15

15. BRAKE SYSTEM

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SERVICE INFORMATION

GENERAL

· Keep grease off of brake pads and disc.

AWARNING

- A contaminated brake disc or pad reduce stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- · Bleed the hydraulic system if it has been disassembled or if the brake feels spongy.
- · Do not allow foreign material to enter the system when filling the reservoir.
- Avoid spilling brake fluid on painted, plastic or rubber parts. Place a rag or shop towel over these parts whenever the system is serviced.
- · Do not mix different types of fluid since they are not compatible.

CAUTION

- Spilling fluid on painted, plastic or rubber parts will damage them. Place a clean shop towel over these parts whenever the system is serviced.
- KEEP BRAKE FLUID OUT OF REACH OR CHILDREN.
- · Always check brake operation before riding the motorcycle.

SPECIFICATIONS

Unit: mm (in)

ITEM Specified brake fluid			STANDARD DOT 4 brake fluid	SERVICE LIMIT
Brake disc thickness	FR	ED, DK types	3.0 (0.12)	2.5 (0.10)
		U type	3.5 (0.14)	3.0 (0.12)
	RR		4.5 (0.18)	4.0 (0.16)
Brake disc runout				0.25 (0.010)
Master cylinder I.D.	FR		12.700 – 12.743 (0.5000 – 0.5017)	12.76 (0.502)
	RR		14.000 - 14.043 (0.5512 - 0.5529)	14.06 (0.554)
Master piston O.D.	FR		12.657 - 12.684 (0.4983 - 0.4994)	12.63 (0.497)
	RR		13.957 - 13.984 (0.5495 - 0.5506)	13.95 (0.549)
Caliper cylinder I.D.	FR		27.000 – 27.050 (1.0630 – 1.0650)	27.06 (1.065)
	RR		27.000 – 27.050 (1.0630 – 1.0650)	27.06 (1.065)
Caliper piston O.D.	FR		26.900 - 26.950 (1.0591 - 1.0610)	26.89 (1.059)
	RR		26.935 - 26.968 (1.0604 - 1.0617)	26.89 (1.059)

TORQUE VALUES

Front master cylinder holder bolt Front reservoir tank cover screw Front brake lever pivot bolt

Front brake caliper pad pin Front brake caliper pin bolt A

Front brake caliper bracket bolt Rear brake master cylinder holder bolt

Push rod lock nut

Rear brake caliper pad pin Rear brake caliper pin bolt

Rear brake caliper bracket pin bolt

Rear brake hose guide screw

Pad pin plug Bleed valve

Brake hose boit

9 N·m (0.9 kgf·m, 6.5 lbf·ft) 2 N·m (0.2 kgf·m, 1.4 lbf·ft) 6 N·m (0.6 kgf·m, 4.3 lbf·ft) 6 N·m (0.6 kgf·m, 4.3 lbf·ft) 18 N·m (1.8 kgf·m, 13 lbf·ft) 23 N·m (2.3 kgf·m, 17 lbf·ft) 13 N·m (1.3 kgf·m, 9 lbf·ft) 30 N·m (3.1 kgf·m, 22 lbf·ft) 14 N·m (1.4 kgf·m, 10 lbf·ft) 18 N·m (1.8 kgf·m, 13 lbf·ft) 10 N·m (1.0 kgf·m, 7 lbf·ft) 27 N·m (2.8 kgf·m, 20 lbf·ft) 13 N·m (1.3 kgf·m, 9 lbf·ft)

6 N·m (0.6 kgf·m, 4.3 lbf·ft)

34 N·m (3.5 kgf·m, 25 lbf·ft)

Apply a locking agent to the threads. 4.3 N·m (0.43 kgf·m, 3.1 lbf·ft) Apply a locking agent to the threads.

2.5 N·m (0.25 kgf·m, 1.8 lbf·ft)

TOOLS

Special

Snap ring pliers

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TROUBLESHOOTING

Brake lever (pedal) soft or spongy

- Air bubbles in the hydraulic system
- Leaking hydraulic system
- Contaminated brake pads/disc
- Worn caliper piston seal
- Worn master cylinder piston seal
- Worn brake pads/disc
- Contaminated caliper
- Caliper not sliding properly
- Contaminated brake pads/disc
- Low fluid level
- Clogged fluid passage
- Warped/deformed brake disc
- Sticking/worn caliper piston
- Sticking/worn master cylinder piston
- Contaminated master cylinder
- Bent brake lever

Brake lever (pedal) hard

- Clogged/restricted brake system
- Sticking/worn caliper piston
- Caliper not sliding properly
- Clogged/restricted fluid passage
- Worn caliper piston seal
- Sticking/worn master cylinder piston
- Bent brake lever

Brake drag

- Contaminated brake pads/disc
- Misaligned wheel
- Worn brake pads/disc
- Warped/deformed brake disc
- Caliper not sliding properly

BRAKE FLUID REPLACEMENT/ AIR BLEEDING

BRAKE FLUID REPLACEMENT

Front

Turn the handlebar until the master cylinder is level. Remove the screws, reservoir cover, diaphragm plate and diaphragm.

Rear

Remove the reservoir tank bracket bolt.

Hold the reservoir level.

Remove the reservoir cap, diaphragm plate and diaphragm.

CAUTION

- Avoid spilling fluid on painted, plastic or rubber parts.
 Place a shop towel over these parts whenever the system is serviced.
- Do not mix different types of fluid since they are not compatible.
- Do not mix brake fluid types and never reuse the contaminated fluid which has been pumped out during brake bleeding, because this will impair the efficiency of the brake system.

Connect a bleed hose to the bleed valve.

Loosen the caliper bleed valve and pump the brake lever or pedal.

Stop operating the brake when fluid stops flowing out of the bleed valve.

Tighten the bleed valve.

AWARNING

A contaminated brake disc or pad reduce stopping power.
 Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.

Front

Fill the master cylinder reservoir with DOT4 brake fluid from a sealed container to the top of the casting ledge.

Rear

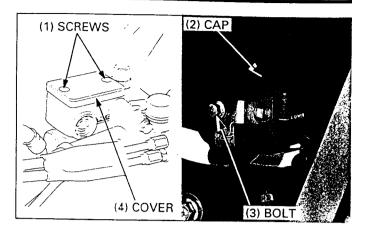
Fill the reservoir to the upper level line with DOT4 brake fluid from a sealed container.

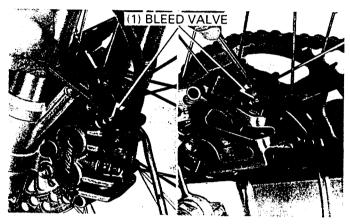
Bleed the brake system (page 15-4).

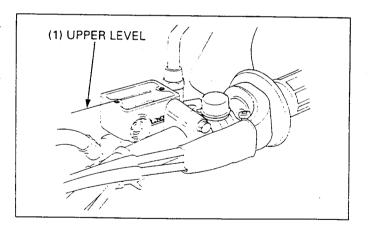
Front

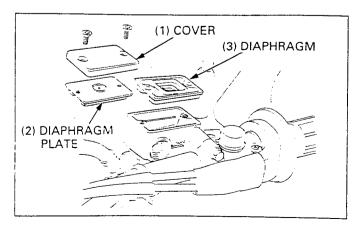
Install the diaphragm, diaphragm cover and reservoir cover. Install and tighten the screws.

TORQUE: 2 N·m (0.2 kgf·m, 1.4 lbf·ft)



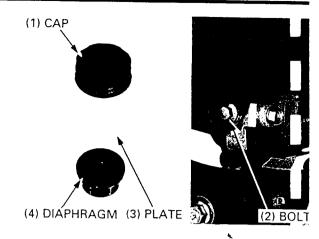






Rear

Install the diaphragm, diaphragm plate and reservoir cap. Install the reservoir tank and bolt.
Tighten the bolt securely.



AIR BLEEDING

Front

Turn the handlebar until the master cylinder is level. Remove the screws, reservoir cover, diaphragm cover and diaphragm.

Fill the master cylinder reservoir with DOT4 brake fluid from a sealed container to the top of the casting ledge.

Rear

Remove the reservoir tank mounting bolt. Hold the reservoir level.

Remove the reservoir cap, diaphragm plate and diaphragm. Fill the reservoir to the upper level line with DOT4 brake fluid from a sealed container.

Connect a commercially available brake bleeder to the bleed valve.

NOTE

- Check the fluid level often while bleeding the brakes to prevent air from being pumped into the system.
- When using a brake bleeding tool, follow the manufacturer's operating instructions.

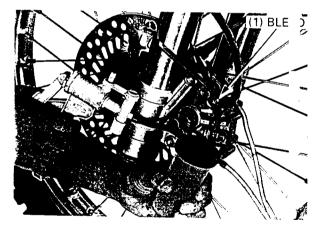
Pump the brake bleeder and loosen the bleed valve. Add fluid when the fluid level in the master cylinder or reservoir is low, to prevent drawing air into the system.

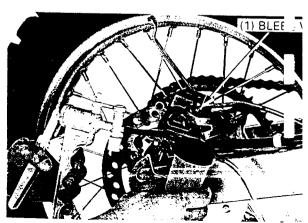
Repeat the above procedures until no air bubbles appear in the plastic hose.

NOTE

 If air is entering the bleeder from around the bleed valve threads, seal the threads with teflon tape.

If a brake bleeder is not available, perform the following procedure.





1) Attach a clear plastic hose to the breed valve.

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2) Operate the brake lever or pedal several times, then open the bleed valve 1/2 turn and close the valve.

NOTE

- Do not release the brake lever or pedal until the bleed valve has been closed.
- 3) Release the brake lever or pedal slowly and wait several seconds after it reaches the end of its travel.
- 4) Add fluid when the fluid level in the master cylinder or reservoir is low, to prevent drawing air into the system.

Repeat step 2, 3 and 4 until bubbles cease to appear in the fluid entering the hose.

Tighten the bleed valve to the specified torque.

TORQUE: 6 N·m (0.6 kgf·m, 4.3 lbf·ft)

Front

Fill the master cylinder reservoir with DOT4 brake fluid from a sealed container to the top of the casting ledge. Install the diaphragm, diaphragm plate and master cylinder cover. Tighten the screws securely.

Rear

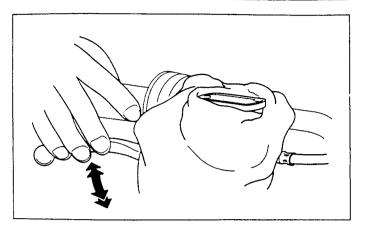
Fill the reservoir to the upper level line with DOT4 brake fluid from a sealed container.

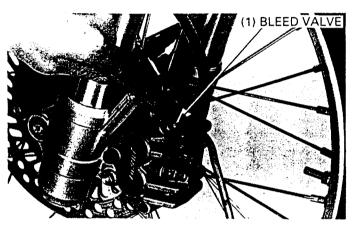
Install the diaphragm, diaphragm plate and reservoir cap. Install the reservoir tank and bolt.

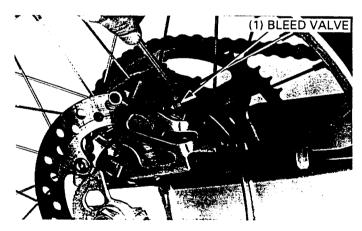
Tighten the bolt securely.

AWARNING

 A contaminated brake disc or pad reduce stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.







BRAKE PAD REPLACEMENT

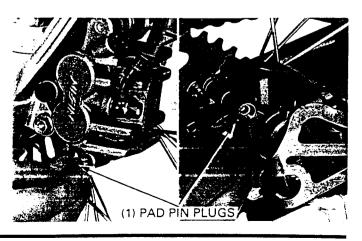
AWARNING

A contaminated brake disc or pad reduce stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.

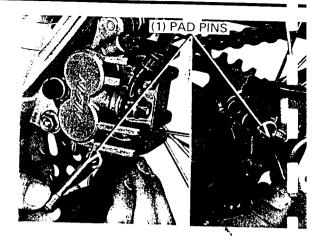
NOTE

 Always replace the brake pads in pairs to assure even disc pressure.

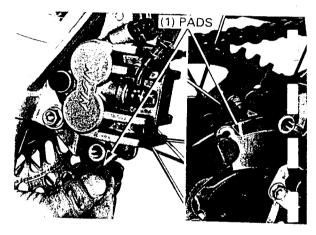
Remove the pad pin plug.



Remove the pad pin.

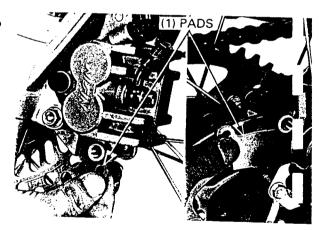


Remove the brake pads.



Insert new right side pad and push the caliper piston to allow clearance for that installation of the left side new pad.

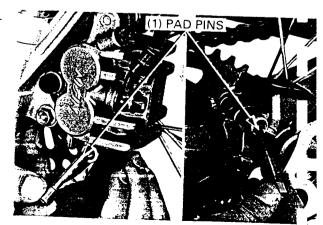
Install the left side pad.



Install the pad pin by pushing the pads against the caliper to depress the pad spring.

Tighten the pad pin to the specified torque.

TORQUE: Front: 18 N·m (1.8 kgf·m, 13 lbf·ft) Rear: 10 N·m (1.0 kgf·m, 7 lbf·ft)

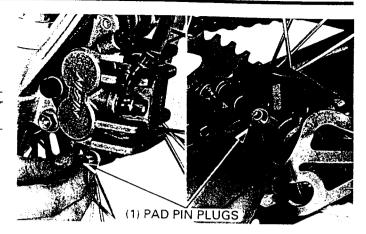


Install and tighten the pad pin plug to the specified torque.

TORQUE: 2.5 N·m (0.25 kgf·m, 1.8 lbf·ft)

AWARNING

 Check the brake system by applying the brake lever or pedal after pad replacement.



BRAKE DISC INSPECTION

Measure the brake disc thickness.

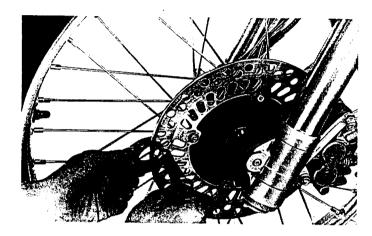
SERVICE LIMITS: Front (ED, DK types): 2.5 mm (0.11 in)

(U type)

: 3.0 mm (0.12 in)

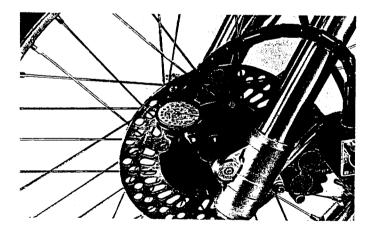
Rear:

4.0 mm (0.16 in)



Measure the brake disc warpage.

SERVICE LIMIT: 0.25 mm (0.010 in)

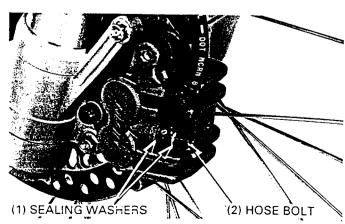


FRONT BRAKE CALIPER

REMOVAL

CAUTION

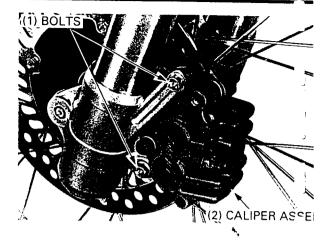
Avoid spilling fluid on painted, plastic or rubber parts.
 Place a shop towel over these parts whenever the system is serviced.



Drain the brake fluid (page 15-3).

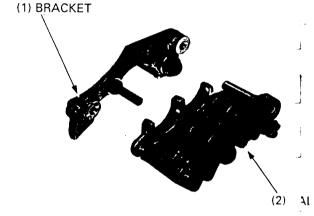
Remove the following:

- Brake hose bolt
- Sealing washers
- Front brake caliper bracket bolts
- Front brake caliper assembly



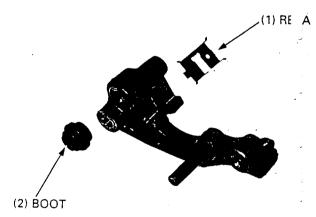
DISASSEMBLY

Remove the caliper bracket from the caliper.

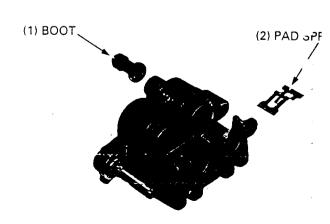


Remove the following:

- Caliper pin boot
- Retainer



- Bracket boot
- Pad spring



If necessary, lightly apply compressed air to the caliper fluid inlet to get the piston out.

Place a shop rag under the caliper to cushion the piston when it is expelled.
Use the air in short spurts.

AWARNING

Do not bring the air nozzle too close to the inlet or the pistons may be forced out with excessive force that could cause injury.

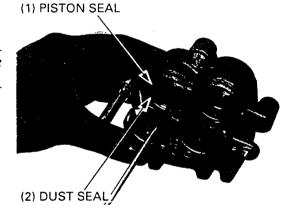


Remove the piston seals and dust seals.

CAUTION

• Be careful not to damage the piston sliding surfaces when removing the seals.

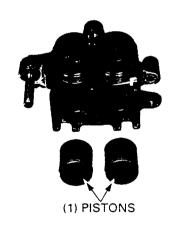
Clean the piston and caliper cylinder with fresh brake fluid.



INSPECTION

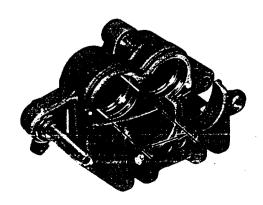
Check the cylinder and pistons for scoring, scratches or other damage.

Replace if necessary.



Measure the I.D. of the cylinder bores.

SERVICE LIMIT: 27.06 mm (1.065 in)

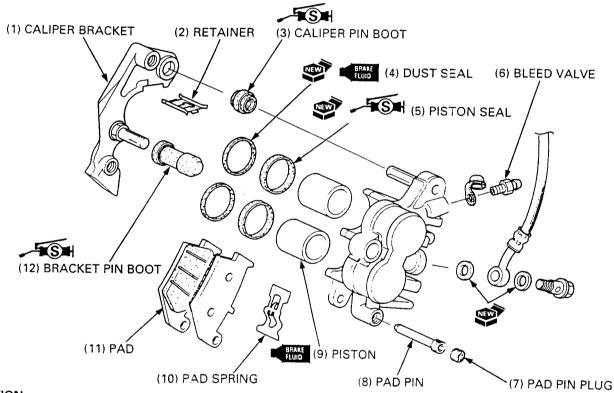


Measure the O.D. of the pistons.

SERVICE LIMIT: 26.89 mm (1.059 in)



ASSEMBLY



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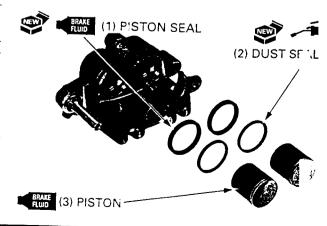
CAUTION

Reusing drained fluids can impair braking efficiency.
 Do not reuse fluid.

NOTE

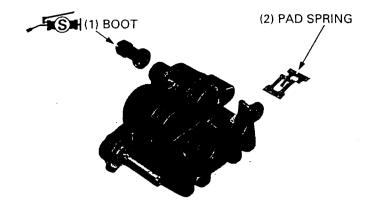
- Replace the piston seals and dust seals as a set whenever they are removed.
- Replace the boots, if damaged.
- Apply silicone grease inside the boots.
- Make sure that each part is free from dust or dirt before reassembly.

Coat the pistons, piston seals and dust seals with the recommended brake fluid.

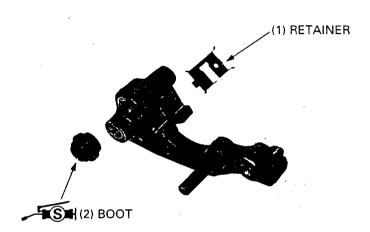


Install the following:

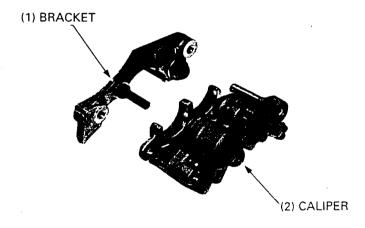
- Piston seals
- __ Dust seals
- Pistons
- Pad spring
- Bracket pin boot



- Retainer
- Caliper pin boot



Install the caliper bracket to the brake caliper.



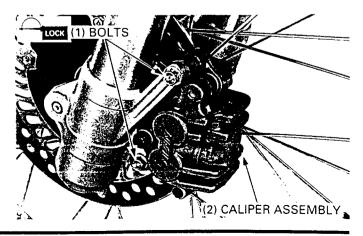
INSTALLATION

Install the front brake caliper assembly.

Clean the brake caliper bracket bolts and apply a locking agent.

Install and tighten the bracket bolts to the specified torque.

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)

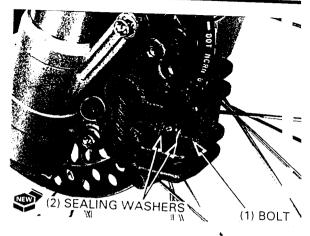


Connect the brake hose eyelet joint with two new sealing washers, then tighten the oil bolt.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Fill the master cylinder with DOT4 brake fluid from a sealed container and bleed any air from the front brake system (page 15-4).

Install the brake pads (page 15-6).



Manufacture Control of the Control o

FRONT MASTER CYLINDER

REMOVAL

CAUTION

- Avoid spilling fluid on painted, plastic or rubber parts.
- Place a shop towel over these parts whenever the system is serviced.

NOTE

 When removing the brake hose bolt, cover the end of the hose to prevent contamination.

CONTRACTOR OF THE PROPERTY OF

Secure the hose to prevent fluid from leaking out.

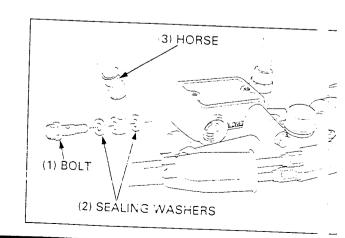
Drain the brake fluid (page 15-3).

Remove the following:

— Brake lever/knuckle guard (page 15-25)

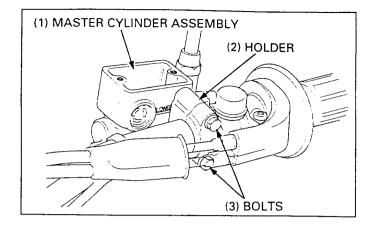
(1) FRONT MASTER CYLINDER

- Brake hose bolt
- Sealing washers
- Brake hose



Remove the following:

- Front master cylinder holder bolts
- Front master cylinder holder
- Front master cylinder



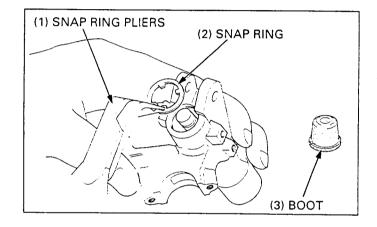
DISASSEMBLY

Remove the boot and snap ring using the special tool.

TOOL:

Snap ring pliers

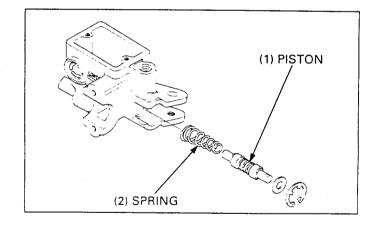
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Remove the following:

- Piston assembly
- Spring

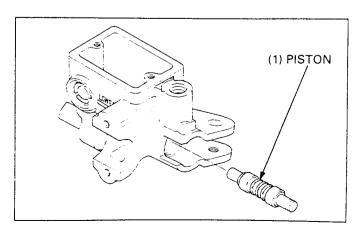
Check the spring and replace if necessary.



INSPECTION

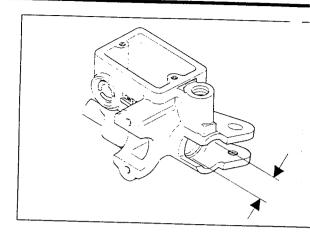
Check the cylinder and piston for scoring, scratches or other damage.

Replace if necessary.



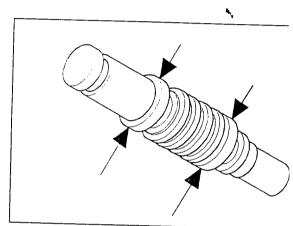
Measure the I.D. of the cylinder bore.

SERVICE LIMIT: 12.76 mm (0.502 in)

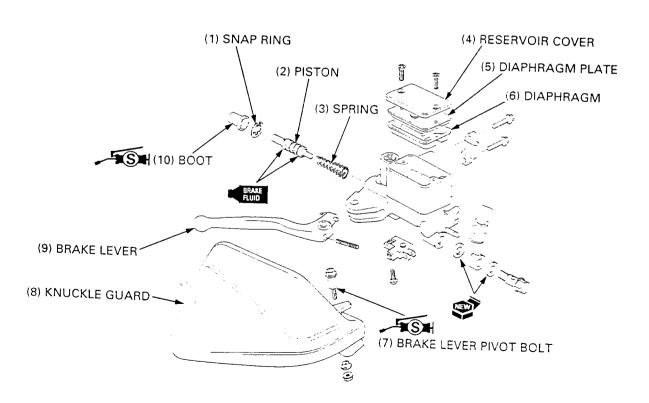


Measure the O.D. of the piston.

SERVICE LIMIT: 12.63 mm (0.497 in)



ASSEMBLY

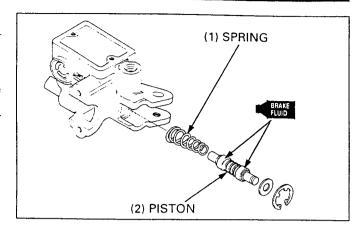


NOTE

- · Replace the piston assembly and spring as a set if damaged.
- · Replace the boot, if damaged.
- · Apply silicone grease to the inside of the boot.
- Make sure that each part is free from dust or dirt before reassembly.

Coat the piston cups with the recommended brake fluid. Install the following:

- Spring
- Piston assembly



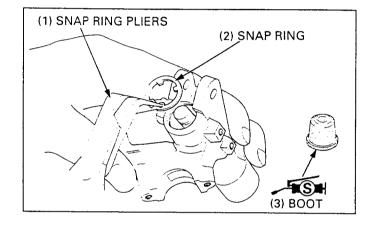
Install the snap ring using the special tool.

TOOL:

Snap ring pliers

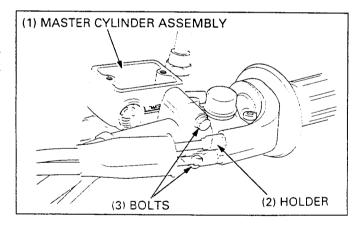
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Install the boot.



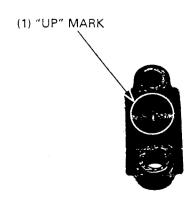
INSTALLATION

Place the master cylinder on the handlebar and install the holder and two mounting bolts with holder's "UP" mark facing up.



Align the end of the holder with the punch mark on the handlebar. Torque the upper bolt first, then the lower bolt.

TORQUE: 9 N·m (0.9 kgf·m, 6.5 lbf·ft)

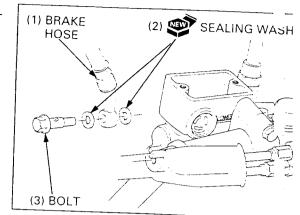


Connect the brake hose eyelet joint with new sealing washers.

Tighten the bolt.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Install the brake lever/knuckle guard (page 15-26). Fill the master cylinder with DOT4 brake fluid from a sealed container and bleed any air from the front brake system (page 15-4).



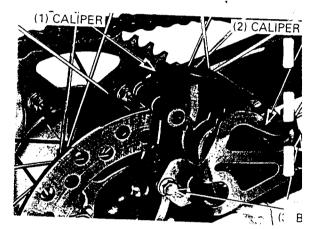
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REAR BRAKE CALIPER

REMOVAL

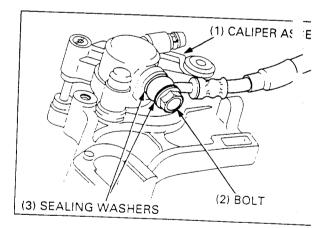
Drain the brake fluid (page 15-3). Remove the caliper guard mounting bolts and caliper guard. Move the rear wheel back to free the tab from the swingarm (page 14-3).

Remove the rear brake caliper.



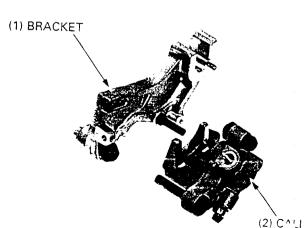
Remove the following:

- Brake hose bolt
- Sealing washers
- Rear brake caliper assembly



DISASSEMBLY

Remove the caliper bracket from the caliper.

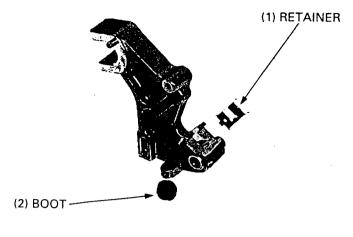


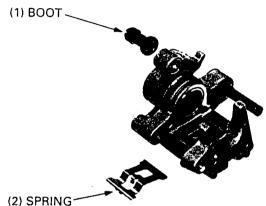
Remove the following:

- Caliper pin boot
- Retainer

- Bracket boot

- Pad spring







If necessary, lightly apply compressed air to the caliper fluid inlet to get the piston out.

Place a shop rag under the caliper to cushion the piston when it is expelled. Use the air in short spurts.

AWARNING

Do not bring the air nozzle too close to the inlet or the pistons may be forced out with excessive force that could cause injury.

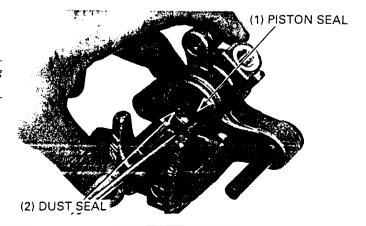


Remove the piston seal and dust seal.

CAUTION

Be careful not to damage the piston sliding surfaces when removing the seals.

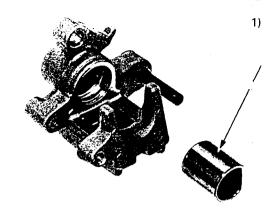
Clean the piston and caliper cylinder with fresh brake fluid.



INSPECTION

Check the cylinder and piston for scoring, scratches or other damage.

Replace if necessary.



Commence of the Commence of th

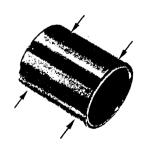
Measure the cylinder bore I.D..

SERVICE LIMIT: 27.06 mm (1.065 in)

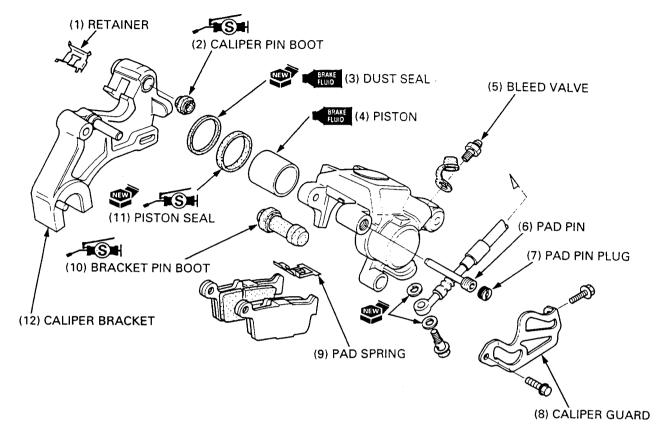


Measure the piston O.D..

SERVICE LIMIT: 26.89 mm (1.059 in)



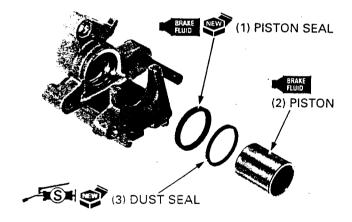
ASSEMBLY



NOTE

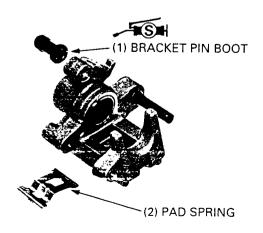
- Replace the piston assembly and spring as a set if damaged.
- Replace the boot, if damaged.
- · Apply silicone grease to the inside of the boot.
- Make sure that each part is free from dust or dirt before reassembly.

Coat the piston, piston seal and dust seal with the recommended brake fluid.



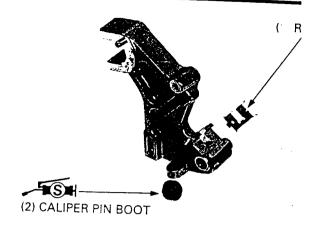
Install the following:

- Piston seal
- Dust seal
- Piston
- Pad spring
- Bracket pin boot



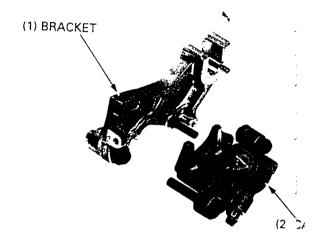
Install the following:

- Retainer
- Caliper pin boot



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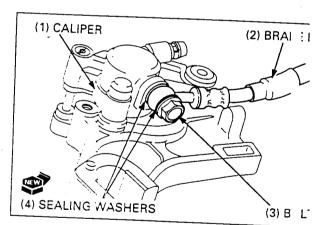
Install the caliper bracket to the brake caliper.



INSTALLATION

Connect the brake hose eyelet joint with two new sealing washers, then tighten the oil bolt.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

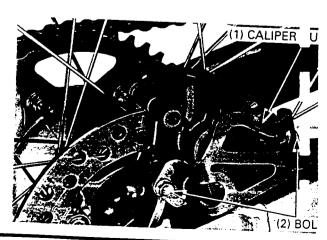


Install the rear brake caliper to the axle shaft. Align the bracket with the slide rail on the swingarm. Install the caliper guard and tighten the mounting bolts.

Adjust the drive chain slack (page 3-13).

Fill the master cylinder with DOT4 brake fluid from a sealed container and bleed any air from the front brake system (page 15-4).

Install the brake pads (page 15-6).



REAR MASTER CYLINDER

REMOVAL

CAUTION

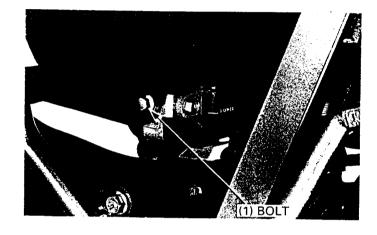
- Avoid spilling fluid on painted, plastic or rubber parts.
- Place a shop towel over these parts whenever the system is serviced.

NOTE

 When removing the brake hose bolt, cover the end of the hose to prevent contamination.
 Secure the hose to prevent fluid from leaking out.

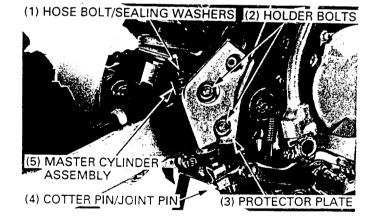
Drain the brake fluid (page 15-3).

Remove the reservoir tank bracket bolt.



Remove the following:

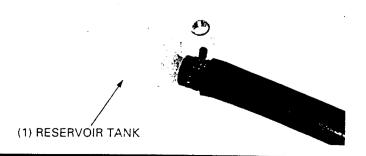
- Cotter pin/joint pin
- Brake hose bolt
- Sealing washers
- Brake hose
- Rear master cylinder holder bolts
- Rear master cylinder protector plate
- Rear master cylinder



DISASSEMBLY

Remove the following:

- Reservoir tank



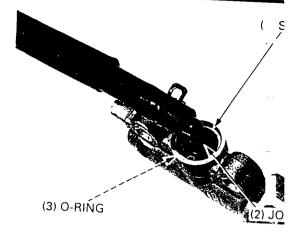
Remove the following:

- Snap ring (use special tool)
- Joint pipe
- O-ring

TOOL:

Snap ring pliers

07914 - 3230001



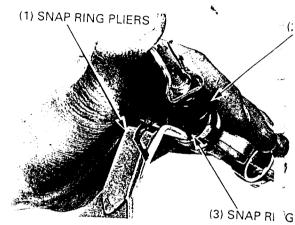
A STATE OF THE STA

- -- Boot
- Snap ring

TOOL:

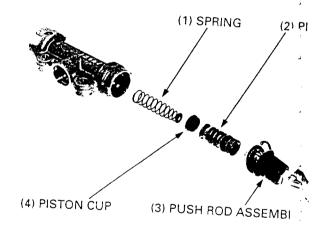
Snap ring pliers

07914 - 3230001



- Push rod assembly
- Piston assembly
- Piston cup
- Spring

Check the spring and replace if necessary.



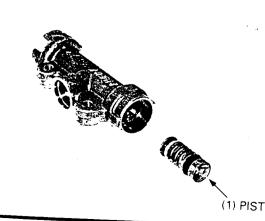
INSPECTION

Check the cylinder and pistons for scoring, scratches or other

Replace if necessary.

NOTE

Replace the piston assembly and spring as a set if dam-



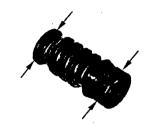
Measure the cylinder bore I.D..

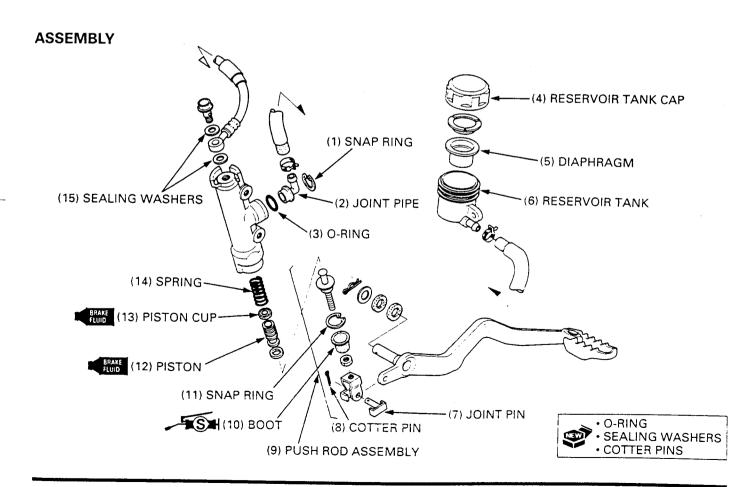
SERVICE LIMIT: 14.06 mm (0.554 in)



Measure the piston O.D..

SERVICE LIMIT: 13.95 mm (0.549 in)





NOTE

- Repair the piston assembly and spring as a set if damaged.
- Replace the boot, if damaged.
- Apply silicone grease to the inside of the boot.
- Make sure that each part is free from dust or dirt before reassembly.

Coat the piston cup with the recommended brake fluid. Install the following:

- Spring
- Piston cup
- Piston assembly
- Push rod assembly

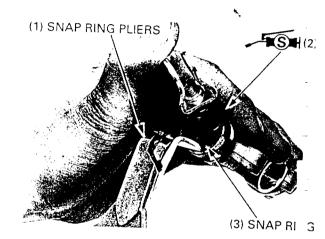
Install the snap ring.

TOOL:

Snap ring pliers

07914 - 3230001

Install the boot.



The second se

(4) PISTON

(1) SPRING

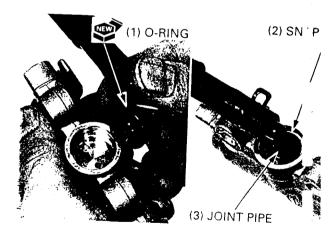
Calana o fin

(3) PUSH ROD ASSEMBLY

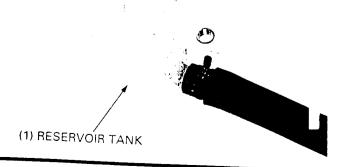
(2) PISTON CL >

Install the following:

- New O-ring
- Joint pipe
- Snap ring (use special tool)



- Reservoir tank



CANADA SALARA SALAR

INSTALLATION

Apply a locking agent to the threads of the master cylinder holder bolts.

Install the following:

- Rear master cylinder assembly
- Master cylinder protector plate
- Master cylinder holder bolt

TORQUE: 14 N·m (1.4 kgf·m, 10 lbf·ft)

- Brake hose

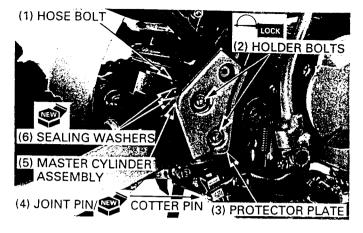
CAUTION

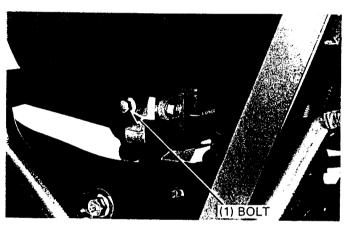
- Align the eyelet joint with the notch in the master cylinder first, then tighten the bolt.
- After installing the brake hose to the master cylinder, make sure it does not interfere with the movement of the shock absorber.
- New sealing washers
- Brake hose bolt

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

- Joint pin
- New cotter pin
- Reservoir tank bracket bolt

Fill the master cylinder with DOT4 brake fluid from a sealed container and bleed any air from the rear brake system (page 15-3).

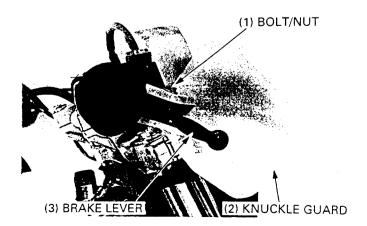




BRAKE LEVER

REMOVAL

Remove the brake lever pivot bolt/nut



Remove the following:

- Knuckle guard
- Brake lever
- Return spring

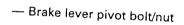
INSTALLATION

Apply silicone grease to the following parts:

- Brake lever adjuster bolt tip
- Brake lever pivot bolt sliding surface

Install the following:

- Return spring
- Brake lever
- Knuckle guard

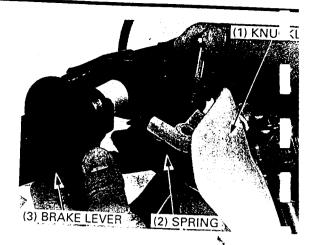


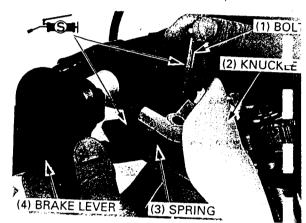
BRAKE PEDAL

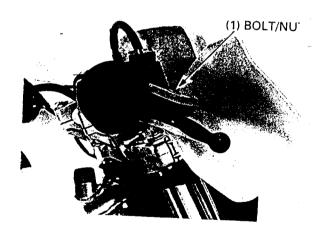
REMOVAL

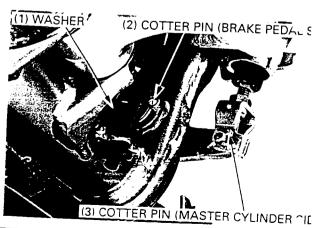
Remove the following:

- Cotter pin (master cylinder side)
- Cotter pin (brake pedal side)
- Washer

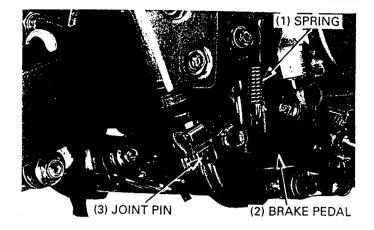








- Joint pin
- Brake pedal return spring
- Brake pedal



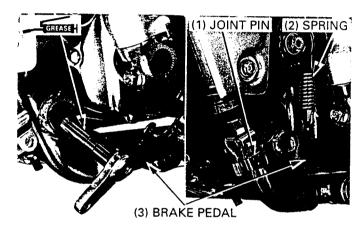
INSTALLATION

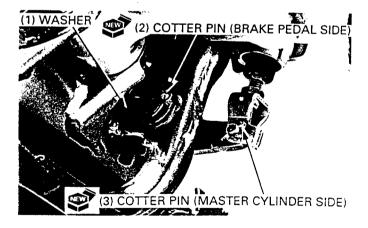
Apply grease to the brake pedal pivot.

Install the following:

- Brake pedal
- Brake pedal return spring
- Joint pin

- Washer
- New cotter pin (brake pedal side)
- New cotter pin (master cylinder side)





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