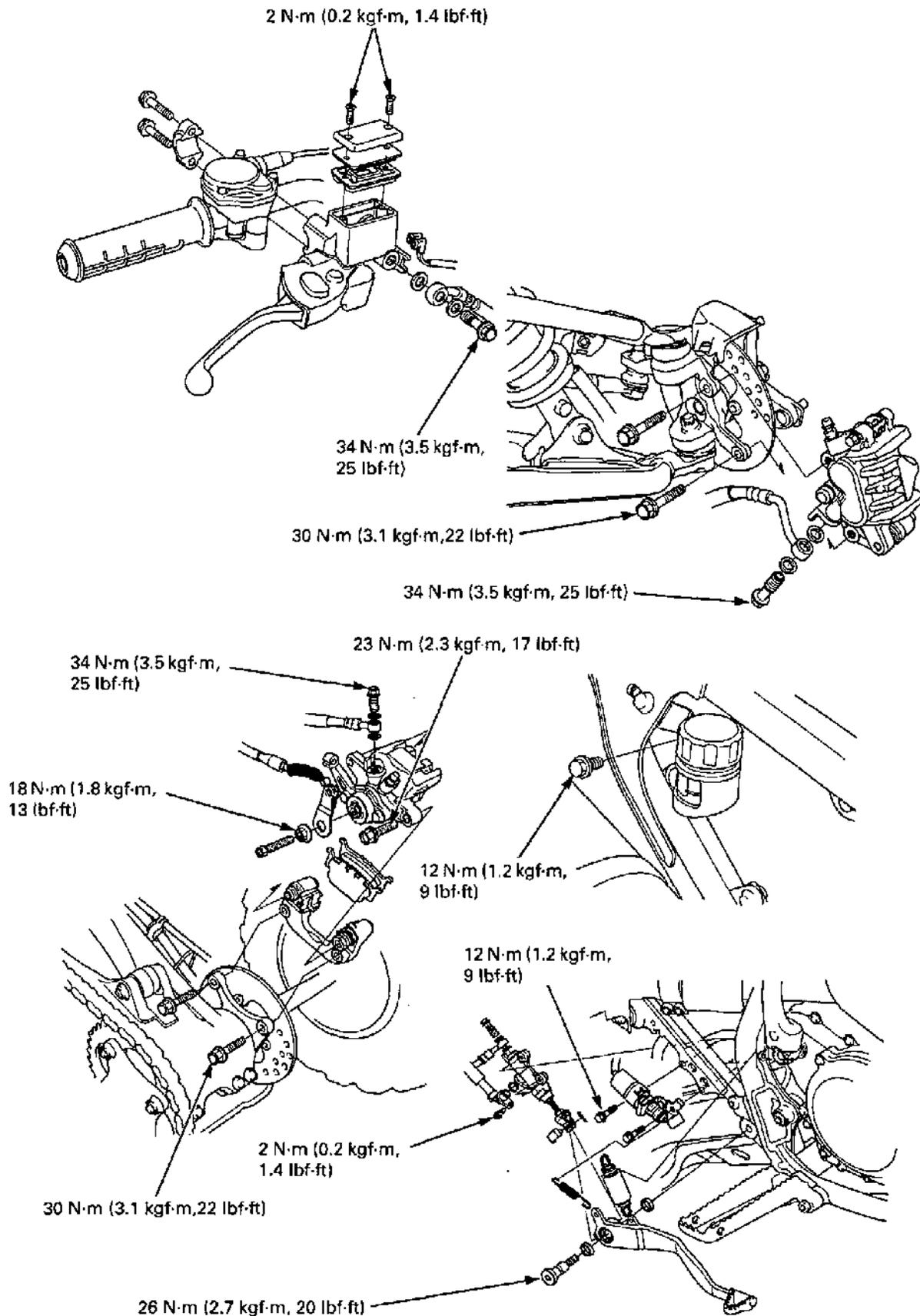


19. HYDRAULIC BRAKE

SYSTEM COMPONENTS	19-2	FRONT MASTER CYLINDER	19-10
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HYDRAULIC BRAKE

SYSTEM COMPONENTS



SERVICE INFORMATION

GENERAL

⚠ CAUTION

- Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.
- Avoid breathing dust particles.
 - Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.

NOTICE

- *Spilled brake fluid will severely damage the plastic parts and painted surfaces. It is also harmful to some rubber parts. Be careful whenever you remove the reservoir cap; make sure the reservoir is horizontal first.*
- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- Never allow contaminants (e.g., dirt, water) to enter an open reservoir.
- Once the hydraulic system has been opened, or if the brake feels spongy, the system must be bled.
- Always use fresh DOT 4 brake fluid from a sealed container when servicing the system. Do not mix different types of fluid as they may not be compatible.
- Always check brake operation before riding the vehicle.

SPECIFICATION

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Recommended brake fluid		DOT 4 brake fluid	-
Front brake	Disc thickness	2.8 – 3.2 (0.11 – 0.13)	2.5 (0.10)
	Disc runout	-	0.30 (0.012)
	Master cylinder I.D.	12.7 (0.55)	-
	Caliper cylinder I.D.	25.4 (1.00)	-
Rear brake	Brake disc thickness	3.8 – 4.2 (0.15 – 0.17)	3.5 (0.14)
	Brake disc runout	-	0.30 (0.012)
	Master cylinder I.D.	12.7 (0.55)	-
	Caliper cylinder I.D.	32.0 (1.26)	-

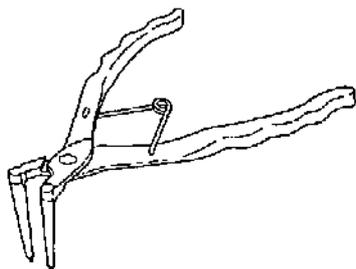
TORQUE VALUES

Brake caliper bleed valve	6 N·m (0.6 kgf·m, 4.3 lbf·ft)	
Front master cylinder reservoir cap screw	2 N·m (0.2 kgf·m, 1.4 lbf·ft)	
Rear brake reservoir mounting bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Front brake disc cover bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	ALOC bolt; replace with a new one.
Front brake pad pin	18 N·m (1.8 kgf·m, 13 lbf·ft)	
Rear brake caliper pin bolt	23 N·m (2.3 kgf·m, 17 lbf·ft)	
Brake hose oil bolt	34 N·m (3.5 kgf·m, 25 lbf·ft)	
Front brake lever pivot bolt	1 N·m (0.1 kgf·m, 0.7 lbf·ft)	
Front brake lever pivot nut	6 N·m (0.6 kgf·m, 4.3 lbf·ft)	
Front brake light switch screw	1 N·m (0.1 kgf·m, 0.7 lbf·ft)	
Front brake caliper bracket mounting bolt	30 N·m (3.1 kgf·m, 22 lbf·ft)	ALOC bolt; replace with a new one.
Rear brake reservoir hose joint screw	2 N·m (0.2 kgf·m, 1.4 lbf·ft)	Apply locking agent to the threads.
Rear master cylinder mounting bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Rear brake caliper mounting bolt	30 N·m (3.1 kgf·m, 22 lbf·ft)	ALOC bolt; replace with a new one.
Parking brake base bolt	23 N·m (2.3 kgf·m, 17 lbf·ft)	
Brake pedal pivot bolt	26 N·m (2.7 kgf·m, 20 lbf·ft)	

HYDRAULIC BRAKE

TOOLS

Snap ring pliers
07914-SA50001



TROUBLESHOOTING

Brake lever/pedal soft or spongy

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

Brake lever/pedal hard

- Clogged/restricted brake system
- Sticking/worn caliper piston
- Sticking/worn master cylinder piston
- Caliper not sliding properly
- Bent brake lever/pedal

Brake drags

- Contaminated brake pad/disc
- Badly worn brake pad/disc
- Warped/deformed brake disc
- Caliper not sliding properly
- Clogged/restricted fluid passage
- Sticking caliper piston

BRAKE FLUID REPLACEMENT/AIR BLEEDING

BRAKE FLUID DRAINING

FRONT BRAKE

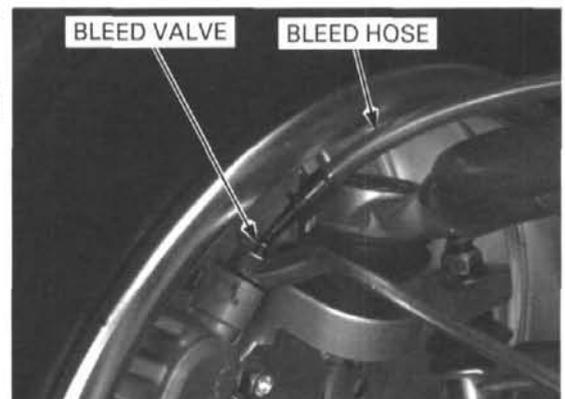
Turn the handlebar to the left until the reservoir is level before removing the reservoir cap.

Remove the screws, reservoir cap, set plate and diaphragm.



Connect a bleed hose to the front brake caliper bleed valve.

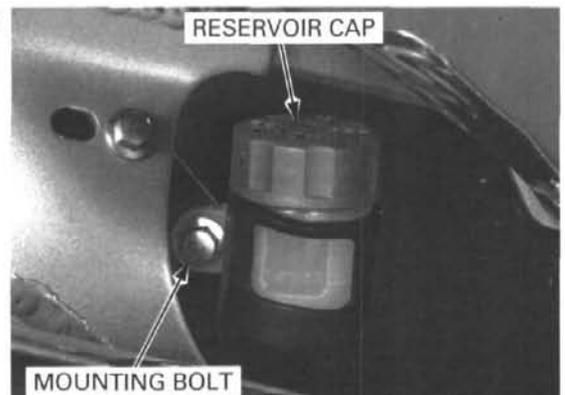
Loosen the bleed valve and pump the front brake lever until no more fluid flows out of the bleed valve.



REAR BRAKE

Remove the rear brake reservoir mounting bolt from the stay.

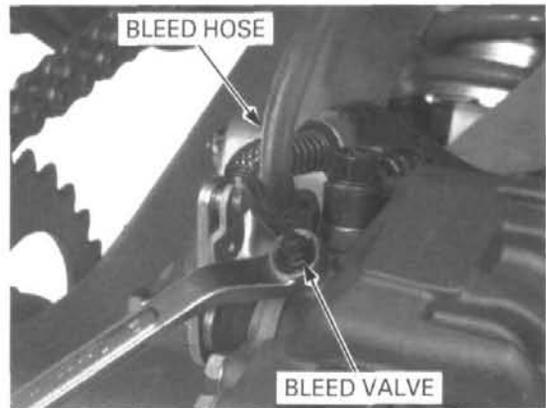
Remove the reservoir cap, set plate and diaphragm.



HYDRAULIC BRAKE

Connect a bleed hose to the rear brake caliper bleed valve.

Loosen the bleed valve and pump the brake pedal until no more fluid flows out of the bleed valve.



BRAKE FLUID FILLING/AIR BLEEDING

FRONT BRAKE

Close the front brake caliper bleed valve.

Fill the front master cylinder reservoir with DOT 4 brake fluid from a sealed container.

Follow the manufacturer's operating instructions.

Connect a commercially available brake bleeder to the bleed valve.

Operate the brake bleeder and loosen the bleed valve.

Check the fluid level often while bleeding the brake to prevent air from being pumped into the system.

If an automatic refill system is not used, add fluid when the fluid level in the reservoir is low.

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

Perform the bleeding procedure until the system is completely flushed/bled.

Tighten the bleed valve.

TORQUE: 6 N·m (0.6 kgf·m, 4.3 lbf·ft)

Perform air bleeding for the other side bleed valve.



If the brake bleeder is not available, perform the following procedure:

Pump up the system pressure with the front brake lever until the lever resistance is felt.

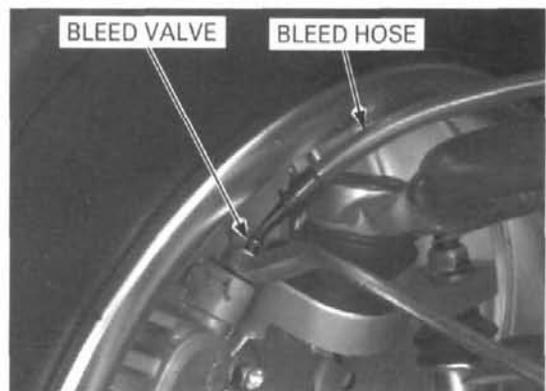
Connect a bleed hose to the front brake caliper bleed valve and bleed the system as follows:

Do not release the brake lever until the bleed valve has been closed.

1. Squeeze the brake lever all the way and loosen the bleed valve 1/2 of a turn. Wait several seconds and then close the bleed valve.
2. Release the brake lever slowly and wait several seconds after it reaches the end of its travel.
3. Repeat the steps 1 and 2 until there are no air bubbles in the bleed hose.

Tighten the bleed valve.

TORQUE: 6 N·m (0.6 kgf·m, 4.3 lbf·ft)



Perform air bleeding for the other side bleed valve.

After bleeding air, operate the front brake lever. If it still feels spongy, bleed the system again.

Fill the front master cylinder reservoir to the casting ledge with DOT 4 brake fluid from a sealed container.

Install the diaphragm, set plate and reservoir cap, and tighten the screws.

TORQUE: 2 N·m (0.2 kgf·m, 1.4 lbf·ft)



REAR BRAKE

Close the rear brake caliper bleed valve.

Fill the rear brake reservoir with DOT 4 brake fluid from a sealed container.

Follow the manufacturer's operating instructions.

Connect a commercially available brake bleeder to the bleed valve.

Operate the brake bleeder and loosen the bleed valve.

Check the fluid level often while bleeding the brake to prevent air from being pumped into the system.

If an automatic refill system is not used, add fluid when the fluid level in the reservoir is low.

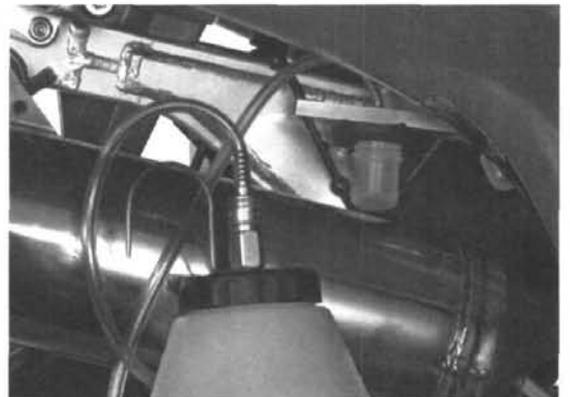
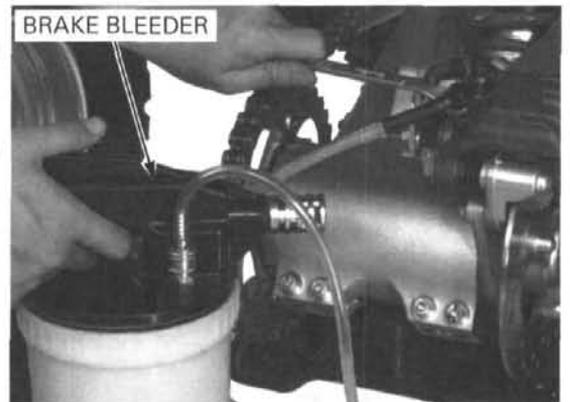
If air enters the bleeder from around the bleed valve threads, seal the threads with teflon tape.

Perform the bleeding procedure until the system is completely flushed/bled.

Tighten the bleed valve.

TORQUE: 6 N·m (0.6 kgf·m, 4.3 lbf·ft)

Perform air bleeding for the other side bleed valve.



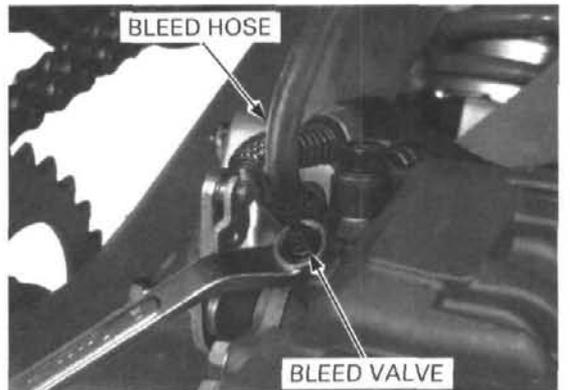
If the brake bleeder is not available, perform the following procedure:

Pump up the system pressure with the brake pedal until the pedal resistance is felt.

Connect a bleed hose to the rear brake caliper bleed valve and bleed the system as follows:

Do not release the brake pedal until the bleed valve has been closed.

1. Depress the brake pedal all the way and loosen the bleed valve 1/2 of a turn. Wait several seconds and then close the bleed valve.
2. Release the brake pedal slowly and wait several seconds after it reaches the end of its travel.
3. Repeat the steps 1 and 2 until there are no air bubbles in the bleed hose.



HYDRAULIC BRAKE

Tighten the bleed valve.

TORQUE: 6 N·m (0.6 kgf·m, 4.3 lbf·ft)

Perform air bleeding for the other side bleed valve.

After bleeding air, operate the brake pedal. If it still feels spongy, bleed the system again.

Fill the rear brake reservoir to the "UPPER" level line with DOT 4 brake fluid from a sealed container.

Install the diaphragm, set plate and reservoir cap. Install the rear brake reservoir onto the stay and tighten the mounting bolt.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



BRAKE PAD/DISC

FRONT BRAKE PAD REPLACEMENT

Remove the front wheel (page 17-11).

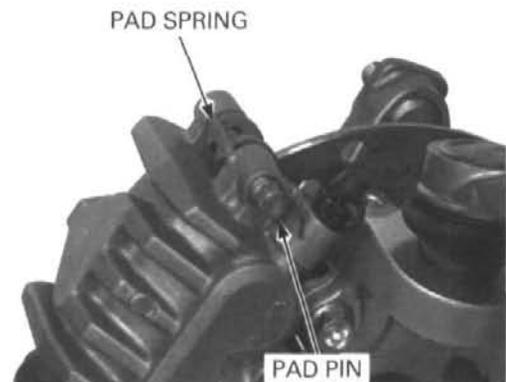
Check the fluid level in the master cylinder reservoir as this operation causes the fluid level to rise.

Push the caliper pistons all the way in by pushing the caliper body against the disc to allow installation of new brake pads.

Remove the bolt and disc cover.



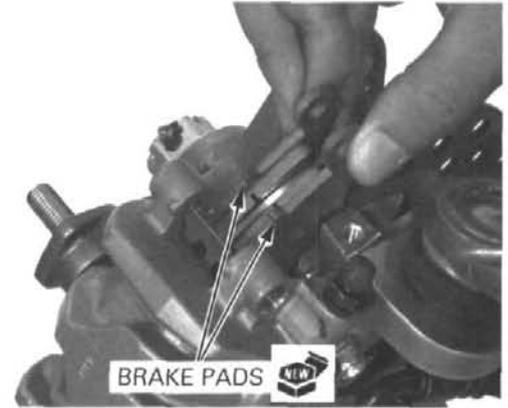
Loosen the pad pin and remove it while pushing the brake pads against the pad spring.



Remove the brake pads from the caliper body.

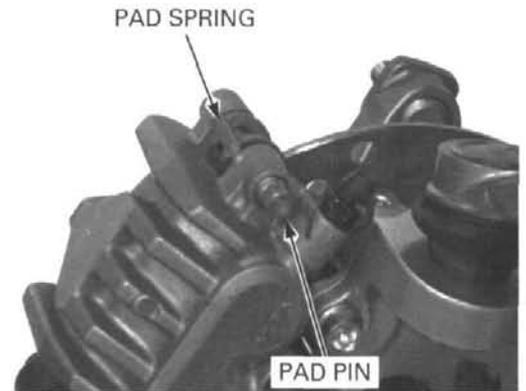
Always replace the brake pads in pairs to ensure even disc pressure.

Install new brake pads into the caliper body so their ends rest on the retainer properly.



Install the pad pin while pushing the brake pads against the pad spring and tighten it.

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)



Install the disc cover with a new bolt and tighten the bolt.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the front wheel (page 17-11).

Squeeze the front brake lever to seat the caliper pistons against the pad.

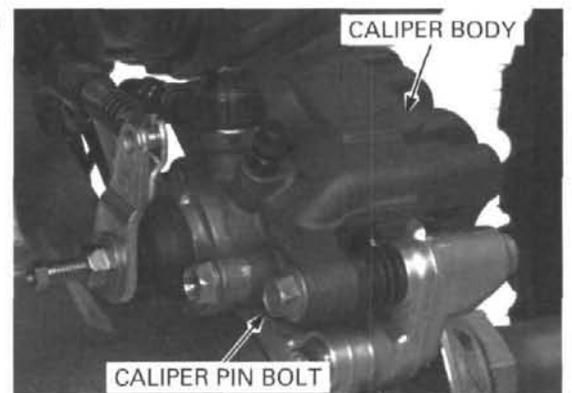


REAR BRAKE PAD REPLACEMENT

Check the fluid level in the rear brake reservoir as this operation causes the fluid level to rise.

Push the caliper pistons all the way in by pushing the caliper body against the disc to allow installation of new brake pads.

Remove the caliper pin bolt.



HYDRAULIC BRAKE

Pivot the caliper body up and remove the brake pads from the caliper bracket.

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

Install new brake pads into the caliper bracket with the shim facing toward the piston side.

Lower the caliper body, install the caliper pin bolt and tighten it.

TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)

Depress the brake pedal to seat the caliper piston against the pad.



BRAKE DISC INSPECTION

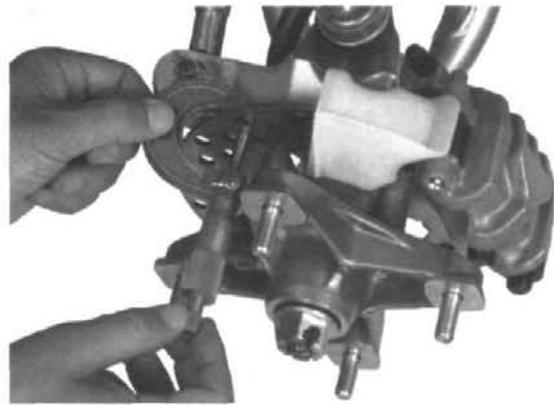
For front brake disc, remove the front wheel (page 17-11).

Visually inspect the brake disc for damage or crack.

Measure the brake disc thickness at several points.

**SERVICE LIMITS: Front: 2.5 mm (0.10 in)
Rear: 3.5 mm (0.14 in)**

Replace the brake disc if the smallest measurement is less than service limit.



Check the brake disc for warpage.

SERVICE LIMIT: 0.30 mm (0.012 in)

Check the front wheel hub bearings or rear axle bearings for excessive play, if the warpage exceeds the service limit.

Replace the brake disc if the bearings are normal.

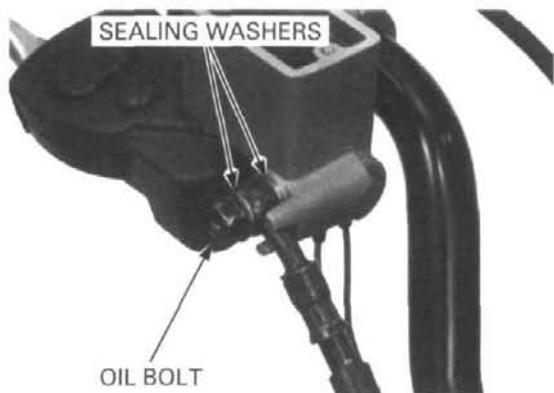


FRONT MASTER CYLINDER

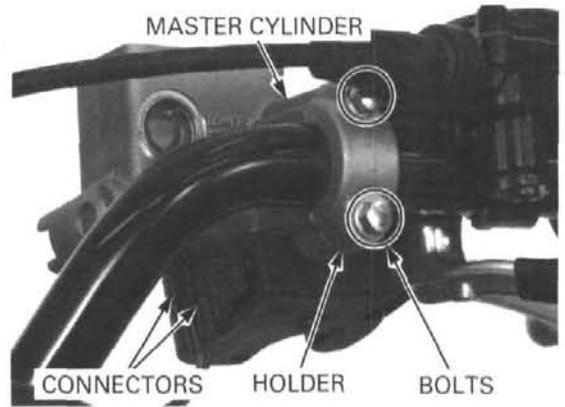
DISASSEMBLY

Drain the brake fluid from the front brake hydraulic system (page 19-5).

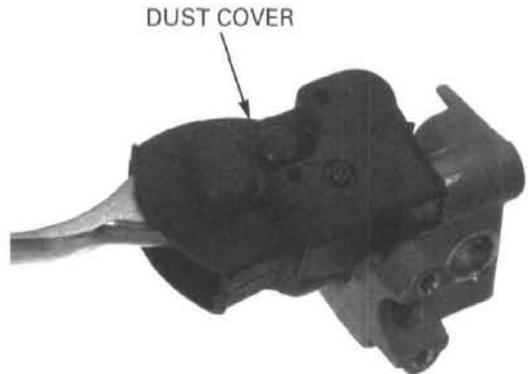
Disconnect the brake hose by removing the oil bolt and sealing washers.



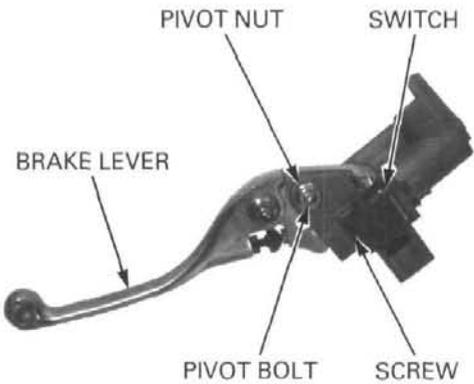
Disconnect the front brake light switch connectors.
Remove the master cylinder holder bolts, holder and master cylinder.



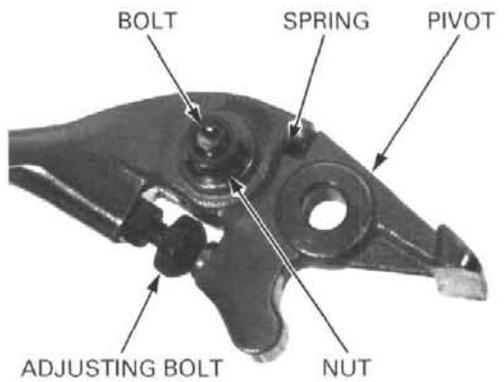
Remove the dust cover from the brake lever.



Remove the pivot nut, bolt and brake lever.
Remove the screw and brake light switch.



Remove the nut, bolt, pivot, spring and adjusting bolt from the lever if necessary.



HYDRAULIC BRAKE

Remove the boot from the master cylinder and master piston.

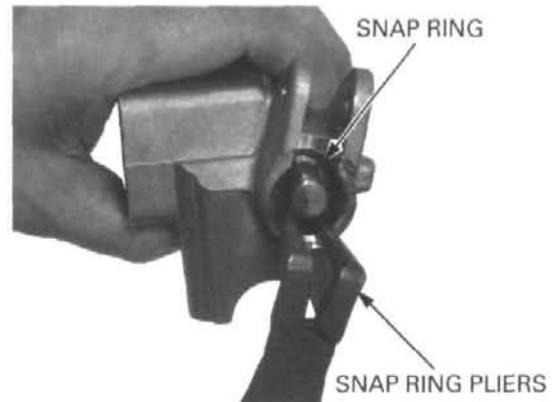


Remove the snap ring using the special tool.

TOOL:

Snap ring pliers

07914-SA50001



Remove the master piston and spring.

Clean the master cylinder, reservoir and master piston in clean brake fluid.

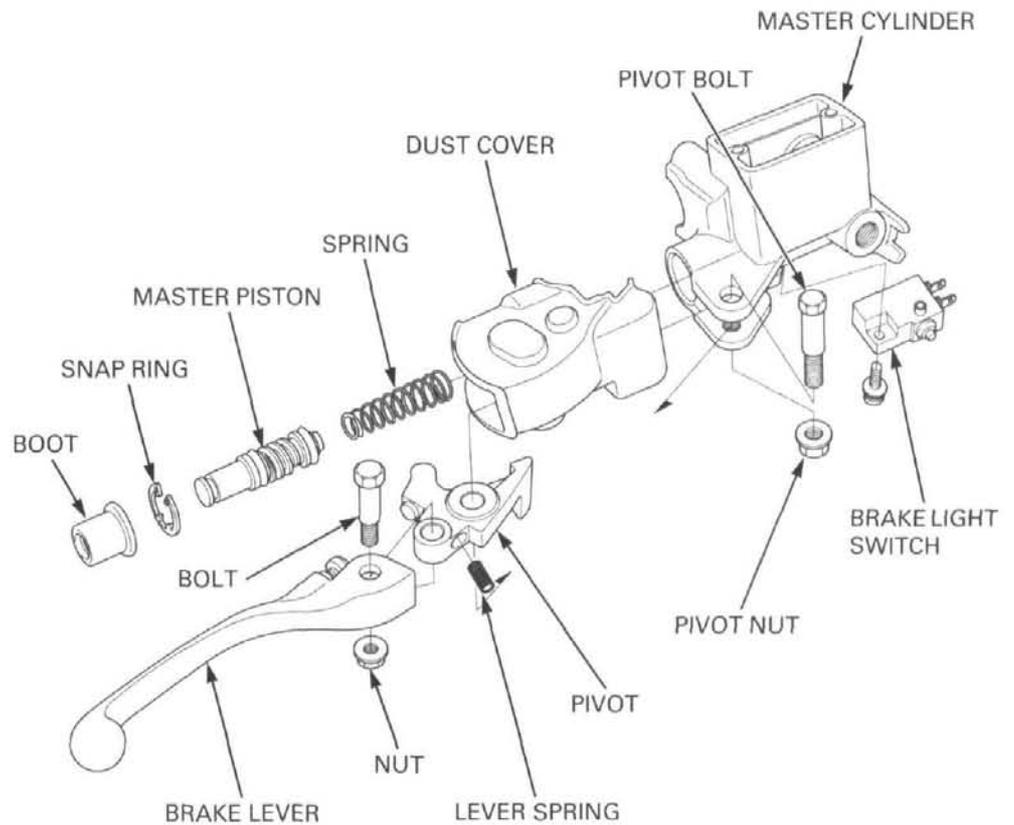
INSPECTION

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

Check the piston cups for wear, deterioration or damage.



ASSEMBLY

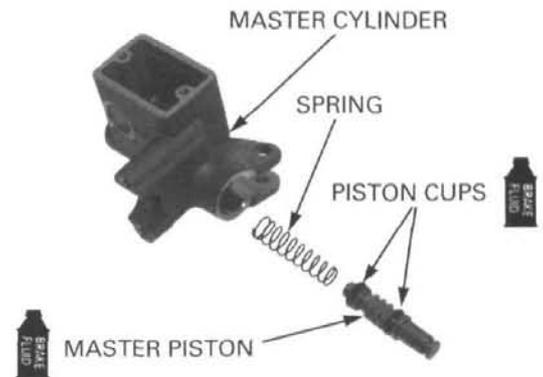


Coat the master piston and piston cups with clean DOT 4 brake fluid.

Install the spring onto the piston end.

Do not allow the piston cup lips to turn inside out.

Install the spring and master piston into the master cylinder.

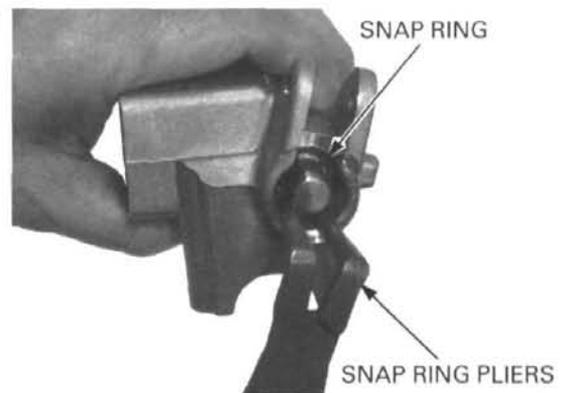


Be certain the snap ring is firmly seated in the groove.

Install the snap ring into the groove in the master cylinder using the special tool.

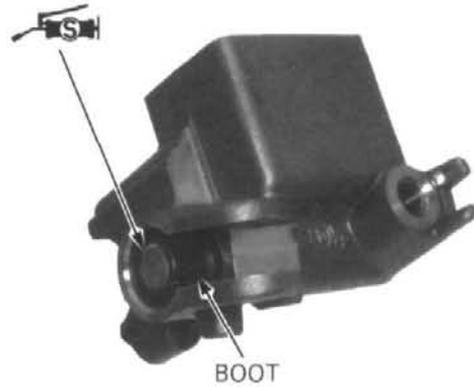
TOOL:
Snap ring pliers

07914-SA50001



HYDRAULIC BRAKE

Install the boot into the master cylinder and the groove in the piston.
Apply silicone grease to the brake lever pivot-to-master piston contact area.

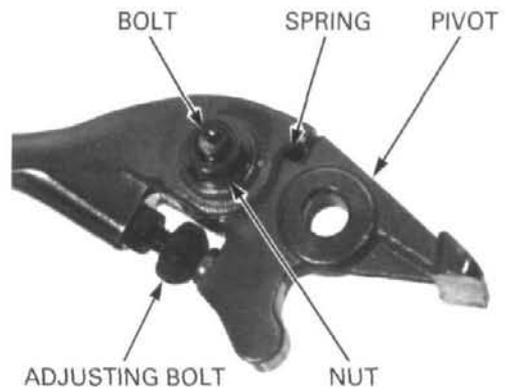


Assemble the adjusting bolt, spring, pivot and bolt, and tighten the bolt.

TORQUE: 1 N·m (0.1 kgf·m, 0.7 lbf·ft)

Install the nut and tighten it.

TORQUE: 6 N·m (0.6 kgf·m, 4.3 lbf·ft)



Apply silicone grease to the brake lever pivot bolt sliding surface.

Install the pivot bolt and tighten it.

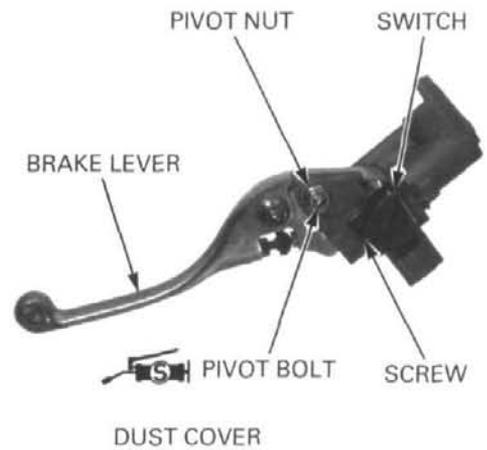
TORQUE: 1 N·m (0.1 kgf·m, 0.7 lbf·ft)

Install the pivot nut and tighten it.

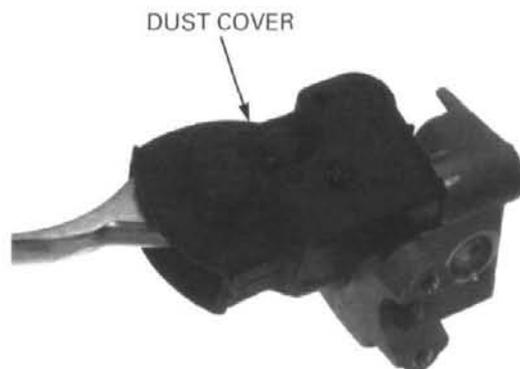
TORQUE: 6 N·m (0.6 kgf·m, 4.3 lbf·ft)

Install the brake light switch and tighten the screw.

TORQUE: 1 N·m (0.1 kgf·m, 0.7 lbf·ft)



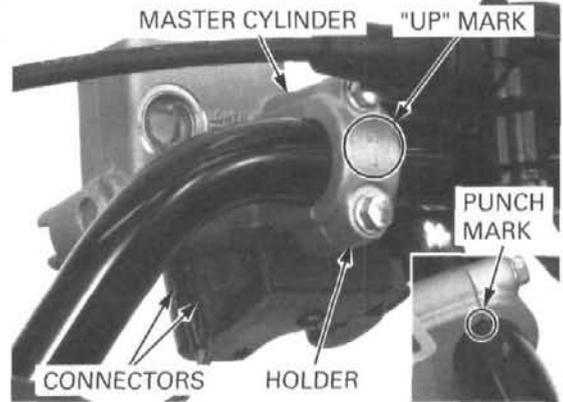
Install the dust cover onto the brake lever.



Align the edge of the master cylinder with the punch mark on the handlebar.

Install the front brake master cylinder and holder with the "UP" mark facing up. Tighten the upper bolt first, then tighten the lower bolt.

Connect the front brake light switch connectors.



Rest the brake hose joint between the stoppers on the master cylinder.

Connect the brake hose with the oil bolt and new sealing washers, and tighten the oil bolt.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Fill and bleed the hydraulic system (page 19-6).



FRONT BRAKE CALIPER

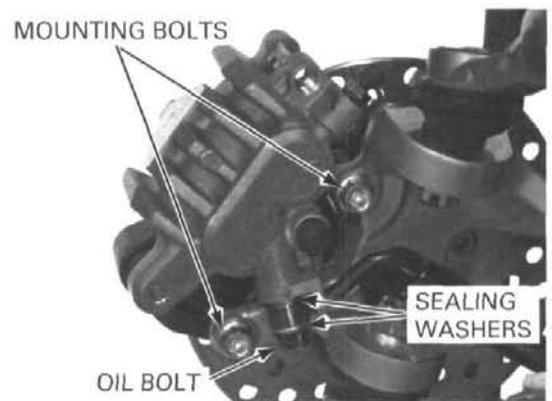
DISASSEMBLY

Drain the brake fluid from the hydraulic system (page 19-5).

Remove the front brake pads (page 19-8).

Disconnect the brake hose from the brake caliper by removing the oil bolt and sealing washer.

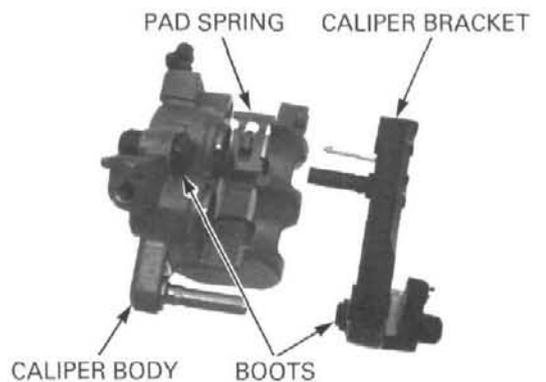
Remove the two mounting bolts and brake caliper assembly.



Remove the caliper bracket from the caliper body.

Remove the caliper pin boot and pad retainer from the caliper bracket.

Remove the pad spring and bracket pin boot from the caliper body.



HYDRAULIC BRAKE

Place a shop towel over the pistons.

Do not use high pressure air or bring the nozzle too close to the inlet.

Position the caliper body with the pistons down and apply small squirts of air pressure to the fluid inlet to remove the pistons.



Be careful not to damage the piston sliding surface.

Push the dust and piston seals in and lift them out.

Clean the seal grooves, caliper cylinders and pistons with clean brake fluid.

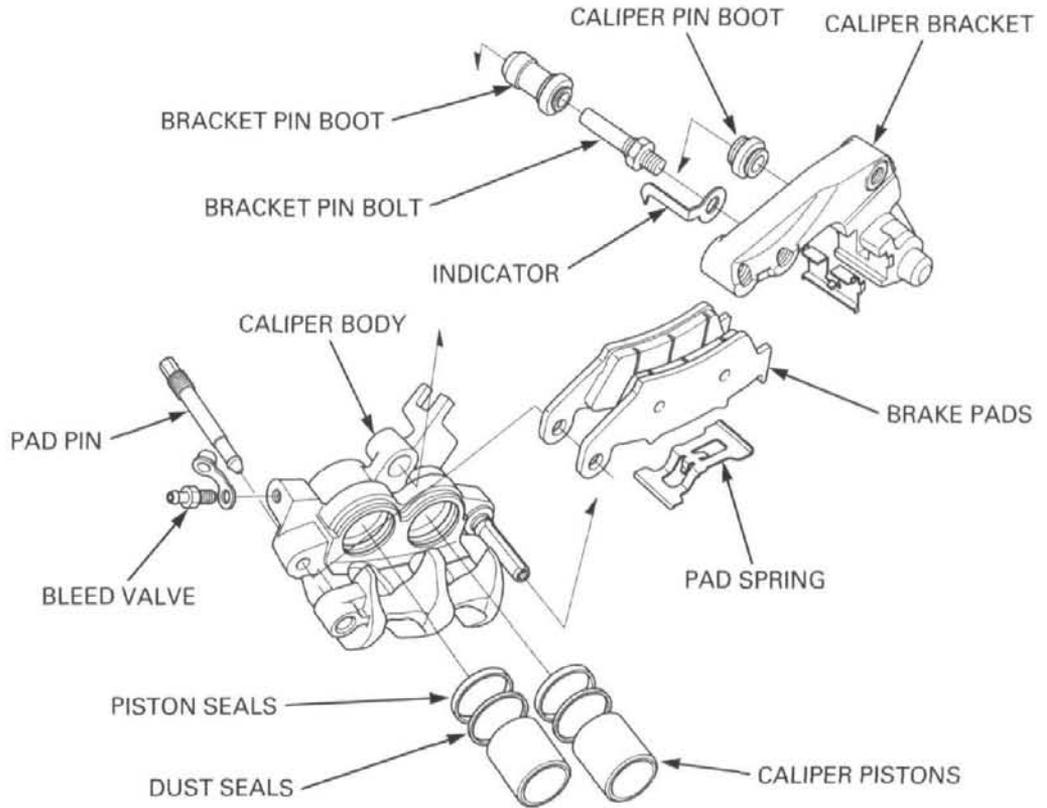


INSPECTION

Check the caliper cylinders and pistons for scoring, scratches or damage.

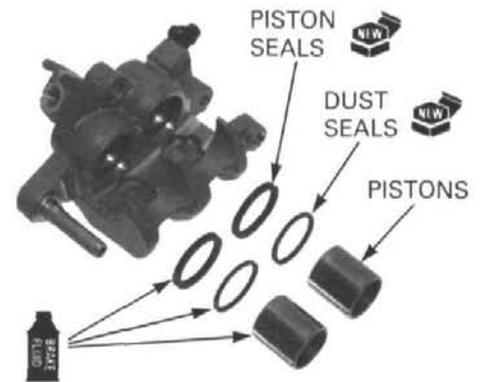


ASSEMBLY



Coat new piston and dust seals with clean brake fluid and install them into the seal grooves in the caliper cylinders.

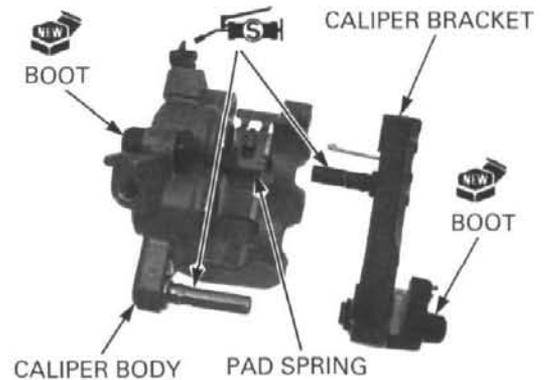
Coat the caliper pistons with clean brake fluid and install them into the caliper cylinders with the open sides toward the pads.



Install the pad spring onto the caliper body as shown.

Install new pin boots into the caliper body and bracket.

Apply silicone grease to the sliding surfaces of the caliper and bracket pins, and install the caliper bracket over the caliper body.



HYDRAULIC BRAKE

Install the brake caliper assembly onto the knuckle with new mounting bolts, and tighten the bolts.

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)

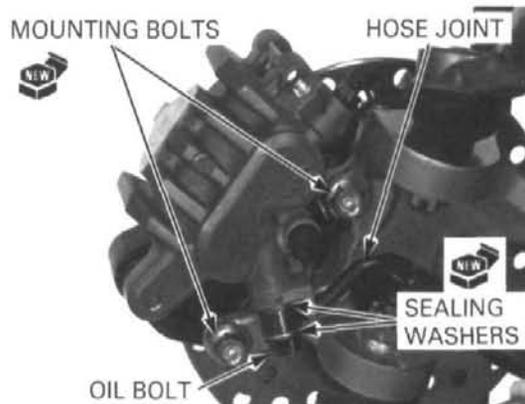
Rest the brake hose joint between the stoppers on the caliper.

Connect the brake hose with the oil bolt and new sealing washers, and tighten the oil bolt.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Install the brake pads (page 19-8).

Fill and bleed the front brake hydraulic system (page 19-6).



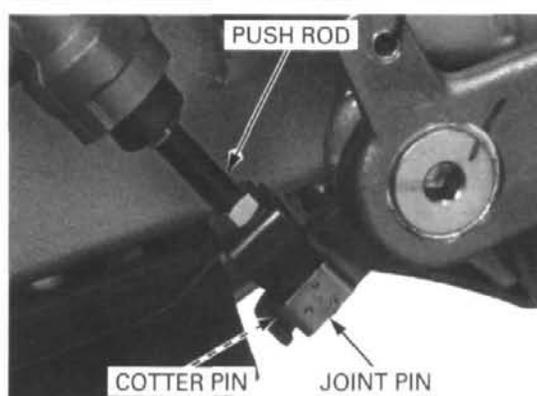
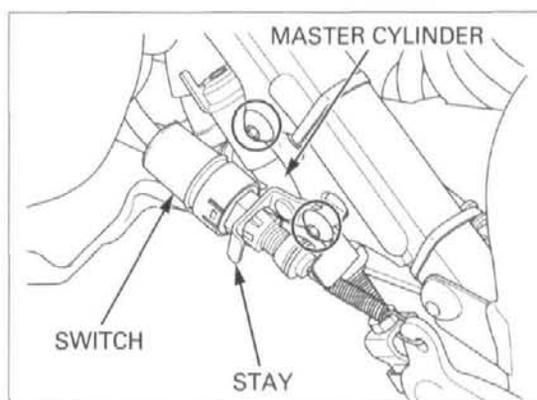
REAR MASTER CYLINDER

DISASSEMBLY

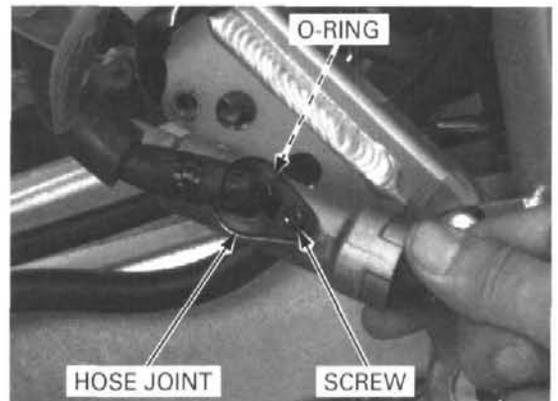
Drain the brake fluid from the rear brake hydraulic system (page 19-5).

Remove the following:

- right mud guard (page 3-3)
 - oil bolt
 - sealing washers
 - brake hose joint
-
- two mounting bolts
 - rear brake light switch with stay
 - master cylinder from the frame
-
- cotter pin
 - joint pin
 - master cylinder push rod from the brake pedal



- screw
- reservoir hose joint
- O-ring



- boot

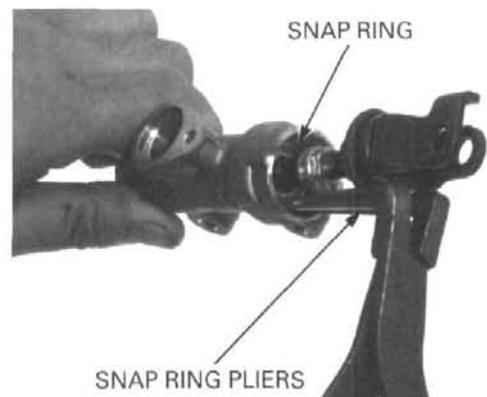


- snap ring using the special tool

TOOL:

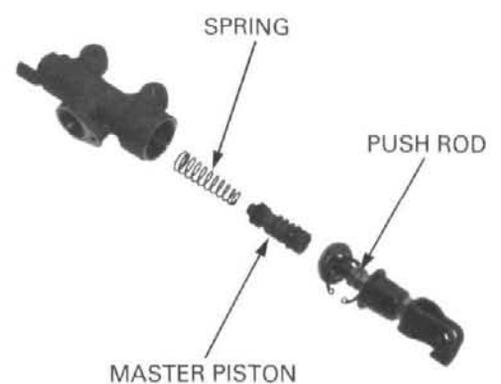
Snap ring pliers

07914-SA50001



- push rod
- master piston
- spring

Clean master cylinder and master piston in clean brake fluid.



HYDRAULIC BRAKE

INSPECTION

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

Check the piston cups for wear, deterioration or damage.



ASSEMBLY

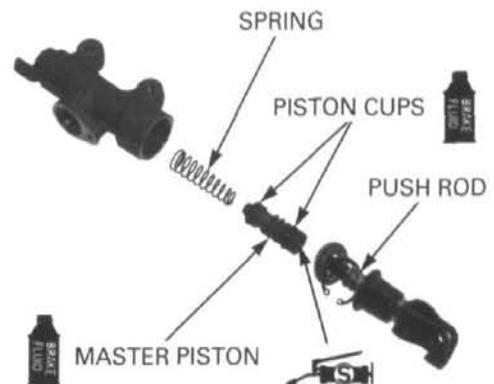
Coat the master piston and piston cups with clean DOT 4 brake fluid.

Install the spring onto the piston end.

Do not allow the piston cup lips to turn inside out.

Install the spring and master piston into the master cylinder.

Install the push rod into the master cylinder.



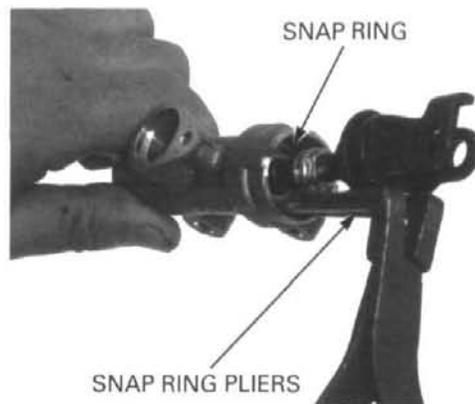
Be certain the snap ring is firmly seated in the groove.

Install the snap ring into the groove in the master cylinder using the special tool.

TOOL:

Snap ring pliers

07914-SA50001



Install the boot into the master cylinder and push rod groove.

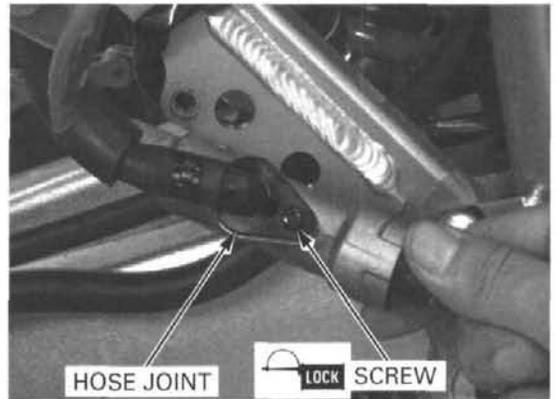


Coat a new O-ring with DOT 4 brake fluid and install it onto the reservoir hose joint.

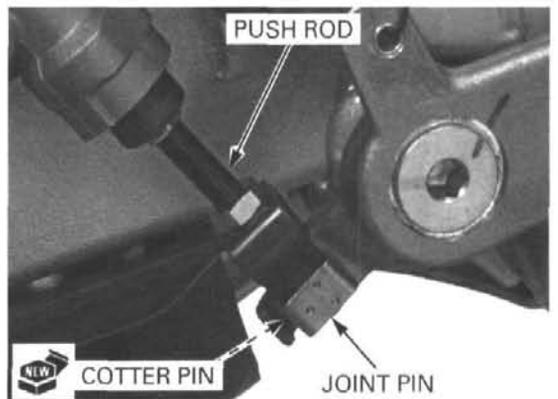


Apply locking agent to the joint screw threads. Install the reservoir hose joint into the master cylinder and tighten the screw.

TORQUE: 2 N·m (0.2 kgf·m, 1.4 lbf·ft)



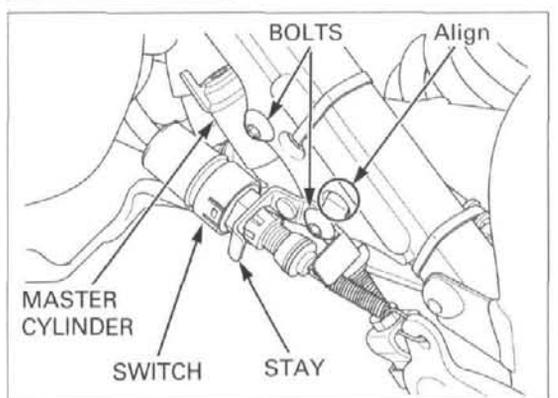
Connect the master cylinder push rod to the brake pedal with the joint pin and a new cotter pin.



Align the switch stay tab with the hole in the frame.

Install the master cylinder and rear brake light switch with stay, and tighten the two mounting bolts.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



HYDRAULIC BRAKE

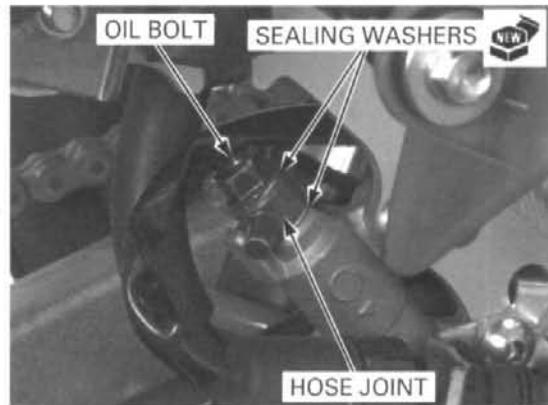
Connect the brake hose with the oil bolt and new sealing washers.

Rest the hose joint onto the stopper of the master cylinder and tighten the oil bolt.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Install the right mud guard (page 3-4).

Fill and bleed the rear brake hydraulic system (page 19-7).



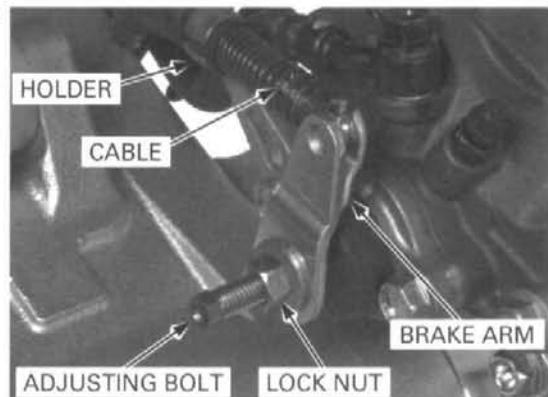
REAR BRAKE CALIPER

DISASSEMBLY

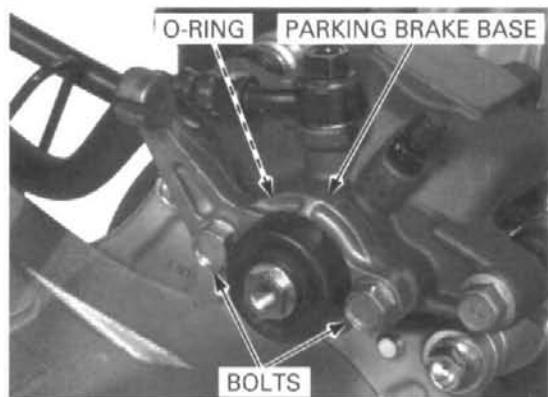
Drain the brake fluid from the rear brake hydraulic system (page 19-5).

Loosen the lock nut, and remove the adjusting bolt and brake arm.

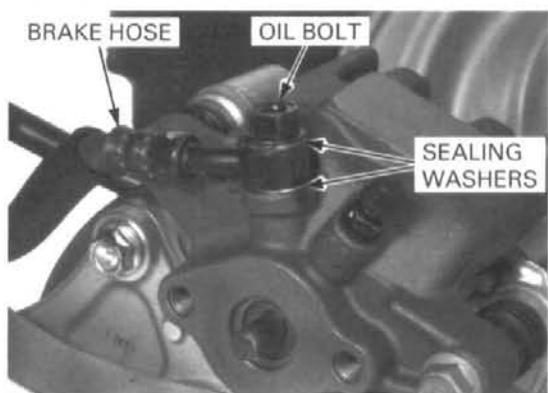
Disconnect the parking brake cable from the brake arm and remove it from the cable holder.



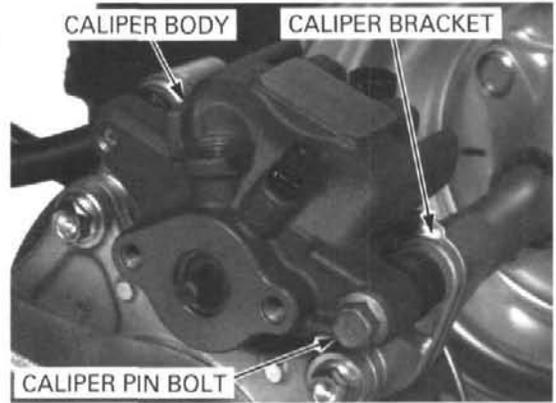
Remove the two bolts and parking brake base. Remove the O-ring.



Disconnect the brake hose from the brake caliper by removing the oil bolt and sealing washer.



Remove the caliper pin bolt.
Pivot the caliper body up and remove it from the bracket.
Remove the brake pads.

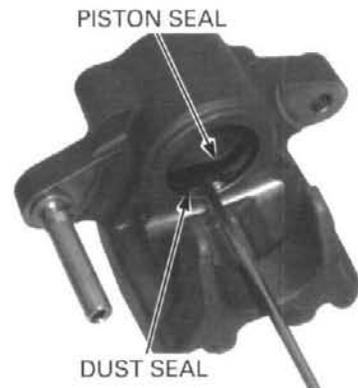


Remove the pad spring and caliper piston.



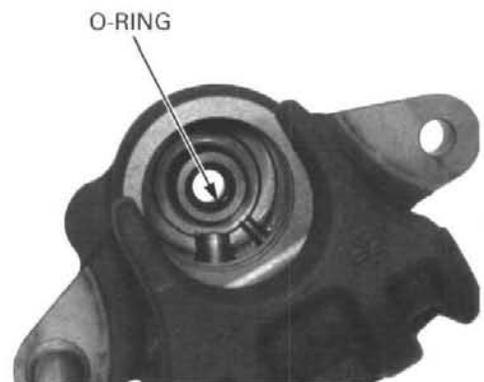
Be careful not to damage the piston sliding surface.

Push the dust and piston seals in and lift them out.



Remove the O-ring.

Clean the seal grooves, caliper cylinder and piston with clean brake fluid.

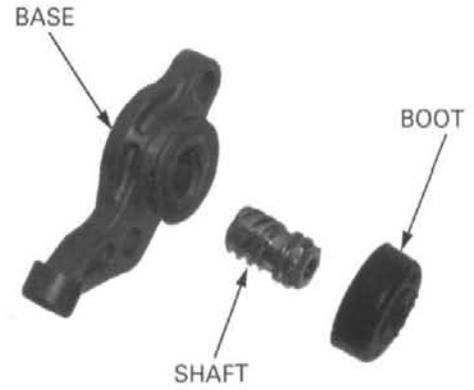


HYDRAULIC BRAKE

INSPECTION

Remove the boot and shaft from the parking brake base.

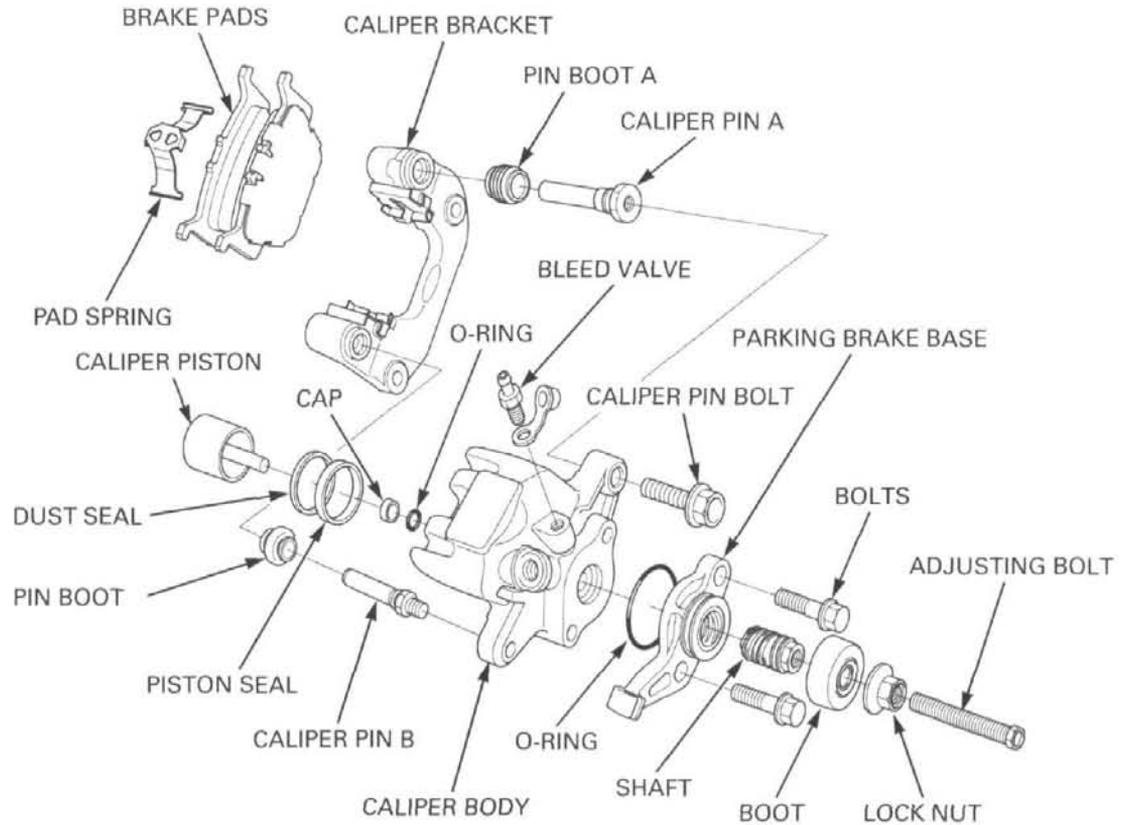
Check the shaft and base threads for wear or damage.



Check the caliper cylinders and pistons for scoring, scratches or damage.



ASSEMBLY



Coat a new O-ring with DOT 4 brake fluid and install it into the caliper hole.



Coat new piston and dust seals with clean brake fluid and install them into the seal grooves in the caliper cylinder.

Coat the caliper piston with clean brake fluid and install it into the caliper cylinder with the opening sides toward the pads.



HYDRAULIC BRAKE

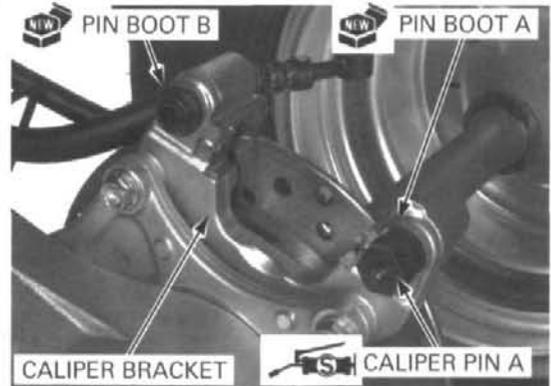
Install the pad spring as shown.



Install new pin boots A and B into the caliper bracket.

Apply silicone grease to the sliding surface of caliper pin A and install it into pin boot A.

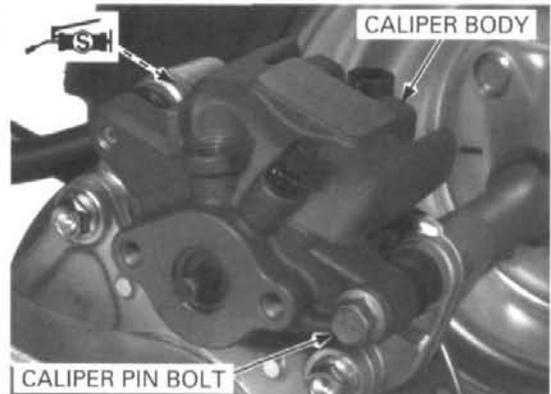
Install the brake pads onto the caliper bracket.



Apply silicone grease to the sliding surface of caliper pin B and install the caliper body onto the bracket.

Install the caliper pin bolt and tighten it.

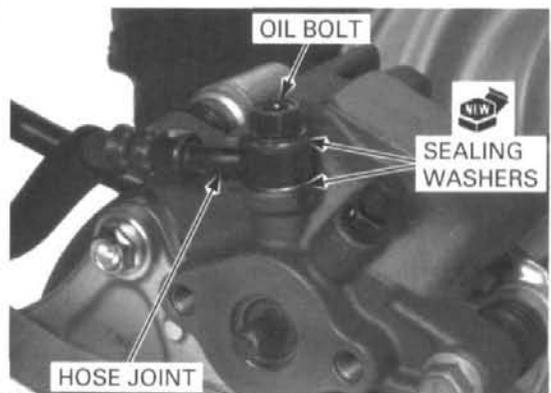
TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)



Connect the brake hose with the oil bolt and new sealing washers.

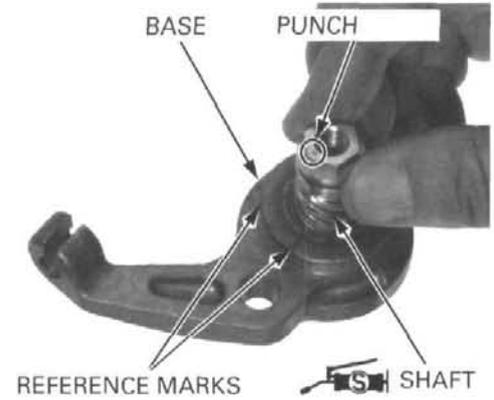
Rest the hose joint onto the stopper of the caliper body and tighten the oil bolt.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)



The parking brake shaft has left-hand threads.

Apply silicone grease to the parking brake shaft sliding surface.
Position the shaft so that the punch mark is within the reference marks on the base, and thread it. Screw the shaft in fully and make sure that the punch mark is within the reference marks.

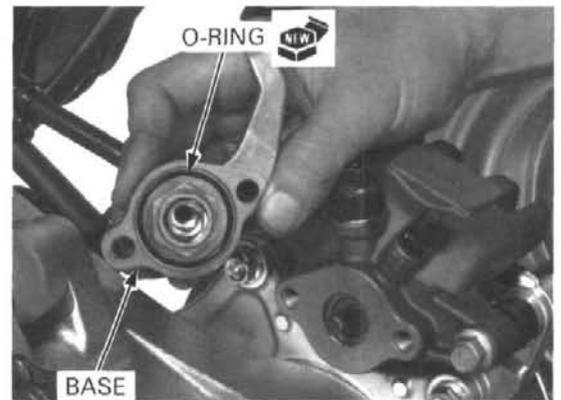


Install a new boot into the parking brake base and shaft grooves properly.

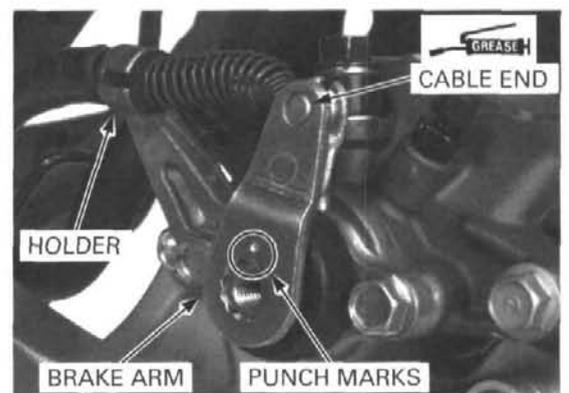


Install a new O-ring into the parking brake base. Install the base onto the caliper body and tighten the two bolts.

TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)



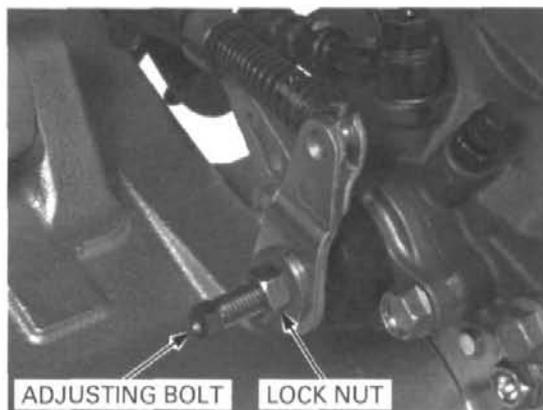
Apply grease to the parking brake cable end. Install the cable into the cable holder and connect it to the brake arm. Turn the parking brake shaft clockwise approximately 90° from fully seated position and install the brake arm on to the shaft by aligning the punch marks.



HYDRAULIC BRAKE

Loosely install the adjusting bolt and lock nut.

Adjust the parking brake cable free play (page 4-28).
Fill and bleed the rear brake hydraulic system (page 19-7).



BRAKE PEDAL

REMOVAL

Remove the following:

- right mud guard (page 3-3)
- brake pedal pivot bolt
- return spring
- brake light switch spring

- cotter pin
- joint pin
- brake pedal
- dust seals

INSTALLATION

Install the brake pedal into the master cylinder push rod joint with the joint pin and a new cotter pin.

Apply grease to the new dust seal lips and install them into the brake pedal pivot.

Hook the brake light switch spring ends to the brake pedal and switch as shown.

Hook the return spring to the brake pedal and frame as shown.

Apply grease to the pivot bolt sliding surface.
Install the pivot bolt and tighten it.

TORQUE: 26 N·m (2.7 kgf·m, 20 lbf·ft)

Install the right mud guard (page 3-4).

