

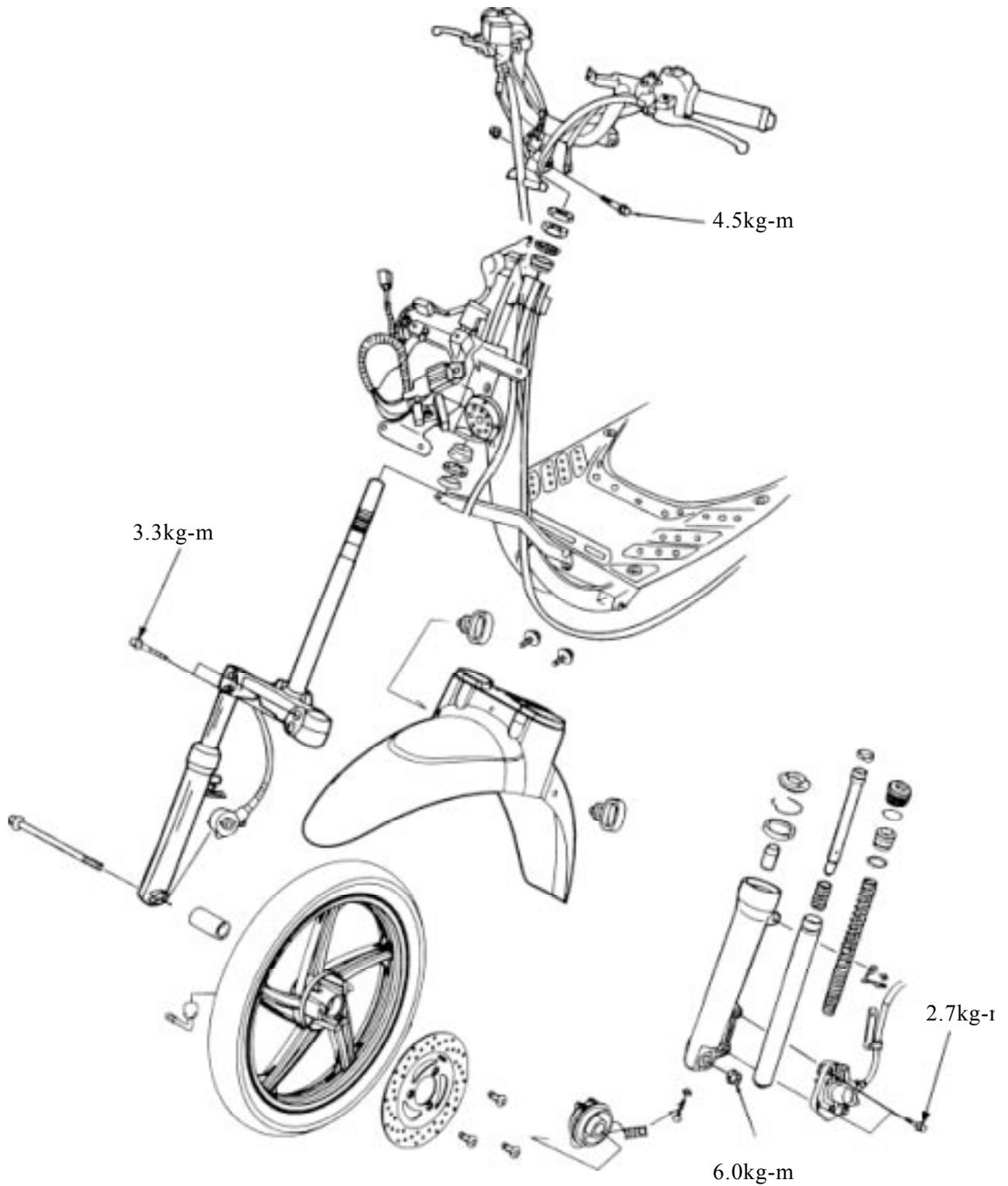
13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK

13

STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK

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13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK



13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK

SERVICE INFORMATION

SPECIFICATIONS

Item	Standard (mm)	Service Limit (mm)
Axle shaft runout	□	0.2
Front wheel rim runout	Radial	2.0
	Axial	2.0
Front shock absorber spring free length	200	182.8
Brake disk thickness	35_ 3.8	3.0
Brake disk runout	□	0.30
Brake master cylinder I.D.	12.700_ 12.743	12.75
Brake master cylinder piston O.D.	12.657_ 12.684	12.64
Brake caliper piston O.D.	25.400_ 25.405	25.45
Brake caliper piston I.D.	25.318_ 25.368	25.30

TORQUE VALUES

Handlebar lock nut	4.0_	5.0kg-m	Front damper nut	1.5_	3.0kg-m
Steering stem lock nut	8.0_	12.0kg-m	Front axle nut	5.0_	7.0kg-m
Steering top cone race	0.5_	1.3kg-m	Brake arm bolt	0.4_	0.7kg-m

SPECIAL TOOLS

Lock nut wrench	Driver handle A
Lock nut socket wrench	Outer driver, 37x40mm
Outer driver, 28x30mm	Pilot, 10mm
Rear shock absorber remover	Bearing puller
Rear shock absorber compressor	Snap ring pliers (close)
Ball race remover	Damper compressor

TROUBLESHOOTING

Hard steering (heavy)

- Excessively tightened steering stem top cone race
- Broken steering balls
- Insufficient tire pressure

Steers to one side or does not track straight

- Broken clutch weight spring
- Bent front fork
- Bent front axle or uneven tire

Poor brake performance

- Incorrectly adjusted brake
- Worn brake linings
- Contaminated brake lining surface
- Worn brake cam
- Worn brake drum
- Poorly connected brake arm

Poor brake performance (disk brake)

- Air in brake system
- Deteriorated brake fluid

- Contaminated brake disk or disk pad
- Worn brake bushing
- Worn brake master cylinder piston oil seal
- Clogged brake fluid line
- Deformed brake disk
- Unevenly worn brake caliper

Front wheel wobbling

- Bent rim
- Loose front axle
- Bent spoke plate
- Faulty tire
- Improperly tightened axle nut

Soft front shock absorber

- Weak shock springs
- Insufficient damper oil

Front shock absorber noise

- Slider bending
- Loose fork fasteners
- Lack of lubrication

13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK

STEERING HANDLEBAR

REMOVAL

Remove the handlebar front and rear covers.
(⇒ 12-3)
Remove two bolts attaching the left brake lever holder.
Remove two bolts attaching the brake master cylinder (disk brake) to the right brake lever.

Brake Master Cylinder



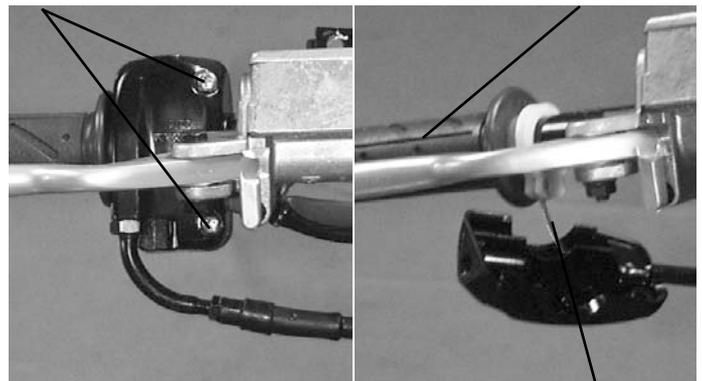
Bolts

Bolts

Remove the two right handlebar switch housing bolts and separate the housing. Disconnect the throttle cable and then remove the throttle pipe from the handlebar.

Bolts

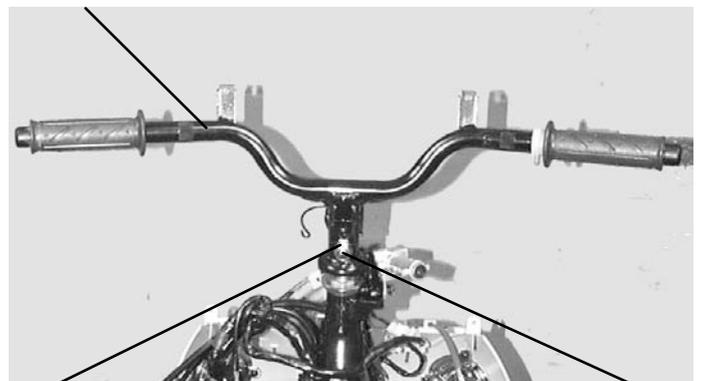
Throttle Pipe



Throttle Cable

Remove the handlebar lock nut to remove the handlebar.

Handlebar



Nut

Bolt

13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK

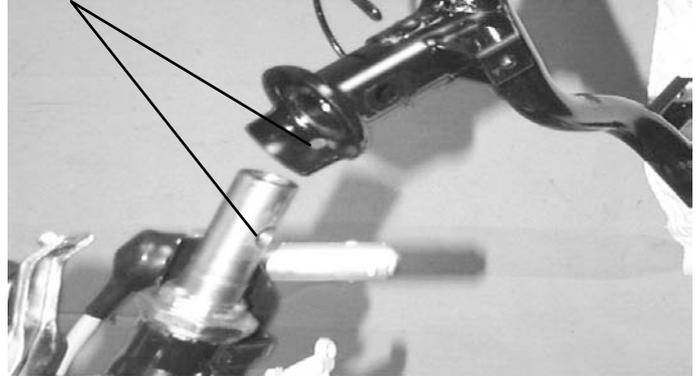
INSTALLATION

Install the handlebar, aligning the tabs of the handlebar with the grooves in the steering stem.

Install and tighten the handlebar lock nut.

Torque: 4.5_ 5.0kg-m

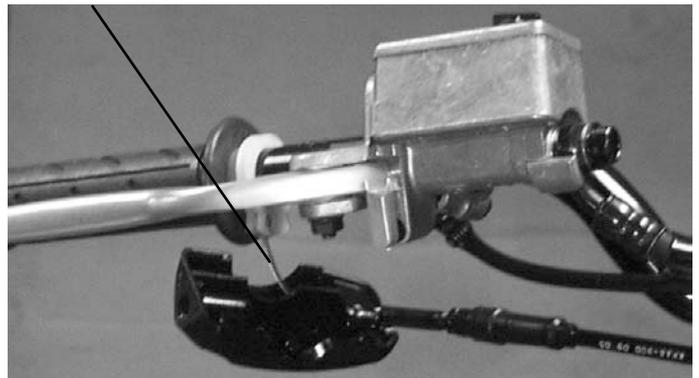
Tab/Groove



Lubricate the throttle pipe front end with grease.

Install the throttle grip and connect the throttle cable.

Throttle Cable



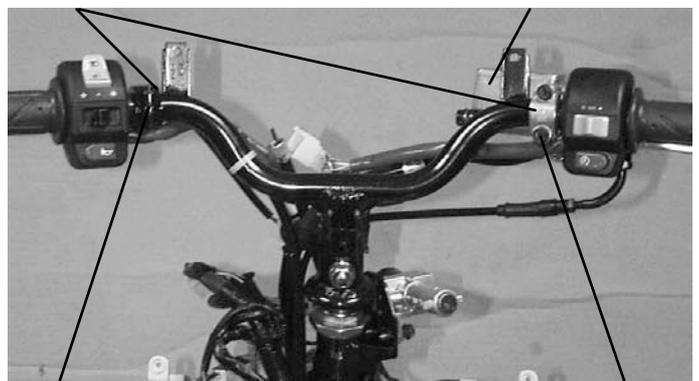
The installation sequence is the reverse of removal.

Install the rear brake lever holder.

Install the front brake master cylinder (disk brake).

Holders

Brake Master Cylinder



Bolts

Bolts

13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK

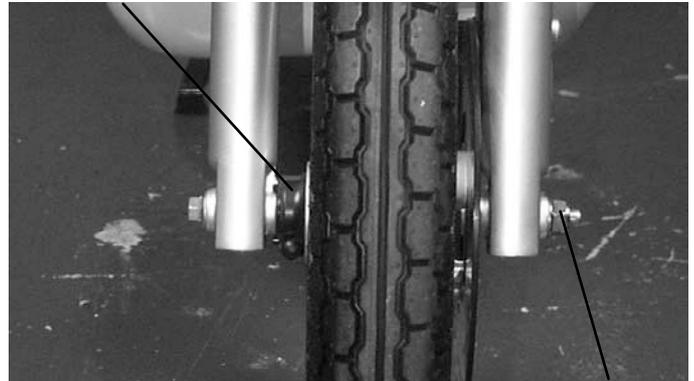
FRONT WHEEL

REMOVAL

(DISK BRAKE)

Jack the motorcycle front wheel off the ground.
Remove the speedometer cable set screw and disconnect the speedometer cable.
Remove the front axle nut and pull out the axle.
Remove the front wheel.
Remove the brake panel side collar.

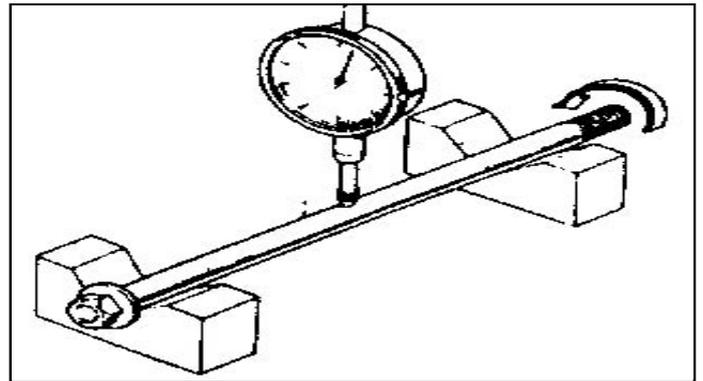
Speedometer Cable



Axle Nut

INSPECTION

Set the axle in V blocks and measure the runout.
The actual runout is $\frac{1}{2}$ of the total indicator reading.
Service Limit: 0.2mm replace if over.

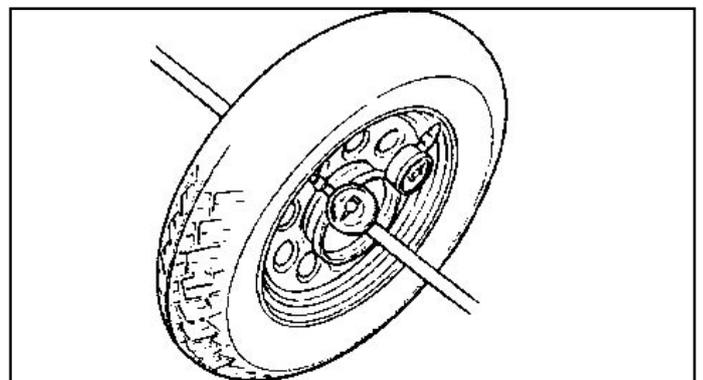


Check the wheel rim runout.

Service Limits:

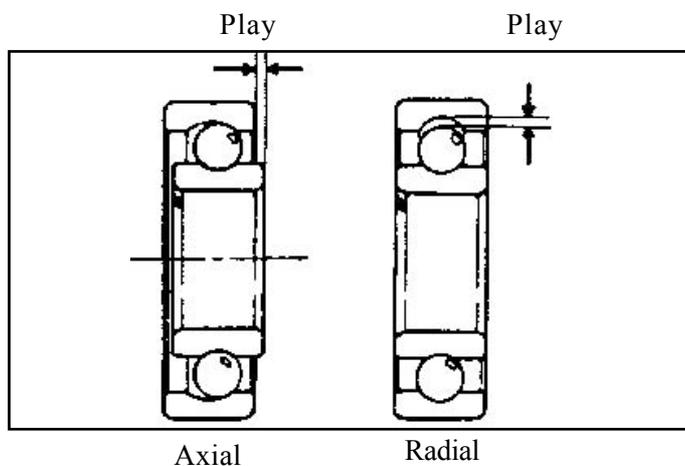
Radial: 2.0mm replace if over

Axial: 2.0mm replace if over



13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK

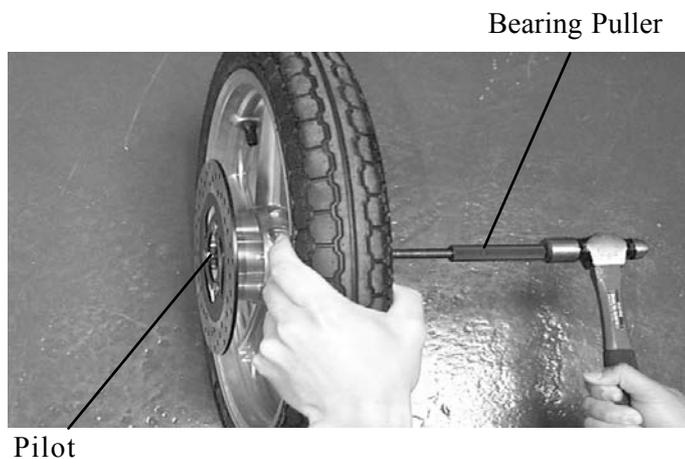
Turn the wheel bearings and replace them if they have excessive play or noise.



DISASSEMBLY
Remove the dust seal.

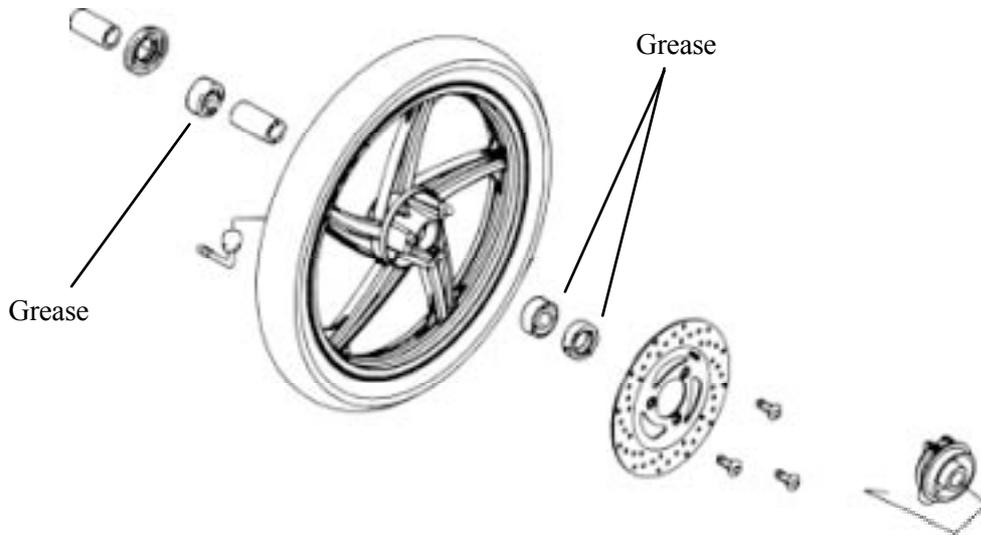


Remove the wheel bearings and distance collar.



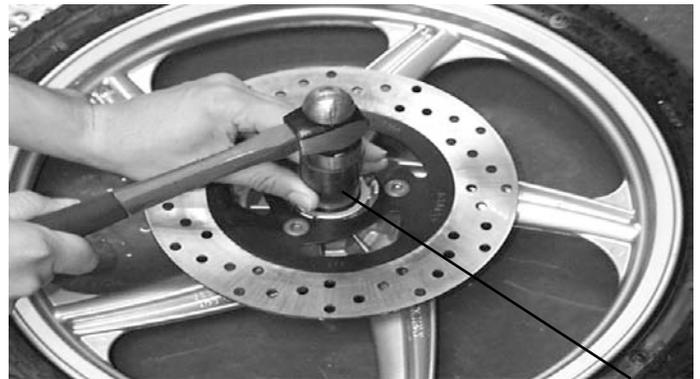
13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK

ASSEMBLY



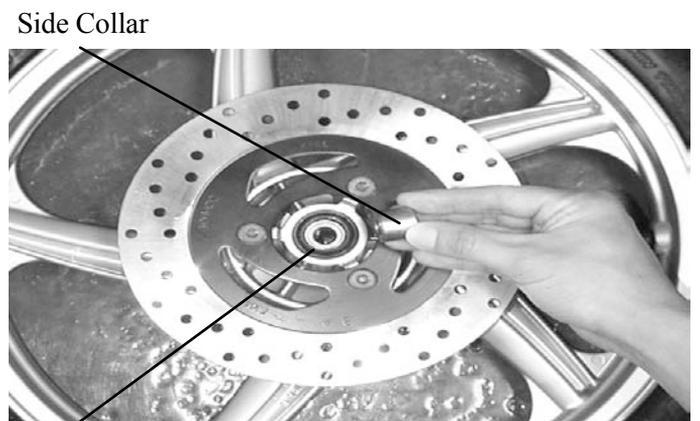
Pack all bearing cavities with grease.
Drive in the left bearing .
Install the distance collar.
Drive in the right bearing.

* Drive the bearing squarely with the sealed end facing out.



Pilot

Apply grease to the dust seal lip and install the dust seal.
Install the side collar.



Dust Seal

13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK

FRONT WHEEL INSTALLATION

(Disk Brake)

Install the front wheel, aligning the speedometer gear tab with the front fork groove.

Connect the speedometer cable.

Torque: 5.0_ 7.0kg-m



Groove

Tab

Axle Nut

Upper Limit

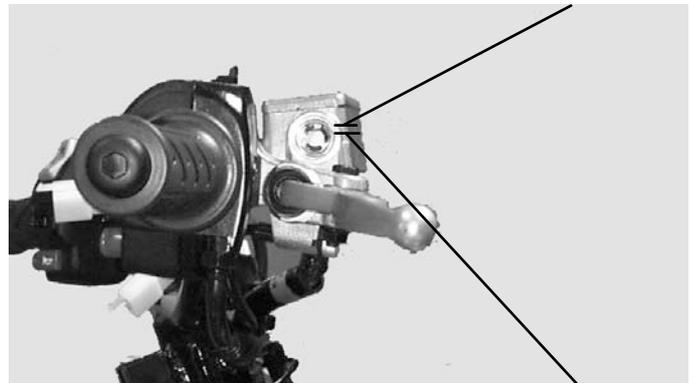
HYDRAULIC BRAKE (FRONT BRAKE)

Brake Fluid Replacement/Air Bleeding

Check the brake fluid level on level ground.

*

- When operating the brake lever, the brake reservoir cap must be tightened securely to avoid spill of brake fluid.
- When servicing the brake system, use shop towels to cover plastic parts and coated surfaces to avoid damage caused by spill of brake fluid.



Lower Limit

Brake Fluid Bleeding

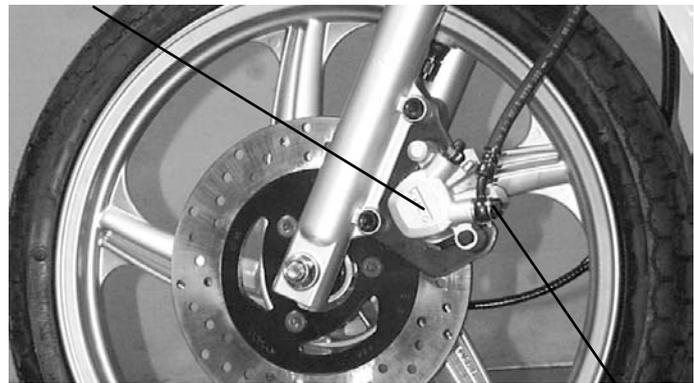
In order to avoid spill of brake fluid, connect a transparent hose to the bleed valve.

Warning

Brake fluid spilled on brake pads or brake disk will reduce the braking effect. Clean the brake pads and brake disk with a high quality brake degreaser.

Fully apply the brake lever and then loosen the brake caliper bleed valve to drain the brake fluid until there is no air bubbles in the brake fluid. Then, tighten the bleed valve. Repeat these steps until the brake system is free of air.

Front Brake Caliper



Bleed Valve

Brake Fluid Refilling

Add DOT-3 brake fluid to the brake reservoir.

*

- When bleeding, be careful not to allow air in the brake reservoir flowing into the brake system.
- When using a brake bleeder, follow the manufacturer's instructions.
- Never use dirty or unspecified brake fluid or mix different brake fluids because it will damage the brake system.

Make sure to bleed air from the brake system.

13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK

Brake Pad/Disk Replacement

* The brake pads must be replaced as a set to ensure the balance of the brake disk.

Remove the two bolts attaching the brake caliper.
Remove the brake caliper.
Remove the brake pads.

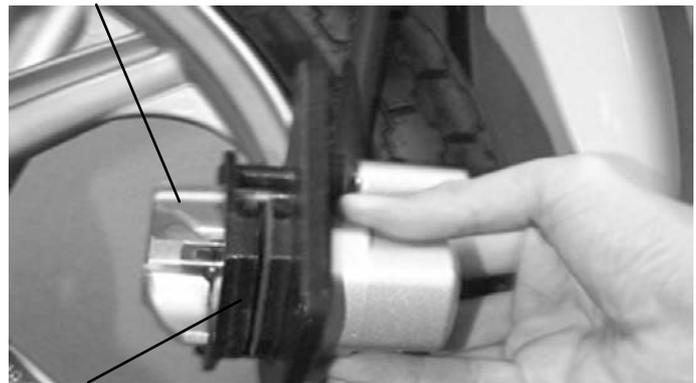


Front Brake Caliper

Install the brake pads in the reverse order of removal.
Torque: 1.5_ 2.0kg-m

* Keep grease or oil off the brake pads to avoid brake failure.

Front Brake Caliper



Brake Pads

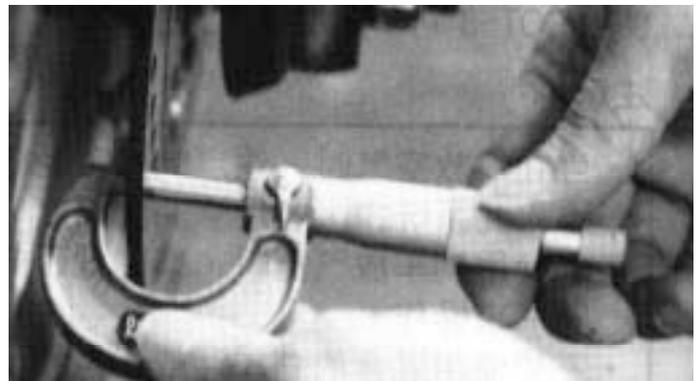
Brake Disk

Measure the brake disk thickness.

Service Limit: 3.0mm

Measure the brake disk runout.

Service Limit: 0.3mm



13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK

BRAKE MASTER CYLINDER

Removal

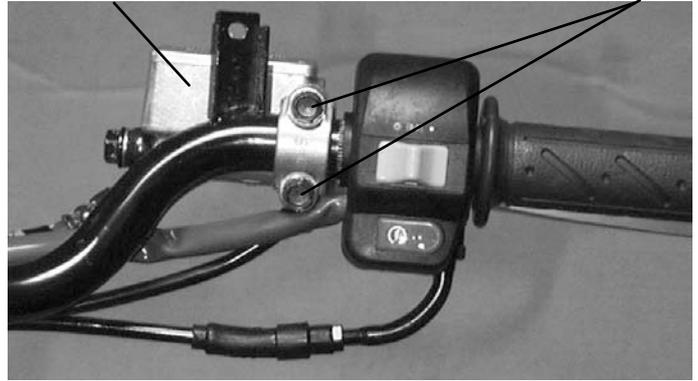
First drain the brake fluid from the hydraulic brake system.

*

- When servicing the brake system, use shop towels to cover rubber and plastic parts and coated surfaces to avoid being contaminated by brake fluid.
- When removing the brake fluid pipe bolt, be sure to plug the pipe to avoid brake fluid leakage.

Brake Master Cylinder

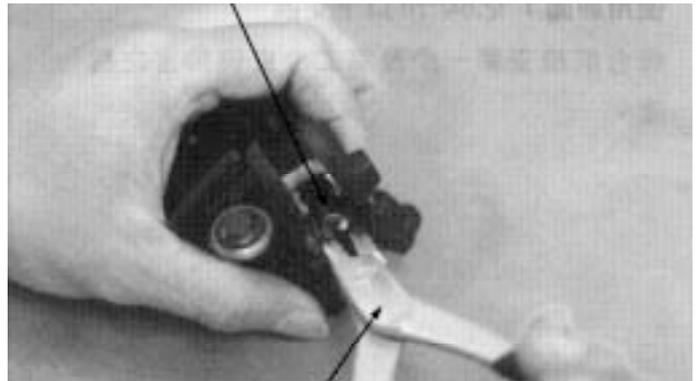
Bolts



Disassembly

Remove the piston rubber cover and snap ring from the brake master cylinder.

Snap Ring



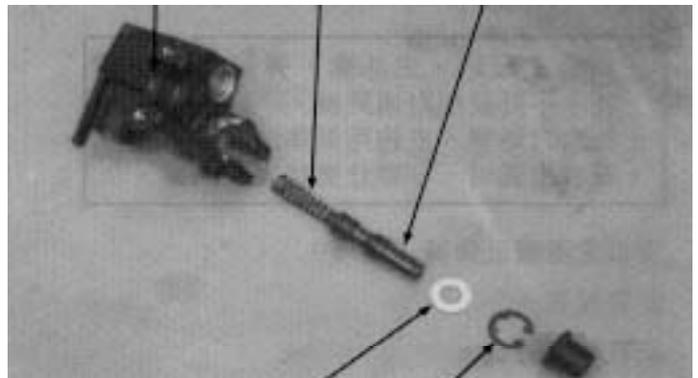
Snap Ring Pliers (close)

Remove the washer, main piston and spring from the brake master cylinder. Clean the inside of the master cylinder and brake reservoir with brake fluid.

Master Cylinder

Spring

Main Piston



Washer

Snap Ring

13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK

Inspection

Measure the brake master cylinder I.D.

Service Limit: 12.75mm

Inspect the master cylinder for scratch or crack.



Measure the brake master cylinder piston O.D.

Service Limit: 12.6mm

Before assembly, inspect the 1st and 2nd rubber cups for wear.



Assembly

Before assembly, apply brake fluid to all removed parts.

Install the spring together with the 1st rubber cup.

*

- During assembly, the main piston and spring must be installed as a unit without exchange.
- When assembling the piston, soak the cups in brake fluid for a while.
- Install the cups with the cup lips facing the correct direction.

Install the main piston, spring and snap ring.

Install the rubber cover.

Install the brake lever.



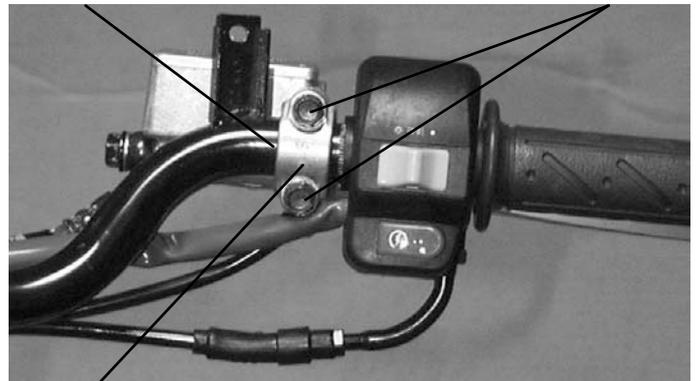
13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK

Place the brake master cylinder on the handlebar and install the holder with “up” mark facing up. Be sure to align the punch mark with the holder joint. First tighten the upper bolt and then tighten the lower bolt.

Torque: 1.0_ 1.4kg-m

Punch Mark

Bolts



“Up” Mark

Install the brake fluid pipe with the attaching bolt and two sealing washers.

Install the handlebar covers. (⇒ 12-3)
Fill the brake reservoir with recommended brake fluid to the upper limit and bleed air according to the method stated in 13-12.

BRAKE CALIPER (FRONT)

Removal

Remove the brake caliper. (⇒ 13-13)
Place a clean container under the brake caliper and disconnect the brake fluid pipe from the caliper.

*

Do not spill brake fluid on any coated surfaces.



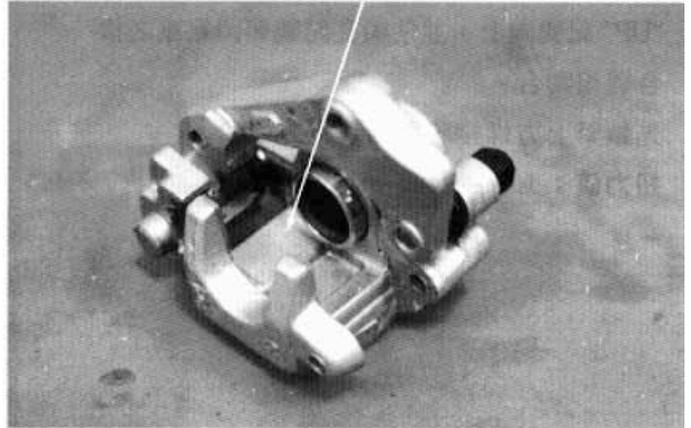
Bolt

13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK

Disassembly

Remove the brake caliper seat from the brake caliper.

Brake Caliper Seat



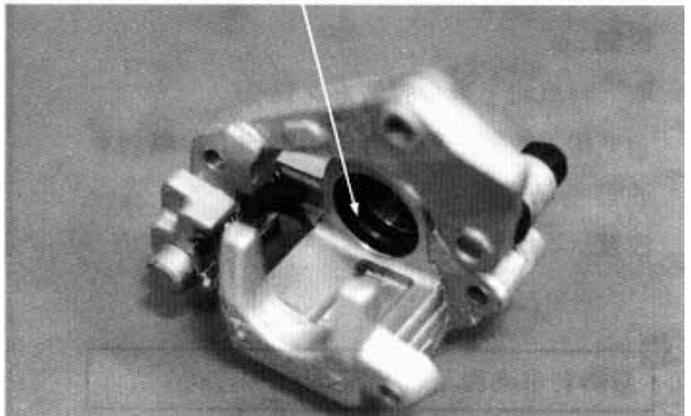
Remove the piston from the brake caliper. If necessary, use compressed air to squeeze out the piston through the brake fluid inlet opening and place a shop towel under the caliper to avoid contamination caused by the removed piston. Check the piston cylinder for scratch or wear and replace if necessary.



Compressed Air

Push the piston oil seal outward to remove it. Clean the oil seal groove with brake fluid.

Piston Oil Seal

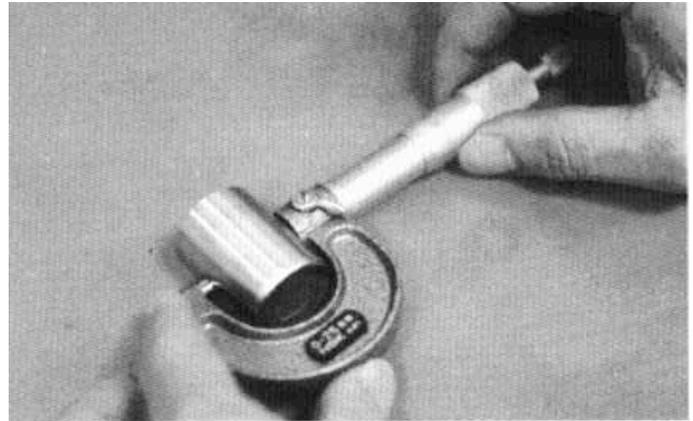


* Be careful not to damage the piston surface.

13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK

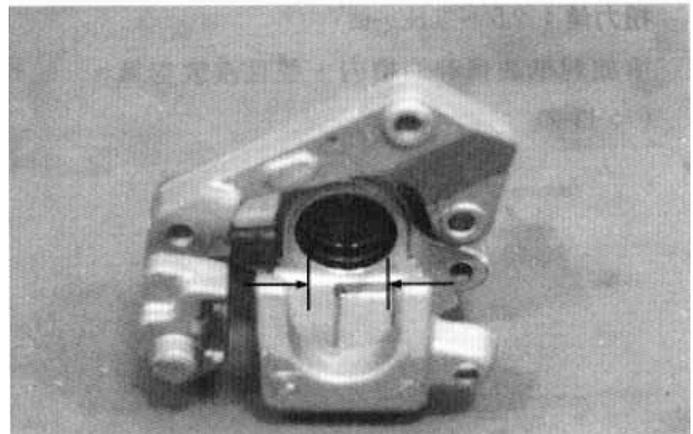
Check the piston for scratch or wear.
Measure the piston O.D. with a micrometer.

Service Limit: 25.45mm



Check the caliper cylinder for scratch or wear and measure the cylinder bore.

Service Limit: 25.30mm



Assembly

Clean all removed parts.

Apply silicon grease to the piston and oil seal.
Lubricate the brake caliper cylinder inside wall with brake fluid.

Install the brake caliper piston with grooved side facing out.

*

Install the piston with its outer end 3-5mm protruding beyond the brake caliper.
--

Wipe off excessive brake fluid with a clean shop towel. Apply silicon grease to the brake caliper seat pin and caliper inside.
Install the brake caliper seat.

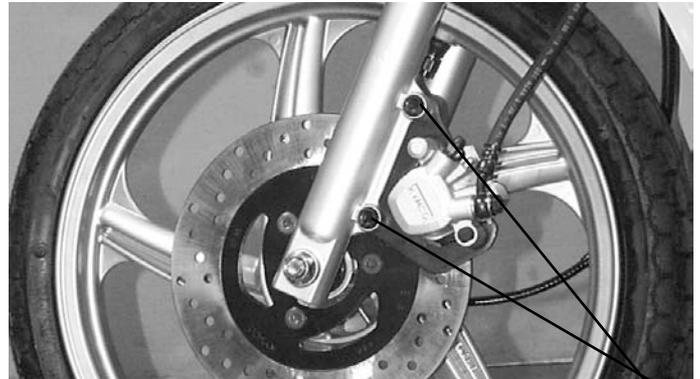


13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK

Installation

Install the brake caliper and tighten the two bolts.

Torque: 2.9_ 3.5kg-m

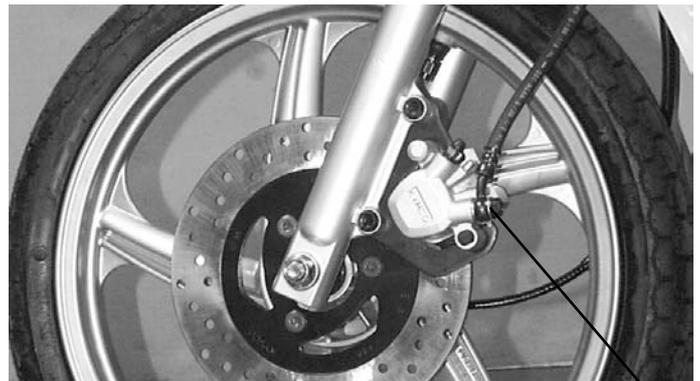


Bolts

Connect the brake fluid pipe to the brake caliper and tighten the fluid pipe bolt.

Torque: 3.0_ 4.0kg-m

Fill the brake reservoir with recommended brake fluid and bleed air from the brake system. (⇒ 13-12)



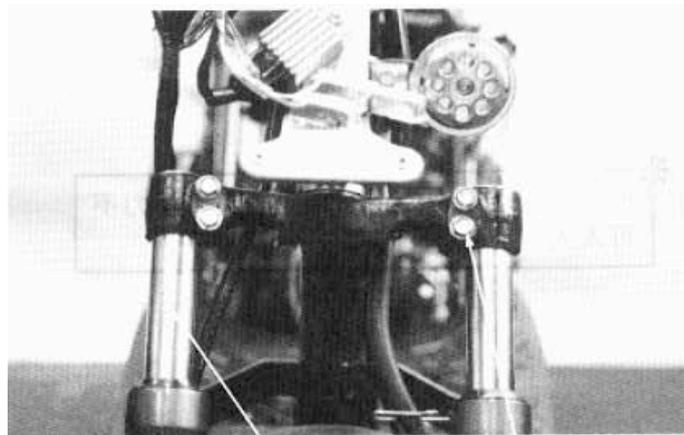
Bolt

13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK

FRONT SHOCK ABSORBER

REMOVAL

Remove the front wheel. (⇒13-5)
Remove the front fender. (⇒12-6)
Remove the front shock absorber upper mount bolts.
Loosen the lower mount bolts to remove the front shock absorbers.

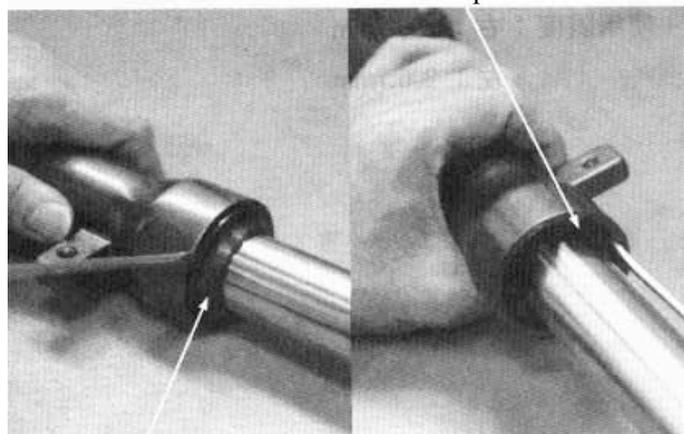


Front Shock Absorber

Mount Bolt

LEFT FRONT SHOCK ABSORBER DISASSEMBLY

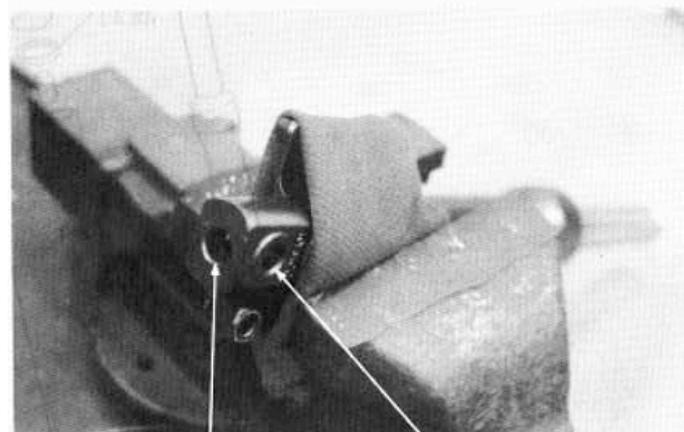
Remove the dust boot.
Remove the circlip.



Dust Boot

Circlip

Use a vise to hold the front shock absorber and remove the shock absorber tube, hex bolt and copper washer from the front shock absorber.



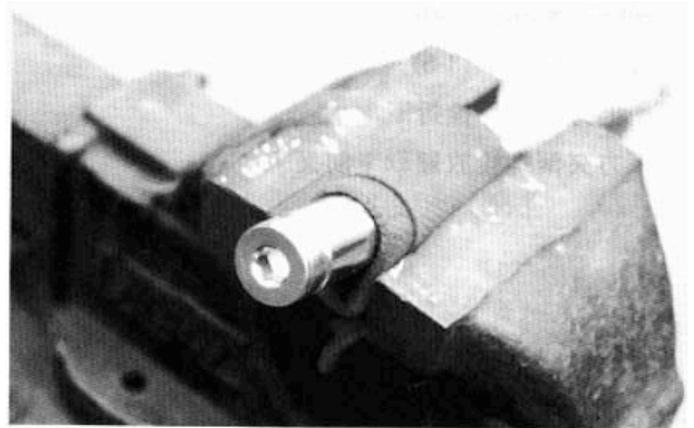
Bolt/Washer

Front Shock Absorber

13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK

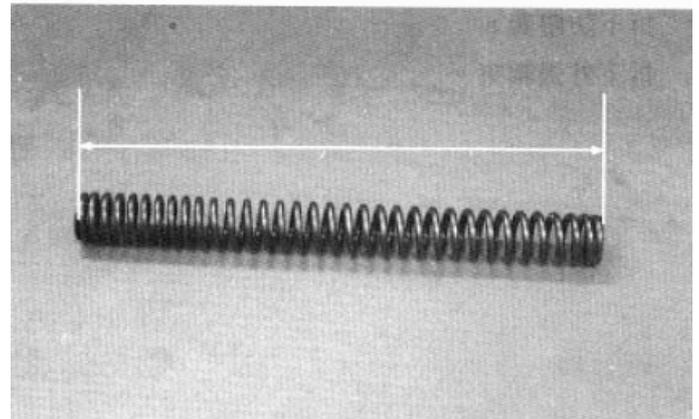
Use a vise to hold the front shock absorber tube and remove the damper from the shock absorber tube.

* When holding the shock absorber tube, place a shop towel under it and do not apply too much force.

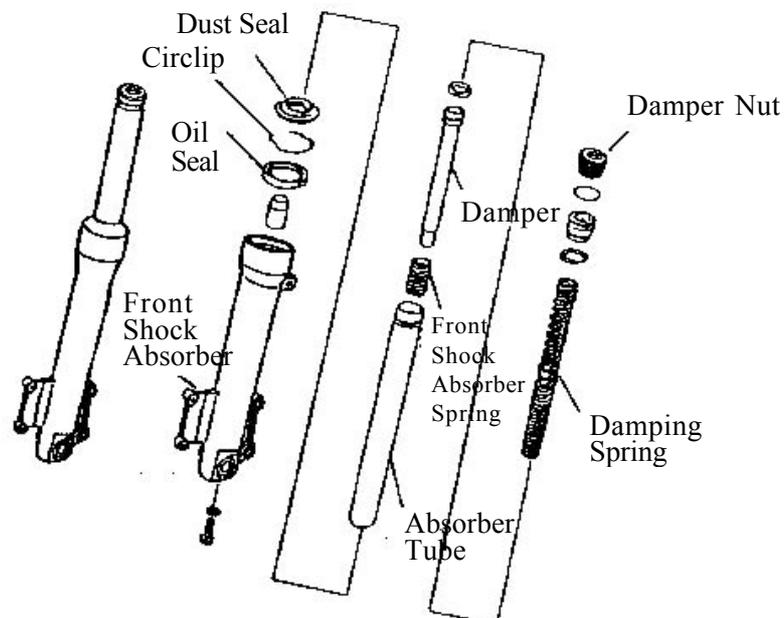


Measure the front shock absorber spring free length.

Service Limit: Right : 200mm
Left : 200mm



FRONT SHOCK ABSORBER ASSEMBLY



13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK

Install the damping spring to the damper and then install them into the front shock absorber tube.
Install the front shock absorber spring and tighten the damper nut.

* Install the front shock absorber spring with the loosely wound coils facing up.

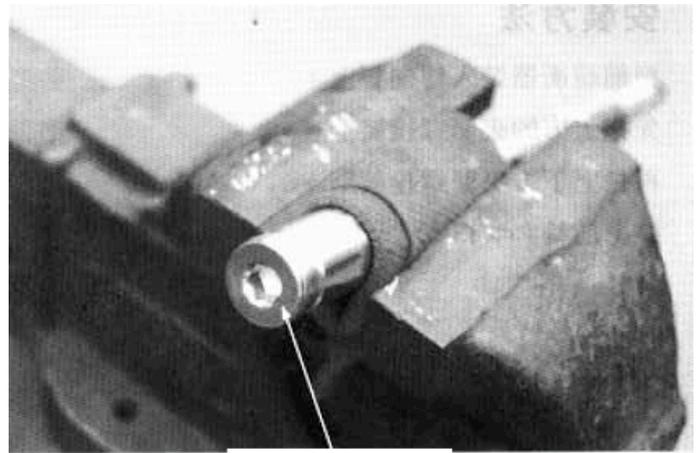
Use a vise to hold the front shock absorber.
Tighten the hex bolt.
(Apply locking agent to the washer and socket hex bolt and install them together.)

Torque: 1.5_ 3.0kg-m

Specified Oil: ss#8

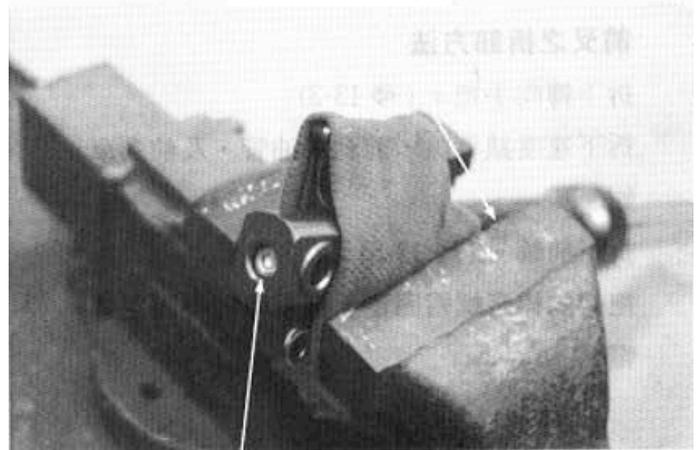
Oil Capacity: 61cc

Install the circlip.
Install the dust boot.



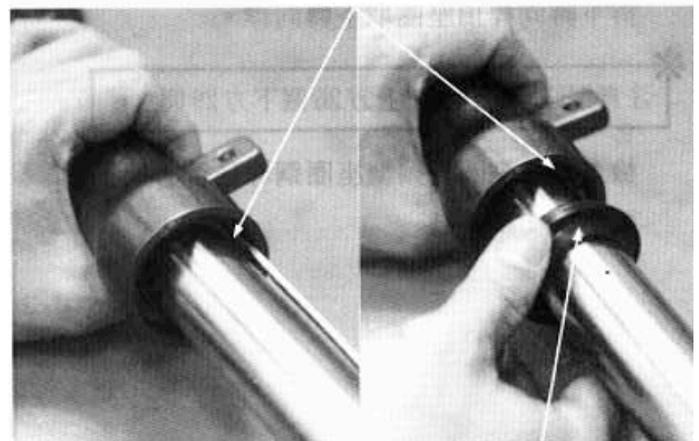
Damper Nut

Front Shock Absorber



Bolt/Washer

Circlips



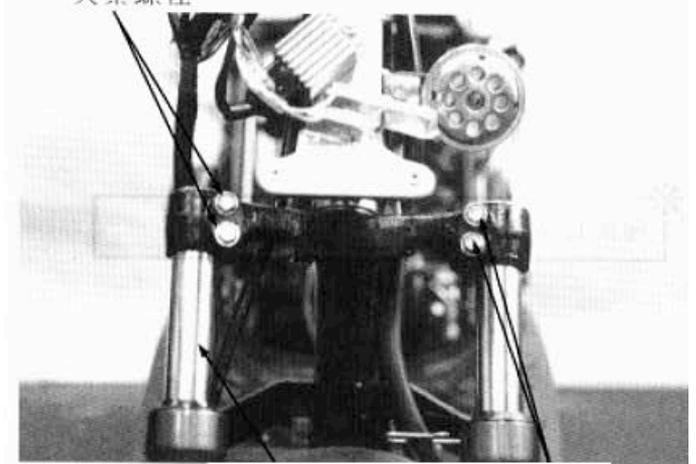
Dust Boot

13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK

INSTALLATION

Install the front shock absorbers onto the steering stem.
Install and tighten the front shock absorber upper mount bolts.
Tighten the lower mount bolts.
Install the front fender.
Install the front wheel. (⇒ 13-8)

Mount Bolts



Front Shock Absorber

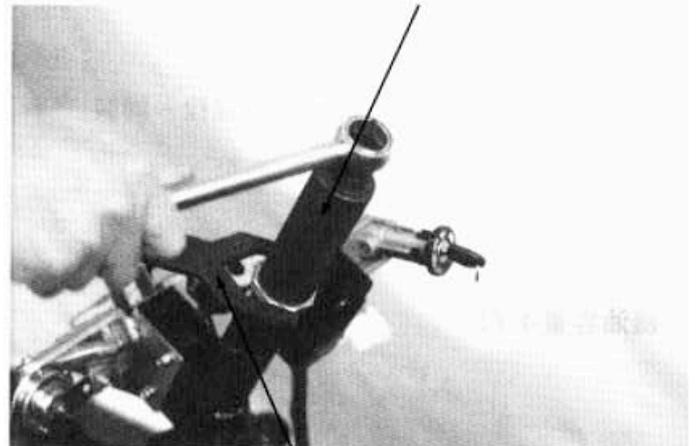
Mount Bolts

FRONT FORK

REMOVAL

Remove the steering handlebar. (⇒ 13-3)
Disconnect the speedometer cable and front brake fluid pipe and remove the front brake caliper.
Remove the front wheel. (⇒ 13-5)
Hold the steering stem top cone race and remove the steering stem lock nut.

Lock Nut Socket Wrench

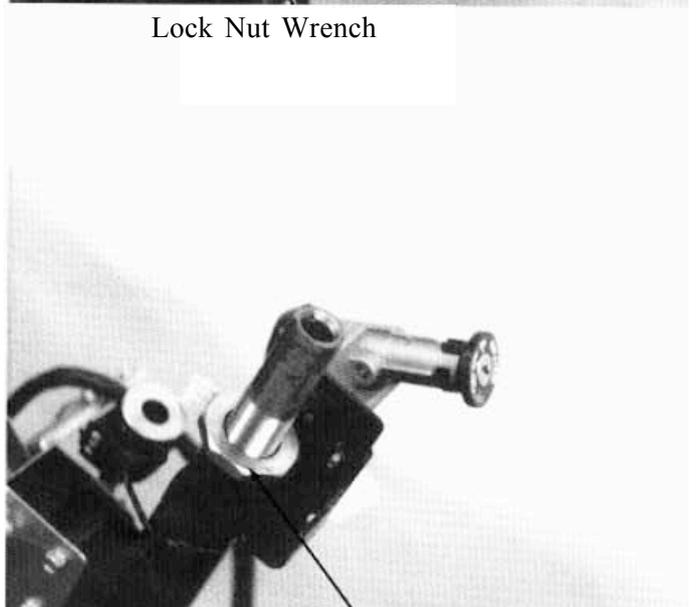


Lock Nut Wrench

Remove the top cone race and remove the front fork.

* Be careful not to lose the steel balls (26 on top race and 19 on bottom race).

Inspect the ball races, cone races and steel balls for wear or damage. Replace if necessary.



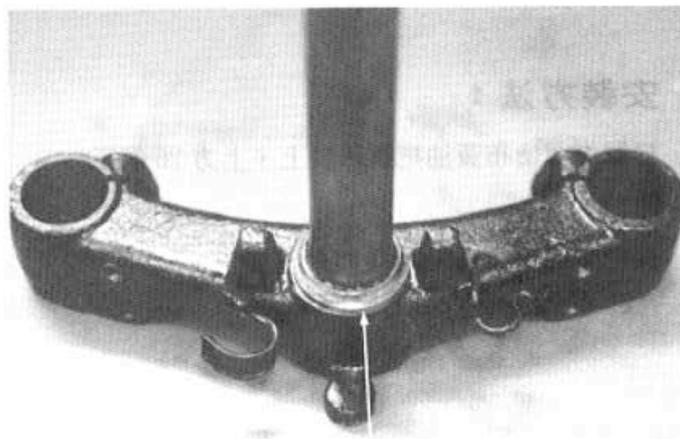
Top Cone Race

13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK

BOTTOM CONE RACE REPLACEMENT

Remove the bottom cone race using a chisel.
Drive a new bottom cone race into place with a proper driver.

* Be careful not to damage the steering stem and front fork.

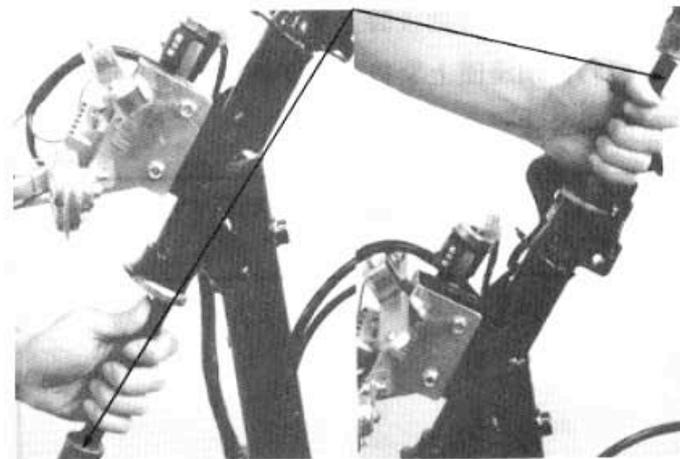


Bottom Cone Race

BALL RACE REPLACEMENT

Drive out the ball races.

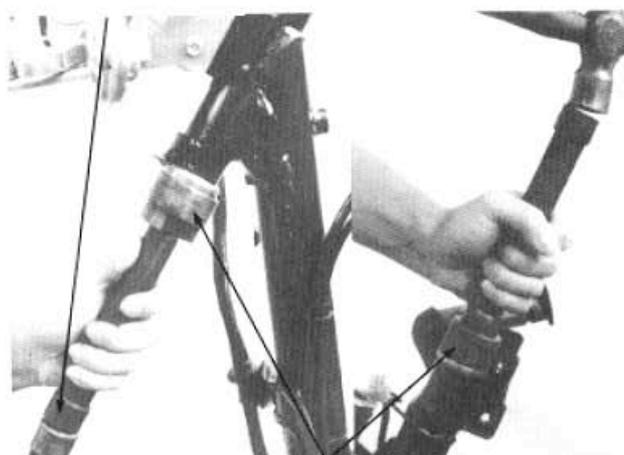
Ball Race Remover



Drive in new ball races.

* Be sure to drive the ball races into place completely.

Driver Handle A



Outer Driver, 37x40mm

13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK

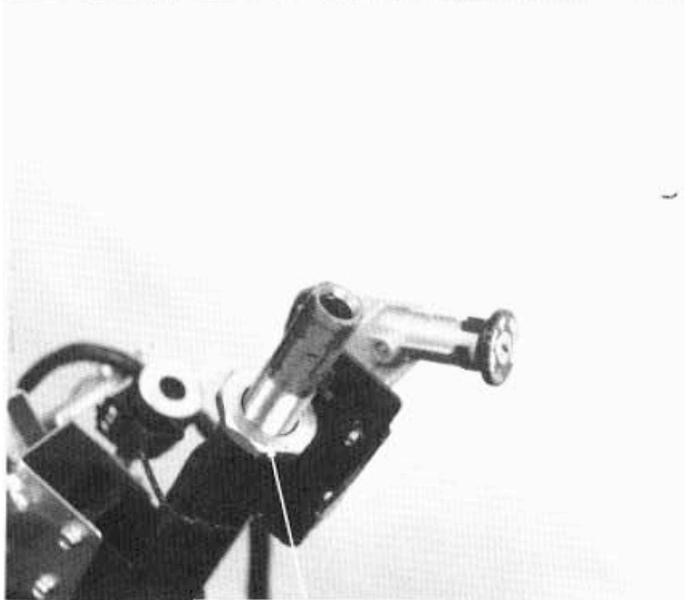
INSTALLATION

Apply grease to top and bottom ball races and install 26 steel balls on the top ball race and 29 steel balls on the bottom ball race. Apply grease to the ball races again and then install the front fork.



Apply grease to the top cone race and install it. Tighten the top cone race and then turn the steering stem right and left several times to make steel balls contact each other closely.

* Check that the steering stem rotates freely without vertical play.



Top Cone Race

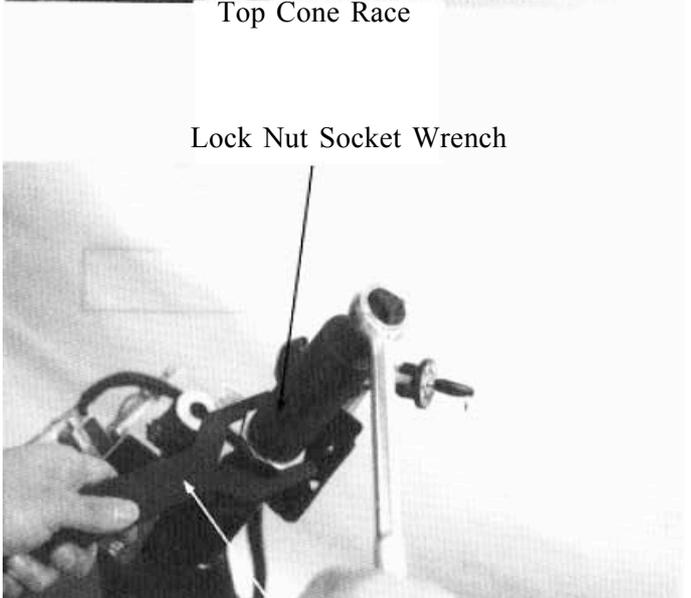
Lock Nut Socket Wrench

Install the steering stem lock nut and tighten it while holding the top cone race.

Torque: 8.0_ 12.0kg-m

Install the handlebar. (⇒ 13-4)

Install the speedometer cable.



Lock Nut Wrench