

DATSON**Model S110 Series****SECTION BR****BRAKE SYSTEM****CONTENTS**

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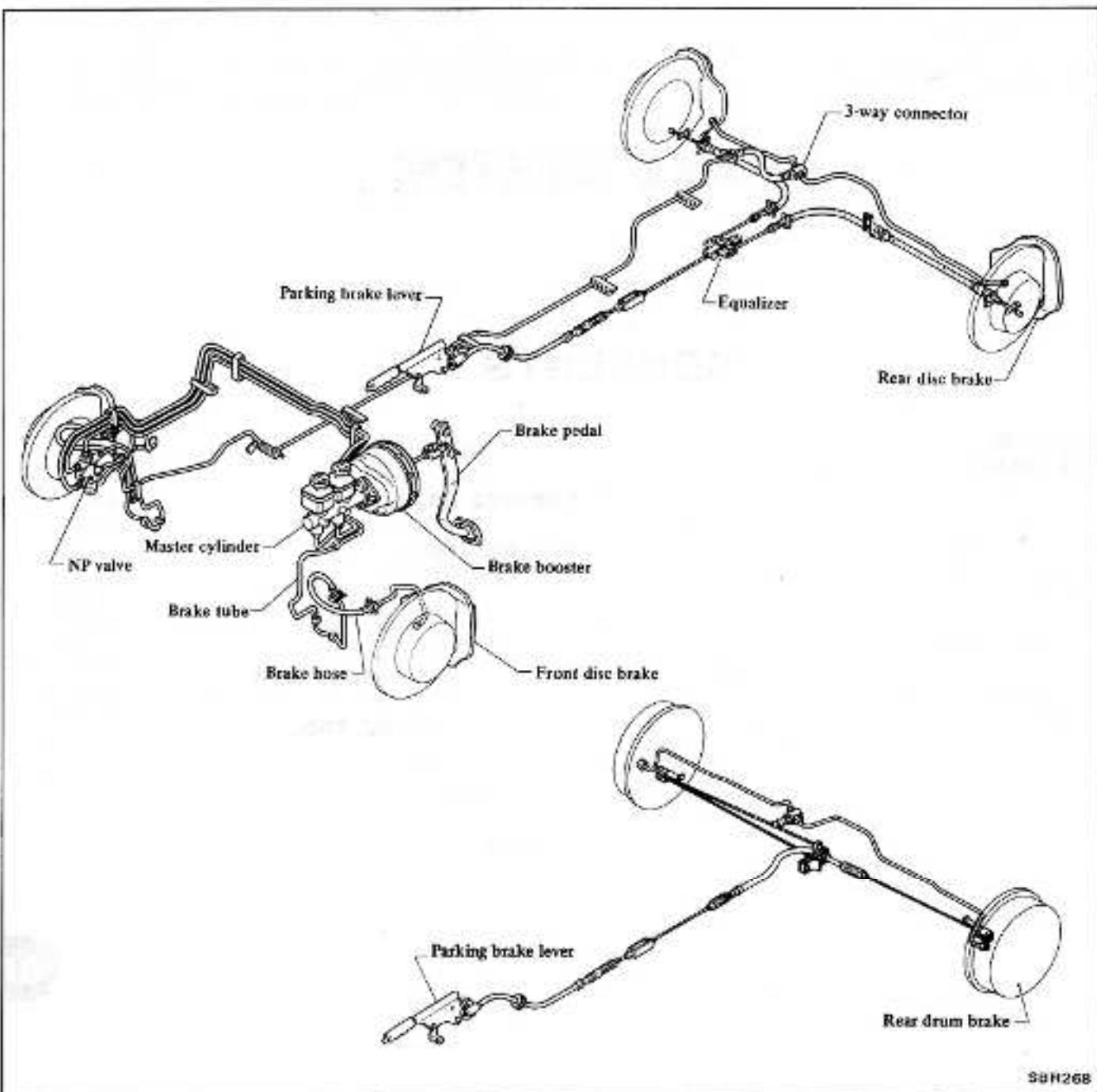
Refer to Section MA (Brake System) for:

- CHECKING FOOT BRAKE
- CHECKING PARKING BRAKE

BR

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DESCRIPTION



SBH268

The brake system is a hydraulically controlled, dual line type which operates independently on front and rear wheels.

The brake booster is a power

assist device which utilizes engine intake manifold vacuum.

The NP valve is a pressure control device for the rear brakes.

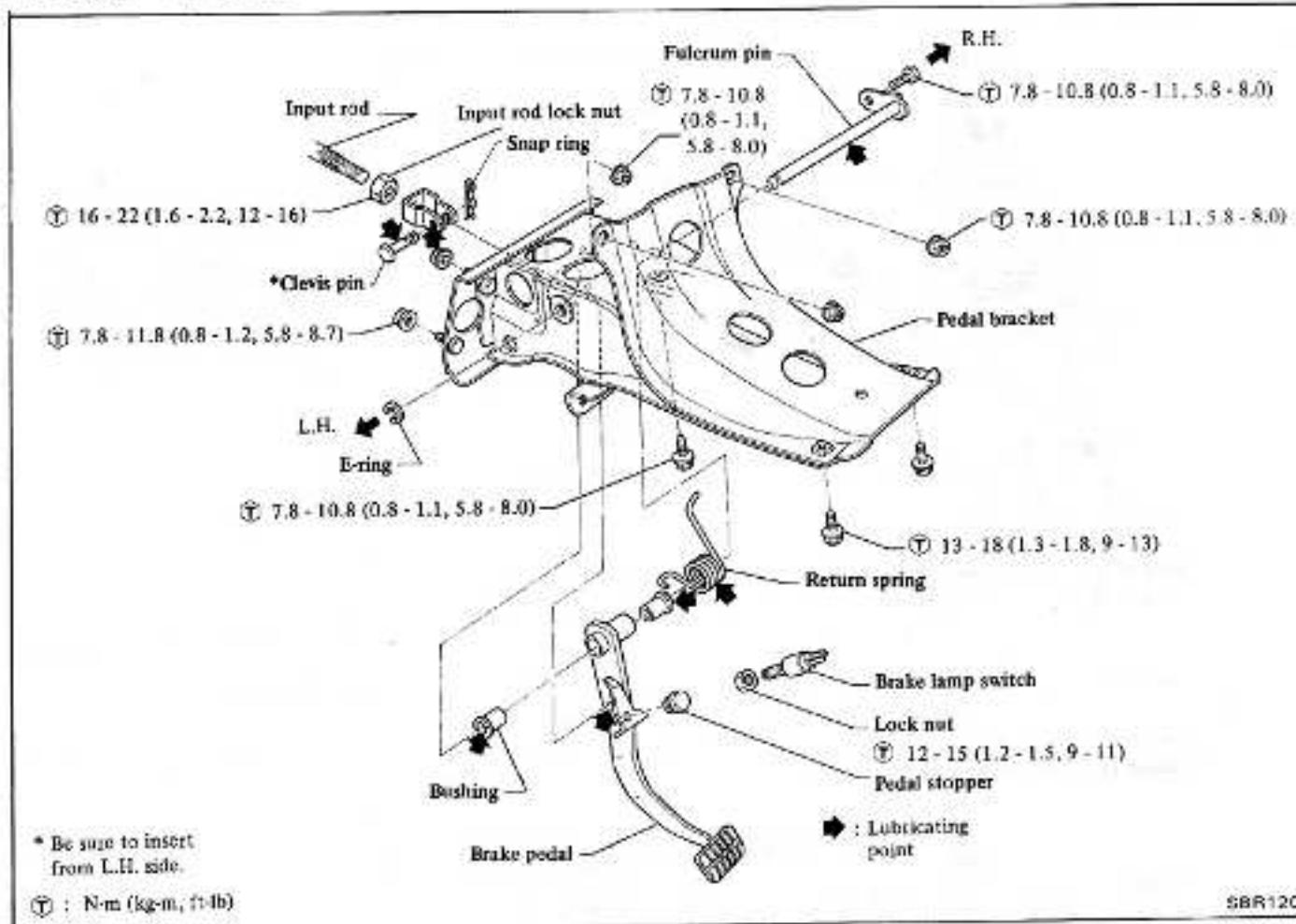
The rear brake is equipped with a

mechanically operated parking brake mechanism.

Both the pad and shoe clearances of the front and rear brakes are automatically adjusted.

SERVICE BRAKE

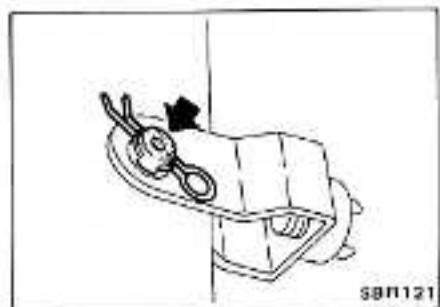
BRAKE PEDAL



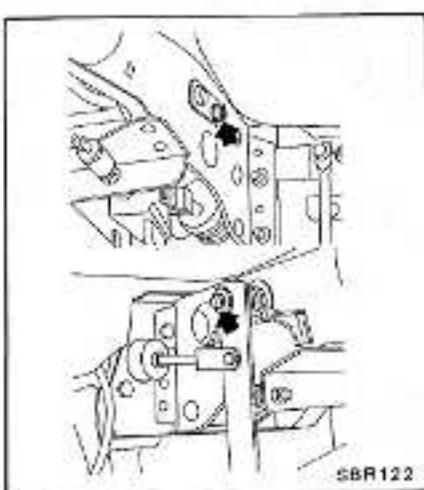
REMOVAL

- Remove pedal bracket assembly with brake pedal (M/T only).
- Disconnect clevis from brake pedal.

When removing clevis pin, be careful not to damage clip of the clevis pin.



- Remove fulcrum pin. Brake pedal can then be taken out.



INSPECTION

Check brake pedal for the following items, servicing as necessary.

- Check brake pedal for bend.
- Check return springs for fatigue.
- Check clevis for deformation and crack at welded part.

INSTALLATION

- Apply coating of recommended multi-purpose grease to sliding portion and return coil spring.
- Adjust brake pedal after installation is completed. Refer to Section MA for adjustment.

\textcircled{T} : Fulcrum pin fixing bolt

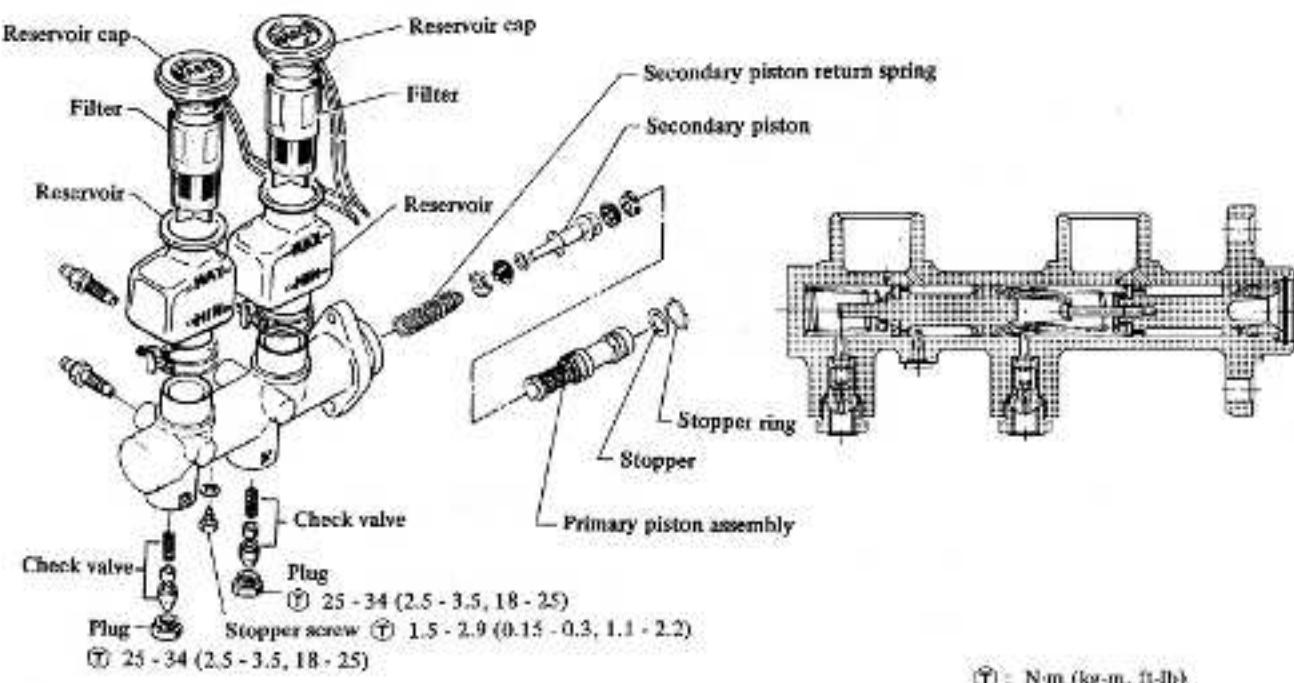
$7.8 - 10.8 \text{ N-m}$
 $(0.8 - 1.1 \text{ kg-m},$
 $5.8 - 8.0 \text{ ft-lb})$

Input rod lock nut

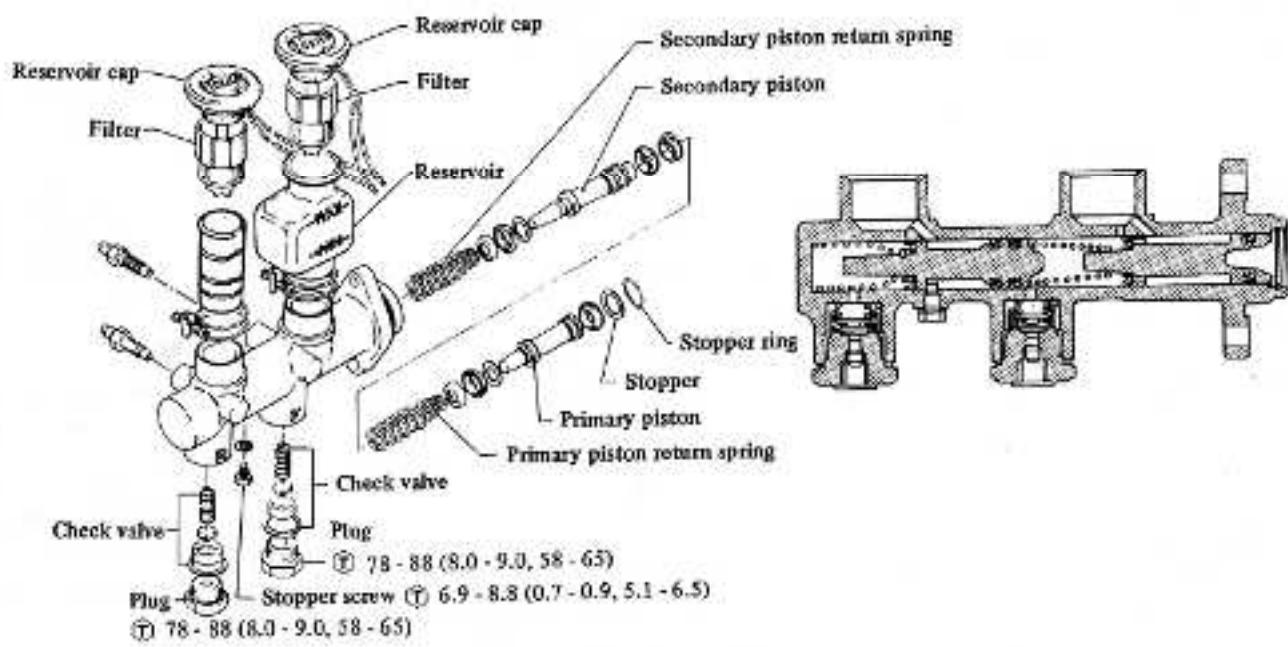
$16 - 22 \text{ N-m}$
 $(1.6 - 2.2 \text{ kg-m},$
 $12 - 16 \text{ ft-lb})$

MASTER CYLINDER

NABCO make (For rear disc brake model)



TOKICO make (For rear drum brake model)

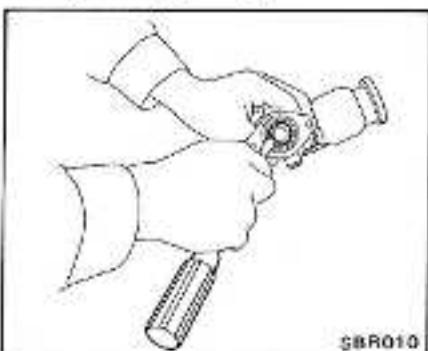


DISASSEMBLY

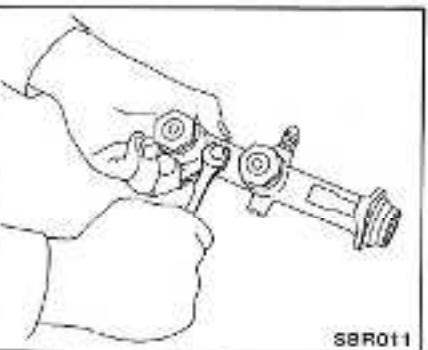
The brake master cylinder is available in both NABCO make and TOKICO make. There is no interchangeability of repair kits or component parts between NABCO and TOKICO makes.

When replacing the repair kit or component parts, ascertain the brand of the brake master cylinder body. Be sure to use parts of the same make as the former ones.

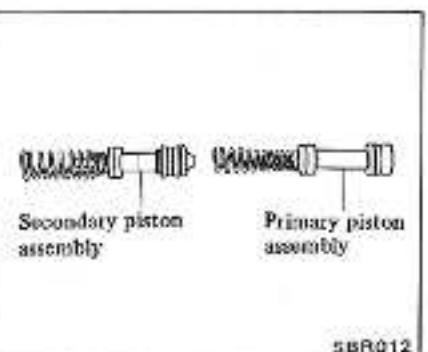
- Pry off stopper ring.



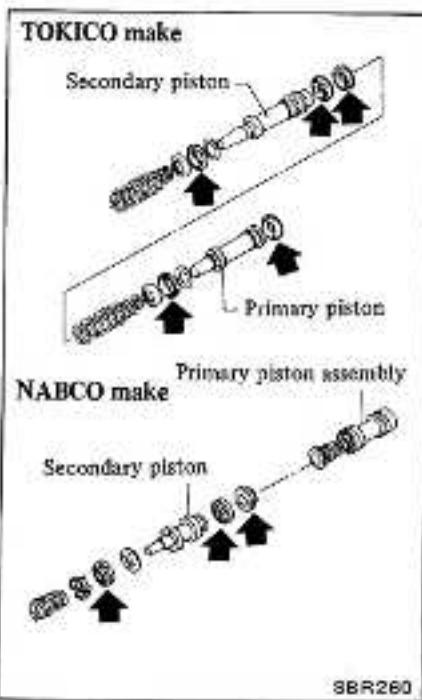
- Remove stopper screw. Primary and secondary piston assemblies can then be taken out.



- Disassemble piston assembly. Do not disassemble primary piston assembly of NABCO make.



- Remove piston cups and discard them.



- Unscrew plugs for disassembling check valve.

INSPECTION

- Clean all parts in a brake fluid.
- Check the parts for evidence of abnormal wear or damage.
- Check piston-to-cylinder clearance.

Piston-to-cylinder clearance:
Less than 0.15 mm (0.0059 in)

ASSEMBLY

- Replace piston cups and packing with new ones.
- Apply brake fluid or rubber grease to sliding contact surface of parts to facilitate assembly of master cylinder.

(T) : Check valve plug (TOKICO make)

78 - 88 N·m
(8.0 - 9.0 kg·m,
58 - 65 ft·lb)

Check valve plug (NABCO make)

25 - 34 N·m
(2.5 - 3.5 kg·m,
18 - 25 ft·lb)

BRAKE HYDRAULIC LINE**INSPECTION**

Check brake lines (tubes and hoses) for evidence of cracks, deterioration or other damage. Replace any faulty parts.

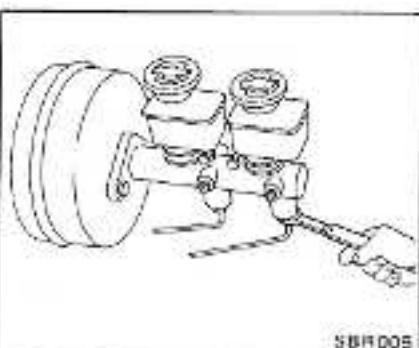
If leakage occurs at end around joints, re-tighten or, if necessary, replace faulty parts.

REMOVAL AND INSTALLATION

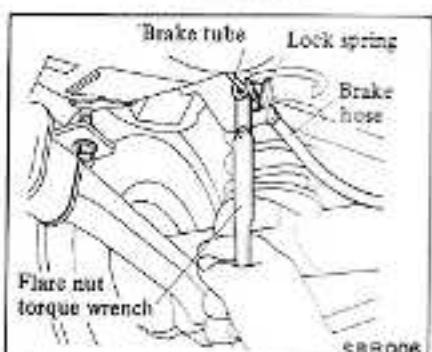
- To remove brake tube, disconnect flare nuts on both ends, and remove retainers and clips.

CAUTION:

When removing or installing brake tubes, use Tool GG94310000.



- To remove brake hose, first remove flare nut securing brake tube to hose, then withdraw lock spring. Next disconnect the other side. Do not twist brake hose.

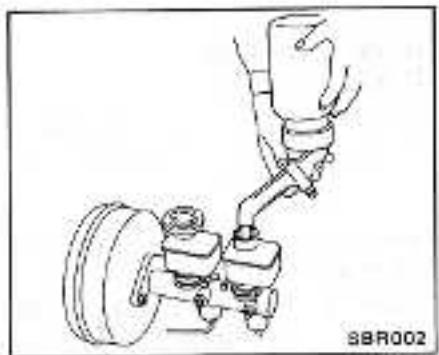


- After installation is completed, bleed brake system. Refer to Bleeding Hydraulic System.

BLEEDING HYDRAULIC SYSTEM

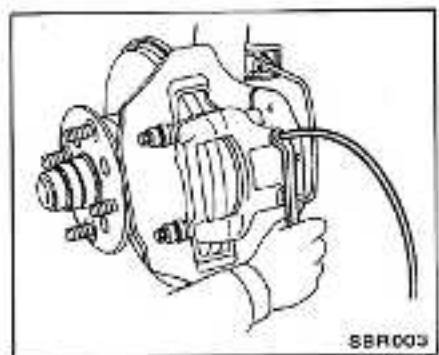
1. Top up reservoir with recommended brake fluid.

- a. Do not mix two different brand brake fluids.
- b. Carefully monitor brake fluid level at master cylinder during bleeding operation.
- c. Do not reuse drained brake fluid.

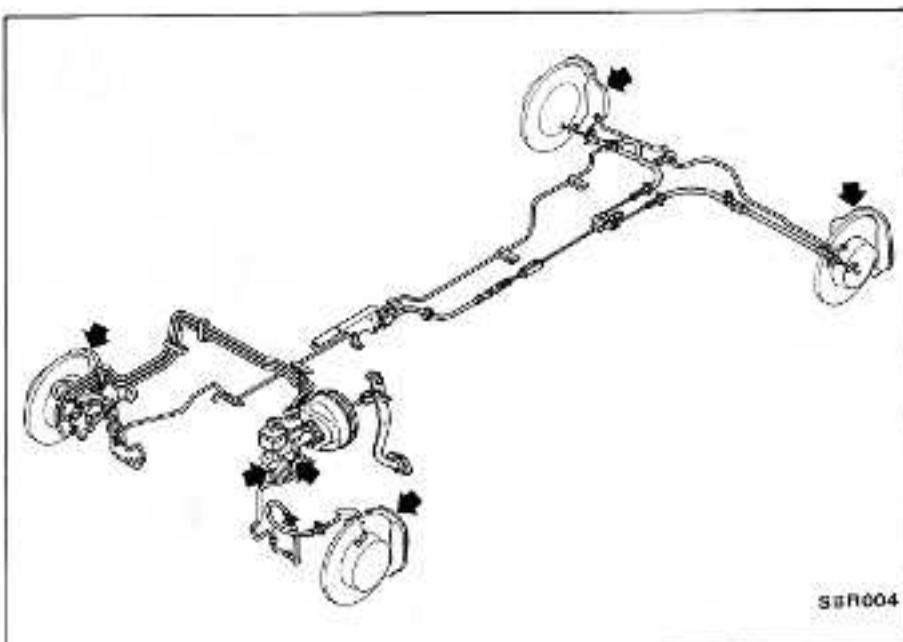


2. Install bleeder hose on bleeder valve. With brake pedal fully depressed, open bleeder valve to exhaust air. Then close bleeder valve and allow brake pedal to return. Repeat bleeding operation until no air bubbles show in hose.

- a. Be careful not to splash brake fluid on painted areas.
- b. Brake fluid containing air is white and contains air bubbles.
- c. Brake fluid containing no air runs out of bleeder valve in a solid stream free of air bubbles.



3. Bleed air in the following sequence. Master cylinder → Rear wheel → Front wheel.

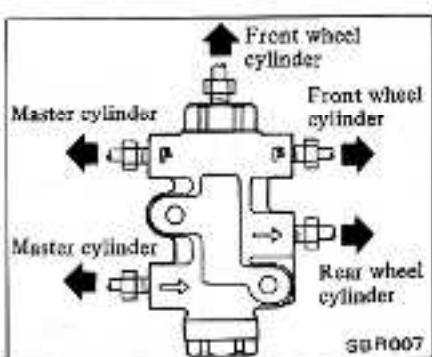


① : Air bleeder valve
6.9 - 8.8 N·m
(0.7 - 0.9 kg·m,
5.1 - 6.5 ft·lb)

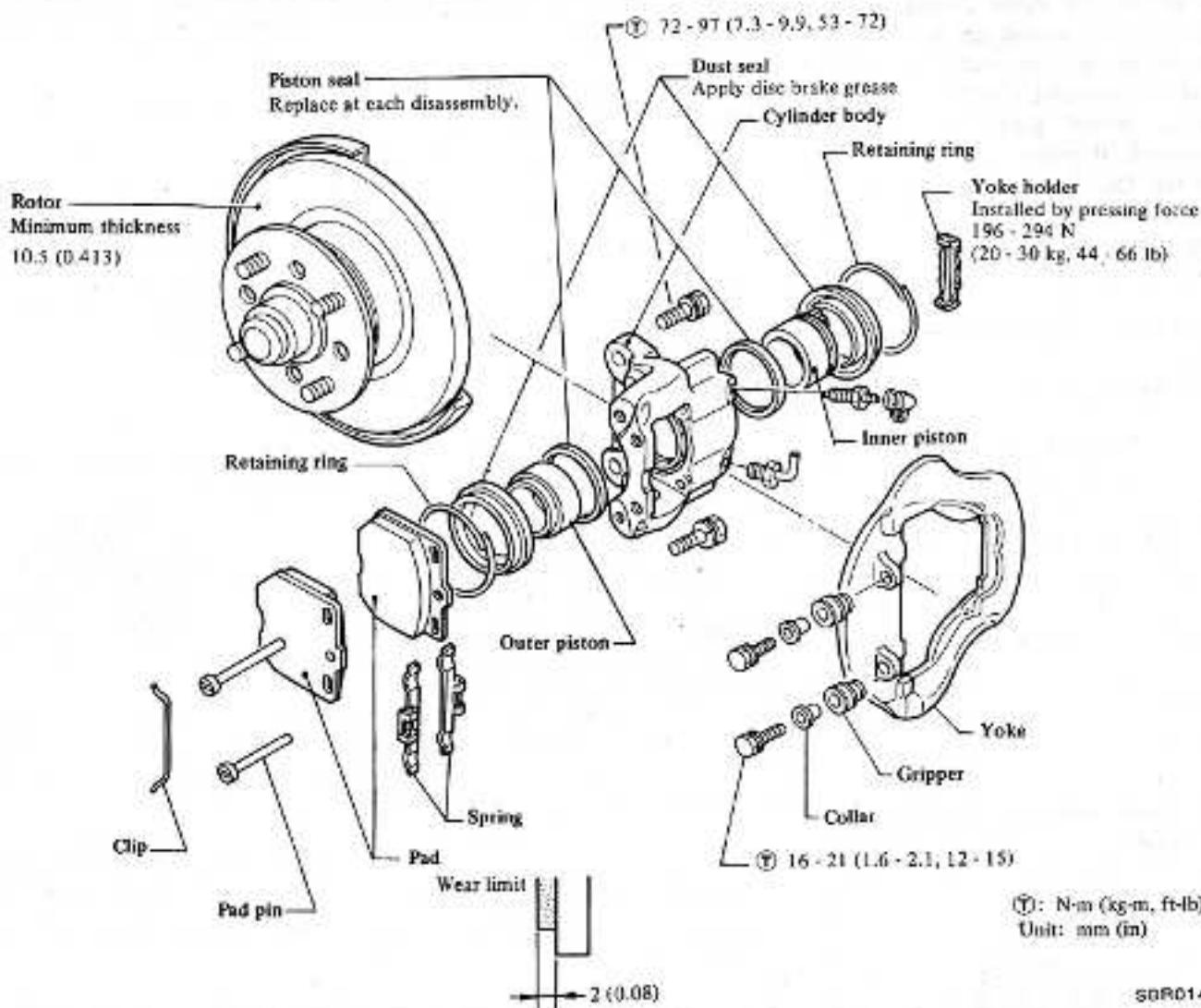
Do not disassemble NP valve.

② : Brake tube flare nut
15 - 18 N·m
(1.5 - 1.8 kg·m,
11 - 13 ft·lb)
NP valve to body
3.9 - 4.9 N·m
(0.4 - 0.5 kg·m,
2.9 - 3.6 ft·lb)

NP VALVE



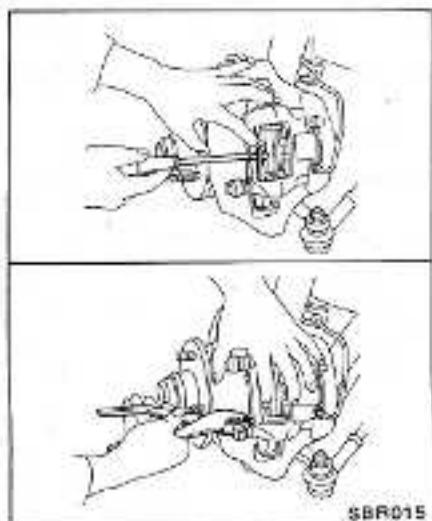
Z·ONE·DATSUN

FRONT DISC BRAKE -N22-

SBR014

PAD REPLACEMENT

1. Remove clip. Remove pad pins holding springs with finger.

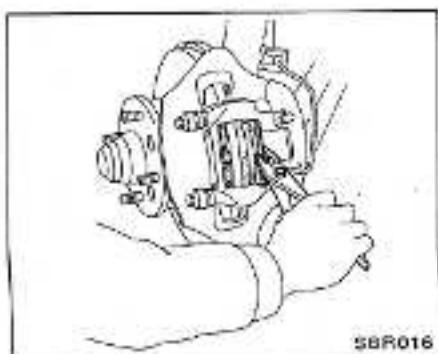


2. Detach pads.

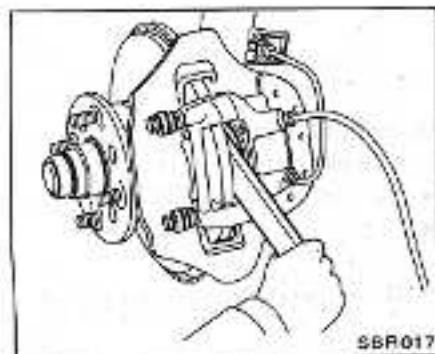
CAUTION:

After removing pads, do not depress brake pedal, or pistons will jump out.

3. Open bleeder valve. Push piston B (outer piston) in until dust seal groove of piston B coincides with end surface of retaining ring on dust seal.



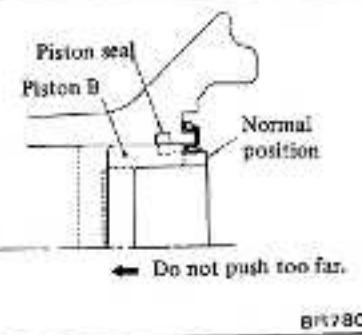
SBR016



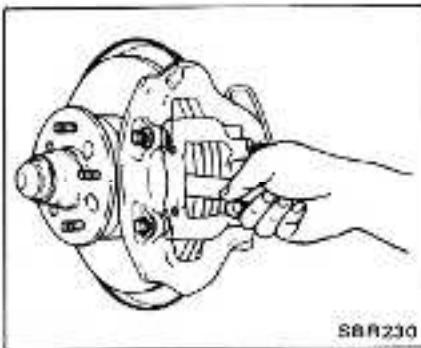
SBR017

CAUTION:

Piston can be easily pushed in by hand, but if pushed too far, groove of piston will go inside of piston seal. At this point, if piston is pressurized or moved, piston seal will be damaged. If piston has been pushed in too far, remove caliper assembly and disassemble it. Then, push piston out in direction shown by arrow. Assemble it again, referring to the following.



4. Install inner pad. Pull yoke to outer side.



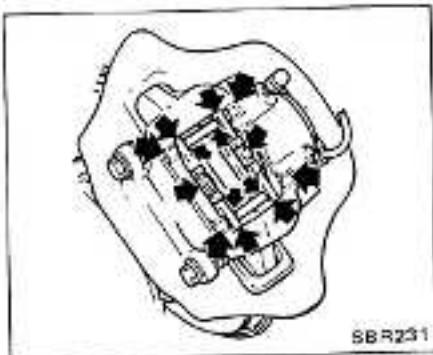
5. Install outer pad.

Coat the following points with recommended brake grease.

- Cylinder body-to-pad clearance
- Pad pin-to-pad clearance
- Pad pin holes of cylinder body

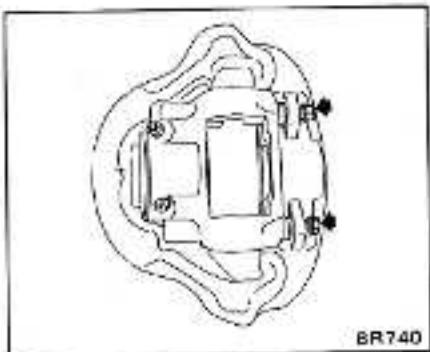
Do not grease friction face of pad.

Then install pad fixing parts previously removed.

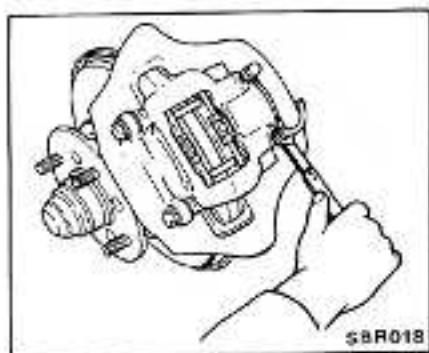
**DISASSEMBLY**

1. Remove pads.

Remove fixing bolt and separate yoke and cylinder body.

**REMOVAL**

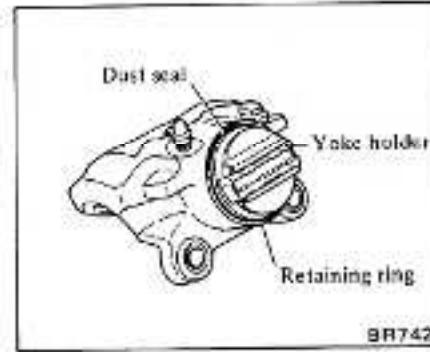
1. Disconnect brake tube.



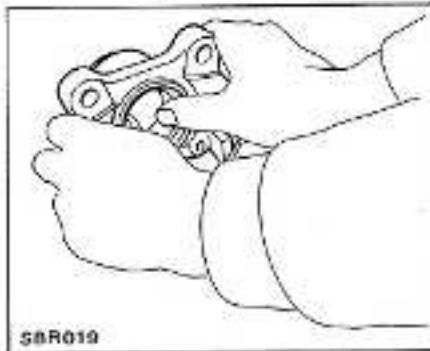
2. Remove caliper assembly.



2. Remove yoke holder, retaining rings and dust seals from both pistons.

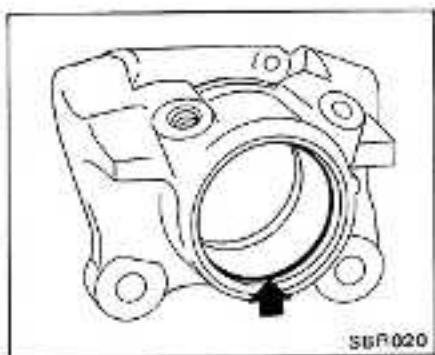


3. Push out pistons from cylinder.



4. Remove piston seals.

Piston seal must be replaced at each disassembly.

**INSPECTION****CAUTION:**

Use brake fluid to clean. Never use mineral oil.

Cylinder body

- Check inside surface of cylinder for score, rust, wear, damage or presence of foreign substances. If any surface fault is detected, replace cylinder body.
- Minor damage from rust or foreign substances may be eliminated by polishing surface with a fine emery cloth. If damage is major, cylinder assembly must be replaced.

Yoke

Check for wear, cracks or other damage. Replace if any fault is detected.

Piston

Check piston for score, rust, wear, damage or presence of foreign substances. Replace if any fault is detected.

CAUTION:

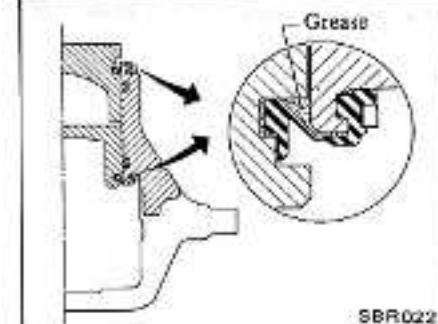
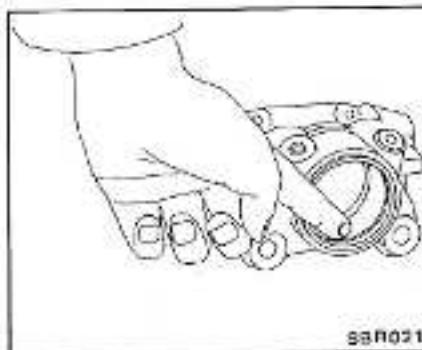
Piston sliding surface is plated. Do not polish with emery paper even if rust or foreign matter is stucked on sliding surface.

Gripper and yoke holder

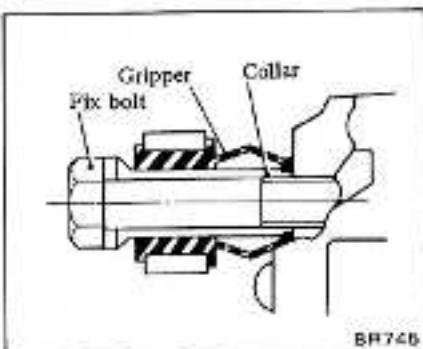
Check for wear, cracks or other damage. Replace if any fault is detected.

ASSEMBLY

- Apply rubber grease or brake fluid to seal grooves and seals. Install piston seals, taking care not to damage them.



- Install yoke holder to piston A. Install gripper to yoke. Apply a coating of 1% soap water to inner wall of gripper, and drive in collar.

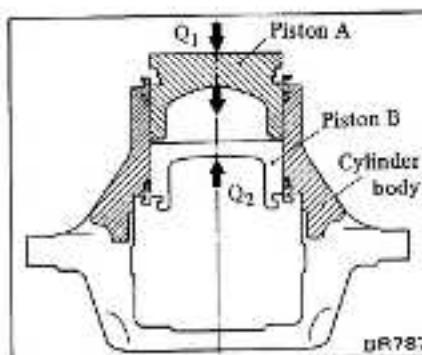


- Apply rubber grease or brake fluid to sliding portions. Insert pistons.

CAUTION:

Insert piston A in direction shown by arrow Q1 and piston B in direction shown by arrow Q2.

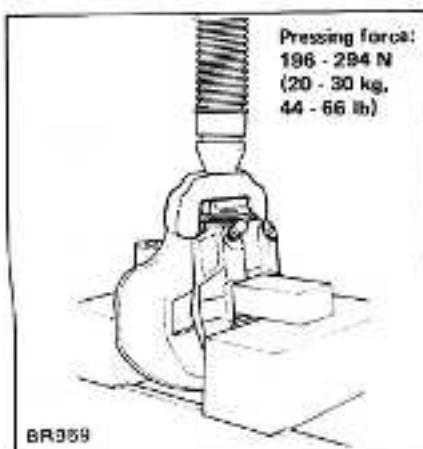
- When inserting pistons, be careful not to insert too far. Refer to Pad Replacement for assembly.
- Install piston A so that its yoke groove coincides with yoke groove of cylinder.



- Install yoke to yoke holder and, supporting end of piston B, press yoke into yoke holder by using press or hands.

CAUTION:

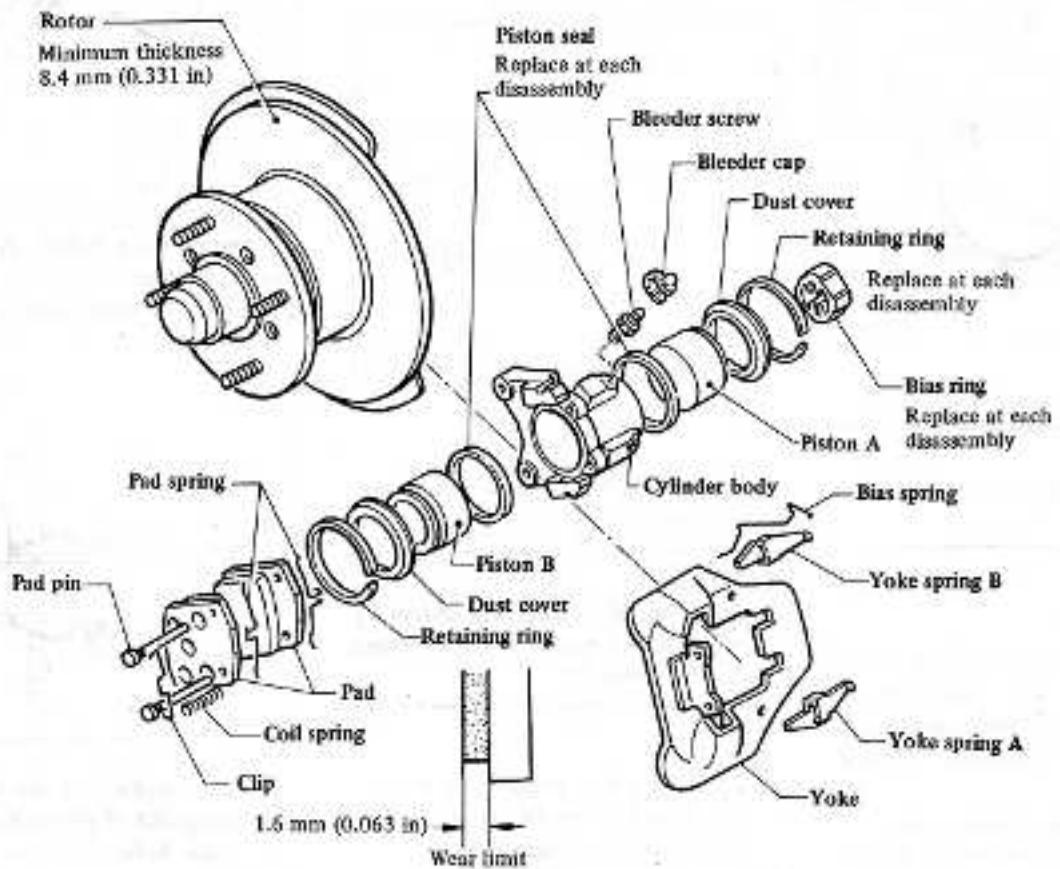
When pressing yoke into yoke holder, be sure to insert yoke vertically so as not to crack or chip yoke holder. If yoke holder is damaged or pressing force is out of specification, replace with a new one.



- Install dust seal and clamp securely with retaining ring.
- Apply recommended disc brake grease to sealing surface of dust seal.
- Be careful not to deform dust seal.
- Wipe off excess grease with alcohol.

- Install pads. Refer to Pad Replacement for installation.

FRONT DISC BRAKE -AN20-



SBR023

PAD REPLACEMENT

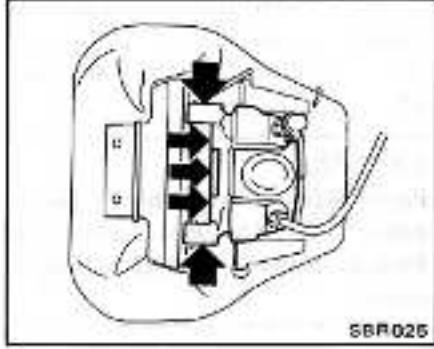
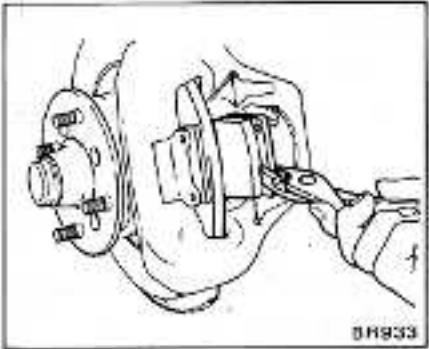
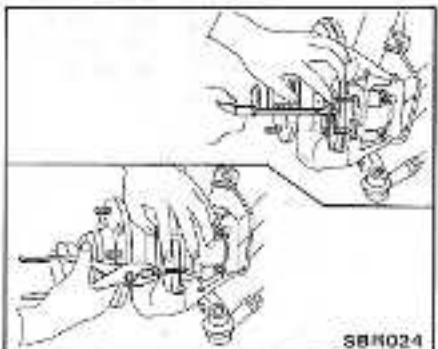
1. Remove clip. Pull out pad pins extracting coil spring and pad springs by hand.

2. Detach pads.

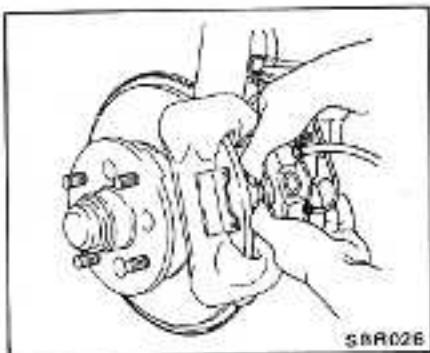
CAUTION:

After removing pads, do not depress brake pedal as piston will jump out.

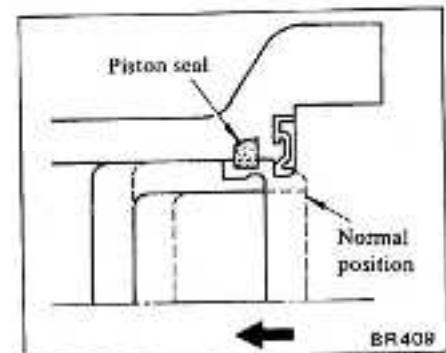
3. Apply brake grease to yoke guide groove of cylinder body, sliding contact portions of yoke, and end surface of piston.



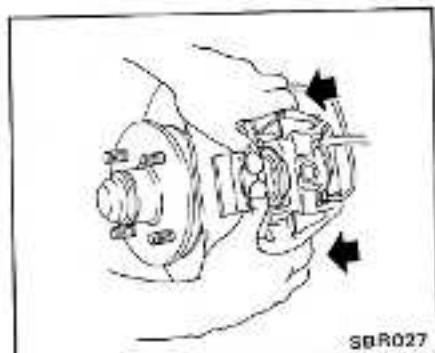
4. Open bleeder valve. Push piston B (outer piston) in cylinder until the end surface of piston B coincides with the end surface of retaining ring on dust cover. Then inner pad can be installed.



CAUTION:
Piston can be easily pushed in by hand, but if pushed too far, groove of piston will go inside of piston seal. At this point, if piston is pressured or moved, piston seal will be damaged. If piston has been pushed in too far, remove caliper assembly and disassemble it. Then, push piston out in direction shown by arrow. Assemble it again, referring to the following.



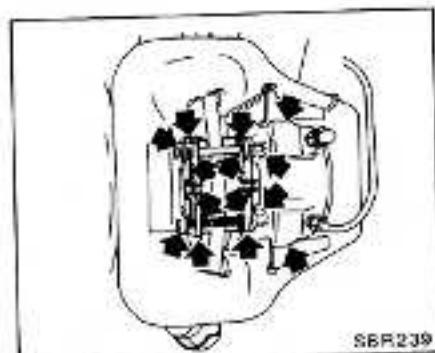
5. Install inner pad. Pull yoke to outer side.



6. Install outer pad.
Coat the following points with recommended brake grease.
- Yoke-to-pad clearance
 - Pad pin holes of the cylinder body, bracket and pads
 - Yoke guide grooves of the cylinder body

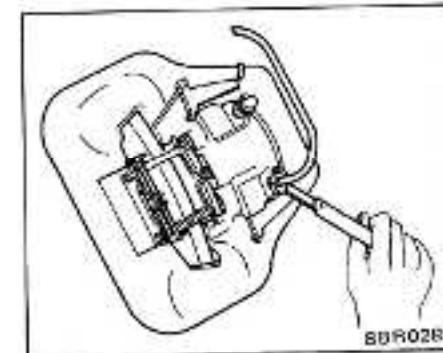
Do not grease friction face of pad.

Then install pad fixing parts previously removed.

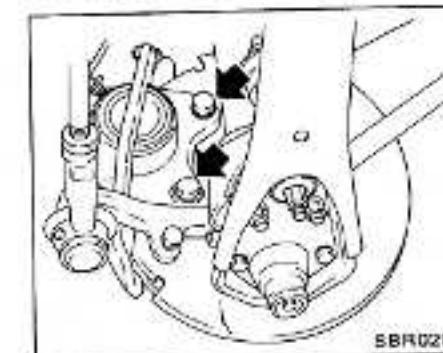


REMOVAL

1. Disconnect brake tube.

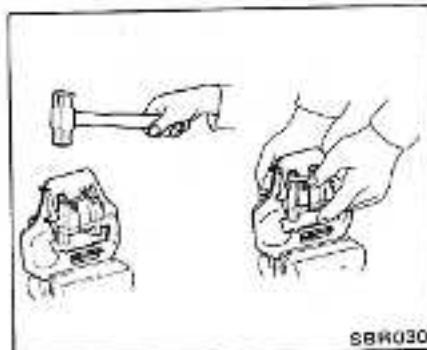


2. Remove caliper assembly.

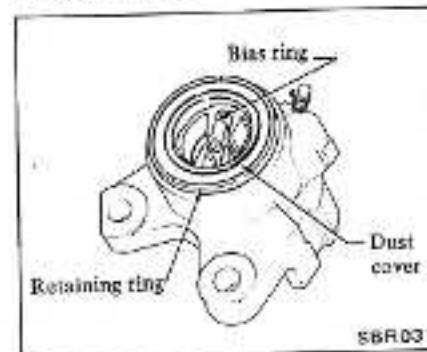


DISASSEMBLY

1. Remove pads. Place in a vise and tap top of yoke, or push by hands. Cylinder will then separate from yoke.



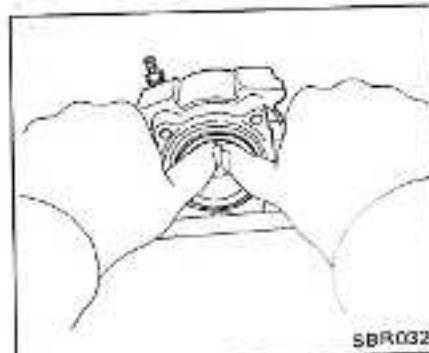
2. Remove bias ring, retaining rings and dust covers.



3. Push out piston A by pushing in piston B. Then, push out piston B by pushing from piston A side.

CAUTION:

Be careful not to damage or score cylinder inner wall and pistons.



4. Remove piston seals.

Piston seal must be replaced at each disassembly.



INSPECTION

CAUTION:

Use brake fluid to clean. Never use mineral oil.

Cylinder body

1. Check inside surface of cylinder for score, rust, wear, damage or presence of foreign substances. If any surface fault is detected, replace cylinder body.

2. Minor damage from rust or foreign substances may be eliminated by polishing surface with a fine emery cloth. If damage is major, cylinder assembly must be replaced.

Yoke

Check for wear, cracks or other damage. Replace if any fault is detected.

Piston

Check piston for score, rust, wear, damage or presence of foreign substances. Replace if any fault is detected.

CAUTION:

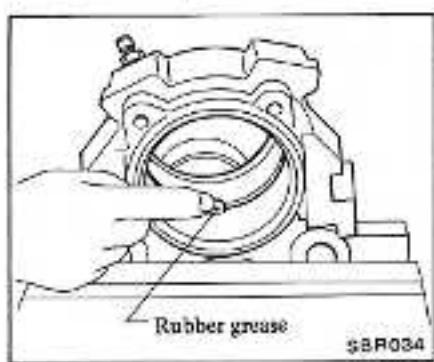
Do not use emery cloth on piston surface.

Piston seal, dust cover and bias ring

Replace piston seal, dust cover and bias ring at each disassembly.

ASSEMBLY

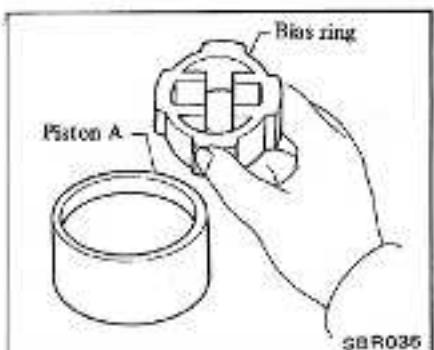
1. Apply rubber grease to cylinder bore and install piston seal.



2. Insert bias ring into piston A.

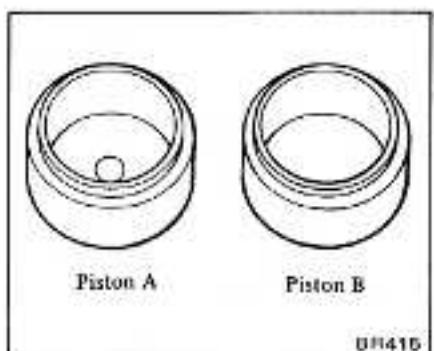
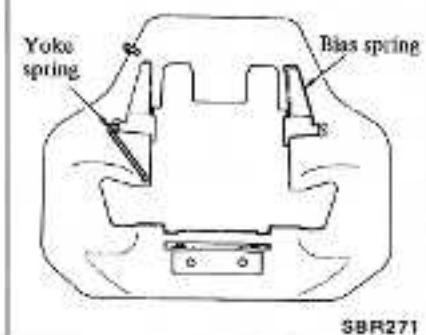
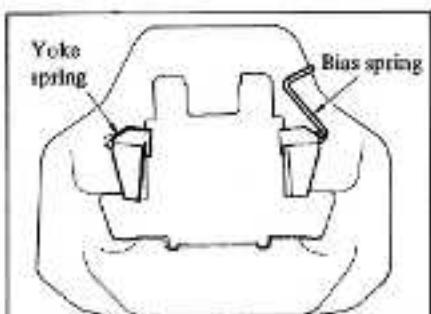
CAUTION:

- Be careful not to mistake piston B for piston A.
- Pistons A and B are distinguished from each other by a dent at inner bottom of piston A.



b. Install piston A so that the yoke groove of bias ring of piston A coincides with the yoke groove of cylinder.

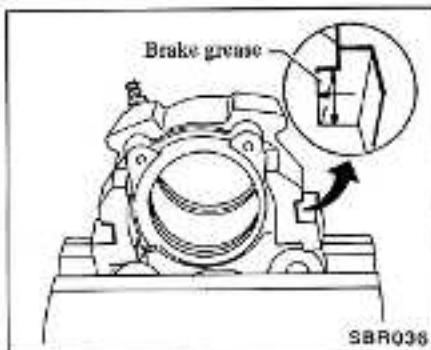
- Install dust cover and retaining ring.
- Install yoke spring on yoke.



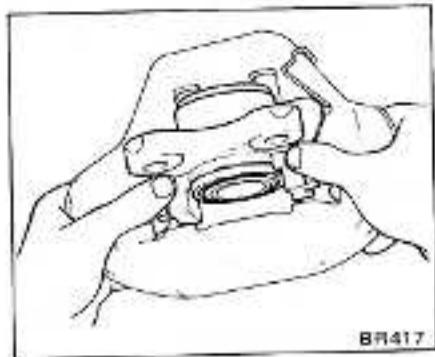
3. Apply rubber grease to sliding portions of pistons and insert into cylinder from each outside.

- When inserting pistons, be careful not to insert too far. Refer to Pad Replacement.

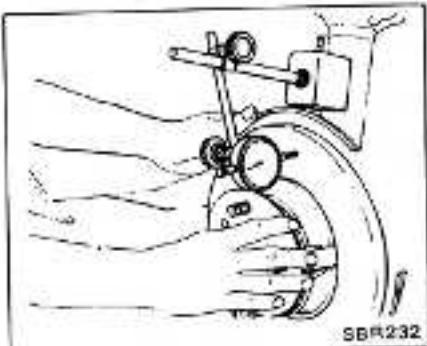
6. Apply brake grease to yoke sliding part of cylinder. Then reposition bias ring so that groove of bias ring coincides with yoke.



7. Leaving yoke springs inserted lightly into cylinder groove, assemble cylinder body and yoke by pushing or tapping yoke lightly.



8. Install pads. Refer to Pad Replacement for installation.



Rotor repair limit:
Maximum runout
(Total indicator reading at center of rotor pad contact surface)

0.12 mm (0.0047 in)

4. Thickness

Standard thickness:

N22:
12.5 mm (0.492 in)

AN20:
10.0 mm (0.394 in)

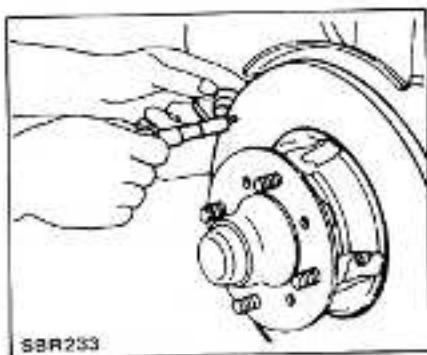
Rotor repair limit:

Minimum thickness:

N22:
10.5 mm (0.413 in)

AN20:
8.4 mm (0.331 in)

3. Parallelism



Rotor repair limit:
Maximum parallelism
(Circumferential direction)
0.07 mm (0.0028 in)

FRONT DISC ROTOR

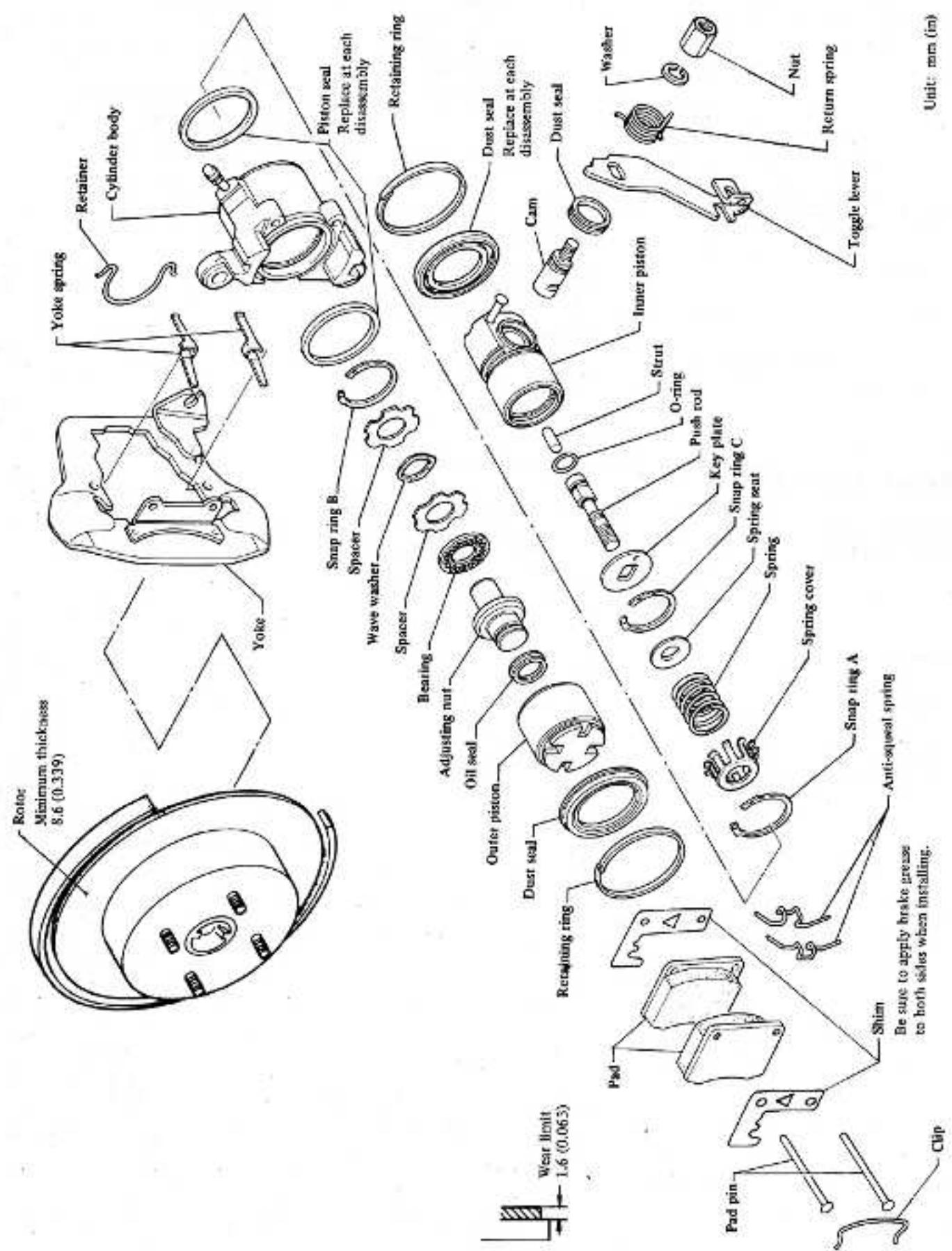
REMOVAL AND INSTALLATION

Refer to section FA.

INSPECTION

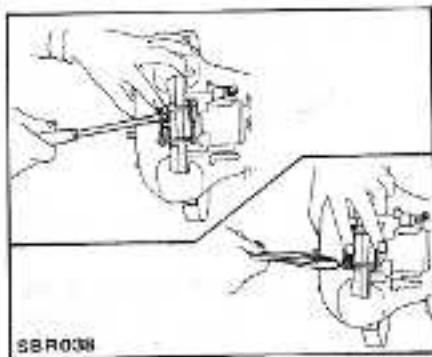
1. Sliding surface
If there are cracks or considerable chips, repair or replace.
2. Runout
Adjust wheel bearing correctly.
Measure runout.

REAR DISC BRAKE -AN12H-



PAD REPLACEMENT

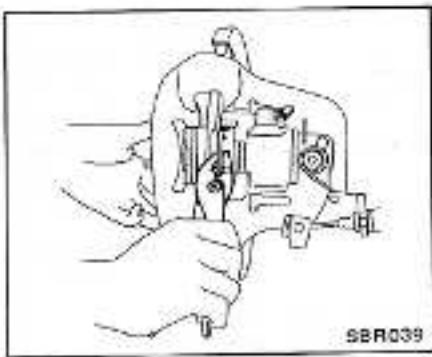
1. Remove clip. Remove pad pins holding springs with finger.



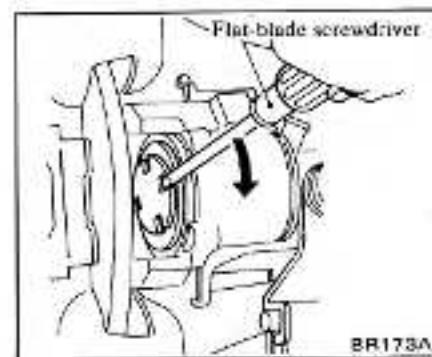
2. Detach pads and shims.

CAUTION:

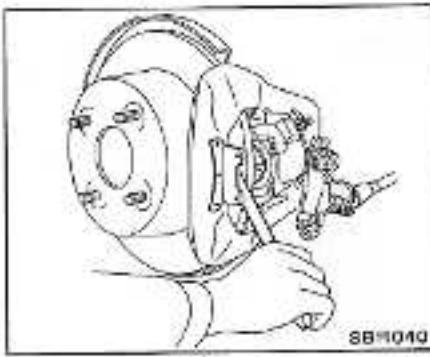
After removing pads, do not depress brake pedal, or pistons will jump out.



3. Retract outer piston into cylinder body by turning it clockwise and pushing it in. Be careful not to damage dust seal.



4. Move yoke until clearances to install pads are equal, with a lever placed between rotor and yoke.



2. Remove caliper assembly.

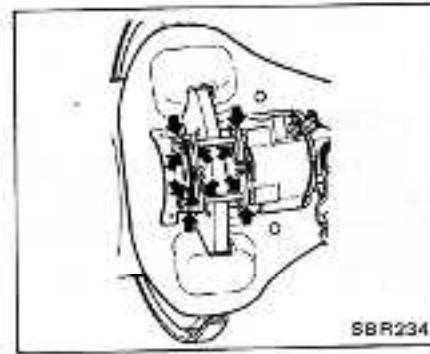


5. Install pads and shims.

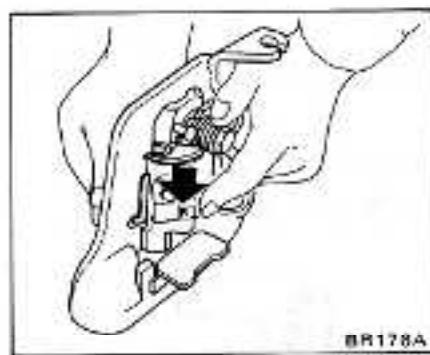
Coat the following points with recommended brake grease.

- Cylinder body-to-pad clearance
 - Yoke-to-pad clearance
 - Pad pin-to-pad clearance
 - Pad pin-to-bracket clearance
- a. Do not grease friction face of pad.
 - b. Be sure to apply brake grease to both sides of shims.

Then install pad fixing parts previously removed.

**DISASSEMBLY**

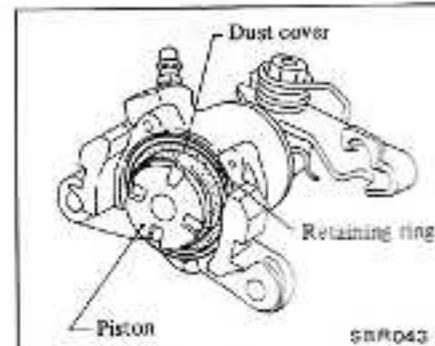
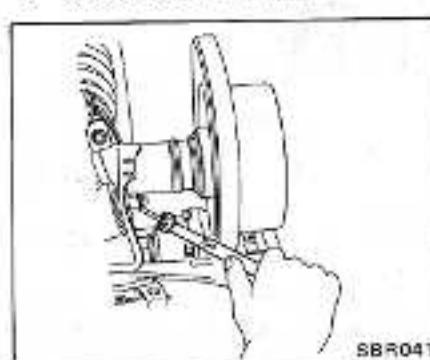
1. Separate cylinder body from yoke by pushing it.



2. Remove retaining rings and dust seals.

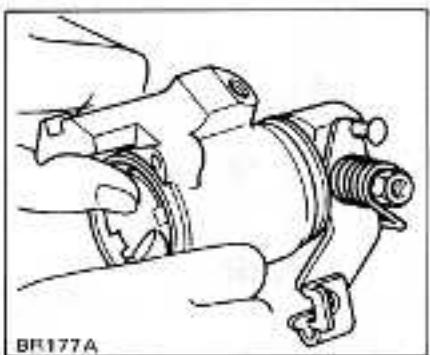
Replace dust seals at each disassembly.

1. Disconnect brake tube.

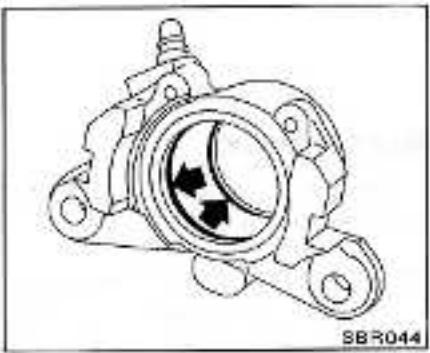


Service Brake - BRAKE SYSTEM

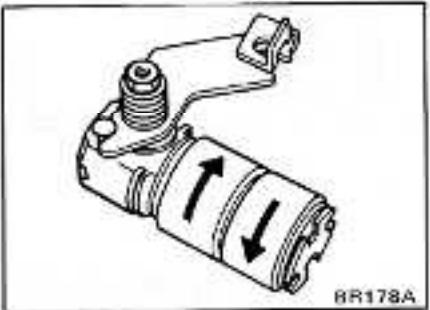
3. Drive out piston assembly by pushing outer piston in.



4. Remove piston seals.
Replace piston seals at each disassembly.



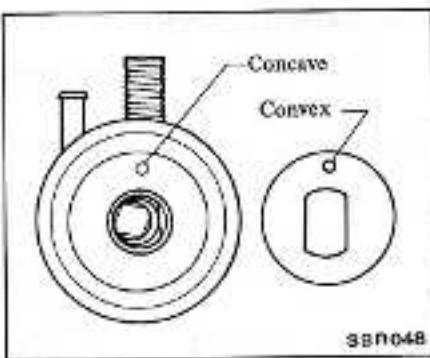
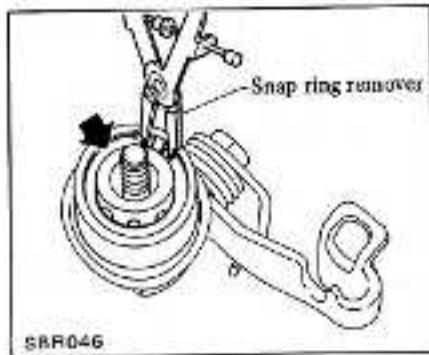
5. Disengage piston assembly by turning inner and outer pistons.



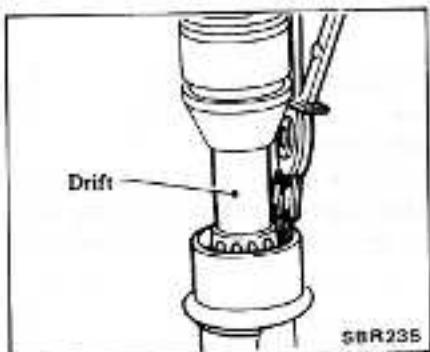
6. Disassemble outer piston by removing snap ring B.



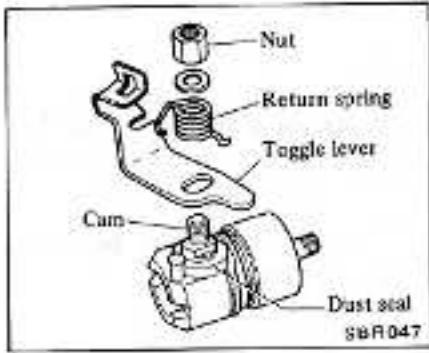
7. Disassemble inner piston by removing snap rings A and C.



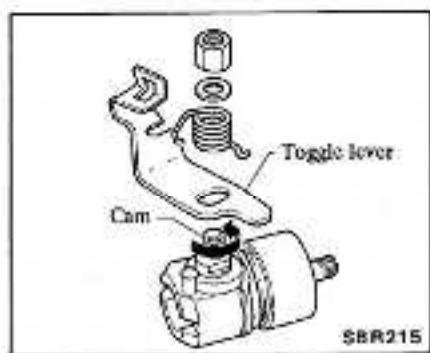
3. Install spring seat, spring, spring cover and snap ring A with suitable press and drift.



8. Remove hand brake toggle lever by removing return spring and nut. Remove dust seal and cam.



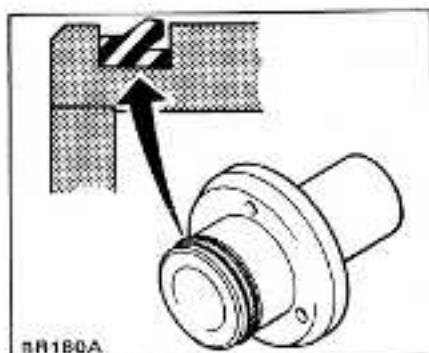
4. When installing parking brake toggle lever after assembling piston, turn cam in direction parking brake operates.



ASSEMBLY

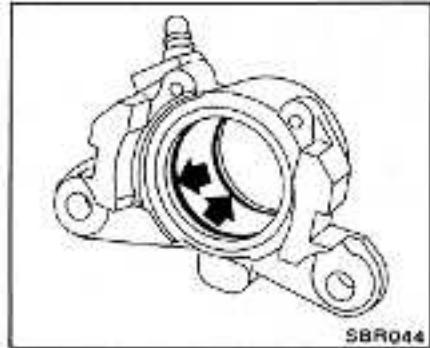
1. Before assembling, apply thin coat of rubber grease to the following:

- Groove in push rod and new O-ring
 - Strut ends
 - Oil seal
 - Piston seal
 - Inside of dust seal
- Securely install oil seal in specified direction.



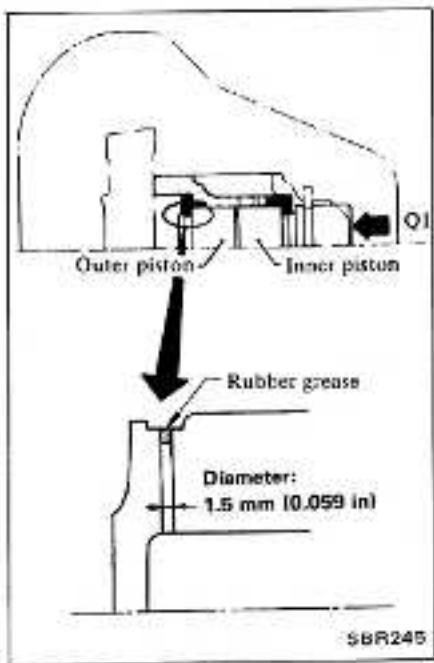
2. Engage square hole in key plate with push rod. Also engage convex in key plate in concave in piston.

5. Apply rubber grease or brake fluid to seal grooves and seals.
6. Install piston seals.



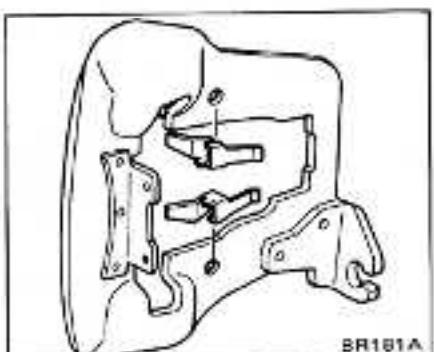
7. Apply rubber grease or brake fluid to sliding portions.

8. Apply rubber grease to one hole [Diameter 1.5 mm (0.059 in)] of outer piston as the figure shows. Then, insert piston assembly in direction of arrow Q1.



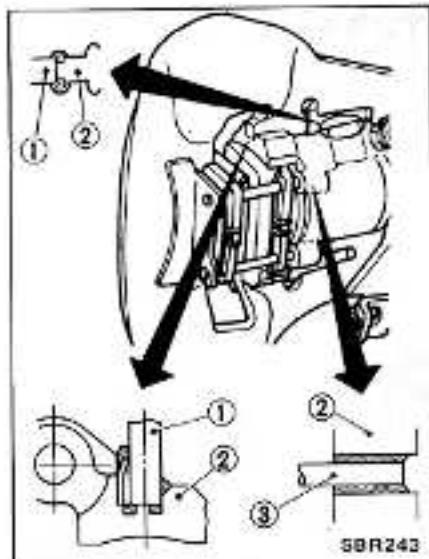
9. Install dust seals and clamp securely with retaining rings.

10. Install yoke spring.

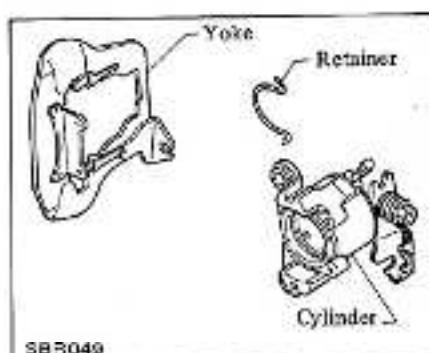


11. Coat the following points with silicone based grease.

- Frictional surfaces of yoke and cylinder body
- Cylinder body pad pin hole



12. Assemble yoke and cylinder with retainer.



13. Install pads. Refer to Pad Replacement for installation.

INSTALLATION

(T) : Caliper fixing bolt

38 - 52 N·m
(3.9 - 5.3 kg·m,
28 - 38 ft·lb)

After installation, depress brake pedal few times to properly adjust brake pad-to-rotor clearance, and check for oil leakage. When brake pedal stroke is constant, brake pad-to-rotor clearance is properly adjusted. It will be automatically adjusted by depressing brake pedal.

REAR DISC ROTOR

REMOVAL AND INSTALLATION

Remove caliper and rotor can be taken out.

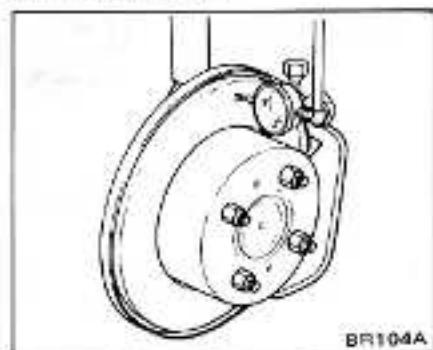
INSPECTION

1. Sliding surface

If there are cracks or considerable chips, repair or replace.

2. Runout

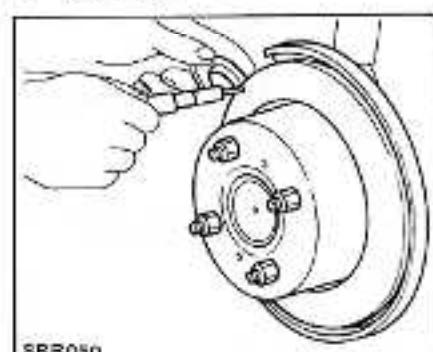
Adjust wheel bearing correctly. Measure runout at the center of rotor pad contact surface.



Rotor repair limit:

Maximum runout
(Total Indicator reading at center of rotor pad contact surface)
0.15 mm (0.0059 in)

3. Parallelism



Rotor repair limit:

Maximum parallelism
(Circumferential direction)
0.07 mm (0.0028 in)

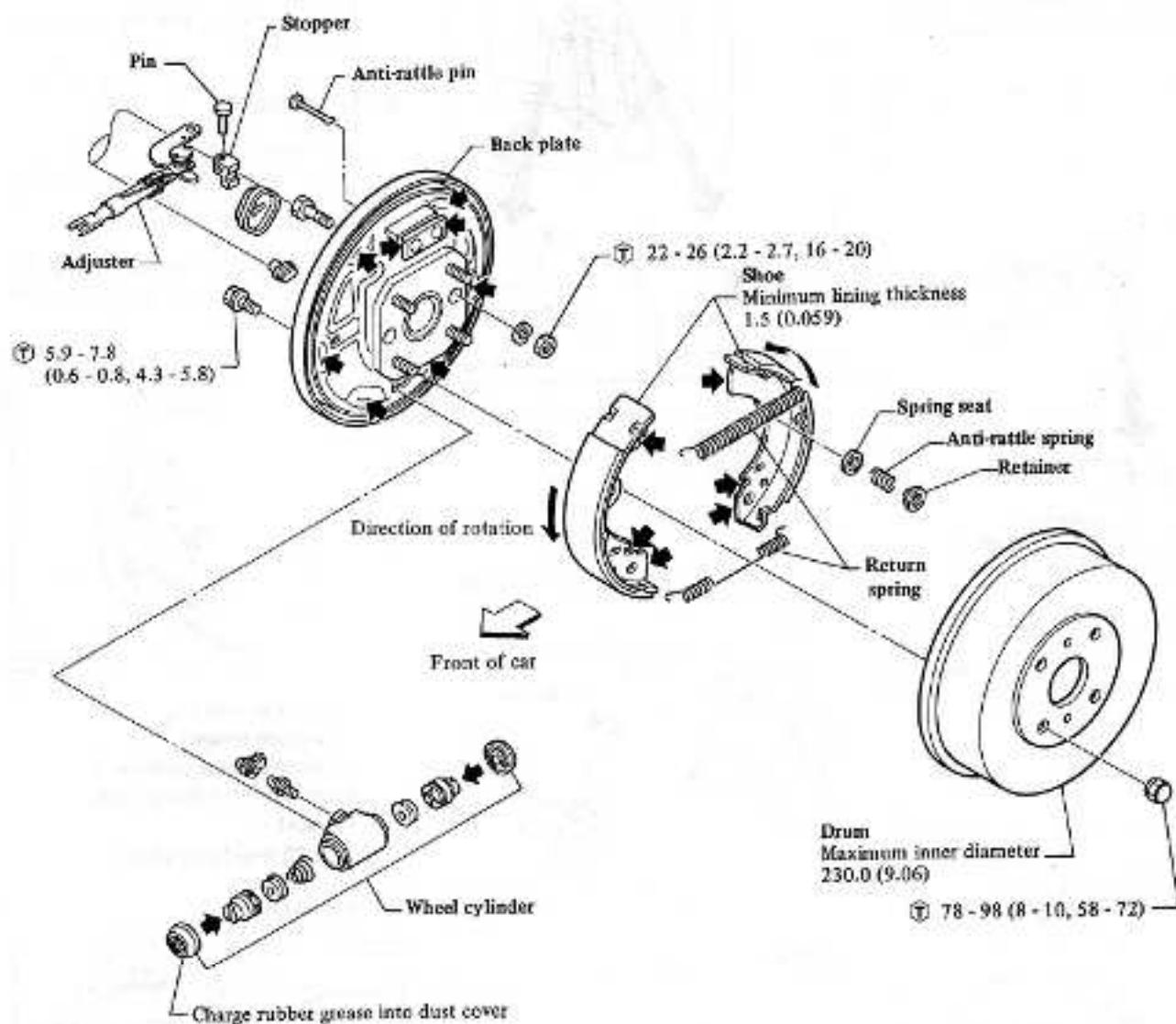
4. Thickness

Standard thickness:

9.6 mm (0.378 in)

Rotor repair limit:

Minimum thickness
8.6 mm (0.339 in)

REAR DRUM BRAKE -LT23A-

Shoe-to-drum clearance is automatically compensated by operating parking brake.

◆ : Lubricating point

⑦ : N·m (kg·m, ft-lb)

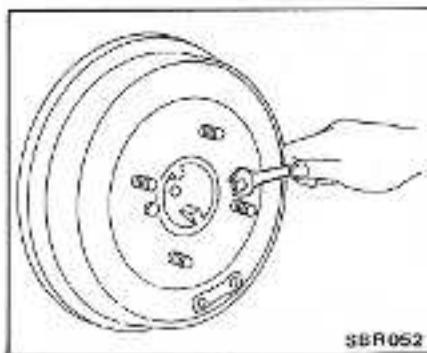
Unit: mm (in)

SB9051

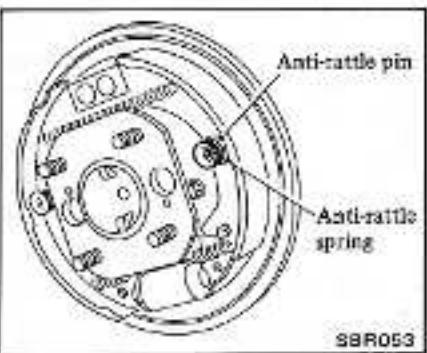
SHOE REPLACEMENT**Removal**

1. Remove wheel and drum.

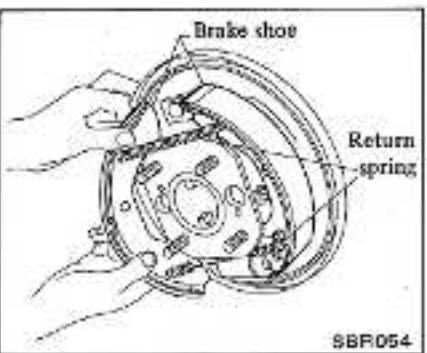
If drum cannot be easily removed, install two bolts (8 mm diameter, 1.25 mm pitch) to drive it out.



2. Remove anti-rattle spring and pin.

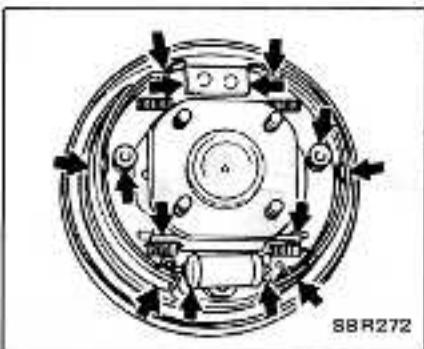


3. Remove return spring and brake shoe.

**Installation****Lubricating points:**

- Contact areas between wheel cylinder, anchor block and brake shoe
- Mating surfaces between brake shoe/adjuster and back plate

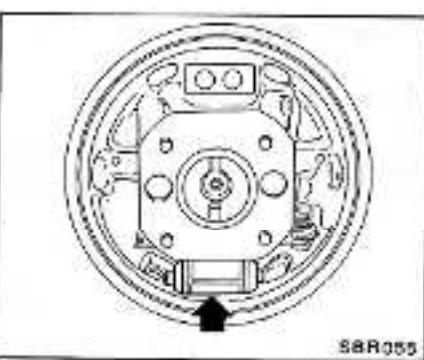
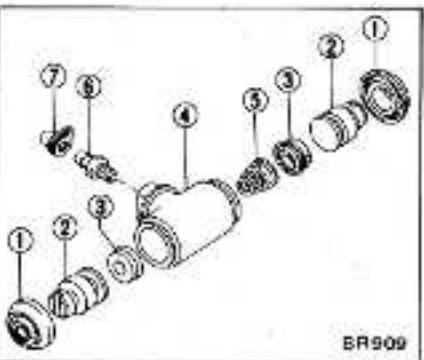
- Contact areas between adjuster and brake shoe
- Contact areas between brake shoe and toggle lever
- Contact areas between anti-rattle pin spring seat and brake shoe



After installation is completed, adjust shoe-to-drum clearance by operating parking brake several times.

WHEEL CYLINDER**Removal**

1. Remove brake shoe.
2. Disconnect brake tube.
3. Then remove wheel cylinder.

**Disassembly**

- | | |
|-----------------------|---------------|
| 1 Dust cover | 5 Spring |
| 2 Piston | 6 Bleeder |
| 3 Piston cup | 7 Bleeder cap |
| 4 Wheel cylinder body | |

Inspection

1. Replace any cylinder or piston which is scratched, scored or worn on its sliding contact surface.
2. Replace worn parts if piston-to-cylinder clearance is beyond limit.

Piston-to-cylinder clearance:
less than 0.15 mm (0.0059 in)

3. Replace any piston cup which is worn or otherwise damaged.
4. Replace if contacting face of cylinder and shoe is worn locally or in step.
5. Replace any damaged dust cover, fatigued piston spring or faulty threaded parts.
6. Replace any tube connector which is worn on its threaded portion.

Assembly

- a. Apply a coating of brake fluid to piston cup at assembly.
- b. Charge with rubber grease or equivalent before installing dust cover.
- c. The brake wheel cylinder is available in both NABCO make and TOKICO make. There is no interchangeability of repair kits or component parts between NABCO and TOKICO makes.

When replacing the repair kit or component parts, ascertain the brand of the brake wheel cylinder body. Be sure to use parts of the same make as the former ones.

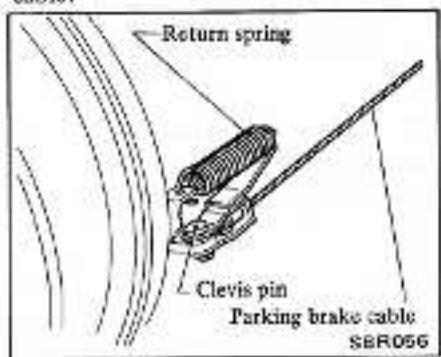
Installation

T : Wheel cylinder fixing bolt
5.9 - 7.8 N·m
(0.6 - 0.8 kg·m,
4.3 - 5.8 ft-lb)

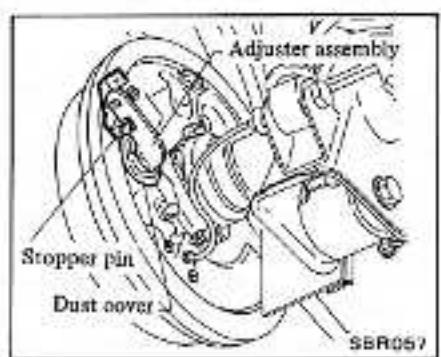
ADJUSTER**Removal**

1. Remove brake shoe.

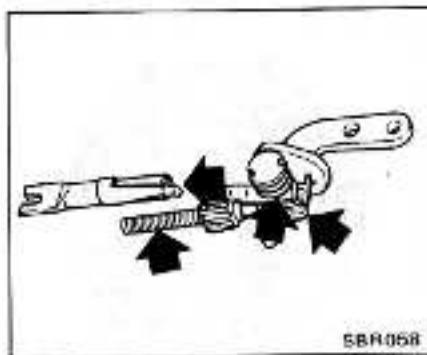
Remove return spring and clevis pin, and disconnect parking brake cable.



2. Remove adjuster assembly with dust cover by removing stopper pin.

**Installation****Lubricating points:**

- Adjuster nut and rod threads
- Mating surfaces between adjuster and toggle lever, and pin and roller.



R.H. brake: Right thread adjuster

L.H. brake: Left thread adjuster

After installation is completed, adjust shoe-to-drum clearance by operating parking brake several times.

Then adjust parking brake system. Refer to Section MA for adjustment.

and tapered. If it is not, repair or replace brake drum.

Standard inner diameter:

228.6 mm (9 in)

Maximum inner diameter:

230.0 mm (9.06 in)

Out-of-roundness (ellipticity):

Less than 0.02 mm (0.0008 in)

Radial run-out**(Total indicator reading):**

Less than 0.1 mm (0.004 in)

Taper**[Measured at a point 40 mm**

(1.57 in) from inlet]:

Less than 0.02 mm (0.0008 in)

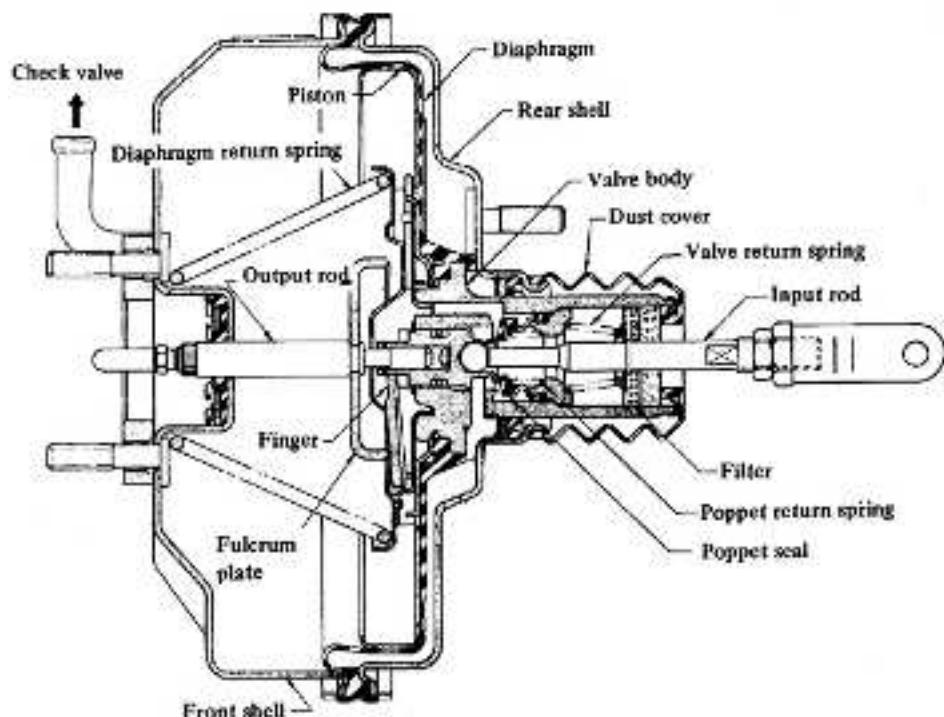
2. Contact surface with which linings come into contact should be fine-finished with No. 120 to 150 sandpaper.

3. Using a drum racer, finish brake drum by machining if it shows any sign of score marks, partial wear or stepped wear on its contact surface.

After brake drum has been completely re-conditioned or replaced, check drum and shoes for proper contact pattern.

BRAKE DRUM**Inspection**

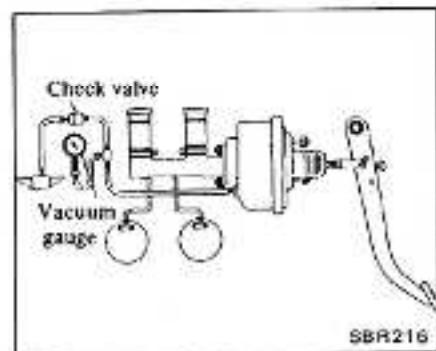
1. Check inner diameter of brake drum to make sure it is properly round

BRAKE BOOSTER

SBR059

INSPECTION**Air tight test (No load)**

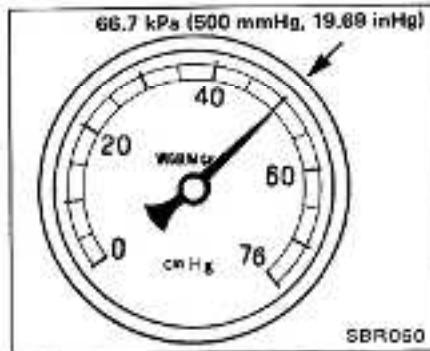
1. Connect a vacuum gauge between check valve and brake booster.



2. Start engine and increase engine speed. Stop engine when vacuum is 66.7 kPa (667 mbar, 500 mmHg, 19.69 inHg).

3. If vacuum pressure drops more than the specified value, correct the cause in accordance with the following chart.

Maximum vacuum leakage
(15 seconds after engine is stopped):
3.3 kPa
(33 mbar, 25 mmHg, 0.98 inHg)



Probable cause	Corrective action
Air leakage at check valve.	Inspect check valve.
Air leakage at output rod seal.	
Air leakage between valve body and seal.	Replace brake booster as an assembly.
Air leakage at valve plunger seat.	
Damaged piping or joints.	Repair or replace.

Air tight test (Under load)

Keep brake pedal fully depressed. Following procedures are same as for no load conditions.

Maximum vacuum leakage

(15 seconds after engine is stopped):
3.3 kPa
(33 mbar, 25 mmHg, 0.98 inHg)

Operating test

1. Connect an oil pressure gauge to brake line, at connection on master cylinder.

2. Install a pedal force gauge on brake pedal.

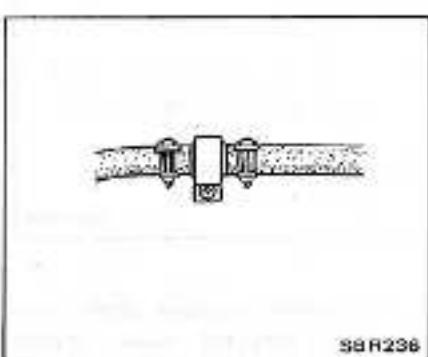
3. Start engine, and increase engine speed until a vacuum pressure of 66.7 kPa (667 mbar, 500 mmHg, 19.69 inHg) is registered on vacuum pressure gauge. With a steady vacuum pressure of 66.7 kPa (667 mbar, 500 mmHg, 19.69 inHg), measure oil pressure with respect to each pedal operating force.

Relationship between oil pressure and pedal operating force is illustrated in Fig. If test results are not as specified, check brake booster for condition in manner described under "Inspection" before removal of this unit.

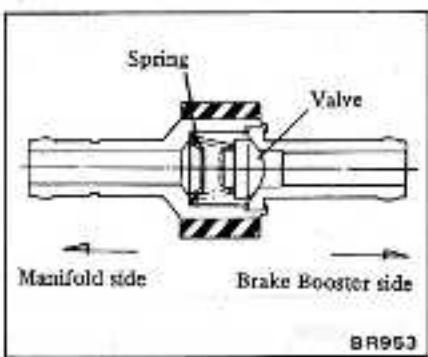
Also check brake line for evidence of fluid leakage.

Check valve

1. Remove check valve.



2. Apply a vacuum pressure of 66.7 kPa (667 mbar, 500 mmHg, 19.69 inHg) to the port of check valve on the brake booster side.



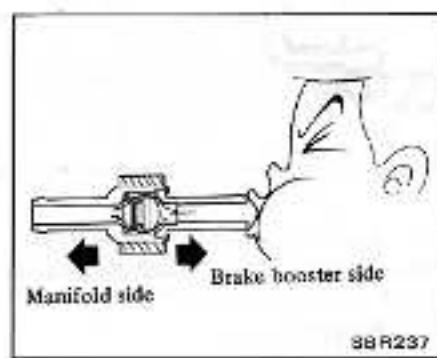
3. If vacuum pressure drops more than the specified value in 15 seconds, replace check valve with a new one.

Maximum vacuum leakage of check valve:

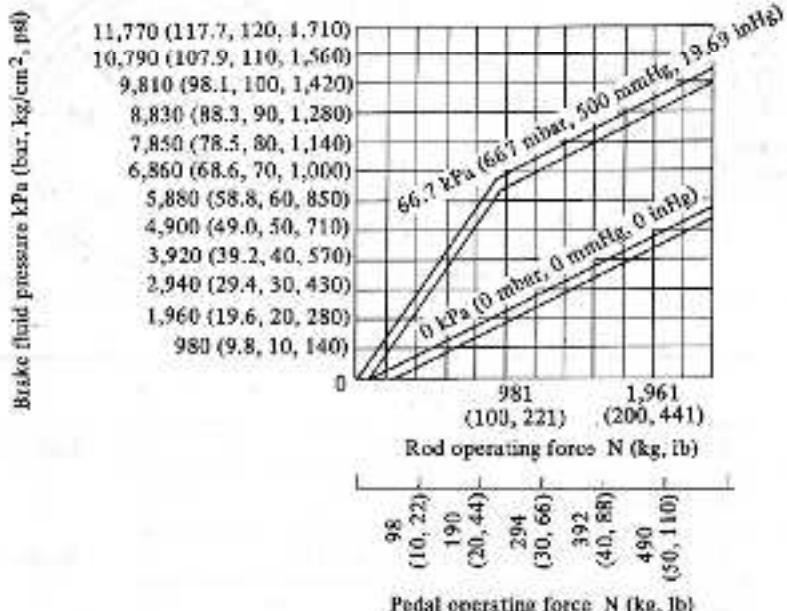
1.3 kPa

(13 mbar, 10 mmHg, 0.39 inHg)

4. When pressure is applied to the brake booster side of check valve and valve does not open, replace check valve with a new one.

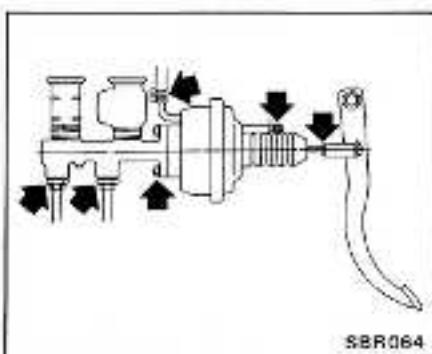


Determine whether source of problem is in brake booster or check valve. Before you reach a final conclusion, always inspect check valve first.

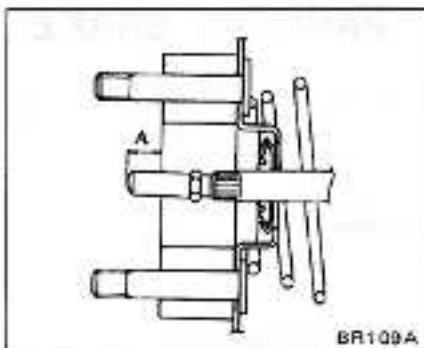


REMOVAL

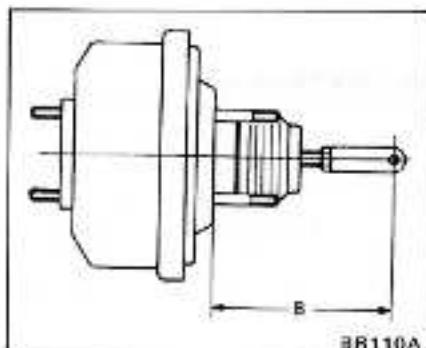
To remove brake booster, detach the following points.



SR064



BR109A



BR110A

2. If length is not within specifications, replace brake booster assembly.

ADJUSTMENT**Output rod length**

PV servo cannot be adjusted as output rod thread portion is secured by adhesion.

1. Check length.

Length "A":

9.75 - 10.00 (0.384 - 0.394 in)

Input rod length

Adjust length by turning clevis.

Length "B":

130 mm (5.12 in)

INSTALLATION

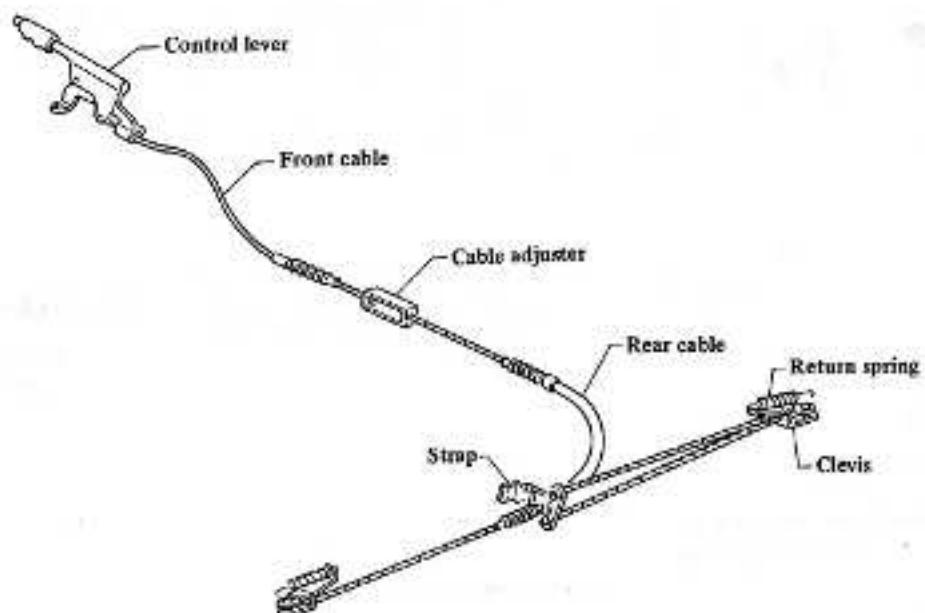
: Master cylinder to brake booster
7.8 - 10.8 N·m
(0.8 - 1.1 kg·m,
5.8 - 8.0 ft-lb)

Brake booster to body
7.8 - 10.8 N·m
(0.8 - 1.1 kg·m,
5.8 - 8.0 ft-lb)

Input rod lock nut
16 - 22 N·m
(1.6 - 2.2 kg·m,
12 - 16 ft-lb)

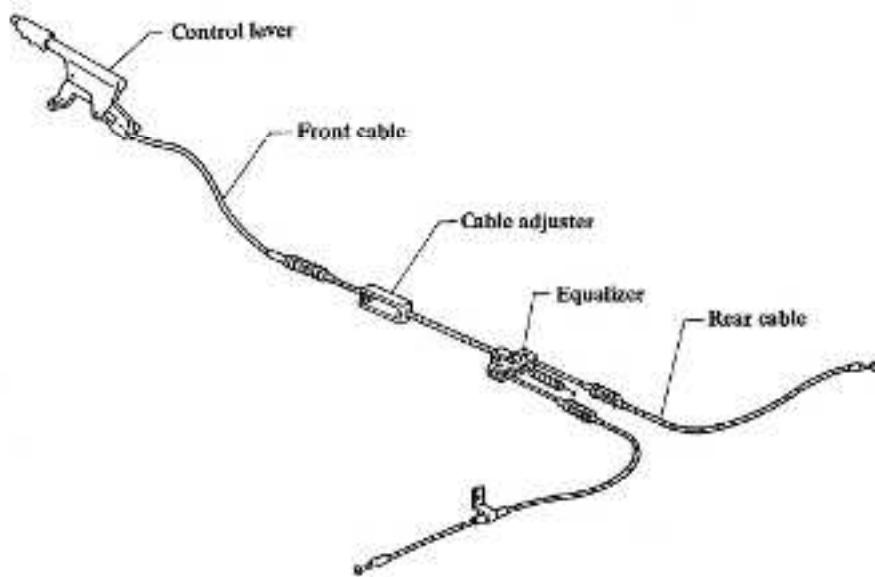
PARKING BRAKE

Rear drum brake type



SBR065

Rear disc brake type

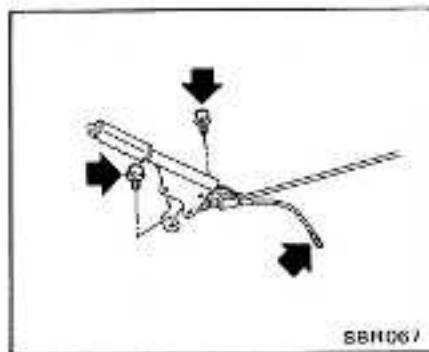


SBR066

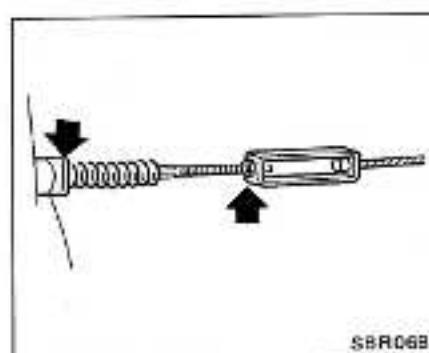
PARKING BRAKE REMOVAL

Control lever and front cable

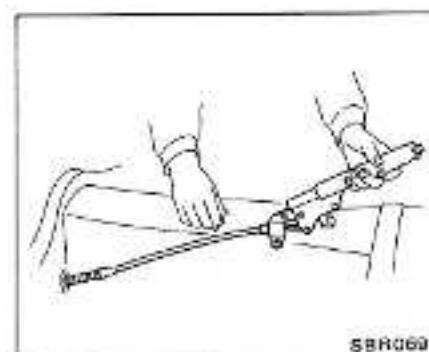
1. Remove console box.
Disconnect harness connector. Remove control lever.



2. Remove grommet rubber and lock plate. Disconnect cable adjuster.



3. Pull front cable out into driver's compartment.



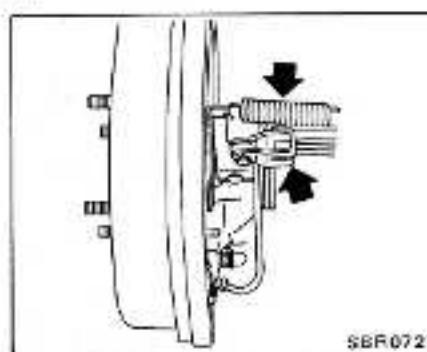
4. If necessary, separate front cable from parking brake lever by breaking pin and replace front cable.

CAUTION:

Be careful not to deform or damage control lever.

Front cable, clevis pin and cotter pin are available as service parts.

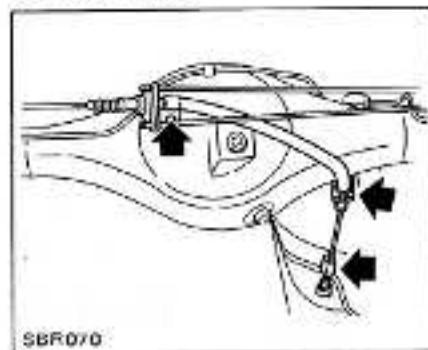
Rear drum brake



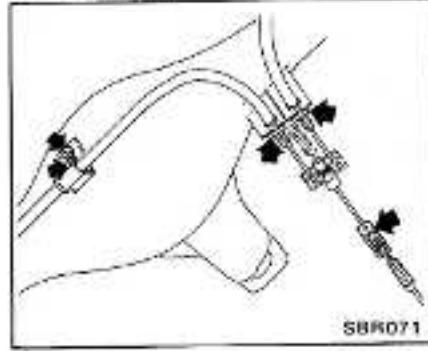
Rear cable

1. Disconnect cable adjuster.
Remove lock plate and strap or cable clamp.

Rear drum brake

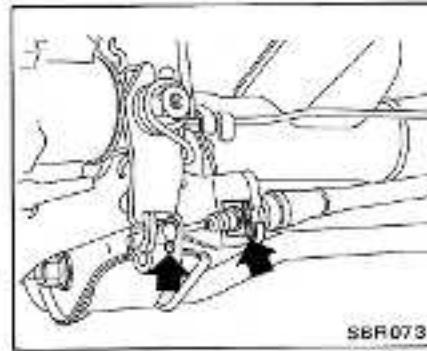


Rear disc brake



2. Remove return spring, or lock plate and cotter pin, and disconnect rear cable from clevis or lever.

Rear disc brake



INSPECTION

1. Check control lever for wear or other damage. Replace if necessary.
2. Replace worn or fatigued springs.
3. Check wires for discontinuity or deterioration. Replace if necessary.
4. Replace malfunctioning warning light or switch.
5. Check parts at each connection and, if found deformed or damaged, replace.

INSTALLATION

When installing front cable to lever, use specified clevis pin and cotter pin.

1. Apply a coat of grease to sliding contact surfaces.
2. Adjust parking brake system after installation is completed. Refer to Section MA for adjustment.

SERVICE DATA AND SPECIFICATIONS

GENERAL SPECIFICATIONS

		Europe	Except Europe
Front	Type	Disc-N22	Disc-AN20
	Cylinder dia. mm (in)	53.98 (2-1/8)	51.1 (2.012)
	Pad mm (in) Width x thickness x length	52.9 x 9.7 x 76.2 (2.063 x 0.382 x 3.000)	41.2 x 10.0 x 61.3 (1.622 x 0.394 x 2.413)
	Rotor outer dia. mm (in)	253.5 (9.98)	245 (9.65)
Rear	Type	Disc-AN12H	Drum-LT23A
	Cylinder dia. mm (in)	40.48 (1.6929)	20.64 (13/16)
	Pad or lining mm (in) Width x thickness x length	42.0 x 10.3 x 66.8 (1.654 x 0.406 x 2.236)	40.0 x 4.5 x 219.4 (1.575 x 0.177 x 8.64)
	Rotor outer dia. or drum inner dia. mm (in)	269 (10.59)	228.6 (9)
Master cylinder inner dia. mm (in)		22.23 (7/8)	20.64 (13/16)
Brake booster type		P75	
NP valve Split point kPa (bar, kg/cm ² , psi) x reducing ratio		1,471 (14.7, 15, 213) x 0.4	2,462 (24.5, 25, 366) x 0.4
		1,961 (19.6, 20, 284) x 0.4	

INSPECTION AND ADJUSTMENT

BRAKE PEDAL

Unit: mm (in)

	Rear disc brake	Rear drum brake
Pedal play "a"	1 - 5 (0.04 - 0.20)	
Depressed height "d"	More than 60 (2.36)	More than 55 (2.17)
Pedal height "h"	155 - 161 (6.10 - 6.34)	

PARKING BRAKE

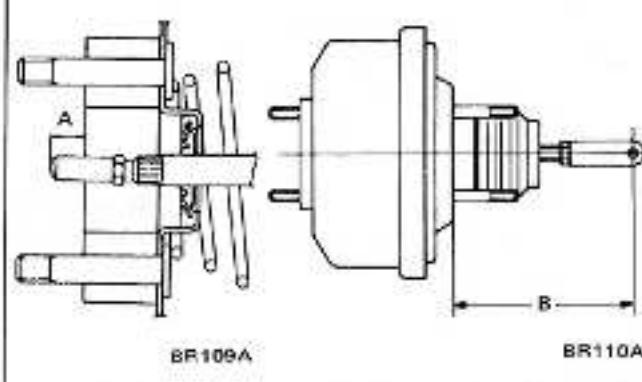
Pulling force N (kg, lb)	196 (20, 44)
Number of notches	7 - 8
Stroke mm (in)	90 - 100 (3.54 - 3.94)

MASTER CYLINDER

Allowable clearance between cylinder and piston mm (in)	Less than 0.15 (0.0059)
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BRAKE BOOSTER

Maximum vacuum leakage (15 seconds after engine is stopped)	kPa (mbar, mmHg, inHg)	3.3 (33, 25, 0.98)
Output rod length "A" mm (in)		9.75 - 10.00 (0.3839 - 0.3937)
Input rod length "B" mm (in)		130 (5.12)



CHECK VALVE

Maximum vacuum leakage: [15 seconds after 66.7 kPa (667 mbar, 600 mmHg, 19.69 inHg) pressure is applied] kPa (mbar, mmHg, inHg)	1.3 (13, 10, 0.39)
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DISC BRAKE

Unit: mm (in)

Type	N22	AN20	AN12H
Pad wear limit	Minimum thickness	2.0 (0.079)	1.6 (0.063)
Rotor repair limit	Maximum runout	0.12 (0.0047)	0.15 (0.0059)
	Maximum parallelism	0.07 (0.0028)	
	Minimum thickness	10.5 (0.413)	8.4 (0.331)

DRUM BRAKE

Unit: mm (in)

Lining wear limit	Minimum thickness	1.5 (0.059)
Drum repair limit	Maximum inner diameter Initial stage 228.6 mm (9 in)	230.0 (9.06)
	Out-of-roundness	Less than 0.02 (0.0008)
	Radial runout	Less than 0.1 (0.004)
	Taper	Less than 0.02 (0.0008)
Wheel cylinder repair limit	Piston-to-cylinder clearance	Less than 0.15 (0.0059)

TIGHTENING TORQUE

Unit	N·m	kg·m	ft·lb
Brake tube flare nut	15 - 18	1.5 - 1.8	11 - 13
Brake hose connector	17 - 20	1.7 - 2.0	12 - 14
Air bleeder valve	6.9 - 8.8	0.7 - 0.9	5.1 - 6.5
Fulcrum pin fixing bolt	7.8 - 10.8	0.8 - 1.1	5.8 - 8.0
Brake booster to body	7.8 - 10.8	0.8 - 1.1	5.8 - 8.0
Input rod lock nut	16 - 22	1.6 - 2.2	12 - 16
Flange to shell cover	7.8 - 10.8	0.8 - 1.1	5.8 - 8.0
Master cylinder to brake booster	7.8 - 10.8	0.8 - 1.1	5.8 - 8.0
Front disc caliper fixing bolt	72 - 97	7.3 - 9.9	53 - 72
Front disc rotor fixing bolt	38 - 52	3.9 - 6.3	28 - 38
Rear disc caliper fixing bolt	38 - 52	3.9 - 5.3	28 - 38
Rear brake back plate fixing bolt	15 - 20	1.5 - 2.0	11 - 14
Baffle plate fixing bolt	22 - 26	2.2 - 2.7	16 - 20
Rear wheel cylinder fixing bolt	5.9 - 7.8	0.6 - 0.8	4.3 - 5.8
Brake lamp switch lock nut	12 - 15	1.2 - 1.6	9 - 11
3-way connector bolt	17 - 20	1.7 - 2.0	12 - 14
NP valve to body	3.9 - 4.8	0.4 - 0.5	2.9 - 3.8

TROUBLE DIAGNOSES AND CORRECTIONS

Condition	Probable cause	Corrective action
Excessive pedal travel	<p>Low brake fluid level or empty master cylinder reservoir.</p> <p>Leakage in master cylinder.</p> <p>Deteriorated check valve.</p> <p>Air in system.</p> <p>Faulty brake adjustment.</p> <p>Excessive lateral play on disc caused by loose or worn wheel bearings or steering parts.</p>	<p>Fill and bleed as necessary. Test for source of leakage by examining all lines, connections and wheel cylinder.</p> <p>Overhaul master cylinder.</p> <p>Replace check valve and bleed system.</p> <p>Bleed system.</p> <p>Adjust pad-to-rotor clearance. Inspect auto-adjuster operation.</p> <p>Replace or adjust faulty parts.</p>
Spongy pedal	<p>Low fluid level in master cylinder.</p> <p>Air in system.</p> <p>Faulty brake adjustment.</p> <p>Reservoir filler cap vent hole clogged.</p> <p>Swollen hose due to deterioration or use of poor quality hose.</p> <p>Distorted brake shoes, or excessively worn or cracked brake drum.</p> <p>Soft or swollen caliper seals.</p> <p>Use of a brake fluid with too low boiling point.</p>	<p>Top with fluid and inspect for leakage.</p> <p>Correct as necessary.</p> <p>Adjust pad-to-rotor clearance. Inspect auto-adjuster operation.</p> <p>Clean and bleed system.</p> <p>Replace hose and bleed system.</p> <p>Replace faulty parts.</p> <p>Drain hydraulic system, flush with alcohol and replace all seals.</p> <p>Replace with specified brake fluid and bleed system.</p>
Poor braking effect	<p>Fluid leakage in brake lines.</p> <p>Low brake fluid level or empty master cylinder reservoir.</p> <p>Air in brake lines.</p> <p>Grease, oil, mud or water on pads.</p> <p>Deterioration of pads.</p> <p>Local fit of pads.</p> <p>Pads excessively worn.</p> <p>Master cylinder or caliper assembly in poor conditions.</p> <p>Frozen or seized caliper pistons on disc brakes.</p> <p>Binding mechanical linkage at brake pedal.</p>	<p>Check master cylinder, piping and caliper for leaks, and repair.</p> <p>Fill and bleed as necessary.</p> <p>Bleed system.</p> <p>Clean brake mechanism and check for cause of problem. Replace pads.</p> <p>Replace.</p> <p>Shave or replace.</p> <p>Replace.</p> <p>Repair or replace.</p> <p>Disassemble caliper and free up as required.</p> <p>Free up as required.</p>

Condition	Probable cause	Corrective action
Unbalanced brakes	Improper tire inflation. Improper auto adjustment of pad-to-rotor clearance. Grease, oil, mud or water on pads. Mud in rotor. Deterioration of pads. Excessive wear of pads. Caliper cylinder in poor condition. Looseness of caliper assembly securing bolts. Scored or out-of-round rotor. Incorrect adjustment of wheel bearings. Incorrect adjustment of wheel alignment.	Inflate to correct pressure. Readjust. Clean brake mechanism and check for cause of problem. Replace pads. Clean. Replace. Replace. Repair or replace. Fasten or replace. Recondition or replace rotor as required. Check for improper pad contact with rotor and grind pad if necessary. Adjust or replace. Adjust.
Brakes fade	Brake fluid has too low boiling point. Use of improper pads. Brake rotor is out-of-round. Hydraulic connections, master cylinder and caliper cylinders are corroded or damaged. Bleed screw is open.	Drain and fill system with approved fluid. Replace. Repair or replace as necessary. Repair as necessary. Close screw and bleed system.
Brakes drag	Pedal linkage is binding or output rod adjustment is too long. Master cylinder compensator part is obstructed. Seized master cylinder piston. Poor pad condition. Poor caliper cylinder condition. Deformation of piston cups. Poor condition of caliper because of faulty piston seals. Excessive runout of rotor. Hand brake will not return. Clogged master cylinder return port. Clogged brake lines. Incorrect adjustment of wheel bearings. Improper pad-to-rotor clearance. No free travel in brake pad return.	Lubricate linkage, check pedal return spring for condition and adjust output rod as necessary. Blow out foreign matter with compressed air. Disassemble master cylinder and replace piston. Bleed system. Clean and repair. Repair or replace. Replace. Replace piston seals. Turn rotor on lathe or replace. Check and repair. Clean. Check and clean. Adjust or repair. Adjust. Adjust pedal height.

Condition	Probable cause	Corrective action
Brake chatters	Groove or out-of-round rotor. Loose or bent support plate. Distorted pads. Grease or brake fluid on pads.	Grind or replace as required. Tighten support plate bolts to specified torque, or replace plate. Replace as necessary. Replace pads.
Brake squeals	Dirty or scored rotor. Bend support plate. Glazed or contaminated pads.	Blow out assembly with compressed air or refinish rotor. Replace faulty unit. Grind pad to eliminate glaze. If it doesn't, replace pad.
Pedal pulsates	Lateral runout of brake rotor is excessive. Excessive variation in thickness of brake rotor surfaces.	Check with dial indicator, turning disc by hand. If runout exceeds specifications, repair or replace disc. Measure around disc face with micrometer. Replace disc as required.
Rear lock (under light brake pedal force)	Improper tire pressures. Excessive wear of tires. Faulty NP valve.	Check and adjust. Check and replace. Replace.
Rear lock (under heavy brake pedal force)	Improper tire pressures. Excessive wear of tires. Poor front braking effect. <ul style="list-style-type: none"> • Grease oil, mud or water on pads. • Excessive wear pads. • Local fit pads. • Master cylinder or caliper cylinder in poor condition. 	Check and adjust. Check and replace. Clean or replace. Replace. Shave or replace. Repair or replace.

SPECIAL SERVICE TOOL

Tool number	Tool name
GG94310000	Flare nut torque wrench

