

1994 Mazda MX-5 Miata

BRAKE SYSTEM 1994 BRAKES Mazda - Disc & Drum

BRAKE SYSTEM

1994 BRAKES Mazda - Disc & Drum

DESCRIPTION & OPERATION

NOTE: For information on anti-lock brake systems, see **ANTI-LOCK BRAKE SYSTEM** article in the **BRAKES** section.

All models use hydraulic-operated brake system with a tandem master cylinder, proportioning valve and a power brake unit. All models are equipped with front disc brakes and either rear disc or drum brakes.

BLEEDING BRAKE SYSTEM

BRAKE LINE BLEEDING SEQUENCE

Application	Sequence
Miata	Longest Line First

ADJUSTMENTS

MASTER CYLINDER PUSH ROD

NOTE: Push rod has an adjustment screw to maintain correct distance between booster push rod and master cylinder piston. If push rod is adjusted too long, it prevents master cylinder piston from completely releasing hydraulic pressure, causing brakes to drag. If push rod is adjusted too short, it causes excessive pedal travel and an undesirable clunk in booster area.

1. Place Adjustment Gauge (49-F043-001) onto master cylinder. Turn screw on adjuster gauge until it contacts piston. Remove adjuster gauge. Apply 19.7 in. Hg to power brake unit.
2. Invert adjuster gauge and place it on power brake unit. Adjust push rod on power brake unit until there is no clearance between push rod and adjuster gauge screw.

PARKING/EMERGENCY BRAKE

1. On models with rear disc brakes, depress brake pedal several times. On models with rear drum brakes, start engine and depress brake pedal several times while vehicle is moving in reverse. Stop engine.
2. Pull parking brake lever with a force of 44 lbs. (20 kg). If stroke is 7-9 notches, parking brake is properly adjusted. If stroke is not as specified, raise and support rear of vehicle. Release parking brake lever.
3. Rotate cable adjusting nut at lever end of cable, located under console cover, until stroke is within specification. Ensure rear brakes do not drag. Ensure parking brake warning light illuminates when brake lever is pulled one notch.

BRAKE PEDAL FREE PLAY

1994 Mazda MX-5 Miata

BRAKE SYSTEM 1994 BRAKES Mazda - Disc & Drum

With engine off, depress pedal a few times to eliminate vacuum. Depress brake pedal by hand and check pedal free play. See BRAKE PEDAL FREE PLAY SPECIFICATIONS table. Adjust play by loosening push rod lock nut. Turn push rod until correct free play is obtained. Tighten push rod lock nut to 18-25 ft. lbs. (24-34 N.m).

BRAKE PEDAL FREE PLAY SPECIFICATIONS

Application	In. (mm)
Miata	.16-.28 (4-7)

BRAKE PEDAL HEIGHT & STOPLIGHT SWITCH

1. Released pedal height is measured from carpet surface on vertical portion of firewall to pedal pad center. Disconnect stoplight switch electrical connector. Loosen lock nut on stoplight switch. Rotate switch away from pedal. Loosen push rod lock nut. Rotate push rod until correct pedal height is obtained. See BRAKE PEDAL HEIGHT SPECIFICATIONS table.
2. Adjust pedal free play. See BRAKE PEDAL FREE PLAY under ADJUSTMENTS. Tighten push rod lock nut to 18-25 ft. lbs. (24-34 N.m).
3. Rotate stoplight switch until it contacts pedal and then rotate an additional 1/2 turn. Tighten stoplight switch lock nut to 10-13 ft. lbs. (14-18 N.m). Reconnect stoplight switch electrical connector.
4. Applied pedal height is measured from angled portion of firewall (without carpet) to pedal pad center. Start engine. Depress brake pedal with 132 lbs. (60 kg) pressure.
5. Measure applied pedal height. See BRAKE PEDAL HEIGHT SPECIFICATIONS table. If distance is not as specified, check for air in system, rear brake adjustment or worn shoes or pads.

BRAKE PEDAL HEIGHT SPECIFICATIONS

Application	In. (mm)
Pedal Released	6.8-7.1 (171-181)
Pedal Applied ⁽¹⁾	3.7 (95)
(1) Minimum height.	

TESTING

PROPORTIONING VALVE

1. Connect 2 pressure gauges to proportioning valve. One to input port and other to output port. Bleed brake system. See BLEEDING BRAKE SYSTEM. Depress brake pedal until pressure gauge reads as specified and check output pressure. See PROPORTIONING VALVE PRESSURE SPECIFICATIONS table.
2. Depress brake pedal again, applying additional pressure. Recheck output pressure. See PROPORTIONING VALVE PRESSURE SPECIFICATIONS table. If output pressure is not as specified, replace valve.

PROPORTIONING VALVE PRESSURE SPECIFICATIONS

Application	Inlet Pressure psi (kg/cm ²)	Outlet Pressure psi (kg/cm ²)
Miata	427 (30)	399-455 (28-32)

1994 Mazda MX-5 Miata

BRAKE SYSTEM 1994 BRAKES Mazda - Disc & Drum

995 (70)

554-640 (39-45)

POWER BRAKE UNIT

1. With engine off, depress brake pedal several times. Press and hold brake pedal and start engine. If brake pedal moves down slightly immediately after engine starts, power brake unit is operating. If brake pedal does not move as specified, go to next step.
2. Run engine for 1-2 minutes. Stop engine. Press brake pedal several times and note if first pedal stroke is longer than subsequent strokes. If first pedal stroke is longer than subsequent strokes, power brake unit is operating. If length of strokes is equal, test check valve and vacuum hose between vacuum source and power brake unit. Repair as necessary, and go to next step.
3. Start engine. Press and hold brake pedal. Stop engine. Hold pedal down for about 30 seconds. If pedal height remains at same height, power brake unit is operating. If pedal height recedes, test check valve and vacuum hose between vacuum source and power brake unit. Repair as necessary.

REMOVAL & INSTALLATION

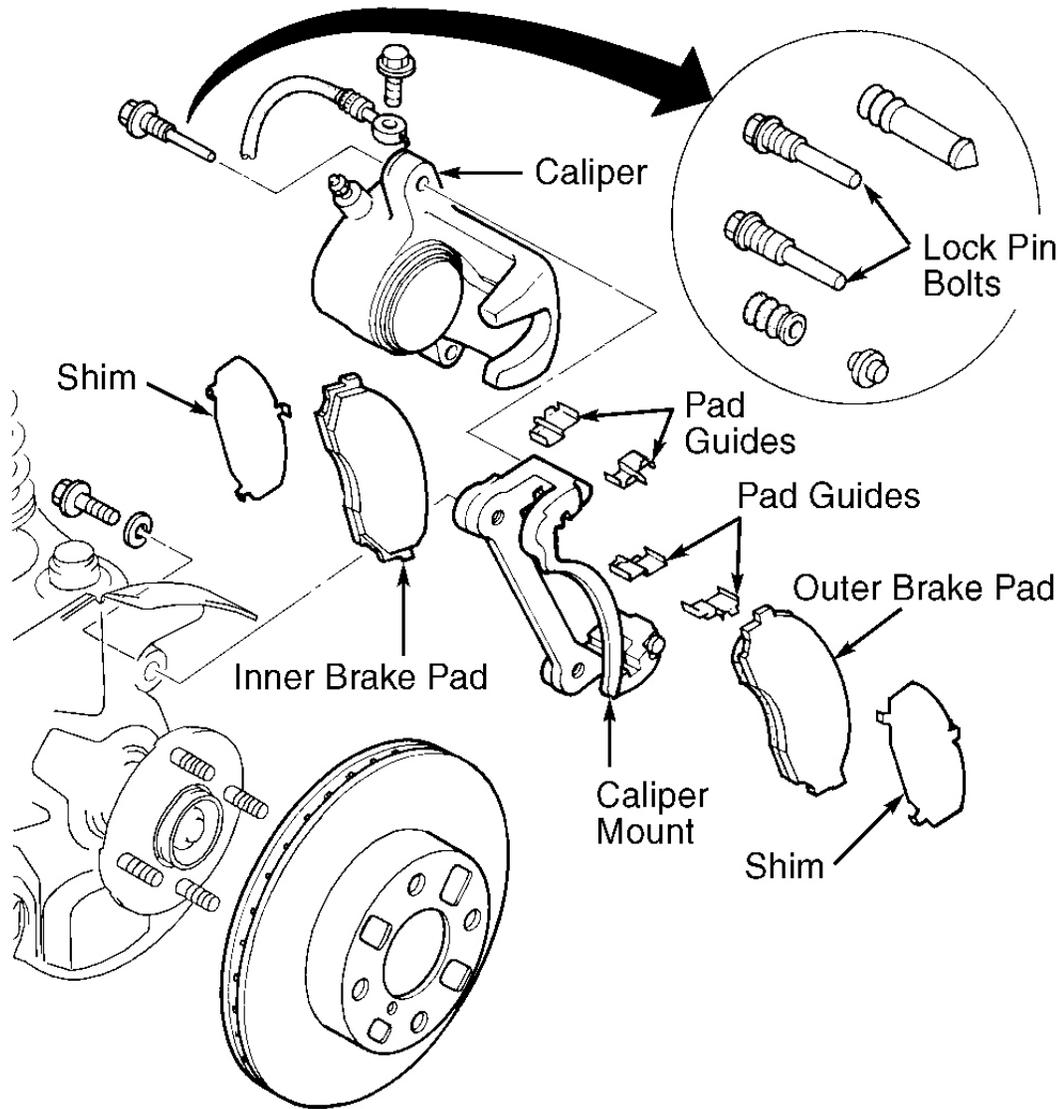
FRONT DISC BRAKE PADS

Removal & Installation

1. Raise and support front of vehicle. Remove front wheel assemblies. Remove lower lock pin/guide bolt. See **Fig. 1**. Pivot caliper upward and support using rope. Remove pads, shims, guide plates or pad guides and "V" springs (if equipped). Replace pad if lining thickness is less than specified. See MINIMUM PAD LINING SPECIFICATIONS (FRONT) table.
2. To install, reverse removal procedure. Use Disc Brake Expander (49-0221-600C) and an old pad to push piston fully inward to install disc pads.

1994 Mazda MX-5 Miata

BRAKE SYSTEM 1994 BRAKES Mazda - Disc & Drum



G91B00829

Fig. 1: Exploded View Of Front Disc Brake Assembly
 Courtesy of MAZDA MOTORS CORP.

MINIMUM PAD LINING SPECIFICATIONS

Application	Thickness In. (mm)
Miata	.04 (1.0)

FRONT DISC BRAKE CALIPER

Removal & Installation

1994 Mazda MX-5 Miata

BRAKE SYSTEM 1994 BRAKES Mazda - Disc & Drum

Raise and support front of vehicle. Remove front wheel assemblies and disconnect brake hose. Plug all openings. Remove front disc brake pads. See FRONT DISC BRAKE PADS under REMOVAL & INSTALLATION. Remove remaining mounting bolt(s). Remove caliper from vehicle. To install, reverse removal procedure. Bleed air from system.

FRONT BRAKE ROTOR

Removal & Installation

1. Raise and support front of vehicle. Remove front wheel assemblies. Remove front disc brake caliper with brake hose connected. Wire caliper aside. Remove grease cap (if equipped). Remove rotor-to-hub screws (if equipped). Remove rotor.
2. Machine rotor if lateral runout exceeds specification. Replace rotor if measured thickness is less than specified minimum thickness. See DISC BRAKE SPECIFICATIONS table. To install, reverse removal procedure.

REAR DISC BRAKE PADS

Removal & Installation

1. Raise and support rear of vehicle. Remove rear wheel assemblies. Remove manual adjustment gear concealment plug from caliper. See **Fig. 2** . Insert an appropriate size Allen wrench through hole and turn manual adjustment gear counterclockwise to retract caliper piston.
2. Remove lower guide bolt from caliper. Rotate caliper upward and wire side. Remove "M" spring. Remove pads, shims and guide plates. Replace pad if lining thickness is less than .04" (1.0 mm). To install, reverse removal procedure. Turn manual adjustment gear clockwise until brake pads slightly touch rotor. Turn manual adjustment gear back 1/3 turn.

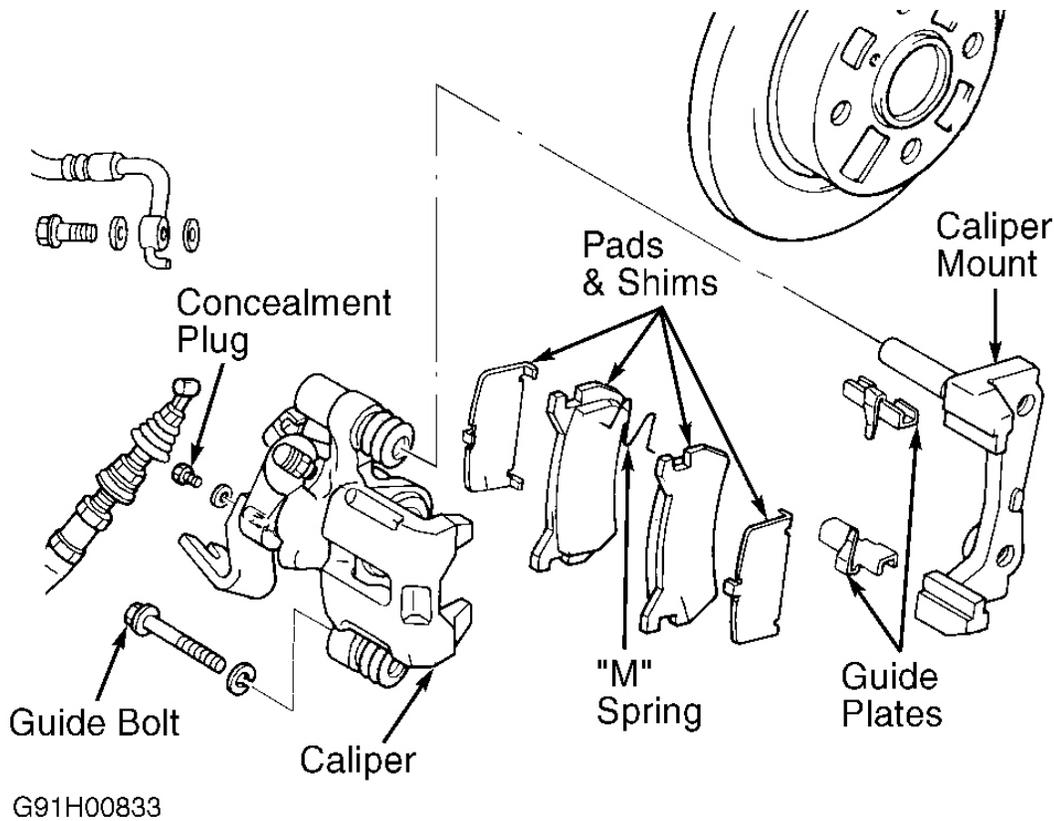


Fig. 2: Exploded View Of Rear Disc Brake Assembly
 Courtesy of MAZDA MOTORS CORP.

REAR BRAKE CALIPER

Removal & Installation

1. Raise and support rear of vehicle. Remove rear wheel assemblies. Release parking brake and disconnect parking brake cable from caliper. Disconnect brake hose from caliper.
2. Remove manual adjustment gear concealment plug from caliper. See **Fig. 2** . Insert an appropriate size Allen wrench through hole and turn manual adjustment gear counterclockwise to retract caliper piston.
3. Remove lower guide bolt from caliper. Rotate caliper upward. Pull caliper toward center of vehicle to slide it off of caliper mount. To install, reverse removal procedure. Bleed air from system.

REAR BRAKE ROTOR

Removal & Installation

1. Raise and support vehicle. Remove rear wheel assemblies. Remove rear brake caliper with brake hose

1994 Mazda MX-5 Miata

BRAKE SYSTEM 1994 BRAKES Mazda - Disc & Drum

connected. Support caliper using wire. Remove rotor-to-hub screws (if equipped). Remove rotor.

2. Machine rotor if lateral runout exceeds specification. Replace rotor if measured thickness is less than specified minimum thickness. See DISC BRAKE SPECIFICATIONS table.
3. To install, reverse removal procedure. Check end play at grease cap. If end play exceeds .002" (.05 mm), check lock nut torque or replace wheel bearings.

REAR AXLE BEARING & OIL SEAL

NOTE: For information on models with sealed wheel bearings, see **WHEEL BEARING in SUSPENSION - REAR** article in the **SUSPENSION** section.

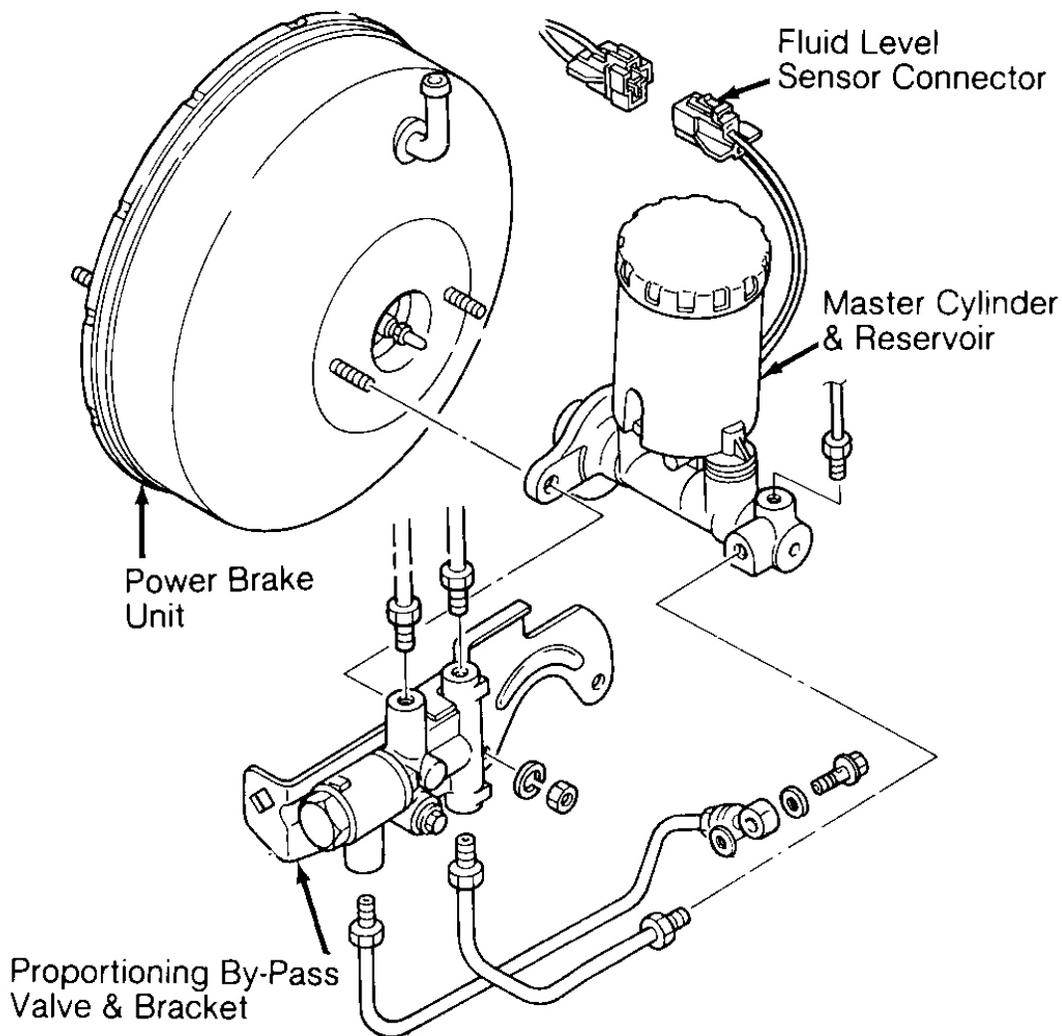
MASTER CYLINDER

Removal & Installation

Disconnect fluid level sensor electrical connector. See **Fig. 3**. Disconnect and plug brake lines at master cylinder to prevent entry of dirt and loss of fluid. Remove nuts attaching master cylinder to firewall or power brake unit. Remove master cylinder from vehicle. To install master cylinder, reverse removal procedure. Bleed air from system.

1994 Mazda MX-5 Miata

BRAKE SYSTEM 1994 BRAKES Mazda - Disc & Drum



93E00848

Fig. 3: Removing Master Cylinder
Courtesy of MAZDA MOTORS CORP.

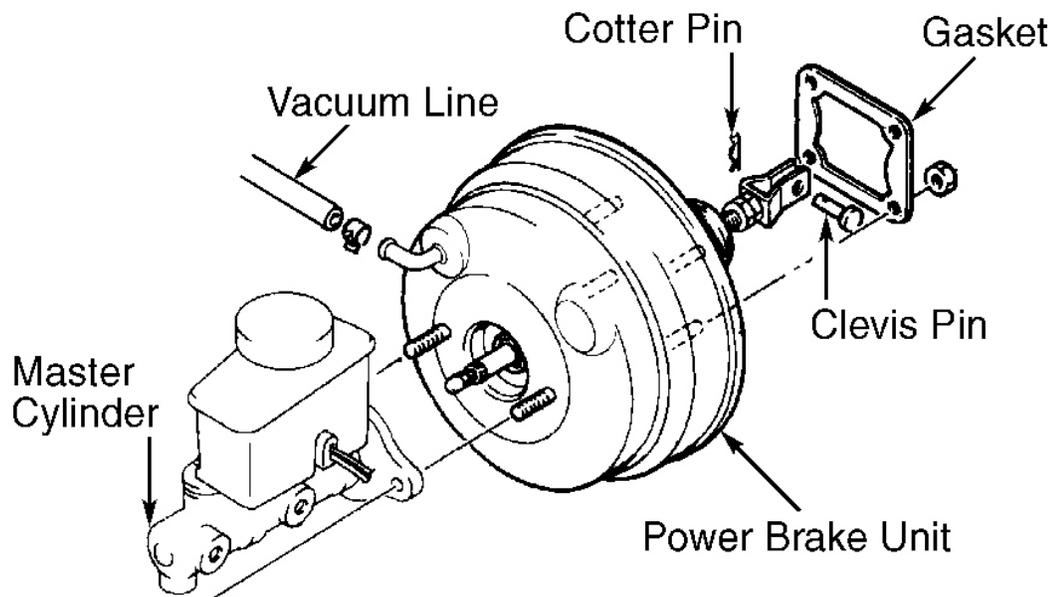
POWER BRAKE UNIT

Removal & Installation

Remove master cylinder from power brake unit. See MASTER CYLINDER under REMOVAL & INSTALLATION. Disconnect vacuum line at power brake unit. See **Fig. 4**. From inside vehicle, remove cotter pin and clevis pin. Separate push rod from brake pedal. Remove power brake unit-to-firewall nuts. Remove power brake unit. To install, reverse removal procedure. Bleed air from system.

1994 Mazda MX-5 Miata

BRAKE SYSTEM 1994 BRAKES Mazda - Disc & Drum



93F00849

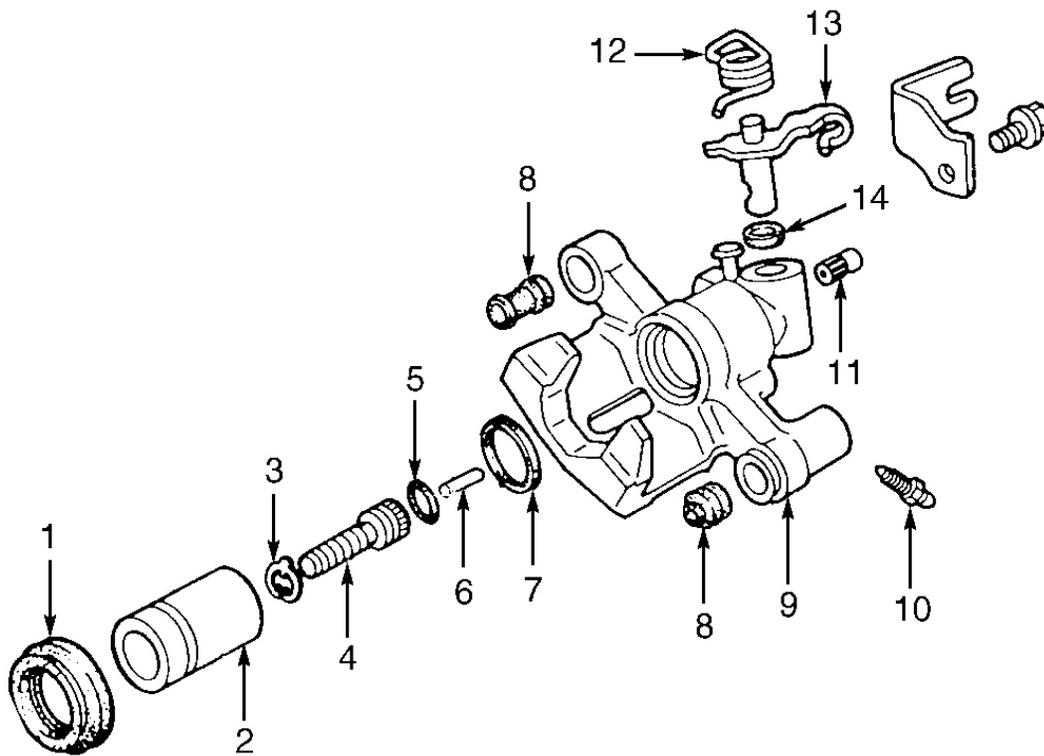
Fig. 4: Removing Power Brake Unit
Courtesy of MAZDA MOTORS CORP.

OVERHAUL

NOTE: Use appropriate illustrations for exploded view of rear caliper assembly, master cylinder and power brake unit. See [Fig. 5](#) through [Fig. 7](#) .

1994 Mazda MX-5 Miata

BRAKE SYSTEM 1994 BRAKES Mazda - Disc & Drum



- 1. Dust Seal
- 2. Piston
- 3. Snap Ring
- 4. Adjusting Bolt
- 5. "O" Ring

- 6. Connecting Link
- 7. Piston Seal
- 8. Boot
- 9. Caliper Body
- 10. Bleeder Screw

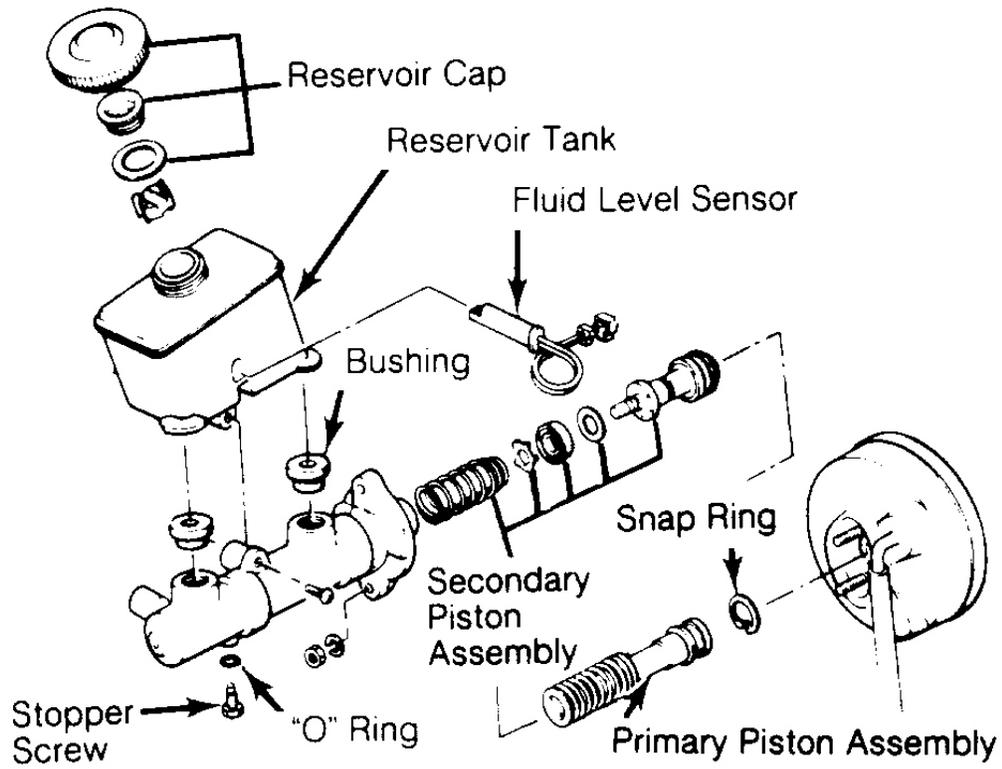
- 11. Manual Adjustment Gear
- 12. Spring
- 13. Operating Lever
- 14. Boot

93J00850

Fig. 5: Exploded View Of Rear Caliper Assembly
Courtesy of MAZDA MOTORS CORP.

1994 Mazda MX-5 Miata

BRAKE SYSTEM 1994 BRAKES Mazda - Disc & Drum

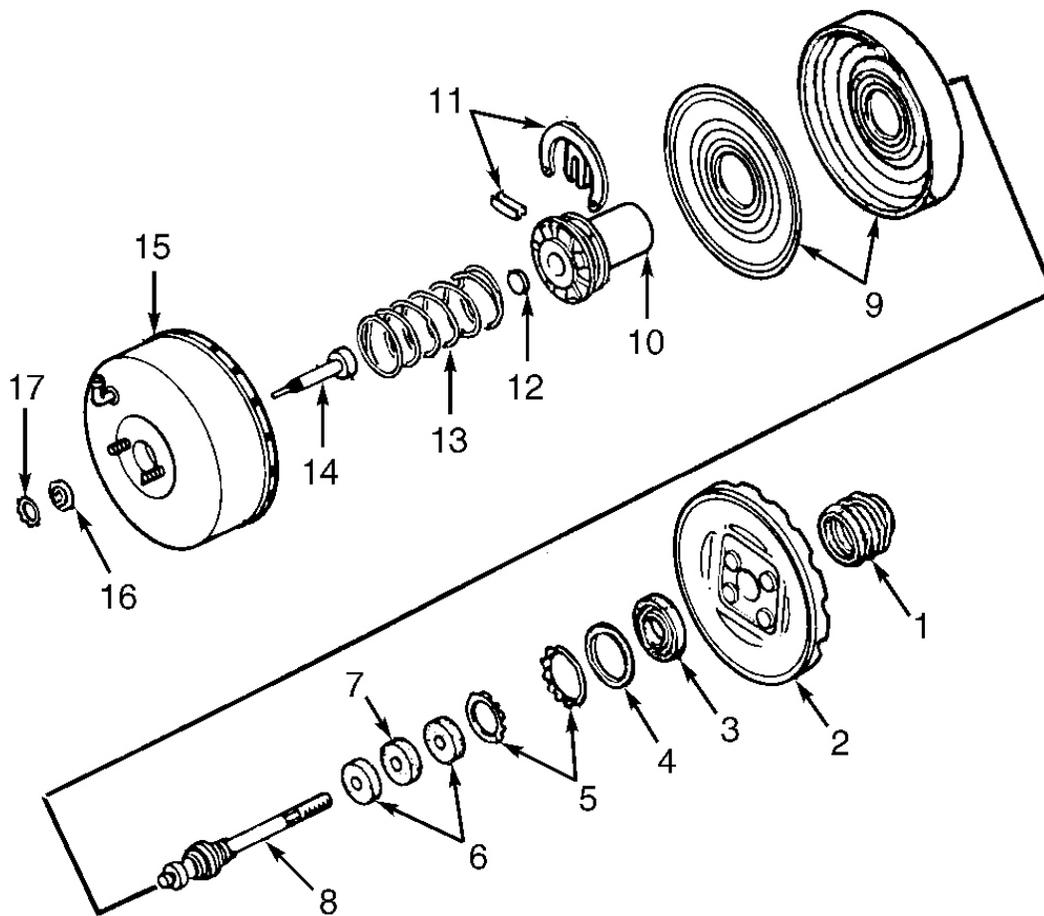


58065
Mazda

Fig. 6: Exploded View Of Typical Master Cylinder
Courtesy of MAZDA MOTORS CORP.

1994 Mazda MX-5 Miata

BRAKE SYSTEM 1994 BRAKES Mazda - Disc & Drum



- | | |
|------------------------|-------------------|
| 1. Dust Boot | 10. Power Piston |
| 2. Rear Shell | 11. Retainer Key |
| 3. Dust Seal | 12. Reaction Disc |
| 4. Bearing | 13. Spring |
| 5. Retainer | 14. Push Rod |
| 6. Air Filter | 15. Front Shell |
| 7. Air Silencer | 16. Seal |
| 8. Valve Rod & Plunger | 17. Retainer |
| 9. Diaphragm & Plate | |

G93B00852

Fig. 7: Exploded View Of Power Brake Unit
Courtesy of MAZDA MOTORS CORP.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

1994 Mazda MX-5 Miata

BRAKE SYSTEM 1994 BRAKES Mazda - Disc & Drum

Application	Ft. Lbs. (N.m)
Caliper Guide Bolt	
Front	58-65 (78-88)
Rear	25-29 (34-39)
Caliper Mounting Bracket Bolt	
Front	36-51 (49-69)
Rear	36-51 (49-69)
Wheel Lug Nut	65-87 (88-118)
	INCH Lbs. (N.m)
Wheel Cylinder Mounting Bolt	88-108 (10-12)

DISC BRAKE SPECIFICATIONS

DISC BRAKE SPECIFICATIONS

Application	In. (mm)
Front ⁽¹⁾	
Original Thickness	.79 (20)
Discard Thickness	.71 (18)
Rear ⁽¹⁾	
Original Thickness	.35 (9)
Discard Thickness	.31 (8)
(1) Maximum lateral runout is .004" (.10 mm).	