2002-07 GENINFO

Brakes - Overview - MINI

MINI BRAKES

BRAKE SYSTEM

The braking system features disc brake and calipers on all four wheels. The hydraulic system has a dual circuit that is split diagonally. A brake booster is fitted to all models. The system incorporates Anti-Lock Brakes (ABS) as a standard with its sub systems of Electronic Brake Force Distribution (EBV), Cornering Brake Control (CBC) and Engine Torque Feedback Control (MSR).

Purpose of the System

The Brake System provides the stopping power for the MINI and a cable operated parking brake. System components include:

- Brake Booster
- Master Cylinder with Reservoir
- Front Wheel Brake Assemblies
- Rear Wheel Brake Assemblies
- Parking Brake

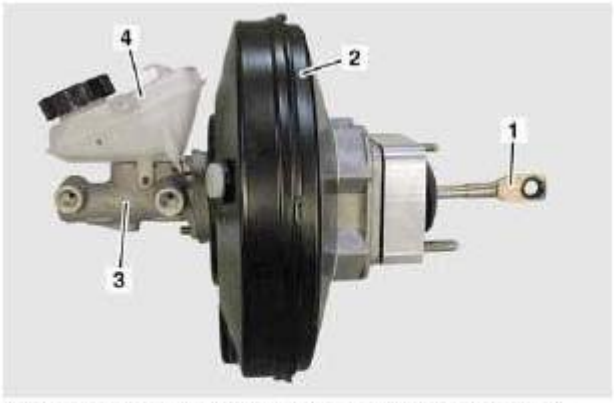
System Components

Brake Booster

All cars are fitted with a 10" diameter vacuum brake booster. The booster is vented through an aluminum baffle plate, fitted between the booster and the bulkhead.

Master Cylinder with Reservoir

The tandem master cylinder is available in two versions one for ABS/ASC and one for DSC, both have a piston diameter of 22.2 mm. The visible difference between the two units is the single sensor fitted to the underside of the master cylinder on the DSC unit. This sensor informs the DSC control unit whether the driver has applied the brakes during DSC intervention.



Master Cylinder/Brake Booster (Non DSC)

1. Brake Pedal Push Rod
2. Brake Booster
3. Master Cylinder
4. Master Cylinder Brake Fluid Reservoir

Fig. 1: Master Cylinder With Reservoir
Courtesy of BMW OF NORTH AMERICA, INC.

Master Cylinder/Brake Booster (DSC)

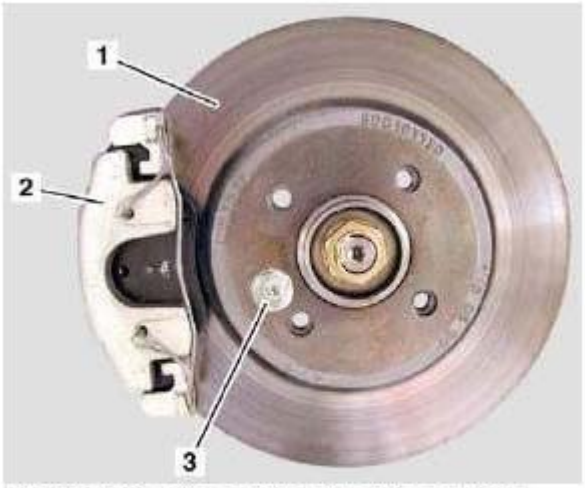
1. DSC Sensor

Fig. 2: DSC Sensor
Courtesy of BMW OF NORTH AMERICA, INC.

The reservoir is secured to the master cylinder by a bolt connecting two mounting tabs. A sensor monitors fluid level, and supplies information to the ABS/DSC control unit. Two "O" rings seal the unit to the master cylinder. The reservoir also supplies fluid to the clutch hydraulics on manual gearbox models. There is an integral filter in the filler neck to prevent dirt contamination of the fluid.

Front Wheel Brake Assembly

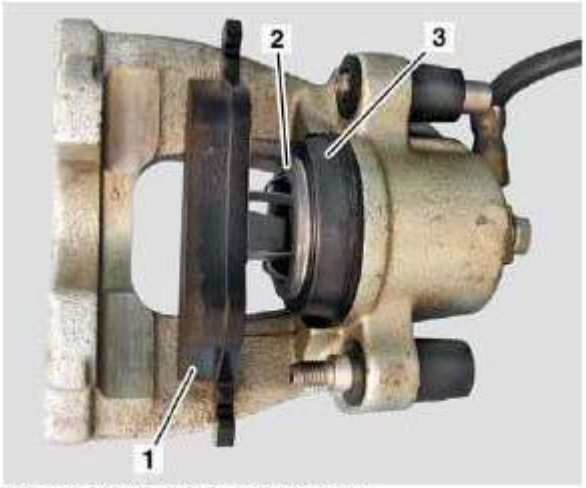
Internally vented discs of 275 mm diameter with single 48 mm piston floating calipers are used at the front. The brake hose is fixed to the caliper using a Banjo type bolt.



Front Brake Disc and Caliper Assembly

1. Vented Brake Disc
2. Brake Caliper (Floating Type)
3. Disc Locating Screw

Fig. 3: Vented Brake Disc And Brake Caliper
Courtesy of BMW OF NORTH AMERICA, INC.



Front Brake Pad and Piston

1. Brake Pad
2. Brake Caliper Piston
3. Brake Caliper Piston Seal

Fig. 4: Back Pad, Brake Caliper Piston And Piston Seal
Courtesy of BMW OF NORTH AMERICA, INC.

Rear Wheel Brake Assembly

Solid brake discs with a diameter of 260 mm and single 32 mm piston floating calipers are used at the rear. The pad on the inside is secured to the caliper piston via a spring that locates in a groove around the outside of the piston.

Rear Brake Disc and Caliper Assembly

1. Solid Brake Disc
2. Rear Brake Caliper (Floating Type)
3. Brake Disc Locating Screw

Fig. 5: Solid Back Disc, Rear Brake Caliper And Screw
Courtesy of BMW OF NORTH AMERICA, INC.

WORKSHOP HINT

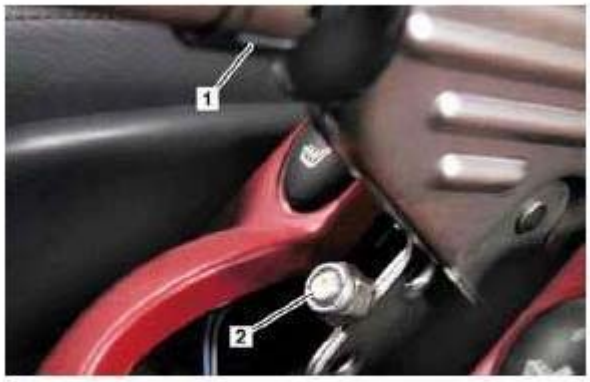
Front Rotor Diameter	275mm
Minimum Rotor Thickness	19.0mm
Brake Pad Thickness	11.5mm
Rear Rotor Diameter	260mm
Minimum Rear Rotor Thickness	10.0mm
Rear Pad Thickness	10.5mm

Rear Brake Disc and Caliper Assembly

1. Solid Brake Disc
2. Rear Brake Caliper (Floating Type)
3. Brake Disc Locating Screw

Parking Brake Assembly

The parking brake operates through the rear caliper piston acting directly on to the disc using the pads. The parking brake is self adjusting, with the adjustment being made on the piston itself. A tool is required to wind back the adjuster when fitting new pads. The parking brake is operated from the handbrake by two Bowden cables with a compensator fitted inside the cabin area and an adjustment nut under the handbrake lever in the center console.



Parking Brake Adjustment Nut
1. Parking Brake Lever
2. Parking Brake Cables Adjustment Nut

Fig. 6: Parking Brake Assembly Nut
Courtesy of BMW OF NORTH AMERICA, INC.

Rear Caliper View From Rear
1. Parking Brake Cable
2. Parking Brake Mechanism

Fig. 7: Parking Brake Cable And Brake Mechanism
Courtesy of BMW OF NORTH AMERICA, INC.

Brake Fluid

Brake fluid meeting DOT 4 specification is the only fluid recommended for use with MINI. Brake fluid must be replaced at 24 month service intervals.

Principle of Operation

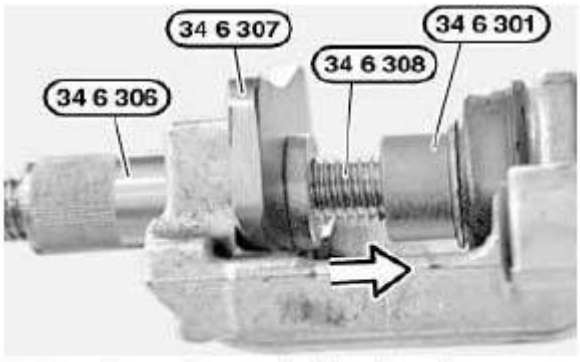
For normal brake operation, the brake booster assembly assists brake pedal pressure and the force is transmitted to the master cylinder assembly. The master cylinder assembly converts brake pedal movement to hydraulic pressure. Primary and secondary brake pipe circuits supply the hydraulic pressure via the ABS hydraulic unit to the brake calipers.

The primary circuit supplies the front right and rear left brakes while the secondary circuit supplies the front left and rear right brakes. The engine intake manifold provides the brake booster assembly with vacuum through a pipe and non-return valve.

Parking Brake Adjustment

The procedure to set up the handbrake correctly is as follows:

- Slacken the parking brake cable-adjusting nut at the handbrake lever. Wind back the rear brake caliper piston using the special tool. Fit brake pad lining into the caliper. Ensure the pad retention spring is fitted in the piston groove. Fit the caliper over the brake disc and secure it to the bracket.
- With the parking brake lever released, check whether the stop of the control lever makes contact with the grooved pin and the circular section at the end of the cable is correctly located in the caliper support. (Cable support has a torsion lock. With the correct fit, cable twisting is impossible.)
- Adjust the parking brake cable on the adjusting nut at the parking brake lever until the control lever on the calipers lift 1-2 mm from the grooved pin. The measurement between the grooved pin and control lever is carried out using a feeler gauge.
- Slowly and forcefully press the brake pedal several times (One shot adjustment). Forcefully pull parking brake and then release. Check wheels for freedom of movement.



Brake caliper piston wind back tool

1. Piston wind back tool
2. Tool location in piston

Fig. 8: Piston Wind Back Tool And Tool Location In Piston
Courtesy of BMW OF NORTH AMERICA, INC.

Rear Caliper Parking Brake Adjustment

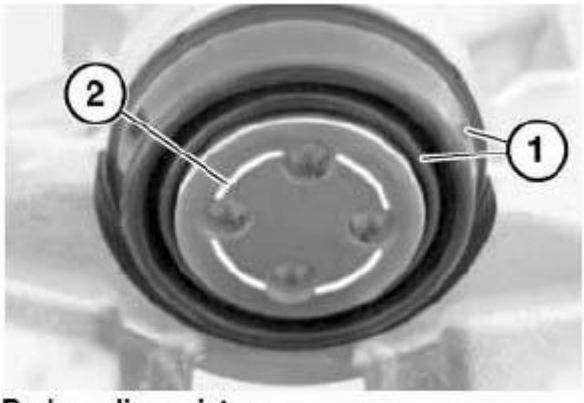
1. Grooved Pin
2. Lever
3. 1 - 2 mm Gap

Fig. 9: Rear Caliper Parking Brake Adjustment
Courtesy of BMW OF NORTH AMERICA, INC.

Rear Brake Pad Replacement

When replacing rear brake pad lining special tool #346 300 is needed to push the caliper piston back in.

NOTE: Adjustment of the parking brake cable is only carried out when the parking brake cable is replaced or the brake caliper is replaced.



Brake caliper piston

1. Piston
2. Dust Sleeve

Fig. 10: Piston And Dust Sleeve
Courtesy of BMW OF NORTH AMERICA, INC.