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FORD MECHANICS SERVICE FORUM

**PASSENGER
CAR
BRAKES**

(STEP ON IT!)

Plaintiffs' Exhibit
FD 6016

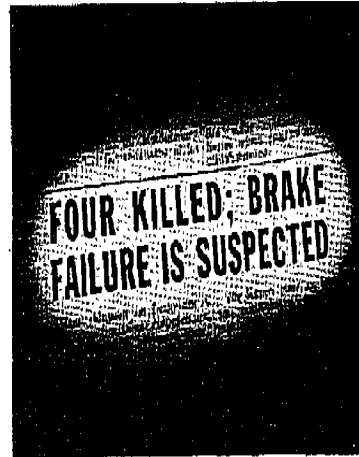
FORD

DIVISION OF

Ford Motor Company

SERVICE DEPARTMENT

FOREWORD

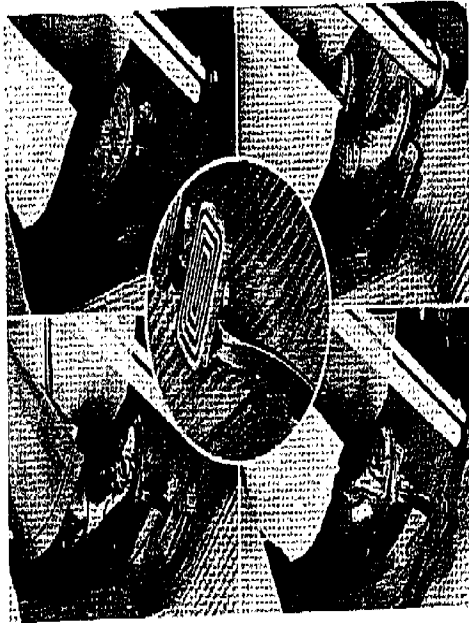


HERE IS a grim reminder of the grave responsibility that you, as a Ford Service Mechanic, must assume. Automobile brake safety depends often on your alertness in spotting the symptoms of brake trouble. You have an opportunity to do this on the many cars that pass through your service department. To neglect this duty or to fail to follow through when you do find evidence of brake trouble may have consequences as tragic as those told in this newspaper headline.

In this booklet you will see examples of the major brake trouble symptoms, proper diagnosis and the procedures for correcting the troubles. The methods are factory approved and broken down to simple detail. Following them will help you maintain the high standards which have made "Friendly Ford Service" a watchword among Ford owners everywhere.

This booklet is the fifth of a series. Keep it. The complete set will become your personal Ford Service reference library.

Additional copies of this, and booklets on other subjects, may be obtained from your Ford Dealer.

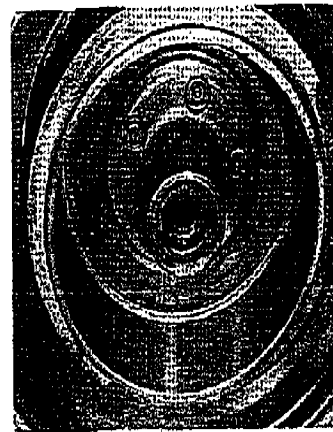


STEP ON IT!

STEP ON IT! No, that's not a hurry-up order, nor is it a command to push the accelerator pedal to the floor board like a racing car driver. "Step on it" is your slogan—your key to the best method for uncovering brake trouble symptoms.

The brake pedal will tell you almost everything there is to know about the condition of a car's brake system. And it is almost impossible to work on any car for any reason without having something to do with the brake pedal. It is easy to reach. All you have to do is "Step on it!"

Low Pedal Reserve. This is the most common trouble symptom—the brake pedal goes down too far when you step on it. Obtain customer permission to remove a wheel and drum for inspection when low pedal reserve is discovered.



Drums should be perfectly round and free of score marks.



Linings should be clean and free of grease or fluid.



Lining Wear. If there is less than $\frac{1}{32}$ " of lining above the rivet heads, linings should be replaced.

Fill Cylinder. Fluid level should be up to within one-quarter inch of the master cylinder filler neck.



Lining-to-Drum Contact. Measure the thickness of the lining at both ends of the shoe to determine whether the lining has been making proper contact with the drum.

Check Cables. Parking brake cables should have no slack. Don't adjust cables too tightly.



If the inspection shows that drums and linings are in good condition . . .

A MINOR ADJUSTMENT

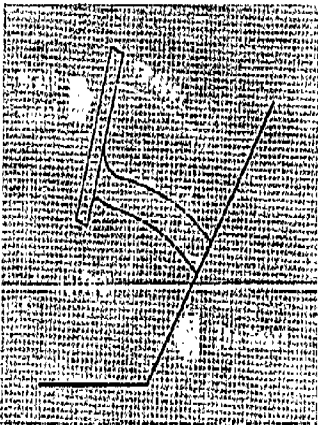
. . . should be sold—to bring pedal reserve up to safe driving standards.

Expand Shoes. With the adjusting tool, expand the brake shoes until it is barely possible to revolve the wheel by hand.





Back Off Shoes. Turn the adjusting screw back approximately 14 notches, or until the wheel turns freely.



Check Travel. If pedal can be depressed more than one-half the total distance to the toe board, brakes must be readjusted to reduce lining-to-drum clearance.

UNEVEN, NOISY, GRABBY BRAKES

THIS TROUBLE symptom usually indicates badly worn brake linings. First, all four wheels and drums should be removed for close examination of linings and drums.

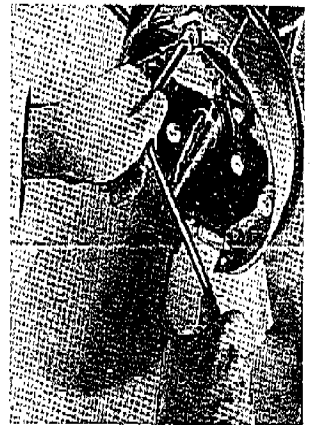
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BRAKE SHOE REPLACEMENT

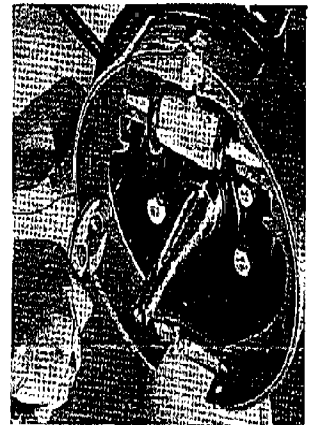
IF LININGS are worn on one wheel, at least replace linings on opposite wheel so that brakes will engage and hold equally.

Disconnect Springs.

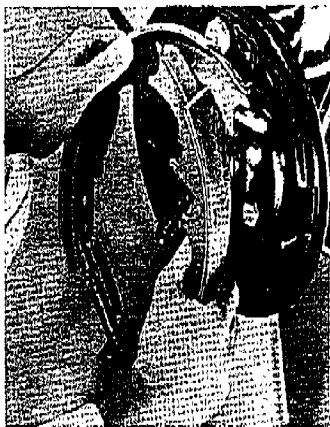
The tool shown, a brake retracting spring remover and replacer is specially designed to do this job quickly and safely.



Remove hold down pins, cups and springs.



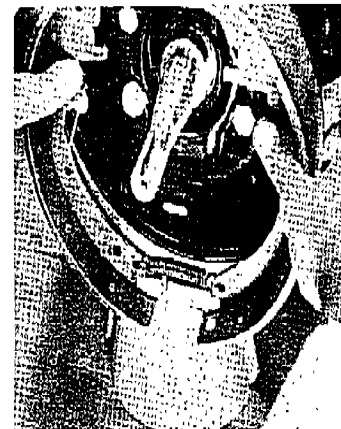
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Disassemble Shoes.

Move the anchor pin ends of the shoes together to relieve tension on the adjusting screw spring. The adjusting screw assembly will then slip off.

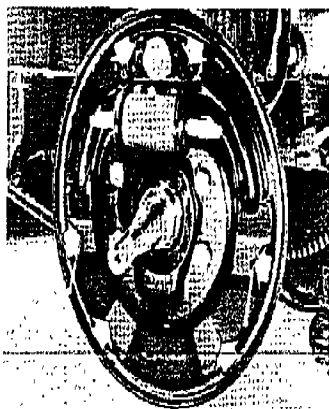
Install adjusting screw and adjusting screw spring.



Use replacement shoes furnished by an authorized
Ford reconditioner

MADE RIGHT-TO FIT RIGHT-TO LAST LONGER

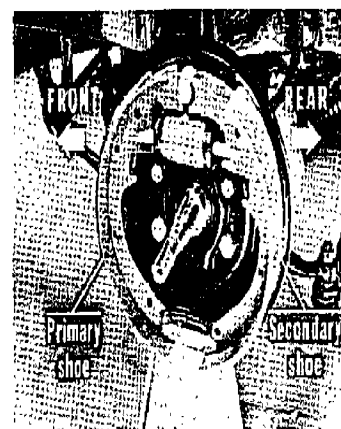
INSTALLING REPLACEMENT SHOES

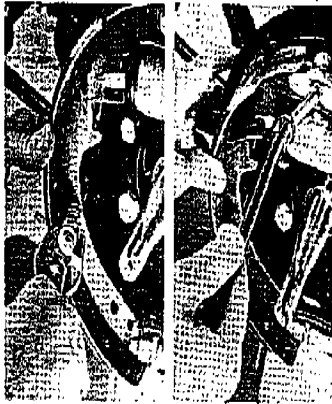


Lubricate all points of contact between brake shoes and other parts. **CAUTION:** Do not get grease on linings.

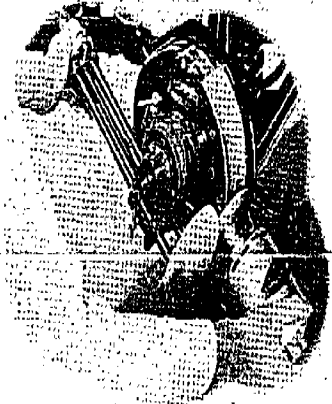
Check Shoe Position.

Primary shoe to front; secondary shoe to rear.





Install hold down pins, cups, springs and retracting springs.



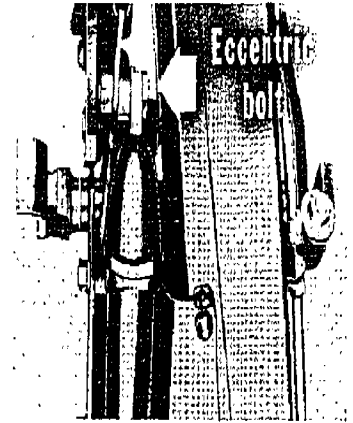
Grind Linings. Perfect drum-to-shoe mating results when the brake linings are accurately ground in place to match the inside diameter of the drum.

MAJOR ADJUSTMENT

THIS PROCEDURE automatically follows brake shoe replacement. Also, make a major adjustment when a minor adjustment fails to restore proper pedal reserve.

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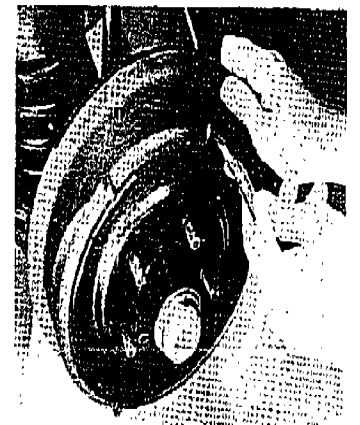
Free Play Adjustment. If brake pedal free play is less than one-quarter inch or more than one-half inch, adjust the eccentric bolt at the rear of the master cylinder.



Fill Master Cylinder.



Wedge secondary shoe forward with a 0.010" feeler gauge. The 0.010" feeler is inserted between lining and drum through lining clearance slot, then moved up to wedge shoe forward.



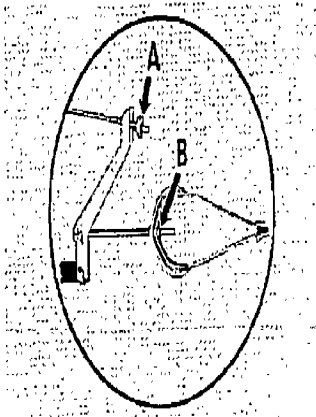
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Expand the shoes. Use adjusting tool to turn adjusting screw to point where the primary shoe is secure against the drum and the secondary shoe snug against the feeler gauge.



Back Off Shoes. Remove feeler gauge and back off shoes until a clearance of 0.010" may be obtained at points one and one-half inches from each end of the secondary shoe. If proper clearance cannot be obtained by this procedure, an anchor pin adjustment is necessary.



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Remove Slack from parking brake cable. Nut adjustments at points "A" and "B" permit easy take up of slack. **CAUTION:** Stop when slack is out, otherwise you might cause brakes to drag.

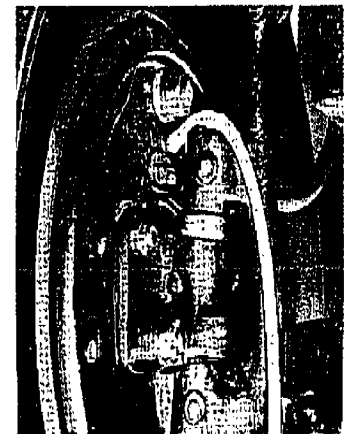
BLEEDING THE HYDRAULIC SYSTEM

Bleeding eliminates air pockets in the system. This procedure also follows wheel and master cylinder work. Illustrated here is the pressure tank system of bleeding, a method requiring the work of only one mechanic.

Attach pressure tank hose to master cylinder.



Attach hose to wheel cylinder bleeder valve.



Start pressure tank. *Close the bleeder valve when bubbles no longer appear in fluid in jar holding end of bleeder tube.*



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SPONGY PEDAL ACTION

SPONGY PEDAL action means that air has entered the hydraulic system. One place air can enter is at the wheel cylinder rubber piston cup. Here's how this happens:



WHEN EXCESSIVE lining-to-drum clearance exists and the parking brake is pulled up, air is sucked in past the wheel cylinder rubber piston cup. Find out the cause of the excessive clearance. Correct it. Bleed the system.

HYDRAULIC LEAKS

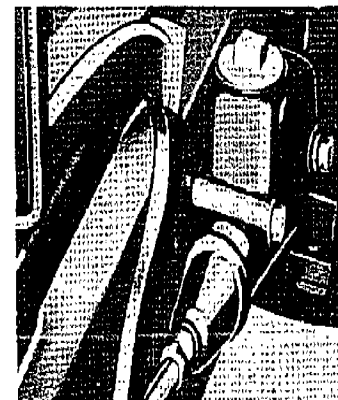


Symptom is NO BRAKES.

Inspect hydraulic lines for breaks or cracks.



Inspect master cylinder for breaks or cracks in the housing or at line connections.





Inspect wheel cylinder assembly for worn rubber piston cup or cross-threaded bleeder screw.

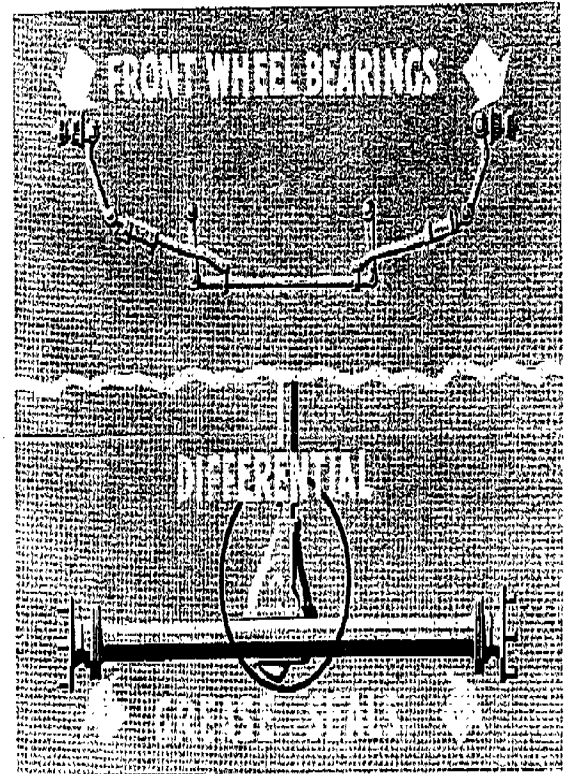
THE LUBE MAN PLAYS A KEY PART IN UNCOVERING OTHER BRAKE TROUBLE SYMPTOMS ... GREASE OR FLUID LEAKS



Check brake drums and backing plates for signs of grease leaks.

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GREASE LEAKS AND FLUID LEAKS BOTH NECESSITATE LINING REPLACEMENT



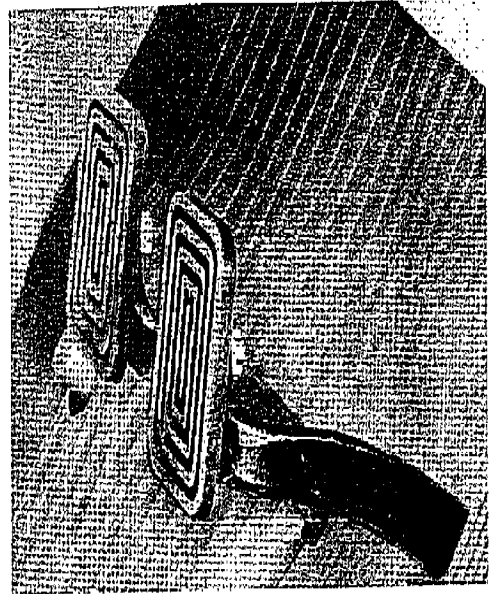
Causes of Grease Leaks: Worn grease seals; too much lubricant in differential; wrong lubricant in front wheel bearings.

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ROAD TEST THE CAR

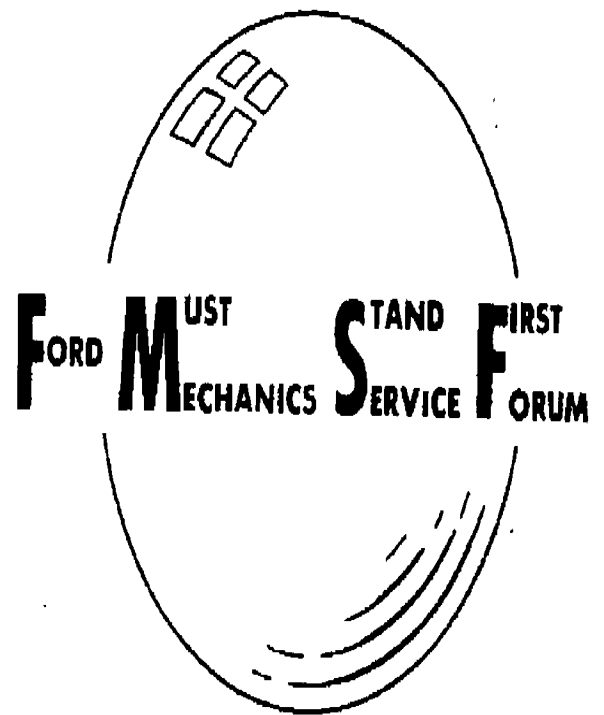


AFTER COMPLETING any brake repair or adjustment procedure, road test the car. This is the final proof of how well and completely you've done your work.



REMEMBER THIS: the brake pedal is as dumb as an onion . . . it won't tell you a thing unless you . . . **STEP ON IT!**





COMPLIMENTS OF

YOUR HEADQUARTERS FOR FRIENDLY SERVICE

AND

GENUINE FORD PARTS

LITHO IN U.S.A.