BRAKES

CONTENTS

Description

The 1965 Imperial and Chrysler Models have a self-adjusting servo contact, two shoe, internal expanding brake. The lower ends of the brake shoes are connected by a tubular star wheel adjusting screw, (Figs. 1 and 2). Police vehicles with heavy duty brakes are not self-adjusting.

SERVICE DIAGNOSIS

Condition	Possible Cause	Correction
SERVICE BRAKES		
PEDAL GOES TO THE FLOOR	(a) Fluid low in reservoir.	(a) Fill and bleed the master cylinder.
	(b) Excessively worn brake lining.	(b) Reline and adjust the brakes.
	(c) Improperly adjusted brake.	(c) Repair or replace self-adjuster as required.
	(d) Leaking wheel cylinders.	(d) Recondition or replace the wheel cylinder and replace both brake shoes.
	(e) Loose or broken brake lines.	(e) Tighten all brake fittings or replace the brake line.
	(f) Air in hydraulic brake system.	(f) Fill and bleed the hydraulic brake system.
	(g) Leaking or worn master cylinder.	(g) Recondition or replace the master cylinder and bleed the hydraulic system.
SPONGY BRAKE PEDAL	(a) Air in hydraulic system.	(a) Fill the master cylinder and bleed the hydraulic system.
	(b) Improper brake fluid (low boiling point).	(b) Drain, flush and refill with brake fluid.
	(c) Excessively worn or cracked brake drums.	(c) Replace all defective brake drums.
	(d) Broken pedal pivot bushing.	(d) Replace nylon pivot bushing.
BRAKES PULLING	(a) Incorrect brake adjustment.	(a) Adjust the brakes and check the fluid.
	(b) Brake drums out of round.	(b) Grind or replace the brake drums.
	(c) Brake shoes distorted.	(c) Replace the faulty brake shoes.
	(d) Contaminated lining.	(d) Replace the contaminated brake lining.
	(e) Unmatched brake lining.	(e) Match the primary, secondary and same type of lining on all wheels.
	(f) Restricted brake hose or line.	(f) Replace the plugged hose or brake line.
	(g) Front end out of alignment.	(g) Align the front end.
	(h) Broken rear spring.	(h) Replace the broken spring.
SQUEALING BRAKES	(a) Incorrect brake lining.	(a) Install matched brake lining.
	(b) Dust in brakes or scored brake drums.	(b) Blow out the brake assembly with compressed air and grind the brake drums.
	(c) Distorted brake shoes.	(c) Replace the brake shoes.
	(d) Bent brake support plate.	(d) Replace the support plate.
	(e) Broken or weak brake shoe return spring.	(e) Replace the return spring.

Condition	Possible Cause	Correction
SERVICE BRAKES (Continued)	(f) Weak or broken brake shoe retaining spring.	(f) Replace the retaining spring.
	(g) Glazed brake lining.	(g) Cam grind or replace the brake lining.
	(h) Saturated brake lining.	(h) Replace the saturated lining.
DRAGGING BRAKES	(a) Incorrect wheel or parking brake adjustment.	(a) Adjust the brakes and check the fluid.
	(b) Parking brakes engaged.	(b) Release the parking brakes.
	(c) Weak or broken brake shoe return spring.	(c) Replace the brake shoe return spring.
	(d) Brake pedal binding.	(d) Free up and lubricate the brake pedal and linkage.
	(e) Master cylinder cup sticking.	(e) Recondition the master cylinder.
	(f) Incorrect master cylinder push rod adjustment.	(f) Properly adjust the master cylinder push rod.
	(g) Obstructed master cylinder relief port.	(g) Use compressed air and blow out the relief port.
	(h) Saturated brake lining.	(h) Replace the brake lining.
	(i) Bent or out of round brake drum.	(i) Grind or replace the faulty brake drum.
HARD PEDAL	(a) Incorrect brake lining.	(a) Install matched brake lining.
	(b) Incorrect brake push rod adjustment.	(b) Adjust the brake push rod and check the fluid.
	(c) Frozen brake pedal linkage.	(c) Free up and lubricate the brake linkage.
	(d) Restricted brake line or hose.	(d) Clean out or replace the brake line or hose.
	(e) Brake booster inoperative.	(e) Recondition or replace the brake booster.
WHEEL LOCKS	(a) Loose or torn brake lining.	(a) Replace the brake lining.
	(b) Incorrect wheel bearing adjustment.	(b) Clean, pack and adjust the wheel bearings.
	(c) Wheel cylinder cups sticking.	(c) Recondition or replace the wheel cylinder.
	(d) Contaminated brake lining.	(d) Reline both front or rears or all four brakes.
BRAKES FADE (HIGH SPEED)	(a) Incorrect lining.	(a) Replace lining.
	(b) Distorted or out of round brake drums	(b) Grind or replace the drums.
	(c) Overheated brake drums.	(c) Inspect for dragging brakes.
	(d) Incorrect brake fluid (low boiling temperature).	(d) Drain, flush, refill and bleed the hydraulic brake system.
	(e) Saturated brake lining.	(e) Reline both front or rear or all four brakes.
PEDAL PULSATES BRAKE CHATTER	(a) Bent or out of round brake drum.	(a) Grind or replace the brake drums.
	(b) Loose support plate.	(b) Tighten the support plate bolts to the proper torque.
	(c) Bent support plate.	(c) Replace the support plate.
	(d) Distorted brake shoes.	(d) Replace the brake shoes.
	(e) Machine grooves in the contact face of the brake drum.	(e) Grind or replace the brake drum.
	(f) Contaminated brake lining.	(f) Replace either front or rear or all four brakes.
BRAKES DO NOT SELF ADJUST	(a) Adjuster screw frozen in the thread.	(a) Clean and free-up all thread areas.
	(b) Adjuster screw corroded at the thrust washer.	(b) Clean the threads and replace the thrust washer if necessary.
	(c) Adjuster lever does not engage star wheel.	(c) Repair, free up or replace adjuster as required.
PARKING BRAKES		
DRAGGING BRAKE	(a) Improper cable or brake shoe adjustment.	(a) Properly adjust the service brakes then adjust the parking brake cable.
	(b) Broken brake shoe return spring.	(b) Replace any broken return spring.
	(c) Broken brake shoe retainer spring.	(c) Replace the broken retainer spring.
	(d) Grease or brake fluid soaked lining.	(d) Replace the grease seal or recondition the wheel cylinders and replace both brake shoes.

Condition	Possible Cause	Correction
PARKING BRAKES (Continued)	(e) Sticking or frozen brake cable.	(e) Clean and lubricate the cables.
	(f) Broken rear spring.	(f) Replace the broken rear spring.
	(g) Bent or rusted cable equalizer.	(g) Straighten, or replace and lubricate the equalizer.
BRAKE WILL NOT HOLD	(a) Broken or rusted brake cable.	(a) Replace or clean and lubricate the brake cable.
	(b) Improperly adjusted brake or cable.	(b) Adjust brakes and cable as necessary.
	(c) Soaked brake lining.	(c) Replace the brake lining.
	(d) Ratchet or pedal mechanism worn.	(d) Replace pedal assembly.
POWER BRAKES		
DRAGGING BRAKES (ALL WHEELS)	(a) Brake shoes improperly adjusted.	(a) Adjust the brakes.
	(b) Brake pedal linkage binding.	(b) Free up the linkage.
	(c) Excessive hydraulic seal friction.	(c) Lubricate the seal.
	(d) Compensator port plugged.	(d) Clean out the master cylinder.
	(e) Sticking valve plunger.	(e) Free up and lubricate the valve plunger.
	(f) Improper booster push rod length adjustment.	(f) Adjust the push rod.
	(g) Fluid cannot return to master cylinder.	(g) Inspect the pedal return and push rod adjustment.
	(h) Parking brake not returning.	(h) Free up as required.
	(i) Improperly staked valve sleeve.	(i) Replace valve assembly.
GRABBING BRAKES	(a) Grease or brake fluid on linings.	(a) Inspect for a leak and replace the lining as required.
	(b) Sticking actuating valve.	(b) Free up the valve.
PEDAL GOES TO FLOOR (or almost to floor)	(a) Self-adjusters not operating.	(a) Inspect the self-adjuster operations.
	(b) Air in hydraulic system.	(b) Bleed the brakes.
	(c) Hydraulic leak.	(c) Locate and correct the leak.
	(d) Fluid low in master cylinder.	(d) Add brake fluid.
	(e) Shoe hanging up on rough platform.	(e) Smooth and lubricate the platforms.
	(f) Broken plunger stem.	(f) Replace valve plunger assembly.
HARD PEDAL (POWER UNIT TROUBLE)	(a) Faulty vacuum check valve.	(a) Replace the check valve.
	(b) Collapsed or leaking vacuum hose.	(b) Replace the hose.
	(c) Plugged vacuum fittings.	(c) Clean out the fittings.
	(d) Leaking vacuum chamber.	(d) Locate and correct the leak.
	(e) Diaphragm assembly out of place in housing.	(e) Position the diaphragm.
	(f) Vacuum leak in forward vacuum housing.	(f) Locate and correct the leak.
SELF-APPLICATION OF BRAKES WHEN ENGINE STARTS	(a) Leak in rear housing.	(a) Locate and correct the leak.
	(b) Diaphragm out of location in housings and allowing atmospheric pressure into rear chamber.	(b) Position the diaphragm.
	(c) Sticking or unseated actuating valve assembly.	(c) Free up the valve and seat properly.
GRUNTING NOISE IN POWER BRAKE ON APPLICATION	(a) Air in hydraulic system.	(a) Bleed the brakes.
	(b) Lack of valve plunger lubrication.	(b) Lubricate the plunger.
	(c) Fluid low in master cylinder.	(c) Add brake fluid.

SERVICE PROCEDURES

SERVICE BRAKES

Adjusting the Brakes

NOTE: Normally self-adjusting brakes will not require manual adjustment but in the event of a brake reline, it may be advisable to make the initial adjustment manually to speed up the adjusting time.

(1) Jack up the vehicle so all wheels are free to turn.

(2) Remove the rear adjusting hole cover from the backing plate on all of the brake supports of the vehicle.

(3) Be sure the parking brake lever is fully released, then back off the parking brake cable adjustment so there is slack in the cable.

(4) Insert the adjusting tool C-3784, into the star wheel of the adjusting screw. Move the handle of the tool downward until a slight drag is felt when the road wheel is rotated.

(5) Insert a thin screw driver into the brake adjusting hole and push the adjusting lever out of engagement with the star wheel (Fig. 3), while holding the adjusting lever out of engagement, back off the star wheel 10 to 12 notches to insure a free wheel with no brake shoe drag.

NOTE: Care should be taken not to bend the adjusting lever.

(6) Repeat the above adjustment at each wheel. The adjustment must be equal at all wheels. Install the adjusting hole covers in the brake supports.

(7) Tighten the parking brake cable adjusting nut until a slight drag is felt at the rear wheels, loosen the cable adjusting nut until both rear wheels can be rotated freely, then back off the cable adjusting nut two full turns.

Testing Automatic Adjuster Operation

Place the vehicle on a hoist, with a helper in the driver's seat to apply the brakes. Remove the plug from the rear adjustment slot in each brake support plate to observe the adjuster star wheel. Then, to

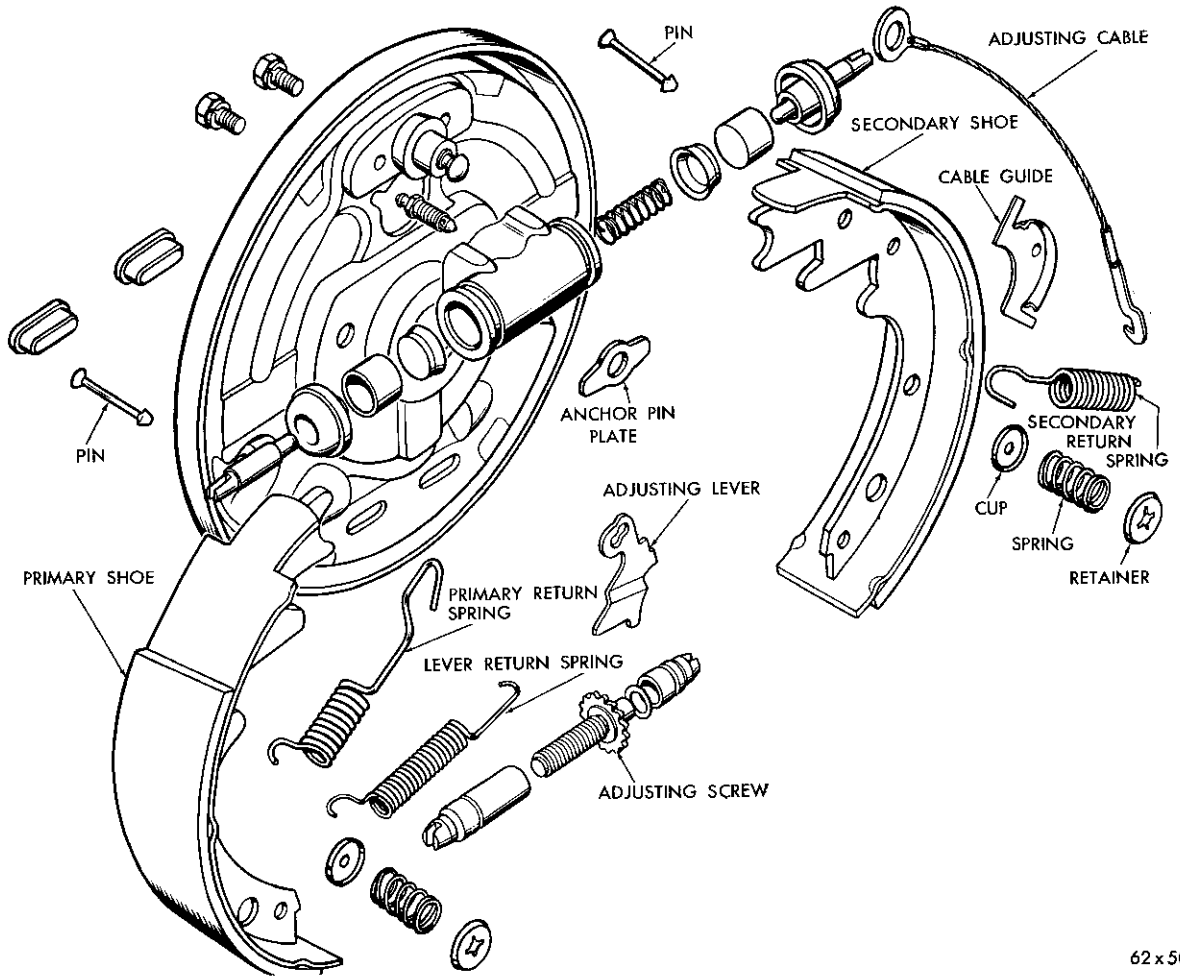

Fig. 1—Front Brake Assembly

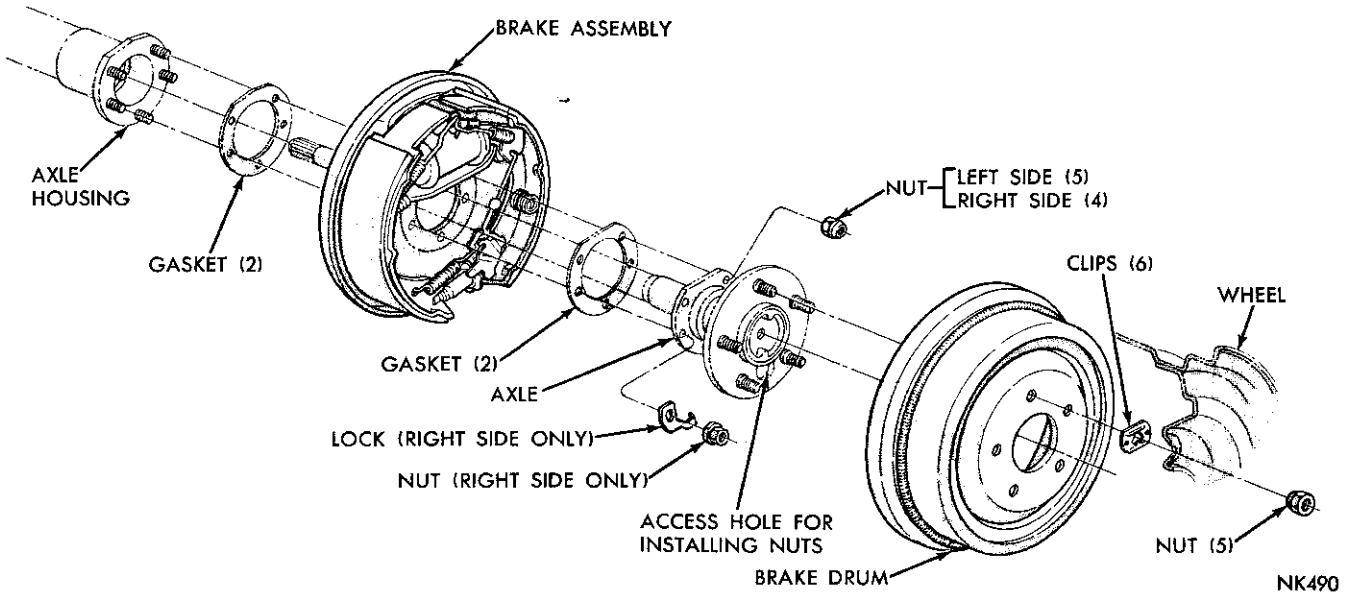

Fig. 2—Rear Brake Assembly

exclude the possibility of maximum adjustment; that is, the adjuster refuses to operate because the closest possible adjustment has been reached; the star wheel should be backed off approximately 30 notches. It will be necessary to hold the adjuster lever away from the star wheel to allow backing off of the adjustment.

Spin the wheel and brake drum in the reverse direction and apply the brakes vigorously. This will provide the necessary inertia to cause the secondary brake shoe to leave the anchor. The wrap up effect will move the secondary shoe, and the cable will pull the adjuster lever up. Upon release of the brake pedal, the lever should snap downward, turning the star wheel. Thus, a definite rotation of the adjuster star wheel can be observed if the automatic adjuster is working properly. If by the described procedure one or more automatic adjusters do not function properly, the respective drum must be removed for adjuster servicing.

BRAKE DRUM REMOVAL

Removing the Front Brake Drums

To aid in the brake drum removal loosen the brake star adjusting wheel (Fig. 3).

(1) With the vehicle on a hoist, jack or suitable stands remove the rear plug from the brake adjusting access hole.

(2) Insert a thin screw driver into the brake adjusting hole and push the adjusting lever away from the star adjusting wheel. **Care should be taken not to bend the adjusting lever.**

(3) Insert Tool C-3784 into the brake adjusting hole and engage the notches of the brake adjusting star wheel. Release the brake adjustment by prying up with the adjusting tool.

(4) Remove the wheel cover, grease cap, cotter pin, lock, adjusting nut, outer wheel bearing and remove the wheel and drum assembly from the spindle.

(5) Inspect the brake lining for wear, shoe alignment, or contamination from grease or brake fluid.

Removing the Rear Brake Drums

(1) With the vehicle on a hoist, jack, or suitable stands, remove the rear plug from the brake adjusting access hole (Fig. 3).

(2) Insert a thin screw driver into the brake adjusting hole and hold the adjusting lever away from the notches of the adjusting screw.

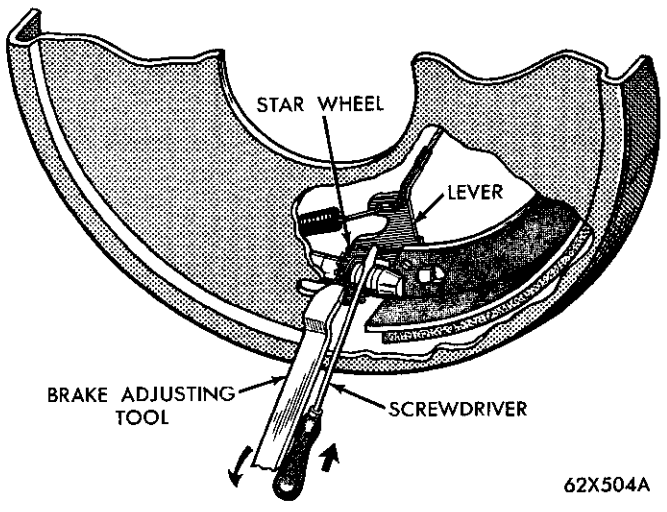

Fig. 3—Adjusting the Brakes

(3) Insert Tool C-3784 into the brake adjusting hole and engage the notches of the brake adjusting screw. Release the brake by prying up with the adjusting tool.

(4) Remove the rear wheel and the clips from the wheel studs that hold the drums on the axle. Remove the drum.

(5) Inspect the brake lining for wear, shoe alignment or contamination from grease or brake fluid.

CAUTION: Install cylinder piston clamps, Tool C-416 to prevent fluid leakage or air entering the hydraulic system during brake shoe removal.

BRAKE SHOE REMOVAL

Removing the Front Brake Shoes

With the vehicle elevated on a hoist, jack or suitable stands, remove the front wheels and drums.

(1) Using Tool C-3785 remove the brake shoe return springs (Fig. 4).

(2) Remove the brake shoe retainer, spring and nails (Fig. 5).

(3) Remove the anchor pin plate.

(4) Remove the primary and secondary brake shoe assembly from the support. Install wheel cylinder clamps, Tool C-416 to hold the pistons in the cylinder.

(5) Overlap the anchor ends of the primary and secondary brake shoes and remove the adjusting star, adjusting lever, adjusting spring, cable and cable guide.

Removing the Rear Brake Shoes

(1) With the vehicle elevated on a hoist, jack or suitable stand, remove the rear wheel, and the drum retaining clips. Remove the drum.

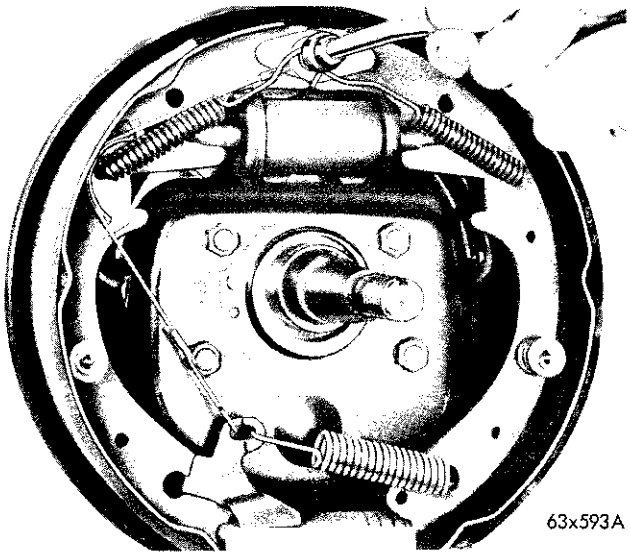

Fig. 4—Removing or Installing the Brake Shoe Return Springs (Front)

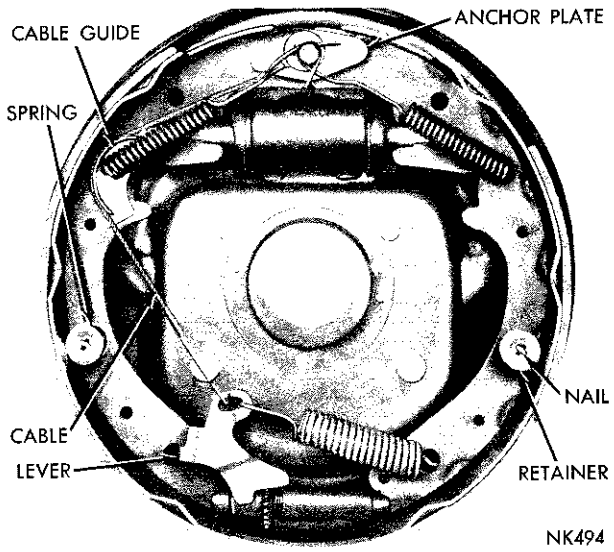

Fig. 5—Removing Brake Shoe Retainer, Spring and Pins

(2) Using Tool C-3785 remove the brake shoe return springs (Fig. 6).

(3) Remove the brake shoe retainer, spring and nails (Fig. 7).

(4) Remove the anchor pin plate and tilt the brake shoe assembly out from the brake support.

(5) Spread the anchor ends of the primary and secondary shoes and remove the parking brake strut and spring.

(6) Disengage the parking brake cable from the parking brake lever and remove the brake assembly.

(7) Overlap the anchor ends of the primary and secondary shoes and remove the adjusting star, adjusting lever, adjusting spring, cable and cable guide.

Cleaning and Inspection

Wipe or brush clean (dry) the metal portions of

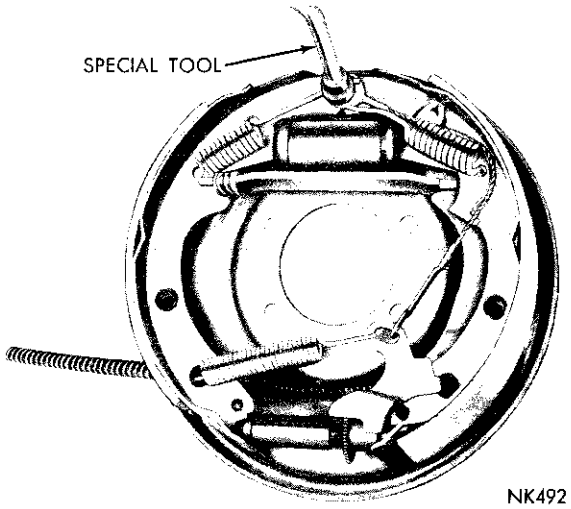

Fig. 6—Removing or Installing the Brake Shoe Return Springs (Rear)

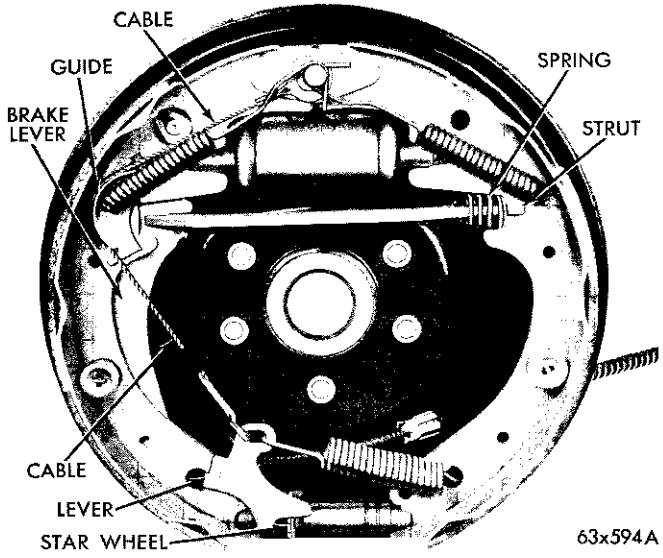

Fig. 7—Brake Assembly (Rear)

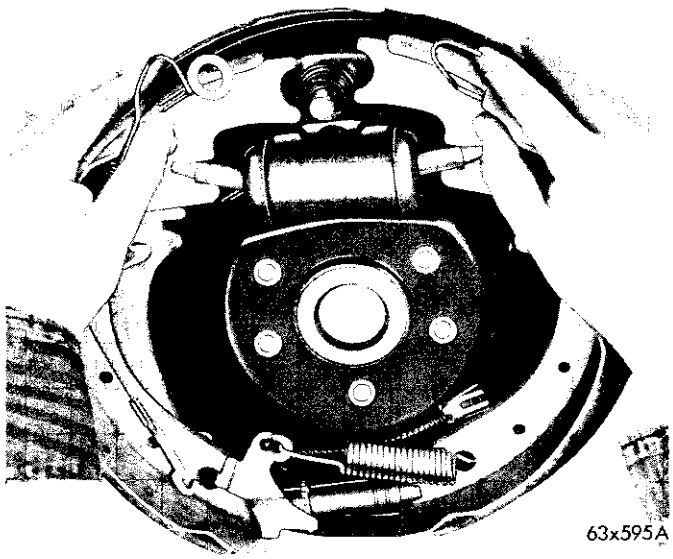

Fig. 8—Removing or Installing the Brake Shoes

the brake shoes. Examine the lining contact pattern to determine if the shoes are bent. The lining should show contact across the entire width, extending from heel to toe. Shoes showing contact only on one side should be replaced. Shoes having sufficient lining but lack of contact at toe and heel should be measured for proper grind.

Clean the support, using a suitable solvent, then inspect for burrs. Remove burrs, then apply a light coat of lubriplate to the brake shoe contact area. Clean the threads of the adjusting screws, then inspect for pulled or stripped threads.

Grinding Recommendations

Brake Shoe Lining—New lining should be measured and ground .060" to .080" (maximum) under the drum diameter.

Drum Refacing—Measure the drum runout with an accurate gauge. Drum runout should not exceed .006 inch out of round. If the drum runout is in excess of .006 inch, (total indicator runout) the drum should be refaced. Remove only as much material as is necessary to clean up the drum. **Do not reface more than .060 inch over the standard drum diameter.**

Brake Shoe Installation

Installing the Front Brake Shoes

To install the front brake shoes, refer to Figure 1, and proceed as follows:

(1) Match a primary with a secondary brake shoe and place them in their relative position on a work bench.

(2) Lubricate the threads of the adjusting screw and install it between the primary and secondary shoes with the star wheel next to the secondary shoe. (Fig. 1). The star adjusting wheels are stamped "R" (right side) and "L" (left side), and indicate their location on the vehicle.

(3) Overlap the anchor ends of the primary and the secondary brake shoes and install the adjusting spring and lever.

(4) Spread the anchor ends of the brake shoes to maintain the adjusting lever and spring in position.

(5) Holding the brake shoes in their relative position, place the brake shoe assembly on the support and over the anchor pin (Fig. 8).

(6) Install the retainer nails, cups, springs and retainers.

(7) Install the anchor pin plate.

(8) Install the cable guide in the secondary shoe and place the "eye" of the adjusting cable over the anchor pin.

(9) Using Tool C-3785 install the return spring into the primary shoe.

(10) Install the secondary return spring.

(11) Place the adjusting cable over the guide and engage the hook of the cable into the adjusting lever.

(12) Lubricate the wheel bearings and install the brake drum and adjust the wheel bearing to the proper preload.

(13) Adjust the brakes as described previously.

Installing the Rear Brake Shoes

(1) Inspect the platforms of the support for nicks or burrs. Apply a thin coat of lubricant to the support platforms.

(2) Attach the parking brake lever to the back side of the secondary shoe (Fig. 7).

(3) Place the secondary and a primary shoe in their relative position on a work bench.

(4) Lubricate the threads of the adjusting screw and install it between the primary and secondary shoes

with the star wheel next to the secondary shoe. The star adjusting wheels are stamped "R" (right side) and "L" (left side), and indicate their location on the vehicle.

(5) Overlap the anchor ends of the primary and the secondary brake shoes and install the adjusting spring and lever.

(6) Holding the brake shoes in their relative position and engage the parking brake cable into the parking brake lever.

(7) Install the parking brake strut and spring between the parking brake lever and the primary shoe (Fig. 8).

(8) Place the brake shoes on the support and install the retainer nails, springs and retainers.

(9) Install the anchor pin plate.

(10) Install the "eye" of the adjusting cable over the anchor pin and install the return spring between the primary shoe and the anchor pin.

(11) Install the cable guide in the secondary shoe then install the secondary return spring.

(12) Place the adjusting cable in the groove of the cable guide and engage the hook of the cable into the adjusting lever.

(13) Install the brake drum and retaining clips. Install the wheel and tire assembly.

(14) Adjust the brakes as described previously.

BLEEDING THE BRAKE SYSTEM

Clean all dirt and foreign material from the cover of the master cylinder to prevent any dirt from falling into the master cylinder reservoir when the cover is removed.

Using the one man bleeder tank C-3496 (with adaptor C-3494A) provides a convenient means of keeping the master cylinder full while pressurizing the hydraulic system for bleeding. **The brakes may also be bled manually by having an assistant slowly pump the brake pedal while the brakes are being bled. Be certain to refill the master cylinder after bleeding each wheel.**

Tighten the brakes of each wheel until the brakes are locked. (This reduces the movement of the wheel cylinder cups and assists in bleeding.)

Starting with the right rear wheel clean all dirt from the bleeder valve. Place bleeder hose C-650 on the bleeder valve and insert the other end of the bleeder hose into a clean jar half filled with clean brake fluid. (This will permit the observation of air bubbles as they are being expelled from the hydraulic system and also prevent air from being drawn back in to the system as the brake pedal is released on manual bleeding.) Follow the manufacturers instructions in the use of the bleeder tools.

When manually bleeding the hydraulic system, push the brake pedal down and let it return slowly, to avoid air being drawn into the system. Bleed intermittently by opening and closing the valve about every four seconds. This causes a swirling action in the cylinder and assists in expelling the air. Continue the action until the brake fluid is expelled in a solid stream, without any bubbles.

Continue this bleeding operation on the other wheels, starting with the left rear wheel, then the right front and finishing with the left front wheel.

If necessary, repeat this bleeding operation if there is any indication (a low, soft or spongy brake pedal) of air remaining in the hydraulic system. Readjust the brakes as described previously.

Test for Fluid Contamination

To determine if contamination exists in the brake fluid (as indicated by swollen or deteriorated rubber cups), the following tests can be made.

(1) Place a small amount of the drained brake fluid into a small clear glass bottle. Separation of the fluid into distinct layers will indicate mineral oil content.

(2) Add water to the contents and shake. If the contents become milky, oil is present. If the contents remain clear, it is not contaminated with mineral oil.

CAUTION: Be safe and discard old brake fluid that has been bled from the system. Fluid drained from the bleeding operation may contain dirt particles or other contamination and should not be reused.

MASTER CYLINDER SERVICING

(1) Disconnect the push rod from the pedal.

(2) Disconnect the brake tube at the master cylinder outlet.

(3) Remove the nuts and bolts that attach the master cylinder to the dash panel. Slide the master cylinder straight out and away from the dash panel.

(4) Remove the push rod return spring.

Disassembly (Fig. 9)

Clean the outside of the master cylinder thoroughly, then drain all the brake fluid.

(1) Remove the piston stop flange attaching screws and remove the dust boot, push rod and piston assembly. (Do not remove the push rod from the piston.)

(2) Remove the brass washer between the piston and the cup. Remove the master cylinder primary cup, spring valve and seal from the master cylinder.

(3) Wash the master cylinder bore with clean fluid and inspect for scoring or pitting.

If the master cylinder piston is badly scored or corroded, replace it with a new one. The primary and secondary cups and valve assembly should be replaced when reconditioning the master cylinder.

Master cylinder walls that have light scratches or show signs of corrosion, can usually be cleaned with crocus cloth. However, cylinders that have deep

scratches or scoring may be honed, providing the diameter of the cylinder bore is not increased more than .002 inch. A master cylinder bore that does not clean up at .002 inch should be discarded and a new cylinder installed. (Black stains on the cylinder wall are caused by the piston cups and will do no harm.) **Use extreme care in cleaning the master cylinder after reconditioning. Remove all dust or grit by flushing the cylinder with alcohol; wipe dry with a clean lintless cloth and clean a second time with alcohol. Dry the master cylinder with compressed air then flush with clean brake fluid. (Be sure the .028 inch diameter hole compensator port in the master cylinder bore is open.)**

Assembly

Before assembling, the piston, cups and valve assembly should be dipped in clean brake fluid. To reassemble the master cylinder, (Fig. 9) then proceed as follows:

(1) Install the seal check valve and spring in the cylinder with the valve toward the outlet of the cylinder.

(2) Install the master cylinder cup in the cylinder with the open end of the cup over the closed end of the return spring.

(3) Install the secondary cup on the master cylinder piston and install the piston and push rod assembly in the cylinder with flat brass washer between the piston and the primary cup.

(4) Install the dust boot on the push rod and install the stop flange screws.

Installation

(1) Reinstall the master cylinder on the firewall and fill with brake fluid. Tighten nuts to 100 inch pounds.

(2) Attach the brake line and the pedal push rod.

(3) Bleed the brake system as described previously.

WHEEL CYLINDER SERVICING

With all the brake drums removed inspect the wheel cylinder boots for evidence of a brake fluid leak. (A slight amount of fluid on the boot may not be a leak, but may be preservative oil used on the assembly.)

(1) In the case of a leak, remove the brake shoes (replace if soaked with grease or brake fluid), boots, piston wheel cylinder cups and wheel cylinder cup expansion spring.

(2) Wash the wheel cylinder bore with clean fluid and inspect for scoring or pitting. Use extreme care in cleaning the wheel cylinder after reconditioning.

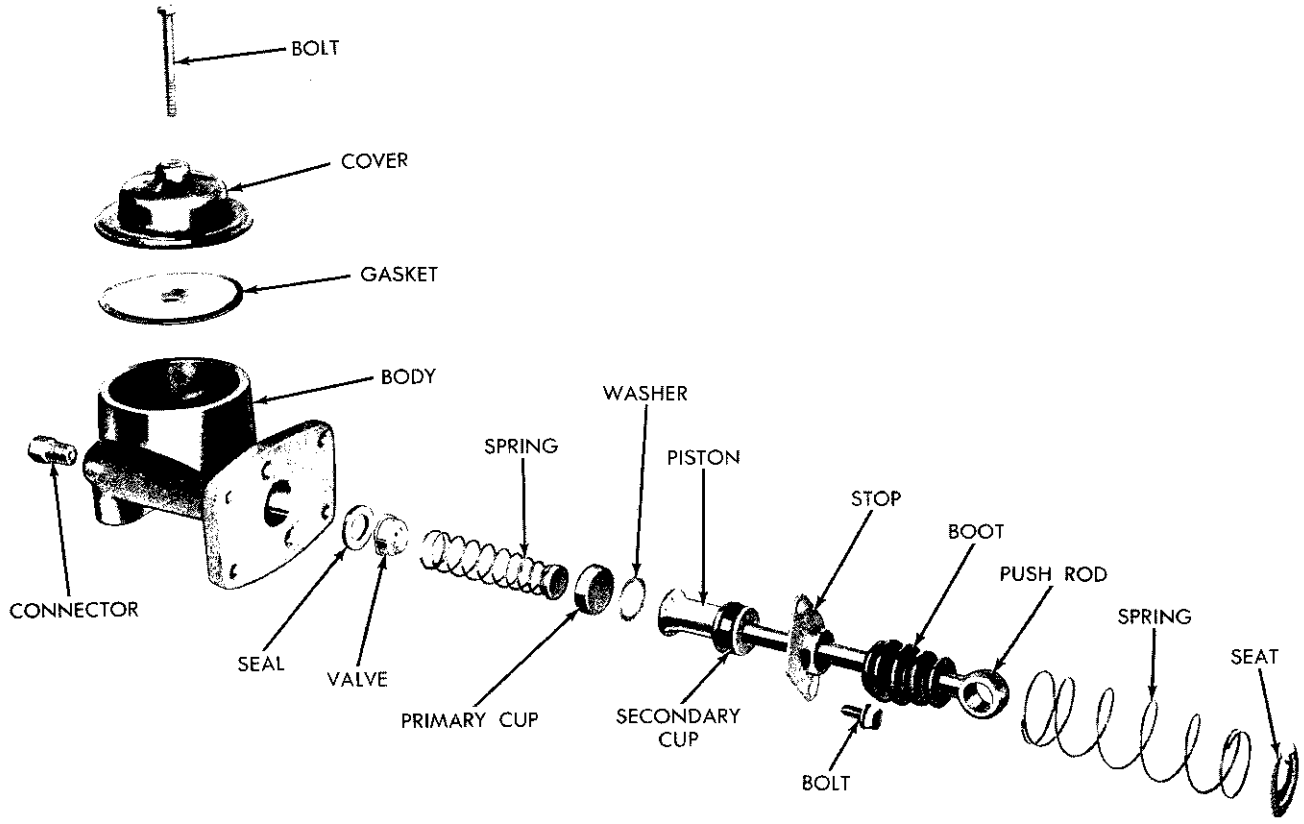

Fig. 9—Master Cylinder Assembly

Remove all dust or grit by flushing the cylinder with alcohol; wipe dry with a clean lintless cloth and clean a second time with alcohol. Dry the cylinder with air pressure, then flush with clean brake fluid. (Be sure bleeder screw port and screw are clean and open.)

Wheel cylinder bores or pistons that are badly scored or corroded should be replaced. The old piston cups should be discarded when reconditioning the wheel cylinders.

Cylinder walls that have light scratches, or show signs of corrosion, can usually be cleaned with crocus cloth, using a circular motion. However, cylinders that have deep scratches or scoring may be honed, using Tool C-3080, providing the diamater of the cylinder bore is not increased more than .002 inch.

NOTE: A cylinder that does not clean up at .002 inch should be discarded and a new cylinder installed. (Black stains on the cylinder walls are caused by the piston cups and will do no harm.)

Should inspection reveal the necessity of installing a new wheel cylinder (front or rear), proceed as follows:

(1) Disconnect the brake hose from the brake tube at the frame bracket (front wheels) or, disconnect the brake tube from the wheel cylinder (rear wheels).

(2) Disconnect the brake hose from the wheel cylinder (front wheels only) and remove the wheel cylinder attaching bolts, then slide the wheel cylinder out of the support.

Disassembly

If the wheel cylinders were not disassembled before removal, (Fig. 10) then proceed as follows:

(1) Remove the boots and push rods.

(2) Press in on one end of the cylinder and force out the piston, cup, piston spring, cup and piston.

Assembly (Fig.10)

NOTE: Before assembling the pistons and new cups in the wheel cylinder, dip them in brake fluid. If the boots are deteriorated, cracked or do not fit tightly on the brake shoe push rod, as well as the wheel cylinder casting, new boots should be installed.

(1) Wash the wheel cylinder with alcohol and blow dry with air.

(2) Install the expansion spring in the cylinder. Install the wheel cylinder cups in each end of the cylinder with the open end of the cups facing each other.

(3) Install the wheel cylinder pistons in each end of the cylinder with the recessed end of the pistons facing the open ends of the cylinder.

(4) Install the boots over the ends of the cylinder. Keep the assembly compressed with the aid of a brake cylinder clamp until the brake shoes are assembled.

Installation

(1) Slide the wheel cylinder into position in the support. Install attaching bolts and tighten securely.

(2) Apply sealing putty around the wheel cylinder to prevent any water or dirt from entering the brake assembly.

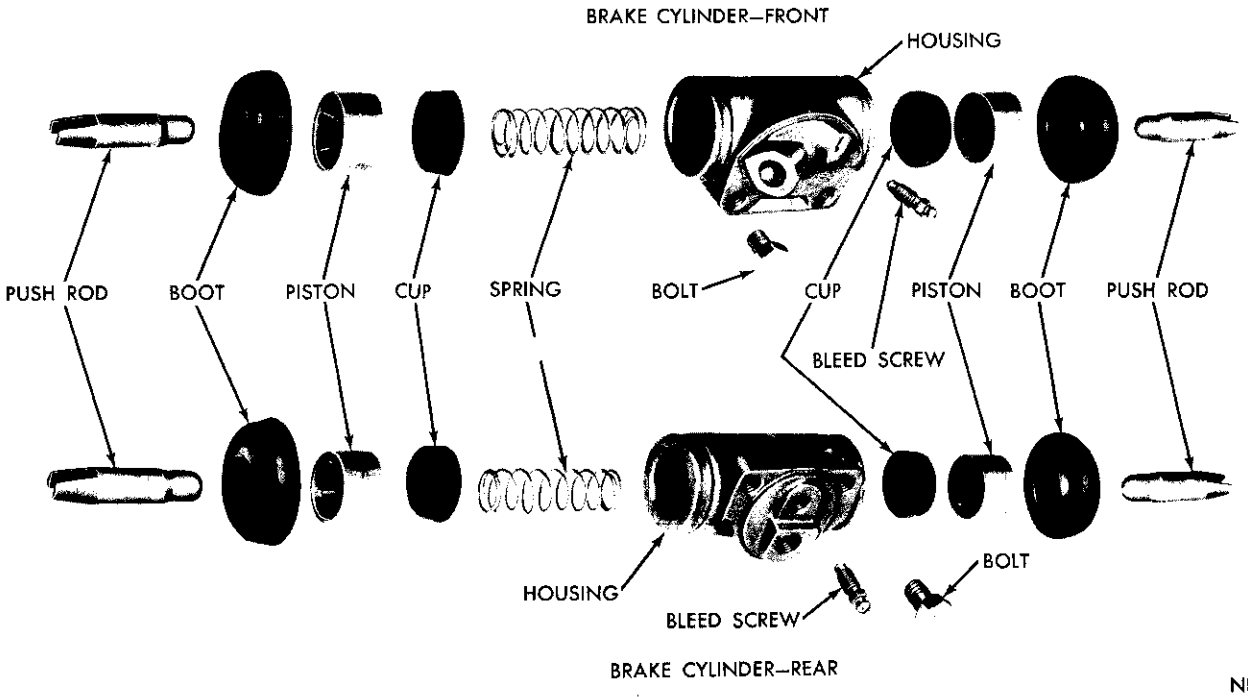

Fig. 10—Wheel Cylinder Assembly (Front and Rear)

(3) Connect the brake tube to the wheel cylinder and tighten to 95 inch pounds (rear wheels) or connect the brake hose to the wheel cylinder (front wheels), and tighten to 25 foot pounds, before connecting the brake hose to the frame bracket.

CAUTION: Should the hose be connected to the wheel cylinder last, the tightening of the hose into the wheel cylinder will twist the hose, which can result in suspension or tire interference.

BRAKE SUPPORT SERVICING

Front Support Removal

(1) Disconnect the brake line from the brake hose at the frame bracket.

(2) With the wheel and brake drum and shoes removed, remove the four support attaching nuts and washers.

(3) Remove the support assembly from the spindle.

Rear Support Removal

(1) With the wheel, brake drum and shoes removed, remove the support attaching nuts and washers.

(2) Remove the rear axle shaft and retainer.

(3) Disconnect the hydraulic brake line from the wheel cylinder.

(4) Disengage the brake cable from the parking brake lever.

(5) Using a suitable tool compress the three flared legs of the cable retainer and pull the brake cable out of the support (Fig. 11).

(6) Remove the brake support from the rear axle housing.

Front Support Installation

(1) With the brake shoes installed on the support, apply a small amount of a putty type sealing material around the back side of all holes and openings of the support to prevent any water or dirt from entering the brake assembly.

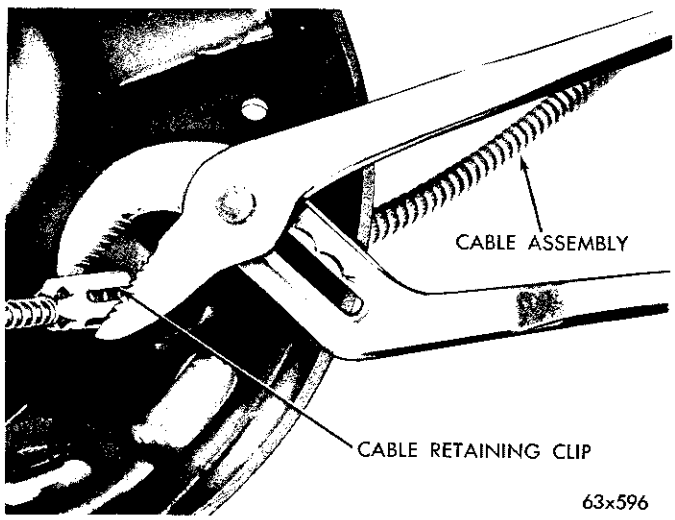

Fig. 11—Removing Brake Cable from Support

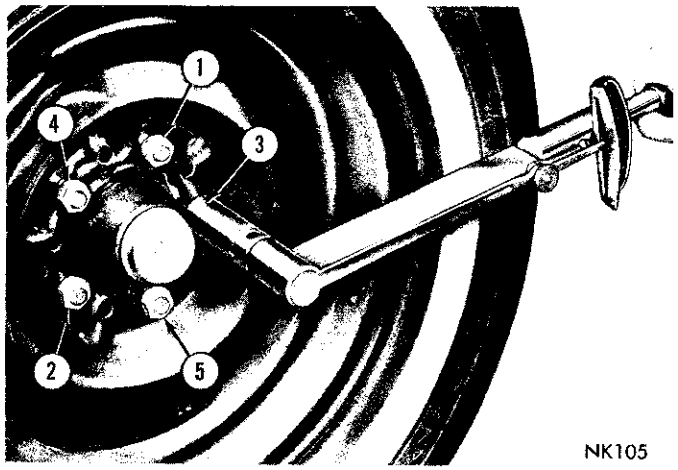

Fig. 12—Wheel Stud Nut Tightening Sequence

(2) Place the support on the spindle support and install the attaching bolts, washers and nuts. Tighten the bottom nuts to 80 foot pounds and the top nuts to 55 foot-pounds torque.

(3) Connect the brake hose to the wheel cylinder and tighten to 25 foot pounds, before connecting the brake hose to the frame bracket.

(4) Install the brake drum and wheel bearings. Adjust the bearings. Bleed and adjust the brakes.

Rear Support Installation

(1) Install the support on the rear axle housing flange.

(2) Insert the rear axle shaft and retainer into the housing then install the retainer nuts and washers. Tighten the retainer nuts to 35 foot-pounds torque.

(3) Install the brake shoes on the support and then apply a small amount of putty type sealing material around the back side of all holes and openings of the support to prevent any water or dirt from entering the brake assembly.

(4) Attach the brake line to the wheel cylinder and tighten to 95 inch-pounds.

(5) Insert the parking brake cable into the support plate and attach the cable to the parking brake lever.

(6) Install the brake drum and wheel. Bleed and adjust the brakes.

Wheel Stud Tightening

The tightening sequence and torquing of the wheel stud nuts is of great importance to insure efficient brake operation. The use of an impact or long handled wrench may distort the drum.

A criss-cross tightening sequence should be used (Fig. 12). Tighten all the stud nuts to one-half the specified torque first (30 ft. lbs.), and then repeat the sequence tightening to the specified 55 foot-pounds.

BRAKE HOSE AND TUBING

Inspection

The flexible hydraulic brake hose should always be installed in the vehicle by first tightening the female end of the hose in the wheel cylinder or rear axle housing tee. The hose is then clipped to the hose bracket in a manner to give minimum twist. Excessive twist can result in hose interference problems with possible hydraulic system failure.

Inspection of brake hose and tubing should be included in all brake service operations. The hoses should be inspected for:

(1) Correct length, severe surface cracking, pulling, scuffing or worn spots. (Should the cotton fabric casing of the hose be exposed to weather by cracks or abrasions in the rubber hose cover, eventual deterioration of the hose can take place with possible failure.)

(2) Faulty installation. Always use factory recommended hose to insure quality, correct length and superior fatigue life. Care should be taken to make sure that the tube and hose mating surfaces are clean and free from nicks and burrs. New copper seal washers should be used and the tube nuts and connections are properly made and tightened. Double wall steel tubing should always be used.

Care should be taken when replacing brake tubing, to use the proper bending and flaring tools and to avoid routing the tubes against sharp edges, moving components or in hot areas. All tubes should be properly attached with recommended retaining clips.

Steel tubing is used to conduct hydraulic pressure to the front and rear brakes. Flexible rubber hose is used at both front brakes and at a rear axle junction block. Steel tubing is used from the junction block to both rear wheel cylinders. All fittings, tubing and hoses should be inspected for rusted, damaged or defective flaring seats. The steel tubing is equipped with a double flare or inverted seat to provide more positive seating in the fitting.

Replacement or Repair

(1) Using Tool C-3478, cut off the damaged seat or damaged tubing (Fig. 13).

(2) Ream out any burred or rough edges showing on inside edges of tubing. This will make the ends of the tubing square and insure better seating of the flared end of the tubing. **Place compression nut on tubing prior to flaring tubing.**

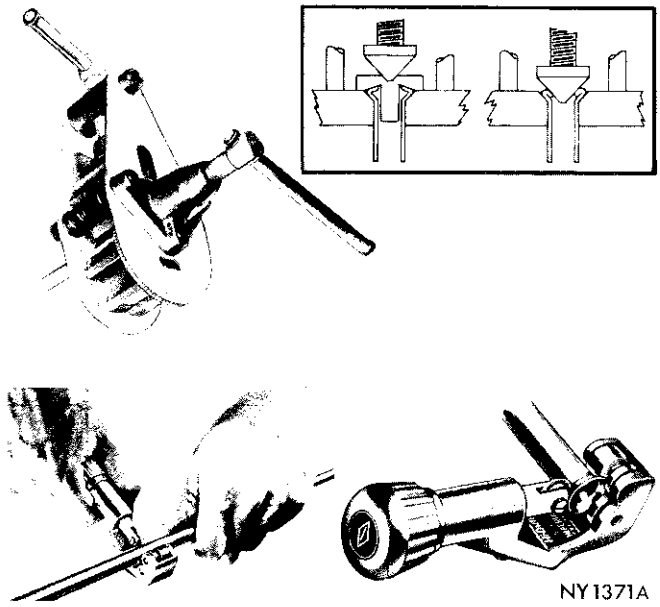

Fig. 13—Cutting and Flaring Steel Tubing

(3) To flare tubing open handles of flaring Tool C-3838 and rotate jaws of tool until the mating jaws of tubing size are centered in the area between vertical posts.

(4) Slowly close handles with tubing inserted in jaws but do not apply heavy pressure to handle as this will lock tubing in place.

(5) Place gauge "Form A" on edge over end of tubing and push tubing through jaws until end of tubing contacts the recessed notch of gauge matching the size of tubing.

(6) Squeeze handles of flaring tool and lock tubing in place.

(7) Place proper sized plug of gauge "A" down in end of tubing. Swing compression disc over gauge and center tapered flaring screw in recess of disc.

(8) Lubricate taper of flaring screw and screw in until plug gauge has seated on jaws of flaring tool. This action has started to invert the extended end of the tubing.

(9) Remove gauge and apply lubricant to tapered end of flaring screw and continue to screw down until tool is firmly seated in tubing.

(10) Remove tubing from flaring tool and inspect seat.

PARKING BRAKES
BRAKE PEDAL

Description

The parking brake pedal assembly used (Fig. 14) on Imperial models is pedal applied but is released by a vacuum chamber. When the engine is started and vacuum is developed, energy is then available to release the parking brake. This is controlled by the transmission shift lever. When the transmission is in neutral position the lever attached to the gearshift tube slide closes a valve (Fig. 16) mounted on the steering

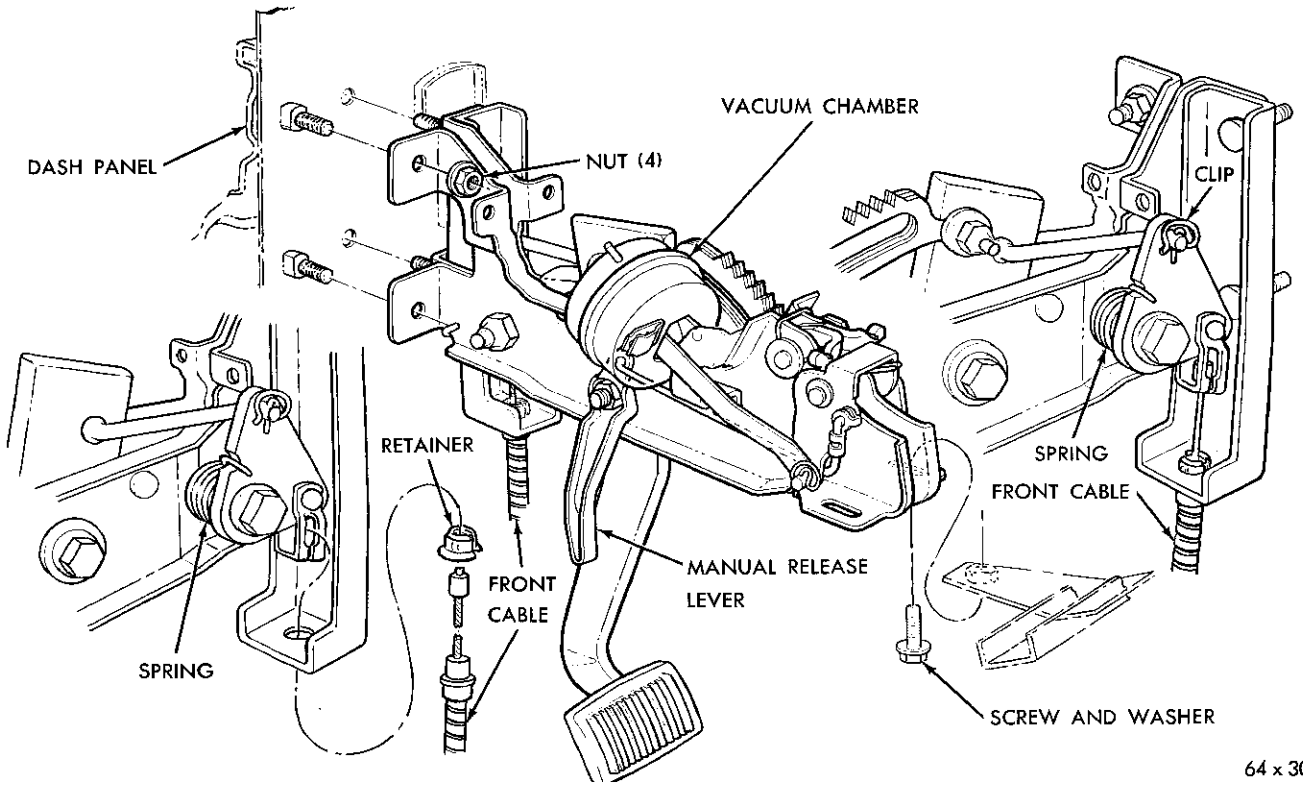

Fig. 14—Parking Brake Pedal (Imperial)

column, this stops the vacuum to the vacuum release chamber and there is no action of the parking brake pedal.

When the shift lever is moved (forward or reverse) the lever is released permitting the vacuum control valve to open and actuate the vacuum release chamber. In the event of engine failure and no vacuum, the brake may be released by a manual release lever mounted on the left side of the parking brake pedal assembly. This assembly prevents the vehicle from being driven with the parking brake in the applied position.

The independent rear brake cables are attached to an intermediate cable by "C" type brackets (Fig. 15). The cable is adjusted at the equalizer clamp at the center of the intermediate cable.

The rear wheel service brakes also act as parking brakes on Chrysler models. The brake shoes are mechanically operated by a lever and strut connected to a flexible steel cable. The wheel brake cable are joined together by an equalizer, which in turn is connected to a forward brake cable extending to the parking brake pedal (Figs. 17 and 18) and release handle.

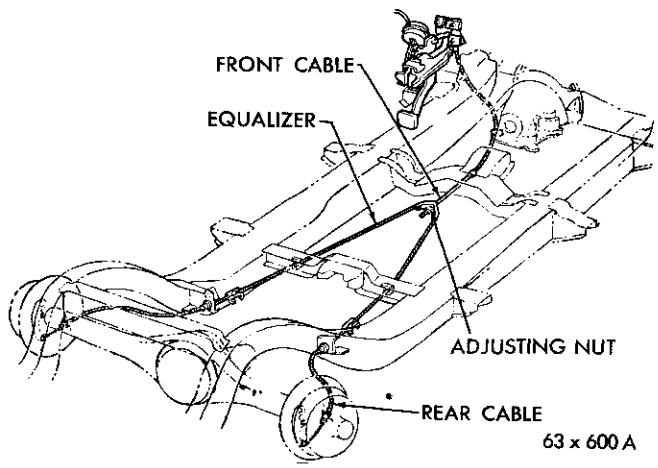

Fig. 15—Parking Brake Cable Routing (Imperial)

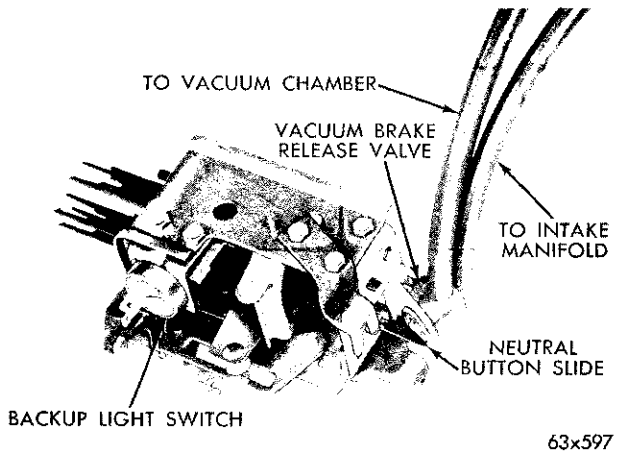

Fig. 16—Vacuum Brake Release Valve

SERVICE PROCEDURES

PARKING BRAKE CABLE ADJUSTMENT

IMPORTANT: The service brakes must be properly adjusted before adjusting the parking brake.

(1) Release the parking brake lever and loosen the cable adjusting nut to be sure the cable is slack (Fig. 15 or 17).

(2) Tighten the cable adjusting nut until a slight drag is felt while rotating the wheel, loosen the cable adjusting nut until both rear wheels can be rotated freely, then back off the cable adjusting nut two full turns.

(3) Apply the parking brake several times, then release and test to see that the rear wheels rotate freely without dragging.

REMOVING THE REAR PARKING BRAKE CABLE

Should it become necessary to remove the parking brake cable (rear), for installation of a new cable, refer to Figure 15 or 17.

(1) With the vehicle jacked up or on a suitable hoist, remove the rear wheels.

(2) Disconnect the brake cable from the equalizer bracket.

(3) Remove the retaining clip from the brake cable frame bracket and remove the cable assembly.

(4) Remove the brake drum from the rear axle.

(5) Remove the brake shoe return springs.

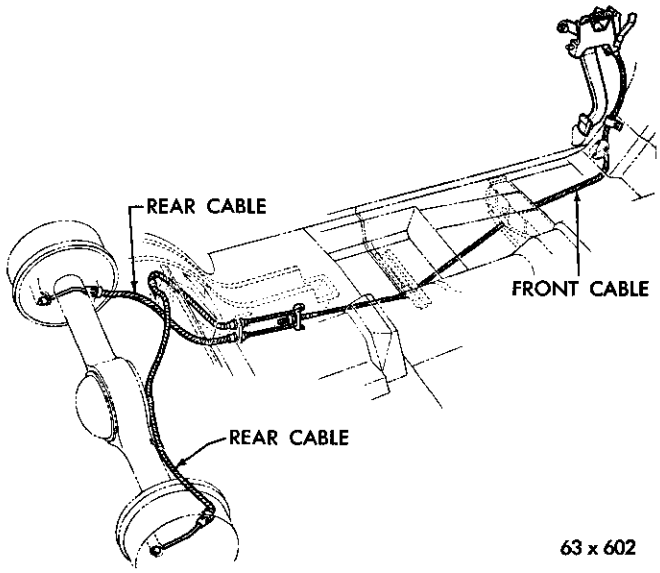

Fig. 17—Parking Brake Cable Routing (Chrysler)

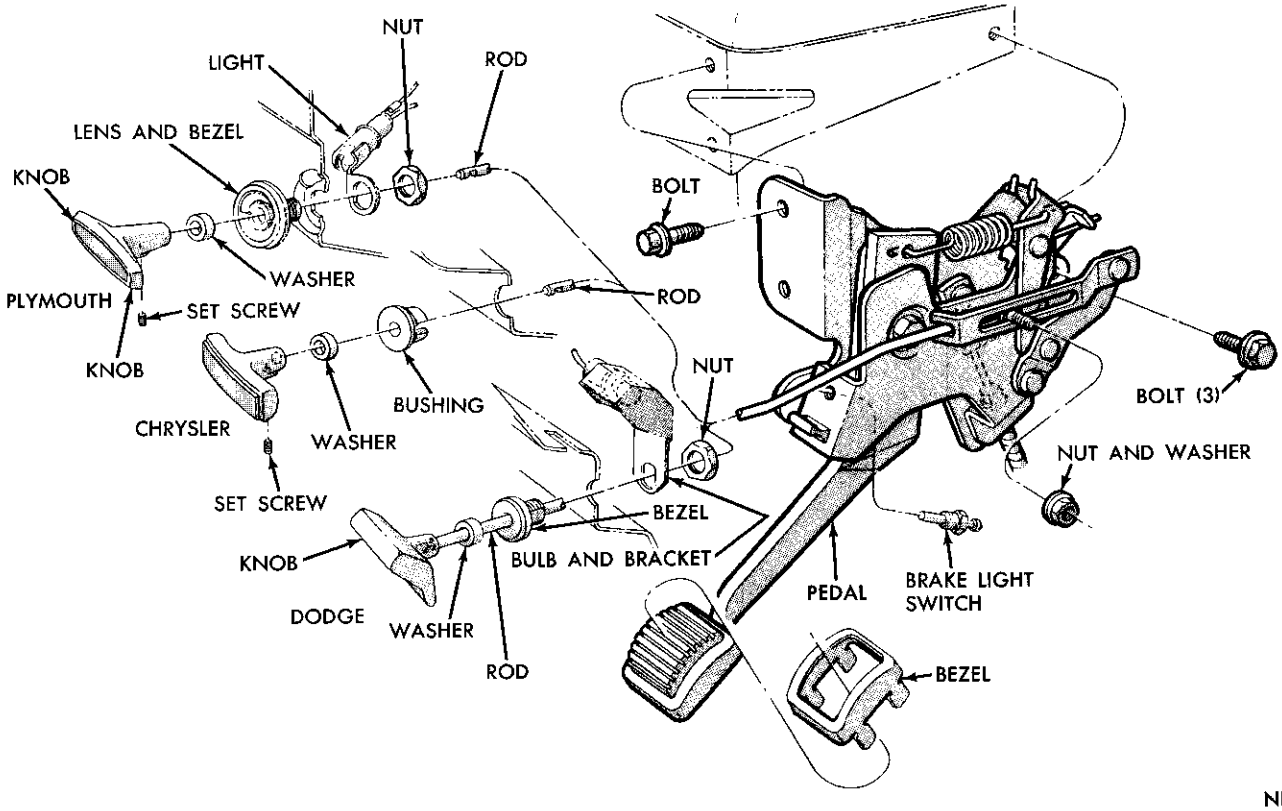

Fig. 18—Parking Brake Pedal (Chrysler)

(6) Remove the brake shoe retaining springs.

(7) Remove the brake shoe strut and spring from the brake support and disconnect the brake cable from the operating arm.

(8) Compress the retainers on the end of the brake cable housing and remove the cable from the brake plate (Fig. 11).

INSTALLING THE REAR PARKING BRAKE CABLE

NOTE: When installing a new brake cable, lubricate the cable with short fibre grease at the contact points.

(1) Insert the brake cable and housing into the brake support plate, making certain that the housing retainers lock the housing firmly into place.

(2) Holding the assembled brake shoes in place on the brake support, engage the brake cable into the brake shoe operating lever.

(3) Install the brake shoe retaining springs and the brake shoe return springs.

(4) Install the brake drum and the wheel.

(5) Insert the brake cable and the housing into the cable bracket and install the retaining clip.

(6) Insert the front end of the brake cable into the equalizer of the intermediate cable.

(7) Adjust the service brakes and the parking brake cable.

REMOVING THE FRONT PARKING BRAKE CABLE

(1) Disengage the front cable from the equalizer and using a screw driver force the cable housing and retaining clip out of the frame crossmember.

(2) Disengage the cable housing from the underbody mounting bracket (Figs. 15 or 17).

(3) Raise the floor mat or carpet and remove the rubber grommet holding the cable housing into the floor pan.

(4) Depress the parking brake pedal, pulling the cable through the housing so that when the pedal is released, the cable may be disengaged from the clevis.

(5) Using a screwdriver pry the housing out of the mounting bracket and retaining clip.

(6) Pull the parking brake cable and housing up out of the floor pan.

INSTALLING THE FRONT PARKING BRAKE CABLE

(1) Insert the parking brake cable down through the floor pan.

(2) Install the cable housing into the underbody mounting bracket.

(3) Insert the end fitting of the cable into the parking brake clevis and force the housing and retaining clip into the pedal bracket assembly. (Refer to Figure 14 or 18.)

(4) Insert the cable through the crossmember and force the housing and retaining clip into the crossmember.

(5) Attach the cable to the equalizer and adjust the parking brake cable.

(6) Apply the brakes several times and test for free wheel rotation.

(7) Test the operation of the vacuum release valve (Fig. 16). (Imperial only.)

POWER BRAKE—BENDIX

Description

The tandem diaphragm type power brake used on Imperial Models (Fig. 19) is a self contained vacuum hydraulic power braking unit. It is of the vacuum suspended type which utilizes engine intake manifold vacuum and atmospheric pressure for its power. This type of unit does not require a vacuum reservoir.

The Bendix Power Brake Unit can be identified by the crimped edge method of attaching the housing and cover together.

The basic elements of the vacuum unit are as follows:

(a) The vacuum power chamber consists of a front and rear shell, a center plate, front and rear diaphragm, hydraulic push-rod and a vacuum diaphragm return spring (Fig. 19).

(b) A mechanically actuated control valve integral with the vacuum power diaphragms, controls the degree of power brake application or release in accordance with the foot pressure applied to the valve operating rod through the brake pedal linkage.

The control valve is of a single poppet type valve with the atmospheric port and a vacuum port. The vacuum port seat is a part of the valve body attached to the diaphragm assembly. The atmospheric port is a part of the valve plunger which moves within the valve housing and vacuum power diaphragm assembly.

(c) A hydraulic master cylinder which contains all of the elements of the standard brake master cylinder except for the special hydraulic push rod which is a part of the power brake.

CAUTION: Do not attempt to adjust the hydraulic push rod.

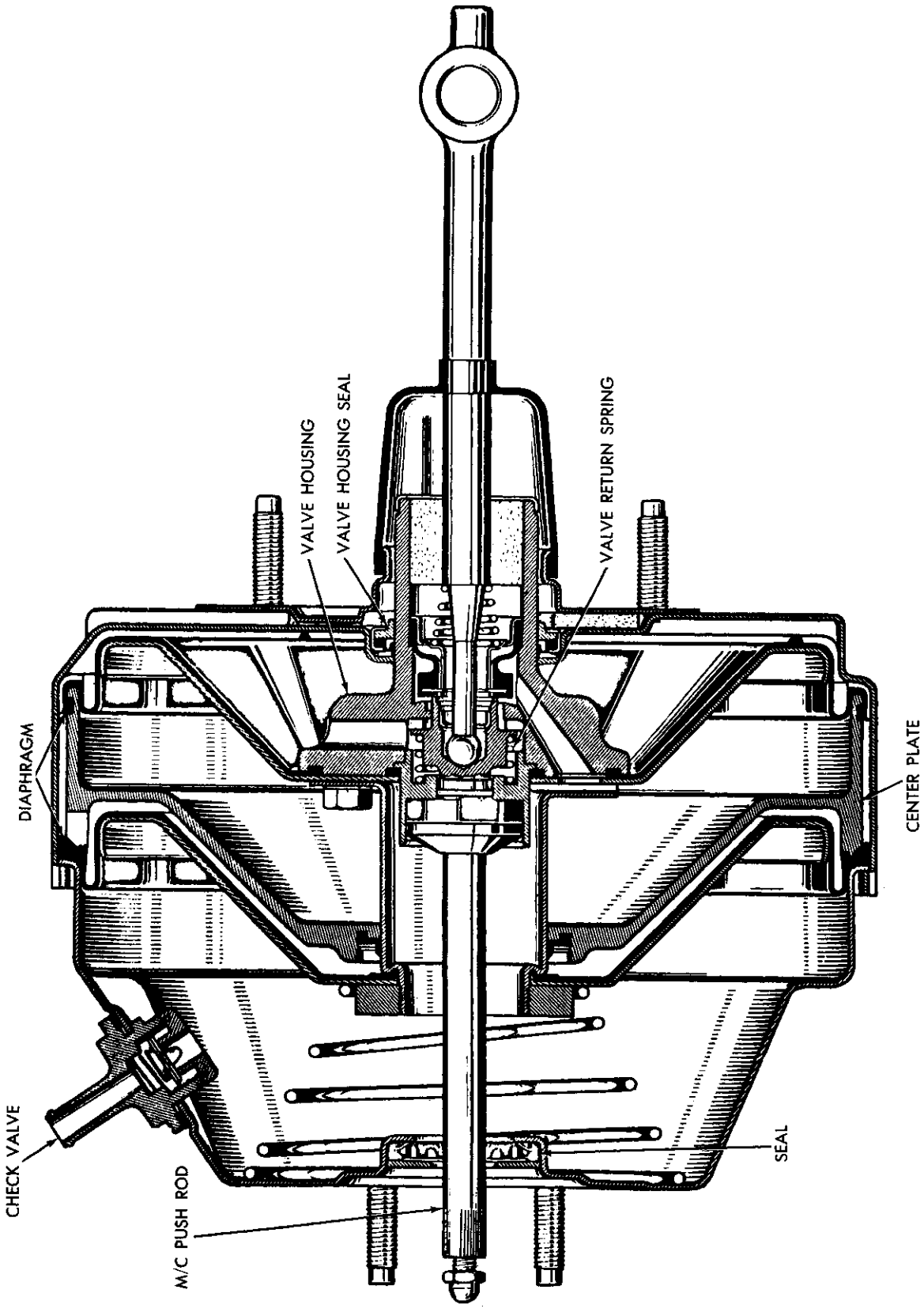

Fig. 19—Power Brake Assembly (Bendix)

SERVICE PROCEDURES

Removal

(1) Disconnect the brake line from the master cylinder.

(2) Disconnect the vacuum line from the check valve.

(3) From under the instrument panel, remove the push rod nut and bolt from the power brake and brake pedal.

(4) From under the instrument panel remove the four brake unit attaching nuts and washers.

(5) Withdraw the brake unit and master cylinder assembly from the brake support bracket.

(6) Remove the four master cylinder attaching nuts and washers and remove the master cylinder from the power brake.

CAUTION: Do not attempt to disassemble the brake booster as this unit will be serviced by the Manufacturer's Service Station.

Installation

(1) Install the master cylinder on the power brake.

(2) Insert the brake push rod through the brake support and install the four attaching washers and nuts.

(3) Install the push rod attaching bolt and nut through the push rod and brake pedal.

(4) Attach the vacuum hose to the check valve.

(5) Attach the brake line to the master cylinder.

(6) Fill the master cylinder and bleed the brakes.

(7) Inspect the adjustment of the stop light switch.

POWER BRAKE—KELSEY HAYES

Description

The power brake, used on Chrysler Models (Fig. 20), is a combined vacuum and hydraulic unit which utilizes engine intake manifold vacuum and atmospheric pressure to provide power assisted application of the vehicle brakes.

The Kelsey Hayes Power Brake Unit can be identified by the twist lock method used in locking the housing and cover together, and by the white colored vacuum check valve assembly.

The power unit provides lighter pedal pressure.

This lighter pressure is obtained in combination with a reduced pedal travel, which makes it possible to bring the pedal down to the approximate height of the accelerator pedal which at closed throttle condition. Thus the driver, after closing the throttle, can shift his toe from one pedal to the other without lifting his heel from the floor.

The power brake, which is a self contained unit, eliminates all external rods and levers, and mounts on the engine side of the dash panel.

The power brake is externally connected to the brake system at three points. The unit is connected by a pedal push rod to the brake pedal, by a vacuum line to the intake manifold (through a vacuum check valve) and a hydraulic tube from the master cylinder to the wheel units.

SERVICE PROCEDURES

Removal

(1) With the engine turned off, apply the brakes several times to balance the internal pressure of the brake.

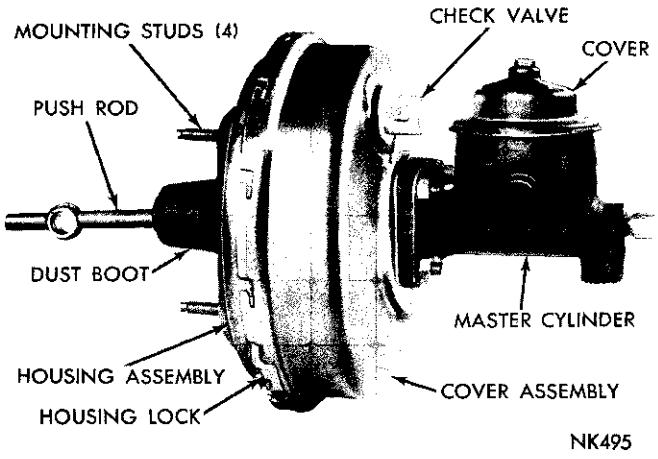

Fig. 20—Power Brake and Master Cylinder (Kelsey Hayes)

(2) Disconnect the hydraulic brake line from the master cylinder.

(3) Disconnect the vacuum hose from the power brake check valve.

(4) Remove the nut and bolt that attach the power brake push rod from the pedal linkage. (Under instrument panel.)

(5) Remove the nuts and washers that attach the power brake unit to the dash panel.

(6) Remove the power brake and master cylinder from the vehicle and place on a service bench for further disassembly. Remove the plastic mounting gasket.

Disassembly

To disassemble the power brake, refer to Figures 21 and 31 then proceed as follows:

(1) Remove the master cylinder from the power brake, (Fig. 22).

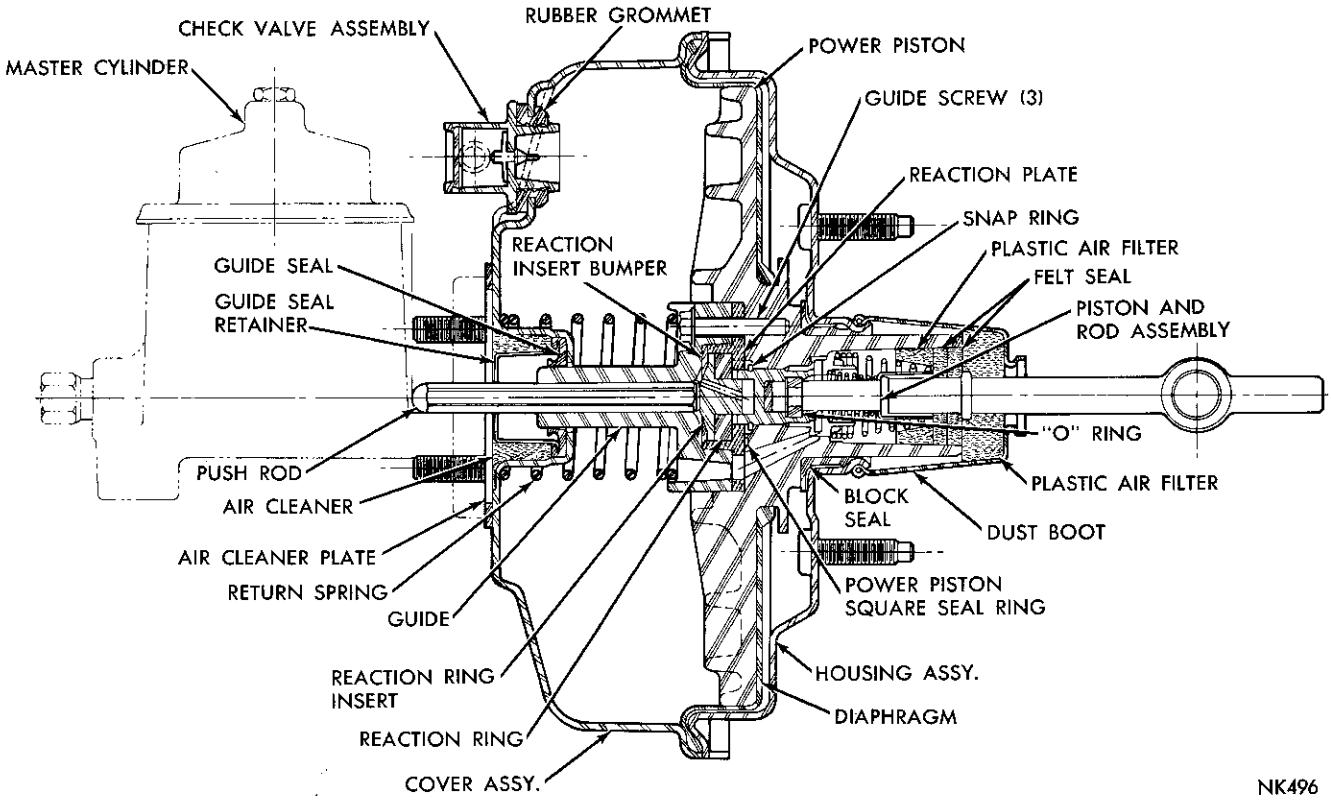

Fig. 21—Power Brake (Sectional View)

(2) Remove the master cylinder push rod and air cleaner plate (Fig. 23).

(3) Install engine lifting fixture C-3804 on two of the unit mounting studs. Install flatwashers and nuts to hold in position.

(4) Install fixture in a vise, **scribe a line on both housing and cover.** (To be used at reassembly.)

(5) Pry out the housing lock, using a screwdriver (Fig. 24). The lock location is on one of the two long tangs on the housing. **Do not bend the lock at removal, as it must be reinstalled at assembly.**

(6) Remove the check valve from the cover, by prying out of the rubber grommet.

(7) Place Tool C-3281 over the master cylinder mounting studs (Fig. 25).

(8) Rotate the tool slowly when removing the cover

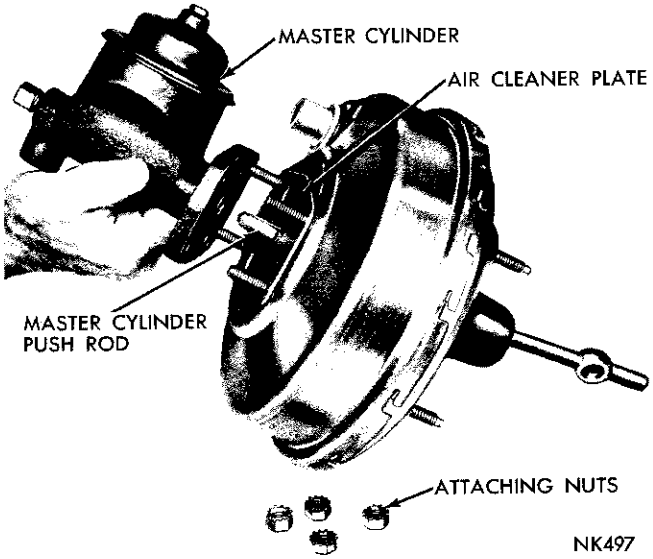

Fig. 22—Removing or Installing the Master Cylinder

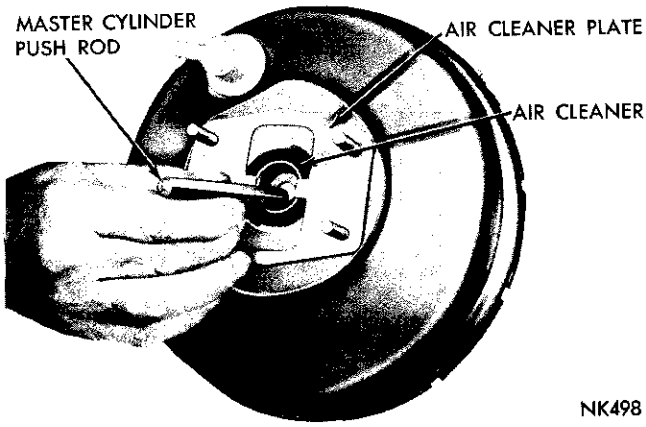

Fig. 23—Removing or Installing the Master Cylinder Push Rod

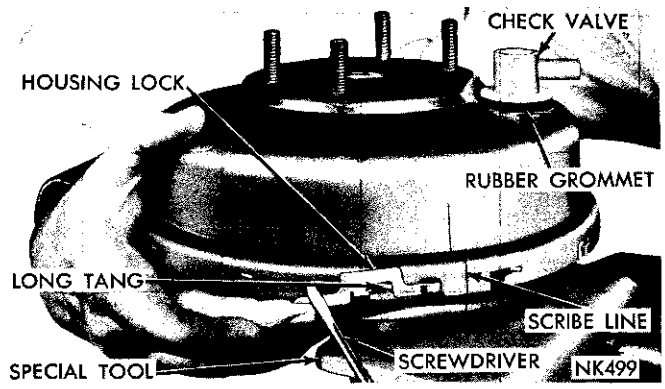

Fig. 24—Removing the Housing Lock

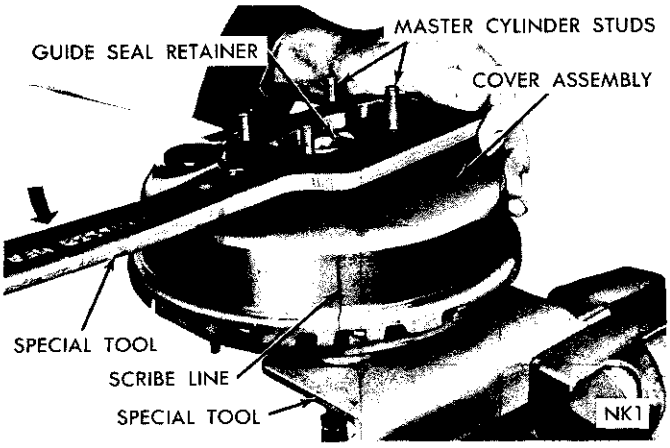

Fig. 25—Removing or Installing the Cover

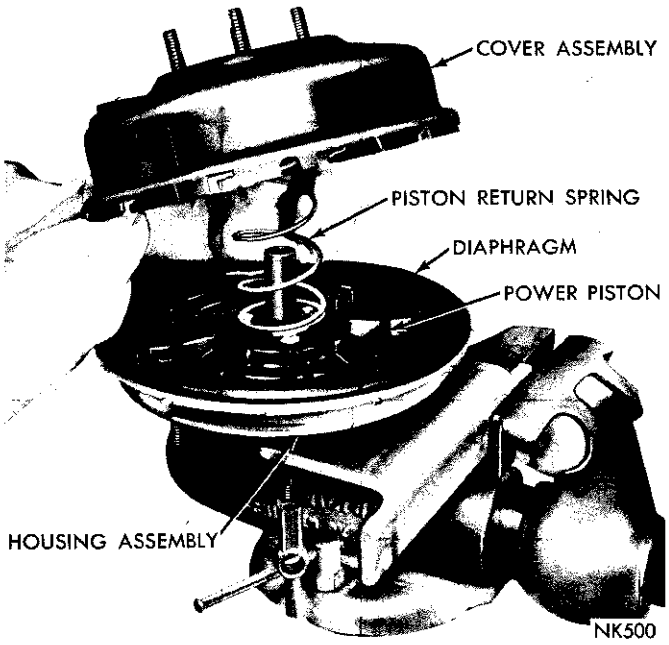

Fig. 26—Piston Return Spring, Diaphragm and Piston

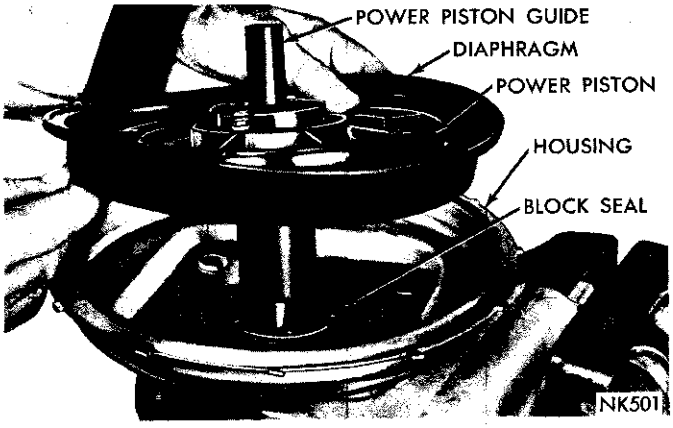

Fig. 27—Removing or Installing the Power Piston

as it is under spring pressure. Separate the housing and cover to expose the power piston return spring and diaphragm (Fig. 26).

(9) Remove the cover and lift out return spring.

(10) Remove the power piston assembly by slowly lifting straight up, (Fig. 27) then lay aside on a smooth clean surface. Remove the brake unit from the engine lifting fixture, Tool C-3804.

(11) Remove the air cleaner, guide seal and the guide seal retainer from the cover (Fig. 28).

(12) Remove the block seal located in the center hole of the housing, using a blunt drift.

CAUTION: Care should be used so as not to scratch the bore of the housing, which could cause a vacuum leak.

DISASSEMBLING THE POWER PISTON

CAUTION: Extreme care should be used when handling the power piston diaphragm and metal parts. The diaphragm should be kept clean. Grease, oil and foreign matter can cause a deterioration of the diaphragm. Protect diaphragm from nicks or cuts.

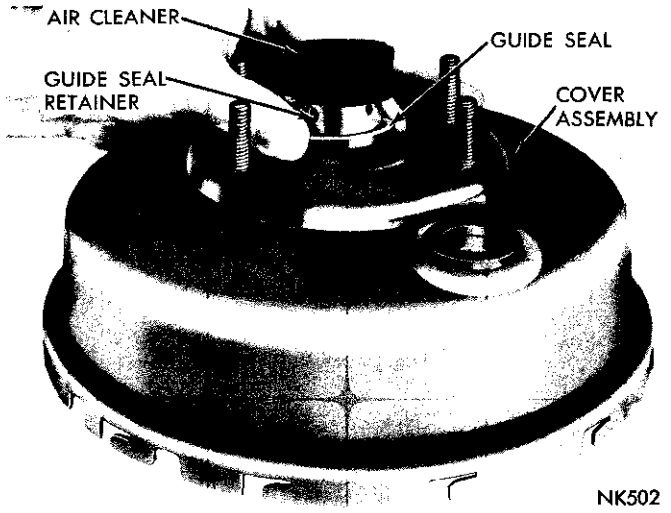

Fig. 28—Removing or Installing the Air Cleaner, Seal and Retainer

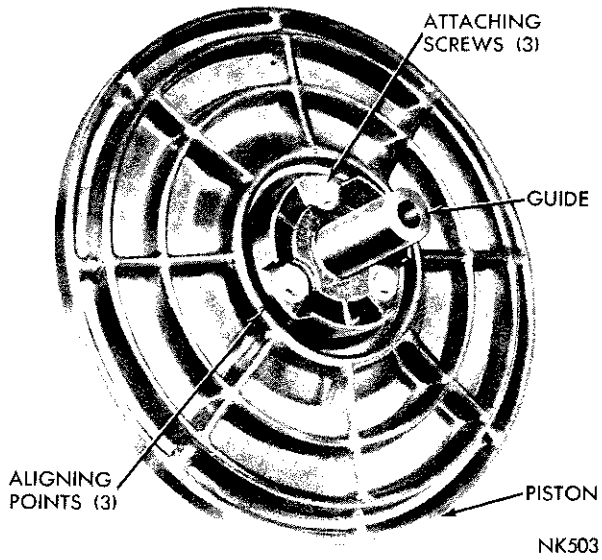

Fig. 29—Power Piston Guide Attaching Screws

(1) Remove the power piston diaphragm from the power piston and lay it aside on a clean shop towel.

(2) Remove the screws that attach the plastic guide to the plastic power piston (Fig. 29). Remove the guide and place to one side.

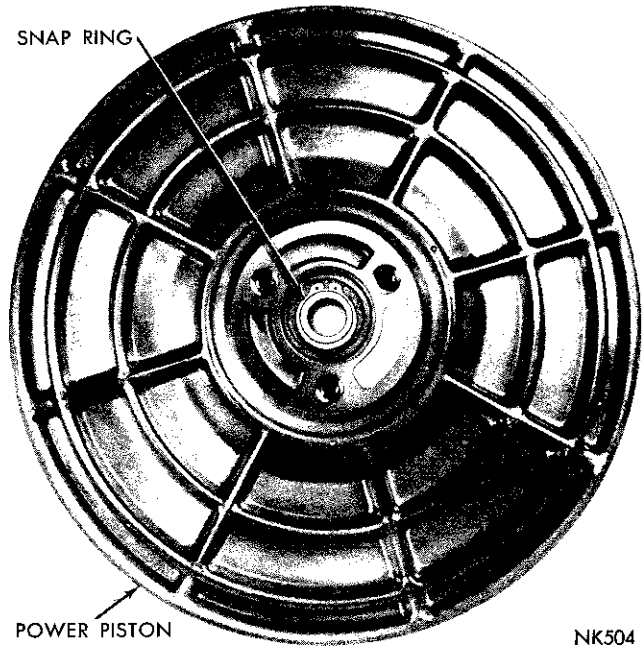

Fig. 30—Control Piston Snap Ring

(3) Remove the power piston square seal ring, reaction ring insert, reaction ring and the reaction plate.

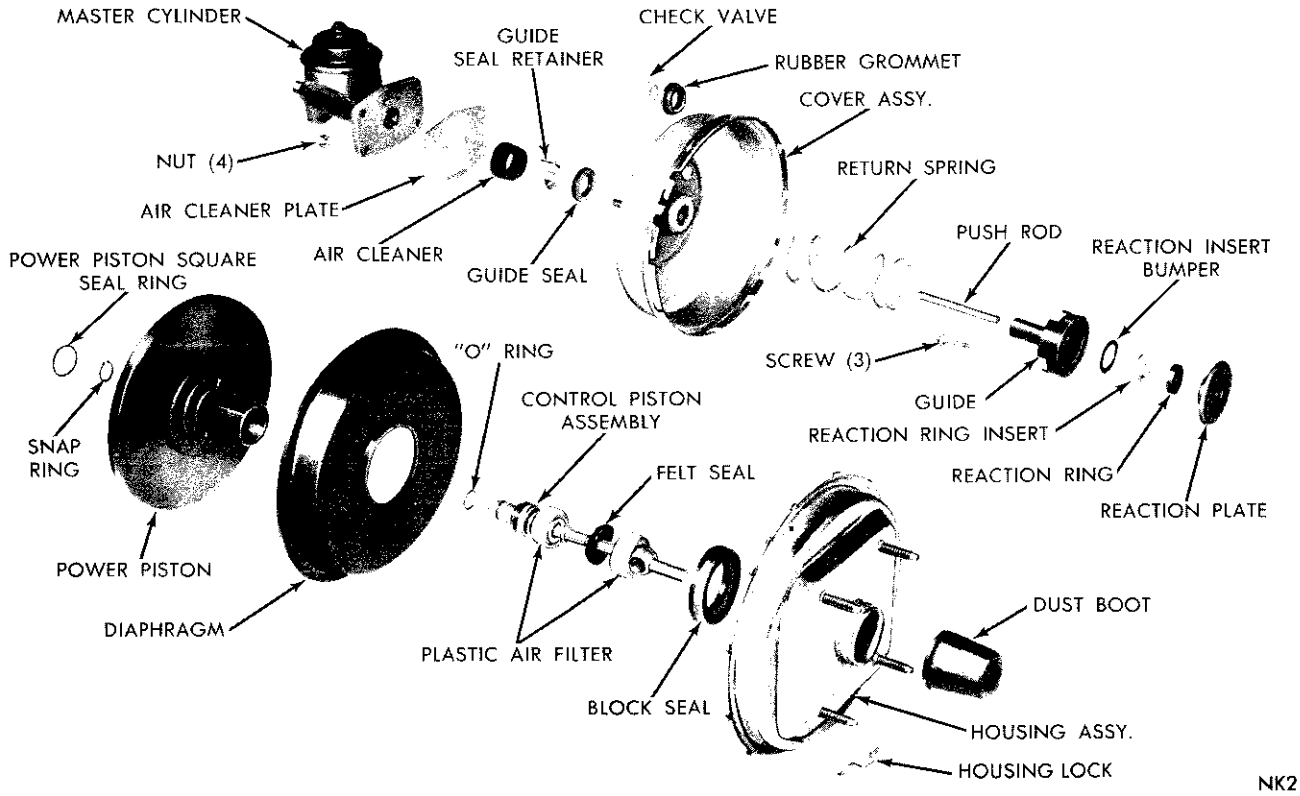

Fig. 31—Power Brake Assembly

If the reaction plate sticks in the power piston, it may be removed by pushing on the operating rod. Do not push too far, as damage to the floating valve can result.

(4) Depress the operating rod slightly, then remove the truarc snap ring, using snap ring pliers (Fig. 30).

(5) Remove the control piston by pulling the operating rod straight out of the power piston.

(6) Remove the "O" seal ring from the end of the control piston.

(7) Remove the filter elements and dust felt from the control piston rod.

Cleaning and Inspection

Thoroughly wash all metal parts in a suitable solvent and blow dry with compressed air. The power diaphragm, plastic power piston and guide, should be washed in a mild soap solution and water. Blow dust and cleaning fluid out of all internal passages. All rubber parts should be replaced, regardless of condition. Install new air filters at reassembly. Inspect all parts for scoring, pitting, dents or nicks. Small imperfections can be smoothed out, using crocus cloth. Replace all parts that are badly scored, nicked or damaged. When reassembling, be sure that all rubber parts are well lubricated with silicone grease, except the diaphragm and the reaction ring.

Assembly (Fig. 31)

(1) Install the control piston "O" ring on the control piston and lubricate with silicone grease.

(2) Lubricate the control piston assembly with silicone grease and insert into the power piston. Install the tru-arc snap ring in its groove, using snap ring pliers (Fig. 30). Wipe all lubricant off the end of the control piston.

(3) Slide the air filter elements and felt seal over the push rod and down past the retaining shoulder on the rod. Install the power piston square seal ring in its groove.

(4) Install the reaction plate in the power piston, aligning the three holes with those in the power piston (Fig. 29).

(5) Place the rubber reaction ring in the reaction plate. **Do not lubricate this ring.**

(6) Lubricate the outer diameter of of the reaction insert with silicone grease and install in the reaction ring.

(7) Install the reaction insert bumper into the guide. Several small spots of silicone grease will hold the bumper in position while the guide is being installed into the power piston.

(8) Place the guide on the power piston, aligning the holes with the aligning points on the power piston (Fig. 29). Install the retaining screws and tighten from 80 to 100 inch pounds. (Remove any resulting chips.)

(9) Install the diaphragm on the power piston, making sure that the diaphragm is seated in the power piston groove.

Assembling the Power Brake Components

(1) With the housing blocked to prevent bending, drive the block seal into the housing, using Tool C-3205 (Fig. 32).

(2) Install a new cover seal on the retainer and lubricate thoroughly inside and out with silicone grease, then install in the cover bore (Fig. 28). Install a new air filter.

(3) Install the check valve in a well lubricated grommet in the cover (Fig. 24).

(4) Reinstall the engine lifting bracket Tool C-3804 and clamp in a vise.

(5) Apply silicone grease to both sides of the bead (outer edge) of the power piston diaphragm.

(6) Insert the power piston assembly into the housing with the operating rod **down** (Fig. 27).

(7) Install the power piston return spring in the flange of the guide.

(8) Place the cover over the return spring and press down on the cover, and at the same time lead the guide through the seal. **(Be sure the scribe lines marked on the housing and cover are aligned when the parts are locked together.)**

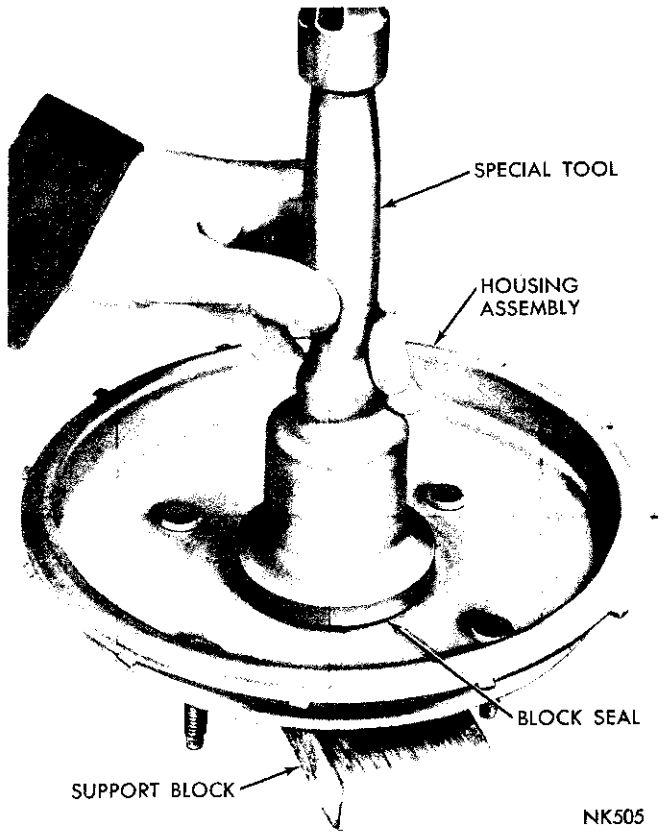

Fig. 32—Installing the Block Seal in the Housing

(9) Rotate the cover to lock it to the housing (Fig. 25). **Be sure the diaphragm is not pinched during the assembly of the unit.**

(10) Install the housing lock on one of the long tangs of the housing (Fig. 24).

IMPORTANT: The lock will not be satisfactory if installed incorrectly. If installed on one of the short tangs, the unit could become unlocked with use.

(11) Remove the unit from the vise and remove Tool C-3804 lifting fixture.

(12) Install the master cylinder push rod and air cleaner plate, then install the master cylinder on the studs. Install the attaching nuts and washers. Tighten to 200 inch pounds.

Installation

(1) Reinstall the dash panel to power brake seal.

(2) Position the power brake unit on the dash panel, then install the attaching nuts and washers. Tighten to 200 inch pounds.

(3) Install the bolt that connects the power brake push rod with the brake pedal linkage. Install the nut and tighten to 30 foot pounds.

(4) Connect the vacuum hose to the unit and connect the hydraulic brake tube. Tighten securely.

(5) Refill the master cylinder reservoir and bleed the brakes.

(6) Readjust the stoplight switch if necessary.

(7) Test the power brake unit as follows:

POWER BRAKE TESTS

Vacuum Leak in the Released Position

With the transmission in neutral or park position, stop the engine and wait 1 minute. Apply the brake several times. Each application should provide less and less pedal travel, following normal depletion of reserve vacuum.

The number of applications on reserve vacuum assist will depend on how hard the pedal is pressed and how far the pedal moves. If vacuum assist is not present, an air leak is indicated.

Unit Operation

After depleting the reserve vacuum, place light foot pressure on the pedal and start the engine. If the power system is functioning properly, the pedal will fall away slightly.

Vacuum Leak in the Holding Positions

With the transmission in neutral or park position, stop the engine while holding a moderately heavy load steadily on the brake pedal. After 1 minute, release and apply the pedal several times. If there is no vacuum assist during this test, but the system was normal during test number 1 above, there is an air leak within the unit. Some units on this test will leak air internally if the pedal load is light. This is a normal condition.

Hydraulic Leak

Depress the brake pedal with light effort while the engine is running, maintaining constant pressure. If the pedal falls noticeably in one minute, the hydraulic system is leaking.

If the pedal has a spongy feel when applying the brakes, air may be present in the hydraulic system.

Road test the brakes by making a brake application at about 40 m.p.h. to determine if the vehicle stops evenly and quickly.

If the system tests are satisfactory and the brake pedal travels to within 1 inch of the floor pan, the brake shoes will require an adjustment or replacement.

Actuation System Tests

(1) Test for free operation and return of the brake pedal. If binding exists, check all pivot points for binding and lubricate or free up as required.

(2) Test the stoplight switch for proper setting and operation.

(3) Check the fluid level in the master cylinder reservoir.

(4) Inspect the vacuum line and connections at the intake manifold, and the vacuum check valve for possible vacuum leaks.

(5) Adjust the engine for good stall free idle and correct as required for vacuum leaks.

POWER BRAKE—MIDLAND ROSS

Description

The Midland Ross Power Brake (Fig. 33) is located on the engine side of the dash panel. The forward cover of the vacuum cylinder supports the master cylinder.

The Midland Ross Power Brake unit can be identified by a clamp and screw method of attaching the housing to the cover.

The power brake derives its power from the intake manifold vacuum and atmospheric pressure. It does not require a vacuum reservoir.

SERVICE PROCEDURES

Removal

(1) With the engine turned off, apply the brakes several times to balance the internal pressure of the brake.

(2) Disconnect the hydraulic brake line from the master cylinder.

(3) Disconnect the vacuum hose from the power brake.

(4) From under the instrument panel, remove the nut and attaching bolt from the power brake push rod and brake pedal linkage.

(5) Remove the four power brake attaching nuts and washers.

(6) Remove the power brake and master cylinder from the vehicle and place on a service bench for further disassembly.

Disassembly (Fig. 34)

(1) Remove the four master cylinder attaching nuts and remove the master cylinder.

(2) Scribe an aligning mark across the joint of the front and rear portions of the brake assembly. This will insure alignment on reassembly.

(3) Remove the dust boot from the push rod.

(4) Remove the filter, filter retainer and cover.

(5) Working from the front of the unit, push the outer lip of the bellows assembly into the vacuum chamber (Fig. 35).

(6) Remove the clamp band securing the front cover to the front of the rear housing.

(7) Using a plastic or rubber hammer tap the outside edge of the rear vacuum housing and separate the housings.

(8) Remove the large snap ring from the rear seal retainer (Fig. 36). Remove the diaphragm, valve

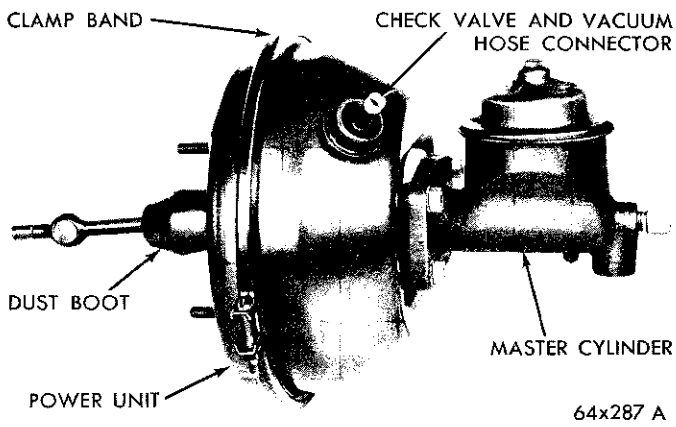

Fig. 33—Power Brake and Master Cylinder (Midland-Ross)

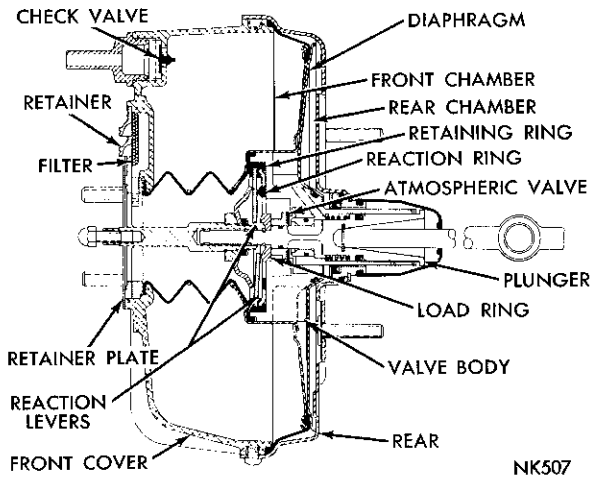

Fig. 34—Power Brake (Sectional View)

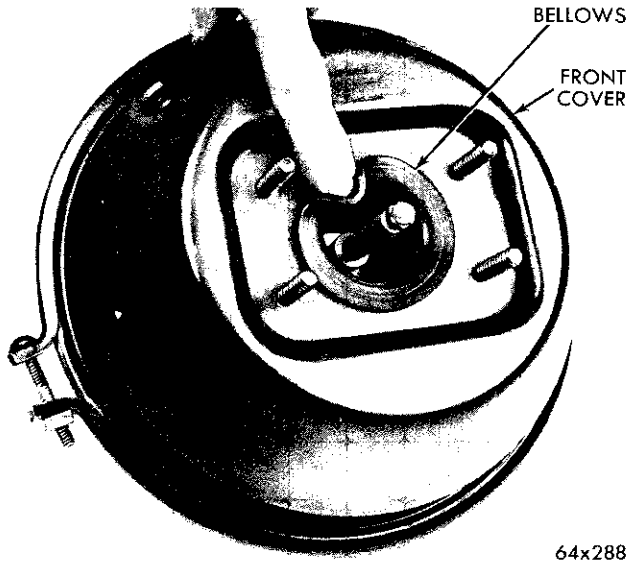

Fig. 35—Unseating the Bellows Seal

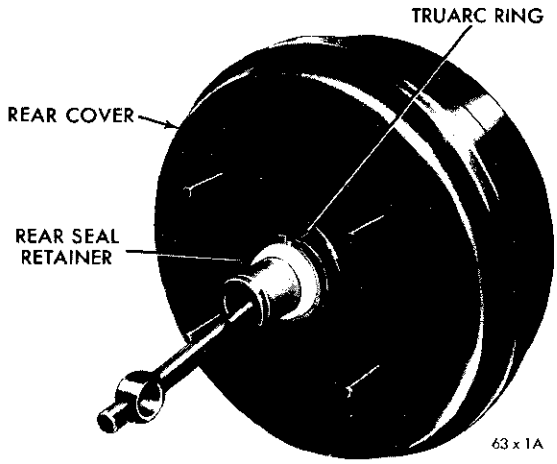

Fig. 36—Rear Seal Retainer

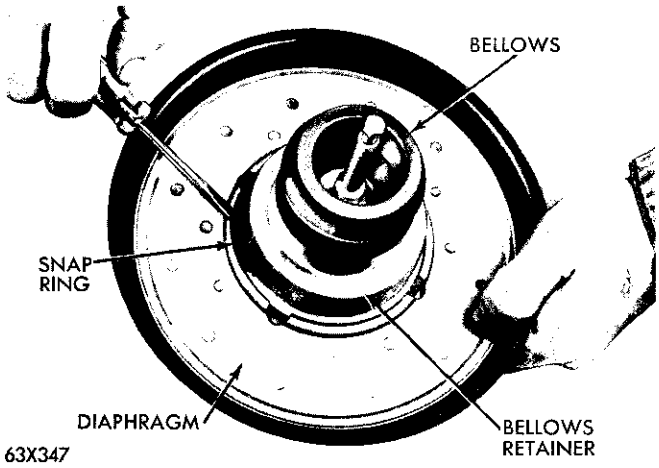

Fig. 37—Removing Bellows Retainer

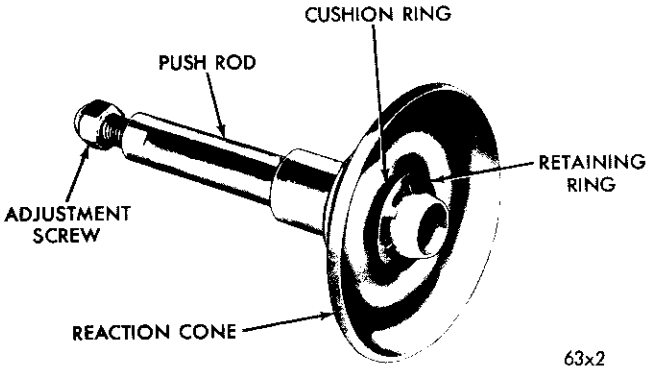

Fig. 38—Master Cylinder Push Rod

housing assembly and rear seal from the rear housing.

(9) Using a screw driver pry out the large retaining snap ring that retains the bellows to the diaphragm (Fig. 37).

(10) Pull the bellows out of the bellows retainer and remove the retaining ring from the bellows.

(11) Slide the master cylinder push rod assembly from the plunger (Fig. 38).

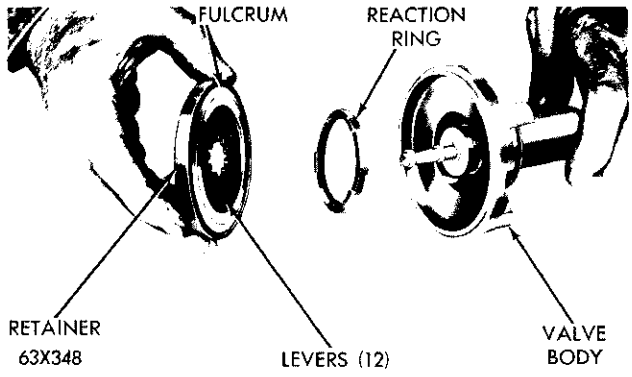

Fig. 39—Valve Body and Reaction Levers

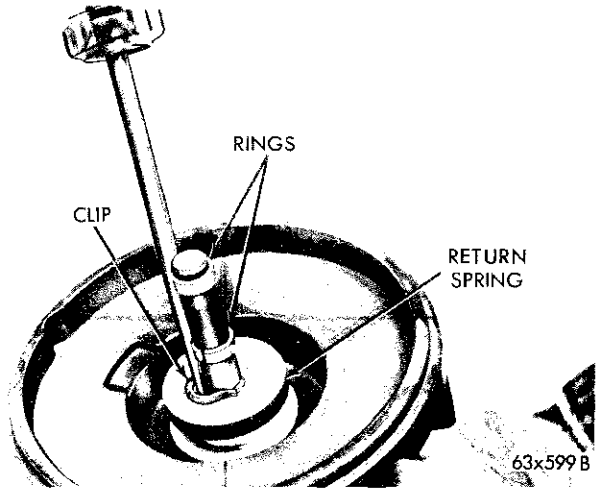

Fig. 40—Removing Valve Retainer

(12) Remove the reaction lever reaction ring and retainer assembly from the valve body and remove the levers from the retainer (Fig. 39).

(13) Remove the two plastic rings from the plunger shaft.

(14) Remove the retaining clip (Fig. 40) from the plunger shaft, remove the load ring and valve return spring. Remove the valve (Fig. 41).

(15) Remove the plunger from the valve body.

(16) Remove the plastic rear seal retainer from the plunger (Fig. 42) **The plunger assembly will be serviced as a unit and need not be dismantled further.**

(17) Using a small screw driver remove the rear seal from the rear seal retainer. Remove the "O" ring from the outer diameter of the seal retainer (Fig. 42).

(18) Remove the two "O" rings and the lip seal ring from the valve plunger (Fig. 43).

(19) Remove the "O" ring from the power piston.

Cleaning and Inspection

Thoroughly wash all the metal parts in a suitable

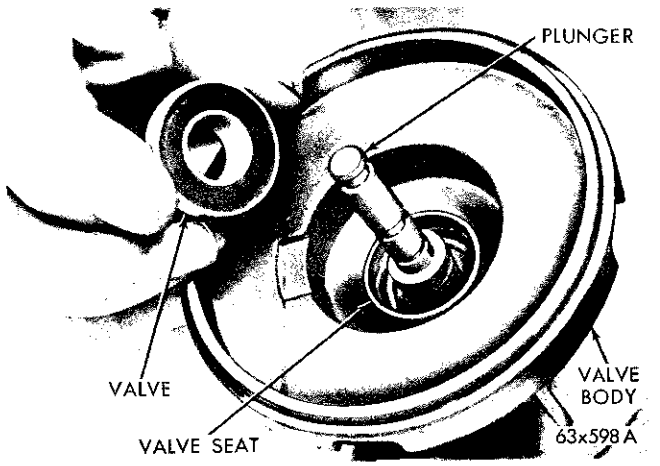

Fig. 41—Removing or Installing Valve

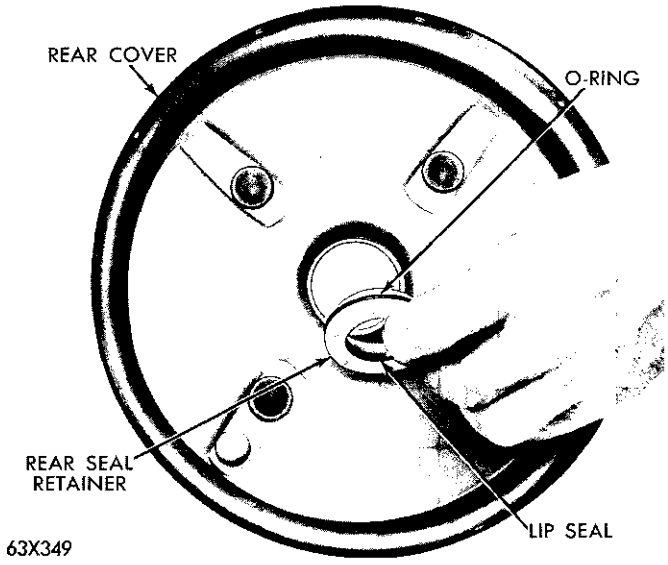

Fig. 42—Rear Seal Assembly

solvent and dry with compressed air. The power diaphragm, plastic power piston, and guide should be washed in a mild soap solution and water. Blow dust and cleaning fluid out of all internal passages. All rubber parts should be replaced, regardless of condition. Install new air filters at reassembly.

Inspect all parts for scoring, pitting, dents, or nicks, small imperfections can be smoothed out, using crocus cloth. Replace all parts that are badly scored, nicked or damaged. Wash all rubber seals in mineral spirits and air dry, relubricate with silicone grease.

Assembly

(1) Install the "O" ring on the power piston.

(2) Install the two "O" rings, and seal on the plunger assembly.

(3) Install rear seal into rear seal retainer with lip of seal toward small end of retainer.

(4) Install the "O" ring on the outside diameter of the rear seal retainer.

(5) Insert the rear seal retainer assembly into the hub of the rear cover.

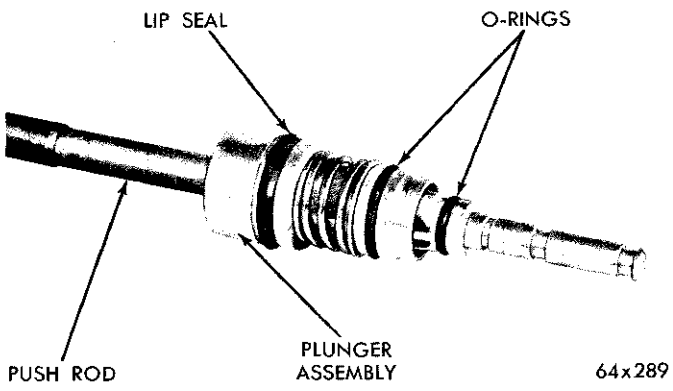

Fig. 43—Valve Plunger Assembly

(6) Holding the seal retainer in place invert the cover over a large socket to support the seal retainer in place.

(7) Apply downward pressure on the rear cover and install the retainer ring.

(8) Install plunger assembly into valve body.

(9) Install the valve into the valve body with the rubber insert contacting the valve seat. Install the valve return spring over the valve.

(10) Install load ring on plunger, concave face out.

(11) Press downward on the valve body and insert the spring clip into the groove of the plunger.

(12) Install the reaction ring with the three raised portions toward the reaction levers, (Fig. 39).

(13) Install the levers and fulcrum ring into the rubber retainer.

(14) Align the indexing tab with the notch in the valve body and insert the assembly into the valve body with the fulcrum ring on the underside.

(15) Install two plastic rings on plunger shaft.

(16) Install the master cylinder push rod onto the plunger assembly.

(17) Install the bellows into the bellows retainer and install the retaining ring onto the bellows.

(18) Place the valve body assembly into the detents of the diaphragm and install the bellows and retainer assembly.

(19) Install the bellows retainer snap ring.

(20) Install the diaphragm and valve assembly into the rear cover.

(21) Align the scribe marks and place the front cover over the bellows and master cylinder push rod.

(22) Align and squeeze the cover and housing together, install clamp band and tighten clamp bolt.

(23) Pull the lip of the bellows up through the front housing.

(24) Clean the filter and the breather.

(25) **Make sure the master cylinder piston stop and screw are installed in the lower hole on the master cylinder mounting face. (Install screw alone in the upper hole.) Install the master cylinder on the power brake unit, install the four nuts and tighten to 100 inch-pounds.**

Installation

(1) Install the power brake unit on the dash panel then install the attaching nuts and washers. Tighten securely.

(2) Install the bolt that connects the power brake push rod with the brake pedal linkage. Tighten securely.

(3) Connect the vacuum hose to the unit and connect the hydraulic brake tube.

(4) Refill the master cylinder and bleed the brakes. Refill the master cylinder after bleeding.

(5) Readjust the stop light switch if necessary.