

## SECTION 8-D BRAKE REPLACEMENT AND REPAIR PROCEDURES

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### SERVICE BULLETIN REFERENCE

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### 8-16 REPLACE OR RELINE BRAKE SHOES

#### a. Matched Replacement Linings

The most satisfactory method of replacing brake lining is to install new shoe and lining assemblies. This insures brake shoes that are not distorted through use, and linings properly riveted to shoes and ground to correct radius by accurate factory machinery.

Each brake shoe and lining set listed under Group 5.017 is packed in a carton containing two primary and two secondary shoe and lining assemblies, enough for two wheels. Sets are available in standard size and also in .030" over-size for use where brake drums have been repaired.

Use brake shoe lining sets listed under Group 5.018 if the old brake shoes are to be relined. Each lining set is packed in a carton containing two primary and two secondary linings, enough for two wheels. Linings are shaped, drilled, and ground to correct thickness and radius, and are packaged with enough rivets for installation on shoes. Linings sets are available in standard and .030" oversizes.

To assure an adequate supply, several optional types of brake shoe lining have been approved for production and service. Since the optional types of lining have slightly different characteristics it is important to use primary and secondary shoe linings that are matched according to engineering specifications, and to use the same type of linings on right and left sides

at front or rear end of car. It is not possible to identify the various types of lining by inspection; however, each carton listed under Groups 5.017 and 5.018 contains correctly matched primary and secondary linings. The parts from several different cartons should not be used at one end of a car; however the linings at front and rear brakes do not have to be of the same type.

#### b. Selection of Brake Lining

Brake linings are made of asbestos for its heat resisting qualities and compounds of bonding material for strength. Some bonding materials are used for their lubricating qualities to guard against drum scoring while others are used to control the friction producing property of the lining, called "coefficient of friction." Good molded linings also have imbedded particles of material used to control friction and wear. When linings are ground, some of the surface particles may be pulled out, giving a pitted appearance. These pits do not affect lining efficiency.

The heat generated by friction will produce different effects in different compounds of bonding material. Some compounds increase friction with increased temperature, which might cause grabbing or locking. Other compounds lose friction with increased temperature, which might cause materially lowered braking power. Brake lining compounds must be carefully selected to produce the braking friction required at the temperatures normally attained in *each vehicle application*.

Since the many factors which govern the selection of brake lining vary widely in different vehicle designs, it is impossible to compound one lining which will work satisfactorily on all cars. Buick engineered brake lining has been selected after exhaustive tests of all types of lining and with complete consideration of all the requirements existant in the various Buick models. The service man does not have the facilities for making similar tests and improving on the selection of lining; therefore *the only safe rule to follow is to use Buick engineered brake lining.*

### a. Removal and Inspection

**NOTE:** When paragraph references in parentheses ( ) have an asterisk (\*) the operation referred to is additional work not covered by the standard replacement operation.

1. Jack up car in a safe manner, remove wheel, then remove brake drum (rear) or drum and hub assembly (front). **NOTE:** Stops located on the backing plates will prevent pistons from leaving the wheel cylinders; however, brake pedal must not be operated while a brake drum is removed.

2. Unhook shoe return springs from anchor pin, using Brake Spring Remover KMO 526 or large pliers. Remove shoe hold down springs, spread shoes to clear wheel cylinder connecting links, remove parking brake strut (rear only), and remove shoes from backing plate. Disconnect cable from parking brake lever (rear only). See figure 8-10.

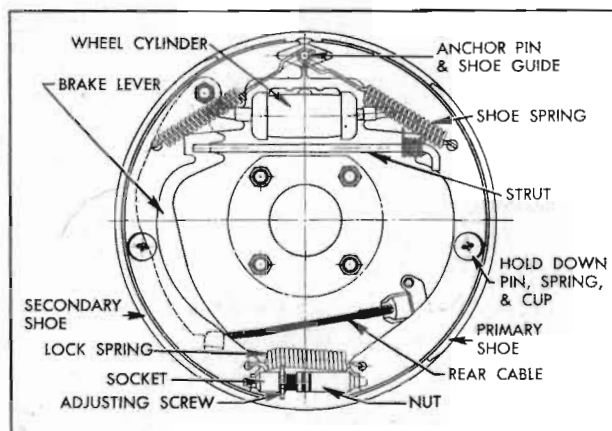


Figure 8-10—Rear Wheel Brake Assembly—Right

3. Separate the brake shoes by removing adjusting screw and lock spring. Remove parking brake lever from secondary brake shoe (rear lever (rear only)). See figure 8-10.

4. Clean all dirt out of brake drum, using care to avoid getting dirt into front wheel bearings. Inspect drums and replace or recondition if required (\*par. 8-17). If front drum and hub is removed, inspect wheel bearings and oil seal packings and replace faulty parts (\*par. 6-14).

5. Carefully pull lower edges of wheel cylinder boots away from cylinders and note whether interior is wet with brake fluid. Fluid at this point indicates leakage past piston cup requiring overhaul of wheel cylinder (\*par. 8-18).

6. If working at rear wheels, inspect backing plate for oil leak past wheel bearing oil seals. Correct any leak by installation of new seals (\*par. 5-9).

7. Check all backing plate attaching bolts to make sure they are tight. Clean all rust and dirt from shoe contact surfaces on plate, using fine emery cloth.

### b. Relining Brake Shoes

If old brake shoes are to be relined, inspect shoes for distortion and for looseness between the rim and web; these are causes for discarding any shoe. If shoes are serviceable, be governed by the following points in installing new linings:

1. Remove old linings by drilling out rivets. Punching rivets out will distort shoe rim. Thoroughly clean surface of shoe rim and file off any burrs or high spots.

2. Use only genuine Buick brake lining and the rivets included in lining package which are of correct size. The rivets must fit the holes and the solid body of rivet should extend through the shoe rim, but no farther.

3. Keep hands clean while handling brake lining. Do not permit oil or grease to come in contact with lining.

4. Start the riveting at center of shoe and lining and work toward the ends. Use a roll set for riveting; a star set might split the tubular end and then the rivet would not fill the hole. The primary lining is shorter than secondary lining, therefore the rivet holes at each end of shoe rim are not used.

5. After riveting is completed, lining must seat snugly against shoe with no more than .005" separation midway between rivets. Check with a .004" (permissible) and a .006" (no go) feeler gauge.

6. It is not necessary to grind Buick lining after installation on shoes as linings are correctly ground in production. It is advisable

however, to place shoes in drum and check for proper arc and fit in drum, using feeler gauges. No more than .004" clearance should exist between lining and drum at any point.

### c. Installation and Adjustment

1. If working on rear brakes, lubricate parking brake cable (par. 8-14).

2. On rear brakes only, lubricate fulcrum end of parking brake lever and the bolt with Bendix or Delco Brake Lubricant, or Lubriplate, then attach lever to secondary shoe with bolt, spring washer, nut, and Pal nut. Make sure that lever is free moving. See figure 8-10.

3. Connect brake shoes together with lock spring, then place adjusting screw, socket, and nut in position. The socket and star wheel must be adjacent to primary shoe on front brake, and adjacent to secondary shoe on rear brake.

4. Attach brake shoes to backing plate with hold down springs, pins, and cups, at the same time engaging shoes with wheel cylinder connecting links. The primary shoe (short lining) goes forward. On rear brakes, connect cable to parking brake lever and install strut between lever and primary shoe as installation is made. See figure 8-10.

5. If old brake shoe return springs are nicked, distorted, or of doubtful strength it is advisable to install new ones. Hook springs in shoes and cover end of anchor pin, using large pliers and being careful not to nick or distort springs.

6. Pry shoes away from backing plate and lubricate shoe contact surfaces with a thin coating of Bendix or Delco Brake Lubricant, or Lubriplate. On rear brakes, sparingly apply same lubricant where brake cable contacts backing plate.

7. Install brake drum and wheel. If working on front brake lubricate and adjust front wheel bearings (par. 6-14). Remove adjusting hole cover from backing plate.

8. Centralize brake shoes and set anchor pin, then adjust all brake shoes and brake cable as described in paragraph 8-15, steps 17 through 22.

**IMPORTANT:** *Brakes must not be severely applied immediately after installation of new brake shoes or linings. Severe application may permanently injure new linings and may score brake drums. When linings are new they must be given moderate use for several days until nicely burnished.*

## 8-17 INSPECTING AND RECONDITIONING BRAKE DRUMS

Whenever brake drums are removed they should be thoroughly cleaned and inspected for cracks, scores, deep grooves, and out-of-round. Any of these conditions must be corrected since they can impair the efficiency of brake operation and also can cause premature failure of other parts.

### a. Cracked Drum

A cracked drum is unsafe for further service and must be replaced. Welding a cracked drum is not recommended.

### b. Scored Drum

Smooth up any slight scores by polishing with fine emery cloth. Heavy or extensive scoring will cause excessive brake lining wear and it will probably be necessary to rebores in order to true up the braking surface.

### c. Grooved Drum

If the brake linings are little worn and drum is grooved, the drum should be rebored just enough to remove grooves and the ridges in the lining should be lightly removed with a lining grinder.

If brake linings are more than half worn, but do not need replacement, the drum should be polished with fine emery cloth but should not be rebored. At this stage, eliminating the grooves in drum and smoothing the ridges on lining would necessitate removal of too much metal and lining, while if left alone, the grooves and ridges match and satisfactory service can be obtained.

If brake linings are to be replaced, a grooved drum should be rebored for use with oversize linings (subpar. e, below). A grooved drum, if used with new lining, will not only wear the lining but will make it difficult, if not impossible, to obtain efficient brake performance.

### d. Out-of-Round or Tapered Drum

An out-of-round drum makes accurate brake shoe adjustment impossible and is likely to cause excessive wear of other parts of brake mechanism due to its eccentric action. An out-of-round drum can also cause severe and very irregular tire tread wear.

A drum that is more than .010" out-of-round on the diameter is unfit for service and should be rebored (subpar. e, below). Out-of-round

as well as taper and wear can be accurately measured with an inside micrometer fitted with proper extension rods.

When measuring a drum for out-of-round, taper, and wear, take measurements at the open and closed edges of machined surface and at right angles to each other. Standard drums are machined to an inside diameter of 11.997" to 12.003", with runout of braking surface held within .005" total indicator reading.

#### e. Reboring Brake Drum

If drum is to be rebored for use with standard size brake linings which are worn very little, only enough metal should be removed to obtain a true, smooth braking surface. If drum has to be rebored more than .010" over the standard diameter (over 12.013"), it should be rebored to .030" oversize and the brake lining should be replaced with .030" oversize lining.

A brake drum must not be rebored more than .060" over the standard diameter (12.063" max.) since removal of more metal will affect dissipation of heat and may cause distortion of drum. Buick brake lining is not furnished larger than .030" oversize and this will not work efficiently in drums bored more than .060" oversize.

Brake drums may be refinished either by turning or grinding. Best brake performance is obtained by turning drums with a very fine feed. Ground and polished drums do not wear in as readily as turned drums and are more likely to cause unequal braking when new. To insure maximum lining life, the refinished braking surface must be smooth and free from chatter or tool marks.

Run-out of the refinished surface of brake drum must not exceed .005" total indicator reading. Run-out of the open edge (opposite the disk) of drum must not exceed .030".

#### f. Brake Drum Balance

During manufacture, brake drums are balanced within 6 inch ounces by welding weights, as required, to the disk near the rim. These weights must not be removed.

After drums are rebored, or if difficulty is experienced in maintaining proper wheel balance, it is recommended that brake drums be checked for static balance. Drums out of balance more than 6 inch ounces may be corrected by installation of service balance weights as shown in figure 8-11. These balance weights are furnished in three sizes under Group 5.810.

Brake drums may be checked for balance on a machine suitable for balancing wheels.

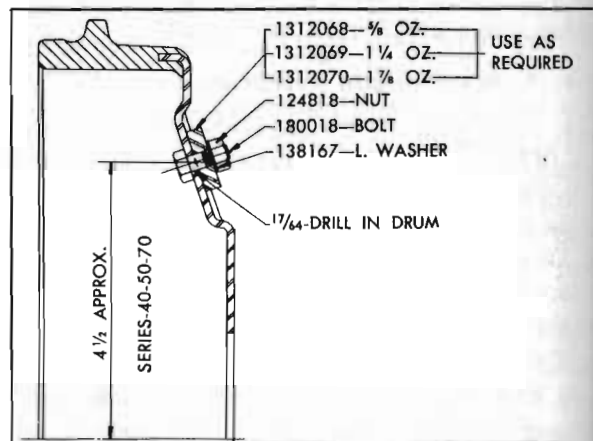


Figure 8-11—Brake Drum Balance Weights—Service Application

### 8-18 BRAKE WHEEL CYLINDER OVERHAUL

1. Remove wheel, drum, and brake shoes. Be careful not to get grease or dirt on brake lining.
2. Disconnect brake pipe or hose from wheel cylinder and cover opening with tape to prevent entrance of dirt. Remove wheel cylinder from backing plate.

3. Remove links, boots, pistons, cups and spring from cylinder. Remove bleeder valve.

4. Discard rubber boots and piston cups. Thoroughly clean all other parts with Declen Flushing Fluid, hydraulic brake fluid or a good grade of alcohol. CAUTION: Do not use anti-freeze alcohol, gasoline, kerosene, or any other cleaning fluid that might contain even a trace of mineral oil.

5. Inspect pistons and cylinder bore for scores, scratches, or corrosion. Light scratches may be polished with crocus cloth. Do not use emery cloth or sand paper. Slight corrosion may be cleaned with fine steel wool and alcohol. If scratches or corroded spots are too deep to be polished satisfactorily the cylinder should be replaced since honing is not recommended for reasons given in paragraph 8-19, step 6.

6. Dip internal parts in brake fluid and reassemble wheel cylinder. When installing piston cups use care to avoid damaging the edges. NOTE: Front wheel cylinder pistons and cups are 1/8" diameter and rear wheel cylinder parts are 1" diameter.

7. Install wheel cylinder on brake backing plate and connect brake pipe or hose.

8. Install brake shoes, drum, and wheel, then flush and bleed hydraulic system (par. 8-10).

9. Adjust brakes (par. 8-12) then road test car for brake performance (par. 8-5 and 8-6).

### 8-19 BRAKE MASTER CYLINDER OVERHAUL

1. Jack up both ends of car in a safe manner.

2. Disconnect master cylinder inner and outer push rods at pedal adjusting nut (fig. 8-7). Disconnect brake pipe from master cylinder and tape end of pipe to prevent entrance of dirt. Remove master cylinder from frame side rail.

3. Remove filler cap nut and drain all fluid from master cylinder. Remove head nut, check valve and spring. Turn the boot back, remove lock ring, then remove push rod, stop plate, piston, and primary cup. See figure 8-12.

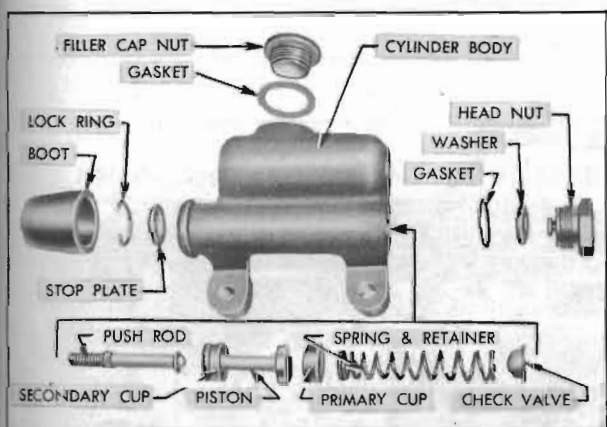


Figure 8-12—Master Cylinder—Disassembled

Discard head nut gasket and washer, check valve, spring and retainer, piston and rubber cups, lock ring, and boot. These parts are furnished in the master cylinder repair kit (Group 4,649).

4. Thoroughly clean all other parts with De-cene or alcohol. **CAUTION:** Do not use anti-freeze alcohol, gasoline, kerosene, or any other cleaning fluid that might contain even a trace of mineral oil.

5. Inspect cylinder bore for scores, scratches, or corrosion. Light scratches in cylinder bore may be polished with crocus cloth. Do not use emery cloth or sandpaper. Slight corrosion may

be cleaned with fine steel wool and alcohol.

6. If scratches or corroded spots are too deep to be polished satisfactorily the cylinder should be replaced since honing is not recommended and oversize pistons and cups are not furnished for service.

Wheel and master cylinder bores have a hard, highly polished "bearingized" surface produced by diamond boring followed by rolling under very heavy pressure. Honing destroys the bearingized surface, leaving a softer and rougher surface which will cause more rapid wear of pistons and rubber cups. Higher friction produced by the rougher surface will also reduce braking power for a given pressure on brake pedal.

The maximum allowable clearance between piston and cylinder bore is .0055". If this clearance is increased by honing, the heavy pressure of brake fluid may force rubber of the cup into the clearance and cause sticking or early failure of the cup. If a choice must be made between honing or replacement of the cylinder, it must be remembered that while a new cylinder may be more expensive a honed cylinder may not give a satisfactory length of service.

7. Make certain that compensating port in cylinder is clear; however, do not run a wire through port as this may result in leaving a burr which will cut a groove in primary cup.

8. Install stop plate, lock ring, push rod and boot. Dip internal parts in brake fluid, then install piston with secondary cup, primary cup, spring with its retainer against primary cup, check valve, and head nut with rubber valve seat washer and nut gasket. Tighten head nut securely. See figure 8-12.

9. Check filler cap nut vent holes to make sure they are clear, then install cap nut and gasket.

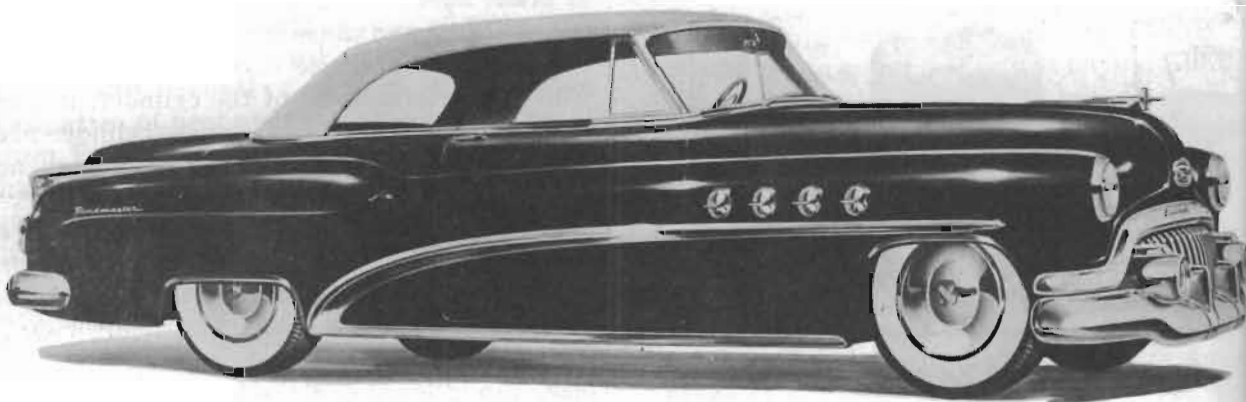
10. Install master cylinder on frame side rail. Connect brake pipe. Connect master cylinder push rods and adjust brake pedal for proper clearance (par. 8-11). Flush and bleed hydraulic system (par. 8-10).

11. Remove car jacks and road test car for brake performance (par. 8-5 and 8-6).

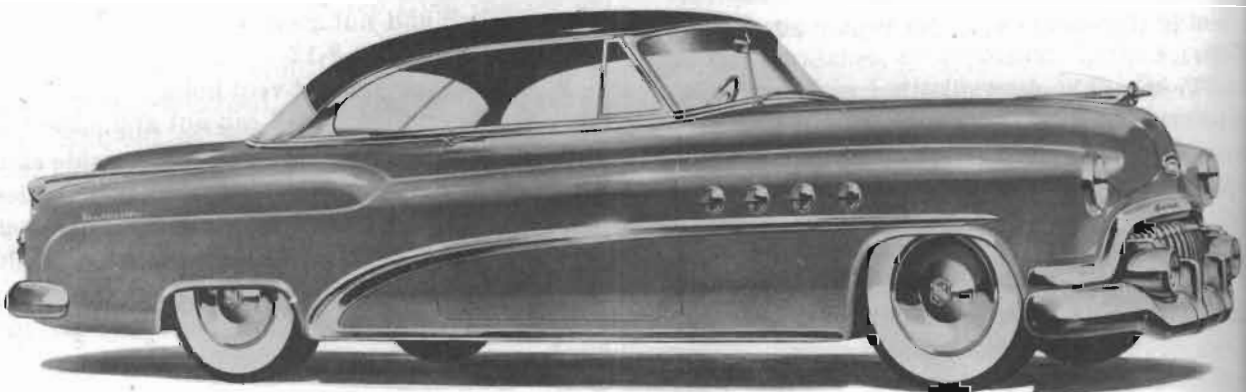
8-22 MODELS 72R, 76C, 76R



Model 72R



Model 76C



Model 76R