

C O N T E N T S

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GENERAL DESCRIPTION

The brake system includes four wheel hydraulic service brakes, combined with a lever operated hand brake that operates only the rear wheel brakes through mechanical linkage. The brake system consists of a brake pedal, master cylinder, wheel cylinders, brake shoes, brake drums, interconnecting linkage and hydraulic lines (Fig. 296).

On Kaiser models the brake pedal is mounted directly on the master cylinder (Fig. 297) providing a direct connection between the pedal and master cylinder. An eccentric bolt connects the brake pedal to the piston push rod providing an adjustment to obtain the proper brake pedal free travel.

On Frazer models the brake pedal is mounted forward from the master cylinder and is connected to the piston push rod by a rod. Pedal free travel is established by changing the length of this rod which is adjustable.

In the Kaiser hand brake system, the rear brake cables are connected to a lever mounted in the frame X-member (Fig. 298) which provides leverage for easy hand brake operation. A cable connects this lever with a pull type handle mounted on the lower instrument panel to the right of the steering column. When the hand brake is applied, approximately a quarter turn of the handle is required to release the locking ratchet.

In the Frazer hand brake system, the front cable is connected directly to the rear cables with an equalizer yoke. The hand brake pistol grip handle is located to the left of the steering column under the instrument panel (Fig. 298).

OPERATION

When the brake pedal is depressed, movement of the pedal is transmitted directly to the brake master cylinder piston assembly. Movement of the master cylinder piston forces the hydraulic fluid through the brake lines into the wheel cylinders. The fluid pressure forces the front and rear pistons in each wheel cylinder outward, expanding the brake shoes against the drums. The greater the pedal pressure, the greater the force exerted against the brake drums.

When the brake pedal is released, the pedal, master cylinder piston, wheel cylinder pistons and brake shoes return to their released positions by means of their respective return springs.

The hand brake is connected by cable linkage from the brake lever, mounted below the instrument panel, to the rear wheel brakes. When the hand brake is applied the movement of the cable linkage to the rear wheels causes the brake shoes to expand, engaging the brake drums.

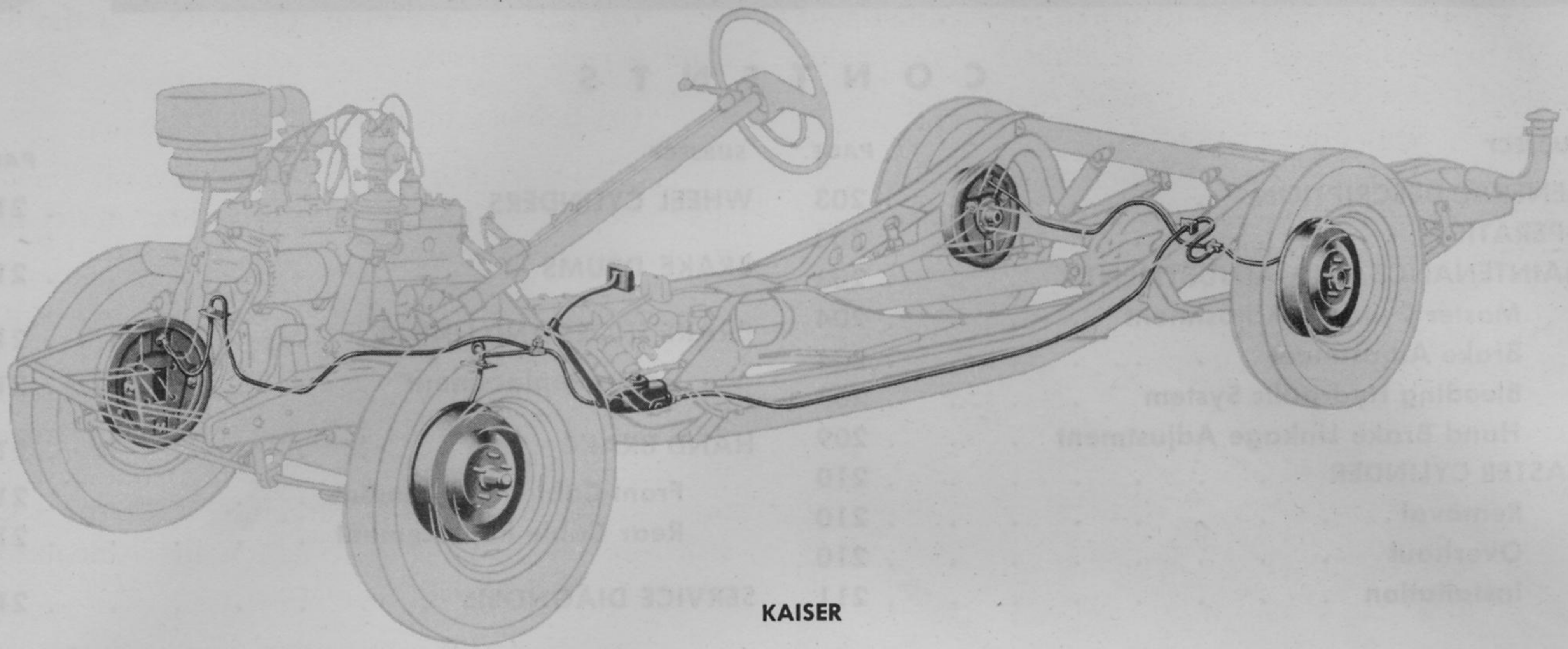
MAINTENANCE AND ADJUSTMENTS

a. GENERAL. Maintenance of the brake system should consist of the following enumerated items to insure efficient braking action. Adjustment procedures are given in paragraphs that follow.

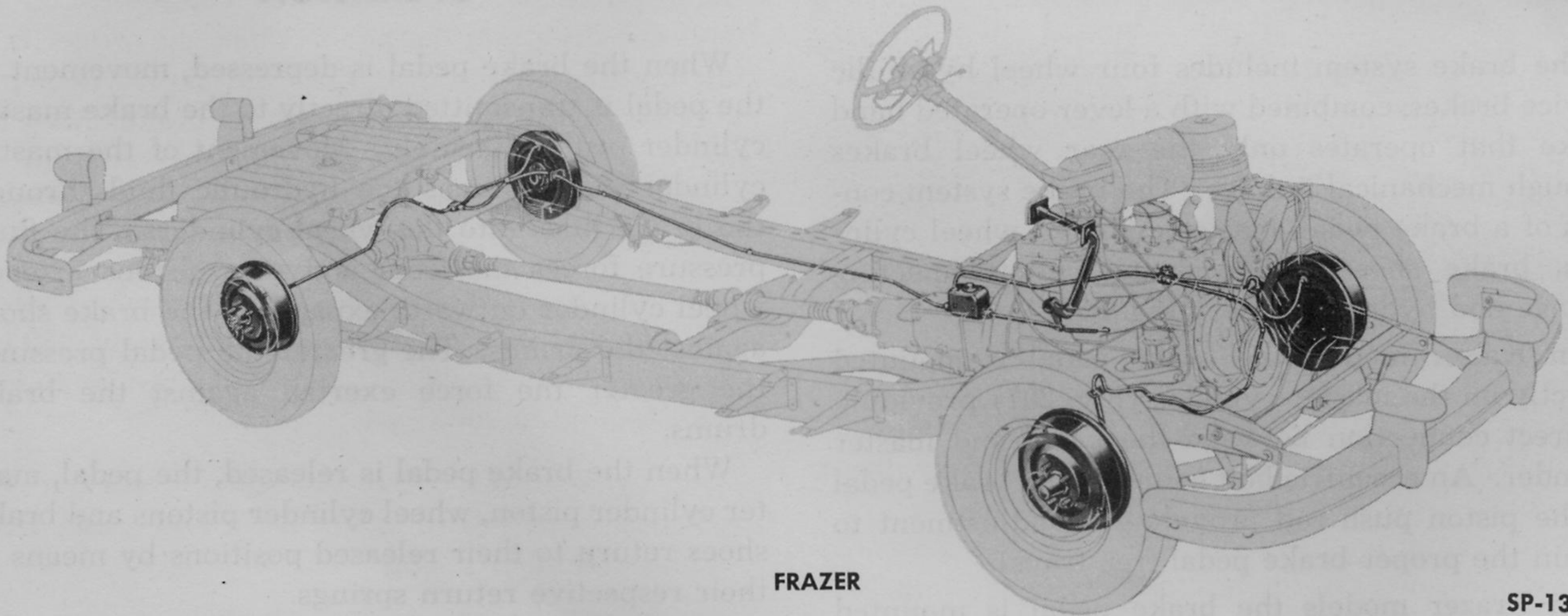
1. Periodically check the hydraulic fluid level in the brake master cylinder and fill as required. Refer to Section 17, "Lubrication," for instructions.

2. Maintain proper brake pedal free travel, measured at the underside of the toe-board.

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KAISER



FRAZER

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Fig. 296—Hydraulic Brake System

3. Adjust the brakes at the four wheels, if the pedal can be depressed more than half way to the floor.

4. Hand brake linkage should be adjusted when it becomes necessary for positive brake application.

5. Brake pedal should be lubricated as shown on chart in Section 17, "Lubrication."

b. MASTER CYLINDER ADJUSTMENT.

1. Pedal Free Travel—Kaiser. The brake master cylinder may be adjusted by loosening the eccentric bolt lock nut (Fig. 297) and turning the eccentric bolt until the brake pedal free travel is $\frac{1}{4}$ to $\frac{1}{2}$ inch, measured from the underside of the toe-board. Tighten the lock nut securely, holding the eccentric

bolt to prevent turning. This adjustment is very important as it assures full release of the brakes.

2. Pedal Free Travel—Frazer. Brake master cylinder adjustment is made by loosening the lock nut on the brake pedal to master cylinder rod and, with the rod clevis disconnected at the pedal, turning the rod in or out of the master cylinder piston push rod, as required. Pedal free travel should be $\frac{1}{4}$ to $\frac{1}{2}$ of an inch, measured from the underside of the toe-board. After adjusting the rod length, tighten the lock nut, connect the rod clevis at the brake pedal and check the pedal free travel.

c. BRAKE ADJUSTMENT. Brakes require periodic servicing and adjustment to assure their proper and efficient operation. Brake adjustment for normal

wear is usually confined to brake shoe adjustment and the addition of hydraulic fluid to the master cylinder reservoir. This type of adjustment is referred to as a "Minor Brake Adjustment."

A "Major Brake Adjustment" is made when the brake shoes have been relined or if the minor adjustment does not give the desired results.

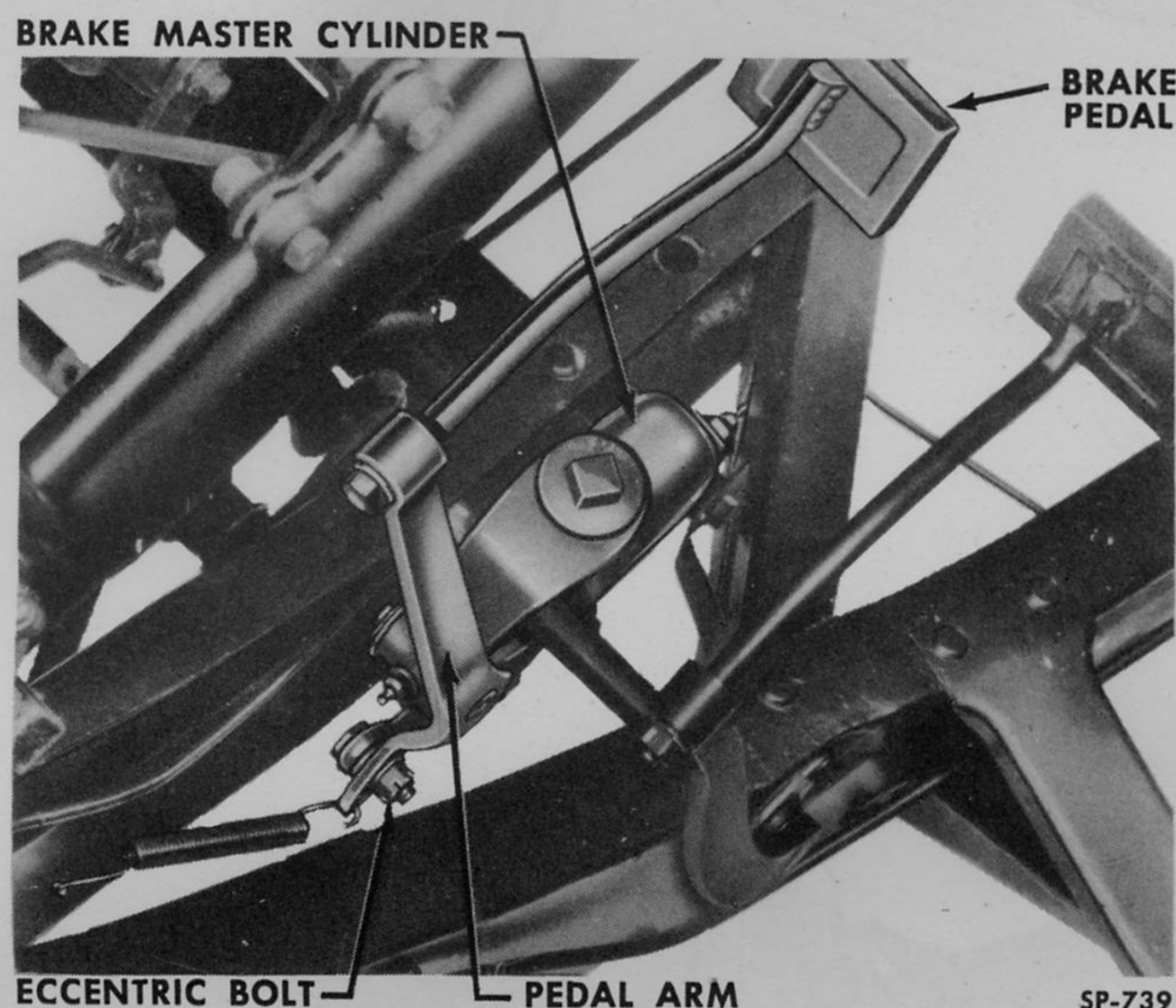


Fig. 297—Brake Pedal and Master Cylinder Mounting—Kaiser

Brake shoe adjustment is controlled by two cams mounted in the brake shoe support plate with an eccentric boss contacting the brake shoe web. By slightly rotating the cam, the eccentric boss will cause movement of the brake shoe "in" or "out." To expand the brake shoes when adjusting brakes, the rear cam of each wheel must be turned down and toward the rear of the vehicle; the front cams must be turned down and toward the front of the vehicle (Fig. 299).

The brake shoe cams are replaceable, secured in the brake shoe support plate with a lock nut. When adjusting the brakes the lock nut must be loosened before rotating the cam. Proper adjustment of the cam will require the use of two wrenches, one to loosen or tighten the lock nut, and the Brake Adjusting Wrench W-213 to rotate the cam (Fig. 300).

1. Minor Brake Adjustment. A minor brake adjustment includes the proper adjustment of all brakes without removing the wheels, filling the master cylinder reservoir, adjusting the hand brake, and road testing the vehicle. Proceed with the minor adjustment as follows:

(a) Lift the wheel or wheels free of the floor using a jack or hoist.

(b) Release the hand brake.

(c) Operate the brake pedal several times or tap the drum with a mallet to "equalize" or "center" the brake shoes.

(d) Adjust the brake shoes as follows: Rotate the cam of the rear shoe until the shoe locks against the brake drum; that is, until the wheel cannot be rotated by hand. With the brake shoe locked against the drum, back off the cam slightly; that is, rotate the cam in the opposite direction until the wheel will rotate without drag. Tighten the lock nut securely to lock the cam in place.

(e) Repeat the operation on the front shoe. After the adjustment has been completed on one wheel, a drag may be heard when the wheel is rotated, although the drag does not slow wheel rotation noticeably. This is caused by brake shoes that are not "centered" and may be corrected by operating the brake pedal several times to center the shoes.

(f) Repeat the above operations on all wheels. By following this procedure approximately .010 inch clearance between the brake shoe lining and the drum should be obtained.

(g) Fill the master cylinder reservoir with K-F approved Hydraulic Brake Fluid using Brake Cylinder Refiller C-362.

(h) Adjust the hand brake linkage as outlined under HAND BRAKE LINKAGE ADJUSTMENT.

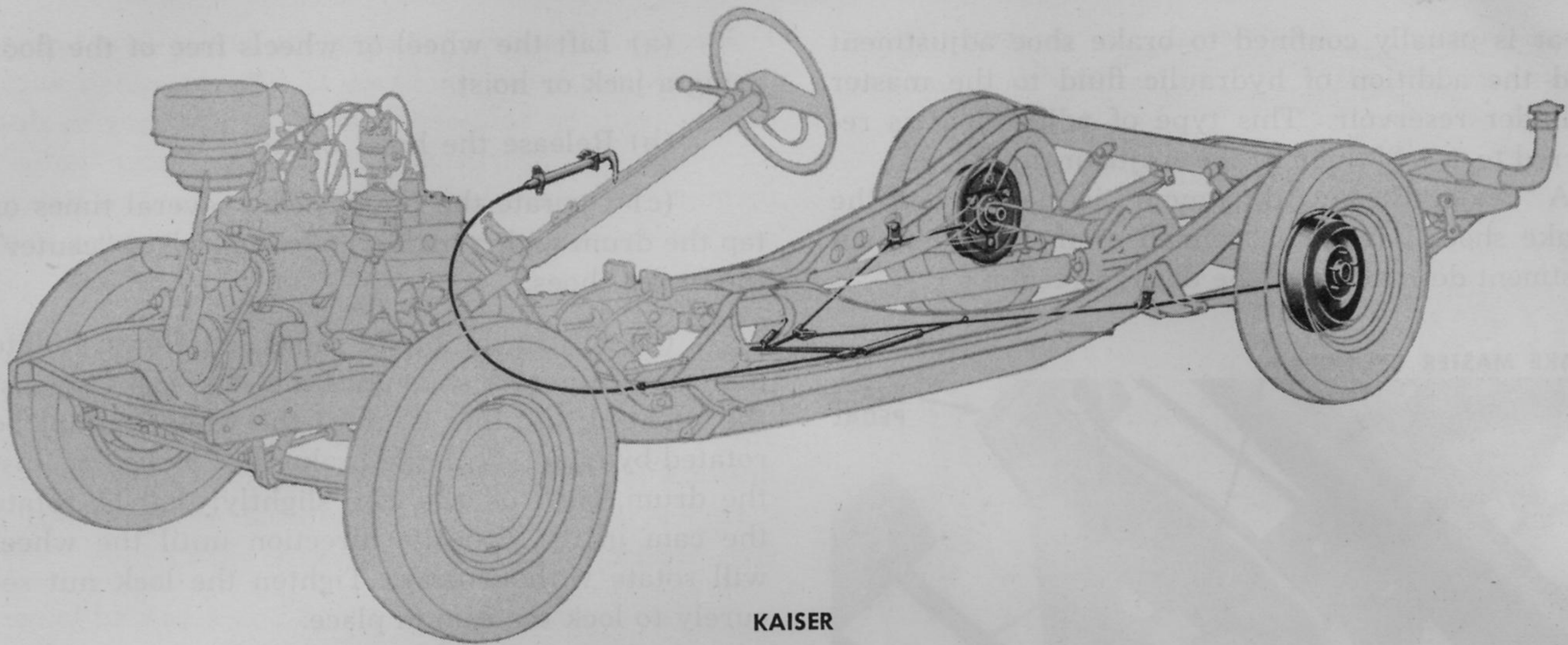
(i) Road test the car to assure proper brake operation.

2. Major Brake Adjustment. A major brake adjustment covers all points detailed in MINOR BRAKE ADJUSTMENT above, and in addition, includes a complete inspection of the brake system, bleeding the hydraulic system, and adjustment of the pedal linkage.

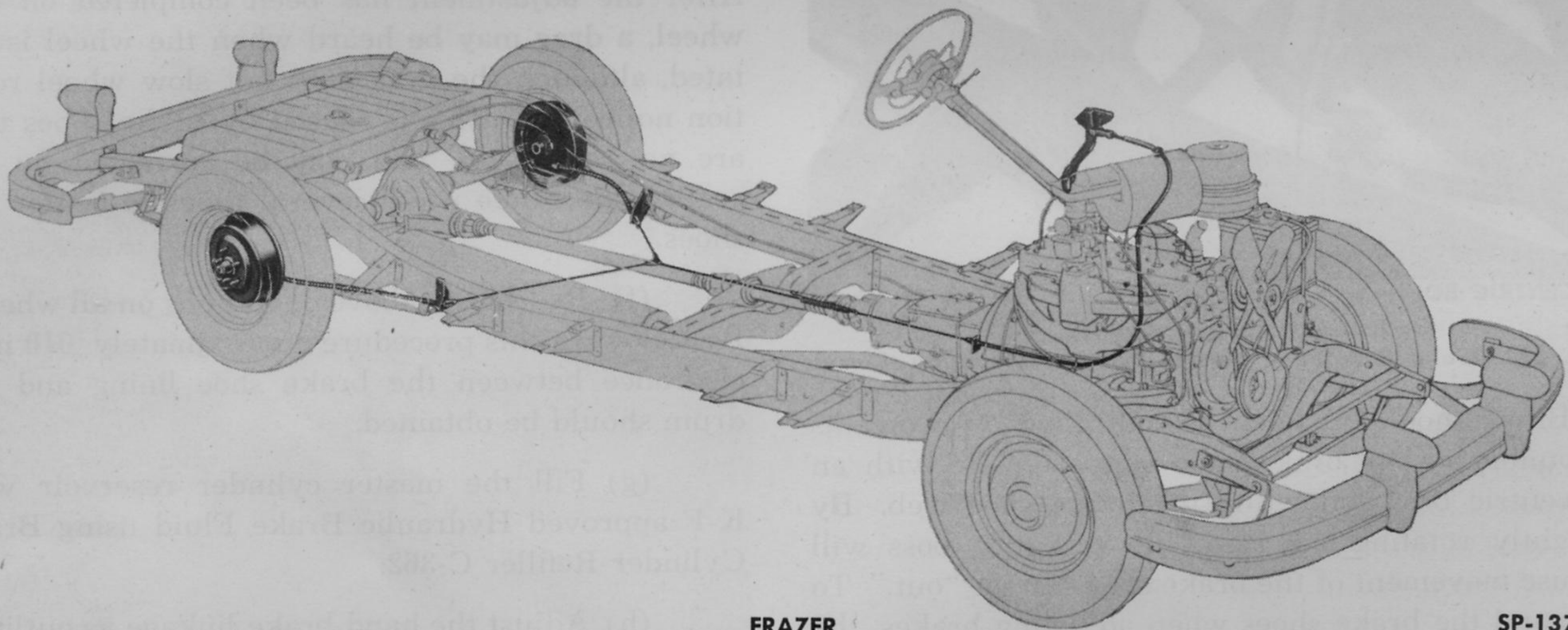
A major brake adjustment is made after the brake shoes have been relined or when desired results cannot be obtained by a minor adjustment. Proceed as follows:

(a) Raise the vehicle and remove all four wheels. Refer to Section 12, "Wheels and Tires," for wheel removal procedure.

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KAISER



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Fig. 298—Hand Brake Installation

(b) Release the hand brake.

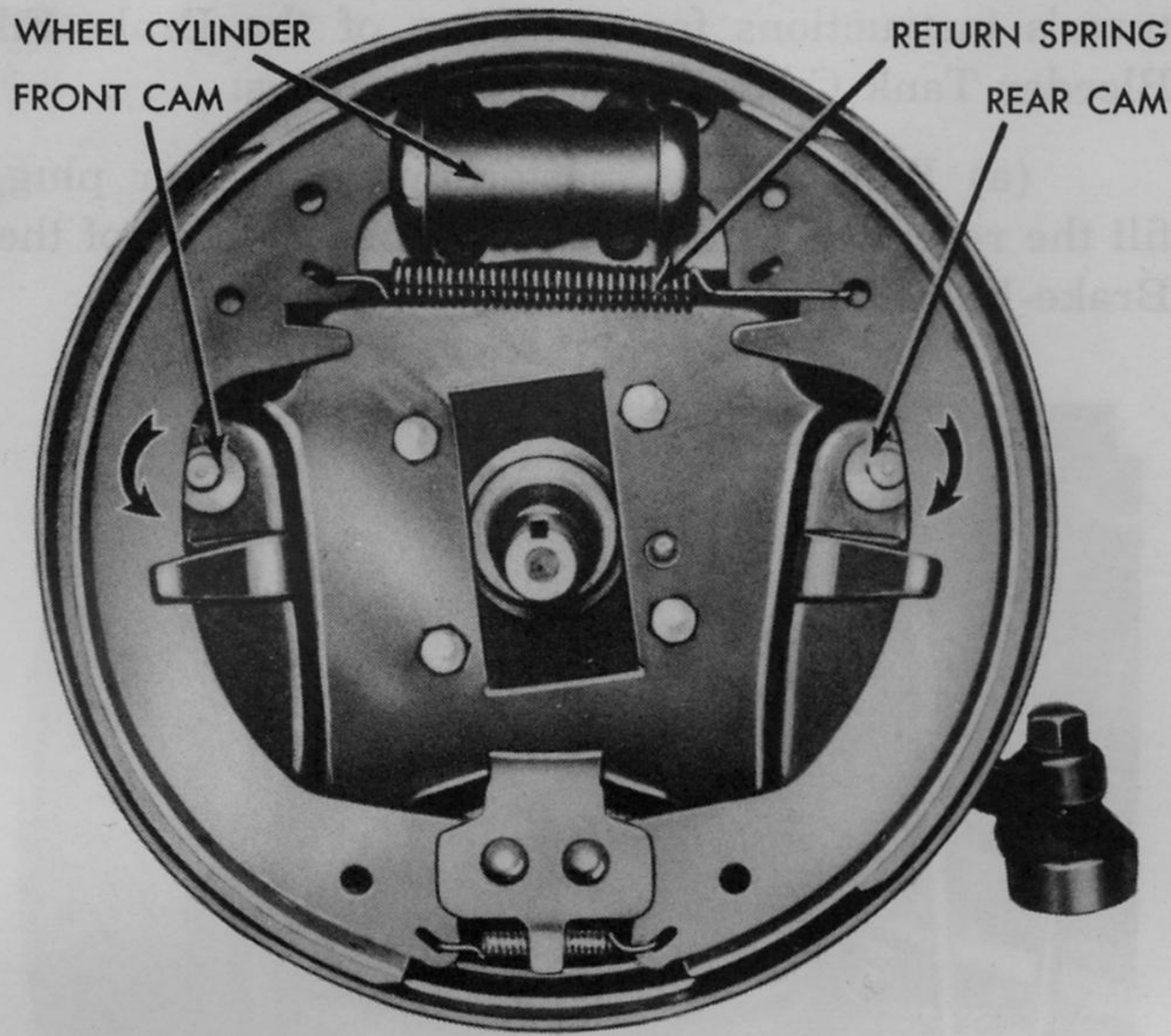
(c) Remove and inspect the brake drums and hubs. If the drums are scored, out-of-round, or bell-mouthed, they must be turned down on a lathe or replaced, as outlined under BRAKE DRUMS, later in this Section.

(d) Inspect the brake linings. If they are oil soaked or worn within $\frac{1}{32}$ of an inch of the rivet heads, the lining should be replaced. If the linings have not been making full contact with the drum, the lining should be replaced. Brake shoe and lining assembly should be replaced if the shoe itself is damaged or warped. Brake shoe and lining assemblies should be replaced or brake shoes relined only

in sets for both front wheels or both rear wheels, as explained under BRAKE SHOES AND LININGS.

(e) Remove all rust, oil, dust, and dirt from the brake shoes, brake shoe support plate, and actuating mechanism. Lubricate the working parts of the actuating mechanism with Lubriplate. On the rear wheels, make sure that the hand brake mechanism operates freely.

(f) Prior to installing the brake drums, check thoroughly for leakage at the wheel cylinders, the master cylinder, and the hydraulic lines. If any cylinders or lines show signs of leakage, repair or replace them.



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Fig. 299—Brake Shoes and Adjusting Cams

(g) Inspect the brake shoe support plate and wheel cylinder attaching bolts and nuts for tightness. Tighten if necessary.

(h) Rotate the brake shoe adjusting cams to the full released position to retract the shoes and install the brake drums as outlined under BRAKE DRUMS.

(i) Adjust the brake shoes. The brake drums are provided with a slot at the outer edge to facilitate checking brake shoe to drum clearance. With this type of drum the brake shoe adjustment is made with the wheels off.



SP-448

Fig. 300—Adjusting Replaceable Type Cams

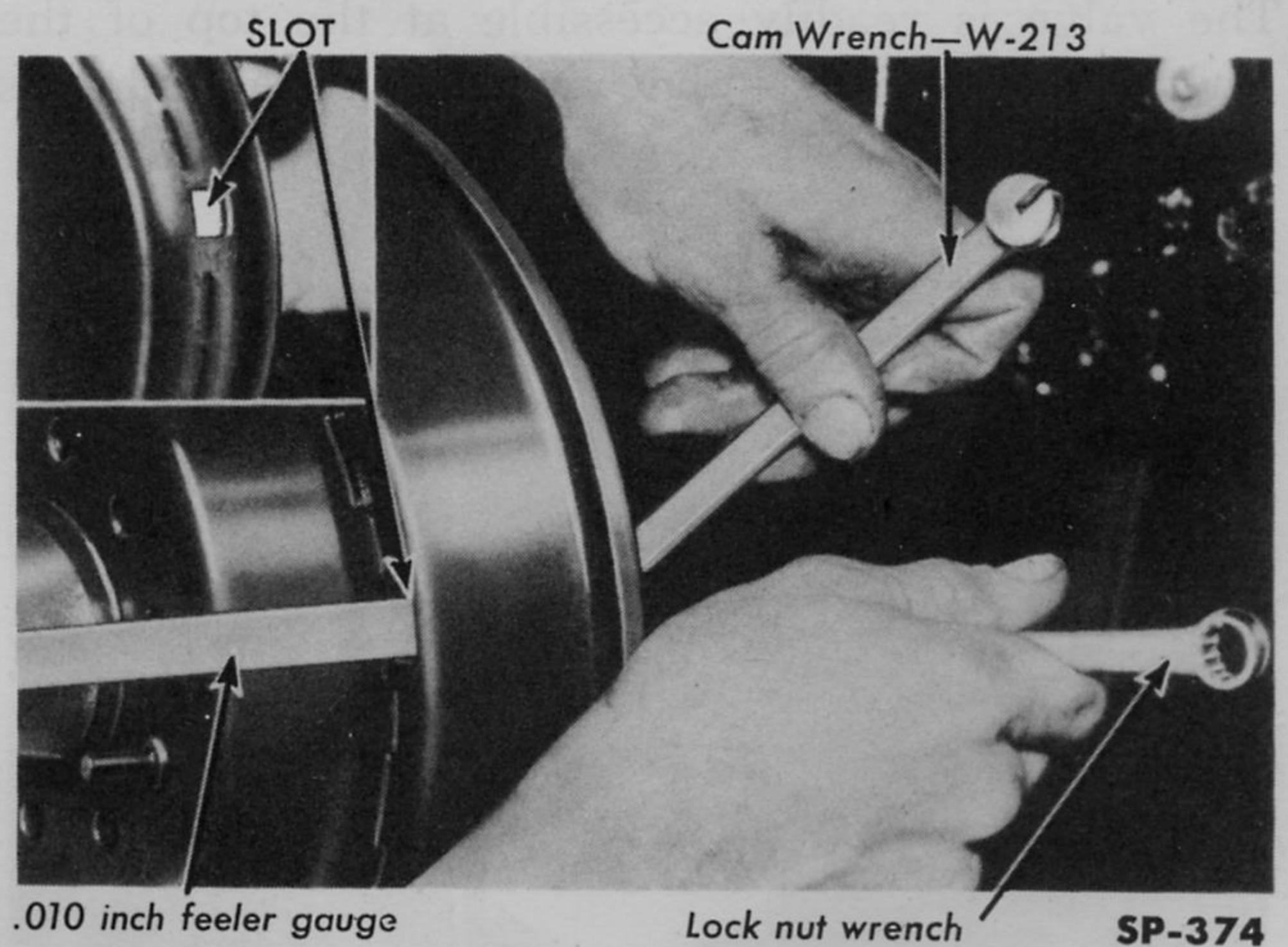
Specified clearance between the brake shoe lining and braking face of the drum is .010 of an inch with the brakes fully released. The clearance may be determined by inserting a .010 inch feeler gauge through the drum slot between the brake shoe lining and the drum, across the full width of the lining and directly over the cam.

Adjust the cam until the feeler gauge drags when it is moved in and out (Fig. 301). Rotate the drum, with the feeler gauge still inserted, over the entire length of the lining several times to assure uniform clearance at all points along the lining.

Repeat the adjustment operation on each brake shoe starting with the rear shoe of each wheel.

(j) Install the wheels and hub caps and lower the hoist or jack.

(k) Bleed the hydraulic system if necessary, referring to BLEEDING HYDRAULIC SYSTEM for procedure.



SP-374

Fig. 301—Adjusting Brake Shoe Lining to Drum Clearance

(l) Adjust the hand brake linkage as outlined under HAND BRAKE LINKAGE ADJUSTMENT. Also check and adjust, if necessary, the brake pedal free travel as described under MASTER CYLINDER ADJUSTMENT.

(m) Road test the car to assure proper brake operation.

d. BLEEDING HYDRAULIC SYSTEM. The hydraulic system must be bled whenever a fluid line has been disconnected or air gets into the system. If a hydraulic line is disconnected at the master cylinder, then the system must be bled at all four wheel cylin-

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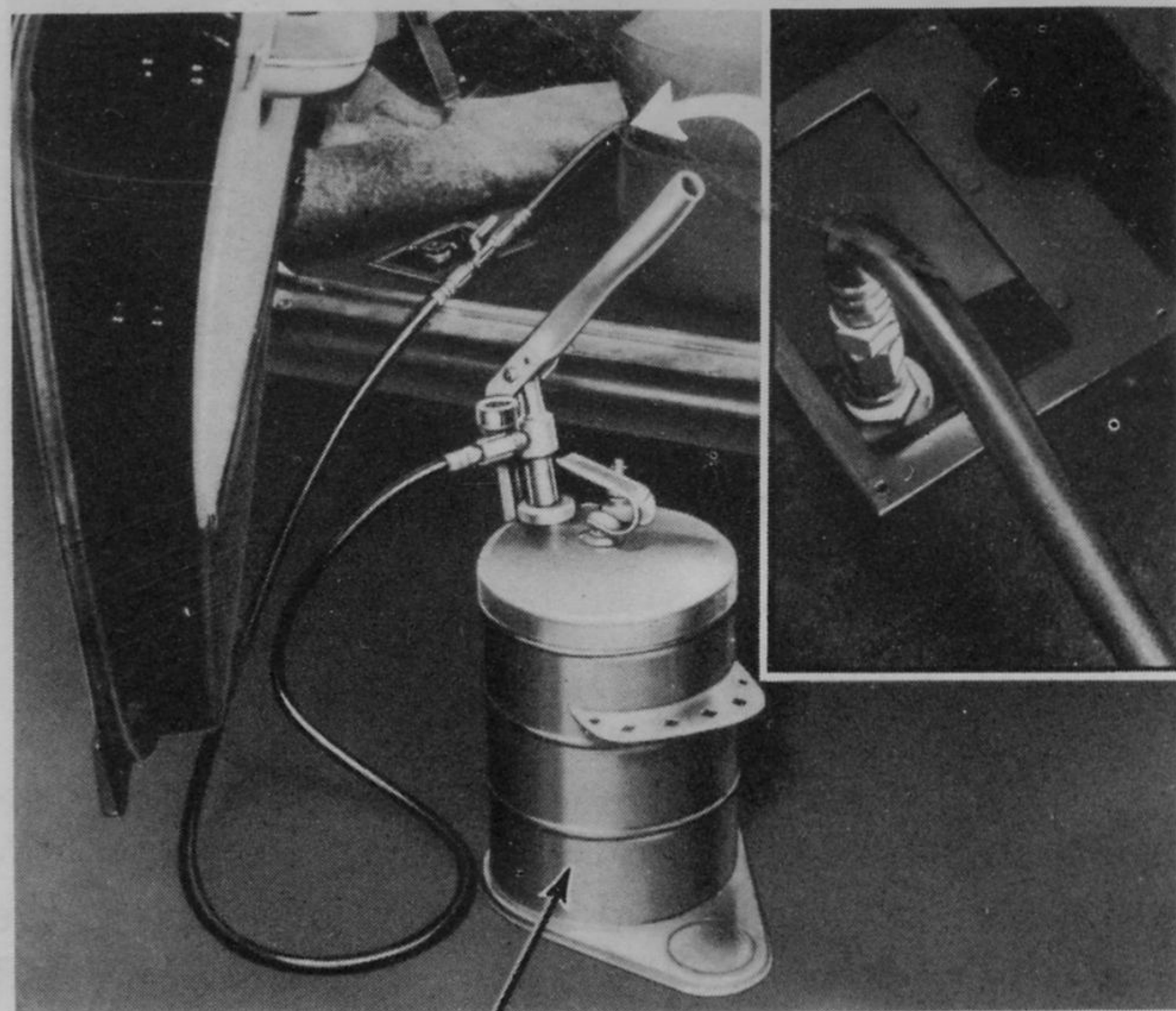
ders. Whenever a hydraulic line is disconnected from an individual wheel cylinder, then that wheel cylinder only must be bled.

The presence of air in the hydraulic system will cause "spongy" brake pedal operation. Air trapped in the system is compressed and does not permit all the pressure applied to the brake pedal to be transmitted through the brake lines.

Two methods are used in bleeding the hydraulic system. The pressure method using Brake-Fil Bleeder Tank C-837 (Fig. 302), quickly and efficiently bleeds and refills the system. The application of this method of bleeding removes air, sediment, and sludge from the system and leaves it full of clean fluid.

Manual bleeding of the hydraulic system is a simple method, forcing additional hydraulic fluid through the brake lines by actuating the brake pedal in order to expel air from the system.

Each wheel cylinder is equipped with a valve expressly for the purpose of bleeding the brake line. The valve is readily accessible at the top of the brake shoe support plate where the cylinder is mounted.



Bleeder tank—C-837

SP-260

Fig. 302—Pressure Bleeding Hydraulic System

1. Pressure Bleeding. Absolute cleanliness is essential when servicing the hydraulic system. All dirt must be removed from the master cylinder filler cap and the valves of the wheel cylinders. The longest brake line must be bled first. Refer to manufac-

turer's instructions for operation of the Brake-Fil Bleeder Tank C-837. Proceed as follows:

(a) Remove the master cylinder filler plug, fill the reservoir, and install the adapter plug of the Brake-Fil Bleeder in the filler opening.



Bleeder hose—C-650

SP-447

Fig. 303—Bleeding Hydraulic System at Wheel Cylinder

(b) Attach one end of Brake Bleeder Hose C-650 to the wheel cylinder valve. Place the opposite end in a glass container partially filled with hydraulic fluid so that the end of the hose is submerged (Fig. 303).

(c) Connect the hose coupler of the Brake-Fil Bleeder Tank to the adapter plug. "Cock" the bleeder tank handle and open the shut-off valve in the tank hose. Refer to Fig. 302.

(d) Turn the bleeder valve on the wheel cylinder to the open position ($\frac{1}{2}$ to $\frac{3}{4}$ turn) and allow the fluid to bleed into the jar. When bubbles cease to appear in the jar and the fluid stream is solid, close the bleeder valve and remove the hose.

(e) Again "cock" the bleeder tank and repeat the operation on the other wheels.

(f) When the bleeding is completed, close the shut-off valve and disconnect the hose from the adapter plug. Remove the adapter plug from the brake master cylinder.

(g) Fill the master cylinder reservoir and install the filler plug.

2. Manual Bleeding. When the manual bleeding method is applied the level of the hydraulic fluid in the reservoir is maintained by use of automatic Brake Cylinder Refiller C-362 (Fig. 304). Operation of the brake pedal forces the hydraulic fluid through the lines to the brake cylinders and out the bleeder drain hose.

Since cleanliness is essential when servicing the hydraulic system, all dirt must be removed from the master cylinder filler cap and the valves of the wheel cylinders. The longest brake line must be bled first. Proceed as follows:

FILLER PLUG Brake cylinder refiller C-362

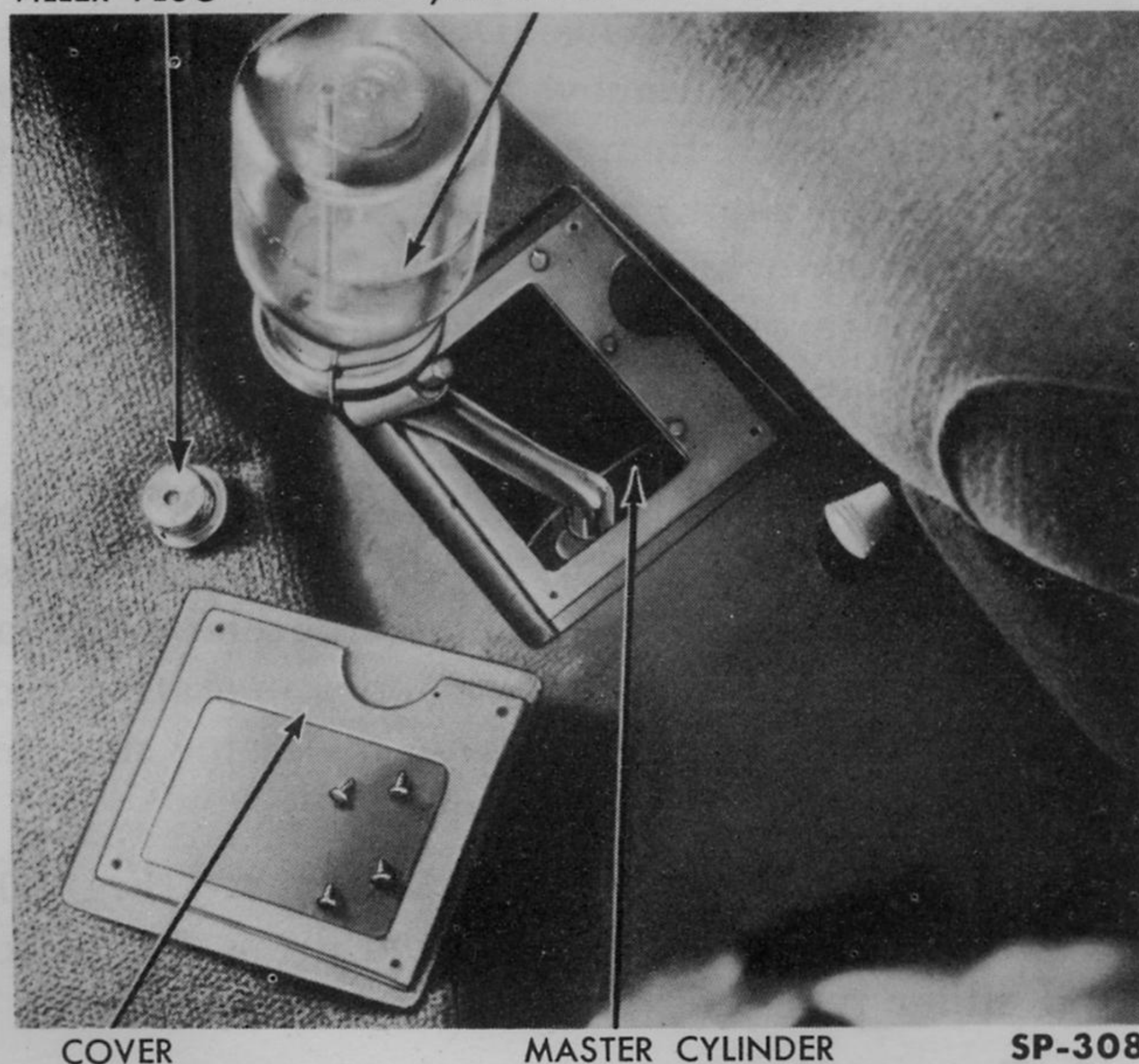


Fig. 304—Filling Brake Master Cylinder

(a) Remove the master cylinder reservoir filler plug and install the automatic Brake Cylinder Refiller C-362, so that the nozzle is in the filler opening.

(b) Attach one end of Brake Bleeder Hose C-650 to the wheel cylinder valve (Fig. 303). Place the opposite end in a glass container filled with hydraulic fluid so that the end of the hose is submerged.

(c) Turn the bleeder valve on the wheel cylinder to the open position ($\frac{1}{2}$ to $\frac{3}{4}$ turn).

(d) Open the valve on the automatic Brake Cylinder Refiller C-362 so that the brake fluid may flow into the master cylinder reservoir.

(e) Pump the brake pedal by hand, forcing fluid through the lines and out the Brake Bleeder Hose C-650. When bubbles cease to appear in the container and the fluid stream is solid, close the bleeder valve and remove the hose.

(f) Repeat the above operations on the other wheels.

(g) When the bleeding is completed, remove the automatic refiller, making sure that the master cylinder reservoir is full of fluid. Install the filler plug.

e. HAND BRAKE LINKAGE ADJUSTMENT. The hand brake linkage for Kaiser models is not the same as on Frazer models. Separate adjustment procedures are given below for each.

1. Hand Brake Linkage Adjustment — Kaiser (Fig. 305). To adjust the hand brake linkage, place the hand brake handle in the fully released position. Disconnect the front cable from the lever which is mounted in the frame X-member. The front cable should then be shortened by turning the clevis onto the end of the cable enough to remove excessive slack and still connect to the lever without moving the lever from its normal position. Pull the hand brake handle out three notches (clicks) on the ratchet. Tighten the rear cable at the rear of the X-member as required to remove excessive slack.

2. Hand Brake Linkage Adjustment — Frazer (Fig. 306). Adjustment of the hand brake on

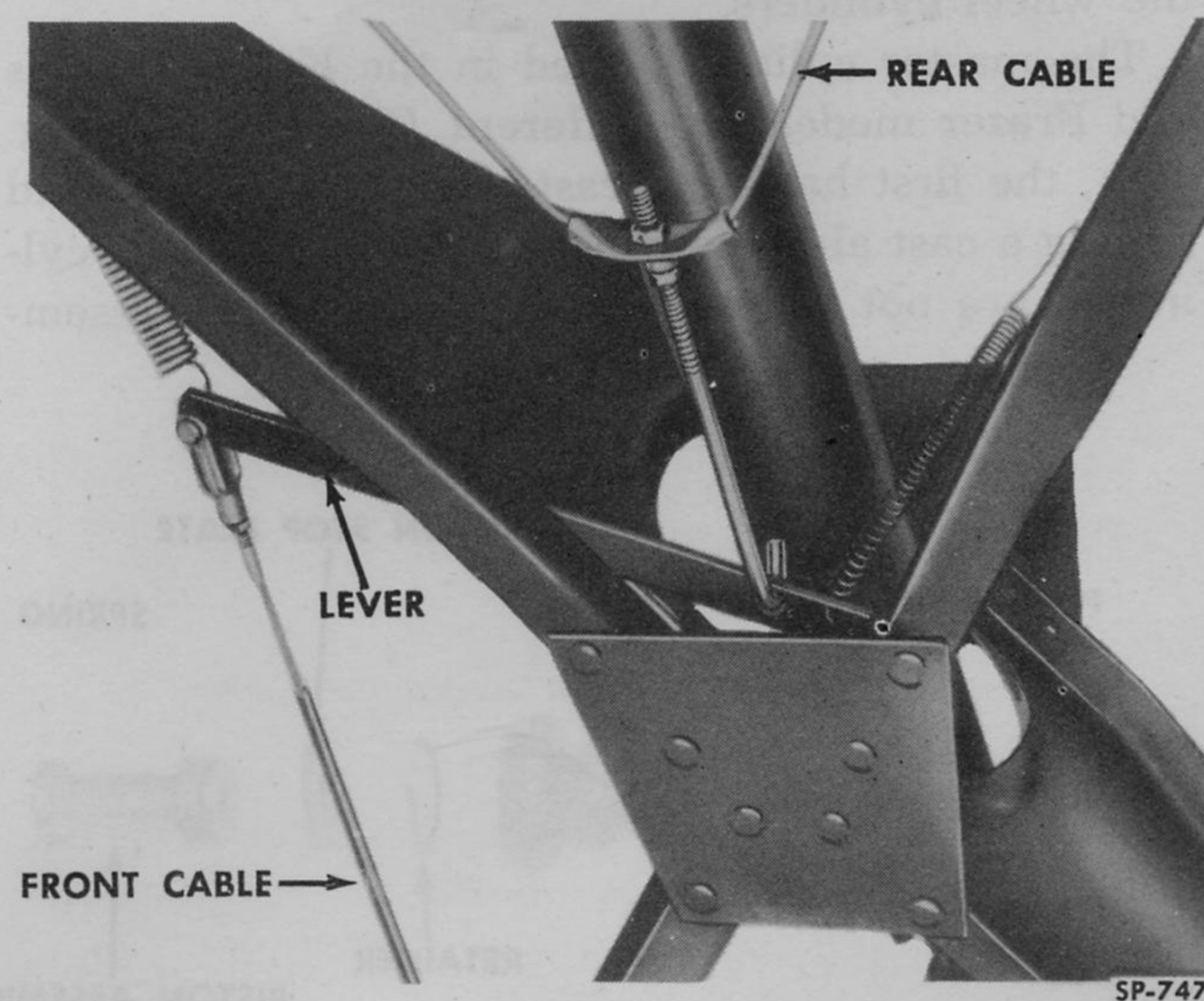
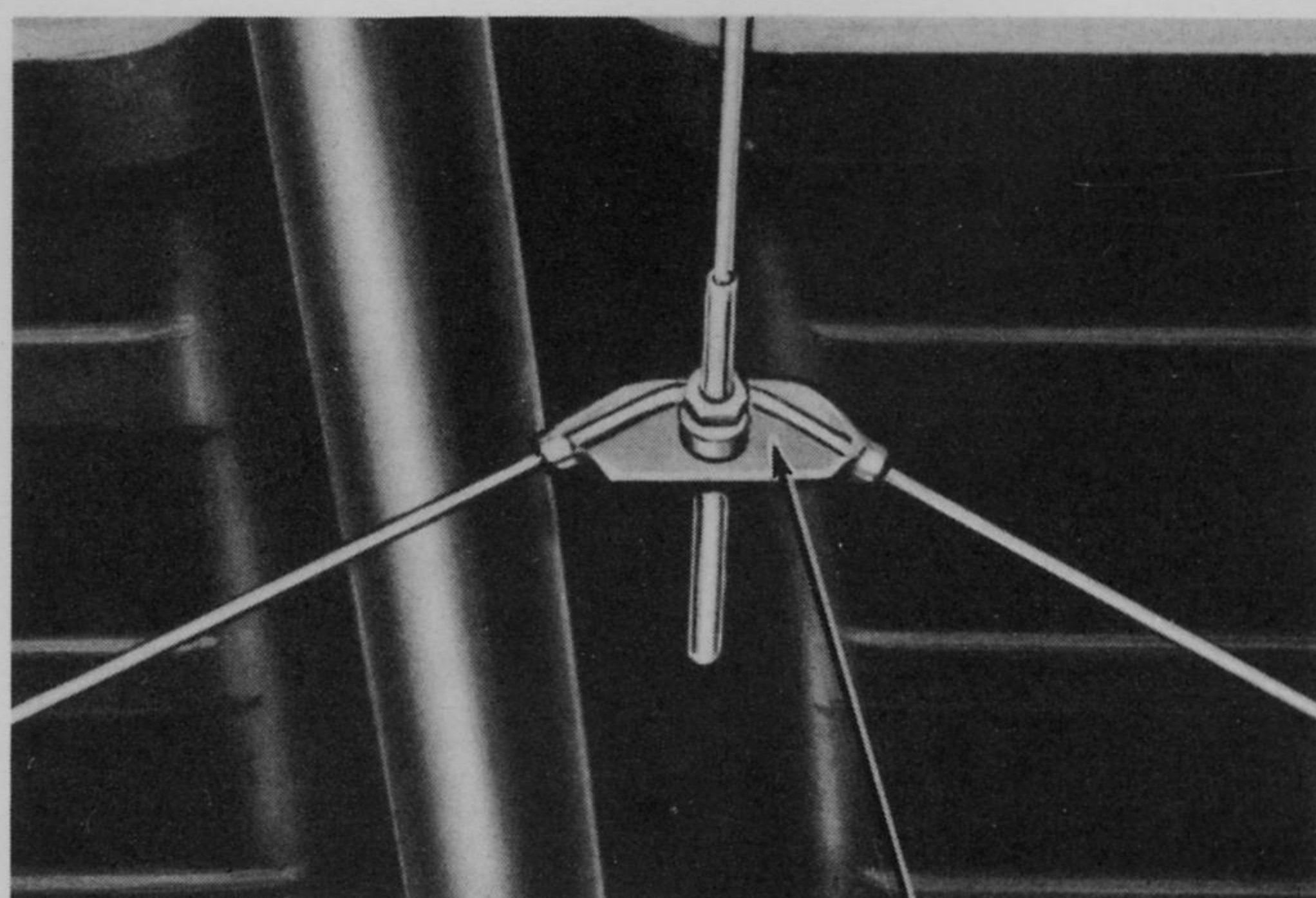


Fig. 305—Hand Brake Equalizer Lever and Rear Cable—Kaiser

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Frazer models is accomplished by loosening and backing off the lock nut on the front side of the equalizer yoke. The nut on the rear side of the equalizer yoke is then run up until proper adjustment is obtained and slack is taken up. Then tighten the lock nut.



EQUALIZER YOKE SP-370

Fig. 306—Hand Brake Adjustment—Frazer

MASTER CYLINDER

The master cylinder consists of a cast body including an integral fluid reservoir, a piston assembly including primary and secondary rubber cups, push rod, check valve, and return spring assembly. The purpose of the master cylinder is to displace fluid from a central supply into the hydraulic lines and the wheel cylinders.

The master cylinders used in the Kaiser models and Frazer models are different (Fig. 307 and Fig. 308), the first having a cast iron body, the second having a cast aluminum body. The two master cylinders are not interchangeable as complete assem-

blies. Although some of the components of the two types of cylinder assemblies are interchangeable, a repair kit for each type is available for servicing the master cylinder assemblies.

The brake master cylinder is located on the frame left side rail at the engine rear support crossmember. For convenience an access hole and cover plate have been provided in the left front floor board to the rear of the clutch and brake pedals for servicing the master cylinder.

a. MASTER CYLINDER REMOVAL. To remove the master cylinder on the Kaiser models, disconnect the hydraulic lines at the rear of the cylinder body and remove the brake pedal return spring. Remove the clutch and brake pedal foot pads and stems from the clutch and brake arms. Detach the clutch pedal return spring and remove the clutch pedal shaft lever clamp bolt. Remove the clutch pedal shaft lever from the shaft. Remove the clutch pedal and shaft assembly which passes through the cylinder body, using care not to damage the bushings. Detach the master cylinder from the frame by removing the two mounting bolts.

To remove the master cylinder on the Frazer models, disconnect the hydraulic lines and disassemble the linkage by removing the clevis pin at the front end of the master cylinder operating rod. Detach the master cylinder from the frame side rail by removing the two mounting bolts.

b. MASTER CYLINDER DISASSEMBLY. (Fig. 307 and 308). With the master cylinder drained of brake fluid either type may be disassembled as follows:

1. Remove the push rod and the boot from the cylinder body.
2. Remove the filler plug and gasket. If disassembling a Frazer cylinder, also remove the cover plate and gasket.

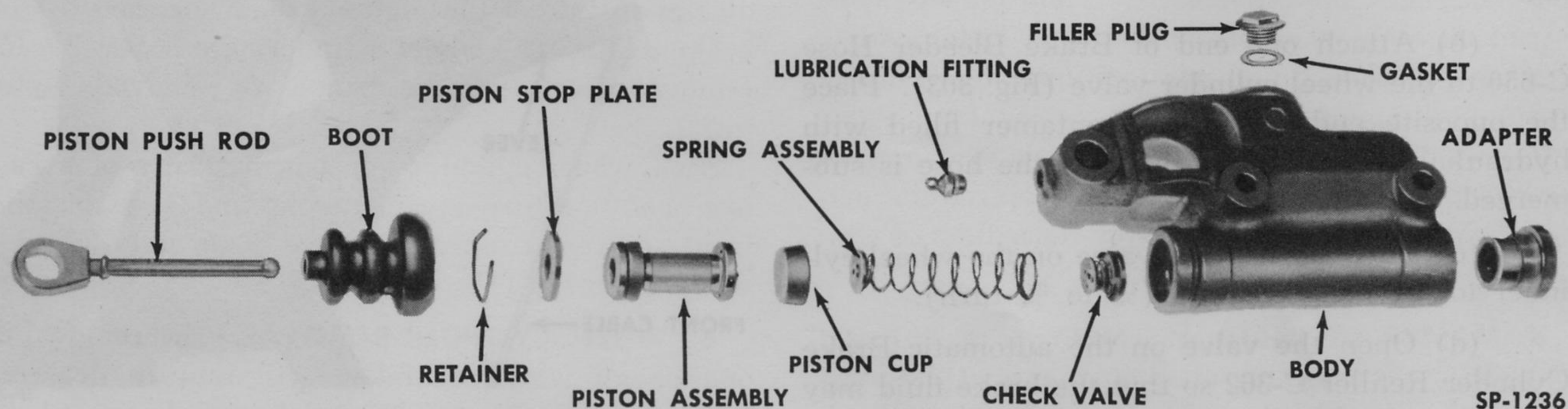


Fig. 307—Master Cylinder—Exploded View—Kaiser

3. Pry out the piston stop plate retainer and remove the stop plate, piston assembly, piston cup, and spring assembly.

4. Remove the check valve from the spring assembly.

5. If disassembling a Kaiser cylinder, unscrew the adapter from the rear end of the cylinder body.

c. MASTER CYLINDER CLEANING AND INSPECTION (Fig. 307 and 308). Immerse all parts of the master cylinder in denatured alcohol and wash parts thoroughly to remove all traces of brake fluid. Wipe all parts dry with a clean cloth. Used compressed air to blow out cylinder and reservoir. Make sure the intake and by-pass ports are open. **CAUTION: Do not use gasoline or kerosene for cleaning master cylinder parts.**

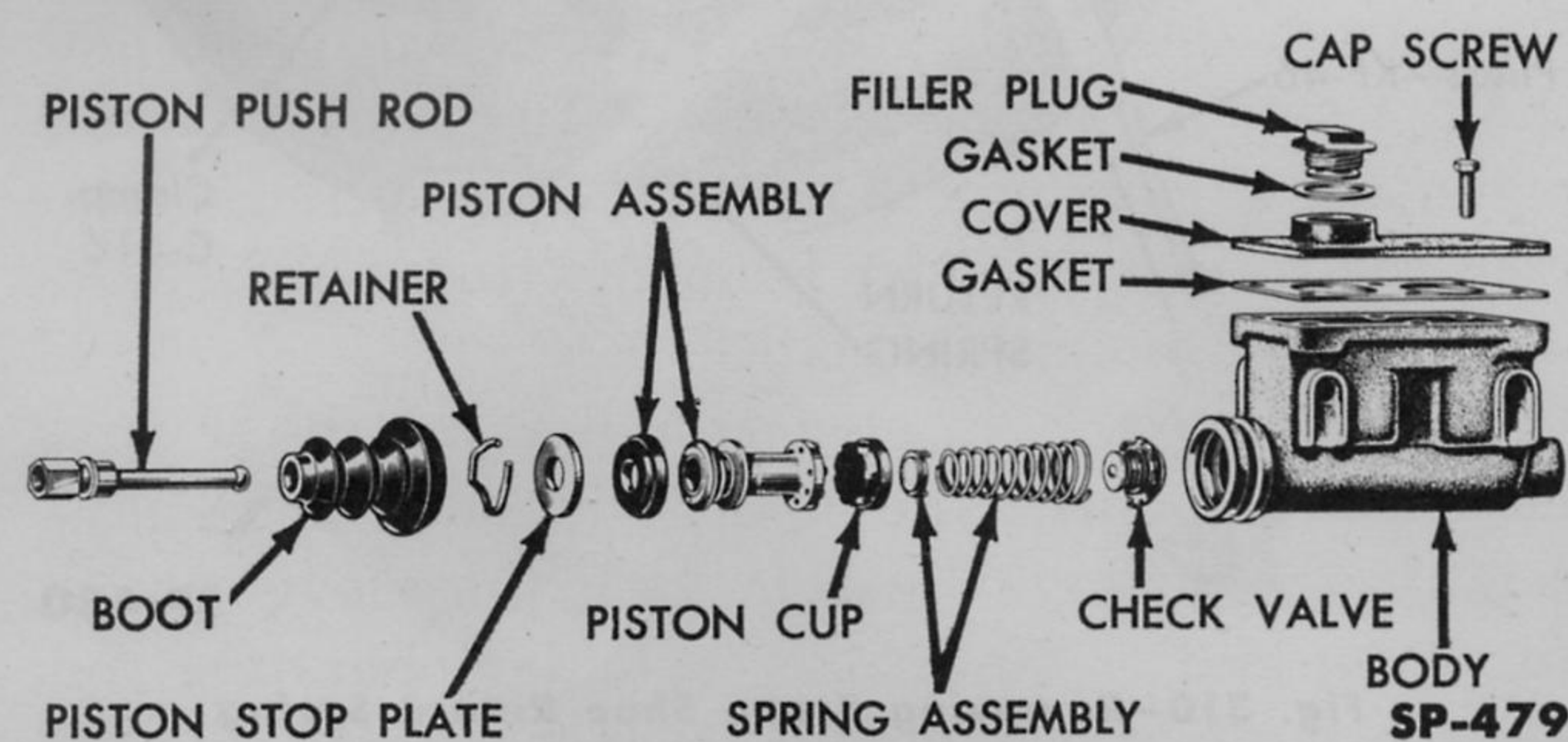


Fig. 308—Master Cylinder—Exploded View—Frazer

Examine the bore of the cylinder body. Evidence of scoring or rust will require honing of the cylinder bore or replacement of the body. If the cylinder is to be honed, be careful not to hone away any more material than is required to remove scores and smooth up the cylinder walls. Remove burrs, caused by honing, from around intake and by-pass ports.

Check the piston fit in the cylinder bore. Specified clearance between the piston and bore is .001-.005 of an inch when checked with a feeler gauge. Excessive clearance will require replacement of the piston or the cylinder assembly.

Inspect the check valve. If it is worn or damaged, the check valve must be replaced. Replace the primary and secondary rubber cups regardless of condition.

d. MASTER CYLINDER ASSEMBLY (Fig. 307 and 308). Prior to assembly all components of the master cylinder must be dipped in hydraulic brake fluid. Proceed as follows:

1. Install the check valve on the piston return spring.

2. Install the spring and valve assembly in the bore of the cylinder body.

3. Install the secondary rubber cup in the cylinder bore against the end of the spring, with the lip toward the spring.

4. Fit the primary cup onto the piston assembly and install the piston and cup in the cylinder bore, with the cup toward the front of the cylinder away from the spring.

5. Install the piston stop plate and retainer in the cylinder body.

6. Install the piston push rod and boot. A new boot must be used if the old one shows evidence of deterioration.

7. Using a new gasket, install the filler plug. If assembling a Frazer cylinder, install the cover plate on the cylinder body using a new gasket.

8. If assembling a Kaiser cylinder thread the adapter into the rear end of the cylinder body.

e. MASTER CYLINDER INSTALLATION. The master cylinder may be installed in the reverse procedure of the removal. Hydraulic connections must be clean and securely attached to prevent loss of fluid. Bleed the hydraulic system as described under BLEEDING HYDRAULIC SYSTEM. The pedal must be adjusted as outlined under MASTER CYLINDER ADJUSTMENT, and hydraulic brake fluid must be added to the system.

WHEEL CYLINDERS

The wheel cylinders are mounted at the top of the brake shoe support plate between the brake shoes, at each wheel. The cylinders are mounted on the outside of the plate and are enclosed by the brake drum. The wheel cylinders are accessible for removal after the brake drums are removed. Refer to Fig. 299.

Each wheel cylinder consists basically of a cast iron body, return spring, front and rear pistons, front and rear rubber cups, two boots and a bleeder valve assembly (Fig. 309).

a. WHEEL CYLINDER REMOVAL. The removal of one or all wheel cylinders will require draining hydraulic fluid in the affected line or lines and removing the wheel and drum. Proceed as follows:

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1. Disconnect the hydraulic line at the wheel cylinder and allow fluid to drain.

2. Remove the wheel and the hub and brake drum assembly. Refer to Section 12, "Wheels and Tires," for front wheel instructions or to REAR BRAKE DRUM REMOVAL, in this Section, for the procedure for rear wheels.

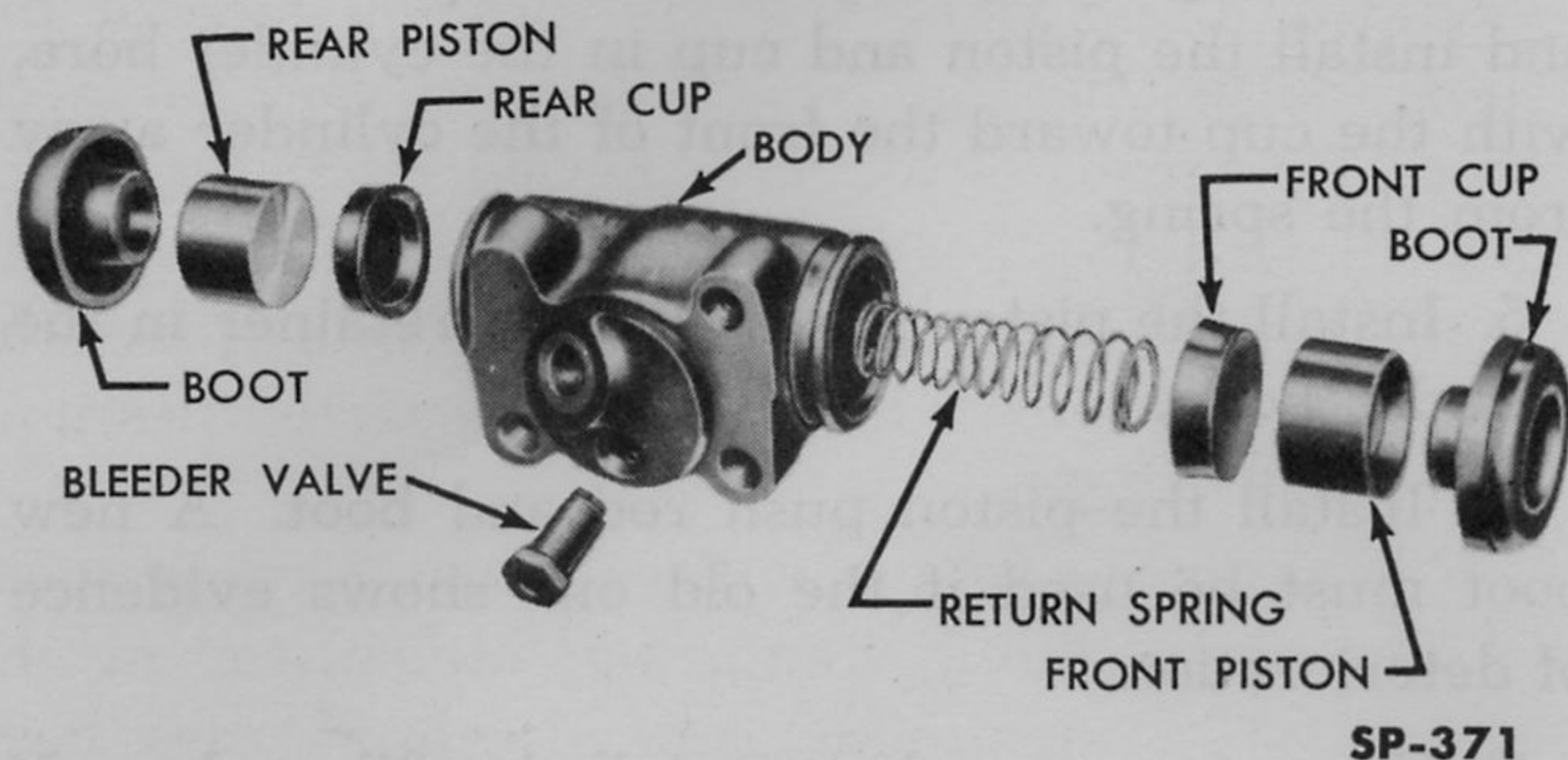


Fig. 309—Typical Wheel Cylinder—Exploded View

3. Install Brake Cylinder Clamp C-416 on the brake cylinder (Fig. 310).

4. Remove the brake shoe return spring using Brake Shoe Return Spring Pliers KF-46 (Fig. 310). Move the brake shoe away from the cylinder.

5. Remove the two bolts and washers attaching the wheel cylinder to the support plate and lift off the cylinder.

b. WHEEL CYLINDER DISASSEMBLY. To disassemble the wheel cylinder remove the Clamp C-416 and the end boots from the cylinder body. Then remove the pistons, the cups and return spring from the body. Turn the threaded bleeder valve assembly out of the cylinder body.

c. WHEEL CYLINDER CLEANING AND INSPECTION. Clean and inspect all components of the wheel cylinder in the same manner as detailed under MASTER CYLINDER INSPECTION AND CLEANING. The rubber cups and the boots should be replaced regardless of condition. If the spring is weak or distorted it must be replaced.

d. WHEEL CYLINDER ASSEMBLY. Before assembling the wheel cylinder, dip all components in hydraulic brake fluid. Install the bleeder valve assembly in the cylinder body. Install the piston return spring, piston cups, and the pistons. The lip of the piston cups must face inward toward the

spring. Install the cylinder end boots. Use Brake Cylinder Clamp C-416 to compress the pistons in the cylinder in preparation for installing on the vehicle.

e. WHEEL CYLINDER INSTALLATION. The installation of the wheel cylinder may be accomplished

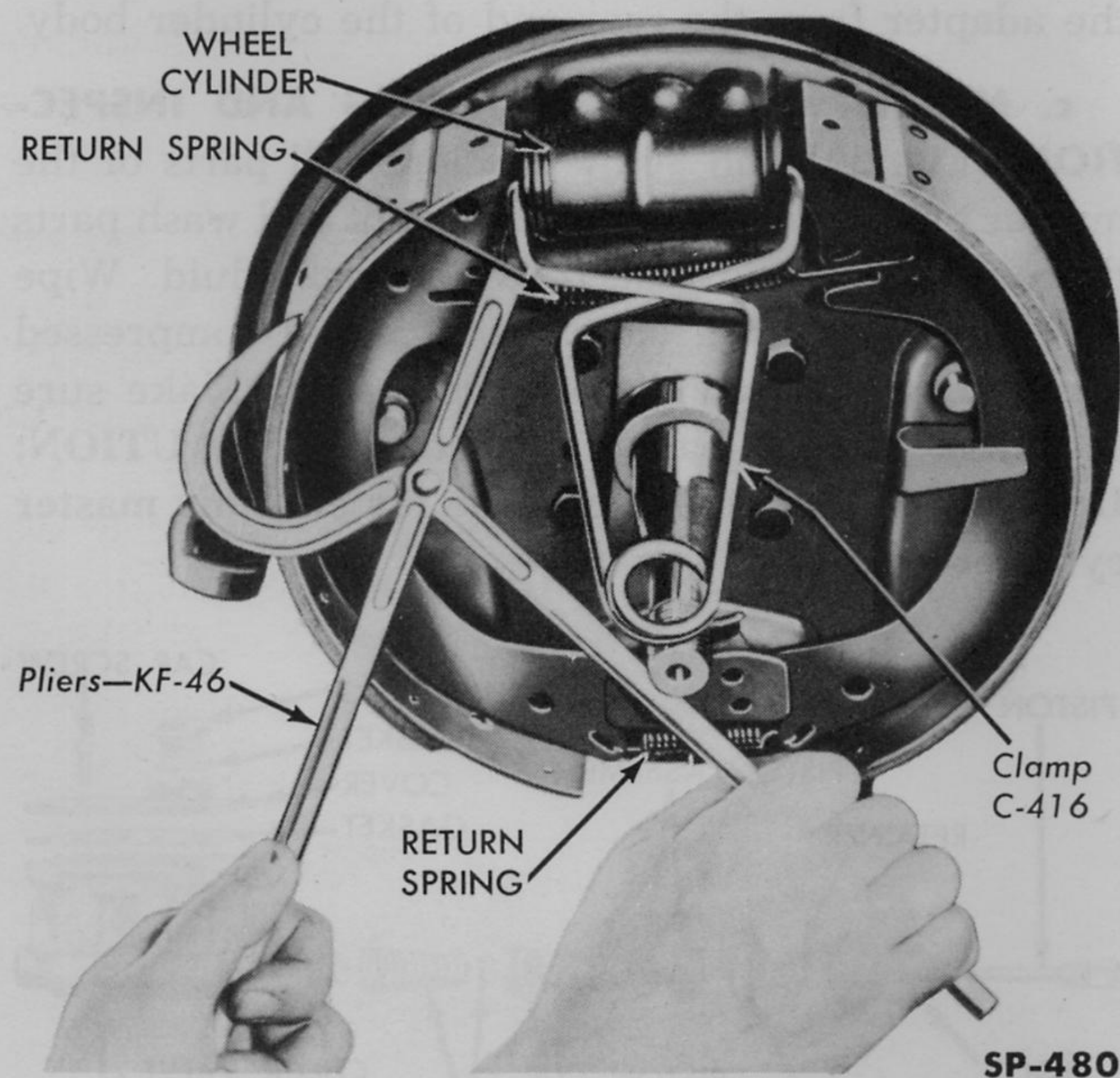


Fig. 310—Removing Brake Shoe Return Spring

by reversing the removal procedure. Rotate the brake shoe adjusting cams to the fully retracted position. Install the wheel cylinder on the support plate, fitting the prongs of the brake shoe webs into the ends of the cylinder. Connect the return spring using Return Spring Pliers KF-46 and remove Clamp C-416 from the wheel cylinder. Refer to Fig. 310.

After installing the wheel cylinder, refill the master cylinder, bleed the system and adjust the brake shoes as detailed under MAJOR BRAKE ADJUSTMENT.

BRAKE DRUMS

The brake drum and hub assemblies are each removable only as a unit. Removal and installation of the front wheel drum and hub assemblies are covered under Section 12, "Wheels and Tires." Rear hub and drum assembly removal and installation procedures are covered in the following paragraphs.

All hub and drum assemblies are provided with a slot in the drum to facilitate checking brake shoe to drum clearance.

a. REAR BRAKE DRUM REMOVAL. To remove the rear hub and drum assembly, proceed as follows:

1. Raise the rear of the vehicle and remove the hub cap, wheel bolts and the wheel.
2. Remove the axle shaft cotter pin, nut and washer.
3. Attach Rear Wheel Hub Puller C-319 and remove the hub and drum assembly and key (Fig. 311).

b. BRAKE DRUM INSPECTION AND REPAIR. Thoroughly inspect the braking surface of the drum. If this surface is scored, out-of-round or bell-mouthed it must be turned down on a lathe or the hub and drum replaced. If the brake drum is to be refaced, the inside diameter may be turned to .060 inch maximum oversize to correspond with the .030 inch oversize shoe set. Refer to BRAKE SHOES AND LINING for additional information.

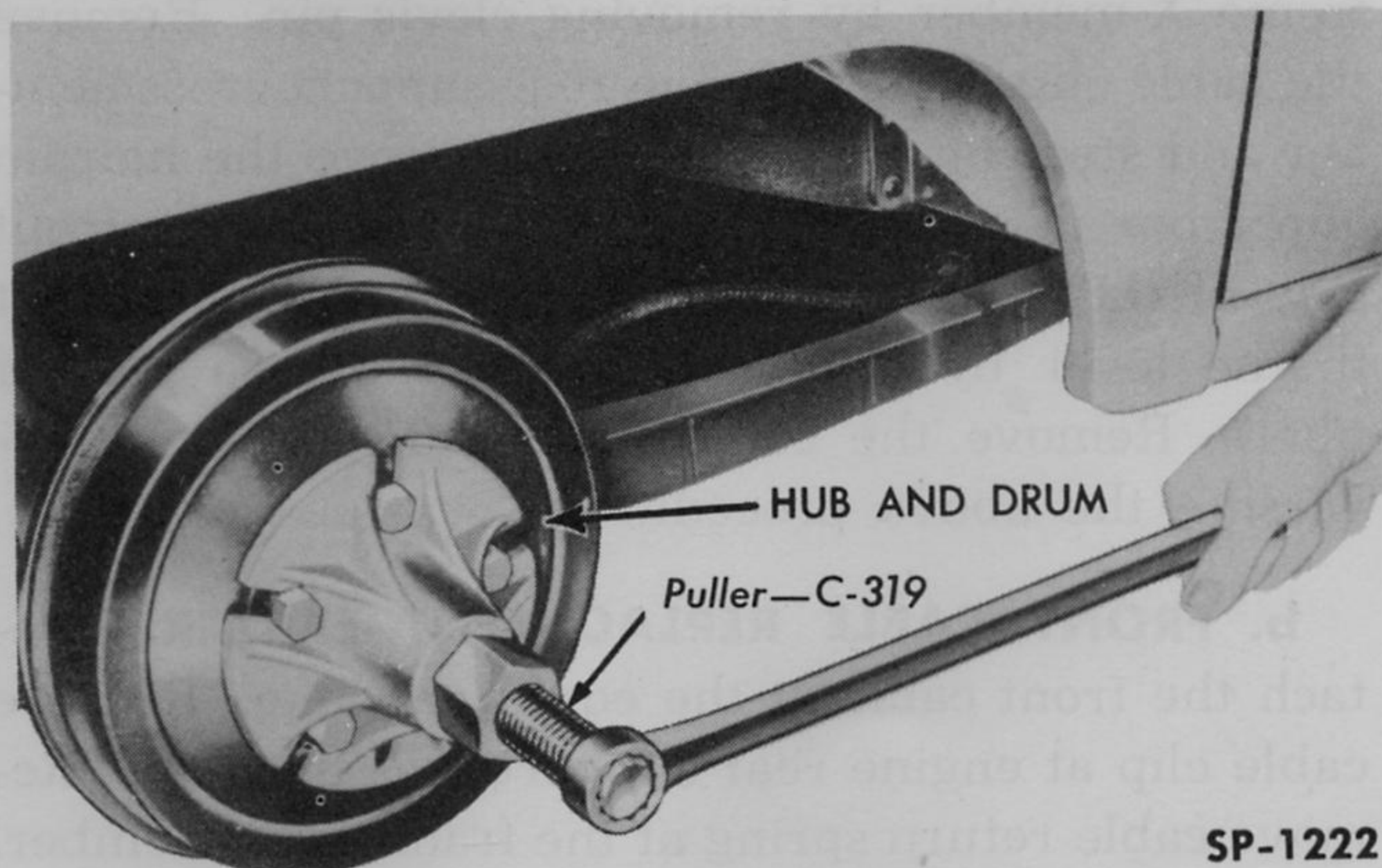


Fig. 311—Removing Rear Hub and Drum Assembly

c. REAR BRAKE DRUM INSTALLATION. To facilitate hub and drum installation, the brake shoe adjusting cams should be turned to allow the brake shoes to fully retract. All dirt must be removed from the drum and brake components. Proceed as follows:

1. Install the rear hub and drum assembly on the axle shaft. Be sure that the key is properly inserted in the axle keyway and that the groove in the hub aligns with the key.
2. Install the axle washer and nut. The nut must be tightened to a minimum of 160 foot pounds torque. Install the cotter pin.

3. Adjust the brakes as outlined under MAJOR BRAKE ADJUSTMENT.

4. Install the wheel, the attaching bolts and the hub cap. Remove the jack.

BRAKE SHOES AND LINING

The brake shoes are floating type, having a moulded lining riveted to the bracing face of the shoe. Adjustment is provided by a cam for each shoe. By means of a clamp arrangement the shoes are allowed to "float" without being fixed to the support plate. Springs provide tension to secure the shoes and to return them to the retracted position. Refer to Fig. 299.

Normal brake usage will eventually cause wear of the brake lining, requiring adjustment at the cams. When maximum cam adjustment has been reached, the brake shoe lining must be replaced. If hydraulic brakes are properly adjusted the brake shoe linings will wear evenly on all wheels, consequently relining of brakes will be required on all four wheels at one time under normal conditions. However, brake shoe and lining assembly replacement, or brake shoe lining replacement, may be made in sets for both front wheels or both rear wheels. Except in cases of low mileage, where only slight wear is evident, lining or shoe replacement on one wheel only is not recommended. When relining the brakes or replacing components, use only K-F approved lining and parts.

a. BRAKE SHOE REMOVAL. Brake shoes are accessible for removal after the wheel and the hub and drum are removed. Proceed as follows:

1. Raise the vehicle and remove the wheel and the hub and drum assembly. Refer to BRAKE DRUMS for procedure information.
2. Install Clamp C-416 on the brake cylinder in position shown in Fig. 310.
3. Remove brake shoe return springs using Pliers KF-46 (Fig. 310).
4. Remove the brake shoes.

b. LINING REPLACEMENT. If the brake shoe lining is oil soaked, or worn within $\frac{1}{32}$ of an inch of the rivet heads, the lining must be replaced. Lining that has not been making full and uniform contact with the drum must also be replaced. The brake shoe and lining should be replaced as an assembly

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if the shoe itself is damaged or warped. Brake shoe and lining assembly replacement, or brake shoe relining should be made only in sets for both front or both rear wheels.

If the brake drum inside diameter has been refaced to .060 inch oversize (standard size is 10.995-11.005 inches diameter), it will be necessary either to install a .030 inch oversize brake shoe and lining set or reline the old brake shoes with a .030 inch oversize lining set to compensate for the increased diameter of the drum.

Both the brake shoe sets and the lining sets consist of replacement parts for either both front wheels or both rear wheels. Front and rear shoes for each wheel are marked "Forward" and "Reverse" respectively and must be installed in their correct position on the support plate. Notice that the forward shoe is fitted with a longer lining surface than the rear shoe. Proceed with the lining replacement on each shoe as follows:

1. Remove the lining rivets using a de-liner punch in a conventional lining riveting machine.

2. Clean and inspect the brake shoe. Evidence of misalignment or distortion will require replacement of the shoe.

3. Position a new lining on the shoe, aligning the two center holes of the lining and the shoe. Install the two center rivets using a conventional lining riveting machine.

4. Install the balance of rivets working from the center out toward the ends. The rivets must be tight, holding the lining securely to the shoe.

c. BRAKE SHOE INSTALLATION. Prior to installing the brake shoes, the support plate and all components must be cleaned. The tightness and alignment of the support plate should be visually checked and the wheel cylinder inspected for leakage. Also be sure the brake shoe hold down clips are properly in place and are not damaged. If the adjusting cams show evidence of wear, they must be replaced. Proceed as follows:

1. Rotate the brake shoe adjusting cams to the fully retracted position.

2. Install the brake shoes so that the web of each is secured under the hold down clip. The heel of the shoe web must be inserted under the retaining plate of the support plate with the upper prong of the shoe inserted in the wheel cylinder.

3. Install the return springs using Pliers KF-46 (Fig. 310). On the rear brakes, the hand brake lever and link must be installed.

4. Remove the Clamp C-416 from the wheel cylinder.

5. Install the hub and brake drum assembly. Refer to BRAKE DRUMS for procedure information.

6. Adjust the brakes as outlined under MAJOR BRAKE ADJUSTMENT.

7. Install the wheel, the attaching bolts and the hub cap. Remove the jack.

HAND BRAKE

The following procedures cover replacement of the front and rear hand brake cables.

a. FRONT CABLE REPLACEMENT—KAISER. Detach the front cable from the lever mounted in the frame X-member by removing clevis pin. Remove the cable clips at the engine rear support crossmember and steering gear housing. Remove the hairpin clip from the hand brake lever tube on the front side of the cowl and pull the cable out of the slot in the lever by pulling downward with a pair of pliers. Remove the cable. Install the cable by reversing the above procedure.

b. FRONT CABLE REPLACEMENT—FRAZER. Detach the front cable at the equalizer yoke. Remove cable clip at engine rear support crossmember. Remove cable return spring at the frame crossmember. Remove cable clip at the steering column lower shifting lever bracket and disconnect yoke at hand brake lever by removing clevis pin. Remove the cable. Install the cable by reversing the above procedure.

c. REAR CABLE REPLACEMENT—KAISER. Detach the rear cable at the yoke that connects the cable to the lever mounted in the frame X-member. Remove the cable guides attached to the frame side rails over the rear springs. Remove the rear wheels and rear hubs and drums for access to the cable connections at the rear brake support plates and brake shoes. (Refer to BRAKE DRUMS for the proper procedure).

Disconnect the end of the cable from the brake operating lever and pull the end of the cable out through the brake support plate at each rear wheel.

Reverse the procedure to install the rear cable and adjust the cable linkage as described under **HAND BRAKE LINKAGE ADJUSTMENT**.

d. REAR CABLE REPLACEMENT—FRAZER. Detach the rear cable at the equalizer yoke. Remove the cable guides on the frame side rails. Remove the rear wheels and hubs and drums and disconnect the rear cables from the brake support plates and brake shoes. (Refer to **BRAKE DRUMS** for the procedure). Disconnect the end of the cable and pull the cable out through the brake support plate at each rear wheel.

Reverse the procedure to install the rear cables and adjust the cable linkage as described under **HAND BRAKE LINKAGE ADJUSTMENT**.

SERVICE DIAGNOSIS

The brake system requires periodic servicing and adjustment to maintain safe and efficient operation. A diagnosis of the brake system is recommended during the servicing and adjustment operation to assure proper operation. Check for the following conditions:

a. PEDAL GOES TO FLOORBOARD. This condition usually requires pumping the pedal to obtain brake action and is caused by one of the following:

1. Normal lining wear.
2. Hydraulic fluid leak in the system.
3. Air in the system.
4. Fluid supply exhausted.

b. SPRINGY OR SPONGY PEDAL. A normal brake pedal travels only to a point where the desired hydraulic pressure is developed. If the pedal

continues to travel under foot pressure, it may be traced to the following causes:

1. Improper shoe adjustment.
2. Air in the system.
3. Hydraulic fluid leak in the system.

c. UNEVEN BRAKING. If uneven braking is evident by the car pulling to one side or one brake locking, it may be caused by the following:

1. Grease or foreign matter on brake linings.
2. Shoe improperly set.
3. Loose support plate.
4. Improper lining.
5. Loose adjusting cam.
6. Improper tire inflation.

d. BRAKES DRAG. If the brakes drag on one or all wheels, it may be caused by the following:

1. Improper shoe adjustment.
2. Weak return springs.
3. Out-of-round drums.
4. Improper hydraulic fluid.

e. BRAKES GRAB. If the brakes grab on one or more wheels it may be caused by the following conditions:

1. Improper adjustment.
2. Loose support plates.
3. Oil soaked linings.
4. Loose front wheel bearings.

