CHAPTER TEN

BRAKES

All models use disc brakes on the front and drum brakes on the rear. The front brakes on both cars use single-piston calipers, but RX-2 caliper design differs from that of the RX-3. The rear brakes, leading and trailing shoe types, are the same for both cars. A vacuum booster reduces braking effort. The handbrake is a mechanical type operating the rear brakes through a cable linkage. Brake specifications are given in **Table 1** at the end of the chapter.

DISC BRAKE PADS

The pads should be checked for wear whenever the wheels are removed. Pads should be replaced when worn to 0.276 in. (7mm) on RX-2's, or 0.295 in. (7.5mm) on RX-3's. Always replace pads in full sets.

Pad Replacement (RX-2)

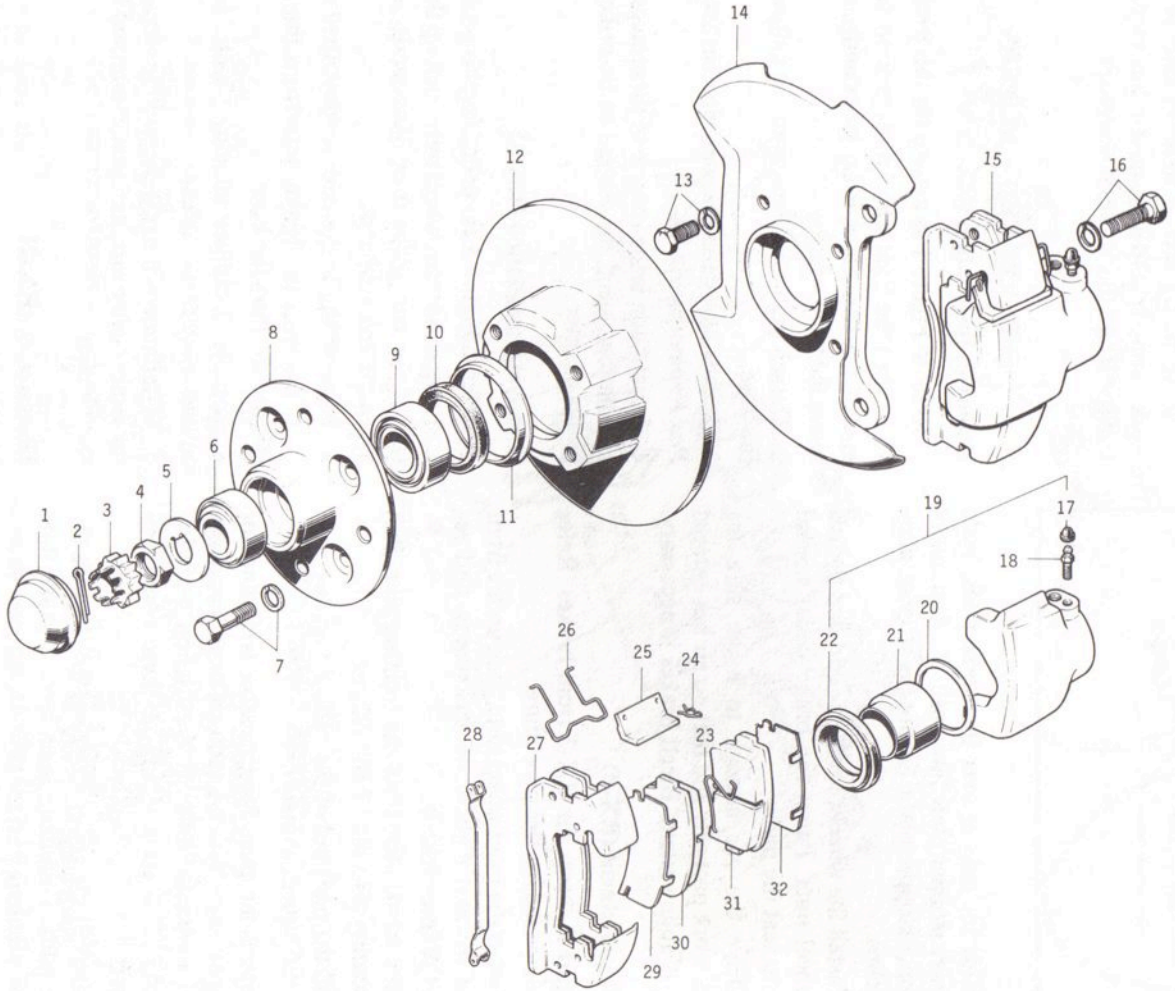
Figure 1 shows the RX-2 front brakes. Refer to it as needed for the following procedure.

1. Loosen the front wheel nuts, jack up the front end of the car, place it on jackstands, and remove the front wheels.
2. Pull the clips out of the caliper stopper plates.
3. Drive the stopper plates out with a hammer and screwdriver.
4. Lift the caliper off the mounting support, together with the anti-rattle spring.

CAUTION

Don't let the caliper hang by the hydraulic hose, or the hose may be damaged.

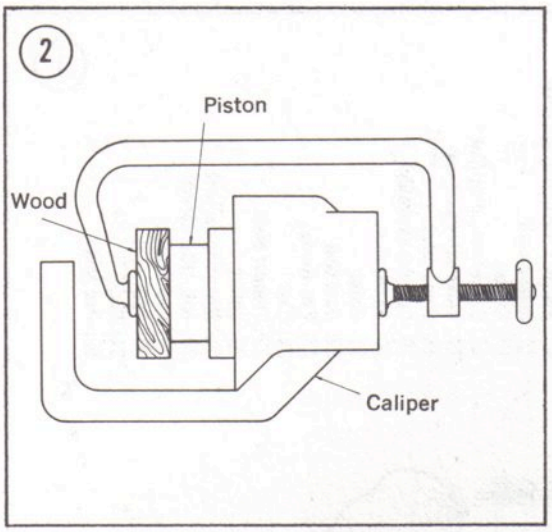
5. Lift the brake pads and anti-squeal shims away from the car.
6. Inspect the brake pads for excessive wear and for damage caused by overheating. Check for grease, oil, or brake fluid on the friction material. Replace all 4 pads if any of these conditions is found.
7. Check the calipers for brake fluid leaks. Overhaul the caliper as described later in this chapter if fluid has been leaking.
8. Place rags beneath the master cylinder reservoir in case it overflows. Open the caliper bleed valve to let brake fluid escape. Press the piston into the cylinder so the caliper will fit over the brake pads when installed. If necessary, use a C-clamp and block of wood to press the piston in. See **Figure 2**. After pressing the piston in, tighten the bleed valve.
9. Install the brake pads in the caliper mounting support, together with their shims. Fit the anti-rattle spring over the pads.



RX-2 FRONT BRAKE

1. Grease cap
2. Cotter pin
3. Nut lock
4. Wheel bearing nut
5. Wheel bearing washer
6. Wheel bearing
7. Hub-to-disc bolt and washer
8. Hub
9. Wheel bearing
10. Grease seal
11. Dust ring
12. Brake disc
13. Splash plate bolt and washer
14. Splash plate
15. Caliper
16. Caliper mounting bolt
17. Bleed valve dust cap
18. Bleed valve
19. Cylinder assembly
20. Piston seal
21. Piston
22. Dust seal
23. Pad spring
24. Clip
25. Stopper plate
26. Spring
27. Mounting support
28. Anti-rattle spring
29. Pad shim
30. Pad
31. Pad
32. Pad shim

(1)



10. Slide the caliper over the brake pads. Slide the lower stopper plate into position, then install the upper stopper plate. Secure the stopper plate with clips.

11. Install the wheels, lower the car, and tighten the wheel nuts. Pump the brake pedal several times to seat the pads.

12. Drive the car enough to make sure the brakes work properly and that no air has entered the hydraulic system. Bleed brakes if necessary.

Pad Replacement (RX-3)

Figure 3 shows the RX-3 front brakes. Refer to it as needed for this procedure.

1. Loosen the front wheel nuts, jack up the front end of the car, place it on jackstands, and remove the front wheels.

2. Remove the clips from the locating pins. Pull the locating pins out of the caliper.

3. Pull the pads out of the caliper together with their anti-squeal shims.

4. Inspect the pads for excessive wear and for damage caused by overheating. Check for grease, oil, or hydraulic fluid on the friction material. Replace all 4 pads if any of these conditions is found.

5. Carefully clean out the space which holds the brake pads. Examine the caliper. If brake fluid has been leaking past the piston seal, remove and overhaul the caliper as described later in this chapter.

6. Place rags beneath the master cylinder reservoir in case it overflows. Open the caliper bleed valve to let brake fluid escape. Press the piston into the cylinder far enough to install the brake pads. Close the bleed valve.

7. Install the brake pads and anti-squeal shims. Install the pad return spring and locating pins. Secure the pins with the clips.

8. Install the front wheels, lower the car, and tighten the wheel nuts. Pump the brake pedal several times to seat the pads.

9. Drive the car enough to make sure the brakes work properly and that no air has entered the system. Bleed the brakes if necessary.

DISC BRAKE CALIPERS

Removal/Installation (RX-2)

Refer to Figure 1 as needed for this procedure.

1. Loosen the front wheel nuts, jack up the front end of the car, place it on jackstands, and remove the front wheels.

2. Detach the brake hose from the caliper. Plug the hose.

3. Remove the caliper as described in Steps 2-4. *Pad Replacement (RX-2).*

4. Installation is the reverse of these steps. After installation, bleed the brakes as described later in this chapter.

Removal/Installation (RX-3)

Refer to Figure 3 as needed for this procedure.

1. Loosen the front wheel nuts, jack up the front end of the car, place it on jackstands, and remove the front wheels.

2. Remove the brake pads as described earlier.

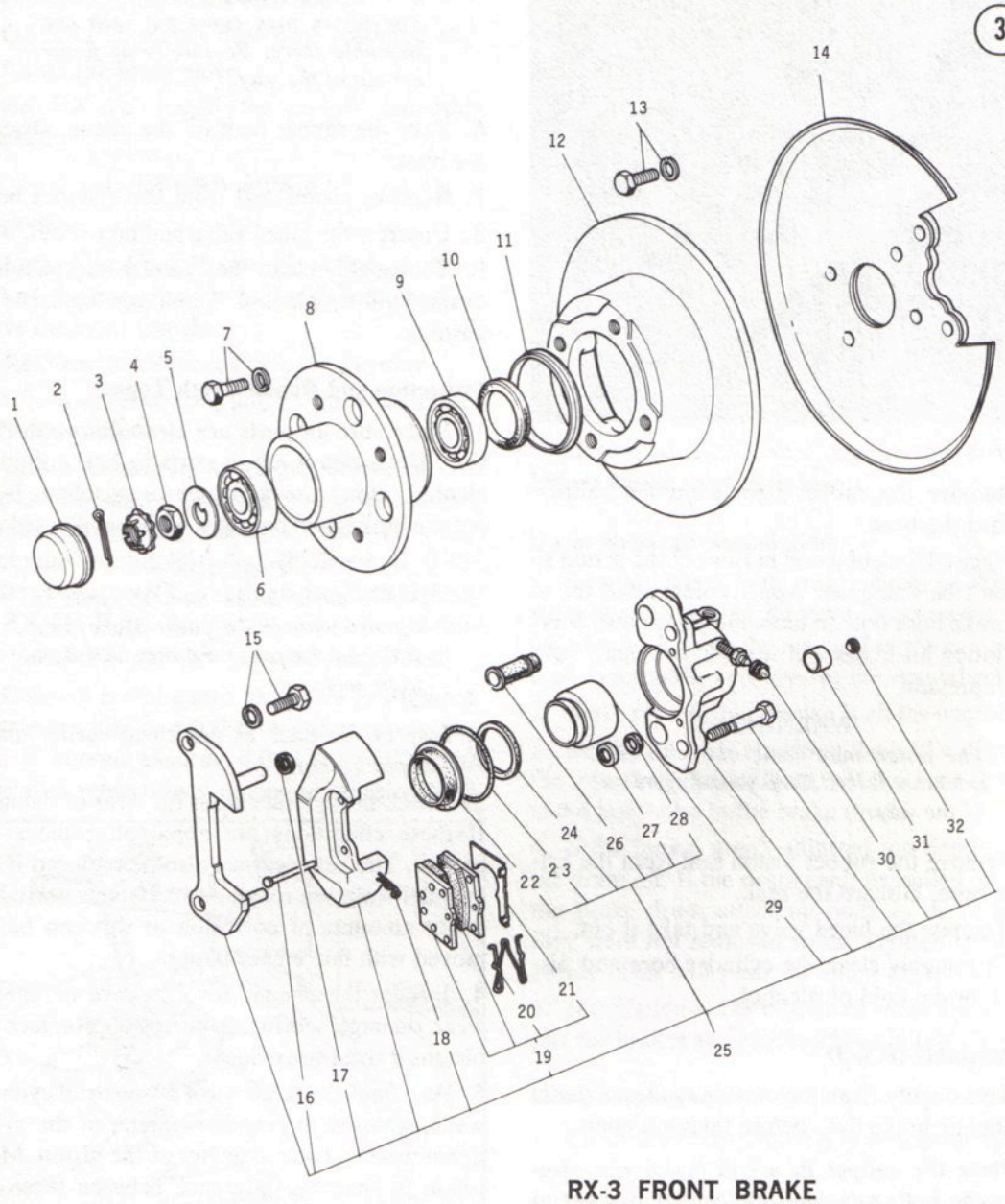
3. Disconnect the brake hose from the caliper (**Figure 4**). Plug the hose.

4. Remove 2 caliper attaching bolts. Lift the caliper away from the car.

5. Installation is the reverse of these steps. Bleed the brakes after installation as described later in this chapter.

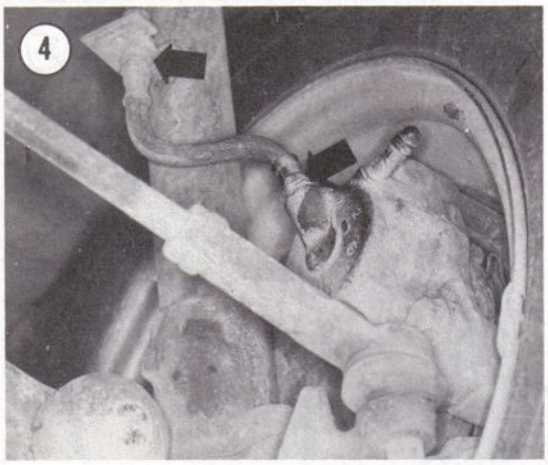
Disassembly (RX-2)

1. Thoroughly clean the outside of the caliper in alcohol or brake fluid before taking it apart.



RX-3 FRONT BRAKE

1. Grease cap
2. Cotter pin
3. Nut lock
4. Wheel bearing nut
5. Wheel bearing washer
6. Wheel bearing
7. Disc-to-hub bolt and washer
8. Hub
9. Wheel bearing
10. Grease seal
11. Dust ring
12. Brake disc
13. Splash plate bolt and washer
14. Splash plate
15. Caliper mounting bolt
16. Caliper pin
17. Spacer
18. Clip
19. Pads
20. Spring
21. Pad shim
22. Dust seal
23. Retaining ring
24. Piston seal
25. Caliper assembly
26. Bushing
27. Wiper seal
28. Seal retainer
29. Piston
30. Bleed valve and dust cap
31. Piston cap
32. Plug



2. Remove the rubber boot from the caliper. Discard the boot.

3. Place a block of wood in front of the piston so it won't be damaged. Apply compressed air to the brake hose hole to blow the piston out. Service station air hoses will work if you don't have a compressor.

WARNING

The piston may come out with considerable force. Keep your fingers out of the way.

4. Remove the rubber piston seal from the cylinder bore. Discard the seal.

5. Unscrew the bleed valve and take it out.

6. Thoroughly clean the cylinder bore and piston in brake fluid or alcohol.

Disassembly (RX-3)

1. Thoroughly clean the outside of the caliper in alcohol or brake fluid before taking it apart.

2. Place the caliper in a soft-jawed vise. Remove the bolts attaching the caliper bracket to the caliper.

3. Remove the retainer ring from the dust boot.

4. Take the caliper out of the vise and pry the bracket off.

5. Place a block of wood on the ground. Hold the caliper slightly above it so the piston points toward the wood. Apply compressed air to the brake hose hole to force the piston out. Use a service station air hose if you don't have a compressor.

WARNING

The piston may come out with considerable force. Be sure your fingers are out of the way.

6. Take the rubber boot off the piston. Discard the boot.

7. Remove piston seal from the cylinder bore.

8. Unscrew the bleed valve and take it out.

9. Thoroughly clean the cylinder and piston in brake fluid or alcohol. Don't use kerosene or gasoline.

Inspection and Repair (Both Types)

1. Make sure all parts are clean before inspection. If necessary, clean parts in brake fluid or alcohol. Don't use kerosene or gasoline. Blow out the brake fluid passages with compressed air.

CAUTION

Never allow brake fluid to come in contact with brake pads. Brake fluid will ruin the pads, and they will have to be replaced.

2. Inspect the pads as described earlier under *Pad Replacement.*

3. Check the cylinder walls for wear or damage. If these conditions are apparent, replace the caliper. The caliper must also be replaced if the cylinder walls are rough or excessively corroded. Slight amounts of corrosion or dirt can be removed with fine emery paper.

4. Inspect the pistons for excessive or uneven wear, damage, scoring, or corrosion. Replace the pistons if these are evident.

5. As a final check for worn pistons and cylinder walls, measure the inside diameter of the cylinder and the outside diameter of the piston. Maximum permissible difference between these figures is 0.006 in. (0.15mm). Replace the cylinder or piston if clearance is excessive.

Assembly (Both Types)

1. Coat a new piston seal with brake fluid. Using only your fingers, install the seal in the caliper bore. Be sure the seal is seated in its groove.

2. On RX-3's, install the dust boot on the piston.

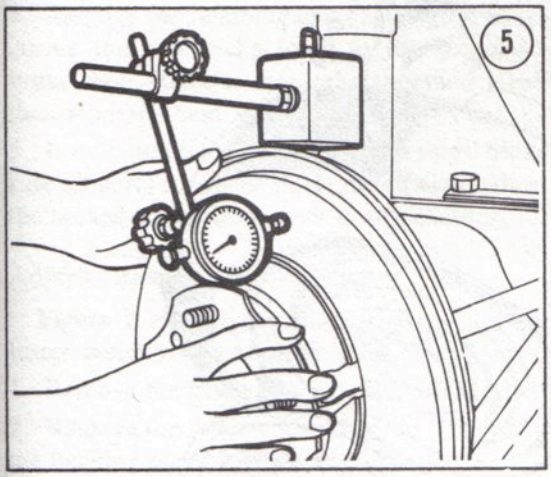
3. Coat the piston and cylinder walls with brake fluid. Install the piston in the caliper.

4. On RX-2's, install the dust boot.
5. On RX-3's, install dust boot retaining clip.
6. Install the bleed valve.
7. On RX-3's, install the caliper mounting bracket.

BRAKE DISCS

Inspection

1. Loosen the front wheel nuts, jack up the front end of the car, place it on jackstands, and remove the front wheels.
2. Remove the caliper as described earlier.
3. Check wheel bearing adjustment as described in Chapter Eleven.
4. Check the disc for scoring or corrosion. The disc can be refaced by a dealer or machine shop if either of these conditions is found. However, minimum permissible disc thickness is 0.433 inch (11mm) on RX-2's, and 0.394 inch (10mm) on RX-3's. If the disc would have to be cut thinner than this to smooth it, it must be replaced.
5. Connect a dial gauge as shown in **Figure 5**. Rotate the disc one full turn and measure runout. If runout exceeds 0.003 in. (0.075mm), have disc refaced by a dealer or machine shop.



Disc Removal/Installation

1. Loosen the front wheel nuts, jack up the front end of the car, place it on jackstands, and remove the front wheels.
2. Remove the caliper as described earlier. On RX-2's, remove the caliper mounting bracket from the mounting adapter.
3. Remove the wheel bearing grease cap, nut lock, and nut as described in Chapter Eleven.
4. Using both hands, pull the brake disc together with the wheel hub.
5. Remove 4 bolts and separate the brake disc from the hub.
6. Installation is the reverse of these steps. Tighten disc-to-hub bolts to 36 ft.-lb. (5 mkg). Adjust the wheel bearings as described in Chapter Eleven. Bleed the brakes as described later in this chapter.

REAR BRAKES

RX-2 and RX-3 rear brakes are similar. **Figure 6** is an exploded view.

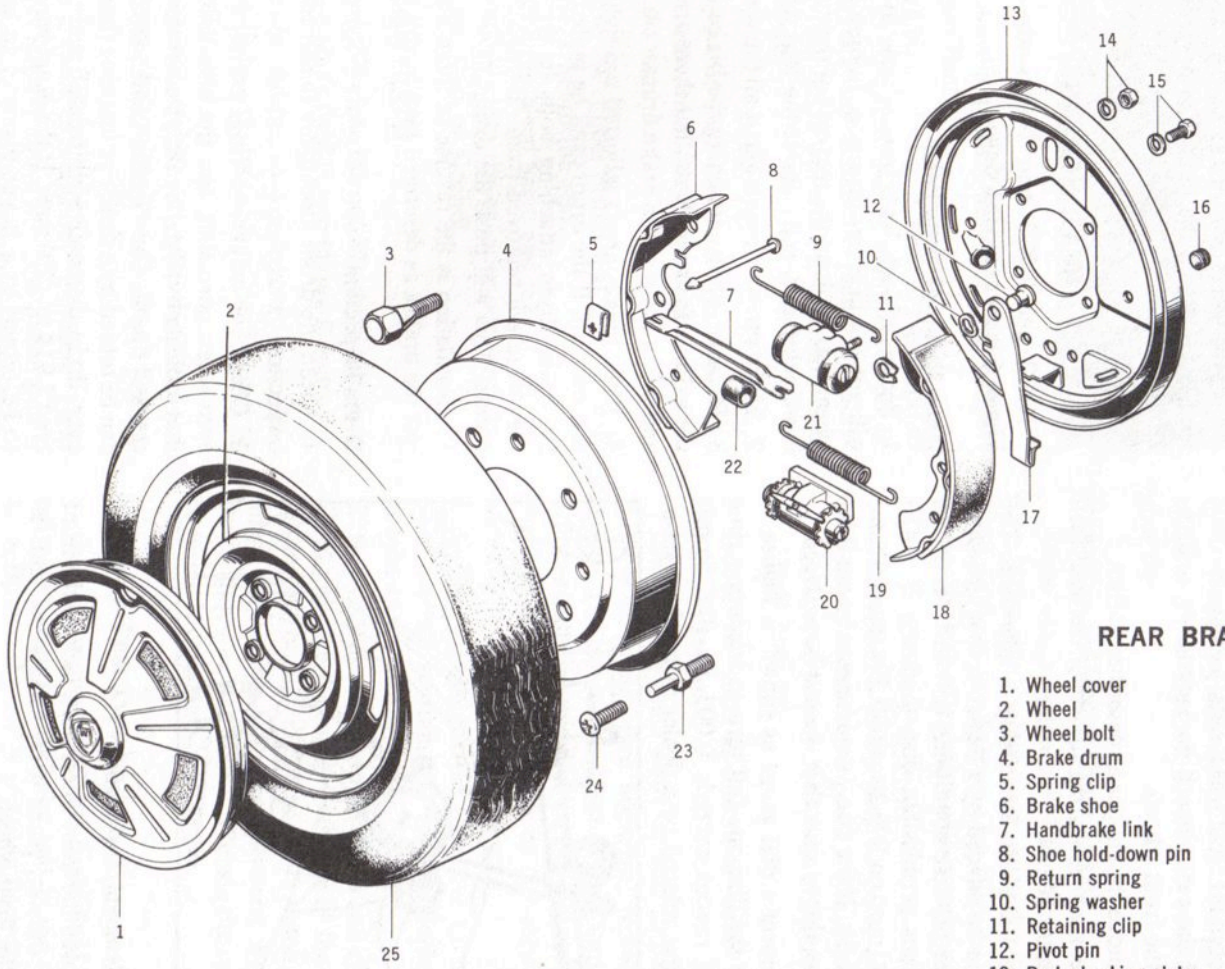
Drum Removal/Installation

1. Securely block both front wheels so the car will not roll in either direction. Loosen the rear wheel nuts, jack up the rear end of the car, place it on jackstands, and remove the rear wheels.
2. Make sure the handbrake is all the way off.
3. Remove 2 bolts attaching the brake drum to the axle shaft flange. Note that there are 2 bolts and 4 bolt holes in the brake drum.
4. If the brakes aren't adjusted too tightly, pull the drum off. If the drum can't be pulled off, put the brake drum attaching bolts in the 2 holes they were *not* removed from. Tighten the bolts evenly. This will push the drum off.
5. Installation is the reverse of these steps. Adjust the brakes as described later in this chapter.

Drum Inspection

1. Clean the drum thoroughly in solvent before inspection.
2. Check for cracks, scoring, excessive or uneven wear, corrosion, and the blue-tinted spots that indicate overheating. Replace overheated or cracked drums. Out-of-round and scored drums can be turned by a dealer or machine shop. However, drum diameter after turning must not exceed 7.914 in. (201mm). If the drum would have to be turned to a larger diameter to true it, it must be replaced.

NOTE: *If one drum is turned, the other should be turned to the same size.*



REAR BRAKE

1. Wheel cover
2. Wheel
3. Wheel bolt
4. Brake drum
5. Spring clip
6. Brake shoe
7. Handbrake link
8. Shoe hold-down pin
9. Return spring
10. Spring washer
11. Retaining clip
12. Pivot pin
13. Brake backing plate
14. Nut and washer
15. Bolt and washer
16. Adjusting hole plug
17. Handbrake lever
18. Brake shoe
19. Return spring
20. Adjuster
21. Wheel cylinder
22. Holder
23. Bolt
24. Screw
25. Tire

3. Remove glaze from serviceable drums with fine emery paper.

Shoe Inspection

1. Remove the brake drum as described earlier.
2. Inspect the lining material on the brake shoes. Make sure it is not cracked, unevenly worn, or separated from the shoes. If linings are only slightly oily or greasy, and not excessively worn, they may be cleaned in trichlorethylene and reused. If the linings are saturated with oil or grease, or contaminated with brake fluid, they must be replaced.

Shoe Removal/Installation

Refer to Figure 6 as needed for this procedure.

1. Unhook and remove the upper return spring with a screwdriver. Remove the lower return spring in the same manner.
2. Remove the shoe hold-down pins. Twist the pins with pliers until they fit through the slots in the retaining clips. The pins and clips can then be removed.
3. Remove the primary (forward) brake shoe. Lift the handbrake link (7, Figure 6) away from the car.
4. Remove the retaining clip (11, Figure 6) securing the handbrake lever to the secondary brake shoe. Remove the brake shoe and lever, then separate them.
5. Installation is the reverse of these steps. Make sure all parts are clean. After installation, adjust the brakes as described later in this chapter.

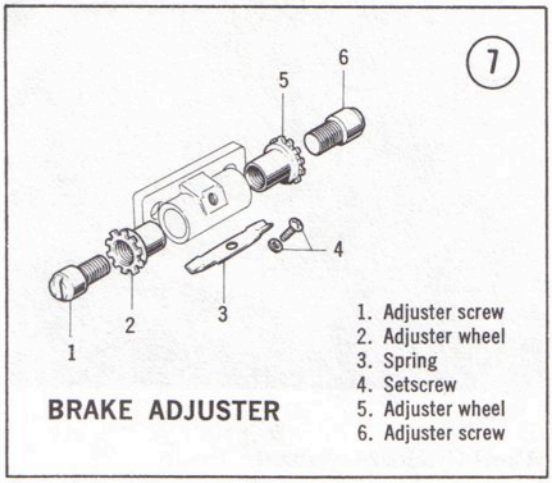
Adjuster Removal/Installation

Figure 7 is a disassembled view of the adjuster. Refer to it as needed for this procedure.

1. Remove the brake shoes as described earlier.
2. Remove the 2 bolts attaching the adjuster to the backing plate. Lift the adjuster off.
3. Installation is the reverse of these steps. After installation, adjust the brakes as described later in this chapter.

Adjuster Disassembly, Inspection, and Assembly

1. Remove the locking screw (4, Figure 7). Take off the adjusting wheel spring (3).



BRAKE ADJUSTER

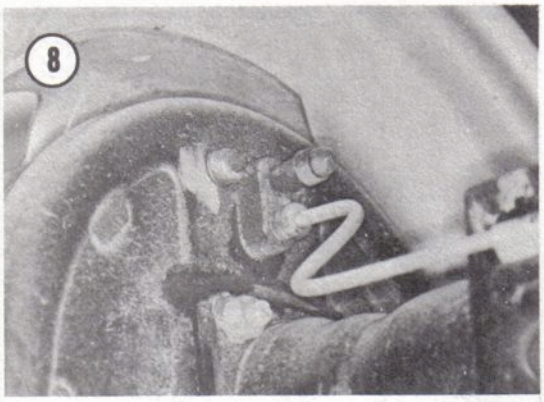
2. Remove the adjusting wheels from the adjuster body. Remove the adjusting screws from the wheels.
3. Clean all parts in solvent. Check for wear, damage, or corrosion. Replace parts with these conditions.
4. Coat the friction surfaces of the adjusting wheels with brake grease. Apply a light film of grease only. Do not allow the grease to touch brake linings or drums.
5. Thread the adjusting screws into the adjusting wheels.

> NOTE: *The rear adjusting screw on the left wheel and front adjusting screw on the right wheel have left-hand threads (turn counterclockwise to screw in).*

6. Insert the adjusting wheels into the adjuster. Position the adjuster spring and secure it with a screw and lockwasher.

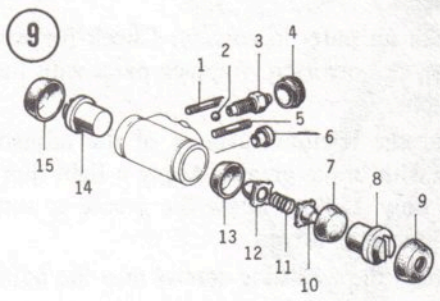
Wheel Cylinder Removal/Installation

1. Remove the brake drum and shoes as described earlier.
2. Disconnect the brake fluid line from the wheel cylinder at the backing plate.
3. Remove 2 nuts attaching the wheel cylinder to the backing plate. Lift the cylinder off. See **Figure 8**.
4. Installation is the reverse of these steps. After installation, bleed the brakes as described later in this chapter.



Wheel Cylinder Overhaul

Figure 9 is an exploded view of one wheel cylinder. Refer to it as needed for this procedure.



WHEEL CYLINDER

1. Stud
2. Check ball
3. Bleed valve
4. Dust cap
5. Stud
6. Tube seat
7. Piston cup
8. Piston
9. Dust cover
10. Filling block
11. Spring
12. Filling block
13. Piston cup
14. Piston
15. Dust cover

1. Remove the rubber boots from both ends of the wheel cylinder.
2. Remove 2 pistons, 2 piston cups, 2 cup fillers, and one return spring.
3. Remove the bleed screw and valve ball.
4. Clean all parts with alcohol or brake fluid. Do not clean in gasoline or kerosene.
5. Check the cylinder and piston for excessive or uneven wear, scoring, or corrosion. Replace if these conditions are evident.
6. As a final check on a suspect cylinder and piston, measure piston outside diameter and cylinder inside diameter with a micrometer. If the different between these figures (piston clearance) exceeds 0.006 in. (0.15mm), the cylinder and piston must be replaced.
7. Check piston cups for wear, damage, and deterioration. Replace if their condition is in any doubt.

NOTE: *If using a repair kit, install all parts. Do not reuse old parts.*

8. Install the bleeder screw and valve ball.
9. Coat the cylinder bore with clean brake fluid. Install the return spring.
10. Dip the cup fillers, cups, and pistons in clean brake fluid. Install them in the cylinder. Be sure the lip of each cup faces into the cylinder.
11. Install a rubber dust cover on each end of the cylinder.

BACKING PLATE

Removal/Installation

This procedure is rarely necessary for brake service. However, if it is required, remove the rear axle as described in Chapter Twelve. Then undo the brake line and lift the backing plate off. Install in the reverse order.

MASTER CYLINDER

The master cylinder on RX-2's and RX-3's is a tandem type with a separate reservoir. **Figure 10** shows the installation.

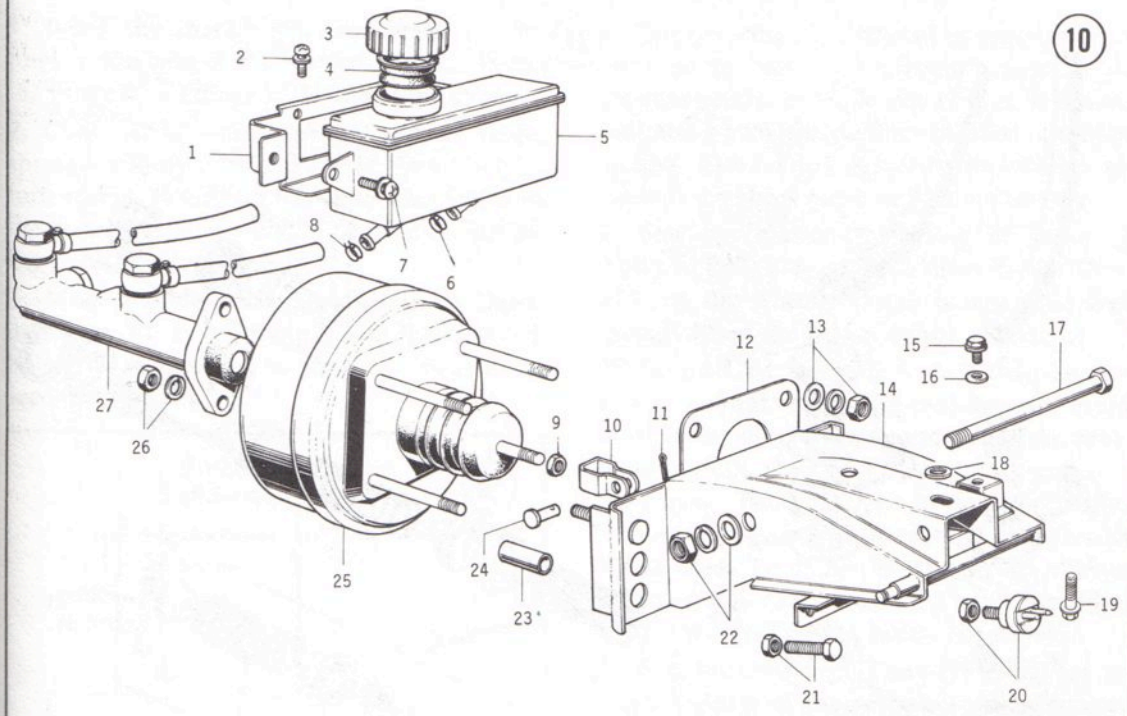
Removal/Installation

1. Disconnect the brake fluid hoses from the master cylinder. Plug the hoses or drain the brake fluid from the reservoir.
2. Disconnect the brake lines from the master cylinder.

CAUTION

Place rags or a container beneath the master cylinder to keep brake fluid off the paint.

3. Remove the master cylinder installation nuts. Pull the master cylinder straight out from the vacuum booster, then lift it out.



MASTER CYLINDER AND VACUUM BOOSTER

1. Reservoir bracket
2. Screw and washer
3. Reservoir cap
4. Baffle
5. Fluid reservoir
6. Hose clamp
7. Screw and washer
8. Hose clamp
9. Locknut
10. Pushrod clevis
11. Cotter pin
12. Gasket
13. Nut and washers
14. Pedal bracket
15. Bolt
16. Washer
17. Pedal pivot bolt
18. Washer
19. Pedal bracket bolt
20. Stoplight switch
21. Bolt and washer
22. Nut and washers
23. Spacer
24. Clevis pin
25. Brake booster
26. Nut and washer
27. Master cylinder

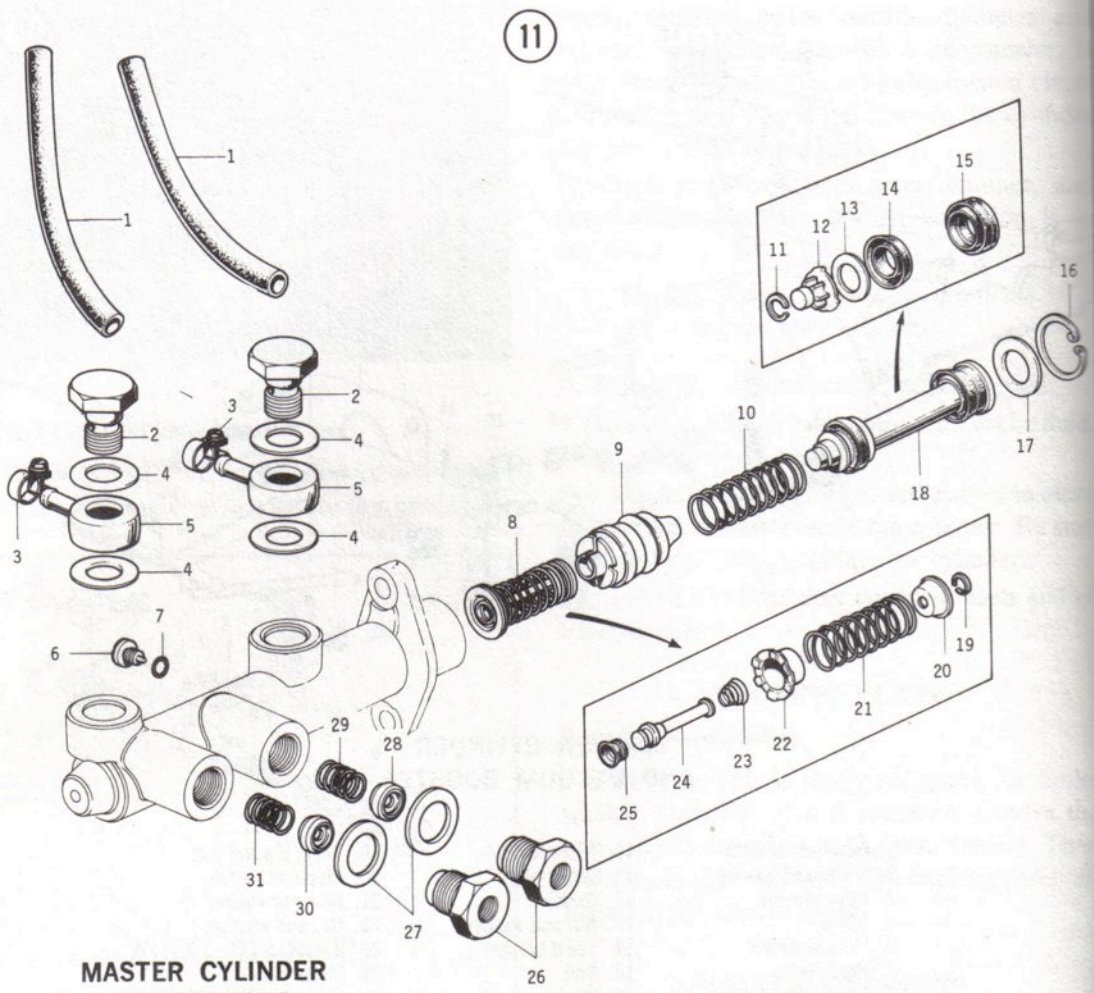
4. Installation is the reverse of these steps. Fill the fluid reservoir with DOT 3 or DOT 4 brake fluid and bleed the brakes.

Disassembly

Refer to **Figure 11** as needed for this procedure.

1. Drain the brake fluid from the master cylinder. Clean the outside of the cylinder in alcohol or brake fluid. Do not use kerosene or gasoline.
2. Push the piston into the cylinder with a screwdriver. Using snap ring pliers, remove the snap ring (16, Figure 11) and stop washer (17).
3. Remove the primary piston assembly and its return spring from the cylinder.
4. Press the secondary piston into the cylinder with a screwdriver. Remove the stop bolt (6, Figure 11). Let up on the screwdriver, then remove the secondary piston.

> NOTE: *It may be necessary to blow the piston out with compressed air. Use a service station air hose if you don't have a compressor. Point the master cylinder at a piece of wood laid on the ground when blowing the piston out.*



MASTER CYLINDER COMPONENTS

1. Brake fluid lines
2. Connector bolts
3. Hose clamps
4. Gaskets
5. Hose fittings
6. Stopper bolt
7. Gasket
8. Piston assembly
9. Piston
10. Piston spring
11. Stop ring
12. Spring seat
13. Piston cup spacer
14. Primary cup
15. Secondary cup
16. Snap ring
17. Stop washer
18. Piston
19. Stop ring
20. Spring seat
21. Piston spring
22. Valve case
23. Valve spring
24. Valve rod
25. Valve
26. Brake line fittings
27. Gaskets
28. Check valve
29. Valve spring
30. Check valve
31. Spring

5. Unscrew the brake fluid hose fittings from the top of the cylinder. Remove the outlet fittings, check valves, and springs from the side of the cylinder.

Inspection

1. Thoroughly clean all metal parts in alcohol or brake fluid before inspection. If installing a repair kit, discard all parts that the kit replaces.

2. Check the cylinder bore and piston for excessive or uneven wear, scoring, and corrosion. Wear is excessive if clearance between cylinder walls and pistons exceeds 0.006 in. (0.15mm). Replace cylinder and piston if these conditions are evident.

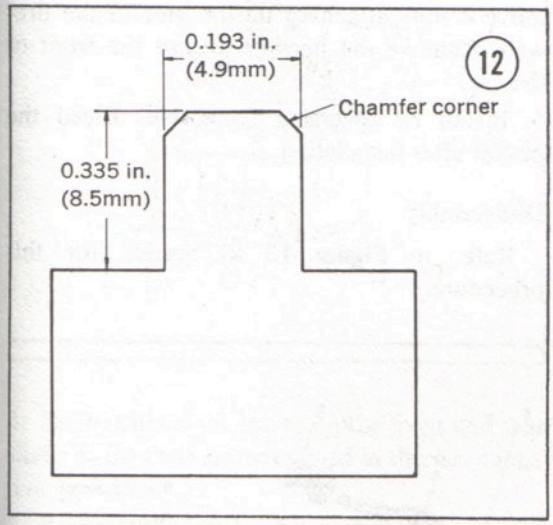
3. Inspect the check valves, stop bolt, hose and line fittings, hoses, and reservoir for wear or damage. Replace as needed.

Assembly

1. Install the check valves and brake line fittings in the side of the master cylinder. Install the brake hose fittings in the top of the cylinder.

2. Coat the secondary piston and its return spring assembly with brake fluid. Install the return spring. If the cup has been removed from the piston, install it with the flat side against the flange on the piston.

3. Make a guide pin to the dimensions shown in **Figure 12**. Insert the pin into the stop bolt hole. This is necessary to prevent damage to the secondary piston cup.



4. Install the secondary piston. Press it into the cylinder with a screwdriver. Remove the guide pin and insert the stop bolt.

5. Dip primary piston and its return spring in brake fluid. Install them in the master cylinder.

> NOTE: *If the cups have been removed from the piston, install them with the lips facing into the cylinder.*

6. Press the piston into the bore with a screwdriver. Install the stop washer and snap ring.

VACUUM BOOSTER

The Master-Vac vacuum booster uses intake manifold vacuum to reduce braking effort. A check valve in the vacuum line between brake booster and manifold allows the booster to build up and store vacuum.

Booster Test

This procedure is designed to uncover problems which can be attributed either to the vacuum booster or to the check valve. If this test indicates a problem, perform the next procedure (*Check Valve Test*) to determine whether the cause is the check valve or vacuum booster.

1. Test the brakes by driving at about 20 mph (30 kph) and applying them firmly. Don't lock up the wheels. If the brake pedal feels spongy, bleed the brakes before continuing.

2. Turn off the engine and place the transmission in neutral. Pump the brake pedal several times to use up all reserve vacuum in the brake booster. Hold the pedal down lightly and start the engine. The pedal should go down further with no increase in foot pressure. If no difference is felt when the engine is started, the vacuum system is defective. Go to the next procedure (*Check Valve Test*) to isolate the cause.

3. Turn the engine off. Pump the pedal several times to use up all reserve vacuum in the booster. Hold the brake pedal down firmly. If the pedal gradually goes down farther with no increase in foot pressure, the hydraulic system is leaking. Examine the brake lines as described later in this chapter.

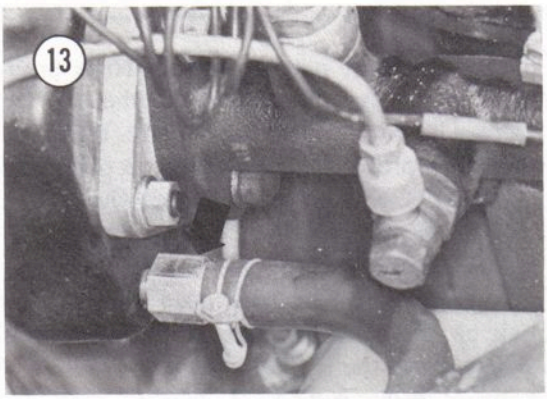
4. Let off the brakes and start the engine. Run it at medium speed. Turn off the engine and let up the gas pedal simultaneously. This builds up vacuum in the booster. Wait at least 90 seconds, then pump the brake pedal. Vacuum assistance should be felt for at least 2 pumps. If not, the system is defective. Perform the check valve test to isolate the cause.

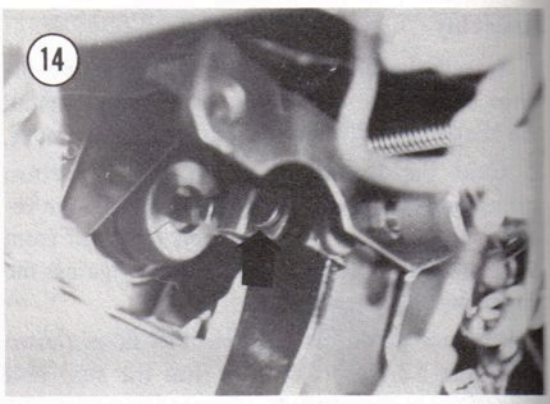
Check Valve Test

1. Inspect the vacuum line running from the manifold to the vacuum booster. It must be air tight. If its condition is in doubt, replace the line and retest the system.

2. Disconnect the vacuum line from the check valve (**Figure 13**). The valve may be at the intake manifold or booster end of the line. Unscrew the check valve and take it out.

3. Apply soap solution to the booster end of the valve. Blow into the manifold end. If air bubbles form, replace the valve.





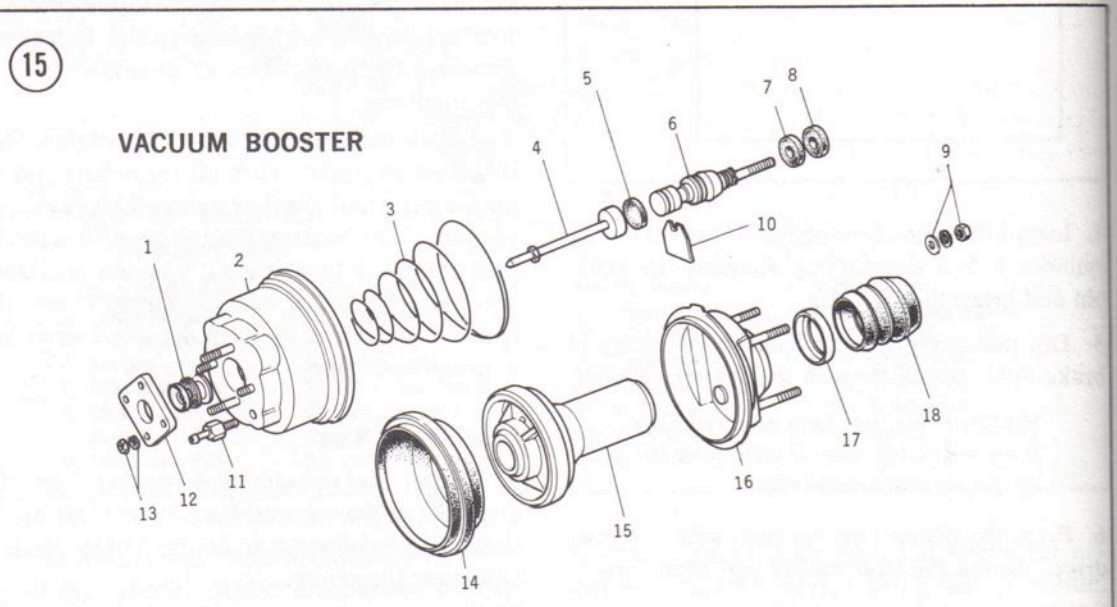
4. Apply soap solution to the manifold end of the check valve. Blow into the other end. If you cannot blow air through the valve, replace it.

Vacuum Booster Removal/Installation

1. Perform Steps 1 and 2, *Master Cylinder Removal/Installation.*
2. Remove clip and clevis pin attaching booster pushrod to brake pedal. See **Figure 14**.
3. Disconnect vacuum hose from booster.
4. Working in the passenger compartment, remove 4 nuts attaching the booster to the firewall. Remove the booster toward the front of the car.
5. Install by reversing Steps 1-4. Bleed the brakes after installation.

Disassembly

Refer to **Figure 15** as needed for this procedure.



1. Front plate and seal assembly*
2. Front shell
3. Spring
4. Pushrod
5. Reaction disc
6. Valve rod assembly**
7. Air silencer filter**
8. Air silencer**
9. Washer, lockwasher, and nut
10. Stop key
11. Check valve**
12. Flange
13. Lockwasher and nut
14. Diaphragm**
15. Diaphragm plate
16. Rear shell
17. Air silencer retainer
18. Dust boot**

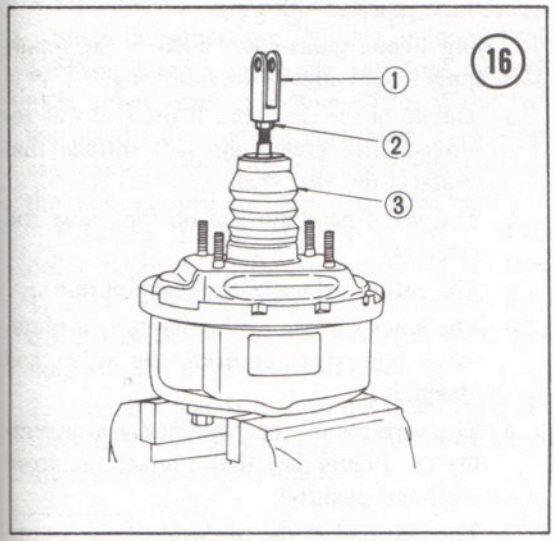
*Included in repair Kit A

**Included in repair Kit B (Kit B includes all Kit A parts)

1. Thoroughly clean the outside of the vacuum booster before disassembly. Make sure your working area is *clean*.

2. Remove the master cylinder from the front of the booster. Unscrew check valve if so equipped.

3. Place the brake booster in a soft-jawed vise with the rear end up (**Figure 16**). Remove the pushrod (1), locknut (2), and dust boot (3).



4. Scribe alignment marks on the front and rear shells so they can be assembled in the same relative positions.

5. Separate the front and rear shells (**Figure 17**). Use the Mazda special tool shown in the figure, or improvise a substitute. Turn the rear shell clockwise until it unlocks from the front shell. Lift the rear shell off, together with the diaphragm plate and valve body assembly.

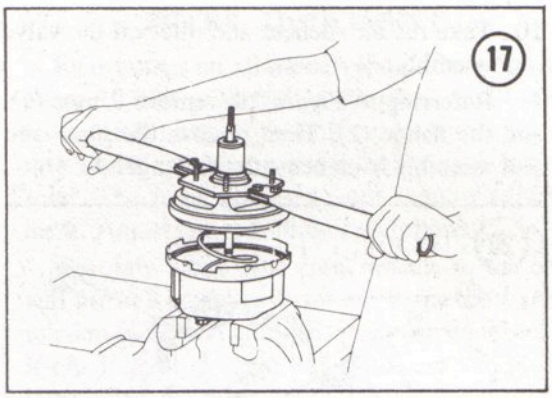
WARNING

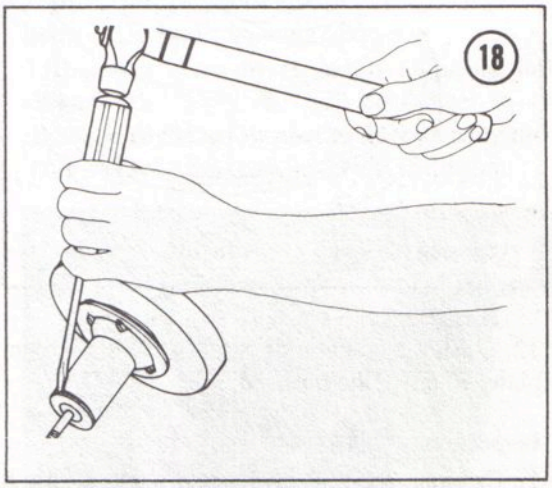
The rear shell is spring-loaded. Keep your face out of its way until you have released the spring tension.

6. Separate the rear shell from the diaphragm plate-valve body.

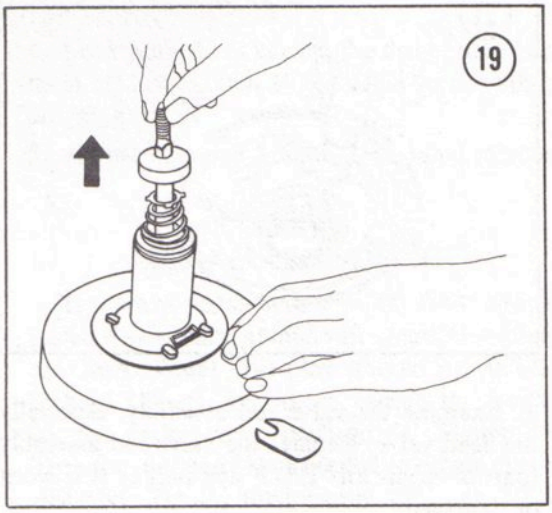
7. Pull the diaphragm out of its groove in the diaphragm plate-valve body.

8. Remove the air silencer retainer from the diaphragm plate-valve body (**Figure 18**). Tap lightly and evenly around the circumference of the retainer. Be careful not to chip the diaphragm plate-valve body.



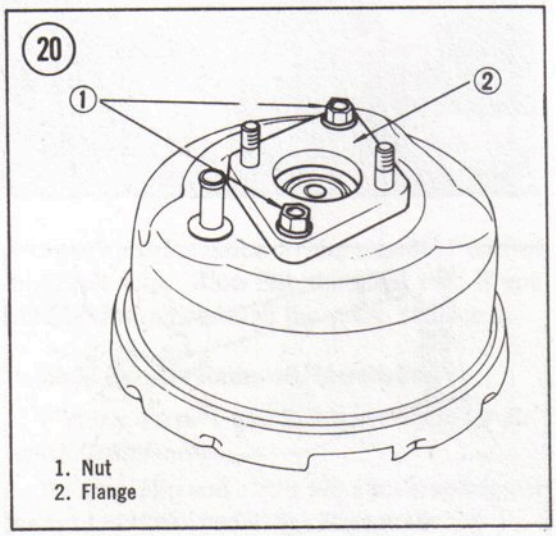


9. Press the valve rod into the diaphragm plate-valve body and shake out the stop key. Pull the valve rod assembly out, together with the air silencer and its filter. See **Figure 19**.



10. Take the air silencer and filter off the valve rod assembly.

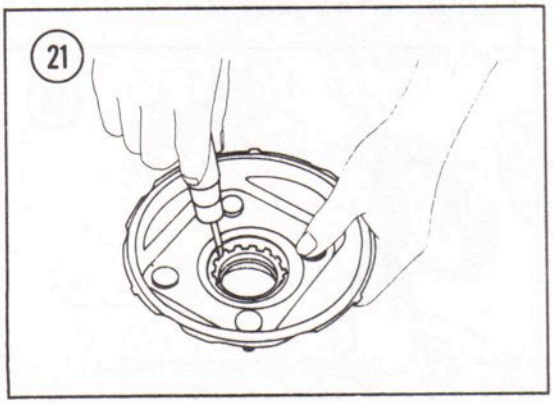
11. Referring to **Figure 20**, remove 2 nuts (1), and the flange (2). Then remove the plate and seal assembly from beneath the flange.



12. Push the reaction disc out of the diaphragm plate. Remove the pushrod.

Inspection

1. Examine the seal in the rear shell. Leave it in place unless it's defective and you're sure you can get a replacement. To replace the seal, loosen the retainer with a screwdriver (**Figure 21**), then push it out.



2. Examine the valve rod assembly, especially the head valve. Replace the valve rod assembly (part of repair kit "B") if any part of it is worn or damaged.

3. Check rubber parts for wear. Also look for nicks, cuts, or other damage. Replace as needed.

4. Check the front shell, rear shell, and diaphragm plate for cracks or other damage. Replace as needed.

Assembly

Assembly is the reverse of the disassembly procedure, plus the following.

1. Using silicon grease contained in the repair kits, apply a light coat to the following:

a. The lip of the rear seal. If the seal was removed, also grease the seal surface that contacts the rear shell.

b. The valve head surface on the valve rod assembly.

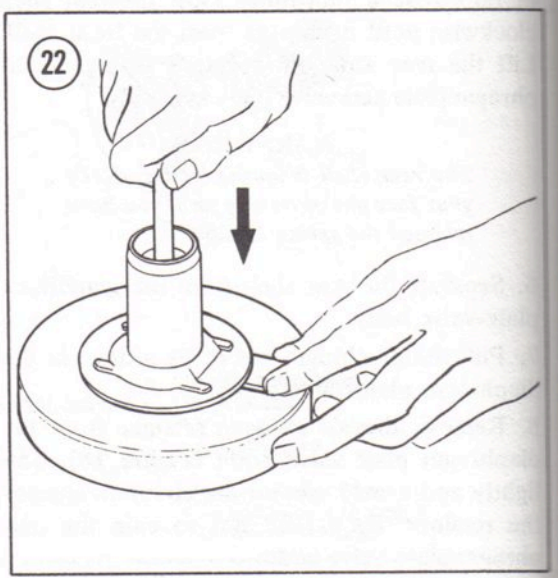
c. The entire surface of the reaction disc.

d. The inner surface of the diaphragm plate-valve body that contacts the valve rod assembly.

e. The surfaces on the plate and seal assembly (1, Figure 15) that contact the front shell and pushrod.

f. The rear end of the pushrod where it contacts the diaphragm plate.

When inserting the valve rod assembly into the diaphragm plate-valve body, be sure the rod goes straight in and is not tilted to either side. When the rod is in, press it down against its spring and insert the stop key. See **Figure 22**.



BRAKE SYSTEM BLEEDING

The hydraulic system should be bled whenever air enters it and reduces braking effectiveness. If the pedal feels spongy, or if pedal travel increases considerably, bleeding is usually required. Bleeding is also necessary whenever a hydraulic line is disconnected or the system is repaired.

Since the procedure requires handling brake fluid, be careful *not* to get any fluid on brake pads, shoes, discs, or drums. Clean all dirt from the bleed valves before beginning. Two people are required, one to operate the brake pedal and the other to open and close the bleed valves.

Bleeding should be done in the following order: Right rear, left rear, right front, left front.

1. Clean away all dirt around the master cylinder reservoir. Top up the reservoir with brake fluid marked DOT 3 or DOT 4.
2. Attach a plastic tube to the bleed valve. Dip the end of the tube in a jar containing several inches of clean brake fluid.

NOTE: *Do not allow the tube to come out of the brake fluid during bleeding. This could allow air into the system, requiring that the bleeding process be partly repeated.*

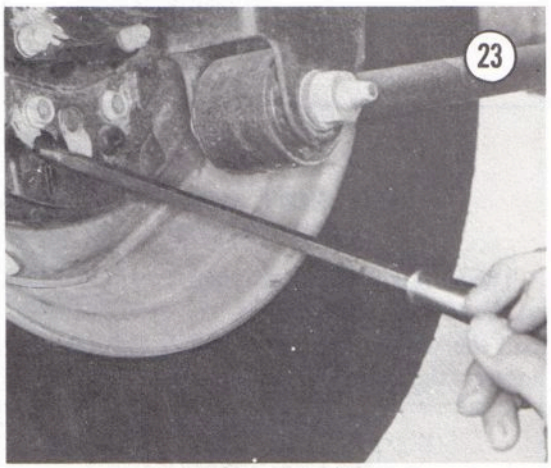
3. Press the brake pedal as far as it will go 2 or 3 times, then hold it down.
4. With the brake pedal held down, open the bleed valve until the brake pedal goes to the floor (⅓-½ turn), then close the bleed valve. Do not let the pedal up until bleed valve is closed.
5. Let the pedal back up slowly.
6. Repeat Steps 3-5 until the fluid entering the jar is free of air bubbles.
7. Repeat the process for the other bleed valves.

NOTE: *Keep an eye on the brake fluid level in the master cylinder throughout the bleeding process. If the reservoir is allowed to become empty, air will enter the hydraulic system and the bleeding procedure will have to be repeated.*

BRAKE ADJUSTMENT

Rear brakes on all models should be checked every 12,000 miles (1971-73 cars) or 14,000 miles (1974) and adjusted if necessary. A separate adjusting wheel is provided for each brake shoe. The front brakes do not require adjustment. Adjust the rear brakes as follows.

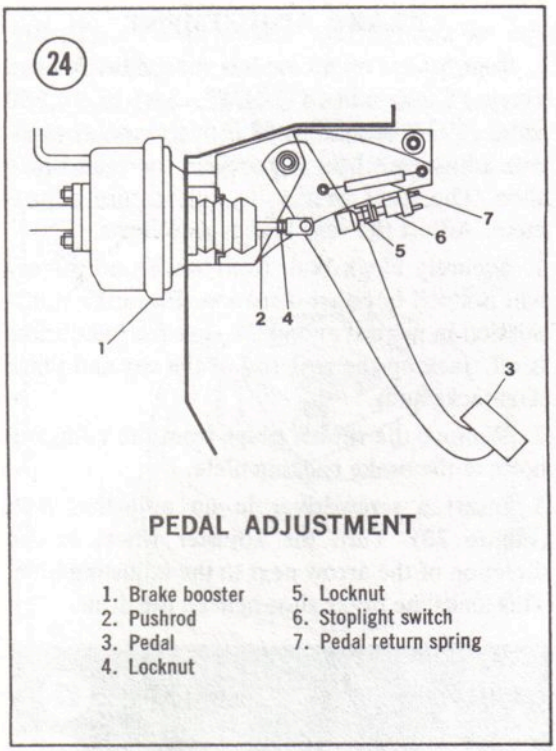
1. Securely block both front wheels so the car will not roll in either direction. Place the transmission in neutral and make sure the handbrake is off. Jack up the rear end of the car and place it on jackstands.
2. Remove the rubber plugs from the adjusting holes in the brake backing plate.
3. Insert a screwdriver in an adjusting hole (**Figure 23**). Turn the adjuster wheel in the direction of the arrow next to the adjusting hole. This locks the brake shoe against the drum.



4. Lock both shoes against the drum, then back them off just enough so the drum turns without dragging.
5. Adjust opposite brake in the same manner.

BRAKE PEDAL ADJUSTMENT

The brake pedal should be checked, and adjusted if necessary, at intervals specified in Chapter Two. Pedal free-play should be 0.2-0.6 inch (5-15mm). To adjust, loosen the locknut on the brake pedal pushrod (4, **Figure 24**). Turn the pushrod (2) as needed to obtain correct free-play. Tighten the locknut.



PEDAL ADJUSTMENT

1. Brake booster
2. Pushrod
3. Pedal
4. Locknut
5. Locknut
6. Stoplight switch
7. Pedal return spring

STOPLIGHT SWITCH REPLACEMENT

The stoplight switch (6, Figure 24) is located on the brake pedal bracket. To replace, disconnect the wires, loosen the switch locknut, and unscrew the switch. Install in the reverse order.

BRAKE LINES AND WARNING SWITCH

The hydraulic system comprises 2 circuits, one for the front and one for the rear. If one circuit fails, the other will keep working. A warning light on the instrument panel alerts the driver of any extreme pressure drop in either system. The light is activated by a pressure switch located in the engine compartment. **Figure 25** shows the hydraulic system for RX-2's; **Figure 26** shows the RX-3 version.

Brake Line Inspection

Referring to either Figure 25 or 26, check the brake lines for the following.

1. Cracks or wear.
2. Leaks at connections. Have an assistant hold the brake pedal down while you check this.
3. Deteriorated or twisted rubber brake hoses.
4. Sufficient clearance between brake lines and other parts of the car to prevent wear and damage to the lines.

Pressure Switch Replacement

If a pressure switch is defective, replace it. Do not attempt to repair the switch. Refer to Figure 25 or 26.

1. Disconnect the warning light wire from the switch.
2. Disconnect the brake lines.
3. Remove the attaching bolt and take out the switch.
4. Install by reversing Steps 1-3. Bleed the brakes after installation.

HANDBRAKE

The handbrake is operated by a lever between the seats. A front cable pulls 2 rear cables, which pull levers at the rear brakes. **Figure 27** shows the RX-3 handbrake system. The RX-2 system is basically the same.

Adjustment

The handbrake should be adjusted whenever the lever can be raised more than 7 notches.

1. Securely block both front wheels so the car will not roll in either direction. Jack up the rear end of the car and place it on jackstands. Make sure the handbrake is all the way off. Place the transmission in neutral.
2. Check the adjustment of the rear brakes. If necessary, adjust as described earlier in this chapter.
3. Remove the boot from the handbrake lever.
4. Turn the handbrake adjusting nut (**Figure 28**) until the rear wheels just begin to drag. Back off the nut until the wheels turn freely.
5. Check the adjustment. The handbrake should lock the wheels when the lever is raised 3-7 notches.

RX-2 HYDRAULIC SYSTEM
(See Key on Next Page)

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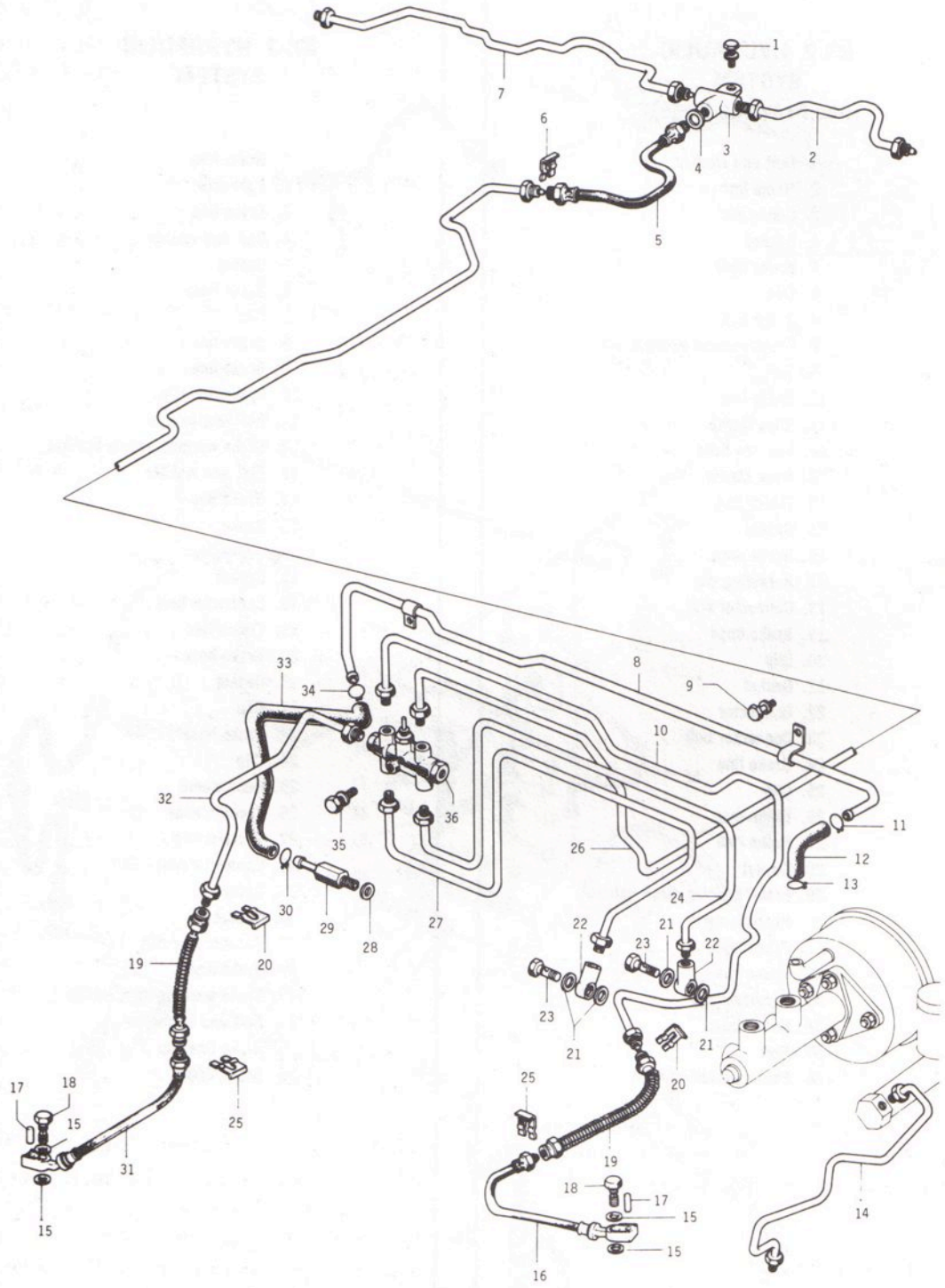

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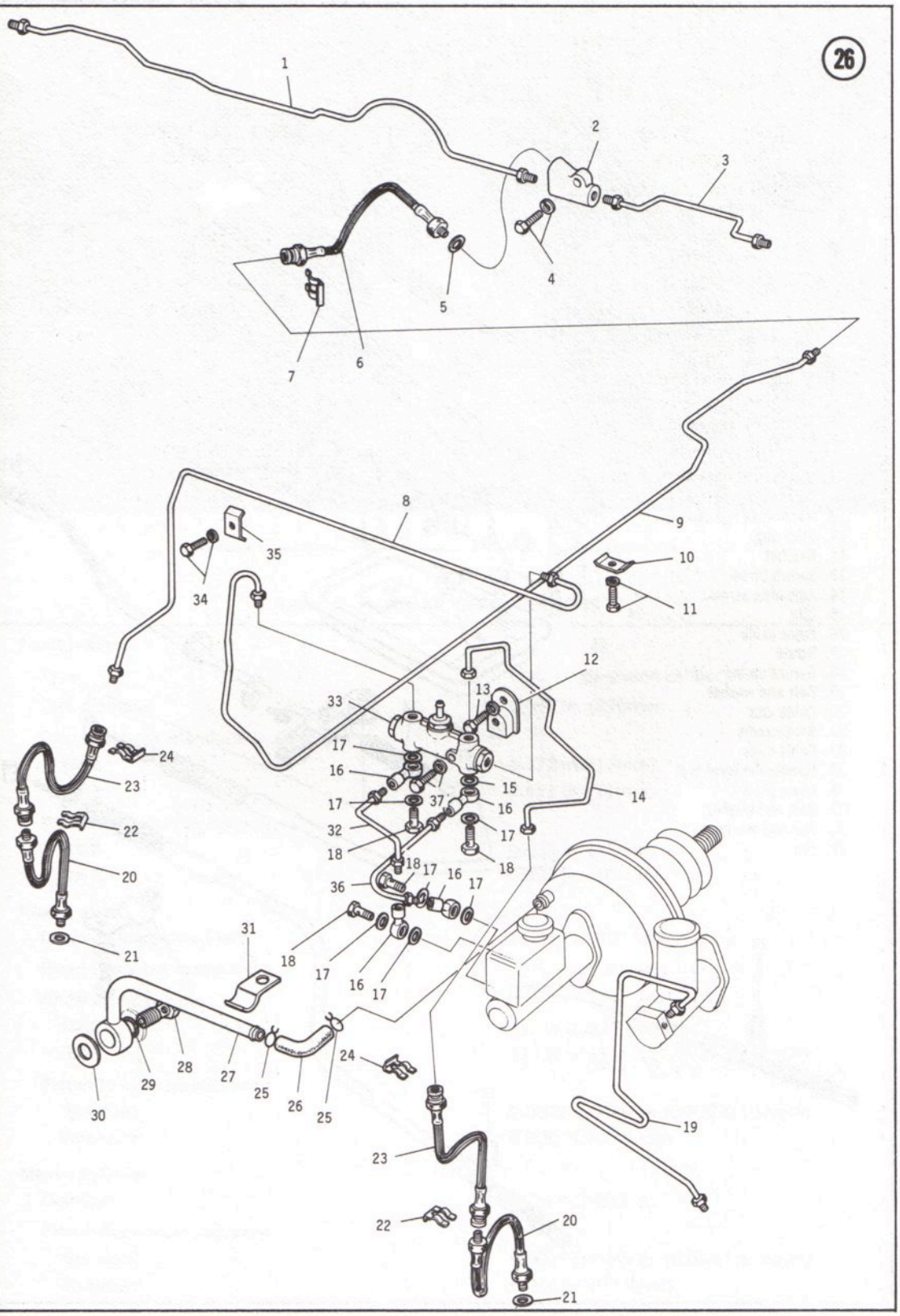
RX-2 HYDRAULIC SYSTEM (See Previous Page)

1. Bolt and washer
2. Brake line
3. Connector
4. Gasket
5. Brake hose
6. Clip
7. Brake line
8. Brake booster vacuum line
9. Bolt
10. Brake line
11. Hose clamp
12. Vacuum hose
13. Hose clamp
14. Clutch line
15. Gasket
16. Brake hose
17. Retaining pin
18. Connector bolt
19. Brake hose
20. Clip
21. Gasket
22. Connector
23. Connector bolt
24. Brake line
25. Clip
26. Brake line
27. Brake line
28. Gasket
29. Brake booster check valve
30. Hose clamp
31. Brake hose
32. Brake line
33. Vacuum hose
34. Hose clamp
35. Bolt
36. Brake warning switch

RX-3 HYDRAULIC SYSTEM

1. Brake line
2. Connector
3. Brake line
4. Bolt and washer
5. Gasket
6. Brake hose
7. Clip
8. Brake line
9. Brake line
10. Brake line clip
11. Bolt and washer
12. Brake warning switch bracket
13. Bolt and washer
14. Brake line
15. Gasket
16. Connector
17. Gasket
18. Connector bolt
19. Clutch line
20. Brake hose
21. Gasket
22. Clip
23. Brake hose
24. Clip
25. Hose clamp
26. Vacuum hose
27. Vacuum line
28. Connector bolt
29. Gasket
30. Gasket
31. Vacuum line clip
32. Brake line
33. Brake warning light switch
34. Bolt and washer
35. Brake line clip
36. Brake line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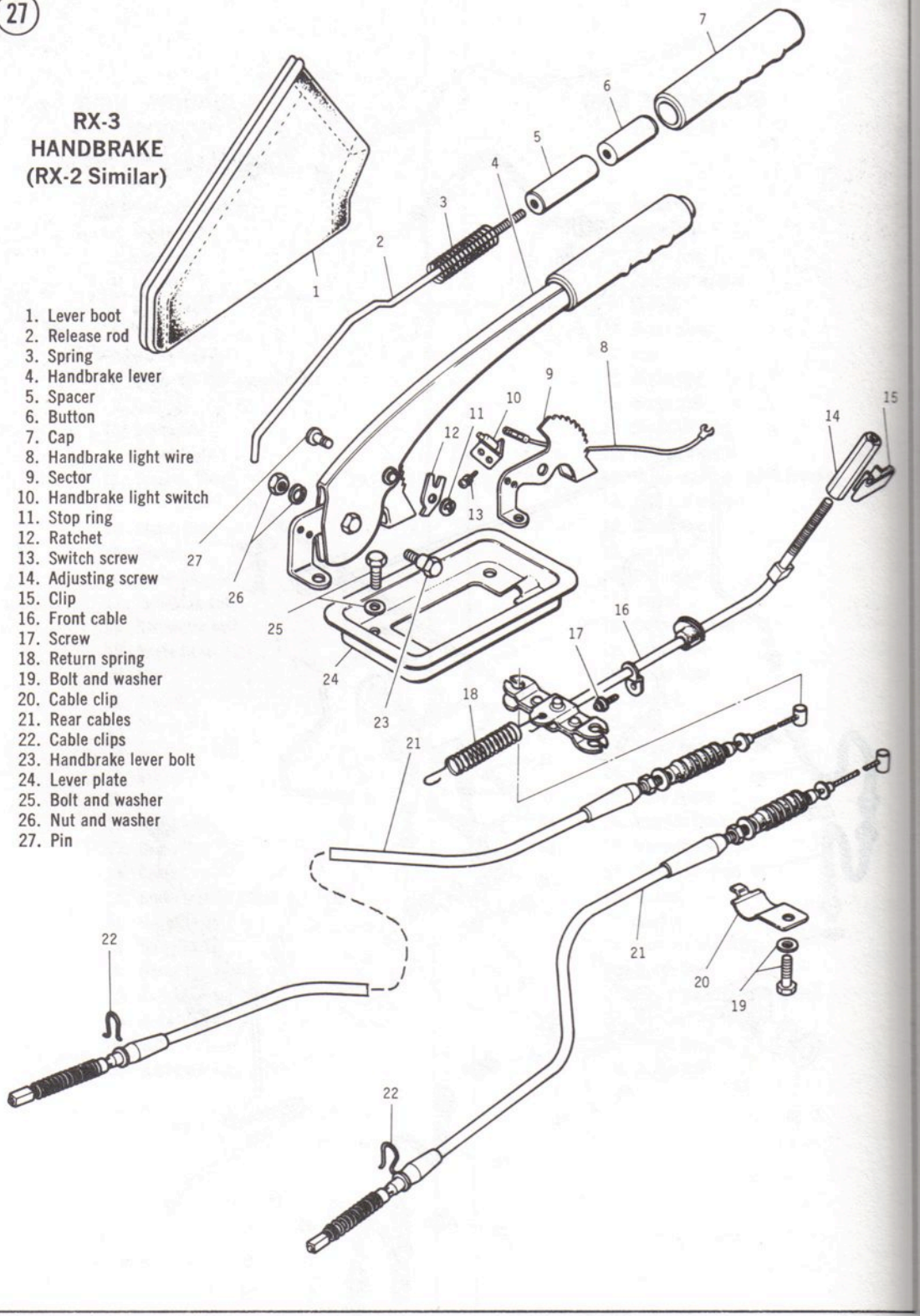
RX-3 HANDBRAKE (RX-2 Similar)



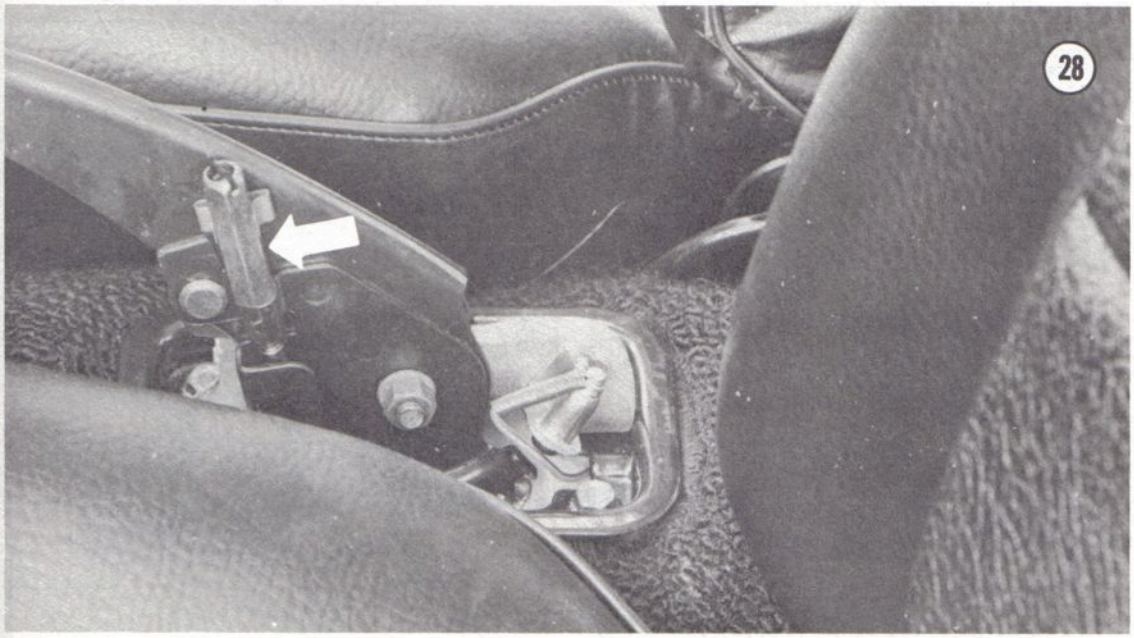


Table 1 BRAKE SPECIFICATIONS

Front brakes	
Type	Disc, single-piston caliper
Disc diameter	9.055 in. (230mm)
Disc thickness, standard	
RX-2	0.472 in. (12mm)
RX-3	0.433 in. (11mm)
Disc thickness, minimum	
RX-2	0.433 in. (11mm)
RX-3	0.394 in. (10mm)
Rear brakes	
Drum diameter, standard	7.874 in. (200mm)
Drum diameter, maximum	7.914 in. (201mm)
Wheel cylinder bore	
RX-2	11/16 in. (17.46mm)
RX-3	11/16 or 5/8 in. (17.46 or 15.87mm)
Piston-to-cylinder clearance	
Standard	0.0013-0.0040 in. (0.032-0.102mm)
Maximum	0.006 in. (0.15mm)
Master cylinder	
Diameter	7/8 in. (22.22mm)
Piston-to-cylinder clearance	
Standard	0.0016-0.0049 in. (0.040-0.125mm)
Maximum	0.006 in. (0.15mm)