SECTION 5C1

LEADING/TRAILING DRUM BRAKES

CAUTION: When servicing brake parts, do not create dust by grinding or sanding brake linings, or by cleaning brake parts with a dry brush or compressed air. Many brake parts contain asbestos fibers which can become airborne if dust is created during servicing. Breathing dust containing asbestos fibers may cause serious bodily harm. A water dampened cloth or water based solution should be used to remove any dust on brake parts. Equipment is commercially available to perform this washing function. These wet methods will prevent asbestos fibers from becoming airborne.

NOTICE: Always use the correct fastener in the proper location. When you replace a fastener, use ONLY the exact part number for that application. General Motors will call out those fasteners that require a replacement after removal. General Motors will also call out the fasteners that require thread lockers or thread sealant. UNLESS OTHERWISE SPECIFIED, do not use supplemental coatings (paints, greases, or other corrosion inhibitors) on threaded fasteners or fastener joint interfaces. Generally, such coatings adversely affect the fastener torque and joint clamping force, and may damage the fastener. When you install fasteners, use the correct sequence and tightening specifications. Following these instructions can help you avoid damage to parts and systems.

NOTICE: Avoid spilling brake fluid on any of the vehicle's painted surfaces, wiring cables or electrical connectors. Brake fluid will damage paint and electrical connections. If any fluid is spilled on the vehicle, flush area with water to lessen damage.

CONTENTS

GENERAL DESCRIPTION

The rear drum brake assembly is a leading/trailing design. The force which the wheel cylinder applies to the leading (front) shoe is multiplied by the lining friction against the rotating drum to provide a very large force applied to the trailing (rear) shoe. Torque from the brake shoes is transferred to the anchor pins, through the backing plate and to the axle housing flange.

When the brakes are applied, the wheel cylinder pistons move both shoes out to contact the drum with enough energy to overcome the rotation of the wheels, slowing and, with continued application, stopping the vehicle.

Adjustment for both the leading and trailing shoes and linings is automatic when the brakes are applied.

It is normal for the leading shoe to wear at a faster rate than the trailing shoe. Reinstall brake shoes in the same position they were removed from. Do not switch the position of shoes that have been in service as this may render the self-adjustment feature inoperative and result in increased pedal travel.

Important

- Replace all components included in repair kits used to service this drum brake system.
- Lubricate rubber parts with clean brake fluid to ease assembly.
- To prevent damage to rubber components, do not use lubricated shop air on brake parts.
- If any hydraulic component is removed or disconnected, it may be necessary to bleed all or part of the brake system.
- Replace shoes and linings in axle sets only.
- The torque values specified are for dry, unlubricated fasteners.
- Perform service operations on a clean bench free from all mineral oil materials.

CAUTION: When servicing brake parts, do not create dust by grinding or sanding brake linings, or by cleaning brake parts with a dry brush or compressed air. Many brake parts contain asbestos fibers which can become airborne if dust is created during servicing. Breathing dust containing asbestos fibers may cause serious bodily harm. A water-dampened cloth or water based solution should be used to remove any dust on brake parts. Equipment is commercially available to perform this washing function. These wet methods will prevent asbestos fibers from becoming airborne.

DIAGNOSIS

LINING INSPECTION

Inspect the brake linings every 10 000 km (6,000 miles) or whenever brake drums are removed. Brake linings should be inspected for cracks, chipping, glazing or uneven wear. All of these conditions could be signs of serious problems in the drum brake assembly. If any of these conditions are noted, brake shoes must be replaced and all components of the rear brakes must be inspected for the cause and further problems. Replace brake shoe whenever the thickness of lining is less than 3 mm (0.12 in.). Brake shoe and lining assemblies should always be replaced in axle sets.

DRUM INSPECTION

Pulsation in the brake pedal is usually corrected by servicing the front brakes; service the rear brakes only if the problem persists. To determine if the front or rear brakes are at fault, drive the vehicle at low speed in an area away from people and moving traffic (such as a large parking lot). Apply the parking brake and drive slowly forward for a short distance. Feel for the pulsation. If it is not noticed, the fault is probably in the front brakes.

Surface Finish

Whenever brake drums are removed, they should be thoroughly cleaned and inspected for cracks, scores, deep grooves, out-of-round and taper. Some minor surface wear is normal and will not affect brake operation. However, inside diameter should never exceed the following: 2-door models - 222 mm (8.740 in.); 4-door models - 256 mm (10.07 in.)

A cracked drum is unsafe for further use and must be replaced. Never attempt to weld a cracked drum. Smooth up any slight scores. Heavy or extensive scoring will cause excessive brake lining wear, and it may be necessary to resurface the drum braking surface.

If brake linings are to be replaced, always refinish a grooved drum. A grooved drum, if used with new lining, will wear the lining and make proper brake performance difficult to obtain.

If the brake linings are slightly worn (but to be reused) and the drum is grooved, polish the drum with fine emery cloth but do not refinish. Eliminating all grooves in the drum and smoothing the ridges on the lining would require removal of too much metal and lining, while if left alone, the grooves and ridges match and satisfactory service can be obtained.

Inside Diameter Check

Before refinishing a drum, measure the inside diameter. During refinishing, only enough metal should be removed to obtain a true, smooth braking surface. On 2-door models, if a drum will not true up when refinished to the maximum allowable inside diameter of 222 mm (8.740 in.), the drum must be replaced. On 4-door models, if a drum will not true up when refinished to the maximum allowable inside diameter of 256 mm (10.07 in.), the drum must be replaced If inside diameter exceeds maximum limits, proper heat dissipation will be adversely affected and may cause distortion of the drum.

Taper Check

An out-of-round or improperly tapered drum makes accurate brake shoe adjustment impossible and is likely to cause excessive wear of other parts of the brake mechanism due to its eccentric action. An out-of-round drum can also cause severe and irregular tire tread wear as well as a pulsating brake pedal. When the drum exceeds the specification limits of 0.01 mm (0.0004 in.) for out-of-round or 0.1 mm (0.004 in.) for taper, refinish the drum to true up the braking surface. If drum cannot be brought within specifications by refinishing, it must be replaced.

When measuring a drum for out-of-round, taper and wear, take measurements at the open and closed edges of the machined surface and at right angles to each other.

Runout Check

Runout is a low spot in the "roundness" of a drum. If runout exceeds maximum of 0.04 mm (0.0016 in.), drum must be replaced as improper stopping or pulsating brakes could result.

Balance

When brake drums are manufactured, they are balanced and weights are welded in place as required. Do not remove any of these weights. Balance of the drum can be usually be checked on a off-vehicle balancer. An out-of-balance drum must be replaced.

ON-VEHICLE SERVICE

DRUM

Figures 1 and 2

Remove or Disconnect

1. Release parking brake lever.
2. Raise and suitably support vehicle. Refer to SECTION 0A.
3. Rear wheel and tire assembly. Refer to SECTION 3E.
4. Backing plate rubber plug from backing plate.
5. Insert a screwdriver into plug hole and push adjuster strut lever and rotate adjuster strut wheel to obtain maximum brake shoe-to-drum clearance.
6. Pull drum from axle hub by insert two screws into drum (Figure 1).

Measure

Tool Required
J 21177-A Drum-to-Shoe Clearance Gage

- Brake drum inner diameter using a J 21177-A (Figure 2).
  - — On 2-door models, if inner diameter exceeds maximum specification of 222 mm (8.74 in.), the drum must be replaced.
  - — On 4-door models, if inner diameter exceeds maximum specification of 256 mm (10.07 in.), the drum must be replaced.

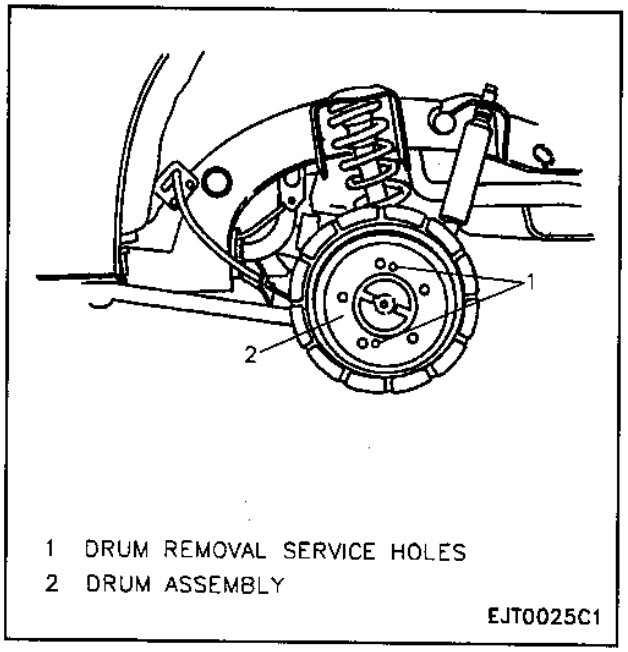

Figure 1—Removing Brake Drum

Install or Connect

1. Before installing drum, set the adjuster strut to maximize brake shoe-to-drum clearance.
2. Brake drum to rear brake assembly; make sure drum is free of dirt and oil.
3. Rear wheel and tire assembly. Refer to SECTION 3E.
4. Lower vehicle.
5. Depress brake pedal five times to obtain proper drum-to-shoe clearance.

Adjust

- Parking brake. Refer to SECTION 5F.

LININGS

Figures 1 and 3

CAUTION: When servicing brake parts, do not create dust by grinding or sanding brake linings, or by cleaning brake parts with a dry brush or compressed air. Many brake parts contain asbestos fibers which can become airborne if dust is created during servicing. Breathing dust containing asbestos fibers may cause serious bodily harm. A water-dampened cloth or water based solution should be used to remove any dust on brake parts. Equipment is commercially available to perform this washing function. These wet methods will prevent asbestos fibers from becoming airborne.

CAUTION: Keep fingers away from retractor spring to prevent fingers from being pinched between spring and shoe web or spring and backing plate.

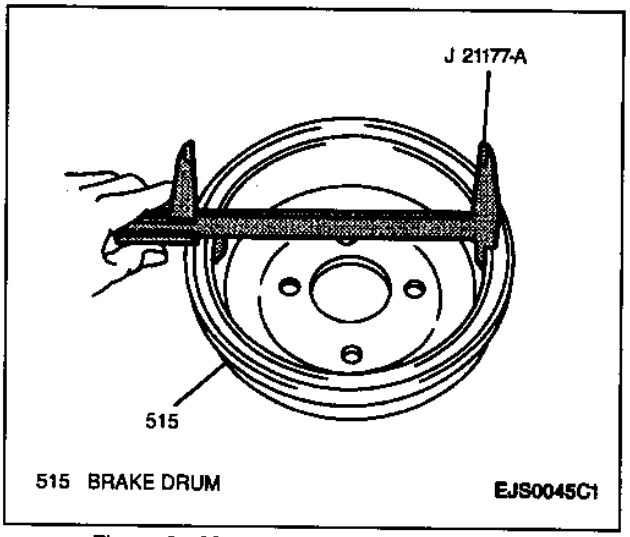

Figure 2—Measuring Drum Inner Diameter

1 WHEEL CYLINDER
2 BRAKE ADJUSTER STRUT LEVER
3 BRAKE ADJUSTER STRUT SPRING
4 SHOE HOLDDOWN SPRING
5 BRAKE SHOE LINING
6 LOWER SHOE RETURN SPRING
7 PARKING BRAKE SHOE LEVER
8 BRAKE ADJUSTER STRUT
9 UPPER SHOE RETURN SPRING
10 PARKING BRAKE LEVER C CLIP

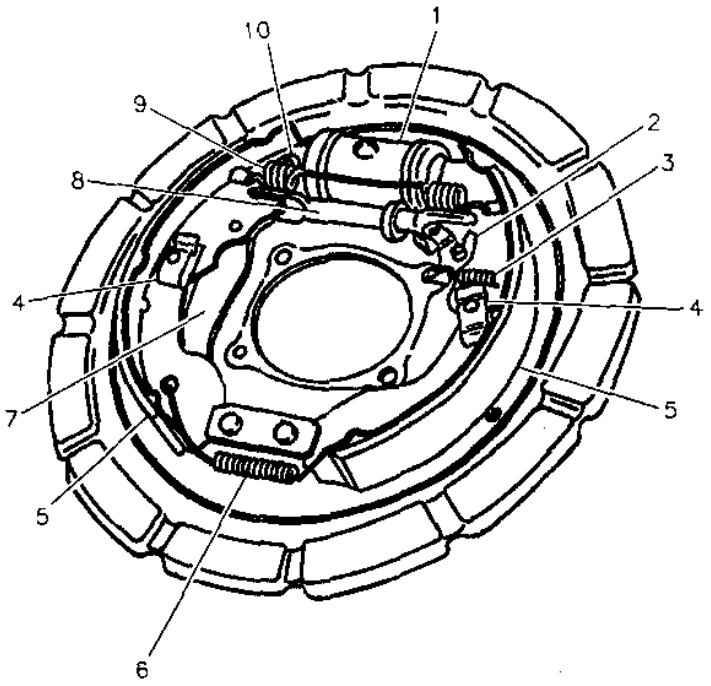

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Figure 3—Drum Brake Assembly

Remove or Disconnect

1. Brake drum. Refer to "Drum" earlier in this section.
2. Brake shoe hold down spring, retaining spring and pins by turning pins 45 degrees and sliding springs off pin (Figure 3).
3. Upper and lower return springs (Figure 1).
4. Adjuster strut, lever and spring (Figure 1).
5. Brake shoes from vehicle.
6. Parking brake cable from parking brake lever.
7. C-clip and parking brake lever from shoe.

Measure

Tool Required:
J 26900-7 Dial Caliper

- Brake shoe lining thickness using a J 26900-7. If thickness of lining is less than 3 mm (0.12 in.), replace the brake shoes. Always replace brake shoes in axle sets.

Install or Connect

1. Parking brake lever to shoe, secure with C-clip.
2. Parking brake cable to parking brake lever.
3. Brake shoes to backing plate; secure with hold down spring by inserting hold down pin from rear of backing plate, sliding hold down spring over pin and turning pin 45 degrees.
4. Insert adjuster strut lever spring into shoe.
5. Adjuster strut lever spring to adjuster strut lever.
6. Insert adjuster strut lever into shoe pivot point.
7. Set adjuster strut to maximum shoe clearance and place it between shoes.
8. Upper and lower return springs.
9. Brake drum. Refer to "Drum" earlier in this section.

WHEEL CYLINDER

Figure 4

CAUTION: Brake fluid may irritate eyes and skin. In case of contact, take the following actions:

- **Eye contact—rinse thoroughly with water.**
- **Skin contact—wash with soap and water.**

Remove or Disconnect

1. Brake shoes. Refer to "Linings" earlier in this section.
2. Brake fluid pipe from back of wheel cylinder by loosening flare nut. Remove bleeder valve cap and install it on the end of brake fluid pipe to prevent leaks or contamination.
3. Two wheel cylinder retaining bolts from rear of backing plate and wheel cylinder from vehicle (Figure 4).

Install or Connect

1. Wheel cylinder to backing plate; secure with two retaining bolts.

Tighten

- Wheel cylinder retaining bolts to 12 N.m (9.0 lbs. ft.).

2. Remove bleeder valve cap from brake fluid pipe and install on bleeder valve.
3. Brake fluid pipe to back of wheel cylinder; secure with flare nut.

Tighten

- Brake fluid pipe flare nut to 16 N.m (12 lbs. ft.).

4. Brake shoes. Refer to "Linings" earlier in this section.

Inspect

- Brake fluid pipe-to-wheel cylinder connection for brake fluid leaks.

5. Bleed brake system. For vehicles without the optional Antilock Braking System (ABS), refer to SECTION 5. For vehicles equipped with ABS, refer to SECTION 5E1.

BACKING PLATE

Figures 4, 5 and 6

Remove or Disconnect

Tools Required:
J 2619-01 Slide Hammer
J 37781 Adapter

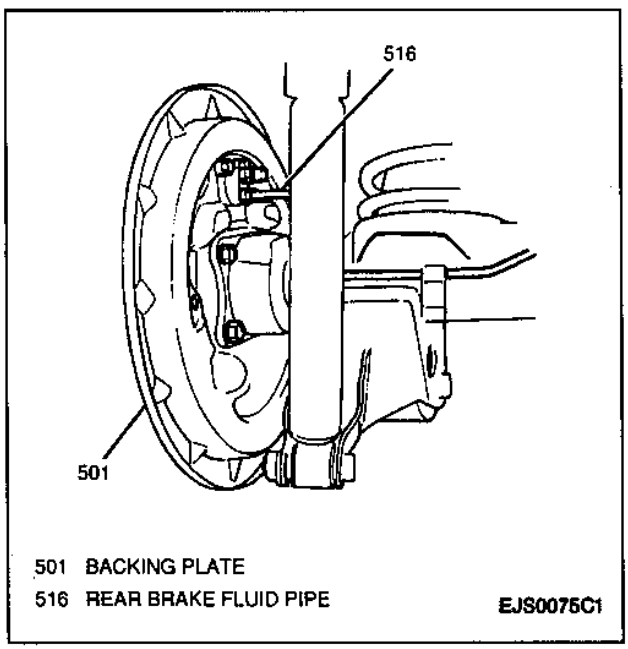


Figure 4—Wheel Cylinder and Backing Plate

1. Brake shoes. Refer to "Linings" earlier in this section.
2. Brake fluid pipe(s) from back of wheel cylinder by loosening flare nut. Remove bleeder valve cap and install it on the end of brake fluid pipe to prevent leaks or contamination.
3. Two wheel cylinder retaining bolts from rear of backing plate and wheel cylinder from vehicle (Figure 4).
4. Parking brake cable from backing plate.
5. Drain rear differential fluid. Refer to SECTION 4B.
6. Wheel bearing retainer nuts from rear axle housing.
7. Rear axle shaft using a J 2619-01 and a J 37781 (Figure 5).
8. Four backing plate nuts and backing plate from vehicle.

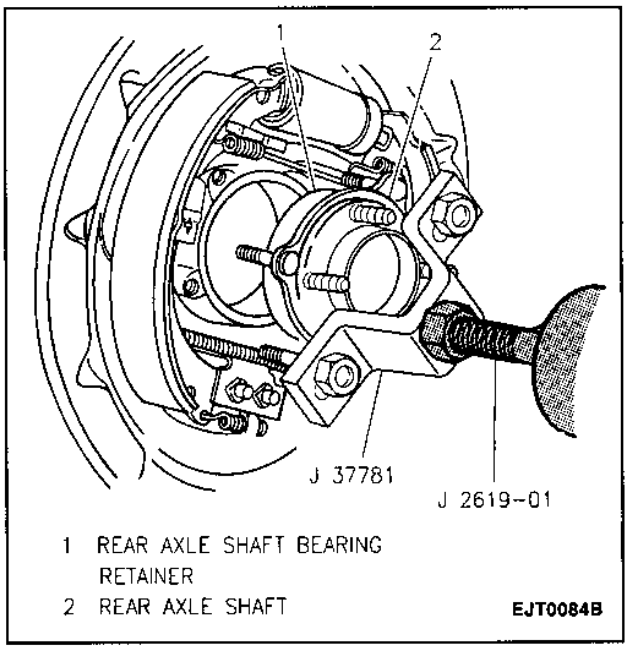


Figure 5—Removing Axle Shaft

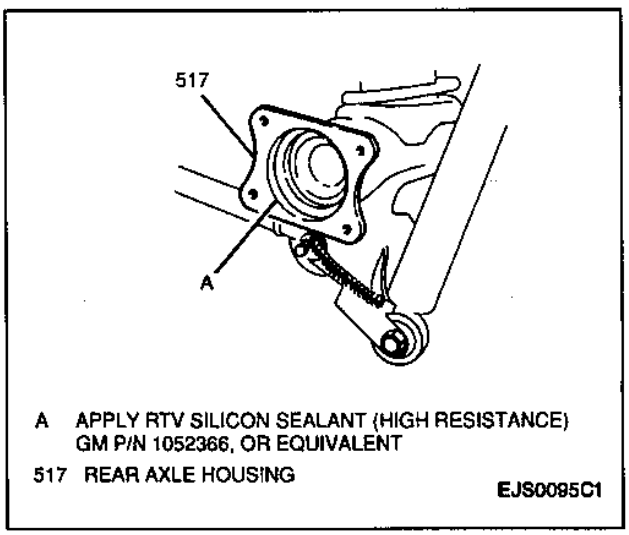


Figure 6—Sealant Application

Install or Connect

1. Apply RTV silicone sealant (high resistance) GM P/N 1052366, or equivalent, to axle housing mating surface (Figure 6).
2. Backing plate to axle housing; secure with four backing plate nuts.

Tighten

- Backing plate nuts to 22 N.m (16 lbs. ft.).

3. Rear axle shaft.
4. Wheel bearing retainer nuts to rear axle housing.

Tighten

- Wheel bearing retainer nuts to 23 N.m (17 lbs. ft.).

5. Parking brake cable to backing plate.
6. Wheel cylinder to backing plate; secure with two retaining bolts.

Tighten

- Wheel cylinder retaining bolts to 12 N.m (9.0 lbs. ft.).

7. Remove bleeder valve cap from brake fluid pipe and install on bleeder valve.
8. Brake fluid pipe(s) to back of wheel cylinder; secure with flare nut.

Tighten

- Brake fluid pipe flare nut to 16 N.m (12 lbs. ft.).

9. Brake shoes. Refer to "Linings" earlier in this section.

Inspect

- Brake fluid pipe-to-wheel cylinder connection for brake fluid leaks.

10. Refill rear differential fluid. Refer to SECTION 4B.
11. Bleed brake system. For vehicles without the optional Antilock Braking System (ABS), refer to SECTION 5. For vehicles equipped with ABS, refer to SECTION 5E1.

ADJUSTMENT

Although the drum brakes are of the self-adjusting type, some adjustments for proper shoe-to-drum clearance may be required when brake shoes have been replaced or drum has been removed for other service.

Adequate adjustment may be accomplished by pressing the brake pedal 3 to 5 times after all service is completed.

Check rear wheels for dragging. After adjustment is completed, road test the vehicle.

PARKING BRAKE

For parking brake diagnosis, refer to SECTION 5. For parking brake service procedures, refer to SECTION 5F.

UNIT REPAIR

DRUM

Cracked, Scored or Grooved

CAUTION: When servicing brake parts, do not create dust by grinding or sanding brake linings, or by cleaning brake parts with a dry brush or compressed air. Many brake parts contain asbestos fibers which can become airborne if dust is created during servicing. Breathing dust containing asbestos fibers may cause serious bodily harm. A water-dampened cloth or water based solution should be used to remove any dust on brake parts. Equipment is commercially available to perform this washing function. These wet methods will prevent asbestos fibers from becoming airborne.

A cracked drum is unsafe for further service and must be replaced. Never attempt to weld a cracked drum. Smooth any slight scores. Heavy or extensive scoring will cause excessive brake lining wear and it may be necessary to refinish the drum's braking surface.

For refinishing procedures, refer to "Refinishing" later in this section.

Out-of-Round or Tapered

A drum that is found to be out-of-round or tapered can be refinished to correct the problem if it is not too severe. Refer to "Refinishing" later in this section.

Refinishing

If a drum must be refinished, remove only enough metal to obtain a true, smooth braking surface. If a drum does not clean up when refinished to a maximum inside diameter of 222 mm (8.74 in.), it must be replaced. Removal of more metal will affect heat dissipation and may cause drum distortion.

When refinishing drums, always use sharp cutting tools or bits. Dull or worn tools leave a poor surface finish which will affect braking performance. Vibration dampening attachments should always be used when refinishing braking surfaces. These attachments eliminate tool chatter and will result in better surface finish.

The optimum spindle speed for refinishing braking surfaces is spindle 200 rpm. Crossfeed for rough cutting should range from 0.25 to 0.15 mm (0.010 to 0.006 in.) per revolution. Finish cuts should be made at crossfeeds no greater than 0.05 mm (0.002 in.) per revolution.

After refinishing, replace any drum that exceeds a maximum inside diameter of 222 mm (8.74 in.).

New Replacement Drum Refinishing

Prior to installation of a new replacement drum, the drum should be cleaned by a single finish cut of no greater than 0.05 mm (0.002 in.) per revolution at an optimum spindle speed of 200 rpm.

WHEEL CYLINDER

Figure 7

CAUTION: Brake fluid may irritate eyes and skin. In case of contact, take the following actions:

- **Eye contact—rinse thoroughly with water.**
- **Skin contact—wash with soap and water.**

Disassemble

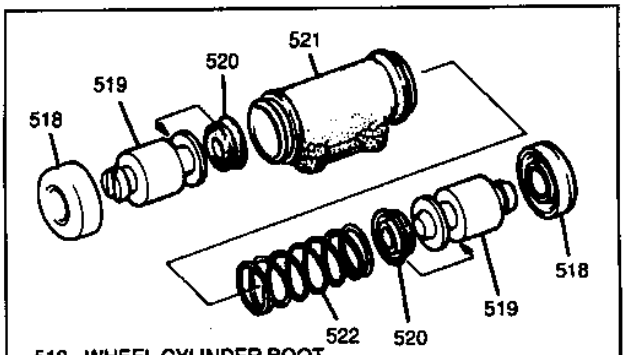
1. Wheel cylinder boots (Figure 7).
2. Wheel cylinder pistons.
3. Wheel cylinder cup seals.
4. Wheel cylinder spring.
5. Bleeder valve from wheel cylinder body.

Clean

- Wheel cylinder body in clean brake fluid and dry with filtered compressed air.

Inspect

- Wheel cylinder body, piston, cup seals and spring for rust, deterioration, wear, pitting and corrosion. Replace as necessary. Replace all components included in repair kits.



518 WHEEL CYLINDER BOOT
519 WHEEL CYLINDER PISTON
520 WHEEL CYLINDER CUP SEAL
521 WHEEL CYLINDER BODY
522 WHEEL CYLINDER SPRING EJS0105C1

Figure 7—Wheel Cylinder Components

Assemble

1. Bleeder valve to wheel cylinder body.

Tighten

- Bleeder valve to 8 N·m (71 lbs. in.).

2. Wheel cylinder spring to wheel cylinder body.
3. Wheel cylinder cup seals to wheel cylinder body, taking care that lip does not become turned under.
4. Wheel cylinder pistons.
5. Wheel cylinder boots over end of wheel cylinder body. Insure lip of boot sits securely in groove on wheel cylinder body.

SPECIFICATIONS

DRUM SPECIFICATIONS

Drum Diameter:	
2 Door:	
New	220 mm (8.66 in.)
Service Limit	222 mm (8.74 in.)
4 Door:	
New	254 mm (10.0 in.)
Service Limit	256 mm (10.07 in.)
Shoe Lining Thickness:	
New	6.5 mm (0.24 in.)
Minimum	3 mm (0.12 in.)
Drum Out-of-Round (Maximum)	0.01 mm (0.0004 in.)
Drum Taper (Maximum)	0.1 mm (0.004 in.)
Drum Runout (Maximum)	0.04 mm (0.0016 in.)

FASTENER TIGHTENING SPECIFICATIONS

Bleeder Valve	8 N.m (71 lbs. in.)
Wheel Cylinder Retaining Bolts	12 N.m (9.0 lbs. ft.)
Backing Plate Nuts	22 N.m (16 lbs. ft.)
Wheel Bearing Retainer Nuts	23 N.m (17 lbs. ft.)
Brake Fluid Pipe Flair Nut	16 N.m (12 lbs. ft.)

SPECIAL TOOLS