

## COURIER

## Courier

## DESCRIPTION

Brake system is hydraulically operated using a tandem master cylinder and vacuum brake booster. Front brakes are single piston cylinder mounted in a caliper retaining bracket. Rear brakes are leading/trailing drum type. Brake system is protected by a pressure differential combination valve and warning light. If a leak occurs in front or rear brake system, or uneven fluid pressure develops; piston is moved off center activating the warning light. Light will remain on until problem is corrected.

## ADJUSTMENT

## PEDAL FREE PLAY

Loosen lock nut on master cylinder push rod at clevis. Turn push rod in or out to obtain .33-.39" (8.5-10.0 mm) free play, measured at pedal pad. When clearance is correct, tighten lock nut.

## FRONT DISC BRAKES

No adjustment is necessary.

## REAR DRUM BRAKES

**CAUTION** — Shoe-to-drum clearance must be made with brake drums at normal room temperature.

1) Rear brakes are self-adjusting and require manual adjustment only after brake shoes have been replaced or adjusting rod length has been changed. To adjust, raise rear of vehicle and support on safety stands. Release parking brake and remove adjusting hole plugs from rear of backing plate.

2) Insert screwdriver through hole, rotate star wheel in direction of arrow stamped on backing plate until wheel locks. Insert a pointed tool through hole and push adjusting lever off star wheel. Back off star wheel 3 or 4 notches until wheel rotates freely without drag. Test drive vehicle after adjustment to ensure equal brake action.

**NOTE** — Adjustment must be equal on both wheels.

## PARKING BRAKE CABLE

Adjust length of cable at equalizer so rear brakes are locked when parking brake lever is pulled out five to ten ratchet clicks ( $1\frac{5}{8}$ - $3\frac{1}{8}$ " ; 40.3-79.4 mm). After adjustment, operate parking brake several times and ensure wheels rotate freely when parking brake is released.

**NOTE** — Service brakes must be properly adjusted prior to adjusting parking brake.

## COMBINATION VALVE

**Combination Valve Reset** — Place ignition switch in "On" position. Depress brake pedal and piston will center itself. This will cause brake warning light to go out.

## HYDRAULIC SYSTEM BLEEDING

**NOTE** — Front and rear hydraulic systems are individual systems and are bled separately. Bleed longest line first on individual system being serviced.

**CAUTION** — Do not bleed hydraulic system through master cylinder stop screw.

1) To bleed secondary (rear) system, attach a bleeder tube to right rear brake cylinder and immerse opposite end of tube in a container partially filled with brake fluid. Open bleeder screw  $\frac{3}{4}$  turn, push brake pedal through full travel, close bleeder screw and return pedal. Continue operation until air bubbles are no longer seen in discharged fluid. Check master cylinder reservoir often; replace fluid as required.

**NOTE** — Left rear wheel cylinder does not have a bleeder screw. Left and right rear wheel cylinders are bled through bleeder on right wheel.

2) To bleed primary (front) system, repeat procedure at right front wheel; then left front wheel. When bleeding operation is completed, fill master cylinder reservoirs to within  $\frac{1}{4}$ " of top of reservoir. Centralize pressure differential valve.

## REMOVAL &amp; INSTALLATION

## DISC BRAKE PADS

**Removal** — Raise front of vehicle, support on safety stands and remove wheel. Remove locking spring clips and drive out stopper plates. Remove caliper body and anti-rattle spring from caliper bracket. Set caliper out of way; DO NOT allow caliper to hang from brake line. Remove disc pads and shims (if equipped). Note position of shims.

**NOTE** — All pads must be replaced at same time.

**Installation** — 1) Pull bleeder cap off caliper and attach a tube to bleed screw. Open bleed screw and seat piston in bore with "C" clamp. Tighten bleed screw and remove clamp.

2) Install new pads and shims (if required) when pad thickness has worn to .276" (7 mm). Install anti-rattle spring and caliper body. Apply light coat of grease to stopper plates. Install plates and spring clips. Install wheel. Check brake fluid level and test brakes for proper operation.

## FRONT DISC BRAKE CALIPER

**Removal** — Raise and support vehicle on safety stands; remove wheel. Remove clip at connection of flexible hose and brake line; separate and plug openings. Remove caliper bracket mounting bolts and remove entire assembly.

**Installation** — Reverse removal procedure, bleed brake system and centralize differential valve.

## BRAKE ROTOR

**Removal** — With caliper assembly removed, remove dust cap, cotter pin, adjusting cap, adjusting nut, thrust washer and outer bearing. Remove hub and rotor assembly from spindle. Remove hub-to-rotor bolts and separate.

## COURIER (Cont.)

**Installation** — Reverse removal procedure, tighten hub-to-rotor bolts securely and adjust wheel bearings. See *Wheel Bearing Adjustment* in *WHEEL ALIGNMENT* Section.

### BRAKE DRUM

**Removal** — Raise and support vehicle on safety stands; remove tire and wheel. Remove brake drum attaching screws and install them in tapered holes in brake drum. Turn screws in evenly to force drum away from wheel hub. Remove drum.

**Installation** — Align attaching screw holes with ones in wheel hub. Transfer screws to retaining position and tighten evenly. Install tire and wheel.

### BRAKE SHOES

**Removal** — With brake drum removed, remove brake shoe return springs, retaining springs and guide pins. Disconnect hand brake cable from lever. Remove brake shoes as an assembly and separate components.

**Installation** — 1) Apply brake grease to adjusting screw threads, contact surfaces of brake shoes and backing plate ledges. Attach parking brake lever to rear shoe with retaining clip. Hold shoe close to backing plate and install parking brake cable to lever.

2) Position both shoes on backing plate, insert adjuster assembly between shoes; ensure shoe slots are engaged in wheel cylinder pistons and adjuster assembly. Install guide pins, retaining springs and return springs. Install drum and adjust brakes.

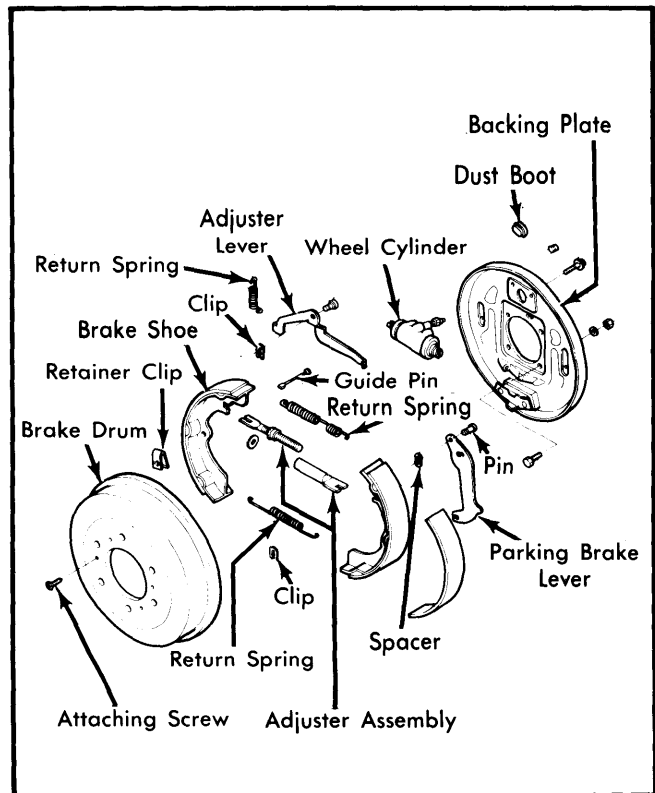


Fig. 2 Exploded View of Rear Brake Assembly

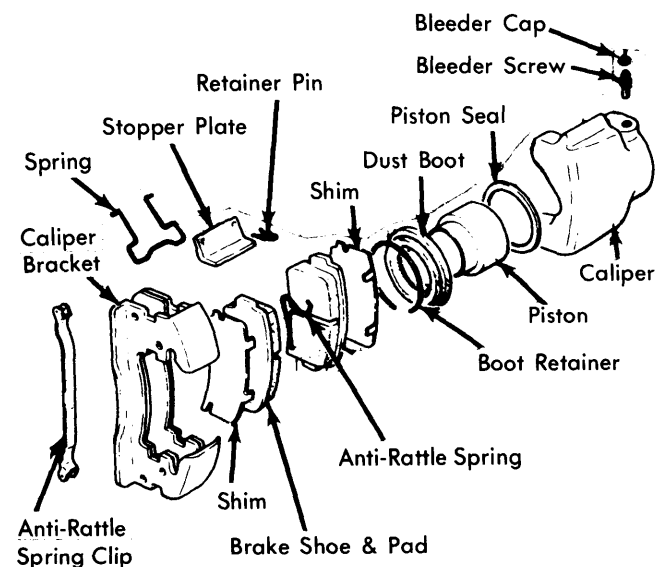


Fig. 1 Exploded View of Front Disc Brake

### WHEEL CYLINDER

**Removal** — With brake drum and shoes removed, disconnect hydraulic line from cylinder (two lines on left rear). Remove attaching bolts and remove wheel cylinder.

**Installation** — Reverse removal procedure, adjust brake shoes, bleed hydraulic system and centralize differential valve.

### MASTER CYLINDER

**Removal** — Disconnect brake hydraulic lines and reservoir lines; plug all openings. Remove master cylinder-to-brake booster mounting nuts. Lift master cylinder outward and upward away from booster and push rod.

**Installation** — Reverse removal procedure and carefully guide push rod into master cylinder piston. Bleed brake system and check pedal free play.

### COMBINATION VALVE

**Removal** — Disconnect warning light wire. Disconnect hydraulic lines from combination valve. Remove bolt mounting valve assembly and take off combination valve.

**Installation** — To install combination valve, reverse removal procedure and note the following: Bleed hydraulic system and reset piston in valve.

### POWER BRAKE BOOSTER

**Removal** — With master cylinder removed, disconnect vacuum line from booster. From inside vehicle, remove cotter pin attaching operating rod clevis to brake pedal, then remove mounting nuts from dash panel. Remove brake booster from engine compartment.

**Installation** — Reverse removal procedure, install master cylinder, bleed brake system, check pedal free play and ensure proper brake operation.

## COURIER (Cont.)

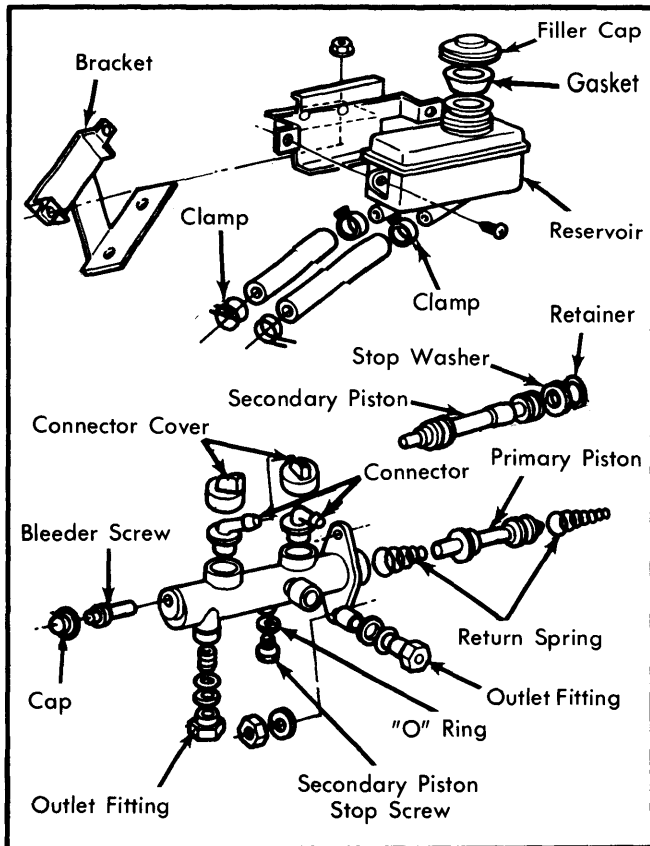


Fig. 3 Exploded View of Master Cylinder and Related Components

## OVERHAUL

## FRONT DISC BRAKE CALIPER

**Disassembly** – 1) Clean outside of caliper. Separate cylinder from bracket. Remove boot retainer and slide off dust boot. Force compressed air into brake line hole to remove piston from caliper.

2) It may be necessary to tap outside of piston housing with plastic hammer while applying air pressure to unseat piston. Dig out piston seal from inside caliper bore.

**Cleaning and Inspection** – Wash all disassembled parts in clean brake fluid and completely dry with compressed air. Inspect caliper bore and piston for scratches, grooves or rust. Minor imperfections can be eliminated with crocus cloth. Piston seal and dust boot must be replaced during each overhaul.

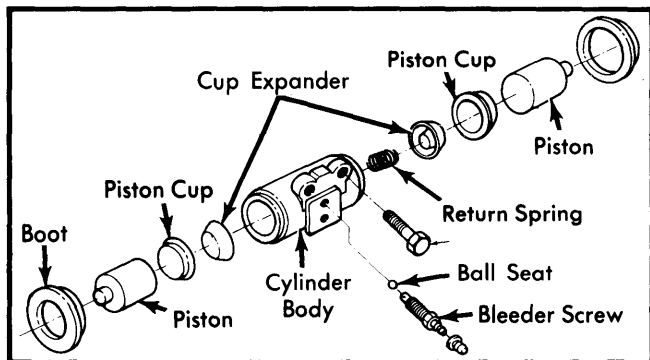


Fig. 4 Exploded View of Wheel Cylinder

**Reassembly** – Lightly coat piston seal with brake fluid and insert into groove in caliper bore. Make sure seal is not twisted in groove. Lubricate piston and bore with brake fluid, then slide piston into place. Fit dust boot with flange seated in inner groove of caliper. Fit dust boot retainer.

## REAR WHEEL CYLINDER

**Disassembly** – Remove pistons and boots and separate. Press in on either piston cup and force out piston cups, expanders and return spring.

**Cleaning & Inspection** – Wash all parts in isopropyl alcohol and check cylinder bore and pistons for wear or damage. Check cylinder bore-to-piston clearance; if greater than .006" (.15 mm), replace necessary part. Replace piston cups during overhaul.

**Reassembly** – Apply brake fluid to cylinder bore and piston cups. Place return spring between cup expanders, place cups against expanders and install into cylinder bore with flat side of cups facing outward. Install small lip of boot in piston groove, install piston in cylinder and seat large lip of boot in cylinder groove.

## MASTER CYLINDER

**Disassembly** – 1) Drain brake fluid from reservoir and separate reservoir from master cylinder inlet ports. Remove primary piston snap ring and stop washer. Slide out primary piston, return spring and cup from bore.

2) Loosen secondary piston stop screw. Push secondary piston into cylinder bore with a screwdriver and remove stop screw and "O" ring. Insert fabricated guide pin (See Fig. 5) into stop screw hole and release pressure on secondary piston. Remove secondary piston return spring and cup (using low pressure air if required). Remove brake line fittings, gaskets, check valves and springs.

**Cleaning & Inspection** – Clean all parts in isopropyl alcohol and dry with compressed air. Check cups for wear, cracks or deformation. Check cylinder bore and pistons for wear, roughness or scoring. Replace defective parts. Check cylinder bore-to-piston clearance; if greater than .006" (.15 mm), replace pistons.

**Reassembly** – 1) Apply brake fluid to pistons and cups. Install check valves and springs, gaskets and brake line fittings in outlet holes.

**NOTE** – Check valve with hole must be installed in outlet hole on side of master cylinder.

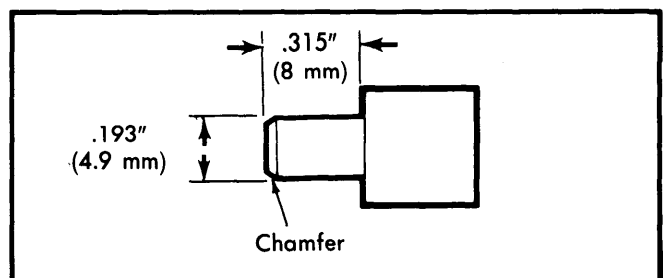
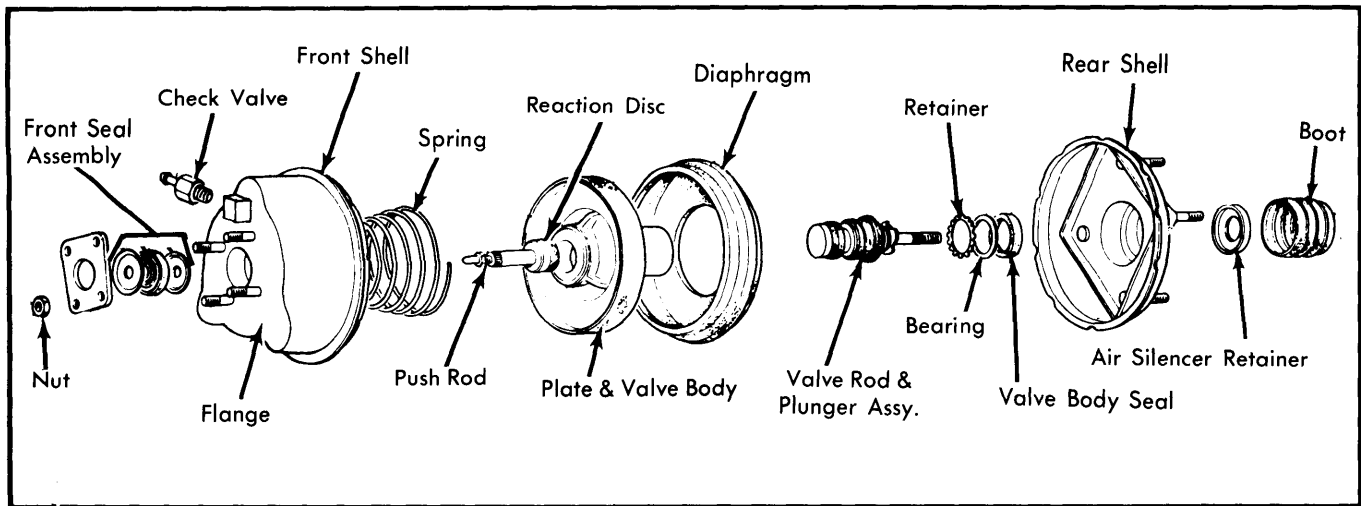


Fig. 5 Dimensions for Fabricating Guide Pin

## COURIER (Cont.)



**Fig. 6 Exploded View of Power Brake Booster**

2) Install secondary and primary cups to secondary piston. Insert fabricated guide pin into stop screw hole. Slide piston assembly and spring into cylinder; seat piston with screwdriver, remove guide pin and install stop screw and "O" ring. Release pressure on secondary piston.

3) Install cups to primary piston and insert piston assembly and spring into cylinder. Install washer and snap ring. Install reservoir and hoses to master cylinder.

### POWER BRAKE BOOSTER

**Disassembly** – 1) Fit booster in vise with rod facing up and scribe index mark on both shells. Remove lock nut, clevis and dust boot. Rotate shell clockwise, unlocking it from front shell. Lift off shell complete with:

- Diaphragm
- Power Piston Assembly
- Valve Rod
- Plunger Assembly

2) Remove spring from front shell. From inside rear shell remove:

- Diaphragm
- Power Piston Assembly
- Valve Rod
- Plunger Assembly

3) Remove rear seal, with punch, from rear shell only if seal needs replacing. Take out air silencer retainer and air filter from power piston. DO NOT damage piston.

4) Press in valve rod and remove retainer key. Take valve rod and plunger assembly off power piston. Press out reaction disc. Slide push rod out of front shell.

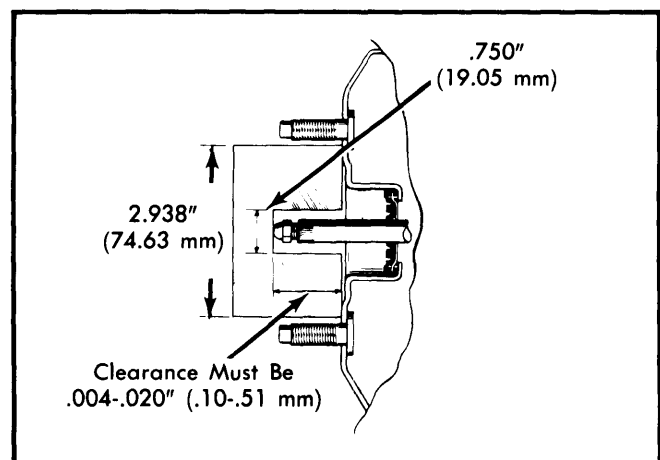
**Cleaning & Inspection** – Wipe parts clean and inspect rubber parts for cuts, nicks or deformation. Inspect power piston for cracks, chipping, distortion and damaged seats. Inspect reaction disc, valve rod and plunger assembly and shells for nicks, dents or other damage. Inspect diaphragm for cuts. Replace defective parts.

**Reassembly** – 1) Apply brake fluid to inside of power piston bore and to surface of valve rod and plunger assembly. Insert valve rod and plunger assembly into power piston. Press in valve rod and align plunger groove with slot in power piston. Insert retainer key.

2) Install diaphragm on power piston; diaphragm must be seated in piston groove. Install air silencer and filter over valve rod and insert in power piston. Coat reaction disc surface with brake fluid and install in power piston.

3) Coat outer edge of diaphragm and rear shell seal with brake fluid. Carefully guide tube end of power piston through rear shell seal. Install push rod to front of power piston. Install return spring in front shell. Position rear shell over front shell, press down and rotate counterclockwise until scribe marks align.

4) Install dust boot, clevis and lock nut. Check push rod clearance with fabricated gauge as shown in Fig. 7. Clearance should be .004-.020" (.10-.51 mm).



**Fig. 7 Adjusting Push Rod Clearance (Dimensions Shown for Making Gauge)**

# Brakes

## COURIER (Cont.)

BRAKE DRUM SPECIFICATIONS				
Application	Drum Diameter In. (mm)	Original Diameter In. (mm)	Maximum Refinish Diameter In. (mm)	Discard Diameter In. (mm)
Courier	10.236 (260)	10.236 (260)	10.276 (261)	.....

DISC BRAKE ROTOR SPECIFICATIONS						
Application	Disc Diameter In. (mm)	Lateral Runout In. (mm)	Parallelism In. (mm)	Original Thickness In. (mm)	Minimum Refinish Thickness In. (mm)	Discard Thickness In. (mm)
Courier	10.079 (256)	.004 (.10)	.....	.472 (12)	.433 (11)	.....

BRAKE SYSTEM SPECIFICATIONS				
Application	Drum Diam. In. (mm)	Wheel Cylinder Diameter		Master Cylinder Diameter In. (mm)
		Front In. (mm)	Rear In. (mm)	
Courier	10.236 (260)	①	.875 (22.2)	.875 (22.2)

① — Front disc brake cylinder bore 2.12" (53.8 mm).