

Fig. 5-1 Diagram of Complete Brake System

# BRAKES

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## STANDARD BRAKES— GENERAL DESCRIPTION

All models are equipped with duo-servo hydraulic brakes. There are two adjustments at each brake, the adjusting screw and the anchor pin.

Fig. 5-1 shows the complete braking system which includes the four brakes, the hydraulic system and the mechanical hand brake system. All four brakes have shields or baffles to keep foreign material from entering the brake assemblies (Fig. 5-2 and 5-3).

### OPERATION OF HYDRAULIC SYSTEM

Depressing the brake pedal moves the master cylinder push rod and piston inward, forcing hydraulic fluid out through the check valve (Fig. 5-4). This flows through the hydraulic lines into the wheel cylinders, forcing the wheel cylinder pistons outward and expanding the brake shoes and linings against the brake drums.

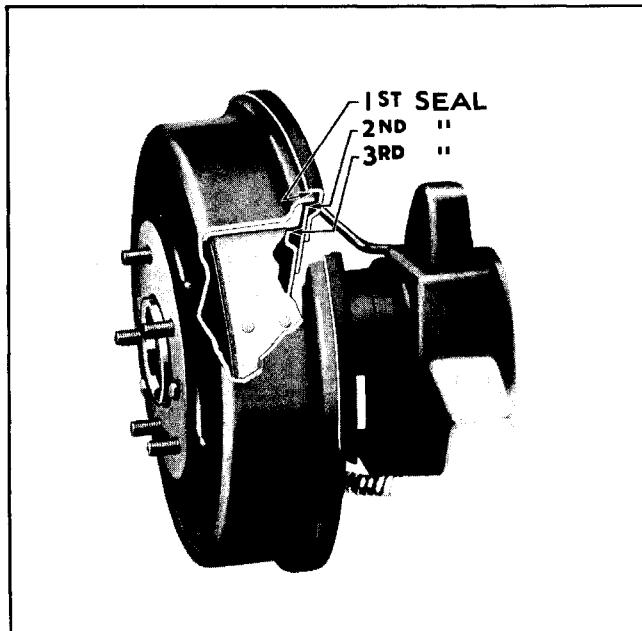
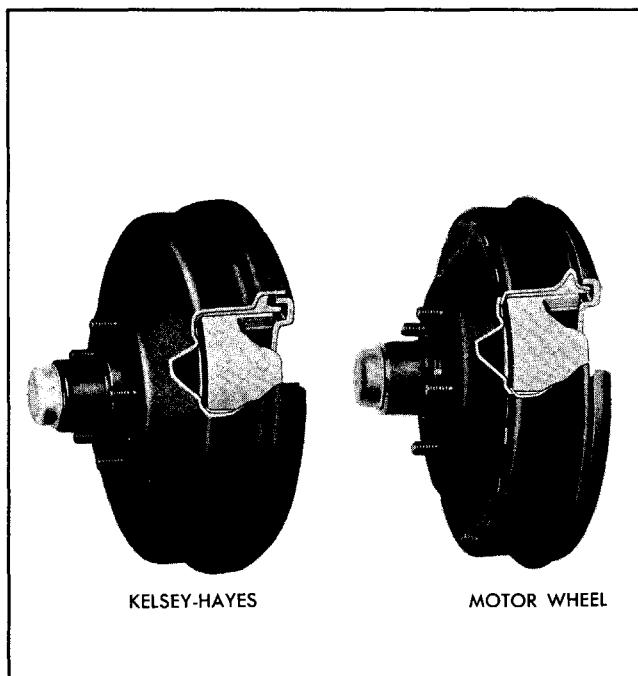


Fig. 5-2 Rear Brake Seals



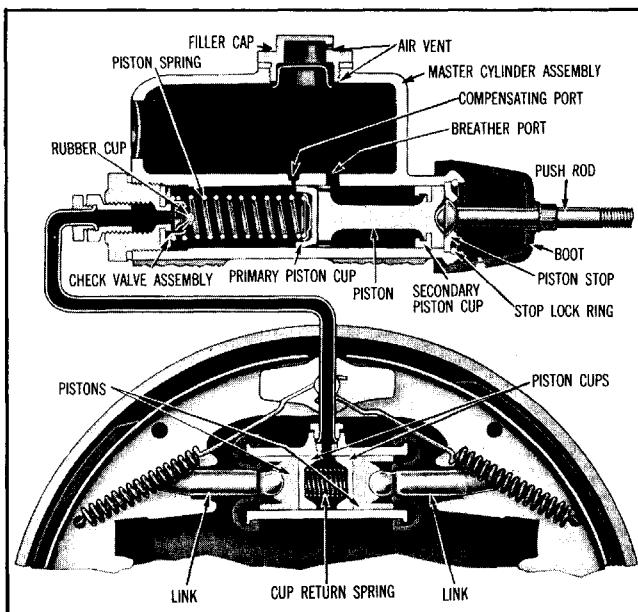
**Fig. 5-3 Front Brake Seals**

When the brake pedal is released quickly, the master cylinder piston returns immediately to the released position. Holes in the piston head allow fluid to pass from the right to the left side of the piston head, past the primary cup, as the piston returns to the released position. This transfer of fluid is necessary when the master cylinder piston returns to the released position faster than fluid returns from the lines.

At the same time (when the pedal is released) the brake shoe return springs force the wheel cylinder pistons to return to the released position. Fluid forced out of the wheel cylinders by this action returns to the master cylinder by overcoming the pressure of the piston spring which holds the check valve closed. As this fluid returns, the excess portion will return to the reservoir through the compensating port which is opened only when the master cylinder piston is in the released position. The piston spring will close the check valve when the pressure in the lines is reduced to approximately 15 lbs., maintaining a slight pressure in the lines. The purpose of this pressure is to keep wheel cylinder cups from leaking and to reduce the possibility of air entering the system.

## PERIODIC SERVICE

The foot brake system requires a check for leaks at regular lubrication periods (see General Lubrication Section), and periodic inspection to see that

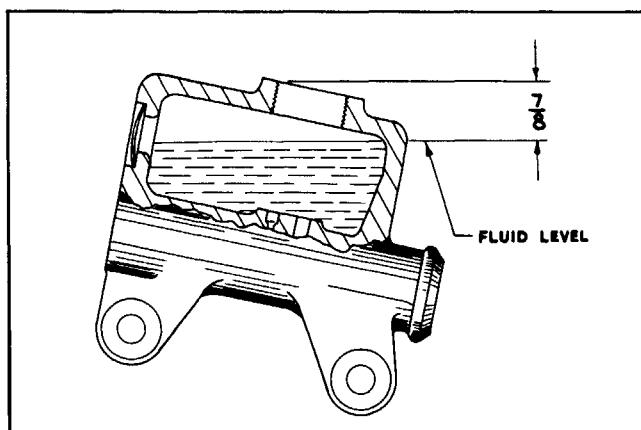


**Fig. 5-4 Schematic Diagram of Hydraulic System**

there is more than 2" from the bottom of pedal pad to floor mat when brakes are applied (2" or less indicates need of adjustment). When the brakes are adjusted, the fluid level in the master cylinder should be checked and brought to  $\frac{7}{8}$ " from gasket surface on top of master cylinder filler neck as shown in Fig. 5-5. (Refer to page 5-12 for recommended brake fluid.)

At the time the car is on a lift for chassis lubrication, visual inspection of the brake hose and lines should be made for signs of chaffing, deterioration or other damage.

The hand brake cables must be lubricated yearly or when brakes are relined. The procedure for lubricating cables is outlined in the General Lubrication Section.



**Fig. 5-5 Correct Level in Master Cylinder**

## ADJUSTMENTS ON CAR

Brakes, like any other part of the car subject to wear, need careful adjustment to maintain them in a safe and adequate operating condition. Every time a car drives into the service department for some form of service, someone in the service department will drive the car and operate the brakes. This simple test may reveal that the brakes are in need of service. Need for brake service is indicated in one of several ways: excessive brake pedal travel (travel to within two inches or less of toe-board), pulling to one side, grabbing, or squealing.

When brake service is indicated, it will be either an adjustment to compensate for lining wear (made at the shoe adjusting screw or at adjusting screw and anchor pin), a complete brake reconditioning operation, or installation of anti-squeak springs on drums.

### BRAKE ADJUSTMENT TO COMPENSATE FOR LINING WEAR

**SHOE ADJUSTMENT.** Remove one front wheel and drum to inspect for lining wear. If brakes have been giving satisfactory service (even braking), reasonable mileage between adjustments, and are worn uniformly (but not to the point where new linings are needed), anchor pin adjustment should not be needed and the following procedure should give a satisfactory adjustment. If service has not been satisfactory or uneven wear is evident, but linings are not worn to a point where complete reconditioning is necessary, follow the procedure on page 5-4, Brake Adjustment Including Anchor Pin.

1. Jack up all wheels, and inspect brake pedal height. Distance from floor mat to underside of pedal pad should be  $4\frac{3}{8}''$ - $4\frac{5}{8}''$  (Fig. 5-6). If necessary, loosen locknut and adjust master cylinder push rod to give correct pedal height. On Synchro-Mesh transmission cars, see that clutch pedal is at same height as brake pedal (adjust clutch pedal height if necessary). **NOTE:** If dust boot is stuck to push rod, it should be loosened before making adjustment. Make sure push rod locknut is tightened securely after making adjustment.

2. Remove remaining wheels, front hub and drum, and rear brake drums and blow out dust from all drums and brake assemblies. Pull all shoe assemblies away from backing plates and apply a small amount of Lubriplate to ledges where brake shoes contact backing plates. Check to see that hand brake cables are not too tight as this would hold rear brake shoes off anchor pin. **CAUTION:** Take extreme care to prevent oil, grease, or brake fluid from getting on linings

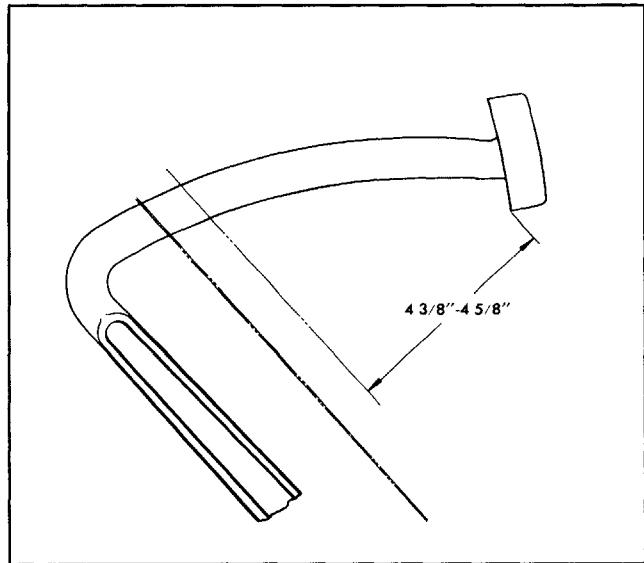


Fig. 5-6 Correct Brake Pedal Height

or drums. Even oily finger prints on linings may upset an otherwise perfect brake adjustment.

3. Remove adjusting hole covers from backing plates.
4. Replace brake drums and wheels (see page 3-5 for Front Wheel Bearing Adjustment).
5. Insert screwdriver or special tool J-1028 in slot of backing plate until it engages star wheel on adjusting screw and move outer end of tool upward to expand brake shoes (Fig. 5-7). Expand until the car wheel can just be turned by hand, then back off adjusting screw 14 notches. After completing adjustment, check to see that wheel turns freely without drag. It may be necessary to tap backing plate to permit shoes to centralize before brake will be free.

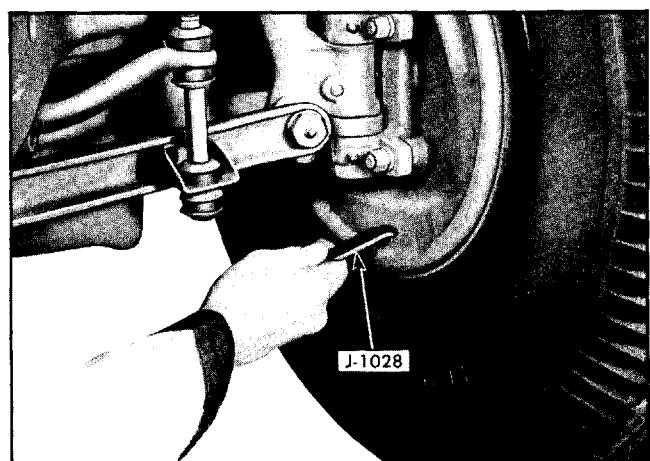


Fig. 5-7 Expanding Adjusting Screw

6. Repeat Step 5 at each wheel, checking after adjustment to see that each wheel turns freely without drag.

7. Apply the hand brake to the first notch and check equalization by turning the rear wheels by hand. If only a slight difference exists, loosen the adjusting screw of the tighter brake. If equalization requires more than a few notches movement, retighten adjusting screw to point for proper adjustment of that brake and equalize rear cable by loosening the cable clamp screws at the spreader and pulling downward on the tight side of the cable. It may be necessary to open the clamp with a screwdriver to allow the cable to equalize. Tighten the clamp screws on the spreader while the hand brake lever is still in the applied position. Brake cables are sufficiently tight if rear wheels can barely be turned by hand while hand brake lever is in the first notch. When hand brake lever is released, it should be possible to turn each wheel by hand without feeling drag when rear cable is pulled downward approximately  $1\frac{1}{2}$ " by other hand gripping cable midway between conduit and clearance hole through frame X member.

Close adjustment for tension may be secured by adjusting the clevis at the rear end of the front cable. In adjusting here, be certain to turn clevis on or off cable end and do not twist the cable. Coarse adjustment is secured by selecting the correct hole in the spreader.

8. Add sufficient brake fluid in the master cylinder to bring fluid level to within  $\frac{7}{8}$ " of top of gasket surface on filler neck (Fig. 5-5). Bleed brakes if necessary to get proper pedal reserve and remove "spongy pedal".

9. Replace all four brake adjusting hole covers. These rubber plugs may be installed by starting top and one end by hand and by pushing other end and bottom lips with screwdriver. Road test car by making three or four stops from speeds not to exceed 35 MPH.

#### BRAKE ADJUSTMENT INCLUDING ANCHOR PIN

If brakes have been pulling to one side, the adjustment to compensate for lining wear given above will not give correct adjustment. In such cases adjust as follows:

1. Perform Steps 1 and 2 under "Adjustment to Compensate for Lining Wear", page 5-3.

2. Replace brake drums and insert a .015" feeler gauge between lining and drum about  $1\frac{1}{2}$ " from ad-

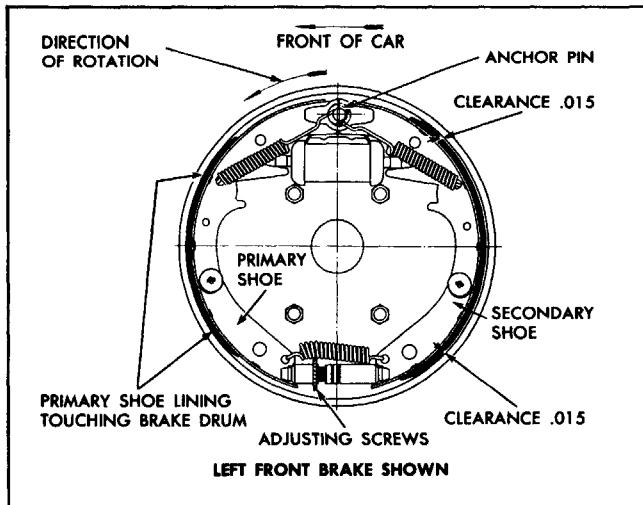


Fig. 5-8 Correct Brake Lining to Drum Clearance

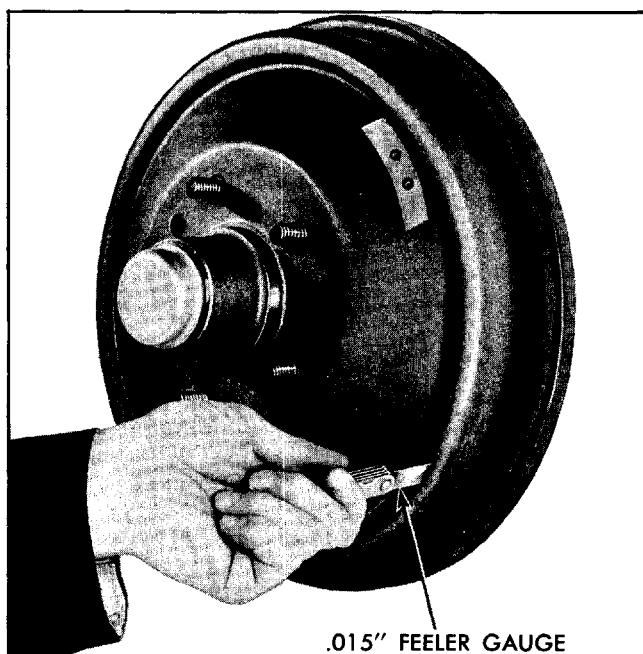


Fig. 5-9 Checking Lining to Drum Clearance

justing screw end of secondary (rear) lining (Fig. 5-8 and 5-9) and expand shoes with adjusting screws using screwdriver or special tool J-1028 until feeler gauge cannot be withdrawn. Then retract adjusting screw until a slight drag on the feeler gauge is secured. NOTE: Expanding shoes until feeler gauge cannot be withdrawn ensures that shoes are against anchor pin and primary shoe is against drum.

Withdraw gauge and re-insert between lining and drum about  $1\frac{1}{2}$ " from anchor pin end of secondary lining. This should give equal or slightly heavier drag than near adjusting screw. If correct drag is not obtained at this point, anchor pin must be adjusted.

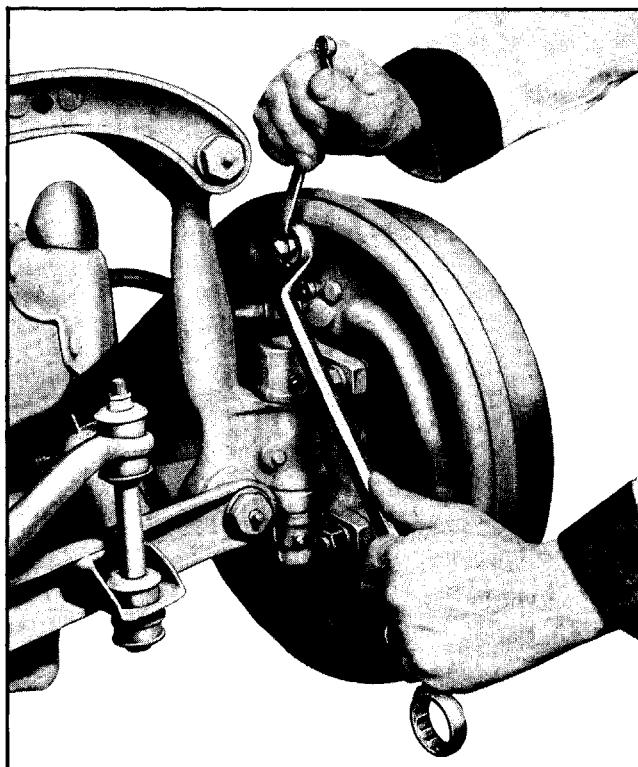


Fig. 5-10 Adjusting Anchor Pin

3. Loosen anchor pin nut (Fig. 5-10) and turn anchor pin in required direction to obtain correct drag on feeler gauge when checking as outlined in Step 2 above. If drag at anchor pin end of secondary shoe is too light, turn anchor pin in direction wheel turns as car moves forward; if too heavy, turn pin in opposite direction.

4. While holding anchor pin with wrench, tighten anchor pin nut to 75 lb. ft. torque and recheck secondary shoe clearance.

5. Repeat Steps 2, 3 and 4 at remaining wheels.

6. Check each wheel for freedom from drag. Complete adjustment following Steps 7, 8 and 9 under "Adjustment to Compensate for Lining Wear", page 5-3.

#### HAND BRAKE ADJUSTMENT

As indicated in the brake adjustment instructions above, the hand brake is automatically adjusted when foot brakes are adjusted. There may be a certain few cases where the hand brake system will require adjustment although the foot brakes are perfectly satisfactory. To check and adjust hand brake only, follow the procedure given in Step 7, page 5-4, "Brake Adjustment to Compensate for Lining Wear".

## MINOR REPAIRS

### BLEEDING BRAKES

Depressing the pedal with a low fluid level in master cylinder reservoir or disconnecting any part of the hydraulic system (except stop lamp switch) permits air to enter the system. Air may also enter the system occasionally when brake shoes are replaced. This air must be removed by bleeding.

Bleeding may either be done by hand pumping the brake pedal using bleeder tube as outlined below or by using pressure bleeding equipment. CAUTION: Always clear away any dirt around master cylinder filler cap before removing cap for any reason. Never depress pedal while brake drums are removed unless bleeder valve is open.

When using pressure bleeding equipment follow instructions of the equipment manufacturer and always use bleeder tube J-747 attached to wheel cylinder to prevent brake fluid from running down backing plate and finding its way onto brake drum and linings. Observe the "CAUTION" on brake fluid in Step 1 below.

When bleeding by operating pedal proceed as outlined below:

1. Fill master cylinder reservoir with recommended brake fluid (page 5-12). CAUTION: Never use a cheap or reclaimed brake fluid as this will positively result in brake trouble. Even though reclaimed fluid may look clear, tests have shown such fluid to be corrosive. If there is doubt as to the grade of fluid in the system, flush out system as outlined on this page and fill with recommended brake fluid (page 5-12).

2. Starting at left front wheel, remove screw from bleeder valve and attach bleeder tube J-747, allowing tube to hang submerged in brake fluid in a clean quart glass jar (Fig. 5-11). Unscrew bleeder valve three quarters of a turn, depress pedal full stroke and allow it to return slowly making sure end of bleeder tube is under surface of liquid in container. Continue operating pedal, refilling reservoir after each five strokes (unless an automatic filling device is used), until liquid containing no air bubbles emerges from bleeder tube. CAUTION: Bleed tube must always be used when bleeding brakes. In addition, end of tube must be below level of brake fluid in glass jar when bleeding other than by pressure.

3. Close bleeder valve securely. Remove bleeder tube, replace screw and proceed one brake at a time to right front, left rear and right rear in order given.

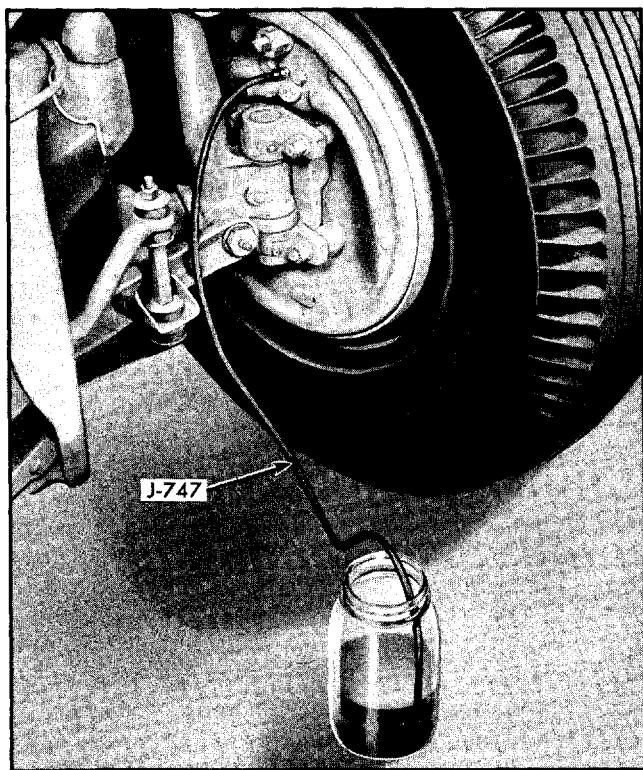


Fig. 5-11 Bleeding Brakes

4. When bleeding operation is completed, refill reservoir to within  $\frac{1}{8}$ " of top of master cylinder filler neck gasket surface (Fig. 5-5) and then replace filler cap. Never attempt to clean fluid that has once been used (see CAUTION in Step 1 above). To avoid trouble and mistakes in the shop, used fluid should be thrown away.

#### FLUSHING HYDRAULIC SYSTEM

It may sometime become necessary to flush out the brake hydraulic system due to the presence of mineral oil, kerosene, gasoline, carbon tetrachloride, etc., which will cause swelling of rubber piston cups and valves so they become inoperative.

To flush hydraulic system, proceed as follows:

1. Attach bleeder tube J-747 and open bleeder valve.
2. Flush out system thoroughly with clean denatured alcohol or Declene, pumping the fluid from master cylinder reservoir and out of wheel cylinder bleeder valve.
3. Repeat 1 and 2 at remaining wheel cylinders. To ensure thorough flushing, approximately  $\frac{1}{2}$  pint of alcohol or Declene should be bled through each wheel cylinder.

4. Replace all rubber parts in master and wheel cylinders. Thoroughly clean cylinders and pistons in alcohol or Declene before installing new parts.

5. After installing parts, fill system with recommended brake fluid (page 5-12) and follow Steps 2 through 4 under "Bleeding Brakes" on this page to flush system of cleaning solution and to bleed brakes. In doing this, pump brake fluid from wheel cylinder bleeder valves until clear fluid flows from bleeder tube and then, if necessary, continue until no air bubbles emerge from bleeder tube.

## COMPLETE BRAKE RECONDITIONING

(Includes Replacement of Linings, Adjustment, etc.)

1. Jack up all four wheels. Remove front wheels, front hub and drum assemblies, rear wheels and rear drums.

2. Inspect linings for wear. Clean brake shoes, drums and backing plates, removing any foreign particles that may have become imbedded in lining surface. Examine shoes for loose rivets, which must be replaced. Install new shoes or reline if linings are worn nearly flush with rivets or if linings show evidence of oil, grease or brake fluid on the surface.

3. Inspect drums for scoring. Road dirt frequently cuts circumferential grooves in drums which do not impair operation of brakes unless grooving is extremely severe. When drums are badly scored, inspect lining carefully for imbedded metal which must be removed. Surfaces of lining and drum should then be sanded. Circumferential grooves if not excessive do not warrant drum replacement.

Where drums are so badly scored as to require turning, the following limits MUST NOT BE EXCEEDED:

- a. If new standard shoe assemblies are to be installed, machining must not remove more than .020" on drum radius or .040" on diameter.
- b. If new .030" oversize shoe assemblies are to be installed, machining must not remove more than .030" on drum radius or .060" on diameter.
4. Use a vixon file or emery cloth to remove grooves from brake shoe ledges on backing plates, and apply a small amount of Lubriplate. Cups and threads of all adjusting screws should also be lubricated.

On rear brakes lubricate parking brake lever fulcrum, link, and cable ramp with Lubriplate, Bendix, or Delco Brake Lubricant. Be sure that too much lubricant is not applied as it may get on linings. This will result in unequalized brakes and necessitate replacement of linings.

5. When replacing shoes, always be certain to assemble secondary shoes to the rear and primary shoes to the front. Note that linings of primary shoes are shorter than secondary linings. **CAUTION:** Take extreme care to prevent oil, grease, or brake fluid from getting on linings. Even oily finger prints on linings may upset an otherwise perfect brake adjustment.

6. Inspect rear springs for evidence of sheared center bolts or broken leaves and replace or repair as necessary.

7. Tighten rear spring "U" bolts as outlined on page 4-32.

8. Tighten rear brake cable conduit clamps at backing plates and frame anchors and inspect cables and conduit for lubrication. Lubricate if necessary.

9. Inspect for loose rear backing plate to housing nuts and front backing plate to knuckle nuts. Rear backing plate nuts should be tightened to 30-35 lb. ft. torque; front backing plate nuts to 55-60 lb. ft. torque.

10. Use new brake shoe return springs if there is any sign of the old springs having been overheated which may be indicated by end coils opened up or failure of shoes to return to anchor pin. Hold down springs usually require replacement at same time. Rubber parts in wheel cylinders may also be damaged by heat.

11. When new shoes or linings have been installed, release adjusting screw until drum will slide freely over shoes.

12. Sand linings lightly wherever finger marked to remove any trace of oil which may have gotten on linings.

13. Install drums, observing instructions for front wheel bearing lubrication and adjustment, and making certain that oil deflector does not become wedged between inner bearing cone and spindle shoulder.

14. Adjust brakes (including anchor pin) as outlined on page 5-4, "Brake Adjustment Including Anchor Pin". **CAUTION:** New linings must be protected from any severe usage for several hundred miles. Stops from high speed or repeated stops from low speed may permanently injure new linings. This information should be conveyed to owner.

## INSPECTION OF BRAKE PARTS

### WHEEL CYLINDERS

With wheel cylinders removed from car and cleaned in alcohol or Declene, inspect as follows:

1. Inspect piston rubber cups for distortion or swelling. Presence of either indicates oil, gasoline, carbon tetrachloride, etc. in hydraulic system which would require flushing of system (page 5-6), and replacing of rubber parts in wheel cylinders as well as in master cylinder. See that rubber cups are flared so they will have tension against the cylinder bore. Loss of flare may be caused by overheating.

2. Inspect cylinder bore and pistons for signs of scoring, rust, pitting or etching. Any of these will require replacement of cylinder and piston. Presence of pitting, rust, or etching in one cylinder calls for careful inspection for similar condition in all remaining wheel cylinders and in master cylinder also. **NOTE:** It is important that no attempt be made to recondition a brake master or wheel cylinder bore to remove pitting or etching as this leaves the walls sufficiently rough to cause premature destruction of rubber cups and enlarges the bore so standard size pistons no longer fit properly. Oversize pistons and cups are not available.

### MASTER CYLINDER

With master cylinder removed from car and cleaned in alcohol or Declene, inspect as follows:

1. Inspect piston rubber cups and check valve for distortion or swelling. Presence of either indicates oil, gasoline, carbon tetrachloride, etc. in hydraulic system which would require flushing of entire system (page 5-6), and replacing of rubber parts in wheel cylinders as well as in master cylinder.

2. Inspect master cylinder bore for signs of scoring, rust, pitting, or etching. Any of these will require replacement of cylinder and piston (see NOTE under Step 2, Wheel Cylinders, above). Presence of pitting, rust, or etching in master cylinder calls for a careful inspection for similar condition in all wheel cylinders.

3. Inspect pedal stop washer in end of master cylinder to see that it is held firmly in place by lock ring bottoming fully in grooved seat in master cylinder.

## TROUBLE DIAGNOSIS AND TESTING

### **TESTING FOR LEAK IN HYDRAULIC SYSTEM**

**NOTE:** If there is any evidence of air in system, brakes must be bled before making this test.

1. Apply brakes by means of a pedal jack, noting carefully the amount of force applied to the pedal.
2. After leaving the jack in this position for 30 seconds, remove the jack, noting the amount of de-

The following is a list of common troubles occurring in the brake system with possible causes and remedies:

### **PEDAL GOES TO TOE BOARD**

<b>CAUSE</b>	<b>REMEDY</b>
Normal wear of lining.	Readjust brakes.
Low fluid level in master cylinder reservoir.	Low fluid level in reservoir will permit air to be pumped into hydraulic lines. This necessitates refilling reservoir and bleeding lines.
External leak in hydraulic system, or leak past master cylinder primary piston cup.	Check for leak in system as outlined above.
Air trapped in hydraulic system.	Air trapped in hydraulic system gives pedal a spongy feeling when depressed. Bleed lines as instructed on page 5-5.

### **ALL BRAKES DRAG AFTER BRAKE ADJUSTMENT IS CHECKED AND FOUND TO BE CORRECT**

<b>CAUSE</b>	<b>REMEDY</b>
Mineral oil, etc., in system.	The presence in the hydraulic system of any mineral oil, kerosene, gasoline, or carbon tetrachloride will cause swelling of rubber piston cups and valves, so they become inoperative. This is first noticed in the master cylinder. Brakes will not release freely if master cylinder primary piston cup has swollen sufficiently to obstruct the compensating port. Flush system thoroughly with a good grade of clean denatured alcohol or Declene as outlined on page 5-6 and replace all internal rubber parts.
Pedal does not return to stop.	Lubricate pedal and make certain that it is free on pedal shaft. Also, see that pedal return spring has not lost its tension and promptly returns pedal to stop. Check for interference between pedal and floor mat. See that stop lamp switch is not defective or that switch arm is not binding on pedal due to lack of lubrication.

**ALL BRAKES DRAG AFTER BRAKE ADJUSTMENT IS  
CHECKED AND FOUND TO BE CORRECT (Continued)**

CAUSE	REMEDY
Compensating port of master cylinder closed.	The compensating port in master cylinder must be completely clear when pedal is in released position. First, see that pedal does not strike against toe board felt retainer. Second, see that compensating port is not plugged by dirt. To check compensator port, remove master cylinder filler plug and watch the fluid in the cylinder as the brake pedal is moved. A "geyser" should be seen as the pedal is first depressed. If no geyser is seen, the compensating port is blocked, either by dirt or a swollen piston cup. Third, inspect master cylinder piston cup and if found to be swollen or elongated, flush system as indicated on page 5-6 and replace damaged parts.

**ONE WHEEL DRAGS**

CAUSE	REMEDY
Improperly adjusted hand brake cables (rear wheels only).	Adjust hand brake cables (step 7, page 5-4).
Weak or broken brake shoe return springs.	Replace defective brake shoe springs and lubricate brake shoe ledges and shoe contact at anchor pin with Lubriplate, Bendix, or Delco Brake Lubricant.
Brake shoe or drum clearance too small.	Readjust brakes to secure complete freedom from drag.
Loose or incorrect front wheel bearings.	Adjust front wheel bearings or replace.
Wheel cylinder piston cups swollen or distorted or piston stuck.	Replace defective or damaged parts. Look for evidence of dirt in hydraulic system which could cause damage to the cylinders or cups. See first item under "All Brakes Drag . . .".
Obstruction in line.	Obstruction in line may be caused by foreign material in line or flattened or kinked tube. If dirt is found in line, remove obstruction and flush hydraulic system with fresh brake fluid. If tube is flattened or kinked, replace damaged parts.
Backing plate shoe ledges grooved.	File ledges smooth.

**CAR PULLS TO ONE SIDE**

CAUSE	REMEDY
Grease or fluid on lining.	Replace with new linings. See BRAKE CAUTIONS on page 5-12. Linings with even a slight trace of grease or fluid will cause trouble and cannot be salvaged by cleaning. Correct cause of grease or fluid reaching linings.

**CAR PULLS TO ONE SIDE (Continued)**

CAUSE	REMEDY
Anchor pin adjustment not correct.	Adjust brakes (including anchor pin). NOTE: The anchor pin position is of great importance in maintaining equalized brakes.
Loose wheel bearings. Loose backing plate at rear axle or front axle.	Adjust wheel bearings. Tighten backing plate on rear or front axle.
Linings not factory specified linings, or primary and secondary shoes reversed.	Various kinds of linings have different friction effect on the drums. Each wheel must have similar linings. The primary and secondary linings must not be interchanged. Use only factory specified linings.
Tires not properly inflated or unequal wear of tread. Different tread non-skid design.	Inflate tires to specified pressures. Rearrange tires so that a pair with non-skid tread surfaces of similar design and equal wear will be installed on front wheels and another pair with like tread will be installed on rear wheels.
Linings charred or drums scored.	Sand surfaces of linings and drums. Remove particles of metal that have become imbedded in surfaces of linings. See Step 3, "Complete Brake Reconditioning," page 5-6, regarding road dirt grooving brake drums. Seriously charred linings should be replaced.
Water, mud, etc., in brakes.	Remove any foreign material from all brake parts and the inside of drums. Lubricate shoe ledges and rear brake cable ramps with Lubriplate, Bendix or Delco Brake Lubricant. Examine backing plate reinforcements and guards for damage. NOTE: The face of the backing plate flange reinforcement of rear brakes should be approximately flush with edge of drum. Overhang of drum, if present, will reduce effectiveness of brake seals.
Weak chassis springs, loose "U" bolts, loose steering gear, etc.	Replace springs, tighten "U" bolts (see Rear Suspension Section), adjust steering gear, etc.
Unequal camber.	Adjust camber so that car does not have a tendency to "lead" when driven on a level road.

**SPONGY PEDAL**

CAUSE	REMEDY
Air trapped in hydraulic system.	Remove air by bleeding as instructed on page 5-5.
Brake adjustment not correct.	Adjust brakes (including anchor pin).

**EXCESSIVE PEDAL PRESSURE REQUIRED TO  
STOP CAR**

CAUSE	REMEDY
Brake adjustment not correct.	Adjust brakes (including anchor pin).
Improper lining.	Install factory specified lining.
Grease or fluid soaked linings.	Correct cause and replace linings. See "Brake Cautions" on page 5-12.
Lining not in full contact with drum.	Inspect position of anchor pin and correct if necessary.
Rusted wheel cylinder.	Replace necessary parts.

**LIGHT PEDAL PRESSURE—BRAKES TOO SEVERE**

CAUSE	REMEDY
Brake adjustment not correct.	Adjust brakes.
Loose backing plate on rear axle or front spindle.	Adjust front wheel bearings and tighten front backing plates. Tighten rear backing plates. Adjust brakes (including anchor pin).
Small amount of grease or fluid on linings.	Correct cause and replace linings.
Charred linings or scored drums.	Sand surfaces of linings and drums. Clean loose dust from brakes and drums. In severe cases replace shoes. Warn owner regarding abuse of brakes.
Improper linings.	Remove all particles of metal that have become imbedded in surfaces of linings. Slightly scored drums do not require replacing (see page 5-6).  Install factory specified linings.

**BRAKES SQUEAK**

CAUSE	REMEDY
Backing plates bent or shoes twisted.	Straighten or replace damaged parts.
Metallic particles or dust imbedded in lining.	Sand surfaces of linings and drums. Remove all particles of metal that have become imbedded in surfaces of linings. Slightly scored drums do not require replacing (see page 5-6).
Lining rivets loose or lining not held tightly against shoe at ends.	Replace rivets.
Chamfer at ends of linings too short.	Use rasp to secure chamfer to $\frac{1}{8}$ " from rivet counterbore.
No obvious or apparent cause.	Install anti-squeak springs on drums.

**PEDAL STRIKES PEDAL PLATE WHEN RELEASED—  
CANNOT BE ADJUSTED**

<b>CAUSE</b>	<b>REMEDY</b>
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Bent pedal.

Straighten or replace pedal.

Pedal stop lock ring out of seat in master cylinder.

Remove master cylinder and rubber boot. Examine lock ring seat to see that seat groove is sufficiently deep to hold lock ring securely. See that lock ring is flat and has ample tension to expand it tightly into bottom of groove. Reassemble stop and lock ring, being certain that lock ring is seated into bottom of groove. After reinstalling master cylinder, bleed lines.

## **BRAKE CAUTIONS**

1. Do not use a substitute for recommended brake fluid (see below) or reclaimed brake fluid.
2. Do not allow grease, paint, oil or brake fluid to come in contact with brake lining.
3. Do not handle brake shoes or drums with greasy hands.
4. Do not clean rubber parts or inside of cylinders with anything but clean alcohol or Declene.
5. Do not use any linings other than those specified by the factory.
6. Do not allow master cylinder reservoir to become less than half full of brake fluid.
7. Under no circumstances should brakes be severely tested after new shoes are installed. They should be given moderate use for several hundred miles until linings become well burnished. Repeated severe applications will cause erratic brake action and permanently injure brake linings. Under no circumstances should severe testing be done that will burn the linings.
8. When linings of one brake require replacement, the linings should also be replaced on the other brake at the same end of the car (except on low mileage new cars on which the brakes have not been abused).

## **SPECIFICATIONS**

Effective braking area .....	179 sq. in.
<b>Drums</b>	
Inside diameter—Front .....	12"
—Rear .....	11"
Out-of-round including taper for full width (max.) .....	
	.010"
<b>Fluid—Delco Super 11 or fluid which complies with heavy duty standards of SAE 70R1 specification</b>	
<b>Lining</b>	
Width—Front .....	2 $\frac{1}{4}$ "
—Rear .....	1 $\frac{3}{4}$ "
Thickness (front and rear) .....	1 $\frac{3}{64}$ "
<b>Pedal height (underside of standard pedal to floor mat) .....</b>	
	4 $\frac{3}{8}$ "-4 $\frac{5}{8}$ "
<b>Wheel cylinder bore—Front .....</b>	
—Rear .....	1 $\frac{1}{16}$ "
	1 $\frac{5}{16}$ "
<b>Master cylinder bore (standard brakes) .....</b>	
	1"
<b>Road splash shields—Front .....</b>	
“Turn Over” Type	
—Rear .....	“Triple”

## SERVICE CRAFTSMAN NEWS REFERENCE