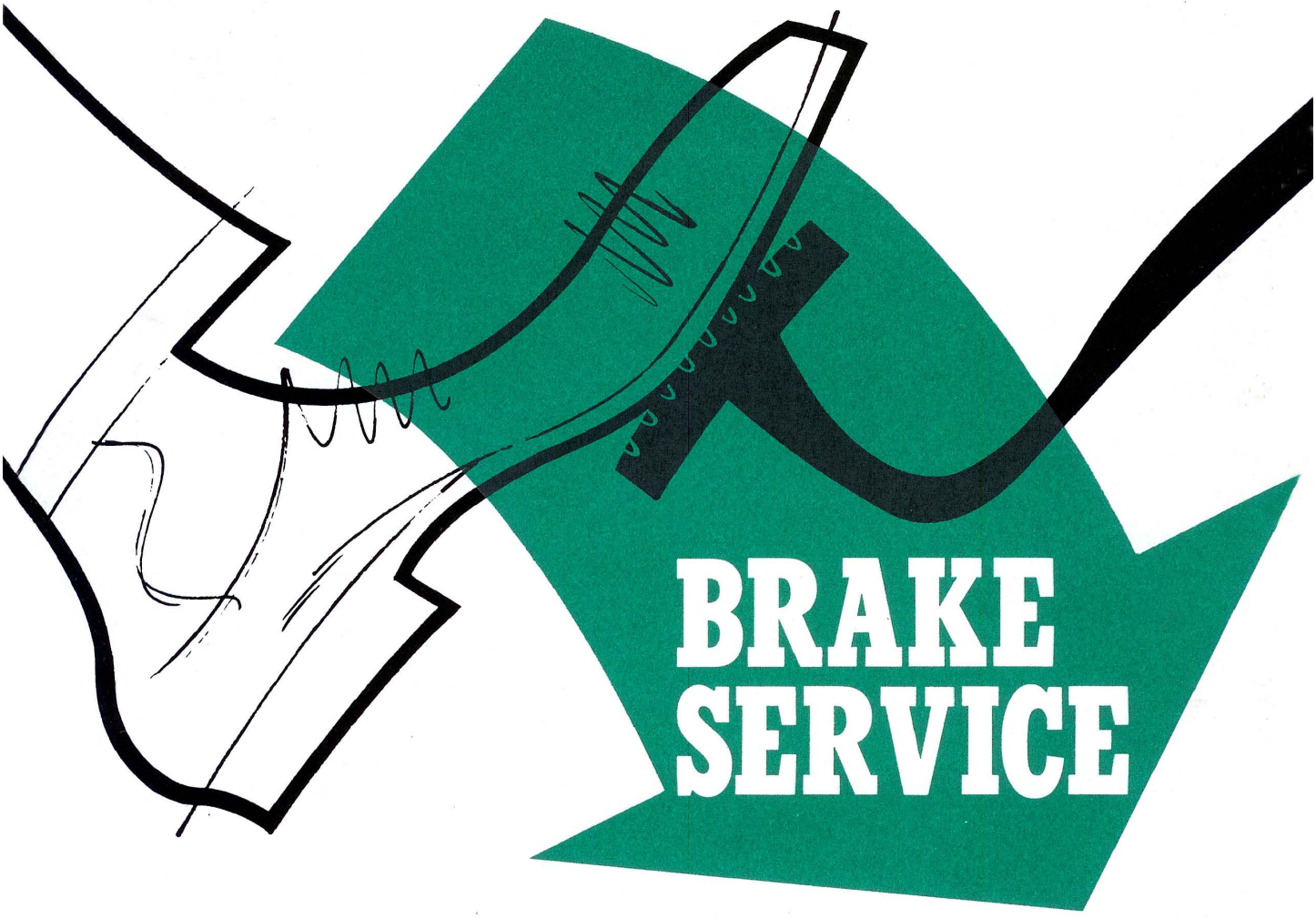
THE MASTER TECHNICIAN'S

SERVICE REFERENCE BOOK

SESSION NO
64
11



BRAKE SERVICE

MASTER TECHNICIANS SERVICE CONFERENCE
PREPARED BY CHRYSLER CORPORATION
PLYMOUTH · DODGE · CHRYSLER · IMPERIAL

MASTER TECHNICIAN CONFERENCE CHRYSLER CORP.

Brake service takes Know-How

There's a lot more to servicing brakes than making sure they stop the car when the driver steps on the brake pedal. Of course, that's the most important part of brake service—seeing that they work.

But it's also very important that the brakes work quietly, and smoothly—without grabbing, pulling or chattering. And just as a whole lot of engineering know-how goes into brake design, a whole lot of servicing know-how goes into brake service and maintenance.

An important part of brake know-how is a knowledge of fundamentals. This reference book explains how the servo contact brakes work, goes into diagnosing brake problems, and ends up with service tips and precautions.

So whether you're involved in routine brake service or troubleshooting complaints, or you're just plain curious about how they work, there's good information here for you.

TABLE OF CONTENTS

HOW THEY WORK

Servo-contact brakes have a dual-piston cylinder to apply hydraulic servo force to both brake shoes. A single anchor above the cylinder serves both shoes. The shoes are connected to each other through a floating adjuster. When there's no hydraulic force at the cylinder, the shoes are held against the anchor by the return springs.

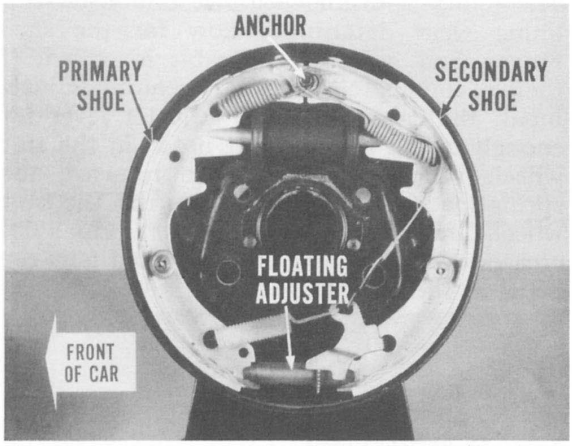


Fig. 1 — Servo-Contact Brake

SELF-ENERGIZING ACTION—CAR GOING FORWARD

When the driver steps on the brake, the wheel cylinder pistons force the shoes out against the drum. Because of friction between the linings and drum, both shoes try to revolve with the drum. This turning movement forces the secondary shoe against the anchor.

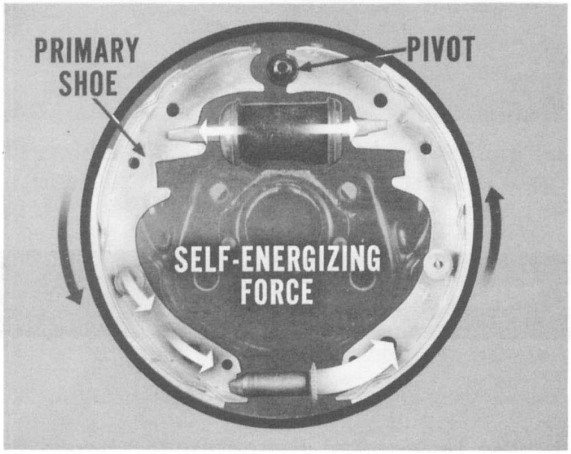


Fig. 2 — Self-energizing action

Then, the turning force on the primary shoe is transmitted through the adjuster to the bottom of the secondary shoe. This is called the self-energizing force. It pushes the secondary shoe out against the drum, using the anchor as a pivot.

SELF-ENERGIZING FORCE VS. HYDRAULIC FORCE

Hydraulic force is small compared to the self-energizing force exerted on the secondary shoe. Consequently, the secondary shoe is pushed against the drum much harder than the primary shoe is. This means the secondary shoe does most of the braking. The primary shoe's main function is to energize the secondary shoe.

PRIMARY AND SECONDARY LININGS

The primary lining is a high friction material. High friction gives it a greater tendency to turn with the drum, and therefore increases the self-energizing action. The secondary shoe, though, is made of a lower-friction, long-wearing material to carry the braking load.

Here's an important point to remember: Each lining is designed for its particular job, and each material is compounded so both will wear at approximately the same rate in normal use. Of course, everyone doesn't drive the same, and very severe brake usage often causes the secondary shoe to wear faster than the primary. *Don't* leave a used primary shoe on the car and replace only the secondary just because the primary shoe still has some lining on it.

DON'T MIX 'EM

Mixing linings or using unapproved linings can get you in all kinds of trouble. For instance, if the shoes were changed around, the primary lining would be in the secondary position and would carry most of the braking load. Since the high-friction primary lining is relatively soft, it would wear out quickly.

If two secondary linings were used on one wheel, brake performance on that wheel would be very poor. The low-friction lining wouldn't give as much self-energizing action as is needed. And if the opposite wheel had the two primary linings, the car would pull badly. Two primary linings on the same wheel would make the brakes very grabby.

BRAKE ACTION—CAR BACKING UP

When the car is backing up, the action of the brake shoes is reversed. The rear servo piston actuates the secondary shoe, which supplies self-energizing force to the primary shoe. The primary shoe then does most of the braking in reverse.

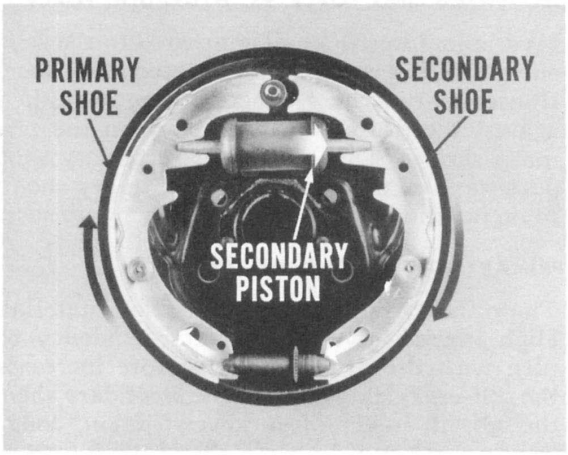


Fig. 3 — Reverse braking action

Of course, you don't get as much self-energizing force in reverse. But reverse braking requirements are considerably less than in forward braking.

AUTOMATIC ADJUSTERS

The automatic adjusters compensate for lining wear by spreading the shoes farther apart at the bottom as the lining wears. This maintains proper lining-to-drum clearance at all times. Therefore it maintains correct pedal height. Here's how the automatic adjuster works:

If the brakes are applied when the car is backing up, the secondary shoe moves away from the anchor. The adjuster cable guide mounted on the shoe web is carried downward and outward by movement of the shoe. The movement of the cable guide pulls on the adjuster cable, so it exerts a pull on the adjuster lever.

The lining-to-drum clearance established by lining wear determines how far the shoe moves, and how far the cable is pulled. If there's enough clearance to require adjustment, the cable pulls the adjuster lever far enough to engage the next notch in the star wheel. When the brakes are released, the spring-loaded adjuster lever turns the star wheel. This lengthens the adjuster, which decreases drum to lining clearance and puts the pedal at the right height.

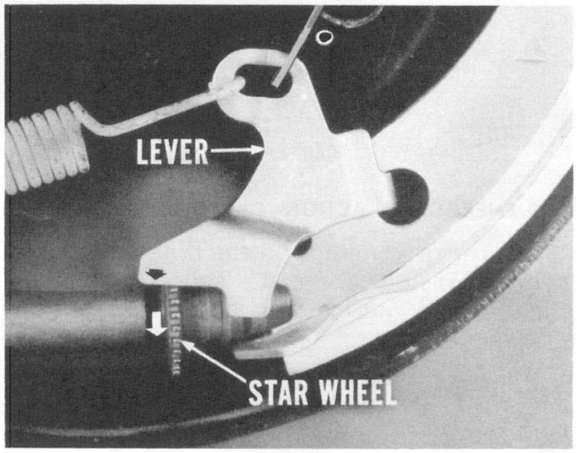
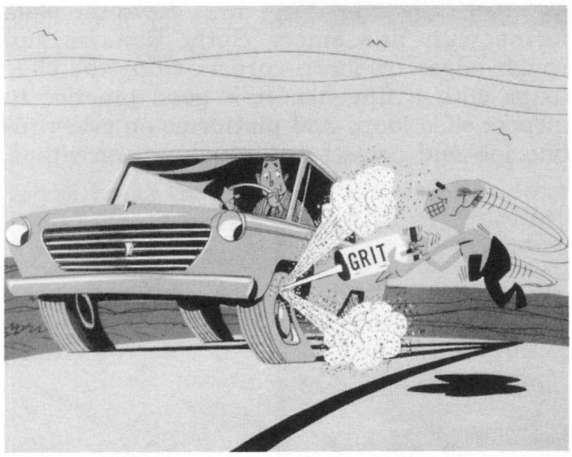


Fig. 4 — Adjuster lever turns star wheel

BRAKE PULL AND DRAG

Pull is simply a condition of uneven braking on opposite sides of the car. Usually, it's caused by unequal friction in the brakes on opposite sides of the car. Thus, if the right-

hand lining grips the drum harder than the left, the car pulls to the right.



IT'S NOT ALWAYS THE BRAKES

Pull during braking doesn't necessarily mean you have brake troubles. Improper front-end alignment—particularly unequal caster—is a possible cause. Other causes are: a weak torsion bar or spring; a loose lower control arm strut; a loose wheel bearing; an underinflated tire. Make sure one of these conditions isn't causing the pull before you blame the brakes.

DIFFERENT DRUM FINISH

If the braking surfaces of drums on opposite sides of the car have different finishes—for instance, one is dull and the other highly polished—it's likely that friction will be different and cause pull. To correct this condition, rough up both drums with 60- or 80-grit emery cloth. Be sure both drums have comparable finishes when you're done.

GLAZED LINING

Occasionally, a lining becomes glazed on the surface from heat. This occurs from a dragging shoe, from improper run-in of new linings, and from prolonged riding of the brakes —for instance, using the brakes instead of the engine for downhill braking. A glaze decreases lining friction. This can cause pull, particularly if one lining is glazed more than the others.

Remove glaze by sanding with emery paper. Be sure to rough up the other linings, too, so you end up with the same lining finish on both sides of the car.

LINING CONTAMINATION

Contamination of a lining changes the friction characteristics of the lining. Sometimes it decreases braking effectiveness and at other times increases friction causing brake grab.

If the contamination is from a leak, be sure to locate the cause of the leak and repair it before you install new linings.

REPLACE CONTAMINATED LININGS

You can't save contaminated linings, so don't try. Solvents or a blowtorch may remove the surface contamination, but they'll also attack the bonding and lining material. This will change the lining friction characteristics and can cause more serious brake problems. Sanding is no good either, because it can't remove contamination that is soaked in.

If you're replacing a relatively new lining that's become contaminated, be sure to pull the opposite wheel, too. Sand all the drums and linings so you have a comparable finish on both sides.

Of course, if the lining is worn, you should replace the linings on both sides of the car.

THE UNEVEN ADJUSTMENT MYTH

Back in the days when cars had mechanical brakes, the lining-to-drum clearance adjustment had to be equal on both sides. If it wasn't, the brakes applied unevenly, and caused pull. Many people think this is still the case with hydraulic brakes, but it just isn't so.

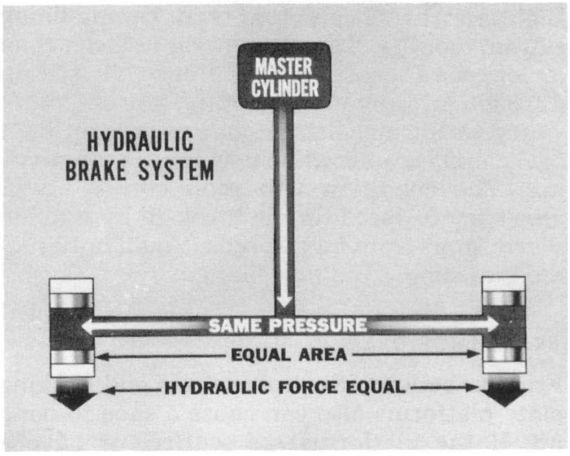


Fig. 5 — Hydraulic force is equal

Remember from Pascal's Law in Session Number 64-5 . . . "Pressure on a confined fluid . . . acts with equal force on equal areas." A hydraulic brake system is no exception. Pressure is equal at all wheel cylinders.

And since the right- and left-hand wheel cylinder pistons always have the same area, the hydraulic *force* available for braking is equal at the right and left sides. Remember, too, that no pressure is built up as long as one piston is moving with no resistance. So, even if one piston has to travel farther, it ends up exerting the same force on its shoe as a piston that travels a shorter distance. In other words, *all* the shoes have to be out against the drum before there's any braking at any wheel.

A PINCHED LINE CAN CAUSE INITIAL PULL

Of course, if a brake line is pinched, it can act as an orifice. The orifice effect would delay pressure application at one cylinder and delay application of the brake. Then you'd have pull on initial application, until enough fluid got past the restriction to apply the piston.

PULL ON LIGHT BRAKE APPLICATIONS

Occasionally you run into a case where the brakes pull when they are applied lightly, but not when they are applied quite hard. This can be caused by such things as a slightly sticking wheel cylinder or friction between the shoes and backing plate platforms. The extra friction uses up part of the hydraulic force on light applications, so the opposite wheel brakes harder.

Light-effort pull can often occur during lining run-in, too. One lining may wear in faster than its opposite, causing a difference in friction during light braking. Generally, you shouldn't worry about a slight amount of pull on light brake applications while new linings are wearing. The condition will soon correct itself. Don't try to speed up the break-in by making severe stops from high speeds. You'll only succeed in ruining the new lining.

BRAKE SHOE DRAG

Friction between the brake shoes and backing plate platforms also can cause a shoe to hang up. If the platforms are scuffed, or have a heavy paint build-up, the shoe may not return when the brake is released. Instead it may drag, wear unevenly, or become glazed.

To correct shoe hang-up, dress down the platforms with fine emery cloth. Remove any rough edges or sharp corners from the shoe loops with a fine file. It is good practice to inspect shoe loops and platforms on every reline job and correct any roughness on either.

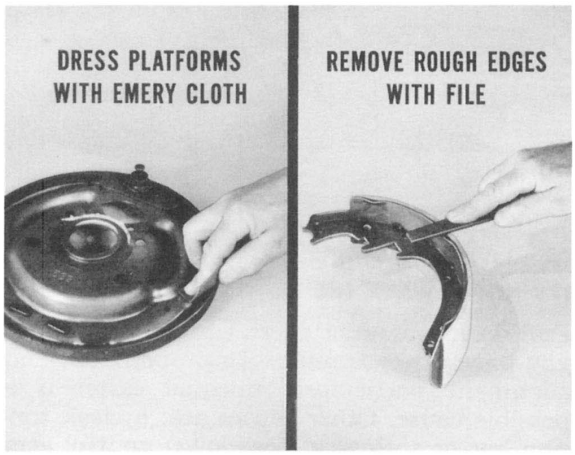


Fig. 6 — Dress down platforms and loops

Be careful not to remove too much metal from the loops. This would cause poor contact between the shoe loop and the platform and you'd end up with brake noise.

Before installing the shoes, put a thin coat of Sil-Glyde lubricant on the platforms. Don't use too much and don't get it on the linings.

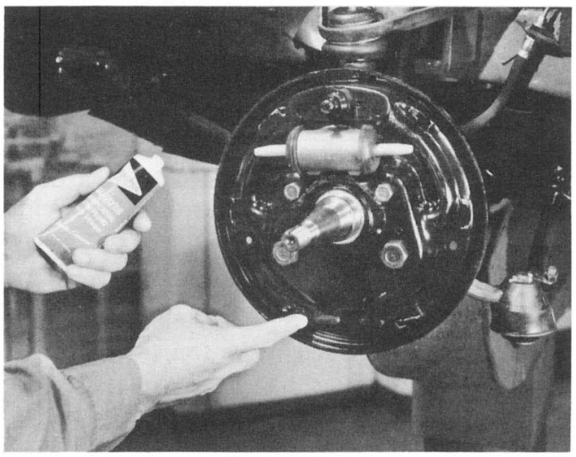


Fig. 7 — Lubricate platforms sparingly

3 BRAKE NOISES

CHATTER

Brake chatter is the result of vibration induced in the brake that can be transmitted to other parts of the car. You might hear it, or just feel it when the brakes are applied.

A loose backing plate may cause the chatter, along with pull, noise and erratic braking. This is easy to diagnose and fix. If the trouble isn't a loose backing plate, you've got some kind of drum trouble. Tech doesn't know of a case of chatter that's been caused by changing linings. So leave the linings alone.

WHEEL STUD NUT TIGHTENING

Often, improper tightening of the wheel stud distorts the brake drums causing chatter during application. Before you pull any drums, loosen and retighten the stud nuts correctly. Often this is all that need be done to correct a case of brake chatter.

Remember to always tighten the stud nuts alternately—first to one-half the recommended torque, then to the full recommended torque.

WHEEL NUT TORQUE

Valiant and Dart	55 ft.-lbs.
All other passenger cars	65 ft.-lbs.

If proper tightening doesn't fix the chatter, check what speed it occurs at. This will give you a clue as to whether it's drum surface irregularity or heat spots on the drums.

HEAT SPOTS—LOW-SPEED CHATTER

A harsh chatter when braking at low speeds—as low as 20 miles per hour—indicates a heat-spotted drum. In high-speed braking, heat spots cause a rumbling noise.

Heat spots are extremely hard areas in the drum, caused by exceeding the drum heat tolerance in severe operation. Chatter is caused by the change in friction in the spotted areas.

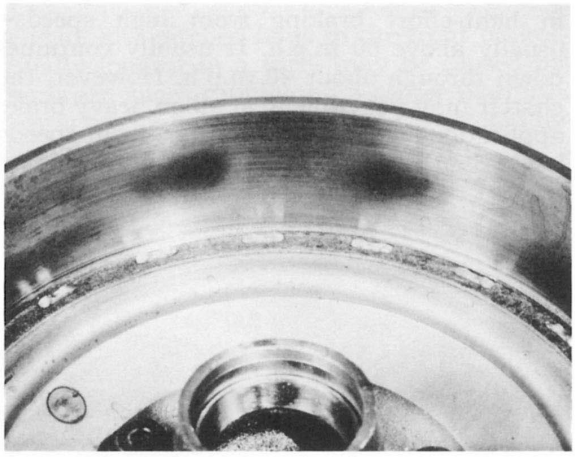


Fig. 8 — "Incipient" heat spot

In their first stage, heat spots show up as blue areas in the drum surface. First stage or *incipient* heat spots can sometimes be removed with coarse-grit emery cloth.

A severe heat spot is a bluish area with a silvery spot in the center. In a severe heat spot, the cast-iron drum material has actually been converted to a very hard steel.

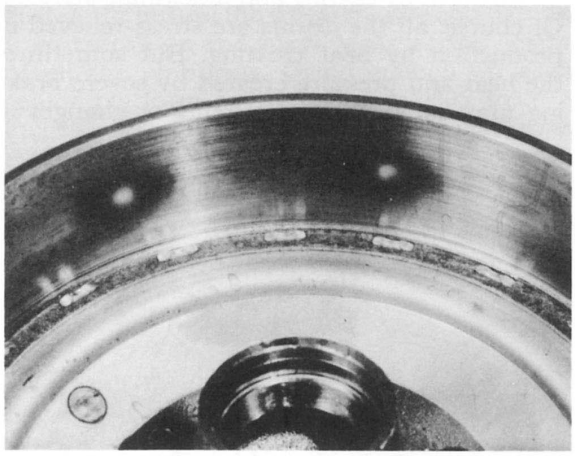


Fig. 9 — Severe heat spot

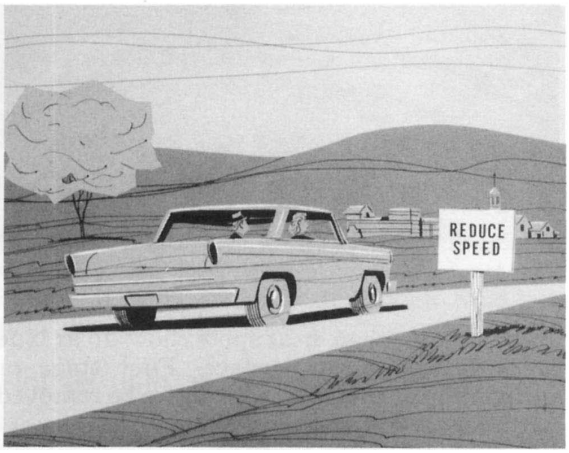
GRIND DRUMS TO REMOVE

Severe heat spots can be removed only by

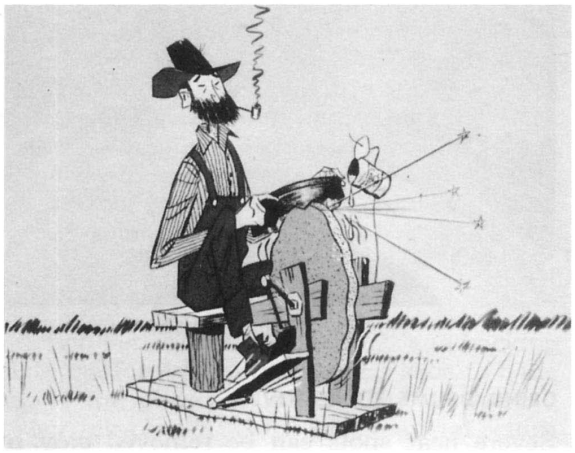
grinding the drums. On a lathe, the cutting tool would bounce as it hit a severe heat spot.

HIGH-SPEED CHATTER

Chatter from drum surface irregularities occurs in light-effort braking from high speeds—usually above 60 m.p.h. It usually continues down through about 40 m.p.h. However, the chatter may not come in at all on heavy brake applications or light applications from speeds lower than 55-60 m.p.h.



The drum surface irregularities which cause high-speed chatter are very slight—you can't measure them easily. They are usually induced in the drum by casting and machining stresses. Of course, all the drums are stress-relieved in production by heat treating. But sometimes the heat and pressure created by severe braking may cause additional relief or changes in the internal stress of the drum. In other words, the drums may not be entirely stress-relieved until they've seen some service.



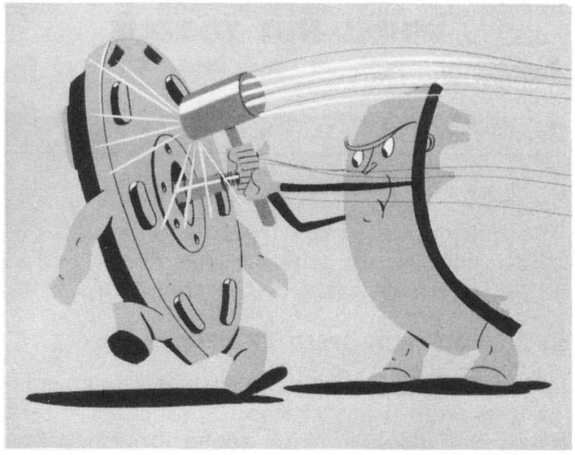
If high-speed chatter develops on a new car, give the linings time to wear in through normal stops. If the chatter persists, the front drums should be resurfaced on a drum grinder to correct the irregularities. The problem won't occur again because the drums have been thoroughly stress relieved.

Only a small thickness of material needs to be removed, so grinding is again in order. On a light lathe cut, the tool tends to follow the irregularities instead of making a true cut. Of course, you could make a deeper lathe cut but the more metal you leave on the drum the better.

Normally, only the front drums need grinding to correct high-speed chatter. The rear brakes are not apt to cause this condition. The rear suspension damps out any chatter that does occur, so it's not felt or heard inside the car.

SHOE KNOCK

"Shoe knock" or "shoe slap" is a condition where the shoe is pulled away from the backing plate, and then snapped back by the hold-down spring. The "knock" or "slap" is the sound of the shoe hitting the platforms.



The problem is caused by spiral cutting tool marks on the drum face. This results in a threading action which pulls the shoes on the left-hand wheels away from the backing plate during braking.

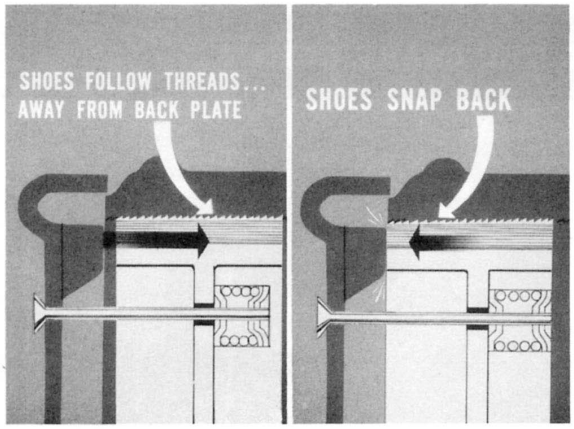


Fig. 10 — Threading causes shoe knock

To correct shoe knock, break up the helix by vigorous hand-sanding with 60- or 80-grit emery paper. Machining isn't necessary unless the finish is very poor and the "threads" are quite deep.

SHOE SCRAPE—10" BRAKE

Shoe scrape occasionally shows up in the left rear brake of a Plymouth or Dodge. It's caused by the secondary shoe moving out and rubbing against the drum during braking. When this happens, you'll be able to see an interference mark at the adjuster end of the secondary shoe with the drum off.

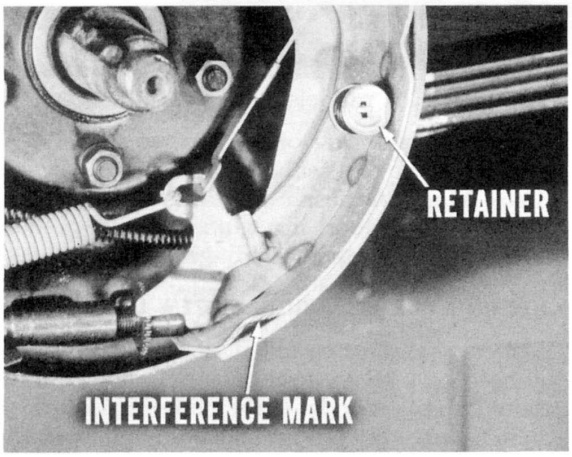


Fig. 11 — Shoe scrape interference mark

Installing an extra hold-down spring retainer usually gives you enough hold-down force to prevent the shoe from moving out. In some extreme cases, you may need to install two extra retainers. Don't do this, though, unless it's absolutely necessary. Too much hold-down force can cause poor shoe return and shoe drag.

FRONT BRAKE HOWL

A loud, low-pitched howl in the front brakes, usually loudest in a turn, may be caused by the brake shoes rubbing on a *center* platform that is too high. This condition is corrected by carefully grinding the center platforms.

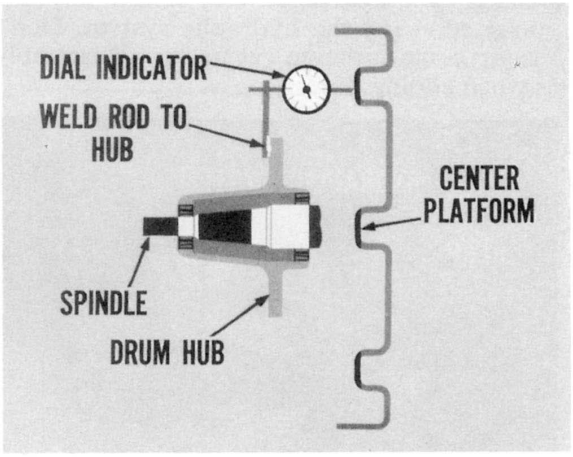
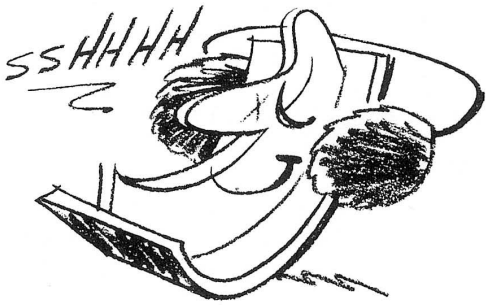


Fig. 12 — Measure platform height

To measure the platform height, attach a dial indicator to an arm welded onto a discarded brake drum hub as shown in the illustration. Install the hub on the wheel spindle and tighten it so there's no end play. Measure the height of all the platforms. Grind enough off each center platform so its height is .005 to .015 inches less than the *lower* of the two platforms on either side of it.

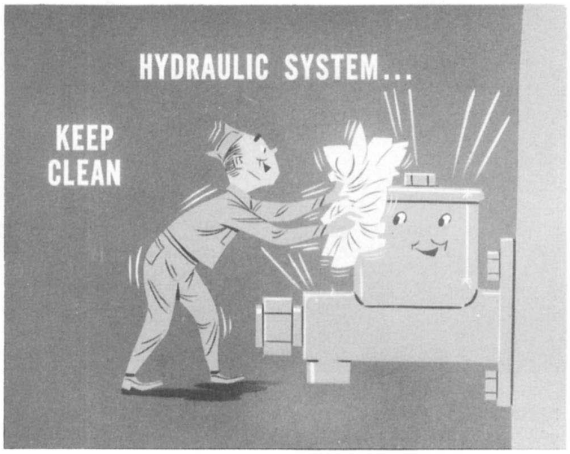
Smooth the platforms with emery paper and lubricate them sparingly with Sil-Glyde before you reinstall the brake shoes.



SERVICING THE BRAKE SYSTEM

KEEP IT CLEAN

Like any other hydraulic system, the brake system doesn't tolerate dirt. Fluid contamination leads to problems like leakage, rust and sticking cylinders. So be very careful anytime you're servicing the hydraulic system. Don't let any contamination get in during assembly or when adding fluid.



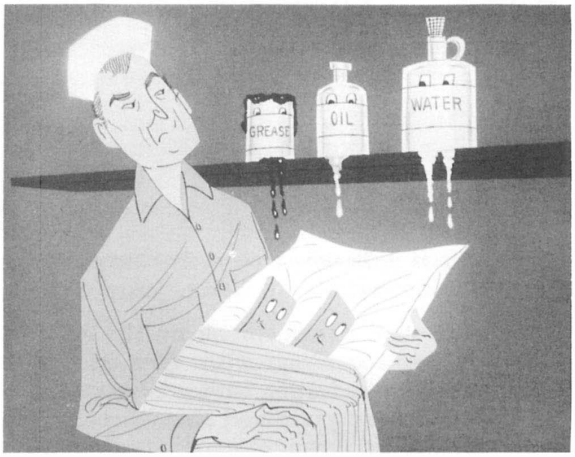
Use the approved procedure for bleeding and watch for evidence of contamination during bleeding. Flush and refill the whole system, if necessary, to eliminate all contamination.

USE APPROVED BRAKE FLUID

When it's necessary to add brake fluid, be sure to use only heavy-duty fluid that conforms to the specifications of SAE 70 R 1 and SAE 70 R 3. Mopar and Chryco brake fluid meets or exceeds these specifications. It has the high boiling point required for safe operation. Don't take a chance on unknown brake fluids that might boil away, break down, or be incompatible with fluid already in the system.

PROTECT THE LININGS

Treat brake linings like a new baby. Don't let them get contaminated with oil, grease, or water. Don't even get dirty fingerprints on the linings.



When you're servicing wheel bearings and the like, be careful with the grease. And be sure to replace any leaking seal you spot that could let the linings get contaminated.

SPEAKING OF SEALS . . .

There's a new seal between the rear wheel cylinders and the backing plate on 10- and 11-inch brakes. The seal is there to keep water from getting past the wheel cylinder opening in the backing plate and running into the axle shaft bearings. You'll find this seal on late-production '64 models.

If you are working on an earlier model that does not have this seal, you should use Miracle Black Magic Adhesive to seal around the cylinder. This is good insurance against premature rear-axle bearing damage.

CHECKING FOR HYDRAULIC SYSTEM LEAKS

You can sometimes tell if there's a fluid leak by holding a heavy foot on the brake pedal for about thirty seconds. If the pedal sinks slowly, there's definitely a fluid leak somewhere in the brake hydraulic system. It could be an external leak or it may be internal leakage in the master cylinder. A sinking pedal and low fluid in the master cylinder reservoir means an external leak. A sinking pedal but no loss of fluid means master cylinder trouble.

Don't always assume there's a leak just because the fluid level is low. Sometimes the reservoir cover isn't sealing perfectly and fluid sloshes out during stops and starts.

So look for evidence of leakage around the master cylinder, and replace the cover gasket if necessary.

WHEEL CYLINDER LEAKS

To see whether a wheel cylinder leaks, you'll have to pull the drums. Pull back the lower lip of the wheel cylinder boots and look for fluid under them. In fact, it's a good idea to do this anytime you have a drum off for any reason.

IMPORTANT: If there's any fluid under the boot, the cylinder needs rebuilding.

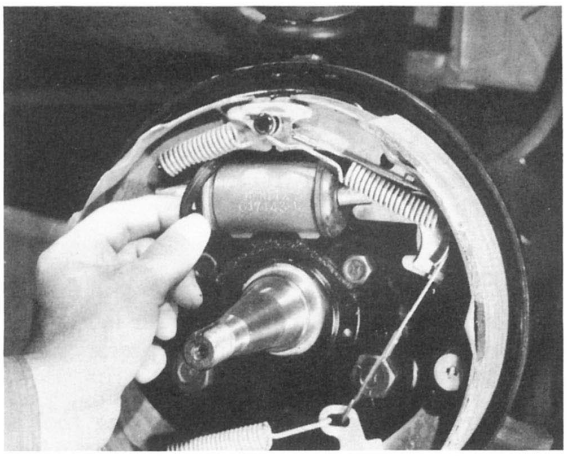


Fig. 13 — Check for wheel cylinder leaks

LOOK FOR AXLE GREASE, TOO

Occasionally someone is a little too generous with front wheel bearing grease. The excess grease gets out past the seal and onto the drum and lining.

Anytime you see an accumulation of grease at the center of the backing plate, check for excess grease and a leaking seal. Of course, if this isn't caught early, the grease eventually gets on the linings and they have to be replaced.

If you see rear axle gear lubricant, it will probably be spattered all over the backing plate and brakes. This indicates a leaking axle shaft inner seal.

USE THE CORRECT LININGS

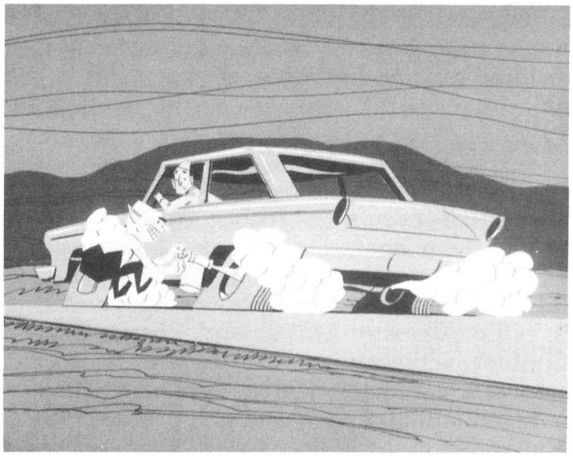
Always match the linings correctly and use only approved linings. The table lists the color codes for 1964 cars. Notice that there has been a mid-year change in police brake linings. Both the original and the newly released linings are listed. Don't mix them if you have a reline job.

1964 LINING COLOR CODES

CAR	SIZE	PRIMARY COLOR CODE	SECONDARY COLOR CODE
Valiant-Dart	9″	1 RED 1 YELLOW	2 RED
Plymouth-Dodge	10″	1 RED 1 BLACK	2 RED 1 BLACK
Plymouth-Dodge Taxi	11″	1 BLACK 2 WHITE	1 WHITE 1 GREEN
Plymouth-Dodge Police and H.D. (original release)	11″	3 BLACK	2 BLACK 1 WHITE
Plymouth-Dodge Police and H.D. (latest release)	11″	1 BLACK 1 ORANGE	2 RED
Dodge 880, Chrysler, Imperial	11″	1 BLACK 1 ORANGE	2 RED

DON'T BURN THEM IN

Tech says that you can't burn new linings in—you can only burn them out. Whatever you do, *avoid unnecessary severe stops with new*



linings. Give them a chance to wear in. It takes a hundred or more normal stops to break new linings in. Don't try to do it in two or three. Here's why:

HEEL-AND-TOE CLEARANCE

New Chrysler and Chryco shoe and lining assemblies are ground under the drum diameter for heel-and-toe clearance on initial contact. If the linings didn't have this clearance, heel-and-toe contact with the drum would cause noise and instability on light applications. You should *never* install a shoe and lining assembly that doesn't have .004-inch heel-and-toe clearance with the drum.

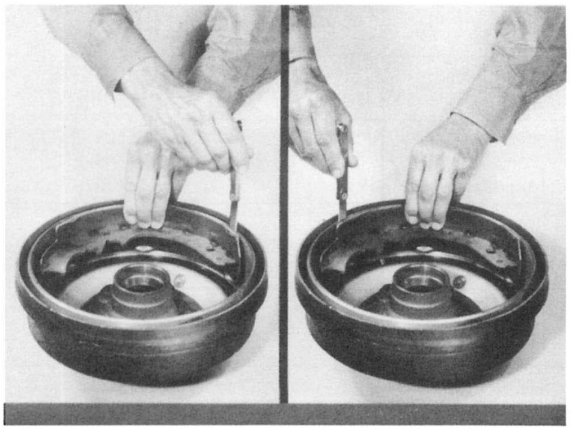


Fig. 14 — Heel-and-toe clearance

With heel-and-toe clearance then, there's a run-in period when contact is mostly on the center part of the lining. Severe stops create excess heat and can scuff or glaze the lining, or bleed out the friction particles.

HANDLE DRUMS CAREFULLY

It pays to baby the brake drums, too. Don't drop them—even a few inches. And don't even bump them against anything. A bump can distort a drum and cause chatter or pedal pulsation. To get an idea of how important this is, notice the way MoPar and Chryco Servo-Contact replacement drums are protected against shocks when you receive them. They're now individually packaged and protected by a cushioning material.

MATCHING DRUMS

Drums should always be resurfaced in pairs to avoid different braking surfaces. During machining it's best to have the wheel mounted on the drum, with the stud nuts properly torqued. This prevents drum distortion during machining. If the equipment won't handle a wheel, use a ½-inch-thick plate, flat within .005-inch mounted to the drum.

USE GOOD EQUIPMENT

Be sure your drum lathe or grinder is in good condition—capable of giving the precision required on brake drums.

On a drum lathe, be sure the cutting tool is sharp and set square to give a smooth cut without leaving machining marks. Make sure, too, that the toolholder isn't loose. This would allow the tool to bounce or follow existing irregularities.

If you grind the drums, use the correct grinding wheel and keep it dressed properly. Follow the equipment manufacturer's operating recommendations, particularly on speed and feed settings.

DEPTH OF CUT

Remove only enough material to be sure the drum is perfectly round and free of surface irregularities. Never enlarge a drum more than .060″ over standard drum diameter. In other words, never remove more than .030″ of material from the drum.

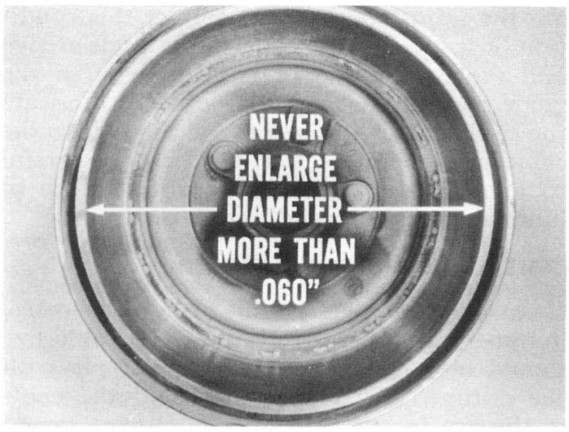


Fig. 15 — Don't cut too deep

After machining, vigorously rub the new surface with emery cloth. The braking surface should have a dull finish all over. Too polished a surface will glaze the linings, causing squeal and pull.

CLEAN THEM UP GOOD

However you resurface drums—on a lathe or grinder, or simply by hand sanding—be sure to clean them thoroughly afterward. Wipe the entire drum with a clean, dry cloth to get rid of any abrasive particles. Don't use compressed air for this job, unless the line has a water and air filter, and you're sure the filter is clean.

Don't use solvents, either, particularly oily ones. Avoid dirty rags and keep away with greasy hands. Any trace of oil or grease on the drum will contaminate the linings.

SERVICING ADJUSTERS

LOW PEDAL

Automatic brake adjusters maintain the correct shoe-to-drum clearance and proper pedal height. Of course, if a car equipped with automatic adjusters has a low pedal it *could* mean that at least one of the adjusters isn't keeping the clearance set correctly. If you suspect that one or more automatic adjusters aren't working, see if a few fairly hard brake applications in reverse will correct the problem. That may be all that's needed to loosen a tight adjusting screw. If this fails to help, you'll have to check the operation of each adjuster.

TO TEST AUTOMATIC ADJUSTERS

The easiest way to test adjuster operation is to back off the adjustment at all brakes to be sure they need adjustment, then spin each wheel backwards and see if the adjuster operates when the brakes are applied. Here are the details:

Test preparation: Raise the car on a hoist. Remove the cover from the rear adjustment slot in each brake support plate so you can see the adjuster star wheel. Then stick a thin screwdriver through the adjusting hole and push the adjuster lever out of engagement with the star wheel. Be sure to hold the lever there while you back off the star wheel about thirty notches. That way, you'll be sure the brake actually needs adjustment. If it's extremely difficult or impossible to turn the star wheel, the trouble may be corroded threads on the adjusting screw.

Observe adjuster operation: You'll need someone in the driver's seat to apply the brakes. Spin the wheel in the reverse direction and have your helper apply the brakes *hard*. This will move the secondary shoe, causing the adjuster cable to pull the adjuster lever up. Then, when the pedal is released, the lever should snap downward, turning the star wheel. So, if the adjuster mechanism is working, you should see a definite rotation of the star wheel.

Check all four adjusters—more than one may be causing the trouble. If you find an automatic adjuster that doesn't function as it should, you'll have to pull the brake drum to service the adjuster.

TEST ADJUSTER WITH DRUM REMOVED

Here's a simple way to test the adjuster after you've removed the drum. Pry the rear brake shoe away about an eighth-of-an-inch from the anchor pin at the top of the brake while watching the adjuster lever. This lever should engage the next tooth of the star wheel with an audible click. Then, when you let the shoe return, the lever should turn the star wheel slightly to lengthen the adjusting screw.

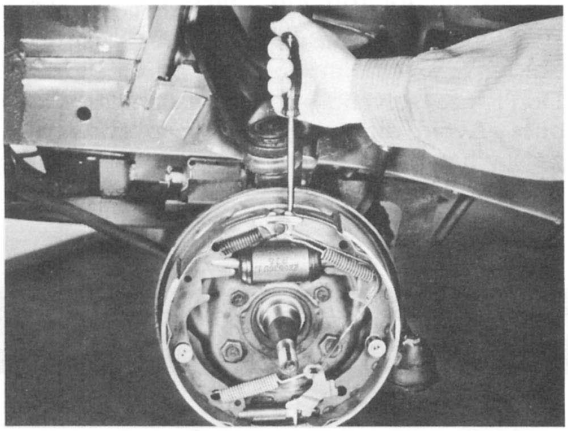


Fig. 16 — Test adjuster with drum off

CABLE BINDING AT GUIDE

If the cable guide isn't flush against the shoe web, the adjuster cable could shift and be pinched between the guide and the web. The cable may bind at that point and fail to operate the adjuster lever. To correct this condition, just position the cable in the guide groove and make sure there's no gap between the guide and the shoe web. It's okay to lubricate the cable guides *sparingly* with Silglyde so the cable will operate easier, but be very careful to avoid getting even the slightest trace of lubricant on the brake linings or drums.

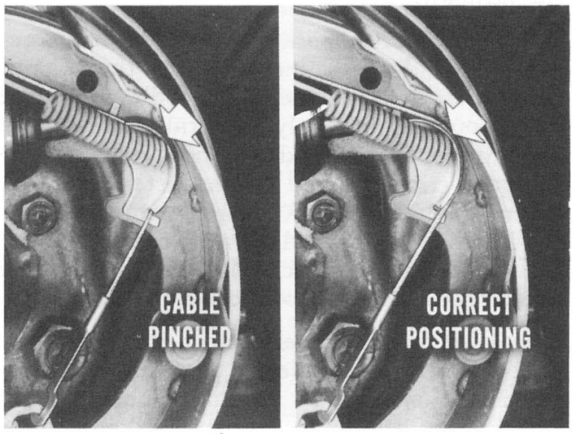


Fig. 17 — Check cable for binding at guide

CABLE EYE IMPROPERLY INSTALLED

To assure free operation of the adjuster cable, it must be properly installed. The cable eye should be positioned on the anchor pin with the crimped-down tabs that hold the cable to the eye facing outward. On all cars except Valiant and Dart, the cable eye must be assembled underneath *both* brake shoe return springs. On Valiant and Dart brakes only, the adjuster cable eye should be installed so that it is *between* the two shoe return springs—primary spring first, then cable eye and finally the secondary spring.

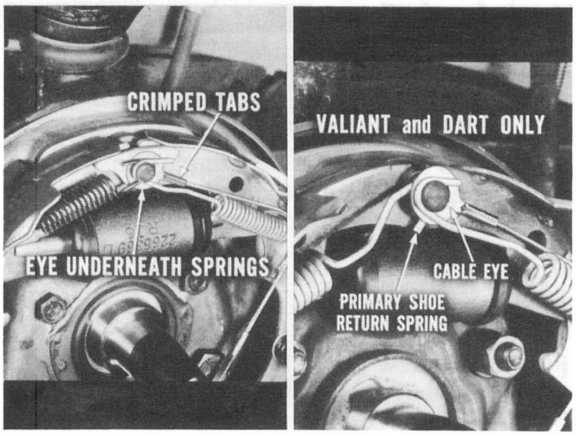


Fig. 18 — Install cable eye correctly

Assembly tip: Whenever you're installing an adjuster cable, remember to do this. Before you hook the shoe return spring to the anchor pin over the eye, pull firmly down on the adjuster cable in the direction of the cable guide. This will insure that the effective length of the cable is correct.

BINDING STAR WHEEL ADJUSTING SCREW

If the star wheel won't turn even though the adjuster cable and lever appear to be in good shape, the threads on the star wheel adjusting

screw might be corroded and binding. In this case, try to free up the threads before you consider replacing the adjusting screw. Sometimes, a few drops of Manifold Heat Control Solvent will help to loosen up the adjusting screw—but be sure to apply it carefully to the threads. Avoid getting solvent on the linings.

OVERADJUSTMENT

In ordinary use, the automatic adjusters will always maintain correct shoe-to-lining clearance without overadjusting. But there are conditions of severe usage where they can adjust the shoes too tight, resulting in drag and pedal build-up.

This occurs when the car is backed up when the drums are overheated after a severe stop or after riding the brakes going downhill. An overheated drum expands—the diameter enlarges. The automatic adjusters don't know the drum diameters are oversize. All they know is that the secondary shoes are traveling far enough during reverse braking to move the lever up another notch. So the brakes adjust for the enlarged diameter and they're too tight when the drum cools.

If you run across this condition, you'll have to make a manual adjustment to correct it and educate the driver on how to avoid it. Tell him to prevent a recurrence by hesitating a few seconds after using the brakes before he backs up. This will give the drums a chance to cool and return to normal size. In extreme cases where car usage requires backing up with the drum hot regularly, the owner should change to manual adjusters.

USE THE RIGHT ADJUSTER

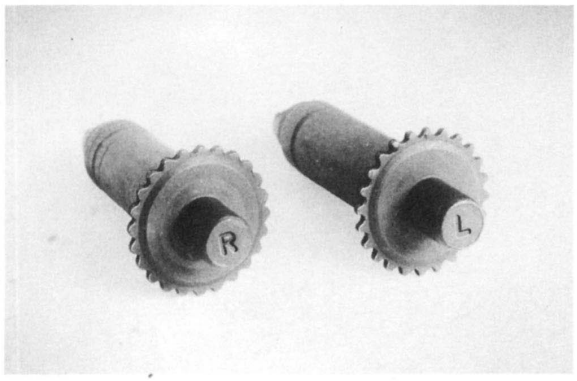


Fig. 19 — "R" for right side; "L" for left side

Cars that have manual adjusters use the same adjuster on all four wheels. With automatic adjusters, though, the thread direction is different on opposite sides of the car. Always install the adjusters stamped "R" on the right side of the car and the adjusters stamped "L" on the left side. If you get them mixed, automatic adjuster action will *increase* the lining-to-drum clearance, causing low pedal.

The adjusters also have different thread pitches for precise adjustment of the different size brakes. It's not always easy to tell the star wheels apart. But you can easily identify the correct pivot nuts by the U- and V-shaped

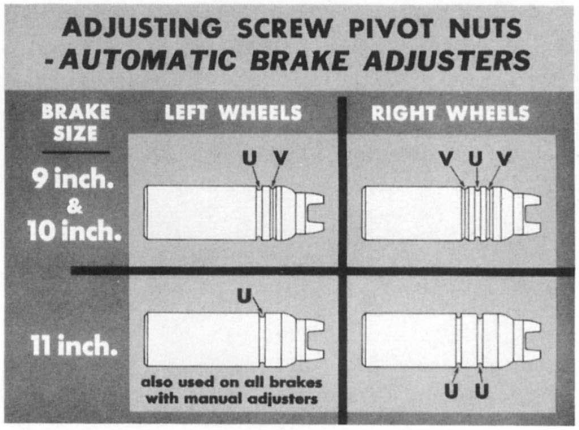


Fig. 20 — Adjuster identification

grooves in the nuts. And you can't put a wrong star wheel into a pivot nut because of the different threads.

MANUAL ADJUSTMENT

Before you button up a brake assembly, check how many teeth there are in the adjuster star wheel. Manual adjusters have twelve teeth; automatic adjusters have 24 or 30. To adjust the lining-to-drum clearance, tighten the adjuster until you feel a drag at the wheel. Then back the adjuster off a full half turn—one-half the number of teeth in the wheel. Check that there's no trace of drag.

LITHO IN U.S.A.