

# **BRAKE SERVICE**

1940 Hudson

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It goes without saying that the braking system, above everything else in an automobile, must be maintained at top efficiency at all times, which just about takes brake servicing out of the category of maintenance items lending themselves to seasonal emphasis or service promotional activities.

However, with winter drawing to a close and a decrease in the amount of snow and ice on the streets and highways, higher driving speeds are again going to be more generally indulged in. This, of course, is going to impose a lot of extra work on the brakes, which because of the rigors of winter operation can well come in for some attention at this time, especially such parts of the system as the mechanical follow-up mechanism and other parts of the operating linkage and cables most affected by water, dirt and freezing.

This is an opportune time, therefore, to inspect the brakes of your owners' cars and the data and procedure information applying to the 1940 Hudson brakes in the following article will be helpful in servicing these units.

There are two distinct types of brakes used on the 1940 Hudson cars. Both types incorporate the Duo- Automatic principle for complete safety and Duo-Servo features for efficiency and long life. Both type shoes give a positive control and smooth operation. The distinction between the two brakes is that the 40 Traveler and 40 Passenger models are of the double anchor floating type while all other models are of the single anchor type. All models incorporate the additional mechanical safety brake.

In all brake operations the following points are important and should be closely observed:

1. Keep all grease, paint, oil and brake fluid from coming in contact with the brake linings.
2. Do not handle brake shoes or drums with greasy hands.
3. Clean all parts of the hydraulic brake system with clean alcohol—never use gasoline or any fluid which contains any mineral oil.
4. Wash hands with soap and water, not gasoline, as handling of rubber cups with hands wet with gasoline will ruin the cups.
5. Use only Hudson Hydraulic Brake Fluid, available in quart or gallon cans.
6. Use only genuine Hudson packaged linings or brake shoes with linings installed and ground—saves time.
7. Keep brake master cylinder at least 1/2 full of Hudson Brake Fluid.

### **Brake Pedal Adjustment:**

To insure full return of the master cylinder piston when the brake is released, there must be 1/4" clearance between the pedal shank (A), Figure 1, and the floor board. If the pedal shank clearance in the fully released position is other than the above mentioned 1/4", it should be adjusted as follows:

1. Loosen the adjustable pull rod lock nut (B), Figure 1, on the pull rod assembly.

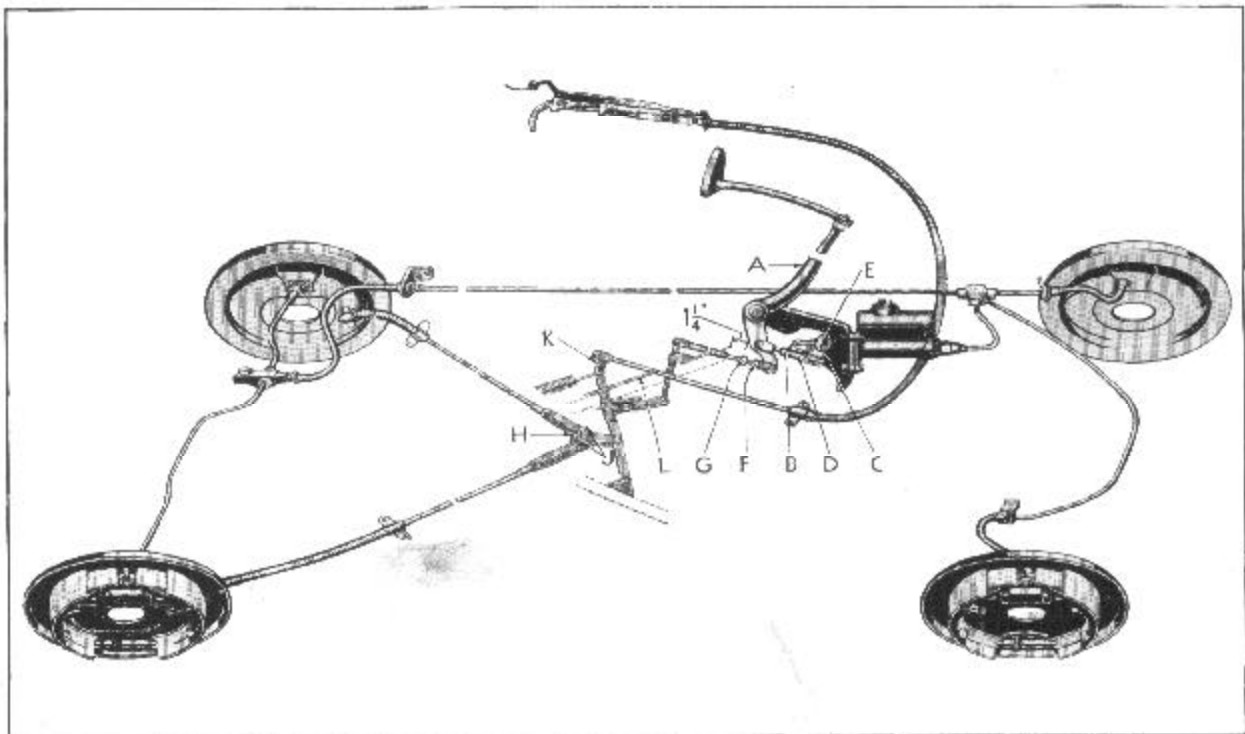


Figure 1

2. Remove the clevis in (C) from the master cylinder operating lever (E)
3. Turn the pull rod (D) to increase the length until the clevis pin (C) just enters the rod with the pedal shank (A) 1/4" from the toe board and the lever (E) against its stop.
4. Insert the clevis pin in the outer hole of the operating lever and insert cotter key and tighten the lock nut.

This adjustment is important as it insures the full return of the master cylinder piston to the end of the cylinder and will prevent the brakes from dragging.

#### ***Pedal Push Rod Adjustment:***

It is essential that the following adjustment be made accurately to obtain the proper mechanical follow-up to the hydraulic operation of the rear brakes.

The safety factor of having a mechanical brake follow-up to the hydraulic brake action is lost unless the following adjustment is checked and performed whenever brake work or inspection is done.

1. With the master cylinder operating lever (E), Figure 1, against the stop, loosen the brake pedal push rod adjusting end lock nut (F).
2. Turn the rod (G) until the rear face of the hex is 1k" from the front end of the pedal push rod.
3. Tighten lock nut (F) securely.

#### **Hydraulic System**

The hydraulic system is dependent upon the proper fluid level in the master cylinder.

The master cylinder performs two supplementary functions:

1. It maintains a constant volume of fluid in the system at all times regardless of expansion due to heat or contraction due to cold.
2. It acts as a pump during bleeding operations.

An occasional filling of the master cylinder reservoir should be the only attention required to the hydraulic system unless the reservoir is permitted to run dry, a main line is disconnected or a wheel cylinder is disconnected for service operations. If the cylinder runs dry or a main line is disconnected, it is necessary to bleed the air out of the lines at all wheel cylinders. If a wheel cylinder is disconnected, it is necessary to bleed only that particular cylinder. In cases where any parts are disassembled for cleaning, they should be washed in alcohol and the entire system should be flushed with alcohol periodically.

#### ***Bleeding the System:***

Whenever a main pipe line is removed from the master cylinder or the supply tank becomes empty, the brake system must be bled at all four wheels.

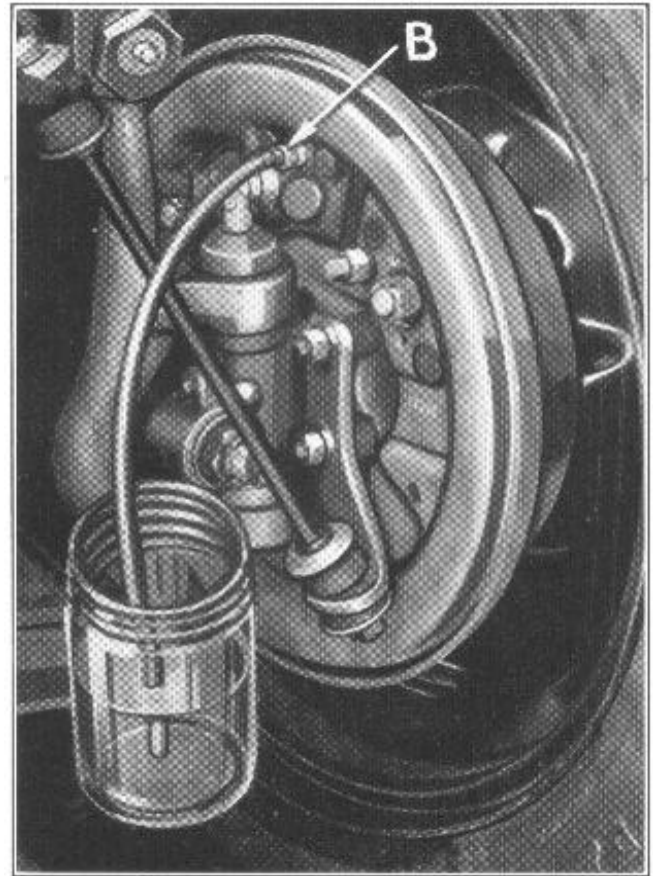
Whenever a line is disconnected from any individual wheel, then that wheel cylinder only must be bled. The bleeding operation should be performed at one wheel cylinder at a time and repeated at the other wheel cylinders if necessary.

The following procedure should be performed:

1. Fill the filler bottle J-713, using only genuine Hudson Hydraulic Brake Fluid.
2. Put nozzle of bottle in master cylinder reservoir and open filler bottle valve before starting.

NOTE: This will keep the reservoir half full of fluid during the entire bleeding operation.

If the filler bottle is not used, fill the reservoir and keep it at least half full during the bleeding operation.



*Figure 2*

3. Remove wheel cylinder bleeder screw and attach end of bleeder hose, Figure 2, in its place and allow the free end to hang into a jar partially filled with fluid.
4. Unscrew bleeder valve (B) 3/4 of a turn.
5. Depress foot pedal by hand, allowing pedal to return to released position slowly:

NOTE: This gives a pumping action which forces the fluid through the tubing and out at the wheel cylinder, carrying with it any air that may be present.

CAUTION: After the brake pedal is depressed, it must be released slowly otherwise air may be drawn into the system.

6. Continue this operation while watching the flow of fluid from the bleeder hose and when all bubbles cease to appear, close the bleeder valve.

NOTE: The end of the hose must be kept below the surface of the fluid in the jar during the entire operation.

7. Remove bleeder hose and replace screw.
  8. Refill master cylinder reservoir.
- Fluid withdrawn in any bleeding operation should not be used again. Replenish fluid in the master cylinder after each cylinder is bled.

If filler bottle J-713 is used, this constant check on the master cylinder is not necessary because of larger capacity of the bottle and the fact that the quantity is easily watched.

Should the master cylinder become drained during the bleeding operation, the bleeding will have to be repeated at all four wheels.

The fluid level should be checked every 1000 miles.

## Operation

### **Double Anchor Floating Type Shoes:**

40 Traveler and 40 Passenger Models.

Both brake shoes of this type of brake are direct acting in that the upper ends of both primary and secondary shoes rest against the wheel cylinder without links between them as in the case of the single anchor type. By means of this type of mounting, it is possible to mount the wheel cylinder higher up on the backing plate so that no portion of the shoe overhangs the point of pressure application.

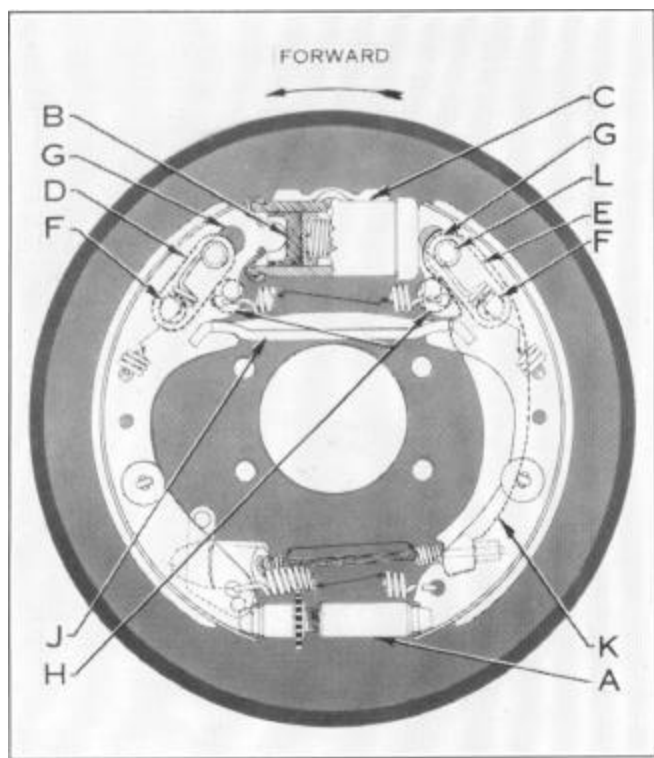


Figure 3

The floating anchors consist of short forged steel links (D) and (E), see Figure 3, near the top of each shoe. These links are pivoted on the backing plates at one end (F) and operate in short slots (G) in the shoe webs at the other end.

In the forward motion, application of the foot brake displaces fluid from the master cylinder which flows through the lines to the wheel cylinder, causing the wheel cylinder to push the primary shoe out against the drum with anchor link (D) free to slide in its slot in the shoe. The primary shoe is forced against the adjusting screw (A) and the reaction load is carried over the bottom of the secondary shoe. The reaction is then carried to the anchor link (E), acting against the end of its slot (G) as an anchor.

Braking action in reverse is in exactly the opposite direction, link (D) becoming the anchor as link (E) swings free. Only

swings free. Only one anchor acts in each direction of rotation.

The brake anchor link nut and felt washer is used to seal the water and dirt from the bearing and prevent the anchor links from freezing in the backing plate.

The links are so arranged that any pull on them is approximately endwise, which leaves the shoes and anchors free to swing within the limits of the lining to drum clearance maintained by the eccentric adjustments (H). This allows the complete shoe assembly to move with the drum, thus eliminating high spots due to irregular drums.

### **Single Anchor Type:**

Models 41, 43, 44, 45, 47, 48 and all Commercial.

Construction of this type brake differs from the double anchor floating type in that the hydraulic cylinder (3), Figure 7, with double opposed pistons is mounted on the backing plate directly below the anchor pin (16). The opposed pistons are connected to the brake shoes through short wheel cylinder links (4).

In the forward motion, application of the foot brake displaces fluid from the master cylinder which flows through the brake lines to the wheel cylinders, which pushes the wheel cylinder links outward. Since these wheel cylinder links are attached to the brake shoes, the shoes, through these links, are actuated to contact the drums. The primary shoe (1) applies the secondary shoe (2) through the adjusting screw (14). The reaction is thus carried to the anchor pin (16), acting against the end of its slot as an anchor.

Braking action in reverse rotation is in exactly the opposite direction.

Brake lining wear will involve the following on double anchor and single anchor brakes:

### **Double Anchor Brakes:**

3-Point adjustment—Model 40 Passenger and 40 Traveler.

1. Primary shoe eccentric adjustment which positions the anchor end of the primary shoe.
2. Secondary shoe eccentric adjustment which positions the anchor end of the secondary shoe.
3. Star wheel adjustment which establishes the correct clearance between the brake linings and the brake drums after the eccentric adjustments have been made.

### **Single Anchor:**

2-Point adjustment—Models 41, 43, 44, 45, 47, 48 and all Commercial.

1. Secondary shoe eccentric adjustment which positions the anchor end of both shoes.
2. Star wheel adjustment which establishes the correct clearance between the brake linings and the brake drums after the eccentric adjustment has been made.

NOTE: An anchor pin adjustment is provided but should not be made until all other adjustments have been properly performed and have failed to produce satisfactory results.

## Wear Adjustments

Adjustments of the double anchor floating type brake and the single anchor brake differ and the same adjustment procedure cannot be used.

### ***Double Anchor Floating Type:***

40 Traveler and 40 Passenger Models.

1. Jack up all wheels clear of the floor.
2. Remove wheels.
3. Disconnect rear brake cables at cable lever toggle by removing clevis pins.
4. Remove inspection hole covers from brake drums and brake backing plates.
5. Insert .010" feeler between brake drum and upper end of lining of primary or front shoe. Loosen eccentric lock nut and turn eccentric in direction of forward wheel rotation until feeler gauge is just snug. Tighten eccentric lock nut holding eccentric in position.
6. Repeat operation 5 on secondary or rear shoe after loosening eccentric lock nut.
7. Expand lower ends of shoes against drum by turning adjusting screw or star wheel with adjusting tool J-1028 until drum can be just turned by hand.
8. Pull hand brake lever two notches from full release position or until 1/8" clearance is obtained between hand brake cable lever and end of slot in lever guide plate.
9. Pull cables tight and adjust ends so that clevis pins just enter holes in toggle.
10. Release hand brake.
11. Back off adjusting screw or star wheel until drum is just free from lining drag. Be sure to back off star wheel at each wheel the same amount. Replace backing plate hole covers and brake drum hole covers.
12. Reinstall wheels and lower car to floor. Test for balance on a level road—avoid testing on side of a crowned road.

### ***Single Anchor Type:***

Models 41, 43, 44, 45, 47, 48 and all Commercial.

1. Jack up all four wheels clear of floor.
2. Remove wheels.
3. Disconnect rear brake cables at cable lever toggle by removing clevis pins.
4. Remove inspection hole covers from brake drums and brake backing plates.
5. Insert a .010" feeler gauge between brake drum and lining on secondary or rear shoe.
6. Loosen eccentric nut and turn eccentric in direction of forward wheel rotation until feeler gauge is just snug at anchor (top) and adjusting (lower) ends of shoe. Hold eccentric in position and tighten lock nut.

NOTE: The clearance at both ends of the secondary shoe should not vary more than .003". In case of clearance variation, it is desirable that clearance at the anchor end be less than at the adjusting end. If the variance is greater than this amount, relocate the anchor pin as outlined under complete brake adjustment.

7. Expand shoes against drums by turning adjusting screw or star wheel with tool J-1028 until drum can be just turned by hand.
8. Pull hand brake lever two notches from full release or until 1/8" clearance is obtained between the hand brake cable lever and end of slot in lever guide plate.

9. Pull cables tight and adjust ends so clevis pins just enter holes in toggle.
10. Release hand brake.
11. Back off adjusting screw or star wheel until drum is just free of lining drag. Be sure to back off each screw the same number of turns. Replace backing plate hole covers and brake drum hole covers.
12. Reinstall wheels and lower car to floor. Test for balance on a level road avoid testing on side of crowned road.

## **Complete Brake Adjustment**

### ***Double Anchor Floating Type Shoes:***

Models 40 Traveler and 40 Passenger.

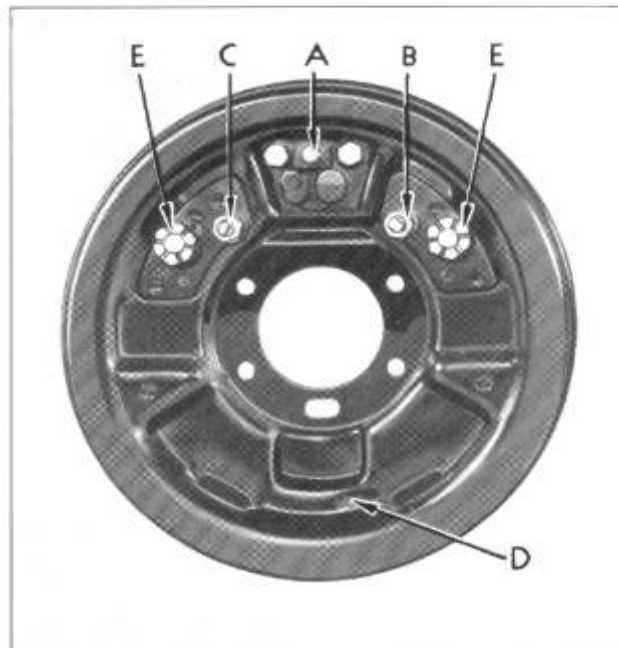
The following complete brake adjustment and lubrication procedure is to be followed in cases where an adjustment for wear does not give satisfactory results or when relining is necessary or new shoes are being installed.

NOTE: During all inspection or disassembly of brakes the hydraulic part of the system should be left intact so that bleeding of the lines will not be necessary.

1. Install wheel cylinder clamps.

CAUTION: Do not depress the brake pedal at any time the brake drums are not in place.

2. Remove, clean and inspect all drums and shoes.
3. Remove links E, Figure 4, from the backing plates.
4. Having cleaned thoroughly all of the brake parts, apply a thin film of Bendix Lubri-Plate Lubricant to:



*Figure 4*

- a. Hand brake cable ramps.
- b. Shoe support ledges (on backing plate).
- c. Eccentrics.
- d. Anchor links.
- e. All points where there is a frictional contact

5. Replace anchor links E and spring washers. Adjust anchor link nuts so that the links are free to turn with all side play removed. Install cotter pins on nuts.
6. Disconnect hand brake cables at equalizer bar.
7. Clean the exposed portion of all hand brake cables and then pull the cable through the conduit from the wheel end to expose that part of the cable sheathed by the conduit. Clean this portion of the cable and lubricate freely with Bendix Cable Lubricant.
8. Push cable into conduit and after shoes have been reinstalled, connect cable to shoe operating lever (12), Figure 6, leaving adjustable yoke end of cable disconnected.
9. To connect brake cable to shoe operating lever, move cable return spring away from cable end and place cable end into groove at end of operating lever.  
NOTE: After cable is in place, allow cable return spring to return against the lever to hold cable in place.
10. Before installing new shoes, turn the primary and secondary shoe eccentrics so that the high side of the eccentric is away from the anchor link.
11. After installing shoes and shoe parts, remove adjusting hole cover from backing plate at each wheel and back off on the star wheel.
12. Install brake drums, making certain that the front wheel bearings are properly adjusted and lubricated and that rear hub nuts are securely tightened with all cotter pins in place.
13. Adjust as described under "Wear Adjustments for Double Anchor Floating Type Brakes."

#### **Single Anchor Type:**

Models 41, 43, 44, 45, 47, 48 and all Commercial. 1. Install wheel cylinder clamps.

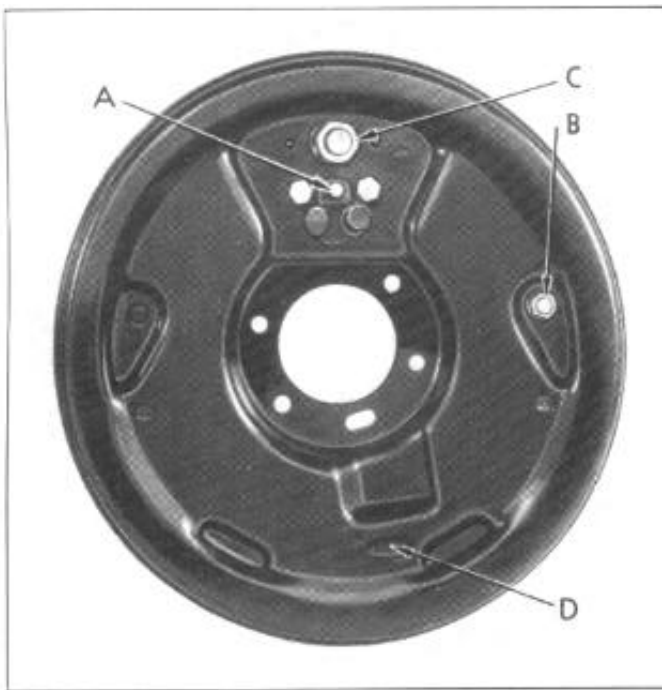


Figure 5

**CAUTION:** Do not depress the brake pedal at any time the brake drums are not in place.

2. Remove, clean and inspect all drums and shoes.
3. Having cleaned thoroughly all the brake parts, apply a light film of Bendix Lubri-Plate Lubricant to
  - a. Hand brake cable ramps.
  - b. Shoe support ledges (on the backing plate).
  - c. Eccentrics.
  - d. All points where there is a frictional contact.
4. Disconnect hand brake cables at equalizer bar.
5. Clean the exposed portion of all hand brake cables and then pull the cables through the conduit from the wheel end to expose that portion of the cable sheathed by the conduit. Clean this portion of the cable and lubricate freely with Bendix Cable Lubricant.
6. Push cable into conduit and after shoes have been installed, connect cable to shoe operating lever (9), Figure 7, leaving adjustable yoke end of cable disconnected.
7. To connect brake cable to shoe operating lever, move cable return spring away from cable end and place cable end into groove at end of operating lever.
8. Before installing new shoes, turn the secondary shoe eccentric (B), Figure 5, so that the high side of the eccentric is away from the anchor link.
9. After installing shoes and shoe parts, remove the adjusting hole cover from the backing plate at each wheel and back off on the star wheel.
10. Install brake drums, making certain that the front wheel bearings are properly adjusted and lubricated and that the rear hubs are securely tightened with all cotter pins in place.
11. Adjust as described under "Wear Adjustments for Single Anchor Brakes."

**NOTE:** If the clearance at the ends of the secondary shoe varies more than .003", adjust the anchor pin as follows: At all four wheels loosen the anchor pin nut (C), Figure 5, one turn and tap anchor pin slightly in necessary direction with a soft hammer, turning the eccentric (B), Figure 5, in the direction of forward wheel rotation to give the specified clearances of .010" at the adjusting screw end and .010" at the anchor end of the shoe against which the eccentric operates. Tighten the anchor pin as tightly as possible with a 16" wrench. Tighten eccentric lock nut.

#### **Brake Shoes and Mountings Disassembly**

##### **Double Anchor Floating Type Shoes:**

Models 40 Traveler and 40 Passenger.

1. Place wheel cylinder clamps on wheel cylinders.
2. Remove brake shoe to anchor pin primary spring (4), Figure 6, secondary spring (5) and brake shoe spring (primary and secondary) (6).
3. Remove brake shoe cable lever strut (10).
4. Remove brake shoe hold-down spring cups (8), springs and spring pin (7).

5. Remove brake adjusting screw spring (14) and screw (13).
6. Remove shoes (1) and (2).

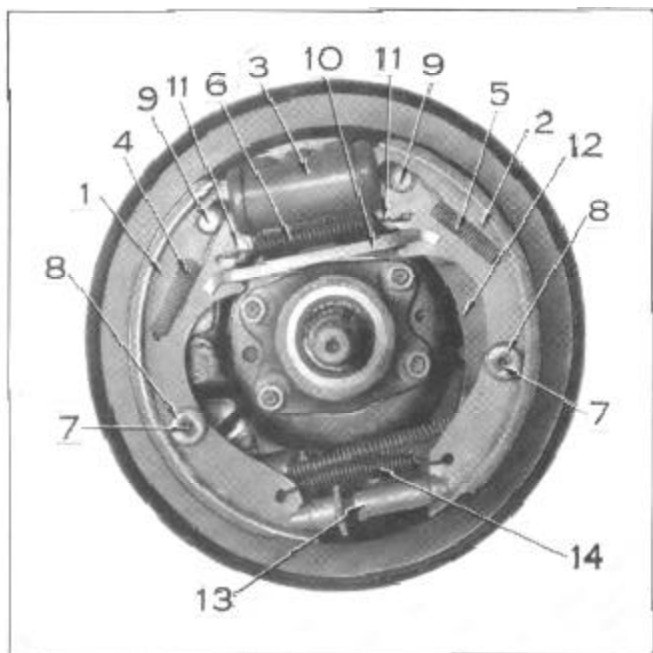


Figure 6

7. On rear brakes only remove brake shoe cable lever by sliding end of cable out of slot at the lower end.
8. If necessary to remove wheel cylinders, disconnect brake hose at frame bracket and remove two cylinder mounting bolts and withdraw cylinder and hose with cylinder clamp in place.

Wash and thoroughly clean all parts and lubricate. To reassemble, reverse order of removal.

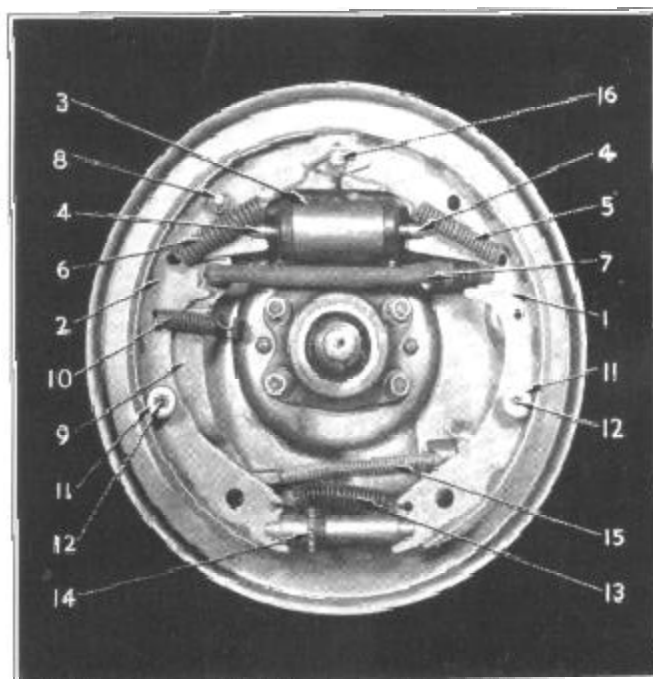


Figure 7

### Single Anchor Type Shoes:

Models 41, 43, 44, 45, 47, 48 and all Commercial.

1. Place wheel cylinder clamps on wheel cylinders.
  2. Remove retracting springs (5) and (6), Figure 7, from primary and secondary shoes (1) and (2).
  3. Remove brake shoe hold-down spring cups (11), springs and spring pins (12).
  4. Remove shoes (1) and (2).
  5. Remove brake adjusting screw spring (13) and screw (14).
  6. Remove shoe to cylinder links (4) and shoe cable lever to shoe pin (8) on rear brakes.
  7. Disconnect rear brake cable (15) from shoe cable lever (9) and remove shoe to anchor bracket spring (10) and shoe cable lever strut (7), also on rear brakes.
  8. Remove eccentric by taking off nut B, Figure 5. 9. Remove wheel cylinder by disconnecting hose at backing plate. Remove two cylinder mounting bolts and withdraw cylinder with cylinder clamp in place.
- Wash and thoroughly clean all parts and lubricate. To reassemble, reverse order of removal.

### Brake Linings:

The lining used on the primary shoe is constructed to give a slightly harder pedal at the low end and thereby minimize the tendency of the brakes grabbing at slow speed.

Various linings have different characteristics and when relining brakes, keep this in mind, otherwise the brake operation on one wheel will differ from that of the others, which will produce a tendency of the car to pull sidewise.

1. Linings which have come in contact with brake fluid, oil or grease should be replaced as they cannot be cleaned.
2. Linings that are chipped should not be used.
3. Lining surfaces should be accurately ground after lining application.
4. Linings held with loose rivets should not be used.
5. Lining ends not properly chamfered should not be used.

Genuine Hudson lining sets are supplied in a package together with rivets. The primary shoe is moulded and the secondary shoe lining is woven. All linings are carefully inspected as an assurance that they will meet Hudson's rigid replacement parts specifications.

### LINING DATA

	Width	Thick- ness	Length/ Wheel	Piece/ Wheel	Lining Area
40 Tray., 40 Pass.	1-3/4"	7/32"	19"	2	133 Sq. In.
40 Comm.	1-3/4"	7/32"	22-1/8"	2	155 Sq. In.
41 Pass.	1-3/4"	7/32"	22-1/8"	2	155 Sq. In.
41 Comm.	1-3/4"	7/32"	22-1/8"	2	155 Sq. In.
43, 47	1-3/4"	7/32"	23-15/16"	2	167.5 Sq. In.
44, 45, 48	1-3/4"	7/32"	23-15/16"	2	167.5 Sq. In.

The 10-1/16" brakes use secondary shoes that are different on the right and left brakes. They are stamped "R" and "L" to distinguish between them. The primary shoes are alike.

In all other cases the shoes without linings are the same right and left as well as primary and secondary.