

14. FRONT WHEEL/FRONT SUSPENSION/ STEERING SYSTEM



14

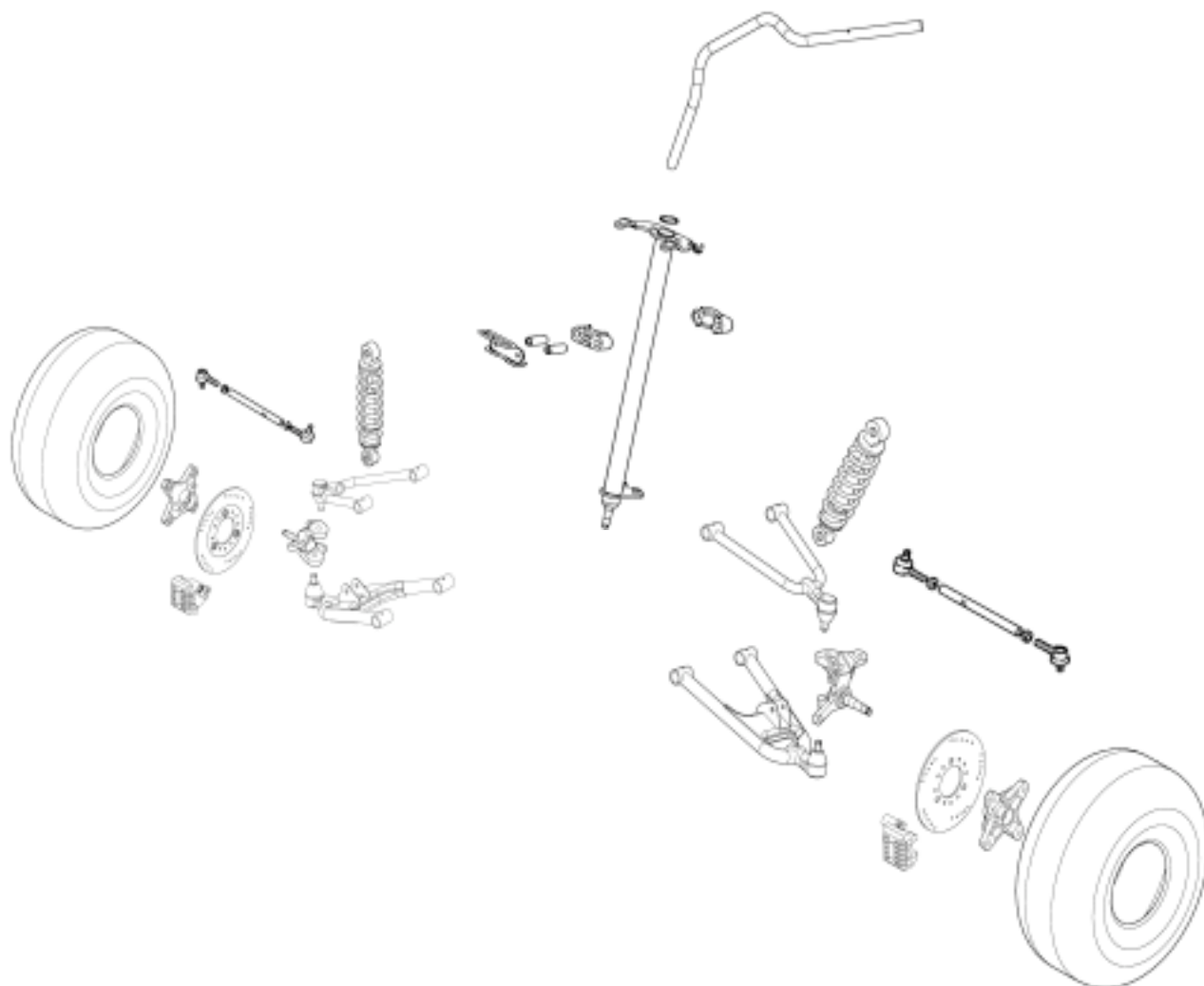
FRONT WHEEL/ FRONT SUSPENSION\STEERING SYSTEM

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14. FRONT WHEEL/Front SUSPENSION/ STEERING SYSTEM



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SERVICE INFORMATION

GENERAL INSTRUCTIONS

- 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 disk
- Inspect the brake system before riding.

SPECIFICATIONS

Item		Standard (mm)	Service Limit (mm)
Front wheel rim run out	Radial	□	2.0
	Axial	□	2.0
Tie rod length		299.5±0.5	□
Rod-end (tie rod) angle		180°	□

TORQUE VALUES

Steering stem nut	6.0_ 8.0kgf-m
Front swing arm nut	4.0_ 5.0kgf-m
Front wheel nut	5.0_ 6.0kgf-m
Front wheel hub nut	6.0~8.0kgf-m
Steering knuckle nut	3.0_ 4.0kgf-m
Front shock absorber upper mount bolt	3.5_ 4.5kgf-m
Front shock absorber lower mount bolt	3.5_ 4.5kgf-m

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

Front shock absorber noise

- Slider bending
- Loose arm fasteners
- Lack of lubrication

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

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FRONT WHEEL

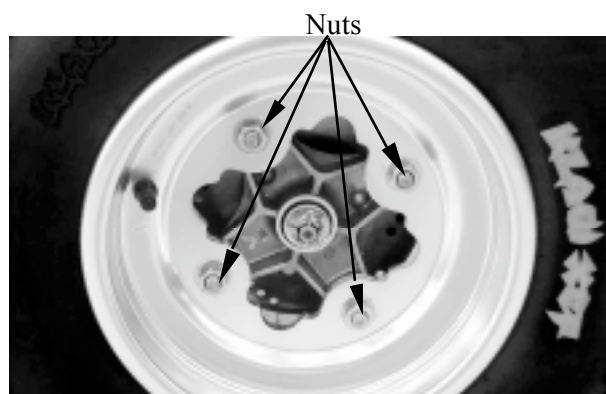
REMOVAL AND INSPECTION

Place the machine on a level place.

Remove four nuts attaching the front wheel hub 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.**



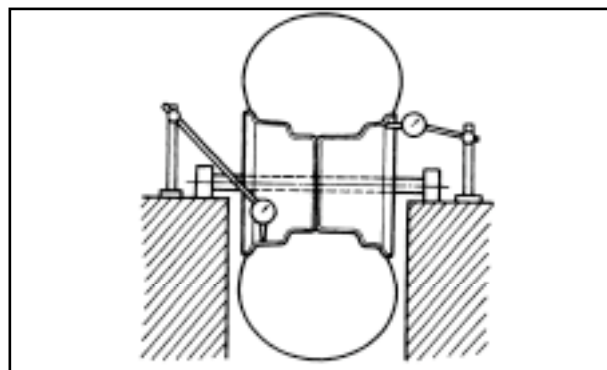
Measure the wheel run out.

Replace wheel or check bearing play if out of specification

Rim run out limits:

Vertical: 2.0mm

Lateral: 2.0mm

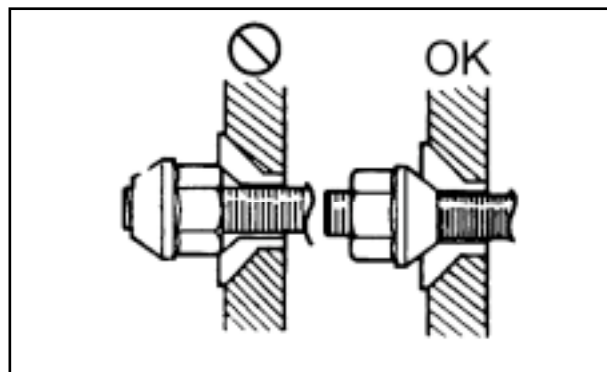


INSTALLATION

When reinstalling a wheel, tighten the wheel nuts in a crisscross (rather than a circular) pattern.

Torque: 5.0_ 6.0kgf-m

⚠ **Be sure the tapered side of the wheel nuts face the wheel rim.**



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FRONT WHEEL HUB

REMOVAL AND INSPECTION

Place the machine on a level place.
Remove the front wheel (⇒ 14-3) and
caliper. (⇒ 13-8)
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 front wheel hub
and then remove front wheel hub.

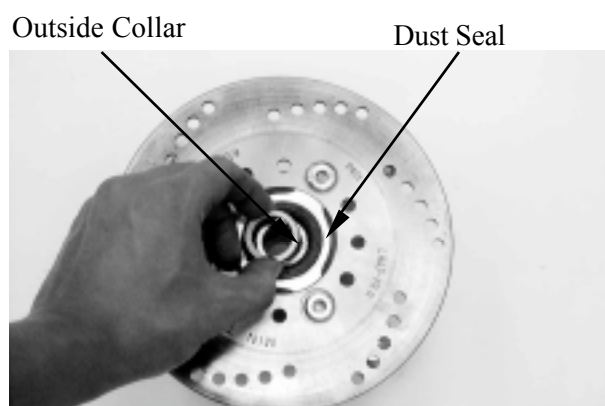
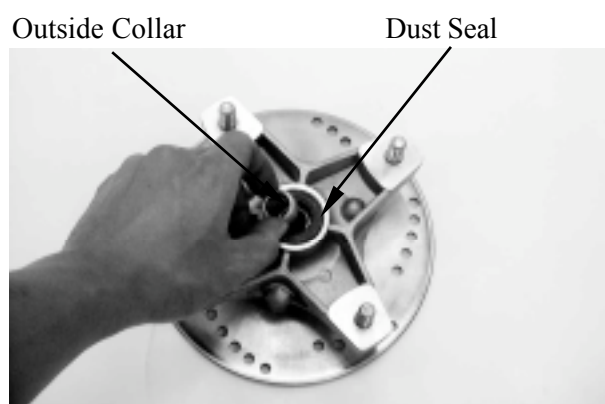
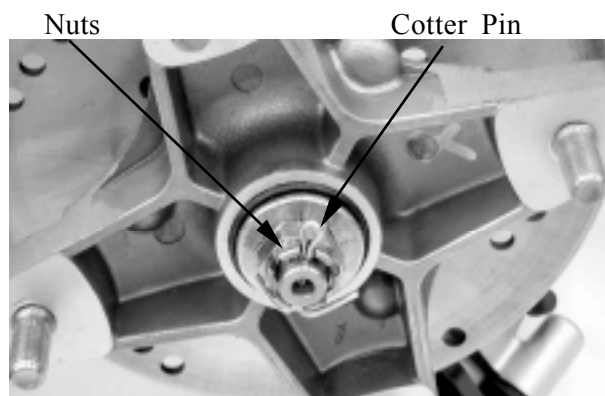
DISASSEMBLY

Remove the outside collars.

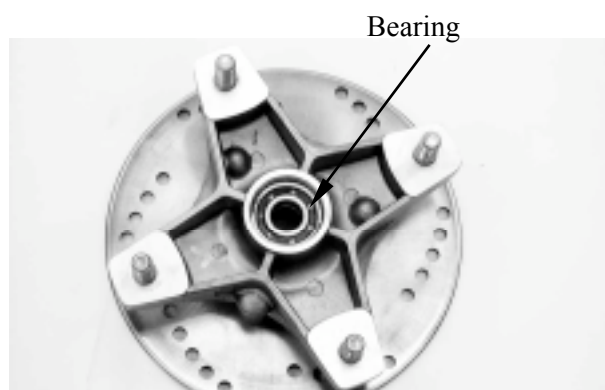
Inspect the dust seals for wear or damage.
If any defects are found, replace the dust
seal with a new one.

Remove the dust seals by a flat-head screw
driver.

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



Inspect the bearings for allow play in the
front wheel hub or the wheel turns roughly.

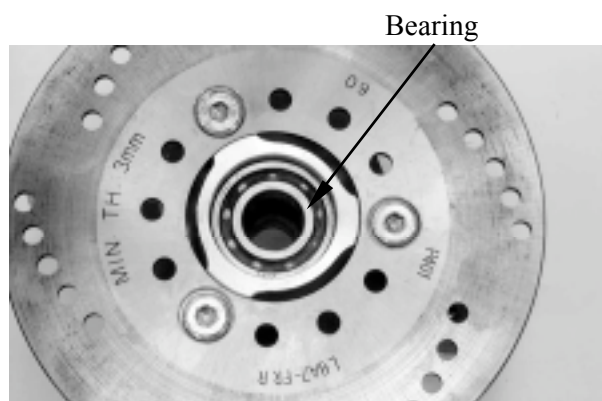


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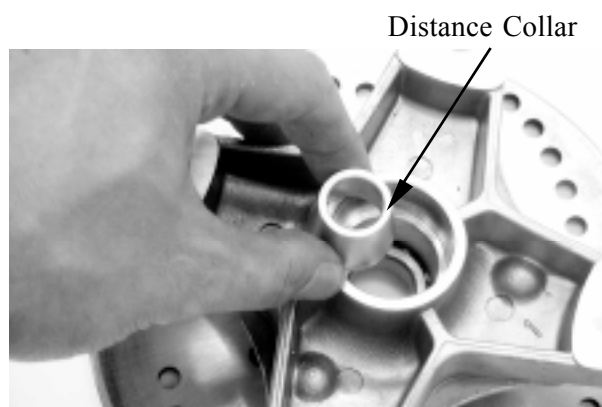
If any defects are found, replace the bearings



Remove the bearings using a general bearing puller.



Remove the distance collar from the front wheel hub.



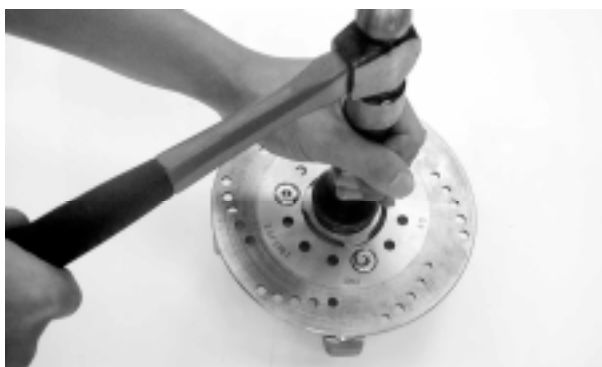
ASSEMBLY

Install the left new bearing and dust seal into the front wheel hub.

Special

Oil seal and bearing install E014

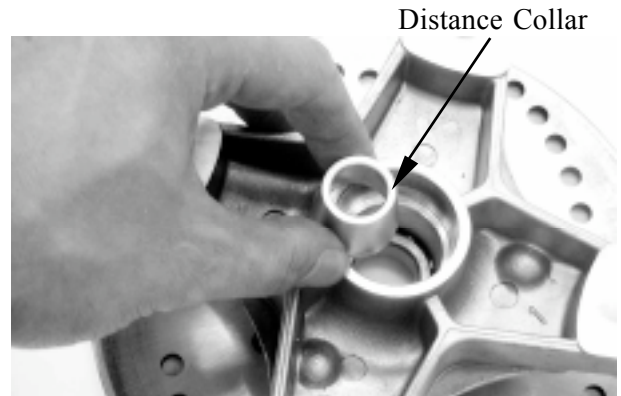
°C Apply the grease onto the oil seal lips, bearing.



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Install the distance collar.

- ◉ Be sure the tapered side of the distance collar face the wheel.



Install the right new bearing and dust seal into the front wheel hub.

- ◉ Apply the grease onto the oil seal lips, bearing.

Special

Oil seal and bearing install E014



- ◉
 - Do not allow the bearings to tilt while driving them in.
 - Do not strike the center race or balls of the bearing. Contact should be made only with the outer race.
 - Pack all bearing cavities with grease.
 - Drive in the bearing squarely

INSTALLATION

Reverse the "FRONT WHEEL HUB REMOVAL AND INSPECTION" procedures.

- ◉ Apply grease onto the bearing and dust seal lips of the wheel panel.

Tighten the front wheel hub nut.

Torque: 5.0_ 6.0kgf-m

Install the cotter pin and band ends of cotter pin.

- ◉ Always use a new cotter pin.

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FRONT SUSPENSION

REMOVAL AND INSPECTION

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

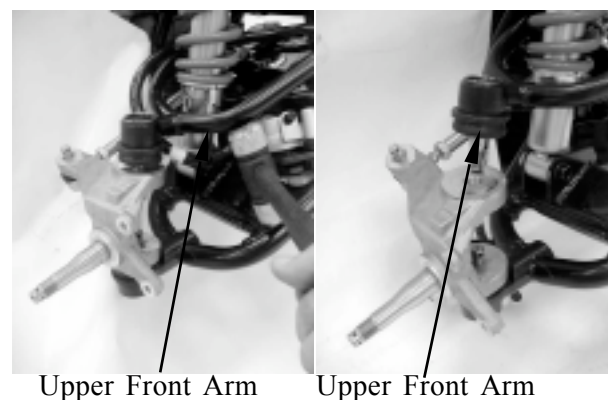
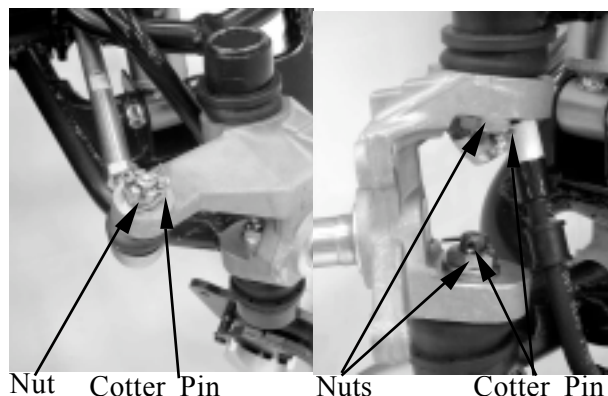


Support the machine securely so there is no danger of it falling over.

Remove the front wheel (⇒ 14-3), caliper (⇒ 13-8) and front wheel hub. (⇒ 14-4)

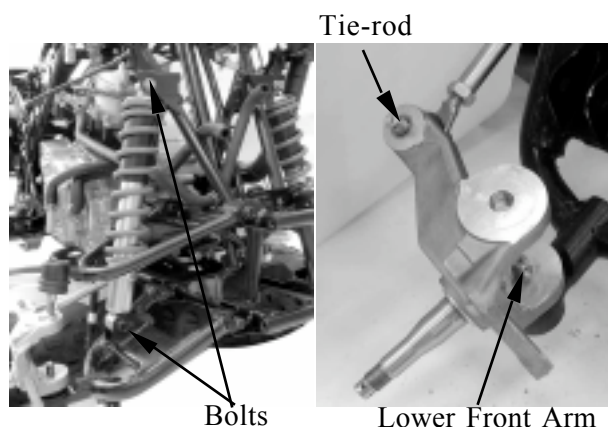
Remove the cotter pins, washer and nuts attaching tie-rod, upper and lower front arm.

Disconnect the upper front arm from the steering knuckle.



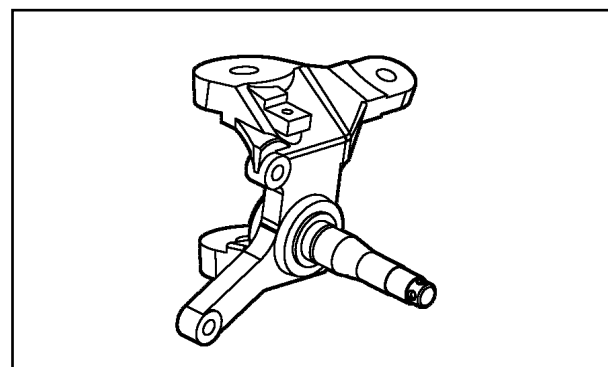
Remove the front shock absorber upper mount and lower mount bolts, then remove the front shock absorber and bush.

Disconnect the tie-rod and lower front arm from steering knuckle, then remove steering knuckle.



Inspect the steering knuckle for cracks, pitting or damage.

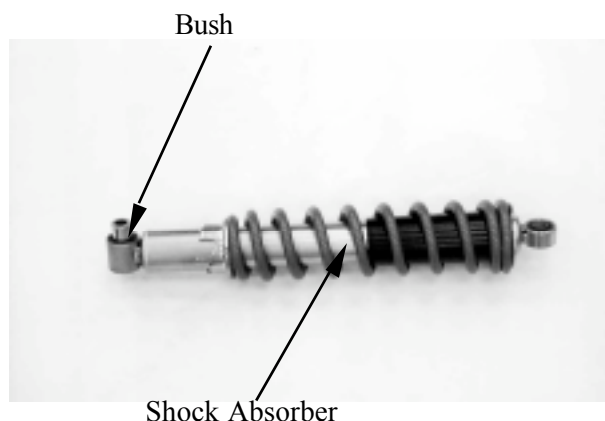
If any defects are found, replace the steering knuckle with a new one.



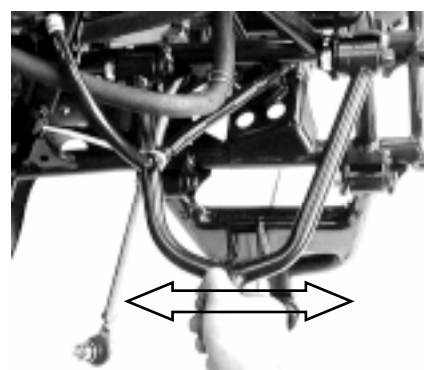
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Inspect the shock absorber rod.
Bends/damage _ Replace the shock absorber assembly.
Inspect the shock absorber.
Oil leaks _ Replace the shock absorber assembly.
Inspect the spring of the shock absorber by move the spring up and down.
Fatigue _ Replace the shock absorber assembly.
Inspect bush.
Wear/damage _ Replace.



Check the upper 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: 40_ 5.0kgf-m

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

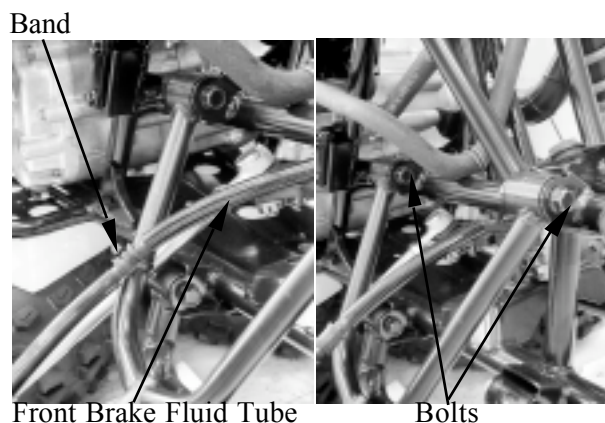
If side play noticeable, replace the inner collars and bushes as a set. as a set.

Check the front arm vertical movement by moving it up and down.
If vertical movement is tight, binding or rough, replace the inner collars and bushes as a set.



Remove the band and then disconnect the front brake fluid tube from the upper front arm.

Remove the two nuts and two bolts attaching the upper front arm, then remove the upper front arm and bushes.



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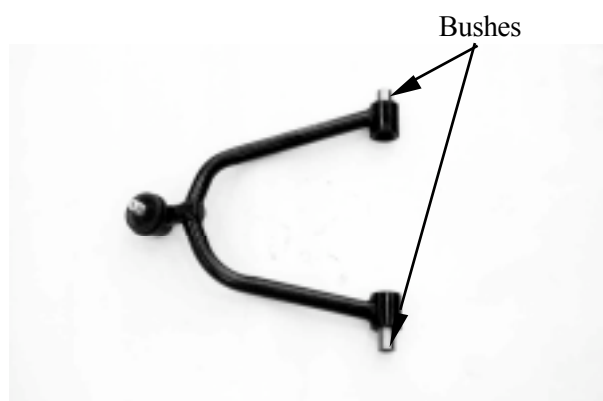
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Inspect the front arm.
Cracks/bends/damage _ Replace.



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

Inspect bushes.
Wear/damage _ Replace.



Check the lower front arm brackets of the frame.

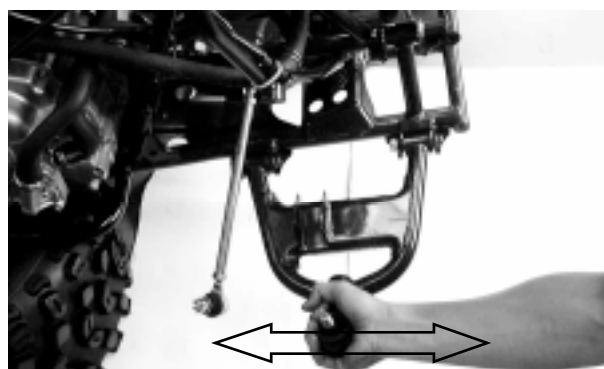
If bent, cracked or damaged, repair or replace the frame.

Check the tightening torque of the front arms securing nuts.

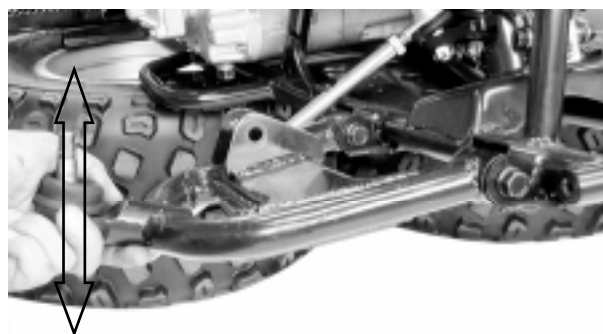
Torque: 4.0_ 5.0kgf-m

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

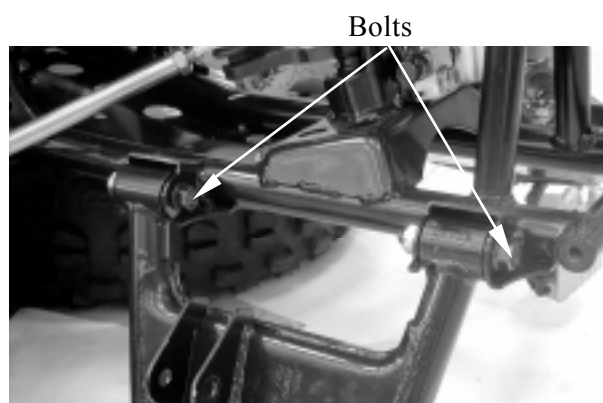
If side play noticeable, replace the inner collar and bushes as a set.



Check the lower front arm vertical movement by moving it up and down.
If vertical movement is tight, binding or rough, replace the inner collar and bushes as a set.




Remove the two nuts and two bolts attaching the lower front arm, then remove the lower front arm and bushes.

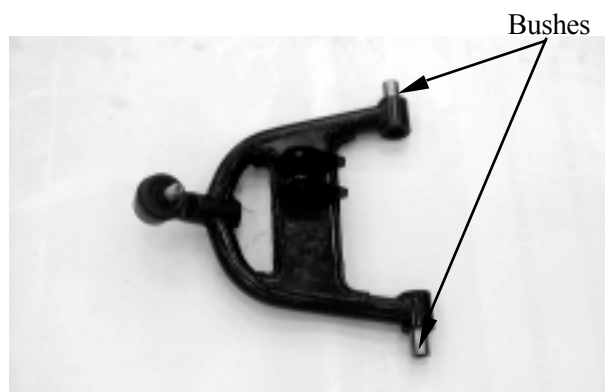


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Inspect the lower front arm.
Cracks/bends/damage _ Replace.


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

Inspect bushes.
Wear/damage _ Replace.



INSTALLATION

Reverse the “FRONT SUSPENSION
REMOVAL AND INSPECTION”
procedures.

-  Apply the grease onto the bushes and inner collars

Install the lower and upper front arms nuts
onto the frame and tighten the nuts.

Torque: 4.0_ 5.0kgf-m


Install the steering knuckle onto the upper
and lower front arms and tighten the nuts.

Torque: 3.0_ 4.0kgf-m

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

Torque: 3.0_ 4.0kgf-m

Install the all cotter pins and band ends of
cotter pins.

-  Always use a new cotter pin.

Apply the grease onto the bush, then install
the shock absorber and tighten the upper
mount and lower mount bolts.

Torque: 3.5_ 4.5kgf-m

Install the front wheel hub (⇒14-6), caliper
(⇒13-10) and front wheel. (⇒14-3)

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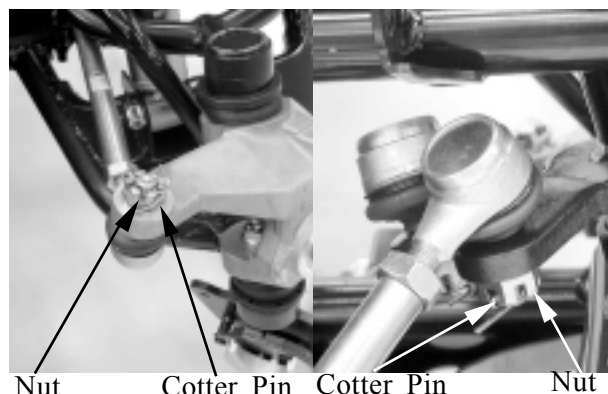
TIE-ROD

REMOVAL AND INSPECTION

Remove the cotter pin and nut attaching the tie-rod and steering column.

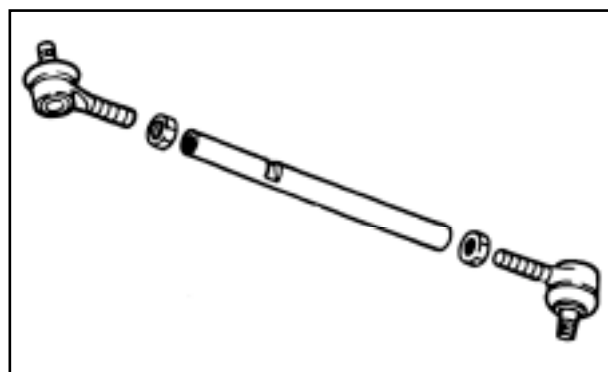
Remove the cotter pin and nut attaching the tie-rod and steering knuckle.

Then remove tie-rods.



Inspect the tie-rod.

Bend/damage _Replace.

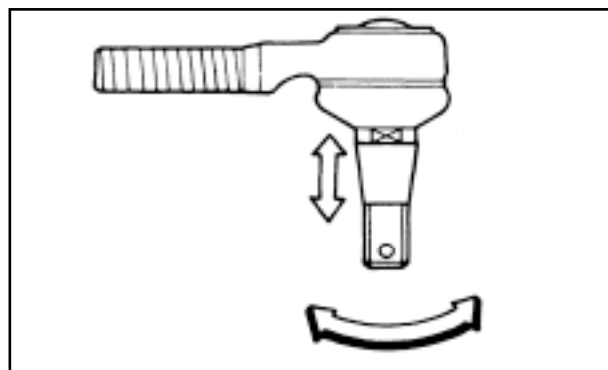


Check the tie-rod end movement.

Tie-rod end exists free play or turns roughly _Replace.

Check the tapered surface of the tie-rod end.

Pitting/wear/damage _Replace.



Adjust the tie-rod length.

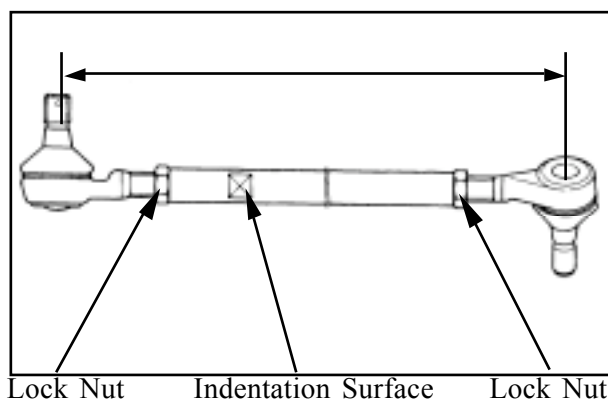
Adjustment steps:

(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: $299.5 \pm 0.5 \text{ mm}$



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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: 2.5_ 3.5kgf-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°

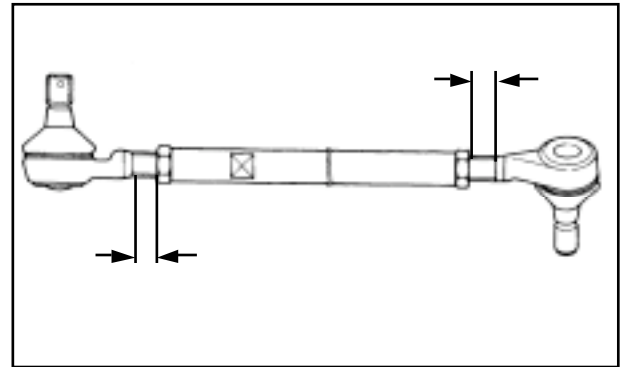
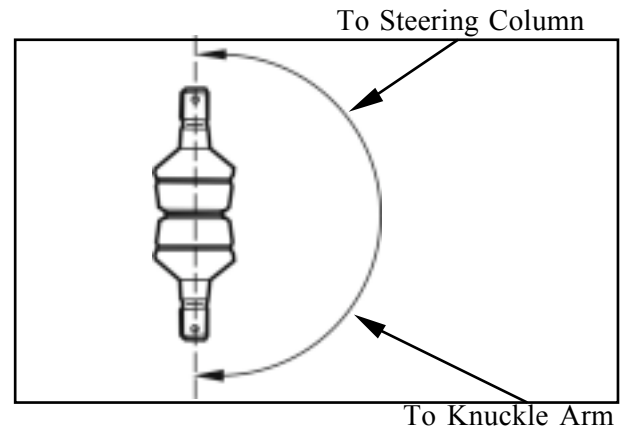
Torque: 2.5_ 3.5kgf-m



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



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



INSTALLATION

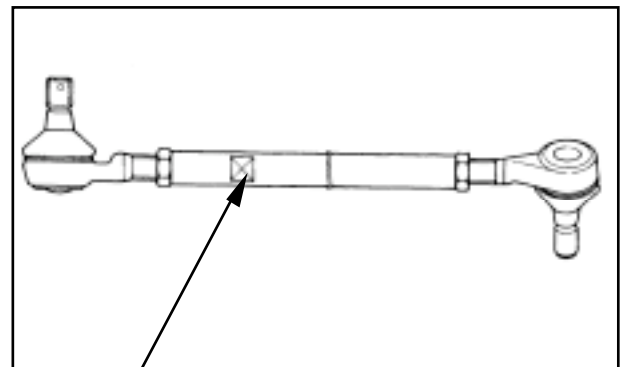
Reverse the "REMOVAL AND INSPECTION" procedures.

Install the tie-rod and washer onto the steering knuckle and steering column, then tighten the nuts.

Torque: 3.0_ 4.0kgf-m



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



Indentation Surface

Install the all cotter pins and band ends of cotter pins.



Always use a new cotter pin.

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HANDLEBAR

REMOVAL AND INSPECTION

Remove the following parts:

Seat, front cover, center cover, front fender and handlebar cover.

Refer to the “FENDERS” section in the CHAPTER 2

Remove the right and left master cylinder and remove bands then disconnect the rear and front fluid tube from the handlebar.

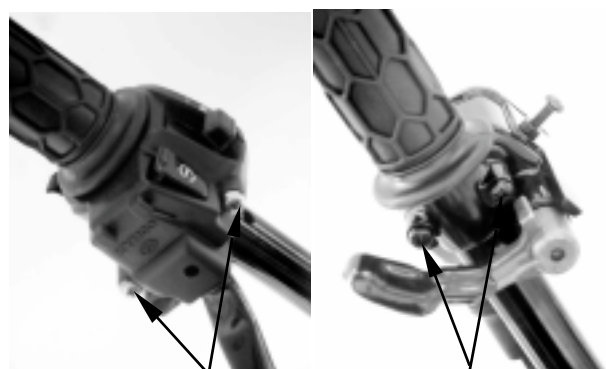
Remove the two screws and remove the handlebar switch.

Remove the two screws and remove throttle unit.



Bolts

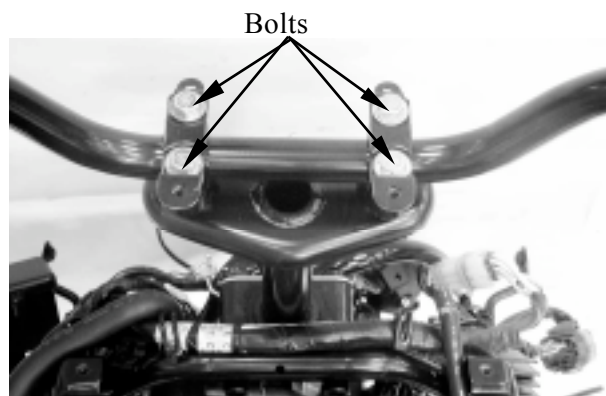
Brake Fluid Tube



Screws

Screws

Remove the four handlebar holder bolts and remove the handlebar.



Bolts

INSPECTION

Inspect the handlebar.

Cracks/bends/damage _ Replace.



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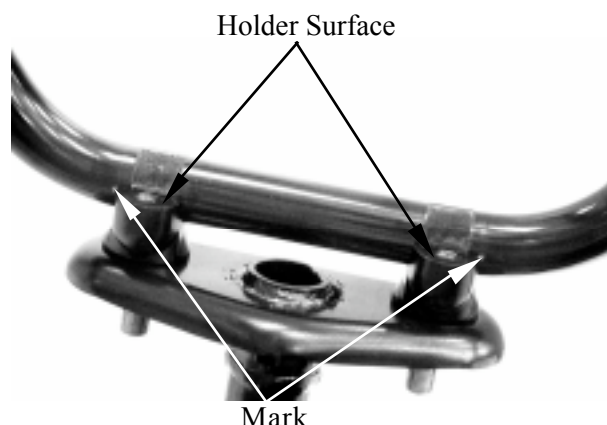
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INSTALLATION

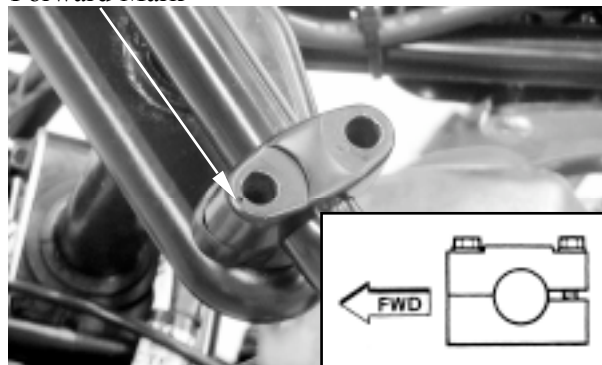
Install handlebar and handlebar holder, then tighten the four bolts.

Torque: 1.8_ 2.5kgf-m

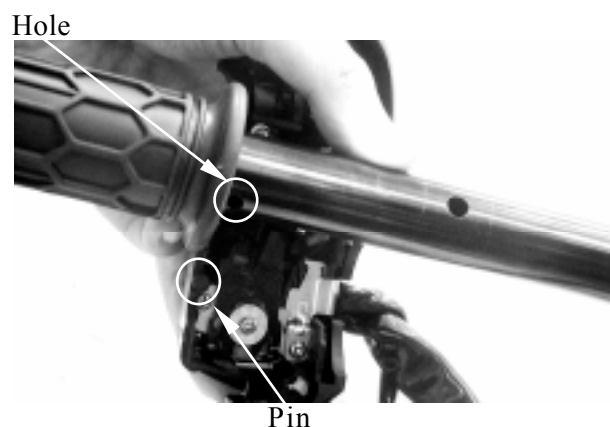
- Align the mark on the handlebar with the lower handlebar holder surface.
- Be sure the upper handlebar holder mark face to front.
- First tighten the bolts on the front side of the handlebar holder, and then tighten the bolts on the rear side.



Forward Mark

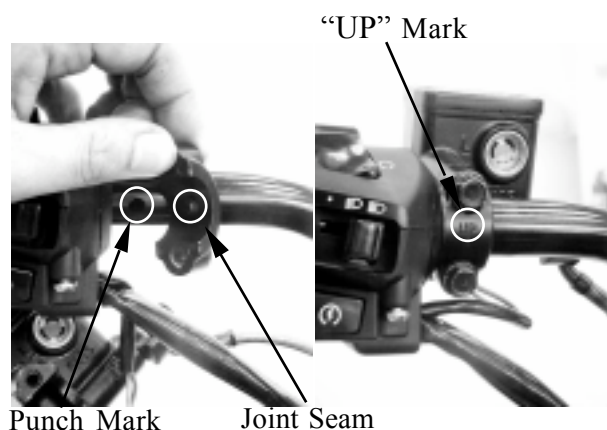


Install the handlebar switch by aligning the pin on the handlebar switch with the hole in the handlebar and then tighten the two screws.



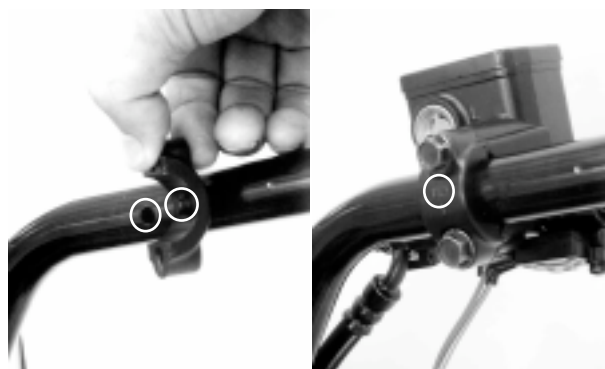
Place the right and left brake master cylinder on the handlebar and install the master cylinder holder with the "UP" mark facing up, aligning the punch mark on the handlebar with the holder joint seam. First tighten the upper bolt and then tighten the lower blot.

Torque: 0.8 ~ 1.2kg-m

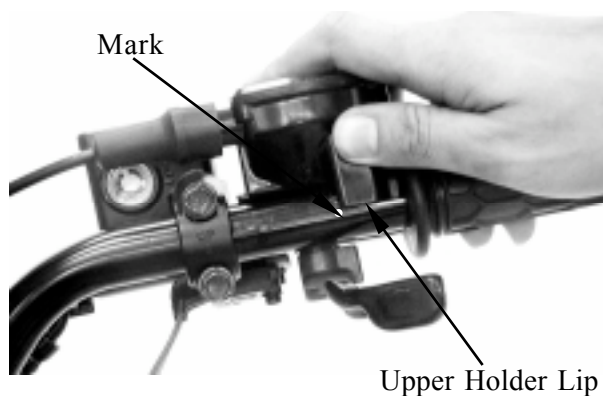


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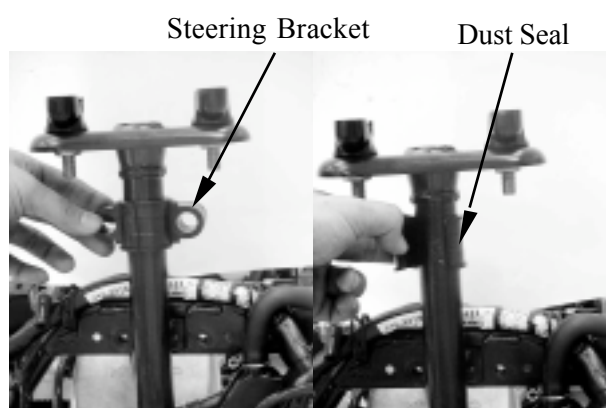
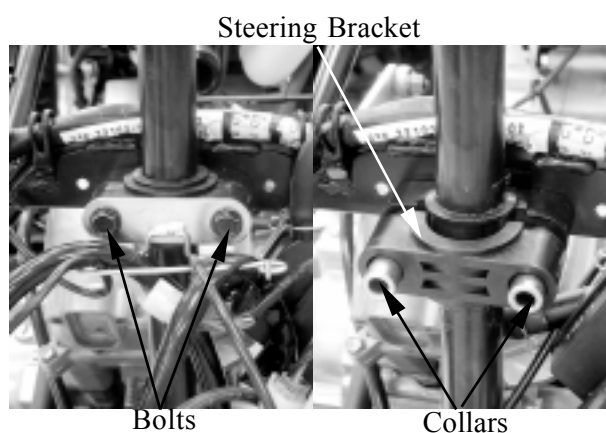
Install the throttle unit by aligning the upper holder lip with the mark in the handlebar and then install the lower holder and tighten the two screws.



STEERING COLUMN REMOVAL AND INSPECTION

Remove handlebar. (⇒ 14-13)

Remove the two bolts and remove the cable holder, steering brackets, collars and dust seal.



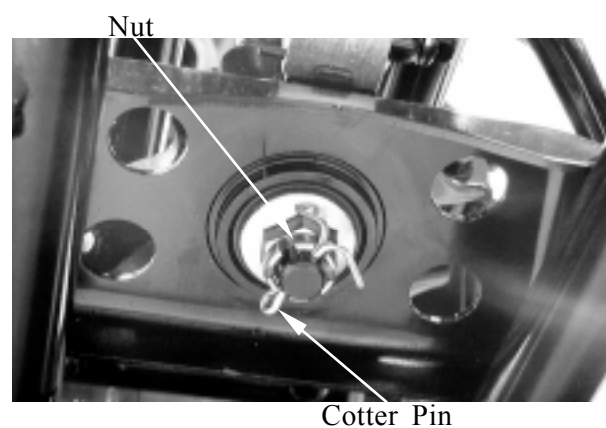
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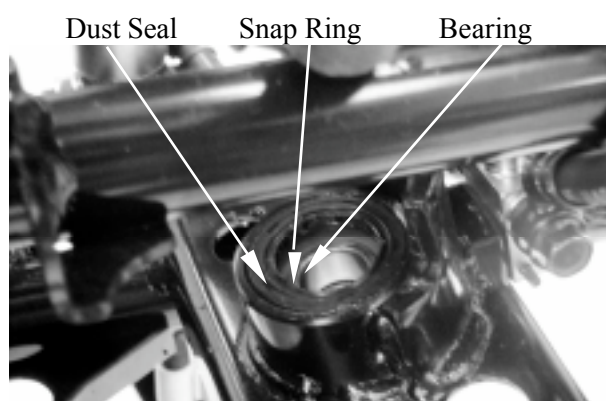
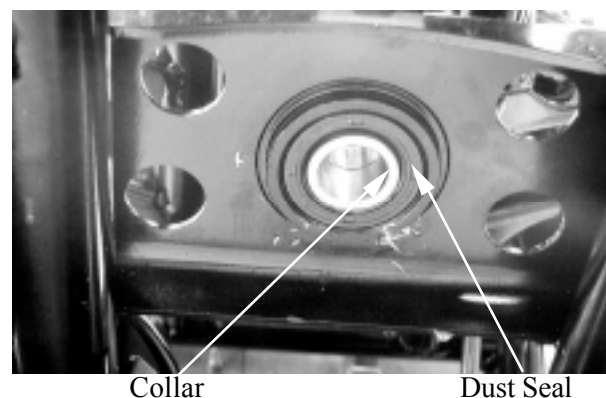
Remove the cotter pins and nuts attaching the tie-rods, then disconnect the tie-rods from the steering column.



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



Inspect the collar, dust seals, snap ring (under the dust seal) and bearing.
Wear/damage _Replace.



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Inspect the steering column.

Bends/damage _Replace.

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

Inspect the steering brackets and oil seal.

Wear damage _Replace.



INSTALLATION

Reverse the “REMOVAL” procedures.

- Apply the grease onto the collar, dust seals, and bearing.

Install the steering column and collar, then tighten the nut under the frame body.

Torque: 6.0_ 8.0kgf-m

Install the cotter pin and band ends of cotter pin.

- Always use a new cotter pin.



Assembly the steering column and tighten the two bolts.

Torque: 1.8_ 2.5kgf-m

Install the tie rods and washer, then tighten the nut.

Torque: 3.0_ 4.0kgf-m

Install the cotter pins and band ends of cotter pins.

- Always use a new cotter pin.



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