

BMW

320i
530i
630CSi

DESCRIPTION

Brake system is hydraulically operated. System uses both a tandem master cylinder and power brake unit. 530i and 630CSi models have 4 piston ATE front disc brakes and 2 piston ATE rear brakes. 320i models are equipped with 2 piston ATE front disc brakes and drum rear brakes. Parking brake is lever actuated and cable operated. On 530i and 630CSi models, brake shoes work against a drum machined in rear disc brake rotor/hub. On 320i models, shoes lock against rear brake drum. All models are equipped with a brake pressure regulator to reduce line pressure to rear brakes.

ADJUSTMENT

DISC PADS

Front and rear disc brake assemblies are self-adjusting, therefore, no adjustment in service is required.

REAR DRUM BRAKES

320i — Raise vehicle. Release parking brake. Using special tool 34 2 000 (or equivalent wrench), tighten brake shoes by turning left cam counterclockwise and right cam clockwise. Loosen cam $\frac{1}{8}$ turn or until wheel is just free to turn.

PARKING BRAKE

530i & 630CSi — 1) Release parking brake lever, raise and support vehicle, and remove rear wheels. Insert a brake adjusting tool through .6" hole in rotor, turn adjuster until rotor can no longer be rotated, then back off adjuster 2 or 3 teeth.

2) Work inside driver compartment, tighten adjustment nuts on lever until parking brake holds vehicle securely before fifth ratchet stop is reached.

320i — 1) Raise and support rear of vehicle. Fully release parking brake. Tighten brake shoes until wheel is locked. Back off adjusters about $\frac{1}{8}$ turn or until wheel can just barely turn.

2) Work inside drivers compartment and tighten nuts on lever until parking brake holds vehicle securely before fifth ratchet stop is reached.

HYDRAULIC SYSTEM BLEEDING

NOTE — Manufacturer recommends replacing brake fluid in entire system once a year to avoid moisture build-up. Attach a pressure bleeder to master cylinder reservoir.

CAUTION — Do not exceed 29 psi. Raise and support vehicle and remove wheels. Attach a bleeder hose to bleeder screw, and immerse opposite end of hose into a container partially filled with brake fluid. Open bleeder screw, allow all air to escape, then close bleeder screw. Continue operation until all air has been expelled from system. **NOTE** — On front wheel four piston calipers, bleed lower inboard screw before bleeding lower outboard screw.

REMOVAL & INSTALLATION

DISC PADS

Removal — Raise and support vehicle and remove wheels. Drive out retaining pins toward inside of vehicle and remove cross spring. Using an extractor tool, remove disc pads from caliper assembly. If disc pad thickness (including backing) has been worn to .080" (.02 mm), replace pads. Only replace pads in sets.

Installation — 1) Using a cylinder brush, clean guide surface and support surface in caliper. Siphon sufficient fluid from master cylinder reservoir to prevent overflowing, then press pistons to bottom of bores.

2) On rear two piston calipers, ensure machined position of piston face makes a 20° angle to lower caliper wall. Install disc pads, cross spring, and retaining pins. After installation, depress brake pedal several times to position pads against rotor.

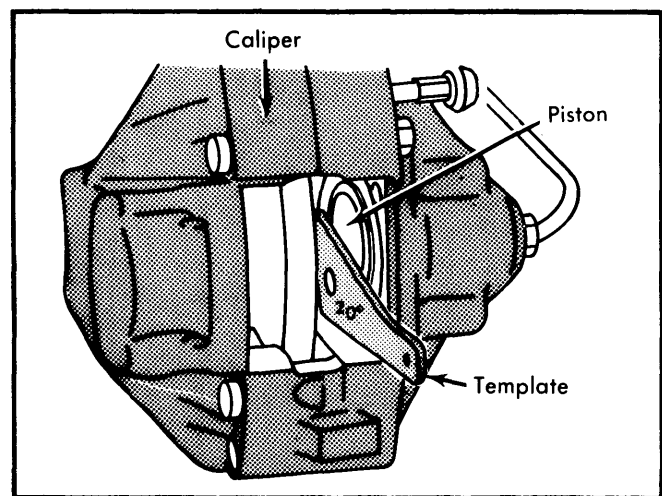


Fig. 1 Piston Alignment for Dual Piston Calipers

CALIPER ASSEMBLY

Removal — Drain brake fluid from master cylinder reservoir. Remove caliper mounting bolts. Disconnect disc pad wear indicator electrical lead. Disconnect brake fluid inlet lines. Lift caliper off rotor.

Installation — Reverse removal procedure and bleed hydraulic system.

ROTOR

Removal: 530i; Front — With caliper assembly removed, remove hub grease cap, cotter pin, and nut. Remove hub and rotor assembly. Remove Allen head bolts retaining rotor to hub and remove rotor.

NOTE — Both brake rotors must be replaced at same time.

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Installation — To install, reverse removal procedure. Tighten all bolts and fittings evenly. Bleed hydraulic system if necessary. Adjust front wheel bearings. See *Wheel Bearing Adjustment* in *WHEEL ALIGNMENT* Section.

Removal: 320i & 630CSi; Front — Raise and support front of vehicle. Separate bracket from strut. Remove caliper and tie out of way with brake line still connected. Remove mounting bolt from hub and take off rotor.

NOTE — Inboard vented brake discs are balanced, DO NOT move or replace balance clips.

Installation — To install, reverse removal procedure.

Removal: 530i & 630CSi; Rear — Raise vehicle and support on safety stands. Remove tire and wheel. Remove caliper and support out of way leaving brake line connected. Slip brake line out of clamp. Take out mounting bolt and remove brake rotor.

NOTE — Both rotors must be replaced at same time. Also, inboard vented brake discs are balanced, DO NOT move or replace balance clips.

Installation — To install, reverse removal procedure.

PARKING BRAKE SHOES

Removal — With rear caliper and rotor removed, disconnect lower return spring using brake spring pliers. Turn retaining springs 90° using removal tool, then set spring aside. Pull brake shoes apart at bottom and lift upward.

Installation — Reverse removal procedure and adjust parking brake shoes and cables.

BRAKE DRUM

Removal & Installation: 320i; Rear — Loosen brake adjuster cams. Remove countersunk Allen bolt and slide off brake drum. To install, reverse removal procedure and note: If one brake drum is reground, drum on other side must also be machined.

BRAKE SHOES

Removal: 320i; Rear — Remove brake drum. Disengage mounting spring, retainer, and pin from each shoe. Disconnect bottom return spring. Pull shoes apart and out of wheel cylinder. Disconnect parking brake cable and remove brake shoes. If brake shoe lining has worn to .118" (3.0 mm) or less, replace brake shoes.

Installation — Reverse removal procedure and note: Connect long end of spring between parking brake lever and brake shoe.

WHEEL CYLINDER

Removal: 320i; Rear — Remove brake drum. Disconnect brake fluid inlet line. Remove wheel cylinder bleeder valve. Remove cylinder mounting bolts and take off cylinder being careful not to drop brake fluid on brake shoes.

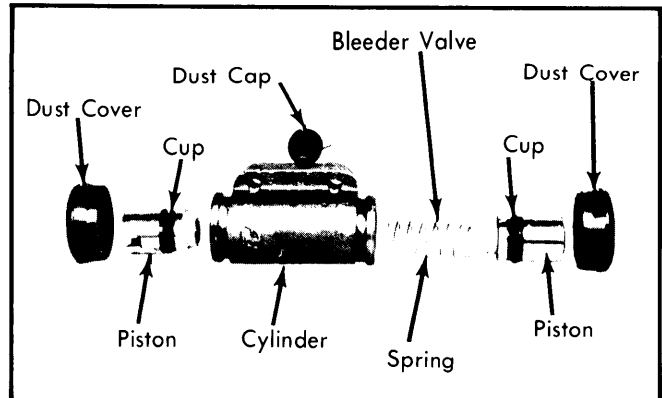


Fig. 2 Exploded View of 320i Rear Wheel Cylinder

Installation — To install, reverse removal procedure and make sure to bleed brake system.

MASTER CYLINDER

Removal — Siphon off brake fluid from reservoir. On 320i models, disconnect clutch hose connection. On 630CSi models, remove air cleaner. Disconnect all hydraulic lines from master cylinder. Remove nuts mounting master cylinder to power booster. On 320i models, remove nuts mounting master cylinder support to inner fender panel. Remove support and master cylinder.

Installation — To install, reverse removal procedure and note: Make sure "O" ring on master cylinder is not damaged. An imperfect fit will not allow correct vacuum build-up.

POWER BRAKE UNIT

NOTE — Mixture control unit must be removed to take off power brake unit (with master cylinder).

Removal: 320i — 1) Remove air intake ducting. Remove 3 screws located in top of control unit. Spread open cable clips. Remove wire holder. Lift up mixture control unit and retain piston with fingers until it can be tapped into place. Disconnect remaining vacuum lines. Remove unit mounting nuts and lift off unit.

2) Siphon out brake fluid from reservoir. Disconnect push rod from brake pedal. Separate hydraulic lines from master cylinder. Also, disconnect clutch hose.

3) Disconnect vacuum hose from brake unit. Remove brake unit mounting nuts and bolts. Separate master cylinder support

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from inner fender panel. Slide master cylinder and power brake assembly from vehicle.

Installation – To install master cylinder and power brake assembly as a unit, reverse removal procedure.

Removal: 530i & 630CSi – Disconnect power brake push rod from brake pedal at clevis pin. Disconnect vacuum hose at power brake unit. Disconnect and plug brake lines at master cylinder. Remove brake unit at mounting bracket and slide entire unit out of vehicle.

Installation – To install brake unit with master cylinder connected, reverse removal procedure. Bleed brake system after assembly is installed.

Check Valve Replacement – Check valve is located in power unit vacuum line at intake manifold. To remove, loosen hose clamps, remove vacuum hoses, and remove valve. To install, reverse removal procedure, making sure arrow or black portion of valve faces intake manifold.

Filter Replacement – With power brake unit removed from vehicle, pull back rubber dust boot and remove retaining ring. Remove silencer and filter. To install, reverse removal procedure.

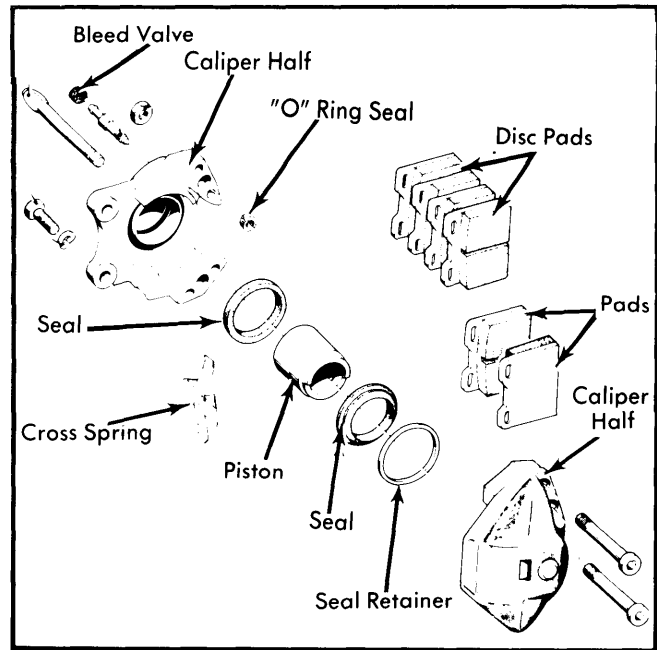


Fig. 3 Disassembled View of Dual Piston Rear Disc Brake for 530i & 630CSi. Front Caliper for 320i is Similar

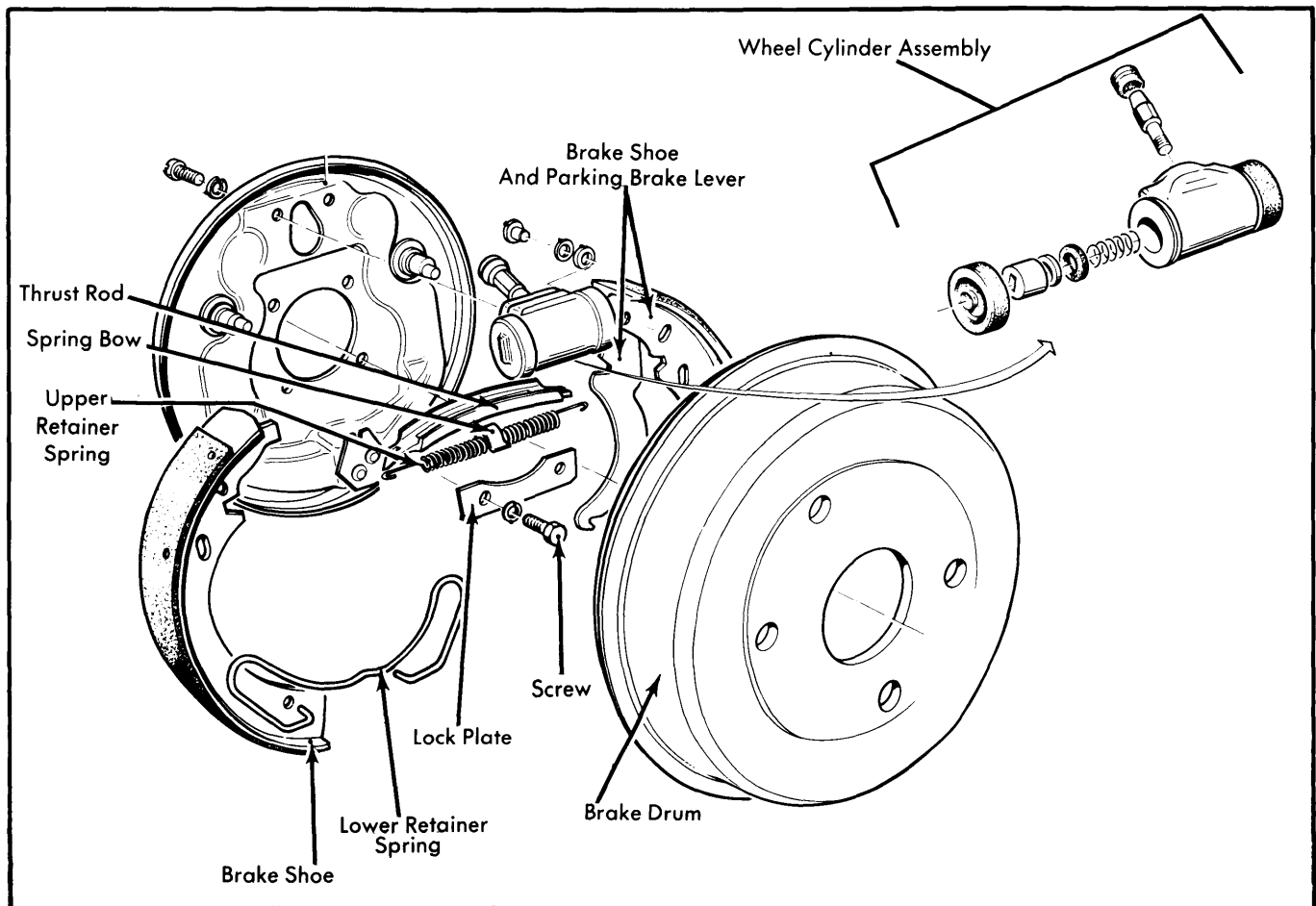


Fig. 4 Exploded View of 320 Rear Drum Brake Assy.

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OVERHAUL

BRAKE CALIPER

Disassembly — With caliper removed from vehicle and disc pads removed from caliper, remove clamping rings and rubber protecting caps. Hold one piston in place using a suitable clamp, insert a piece of wood in caliper cavity, then apply compressed air to fluid inlet and remove opposite piston. Remove sealing ring using a suitable plastic tool. Remove remaining piston(s) and seal(s) in same manner. **NOTE** — *DO NOT separate caliper halves unless a leak is detected.* To disassemble, remove expansion bolts, separate caliper halves, and remove sealing rings.

Cleaning & Inspection — Clean all parts in alcohol and check for wear or damage; replace parts as necessary.

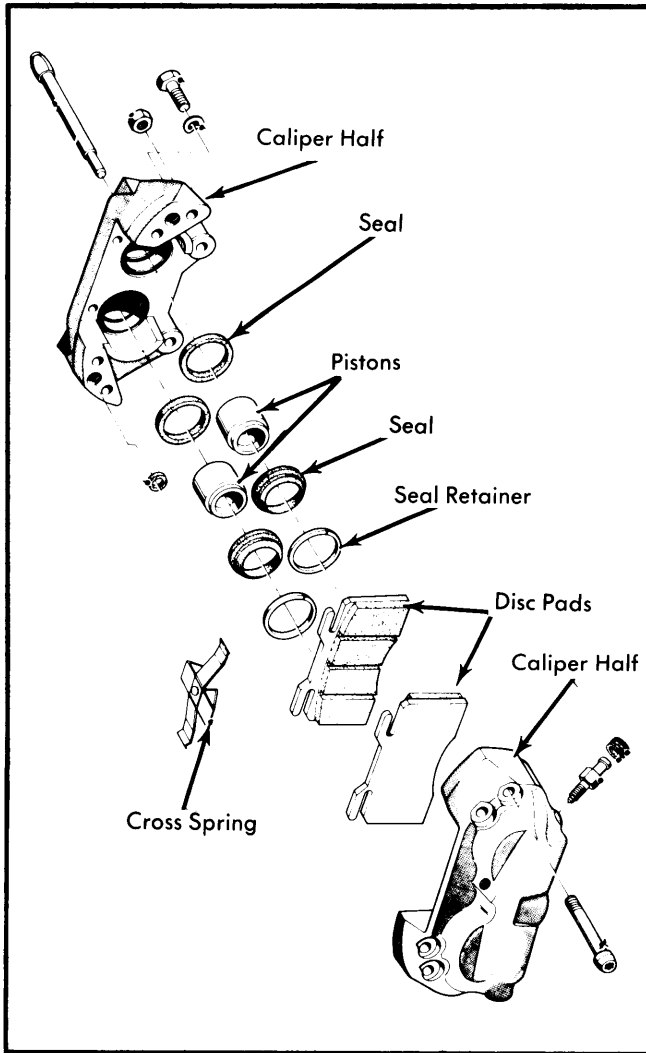


Fig. 5 Four Piston Front Disc Brake Caliper Assy. for 530i & 630CSi

Reassembly — Reassemble caliper (if separated) using new seals and expansion bolts. Tighten expansion bolts from inside out. Coat pistons and caliper bores with ATE brake cylinder paste (or equivalent), install sealing rings, then install pistons

into bores. Make sure pistons are not tilted when inserting. On two piston calipers, make sure machined surface of piston face makes a 20° angle to lower caliper wall. Install rubber protecting caps and clamp rings.

MASTER CYLINDER

Disassembly — Push in on primary piston and remove secondary piston stop screw. Remove snap ring from end of cylinder and remove primary and secondary piston assemblies and return spring. Disassemble piston assemblies noting number and position of parts used.

Cleaning & Inspection — Clean all parts in alcohol and inspect for wear or damage. **NOTE** — *Cylinders with surface defects in bores must be replaced; do not overhaul.*

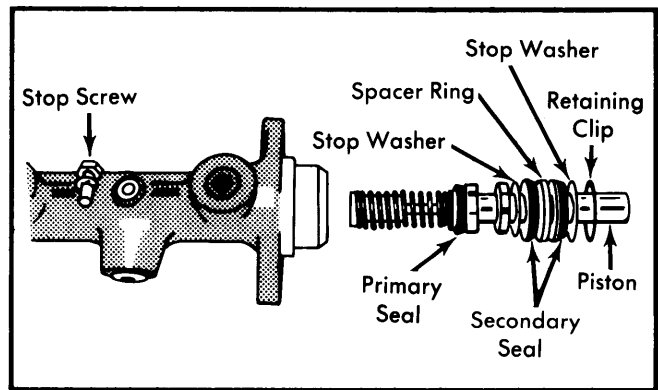


Fig. 6 Master Cylinder Primary Piston Assembly

Reassembly — Reassemble piston assemblies using thin coating of ATE brake paste. Install piston assemblies into cylinder bore using a suitable guide sleeve (BMW 34 3 000) to prevent damaging seals. Install secondary piston stop screw, making sure that piston is pushed fully forward before screw is installed and tightened. Install retaining ring in end of master cylinder bore.

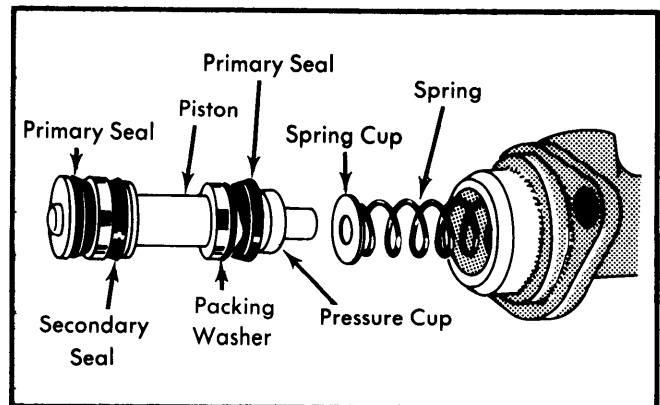


Fig. 7 Master Cylinder Secondary (Front) Piston Assy.

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TIGHTENING SPECIFICATIONS	
Application	Ft. Lbs. (mkg)
Caliper Mounting Bolts	
Front.....	58-69 (8.0-9.5)
Rear.....	43-48 (6.0-6.7)
Rotor-to-Wheel Hub	
320i & 630CSi	3.0-3.5 (.4-.5)
530i.....	43-48 (6.0-6.7)
Brake Line-to-Caliper	9-12 (1.3-1.6)
Caliper Expansion Bolts	
530i, Front.....	33-41 (4.6-5.7)
530i, Rear.....	16 (2.2)
Master Cylinder-to-Power Unit	
320i.....	12-14 (1.6-2.0)
630CSi	16-21 (2.1-2.9)
Power Brake Unit-to-Holder	
320i & 630CSi	16-17 (2.2-2.4)

DISC BRAKE ROTOR SPECIFICATIONS						
Application	Disc Diameter In. (mm)	Lateral Runout In. (mm)	Parallelism In. (mm)	Original Thickness In. (mm)	Minimum Refinish Thickness In. (mm)	Discard Thickness In. (mm)
320i Front	10.040 ^① (255)	.008 ^② (.2)	.0008 (.02)	.866 (22)	.....	.827 (21)
530i Front	10.708 ^① (272)	.008 ^② (.2)	.0008 (.02)	.499 (12.7)	.....	.460 (11.7)
Rear	10.708 ^① (272)	.008 ^② (.2)	.0008 (.02)	.374 (9.5)	.....	.334 (8.5)
630CSi Front	11.024 ^① (280)	.008 ^② (.2)	.....	.866 (22)	.....	.827 (21)
Rear	10.708 ^① (272)	.008 ^② (.2)	.....	.748 (19)	.....	.709 (18)

- ① - ±.008" (.2 mm).
- ② - Installed on vehicle.

BRAKE SYSTEM SPECIFICATIONS				
Application	Drum Diam. In. (mm)	Wheel Cylinder Diameter		Master Cylinder Diameter In. (mm)
		Front In. (mm)	Rear In. (mm)	
320i	9.842 ^① (250)	1.890 ^② (48)	.750 (19.05)	.....
530i & 630CSi	6.300 ^③ (160)	1.575 ^② (40)	1.652 ^② (42)	.....

- ① - Rear
- ② - Piston Diameter
- ③ - Parking brake inside diameter.