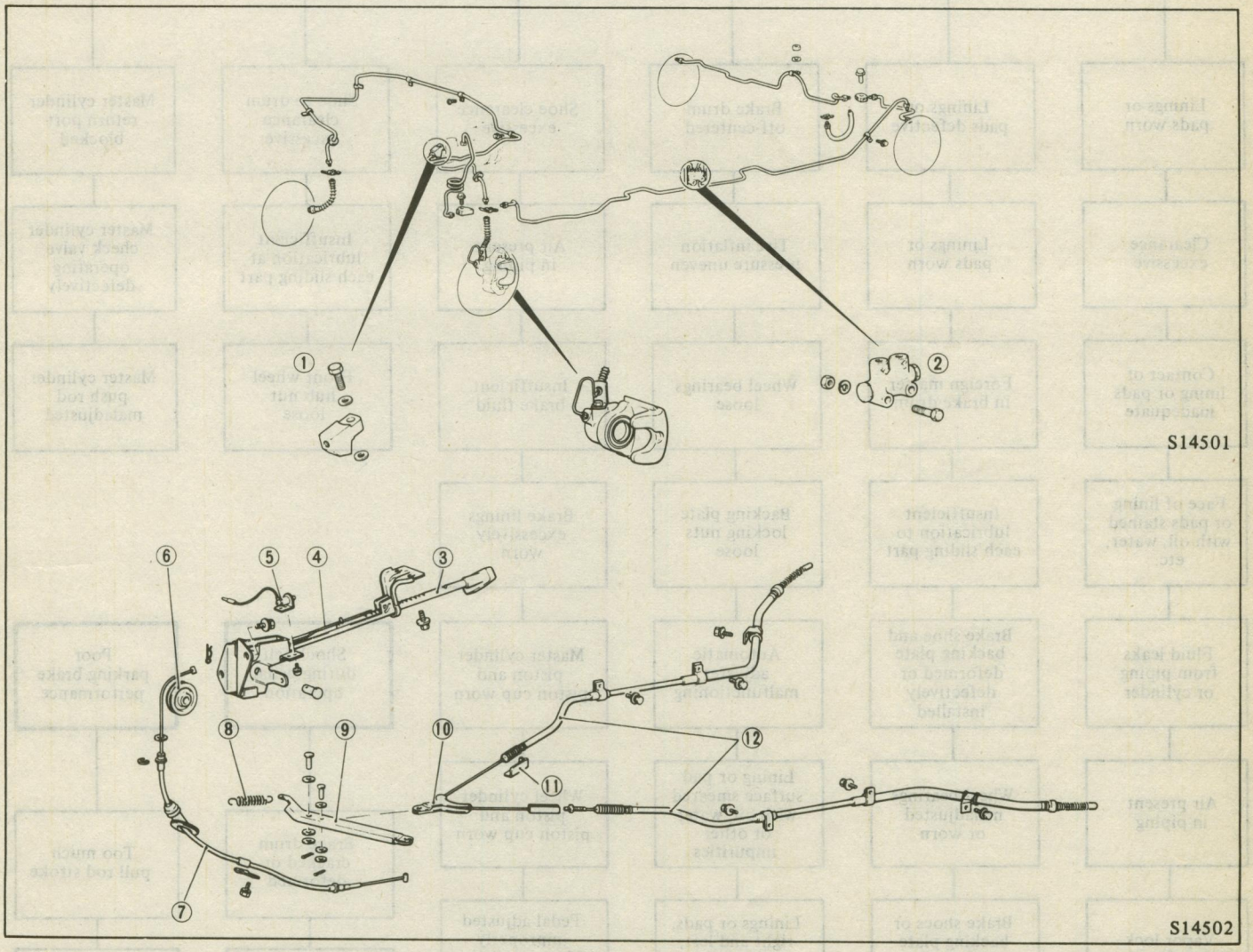
# BRAKES
# PARKING AND SERVICE

## CONTENTS

## GENERAL INFORMATION

The sliding caliper type disc brakes and the duo-servo brakes with automatic-adjuster are used for front and rear wheels respectively on all models.

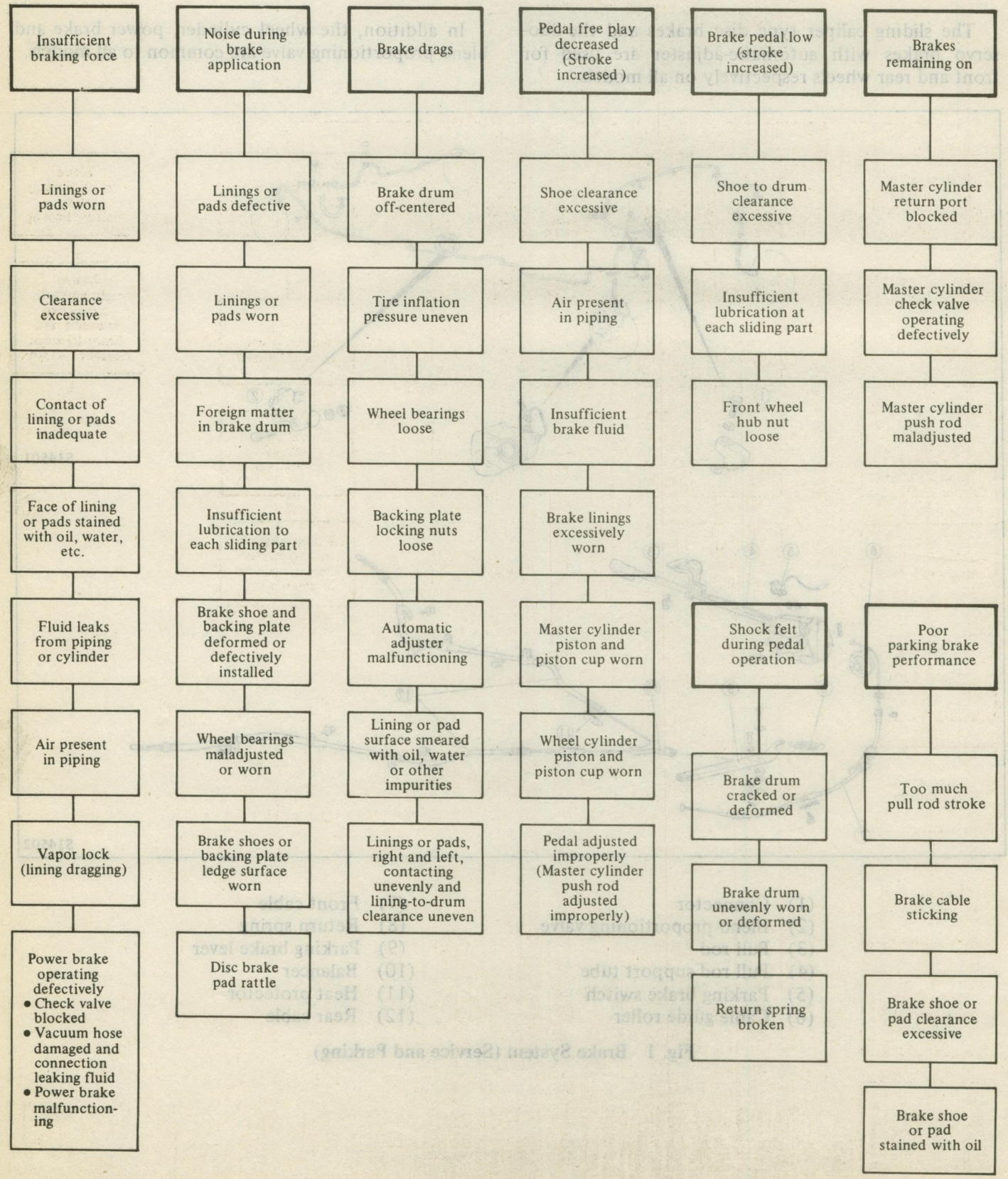
In addition, the wheel cylinder, power brake and blend proportioning valve are common to all models.

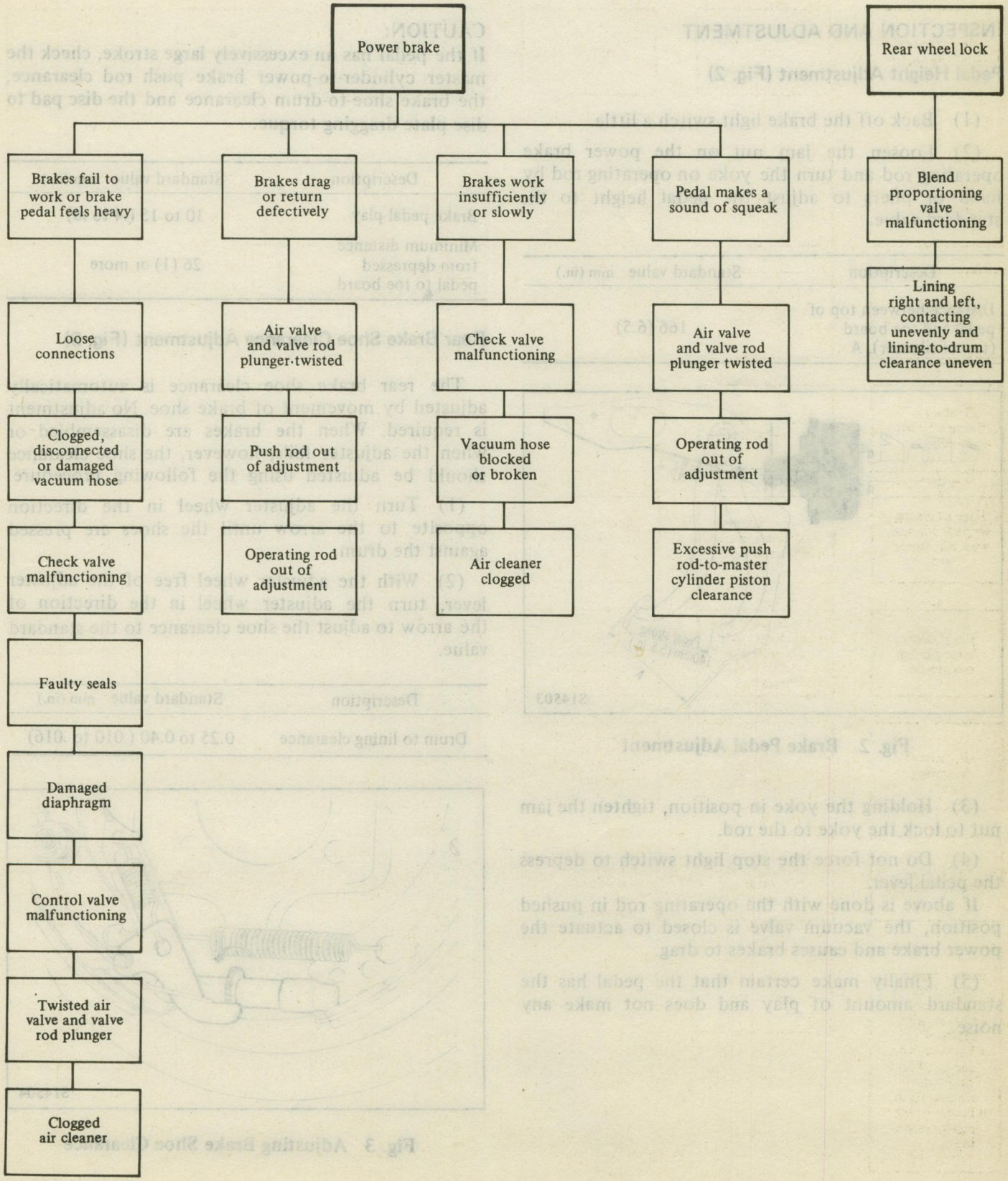



(1) Connector
(2) Blend proportioning valve
(3) Pull rod
(4) Pull rod support tube
(5) Parking brake switch
(6) Cable guide roller
(7) Front cable
(8) Return spring
(9) Parking brake lever
(10) Balancer
(11) Heat protector
(12) Rear cable

**Fig. 1 Brake System (Service and Parking)**

## TROUBLE SHOOTING




Power brake
Brakes fail to work or brake pedal feels heavy
Loose connections
Clogged, disconnected or damaged vacuum hose
Check valve malfunctioning
Faulty seals
Damaged diaphragm
Control valve malfunctioning
Twisted air valve and valve rod plunger
Clogged air cleaner
Brakes drag or return defectively
Air valve and valve rod plunger twisted
Push rod out of adjustment
Operating rod out of adjustment
Brakes work insufficiently or slowly
Check valve malfunctioning
Vacuum hose blocked or broken
Air cleaner clogged
Pedal makes a sound of squeak
Air valve and valve rod plunger twisted
Operating rod out of adjustment
Excessive push rod-to-master cylinder piston clearance
Rear wheel lock
Blend proportioning valve malfunctioning
Lining right and left, contacting unevenly and lining-to-drum clearance uneven

## SERVICE PROCEDURES

### INSPECTION AND ADJUSTMENT

#### Pedal Height Adjustment (Fig. 2)

(1) Back off the brake light switch a little.

(2) Loosen the jam nut on the power brake operating rod and turn the yoke on operating rod by hand or pliers to adjust the pedal height to the standard value.

| Description | Standard value mm (in.) |
|---|---|
| Distance between top of pedal and toe board (top of silencer), A | 166 (6.5) |

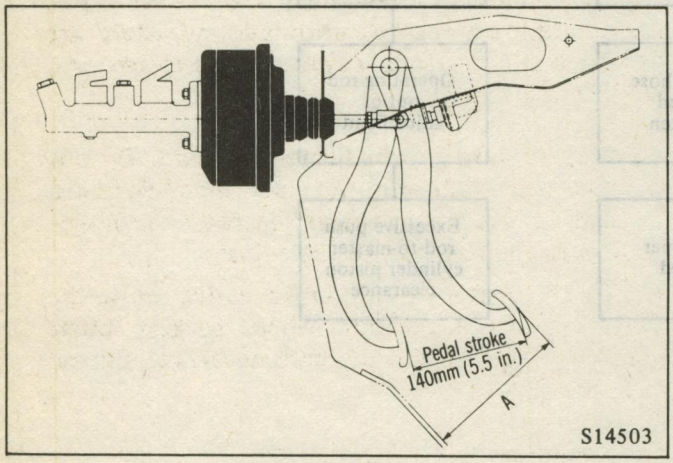



**Fig. 2 Brake Pedal Adjustment**

(3) Holding the yoke in position, tighten the jam nut to lock the yoke to the rod.

(4) Do not force the stop light switch to depress the pedal lever.

If above is done with the operating rod in pushed position, the vacuum valve is closed to actuate the power brake and causes brakes to drag.

(5) Finally make certain that the pedal has the standard amount of play and does not make any noise.

CAUTION:

**If the pedal has an excessively large stroke, check the master cylinder-to-power brake push rod clearance, the brake shoe-to-drum clearance and the disc pad to disc plate dragging torque.**

| Description | Standard value mm (in.) |
|---|---|
| Brake pedal play | 10 to 15 (.4 to .6) |
| Minimum distance from depressed pedal to toe board | 26 (1) or more |

#### Rear Brake Shoe Clearance Adjustment (Fig. 3)

The rear brake shoe clearance is automatically adjusted by movement of brake shoe. No adjustment is required. When the brakes are disassembled or when the adjuster fails, however, the shoe clearance should be adjusted using the following procedure.

(1) Turn the adjuster wheel in the direction opposite to the arrow until the shoes are pressed against the drum.

(2) With the adjuster wheel free of the adjuster lever, turn the adjuster wheel in the direction of the arrow to adjust the shoe clearance to the standard value.

| Description | Standard value mm (in.) |
|---|---|
| Drum to lining clearance | 0.25 to 0.40 (.010 to .016) |

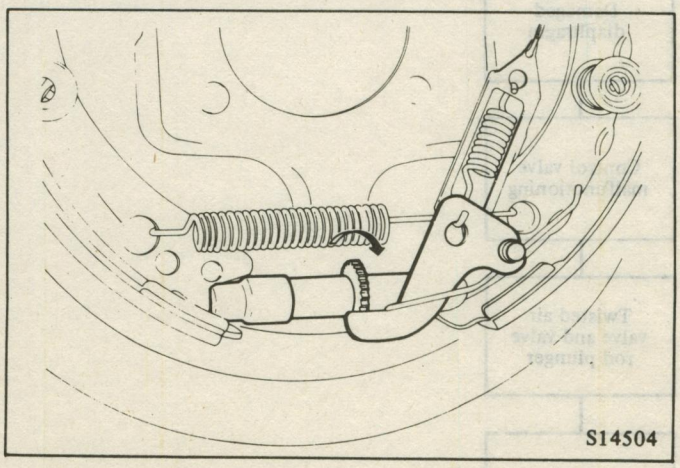



**Fig. 3 Adjusting Brake Shoe Clearance**

(3) Adjust the shoe clearance by moving the vehicle in reverse direction and depressing the brake pedal several times until the pedal stroke is constant.

### Parking Brake Pull Rod Adjustment (Fig. 4)

Check to see if the parking brake pull rod has the standard amount of stroke. Adjust it if necessary.

(1) Adjust the rear brake shoe clearance to the correct dimension. [Refer to Shoe Clearance Adjustment (3)]

(2) Adjust the turnbuckle to obtain a parking brake stroke equal to the standard value when the parking brake is pulled with a force of 294N (66 lbs.).

CAUTIONS:

- **Make sure that the parking brake rear cable is not taut when the pull rod is released.**
- **Make sure that the balancer is nearly parallel with the center line of the car.**
- **Ensure that clearance between the balancer and crossmember is about 200 mm (8 in.).**

| Description | Standard value mm (in.) | Remarks |
|---|---|---|
| Parking brake pull rod stroke | 16 to 17 notches [Approx. 110 (4.3)] | Brakes must be applied properly at pulling force of 294N (66 lbs.) |

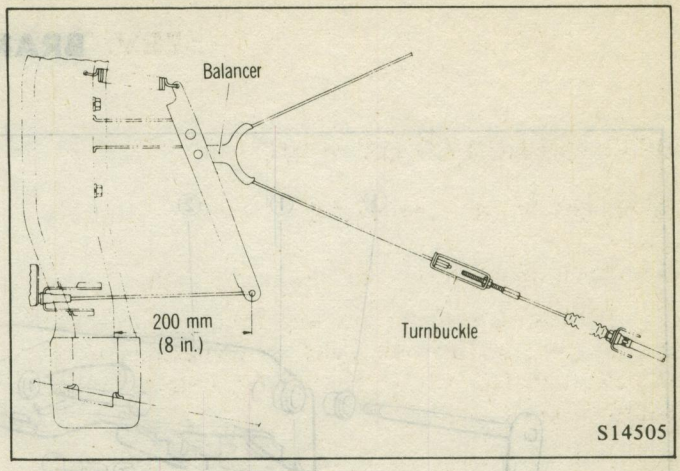



**Fig. 4 Parking Brake Adjustment**

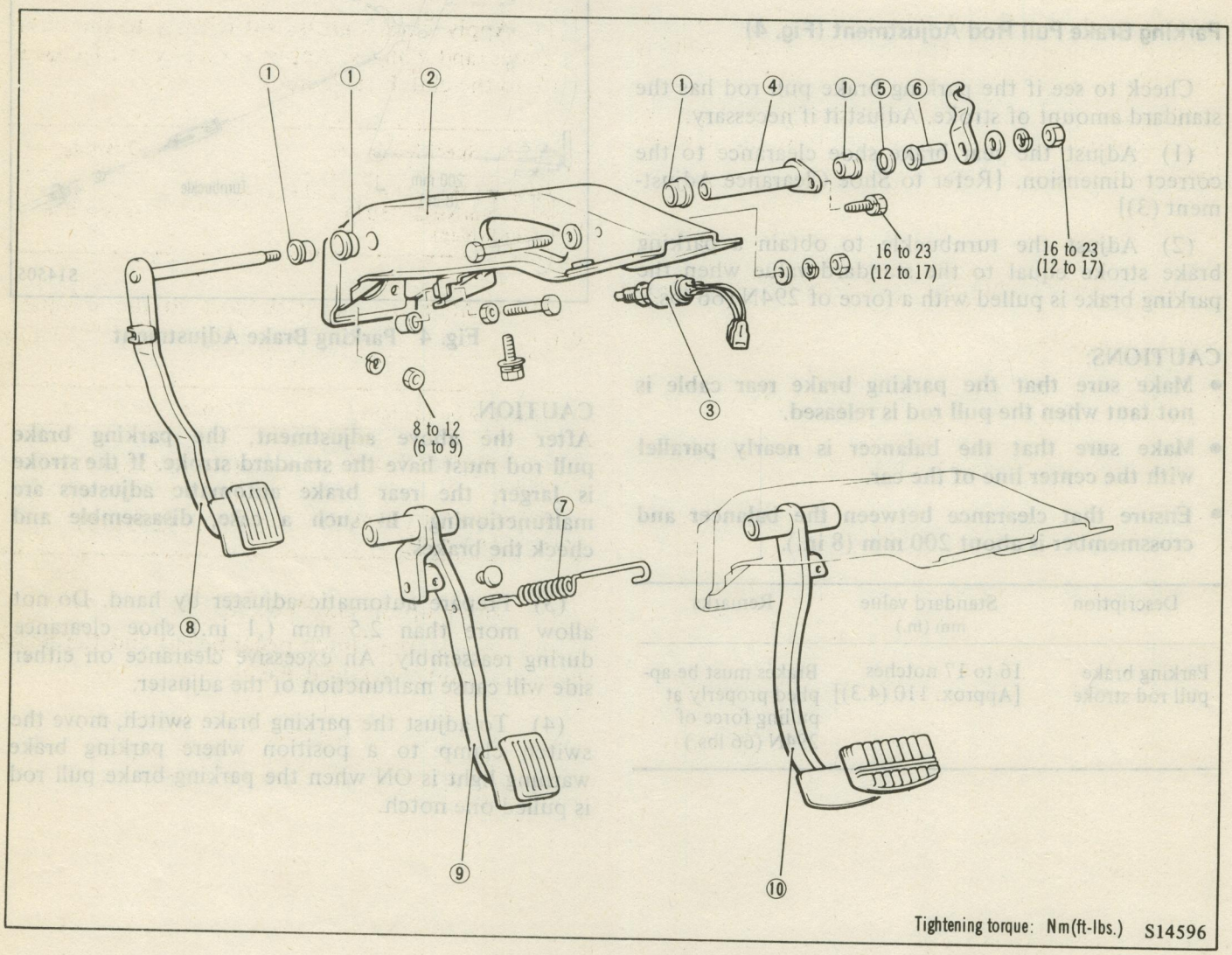
CAUTION:

**After the above adjustment, the parking brake pull rod must have the standard stroke. If the stroke is larger, the rear brake automatic adjusters are malfunctioning. In such a case, disassemble and check the brakes.**

(3) Prepare automatic adjuster by hand. Do not allow more than 2.5 mm (.1 in.) shoe clearance during reassembly. An excessive clearance on either side will cause malfunction of the adjuster.

(4) To adjust the parking brake switch, move the switch clamp to a position where parking brake warning light is ON when the parking brake pull rod is pulled one notch.

## BRAKE PEDAL




(1) Bushing
(2) Support member
(3) Stop light switch
(4) Pedal rod
(5) Spring (dished plane washer)
(6) Spacer
(7) Return spring
(8) Clutch pedal
(9) Brake pedal (Manual transmission)
(10) Brake pedal (Automatic transmission)

**Fig. 5 Brake Pedal Control**

## REMOVAL

(1) Disconnect the brake pedal from the operating rod, remove the clutch cable and remove the support member with both pedals as an assembly from body.

(2) Remove the nut and clutch pedal and remove the pedal rod and brake pedal from the support member.

## INSPECTION

(1) Check the bushing, pedal shaft and pad for wear, deformation and damage. Correct or replace any defective part.

(2) Check the pedals for bend and distortion. Correct or replace the pedal, if defective.

## INSTALLATION

During installation, observe the following items.

(1) Apply chassis grease sufficiently to the bushing bores and flanges. Apply a thin coat of chassis grease to the clutch cable hook.

| Specified grease | Quantity |
|---|---|
| MOPAR Multi-Mileage Lubricant Part Number 2525035 or equivalent | As required |

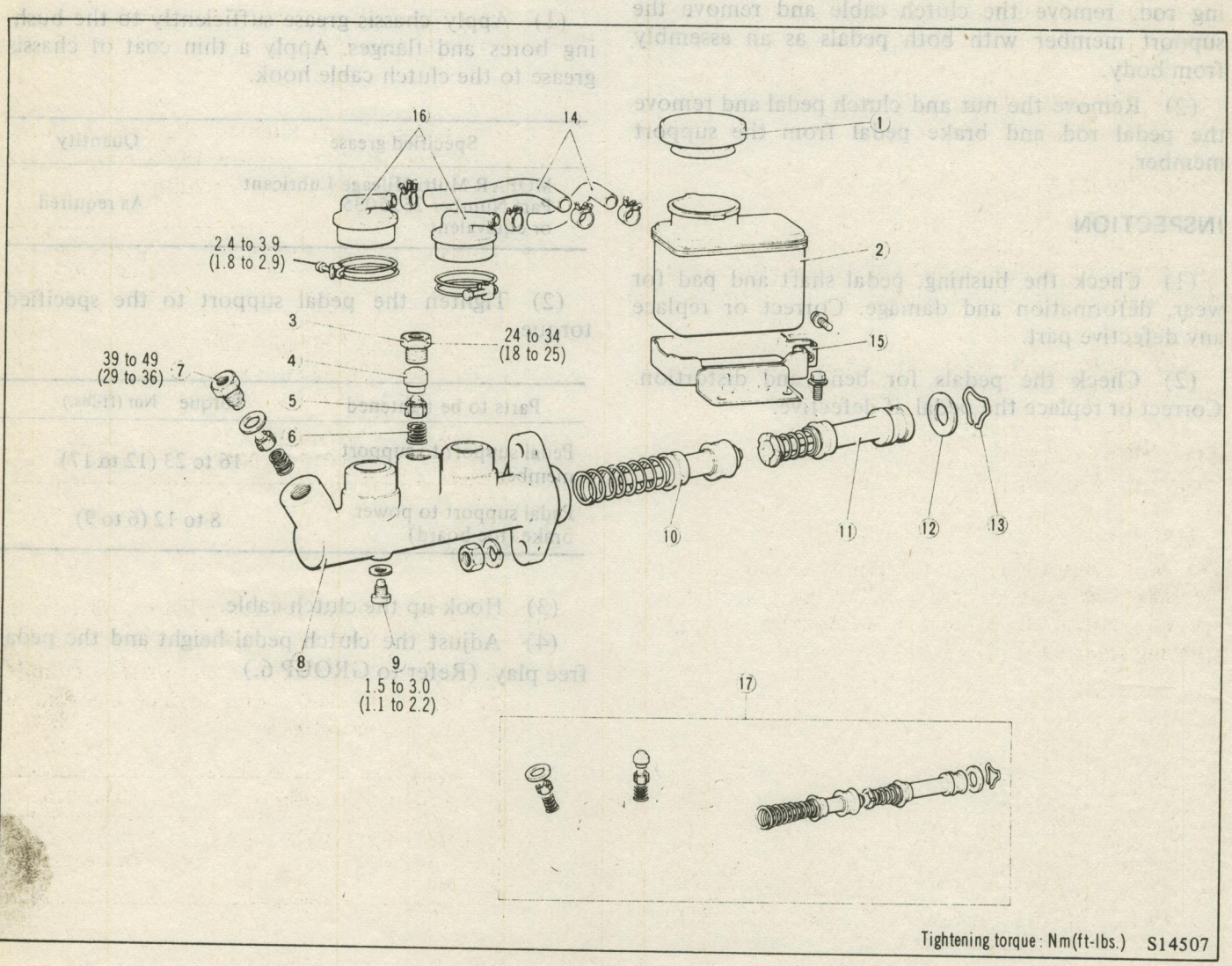
(2) Tighten the pedal support to the specified torque.

| Parts to be tightened | Torque Nm (ft-lbs.) |
|---|---|
| Pedal support to support member | 16 to 23 (12 to 17) |
| Pedal support to power brake (toe board) | 8 to 12 (6 to 9) |

(3) Hook up the clutch cable.

(4) Adjust the clutch pedal height and the pedal free play. (Refer to GROUP 6.)

## MASTER CYLINDER




(1) Reservoir cap
(2) Fluid reservoir
(3) Check valve cap
(4) Outer pipe seat
(5) Check valve
(6) Check valve spring
(7) Valve case
(8) Master cylinder
(9) Secondary piston stop
(10) Secondary piston assembly
(11) Primary piston assembly
(12) Piston stop
(13) Stop ring
(14) Reservoir hose
(15) Bracket
(16) Nipple
(17) Master cylinder kit

**Fig. 6 Exploded View of Master Cylinder**

## REMOVAL

(1) After disconnecting the brake tube from the master cylinder, slowly depress the pedal to drain the fluid.

(2) After removing the master cylinder from the booster assembly, clean the cylinder.

## DISASSEMBLY

(1) To disassemble the master cylinder, remove the stop ring, piston stop, primary piston assembly, secondary piston and secondary return spring in that order.

(2) Loosen the valve case and remove the check valve and the check valve spring.

(3) Wash the master cylinder, pistons and cups in brake fluid. Use care not to damage the cylinder, pistons and piston cups.

CAUTION:
**Do not disassemble the primary piston assembly because the distance between spring seat (A) and spring retainer (B) is factory-adjusted by means of forming screw (C). (See Fig. 7)**

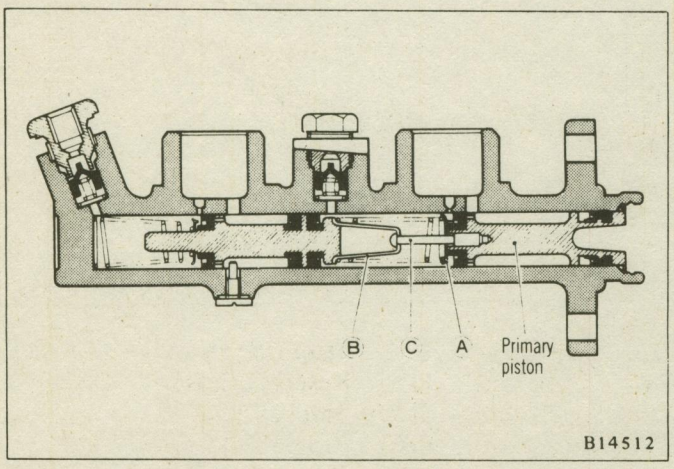



**Fig. 7 Sectional View of Master Cylinder**

## INSPECTION

(1) Check the inner surface of master cylinder and the outer surface of piston. Replace the piston if damaged.

(2) Check the master cylinder-to-piston clearance. If the clearance exceeds the service limit, replace any part that is defective.

(3) Check the piston cups for damage, deformation and wear. Replace the piston cups if defective.

(4) Check the primary and secondary return springs for loss of tension and damage. Replace any part that is defective.

CAUTION:
**When any related parts such as the return spring, piston cup and piston require replacement, it is necessary to replace the piston assembly.**

| Description | Standard value mm (in.) | Service limit mm (in.) |
|---|---|---|
| Master cylinder I.D. | 22.220 to 22.272 (.8748 to .8768) | |
| Piston O.D. | 22.147 to 22.180 (.8719 to .8732) | |
| Cylinder-to-piston clearance | 0.040 to 0.125 (.0016 to .0049) | 0.150 (.0059) |

## ASSEMBLY

When assembling the master cylinder, observe the following items.

(1) Apply brake fluid to the master cylinder bore and the piston cup outer surface prior to assembly of the master cylinder.

| Specified brake fluid | Quantity |
|---|---|
| MOPAR Brake Fluid (DOT 3) Part Number 2933249 or equivalent | As required |

CAUTION:
**Be careful not to damage the cylinder, pistons, and piston cups when assembling.**

(2) Tighten the following parts to the specified torques when assembling the master cylinder.

| Parts to be tightened | Torque Nm (ft-lbs.) |
|---|---|
| Check valve cap | 24 to 34 (18 to 25) |
| Check valve case | 39 to 49 (29 to 36) |
| Secondary piston stop | 1.5 to 3.0 (1.1 to 2.2) |
| Fluid reservoir band | 2.4 to 3.9 (1.8 to 2.9) |

(3) After assembling the master cylinder, check to see that the return port is not blocked by the piston cup when the piston is in the returned position.

## INSTALLATION

During installation, observe the following items.

(1) Before installing the master cylinder, ascertain that the standard amount of clearance exists between the back of the master cylinder piston and the power brake push rod.

| Description | Standard value mm (in.) |
|---|---|
| Clearance between back of master cylinder piston and power brake push rod | 0 to 0.75 (0 to .03) |

(2) Tighten the master cylinder and brake tube flare nuts to the specified torques. (See Fig. 8)

(3) After installing the master cylinder, adjust the pedal and bleed the hydraulic system.

| Parts to be tightened | Symbol | Torque Nm (ft-lbs.) |
|---|---|---|
| Master cylinder | A | 8 to 12 (6 to 9) |
| Brake tube flare nut | B | 12 to 16 (9 to 12) |
| Master cylinder connector bolts | C | 25 to 34 (18 to 25) |

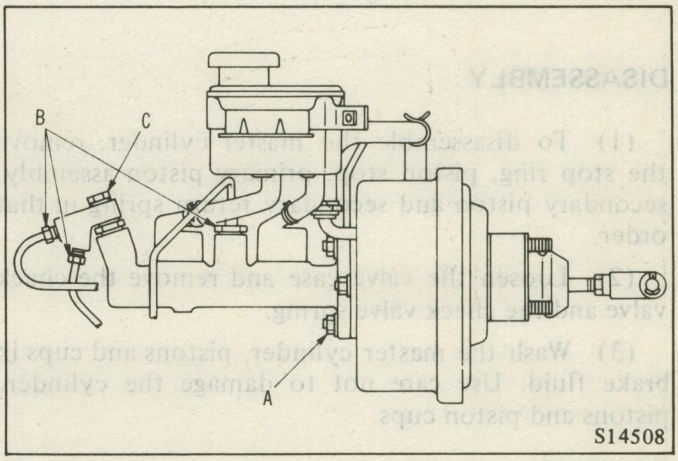
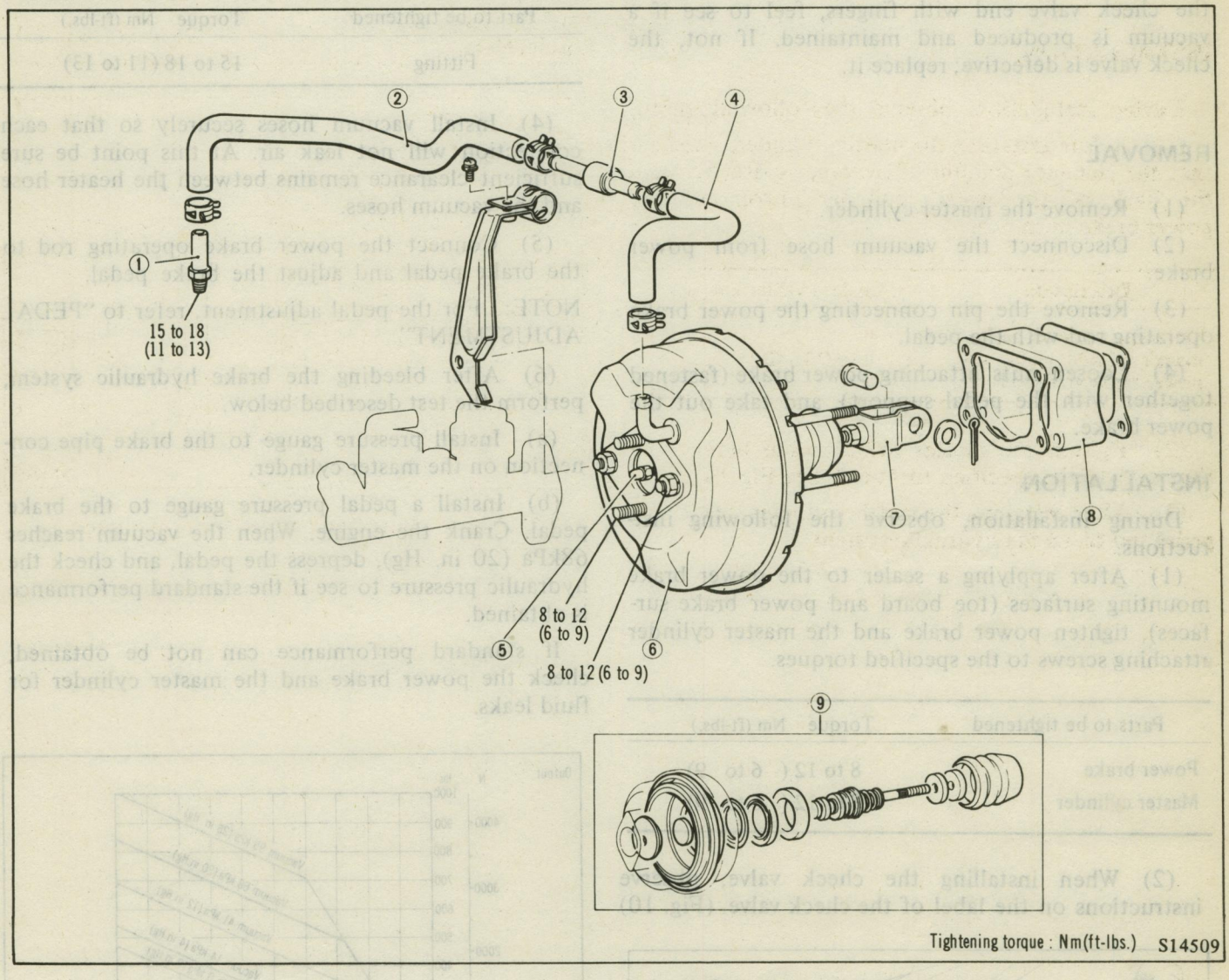



**Fig. 8 Location of Tightening Torque**

## POWER BRAKE




(1) Fitting
(2) Vacuum hose
(3) Check valve
(4) Vacuum hose
(5) Push rod
(6) Power brake (booster assembly)
(7) Yoke
(8) Booster spacer
(9) Brake booster repair kit

**Fig. 9 Exploded View of Power Brake**

NOTE: Power brake trouble is likely to be confused with a malfunctioning check valve; therefore a check of the check valve should be performed first.

## CHECKING THE CHECK VALVE

With the power brake side vacuum hose disconnected at the check valve, crank the engine. Holding the check valve end with fingers, feel to see if a vacuum is produced and maintained. If not, the check valve is defective; replace it.

## REMOVAL

(1) Remove the master cylinder.

(2) Disconnect the vacuum hose from power brake.

(3) Remove the pin connecting the power brake operating rod with the pedal.

(4) Loosen nuts attaching power brake (fastened together with the pedal support), and take out the power brake.

## INSTALLATION

During installation, observe the following instructions.

(1) After applying a sealer to the power brake mounting surfaces (toe board and power brake surfaces), tighten power brake and the master cylinder attaching screws to the specified torques.

| Parts to be tightened | Torque Nm (ft-lbs.) |
|---|---|
| Power brake | 8 to 12 ( 6 to 9) |
| Master cylinder | 8 to 12 ( 6 to 9) |

(2) When installing the check valve, observe instructions on the label of the check valve. (Fig. 10)

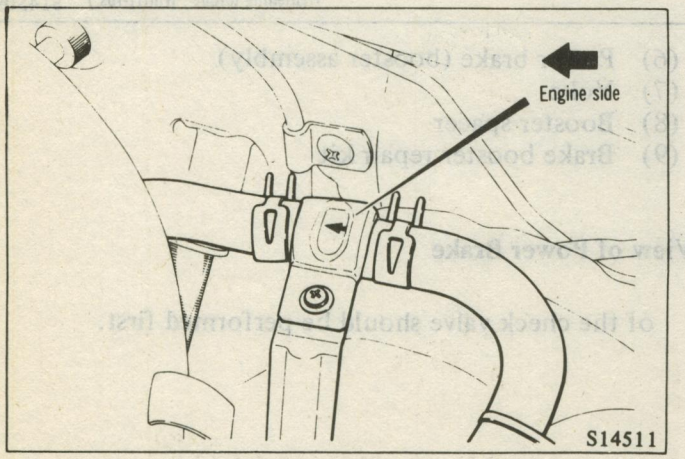



**Fig. 10 Installing the Check Valve**

(3) Before installing the fitting, apply sealant to it so that no air will leak; then tighten it to the specified torque.

| Part to be tightened | Torque Nm (ft-lbs.) |
|---|---|
| Fitting | 15 to 18 (11 to 13) |

(4) Install vacuum hoses securely so that each connection will not leak air. At this point be sure sufficient clearance remains between the heater hose and the vacuum hoses.

(5) Connect the power brake operating rod to the brake pedal and adjust the brake pedal.

NOTE: For the pedal adjustment, refer to "PEDAL ADJUSTMENT"

(6) After bleeding the brake hydraulic system, perform the test described below.

(a) Install pressure gauge to the brake pipe connection on the master cylinder.

(b) Install a pedal pressure gauge to the brake pedal. Crank the engine. When the vacuum reaches 68kPa (20 in. Hg), depress the pedal, and check the hydraulic pressure to see if the standard performance is obtained.

If standard performance can not be obtained, check the power brake and the master cylinder for fluid leaks.

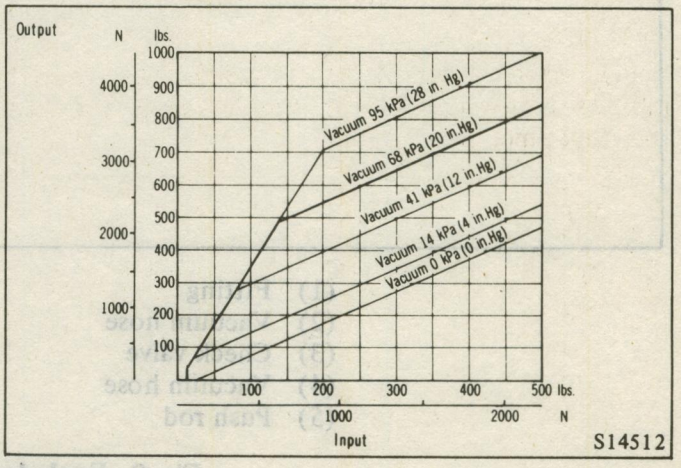



**Fig. 11 Power Brake Performance**

**CAUTION:**
**Do not attempt to disassemble power brake units.**

# BRAKE TUBES

## TUBES

### Bleeding of Brake Hydraulic Tubes

The brake hydraulic system should be bled whenever a brake tube, brake hose, master cylinder or wheel cylinder has been removed or whenever the brake pedal feels spongy when depressed. Bleeding should be carried out in the sequence of the right rear wheel, left rear wheel, right front wheel and left front wheel (that is, bleeding should be started with the wheel cylinder farthest from the master cylinder and the bleeding of the left side rear brake is not required).

(1) Check the fluid level of the master cylinder fluid reservoir. If fluid is below specified level, add fluid.

(2) Remove the bleeder screw cap on the wheel cylinder or caliper assembly. Connect one end of a vinyl pipe to the bleeder screw and place the other end in a container (glass container of approx. 0.5 ℓ (30 cu.in.) filled to about one half of its capacity with brake fluid.

(3) After depressing the brake pedal several times slowly, turn the bleeder screw back a little while the pedal is kept in the depressed position. Tighten the bleeder screw while the fluid is flowing in the vinyl pipe.

(4) Repeat the above operation until no air bubbles are visible in the fluid coming out from the vinyl pipe.

CAUTION:
**When bleeding the system, be sure to maintain sufficient fluid in the master cylinder.**

(5) Install the bleeder screw cap and replenish the fluid reservoir with brake fluid up to the MAX level.

| Description | Specified brake fluid |
|---|---|
| Fluid to be used | MOPAR Brake Fluid (DOT 3) Part Number 2933249 or equivalent |

CAUTION:
**Use the recommended brake fluid. Avoid using a mixture of the recommended fluid and other fluid. Since the boiling point of the brake fluid is largely affected by its water content, use a 1 ℓ (60 cu.in.) or 0.5 ℓ (30 cu.in.) brake fluid container and make sure to close the cap of the container tightly after use.**

| Parts to be tightened | Torque Nm (ft-lbs.) |
|---|---|
| Bleeder screw | 7 to 9 (5 to 7) |
| Brake tube flare nut | 12 to 16 (9 to 12) |
| Three-way connector | 25 to 34 (18 to 25) |

### Inspection

(1) Check the brake tube and hose for damage, interference, rust, and leaks at joints.

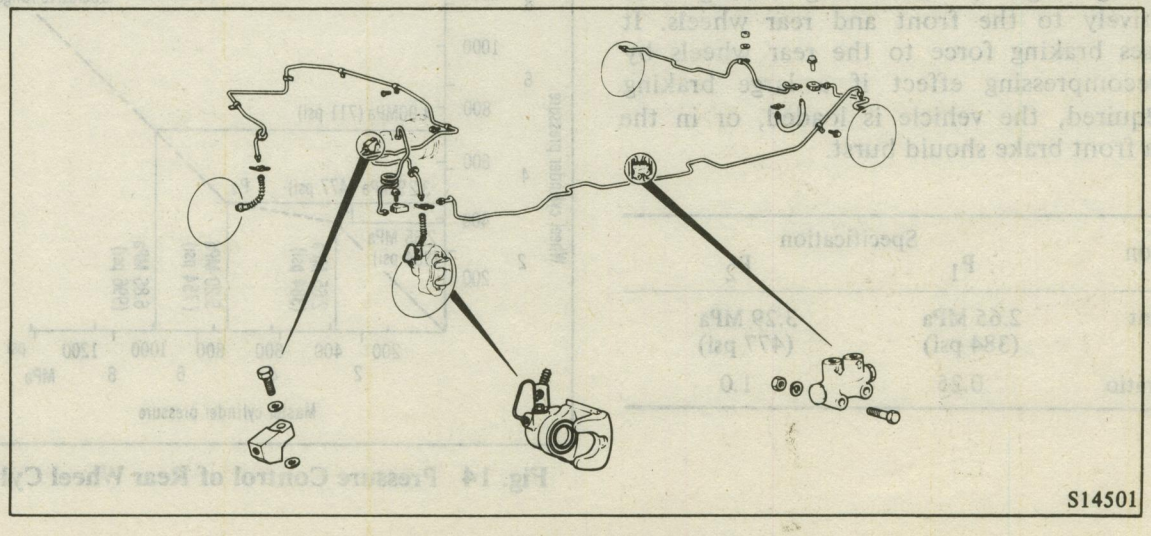
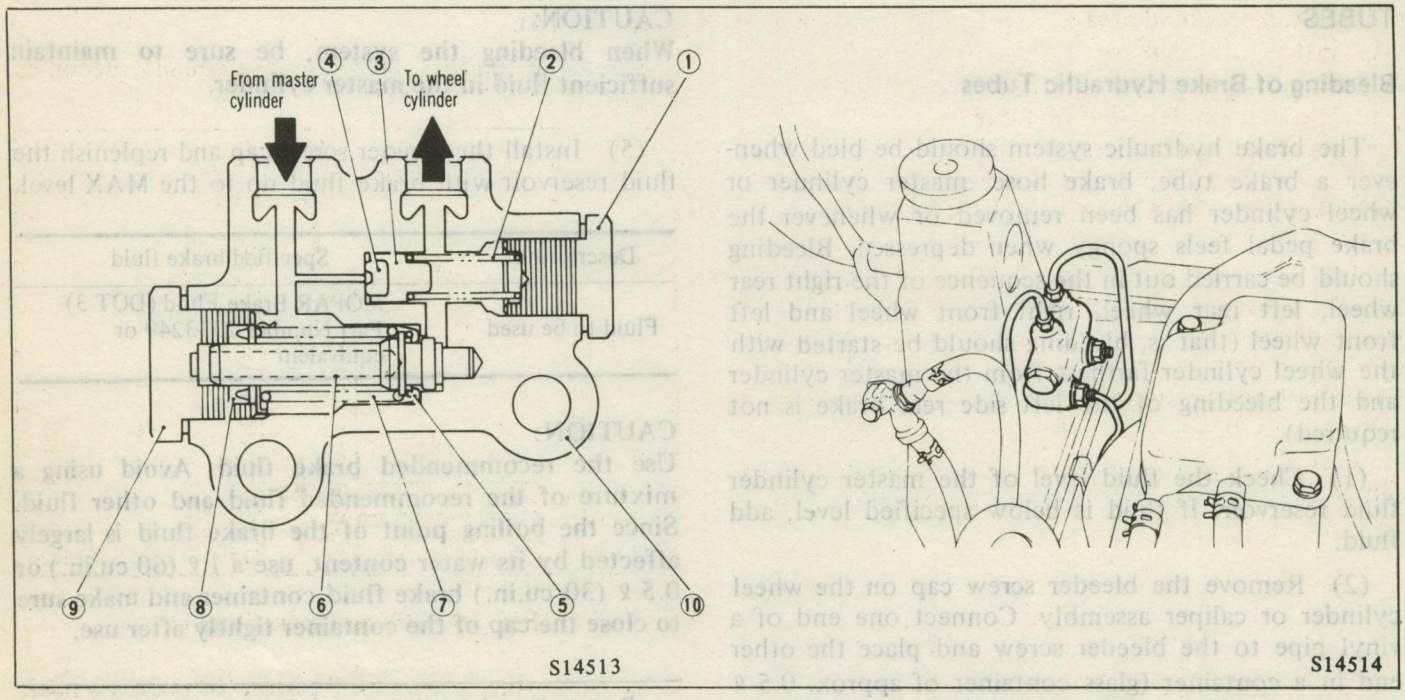



**Fig. 12 Brake Piping System**

## BLEND PROPORTIONING VALVE (BPV)




(1) Bypass valve plug (B plug)
(2) Compression spring (B spring)
(3) Bypass valve piston (B piston)
(4) Bypass valve seal (B seal)
(5) Proportioning valve seal (P seal)
(6) Proportioning valve piston (P piston)
(7) Compression spring (P spring)
(8) Cup seal
(9) Proportioning valve plug (P plug)
(10) Body

**Fig. 13 Blend Proportioning Valve**

The BPV serves to improve efficiency within normal braking range by distributing braking force most effectively to the front and rear wheels. It also increases braking force to the rear wheels by releasing decompressing effect if a large braking force is required, the vehicle is loaded, or in the event that a front brake should burst.

| Description | Specification | |
|---|---|---|
| | $P_1$ | $P_2$ |
| Split point | 2.65 MPa (384 psi) | 3.29 MPa (477 psi) |
| Reducing ratio | 0.25 | 1.0 |

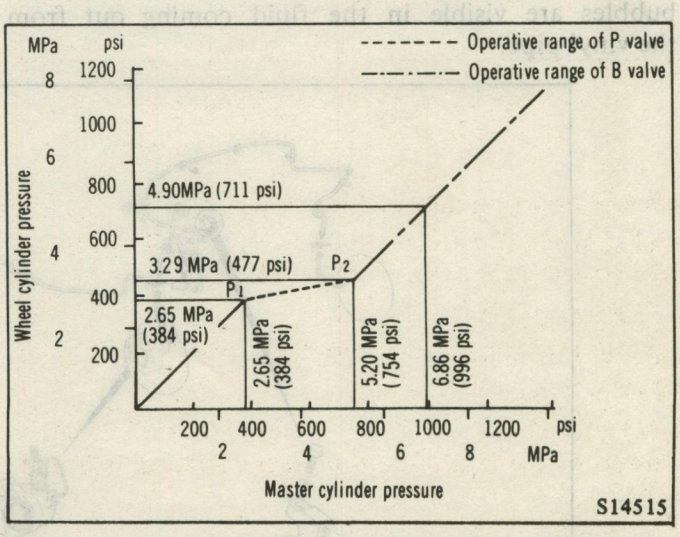



**Fig. 14 Pressure Control of Rear Wheel Cylinder**

### Operation

$F_1$ : P spring force
$F_2$ : B spring force
$A_1$ : Piston sectional area
$A_2$ : Piston sectional area
$A_3$ : Bypass valve seal contacting area
Pm: Master cylinder fluid pressure
Pw: Rear wheel cylinder fluid pressure

### When Proportioning Valve is out of Operation

(1) When Pm is not higher than 2.65 MPa (384 psi), P piston ⑥ is pushed by P spring ⑦ in the direction indicated by the arrow due to a lower fluid pressure (See Fig. 15). Thus the fluid from the master cylinder will not be subjected to decompression as it is delivered to the rear wheel cylinder through the gap between P piston ⑥ and P seal ⑤. The fluid pressure can be expressed by the following equation:

$$F_1 + Pm\,(A_2 - A_1) > Pw \times A_2$$

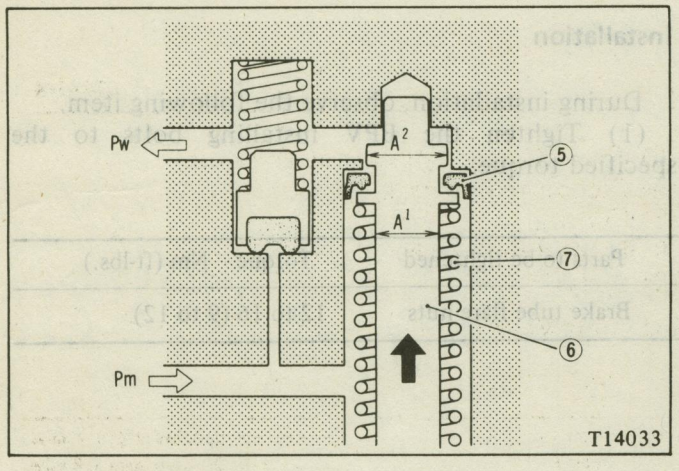



Fig. 15 BPV out of Operation

### When Proportioning Valve is in Operation

(1) When Pm reaches 2.65 MPa (384 psi), the fluid pressure equation is in the form of:

$$F_1 + Pm\,(A_2 - A_1) = Pw \times A_2$$

and Pw is coming under decompression. The reducing ratio is set at 0.25.

(2) When Pm is within a range 2.65 to 3.29 MPa (384 to 477 psi), the fluid pressure relation is found to be:

$$F_1 + Pm\,(A_2 - A_1) \leqq Pw \times A_2$$

Now, when the inequality is valid, P piston ⑥ is driven by Pw in the direction as indicated by the arrow and this causes the fluid circuit to be closed as P piston ⑥ comes in close contact with P seal ⑤ (See Fig. 16).

When the fluid circuit closes, the equality becomes valid.

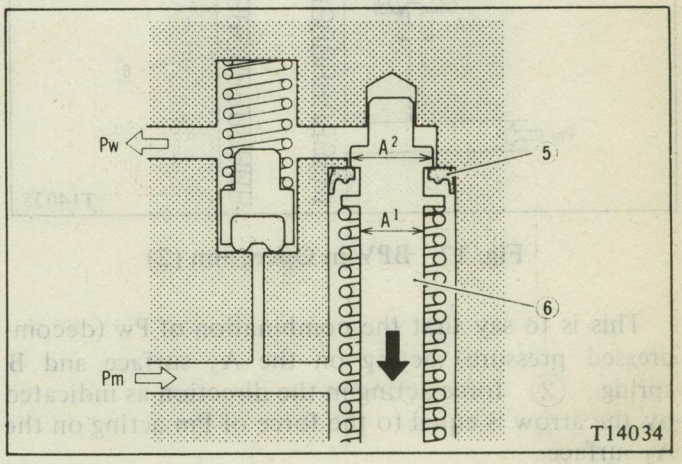



Fig. 16 BPV in Operation (1)

As Pm further increases, P piston ⑥ is driven back and in an instant higher master cylinder pressure is delivered to the rear wheel cylinder between P seal and P piston. This causes P piston ⑥ to be driven again in the direction as indicated by the arrow shown in Fig. 15 until it comes in close contact with P seal ⑤ and the fluid will be closed.

Rear wheel cylinder pressure should be adjusted by repeating this pumping action.

### When Bypass Valve is out of Operation

When Pm is less than 5.20 MPa (754 psi), the pressure relation is found to be:

$$Pm \times A_3 < F_2 + Pw \times A_3$$

B piston ③ will not operate.

### When Bypass Valve is in Operation

(1) When Pm reaches 5.20 MPa (754 psi), the fluid pressure relation is found to be:

$$Pm \times A_3 = F_2 + Pw \times A_3$$

which shows that equal forces act on B piston ③ shutting off the bypass port between the master cylinder and the wheel cylinder. (Fig. 17)

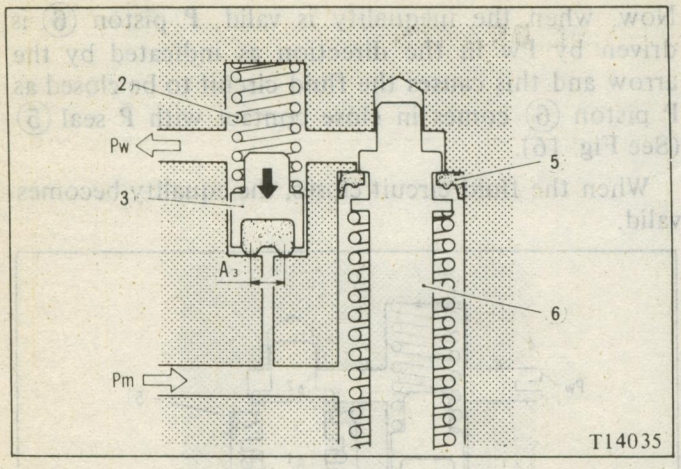



Fig. 17 BPV in Operation (2)

This is to say that the combination of Pw (decompressed pressure) acting on the $A_3$ surface and B spring (2) force acting in the direction as indicated by the arrow is equal to the force of Pm acting on the $A_3$ surface.

(2) When Pm exceeds 5.20 MPa (754 psi), the fluid pressure relation turns to be:

$Pm \times A_3 > F_2 + Pw \times A_3$

This means that the reducing ratio becomes 1.0 as B position (3) is opened by the force of Pm. In this state proportioning valve is out of operation.

This is to say that P valve (6) operates between the split points $P_1$ and $P_2$ shown in Fig. 14 and B piston (3) only operates within the section above the point.

### Removal and Inspection

The BPV should not be disassembled, because its performance significantly depends on the setting load.

(1) Check pipe connecting portions and plugs for fluid leakage and damage. Tighten or replace any loose or defective parts.

(2) To inspect the function of the BPV, check the hydraulic pressure of the master cylinder rear side and rear wheel cylinder side, using two pressure gauges. [10 MPa (1,500 psi.)]

Replace the BPV if the measured value is not within the range of standard value shown in the following table.

| Area | Standard value MPa (psi.) |
|---|---|
| Wheel cylinder / master cylinder | 3.21±0.20 / 4.90 (465.3±28.4 / 711.2) |
| | 3.92±0.29 / 5.88 (568.9±42.7 / 853.4) |
| | 4.90±0.29 / 6.86 (711.2±42.7 / 995.6) |

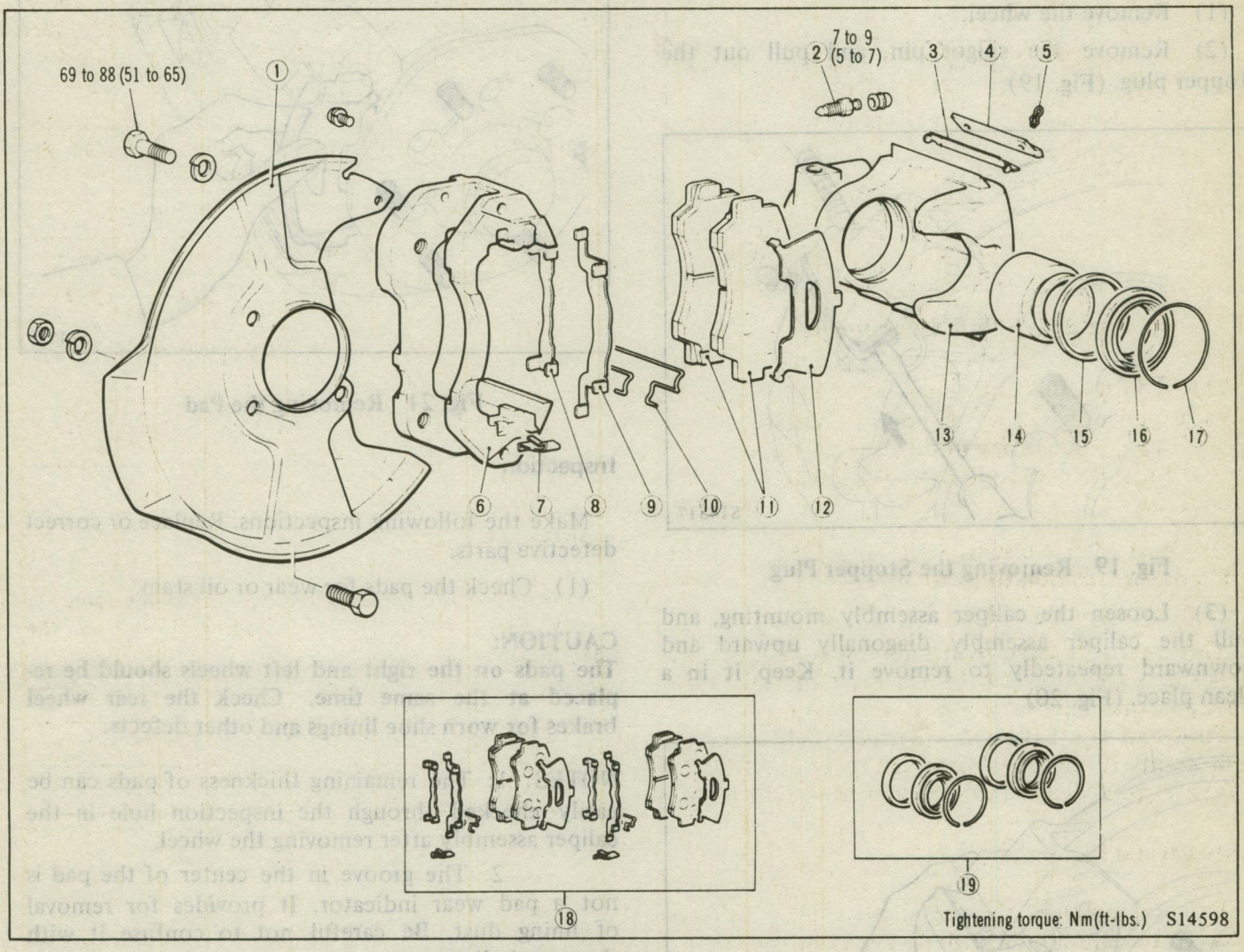
### Installation

During installation, observe the following item.

(1) Tighten the BPV installing bolts to the specified torque.

| Parts to be tightened | Torque Nm (ft-lbs.) |
|---|---|
| Brake tube flare nuts | 12 to 16 (9 to 12) |

## SLIDING CALIPER TYPE DISC BRAKES




(1) Dust cover
(2) Bleeder screw
(3) Pad support plate
(4) Stopper plug
(5) Spigot pin
(6) Caliper support
(7) Pad clip (inner)
(8) Pad clip B
(9) Pad clip (outer)
(10) Anti-rattle spring
(11) Brake pad
(12) Anti-squeak shim
(13) Caliper body
(14) Piston
(15) Piston seal
(16) Dust boot
(17) Boot ring
(18) Pad repair kit
(19) Seal and boot repair kit

**Fig. 18 Exploded View of Sliding Caliper Type Disc Brake**

## DISC BRAKE PAD

### Removal

(1) Remove the wheel.

(2) Remove the spigot pin, and pull out the stopper plug. (Fig. 19)

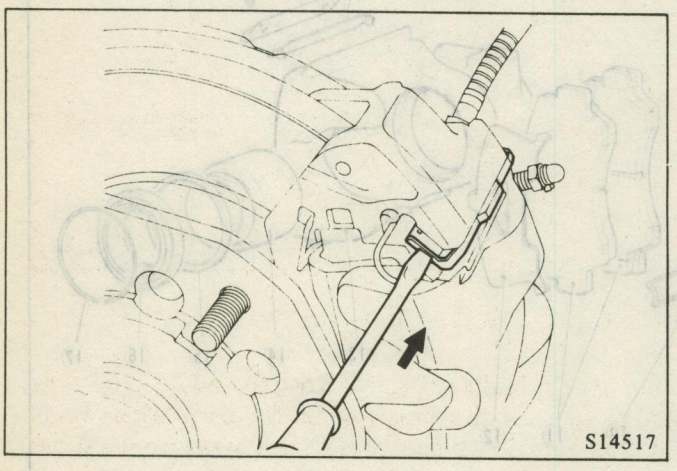



**Fig. 19 Removing the Stopper Plug**

(3) Loosen the caliper assembly mounting, and pull the caliper assembly diagonally upward and downward repeatedly to remove it. Keep it in a clean place. (Fig. 20)

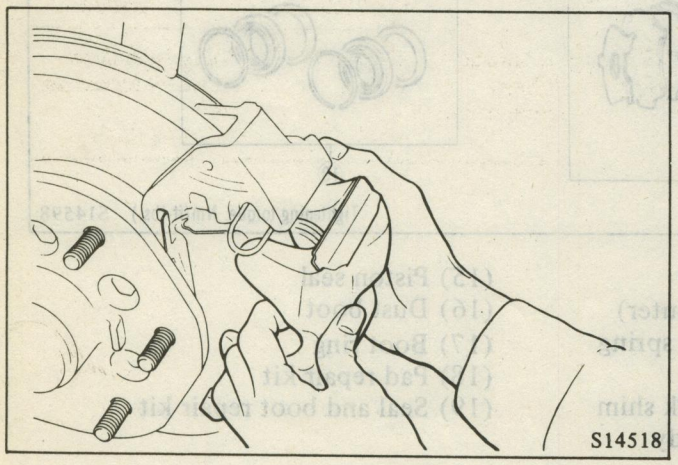



**Fig. 20 Removing the Caliper Assembly**

(4) Remove the pad from the caliper support.

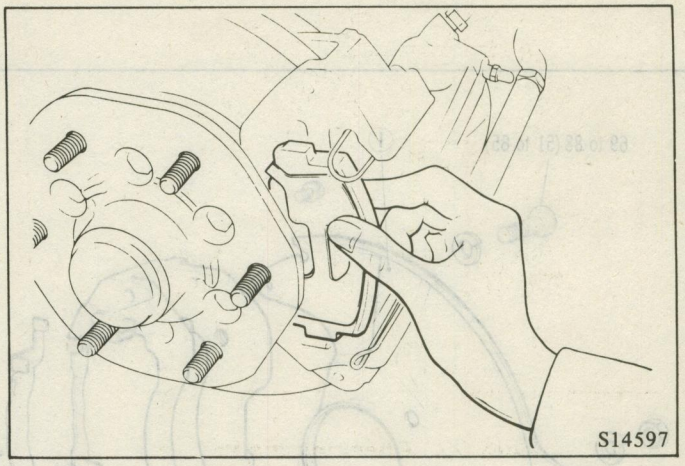



**Fig. 21 Removing the Pad**

### Inspection

Make the following inspections. Replace or correct defective parts.

(1) Check the pads for wear or oil stain.

**CAUTION:**
**The pads on the right and left wheels should be replaced at the same time. Check the rear wheel brakes for worn shoe linings and other defects.**

NOTES: 1: The remaining thickness of pads can be easily checked through the inspection hole in the caliper assembly after removing the wheel.

2: The groove in the center of the pad is not a pad wear indicator. It provides for removal of lining dust. Be careful not to confuse it with the wear indicator.

| Description | Standard value mm (in.) | Service limit mm (in.) |
|---|---|---|
| Thickness of pad | 10.5 (.41) | 1.0 (.04) |

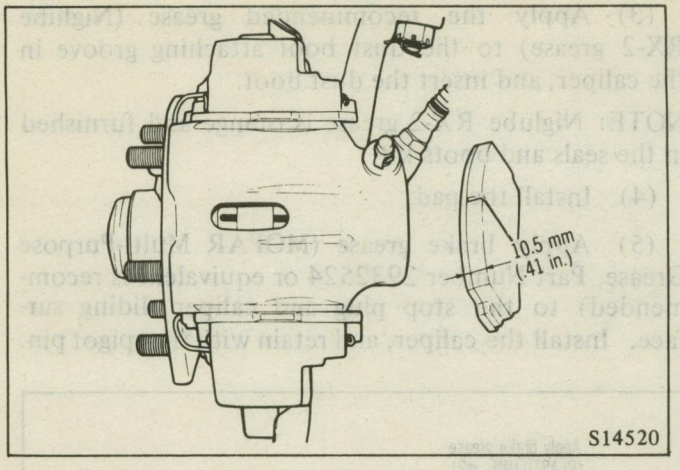



Fig. 22 Checking the Pad

(2) Check the anti-rattle spring, pad clips and pad clip B for damage. (Fig. 18)

(3) Check the stopper plug and pad support plate for wear and damage.

### Installation

During installation, observe the following items.

(1) When the pad has been replaced, clean the exposed part of the piston. Then, gently push the piston into the original position, taking care not to push the piston diagonally. (Fig. 23)

CAUTION:
**If it is hard to push the piston with the hammer handle, loosen the bleeder screw, and the piston will go in easily. After the piston has been set in this manner, be sure to bleed the system.**

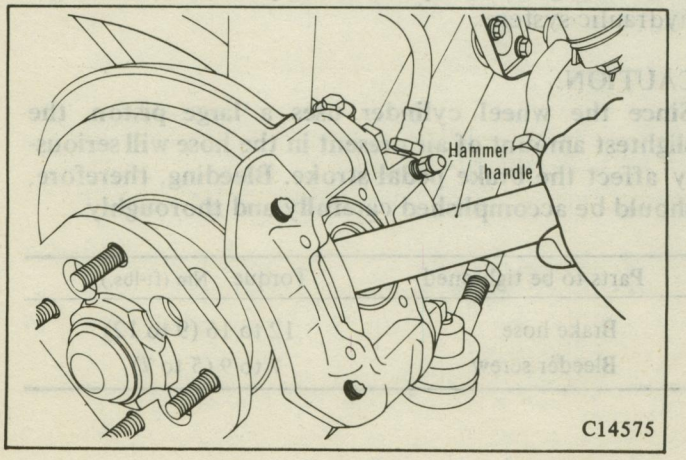



Fig. 23 Forcing the Piston

(2) Install the pad clip B and the inner and outer pad clips in proper directions of installation. (Fig. 24)

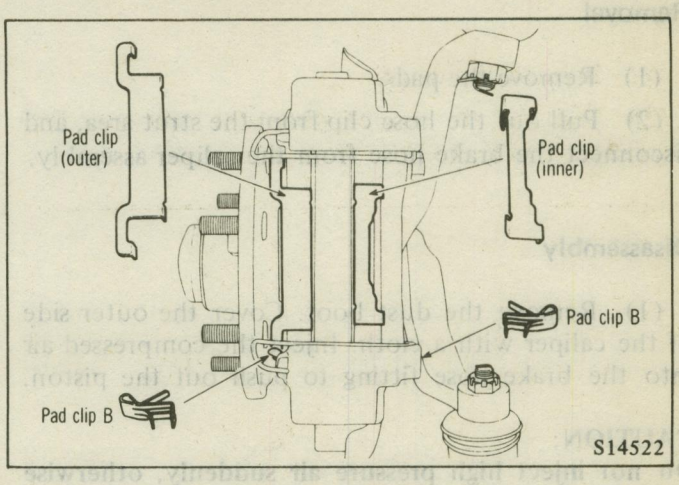



Fig. 24 Installing the Clips

To check brake dragging torque, while engine is started, depress the brake pedal for about 5 seconds with the vehicle stopped, and then measure the dragging torque using a spring balance. And measure it again after the disc has been turned 10 rounds or so. If the standard value is exceeded, disassemble the caliper and check the piston sliding part for dirtiness, rust and elasticity of the piston seal.

| Description | Standard value Nm (in-lbs.) | Remarks N (lbs.) |
|---|---|---|
| Brake dragging torque (after disc has been turned 10 rounds or so.) | 4 (29) or less | Tangential force at wheel mounting bolt: 57 (12.5) |

## CALIPER ASSEMBLY

### Removal

(1) Remove the pads.

(2) Pull out the hose clip from the strut area, and disconnect the brake hose from the caliper assembly.

### Disassembly

(1) Remove the dust boot. Cover the outer side of the caliper with a cloth. Inject the compressed air into the brake hose fitting to push out the piston.

CAUTION:
**Do not inject high pressure air suddenly, otherwise the piston may shoot out, injuring your fingers.**

(2) Remove the piston seal taking care not to damage the cylinder.

(3) Clean all disassembled parts in the following cleaning liquid.

- Metal parts ....Trichloroethylene, alcohol or brake fluid
- Piston seal .....Brake fluid or alcohol
- Dust boot.....Alcohol

CAUTION:
**Washing the piston seal or dust boot in alcohol should be completed within 30 seconds.**

### Inspection

(1) Check the cylinder and piston for wear, damage or rust. Replace defective parts.

### Assembly

(1) The piston seal and dust boot, when overhauled, must be replaced with new parts.

NOTES: 1: When replacing inner parts, use kit parts.

2: The kit parts include rubber grease. Apply the rubber grease to the piston seal.

(2) Apply rubber grease to the piston seal and brake fluid to piston sliding parts. Insert the piston by hand being careful not to twist the seal.

NOTE: Rubber grease is semitransparent red and furnished in the seals and boots kit.

(3) Apply the recommended grease (Niglube RX-2 grease) to the dust boot attaching groove in the caliper, and insert the dust boot.

NOTE: Niglube RX-2 grease is orange and furnished in the seals and boots kit.

(4) Install the pad.

(5) Apply brake grease (MOPAR Multi-Purpose Grease, Part Number 2932524 or equivalent is recommended) to the stop plug and caliper sliding surface. Install the caliper, and retain with the spigot pin.

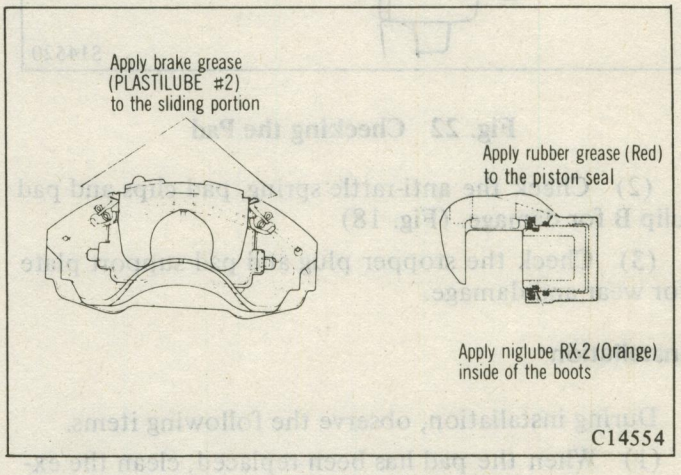



**Fig. 25 Grease Applying Point**

### Installation

When installing the caliper assembly, observe the following instructions referring to "Disc Brake Pads".

(1) After tightening the brake hose to the brake hose fitting to the specified torque, bleed the brake hydraulic system.

CAUTION:
**Since the wheel cylinder uses a large piston, the slightest amount of air present in the hose will seriously affect the brake pedal stroke. Bleeding, therefore, should be accomplished carefully and thoroughly.**

| Parts to be tightened | Torque Nm (ft-lbs.) |
|---|---|
| Brake hose | 12 to 16 (9 to 12) |
| Bleeder screw | 7 to 9 (5 to 7) |

## BRAKE DISC

### Removal

(1) Remove bolts attaching the caliper support to the knuckle, and hold the disc brake assembly in an appropriate position. (Fig. 26)

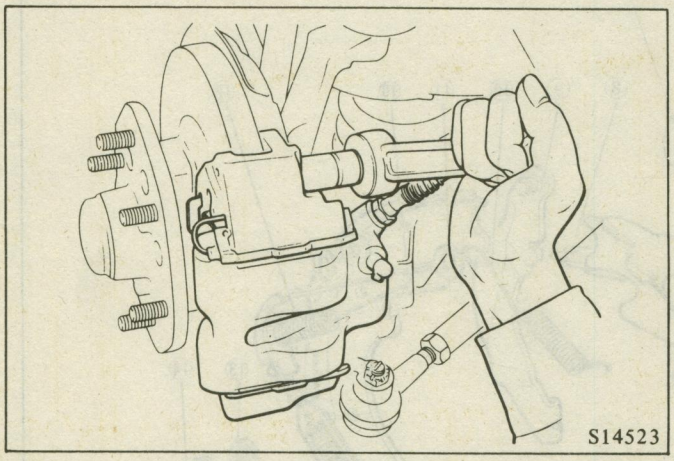



**Fig. 26 Removing the Disc Brake Assembly**

(2) Remove the hub assembly from the knuckle. Using a vice, disconnect the disc from the hub.

**CAUTION:**
**When clamping the brake disc in a vice, copper or aluminum vice jaws must be used.**

### Inspection

(1) Check the disc for wear, damage and roughness on its face. Correct or replace defective parts.

| Description | Standard value mm (in.) | Service limit mm (in.) |
|---|---|---|
| Thickness of disc | 20.0 (.79) | 18.4 (.72) |

### Installation

During installation, observe the following items.

(1) Tighten the following parts to the specified torques.

| Parts to be tightened | Torque Nm (ft-lbs.) |
|---|---|
| Disc to hub | 46 to 51 (34 to 38) |
| Caliper support | 69 to 88 (51 to 65) |

(2) Install the front hub.

(3) Check the disc for runout. If the runout exceeds the standard value, change the relative position of the disc to the hub. If the runout cannot be corrected by this change, replace the disc. (Fig. 27)

| Description | Standard value mm (in.) |
|---|---|
| Disc runout | 0.15 (.006) or less |

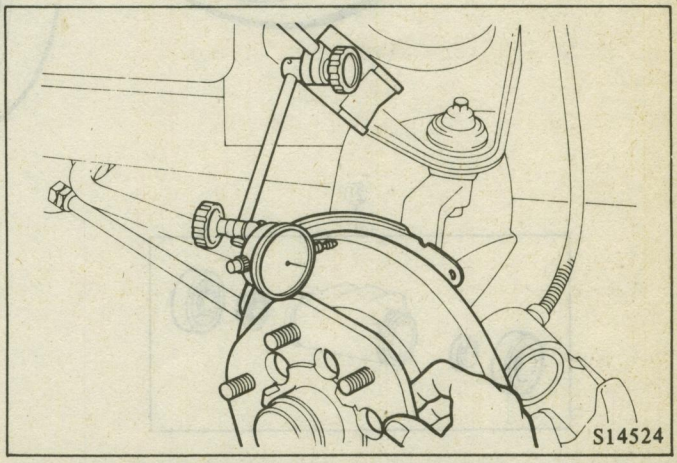
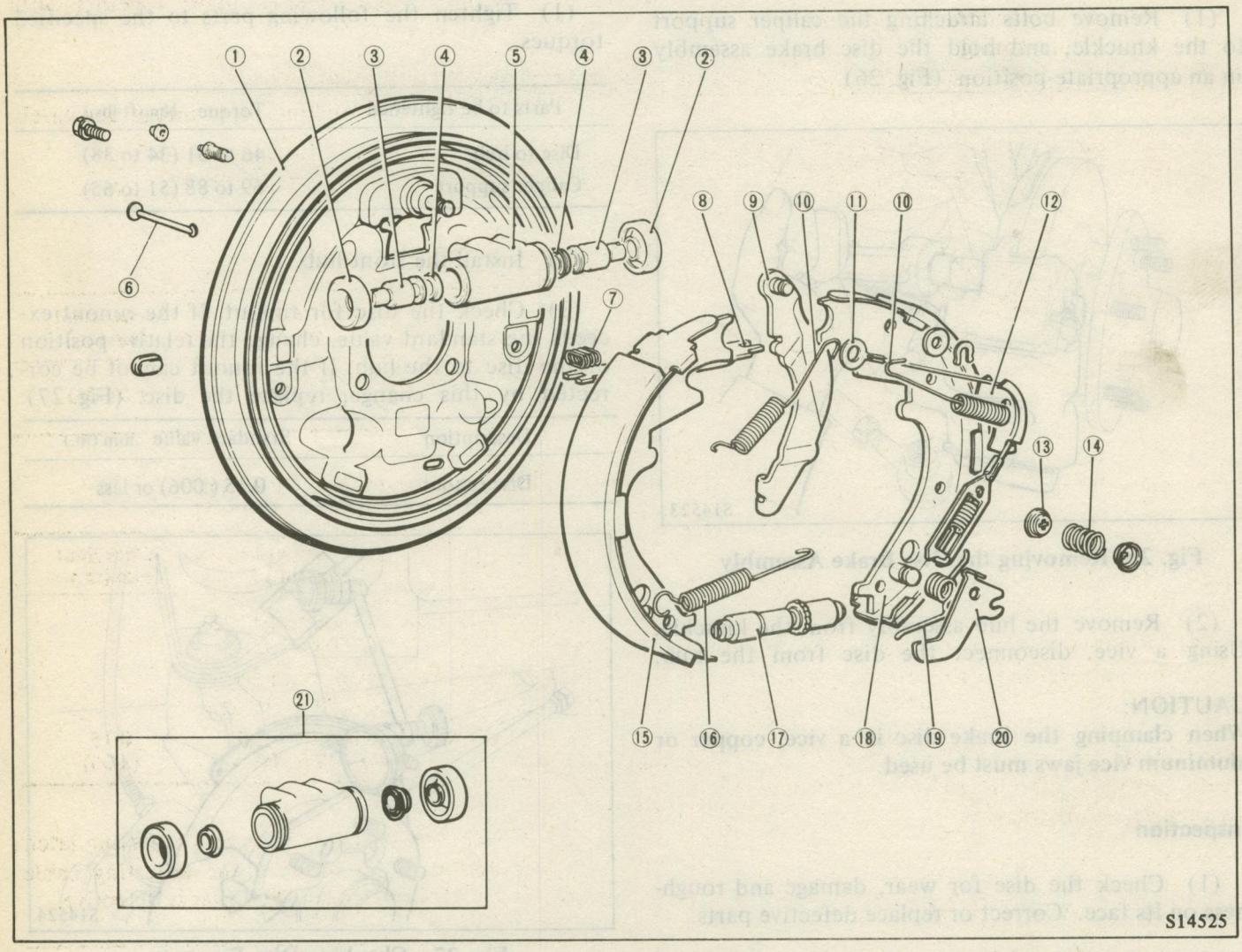



**Fig. 27 Checking Disc Runout**

(4) Install the caliper assembly to the adapter and tighten to the standard torque.

| Part to be tightened | Torque Nm (ft-lbs.) |
|---|---|
| Caliper assembly | 69 to 88 (51 to 65) |

## DUO-SERVO BRAKES




(1) Backing plate
(2) Wheel cylinder boot
(3) Wheel cylinder piston
(4) Wheel cylinder piston cup
(5) Wheel cylinder body
(6) Shoe hold-down pin
(7) Anti-rattle spring
(8) Parking brake strut
(9) Parking brake lever
(10) Shoe return spring
(11) Adjusting cable
(12) Cable guide
(13) Shoe hold-down cup
(14) Shoe hold-down spring
(15) Primary shoe assembly
(16) Adjusting spring
(17) Adjuster assembly
(18) Secondary shoe assembly
(19) Adjuster spring
(20) Autoadjuster lever
(21) Wheel cylinder repair kit

**Fig. 28 Exploded View of Duo-servo Brake**

## REMOVAL

(1) After removing the wheel, remove the brake drum.

(2) Using a standard brake return spring tool, remove the return spring.

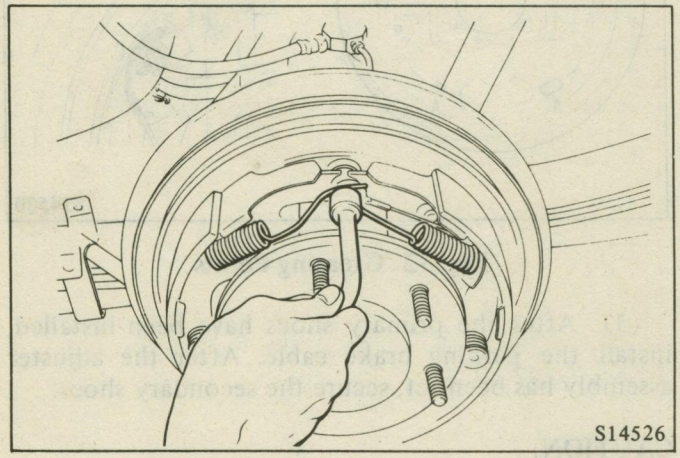



**Fig. 29 Removing Shoe Return Spring**

(3) Remove the adjusting spring and the adjusting lever.

(4) Remove the brake shoes and adjuster assembly then remove the cable from the parking brake lever. (Fig. 30)

**CAUTION:**
**Note that the left and right adjuster assemblies are symmertical construction.**

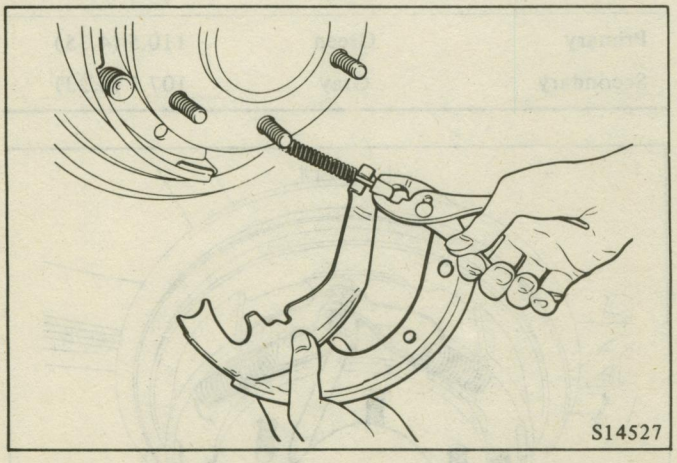



**Fig. 30 Removing Parking Brake Cable**

(5) After disconnecting the brake pipe from the wheel cylinder, remove the wheel cylinder from the backing plate.

(6) Remove the backing plate together with rear axle shaft.

**CAUTION:**
**Do not remove the backing plate unless absolutely necessary.**

## INSPECTION

(1) Checking the Brake Shoes

| Description | Standard value mm (in.) | Service limit mm (in.) |
|---|---|---|
| Thickness of shoe lining | 5.4 (.213) | 1.0 (.04) |

(2) Checking the Wheel Cylinders

| Description | Standard value mm (in.) | Service limit mm (in.) |
|---|---|---|
| Wheel cylinder I.D. | 19.050 to 19.102 (.750 to .752) | |
| Piston O.D. | 18.997 to 19.030 (.7479 to .7492) | |
| Piston-to-cylinder clearance | 0.020 to 0.105 (.0008 to .0041) | 0.15 (.006) |

(3) Check the adjusting lever and adjusting latch for wear and damage. Measure the adjusting cable length (FIg. 31). Replace any part that is defective.

| Description | Standard value mm (in.) |
|---|---|
| Adjusting cable length | 254.5 ± 0.15 (10.020 ± .006) |

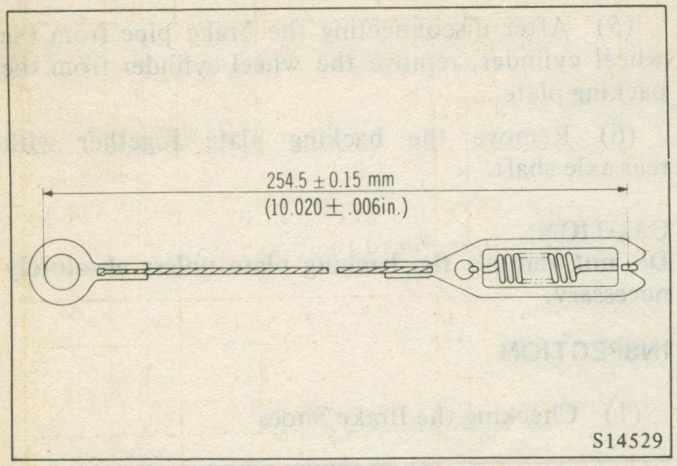



Fig. 31 Measuring Adjusting Cable Length

(4) Check the inner wall of the brake drum for groove wear and presence of oil. Correct or replace the drum if it is defective.

| Description | Standard value mm (in.) | Repair limit mm (in.) |
|---|---|---|
| Brake drum I.D. | 241.3 (9.5) | 243.3 (9.579) |

## INSTALLATION

During installation, observe the following items.

(1) Install the wheel cylinder to the backing plate by tightening it to the specified torque.

| Part to be tightened | Torque Nm (ft-lbs.) |
|---|---|
| Wheel cylinder | 18 to 20 (13 to 15) |

(2) Apply brake grease [MOPAR Multi-Purpose Grease (Part Number 2932524) or equivalent] to the backing plate ledge surface (A), to the contacting surfaces (B) of anchor pin and shoe web, to the contacting surfaces (C) of adjustor cable and cable guide, and to the contacting surfaces (D) of parking brake lever pin and shoe web.

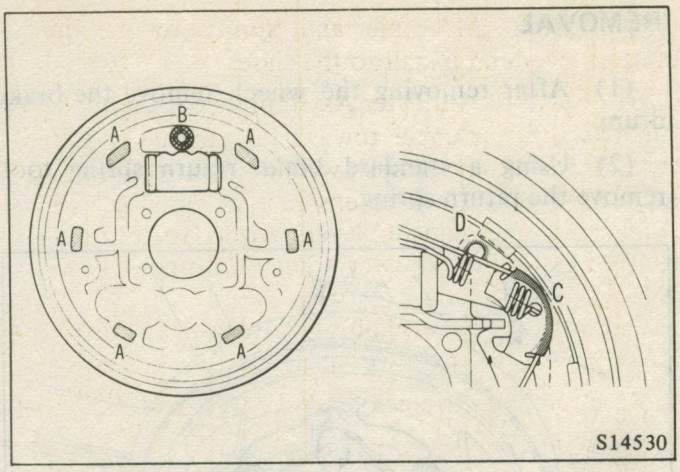



Fig. 32 Greasing Points

(3) After the primary shoes have been installed, install the parking brake cable. After the adjuster assembly has been set, secure the secondary shoes.

**CAUTION:**
**After the adjuster assembly has been cleaned, apply grease to the threaded area and check to ensure that it turns smoothly.**

(4) Install the primary shoe return springs, adjusting cable and secondary shoe return springs in that order.

Note that the free length of shoe return springs differ between primary and secondary side.

| | Identification color | Free length mm (in.) |
|---|---|---|
| Primary | Green | 110.5 (4.35) |
| Secondary | Gray | 107.5 (4.23) |

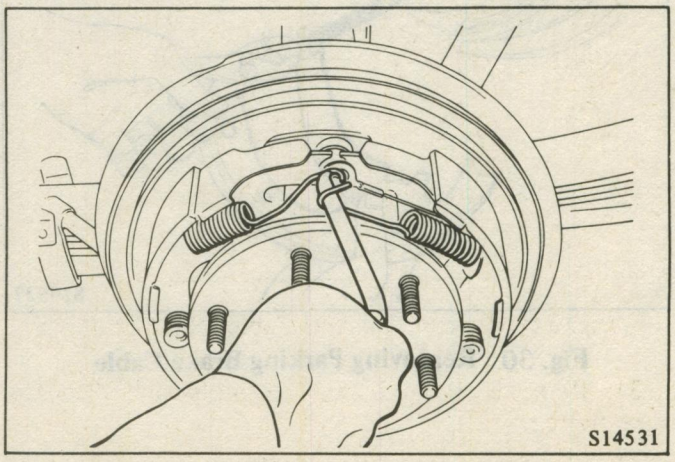



Fig. 33 Installing Return Spring

(5) Install the cable and spring to the auto-adjuster lever and install to the shoes.

(6) Checking Adjuster Assembly Operation

Pull the adjuster cable toward you to see if the adjuster lever goes into mesh with the next tooth of the adjuster wheel. Check to ensure that when the cable is released, the adjuster lever returns to its original position after the adjuster wheel has moved a tooth ahead.

If the adjuster assembly does not operate correctly, perform the following checks.

* Mounted conditions of adjusting cable and cable guide.
* Mounted conditions of adjuster lever and adjusting spring.
* Operation of adjuster assembly.

(7) The brake shoe lining-to-drum clearance is automatically adjusted simply by depressing the brake pedal several times.

| Description | Standard value mm (in.) |
|---|---|
| Brake shoe lining-to-drum clearance | 0.25 to 0.40 (.010 to .016) |

(8) After the brake tube has been tightened to the specified torque, bleed the brake system.

| Parts to be tightened | Torque Nm (ft-lbs.) |
|---|---|
| Brake tube flare nut | 12 to 16 (9 to 12) |
| Bleeder screw | 7 to 9 (5 to 7) |

(9) Move the vehicle in reverse direction and depress the brake pedal. Repeat this until a constant pedal stroke is obtained.

## PARKING BRAKES

### REMOVAL

#### Front Cable

(1) Loosen parking brake lever fully to loosen cable. Then remove the front cable (rear end).

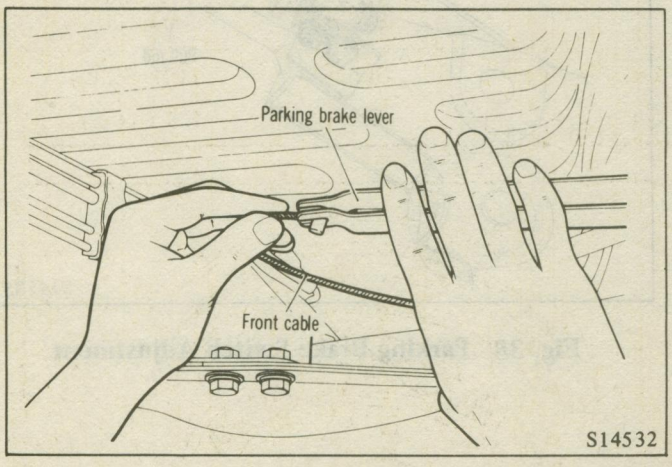



**Fig. 34 Removing Front Cable (Rear End)**

(2) Remove the pull rod assembly and parking brake switch.

(3) Withdraw the roller shaft and remove the roller.

(4) Disconnect the front cable (front end) from the pull rod. Remove the front cable and pull rod from the tube.

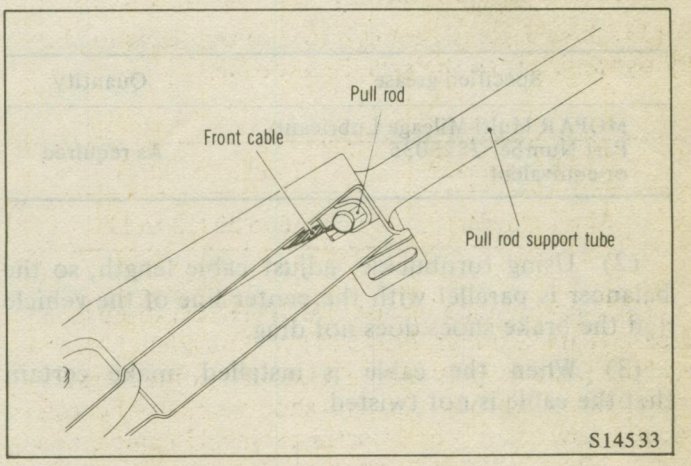



**Fig. 35 Removing Front Cable (Front End)**

#### Rear Cable

(1) Disconnect the rear cable under the floor and remove the return spring, parking brake lever and cable clamp.

(2) Disassembly the rear brakes.

(3) Remove the cable from the rear brake parking brake.

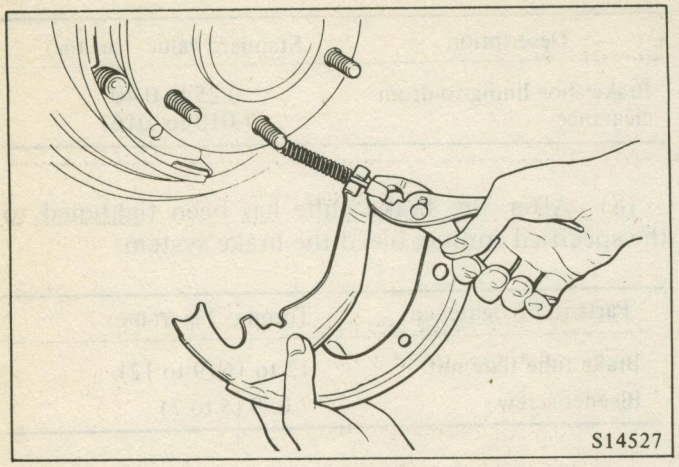



Fig. 36 Removing Rear Cable

## INSPECTION

(1) Check the pull rod for wear of latch and damage and movement of cable. Replace the part if necessary.

## INSTALLATION

During installation, observe the following items.

(1) Apply an appropriate amount of chassis grease to each sliding part.

| Specified grease | Quantity |
|---|---|
| MOPAR Multi-Mileage Lubricant Part Number 2525035 or equivalent | As required |

(2) Using turnbuckle, adjust cable length, so the balancer is parallel with the center line of the vehicle and the brake shoes does not drag.

(3) When the cable is installed, make certain that the cable is not twisted.

(4) To install heat protector to the boot on RH rear cable, align the groove on the heat protector with that on the No. 3 crossmember bracket. (Fig. 37)

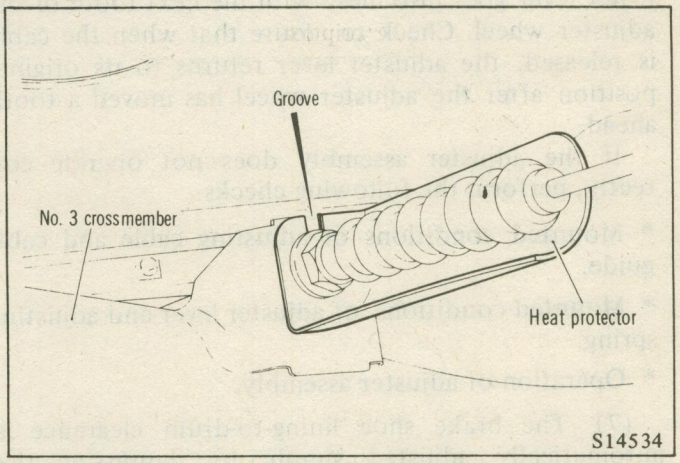



Fig. 37 Installing the Heat Protector

(5) After the parking brakes has been adjusted, adjust the parking brake switch calmp, so brake warning light will go out with the pull rod released, and the light will come on with the pull rod pulled by one notch.

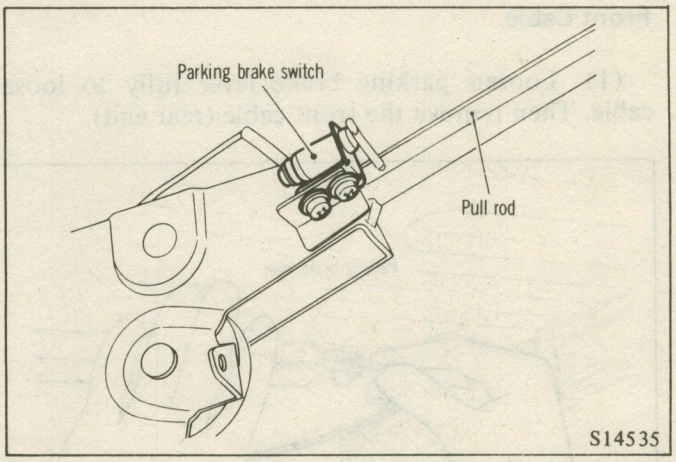



Fig. 38 Parking Brake Switch Adjustment

# SPECIFICATIONS

| Description | Specifications |
|---|---|
| Service Brakes | |
| Brake type | |
| Front | Sliding caliper type disc brake |
| Rear | Duo-servo type drum brake |
| Method of brake shoe clearance adjustment | |
| Front | Automatic adjustment type |
| Rear | Automatic adjustment type |
| Brake drum I.D. | |
| Rear | 241.3 mm (9.5 in.) |
| Brake shoe lining dimensions (Length x width x thickness) | |
| Front (Pad dimensions) | 112 x 50 x 10.5 mm (4.14 x 1.97 x .41 in.) |
| Rear Primary | 231 x 50 x 5.4 mm (9.08 x 1.97 x .21 in.) |
| Secondary | 262 x 50 x 5.4 mm (10.31 x 1.97 x .21 in.) |
| Master cylinder | |
| Type | Tandem type |
| I.D. | 22.22 mm (7/8 in.) fitted with power brake |
| Residual pressure | |
| Front | 0 kPa (0 psi) |
| Rear | 0 kPa (0 psi) |
| Wheel cylinder I.D. | |
| Front | 30 mm (1.181 in.) |
| Rear | 19.05 mm (3/4 in.) |
| Power brake | |
| Type | Vacuum booster type |
| Effective dia. of power cylinder | 190.5 mm (7.5 in.) |
| Booster power | 3.58 [at 882N (197.1 lbs.)] |
| Pedal stroke | 140 mm (5.5 in.) |
| Blend proportioning valve | Provided |
| Parking Brakes | |
| Parking brake type | Stick type |
| Cable arrangement | V type |

# SERVICING STANDARD

| Description | Standard dimension | Service limit | Remarks |
|---|---|---|---|
| Service Brakes | | | |
| Brake control | | | |
| Distance between pedal top face and toe board | 166 mm (6.5 in.) | | |
| Play of pedal | 10 to 15 mm (.4 to .6 in.) | | |
| Distance from brake pedal depressed to toe board | 26 mm (1 in.) or more | | Pedal pressure: approx. 490N (110 lbs.) |
| Master cylinder | | | |
| I.D. | 22.220 to 22.272 mm (.8748 to .8768 in.) | | |
| Piston diameter | 22.147 to 22.180 mm (.8719 to .8732) | | |
| Clearance between master cylinder and master cylinder piston | 0.040 to 0.125 mm (.0016 to .0049 in.) | 0.150 mm (.0059 in.) | |
| Piston-to-power brake push rod clearance | 0 to 0.75 mm (0 to .03 in.) | | |
| Disc brake | | | |
| Thickness of pad | 10.5 mm (.41 in.) | 1.0 mm (.04 in.) | |
| Thickness of disc rotor | 20.0 mm (.79 in.) | 18.4 mm (.72 in.) | |
| Dragging torque | 4 Nm (29 in-lbs.) or less | | Tangential force in hub bolt position: 57N (12.5 lbs.) When brake pedal is depressed |
| Disc runout | Less than 0.15 mm (.006 in.) | | |
| Duo-servo brake | | | |
| Thickness of lining | 5.4 mm (.213 in.) | 1.0 mm (.04 in.) | |
| Wheel cylinder I.D. | 19.050 to 19.102 mm (.750 to .752 in.) | | |
| Piston O.D. | 18.997 to 19.030 mm (.7479 to .7492 in.) | | |
| Clearance between wheel cylinder and piston | 0.020 to 0.105 mm (.0008 to .0041 in.) | 0.15 mm (.006 in.) | |
| Brake drum I.D. | 241.3 mm (9.5 in.) | 243.3.mm (9.579 in.) | |
| Clearance between drum and lining | 0.25 to 0.40 mm (.010 to .016 in.) | | |
| Parking Brakes | | | |
| Parking brake pull rod stroke | 16 to 17 notches | | When pull rod assembly is pulled with 294N (66 lb.) force. |
| Clearance between balancer and crossmember | 200 mm (8.0 in.) | | |

# TIGHTENING TORQUE

| Description | Torque Nm (ft-lbs.) |
|---|---|
| Service Brakes | |
| Pedal support to support member | 16 to 23 (12 to 17) |
| Pedal support to power brake (toe board) | 8 to 12 ( 6 to 9) |
| Master cylinder | |
| Check valve cap tightening | 24 to 34 (18 to 25) |
| Check valve case tightening | 39 to 49 (29 to 36) |
| Piston stop tightening | 1.5 to 3.0 (1.1 to 2.2) |
| Reservoir tank band tightening | 2.4 to 3.9 (1.8 to 2.9) |
| Master cylinder installation | 8 to 12 ( 6 to 9) |
| Piping flare nut tightening | 12 to 16 ( 9 to 12) |
| Master cylinder connector bolt tightening | 25 to 34 (18 to 25) |
| Power brake hose fitting tightening | 15 to 18 (11 to 13) |
| Power brake installation | 8 to 12 ( 6 to 9) |
| Bleeder screw tightening | 7 to 9 ( 5 to 7) |
| Brake hose tightening | 12 to 16 ( 9 to 12) |
| Three-way connector installation | 25 to 34 (18 to 25) |
| Blend proportioning valve | 11.7 to 14.6 (8.6 to 10.8) |
| Brake tube flare nut | 12 to 16 ( 9 to 12) |
| Disc Brake | |
| Caliper assembly (torque plate) installation | 69 to 88 (51 to 65) |
| Disc rotor to hub connection | 46 to 51 (34 to 38) |
| Duo-servo brake | |
| Wheel cylinder installation | 18 to 20 (13 to 15) |
| Parking Brakes | |
| Cable lever installation | 15 to 19 (11 to 14) |

## TIGHTENING TORQUE

| Description | Torque Nm (ft-lbs) |
|---|---|
| Service Brakes | |
| Pedal support to support member | 16 to 23 (12 to 17) |
| Pedal support to power brake (toe board) | 8 to 12 ( 6 to 9) |
| Master cylinder | |
| Check valve cap tightening | 24 to 34 (18 to 25) |
| Check valve case tightening | 39 to 49 (29 to 36) |
| Piston stop tightening | 1.5 to 2.0 (1.1 to 2.2) |
| Reservoir tank band tightening | 2.4 to 3.9 (1.8 to 2.9) |
| Master cylinder installation | 8 to 12 ( 6 to 9) |
| Piping flare nut tightening | 12 to 16 ( 9 to 12) |
| Master cylinder connector bolt tightening | 25 to 34 (18 to 25) |
| Power brake hose fitting tightening | 15 to 18 (11 to 13) |
| Power brake installation | 8 to 12 ( 6 to 9) |
| Bleeder screw tightening | 7 to 9 ( 5 to 7) |
| Brake hose tightening | 12 to 16 ( 9 to 12) |
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| Parking Brakes | |
| Cable lever installation | 15 to 19 (11 to 14) |