CHAPTER 11
Drum Brake Diagnosis and Service

FIGURE 11.1 An aqueous-based (water-based) brake washer can be used to wet down the outside of the brake assembly before removing the drum.

FIGURE 11.2 Tinnerman nuts are used at the assembly plant to prevent the brake drum from falling off until the wheels are installed.
FIGURE 11.3 Turning the bolts that are threaded into the brake drum forces the drum off of the hub.

FIGURE 11.4 If the brake shoes have worn into the drum, the adjuster can be backed in after removing the access plug.

FIGURE 11.5 Using side-cut pliers to cut the heads off of the hold-down pins (nails) from the backing plate to release the drum from the shoes.
FIGURE 11.6 A liquid soaking solvent, such as brake cleaner, should be used to wet the linings.

FIGURE 11.7 Using a brake spring tool to release a return (retracting) spring from the anchor pin.

FIGURE 11.8 A special tool, called a hold-down spring tool, being used to depress and rotate the retainer.
FIGURE 11.9 A typical rusting backing plate shoe pad. This can cause the brakes to squeak when the shoes move outward during a brake application and again when the brake pedal is released.

FIGURE 11.10 Applying lithium grease to the raised pads on the backing plate.

FIGURE 11.11 A rule of thumb is that the lining should be at least the thickness of a nickel.
FIGURE 11.12 A tire tread depth gauge can be used to measure lining thickness. When measuring riveted linings, measure to the head of the rivets.

FIGURE 11.13 Cracked brake lining must be replaced.

FIGURE 11.14 The top spring is a good-looking spring because all coils of the spring are touching each other.
FIGURE 11.15 Exploded view of a typical wheel cylinder. Note how the flat part of the cups touches the flat part of the piston. The cup expander and spring go between the cups.

FIGURE 11.16 Many wheel cylinders are bolted to the support plate (backing plate). The O-ring seal helps keep water and dirt out of the drum brake.

FIGURE 11.17 This special tool makes it a lot easier to remove the wheel cylinder clip.
FIGURE 11.18 The rust inside this wheel cylinder will not affect the operation as it is located inside the working area of the sealing cups.

FIGURE 11.19 When new, thicker brake linings are installed, the pistons and cups are forced back into the wheel cylinder and pushed through the sludge that is present in every cylinder.

FIGURE 11.20 This starwheel adjuster is damaged and must be replaced.
FIGURE 11.21 Pre-assembly of the starwheel adjuster with its connecting spring often helps when reassembling a drum brake.

FIGURE 11.22 Sometimes it is necessary to cross the shoes when pre-assembling the starwheel adjuster and connecting spring.

FIGURE 11.23 Brake spring pliers being used to install the connecting spring.
FIGURE 11.24 Notice that the brake shoe is not contacting the anchor pin. This often occurs when the parking brake cable is stuck or not adjusted properly.

FIGURE 11.25 The first step in using a brake shoe clearance gauge is to adjust it to the drum inside diameter and tighten the lock screw.

FIGURE 11.26 Place the gauge over the shoes and adjust the brakes until they contact the inside of the gauge.
FIGURE 11.27 To prevent getting grease on the lining, the wise service technician covers the friction material with masking tape.

Tools needed to service a drum brake assembly include brake tools, silicone grease, wheel lug nut sockets, and torque-limiting adapters or a torque wrench.

After safely hoisting the vehicle to chest height, remove the brake drum.
Remove the primary (forward facing) shoe return spring, using a brake tool. Then, remove the secondary return spring.

Remove the parking brake strut along with the antirattle spring.

Use a brake tool to depress the hold-down spring, and then rotate it until the slot in the retainer lines up with the flattened part of the hold-down pin.
Removing the primary brake shoe plus the starwheel adjuster and connecting spring.

When the secondary lining hold-down spring is removed, the adjusting lever and pawl return spring can be removed.

The parking brake lever can now be disconnected from the secondary brake shoe.
Check the wheel cylinder for leakage. This wheel cylinder is relatively new and not leaking.

Clean all six brake shoe ledges. Lubricate the ledges with silicone brake grease.

Many technicians prefer to assemble the connecting spring and starwheel adjuster to both shoes to help in the reinstallation.
Attaching the parking brake lines to the secondary shoe. The assembled parts at the bottom help keep everything together.

Installing the secondary shoe hold-down spring.

Installing the secondary shoe return spring. Note that the primary return spring has already been installed.
After installing the brake shoes and springs, use a drum/shoe clearance gauge and set it to the inside diameter of the drum.

Adjust the starwheel adjuster until the linings contact the drum brake shoe clearance gauge.

After installing the drum, it may be necessary to make the final adjustment using a brake adjusting tool (spoon).
After completing the brake service, be sure to cover the brake adjustment opening to prevent water from getting into the brake.