

SECTION 5 BRAKES

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GENERAL DESCRIPTION

All 1968 Corvairs are equipped with a new split brake system as a safety feature. The system is designed with separate hydraulic systems for the front and rear brakes using a dual main cylinder (Fig. 1). If a wheel cylinder or brake line should fail at either the front or rear brake system of the vehicle, the operator can still bring the vehicle to a controlled stop. The main cylinder has two entirely separate reservoirs and outlets in a common

body casting. The front reservoir and outlet are connected to the rear wheel brakes, and the rear reservoir and outlet are connected to the front wheel brakes. Two pistons within the main cylinder receive mechanical pressure from the brake pedal push rod and transmit it through the brake lines as hydraulic pressure to the wheel cylinders. The filler cap is accessible from inside the trunk.

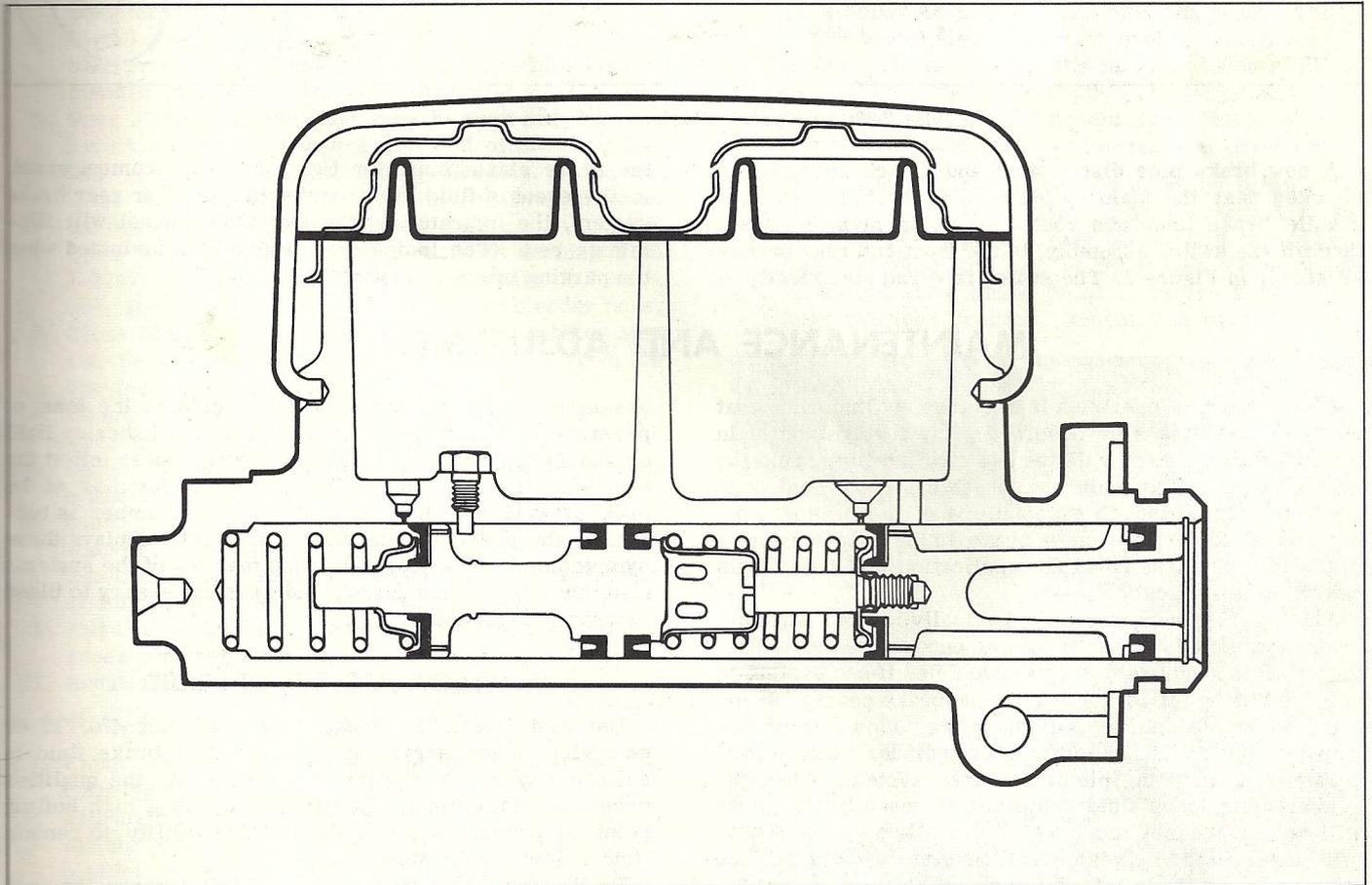


Fig. 1—Split Brake System—Main Cylinder

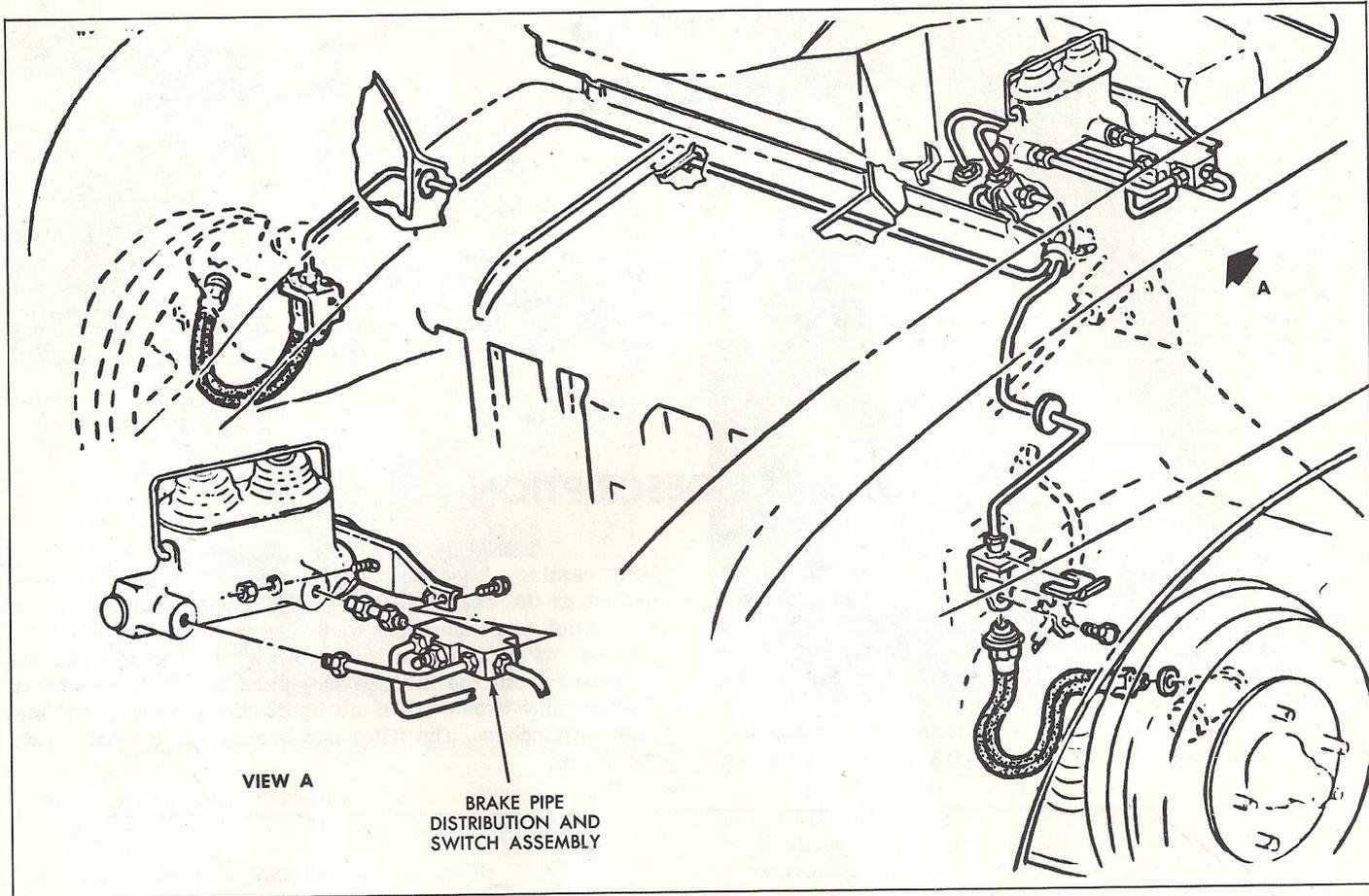


Fig. 2—Brake Pipe Distribution and Switch Assembly

A new brake pipe distribution and switch assembly is mounted near the main cylinder. The front and rear hydraulic brake lines are routed from the main cylinder, through the switch assembly, to the front and rear brakes as shown in Figure 2. The switch is wired electrically to

the brake alarm indicator light on the instrument panel. In the event of fluid loss in either the front or rear brake system, the indicator on the instrument panel will illuminate red. (The indicator will also be illuminated when the parking brake is applied.)

MAINTENANCE AND ADJUSTMENTS

In any service operation it is extremely important that absolute cleanliness be observed. Any foreign matter in the hydraulic system will tend to clog the lines, ruin the rubber cups of the main and wheel cylinders and cause inefficient operation or even failure of the braking system. Dirt or grease on a brake lining may cause that brake to grab first on brake application and fade out on heavy brake application.

The split system consists basically of two separate brake systems. When a failure is encountered on either, the other is adequate to stop the vehicle. If one system is not functioning, it is normal for the brake pedal lash and pedal effort to substantially increase. This occurs because of the design of the master cylinder which incorporates an actuating piston for each system. When the rear system loses fluid and takes in the air, its piston will bottom against the front piston. When the front system loses fluid, its piston will bottom on the end of the main cylinder body. A pressure differential causes an uneven hydraulic pressure balance between the front and rear systems. The brake pipe distribution and switch

assembly, near the main cylinder, detects the loss of pressure and illuminates the brake alarm indicator light on the instrument panel. The pressure loss is felt at the brake pedal by an apparent lack of brakes for most of the brake travel and then, when the failed chamber is bottomed, the pedal will harden. If a vehicle displays these symptoms, it is a good indication that one of the systems contains air or has failed, and it is necessary to bleed or repair the brakes.

HYDRAULIC BRAKE FLUID

Use GM Hydraulic Brake Fluid Supreme No. 11 or equivalent when servicing brakes. This brake fluid is satisfactory for any climate and has all the qualities necessary for proper operation, such as a high boiling point to prevent vapor lock and the ability to remain fluid at low temperatures.

In the event that improper fluid has entered the system, it will be necessary to service the system as follows:

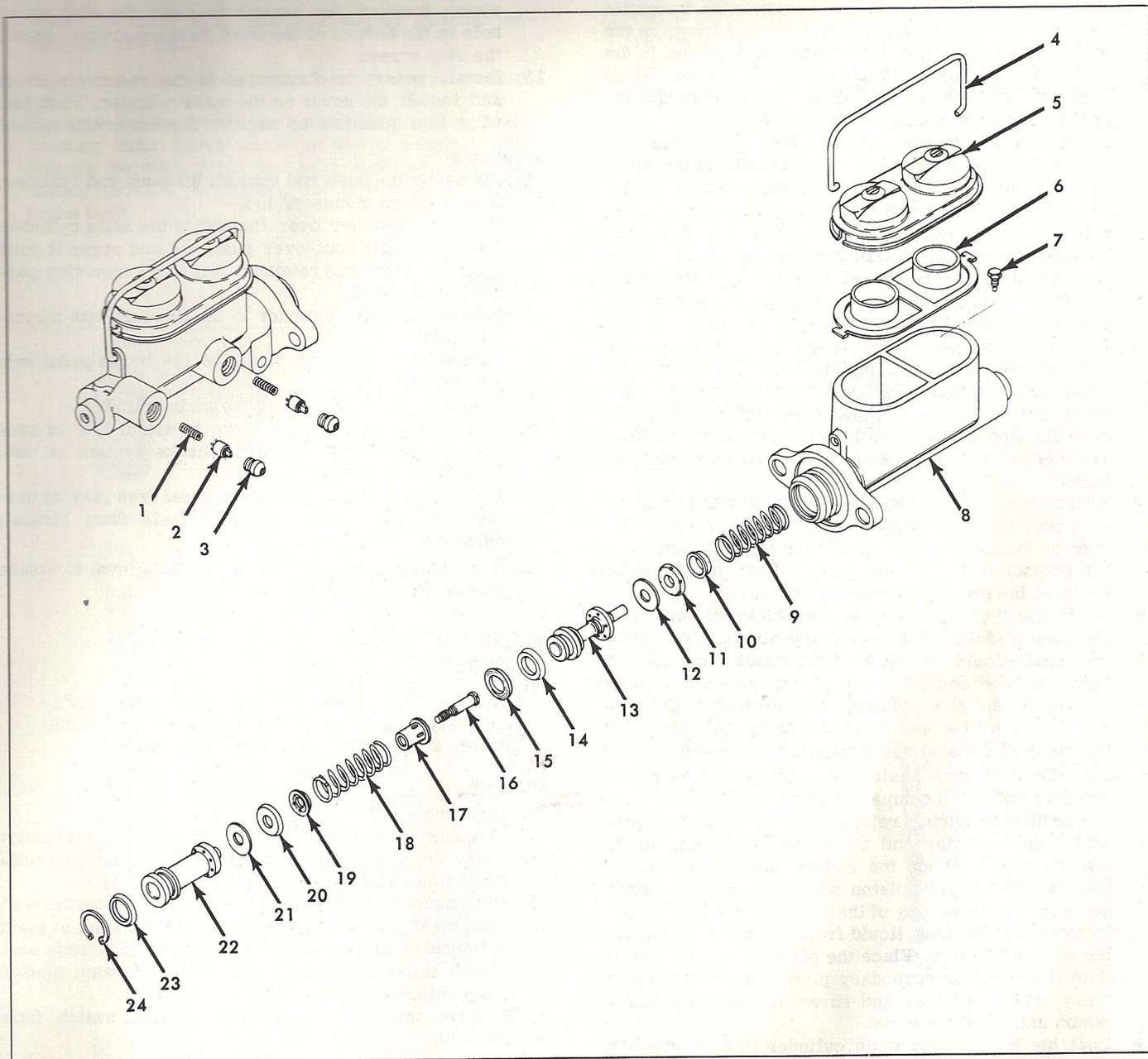


Fig. 5—Main Cylinder—Exploded View

- | | | | |
|----------------|--------------------|----------------------------|----------------------|
| 1. Spring | 7. Stop Screw | 13. Primary Piston | 19. Spring Retainer |
| 2. Check Valve | 8. Body | 14. Seal | 20. Seal |
| 3. Valve Seat | 9. Spring | 15. Seal | 21. Seal Protector |
| 4. Bail Wire | 10. Retainer | 16. Piston Extension Screw | 22. Secondary Piston |
| 5. Cover | 11. Seal | 17. Secondary Piston Stop | 23. Seal |
| 6. Diaphragm | 12. Seal Protector | 18. Spring | 24. Retaining Ring |

- Use Declene or equivalent to clean all metal parts thoroughly. Immerse parts in the cleaning fluid and brush with hair brush to remove foreign matter. Blow out all passages, orifices, and valve holes. Air dry the parts and place on clean paper or lint-free clean cloth.

NOTE: Be sure to keep parts clean until re-assembly. Rewash parts if there is any occasion to doubt cleanliness.

- Check pistons for scratches or other visual damage; replace if necessary.

Assembly (Fig. 5)

Use care when reassembling the main cylinder check valves. Improper assembly of the check valve seats will result in distortion of the seats. If this occurs, there will be no check valve action and a loss of brake pedal travel will result; the pedal will have to be pumped one or more times before actual car braking occurs.

1. Place the main cylinder in a vise with the outlet holes facing up. Place the check valve springs in the outlet holes. Be sure the springs are seated in the bottom of the holes. Place new rubber check valves over the springs, being careful not to displace the springs from the spring seats.
2. Place new brass tube seats in the outlet holes. Be sure seats are not cocked as this would cause burrs to be turned up as the tube seats are pressed in. Thread a spare brake line tube nut into the outlet hole and turn the nut down until the tube seat bottoms. Remove the tube nut and check the outlet hole for loose burrs, which might have been turned up when the tube seat was pressed down. Repeat this process to bottom the second seat.
3. Put new secondary seals in the two grooves in the end of the secondary piston assembly. The seal which is nearest the end will have its lips facing toward that end. The seal in the second groove should have its lips facing toward the portion of the secondary piston which contains the small compensating holes.
4. Assemble a new primary seal protector and primary seal over the end of the secondary piston with the flat side of the seal seats against the seal protector and the protector against the flange of the piston which contains the small compensating holes.
5. Assemble the new secondary seal into the groove on the push rod end of the primary piston. The lips of this seal should face toward the small compensating holes in the opposite end of the primary piston.
6. Assemble the new primary seal protector and primary seal on the end of the primary piston with the flat side of the seal seated against the seal protector and the protector against the flange on the piston which contains the compensating holes.
7. Assemble the spring retainer in one end of the primary piston spring and the secondary piston stop in the other end. Place the end of the spring over the end of the primary piston with the spring retainer seats inside of the lips of the primary seal.
8. Remove all cleaning liquid from the threaded hole in the primary piston. Place the piston extension screw down through the secondary piston stop and the primary spring retainer and screw it into the primary piston until it bottoms out.
9. Coat the bore of the main cylinder with clean brake fluid. Coat the primary and secondary seals on the secondary piston with clean brake fluid. Insert the secondary piston spring retainer into the secondary piston spring. Place the retainer and spring down over the end of the secondary piston until the retainer locates inside of the lips of the primary cup.
10. Hold the master cylinder with the open end of the bore down. Push the secondary piston into the bore until the spring seats against the closed end of the bore.
11. Position the main cylinder in a vise with the open end of the bore up. Coat the primary and secondary seal on the primary piston with clean brake fluid. Push the primary piston assembly, spring end first, into the bore of the main cylinder. Hold the piston down and snap the lock ring into position in the small groove in the I.D. of the bore.
12. Push the primary piston down to move the secondary

piston forward far enough to clear the stop screw hole in the bottom of the front fluid reservoir. Install the stop screw.

13. Install reservoir diaphragm in the reservoir cover and install the cover on the main cylinder. Push bail wire into position to secure the reservoir cover.

Installation

1. Assemble the push rod through the push rod retainer, if it has been disassembled.
2. Push the retainer over the end of the main cylinder. Assemble new boot over push rod and press it down over the push rod retainer. Slide new mounting gasket into position.
3. Secure the main cylinder to the firewall with mounting bolts.
4. Connect the push rod clevis to the brake pedal with pin and retainer.
5. Connect the brake lines to the main cylinder.
6. Fill main cylinder reservoirs to within 1/4" of reservoir rear rims. Bleed the brake system as outlined in this section.
7. If necessary, adjust the brake pedal free play as outlined in the 1965 Corvair Chassis Shop Manual, Section 5.
8. If manually bled, recheck brake fluid level to insure proper fluid level.

BRAKE PIPE DISTRIBUTION AND SWITCH ASSEMBLY (Fig. 2)

NOTE: The brake pressure differential warning switch is a non-adjustable, non-serviceable valve. If defective it must be replaced.

Removal

1. Disconnect battery cable.
2. Disconnect electrical lead from switch assembly.
3. Place dry rags below the switch to absorb any fluid spilled during removal of switch.
4. Disconnect four hydraulic lines from connections at switch. If necessary, loosen line connections at main cylinder to loosen lines. Cover open line ends with clean, lint-free material to prevent foreign matter from entering the system.
5. Remove mounting screw and remove switch from vehicle.

Installation

1. Make sure new switch is clean and free of dust and lint. If any doubt exists, wash switch in Declene, or equivalent, and dry with air.
2. Place switch in position and secure to bracket with mounting screw.
3. Remove protective material from open hydraulic brake lines and connect lines to switch. If necessary, tighten brake line connections at main cylinder.
4. Connect switch electrical lead.
5. Connect battery cable.
6. Bleed the brake systems as outlined in this section.

Brake Warning Light Checking Procedure

1. Determine if bulb is functioning by applying parking brake, then release.

2. Check to make sure that both master cylinder reservoirs are full.
3. Open wheel cylinder bleed screw at one rear wheel.
4. Depress brake pedal and hold down. The brake warning light should come on due to pressure difference between front and rear systems. Approximately 150-250 psi differential is needed to operate brake light.

5. Close bleed screw, then release brake pedal. Refill rear reservoir, if needed.

NOTE: Caution should be taken to prevent air from entering hydraulic system during checks on switch.

The recommended checking interval should be 24 months or 24,000 miles, any time major brake work is done or any time a customer complains of excessive pedal travel.

SPECIAL TOOLS

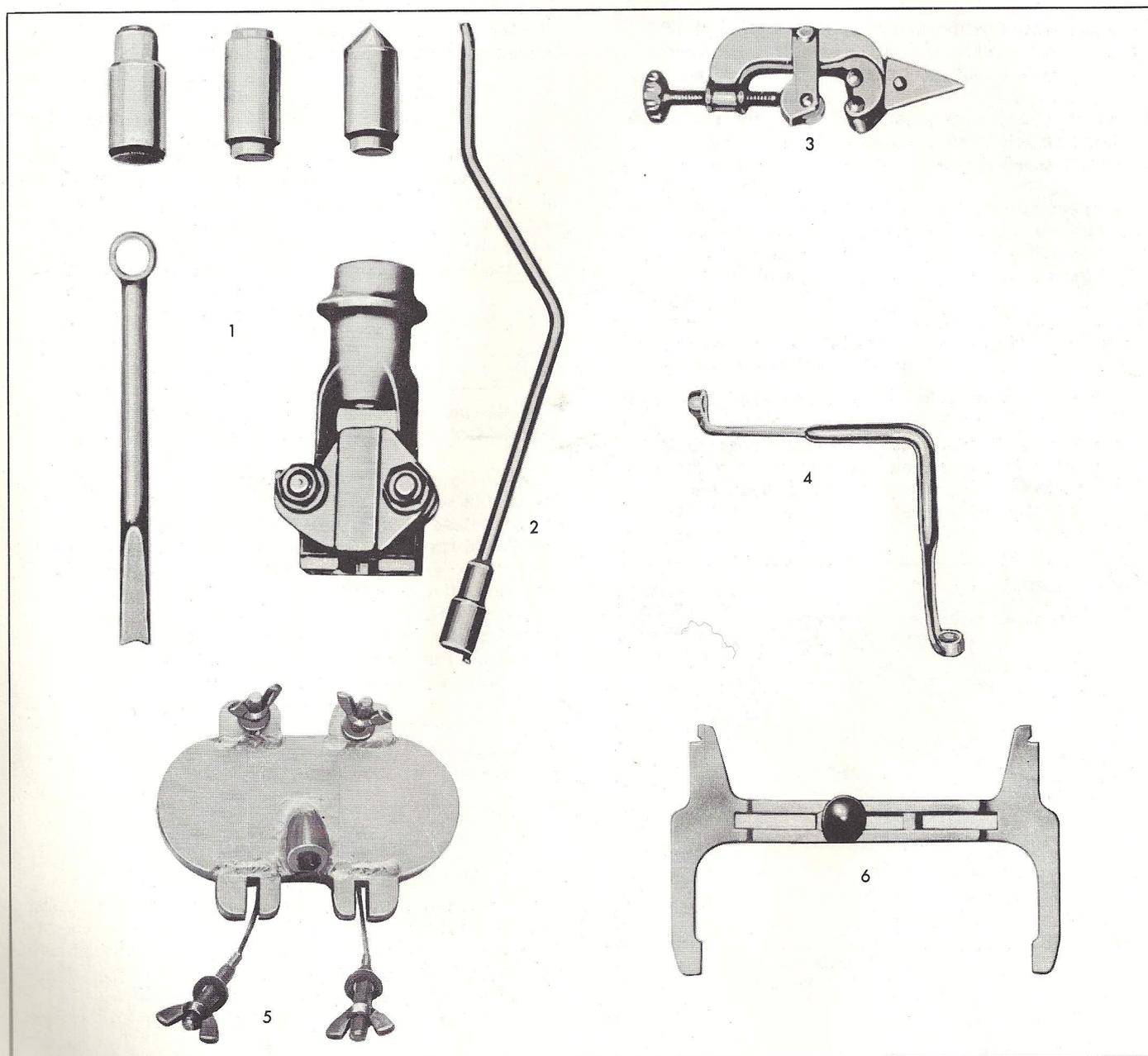


Fig. 6—Special Tools

1. J-8051 Brake Tool Flaring Tool
2. J-8049 Brake Spring Remover and Installer

3. J-8113 Brake Tube Cutter
4. J-21472 Brake Bleeder Wrench

5. J-22489 Pressure Bleeder Adapter
6. J-21177 Drum-to-Brake Shoe Clearance Gauge