1935 Brakes

Bendix Equal Action Duo Servo Type
Rotary Equalizer - Cable Control

The 1935 Terraplane and Hudson Brakes are of the Bendix Equal Action Duo Servo type and incorporate a number of new features which insure equal, softer action, increased power, longer life and make the need for adjustment less frequent.

The brake drums are heavier than those formerly used and are machined and polished on the wearing surface. The maximum tolerance for eccentricity has been reduced to .005".

The brake shoes have been redesigned so that they more readily conform to the contour of the drum, thereby giving more equal pressure over the entire contact surface. This results in less lining wear and reduced tendency to score or distort the brake drums.

The brake control layout, Fig. 1, has been completely redesigned to insure equal movement transmitted to each brake shoe regardless of the force applied to the pedal. The pedal push rod acts directly against the left end of a rugged drop forged Rotary Equalizer which is pivoted under the center of the frame "X" member. The four cables connecting to the wheel brakes are attached to the Rotary Equalizer, each located 1-7/8" inches from the pivot pin, and all at the same angle to their leverage arms represented by a line drawn through the attaching clevis pin and the equalizer pivot. (Fig. 1-upper insert). This insures equal movement of all cables throughout their entire range of movement. Since the connections are close to the pivot and the section of the drop forged Rotary Equalizer is large, any possibility of distortion even under loads of several times that which it is possible to apply to the pedal, is eliminated.

The hand brake has been located to the left of the driver with the mounting on the body dash panel. The lever extends downward from the pivot on the dash bracket so that the hand grip is conveniently located just below the instrument panel. The hand brake lever is connected to the right side of the Rotary Equalizer by a cable and actuates all four wheel brakes.

General Adjustment Instructions

The Brake Control System: The proper functioning of the brake control system is of vital importance. A freely operating brake control system permits its return to the stop provided which is a return rest at the rotary equalizer on the chassis. With the brake control system returning to the maximum released position, a longer period of operation can be expected before readjustment is necessary. No backlash should be present at the brake pedal or at the operating lever of each brake. See Paragraph 4 for adjustment of pedal rod. Do not adjust cable length except with shoes expanded as outlined in Paragraph 8.

Lubrication: The brake pedal and rotary equalizer bearings, clevis connections and other frictional parts of the braking system should be lubricated every 1000 miles of car service to insure their free return to the stops provided. Lubrication of the cable and conduit control is described in Paragraphs 14 and 15.

Return Springs: To hasten the release action of a brake control system that has been in service some time, the uniformed mechanic will some times install additional return springs at various points in the brake control system. This is detrimental to satisfactory brake performance, will increase the pedal pressure and is entirely unnecessary. It will be found that correct lubrication and proper adjustment will produce satisfactory operation of the brake control system. Check all return springs. Replace, if found weak or broken.

General Points of Importance: Satisfactory braking performance can be obtained only when all four brakes are functioning alike. The brake control system should be well lubricated, the spring clips holding the chassis springs to the front and rear axles tight, wheel bearings properly adjusted, and the four brakes balanced. The braking system should be broken-in carefully just the same as other mechanical units of the car. Hard application of the brakes before the linings have become polished may gall the linings or score the drums. It is very essential that the parking brake system be effective at all times. Adjustment for lining wear should be made when the brake pedal can be depressed within 1-1/2" of the toe board at the end of a heavy brake application.

Oily or Greasy Brake Lining: Much braking trouble will be avoided if the lubrication of the rear axle and front wheel bearings is held to the correct amount and not over-done. Where it is found that the brake lining has become excessively saturated with oil or grease, heavy pedal pressure or possibly sensitive brake action will result and the only cure is replacing the brake lining. If molded lining becomes not overly saturated with the lubricant it may be possible to remove the lubricant from the lining with the use of high test gasoline.

Lining Renewal: When lining renewal is required, use only genuine Hudson-Terraplane lining which is available from the factory parts department, boxed in complete sets (lining and rivets for one car).

There are only two adjustments in a braking system of this type to compensate for brake lining wear. These points (at the brakes proper) are as follows: *Continued on page 3*

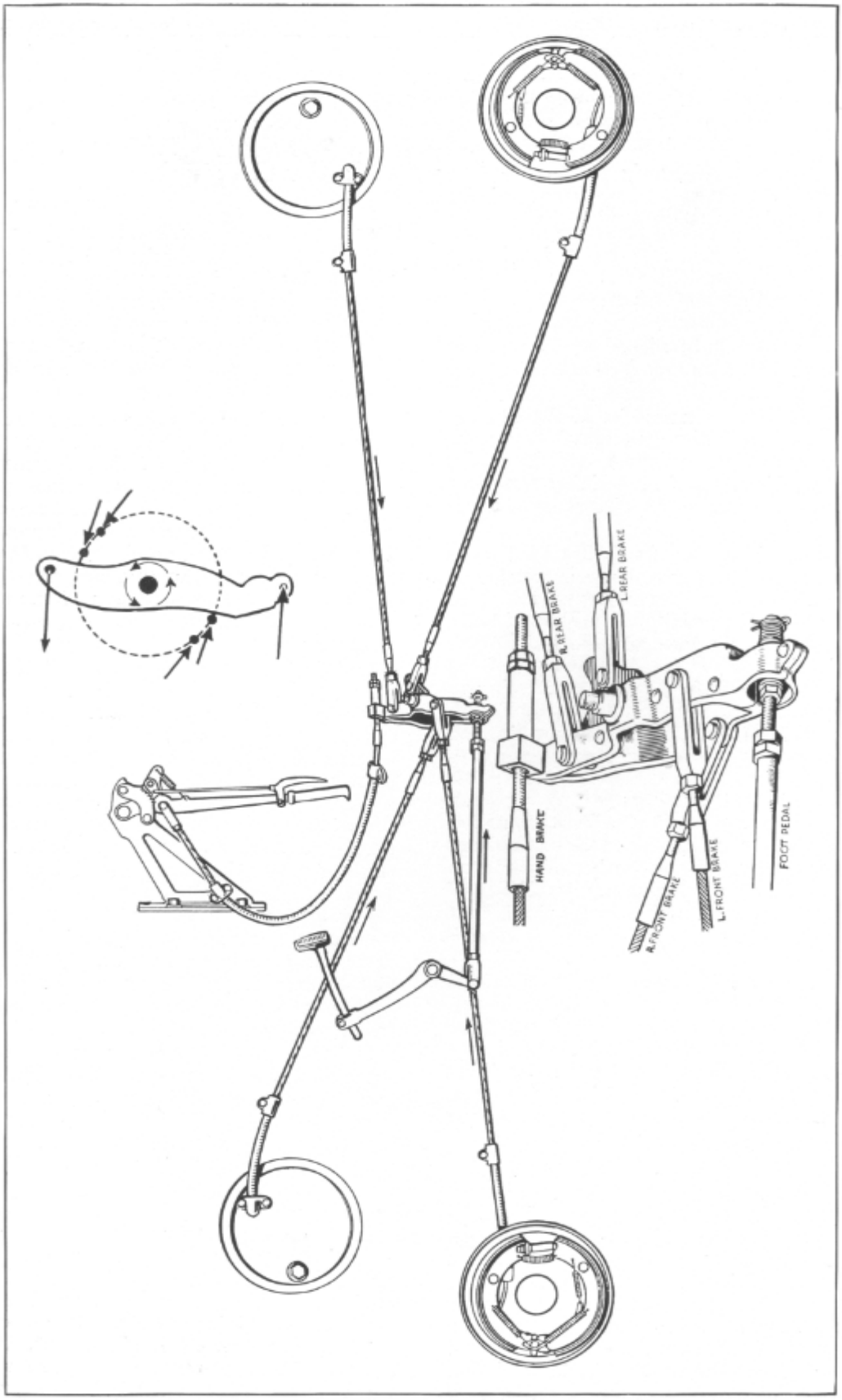
R. REAR BRAKE
L. REAR BRAKE
HAND BRAKE
R. FRONT BRAKE
L. FRONT BRAKE
FOOT PEDAL

Figure 1

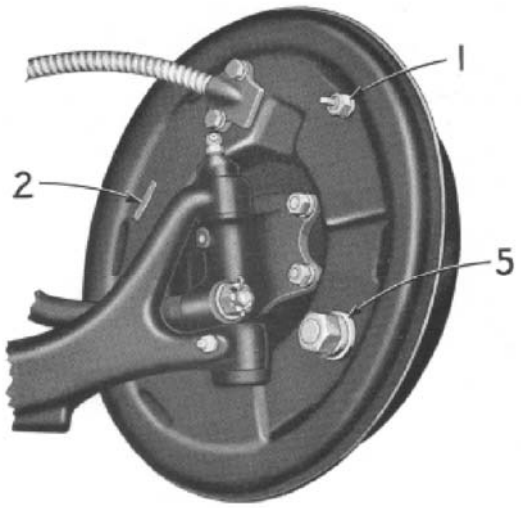

Figure 2—Left Front Brake

The Eccentric Adjustment - l - Fig. 2. This adjustment centralizes the brake shoe in the brake drum.

The Adjusting Screw - Fig. 3. This adjustment compensates for lining wear.

Do not make any adjustments in the brake control system to compensate for brake lining wear. Remember the only adjustments for lining wear are at the brake shoes, and not in the control system.

Figure 3

Adjustment For Wear Only

1. Jack up all four wheels in a safe manner.

2. Disconnect all four cables leading to front and rear brakes at the rotary equalizer, by removing safety plugs and clevis pins.

3. Lubricate brake pedal, hand brake lever, rotary equalizer bearings, over-running linkage and all clevises. See that pedal, hand lever, rotary equalizer operate freely and that linkage returns sharply to release stop when pedal and hand lever are released.

4. With the rotary equalizer against the frame bracket stop and the hand lever in the full "off " position, adjust the lock nuts on the lower end of the pedal push rod so that they are against the pedal push tube when the pedal shank is against the rubber bumper on the underside of the toe board bracket. Adjust the sleeve on the end of the hand brake cable so that it is just against the rear face of the rotary equalizer. Be sure the Rotary Equalizer is still against the frame bracket stop after the above adjustments are made.

5. Remove all wheels.

6. Remove adjustment hole covers from brake backing plates (2-Fig. 2) and inspection hole covers-from brake drums.

7. *At All Wheels:* Loosen eccentric lock nut (1-Fig. 2) on eccentric adjustment and insert .010” feeler gauge between the lining of top shoe and brake drum (Fig. 4). Turn the eccentric adjustment in the direction of forward wheel revolution until .010” feeler is just snug at anchor and adjusting ends of top shoe. Tighten eccentric lock nut. The clearance at both ends of top shoe should not vary more than .003'. Should the variation between the two ends be greater than .003', it will be necessary to relocate anchor pin as outlined in Paragraph 17. (In case of clearance variation, it is desirable that clearance at anchor end of shoe be less than at adjusting end.) (See Note on Page 5.) Do not adjust anchor pin unless this inspection shows it necessary.

8. A*t All Wheels:* Expand the brake shoes by turning notched adjusting screw toward rim of backing plate, using Bendix adjusting tool or screw driver inserted through backing plate), moving outer end of tool toward center of wheel (Fig. 3). Continue until brake drum can just be turned by hand.

9. Pull cables by hand toward rotary equalizer to remove all cable slack and lost motion at cam levers. Adjust clevises so that pin will just enter clevis and rotary equalizer freely. Lock clevis jam nuts and insert clevis pin cotters. Insert safety plugs.

1. Primary Shoe
2. Adjusting Screw
3. Adjusting End of Shoe
4. Secondary Brake Shoe
5. Anchor Pin
6. Primary Shoe Return Spring
7. Cable Return Spring
8. Backing Plate
9. Adjusting Screw Spring
10. Secondary Shoe Return Spring
11. Operating Lever Anti-Rattle Spring
12. Operating Lever
13. Brake Shoe Hold Down Spring
14 Eccentric

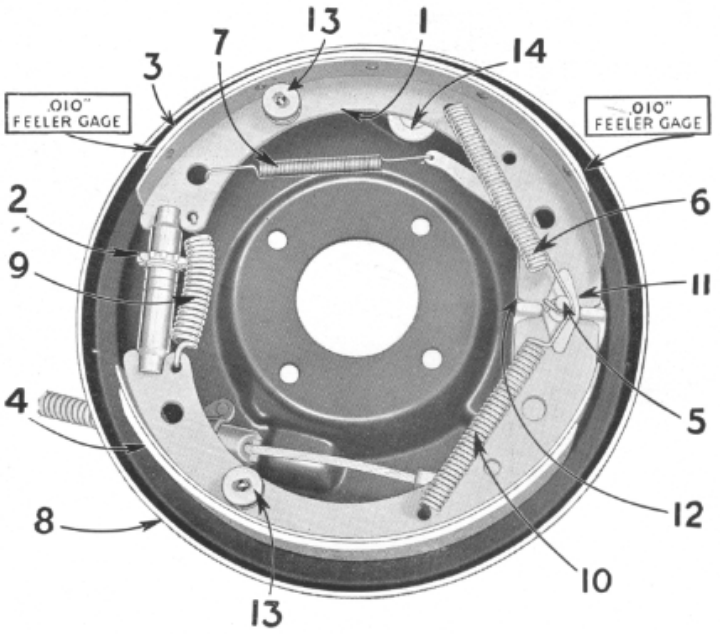

Figure 4—Left Rear Brake Brake Control System

Primary and secondary brake shoes are marked with a "P" and "S" respectively. Irrespective of the position in which the brake assembly is mounted on the axle, the primary shoe is always the one "ahead" of the anchor in the direction of the forward rotation of the drum, and transmits servo action to the secondary shoe during a forward braking application. In reverse braking the opposite brake action takes place. The heavier shoe return spring must always be attached to the shoe which "hides" the brake operating lever

10. Release adjusting screw the same number of notches at each wheel until brake drums are completely free of brake drag. Twelve to fourteen notches usually are sufficient.

11. Depress brake pedal with pedal jack or set hand lever until wheel with the least brake drag can just be turned over by hand. Then back off the adjusting on the tight brakes until the brake drag is alike on all four wheels. Pedal reserve should not be less than one-half of total pedal stroke. Recheck adjustments if pedal reserve is less than this.

12. Reassemble the covers at each drum inspection and adjustment hole.

13. Lower car and test on brake testing machine or road. *Always loosen adjusting screw on tight brakes rather than tighten adjusting screw on loose brakes.* This is a safeguard against a car going into service with one or more brakes too tight.

Complete Brake Adjustment

NOTE: These complete brake adjustment instructions are to be followed in cases where an inspection, as in paragraph 7, shows that an adjustment for lining wear only will be inadequate or where new shoes have been installed.

When a complete brake adjustment is required it is recommended that all brake drums be removed and cleaned and brakes cleaned and inspected as to lining condition. After cleaning with a stiff brush and air hose, Bendix Lubriplate grease should be lightly applied to cable ramp, shoe support ledges on backing plate, eccentric, shoe ends and all moving parts at frictional contact points.

After the car has been jacked up, with cables disconnected at rotary equalizer, and the drums and shoe removed continue as follows:

14. Lubricate cable and conduit assemblies by disconnecting cable at brake operating lever, cleaning exposed portion of cable and then pulling cables thru conduits from the brake end to expose that portion of cable which is sheathed by conduit. Clean this portion of cable, lubricate freely with Bendix cable lubricant.

15. Return cable into conduit and connect to brake operating lever, leaving rotary equalizer clevises disconnected. Conduit ends must always be firmly bottomed in abutment brackets.

16. Reinstall shoes and shoe parts and drums. Remove adjusting hole covers from backing plate and covers from drum feeler gauge holes if this has not been done.

17. Anchor Pin Adjustment: At all four wheels loosen the anchor pin nut (Fig. 5) one turn and tap anchor pin slightly in necessary direction with a soft hammer, and turn the eccentric 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.

Figure 5
Sliding Adjustment Type Anchor

TIGHTEN THE ANCHOR PIN NUT AS TIGHT AS POSSIBLE WITH A SIXTEEN INCH WRENCH. Tighten eccentric lock nut. Recheck clearances to insure tightening anchor nut has not disturbed lining to drum clearance.

18. Continue adjustments as outlined in Paragraphs 8, 9, 10, 11, 12 and 13.

NOTE: Normal Servo Action is obtained when equal lining to drum clearance is maintained at both ends of the shoes. More clearance at the adjusting end than at the anchor end of the secondary shoe will reduce the effectiveness of the Servo Action. This will "harden" the brake action, and extreme adjustment of this kind will materially increase the pedal pressure required. Although .003" variation in lining to drum clearance is permissible per shoe, a combination of adjustments that will increase the Servo Action on some shoes and decrease it on others will produce unequal braking effect.

There are no short cuts to satisfactory brake performance. Follow the recommended procedure step by step. Be accurate in your measurements. This is the only way to reduce the average time per brake adjustment in the shop and also increase owner satisfaction.