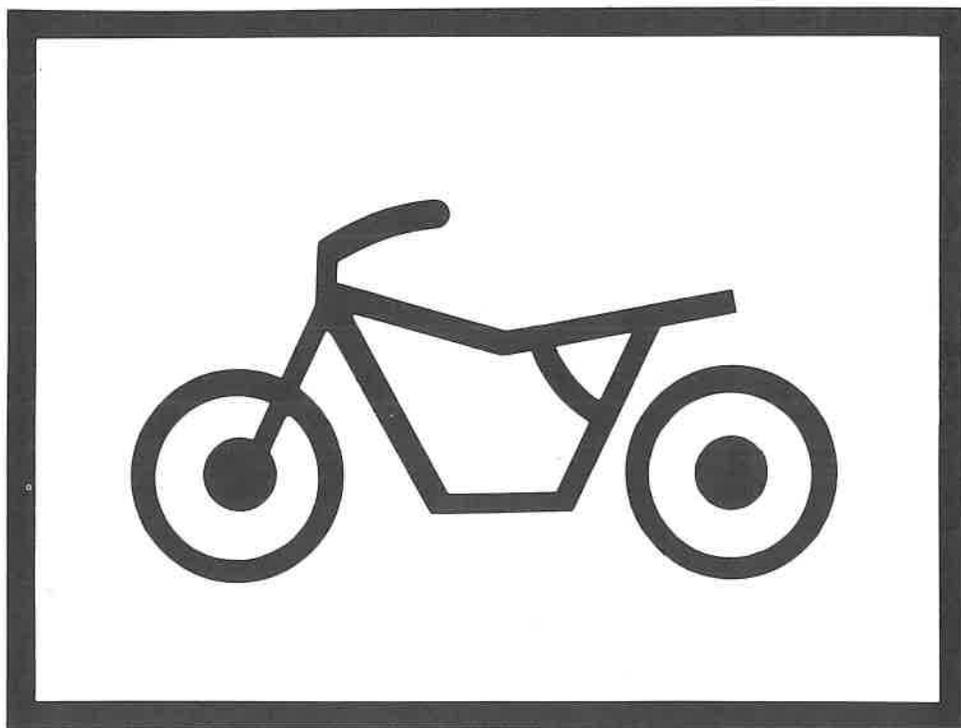


# CHAPTER 5 CHASSIS

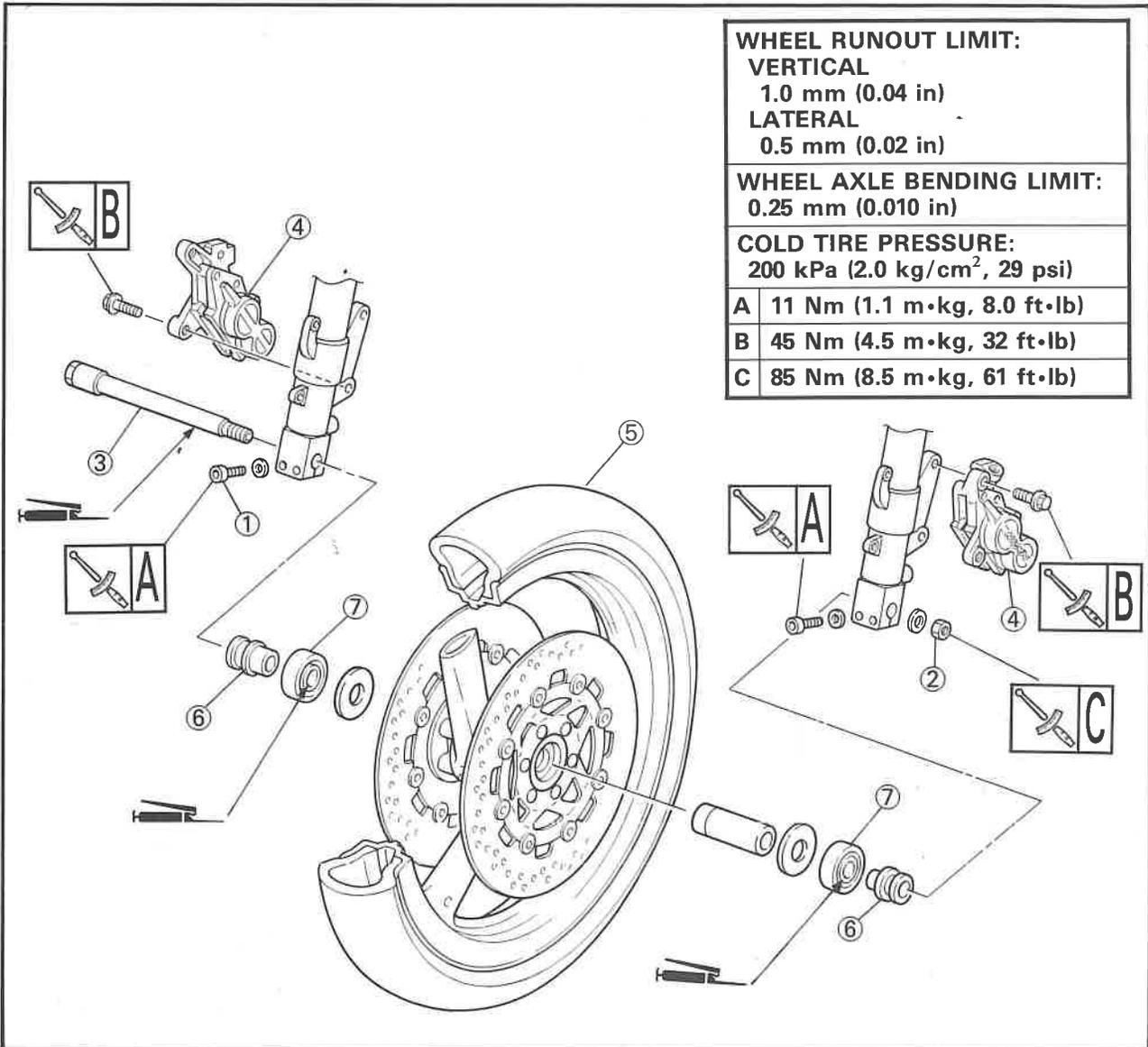


**FRONT WHEEL  
PREPARATION FOR REMOVAL**

\* Hold the machine by placing the suitable stand.

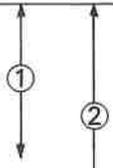
**⚠ WARNING**

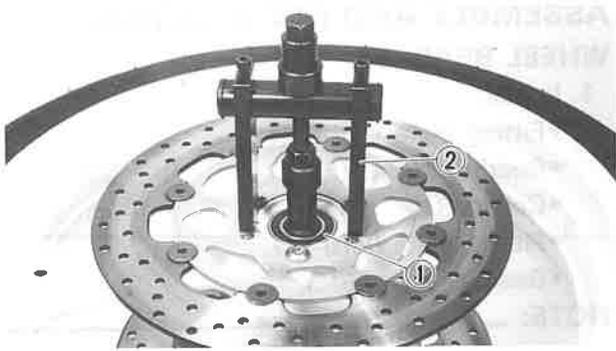
Support the machine securely so there is no danger of it falling over.



**5**

Extent of removal:    ① Front wheel removal    ② Wheel bearing removal

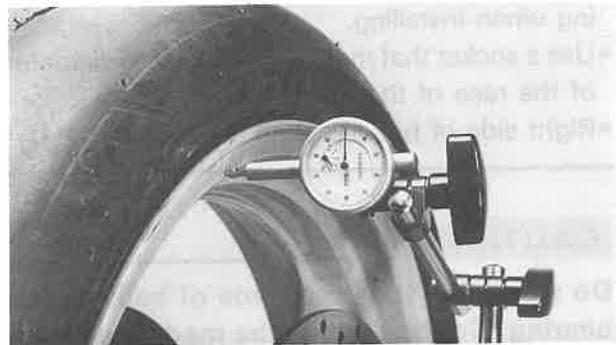
Extent of removal	Order	Part name	Q'ty	Remarks
	1	Bolt (axle holder)	4	Only loosening.
	2	Nut (front wheel axle)	1	
	3	Front wheel axle	1	
	4	Front brake caliper	2	
	5	Front wheel	1	
	6	Collar	2	Refer to "REMOVAL POINTS".
	7	Bearing	2	



**REMOVAL POINTS**  
**WHEEL BEARING (IF NECESSARY)**

1. Remove:
  - Bearing ①

**NOTE:** \_\_\_\_\_  
Remove the bearing ① using a general bearing puller ②.

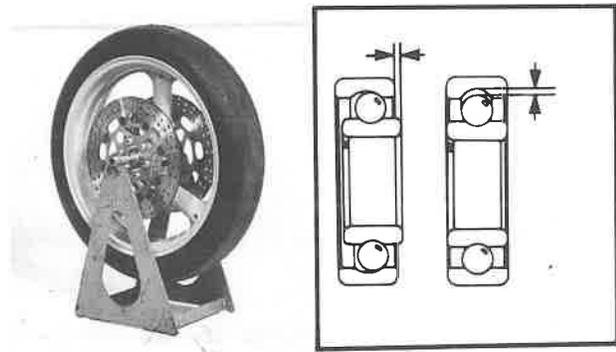


**INSPECTION**  
**FRONT WHEEL**

1. Measure:
  - Wheel runout
 Out of limit → Replace.

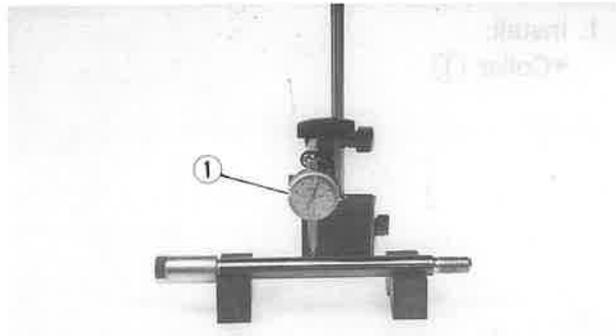


**Rim Runout Limits:**  
**Radial: 1.0 mm (0.04 in)**  
**Lateral: 0.5 mm (0.02 in)**



2. Inspect:
  - Bearing
 Rotate inner race with a finger.  
 Rough spot/Seizure → Replace.

**NOTE:** \_\_\_\_\_  
Replace the bearings, oil seal and wheel collar as a set.



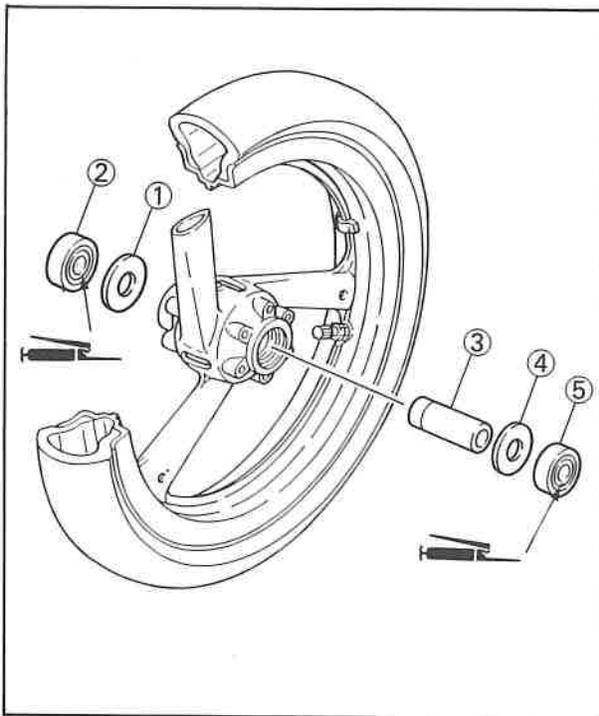
3. Inspect:
  - Wheel axle bends
 Out of specification → Replace.  
 Use Dial Gauge ①.



**Wheel Axle Bending Limit:**  
**0.25 mm (0.010 in)**

**NOTE:** \_\_\_\_\_  
The bending value is shown by one half of the Dial Gauge reading.

**⚠ WARNING** \_\_\_\_\_  
Do not attempt to straighten a bent axle.



## ASSEMBLY AND INSTALLATION WHEEL BEARING

### 1. Install:

- Fitting plate (right) ①
- Bearing (right) ②
- Collar ③
- Fitting plate (left) ④
- Bearing (left) ⑤

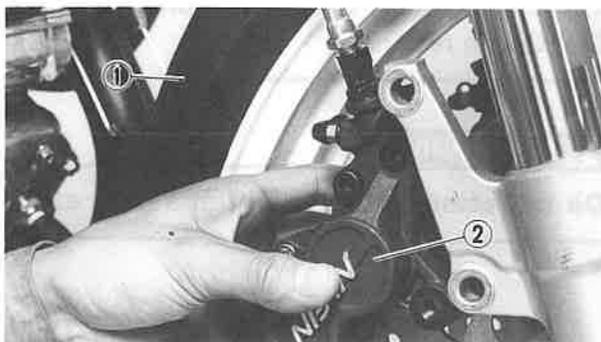
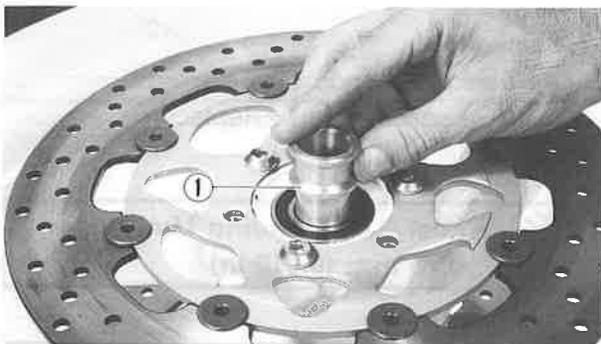
### NOTE:

- Apply the lithium soap base grease on the bearing when installing.
- Use a socket that matches the outside diameter of the race of the bearing.
- Right side of bearing shall be installed first.

### CAUTION:

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

# 5



## FRONT WHEEL

### 1. Install:

- Collar ①

### 2. Install:

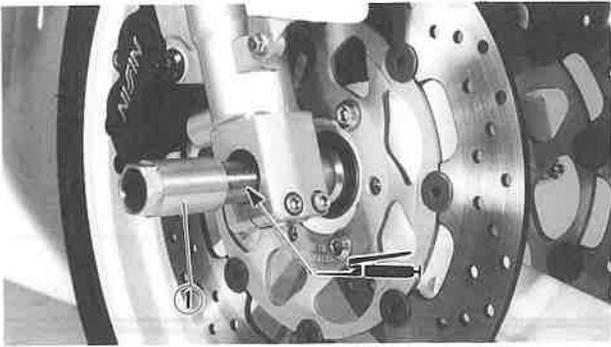
- Front wheel ①
- Front brake caliper ②

### NOTE:

Before installing the wheel axle, install the front brake caliper.

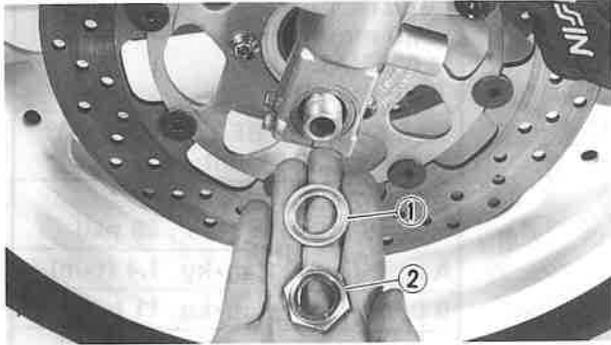


**Bolt (Front Brake Caliper):**  
45 Nm (4.5 m•kg, 32 ft•lb)



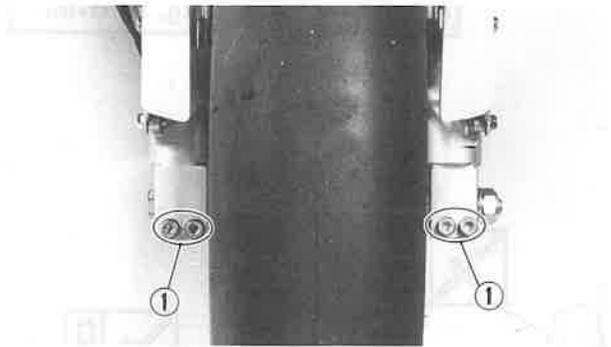
3. Install:
- Front wheel axle ①

**NOTE:** \_\_\_\_\_  
 Apply the lithium soap base grease on the wheel axle.  
 \_\_\_\_\_



4. Install:
- Plain washer ①
  - Nut (front wheel axle) ②

	<b>Nut (Front Wheel Axle):</b> <b>85 Nm (8.5 m•kg, 61 ft•lb)</b>
---	---



5. Tighten:
- Bolt (axle holder) ①

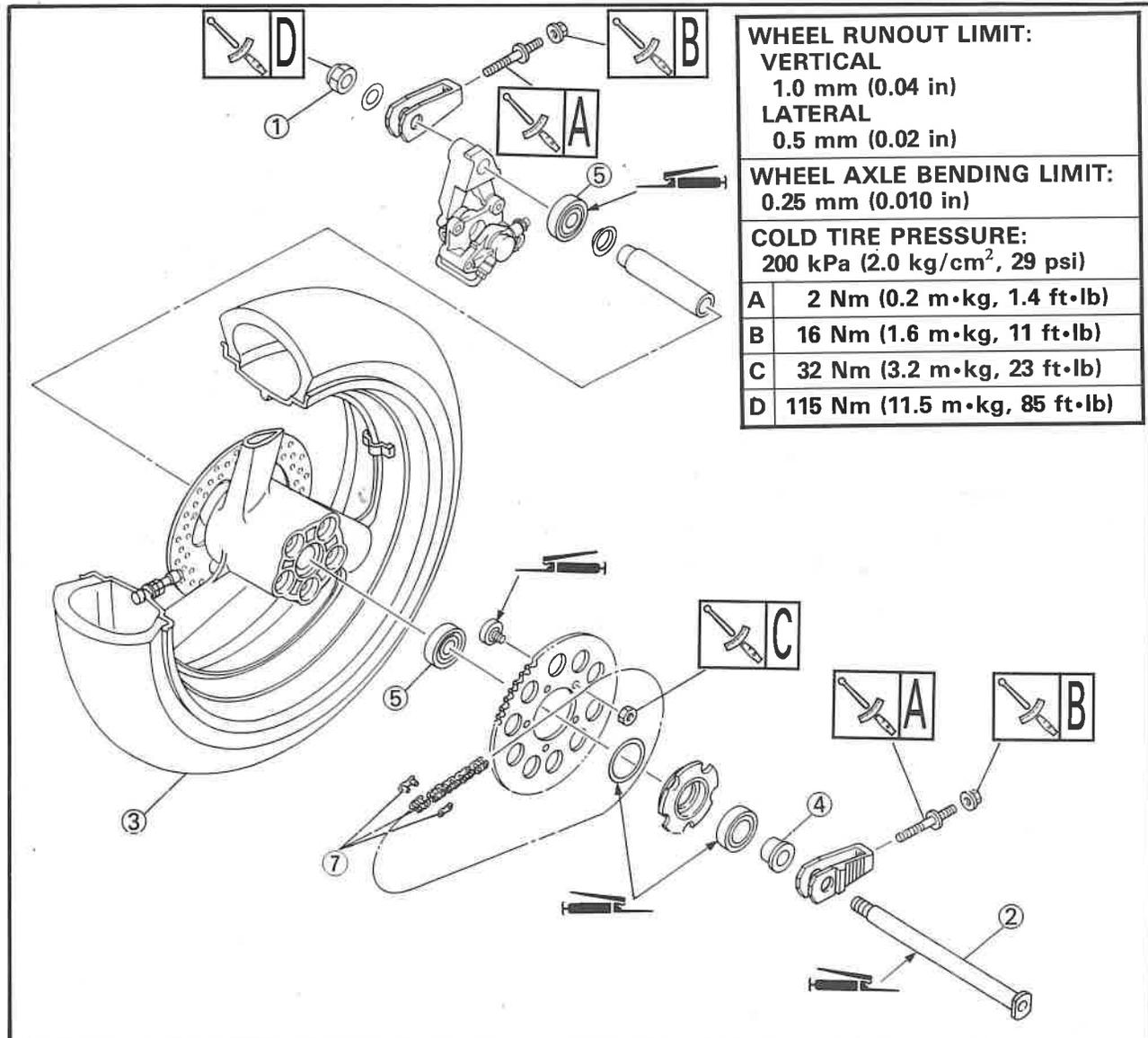
	<b>Bolt (Axle Holder):</b> <b>11 Nm (1.1 m•kg, 8.0 ft•lb)</b>
---	--

## REAR WHEEL AND DRIVE CHAIN PREPARATION FOR REMOVAL

\* Hold the machine by placing the suitable stand.

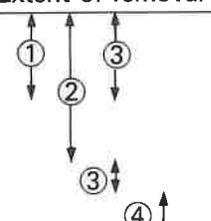
### ⚠ WARNING

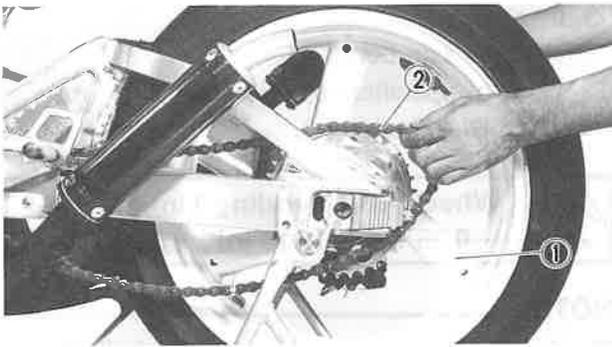
Support the machine securely so there is no danger of it falling over.



**5**

Extent of removal:    ① Rear wheel removal    ② Wheel bearing removal  
                                  ③ Driven sprocket removal    ④ Drive chain removal

Extent of removal	Order	Part name	Q'ty	Remarks
	1	Nut (rear wheel axle)	1	
	2	Rear wheel axle	1	
	3	Rear wheel	1	Refer to "REMOVAL POINTS".
	4	Collar	1	
	5	Bearing	2	Refer to "REMOVAL POINTS".
	6	Driven sprocket	1	
	7	Drive chain	1	Refer to "REMOVAL POINTS".



## REMOVAL POINTS

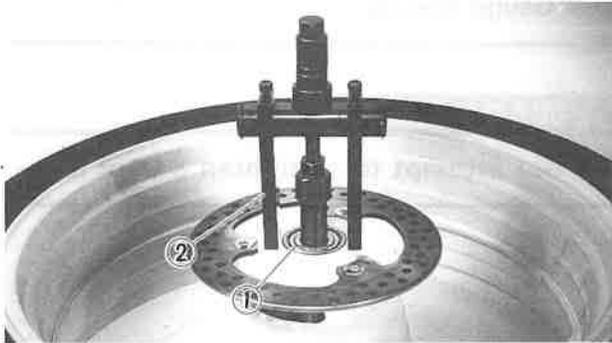
### REAR WHEEL

1. Remove:
  - Rear wheel ①

**NOTE:** \_\_\_\_\_

Push the rear wheel forward and remove the drive chain ②.

\_\_\_\_\_



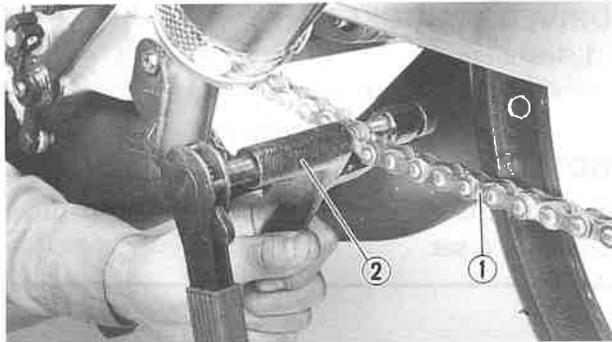
### WHEEL BEARING (IF NECESSARY)

1. Remove:
  - Bearing ①

**NOTE:** \_\_\_\_\_

Remove the bearing ① using a general bearing puller ②.

\_\_\_\_\_



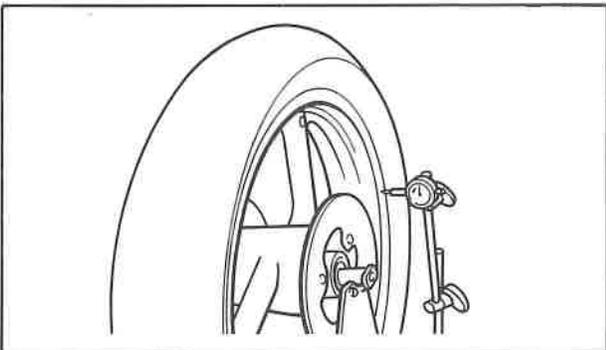
### DRIVE CHAIN

1. Remove:
  - Drive chain ①

**NOTE:** \_\_\_\_\_

Remove the drive chain ① using a chain cutter ②.

\_\_\_\_\_



### INSPECTION

#### REAR WHEEL

1. Measure:
  - Wheel runout

Out of limit → Replace.



**Rim Runout Limits:**  
 Radial: 1.0 mm (0.04 in)  
 Lateral: 0.5 mm (0.02 in)

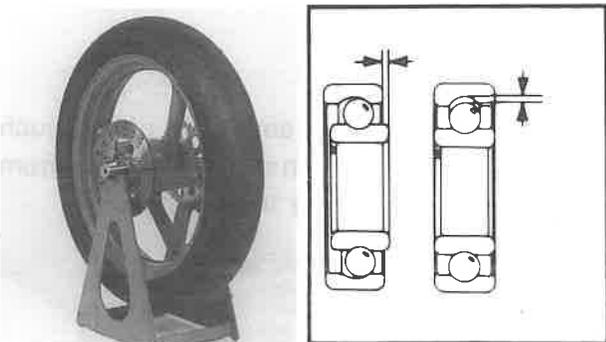
2. Inspect:
  - Bearing

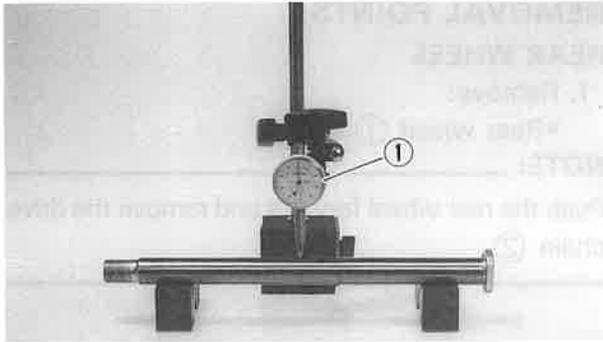
Rotate inner race with a finger.  
 Rough spot/Seizure → Replace.

**NOTE:** \_\_\_\_\_

Replace the bearings, oil seal and wheel collar as a set.

\_\_\_\_\_





3. Inspect:
  - Wheel axle bends  
Out of specification → Replace.  
Use Dial Gauge ①.



**Wheel Axle Bending Limit:**  
0.25 mm (0.010 in)

**NOTE:** \_\_\_\_\_  
The bending value is shown by one half of the Dial Gauge reading.

**⚠ WARNING** \_\_\_\_\_

**Do not attempt to straighten a bent axle.**



**DRIVEN SPROCKET**

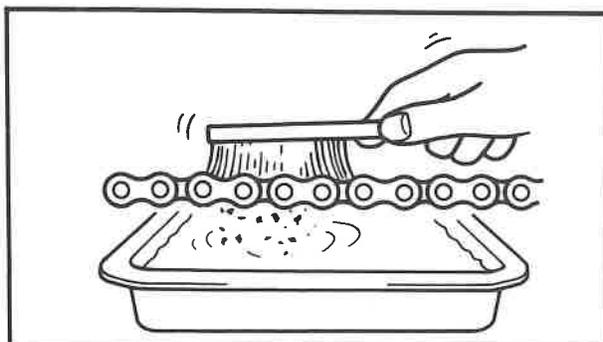
1. Inspect:
  - Sprocket teeth ①
  - Excessive wear → Replace.

**NOTE:** \_\_\_\_\_  
Replace the drive, driven sprockets and drive chain as a set.



**SPROCKET DAMPER**

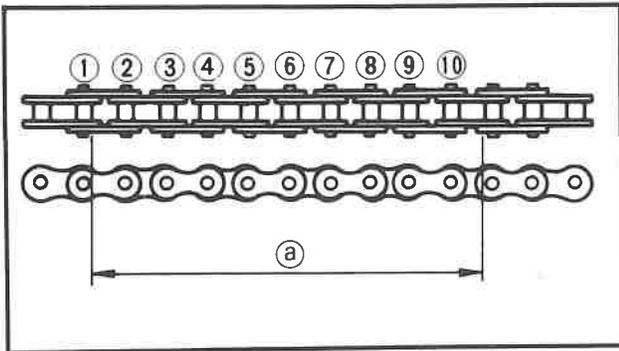
1. Inspect:
  - Rubber ①
  - Wear/Damage → Replace.



**DRIVE CHAIN**

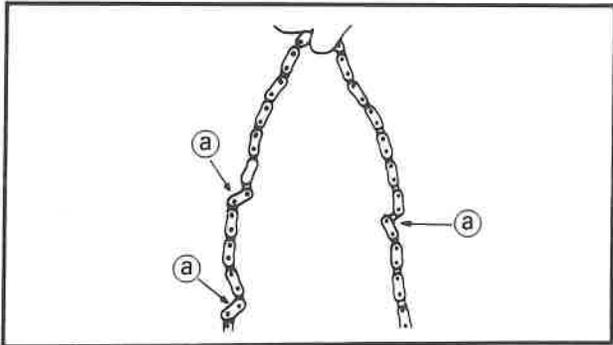
1. Clean:
  - Drive chain  
Place it in solvent, and brush off as much dirt as possible. Then remove the chain from the solvent and dry the chain.

**5**

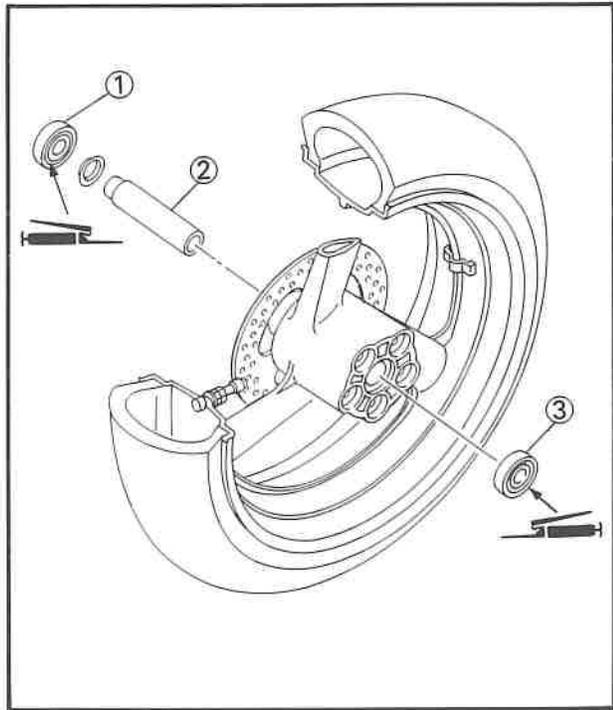


2. Measure:
- Drive chain length (10 links) (a)
  - Out of specification → Replace.

 **Drive Chain Length (10 links):**  
Limit: 153.0 mm (6.024 in)



3. Check:
- Drive chain stiffness (a)
  - Clean and oil the chain and hold as illustrated.
  - Stiff → Replace drive chain.



**ASSEMBLY AND INSTALLATION**  
**WHEEL BEARING**

1. Install:
- Bearing (right) (1)
  - Spacer (2)
  - Bearing (left) (3)

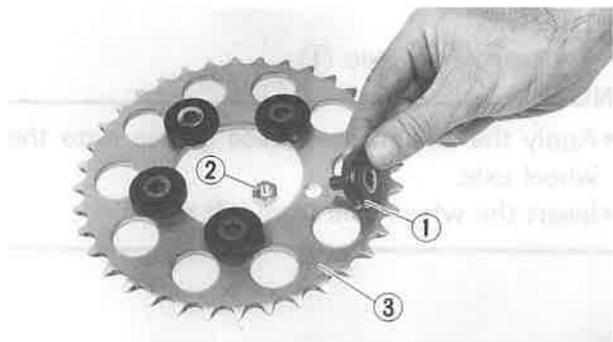
**NOTE:**

- Apply the lithium soap base grease on the bearing when installing.
- Use a socket that matches the outside diameter of the race of the bearing.
- Right side of bearing shall be installed first.

**CAUTION:**

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

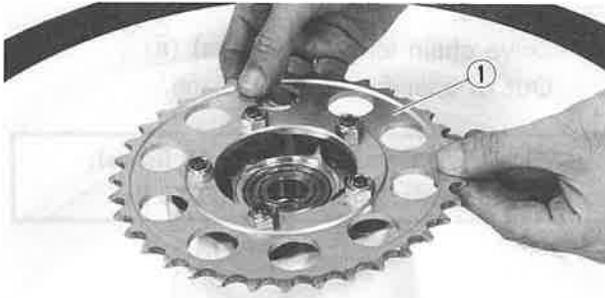
**5**



**DRIVEN SPROCKET**

1. Install:
- Sprocket damper (1)
  - Nut (sprocket damper) (2)
  - To driven sprocket (3).

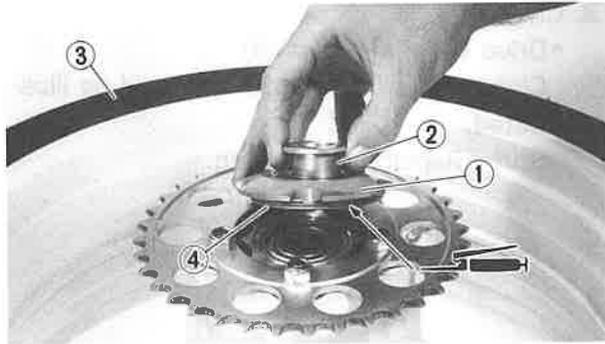
 **Nut (Sprocket Damper):**  
32 Nm (3.2 m•kg, 23 ft•lb)



## REAR WHEEL

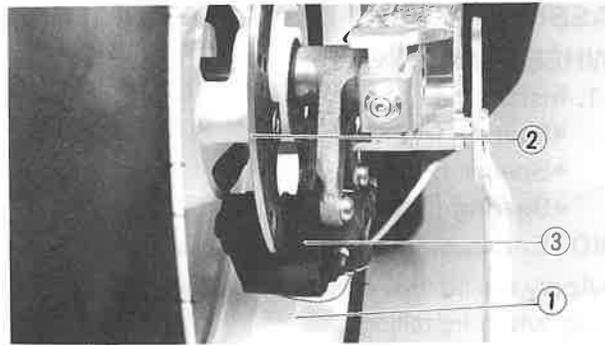
1. Install:
  - Driven sprocket ①
  - To rear wheel ②.

**NOTE:** \_\_\_\_\_  
 Apply the lithium soap base grease onto the sprocket damper.  
 \_\_\_\_\_

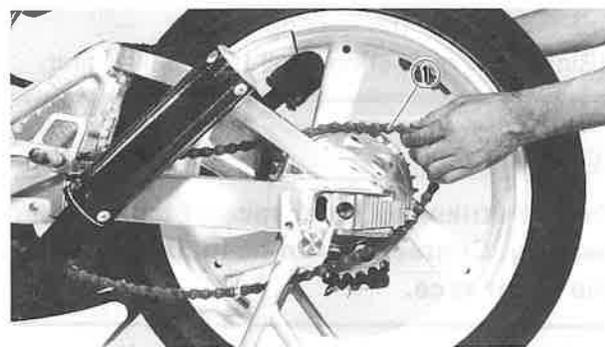


2. Install:
  - Clutch hub ①
  - Collar ②
  - To rear wheel ③.

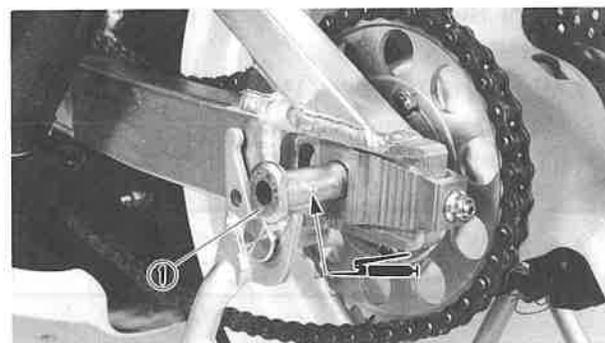
**NOTE:** \_\_\_\_\_  
 Apply the lithium soap base grease onto the O-ring ④.  
 \_\_\_\_\_



3. Install:
    - Rear wheel ①
- NOTE:** \_\_\_\_\_  
 Install the brake disc ② between the brake pads ③ correctly.  
 \_\_\_\_\_

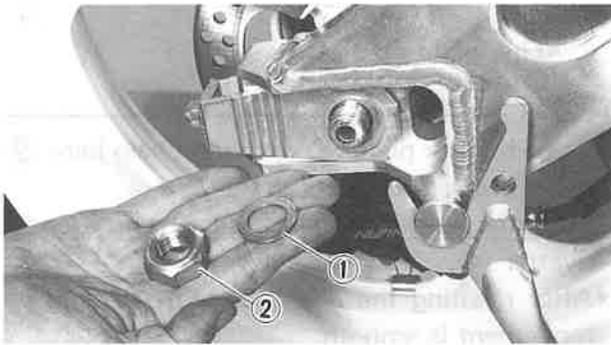


4. Install:
    - Drive chain ①
- NOTE:** \_\_\_\_\_  
 Push the rear wheel forward and install the drive chain.  
 \_\_\_\_\_

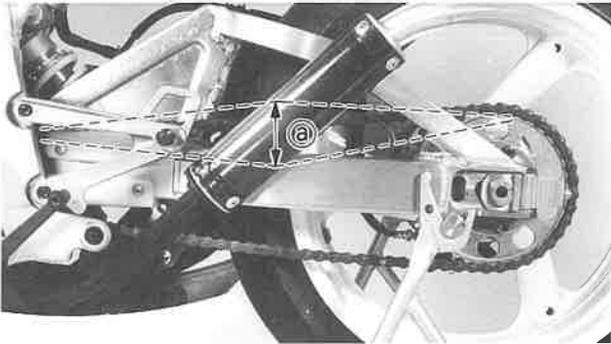


5. Install:
    - Rear wheel axle ①
- NOTE:** \_\_\_\_\_  
 • Apply the lithium soap base grease onto the wheel axle.  
 • Insert the wheel axle from left side.  
 \_\_\_\_\_

**5**



6. Install:
- Plain washer ①
  - Nut (rear wheel axle) ②

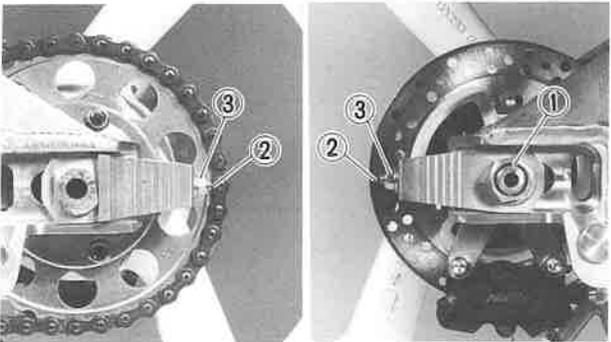


7. Adjust:
- Drive chain slack ①



**Drive Chain Slack ①:**  
30 ~ 40 mm (1.2 ~ 1.6 in)

Refer to the "DRIVE CHAIN SLACK ADJUSTMENT" section in the CHAPTER 3.



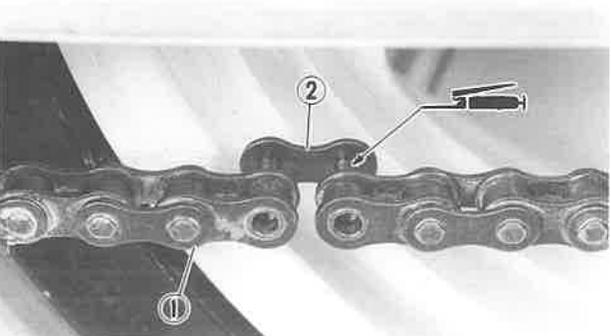
8. Tighten:
- Nut (rear wheel axle) ①
  - Adjuster ②
  - Locknut ③



**Nut (Rear Wheel Axle):**  
115 Nm (11.5 m•kg, 85 ft•lb)

**Adjuster:**  
2 Nm (0.2 m•kg, 1.4 ft•lb)

**Locknut:**  
16 Nm (1.6 m•kg, 11 ft•lb)

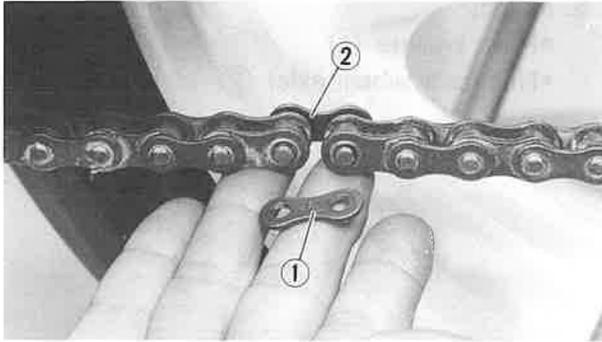


## DRIVE CHAIN

1. Install:
- Drive chain ①
  - Chain joint ②

### NOTE:

- Always use a new chain joint.
- When installing the drive chain, apply the lithium soap base grease onto the chain joint.



2. Install:
- Link plate ①

**NOTE:**

- Press the link plate ① onto the chain joint ② using a chain rivetter ③.
- Rivet the end of the chain joint using a chain rivetter ④.
- After rivetting the chain joint, make sure its movement is smooth.





MEMO

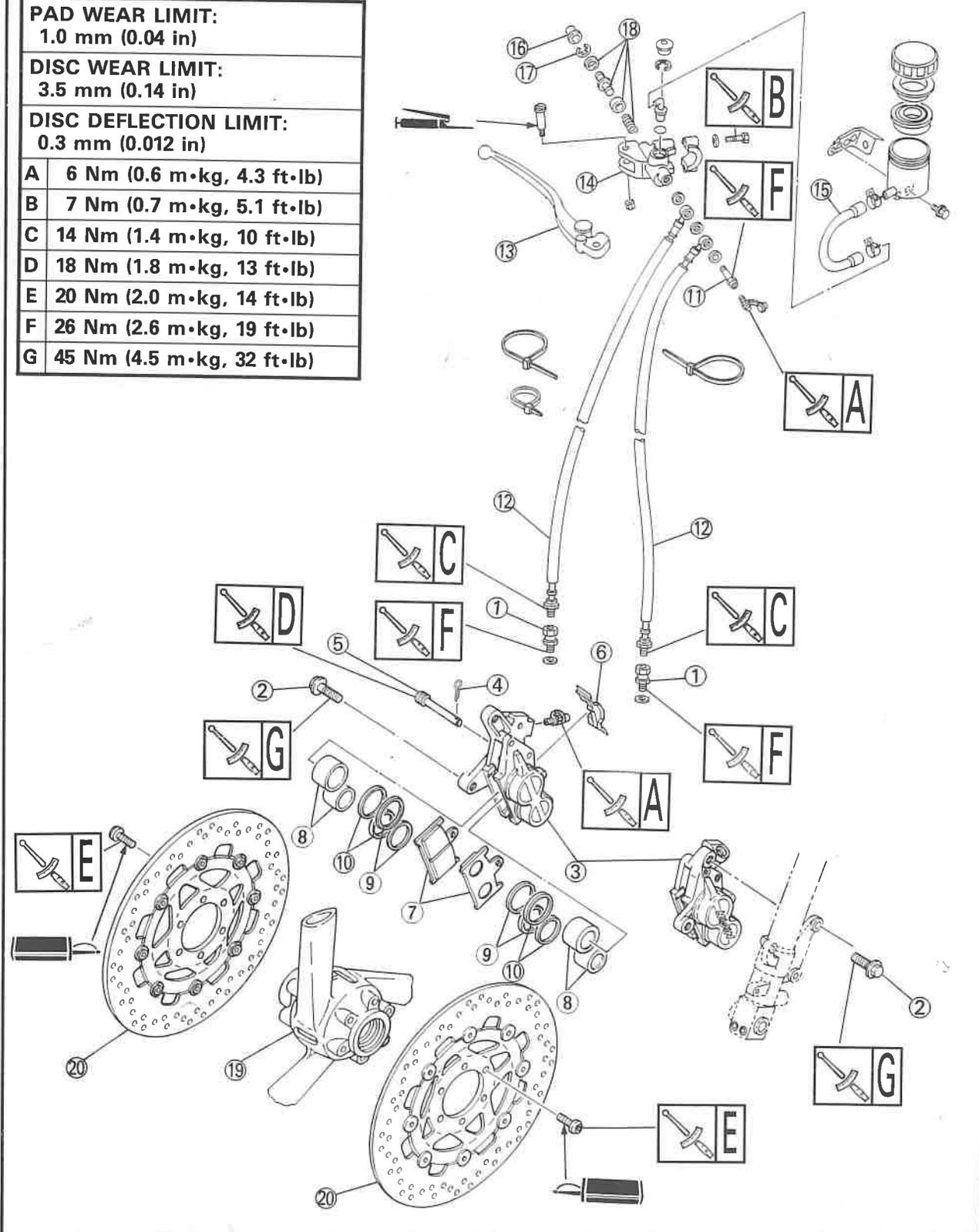
**FRONT BRAKE  
PREPARATION FOR REMOVAL**

\* Hold the machine by placing the suitable stand.

**⚠ WARNING**

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

<b>PAD WEAR LIMIT:</b>	1.0 mm (0.04 in)
<b>DISC WEAR LIMIT:</b>	3.5 mm (0.14 in)
<b>DISC DEFLECTION LIMIT:</b>	0.3 mm (0.012 in)
<b>A</b>	6 Nm (0.6 m•kg, 4.3 ft•lb)
<b>B</b>	7 Nm (0.7 m•kg, 5.1 ft•lb)
<b>C</b>	14 Nm (1.4 m•kg, 10 ft•lb)
<b>D</b>	18 Nm (1.8 m•kg, 13 ft•lb)
<b>E</b>	20 Nm (2.0 m•kg, 14 ft•lb)
<b>F</b>	26 Nm (2.6 m•kg, 19 ft•lb)
<b>G</b>	45 Nm (4.5 m•kg, 32 ft•lb)



**5**



**CAUTION:**

Disc brake components rarely require disassembly. **DO NOT:**

- Disassemble components unless absolutely necessary.
- Use solvents on internal brake component.
- Use contaminated brake fluid for cleaning.
- Use only clean brake fluid.
- Allow brake fluid to come in contact with the eyes otherwise eye injury may occur.
- Allow brake fluid to contact painted surfaces or plastic parts otherwise damage may occur.
- Disconnect any hydraulic connection otherwise the entire system must be disassembled, drained, cleaned, and then properly filled and bled after reassembly.

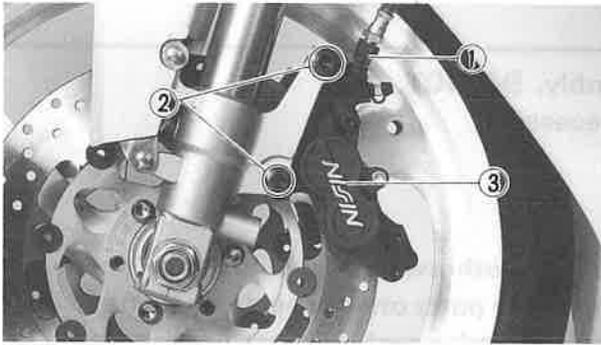
Extent of removal:    ① Brake pads removal    ② Caliper removal and disassembly  
                                  ③ Master cylinder removal and disassembly    ④ Brake disc removal

Extent of removal	Order	Part name	Q'ty	Remarks	
	1	Adapter	1ea.	Drain the brake fluid.	
	2	Bolt (caliper)	2ea.		
	3	Caliper	1ea.		
	4	Cotter pin	1ea.		
	5	Pad pin	1ea.		
		6	Pad support	1ea.	Refer to "REMOVAL POINTS".
		7	Brake pad	2ea.	
		8	Caliper piston	4ea.	
		9	Dust seal	4ea.	
		10	Piston seal	4ea.	
		11	Union bolt	1	Drain the brake fluid.
		12	Brake hose	2	
		13	Brake lever	1	
		14	Master cylinder	1	
		15	Reservoir hose	1	
		16	Master cylinder boot	1	Refer to "REMOVAL POINTS".
		17	Circlip	1	
		18	Master cylinder kit	1	
		19	Front wheel	1	Refer to "FRONT WHEEL" section.
		20	Brake disc	2	

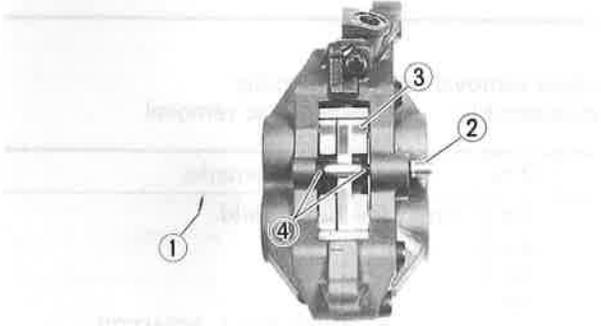
**5**

**⚠ WARNING**

The brake components of this machine are suit for closed circuit use only. Never use on any public road.

**REMOVAL POINTS****CALIPER**

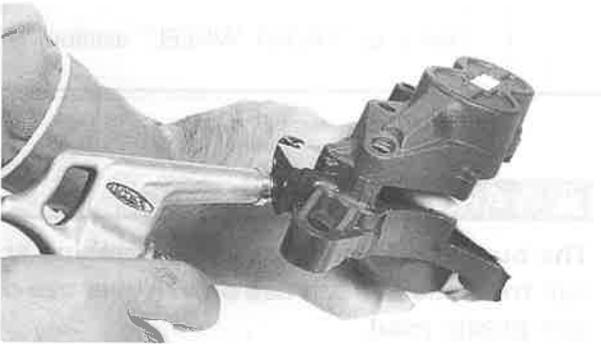
1. Remove:
  - Adapter ①
  - Bolt (caliper) ②
  - Caliper ③

**BRAKE PAD**

1. Remove:
  - Cotter pin ①
  - Pad pin ②
  - Pad support ③
  - Brake pad ④

**NOTE:**

Loosen the pad pin before removing the caliper from the front fork.

**5****CALIPER PISTON**

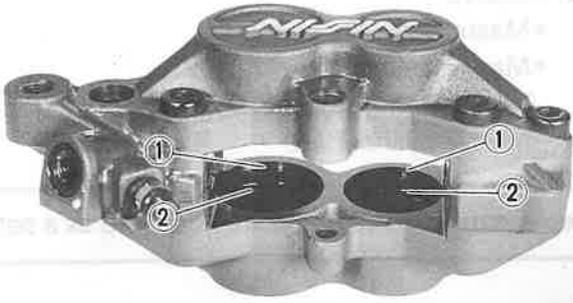
1. Remove:
  - Caliper piston
 Use compressed air and proceed carefully.

**⚠ WARNING**

- Cover piston with rag and use extreme caution when expelling piston from cylinder.
- Never attempt to pry out piston.

**Caliper piston removal steps:**

- Insert a piece of rag into the caliper to lock one caliper.
- Carefully force the piston out of the caliper cylinder with compressed air.

**PISTON SEAL KIT**

1. Remove:
  - Dust seal ①
  - Piston seal ②

**NOTE:**

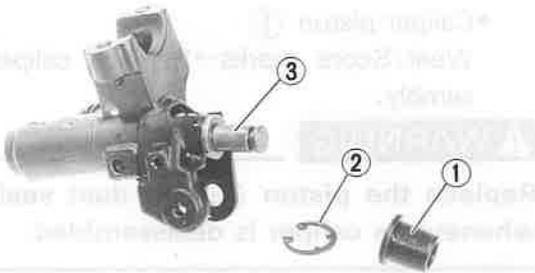
Remove the piston and dust seal by pushing it with a finger.

**CAUTION:**

Never attempt to pry out piston and dust seals.

**⚠ WARNING**

Replace the piston and dust seals whenever a caliper is disassembled.

**MASTER CYLINDER KIT**

1. Remove:
  - Master cylinder boot ①
  - Circlip ②
  - Master cylinder kit ③
 Use a long nose circlip plier.

**INSPECTION****MASTER CYLINDER**

1. Inspect:
  - Master cylinder body (a)
    - Wear/Scratches → Replace master cylinder assembly.
    - Stains → Clean.

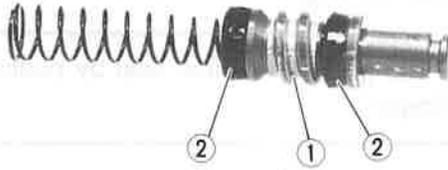
**NOTE:**

Use new brake fluid.



2. Inspect:

- Diaphragm ①
  - Crack/Damage → Replace.



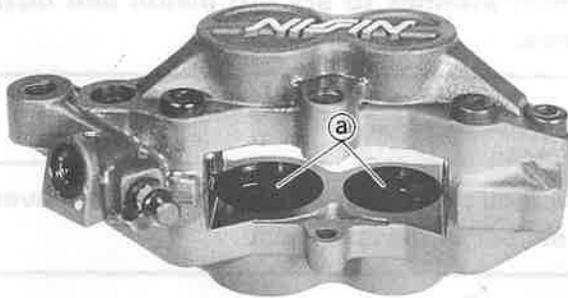
3. Inspect:

- Master cylinder piston ①
- Master cylinder cup ②

Wear/Damage/Score marks → Replace master cylinder kit.

**NOTE:**

Replace master cylinder piston and cup as a set.



**CALIPER**

1. Inspect:

- Caliper cylinder (a)

Wear/Score marks → Replace caliper assembly.



2. Inspect:

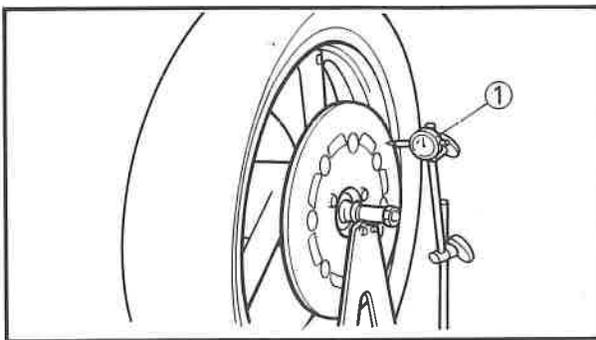
- Caliper piston ①

Wear/Score marks → Replace caliper assembly.

**⚠ WARNING**

Replace the piston ② and dust seals ③ whenever a caliper is disassembled.

5



**BRAKE DISC**

1. Measure:

- Brake disc deflection
- Use Dial Gauge ①.

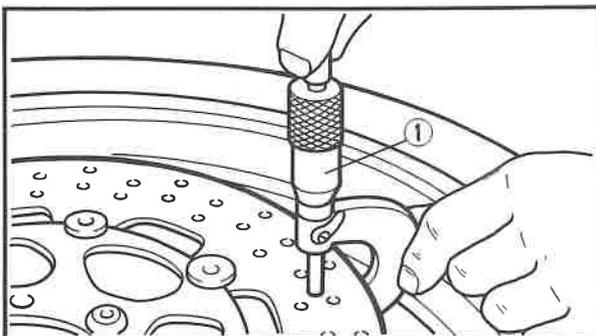
Out of specification → Inspect wheel runout. If wheel runout is in good condition, replace.



**Maximum Deflection:**  
0.3 mm (0.012 in)

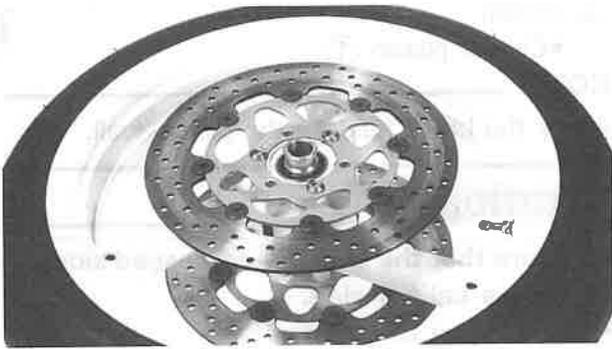
2. Measure:

- Brake disc thickness (a)
- Out of limit → Replace.

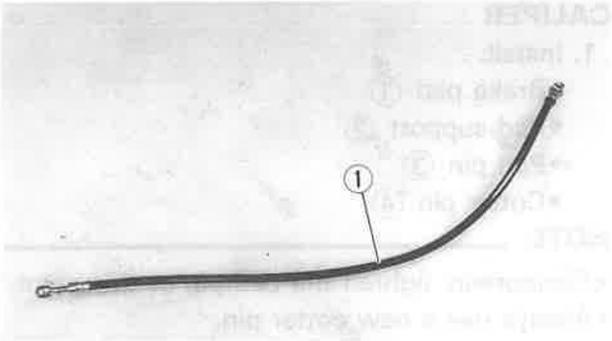


**Disc Wear Limit:**

Standard	Limit
4.0 mm (0.16 in)	3.5 mm (0.14 in)



3. Inspect:
  - Brake disc surface
  - Score marks/Damage → Replace.



### BRAKE HOSE

1. Inspect:
  - Brake hose ①
  - Crack/Damage → Replace.

### ASSEMBLY AND INSTALLATION

#### ⚠ WARNING

- All internal parts should be cleaned in new brake fluid only.
- Internal parts should be lubricated with brake fluid when installed.
- Replace the piston seal and dust seal whenever a caliper is disassembled.

### CALIPER PISTON

1. Clean:
  - Caliper
  - Piston seal
  - Dust seal
  - Caliper piston
 Clean them with brake fluid.

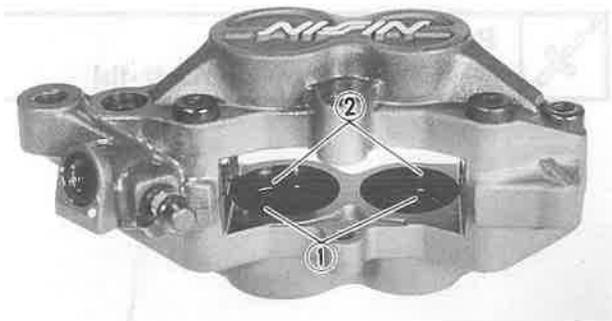
2. Install:
  - Piston seal ①
  - Dust seal ②

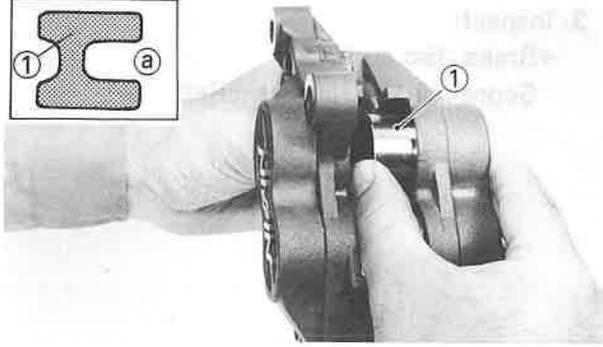
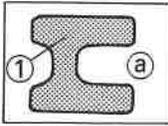
#### NOTE:

Fit the piston and dust seal onto the slot on caliper correctly.

#### ⚠ WARNING

Replace the piston and dust seals whenever a caliper is disassembled.





3. Install:

- Caliper piston ①

**NOTE:**

Apply the brake fluid on the piston wall.

**CAUTION:**

- Be sure that the shallow depressed side (a) face the caliper side.
- Never force to insert.

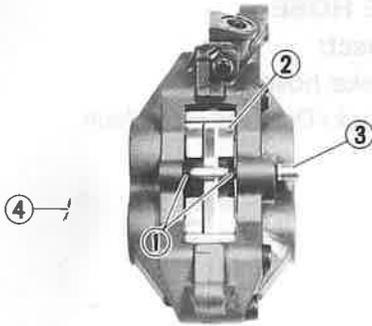
**CALIPER**

1. Install:

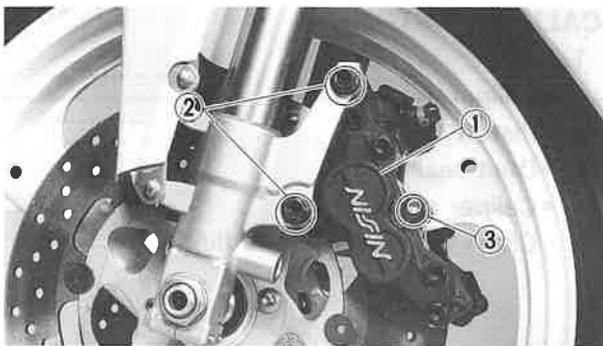
- Brake pad ①
- Pad support ②
- Pad pin ③
- Cotter pin ④

**NOTE:**

- Temporarily tighten the pad pin at this point.
- Always use a new cotter pin.



**5**



2. Install:

- Caliper ①
- Bolt (caliper) ②



**Bolt (Caliper):**

45 Nm (4.5 m•kg, 32 ft•lb)

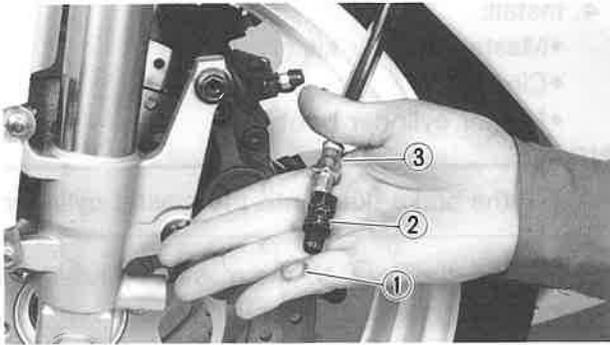
3. Tighten:

- Pad pin ③



**Pad Pin:**

18 Nm (1.8 m•kg, 13 ft•lb)



4. Install:
- Copper washer ①
  - Adapter ②
  - Brake hose ③

**NOTE:** \_\_\_\_\_  
Always use a new copper washer.

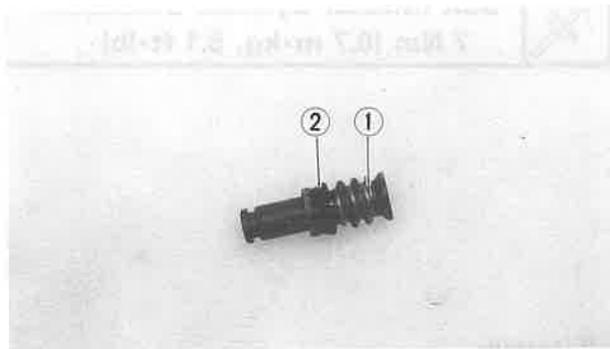


**Adapter:**  
26 Nm (2.6 m•kg, 19 ft•lb)  
**Brake Hose:**  
14 Nm (1.4 m•kg, 10 ft•lb)

5. Air bleed:
- Brake system
- Refer to CHAPTER 3. —“BRAKE SYSTEM AIR BLEEDING” section.

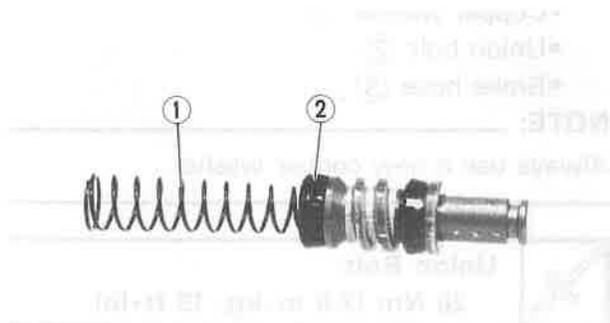
**MASTER CYLINDER KIT**

1. Clean:
- Master cylinder
  - Master cylinder kit
- Clean them with brake fluid.



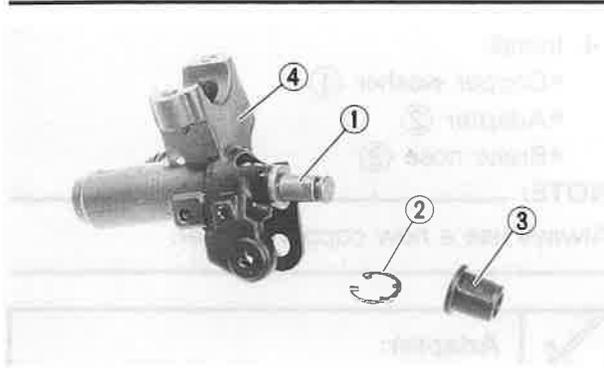
2. Install:
- Master cylinder piston ①
  - Master cylinder cup (primary) ②

**NOTE:** \_\_\_\_\_  
•Apply the brake fluid on the master cylinder cup.  
•After installing, cylinder cup should be installed as shown direction. Wrong installation cause improper brake performance.



3. Install:
- Spring ①
  - Master cylinder cup (secondary) ②

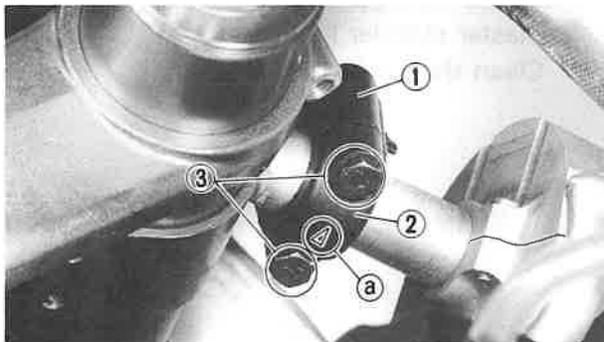
**NOTE:** \_\_\_\_\_  
Install the spring at the smaller dia. side.



4. Install:
- Master cylinder kit ①
  - Circlip ②
  - Master cylinder boot ③

**NOTE:**

- Apply the brake fluid onto the master cylinder kit.
- Install the circlip ② to the master cylinder ④ using a long nose circlip plier.



**MASTER CYLINDER**

1. Install:
- Master cylinder ①
  - Master cylinder bracket ②
  - Bolt (master cylinder bracket) ③

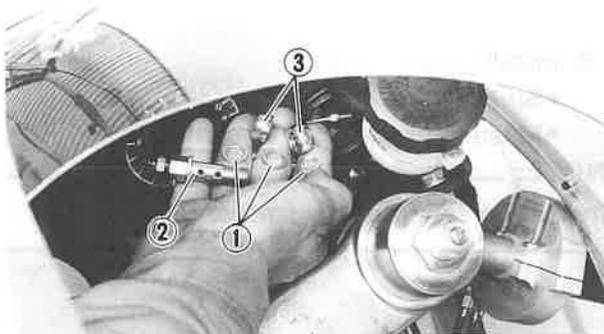
**NOTE:**

Install the bracket so that the arrow mark (a) face upward.



**Bolt (Master Cylinder Bracket):**  
7 Nm (0.7 m•kg, 5.1 ft•lb)

5



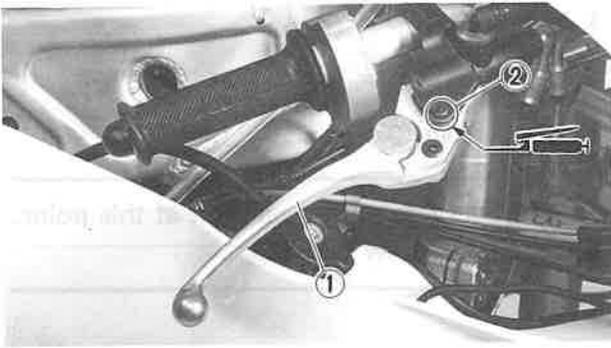
2. Install:
- Copper washer ①
  - Union bolt ②
  - Brake hose ③

**NOTE:**

Always use a new copper washer.



**Union Bolt:**  
26 Nm (2.6 m•kg, 19 ft•lb)

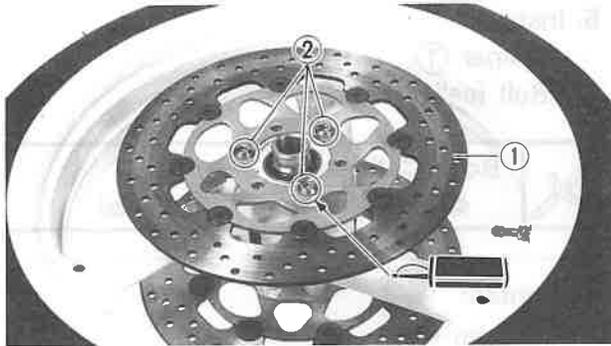


## 3. Install:

- Brake lever ①
- Bolt (brake lever) ②

**NOTE:**

Apply the lithium soap base grease on the sliding surface.

**BRAKE DISC**

## 1. Install:

- Brake disc ①
- Bolt (brake disc) ②

**NOTE:**

Tighten the bolts in stage, using a diagonal pattern.

**Bolt (Brake Disc):**

20 Nm (2.0 m•kg, 14 ft•lb)

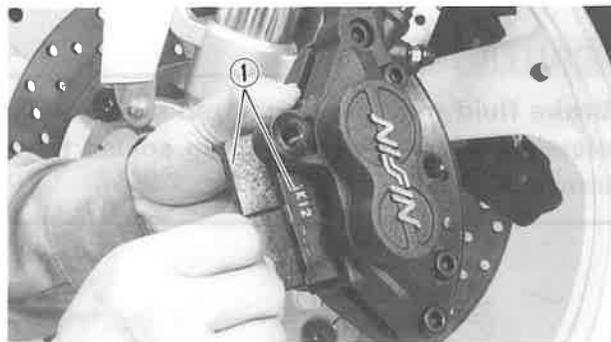
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**BRAKE PAD REPLACEMENT**

1. Connect the transparent hose ① to the bleed screw and place the suitable container under its end.
2. Loosen the bleed screw and push the caliper piston in.

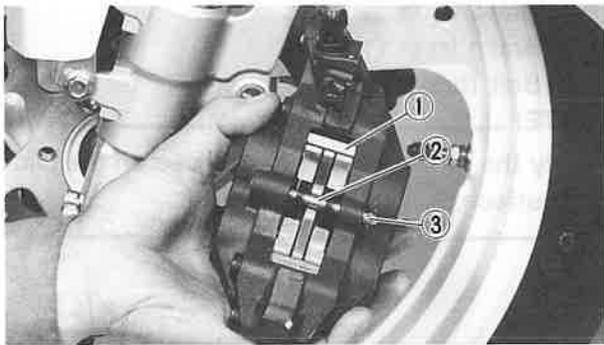
**CAUTION:**

Do not reuse the drained brake fluid.



## 3. Install:

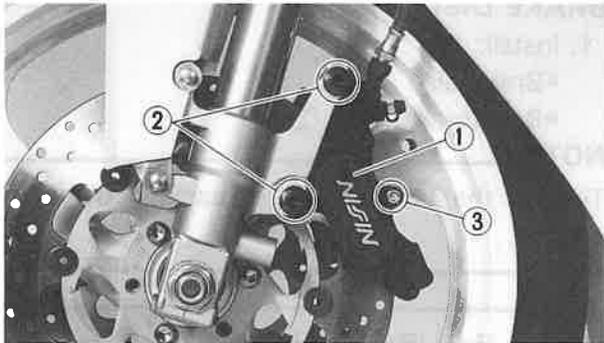
- Brake pad ①



4. Install:
- Pad support ①
  - Pad pin ②
  - Cotter pin ③

**NOTE:** \_\_\_\_\_

- Temporarily tighten the pad pin at this point.
- Always use a new cotter pin.



5. Install:
- Caliper ①
  - Bolt (caliper) ②

	<b>Bolt (Caliper):</b> 45 Nm (4.5 m•kg, 32 ft•lb)
---	--

6. Tighten:
- Pad pin ③

	<b>Pad Pin:</b> 18 Nm (1.8 m•kg, 13 ft•lb)
---	---

**5**

**BRAKE FLUID**

1. Fill:
- Brake fluid

	<b>Recommended Brake Fluid:</b> DOT #4
---	---

**NOTE:** \_\_\_\_\_

If DOT #4 is not available, #3 can be used.

**CAUTION:** \_\_\_\_\_

Brake fluid may erode painted surfaces or plastic parts. Always clean up spilled fluid immediately.

**⚠ WARNING**

- Use only the designated quality brake fluid: otherwise, the rubber seals may deteriorate, causing leakage and poor brake performance.
- Refill with the same type of brake fluid; mixing fluids may result in a harmful chemical reaction and lead to poor performance.
- Be careful that water does not enter the master cylinder when refilling. Water will significantly lower the boiling point of the fluid and may result in vapor lock.

## 2. Air bleed:

- Brake system

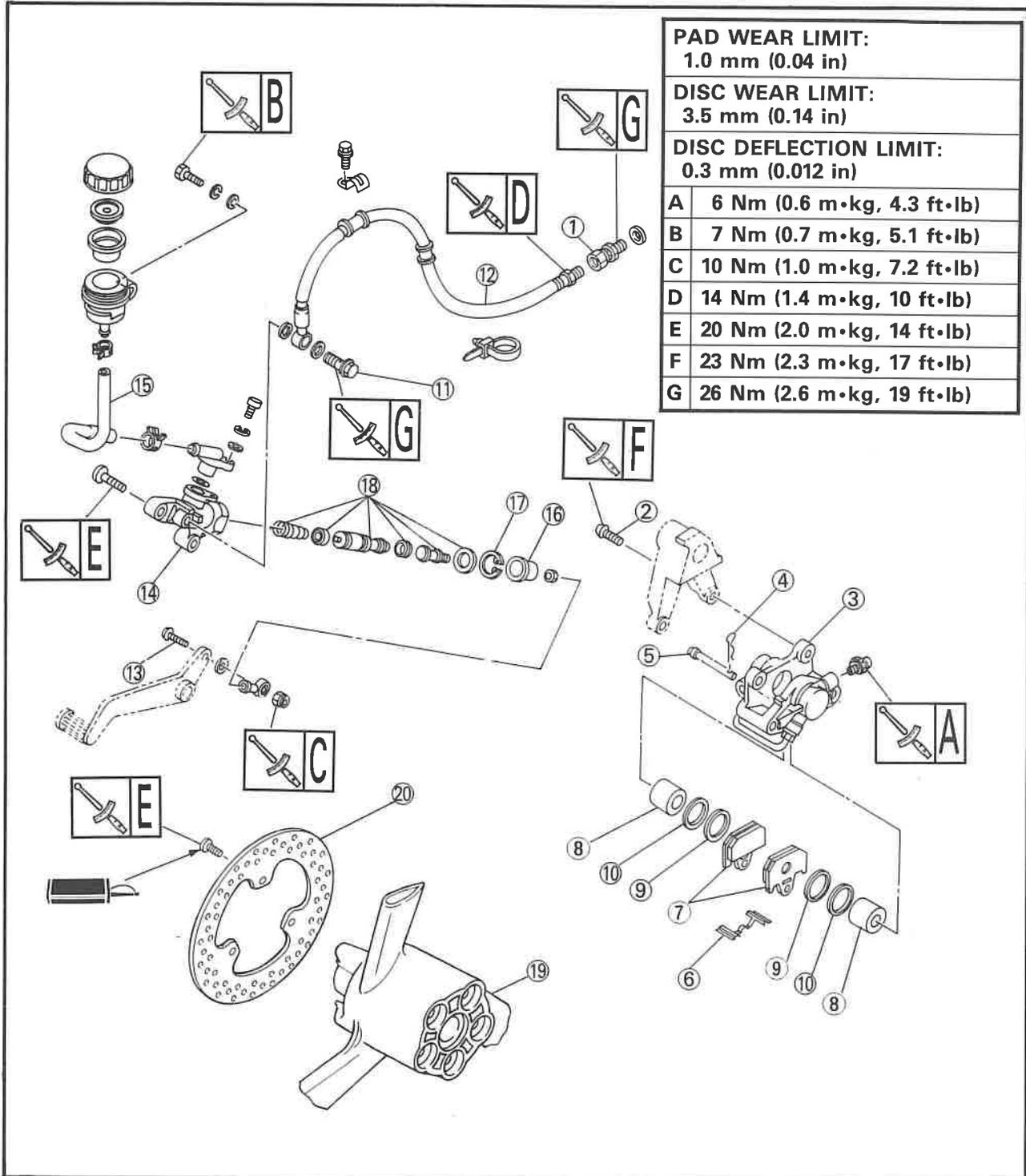
Refer to the "BRAKE SYSTEM AIR BLEEDING" section in the CHAPTER 3.

**REAR BRAKE  
PREPARATION FOR REMOVAL**

\* Hold the machine by placing the suitable stand.

**⚠ WARNING**

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



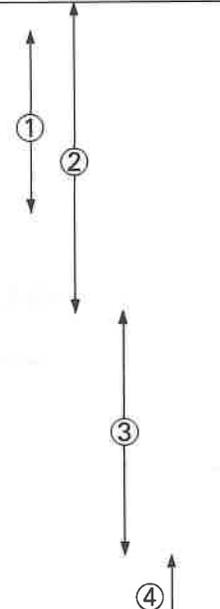
**5**

**CAUTION:**

Disc brake components rarely require disassembly. **DO NOT:**

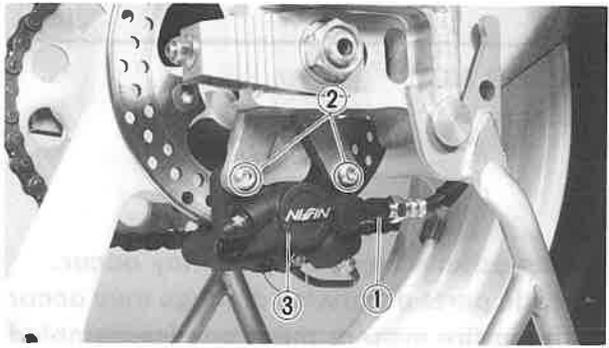
- Disassemble components unless absolutely necessary.
- Use solvents on internal brake component.
- Use contaminated brake fluid for cleaning.  
Use only clean brake fluid.
- Allow brake fluid to come in contact with the eyes otherwise eye injury may occur.
- Allow brake fluid to contact painted surfaces or plastic parts otherwise damage may occur.
- Disconnect any hydraulic connection otherwise the entire system must be disassembled, drained, cleaned, and then properly filled and bled after reassembly.

Extent of removal:    ① Brake pad removal    ② Caliper removal and disassembly  
                                  ③ Master cylinder removal and disassembly    ④ Brake disc removal

Extent of removal	Order	Part name	Q'ty	Remarks	
	1	Adapter	1	Drain the brake fluid.	
	2	Bolt (caliper)	2		
	3	Caliper	1		
	4	Clip	1		
	5	Pad pin	1		
					Refer to "REMOVAL POINTS".
	6	Pad support	1		
	7	Brake pad	2		
	8	Caliper piston	2		
	9	Dust seal	2		
	10	Piston seal	2		
					Drain the brake fluid.
	11	Union bolt	1		
	12	Brake hose	1		
	13	Brake pedal connecting bolt	1		
	14	Master cylinder	1		
	15	Reservoir hose	1		
					Refer to "REMOVAL POINTS".
	16	Master cylinder boot	1		
	17	Circlip	1		
18	Master cylinder kit	1			
19	Rear wheel	1	Refer to "REAR WHEEL" section.		
20	Brake disc	1			

**⚠ WARNING**

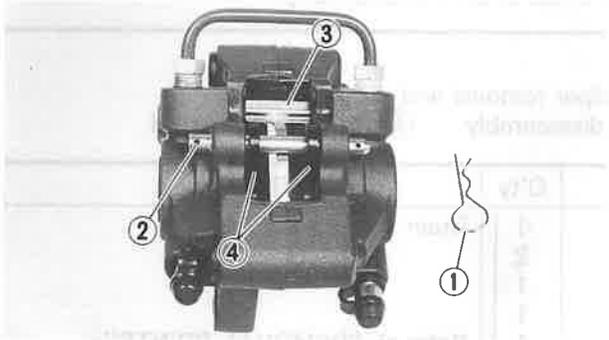
The brake components of this machine are suit for closed circuit use only. Never use on any public road.



**REMOVAL POINTS**

**CALIPER**

1. Remove:
  - Adapter ①
  - Bolt (caliper) ②
  - Caliper ③



**BRAKE PAD**

1. Remove:
  - Clip ①
  - Pad pin ②
  - Pad support ③
  - Brake pad ④



**CALIPER PISTON**

1. Remove:
  - Caliper piston

Use compressed air and proceed carefully.

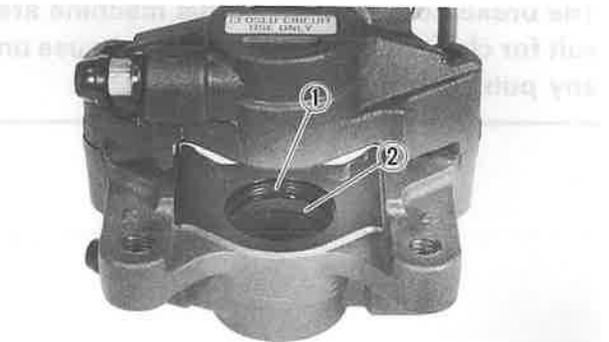
**⚠ WARNING**

- Cover piston with rag and use extreme caution when expelling piston from cylinder.
- Never attempt to pry out piston.

**Caliper piston removal steps:**

- Insert a piece of rag into the caliper to lock one caliper.
- Carefully force the piston out of the caliper cylinder with compressed air.

5



**PISTON SEAL KIT**

1. Remove:
  - Dust seal ①
  - Piston seal ②

**NOTE:**

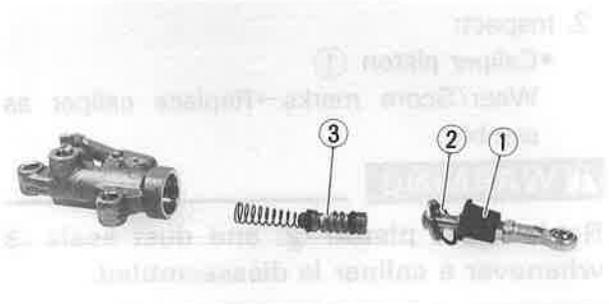
Remove the piston and dust seal by pushing it with a finger.

**CAUTION:**

Never attempt to pry out piston and dust seals.

**⚠ WARNING**

Replace the piston seals whenever a caliper is disassembled.



**MASTER CYLINDER KIT**

1. Remove:
  - Master cylinder boot ①
  - Circlip ②
  - Master cylinder kit ③
 Use a long nose circlip plier.



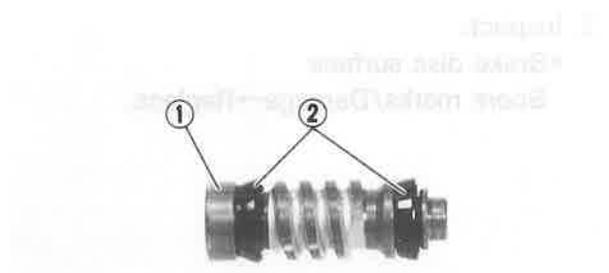
**INSPECTION  
MASTER CYLINDER**

1. Inspect:
  - Master cylinder body (a)
 Wear/Scratches → Replace master cylinder assembly.  
 Stains → Clean.

**NOTE:** \_\_\_\_\_  
Use new brake fluid.

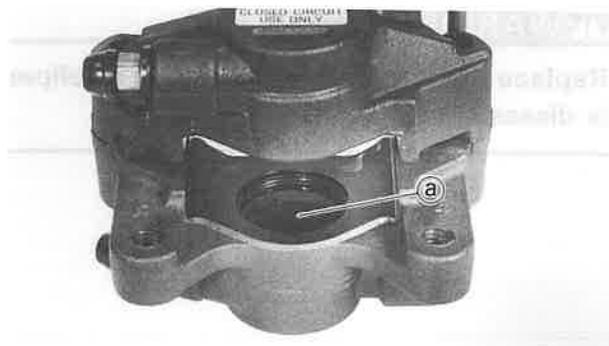


2. Inspect:
  - Diaphragm ①
 Crack/Damage → Replace.



3. Inspect:
  - Master cylinder piston ①
  - Master cylinder cup ②
 Wear/Damage/Score marks → Replace master cylinder kit.

**NOTE:** \_\_\_\_\_  
Replace master cylinder piston and cup as a set.



**CALIPER**

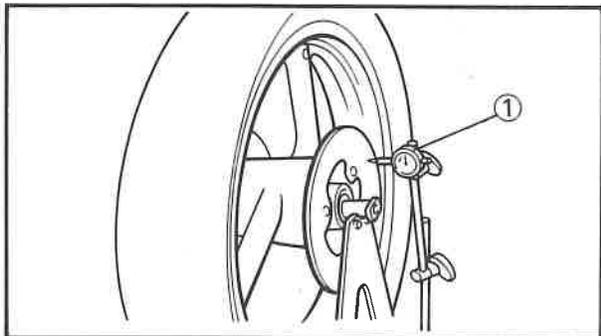
1. Inspect:
  - Caliper cylinder (a)
  - Wear/Score marks → Replace caliper assembly.



2. Inspect:
  - Caliper piston (1)
  - Wear/Score marks → Replace caliper assembly.

**⚠ WARNING**

Replace the piston (2) and dust seals (3) whenever a caliper is disassembled.

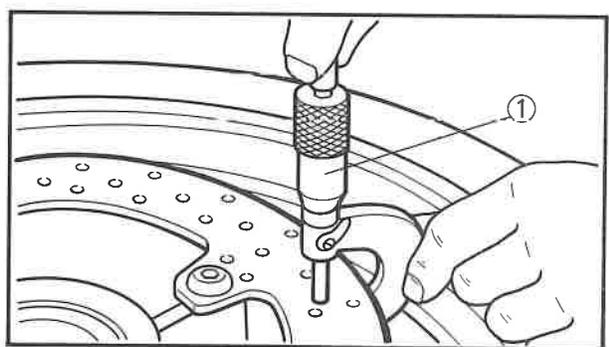


**BRAKE DISC**

1. Measure:
  - Brake disc deflection
  - Use Dial Gauge (1).
  - Out of specification → Inspect wheel runout.
  - If wheel runout is in good condition, replace.

**Maximum Deflection:**  
0.3 mm (0.012 in)

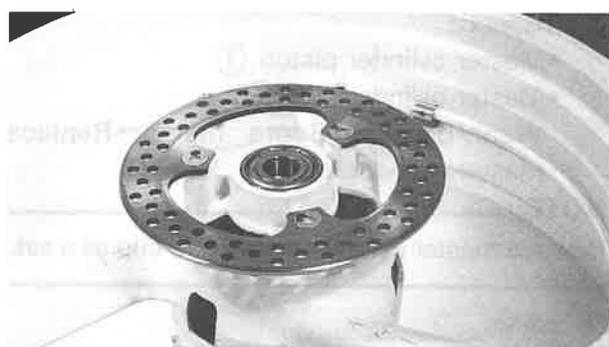
**5**



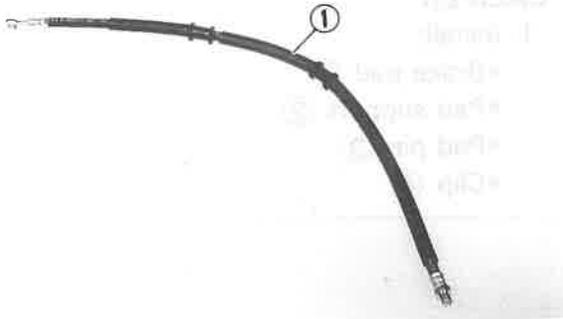
2. Measure:
  - Brake disc thickness (a)
  - Out of limit → Replace.

**Disc Wear Limit:**

Standard	Limit
4.0 mm (0.16 in)	3.5 mm (0.14 in)



3. Inspect:
  - Brake disc surface
  - Score marks/Damage → Replace.



**BRAKE HOSE**

1. Inspect:
  - Brake hose ①
  - Crack/Damage → Replace.

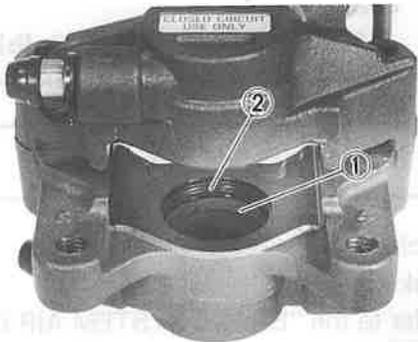
**ASSEMBLY AND INSTALLATION**

**⚠ WARNING**

- All internal parts should be cleaned in new brake fluid only.
- Internal parts should be lubricated with brake fluid when installed.
- Replace the piston seal and dust seal whenever a caliper is disassembled.

**CALIPER PISTON**

1. Clean:
  - Caliper
  - Piston seal
  - Dust seal
  - Caliper piston
  - Clean them with brake fluid.



2. Install:
  - Piston seal ①
  - Dust seal ②

**NOTE:** \_\_\_\_\_  
Fit the piston and dust seal onto the slot on caliper correctly.

**⚠ WARNING**

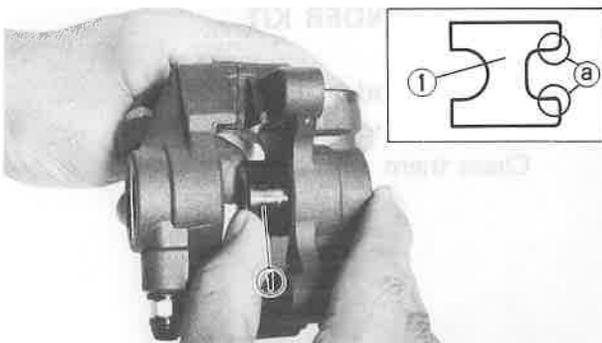
Replace the piston and dust seals whenever a caliper is disassembled.

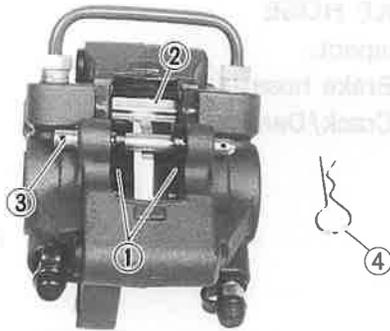
3. Install:
  - Caliper piston ①

**NOTE:** \_\_\_\_\_  
Apply the brake fluid on the piston wall.

**CAUTION:**

- Be sure that the rounded corner (a) face the caliper side.
- Never force to insert.





**CALIPER**

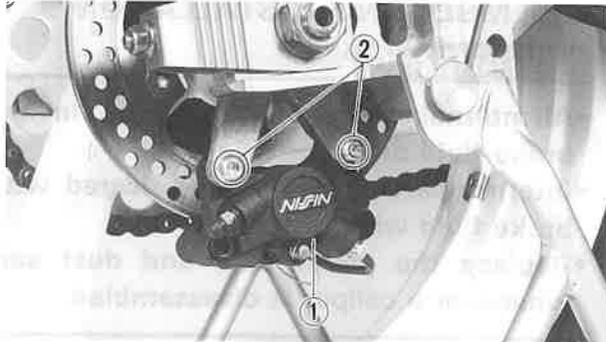
1. Install:

- Brake pad ①
- Pad support ②
- Pad pin ③
- Clip ④

2. Install:

- Caliper ①
- Bolt (caliper) ②

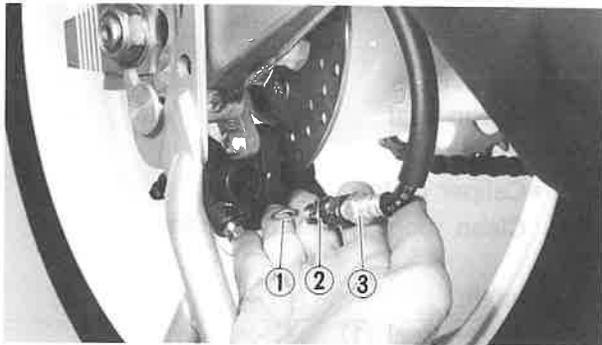
	<p><b>Bolt (Caliper):</b>  <b>23 Nm (2.3 m•kg, 17 ft•lb)</b></p>
---	--



3. Install:

- Copper washer ①
- Adapter ②
- Brake hose ③

	<p><b>Adapter:</b>  <b>26 Nm (2.6 m•kg, 19 ft•lb)</b></p>
	<p><b>Brake Hose:</b>  <b>14 Nm (1.4 m•kg, 10 ft•lb)</b></p>



**NOTE:** \_\_\_\_\_

Always use a new copper washer.

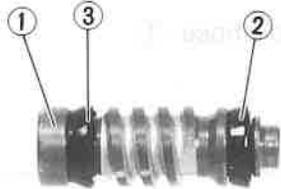
4. Air bleed:

- Brake system  
Refer to the "BRAKE SYSTEM AIR BLEEDING" section in the CHAPTER 3.

**MASTER CYLINDER KIT**

1. Clean:

- Master cylinder
  - Master cylinder kit
- Clean them with brake fluid.



2. Install:
- Master cylinder piston ①
  - Master cylinder cup (primary) ②
  - Master cylinder cup (secondary) ③

**NOTE:**

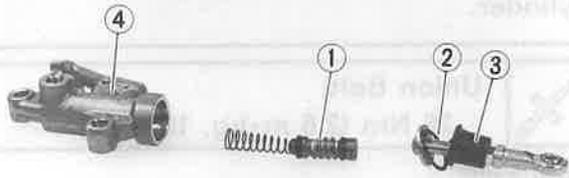
- Apply the brake fluid on the master cylinder cup.
- After installing, cylinder cup should be installed as shown direction. Wrong installation cause improper brake performance.



3. Install:
- Spring ①
  - Master cylinder piston ②

**NOTE:**

Install the spring at the smaller dia. side.



4. Install:
- Master cylinder kit ①
  - Circlip ②
  - Master cylinder boot ③

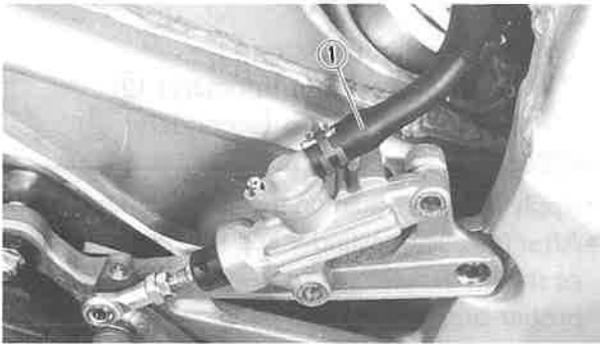
**NOTE:**

- Apply the brake fluid on the master cylinder kit.
- Install the circlip ② to the master cylinder ④ using a long nose circlip plier.

**MASTER CYLINDER**

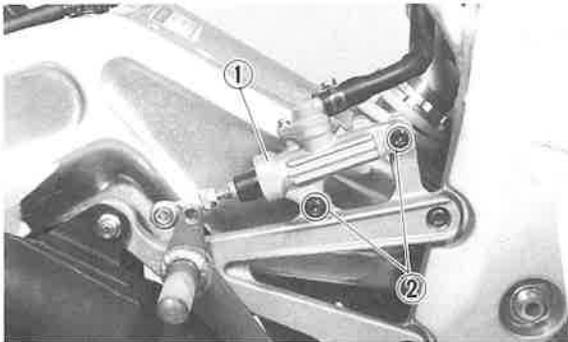
1. Install:

- Reservoir hose ①



2. Install:

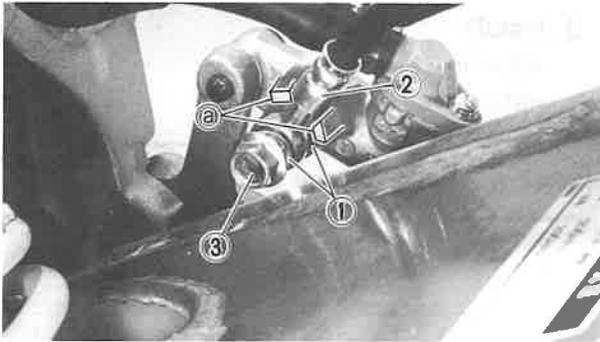
- Master cylinder ①
- Bolt (master cylinder) ②



 **Bolt (Master Cylinder):**  
20 Nm (2.0 m•kg, 14 ft•lb)

3. Install:

- Copper washer ①
- Brake hose ②
- Union bolt ③



**NOTE:** \_\_\_\_\_

Always use a new copper washer.

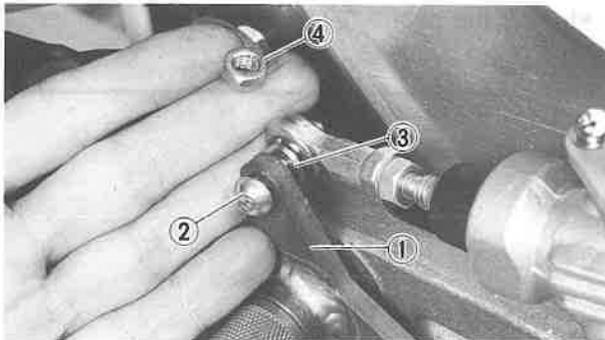
**CAUTION:** \_\_\_\_\_

When installing the brake hose to the master cylinder, lightly touch the brake pipe between the projections ① on the master cylinder.

 **Union Bolt:**  
26 Nm (2.6 m•kg, 19 ft•lb)

4. Install:

- Brake pedal ①
- Brake pedal connecting bolt ②
- Plate washer ③
- Nut (brake pedal connecting bolt) ④

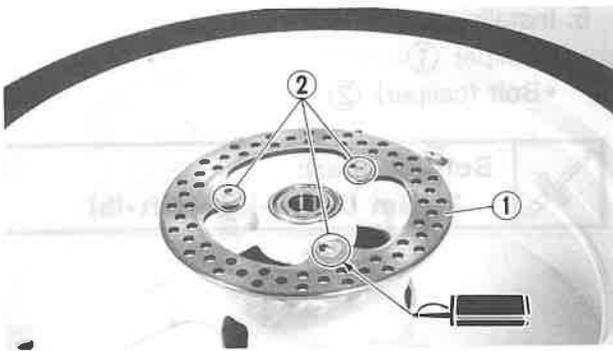


 **Nut (Brake Pedal Connecting Bolt):**  
10 Nm (1.0 m•kg, 7.2 ft•lb)

**NOTE:** \_\_\_\_\_

- Install the plate washer ③ between the brake pedal and master cylinder.
- After installing, check the brake pedal height. Refer to the "REAR BRAKE ADJUSTMENT" section in the CHAPTER 3.

5



## BRAKE DISC

1. Install:

- Brake disc ①
- Bolt (brake disc) ②

### NOTE:

Tighten the bolts in stage, using a diagonal pattern.



**Bolts (Brake Disc):**  
 20 Nm (2.0 m•kg, 14 ft•lb)  
 LOCTITE®



## BRAKE PAD REPLACEMENT

1. Connect the transparent hose ① to the bleed screw ② and place the suitable container under its end.
2. Loosen the bleed screw and push the caliper piston in.

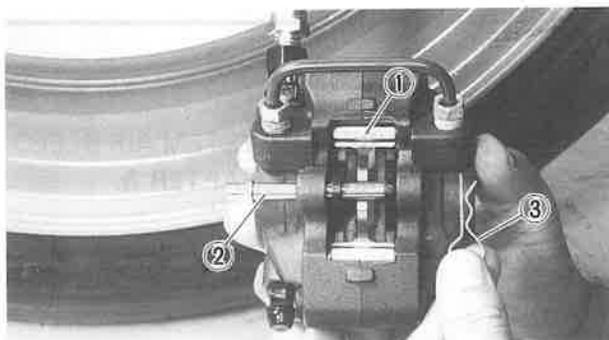
### CAUTION:

**Do not reuse the drained brake fluid.**



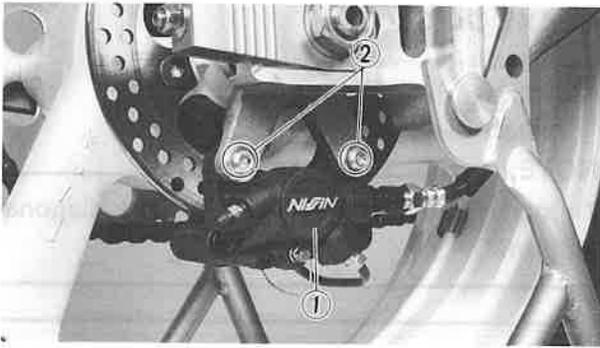
3. Install:

- Brake pad



4. Install:

- Pad support ①
- Pad pin ②
- Clip ③



## 5. Install:

- Caliper ①
- Bolt (caliper) ②

**Bolt (Caliper):**

**23 Nm (2.3 m·kg, 17 ft·lb)**

**BRAKE FLUID**

## 1. Fill:

- Brake fluid



**Recommended Brake Fluid:**  
**DOT #4**

**NOTE:**

If DOT #4 is not available, #3 can be used.

**CAUTION:**

Brake fluid may erode painted surfaces or plastic parts. Always clean up spilled fluid immediately.

**! WARNING**

- Use only the designated quality brake fluid; otherwise, the rubber seals may deteriorate, causing leakage and poor brake performance.
- Refill with the same type of brake fluid; mixing fluids may result in a harmful chemical reaction and lead to poor performance.
- Be careful that water does not enter the master cylinder when refilling. Water will significantly lower the boiling point of the fluid and may result in vapor lock.

## 2. Air bleed:

- Brake system

Refer to the "BRAKE SYSTEM AIR BLEEDING" section in the CHAPTER 3.

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MEMO

**FRONT FORK  
PREPARATION FOR REMOVAL**

\* Remove the following parts:

- Cowling
- Caliper
- Front wheel
- Band (Brake hose clamp)

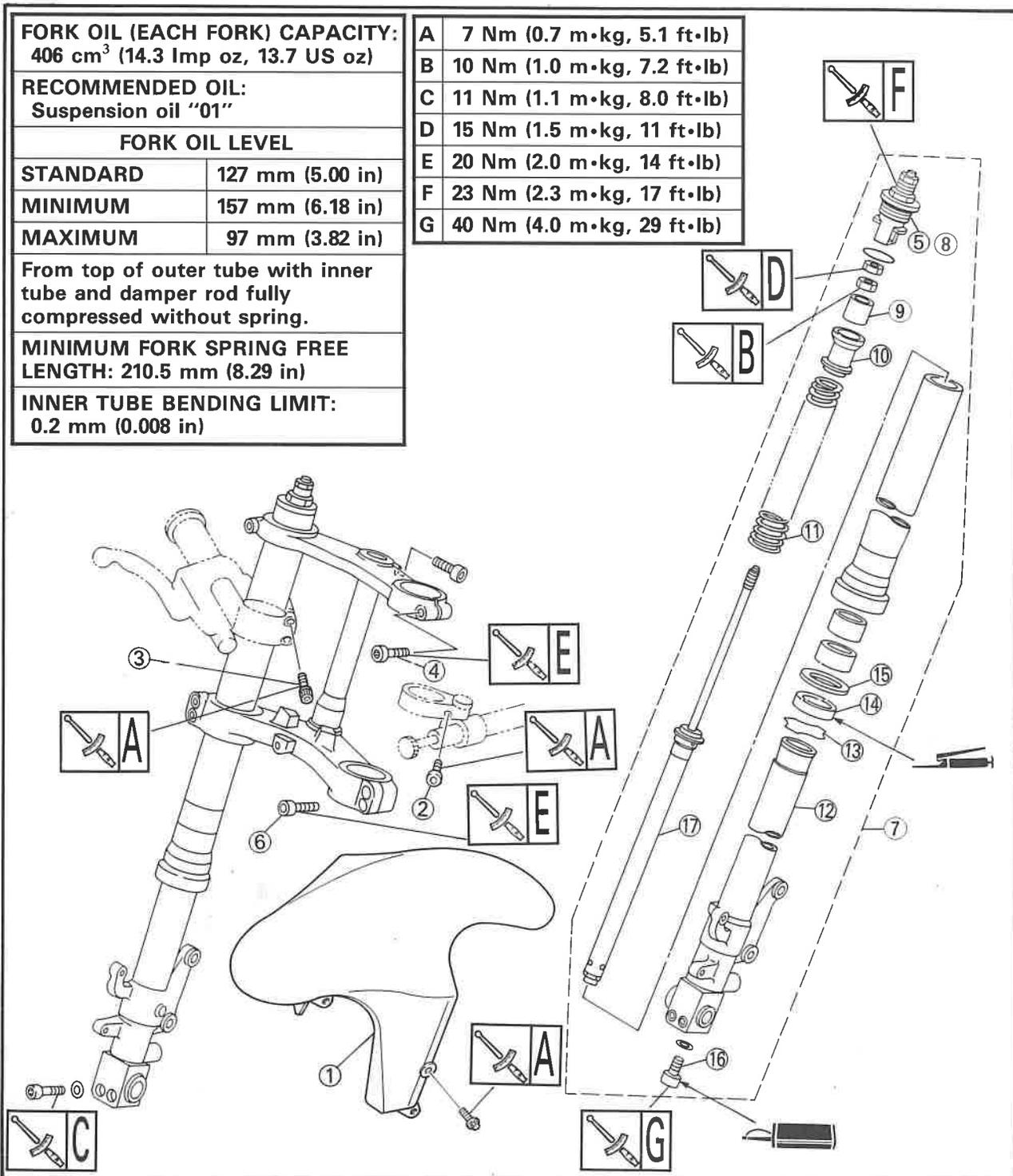
\* Hold the machine by placing the suitable stand.

**⚠ WARNING**

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

<b>FORK OIL (EACH FORK) CAPACITY:</b> 406 cm <sup>3</sup> (14.3 Imp oz, 13.7 US oz)	
<b>RECOMMENDED OIL:</b> Suspension oil "01"	
<b>FORK OIL LEVEL</b>	
<b>STANDARD</b>	127 mm (5.00 in)
<b>MINIMUM</b>	157 mm (6.18 in)
<b>MAXIMUM</b>	97 mm (3.82 in)
From top of outer tube with inner tube and damper rod fully compressed without spring.	
<b>MINIMUM FORK SPRING FREE LENGTH:</b> 210.5 mm (8.29 in)	
<b>INNER TUBE BENDING LIMIT:</b> 0.2 mm (0.008 in)	

<b>A</b>	7 Nm (0.7 m•kg, 5.1 ft•lb)
<b>B</b>	10 Nm (1.0 m•kg, 7.2 ft•lb)
<b>C</b>	11 Nm (1.1 m•kg, 8.0 ft•lb)
<b>D</b>	15 Nm (1.5 m•kg, 11 ft•lb)
<b>E</b>	20 Nm (2.0 m•kg, 14 ft•lb)
<b>F</b>	23 Nm (2.3 m•kg, 17 ft•lb)
<b>G</b>	40 Nm (4.0 m•kg, 29 ft•lb)



Extent of removal: ① Front fork removal ② Oil seal removal ③ Front fork disassembly

Extent of removal	Order	Part name	Q'ty	Remarks
	1	Front fender	1	
	2	Pinch bolt (steering damper stay)	1	Only loosening. (left side only)
	3	Pinch bolt (handlebar)	2ea.	Only loosening.
	4	Pinch bolt (handle crown)	1ea.	Only loosening.
	5	Cap bolt	1ea.	Only loosening.
	6	Pinch bolt (under bracket)	2ea.	Only loosening.
	7	Front fork	1ea.	
	8	Cap bolt	1ea.	Use special tool. Refer to "REMOVAL POINTS".
	9	Spacer	1ea.	
	10	Spacer guide	1ea.	
	11	Fork spring	1ea.	Drain the fork oil.
	12	Inner tube	1ea.	Use special tool. Refer to "REMOVAL POINTS".
	13	Stopper ring	1ea.	
	14	Oil seal	1ea.	
	15	Oil seal washer	1ea.	
	16	Bolt (damper rod)	1ea.	Refer to "REMOVAL POINTS".
	17	Damper rod	1ea.	



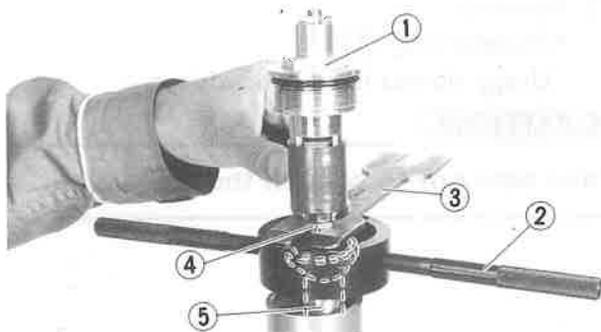
**REMOVAL POINTS**

**CAP BOLT**

- Remove:
  - Cap bolt ①
 From the outer tube.

**NOTE:** \_\_\_\_\_

Before removing the front fork from the machine, loosen the cap bolt ①.



- Remove:
  - Cap bolt ①

**NOTE:** \_\_\_\_\_

- While compressing the fork spring with Fork Spring Compressor ②, set the Rod Holder ③ between the locknut ④ and spacer guide ⑤.
- Hold the locknut ④ and remove the cap bolt ①.

	<b>Fork Spring Compressor:</b>
	YM-01441/90890-01441
	<b>Rod Holder:</b>
	YM-01434/90890-01434

**HANDLING NOTE****NOTE:**

The front fork requires careful attention. So it is recommended that the front fork be maintained at the dealers.

**CAUTION:**

To prevent an accidental explosion of air, the following instructions should be observed:

- The front fork with a built-in piston rod has a very sophisticated internal construction and is particularly sensitive to foreign material.

Use enough care not to allow any foreign material to come in when the oil is replaced or when the front fork is disassembled and reassembled.

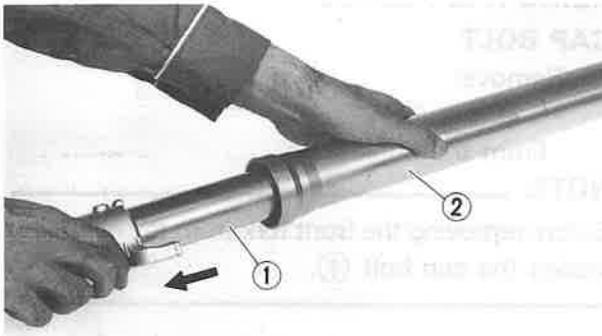
- Before removing the cap bolts or front forks, be sure to extract the air from the air chamber completely.

**OIL SEAL**

## 1. Remove:

- Inner tube ①

Pull out the inner tube ① from the outer tube ②.



## 2. Remove:

- Stopper ring ①

Using slotted-head screwdriver.

**CAUTION:**

Take care not to scratch the inner tube.

## 3. Remove:

- Oil seal ①

Using slotted-head screwdriver.

**CAUTION:**

- Take care not to scratch the outer tube inner surface.

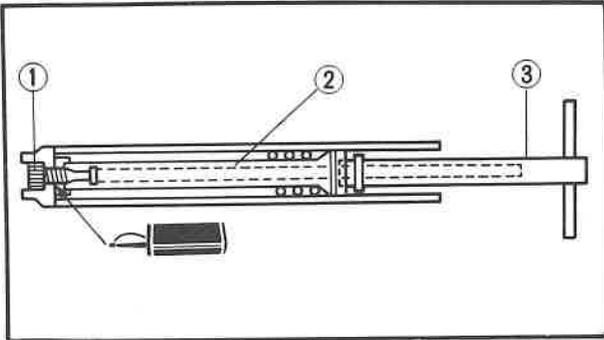
- Replace the oil seal whenever removed.

**DAMPER ROD**

1. Remove:
  - Nut (cap bolt) ①
  - Locknut ②



2. Remove:
  - Bolt (damper rod) ①
  - Damper rod ②
 Use a Damper Rod Holder ③ to lock the damper rod.



	<b>Damper Rod Holder:</b> 90890-01425
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**INSPECTION  
DAMPER ROD**

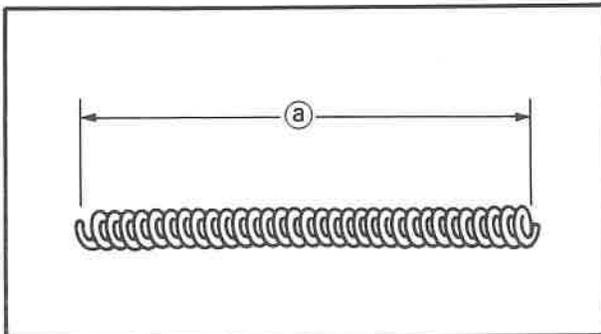
1. Inspect:
  - Damper rod ①
 Bend/Damage → Replace damper rod.

**CAUTION:** \_\_\_\_\_

The front fork with a built-in piston rod has a very sophisticated internal construction and is particularly sensitive to foreign material.

Use enough care not to allow any foreign material to come in when the oil is replaced or when the front fork is disassembled and reassembled.

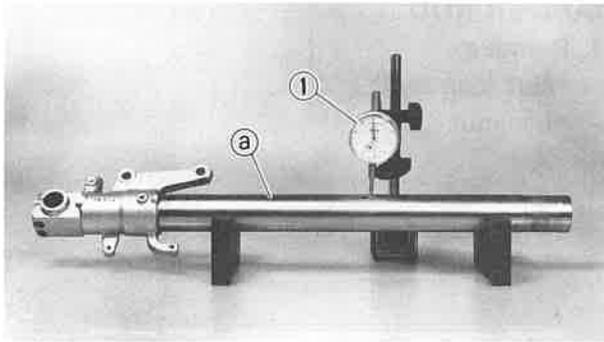
**5**



**FORK SPRING**

1. Measure:
  - Fork spring free length (a)
 Out of specification → Replace.

	<b>Fork Spring Free Length:</b>	
	<b>Standard</b>	<b>Limit</b>
	212.5 mm (8.37 in)	210.5 mm (8.29 in)



**INNER TUBE**

1. Inspect:

- Inner tube surface (a)
  - Score marks → Repair or replace.
  - Use #1,000 grit wet sandpaper.
  - Damaged oil lock piece → Replace.
- Inner tube bends
  - Out of specification → Replace.
  - Use Dial Gauge (1).

 **Inner Tube Bending Limit:**  
0.2 mm (0.008 in)

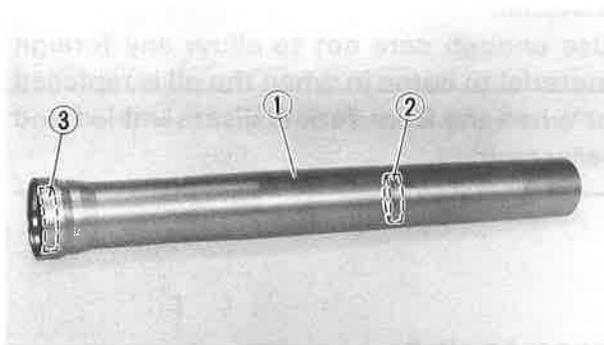
**NOTE:**

The bending value is shown by one half of the Dial Gauge reading.

**⚠ WARNING**

Do not attempt to straighten a bent inner tube as this may dangerously weaken the tube.

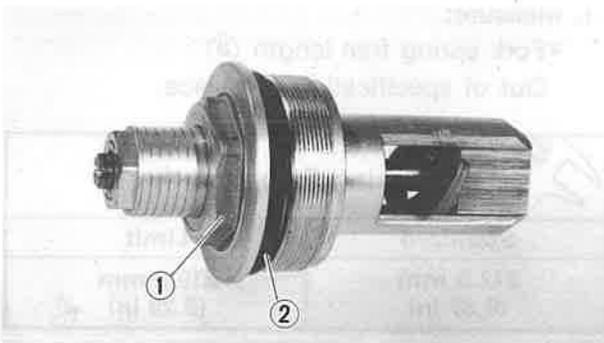
**5**



**OUTER TUBE**

1. Inspect:

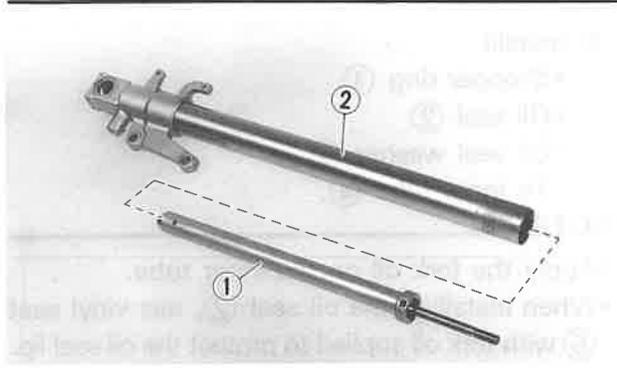
- Outer tube (1)
  - Damage → Replace.
- Piston metal (2)
- Slide metal (3)
  - Score marks/Wear → Replace the outer tube.



**CAP BOLT**

1. Inspect:

- Cap bolt (1)
- O-ring (2)
  - Wear/Damage → Replace.



**ASSEMBLY AND INSTALLATION**  
**FRONT FORK ASSEMBLY**

1. Wash the all parts in a clear solvent.
2. Install:
  - Damper rod ①
  - To inner tube ②.

**CAUTION:** \_\_\_\_\_

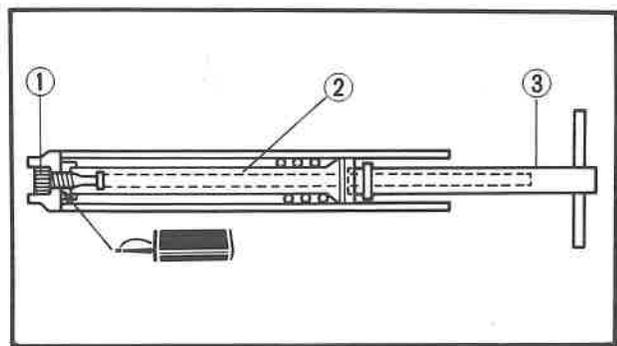
To install the damper rod assembly into the inner tube, hold the inner tube aslant. If the inner tube is held vertically, the rod assembly may fall into it, damaging the valve inside.



3. Install:
  - Copper washer ①
  - Bolt (damper rod) ②
  - To inner tube.

**NOTE:** \_\_\_\_\_

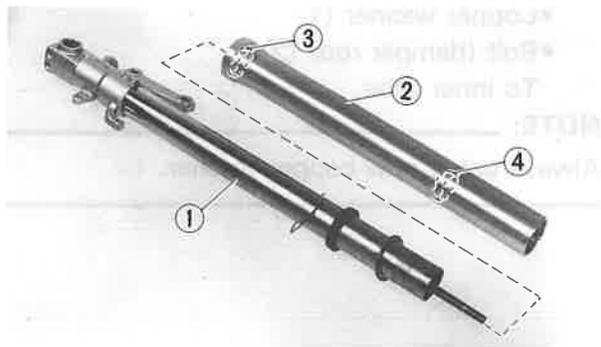
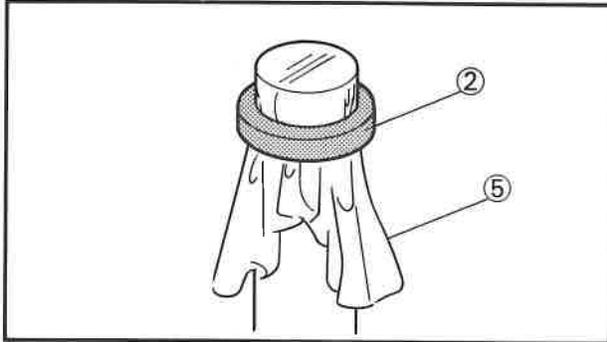
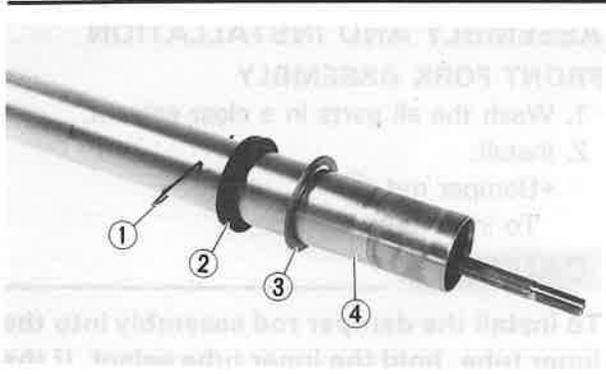
Always use a new copper washer.



4. Tighten:
  - Bolt (damper rod) ①
  - Use Damper Rod Holder ③ to lock the damper rod ②.

	<b>Damper Rod Holder:</b> 90890-01425
---	--

	<b>Bolt (Damper Rod):</b> 40 Nm (4.0 m•kg, 29 ft•lb) LOCTITE®
---	---



5. Install:

- Stopper ring ①
- Oil seal ②
- Oil seal washer ③
- To inner tube ④.

**NOTE:**

- Apply the fork oil on the inner tube.
- When installing the oil seal ②, use vinyl seat ⑤ with fork oil applied to protect the oil seal lip.
- Install the oil seal with its manufacture's marks or number facing the axle holder side.

**CAUTION:**

Always use a new oil seal.

6. Install:

- Inner tube ①.
- To outer tube ②.

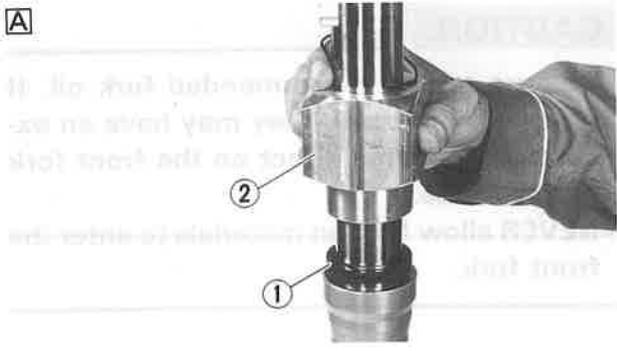
**CAUTION:**

When installing the inner tube, take care not to scratch the slide metal ③ and piston metal ④.

7. Install:

- Oil seal washer ①
- To outer tube slot.

5

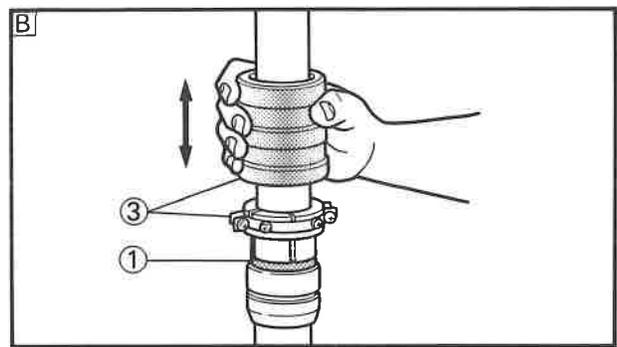


- 8. Install:
  - Oil seal ①

**NOTE:** \_\_\_\_\_  
 Press the oil seal into the outer tube with Fork Seal Driver ②, ③.

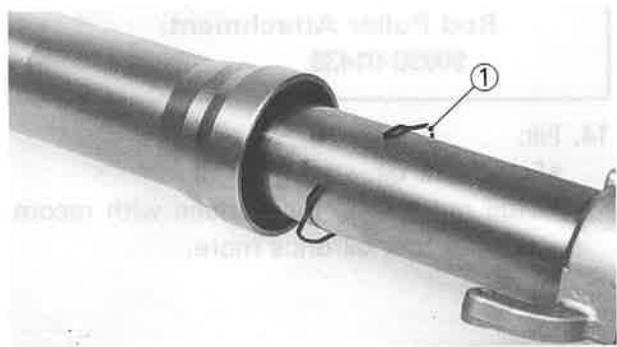
	<b>Fork Seal Driver:</b>	
	YM-1424 .....	②
	90890-01442 .....	③

- Ⓐ For USA and CDN
- Ⓑ Except for USA and CDN

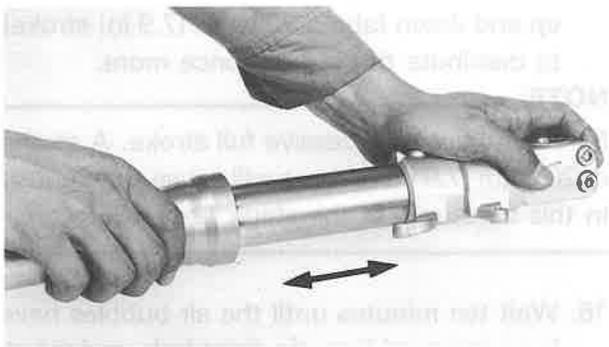


- 9. Install:
  - Stopper ring ①

**NOTE:** \_\_\_\_\_  
 Fit the stopper ring correctly in the groove in the outer tube.

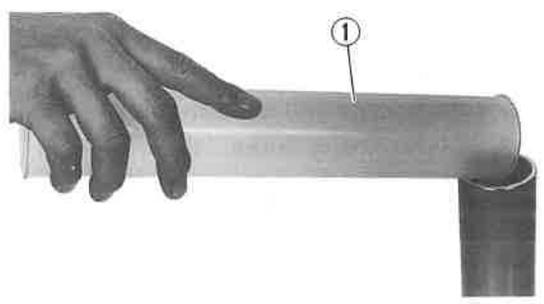


- 10. Check:
  - Inner tube smooth movement
  - Tightness/Binding/Rough spots → Repeat the steps 2 to 9.



5

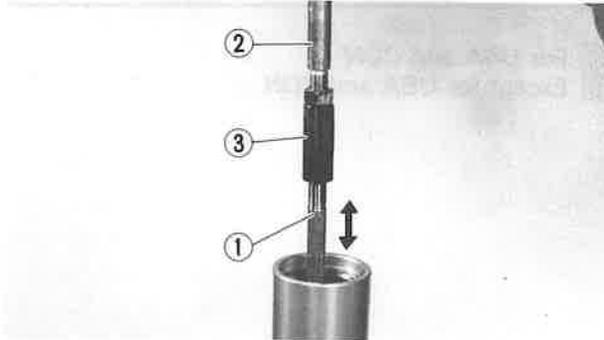
- 11. Compress the front fork fully.
- 12. Fill:
  - Front fork oil
  - Until outer tube top surface with recommended fork oil ①.



	<b>Recommended Oil:</b>
	Suspension Oil "01"

**CAUTION:**

- Be sure to use recommended fork oil. If other oils are used, they may have an excessively adverse effect on the front fork performance.
- NEVER allow foreign materials to enter the front fork.



13. After filling, pump the damper rod ① slowly up and down more than 10 times to distribute the fork oil.

**NOTE:**

Use the Rod Puller ② and Rod Puller Attachment ③ to pull and down the damper rod.



**Rod Puller:**

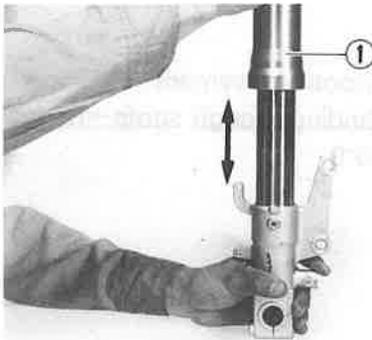
YM-01437/90890-01437

**Rod Puller Attachment:**

90890-01436

14. Fill:

- Front fork oil  
Until outer tube top surface with recommended fork oil once more.



15. After filling, pump the outer tube ① slowly up and down (about 200 mm (7.9 in) stroke) to distribute the fork oil once more.

**NOTE:**

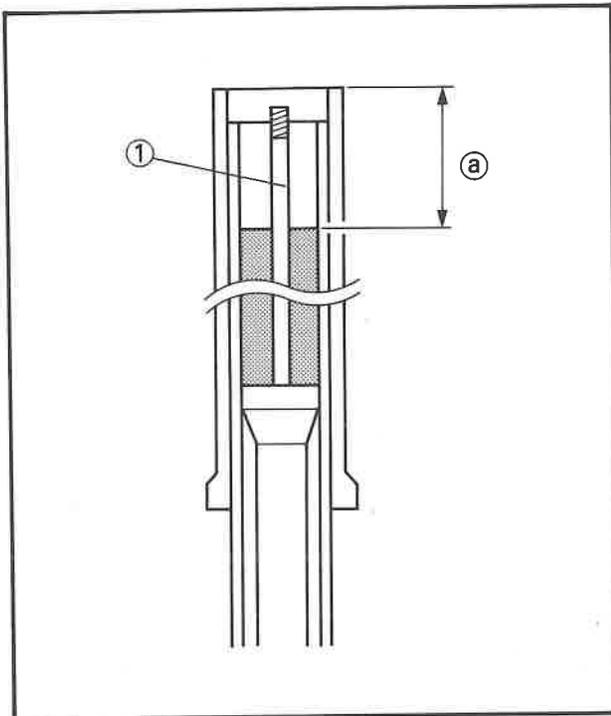
Be careful not to excessive full stroke. A stroke of 200 mm (7.9 in) or more will cause air to enter. In this case, repeat the steps 12 to 15.

16. Wait ten minutes until the air bubbles have been removed from the front fork, and the oil has dispense evenly in system before setting recommended oil level.

**NOTE:**

Fill with the fork oil up to the top end of the outer tube, or the fork oil will not spread over to every part of the front forks, thus making it impossible to obtain the correct level.

Be sure to fill with the fork oil up to the top of the outer tube and bleed the front forks.



17. Measure:

- Oil level (left and right) (a)
- Out of specification → Adjust.

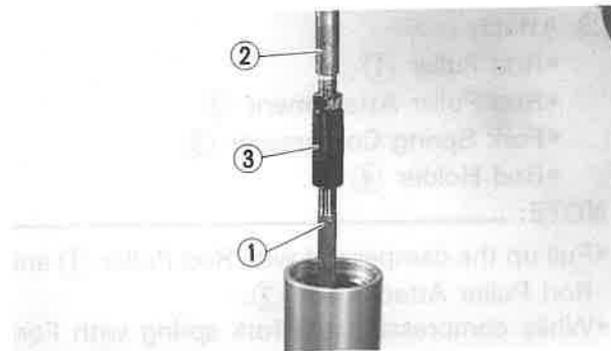
 **Fork Oil Level:** (400 cc)

Standard	127 mm (5.00 in)
Minimum	157 mm (6.18 in)
Maximum	97 mm (3.82 in)

From top of outer tube with inner tube and damper rod (1) fully compressed without spring.

**⚠ WARNING**

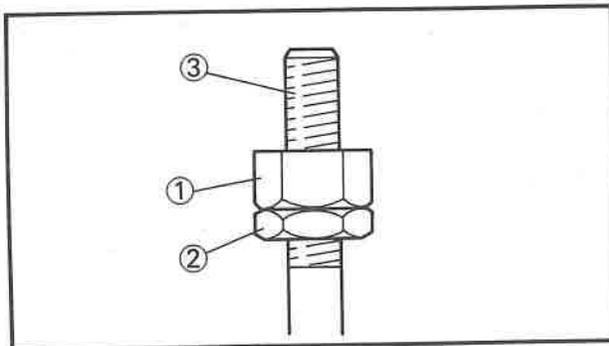
Never fail to make the oil level adjustment between the maximum and minimum level and always adjust each front fork to the same setting. Uneven adjustment can cause poor handling and loss of stability.



18. Pull up the damper rod (1) with Rod Puller (2) and Rod Puller Attachment (3).

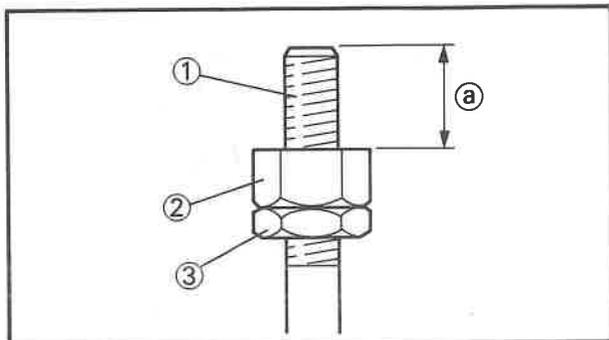
 **Rod Puller:**  
YM-01437/90890-01437

**Rod Puller/Attachment:**  
90890-01436



19. Install:

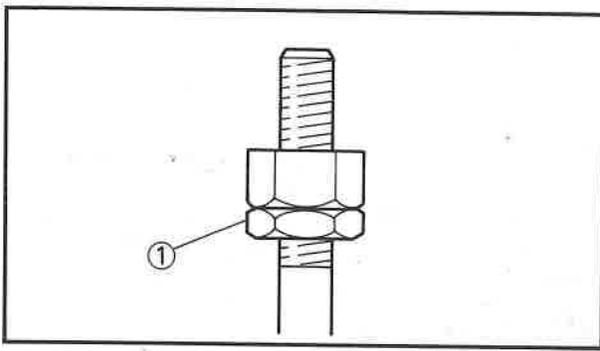
- Locknut (1)
- Nut (cap bolt) (2)
- To damper rod (3).



20. Adjust:

- Distance (a)
- Out of specification → Turn the nut (2) and locknut (3) until the specified distance is obtained.

 **Distance (a):**  
12 mm (0.47 in) or more  
Between damper rod top (1) and nut top (2).



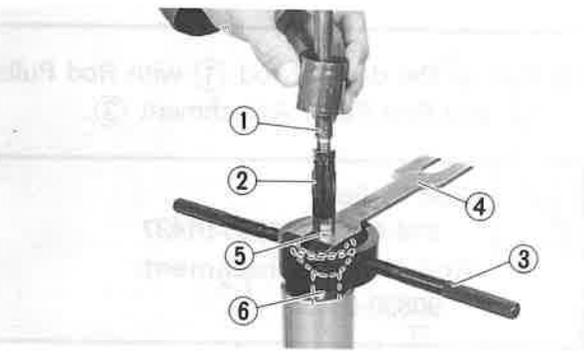
21. Tighten:
- Locknut ①

	<b>Locknut:</b> 10 Nm (1.0 m•kg, 7.2 ft•lb)
---	--



22. Install:
- Fork spring ①
  - Spacer guide ②
  - Spacer ③

**NOTE:** \_\_\_\_\_  
 Install the fork spring with its smaller dia. portion upward.



23. Attach:
- Rod Puller ①
  - Rod Puller Attachment ②
  - Fork Spring Compressor ③
  - Rod Holder ④

**NOTE:** \_\_\_\_\_  
 • Pull up the damper rod with Rod Puller ① and Rod Puller Attachment ②.  
 • While compressing the fork spring with Fork Spring Compressor ③, set the Rod Holder ④ between the locknut ⑤ and spacer guide ⑥.

5

	<b>Rod Puller:</b> YM-01437/90890-01437 <b>Rod Puller Attachment:</b> 90890-01436 <b>Fork Spring Compressor:</b> YM-01441/90890-01441 <b>Rod Holder:</b> YM-01434/90890-01434
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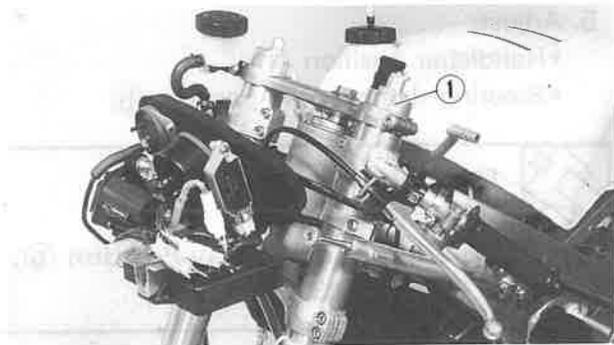
24. Install:  
 • Cap bolt ①

**NOTE:** \_\_\_\_\_  
 Hold the nut ② and tighten the cap bolt ① with specified torque.

	<p><b>Cap Bolt:</b>                  15 Nm (1.5 m•kg, 11 ft•lb)</p>
---	---



25. Install:  
 • Cap bolt ①  
 To outer tube.  
 Temporarily tighten the cap bolt.



**INSTALLATION**

1. Install:  
 • Front fork ①  
 Temporarily tighten the pinch bolts (under bracket).
2. Tighten:  
 • Cap bolt

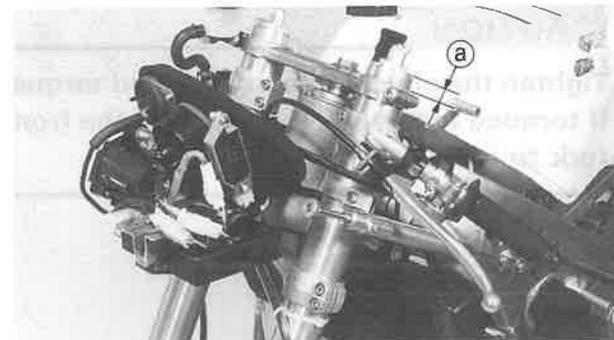
	<p><b>Cap Bolt:</b>                  23 Nm (2.3 m•kg, 17 ft•lb)</p>
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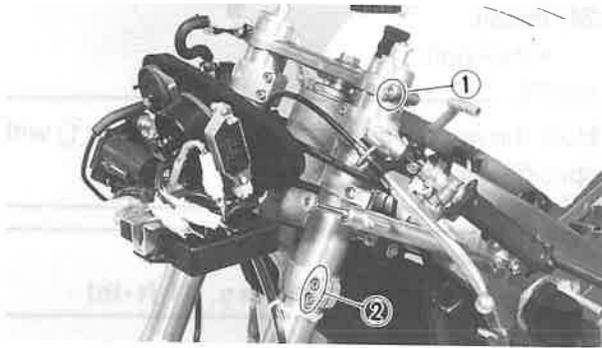
**NOTE:** \_\_\_\_\_  
 Do not tighten the pinch bolts (handle crown) yet.

3. Adjust:  
 • Front fork top end ①

 <b>Front Fork Top End ①:</b>	
<b>Standard</b>	<b>Extent of adjustment</b>
13 mm (0.51 in)	Zero ~ 16 mm (Zero ~ 0.63 in)

**CAUTION:** \_\_\_\_\_  
 Never attempt to install the front fork beyond the maximum or minimum setting.





## 4. Tighten:

- Pinch bolt (handle crown) ①
- Pinch bolt (under bracket) ②

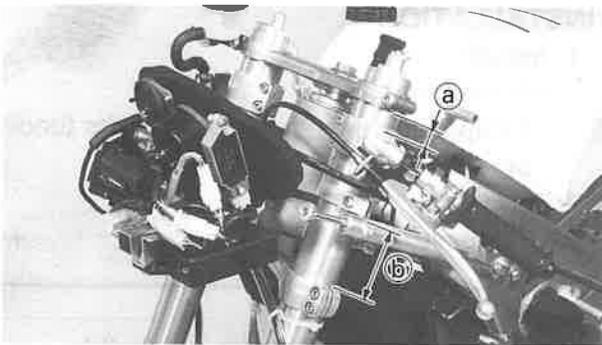


**Pinch Bolt (Handle Crown):**  
20 Nm (2.0 m·kg, 14 ft·lb)

**Pinch Bolt (Under Bracket):**  
20 Nm (2.0 m·kg, 14 ft·lb)

**CAUTION:**

Tighten the pinch bolts to specified torque. If torqued too much, it may cause the front fork to malfunction.



## 5. Adjust:

- Handlebar position ①
- Steering damper stay position ②



**Handlebar Position ①:**  
20 mm (0.79 in)

**Steering Damper Stay Position ②:**  
85 mm (3.35 in)

5



## 6. Tighten:

- Pinch bolt (handlebar) ①
- Pinch bolt (steering damper stay) ②

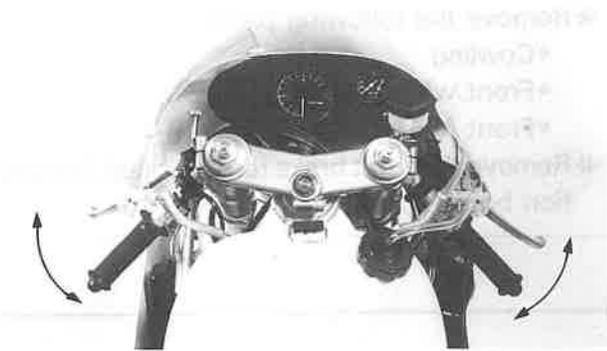


**Pinch Bolt (Handlebar):**  
7 Nm (0.7 m·kg, 5.1 ft·lb)

**Pinch Bolt (Steering Damper Stay):**  
7 Nm (0.7 m·kg, 5.1 ft·lb)

**CAUTION:**

Tighten the pinch bolts to specified torque. If torqued too much, it may cause the front fork to malfunction.



## 7. Check:

- Steering smooth action

Turn the handlebar to make sure no parts are being contacted with others.

Contact → Repair.



**STEERING**

**PREPARATION FOR REMOVAL**

\* Hold the machine by placing the suitable stand.

**⚠ WARNING**

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

\* Remove the following parts:

- Cowling
- Front wheel
- Front fender

\* Remove the front brake reservoir tank installation bolt.

**A TIGHTENING STEPS:**

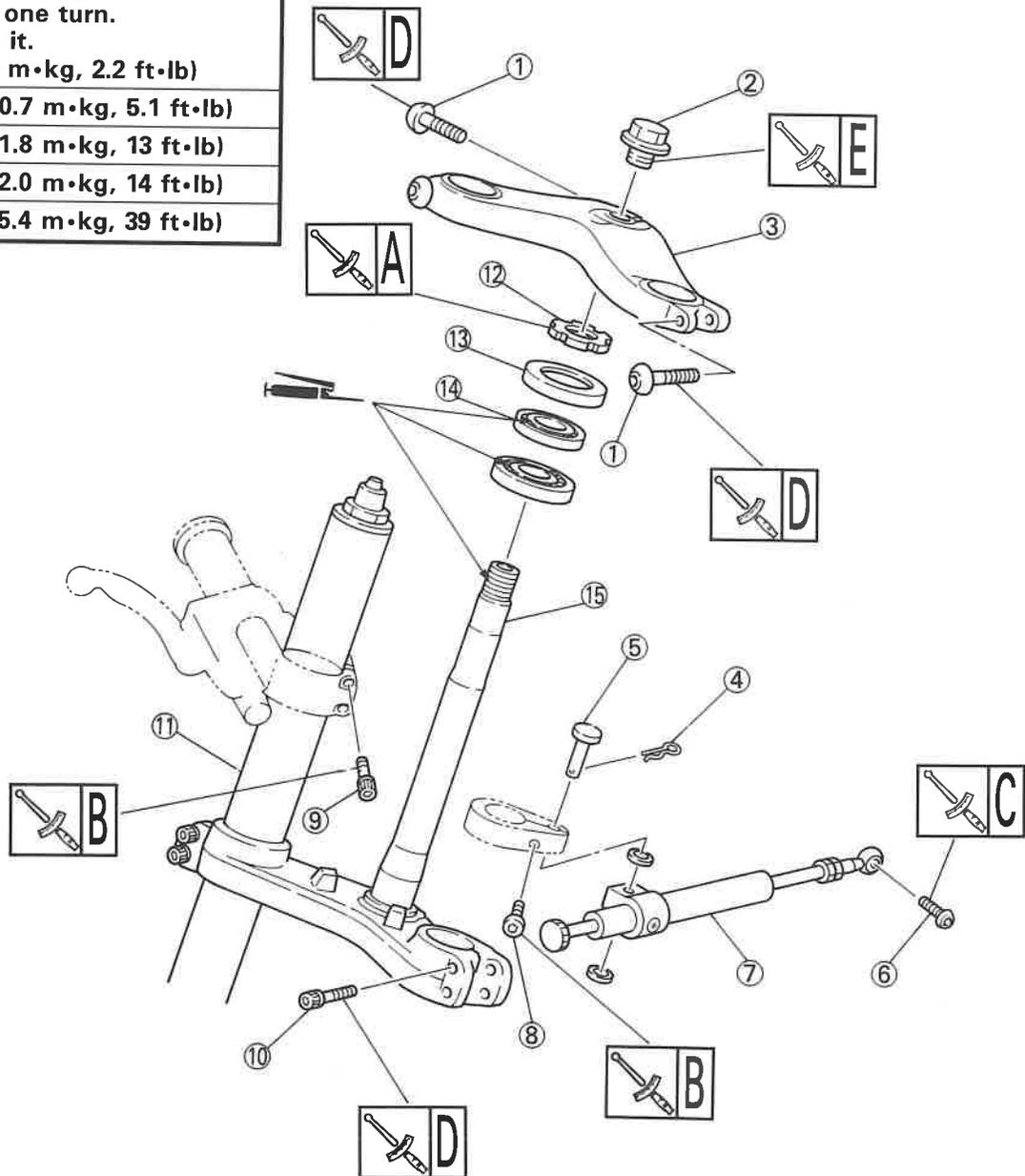
- Tighten ring nut.  
46 Nm (4.6 m•kg, 33 ft•lb)
- Loosen it one turn.
- Retighten it.  
3 Nm (0.3 m•kg, 2.2 ft•lb)

**B** 7 Nm (0.7 m•kg, 5.1 ft•lb)

**C** 18 Nm (1.8 m•kg, 13 ft•lb)

**D** 20 Nm (2.0 m•kg, 14 ft•lb)

**E** 54 Nm (5.4 m•kg, 39 ft•lb)



Extent of removal: ① Steering damper removal ② Under bracket removal

Extent of removal	Order	Part name	Q'ty	Remarks
	1	Pinch bolt (handle crown)	3	Only loosening.
	2	Steering shaft bolt	1	
	3	Handle crown	1	
	4	Clip	1	
	5	Pin	1	
	6	Bolt (steering damper)	1	Only loosening.
	7	Steering damper	1	
	8	Pinch bolt (steering damper stay)	1	
	9	Pinch bolt (handlebar)	4	Only loosening.
	10	Pinch bolt (under bracket)	4	Only loosening.
	11	Front fork	2	Refer to "FRONT FORK" section. Use special tool. Refer to "REMOVAL POINTS".
	12	Ring nut	1	
	13	Ball race cover	1	
	14	Bearing	1	



**REMOVAL POINTS**

**RING NUT**

- Remove:
  - Ring nut
 Use the Ring Nut Wrench.

	<b>Ring Nut Wrench:</b> YU-01268/90890-01268
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**⚠ WARNING**

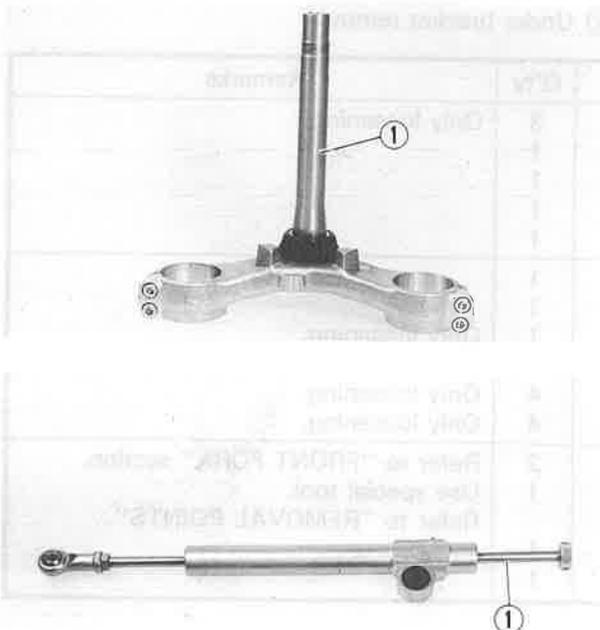
Support the steering shaft so that it may not fall down.



**INSPECTION**

**BEARING**

- Wash the bearings in solvent.
- Inspect:
  - Bearing (upper and lower) ①
 Pitting/Damage → Replace races and bearing.  
 Install the bearing in the races. Spin the bearings by hand. If the bearings hang up or are not smooth in their operation in the races, replace bearings and races.



**STEERING SHAFT**

1. Inspect:

- Steering shaft ①  
Bend/Damage → Replace.

**STEERING DAMPER**

1. Inspect:

- Steering damper ①  
Bend/Damage → Replace.

**ASSEMBLY AND INSTALLATION UNDER BRACKET**

1. Install:

- Bearing ①
- Ball race cover ②

**NOTE:** \_\_\_\_\_

Apply the lithium soap base grease on the bearing.

2. Install:

- Under bracket ①

**NOTE:** \_\_\_\_\_

Apply the lithium soap base grease on the bearing.

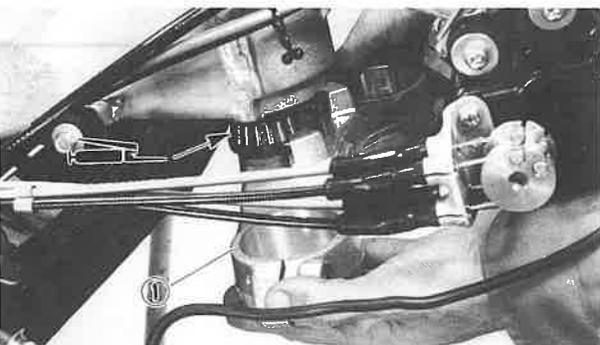
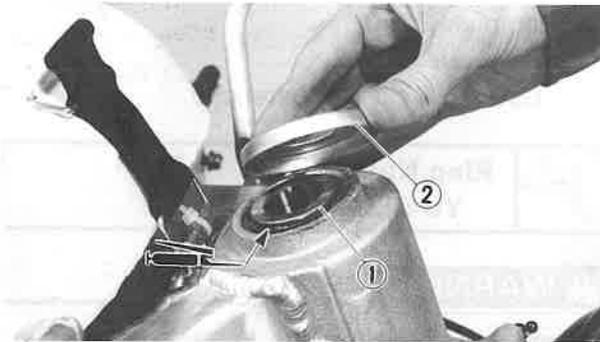
3. Install:

- Ring nut ①  
Use the Ring Nut Wrench ②.

**NOTE:** \_\_\_\_\_

Apply the lithium soap base grease on the steering shaft thread.

	<p><b>Ring Nut Wrench:</b> YU-33975/90890-01403</p>
--	---



5

**Ring nut tightening steps:**

**NOTE:** \_\_\_\_\_

Set the Torque Wrench to the Ring Nut Wrench so that they form a right angle.

- Tighten the ring nut using the Ring Nut Wrench.



**Ring Nut (Initial Tightening):**  
46 Nm (4.6 m•kg, 33 ft•lb)

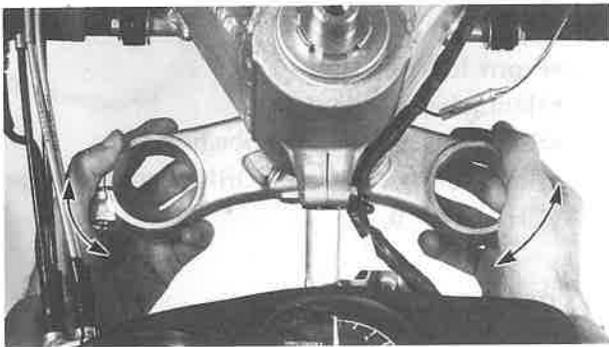
- Loosen the ring nut completely and retighten it to specification.

**⚠ WARNING** \_\_\_\_\_

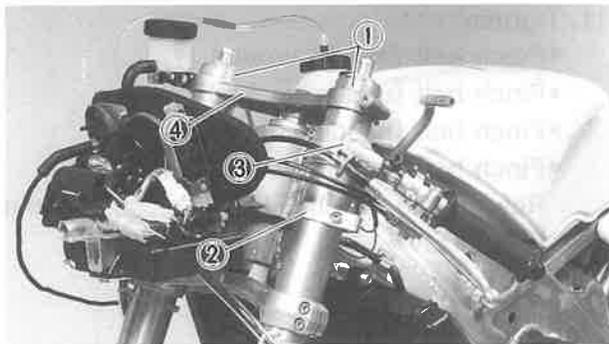
Do not over-tightening.



**Ring Nut (Final Tightening):**  
3 Nm (0.3 m•kg, 2.2 ft•lb)



4. Check the steering shaft by turning it lock to lock. If there is any binding, remove the steering shaft assembly and inspect the steering bearings.

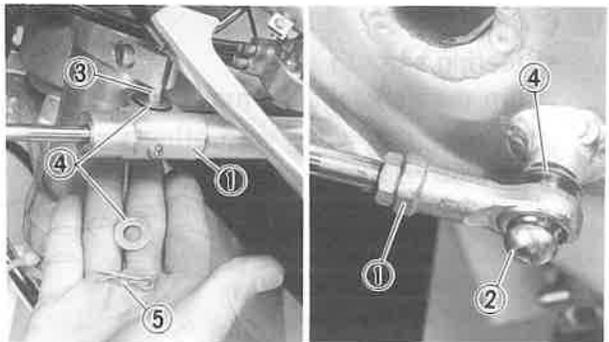


5. Install:

- Front fork (left and right) ①
- Steering damper stay ②
- Handlebar ③
- Handle crown ④

**NOTE:** \_\_\_\_\_

Temporarily tighten the pinch bolts.



6. Install:

- Steering damper ①
- Bolt (steering damper) ②
- Pin ③
- Plate washer ④
- Clip ⑤



**Bolt (Steering Damper):**  
18 Nm (1.8 m•kg, 13 ft•lb)

**5**



7. Install:
- Steering shaft bolt ①



**Steering Shaft Bolt:**  
54 Nm (5.4 m•kg, 39 ft•lb)

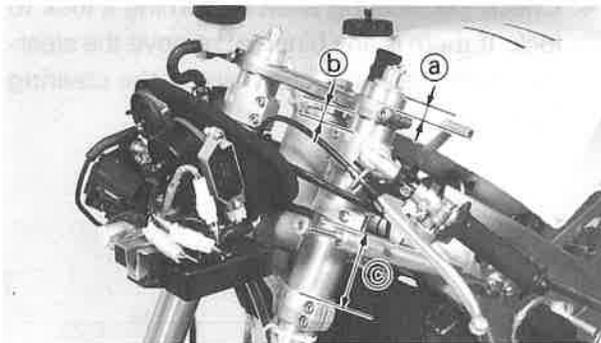


8. Check:
- Steering smooth action  
Turn the handlebar lock to lock.  
Unsmooth action→Adjust the steering ring nut.

9. Tighten:
- Pinch bolt (steering shaft) ①

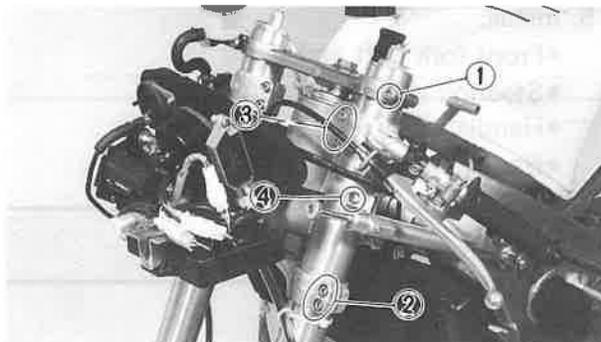


**Pinch Bolt (Steering Shaft):**  
20 Nm (2.0 m•kg, 14 ft•lb)

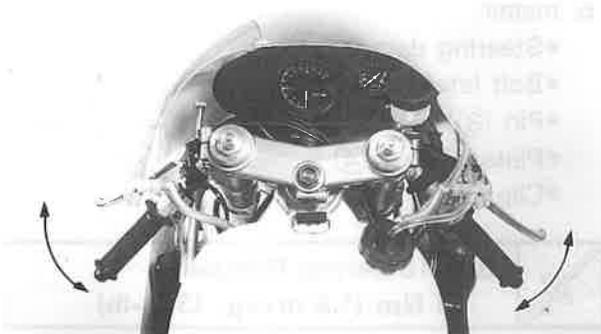


10. Adjust:
- Front fork top end ①
  - Handlebar position ②
  - Steering damper stay position ③  
Refer to the "FRONT FORK" section in the CHAPTER 5.

5



11. Tighten:
- Pinch bolt (handle crown) ①
  - Pinch bolt (under bracket) ②
  - Pinch bolt (handlebar) ③
  - Pinch bolt (steering damper stay) ④  
Refer to the "FRONT FORK" section in the CHAPTER 5.



12. Check:
- Steering smooth action  
Turn the handlebar to make sure no parts are being contacted with others.  
Contact→Repair.

---

MEMO

**SWINGARM**

**PREPARATION FOR REMOVAL**

\* Hold the machine by placing the suitable stand.

**⚠ WARNING**

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

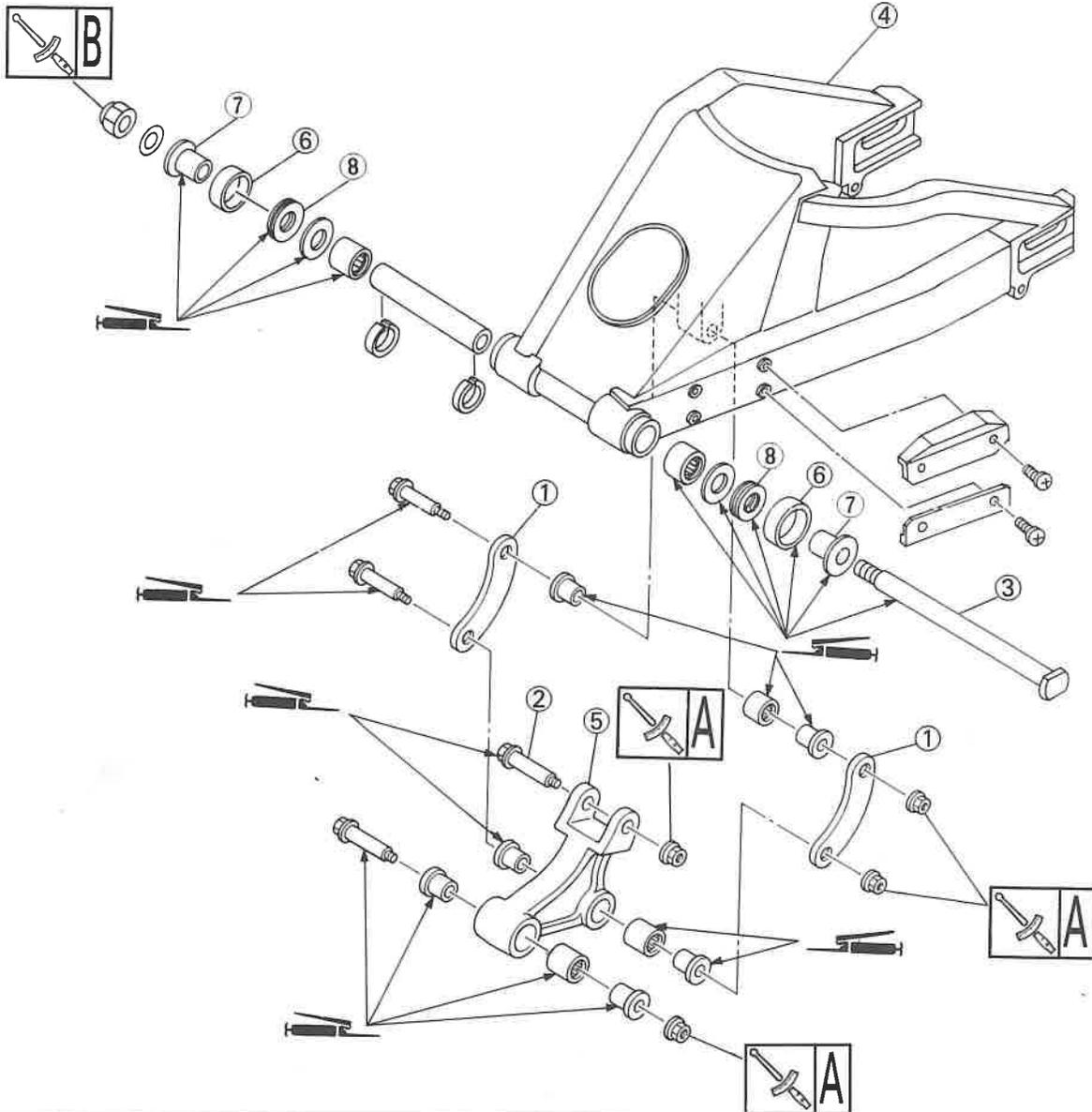
\* Remove the following parts:

- Lower cowl
- Exhaust pipe
- Rear wheel
- Rear brake caliper
- Brake hose holder

\* Disconnect the drive chain.

**SWINGARM FREE PLAY LIMIT**  
**END: 1.0 mm (0.04 in)**  
**SIDE CLEARANCE:**  
 0.1~0.3 mm (0.004~0.012 in)

<b>A</b>	<b>35 Nm (3.5 m·kg, 25 ft·lb)</b>
<b>B</b>	<b>115 Nm (11.5 m·kg, 85 ft·lb)</b>

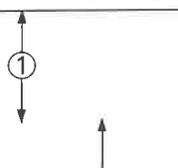
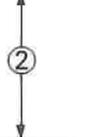


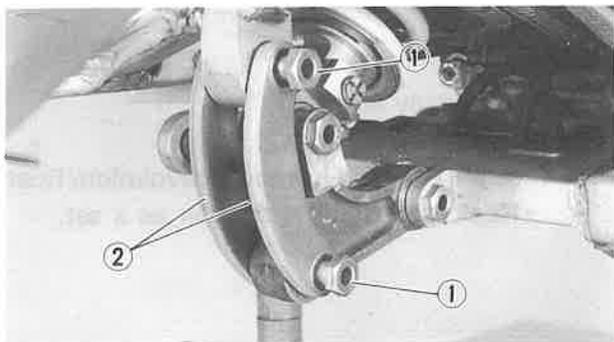
**5**

**NOTE ON REMOVAL AND REASSEMBLY**

- For reassembly, the removed parts should be cleaned with the solvent, and apply the grease on the sliding surface.

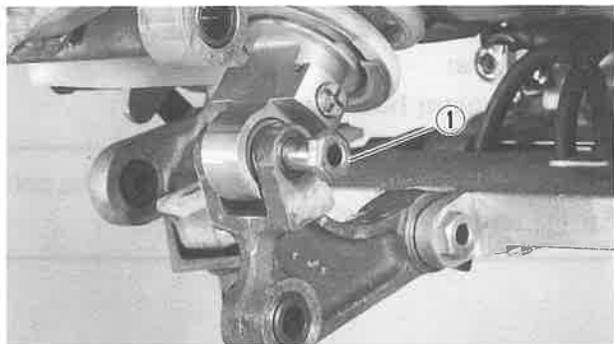
Extent of removal: ① Swingarm removal ② Swingarm disassembly

Extent of removal	Order	Part name	Q'ty	Remarks
	1	Connecting rod	2	Refer to "REMOVAL POINTS".
	2	Bolt (rear shock absorber)	1	
	3	Pivot shaft	1	
	4	Swingarm	1	
	5	Relay arm	1	
	6	Cover	2	
	7	Solid bush	2	
	8	Bearing	2	



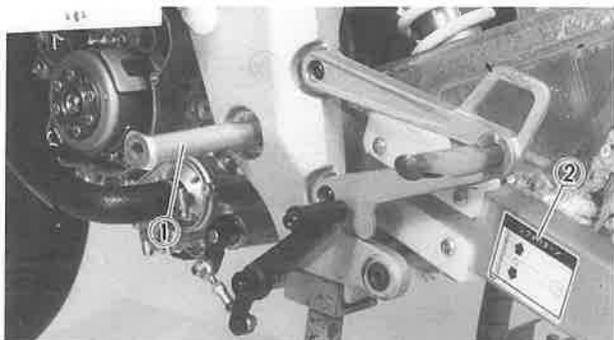
**REMOVAL POINTS  
SWINGARM**

1. Remove:
  - Bolt (connecting rod) ①
  - Connecting rod ②

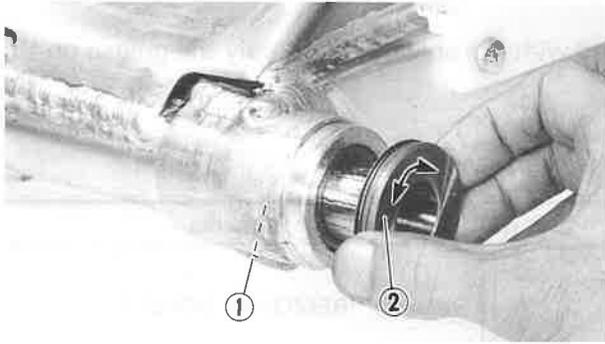


2. Remove:
  - Bolt (rear shock absorber—relay arm) ①

**5**



3. Remove:
  - Pivot shaft ①
  - Swingarm ②



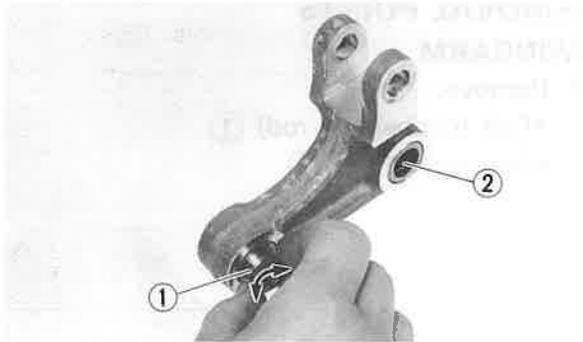
**INSPECTION**

Wash the bearings, bushes, collars, and thrust covers in a solvent.

**SWINGARM**

1. Inspect:

- Bearing (swingarm) ①
  - Solid bush (swingarm) ②
- Free play exists/Unsmooth revolution/Rust  
→ Replace bearing and solid bush as a set.

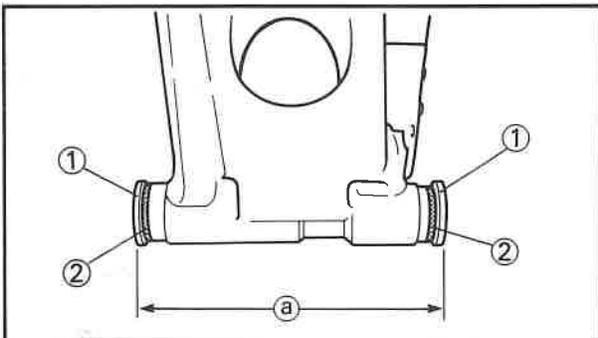


**RELAY ARM**

1. Inspect:

- Collar (relay arm) ①
  - Bearing (relay arm) ②
- Free play exists/Unsmooth revolution/Rust  
→ Replace bearing and collar as a set.

**5**



**SWINGARM SIDE CLEARANCE**

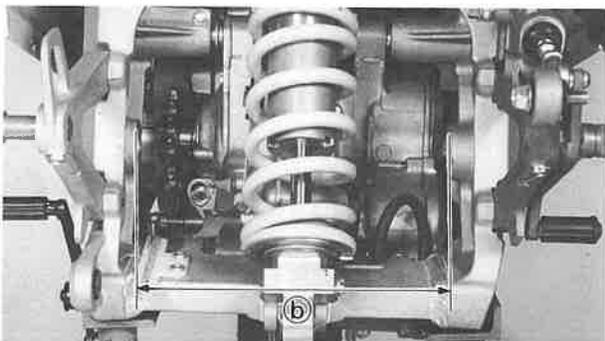
1. Measure:

- Swingarm head pipe width (a)

**NOTE:** \_\_\_\_\_

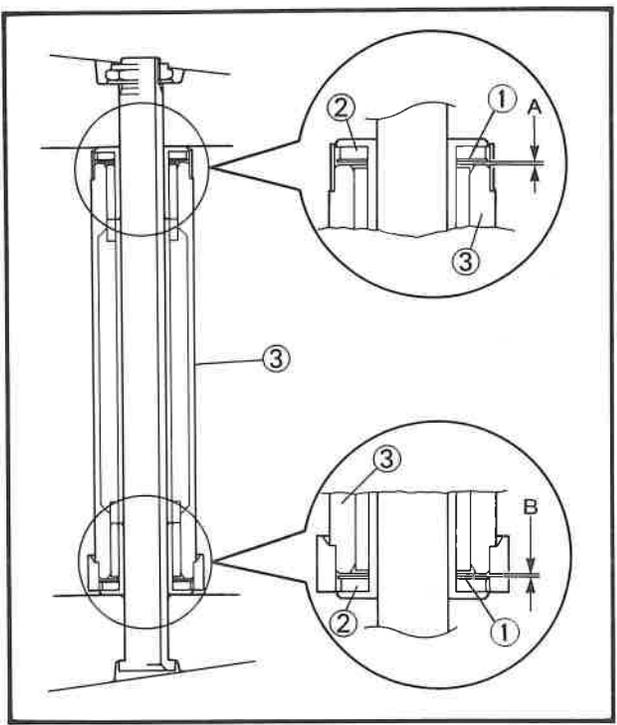
Measure the width of the head pipe with the collar ① and bearing ② installed.

\_\_\_\_\_



2. Measure:

- Pivot width (frame) (b)



3. Calculate:
- Swingarm side clearance "A+B"
  - Out of specification → Adjust side clearance using shim.
  - By using formula given below.

$$"A+B" = b - a$$

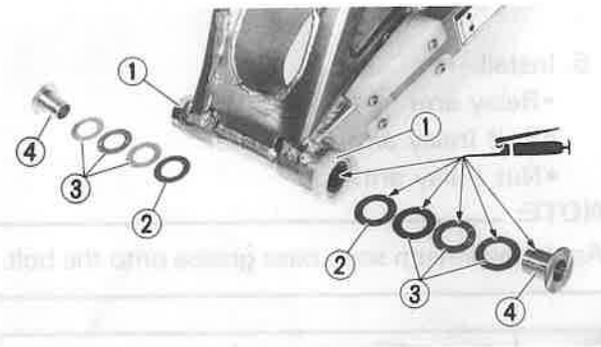
 Side Clearance "A+B":  
0.1 ~ 0.3 mm (0.004 ~ 0.012 in) \*

If the thrust clearance is out of specification, adjust it to specification by installing the adjuster shim ① at position, A and B.

**NOTE:** \_\_\_\_\_

- The adjust shim is available only in the 0.2 mm (0.008 in)-thick type.
- When only one shim is required, install it on the left side, and when two shims are necessary, install them on both right and left sides.

- Adjust shim ①
- Bearing ②
- Swingarm head pipe ③



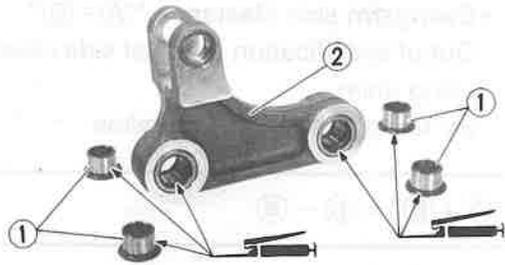
**ASSEMBLY AND INSTALLATION SWINGARM**

1. Install:
- Cover ①
  - Shim ② (if necessary)
  - Bearing ③
  - Solid bush ④\*

**NOTE:** \_\_\_\_\_

Apply the lithium soap base grease onto the solid bush, bearing and shim.

\* no bushings,  
use feeler gauge to set adjuster to range, then tighten nut for pivot shaft

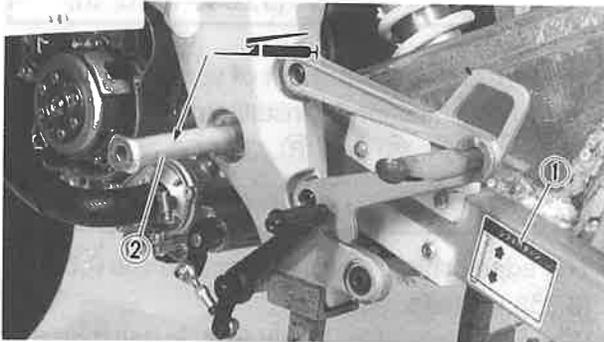


2. Install:

- Collar ①
- To relay arm ②.

**NOTE:** \_\_\_\_\_

Apply the lithium soap base grease onto the bearing and collar.



3. Install:

- Swingarm ①
- Pivot shaft ②
- Plate washer
- Nut (pivot shaft)

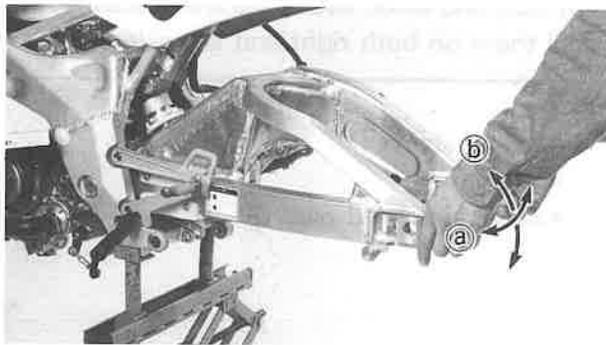
**NOTE:** \_\_\_\_\_

- Apply the lithium soap base grease on the pivot shaft.

- Insert the pivot shaft from left side.



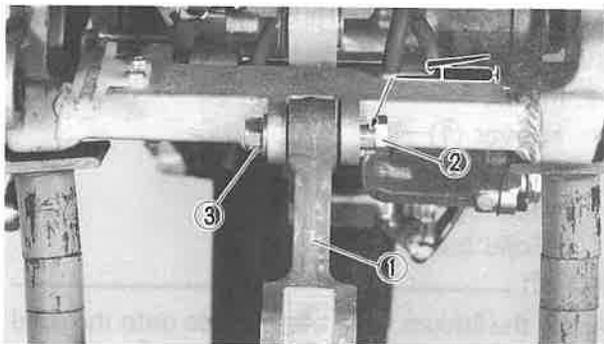
**Nut (Pivot Shaft):**  
115 Nm (11.5 m•kg, 85 ft•lb)



4. Check:

- Swingarm side play ①  
Free play exists → Check side clearance.
- Swingarm up and down movement ②  
Unsmooth movement/Binding/Rough spots  
→ Grease or replace bearings, solid bushes and collars.

**5**



5. Install:

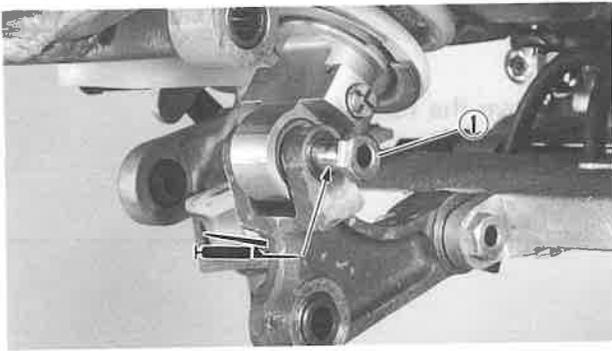
- Relay arm ①
- Bolt (relay arm) ②
- Nut (relay arm) ③

**NOTE:** \_\_\_\_\_

Apply the lithium soap base grease onto the bolt.



**Nut (Relay Arm):**  
35 Nm (3.5 m•kg, 25 ft•lb)



6. Install:

- Bolt (rear shock absorber—relay arm) ①
- Nut (rear shock absorber—relay arm)

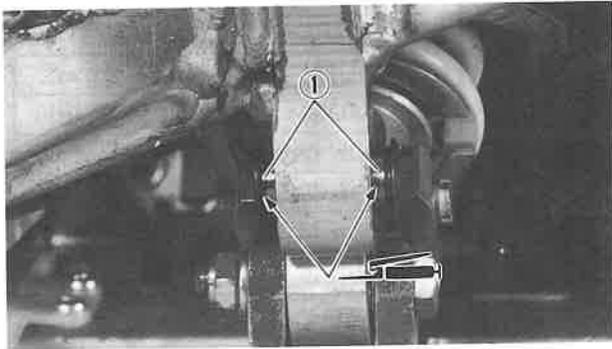
NOTE:

Apply the lithium soap base grease on the bolt.



**Nut (Rear Shock Absorber—  
Relay Arm):**

**35 Nm (3.5 m•kg, 25 ft•lb)**

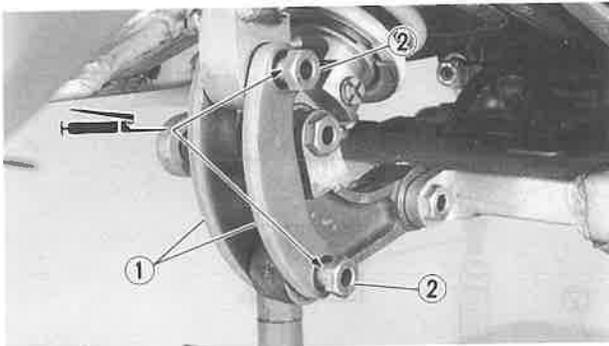


7. Install:

- Collar (swingarm) ①

NOTE:

Apply the lithium soap base grease on the bearing and collar.



8. Install:

- Connecting rod ①
- Bolt (connecting rod) ②
- Nut (connecting rod)

NOTE:

Apply the lithium soap base grease on the bolt.



**Nut (Connecting Rod):**

**35 Nm (3.5 m•kg, 25 ft•lb)**



## REAR SHOCK ABSORBER PREPARATION FOR REMOVAL

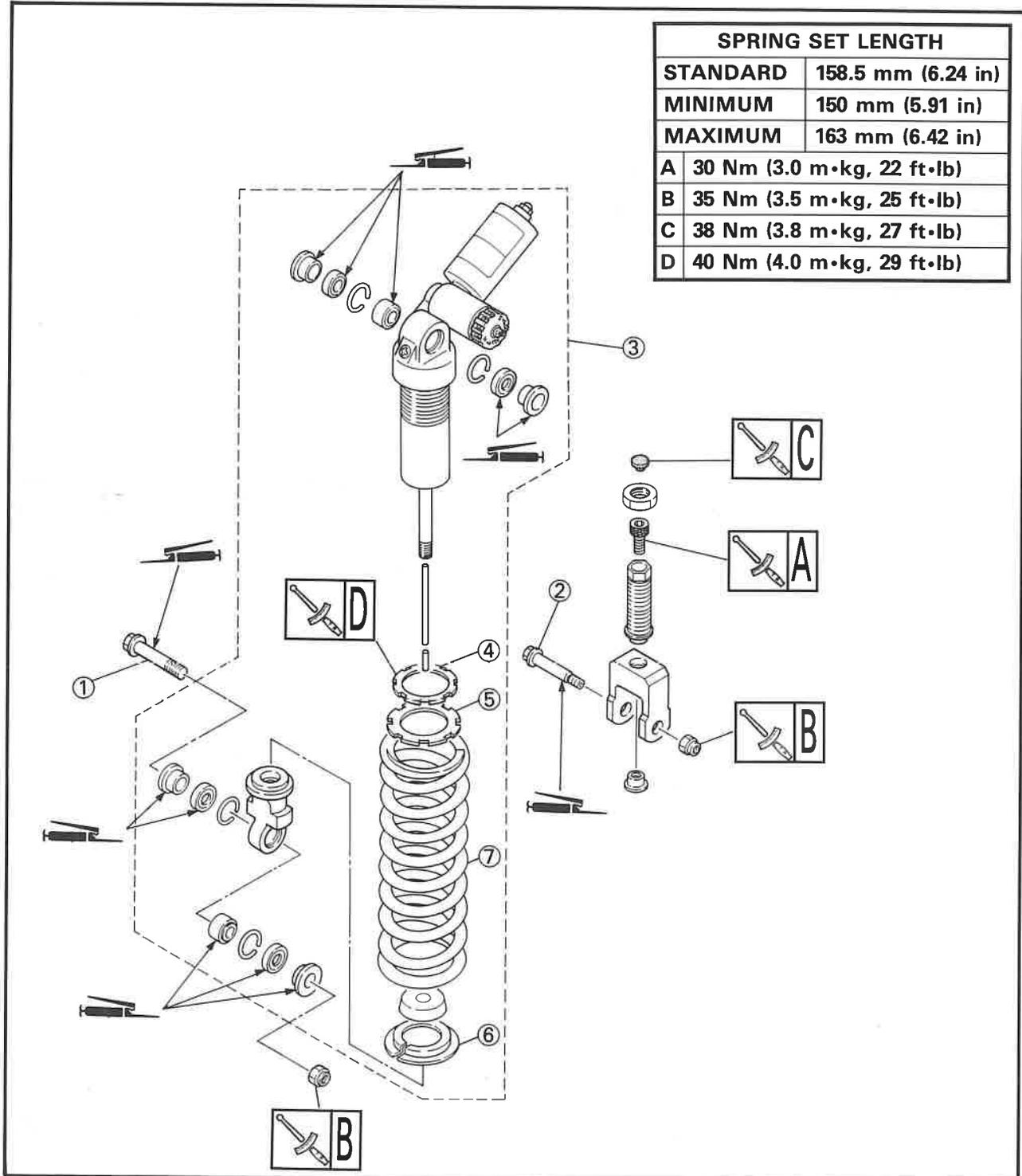
\* Hold the machine by placing the suitable stand.

### ⚠ WARNING

Securely support the machine so there is no danger of it falling over.

\* Remove the following parts:

- Lower cowl
- Exhaust pipe
- Fuel tank



5

Extent of removal:    ① Rear shock absorber removal    ② Spring (rear shock absorber) removal

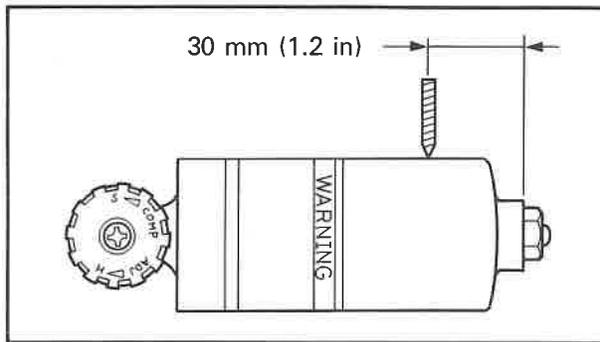
Extent of removal	Order	Part name	Q'ty	Remarks
	1	Bolt (rear shock absorber— relay arm)	1	} Refer to "REMOVAL POINTS".
	2	Bolt (rear shock absorber— frame)	1	
	3	Rear shock absorber	1	} Refer to "REMOVAL POINTS".
	4	Locknut	1	
	5	Adjuster	1	
	6	Spring guide	1	
	7	Spring (rear shock absorber)	1	

### ⚠ WARNING

This shock absorber is provided with a separate type tank filled with high-pressure nitrogen gas. To prevent the danger of explosion, read and understand the following information before handling the shock absorber.

The manufacturer can not be held responsible for property damage or personal injury that may result from improper handling.

1. Never tamper or attempt to disassemble the cylinder or the tank.
2. Never throw the shock absorber into an open flame or other high heat. The shock absorber may explode as a result of nitrogen gas expansion and/or damage to the hose.
3. Be careful not to damage any part of the gas tank. A damaged gas tank will impair the damping performance or cause a malfunction.
4. Take care not to scratch the contact surface of the piston rod with the cylinder; or oil could leak out.
5. Never attempt to remove the plug at the bottom of the nitrogen gas tank. It is very dangerous to remove the plug.
6. When scrapping the shock absorber, follow the instructions on disposal.

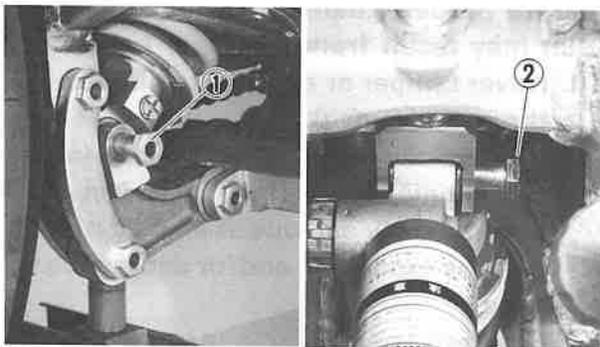


### NOTES ON DISPOSAL (YAMAHA DEALERS ONLY)

Before disposing the shock absorber, be sure to extract the nitrogen gas. To do so, drill a 2 or 3 mm (0.08 ~ 0.12 in) hole through the tank at a position 30 mm (1.2 in) from the bottom end of the tank. At this time, wear eye protection to prevent eye damage from escaping gas and/or metal chips.

### **⚠ WARNING**

To dispose of a damaged or worn-out shock absorber, take the unit to your Yamaha dealer for this disposal procedure.



### REMOVAL POINTS

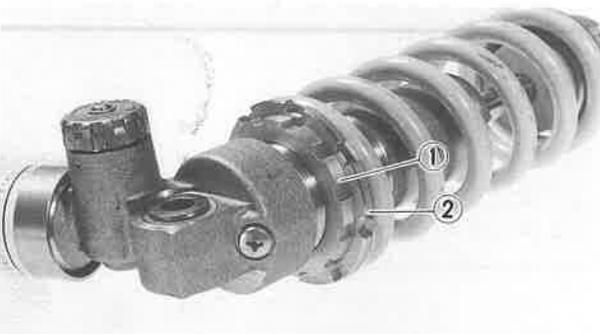
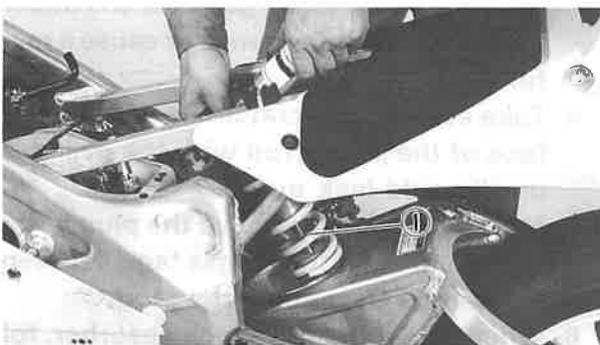
#### REAR SHOCK ABSORBER

1. Remove:

- Bolt (rear shock absorber—relay arm) ①
- Bolt (rear shock absorber—frame) ②

2. Remove:

- Rear shock absorber ①
- From upside.



#### SPRING (REAR SHOCK ABSORBER)

1. Loosen:

- Locknut ①
- Adjuster ②

**5**

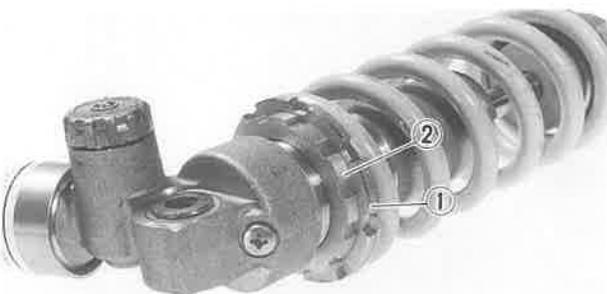
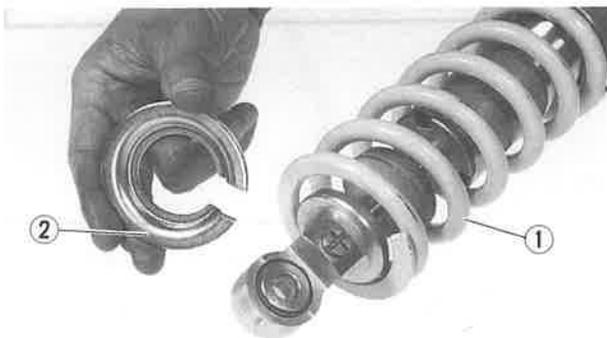


2. Remove:
  - Spring guide ①
  - Spring ②

**NOTE:** \_\_\_\_\_  
While compressing the spring, remove the spring guide.

## INSPECTION DAMPER ROD/SHOCK ABSORBER/ SPRING/SPRING GUIDE

1. Inspect:
  - Damper rod ①  
Bends/Damage → Replace absorber assembly.
  - Shock absorber ②  
Oil leaks → Replace absorber assembly.  
Gas leaks → Replace absorber assembly.
  - Spring ③  
Damage → Replace spring.  
Fatigue → Replace spring.  
Move spring up and down.
  - Spring guide ④  
Wear/Damage → Replace spring guide.



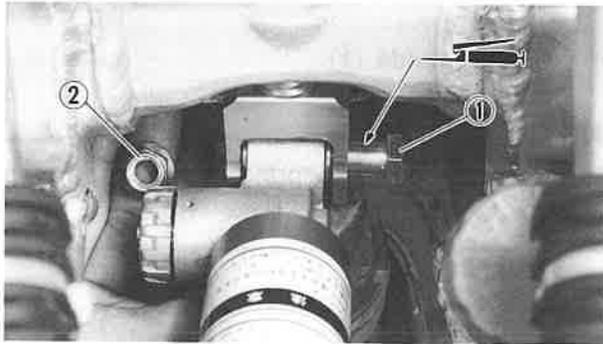
## ASSEMBLY AND INSTALLATION SPRING (REAR SHOCK ABSORBER)

1. Install:
  - Spring ①
  - Spring guide ②

**NOTE:** \_\_\_\_\_  
While compressing the spring, install the spring guide.

2. Install:
  - Adjuster ①
  - Locknut ②

**CAUTION:** \_\_\_\_\_  
Never attempt to turn the adjuster beyond the maximum or minimum setting.



## REAR SHOCK ABSORBER

1. Install:
  - Rear shock absorber
2. Install:
  - Bolt (rear shock absorber—frame) ①
  - Nut (rear shock absorber—frame) ②

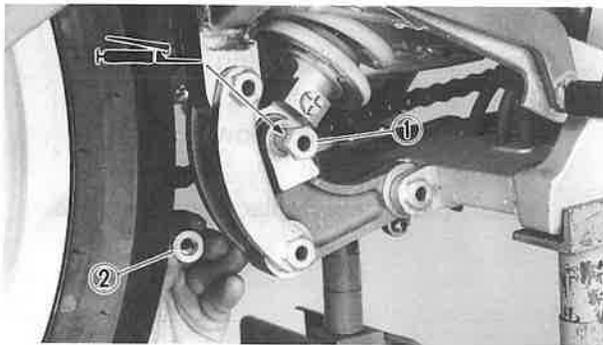
**NOTE:** \_\_\_\_\_

Apply the lithium soap base grease on the bolt.



**Nut (Rear Shock Absorber—  
Frame):**

**35 Nm (3.5 m•kg, 25 ft•lb)**



3. Install:
  - Bolt (rear shock absorber—relay arm) ①
  - Nut (rear shock absorber—relay arm) ②

**NOTE:** \_\_\_\_\_

Apply the lithium soap base grease on the bolt.



**Nut (Rear Shock Absorber—  
Relay Arm):**

**35 Nm (3.5 m•kg, 25 ft•lb)**