

1997 Mazda MX-5 Miata

BRAKE SYSTEM 1995-97 BRAKES Mazda - Disc & Drum

BRAKE SYSTEM

1995-97 BRAKES Mazda - Disc & Drum

DESCRIPTION & OPERATION

NOTE: For information on anti-lock brake systems, see appropriate ANTI-LOCK article in BRAKES.

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 rear drum brakes.

Rear Anti-lock System (RABS) is standard on B2300, B3000, B4000 and MPV models.

BLEEDING BRAKE SYSTEM

NOTE: If vehicle is equipped with anti-lock brakes, see appropriate ANTI-LOCK article for brake bleeding procedure.

BRAKE LINE BLEEDING SEQUENCE

Application	Sequence
B2300, B3000 & B4000	(1) RR, LR, RF, LF
All Other Models	Longest Line First

(1) Bleed master cylinder and RABS hydraulic unit before bleeding wheel cylinders and calipers.

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.

Miata Without ABS, MPV, MX-6 M/T Without ABS & 626 M/T Without ABS

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 gauge on power brake unit. Adjust push rod on power brake unit until there is no clearance between push rod and adjuster gauge screw.

B2300, B3000 & B4000

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Remove master cylinder to gain access to push rod. To check screw adjustment, fabricate a gauge. See **Fig. 1**. With engine running and vacuum line connected to booster, place gauge against master cylinder mounting surface of booster. Adjust push rod screw by turning it until end of screw just touches inner edge of gauge slot.

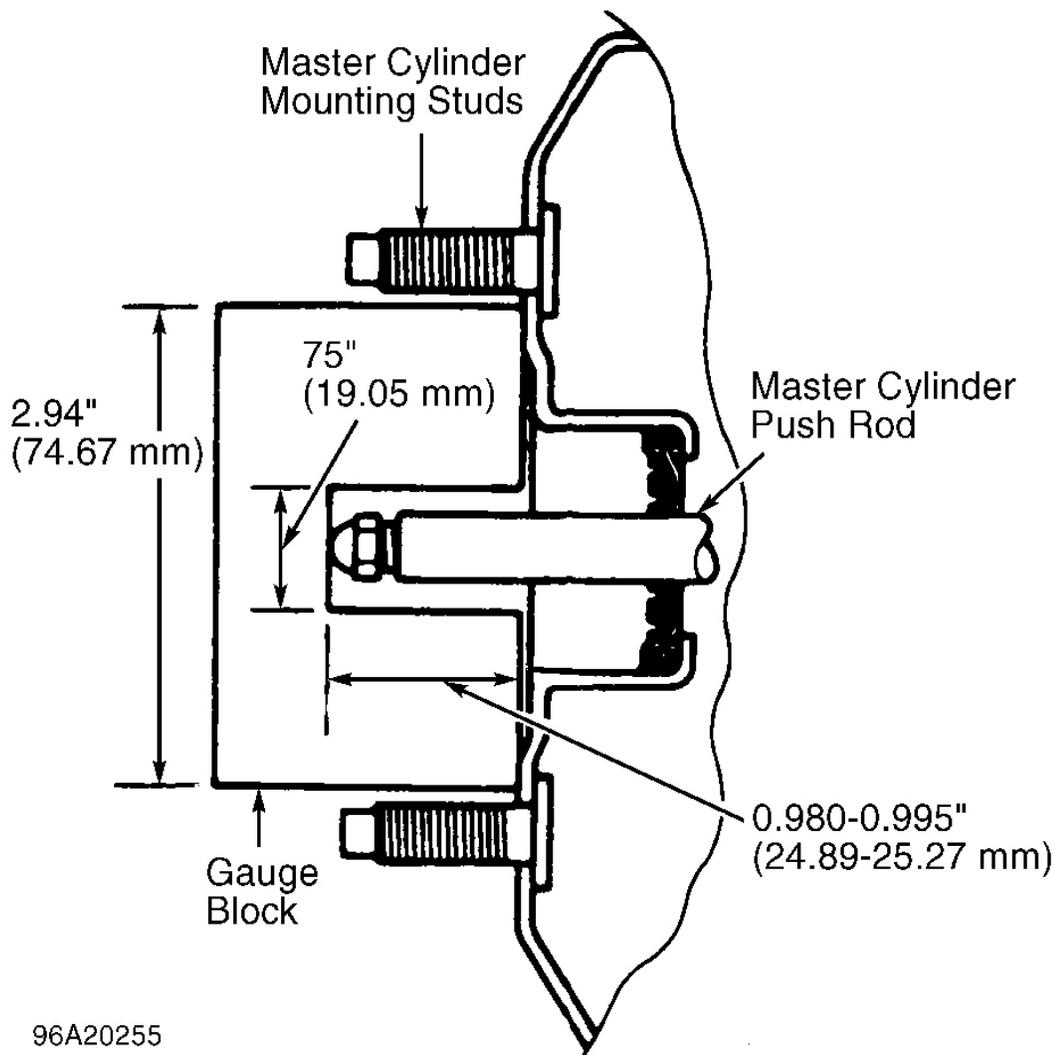


Fig. 1: Adjusting Brake Booster Push Rod (B2300, B3000 & B4000)
Courtesy of FORD MOTOR CO.

REAR BRAKE SHOES ADJUSTMENT

NOTE: Rear brakes are self-adjusting and require manual adjustment only if brake shoes have been replaced.

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1. Raise and support rear of vehicle. Remove rear wheel assemblies. If drums are installed on vehicle, remove cover from adjusting hole at bottom of brake backing plate. Turn adjusting screw with a brake adjusting tool until shoes drag against brake drum and lock drum.
2. When shoes are against drum, loosen adjusting screw an additional 10-12 notches so drum rotates freely. If drum does not rotate freely, remove wheel and drum and vacuum dust and dirt from linings. Use sandpaper and remove rust from points where shoes touch backing plate. Apply a light coating of molybdenum grease to brake shoe-to-backing plate contact points. Install wheel and drum and adjust shoes.
3. To adjust brakes with rear drums removed, first clean all rust and dirt on points where shoes touch backing plate and apply a small amount of molybdenum grease to those areas. Using a brake shoe adjustment gauge, measure inside diameter of drum braking surface.
4. Reverse tool and adjust brake shoes until they touch gauge. Gauge contact points on shoes must be parallel to vehicle with center line through center of axle. Hold automatic adjusting lever out of engagement while rotating adjusting screw to prevent burring screw slots. Ensure adjusting screw rotates freely.

MX-3, MX-6, Protege & 626

Raise and support rear of vehicle. Remove rear wheel assemblies. Release parking brake. Remove brake drum. Insert screwdriver between adjusting plate and quadrant. Twist screwdriver to disengage teeth. See **Fig. 2** . Push quadrant adjusting lever toward backing plate. Install brake drum. Operate parking brake a few times to reset adjuster. Adjust parking brake.

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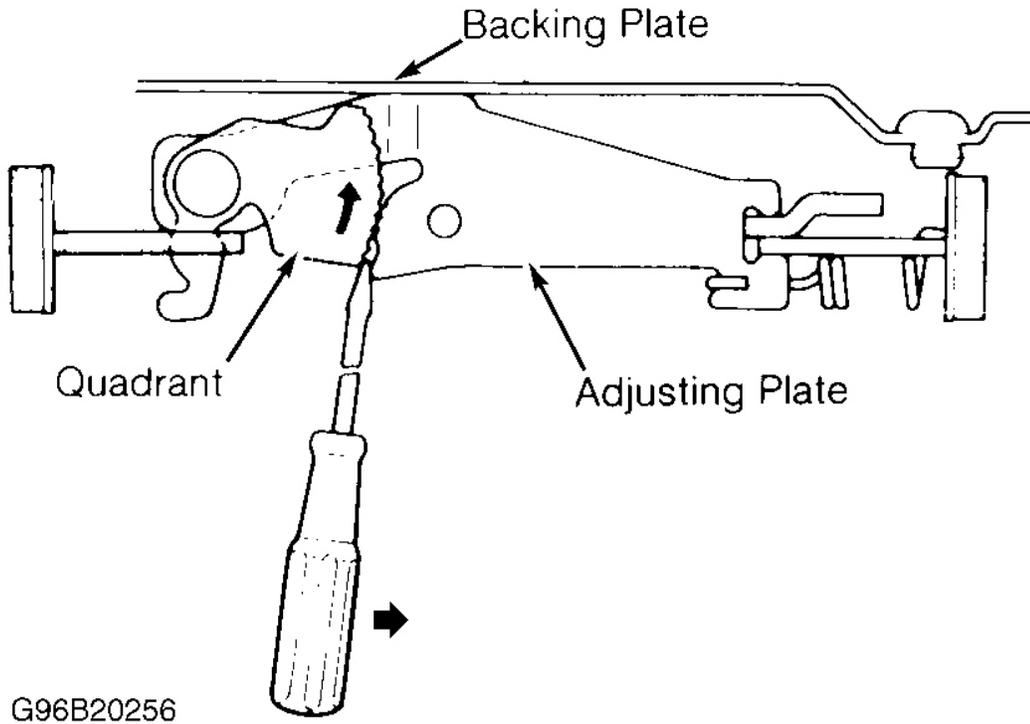


Fig. 2: Moving Quadrant On Rear Drum Brake Adjuster (MX-6 & 626 Shown; MX-3 & Protege Are Similar)

Courtesy of MAZDA MOTORS CORP.

PARKING BRAKE SHOES ADJUSTMENT

Millenia, MPV & 929

1. Raise and support rear of vehicle. Remove rear wheel assemblies. Remove service plug from rotor. Insert a screwdriver into service plug hole and turn adjuster in direction of arrow marked on rotor until rotor will not turn.
2. On Millenia and MPV, rotate adjuster 3-5 notches in opposite direction. On 929, rotate adjuster 6-8 notches in opposite direction. On all models, ensure rotor rotates freely. Install service plug.

PARKING/EMERGENCY BRAKE

NOTE: B2300, B3000 & B4000 are equipped with self-adjusting parking brake system. Manual adjustment is not required.

Miata, MX-3, MX-6, Protege & 626

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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. On Miata, pull parking brake lever with a force of 44 lbs. (20 kg). On all other models, pull parking brake lever with a force of 22 lbs. (10 kg). If stroke is 7-9 notches on Miata or 5-7 notches on all others, 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.

Millenia

1. Depress brake pedal several times. Pull parking brake lever with a force of 22 lbs. (10 kg). If stroke is 3-5 notches, parking brake is properly adjusted. If stroke is not 3-5 notches, raise and support rear of vehicle. Release parking brake lever.
2. Remove parking brake lever cover. Rotate cable adjusting nut at lever end of cable until stroke is within specification. Ensure rear brakes do not drag. Ensure parking brake warning light illuminates when brake lever is pulled one notch.

MPV (1995-96)

1. Depress brake pedal several times. Pull parking brake lever with a force of 22 lbs. (10 kg). If stroke is 3-6 notches, parking brake is properly adjusted. If stroke is not as specified, raise and support rear of vehicle. Release parking brake lever.
2. Remove adjusting nut clip and 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.

MPV (1997)

1. Depress brake pedal several times. Pull parking brake lever with a force of 44 lbs. (20 kg). If stroke is 6-9 notches, parking brake is properly adjusted. If stroke is not as specified, raise and support rear of vehicle. Release parking brake lever.
2. Remove adjusting nut clip and 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.

RX7

1. Depress brake pedal several times. Pull parking brake lever with a force of 22 lbs. (10 kg). If stroke is 7-10 notches, parking brake is properly adjusted. If stroke is not 7-10 notches, raise and support rear of vehicle. Release parking brake lever.
2. 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.

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929

1. Depress brake pedal several times. Depress parking brake pedal several times with a force of 44 lbs. (20 kg). If stroke is 5-7 notches, parking brake is properly adjusted. If stroke is not 5-7 notches, rotate adjusting nut, located under parking brake pedal, until stroke is within specification.
2. Ensure rear brakes do not drag. Ensure parking brake warning light illuminates when brake pedal is depressed one notch.

BRAKE PEDAL FREE PLAY

NOTE: On B2300, B3000 & B4000, brake pedal free play is built into pedal linkage and is not adjustable.

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** . 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, MPV & MX-3	.16-.28 (4-7)
Millenia, MX-6, Protege & 626	.16-.47 (4-12)
RX7	.12-.31 (3-8)
929	.12-.47 (8-12)

BRAKE PEDAL HEIGHT & STOPLIGHT SWITCH

NOTE: B2300, B3000 & B4000 are equipped with dual brake master cylinder and vacuum booster. System is designed to permit full stroke of master cylinder when brake pedal is fully depressed. Brake pedal height adjustment is not required.

Miata, MPV, MX-3, MX-6, RX7, 626 & 929

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** .
2. Adjust pedal free play. See **BRAKE PEDAL FREE PLAY** . 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 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** . If distance is not

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as specified, check for air in system, rear brake adjustment (drum brakes) or worn shoes or pads.

BRAKE PEDAL HEIGHT SPECIFICATIONS

Application	In. (mm)
Pedal Released	
Miata	6.8-7.1 (171-181)
MPV	7.5-7.9 (191-201)
MX-3	7.6-7.7 (193-196)
MX-6 & 626	7.5-7.7 (191-196)
RX7	6.5-6.9 (165-176)
929	7.4-7.7 (188-195)
Pedal Applied ⁽¹⁾	
Miata	3.7 (95)
MPV, MX-6 & 626	3.3 (85)
MX-3	2.8 (70)
RX7	3.9 (100)
929	1.6 (40)
(1) Minimum height.	

Millenia & Protege

1. Released pedal height is measured between brake pedal and stoplight switch mounting bracket. See **Fig. 3**. Disconnect stoplight switch electrical connector and remove switch. Measure length "L" between stoplight switch mounting bracket and brake pedal. See **Fig. 3**. On Millenia, length should be .79-.90" (20-23 mm). On Protege, length should be .71-.86" (18-22 mm).
2. On all models, if clearance is as specified, install stoplight switch. No adjustment is necessary. If clearance is not as specified, loosen lock nut "B" and rotate self-locking nut "A" counterclockwise until it does not contact brake pedal.
3. Loosen push rod lock nut and rotate push rod until correct clearance between brake pedal and stoplight switch mounting bracket is obtained. Tighten push rod lock nut. Rotate self-locking nut "A" clockwise until clearance between brake pedal and end of self-locking nut "A" is .004-.039 (.1-1.0 mm). See **Fig. 3**. Tighten lock nut "B".

NOTE: When adjusting brake pedal height, a NEW stoplight switch must be used. Stoplight switch can only be adjusted one time.

4. Install NEW stoplight switch. Stoplight switch is automatically adjusted by pulling back on brake pedal until stoplight switch click noise is heard. Reconnect stoplight switch electrical connector. Check stoplight operation. Adjust pedal free play. See **BRAKE PEDAL FREE PLAY**. Tighten push rod lock nut to 18-25 ft. lbs. (24-34 N.m).
5. 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. On Millenia, distance should be 2.7" (70 mm). On Protege, distance should be 3.8" (95 mm). On all models, if distance is not as specified, check

for air in system, rear brake adjustment (drum brakes) or worn shoes or pads.

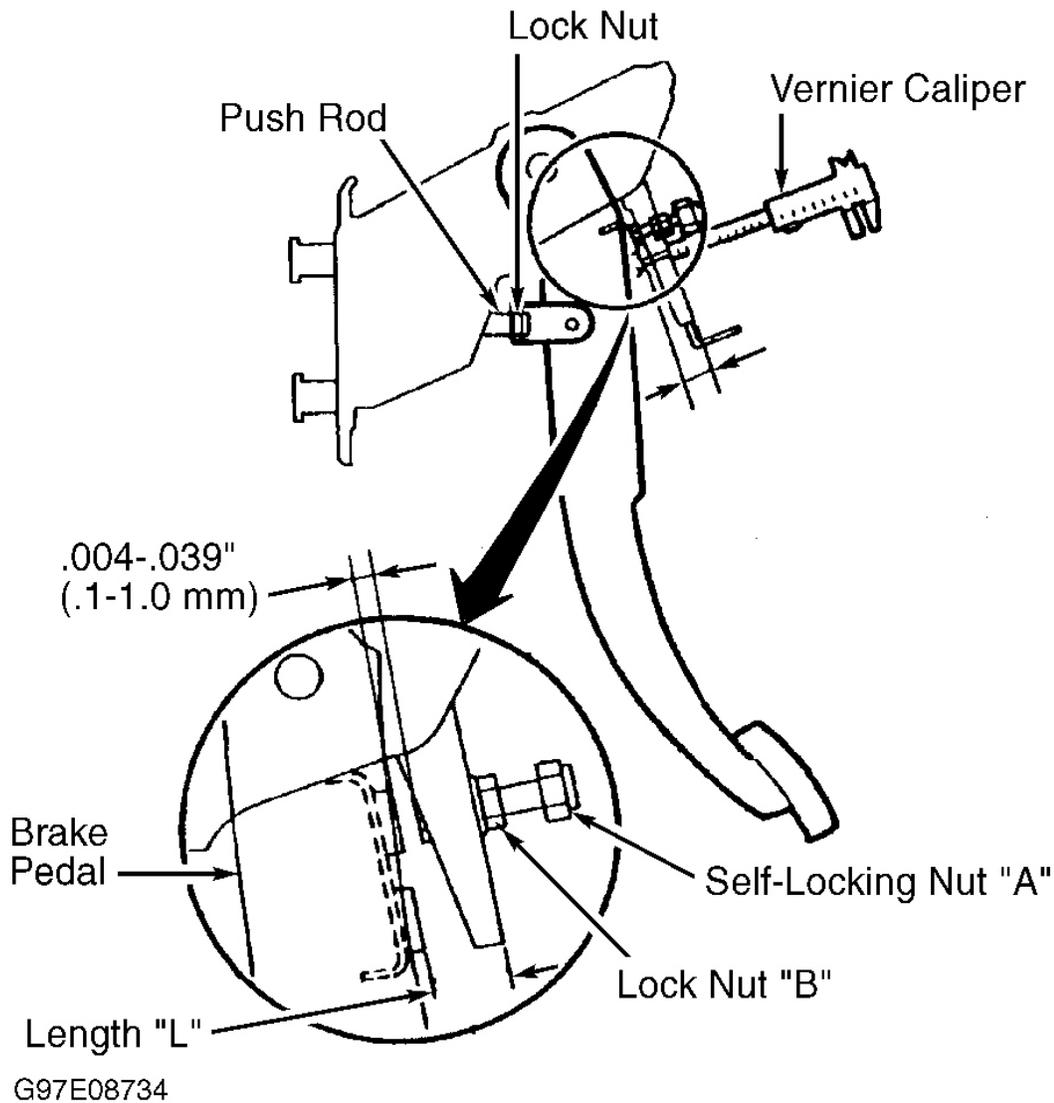


Fig. 3: Adjusting Brake Pedal Height (Millenia Shown; Protege Is Similar)
 Courtesy of MAZDA MOTORS CORP.

TESTING

PROPORTIONING VALVE

NOTE: B2300, B3000 and B4000 are not equipped with a proportioning valve.

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1. Connect 2 pressure gauges and adapters 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** .
2. Depress brake pedal again, applying additional pressure. Recheck output pressure. See **PROPORTIONING VALVE PRESSURE SPECIFICATIONS** . If output pressure is not as specified, replace proportioning valve.

PROPORTIONING VALVE PRESSURE SPECIFICATIONS

Application	Inlet Pressure psi (kg/cm ²)	Outlet Pressure psi (kg/cm ²)
Miata		
With ABS	569 (40) 850 (60)	526-612 (37-43) 626-740 (44-52)
Without ABS	427 (30) 850 (60)	384-470 (27-33) 540-654 (38-46)
Millenia		
	430 (31) 850 (60)	400-460 (28-32) 520-600 (37-42)
MPV		
1995	512 (36) 1422 (100)	484-540 (34-38) 854-995 (60-70)
1996-97	427 (30) 853 (61)	370-484 (26-34) 583-697 (41-49)
MX-3		
With ABS	356 (25) 853 (61)	328-384 (23-27) 512-598 (36-42)
Without ABS	427 (30) 853 (61)	399-455 (28-32) 512-598 (36-42)
MX-6 & 626		
With ABS	500 (35) 850 (60)	470-530 (33-37) 597-683 (42-48)
Without ABS	500 (35) 850 (60)	470-530 (33-37) 557-643 (39-45)
Protege		
With ABS	356 (25) 853 (61)	328-384 (23-27) 568-654 (40-46)
Without ABS 1.5L	356 (25) 853 (61)	328-384 (23-27) 483-569 (34-40)
Without ABS 1.8L	356 (25) 853 (61)	328-384 (23-27) 654-740 (46-52)
RX7		
	570 (40) 850 (60)	530-610 (37-43) 626-739 (44-52)
929	427 (30) 853 (61)	399-455 (28-32) 541-654

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, 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, check valve and vacuum hose between vacuum source and power brake unit. Repair as necessary.

REMOVAL & INSTALLATION

FRONT DISC BRAKE PADS

Removal & Installation (B2300, B3000 & B4000)

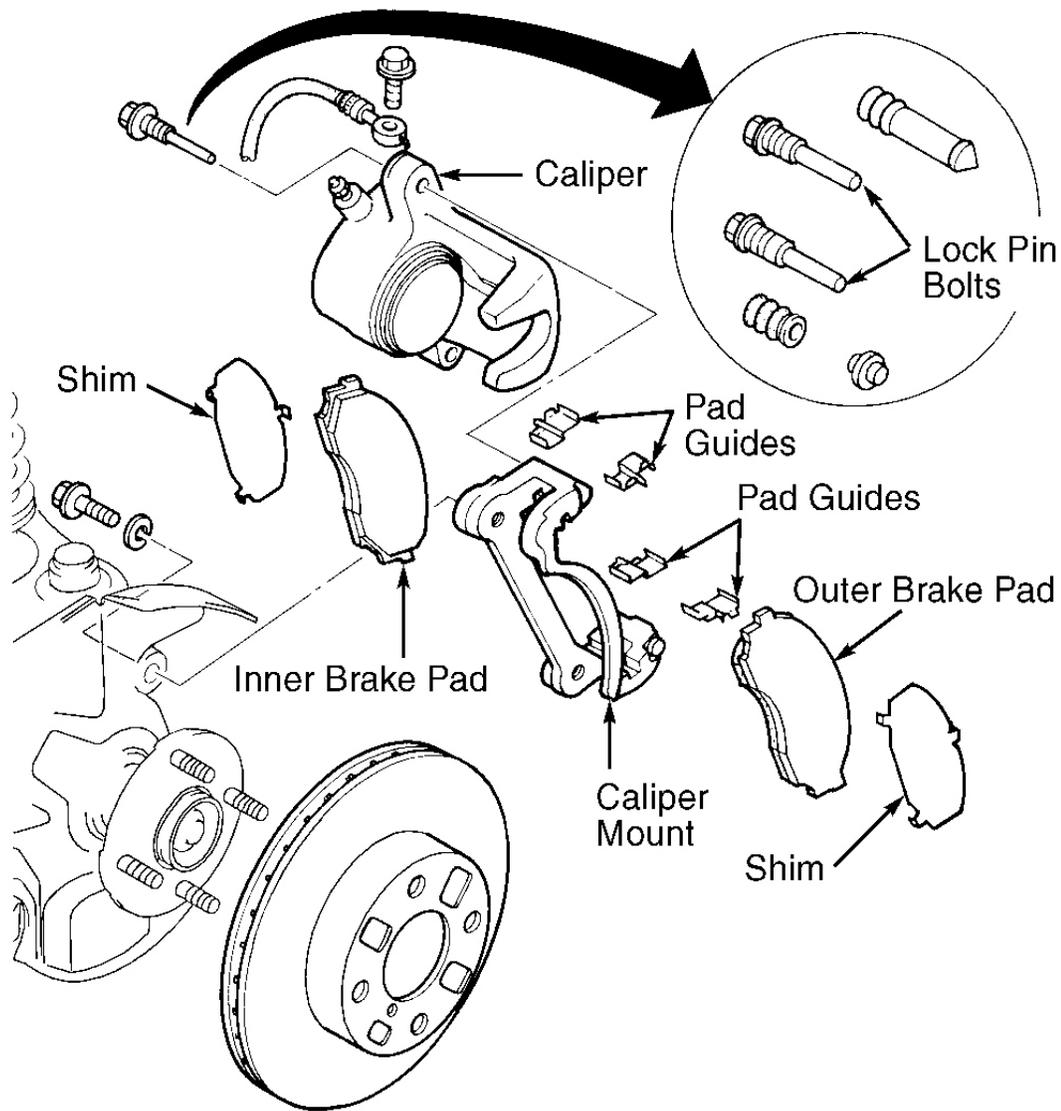
1. To prevent master cylinder overflow when caliper piston is depressed, remove and discard some brake fluid from master cylinder reservoir. Raise and support vehicle. Remove front wheel assemblies. Place a large "C" clamp on caliper.
2. Tighten clamp to bottom piston in cylinder bore. Remove clamp. Remove 2 caliper pin bolts. Remove caliper from rotor and wire aside. Slide brake pads off caliper anchor plate. Remove anchor plate (if necessary). Replace pad if lining thickness is less than specified. See **MINIMUM PAD LINING SPECIFICATIONS (FRONT)**.
3. To install, reverse removal procedure. Use "C" clamp and old pad to push caliper piston into piston bore until piston bottoms out. Bleed air from brake system (if necessary).

Removal & Installation (Miata, Millenia, MPV, MX-6, 626 & 929)

1. Raise and support front of vehicle. Remove front wheel assemblies. Remove lower lock pin/guide bolt. See **Fig. 4**, **Fig. 5** or **Fig. 6**. Pivot caliper upward and support using rope.
2. 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)**.
3. 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.

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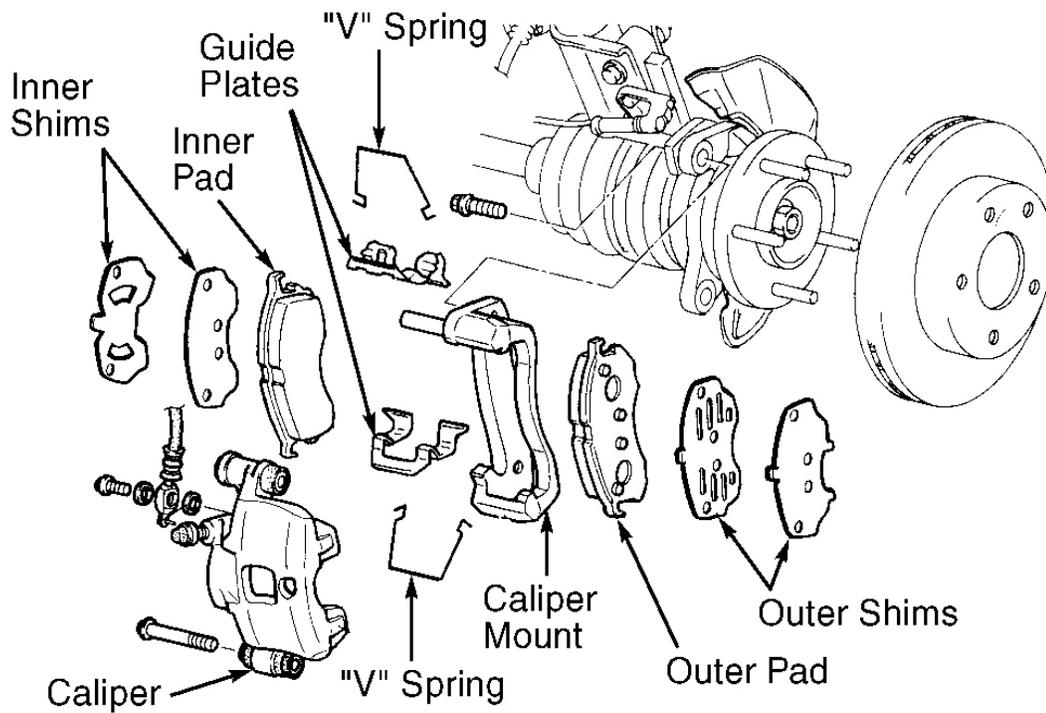


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**Fig. 4: Exploded View Of Front Disc Brake Assembly (Miata Shown; MPV Is Similar)
Courtesy of MAZDA MOTORS CORP.**

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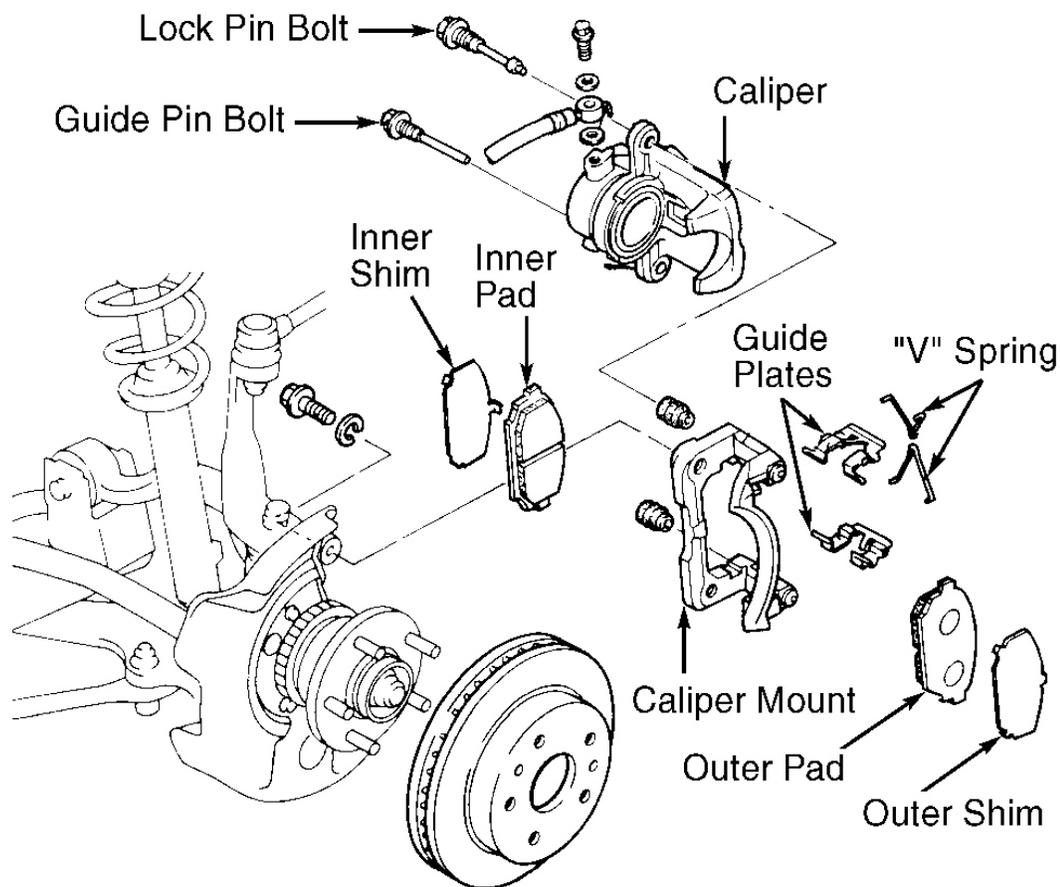


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Fig. 5: Exploded View Of Front Brake Disc Assembly (MX-6 & 626)
Courtesy of MAZDA MOTORS CORP.

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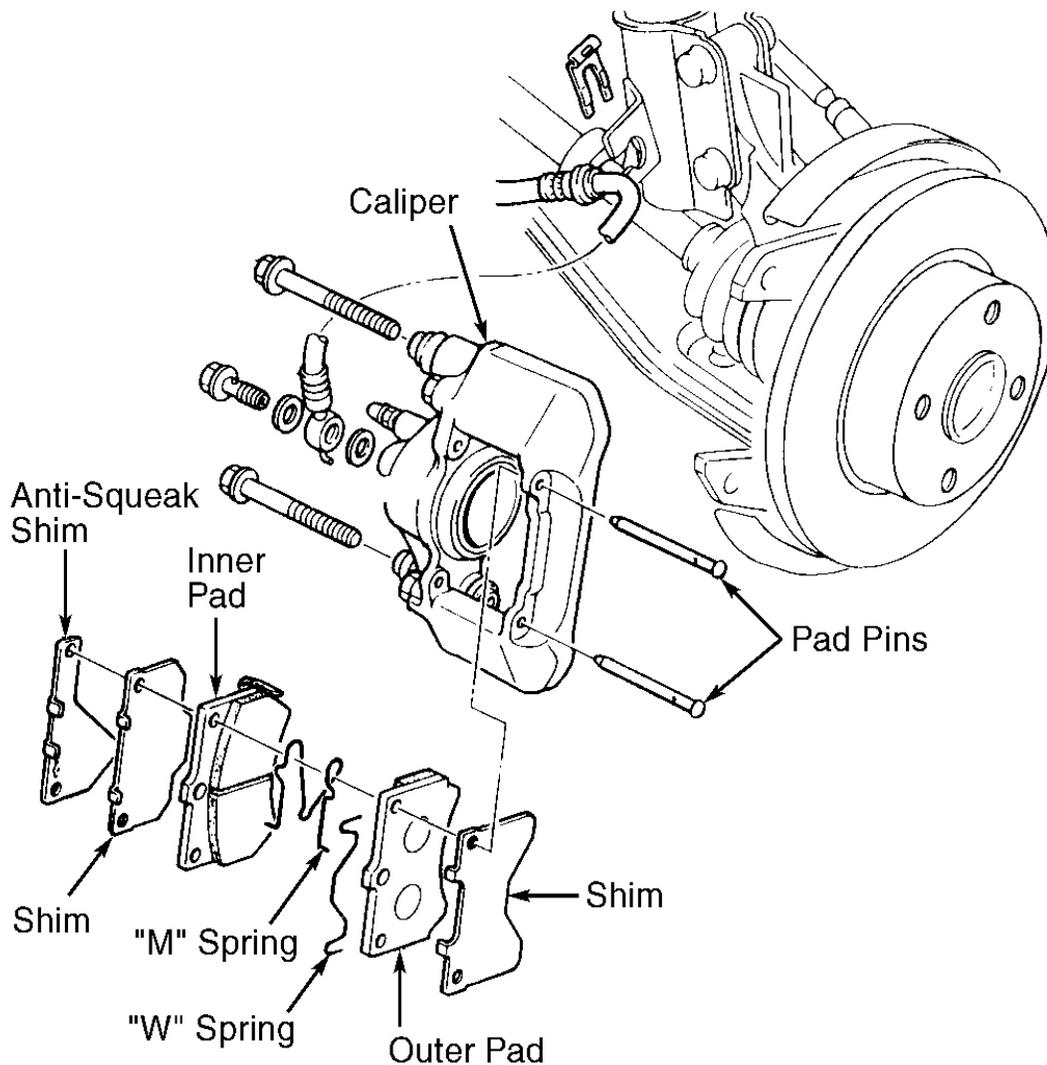
Fig. 6: Exploded View Of Front Disc Brake Assembly (929 Shown; Millenia Is Similar)
Courtesy of MAZDA MOTORS CORP.

Removal & Installation (MX-3 & Protege)

1. Raise and support front of vehicle. Remove front wheel assemblies. Remove "M" spring. See **Fig. 7**. Remove "W" spring. Remove pad pins. Remove pads, shims and anti-squeak shim. Replace pad if lining thickness is less than specified. See **MINIMUM PAD LINING SPECIFICATIONS (FRONT)**.
2. To install, reverse removal procedure. Use Disc Brake Expand Tool (49-0221-600C) and an old pad to push piston fully inward to install disc pads.

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Fig. 7: Exploded View Of Front Disc Brake Assembly (MX-3 & Protege)
Courtesy of MAZDA MOTORS CORP.

Removal & Installation (RX7)

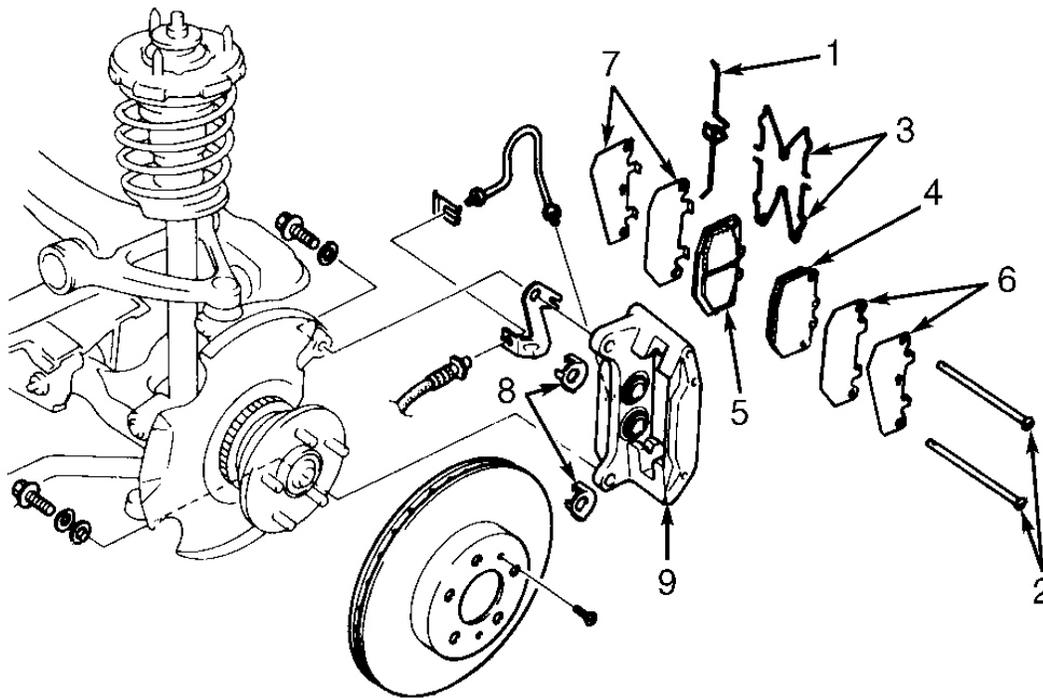
1. Raise and support front of vehicle. Remove front wheel assemblies. Remove "M" clip. See **Fig. 8** . Remove pad pins. Remove "M" spring. Remove pads and shims. Replace pad if lining thickness is less than specified. See **MINIMUM PAD LINING SPECIFICATIONS (FRONT)** .
2. To install, reverse removal procedure. Use Disc Brake Expander (49-0221-600C) and an old pad to push piston fully inward to install disc pads. Ensure shims are installed with arrows facing direction of forward rotor rotation.

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MINIMUM PAD LINING SPECIFICATIONS (FRONT)

Application	Thickness In. (mm)
B2300, B3000 & B4000	.12 (3.0)
Miata, MX-6, Protege, RX7, 626 & 929	.04 (1.0)
Millenia, MPV & MX-3	.08 (2.0)



- | | | |
|----------------|----------------|-----------------|
| 1. "M" Clip | 4. Outer Pad | 7. Inner Shims |
| 2. Pad Pins | 5. Inner Pad | 8. Guard Plates |
| 3. "M" Springs | 6. Outer Shims | 9. Caliper |

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Fig. 8: Exploded View Of Front Disc Brake Assembly (RX7)

Courtesy of MAZDA MOTORS CORP.

FRONT DISC BRAKE CALIPER

NOTE: For removal and installation of front disc brake caliper for B2300, B3000 & B4000, see FRONT DISC BRAKE PADS .

Removal & Installation (Except B2300, B3000 & B4000)

Raise and support front of vehicle. Remove front wheel assemblies and disconnect brake hose. Plug all

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openings. Remove front disc brake pads. See **FRONT DISC BRAKE PADS** . Remove remaining mounting bolt(s). Remove caliper from vehicle. To install, reverse removal procedure. Bleed air from system.

FRONT BRAKE ROTOR

Removal & Installation (B2300, B3000 & B4000 2WD)

1. Raise and support vehicle. Remove front wheel assemblies and brake caliper. See **FRONT DISC BRAKE PADS** . Remove grease cap, cotter pin, retainer, adjusting nut, washer and outer bearing. Carefully remove hub and rotor assembly. Remove inner bearing and seal.
2. To install, reverse removal procedure. Adjust front wheel bearings. While rotating rotor, tighten adjusting nut 17-25 ft. lbs. (23-34 N.m) to seat bearings. Back off adjusting nut 1/2 turn. Tighten adjusting nut to 18-20 INCH lbs. (2.0-2.3 N.m). Install bearing retainer and NEW cotter pin. DO NOT turn adjusting nut to align cotter pin.

Removal (B2300, B3000 & B4000 4WD With Automatic Locking Hubs)

1. Raise and support vehicle. Remove front wheel assemblies and caliper. See **FRONT DISC BRAKE PADS** . Remove retainer washers from lug nut studs. Remove automatic locking hub assembly from spindle.
2. Remove snap ring from end of spindle shaft. Remove axle spacers. See **Fig. 9** . Carefully pull cam assembly off wheel bearing adjusting nut. If necessary, rotate adjusting nut slightly to relieve pressure on locking key.
3. Using a magnet, remove locking key. Using 2 3/8" Hex Lock Nut Wrench (49-UN01-037), remove wheel bearing adjusting nut. Remove outer wheel bearing and rotor.

Installation

When installing rotor, outer bearing and adjusting nut, tighten adjusting nut to 35 ft. lbs (47 N.m) to seat bearings. Spin rotor, and back off adjusting nut 1/4 turn. Tighten adjusting nut to 16 INCH lbs. (1.8 N.m). To install remaining components, reverse removal procedure. See **Fig. 7** . After assembly is complete, wheel to spindle end play should be .000-.003" (.00-.08 mm).

CAUTION: Extreme caution must be used when aligning adjusting nut lug with spindle locking key slot to prevent damage to locking key.

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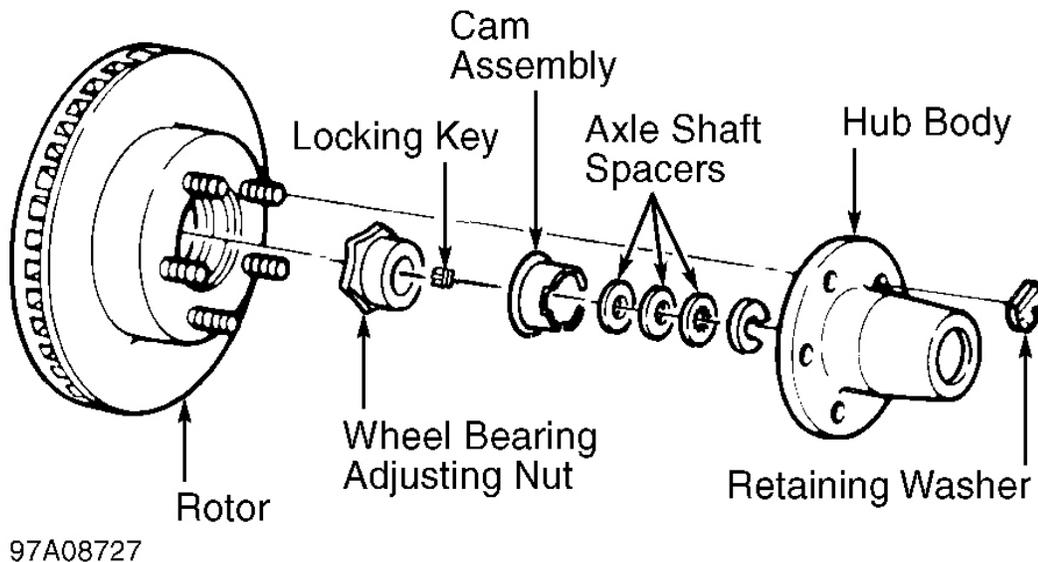


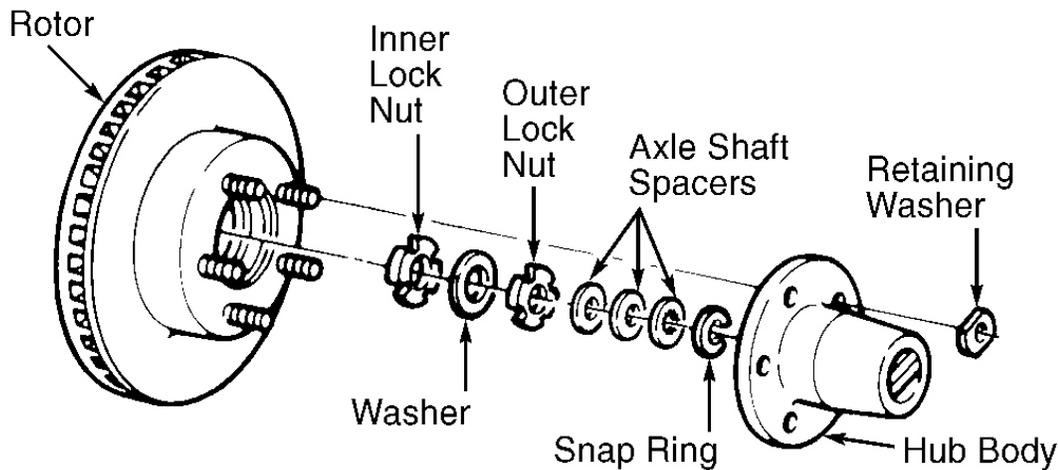
Fig. 9: Removing Front Rotor (B2300, B3000 & B4000 With Automatic Locking Hubs)
Courtesy of FORD MOTOR CO.

Removal (B2300, B3000 & B4000 4WD With Manual Locking Hubs)

1. Raise and support vehicle. Remove front wheel assemblies and caliper. See **FRONT DISC BRAKE PADS** . Remove retainer washers from lug nut studs. Remove manual locking hub assembly from spindle.
2. Remove snap ring from end of spindle shaft. Remove axle spacers. See **Fig. 10** . Using Lock Nut Wrench (49-UN01-042), remove outer wheel bearing lock nut. Remove lock washer. Using lock nut wrench, remove inner wheel bearing lock nut. Remove outer wheel bearing, cup and rotor.

Installation

When installing rotor, outer bearing and inner lock nut, tighten inner lock nut to 35 ft. lbs. (47 N.m) to seat bearings. Spin rotor, and back off inner lock nut 1/4 turn. Tighten inner lock nut to 16 INCH lbs. (1.8 N.m). To install remaining components, reverse removal procedure. See **Fig. 10** . After assembly is complete, wheel to spindle end play should be .000-.003" (.00-.08 mm).



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Fig. 10: Removing Front Rotor (B2300, B3000 & B4000 With Manual Locking Hubs)
 Courtesy of FORD MOTOR CO.

Removal & Installation (Except B2300, B3000 & B4000)

1. Raise and support front of vehicle. Remove front wheel assemblies. Remove front disc brake caliper with brake hose connected. See **FRONT DISC BRAKE CALIPER** . Wire caliper aside. 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** . To install, reverse removal procedure.

REAR DISC BRAKE PADS

Removal & Installation (Miata & Protege)

1. Raise and support rear of vehicle. Remove rear wheel assemblies. Remove manual adjustment gear concealment plug from caliper. See **Fig. 11** . 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.

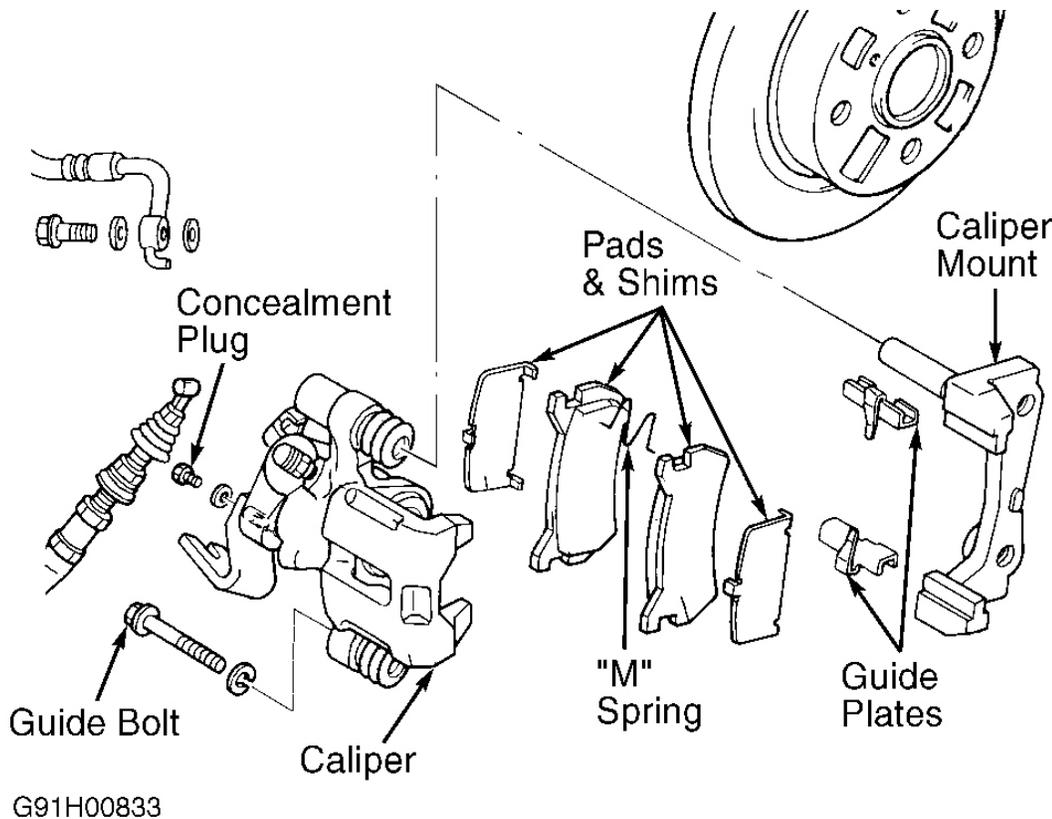


Fig. 11: Exploded View Of Rear Disc Brake Assembly (Miata & Protege Shown; MX-6 & 626 Are Similar)

Courtesy of MAZDA MOTORS CORP.

Removal & Installation (Millenia)

1. To prevent master cylinder overflow when caliper piston is depressed, remove and discard some brake fluid from master cylinder reservoir. Raise and support rear of vehicle.
2. Remove rear wheel assemblies. Remove lower guide bolt from caliper. See **Fig. 12** . Rotate caliper upward and support using wire. Remove "V" spring. Remove pads, shims and guide plates. Replace pads if lining thickness is less than .08" (2.0 mm).
3. 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.

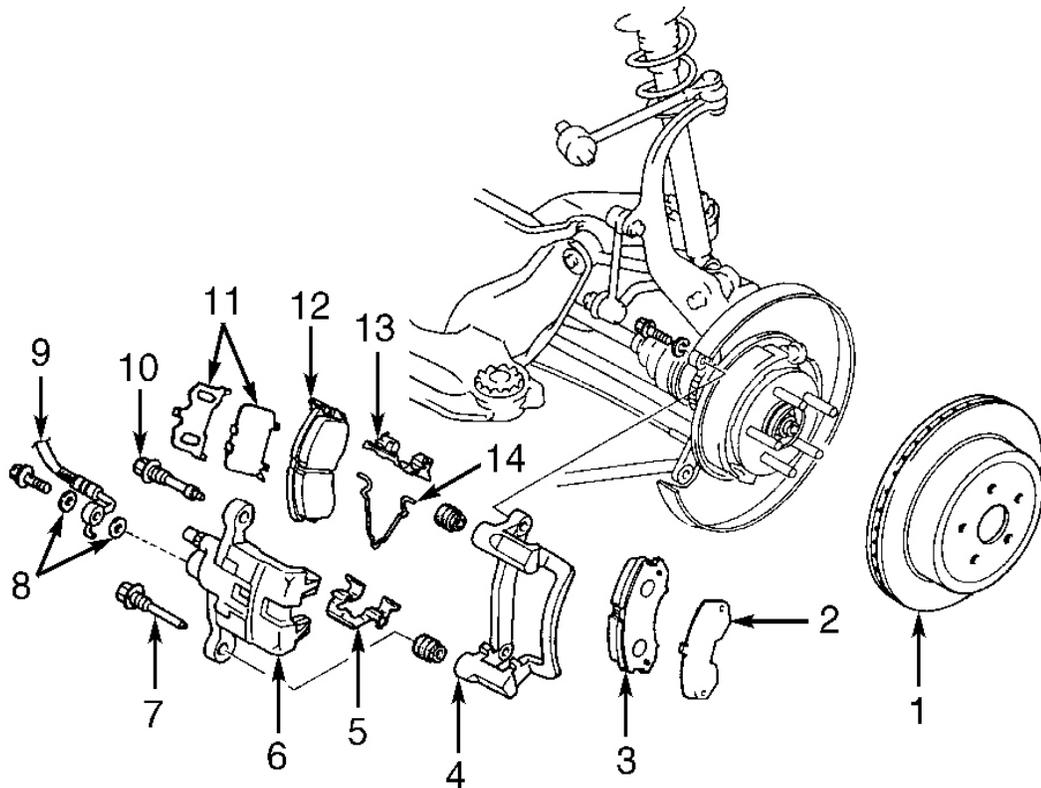
Removal & Installation (MPV & 929)

1. Raise and support rear of vehicle. Remove rear wheel assemblies. Remove upper guide bolt from caliper. See **Fig. 12** . Rotate caliper downward and support using wire. Remove "V" spring. Remove pads, shims and guide plates. Replace pad if lining thickness is less than .04" (1.0 mm).

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BRAKE SYSTEM 1995-97 BRAKES Mazda - Disc & Drum

2. To install, reverse removal procedure. Use Disc Brake Expander (49-022 1-600C) and an old pad to push piston fully inward to install disc pads.



- | | | |
|------------------|-------------------|-----------------|
| 1. Rotor | 6. Caliper | 11. Inner Shim |
| 2. Outer Shim | 7. Guide Pin | 12. Pad |
| 3. Pad | 8. Gaskets | 13. Guide Plate |
| 4. Caliper Mount | 9. Brake Flexhose | 14. "V" Spring |
| 5. Guide Plate | 10. Guide Bolt | |

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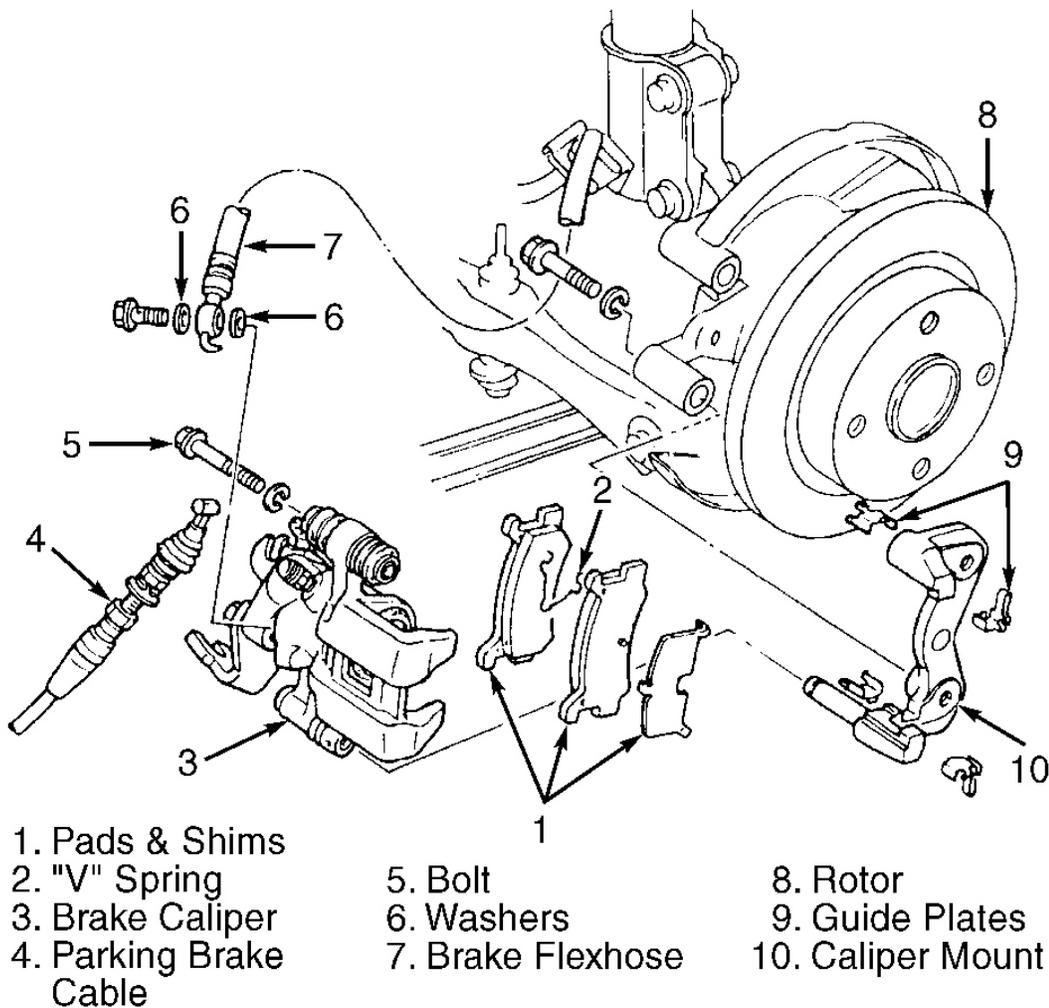
Fig. 12: Exploded View Of Rear Disc Brake Assembly (MPV & 929)
Courtesy of MAZDA MOTORS CORP.

Removal & Installation (MX-3)

1. Raise and support rear of vehicle. Remove rear wheel assemblies. Remove upper caliper mounting bolt. See **Fig. 13**. Rotate caliper downward. Remove "V" spring, brake pads, shims and guide plates. Replace brake pads if pad lining thickness is less than .04" (1.0 mm).
2. To install, reverse removal procedure. Using Brake Piston Wrench (49 FA18 602), turn wrench clockwise until piston bottoms out in brake caliper.

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BRAKE SYSTEM 1995-97 BRAKES Mazda - Disc & Drum



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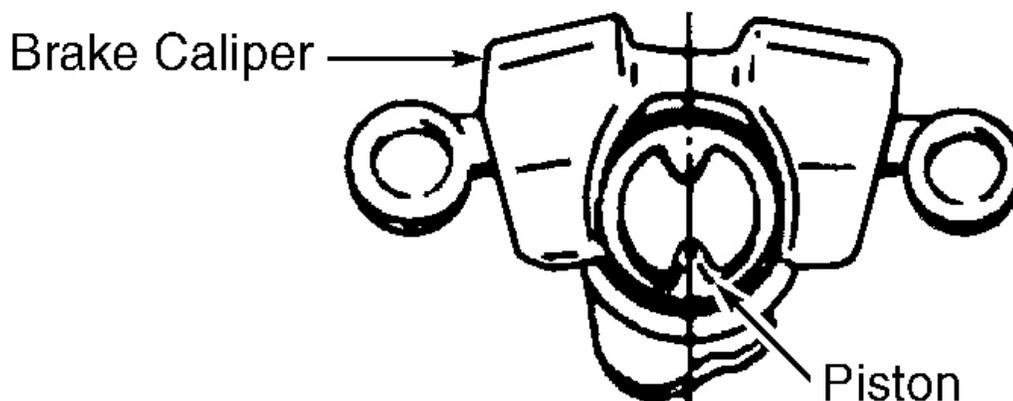
Fig. 13: Exploded View Of Rear Disc Brake Assembly (MX-3)
Courtesy of MAZDA MOTORS CORP.

Removal & Installation (MX-6 & 626)

1. Raise and support rear of vehicle. Remove rear wheel assemblies. Release parking brake and disconnect parking brake cable from caliper. Remove manual adjustment gear concealment plug from caliper. See **Fig. 11** . Insert an appropriate size Allen wrench through hole and turn manual adjustment gear counterclockwise to retract caliper piston.
2. Remove upper guide bolt from caliper. Rotate caliper downward and support using wire. Remove "M" springs. Remove pads, shims and guide plates. Replace pad if lining thickness is less than .04" (1.0 mm).
3. To install, reverse removal procedure. Turn manual adjustment gear clockwise until brake pads slightly touch rotor. Turn manual adjustment gear back 1/3 turn.

Removal & Installation (RX7)

1. Raise and support rear of vehicle. Remove rear wheel assemblies. Remove lower guide bolt from caliper. Rotate caliper upward and support using wire. Remove "V" spring. Remove pads, shims and guide plates. Replace pad if lining thickness is less than .04" (1.0 mm).
2. To install, reverse removal procedure. Use Disc Brake Piston Wrench (49-FA18-602) to rotate piston clockwise to install disc pads. Ensure grooves in piston are aligned. See **Fig. 14**.



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Fig. 14: Aligning Brake Caliper Piston (RX7)
 Courtesy of MAZDA MOTORS CORP.

REAR BRAKE CALIPER**Removal & Installation (Miata, MPV, MX-6, Protege, RX7, 626 & 929)**

1. Raise and support rear of vehicle. Remove rear wheel assemblies. On all models except MPV and 929, release parking brake and disconnect parking brake cable from caliper. On all models, disconnect brake hose from caliper.
2. On Miata, MX-6, Protege and 626, remove manual adjustment gear concealment plug from caliper. See **Fig. 11**. Insert an appropriate size Allen wrench through hole and turn manual adjustment gear counterclockwise to retract caliper piston.
3. On all models, remove guide bolts from caliper. Remove brake caliper from caliper mount. To install, reverse removal procedure. Bleed air from system.

Removal & Installation (Millenia)

1. Raise and support rear of vehicle. Remove rear wheel assemblies. Disconnect brake flexhose from

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caliper. Remove rear brake pads. See **REAR DISC BRAKE PADS** . Remove remaining caliper guide bolt. Remove brake caliper from caliper mount. To install, reverse removal procedure. Bleed air from system.

Removal & Installation (MX-3)

1. Raise and support rear of vehicle. Remove rear wheel assemblies. Release parking brake and disconnect parking brake cable from caliper. Disconnect brake flexhose from caliper. See **Fig. 13** .
2. Remove upper caliper mounting bolt. Rotate caliper downward. Remove "V" spring, pads, shims and guide plates. Replace brake pads if pad lining thickness is less than .04" (1.0 mm).
3. Remove lower caliper mounting bolt. Pull caliper toward center of vehicle to slide it off of caliper mount. To install, reverse removal procedure. Using Brake Piston Wrench (49 FA18 602), turn wrench clockwise until piston bottoms out in brake caliper. Bleed air from system.

REAR BRAKE ROTOR

Removal & Installation (Miata, Millenia, MPV, MX-3, MX-6, Protege, RX7, 626 & 929)

1. Raise and support vehicle. Remove rear wheel assemblies. Remove rear brake caliper with brake hose connected. See **REAR BRAKE CALIPER** . 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** .
3. To install, reverse removal procedure. Check end play at grease cap. On 929, if end play exceeds .004" (.10 mm), check lock nut torque or replace wheel bearings. On all other models, if end play exceeds .002" (.05 mm), check lock nut torque or replace wheel bearings.

REAR BRAKE SHOES & WHEEL CYLINDERS

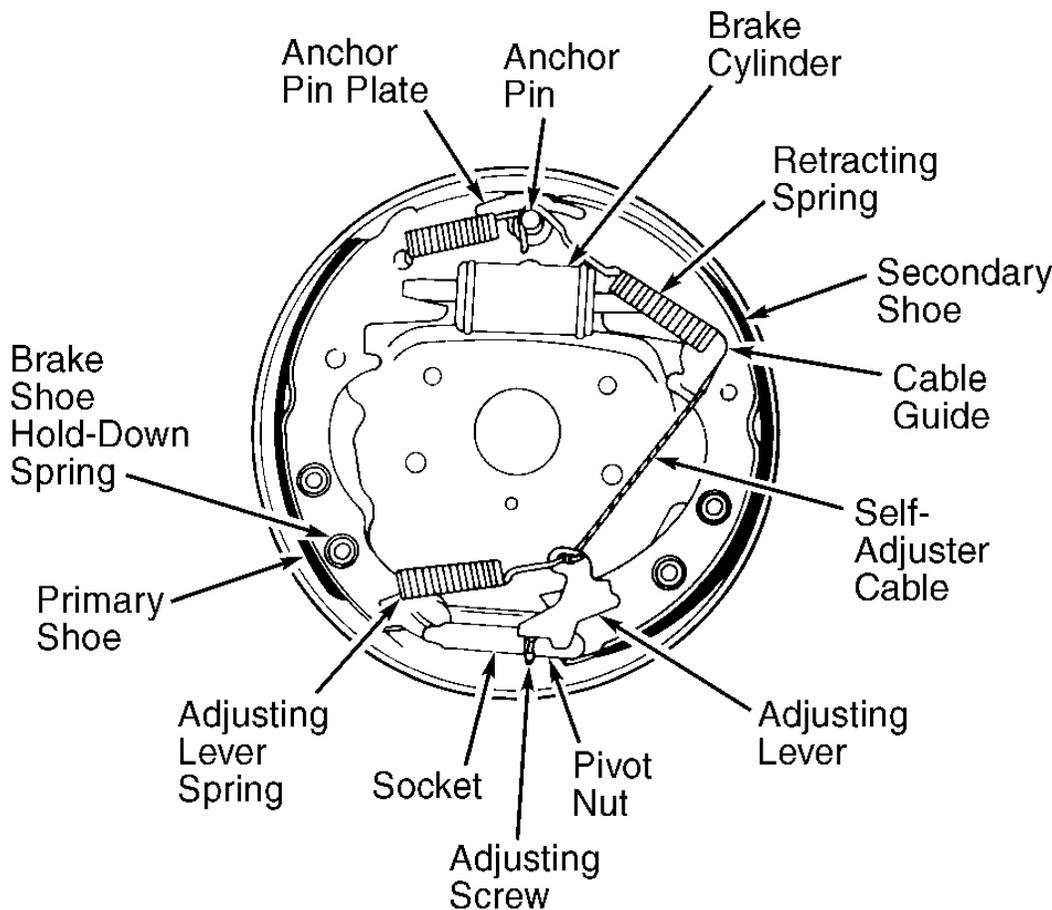
Removal (B2300, B3000 & B4000)

1. Raise and support vehicle. Remove rear wheel assemblies. Remove brake drum. Machine or replace drum as necessary if inner diameter is not as specified. See **DRUM BRAKE SPECIFICATIONS** .
2. Place a wheel cylinder clamp over ends of wheel cylinder. Disengage adjusting lever from adjusting screw by pulling backwards on self adjuster cable. See **Fig. 15** .
3. Move outboard side of adjusting screw upward and back off pivot nut as far as possible. Pull adjusting lever, cable and adjusting lever spring down and toward rear to unhook pivot hook from large hole in secondary shoe. DO NOT pry pivot hook from hole.
4. Remove adjusting lever spring and adjusting lever. Remove secondary shoe-to-retracting spring. Remove primary shoe-to-retracting spring. Unhook cable anchor and remove anchor pin plate.
5. Note color and position of shoe hold-down springs for reassembly. Remove cable guide, shoe hold-down springs, brake shoes, adjusting screw, pivot nut and socket. Remove parking brake link spring and link.
6. Disconnect parking brake cable from lever. Remove secondary shoe. Disassemble parking brake lever from shoe by removing retaining clip and spring washer. See **Fig. 16** . Remove brake cylinder-to-shoe connecting links. Disconnect brake line from brake cylinder. Remove brake cylinder.

Installation

1. To install, reverse removal procedure. Clean and sand brake shoe contact points on backing plate. Apply a light coating of lithium base grease to brake shoe contact points on backing plate. Lubricate adjusting screw, pivot nut and socket.
2. Install primary and secondary shoes in original positions. Adjust brake shoes. See **REAR BRAKE SHOES ADJUSTMENT** . Bleed air from system.

NOTE: Socket end of adjusting screw assembly and adjusting lever are marked with an "R" or "L" for reassembly onto proper side of vehicle. Interchanging adjusting screw assembly and adjusting lever from one side of vehicle to other will cause brake shoes to retract when automatic adjuster is operated.

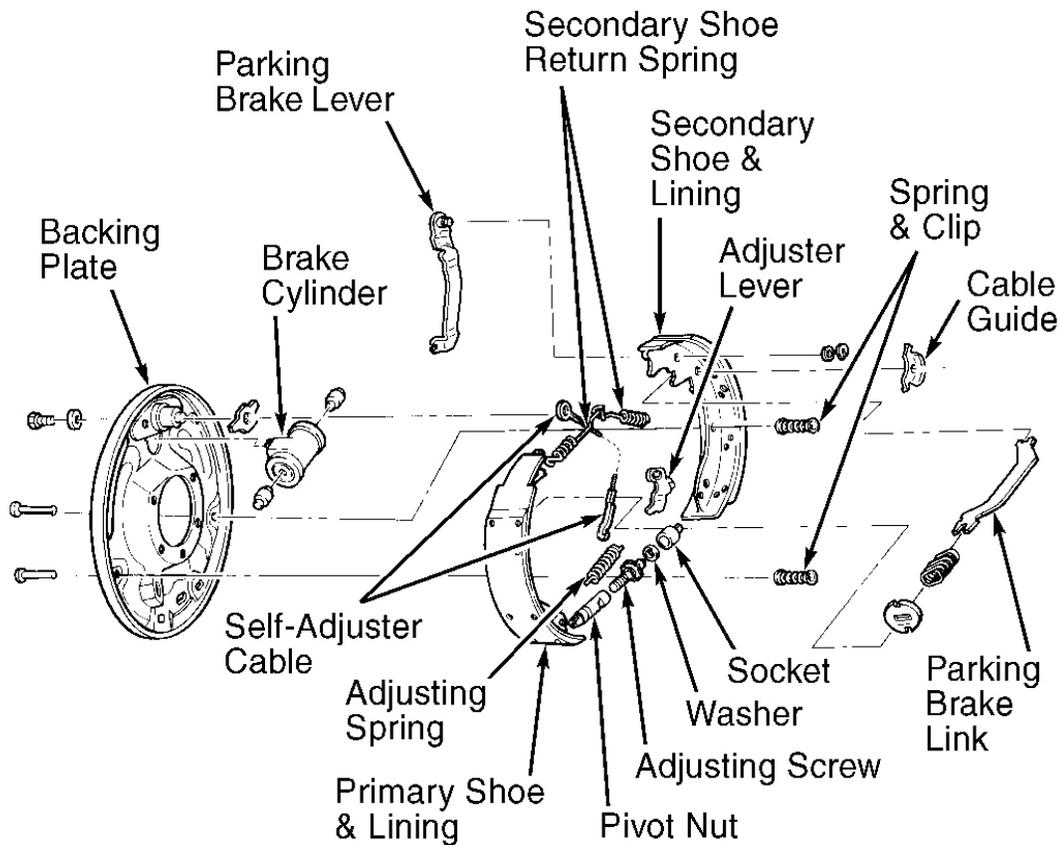


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Fig. 15: Identifying Rear Brake Assembly Components (B2300, B3000 & B4000)
Courtesy of FORD MOTOR CO.

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Fig. 16: Exploded View Of Rear Drum Brake Assembly (B2300, B3000 & B4000)
Courtesy of MAZDA MOTORS CORP.

Removal (MX-3, MX-6, Protege & 626)

1. Raise and support vehicle. Remove rear wheel assemblies. Remove brake drum. Machine or replace drum as necessary if inner diameter is not as specified. See **DRUM BRAKE SPECIFICATIONS**.
2. Remove return springs, hold pins and springs, and anti-rattle spring. See **Fig. 17**. Note positions of primary and secondary shoes and remove brake shoes. Minimum brake shoe lining thickness is .04" (1.0 mm).
3. Remove stopper spring and clip (if equipped), and return spring. Release parking brake and disconnect parking brake cable. Remove operating lever assembly. Using Flare Nut Wrench (49-0259-770B), disconnect brake line from wheel cylinder. Remove wheel cylinder.

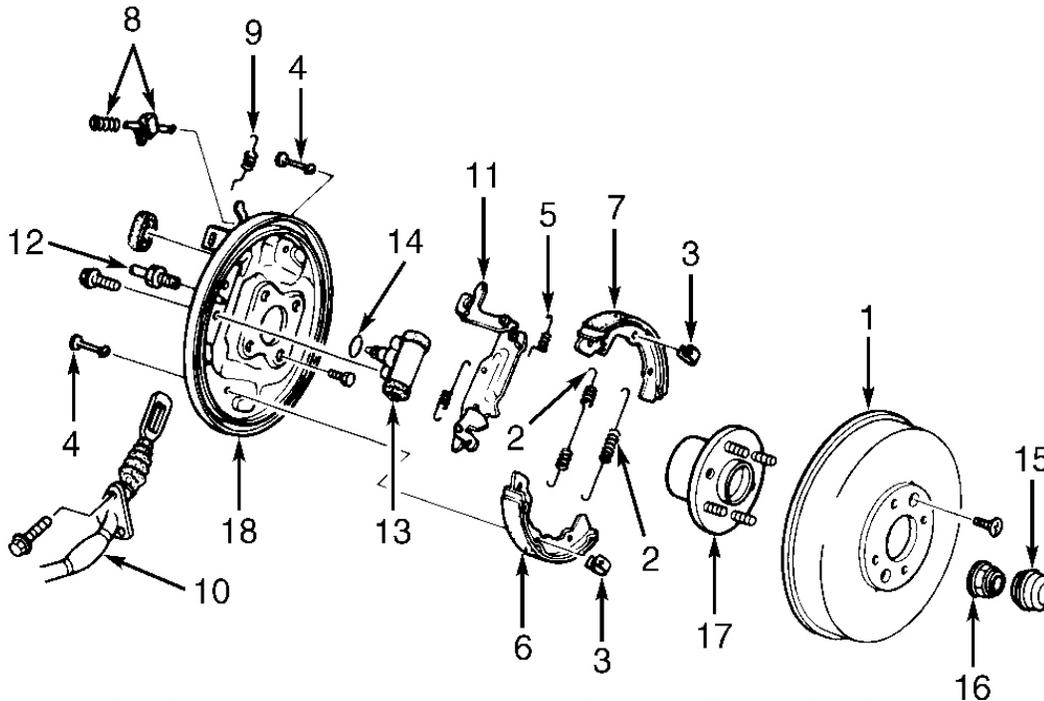
Installation

1. To install, reverse removal procedure. Apply lithium base grease to wheel cylinder and anchor sliding parts, adjuster threads and shoe contact points on backing plate.

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BRAKE SYSTEM 1995-97 BRAKES Mazda - Disc & Drum

2. Install primary and secondary shoes in original positions (secondary shoe is longer). Adjust brake shoes. See **REAR BRAKE SHOES ADJUSTMENT** . Bleed air from system.



- | | |
|--------------------------|------------------------------|
| 1. Brake Drum | 10. Parking Brake Cable |
| 2. Return Spring | 11. Operating Lever Assembly |
| 3. Hold Spring | 12. Brakeline |
| 4. Hold Pin | 13. Wheel Cylinder |
| 5. Anti-Rattle Spring | 14. Gasket |
| 6. Primary Shoe | 15. Grease Cap |
| 7. Secondary Shoe | 16. Lock Nut |
| 8. Stopper Spring & Clip | 17. Hub |
| 9. Return Spring | 18. Backing Plate |

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Fig. 17: Exploded View Of Rear Drum Brake Assembly (MX-3 & Protege Shown; MX-6 & 626 Are Similar)

Courtesy of MAZDA MOTORS CORP.

PARKING BRAKE SHOES

Removal (Millenia, MPV & 929)

Raise and support vehicle. Remove rear wheel assemblies. Remove service plug. See **Fig. 18** . Remove brake caliper with brake hose connected. Support caliper using wire. Remove brake rotor. Remove return springs,

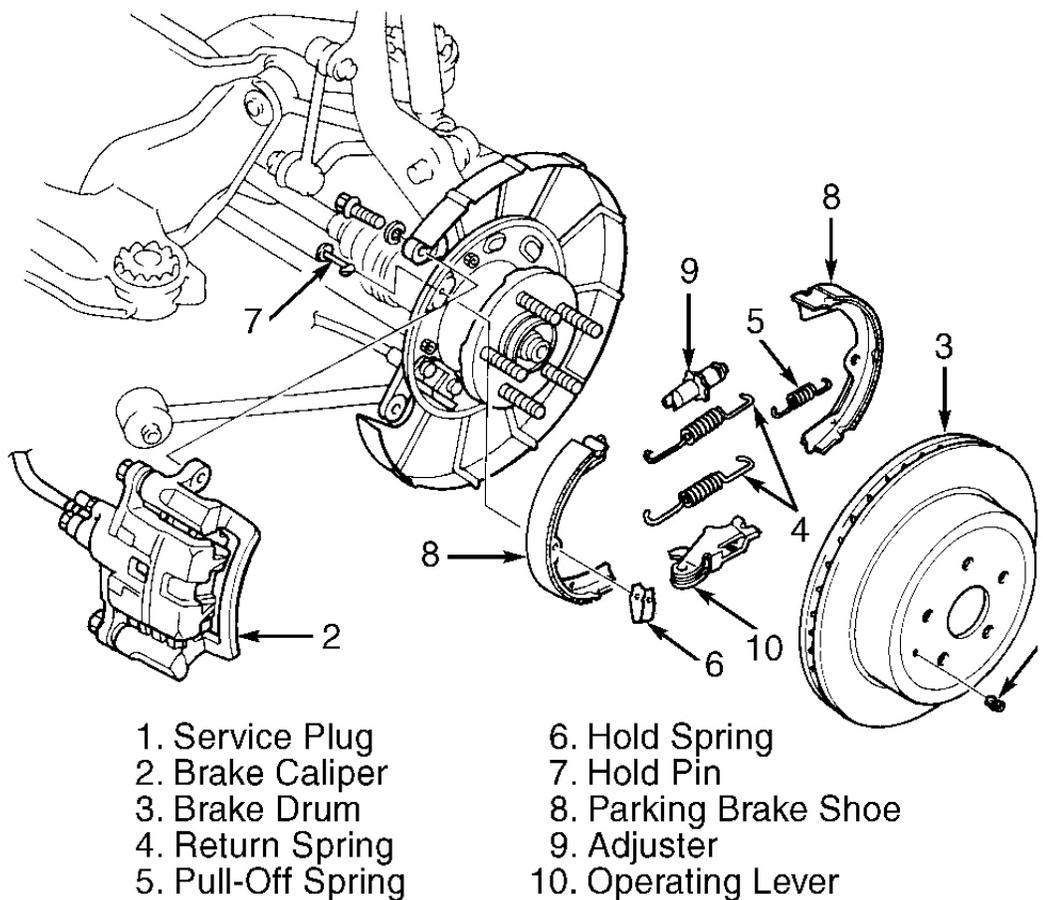
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pull-off spring, and hold springs and pins. Remove parking brake shoes. Minimum parking brake shoe lining thickness is .04" (1.0 mm). Remove adjuster and operating lever.

Installation

To install, reverse removal procedure. Apply lithium base grease to anchor sliding plate, adjuster threads and shoe contact points on backing plate. Set marked side (with arrow) of operating lever to front side. Ensure threaded side of adjuster faces forward on left wheel and rearward on right wheel. Adjust parking brake shoes. See **PARKING BRAKE SHOES ADJUSTMENT** . Bleed air from system.



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Fig. 18: Exploded View Of Parking Brake Assembly (Millenia, MPV & 929)
Courtesy of MAZDA MOTORS CORP.

REAR AXLE BEARING & OIL SEAL

NOTE: For information on models with sealed wheel bearings, see appropriate article

in **SUSPENSION**.

MASTER CYLINDER

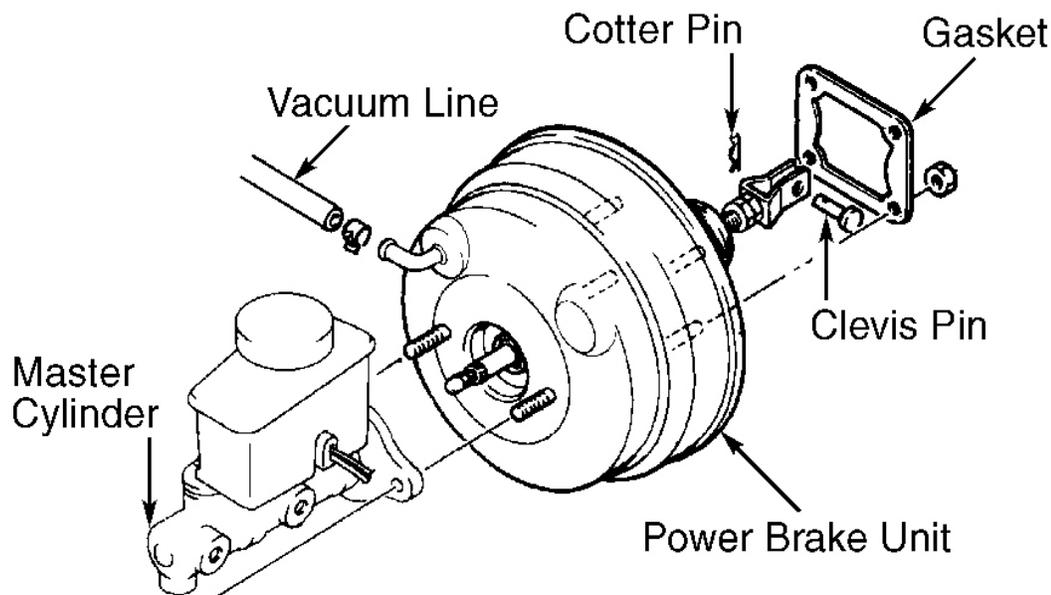
Removal & Installation

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

POWER BRAKE UNIT

Removal & Installation

Remove master cylinder from power brake unit. See **MASTER CYLINDER** . Disconnect vacuum line at power brake unit. See **Fig. 19** . 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.



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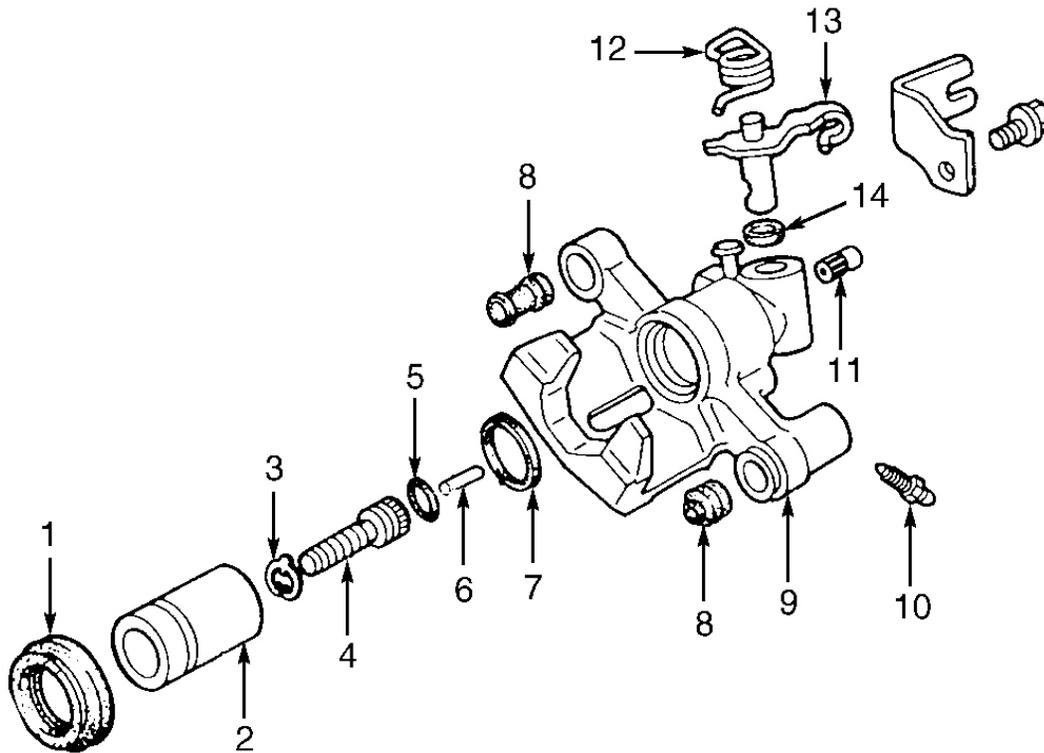
Fig. 19: Removing Power Brake Unit (Typical)
Courtesy of MAZDA MOTORS CORP.

OVERHAUL

1997 Mazda MX-5 Miata

BRAKE SYSTEM 1995-97 BRAKES Mazda - Disc & Drum

NOTE: Use appropriate illustrations for exploded view of rear caliper assembly and master cylinder. See Fig. 20 through Fig. 29 .



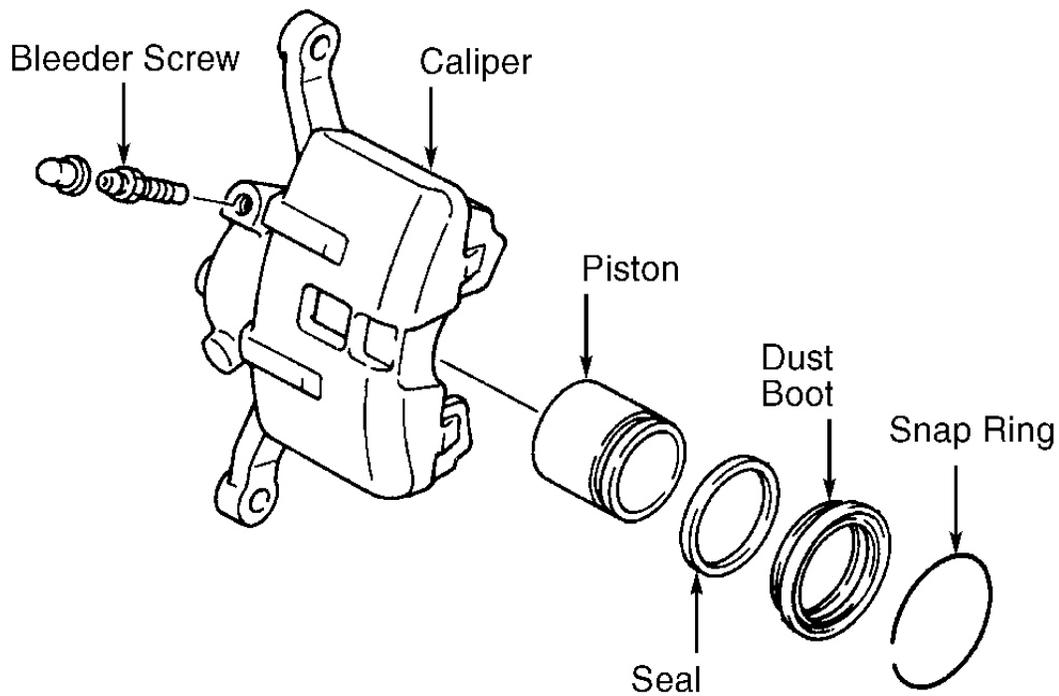
- | | | |
|-------------------|--------------------|----------------------------|
| 1. Dust Seal | 6. Connecting Link | 11. Manual Adjustment Gear |
| 2. Piston | 7. Piston Seal | 12. Spring |
| 3. Snap Ring | 8. Boot | 13. Operating Lever |
| 4. Adjusting Bolt | 9. Caliper Body | 14. Boot |
| 5. "O" Ring | 10. Bleeder Screw | |

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Fig. 20: Exploded View Of Rear Caliper Assembly (Miata & Protege Shown; MX-6 & 626 Are Similar)
Courtesy of MAZDA MOTORS CORP.

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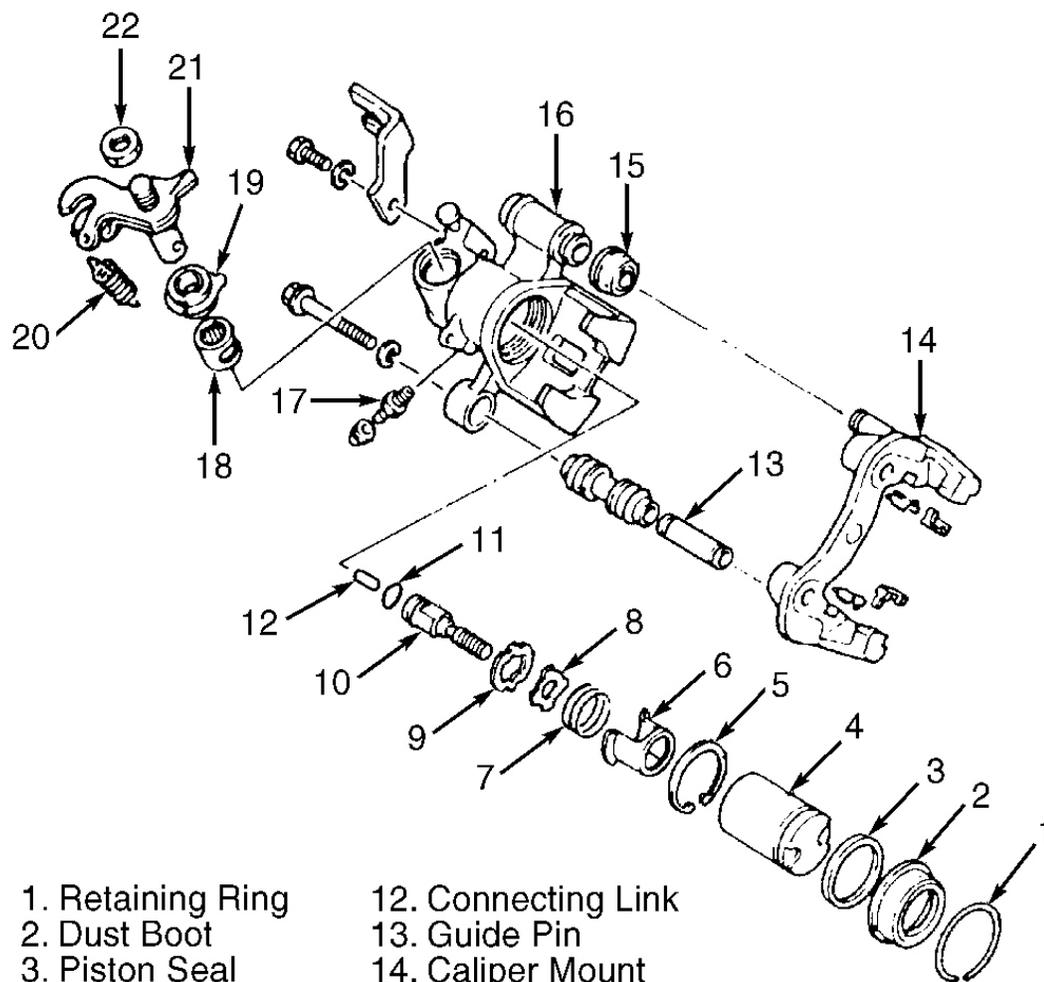


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Fig. 21: Exploded View Of Rear Caliper Assembly (Millenia)
Courtesy of MAZDA MOTORS CORP.

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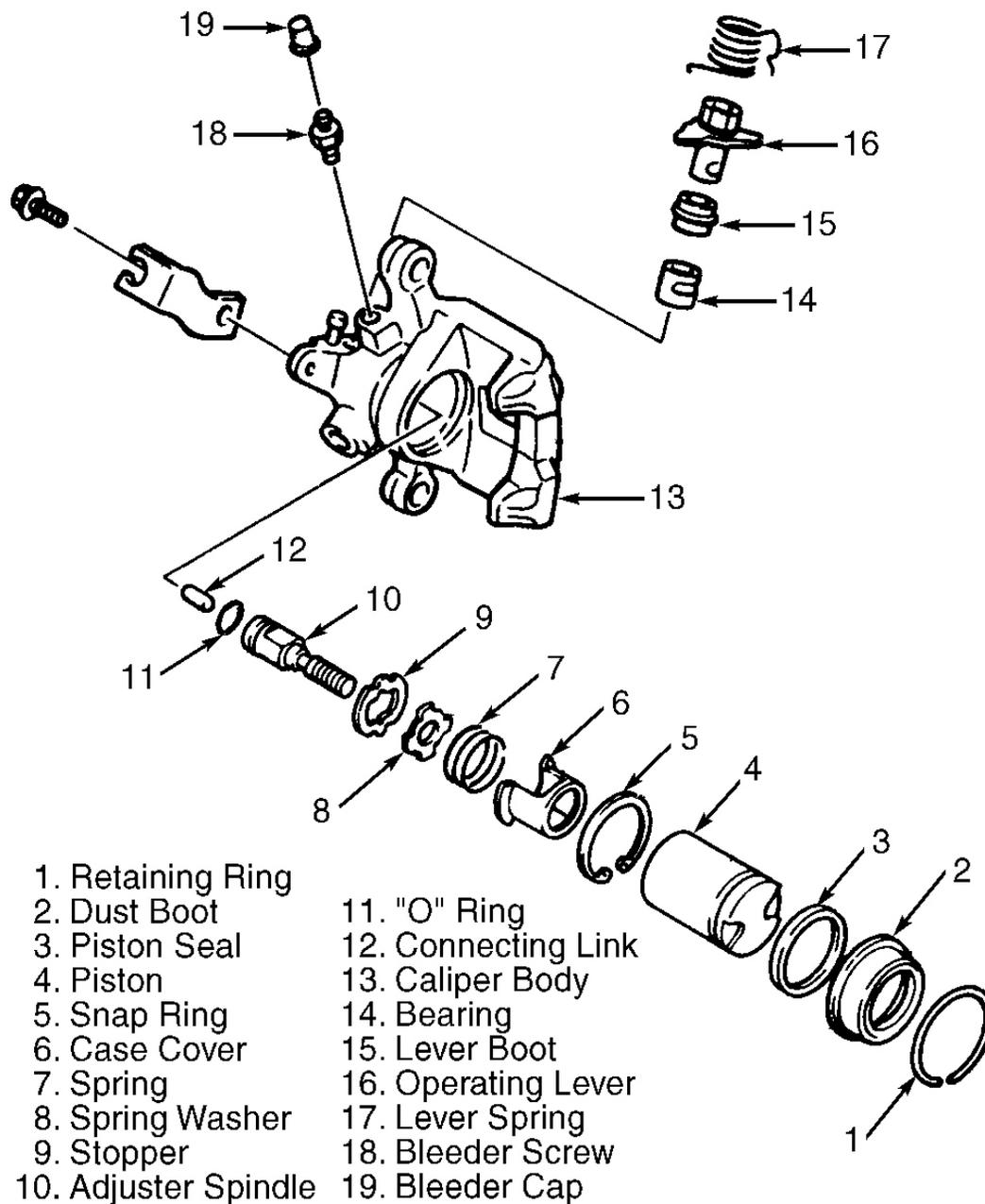
- | | |
|----------------------|---------------------|
| 1. Retaining Ring | 12. Connecting Link |
| 2. Dust Boot | 13. Guide Pin |
| 3. Piston Seal | 14. Caliper Mount |
| 4. Piston | 15. Bushing |
| 5. Snap Ring | 16. Caliper |
| 6. Case Cover | 17. Bleeder Screw |
| 7. Spring | 18. Bleeder Bearing |
| 8. Spring Washer | 19. Boot |
| 9. Stopper | 20. Spring |
| 10. Adjuster Spindle | 21. Operating Lever |
| 11. "O" Ring | 22. Nut |

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Fig. 22: Exploded View Of Rear Caliper Assembly (MX-3)
Courtesy of MAZDA MOTORS CORP.

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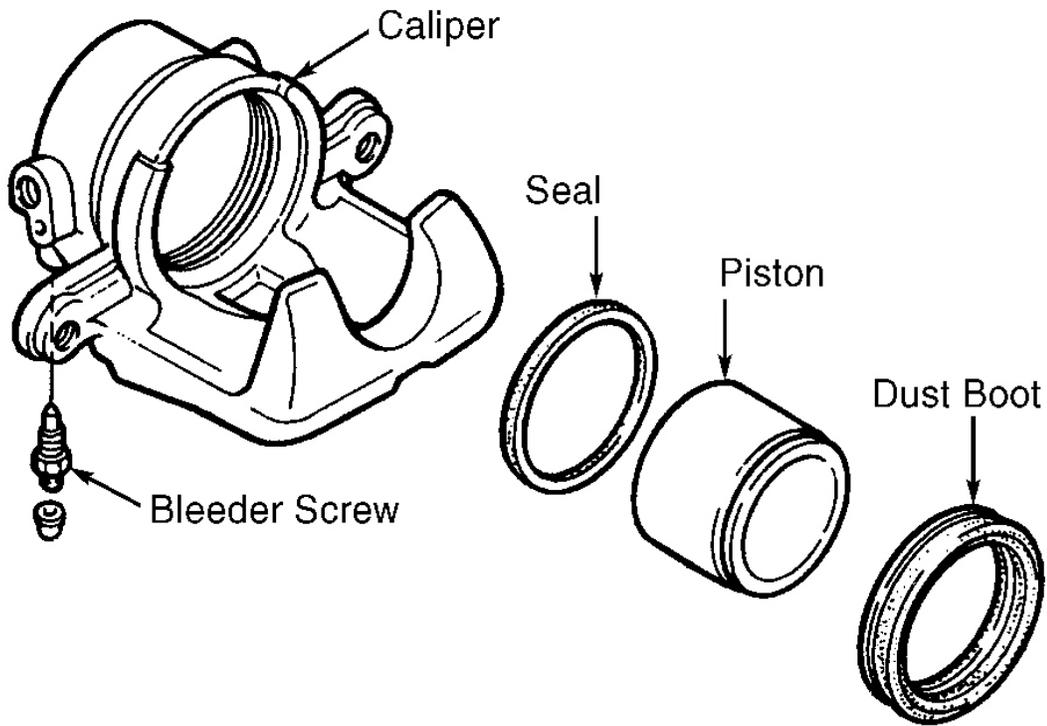


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Fig. 23: Exploded View Of Rear Caliper Assembly (RX7)
Courtesy of MAZDA MOTORS CORP.

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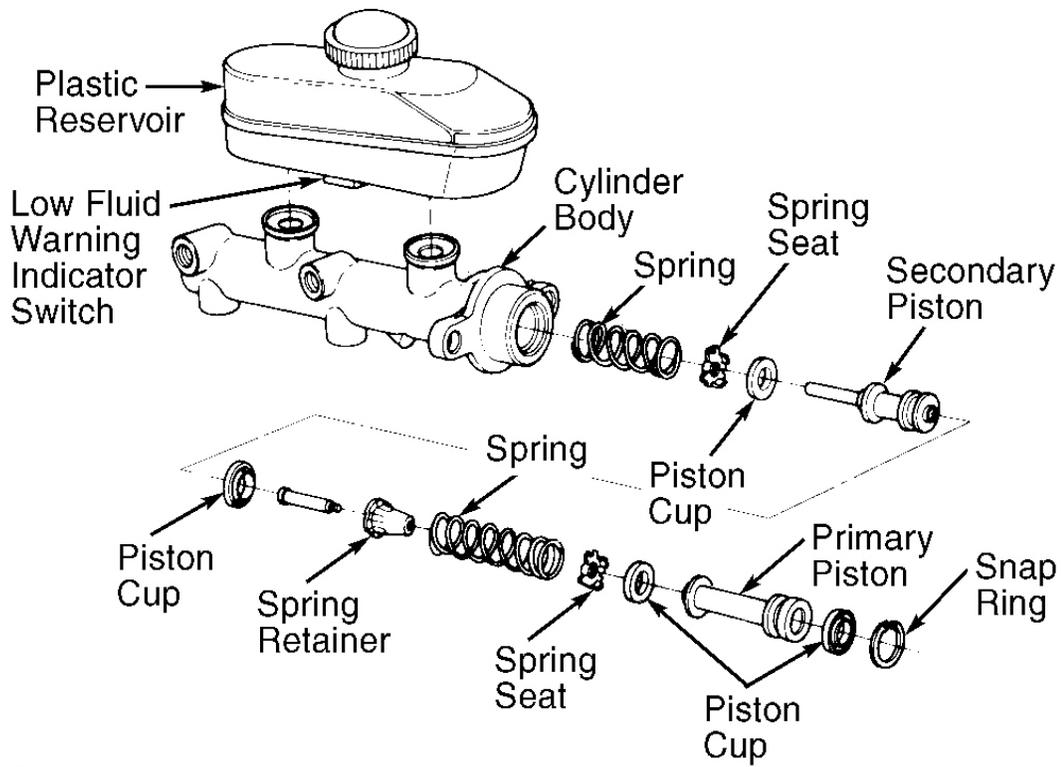


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Fig. 24: Exploded View Of Rear Caliper Assembly (929)
Courtesy of MAZDA MOTORS CORP.

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BRAKE SYSTEM 1995-97 BRAKES Mazda - Disc & Drum

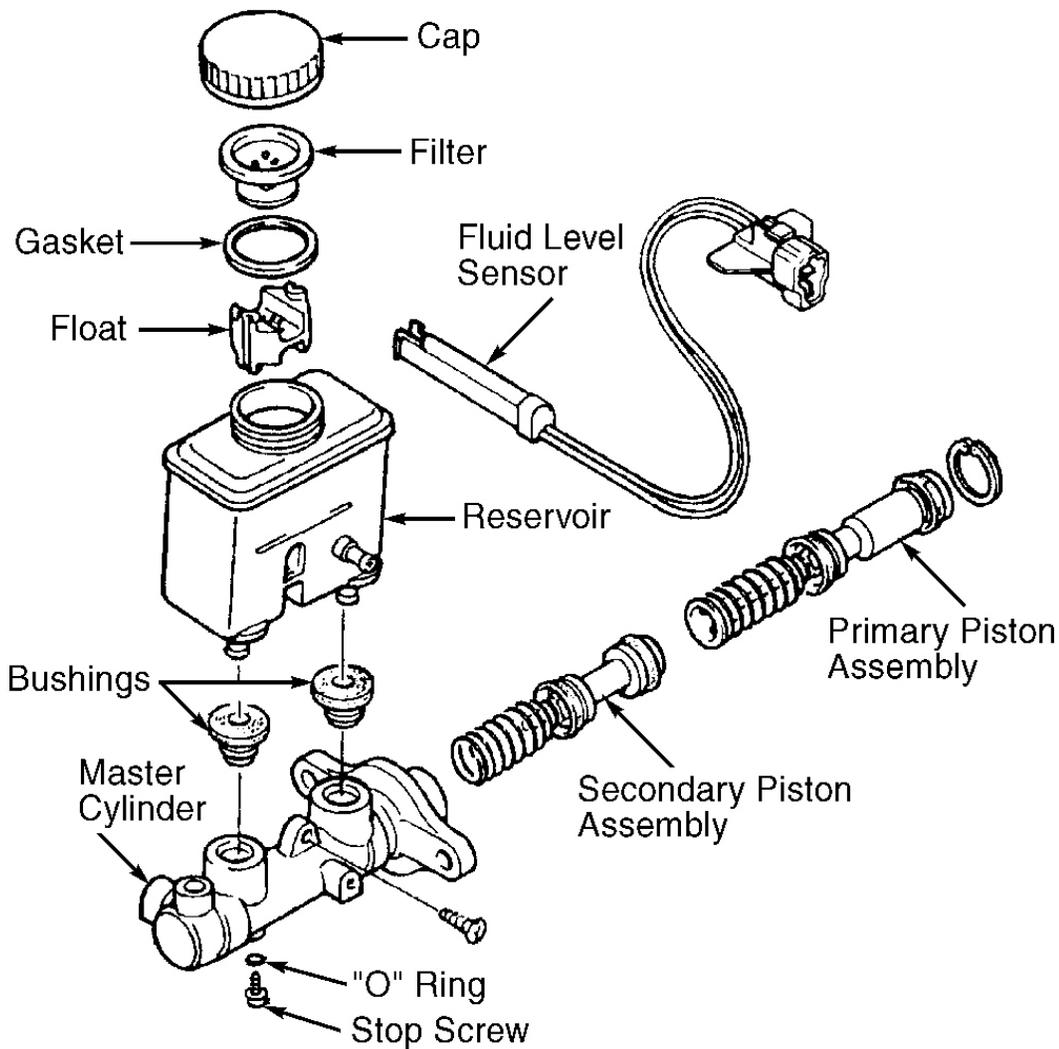


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Fig. 25: Exploded View Of Master Cylinder (B2300, B3000 & B4000)
Courtesy of MAZDA MOTORS CORP.

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BRAKE SYSTEM 1995-97 BRAKES Mazda - Disc & Drum

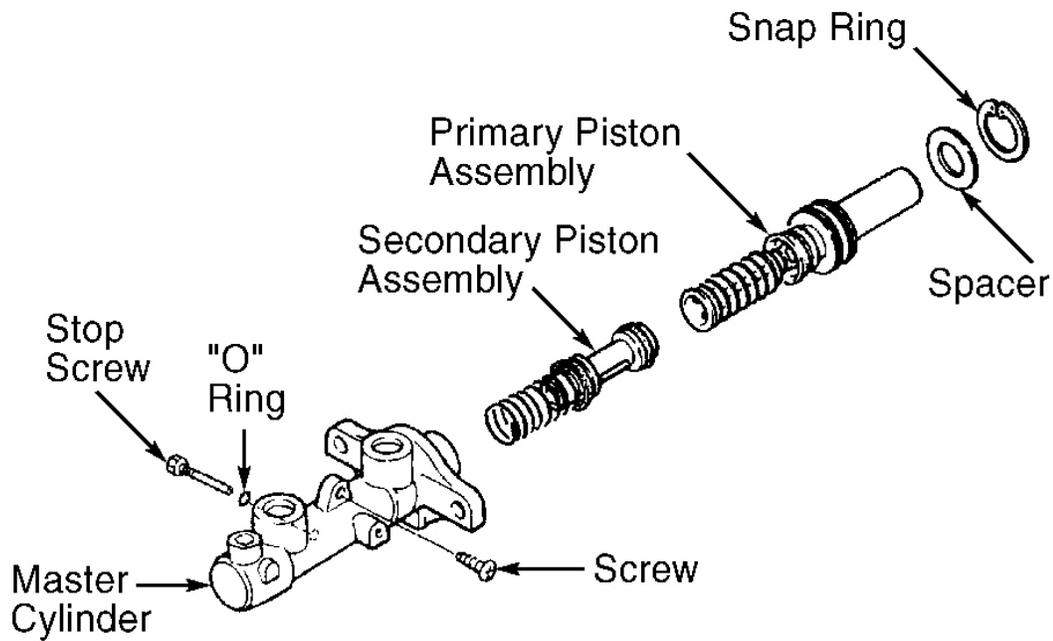


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**Fig. 26: Exploded View Of Master Cylinder (Miata Without ABS, MPV, MX-3 Without ABS, MX-6 M/T Without ABS & 626 M/T Without ABS)
Courtesy of MAZDA MOTORS CORP.**

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**Fig. 27: Exploded View Of Master Cylinder (Miata With ABS, MX-3 With ABS, RX7 & 929)
Courtesy of MAZDA MOTORS CORP.**

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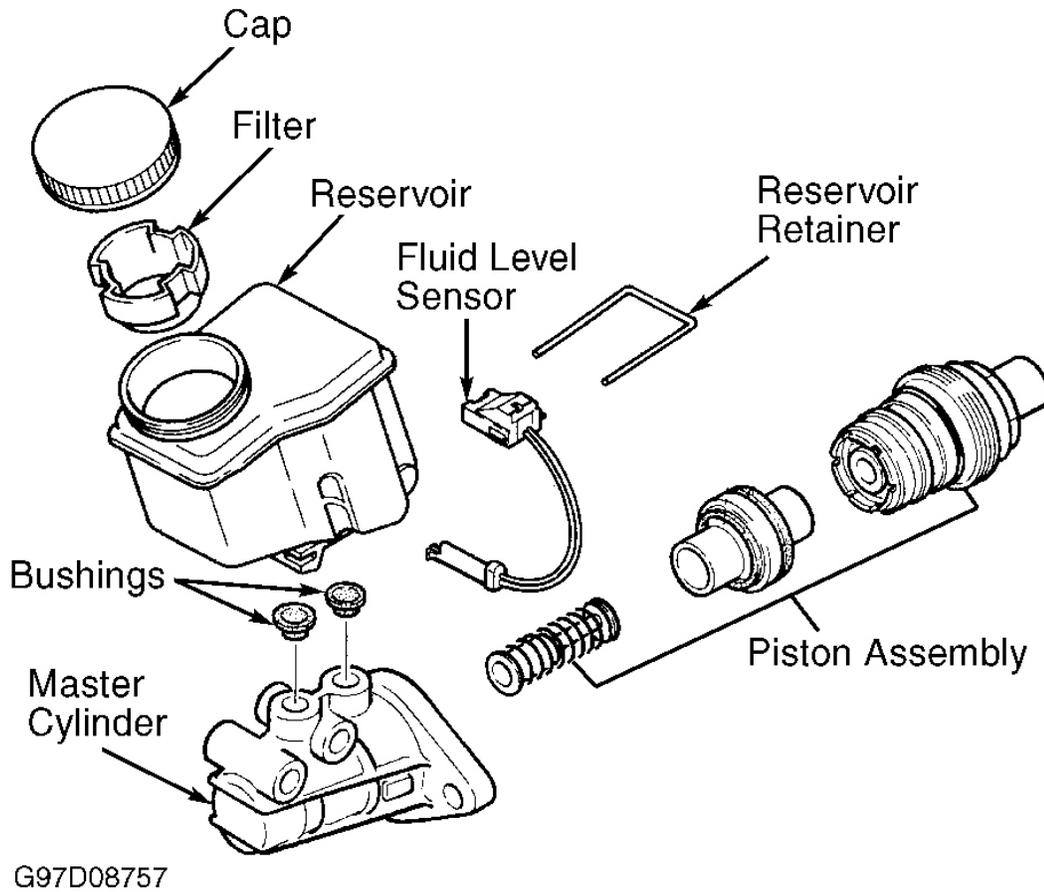


Fig. 28: Exploded View Of Master Cylinder (Millenia)
Courtesy of MAZDA MOTORS CORP.

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BRAKE SYSTEM 1995-97 BRAKES Mazda - Disc & Drum

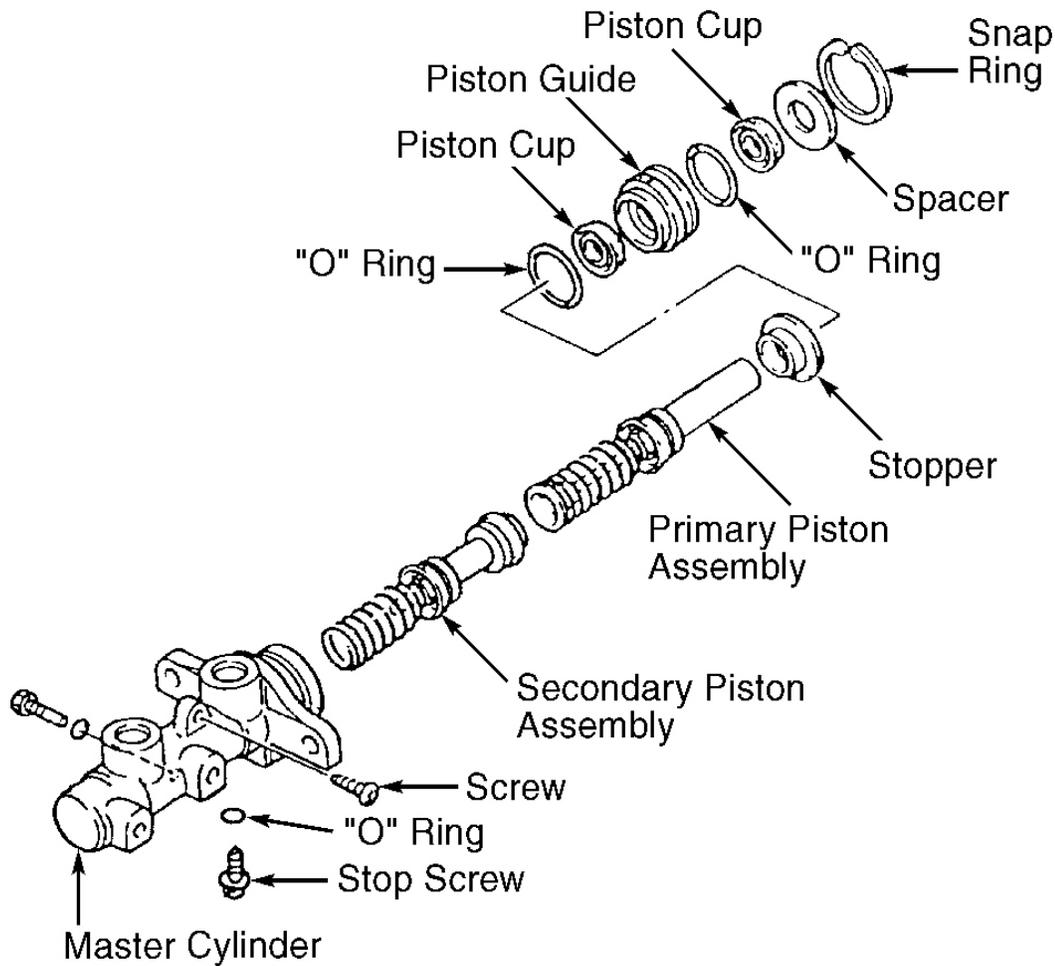


Fig. 29: Exploded View Of Master Cylinder (MX-6 & 626; With ABS &/Or A/T)
 Courtesy of MAZDA MOTORS CORP.

SPECIFICATIONS

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Backing Plate Bolts (Rear)	
B2300, B3000 & B4000	25-35 (34-47)
MX-3 & Protege	33-43 (45-58)
MX-6 & 626	37-50 (50-68)

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BRAKE SYSTEM 1995-97 BRAKES Mazda - Disc & Drum

Caliper Guide Bolts (Front)

Miata	58-65 (78-88)
Millenia & 929	46-62 (63-84)
MPV	62-69 (84-93)
MX-6 & 626	22-30 (30-40)

Caliper Guide Bolts (Rear)

Miata	33-36 (45-49)
MPV	28-36 (38-49)
Millenia & MX-3	12-18 (16-24)
MX-6 & 626	26-29 (35-39)
Protege	33-44 (45-60)
RX7	46-62 (63-84)
929	28-36 (38-49)

Caliper Mount Bracket Bolts (Front)

Miata	36-51 (49-69)
Millenia	75-101 (102-137)
MPV	66-79 (89-107)
MX-6 & 626	58-74 (79-100)
929	75-87 (102-118)

Caliper Mount Bracket Bolts (Rear)

Miata	34-48 (46-66)
Millenia & MPV	37-50 (50-68)
MX-3 & Protege	33-44 (45-60)
MX-6 & 626	34-48 (46-66)
RX7	34-49 (46-67)
929	34-49 (46-67)

Front Caliper Mounting Bolt

B2300, B3000 & B4000	74-96 (100-130)
MX-3 & Protege	30-36 (40-49)
RX7	58-72 (79-98)

Power Brake Unit Nuts

B2300, B3000 & B4000	16-21 (22-28)
Except B2300, B3000 & B4000	14-18 (19-25)

Rear Axle Lock Nut

Miata	160-216 (216-294)
Millenia, MX-3, MX-6, Protege, RX7, 626 & 929	131-173 (177-235)

Wheel Lug Nut

B2300, B3000 & B4000	85-115 (115-155)
All Other Models	65-87 (88-118)
	INCH Lbs. (N.m)

Wheel Cylinder Bleeder Screw ⁽¹⁾ MX-3 & Protege	52-78 (5.9-8.8)
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BRAKE SYSTEM 1995-97 BRAKES Mazda - Disc & Drum

Wheel Cylinder Mounting Bolt ⁽¹⁾	88-108 (10-12)
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(1) Information is not available at time of publication for B2300, B3000 & B4000.

DISC BRAKE SPECIFICATIONS

DISC BRAKE SPECIFICATIONS

Application	In. (mm)
B2300, B3000 & B4000 - Front ⁽¹⁾	
Original Thickness	.94 (24)
Minimum Thickness	.81 (21)
Miata	
Front ⁽²⁾	
Original Thickness	.79 (20)
Minimum Thickness ⁽³⁾	.71 (18)
Rear ⁽²⁾	
Original Thickness	.35 (9)
Minimum Thickness ⁽⁴⁾	.31 (8)
Millenia	
Front ⁽⁵⁾	
Original Thickness	1.10 (28)
Minimum Thickness ⁽⁶⁾	1.02 (26)
Rear ⁽⁵⁾	
Original Thickness	.37 (9.5)
Minimum Thickness ⁽⁴⁾	.29 (7.5)
MPV	
Front ⁽²⁾	
Original Thickness	1.10 (28)
Minimum Thickness ⁽⁶⁾	1.02 (26)
Rear ⁽²⁾	
Original Thickness	.71 (18)
Minimum Thickness ⁽⁷⁾	.63 (16)
MX-3	
Front ⁽²⁾	
Original Thickness	.87 (22)
Minimum Thickness ⁽⁸⁾	.79 (20)
Rear ⁽²⁾	
Original Thickness	.35 (9)

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BRAKE SYSTEM 1995-97 BRAKES Mazda - Disc & Drum

Minimum Thickness ⁽⁴⁾	.31 (8)
MX-6 & 626	
Front ⁽²⁾	
Original Thickness	.94 (24)
Minimum Thickness ⁽⁹⁾	.87 (22)
Rear ⁽²⁾	
Original Thickness	.39 (10)
Minimum Thickness ⁽¹⁰⁾	.31 (8)
Protege	
Front ⁽¹¹⁾	
Original Thickness	.87 (22)
Minimum Thickness ⁽⁸⁾	.79 (20)
Rear ⁽¹¹⁾	
Original Thickness	.35 (9)
Minimum Thickness ⁽¹²⁾	.28 (7)
RX7	
Front ⁽²⁾	
Original Thickness	.87 (22)
Minimum Thickness	.79 (20)
Rear ⁽²⁾	
Original Thickness	.79 (20)
Minimum Thickness	.71 (18)
929	
Front ⁽²⁾	
Original Thickness	.94 (24)
Minimum Thickness	.87 (22)
Rear ⁽²⁾	
Original Thickness	.71 (18)
Minimum Thickness	.63 (16)

(1) Maximum lateral runout is .003" (.08 mm).

(2) Maximum lateral runout is .004" (.10 mm).

(3) If using a brake lathe to machine rotor on vehicle, minimum thickness is .74" (18.8 mm).

(4) If using a brake lathe to machine rotor on vehicle, minimum thickness is .33" (8.4 mm).

(5) Maximum lateral runout is .002" (.05 mm).

(6) If using a brake lathe to machine rotor on vehicle, minimum thickness is 1.06" (26.8 mm).

(7) If using a brake lathe to machine rotor on vehicle, minimum thickness is .66" (16.8 mm).

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- (8) If using a brake lathe to machine rotor on vehicle, minimum thickness is .82" (20.8 mm).
- (9) If using a brake lathe to machine rotor on vehicle, minimum thickness is .90" (22.8 mm).
- (10) If using a brake lathe to machine rotor on vehicle, minimum thickness is .35" (8.8 mm).
- (11) Maximum lateral runout is .002" (.50 mm).
- (12) If using a brake lathe to machine rotor on vehicle, minimum thickness is .31" (7.8 mm).

DRUM BRAKE SPECIFICATIONS

DRUM BRAKE SPECIFICATIONS

Application	In. (mm)
B2300, B3000 & B4000 Drum Diameter	
Original	
9"	9.00 (228.6)
10"	10.00 (254.0)
Maximum Refinish Diameter	
9"	9.09 (230.8)
10"	10.09 (256.3)
Millenia & MPV Parking Brake Drum Diameter	
Original	7.48 (190.0)
Maximum Finish Diameter	5.51 (191.0)
MX-3 & Protege	
Drum Diameter	
Original	7.87 (200.0)
Maximum Finish Diameter	7.93 (201.5)
Wheel Cylinder Bore Diameter	
MX-3	0.687 (17.46)
Protege	0.75 (19.0)
MX-6 & 626 Drum Diameter	
Original	9.00 (228.6)
Maximum Finish Diameter	9.06 (230.1)
Wheel Cylinder Bore Diameter	0.687 (17.46)
929 Parking Brake Drum Diameter	
Original	7.48 (190.0)
Maximum Refinish Diameter	5.51 (191.0)