

BRAKES

Brakes - Operating Fluids

1.0 GENERAL INFORMATION

Brake fluid, (glycol-based) as used in BMW brake systems, must conform with the following requirements:

- High boiling point
- Good low temperature resistance
- Low compressibility
- Corrosion inhibition for all metal parts inside of brake system
- Compatibility with all rubber parts used in brake system

These requirements are fulfilled by reputable brand name DOT 4 brake fluids.

Silicone-based brake fluid has better compressibility, but because it cannot absorb moisture, is subject to vapor lock at temperatures above 212°F/ 100°C. At lower temperatures, it may even ice-up. **Silicone-based brake fluid is not approved by BMW.**

Glycol-based brake fluid absorbs moisture from the atmosphere (hygroscopicity) through the brake fluid reservoir, brake hoses, etc. This absorption of water lowers the original boiling point of brake fluid and active safety of the entire system. If there is extended use of the brakes while driving downhill at high speeds, the thermal loads could cause vapor bubbles in the brake fluid. This situation could lead to reduced braking effectiveness.

The original boiling point of factory-approved brake fluids is approximately 500°F/260°C. Due to the hygroscopic behavior of brake fluid, 2% of water within one year is permissible. The boiling point of brake fluid will drop by 100°C with 3% water absorption. It is essential to conform with brake fluid changing intervals in order to guarantee the safety and maximum effectiveness of a brake system.

It would not be sufficient simply to replace the brake fluid in the reservoir. Experience has shown that vapor bubbles will occur first on areas of the brake caliper. This area is subjected to high thermal loads and also exposed to heat transmission.

When replacing the brake fluid, the brake fluid used as the working fluid in the hydraulic clutch should also be replaced. This is done by draining the clutch operation system or bleeding with the help of the clutch slave cylinder.

The brake fluid should be replaced by filling the brake fluid reservoir. Make sure that each bleeder valve of all wheel cylinders or brake calipers is kept open until the escaping brake fluid is clear and without air bubbles. Never use brake fluid that has been drained from the system.

Storage of brake fluids also deserves your special attention. The aging process begins with the initial contact between the brake fluid and the atmosphere. This means immediately after a new container is opened.

To keep the boiling point of stored brake fluids as high as possible, we recommend conforming with the following points:

- Close all containers tightly.
- Select small size containers, which can be used up quickly.
- Avoid pouring contents of one container into a different container.

2.0 HANDLING BRAKE FLUIDS

Brake fluids could be mixed up accidentally with mineral oil products so it is important to leave them in their original containers and not pour them into a different container.

CAUTION: If brake fluid accidentally comes into contact with your skin, wash it off with soap and water immediately. Eyes should be thoroughly flushed with cold water if contacted by brake fluid. Vomiting should be induced if brake fluid is internally consumed and a physician should be consulted.

If brake fluid is spilled or drips on a painted surface, wash it off with water immediately to prevent damage to the paint finish. Never rub it off. Brake fluids should not have contact with grease or oil. Wash hands to remove grease and oil before working with brake fluids. Also make sure that grease cannot enter the brake system.

Drained brake fluid must never be discarded in the garbage, oil disposal tanks or water drains.

Read instructions on container label prior to use.

3.0 BMW TESTED AND APPROVED BRAKE FLUIDS

BMW Tested and Approved DOT 4 ESL Brake Fluid is available as follows:

BMW PARTS SPECIFICATION

12 fl. oz. bottle	BMW Part No. 81 22 0 142 156
1 gallon container	BMW Part No. 81 22 0 142 155

4.0 BRAKE FLUID CHANGE INTERVALS

All Models Brake fluid change interval every 2 years.

5.0 OTHER OPERATING FLUIDS

ANTI-SQUEAK/CORROSION PASTE

Bostik NEVER-SEEZ® to prevent disc brake squeaking. It is applied on cleaned recesses, pressure surfaces of piston crowns, brake pad backplates and possibly transfer plates-but not on friction liners.

To prevent corrosion between the ABS impulse sensor and the hole in the wheel suspension component, apply a

thin coat of Bostik NEVER-SEEZ® to cleaned sensor and hole before assembly.

BMW PARTS SPECIFICATION

Bostik NEVER-SEEZ®	Part No. NSBT-16
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BRAKE CLEANER SPRAY

Non-CFC spray (former BMW Part No. 81 22 9 407 704) for cleaning brakes, brake pads, brake shoes, drums, disks and other brake components. Also suitable for clutch pressure plates.

BMW PARTS SPECIFICATION

3M	Part No. 8895
Loctite	Part No. 82220
CRC	Part No. 08088

BRAKES

Brakes - Repair - Z4

3400 BRAKE TESTING AND BLEEDING

34 00 050 BLEEDING BRAKE SYSTEM WITH DSC

NOTE: READ AND COMPLY WITH GENERAL INFORMATION.
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 to help carry out this work.

Always use BMW-approved brake fluids, refer to BRAKES - OPERATING FLUIDS

IMPORTANT: Under certain circumstances it is not possible after the brake system is opened to bleed the brake system fully at the rear EMF brake calipers. If there is still residual air in the rear brake calipers after normal bleeding, it will be necessary to work through an additional bleeding procedure !

Connect BMW diagnosis system.

Select path: Service functions - Chassis/Suspension - Slip control systems - Bleeding procedure.

Connect brake fluid changer to expansion tank and switch on.

IMPORTANT: Check relevant Operating Instructions for each device.
Charging pressure should not exceed 2 bar.

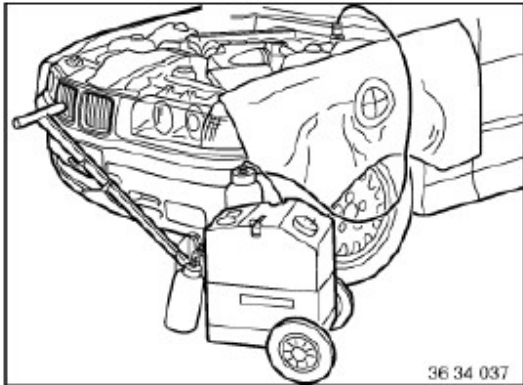


Fig. 1: Connecting Brake Fluid Changer To Expansion Tank
Courtesy of BMW OF NORTH AMERICA, INC.

Fully rinse the brake system

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

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

Close bleed valve.

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

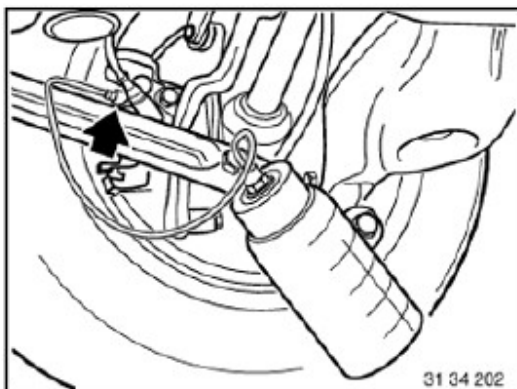


Fig. 2: Locating Bleeder Valve On Rear Right Brake Caliper
Courtesy of BMW OF NORTH AMERICA, INC.

Bleeding rear axle brake circuit

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

Close bleeder valve.

Run bleeding routine with DIS with bleeder valve open.

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

Close bleed valve.

Repeat procedure at rear left.

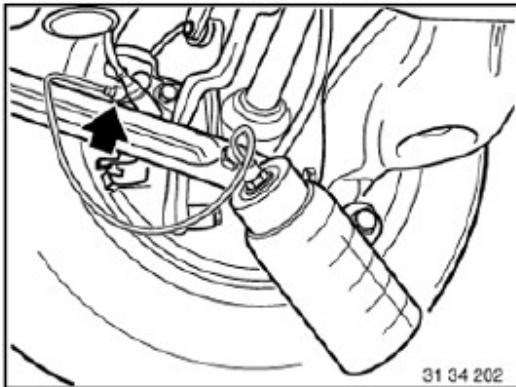


Fig. 3: Locating Bleeder Valve On Rear Right Brake Caliper
Courtesy of BMW OF NORTH AMERICA, INC.

Bleeding front axle brake circuit

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

Close bleeder valve.

Run bleeding routine with DIS with bleeder valve open.

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

Close bleed valve.

Repeat procedure at front left.

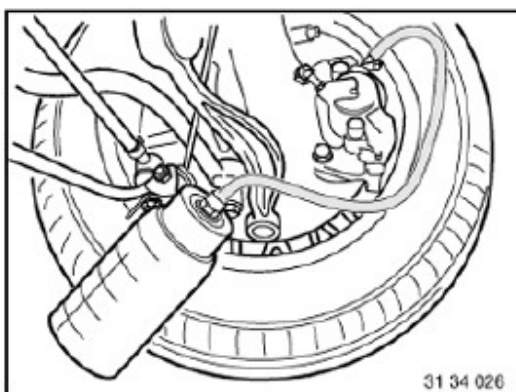


Fig. 4: Connecting Vent Hose With Collecting Vessel To Bleeder Valve
Courtesy of BMW OF NORTH AMERICA, INC.

Switch off brake fluid changer and remove from expansion tank.

Check brake fluid level.

Close expansion tank.

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

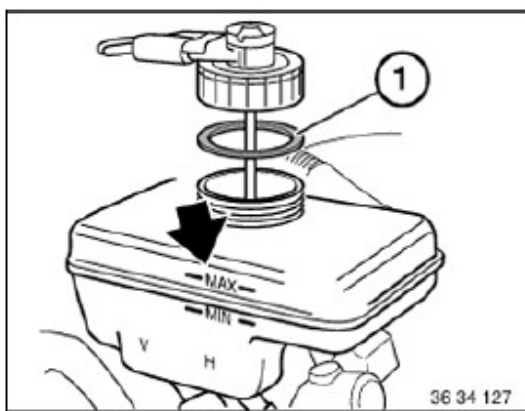


Fig. 5: Locating Brake Fluid Level Marking (Max)
Courtesy of BMW OF NORTH AMERICA, INC.

34 00 EMF ADDITIONAL BRAKE BLEEDING PROCEDURE

NOTE: This bleeding procedure serves to eliminate residual air in the brake system. Under certain circumstances it may not be possible to remove the entire residual air from the EMF brake calipers by means of the normal bleeding procedure. In these cases, the following procedure applies.

Connect brake fluid changer to expansion tank and switch on.

NOTE: Check relevant Operating Instructions for each device.

Charging pressure should not exceed 2 bar.

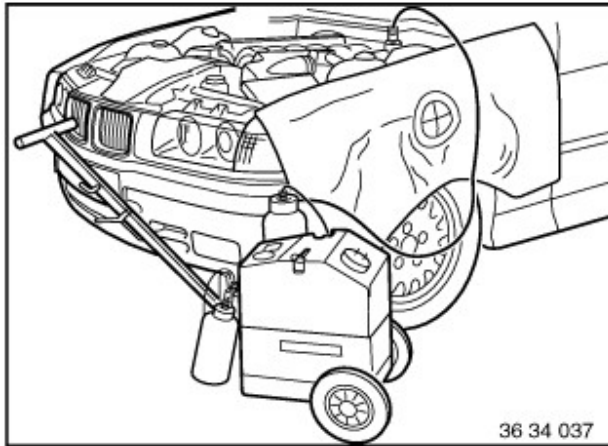


Fig. 6: Connecting Brake Fluid Changer To Expansion Tank

Close bleeder valve. Flush brake caliper in installation position. Close bleed valve.

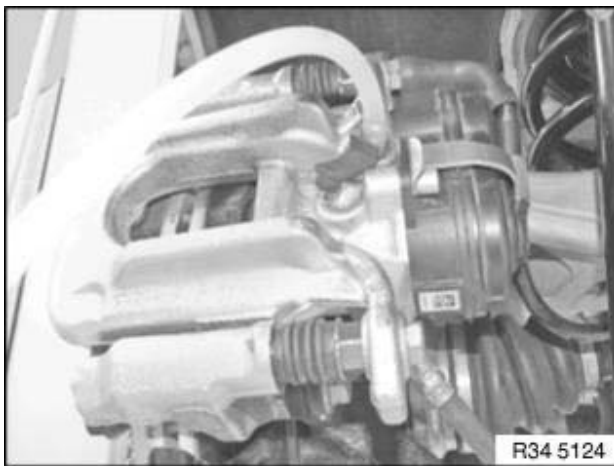


Fig. 7: Flushing Brake Caliper In Installation Position

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

Installation: Replace guide screws. Tightening torque, see 34 21 4AZ in **34 21 REAR BRAKE** .

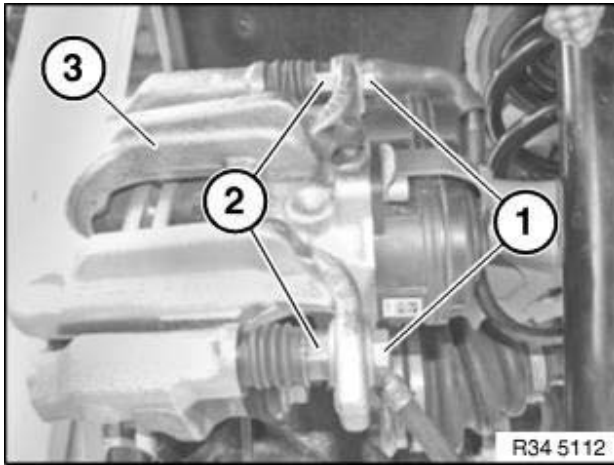


Fig. 8: Removing Brake Caliper

Disconnect plug connection on EMF actuator and disengage cable from cable tie. Turn brake caliper so that EMF actuator points downwards. Open bleed valve and flush brake caliper. Close bleed valve.

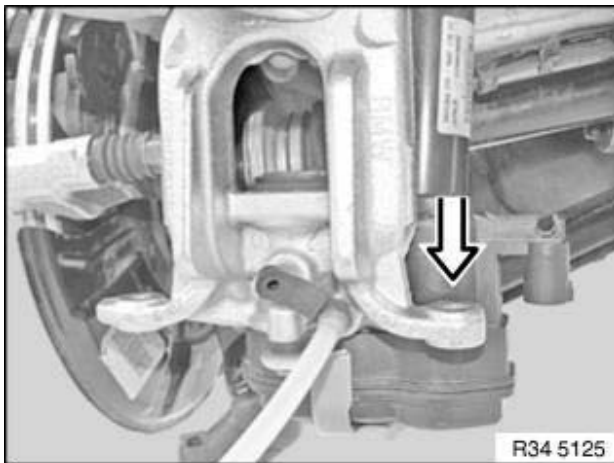


Fig. 9: Turn Brake Caliper So EMF Actuator Points Downwards

Turn brake caliper so that EMF actuator points upwards. Open bleed valve and flush brake caliper. Close bleed valve. Reinstall brake caliper in installation position and flush again.

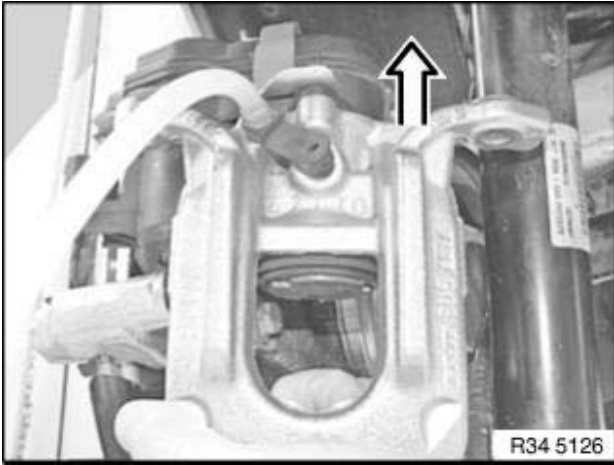


Fig. 10: Turn Brake Caliper So EMF Actuator Points Upwards

Switch off brake fluid changer and remove from expansion tank. Check brake fluid level. If necessary, top up/draw off to max. level. Close expansion tank.

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

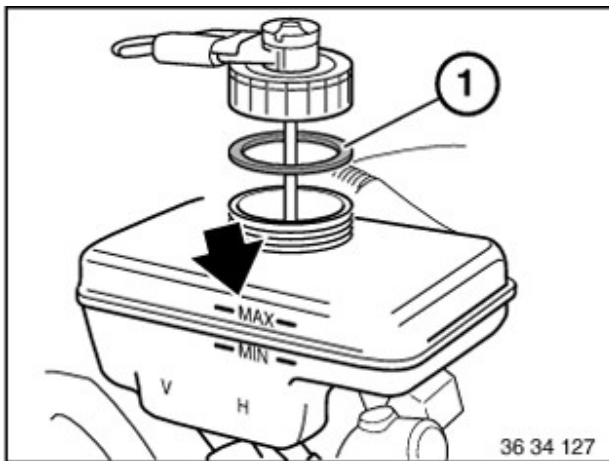


Fig. 11: Pay Attention To Rubber Seal (1) In Sealing Cap

34 00 ... CHECKING BRAKE DISCS

Necessary preliminary tasks

- Remove wheels.

Checking thickness difference:

- Measure thickness difference within brake surfaces at 8 points (spread over the circumference) with a micrometer gauge
- Compare measurement result with setpoint value.

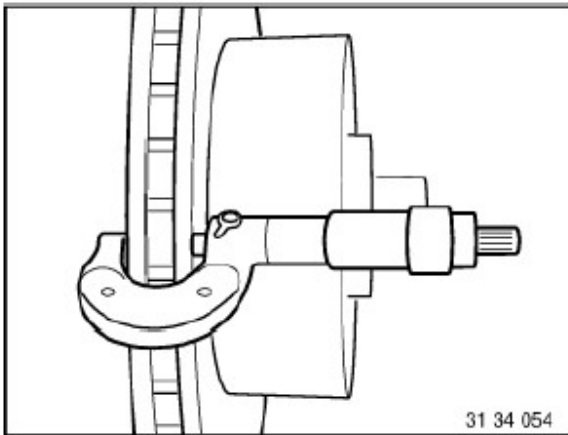


Fig. 12: Measuring Brake Surface Thickness Using Micrometer
 Courtesy of BMW OF NORTH AMERICA, INC.

Check minimum brake disc thickness:

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

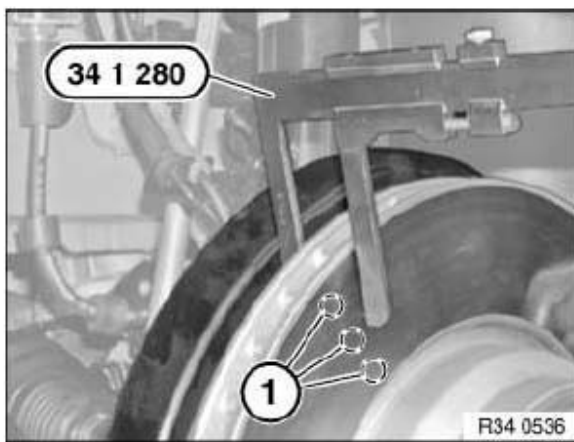


Fig. 13: Positioning Special Tool (34 1 280) At Three Measuring Points
 Courtesy of BMW OF NORTH AMERICA, INC.

34 00 009 CHECKING BRAKES ON TEST STAND

Necessary preliminary tasks

- Check tires for damage
- Check tyre treads
- Check tyre pressure

**IMPORTANT: The corresponding system must be deactivated on vehicles equipped with DSC.
The DSC indicator and warning light in the instrument panel must light up!**

The brakes must be at normal operating temperature. To do so, gently warm up the brake discs and brake drums while dry by braking the vehicle several times.

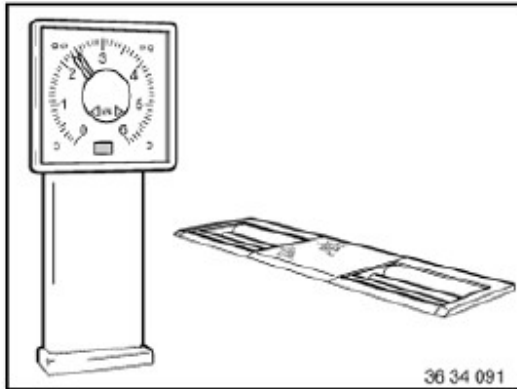


Fig. 14: Identifying Brake Test Stand
Courtesy of BMW OF NORTH AMERICA, INC.

**IMPORTANT: Only brake test stands with test speeds of 2.5-6 km/h may be used.
You must follow without fail the guidelines contained in the operating instructions of the relevant test stand manufacturer.
Failure to do so may result in damage to the vehicle and the system and also personal injury.**

34 00 010 CHECKING THICKNESS OF BRAKE PAD

Checking thickness of brake pad

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

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

Insert special tool **34 1 260** through 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**

Safe limit for lining wear, front brake.
Safe limit for lining wear, rear brake.

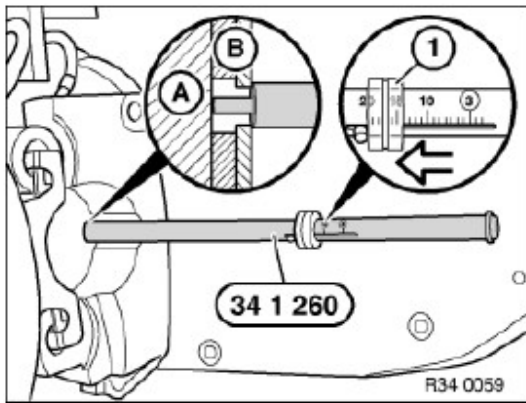


Fig. 15: Sliding Ring

Courtesy of BMW OF NORTH AMERICA, INC.

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.

General

- 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.
- Do not under any circumstances allow any oil or grease to get into the brake system.

This would result in a complete malfunction of the brake system.

- When cleaning brake components with brake cleaner, do not allow brake cleaner to get into in the brake system.
- Even the most minute traces of brake cleaner must be avoided.

Brake fluid

- Replace brake fluid at least every two years.
- Never reuse drained brake fluid.
- Always use BMW-approved brake fluid, refer to **BRAKES - OPERATING FLUIDS** .
- Dispose of brake fluid in approved appliances only.
- 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.

Wheel brakes

- Brake pads:

Brake pads must be replaced when the warning threshold of the brake pad wear indicator See **REAR BRAKE** or **FRONT BRAKE** is reached.

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 oil or grease. 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 See **REAR BRAKE** or **FRONT BRAKE** , disc runout, parallelism and surface roughness of the friction surfaces must not exceed or drop below the permitted values.

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

- Always strip preservative off new parts before installation.
- Brake calipers:

Only approved glycol-based 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 caliper guides.

Brake lines, brake hoses

- 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 position.
- Close off open connections of brake lines and individual components to prevent dirt from getting into the brake system.
- When tightening down brake line couplings, observe tightening torque **34 32 1AZ** .

Traction control system

The traction control system is essentially maintenance-free; however the following must be observed:

- 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.
- Terminals must be completely tight on end poles of battery.
- Brake lines on hydraulic unit must not be swapped over: if applicable, mark them prior to disassembly.

On completion of repair work, carry out swap-over test with the DIS diagnosis system.

34 00 ... GENERAL INFORMATION ON BRAKING IN NEW BRAKE DISCS/BRAKE PADS

IMPORTANT: After completing work:

- **Carry out function check on brake analyzer (test stand) to ensure that the brakes complies 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 interior rearview mirror.**

34 00 012 PARKING BRAKE FUNCTION CHECK

IMPORTANT: 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 parking brake actuators are released.

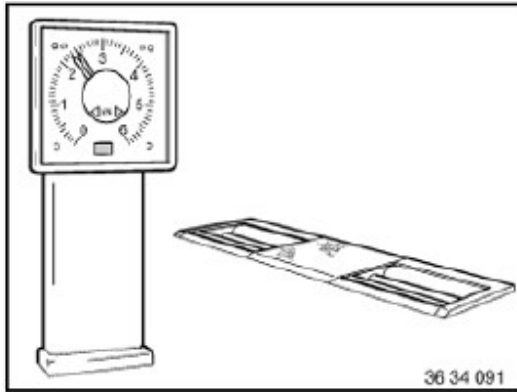


Fig. 16: Identifying Brake Test Stand (Parking Brake Function)
Courtesy of BMW OF NORTH AMERICA, INC.

Actuate parking brake switch = application of brake pads.

The parking brake indicator light flashes quickly when brake test stand mode is activated and parking brake 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

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 parking brake actuators are fully locked.

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

Checking brake force differential at wheel:

Apply parking brake until a wheel circumferential force (measured on brake test stand) of min. 1000 N is reached.

Max. permitted brake force differential right/left < or = 35 % (referred to greater brake value).

34 00 012 PARKING BRAKE FUNCTION CHECK

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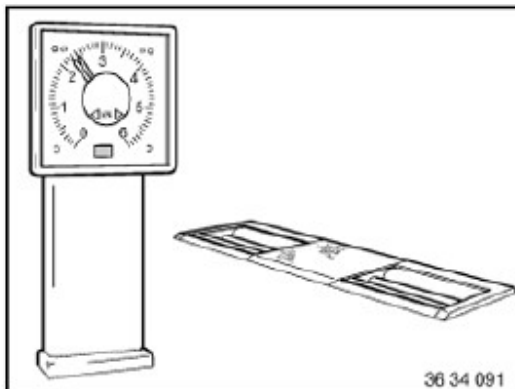


Fig. 17: Identifying Brake Test Stand (Parking Brake Function)
Courtesy of BMW OF NORTH AMERICA, INC.

Actuate parking brake switch = application of brake pads.

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Actuate parking brake switch = test force 1

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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 parking brake actuators are fully locked.

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

Checking brake force differential at wheel:

Apply parking brake until a wheel circumferential force (measured on brake test stand) of min. 1000 N is reached.

Max. permitted brake force differential right/left $\leq$ 35 % (referred to greater brake value).

34 00 027 REPLACING FLUID IN BRAKE SYSTEM

NOTE: READ AND COMPLY WITH GENERAL INFORMATION.

IMPORTANT: When carrying out repairs to the master brake cylinder or hydraulic unit, follow the procedure set out in BLEEDING BRAKE SYSTEM WITH DSC .
Under certain circumstances it is not possible after the brake system is opened to bleed the brake system fully at the rear EMF brake calipers. If there is still residual air in the rear brake calipers after normal bleeding, it will be necessary to work through an additional bleeding procedure !

Use only BMW-approved brake fluids, see BRAKES - OPERATING FLUIDS

Connect brake fluid changer to expansion tank and switch on.

NOTE: Check relevant equipment manufacturer's operating instructions for each device.
Charging pressure should not exceed 2 bar.

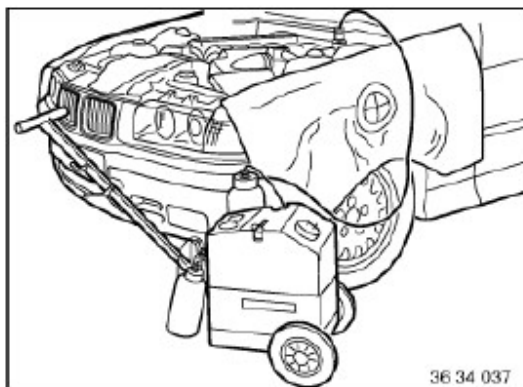


Fig. 18: Connecting Brake Fluid Changer To Expansion Tank
Courtesy of BMW OF NORTH AMERICA, INC.

Fully rinse the 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.

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

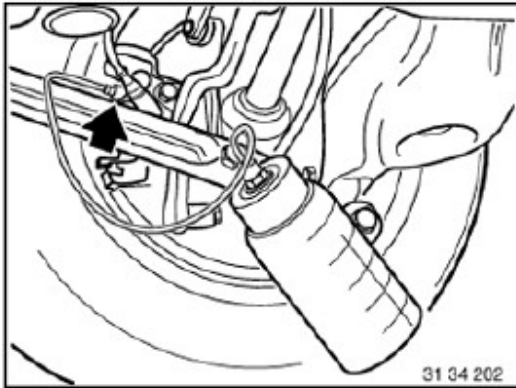


Fig. 19: Locating Bleeder Valve On Rear Right Brake Caliper
 Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: The clutch slave cylinder must also be scavenged in vehicles with manual transmissions.

Switch off brake fluid changer and remove from expansion tank.

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

Close expansion tank.

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

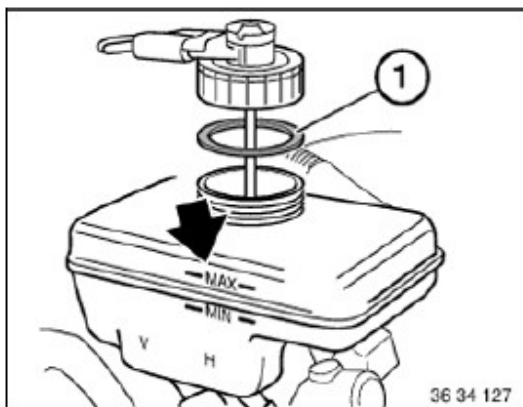


Fig. 20: Locating Brake Fluid Level Marking (Max)
 Courtesy of BMW OF NORTH AMERICA, INC.

After installation

- Reset CBS display according to factory specification:
- Switch on the ignition (terminal 15)

- Press the trip odometer for approximately 10 seconds until the first CBS item appears. (The next item is reached by briefly pressing the button again)
- If the value is to be reset, press the button again for approximately 3 seconds until "Reset?" appears.
- Reset is confirmed by pressing the button again for 3 seconds.

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

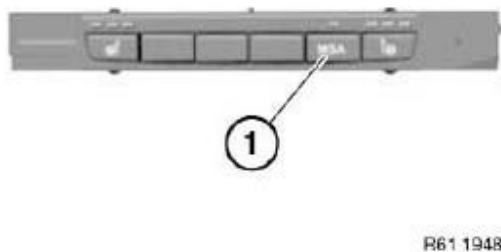


Fig. 21: Identifying MSA Button

Courtesy of BMW OF NORTH AMERICA, INC.

- 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

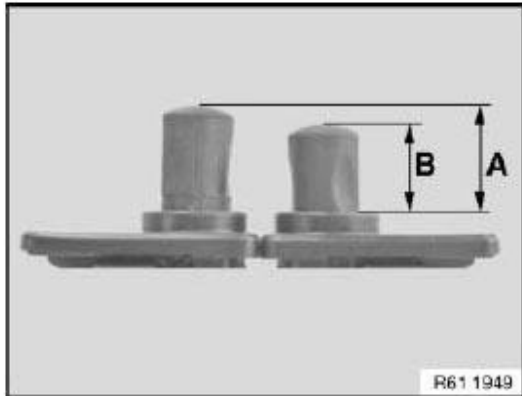


Fig. 22: Identifying Basic Setting For Engine Hood/Bonnet Open
Courtesy of BMW OF NORTH AMERICA, INC.

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 for diagnosis tool.

3411 FRONT BRAKES

34 00 ... CHECKING BRAKE DISCS

Necessary preliminary tasks

- Remove wheels.

Checking thickness difference:

- Measure thickness difference within brake surfaces at 8 point (spread over the circumference) with a micrometer gauge
- Compare measurement result with setpoint value

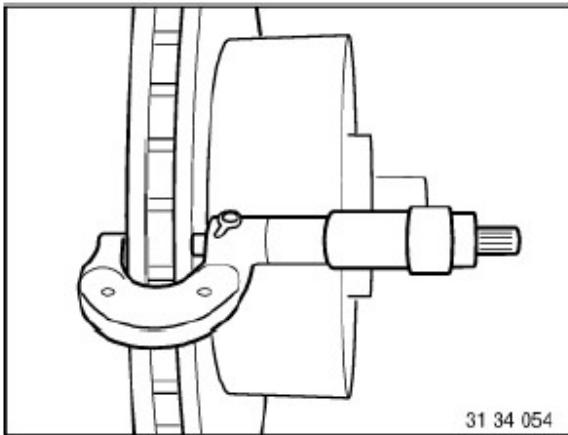


Fig. 23: Measuring Brake Disc Surface Thickness
 Courtesy of BMW OF NORTH AMERICA, INC.

Check minimum brake disc thickness:

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

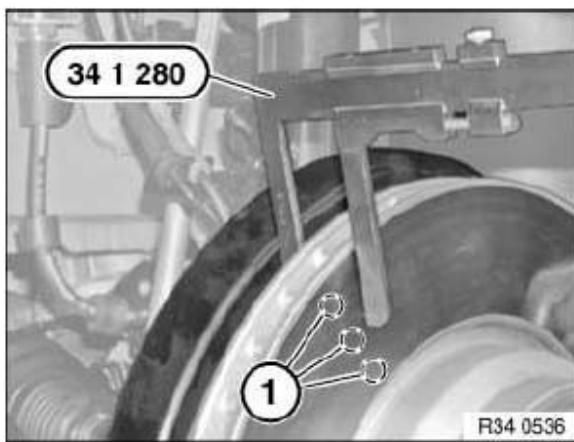
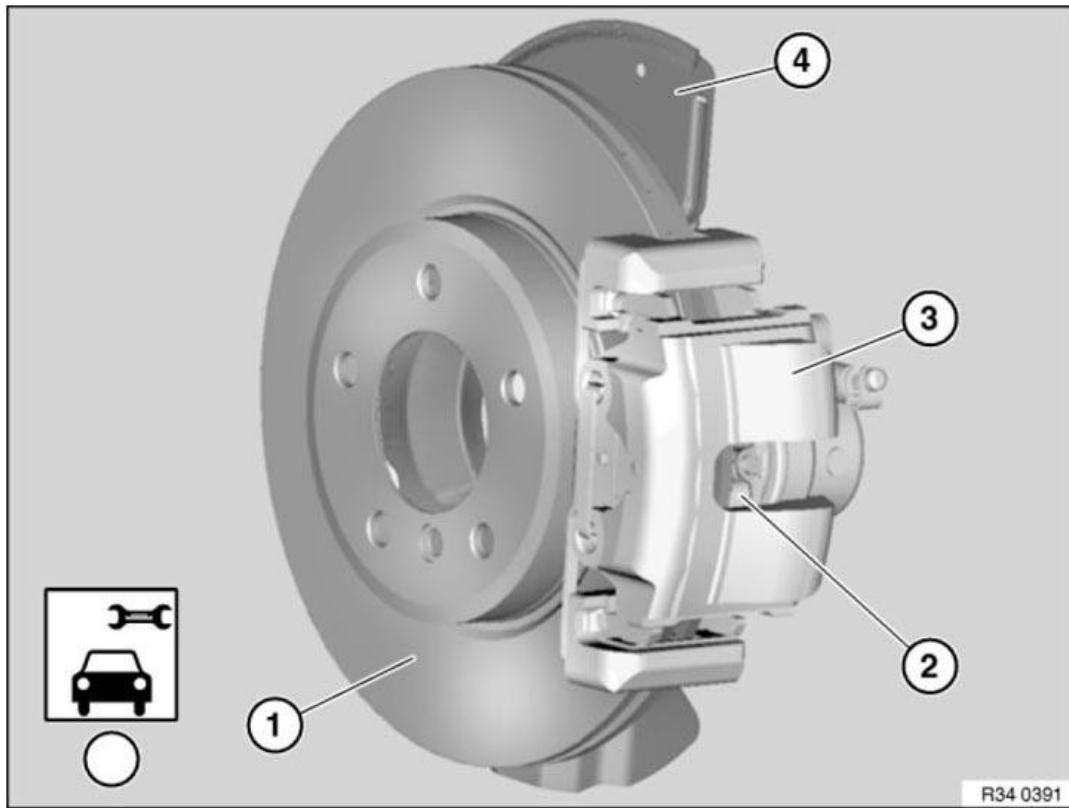


Fig. 24: Positioning Special Tool (34 1 280) At Three Measuring Points
 Courtesy of BMW OF NORTH AMERICA, INC.

34 11 ... OVERVIEW OF FRONT BRAKES



- 1 Brake disc
- 2 Brake pad
- 3 Brake calliper
- 4 Brake guard plate

Fig. 25: Overview Of Front Brakes
 Courtesy of BMW OF NORTH AMERICA, INC.

1. Brake disc
2. Brake pad
3. Brake calliper
4. Brake guard plate
5. Checking thickness of brake pad

34 11 667 PRECISION-TURNING BOTH FRONT BRAKE DISCS ON BOTH SIDES

IMPORTANT: Always precision-turn both sides of both brake discs on one axle.
 Observe Max. machining dimension per friction ring side
 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).

Stationary brake disc lathe

IMPORTANT: Only BMW-approved brake disc lathes may be used!

In the case of stationary brake disc lathes, the brake disc must be removed.

Please refer to the lathe manufacturer's instruction manual for the exact procedure.

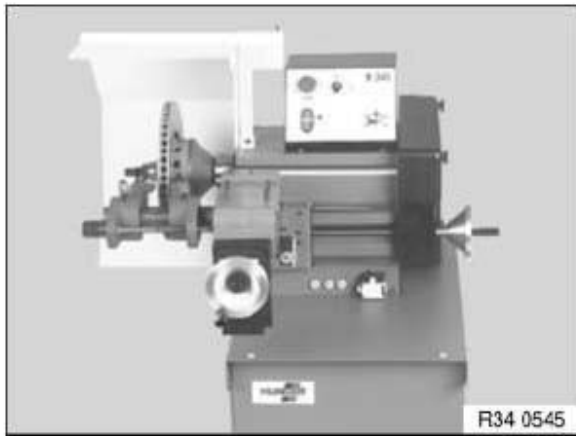


Fig. 26: Identifying Stationary Brake Disc Lathe
Courtesy of BMW OF NORTH AMERICA, INC.

Mobile brake disc lathe

IMPORTANT: Only BMW-approved brake disc lathes may be used!

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

The brake discs remain on the car.

Please refer to the lathe manufacturer's instruction manual for the exact procedure.



Fig. 27: Identifying Mobile Brake Disc Lathe

Courtesy of BMW OF NORTH AMERICA, INC.

After fine-grinding the brake discs, measure the thickness difference inside the braking surfaces at 8 points with an external micrometer.

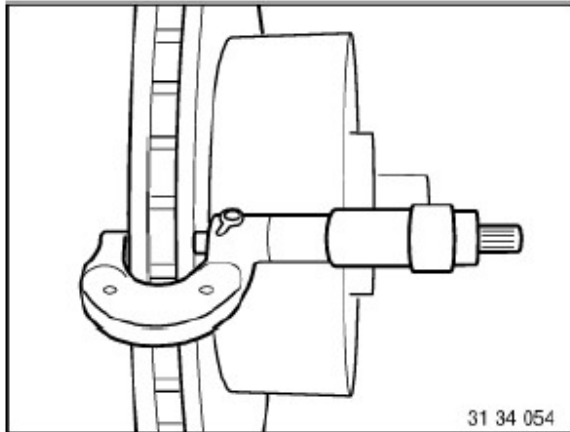


Fig. 28: Checking Brake Disc Thickness
Courtesy of BMW OF NORTH AMERICA, INC.

34 11 250 REMOVING AND INSTALLING/REPLACING A BRAKE CARRIER/BRAKE GUARD PLATE AT FRONT

Necessary preliminary tasks

- Remove front **BRAKE DISCS**

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

Installation:

Tightening torque **34 11 3AZ** .

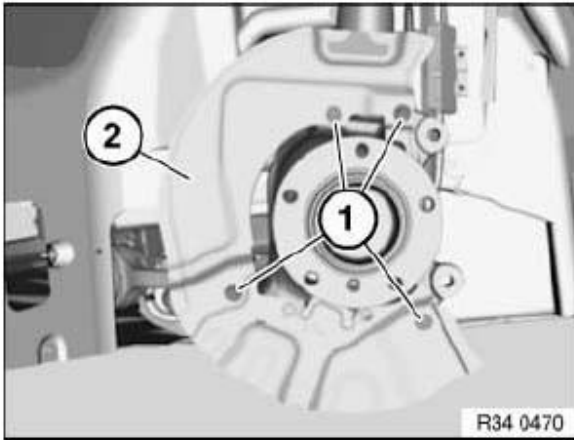


Fig. 29: Identifying Brake Guard Plate With Mounting Screws
Courtesy of BMW OF NORTH AMERICA, INC.

34 11 000 REMOVING AND INSTALLING OR REPLACING BRAKE PADS ON BOTH FRONT DISC BRAKES (TEVES FLOATING CALIPER)

Special tools required

IMPORTANT:

- **Brake pad wear sensor:** after removal it must be replaced (brake pad wear sensor loses its retention capability in the brake pad).
- **Retaining spring:** for vehicles older than 48 months it is recommended to replace the retaining spring!

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 no. 83 19 2 154 780 and apply a thin coating of brake pad paste BMW part no. 83 19 2 158 851.

Necessary preliminary work

- Remove **WHEELS** .
- Remove **BRAKE PAD WEAR SENSOR**

Lift out retaining spring (1).

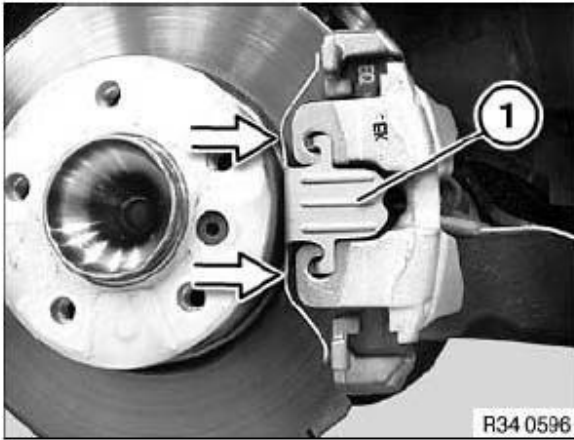


Fig. 30: Lifting Out Retaining Spring
 Courtesy of BMW OF NORTH AMERICA, INC.

Remove plastic plugs (1).

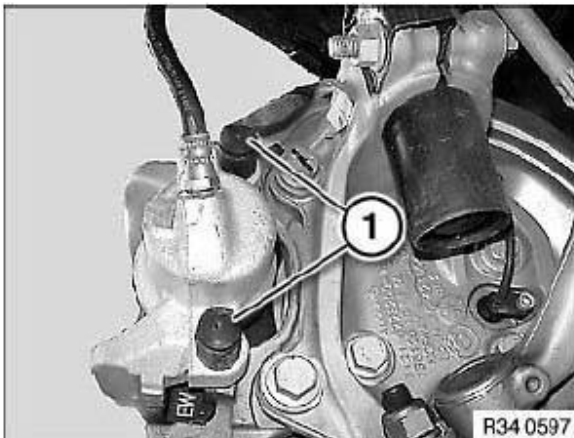


Fig. 31: Identifying Plastic Plugs
 Courtesy of BMW OF NORTH AMERICA, INC.

Unfasten guide screws (1) and lift out brake caliper towards rear of vehicle.

Installation note:

Tightening torque **34 11 4AZ** .

Clean guide screws only; do not grease.

Check threads.

Replace all guide bolts which are not in perfect condition.

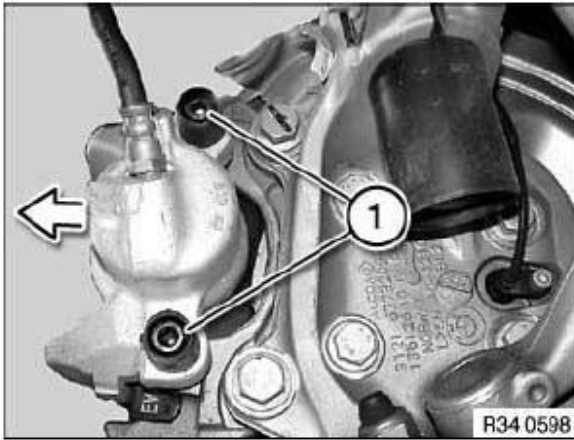


Fig. 32: Lifting Out Brake Calliper
 Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Tie brake caliper back and do not allow to hang from brake hose.

Remove outer brake pad.

Inner brake pad is located with its spring in the piston.

IMPORTANT: Mark any worn brake pads.
 In the event of one-sided brake pad wear, do not change brake pads round.

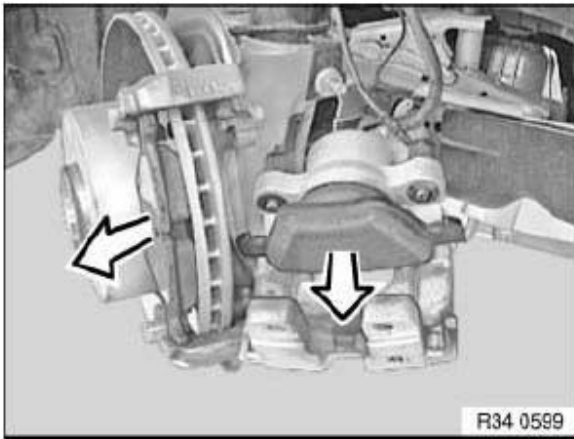


Fig. 33: Removing Outer Brake Pad
 Courtesy of BMW OF NORTH AMERICA, INC.

Observe MINIMUM THICKNESS OF BRAKE PADS .

Clean brake pads.

Do not grease backs of brake pads sleeve.

NOTE: **The outer brake pads gradually need to be changed as well.**

The previous version (A) with retaining spring (1) is replaced by brake pads of version (B) without retaining spring!

The use of pad sets of version (A) with retaining spring continues to be permissible!

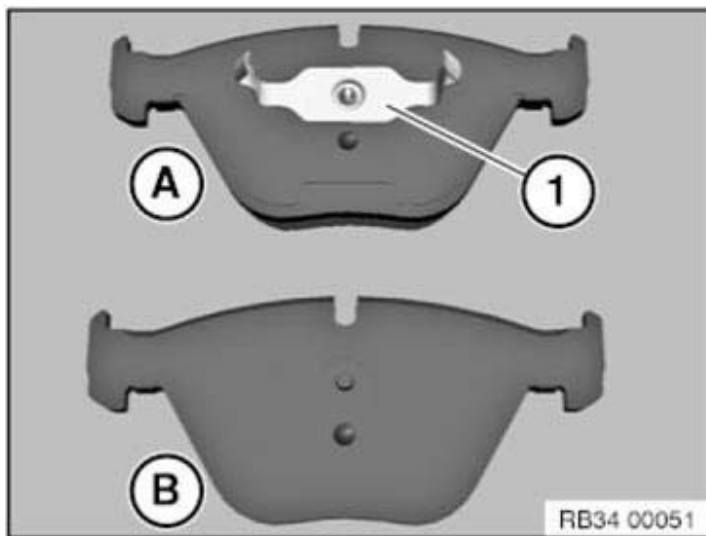


Fig. 34: Identifying Brake Pads With/Without Retaining Spring
Courtesy of BMW OF NORTH AMERICA, INC.

Check minimum brake disc thickness:

- Position special tool 34 1 280 at three measuring points in area (1) and measure.
- Compare measurement result and lowest value with SETPOINT VALUE .

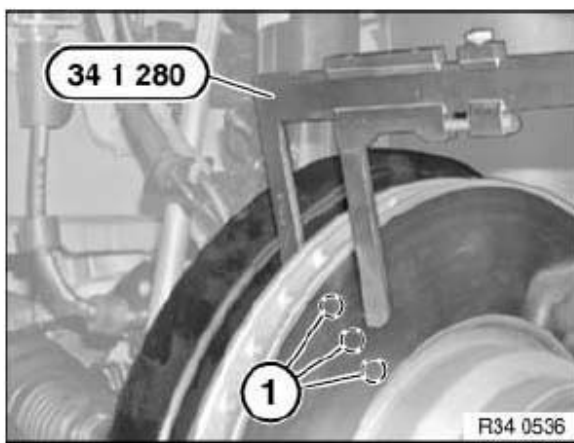


Fig. 35: Positioning Special Tool (34 1 280) At Three Measuring Points
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: New brake pads may only be fitted if the brake disc thickness is greater than the MINIMUM BRAKE DISC THICKNESS (MIN TH).

IMPORTANT: When pressing down piston, note brake fluid level in expansion tank.

Overflowing brake fluid will damage the paintwork.

Turn piston back fully with special tool 34 1 050.

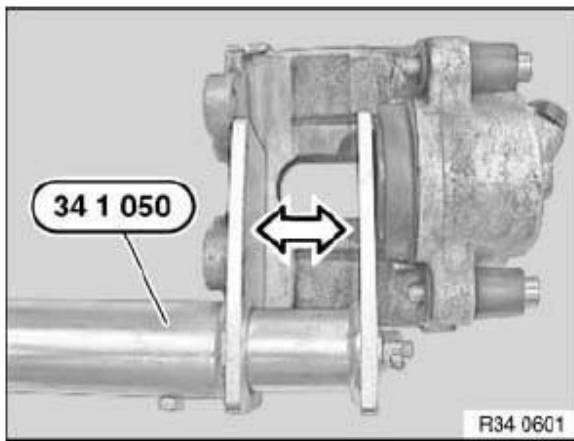


Fig. 36: Turning Piston Using Special Tool (34 1 050)
Courtesy of BMW OF NORTH AMERICA, INC.

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

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

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

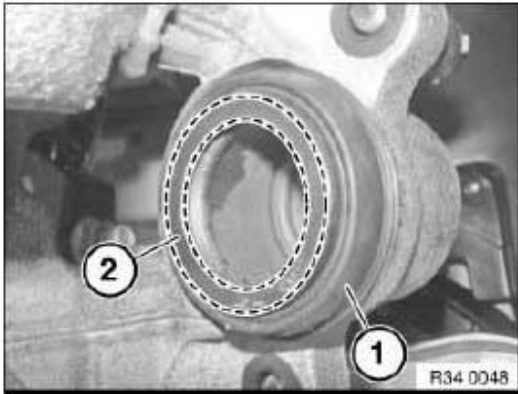


Fig. 37: Identifying Dust Boot And Brake Piston Contact Surface
 Courtesy of BMW OF NORTH AMERICA, INC.

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

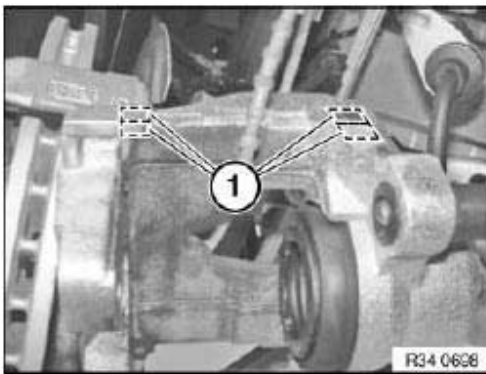


Fig. 38: Identifying Brake Pad Tee Heads/Brake Caliper Housing Contact Surface
 Courtesy of BMW OF NORTH AMERICA, INC.

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

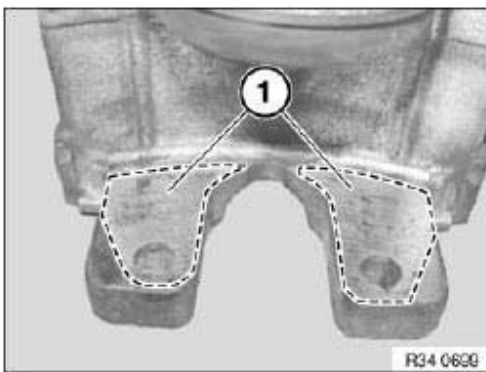


Fig. 39: Identifying Brake Caliper Contact Surface

Courtesy of BMW OF NORTH AMERICA, INC.

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. Instead, clean with and apply a thin coating of brake pad paste.

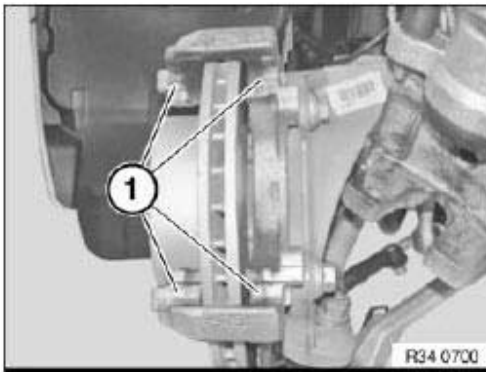


Fig. 40: Identifying Brake Pad Guide Surface
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: **After completing work:**

- When installing new brake pads at front and rear axles, brake fluid level must be brought up to "MAX" marking.
- Fully depress brake pedal several times so that brake pads contact brake discs.
- Read and comply with notes on braking in new brake discs/brake pads.
- When replacing pads, reset CBS display in accordance with factory specification.

34 11 220 REMOVING AND INSTALLING/REPLACING BOTH FRONT BRAKE DISCS

Special tools required

Necessary preliminary tasks

- Remove **WHEELS** .
- Remove and clean **BRAKE PADS**

Check minimum brake disc thickness:

- Position special tool 34 1 280 at three measuring points in area (1) and measure.
- Compare measurement result and lowest value with **SETPPOINT VALUE** .

If the brake discs are replaced, you must also fit new brake pads.

Brake discs may only be replaced in pairs (on each axle).

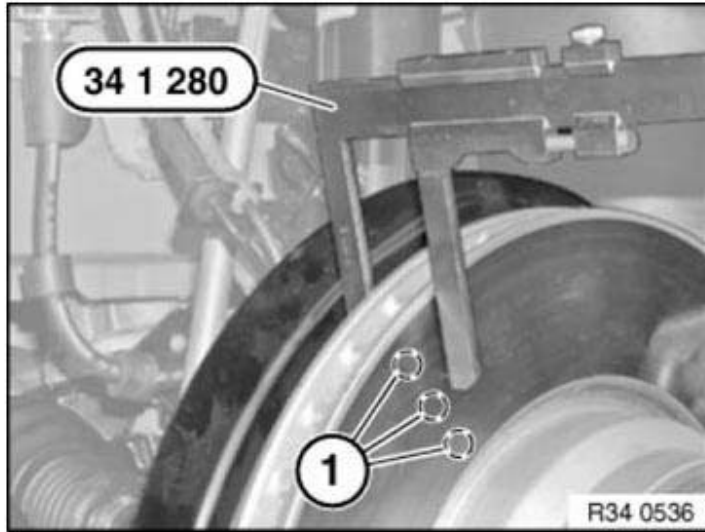


Fig. 41: Positioning Special Tool (34 1 280) At Three Measuring Points
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: New brake pads may only be fitted if the brake disc thickness is greater than the **MINIMUM BRAKE DISC THICKNESS (MIN TH)**.

Release screws (1), remove brake calliper (2) with brake console (3) and tie back.

Installation:

Tightening torque **34 11 2AZ** .

Check that brake hose is correctly seated in holder.

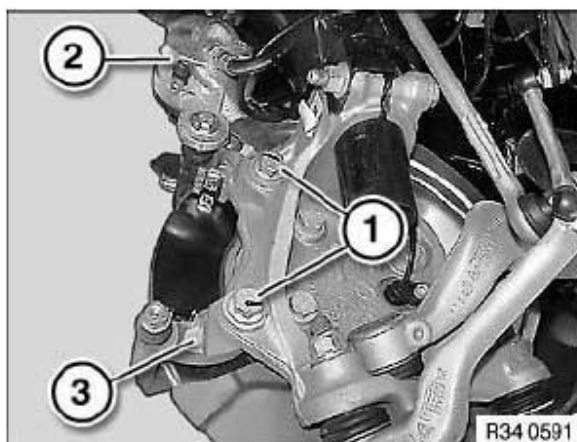


Fig. 42: Identifying Brake Calliper And Brake Console With Mounting Screws

Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: To release brake disc: Do not under any circumstances strike friction ring with a hammer or similar!
If necessary, carefully tap on base of brake disc chamber with a rubber mallet.
Clean contact surface of brake disc at wheel hub thoroughly and remove traces of corrosion.
Unevenness on contact surface may result in distortion of brake disc!

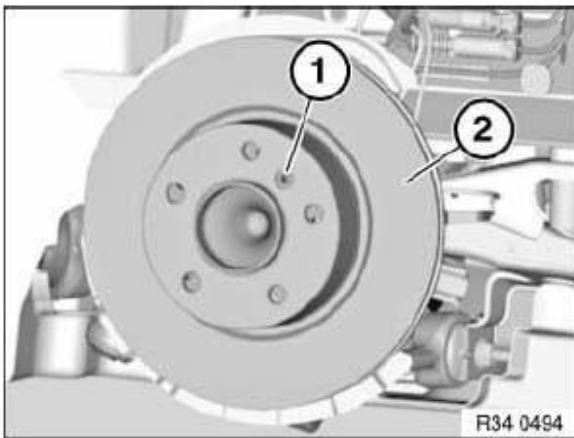


Fig. 43: Identifying Brake Disc With Mounting Screws
Courtesy of BMW OF NORTH AMERICA, INC.

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

Installation:

Replace screw.

Tightening torque **34 11 1AZ** .

After installation

- Read and comply with notes on **BRAKING IN NEW BRAKE DISCS/BRAKE PADS** .

34 11 020 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT FRONT BRAKE CALIPER

IMPORTANT: 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).

Necessary preliminary tasks

- Remove **WHEELS** .

- Read and comply with GENERAL INFORMATION .

After completing work: BLEED BRAKING SYSTEM

Press clutch 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.

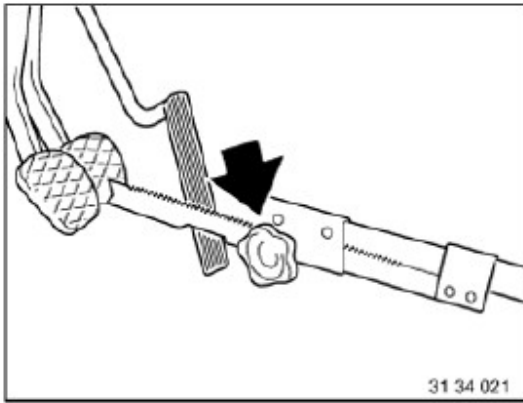


Fig. 44: Locating Brake Tensioner
Courtesy of BMW OF NORTH AMERICA, INC.

Pull brake hose out of both holders (1).

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

Disconnect brake hose from brake line (3).

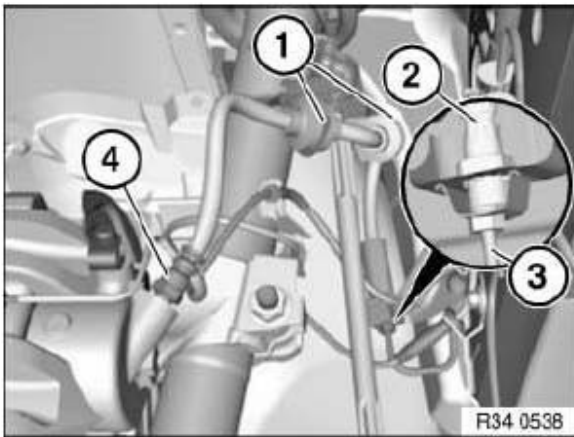


Fig. 45: Identifying Brake Calliper, Brake Line, Brake Hose Square Head And Holder
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Tightening torque **34 32 1AZ** .

Detach brake hose from brake caliper (4).

Installation:

Tightening torque **34 32 2AZ** .

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

NOTE: **First tighten brake hose on brake caliper.**
 Move wheels into straight-ahead position.
 Insert brake hose in bracket and screw onto brake pipe.

Unscrew guide bolts (1).

Remove brake calliper by pulling upwards.

Installation:

Clean guide screws only; do not grease.

Check threads.

Replace all guide screws which are not in perfect condition.

Tightening torque **34 11 4AZ** .

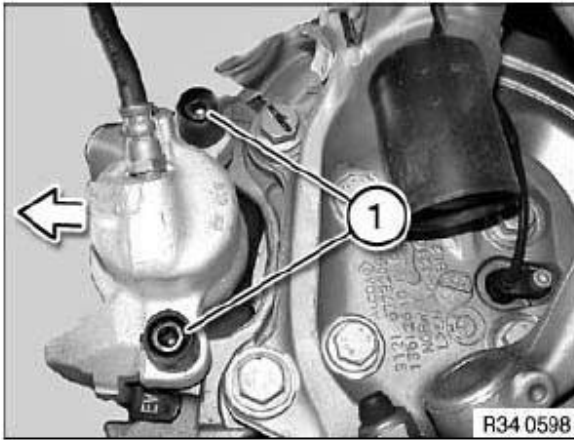


Fig. 46: Pulling Brake Calliper
 Courtesy of BMW OF NORTH AMERICA, INC.

3421 REAR BRAKES

34 00 ... CHECKING BRAKE DISCS

Special tools required

Necessary preliminary tasks

- Remove wheels.

Checking thickness difference:

- Measure thickness difference within brake surfaces at 8 point (spread over the circumference) with a micrometer gauge
- Compare measurement result with setpoint value

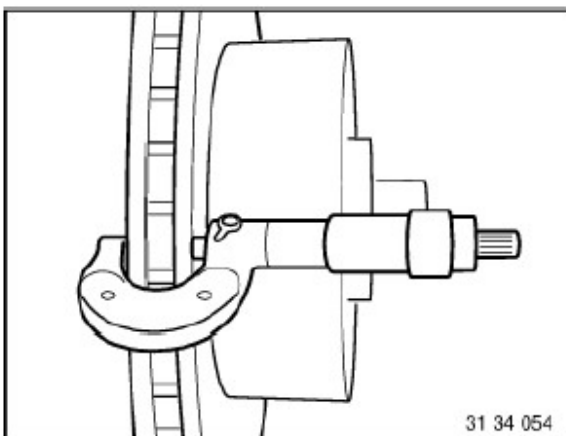


Fig. 47: Checking Brake Disc Thickness

Courtesy of BMW OF NORTH AMERICA, INC.

Check minimum brake disc thickness:

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

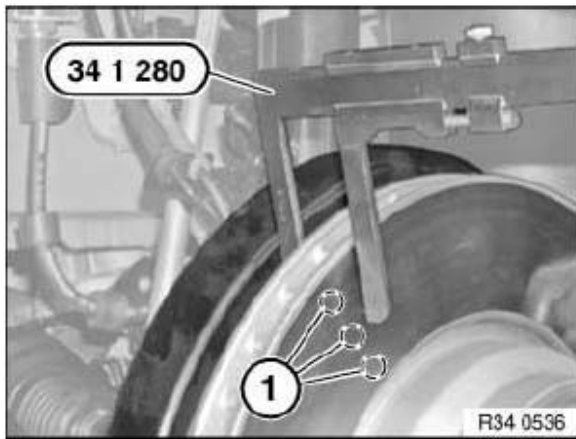
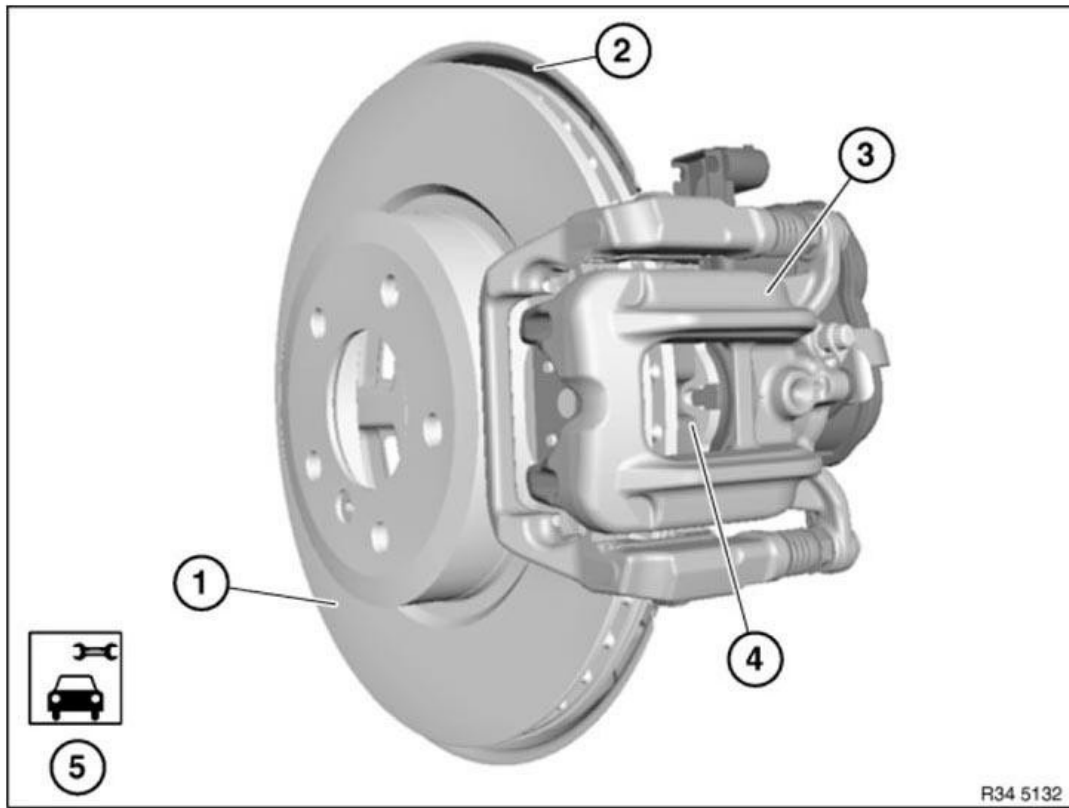


Fig. 48: Positioning Special Tool (34 1 280) At Three Measuring Points
Courtesy of BMW OF NORTH AMERICA, INC.

34 21 ... OVERVIEW OF REAR BRAKE



- | | |
|-------------------------|--|
| 1 <u>Brake disc</u> | 4 <u>Brake guard plate</u> |
| 2 <u>Brake pad</u> | 5 <u>Checking thickness of brake pad</u> |
| 3 <u>Brake calliper</u> | |

Fig. 49: Overview Of Rear Brake

Courtesy of BMW OF NORTH AMERICA, INC.

1. Brake disc
2. Brake pad
3. Brake calliper
4. Brake guard plate
5. Checking thickness of brake pad

34 21 947 PRECISION-TURNING BOTH REAR BRAKE DISCS ON BOTH SIDES

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

Observe Max. machining dimension per friction ring side

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).

Stationary brake disc lathe

IMPORTANT: Only may be used!

In the case of stationary brake disc lathes, the brake disc must be removed.

Please refer to the lathe manufacturer's instruction manual for the exact procedure.

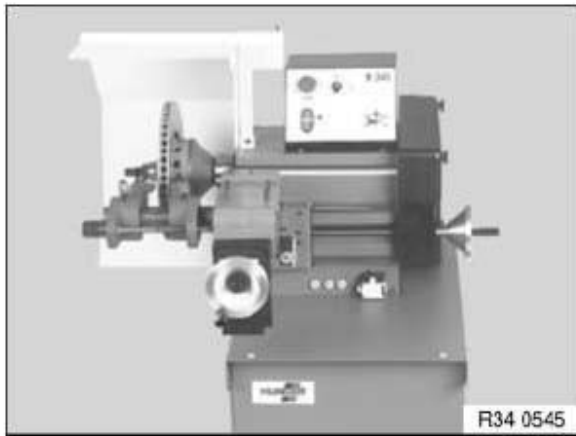


Fig. 50: Identifying Stationary Brake Disc Lathe
Courtesy of BMW OF NORTH AMERICA, INC.

Mobile brake disc lathe

IMPORTANT: Only may be used!

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

The brake discs remain on the car.

Please refer to the lathe manufacturer's instruction manual for the exact procedure.



Fig. 51: Identifying Mobile Brake Disc Lathe

Courtesy of BMW OF NORTH AMERICA, INC.

After fine-grinding the brake discs, measure the thickness difference inside the braking surfaces at 8 points with an external micrometer.

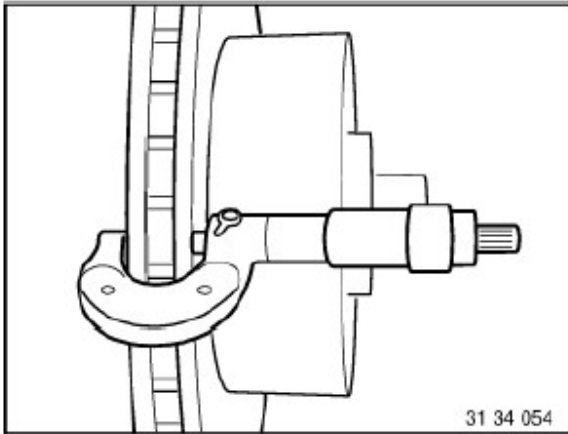


Fig. 52: Checking Brake Disc Thickness
Courtesy of BMW OF NORTH AMERICA, INC.

34 21 320 REMOVING AND INSTALLING OR REPLACING BOTH REAR BRAKE DISCS

Necessary preliminary tasks

- Remove **WHEELS** .
- Remove **BRAKE PADS**

After completing work:

- Read and comply with notes on **BRAKING IN NEW BRAKE DISCS/BRAKE PADS** .

Check minimum brake disc thickness:

- Position special tool 34 1 280 at three measuring points in area (1) and measure.
- Compare measurement result and lowest value with **SETPOINT VALUE** .

NOTE: **If the brake discs are replaced, you must also fit new brake pads.
Always replace brake discs in pairs.**

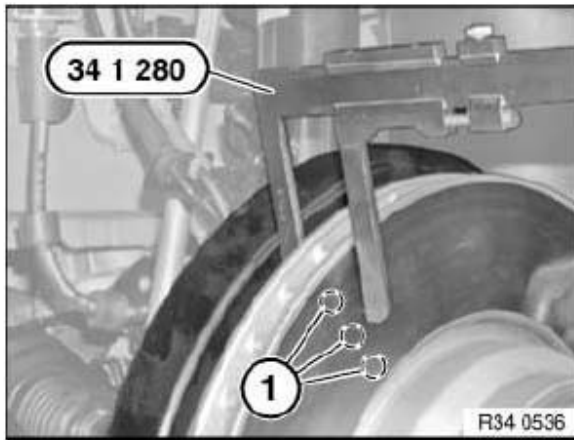


Fig. 53: Positioning Special Tool (34 1 280) At Three Measuring Points
 Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: New brake pads may only be fitted if the brake disc thickness is greater than the **MINIMUM BRAKE DISC THICKNESS (MIN TH)**.
 Release screws (1). Detach brake caliper mounting bracket.

Installation:

Tightening torque **34 21 2AZ** .

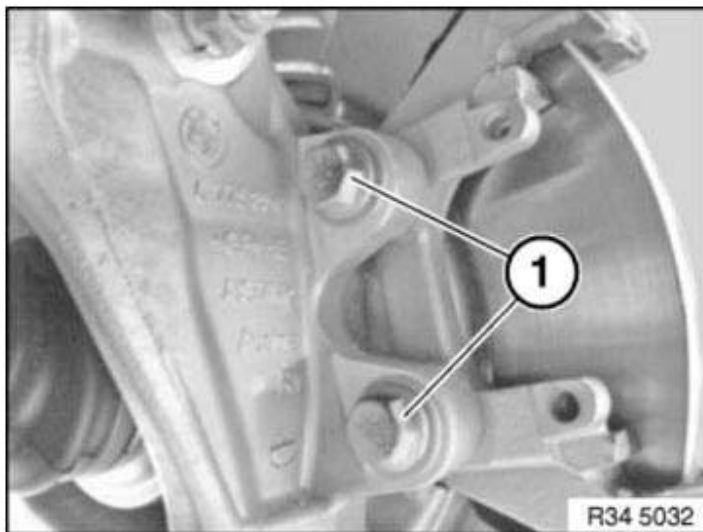


Fig. 54: Identifying Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: To release brake disc: Do not under any circumstances strike friction ring with a hammer or similar!
 If necessary, carefully tap on base of brake disc chamber with a rubber mallet.
 Clean contact surface of brake disc at wheel hub thoroughly and remove traces of corrosion.

Unevenness on contact surface may result in distortion of brake disc!

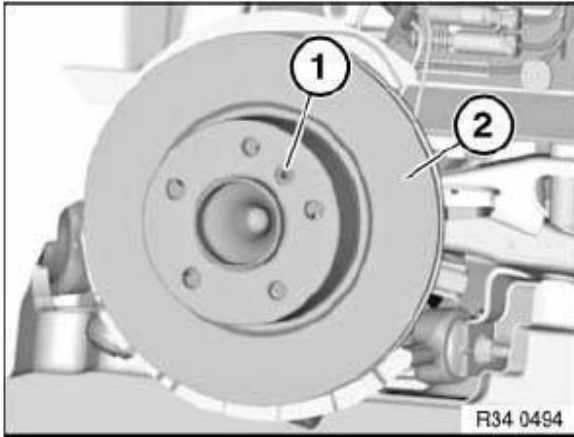


Fig. 55: Identifying Brake Disc With Mounting Screws
Courtesy of BMW OF NORTH AMERICA, INC.

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

Installation:

Replace screw.

Tightening torque **34 21 1AZ** .

34 21 200 REMOVING AND INSTALLING OR REPLACING BRAKE PADS ON BOTH REAR DISC BRAKES (TRW FLOATING CALIPER)

Replacing Brake Pads

IMPORTANT:

- **Brake pad wear sensor:** after removal it must be replaced (brake pad wear sensor loses its retention capability in the break pad).
- **Retaining spring:** for vehicles older than 48 months it is recommended to replace the retaining spring!

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 no. 83 19 2 154 780 and apply a thin coating of brake pad paste BMW part no. 83 19 2 158 851.

Before removing the brake pads, move the actuators of the electric parking brake into an installation position.

The following procedure must be carried out:

- Connect BMW diagnosis system
- Carry out vehicle test
- Carry out Service function parking brake/installation position

Necessary preliminary work

- Remove **WHEELS** .
- Remove rear **BRAKE PAD WEAR SENSOR**

Unscrew guide bolts (1).

If necessary, grip at hexagon head (2).

Remove brake caliper (3).

Installation note:

Replace guide bolts.

Tightening torque **34 21 4AZ** .

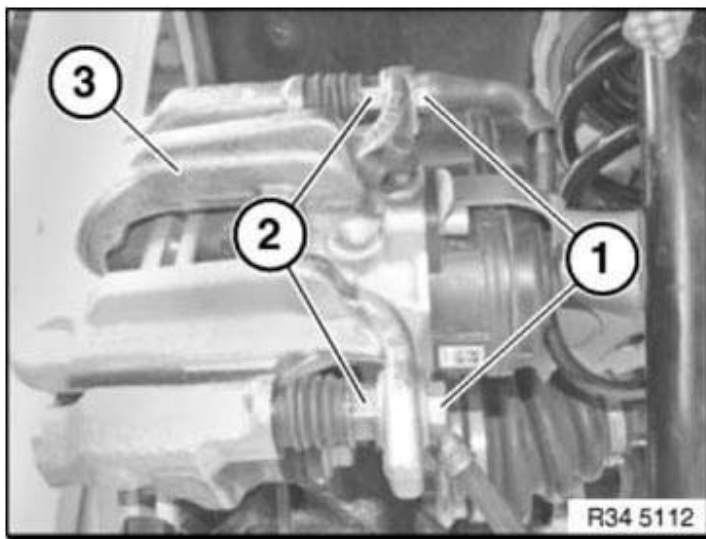


Fig. 56: Identifying Brake Caliper And Guide Bolts With Hexagon Head
 Courtesy of BMW OF NORTH AMERICA, INC.

Remove brake pads (1) in direction of arrow from brake anchor plate.

IMPORTANT: Mark any worn brake pads.

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

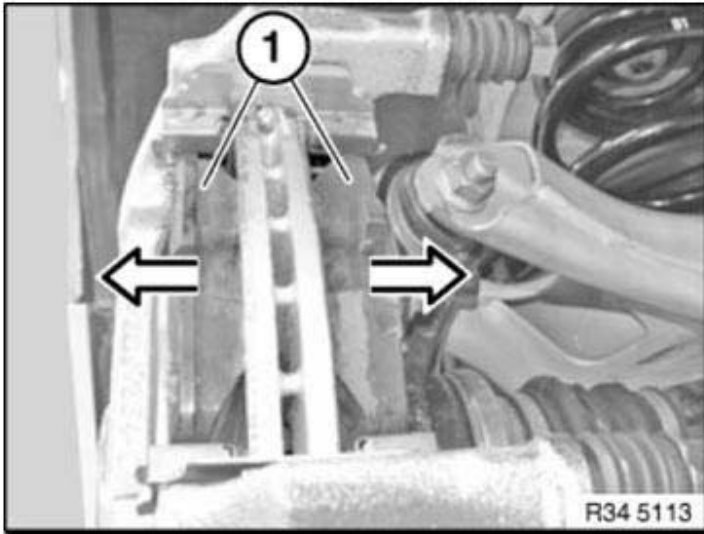


Fig. 57: Removing Brake Pads From Brake Anchor Plate
 Courtesy of BMW OF NORTH AMERICA, INC.

Observe **MINIMUM THICKNESS OF BRAKE PADS** .

Clean brake pads.

Do not apply grease to brake lining backplate.

Check minimum brake disc thickness:

- Position special tool 34 1 280 at three measuring points in area (1) and measure.
- Compare measurement result and lowest value with **SETPOINT VALUE** .

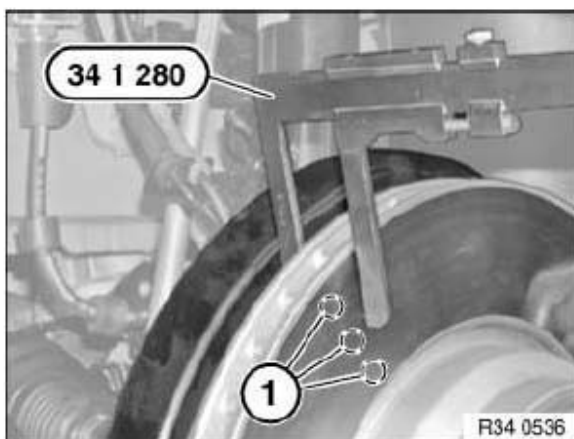


Fig. 58: Positioning Special Tool (34 1 280) At Three Measuring Points
 Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: New brake pads may only be fitted if the brake disc thickness is greater than the MINIMUM BRAKE DISC THICKNESS (MIN TH).

Press brake piston fully back with special tool 34 1 050.

IMPORTANT: When pressing piston back, note brake fluid level in expansion tank.
Overflowing brake fluid will damage the paintwork.

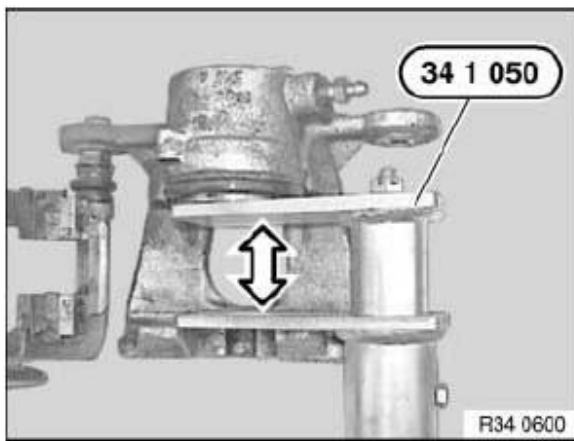


Fig. 59: Pressing Brake Piston Using Special Tool (34 1 050)
Courtesy of BMW OF NORTH AMERICA, INC.

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

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

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

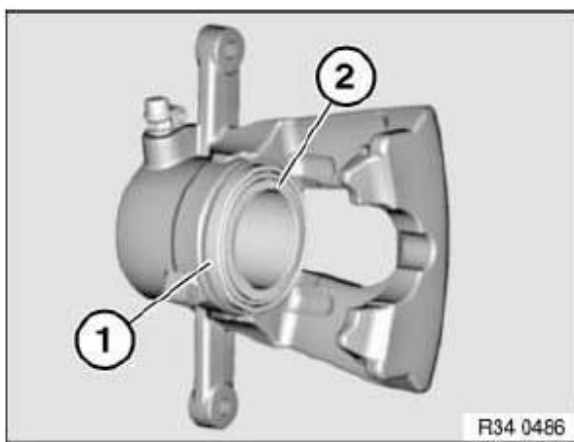


Fig. 60: Identifying Dust Boot And Brake Piston Contact Surface

Courtesy of BMW OF NORTH AMERICA, INC.

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

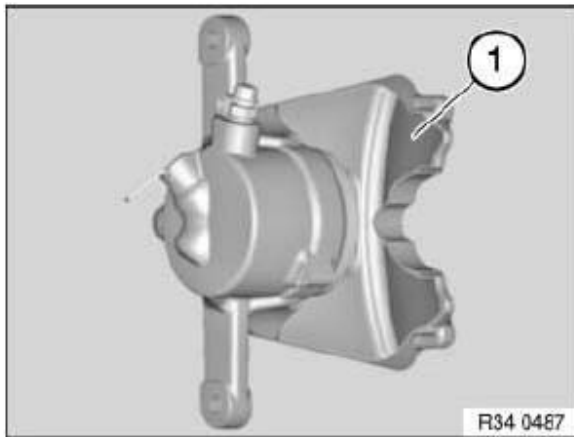


Fig. 61: Identifying Brake Caliper Contact Surface
Courtesy of BMW OF NORTH AMERICA, INC.

So as not to damage the surface coating, if **possible do not mechanically clean** pad guides (1). Instead, clean with brake cleaner and apply a thin coating of brake pad paste.

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

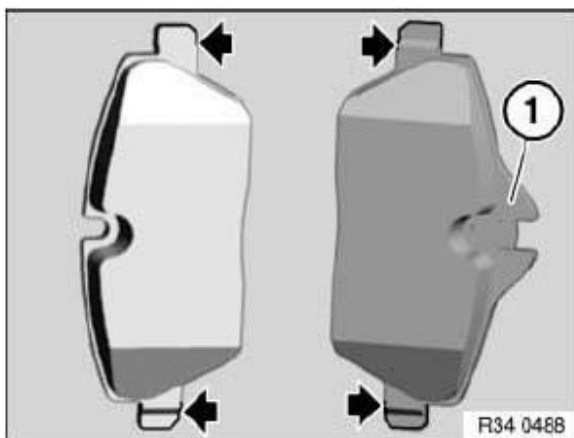


Fig. 62: Identifying Pad Guides
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: After completing work:

- Fully depress brake pedal several times so that brake pads contact brake

discs.

- When installing new brake pads at front and rear axles, brake fluid level must be brought up to "MAX" marking.
- Read and comply with notes on BRAKING IN NEW BRAKE DISCS/BRAKE PADS .
- When replacing pads, reset CBS display in accordance with factory specification.
- The installation position of the actuator is automatically cancelled when a speed signal is detected.

Replacement

Remove lining springs (1) and replace.

Installation note:

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.

Instead, clean with brake cleaner and apply a thin coating of brake pad paste.

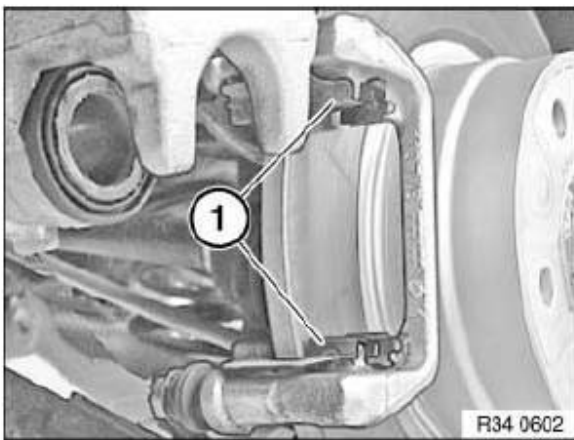


Fig. 63: Identifying Lining Springs

Courtesy of BMW OF NORTH AMERICA, INC.

34 21 745 REMOVING AND INSTALLING OR REPLACING REAR LEFT OR RIGHT BRAKE CALLIPER (TRW)

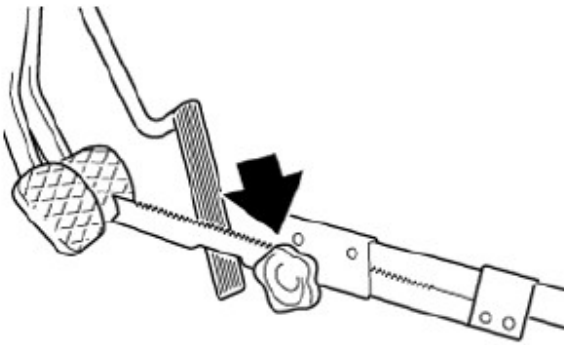
Necessary preliminary tasks

- Remove WHEEL
- Read and comply with GENERAL INFORMATION .
- Turn off ignition

After completing work: **BLEED BRAKING SYSTEM**

Press clutch 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.



31 34 021

Fig. 64: Locating Brake Tensioner
Courtesy of BMW OF NORTH AMERICA, INC.

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

Disconnect brake hose from brake line (1).

Installation:

Tightening torque **34 32 1AZ** Brake Lines.

Pull off retaining clip (3) so that brake hose can be turned.

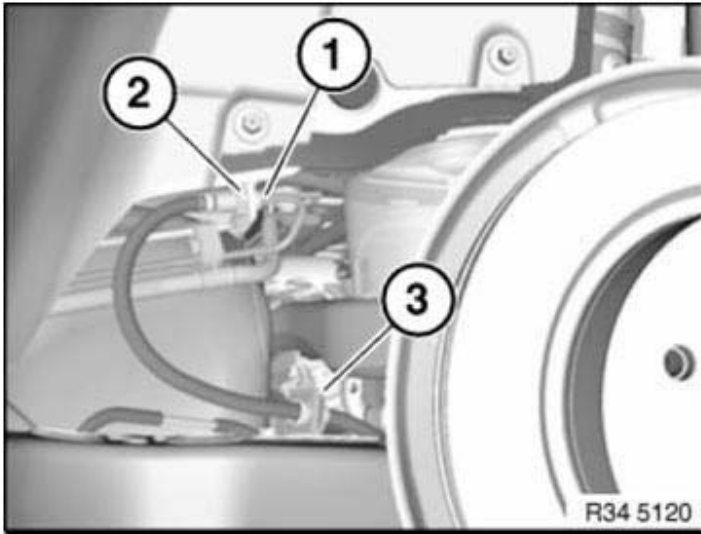


Fig. 65: Identifying Brake Line With Square Head And Retaining Clip
 Courtesy of BMW OF NORTH AMERICA, INC.

Pull off retaining clip (1) so that brake hose can be turned.

Detach brake hose from brake caliper (2).

Installation:

Tightening torque **34 32 3AZ** Brake Lines .

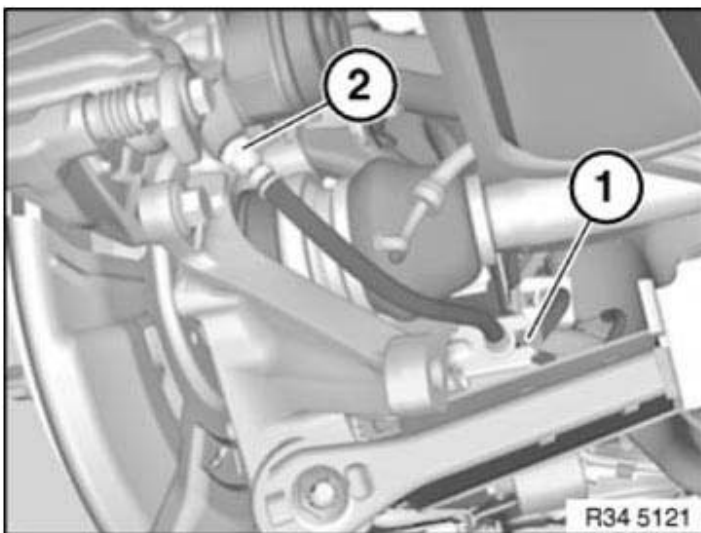


Fig. 66: Identifying Retaining Clip And Brake Caliper
 Courtesy of BMW OF NORTH AMERICA, INC.

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

NOTE: First tighten brake hose on brake caliper.
Insert brake hose in bracket and screw onto brake pipe.

Disconnect plug connection on parking brake actuator.

IMPORTANT: Switch off ignition at least 30 secs. before disconnecting the plug connection.

Unscrew guide bolts (1).

If necessary, grip at hexagon head (2).

Remove brake caliper (3).

Installation:

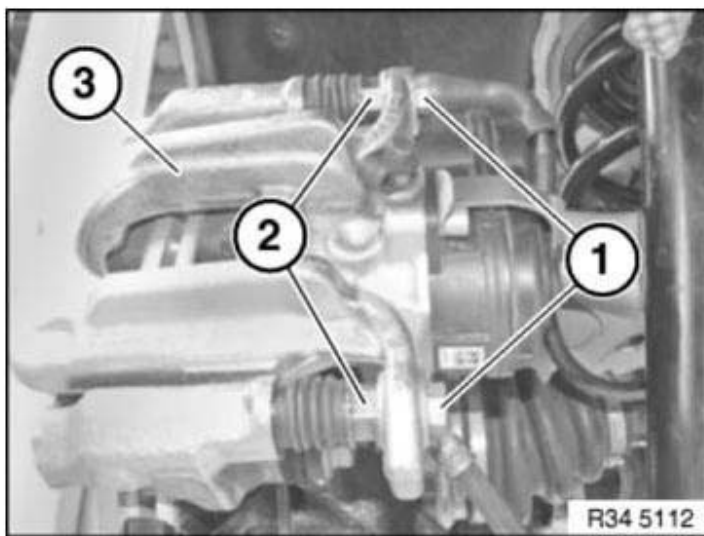


Fig. 67: Identifying Brake Caliper And Guide Bolts With Hexagon Head
Courtesy of BMW OF NORTH AMERICA, INC.

Replace guide screws.

Tightening torque **34 21 4AZ** Rear Brake .

The **PARKING BRAKE ACTUATOR** must be modified if the brake caliper is replaced.

After installation, observe the following: switch on ignition and, using parking brake operating element, open parking brake once, close once and open again.

34 21 169 REMOVING AND INSTALLING/REPLACING A BRAKE ANCHOR PLATE/BRAKE GUARD PLATE AT REAR

Necessary preliminary tasks

- Remove drive flange on rear axle shaft See **3341005 REPLACING LEFT DRIVE FLANGE ON REAR AXLE SHAFT** or **3341007 REPLACING RIGHT DRIVE FLANGE ON REAR AXLE SHAFT** .

Release screws (1).

Installation:

Replace bolts.

Tightening torque **34 21 3AZ** .

Remove retaining plate (2).

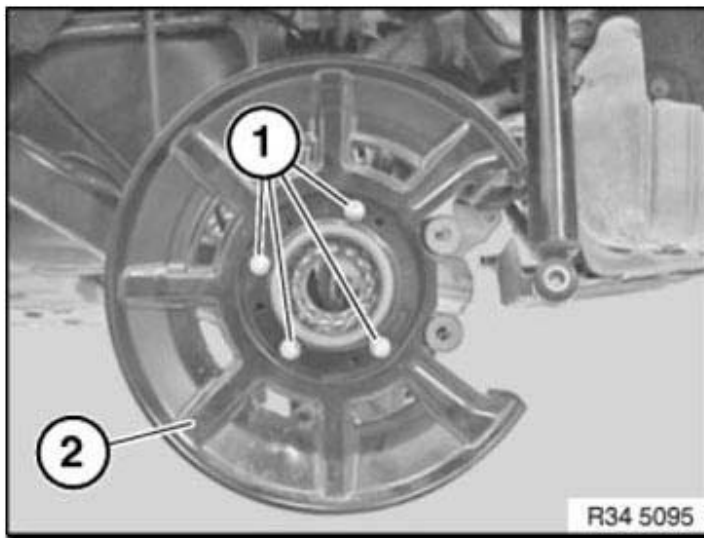


Fig. 68: Identifying Retaining Plate And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

34 21 295 REPLACING REAR LEFT OR RIGHT DUST COLLAR ON BRAKE CALIPER

Necessary preliminary work

- 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.

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.**

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

IMPORTANT: Dust boot must not be re-used!

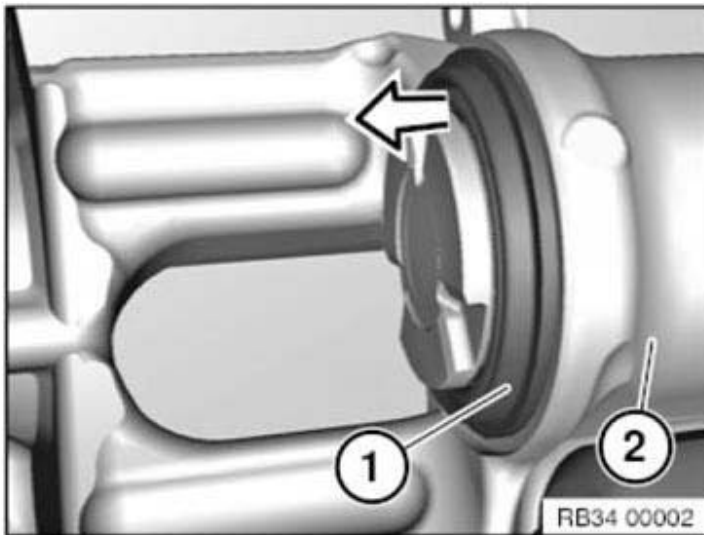


Fig. 69: Removing Dust Boot From Brake Caliper
Courtesy of BMW OF NORTH AMERICA, INC.

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

IMPORTANT: 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!

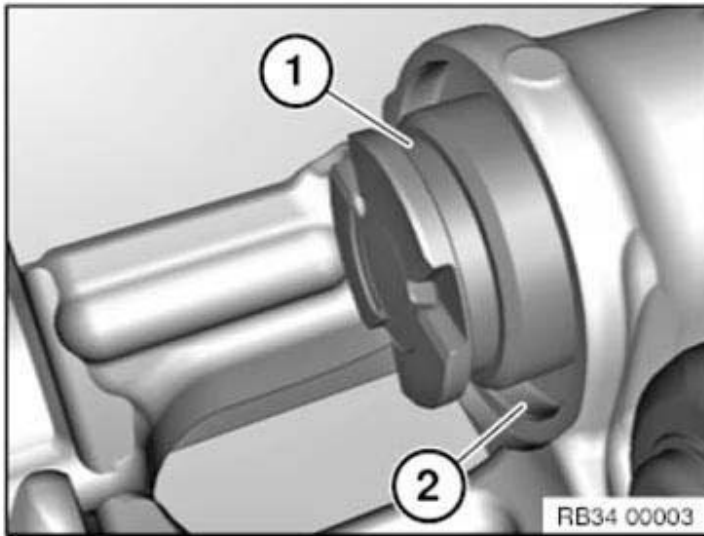


Fig. 70: Identifying Brake Caliper Housing And Piston Groove
 Courtesy of BMW OF NORTH AMERICA, INC.

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.

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

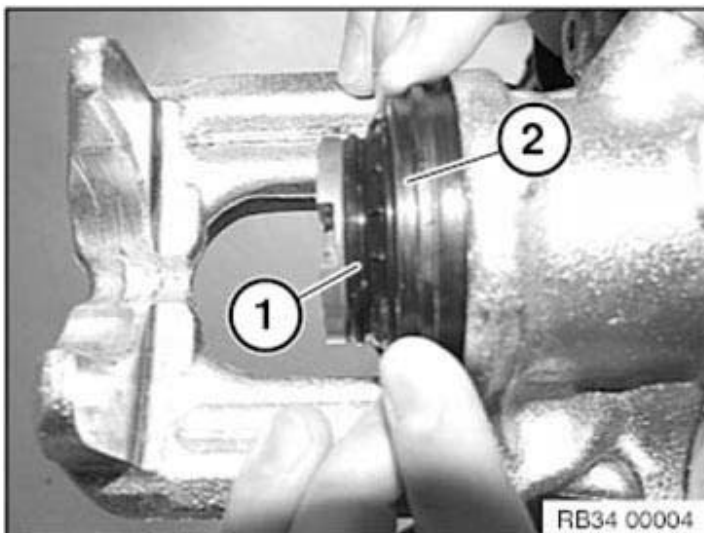
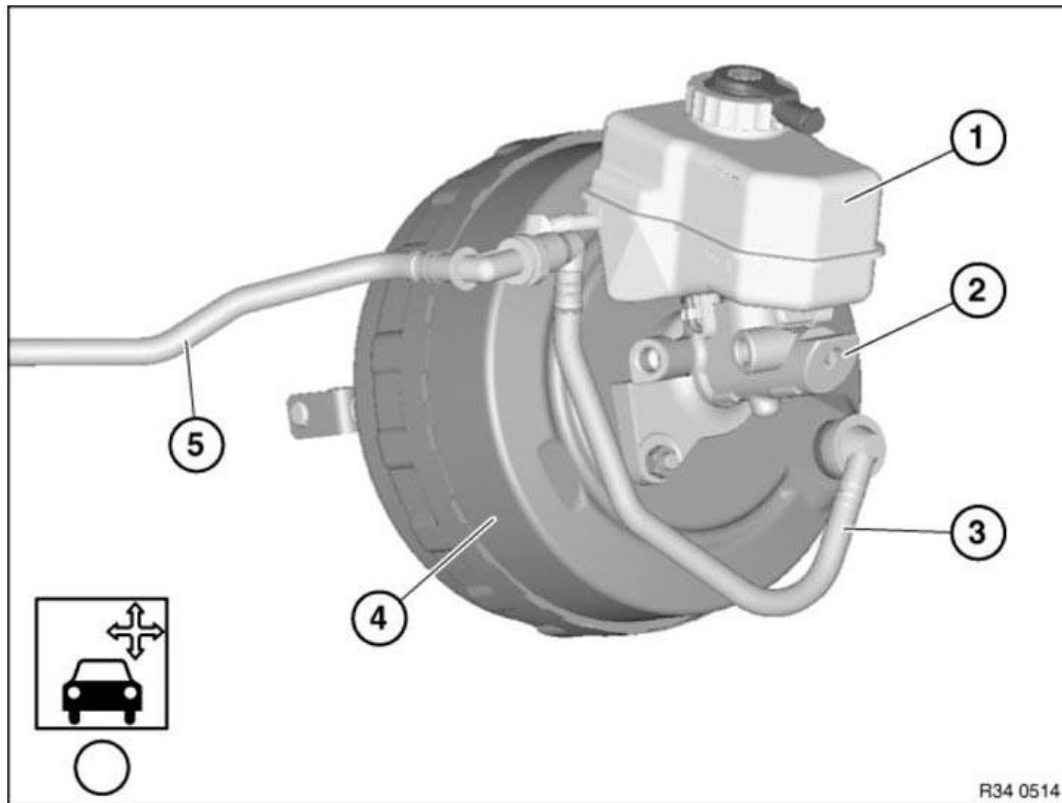


Fig. 71: Pulling Sealing Lip Of Dust Boot
 Courtesy of BMW OF NORTH AMERICA, INC.

3431 MASTER BRAKE CYLINDER

34 31 ... OVERVIEW OF BRAKE MASTER CYLINDER/BRAKE BOOSTER



- | | |
|-------------------------|-----------------|
| 1 Expansion tank | 4 Brake booster |
| 2 Brake master cylinder | 5 Vacuum hose |
| 3 Non-return valve | |

Fig. 72: Overview Of Brake Master Cylinder / Brake Booster
Courtesy of BMW OF NORTH AMERICA, INC.

1. Expansion tank
2. Brake master cylinder
3. Non-return valve
4. Brake booster
5. Vacuum hose
6. Bleed braking system

34 31 181 REMOVING AND INSTALLING/REPLACING EXPANSION TANK FOR HYDRAULIC BRAKE ACTUATION

Necessary preliminary tasks

- Read and comply with **GENERAL INFORMATION** .
- Extract brake fluid out of expansion tank. Use a suction bottle used exclusively for drawing off brake fluid.

Do not reuse drawn out brake fluid.

If necessary, pull off supply hose of clutch hydraulic system if necessary.

Unfasten plug connection (1) and disconnect.

Release screw (2).

Pull expansion tank in direction of arrow vertically out of brake master cylinder.

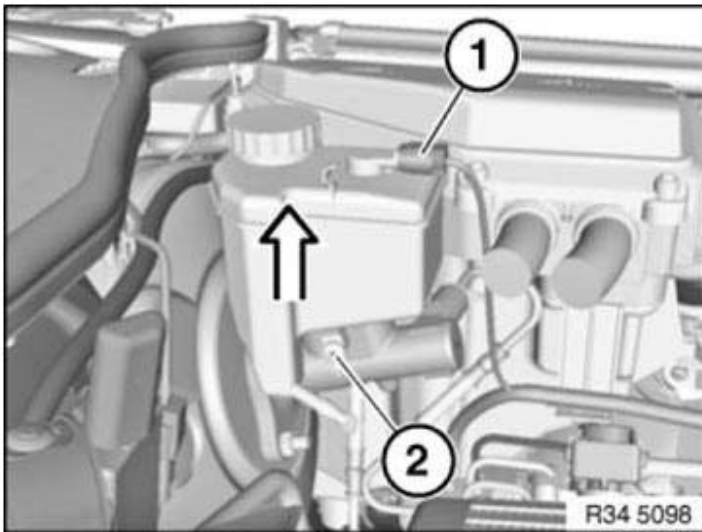


Fig. 73: Pulling Expansion Tank Out Of Brake Master Cylinder
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Check rubber plug in brake master cylinder for damage and replace if necessary.
Push the expansion tank vertically onto the master brake cylinder.

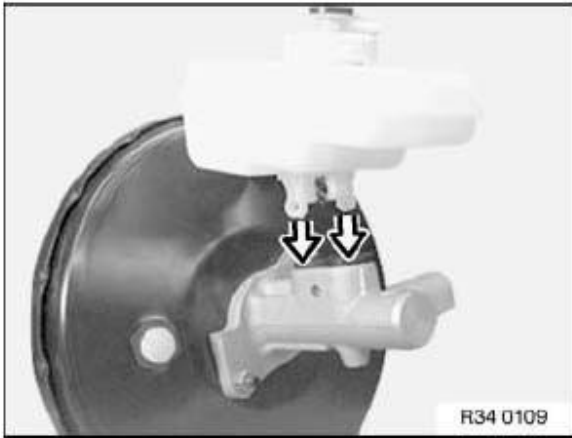


Fig. 74: Pushing Expansion Tank Onto Master Brake Cylinder
Courtesy of BMW OF NORTH AMERICA, INC.

After installation

- **BLEED BRAKING SYSTEM**

34 31 505 REMOVING AND INSTALLING/REPLACING MASTER BRAKE CYLINDER FOR DSC

Necessary preliminary tasks

- Remove **EXPANSION TANK** .
- Read and comply with **GENERAL INFORMATION** .

IMPORTANT: Do not bend brake lines.

Unfasten brake lines (1).

Installation:

Tightening torque **34 32 1AZ** .

Close off brake lines and brake master cylinder with plugs **32 1 270** .

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

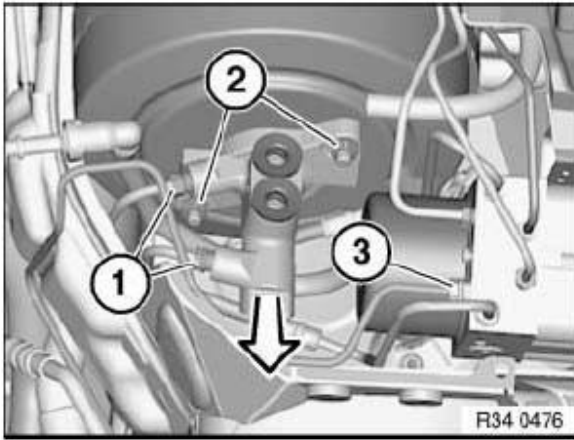


Fig. 75: Removing Brake Master Cylinder Out Of Brake Booster
 Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Replace self-locking nuts.

Tightening torque **34 31 1AZ** .

Installation

Replace sealing ring.

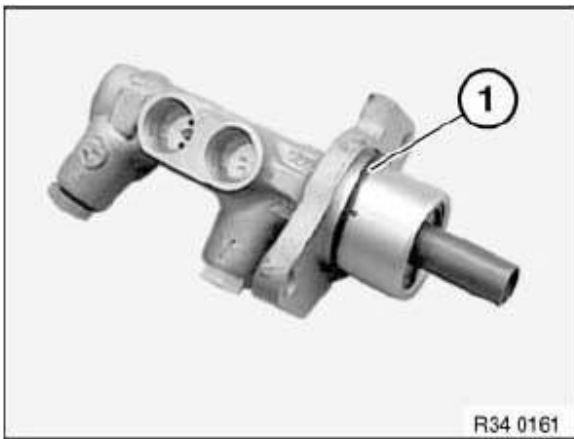


Fig. 76: Identifying Sealing Ring
 Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

When inserting the brake master cylinder (2) into the brake booster (1), make sure the pressure rod of the brake booster and that of the brake master cylinder meet each other on one level.

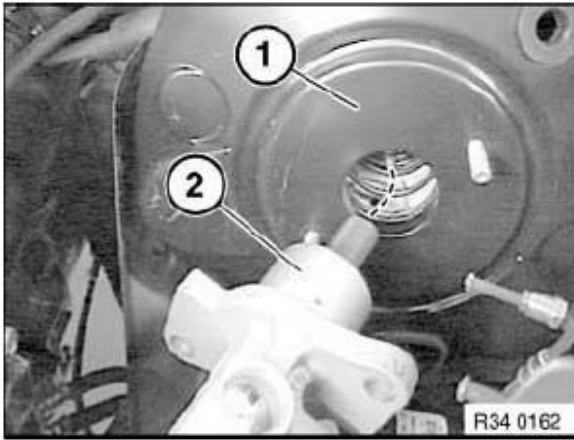


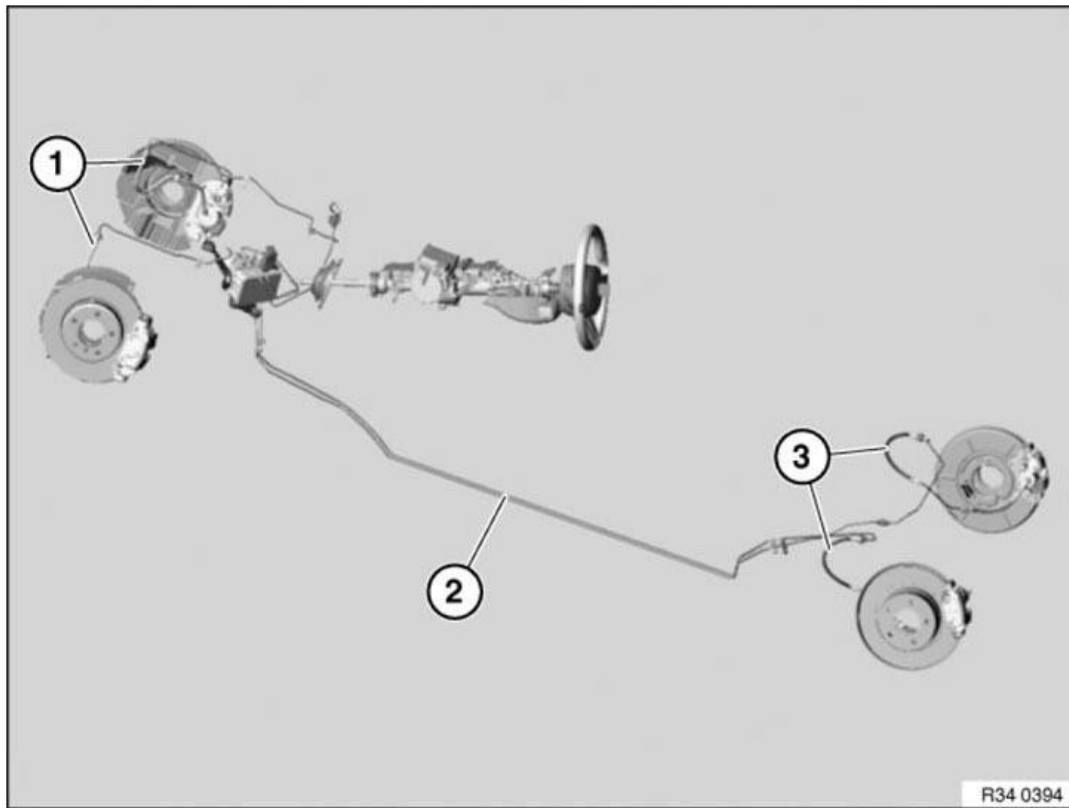
Fig. 77: Identifying Brake Master Cylinder And Brake Booster
Courtesy of BMW OF NORTH AMERICA, INC.

After installation

- **BLEEDING BRAKE SYSTEM WITH DSC**

3432 BRAKE LINES

34 32 ... OVERVIEW OF BRAKE LINES



- 1 Brake hose, front 3 Brake hose, rear
2 Brake tubes

Fig. 78: Overview Of Brake Lines

Courtesy of BMW OF NORTH AMERICA, INC.

1. Brake hose, front
2. Brake tubes
3. Brake hose, rear

34 32 861 REPLACING ALL BRAKE PIPES

Special tools required

NOTE: The brake lines are only supplied in the straight version and correct length with connecting nipple.
Read and comply with General Information.
After completing work, bleed brake system.
OBSERVE SAFETY INSTRUCTIONS ON RAISING THE VEHICLE .

New brake lines are bent into shape with bending tool 34 5 100.

Removed brake pipes can be used as templates for bending.

IMPORTANT:

- Protective coating of brake line must not be damaged during bending.
- Do not kink or bend back brake lines.
- Watch distances to rigid and movable vehicle parts. Brake lines may not make contact or rub.
- Tighten down brake line couplings with torque wrench.

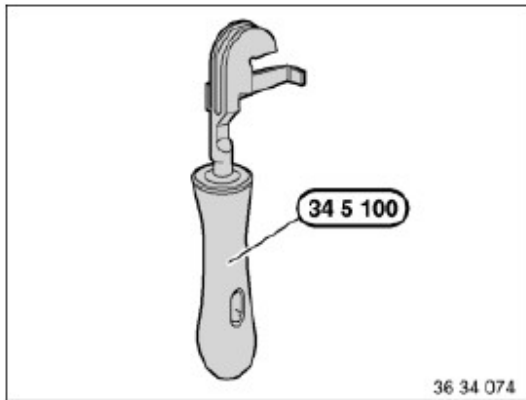


Fig. 79: Identifying Bending Tool (34 5 100)
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Tightening torque, see 34 32 1AZ in **34 32 BRAKE LINES** .

34 32 881 REPLACING FRONT LEFT OR RIGHT BRAKE HOSE

NOTE:

- Read and comply with **GENERAL INFORMATION** .

After completing work: **BLEED BRAKING SYSTEM**

Press clutch 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.

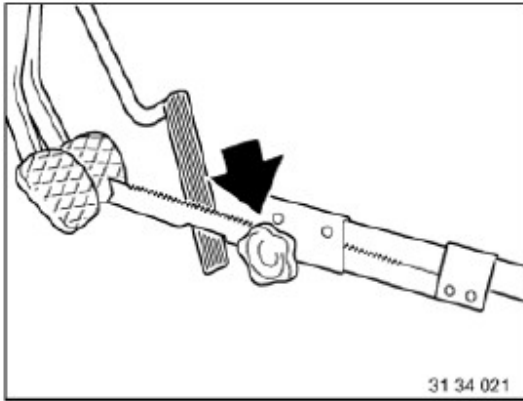


Fig. 80: Locating Brake Tensioner
 Courtesy of BMW OF NORTH AMERICA, INC.

Pull brake hose out of both holders (1).

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

Detach brake hose from brake line (3).

Installation:

Tightening torque **34 32 1AZ** .

Detach brake hose from brake caliper (4).

Installation:

Tightening torque **34 32 2AZ** .

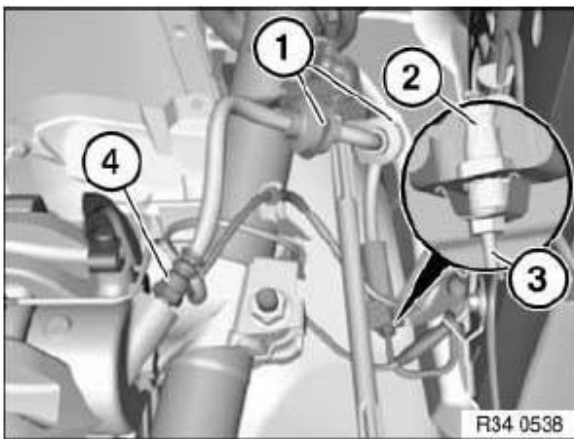


Fig. 81: Identifying Brake Calliper, Brake Line, Brake Hose Square Head And Holder

Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: First tighten brake hose on brake caliper.
Move wheels into straight-ahead position.
Insert brake hose in bracket and screw onto brake pipe.
Never twist brake hose when installing it and avoid all contact with parts attached rigidly to the body.

34 32 951 REPLACING REAR LEFT OR RIGHT BRAKE HOSE

NOTE: Read and comply with GENERAL INFORMATION .
After completing work: BLEED BRAKING SYSTEM

Press clutch 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.

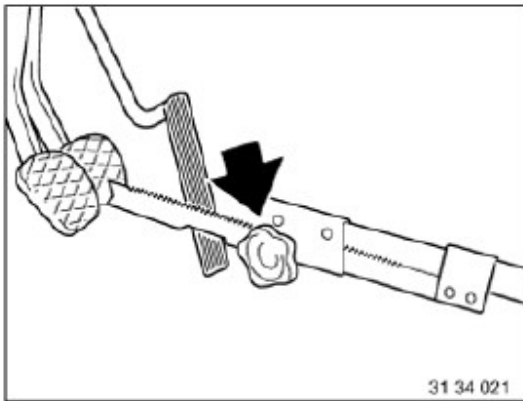


Fig. 82: Locating Brake Tensioner

Courtesy of BMW OF NORTH AMERICA, INC.

Release union nut (1); to do so, grip brake hose at square (2).

Installation:

Tightening torque 34 32 1AZ .

Remove retaining clip (3) and remove brake hose from mounting.

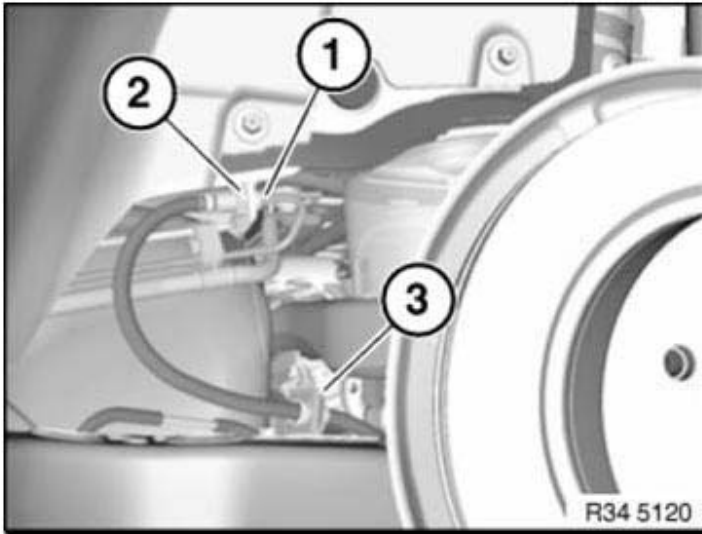


Fig. 83: Identifying Retaining Clip And Union Nut
 Courtesy of BMW OF NORTH AMERICA, INC.

Remove retaining clip (1) and remove brake hose from mounting.

Disconnect brake hose (2) from brake caliper.

Installation:

Tightening torque **34 32 3AZ** .

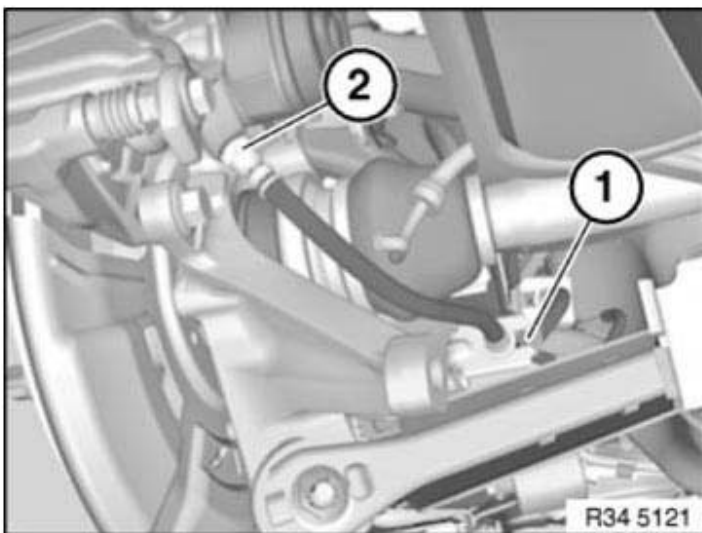


Fig. 84: Identifying Retaining Clip And Brake Hose
 Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Mount and tighten brake hose on brake caliper first, then on brake line/brake hose point of connection.
Never twist brake hose when installing it and avoid all contact with parts attached rigidly to the body.

3433 BRAKE BOOSTER

34 33 505 REMOVING AND INSTALLING OR REPLACING BRAKE BOOSTER

Necessary preliminary tasks

- Read and comply with GENERAL INFORMATION .
- Remove BRAKE MASTER CYLINDER
- Disconnect BATTERY NEGATIVE LEAD
- Remove TRIM PANEL for pedal assembly

Release brake lines (1) and remove.

Installation:

Tightening torque 34 32 1AZ .

Remove non-return valve (2) in direction of arrow from brake booster.

Installation:

Check rubber seal in brake booster and replace if necessary.

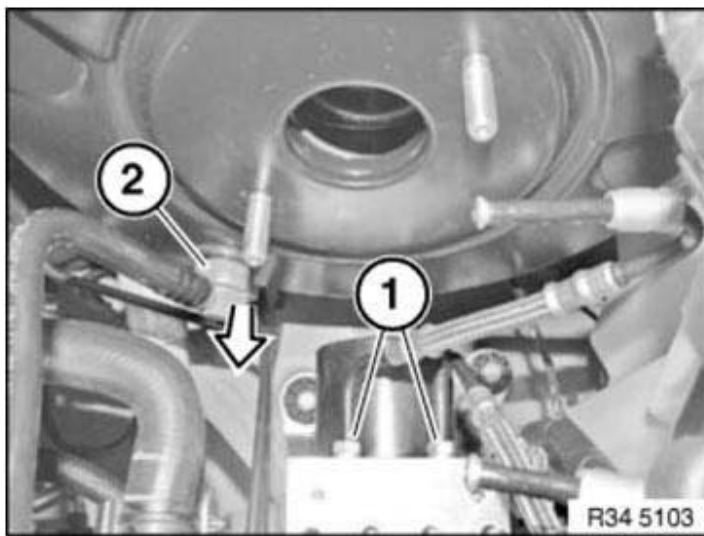


Fig. 85: Removing Non-Return Valve From Brake Booster
Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect plug connection (1).

Release screw (2) and swing out battery terminal.

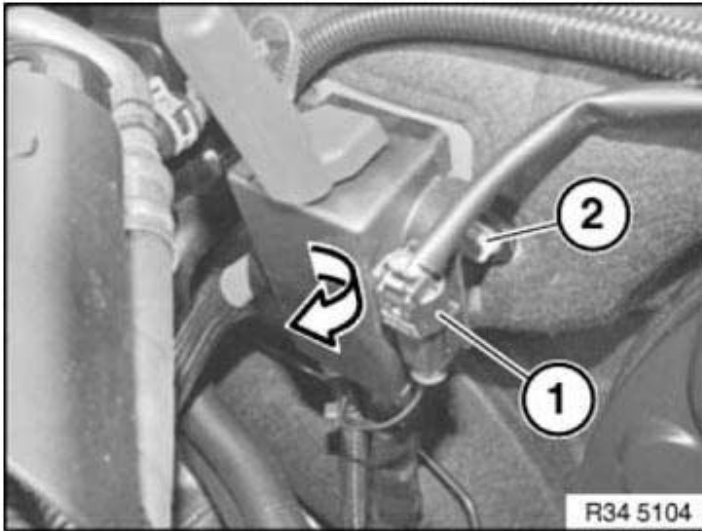


Fig. 86: Removing Battery Terminal
Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect plug connection (1).

Unhinge the recoil spring (2).

Remove retaining clip (3).

Installation:

Replace locking clip (3).

Locking clip (3) must be seated with both legs in the pin groove.

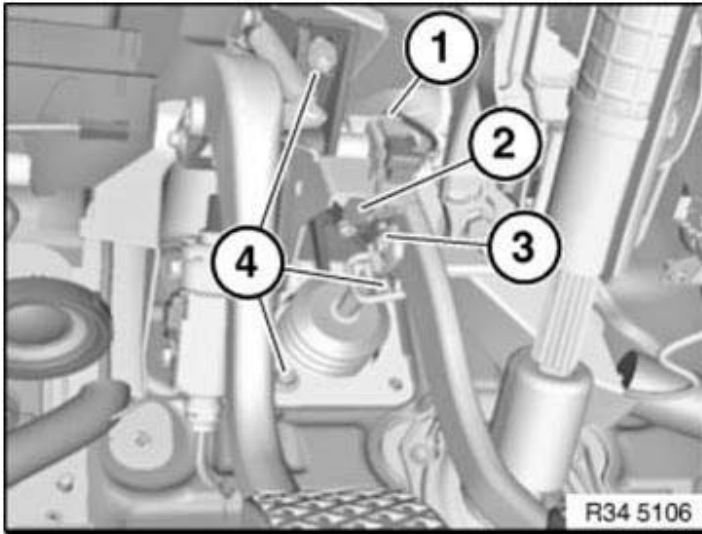


Fig. 87: Identifying Plug Connection, Recoil Spring, Locking Clip And Nuts
Courtesy of BMW OF NORTH AMERICA, INC.

Unscrew nuts (4).

Installation:

Tightening torque **35 11 1AZ** .

Move brake booster a little towards engine compartment.

Feed piston rod (1) by turning bearing support out of retaining lug (2).

Installation:

Feed brake pedal in depressed position into piston rod, moving the brake booster a little towards the engine compartment.

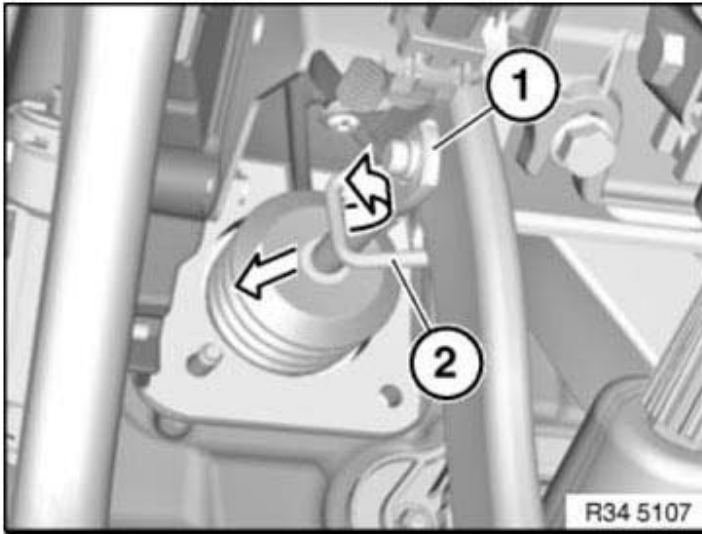


Fig. 88: Removing Piston Rod Out Of Retaining Lug
 Courtesy of BMW OF NORTH AMERICA, INC.

Remove bearing support.

IMPORTANT: Do not use any force when removing and installing the brake unit; the brake unit can be damaged under certain circumstances.
 Brake lines must not be bent.

Carefully pull brake booster (1) out of bulkhead and tilt out.

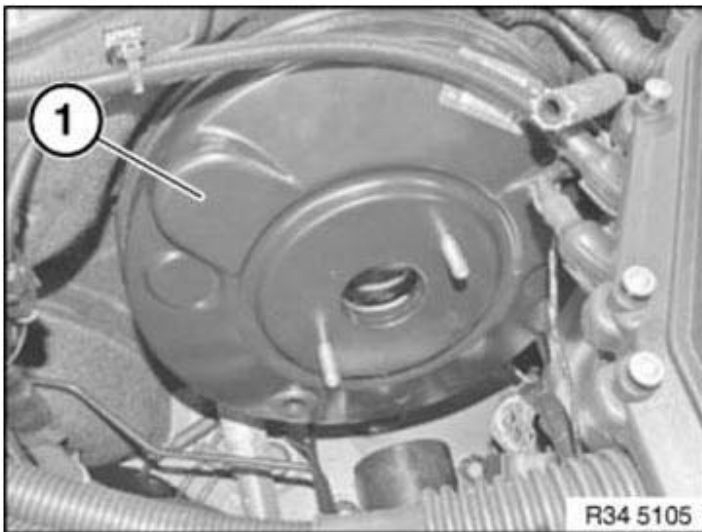


Fig. 89: Identifying Brake Booster
 Courtesy of BMW OF NORTH AMERICA, INC.

34 33 051 REMOVING AND INSTALLING/REPLACING NON-RETURN VALVE FOR BRAKE BOOSTER

NOTE: This operation is described in: Replacing VACUUM HOSE FOR BRAKE BOOSTER .

34 33 071 REPLACING VACUUM HOSE FOR BRAKE BOOSTER (N52K)

IMPORTANT: Before beginning work, fully press the brake pedal several times to reduce the vacuum pressure in the brake booster. This makes it easier to remove the vacuum hose.
Vacuum hose and non-return valve are welded together and are replaced together as a single unit.

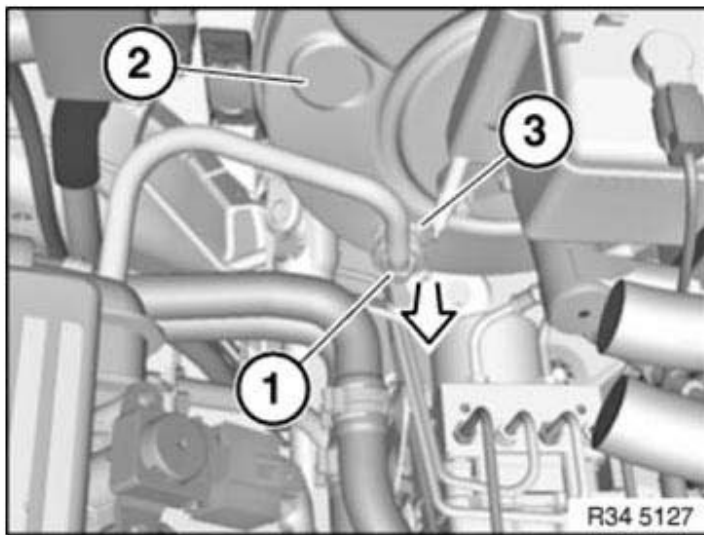


Fig. 90: Removing Vacuum Hose
Courtesy of BMW OF NORTH AMERICA, INC.

Necessary preliminary tasks

- Read and comply with GENERAL INFORMATION .

IMPORTANT: Do not kink vacuum line.
Vacuum line and brake lines must not touch each other in area of brake booster!
Contact with surrounding components is only permitted at the designated toothed rings!

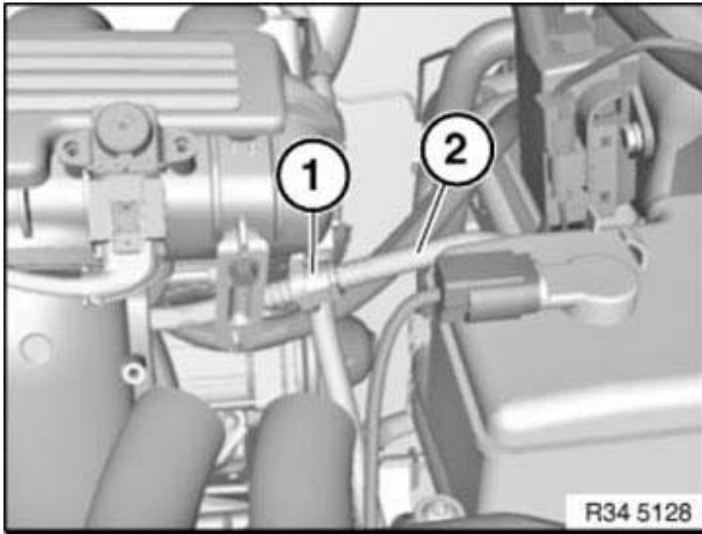


Fig. 91: Identifying Vacuum Line And Brake Lines
Courtesy of BMW OF NORTH AMERICA, INC.

Detach vacuum line (1) from brake booster (2).

Installation:

Check seal (3), replace if necessary.

Release quick-release coupling (1).

Installation:

Snap fastener must be felt and heard to snap into place.

Remove vacuum line (2).

34 33 071 REPLACING VACUUM HOSE FOR BRAKE BOOSTER (N54)

IMPORTANT: Before beginning work, fully press the brake pedal several times to reduce the vacuum pressure in the brake booster. This makes it easier to remove the vacuum hose.

Vacuum hose and non-return valve are welded together and are replaced together as a single unit.

Necessary preliminary tasks

- Read and comply with **GENERAL INFORMATION**.

IMPORTANT: Do not kink vacuum line. Vacuum line and brake lines must not touch each other in area of brake booster!

Detach vacuum line from brake booster.

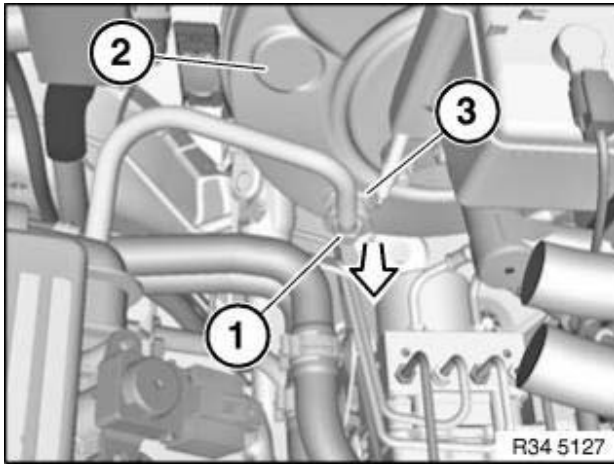


Fig. 92: Detaching Vacuum Line From Brake Booster
Courtesy of BMW OF NORTH AMERICA, INC.

Installation: Check seal, replace if necessary.

Pull off vacuum hose. Unclip vacuum line from holder. Disconnect snap fastener and remove vacuum line.
Installation: Snap fastener must be felt and heard to snap into place.

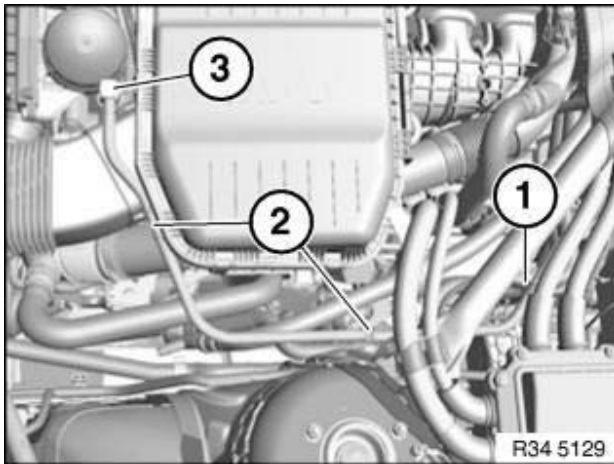


Fig. 93: Identifying Snap Fastener And Vacuum Line
Courtesy of BMW OF NORTH AMERICA, INC.

3435 ELECTRICAL COMPONENTS/WEAR INDICATOR

34 35 001 REPLACING A BRAKE PAD SENSOR (FRONT)

IMPORTANT: 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 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 ground sliding contact.

Necessary preliminary tasks

- Remove WHEEL

Detach brake pad sensor (1) in direction of arrow from brake pad.

Disengage line from cable guides (2).

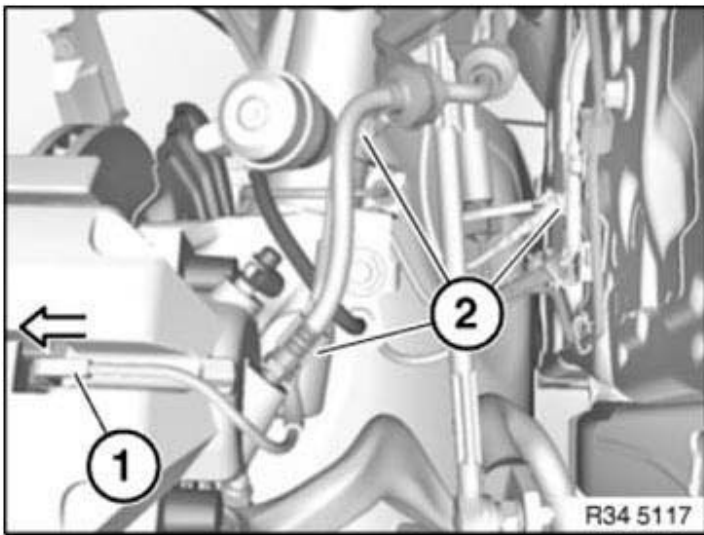


Fig. 94: Removing Brake Pad Sensor From Brake Pad
Courtesy of BMW OF NORTH AMERICA, INC.

Press together retaining lugs (1) of cable holder on spring strut and remove cable tie in downward direction.

Installation:

Replace cable holder if retaining lugs are damaged.

Make sure retaining lugs are correctly seated.

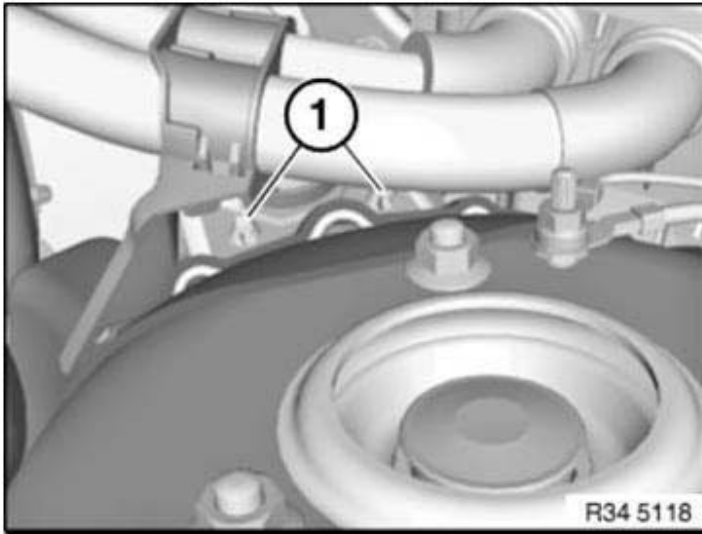


Fig. 95: Identifying Retaining Lugs
 Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect relevant plug connection on cable holder (1).

Unclip plug housing on cable holder.

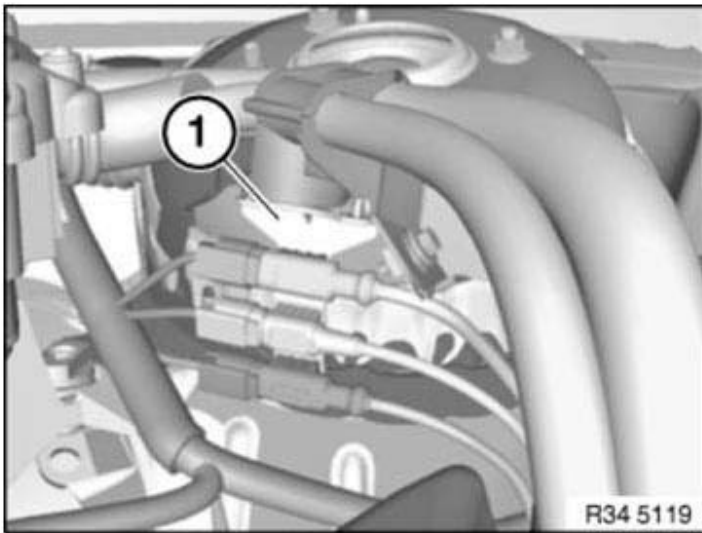


Fig. 96: Identifying Cable Holder
 Courtesy of BMW OF NORTH AMERICA, INC.

34 35 001 REPLACING A BRAKE PAD SENSOR (REAR)

IMPORTANT: 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 an already ground brake pad wear sensor has to be replaced although the **MINIMUM BRAKE PAD THICKNESS** has not yet been reached, it is necessary to file down the new sliding contact with a file to the same length as the ground sliding contact.

Necessary preliminary tasks

- Remove rear right **WHEEL**
- Remove rear right **SPLASH GUARD**

Pull brake pad wear sensor (1) in direction of arrow out of brake pad.

Disengage line from brake pad wear sensor from holders (2).

Installation:

Make sure brake pad wear sensor (2) is correctly seated in brake pad and holder (1).

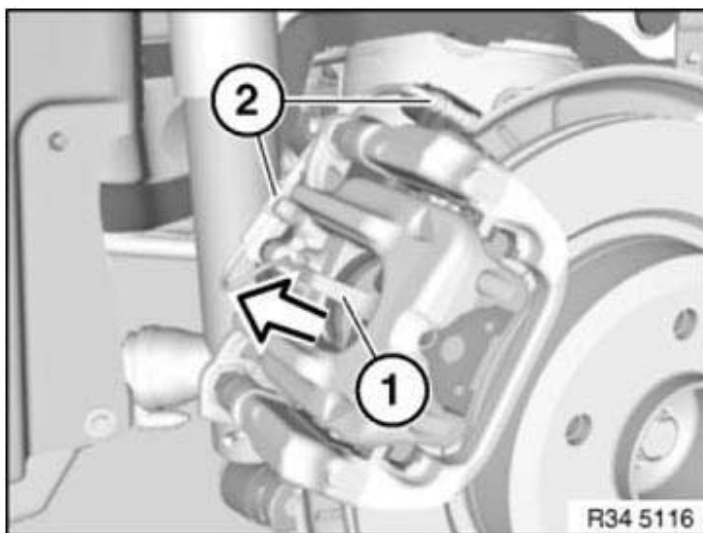


Fig. 97: Pulling Brake Pad Wear Sensor Out Of Brake Pad
Courtesy of BMW OF NORTH AMERICA, INC.

Unclip line (1) along cable guide.

Open housing cover (2).

Disconnect plug connection.

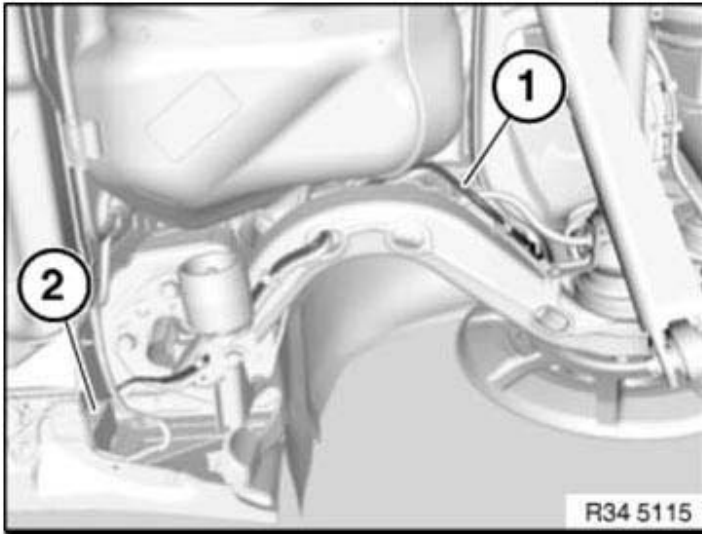


Fig. 98: Identifying Housing Cover And Line
Courtesy of BMW OF NORTH AMERICA, INC.

3441 PARKING BRAKE

34 41 ... ELECTROMECHANICAL PARKING BRAKE - EMERGENCY RELEASE

Necessary preliminary tasks

- Remove **PARKING BRAKE ACTUATOR** on left and right

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

Using an 7 mm WAF Allen key (1), turn back brake caliper spindle in clockwise direction.

Turn back until wheel can turn freely.

IMPORTANT: Do not turn the spindle to the end stop.

**At the end stop a fault code is set which will cause the system to shut down!
If this is the case, clear the fault memory**

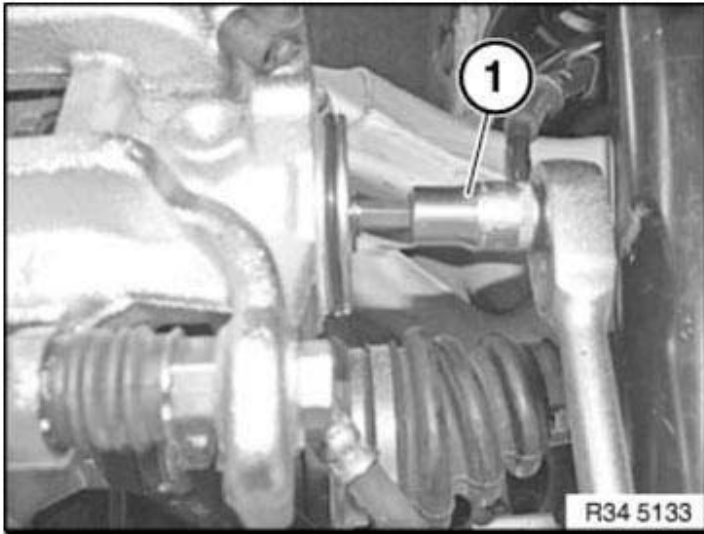
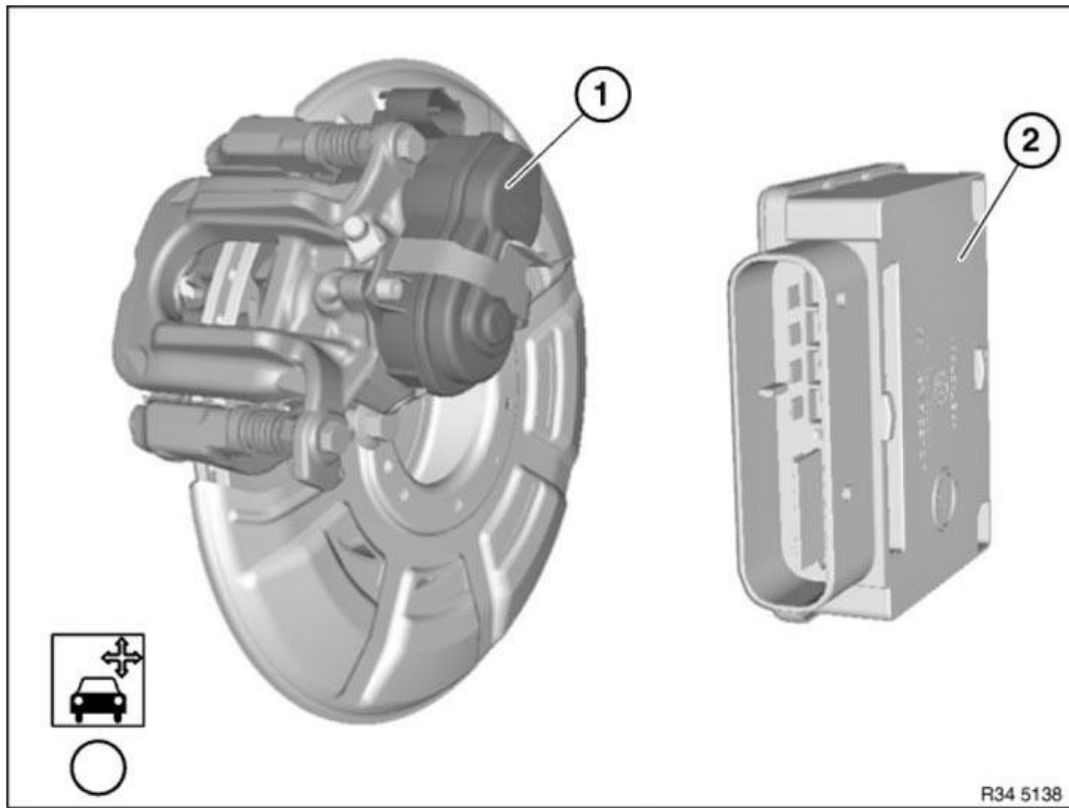


Fig. 99: Identifying WAF Allen Key
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: **Startup after circuit interruption:**

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

34 41 ... OVERVIEW OF PARKING BRAKE



- 1 Parking brake actuator
- 2 Parking brake control unit

Fig. 100: Overview Of Parking Brake
Courtesy of BMW OF NORTH AMERICA, INC.

1. Parking brake actuator
2. Parking brake control unit
3. Adjusting parking brake

34 41 295 REMOVING AND INSTALLING CONTROL UNIT FOR PARKING BRAKE

IMPORTANT: Read and comply with notes on protection against electrostatic damage (ESD protection).

Necessary preliminary tasks

- Remove LUGGAGE COMPARTMENT TRIM on side panel on right

Remove control unit (1) from electronics box.

Disconnect plug connection.

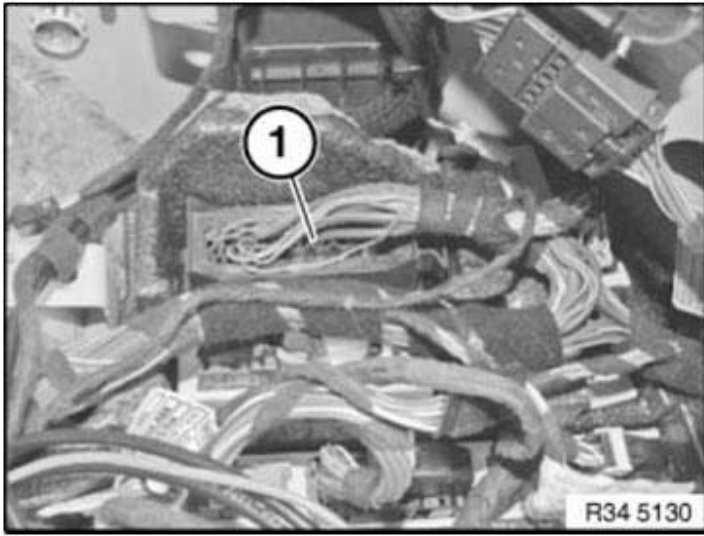


Fig. 101: Identifying Control Unit
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement

- Carry out programming/encoding of control units.

34 52 162 REMOVING AND INSTALLING/REPLACING PARKING BRAKE ACTUATOR

Necessary preliminary tasks

- Release parking brake
- Turn off ignition

IMPORTANT: Switch off ignition at least 30 secs. before disconnecting the plug connection.

After installation, observe the following: switch on ignition and, using parking brake operating element, open parking brake once, close once and open again.

Disconnect plug connection (1).

Disengage cable from cable holder.

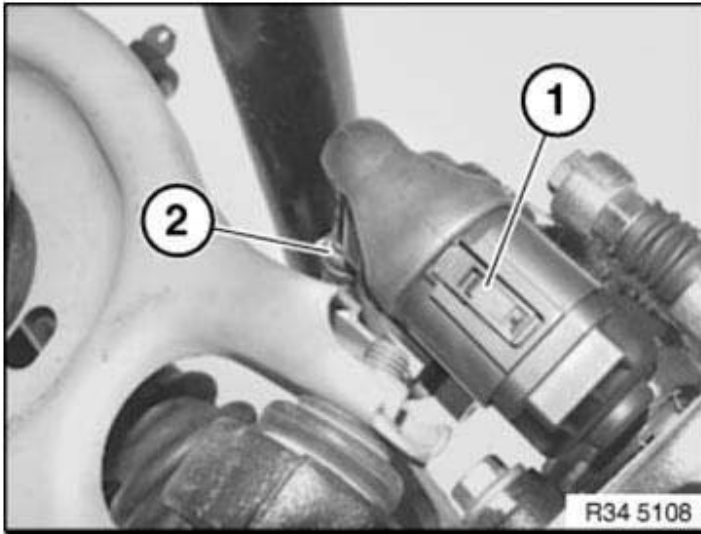


Fig. 102: Identifying Plug Connection
 Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1).

Installation:

Replace screws

Tightening torque **34 41 1AZ** .

Take off holder (2).

Detach actuator drive (3) from brake caliper.

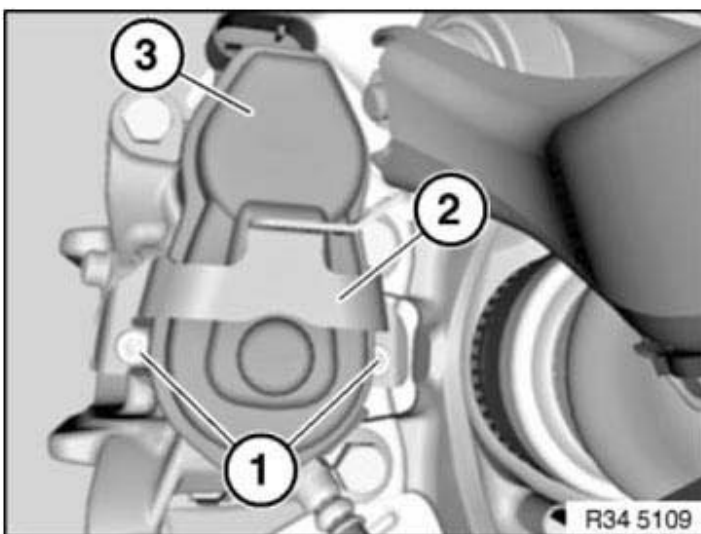


Fig. 103: Identifying Actuator Drive With Holder And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Check sealing ring (1), replace if necessary.

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

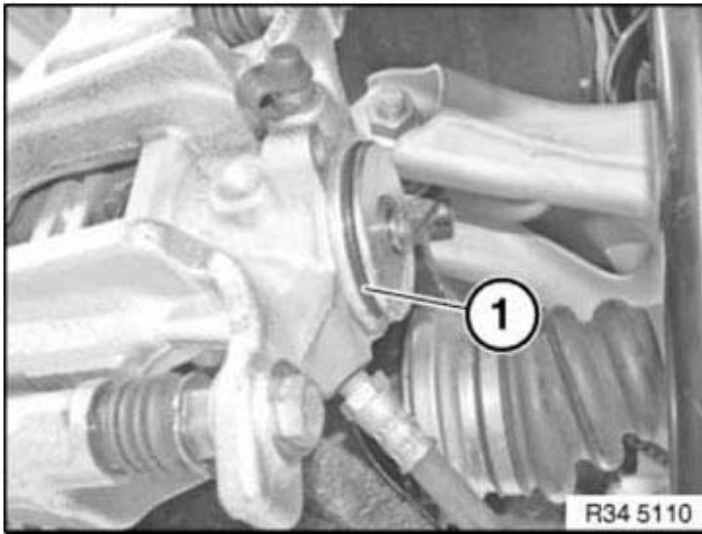


Fig. 104: Identifying Sealing Ring
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

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

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

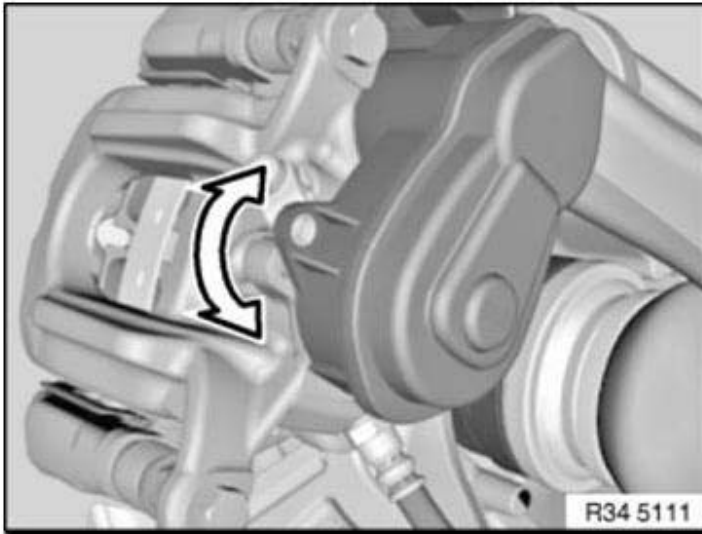


Fig. 105: Turning Actuator Drive
Courtesy of BMW OF NORTH AMERICA, INC.

3451 MECHANICAL/HYDRAULIC COMPONENTS

34 51 527 REMOVING AND INSTALLING OR REPLACING DSC HYDRAULIC UNIT

Necessary preliminary tasks

- Read and comply with **GENERAL INFORMATION** .
- Remove left **SUSPENSION CROSS-BRACE**
- Extract brake fluid

NOTE: **Extract brake fluid out of expansion tank. Use a suction bottle used exclusively for drawing off brake fluid.**

Do not reuse drawn out brake fluid.

After completing work:

- Bleed **BRAKING SYSTEM**

IMPORTANT: **Do not mix up brake lines.**
If necessary, mark before removal.
Close off connection bores with plugs.

Disconnect plug connection (1).

Unfasten brake lines (2).

Installation:

Tightening torque **34 32 1AZ** .

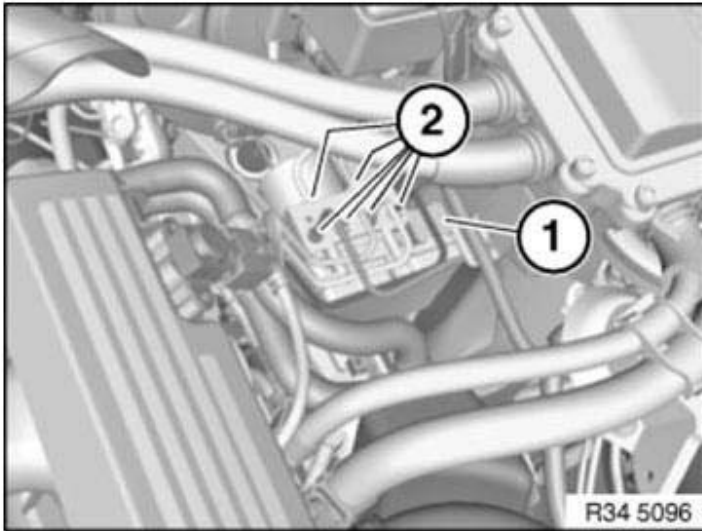


Fig. 106: Identifying Plug Connection And Brake Lines
Courtesy of BMW OF NORTH AMERICA, INC.

Unclip holders (1) for water hoses.

Release screw (2).

Installation:

Tightening torque **34 51 6AZ** .

Remove rear hydraulic control unit from holder and remove towards top.

IMPORTANT: Brake lines must not be bent!

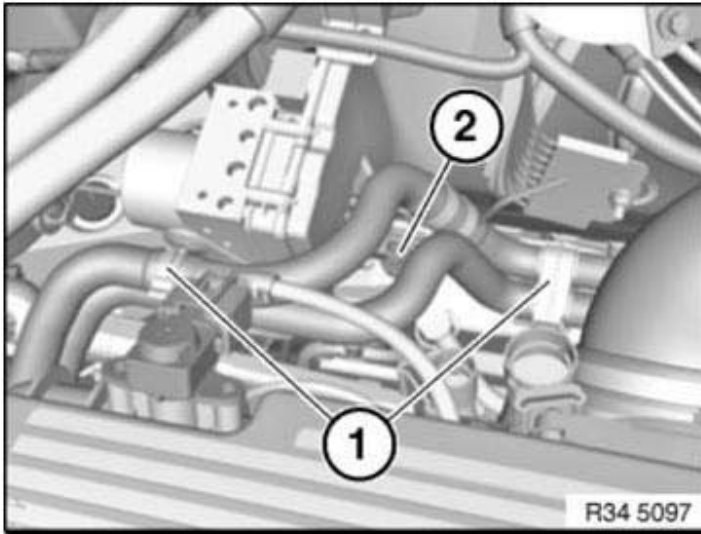


Fig. 107: Identifying Screws And Holder
 Courtesy of BMW OF NORTH AMERICA, INC.

When replacing hydraulic unit

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

Installation:

Tightening torque **34 51 5AZ** .

Modify **DSC CONTROL UNIT** .

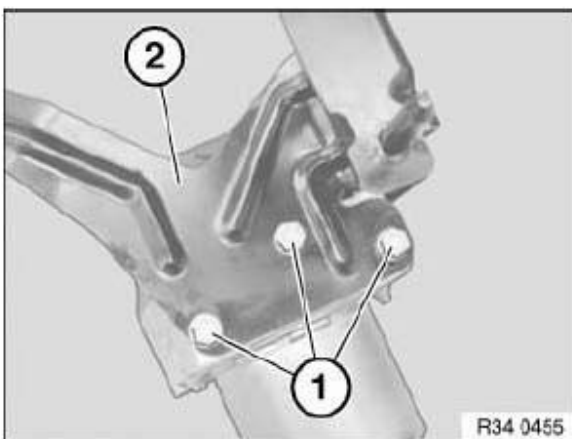


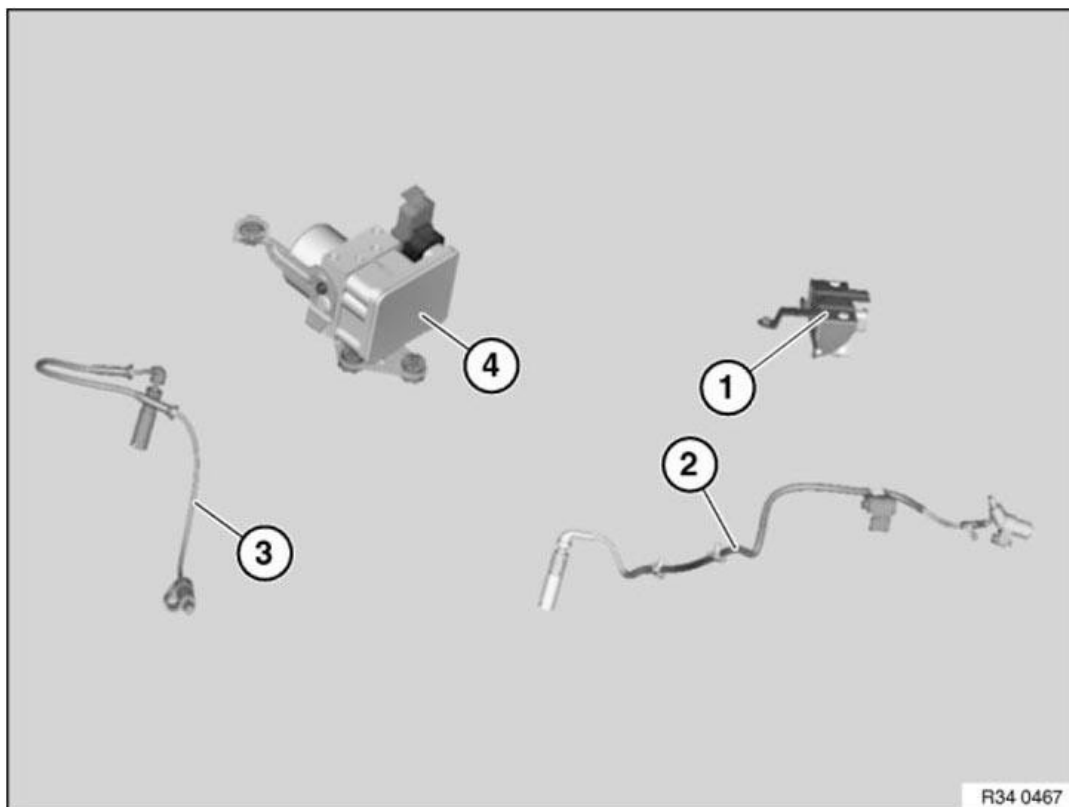
Fig. 108: Identifying Hydraulic Unit Convert Holder And Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

When replacing control unit

- Carry out programming/coding.
- ADJUSTMENT OF STEERING ANGLE SENSOR
- Mix-up check of brake lines

3452 ELECTRONIC COMPONENTS

34 52 ... OVERVIEW OF ELECTRONIC COMPONENTS



- | | |
|-----------------------------|------------------------------|
| 1 <u>DSC sensor</u> | 3 <u>Pulse sensor, front</u> |
| 2 <u>Pulse sensor, rear</u> | 4 <u>DSC control unit</u> |

Fig. 109: Overview Of Electronic Components
Courtesy of BMW OF NORTH AMERICA, INC.

- DSC sensor
- Pulse sensor, rear
- Pulse sensor, front
- DSC control unit

34 52 550 REMOVING AND INSTALLING/REPLACING DSC SENSOR

IMPORTANT: Read and comply with notes on PROTECTION AGAINST ELECTROSTATIC

DISCHARGE (ESD PROTECTION) .

Necessary preliminary tasks

- **REMOVE RIGHT FRONT SEAT**
- **REMOVE FRONT RIGHT DOOR SILL COVER STRIP**
- Remove **SIDE PANEL** in right footwell

Fold carpet (1) to one side and expose DSC sensor (2).

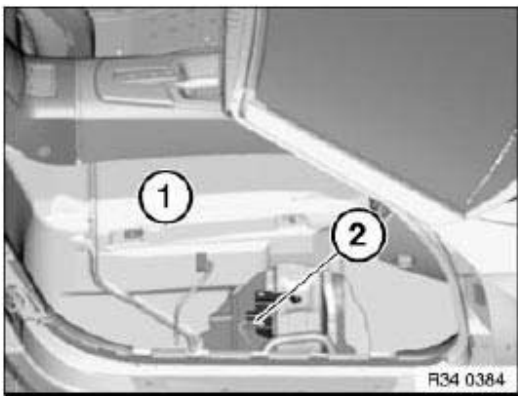


Fig. 110: Identifying Carpet And DSC Sensor
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Vibration-sensitive component.
Implement screw connection correctly, otherwise there may be malfunctions in the DSC.

Unlock and disconnect plug (1).

Release screws (2) and remove DSC sensor (3) with holder.

Installation:

Tightening torque **34 51 3AZ** .

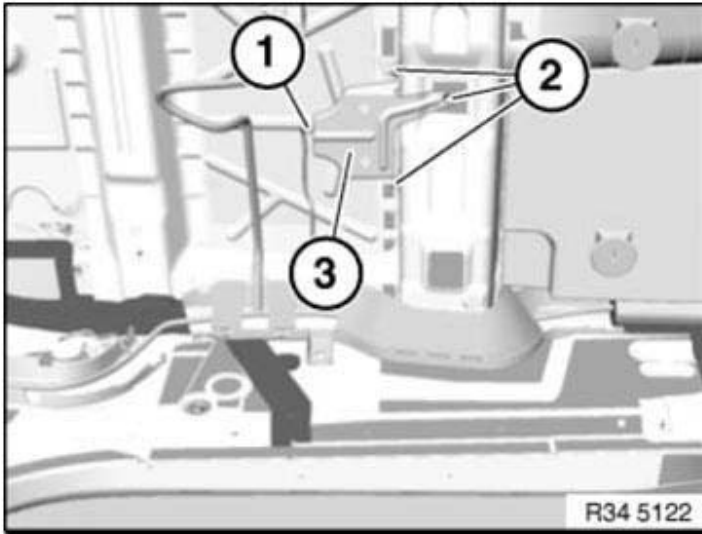


Fig. 111: Identifying DSC Sensor With Plug And Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

Release nuts (1) and detach DSC sensor (2) from holder.

Installation:

Tightening torque **34 51 2AZ** .

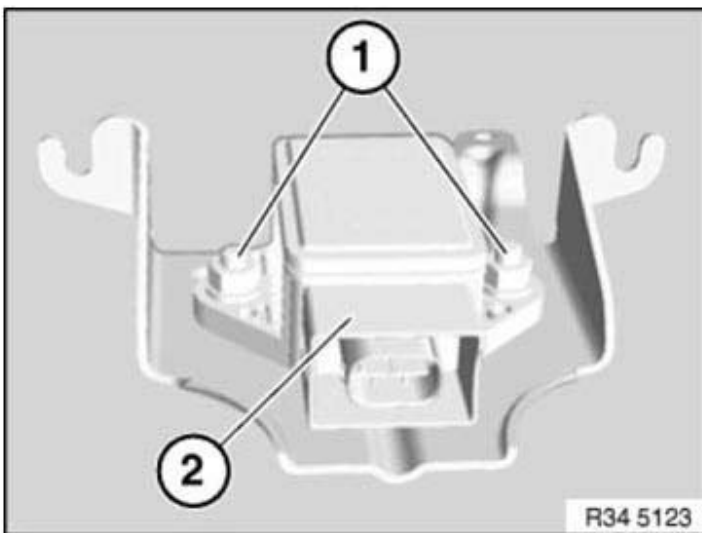


Fig. 112: Identifying DSC Sensor
 Courtesy of BMW OF NORTH AMERICA, INC.

Carry out calibration/adjustment of DSC sensor.

34 52 516 REMOVING AND INSTALLING/REPLACING DSC CONTROL UNIT

IMPORTANT: Read and comply with notes on PROTECTION AGAINST ELECTROSTATIC DISCHARGE (ESD PROTECTION) .

Necessary preliminary tasks

- Remove left SUSPENSION CROSS-BRACE
- Disengage heater feed/heater return water hoses from holders

Disconnect plug connection (1).

Unfasten screws (2).

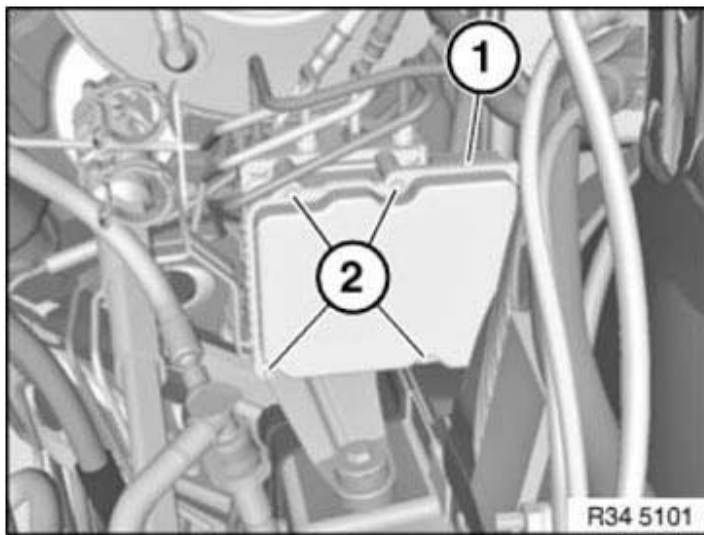


Fig. 113: Identifying Plug Connection And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Carefully detach control unit (1) in direction of arrow from hydraulic control unit (2).

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

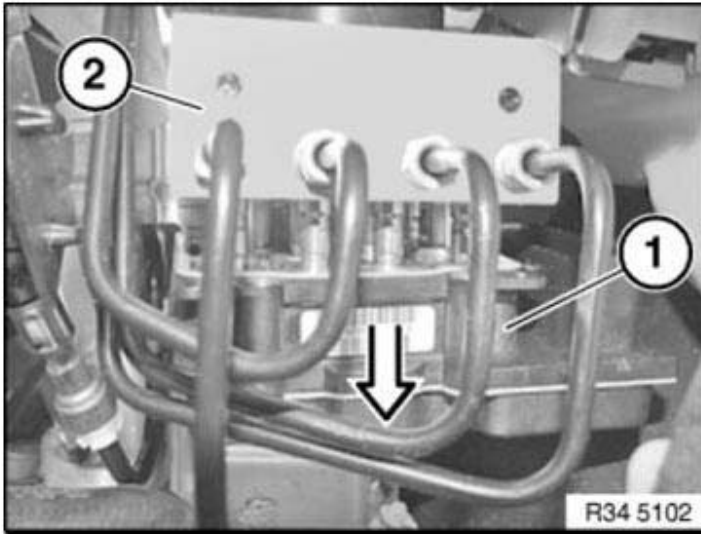


Fig. 114: Disconnecting Control Unit From Hydraulic Control
 Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Keep sealing faces clean.

Replace screws.

Observe tightening sequence (1-4).

Tightening torque **34 51 1AZ** .

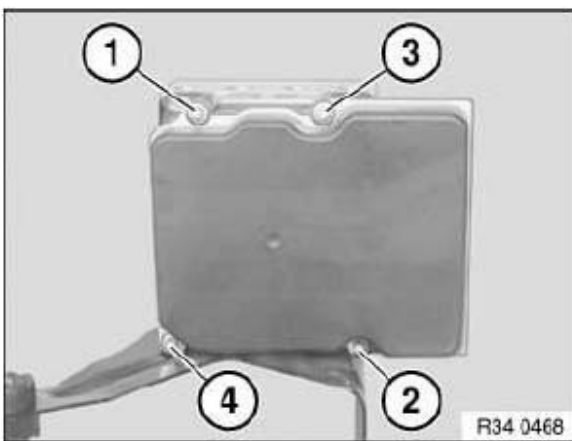


Fig. 115: Front Control Unit Screws Tightening Sequence
 Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

- Carry out programming/encoding
- **STEERING ANGLE SENSOR ADJUSTMENT**

or

- Function check of hydraulic control unit

34 52 162 REMOVING AND INSTALLING/REPLACING PARKING BRAKE ACTUATOR

Necessary preliminary tasks

- Release parking brake
- Turn off ignition

IMPORTANT: Switch off ignition at least 30 secs. before disconnecting the plug connection.

After installation, observe the following: switch on ignition and, using parking brake operating element, open parking brake once, close once and open again.

Disconnect plug connection (1).

Disengage cable from cable holder.

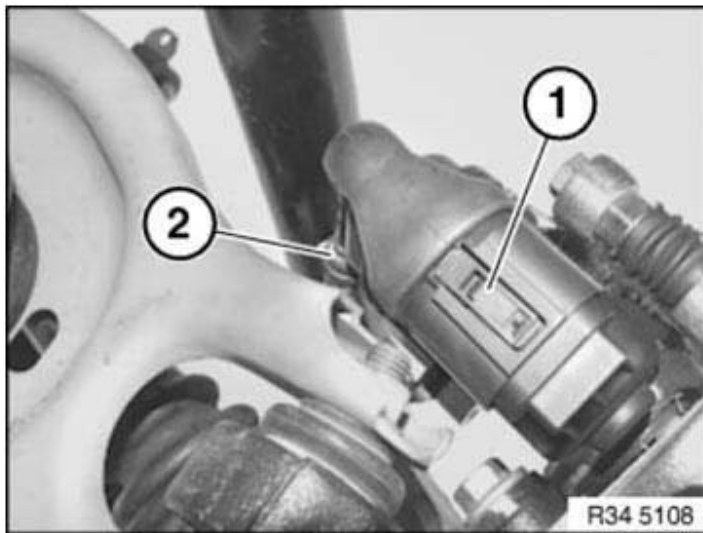


Fig. 116: Identifying Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1).

Installation:

Replace screws

Tightening torque **34 41 1AZ** .

Take off holder (2).

Detach actuator drive (3) from brake caliper.

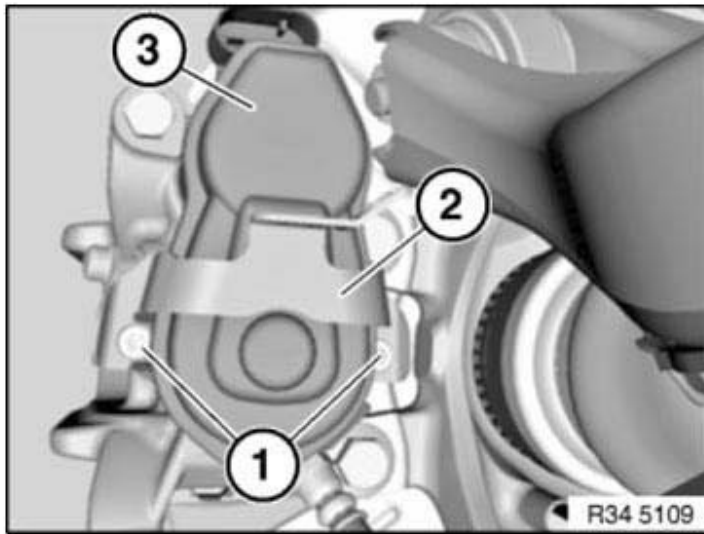


Fig. 117: Identifying Actuator Drive With Holder And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Check sealing ring (1), replace if necessary.

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

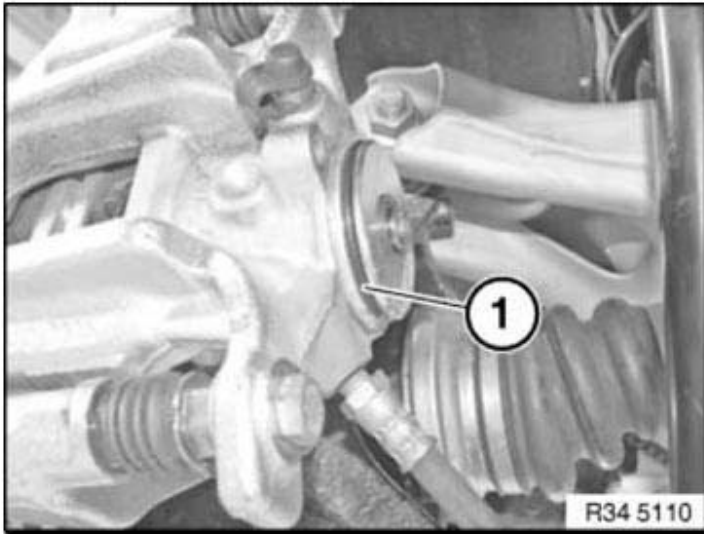


Fig. 118: Identifying Sealing Ring
 Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

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

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

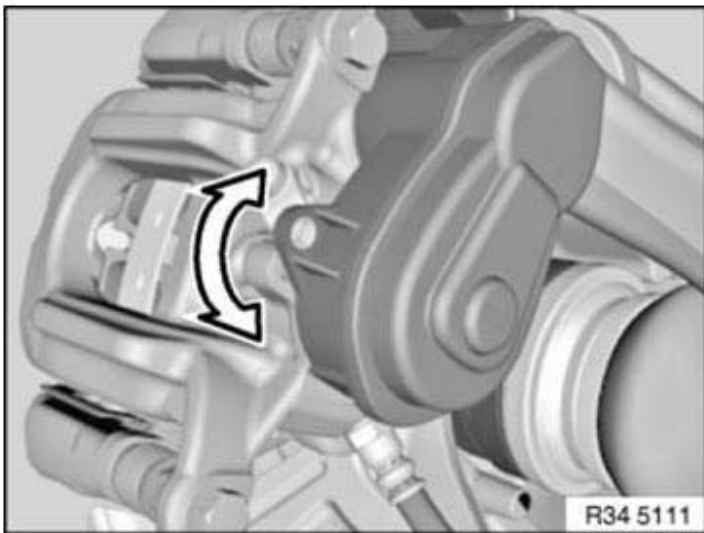


Fig. 119: Turning Actuator Drive
 Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: 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 an already ground brake pad wear sensor has to be replaced although the **MINIMUM BRAKE PAD THICKNESS** has not yet been reached, it is necessary to file down the new sliding contact with a file to the same length as the ground sliding contact.

Necessary preliminary tasks

- Remove rear right **WHEEL**
- Remove rear right **SPLASH GUARD**

Pull brake pad wear sensor (1) in direction of arrow out of brake pad.

Disengage line from brake pad wear sensor from holders (2).

Installation:

Make sure brake pad wear sensor (2) is correctly seated in brake pad and holder (1).

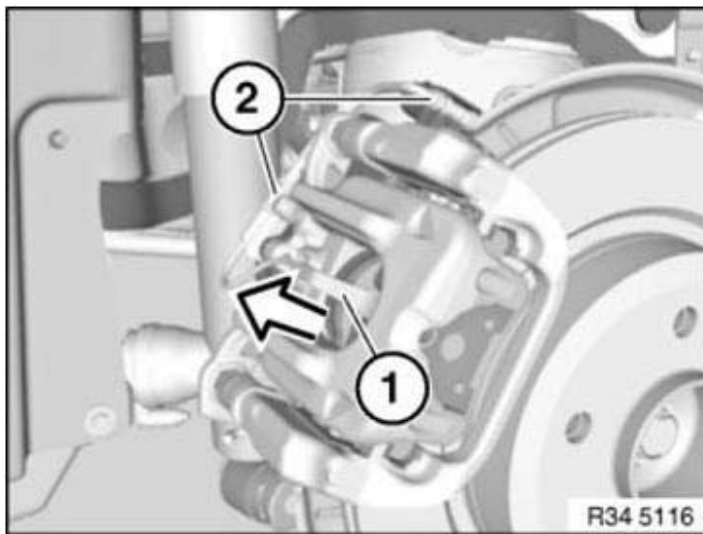


Fig. 120: Pulling Brake Pad Wear Sensor Out Of Brake Pad
Courtesy of BMW OF NORTH AMERICA, INC.

Unclip line (1) along cable guide.

Open housing cover (2).

Disconnect plug connection.

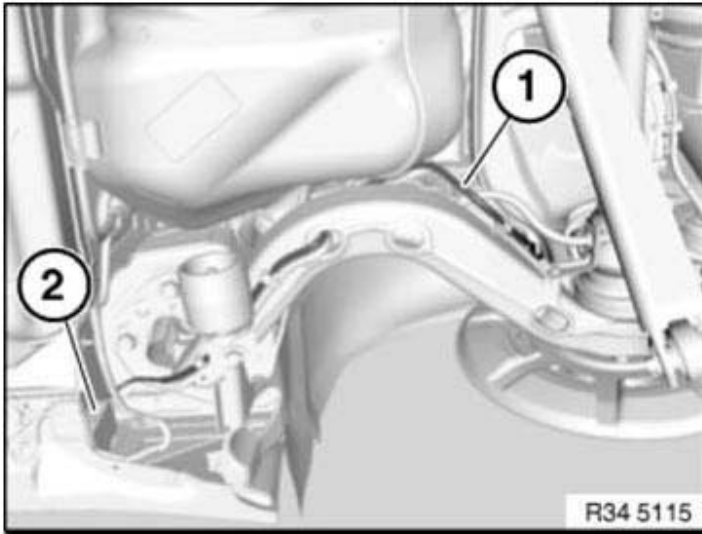


Fig. 121: Identifying Housing Cover And Line
Courtesy of BMW OF NORTH AMERICA, INC.

34 52 535 REPLACING A REAR PULSE GENERATOR

IMPORTANT: Read and comply with notes on **PROTECTION AGAINST ELECTROSTATIC DAMAGE** (ESD protection).

Necessary preliminary tasks

- Remove rear **WHEEL**
- Remove rear **SPLASH GUARD**
- Read and comply with **GENERAL INFORMATION** .

Release screw (1).

Withdraw wheel speed sensor (2) from bore hole.

Installation:

Tightening torque **34 51 4AZ** .

Clean bore for pulse generator and lubricate with Staburags NBU 12/K lubricating grease.

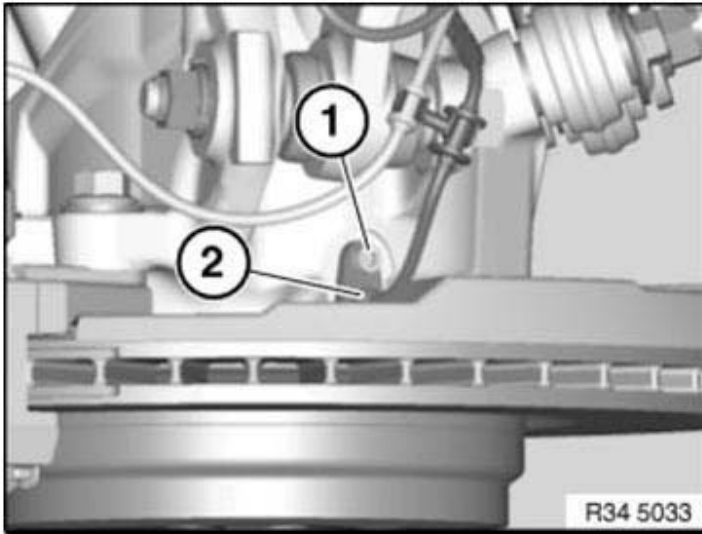


Fig. 122: Identifying Wheel Speed Sensor And Screw
Courtesy of BMW OF NORTH AMERICA, INC.

Disengage line (1) along trailing arm from holders.

Installation:

Ensure proper locking of the holders and proper seating of the line in the holders.

Open housing cover (1).

Disconnect plug connection.

Installation:

Ensure proper locking of plug connector and proper seating of rubber grommets.

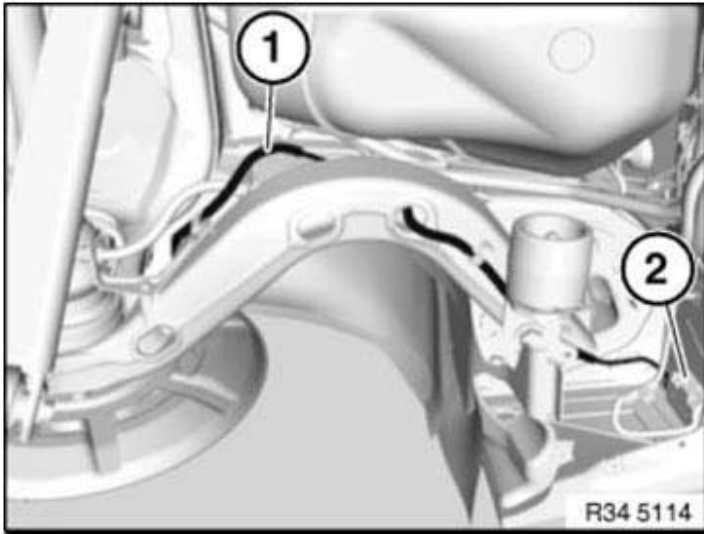


Fig. 123: Identifying Line
 Courtesy of BMW OF NORTH AMERICA, INC.

34 52 525 REPLACING ONE FRONT PULSE GENERATOR

NOTE: Read and comply with GENERAL INFORMATION .

Open plug housing (1), pull plug connection (2) out of bracket and disconnect.

Pull cable with rubber grommet out of holders (3).

Installation:

Ensure proper locking of plug connector and proper seating of rubber grommets.

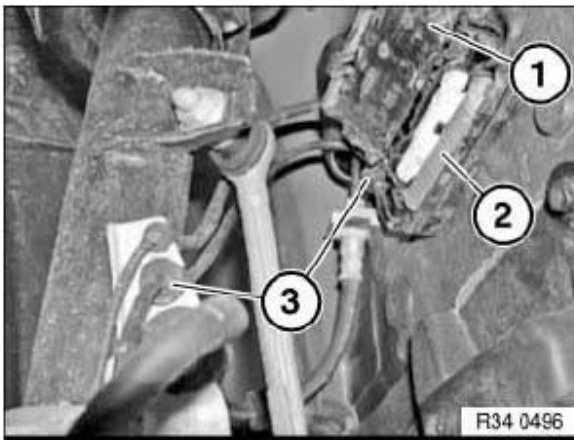


Fig. 124: Identifying Plug Housing, Plug Connection And Holders
 Courtesy of BMW OF NORTH AMERICA, INC.

Release hexagon socket head cap screw (1) and pull wheel speed sensor (2) out of bore.

Installation:

Tightening torque **34 51 4AZ** .

Clean bore for pulse generator and lubricate with Staburags NBU 12/K grease.

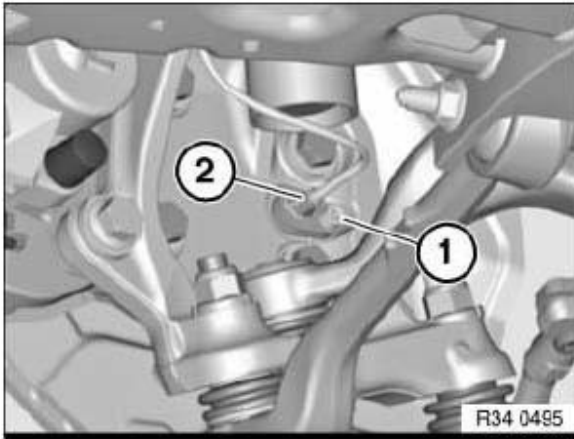


Fig. 125: Identifying Wheel Speed Sensor And Hexagon Socket Head Cap Screw
Courtesy of BMW OF NORTH AMERICA, INC.

BRAKES

Brakes - Special Tools - Z4

34 BRAKES

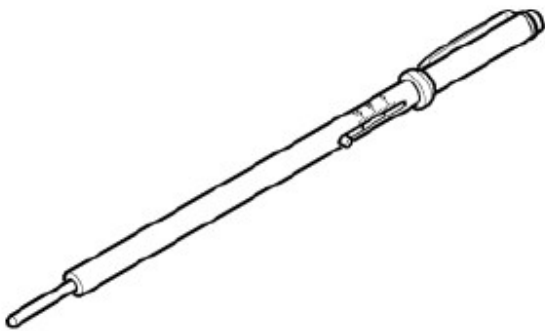
34-1260 GAUGE

341260 Gauge Minimum set: Mechanical tools MW

NOTE: (Brake pad measuring gauge) For measuring brake pad thickness without dismantling wheels.

SI number

01 12 95 (992)



W34 1 260

Fig. 1: Identifying Gauge (341260)

Courtesy of BMW OF NORTH AMERICA, INC.

BRAKES

Brakes - Technical Data - Z4

E89 FRONT BRAKE

34 11 FRONT BRAKE E89

FRONT BRAKE SPECIFICATION

IMPORTANT:

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

Minimum brake disc thickness during general inspection (GI):

Nominal size thickness minus 2.4 mm

(Not applicable to perforated brake discs and M vehicles)

M vehicles and perforated brake discs:

Nominal size thickness minus 1.6 mm

Depending on:

Engine type

Transmission version

Equipment specification (e.g. maximum load increase, chassis official-use, national version, etc.)
different brake discs can be fitted

The brake discs must always be assigned by way of the relevant vehicle identification number and the Electronic Parts Catalogue (ETK)!

Different thicknesses on brake linings	Max. mm	0.01
Max. machining limit per friction ring side (M vehicles and perforated brake discs must not be machined). Brake disc minimum thickness (MIN TH) must not be undershot.	mm	0.8
Nominal size (diameter x thickness)	mm	384x30
Brake disk minimum thickness (MIN TH) stamped on brake disk body	mm	28.4
Nominal size (diameter x thickness)	mm	330x24
Nominal size (diameter x thickness)	mm	300x24
Brake disk minimum thickness (MIN TH) stamped on brake disk body	mm	22.4
Wear warning from residual lining thickness	mm	3.7

E89 REAR BRAKE

34 21 REAR BRAKE DISCS E89

REAR BRAKE DISCS SPECIFICATION

IMPORTANT:

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

Minimum brake disc thickness during general inspection (GI):

Nominal size thickness minus 2.4 mm

(Not applicable to perforated brake discs and M vehicles)

M vehicles and perforated brake discs:

Nominal size thickness minus 1.6 mm

Depending on:

Engine type

Transmission version

Equipment specification (e.g. maximum load increase, chassis official-use, national version, etc.)

different brake discs can be fitted

The brake discs must always be assigned by way of the relevant vehicle identification number and the Electronic Parts Catalogue (ETK)!

Different thicknesses on brake linings	Max. mm	0.01
Max. machining limit per friction ring side (M vehicles and perforated brake discs must not be machined). Brake disc minimum thickness (MIN TH) must not be undershot.	mm	0.8
Nominal size (diameter x thickness)	mm	324x20
Nominal size (diameter x thickness)	mm	300x20
Brake disk minimum thickness (MIN TH) stamped on brake disk body	mm	18.4
Wear warning from residual lining thickness	mm	3.7

BRAKES

Brakes - Tightening Torques - Z4

E89 BRAKE BOOSTER

34 33 BRAKE BOOSTER

TIGHTENING TORQUE SPECIFICATION - BRAKE BOOSTER

		Type	Thread	Tightening specification	Measure
1AZ	Brake booster to pedal assembly console	E89	M8	Replace self-locking nuts Retighten 1x after 5 minutes on brake booster	22 Nm

E89 BRAKE LINES

34 32 BRAKE LINES

TIGHTENING TORQUE SPECIFICATION - BRAKE LINES

		Type	Thread	Tightening specification	Measure
1AZ	Brake line screws/union screws	E89	M12 x 1		12 Nm
		E89	M10 x 1		12 Nm
2AZ	Brake hose to brake caliper, front	E89			24 Nm
3AZ	Brake hose to brake caliper, rear	E89			24 Nm
4AZ	Brake hose holder to trailing arm, rear	E89			8 Nm

E89 BRAKE MASTER CYLINDER

34 31 BRAKE MASTER CYLINDER

TIGHTENING TORQUE SPECIFICATION - BRAKE MASTER CYLINDER

		Type	Thread	Tightening specification	Measure
1AZ	Brake master	E89	M8	Replace self-	21±3 Nm

cylinder to brake booster (vacuum)			locking nuts	
------------------------------------	--	--	--------------	--

E89 FRONT BRAKE

34 11 FRONT BRAKE

TIGHTENING TORQUE SPECIFICATION - FRONT BRAKE

		Type	Thread	Tightening specification	Measure
1AZ	Brake disc to wheel hub	E89		Replace screws	16 Nm
2AZ	Brake anchor plate to swivel bearing	E89	M12x1.5		110 Nm
3AZ	Guard plate to swivel bearing	E89	M6	Replace self-locking or microencapsulated screws	12 Nm
4AZ	Guide screw (socket head cap screw)	E89	WAF 7		30 Nm
5AZ	Guide screw (hexagon screw)	E89	WAF 13	Replace self-locking or microencapsulated screws	35 Nm

E89 PARKING BRAKE

34 41 PARKING BRAKE

TIGHTENING TORQUE SPECIFICATION - PARKING BRAKE

		Type	Thread	Tightening specification	Measure
1AZ	EMF actuator to brake caliper	E89		Replace screws	11±1 Nm

E89 PEDAL ASSEMBLY CONSOLE

35 11 PEDAL ASSEMBLY CONSOLE

TIGHTENING TORQUE SPECIFICATION - PEDAL ASSEMBLY CONSOLE

		Type	Thread	Tightening specification	Measure
1AZ	Bearing pedestal	E89	M8	Replace self-	21 Nm

to brake assembly and body			locking nuts Retighten 1x on brake booster after 5 min	
----------------------------	--	--	---	--

E89 REAR BRAKE

34 21 REAR BRAKE

TIGHTENING TORQUE SPECIFICATION - REAR BRAKE

		Type	Thread	Tightening specification	Measure
1AZ	Brake disc to wheel hub	E89	M8	Replace screws	16 Nm
2AZ	Brake anchor plate to wheel carrier	E89	M12x1.5		110 Nm
3AZ	Protective plate to wheel carrier	E89	M6	Replace screws	12 Nm
4AZ	Guide screw (brake caliper to brake anchor plate)	E89	wrench size 13 mm		35 Nm

E89 SLIP CONTROL SYSTEM (DSC)

34 51 SLIP CONTROL SYSTEM (DSC)

TIGHTENING TORQUE SPECIFICATION - SLIP CONTROL SYSTEM (DSC)

	Type	Thread	Tightening specification	Measure
1AZ Control unit to hydraulic control unit	E89		Initial tightening Final tightening	2±0.5 Nm 4.3+0.5 Nm
2AZ DSC sensor to holder	E89			8 Nm
3AZ Bracket, DSC sensor, to body	E89			8 Nm
4AZ Pulse generator to swivel bearing/wheel carrier	E89			8 Nm
5AZ Bracket to hydraulic unit	E89			8 Nm
6AZ Bracket, hydraulic unit to body	E89			8 Nm

E89 TESTING AND BLEEDING BRAKES

34 00 TESTING AND BLEEDING BRAKES

TIGHTENING TORQUE SPECIFICATION - TESTING AND BLEEDING BRAKES

			Tightening	
--	--	--	------------	--

		Type	Thread	specification	Measure
1AZ	Vent valve	E89	wrench size 9 mm		7-11 Nm
		E89	wrench size 11 mm		12-18 Nm

BRAKES

Pedals - Operating Fluids

1.0 GENERAL INFORMATION

For lubricating friction points on the pedal assemblies, use Syntheso Glep 1 (BMW Part No. 83 23 9 407 778).

BRAKES

Pedals - Repair - Z4

3500 GENERAL

64 00 000 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 bath 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.

3511 PEDAL MOUNTING BLOCK

35 11 000 REMOVING AND INSTALLING COMPLETE BEARING BLOCK FOR FOOT PEDAL

Necessary preliminary tasks

- Read and comply with **GENERAL INFORMATION** .
- Remove **BRAKE MASTER CYLINDER**
- Remove left **SUSPENSION CROSS-BRACE**
- Remove **TRIM PANEL** for pedal assembly
- Remove **CLUTCH MASTER CYLINDER** from bearing block (clutch hydraulic system remains closed)

Release brake lines (1) and remove.

Installation:

Tightening torque **34 32 1AZ** .

Remove non-return valve (2) in direction of arrow from brake booster.

Installation:

Check rubber seal in brake booster and replace if necessary.

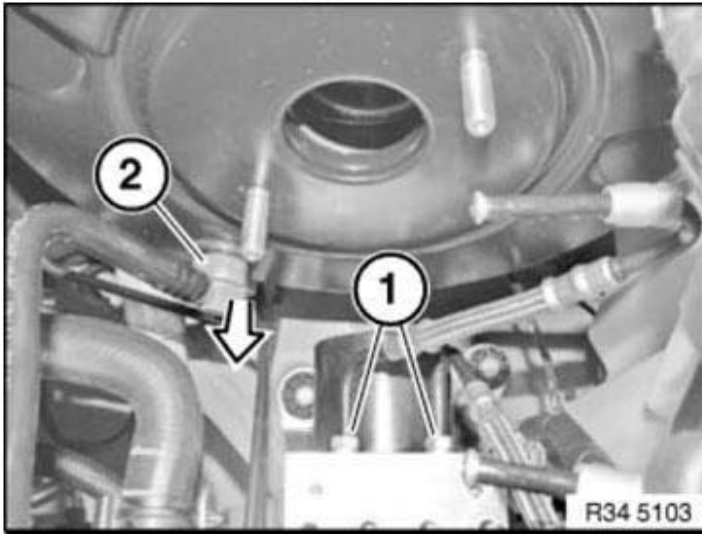


Fig. 1: Removing Non-Return Valve From Brake Booster
Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect plug connection (1).

Unhinge the recoil spring (2).

Remove retaining clip (3).

Installation:

Replace locking clip (3).

Locking clip (3) must be seated with both legs in the pin groove.

Release screws (4).

Installation:

Tightening torque **35 11 1AZ** .

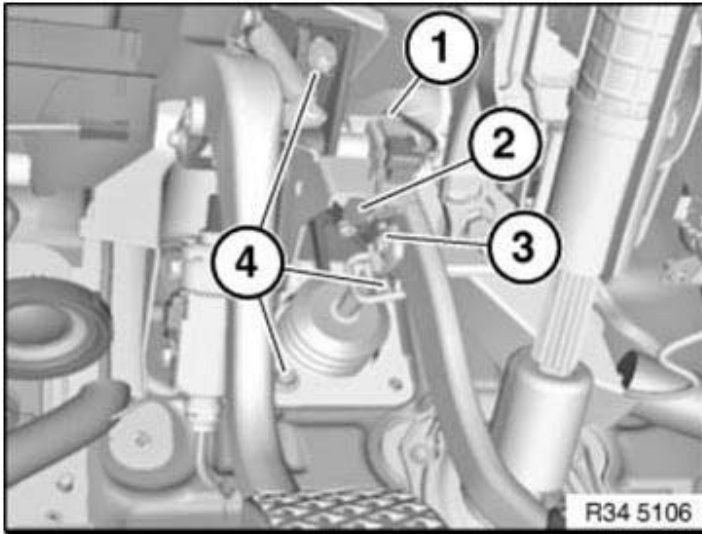


Fig. 2: Identifying Plug Connection, Recoil Spring, Locking Clip And Nuts
 Courtesy of BMW OF NORTH AMERICA, INC.

Move brake booster a little towards engine compartment.

Feed piston rod (1) by turning bearing block out of retaining lug (2).

Installation:

Feed brake pedal in depressed position into piston rod, moving the brake booster a little towards the engine compartment.

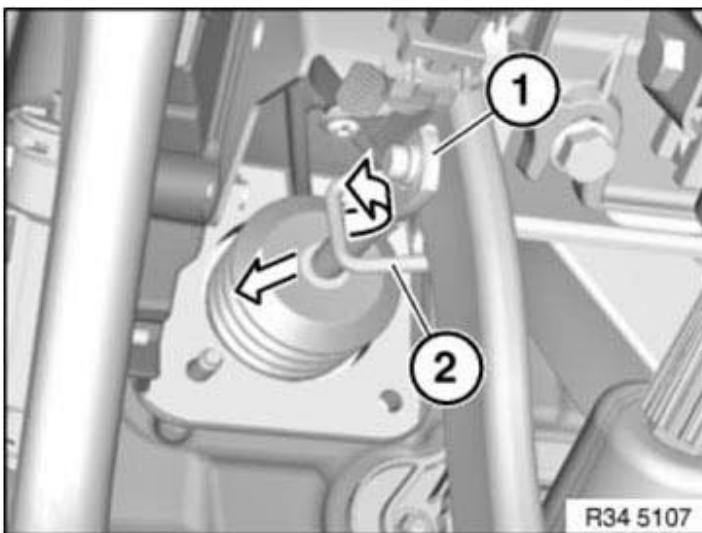


Fig. 3: Turning Bearing Block Out Of Retaining Lug
 Courtesy of BMW OF NORTH AMERICA, INC.

Remove mounting block.

IMPORTANT: Do not use any force when removing and installing the brake unit; the brake unit can be damaged under certain circumstances.
Brake lines must not be bent.

3540 ACCELERATOR PEDAL ACTUATION

35 40 001 REMOVING AND INSTALLING OR REPLACING ACCELERATOR PEDAL MODULE

Take off cap.

Release screw.

Pull accelerator pedal module upwards out of fixture.

Installation:

Tightening torque 35 40 1AZ .

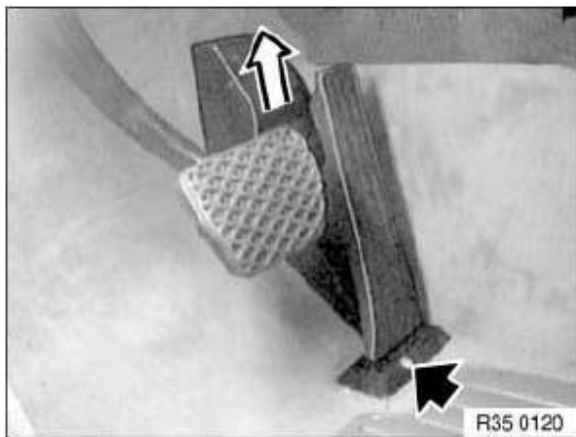


Fig. 4: Pulling Accelerator Pedal Module
Courtesy of BMW OF NORTH AMERICA, INC.

Pull off plug (1).

Remove accelerator pedal module.

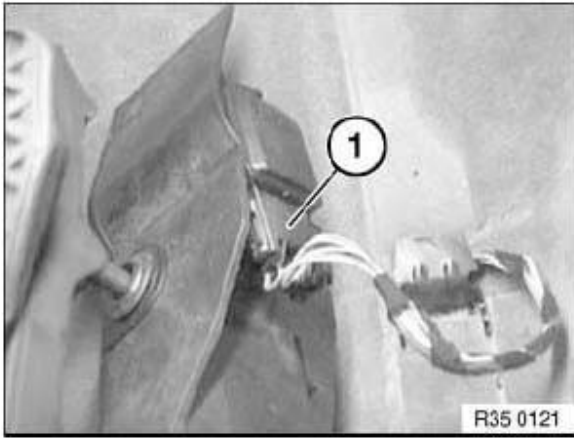


Fig. 5: Identifying Accelerator Pedal Module Plug
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Accelerator pedal module can only be replaced completely with adapter plate.

BRAKES

Pedals - Tightening Torques - Z4

E89 PARKING BRAKE

34 41 PARKING BRAKE

TIGHTENING TORQUE SPECIFICATION - PARKING BRAKE

	Type	Thread	Tightening specification	Measure
1AZ EMF actuator to brake caliper	E89		Replace screws	11±1 Nm

E89 PEDAL ASSEMBLY CONSOLE

35 11 PEDAL ASSEMBLY CONSOLE

TIGHTENING TORQUE SPECIFICATION - PEDAL ASSEMBLY CONSOLE

	Type	Thread	Tightening specification	Measure
1AZ Bearing pedestal to brake assembly and body	E89	M8	Replace self-locking nuts. Retighten 1x on brake booster after 5 min.	21 Nm

E89 PEDALS

35 40 PEDALS

TIGHTENING TORQUE SPECIFICATION - PEDALS

	Type	Thread	Tightening specification	Measure
1AZ Accelerator pedal module to body	E89	M6		8 Nm