




LAB - Drum Brake Job

Students: 1. _____
 2. _____
 3. _____

Date: _____
 Block: _____



Fill in each box with the appropriate information.

Be sure to have the Instructor's initials before moving on to the next step. These are there to ensure everything is SAFE and CORRECT. Each team member must be able to answer questions from your instructor to receive credit for this lab.

VEHICLE IDENTIFICATION			
Year:		Make:	
Model:		Mileage:	
VIN Number:			
Maximum Brake Drum Thickness:			
BEFORE YOU BEGIN			
SAFETY  Jack Stands  2-Post  4-Post	<input type="checkbox"/> Brake dust may contain ASBESTOS: a very fine, cancerous particle that NEVER leaves your body. Make extra effort to ensure the brake dust does not become airborne. <input type="checkbox"/> Brakes are done PER AXLE. <input type="checkbox"/> New SHOES should go on new or freshly machined DRUMS <input type="checkbox"/> Assembly must be WHITE-GLOVE CLEAN (no fingerprints, even!) <input type="checkbox"/> Wheel Cylinders should be SERVICED or REPLACED if PISTONS do not move FREELY		
	A BRAKE JOB MUST BE DONE 100% CORRECTLY YOU ARE RESPONSIBLE FOR THEIR SAFETY		
	<input type="checkbox"/> The Instructor MUST see your work BEFORE THE WHEELS ARE REPLACED <input type="checkbox"/> Raise and support the vehicle properly – see you instructor if you are unsure IMPROPER USE OF THE HOIST or JACK STANDS CAN BE FATAL! CORRECT SETUP IS CRITICAL FOR YOUR SAFETY AND THE SAFETY OF OTHERS! GET YOUR INSTRUCTOR TO HELP!		
<u>Jack Stands:</u> Raise the vehicle with jack in correct place, use jack stands in correct place <u>Two-Post Hoists:</u> Position & lock arms, raise slightly, check stability, raising, set on locks. <u>4-Post Hoists:</u> In Gear/Park, E-Brake on, wheel chocks, raise, set on locks.			
STOP!!!		INSTRUCTOR'S INITIALS:	

1

- Remove Wheels
- Is the brake drum [SPLIT] or [One Piece] ?? **CIRCLE YOUR ANSWER BELOW**

SPLIT DRUM?	ONE PIECE?
<p>This type is separate from the hub. It slips over the wheel studs and is secured by the wheel.</p> 	<p>This drum and the hub are one piece. It is secured by the wheel bearing. The wheel bearing nut might be castellated and set ~just~ snug and secured by a cotter pin, or significantly torqued and set by "staking" into a keyway.</p> 

- Remove the brake drum.
 - o **NOTE:** If the drum doesn't come off, first remove the E-Brake
 - o **NOTE:** Brake shoes can wear a groove into the drum which prevents it from coming off. In this case, the brake adjustment will have to be backed off.

- CHECK that the bleeder screws can be cracked loose. BE GENTLE – there are tricks to un-sticking them, but it's harder if you round the hex or shear them off.
- Give one of the brake shoes a smack with your hand to see if the pistons in the wheel cylinders are seized.
 - o Sometimes they can be rebuilt, but it is often not cost-effective
 - o See your instructor if the cylinder appear seized

WHEEL CYLINDERS MOVE FREELY?

[YES] [NO]

CAUTION

Brake bleeder screws are fragile. If you shear one off, you might have to replace the entire wheel cylinder or caliper!!

To loosen a stuck bleeder screw, try these methods:

1. Soak with WD40 and let sit for a while
2. Apply pressure with a wrench and tap the top of the bleeder with a hammer
3. Apply pressure with a wrench and tap the base of the wheel cylinder with a blunted air-chisel
4. Heat bleeder screw with a torch and allow to cool

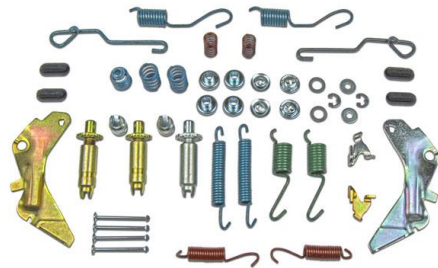
- INSPECT the new BRAKE SHOES. Do the **LOOK** and **MEASURE** exactly the same? **NEVER** get into a project **ASSUMING** the parts are correct – mistakes happen!

BRAKE SHOES LOOK EXACTLY THE SAME

[YES] [NO]

Brake Shoe WIDTH: _____ inches

Brake Shoe LENGTH: _____ inches

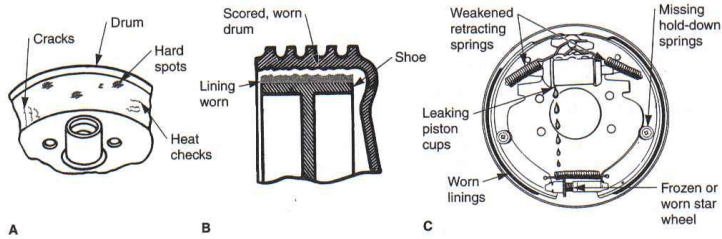


- INSPECT ALL SPRINGS AND HARDWARE. Anything broken, missing, or excessively corroded must be replaced

STOP!!!

INSTRUCTOR'S INITIALS:

- Inspect the Brake Drum for any defects (examples:)



Defects you found:

- Brake drums have a maximum thickness. They may warp easily, or fail completely.
- Maximum thickness is often cast into the drum itself. If it is not there or cannot be read, you must consult the Service Manual, AllData, or other resources to find the specification.

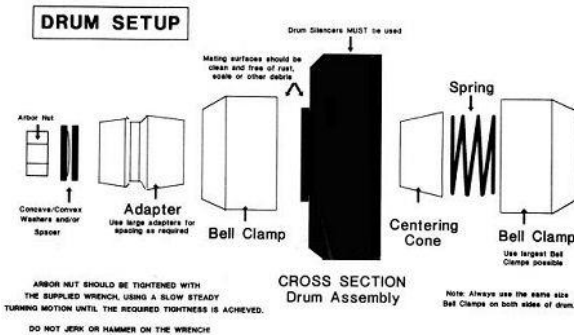
Maximum Brake Drum Diameter:
 _____ [inches] or [mm]

- Use a Brake Drum Micrometer to measure:



Measured Brake Drum Diameter:
 _____ [inches] or [mm]
Circle: [GOOD] [BAD]

- Measure the brake drum inner diameter at the nastiest, largest, most worn diameter. ~Most~ brake drums in good shape are machined around 0.010" (0.25mm) or so
- Set up the brake drum as shown below
 - Wire brush the drum center so it centers on the Cone perfectly
 - Wire brush the drum mounting surface so it rides flat on the Bell Clamp perfectly
 - Wrap wide rubber band (vibration damper) around the drum
 - Install the correct cutting arm
 - GET YOUR INSTRUCTOR TO CHECK YOUR SETUP!!



STOP!

INSTRUCTOR'S SIGNATURE:

- Take only as light a cut as you can get away with. You want a smooth finish, WITHIN spec
- **WHILE** the machine is cutting, **go take care of the shoes.**

"Waiting? Waiting don't pay the bills!"

- When you hear the machine stop, inspect it and cut again if need be, then set up the next drum



SERVICE ONE SIDE AT A TIME

THIS KEEPS ONE ASSEMBLED BRAKE TO COMPARE

- Remove the UPPER (Primary and Secondary) return springs, adjusting cable or lever, etc.
- Lay out ALL PARTS IN ORDER to simplify reassembly.
- Brake shoes are usually held down by a small spring that needs to be compressed and turned to release them. You will need to hold the locating pin on the back side to do this.

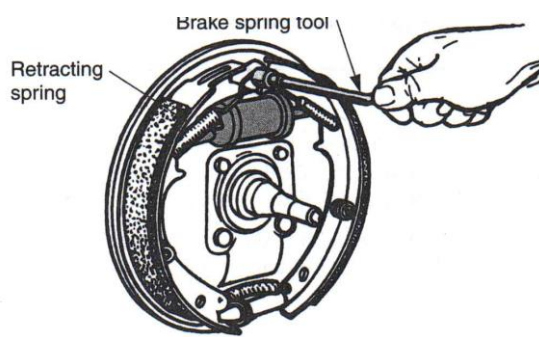


Figure 2. Use a spring tool to force the retracting springs off the anchor.

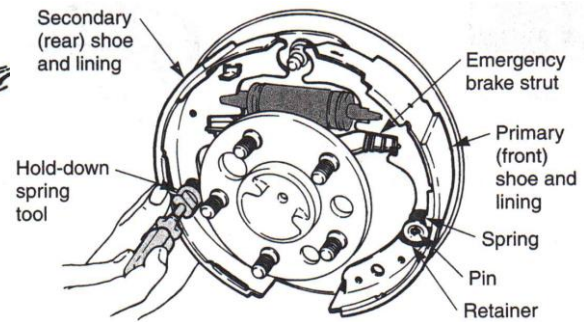


Figure 3. Push in and turn the tool to remove the hold-down springs. Use your finger to hold the pin on the rear of the backing plate.

- The brake shoes, STAR WHEEL, and lower return springs can now be removed as one unit
- Clean the BAKING PLATE with a rag, and place some Never-Seize on the raised bumps on the backing plate where the brake shoes sit.
- UNTHREAD the Star Wheel Adjuster, wire-wheel the threads clean, coat with Never-Seize, then thread back together.
- If the Parking Brake (Emergency Brake) hardware is connected to the old shoe, remove them without damaging the parts, and transfer them to the correct new shoe – use Never-Seize. *(There are tricks to doing this – ASK!)*

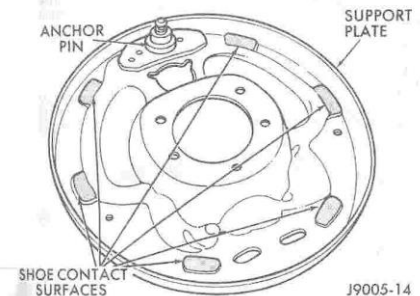


Fig. 3 Shoe Contact Surfaces-9 Inch Brake Support Plate

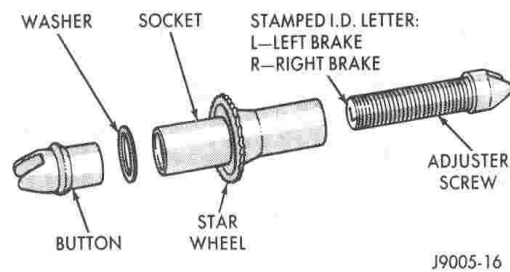


Fig. 5 Adjuster Screw Components-9 Inch Brake

STOP!

INSTRUCTOR'S SIGNATURE:

REASSEMBLY

4

- Fingerprints have skin oils. Oil is not good on brakes. DO NOT touch the brake surfaces when assembling
 - This is usually a whole lot of fun. If you can call it that.
 - I usually start by attaching one shoe to the backing plate
 - Small shoe goes to the front
 - Then I connect the e-brake cable to the lever (if equipped)
 - Then I attach the star wheel adjuster and its spring to the bottom of the attached shoe and the unattached shoe, and attach the second shoe
 - Then I attach the retracting springs and whatever else goes in.

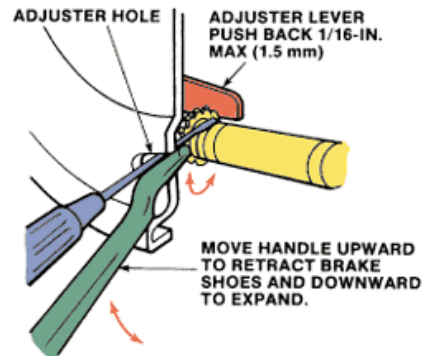
This is about where you'll wish you paid more attention to how it came apart.

- Have your wise, patient, and persevering instructor check over your work.

STOP!!!**INSTRUCTOR'S INITIALS:**

5

- Spray all your handiwork down with Brakleen
- Slip the freshly machined brake drum in place
- Adjust the brake shoes with the Star Wheel Adjuster, such that the brakes start to drag on the drum when rotating it by hand.

**STOP!!!****INSTRUCTOR'S INITIALS:****CONFIRMATION**

6

- Test the vehicle's brakes and ensure they work properly
- Test the vehicle's e-brake to ensure it works properly
 - 90% of the time, a e-brake that doesn't hold is because of worn or poorly-adjusted drum brakes)

What are three things you learned in this lab?

- 1.
- 2.
- 3.