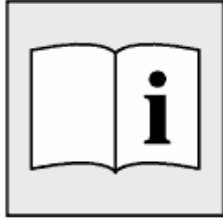


- 1 Brake booster
- 2 Expansion tank
- 3 Vacuum hose

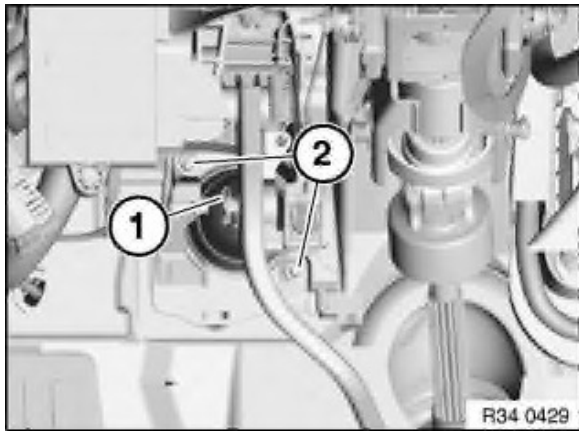
- 4 Brake master cylinder
- 5 Bleeding braking system
- 6

*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



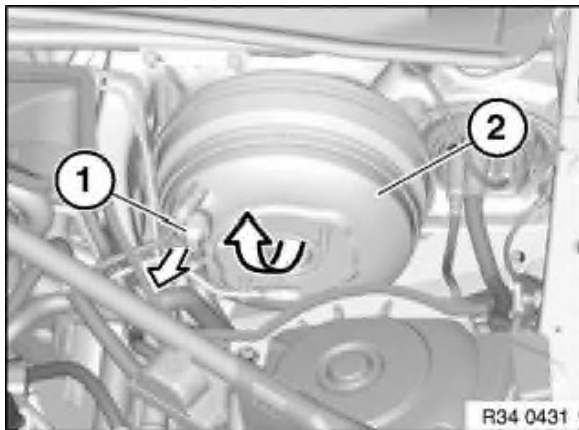
Detach locking clip (1) from brake pedal, disengage and pull out locking pin.

Unscrew nuts (2).

Installation:

Replace self-locking nuts.

Tightening torque 35 11 1AZ.



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

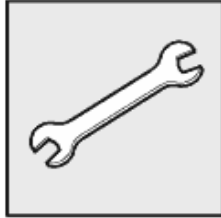
Carefully pull brake booster (2) out of bulkhead and tilt out.

Installation:

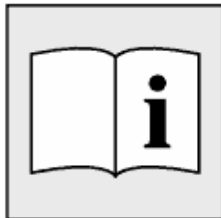
Replace seal between brake booster and bulkhead.

Important!

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

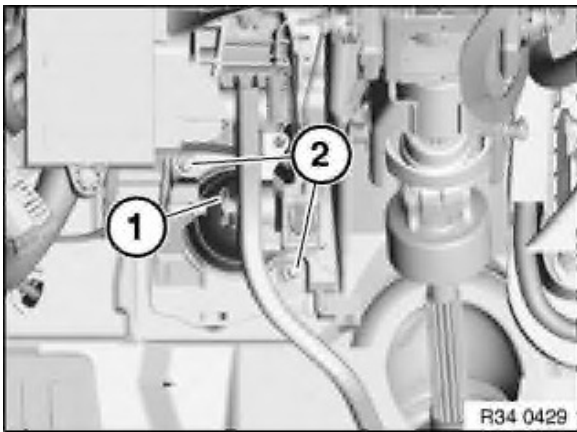
**Special tools required:**

- 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.

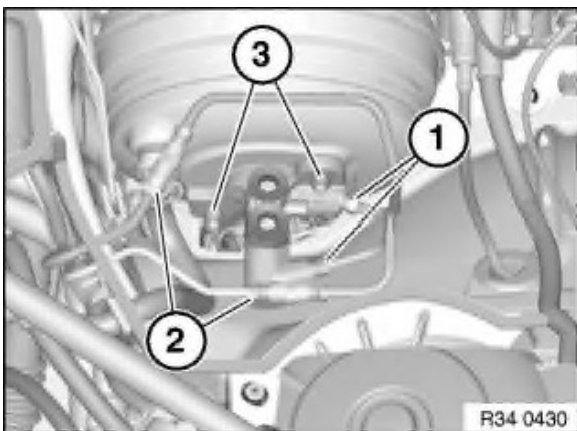


Remove locking clip (1) and disengage and pull out locking pin.
Slacken nuts (2).

Installation:

Replace self-locking nuts.

Tightening torque 35 11 1AZ .



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.

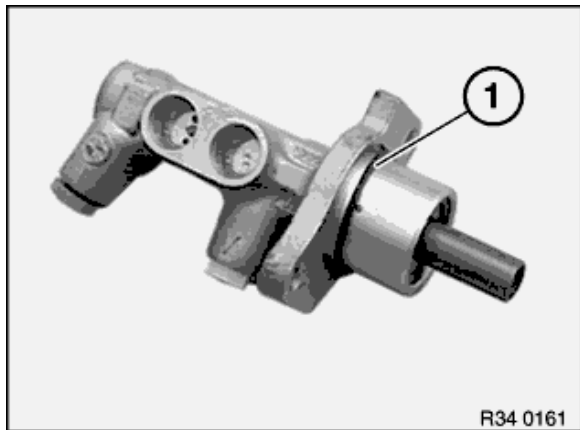
Tightening torque 34 32 1AZ .

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

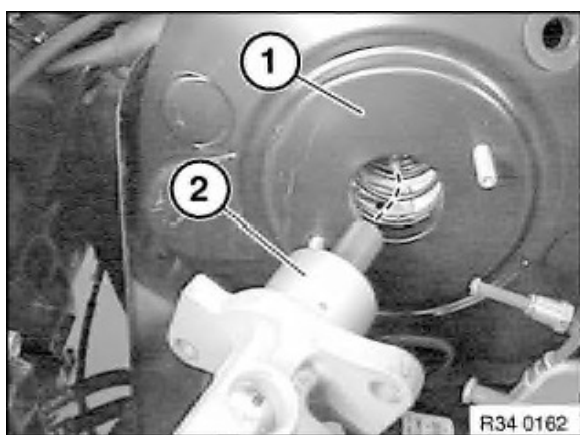
Installation:

Replace self-locking nuts.

Tightening torque 34 31 1AZ .

**Installation:**

Replace sealing ring.

**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.

32 1 270 Plugs (set)

Minimum set: Mechanical tools

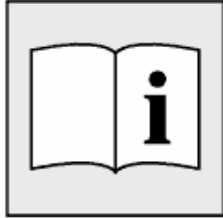


Note: 27-piece, 3x per size - For sealing off hydraulic lines for brakes, steering etc.

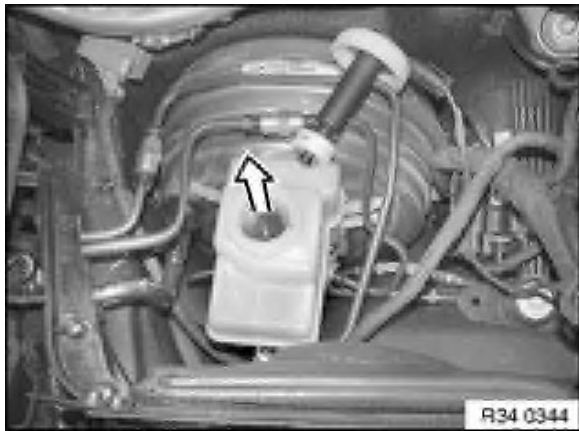
Series: E12, E21, E23, E24, E28, E30, E30/C, E30tou, E31, E32, E32/3, E34, E34tou, E36, E36/2, E36/3, E36/5, E36/7, E36/C, E36tou, E38, E38/3, E39, E39PL, E39tou, E46, E46/16, E46/2, E46/3, E46/5, E46/C, E52, E53, E60, E61, E63, E64, E65, E66, E67, E68, E70, E81, E82, E83, E85, E86, E87, E90, E91, E92, E93, R50, R52, R53, R55, R56, RR1, RR2

SI number: 1 14 01 (766)

Order number: 32 1 270
Plugs (set)

*Necessary preliminary tasks:*

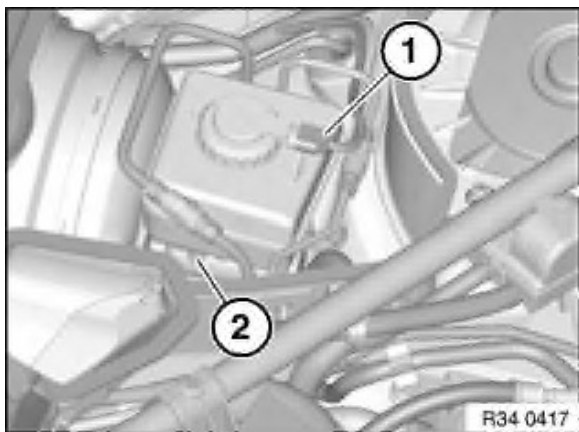
- Remove lower section of microfilter housing.
- Read and comply with General Information.



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.

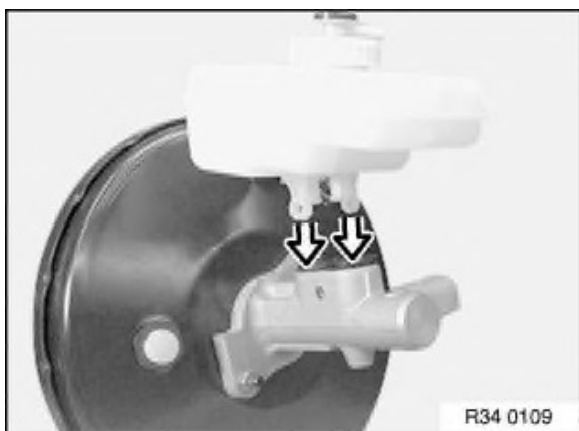


Unfasten plug connection (1) and disconnect.
Release retaining screw (2).

Installation:

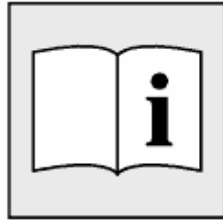
Tightening torque 34 31 3AZ .

Pull expansion tank vertically out of brake master cylinder.

*Installation:*

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

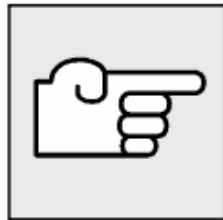
Push the expansion tank vertically onto the master brake cylinder.

*Necessary preliminary tasks:*

- Remove microfilter air duct.

Security version:

- Pay attention to engine compartment protective features

Left microfilter housing lower section:

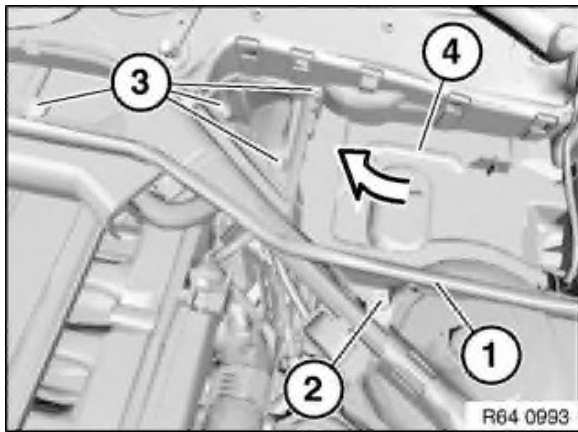
Unclip hose.

Installation:

Make sure hose is correctly seated.

Right microfilter housing lower section:*Installation:*

Ensure correct cable routing.

Left or right microfilter housing lower section:

Partially detach engine compartment gasket (1).

Release screw (2).

Turn quick-release fasteners (3) approx. 90 ° counterclockwise.

Feed out microfilter housing lower section (4) in direction of arrow and remove.

Installation:

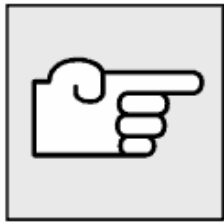
Make sure microfilter housing lower section (4) is correctly seated.

**Important!**

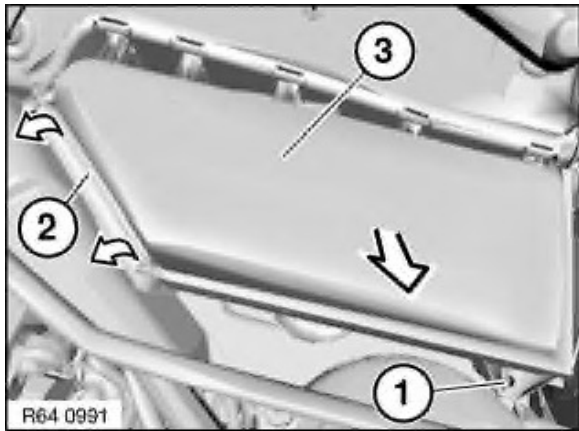
Risk of damage!

A/C system must not be operated without the prescribed filter element.

Follow manufacturer's instructions.

Security version:

When replacing microfilter air duct, pay attention to engine compartment protective plating .



If necessary, disconnect plug connection for engine hood contact switch.

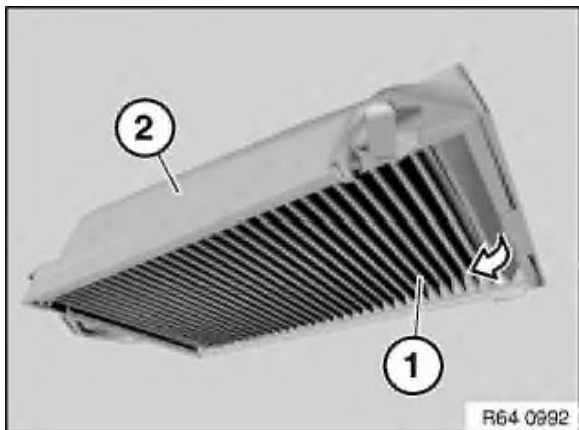
Turn quick-release fastener (1) approx. 90 ° counterclockwise.

Open holder (2) in direction of arrow.

Remove microfilter air duct (3) in direction of arrow.

Installation:

Make sure microfilter air duct (3) is correctly seated.



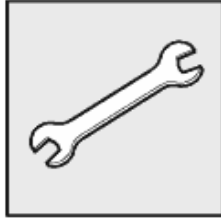
Lever microfilter for interior ventilation (1) in direction of arrow out of microfilter air duct (2) and remove.

Installation:

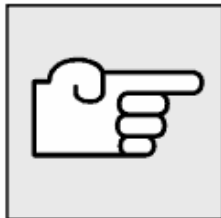
Make sure microfilter for interior ventilation (1) is correctly seated in microfilter air duct (2).

34 31 Brake Master Cylinder

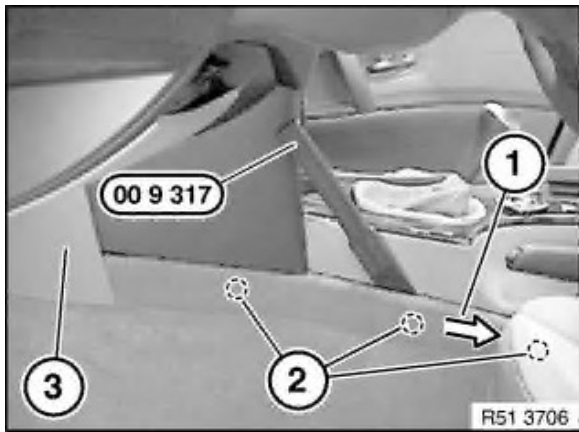
	Type	Thread	Tightening specification	Measure
1AZ Brake master cylinder to brake booster (vacuum)	E30			24 Nm
	E32		Replace self-locking nut.	21 Nm
	E28 / E34 / E36 / E46 / E38 / E39 / E52 / E53 / E85 / E86 / E83		Replace self-locking nut.	26 Nm
	E65 / E66 / E60 / E61 / E63 / E64		Replace self-locking nut. Retighten after 30 minutes.	26 Nm
2AZ Brake master cylinder to brake booster hydraulic	E31 / E32 / E34 / E24		Replace hexagon socket head screw with a hexagon screw, refer to BMW Parts Service	28 Nm
3AZ Expansion tank to brake master cylinder	E36 / E46 / E85 / E86			3,5 Nm
	E83 / E60 / E61 / E63 / E64			8 ±2 Nm

**Special tools required:**

- 00 9 317

*Note:*

Move driver's seat completely towards rear.

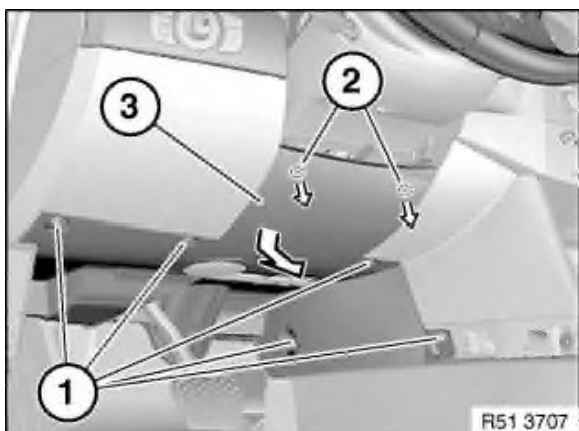


Drive bottom trim (1) towards rear with special tool 00 9 317 and remove.

Installation:

Make sure bottom trim (1) is correctly seated at retaining points (2).

Feed bottom trim (1) correctly into trim for pedal assembly (3).

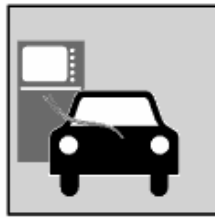


Release screws (1).

Unclip trim for pedal assembly (3) at retaining points (2) in direction of arrow.

Pull back trim for pedal assembly (3).

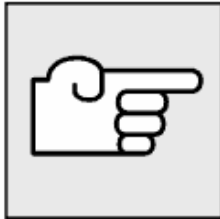
Disconnect associated plug connections and remove trim for pedal assembly (3).



Important!

Disconnecting the plug connection for the hands-free system speaker results in fault memory entries in the telephone control unit (limitation in the emergency SOS call system).

After fitting, read out fault memory and if necessary delete entries.



Replacement:

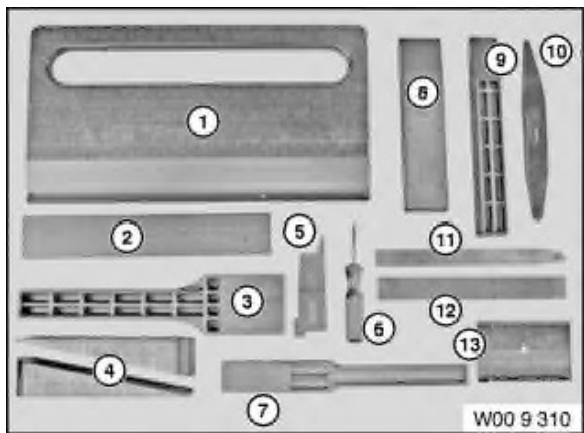
- Remove speaker for hands-free system
- Remove footwell light

Security version

- Remove intercom system speaker

00 9 310 Assembly wedges (set in plastic case)

Minimum set: Mechanical tools



Note:

For straightening and assembly jobs on vehicle bodies, e.g. fitting trim panels, removing window weatherstrips, repairing small-scale dents, removing residual adhesive materials, measuring gap widths, levering out trim panel parts

Series:

E12, E21, E23, E24, E28, E30, E30/C, E30tou, E31, E32, E32/3, E34, E34tou, E36, E36/2, E36/3, E36/5, E36/7, E36/C, E36tou, E38, E38/3, E39, E39PL, E39tou, E46, E46/16, E46/2, E46/3, E46/5, E46/C, E52, E53, E60, E61, E63, E64, E65, E66, E67, E68, E70, E71, E81, E82, E83, E85, E86, E87, E88, E90, E91, E92, E93, R50, R52, R53, R55, R56, RR1, RR2

SI number:

1 25 05 230

Order number:

00 9 310

Assembly wedges (set in plastic case)

Consisting of:

- | | |
|---------------|-------------------------------------|
| 1 = 00 9 311 | Trim remover |
| 2 = 00 9 312 | Striking wedge, square |
| 3 = 00 9 313 | Striking wedge, large |
| 4 = 00 9 314 | Adjusting wedges (2 x) |
| 5 = 00 9 315 | Gap wedge |
| 6 = 00 9 316 | Sealing lip wedge |
| 7 = 00 9 317 | Trim panel wedge |
| 8 = 00 9 318 | Universal wedge |
| 9 = 00 9 319 | Striking wedge, small |
| 10 = 00 9 321 | Fishbone |
| 11 = 00 9 322 | Plastic wedge |
| 12 = 00 9 323 | Cleaning wedge (scraper) |
| 13 = 00 9 324 | Trim remover (metal plate) |
| 14 = 00 9 329 | Case with inlay for assembly wedges |

Note: For removing stem trims from E60

In conjunction with: 009310

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 (refer to BMW Parts Service), 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 BMW Service Operating Fluids.
- Always dispose of brake fluid in approved receptacles, refer to BMW Service Workshop Planning documentation.
- Do not allow brake fluid to drain into drain pipes, into the outside environment or into unsuitable facilities. This would create the risk of groundwater contamination since brake fluid is classed as a fluid that is hazardous to water.
- Do not allow brake fluid to come into contact with paintwork as this will destroy the paint.
- Brake fluid must not be allowed to remain on bare skin too long in order to avoid skin problems. Wash skin coated with brake fluid with water and soap.
- If brake fluid makes contact with eyes, immediately flush with large quantity of clean water and visit eye doctor.

Wheel brakes:

- Brake linings:

Brake linings must be replaced when the warning threshold of the brake lining wear indicator is reached.

Refer to Technical Data.

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

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

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

One-sided angled areas on the brake linings 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 BMW Service Operating Fluids).

Brake lines, brake hoses: brake lining 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.

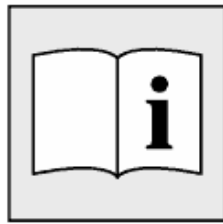
Tightening torque, 34 32 1AZ .

Wheel-slip control system:

The slip control system is basically maintenance-free.

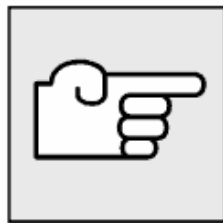
However, be sure to adhere to the following:

- 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.



Necessary preliminary tasks:

- Remove lower section of microfilter housing.
- Read and comply with General Information.

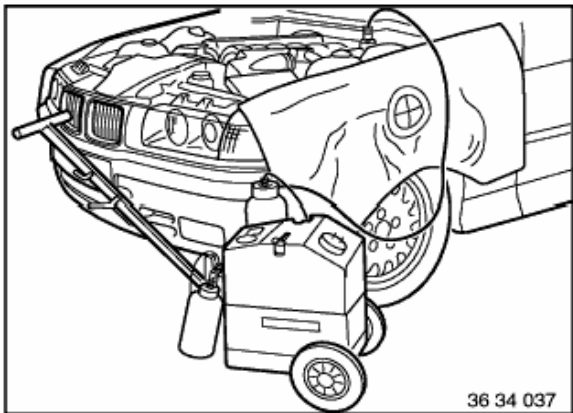


Observe the filling and bleeding instructions when replacing or repairing:

- Replace
- Hydraulic unit
- Components and connecting lines which are fitted between these assemblies.

Connect bleeder unit with max. 2 bar filling pressure.

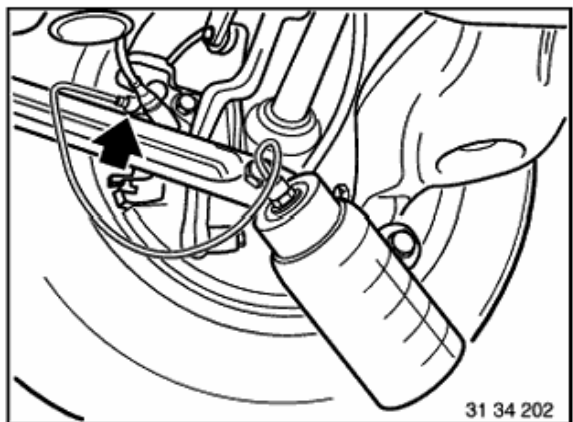
A second person is needed to help carry out this work.



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.



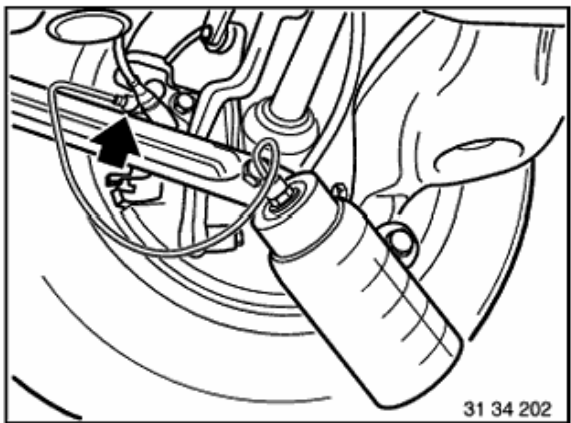
Flushing brake system completely

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.



Bleeding rear-axle brake circuit

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

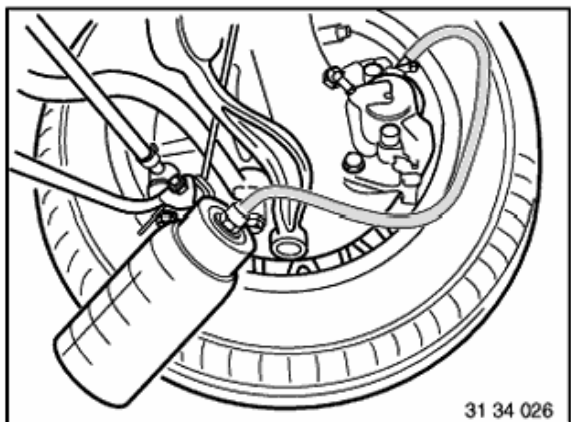
Close bleeder valve.

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.



Bleeding front-axle brake circuit

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

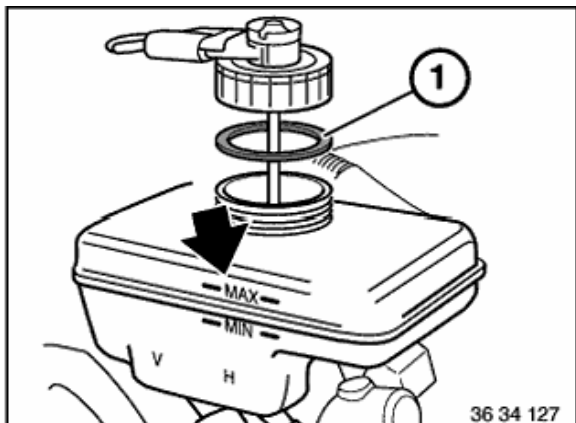
Close bleeder valve.

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.



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.

35 11 Pedal Assembly Console

	Type	Thread	Tightening specification	Measure
1AZ Bearing pedestal to brake assembly and body	E38 / E39 / E52			31 Nm
	E36 / E46			25 Nm
	E53 / E65 / E66 / E67 / E60 / E61 / E63 / E64 / E83		Retighten 1x on brake booster after 30 min.	21 Nm
	E85 / E86	M8	Retighten 1x on brake booster after 30 min	22 Nm
2AZ Bracket to bearing block	E85 / E86	M6		9 Nm

34 32 Brake Lines

	Type	Thread	Tightening specification	Measure
1AZ Brake hose couplings	E36 / E38 / E39	M10 x 1		18 Nm
	E53 / E60 / E61 / E63 / E64 / E65 / E66 / E67 / E83 / E85 / E86	M10 x 1		14 Nm
	E36 / E38 / E39	M12 x 1		18 Nm
	E53 / E60 / E61 / E63 / E64 / E65 / E66 / E67 / E85 / E86	M12 x 1		14 Nm
2AZ Brake hose to brake caliper, front and rear	E85 / E83 / E86			19 Nm
3AZ Bracket to trailing arm	E85 / E86 / E83	M6		9 Nm
	E85 / E86	M5		5 Nm
4AZ Brake hose to brake caliper, front	E53 / E60 / E61 / E63 / E64 / E65 / E66 / E67	M10 x 1		24 ± 2 Nm
5AZ Brake hose to brake caliper, rear	E53	Banjo bolt M10x1		40 Nm
	E60 / E61 / E63 / E64 / E65 / E66 / E67	M10 x 1		24 ± 2 Nm
6AZ Brake lines to hydraulic control unit	E83			17 Nm

	E60 / E61 / E63 / E64 / E65 / E66 / E67	M10 x 1		18 Nm
	E60 / E61 / E63 / E64 / E65 / E66 / E67	M12 x 1		17 Nm

34 31 Brake Master Cylinder

	Type	Thread	Tightening specification	Measure
1AZ Brake master cylinder to brake booster (vacuum)	E30			24 Nm
	E32		Replace self-locking nut.	21 Nm
	E28 / E34 / E36 / E46 / E38 / E39 / E52 / E53 / E85 / E86 / E83		Replace self-locking nut.	26 Nm
	E65 / E66 / E60 / E61 / E63 / E64		Replace self-locking nut. Retighten after 30 minutes.	26 Nm
2AZ Brake master cylinder to brake booster hydraulic	E31 / E32 / E34 / E24		Replace hexagon socket head screw with a hexagon screw, refer to BMW Parts Service	28 Nm
3AZ Expansion tank to brake master cylinder	E36 / E46 / E85 / E86			3,5 Nm
	E83 / E60 / E61 / E63 / E64			8 ±2 Nm