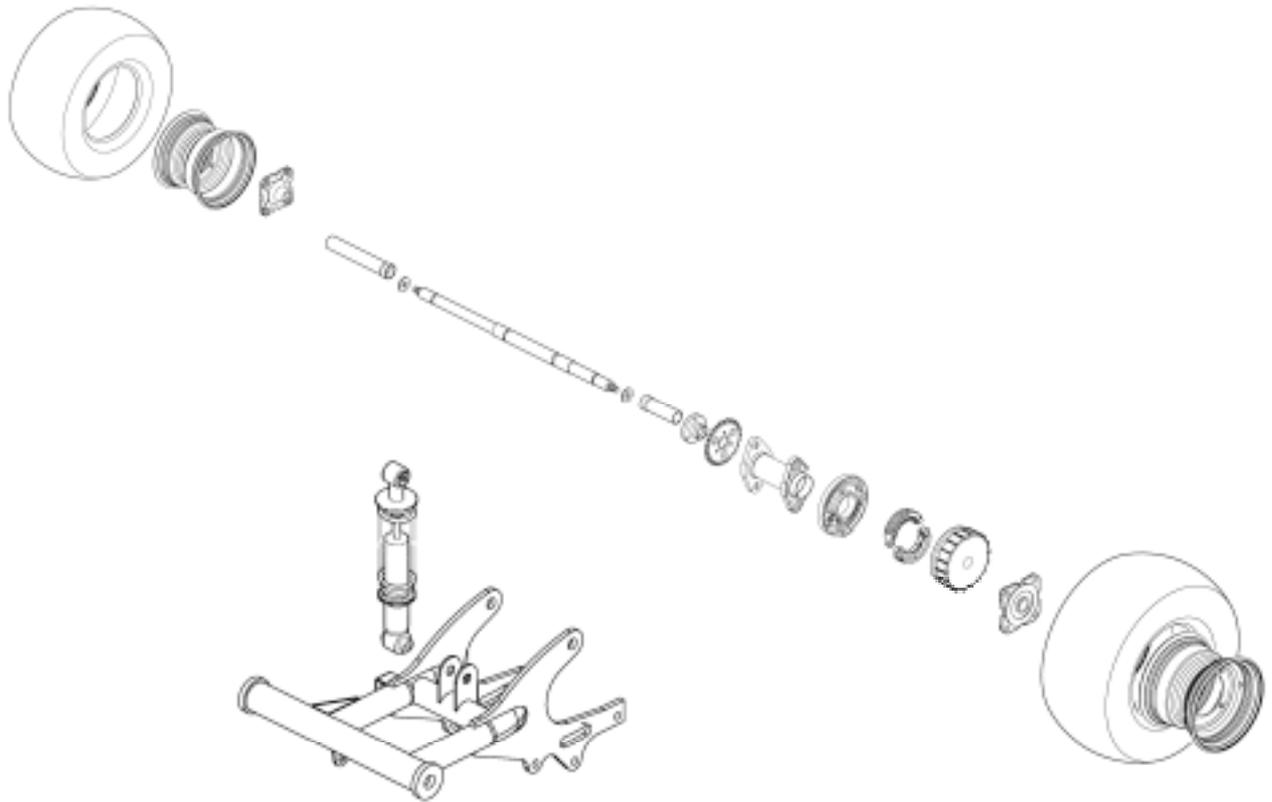

**REAR WHEEL/SWING ARM/
HYDRAULIC BRAKE**

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13. REAR WHEEL/SWING ARM/ HYDRAULIC BRAKE



13. REAR WHEEL/SWING ARM/ HYDRAULIC BRAKE

SERVICE INFORMATION

GENERAL INSTRUCTIONS

- During servicing, keep oil or grease off the brake drum and brake linings.
- During servicing, keep oil or grease off the brake disk and brake pads.
- Drain the brake fluid from the hydraulic brake system before disassembly.
- Contaminated brake disk or brake pads reduce stopping power. Clean the contaminated brake disk with high-performance brake degreaser and replace the brake pads.
- Do not use brake fluid for cleaning.
- Bleed air from the brake system if the brake system is removed or the brake is soft.
- Do not allow any foreign matters entering the brake reservoir when filling the brake reservoir with brake fluid.
- Brake fluid will damage painted, coated surfaces and plastic parts. When working with brake fluid, use shop towels to cover and protect painted, rubber and plastic parts. Wipe off any splash of brake fluid with a clean towel. Do not wipe the motorcycle with a towel contaminated by brake fluid.
- Make sure to use recommended brake fluid. Use of other unspecified brake fluids may cause brake failure.
- Inspect the brake operation before riding.

SPECIFICATIONS

Item		Standard (mm)	Service Limit (mm)
Rear wheel	Rim run out	Radial	□
		Axial	□
	Rear brake drum I.D	130_ 130.2	131
Brake disk thickness (disk brake)		3.8_ 4.2	3.0
Brake disk runout (disk brake)		°_	0.3
Rear brake lining thickness (drum brake)		4.5	2.0

TORQUE VALUES

Rear wheel nut	4.0_ 5.0kgf-m
Rear shock absorber upper mount bolt	3.5_ 4.5kgf-m
Rear shock absorber lower mount bolt	3.5_ 4.5kgf-m
Rear swing arm axle	6.0_ 8.0kgf-m
Rear wheel hub nut	6.0_ 8.0kgf-m
Brake arm bolt	1.8_ 2.5kgf-m
Caliper holder bolt	2.9_ 3.5kgf-m
Brake fluid tube bolt	3.0_ 4.0kgf-m
Caliper bleed valve	0.4_ 0.7kgf-m
Master cylinder bolt	1.0_ 1.4kgf-m

TROUBLESHOOTING

Rear wheel wobbling

- Bent rim
- Faulty tire
- Axle not tightened properly

Soft rear shock absorber

- Weak shock absorber spring
- Faulty damper

Loose brake lever (Disk Brake)

- Air in hydraulic brake system
- Brake fluid level too low
- Hydraulic brake system leakage

Hard braking (Disk Brake)

- Seized hydraulic brake system
- Seized piston

Brake noise (Disk Brake)

- Contaminated brake pad surface
- Excessive brake disk run out
- Incorrectly installed caliper
- Brake disk or wheel not aligned

Poor brake performance (Disk Brake)

- Air in brake system
- Deteriorated brake fluid
- Contaminated brake pads and brake disk
- Worn brake pads
- Worn brake master cylinder piston oil seal
- Clogged brake fluid line
- Deformed brake disk
- Unevenly worn brake caliper

Poor brake performance (Drum Brake)

- Brake not adjusted properly
- Worn brake linings
- Worn brake shoes at cam contacting area
- Worn brake cam
- Worn brake drum

Tight brake lever (Disk Brake)

- Seized piston
- Clogged hydraulic brake system
- Smooth or worn brake pad

Poor brake performance (Disk Brake)

Contaminated brake pad surface

13. REAR WHEEL/SWING ARM/ HYDRAULIC BRAKE

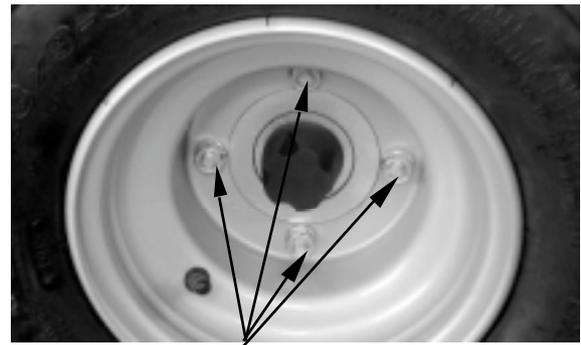
REAR WHEEL

REAR WHEEL REMOVAL

Place the machine on a level place.
Remove four nuts attaching the wheel.

⊘ Elevate the rear wheels by placing a suitable stand under the rear of frame.
Support the machine securely so there is no danger of it falling over.

Remove wheel.



Nuts

INSPECTION

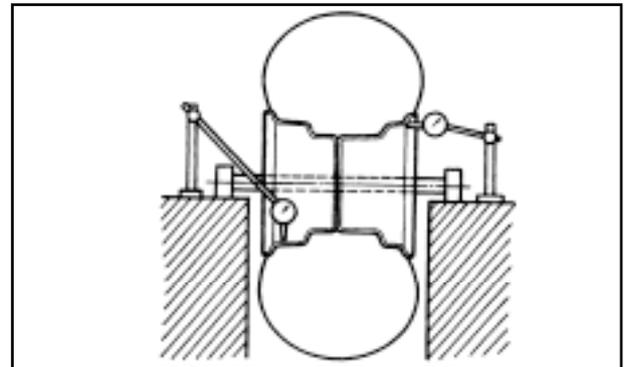
Measure the wheel runout.

Service Limit:

Vertical: 2.0 mm

Lateral: 2.0mm

Replace wheel if out of specification.



INSTALLATION

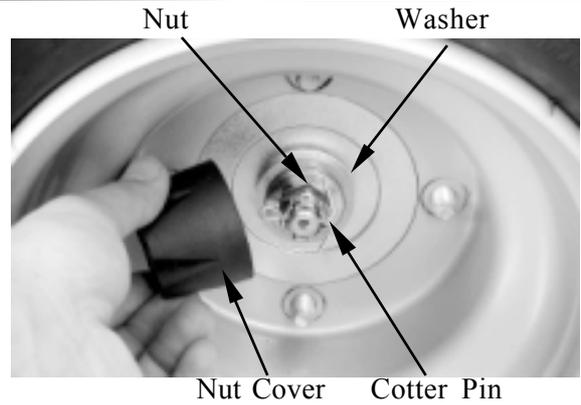
Install the rear wheel and tighten the nuts (wheel).

Torque: 4.0_ 5.0kgf-m

13. REAR WHEEL/SWING ARM/ HYDRAULIC BRAKE

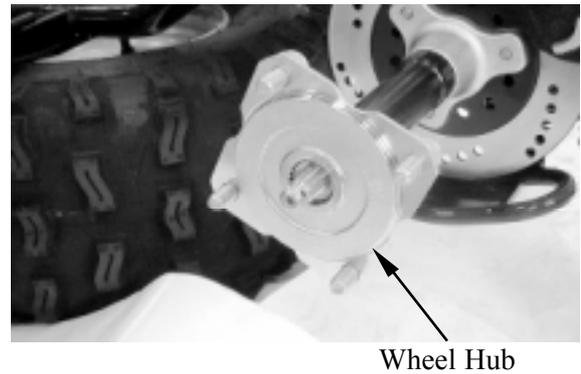
REAR WHEEL HUB REMOVAL

Remove rear wheel nuts. (See page 13-4)
Remove the wheel hub nut cover and cotter pin.
Loosen nut attaching the wheel hub.



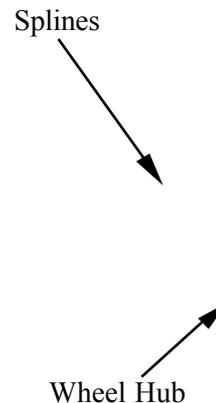
Remove rear wheel. (See page 13-4)
Remove wheel hub nut, washer and wheel hub.

- Elevate the rear wheels by placing a suitable stand under the rear of frame. Support the machine securely so there is no danger of it falling over.



INSPECTION

Replace it if the wheel hub is cracks or damage.
Replace it if splines of the wheel hub is wear or damage.



INSTALLATION

- Apply grease onto the splines of the wheel hub.

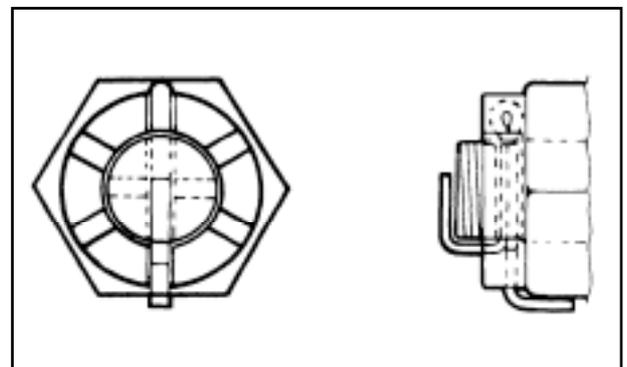
Install wheel hub, washer and wheel hub nut.

Torque: 6.0_ 8.0kgf-m

Install the cotter pin and band ends of cotter pin.

- Do not loosen the axle nut after torque tightening. If the axle nut groove is not aligned with the cotter pin hole, align groove with the hole by tightening up on the axle nut.

- Always use a new cotter pin.

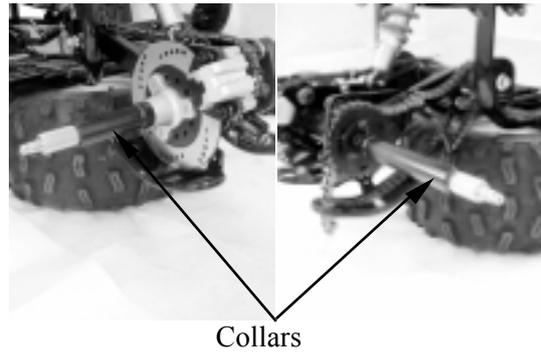


13. REAR WHEEL/SWING ARM/ HYDRAULIC BRAKE

REAR AXLE REMOVAL

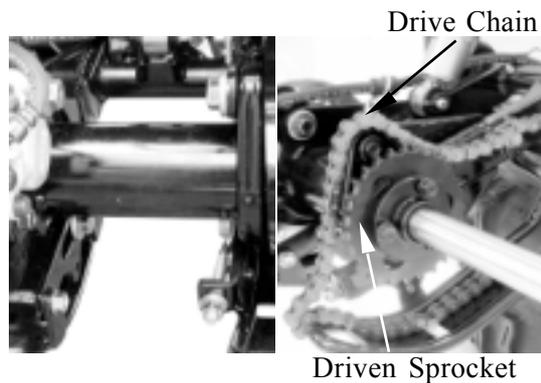
Remove the rear wheel hub of the both rear wheels. (See page 13-5).

Remove the collars on the rear axle right and left side.

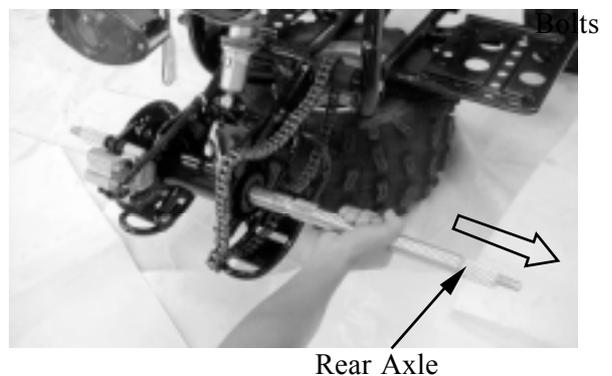


Relax the drive chain. (Refer to the “DRIVE CHAIN SLACK ADJUSTMENT” section in chapter 3.)

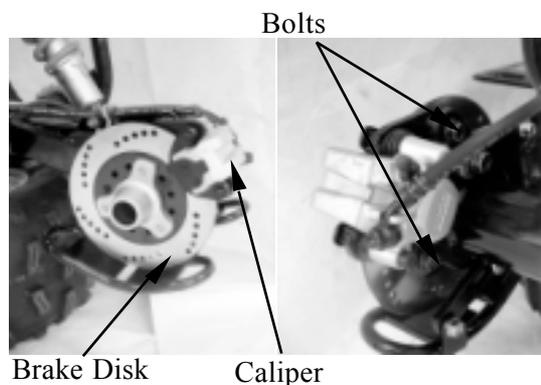
Remove driven sprocket.



Remove the rear axle from right side.

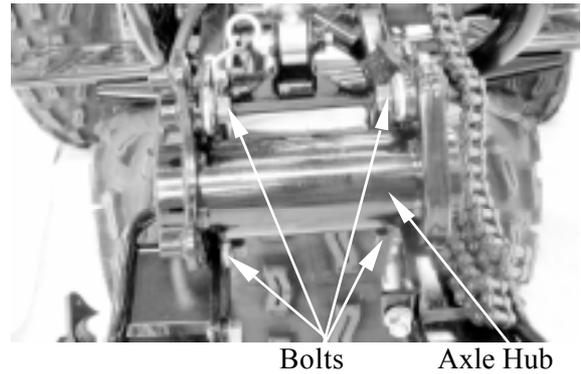


Remove the two bolts and caliper and then remove brake disk.



13. REAR WHEEL/SWING ARM/ HYDRAULIC BRAKE

Remove the four bolts and rear axle hub.



INSPECTION

Replace it if the rear axle is scratched (excessively) or damaged.

Replace if splines and threads of the rear axle are worn or damaged.

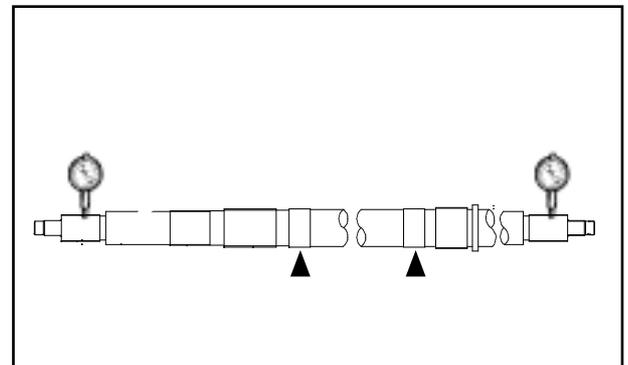


Measure the rear axle run out.

Service limit: less than 1.5mm

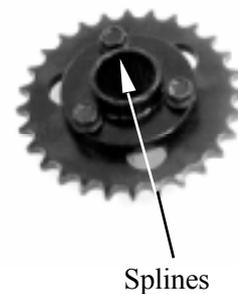
Replace if it is out of specification.

⊘ Do not attempt to straighten a bent axle.



Replace it if the driven sprocket has cracks or damage.

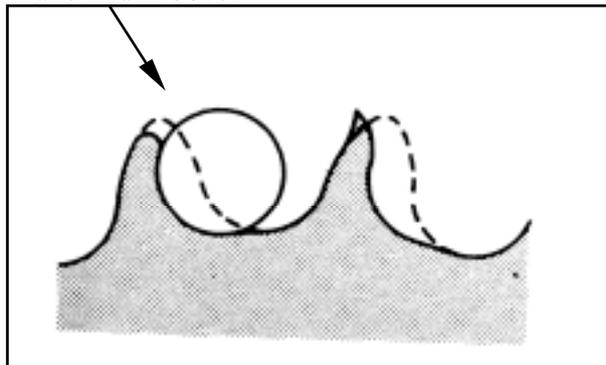
Replace it if the splines of the driven sprocket are worn or damaged.



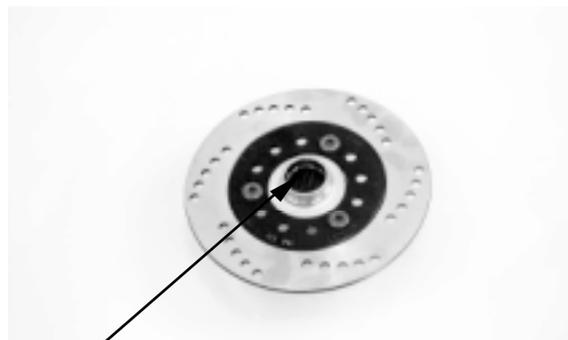
13. REAR WHEEL/SWING ARM/ HYDRAULIC BRAKE

Inspect the driven sprocket.
Replace sprocket if more than 1/4 teeth wear or bent teeth.

Brake Drum Cover

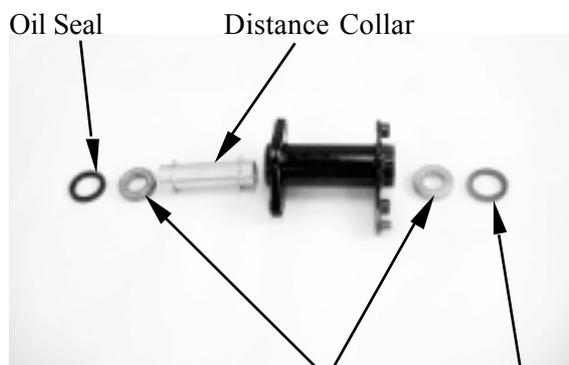


Replace it if the brake disk is cracks or damage.
Replace it if splines of the brake disk is wear or damage.



Splines

Inspect rear axle hub.
Replace it if bearing allow play in the axle hub or the bearing turns roughly.
Replace it if oil seal is wear or damage.
Replace it if rear axle hub is cracks, bend or damage.
Bearing and oil seal replacement steps:
Clean the outside of the rear axle.
Remove the oil seal by a flat-head screw driver.



Oil Seal

Distance Collar

Bearings

Oil Seal

- Place a wood block against the outer edge to protect this edge.

Remove the bearing by a general bearing puller.

Install the new bearings and oil seal by reversing the previous steps.

- Do not strike the center race or balls of the bearing.
Contact should be made only with the outer race.

13. REAR WHEEL/SWING ARM/ HYDRAULIC BRAKE

INSTALLATION

Reverse the “REMOVAL” procedures.

Install the rear axle hub.



Apply grease onto the oil seal lips,
bearings and bushes.



At this time, the rear axle hub should not
be tightened completely.
Final tightening is done after the chain
slack adjustment.

Install the rear axle.

Install brake disk, driven sprocket and
collars.

Install wheel hub (see page 13-5) and rear
wheel (see page 13-4).

Adjust drive chain slack. (Refer to the
“DRIVE CHAIN SLACK
ADJUSTMENT” section in chapter 3.)

Approximately: 10~20 mm

13. REAR WHEEL/SWING ARM/ HYDRAULIC BRAKE

REAR SWING ARM

REMOVAL

Place the machine on a level place.

Elevate the rear wheels by placing a suitable stand under the rear of frame.

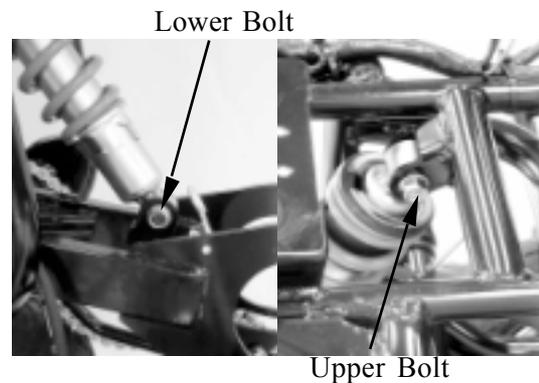
-  Support the machine securely so there is no danger of it falling over.

Remove the rear wheels, rear hubs, rear axle and axle hub. (Refer to the “REAR WHEEL” section in chapter 13.)

Remove the lower bolt attaching the rear shock absorber.

-  When removing the lower bolt, hold the swing arm so that it does not drop downwards when the bolt is removed.

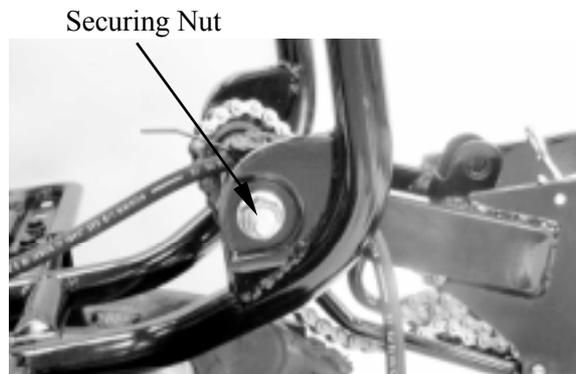
Remove the upper bolt and then remove the shock absorber.



INSPECTION

Check the tightening torque of the pivot shaft (swing arm) securing nut.

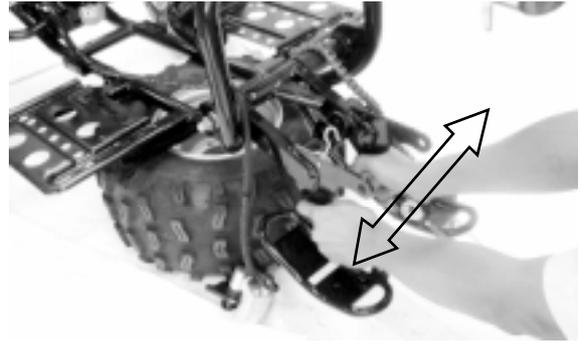
Torque: 6.0_ 8.0kgf-m



13. REAR WHEEL/SWING ARM/ HYDRAULIC BRAKE

Check the swing arm side play by moving it from side to side.

If side play noticeable, check the inner collar, bushing and thrust cover.



Check the swing arm vertical movement by moving it up and down.

If vertical movement is tight, binding or rough, to check the inner collar, bushing and thrust cover.



INSPECTION

Inspect the shock absorber rod.

Replace the shock absorber assembly if bends or damage.

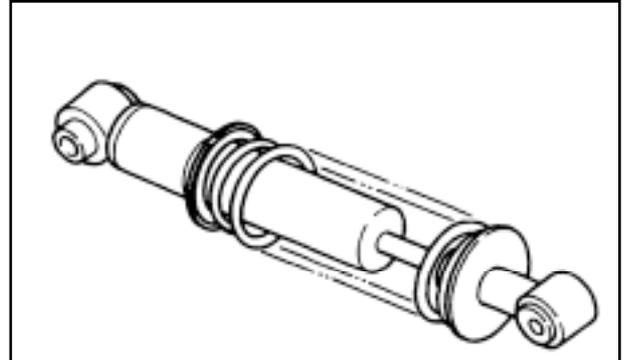
Inspect the shock absorber.

Replace the shock absorber assembly if oil leaks

Inspect the spring.

Replace the shock absorber assembly if fatigue.

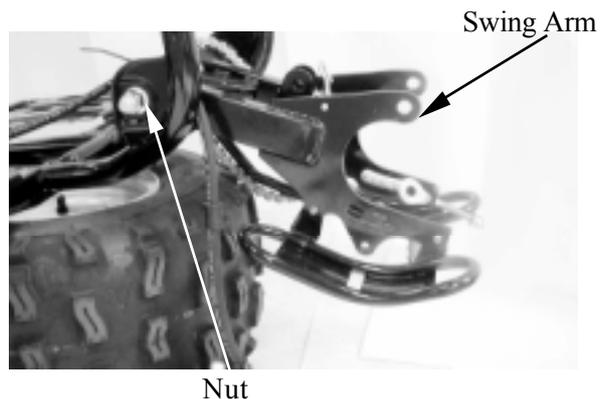
Move the spring up and down.



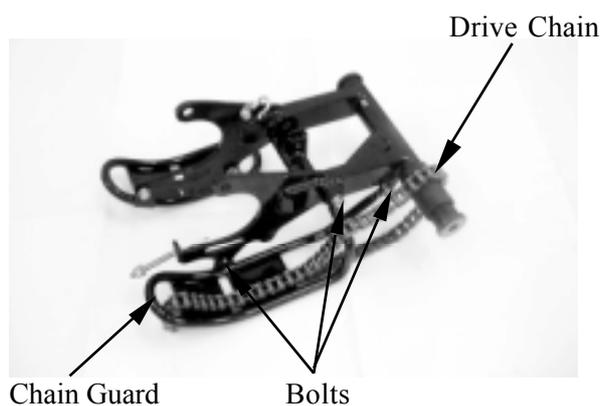
13. REAR WHEEL/SWING ARM/ HYDRAULIC BRAKE

REAR SWING ARM REMOVAL

Remove the nut and pivot shaft, then remove swing arm.



Remove the three bolts and chain guard.
Remove the drive chain.



Remove thrust covers and collar.



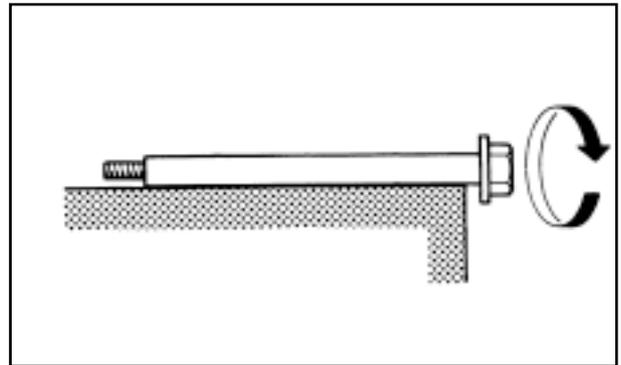
13. REAR WHEEL/SWING ARM/ HYDRAULIC BRAKE

INSPECTION

Roll the axle on a flat surface to inspect the pivot shaft.

Replace it if bends.

 Do not attempt to straighten a bent axle.

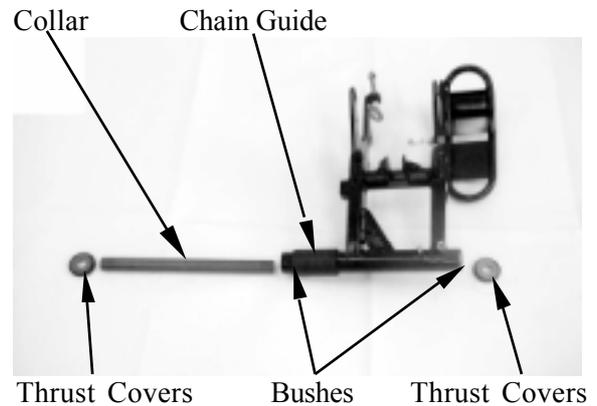


Inspect the swing arm.

Replace it if crack, bend or damage.

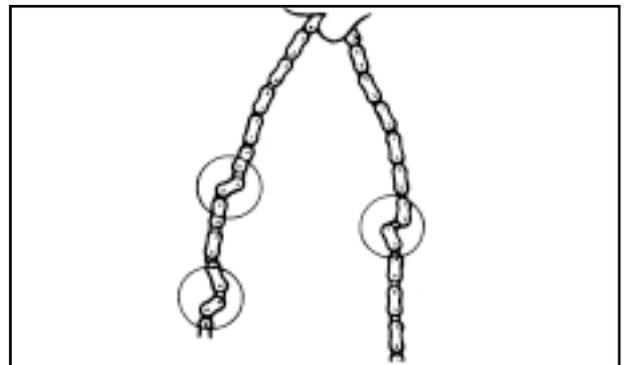
Inspect the thrust cover, chain guide, collar and bush.

Replace them if wear or damage.



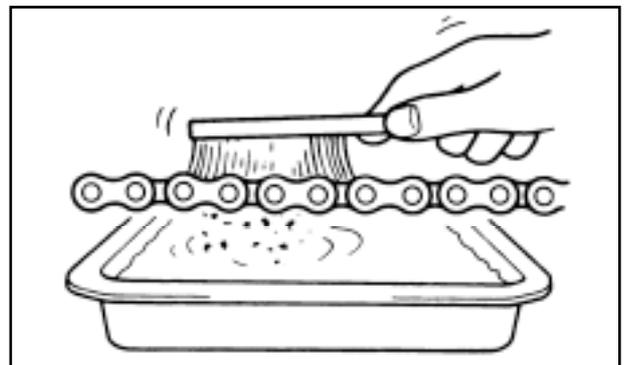
Inspect the drive chain stiffness.

Clean and lubricate or replace it if stiff.



CLEAN

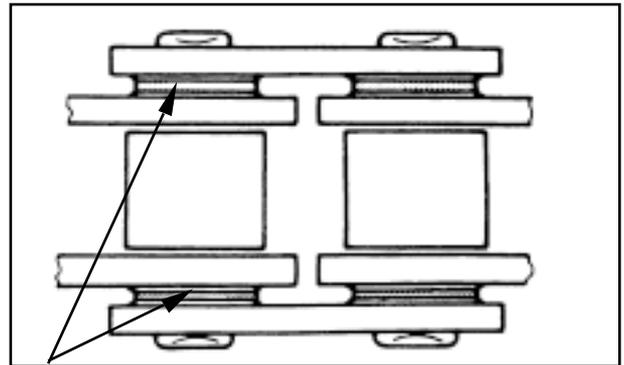
Place it in kerosene, and brush off as much dirt as possible. Then remove the chain from the kerosene and dry the chain.



13. REAR WHEEL/SWING ARM/ HYDRAULIC BRAKE



This machine has a drive chain with small rubber O-rings between the chain plates. Steam cleaning, high-pressure washes, and certain solvent can damage these O-rings. Use only kerosene to clean the drive chain.



O-ring

INSTALLATION

Reverse the "REMOVAL" procedure.

Apply grease onto the collar, bush, pivot shaft and thrust cover.

Install the swing arm and tightening the nut.

Torque: 6.0_ 8.0kgf-m

Install the shock absorber and tightening the bolts.

Torque: 3.5_ 4.5kgf-m

13. REAR WHEEL/SWING ARM/ HYDRAULIC BRAKE

HYDRAULIC BRAKE

BRAKE FLUID CHANGE

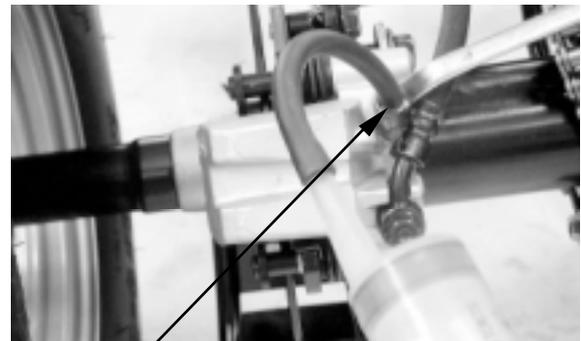
Place the machine on a level place and set the handlebar upright.
Remove the two screws attaching the brake fluid reservoir cap.

* Use shop towels to cover plastic parts and coated surfaces to avoid damage caused by splash of brake fluid.



Screw

Connect a transparent hose to the brake caliper bleed valve and then loosen the bleed valve nut.
Use a syringe to draw the brake fluid out through the hose.



Bleed Valve

BRAKE FLUID REFILLING

Connect a transparent hose and syringe to the brake caliper bleed valve and then loosen the bleed valve nut.
Fill the brake reservoir with brake fluid and use the syringe to draw brake fluid into it until there is no air bubbles in the hose.
Then, tighten the bleed valve nut.
Torque: 0.4_ 0.7kg-m

*

- When drawing brake fluid with the syringe, the brake fluid level should be kept over 1/2 of the brake reservoir height.
- Use only the recommended brake fluid.

Brake Reservoir



Bleed Valve

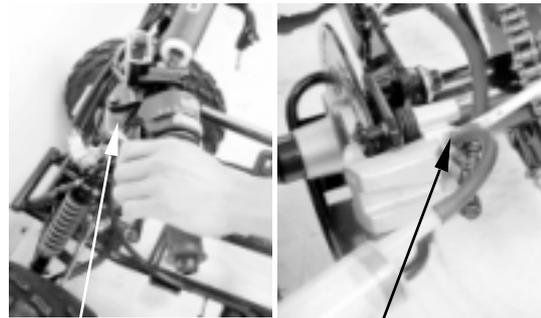
Recommended Brake Fluid: DOT-4

13. REAR WHEEL/SWING ARM/ HYDRAULIC BRAKE

BRAKE SYSTEM BLEEDING

Connect a transparent hose to the bleed valve and fully apply the brake lever after continuously pull it several times. Then, loosen the bleed valve nut to bleed air from the brake system. Repeat these steps until the brake system is free of air.

* When bleeding air from the brake system, the brake fluid level should be kept over 1/2 of the brake reservoir height.



Brake Lever

Bleed Valve

BRAKE PAD/DISK

BRAKE PAD REPLACEMENT

Remove the two bolts attaching the brake caliper holder.

* The brake pads can be replaced without removing the brake fluid tube.

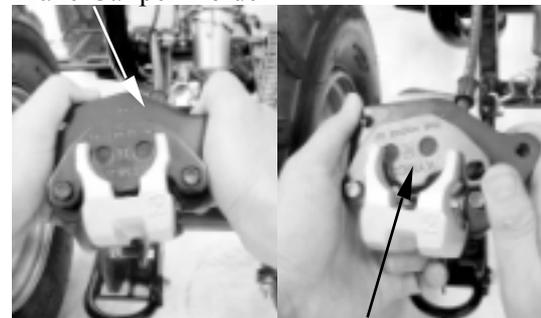
Remove the brake caliper.



Bolts

Push the brake caliper holder and then remove brake pad.

Brake Caliper Holder



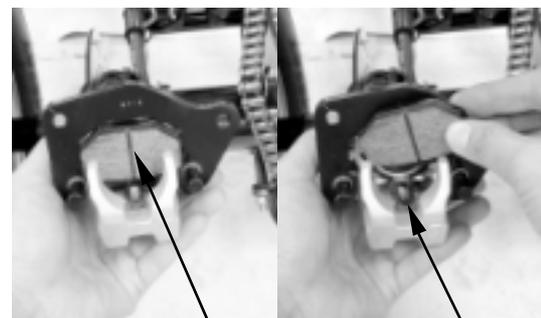
Brake Pad

Remove the other brake pad.

ASSEMBLY

Assemble the brake pads in the reverse order of removal.

* Make sure the pad spring has fitted.



Brake Pad

Pad Spring

13. REAR WHEEL/SWING ARM/ HYDRAULIC BRAKE

BRAKE DISK

Measure the brake disk thickness.

Service Limit: 3.0mm

Measure the brake disk run out.

Service Limit: 0.3mm



BRAKE MASTER CYLINDER

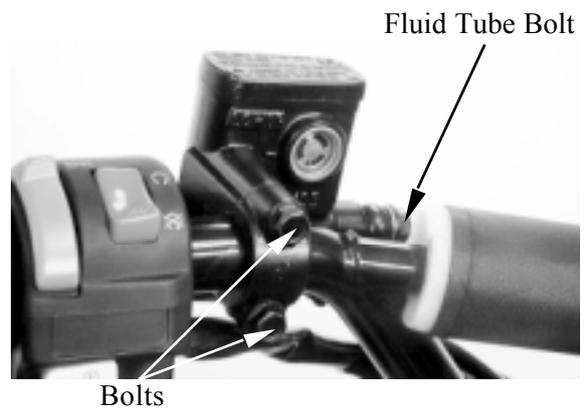
REMOVAL

Drain the brake fluid from the hydraulic brake system.

- * Do not splash brake fluid onto any rubber, plastic and coated parts. When working with brake fluid, use shop towels to cover these parts.

Remove the two master cylinder holder bolts and remove the master cylinder.

- * When removing the brake fluid tube bolt, be sure to place towels under the tube and plug the tube end to avoid brake fluid leakage and contamination.



13. REAR WHEEL/SWING ARM/ HYDRAULIC BRAKE

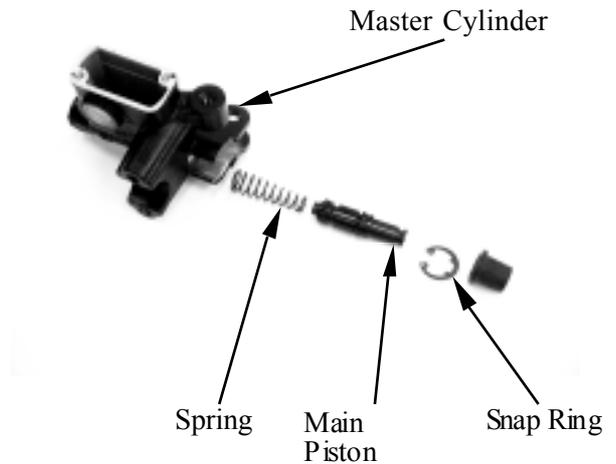
DISASSEMBLY

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



Snap Ring Pliers

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.



INSPECTION

Check the cylinder inside wall, and spring for scratch, corrosion or other abnormal condition.

If any abnormal condition is found, replace the inner parts or master cylinder.



13. REAR WHEEL/SWING ARM/ HYDRAULIC BRAKE

ASSEMBLY

Before assembly, apply brake fluid to all removed parts.

- 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 and snap ring.
Install the rubber cover.
Install the brake lever.
Install the brake fluid tube with the bolt and two sealing washers.
Fill the brake reservoir with recommended brake fluid to the upper level.
Bleed air from the hydraulic brake system.
(See page 13-15.)



Fluid Tube Bolt Sealing Washer

Place the brake master cylinder on the handlebar and install the master cylinder holder with the "UP" mark facing up, aligning the tab on the holder with the hole in the handlebar.
First tighten the upper bolt and then tighten the lower bolt.

Torque: 1.0_ 1.4kg-m



"UP" Mark

13. REAR WHEEL/SWING ARM/ HYDRAULIC BRAKE

BRAKE CALIPER

DISASSEMBLY

Remove the brake caliper, brake pads and pad spring. (See page 13-16)

Place a clean container under the brake caliper and disconnect the brake fluid tube from the brake caliper.

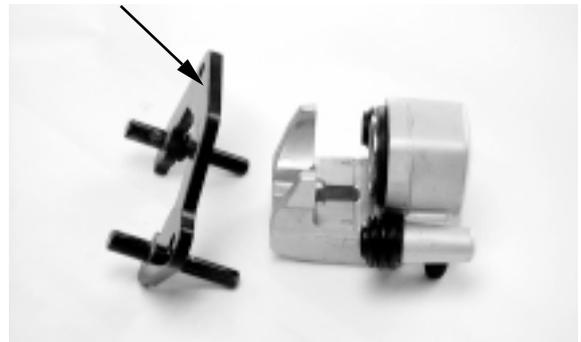
* Be careful not to splash brake fluid on any coated surfaces.



DISASSEMBLY

Remove the brake caliper holder from the brake caliper.

Brake Caliper Holder



Remove the pistons from the brake caliper. Use compressed air to press out the pistons through the brake fluid inlet opening and place a shop towel under the caliper to avoid contamination caused by the removed pistons.



Push the piston oil seals inward to remove them. Clean each oil seal groove with brake fluid.

* Be careful not to damage the piston surface.

Piston Oil Seals



13. REAR WHEEL/SWING ARM/ HYDRAULIC BRAKE

INSPECTION

Inspect the caliper cylinder wall and piston surface for scratch, corrosion or other damages.

If any abnormal condition is noted, replace the caliper.



ASSEMBLY

Clean all removed parts.

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

Install the oil seals and then install the brake caliper pistons with the grooved side facing out.

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



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

13. REAR WHEEL/SWING ARM/ HYDRAULIC BRAKE

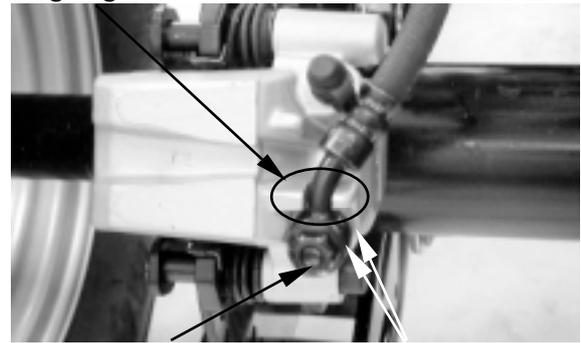
INSTALLATION

Connect the brake fluid tube to the brake caliper, aligning the fluid tube with groove in the caliper and tighten the fluid tube bolt.

Torque: 3.0_ 4.0kg-m

Add the recommended brake fluid into the brake reservoir and bleed air from the brake system. (Refer to 13-15.)

Aligning The Fluid Tube With Groove



Fluid Tube Bolt

Washers

Install the brake caliper onto rear axle hub and tighten the bolts.

Torque: 2.9_ 3.5kg-m

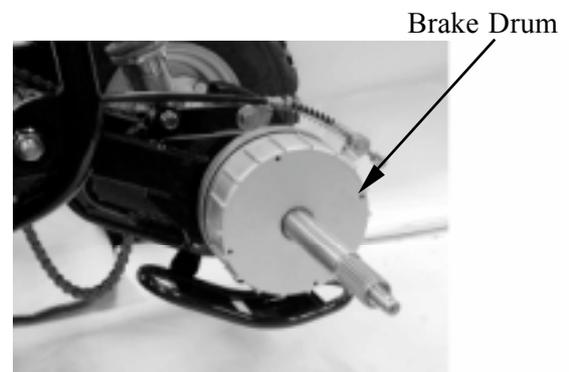


DRUM BRAKE

REMOVAL

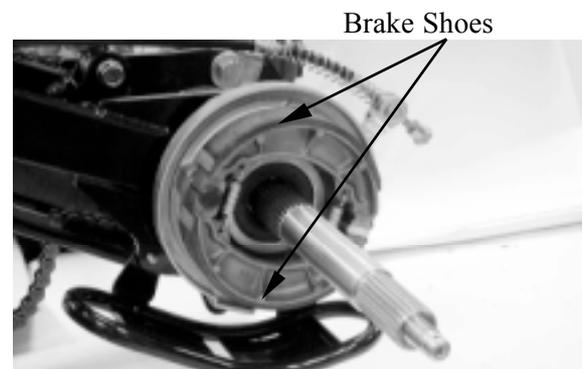
Remove wheel hub and axle hub. (See page 13-5)

Remove brake drum.



Brake Drum

Remove brake shoes.



Brake Shoes

13. REAR WHEEL/SWING ARM/ HYDRAULIC BRAKE

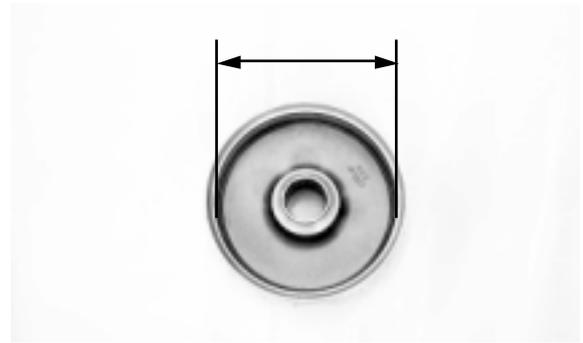
INSPECTION

Inspect the inner surface of the brake drum is scratches, polish brake drum lightly and evenly with emery cloth.

Measure the inside diameter of the brake drum.

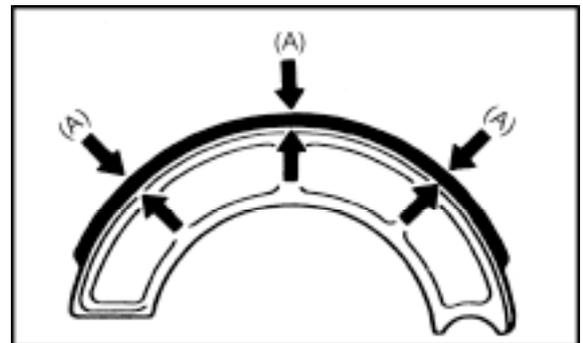
Service limit: 131mm

Replace it if it is out of specification.



Measure the front brake lining thickness (A).

Service limit: 2.0mm replace it if below



INSTALLATION

Reverse the “REMOVE” procedures.