BRAKE DRUM AND BRAKE ASSEMBLY REPAIR

FRONT BRAKE DRUM REMOVAL AND INSTALLATION

REMOVAL

1. Raise the car so that the wheel is clear of the floor.

2. Remove the hub cap, wheel, and bearing dust cap. Remove the cotter pin, nut, and washer

3. Pull the brake drum approximately two inches forward and push back into position Remove the wheel bearing and withdraw the brake drum

If the brake drum will not come off, insert a narrow screwdriver through the brake adjusting hole in the carrier plate, and disengage the adjusting lever from the adjusting screw While thus holding the adjusting lever away from the adjusting screw, back off the adjusting screw with the brake adjusting tool (Fig 5). **Back off the adjustment only if the drum cannot be removed. Be very careful not to burr, chip, or damage the notches in the adjusting screw; otherwise, the self adjusting mechanism will not function properly.**

INSTALLATION

1. Remove the protective coating from a new drum with carburetor degreaser

2. Make sure that the grease in the hub is clean and adequate

3. Place the brake drum over the spindle and into position With the smaller diameter of the wheel bearing pointed inward, place the bearing over the spindle and push into position, followed by the washer and retaining nut

4. Adjust the wheel bearing

REAR BRAKE DRUM REMOVAL AND INSTALLATION

REMOVAL

1. Raise the car so that the wheel is clear of the floor

2. Remove the hub cap and wheel Remove the three Tinnerman nuts and remove the brake drum

If the brake drum will not come off, insert a narrow screwdriver through the brake adjusting hole in the carrier plate and disengage the adjusting lever from the adjusting screw While thus holding the adjusting lever away from the adjusting screw, back off the adjusting screw with the brake adjusting tool (Fig 5). **Back off the adjustment only if the drum cannot be removed. Be very careful not to burr, chip, or damage the notches in the adjusting screw; otherwise, the self adjusting mechanism will not function properly.**

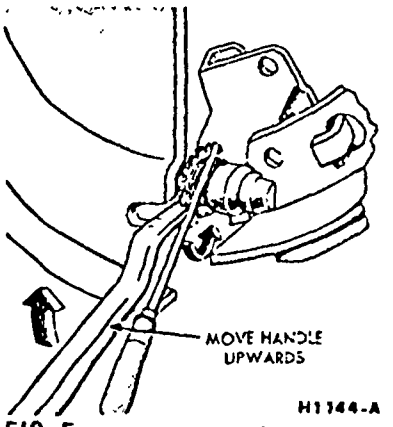

FIG. 5—Backing Off Brake Adjustment

INSTALLATION

1. Remove the protective coating from a new drum with carburetor degreaser.

2. Place the drum over the brake assembly and into position Install the three Tinnerman nuts and tighten securely.

3. Install the wheel

BRAKE DRUM REFINISHING

Minor scores on a brake drum can be removed with a fine emery cloth. A drum that is excessively scored or shows a total indicator runout of over .007 inch should be turned down Remove only enough stock to eliminate the scores and true up the drum The refinished diameter must not exceed .060 inch oversize

If the drum diameter is less than .030 inch oversize after refinishing, standard linings may be installed. If the drum diameter is between .030 inch and .060 inch oversize, shimmed linings or oversize linings must be installed

After a drum is turned down, wipe the refinished surface with a cloth soaked in clean denatured alcohol If one drum is turned down, the opposite drum on the same axle should also be cut down to the same size.

BRAKE SHOE AND ADJUSTING SCREW REMOVAL AND INSTALLATION

REMOVAL

1. With the wheel and drum removed, install a clamp over the ends of the brake cylinder as shown in Fig. 6

2. Contract the shoes as follows:

a. Disengage the adjusting lever from the adjusting screw by pulling backward on the adjusting lever (Part 9-1, Fig 1)

b. Move the outboard side of the adjusting screw upward and back off the pivot nut as far as it will go

3. Pull the adjusting lever, cable and automatic adjuster spring down and toward the rear to unhook the pivot hook from the large hole in the secondary shoe web. **Do not attempt to pry the pivot hook out of the hole.**

4. Remove the automatic adjuster spring and adjusting lever (Part 9-1, Fig 1)

5. Remove the secondary shoe to anchor spring with the tool shown in Fig 6 With the same tool, remove the primary shoe to anchor spring and unhook the cable anchor

6. Remove the anchor pin plate

7. Remove the cable guide from the secondary shoe (Part 9-1, Fig 1)

8. Remove the shoe hold-down springs, shoes, adjusting screw, pivot nut and socket

9. On rear brakes, remove the parking brake link and spring Disconnect the parking brake cable from the parking brake lever

10. After removing the rear brake primary shoe, disassemble the parking brake lever from the shoe by removing the retaining clip and spring washer (Part 9-1, Fig 1)

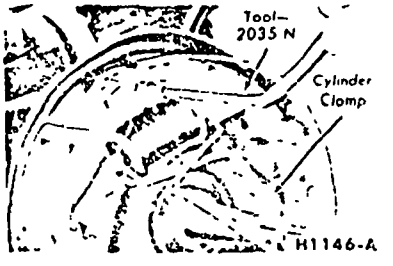

FIG. 6—Retracting Spring Removal

CLEANING AND INSPECTION

1. Wash all the parts except the brake shoes in a cleaning fluid and dry with compressed air.

2. Brush all dust from the carrier plates and interior of the brake drums.

3. Inspect the brake shoes for excessive lining wear or shoe damage. If the lining is worn to within 1/32 inch of the rivet heads or if the shoes are damaged, they must be replaced. Replace any lining that has been oil saturated. Replace lining in axle sets. Prior to replacement of lining, the drum diameter should be checked to determine if oversize or shimmed linings must be installed.

4. Inspect all other brake parts and replace any that are worn or damaged.

5. Inspect the brake drums and, if necessary, refinish as outlined in this section

INSTALLATION

1. Before installing the rear brake shoes, assemble the parking brake lever to the secondary shoe and secure with the spring washer and retaining clip.

2. Apply a light coating of high-temperature grease at the points where the brake shoes contact the carrier plate

3. Position the brake shoes on the carrier plate, and install the hold-down spring pins, springs, and cups On the rear brake, install the parking brake link and spring Connect the parking brake cable to the parking brake lever (Part 9-1, Fig 1)

4. Install the anchor pin plate on the anchor pin Place the cable anchor over the anchor pin with the crimped side toward the carrier plate

5. Install the primary shoe to anchor spring with the tool shown in Fig 7

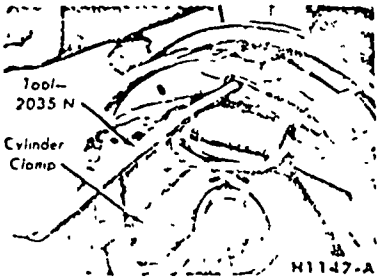

FIG. 7—Retracting Spring Installation

6. Install the cable guide on the secondary shoe web with the flanged hole fitted into the hole in the secondary shoe web Thread the cable around the cable guide groove (Part 9-1, Fig. 1)

It is imperative that the cable be positioned in this groove and not between the guide and the shoe web.

7. Install the secondary shoe to anchor spring (Fig. 7).

Be certain that the cable end is not cocked or binding on the anchor pin when installed. All parts should be flat on the anchor pin. Remove the brake cylinder clamp.

8. Apply high-temperature grease to the threads and the socket end of the adjusting screw Turn the adjusting screw into the adjusting pivot nut to the limit of the threads and then back off 1/2 turn.

Interchanging the brake shoe adjusting screw assemblies from one side of the car to the other would cause the brake shoes to retract rather than expand each time the automatic adjusting mechanism operated To prevent installation on the wrong side of the car, the socket end of the adjusting screw is stamped with an R or L (Fig 8) The adjusting pivot nuts can be distinguished by the number of lines machined around the body of the nut. Two lines indicate a right hand nut, one line indicates a left hand nut.

9. Place the adjusting socket on the screw and install this assembly between the shoe ends with the adjusting screw nearest the secondary shoe.

10. Hook the cable hook into the hole in the adjusting lever from the backing plate side The adjusting levers are stamped with an R or L to indicate their installation on a right or left hand brake assembly (Fig 8)

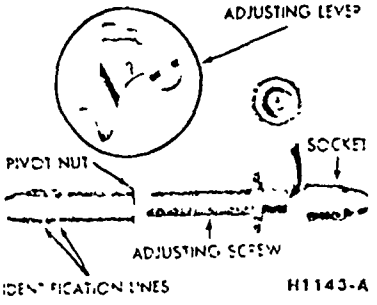

FIG. 8—Adjusting Screw and Lever Identification

11. Position the hooked end of the adjuster spring into the large hole in the primary shoe web, and connect the loop end of the spring to the adjuster lever hole

12. Pull the adjuster lever, cable and automatic adjuster spring down and toward the rear to engage the pivot hook in the large hole in the secondary shoe web (Part 9-1, Fig 1)

13. After installation, check the action of the adjuster by pulling the section of the cable between the cable guide and the adjusting lever toward the secondary shoe web far enough to lift the lever past a tooth on the adjusting screw wheel The lever should snap into position behind the next tooth, and release of the cable should cause the adjuster spring to return the lever to its original position This return action of the lever will turn the adjusting screw one tooth

If pulling the cable does not produce the action described or if the lever action is sluggish instead of positive and sharp, check the position of the lever on the adjusting screw-toothed wheel With the brake in a vertical position (anchor at the top), the lever should contact the adjusting wheel 7/16 inch (plus or minus 1/16 inch) above the centerline of the screw If the contact point is below this centerline, the lever will not lock on the teeth in the adjusting screw wheel, and the screw will not be turned as the lever is actuated by the cable

To determine the cause of this condition

a. Check the cable end fittings The cable should completely fill or extend slightly beyond the crimped section of the fittings If it does not meet this specification, possible damage is indicated and the cable assembly should be replaced

b. Check the cable length The cable should measure 11 3/4 inches plus or minus 1/64 inch) from the end of the cable anchor to the end of the cable hook

c. Check the cable guide for damage The cable groove should be flat to the shoe web and the hole in the guide should be flat against the web Replace the guide if it shows damage

d. Check the pivot hook on the [illegible] The hook [illegible] cable and the [illegible] proper pivoting [illegible]

... the lever if the hook shows ...

... that the adjusting screw ... is properly seated in the notch in the shoe web.

ADJUSTMENT

... hydraulic service brakes are ... adjusting and require a manual ... only after the brake ... have been relined, replaced, or ... the length of the adjusting screw has been changed while performing some other service operation.

1. After the shoes have been installed or the adjusting screw has been turned, install the drum. Be sure that all excess grease, oil, and other foreign material are wiped off the carrier plate and drum.

Before installing the brake drum on the front wheel spindle, wipe the spindle completely free of grease. Install the drum carefully so that the grease seal retainers within the hub will not be damaged.

2. Remove the adjusting hole cover from the carrier plate and, from the carrier plate side, turn the adjusting screw upward to expand the shoes (Fig. 9). Expand the shoes until a slight drag is felt when the drum is rotated.

3. **Remove the drum.** While holding the adjusting lever out of engagement with the adjusting screw, back off the adjusting screw ¾ of a turn with the fingers. If finger movement will not turn the screw, free it up otherwise, the self adjusting lever will not turn the screw. Lubricate the screw with oil and coat with wheel bearing grease.

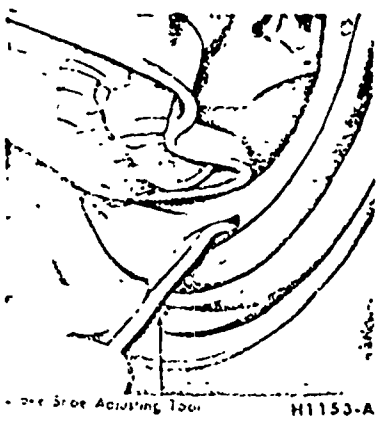

FIG. 9—Expanding Brake Shoes

Any other adjustment procedure may cause damage to the adjusting screw with consequent self adjuster problems.

4. Apply a small quantity of high-temperature grease to the points where the shoes contact the carrier plate, being careful not to get the lubricant on the linings. Install the wheel and drum.

5. Install the adjusting hole cover on the brake carrier plate.

6. When adjusting the rear brake shoes, check the parking brake cables for proper adjustment. Make sure that the equalizer lever operates freely.

7. After the brake shoes have been properly adjusted, check the operation of the brakes.

BRAKE SHOE RELINING

Brake linings that are worn to within 1/32 inch of the rivet or have been saturated with grease or oil should be replaced. Failure to replace worn linings will result in a scored drum. **When it is necessary to replace linings, they must also be replaced on the wheel on the opposite side of the car.**

Inspect brake shoes for distortion, cracks, or looseness. If this condition exists, the shoe should be discarded. **Do not repair a defective brake shoe.**

1. Wash the brake shoes thoroughly in a clean solvent. Remove all burrs or rough spots from the shoes.

2. Check the inside diameter of the brake drum. If the drum is less than .030 inch oversize, standard lining may be installed. If the diameter exceeds .030 inch, oversized or shimmed lining should be installed.

3. Position the new lining on the shoe. Starting in the center, insert and secure the rivets, working alternately towards each end. Install all parts supplied in the kit. **Ford replacement linings are ground and no further grinding is required when the original drum diameter is maintained.**

4. Check the clearance between the shoe and lining. The lining must seat tightly against the shoe with not more than 0.005-inch clearance between any two rivets.

BRAKE CYLINDER REPLACEMENT

REMOVAL

1. With the wheel in a raised position, remove the wheel and the drum.

2. Place a clamp over the ends of the brake cylinder as shown in Fig. 6.

3. Remove the brake shoe assemblies, following procedures outlined in this section.

4. Disconnect the brake line from the brake cylinder. To disconnect the hose at a front cylinder, loosen the pipe fitting that connects the opposite end of the hose to the brake tube at a bracket on the frame. Remove the horseshoe-type retaining clip from the hose and bracket, disengage the hose from the bracket, then unscrew the entire hose assembly from the front brake cylinder.

At a rear cylinder, unscrew the pipe fitting that connects the tube to the cylinder. **Be sure the engine is stopped and there is no vacuum in the booster system before disconnecting the hydraulic lines.**

5. Remove the brake cylinder retaining bolts and lock washers and remove the cylinder. Remove the clamp from the cylinder.

INSTALLATION

1. Insert the cylinder into the opening on the carrier plate and install the retaining bolts and lockwashers. Install a front wheel cylinder with the inlet toward the rear of the car.

2. On a front cylinder, install a new copper gasket over the hose fitting. Screw the hose assembly into the cylinder. Engage the opposite end of the hose to the bracket on the frame, install the horseshoe-type retaining clip, and connect the brake tube to the hose with the pipe fitting nut. Tighten the nut with Milbar tool 1112-144 until the tool "clicks" at 12 ft. lbs.

On a rear cylinder, connect the tube to the cylinder by tightening the pipe fitting nut to the cylinder. Tighten the nut with Milbar tool 1112-144 until the tool "clicks" at 12 ft. lbs.

3. Install the links in the ends of the brake cylinder, install the shoe and adjuster assemblies and adjust the shoes as outlined in this section.

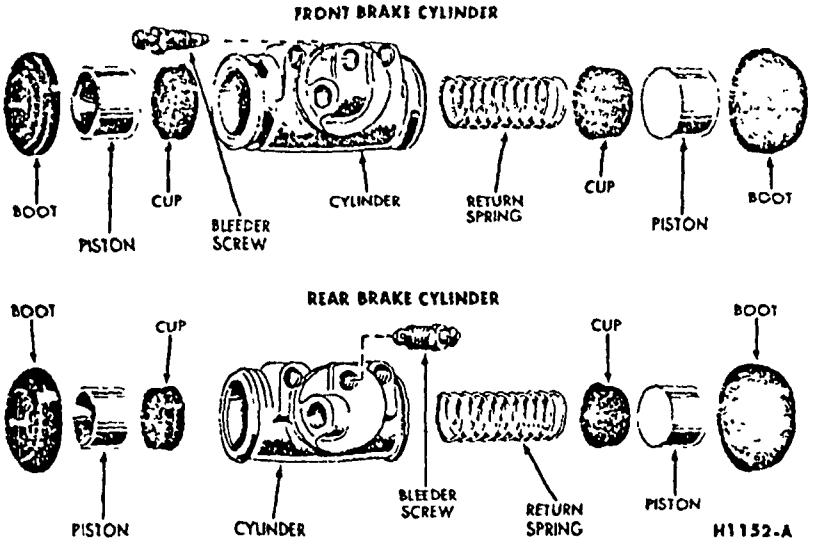

FIG. 10—Front and Rear Brake Cylinders

4. Install the brake drum and wheel and bleed the brakes as outlined in this section

BRAKE CYLINDER OVERHAUL

It is not necessary to remove the brake cylinder from the carrier plate to disassemble, inspect, or hone and overhaul. Removal is necessary only when the cylinder is damaged or scored beyond repair.

DISASSEMBLY

1. Remove the links and the rubber boots from the ends of the brake cylinder. Remove the pistons, cups, and return spring from the cylinder bore (Fig. 10).

2. Remove the bleeder screw from the cylinder.

INSPECTION

1. Wash all parts in clean denatured alcohol and dry with compressed air.

2. Check all internal parts for excessive wear or damage. If any of the internal parts require replacing, all should be replaced.

3. Inspect the cylinder bore for score marks or rust. If either condition is present, the cylinder bore must be honed. However, the cylinder should not be honed more than .003 inch beyond its original diameter.

4. Check the bleeder hole to be sure that it is open.

ASSEMBLY

1. Apply a coating of heavy-duty brake fluid to all internal parts.

2. Thread the bleeder screw into the cylinder and tighten securely.

3. Insert the return spring, cups, and pistons into their respective positions in the cylinder bore (Fig. 10). Place a boot over each end of the cylinder.

BRAKE CARRIER PLATE REPLACEMENT

REMOVAL

1. Remove the wheel and brake drum. Disconnect the brake line from the brake cylinder.

2. Remove the brake shoe and adjuster assemblies and the brake cylinder as outlined in this section. On the rear wheels, disconnect the parking brake lever from the cable.

3. If the rear carrier plate is being replaced, rotate the axle shaft so that the hole in the axle shaft flange lines up with the carrier plate retaining nuts and remove the nuts. Pull the axle shaft assembly out of the housing with tool 4235N and a slide hammer (Part 6-1, Fig. 3), then remove the carrier plate.

If the front carrier plate is being replaced, remove the bolts and nuts that secure the plate to the front wheel spindle and remove the plate.

INSTALLATION

1. Position a new rear carrier plate on the retaining bolts in the axle housing flange. Insert the axle shaft into the housing so that the splines engage the differential side gear with the bearing retainer slid onto the retaining bolts and against the carrier plate. Install the retaining nuts through the access hole in the axle shaft flange.

Position a new front carrier plate to the wheel spindle and install the retaining bolts and nuts.

2. Install the brake shoe and adjuster assemblies and the brake cylinder as outlined in this section. On a rear brake connect the parking brake cable to the lever.

3. Connect the brake line to the brake wheel cylinder. Then install the wheel and brake drum.

4. Adjust the brake shoes and bleed the brake system as outlined in this section.

HYDRAULIC SYSTEM BLEEDING

When any part of the hydraulic system has been disconnected for repair or replacement, air may get into the lines and cause spongy pedal action. Bleed the hydraulic system after it has been properly connected to be sure that all air is expelled from the brake cylinders and lines.

The hydraulic system can be bled manually or with pressure bleeding equipment.

MANUAL BLEEDING

Bleed the longest lines first. Keep the master cylinder reservoir filled with new heavy-duty brake fluid during the bleeding operation.

Never use brake fluid which has been drained from the hydraulic system.

1. Attach a rubber drain tube to the bleeder screw at the brake cylinder that is located the farthest from the master cylinder. The end of the tube should fit snugly around the bleeder screw.

2. Submerge the free end of the tube in a container partially filled with clean brake fluid, and loosen the bleeder screw.

3. Push the brake pedal down slowly by hand, allowing it to return slowly to the full-released position. Repeat this operation until air bubbles cease to appear at the submerged end of the tube.

4. When the fluid is completely free of air bubbles, tighten the bleeder screw and remove the drain tube.