

## 12. FRONT WHEEL/FRONT BRAKE/FRONT SUSPENSION/STEERING SYSTEM



### FRONT WHEEL/FRONT BRAKE/ FRONT SUSPENSION\STEERING SYSTEM

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### SERVICE INFORMATION

#### GENERAL INSTRUCTIONS

- Remove the machine frame covers before removing the front wheel. Jack the machine front wheel off the ground and be careful to prevent the machine from falling down.
- During servicing, keep oil or grease off the brake drum and brake linings.
- Inspect the brake system before riding.

#### SPECIFICATIONS

Item		Standard (mm)	Service Limit (mm)
Front wheel rim run out	Radial	□	2.0
	Axial	□	2.0
Front brake drum I.D		110	111
Front brake lining thickness		4	1.5
Tie rod length		266.5	□
Rod-end (tie rod) angle		180°	□

#### TORQUE VALUES

Steering stem nut	6.0_	8.0kgf-m
Swing arm nut	4.0_	5.0kgf-m
Front wheel nut	6.0_	8.0kgf-m
Front wheel hub nut	6.0_	8.0kgf-m
Front shock absorber upper mount bolt	3.5_	4.5kgf-m
Front shock absorber lower mount bolt	3.5_	4.5kgf-m

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### SPECIAL TOOLS

Oil seal and bearing install E014

### TROUBLESHOOTING

#### Hard steering (heavy)

- Insufficient tire pressure
- Bent spoke plate

#### Steers to one side or does not track straight

- Uneven front shock absorbers
- Bent front arm
- Bent steering knuckle

#### Poor brake performance

- Incorrectly adjusted brake
- Worn brake linings
- Contaminated brake lining surface
- Worn brake shoes at cam contacting area
- Worn brake drum
- Poorly connected brake arm

#### Front wheel wobbling

- Bent rim
- Excessive wheel bearing play

- Faulty tire
- Improperly tightened axle nut

#### Soft front shock absorber

- Weak shock springs
- Insufficient damper oil

#### Front shock absorber noise

- Slider bending
- Loose arm fasteners
- Lack of lubrication

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### FRONT WHEEL

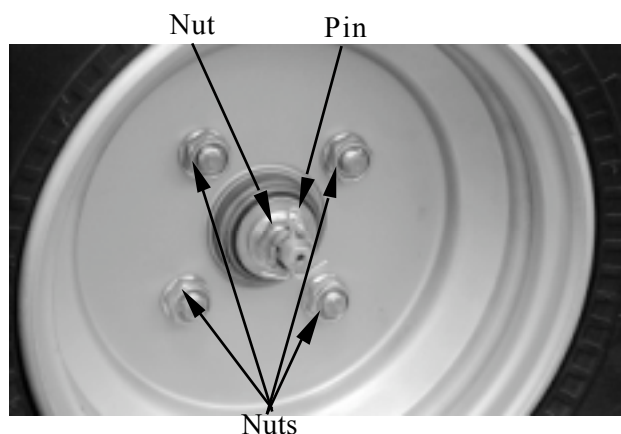
#### REMOVAL

Place the machine on a level place.

Remove four nuts attaching the wheel panel and front wheel.

Elevate the front wheels by placing a suitable stand under the frame.

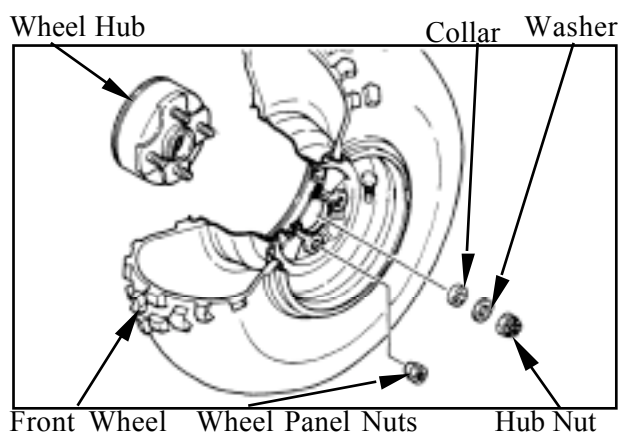
\* Support the machine securely so there is no danger of it falling over.



Remove the cotter pin.

Remove nut attaching the wheel hub and washer.

Remove the collar and wheel hub.

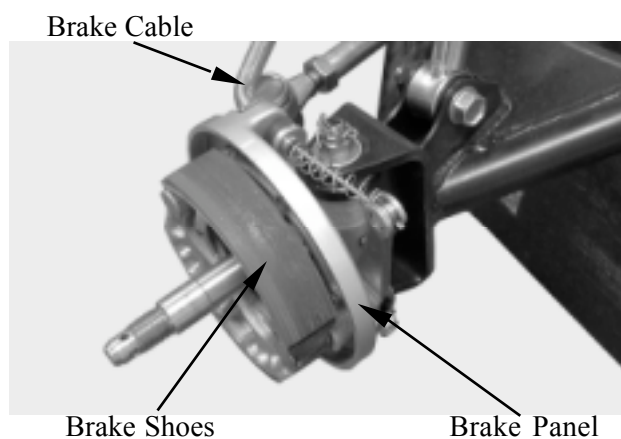


### FRONT BRAKE DISASSEMBLY

Loosen the lock nut and tighten the adjuster nut at brake lever. (Refer to the "FRONT BRAKE ADJUSTMENT" section in the CHAPTER 3.).

Disconnect the front brake cable from brake cam lever and remove the brake panel.

Remove the brake shoes.

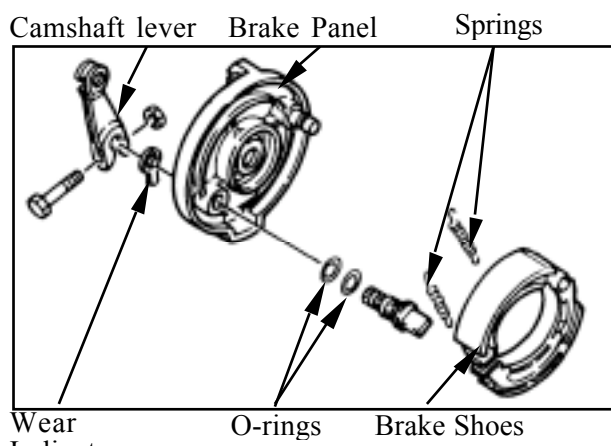


#### REMOVE

Remove brake shoes and springs.

Remove the bolt attaching camshaft lever and remove camshaft lever.

Remove the wear indicator, camshaft and O-rings



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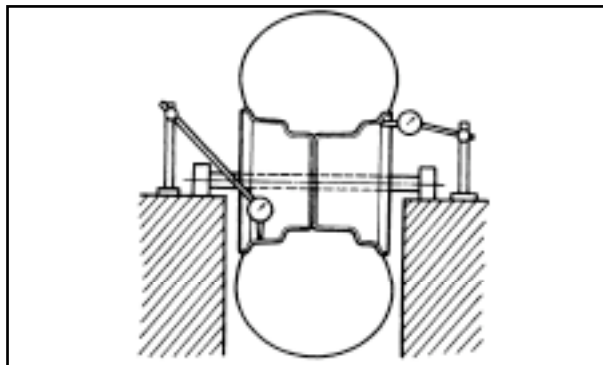


Measure the wheel run out.  
Replace wheel or check bearing play if out of specification

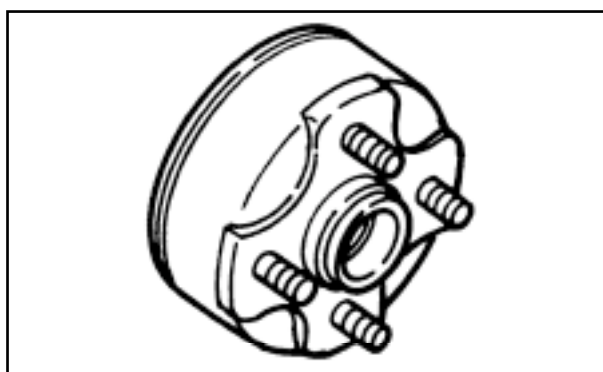
### **Rim run out limits:**

Vertical: 2.0mm

Lateral: 2.0mm



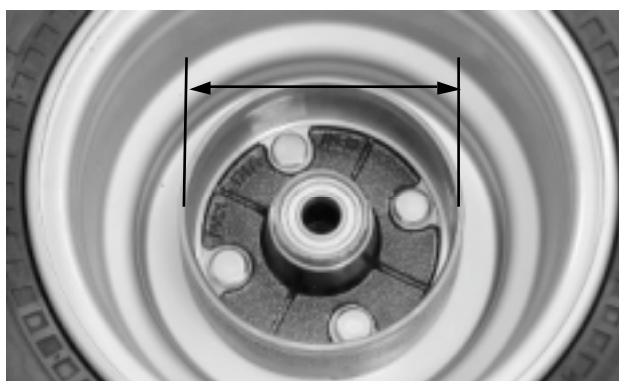
Inspect the front wheel hub.  
Replace if cracks or damage.



Inspect the front brake drum.  
Measure the front brake drum I.D.  
**Service limits:** 111mm

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Keep oil or grease off the brake drum.



### **FRONT WHEEL BEARING**

Remove the side collar.



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Remove the dust seal.

Turn the inner race of each bearing with your finger to see if they turn smoothly and quietly. Also check if the outer race fits tightly in the hub.



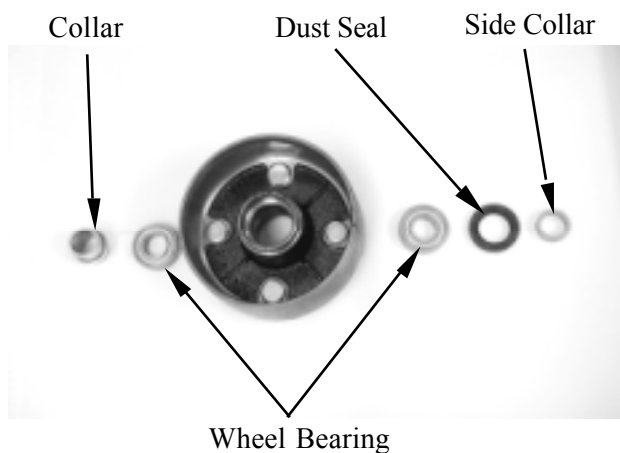
### BEARING REPLACEMENT

Remove the front wheel bearings and distance collar.



Replace the bearings if the races do not turn smoothly, quietly, or if they fit loosely in the hub.

Apply grease to a new dust seal lip and install the dust seal.



Pack all bearing cavities with grease.

Drive in the left bearing.

Install the distance collar.

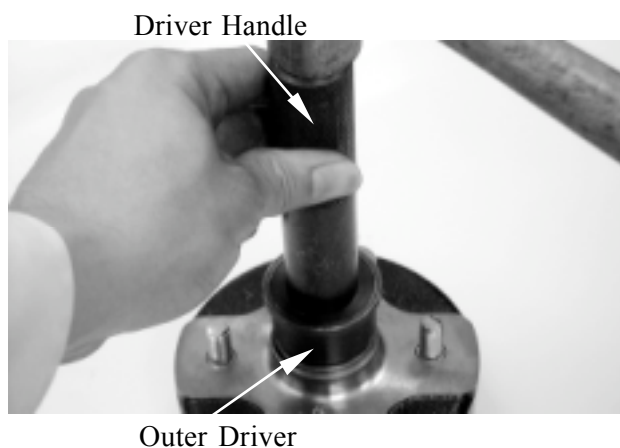
Drive in the right bearing.

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- Do not allow the bearings to tilt while driving them in.
- Drive in the bearing squarely with the sealed end facing out.

Special

Oil seal and bearing install E014



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### FRONT BRAKE

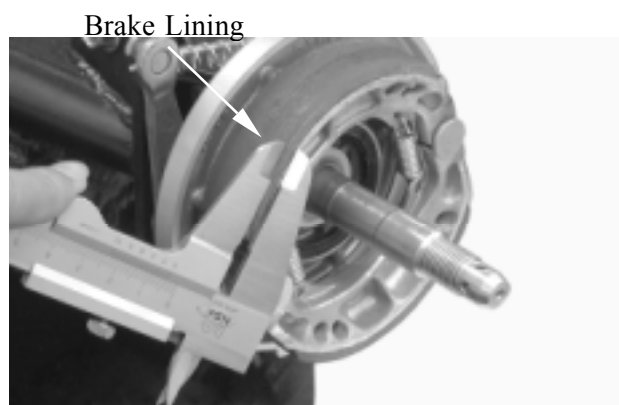
#### FRONT BRAKE LINING INSPECTION

Measure the front brake lining thickness.

**Service limit:** 2.0mm replace if below

**\***

Keep oil or grease off the brake linings.



### REMOVAL

Inspect the shoe springs, O-rings, camshaft lever and wear indicator.

Replace if damage.

Inspect the brake shoe plate.

Replace if cracks or damage.

Inspect the brake shoe pivot pin.

Replace if wear or damage.

Inspect the camshaft hole and camshaft.

Replace if scratches or excessive wear.

### INSTALLATION

Reverse the "REMOVAL" procedures.

**\***

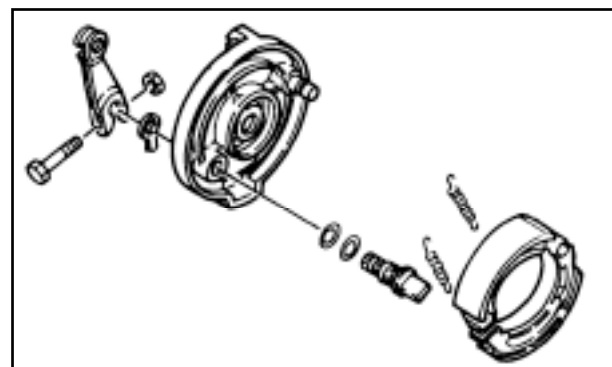
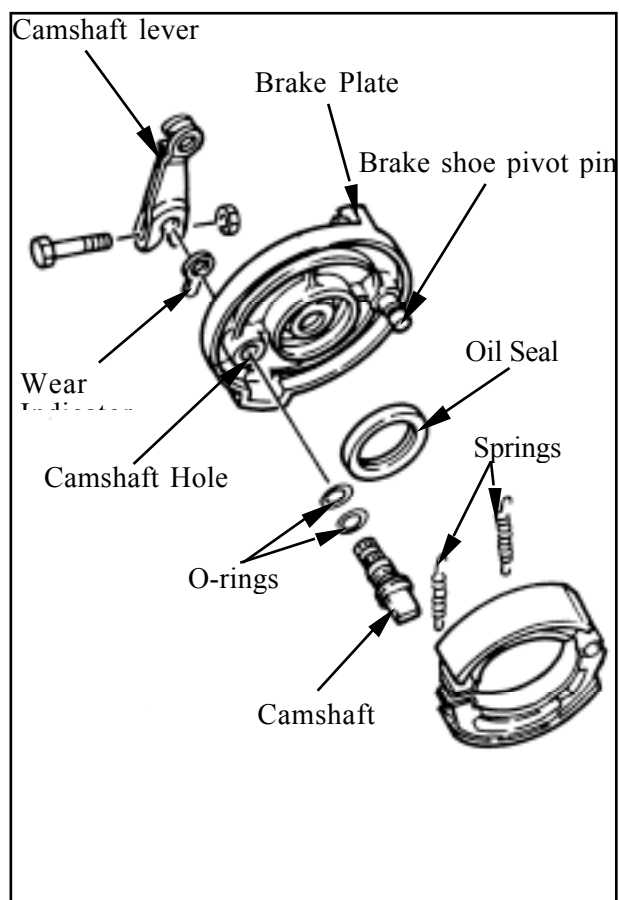
- Install the camshaft to the brake shoe plate with the slot of the camshaft placing at bass line of the wear indicator scale.
- Align the projection with the slot of the camshaft when installing the wear indicator to the camshaft.
- Align the cut-out of the camshaft lever with the slot of the camshaft when installing the camshaft lever to the camshaft.

Tighten the bolt for camshaft lever.

**Torque:** 1.8\_ 2.5kgf-m

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Apply the grease onto the o-ring, oil seal lips, pivot pin of brake shoe and camshaft.

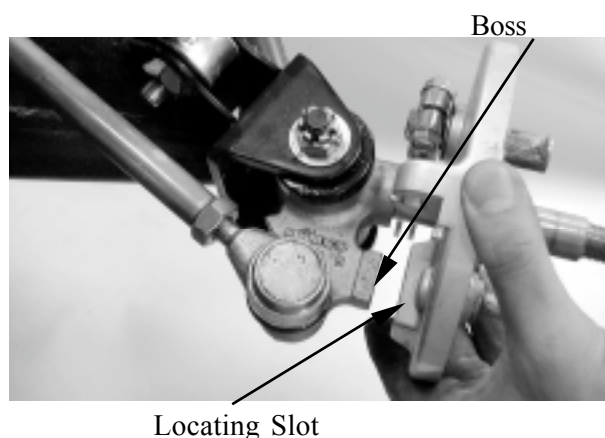




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Install the brake shoe plate.

- \* Make sure that the boss on the knuckle correctly engages with the locating slot on the brake shoe plate.



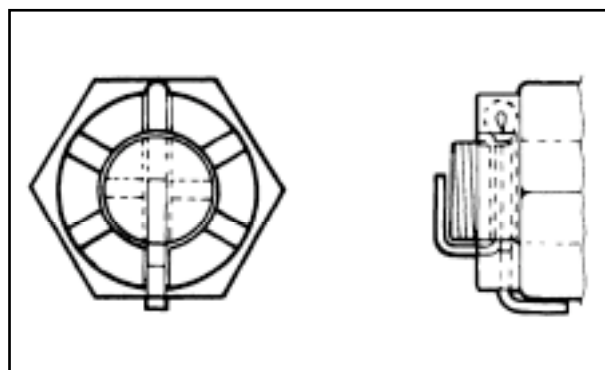
Apply the grease onto the bearings and oil seal lips of the wheel hub.  
Install wheel hub, plate washer and tight the nut (wheel hub).

**Torque:** 6.0\_ 8.0kgf-m

Install cotter pins.

- \* Always use a new 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 it on the axle nut.



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

**Torque:** 6.0\_ 8.0kgf-m

- \* Tapered wheel nuts are used for front wheels.  
Install the nuts with its tapered side towards the wheel.



Adjust the front brake cable free play.

Refer to the "FRONT BRAKE ADJUSTMENT" section in the CHAPTER 3.

**Brake cable free play:** 10\_ 20mm at lever pivot.

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### FRONT SUSPENSION

#### REMOVAL

Elevate the front wheels by placing a suitable stand under the frame.



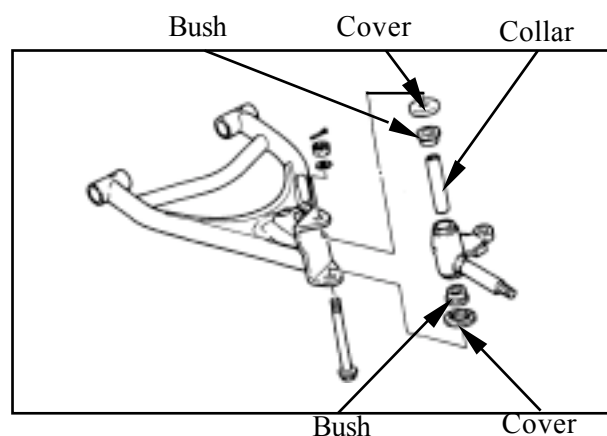
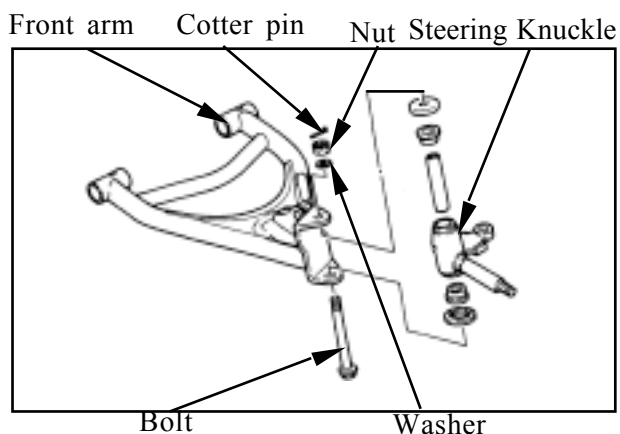
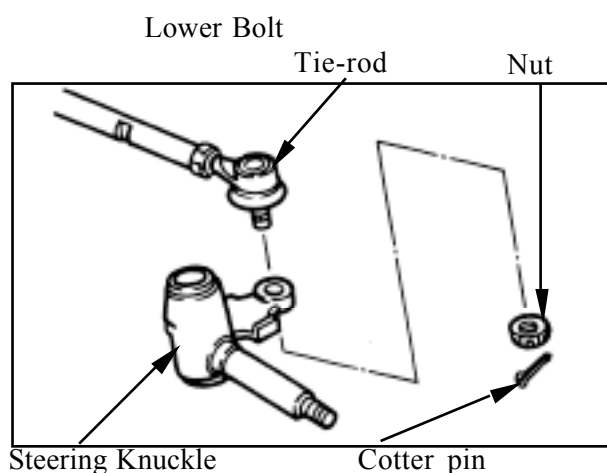
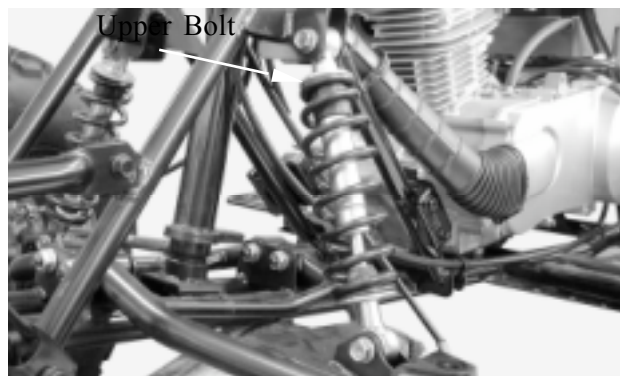
Support the machine securely so there is no danger of it falling over.

Remove the front wheel, wheel hub, brake shoe plate.

Remove the upper and lower bolt, then remove the shock absorber.

Remove the cotter pin and nut, then remove tie-rod from steering knuckle.

Remove cotter pin, nut, washer and bolt, then remove the steering knuckle, covers, collar and bush from the front arm.



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### INSPECTION

Check the front arm brackets of the frame.

If bent, cracked or damaged, repair or replace the frame.

Check the tightening torque of the front arms securing nuts.

**Torque:** 4.0\_ 5.0kgf-m

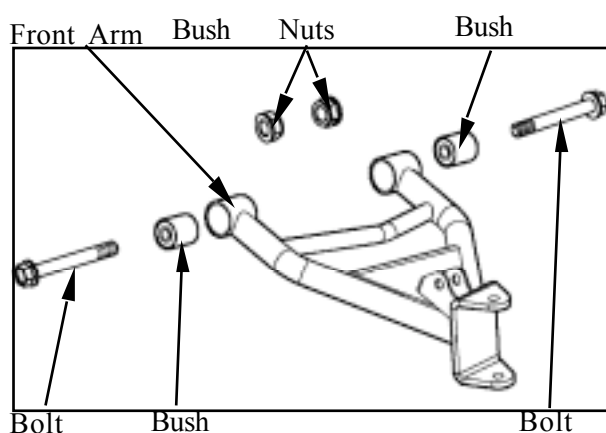
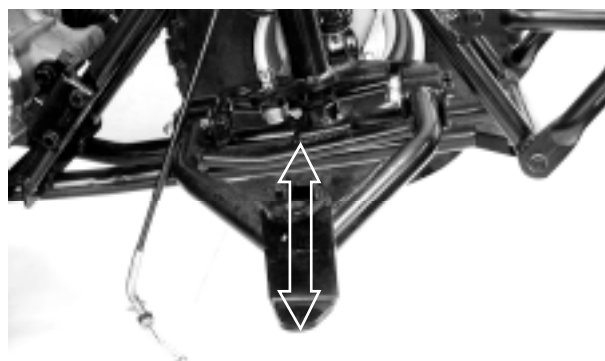
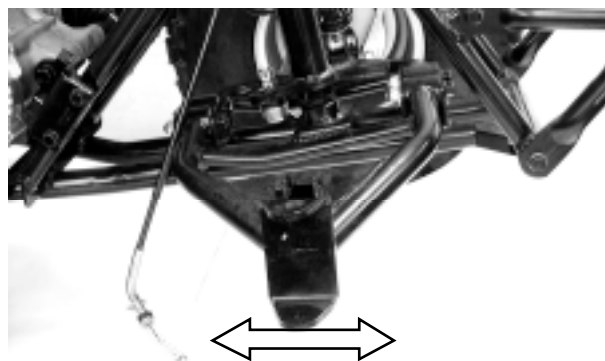
Check the front arm side play by moving it from side to side.

If side play noticeable, replace the inner collar, bushings and thrust covers as a set.

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

If vertical movement is tight, binding or rough, replace the inner collar, bushings and thrust covers as a set.

Remove the two nut and two bolt attaching the front arm, then remove the front arm.



### INSPECTION

Inspect the shock absorber rod.

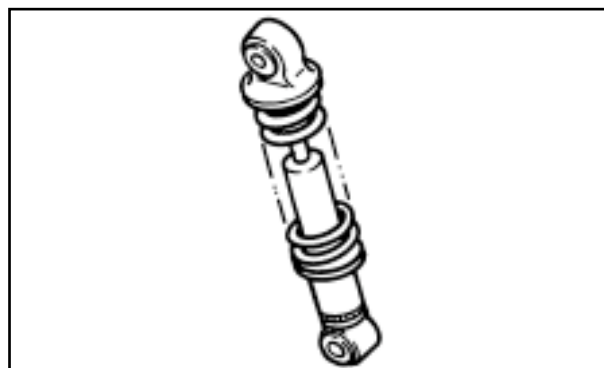
Replace the shock absorber assembly if bends or damage.

Inspect the shock absorber.

Replace the shock absorber assembly if oil leaks.

Inspect the spring of the shock absorber by move the spring up and down.

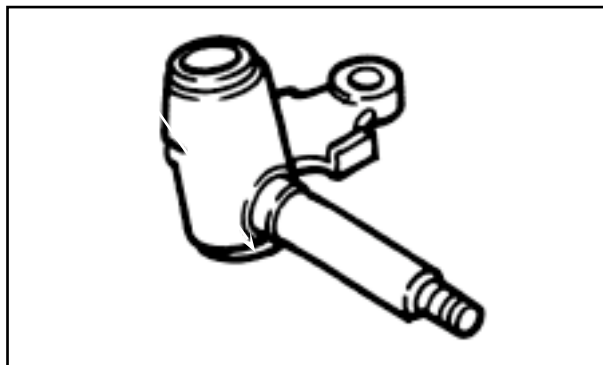
Replace the shock absorber assembly if fatigue.



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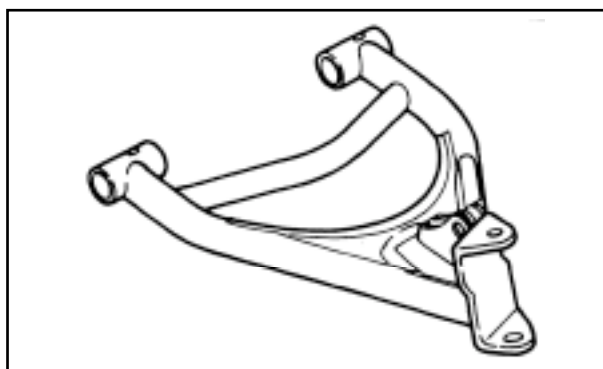
Inspect the steering knuckle.  
Replace if cracks, pitting or damage.



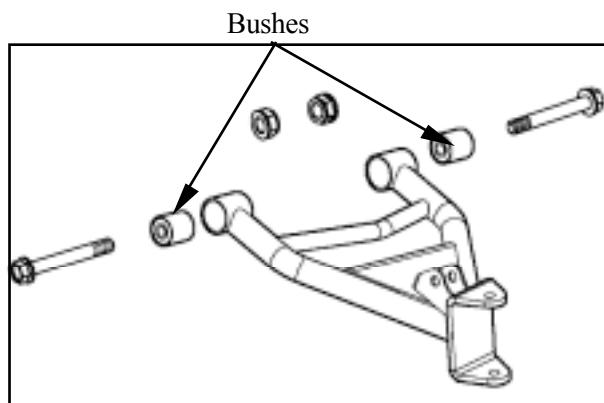
Inspect the front arm.  
Replace if cracks, bends or damage.

\*

Do not attempt to straighten a bent arm,  
this may dangerously weaken the arm.



Inspect bushes.  
Replace if wear or damage.



### INSTALLATION

Reverse the "REMOVAL" procedures.

\*

Apply the grease onto the bushes, collars  
and covers.

Install the front arm nut onto the frame and  
tighten the nuts.

**Torque:** 4.0\_ 5.0kgf-m

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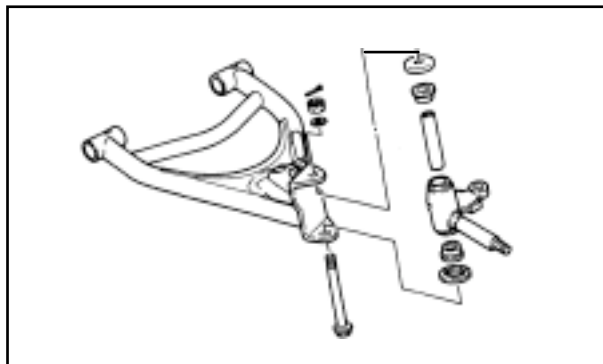


Apply the grease onto the bush, collars and covers, then install the steering knuckle onto the front arm and tighten the nut.

**Torque:** 4.0\_ 5.0kgf-m

Install the cotter pin and band ends of cotter pin.

\* Always use a new cotter pin.

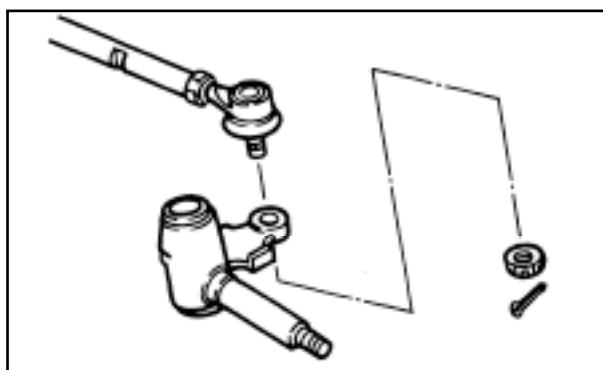


Install the tie-rod onto the steering knuckle and tighten the nut.

**Torque:** 4.0\_ 5.0kgf-m

Install the cotter pin and band ends of cotter pin.

\* Always use a new cotter pin.



Bleed Valve

Install the shock absorber and tighten the upper and lower bolts.

**Torque:** 3.5\_ 4.5kgf-m



Install the brake shoe plate, wheel hub and front wheel.

Refer to the "FRONT WHEEL INSTALLATION" section.

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### STEERING SYSTEM

#### REMOVAL

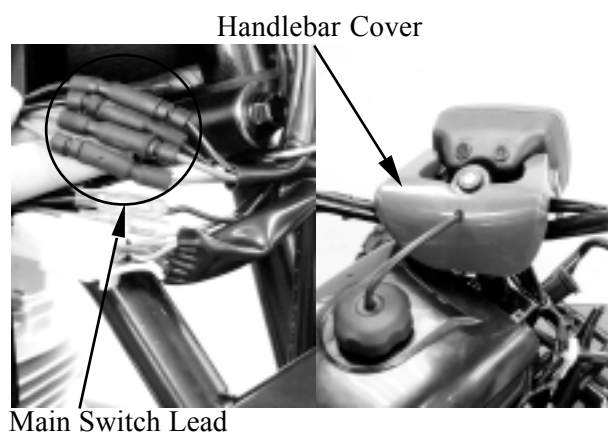
Remove the following parts:

Seat, Front cover, Center cover and Front fender

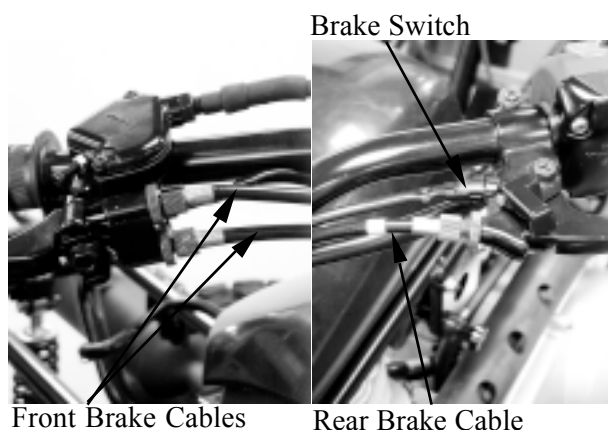
Refer to the “FENDERS” section in the CHAPTER 2

Disconnect the main switch lead.

Remove the handlebar cover with main switch.

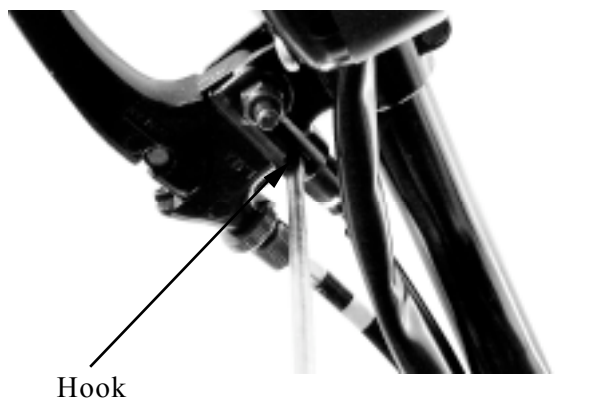


Disconnect the front brake cables from the brake lever, rear brake cable from the brake lever and brake switch from the bracket of the brake lever.



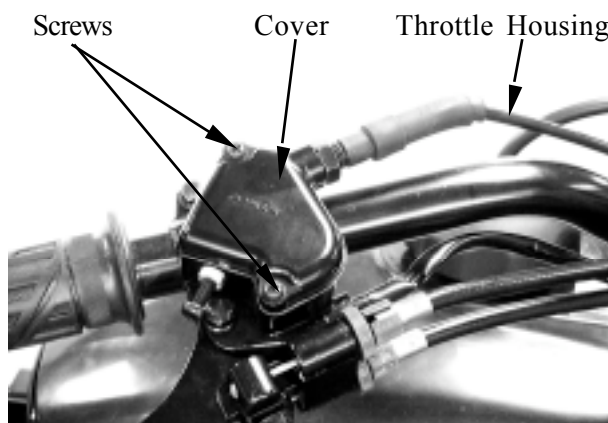
\*

Disconnect the brake switch from the bracket of the brake lever while pushing the hook of the brake switch with a driver.



Remove the two screws to remove the cover of the throttle housing.

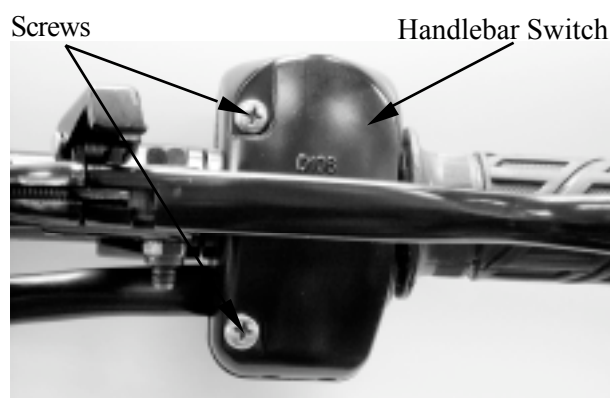
Disconnect the throttle cable from the lever.





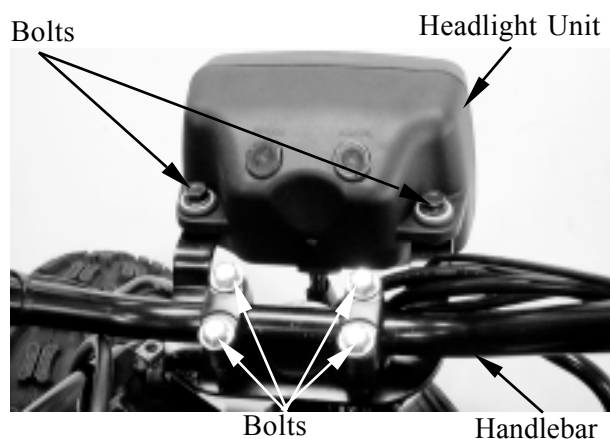
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Remove the two screws and remove the handlebar switch.

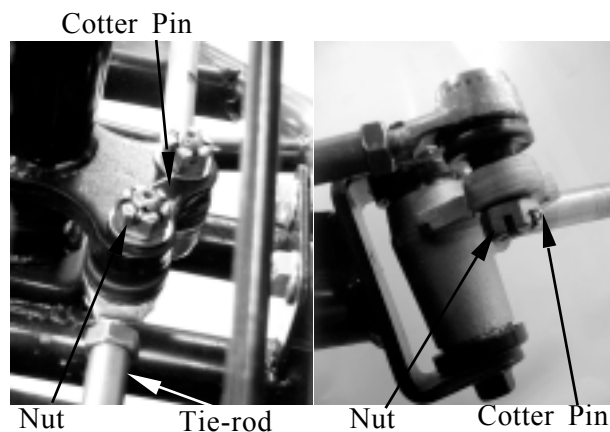


Remove the two bolts and remove headlight unit.

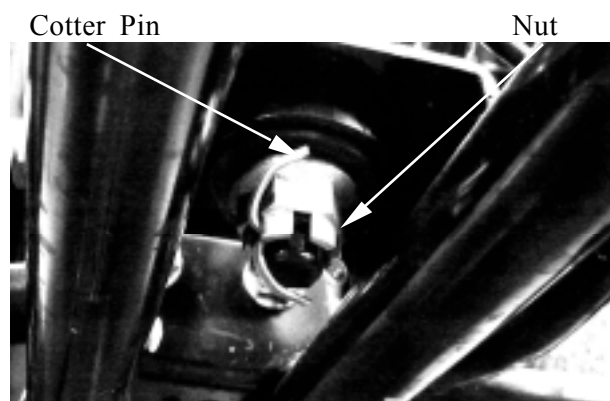
Remove the four handlebar holder bolts and remove the handlebar.



Remove the cotter pins and nuts attaching the tie-rods, then remove tie-rods.



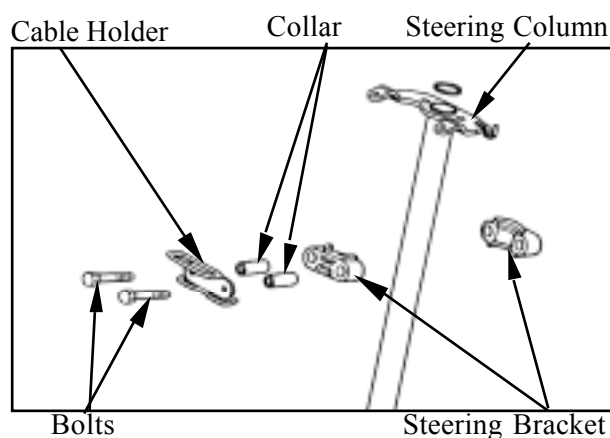
Remove the cotter pin and nut attaching the steering column, then remove steering column and collar.



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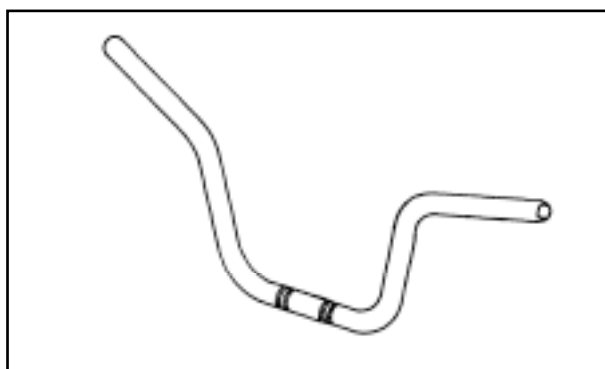


Remove the two bolts to remove the cable holder, steering bracket, collars and steering column.



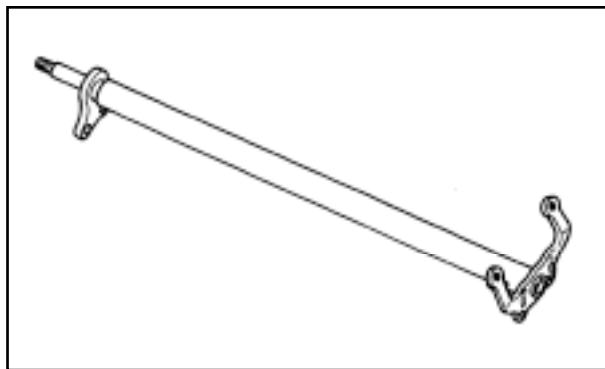
### INSPECTION

Inspect the handlebar.  
Replace if cracks, bends or damage.

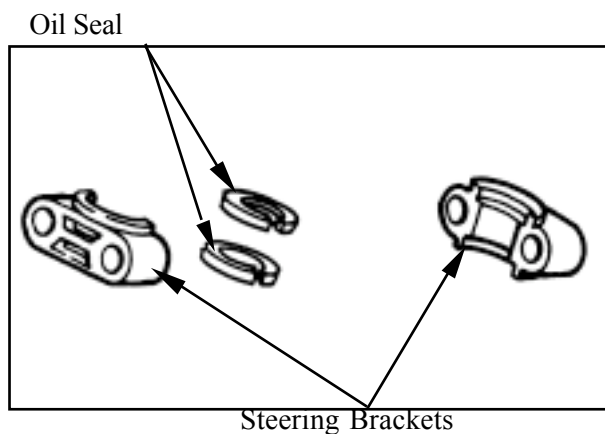


Inspect the steering column.  
Replace if bends or damage.

\* Do not attempt to straighten a bent shaft, this may dangerously weaken the



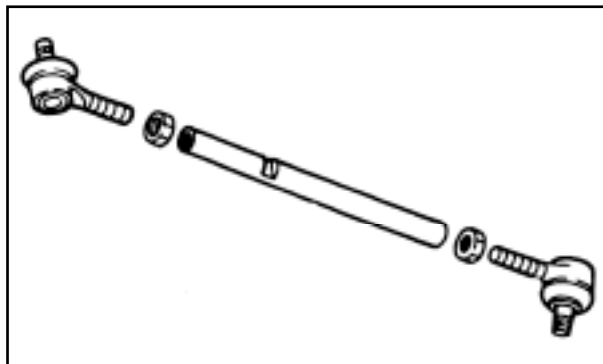
Inspect the steering brackets and oil seal.  
Replace if wear or damage.



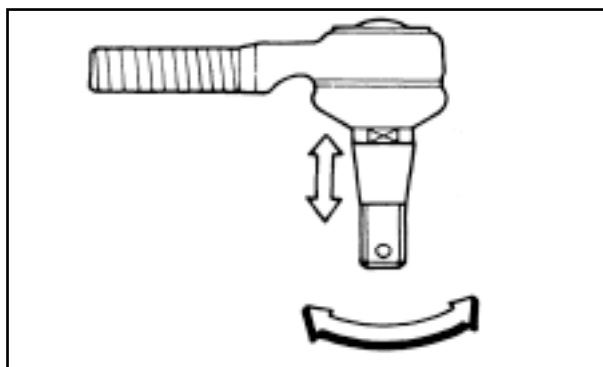


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Inspect the tie-rod.  
Replace if bend or damage.



Check the tie-rod end movement.  
Replace if the tie-rod end exists free play or turns roughly.  
Check the tapered surface of the tie-rod end.  
Replace if pitting, wear or damage.



Adjust the tie-rod length.  
Adjustment steps:  
(The following procedures are done on both tie-rods, right and left.)  
Loosen the lock nuts.  
Adjust the tie-rod length by tuning both tie-rod ends.

**Tie rod length:** 266.5mm

Set the rod-end (steering column side) in an angle where the indentation surface of the tie-rod is parallel to the rod-end shaft, and then tighten the lock nut.

**Torque:** 3.0\_ 4.0kgf-m

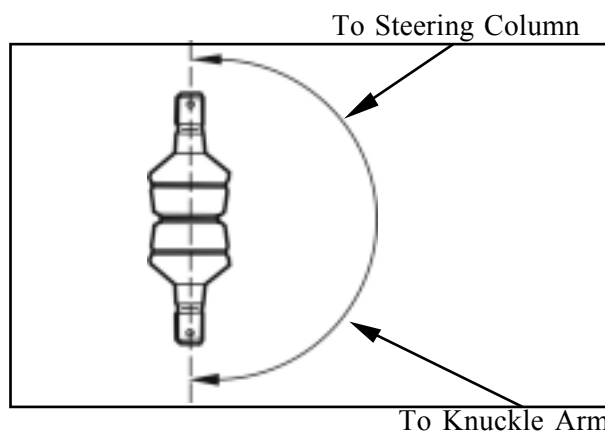
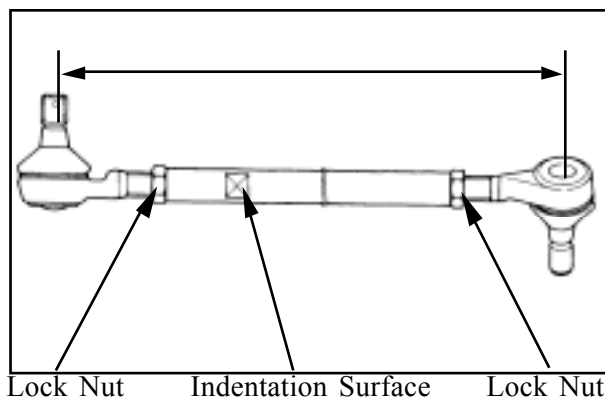
Set the other rod-end (knuckle arm side) in an angle as shown (right-hand tie-rod and left-hand tie-rod), and then tighten the lock nut.

Rod-end (tie rod) angle: 180°

**Torque:** 3.0\_ 4.0kgf-m

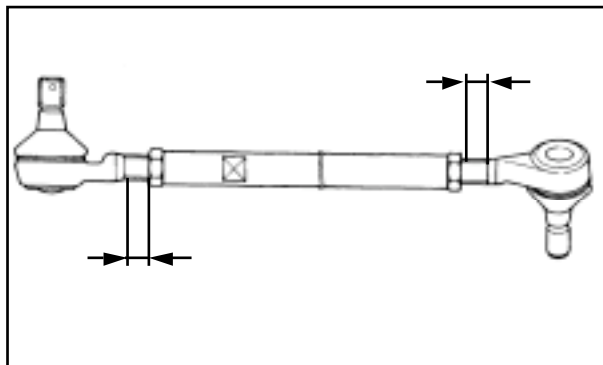
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After making adjustment on both tie rods be sure to mark them R and L for identification.

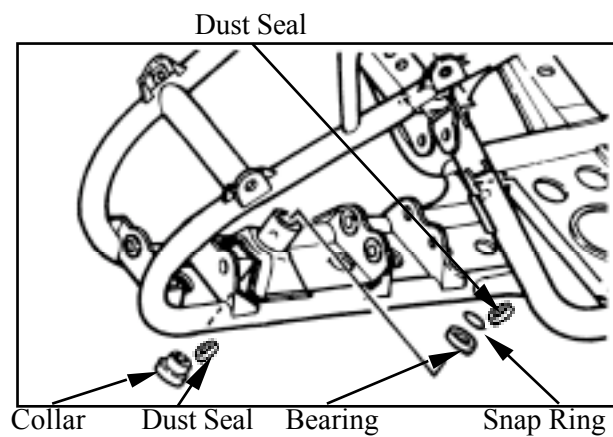


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- \* The threads on both rod-end must be of the same length.



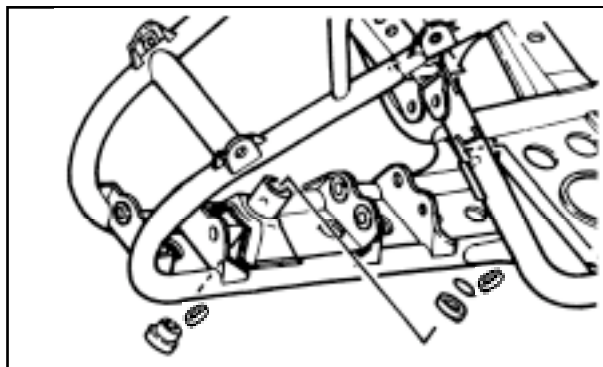
Inspect the collar, dust seal, snap ring and bearing.  
Replace if wear or damage.



### INSTALLATION

Reverse the "REMOVAL" procedures.

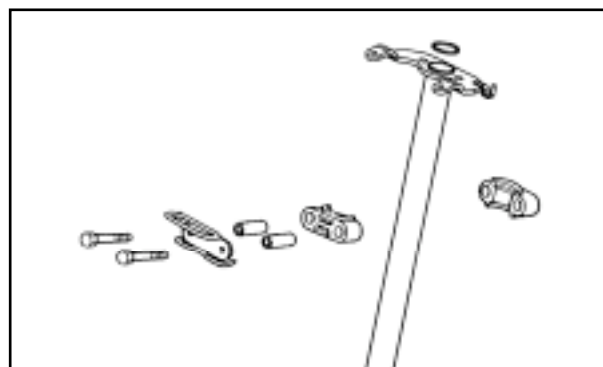
- \* Apply the grease onto the collar, dust seal, and bearing.



Assembly the steering column and tighten the two bolts.

**Torque:** 3.0\_ 4.0kgf-m

Band the lock washer tabs.



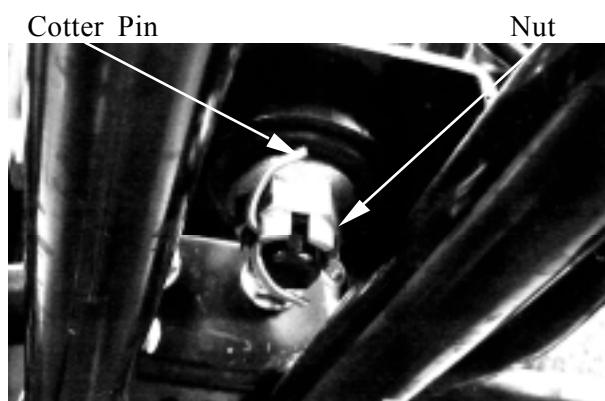
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Install the steering column and collar, then tighten the nut.

**Torque:** 6.0\_ 8.0kgf-m

Install the cotter pin and band ends of cotter pin.

- \* Always use a new cotter pin.

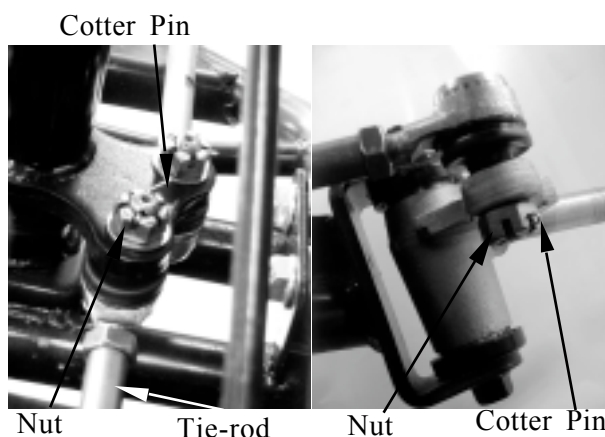


Install the tie rods and tighten the nut.

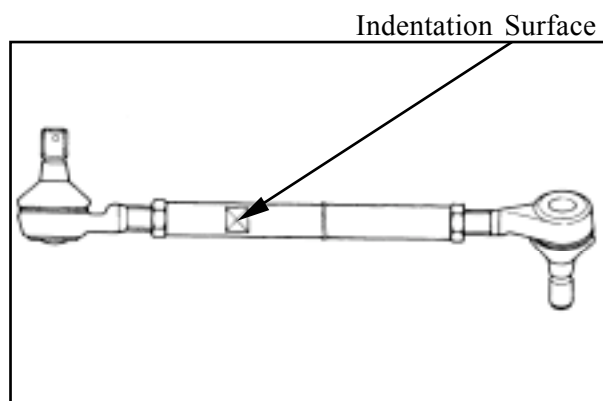
**Torque:** 4.0\_ 5.0kgf-m

Install the cotter pin and band ends of cotter pin.

- \* Always use a new cotter pin.

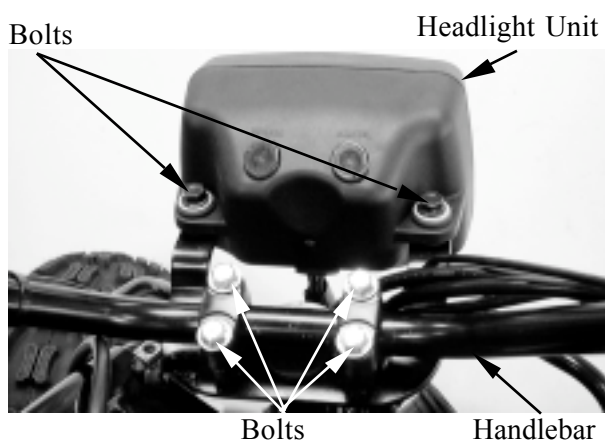


- \* Be sure that the rod-end on the indentation surface side is connected to the steering column.



Install handlebar and handlebar holder, then tighten the four bolts.

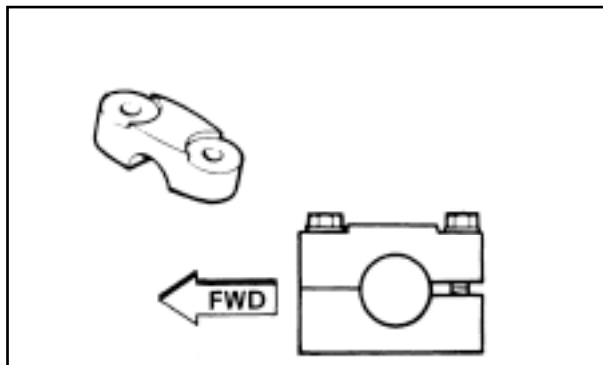
**Torque:** 1.8\_ 2.5kgf-m



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- Be sure the upper handlebar holder mark face to front.
- First tighten the bolts on the front side of the handlebar holder, and then tighten the bolts on the rear side.



Apply the grease onto the end of the throttle cable and end of the brake cable.

Refer to the “TOE-IN ADJUSTMENT” section in the CHAPTER 3 to adjust toe-in.

Refer to the “FRONT BRAKE ADJUSTMENT” section in the CHAPTER 3 to adjust front brake.

Refer to the “REAR BRAKE ADJUSTMENT” section in the CHAPTER 3 to adjust rear brake.