Inter Office

Ford Parts and Service Division

July 11, 1975

Mr. H. B. Lick
Central Medical Services Bldg.
Room 210
Rouge Plant

cc Mr. S. Keoleian
Mr. R. L. Peaker

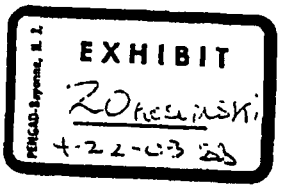
As discussed during our recent phone conversation, we have reviewed the contents of our current service manuals for mention of cautions regarding brake repair. We are not currently providing a procedure for removal of dust from the brake drums or brake lining area.

I have noted on the attached copies of our shop manual, the locations that should include a caution regarding asbestos particles.

If you will provide some suggested copy for a caution, we will insert it in the next printing. We will also incorporate this caution in all future texts, such as training manuals and video tapes, that pertain to the areas where asbestos dust may be considered harmful.

C. R. Weed

Attachments



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REMOVAL AND INSTALLATION

BRAKE DRUM REMOVAL AND INSTALLATION THROUGH 1000 SERIES

Use the following service procedures for both hydraulic and air brakes. Since the E 100 through E 350, E 100 E-350 rear drums, Bronco or the F 350 4x4 (front and rear) and the 4-wheel drive front brake drum procedures apply to hydraulic brakes only, they are covered in Part 12-02.

FRONT BRAKE DRUM

1. Raise the vehicle until the tire clears the floor and remove the wheel and tire from the hub. Loosen the brake shoe adjusting screw until the shoes no longer touch the brake drum. Remove the grease cap and the gasket (if equipped) from the hub.
2. On vehicles with 4,000 through 7,000 lb. and 16,000 20,000 lb. front axles, remove the cotter pin, adjusting nut and flat washer from the spindle. On vehicles with 9,000, 11,000 or 15,000 lb. axles, remove the lock nut, dimpled washer, locking ring, and adjusting nut and pin assembly.
3. Remove the outer bearing cone and roller assembly. Pull the hub and drum assembly off the wheel spindle.
4. Remove the front wheel-to-hub retaining nuts (or rim and tire attaching nuts). Remove the wheel (or rim and tire) from the hub and drum.
5. Remove the brake drum retainers and attaching bolts, screws, or bolts and nuts.
6. Remove the brake drum from the hub.
7. Check the drum for damage or wear, and repair or replace if necessary. If a new drum will be installed, be sure to remove the protective coating with degreaser.

Install new grease retainer seals whenever a wheel and hub is removed.

8. Place the brake drum on the hub and install the retainers and retaining bolts, screws or bolts and nuts.
9. Install the hub and drum on the wheel spindle. Keep the hub centered on the spindle to prevent damage to the grease retainer or the spindle threads.
10. On vehicles with 4,000 through 7,000 lb. and 16,000 lb. front axles, install the outer bearing cone and roller and the flat washer on the spindle. Install the adjusting nut. On vehicles with 9,000, 11,000 or 15,000 lb. front axles, install the outer bearing cone and roller assembly and the bearing adjusting nut and pin assembly.
11. Install the wheel and tire on the hub. Then install the clamps (if applicable) and the wheel stud nuts.
12. While rotating the wheel, torque the adjusting nut to specification. Adjust wheel bearings as described in Group 11.
13. Install the dimpled washer with the dimple indexed in one of the holes in the adjusting nut. Install the lock nut and torque to specification. Bend the dimpled washer over a flat of the lock nut.
14. Install the gasket (if equipped) and the grease cap, and torque the wheel stud nuts to specification. Install the hub cap (if equipped), and adjust the brakes as described in this Part.

REAR BRAKE DRUM E250-E350, F250-F350, P350-P400

1. Raise the vehicle and install safety stands.
2. Remove the wheel and tire as an assembly. Loosen the brake shoe adjusting screw until the shoes no longer touch the brake drum.
3. Remove the rear axle shaft retaining nuts, adapters, axle shaft and grease seal.
4. Remove the wheel bearing locknut, lock washer, and adjusting nut. On E 250 and E-350 vehicles, remove the locking wedge and adjusting nut.
5. Remove the hub and drum from the axle.
6. Remove the brake drum-to-hub retaining screws, bolts or bolts and nuts. Remove the brake drum from the hub.
7. Check the drum for damage or wear, and repair or replace if necessary. Do not machine brake drums to a braking surface diameter greater than the maximum diameter shown on the drum. If a new drum will be installed, remove the protective coating with degreaser.

Install new grease retainer seals whenever a wheel and hub is removed.

8. Position the brake drum on the hub and install the attaching screws, bolts, or bolts and nuts.
9. Position the hub and drum, as an assembly, on the axle and start the adjusting nut.
10. Adjust the wheel bearing nut, and install the wheel bearing lock washer and lock nut.
11. Install a new rear axle oil seal, axle shaft and gasket, stud adapters, and attaching nuts.
12. Install the wheel and tire as an assembly.
13. Adjust the brake shoes. Remove the safety stands and lower the vehicle.

OVERHAUL

BRAKE DRUM REFINISHING E100 E350, F100-F350, P350-P400, U100

Minor scores on a brake drum can be removed with fine emery cloth, provided the emery is thoroughly cleaned off the drum after the operation.

A badly scored, rough, or out-of-round drum should be ground or turned on a drum lathe. Do not remove any more material from the drum than is necessary to provide a smooth surface for the brake shoe contact. Brake drum maximum braking surface diameter is shown on each brake drum (Fig. 19). Brake drums which exceed the maximum braking surface diameter shown on the brake drum either through wear or refinishing, must be replaced. The maximum braking surface diameter specification, which is shown on each brake drum (Fig. 18), allows for a 0.060 inch machining cut over the original nominal drum diameter plus 0.010 inch additional wear before reaching the drum-discard diameter.

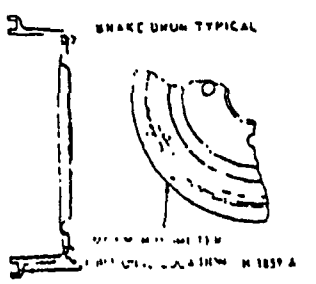

FIG. 18 Brake Drum Maximum Inside Braking Surface Diameter Marking Location

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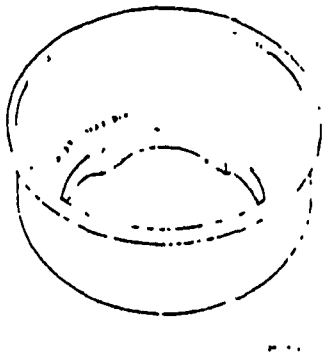

FIG 19 Brake Drum Maximum Braking Surface Diameter Marking Location—Typical Medium—Heavy Truck Shown

On all vehicles 500 and up Series heavy trucks, the maximum braking surface diameter specification, which is shown on each brake drum, allows for 0.060 inch machining cut over the original nominal drum diameter, plus 0.030-inch additional wear before the drum must be replaced. After refinishing the brake surface runout must not exceed 0.070-inch total indicator reading, measured from the bearing cup.

On 500 and up Series heavy trucks, if the drum diameter is less than 0.030-inch oversize after refinishing, install standard linings on the brake assemblies. If the diameter is over 0.030 inch, install oversize or shimmed linings.

BRAKE SHOE AND BAND RELINING

1. Remove the rivets holding the old lining and remove the lining.
2. Clean the shoe or band thoroughly with cleaning fluid, especially the rim surface. Wipe the shoe or band dry and remove all burrs or rough spots from the shoe. Do not use shoes with elongated rivet holes.
3. On service brake check the inside diameter of the brake drum.
4. Position a new lining on the shoe or band. Install new rivets, beginning with the rivet holes near the center of the shoe. On some vehicles, the primary lining is shorter than the secondary lining. If this condition exists, position the shorter (primary) lining in line with the heel end of the shoe. Do not let brake fluid, oil, or grease touch the brake lining. If a brake lining kit is used to replace the worn linings, follow the instructions in the kit and install all the parts provided.
5. Check the clearance between the lining and shoe rim. The lining must seat snugly against the rim with not more than 0.0005-inch separation between the two rivets. If only the linings are replaced on disc service eight-inch brakes with four rivets per shoe, the brake linings must be cam ground 0.010 inch at the ends after the linings are riveted to the brake shoe.

FRONT DISC BRAKES

1. Remove the shoe and lining as described in Part 12-24.
2. Measure the thickness of the brake lining. If the lining thickness at any point on the assembly is less than 0.250 inch above the backing plate rivets or if the lining shows evidence of brake fluid or oil contamination that is causing a brake pull, replace all four shoe and lining assemblies.
3. Check caliper to spindle mounting bolt torque (1,250-1,500 pound-feet). Torque them to specification if required.
4. To check rotor runout, first eliminate the wheel bearing end play by tightening the adjusting nut. Then check to be sure the rotor can still be rotated.
5. Clamp a dial indicator to the spindle so the stylus contacts the rotor approximately 1 inch from the outer edge. Rotate the rotor and take an indicator reading. If the reading exceeds 0.010-inch total lateral runout within a six inch radius on the indicator, replace or resurface the disc brake rotor. The following requirements must be met when resurfacing disc brake rotors.

   Use Rotunda Disc Brake Refinishing Lathe, Tool FRI-1406-II to refinish the disc brake rotors. Follow the step-by-step resurfacing instructions that come with the tool.

   Not more than 0.020 inch of material may be machined equally off each surface (A and B, Fig. 20). If rotor thickness falls below the minimum shown on each rotor, it must be replaced.

   The finished braking surfaces of the rotor must be flat and parallel within 0.001 inch; lateral runout must not exceed 0.003-inch total indicator reading; and the surface finish of the braking surfaces must be 16 to 80 microinches.

   When the runout check is finished, adjust the bearings as described in Part 11-10 to prevent bearing failure.
6. Check the rotor for scoring. Remove minor scores with a fine emery cloth. If the rotor is excessively scored, refinish it as outlined in Step 5 or replace the rotor if necessary.
7. Check the caliper. If it is cracked or shows any signs of leakage replace it. If the caliper is leaking around the dust boot, remove and repair it.
8. Check brake hoses for signs of cracking, leaks or abrasion. Replace them if necessary.

BRAKE CYLINDER

1. Clean all brake cylinder parts in clean isopropyl alcohol. Inspect all parts for wear or damage. Check the cylinder bore for rust, scores or other damage. Be sure the bleeder screw passage is clean and open. Replace all parts that are worn or damaged.
2. If dirt is found in any part of the hydraulic system, flush the entire system with clean isopropyl alcohol.

MASTER CYLINDER

1. Clean all master cylinder parts in clean isopropyl alcohol, and inspect the parts for wear or damage. Replace them if required. When a master cylinder repair kit is used, follow the instructions in the kit and install all of the parts provided.
2. Make sure that all ports and vents in the master cylinder are open and free of foreign matter.
3. On a single brake system master cylinder, check the spring valve (inserted in the front end of the piston)

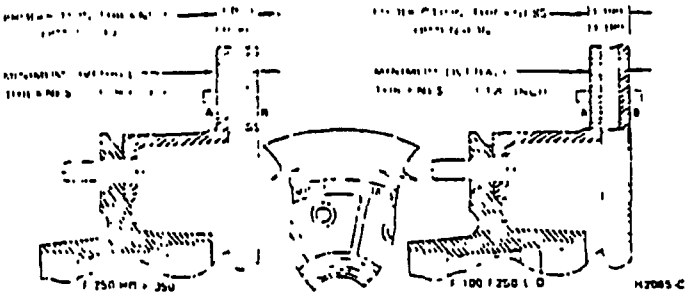

FIG. 20 Disc Brake Rotor Service Limits

screw inside the hole to expand the brake shoes until they drag against the brake drum and lock the drum

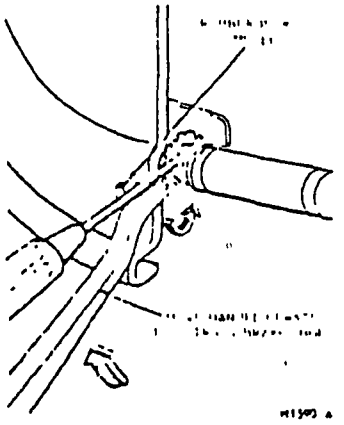

FIG. 11 Backing Off Brake Adjustment—F 100-250, E 100-150, with Rear Drum Brakes

Loosen the adjusting screw until a slight drag is noted (Fig 11)

3. When the shoes are against the drum, loosen the adjusting screw an additional 10 to 12 notches so that the drum rotates freely without drag If the drum does not rotate freely, remove the wheel and drum, and blow out any dust and dirt from the linings Using sand paper, remove any rust from the points where the shoes touch the backing plate Apply a light coating of high temperature grease (C1AZ 19590 B) Do not get the lubricant on the linings
4. Install the wheel and drum, and adjust the shoes Install the adjusting hole cover on the brake backing plate
5. Check and adjust the other three brake assemblies
6. Apply the brakes If the pedal travels more than halfway to the floor, there is too much clearance between the brake shoes and the drums Repeat Steps 2 and 4 above
7. When all brake shoes have been properly adjusted, lower the vehicle and road test to check brake operation Perform the road test only when the brakes will apply and the vehicle can be safely stopped

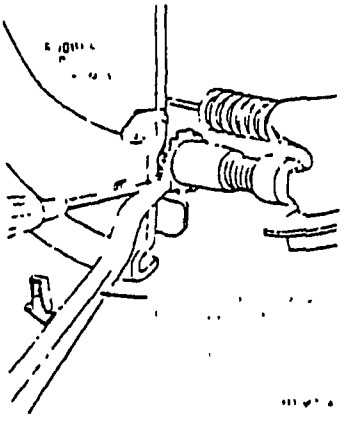

FIG 12 Expanding Brake Shoes—F 250-350, E 750 350 Rear, and F 350-400

REMOVAL AND INSTALLATION

BRAKE DRUMS

Front Brake Drum—P-350-400 Series

Removal

1. Raise the vehicle until the tire clears the floor
2. Remove the wheel cover or hub cap and wheel bearing dust cap Remove the cotter pin, nut lock, nut, and washer
3. Pull the brake drum approximately two inches forward, then push it back into position. Remove the wheel bearing and pull off 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 holding the adjusting lever from the adjusting screw loosen the adjusting screw with the brake adjusting tool (Fig 11) Loosen the adjusting screw only if the drum cannot be removed. Do not burr, chip, or damage the notches in the adjusting screw or the self adjusting mechanism will not function properly If the adjusting screw was loosened, check to be sure the adjusting lever is still properly seated in the shoe web.

Installation

1 If the hub and drum assembly will be replaced, remove the protective coating from a new drum with carburetor degreaser Install new bearings and a new grease retainer Pack the wheel bearing install the inner bearing cone and roller assembly in the inner cup, and install the new grease retainer as described in Part 11-10. If the original drum will be installed, be sure the grease in the hub is clean and adequate
2. Install the drum assembly, outer wheel bearing, washer, and adjusting nut as described in Part 11-10.
3 Adjust the wheel bearing, install the nut lock and cotter pin, and grease cap
4 Install the wheel and hub cap If the adjustment screw was loosened, adjust the brake as described in this Part

REAR BRAKE DRUM—F-100, F-250 (UP TO 6900 G.V.W.), E-100-150 AND U-100

Removal

1 Raise the vehicle so the wheel is clear of the floor
2. Remove the hub cap and wheel and tire assembly Remove the three retaining 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 backing plate and disengage the adjusting lever from the adjusting screw While holding the adjusting lever away from the adjusting screw, loosen the adjusting screw with the brake adjusting tool (Fig 11) Loosen the adjusting screw only if the drum cannot be removed Do not burr chip, or damage the notches in the adjusting screw or the self adjusting mechanism will not function properly.

If the adjusting screw was loosened, check to be sure the adjusting lever is still properly seated in the shoe web.

Installation

1 Remove the protective coating from a new drum with carburetor degreaser
2 Adjust the brakes as described in this Part
3 Install the drum
4 Install the brake drum retaining nuts and tighten securely Install the wheel on the axle shaft flange studs against the drum and torque the retaining nuts to specification

REAR BRAKE DRUM—F-250 (ABOVE 6900 G.V.W.) 350, E-250-E-350, P-350, P-400

Removal

1 Raise the vehicle and install safety stands

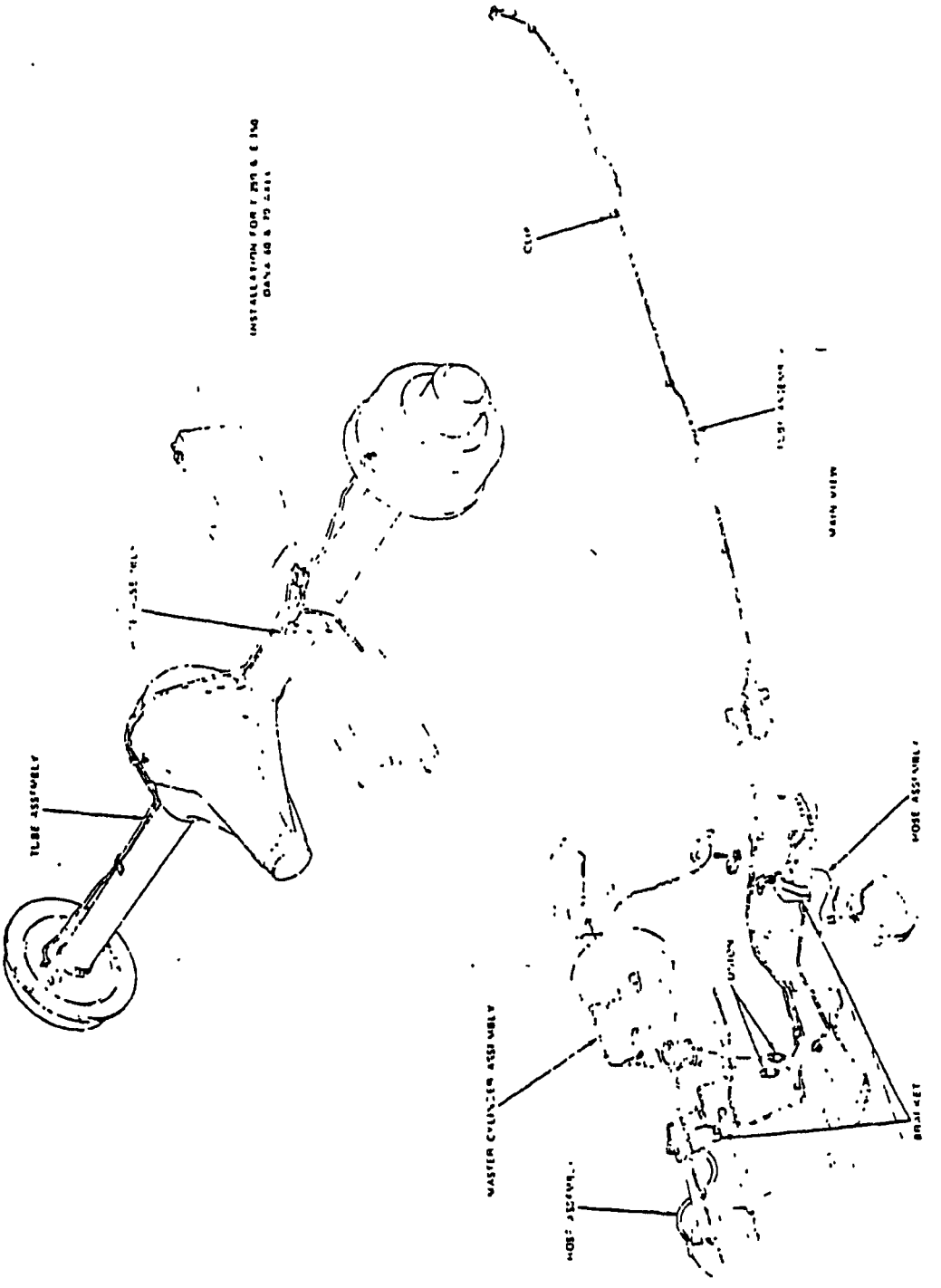

FIG. 10 F 100 E-350 Brake System

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REMOVAL AND INSTALLATION

BRAKE SHOES AND ADJUSTING SCREW

P-500 Series—Rear

Removal

1. Raise the vehicle until the tires clear the floor. Remove the wheel and tire assembly, and remove the drum or hub and drum assembly. Mark the hub and drum to aid assembly in the same position.
2. Clamp the brake cylinder boots against the ends of the cylinder and remove the brake shoe retracting springs using Tool 2035-N (Fig. 5).
3. Remove the brake shoe guide bolt, cotter pin, nut, washer, and bolt from both shoes, and remove the shoes from the backing plate.
4. Remove the clamp-type adjusting wheel lock from the anchor pin support and unthread the adjusting screw and wheel assembly from the anchor pin support.

Installation

1. Lubricate all points where brake shoes contact other brake assembly parts with high temperature grease (C1AZ-19590-B).
2. Thread the adjusting screw and wheel assembly into the anchor pin support and install the clamp type adjusting wheel lock. Thread the adjusting wheel into the support so the brake shoe rests against the adjusting wheel end.
3. Place the brake shoe against the backing plate, insert the ends in the brake cylinder links, and install the shoe guide bolt, washer, and nut (Fig. 4). Finger tighten the nut, then loosen it one full turn and install the cotter pin.
4. Install the retracting springs using Tool 2035-N (Fig. 5).
5. Remove the cylinder clamps, install the drum or the hub and drum assembly, and install the wheel assembly. Align the marks on the hub and drum for proper installation.
6. Adjust the brakes, and lower the vehicle.

600-900 SERIES—REAR—WAGNER

Removal

1. Raise the vehicle until the tires clear the floor. Remove the wheel and tire assembly, and the drum or hub and drum assembly. It may be necessary to loosen the adjusting wheels slightly to free the grooved drums. Do not loosen the adjustment so much that adjusting wheel jams against the friction ring on the adjuster screw or damage to the ring may result.

   Mark the hub and drum to aid assembly in the same position. Be sure there is no vacuum in the system before disconnecting the hydraulic lines. Expel vacuum in the system by pushing down on brake pedal with the engine off.
2. Unhook the automatic adjuster springs (Fig. 2). Remove each long adjuster link by pivoting it at the adjusting wheel cranks until their slots align with the link hooks. Lift out the links and slide the hooks from the anchor pin cranks. Remove the short links by rotating the anchor cranks until the link hooks clear the eccentrics on the shoe webs. Then remove the smaller hooks from the cranks.
3. Spread the anchor crank C-washers and remove the cranks. (It is usually unnecessary to remove the adjusting wheel cranks.) If shoes will be relined, remove adjuster eccentrics from the shoe webs by unscrewing their self-tapping screws.
4. Remove the shoe retraction springs by sliding the looped ends off the pins. Remove the shoe hold-down lock wires, castellated nuts, and plain washers, and lift the shoes off the backing plate.
5. Unthread the adjusting screw and adjusting wheel from each of the anchor supports.

Installation

1. Insert the adjusting wheels in the anchor support slots and thread in the adjuster screws from the shoe side, with the friction ring end toward the shoe. For new linings, loosen adjusters, but do not loosen them far enough to jam the adjusting wheels.

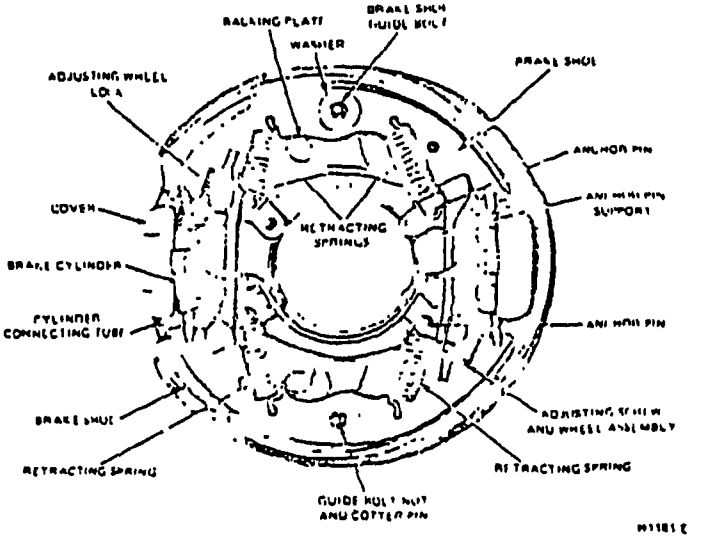

FIG. 4 Two Cylinder Brake—Rear—P-500

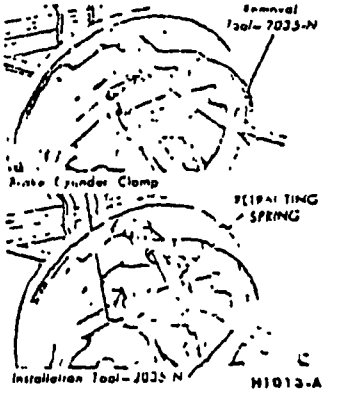

FIG. 5 Retracting Spring Replacement—Typical

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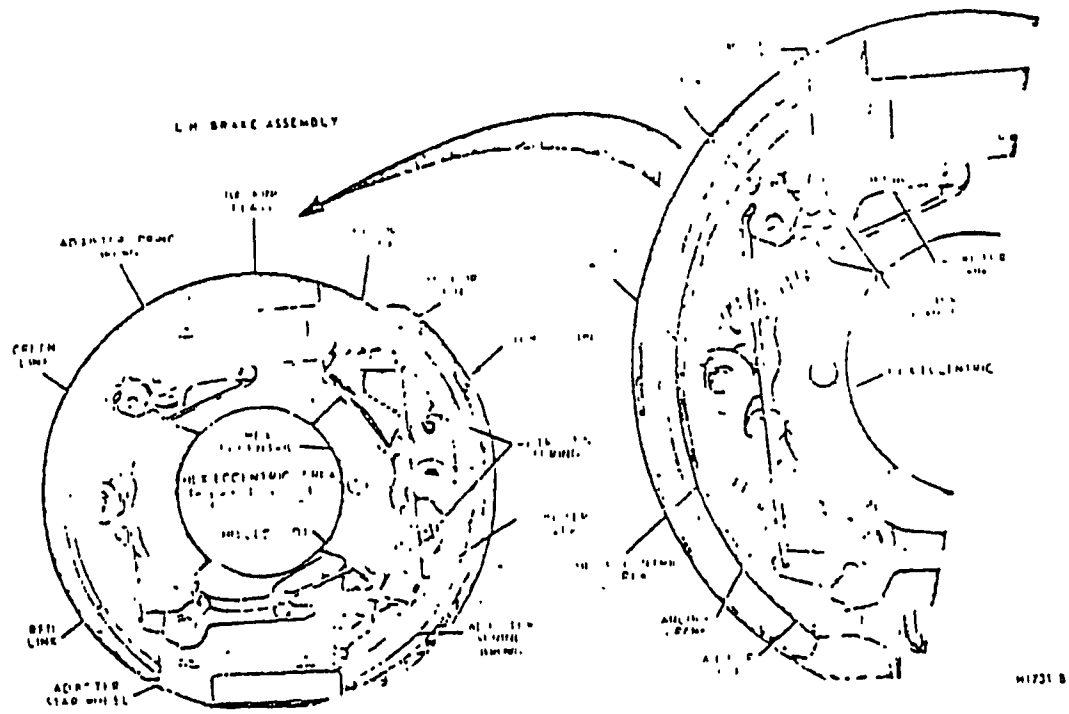

FIG. 2 Two-Cylinder Brake Shoe (Wagner)—Rear

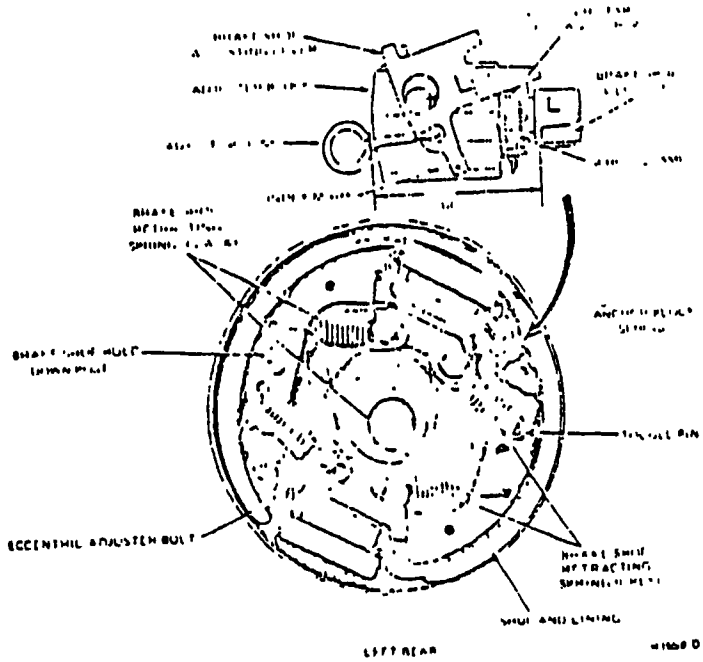

FIG. 3 Hydraulic Brake Assembly (Kelsey-Hayes)

C-Series

Removal

1 Remove the brake pedal retracting spring (Figs. 9 and 11).
2 Remove the brake master cylinder push rod eccentric bolt nut, bolt, and nylon bushings.
3 Remove the brake pedal bumper-to-bracket retaining nut. Remove the bolt and bumper.
4 On models with a single hydraulic brake system, remove the master cylinder push rod by pulling up the tab on the push rod boot, and pulling the push rod and boot from the cylinder.
5 Remove the nut from the bolt, slide the bolt to the right and remove the brake pedal assembly, sleeve, and bushing.
6 Remove the bushings from the pedal assembly.

Installation

1 Coat all bushings and the pedal shaft with a small amount of lubriplate or an equivalent lubricant. Position the nylon bushings in the brake pedal shaft bore.
2. Position the brake pedal assembly, sleeve, and bushings in the pedal support bracket, slide the bolt to the left and install the nut. Torque the nut to specification.
3 On models with a single hydraulic brake system, install the push rod and boot in the master cylinder.
4 On models with a single hydraulic brake system, install the pedal bumper bolt, bumper and nut. Tighten the nut securely.
5 Install the nylon bushings in the push rod bore and install the push rod eccentric bolt and nut.
6. Install the pedal retracting spring.
7. On models with a single hydraulic brake system, adjust the brake pedal free-travel to 1/16 to 1/4 inch. Torque the eccentric bolt nut to specification.

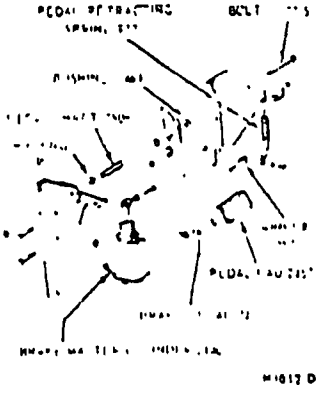

FIG. 11 Single Master Cylinder and Brake Pedal Installation—C-Series

OVERHAUL

BRAKE WHEEL CYLINDER

Disassembly

1 With the wheel cylinder removed, remove the rubber boots from the ends of the brake cylinder. Remove the pistons, cups, and piston return spring from the cylinder (Fig. 12).

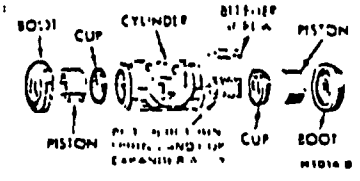

FIG. 12 Double Servo Brakes Cylinder

2. Remove the bleeder screw from the cylinder.

Assembly

1 Coat all brake cylinder parts with clean extra heavy duty brake fluid C6AZ-19542-A.
2 Install the bleeder screw (Fig. 12) in the brake cylinder.
3 Place the piston return spring, cups, and pistons in the cylinder bore, and install a boot and link over each end of the cylinder. Clamp the brake cylinder pistons against the ends of the cylinder. When using a brake cylinder repair kit follow the instructions in the kit and install all of the parts provided.

MASTER CYLINDER

Single Brake System

Disassembly

1 Remove the master cylinder. Clean the outside of the master cylinder, and remove the filler cap and gasket. Pour out any brake fluid left in the cylinder and reservoir.

On C-Series vehicles, (Fig. 13), remove the bolts that hold the cylinder body on the reservoir and remove the reservoir. Press down on the piston to compress the return spring, and remove the snap ring. Remove the piston, primary cup, piston filler, return spring, check valve and check valve seat.

On vehicles with a frame-mounted vacuum brake booster, the check valve is installed in the booster instead of in the master cylinder.

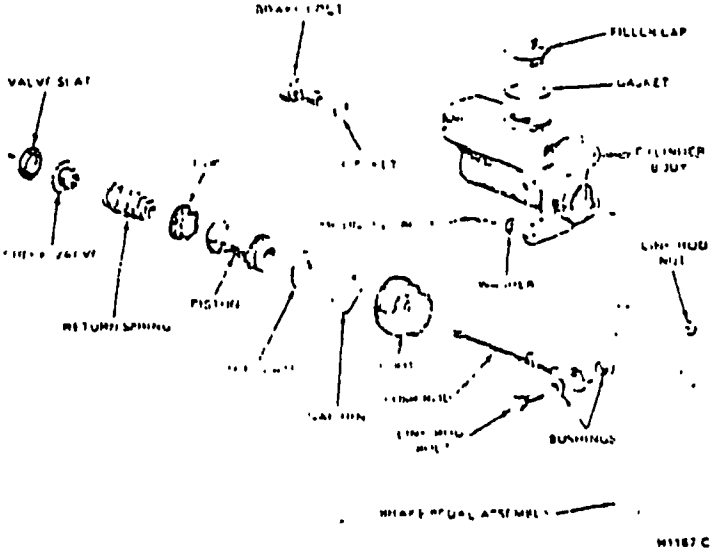

FIG. 13 C Series Brake Master Cylinder—Disassembled

2. Connect the brake hydraulic system lines to the differential valve assembly and tighten the tube nuts securely
3. Connect the shell-wire connector to the brake warning lamp switch. Make sure the plastic lugs on the connector hold the connector securely to the switch
4. Bleed the brakes and centralize the pressure differential valve as described in this Part

BRAKE PEDAL ASSEMBLY

L, LN-, and LT-Series

Removal

1. Remove the stop light switch from the pedal bracket
2. Remove the brake master cylinder push rod bolt nut, and nylon bushing
3. Remove the nut from the pedal shaft. Slide the shaft to the left and remove the brake pedal and sleeve
4. Remove the bushings from the pedal.

Installation

1. Coat all bushings and the pedal shaft with a small amount of Lubriplate or an equivalent lubricant.
2. Position the nylon bushings in the brake pedal shaft bore
3. Position the brake pedal assembly and sleeve in the pedal support bracket. Slide the pedal shaft through the sleeve and pedal and secure with the nut. Torque the nut to specification
4. Position the nylon bushings in the bore of the push rod. Connect the push rod to the brake pedal with the bolt and nut
5. Adjust the brake pedal free travel to 1/16 to 1/8-inch. Torque the eccentric bolt nut to specification
6. Install the stop light switch in the pedal bracket as far in as possible. Pull the pedal to its furthest return position to properly reset the stoplight switch

P-500 Series

Removal

1. Open the front cover and disconnect the transmission gearshift rods from the shift levers. Position the rods so maximum working space is available at the pedal support bracket
2. Remove the pedal pads from the clutch and brake pedal (Fig. 10)
3. Remove the screws that hold the floor covers at the steering column, and remove the covers. Unlatch the engine cover assembly and open.
4. Remove the floor plate retaining screws. Remove the accelerator pedal from the accelerator linkage and remove the floor plate
5. Disconnect the clutch and brake pedal retracting springs
6. Loosen the pedal support bracket clamp bolt. Remove the cotter pins and clevis pins from the clutch and brake pedals
7. Turn the front wheels all the way to the left. Through the left front fender apron, remove the locking pin from the clutch pedal and remove the pedal. Push the pedal shaft toward the centerline of the vehicle. From inside the cab, slide the pedal shaft and clutch pedal lever to the right and out of the support bracket. Remove the brake pedal from the support bracket. Remove the bushings from the pedal and the pedal support bracket

Installation

1. Coat all bushings and the pedal shaft with a small amount of lubricant ESA-M1C75-B or equival nt. Install new bushings in the pedal support bracket and the brake pedal
2. Position the brake pedal in the support bracket and slide the pedal shaft and clutch pedal lever through the bracket and pedal
3. Through the left front fender apron, install the clutch pedal on the shaft and secure it with a new cotter pin
4. Position the clutch rod on the clutch pedal lever, install the clevis pin and secure it with a new cotter pin
5. Position the brake master cylinder push rod in the brake pedal, install the clevis pin, and secure it with a new cotter pin
6. Install the clutch and brake pedal retracting springs
7. With the brake pedal against the stop, adjust the brake master cylinder push rod to give 0.07 to 0.24-inch free play measured at center line of pedal pad before push rod contacts piston. Remove the clevis pin from the push rod and turn the rod until the specified free travel is obtained. Tighten the jam nut and install clevis pin after adjustment

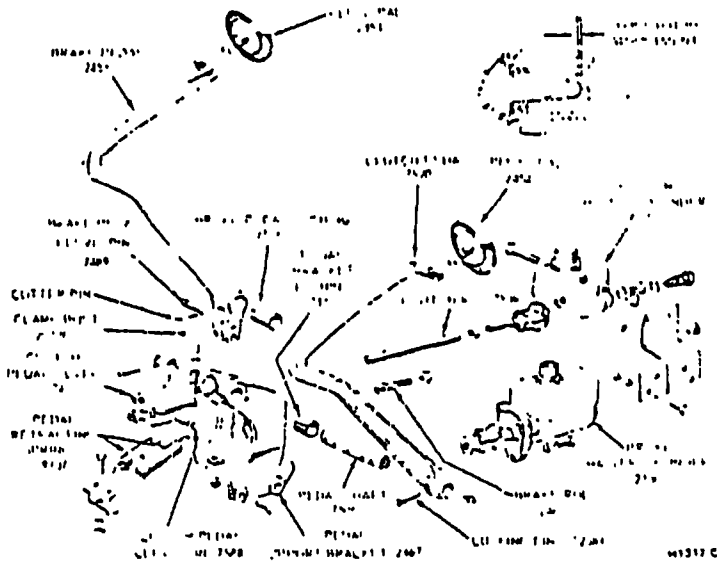

FIG. 10 Brake Pedal and Related Parts—P-500

B Series

Removal

1. Remove the stop light switch from the pedal bracket (Fig. 11)
2. Remove the retainer clip, master cylinder push rod and bushing
3. Remove the clip from the pedal shaft. Slide the shaft to the left and remove the brake pedal
4. Remove the bushings from the pedal

Installation

1. Coat all bushings and the pedal shaft with a small amount of Lubriplate or an equivalent lubricant
2. Install the nylon bushings in the brake pedal shaft bore
3. Position the brake pedal assembly in the pedal support bracket. Slide the pedal shaft through the pedal and secure with the retainer clip
4. Position the nylon bushing in the bore of the push rod to assemble the brake pedal with the clevis pin
5. Install the stoplight switch in the pedal bracket as far in as possible. Pull the pedal to its furthest return position to properly reset the stoplight switch.

PART 12-09 Drum Brakes — Dual Cylinders, Single Piston (Wagner)

Applies To 600 Thru 900 Series Trucks

ADJUSTMENTS

BRAKE SHOE ADJUSTMENT

Adjust the brake shoes when the brake drums are at normal room temperature. If the shoes are adjusted when the drums are hot and expanded, they may drag as the drums cool and contract.

Brake adjustment re-establishes the brake lining-to-drum clearance and compensates for normal lining wear.

Follow the adjustment procedures below.

SELF ADJUSTING BRAKES—600-900 SERIES

Manually adjust two-cylinder front brakes using the hex-head self locking cam adjusters. Subsequent adjustment is automatic. For manual adjustment:

1. Raise the vehicle and check the front brakes for drag by rotating the wheels.
2. Adjust one shoe by rotating the wheel forward while turning the cam hex-head forward. Expand the shoe until a light drag is felt on the drum. Do *not apply excessive force on the hex-head cam*, or the automatic adjuster parts may be damaged. Loosen the adjustment until the wheel turns freely. Adjust the other cam in the *same manner*.
3. Adjust the other front wheel brake using the procedure above.
4. Apply the brakes and recheck the adjustment.

REMOVAL AND INSTALLATION

BRAKE DRUMS THROUGH 900 SERIES

Removal and Installation

Service procedures for these models are described in Part 12-01.

BRAKE SHOES AND ADJUSTING MECHANISM

600-900 Series

Removal

1. Raise the vehicle until the tires clear the floor. Remove the wheel and tire assembly. Remove the drum or the hub and drum assembly. Mark the hub and drum to aid assembly in the same position.

   Expell all vacuum in the system before disconnecting the hydraulic lines. Expell vacuum in the system by pushing down on brake pedal when engine is off.
2. Remove both brake shoe retracting springs (Fig. 1).
3. Remove the C-washers and flat washers from the hold-down studs. Lift the shoes off the backing plate.
4. To remove the adjuster assembly from the shoe, unhook the wedge spring from the wedge and the coil spring from the shoe web. Work the coil spring off the lever pivot pin and slide the spring hook from the plug lever pin. Pull the adjuster lever from the back of the shoe and remove the plug, wedge washer, wedge, and wedge guide.

Installation

1. To install the adjuster assembly, position the wedge guide with its pin in the hole provided in the brake shoe. Place the wedge guide on the side of the brake shoe farthest away from the carrier plate. Position the wedge on the shoe web with its serrated edge resting against the serrations on the wedge guide.
2. Insert the drum contact plug so its head is through the hole in the brake shoe and lining and its shank rests over the wedge and wedge guide. The plug must be installed from the inside of the brake shoe.
3. From the opposite side of the shoe, install the shoe adjustment lever, guiding the pin into the mating hole of the contact plug. Install the washer over the wedge on the lever pivot pin.
4. Position the U-hook of the adjuster torsion spring on the plug lever pin. Attach one end of the wedge spring to the hook, and install the coiled portion of the torsion spring over the lever pivot pin. Install the outer end of the torsion spring over the edge of the shoe web.

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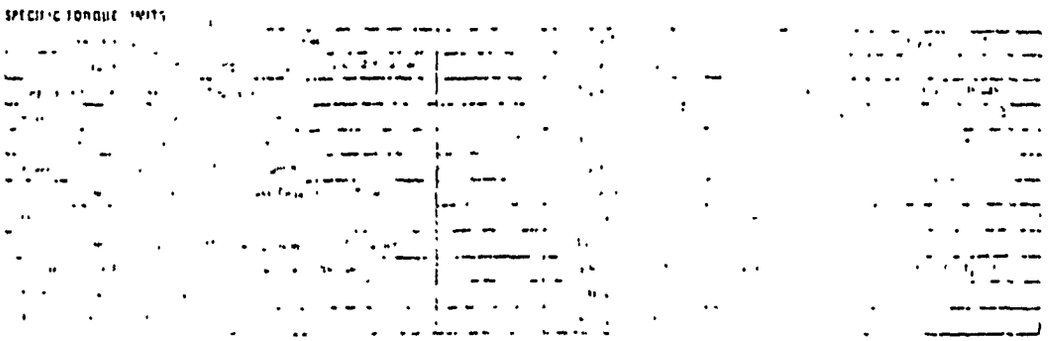
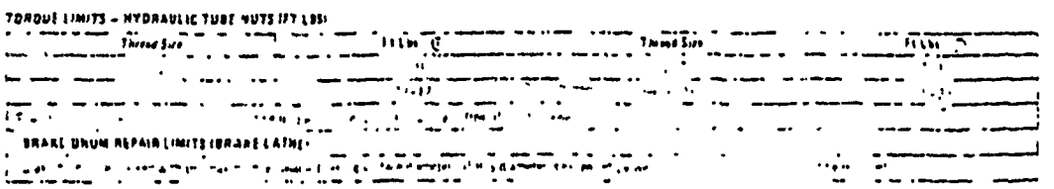
16 Compress the spring and install the remaining snap ring and split washer on the piston stop rod.
17 Slide the piston stop rod into the secondary piston and engage the snap ring in its groove.
18 Slide the end cap and piston assembly into the master cylinder bore and [illegible] the end cap and the master cylinder body. Torque the cap to 15 to 20 ft lb.
19 Install washers on the reservoir retainers and place the retainers in the mounting holes of the reservoir.
20 Place the rubber washers and O rings on the retainers.
21 Install the reservoir and retainer assembly on the master cylinder body and torque the retainers to 15 to 20 ft lb.
22 Replace the springs and check valves in the outlet ports of the cylinder.
23 Replace the primary and secondary pistons and torque to 15 to 20 ft-lb.
24 Install the mounting seal on the flange of the master cylinder. Install the fill cap and gasket.

SPECIFICATIONS

SPECIFIC TORQUE UNITS



TORQUE LIMITS – HYDRAULIC TUBE NUTS (FT LBS)



BRAKE DRUM REPAIR LIMITS (BRAKE LATHE)