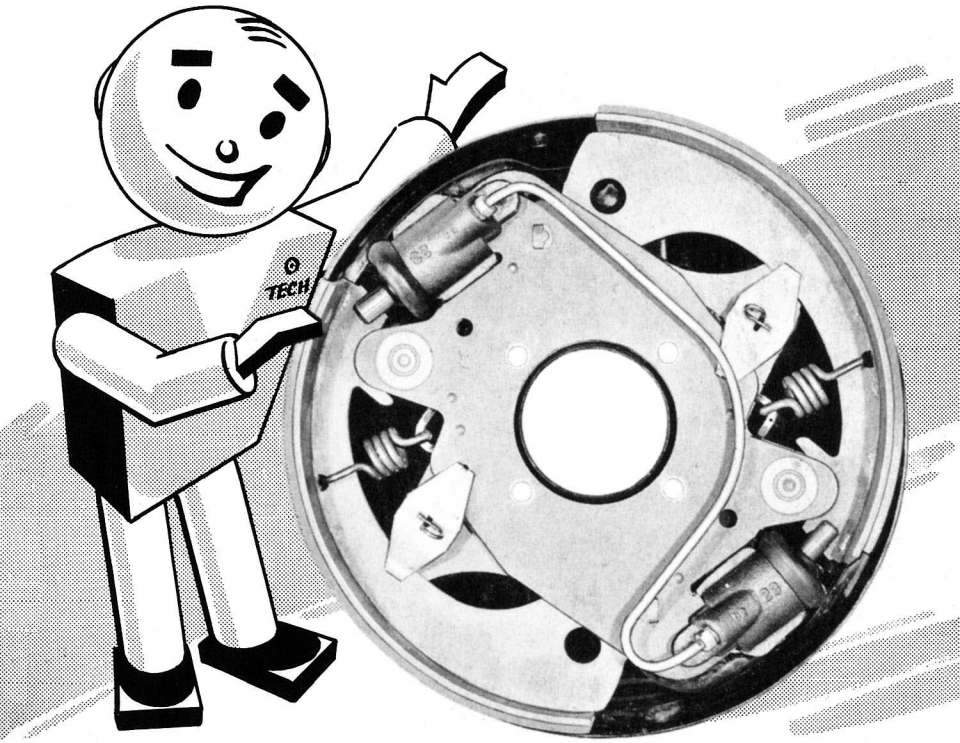
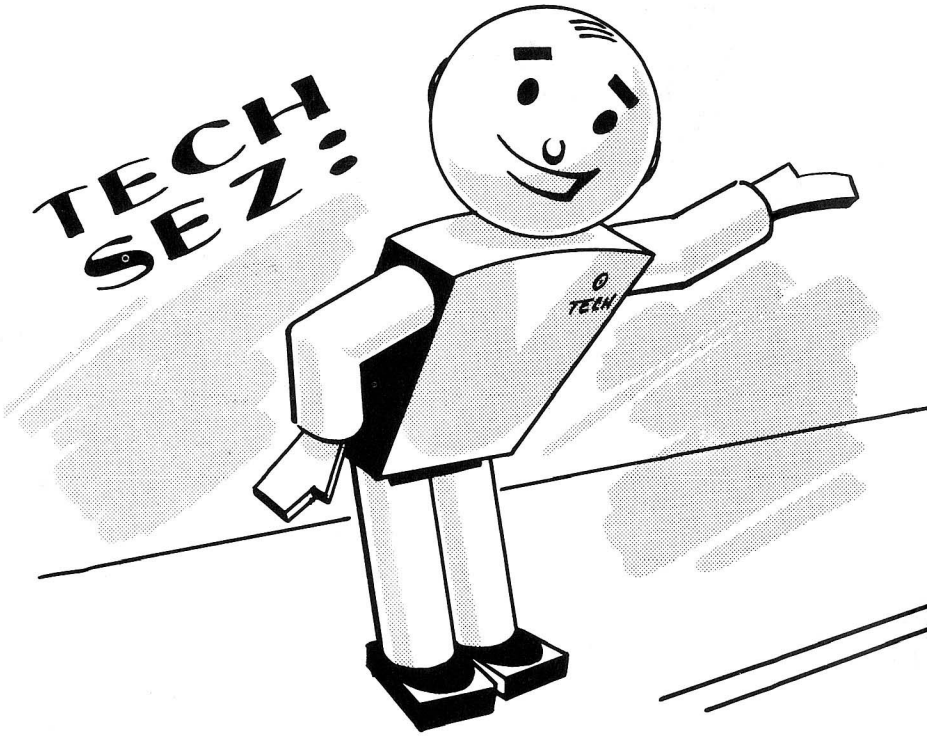
"THE NEW CENTER-PLANE BRAKE"



SERVICE REFERENCE BOOK

SESSION NO. 96

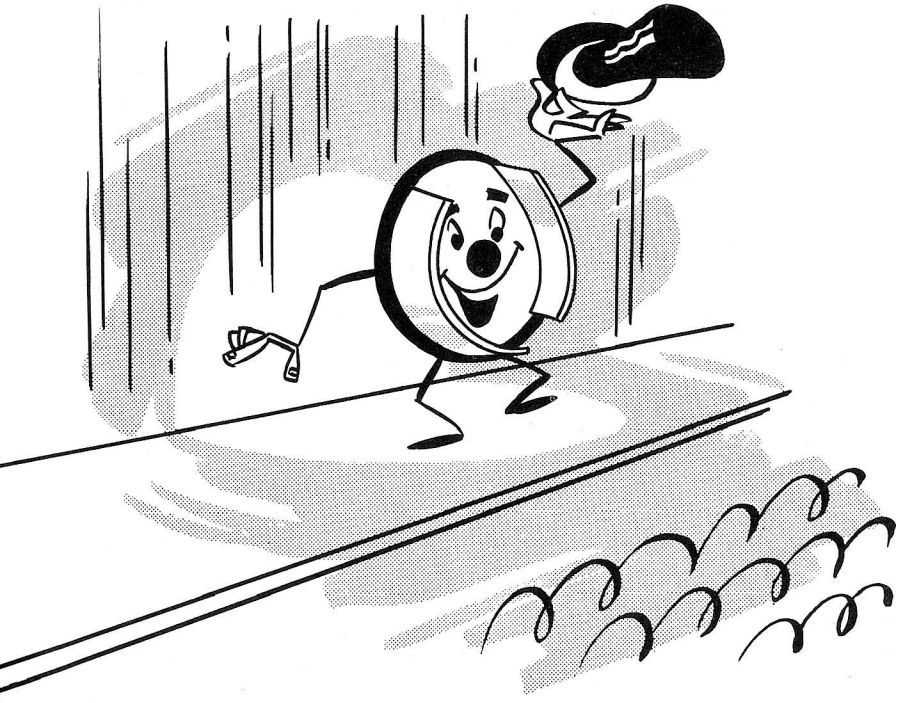
Prepared by
CHRYSLER CORPORATION
PLYMOUTH · DODGE · DE SOTO
AND CHRYSLER DIVISIONS



"ALL EYES ARE ON THE NEW CENTER-PLANE BRAKE!"

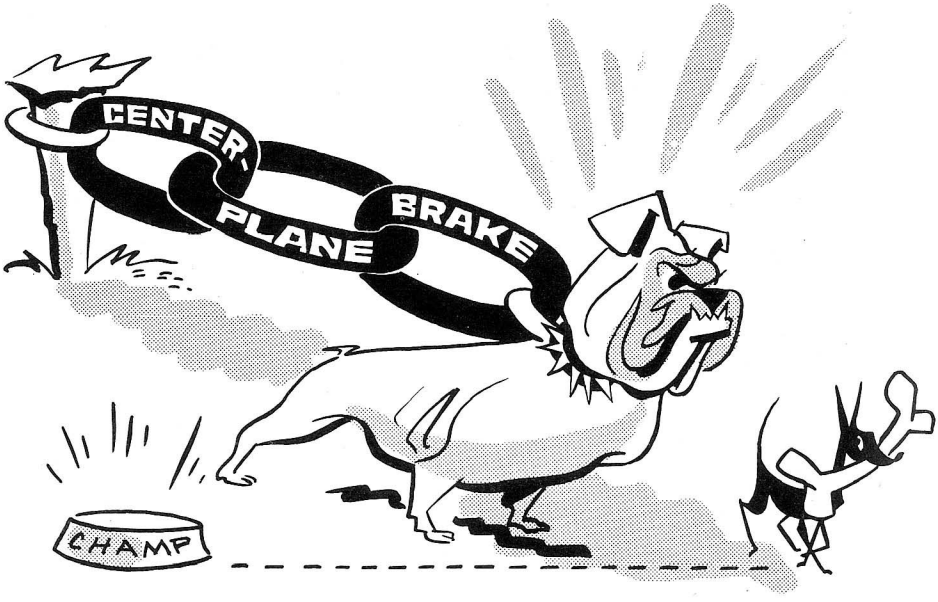
Safe! Sure! Fast-acting! That's the story of the new Center-Plane brake. What's more . . . this improved design is easier to service whenever it needs attention.

So, in this reference book, you'll find a section on the new parts involved, how they operate, and what to do when adjustments may be needed. In addition, there are handy tips on correcting conditions common to the kind of brakes you've been taking care of.



Here's your guide to this information:

THE FORWARD LOOK—FOR SAFETY

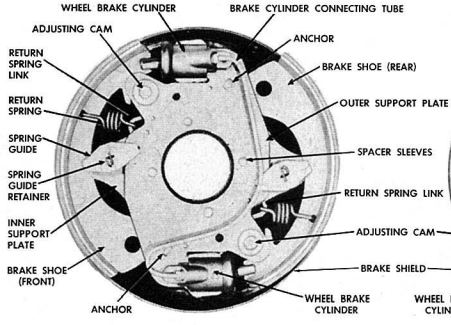


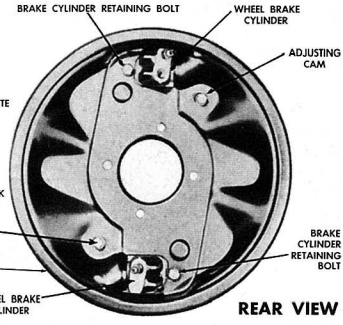
The Forward Look has been applied to car safety, and the new center-plane brake is the result. Today's cars are heavier. They've got more horsepower. They all travel faster, too. Therefore, to control the increased weight, power, and speed, you just have to have *safer* braking! So, a new design of hydraulic brake has been produced, and is known as the Center-Plane brake. It is used on the 1956 Imperial, Chrysler and De Soto models.

Now, from a service technician's point of view, here's an important news item. This new center-plane design not only provides more effective braking, but it's also a lot easier to adjust and service. That's because it works very simply, and there are no complicated parts involved.

CENTER-PLANE BRAKE ASSEMBLY

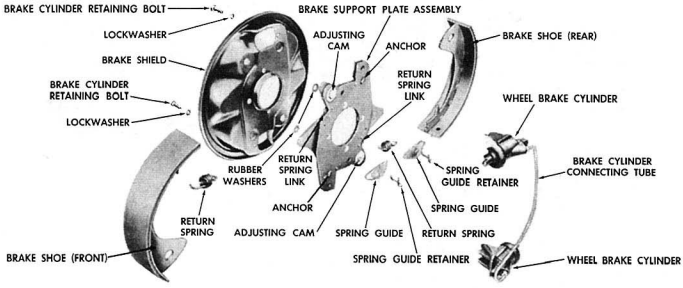
FRONT WHEEL BRAKE



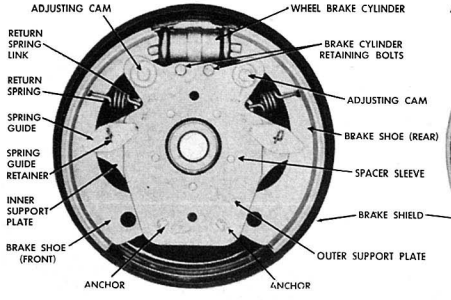


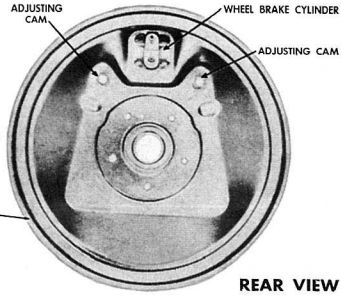
REAR VIEW

EXPLODED VIEW



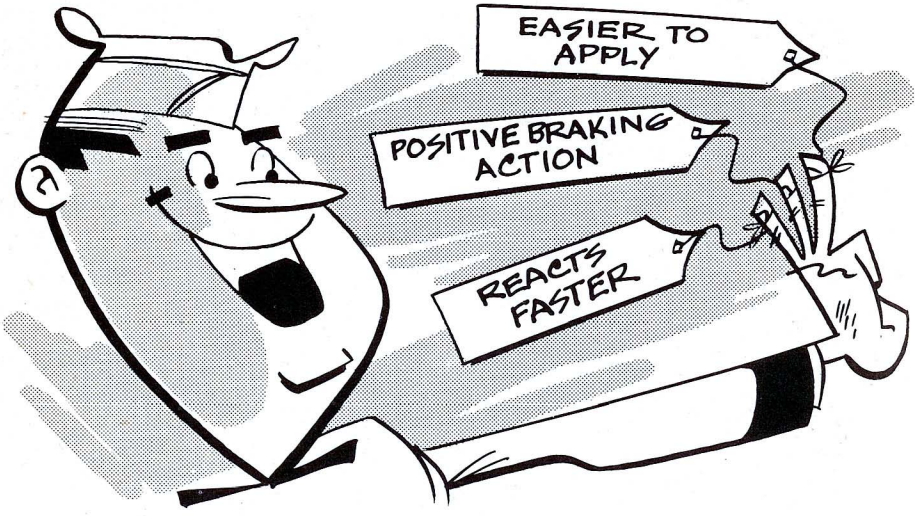
REAR WHEEL BRAKE





REAR VIEW

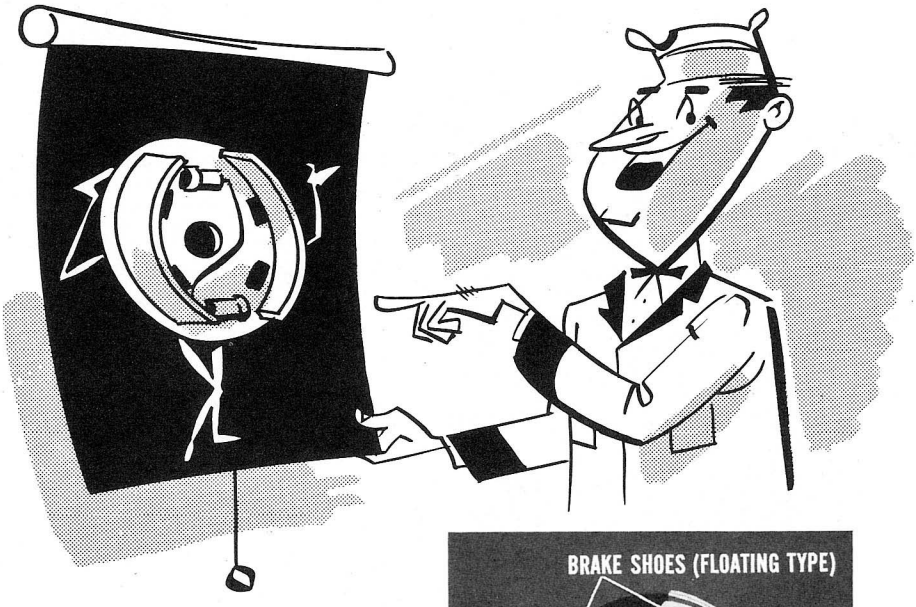
These new brakes have several outstanding features which will be quickly recognized by the driver. First, he'll notice that the brakes are easier to apply. There's less pedal effort required. Also, they make more successive high-speed stops possible . . . each one a positive braking action. All of this, of course, adds up to "Safety" with a capital "S!" And, this new brake reacts faster than ever. Good braking takes place in a hurry. That's another big safety feature.



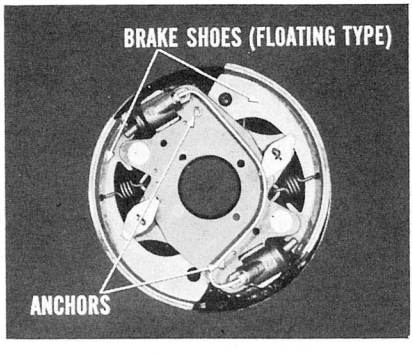
Let's take a closer look at this new center-plane brake, and study its design features and operating characteristics.

DESIGN FEATURES

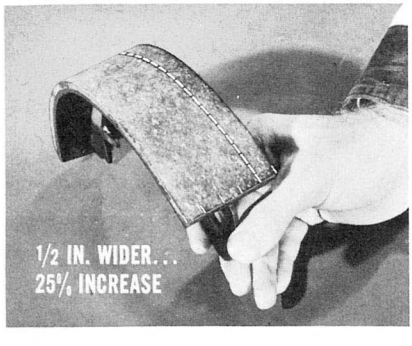
Basically . . . the new brake introduces two important improvements: First, there's a new center-plane construction; and second, the anchor bolts have been eliminated, resulting in a "floating" brake shoe—a shoe that is not rigidly attached to the support plate.



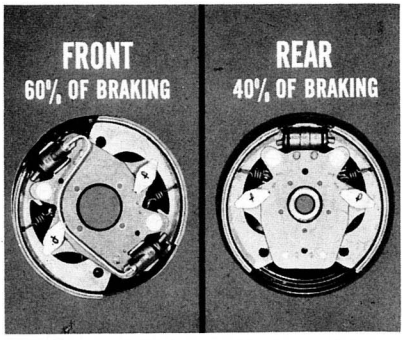
Anchors are used at the heel ends, but they serve more like a pivot point and ramp for the shoe than the former type of anchor did.



Another thing along the safety line . . . brake shoes have been redesigned and are ½" wider. This means a 25% increase in lining area, and far greater stopping power!



In spite of some of the design differences, you'll notice that the same type of brake drum design is still being used. Cyclebond brake linings and the same wheel cylinder arrangement are also featured on the center-plane brake.

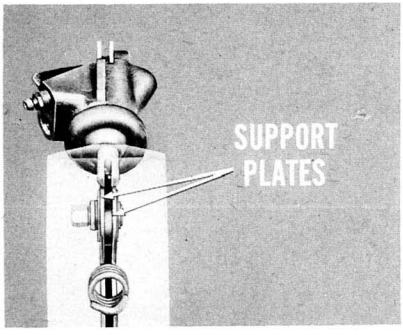


Two wheel cylinders on each front brake are still important since 60 per cent of the braking is done at the front wheels. At each rear brake, there's a double-acting cylinder to provide the 40 per cent braking that is handled by the rear wheels.

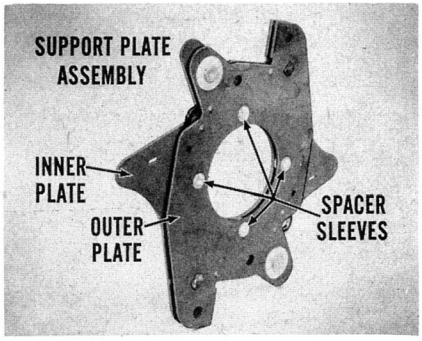
Because of these familiar parts, you'll find the new brake easy to work with. The main differences are in how the brake shoes, guides, and anchors are constructed. There's also a difference in the action of the brake shoe when it's being applied.

Definition of "Center-Plane"—By this time, you may have wondered about the term "center-plane" and what it really means. "Center-plane" simply means that the wheel cylinders and brake shoe return springs are mounted right in line with the center plane of the shoe.

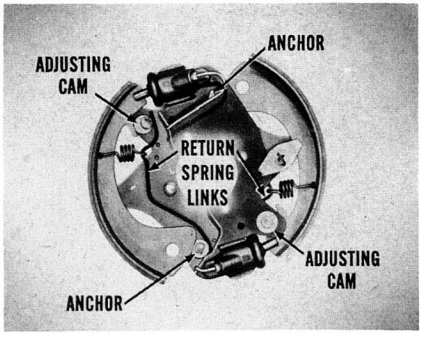
The basic arrangement has many advantages. For one thing, the forces that apply and release the brake shoe all work in a *single plane.* Two steel support plates help guide the shoe in this same plane. As you can see, then, everything working together in one plane keeps that brake shoe from cocking. It's a kind of "no-tilt" action shoe.



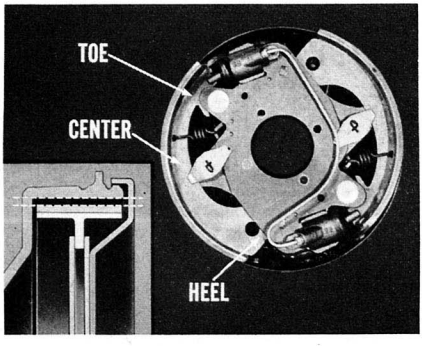
One of the most important items in this single plane action feature is the new support plate assembly. There's an inner and outer support plate. They are separated by four spacer sleeves at the mounting bolt holes.



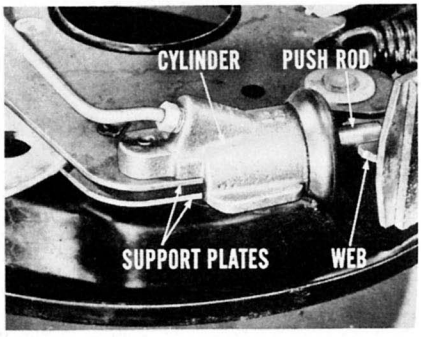
The brake shoe anchors, adjusting cams and return spring links are also attached to the support plate setup. The sleeves, cams, and anchors team up to keep equal spacing at all points between the inner and outer support plates. This spacing, by the way, is about $\frac{1}{32}$" wider than the thickness of the brake shoe web.



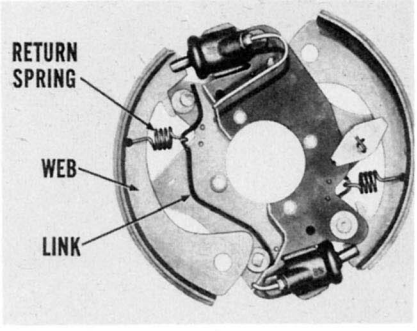
The plates, then, support the web of the shoe at the toe, center, and heel. This keeps the shoe from tilting so the surface of the lining always contacts the surface of the brake drum evenly over its entire width.



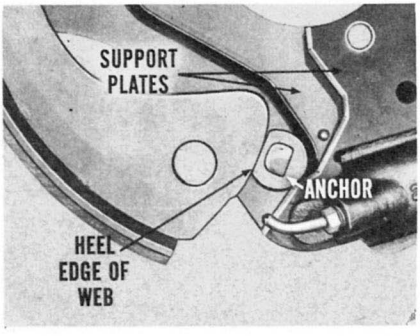
The manner in which the wheel cylinders are mounted also helps to provide an even application of the brake shoe. In short, the cylinders are mounted to the support plate assembly. On the front brake, part of each support plate extends against the back of the cylinder to form a very rigid mounting. This improved center-plane mounting puts the push rod directly in line with the shoe web. That means the push rod pushes the brake shoe out in a straight line.



The return spring, too, ties in with the movement of the shoe. The spring is hooked to the web of the shoe and to a link located between the support plates. When the spring pulls the shoe back to released position, it pulls it straight back. In other words, the shoe travels out and back in a straight line, with no possibility of wobbling.

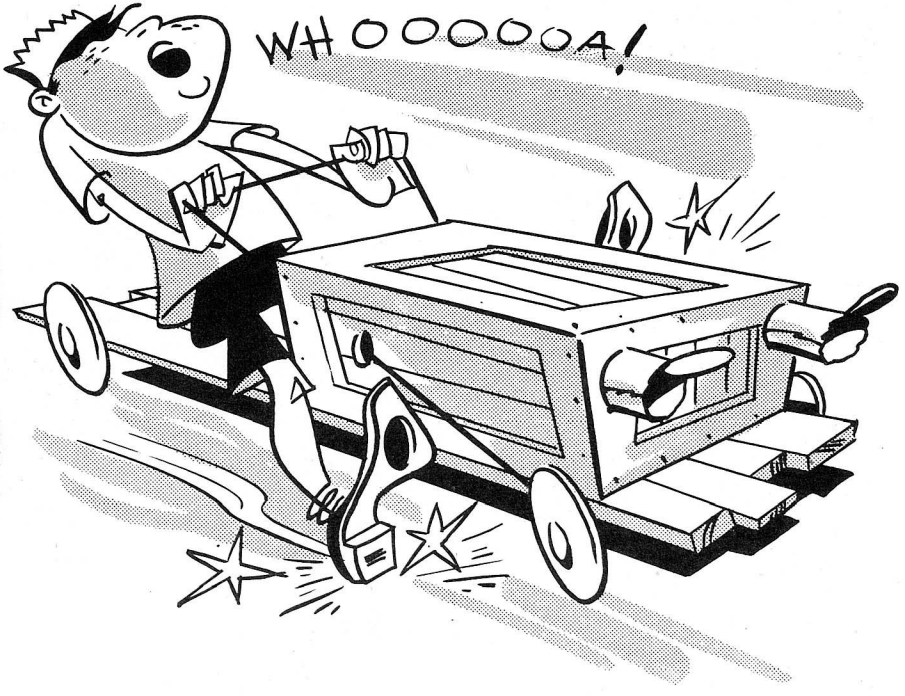


Here's something else. You will notice that the anchor doesn't go through the web of the shoe. Instead, the anchor is riveted between the support plates. The heel edge of the web just rests against it. Right at that point, too, the web of the heel end is cam-shaped.



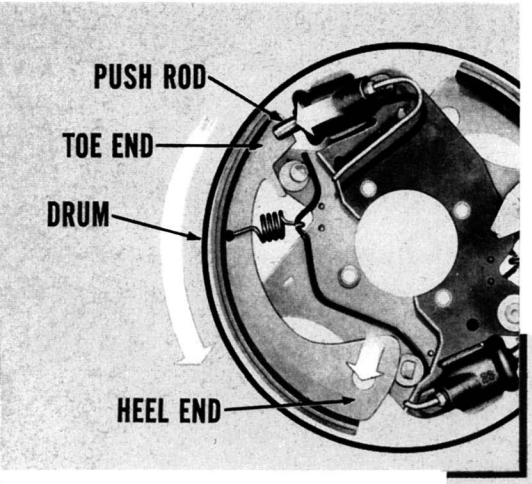
This cam contour where the shoe rests against the anchor helps control the way the shoe pivots during application. This is important to remember, as you'll recall that the shoe is "floating"—it's not rigidly fastened at either end to the support plates.

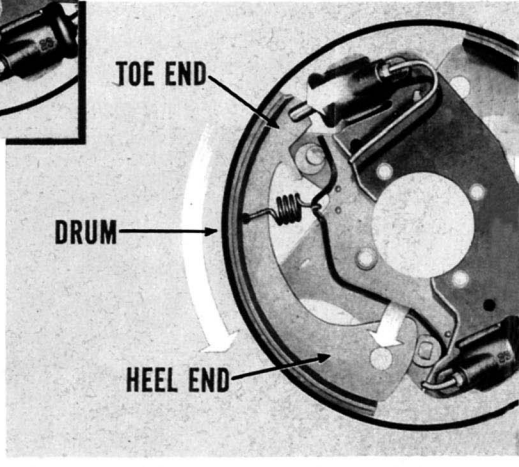
NOTE: Incidentally, that small step on the cam contour is deliberately engineered into the shape of the web at that point. In case anyone tries to file it off to make a smooth cam at that heel end, tell him he's off base. The step belongs in the design.



OPERATION

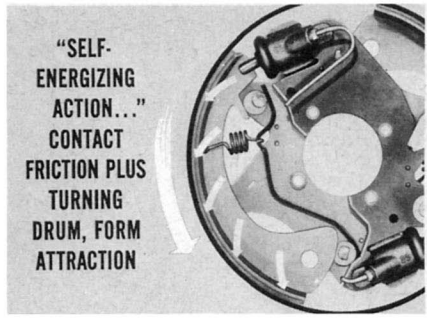
When the wheel cylinder push rod pushes the toe end of the shoe out against the rotating drum, the drum tends to carry the shoe with it. Since the shoe is free to move slightly, the cam-shaped heel end of the shoe pivots at the anchor.



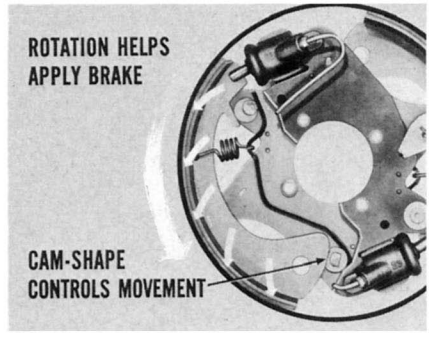


Instantly, then, the heel end of the shoe is forced out against the drum. Actually, this movement happens faster than it takes to read about it. The heel and toe ends of the shoe go out against the drum at practically the same instant.

As soon as the lining contacts the drum, controlled "self-energizing action" begins and draws the shoe into even tighter contact. By "self-energizing action" we mean that the shoe and drum do part of the braking job themselves. Contact friction, plus the turning drum, form a great attraction for the shoe.



It's a lot like holding a chisel on a grinding wheel. If you hold the chisel loosely, the wheel tries to take it out of your hand. The drum, in the case of the center-plane brake, tries to carry the shoe the same way. So, the rotating force of the drum helps apply the brake because it draws the shoe tighter against the drum. And yet the brake can't grab because the cam-shape at the heel end controls the shoe movement. It won't let the shoe wedge itself between the drum and anchor.

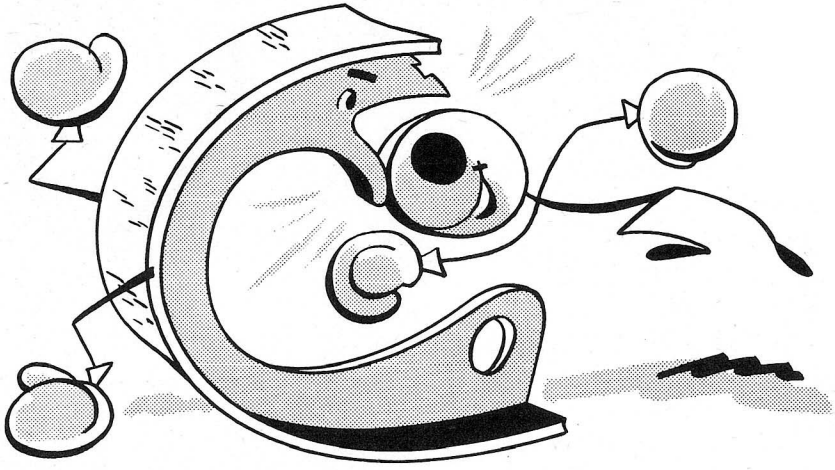


That is the "self-energizing" story in a nutshell. It's one primary reason why this brake provides good stopping power at the wheels with only a light pedal pressure on the part of the owner.

This new design *controls* the self-energizing action so you get all of its braking benefits, with none of the harsh action possible when the self-energizing action is *not* controlled.

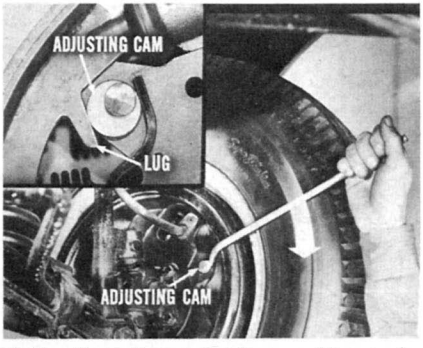
Another big advantage of this new design is the ease of service. So let's get into that part of the story.

SERVICE AND ADJUSTMENT



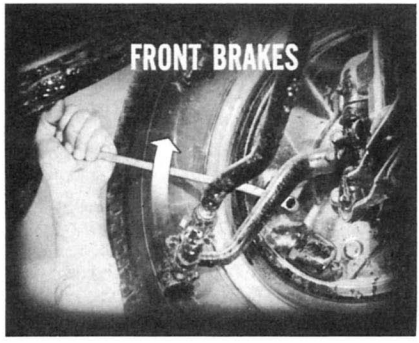
One important thing to keep in mind is that this new brake requires only a *minor* adjustment. You no longer have to make a *major* adjustment, such as shifting the anchors, and measuring clearances at the toe and heel ends of the shoe.

All you have to do is turn the adjusting cam to move the brake shoe out against the drum, as you always have. The cam, in this design, bears against a lug on the brake shoe web. Turning the cam controls clearance between the lining and drum, controls the amount of brake pedal travel, and corrects for any normal wear on the lining.



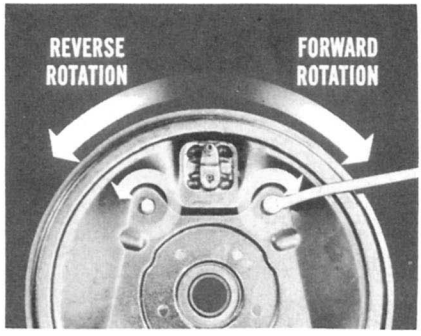
Adjusting Front Brakes. Now when it comes to adjusting the front brakes, there is a key point that *is* different from any previous ad-

justment procedure. On front brakes you turn each adjusting cam in the direction of *forward wheel rotation.* But remember . . . turning the cams the way the wheels rotate forward means you'll push *up* on the hand-end of the wrench when adjusting the front brake rear shoe.



Turn each brake shoe against the drum until it locks the wheel. Then turn the adjusting cam slowly in the opposite direction until there is no drag.

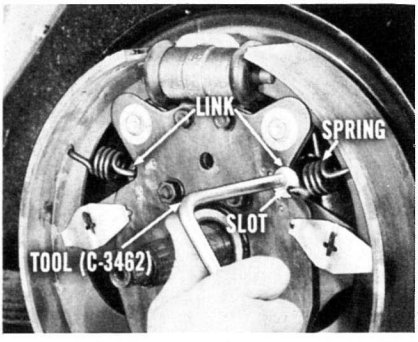
Adjusting Rear Brakes. When adjusting rear brakes the procedure's the same as you've been using. Turn the forward shoe adjusting cam in the direction of forward wheel rotation. Turn the rear shoe adjusting cam in the direction of reverse wheel rotation. Turn each shoe out until it locks the wheel, then back it off until the wheel is free.



Don't forget . . . after making a brake adjustment, hit the brake pedal a few times. Then, spin all four wheels to make sure they are free of brake drag. You won't want to find a shoe hanging up after you lower the car to the floor.

If the brakes have been relined, or if new shoe assemblies have been installed, apply the brake pedal *before* you start adjusting the shoes. This causes the shoes to center themselves in the drum, and makes adjustment easier.

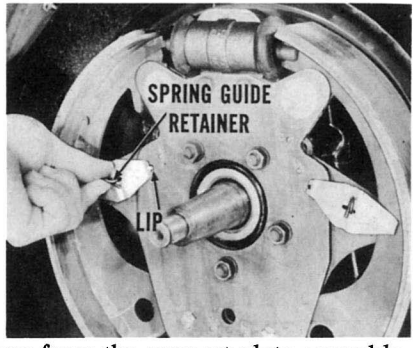
Removing and Installing Shoes. Removal of the brake shoe, whenever required, is also easy. Block the brake pedal first so nobody will accidentally hit the pedal while the drums are off. After that, back off the adjusting cams to provide clearance between the drum and the linings. Finally, remove the wheel, hub and drum assembly.



Use tool (C-3462) to remove the return springs. Just insert the new tool in the return spring link so the slot in the tool cam engages the spring hook. Turn the handle to disengage the spring. Then, turn the handle in the opposite direction to release the spring.

If you ever try removing or installing the return springs without this special tool, you'll appreciate how handy it is for this particular job.

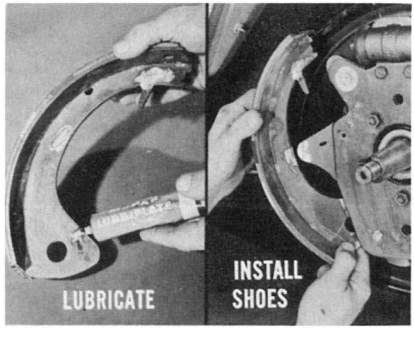
Now, once the springs are off, remove the two spring guide retainers and guides. Just push the retainer in and give it a ¼-turn. That lip on the guide, by the way, is for correct positioning on the outer support plate.



You now can slide the shoes away from the support plate assembly. To install the shoes, reverse the removal steps just outlined.

If you ever replace the shoe assembly, or reline this new brake, you may be wondering about grinding the linings. In most cases, the service shoes you get from your parts wholesaler will come to you already ground .010″ to .024″ under drum diameter. If you do your own relining, you'll have to take care of this grinding operation yourself. And remember, the linings always have to be ground *before* they're installed on the car. You can't grind them on the car.

Anytime you install the shoes, be sure to always apply a thin layer of MoPar Lubriplate to the web where it contacts the support plates, cams and anchors. Then go ahead and install the shoes, the drums and adjust the brakes.



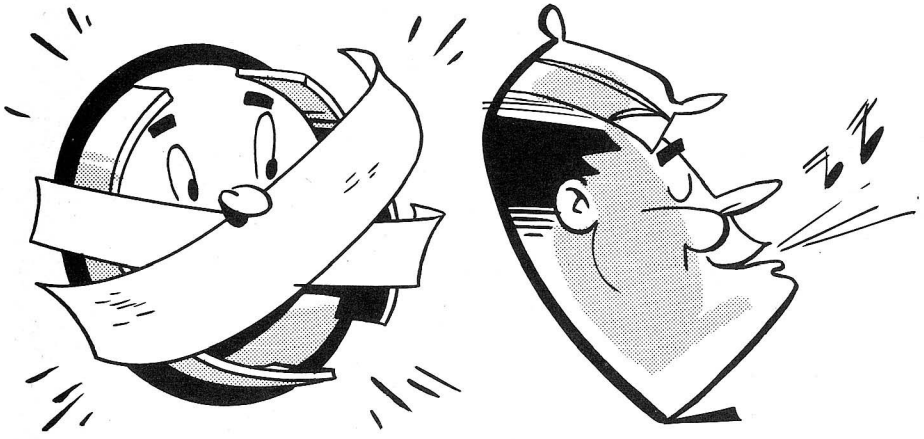
Another tip . . . whenever you replace linings or brake shoes, always use approved lining and shoe assemblies. They're engineered especially for the new Center-Plane Brake. So, play it safe and use genuine parts

And when you reline the front or rear brakes, be sure to use the same material. When you reline the front brakes, be sure to reline *both* fronts–not just one.

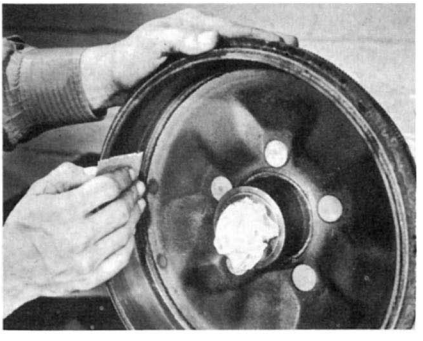
CORRECTING A BRAKE SQUEAL CONDITION

Road-test the Car. Keep in mind that it always pays to road-test a car, especially when an owner reports a brake squeal condition on past model cars. Locating the squeal isn't always easy, so take someone along on the road test to help you. Have your helper stand on the curb and listen for the noise as you stop alongside the curb. That way you'll know if it's the front or rear brakes that are at fault.

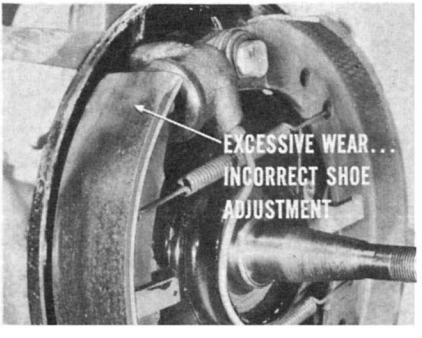
Installing a brake drum damper spring on each rear wheel will often eliminate a noise at that point. These springs are standard equipment on front wheels. However, *test all damper springs* to be sure they fit tightly. A spring that's gone limp won't be able to damp out any noise. In addition, always install the full spring–not the combination spring and band.

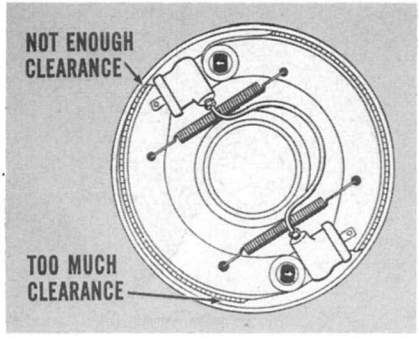


Now, suppose that damper springs don't eliminate a squeal condition. In a case like this, pull the wheel and check the drum. If you find that there is a black or gray, binder-type of deposit glazed on the drum surface, use emery cloth or fine sandpaper to sand off the deposit. Before you do this, however, stuff a *clean* rag into the hub so none of the emery dust or sandpaper grit can get in to score the bearings.

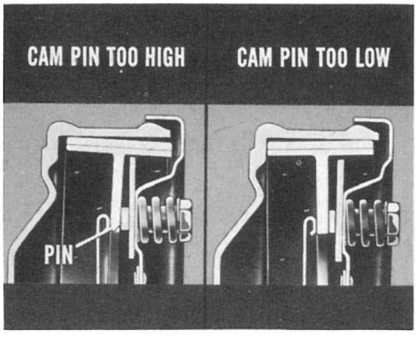


Check Wear Patterns. If your inspection shows that the drums are okay, check the worn areas of the lining. If there is uneven wear, you can easily tell what's wrong. For instance, excessive wear at the toe means high pressure there because of incorrect brake shoe adjustment.

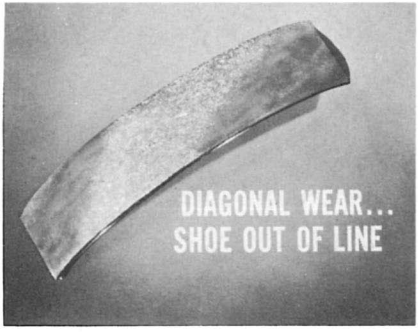




Toe wear means there's usually not enough clearance at the toe, and too much at the heel. As a result, there's only partial contact between the lining and drum. This leaves the rest of the brake shoe free to vibrate and produce a noise when the brake is applied.

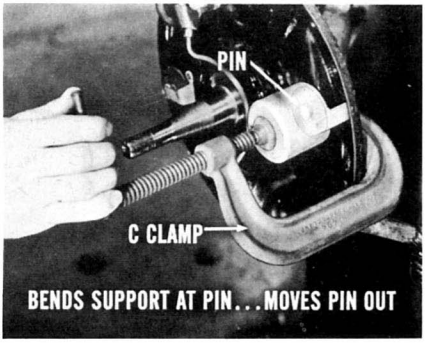


Excessive wear on one edge of the lining means the adjusting cam pin is too high or too low. Wear on the *inside edge* means an adjusting cam pin is too high. This tilts the shoe outward. A pin that's too low will tilt the shoe inward and wear will show on the *outside edge*. Both conditions can cause squeal.

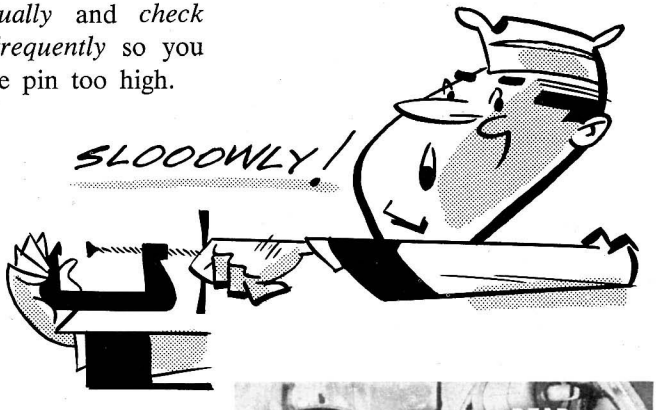


Diagonal or spotty wear points to a shoe that's out of line with the drum. The shoe might be bent, twisted, or the brake support plate could be sprung which results in an incorrect cam pin height.

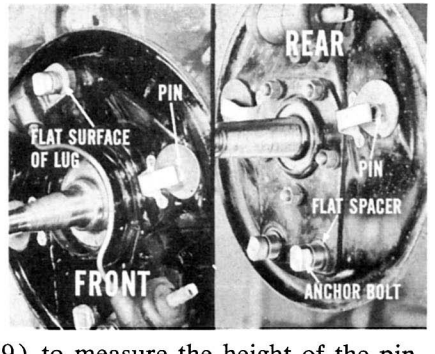
There's a new tool for raising the height of a cam pin that's too low. You put this cam pin height adjusting tool (C-3248) over the pin and tighten it with a C-clamp. This bends the brake support at the pin and moves the pin outward.



CAUTION: Tighten the C-clamp *gradually* and *check pin height frequently* so you won't get the pin too high.



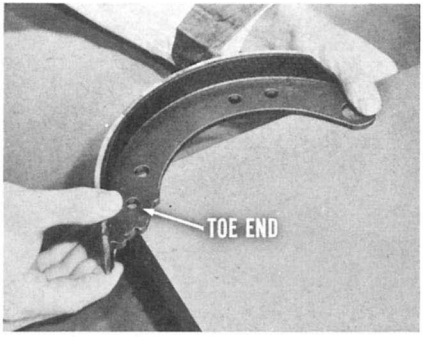
On front wheel brakes, the pin—or the rubber plug in the end of the pin—should be as high as the flat surface on the mounting lug behind the cylinder. On rear brakes, the pin should be as high as the flat spacer under the anchor bolt.

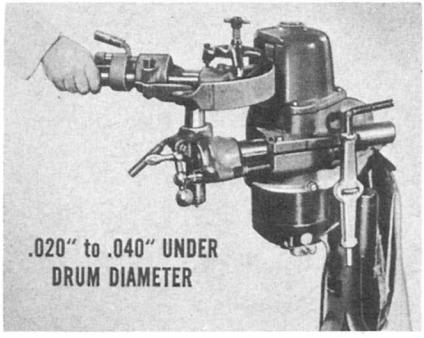


Use the special gauge (MT-19) to measure the height of the pin. If the pin is too long, just file the end to get the correct height.

Keep in mind that you can't grind the lining of a misaligned shoe to square it with the drum. Neither can you straighten a twisted shoe successfully. Always replace the shoe instead. Replace the brake support, too, if you find that it's been sprung.

Checking a Shoe for Twist. Here's how to check a shoe for twist. Support the anchor end of the web on a surface plate and hold the web flat with the plate. Swing the toe end up to the surface plate. If the shoe is bent, the web will either strike the plate, or ride above it. If that's what you find, then off with the old and on with the new shoe.





Another thing . . . always check a new shoe assembly to see if it needs grinding. If it does, remember that on past model brakes the linings should be cam ground .020" to .040" under drum diameter.

A CLOSING THOUGHT ON SAFETY...

For safety's sake, it's up to you and all master technicians to stay on top of brake service. After all, the brakes are one of the most important car controls. When the chips are down and you've got to stop a heavy, fast-moving car . . . well, your life may depend on how effectively those brakes work.

If other passengers are along, their safety also depends upon how well the brakes operate. They've just got to work properly every time! All owners feel this way, of course, and when *they* know that *you* know all that's needed to keep brakes performing safely . . . your service department will win their lasting respect and confidence.

RECORD YOUR ANSWERS TO THESE QUESTIONS ON QUESTIONNAIRE NO. 96

Center-plane brake shoes are rigidly fastened to the support plate at the heel ends, which is why they are considered "floating" shoes.	RIGHT	1	WRONG
When adjusting center-plane front brakes, turn both adjusting cams in the direction of forward wheel rotation to reduce clearance between lining and drum.	RIGHT	2	WRONG
After adjusting the brakes, depress the brake pedal a few times and check to see if the wheels are free.	RIGHT	3	WRONG
When adjusting rear brakes, turn front shoe adjusting cam in direction of forward wheel rotation; rear shoe adjusting cam in direction of reverse wheel rotation.	RIGHT	4	WRONG
Brake shoe assemblies for center-plane brakes are not ground under drum diameter.	RIGHT	5	WRONG
Brake drum damper springs often eliminate squeal but they must fit tightly on the drum.	RIGHT	6	WRONG
Excessive wear at the toe end of a brake lining means too much clearance there and too little clearance at the heel.	RIGHT	7	WRONG
Excessive wear on the lining edge means incorrect height of the adjusting cam pin.	RIGHT	8	WRONG
Diagonal wear may mean a bent or twisted shoe, or a sprung brake support that has resulted in an incorrect cam pin height.	RIGHT	9	WRONG
On past model brakes, linings should be cam ground .020" to .040" under drum diameter.	RIGHT	10	WRONG

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