OAKLAND SERVICE SHOP MANUAL

Section Four

BRAKES

BRAKES

1930 PONTIAC SIX AND OAKLAND EIGHT CARS

Oakland-Pontiac brakes are of the four-wheel internal expanding type operated on the controlled servo or self-energizing principle. Mechanical operation of the brakes provides the highest possible factor of safety and insurance against loss of control of the car. The brakes and linkage are so designed that in the event of failure of any part, which is highly improbable, there would still be braking action on at least two wheels so that the car could be kept under control. The self-energizing principle provides very easy operation of the brake pedal or hand brake lever with the resulting ease of control in traffic. Besides the high degree of safety and ease of operation, the Oakland-Pontiac brakes are long wearing and very easy to adjust when this does become necessary.

Braking System

The braking system used is the simplest four-wheel braking system which has yet been designed. In appearance, the control resembles the hydraulic type of control very much, but is without the complication and uncertainty inherent in the hydraulic type. The brake system consists of a foot pedal and connecting linkage, special flexible cables between the frame and brake mechanism, a toggle assembly for operating the brake shoe, and the circular one-piece full floating shoe. The hand brake lever is interconnected to operate on all four wheels. These elements can be seen on Illustration 4-1.

Foot Pedal and Linkage

A double link, consisting of a push and pull rod, connects the lower end of the brake pedal with a lever on an intermediate cross shaft which extends to the frame side member on each side. With this construction there is no possibility of the cross shaft bending under severe brake application, as the same effort is applied to both the upper and lower portions of the cross shaft lever in opposite directions, so that no bending force is applied to the shaft.

Barrel shaped mountings at both ends of the brake cross shaft prevent binding under the most extreme conditions of frame distortion. The hollow cross shaft is filled with lubricant and needs to be refilled only about twice a year. This, and an occasional oiling

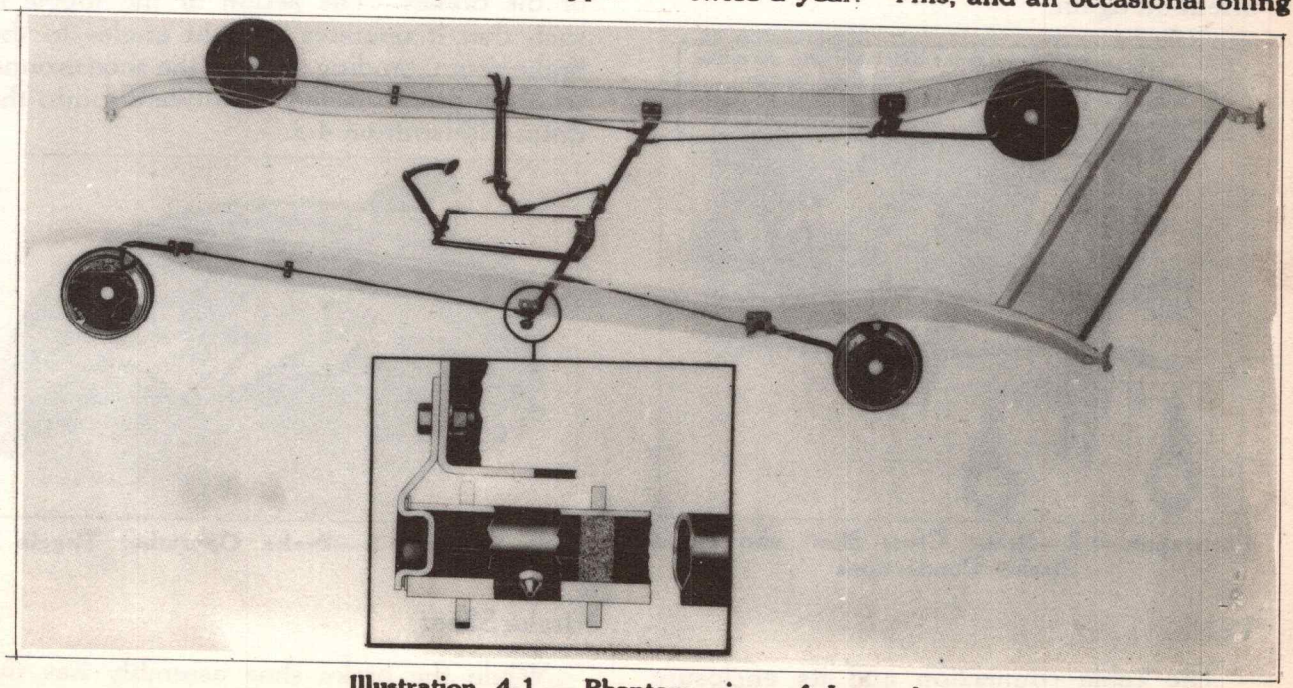


Illustration 4-1 — Phantom view of Internal Mechanical Four Wheel Brakes Used on 1930 Pontiac Six and Oakland Eight

of the clevis pins on the brake rods is the only lubrication these brakes need.

Small levers on the outer ends of the brake cross shaft actuate four pull rods along the sides of the frame. These four brake rods are adjustable, but once set, need to be changed only to compensate for wear in the clevis pins or stretch in the rods. The outer ends of the pull rods connect to the brake cables.

Hand Brake Lever

The brakes on all four wheels are operated by the hand lever independently of the brake pedal. The hand lever has about 50% greater travel than the foot pedal, so that even when the foot pedal is depressed to the toe board, full operation of all four brakes is obtained through the lever. This provides a parking or emergency brake of unusual power and safety. As the hand brake operates on the same brake shoes as the foot brakes, the only attention it requires after the foot brakes are properly adjusted is to see that the hand lever has about one inch travel from its extreme forward position before it starts depressing the foot pedal. Once this has been properly set by means of the hand brake pull rod, it should never require attention again.

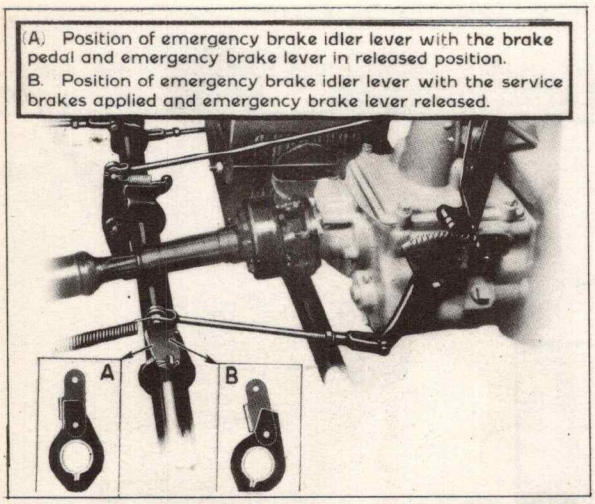


Illustration 4-2—Brake Cross Shaft and Hand Brake Connections

Cables

The cable connection and its enclosure constitutes one of the unique features of the system. It transmits the braking effort from the brake hook up to the toggle assembly in the brakes. It consists essentially of a flexible cable guide in a flexible conduit, the conduit being anchored at the brake and on the frame in such a way that the braking effort is not affected by any movement of the wheels in turning or by the rise and fall of the frame as the car travels over the road. This cable replaces the usual front wheel brake operating mechanism and eliminates the universal joints, shafts and levers commonly used. The steel cable and conduit are covered by a waterproof boot which seals in the graphite grease which is packed in the unit. This construction reduces the friction loss between conduit and the cable and makes any attention during the life of the car unnecessary. The entire unit is waterproof and noiseless.

The cable is connected to the toggle assembly which forces the two ends of the brake shoe apart. This is the ideal method of applying the brakes in that the initial movement of the toggle quickly takes up the clearance between the brake shoe and the drum while the final movement, as the toggle straightens out, enormously multiplies the effort of the pedal pressure in the application of the brakes. The action of the toggle is such that it operates at right angles to the brake drum, tending to force the shoe around with the drum instead of outwardly into the drum. Illustration 4-3.

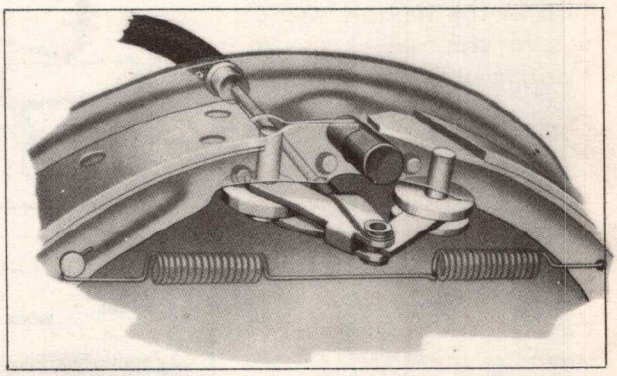


Illustration 4-3—Brake Operating Toggle

Brake Shoes

While the brake shoe assembly has the general appearance of an internal shoe brake,

this construction cannot properly be called shoe type as the shoe is a combination band and shoe. The construction can be seen in Illustration 4-8. The assembly is of pressed steel construction, one-half a rigid steel stamping with varying height flange and the other half a flexible rolled section riveted and welded to the rigid parts, the two together forming a circular shoe. The rigid half acts as a shoe while the flexible half acts as a band. The entire brake assembly is held by an anchor pin located between the two ends of the band. This construction allows the entire brake assembly to oscillate or "float" in unison with the brake drum as the brakes are applied.

The band or flexible portion of the brake assembly has three functions:

1. It exerts a retarding force against the rotation of the drum, acting as an ordinary brake.

2. Since it is flexible, it permits the brake assembly as a whole to adapt itself to any eccentricity or out-of-roundness of the drum without varying the braking effort.

3. The wrapping effect of the band forces the rigid or shoe portion against the brake drum. The shoe section is thus pushed against the brake drum by a force equal to the total amount of braking effort or friction developed in the band section. This action makes the rigid half, which actually imparts about 60% of the braking effort, in effect a separate brake applied by the friction in the flexible section. This is the reason for the ease of operation of the Oakland-Pontiac brakes.

Operation

In the normal position, the brake shoe assembly is held against the anchor pin by a spring, and the ends of the band are held together by the long spring. When the brake pedal is depressed, the motion is transmitted through the cross shaft to the cables and by them to the toggles. At the first application of the toggle, the band end of the brake is brought into contact with the drum to begin the wrapping action, forcing the rigid half of the shoe against the drum also. This self-energizing action is built up in proportion to the pedal pressure. By means of this action the brakes are applied with several times the pressure possible with direct pedal action. The operation in reverse is the same except that the flexible portion of the shoe is forced into the drum by the dragging action of the rigid half.

Due to the action of the flexible half of the shoe in adjusting itself to the shape of the brake drum, the brakes are adjusted with unusually large clearance between the drum and the friction material. This eliminates all dragging of the brakes, so that the only wear on the brake linings is that resulting from applying the brakes. This assures even wear of the linings on all shoes and means fewer adjustments. Ordinary adjustment of the brakes is easily made by means of an adjusting screw which has the effect of expanding the flexible part of the brake shoe.

Because of the unusual clearance, the ease of adjusting all four brakes for uniform operation, and the absence of any factor which would tend to cause unequal operation, no equalizing device is required on the brakes. This is a decided advantage, for it makes possible a very simple brake hook up and provides more positive and reliable brake action.

Adjustment of Foot Brakes, 1930 Pontiac Six and Oakland Eight

Before attempting to make any adjustment of the brakes, INFLATE THE TIRES TO THE CORRECT PRESSURE. Clean and lubricate the brake linkage and make

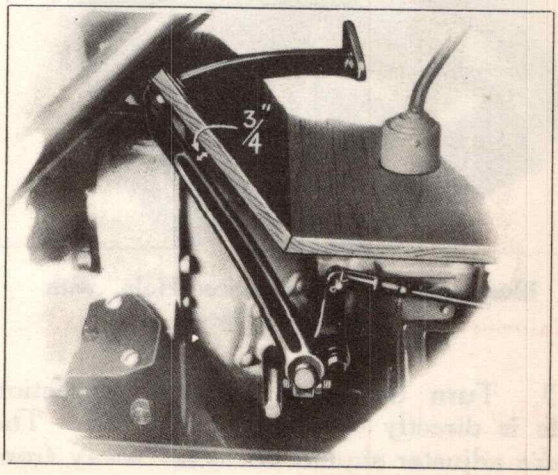


Illustration 4-4—Brake Pedal Adjustment

sure it is working freely. Check the front wheels for looseness in the wheel bearings.

1. Set the brake pedal stop screw to give 3/4" clearance between the pedal shank and the under side of the toe board. See Illustration 4-4.

2. Jack up all four wheels and remove the brake adjuster cover on the inner side of the brake support plate (see Illustration 4-5)

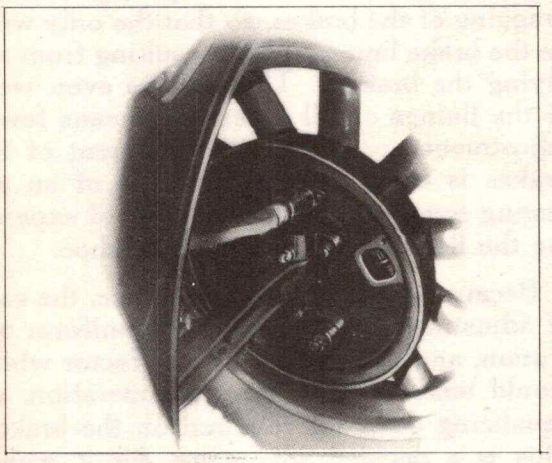


Illustration 4-5—Brake Adjustment Cover Removed

and remove the cover from the inspection hole (Illustration 4-6) in the brake drum between the spokes.

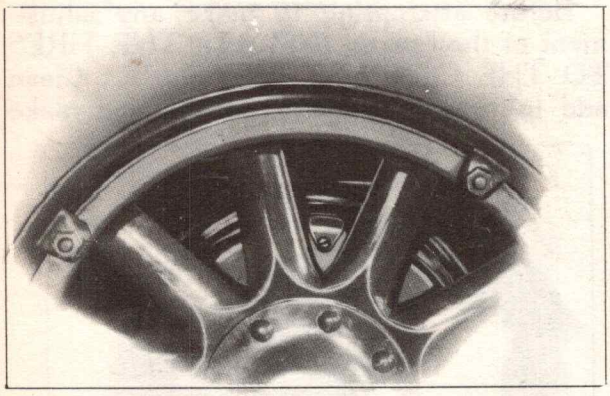


Illustration 4-6—Inspection Hole, with Cover in Place

3. Turn the wheel till the inspection hole is directly over the anchor pin. The brake adjuster should be 1/32" away from the anchor pin. See Illustration 4-7.

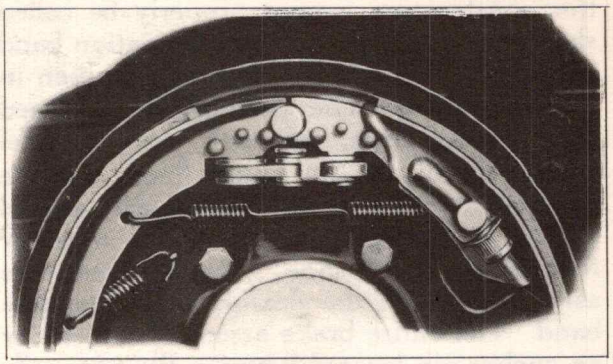


Illustration 4-7—Showing 1/32 Clearance between Brake Adjuster and Anchor Pin

To adjust this clearance, lengthen or shorten the brake rod as follows: Without removing the clevis from its lever, back off the jam nut, hold the cable connection fitting—the rod swivels in the cable fitting, and turn the brake rod with a pair of pliers to the right or left till the proper clearance is obtained. Tighten the jam nut. See Illustration 4-8.

4. Adjust the clearance between the brake shoes and brake drum as follows: Turn the wheel till the inspection hole is directly over the brake adjuster stop. Insert a 3/64" feeler for Pontiac, and a 1/16" feeler for Oakland, between the brake shoe and the brake drum at this point. Back off the brake adjuster stop retaining nut, located on the back of the brake support plate, until the tension is relieved. With a screw driver,

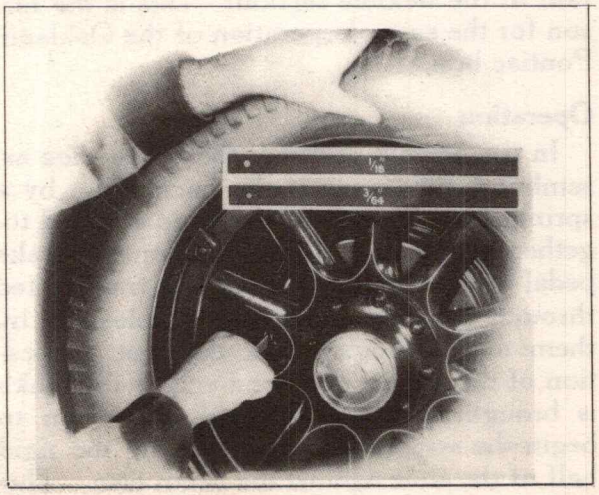
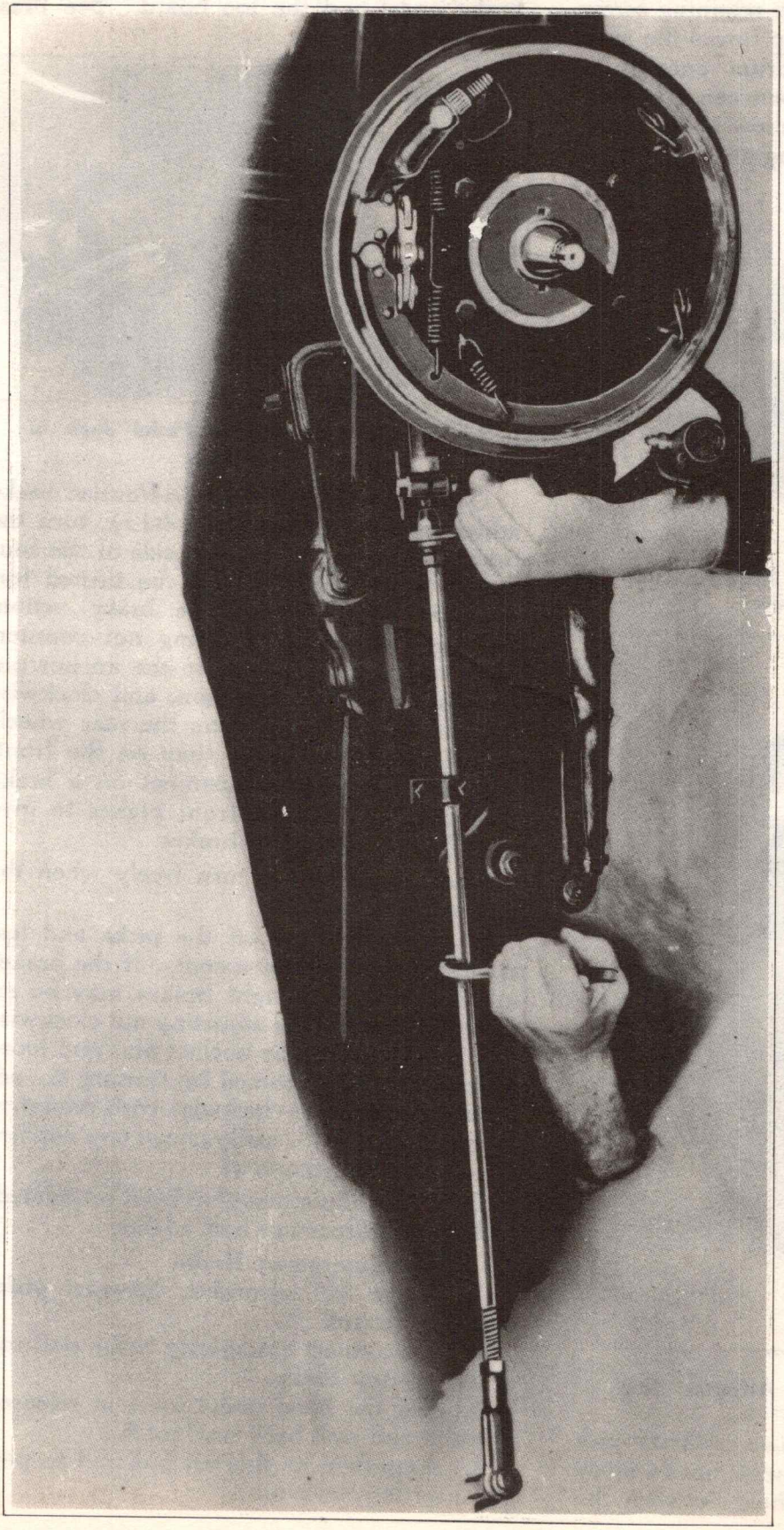


Illustration 4-9—Checking Band Clearance



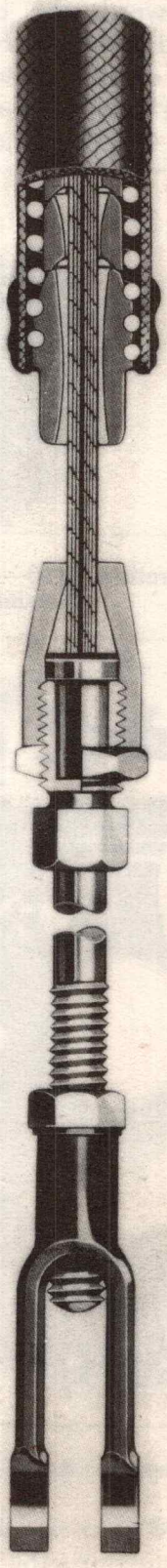


Illustration 4-8—Adjusting Brake Rod for Anchor Pin Clearance

turn the brake adjuster stop retaining screw until the brake adjuster stop forces the shoe over towards the brake drum enough to barely tighten the feeler between the shoe and the drum. Hold the screw in this position and tighten the retaining nut. See Illustrations 4-9, 4-10 and 4-11.

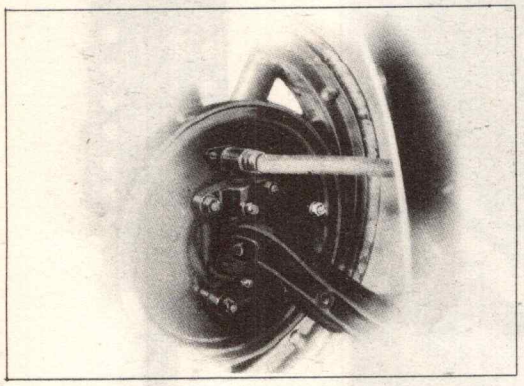


Illustration 4-10—Brake Adjuster Stop Retaining Screw

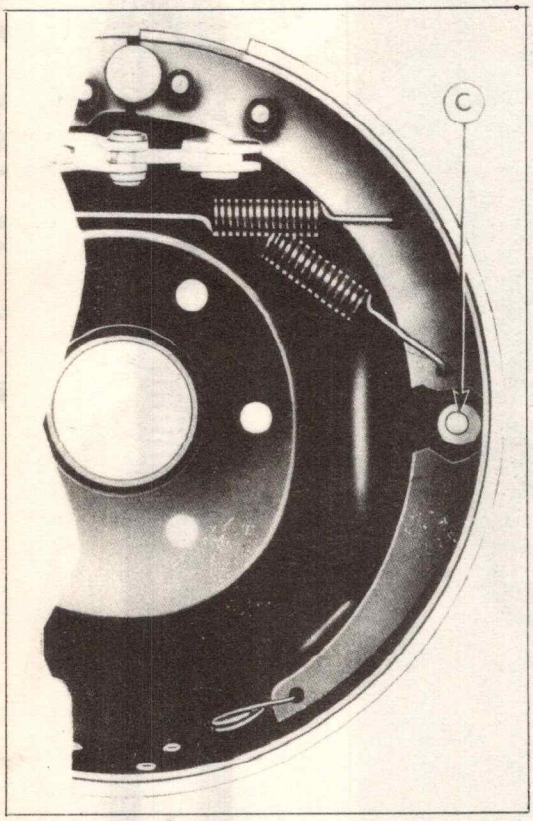


Illustration 4-11—Brake Adjuster Stop

5. With a pedal jack (an ordinary jack will do) depress the brake pedal until a block of wood 3" wide is just held between the brake pedal and the toe board. See Illustration 4-12.

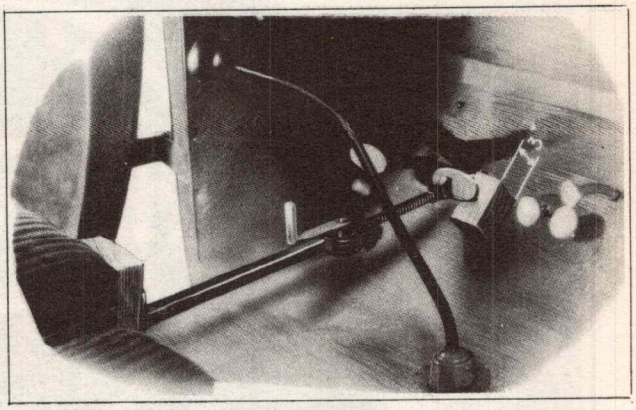


Illustration 4-12—Brake Pedal Jack in Position

Using the special Oakland-Pontiac brake adjusting tool, (Illustration 4-13), turn the brake adjusting nut on each side of the four brakes until the wheel can be turned forward by hand against the brake action. Turning the brake adjusting nut counter-clockwise with reference to the anchor pin increases the braking action, and clockwise decreases it. The drag on the rear wheels should be slightly more than on the front. When making this adjustment on a brake dynamometer, set the front brakes to give 1/3 the load of the rear brakes.

The wheels should turn freely when the brakes are released.

6. Take the car off the jacks and test the brakes on dry pavement. If the brakes are not equalized, tight brakes may be relieved by turning the adjusting nut clockwise with reference to the anchor pin, and loose brakes may be tightened by turning the adjusting nut counter-clockwise with reference to the anchor pin. Usually one or two notches are all that are required.

When the adjustment has been completed, replace the inspection hole covers.

To Adjust Emergency Brake

1. Have 3/4" clearance between pedal and floor board.
2. Disconnect emergency brake pull rod at emergency brake.
3. Set the hand brake lever in released position and pull back one notch.
4. Lengthen or shorten pull rod to permit inserting clevis pin.

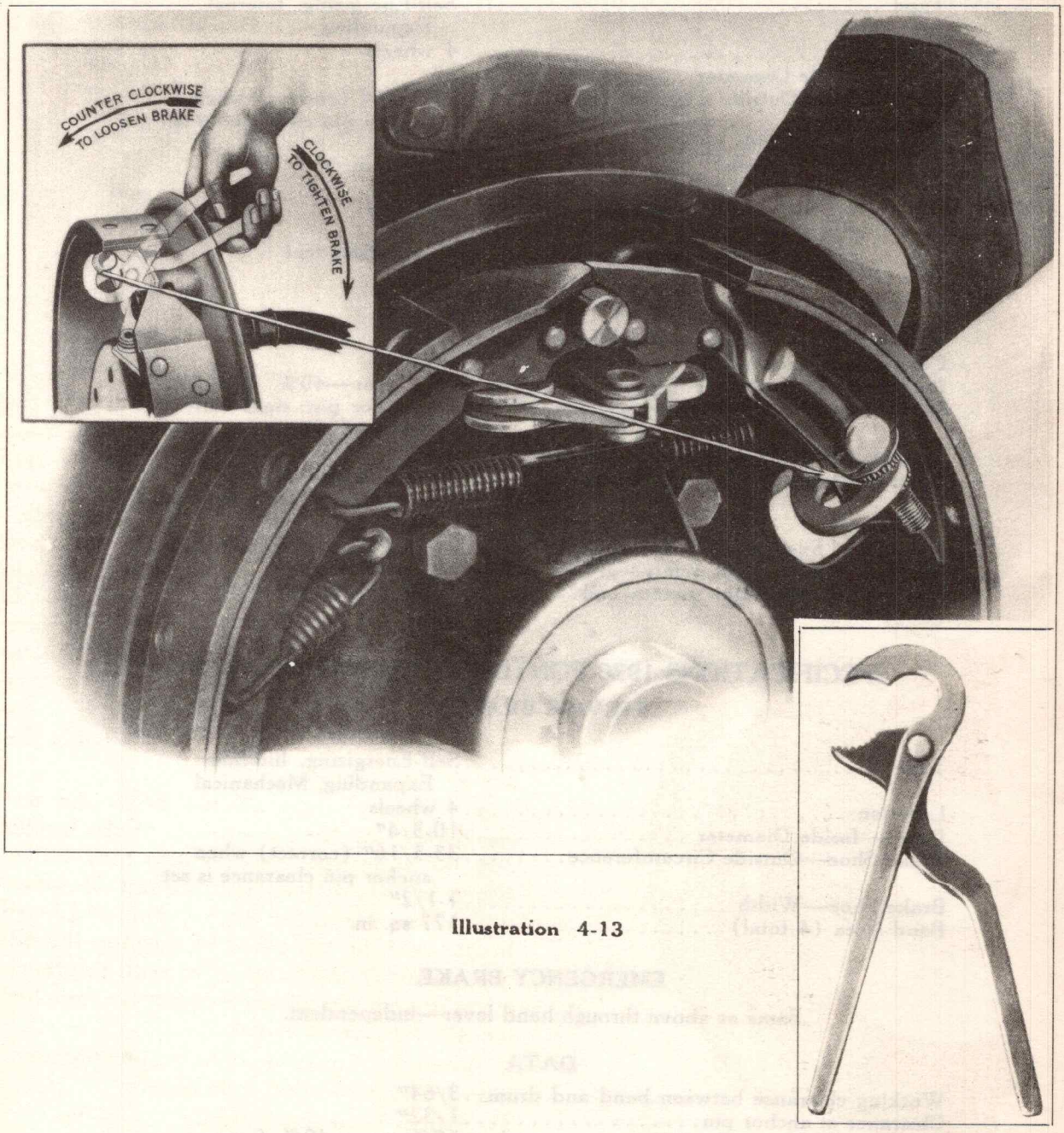


Illustration 4-13

SPECIFICATIONS OAKLAND EIGHT INTERNAL BRAKES

SERVICE BRAKES

Type	Self-Energizing, Internal Expanding
Location	4 wheels
Drum—Inside Diameter	12″
Brake Shoe—Outside Circumference	37-5/16″ (correct) when anchor pin clearance is set
Brake Shoe—Width	1-3/4″
Band Area (4 wheels)	236 sq. in.

EMERGENCY BRAKES

Same as above through hand lever—independent

DATA

Working clearance between band and drum	1/16″
Clearance at anchor pin	1/32″
Percentage of braking effort	60% rear—40% front
Number of adjustments to wheel	3—anchor pin; rigid half; brake adjuster stop
Clearance of brake pedal at toe board	3/4″
Number of adjustable brake rods	5—4 brake rods 1 pedal pull rod plus hand brake pull rod
Number of fixed length brake rods	1—pedal push rod
Number of lubrication points—grease	2—cross shaft
Number of lubrication points—oil	12—clevis pins

SPECIFICATIONS 1930 PONTIAC INTERNAL BRAKES

SERVICE BRAKES

Type	Self-Energizing, Internal Expanding, Mechanical
Location	4 wheels
Drum—Inside Diameter	10-3/4″
Brake Shoe—Outside Circumference	33-5/16″ (correct) when anchor pin clearance is set
Brake Shoe—Width	1-1/2″
Band Area (4 total)	177 sq. in.

EMERGENCY BRAKE

Same as above through hand lever—independent.

DATA

Working clearance between band and drum	3/64″
Clearance at anchor pin	1/32″
Percentage of braking effort	60% rear—40% front
Number of adjustments to wheel	3—anchor pin; rigid half; brake adjuster stop
Clearance of brake pedal at toe board	3/4″
Number of adjustable brake rods	5—4 brake rods 1 pedal pull rod plus hand brake pull rod
Number of fixed length brake rods	1—pedal push rod
Number of lubrication points—grease	2—cross shaft
Number of lubrication points—oil	12—clevis pins