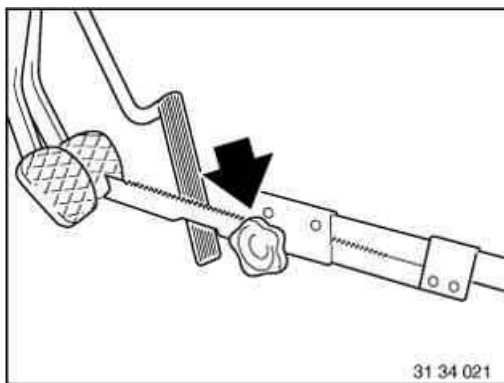


Attention!

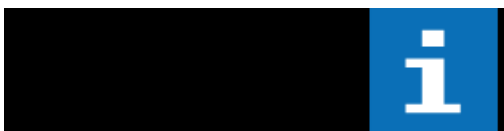
Grip brake hose at square head (2) so that connecting piece cannot rotate in retaining bracket.

Mount brake hose on brake line (1) and tighten down.

Tightening torque [34 32 1AZ](#).

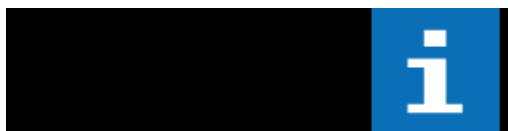


Remove pedal support.



Required follow-up work:

- [Bleed brake system.](#)
- Fit [wheel.](#)

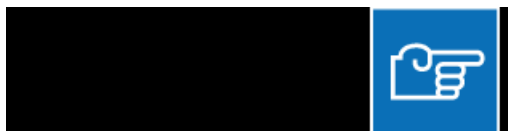
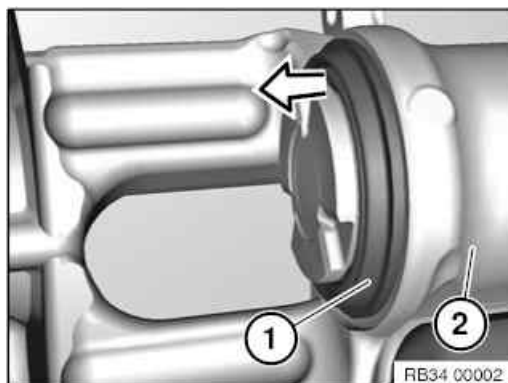
**Necessary preliminary tasks:**

- Remove rear [brake pads](#).

Note:

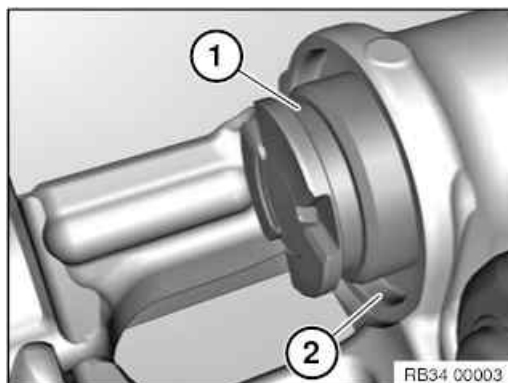
Dust boot can be replaced without dismantling the brake caliper and without removing the piston.

Use original BMW repair kit.

**Removal:**

Remove dust boot (1) from brake caliper (2) in direction of arrow with a suitable tool. **Attention!**

Dust boot must not be re-used!

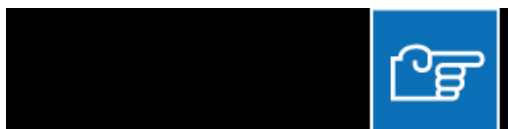


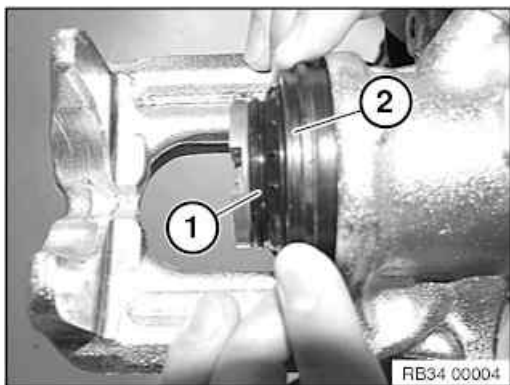
Clean contact surface of dust boot at brake caliper housing (1) and piston groove (2) with a lint-free cloth. **Attention!**

Carefully check brake caliper housing, cylinder bore and brake piston for damage and corrosion!

Corroded or damaged components must be replaced!

The contact surface on the brake caliper housing must be dry and free of grease before installing the dust boot!

**Installation:**

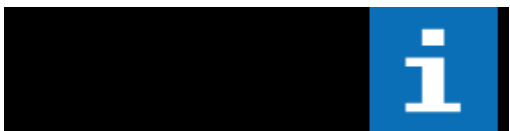


Pull sealing lip (1) of dust boot over the brake piston until the dust boot (2) is properly seated in the brake piston groove.

Put dust boot (2) uniformly onto contact surface of brake caliper housing and uniformly push in.

Attention!

The dust boot must be correctly lying against the entire circumference of the brake caliper housing and the brake piston groove.



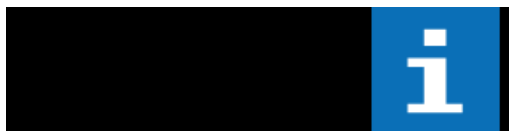
Required follow-up work:

- Install [rear brake pads](#).

When the repair work is complete, please pay attention to the following:

- Check brake pads and brake discs for wear.
- Perform brake test on test stand
- Perform test drive.

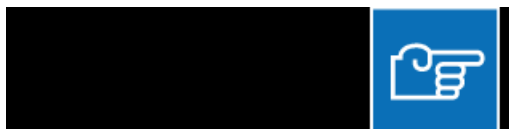
34 31 181 Removing and installing/replacing expansion tank for hydraulic brake system



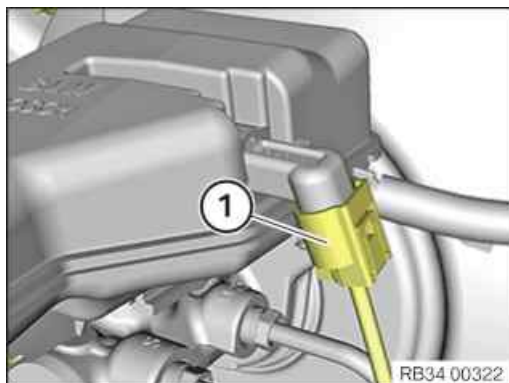
Necessary preliminary tasks:

- Read and comply with [General Information](#).
- Remove [console for windscreen wiper system](#).
- Remove [\(rear\) left strut brace](#).
- Extract brake fluid out of expansion tank.

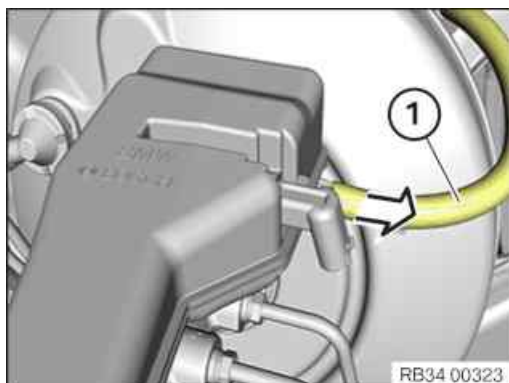
Important! Do not reuse drawn out brake fluid.



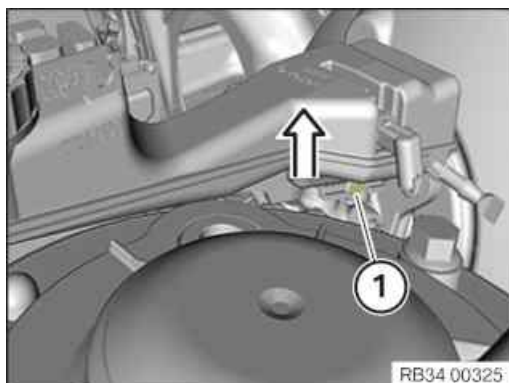
Removal:



Unfasten plug connection (1) and disconnect.



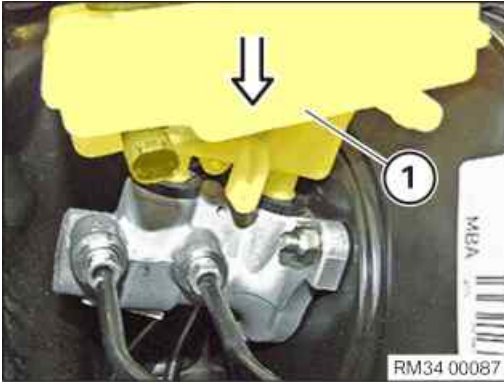
Pull off supply hose (1) of clutch hydraulic system.



Release screw (1) and lift off expansion tank vertically in upward direction.



Installation:

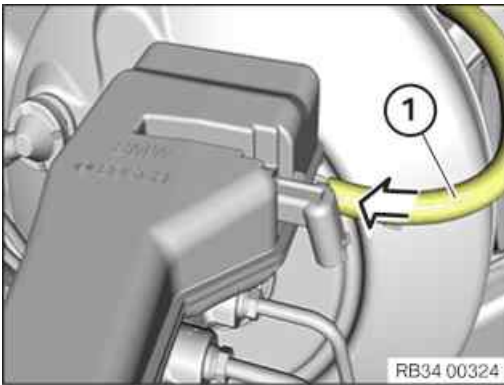


Important!

Check rubber plug in tandem brake master cylinder for damage and renew if necessary.

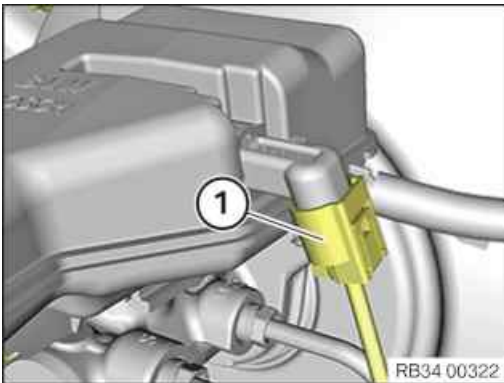
Push expansion tank (1) vertically onto the tandem brake master cylinder.
Fit fastening bolt and tighten.

Tightening torque [34 31 2AZ](#).



Fit supply hose (1) of clutch hydraulic system and push on to the expansion tank. **Important!**

Make absolutely sure the supply hose is positioned correctly on the expansion tank!



Position plug connection (1) and snap into place.

**Required follow-up work:**

- Install [\(rear\) left strut brace](#).
- Install [console for windscreen wiper system](#).
- Top up brake fluid.

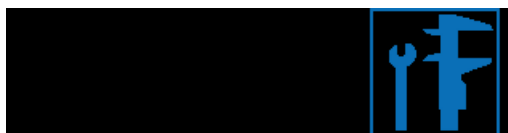
Important!**For right-hand drive vehicles only:**

Air bubbles may remain in the area at the rear when filling the expansion tank!

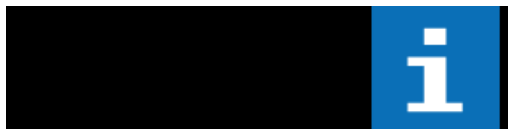
After concluding repair work, a test drive is absolutely necessary!

Afterwards, the brake fluid level in the expansion tank will need to be checked!

If the brake fluid level has dropped, it will need to be topped up again until the maximum mark!

**Special tools required:**

- [32 1 270](#)

**Necessary preliminary tasks:**

- Read and comply with [General Notes](#).
- Remove [expansion tank](#).
- Remove [battery](#).

Important! Before beginning repair work, fully press the brake pedal several times to reduce the vacuum pressure in the brake servo.

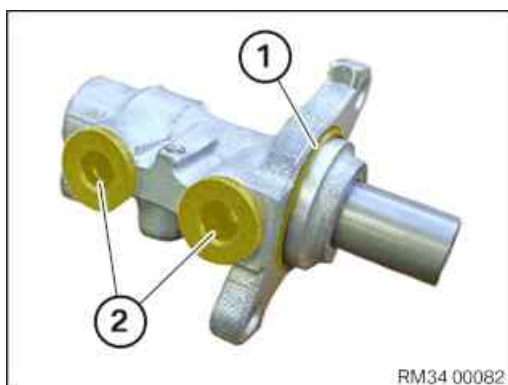
**Important!**

Do not bend brake lines.

Close off brake lines and tandem brake master cylinder with seal plugs [32 1 270](#).

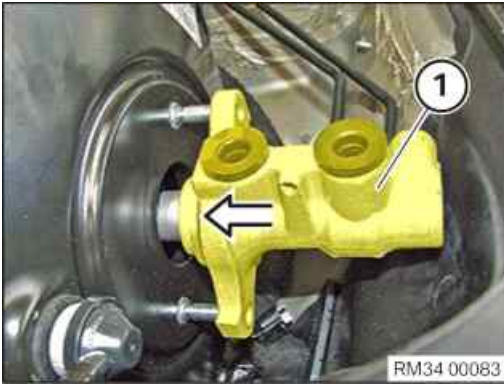
Unfasten brake lines (1).

Release nuts (2) and feed tandem brake master cylinder out of brake servo.

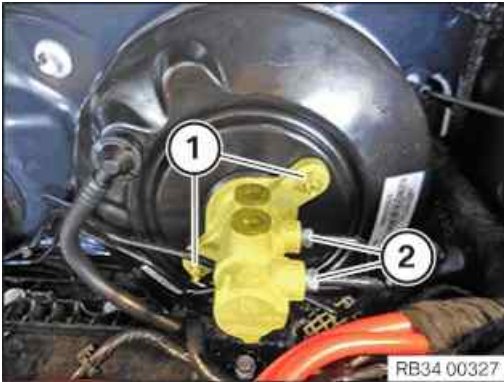
**Installation:**

Replace sealing ring (1).

Check rubber plugs (2) and replace if necessary.



When inserting the tandem brake master cylinder (1) into the brake servo, make sure the anti-roll bar link of the brake servo and the tandem brake master cylinder meet each other on one level.



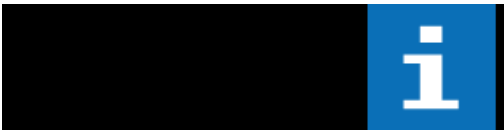
Insert nuts (1) and tighten.

Replace self-locking nuts.

Tightening torque [34 31 1AZ](#).

Fit brake lines (2) and tighten.

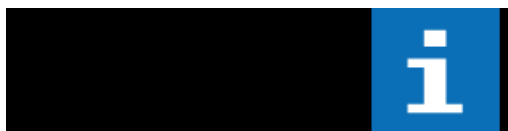
Tightening torque [34 32 1AZ](#).



Required follow-up work:

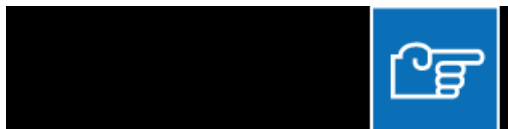
- Install [expansion tank](#).
- Install [battery](#).
- Bleed [brake system](#) with DSC.

34 31 170 Replacing brake fluid level switch

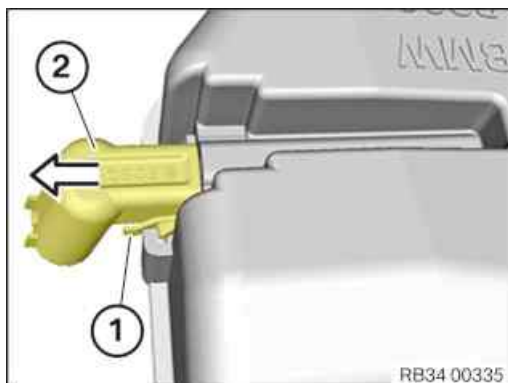


Necessary preliminary tasks:

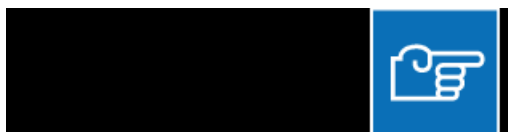
- Remove [expansion tank](#).



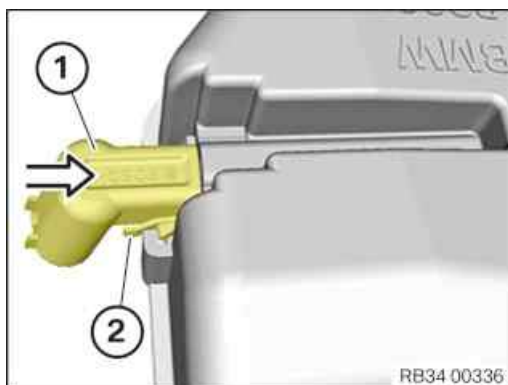
Removal:



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



Installation:

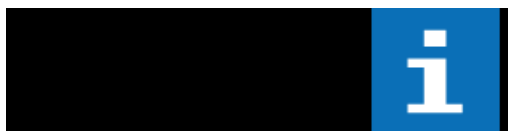


Install brake fluid switch (1) in direction of arrow. **Important!**
Make sure retaining lug (2) is engaged correctly.

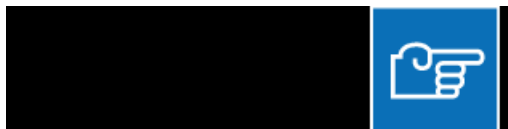
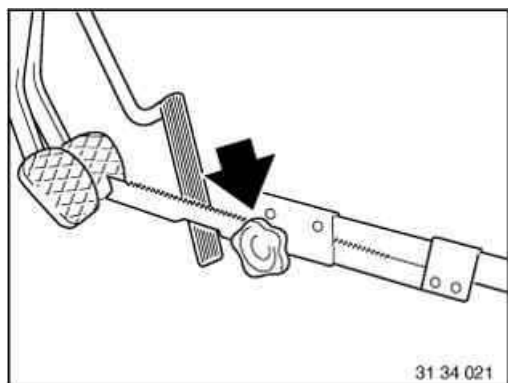


Required follow-up work:

- Install [expansion tank](#).

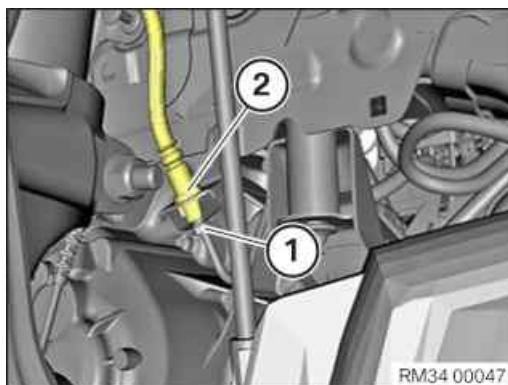
**Necessary preliminary tasks:**

- Read and comply with [General Information](#).

**Removal:**

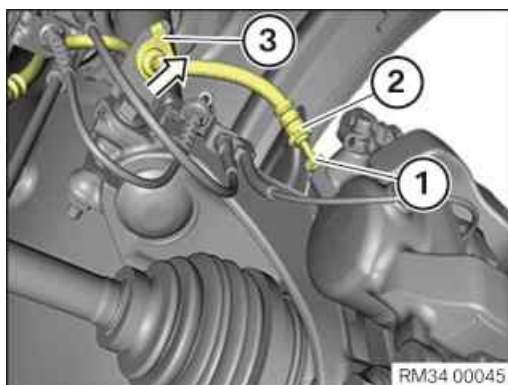
Press brake pedal down to floor and secure with pedal support. *Note:* The pedal support may only be released when the brake lines are reconnected.

This prevents brake fluid from emerging from the expansion tank and air from entering the system when the brake lines are opened.

**Attention!**

Grip brake hose at square head (2) so that connecting piece cannot rotate in retaining bracket.

Disconnect brake hose from brake line (1).



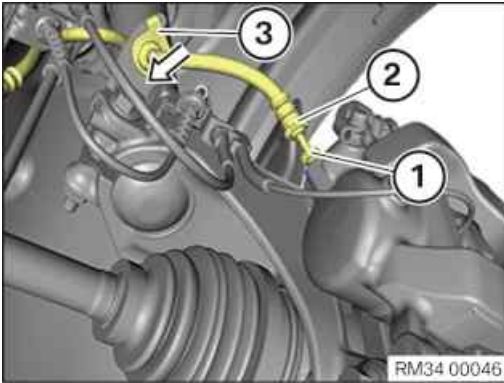
Release brake hose (1) from brake caliper; if necessary, grip at knurled screw (2).

Remove retaining bracket (3) in direction of arrow.

**Installation:**

**Attention!**

Make sure that the brake hose is routed correctly!



Mount brake hose (1) on brake caliper.

Attention!

First tighten brake hose on brake caliper.

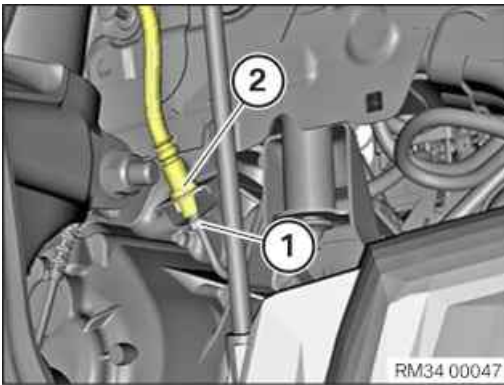
Move wheels into straight-ahead position.

Never twist brake hose when installing it and avoid all contact with parts attached rigidly to the body.

Tighten down brake hose (1); grip at knurled screw (2) for this purpose.

Tightening torque [34 32 2AZ](#).

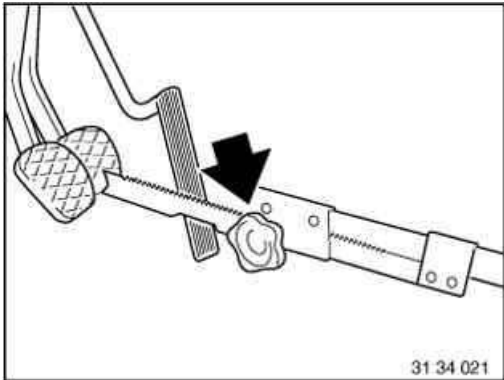
Install retaining bracket (3) in direction of arrow.

**Attention!**

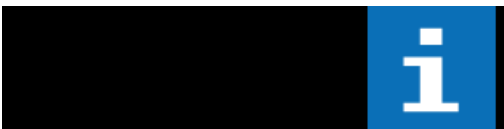
Grip brake hose at square head (2) so that connecting piece cannot rotate in retaining bracket.

Tightening torque [34 32 1AZ](#).

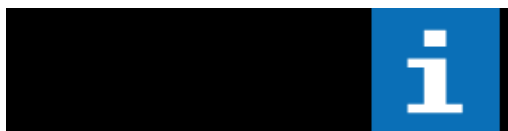
Mount brake hose on brake line (1) and tighten down.



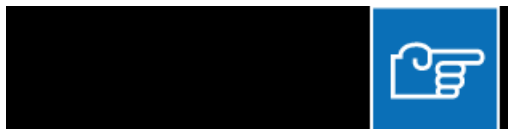
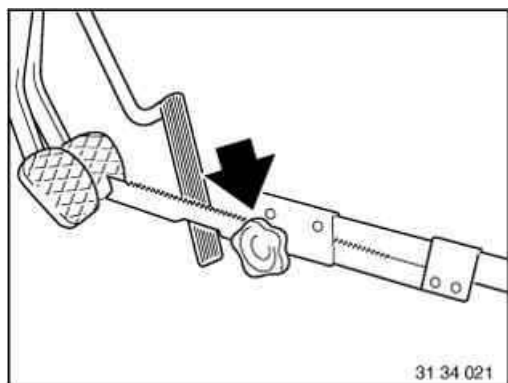
Remove pedal support.

**Required follow-up work:**

- [Bleed brake system.](#)

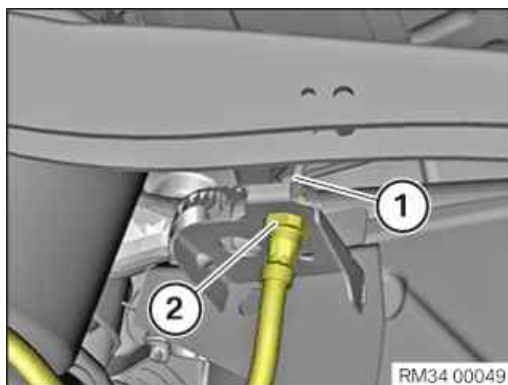
**Necessary preliminary tasks:**

- Read and comply with [General Information](#).

**Removal:**

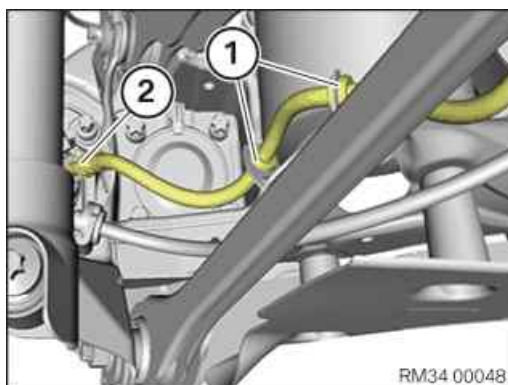
Press brake pedal down to floor and secure with pedal support. *Note:* The pedal support may only be released when the brake lines are reconnected.

This prevents brake fluid from emerging from the expansion tank and air from entering the system when the brake lines are opened.

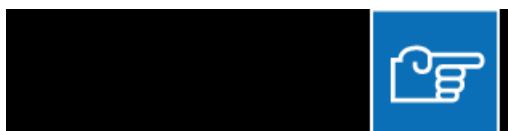
**Attention!**

Grip brake hose at square head (2) so that connecting piece cannot rotate in retaining bracket.

Disconnect brake hose from brake line (1).

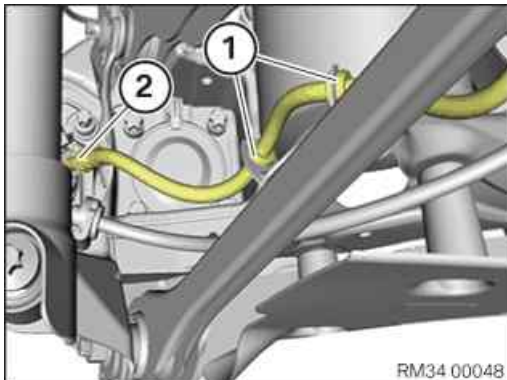


Disengage brake hose from brackets (1).
Detach brake hose (2) from brake caliper.

**Installation:**

**Attention!**

Make sure that the brake hose is routed correctly!



Mount brake hose (2) on brake caliper.

Attention!

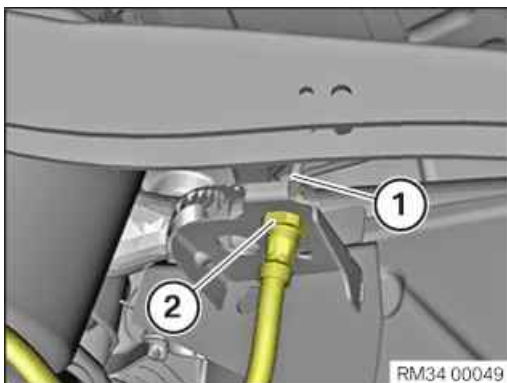
First tighten brake hose on brake caliper.

Never twist brake hose when installing it and avoid all contact with parts attached rigidly to the body.

Tighten down brake hose (2).

Tightening torque [34 32 3AZ](#).

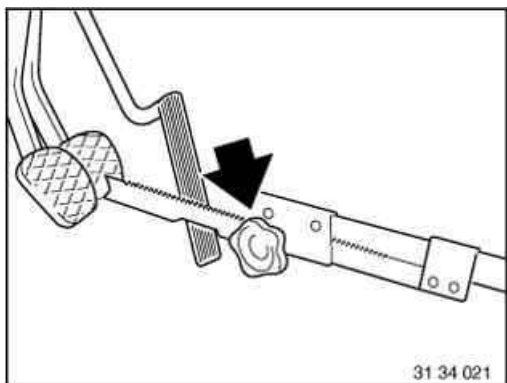
Insert brake hose in brackets (1).

**Attention!**

Grip brake hose at square head (2) so that connecting piece cannot rotate in retaining bracket.

Mount brake hose on brake line (1) and tighten down.

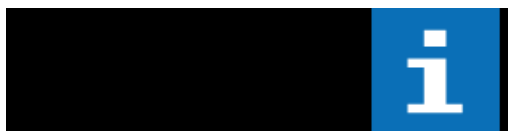
Tightening torque [34 32 1AZ](#).



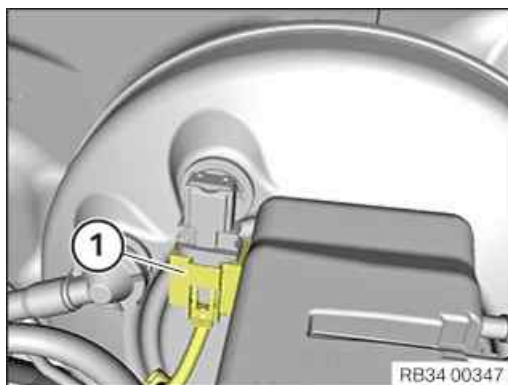
Remove pedal support.

**Required follow-up work:**

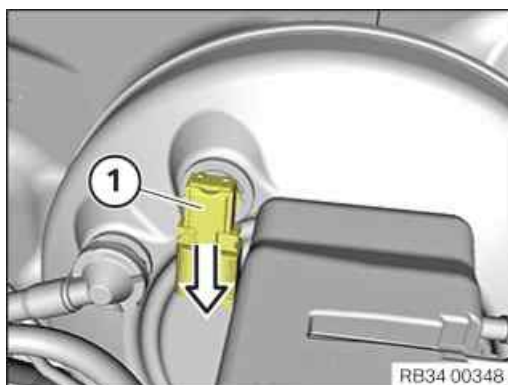
- [Bleed brake system.](#)

**Necessary preliminary tasks:**

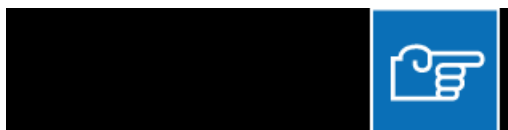
- Read and comply with [General Information](#).
- Remove [battery](#).

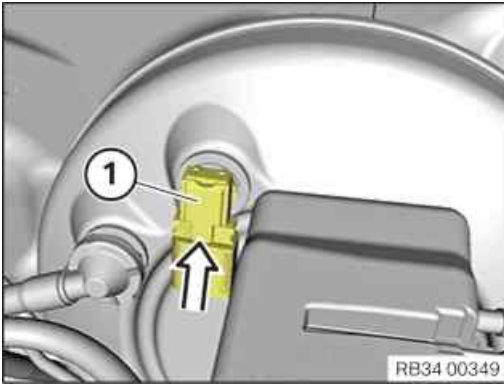
**Removal:**

Disconnect plug connection (1) on the brake vacuum sensor.



Carefully pull out brake vacuum sensor (1) from brake booster in direction of arrow.

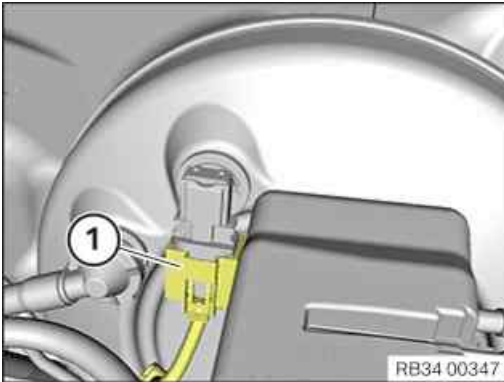
**Installation:**



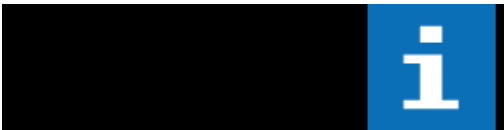
Note:

Check seal in brake booster and replace if necessary.

Install brake vacuum sensor (1) in brake booster in the direction of the arrow.

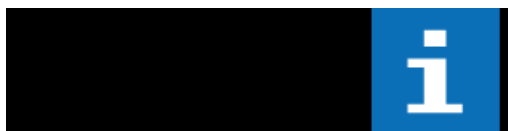


Position plug connection (1) and lock.

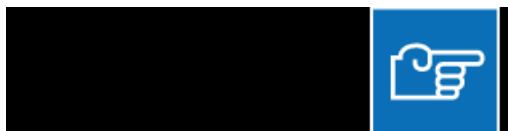
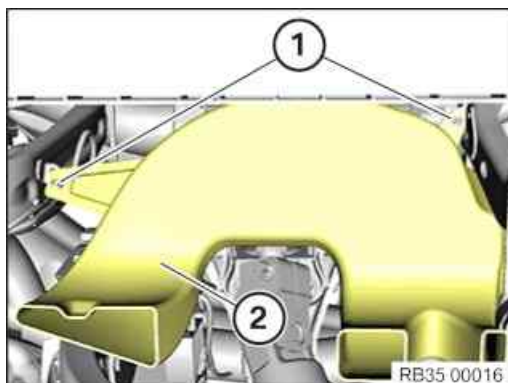


Required follow-up work:

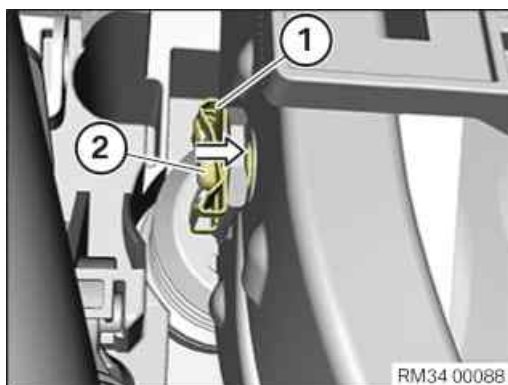
- Install [battery](#).

**Necessary preliminary work:**

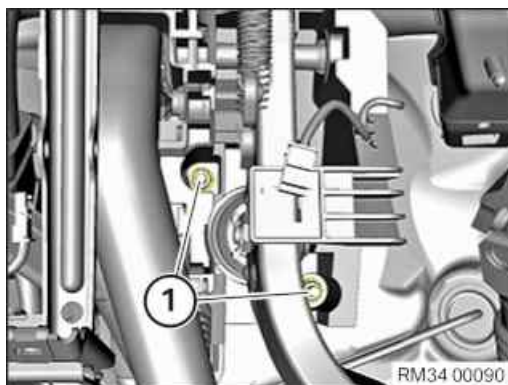
- Read and comply with [General Information](#).
- Remove the [tandem brake master cylinder](#).

**Removal:**

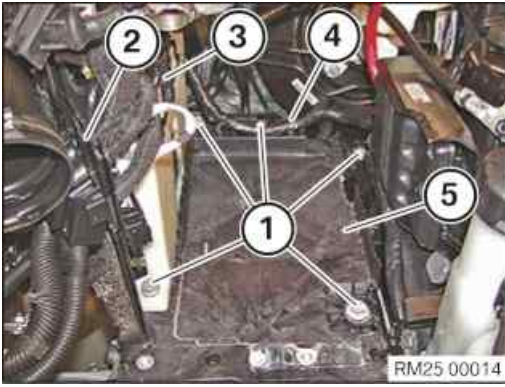
Remove screws (1) and remove footwell air duct (2).



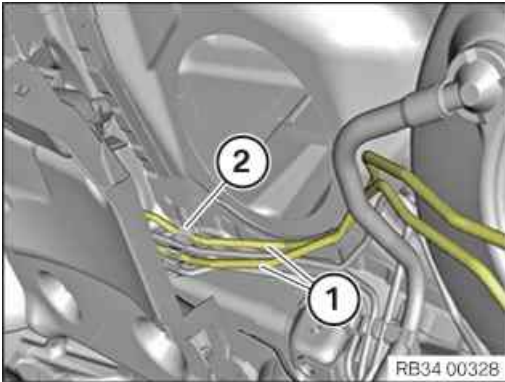
Detach retaining clip (1) from brake pedal, disengage and pull out retaining bolt (2).



Unscrew nuts (1).



Release screws (1).
 Release battery housing (2) from bracket and remove.
 Release control unit (3) from bracket.
 Detach wiring harness (4) from battery tray (5).
 Remove battery tray (5).



Unclip brake lines (1) from holder (2).



Pull non-return valve (1) in direction of arrow out of brake booster.

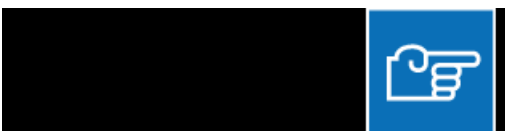


Attention!

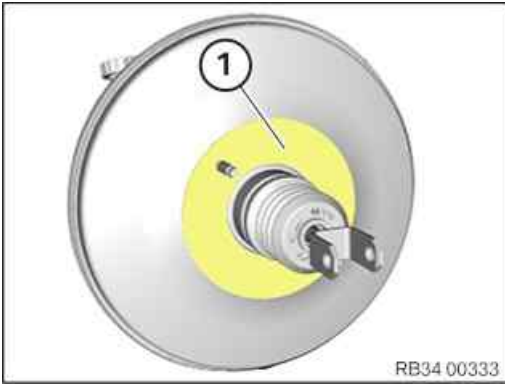
Do not use any force when removing and installing the brake booster; the brake booster can be damaged under certain circumstances.

Brake lines must not be bent.

Carefully pull brake servo (1) out of bulkhead and tilt out in upward direction.

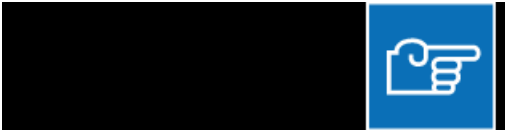


Preparation for installation:



Renew seal (1).

Parts: Gasket



Installation:



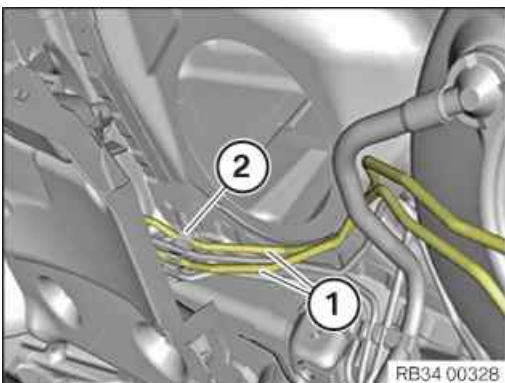
Carefully insert brake servo (1) into bulkhead.



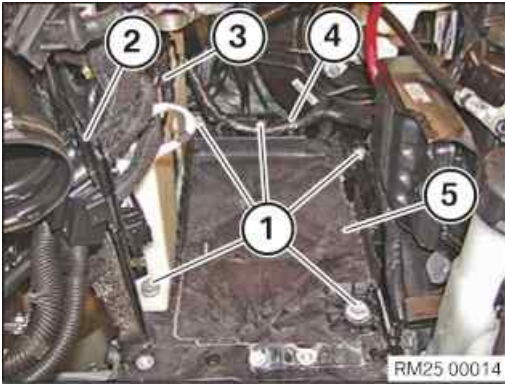
Installation note:

Renew seal for vacuum line/ check valve (1) in the brake booster.

Install non-return valve (1) in direction of arrow into brake booster.



Clip brake lines (1) into bracket (2).



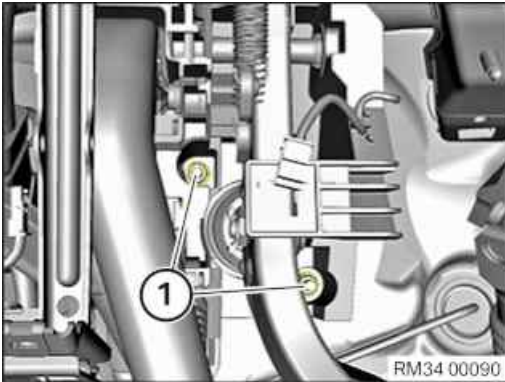
Install battery tray (5).

Tighten down screws (1).

Install wiring harness (4) on battery tray (5).

Insert control unit (3) in bracket.

Insert battery housing (2) into bracket.

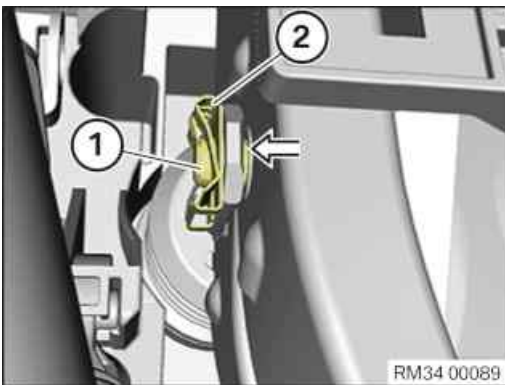


Insert nuts (1) and tighten.

Replace self-locking nuts.

Parts: Self-locking nuts

Tightening torque [34 33 1AZ](#).



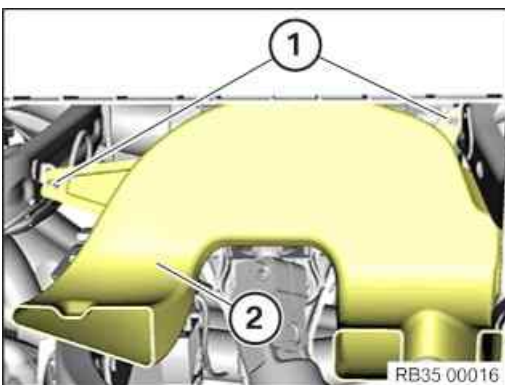
Grease retaining bolt (1) with lubricating grease NBU 12K (part number: **83 23 9 407 810**; see BMW Service Operating Fluids).

Install retaining bolt (1) through brake pedal.

Mount retaining clip (2) on retaining bolt.

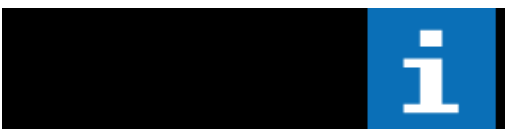
Replace retaining clip (2).

Parts: Retaining clip



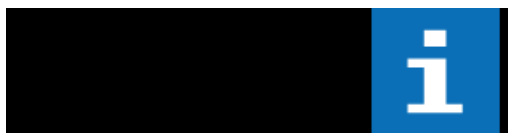
Install footwell air duct (2).

Insert screws (1) and tighten.

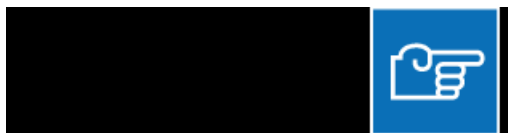
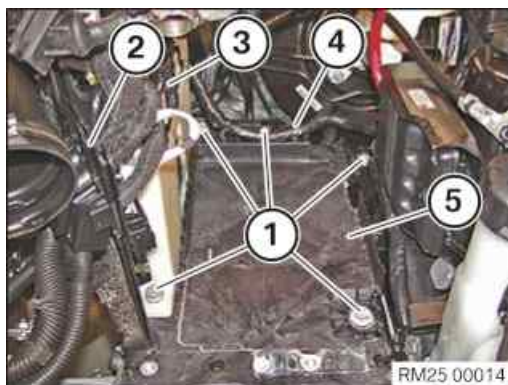


Required follow-up work:

- Install [tandem brake master cylinder](#).
- Install left [footwell trim](#).

**Necessary preliminary tasks:**

- Read and comply with [General Notes](#).
- Remove [battery](#).

**Removal:**

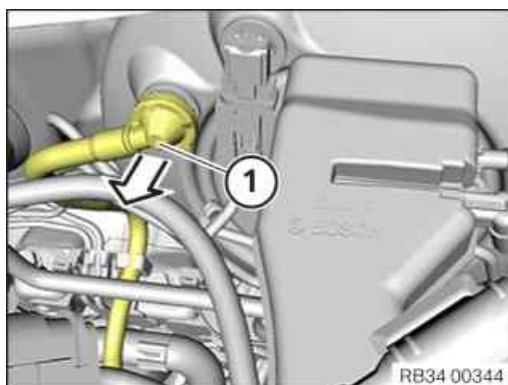
Release screws (1).

Release battery housing (2) from bracket and remove.

Release control unit (3) from bracket.

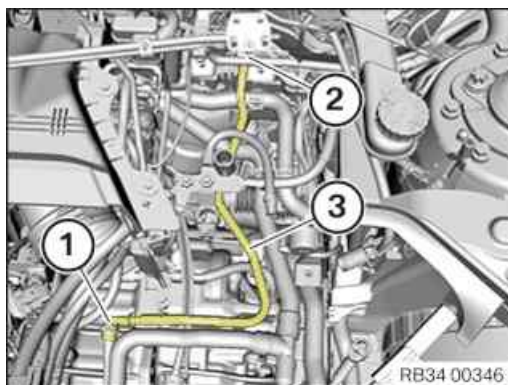
Detach wiring harness (4) from battery tray (5).

Remove battery tray (5).

**Important!**

Before beginning work, fully press the brake pedal several times to reduce the vacuum pressure in the brake servo. This makes it easier to pull off the vacuum hose.

Remove non-return valve (1) from brake booster in the direction of the arrow.



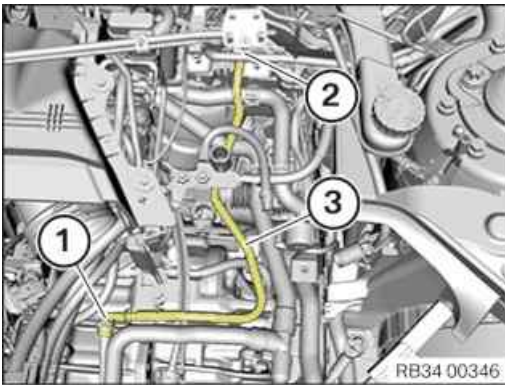
Unlock and disconnect snap fastener (1).

Remove vacuum line from bracket (2).

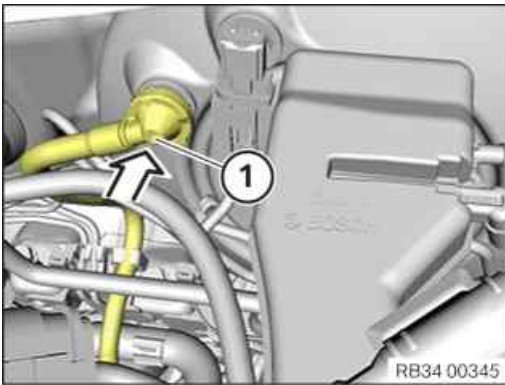
Remove vacuum line (3).



Installation:

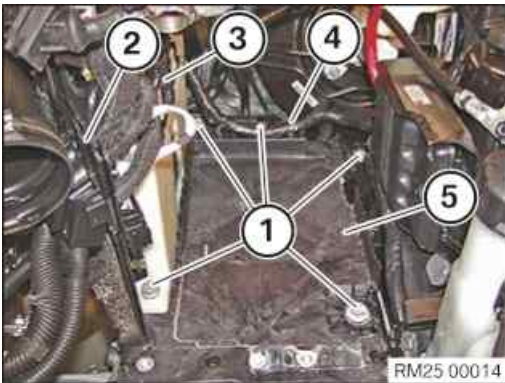


Install vacuum line (3).
Position snap fastener (1) and lock.
Install vacuum line in bracket (2).

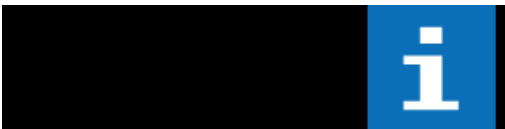


Note:
Check seal in brake booster, replace if necessary.

Install non-return valve (1) in direction of arrow into brake booster.



Install battery tray (5).
Tighten down screws (1).
Install wiring harness (4) on battery tray (5).
Insert control unit (3) in bracket.
Insert housing (2) in bracket.



Required follow-up work:

- Install [battery](#).

**Attention!**

The brake pad wear sensor must be replaced once it has been removed (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.

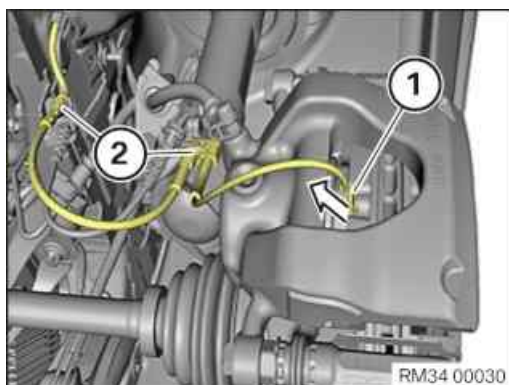
When renewing the brake pad wear sensor, a CBS reset needs to be carried out.

If a brake pad wear sensor was renewed without renewing the brake pads, the following needs to be paid attention to:

- Carry out service function "CBS correction reset" via diagnosis system and information system.

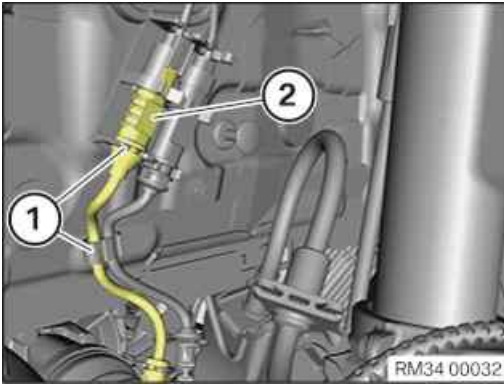
**Necessary preliminary work:**

- Removing the front left [wheel](#).
- Partially detaching the front left [wheel arch panel](#).

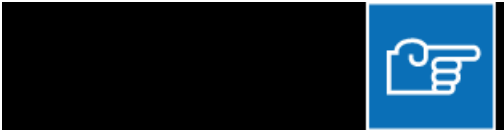
**Removal:**

Push together clamp (1) and pull off brake pad wear sensor from brake pad in direction of arrow.

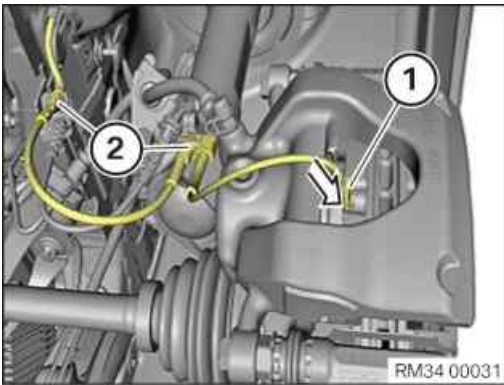
Detach cable of brake pad wear sensor from brackets (2).



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



Installation:

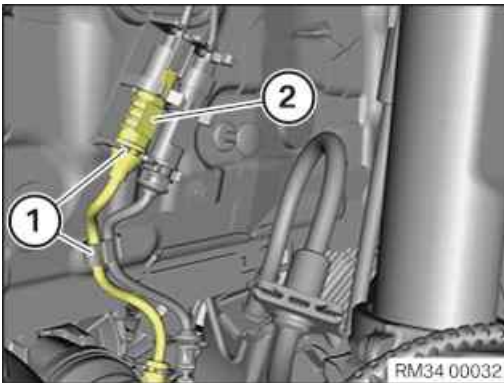


Install brake pad wear sensor (1) in the brake pad in direction of arrow.

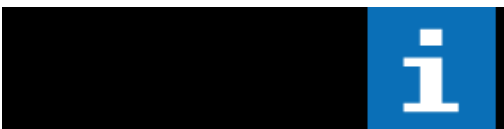
Attention!

Make sure clamp (1) and brake pad wear sensor are properly seated in brake pad.

Attach brake pad wear sensor in the brackets (2).



Attach brake pad wear sensor in brackets (1).
Connect plug connection (2).



Required follow-up work:

- Mounting the front left [wheel arch panel](#).
- Mounting the [wheel](#).
- Reset CBS.

**Attention!**

The brake pad wear sensor must be replaced without fail after disassembly (the brake pad wear sensor loses its adhesive capability in the brake pad).

Observe the following if a brake pad wear sensor that has already been sanded has to be replaced even though the minimum brake pad thickness has not yet been reached: The new sliding contact must be filed down with a file to the same length as the sanded sliding contact.

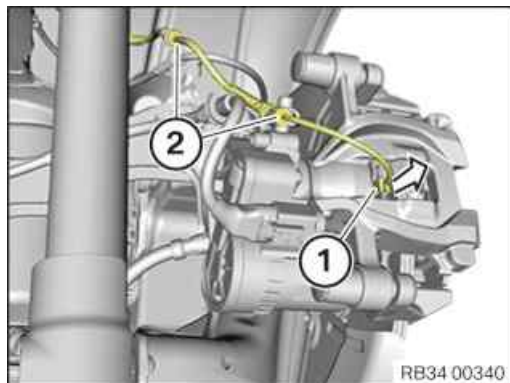
Carry out a CBS reset after having renewed the brake pad wear sensor.

If a brake pad wear sensor was renewed without renewing the brake pads, you must observe the following:

- Carry out service function "CBS correction reset" via diagnosis system and information system.

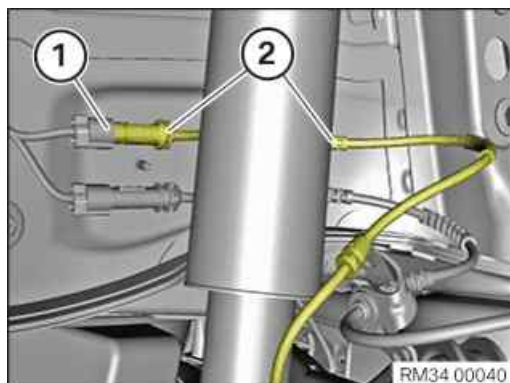
**Necessary preliminary work:**

- Remove [wheel](#) at the rear right.
- Partially detach rear [wheel arch panel](#).

**Removal:**

Pull off the brake pad wear sensor (1) from the brake pad in the direction of the arrow.

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

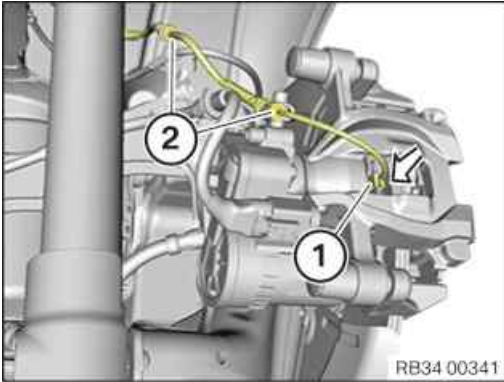


Detach the brake pad wear sensor from the brackets (2).

Disconnect plug connection (1).



Installation:

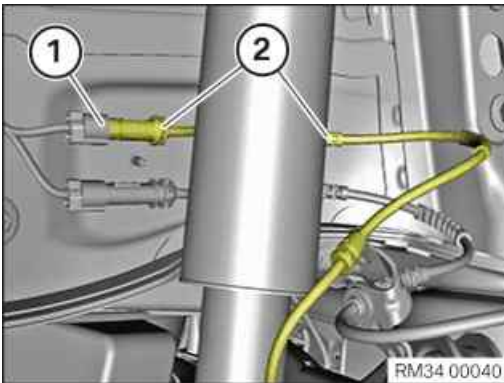


Install the brake pad wear sensor (1) in the brake pad in the direction of the arrow.

Attention!

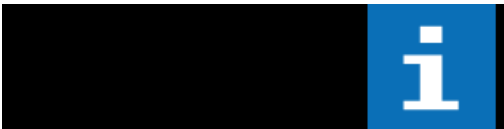
Make sure the clamp (1) and brake pad wear sensor are correctly positioned in the brake pad.

Attach the brake pad wear sensor in the brackets (2).



Attach the brake pad wear sensor in the brackets (2).

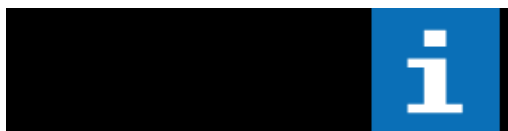
Connect plug connection (1).



Required reworking:

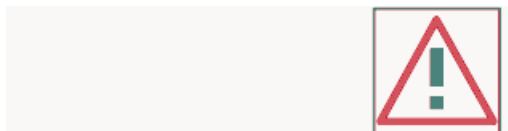
- Mounting the rear right [wheel arch panel](#).
- Mounting the rear right [wheel](#).
- Reset CBS.

34 41 ... Electromechanical parking brake - emergency release



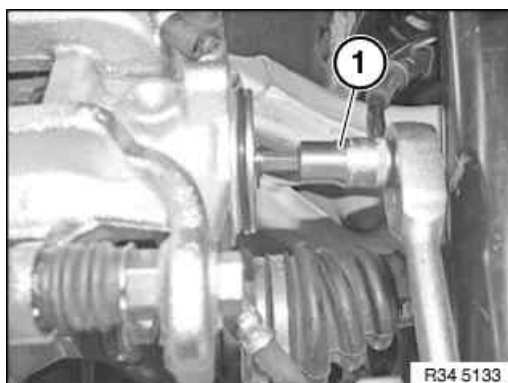
Necessary preliminary work:

- Remove [EMF actuators](#) on left and right.



Attention!

Secure vehicle against rolling, e.g. with chocks.



Using an 7 mm WAF hexagon socket wrench (1), turn back brake caliper spindle in clockwise direction.

Turn back until the wheel can turn freely.

Attention!

Do not turn the spindle to the end stop.

A fault code is set upon reaching the end stop. It deactivates the system!

If this is the case, delete the fault memory.



Note:

Start-up after open circuit:

1. Switch on ignition
2. Press brake button with brake pedal pressed.
3. The indicator light in the instrument panel goes out as soon as the parking brake is released.

**Important!**

After completing work:

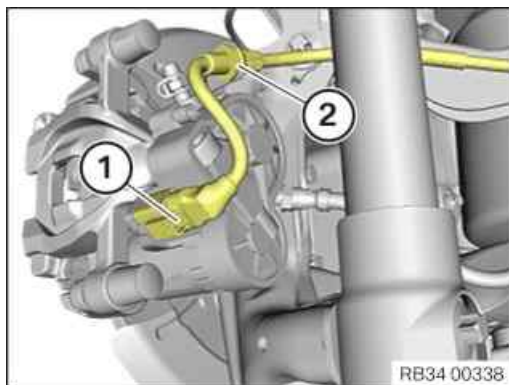
- Carry out function check on brake analyzer (test stand) to ensure that the brakes comply with legal requirements.
- Carry out test braking while driving at low speed; the effectiveness of the brakes may be reduced during the initial braking operations.
- Exaggerated drastic and continuous braking operations for faster braking in are not permitted.
- Advise the customer not to perform any wilful drastic braking in the first 200 km after brake replacement.
- Attach mirror tag to inside mirror.

**Necessary preliminary tasks:**

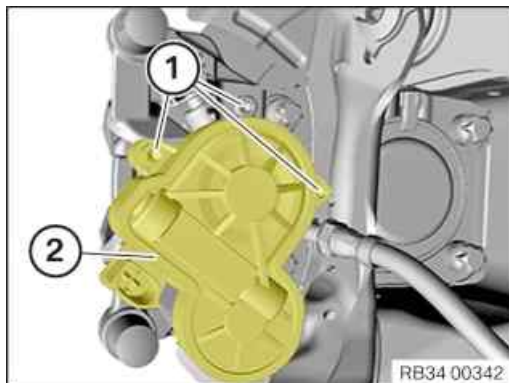
- Release parking brake.
- Switch off ignition.

Important!

Switch off ignition at least 30 s before disconnecting the plug connection!

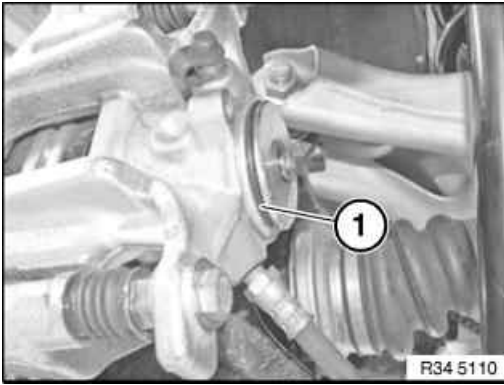
**Removal:**

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



Remove screws (1) and remove actuator (2).
Take off holder.

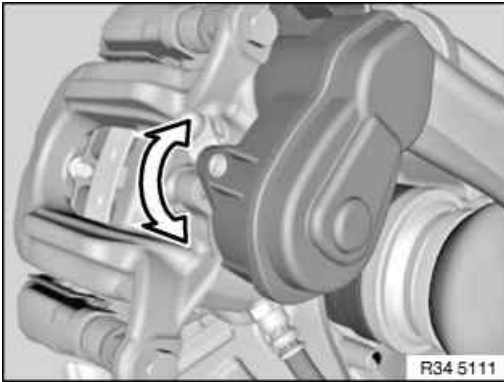
**Installation:**



Note:

Check sealing ring (1), replace if necessary.

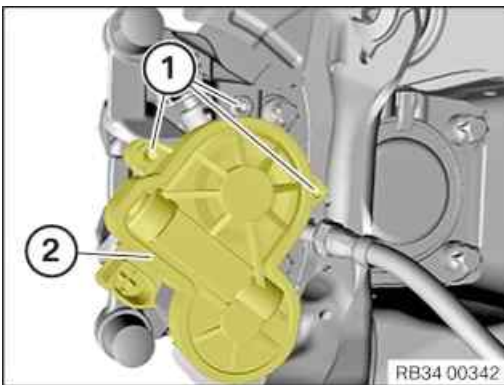
Apply a light coating of brake fluid to sealing ring (1) before fitting.



Note:

Carefully fit actuator drive until teeth engage and actuator drive rests flush on brake caliper.

If necessary, turn actuator drive slightly until bore hole and thread are flush.

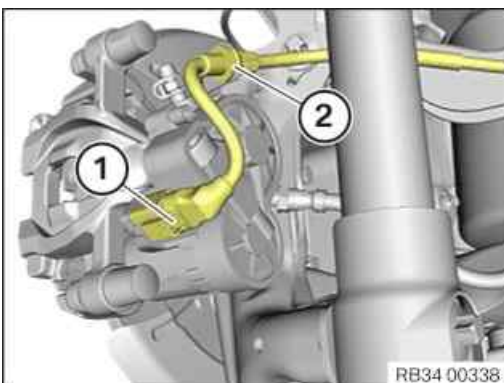


Insert screws (1) and tighten.

Replace screws.

Parts: screws.

Tightening torque [34 41 1AZ](#).



Attach cable to bracket (2).

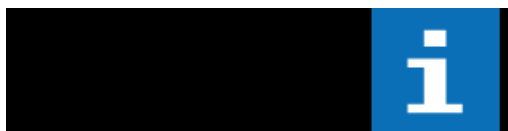
Position plug connection (1) and lock.



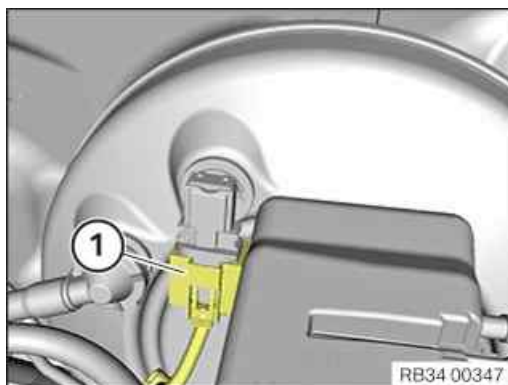
Required follow-up work: Note:

After completing repair work:

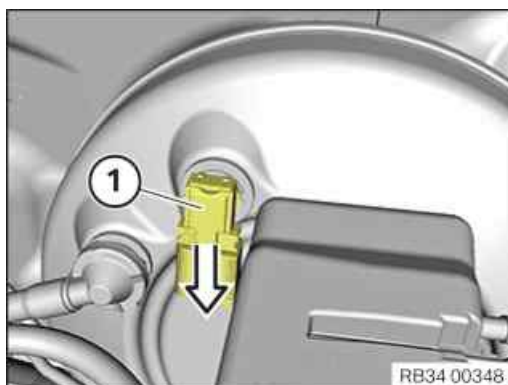
- Switch on ignition and, using electrical parking brake operating element, open parking brake once, close once and open again.

**Necessary preliminary tasks:**

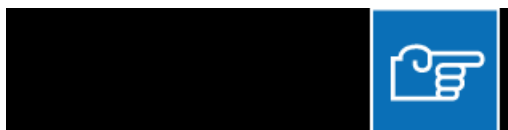
- Read and comply with [General Information](#).
- Remove [battery](#).

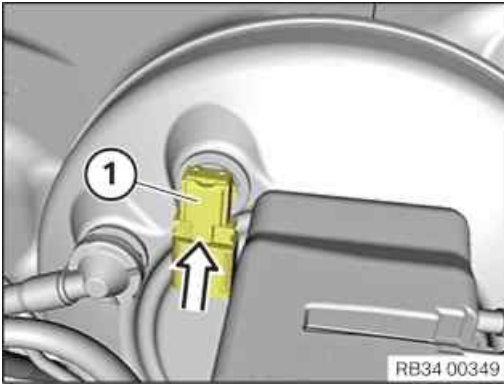
**Removal:**

Disconnect plug connection (1) on the brake vacuum sensor.



Carefully pull out brake vacuum sensor (1) from brake booster in direction of arrow.

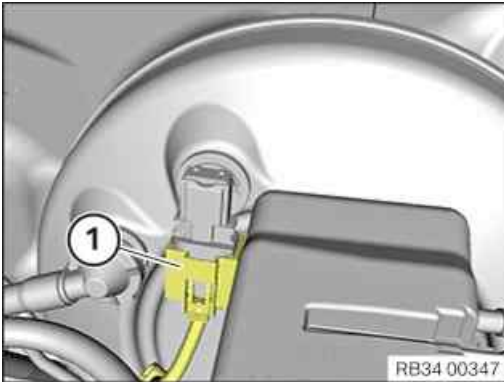
**Installation:**



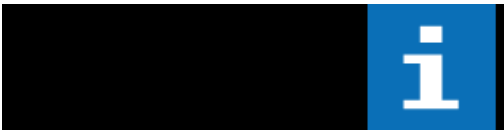
Note:

Check seal in brake booster and replace if necessary.

Install brake vacuum sensor (1) in brake booster in the direction of the arrow.

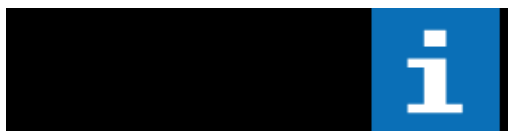


Position plug connection (1) and lock.

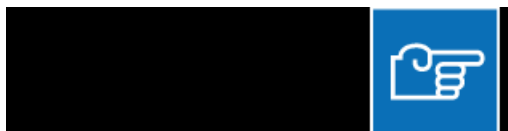
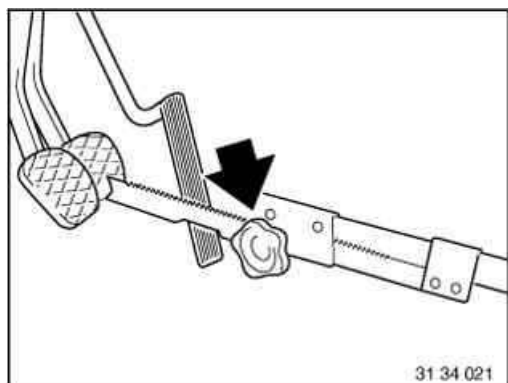


Required follow-up work:

- Install [battery](#).

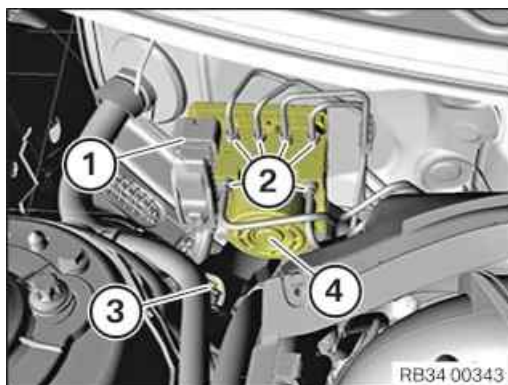
**Necessary preliminary tasks:**

- Read and comply with [General Notes](#).
- Removing the right [cowl panel cover](#).
- Remove [strut brace \(rear\) at right](#).

**Removal:**

Press brake pedal down to floor and secure with pedal support. *Note:* The pedal support may only be released when the brake lines are reconnected.

This prevents brake fluid from emerging from the expansion tank and air from entering the system when the brake lines are opened.



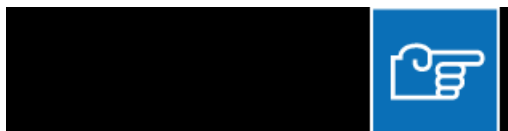
Disconnect plug connection (1).

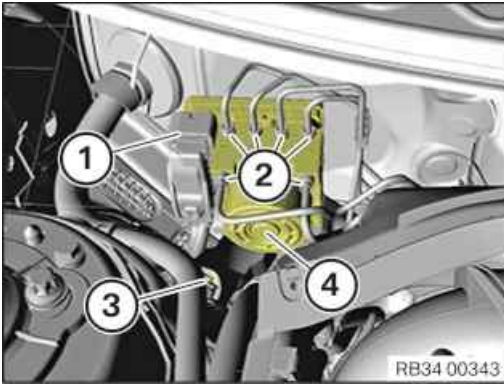
Attention!

- Do not mix up brake lines and if necessary mark prior to removal.
- Close off connecting bores with seal plugs.
- Brake lines must not be bent.

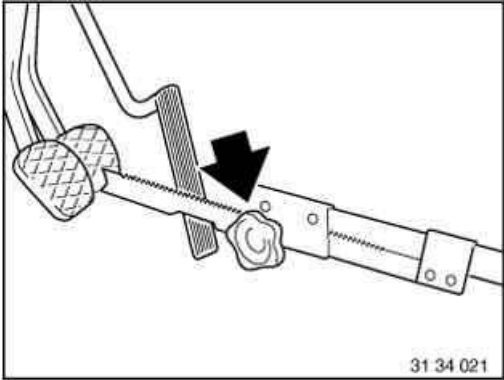
Unfasten brake lines (2).

Release screw (3) and remove hydraulic unit (4).

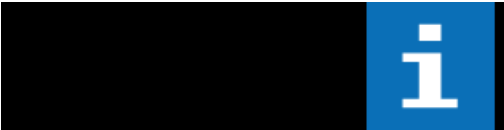
**Installation:**



Install hydraulic unit (4).
 Fit bolt (3) and tighten.
 Tightening torque [34 51 2AZ](#).
 Fit brake lines (2) and tighten.
 Tightening torque [34 32 1AZ](#).
 Connect plug connection (1).



Remove pedal support.



Required follow-up work:

- Install [cowl panel cover](#).
- Install [strut brace \(rear\) at right](#).
- [Bleed brake system](#).
- Adjustment of steering angle sensor.
- Function check - hydraulic unit.

If the control unit is replaced:

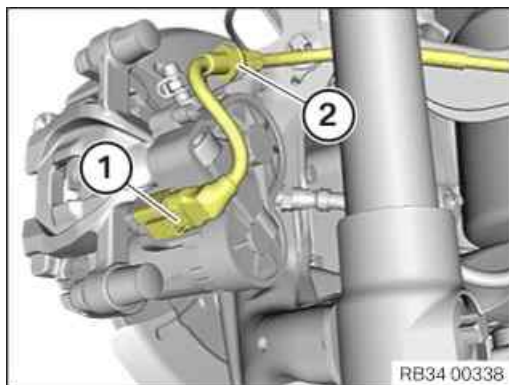
- Carry out [programming/encoding](#).

**Necessary preliminary tasks:**

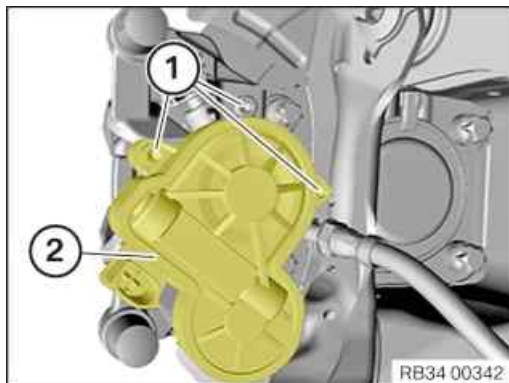
- Release parking brake.
- Switch off ignition.

Important!

Switch off ignition at least 30 s before disconnecting the plug connection!

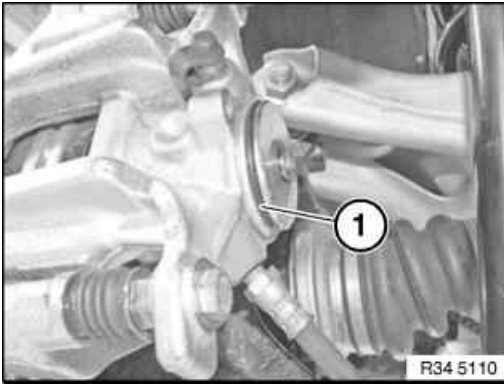
**Removal:**

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



Remove screws (1) and remove actuator (2).
Take off holder.

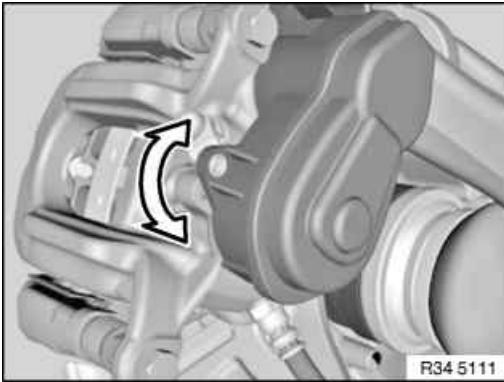
**Installation:**



Note:

Check sealing ring (1), replace if necessary.

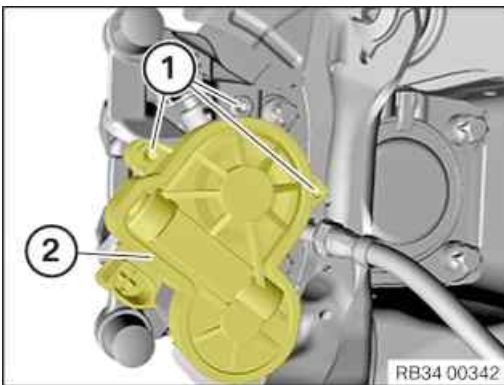
Apply a light coating of brake fluid to sealing ring (1) before fitting.



Note:

Carefully fit actuator drive until teeth engage and actuator drive rests flush on brake caliper.

If necessary, turn actuator drive slightly until bore hole and thread are flush.

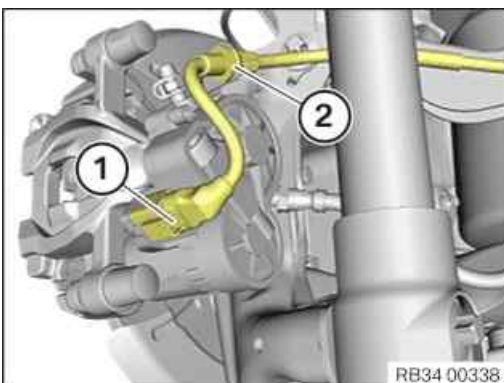


Insert screws (1) and tighten.

Replace screws.

Parts: screws.

Tightening torque [34 41 1AZ](#).



Attach cable to bracket (2).

Position plug connection (1) and lock.



Required follow-up work: Note:

After completing repair work:

- Switch on ignition and, using electrical parking brake operating element, open parking brake once, close once and open again.

Requested document not found

[Repair Hint \(REH\) 1.7 Electronic brake system \(EBS\)](#)

[Repair Instructions \(REP\) Removing and installing/replacing EMF actuator](#)

[Repair Instructions \(REP\) Removing and installing/replacing optional equipment system \(SAS\) control unit](#)

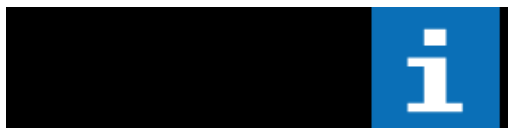
[Repair Instructions \(REP\) Removing and installing/replacing the DSC control unit](#)

[Repair Instructions \(REP\) Replacing a rear pulse sensor](#)

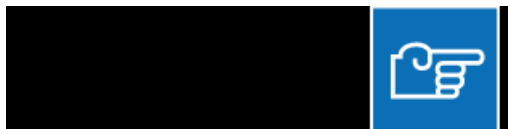
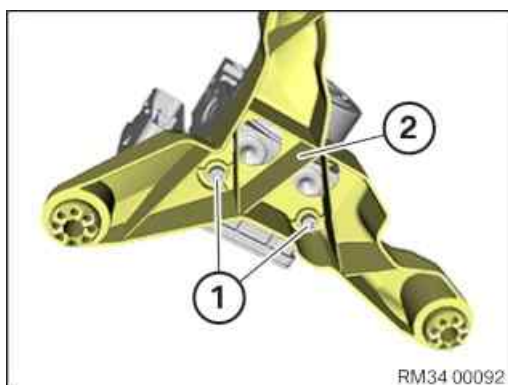
[Repair Instructions \(REP\) Replacing one front pulse sensor](#)

**Attention!**

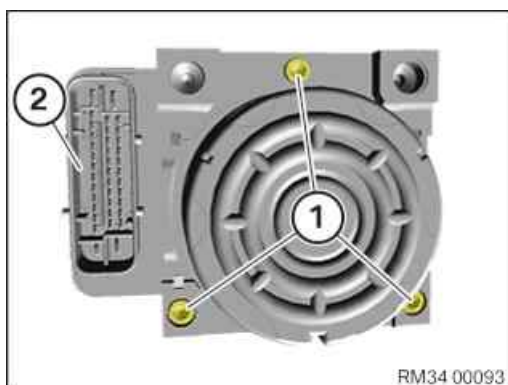
Read and comply with notes on [protection against electrostatic discharge \(ESD protection\)](#).

**Necessary preliminary work:**

- Remove [hydraulic unit](#).

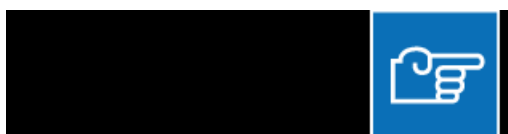
**Removal:**

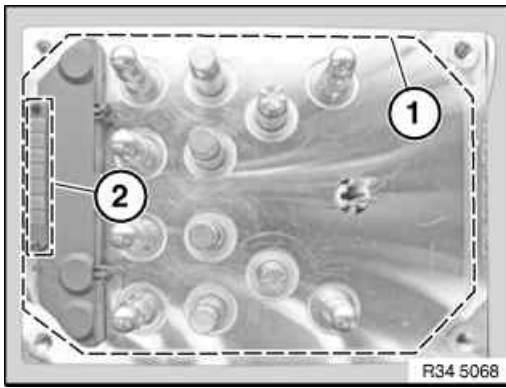
Release screws (1) and remove holder (2).

**Attention!**

Risk of damage to the contacts when removing and installing the hydraulic control unit.

Release screws (1) and carefully detach control unit (2) towards front.

**Preparation for installation:**

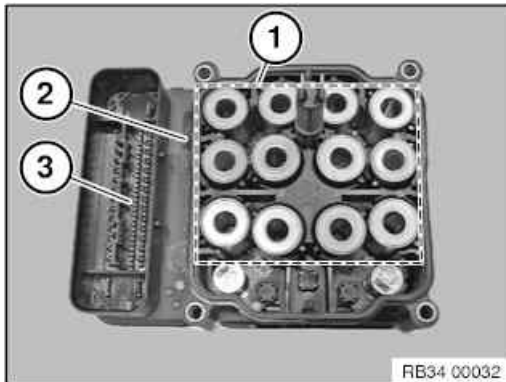


Attention!

Cleaning with compressed air, chemical solvents and sharp-edged objects is not permitted.

Do not touch pressure sensor contacts (2) with your fingers or clean the contacts.

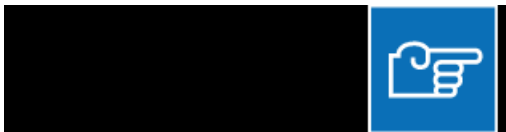
If necessary, clean sealing surface (1) with a plastic scraper or a fluff-free cloth.



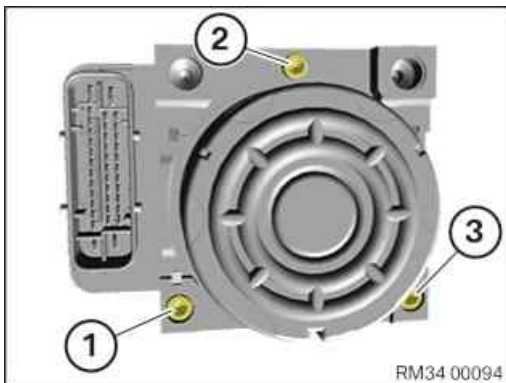
Attention!

Do not touch, clean or readjust valve coils (1) and pressure sensor contact springs with your fingers.

Check gasket (2) for damage. If damaged, replace DSC control unit (3).



Installation:



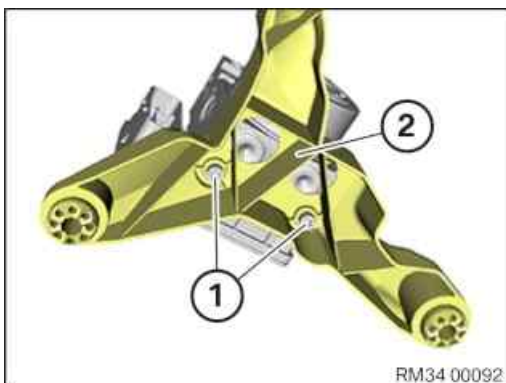
Installation note:

Make sure screws are inserted evenly and DSC control unit rests on hydraulic unit.

Renew screws.

Observe tightening sequence (1-3).

Tightening torque [34 51 1AZ](#).



Attach holder (2).

Insert screws (1) and tighten.

Tightening torque [34 51 2AZ](#).



Required follow-up work:

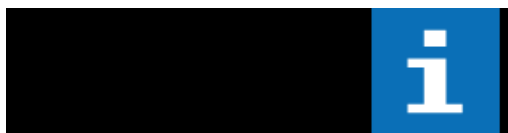
- Installing the [hydraulic unit](#).



Replacement:

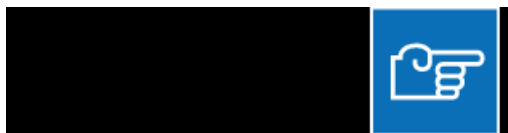
Carry out [programming/encoding](#).

34 52 535 Replacing a rear pulse sensor

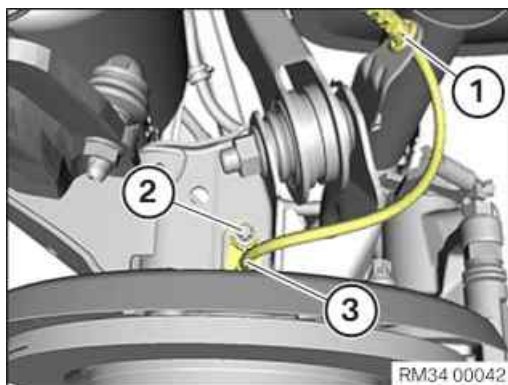


Necessary preliminary tasks:

- Removing the rear [wheel](#).
- Partially detaching the rear [wheel arch panel](#)

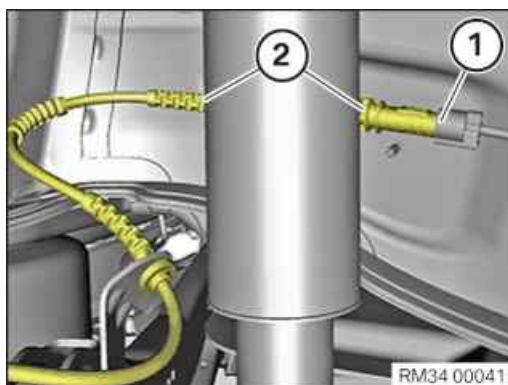


Removal:



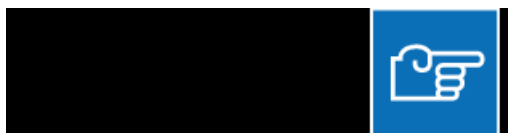
Take the cable out of the bracket (1).

Release screw (2) and remove pulse sensor (3).

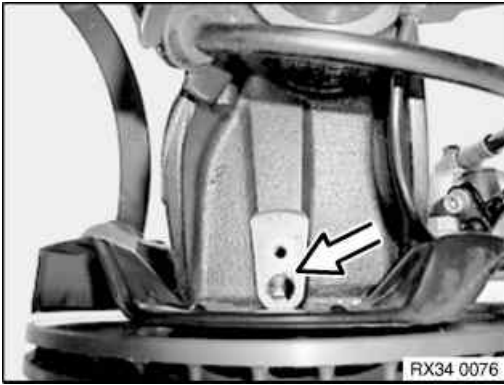


Disconnect plug connection (1).

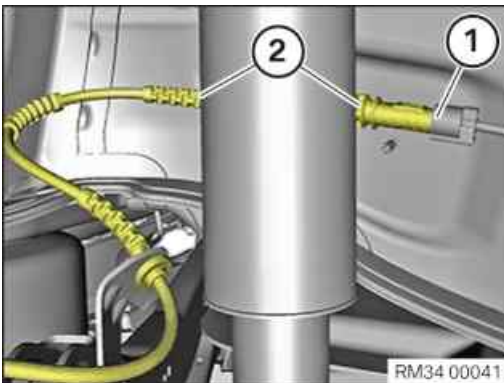
Disengage cable from holders (2).



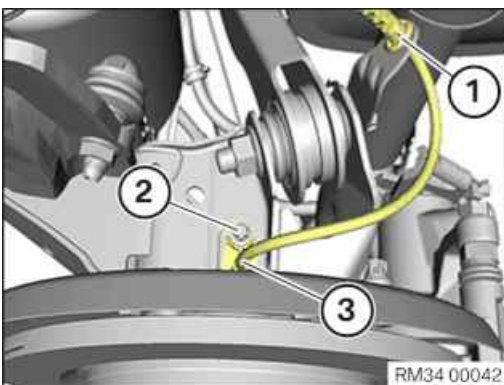
Installation:



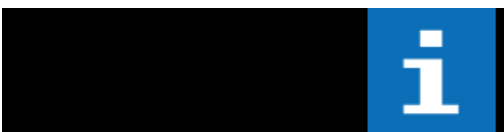
Clean bore hole for pulse sensor and grease with Staburags NBU 12/K lubricating grease (refer to BMW Service Operating Fluids). **Important!** Check sensor head prior to installation for damage, replacing if necessary.



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



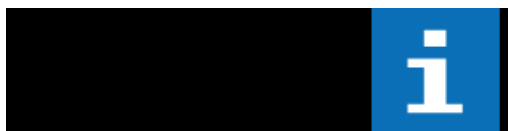
Install cable in bracket (1).
Install pulse sensor (3).
Fit bolt (2) and tighten.
Tightening torque [34 51 5AZ](#).



Required follow-up work:

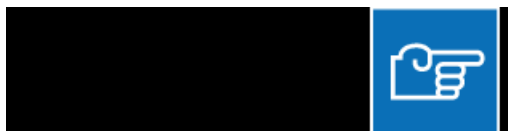
- Installing the rear [wheel arch panel](#)
- Mounting the rear [wheel](#).

34 52 525 Replacing one front pulse sensor

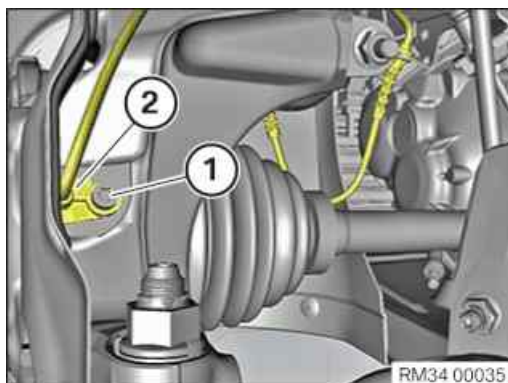


Necessary preliminary tasks:

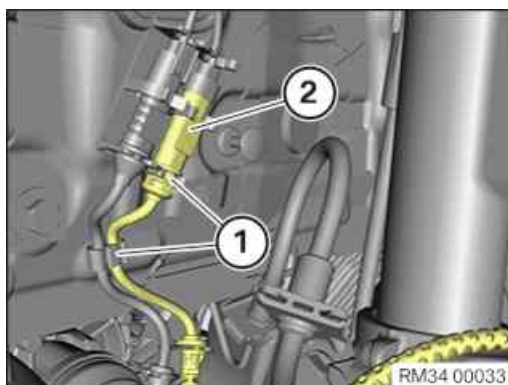
- Remove front [wheel](#).
- Partially detach front [wheel arch panel](#).



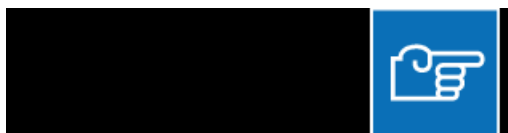
Removal:



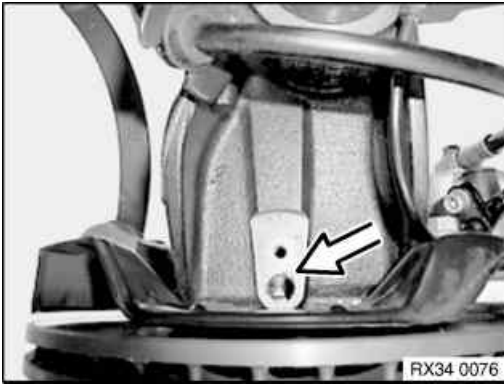
Release screw (1) and remove pulse sensor (2).
Remove cable from bracket on spring strut.



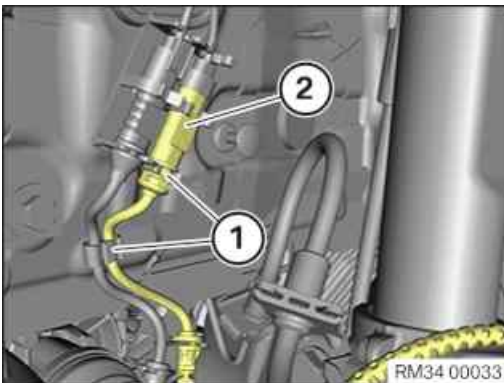
Disengage cable from holders (1).
Disconnect plug connection (2).



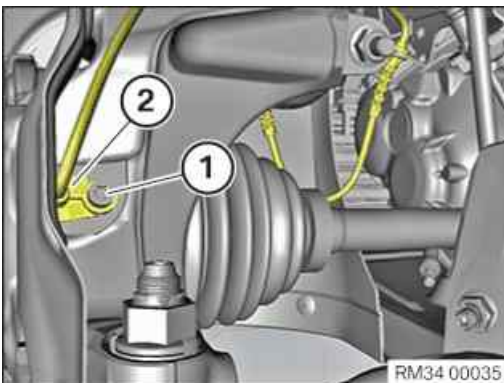
Installation:



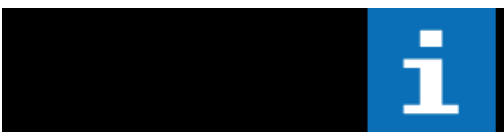
Clean bore hole for pulse sensor and grease with Staburags NBU 12/K lubricating grease (refer to BMW Service Operating Fluids). **Important!** Check sensor head prior to installation for damage, replacing if necessary.



Attach brake pad wear sensor in brackets (1).
Connect plug connection (2).



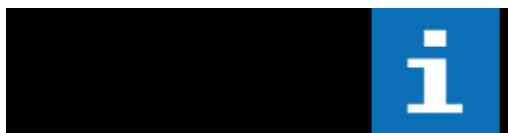
Install pulse sensor (2).
Insert screw (1) and tighten down.
Tightening torque [34 51 4AZ](#).
Install cable in bracket on spring strut.



Required follow-up work:

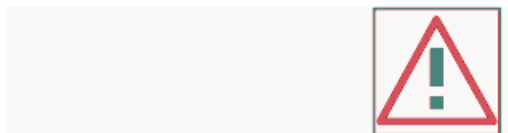
- Install front [wheel arch panel](#).
- Install [wheel](#).

34 41 ... Electromechanical parking brake - emergency release



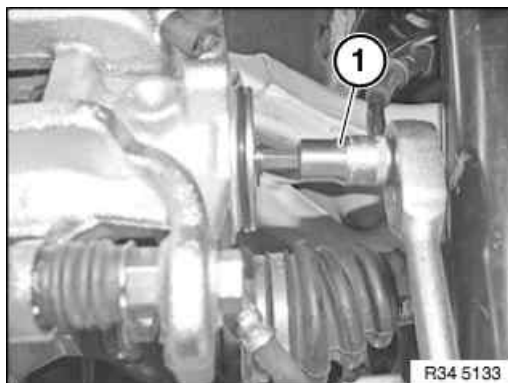
Necessary preliminary work:

- Remove [EMF actuators](#) on left and right.



Attention!

Secure vehicle against rolling, e.g. with chocks.



Using an 7 mm WAF hexagon socket wrench (1), turn back brake caliper spindle in clockwise direction.

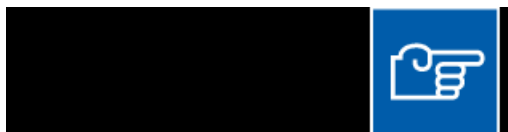
Turn back until the wheel can turn freely.

Attention!

Do not turn the spindle to the end stop.

A fault code is set upon reaching the end stop. It deactivates the system!

If this is the case, delete the fault memory.



Note:

Start-up after open circuit:

1. Switch on ignition
2. Press brake button with brake pedal pressed.
3. The indicator light in the instrument panel goes out as soon as the parking brake is released.

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!

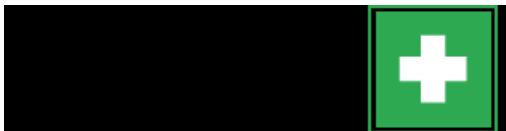
Observe following instructions during use:

- 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.



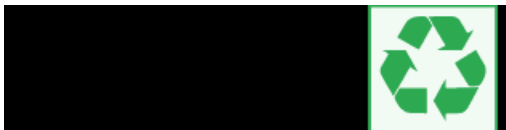
Important!

Follow hazard warnings and wear personal protection equipment!



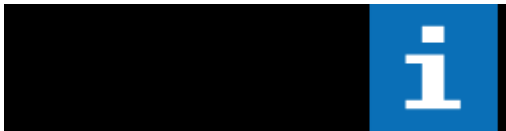
First Aid:

- 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.



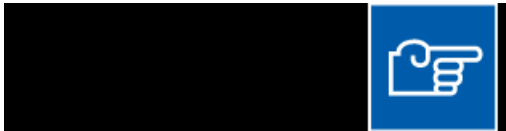
Recycling:

Dispose of cleaning agents/paints in a professional manner!
Observe national/country-specific disposal regulations.



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