

5-7. Brake

1. General

1) Service Brake

The service brake employs a hydraulic 4-wheel brake system. The master cylinder has a tandem design. The brake piping system is of a dual type: a crossed piping type on the 12-inch tire equipped model and a front and rear separate piping type on the 10-inch tire equipped model. The front brakes are of a disc type on the 12-inch tire equipped model and a two-leading drum type on the 10-inch tire equipped model. The rear brakes have leading-trailing drum designs on both models.

On models destined for Europe, a dual proportioning valve is used as an anti-lock device for the rear wheels. The parking brake has a mechanical design which operates on the rear wheels.

The brake fluid leakage warning has a sensor installed in the reservoir tank which illuminates the warning light on the instrument panel when the brake fluid is low.

(1) Master cylinder

When the primary piston is forced to move through the push rod, pressure rises and moves the secondary piston resulting in a pressure build-up in both chambers. There are two sections of braking piping; the primary side of the master cylinder is connected to the front brakes and the secondary side to the rear brakes.

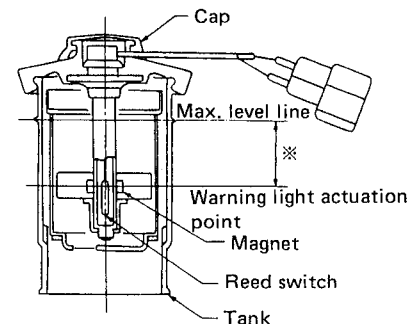
NOTE:

If one section of the brake circuit fails due to leakage or damage, the braking action will be less than half that provided when both sections function normally.

(2) Brake fluid leakage warning

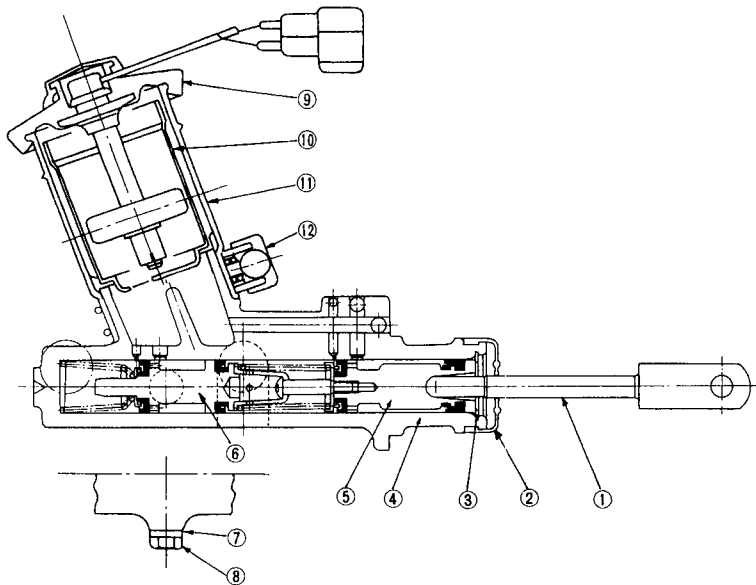
When the brake fluid is low, the float descends and its magnet actuates the warning light on the instrument panel.

The warning light illuminates when the ignition switch is turned on even though the brake fluid is at a normal level; it will go out when the engine starts. This enables the driver to check for a break in the warning light circuit.



※ 12-inch tire equipped model:
About 26 mm (1.02 in)
10-inch tire equipped model:
About 21 mm (0.83 in)

Fig. 5-7-2



- | | | |
|-----------------|--------------------|-------------------|
| 1 Push rod | 5 Primary piston | 9 Cap assembly |
| 2 Boot | 6 Secondary piston | 10 Filter |
| 3 Snap ring | 7 Gasket | 11 Reservoir tank |
| 4 Cylinder body | 8 Piston stopper | 12 Band assembly |

Fig. 5-7-1

K14-009

(3) Front brakes

• 12-inch tire equipped model

The front brake has a power brake design to increase high braking performance. The wheel cylinder is used to automatically provide the adequate clearance between the disc rotor and the pad at all times. Pad wear can be checked easily through the access hole in the caliper body.

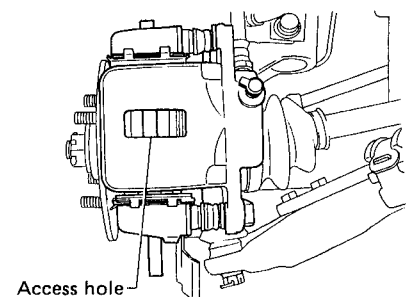
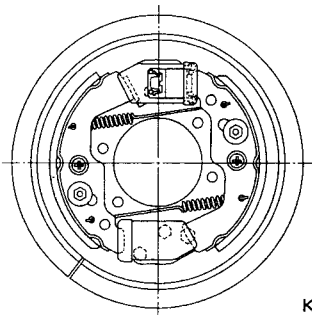


Fig. 5-7-3

K14-038

● 10-inch tire equipped model

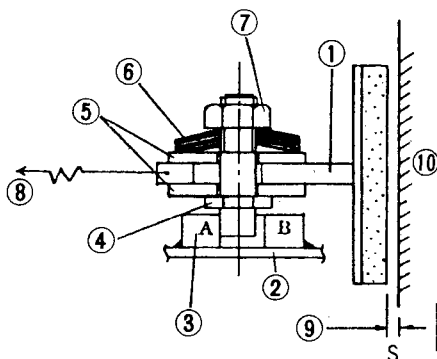
The two-leading type drum brake design is employed. It has a self-adjusting mechanism which automatically adjusts the brake shoe clearance.



K14-018

Fig. 5-7-4

The self-adjusting mechanism operates as described below.



- | | |
|-------------------|-------------------------------|
| 1 Shoe web | 7 Nut |
| 2 Back plate | 8 Force of shoe return spring |
| 3 Adjusting block | 9 Shoe clearance |
| 4 Adjusting bolt | 10 Drum sliding surface |
| 5 Friction plate | |
| 6 Friction spring | |

K14-011

Fig. 5-7-5

As brake lining wear progresses and the shoe clearance increases from ΔS to $S + \Delta S$, the brake shoe, held stationary by part A of adjusting block (3), expands when braking. The point of adjusting bolt (4) attached to shoe web (1) leaves part A of block (3) and runs against part B.

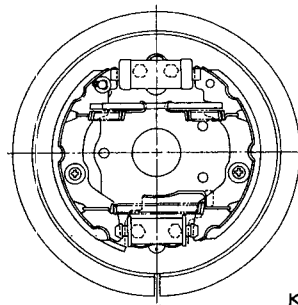
As the wheel cylinder piston is forced further out, the shoe overcomes the frictional force of friction spring (6) and slides between friction plate (5) and shoe web (1) as far as increased shoe clearance ΔS .

When the brake is released, the shoe separates from the drum and the point of adjusting bolt (4) is returned until stopped by part A of adjusting block (3). Since the frictional force of the friction spring is greater than the force of the return spring, shoe clearance S is maintained.

In this way, the self-adjusting mechanism compensates for lining wear and keeps the shoe clearance constant.

(4) Rear brakes

The rear wheels have leading-trailing type drum brakes. The shoe clearance adjustment must be made manually.



K14-019

Fig. 5-7-6

(5) Dual proportioning valve

The dual proportioning valve is used on models destined for Europe. It is adjusted so that when the brakes are applied suddenly, fluid pressure in the rear wheel cylinder becomes lower than that in the front wheel cylinder to prevent the rear wheels from being locked faster than the front wheel.

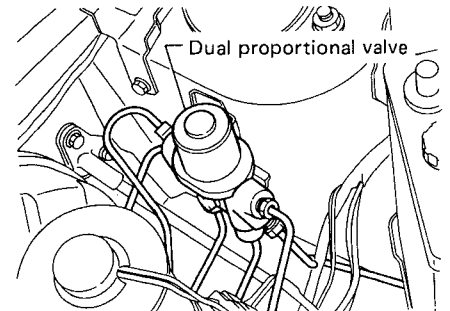


Fig. 5-7-7

K14-039

2) Parking Brake

The parking brake is operated by a lever. Pulling the lever causes the rear-wheel brakes to be applied. With the parking brake lever pulled, the warning light on the instrument panel illuminates.

2. Specifications

Service brake	Type		Front	Disc	Disc (Colette type)
			Drum	Drum (Two-leading)	
			Rear		Drum (Leading-trailing)
	Brake disc rotor diameter				mm (in) 212 (8.35)
	Brake drum inner diameter		Front		180 (7.09)
			Rear		170 (6.69)
	Size of brake lining length × width × thickness		Front	Disc	93.8 × 35.5 × 9 (3.693 × 1.398 × 0.35)
				Drum	173 × 35 × 5 (6.81 × 1.38 × 0.20)
			Rear		181 × 30 × 4.4 (7.13 × 1.18 × 0.173)
	Surface area of lining		Front	Disc	33.3 × 2 × 2 (5.16 × 2 × 2)
				Drum	60 × 2 × 2 (9.3 × 2 × 2)
			Rear		54 × 2 × 2 (8.4 × 2 × 2)
	Wheel cylinder bore		Front	Disc	48.1 (1.894)
				Drum	23.81 (0.9374)
Rear			12-inch tire equipped model	17.46 (0.6874)	
			10-inch tire equipped model	14.29 (0.5626)	
Master cylinder	Type				Tandem
	Cylinder bore				mm (in) 19.05 (0.7500)
	Level indicator				Provided
Parking brake	Type				Mechanical rear-wheel braking
	Wheels to be braked				2 rear wheels
	Lining	Size		mm (in)	181 × 30 × 4.4 (7.13 × 1.18 × 0.173)
		Area		cm ² (sq in)	54 × 2 × 2 (8.4 × 2 × 2)
Power brake assist unit	Type				Vacuum suspended type
	Effective diameter				mm (in) 12.7 (0.5)
Anti-lock device (for rear wheels)	Type				Dual proportioning valve
	Split point				kPa (kg/cm ² , psi) 2,452 (25, 356)
	Reducing ratio				0.3

3. Component Parts and Service Data

1) Master Cylinder

- 1 Cap
- 2 Filter
- 3 Oil reservoir tank
- 4 Band
- 5 Cylinder body
- 6 Piston stopper
- 7 Gasket
- 8 Secondary piston
- 9 Primary piston
- 10 Snap ring
- 11 Boot
- 12 Push rod

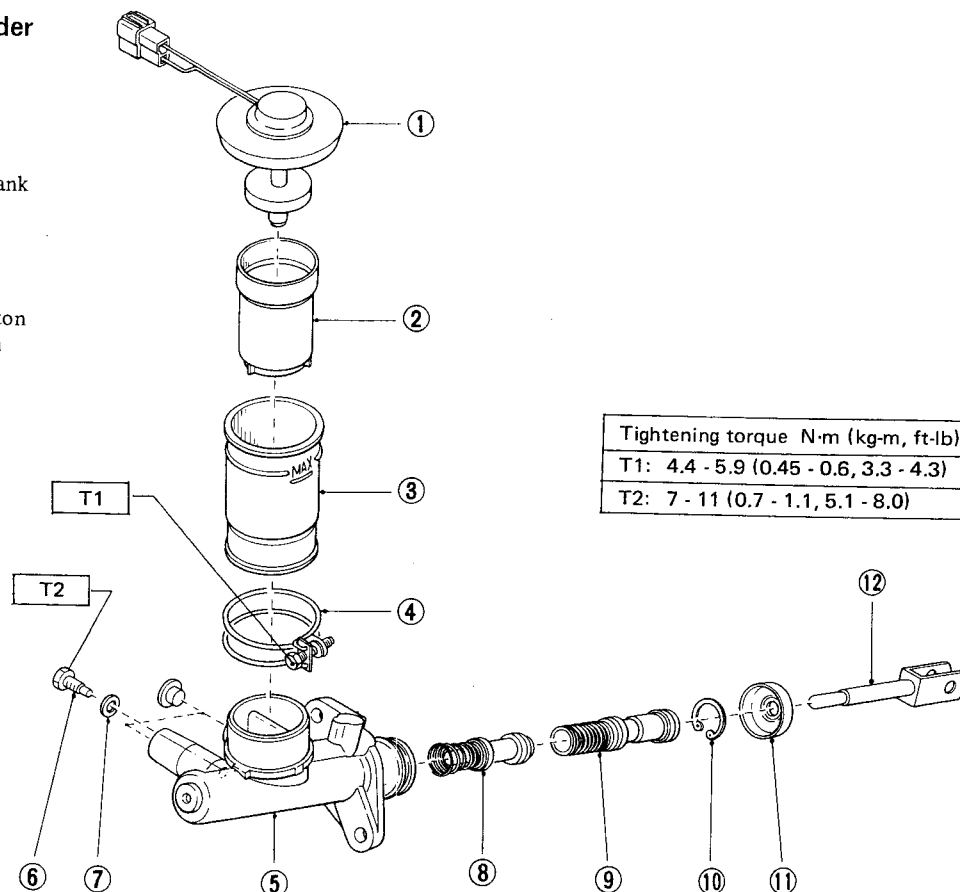


Fig. 5-7-8

K14-035

2) Front Brake

• Disc brake

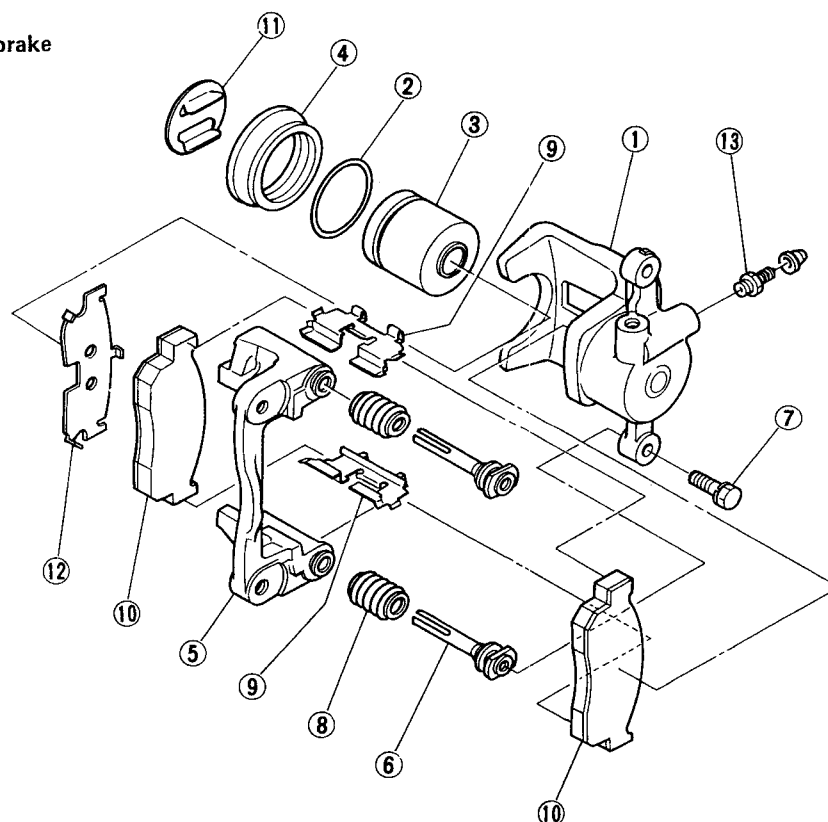
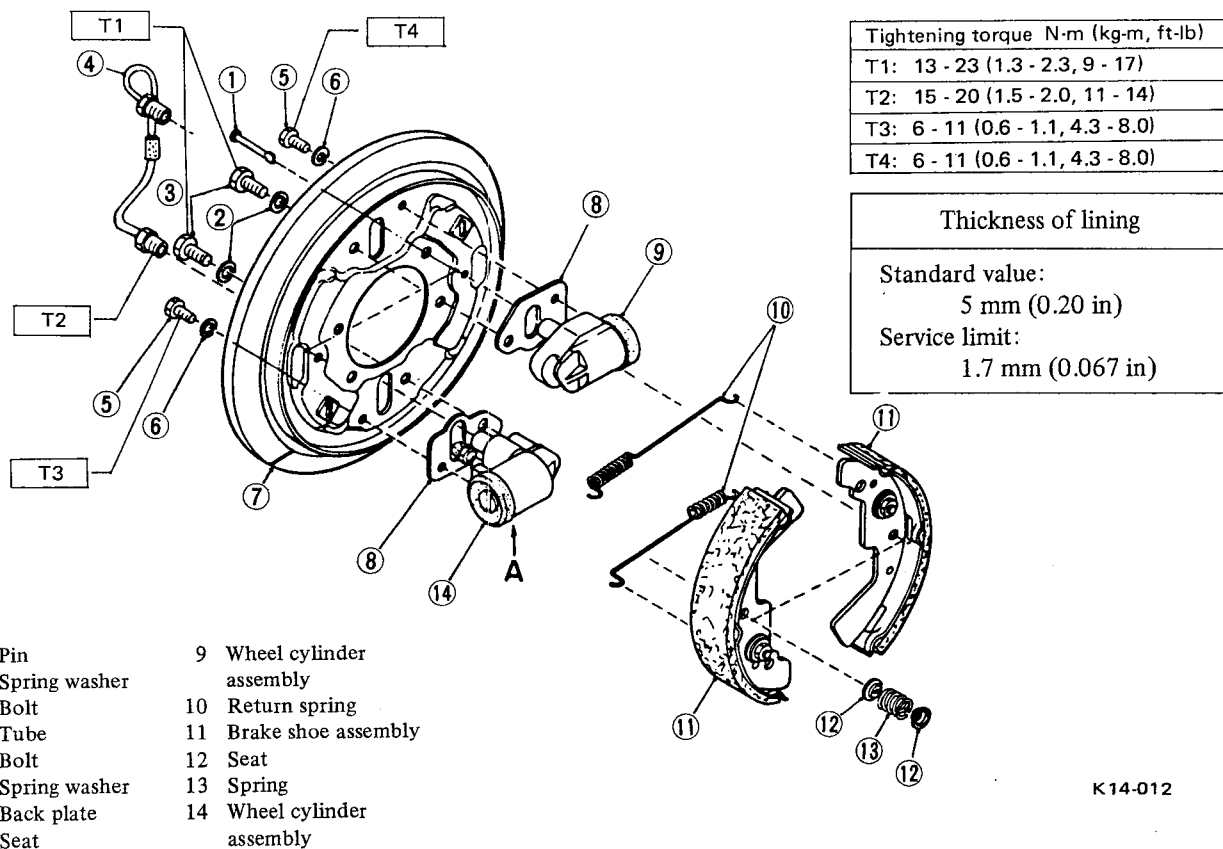


Fig. 5-7-9

K14-047

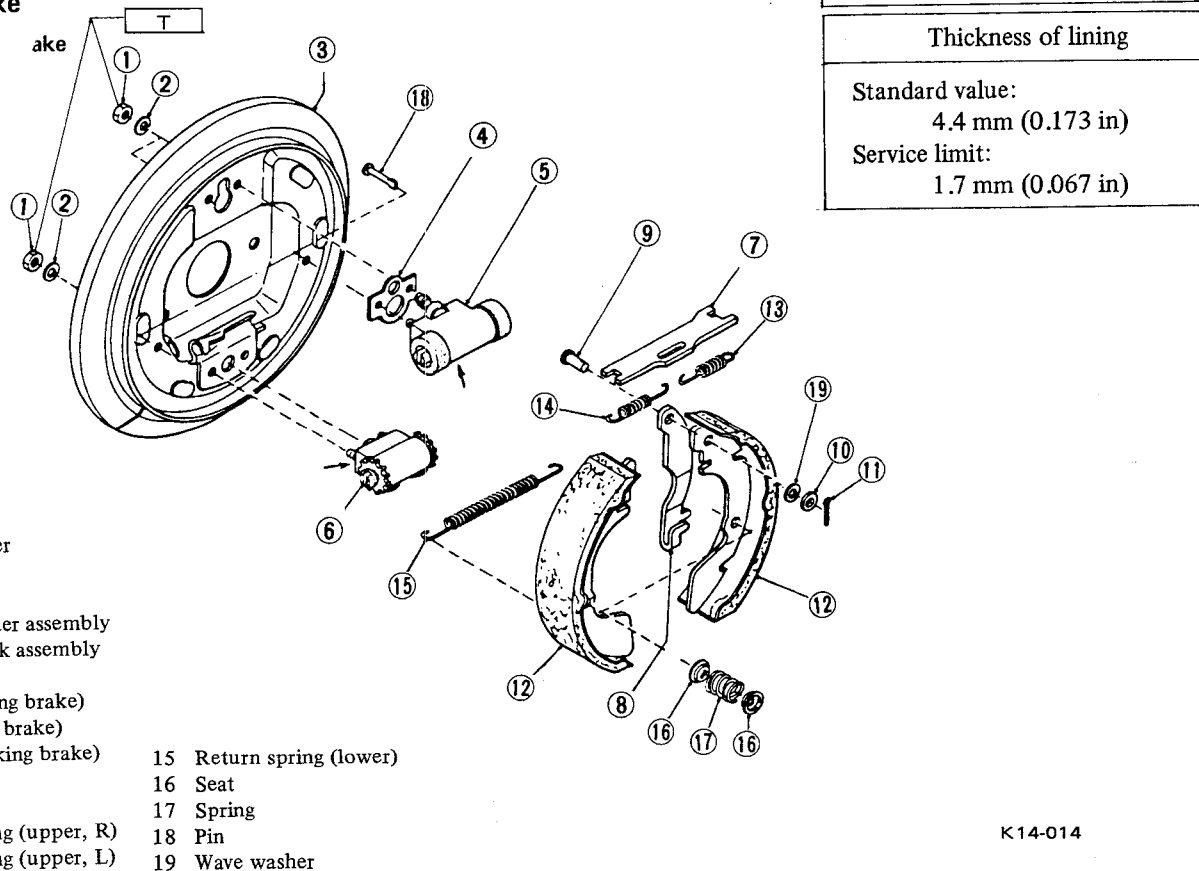
● Drum brake



K14-012

Fig. 5-7-10

3) Rear Brake



K14-014

Fig. 5-7-11

4) Front Wheel Cylinder

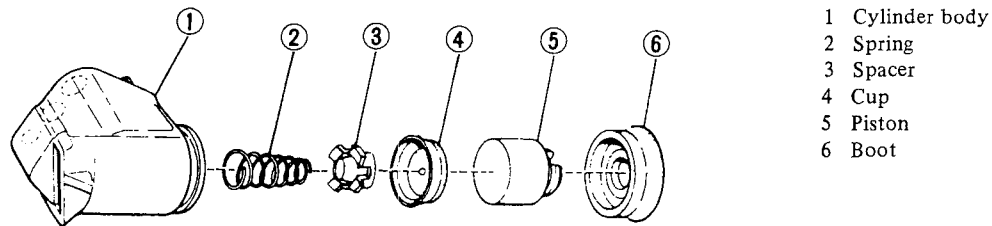


Fig. 5-7-12

K14-013

5) Rear Wheel Cylinder

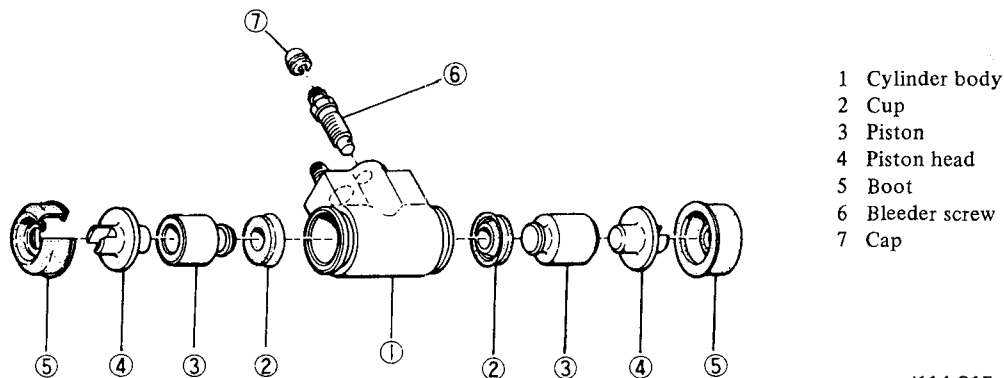


Fig. 5-7-13

K14-015

6) Rear Brake Anchor Block

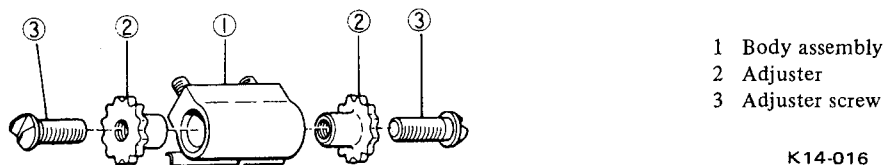


Fig. 5-7-14

K14-016

7) Power Brake Unit

Tightening torque N.m(kg-m,ft-lb)	
T1:	15 ± 2.9 ($1.5 \pm 0.3, 11 \pm 2.2$)
T2:	18 ± 4.9 ($1.8 \pm 0.5, 13 \pm 3.6$)

- 1 Vacuum hose joint bolt
- 2 Vacuum hose
- 3 Clip
- 4 Nut
- 5 Spring washer
- 6 Seal
- 7 Flange nut

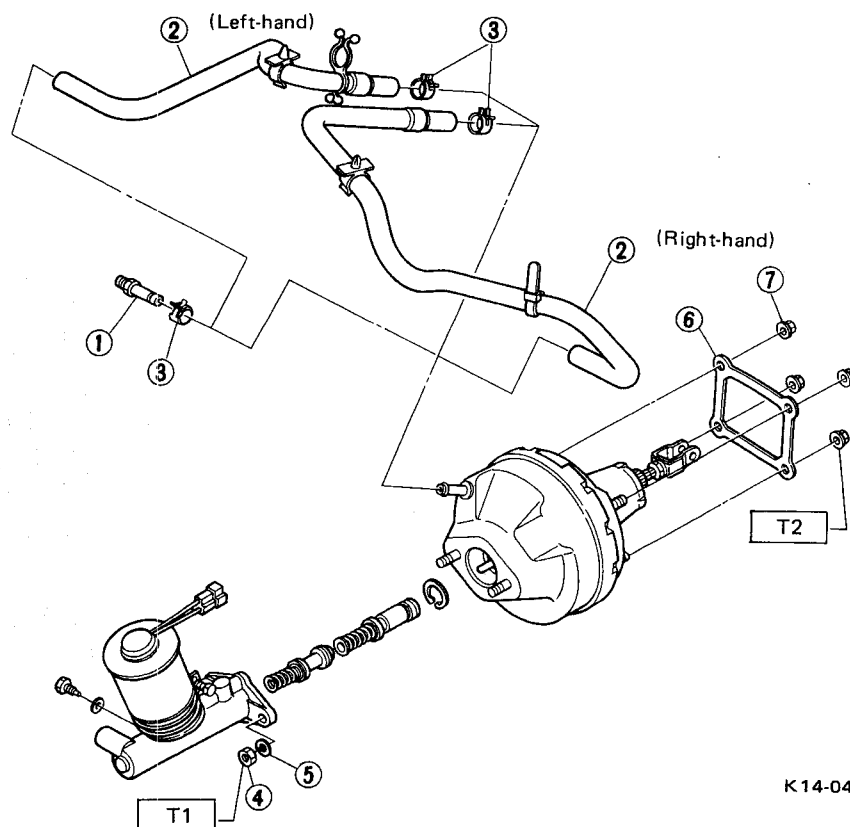


Fig. 5-7-15

K14-048

8) Parking Brake

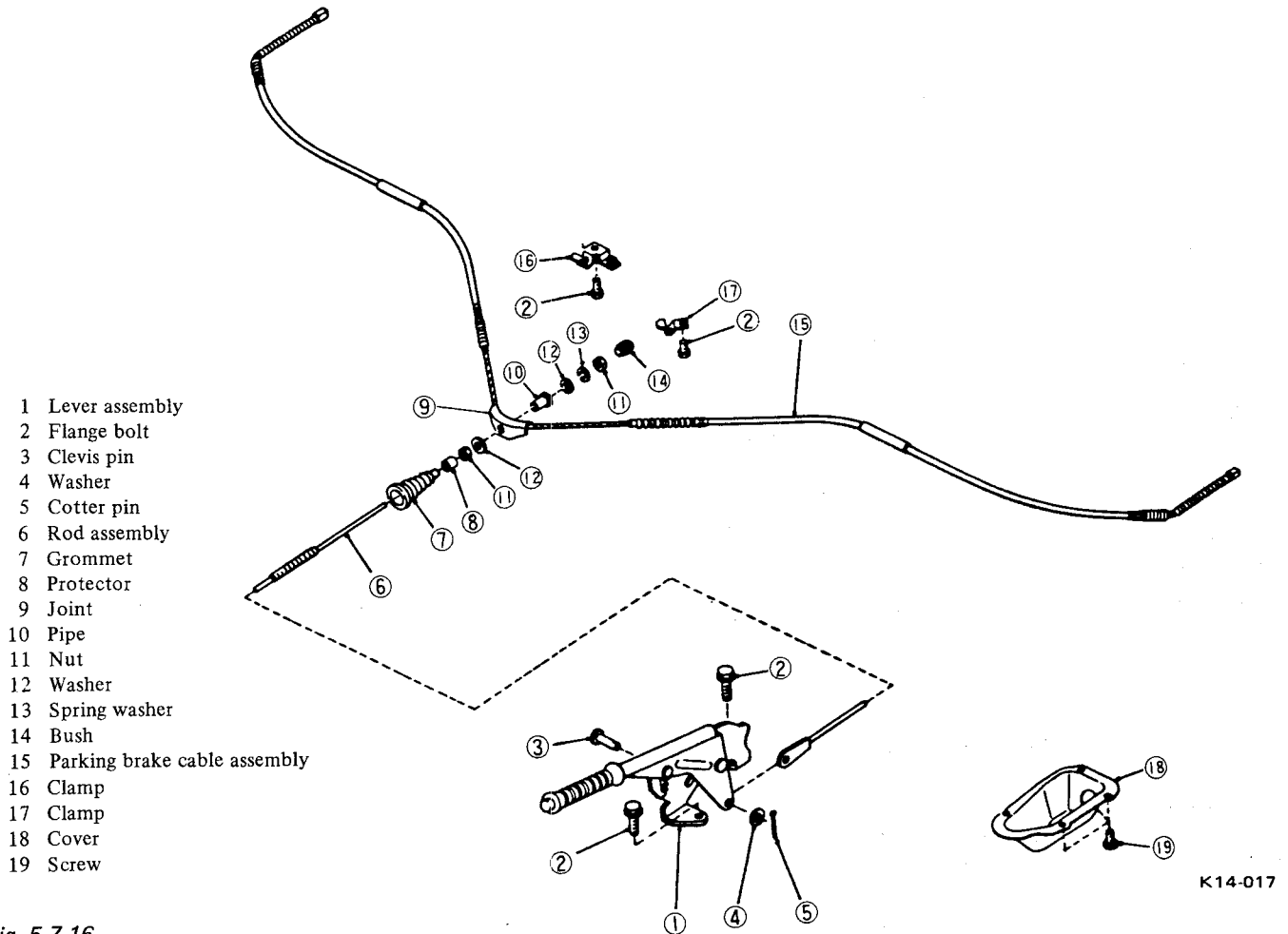


Fig. 5-7-16

4. Service Precautions for Major Components

1) Master Cylinder

- 1) When draining or replacing brake fluid, cover the painted surfaces and the engine surroundings with a cloth.
- 2) Before disassembling the removed master cylinder, always remove the exterior dirt with a cloth, brushing or compressed air.

Wash the disassembled parts with brake fluid and check for wear and damage.

NOTE:

Use only clean brake fluid to clean the parts.

- 3) Do not disassemble the primary and secondary piston assemblies. When a piston cup, etc. needs to be replaced, replace the piston assembly.
- 4) The reservoir tank should not be removed. If it is removed for any reason, it should be replaced with a new one.
- 5) When reassembling the master cylinder, be careful not to damage the inside of the cylinder or the piston cup. To install the piston stopper, push the primary piston to force the secondary piston inward sufficiently to permit installation.

NOTE:

- a. Apply brake fluid to the sliding parts for easy assembly.
- b. Always replace the gasket.

2) Front Disc Brake Pad Replacement

- 1) Replace the pads of the front disc brake in the following order:
 - (1) The wheel
 - (2) Two bolts installing the caliper body to the support.
 - (3) The caliper body
 - (4) The pad and pad clip

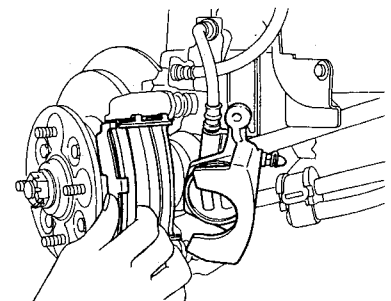


Fig. 5-7-17

K14-040

NOTE:

- Do not turn the caliper body, after removing one caliper body fixing bolt.
- Do not touch the brake pedal after the pads have been removed.

- Replace the pad if it is wet with oil or worn.

Pad thickness (including back metal)
Standard value: 15.0 mm (0.591 in)
Service limit: 7.5 mm (0.295 in)

NOTE:

Always replace the pads for both the left and right wheels at the same time. Also replace pad clips and shim if they are twisted or worn.

- Check for wear and damage, and correct or replace if abnormal.

Disc rotor thickness
Standard value: 10.0 mm (0.394 in)
Service limit: 8.5 mm (0.335 in)

- Install the pads of the front disc brake in the reverse order of replacement, paying attention to the following points:

- Before installing the pad and pad clip, position the piston in the cylinder. If the piston is hard to move back, loosen the air bleeder and push the piston in.

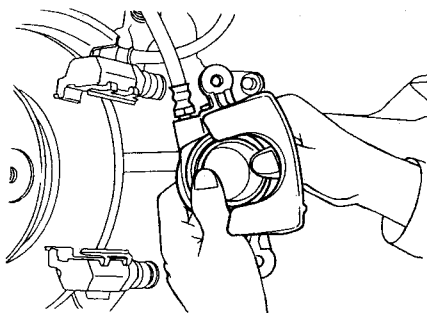


Fig. 5-7-18

K14-041

- Install the pad clips on the support and then install the pad. Do not confuse one end of the support with the other.
- Secure the caliper body with two bolts (w/M8 spring washers).

Tightening torque N·m (kg-m, ft-lb)
T: 22 - 31 (2.2 - 3.2, 16 - 23)

- Depress and release the brake pedal several times to adjust the pedal stroke.

- Turn the wheel several times in both directions. Turn several turns of a string around the wheel and pull the string to ensure the wheel turns smoothly at a force lower than 29 N (3 kg, 7 lb). If the wheel does not rotate smoothly, remove the wheel and check the rotor for run-out.

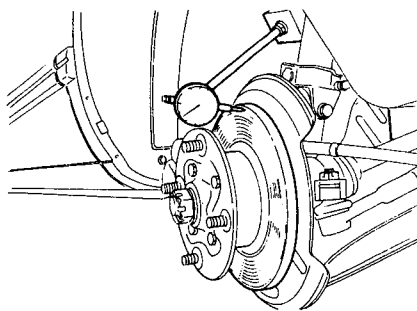


Fig. 5-7-19

A17-109

If the rotor run-out exceeds the specified limit, check the condition of the bearing and replace the bearing if beyond repair.

Disc rotor run-out	
Limit	0.15 mm (0.0059 in)

NOTE:

Measure the disc rotor run-out at a point less than 10 mm (0.394 in) from the outer periphery of the rotor.

3) Caliper Assembly

- Remove the caliper assembly of the front disc brake in the following order:

- The wheel

- Disconnect the brake hose from the caliper body assembly.
- Remove the caliper assembly from the housing.

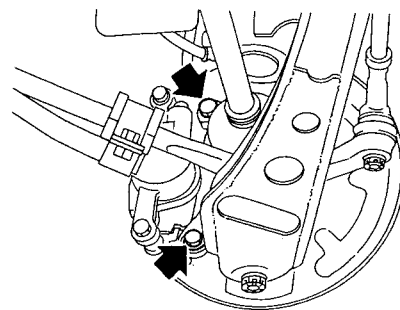


Fig. 5-7-20

K14-042

- Disassemble the caliper assembly in the following order:

- Loosen the bleeder screw and drain the brake fluid.
- Separate the caliper body and support.
- Remove the inner shim from the piston.
- Remove the piston from the caliper body. To facilitate removal, place a wooden plate between the cylinder and piston and use air to drive the piston out.

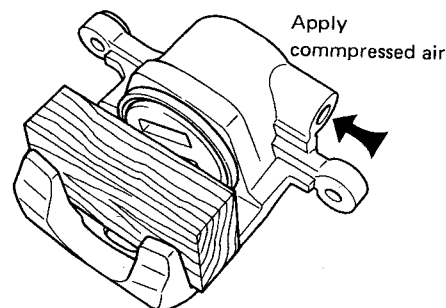


Fig. 5-7-21

K14-043

- Remove the piston boot and piston seal.
 - Remove the pin and the lock pin boot from the support.
 - Remove the pad clip.
- Be careful not to deform the clip.

- Inspect the disassembled parts and correct or replace if defective.

- Cylinder
Uneven wear, damage or rust.
- Support
Wear, damage or rust.
- Pin and boot
Deformation, wear or damage.

NOTE:

- Use sandpaper to grind off any trace of rust or foreign matter; if rust or foreign matter is too hard to remove, replace the part.
- Install a new piston seal and piston boot. Do not reuse the old ones.

(4) Assemble and install the caliper assembly in the reverse order of disassembly and replacement, paying attention to the following points:

- Clean the inner part of the caliper body (cylinder) with the brake fluid. Apply a thin coat of rubber-grease to the piston seal, and fit the seal in the groove provided in the cylinder by hand.

NOTE:

Pay attention to prevent the seal from twisting.

- Apply a coat of rubber grease to the outer surface of the piston, sliding contact of the cylinder and the groove in the piston boot.

- Attach the piston and piston boot to the caliper body. To facilitate this operation, install the piston boot on the end of the piston and position the boot in the groove on the caliper body.

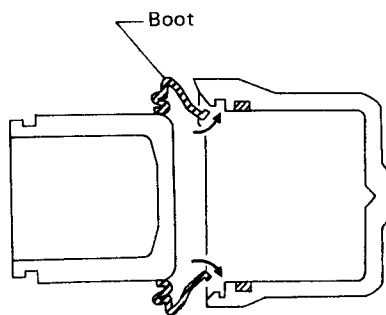


Fig. 5-7-22

K14-044

- Progressively push the piston in the caliper body and position the boot into the groove in the piston just before the piston reaches the final position.

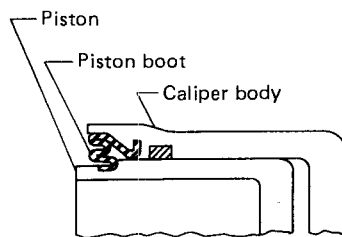


Fig. 5-7-23

K14-045

- Apply an even coat of rubber grease to the sliding surface of the pin and the groove in the pin boot, and attach them to the support.

- Secure the support to the housing with two bolts.

Tightening torque:
42 - 62 N·m
(4.3 - 6.3 kg-m, 31 - 46 ft-lb)

- Attach an inner shim to the piston.

- Install the pad, pad clip and outer shim in the caliper body.

- Secure the caliper body to the support.

NOTE:

After the pad has been installed, ensure that it is securely held by the pad clip.

- After properly installing the brake hose, bleed air from the brake system.

Tightening torque:
Brake hose
16 - 20 N·m
(1.6 - 2.0 kg-m, 12 - 14 ft-lb)
Bleeder screw
6 - 10 N·m
(0.6 - 1.0 kg-m, 4.3 - 7.2 ft-lb)

NOTE:

- Be careful not to twist the brake hose during installation.
- After installing the brake hose, depress the brake pedal several times to check for any indication of fluid leakage.

4) Front Drum Brake

1) Remove the components of the front drum brake in the following order.

- The wheel.
- The Castle nut, conical spring and center piece.
- The flare nut on the brake tube connecting the car body to the wheel cylinder and brake tube fixing clip.
- The brake drum.
- The brake assembly.
- The shoe set spring, shoe set seat and shoe set pin.
- The shoe assembly.
- The wheel cylinder.

2) When the brake drum is difficult to remove due to wear on the sliding surface, insert a screwdriver into the service hole in the brake shoe through the brake-drum service hole, then remove the brake drum while forcibly returning the auto-adjuster by prying the shoe toward the wheel cylinder.

3) The auto-adjuster should never be disassembled, because the nut is caulked with the adjuster provided with the specified sliding resistance.

4) Measure the thickness of the brake lining and, if it is less than 1.7 mm (0.067 in), replace the shoe assembly with the auto-adjuster.

Thickness of lining

Standard value: 5 mm (0.20 in)
Service limit: 1.7 mm (0.067 in)

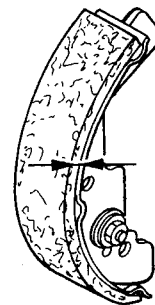


Fig. 5-7-24

K14-036

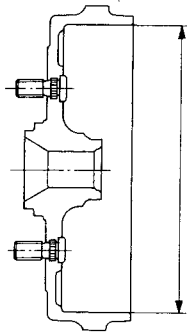
NOTE:

- When replacing the shoe assembly, the assemblies of the left and right brakes must also be replaced.
- When replacing either the left or right brake assemblies, the shoe assembly of the other brake should also be replaced.

Brakes

5) If the sliding surface of the brake drum is scored, remove the score marks with #60 emery cloth and finish with #220 fine emery cloth. When the brake drum is locally worn or deeply scored, repair by grinding or replace the drum.

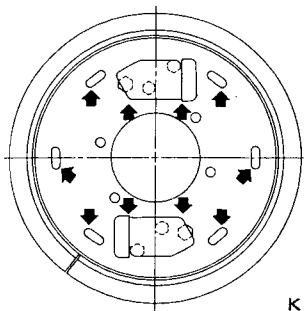
Brake drum inner diameter
Standard value: 180 mm (7.09 in)
Service limit: 182 mm (7.17 in)



K14-020

Fig. 5-7-25

6) When installing the shoe assembly to the back plate assembly, coat the contact surfaces of the shoe assembly and the back plate and the wheel cylinder assembly with grease.



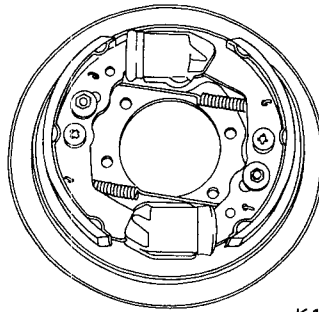
K14-021

Fig. 5-7-26

NOTE:

Be careful, when applying grease, not to soak the lining surface. This will cause poor braking action.

7) The shoe assembly should be installed by first fitting the side of the wheel cylinder piston and then fitting the side of the anchor.



K14-007

Fig. 5-7-27

NOTE:

Make sure that the adjusting bolt point of the shoe assembly auto-adjuster is inserted in the long hole of the adjusting block.

8) Fit the brake tube so that it is not in contact with adjacent metallic parts. Further, be sure there is a gap of more than 3 mm (0.12 in) between the back plate and the brake tube.

9) When installing the brake drum, make sure that the lining surface and brake drum are not soaked with oil or grease.

10) After bleeding air out of the braking system, drive the vehicle at low speed and forcefully apply the brakes 2 or 3 times in order to check the operation of the auto-adjuster.

5) Rear Brake

1) Remove the components of the rear brake in the following order.

- (1) The wheel.
- (2) The hub cap and cotter pin.

NOTE:

Loosen, but not remove the castle nut.

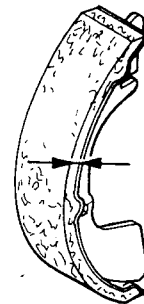
(3) Brake drum.

NOTE:

- a. Before removing the brake drum, put a flat-bladed screwdriver through the adjusting hole in the brake drum and completely retract the adjuster of the anchor block assembly by turning it toward the outside of the drum.
- b. Loosen the adjusting nut on the rear end of the parking brake lever rod to slacken the cable.

- (4) The flare nut on the brake tube.
- (5) The shoe set spring, shoe set seat and shoe set pin.
- (6) The brake shoe assembly.
- (7) Return spring.
- (8) The parking brake cable.
- (9) The wheel cylinder assembly and anchor block assembly.
- 2) Measure the thickness of the brake lining and, if it is less than 1.7 mm (0.067 in), replace the shoe assembly.

Thickness of lining
Standard value: 4.4 mm (0.173 in)
Service limit: 1.7 mm (0.067 in)



K14-037

Fig. 5-7-28

Brakes

To replace the trailing shoe assembly, remove the cotter pin. The clevis pin should also be replaced if worn.

The cotter pin, once removed, cannot be reused.

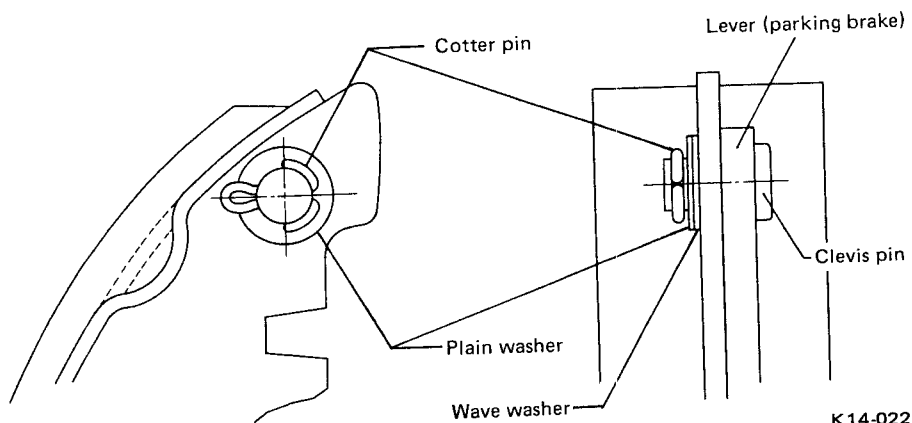


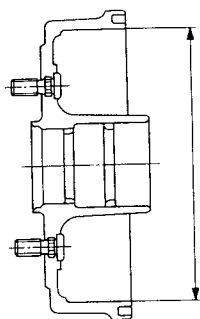
Fig. 5-7-29

NOTE:

- When a brake lining needs to be replaced, replace the leading shoes and trailing shoes of the left and right wheels.
- When either the left or the right brake assembly is replaced, always replace the leading shoe and trailing shoe of the other.

3) If the sliding surface of the brake drum is scored, remove score marks with #60 emery cloth and finish with #220 emery cloth. A locally worn or deeply scored brake drum should be repaired by grinding or replaced.

Brake drum inner diameter	
Standard value:	170 mm (6.69 in)
Service limit:	172 mm (6.77 in)



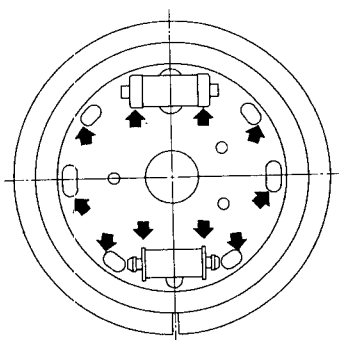
K14-023

Fig. 5-7-30

4) Before installing the brake assembly, apply brake grease to the contact surface between the back plate assembly and shoe assembly and between the wheel cylinder and adjusting screw of the anchor block.

NOTE:

Be careful not to soak the lining surface with grease. This will cause poor braking action.



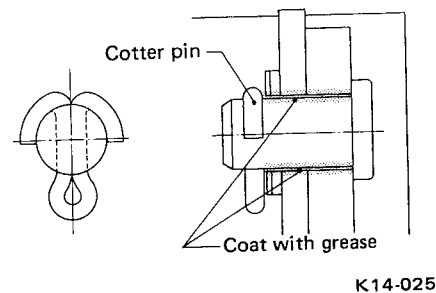
K14-024

Fig. 5-7-31

5) When installing the parking brake lever to the trailing shoe assembly, apply grease containing molybdenum bisulfide to the contact surfaces between the clevis pin, shoe web and parking brake lever.

NOTE:

Bend cotter pin into an anchor-like shape. Take care not to crack the pin.

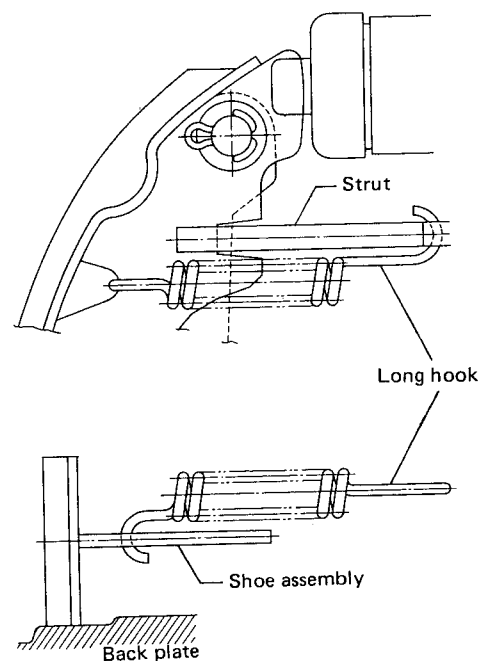


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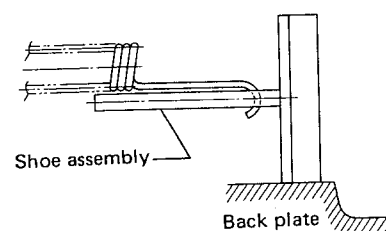
Fig. 5-7-32

6) Be careful to properly install the upper and lower return springs to the leading shoe, trailing shoe and strut.

Upper side



Lower side



K14-026

Fig. 5-7-33

7) The shoe assembly, with the strut and return spring attached, should first be attached to the wheel cylinder assembly and then to the anchor block.

8) After linking the parking brake cable to the brake lever, check to see that the cable is properly housed in the cable guide.

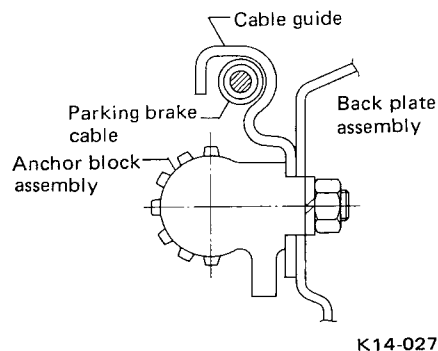


Fig. 5-7-34

9) When installing the brake drum, ensure that the inside of the drum and the back of the brake lining are not soaked with oil or grease.

10) After assembling, bleed air out of the brake circuit.

11) The rear-brake shoe clearance should be adjusted with the rear wheels jacked up after mounting the tires.

(1) Ensure that the wheel to be adjusted rotates freely.

(2) Align the adjusting hole in the brake drum with the anchor block adjuster, then turn the adjuster with a flat-bladed screwdriver through the adjusting hole.

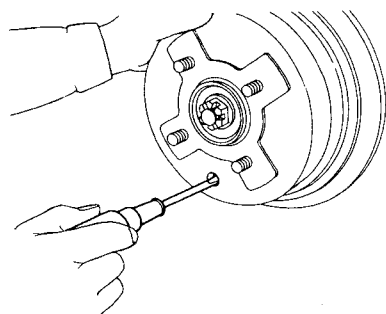


Fig. 5-7-35

(3) First turn the adjuster by moving the screwdriver toward the center of the brake drum until the wheel cannot be turned by hand. (Reference: About 69 to 88 N (7 to 9 kg, 15 to 20 lb) on the tire circumference)

(4) Then move the screwdriver toward the circumference of the brake drum to turn back the adjuster by 5 teeth.

NOTE:

a. Count the number of teeth turned back by listening to the number of clicks made by the adjuster lock spring.

b. The adjustment must be made accurately. If the number of the teeth turned back is fewer than 5, the brake may drag.

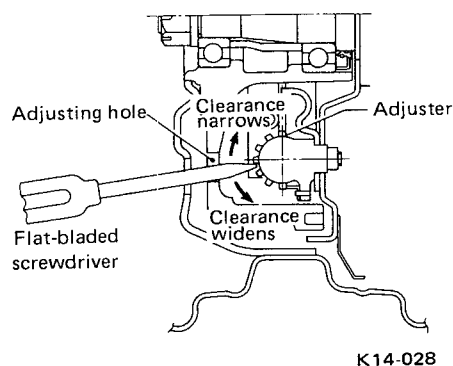


Fig. 5-7-36

(5) Depress the brake pedal several times to center the brake shoes and ensure that the wheel rotates smoothly. Do not be concerned if a slight dragging noise is heard at this time.

NOTE:

When the wheel turns heavily or makes a loud dragging noise, readjust the shoe clearance.

(6) Carry out the above work on both the leading and the trailing shoes.

NOTE:

After adjusting the brake shoe clearance, plug the adjusting hole in the brake drum.

6) Wheel Cylinder

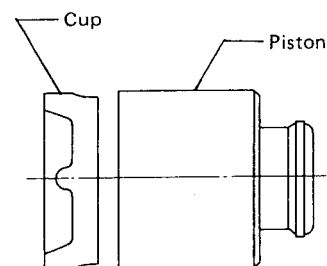
1) The wheel cylinder can be disassembled and inspected with the cylinder mounted on the back plate. There is no need to remove it from the back plate unless the wheel cylinder assembly is to be replaced.

NOTE:

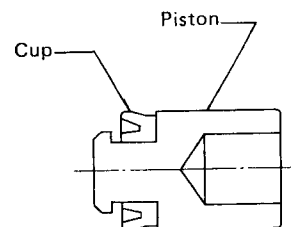
a. When removing the cup from the piston, be careful not to damage the piston.

b. Wash each component with clean brake fluid. Use only clean brake fluid.

2) Pay attention to the facing of the cup when installing it.



Front wheel cylinder



Rear wheel cylinder

K14-029

Fig. 5-7-37

3) When replacing the wheel cylinder repair kit, ensure that the sizes of the cylinder and cup are correct.

4) When washing the wheel cylinder parts and inserting the piston into the cylinder, take extra care not to damage either the inner wall of the cylinder or the piston cup.

7) Bleeding Air from Brake Hydraulic Circuit

Air should be purged from the front and rear brakes in the following manner.

- 1) With the brake fluid reservoir tank filled with fresh brake fluid, bleed out air. Take care to prevent air from entering the brake piping.

Recommended brake fluid

FMVSS No. 116, fresh DOT 3
brake fluid

- 2) Ensure that brake fluid is not leaking from any of the braking system connections.
- 3) Place one end of a vinyl tube into the air bleeder and the other end into a suitable container.
- 4) After pumping the brake pedal several times, keep the pedal depressed and loosen the air bleeder. This will exhaust air and fluid from the brake circuit. Quickly tighten the bleeder and release the brake pedal. Repeat the above operation until no air bubbles are seen in the drained brake fluid.
- 5) When no air bubbles are found in the fluid, securely tighten the air bleeder.

Tightening torque:
6 - 10 N·m
(0.6 - 1.0 kg-m, 4.3 - 7.2 ft-lb)

- 6) First air bleed the wheel cylinder farthest from the master cylinder. After bleeding all the wheel cylinders, fully depress the brake pedal to check for leakage in the braking system.
- 7) Fill the brake fluid reservoir tank to the normal level. Drive the vehicle at low speed and check the performance of the brakes.

8) Power Brake Unit

Remove the power brake unit in the following order:

- (1) Remove the following parts in the engine compartment.
 - a. Disconnect connector for brake fluid level indicator.
 - b. Brake pipes.
 - c. Master cylinder mounting nuts.
 - d. Vacuum hose.
- (2) Remove the following parts from the pedal bracket.
 - a. Snap pin.
 - b. Clevis pin connecting the operating rod to the brake pedal.
 - c. Four nuts securing the power brake unit to the toe board.
- (3) Remove the power brake unit from the toe board while shunning the brake pipes.

Install the power brake unit in the reverse order of removal, paying attention to the following points:

- (1) Install power brake unit in position.

Tightening torque:
13 - 23 N·m
(1.3 - 2.3 kg-m, 9 - 17 ft-lb)

- (2) Connect operating rod to brake pedal with snap pin and clevis pin.

NOTE:

After installing the snap pin and clevis pin, ensure the brake pedal free play is within the 1 to 7 mm (0.04 to 0.28 in) range.

Operation check

- Checking without using gauges
This method cannot determine the exact portion which has failed, but it can provide a rough understanding of the nature of the failure if checking is conducted in accordance with the following procedure.

- (1) Air tightness check

Start the engine, and run it for 1 to 2 minutes, then turn it off. Depress the brake pedal several times applying the same pedal force as that used in ordinary braking operations. The pedal stroke should be greatest on the 1st depression, and it should become smaller with each successive depression. If no change occurs in the pedal height while in a depressed state, the power brake unit is faulty.

NOTE:

In the event of defective operation, inspect the condition of the check valve and vacuum hose. Replace them if faulty and conduct the test again. If no improvement is observed, check precisely with gauges.

- (2) Operation check

- a. With the engine off, depress the brake pedal several times applying the same pedal force and make sure that the pedal height does not vary with each depression of the pedal.
- b. With the brake pedal depressed, start the engine.
- c. As the engine starts, the brake pedal should move slightly toward the floor. If no change occurs in the pedal height, the power brake unit is faulty.

NOTE:

If faulty, check precisely with gauges.

- (3) Loaded air tightness check

Depress the brake pedal while the engine is running, and turn off the engine while the pedal is still depressed. Keep the pedal depressed for 30 seconds; if no change occurs in the pedal height, the power brake unit is functioning normally; if the pedal height increases, it is faulty.

NOTE:

If faulty, check precisely with gauges.

Brakes

- Checking with gauge
Connect gauges as shown in figure.

After bleeding air from pressure gauges, proceed to each check.

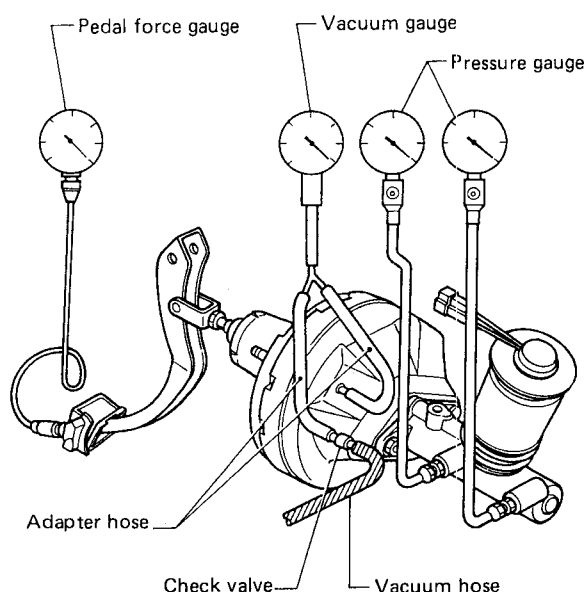


Fig. 5-7-38

K14-049

(1) Air tightness check

- Start the engine and keep it running until a vacuum of 66.65 kPa (500 mmHg, 19.69 inHg) is indicated on the vacuum gauge. Do not depress the brake pedal.
- Stop the engine and watch the gauge. If the vacuum drop range is less than 3.33 kPa (25 mmHg, 0.98 inHg) within 15 seconds after stopping the engine, the power brake unit is functioning properly.

If defective, the cause may be one of those listed below.

- Check valve malfunction
- Leak from vacuum hose
- Leak from the shell jointed portion or stud bolt welded portion
- Damaged diaphragm
- Leak from valve body seal and bearing portion
- Leak from plate & seal assembly portion
- Leak from poppet valve assembly portion

(2) Loaded air tightness check

- Start the engine and depress the brake pedal with pedal force of 196 N (20 kg, 44 lb). Keep the

engine running until a vacuum of 66.65 kPa (500 mmHg, 19.69 inHg) is indicated on the vacuum gauge while the pedal is still depressed.

- Stop the engine and watch the vacuum gauge.

If the vacuum drop range is less than 3.33 kPa (25 mmHg, 0.98 inHg) within 15 seconds after stopping the engine, the power brake unit is functioning properly. If defective, refer to a described above.

(3) Lack of boosting action check

Turn off the engine, and set the vacuum gauge reading at "0". Then, check the fluid pressure when the brake pedal is depressed. The pressure must be greater than the standard value listed below.

Pedal force	Fluid pressure
147 N (15 kg, 33 lb)	392 kPa (4 kg/cm ² , 57 psi)
294 N (30 kg, 66 lb)	2,550 kPa (26 kg/cm ² , 370 psi)

(4) Boosting action check

Set the vacuum gauge reading at 66.65 kPa (500 mmHg, 19.7 inHg) by running the engine. Then, check the fluid pressure when the brake pedal is depressed. The pressure must be greater than the standard value listed below.

Pedal force	Fluid pressure
147 N (15 kg, 33 lb)	34.32 kPa (35 kg/cm ² , 498 psi)
294 N (30 kg, 66 lb)	5,884 kPa (60 kg/cm ² , 853 psi)

10) Dual Proportional valve

1) Check brake pipe connections for any sign of leakage. Retighten the connection or replace the pipe, as needed.

NOTE:

Do not attempt to disassemble or adjust the D.P. valve.

2) Remove the D.P. valve in the following order:

(1) Remove the flare nuts from the brake pipe end fittings at six places.

(2) Remove the bolts securing the D.P. valve and detach the D.P. valve.

3) Install the D.P. valve in the reverse order of removal, paying attention to the following points:

(1) When installing the D.P. valve, position the protrusion of the bracket in the lock hole on the valve body.

(2) Tighten both the brake pipe fixing flare nuts and the D.P. valve fixing bolts to the specified torque settings.

Tightening torque:

- Brake pipe flare nuts
15 – 20 N·m
(1.5 – 2.0 kg-m,
11 – 14 ft-lb)
- D.P. valve mounting bolts
4.4 – 7.4 N·m
(0.45 – 0.75 kg-m,
3.3 – 5.4 ft-lb)

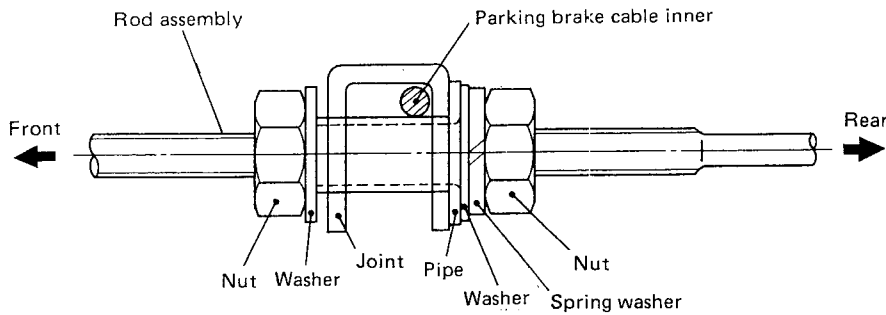


Fig. 5-7-39

9) Parking Brake

1) When installing the parking rod, carefully install the joint the proper order.

2) When removing the parking brake cable from the back plate, pry the flanged part with a flat-bladed screwdriver.

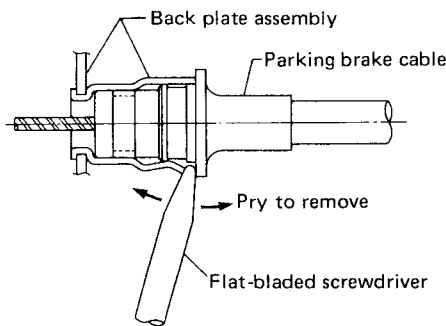


Fig. 5-7-40

To install the cable, place a round bar against the flanged part and tap the bar with a hammer.

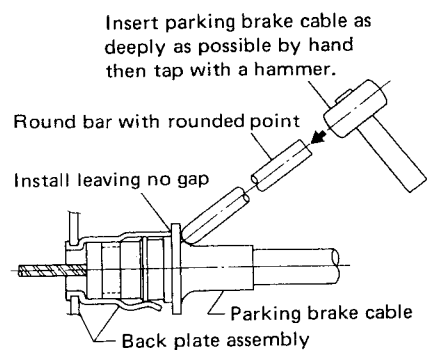


Fig. 5-7-41

3) The parking brake should be adjusted after adjusting the shoe clearance of the rear brakes. The parking brake lever stroke should be adjusted by loosening the lock nut on the front side of the parking brake rod and tightening the lock nut on the rear side.

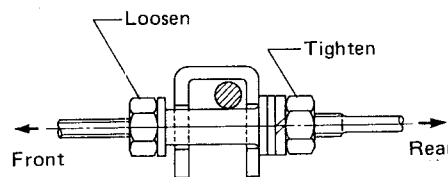


Fig. 5-7-42

Adjustment standard

The operation of the parking brake is normal if it is applied at the sixth crest of the ratchet when the brake lever is pulled by a force of about 245 N (25 kg, 55 lb). The total number of the crests is 14.

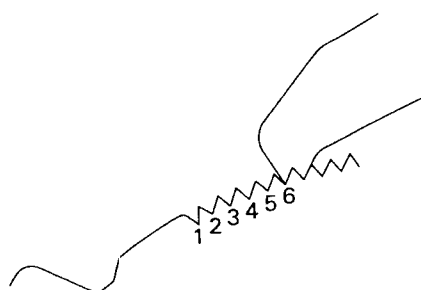


Fig. 5-7-43

NOTE:

After adjustment, completely release the parking brake and ensure that the rear wheels rotate smoothly.