

BRAKES**Brakes - Repair Instructions****BRAKE TESTING AND BLEEDING****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 rags which do not lose lint.
- Wash away or vacuum up brake dust, do not clear it away using compressed air. This dust is a health hazard.
- Ensure that no oils or grease enter the brake system: these substances would cause complete failure of the entire brake system.
- When cleaning brake components with brake cleaner do not allow brake cleaner to get into 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 re-use drained brake fluid.
- Always use BMW-approved brake fluid, refer to **BRAKES - OPERATING FLUIDS** .
- Always dispose of brake fluid in approved receptacles.
- 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 is reached.

Refer to **TECHNICAL DATA** .

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

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

In the case of rotation-dependent brake pads, make sure the arrow marking points in the direction of rotation of the brake disk 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 disk contact side of the brake caliper for when the vehicle is moving forward.

○ Brake discs:

Brake disks must not be scored or cracked. Furthermore, minimum brake disk thickness, disk runout, parallelism and surface roughness of the friction surfaces must not exceed or drop below the permitted values.

Refer to **TECHNICAL DATA** .

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

○ Brake drums:

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

Refer to **TECHNICAL DATA** .

Always strip preservative off new parts before installation.

○ Brake calipers:

Only approved pastes on the basis of glycine must 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, refer to **BRAKES - OPERATING FLUIDS** .

Brake lines, brake hoses: brake pad wear indicator

- 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 open connections on brake lines and individual components to prevent dirt from entering the brake system.
- Observe tightening torques when tightening down brake line screw connections.

Tightening torque: **34 32 1AZ** .

Wheel-slip control system:

The slip control system is basically maintenance-free.

However, be sure to adhere to the following:

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

34 00... GENERAL INFORMATION ON BREAKING 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 breaking in are not permitted.
- Advise the customer not to perform any wilful drastic breaking in the first 200 km after brake replacement.
- Attach mirror tag to interior rearview mirror.

34 00... TESTING AWD VEHICLES ON DYNAMIC BRAKE AND POWER ANALYZERS (E30, E34, E46, E53, E83, E60, E61, E90, E91, E92)

IMPORTANT: Power measurements on single-axle roller dynamometers are generally not permitted as total failure of the transfer case cannot be ruled out during such measurements.

34 00... CHECKING BRAKE DISCS

Special tools required:

- 34 1 280

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. See **BRAKES - TECHNICAL DATA** .

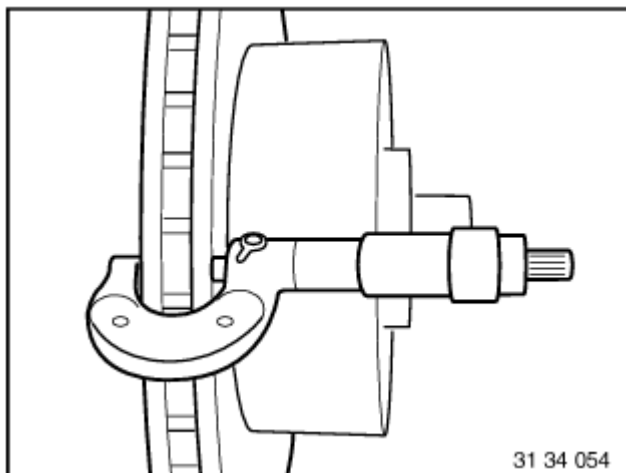


Fig. 1: Checking Rotor Thickness Difference
Courtesy of BMW OF NORTH AMERICA, INC.

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. See **BRAKES - TECHNICAL DATA** .

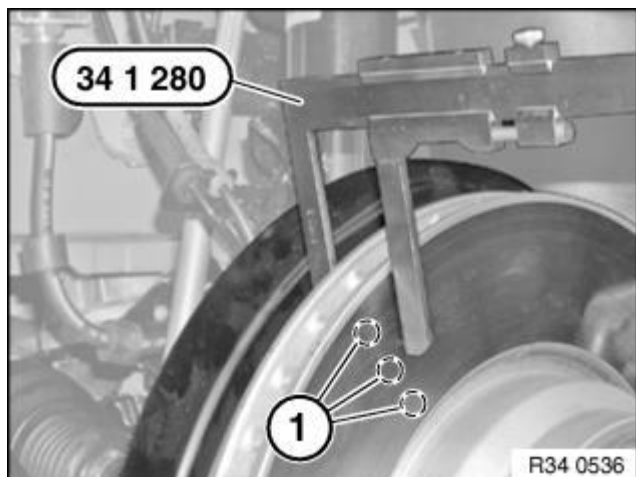


Fig. 2: Checking Minimum Rotor Thickness
 Courtesy of BMW OF NORTH AMERICA, INC.

34 00 009 CHECKING BRAKES ON TEST STAND

Necessary preliminary tasks:

- Check tires for damage
- Check tire treads
- Check tire pressure

In the case of vehicles with DSC, the system must be deactivated with the switch. The DSC telltale and warning light must light up in the instrument cluster!

The brakes must be at normal operating temperature. For this purpose, gently warm up the brake disks/drums while dry by braking the vehicle several times.

E65 and E66: Carry out function check on parking brake.

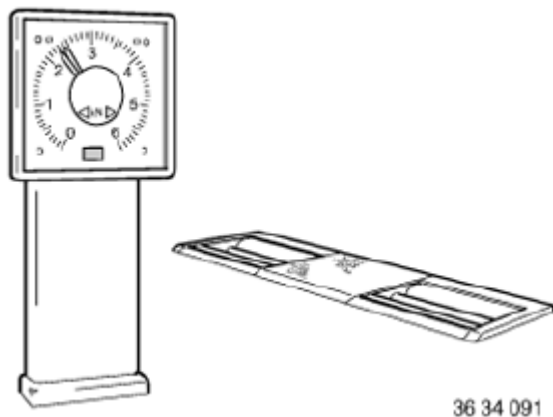


Fig. 3: Identifying Brake Test Stands (Dynamic Analyzers)

Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Only brake test stands (dynamic analyzers) 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

Special tools required:

- 34 1 260

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 disk
- B. Brake pad with backplate

SAFE LIMIT FOR PAD WEAR, FRONT BRAKE .

SAFE LIMIT FOR PAD WEAR, REAR BRAKE .

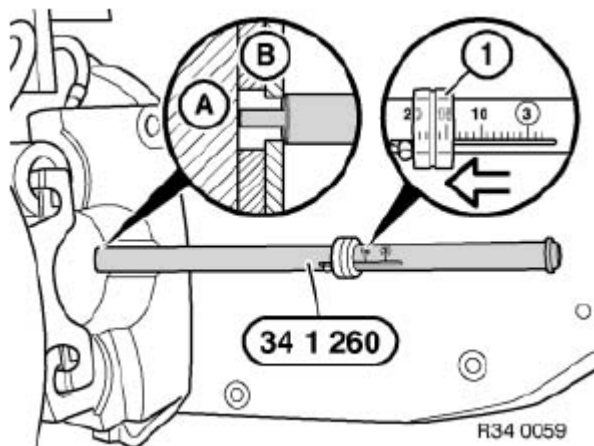


Fig. 4: Inserting Special Tool 34 1 260 Through Rim

Courtesy of BMW OF NORTH AMERICA, INC.

34 00 012 PARKING BRAKE FUNCTION CHECK

NOTE: If deviations are identified during the following check, the parking brake must be adjusted:

Drive vehicle onto chassis dynamometer.

Warm up brakes.

Check handbrake.

0th tooth (handbrake released): Vehicles with manual transmission: Shift lever in neutral position.

Vehicles with automatic transmission: Selector lever in "N" position.

- o Without locking differential ≤ 150 N.
- o With locking differential ≤ 200 N (possibly odd display).

1st tooth: No increase in braking force with regard to 0th tooth. Indicator lamp can be lit.

2nd tooth: Indicator lamp must be lit.

3rd tooth: Increase in braking force.

5th tooth: The brake force display must have reached ≥ 400 N.

Checking brake force differential at wheel:

Apply handbrake 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).

It must be possible to brake with locked wheels with the handbrake.

34 00 017 CHECKING BRAKE BOOSTER (LOW-PRESSURE TEST)

Special tools required:

- **34 3 100**

Necessary preliminary tasks:

- **REMOVE LEFT MICROFILTER HOUSING**

- Detach hose from connection piece. Install vacuum tester **34 3 100** between connection piece and vacuum hose of non-return valve.
- Start engine.
- Check buildup of partial vacuum.
- Switch off engine.
- Press the brake pedal to set a vacuum pressure of not more than 0.8 bar and wait for the value to stabilize.
- When the brake pedal is not pressed, the vacuum pressure is permitted to drop over a test period of 1 minute by max. 0.06 bar.

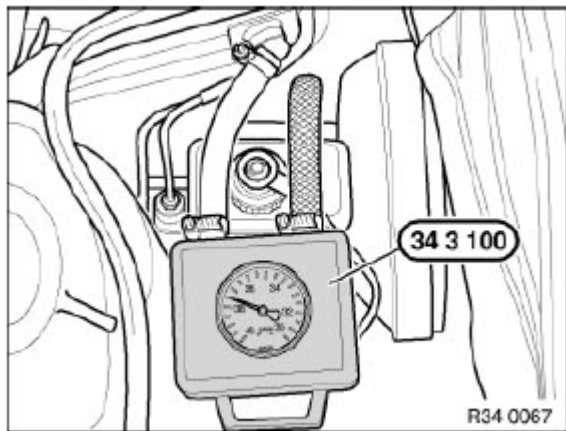


Fig. 5: Identifying Vacuum Tester 34 3 100 Between Connection Piece And Vacuum Hose Of Non-Return Valve

Courtesy of BMW OF NORTH AMERICA, INC.

If specified values are not reached:

- Check line connections for vacuum seal.
- Replace non-return valve.
- Check seal between brake booster and brake master cylinder (sealing ring) for perfect condition and correct seating.
- If the specified values are not achieved when the test is repeated, you must replace the brake booster.

34 00 025 REPLACING FLUID IN ABS/ASC+T BRAKE SYSTEM

Necessary preliminary tasks:

- **READ AND COMPLY WITH GENERAL INFORMATION.**
- **REMOVE LOWER SECTION OF MICROFILTER HOUSING .**

IMPORTANT: When carrying out repairs to the brake system, follow the procedure set out in BLEEDING BRAKE SYSTEM WITH DSC.

Connect bleeder unit to expansion tank and switch on.

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

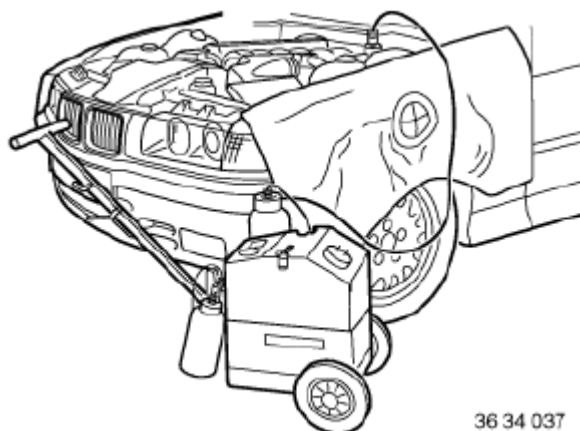


Fig. 6: Connecting Bleeder Unit To Expansion Tank
Courtesy of BMW OF NORTH AMERICA, INC.

Flushing brake system completely

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 bleed valve.

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

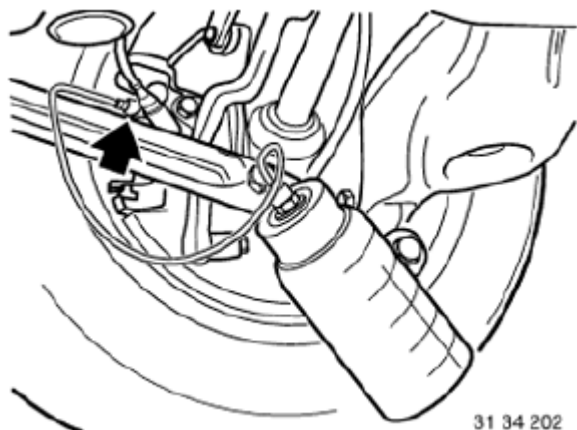


Fig. 7: Connecting Bleeder Hose With Collecting Tray To Bleeder Valve
Courtesy of BMW OF NORTH AMERICA, INC.

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.

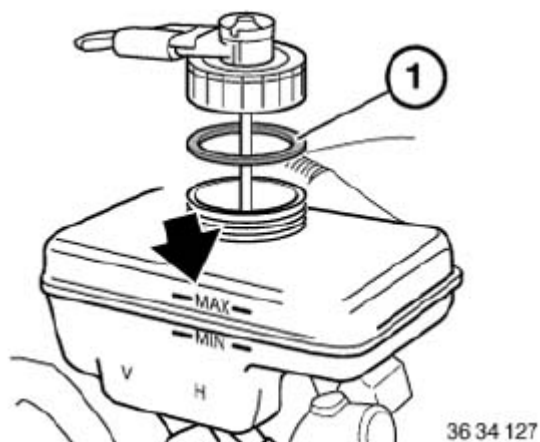


Fig. 8: Identifying Rubber Seal

Courtesy of BMW OF NORTH AMERICA, INC.

34 00 050 BLEEDING BRAKE SYSTEM WITH DSC

Necessary preliminary tasks:

- **REMOVE LOWER SECTION OF MICROFILTER HOUSING .**
- **READ AND COMPLY WITH GENERAL INFORMATION.**

Observe the filling and bleeding instructions when replacing or repairing:

- Replace
- 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.

IMPORTANT: Check relevant Operating Instructions for each device.

Charging pressure should not exceed 2 bar.

- Connect BMW Diagnosis and Information System (DIS).
- Select path: Service functions - Chassis/Suspension - Slip control systems - Bleeding procedure.
- Connect bleeder unit to expansion tank and switch on.

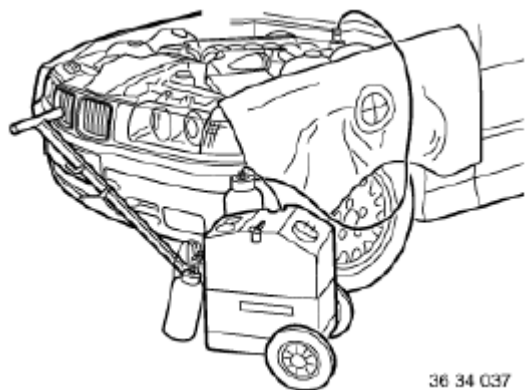


Fig. 9: Connecting Bleeder Unit To Expansion Tank
Courtesy of BMW OF NORTH AMERICA, INC.

Flushing brake system completely

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 bleed valve.

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

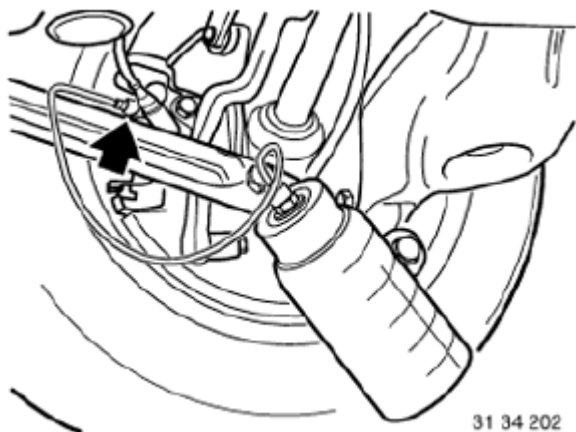


Fig. 10: Connecting Bleeder Hose With Collecting Tray To Bleeder Valve
Courtesy of BMW OF NORTH AMERICA, INC.

Bleeding rear-axle brake circuit

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

Close bleeder valve.

Run through bleeding routine with BMW Diagnosis and Information System (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.

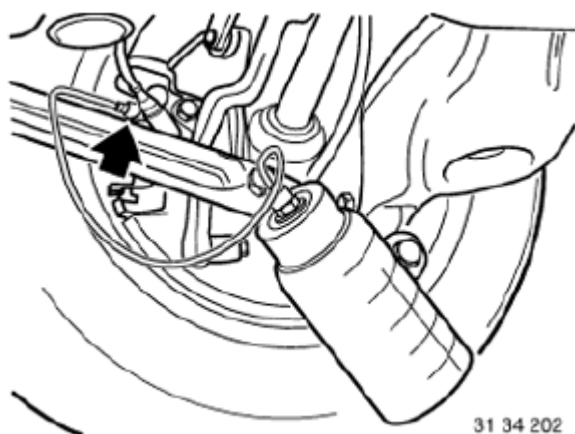


Fig. 11: Connecting Bleeder Hose With Collecting Tray To Bleeder Valve

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 caliper.

Close bleeder valve.

Run through bleeding routine with BMW Diagnosis and Information System (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.

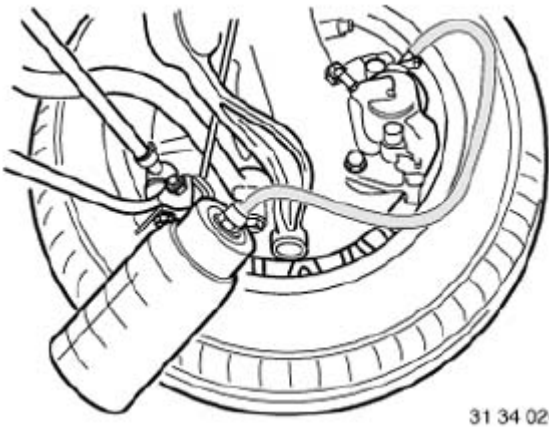


Fig. 12: Connecting Bleeder Hose With Collecting Tray To Bleeder Valve
 Courtesy of BMW OF NORTH AMERICA, INC.

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.

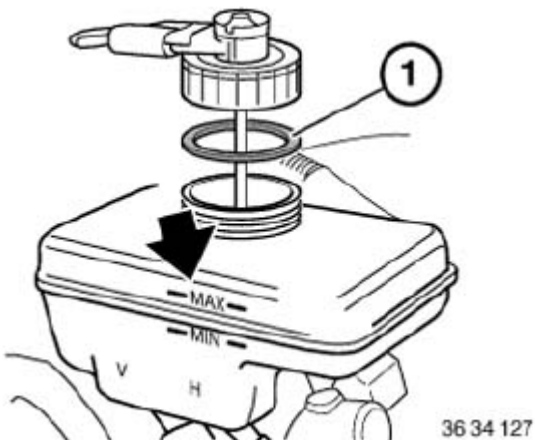
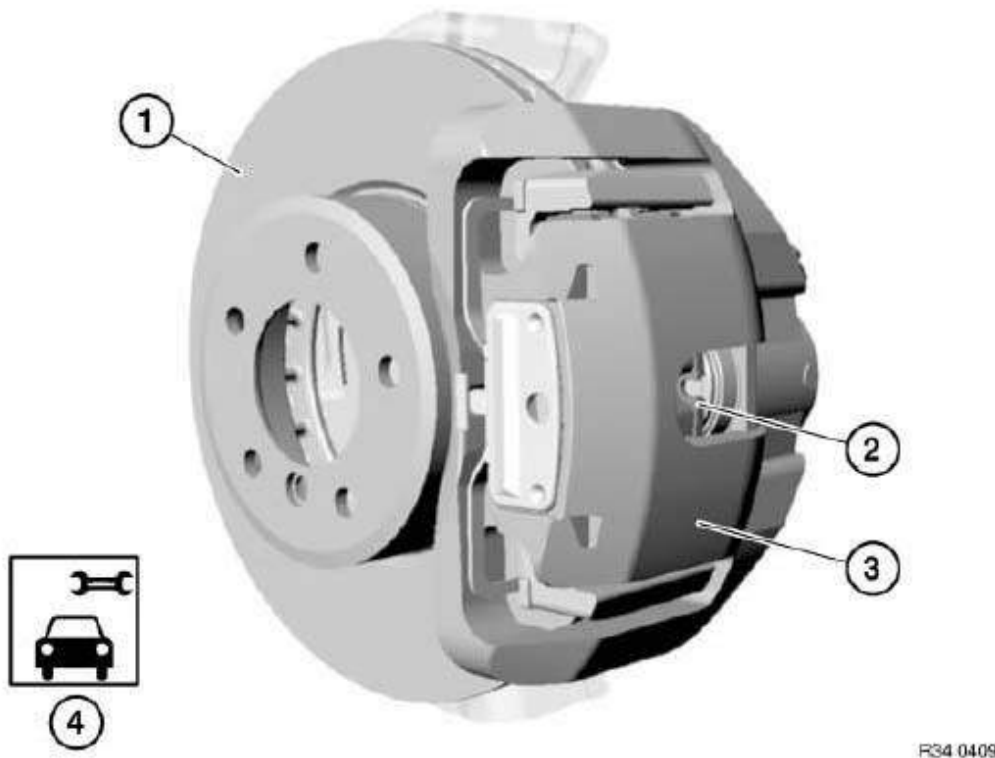


Fig. 13: Identifying Rubber Seal
 Courtesy of BMW OF NORTH AMERICA, INC.

FRONT BRAKES

34 11... OVERVIEW OF FRONT BRAKE

1 [Brake disk](#)2 [Brake pad](#)3 [Brake caliper](#)4 [Checking thickness of brake lining](#)**Fig. 14: Overview Of Front Brake**

Courtesy of BMW OF NORTH AMERICA, INC.

34 11 000 REMOVING AND INSTALLING/REPLACING BRAKE PADS ON BOTH FRONT DISC BRAKES**Special tools required:**

- [34 1 080](#)
- [34 1 280](#)
- [34 6 320](#)

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).

IMPORTANT: Sport brake pads for M5 / M6:

- Due to the increased strain on the brake discs, we recommend that you also replace the brake discs when fitting this brake pad.

- It is absolutely essential to replace the brake discs if cracked > or = 13 mm even before the brake pad is worn.

Necessary preliminary tasks:

- Remove wheels
- Remove **BRAKE PAD WEAR SENSOR**

Observe **SAFETY INSTRUCTIONS** on raising the vehicle.

Lever out retaining spring (1) in direction of arrow towards rear.

Installation:

Attach retaining spring (1) first at top and bottom and then allow retaining lug (2) to engage in recess of brake caliper housing.

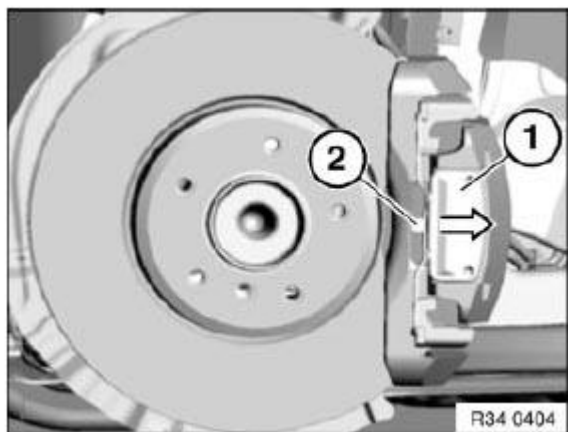


Fig. 15: Identifying Retaining Spring And Retaining Lug
Courtesy of BMW OF NORTH AMERICA, INC.

Remove plastic plugs (1).

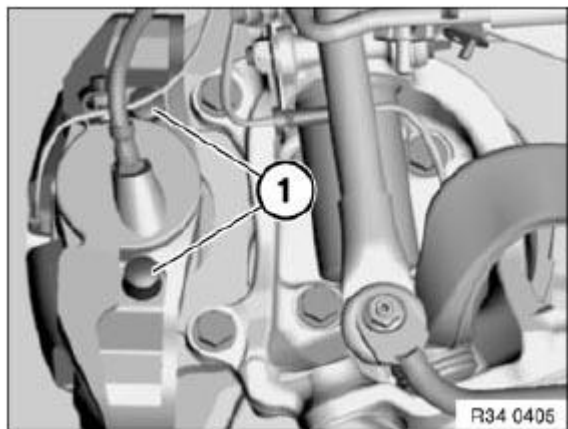


Fig. 16: Identifying Plastic Plugs

Courtesy of BMW OF NORTH AMERICA, INC.

Left:

Pull brake pad wear sensor (1) towards rear out of pad.

Release guide screws (2) with special tool **34 1 080** . Withdraw brake caliper backwards.

Installation:

Only clean guide screws; do not grease.

Check threads.

Replace all guide screws which are not in perfect condition.

Tightening torque **34 11 3AZ** .

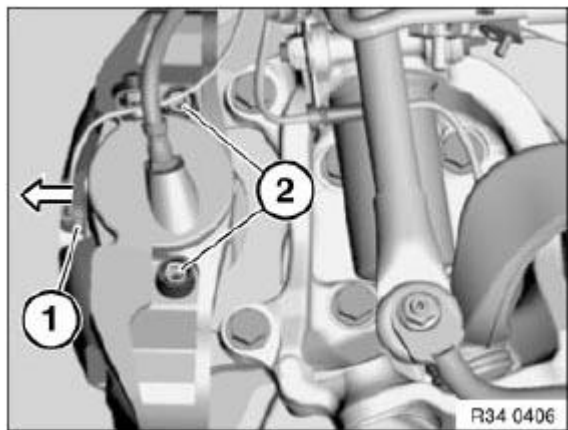


Fig. 17: Identifying Brake Pad Wear Sensor

Courtesy of BMW OF NORTH AMERICA, INC.

Press back brake pads and piston with special tool 34 6 320.

IMPORTANT: When forcing piston back:

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

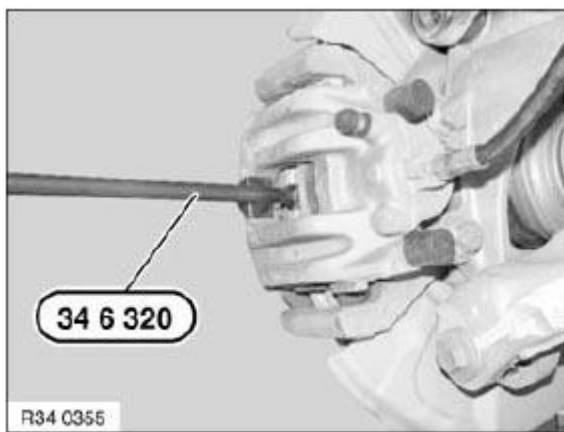


Fig. 18: Pressing Back Brake Pads And Piston With Special Tool 34 6 320
Courtesy of BMW OF NORTH AMERICA, INC.

Press brake pads inwards and remove.

The two brake pads are seated with a spring in the piston or in the brake caliper housing and must not be mixed up.

IMPORTANT: Mark any worn brake pads.

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

Observe **MINIMUM THICKNESS OF BRAKE PADS** .

Clean brake pads.

Do not apply grease to brake pad backplate.

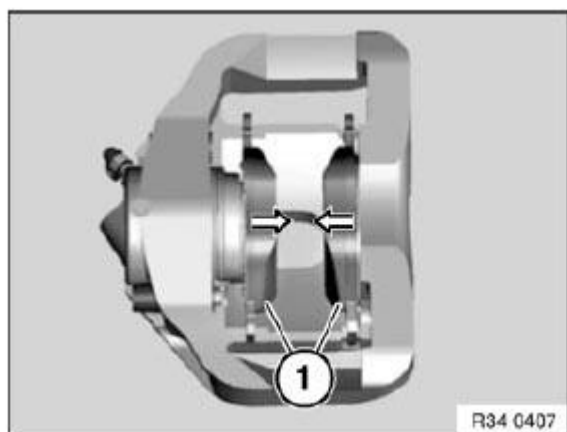


Fig. 19: Identifying Brake Pads

Courtesy of BMW OF NORTH AMERICA, INC.

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!

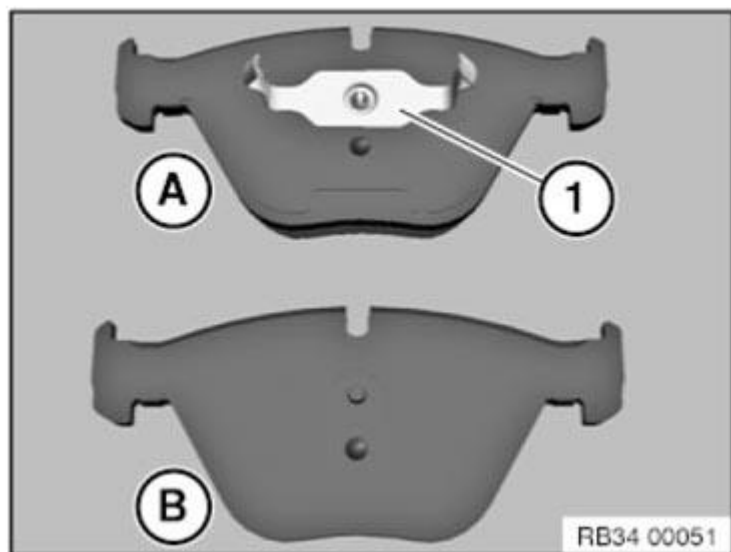


Fig. 20: Identifying Brake Pads With/Without Retaining Spring

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** .

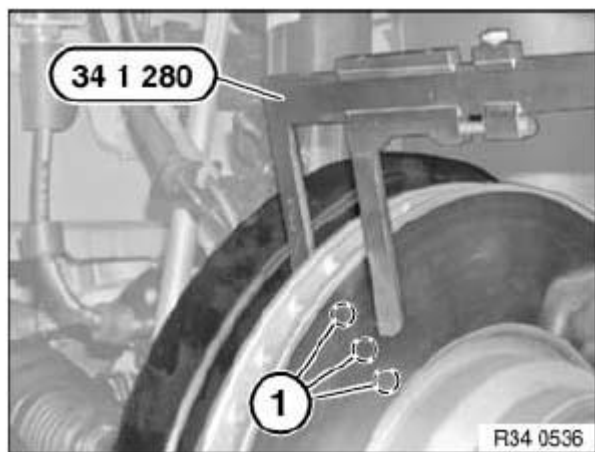


Fig. 21: Identifying Measuring Points Area
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: New brake pads may only be installed if the brake disc thickness is greater than or equal to the **MINIMUM BRAKE DISC THICKNESS** (MIN TH) (not incl. M vehicles).

In the case of M vehicles and perforated brake discs, new brake pads may only be installed if the brake disc thickness is greater than the **MINIMUM BRAKE DISC THICKNESS** (MIN TH).

NOTE: The minimum brake disc thickness is configured in such a way that it lasts the life of a further set of brake pads (does not apply to M vehicles and perforated brake discs).

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

Clean contact face (2) of brake piston and apply a thin coating of anti-squeak compound.

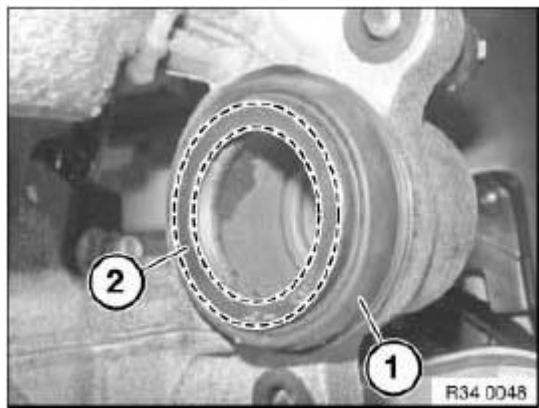


Fig. 22: Identifying Dust Sleeve And Contact Face

Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Dust sleeve must not come into contact with anti-squeak compound as this may cause the dust sleeve to swell.

Clean mounting faces (1) and (2) of brake pad hammer heads/brake caliper housing and coat with anti-squeak compound.

NOTE: Grease contact surfaces on brake caliper at top and bottom.

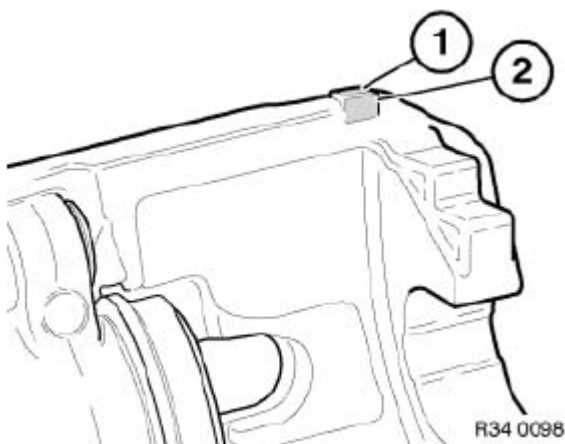


Fig. 23: Identifying Mounting Faces

Courtesy of BMW OF NORTH AMERICA, INC.

Clean mounting face (3) of brake caliper and apply a thin coating of anti-squeak compound.

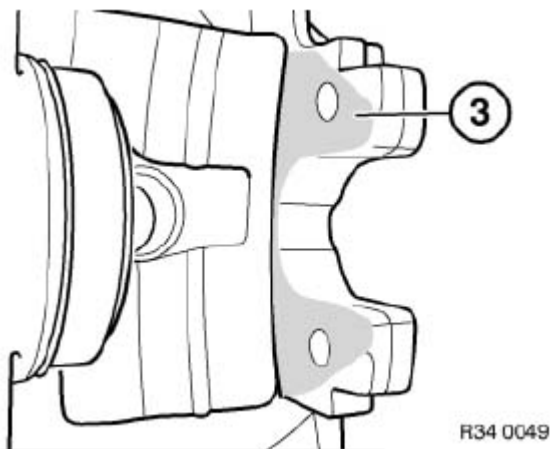


Fig. 24: Identifying Mounting Faces

Courtesy of BMW OF NORTH AMERICA, INC.

Clean brake caliper holder at hammerhead guides and apply a thin coating of anti-squeak compound.

Refer to **BRAKES - OPERATING FLUIDS** .

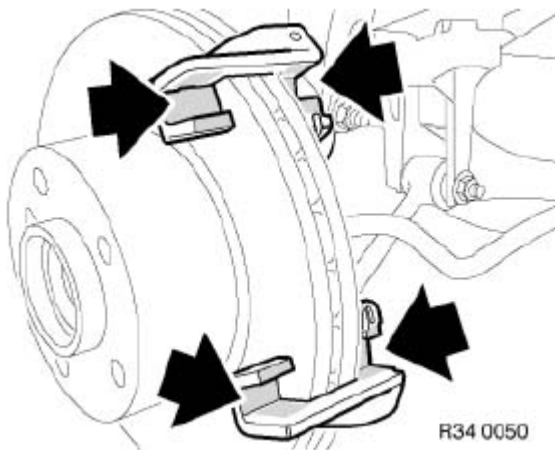


Fig. 25: Locating Brake Caliper Holder

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 **BREAKING IN NEW BRAKE DISCS / BRAKE PADS**.
- When replacing pads, reset CBS display in accordance with

MAINTENANCE REMINDER LIGHT RESET PROCEDURES .

IMPORTANT: On the E60 M5 and E63/E64 M6 the fault memory entry "Mastervac vacuum pressure sensor" may be stored after the brake pads have been replaced. The fault memory entry must be deleted. The vacuum pressure sensor only has to be replaced if the fault is entered repeatedly.

34 00 017 CHECKING BRAKE BOOSTER (LOW-PRESSURE TEST)

Necessary preliminary tasks:

- Remove **LEFT MICROFILTER HOUSING**
 - Detach hose from connection piece. Install vacuum tester 34 3 100 between connection piece and vacuum hose of non-return valve.
 - Start engine.
 - Check buildup of partial vacuum.
 - Switch off engine.
 - Press the brake pedal to set a vacuum pressure of not more than 0.8 bar and wait for the value to stabilize.
 - When the brake pedal is not pressed, the vacuum pressure is permitted to drop over a test period of 1 minute by max. 0.06 bar.

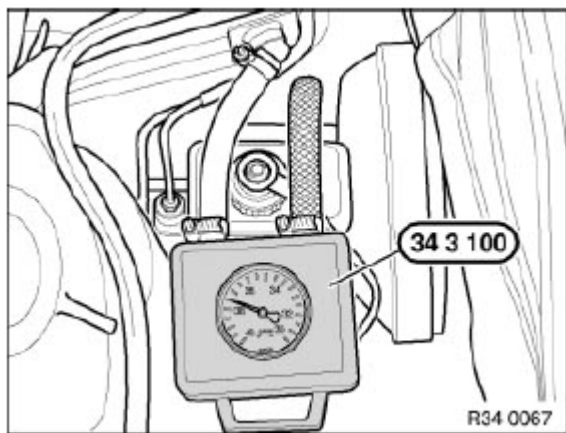


Fig. 26: Installing Vacuum Tester (34 3 100) Between Connection Piece And Vacuum Hose Of Non-Return Valve

Courtesy of BMW OF NORTH AMERICA, INC.

If specified values are not reached:

- Check line connections for vacuum seal.
- Replace non-return valve.
- Check seal between brake booster and brake master cylinder (sealing ring) for perfect condition and

correct seating.

- If the specified values are not achieved when the test is repeated, you must replace the brake booster.

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

Special tools required:

- **34 1 280**

Necessary preliminary tasks:

- Remove wheels
- **IF NECESSARY, REMOVE AND CLEAN BRAKE PADS**

After completing work, read and comply with notes on **BREAKING IN NEW BRAKE DISCS / BRAKE PADS**.

Observe **SAFETY INSTRUCTIONS** on raising the vehicle.

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** .

IMPORTANT: New brake pads may only be installed if the brake disc thickness is greater than or equal to the **MINIMUM BRAKE DISC THICKNESS (MIN TH)** (not incl. M vehicles).

In the case of M vehicles and perforated brake discs, new brake pads may only be installed if the brake disc thickness is greater than the **MINIMUM BRAKE DISC THICKNESS (MIN TH)**.

NOTE: The minimum brake disc thickness is configured in such a way that it lasts the life of a further set of brake pads (does not apply to M vehicles and perforated brake discs).

Always replace brake discs in pairs.

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

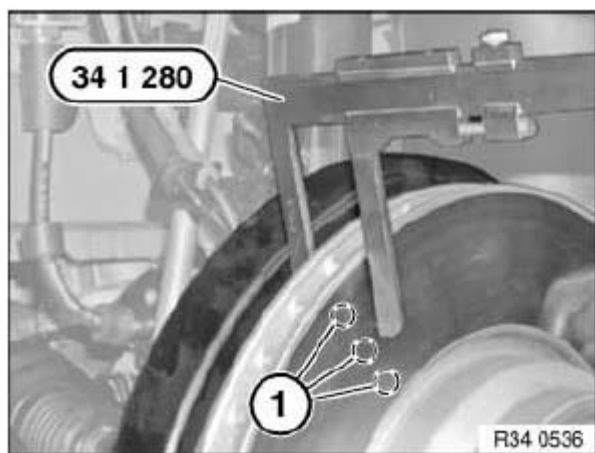


Fig. 27: Identifying Measuring Points Area
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1), remove brake caliper and tie up.

Installation:

Tightening torque **34 11 2AZ** .

NOTE: Brake hose remains connected.
If the brake hose was pulled from the mounting fixture during removal, make sure it is positively attached when installed!

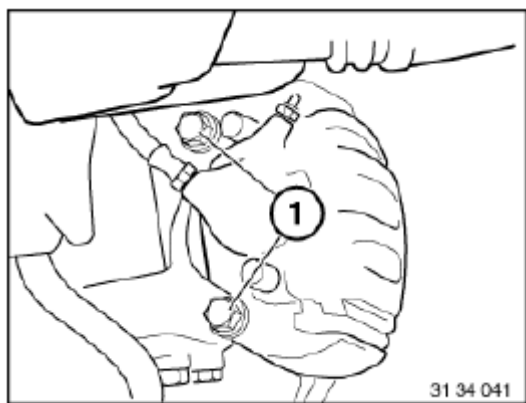


Fig. 28: Identifying Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Unscrew bolts and take off brake disc.

Installation:

Tightening torque **34 11 1AZ** .

Clean contact surface of brake disc at wheel hub thoroughly and remove traces of corrosion if necessary. Unevenness on contact surface may result in distortion of brake disc!

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.

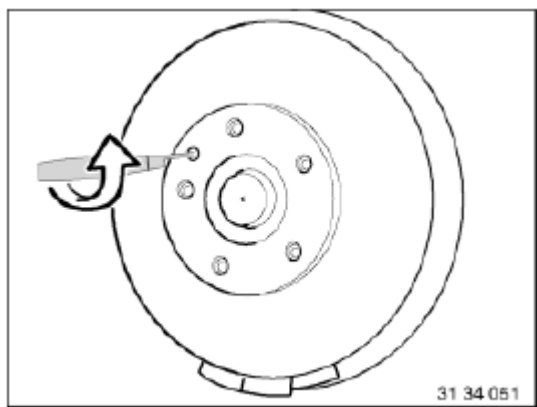


Fig. 29: Unscrewing Bolts

Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Internally ventilated brake discs are balanced. Never remove or reposition balance clips.

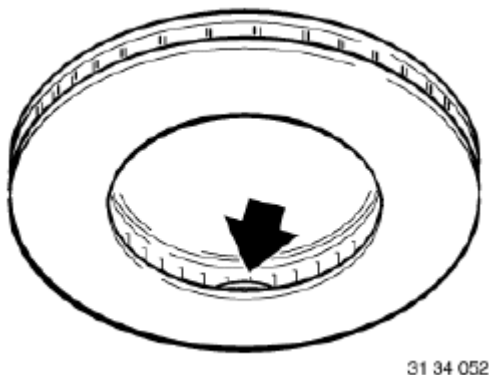


Fig. 30: Locating Balance Clips

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 DISKS**

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

Installation:

Tightening torque **34 11 5AZ** .

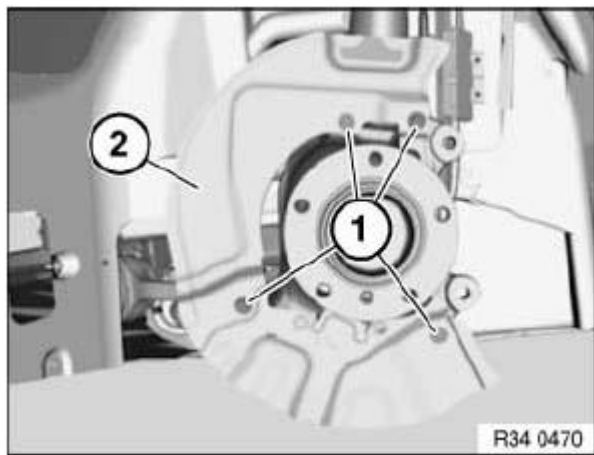


Fig. 31: Identifying Screws And Brake Guard Plate
Courtesy of BMW OF NORTH AMERICA, INC.

34 11 519 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT FRONT BRAKE CALIPER

Necessary preliminary tasks:

- Remove wheels

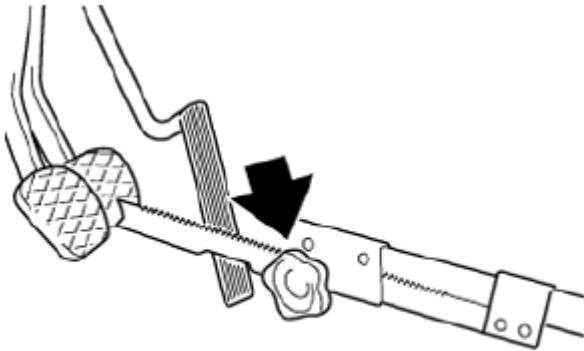
Observe **SAFETY INSTRUCTIONS** on raising the vehicle.

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. 32: Locating Pedal Support**Courtesy of BMW OF NORTH AMERICA, INC.**

Left side: Disconnect plug connection for wear indicator.

Release brake hose on brake caliper.

Slacken connection for brake hose and brake line.

Installation:

Tighten brake hose on brake caliper.

Tightening torque **34 32 4AZ** .

Move steering to straight-ahead position.

Screw brake hose to brake line, ensuring that brake hose is not twisted.

Tightening torque **34 32 1AZ** .

Release screws (1) and remove brake caliper.

Installation:

Tightening torque **34 11 2AZ** .

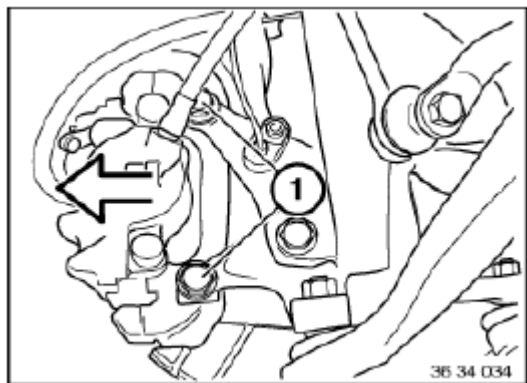


Fig. 33: Identifying Screws

Courtesy of BMW OF NORTH AMERICA, INC.

34 11 552 OVERHAULING LEFT OR RIGHT FRONT BRAKE CALIPER (BRAKE CALIPER REMOVED)

Special tools required:

- **34 1 133**

NOTE: Use repair kit

Bear in mind that guide sleeves and screws come in different lengths:

- **16" brake system:** two short guide sleeves with two short screws.
- **17" brake system:** one long guide sleeve and one short guide sleeve with one long screw and one short screw.
- **18" brake system:** two long guide sleeves with two long screws.

Take off plastic caps (1).

Unscrew guide screws (2).

Installation:

Only clean guide screws; do not grease. Check guide bolts, replace if necessary.

E65 and E66:

Tightening torque: **34 11 3AZ**

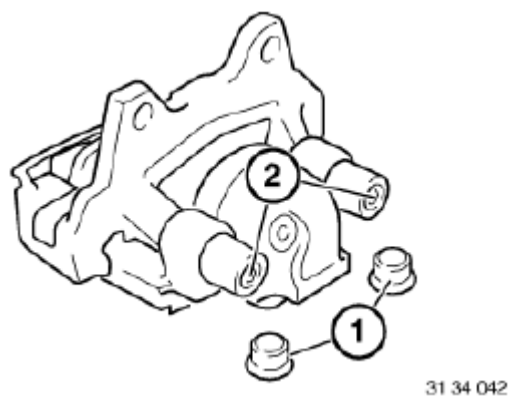


Fig. 34: Identifying Plastic Caps And Guide Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

Dismantle brake caliper and remove brake pads.

Installation:

Press brake pads fully outwards and insert spring (4).

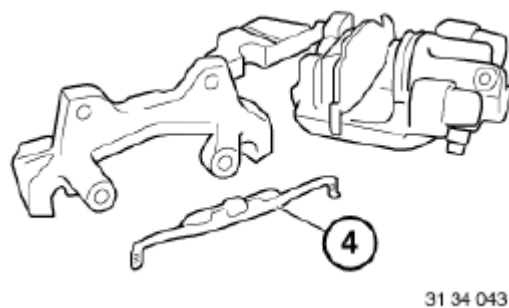


Fig. 35: Identifying Spring
 Courtesy of BMW OF NORTH AMERICA, INC.

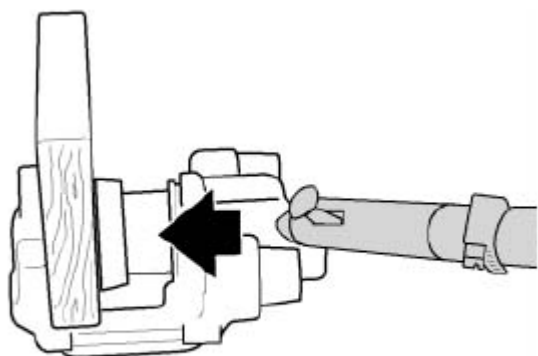
WARNING: *Danger of injury!*

In the following work step, large forces occur at the brake caliper piston up to more than 2800 N.

Carefully force piston out through connection bore with compressed air.

To protect piston, place a protective plate (e.g. hard wood or hard felt) in caliper recess.

Do not grip piston with fingers - risk of trapping!

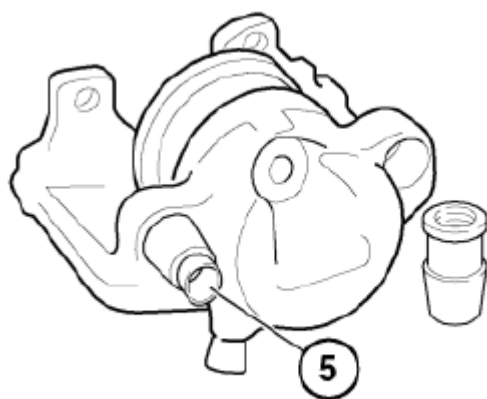


31 34 044

Fig. 36: Placing Protective Plate In Caliper Recess
 Courtesy of BMW OF NORTH AMERICA, INC.

Check guide sleeves (5), fitting repair-kit guide sleeve if necessary.

IMPORTANT: Bear in mind that guide sleeves and screws come in different lengths. Long guide sleeve with long screw is seated on disk inlet at bottom, short sleeve with short screw is seated on disk outlet at top.



31 34 045

Fig. 37: Identifying Guide Sleeves
 Courtesy of BMW OF NORTH AMERICA, INC.

Remove sealing ring carefully with a plastic needle.

Clean cylinder bores and parts with alcohol and dry with compressed air.

Thoroughly inspect cylinder bore, piston and flange surfaces. Machining of cylinders and pistons is not permitted.

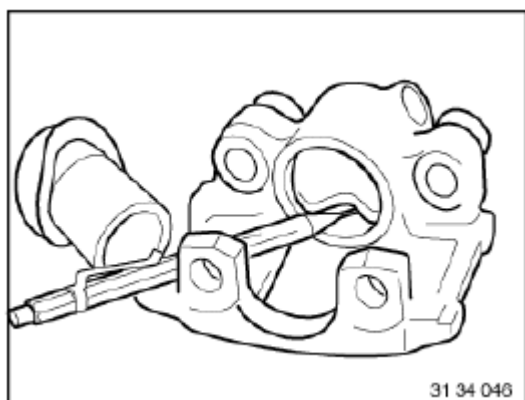


Fig. 38: Removing Sealing Ring With Plastic Needle
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Apply a light coat of Ate brake cylinder paste to cylinder bore, piston and sealing sleeve,

Refer to **BRAKES - OPERATING FLUIDS** .

Install sealing cover in rear annular groove of cylinder bore.

Press in piston with a hardwood board.

IMPORTANT: Do not tilt piston.

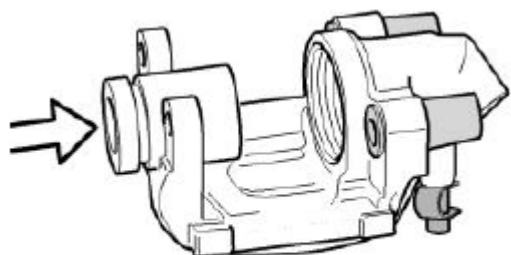


Fig. 39: Pressing Piston With Hardwood Board
Courtesy of BMW OF NORTH AMERICA, INC.

Press on dust protection sleeve evenly up to stop with special tool **34 1 133** .

Installation:

The area between dust protection sleeve and brake caliper housing must be kept dry so as to ensure correct seating for the dust protection sleeve.

Keep Ate brake cylinder paste or brake fluid away from this area.

Make sure dust protection sleeve is correctly seated on piston.

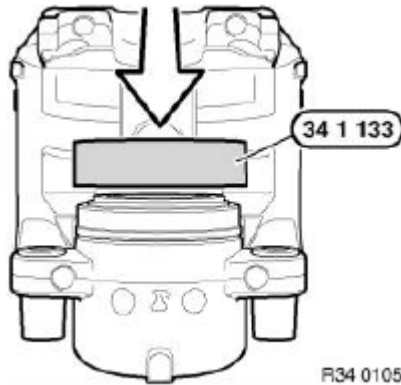


Fig. 40: Pressing Dust Protection Sleeve
Courtesy of BMW OF NORTH AMERICA, INC.

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.

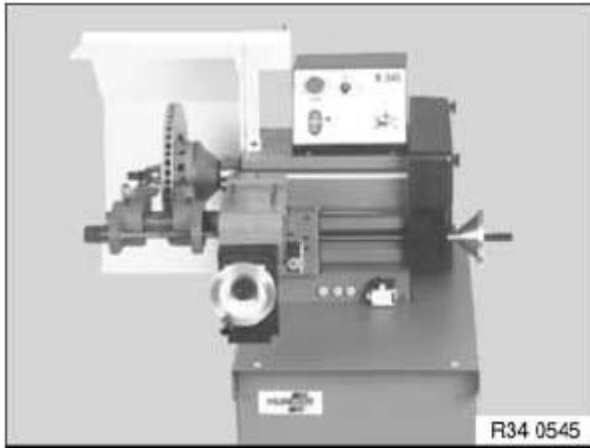


Fig. 41: Identifying Stationary Brake Disc Lathe
Courtesy of BMW OF NORTH AMERICA, INC.

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. 42: 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.

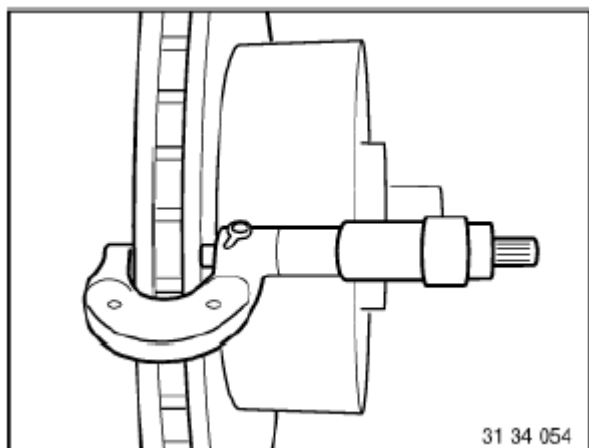


Fig. 43: Measuring Brake Discs Thickness
Courtesy of BMW OF NORTH AMERICA, INC.

REAR BRAKES

34 21... OVERVIEW OF REAR BRAKE

1 [Brake disk](#)2 [Brake pad](#)3 [Brake caliper](#)4 [Checking thickness of brake lining](#)**Fig. 44: Overview Of Rear Brake**

Courtesy of BMW OF NORTH AMERICA, INC.

34 21 171 REMOVING AND INSTALLING / REPLACING A BRAKE CARRIER / BRAKE GUARD AT REAR*Necessary preliminary tasks:*

- Remove **EXPANDER LOCK**
- Remove **WHEEL HUB**

Release screws (1) and remove brake carrier (2).

*Installation:*Tightening torque **34 21 6AZ** .

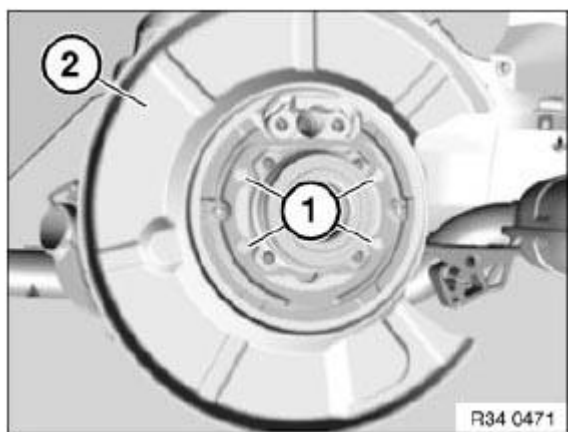


Fig. 45: Identifying Screws And Brake Carrier
Courtesy of BMW OF NORTH AMERICA, INC.

34 21 200 REMOVING AND INSTALLING OR REPLACING BRAKE PADS ON BOTH REAR DISC BRAKES

Special tools required:

- 34 1 050
- 34 1 080
- 34 1 280

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
- Remove **BRAKE PAD WEAR SENSOR**

Observe **SAFETY INSTRUCTIONS** on raising the vehicle.

Remove plastic plugs (1).

Right side:

Disconnect plug connection for brake pads wear sensor.

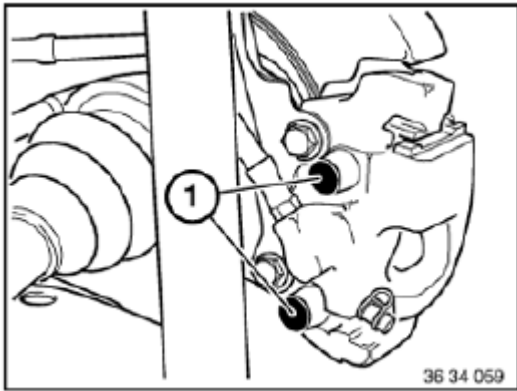


Fig. 46: Identifying Plastic Plugs

Courtesy of BMW OF NORTH AMERICA, INC.

Release guide screws (2) with special tool 34 1 080.

Installation:

Only clean guide screws; do not grease.

Check threads.

Replace all guide screws which are not in perfect condition.

Tightening torque **34 21 5AZ** .

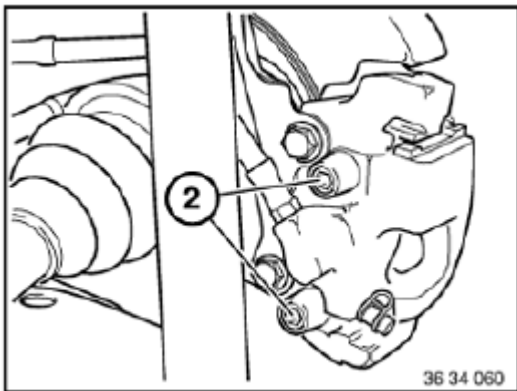


Fig. 47: Identifying Guide Screws

Courtesy of BMW OF NORTH AMERICA, INC.

Lift out retaining spring (3).

Withdraw brake caliper backwards.

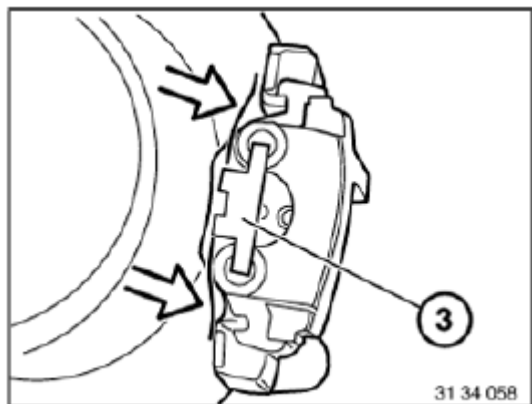


Fig. 48: Identifying Retaining Spring

Courtesy of BMW OF NORTH AMERICA, INC.

Turn piston fully back with special tool 34 1 050.

IMPORTANT: When forcing piston back:

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

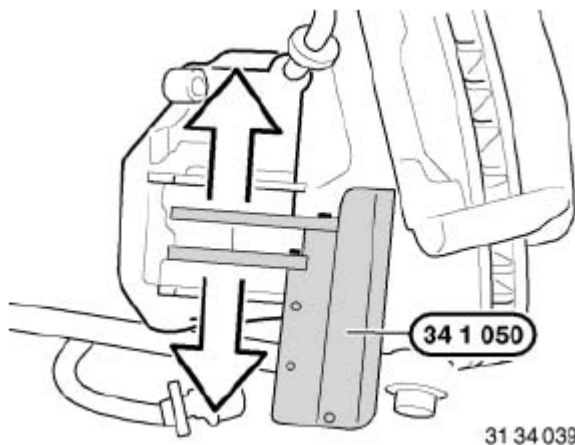


Fig. 49: Turning Piston Fully Back With Special Tool 34 1 050

Courtesy of BMW OF NORTH AMERICA, INC.

Remove outer brake pad.

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

IMPORTANT: Mark any worn brake pads.

If the brake pads are worn on one side, they must not be mixed up!

Observe **MINIMUM THICKNESS OF BRAKE PADS** .

Clean brake pads.

Do not apply grease to brake pad backplate.

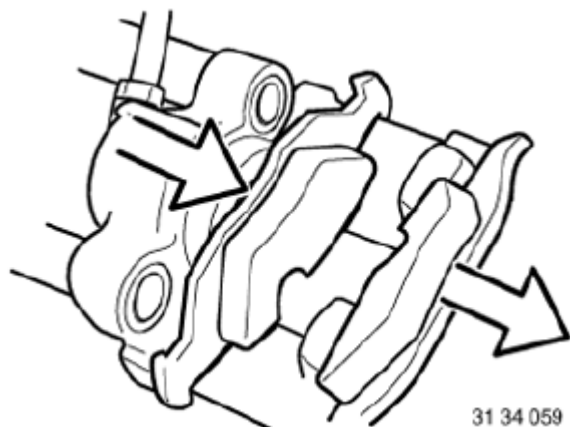


Fig. 50: Removing Outer Brake Pad
Courtesy of BMW OF NORTH AMERICA, INC.

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** .

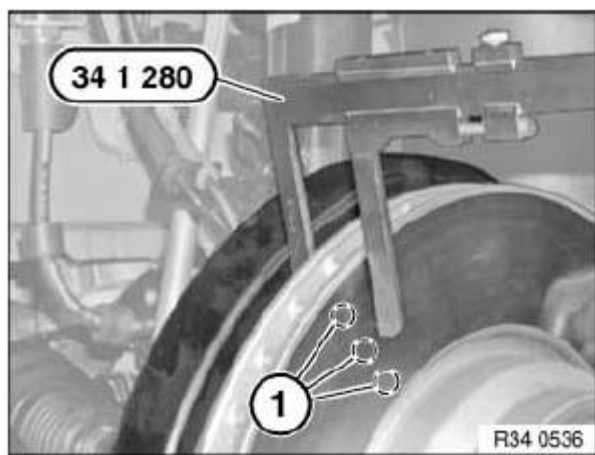


Fig. 51: Measuring Brake Disc Thickness
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: New brake pads may only be installed if the brake disc thickness is greater than or equal to the **MINIMUM BRAKE DISC THICKNESS (MIN TH)** (not incl. M vehicles).

In the case of M vehicles and perforated brake discs, new brake pads may only be installed if the brake disc thickness is greater than the **MINIMUM BRAKE DISC THICKNESS** (MIN TH).

NOTE: The minimum brake disc thickness is configured in such a way that it lasts the life of a further set of brake pads (does not apply to M vehicles and perforated brake discs).

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

Clean contact face (2) of brake piston and apply a thin coating of anti-squeak compound.

IMPORTANT: Dust sleeve must not come into contact with anti-squeak compound as this may cause the dust sleeve to swell.

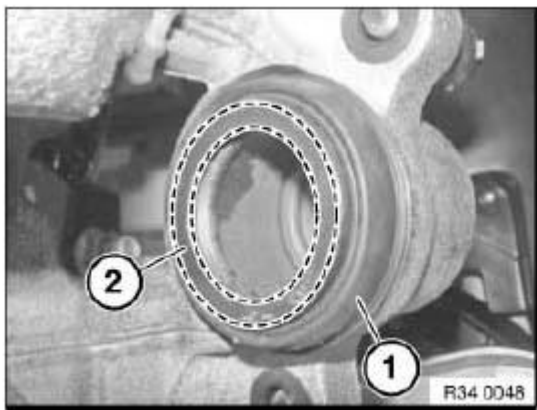


Fig. 52: Identifying Dust Sleeve And Contact Face
Courtesy of BMW OF NORTH AMERICA, INC.

Clean mounting faces (1) and (2) of brake pads hammer heads/brake caliper housing and coat with anti-squeak compound.

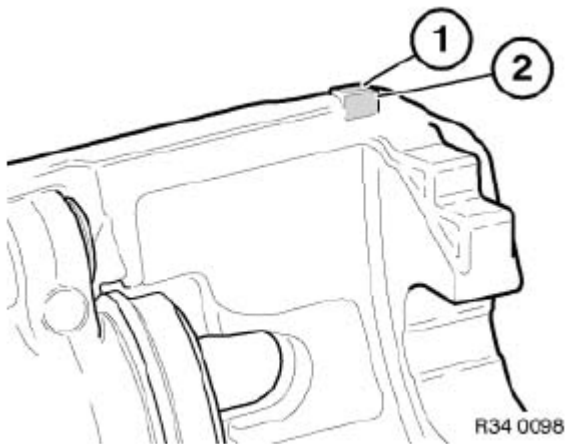


Fig. 53: Identifying Mounting Faces

Courtesy of BMW OF NORTH AMERICA, INC.

Clean contact face (3) of brake caliper and apply a thin coating of anti-squeak compound.

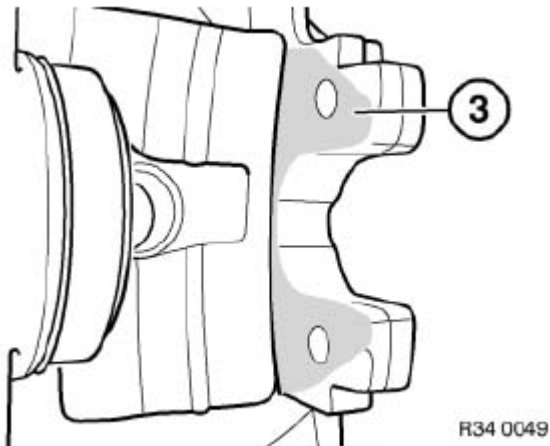


Fig. 54: Identifying Mounting Faces

Courtesy of BMW OF NORTH AMERICA, INC.

Clean brake caliper mounting bracket at hammer head guides and apply a thin coating of anti-squeak compound.

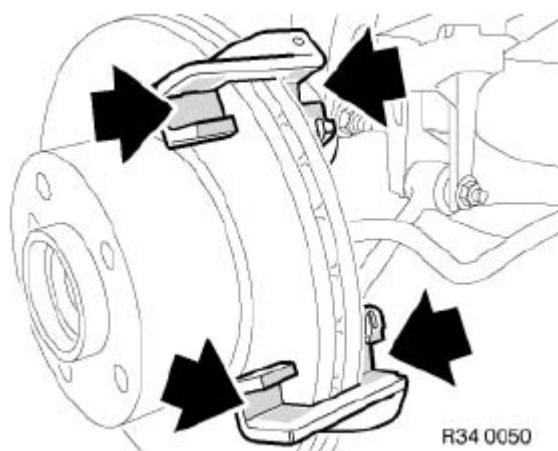


Fig. 55: Locating Brake Caliper Holder

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 BREAKING IN NEW BRAKE DISCS / BRAKE PADS.
- If necessary, when replacing pads, reset CBS display in accordance with MAINTENANCE REMINDER LIGHT RESET PROCEDURES.

IMPORTANT: On the E60 M5 and E63 M6 the fault memory entry "Mastervac vacuum pressure sensor" may be stored after the brake pads have been replaced. The fault memory entry must be deleted. The vacuum pressure sensor only has to be replaced if the fault is entered repeatedly.

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

Special tools required:

- 34 1 280

Necessary preliminary tasks:

- Remove wheels
- IF NECESSARY, REMOVE AND CLEAN BRAKE PADS

E65 and E66: Release parking brake (push-button to left of steering wheel).

After completing work:

- **ADJUST HANDBRAKE** (not for E65 and E66)
- Read and comply with notes on **BREAKING IN NEW BRAKE DISCS / BRAKE PADS**.

Observe **SAFETY INSTRUCTIONS** on raising the vehicle.

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**.

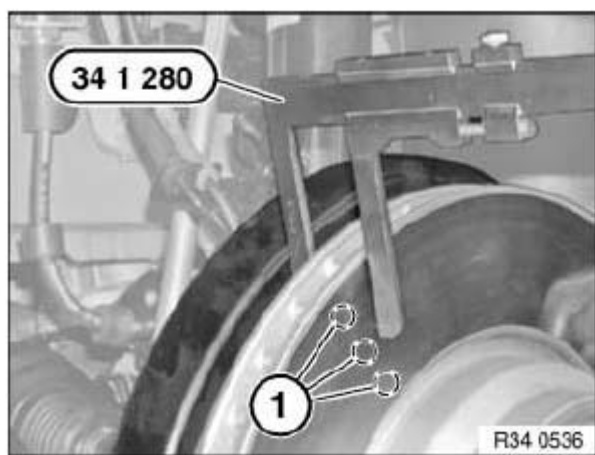


Fig. 56: Measuring Brake Disc Thickness

Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: New brake pads may only be installed if the brake disc thickness is greater than or equal to the **MINIMUM BRAKE DISC THICKNESS (MIN TH)** (not incl. M vehicles).

In the case of M vehicles and perforated brake discs, new brake pads may only be installed if the brake disc thickness is greater than the **MINIMUM BRAKE DISC THICKNESS (MIN TH)**.

NOTE: The minimum brake disc thickness is configured in such a way that it lasts the life of a further set of brake pads (does not apply to M vehicles and perforated brake discs).

Always replace brake discs in pairs.

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

Release screws (1), remove brake caliper and tie up.

NOTE: Brake hose remains connected.

Installation:

Tightening torque **34 21 3AZ** .

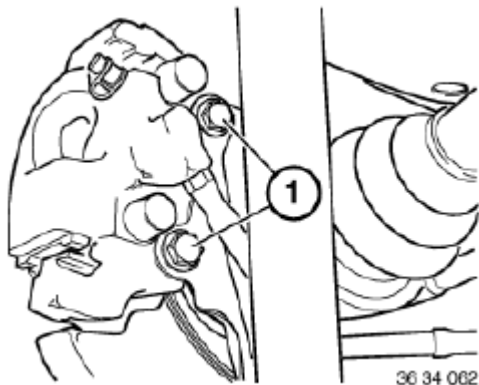


Fig. 57: Identifying Screws

Courtesy of BMW OF NORTH AMERICA, INC.

Unscrew bolts and take off brake disc.

Installation:

Tightening torque **34 21 1AZ** .

Clean contact surface of brake disc at wheel hub thoroughly and remove traces of corrosion if necessary. Unevenness on contact surface may result in distortion of brake disc!

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.

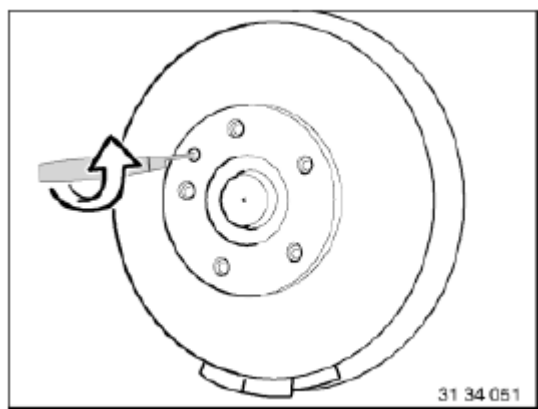
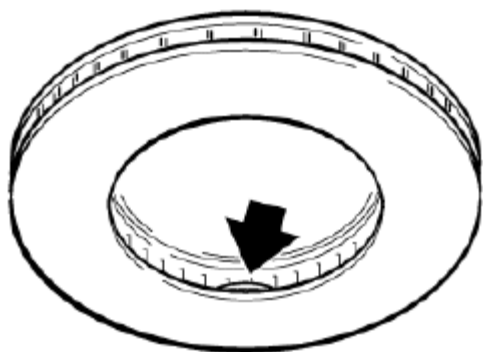


Fig. 58: Unscrewing Bolts

Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Internally ventilated brake discs are balanced.
Never remove or reposition balance clips.



31 34 052

Fig. 59: Locating Balance Clips

Courtesy of BMW OF NORTH AMERICA, INC.

34 21 745 REMOVING AND INSTALLING OR REPLACING LEFT OR RIGHT REAR BRAKE CALIPER

Necessary preliminary tasks:

- Remove wheels

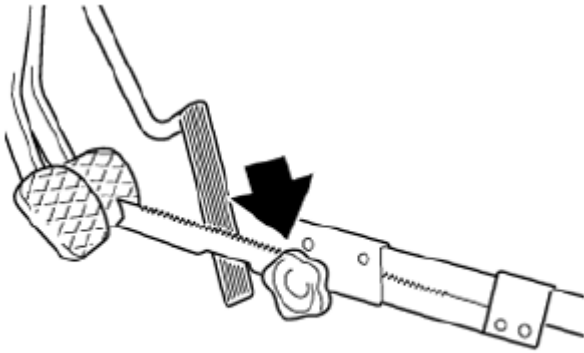
Observe **SAFETY INSTRUCTIONS** on raising the vehicle.

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. 60: Locating Pedal Support

Courtesy of BMW OF NORTH AMERICA, INC.

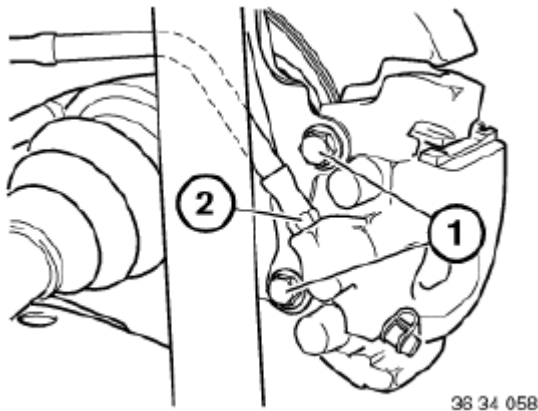
Right side: Disconnect plug connection for brake pads wear sensor.

Release screws (1).

Installation:

Tightening torque **34 21 3AZ** .

Disconnect brake hose (2).



36 34 058

Fig. 61: Identifying Brake Hose And Screws

Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Tightening torque **34 32 5AZ** .

Unfasten brake hose at connection point to brake line.

Tightening torque **34 32 1AZ** .

First tighten the brake hose on the brake cover, then tighten connection on brake line.

Install brake hose without torsional stress.

Pull off fist caliper towards rear of vehicle.

IMPORTANT: Check routing and securing of brake-pad-wear indicator cable. Check for correct securing with tab of dust cap. It is absolutely essential to prevent the cable on the rim from being scuffed.

34 21 812 OVERHAULING LEFT OR RIGHT REAR BRAKE CALIPER (BRAKE CALIPER REMOVED)

Special tools required:

- **34 1 132**

NOTE: Use original BMW repair kit.

Take off plastic caps (1).

Unscrew guide screws (2).

Installation:

Only clean guide screws; do not grease. Check guide bolts, replace if necessary.

Tightening torque: **34 21 5AZ** .

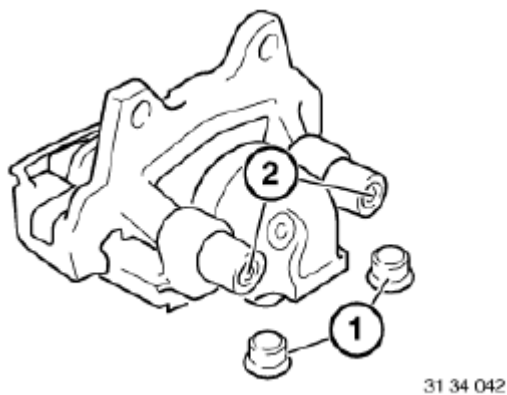


Fig. 62: Identifying Plastic Caps And Guide Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Dismantle brake caliper and remove brake pads.

Installation:

Press brake pads fully outwards and insert spring (4).

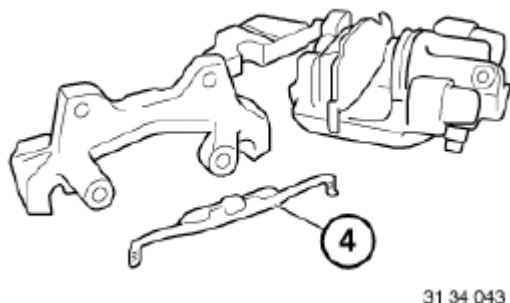


Fig. 63: Identifying Spring

Courtesy of BMW OF NORTH AMERICA, INC.

WARNING: Danger of injury!

In the following work step, large forces occur at the brake caliper piston (up to more than 2800 N).

Carefully force piston out through connection bore with compressed air.

To protect piston, place a protective plate (e.g. hard wood or hard felt) in caliper recess.

Do not grip piston with fingers - risk of trapping!

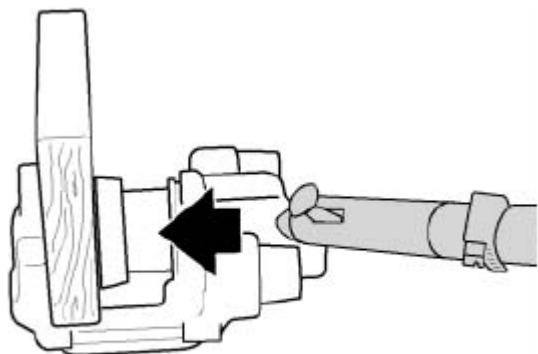


Fig. 64: Placing Protective Plate In Caliper Recess

Courtesy of BMW OF NORTH AMERICA, INC.

Check guide sleeves (5), fitting repair-kit guide sleeve if necessary.



Fig. 65: Identifying Guide Sleeves

Courtesy of BMW OF NORTH AMERICA, INC.

Remove sealing ring carefully with a plastic needle.

Clean cylinder bores and parts with alcohol and dry with compressed air.

Thoroughly inspect cylinder bore, piston and flange surfaces. Machining of cylinders and pistons is not permitted.

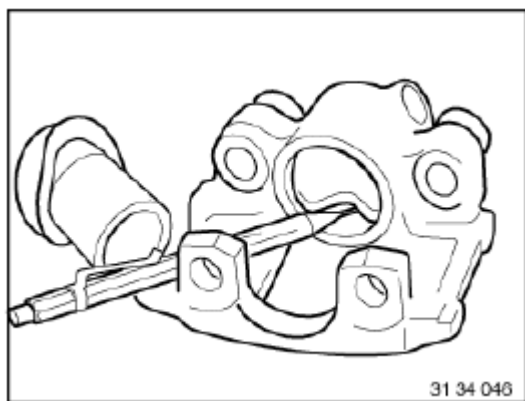


Fig. 66: Removing Sealing Ring With Plastic Needle

Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

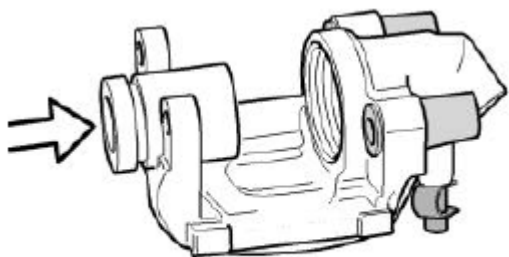
Apply a light coat of Ate brake cylinder paste to cylinder bore, piston and sealing sleeve,

Refer to **BRAKES - OPERATING FLUIDS** .

Install sealing cover in rear annular groove of cylinder bore.

Press in piston with a hardwood board.

IMPORTANT: Do not tilt piston.



R34 0111

Fig. 67: Pressing Piston With Hardwood Board
Courtesy of BMW OF NORTH AMERICA, INC.

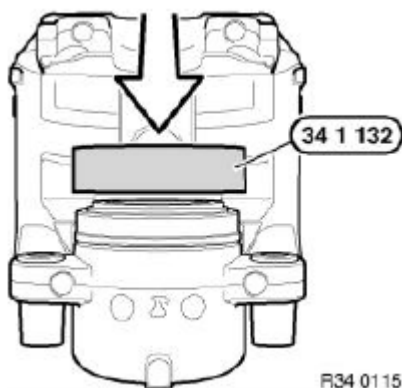
Press on dust protection sleeve evenly up to stop with special tool 34 1 132 .

Installation:

The area between dust protection sleeve and brake caliper housing must be kept dry so as to ensure correct seating for the dust protection sleeve.

Keep Ate brake cylinder paste or brake fluid away from this area.

Make sure dust protection sleeve is correctly seated on piston.



R34 0115

Fig. 68: Pressing Dust Protection Sleeve
Courtesy of BMW OF NORTH AMERICA, INC.

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 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.

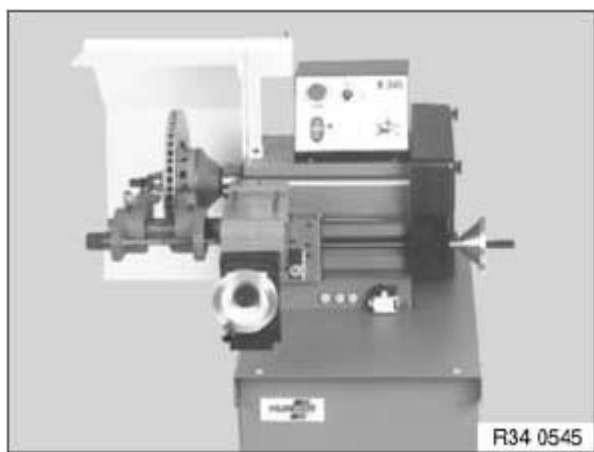


Fig. 69: Identifying Stationary Brake Disc Lathe
Courtesy of BMW OF NORTH AMERICA, INC.

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. 70: 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.

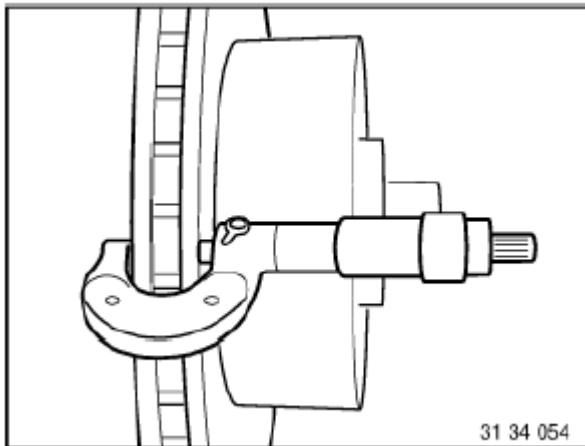
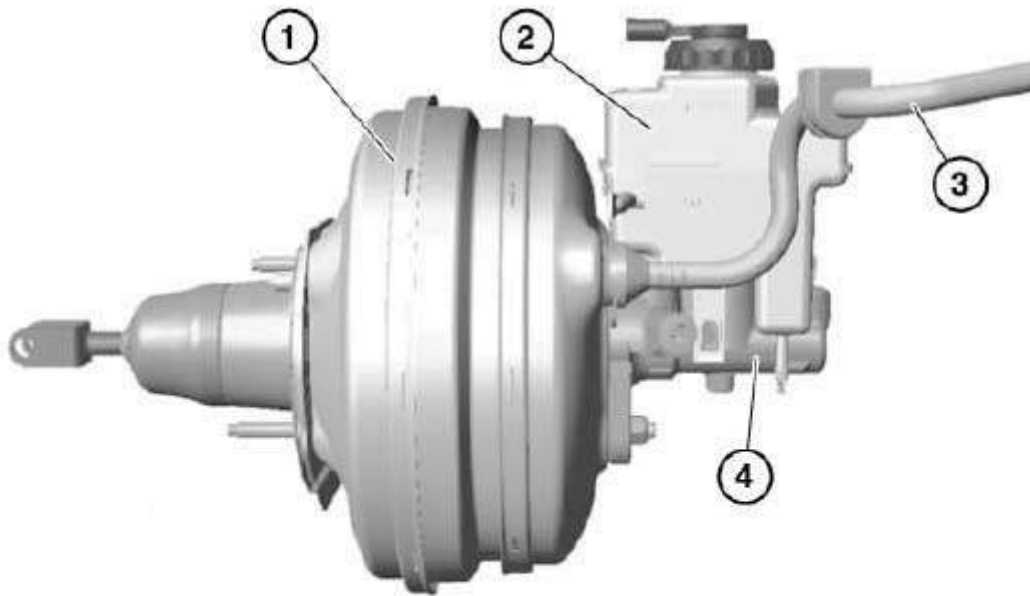


Fig. 71: Measuring Brake Discs Thickness
Courtesy of BMW OF NORTH AMERICA, INC.

MASTER BRAKE CYLINDER

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



R34 0410

- | | | | |
|---|--------------------------------|---|---|
| 1 | Brake booster | 4 | Brake master cylinder |
| 2 | Expansion tank | 5 | Bleeding braking system |
| 3 | Vacuum hose | 6 | |

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

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

Necessary preliminary tasks:

- **REMOVE LOWER SECTION OF MICROFILTER HOUSING .**
- **READ AND COMPLY WITH GENERAL INFORMATION.**

Suck the brake fluid out of the expansion tank. Use suction bottle exclusively to draw off brake fluid.

IMPORTANT: Do not reuse drawn out brake fluid.



Fig. 73: Identifying Expansion Tank

Courtesy of BMW OF NORTH AMERICA, INC.

Unfasten plug connection (1) and disconnect.

Release retaining screw (2).

Installation:

Tightening torque **34 31 3AZ** .

Pull expansion tank vertically out of brake master cylinder.

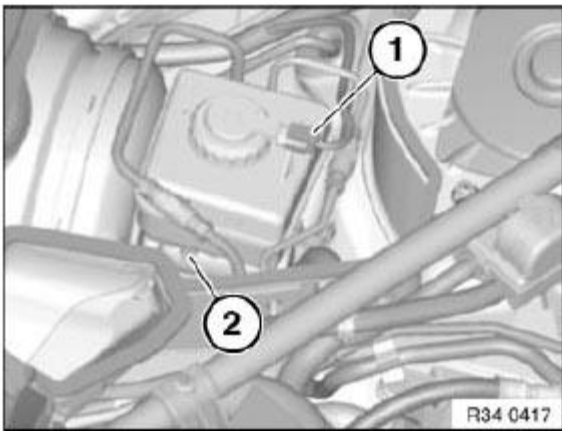


Fig. 74: Identifying Plug Connection And Retaining Screw

Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

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

Push the expansion tank vertically onto the master brake cylinder.

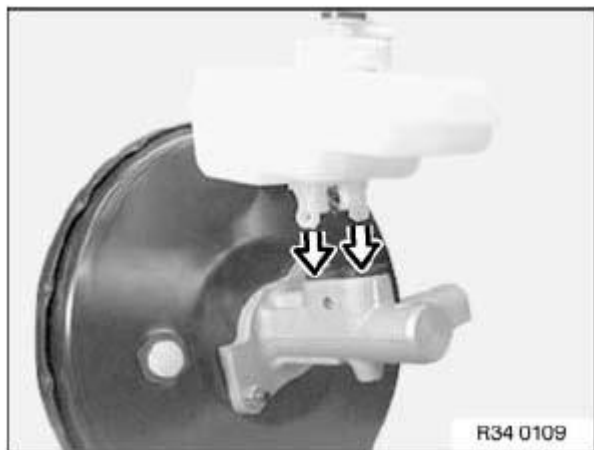


Fig. 75: Pushing Expansion Tank Vertically Onto Master Brake Cylinder
Courtesy of BMW OF NORTH AMERICA, INC.

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

Special tools required:

- **32 1 270**

Necessary preliminary tasks:

- **REMOVE EXPANSION TANK.**
- Remove **FOOTWELL TRIM** .
- **READ AND COMPLY WITH GENERAL INFORMATION.**

After completing tasks, **BLEED BRAKE SYSTEM WITH DSC.**

Remove locking clip (1) and disengage and pull out locking pin.

Slacken nuts (2).

Installation:

Replace self-locking nuts.

Tightening torque **35 11 1AZ** .

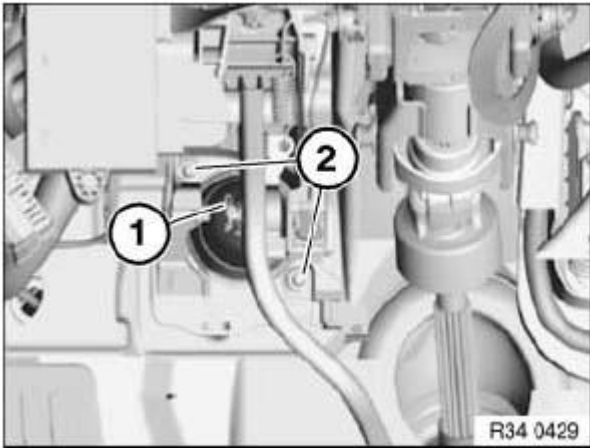


Fig. 76: Identifying Slacken Nuts And Locking Clip
 Courtesy of BMW OF NORTH AMERICA, INC.

Unfasten brake lines (1).

Detach brake lines at junction (2) and remove short sections.

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

Installation:

Fit lines at both connection points and then tighten down.

Tightening torque **34 32 1AZ** .

Release nuts (3) and feed brake master cylinder out of brake booster.

Installation:

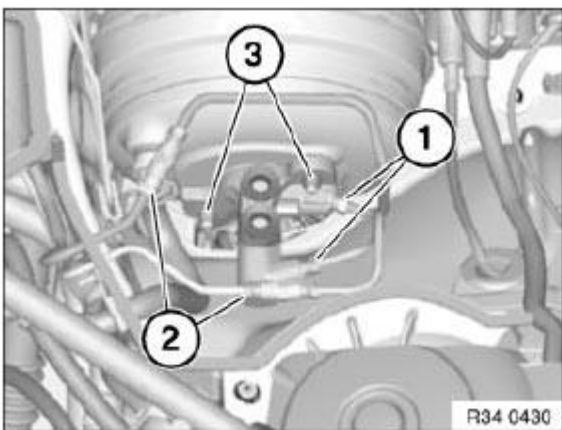


Fig. 77: Identifying Brake Lines And Nuts

Courtesy of BMW OF NORTH AMERICA, INC.

Replace self-locking nuts.

Tightening torque **34 31 1AZ** .

Installation:

Replace sealing ring.

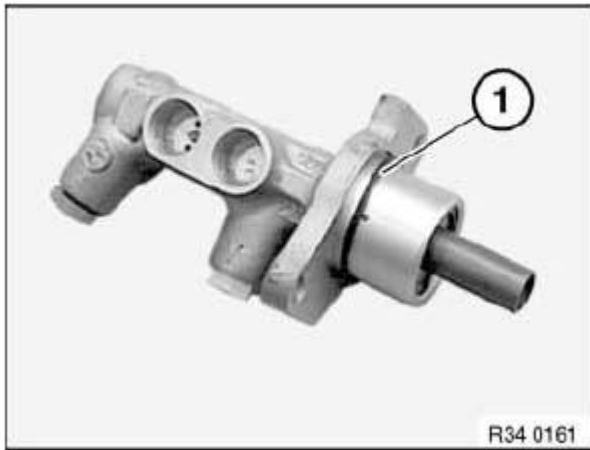


Fig. 78: Identifying Sealing Ring

Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Brake booster (1) must be loosely screwed into place so as not to jam brake master cylinder (2) during installation.

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.

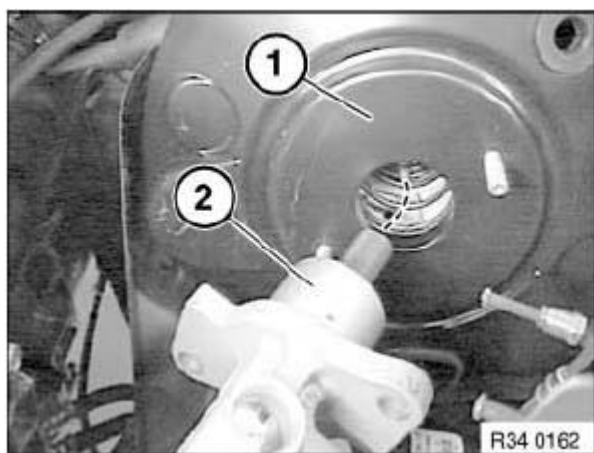
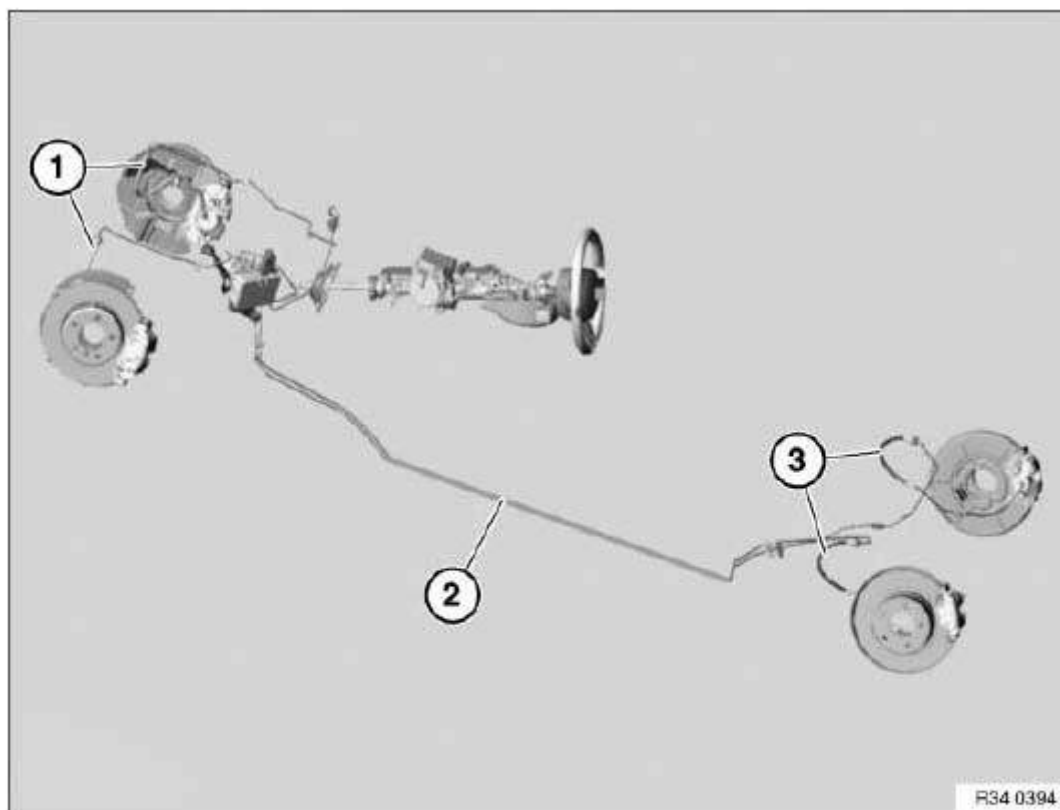


Fig. 79: Identifying Brake Booster And Jam Brake Master Cylinder
Courtesy of BMW OF NORTH AMERICA, INC.

BRAKE LINES

34 32... OVERVIEW OF BRAKE LINES



1 [Brake hose, front](#)

2 [Brake tubes](#)

3 [Brake hose, rear](#)

Fig. 80: Overview Of Brake Lines

Courtesy of BMW OF NORTH AMERICA, INC.

34 32 861 REPLACING ALL BRAKE PIPES

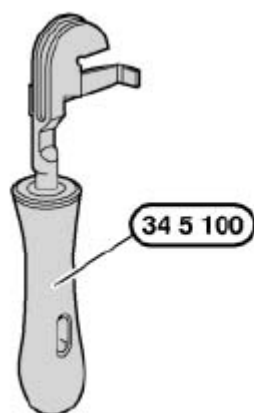
Special tools required:

- [34 5 100](#)

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.



36 34 074

Fig. 81: Identifying Bending Tool 34 5 100

Courtesy of BMW OF NORTH AMERICA, INC.

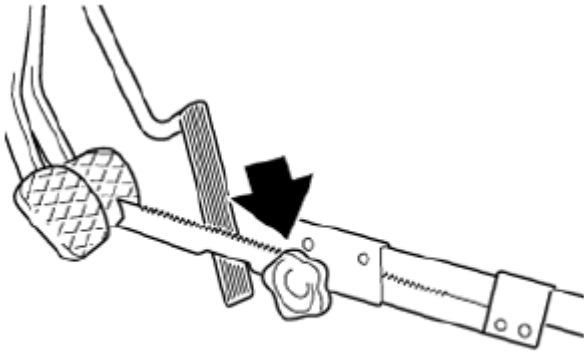
IMPORTANT:

- 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.

*Installation:*Tightening torque **34 32 1AZ** .**34 32 881 REPLACING FRONT LEFT OR RIGHT BRAKE HOSES****NOTE:** After completing work: **BLEED BRAKE 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. 82: Locating Pedal Support

Courtesy of BMW OF NORTH AMERICA, INC.

Pull brake hose out of holder (1).

IMPORTANT: Grip brake hose at square head (3) to prevent connecting piece from turning in retaining bracket.

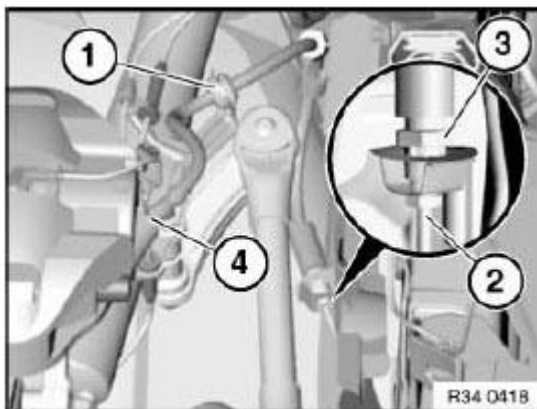
Detach brake hose from brake line (2).

Installation:

Tightening torque **34 32 1AZ** .

Detach brake hose from brake caliper (4).

Tightening torque **34 32 4AZ** .

**Fig. 83: Identifying Brake Caliper, Holder And Square Head**

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.

Installation:

First tighten brake hose on brake caliper.

Move wheels into straight-ahead position.

Insert brake hose in bracket and screw onto brake pipe.

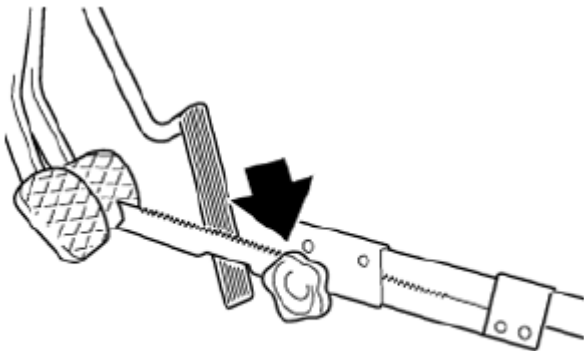
34 32 980 REPLACING REAR LEFT OR RIGHT BRAKE HOSES

NOTE: READ AND COMPLY WITH GENERAL INFORMATION.
Observe SAFETY INSTRUCTIONS on raising the vehicle.
After completing tasks, BLEED BRAKE 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. 84: Locating Pedal Support
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** .

Detach brake hose from brake caliper (3).

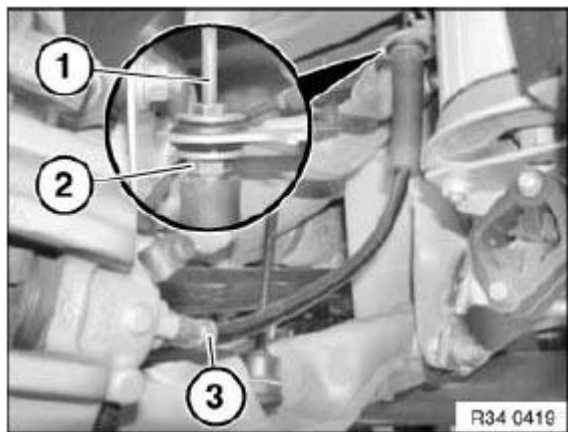


Fig. 85: Identifying Brake Caliper, Brake Line And Square Head
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Tightening torque **34 32 5AZ** .

BRAKE BOOSTER

34 33 071 REPLACING VACUUM HOSE FOR BRAKE BOOSTER (M54)

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 PA pipe.
Non-return valve and PA pipe are welded together and are replaced together as a single unit.

Necessary preliminary tasks:

- **READ AND COMPLY WITH GENERAL INFORMATION.**
- **REMOVE LOWER SECTION OF MICROFILTER HOUSING .**

Detach non-return valve (1) from brake booster.

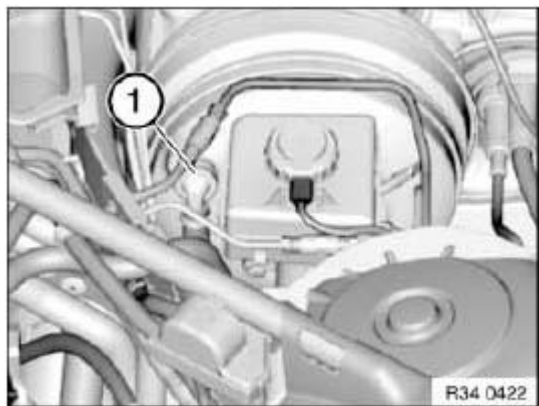


Fig. 86: Identifying Non-Return Valve
Courtesy of BMW OF NORTH AMERICA, INC.

Unfasten hose clip (1).

Detach molded hose (3) from PA tube.

Withdraw molded hose (3) from fixture (2).

Installation:

Replace hose clip.

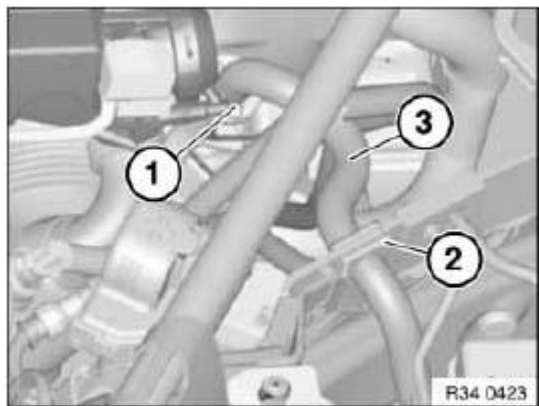


Fig. 87: Identifying Molded Hose, Clip And Fixture
Courtesy of BMW OF NORTH AMERICA, INC.

34 33 071 REPLACING VACUUM HOSE FOR BRAKE BOOSTER (M57TU / M57T2 / M47T2)

READ AND COMPLY WITH GENERAL INFORMATION.

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 PA

pipe.

Non-return valve and PA pipe are welded together and are replaced together as a single unit.

Necessary preliminary tasks:

REMOVE LOWER SECTION OF MICROFILTER HOUSING .

Installation:

Replace hose clamps.

Detach non-return valve (1) from brake booster.

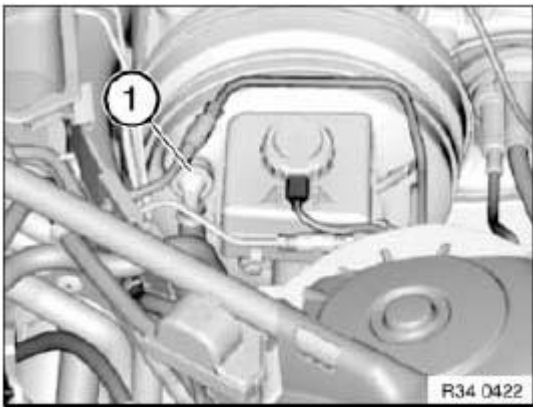


Fig. 88: Identifying Non-Return Valve
Courtesy of BMW OF NORTH AMERICA, INC.

Detach vacuum hose from holder (1).

Unfasten hose clip (2).⁷

Detach molded hose from PA tube.

Installation:

Replace hose clip.

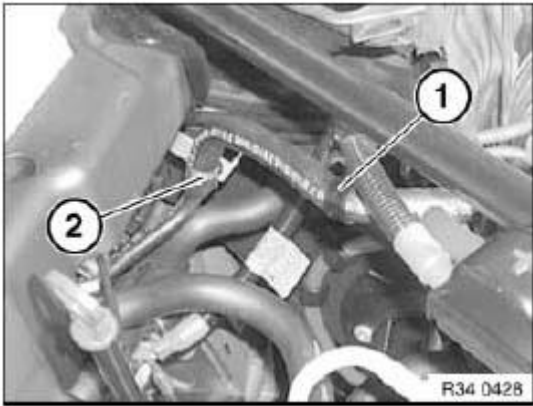


Fig. 89: Identifying Holder And Hose Clip

Courtesy of BMW OF NORTH AMERICA, INC.

34 33 505 REMOVING AND INSTALLING/REPLACING BRAKE BOOSTER

Necessary preliminary tasks:

- **READ AND COMPLY WITH GENERAL INFORMATION**
- **REMOVE BRAKE MASTER CYLINDER**

For cars with S85 engines:

- Remove vacuum pump
- Remove bracket for vacuum pump
- Remove vacuum line

Detach locking clip (1) from brake pedal, disengage and pull out locking pin.

Unscrew nuts (2).

Installation:

Replace self-locking nuts.

Tightening torque **35 11 1AZ** .

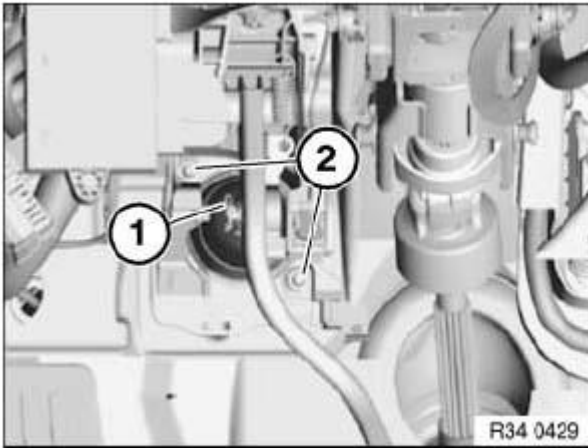


Fig. 90: Identifying Locking Clip And Nuts
Courtesy of BMW OF NORTH AMERICA, INC.

Remove non-return valve (1) from brake booster.

Carefully pull brake booster (2) out of bulkhead and tilt out.

Installation:

Replace seal between brake booster and bulkhead.

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

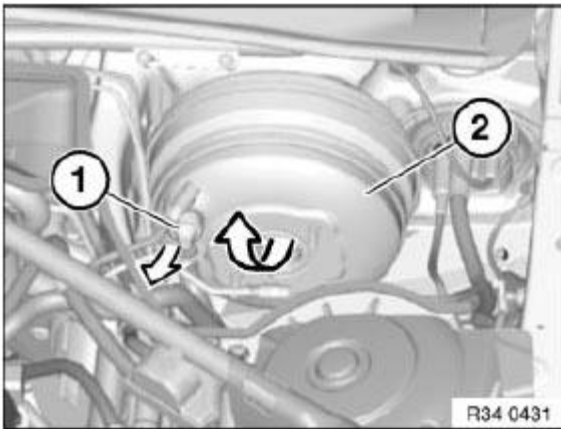


Fig. 91: Identifying Non-Return Valve And Brake Booster
Courtesy of BMW OF NORTH AMERICA, INC.

ELECTRICAL COMPONENTS/WEAR INDICATOR

34 35 001 REPLACING A BRAKE PAD SENSOR

CARMANUALSUSA

Saturday, September 05, 2015 9:16:23 AM

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Necessary preliminary tasks:

- Remove wheel

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.

Open cover (1) on plug housing (3).

Unclip lead of brake pad sensor (2) from plug housing (3).

Disconnect associated plug connection of lead from brake pad sensor (2).

Expose lead for brake pad sensor up to brake pad.

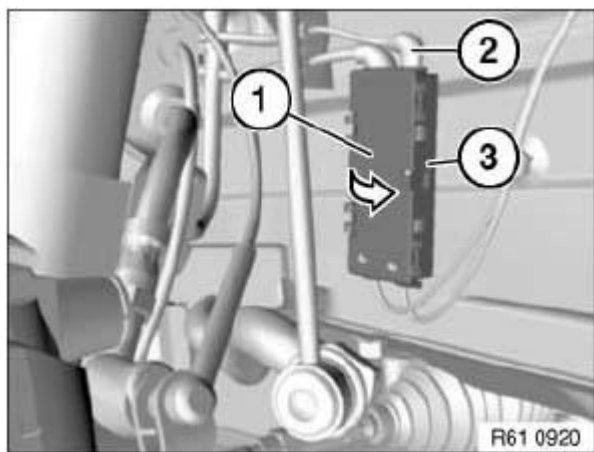


Fig. 92: Identifying Brake Pad Sensor, Plug Housing And Cover
Courtesy of BMW OF NORTH AMERICA, INC.

Press clip (1) together and detach brake pad sensor (2) in direction of arrow from brake pad (3).

Installation:

Make sure clip (1) and brake pad sensor (2) are correctly seated in brake pad (3).

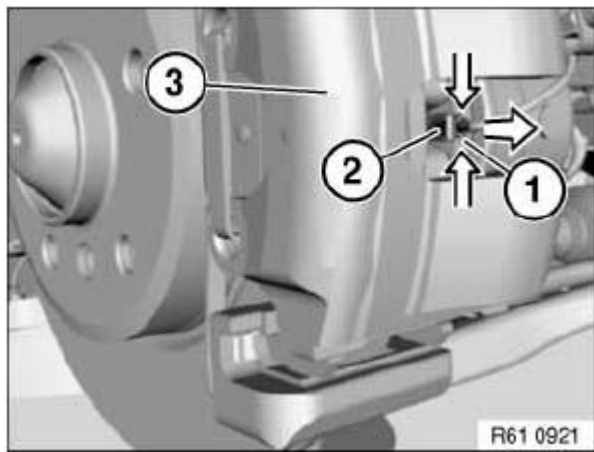


Fig. 93: Identifying Clip, Brake Pad Sensor And Brake Pad
Courtesy of BMW OF NORTH AMERICA, INC.

PARKING BRAKE

34 10 014 ADJUSTING HANDBRAKE

Special tools required:

- **32 1 030**

Perform inspection in the following manner:

When 1st ratchet is engaged, no braking force should be exerted.

The difference in wheel circumferential forces between the left and right wheels may deviate by max. 30 % from the greater value (measured on brake analyzer).

In event of larger deviations of wheel circumferential force: carry out readjustment.

Braking with locked wheels must be possible with the parking brake.

The parking brake must be reset if the actuation stroke is greater than 10 teeth.

NOTE: Accurate adjustment of the parking brake is only possible if the parking brake Bowden cables and all moving parts on the parking brake move easily and function correctly.

Basic setting of the parking brake is required whenever:

- When replacing parking brake pads.
- When replacing brake discs.
- In event of excessive actuation stroke (10 teeth).

- When replacing parking brake Bowden cables

1. Setting instruction for brake pads (basic setting)

Lock adjuster unit (ASZE).

Actuate parking brake lever. Screw in special tool **32 1 030** partially. Press stop (1) of adjusting spring back to such an extent that retaining hook (2) engages in stop (1).

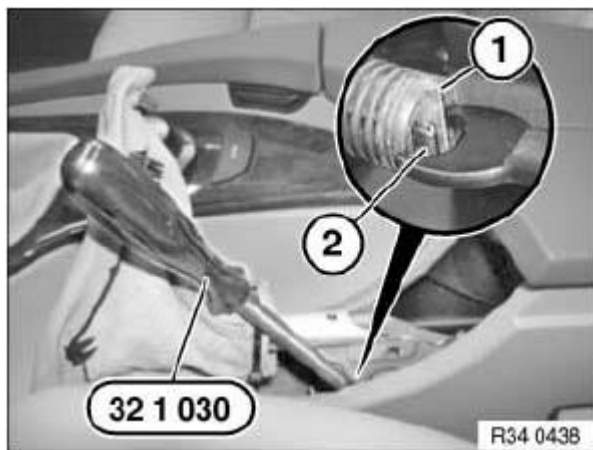


Fig. 94: Identifying Retaining Hook And Stop
Courtesy of BMW OF NORTH AMERICA, INC.

Completely unscrew one wheel stud on each rear wheel.

Installation:

Tightening torque **36 10 1AZ** .

Turn wheel until adjustment screw is visible in tapped hole.



Fig. 95: Locating Adjustment Screw

Courtesy of BMW OF NORTH AMERICA, INC.

Turn adjusting screw with a screwdriver until the wheel is no longer able to turn.

Then unfasten the adjusting screw 8 notches.

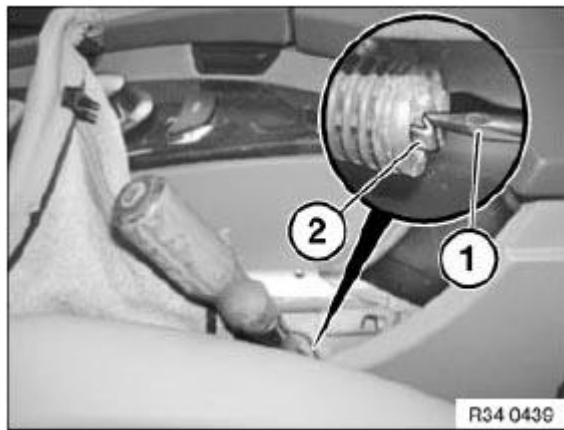
**Fig. 96: Turning Adjusting Screw With Screwdriver**

Courtesy of BMW OF NORTH AMERICA, INC.

Unlock adjuster unit (ASZE).

Lever restraint hook (2) outwards with a suitable screwdriver (1).

Restraint hook (2) must disengage from stop of adjusting spring.

**Fig. 97: Identifying Restraint Hook And Screwdriver**

Courtesy of BMW OF NORTH AMERICA, INC.

2. Setting instruction for parking brake Bowden cables

The parking brake lever must be applied 5 times to approx. 400 N actuating force.

2.1 On brake analyzer

0th tooth (parking brake released): Vehicles with manual transmission: Shift lever in neutral position.

Vehicles with automatic transmission: Selector lever in "N" position.

- Without locking differential $< \text{ or } = 150 \text{ N}$.
- With locking differential $< \text{ or } = 200 \text{ N}$ (possibly odd display).

1st tooth: No increase in braking force with regard to 0th tooth.

Indicator lamp can be lit.

2nd tooth: Indicator lamp must be lit.

3rd tooth: Increase in braking force.

5th tooth: The brake force display must have reached $> \text{ or } = 400 \text{ N}$.

Checking brake force differential at wheel:

Apply parking brake until a wheel circumferential force (brake force display) of min. 1000 N is reached.

Max. permitted brake force differential right/left $> \text{ or } = 35 \%$ (referred to greater brake value).

3. Breaking in the duo-servo parking brake

The following breaking-in procedures are applicable in case of insufficient braking effect or after replacing brake discs and/or brake pads.

3.1 On brake analyzer

Apply parking brake lever until wheel circumferential force at first wheel is 800 N.

Lock parking brake lever in next lower tooth.

Release parking brake lever after approx. 2 minutes.

3.2 When driving on road

(If possible inside the company grounds or on an unused road)

At approx. 40 km/h apply parking brake lever until a braking effect can be felt.

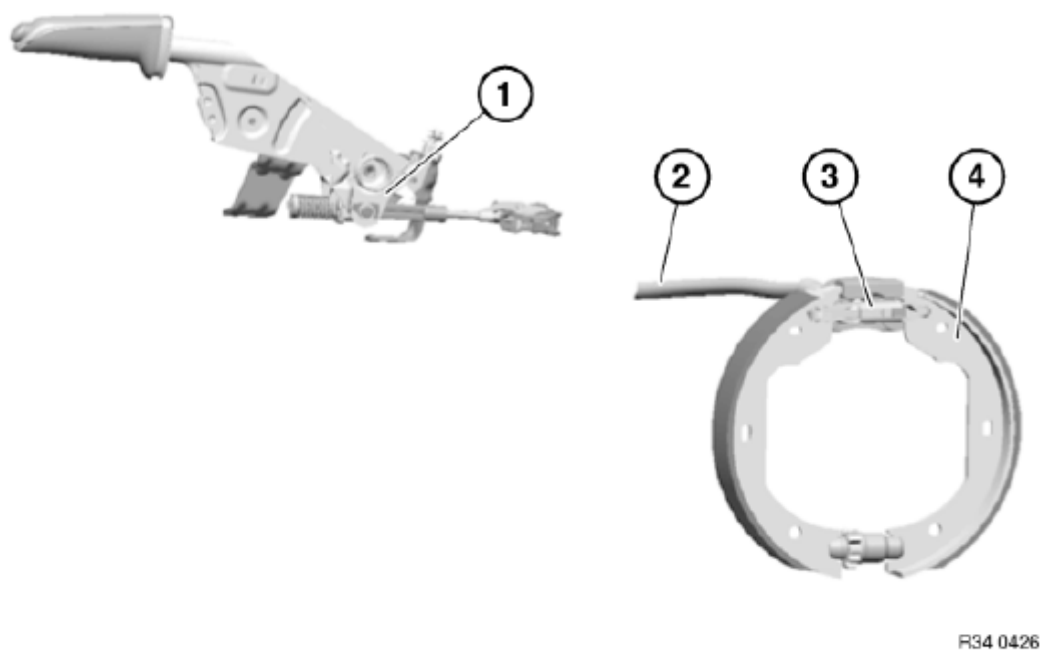
Pull parking brake lever to next notch and drive on for approx. 400 m.

A basic requirement is that parking brake is adjusted uniformly.

NOTE: If necessary, repeat breaking-in procedure.

IMPORTANT: Allow brake to cool down sufficiently.

34 41... OVERVIEW OF PARKING BRAKE



1 [Handbrake lever](#)

2 [Handbrake Bowden cables](#)

3 [Expander lock](#)

4 [Handbrake shoes](#)

5 [Adjusting handbrake](#)

Fig. 98: Overview Of Parking Brake

Courtesy of BMW OF NORTH AMERICA, INC.

34 41 000 REMOVING AND INSTALLING / REPLACING HANDBRAKE LEVER

Special tools required:

- **32 1 030**

Necessary preliminary tasks:

- **REMOVE CENTRE CONSOLE**

After completing tasks, adjust **PARKING BRAKE**.

Lock adjuster unit (ASZE).

Actuate parking brake lever. Screw in special tool **32 1 030** partially. Press stop (1) of adjusting spring back to such an extent that retaining hook (2) engages in stop (1).

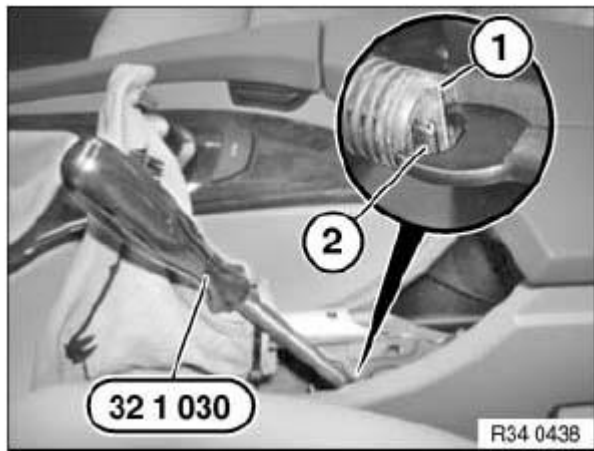


Fig. 99: Identifying Retaining Hook And Stop
Courtesy of BMW OF NORTH AMERICA, INC.

Unclip mounting clip (1) upwards out of balance arm (2).

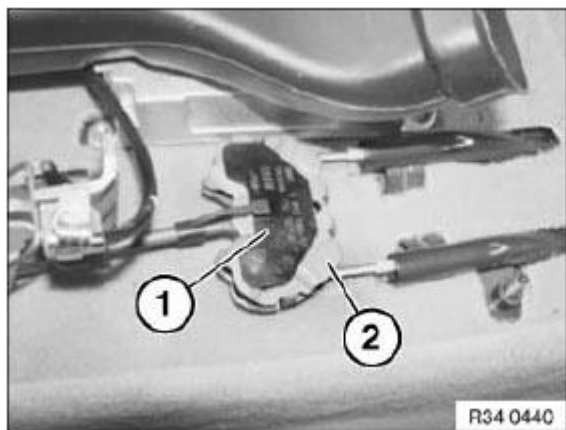


Fig. 100: Identifying Mounting Clip And Balance Arm
Courtesy of BMW OF NORTH AMERICA, INC.

Guide handbrake Bowden cables (1) with a screwdriver inwards and pull out of balance bar (2).

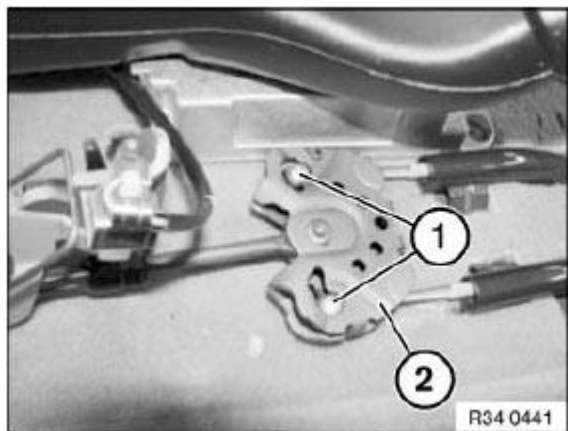


Fig. 101: Identifying Bowden Cables And Balance Bar
Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect cable (1) from handbrake check switch.

Release screws (2) and remove parking brake lever (3).

Installation:

Tightening torque **34 41 1AZ** .

Parking brake lever and adjustment unit (ASZE) are only exchanged completely as a single unit.

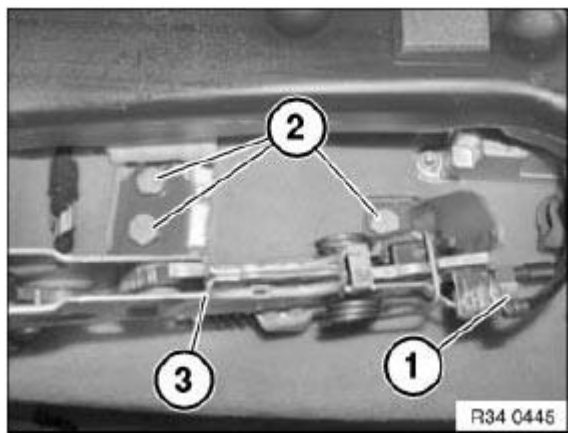


Fig. 102: Identifying Screws And Parking Brake Lever
Courtesy of BMW OF NORTH AMERICA, INC.

34 41 120 REMOVING AND INSTALLING / REPLACING BOTH HANDBRAKE BOWDEN CABLES

Special tools required:

- **32 1 030**

Necessary preliminary tasks:

- **REMOVE CENTRE CONSOLE**
- **REMOVE REAR BRAKE DISCS**
- Remove **EXHAUST SYSTEM** .
- Remove heat shield.

After completing tasks, adjust **PARKING BRAKE**.

Lock adjuster unit (ASZE):

Actuate parking brake lever. Screw in special tool **32 1 030** partially. Press stop (1) of adjusting spring back to such an extent that retaining hook (2) engages in stop (1).

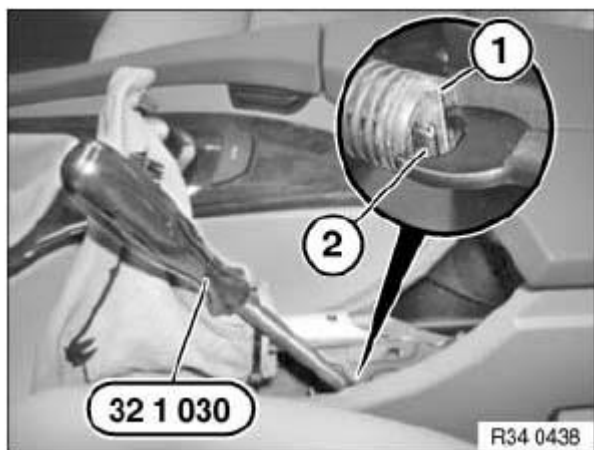


Fig. 103: Identifying Retaining Hook And Stop
Courtesy of BMW OF NORTH AMERICA, INC.

Unclip mounting clip (1) upwards out of balance arm (2).

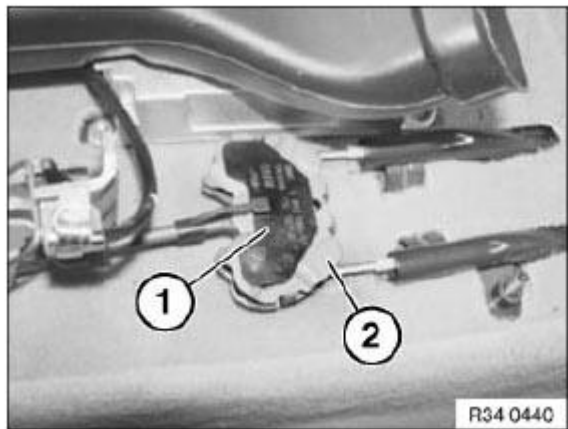


Fig. 104: Identifying Mounting Clip And Balance Arm
Courtesy of BMW OF NORTH AMERICA, INC.

Guide handbrake Bowden cables (1) with a screwdriver inwards and pull out of balance bar (2).

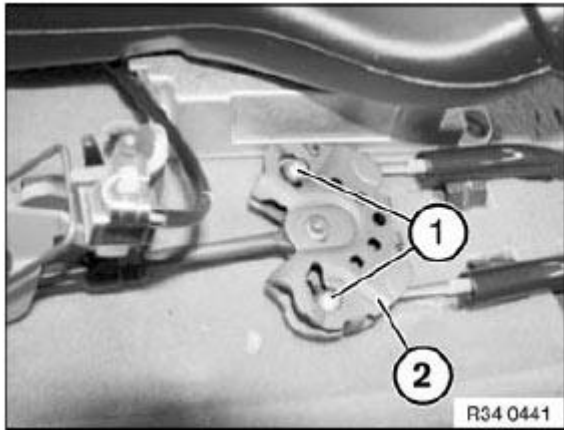


Fig. 105: Identifying Bowden Cables And Balance Bar
Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect handbrake Bowden cables at expander locks.

Release screw (1) and remove bracket.

Installation:

Tightening torque **34 41 5AZ** .

Pull handbrake Bowden cables (2) out of wheel carrier.

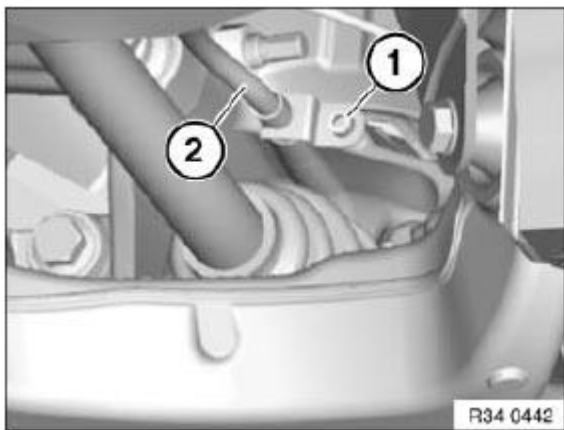


Fig. 106: Identifying Handbrake Bowden Cables And Screw
Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect handbrake Bowden cables (1) out of mountings.

Pull handbrake Bowden cables (1) out of guide (2) and remove.

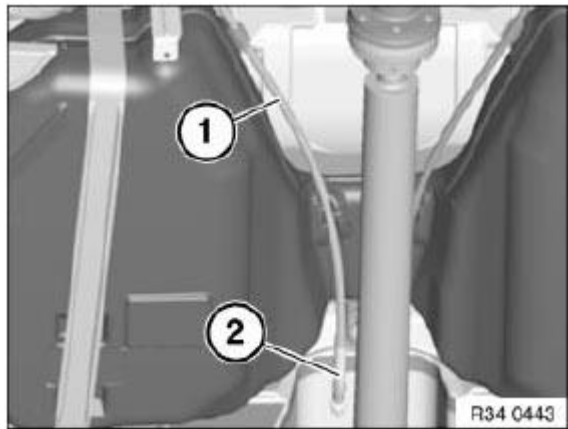


Fig. 107: Identifying Handbrake Bowden Cables And Guide
Courtesy of BMW OF NORTH AMERICA, INC.

34 41 220 REMOVING AND INSTALLING/REPLACING ALL PARKING BRAKE PADS

Special tools required:

- **32 1 030**
- **34 4 000**

Necessary preliminary tasks:

- Remove rear **BRAKE DISC**

Lock adjuster unit (ASZE).

Actuate parking brake lever. Screw in special tool **32 1 030** partially. Press stop (1) of adjusting spring back to such an extent that retaining hook (2) engages in stop (1).

Installation:

Unlock adjuster unit (ASZE).

Lever out restraining hook (2) with a suitable screwdriver.

Restraining hook (2) must detach from stop (1) of adjusting spring.

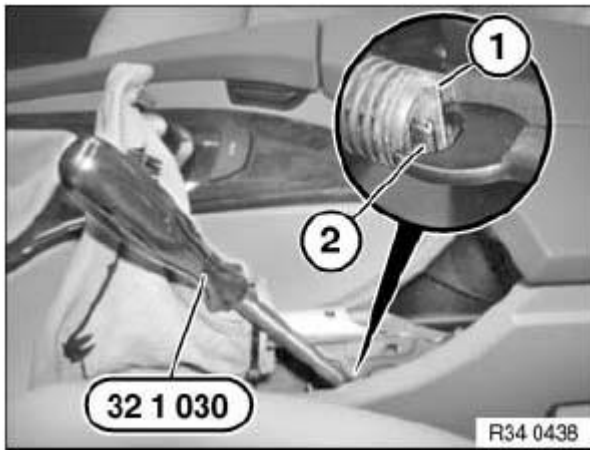


Fig. 108: Identifying Restraining Hook And Stop
Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect return spring (1) with brake spring pliers.

Installation:

Check and if necessary replace return spring (1).

Pay attention to installation position of adjustment screw (2).

Apply a thin coat of grease to bush and screw threads.

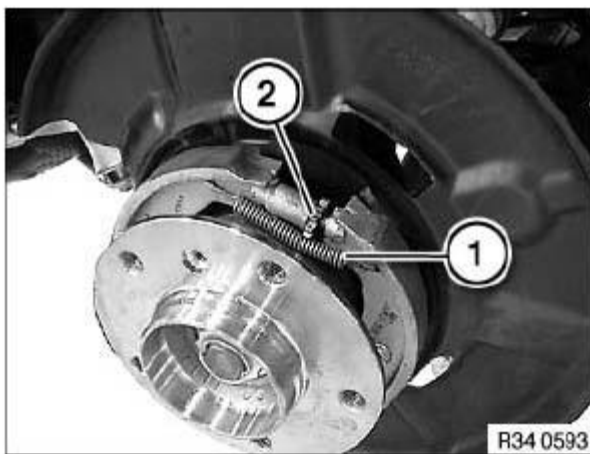


Fig. 109: Identifying Return Spring And Screw
Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect return spring (1) with brake spring pliers.

Installation:

Check and if necessary replace return spring (1).

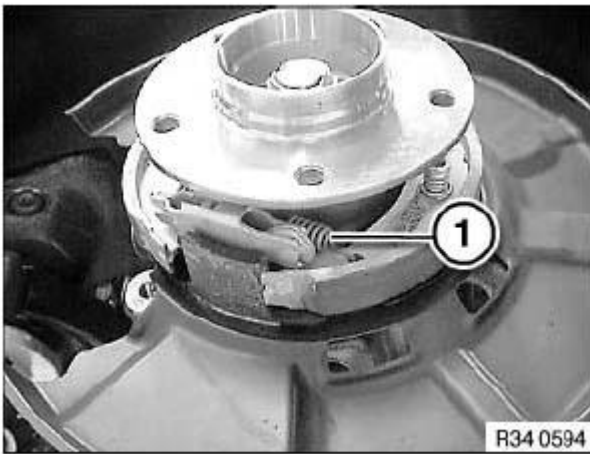


Fig. 110: Identifying Return Spring
Courtesy of BMW OF NORTH AMERICA, INC.

Turn clamping pins (1) with special tool **34 4 000** through 90° and disconnect.

Remove brake pads (2).

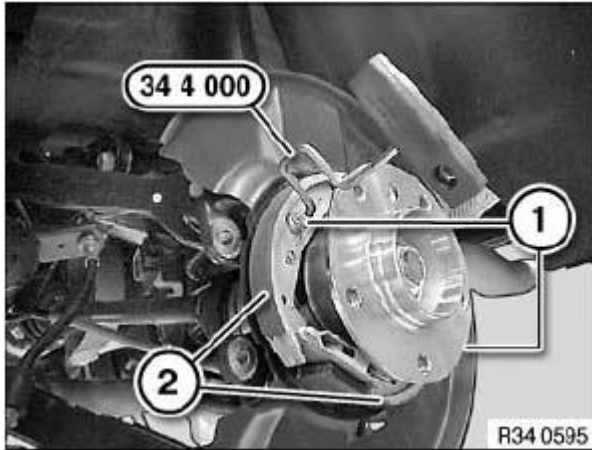


Fig. 111: Identifying Brake Pads And Clamping Pins
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Adjusting **PARKING BRAKE**

34 41 250 REMOVING AND INSTALLING/REPLACING EXPANDER LOCK FOR PARKING BRAKE SHOES

Special tools required:

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- **32 1 030**

Necessary preliminary tasks:

- Remove **PARKING BRAKE PADS**

Lock adjuster unit (ASZE).

Actuate parking brake lever. Screw in special tool **32 1 030** partially. Press stop (1) of adjusting spring back to such an extent that retaining hook (2) engages in stop (1).

Installation:

Unlock adjuster unit (ASZE).

Lever out restraining hook (2) with a suitable screwdriver.

Restraining hook (2) must detach from stop (1) of adjusting spring.

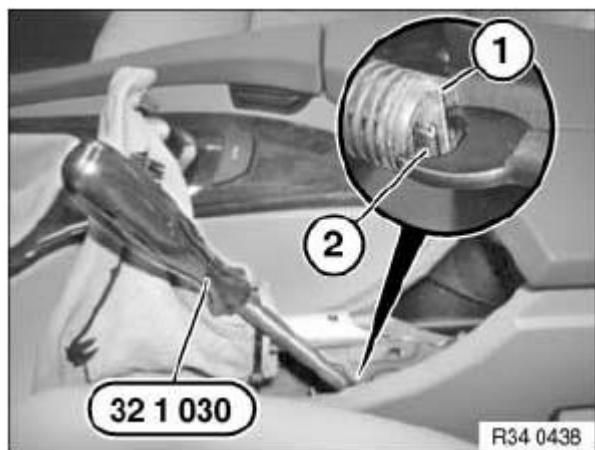


Fig. 112: Identifying Restraining Hook And Stop
Courtesy of BMW OF NORTH AMERICA, INC.

Pull brake shoe expander (1) forwards, disconnect handbrake Bowden cable (2) and remove expander lock.

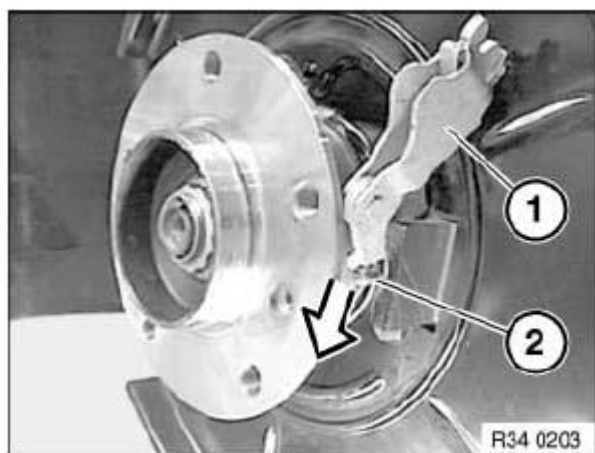


Fig. 113: Identifying Expander Lock And Handbrake Bowden Cable
 Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Adjusting **PARKING BRAKE**

MECHANICAL/HYDRAULIC COMPONENTS

34 51 527 REMOVING AND INSTALLING/REPLACING HYDRAULIC UNIT FOR DSC (M54 / N62 /N52 /N46)

Necessary preliminary tasks:

- Before removing hydraulic unit, read out control unit fault memory and if necessary print out diagnostic trouble code.
- Read and comply with **General Information**.

After completing work: **Bleed braking system**

Installation:

When replacing the control unit, carry out the following tasks with the DIS (Diagnosis and Information System):

- Vehicle coding (performed by the vehicle itself)
- Adjustment of steering angle sensor (performed by the vehicle itself)
- Adjustment of brake pressure sensor (performed by the vehicle itself)
- Adjustment of lateral acceleration sensors (performed by the vehicle itself)
- Function check, hydraulic unit

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.

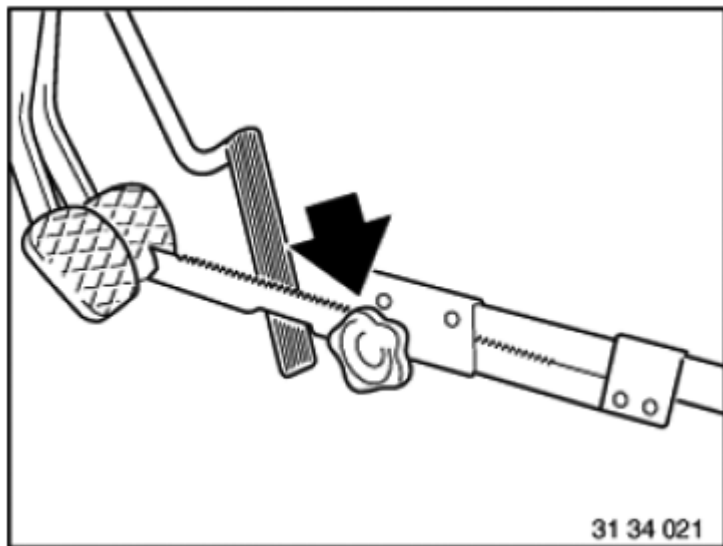


Fig. 114: Locating Brake Tensioner

Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Do not mix up brake pipes (mark if necessary). Close off connection bores with plugs.

Disconnect plug connection (1).

IMPORTANT: Do not bend brake lines.

Unfasten brake lines (2). Installation: Tightening torque 34 32 1AZ. Release screw (3) and remove hydraulic unit.

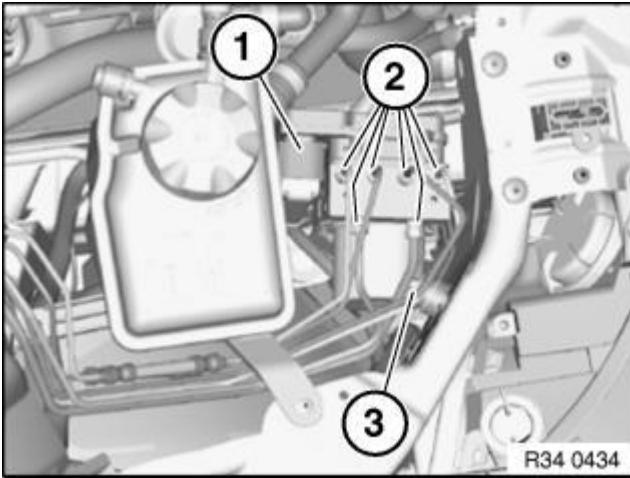


Fig. 115: Release Screw (3) And Remove Hydraulic Unit
Courtesy of BMW OF NORTH AMERICA, INC.

When replacing hydraulic unit: Release screws (1) and convert holder (2).

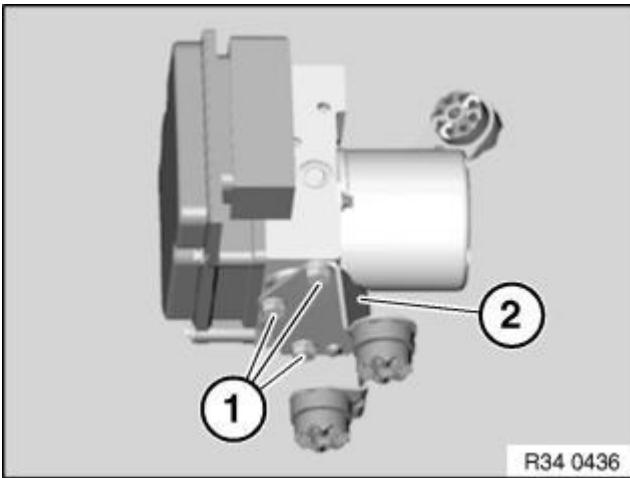
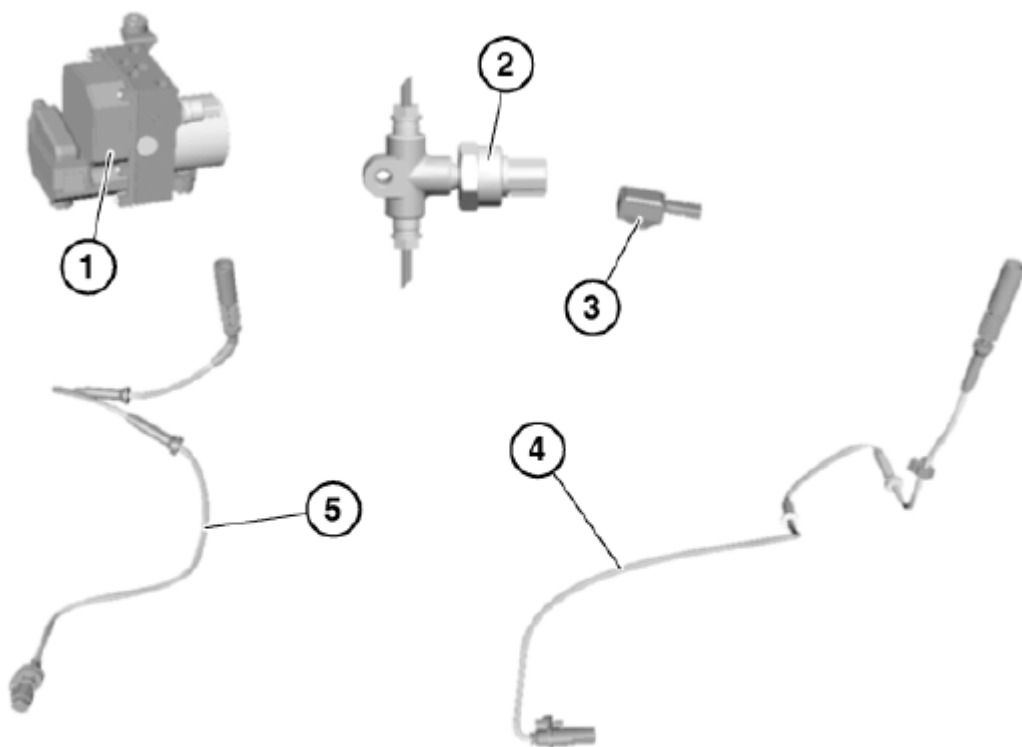


Fig. 116: Release Screws (1) And Convert Holder (2)
Courtesy of BMW OF NORTH AMERICA, INC.

ELECTRONIC COMPONENTS

34 52... OVERVIEW OF ELECTRONIC COMPONENTS



R34 0427

- 1 [DSC control unit](#)
- 2 [ACC pressure sensors](#)
- 3 [Rotation rate sensor](#)

- 4 [Pulse generator, rear](#)
- 5 [Pulse generator, front](#)

Fig. 117: Overview Of Electronic Components
 Courtesy of BMW OF NORTH AMERICA, INC.

34 52 516 REMOVING AND INSTALLING / REPLACING DSC CONTROL UNIT

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

Necessary preliminary tasks:

- Before removal, read out the control unit fault memory and if necessary print out the diagnostic trouble code.

Installation:

When replacing the control unit, carry out the following tasks with the DIS (Diagnosis and Information System):

- Vehicle coding (performed by the vehicle itself)
- Adjustment of steering angle sensor (performed by the vehicle itself)
- Adjustment of brake pressure sensor (performed by the vehicle itself)
- Adjustment of lateral acceleration sensors (performed by the vehicle itself)
- Function check, hydraulic unit

Unfasten plug connection (1).

Release screws (2) and carefully detach control unit (3) towards front.

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

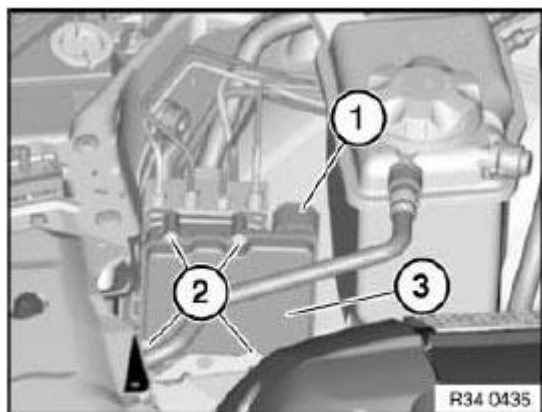


Fig. 118: Identifying Screws, Control Unit And Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Keep sealing faces clean.

Replace screws.

Observe tightening sequence (1-4).

Tightening torque: **34 51 1AZ** .

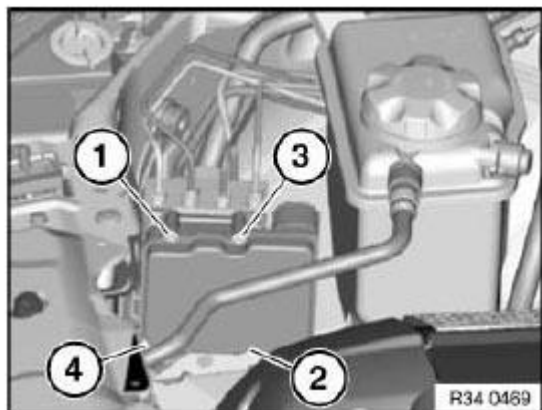


Fig. 119: Tightening Sequence Of Control Unit Screws

Courtesy of BMW OF NORTH AMERICA, INC.

34 52 525 REPLACING ONE FRONT PULSE GENERATOR

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

NOTE: READ AND COMPLY WITH GENERAL INFORMATION.
Observe SAFETY INSTRUCTIONS on raising the vehicle.

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

Pull cable with rubber grommet out of bracket on spring strut.

Installation:

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

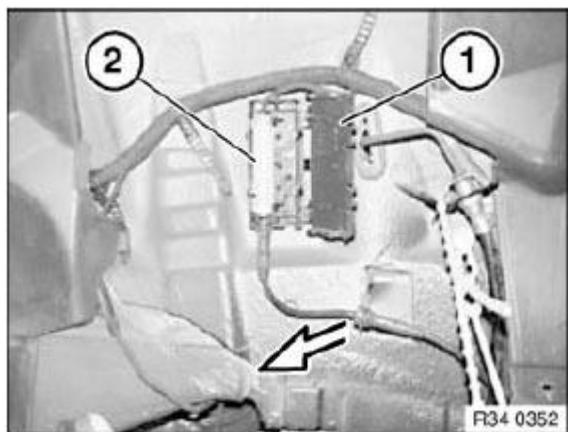


Fig. 120: Identifying Plug Housing And Plug Connection

Courtesy of BMW OF NORTH AMERICA, INC.

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

Installation:

Tightening torque **34 51 6AZ** .

Clean bore hole for pulse generator and grease with Staburags NBU 12/K lubricating grease (refer to **BRAKES - OPERATING FLUIDS**).

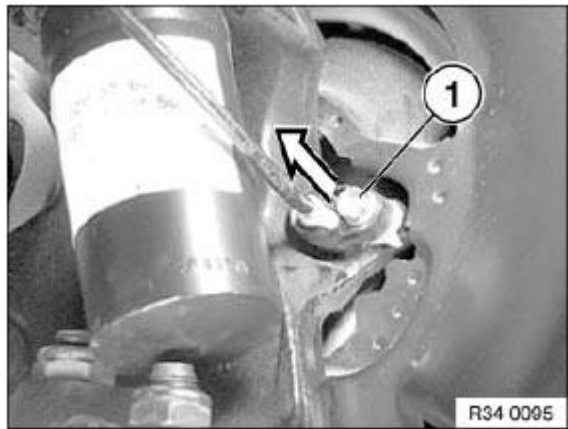


Fig. 121: Identifying Hexagon Socket Head Cap Screw
Courtesy of BMW OF NORTH AMERICA, INC.

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.
- **READ AND COMPLY WITH GENERAL INFORMATION.**

Observe **SAFETY INSTRUCTIONS** on raising the vehicle.

Open plug housing (1).

Pull plug connection (2) out of mounting and disconnect.

Pull cable out of brackets on swinging arm.

Installation:

Ensure proper locking of the plug connector and proper seating of the cable in the brackets.

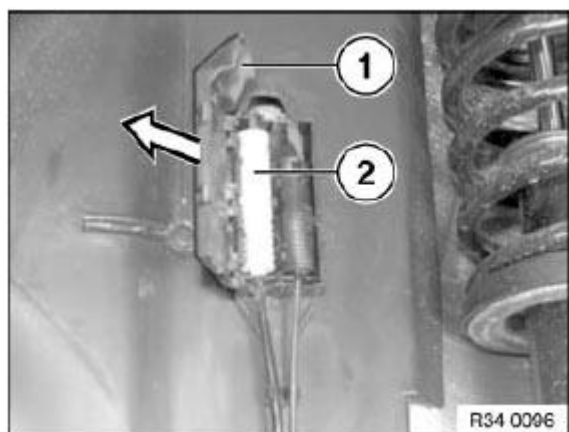


Fig. 122: Identifying Plug Housing And Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

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

Installation:

Tightening torque **34 51 6AZ** .

Clean bore hole for pulse generator and grease with Staburags NBU 12/K lubricating grease (refer to **BRAKES - OPERATING FLUIDS**).

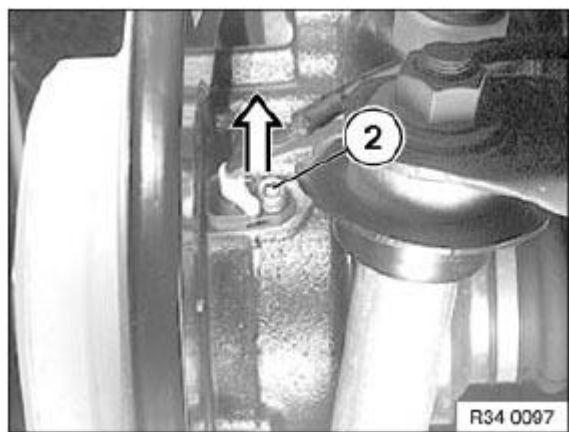


Fig. 123: Identifying Hexagon Socket Head Cap Screw
Courtesy of BMW OF NORTH AMERICA, INC.

34 52 550 REMOVING AND INSTALLING / REPLACING DSC SENSOR

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

Necessary preliminary tasks:

- Remove right front seat. See **REMOVING AND INSTALLING LEFT OR RIGHT FRONT SEAT (NORMAL/SEMI-ELECTRIC)** or **REMOVING AND INSTALLING LEFT OR RIGHT FRONT SEAT (COMFORT)**
- Remove **FRONT INSIDE ENTRANCE COVER STRIP**
- Lift carpet and fold back to one side

NOTE: The yaw sensor comprises the function of the transversal-acceleration sensor and the yaw sensor.

Unlock plug connection.

Installation:

Make sure plug connection locks correctly.

Release screws (1) and remove rotation rate sensor.

Installation:

Tightening torque **34 51 3AZ** .

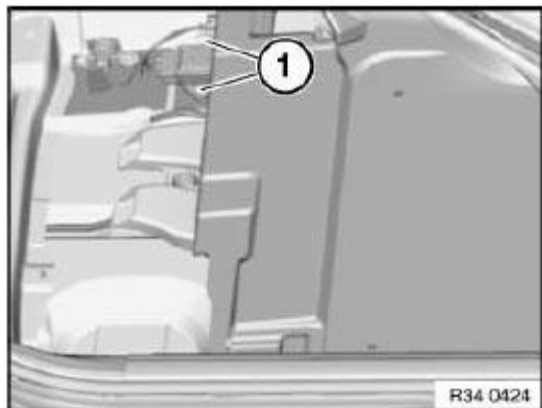


Fig. 124: Identifying Screws

Courtesy of BMW OF NORTH AMERICA, INC.

Carry out calibration/adjustment of DSC sensor.

34 52 575 REMOVING AND INSTALLING/REPLACING FRONT PRESSURE SENSOR FOR ACC

Necessary preliminary tasks:

- Remove front right **WHEEL ARCH TRIM**

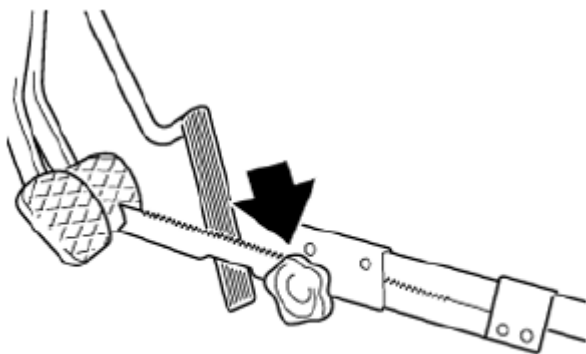
- Read and comply with **GENERAL INFORMATION**.

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.



31 34 021

Fig. 125: Locating Pedal Support

Courtesy of BMW OF NORTH AMERICA, INC.

Unfasten plug connection (1).

Release pressure sensor (2) and remove.

Installation:

Tightening torque **34 51 12AZ** .

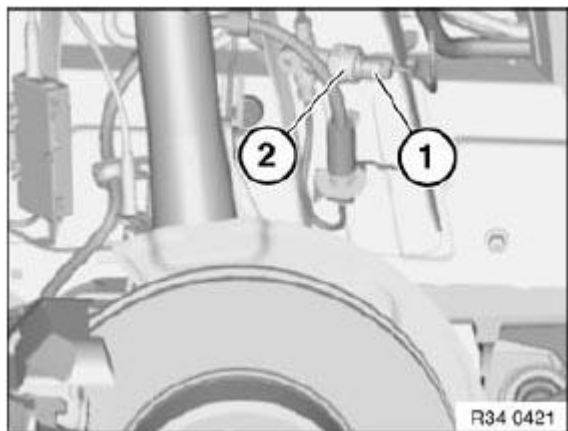


Fig. 126: Identifying Pressure Sensor And Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

34 52 580 REMOVING AND INSTALLING / REPLACING REAR PRESSURE SENSOR FOR ACC

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.

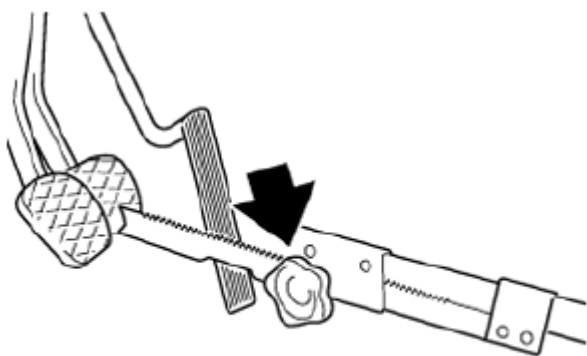


Fig. 127: Locating Pedal Support
Courtesy of BMW OF NORTH AMERICA, INC.

Vehicles with N52 engine:

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If necessary, remove heat shield (1).

Installation:

Make sure heat shield is correctly seated.

If necessary, replace heat shield.

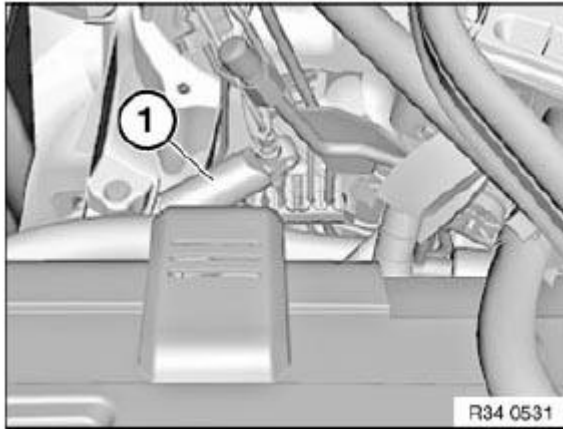


Fig. 128: Identifying Heat Shield

Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect plug connection (1).

Release pressure sensor (2) and remove.

Installation:

Tightening torque **34 51 12AZ** .

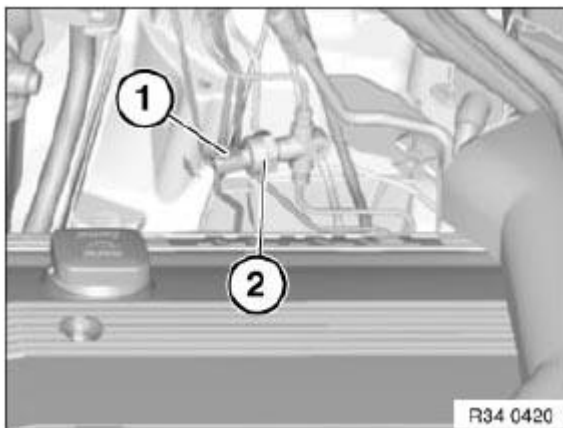


Fig. 129: Identifying Plug Connection And Pressure Sensor

Courtesy of BMW OF NORTH AMERICA, INC.