CHRYSLER CORP. IMPORTS

Arrow
Arrow Pickup
Challenger
Champ
Colt
D50 Pickup
Sapporo

DESCRIPTION

Brake system is hydraulically operated using tandem master cylinder, proportioning valve to control braking action and vacuum power brake unit. Arrow, Champ and Colt Hatchback models are equipped with pin caliper type front disc brakes, all other models are equipped with sliding caliper front disc brakes. Rear brakes are duo-servo drum on Arrow and D50 pickups and leading/trailing drum on all other models except Arrow with 2600 cc engine. Arrow with 2600 cc engine rear brakes are sliding caliper disc (optional on Challenger and Sapporo). All service brake systems are self-adjusting. Parking brake is cable actuated to rear brake system on all models.

ADJUSTMENT

PEDAL HEIGHT & FREE PLAY

Back off stop light switch. Adjust pedal height (distance from top of pedal to floor board) to specification by loosening lock nut and rotating master cylinder push rod (yoke, if equipped). DO NOT depress push rod. Tighten lock nut and ensure brake pedal free play is .4-.6" (10-15 mm) on all models.

STOP LIGHT SWITCH

On Champ and Colt Hatchback models, loosen lock nut and adjust switch-to-pedal arm clearance to .01-.04" (.5-1 mm). Tighten lock nut. On all other models, adjust stop light switch until it just contacts brake pedal lever. DO NOT depress master cylinder push rod during stop light switch adjustment.

Pedal Height Specifications

Application	Pedal Height In. (mm)
Arrow	
Man. Trans.	6.4 (163)
Auto. Trans.	6.5 (165)
Challenger, Sapporo & Colt Station Wagon	6.9 (175)
Champ & Colt Hatchback	7.1-7.3 (180-185)
Arrow & D50 Pickup	6.5 (165)

PARKING BRAKE

Arrow (Exc. Rear Disc) – Remove parking brake lever cover and fully release brake lever. Adjust nut (underside of lever) until lever-to-stop clearance is .008-.08" (.2-2 mm) and stroke is 5-7 notches at 44 lbs. force.

Challenger, Sapporo (Exc. Rear Disc) & Colt Sta. Wgn. – 1) Release parking brake lever and ensure that rubber hanger-to-bracket clearance (at rear axle) is .2-.6" (5-15 mm). Then loosen cable attaching bolt and adjusting nut for left wheel. Move cable lever to the right and adjust clearance between extension lever and stopper on left wheel to .1" (2.5 mm) or less.

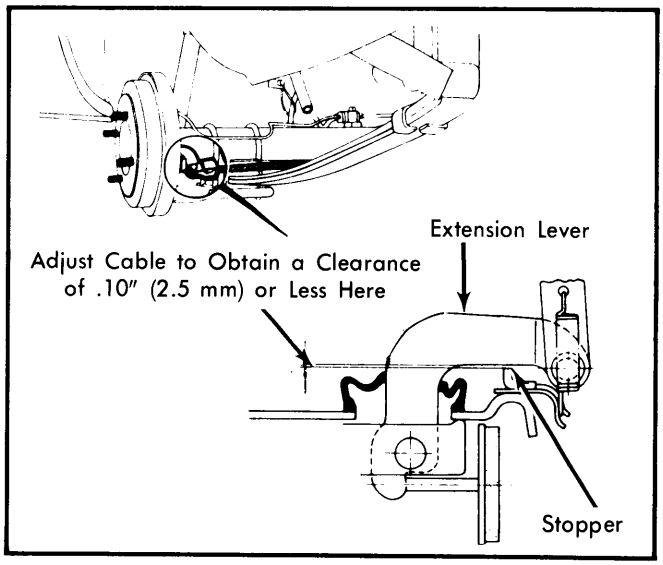

Fig. 1 Adjusting Parking Brake on Challenger, Sapporo and Colt St. Wgn.

2) With left cable adjusted, turn adjusting nut until the same clearance is obtained on right wheel extension lever. With parking brake properly adjusted, lever stroke should be 4-6 notches at 44 lbs. force.

Arrow, Challenger & Sapporo (W/Rear Disc) – Fully release parking brake lever and depress brake pedal twice. Loosen adjusting nut at center of rear axle housing (brake lever on Arrow). Adjust cable so rear wheel drag is 23 lbs. (10 kg) or less after brake pedal is depressed, measured with spring pull scale. Parking brake lever stroke should be 5-7 notches at 44 lbs. force.

Champ & Colt Hatchback – Remove parking brake lever cover and release brake lever. Adjust both cables to equal lengths, allowing enough slack in cables to prevent brake shoe drag. Properly adjusted parking brake lever stroke should be 6-7 notches at 44 lbs. force.

Arrow & D50 Pickups – Service brake adjustment must be accurate before making parking brake adjustment. Fully release parking brake and allow slack in rear cable to prevent brake shoe drag. Set balancer-to-crossmember clearance to 8" (203 mm) by adjusting turnbuckle. Balancer must be parallel with center line of vehicle. Brake lever stroke should be 16-17 notches at 66 lbs. force.

NOTE – *If parking brake lever stroke is larger than specified after adjustment for all models, automatic adjuster is malfunctioning.*

PROPORTIONING VALVES

Different types of proportioning valves are used between models. However, pressure testing is similar on all models. The following are special descriptions that apply by model:

Arrow, Challenger, Colt Sta. Wgn. & Sapporo – Valve accomplishes three functions: Pressure control of rear service brakes; deactivating rear brake pressure control when front

CHRYSLER CORP. IMPORTS (Cont.)

service brakes fail; trouble warning. Model application is identified by color dot on valve body:

- Black – Challenger and Sapporo with rear disc.
- White – Arrow with rear disc and Colt Sta. Wgn.
- None – Arrow, Challenger and Sapporo with rear drum brakes.

Champ & Colt Hatchback – Valve body contains two separate proportioning valves. Valve body is identified with "A70" stamped on plug.

Arrow & D50 Pickup – Valve accomplishes two functions: Improves braking efficiency by distributing braking force to front and rear wheels; increases braking force to rear wheels when large braking force is required or front brakes fail.

Pressure Test – Performed using two pressure gauges that measure at least 1500 psi. Hook one gauge to master cylinder rear side and one to rear wheel cylinder. Pressure readings should be as shown in chart. Replace defective part as required. DO NOT disassemble proportioning valve.

NOTE – *The proportioning valve on Champ and Colt Hatchback models contains two valves; each must be tested separately.*

Brake Hydraulic Pressure Chart (psi)

Application	Wheel Cyl. Pressure	Master Cyl. Pressure
Challenger & Sapporo W/Rear Disc	674	853
Arrow W/Rear Disc & Colt Sta. Wgn.	531	711
Arrow, Challenger & Sapporo W/Rear Drum	460	640
Champ & Colt Hatchback	496-525	853
Pickups	437-493	711

Warning Light Test – To test warning light (if equipped), loosen bleeder screw of one wheel cylinder and depress brake pedal; warning light should come on. If not, check switch and wire connector.

Proportioning Valve Reset (Exc. Champ, Colt Hatchback & Pickups) – After repairs on brake system, bleed brake lines. With all lines bled and bleeder valves secured, depress brake pedal hard. This will center valve and warning light should go out.

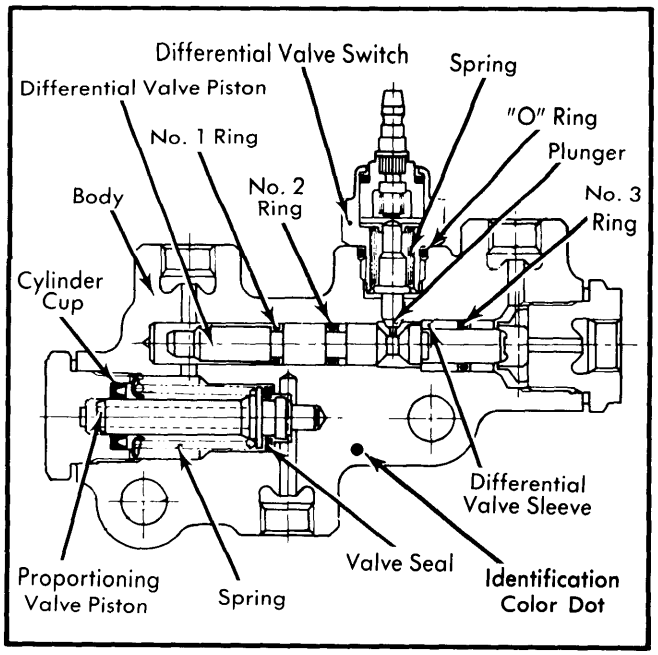

Fig. 2 Sectional View of Proportioning Valve Arrow, Challenger, Sapporo & Colt Sta. Wgn.

REMOVAL & INSTALLATION

FRONT DISC BRAKE PADS

Removal (Arrow, Champ & Colt Hatchback) – Raise and support vehicle. Remove front wheel. Remove protector by prying up edge of clip at center of protector. Hold center of "M" clip, detach "M" clip from pad and its ends from retaining pins; remove clip. Remove retaining pins from caliper and remove "K" spring. Remove pads and anti-squeal springs from caliper by grasping backing plate area of pads with pliers.

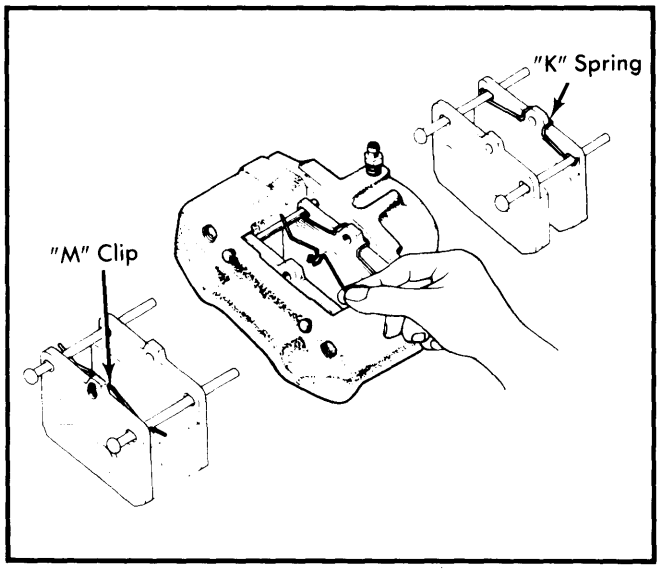

Fig. 3 Installing Spring and Clip on Brake Pads (Arrow, Champ and Colt Hatchback)

CHRYSLER CORP. IMPORTS (Cont.)

NOTE – *Replace all pads (left and right side) at same time.*

Installation – Press piston to bottom of bore using a suitable tool, install disc pads and retaining pins. Install "K" spring and "M" clip, making sure positions are not reversed. *See Fig. 3.* Install pad protector with retaining clips on inner side of caliper (Champ and Colt) and on outer side of caliper (Arrow).

Removal (All Others) – Raise and support vehicle. Remove front wheel. Remove retaining clip and pull out stopper plug. Loosen caliper assembly mounting bolts. Pull caliper assembly up and down in a diagonal manner and remove from mounting bracket. Remove inner and outer pad clips, then pull pads and anti-squeal shims from caliper support.

Installation – To install, reverse removal procedure and note the following: Press piston to bottom of caliper bore prior to pad installation. Ensure pad retaining clips are installed as shown in *Fig. 4*.

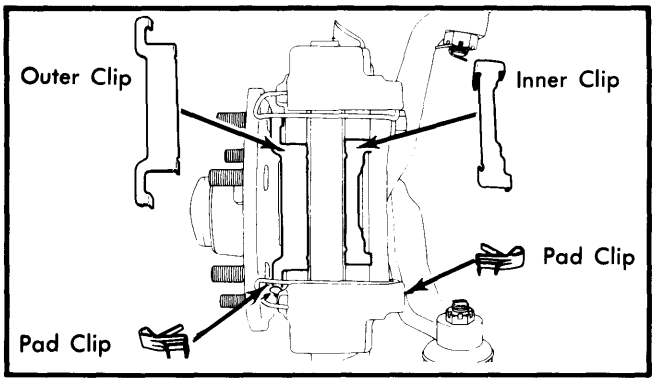

Fig. 4 Installing Pad Retaining Clips on Front Disc Brakes of Challenger, Sapporo, Colt Sta. Wgn. & Pickups

FRONT DISC BRAKE CALIPER

Removal (Arrow, Champ & Colt Hatchback) – Remove disc pads. Disconnect hydraulic line and remove bolts attaching caliper assembly to steering knuckle. Remove caliper assembly.

Installation – Reverse removal procedure, tighten caliper mounting bolts evenly and bleed hydraulic system.

Removal (All Others) – Remove disc pads. Pull out hose clip from strut area, then disconnect brake hose from caliper. Remove caliper.

Installation – To install, reverse removal procedure, tighten caliper mounting bolts evenly and bleed brake system.

FRONT DISC BRAKE ROTOR

Removal – With caliper assembly removed, remove hub dust cap, cotter pin, locknut (if used) and adjusting nut. On Champ and Colt Hatchback, remove drive shaft from hub with suitable puller. On all models, pull hub and rotor assembly from spindle using care not to drop outer wheel bearing. Remove hub-to-rotor attaching bolts and separate rotor from hub.

Installation – To install, reverse removal procedures and tighten hub-to-rotor bolts evenly. Bleed hydraulic system if necessary and adjust wheel bearings. *See Wheel Bearing Adjustment in WHEEL ALIGNMENT Section.*

REAR DISC BRAKE PADS

Removal – **1)** Raise and support vehicle. Remove rear wheels. Remove caliper assembly dust cover. Disconnect parking brake cable from caliper.

2) Remove retaining pin and pull out stopper plug. Remove caliper assembly from rotor. Pull pads from caliper support.

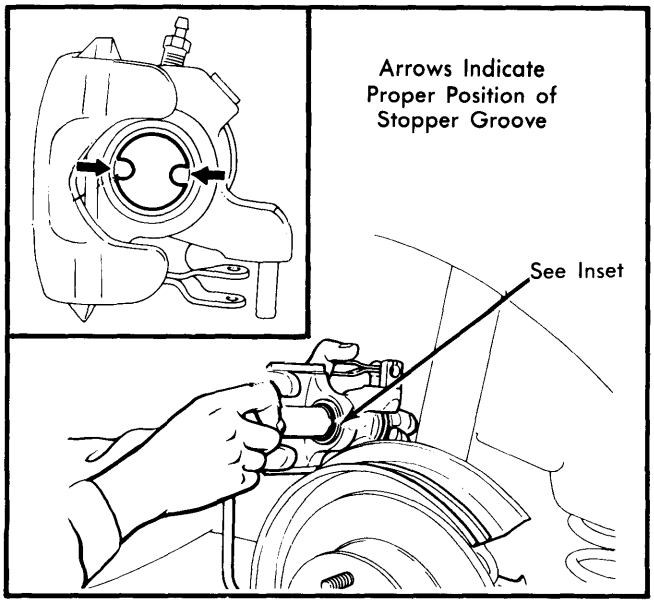

Fig. 5 Positioning of Piston Stopper Groove on Rear Disc Brakes

Installation – To install, reverse removal procedure and note the following: Press the piston into its original position with clockwise rotation using a suitable driver. Ensure piston stopper groove is positioned as shown in *Fig. 5* so projection on back of pad will securely fit groove. Pad clips must be installed properly.

NOTE – *DO NOT use screwdriver to push piston into original position.*

REAR DISC BRAKE CALIPER

Removal – Remove disc pads. Pull out hose clip from axle housing and disconnect brake hose from caliper assembly. Remove clevis pin connecting lever assembly to parking brake cable. Remove caliper assembly.

Installation – To install, reverse removal procedure and bleed brake system.

REAR DISC BRAKE ROTOR

Removal – Remove disc pads. Remove caliper support-to-axle housing bolts. Remove caliper support. Remove rotor from axle shaft.

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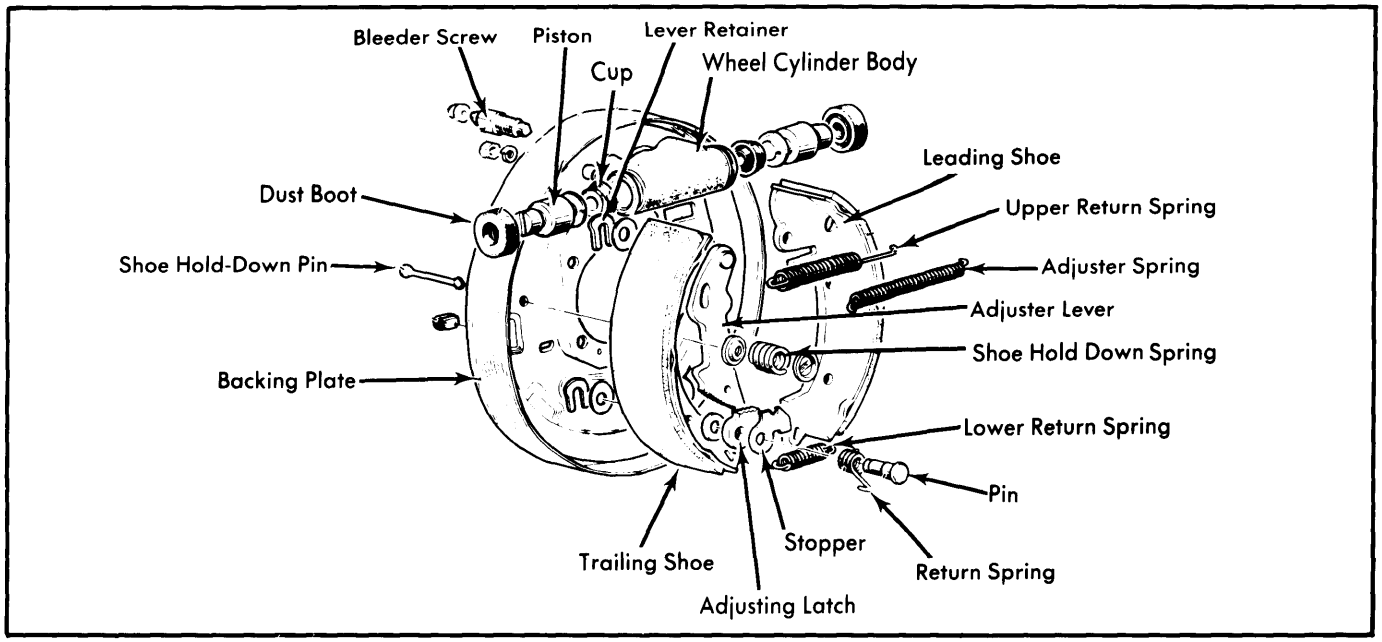

Fig. 6 Exploded View of Rear Brake Assembly for Component Relationship (Arrow, Challenger, Sapporo & Colt Sta. Wgn.)

Installation – To install, reverse removal procedure and tighten bolts evenly.

REAR BRAKE SHOES

Removal – Raise and support vehicle. Remove brake drum and complete the following by model:

- Champ & Colt Hatchback – Remove clip spring, shoe return spring and hold down spring. Remove shoes and adjuster as an assembly and separate. Remove parking brake cable from lever.
- Pickups – Remove return springs, adjusting spring and lever. Remove shoes and adjuster as an assembly and separate. Remove parking brake cable from lever.
- All Other Models – Remove hold down springs. Disconnect strut-to-shoe spring and upper shoe return spring end from trailing shoe. Remove trailing shoe and lower return spring. Hold adjuster latch down, pull adjusting lever toward center of brake and remove leading shoe assembly. Remove upper shoe return spring and strut-to-shoe spring.

Installation – **1)** Reverse removal procedure and note the following: Apply brake grease to all shoe contact points, adjuster assembly, wheel cylinder and parking brake lever pin. Adjust amount of engagement of adjusting lever with strut, only after pulling lever fully toward center of brake. Note that adjusting lever and latch spring differ between right and left sides.

2) Champ and Colt Hatchback models require check of parking brake cable to ensure it will not advance brake lever when released. Adjuster will malfunction if lever advances.

3) Pickups require check of adjuster after installation is complete. Adjuster lever should mesh with next tooth of adjuster when pulled and return to original position after wheel has moved one tooth. Adjuster assemblies differ between right and left sides.

MASTER CYLINDER

Removal – Remove sensor connector (if equipped). Disconnect brake lines from master cylinder. Slowly depress brake pedal several times to drain fluid from cylinder housing. Remove master cylinder from booster unit and separate reservoirs from housing.

Installation – Reverse removal procedure, check and adjust clearance between back of master cylinder piston and power brake push rod prior to installation. Clearance should be 0-.03" (0-.75 mm) on all models. Check and adjust pedal height and bleed hydraulic system after installation.

POWER BRAKE UNIT CHECK VALVE REPLACEMENT

NOTE – *Before removal, test check valve. Pull off vacuum hose, place finger over check valve and crank engine; vacuum should be created.*

Removal – Remove hose clamps from both ends of check valve. Remove check valve clamp and remove check valve.

Installation – Coat both ends of check valve with sealer and install valve with arrow (identification mark) pointing toward intake manifold side. Install check valve clamp, vacuum hoses and secure hose clamps.

CHRYSLER CORP. IMPORTS (Cont.)

OVERHAUL

FRONT DISC BRAKE CALIPER

Disassembly (Arrow, Champ & Colt Hatchback) – Remove caliper attaching bridge bolts. Separate inner and outer caliper halves and remove torque plate. Remove retaining ring and dust seal. Apply compressed air to fluid inlet to remove piston. Remove piston seal without damaging caliper bore or seal groove.

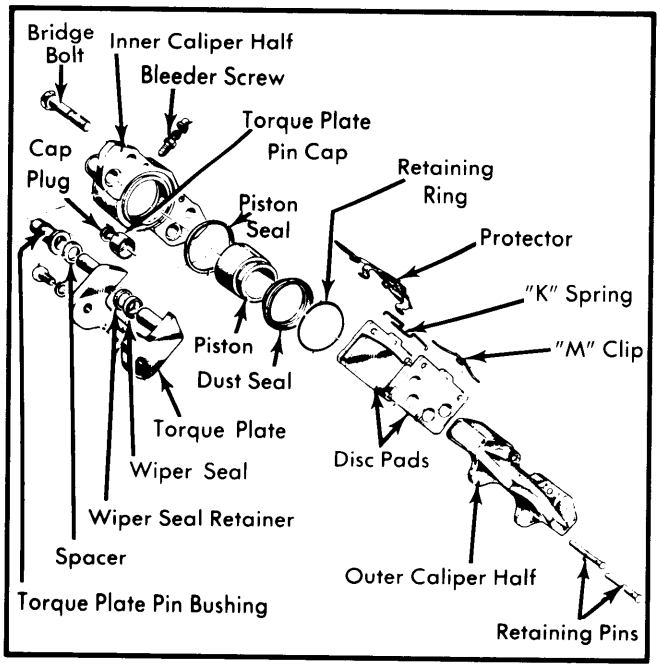

Fig. 7 Disassembled View of Disc Brake Caliper (Arrow, Champ & Colt Hatchback)

Cleaning & Inspection – Clean all metal parts in trichloroethylene, alcohol or brake fluid; clean piston seal in brake fluid or alcohol; clean dust seal and other rubber parts in alcohol only. Inspect caliper bore and piston for wear, damage or rust; replace parts as necessary. Always replace piston seal and dust seal.

NOTE – *Repair kits contain proper lubricants to be used during reassembly.*

Reassembly – Reverse disassembly procedure and note the following: Apply rubber grease to piston seal and brake fluid to piston when reassembling. If torque plate was removed from inner caliper half, clean torque plate shaft and shaft bore in caliper, then apply special rubber grease to rubber bushing, wiper seal inner surface, and torque plate shaft before reassembly. Tighten bridge bolts of caliper halves evenly.

NOTE – *Possible cause of increased pedal stroke is: Insufficient fit between piston and piston seal. Correct by manually levering piston to seat several times. This will create a better fit between piston and seal. Make sure brake pad is removed during this procedure.*

Disassembly (All Others) – Remove dust boot. Apply compressed air to fluid inlet to remove piston. Remove piston seal without damaging caliper bore or seal grooove.

Cleaning & Inspection – Clean all metal parts in trichloroethylene, alcohol or brake fluid; clean piston seal in alcohol or brake fluid; clean dust boot and other rubber parts in alcohol only. Inspect caliper bore and piston for wear, damage or rust; replace parts as necessary. Always replace piston seal and dust boot.

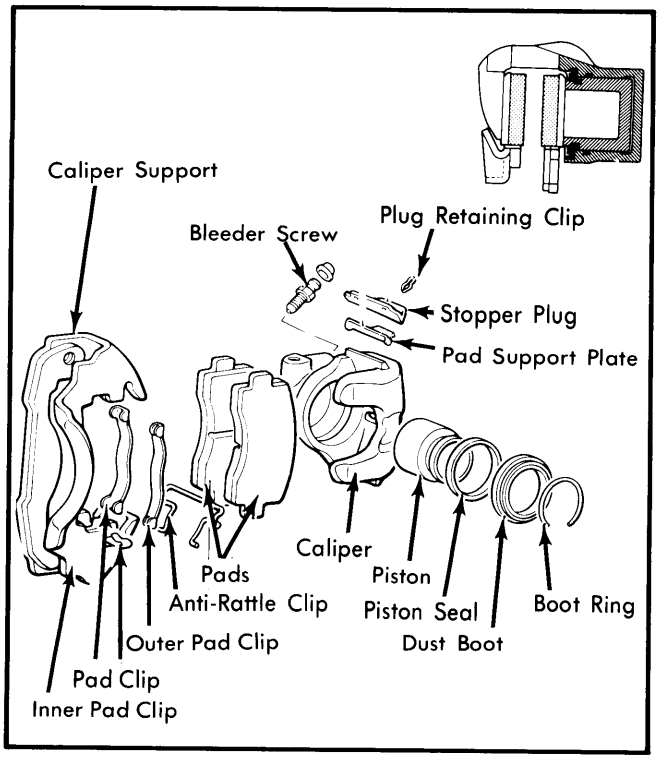

Fig. 8 Exploded View of Front Disc Brake Caliper (Challenger, Sapporo, Colt Sta. Wgn. & Pickups)

Reassembly – Coat piston seal with suitable rubber grease. Slide seal into groove in cylinder bore. Slip piston into bore making sure seal is not twisted. Lightly coat dust seal groove with recommended rubber grease. Fit dust boot into place. Refit cylinder to caliper.

REAR DISC BRAKE CALIPER

Disassembly – **1)** Remove cap ring and take off lever cap. *See Fig. 9.* Remove retaining ring and spring, then pull out lever assembly. Slightly rotate automatic adjuster spindle, using pliers if necessary, and pull out assembly.

2) Using suitable bearing remover tool (MB990665), pull bearings from caliper. Take off piston boot. Working through vacant area created by adjuster spindle removal, force piston out of caliper. Use a blunt tool to push out piston. Remove piston seal without damaging caliper bore or seal groove.

Cleaning & Inspection – **1)** Clean all metal parts in trichloroethylene, alcohol or brake fluid; clean piston seal and adjuster seal in alcohol or brake fluid; clean piston boot and other rubber parts in alcohol only. Check cylinder and piston for wear, damage or rust; replace worn parts as necessary. Always replace piston seal, adjuster seal and piston boot.

CHRYSLER CORP. IMPORTS (Cont.)

2) Check bearings, connecting link, springs, adjuster spindle and lever assembly for wear, damage or rust. Check lever assembly for excessive play between shaft and bearing. Check staking of piston inner sleeve stopper plate. Ensure piston-to-automatic adjuster spindle clearance is .013-.017" (.33-.43 mm).

Reassembly – **1)** Lightly coat piston seal and piston with lubricant. Slide piston and seal into place, ensuring seal does not twist in groove. Lubricate boot and slide boot into position making sure it engages groove in cylinder bore.

NOTE – *Repair kit includes recommended lubricants.*

2) Using suitable bearing installation tool (MB990665), press in bearings until ends are flush with caliper body. Make sure mark on end of bearing faces out.

3) Coat automatic adjuster seal with recommended grease. Fit adjuster spindle and hardware in place until spindle turns freely. Make sure spring faces proper direction.

4) Press in connecting link spring washers with suitable tool (MB990666). Fit automatic adjuster spindle into place (spindle is not a press fit). Insert connecting link and lever assembly.

5) Fill lever cap with Niglube RX-2 (or equivalent), making sure all areas have significant amount of grease. Lightly grease stopper plug and caliper sliding surface. Assembly is ready for installation.

MASTER CYLINDER

Disassembly – Remove dust boot, retaining ring, stop washer and piston stop bolt. Withdraw primary piston assembly, secondary piston assembly and secondary return spring from master cylinder. Remove check valve caps, tube seats, check valves and check valve springs. Champ and Colt Hatchback master cylinders are equipped with two identical check valves.

NOTE – *DO NOT disassemble primary piston assembly.*

Cleaning & Inspection – Check master cylinder bore and piston for wear or other damage and replace as necessary. Check clearance between cylinder bore and piston; if clearance exceeds .006" (.15 mm), replace parts as necessary. Check all parts of primary and secondary piston assemblies and piston cups and springs; if any parts are found defective, replace components as assemblies.

Reassembly – Reverse disassembly procedure and note the following: Apply rubber grease to all parts (except boots) before reassembly. When assembled, check that return port is not blocked by piston cup when piston is located at return position.

NOTE – *Check valves differ between rear disc and rear drum models. Ensure correct check valve is properly installed.*

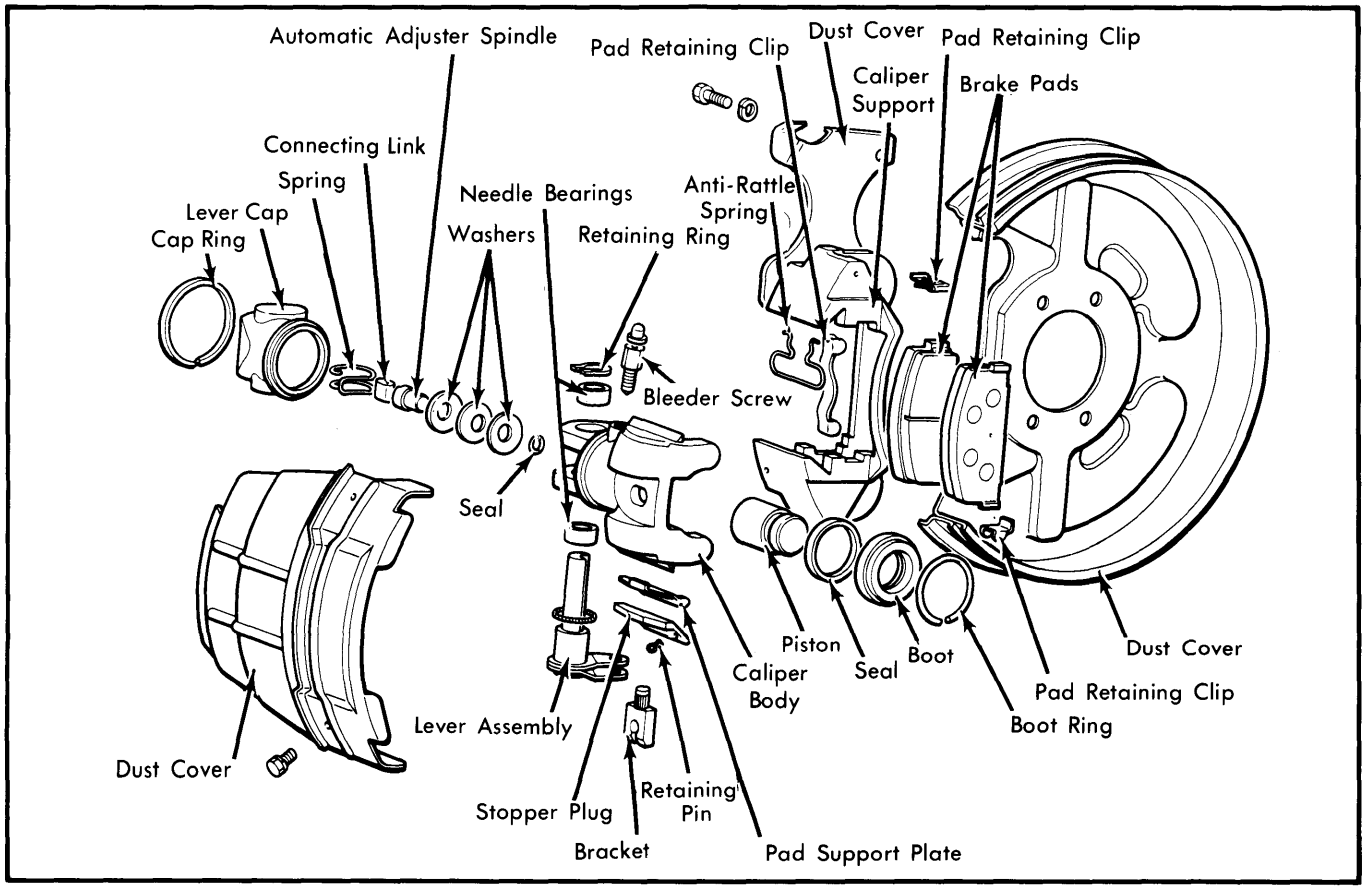

Fig. 9 Exploded View of Rear Disc Brake Caliper Assembly

CHRYSLER CORP. IMPORTS (Cont.)

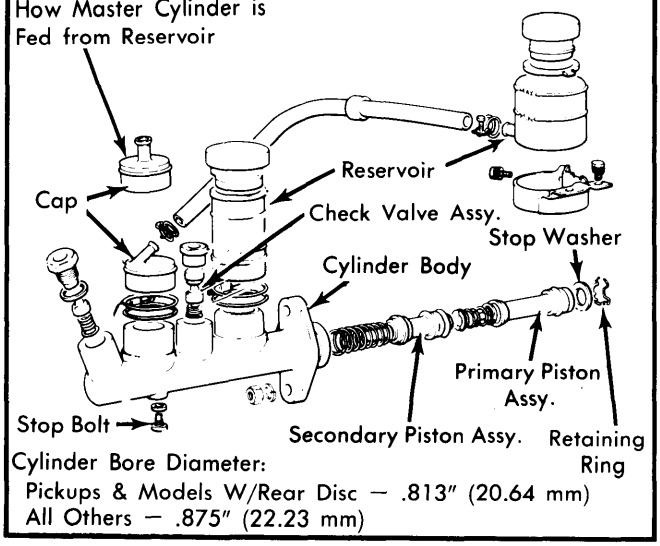

Fig. 10 Disassembled View of Master Cylinder

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs (mkg)
Rotor-to-Hub Bolts	
Champ & Colt Hatchback	29-36 (4.0-5.0)
Pickups	34-38 (4.5-5.0)
All Others	25-29 (3.5-4.0)
Caliper	
Adapter (Front)	
Challenger, Sapporo & Colt Sta. Wgn.	29-36 (4.0-5.0)
Torque Plate (Front)	
All Except Arrow, Champ & Colt Hatchback	51-65 (7.0-9.0)
Bridge Bolts (Front)	
Arrow, Champ & Colt Hatchback	58-69 (8.0-9.5)
Caliper Assembly	
Front	
Champ & Colt Hatchback	43-58 (6.0-8.0)
All Others	51-65
Rear (Support)	29-36 (4.0-5.0)

DRUM BRAKE SPECIFICATIONS

Application	Wheel Cyl. Bore Diameter In. (mm)	Drum Diameter In. (mm)	Original Diameter In. (mm)	Maximum Refinish Diameter In. (mm)	Discard Diameter In. (mm)
Arrow (With Rear Drum)	.750 (19.05)	9.00 (229.0)	9.00 (229.0)	.....	9.08 (230.6)
Champ & Colt Hatchback	.750 (19.05)	7.10 (180.3)	7.10 (180.3)	....	7.20 (182.0)
Pickups	.750 (19.05)	9.50 (241.3)	9.50 (241.3)	.....	9.58 (243.3)
All Others	.813 (20.7)	9.00 (229.0)	9.00 (229.0)	.....	9.08 (230.6)

DISC BRAKE SPECIFICATIONS

Application	Caliper Bore Diameter In. (mm)	Lateral Runout In. (mm)	Parallelism In. (mm)	Original Thickness In. (mm)	Minimum Refinish Thickness In. (mm)	Discard Thickness In. (mm)
Arrow (With Rear Drum)	.....	.006 (.15)	.....	.51 (13.0)	.....	.45 (11.4)
Champ & Colt Hatchback	2.01 (51.1)	.006 (.15)	.....	.51 (13.0)	.....	.45 (11.4)
Pickups	1.18 (30.0)	.006 (.15)	.....	.79 (20.1)	.....	.72 (18.4)
All With Rear Disc						
Front	.....	.006 (.15)	.....	.49 (12.5)	.....	.43 (11.0)
Rear	.....	.006 (.15)	.....	.39 (10.0)	.....	.33 (8.4)