

BRAKE SYSTEM

Article Text

1992 Mitsubishi Mirage

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Monday, April 01, 2002 10:05AM

ARTICLE BEGINNING

1992 BRAKES

Chrysler Motors/Mitsubishi - Disc & Drum

Chrysler Motors: Colt, Colt 200, Colt Vista, Ram-50,
Stealth, Summit, Summit Wagon;

Mitsubishi: Diamante, Eclipse, Expo/Expo LRV, Galant,
Mirage, Montero, Pickup, 3000GT

INTRODUCTION

This article contains information on repair and service of basic hydraulic brake system. If vehicle is equipped with anti-lock brakes, see the ANTI-LOCK BRAKE SYSTEM article in this section.

DESCRIPTION

Brake system consists of a master cylinder, vacuum power brake unit, proportioning valve and self-adjusting assembly. Expo/Expo LRV, Montero, Pickup and Ram-50 have a Load-Sensing Proportioning Valve (LSPV). All models are equipped with front disc brakes and either rear disc or drum brakes. Parking brake assembly activates rear brakes.

BLEEDING BRAKE SYSTEM

BLEEDING PROCEDURES

Bleed brakes whenever hydraulic lines are opened or pedal feels spongy. Bleed hydraulic system in appropriate sequence. Refer to the BRAKE LINE BLEEDING SEQUENCE table. On all models except Montero, Pickup and Ram-50, bleed system with engine running.

BRAKE LINE BLEEDING SEQUENCE TABLE

Application	Sequence
Colt, Colt 200, Colt Vista, Expo/Expo LRV, Mirage, Summit & Summit Wagon	LR, RF, RR, LF
Diamante, Eclipse, Galant, Stealth & 3000GT	RR, LF, LR, RF
Montero	RR, LR, LSPV, RF, LF
Pickup & Ram-50	RR, LSPV, RF, LF

ADJUSTMENTS

BRAKE PEDAL HEIGHT & FREE PLAY

- 1) Separate connector from stoplight switch, and loosen lock

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nut. Position switch so it does not contact brake pedal arm. Adjust brake pedal height by rotating master cylinder push rod (yoke, if equipped) until distance from top of brake pedal, with pedal released, is within specification. See BRAKE PEDAL SPECIFICATIONS table.

2) DO NOT depress push rod. Tighten lock nut, and ensure brake pedal height is within specification. Start engine to evacuate brake booster chamber. Stop engine, and apply brake several times to remove vacuum from brake booster.

3) Using hand pressure, depress brake pedal to measure free play before resistance is felt. Free play distance for all models is .12-.31" (3.0-7.9 mm). If distance is not within specification, bleed system and check for misadjusted brakes.

BRAKE PEDAL SPECIFICATIONS TABLE

Application	Pedal Height: In. (mm)
Colt, Colt 200, Mirage & Summit	6.6-6.7 (168-170)
Colt Vista, Expo/Expo LRV & Summit Wagon	7.7-7.9 (196-201)
Diamante, Eclipse & Galant	6.9-7.1 (175-180)
Montero	7.3-7.7 (185-196)
Pickup & Ram-50	6.5 (165)
Stealth & 3000GT	7.0-7.2 (178-183)

LOAD-SENSING PROPORTIONING VALVE (LSPV)

Expo/Expo LRV

Park the vehicle on a level surface. Remove any excess weight from the vehicle. Measure the spring length. If spring length is not within specification, adjust the turnbuckle until the correct length is obtained. Refer to the LOAD-SENSING SPRING LENGTH table in this article. See Fig. 1.

Montero, Pickup & Ram-50

Park vehicle on level surface. Remove excess weight from vehicle. Ensure lever is not against stopper bolt. Check spring length. If spring length is not correct, adjust cable or support until correct length is obtained. See the LOAD-SENSING SPRING LENGTH table. See Fig. 2.

LOAD-SENSING SPRING LENGTH TABLE

Application	In. (mm)
Expo/Expo LRV	3.3-3.4 (84-86)
Montero	8.8-9.0 (224-229)
Pickup & Ram-50	7.0-7.1 (178-180)

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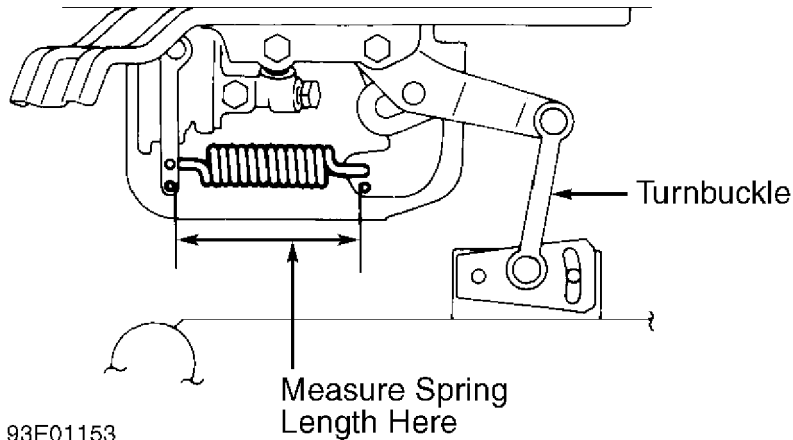
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Fig. 1: Adjusting Load-Sensing Proportioning Valve Spring (Expo/Expo LRV)

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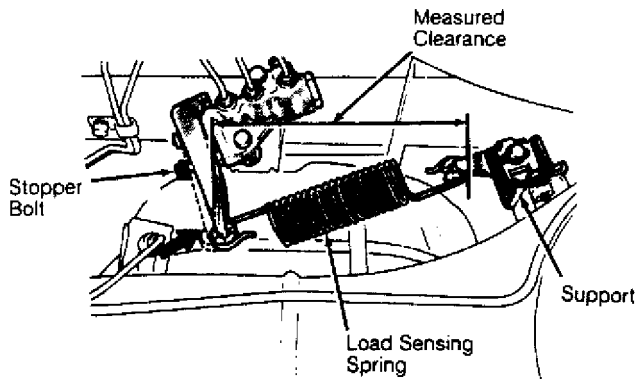


Fig. 2: Adjusting Load-Sensing Proportioning Valve Spring (Montero, Pickup & Ram-50)

Courtesy of Mitsubishi Motor Sales of America.

MASTER CYLINDER PUSH ROD

Check and adjust clearance between back of master cylinder piston and the master cylinder push rod. See Fig. 3. Also, refer to the PUSH ROD CLEARANCE SPECIFICATIONS table. After adjusting push rod clearance, adjust pedal height and bleed brake system.

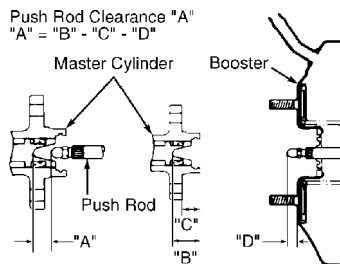


Fig. 3: Adjusting Push Rod Clearance

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PUSH ROD CLEARANCE SPECIFICATIONS TABLE

Application (1)	In. (mm)
Colt, Colt 200, Mirage & Summit	
7" Booster .....	.020-.028 (0.51-0.71)
8" Booster .....	.024-.031 (0.61-0.79)
Diamante .....	.026-.033 (0.66-0.84)
Eclipse	
7" & 8" Booster .....	.020-.028 (0.51-0.71)
9" Booster .....	.031-.039 (0.79-0.99)
Colt Vista & Summit Wagon	
7" & 8" Booster .....	.020-.028 (0.51-0.71)
8" & 9" Booster .....	.024-.031 (0.61-0.79)
9" Booster .....	.031-.039 (0.79-0.99)
Expo/Expo LRV & Galant	
7" & 8" Booster .....	.020-.028 (0.51-0.71)
8" & 9" Booster .....	.024-.031 (0.61-0.79)
9" Booster .....	.031-.039 (0.79-0.99)
Montero .....	.026-.035 (0.66-0.89)
Pickup & Ram-50 .....	.028-.043 (0.71-1.09)
Stealth & 3000GT	
7" & 8" Booster .....	.022-.030 (0.56-0.76)
8" & 9" Booster .....	.026-.033 (0.66-0.84)

(1) - Front half-shell is smaller than rear half-shell on models using boosters with 2 diameters.

PARKING/EMERGENCY BRAKE

NOTE: Adjust service brake before adjusting parking brake.

Except Pickup & Ram-50

Start engine, and apply brake pedal. Pull parking brake lever with a force of 44-45 lbs. (20.0-20.4 kg). Parking brake lever should move up 4-6 notches on Expo/Expo LRV with rear drum in disc brakes and Montero, 3-5 notches on Diamante, Stealth and 3000GT and 5-7 notches on all other models. If adjustment is necessary, turn adjusting nut located under console or at end of cable rod. See Fig. 4.

Pickup & Ram-50

Fully release parking brake, and allow slack in rear cable to prevent brake shoe drag. Adjust turnbuckle on 2WD models (turn adjusting nut on equalizer on 4WD models) to obtain a brake lever stroke of 16-17 notches with a force of 66 lbs. (29.9 kg). See Fig. 4. Ensure equalizer is at right angle to joint.

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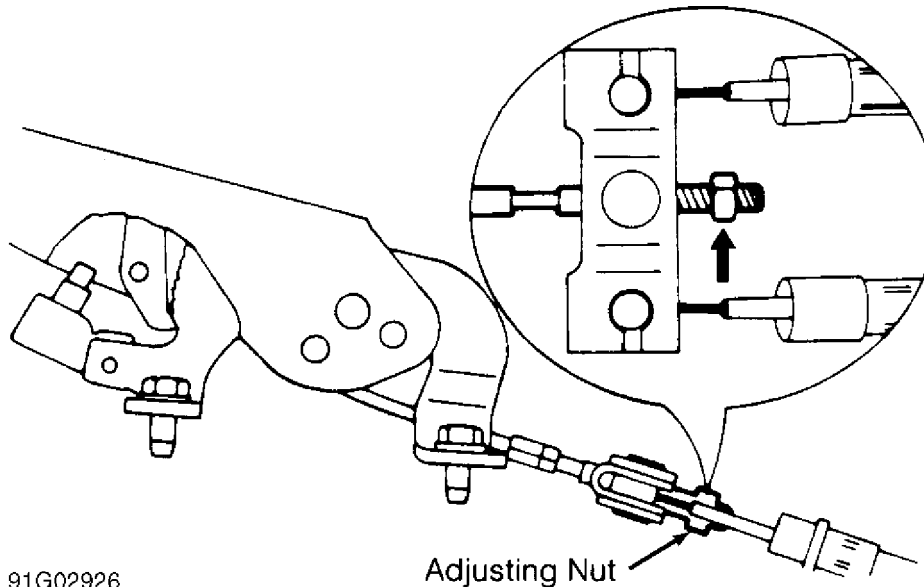
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Fig. 4: Adjusting Parking/Emergency Brake (Typical)
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REAR BRAKE SHOES

To adjust brake shoe clearance, first adjust brake shoe outside diameter on models listed in BRAKE SHOE INSTALLATION DIAMETER table. On other models, set adjustment assembly so brake shoes lightly contact brake drum. On all models, with brake drum installed, fully release parking brake and depress brake pedal several times to center shoes and adjust brake shoe clearance. Adjust parking brake, and check pedal travel. Rotate brake drum to verify free movement.

BRAKE SHOE INSTALLATION DIAMETER TABLE

Application	In. (mm)
Colt, Colt 200, Mirage & Summit	7.06-7.07 (179.3-179.6)
Galant	7.96-7.97 (202.2-202.4)
Pickup & Ram-50	9.97-9.98 (253.2-253.5)

STOPLIGHT SWITCH

Loosen lock nut, and adjust switch-to-pedal arm clearance to .02-.04" (0.5-1.0 mm). Tighten lock nut. DO NOT depress master cylinder push rod during stoplight switch adjustment.

TESTING

POWER BRAKE UNIT

Check Valve Inspection

Remove vacuum hose from power brake unit. On Colt, Colt 200,

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Mirage and Summit, remove check valve from hose; check valve and hose are a unit on all other models. Using a vacuum pump, ensure airflow is in direction of intake manifold only.

System Check

1) Run engine for 2 minutes. Shut engine off, and depress brake pedal several times with normal pressure. If pedal height gradually becomes higher with successive applications, power brake unit is okay. If pedal height remains steady, power brake unit is faulty.

2) With engine stopped, depress brake pedal repeatedly until its height no longer falls. Hold brake pedal down, and start engine. If pedal moves downward slightly, power brake unit is okay. If pedal height does not change, power brake unit is faulty.

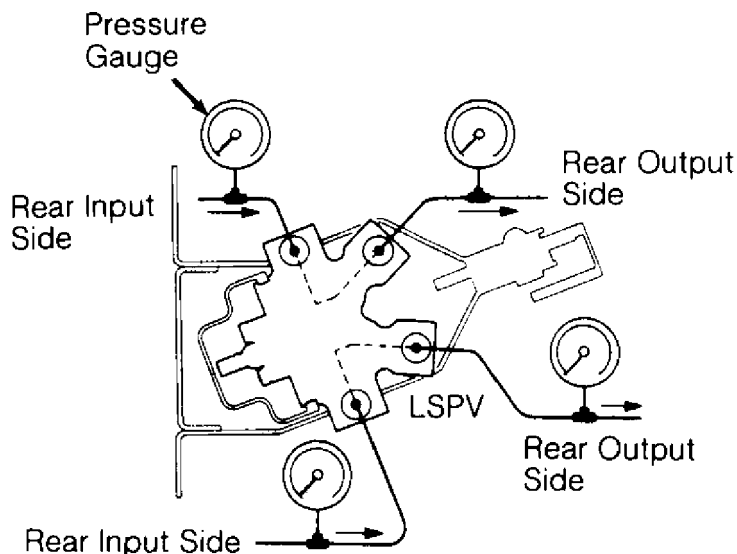
3) With engine running, press and hold brake pedal. Shut off engine. Hold brake pedal for 30 seconds. Brake pedal height should not change. If pedal height falls, power brake unit is faulty.

LOAD-SENSING PROPORTIONING VALVE (LSPV)

Expo/Expo LRV, Montero, Pickup & Ram-50

1) Before diagnosing Load-Sensing Proportioning Valve (LSPV), ensure all other brake components are operating properly. When all other brake system components are determined to be okay, ensure LSPV spring length is within specification. See Fig. 1 or 2. Also refer to LOAD-SENSING PROPORTIONING VALVE (LSPV) under ADJUSTMENTS.

2) After spring length is determined to be within specification, connect pressure gauges to input and output ports of LSPV. See Fig. 5 or 6. Bleed the brake hydraulic system. Refer to BLEEDING BRAKE SYSTEM.



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Fig. 5: Connecting Pressure Gauges To LSPV (Expo/Expo LRV)
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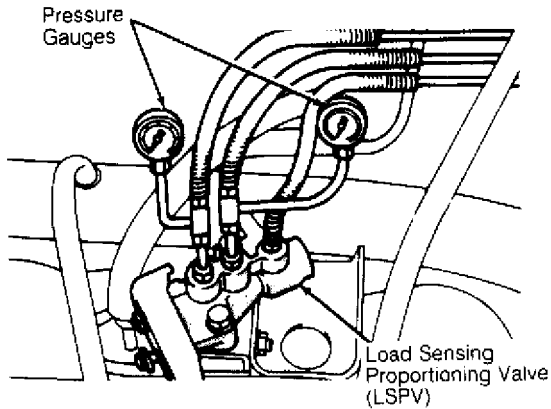


Fig. 6: Connecting Pressure Gauges To LSPV (Montero, Pickup & Ram-50)
Courtesy of Mitsubishi Motor Sales of America.

3) On Expo/Expo LRV, loosen turnbuckle to relieve spring tension. See Fig. 1. Slowly depress brake pedal and check readings on pressure gauges. See LSPV PRESSURE SPECIFICATIONS table. Tighten turnbuckle until spring length is 4.00" (101.6 mm). Slowly depress brake pedal and check readings on pressure gauges. If fluid pressure is not within specification, replace LSPV assembly.

4) On Montero, disconnect spring at support and pull spring and lever toward support until spring length is 8.9" (226 mm). See Fig. 2. Without depressing brake pedal, check readings on pressure gauges. See LSPV PRESSURE SPECIFICATIONS table. Push lever away from support until spring length is 10.1" (257 mm). Without depressing brake pedal, check readings on pressure gauges. If fluid pressure is not within specification, replace LSPV assembly.

5) On Pickup and Ram-50, remove load-sensing spring. See Fig. 2. Slowly depress brake pedal. Check readings on pressure gauges. See LSPV PRESSURE SPECIFICATIONS table. Install load-sensing spring. Load weight into rear of vehicle until measured spring length is 7.0" (178 mm) with lever pressed in slightly.

6) Slowly depress brake pedal. Check readings on pressure gauges. See LSPV PRESSURE SPECIFICATIONS table. If fluid pressure is not within specification, replace LSPV assembly.

LSPV PRESSURE SPECIFICATIONS TABLE

Application	Inlet Pressure psi (kg/cm ²)	Outlet Pressure psi (kg/cm ²)
Expo/Expo LRV		
Turnbuckle Loosened		
Test 1	1066 (75)	455-526 (32-3 37)
Test 2	1992 (140)	888-1002 (62-70)
Turnbuckle Tightened	1992 (140)	1571-1813 (110-127)
Montero		
LSPV Spring Pulled		
Test 1	1422 (100)	873-1002 (61-70)
Test 2	2560 (180)	1129-1314 (79-92)
LSPV Lever Pushed	2560 (180)	(1) 1863-2148 (131-151)

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Pickup & Ram-50

LSPV Spring Removed

Test 1	853 (60)	242-327 (17-23)
Test 2	1992 (140)	370-540 (26-38)
LSPV Spring Installed	...	1992 (140)	.....	(2) 299-583 (21-41)

- (1) - Maximum side-to-side pressure differential is 57 psi (4 kg/cm²).
- (2) - On vehicles with both 2WD and heavy-duty suspension, outlet pressure is 526-697 psi (37-49 kg/cm²).

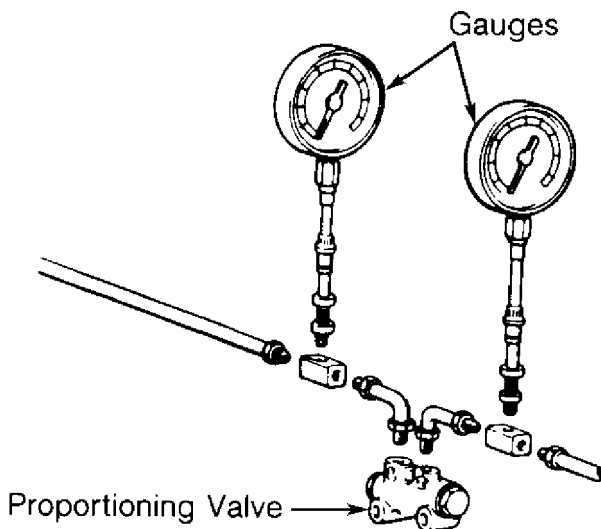
PROPORTIONING VALVE (NON-LOAD-SENSING)

Pressure Test

1) Connect pressure gauges to input and output ports of proportioning valve. See Fig. 7. Bleed the brake hydraulic system. See BLEEDING BRAKE SYSTEM.

2) Slowly depress brake pedal. Check readings on pressure gauges. Make sure output pressure begins to drop relative to input pressure at the specified pressure range (split point). Refer to the SPLIT POINT PRESSURE SPECIFICATIONS table.

3) Continue depressing brake pedal, and check readings on pressure gauges. See PROPORTIONING VALVE PRESSURE SPECIFICATIONS table. If fluid pressures or split point are not within specification, replace proportioning valve.



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Fig. 7: Connecting Pressure Gauges To Proportioning Valve (Typical)
Courtesy of Mitsubishi Motor Sales of America.

SPLIT POINT PRESSURE SPECIFICATIONS TABLE

Application	psi (kg/cm ²)
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Colt, Colt 200, Mirage & Summit	
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Hatchback	348-420 (25-30)
Sedan	420-491 (30-35)
Colt Vista & Summit Wagon	462-533 (33-38)
Diamante, Stealth & 3000GT	533-604 (38-43)
Eclipse	
2WD	561-633 (39-45)
4WD	491-561 (35-39)
Galant	
2WD	
DOHC	491-561 (35-39)
SOHC	561-633 (39-45)
4WD	704-775 (50-55)

PROPORTIONING VALVE PRESSURE SPECIFICATIONS TABLE

Application	Inlet Pressure psi (kg/cm ²)	(1) Outlet Pressure psi (kg/cm ²)
Colt, Colt 200, Mirage & Summit		
Hatchback	953 (67)	519-590 (37-42)
Sedan	1024 (72)	590-661 (42-47)
Colt Vista & Summit Wagon	1067 (75)	676 (48)
Diamante	1138 (80)	676-747 (48-53)
Eclipse		
2WD	1163 (82)	739-811 (52-57)
4WD	1095 (77)	661-739 (47-52)
Galant		
2WD		
DOHC	1095 (77)	661-739 (47-52)
SOHC	1163 (82)	789-861 (56-61)
4WD	1309 (92)	931-1003 (66-71)
Stealth & 3000GT	1138 (80)	739-811 (52-57)

(1) - Maximum side-to-side pressure differential is
57 psi (4 kg/cm²).

REMOVAL & INSTALLATION

FRONT DISC BRAKE PADS

CAUTION: DO NOT remove or contaminate special grease coating on
lock pins.

Removal

1) Raise and support vehicle. Remove front wheel(s). Remove
lower lock pin or sleeve bolt. See Fig. 16. Lift caliper body upward.

2) Support caliper aside. Remove shim(s), shim holder (if
equipped), anti-squeak shim and pad assembly from support mounting.
Remove pad clips.

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Installation

If installing new pads, compress piston to bottom of bore. Install retaining clips, pad assembly, shim(s), shim holder (if equipped) and anti-squeak shim onto support mounting. Depress brake pedal several times to expand caliper piston.

FRONT BRAKE CALIPER

Removal

1) Raise and support vehicle. Remove front wheel(s). Separate rubber flexhose from hydraulic line at brake hose mount, located on strut housing. Secure end of hydraulic line to prevent spillage of brake fluid.

2) Remove hose clip from brake hose mount. Disconnect brake hose from caliper. Remove upper and lower caliper-to-steering knuckle bolts. Lift caliper body upward. Remove caliper.

Installation

To install, reverse removal procedure. Tighten bolts to specification. See TORQUE SPECIFICATIONS table. Bleed brake system. See BLEEDING BRAKE SYSTEM.

FRONT BRAKE ROTOR

Removal (Colt, Colt 200, Mirage & Summit)

1) Raise and support front of vehicle. Remove front wheel(s). Remove caliper. Remove cotter pin, wheel bearing nut and washer.

2) Separate lower ball joint and tie rod end from steering knuckle. Using Puller (MB990241-01), push drive shaft through hub. Remove steering knuckle-to-strut housing bolts.

3) Remove knuckle from strut assembly. Remove hub and knuckle assembly. Using Bracket (MB991056) and Bolt (MB990998), separate hub from steering knuckle. See Fig. 8. Remove rotor from hub.

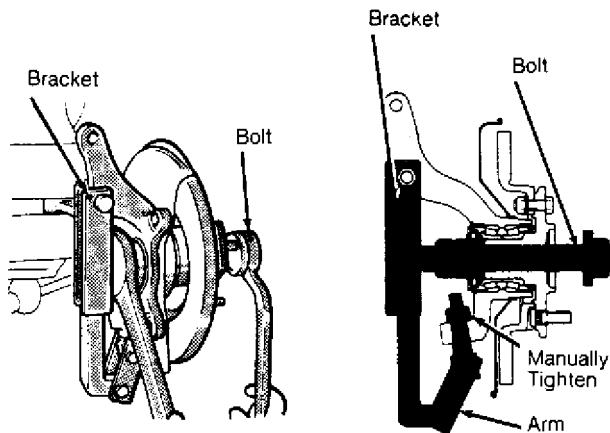


Fig. 8: Removing Hub From Steering Knuckle (Colt, Colt 200, Mirage & Summit)
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Installation

1) Using Bolt (MB990998), install hub and rotor assembly into knuckle. Tighten bolt to 144-188 ft. lbs. (195-255 N.m). Rotate hub to seat bearings.

2) Measure hub starting torque and wheel bearing end play. Starting torque should be 11 INCH lbs. (1.2 N.m) and end play should be .008" (.20 mm) or less. If end play is not within specification, check hub installation. Reverse removal procedure to complete installation.

Removal & Installation (Colt Vista, Diamante, Eclipse, Expo/Expo LRV, Galant, Stealth, Summit Wagon, & 3000GT)

Raise vehicle, and remove wheel(s). Remove caliper, and slide rotor off hub. To install, reverse removal procedure.

Removal (Montero, Pickup 2WD & Ram-50 2WD)

Raise and support vehicle. Remove front caliper. Remove hub (dust) cap, cotter pin and nut. Remove washer and outer wheel bearing. Remove front hub assembly. Remove bolts attaching rotor to front hub, and separate assemblies.

Installation

To install, reverse removal procedure. Tighten wheel bearings to 22 ft. lbs. (30 N.m). Loosen nut, and then retighten it to 72 INCH lbs. (8 N.m). Install cotter pin. If pin does not align, loosen nut as needed to a maximum of 30 degrees.

Removal (Pickup 4WD & Ram-50 4WD)

Raise and support vehicle. Remove and support brake calipers. Place hub in free-wheeling position. Remove drive hub cover using an oil filter wrench and protective cloth. Remove snap ring, shim and free-wheeling hub from drive axle. See Fig. 9. Remove lock washer. Remove lock nut using Lock Nut Wrench (MB990954). Remove front hub assembly.

Installation

1) Install front hub assembly. Install lock nut, and tighten it to 94-145 ft. lbs. (127-197 N.m). Loosen lock nut, and retighten it to 18 ft. lbs. (24 N.m). Loosen lock nut 30-40 degrees. Reverse removal procedure for remaining components.

2) After installation is complete, check drive axle end play. Adjust end play if it is not .002" (.05 mm) or less. Rotate drive axle forward and rearward until maximum end play is obtained.

3) If adjusting axle shaft end play, use proper shim to obtain desired end play. Shim is located behind snap ring on end of drive axle. Install shim, and recheck axle end play.

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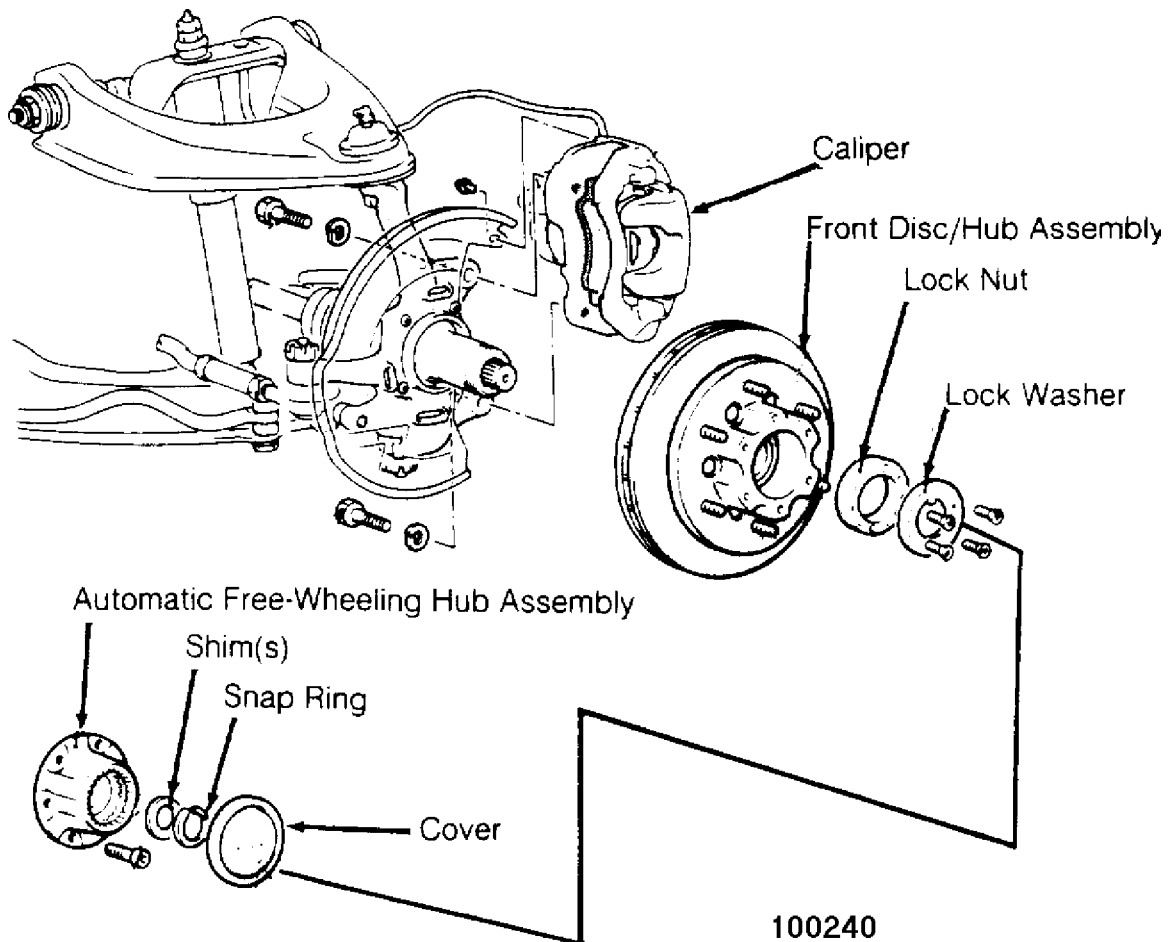


Fig. 9: Exploded View Of Front Brake Assembly (Pickup 4WD & Ram-50 4WD)

Courtesy of Mitsubishi Motor Sales of America.

PARKING BRAKE SHOES

Removal (Colt Vista, Diamante, Expo/Expo LRV, Montero, Stealth, Summit Wagon, & 3000GT)

1) Raise and support vehicle. Remove rear wheel(s). Disconnect rear speed sensor. Remove rear disc brake calipers and rotors. Remove hub cap, flange nut and washer. See Fig. 10.

2) Remove rear hub bearing and adjusting wheel spring. Remove shoe hold-down cup, spring and pin. Note how shoe-to-anchor spring is installed, and then remove adjuster and shoe-to-anchor spring. Remove strut and return spring. Remove clip and shoe and lining assembly.

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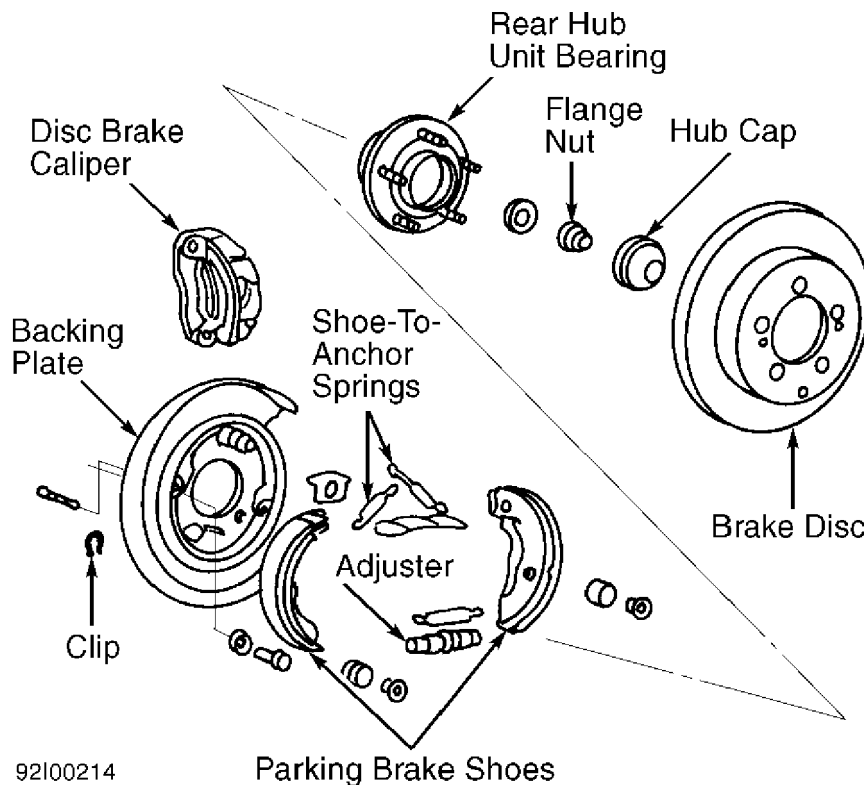
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Fig. 10: Exploded View Of Parking Brake Assembly (Typical)
Courtesy of Mitsubishi Motor Sales of America.

CAUTION: Shoe-to-anchor spring must be installed correctly for proper functioning of parking brakes.

Installation

1) To install, reverse removal procedure. When installing shoe-to-anchor spring, ensure spring is installed correctly. When installing adjuster, install left adjuster with adjusting bolt facing vehicle front and right adjuster with adjusting bolt facing vehicle rear.

2) After tightening flange nut, align spindle indentation and crimp nut. After installing speed sensor, ensure gap between rotor teeth and sensor pole piece is .008-.028" (0.20-0.71 mm).

REAR DISC BRAKE PADS

NOTE: Replace inner and outer pads at same time.

Removal

Raise and support vehicle. Remove rear wheel(s), and disconnect parking brake cable. Remove lower lock pin bolt. Lift caliper body upward. Using a wire, support caliper from underbody. Remove inner shim(s), anti-squeak shim and pad assembly from support mounting. Remove pad clips.

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Rotate piston to align notches in piston projection on back of pads (if equipped). Install retaining clips, pad assembly, inner shim(s) and anti-squeak shim onto support mounting. Lower caliper body, and install lock pin.

REAR BRAKE CALIPER

Removal

Raise and support vehicle. Remove rear wheel(s). Disconnect parking brake cable connection. Disconnect brake hose from caliper. Secure end of hydraulic line to prevent spillage of brake fluid. Remove upper and lower caliper mounting bolts. Lift caliper body upward. Remove caliper.

Installation

To install, reverse removal procedure. Tighten bolts to specification. See TORQUE SPECIFICATIONS table. Bleed brake system. See BLEEDING BRAKE SYSTEM.

REAR BRAKE ROTOR

Removal & Installation

Raise and support vehicle. Remove rear caliper and rotor. To install, reverse removal procedure.

REAR BRAKE DRUM & SHOES

Removal (Colt, Colt 200, Colt Vista, Expo/Expo LRV, Mirage, Summit & Summit Wagon)

1) Raise and support vehicle. Remove rear hub (dust) cap and nut. See Fig. 11. On type No. 1 drums, remove outer wheel bearing and hub/brake drum assembly. On type No. 2 drums, remove brake drum assembly. On both brake types, remove shoe retainer spring, shoe-to-shoe spring and shoe hold-down spring.

2) Disconnect parking brake cable from lever. Remove brake shoes with adjuster spring as an assembly, and separate adjuster spring from brake shoes. Remove parking brake lever snap ring, and disengage lever from brake shoe.

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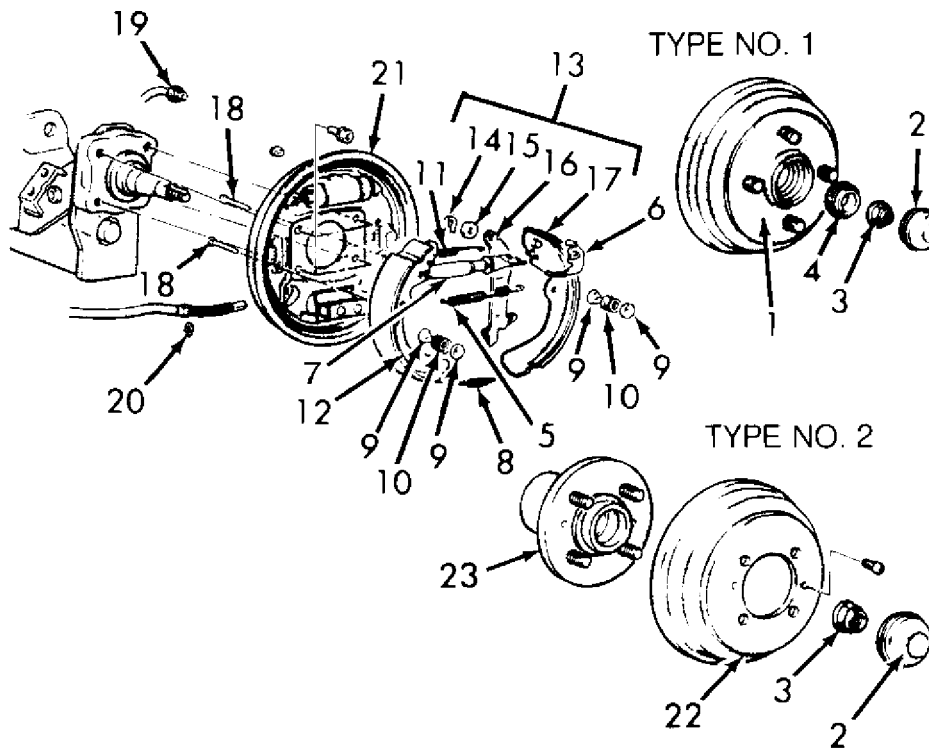
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- | | |
|-----------------------------|---------------------------------|
| 1. Drum & Hub Assembly | 13. Shoe, Lining & Pin Assembly |
| 2. Hub Cap | 14. Retainer |
| 3. Wheel Bearing Nut | 15. Wave Washer |
| 4. Outer Bearing Inner Race | 16. Parking Lever |
| 5. Shoe-To-Lever Spring | 17. Shoe & Lining Assembly |
| 6. Adjuster Lever | 18. Shoe Hold-Down Pins |
| 7. Auto Adjuster Assembly | 19. Brake Tube |
| 8. Retainer Spring | 20. Snap Ring |
| 9. Shoe Hold-Down Cups | 21. Backing Plate |
| 10. Shoe Hold-Down Springs | 22. Drum |
| 11. Shoe-To-Shoe Springs | 23. Hub Assembly |
| 12. Shoe & Lining Assembly | |

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Fig. 11: Exploded View Of Rear Brake Assembly (Colt, Colt 200, Colt Vista, Expo/Expo LRV, Mirage, Summit & Summit Wagon)
Courtesy of Mitsubishi Motor Sales of America.

Installation

1) To install, reverse removal procedure. Apply Lubriplate to backing plate bosses, adjuster assembly threads and parking brake lever pin.

2) Set adjustment assembly so brake shoes lightly contact brake drum. Depress brake pedal to center shoes, and check pedal travel. Rotate brake drum to ensure free movement.

Removal (Galant)

1) Raise and support vehicle. Remove rear hub (dust) cap, cotter pin, lock cap and wheel bearing nut. See Fig. 12. Remove washer and outer wheel bearing. Remove hub/brake drum assembly. Remove shoe

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retainer spring, shoe-to-shoe spring and shoe hold-down spring.

2) Remove retainers, washer and adjuster lever. Remove washer and shoe assembly. Disconnect parking brake cable from lever. Remove parking brake lever snap ring, and disengage lever from brake shoe.

Installation

1) To install, reverse removal procedure. Apply Lubriplate to backing plate bosses, adjuster assembly threads and parking brake lever pin.

2) Before installing brake drum, set shoe outer diameter to 7.96-7.97" (202.2-202.4 mm). Install brake drum. Reverse removal procedure for remaining components.

3) When installing wheel bearing nut, tighten it to 14 ft. lbs. (19 N.m). Rotate brake drum a few times to seat bearing. Loosen nut, and retighten it to 84 INCH lbs. (9.5 N.m) while rotating brake drum. Install lock cap and cotter pin. Wheel bearing nut may be backed off a maximum of 15 degrees to align cotter pin holes.

Removal (Pickup & Ram-50)

1) Raise and support vehicle. Remove wheel and brake drum. Remove shoe return spring and brake shoe adjuster. See Fig. 13. Remove adjusting spring, shoe retaining spring and shoe hold-down pins.

2) Remove shoe and lining assembly with parking brake lever. Remove cable from parking lever. Remove parking brake lever snap ring, and disengage lever from brake shoe.

Installation

1) To install, reverse removal procedure. Apply Lubriplate to backing plate bosses, adjuster assembly threads and parking brake lever pin.

2) Set adjustment assembly so brake shoes lightly contact brake drum. Depress brake pedal to center shoes, and check pedal travel. Rotate brake drum to ensure free movement.

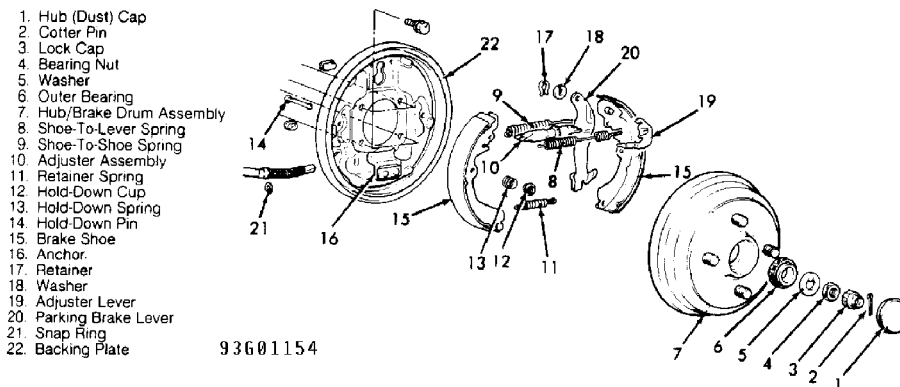


Fig. 12: Exploded View Of Rear Brake Assembly (Galant)
Courtesy of Mitsubishi Motor Sales of America.

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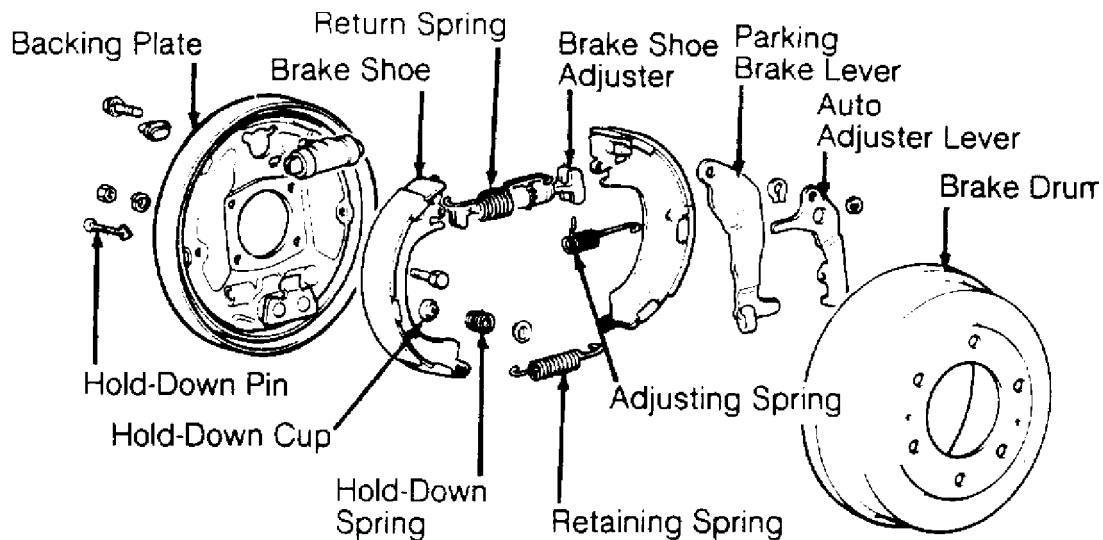
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Fig. 13: Exploded View Of Rear Brake Assembly (Pickup & Ram-50)
Courtesy of Mitsubishi Motor Sales of America.

WHEEL CYLINDERS

Removal & Installation

Raise and support vehicle. Remove rear brake drum and shoes. See REAR BRAKE DRUM & SHOES. Remove wheel cylinder and seal assembly. To install, reverse removal procedure. Bleed brakes.

MASTER CYLINDER

Removal

Drain brake fluid from master cylinder. Remove sensor connector (if equipped). Disconnect brakelines from master cylinder, and install plugs to prevent brake fluid spillage. Remove master cylinder from booster unit, and separate reservoirs from housing (if necessary).

Installation

To install, reverse removal procedure. Before installation, check and adjust clearance between back of master cylinder piston and power brake push rod. Refer to MASTER CYLINDER PUSH ROD under ADJUSTMENTS. After installation is complete, adjust pedal height. Refer to BRAKE PEDAL HEIGHT & FREE PLAY under ADJUSTMENTS. Bleed brake system. Refer to BLEEDING BRAKE SYSTEM.

POWER BRAKE UNIT

Removal

Remove brake master cylinder. Disconnect vacuum hose from power brake unit. Disconnect clevis pin attaching brake pedal to power brake unit push rod. From inside vehicle, remove 4 nuts attaching power brake unit to firewall. Remove power brake unit.

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Installation

To install, reverse removal procedure. Install master cylinder. Bleed brake system if necessary.

POWER BRAKE UNIT CHECK VALVE

NOTE: To test check valve before removal, stop engine and apply service brake to ensure air flows toward intake manifold only.

Removal & Installation

Remove vacuum hose with check valve from power brake unit. Loosen hose clamp(s) and remove check valve from hose on Colt, Colt 200, Mirage and Summit. On all models, coat end(s) of check valve with sealant before installation. Install valve with arrow (identification mark) pointing toward intake manifold. Install and secure hose clamp(s).

REAR AXLE BEARINGS & OIL SEAL

Removal (Montero, Pickup & Ram-50)

1) With disc or drum removed, disconnect brakeline from wheel cylinder. Disconnect parking brake cable end, and remove cable attaching bolts. Remove brake backing plate, bearing case and axle shaft as an assembly. If axle shaft binds, use slide hammer and puller to remove.

2) Remove shims, "O" ring and snap ring. Retain shims for installation. Secure axle shaft assembly in a vise, and remove one retainer bolt from backing plate. Push bearing case completely to side of dust cover. Place adhesive tape around edge of bearing case at retainer bolt hole to prevent damage.

CAUTION: DO NOT damage bearing case or axle shaft when grinding or chiseling retainer ring.

3) Secure axle shaft, and grind retainer ring until retainer ring wall thickness is .04-.06" (1.0-1.5 mm) on axle shaft side and .08" (2.0 mm) on bearing side. See Fig. 14.

4) Change angle of grind, and remove remaining .08" (2.0 mm) of retainer ring wall on bearing side. See Fig. 14. Using a chisel, cut retainer ring. Remove ring. DO NOT damage axle shaft.

5) Install Puller (MB990787-01) to remove bearing case from axle shaft. Rotate nuts with equal force to remove wheel bearing. Remove bearing outer race using a hammer and drift. Remove oil seal from axle housing using a slide hammer and hook.

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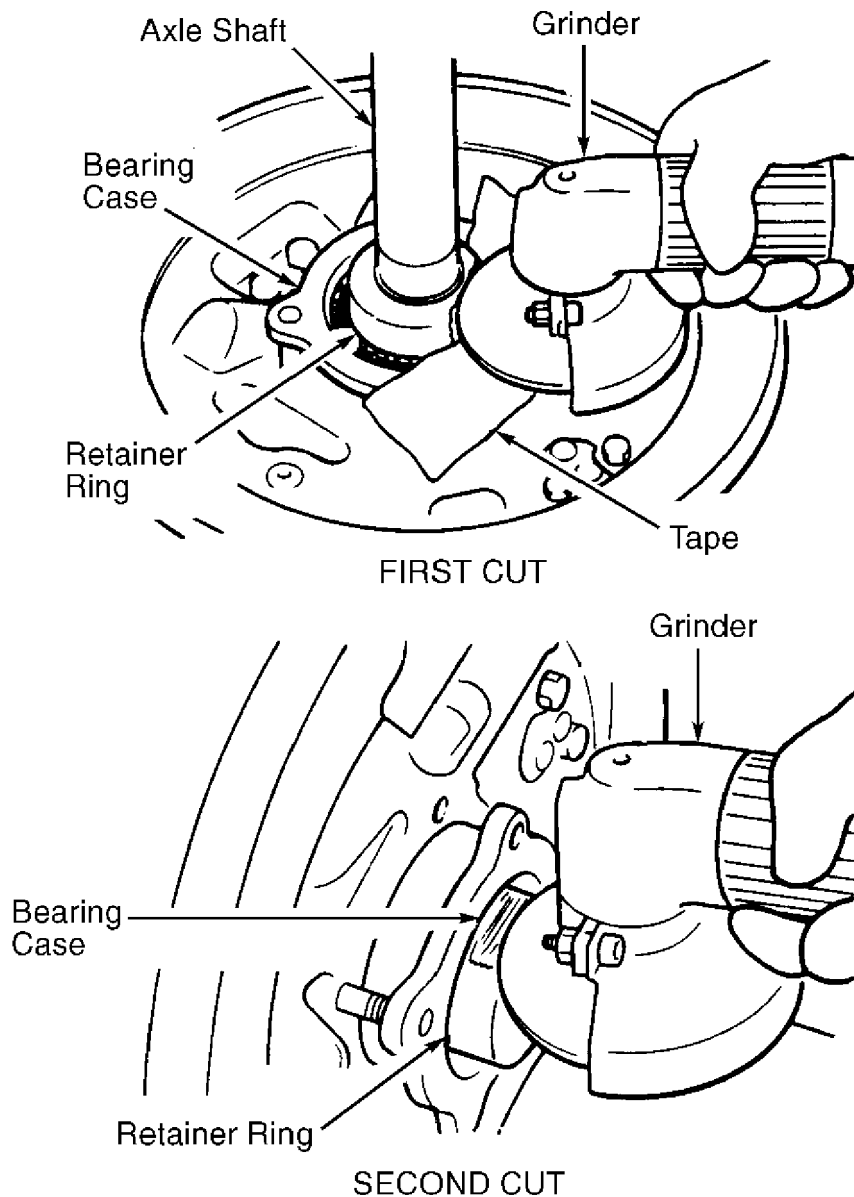
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Fig. 14: Grinding Bearing Retainer Ring (Montero, Pickup & Ram-50)
Courtesy of Mitsubishi Motor Sales of America.

Installation

1) Apply Multipurpose Grease (SAE J310) to oil seal, oil seal cavity and contact surfaces. Install oil seal using seal driver. Press new oil seal into bearing case until it is flush with face of bearing case. Install backing plate and bearing case.

2) Apply grease to external surfaces of bearing outer race. Press bearing outer race into bearing case. Install rear brake assembly and bearing case. Pack bearing case and axle threads with grease. Install new retainer ring and snap ring.

3) Using a feeler gauge, measure clearance between snap ring and new retainer ring. Clearance should be less than .0065" (.166 mm).

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If clearance exceeds specification, install a new snap ring to bring clearance to specification. See SNAP RING THICKNESS SPECIFICATION table.

SNAP RING THICKNESS SPECIFICATION TABLE

Thickness In. (mm)	Color
.060 (1.52)	Red
.067 (1.70)	Purple
.073 (1.85)	Blue
.079 (2.01)	Yellow
.085 (2.16)	Neutral

4) Adjust clearance between bearing case and rear axle by inserting .04" (1.0 mm) shim and "O" ring into left rear axle housing. Apply semi-drying sealant to mating surface of bearing case. See Fig. 15. Install left axle shaft into rear housing, and tighten nuts diagonally to 36-43 ft. lbs. (49-58 N.m).

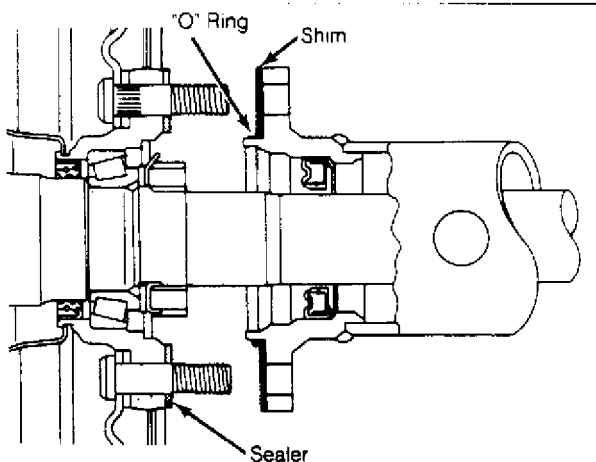


Fig. 15: Applying Sealant (Montero, Pickup & Ram-50)
Courtesy of Mitsubishi Motor Sales of America.

5) Install right axle shaft without shims and "O" ring. Temporarily tighten axle shaft nuts to about 53 INCH lbs. (6 N.m). Using a feeler gauge, measure clearance between bearing case and rear axle housing.

6) Remove right axle shaft. Install shims to equal bearing case-to-axle housing clearance plus .002-.008" (.05-.20 mm). Install "O" ring to right rear axle housing. Apply sealant to mating surface of bearing case. See Fig. 15.

7) Install axle into housing, tightening nuts diagonally to 36-43 ft. lbs. (49-58 N.m). Check axle shaft for .002-.008" (.05-.20 mm) end play using dial indicator. If end play is not within specification, change shims to obtain correct end play. To install remaining components, reverse removal procedure. Adjust parking brake,

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and bleed brake system. See BLEEDING BRAKE SYSTEM.

REAR AXLE HUB BEARINGS

Removal (Galant)

Raise vehicle, and remove wheel(s). Remove hub (dust) cap, cotter pin, lock cap and bearing nut. See Fig. 12. Remove washer and outer wheel bearing. Remove hub/drum assembly. Pry off inner seal, and remove inner bearing.

Installation

Reverse removal procedure. Tighten wheel bearing nut to 14 ft. lbs. (19 N.m), and then rotate brake drum a few times to seat bearing. Loosen nut, and retighten it to 84 INCH lbs. (9.5 N.m) while rotating brake drum. Install lock cap and cotter pin. Wheel bearing nut may be backed off a maximum of 15 degrees to align cotter pin holes.

Removal & Installation (Colt, Colt 200, Colt Vista, Expo/Expo LRV, Mirage, Summit & Summit Wagon)

1) Raise and support vehicle. Remove rear hub (dust) cap and nut. See Fig. 11. On type No. 1 drums, remove outer wheel bearing and hub/brake drum assembly. On type No. 2 drums, remove brake drum and hub assembly. On both brake types, press inner bearing and race out of hub assembly.

2) To install, reverse removal procedure. Press inner bearing and seal into hub assembly. Tighten wheel bearing nut to specification. See WHEEL BEARING NUT SPECIFICATIONS table. Rotate brake drum to ensure free movement.

WHEEL BEARING NUT SPECIFICATIONS TABLE

Application	Ft. Lbs. (N.m)
Colt, Colt 200, Mirage & Summit	108-145 (146-197)
Colt Vista & Summit Wagon	145-188 (197-255)
Expo/Expo LRV	166 (225)

OVERHAUL

NOTE: For exploded views of front disc brake calipers, see Figs. 16 and 18. For exploded views of rear brake calipers, see Figs. 19 and 20. For exploded view of master cylinder, see Fig. 17.

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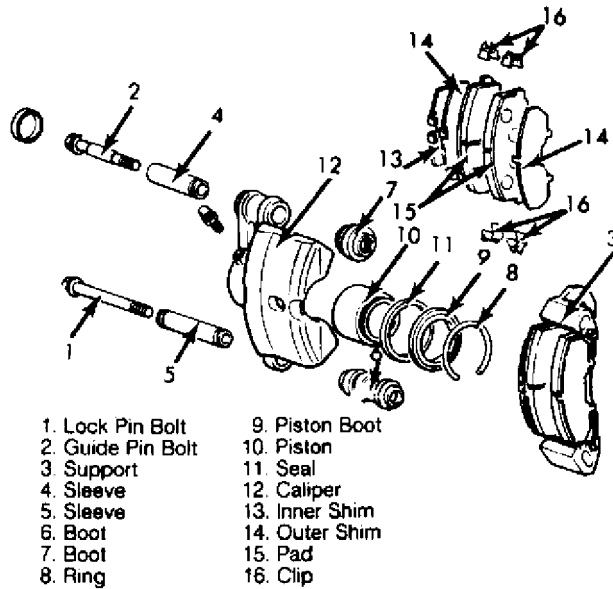


Fig. 16: Exploded View Of Front Disc Brake Assembly (Typical Single Piston)
Courtesy of Chrysler Motors.

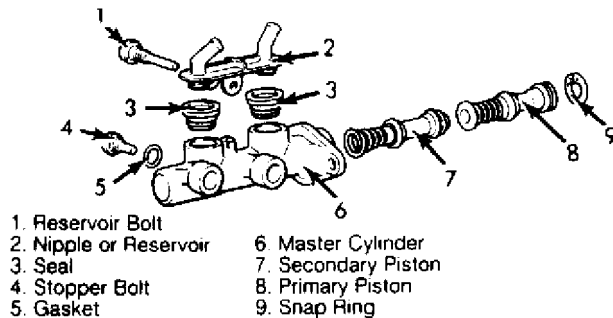


Fig. 17: Exploded View Of Master Cylinder (Typical)
Courtesy of Mitsubishi Motor Sales of America.

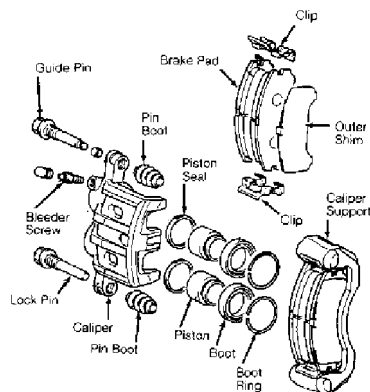


Fig. 18: Exploded View Of Front Disc Brake Caliper (Typical Dual Piston)
Courtesy of Mitsubishi Motor Sales of America.

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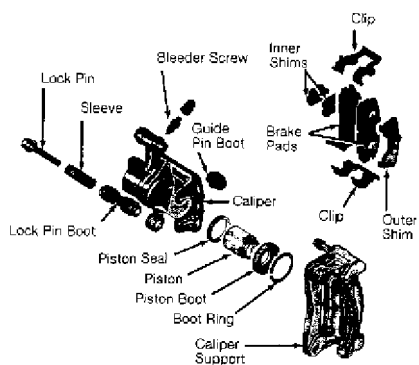


Fig. 19: Exploded View Of Rear Disc Brake Caliper Assembly
(Diamante, Montero, Stealth & 3000GT)
Courtesy of Mitsubishi Motor Sales of America.

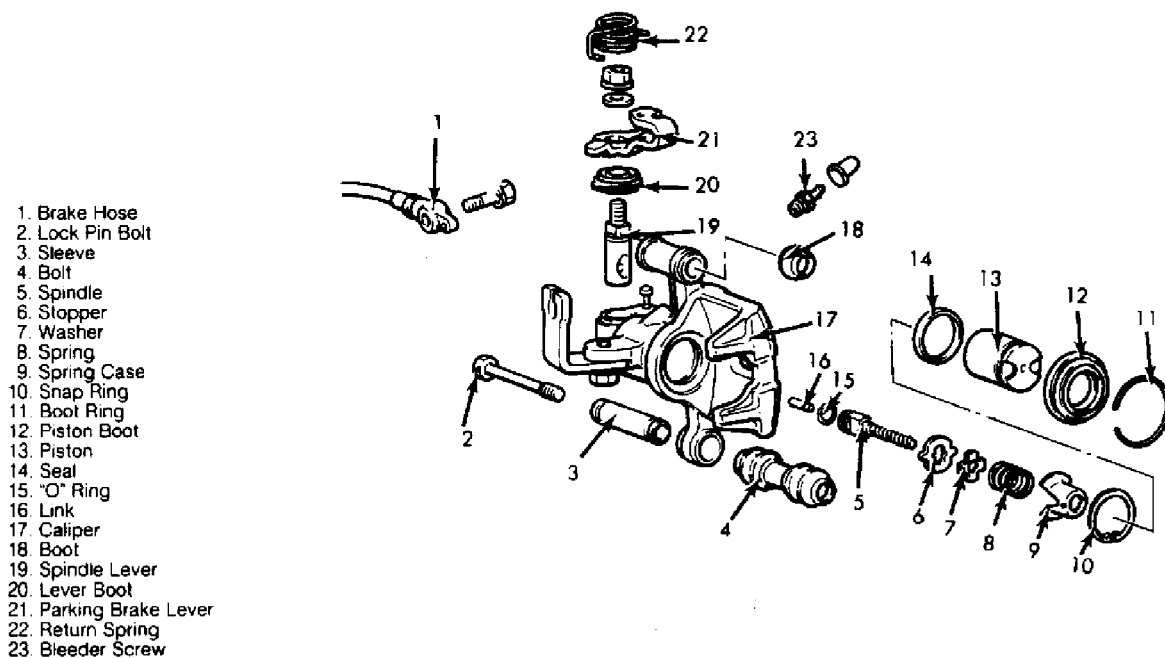


Fig. 20: Exploded View Of Rear Disc Brake Caliper Assembly
(Eclipse, Galant & Mirage)
Courtesy of Mitsubishi Motor Sales of America.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS TABLE

Application	Ft. Lbs. (N.m)
Caliper Guide Or Lock Pin Bolt	
Colt, Colt 200 & Summit	27-36 (37-49)
Diamante, Stealth & 3000GT	

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Front	54 (73)
Rear	20 (27)
Eclipse & Galant	46-62 (62-84)
Expo/Expo LRV	54 (73)
Mirage	
Front	
1.5L	27-36 (37-49)
1.6L	46-62 (62-84)
Rear	16-23 (22-31)
Montero, Pickup & Ram-50	
Guide Pin Bolt	29-36 (39-49)
Lock Pin Bolt	23-30 (31-41)
Colt Vista & Summit Wagon	
Front	54 (73)
Rear	32 (43)
Caliper Mounting Bolts	
Except Expo/Expo LRV	
Front	58-72 (79-98)
Rear	36-43 (49-58)
Expo/Expo LRV	65 (88)
Companion Flange Nut	
Eclipse 4WD & Galant 4WD	116-159 (157-216)
Front Wheel Bearing Nut	
FWD	144-188 (195-254)
RWD & 4WD	(1)
Rear Wheel Bearing Nut	
Colt, Colt 200, Mirage & Summit	108-145 (146-197)
Except Colt, Colt 200, Mirage & Summit	(1)
Rotor-To-Hub Bolts Or Nuts	
Except Pickup 2WD	36-43 (49-58)
Pickup 2WD	34-38 (46-52)
Wheel Lug Nut	
Colt, Colt 200, Colt Vista, Diamante, Expo/Expo LRV, Galant, Mirage, Summit & Summit Wagon	65-80 (88-108)
Eclipse, Pickup, Ram-50, Stealth & 3000GT	87-101 (118-137)
Montero	72-87 (98-118)
	INCH Lbs. (N.m)
Master Cylinder-To-Power Brake Unit Nut	
Diamante	84 (10)
Except Diamante, Stealth & 3000GT	72-108 (8-12)
Stealth & 3000GT	120 (14)

(1) - See REAR AXLE HUB BEARINGS under REMOVAL &
INSTALLATION or FRONT BRAKE ROTOR under REMOVAL
& INSTALLATION.

DISC BRAKE SPECIFICATIONS

DISC BRAKE SPECIFICATIONS TABLE

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Application	In. (mm)
Disc Diameter	
Colt, Colt 200, Mirage 1.5L & Summit	
Solid Disc	9.2 (234)
Ventilated Disc	9.3 (236)
Colt Vista, Eclipse, Galant, Mirage 1.6L & Summit Wagon	
Front	10.1 (257)
Rear	10.4 (264)
Diamante	
Front	10.9 (277)
Rear	10.5 (267)
Expo/Expo LRV	10.1 (257)
Montero	9.0 (229)
Pickup & Ram-50	
2WD	10.2 (259)
4WD	10.9 (277)
Stealth & 3000GT	
2WD	9.0 (229)
4WD	
Front	9.8 (249)
Rear	9.4 (239)
Lateral Runout	
Colt Vista, Diamante, Eclipse,	
Expo/Expo LRV, Galant & Summit Wagon .....	.003 (.08)
All Other Models .....	.006 (.15)
Parallelism	(1)
Original Thickness	
Colt, Colt 200, Mirage 1.5L & Summit	
Solid Disc .....	.51 (12.9)
Ventilated Disc .....	.71 (18.0)
Colt Vista, Eclipse, Expo/Expo LRV,	
Galant, Mirage 1.6L & Summit Wagon	
Front .....	.94 (23.9)
Rear .....	.39 (9.9)
Diamante	
Front .....	.94 (23.9)
Rear .....	.71 (18.0)
Montero, Pickup & Ram-50 .....	.87 (22.1)
Stealth & 3000GT	
Front	
2WD .....	.94 (23.9)
4WD	1.18 (30.0)
Rear	
2WD .....	.71 (18.0)
4WD .....	.79 (20.1)
Master Cylinder Diameter	
Colt, Colt 200, Mirage 1.5L & Summit	
Hatchback875 (22.23)
Sedan813 (20.65)
Colt vista, Expo/Expo LRV, Mirage 1.6L,	

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Montero, Pickup, Ram-50 & Summit Wagon	.938	(23.83)
Diamante	1.000	(25.40)
Eclipse		
Non-Turbo	.875	(22.23)
Turbo		
2WD	.938	(23.83)
4WD	1.000	(25.40)
Galant		
2WD		
DOHC	.938	(23.83)
SOHC	.875	(22.23)
4WD	1.000	(25.40)
Minimum Refinish Thickness		
Colt, Colt 200, Mirage 1.5L & Summit		
Hatchback	.45	(11.4)
Sedan	.65	(16.5)
Colt Vista, Diamante & Summit Wagon		
Front	.88	(22.4)
Rear	.65	(16.5)
Eclipse, Galant & Mirage 1.6L		
Front	.88	(22.4)
Rear	.33	(8.4)
Expo/Expo LRV	.94	(23.9)
Montero, Pickup & Ram-50	.80	(20.3)
Stealth & 3000GT		
Front		
2WD	.88	(22.4)
4WD	1.12	(28.5)
Rear		
2WD	.65	(16.5)
4WD	.72	(18.3)
Discard Thickness		
Colt, Colt 200, Mirage 1.5L & Summit		
Hatchback	.44	(11.2)
Sedan	.64	(16.3)
Colt Vista, Diamante & Summit Wagon		
Front	.87	(22.1)
Rear	.64	(16.3)
Eclipse, Galant & Mirage 1.6L		
Front	.87	(22.1)
Rear	.32	(8.1)
Expo/Expo LRV	.88	(22.4)
Montero, Pickup & Ram-50	.78	(19.8)
Stealth & 3000GT		
Front		
2WD	.87	(22.1)
4WD	1.11	(28.2)
Rear		
2WD	.64	(16.3)
4WD	.71	(18.0)

(1) - Information is not available.

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DRUM BRAKE SPECIFICATIONS

DRUM BRAKE SPECIFICATIONS TABLE

Application	In. (mm)
Drum Diameter	
Colt, Colt 200, Mirage & Summit	7.1 (180)
Colt Vista, Expo/Expo LRV & Summit Wagon	
8" Drum	8.0 (203)
9" Drum	9.0 (229)
Galant	8.0 (203)
Pickup & Ram-50	10.0 (254)
Drum Width	(1)
Master Cylinder Diameter	(2)
Maximum Refinish Diameter	
Colt, Colt 200, Mirage & Summit	7.2 (183)
Colt Vista, Expo/Expo LRV & Summit Wagon	
8" Drum	8.1 (206)
9" Drum	9.1 (231)
Galant	8.1 (206)
Pickup & Ram-50	10.1 (257)
Wheel Cylinder Diameter	
Colt, Colt 200, Mirage & Summit	.750 (19.10)
Colt Vista, Expo/Expo LRV & Summit Wagon	(1)
Galant	.690 (17.50)
Pickup & Ram-50	
2WD	.937 (23.80)
4WD	.875 (22.23)
Drum Discard Diameter	
Colt, Colt 200, Mirage & Summit	7.22 (183.4)
Colt Vista, Expo/Expo LRV & Summit Wagon	
8" Drum	8.12 (206.2)
9" Drum	9.12 (231.6)
Galant	8.12 (206.2)
Pickup & Ram-50	10.12 (257.0)

(1) - Information is not available.

(2) - See DISC BRAKE SPECIFICATIONS.

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