Tapered roller bearings should be so adjusted as to eliminate any lateral movement of the bearings, but not so tight that a thrust load will be thrown on the bearings when the caps are drawn down tight against the shims. In other words, sufficient shims should be used behind the bearing caps so that the shaft is free-turning with end play not exceeding .004".

The edges of constant mesh gears should be flush with each other, and there should be clearance between the gears and the edge of the case to prevent the gears from rubbing against the case cover. To obtain the proper tooth contact when equipped with tapered roller bearings, remove or add shims under the bearing caps as required. Where no shims are used, spacers of the proper thickness should be installed to obtain the desired result.

*When shims are removed from behind one bearing cap for the purpose of aligning gears, an equal quantity and thickness of shims should be removed or added to the opposite bearing cap so as to maintain the proper bearing adjustment.*

### Disassemble

Unscrew the nuts from the ends of the shafts and pull off the universal flanges. Remove the output shaft bearing caps and, if ball bearing equipped, unscrew the shaft nuts. Take off the front cover, the top cover and the baffle plates; all the shafts may now be lifted from the case and stripped, tagging each gear, bearing and spacer as to their location to insure correct assembly.

To disassemble the differential, mark the relative position of the case halves so that assembly may be made in the same position. If the case is riveted, use a drill which is smaller than the rivet and drill through the heads to a depth just below the bottom of the rivet head. Then cut off the heads of the rivets with a chisel and punch the rivets out of the case. Separate the case and remove all parts.

### Inspection of Parts

Helical gear backlash should be from .003" to .005". Clearance between the mainshaft and side gear bushings .0016" to .0029"; between the main drive shaft and spider splines, .001" to .0025"; between the output shafts and gear splines, tight to .001"; between the spider and pinion bushings, .0016" to .0034"

### Reassemble

Reverse the order of disassembly to assemble the unit, being sure the halves of the differential case are assembled according to the marks made before the unit was taken apart. It is recommended that a special riveting fixture be used when assembling the case to insure the correct seating of the two halves.

Make sure all gaskets are in good condition and of the original thickness, as leakage and misalignment is sure to result if improper gaskets are used. Check the sealing surface of the universal flange yokes to be sure they are smooth and concentric—as a rough or damaged yoke will damage the oil seal.

Before installing the torque divider, be sure the breather is clean and that its filter is in good condition.

# Brake Section

## BENDIX UNI-SERVO & DUO-SERVO BRAKES

### Adjustment, Figs. 1 & 2

Raise wheels and remove adjusting hole covers from support plates. Insert screwdriver or star wheel adjusting tool in slot of support plate to engage star wheel. Move outer end of tool toward center of axle to expand brake shoes. Expand shoes until wheel can just be turned by hand and then back off on star wheel 12 to 14 notches. After adjusting each brake check to see that the wheel turns freely.

## CHRYSLER TWO CYLINDER BRAKE

On this type brake, Fig. 3, each shoe is actuated by its own cylinder which has a single piston. One cylinder is at the top of the brake assembly and operates the front shoe. The other cylinder is at the bottom of the brake assembly and operates the rear shoe. Each cylinder is mounted by means of an anchor pin for the opposite shoe.

### Adjustment

Following overhaul or when new brake linings are installed, the initial adjustment should be carefully made to properly locate the curvature of the lining to the drum and obtain the proper clearance.

Each shoe must be adjusted to center the brake shoe arc in relation to the drum. Back off on both the anchor pins and cams and adjust each shoe individually. Adjust the cam to bring the lining into contact with the drum and rotate the anchor pin sufficient to relieve drag. Repeat until additional rotation of the anchor pin will no longer relieve drag. Lock the anchor pin lock nut and back off the cam just enough to permit the wheel to turn freely.

Subsequent adjustments to compensate for lining wear are made with the eccentric cam only. Turn the cam to bring the lining into contact with the drum. Then back off just enough to

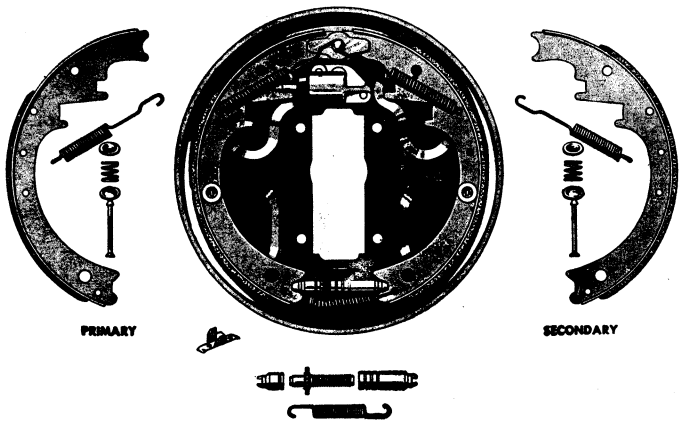



**Fig. 1 Bendix Uni-Servo brake with single piston wheel cylinder**

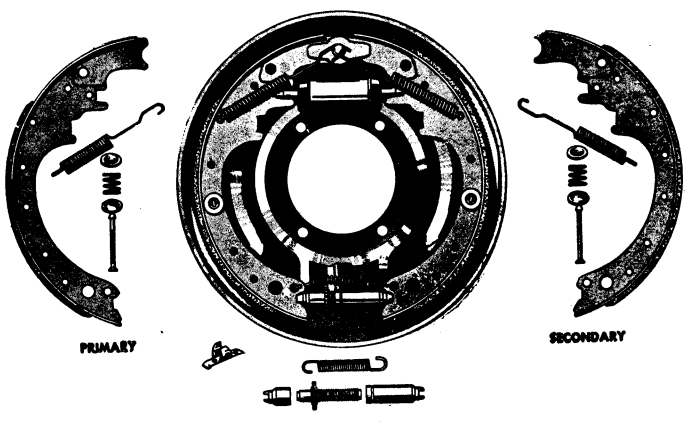



**Fig. 2 Bendix Duo-Servo brake with dual piston wheel cylinder**

permit free rolling drum. Repeat on the opposite shoe.

## LOCKHEED SINGLE CYLINDER BRAKE

This type brake, Fig. 4, has one cylinder mounted in each brake assembly. The cylinder is equipped with two pistons which operate in opposite directions. The brake is anchored at one end of each shoe and each shoe is provided with a cam adjustment.

### Adjustment

Adjustment of this type brake is accomplished in the same manner outlined above for the Two-Cylinder Brake.

## CHRYSLER FLOATING SHOE BRAKE

On this type brake, Fig. 5, each shoe is floating and self-centering. The shoe is actuated by a lever which is, in turn, actuated by the wheel cylinders. By means of the levers, force can be applied to the center of the shoes through the pressure button. Each shoe is free to move against the upper or lower abutment which anchors and energizes the shoe. This movement is dependent upon the direction of drum rotation.

### Adjustment

To adjust these brakes when installing new shoes and linings, or when compensating for lining wear, proceed as follows:

1. With the brakes cold, the drum in place and wheel jacked up, rotate the drum in both directions to make sure that the brakes are free.
2. By means of the adjuster bolt in the recess in the bottom of the backing plate, adjust one shoe tight against the drum. It should not be possible to rotate the drum in either direction when this is done.
3. Back off the adjuster until there remains only a very slight drag caused by the adjustment of this shoe.
4. After adjusting the first shoe, repeat the same procedure for the other shoe.

## TIMKEN DPH BRAKES

Used on the rear of trucks equipped with Timken axles, these brakes, Fig. 6, while of the same basic design for all sizes, will vary slightly depending upon the size and type of actuation. Liners of equal length and identical material are riveted to interchangeable shoes. Either a straight bore hydraulic wheel cylinder or toggle head cam assembly actuate the lever arms to apply pressure to the center of the shoes by means of movable pressure blocks. Shoes are self-centering and rotation is prevented by self-aligning abutment blocks bearing against the angled faces of the shoes.

Figs. 7 and 8 illustrate the procedure for removing and installing brake shoes.

### Adjustment

Raise the vehicle so the wheels will be free to rotate. Loosen the anchor pin lock nut and turn the front anchor pin in the direction the wheel turns when the vehicle moves forward and the rear anchor pin in the direction the wheel turns when the truck moves backward, Fig. 9.

Adjust each anchor pin as required to bring the lining into contact with the drum and back off just enough to allow minimum running clearance. Tighten the anchor pin nuts to 172-200 lb. ft. torque. Check the running clearance by rotating the wheel in both directions.

### Heavy Duty Anchor Pin Brake

This type brake is similar in design to DPH brake described above. The brake assembly is mounted on a spider, and dust shields (where used) are secured either by the stationary or adjustable anchor pin lock nuts or cap screws. Anchor pin straps increase the rigidity

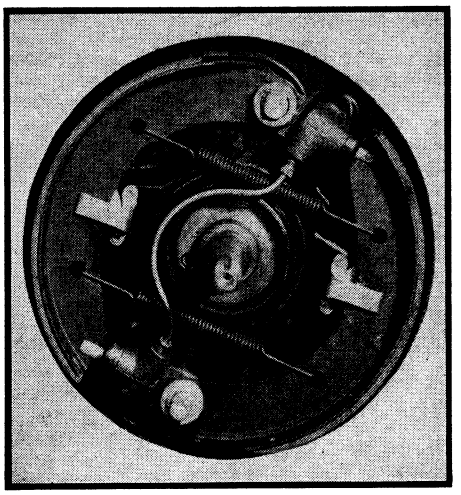


**Fig. 3 Chrysler single piston, two cylinder brake**

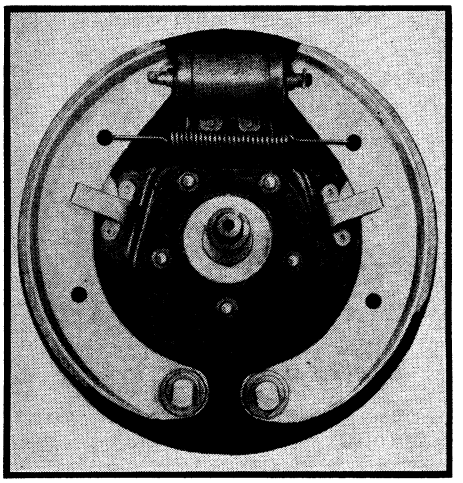


**Fig. 4 Lockheed two piston, single cylinder brake**

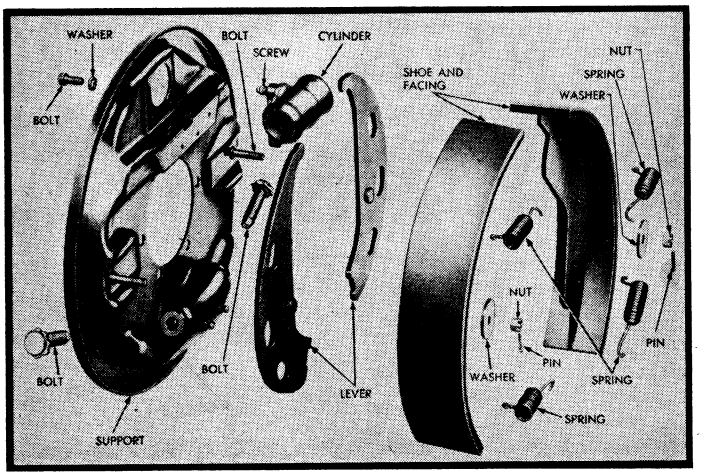



**Fig. 5 Chrysler two piston, single cylinder floating shoe type brake**

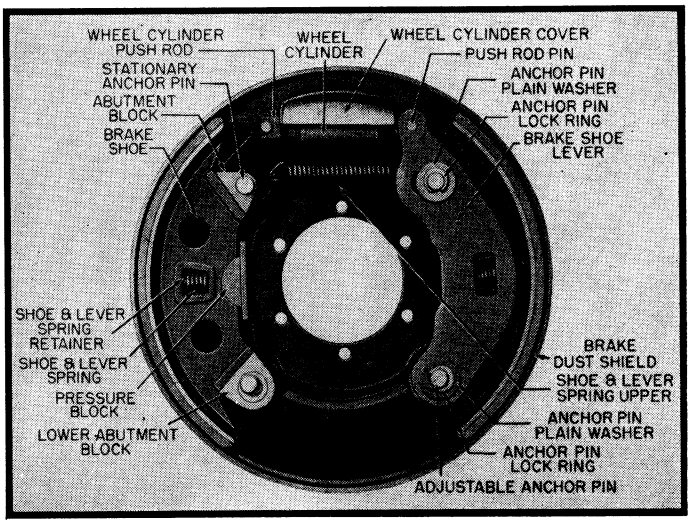



**Fig. 6 Timken DPH anchor pin brake. Top half of left lever is removed**

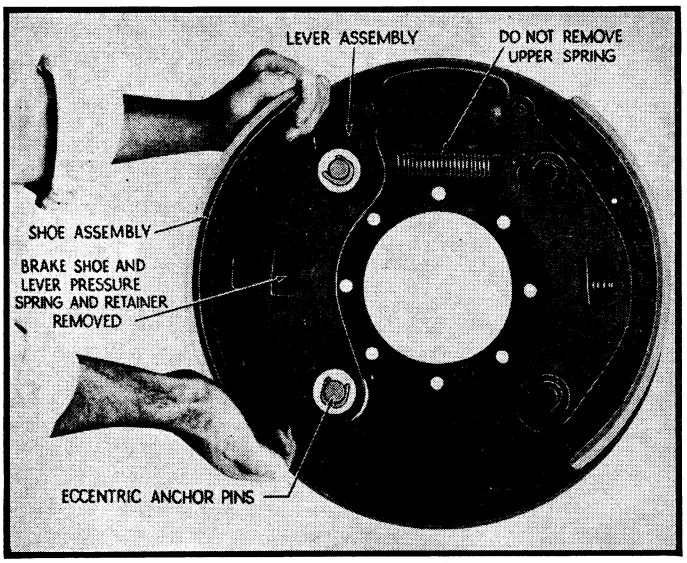



Fig. 7 Removing shoe from Timken DPH anchor pin brake

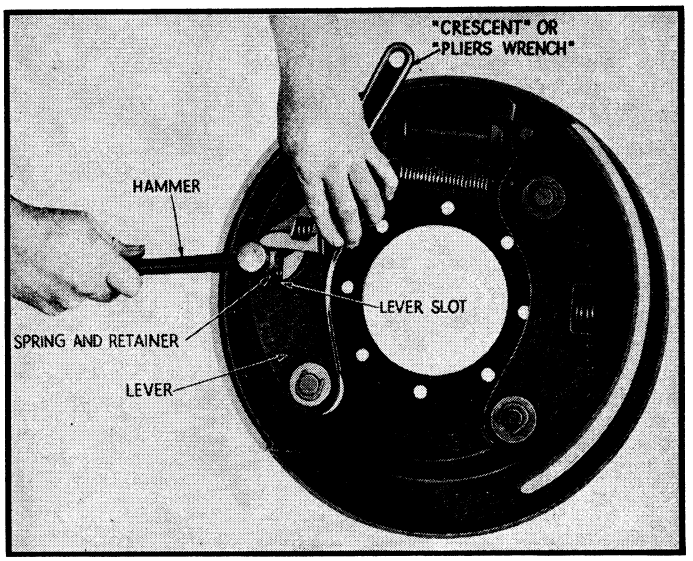
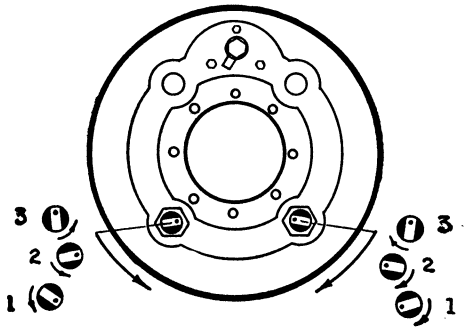



Fig. 8 Assembling shoe on Timken DPH anchor pin brake




1. FULL RELEASE POSITION
2. NORMAL ADJUSTMENT POSITION
3. WORN POSITION

Fig. 9 Timken DPH anchor pin brake adjustments

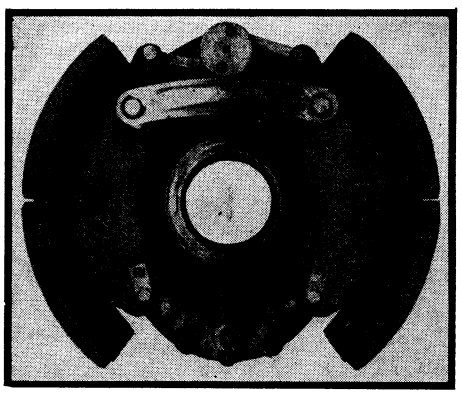


Fig. 10 Timken DPH brake with gear box adjustment

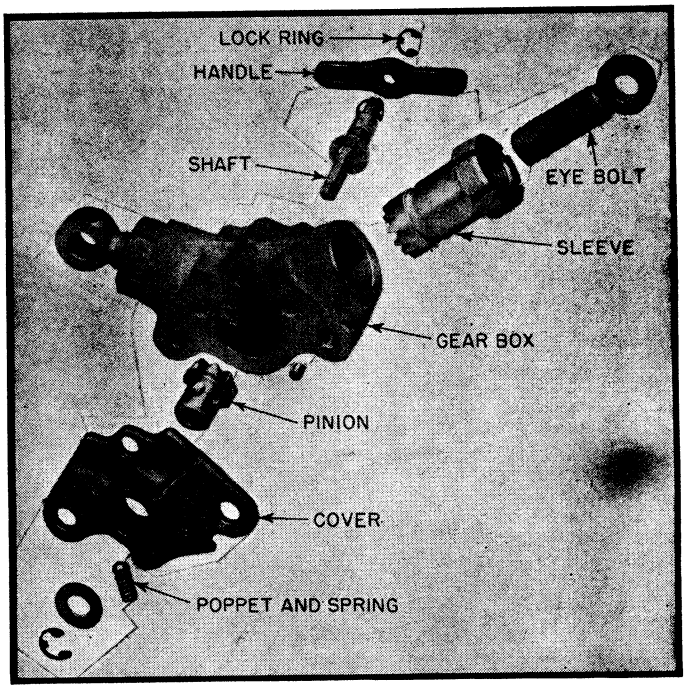



Fig. 11 Layout of gear box. Timken DPH brake

and replace the plain anchor pin washers. Push rods have drilled ends and push rod pins are secured with lock rings.

These brakes are adjusted in the same manner as the DPH brake described above, using 5/8" open end and 1 5/8" box wrenches. An offset box wrench is required on assemblies using short anchor pins. Tighten anchor pin lock nuts to 225-250 lb. ft. on 16½ x 4 brakes, and 250-300 lb. ft. on 16½ x 5-6-7 brakes.

## Heavy Duty Single Anchor Point Adjustment

On this type brake, Figs. 10 and 11, the adjusting gear box replaces the adjustable anchor pins and permits the equal adjustment of both shoes simultaneously. A hexagon shaft extends through the spider and adjustments are made with the attached handle or a 3/8" socket.

## Minor Adjustment

To compensate for lining wear, turn the adjusting handle (or wrench) to bring liners in contact with drum. Then back off just enough to allow minimum clearance. Rotate the drum in both directions to be sure there is no drag.

## Major Adjustment

During major overhaul the gear box should be installed with the eye bolts in full release position.

Turn the adjusting handle to bring the liners in contact with the drum and back off just enough to relieve drag. Apply the brakes firmly to center the shoes and check the liner-to-drum clearance at both shoes with a feeler gauge. If the difference in the clearance between the two shoes varies in excess of .010", ad-

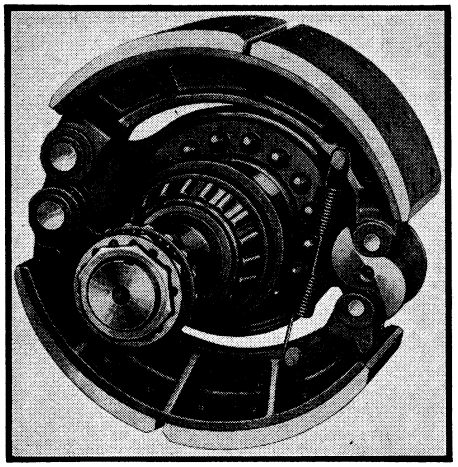


Fig. 12 Timken P series brake. Designed for air actuation

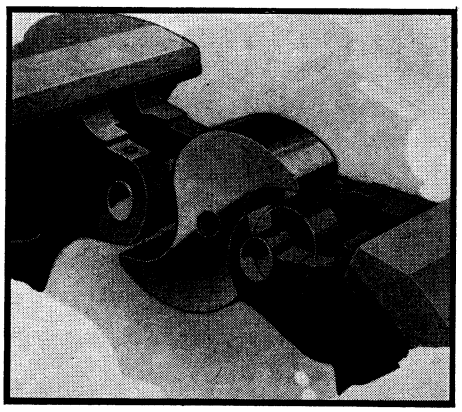


Fig. 13 Timken roller cam followers. P Series brake

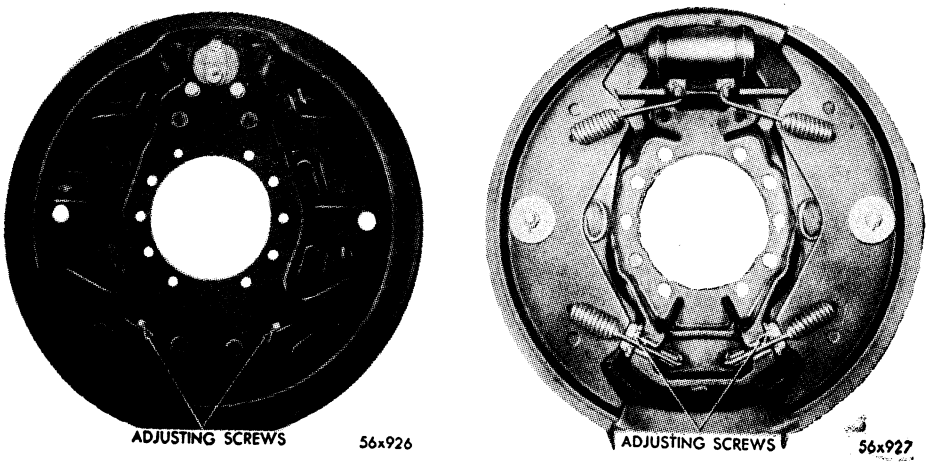



Fig. 14 Wagner Duplex brake

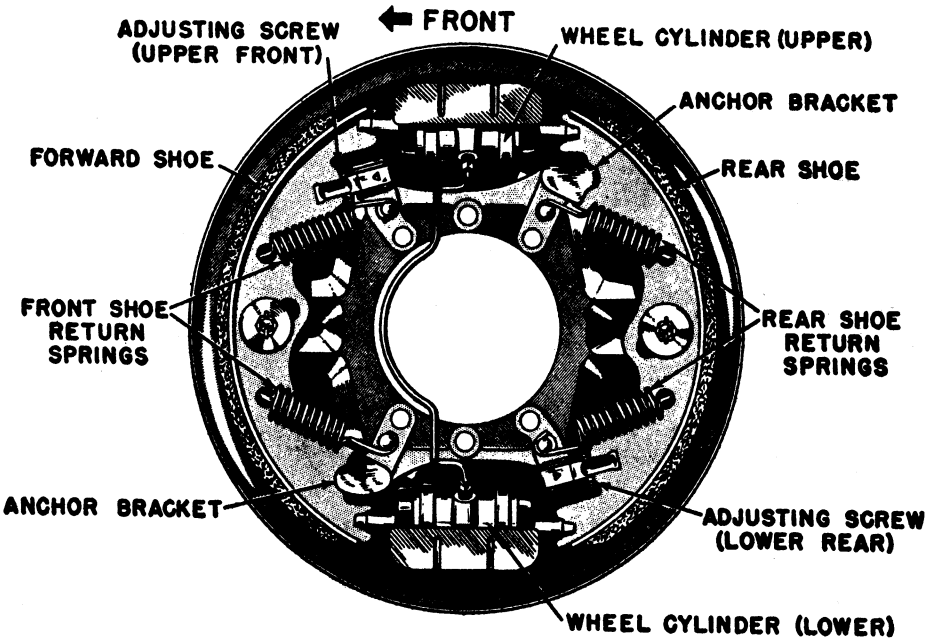



Fig. 15 Wagner Twinplex brake

just the gear box as follows:

1. Remove hub and drum assembly.
2. Remove nuts and washers from gear box.
3. Remove lock ring and cover and pinion assembly.
4. Turn forward or rear sleeve as required to equalize liner contact.
5. Reinstall parts removed, adjust wheel bearings and adjust the brakes to provide minimum running clearance without drag.

## TIMKEN P SERIES BRAKE

The P Series brake is a heavy duty two shoe type designed for use with air actuation. The shoes are mounted with individual anchor pins on open type spiders. Dust shields are available where operating conditions warrant this protection, Fig. 12.

The brakes are actuated by "S" type, constant lift cams, which are forged integral with the shaft and mounted in needle bearings. Cam pressure is applied through roller cam followers, Fig. 13, attached to the brake shoes.

See the *Air Brakes* chapter for service on the air system.

### Adjustment

New liners should be circle ground to a few thousandths less than the drum diameter. Adjust the cam as required to obtain 80% contact. Adjust the slack adjusters or levers to obtain ¾" travel at 60 lbs. air pressure. When travel increases to 1½" due to wear, readjust to ¾".

## WAGNER DUPLEX BRAKE

### Adjustment, Fig. 14

Insert a screwdriver or special adjusting tool into one of the adjusting holes in the backing plate far enough to engage the notches in the star wheel. Move adjusting screw a notch at a time until shoe drag increases to where the wheel can just be turned by hand. Back off adjuster until there remains only a very slight drag caused by the adjustment of this shoe. Repeat the adjustment on the other shoe in like manner.

## WAGNER TWINPLEX BRAKE

### Adjustment, Fig. 15

Jack up wheels, release parking brake and see that brake pedal is in fully released position. Remove adjusting hole covers. Insert a screwdriver or special adjusting tool into one of the adjusting holes in the backing plate to engage the notches in the star wheel. Move the outer end of the tool toward the axle to turn the adjusting screw outward a notch or two at a time until shoe drag increases to where the wheel can just be turned by hand. Back off on the star wheel adjusting screw until brake drum is just free of drag. *Both screws should be backed off an equal number of notches.* Repeat for each shoe of each brake and replace adjusting hole covers.

## MASTER CYLINDER, REPLACE

### All Models

To remove the master cylinder, disconnect the brake line tube at the master cylinder. Remove the clevis pins which connect the piston push rod and pedal. (On trucks equipped with piston type booster brakes, remove the clevis pins which connect the piston push rod and operating link.) Unfasten the master cylinder from the clutch housing and lift out the unit.

Install the master cylinder in the reverse order of removal and bleed the brake system.

## POWER BRAKES

Vacuum booster brakes are described in the *Vacuum Brakes* chapter and the air brake actuating system is covered in the *Air Brakes* chapter.

# Wheel Alignment & Steering Gear Section

## WHEEL ALIGNMENT SPECIFICATIONS

| Model | Year | Caster, Deg. | Camber, Deg. | Toe-In, Inch | Kingpin Inclination, Deg. |
|---|---|---|---|---|---|
| B-1-FA | 1949 | 1 | 2 | 1/8 | 7 |
| B-1-FL | 1949 | 1 | 2 | 1/8 | 7 |
| B-1-FM | 1949 | 1 | 2 | 1/8 | 7 |
| B-1-FMA | 1949 | 1 | 2 | 1/8 | 7 |
| B-1-H | 1949 | 1 | 2 | 1/8 | 7 |
| B-1-HA | 1949 | 1 | 2 | 1/8 | 7 |
| B-1-HH | 1949 | 1 | 2 | 1/8 | 7 |
| B-1-HHA | 1949 | 1 | 2 | 1/8 | 7 |
| B-1-HHM | 1949 | 1 | 2 | 1/8 | 7 |
| B-1-HHMA | 1949 | 1 | 2 | 1/8 | 7 |
| B-1-HM | 1949 | 1 | 2 | 1/8 | 7 |
| B-1-HMA | 1949 | 1 | 2 | 1/8 | 7 |
| B-1-J | 1949 | 1 | 2 | 1/8 | 7 |
| B-1-JA | 1949 | 1 | 2 | 1/8 | 7 |
| B-1-JAL | 1949 | 1 | 2 | 1/8 | 7 |
| B-1-JL | 1949 | 1 | 2 | 1/8 | 7 |
| B-1-JM | 1949 | 1 | 2 | 1/8 | 7 |
| B-1-JMA | 1949 | 1 | 2 | 1/8 | 7 |
| B-1-JMAL | 1949 | 1 | 2 | 1/8 | 7 |
| B-1-JML | 1949 | 1 | 2 | 1/8 | 7 |
| B-1-KA | 1949 | 1 | 2 | 1/8 | 7 |
| B-1-KAL | 1949 | 1 | 2 | 1/8 | 7 |
| B-1-KMA | 1949 | 1 | 2 | 1/8 | 7 |
| B-1-KMAL | 1949 | 1 | 2 | 1/8 | 7 |
| B-1-PW | 1949 | 1/2 | 1 1/2 | 1/8 | 8 |
| B-1-R | 1949 | 1 1/2 | 2 | 1/8 | 7 |
| B-1-RA | 1949 | 1 1/2 | 2 | 1/8 | 7 |
| B-1-T | 1949 | 2 | 1 | 1/8 | 8 |
| B-1-TA | 1949 | 2 | 1 | 1/8 | 8 |
| B-1-V | 1949 | 2 | 1 | 1/8 | 8 |
| B-1-VA | 1949 | 2 | 1 | 1/8 | 8 |
| B-1-VX | 1950 | 2 | 1 | 1/8 | 8 |
| B-2-B | 1950 | 1 | 1 1/2 | 1/8 | 4 |
| B-2-C | 1950 | 1 1/2 | 1 1/2 | 1/8 | 4 |
| B-2-D | 1950 | 1 | 1 1/2 | 1/8 | 4 |
| B-2-F | 1950 | 1 1/2 | 2 | 1/8 | 7 |
| B-2-FA | 1950 | 1 1/2 | 2 | 1/8 | 7 |
| B-2-FL | 1950 | 1 1/2 | 2 | 1/8 | 7 |
| B-2-G | 1950 | 1 1/2 | 2 | 1/8 | 7 |
| B-2-GA | 1950 | 1 1/2 | 2 | 1/8 | 7 |
| B-2-GM | 1950 | 1 1/2 | 2 | 1/8 | 7 |
| B-2-GMA | 1950 | 1 1/2 | 2 | 1/8 | 7 |
| B-2-H | 1950 | 2 | 2 | 1/8 | 7 |
| B-2-HA | 1950 | 2 | 2 | 1/8 | 7 |
| B-2-HM | 1950 | 2 | 2 | 1/8 | 7 |
| B-2-HMA | 1950 | 2 | 2 | 1/8 | 7 |
| B-2-HH | 1950 | 2 | 2 | 1/8 | 7 |
| B-2-HHA | 1950 | 2 | 2 | 1/8 | 7 |
| B-2-HHM | 1950 | 2 | 2 | 1/8 | 7 |
| B-2-HHMA | 1950 | 2 | 2 | 1/8 | 7 |
| B-2-J | 1950 | 2 | 2 | 1/8 | 7 |
| B-2-JA | 1950 | 2 | 2 | 1/8 | 7 |
| B-2-JAL | 1950 | 2 | 2 | 1/8 | 7 |
| B-2-JL | 1950 | 2 | 2 | 1/8 | 7 |
| B-2-JM | 1950 | 2 | 2 | 1/8 | 7 |
| B-2-JMA | 1950 | 2 | 2 | 1/8 | 7 |
| B-2-JMAL | 1950 | 2 | 2 | 1/8 | 7 |
| B-2-JML | 1950 | 2 | 2 | 1/8 | 7 |
| B-2-K | 1950 | 2 | 2 | 1/8 | 7 |
| B-2-KA | 1950 | 2 | 2 | 1/8 | 7 |
| B-2-KAL | 1950 | 2 | 2 | 1/8 | 7 |
| B-2-KL | 1950 | 2 | 2 | 1/8 | 7 |
| B-2-KM | 1950 | 2 | 2 | 1/8 | 7 |
| B-2-KMA | 1950 | 2 | 2 | 1/8 | 7 |
| B-2-KMAL | 1950 | 2 | 2 | 1/8 | 7 |
| B-2-KML | 1950 | 2 | 2 | 1/8 | 7 |
| B-2-PW | 1950 | 1/2 | 1 1/2 | 1/8 | 8 |
| B-2-R | 1950 | 2 1/2 | 2 | 1/8 | 7 |
| B-2-RA | 1950 | 2 1/2 | 2 | 1/8 | 7 |
| B-2-T | 1950 | 1 3/4 | 1 | 1/8 | 8 |
| B-2-TA | 1950 | 1 3/4 | 1 | 1/8 | 8 |
| B-2-V | 1950 | 1 3/4 | 1 | 1/8 | 8 |
| B-2-VA | 1950 | 1 3/4 | 1 | 1/8 | 8 |
| B-2-Y | 1950 | 1 3/4 | 1 | 1/8 | 8 |
| B-2-YA | 1950 | 1 3/4 | 1 | 1/8 | 8 |
| B-3-B | 1951-53 | 3 | 1 1/2 | 1/8 | 4 |
| B-3-C | 1951-53 | 2 1/2 | 1 1/2 | 1/8 | 4 |
| B-3-D | 1951-53 | 1 1/2 | 1 1/2 | 1/8 | 4 |
| B-3-DU | 1951-52 | 1 1/2 | 1 1/2 | 1/8 | 4 |
| B-3-EU | 1951-52 | 1 1/2 | 2 | 1/8 | 7 |
| B-3-F | 1951-53 | 1 1/2 | 2 | 1/8 | 7 |
| B-3-FA, FS | 1951-53 | 1 1/2 | 2 | 1/8 | 7 |
| B-3-G | 1951-53 | 1 1/2 | 2 | 1/8 | 7 |
| B-3-GA, GS | 1951-53 | 1 1/2 | 2 | 1/8 | 7 |
| B-3-GM | 1951-52 | 2 | 2 | 1/8 | 7 |
| B-3-GMA | 1951-52 | 2 | 2 | 1/8 | 7 |
| B-3-H | 1951-53 | 2 | 2 | 1/8 | 7 |
| B-3-HH | 1951-53 | 2 | 2 | 1/8 | 7 |
| B-3-HA | 1951-53 | 2 | 2 | 1/8 | 7 |
| B-3-HHA,HS | 1951-53 | 2 | 2 | 1/8 | 7 |