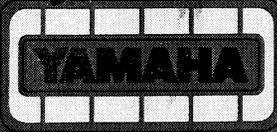
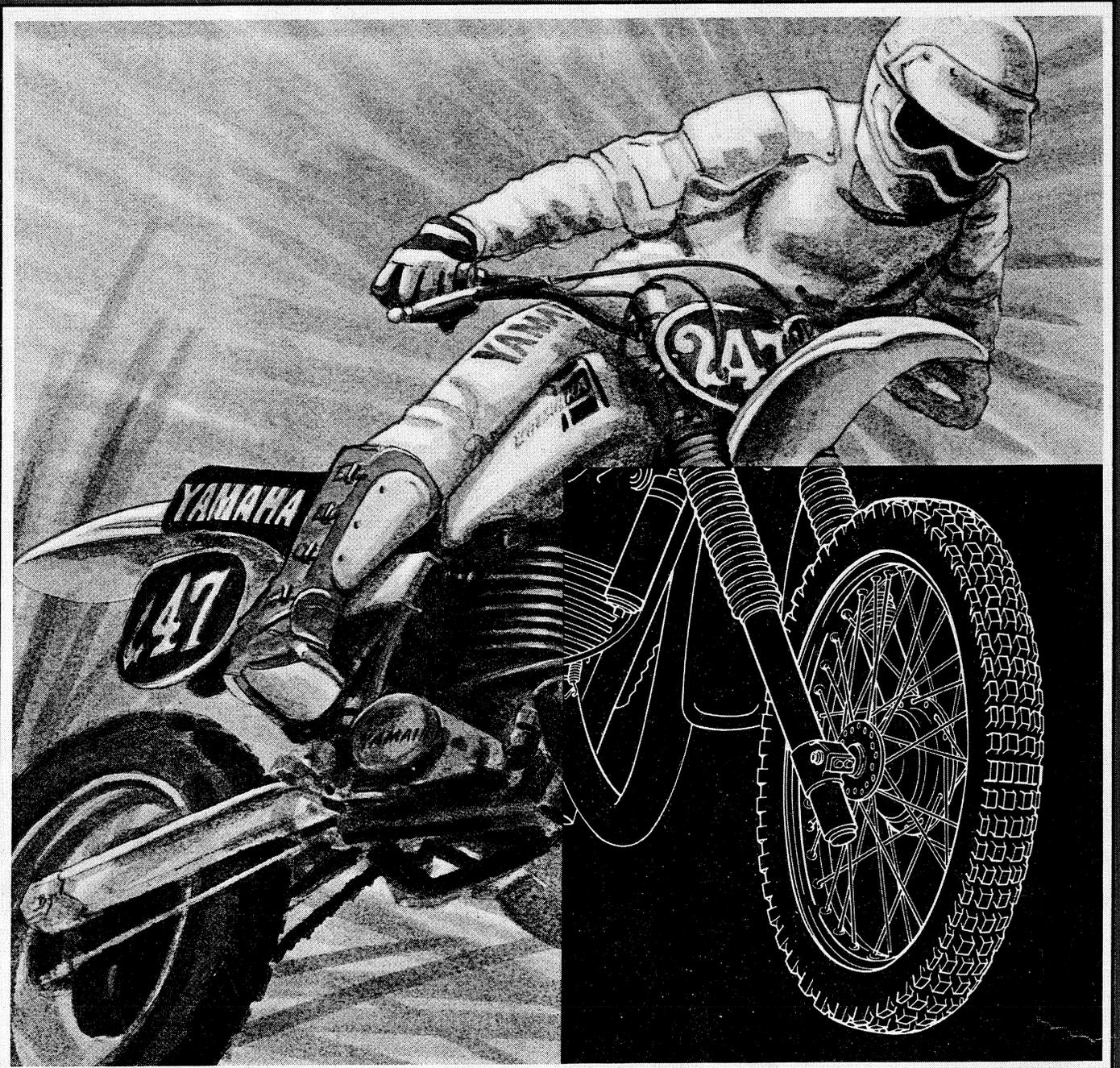


Genuine



TT 350 S

# Service Manual



- SPECIFICATIONS
- EXPLODED VIEWS
- RECOMMENDED MAINTENANCE
- TUNE-UP AND OVERHAUL PROCEDURES

LIT-11616-05-17



**YAMAHA**

**TT350S**

**Service Manual**

**TT350S**

**SERVICE MANUAL**

**© 1985 by Yamaha Motor Corporation, U.S.A.**

**1st Edition, October 1985**

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**Printed in U.S.A.**

**P/N LIT-11616-05-17**

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## NOTICE

This manual was written by the Yamaha Motor Company primarily for use by Yamaha dealers and their qualified mechanics. It is not possible to put an entire mechanic's education into one manual, so it is assumed that persons using this book to perform maintenance and repairs on Yamaha machines have a basic understanding of the mechanical concepts and procedures inherent to machine repair technology. Without such knowledge, attempted repairs or service to this model may render it unfit to use and/or unsafe.

Yamaha Motor Company, Ltd. is continually striving to improve all models manufactured by Yamaha. Modifications and significant changes in specifications or procedures will be forwarded to all Authorized Yamaha dealers and will, where applicable, appear in future editions of this manual.

**TECHNICAL PUBLICATIONS  
SERVICE DIVISION  
MOTORCYCLES OPERATIONS  
YAMAHA MOTOR CO., LTD.**

## HOW TO USE THIS MANUAL

### PARTICULARLY IMPORTANT INFORMATION

This material is distinguished by the following notation.

**NOTE:** A NOTE provides key information to make procedures easier or clearer.

**CAUTION:** A CAUTION indicates special procedures that must be followed to avoid damage to the machine.

**WARNING:** A WARNING indicates special procedures that must be followed to avoid injury to a machine operator or person inspecting or repairing the machine.

---

## **MANUAL FORMAT**

All of the procedures in this manual are organized in a sequential, step-by-step format. The information has compiled to provide the mechanic with an easy to read, handy reference that contains comprehensive explanations of all disassembly, repair, assembly, and inspection operations.

In this revised format, the condition of a faulty component will precede an arrow symbol and the course of action required will follow the symbol, e.g.,

- Bearing;

Pitting/Damage → Replace.

## **EXPLODED DIAGRAM**

Each chapter provides exploded diagrams before each disassembly section for ease in identifying correct disassembly and assembly procedures.

① GEN INFO 	② INSP ADJ 	
③ ENG 	④ COOL 	
⑤ CARB 	⑥ CHAS 	
⑦ ELEC 	⑧ APPX 	
⑨ 	⑩ 	
⑪ 	⑫ 	
⑬ 	⑭ 	
⑮ 	⑯ 	⑰ 
⑱ 	⑲ 	⑳ 
㉑ 		

## SYMBOL MARKS (Refer to the illustration)

Symbol marks ① to ⑧ are designed as thumb tabs to indicate the chapter's number and content.

- ① General information
- ② Periodic inspection and adjustment
- ③ Engine
- ④ Cooling system
- ⑤ Carburetion
- ⑥ Chassis
- ⑦ Electrical
- ⑧ Appendices

Symbol marks ⑨ to ⑭ indicate specific data as the following items:

- ⑨ Recommended liquid
- ⑩ Recommended grease
- ⑪ Tightening torque
- ⑫ Wear limit
- ⑬ Engine speed
- ⑭  $\Omega$ , V, A

Symbol marks ⑮ to ㉑ in the exploded diagram indicate grade of lubricant and location of lubrication point.

- ⑮ Apply engine oil
- ⑯ Apply gear oil
- ⑰ Apply molybdenum disulfide oil
- ⑱ Apply wheel bearing grease
- ⑲ Apply lightweight lithium-soap base grease
- ⑳ Apply molybdenum disulfide grease
- ㉑ Apply locking agent (LOCTITE<sup>®</sup>)

Being a Yamaha owner, you obviously prefer a quality product.

**gēn·ū·īne**

*adj.* 1. Real 2. Authentic,  
not artificial 3. Yamaha.

GENUINE **YAMAHA** PARTS & ACCESSORIES

Don't compromise the quality and performance of your Yamaha with off-brand alternatives. You'll be getting exactly what you're paying for.

---

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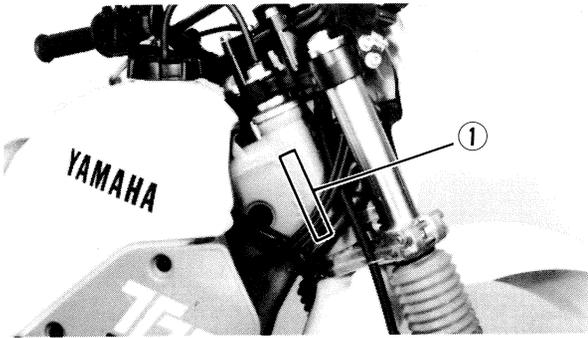
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<b>PERIODIC INSPECTIONS AND ADJUSTMENTS</b>	 <b>INSP ADJ</b> <b>2</b>
<b>ENGINE OVERHAUL</b>	 <b>ENG</b> <b>3</b>
<b>CARBURETION</b>	 <b>CARB</b> <b>4</b>
<b>CHASSIS</b>	 <b>CHAS</b> <b>5</b>
<b>ELECTRICAL</b>	 <b>ELEC</b> <b>6</b>
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## **CHAPTER 1. GENERAL INFORMATION**

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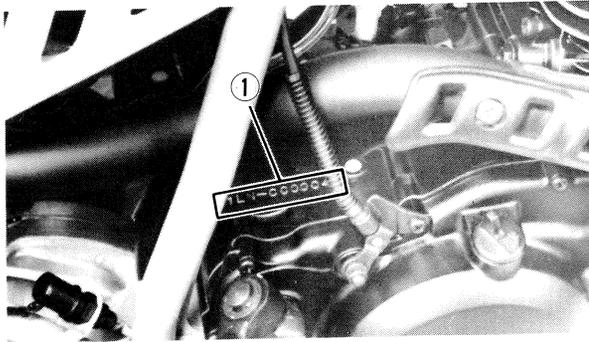
**GENERAL INFORMATION  
MACHINE IDENTIFICATION**

**VEHICLE IDENTIFICATION NUMBER**

The vehicle identification number ① is stamped into the right side of the steering head pipe.

**NOTE:** \_\_\_\_\_  
The Vehicle identification number is used to identify your machine and may be used to register your machine with the licensing authority in your state.

**Starting Serial Number:**  
**JYA1RG00\*GA00101**



**ENGINE SERIAL NUMBER**

The engine serial number ① is stamped into the left side of the engine.

**NOTE:** \_\_\_\_\_  
The first three digits of these numbers are for model identifications; the remaining digits are the unit production number.

**Stating Serial Number:**  
**1RG-000101**

**NOTE:** \_\_\_\_\_  
Designs and specifications are subject to change without notice.

**IMPORTANT INFORMATION**

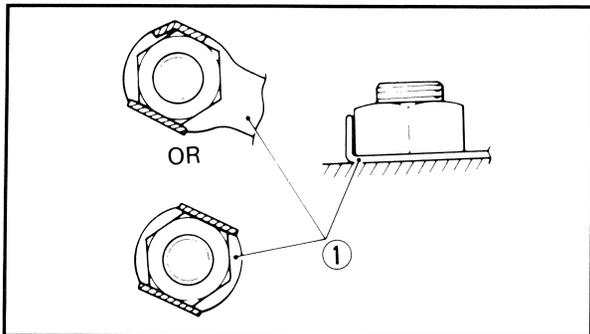
**ALL REPLACEMENT PARTS**

1. Use only genuine Yamaha parts for all replacements. Use oil and/or grease recommended by Yamaha for assembly and adjustment. Other brands may be similar in function and appearance, but inferior in quality.

**GASKETS, OIL SEALS, AND O-RINGS**

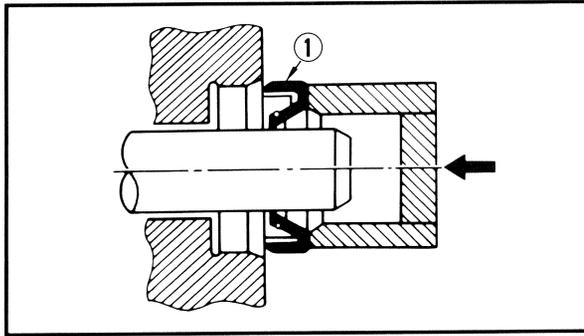
1. All gaskets, seals and O-rings should be replaced when an engine is overhauled. All gasket surfaces, oil seal lips and O-rings must be cleaned.

2. Properly oil all mating parts and bearings during reassembly. Apply grease to the oil seal lips.



**LOCK WASHERS/PLATES AND COTTER PINS**

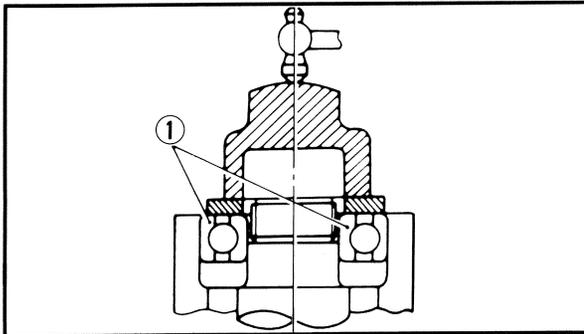
1. All lock washers/Plates ① and cotter pins must be replaced when they are removed. Lock tab(s) should be bent along the bolt or nut flat(s) after the bolt or nut has been properly tightened.



**BEARINGS AND OIL SEALS**

1. Install the bearing(s) and oil seal(s) with their manufacturer's marks or numbers facing outward. (In other words, the stamped letters must be on the side exposed to view.) When installing oil seal(s), apply a light coating of light-weight lithium base grease to the seal lip(s). Oil the bearings liberally when installing.

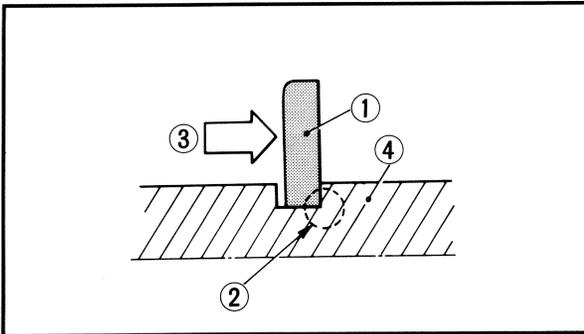
① Oil seal



**CAUTION:**

**Do not use compressed air to spin the bearings dry. This causes damage to the bearing surfaces.**

① Bearing



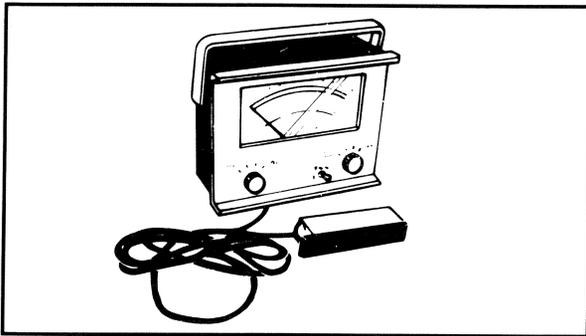
**CIRCLIPS**

1. All circlips should be inspected carefully before reassembly. Always replace piston pin clips after one use. Replace distorted circlips. When installing a circlip ①, make sure that the sharp edged corner ② is positioned opposite to the thrust ③ it receives. See the sectional view.

④ Shaft

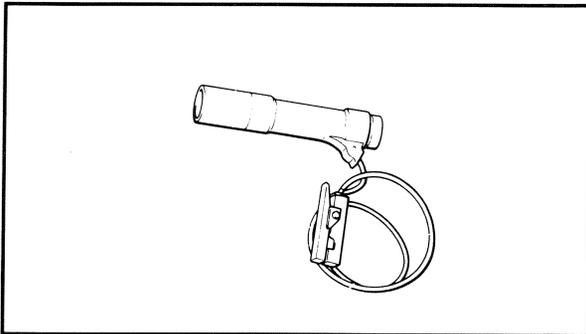
**SPECIAL TOOLS**

The proper special tools are necessary for complete and accurate tune-up and assembly. Using the correct special tool will help prevent damage caused by the use of improper tools or improvised techniques.

**FOR TUNE UP**

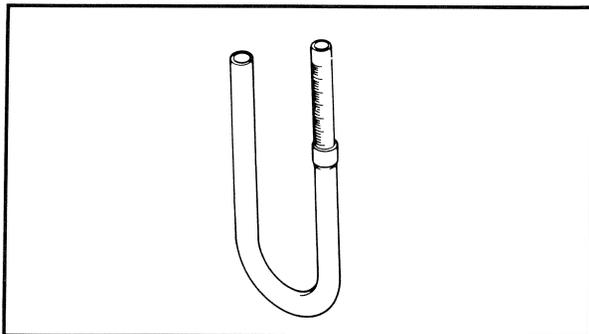
1. Inductive Tachometer  
P/N YU-08036

This tool is needed for detecting engine rpm.



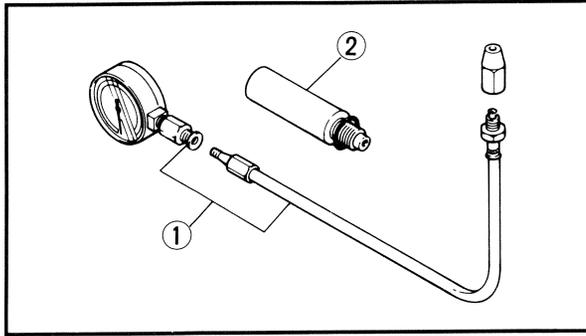
2. Inductive Timing Light  
P/N YM-33277

This tool is necessary for adjusting timing.



3. Fuel Level Gauge  
P/N YM-01312

This gauge is used to measure the fuel level in the float chamber.

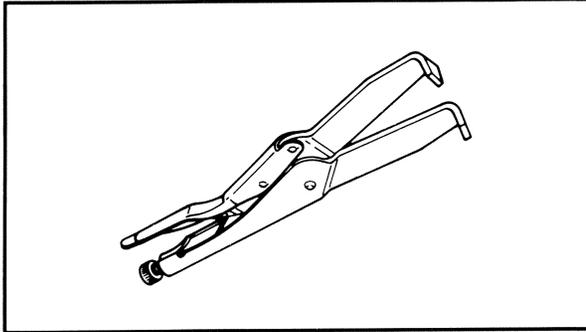


4. Compression Gauge — ①  
 P/N YU-33223  
 Attachment — ②  
 P/N YU-33223-3

This gauge is used to measure the engine compression.

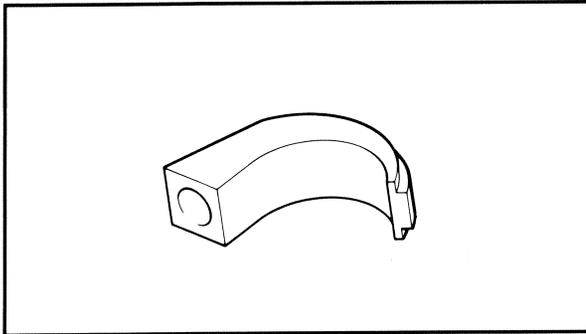
**FOR ENGINE SERVICE**

1. Universal Clutch Holder  
 P/N YU-91042



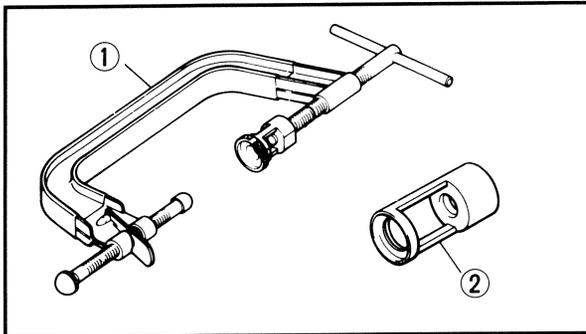
This tool is used to hold the clutch when removing or installing the clutch boss lock nut.

2. Valve Adjusting Tool  
 P/N YM-4106



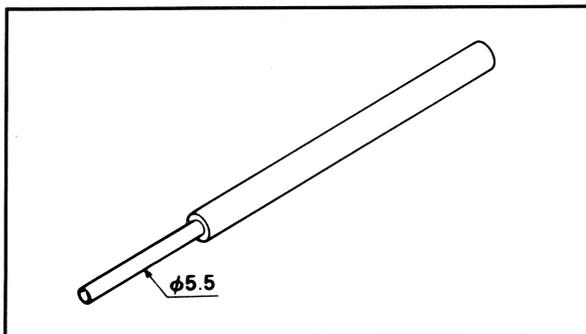
This tool is necessary to replace valve adjusting pads.

3. Valve Spring Compressor — ①  
 P/N YM-04019  
 Valve Spring Attachment — ②  
 P/N YM-4108

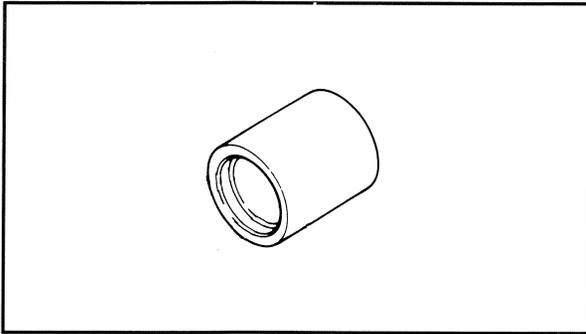


These tools are used when removing and installing the valve assembly.

4. Valve Guide Remover  
 P/N YM-01122

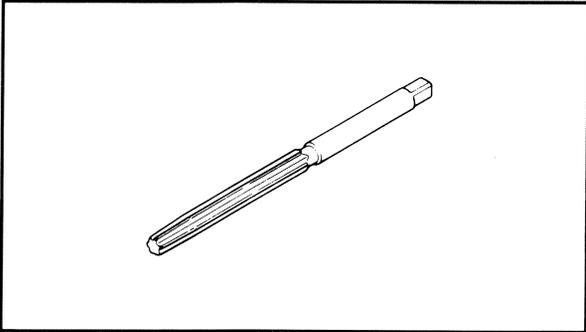


This tool must be used to remove the valve guides.



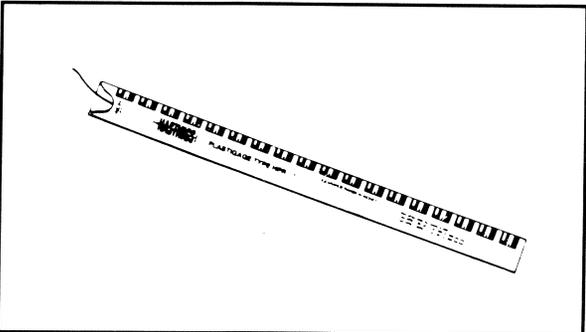
5. Valve Guide Installer  
P/N YM-4015

This tool is needed for proper installation of the valve guides.



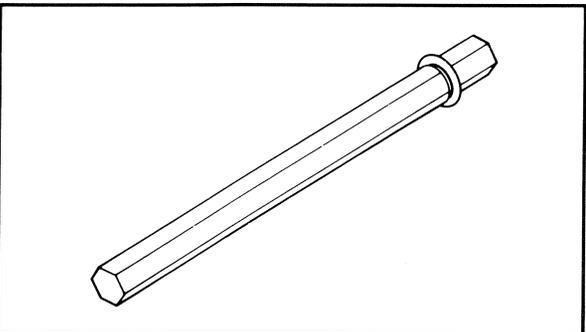
6. Valve Guide Reamer  
P/N YM-01196

This tool must be used when replacing the valve guide.



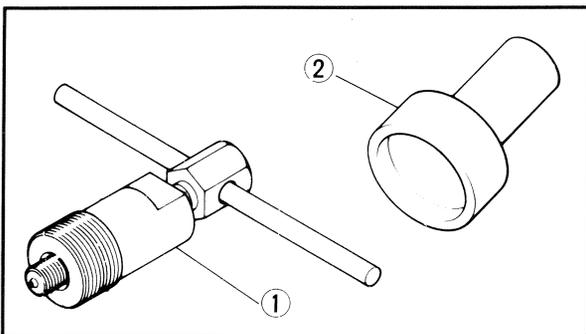
7. Plastigauge Set "Green"  
P/N YU-33210

This tool is needed when measuring clearance for camshaft cap.



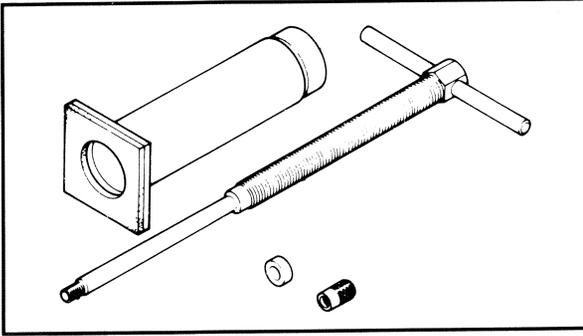
8. 8 mm (0.32 in.) Wrench Adapter  
P/N YM-28897

This tool is used to retighten the cylinder head securing bolts.



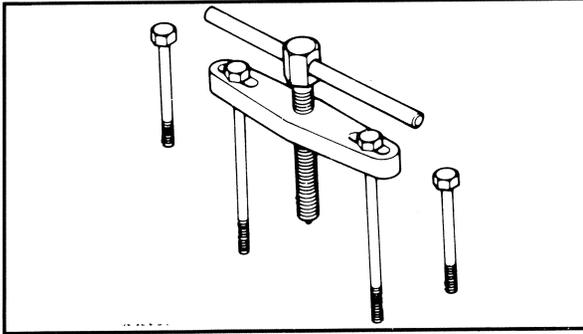
9. Flywheel Puller — ①  
P/N YM-01189  
Adapter — ②  
P/N YM-1382

These tools are used for removing the flywheel.



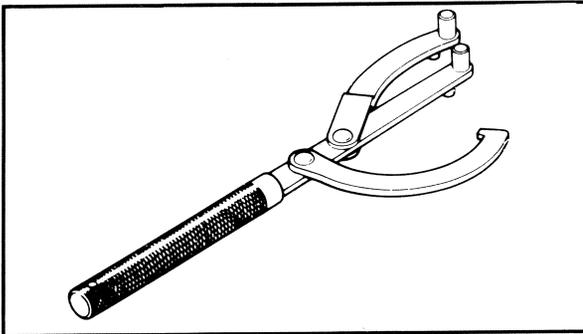
10. Piston Pin Puller  
P/N YU-01304

This tool is used to remove the piston pin.



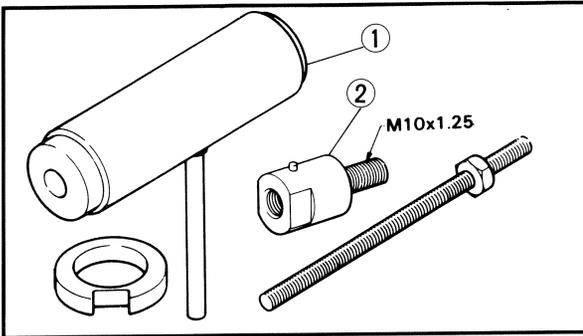
11. Crankcase-Separator  
P/N YU-01135

This tool is used for removing the crankshaft from the crankcase.



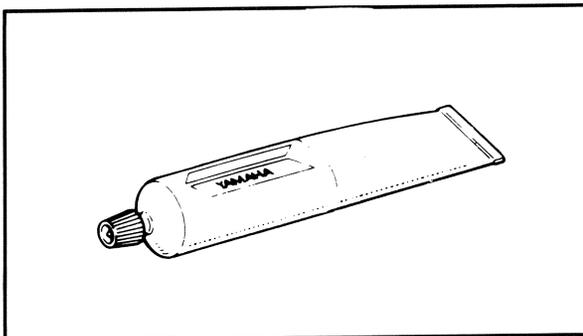
12. Rotor Holder  
P/N YU-01235

This tool is used when loosening or tightening the flywheel magneto securing bolt.



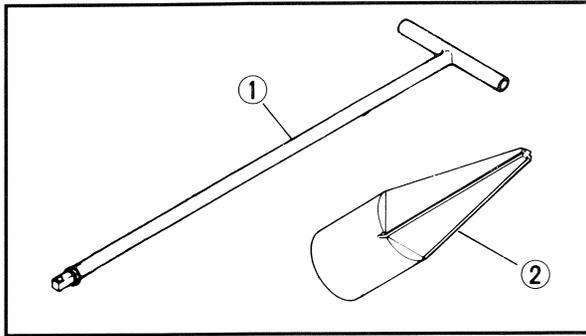
13. Crankshaft Installing Set — ①  
P/N YU-90050  
Adapter \_\_\_\_\_ ②  
P/N YM-1383

These tools are used when installing the crankshaft.



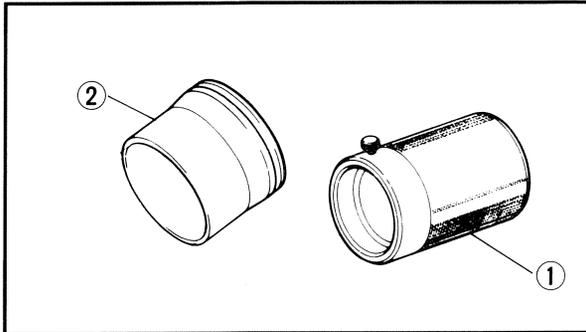
14. Quick Gasket®  
ACC-11001-05-01

This sealant (bond) is used for crankcase mating surfaces, etc.

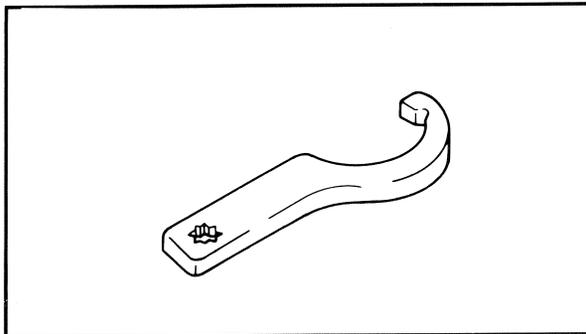
**FOR CHASSIS SERVICE**

1. T-Handle  
P/N YM-01326 — ①  
Damper Rod Holder  
P/N YM-01300-1 — ②

This tool is used to loosen and tighten the front fork cylinder holding bolt.

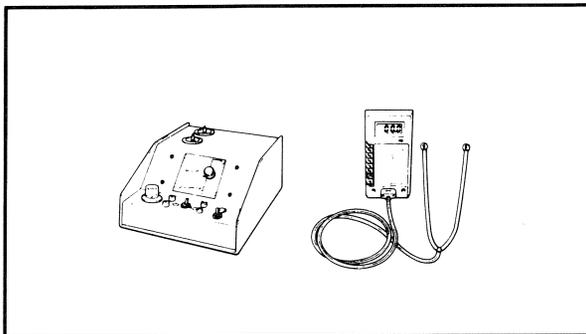


2. Front Fork Seal Driver Weight  
P/N YM-33963 — ①  
Adapter  
P/N YM-33968 — ②



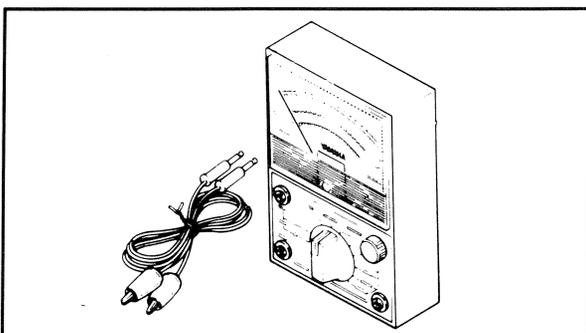
3. Ring Nut Wrench  
P/N YU-33975

This tool is used to loosen and tighten the steering ring nut.

**FOR ELECTRICAL COMPONENTS**

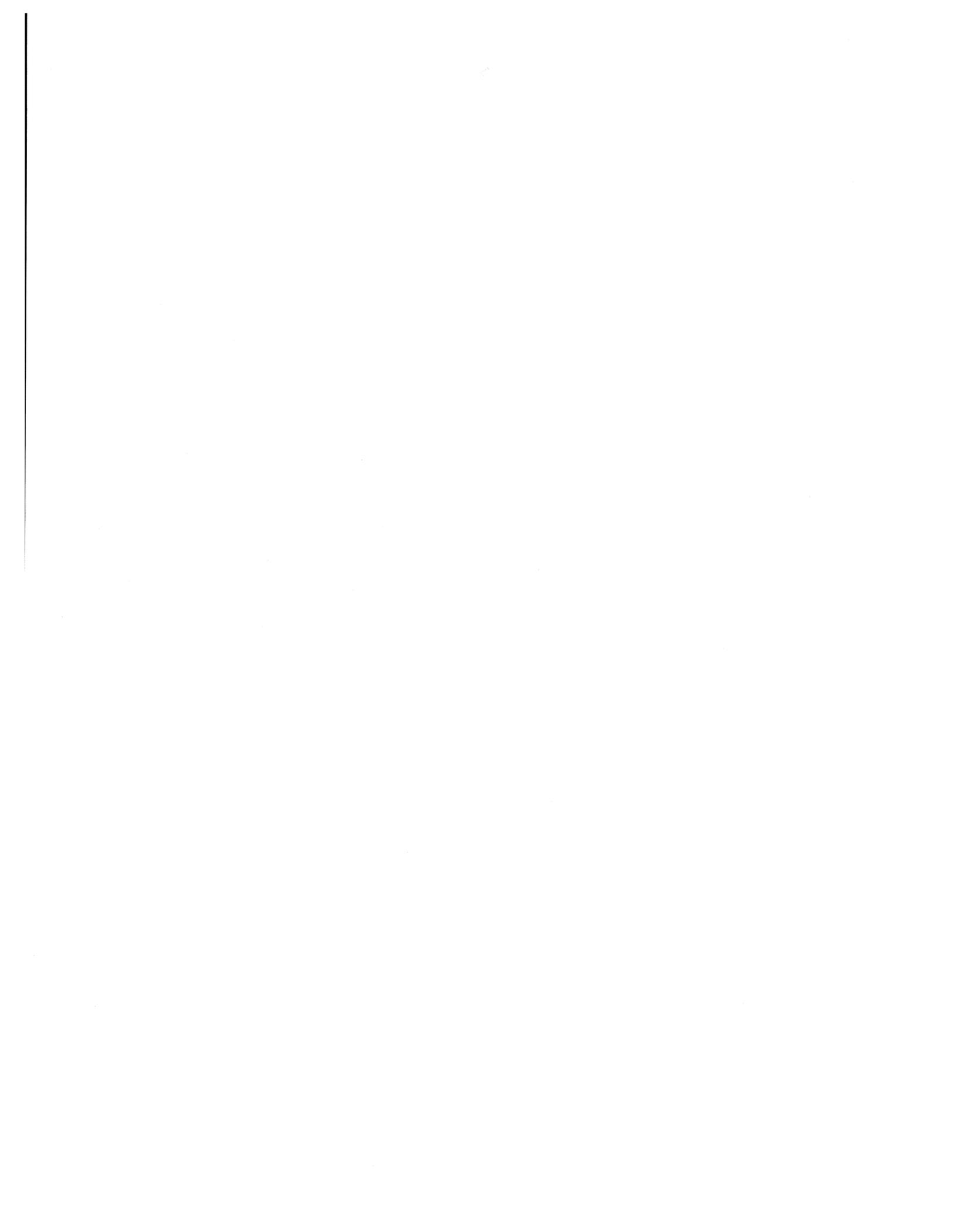
1. Electro Tester  
P/N YU-33260

This instrument is necessary for checking the ignition system components.



2. Pocket Tester  
P/N YU-03112

This instrument is invaluable for checking the electrical system.



## CHAPTER 2. PERIODIC INSPECTIONS AND ADJUSTEMENTS

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**PERIODIC INSPECTIONS AND ADJUSTMENTS**

**INTRODUCTION**

This chapter includes all information necessary to perform recommended inspections and adjustments. These preventive maintenance procedures, if followed, will ensure more reliable vehicle operation and a longer service life. The need for costly overhaul work will be greatly reduced. This information applies to vehicles already in service as well as new vehicles that are being prepared for sale. All service technicians should be familiar with this entire chapter.

**PERIODIC MAINTENANCE/LUBRICATION**

Unit: km (mi)

ITEM	REMARKS	BREAK-IN 1,000 (600)	EVERY	
			6,000 (4,000) or 6 Months	12,000 (8,000) or 12 Months
Valve(s)*	Check valve clearance. Adjust if necessary.	○	○	○
Spark plug(s)	Check condition. Clean or replace if necessary.	○	○	○
Air filter	Clean. Replace if necessary.		○	○
Carburetor*	Check idle speed/starter operation. Adjust if necessary.	○	○	○
Fuel line*	Check fuel hose (and vacuum pipe) for cracks or damage. Replace if necessary.		○	○
Engine oil	Replace (Warm engine before draining).	○	○	○
Engine oil filter	Replace.	○		○
Front brake*	Check operation/fluid leakage/See NOTE/ Correct if necessary.		○	○
Rear brake*	Check operation. Adjust if necessary.		○	○
Clutch	Check operation. Adjust if necessary.		○	○
Decompression system*	Check operation. Adjust if necessary.		○	○
Rear arm pivot*	Check rear arm assembly for looseness. Correct if necessary. Moderately repack every 24,000 (16,000) or 24 months.***			○
Rear suspension link pivots*	Check operation. Apply grease lightly every 24,000 (16,000) or 24 months.***			○
Wheels*	Check balance/damage/runout/spoke tightness. Repair if necessary.		○	○
Wheel bearings*	Check bearings assembly for looseness/damage. Replace if damaged.		○	○
Steering bearing*	Check bearings assembly for looseness. Correct if necessary. Moderately repack every 24,000 (16,000) or 24 months.**	○		○
Front forks*	Check operation/oil leakage. Repair if necessary.		○	○
Rear shock absorber*	Check operation/oil leakage. Repair if necessary.		○	○

**PERIODIC MAINTENANCE/LUBRICATION**



ITEM	REMARKS	BREAK-IN 1,000 (600)	EVERY	
			6,000 (4,000) or 6 Months	12,000 (8,000) or 12 Months
Drive chain	Check chain slack/alignment. Adjust if necessary. Clean and lube.	EVERY 500 (300)		
Fittings/ Fasteners*	Check all chassis fittings and fasteners. Correct if necessary.	○	○	○
Sidestand*	Check operation. Repair if necessary.	○	○	○
Battery	Check specific gravity. Check breather pipe for proper operation. Correct if necessary.		○	○

\*: It is recommended that these items be serviced by a Yamaha dealer.

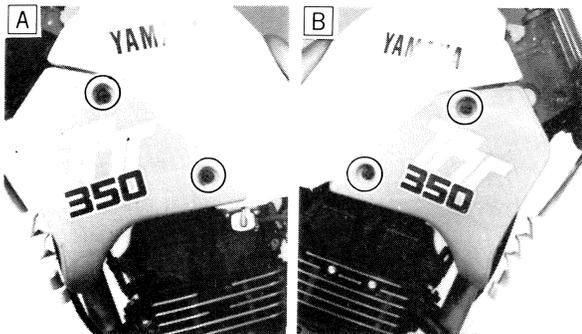
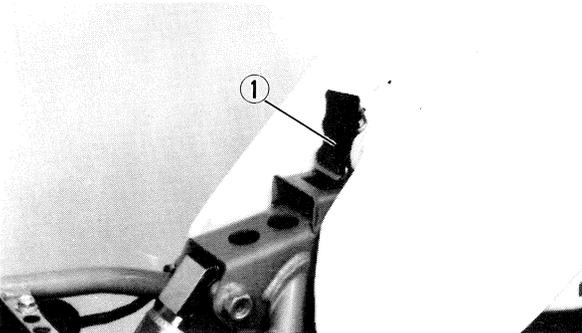
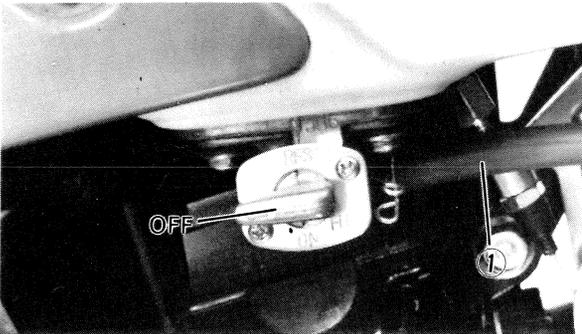
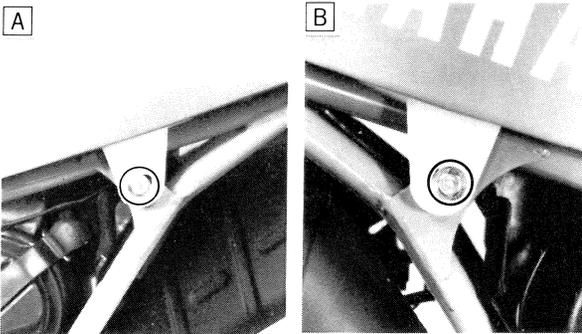
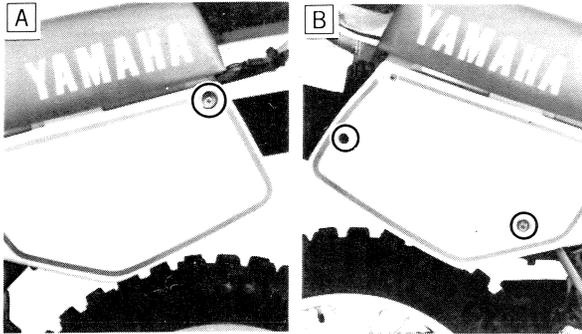
\*\* : Medium weight wheel bearing grease.

\*\*\*: Lithium soap base grease.

**NOTE:**

**Brake fluid replacement:**

1. When disassembling the master cylinder or caliper cylinder, replace the brake fluid. Normally check the brake fluid level and add the fluid as required.
2. On the inner parts of the master cylinder and caliper cylinder, replace the oil seals every two years.
3. Replace the brake hoses four years, or if cracked or damaged.



**ENGINE**

**VALVE CLEARANCE ADJUSTMENT**

**Removal**

1. Remove:
  - Side covers

- A** Left side
- B** Right side

2. Remove:
  - Seat

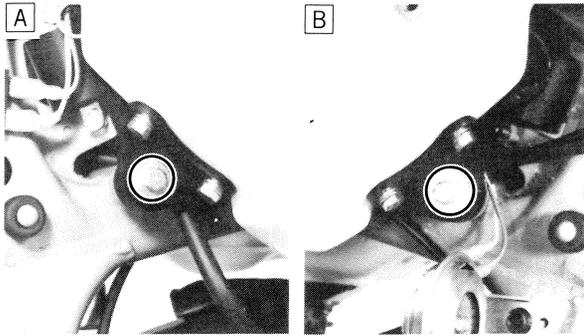
- A** Left side
- B** Right side

3. Turn the fuel cock to "OFF" and disconnect the fuel pipe ① .

4. Unhook the holder ① .

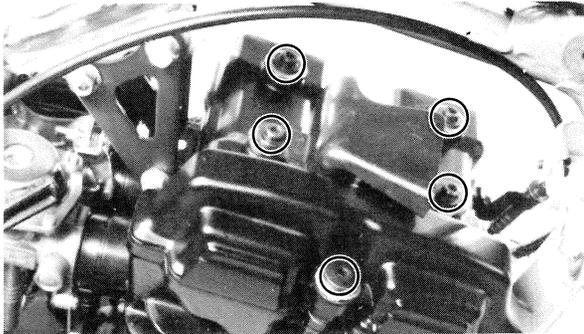
5. Remove:
  - Air scoops

- A** Left side
- B** Right side

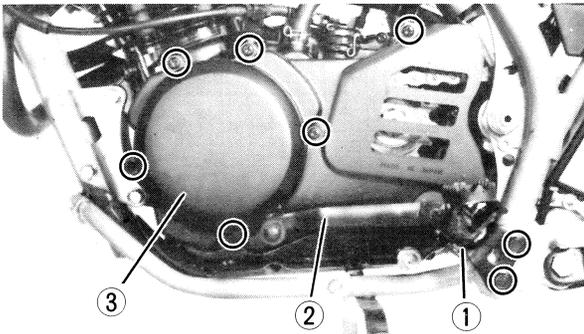


6. Remove:
- Fuel tank

- A** Left side  
**B** Right side



7. Remove:
- Spark plug cap
8. Remove:
- Spark plug
  - Cylinder head cover



9. Remove:
- Footrest (Left) ①
  - Change pedal ②
  - Crankcase cover (Left) ③

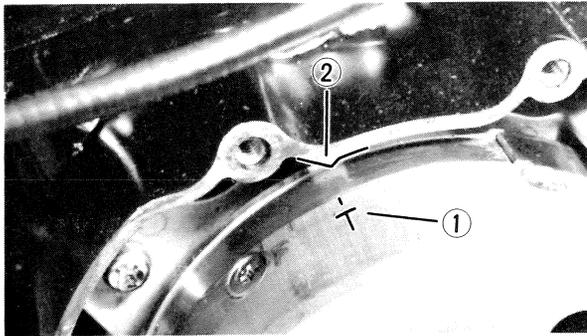
## Inspection and Adjustment

1. Measure:
- Valve clearance

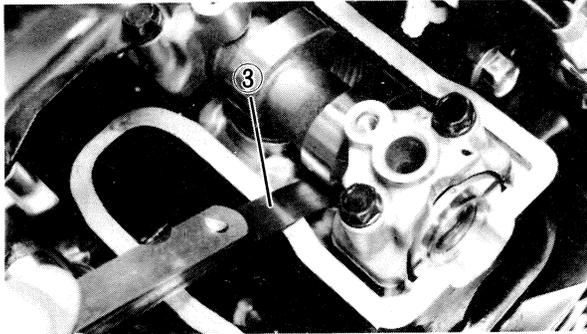
**NOTE:** \_\_\_\_\_  
Be sure piston is at Top Dead Center (TDC) on compression stroke when measuring clearance.  
\_\_\_\_\_

### Valve clearance measurement steps:

**NOTE:** \_\_\_\_\_  
Valve clearance must be measured when the engine is cool to the touch.  
\_\_\_\_\_

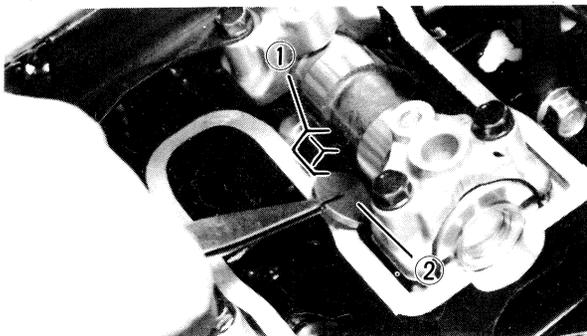


- Turn the crankshaft counterclockwise to align the "T" mark ① on the rotor with the crankcase mark ② when the piston is at TDC on the compression stroke.
- Measure the valve clearance using a Feeler Gauge ③ .
- Record the measured amount if the clearance is incorrect.



**Valve Clearance (cold):**

Intake Valve	Exhaust Valve
0.08 ~ 0.12 mm (0.0031 ~ 0.0047 in)	0.13 ~ 0.17 mm (0.0051 ~ 0.0067 in)



**2. Adjust:**

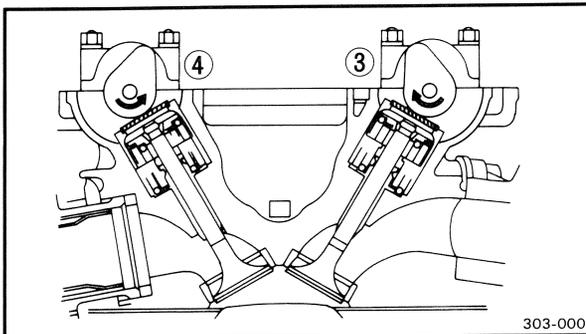
- Valve clearance

**Valve clearance adjustment steps:**

- Position the valve lifter slots (intake and exhaust side) facing each other.
- Depress the valve lifter and install the Tappet Adjusting Tool (YM-4106) ① onto the cylinder head.
- Turn the camshaft until the lobe of the Tappet Adjusting Tool ① depresses the valve lifter.
- Remove the pads ② from the lifter. Use a small screwdriver and a magnetic rod for removal. Note pad numbers.

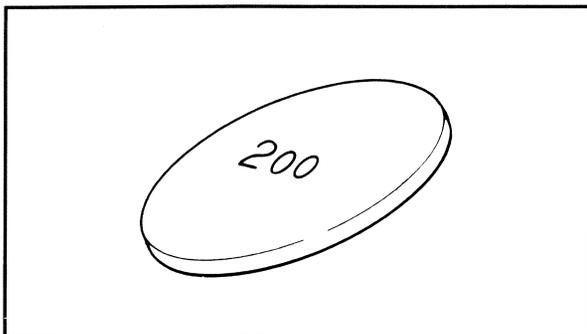
**CAUTION:**

Turn the camshaft as follows:  
(view from left side of the machine Intake ③ : Carefully rotate **CLOCKWISE**. Exhaust ④ : Carefully rotate **COUNTER-CLOCKWISE**.)



303-000

# VALVE CLEARANCE ADJUSTMENT



•Select the proper valve adjusting pad from the chart below:

Pad range		Pad Availability: 25 increments
No. 200~ No. 320	2.00 mm (0.079 in) 3.20 mm (0.130 in)	Pads stepped in 0.05 mm (0.002 in) increments

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

The thickness of each pads is marked on the pad face that contacts the valve lifter (not the cam).

•Round off the hundredths digit of the original pad number to the nearest 0.05 mm (0.002 in) increment.

Hundredths digit	Rounded valve
0 or 2	0
5	(NOT ROUNDED OFF)
8	10

**EXAMPLE:**

Original pad number = 258 (2.58 mm)

Rounded off digit = 260

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

Pads can only be selected in 0.05 mm (0.002 in) increments.

•Locate the "Installed Pad Number" on the chart, and then find the measured valve clearance. The point where these coordinates intersect is the new pad number.

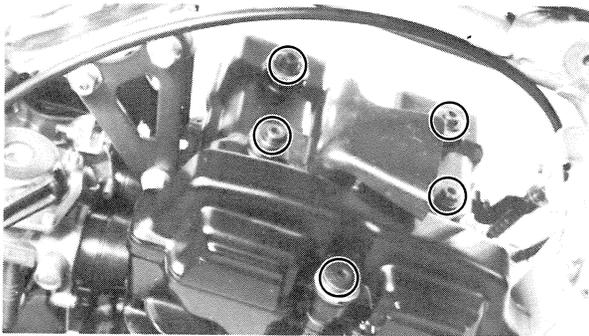
**NOTE:** \_\_\_\_\_

Use the new pad number as a guide only as the number must be verified.

**Pad number verification steps:**

- Install the new pad with the number down.
- Remove the adjusting tool.
- Recheck the valve clearance.
- If the clearance is incorrect, repeat all of the clearance adjustment steps until the proper clearance is obtained.





## Installation

Reverse the removal procedure.

Note the following points.

1. Install:
  - Cylinder head cover



**10 Nm (1.0 m·kg, 7.2 ft·lb)**

2. Install:
  - Crankcase cover (Left)
  - Change pedal
  - Footrest (Left)



- Screws (Crank Case Cover):  
7 Nm (0.7 m·kg, 5.1 ft·lb)
- Bolt (Change pedal):  
10 Nm (1.0 m·kg, 7.2 ft·lb)
- Bolts (Footrest):  
33 Nm (3.3 m·kg, 24 ft·lb)

3. Install:
  - Spark plug

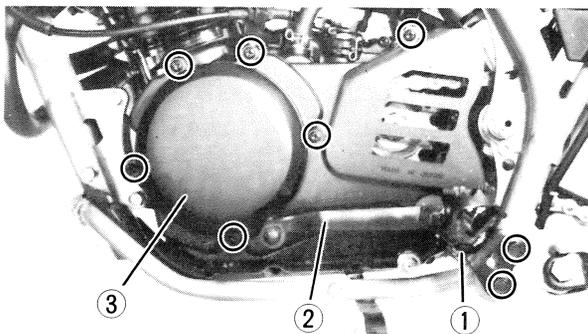


**18 Nm (1.8 m·kg, 13 ft·lb)**

## DECOMPRESSION CABLE ADJUSTMENT

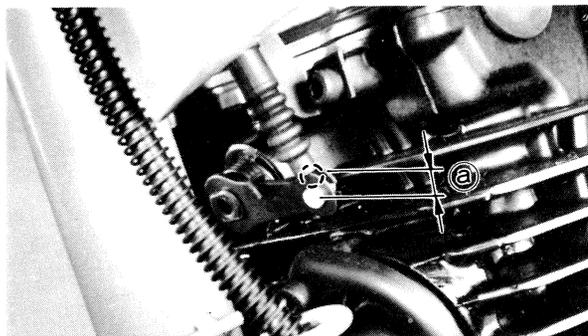
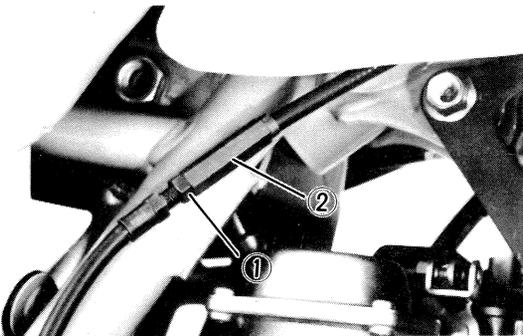
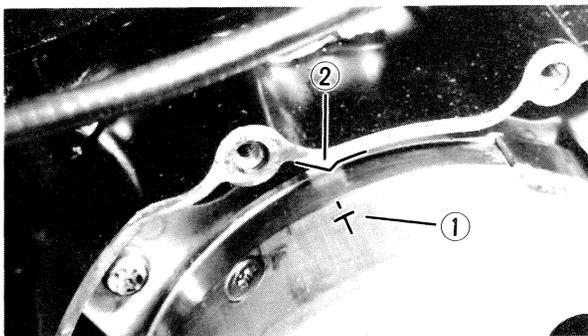
### NOTE:

Decomp-cable adjustment must follow the valve clearance adjustment.



## Removal

1. Remove:
  - Footrest (Left) ①
  - Change pedal ②
  - Crank Case Cover (Left) ③
  - Spark plug



**Adjustment**

1. Turn the crankshaft counterclockwise to align the "T" mark ① on the rotor with the crankcase mark ② when the piston is at TDC on the compression stroke.

2. Loosen:

- Locknut ①

3. Turn the adjuster ② in or out until proper free play ③ is obtained.



**Decompression Lever Free Play**

③ :  
2 ~ 3 mm (0.079 ~ 0.12 in)

5. Tighten:

- Locknut

**Installation**

Reverse the removal procedure.

Note the following points.

1. Install:

- Spark plug



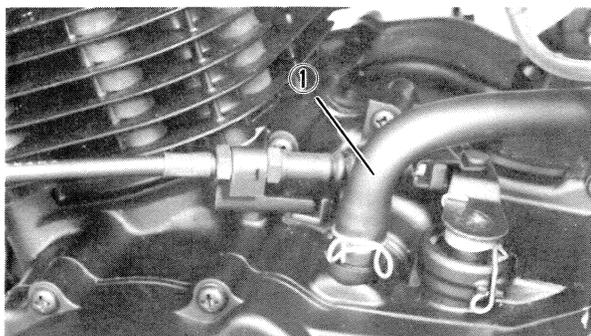
**18 Nm (1.8 m·kg, 13 ft·lb)**

2. Install:

- Crank Case Cover (Left)
- Change pedal
- Footrest (Left)

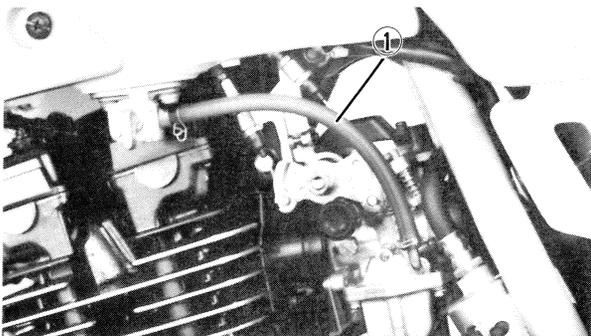


- Screws (Crank Case Cover):  
7 Nm (0.7 m·kg, 5.1 ft·lb)
- Bolt (Change pedal):  
10 Nm (1.0 m·kg, 7.2 ft·lb)
- Bolts (Footrest):  
33 Nm (3.3 m·kg, 24 ft·lb)



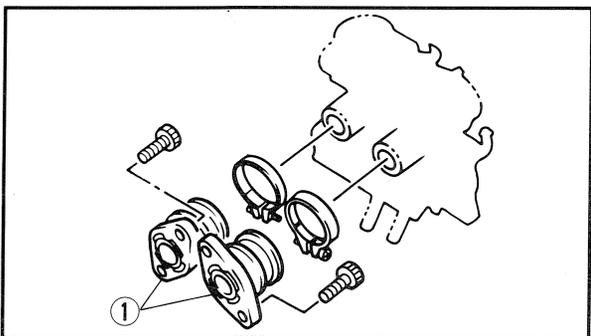
**CRANKCASE VENTILATION PIPE INSPECTION**

1. Inspect:
- Crankcase ventilation hose ①
  - Cracks/Damage → Replace.



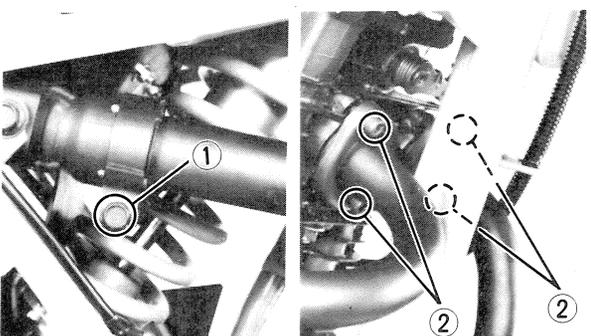
**FUEL LINE INSPECTION**

1. Inspect:
- Fuel pipe ①
  - Cracks/Damage → Replace.



**INTAKE MANIFOLD INSPECTION**

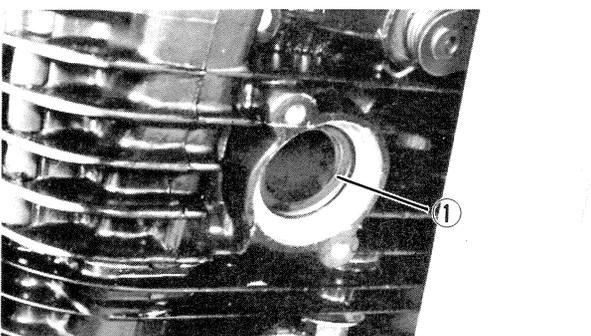
1. Inspect:
- Carburetor joint ①
  - Cracks/Damage → Replace.



**EXHAUST PIPE GASKET INSPECTION**

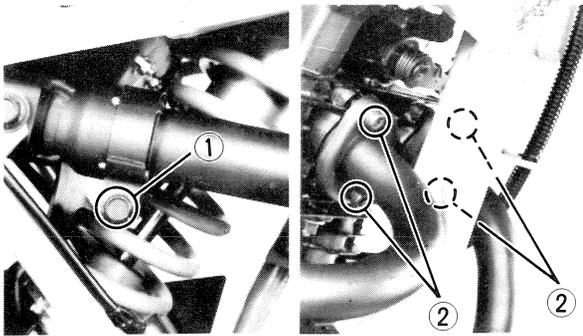
Removal

1. Remove:
- Bolt ① (Muffler)
  - Bolts ② (Exhaust pipe)



**Inspection**

1. Inspect:
- Exhaust pipe gasket(s) ①
  - Damage → Replace.



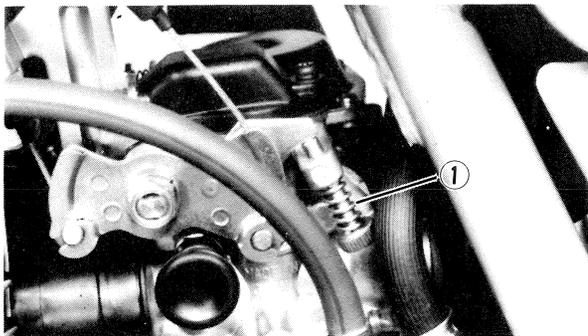
**Installation**

1. Install:
  - Exhaust pipe



- Bolt ① (Muffler):  
20 Nm (2.0 m·kg, 14 ft·lb)
- Bolt ② (Exhaust pipe):  
12 Nm (1.2 · kg, 8.7 ft·lb)

2. Inspect:
  - Exhaust pipe gasket  
Exhaust gas leakage → Repair.

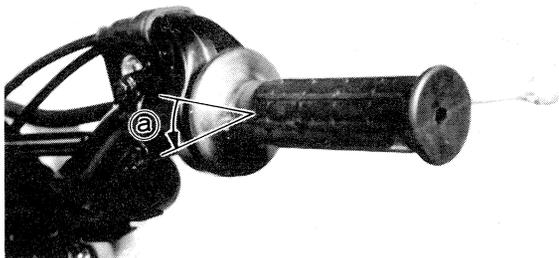


**IDLE SPEED ADJUSTMENT**

1. Warm up engine for a few minutes.
2. Adjust:
  - Idle speed  
Turn the throttle stop screw ① clockwise to increase engine speed and counterclockwise to decrease engine speed.



**Engine Idle Speed:**  
1,400 ~ 1,500 r/min



**THROTTLE CABLE ADJUSTMENT**

**NOTE:** \_\_\_\_\_  
Before adjusting the throttle cable free play, the engine idling speed should be adjusted.  
\_\_\_\_\_

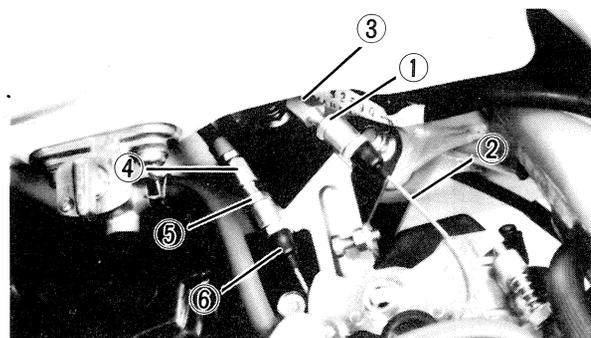
1. Check:
  - Throttle cable free play ①  
Out of specification → Adjust.



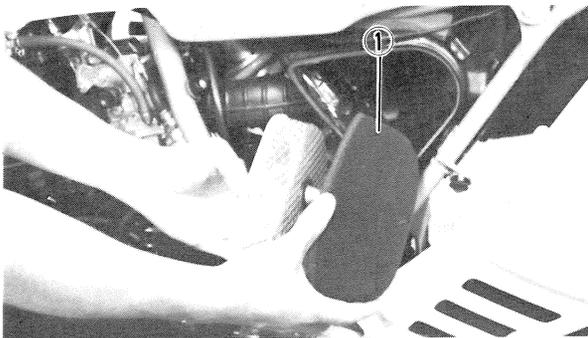
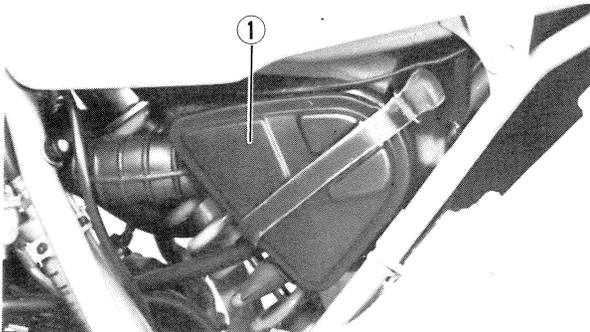
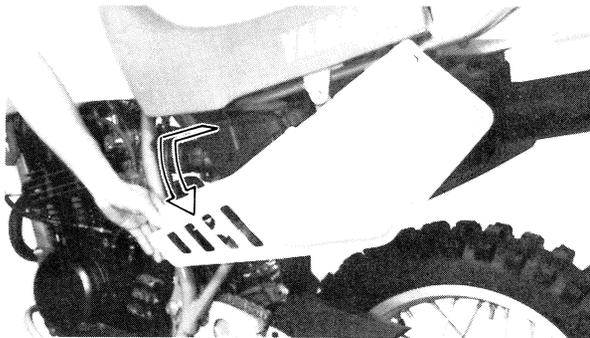
**Throttle Cable Free Play ① :**  
2 ~ 5 mm (0.08 ~ 0.20 in)

2. Adjust:
  - Throttle cable free play  
By the following adjustment steps.

**Throttle cable adjustment steps:**  
• Loosen the locknuts ① on the throttle cable 1 ② .



- Turn the adjuster ③ clockwise or counterclockwise until proper free play is attained.
- If the play is still incorrect after the adjuster is loosened 5 mm (0.2 in), make an adjustment with the adjuster ④ on the throttle cable 2 ⑤.
- ⑥ Locknuts
- Tighten the locknuts.



## AIR FILTER CLEANING

1. Unhook the sidecover and turn it counterclockwise.

2. Remove:

- Air filter case cover ①  
Unhook the cover holder.

3. Remove:

- Air filter element ①  
Unhook the element holder.

### CAUTION:

The engine should never be run without the air cleaner element; excessive piston and/or cylinder wear may result.

4. Clean:

- Air filter element  
Clean it with solvent.

### NOTE:

After cleaning, remove the remaining solvent by squeezing the element.



## AIR FILTER CLEANING/ENGINE OIL LEVEL INSPECTION

5. Inspect:

- Element  
Damage → Replace.

6. Apply:

- SAE 10W30 motor oil

7. Squeeze out the excess oil.

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

The element should be wet but not dripping.

8. Apply:

- All-purpose grease  
To the air filter seat.

9. Install:

- Air filter element.

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

Make sure its sealing surface matches the sealing surface of the case so there is no air leak.

10. Install:

- Air filter case cover
- Side cover (Left)

## ENGINE OIL LEVEL INSPECTION

1. Inspect:

- Engine oil level  
Oil level low → Add sufficient oil.  
By the following inspection steps.

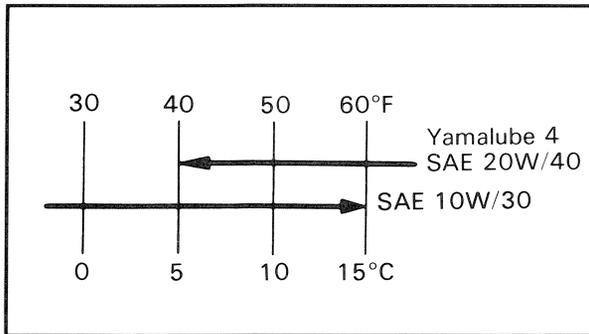
### Engine oil level inspection steps:

- Place the machine on a level place.

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

Be sure the machine is positioned straight up and on both wheels.

- Warm up the engine for a few minutes.
- Stop the engine.
- Inspect the oil level through the level window located at the lower part of left side crankcase cover.  
Oil level low → Add oil to proper level.



**Recommended Engine Oil:**

**At 5°C (40°F) or Higher:**

**Yamalube 4 or  
SAE 20W40 Type SE Motor Oil**

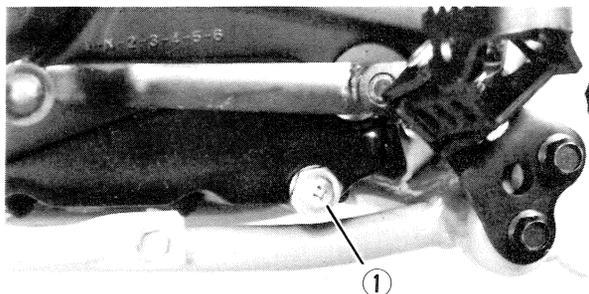
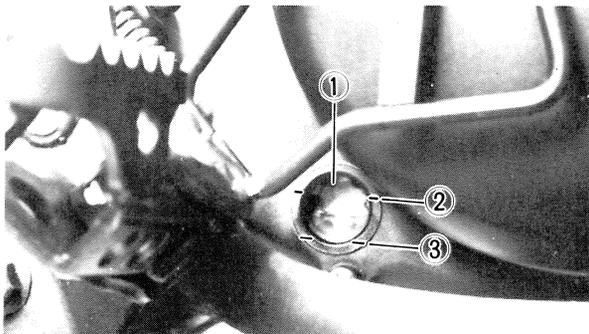
**At 15°C (60°F) or Lower:**

**SAE 10W30 Type SE Motor Oil**

**NOTE:**

- Wait a few minutes until level settles before checking.
- Oil level should be between maximum and minimum marks.

- ① Level window
- ② Maximum
- ③ Minimum



**ENGINE OIL REPLACEMENT**

**Without filter change**

1. Warm up engine for several minutes.
2. Place a receptacle under the engine.
3. Remove:
  - Oil filler cap
4. Remove:
  - Drain plug ①
 Drain the engine oil
5. Inspect:
  - Gasket (Drain plug)
 Damage → Replace.
6. Tighten:
  - Drain plug



**Oil Drain Plug:**

**43 Nm (4.3 m·kg, 31 ft·lb)**

7. Fill:
  - Crankcase



**Recommended Engine Oil:**

**1.3 L (1.14 Imp qt, 1.37 US qt)**

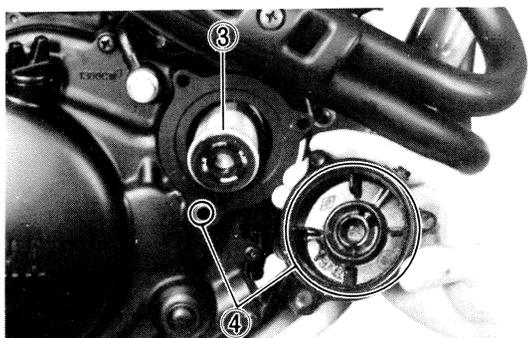
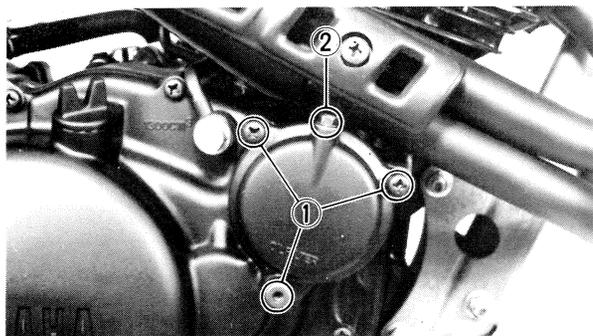
**Yamalube 4,  
SAE 20W40 Type SE Motor Oil  
or SAE 10W30 Type SE Motor Oil**



**CAUTION:**

Do not allow foreign material to enter the crankcase.

7. Install:
- Filler cap



**With filter change**

Follow the "Without filter change" steps 1 ~ 4. Then proceed as follows:

1. Remove:
  - Screws ①
  - Bolt
  - Air bleed screw ②
  - Oil filter cover
  - Oil filter
2. Install:
  - Oil filter (New) ③

Replace periodically as indicated.
3. Inspect:
  - O-rings ④

Cracks/Damage → Replace.
4. Install:
  - Drain plug
  - Oil filter cover
  - Screw
  - Bolt
  - Air bleed screw



**Drain Plug:**  
43 Nm (4.3 m·kg, 31 ft·lb)  
**Oil Filter Bolt:**  
10 Nm (1.0 m·kg, 7.2 ft·lb)  
**Oil Filter Screw:**  
7 Nm (0.7 m·kg, 5.1 ft·lb)  
**Air Bleed Screw:**  
5 Nm (0.5 m·kg, 3.6 ft·lb)

5. Fill:
- Crankcase



**Recommended Engine Oil:**  
1.3 L (1.14 Imp qt, 1.37 US qt)  
Yamalube 4,  
SAE 20W40 Type SE Motor Oil  
or SAE 10W30 Type SE Motor Oil

6. Warm up engine for a few minutes, then stop engine.

7. Inspect:

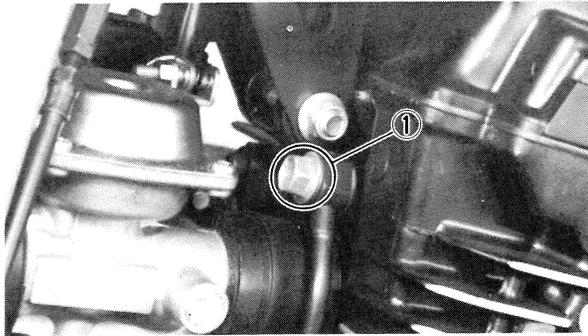
Oil Level

Oil Level Low → Add oil to proper level.

**CAUTION:**

**Check oil pressure after replacing engine oil as follows:**

- Slightly loosen the checking bolt ① in the cylinder head.
- Start the engine. Keep it idling until oil begins to seep from the loosened checking bolt.
- Turn the engine off, and tighten the checking bolt to specification.



20 Nm (2.0 m·kg, 14 ft·lb)

- Turn off engine immediately if no oil seeps from the checking bolt after one minute to prevent engine seizure.
- Locate and resolve problem, then recheck oil pressure.

## OIL STRAINER CLEANING

1. Warm up engine for several minutes.

2. Place a receptacle under the engine.

3. Remove:

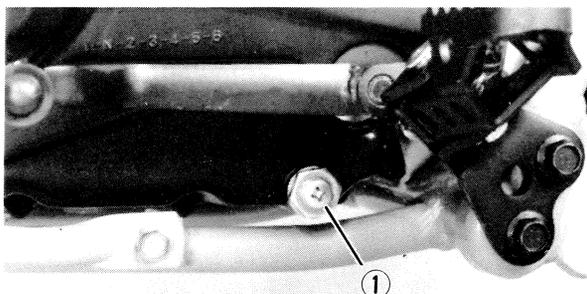
- Oil filler cap

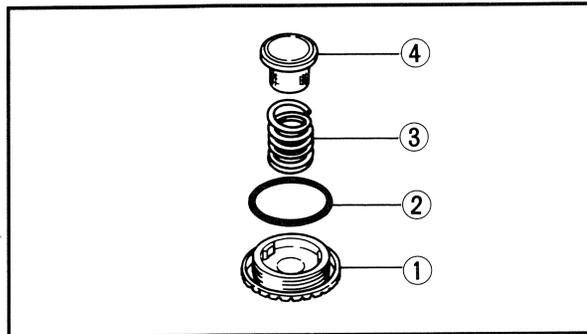
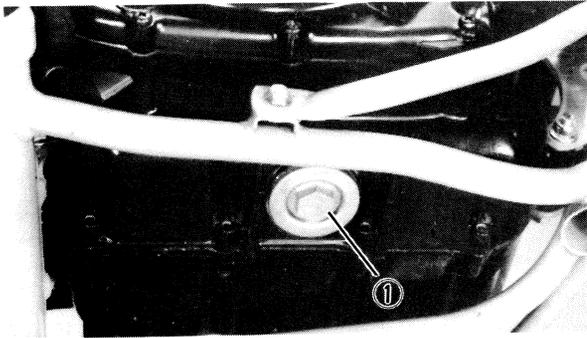
4. Remove:

- Drain plug ①
- Drain the engine oil.

5. Inspect:

- Gasket
- Damage → Replace.





6. Remove:

- Oil strainer plug ①
- O-ring ②
- Compression spring ③
- Oil strainer ④

7. Inspect:

- Oil strainer  
Contamination → Clean or replace.
- O-ring  
Cracks/Damage → Replace.

8. Install:

- Oil strainer
- Compression spring
- O-ring
- Oil strainer plug



**Oil Strainer Plug:**  
**32 Nm (3.2 m·kg, 23 ft·lb)**

9. Tighten:

- Drain plug



**Drain Plug:**  
**43 Nm (4.3 m·kg, 31 ft·lb)**

10. Fill:

- Crankcase



**Recommended Engine Oil:**  
**1.6 L (1.4 Imp qt, 1.7 US qt)**  
**Yamalube 4,**  
**SAE 20W40 Type SE Motor Oil or**  
**SAE 10W30 Type SE Motor Oil**

**CAUTION:**

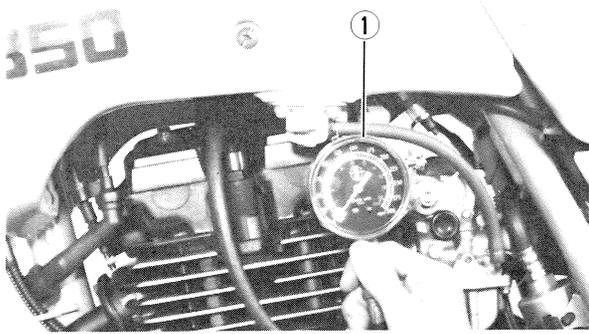
Do not allow foreign material to enter the crankcase.

11. Install:

- Filler cap

**COMPRESSION PRESSURE MEASUREMENT**

Insufficient compression pressure will result in performance loss and may indicate leaking valves or worn or damaged piston rings.



1. Measure:
  - Valve clearance
2. Warm up engine for several minutes, then stop the engine.
3. Remove:
  - Spark plugs
4. Connect:
  - Compression Gauge (YU-33223) ①
5. Measure:
  - Compression

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

Turn over engine by kick starting with choke and throttle valve wide-open until the pressure indicated on gauge can rise no further. Compression should be within the specified levels.

<b>Compression Pressure (at sea level):</b>	
Standard . . .	1,079 kPa (11 kg/cm <sup>2</sup> , 156 psi)
Minimum . . .	883 kPa (9 kg/cm <sup>2</sup> , 128 psi)
Maximum . . .	1,177 kPa (12 kg/cm <sup>2</sup> , 171 psi)

**WARNING:** \_\_\_\_\_

When cranking engine, ground spark plug wires to prevent sparking.

<b>Compression test steps (below minimum levels):</b>	
<ul style="list-style-type: none"> <li>• Squirt a few drops of oil into cylinder.</li> <li>• Measure compression again.</li> </ul>	
<b>Reading</b>	<b>Diagnosis</b>
Higher than without oil	<ul style="list-style-type: none"> <li>• Worn cylinder, piston and piston rings</li> </ul>
Same as without oil	<ul style="list-style-type: none"> <li>• Defective piston, ring(s), valve(s) and cylinder head gasket</li> <li>• Improper valve timing and valve clearance</li> </ul>
<b>Compression test steps (above maximum levels):</b>	
<ul style="list-style-type: none"> <li>• Check cylinder head, valve surfaces, or piston crown for carbon deposits.</li> </ul>	



**CHASSIS**

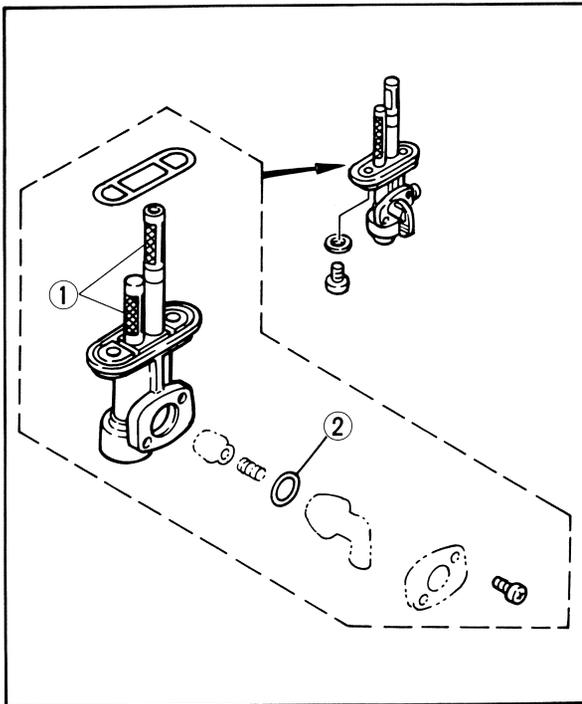
**FUEL COCK CLEANING**

1. Turn the fuel cock lever to the "OFF".
2. Disconnect:
  - Fuel pipe
3. Remove:
  - Side covers (left and right)
  - Seat
  - Fuel tank
4. Drain:
  - Fuel

**WARNING:**

**FUEL IS HIGHLY FLAMMABLE:**

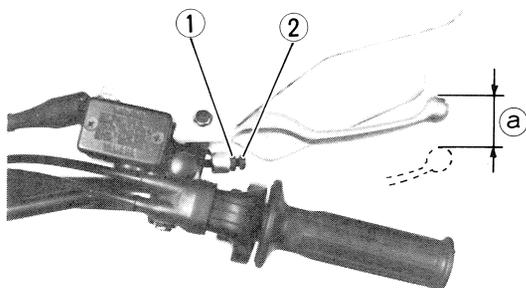
- Always turn off the engine when draining.
- Take care not to spill any fuel on the engine or exhaust pipe/muffler when draining.
- Never drain fuel while smoking or in the vicinity an open flame.



5. Remove:
  - Fuel cock
6. Clean:
  - Filter screen ①  
Clean it with solvent.
7. Inspect:
  - Filter screen ①
  - O-ring ②  
Damage → Replace.
8. Install:
  - Components in above list (steps "3 and 2")

**NOTE:**

Be careful not to clamp the fuel cock too tightly as this may unseat the O-ring and lead to a fuel leak.



**FRONT BRAKE ADJUSTMENT**

1. Loosen:
  - Locknut ①
2. Adjust:
  - Free play (a)
 Turn the adjuster ② until the free play a is within the specified limits.

 **Free play (a) :**  
5 ~ 8 mm (0.2 ~ 0.3 in)

**CAUTION:**

Proper lever free play is essential to avoid excessive brake drag.

**WARNING:**

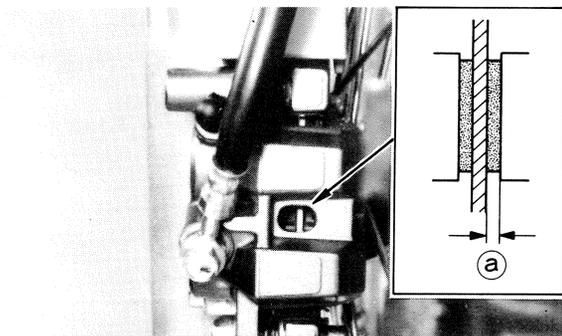
A soft or spongy feeling in the brake lever can indicate the presence of air in the brake system. This air must be removed by bleeding the brake system before the machine is operated. Air in the system will cause greatly diminished braking capability and can result in loss of control and an accident. Inspect and bleed the system if necessary.

3. Tighten:
  - Locknut

**FRONT BRAKE PAD INSPECTION**

1. Inspect:
  - Wear limit (a)
 Out of specification → Replace pads.

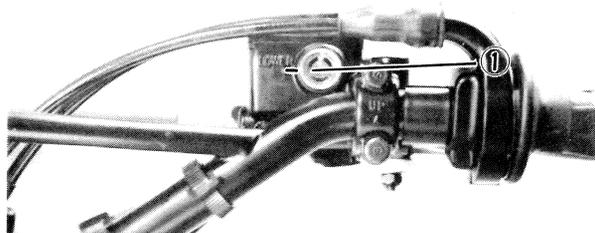
 **Wear Limit (a) :**  
0.8 mm (0.031 in)



**BRAKE FLUID LEVEL INSPECTION**

1. Inspect:
  - Brake fluid level
 Brake fluid level low → Replenish fluid.

 **Brake Fluid:**  
DOT #3



① Lower level



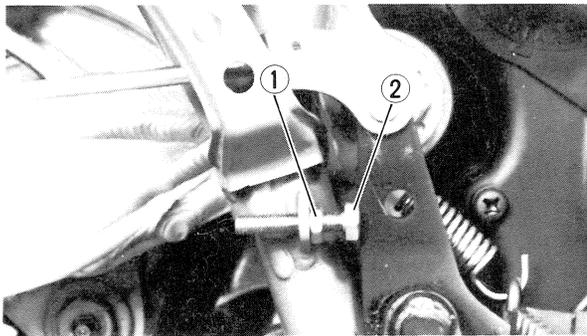
**NOTE:**

Be sure that:

- Spilled fluid is cleaned up immediately to prevent painted surfaces or plastic parts from eroding.

**WARNING:**

- Use only the designated quality brake fluid, otherwise poor brake performance will result.
- Water does not enter the master cylinder when refilling, otherwise poor brake performance.



**REAR BRAKE ADJUSTMENT**

**Pedal Height Adjustment**

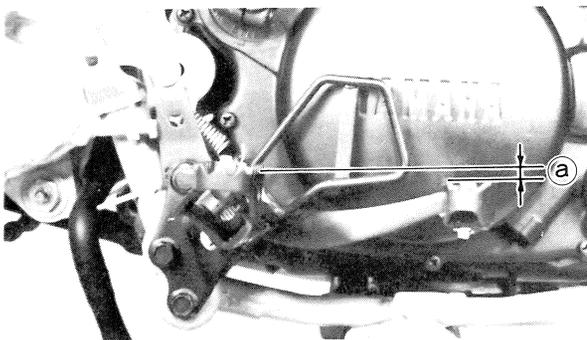
1. Loosen:

- Locknut (1)

2. Adjust:

- Brake pedal height (a)

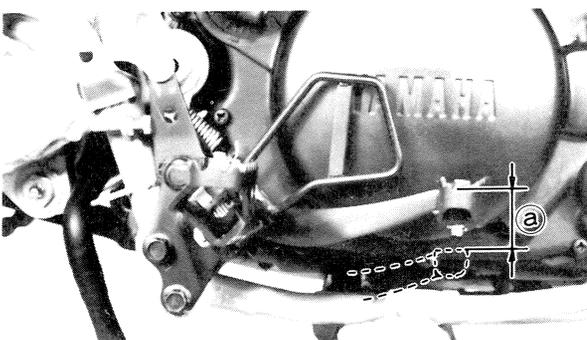
Turn the adjuster (2) until the brake pedal position is at the specified height.



**Brake Pedal Height (a) :**  
Zero mm (Zero in)  
Below the Top of the Footrest

**WARNING:**

After adjusting the pedal height, adjust brake pedal free play.



**Free Play Adjustment**

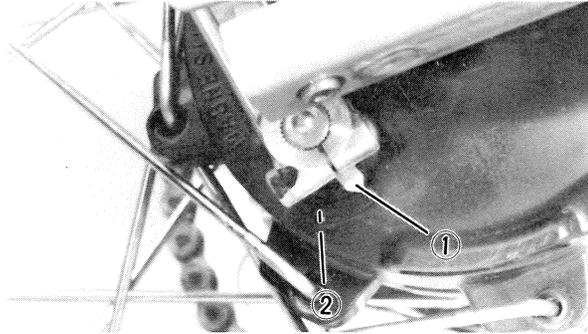
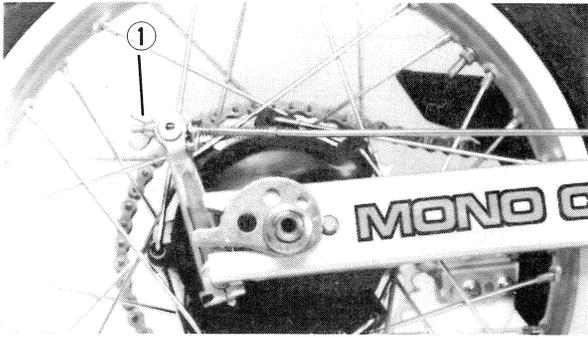
1. Adjust:

- Free play (a)

Turn the adjuster (1) until the free play is within the specified limits.

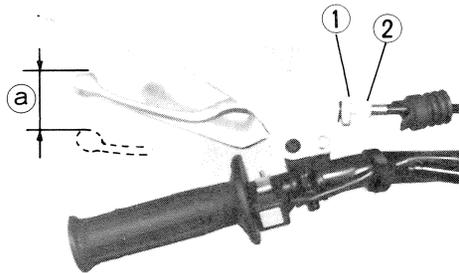


**Free play (a) :**  
20 ~ 30 mm (0.8 ~ 1.2 in)



**REAR BRAKE LINING INSPECTION**

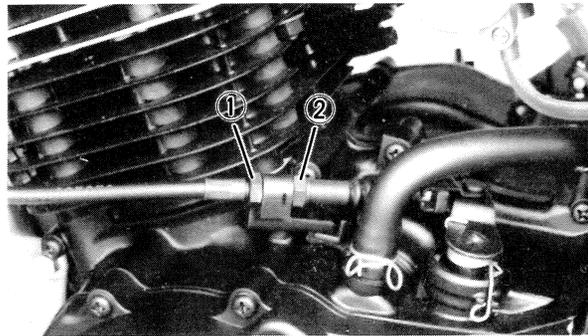
1. Depress the brake pedal.
2. Inspect:
  - Wear indicator ①
  - Indicator reaches the wear limit line ② → Replace shoes.



**CLUTCH ADJUSTMENT**

**Free Play Adjustment**

1. Loosen:
  - Locknuts ①
2. Adjust:
  - Free play ①
  - Turn the adjusters ② until the free play is within the specified limits.



	Free play ① :
	8 ~ 13 mm (0.3 ~ 0.5 in)

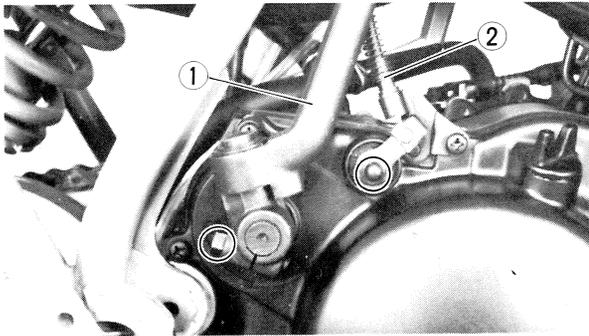
3. Tighten:
  - Locknuts

**NOTE:**

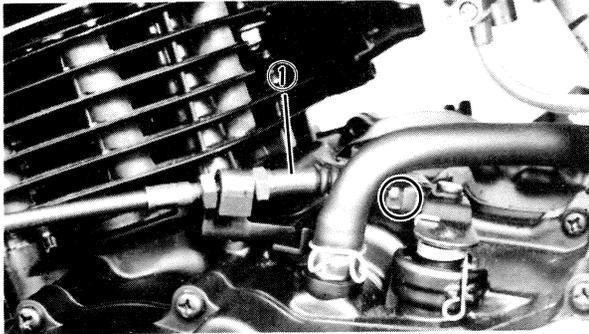
The above procedure provides for maximum cable free play to allow for proper clutch actuating mechanism adjustment.

**Mechanism Adjustment**

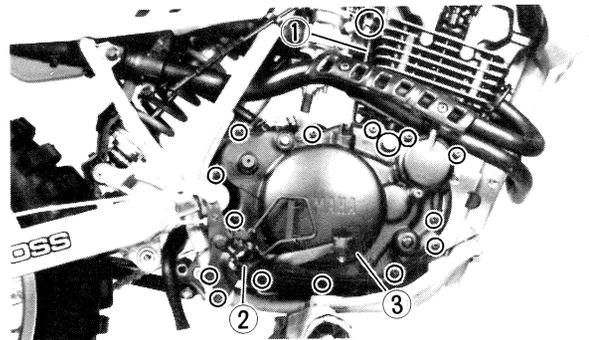
1. Loosen:
  - Cable length adjuster locknuts (Fully)
2. Tighten:
  - Cable length adjusters (Until tight)
3. Drain:
  - Engine oil



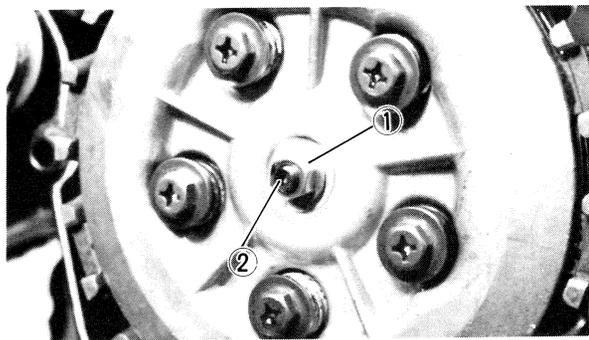
4. Remove:
- Kick crank ①
  - Decompression cable ②



5. Remove:
- Clutch cable ①  
(at push lever end)



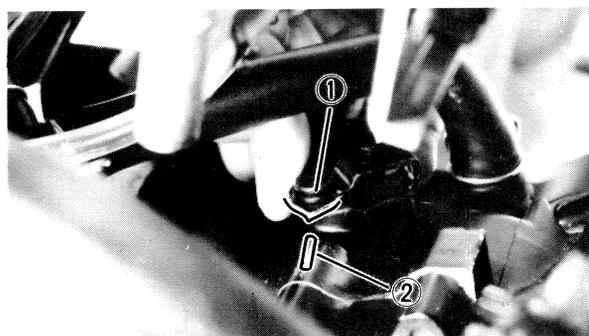
6. Remove:
- Oil pipe ①
  - Footrest (Right) ②
  - Crankcase cover (Right) ③



7. Loosen:
- Locknut ①
8. Push the push lever toward the front of the engine with your finger until it stops.

② Adjuster

9. Adjust:
- Free play
- With the push lever in this position, turn the adjuster either in or out until the push lever mark ① and crankcase match mark ② are aligned.



10. Tighten:
- Locknut

	<b>Locknut:</b>
	<b>8 Nm (0.8 m·kg, 5.8 ft·lb)</b>

11. Install:
- Crankcase cover (Right)
  - Clutch cable
  - Decompression cable
  - Kick crank
  - Footrest (Right)



**Screws (Crank case cover):**  
7 Nm (0.7 m·kg, 5,8 ft·lb)  
**Cap nut (Decompression cable):**  
8 Nm (0.8 m·kg, 5,8 ft·lb)  
**Bolt (Kick crank):**  
20 Nm (2.0 m·kg, 14 ft·lb)  
**Bolts (Footrest):**  
33 Nm (3.3 m·kg, 24 ft·lb)

12. Fill:
- Crankcase



**Recommended engine oil:**  
1.6 L (1.4 Imp qt, 1.7 US qt)  
Yamalube 4,  
SAE 20W40 Type SE Motor Oil  
or SAE 10W30 Type SE Motor Oil

13. Install:
- Filler cap
14. Adjust:
- Clutch lever free play

## DRIVE CHAIN SLACK CHECK

**NOTE:** \_\_\_\_\_  
Before checking and/or adjusting the chain slack, rotate the rear wheel through several revolutions. Check the chain slack several times to find the point where the chain is the tightest. Check and/or adjust the chain slack where the rear wheel is in this "tight chain" position.

1. Place the machine on a level place, and hold it in an upright position.

**NOTE:** \_\_\_\_\_  
The both wheels on the ground without rider on it.



2. Check:
  - Drive chain slack (a)
  - Out of specification → Adjust.

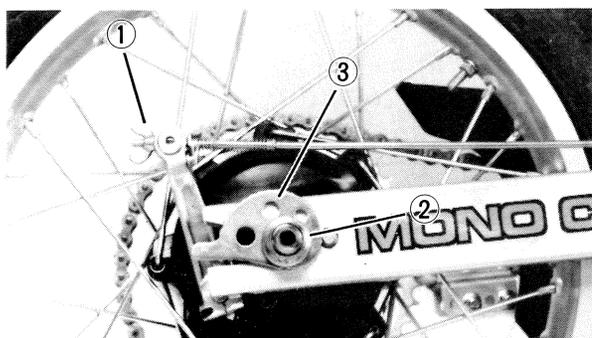


**Drive Chain Slack (a) :**  
40 ~ 45 mm (1.6 ~ 1.8 in)

**DRIVE CHAIN SLACK ADJUSTMENT**

**CAUTION:**

Excessive chain slack will overload the engine and other vital parts; keep the slack within the specified limits.



1. Loosen:
  - Adjuster (1)
  - Axle nut (2)
2. Adjust:
  - Drive chain slack
  - Turn the chain pullers (3) until axle is situated in same position.
3. Tighten:
  - Axle nut



**Rear Wheel Axle Nut:**  
100 Nm (10.0 m·kg, 72 ft·lb)

4. Adjust:
  - Rear brake free play

**DRIVE CHAIN LUBRICATION**

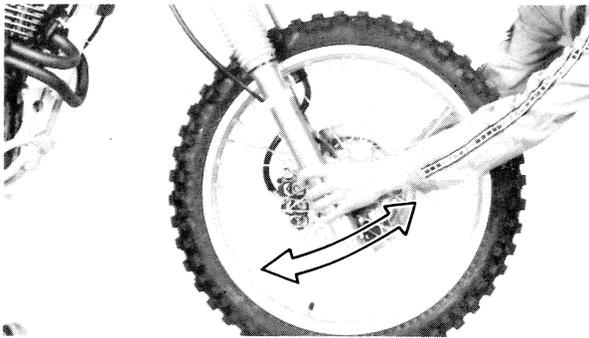
The chain consists of many parts which work against each other. If the chain is not maintained properly, it will wear out rapidly, therefore, form the habit of periodically servicing the chain. This service is especially necessary when riding in dusty conditions.

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

Do not use any other lubricants on the drive chain. They may contain solvents that could damage the O-rings.



**SAE 30 ~ 50 W Motor Oil**



### **STEERING HEAD INSPECTION**

**WARNING:** \_\_\_\_\_

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

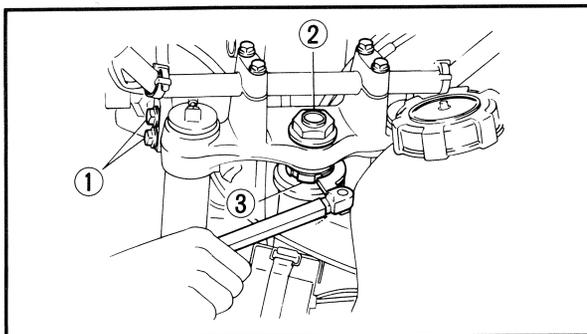
1. Elevate the front wheel by placing a suitable stand under the engine.
2. Check:
  - Steering assembly bearings  
Grasp the bottom of the forks and gently rock the fork assembly back and forth.  
Looseness → Adjust steering head.

### **STEERING HEAD ADJUSTMENT**

**WARNING:** \_\_\_\_\_

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

1. Elevate the front wheel by placing a suitable stand under the engine.



2. Loosen:
  - Fork pinch bolt ①
  - Steering fitting bolt ②
3. Tighten:
  - Ring nut ③

By the following steps.

**Ring nut tightening steps:**

- Tighten the ring nut using the Ring Nut Wrench (YU-33975).

**NOTE:** \_\_\_\_\_  
Set the torque wrench to the ring nut wrench so that they form a right angle.  
\_\_\_\_\_



**Ring Nut (Initial Tightening):**  
**37 Nm (3.7 m·kg, 27 ft·lb)**

- Loosen the ring nut one turn.
- Retighten the ring nut using the Ring Nut Wrench.

**WARNING:** \_\_\_\_\_  
**Avoid over-tightening.**  
\_\_\_\_\_



**Ring Nut (Final Tightening):**  
**10 Nm (1.0 m·kg, 7.2 ft·lb)**

4. Tighten:
  - Steering fitting bolt
  - Fork pinch bolt



**Steering Fitting Bolt:**  
**85 Nm (8.5 m·kg, 61 ft·lb)**  
**Fork Pinch Bolt:**  
**23 Nm (2.3 m·kg, 17 ft·lb)**

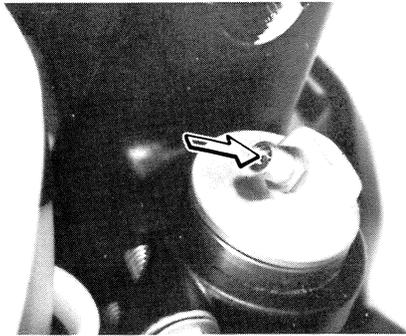
5. Check:
  - Steering assembly bearings

Looseness → Adjust steering head.

**FRONT FORK OIL CHANGE**

**WARNING:** \_\_\_\_\_

- Fork oil leakage can cause loss of stability and safe handling. Have any problem corrected before operating the machine.
- Securely support the machine so there is no danger of it falling over.



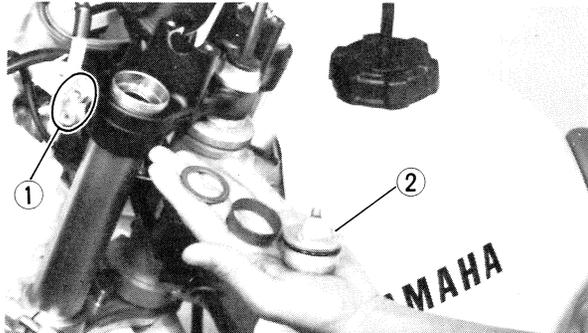
1. Elevate the front wheel by placing a suitable stand under the engine.

2. Remove:

- Handlebars
- Air valve cap

**NOTE:**

Keep the valve open by pressing it for several seconds so that the air can be let out of the inner tube.



3. Loosen:

- Pinch bolts (steering crown) ①

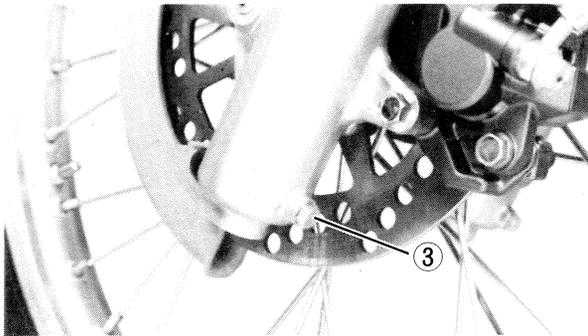
4. Remove:

- Cap bolt ②
- Drain screw ③

Drain the fork oil.

**WARNING:**

Do not let oil contact the disc brake components. If any oil should contact the brake components, it must be removed before the machine is operated. Oil will cause diminished braking capacity and will damage the rubber components of the brake assembly.



5. Inspect:

- O-ring (cap bolt)
  - Gasket (drain screw)
- Damage → Replace.

6. Install:

- Drain screw

7. Fill:

- Fork oil

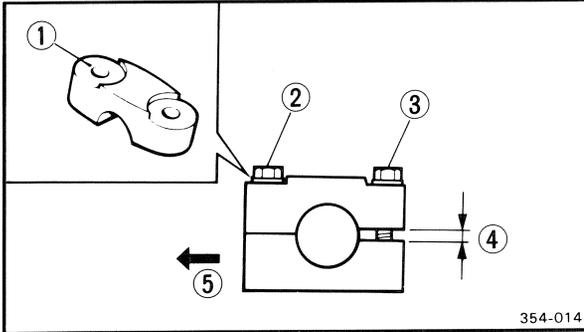
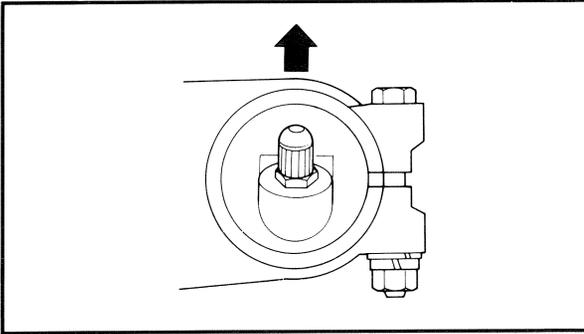


Each Fork:

533 cm<sup>3</sup> (18.76 Imp oz,  
18.02 US oz)

Recommended Oil:

After filling, pump the forks slowly up and down to distribute the oil.



8. Install:
- Cap bolt

**NOTE:** \_\_\_\_\_  
Be sure to install the cap bolt so that its air valve top points straight forward.

- Pinch bolt (steering crown)
- Handlebars

- ② 1st
- ③ 2nd
- ④ Gap
- ⑤ Forward

**NOTE:** \_\_\_\_\_  
The upper handlebar holder should be installed with the punched mark ① forward.

**CAUTION:** \_\_\_\_\_  
First tighten the bolts on the front side of the handlebar holder, and then tighten the bolts on the rear side.



**Cap Bolt:**  
23 Nm (2.3 m·kg, 17 ft·lb)  
**Pinch Bolt (Steering Crown):**  
23 Nm (2.3 m·kg, 17 ft·lb)  
**Handlebar Installation Bolt:**  
23 Nm (2.3 m·kg, 17 ft·lb)

9. Adjust:
- Front fork air pressure  
Refer to "FRONT FORK ADJUSTMENT" section.

**FRONT FORK ADJUSTMENT**

**WARNING:** \_\_\_\_\_  
Always adjust each air pressure to the same setting. Uneven adjustment can cause poor handling and loss of stability.

1. Elevate the front wheel by placing a suitable stand under the engine.

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

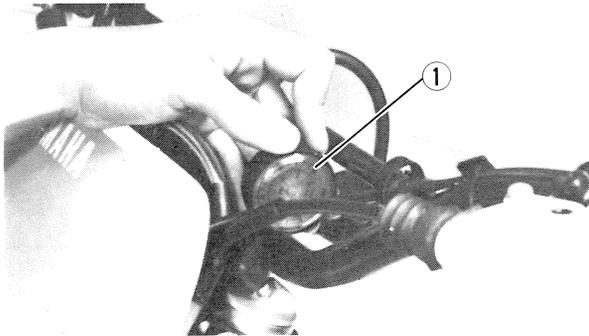
When checking and adjusting the air pressure, there should be no weight on the front end of the machine.

2. Adjust:

- Air pressure

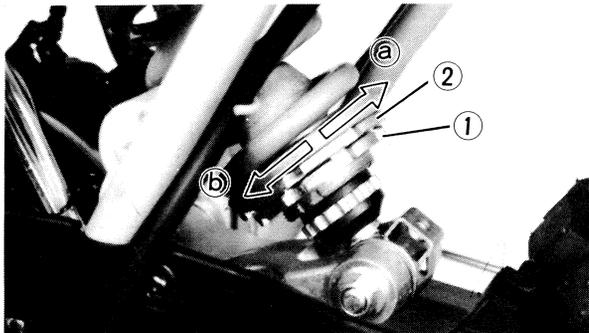
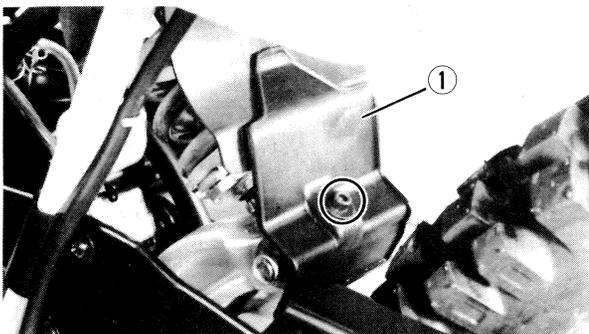
**NOTE:** \_\_\_\_\_

The air pressure of the front forks can be adjusted to suit rider's preference, weight, and the course conditions.



By the following adjustment steps.

<p><b>Air pressure adjustment steps:</b></p> <ul style="list-style-type: none"> <li>• Remove the valve caps.</li> <li>• Using the air check gauge ①, check and adjust the air pressure.</li> </ul>
<p><b>Stiffer</b> → Increase the air pressure. (Use an air pump or pressurized air supply.)</p> <p><b>Softer</b> → Decrease the air pressure. (Release the air by pushing the valve.)</p>
<p><b>Standard Air Pressure:</b> Zero kPa (Zero kg/cm<sup>2</sup>, Zero psi)</p> <p><b>Maximum Air Pressure:</b> 118 kPa (1.2 kg/cm<sup>2</sup>, 17 psi)</p>
<p><b>CAUTION:</b> _____</p> <p>Never exceed the maximum pressure, or oil seal damage may occur.</p>
<p><b>WARNING:</b> _____</p> <p>The difference between both the left and right tubes should be 9.8 kPa (0.1 kg/cm<sup>2</sup>, 1.4 psi) or less.</p>
<ul style="list-style-type: none"> <li>• Install the valve caps securely.</li> </ul>



**REAR SHOCK ABSORBER ADJUSTMENT**

1. Remove:
- Cover ①

2. Adjust:
- Spring preload
  - Damping

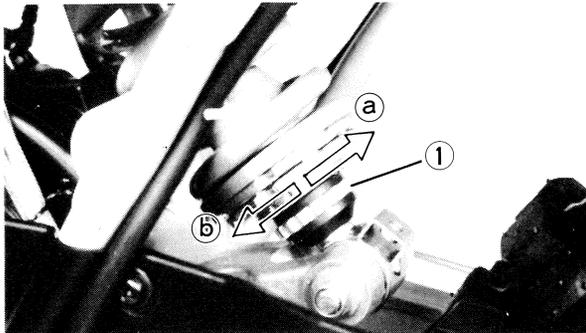
**NOTE:** \_\_\_\_\_  
 The spring preload and damping of the rear shock absorber can be adjusted to suit rider's preference, weight, and the course conditions.

By the following adjustment steps.

<b>Spring preload adjustment steps:</b>	
<ul style="list-style-type: none"> <li>•Loosen the locknut ① .</li> <li>•Adjust the spring preload with the spring preload adjuster ② .</li> </ul>	
<p><b>Stiffer</b> (a) → Increase the spring preload.                  (Turn the adjuster clockwise.)</p> <p><b>Softer</b> (b) → Decrease the spring preload.                  (Turn the adjuster counter-clockwise.)</p>	
	<p><b>Standard Length:</b> 247.0 mm (9.72 in)</p> <p><b>Minimum Length:</b> 234.5 mm (9.23 in)</p> <p><b>Maximum Length:</b> 257.5 mm (10.14 in)</p>
<b>NOTE:</b> _____	
<ul style="list-style-type: none"> <li>•When adjusting, use the special wrench which is included in the owner's tool kit.</li> <li>•The length of the spring (installed) changes 1 mm (0.04 in) per turn of the adjuster.</li> </ul>	
<b>CAUTION:</b> _____	
<p><b>Never attempt to turn the adjuster beyond the maximum or minimum setting.</b></p>	
<ul style="list-style-type: none"> <li>•Tighten the locknut.</li> </ul>	
	<p><b>Locknut:</b> 55 Nm (5.5 m·kg, 40 ft·lb)</p>

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

Always tighten the locknut against the spring adjuster and torque the locknut to specification.



**Damping adjustment steps:**

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

Before adjustment, make sure of the following:

- First turn in damping adjuster ① fully.
- Then, turn the damping adjuster ① 5 clicks back from the fully turned-in position.

- Adjust the damping with the damping adjuster ①.

Stiffer (a) → Increase the damping.  
(Turn the adjuster clockwise.)  
Softer (b) → Decrease the damping.  
(Turn the adjuster counter-clockwise.)

**Standard Position:**

5 clicks out

**Minimum Position:**

30 clicks out

**Maximum Position:**

Zero (stiffest position)

**WARNING:** \_\_\_\_\_

Never attempt to turn the adjuster beyond the maximum or minimum setting.



**WHEEL BEARINGS CHECK**

**Front Wheel**

1. Check:
  - Front wheel bearings

Raise the front end of the machine, and spin the wheel by hand. Touch the axle or front fender while spinning the wheel.

Excessive vibration → Replace bearings.

**Rear Wheel**

1. Remove:
  - Rear Wheel
2. Check:
  - Bearing movement

Roughness → Replace bearings.

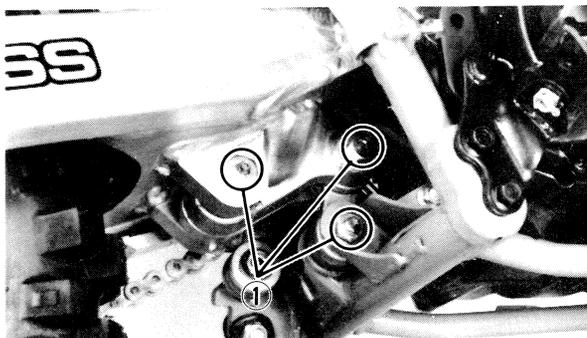
**CABLE INSPECTION AND LUBRICATION**

**Cable inspection and lubrication steps:**

- Remove the screws that secure throttle housing to handlebar.
- Hold cable end high and apply several drops of lubricant to cable.
- Coat metal surface of disassembled throttle twist grip with suitable all-purpose grease to minimize friction.
- Check for damage to cable insulation. Replace any corroded or obstructed cables.
- Lubricate any cables that do not operate smoothly.



**SAE 10W30 Motor Oil**



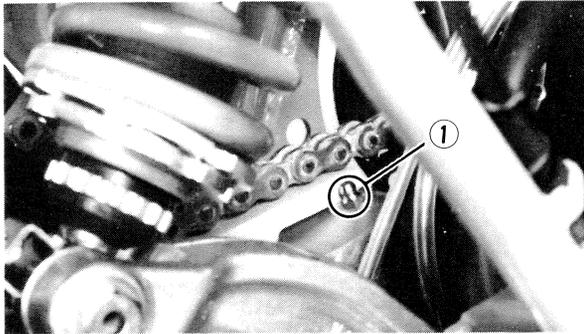
**SWINGARM AND RELAY ARM LUBRICATION**

1. Lubricate:
  - Pivot points ① (swingarm and relay arm)

Use a grease gun.



**Lithium Base Grease**



**TIRES CHECK**

1. Measure:

- Tire pressure (cold tire pressure)  
Out of specification → Adjust.

Cold tire Pressure	Front	Rear
Off-road Riding	98 kPa (1.0 kg/cm <sup>2</sup> , 14 psi)	98 kPa (1.0 kg/cm <sup>2</sup> , 14 psi)

**WARNING:**

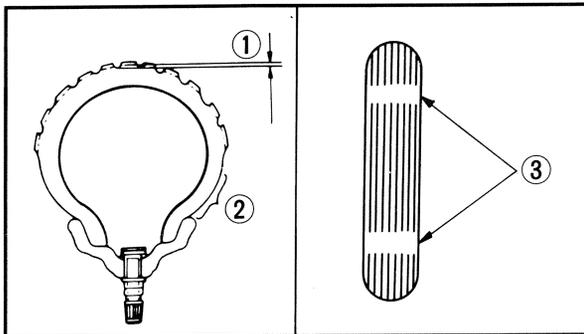
Tire inflation pressure should be checked and adjusted when the temperature of the tire equals the ambient air temperature.

2. Inspect:

- Tire surfaces  
Wear/Damage → Replace.



**Minimum Tire Treads Depth:**  
Front and Rear:  
1.0 mm (0.04 in)



- ① Tread depth
- ② Side wall
- ③ Wear indicator

**WARNING:**

- It is dangerous to ride with a wornout tire. When a tire tread begins to show lines, replace the tire immediately.
- Patching a punctured tube is not recommended. If it is absolutely necessary to do so, use great care and replace the tube as soon as possible with a good quality replacement.



**WHEELS CHECK**

1. Inspect:
  - Wheel  
Crack/bend/warpage → Replace.
  - Spoke  
Tight/Damage → Adjust/Replace.

**WARNING:**

Never attempt even small repairs to the wheel.

**NOTE:**

Always balance the wheel when a tire or wheel has been changed or replaced.

2. Tighten:
  - Valve stem locknut



**Valve Stem Locknut:**  
1.5 Nm (0.15 m·kg, 1.1 ft·lb)

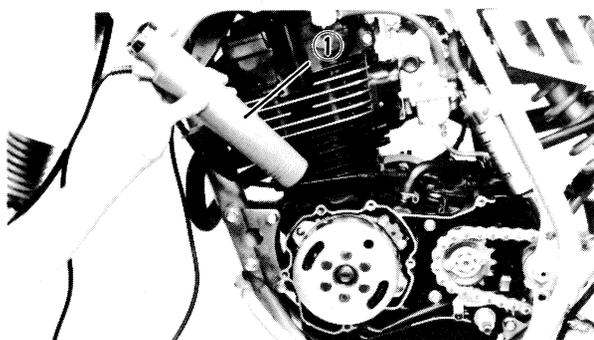
**WARNING:**

Ride conservatively after installing a tire to allow it to seat itself properly on the rim.

**ELECTRICAL**

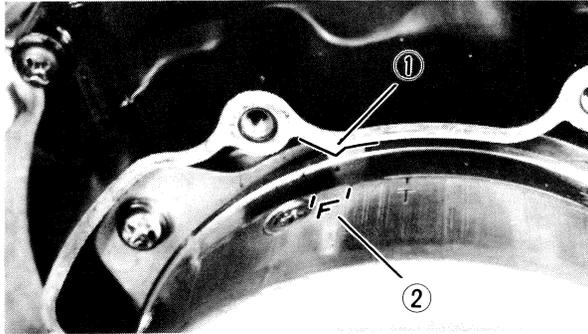
**IGNITION TIMING CHECK**

1. Remove:
  - Footrest (Left)
  - Change pedal
  - Crankcase cover (Left)
2. Connect:
  - Timing Light (YM-33277) ① (to the spark plug lead)



3. Warm up the engine and allow it to idle at the specified speed. Use the tachometer (YU-08036).

	<b>Engine Idle Speed:</b> 1,400 ~ 1,500 r/min
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4. Check:

- Crankcase mark ①

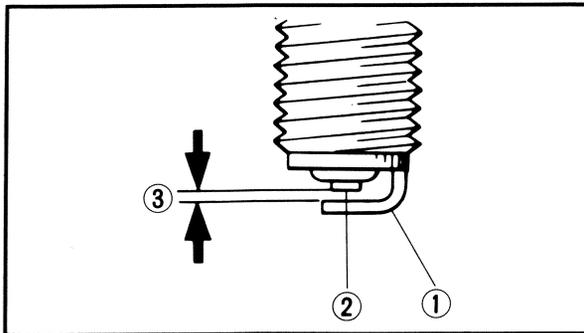
The crankcase mark should be within the "F" ② mark on the flywheel.

Out of range/Unsteady → Check flywheel and pick up assembly for tightness and/or damage.

5. Install:

- Crankcase cover (Left)
- Change pedal
- Footrest (Left)

	<ul style="list-style-type: none"> <li>•Screws (Crankcase Cover): 7 Nm (0.7 m·kg, 5.1 ft·lb)</li> <li>•Bolt (Change Pedal): 10 Nm (1.0 m·kg, 7.2 ft·lb)</li> <li>•Bolts (Footrest): 33 Nm (3.3 m·kg, 24 ft·lb)</li> </ul>
--	---



## SPARK PLUG INSPECTION

1. Inspect:

- Electrode ①  
Wear/Damage → Replace.

•Insulator color ②  
Normal condition is a medium to light tan color.

Distinctly different color → Check the engine condition.

3 Spark plug gap

2. Clean:

- Spark plug  
Clean the spark plug with a spark plug cleaner or wire brush.



3. Inspect:

- Spark plug type  
Incorrect → Replace.

**Standard Spark Plug:**  
**D8EA (NGK), X24ES-U (N.D.)**

4. Measure:

- Spark plug gap  
Out of specification → Regap.  
Use a wire gauge.



**Spark Plug Gap:**  
**0.6 ~ 0.7 mm (0.024 ~ 0.028 in)**

5. Tighten:

- Spark plug

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

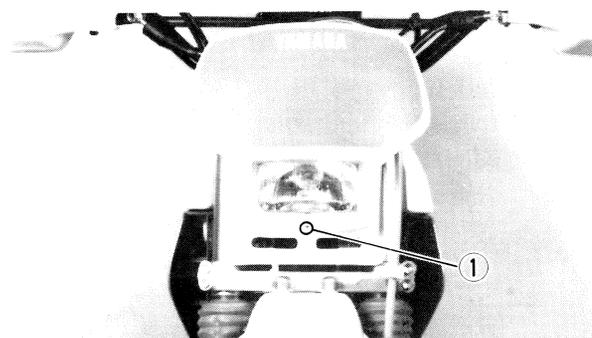
Before installing a spark plug, clean the gasket surface and plug surface.



**Spark Plug:**  
**18 Nm (1.8 m·kg, 13 ft·lb)**

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

If a torque wrench is not available when you are installing a spark plug, a good estimate of the correct torque is 1/4 to 1/2 turns part finger tight. Have the spark plug torqued to the correct value as soon as possible with a torque wrench.

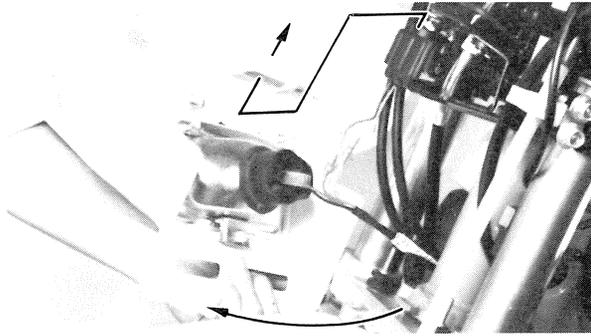


**HEADLIGHT BEAM ADJUSTMENT**

1. Adjust:

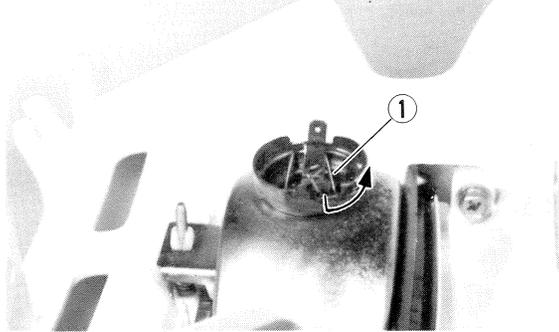
- Headlight beam (Vertically)

	Vertical Adjustment
Higher	Turn the adjusting screw <b>①</b> clockwise.
Lower	Turn the adjusting screw <b>①</b> counterclockwise.



**HEADLIGHT BULB REPLACEMENT**

1. Remove:
  - Headlight assembly
2. Disconnect:
  - Headlight leads

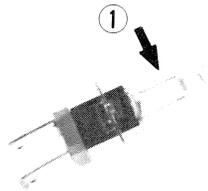


3. Remove:
  - Bulb cover
  - Defective bulbUnhook bulb holder ① and remove bulb.

**WARNING:**

**Do not touch headlight bulb when it is on as bulb generates enormous heat; keep flammable objects away.**

- ① Don't touch



4. Install:
  - Bulb (New)
  - Bulb holder
  - Bulb cover

**CAUTION:**

**Avoid touching glass part of bulb. Also keep it free from oil otherwise, transparency of glass, bulb life and illuminous flux will be adversely affected. If oil gets on bulb, clean it with a cloth moistened thoroughly with alcohol or lacquer thinner.**

5. Connect:
  - Headlight leads
6. Install the headlight assembly and adjust headlight beam.





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## CHAPTER 3. ENGINE OVERHAUL

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## ENGINE OVERHAUL

### ENGINE REMOVAL

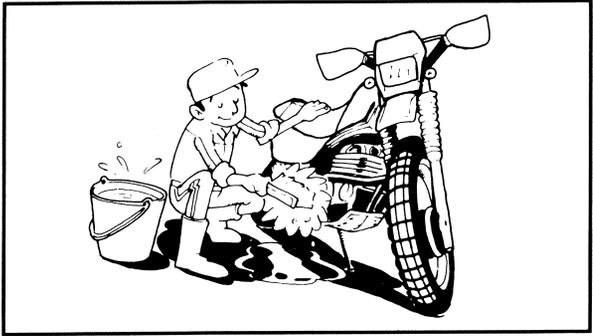
**NOTE:** \_\_\_\_\_

It is not necessary to remove the engine in order to remove the following components.

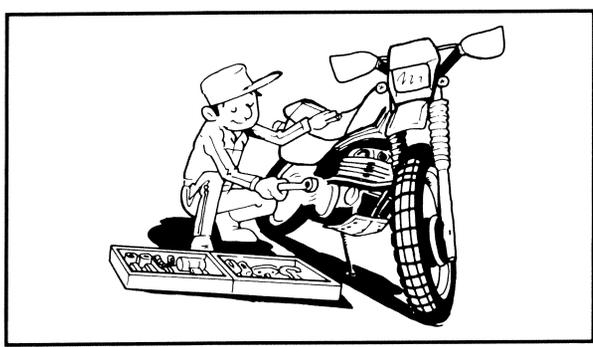
- Piston
- Clutch
- Carburetor
- AC magneto

**PREPARATION FOR REMOVAL**

1. Remove all dirt, mud, and foreign material before removal and disassembly.



2. Use proper tools and cleaning equipment. Refer to CHAPTER 1, "SPECIAL TOOL."



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

When disassembling the engine, keep mated parts together. This includes gears, cylinders, pistons, and other parts that have been "mated" through normal wear. Mated parts must be reused as an assembly or replaced.



3. During the engine disassembly, clean all parts and place them in trays in the order of disassembly. This will speed up assembly time and help assure that all parts are correctly reinstalled in the engine.

4. Drain engine oil completely. Refer to "CHAPTER 2-ENGINE OIL REPLACEMENT" section.

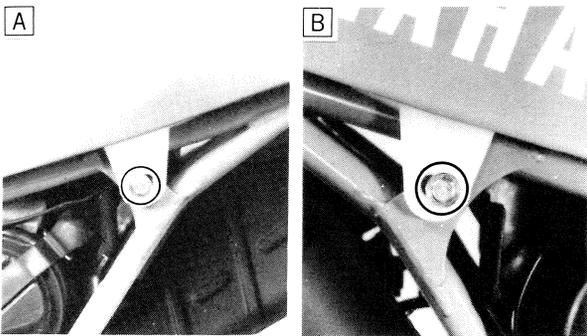
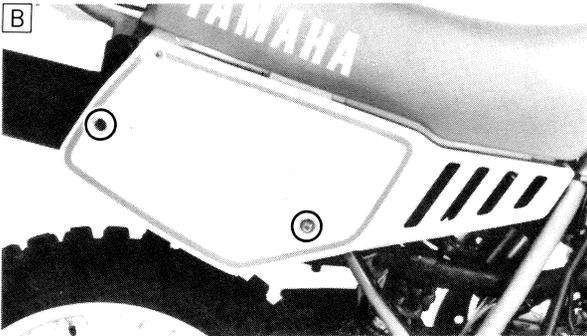




**SEAT, AIR SCOOPS AND FUEL TANK**

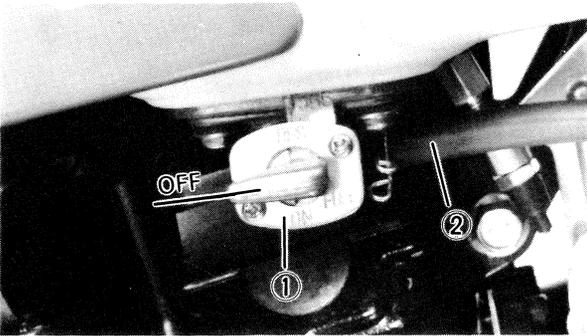
1. Remove:  
Side covers (Left and right)

- A Left side
- B Right side

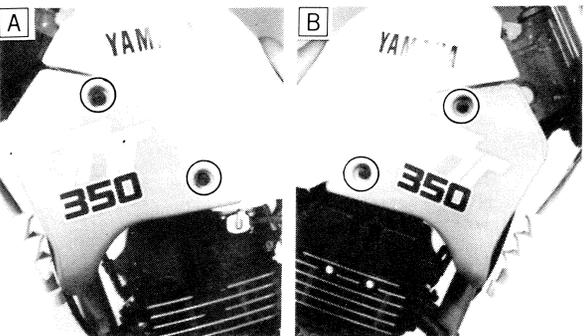


2. Remove:  
Seat

- A Left side
- B Right side

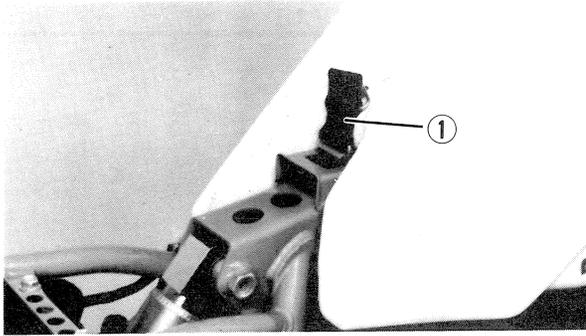


3. Turn the fuel cock ① to the "OFF" position.
4. Disconnect:  
Fuel pipe ②

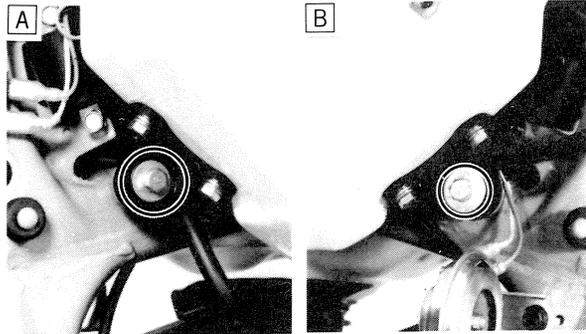


5. Remove:  
Air scoops (Left and right)

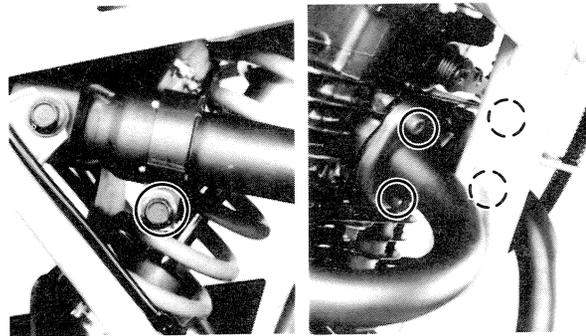
- A Left side
- B Right side



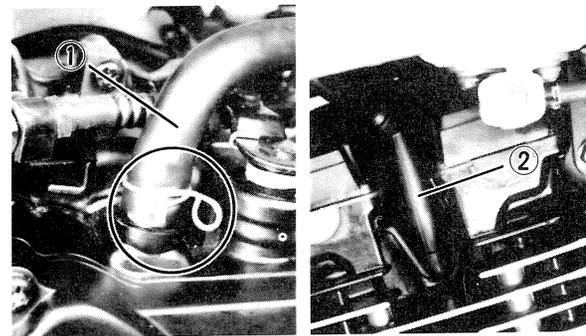
6. Remove:
- Fuel tank
- Unhook the fuel tank holder ①



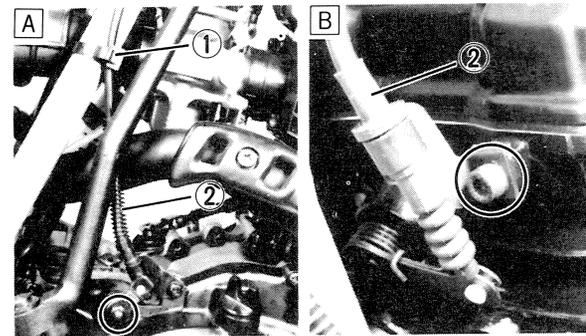
- A Left side  
B Right side



- EXHAUST PIPE**
1. Remove:
- Exhaust pipe

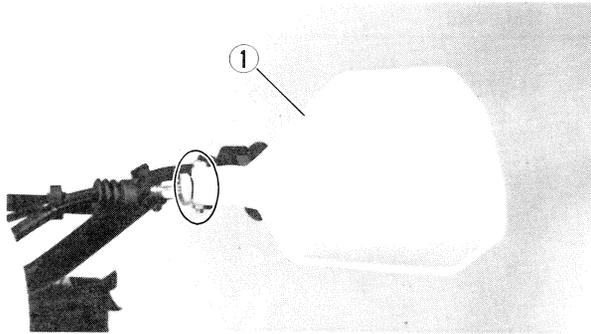


- CABLES AND PIPES**
1. Remove:
- Crankcase Ventilation pipe ①
  - Spark plug cap ②

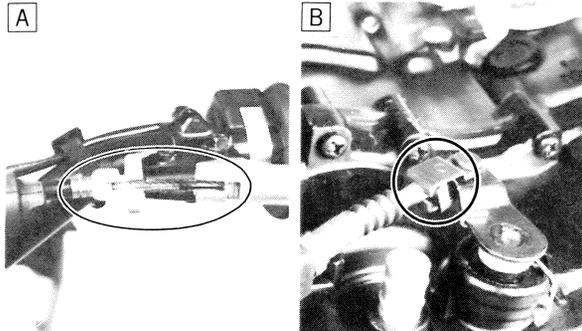


2. Remove:
- Band ① (Decompression Cable)
  - Decompression Cable ②

- A Cylinder head side  
B Right Crankcase side

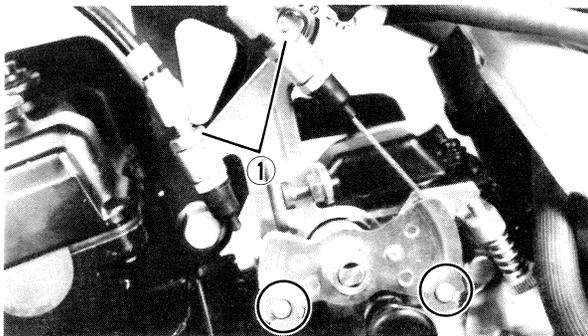


3. Remove:
  - Bush guard ① (Left)
4. Loosen:
  - Clutch cable adjuster

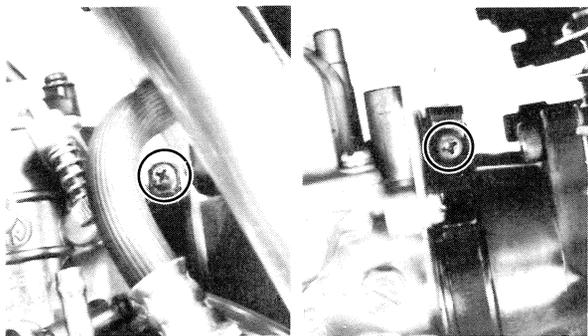


5. Remove the clutch cable ends from the clutch lever and push lever.

- A** Clutch lever side
- B** Push lever side

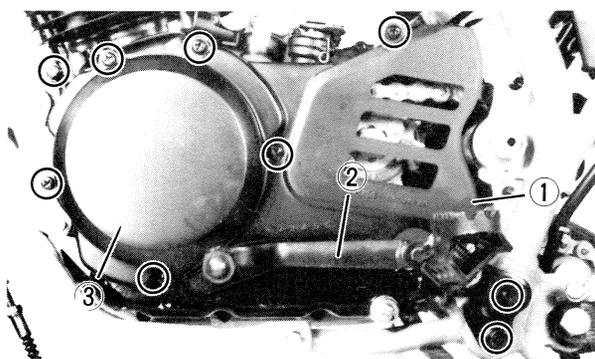


6. Loosen the throttle cable adjuster lock nuts ① and remove the throttle cable ends from the carburetor.



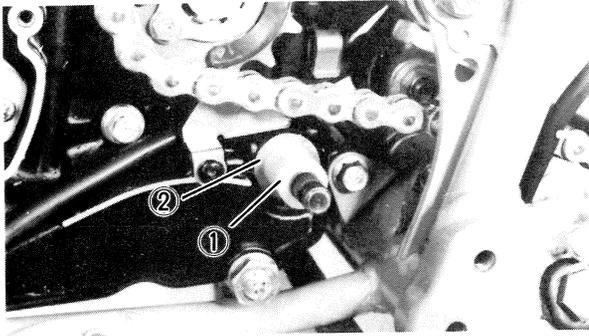
## CARBURETOR

1. Loosen:
  - Screws
2. Remove:
  - Carburetor



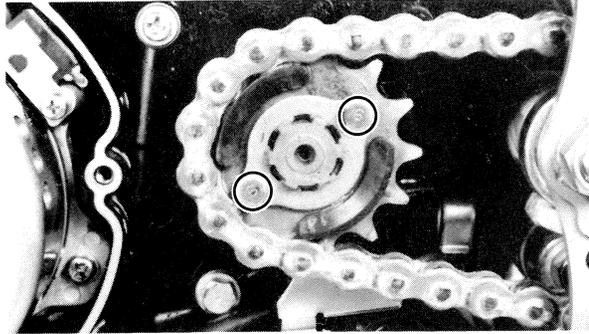
## DRIVE CHAIN

1. Remove
  - Footrest ① (Left)
  - Change pedal ②
  - Crankcase cover ③ (Left)



## 2. Remove:

- Spacer ① (Shift shaft)
- Plain washer ② (shift shaft)



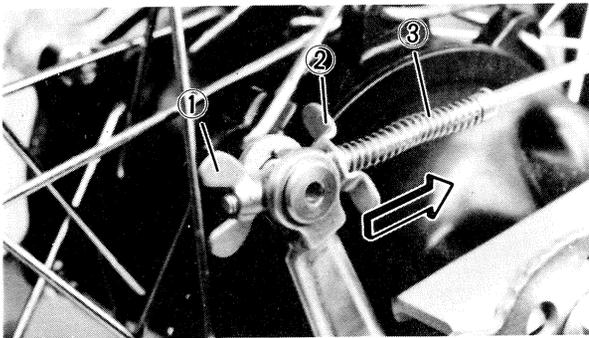
## 3. Loosen:

- Bolts (Drive sprocket)

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

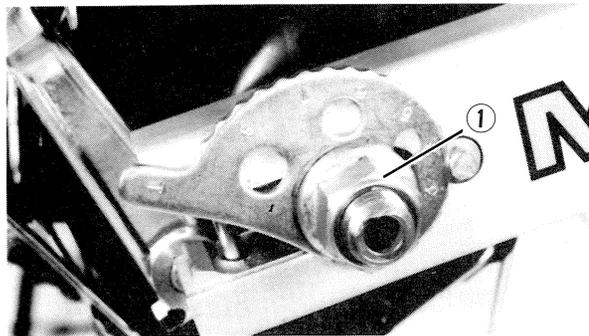
Apply the rear brake.

---



## 4. Remove:

- Rear brake adjuster ①
- Spring holder ②
- Spring ③



## 5. Loosen

- Rear axle nut ①

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

Move the rear wheel forward and loosen the drive chain.

---

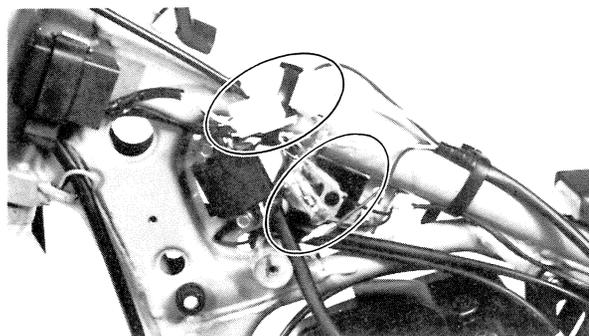
## 6. Remove:

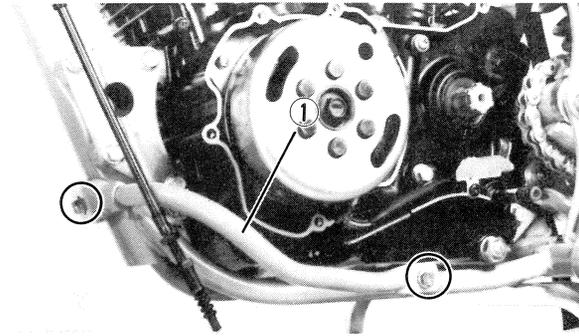
- Drive sprocket

**CDI MAGNETO LEADS**

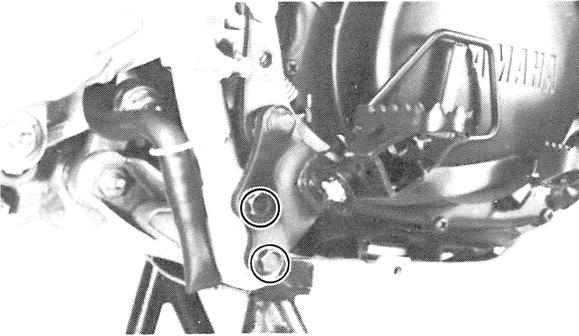
## 1. Disconnect:

- CDI magneto leads

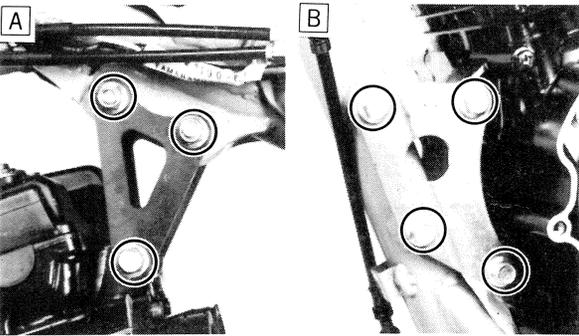


**ENGINE GUARD**

1. Remove:
  - Engine guard ①

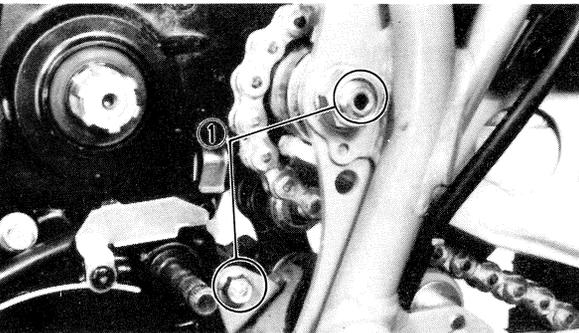
**ENGINE REMOVAL**

1. Remove
  - Footrest (with brake pedal)

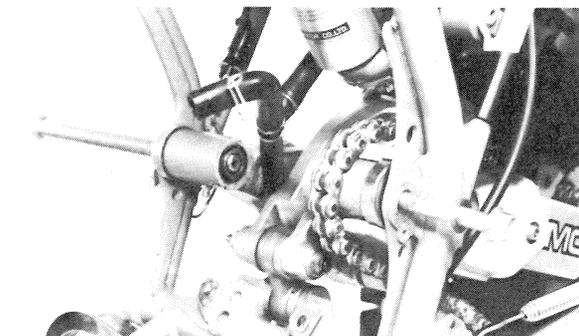


2. Remove:
  - Mounting bolts (Upper)
  - Mounting bolts (Front)

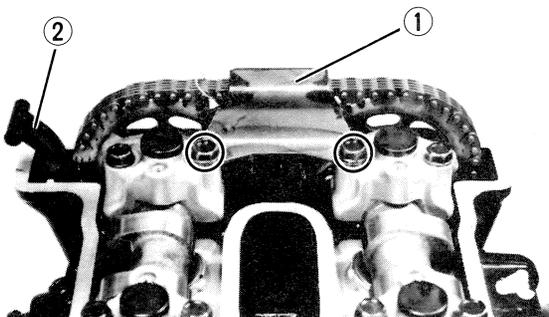
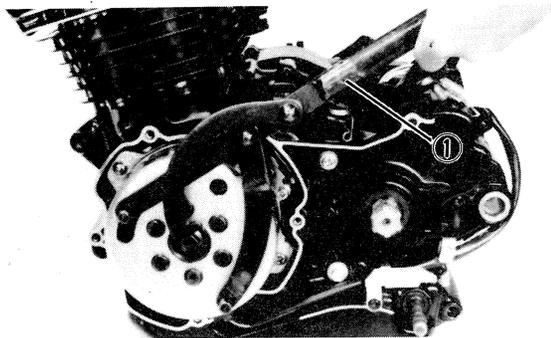
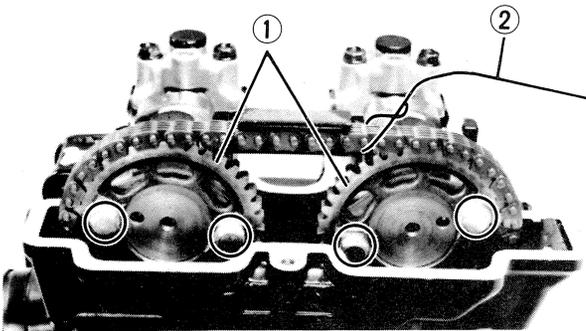
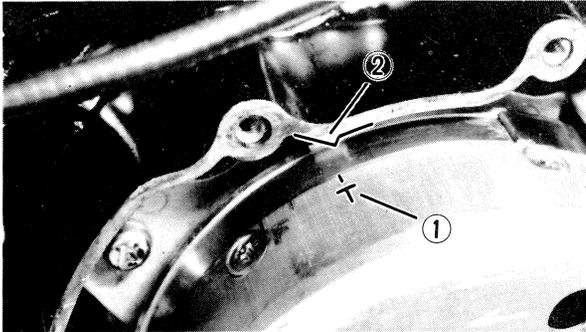
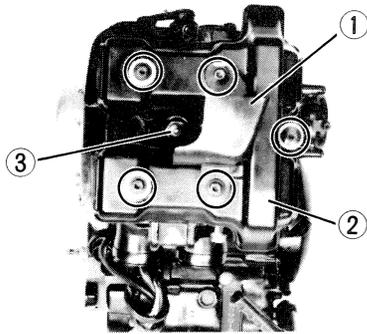
- A** Upper  
**B** Front



3. Remove:
  - Mounting bolts ① (Rear)
  - Engine assembly.  
(To right side)

**NOTE:**

The engine and rear arm are installed using the same pivot shaft. Therefore, take care so that the pivot shaft is pulled, not entirely out, but far enough to set the engine free.



## ENGINE DISASSEMBLY

### CAMSHAFT, CYLINDER HEAD AND CYLINDER

#### 1. Remove:

- Air baffle plate ①
- Cylinder head cover ②
- Spark plug ③

#### 2. Turn:

- Camshafts

#### 3. Align:

- Flywheel "T" mark ①  
(with the crankcase mark ②)

#### 4. Remove:

- Sprockets ①

#### NOTE:

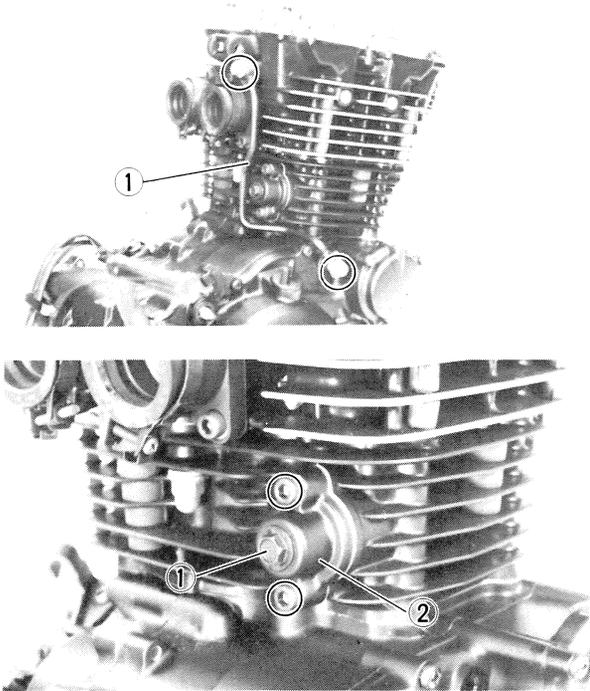
Fasten safety wire ② to the cam chain to prevent it from falling into the crankcase.

#### NOTE:

If difficult to loosen the cam sprocket securing bolts; hold the flywheel magneto with the rotor holding tool ① (YU-01235).

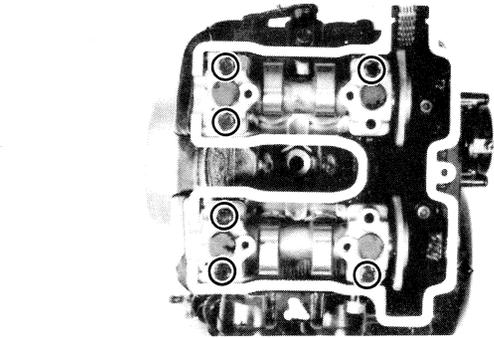
#### 5. Remove:

- Upper chain guide ①
- Exhaust side chain guide ②



6. Remove:
- Oil Pipe ①

7. Remove:
- Blind bolt ①
  - Tensioner assembly ②

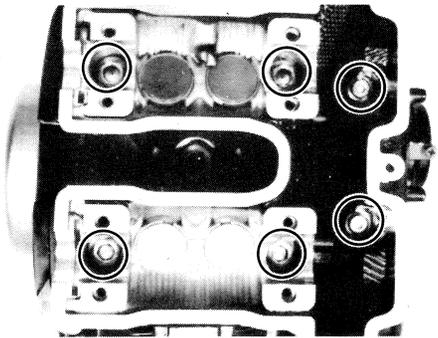


8. Remove:
- Cam caps
  - Camshafts
  - Dowel pins

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

Do not rotate the camshaft or valve damage may occur.

\_\_\_\_\_

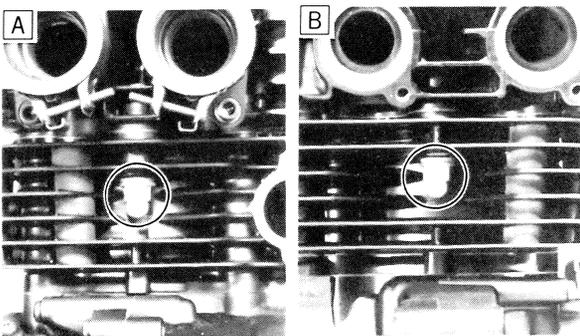


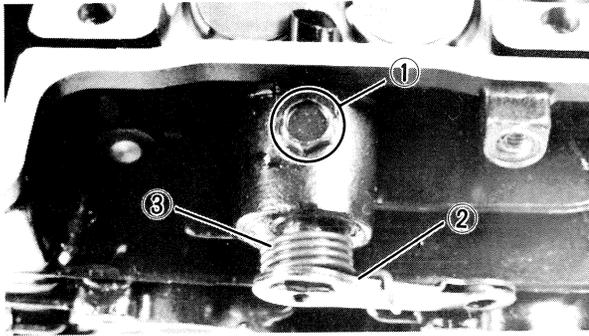
9. Remove:
- Cylinder head

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

Loosen the bolts and nuts in their proper loosening sequence.

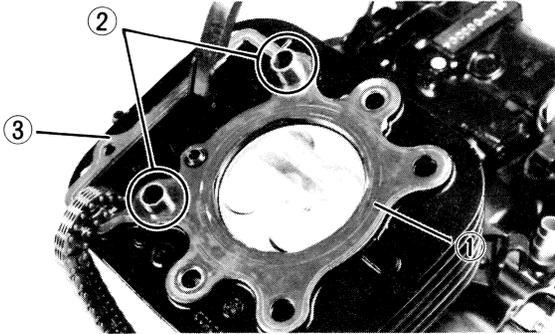
\_\_\_\_\_





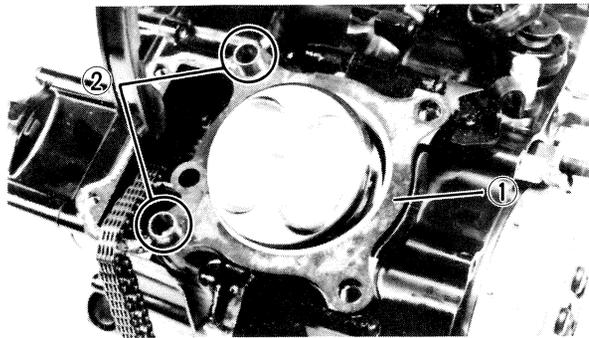
10. Remove:

- Bolt ①
- Decompression cam ②
- Spring ③



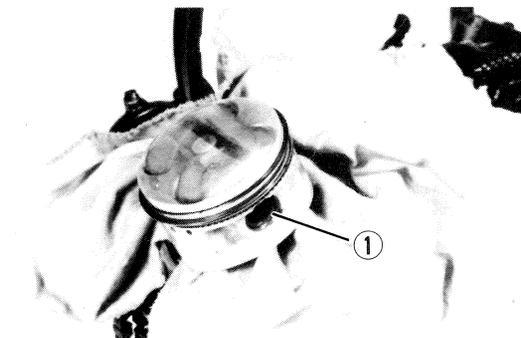
11. Remove:

- Cylinder head gasket ①
- Dowel pins ②
- Cylinder ③



12. Remove:

- Cylinder gasket ①
- Dowel pins ②



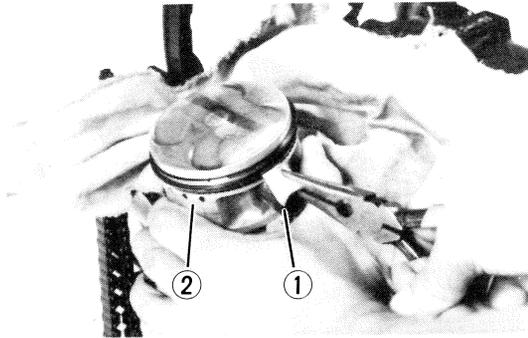
### PISTON

1. Remove:

- Piston pin circlip ①

#### NOTE:

Before removing piston pin circlip, cover crankcase with a clean rag to prevent circlip from falling into crankcase cavity.



2. Remove:

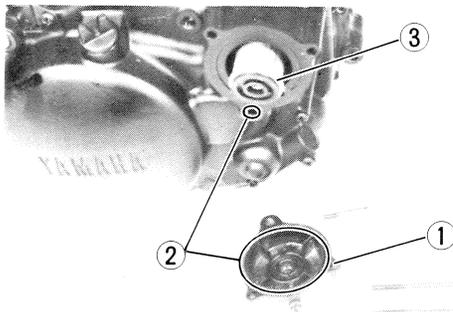
- Piston pin ①
- Piston ②

**NOTE:**

Before removing the piston pin, deburr the clip grooved and pin hole area. If the piston pin groove is deburred and piston pin is still difficult to remove, use Piston Pin Puller (YU-01304).

**CAUTION:**

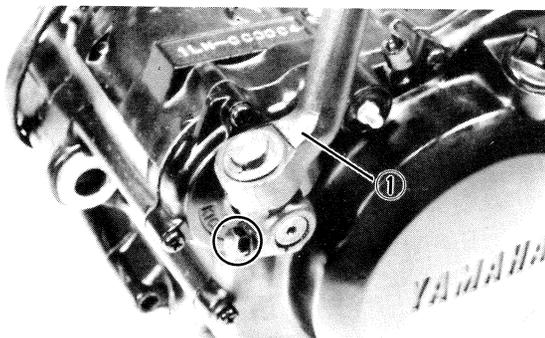
Do not use a hammer to drive the piston pin out.



**OIL FILTER**

1. Remove:

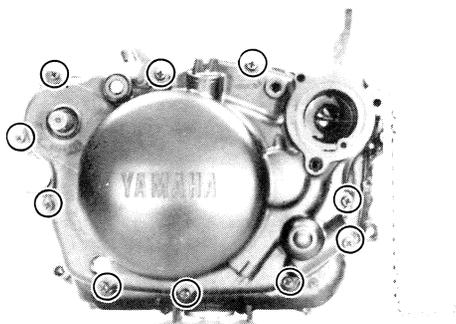
- Oil filter cover ①
- O-rings ②
- Oil filter ③



**RIGHT CRANKCASE COVER**

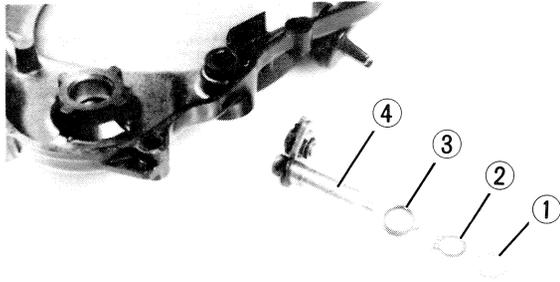
1. Remove:

- Kick crank assembly ①

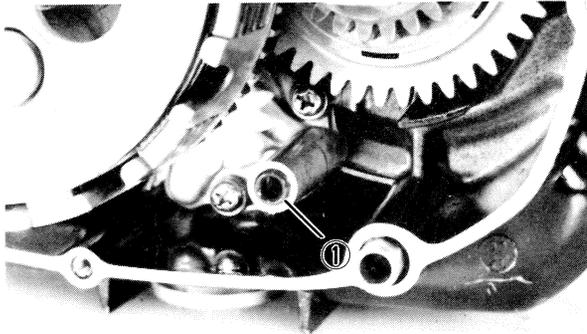


2. Remove:

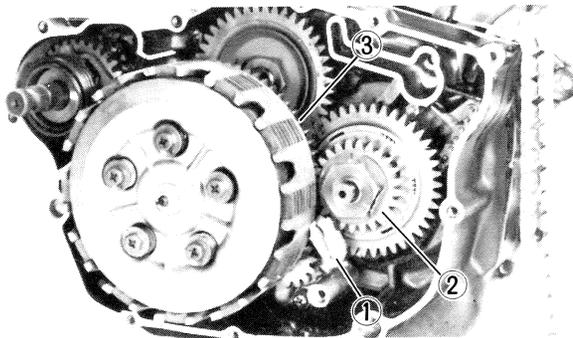
- Right crankcase cover
- Gasket
- Dowel pins



3. Remove:
- Washer ①
  - Circlip ②
  - Torsion spring ③
  - Decompression lever ④

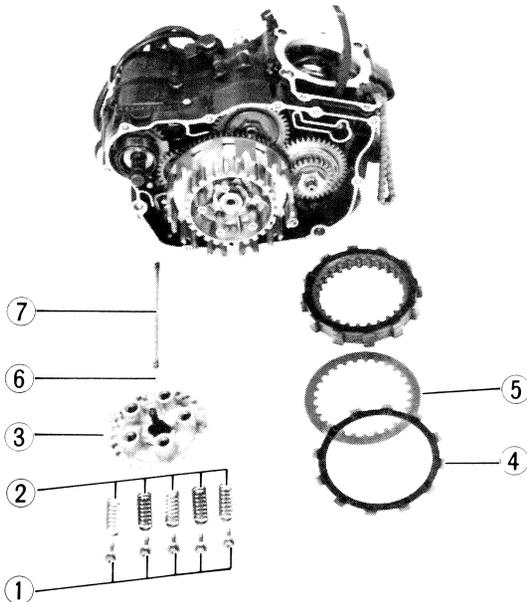


4. Remove:
- O-ring ①

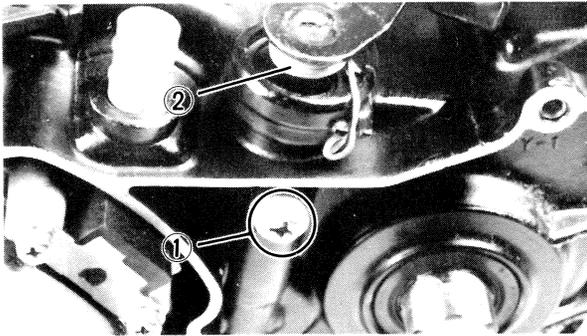


**CLUTCH**

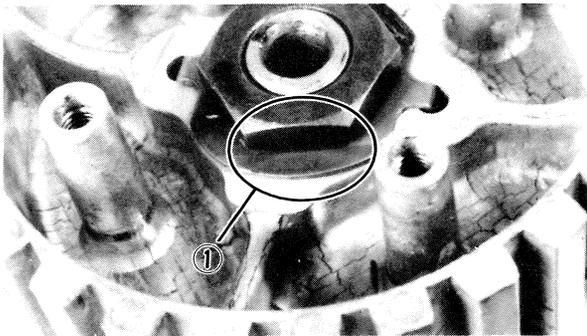
1. Place a folded rag ① between the teeth of drive gear ② and driven gear ③ to lock them.



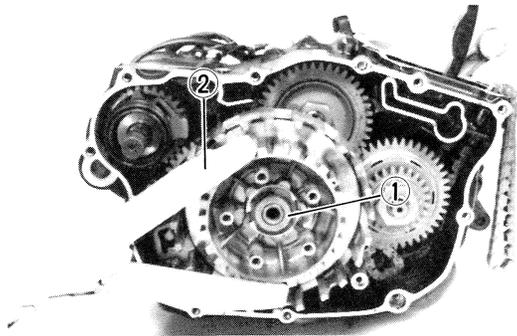
2. Remove:
- Clutch spring holding screws ①
  - Clutch springs ②
  - Pressure plate assembly ③
  - Friction plates ④
  - Clutch plates ⑤
  - Push rod ball ⑥
  - Push rod #2 ⑦



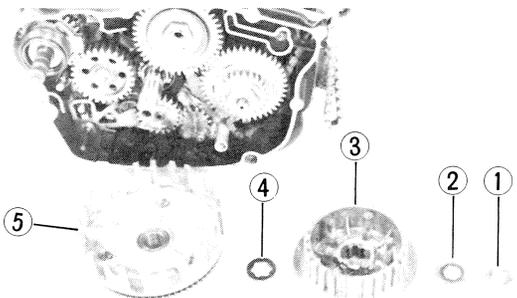
3. Remove:
- Screw ①
  - Clutch push lever axle assembly ②



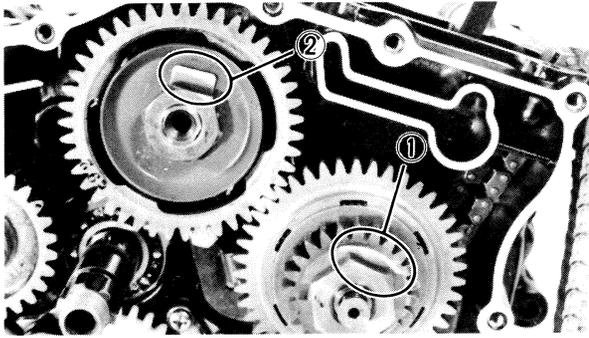
4. Straighten:
- Lock washer tab ①



5. Loosen:
- Clutch boss securing nut ①
  - Use Universal Clutch Holder ② (YM-91042).



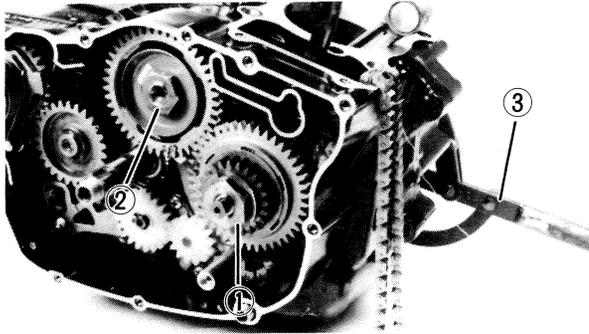
6. Remove:
- Clutch boss securing nut ①
  - Lock washer ②
  - Clutch boss ③
  - Washer ④
  - Primary driven gear assembly ⑤



**PRIMARY DRIVE GEAR AND BALANCER DRIVEN GEAR**

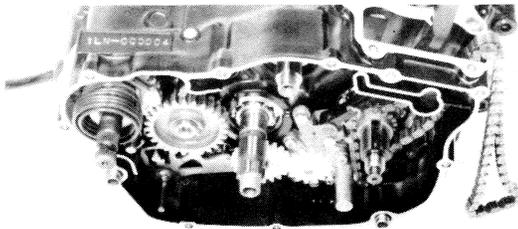
1. Straighten:

- Lock washer tab ① (Primary drive gear)
- Lock washer tab ② (Balancer driven gear)



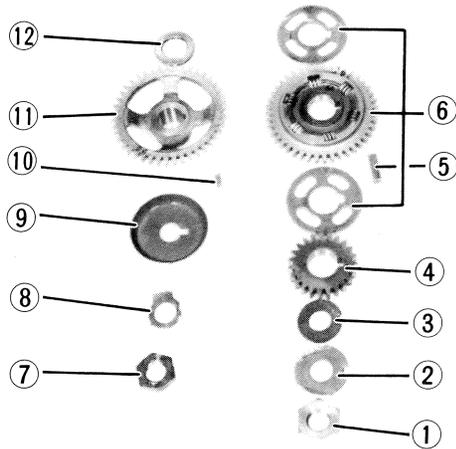
2. Loosen:

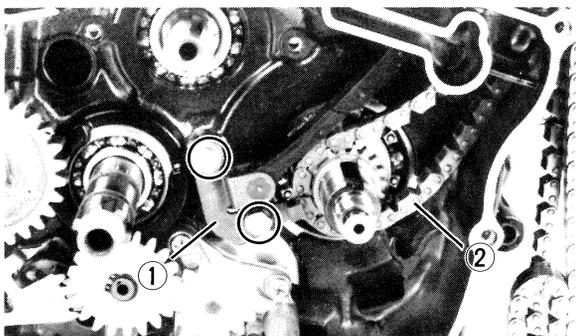
- Primary drive gear securing nut ①
- Balancer driven gear securing nut ②
- Use Rotor Holding Tool (YU-01235) ③



3. Remove:

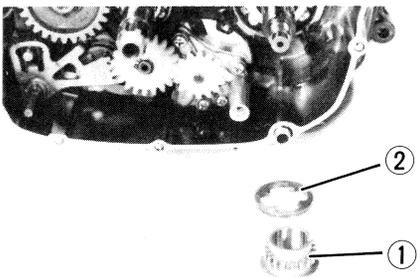
- Nut ①
- Lock washer ②
- Washer ③
- Primary drive gear ④
- Key ⑤
- Balancer drive gear assembly ⑥
- Nut ⑦
- Lock washer ⑧
- Breather plate ⑨
- Key ⑩
- Balancer driven gear ⑪
- Washer ⑫



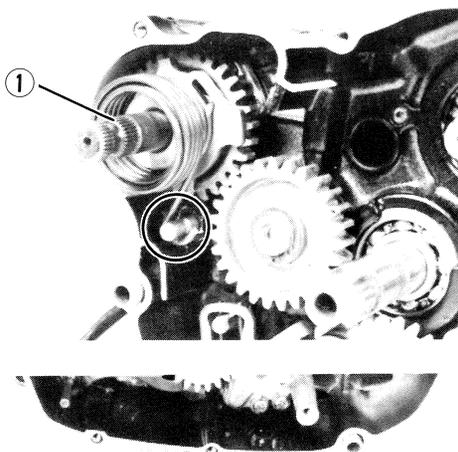


**INTAKE SIDE CHAIN GUIDE AND CAM CHAIN**

1. Remove:
  - Intake side chain guide ①
  - Cam chain ②

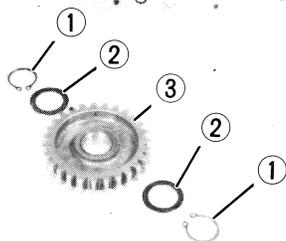


2. Remove:
  - Chain drive gear ①
  - Washer ②

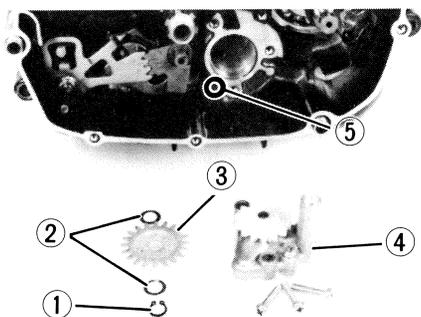


**KICK AXLE AND IDLE GEAR**

1. Unhook the kick spring from its position.
2. Remove:
  - Kick axle assembly ①
  - Rotate the shaft counterclockwise.
  - Plane washer

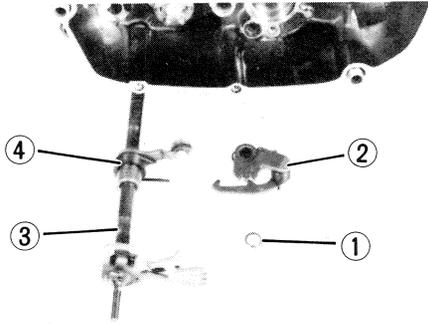


3. Remove:
  - Circlips ①
  - Washers ②
  - Kick idle gear ③



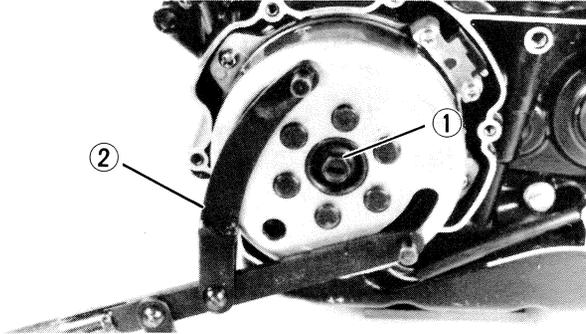
**OIL PUMP**

1. Remove:
  - Circlip ①
  - Washers ②
  - Oil pump idle gear ③
  - Oil pump assembly ④
  - O-ring ⑤



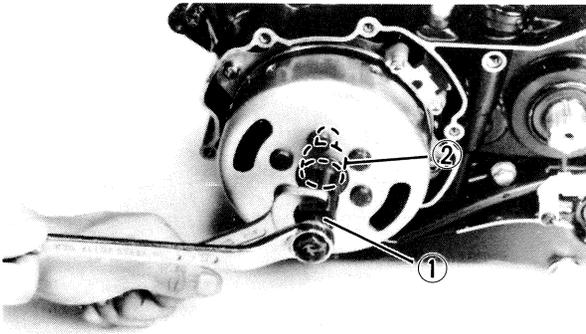
**CHANGE LEVER**

1. Remove:
  - Circlip ①
  - Change lever ②
  - Change lever assembly ③
  - Stopper lever 4

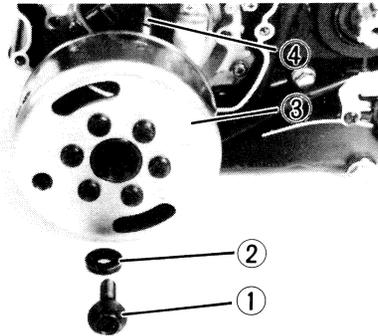


**CDI MAGNETO**

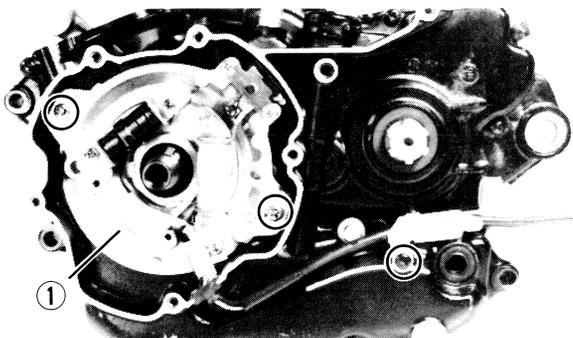
1. Loosen:
  - Bolt ①Use Rotor Holding Tool ② (YU-01235).



2. Attach:
  - Flywheel puller ① (YM-01189)
  - Adapter ② (YM-01382)



3. Remove:
  - Bolt ①
  - Plate washer ②
  - CDI Rotor ③
  - Key ④



4. Remove:
  - CDI Base plate assembly ①

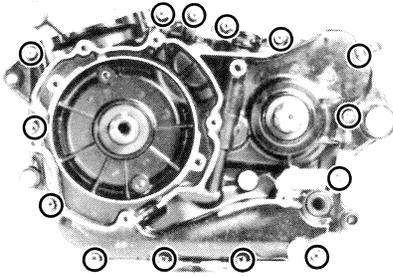
**CRANKCASE**

1. Remove:

- Crankcase holding screws

**NOTE:**

Loosen each screw 1/4 turn, and remove them after all are loosened.

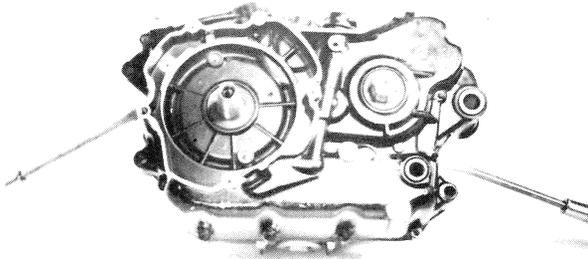


2. Remove:

- Right crankcase  
(using two screw drivers)

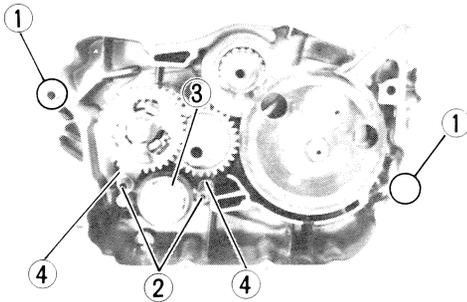
**NOTE:**

As pressure is applied, alternately tap on the balancer shaft, transmission shafts, and shift cam.



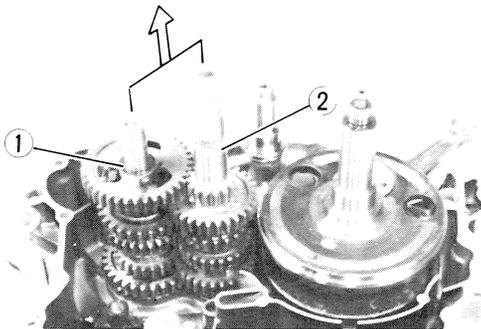
3. Remove:

- Dowel pins ①
- Shift shafts ②
- Shift cam ③
- Shift forks ④



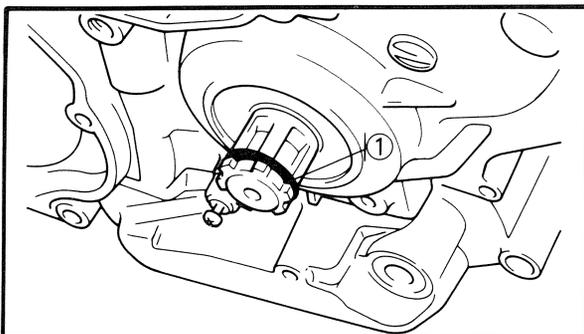
4. Remove:

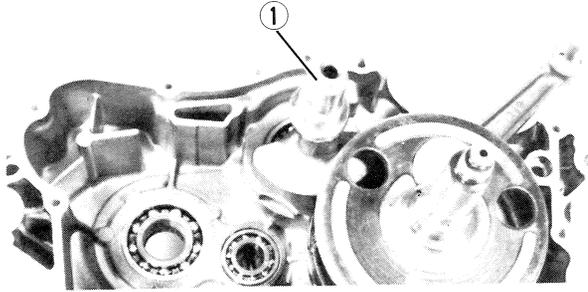
- Drive axle ① and main axle ② assembly



**NOTE:**

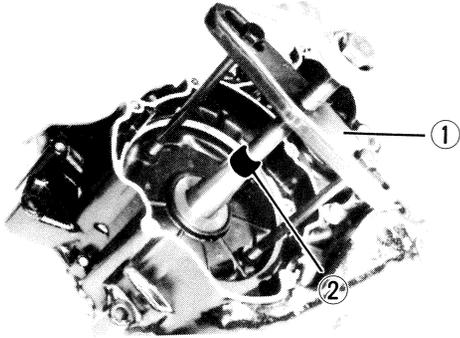
When removing the drive axle from the crankcase, pay attention to the crankcase oil seal lip. A recommended practice is to fit the "O-ring" ① in the drive axle groove and apply grease over the fitted area before removing drive axle.





5. Remove:

- Balancer shaft ①



6. Remove:

- Crankshaft  
Use Crankcase Separator ① (YU-01135)  
and Flywheel Puller Attachment (YM-1382) ② .

## BEARINGS AND OIL SEALS

### NOTE:

- It is not necessary to remove bearings and oil seals unless damaged. See Bearings and oil seals (INSPECTION AND REPAIR.)
- To facilitate bearing removal and installation, first heat the cases to approximately 95° ~ 125°C (205° ~ 257°F) using an oven. Bring the case up to proper temperature slowly.

1. Remove:

- Oil seals

### CAUTION:

- Use a screwdriver to pry out the seal.
- Place a piece of wood under the screwdriver to prevent damage to the case.

2. Remove:

- Bearings



## INSPECTION AND REPAIR

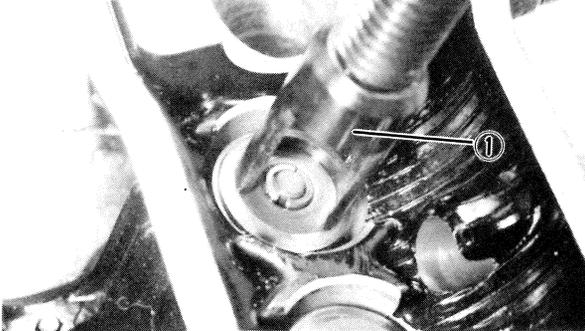
## CYLINDER HEAD

## 1. Remove:

- Valve pads
- Lifters

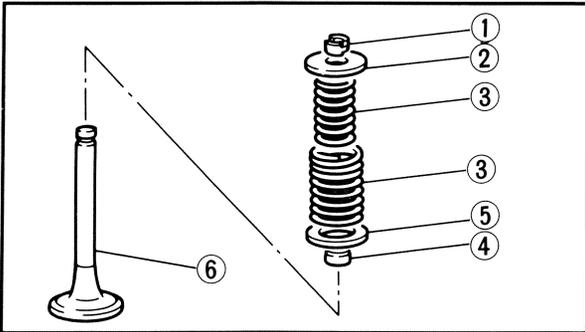
**NOTE:** \_\_\_\_\_

Identify each lifter and pad position very carefully so that it can be reinstalled in its original place.



## 2. Attach:

- Valve Spring Compressor (YM-04019) ①

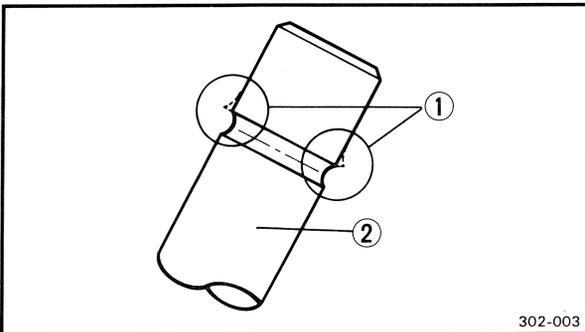


## 3. Remove:

- Valve retainers ①
- Valve spring seat ②
- Valve springs ③
- Oil seal ④
- Valve spring seat ⑤
- Valve ⑥

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

Deburr any deformed valve stem end. Use an oil stone to smooth the stem end.



- ① Deburr
- ② Valve stem

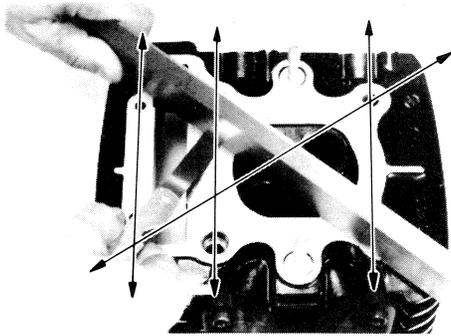
## 4. Eliminate:

- Carbon deposit  
(from combustion chamber)
- Use rounded scraper.

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

Do not use a sharp instrument and avoid damaging or scratching:

- Spark plug threads
- Valve seat
- Aluminum



5. Measure:

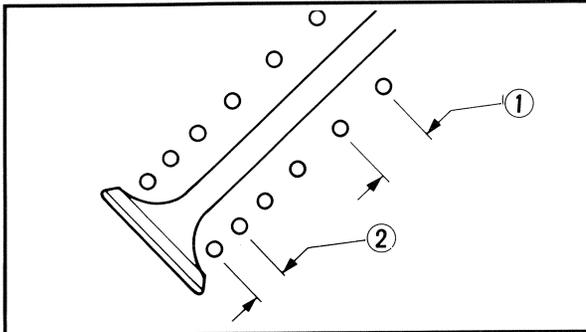
- Warpage

Exceeds allowable limit → Resurface.



**Cylinder Head Warpage:**

Less than 0.03 mm (0.0012 in)



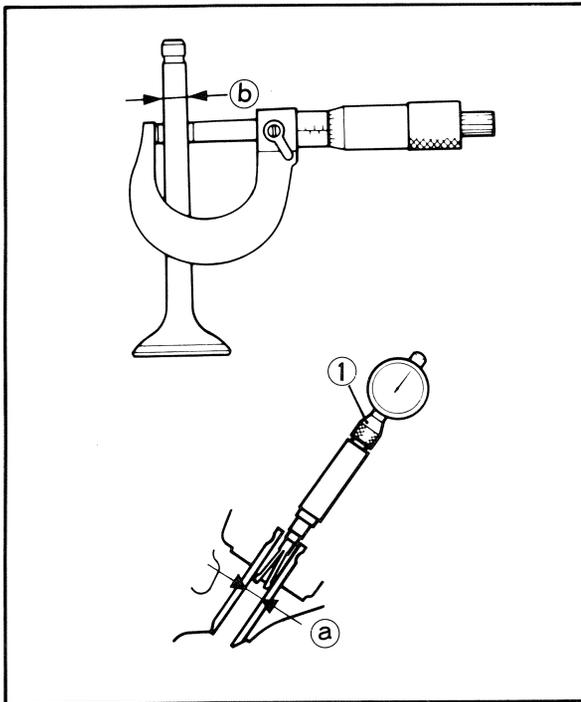
6. Install:

- Valve springs

② Smaller pitch

**NOTE:**

All valve springs must be installed with the larger pitch ① upward as shown.



**VALVE, VALVE GUIDE, VALVE SEATS AND VALVE SPRING**

1. Measure:

- Valve stem clearance

Valve stem clearance =

$$\text{Valve guide inside diameter (a)} - \text{Valve stem diameter (b)}$$

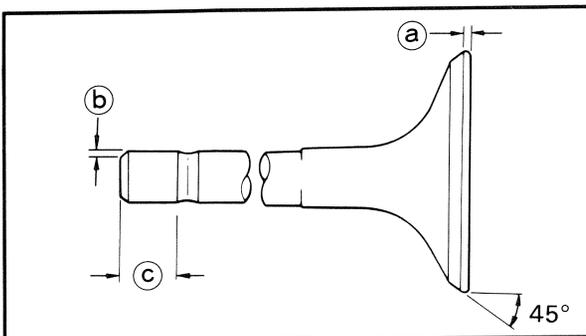
Out of specification → Replace valve guide.



**Valve stem clearance**

<b>Intake</b>	<b>0.010~0.037mm (0.0004 ~ 0.0014 in.)</b>
<b>Exhaust</b>	<b>0.025~0.040mm (0.0010~0.0016in.)</b>

① Bore gauge



4. Measure:

- Valve face:

Pitting/Wear → Regrind.

Out of specification → Replace.



Minimum Thickness (Service limit) (a) :

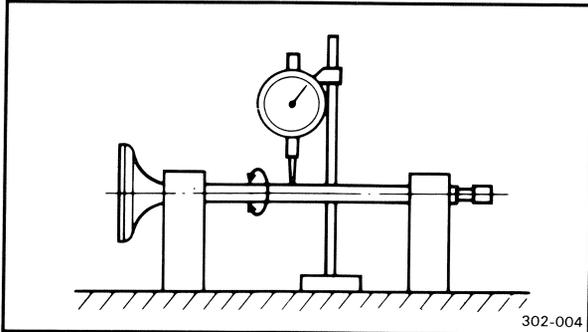
0.7 mm (0.028 in)

Beveled (b) :

0.5 mm (0.020 in)

Minimum Length (Service limit) (c) :

4.0 mm (0.157 in)



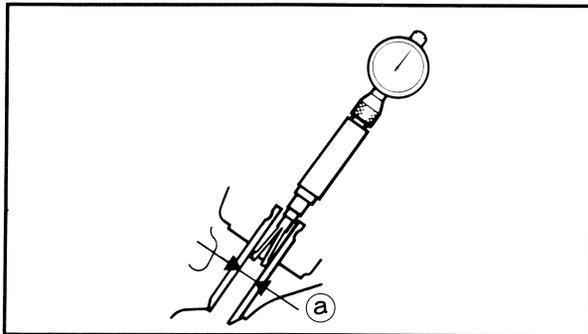
3. Check:

- Valve stem end  
Mushroom shape or diameter larger than rest or stem → Replace.
- Runout  
Out of specification → Replace.



Maximum Valve Stem Runout:

0.01 mm (0.0004 in)



4. Measure:

- Valve guide (inside diameter) (a)  
Out of specification → Replace.



Valve Guide Inside Diameter:

5.500 ~ 5.512 mm

(0.216 ~ 0.217 in)

5. Inspect:

- Valve guide  
Wear/Oil leakage → Replace.

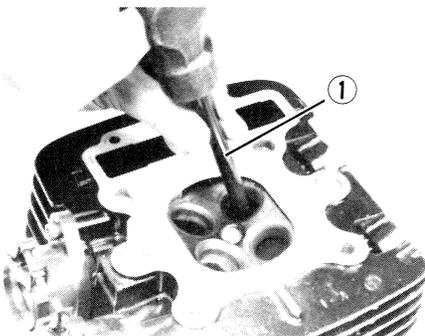
**NOTE:**

Heat the cylinder head in an oven to 100°C (212°F) to ease valve guide removal and reinstallation and to maintain correct interference fit.

**Valve Guide Replacement**

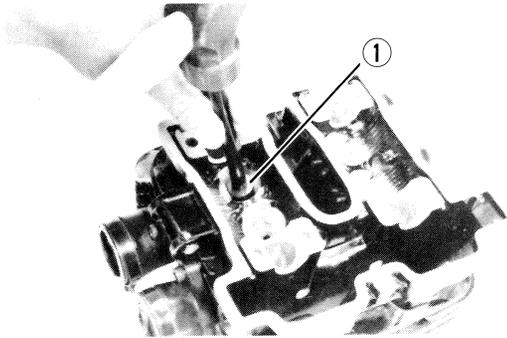
1. Remove:

- Valve guide  
Use Valve Guide remover (YM-01122) (1).



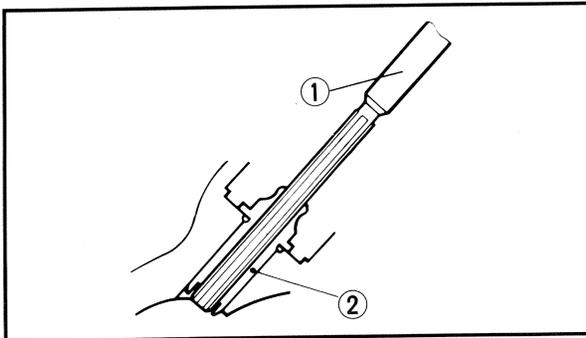
**NOTE:**

- Always replace guide if valve is replaced.
- Always replace oil seal if valve is removed.



2. Install:

- Valve guide (new)
- Use Valve Guide Installer (YM-4015) ①.



3. Bore valve guide ② to obtain proper valve stem clearance.

- Use 5.5 mm Reamer (YM-01196) ①.

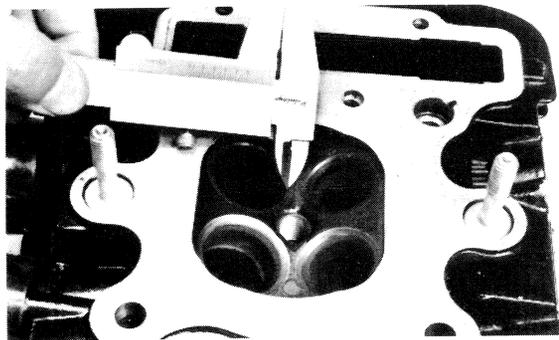
**Valve Seat**

1. Inspect:

- Valve seat
- Pitting/Wear → Cut.

2. Measure:

- Valve seat width
- Out of specification → Follow next steps.



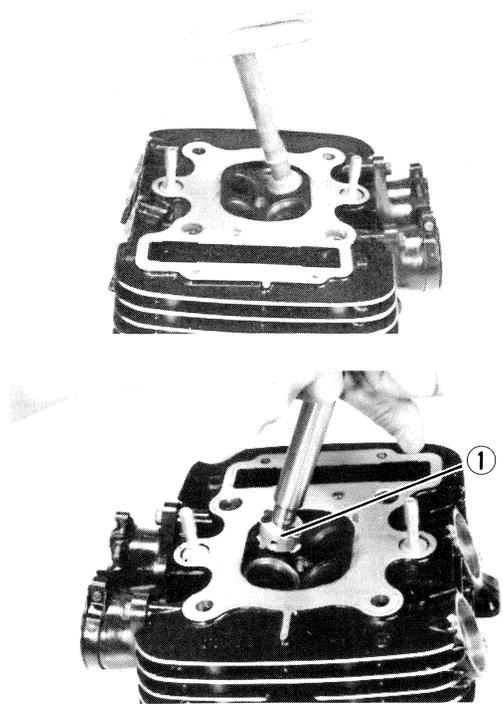
	Standard width	Wear limit
Valve Seat Width	0.9 ~ 1.1 mm (0.035 ~ 0.043 in)	1.8mm (0.07 in)

3. Apply:

- Mechanic's bluing dye (Dykem)  
(to valve and seat)
- Fine grinding compound (Small amount)  
(to valve face surface)

4. Position:

- Valve  
(into cylinder head)



5. Spin it rapidly back and forth, then lift valve and clean off all grinding compound.

6. Inspect:

- Valve seat surface

Wherever valve seat and valve face made contact, bluing will have been removed.

7. Measure:

- Valve seat width

Valve seat width must be uniform in contact area.

Out of specification → Cut.

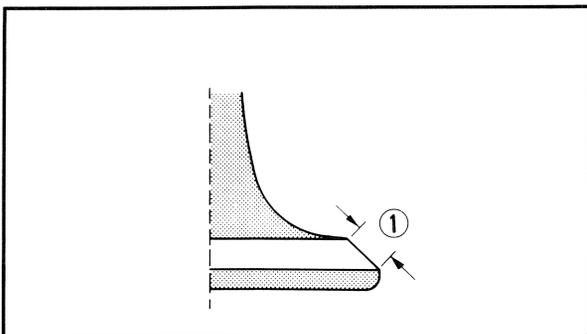
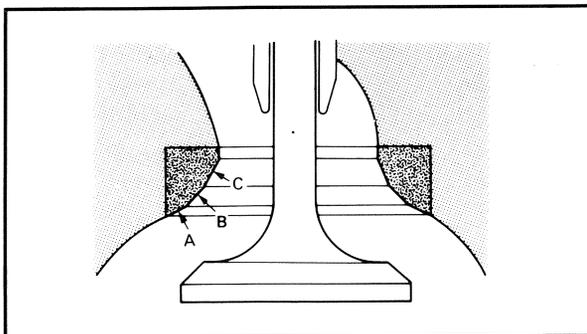
8. Cut valve seat.

**NOTE:**

Cut valve seat using valve seat cutter ① if valve seat width exceeds limit or if valve seat is pitted or worn.

**CAUTION:**

When twisting cutter, keep an even downward pressure to prevent chatter marks.



**Valve seat recutting steps are necessary if:**

- Valve seat is uniform around perimeter of valve face but too wide or too narrow or not desired position on valve face.

Cut valve seat as follows:

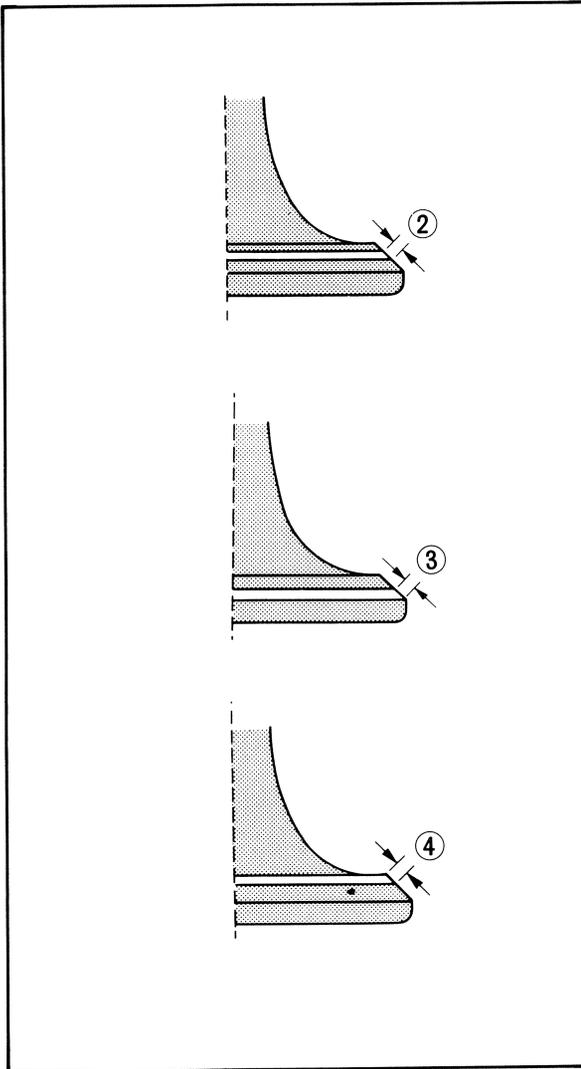
Section A 20° Cutter

Section B 45° Cutter

Section C 60° Cutter

- Valve face indicates that valve seat is desired position but too wide. ① .

Valve seat cutter set		Desired result
Use	20° Cutter	to reduce valve seat width.
	60° Cutter	



- Valve seat is desired position but too narrow ② .

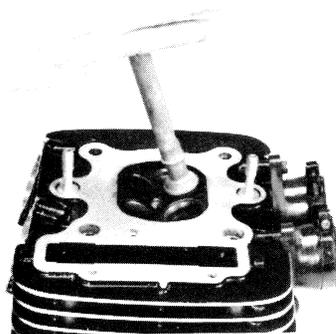
Valve seat cutter set		Desired result
Use	45° Cutter	to achieve a uniform valve seat width (Standard specification).

- Valve seat is too narrow and touching the valve margin ③ .

Valve seat cutter set		Desired result
Use	20° Cutter, first	to obtain correct seat width.
	45° Cutter	

- Valve seat is too narrow and touching the bottom edge of the valve face ④ .

Valve seat cutter set		Desired result
Use	60° Cutter, first	to obtain correct seat width.
	45° Cutter	



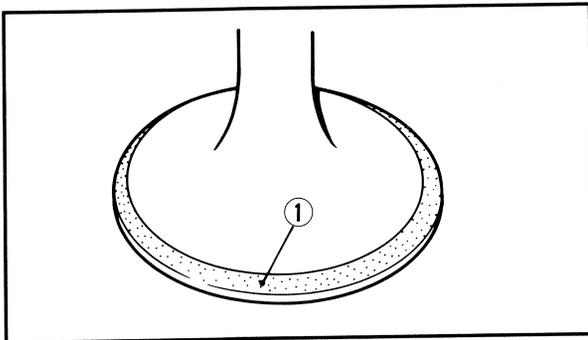
**NOTE:**

Lap valve/valve seat assembly if:

- Valve face/valve seat are used or severely worn.
- Valve and valve guide has been replaced.
- Valve seat has been cut.

**Valve/Valve Seat Assembly Lapping**

1. Apply:
  - Coarse lapping compound (Small amount)  
(to valve face)
2. Position
  - Valve  
(in cylinder head)
3. Rotate:
  - Valve  
Turn until valve and valve seat are evenly polished, then clean off compound.
4. Repeat above steps with fine compound and continue lapping until valve face shows a completely smooth surface uniformly.



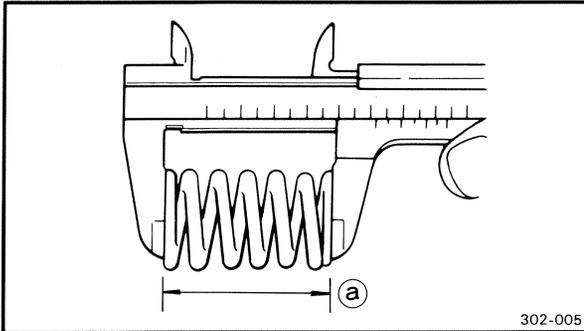
5. Eliminate:
  - Compound  
(from valve face)
6. Apply:
  - Mechanic's bluing dye (Dykem) ①  
(to valve face and seat)
7. Rotate:
  - Valve  
Valve must make full seat contact indicated by grey surface all around valve face where bluing was removed.
8. Apply:
  - Solvent  
(into each intake and exhaust port)  
Leakage past valve seat → Replace valve until seal is complete.

**NOTE:** \_\_\_\_\_  
Pour solvent into intake and exhaust ports only after completion of all valve work and assembly of head parts.  
\_\_\_\_\_

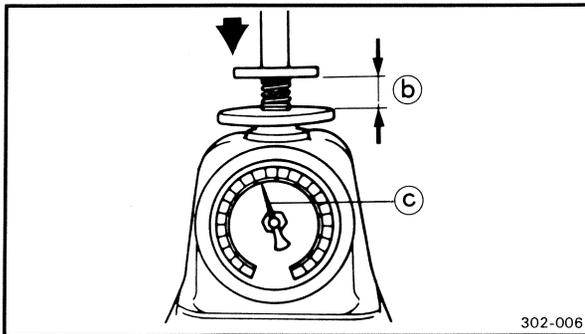


**Relaping steps:**

- Reassemble head parts.
- Repeat lapping steps using fine lapping compound.
- Clean all parts thoroughly.
- Reassemble and check for leakage again using solvent.
- Repeat steps as often as necessary to effect a satisfactory seal.



302-005



302-006

**Valve Spring Measurement**

1. Measure:

- Valve spring free length (a)  
Out of specification → Replace.



**Valve spring free length (a):**

Inner spring		Outer spring	
Standard	Wear limit	Standard	Wear limit
38.1 mm (1.50 in)	37.7 mm (1.49 in)	41.2 mm (1.62 in)	40.7 mm (1.61 in)

2. Measure:

- Valve spring installed force (c)  
Out of specification → Replace.

(b) Installed length



**Valve spring installed force**

Inner spring		Outer spring	
(b)	(c)	(b)	(c)
31.8 mm (1.25 in)	6.43 kg (14.2 lb)	33.8 mm (1.33 in)	13.6 kg (30.0 lb)

**CAMSHAFT, CAM CHAIN AND CAM SPROCKET**

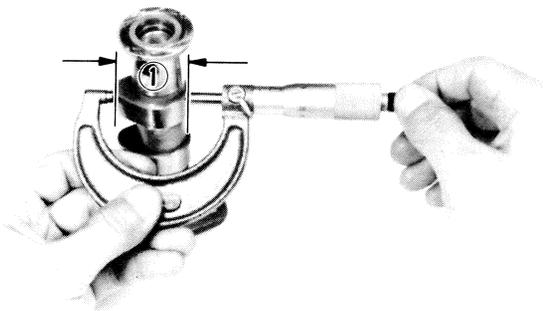
**Camshaft**

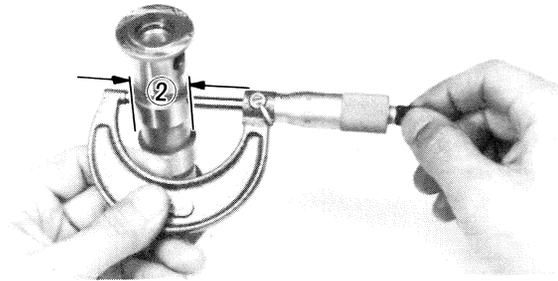
1. Measure:

- Large cam lobe length (1)
- Small cam lobe length (2)

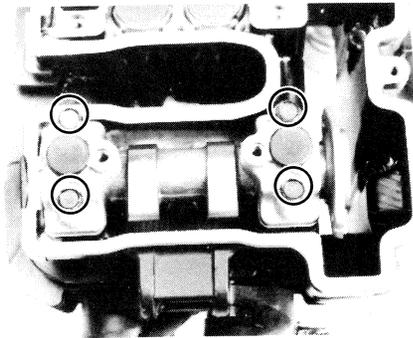
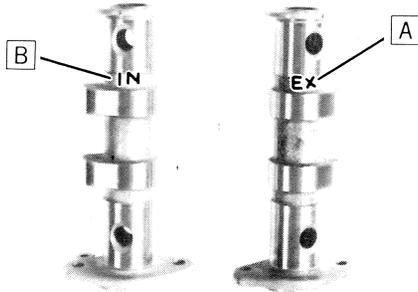
Use a micrometer.

Out of specification → Replace.





	Intake and Exhaust
Cam Lobe ①	35.75 ~ 35.85 mm mm (1.407 ~ 1.411 in.)
Cam Lobe ②	27.998 ~ 28.098 mm (1.102 ~ 1.106 in.)



### Camshaft/Cap Clearance Measurement

- Install:
  - Camshaft
- Position:
  - Strip of Plastigage® (YU-33210)  
(onto camshaft.)

**A** For Exhaust

**B** For Intake

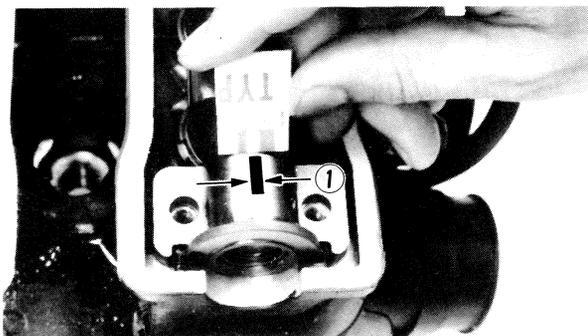
- Install:
  - Camshaft caps
- Tighten:
  - Camshaft cap bolts



**Camshaft Cap Bolt:**  
10 Nm (1.0 m·kg, 7.2 ft·lb)

### NOTE:

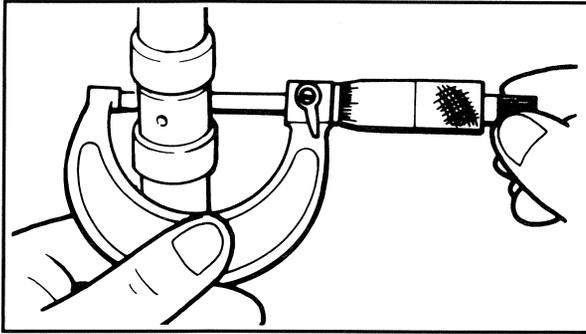
Do not turn the camshaft when measuring clearance with plastigage.



- Measure:
  - Camshaft caps
- Measure:
  - Width of Plastigage® ①  
Out of specification → Follow step 7.



**Camshaft-to-cap Clearance:**  
Standard: 0.020~0.054 mm  
(0.0008~0.0021in)  
Maximum: 0.150mm (0.006in)



## 7. Measure:

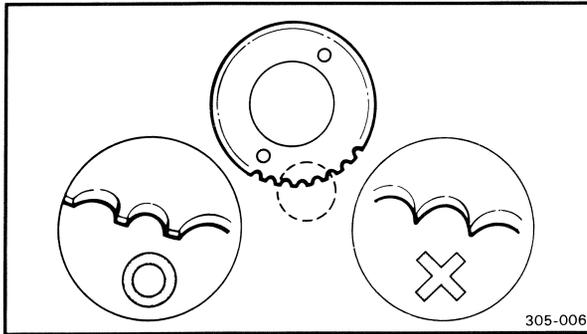
- Camshaft bearing surface diameter  
Use micrometer.  
Out of specification → Replace camshaft.  
Within specification → Replace cylinder head.

**Camshaft Bearing Surface****Diameter:**

**Standard: 24.967~24.980mm**  
**(0.982~0.983in)**

**Cam Cap Inside Diameter:**

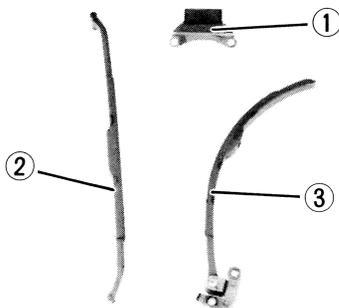
**Standard: 25.000~25.021mm**  
**(0.984~0.985in)**

**Cam Chain**

1. Inspect:
  - Cam chain  
Chain stretch/Cracks → Replace.

**Cam Sprockets**

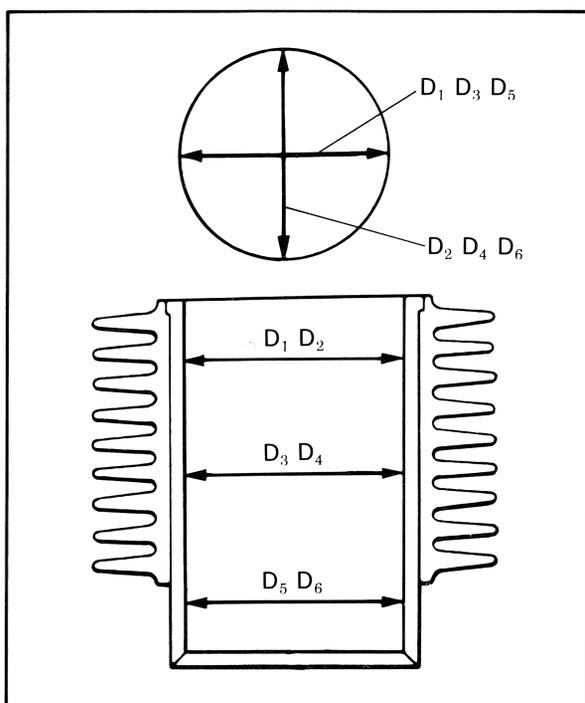
1. Inspect:
  - Cam sprockets  
Wear/Damage → Replace.

**Cam Guide**

1. Inspect:
  - Upper chain guide ①
  - Exhaust side chain guide ②
  - Intake side chain guide ③
 Wear → Replace.

**CYLINDER**

1. Inspect:
  - Cylinder walls  
Vertical scratches → Rebore or Replace cylinder.
2. Measure:
  - Cylinder inside diameter



**NOTE:**

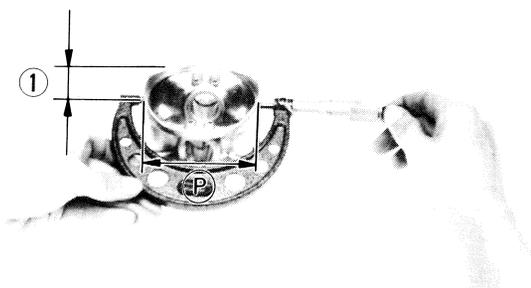
Obtain measurements at three depths by placing measuring instrument parallel to and at right angles to crankshaft.

Out of specification → Rebore cylinder, and replace piston and piston rings.

	Standard	Wear limit
Cylinder bore: C	86.0 mm (3.386 in)	86.1 mm (3.390 in)
Cylinder taper: T	—	0.008 mm (0.0003 in)

C = Maximum D

T = Maximum D<sub>1</sub>, D<sub>2</sub> - Minimum D<sub>5</sub>, D<sub>6</sub>



**PISTON, PISTON RING AND PISTON PIN**

**Piston**

1. Measure:

- Piston skirt diameter "P"

**NOTE:**

Measure the piston skirt diameter where the distance 2.0 mm (0.08 in) ① from the piston bottom edge.

	Piston size P
Standard	86.0 mm (3.386 in)
Oversize 2	86.5 mm (3.406 in)
Oversize 4	87.0 mm (3.425 in)

2. Measure:

- Piston clearance

<b>Piston Clearance =</b>
<b>Cylinder inside diameter —</b> <b>Piston skirt diameter "P"</b>



Out of specification → Rebore cylinder, and replace piston and piston rings.



**Piston Clearance:**

**0.04 ~ 0.06 mm**  
**(0.00157 ~ 0.00246 in)**



**Piston Ring**

1. Measure:

- Ring side clearance

Use a feeler gauge.

Out of specification → Replace piston.

**NOTE:**

Clean carbon from piston ring grooves and rings before measuring side clearance.



**Piston ring side clearance:**

Top	<b>0.04 ~ 0.08 mm</b> <b>(0.0016 ~ 0.0031 in)</b>
2nd	<b>0.03 ~ 0.07 mm</b> <b>(0.0012 ~ 0.0028 in)</b>
Oil	<b>0.02 ~ 0.06 mm</b> <b>(0.0008 ~ 0.0024 in)</b>

2. Position:

- Piston ring

(in cylinder)

**NOTE:**

Insert a ring into cylinder, and push it approximately 20 mm (0.8 in) into cylinder. Push ring with piston crown so that ring will be at a right angle to cylinder bore.

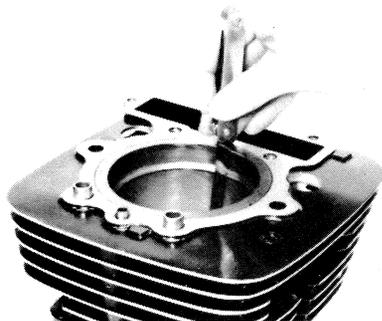
3. Measure:

- Ring end gap

Out of specification → Replace.

**NOTE:**

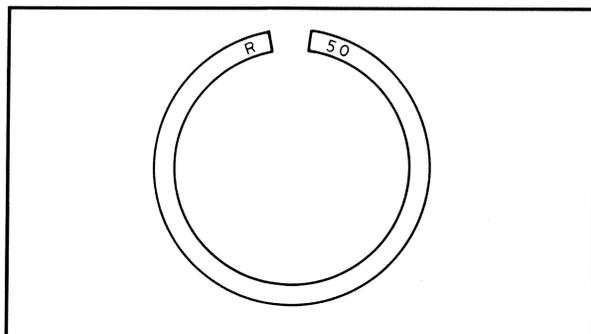
You cannot measure end gap on expander spacer of oil control ring. If oil control ring rails show excessive gap, replace all three rings.





**Piston ring end gap (Installed)**

Top ring	0.25 ~ 0.40 mm (0.010 ~ 0.016 in)
2nd ring	0.25 ~ 0.40 mm (0.010 ~ 0.016 in)
Oil ring	0.20 ~ 0.70 mm (0.008 ~ 0.028 in)

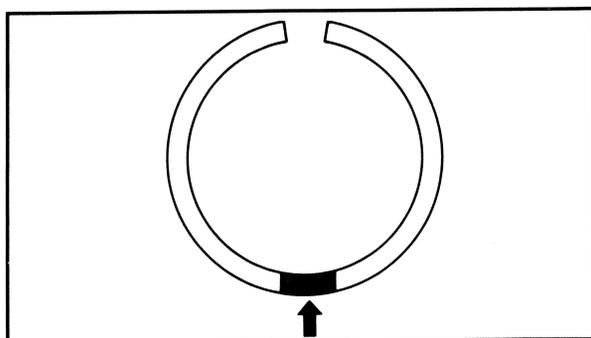


**Piston Ring Oversize**

- Top and 2nd piston ring

Oversize top and middle ring sizes are stamped on top of ring.

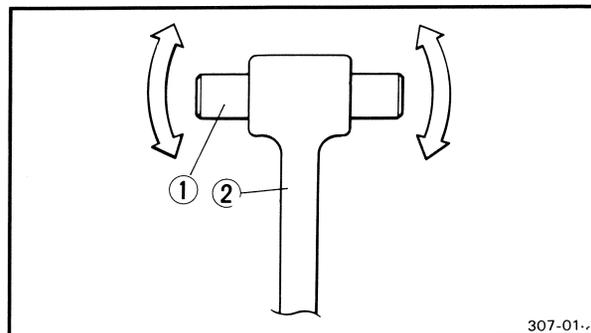
Oversize 2	50
Oversize 4	100



- Oil control ring

Expander spacer of bottom ring (oil control ring) is color-coded to identify sizes.

Size	Color
Oversize 2	Blue
Oversize 4	Yellow



**Piston Pin**

1. Lubricate:

- Piston pin (Lightly)

2. Install:

- Piston pin ①  
(into small end of connecting rod ② )

3. Check:

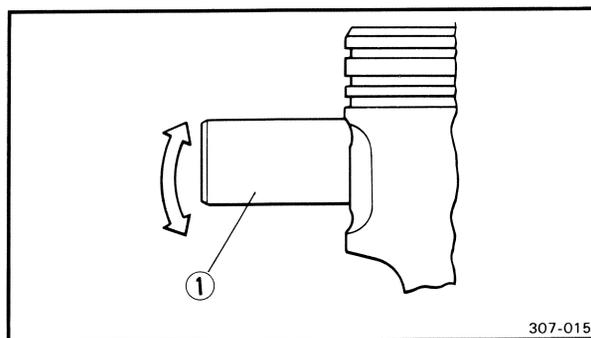
- Free play  
Free play → Inspect connecting rod for wear.  
Wear → Replace connecting rod and piston pin.

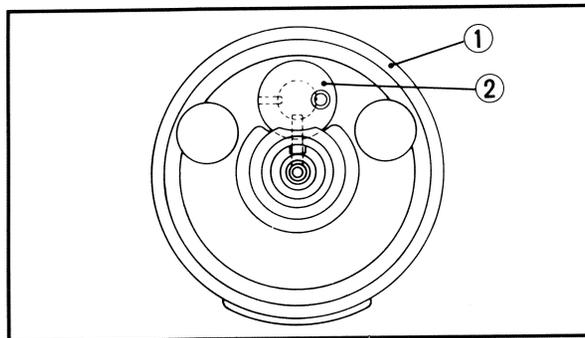
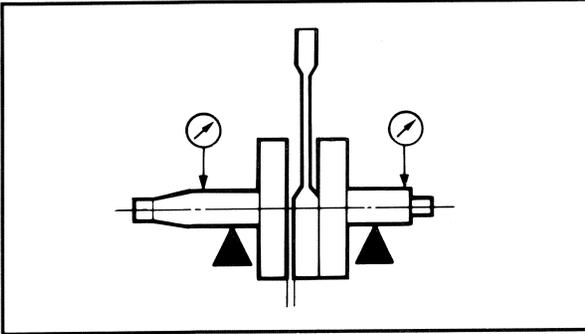
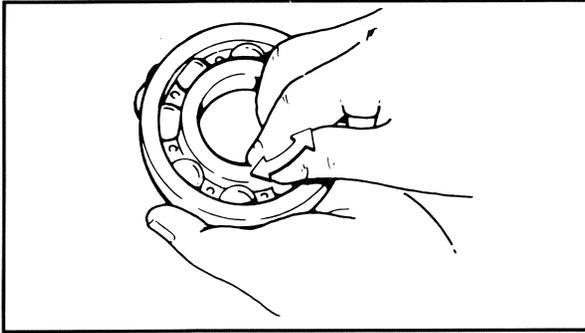
4. Piston:

- Piston pin ①  
(into piston)

5. Check:

- Free play  
(into piston)  
Free play → Replace piston pin and/or piston.





## CRANKSHAFT AND CONNECTING ROD

### Crankshaft Bearings

1. Inspect
  - Bearing races
  - Pitting/Rust/Scoring → Replace.

#### NOTE:

- Clean and dry bearing before checking.
- Lubricate bearings immediately after examining them to prevent rust.

### Crankshaft Runout

1. Place both ends of crankshaft on V-blocks.
2. Rotate:
  - Crankshaft
3. Measure:
  - Crankshaft runout (at main journal bearings)
  - Use a Dial Gauge.



**Maximum Crankshaft Runout:**  
0.03 mm (0.0012 in)

### Crankshaft Assembly

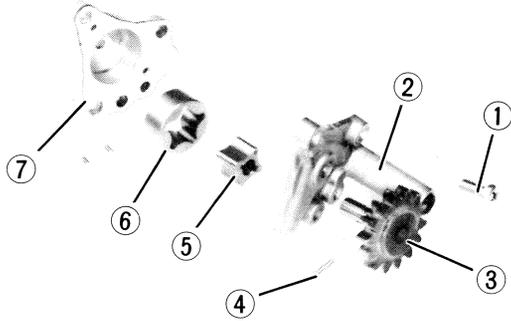
1. Install:
  - Crank web ①
  - Crank pin ②

#### NOTE:

Make sure oil passages of crank and crank pin are lined up during assembly.

#### CAUTION:

The crankshaft oil passage and the crank pin oil passage **MUST** be properly aligned. The deviation of one center line from the other must be **LESS THAN 1 mm (0.04 in)**.



**OIL PUMP**

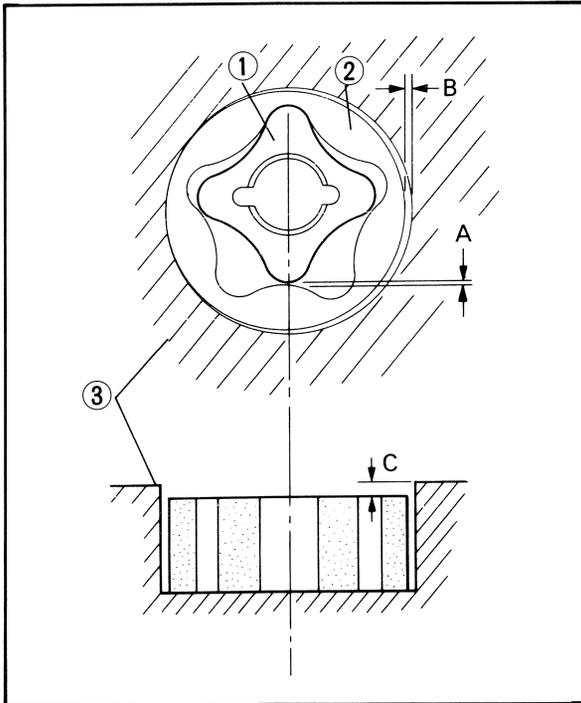
1. Remove:

- Screw ①
- Pump cover ②
- Pump shaft ③
- Pin ④
- Inner rotor ⑤
- Outer rotor ⑥
- Pump housing ⑦

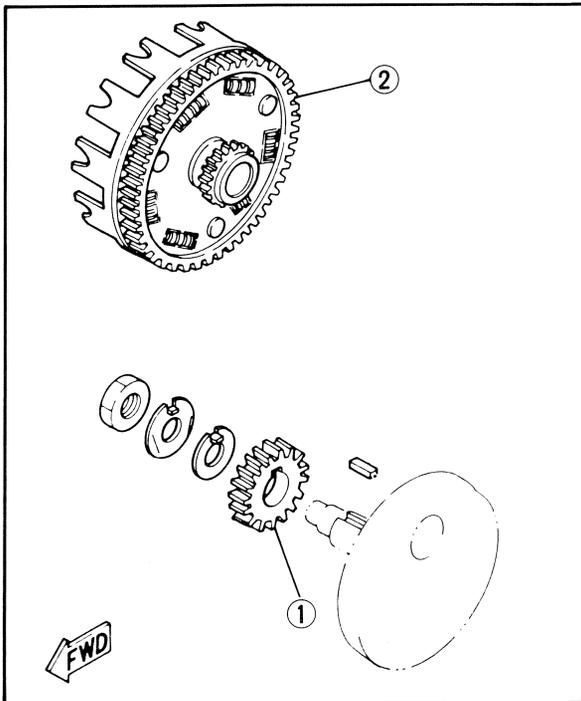
2. Measure:

- Clearance "A"  
(between inner rotor ① and outer rotor ②)
- Clearance "B"  
(between outer rotor ② and pump housing ③)
- Clearance "C"  
(between pump housing ③ and rotors ①, ②)

Out of specification → Replace oil pump.



	Oil pump clearance:
Clearance "A"	0.15 mm (0.006 in)
Clearance "B"	0.03~0.09 mm (0.001~0.004 in)
Clearance "C"	0.03~0.09 mm (0.001~0.004 in)

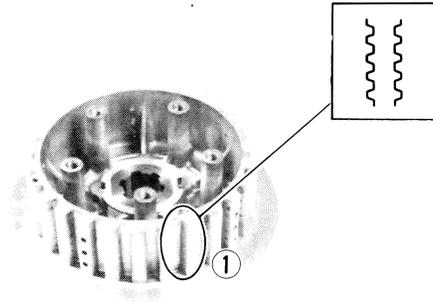
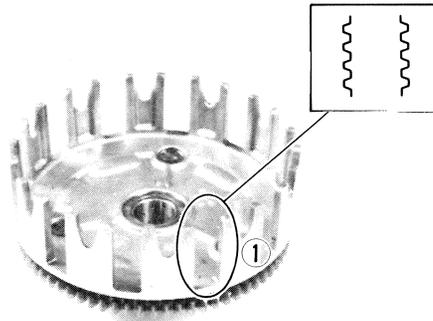


**PRIMARY DRIVE**

1. Inspect:

- Primary drive gear ①
  - Primary driven gear ②
- Wear/Damage → Replace both gears.  
Excessive noises during operation → Replace both gears.

Primary reduction ratio:		
No. of teeth		Ratio
Drive	Driven	
24	70	2,916



**CLUTCH**

1. Inspect:

- Clutch housing dogs ①
- Cracks/Pitting (edges):  
Moderate → Deburr.  
Severe → Replace clutch housing.

**NOTE:**

Pitting on friction plate dogs of clutch housing will cause erratic operation.

2. Inspect:

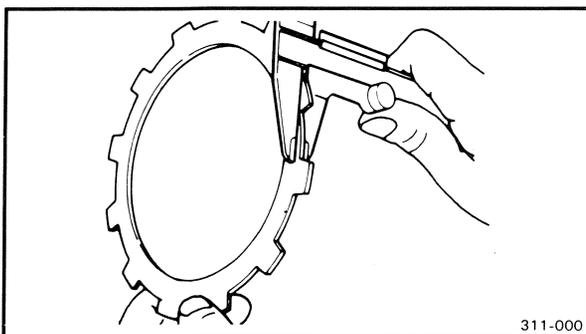
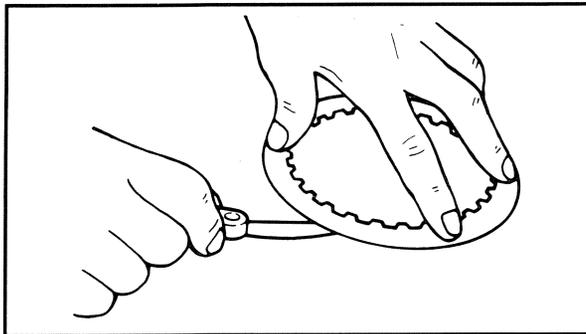
- Clutch housing bearing
- Damage → Replace.

3. Inspect:

- Clutch boss spline ①
- Pitting:  
Moderate → Deburr.  
Severe → Replace.

**NOTE:**

Pitting on clutch plate splines of clutch boss will cause erratic operation.

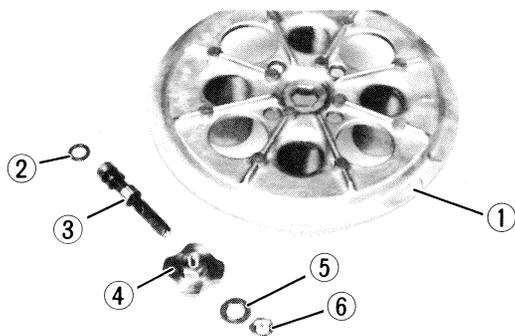


311-000

4. Measure:

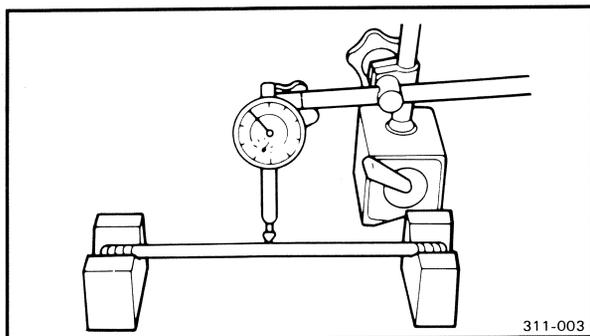
- Clutch plate warpage
- Friction plate thickness
- Out of specification → Replace clutch or friction plate as a set.

	Standard	Wear limit
Friction plate thickness	2.7~2.9 mm (0.106~0.114 in)	2.5 mm (0.098 in)
Clutch plate warp limit	—	0.05 mm (0.002 in)



## 5. Inspect:

- Pressure plate ①
  - O-ring ②
  - Short push rod ③
  - Push plate ④
  - Plain washer ⑤
  - Locknut ⑥
- Damage → Replace.

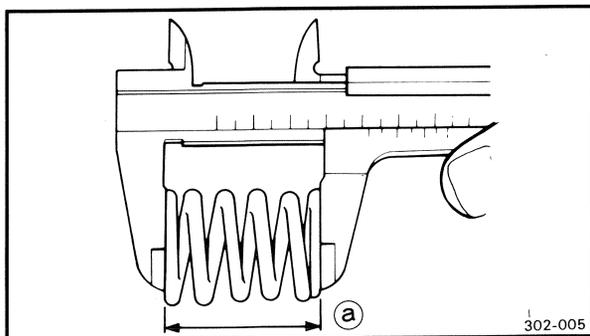


## 6. Measure:

- Long push rod
- Roll on V-block.  
Exceeds bending limit → Replace.



**Bend Limit: 0.5 mm (0.02 in)**



## 7. Measure:

- Clutch spring free length ①
- Out of specification → Replace spring as a set.

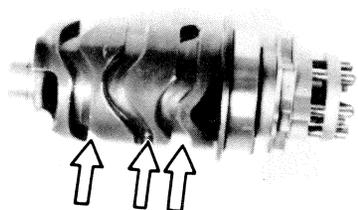
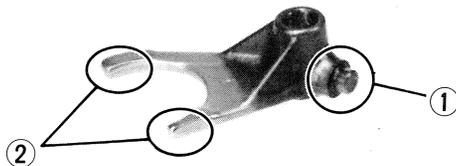


**Clutch spring minimum free length ① :  
40.3 mm (1.587 in)**

## TRANSMISSION

## 1. Inspect:

- Shift fork cam follower ①
  - Shift fork pawl ②
- Scoring/Bends/Wear → Replace.



## 2. Inspect:

- Shift cam groove
  - Shift cam dowel and side plate
  - Shift cam stopper plate, circlip and stopper
- Wear/Damage → Replace.



## 3. Check:

- Guide bar  
Roll across a surface plate.  
Bends → Replace.

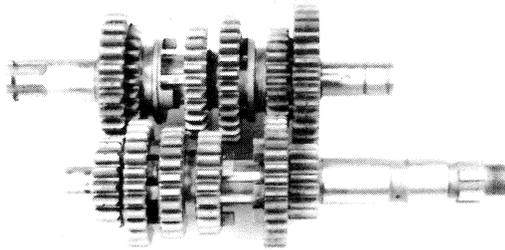
## 4. Measure:

- Transmission shaft runout  
Use centering device and dial gauge.  
Out of specification → Replace bent shaft.

**Maximum Runout:****0.08 mm (0.0031 in)**

## 5. Inspect:

- Gear teeth  
Blue discoloration/Pitting/Wear → Replace.
- Mated dogs  
Rounded edges/Cracks/Missing portions  
→ Replace.



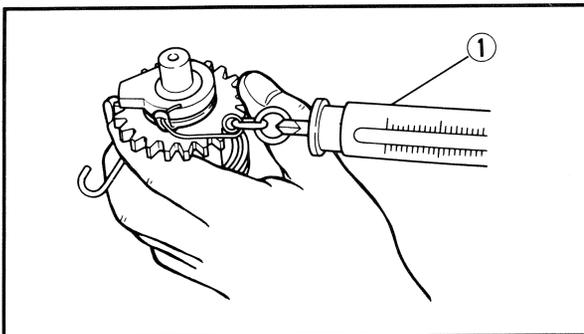
## 6. Check:

- Proper gear engagement (Each gear  
(to its counter part))
- Gear movement  
Roughness → Replace.

**SHIFTER**

## 1. Inspect:

- shaft return spring  
Damage → Replace.
- Change shaft  
Damage/Bends/Wear → Replace.

**KICK STARTER**

## 1. Inspect:

- Kick axle  
Damage/Wear → Replace.

## 2. Measure:

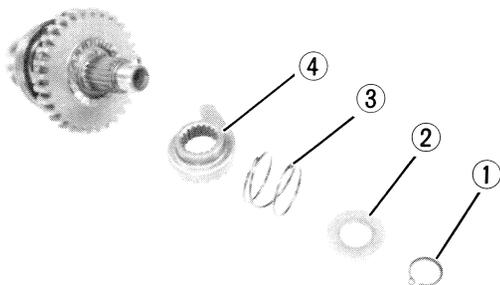
- Kick spring tension  
Out of specification → Replace.  
Use a spring balance ①.



Standard tension: 1.0 kg (2.2 lb)

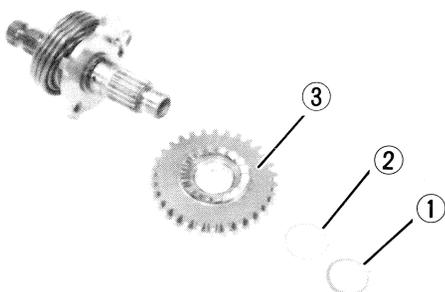
**CAUTION:**

Do not try to bend the clip.



3. Remove:

- Circlip ①
- Washer ②
- Ratchet wheel spring ③
- Ratchet wheel ④

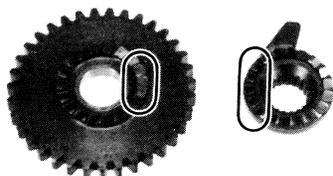


4. Remove:

- Circlip ①
- Washer ②
- Kick gear ③

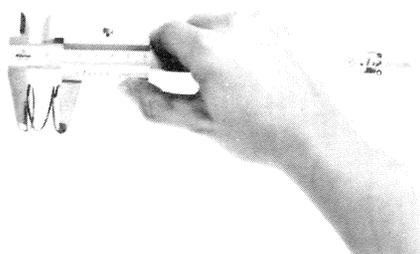
5. Check:

- Ratchet teeth  
Damage/Wear → Replace as a set.

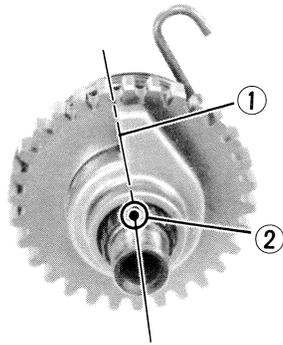


6. Measure:

- Ratchet wheel spring  
Out of specification → Replace.



Ratchet wheel spring free length	
Standard	Wear limit
17.2 mm (0.677 in)	15.0 mm (0.591 in)



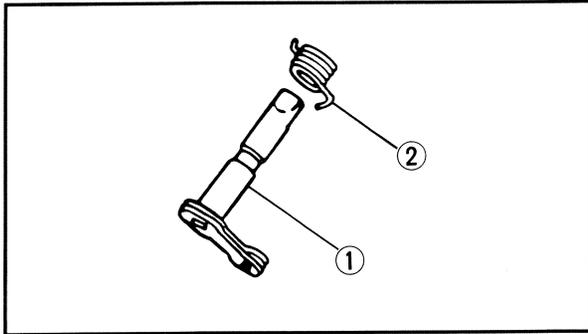
7. Install:

Reverse the removal procedure.

Note the following point.

**NOTE:**

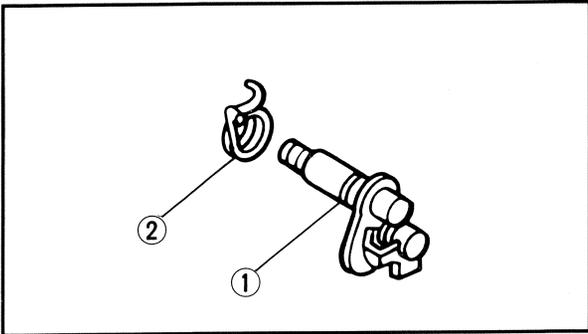
Align the straight surface of the ratchet wheel pawl ① with the kick axle mark ② .



**DECOMPRESSION CAM AND LEVER**

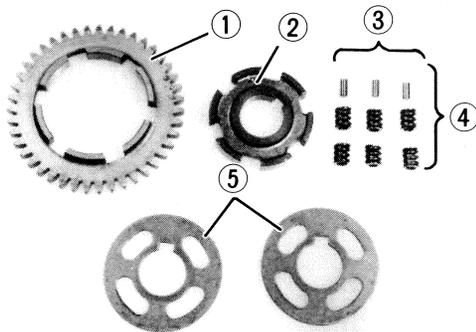
1. Check:

- Decompression cam ①
  - Spring ②
- Damage/Wear → Replace.



2. Check:

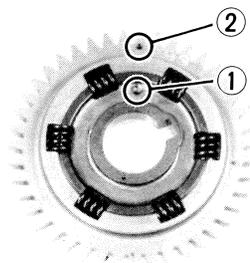
- Decompression lever ①
  - Spring ②
- Damage/Wear → Replace.



**BALANCER DRIVE GEAR**

1. Inspect:

- Balancer drive gear ①
  - Boss ②
  - Pin ③
  - Spring ④
  - Washer ⑤
- Damage/Wear/Fatigue → Replace.



2. Align:

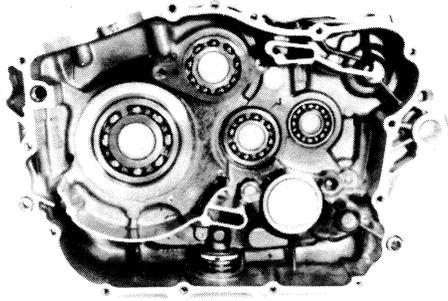
- Boss match mark ①
- (with the drive gear mark ② )

**CRANKCASE**

## 1. Inspect:

- Case halves
- Bearing seat
- Fitting

Damage → Replace.

**BEARINGS AND OIL SEALS**

## 1. Inspect:

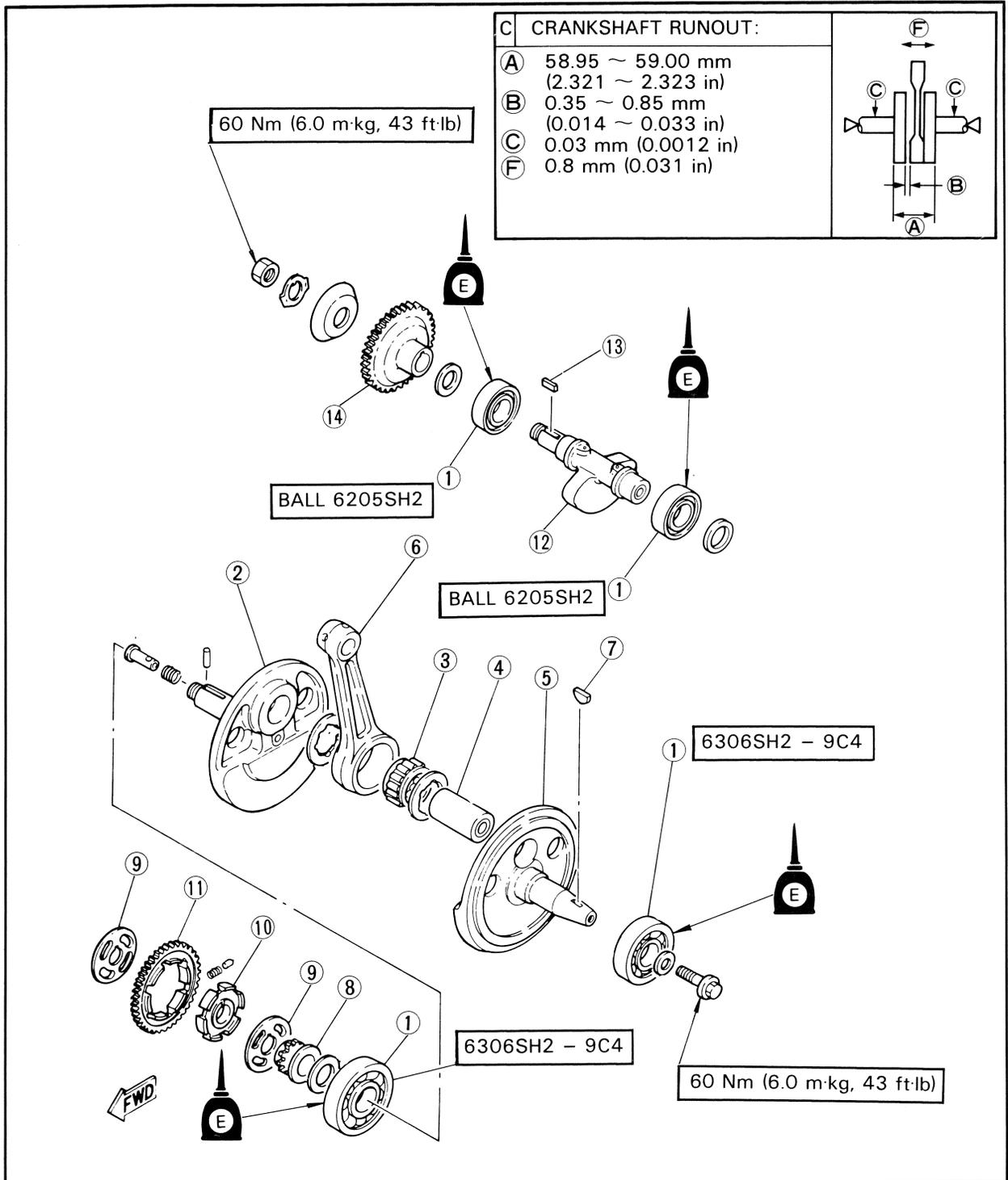
- Clean and lubricate, then rotate inner race with finger.  
Roughness → Replace bearing (see Removal).

## 2. Inspect:

- Oil seals
- Damage/Wear → Replace (see Removal).

**CRANKSHAFT AND BALANCER SHAFT**

- |                   |                        |
|-------------------|------------------------|
| ① Bearing         | ⑧ Cam chain drive gear |
| ② Crank (Right)   | ⑨ Washer               |
| ③ Big-end bearing | ⑩ Boss                 |
| ④ Crank pin       | ⑪ Balancer drive gear  |
| ⑤ Crank (Left)    | ⑫ Balancer shaft       |
| ⑥ Connecting rod  | ⑬ Straight key         |
| ⑦ Woodruff key    | ⑭ Balancer driven gear |



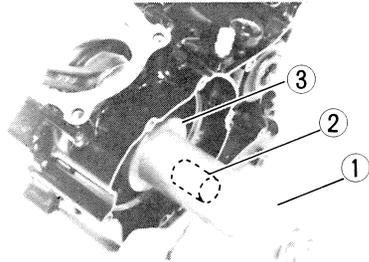


## ENGINE ASSEMBLY AND ADJUSTMENT

### CRANKSHAFT AND BALANCER SHAFT

**CAUTION:**

To protect the crankshaft against scratches or to facilitate the operation of the installation, apply the grease to the oil seal lips, and apply the engine oil to each bearing.



## 1. Attach:

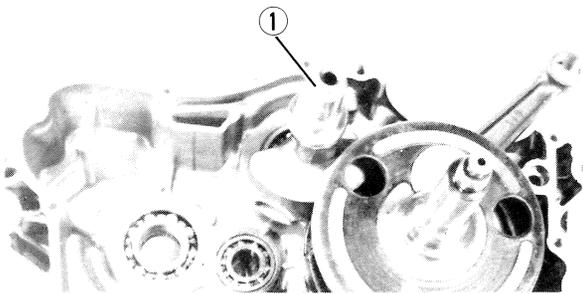
- Crankshaft Installing Tool  
(YU-90050 ① , YM-1383 ② and YU-01202 ③ )

## 2. Install:

- Crankshaft

**NOTE:**

Hold the connecting rod at top dead center with one hand while turning the nut of the Installing Tool with the other. Operate the Installing Tool until the crankshaft bottoms against the bearing.



## 3. Install:

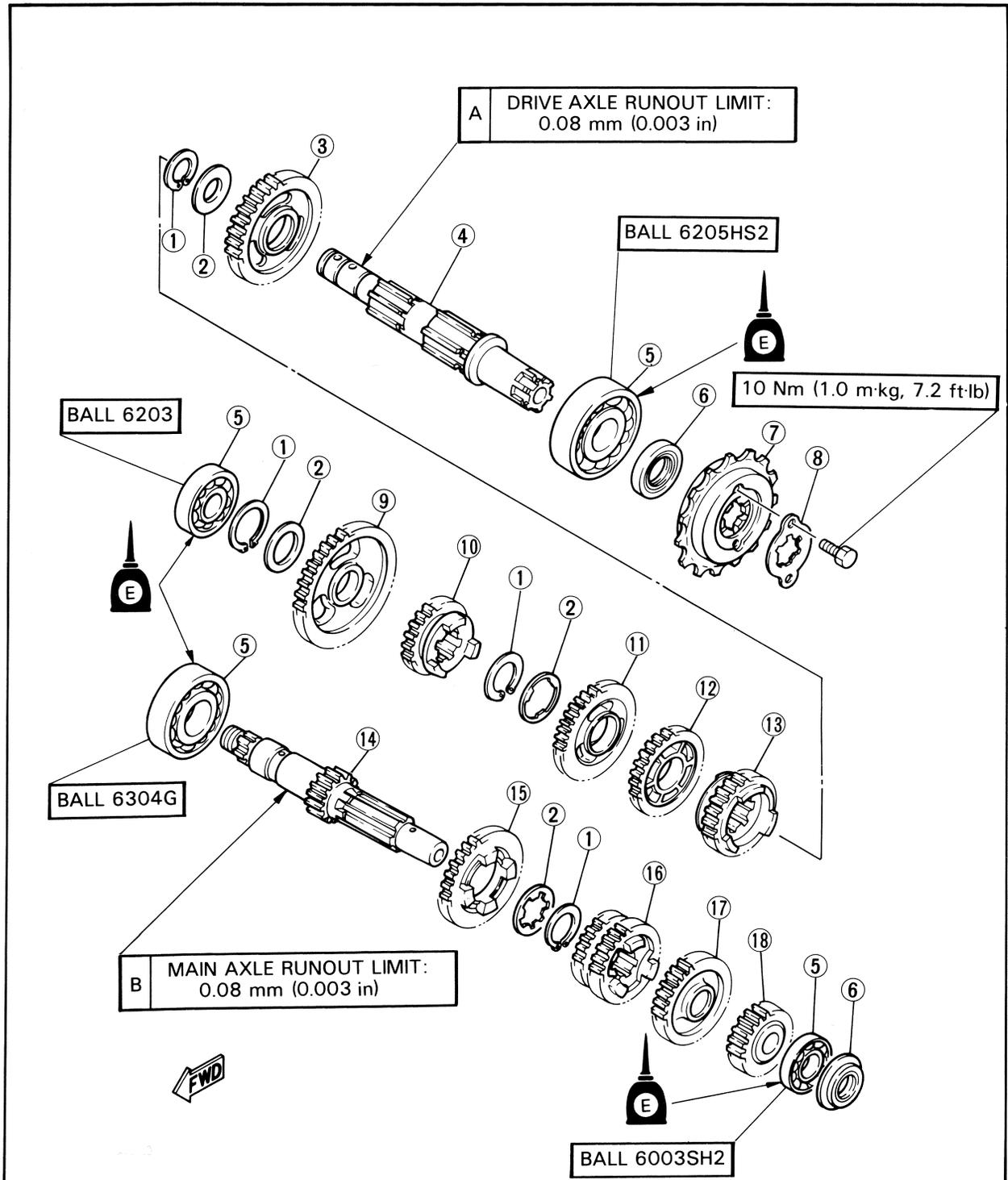
- Balancer shaft ①



TRANSMISSION AND SHIFTER

Transmission

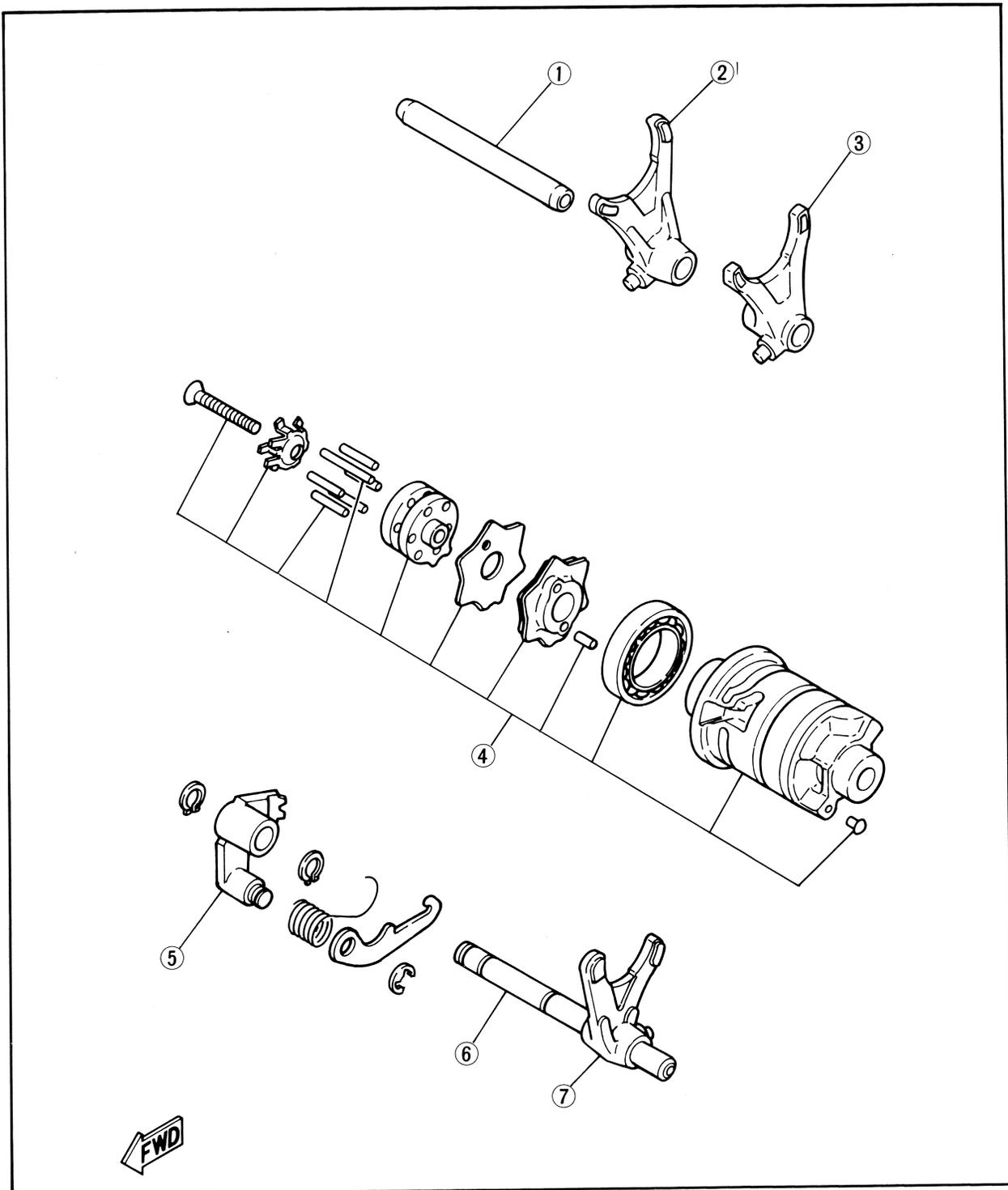
- |                        |                        |                                 |
|------------------------|------------------------|---------------------------------|
| ① Circlip              | ⑦ Drive sprocket       | ⑬ 5th wheel gear (24T)          |
| ② Plain washer         | ⑧ Holding plate        | ⑭ Main axle                     |
| ③ 2nd wheel gear (29T) | ⑨ 1st wheel gear (37T) | ⑮ 6th pinion gear (29T)         |
| ④ Drive axle           | ⑩ 6th wheel gear (22T) | ⑯ 3rd/4th pinion gear (19T/25T) |
| ⑤ Bearing              | ⑪ 3rd wheel gear (26T) | ⑰ 5th pinion gear (27T)         |
| ⑥ Oil seal             | ⑫ 4th wheel gear (27T) | ⑱ 2nd pinion gear (16T)         |

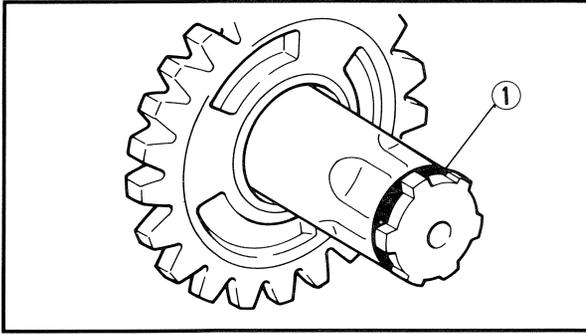




Shift

- ① Guide bar 1
- ② Shift fork (#3)
- ③ Shift fork (#1)
- ④ Shift cam assembly
- ⑤ Change lever 2
- ⑥ Guide bar 2
- ⑦ Shift fork (#2)



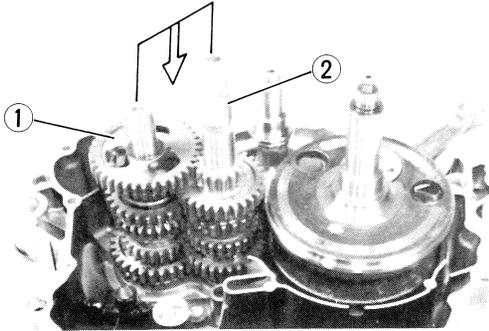
**TRANSMISSION AND SHIFTER**

1. Install:

- O-ring ①

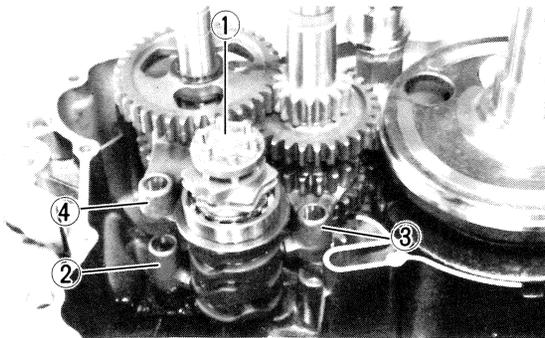
**NOTE:**

When install the drive axle into the crankcase, pay careful attention to the crankcase oil seal lip. It is recommended to set a suitable O-ring into the drive axle groove.



2. Install:

- Drive axle ① and main axle ② assembly

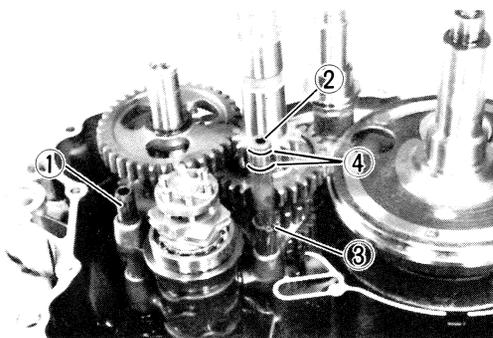


3. Install:

- Shift cam assembly ①
- Shift fork #1 ②
- Shift fork #2 ③
- Shift fork #3 ④

**NOTE:**

- Mesh the shift fork #1 with the 6th wheel gear and #3 with the 5th wheel gear on the drive axle.
- Mesh the shift fork #2 with the 3rd/4th pinion gear on the main axle.
- Install the shift forks with the embossed number should face downward.

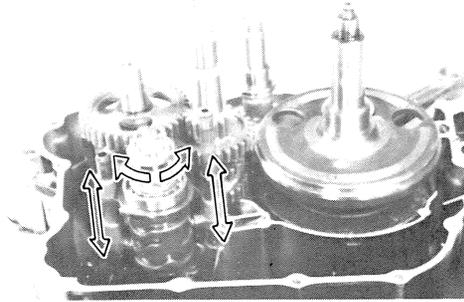


4. Install:

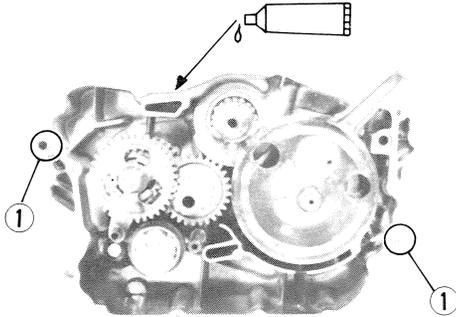
- Guide bar 1 ①
- Guide bar 2 ②
- Circlip ③

**NOTE:**

Install the guide bar ② with the circlip grooves ④ should face upward.



5. Check:
- Shifter operation
- Unsmooth operation → Repair.

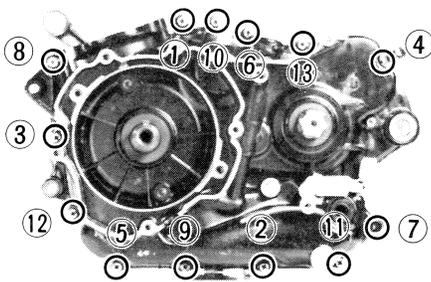


**CRANKCASE**

1. Install:
  - Dowelpins ①
2. Apply:
  - Quick Gasket® (ACC-11001-05-01)  
(To crankcase matching surfaces.)
3. Install:
  - Right crankcase  
(onto the left crankcase)

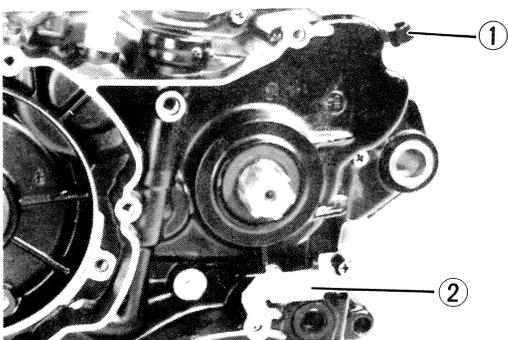
**CAUTION:**

Before installing and torquing the crankcase holding screws, be sure to check whether the transmission is functioning properly by manually rotating the shift cam either way.

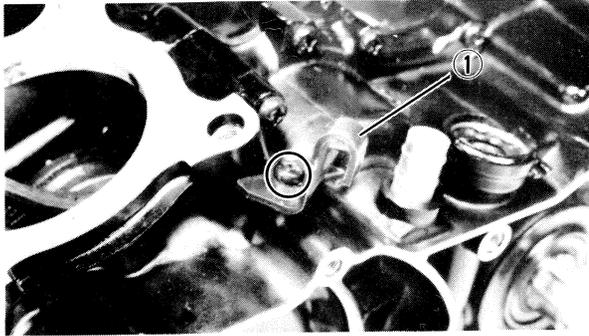


4. Tighten:
  - Crankcase holding screws  
(Follow proper sequence)

	<p><b>Crankcase Holding Screws:</b> 7 Nm (0.7 m·kg, 5.1 ft·lb)</p>
--	--

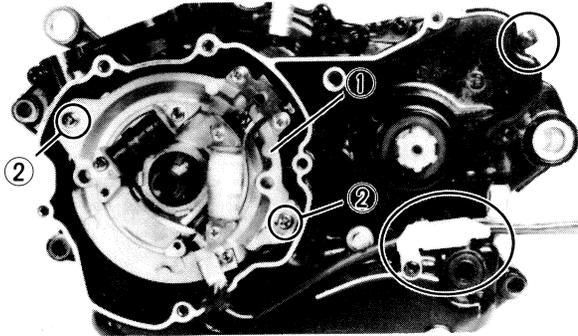


- NOTE:**
- Install the lead wire clamp ① on screw No. 4.
  - Install the lead wire bracket ② on screw No. 7.



5. Install:

- Clutch cable brakcet ①



**CDI MAGNETO**

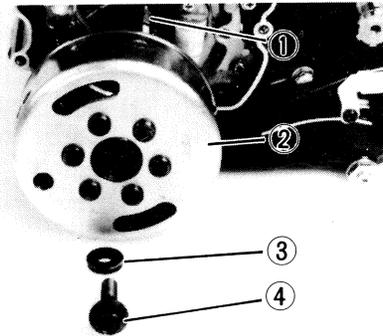
1. Install:

- CDI Base plate assembly ①
- Base plate holding screws ②



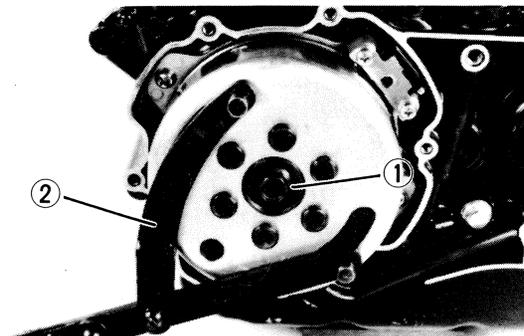
**Base Plate Holding Screw:**  
7 Nm (0.7 m·kg, 5.1 ft·lb)

Clamp the CDI magneto leads.



2. INstall:

- Key ①
- CDI Rotor ②
- Plate washer ③
- Bolt ④

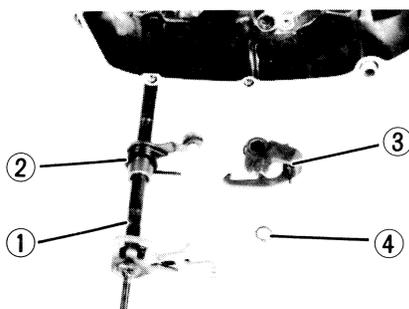


3. Tighten:

- Bolt ①
- Use Rotor Holding Tool ② (YU-01235).



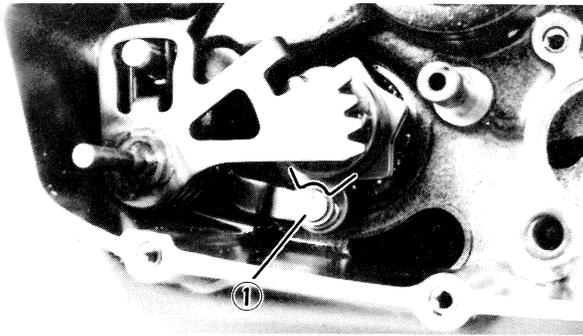
**CDI Rotor Holding Bolt:**  
60 Nm (6.0 m·kg, 43 ft·lb)



**CHANGE LEVER**

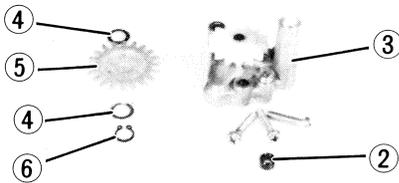
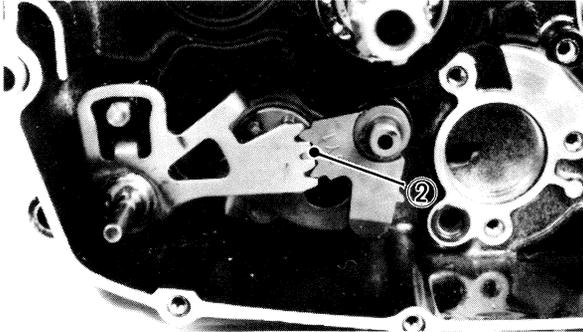
1. Install:

- Change lever assembly ①
- Stopper lever ②
- Change lever ③
- Circlip ④



**NOTE:**

- Mesh the stopper lever ① with the shift cam.
- Mesh the change lever 2 mark ② with change lever pawl center.



**OIL PUMP**

1. Install:

- O-ring ①
- Oil seal ②
- Oil pump assembly ③



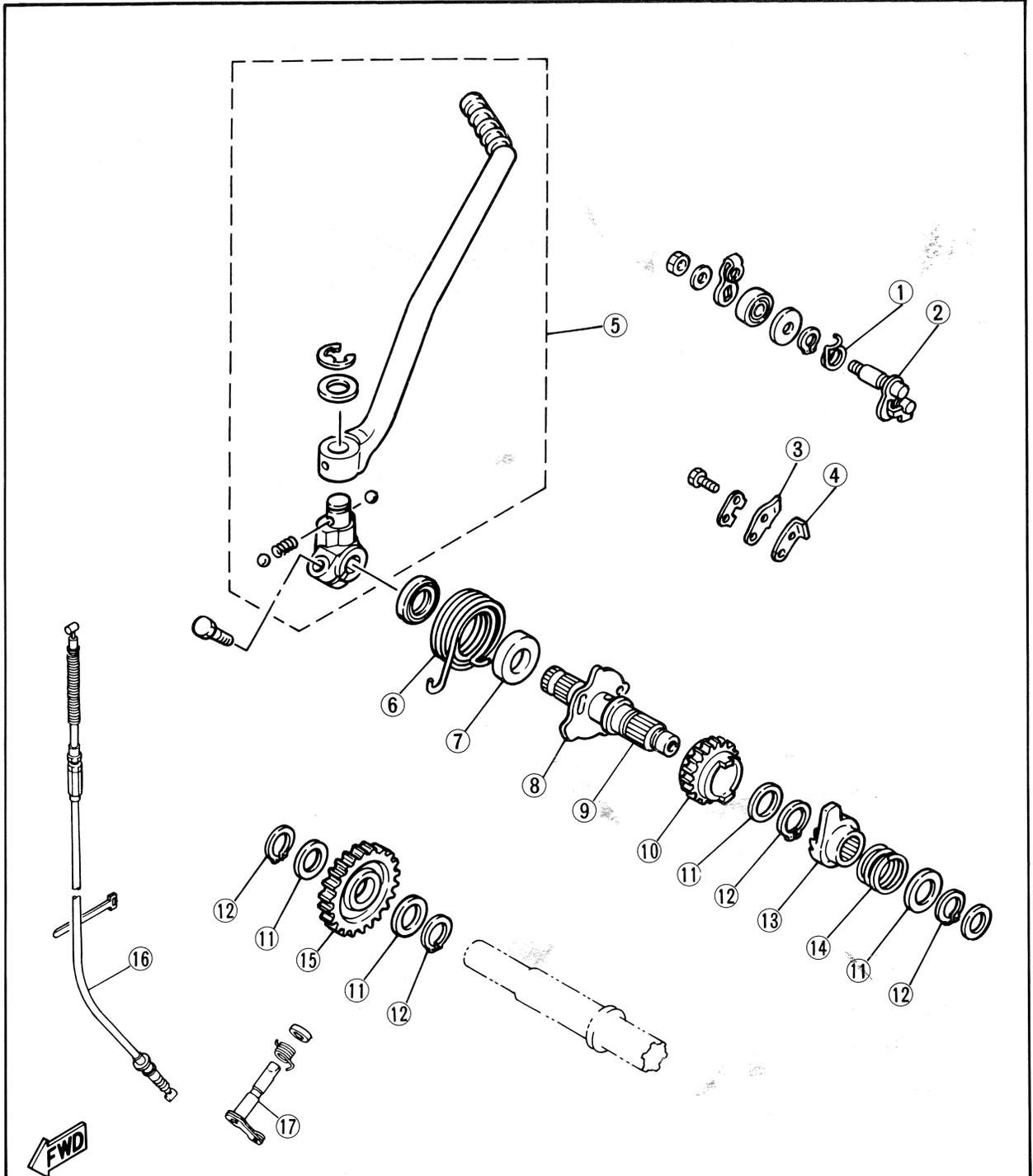
**Oil Pump Securing Screw:  
7 Nm (0.7 m·kg, 5.1 ft·lb)**

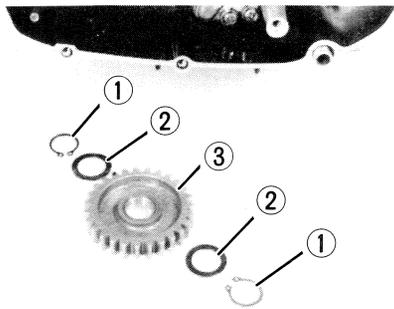
- Washer ④
- Oil pump idle gear ⑤
- Washer ④
- Circlip ⑥



KICK STARTER

- |                         |                        |
|-------------------------|------------------------|
| ① Torsion spring        | ⑩ Kick gear            |
| ② Decompression lever   | ⑪ Washer               |
| ③ Ratchet wheel stopper | ⑫ Circlip              |
| ④ Ratchet wheel guide   | ⑬ Ratchet wheel        |
| ⑤ Kick crank assembly   | ⑭ Ratchet wheel spring |
| ⑥ Kick spring           | ⑮ Kick idle gear       |
| ⑦ Spring guide          | ⑯ Decompression cable  |
| ⑧ Decompression cam     | ⑰ Decompression cam    |
| ⑨ Kick axle             |                        |

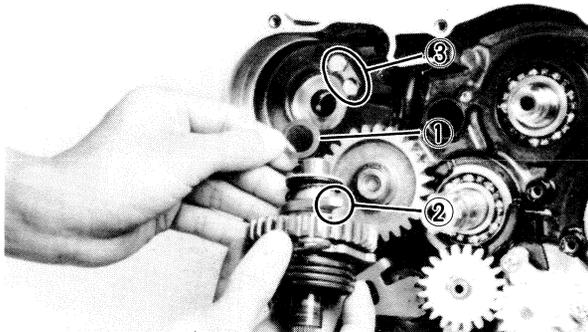




**KICK STARTER AND IDLE GEAR**

1. Install:

- Circlips ①
- Washers ②
- Kick idle gear ③

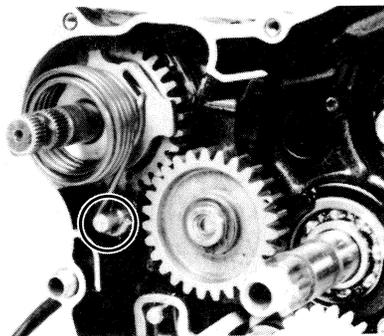


2. Install:

- Plain washer ①
- Kick starter assembly

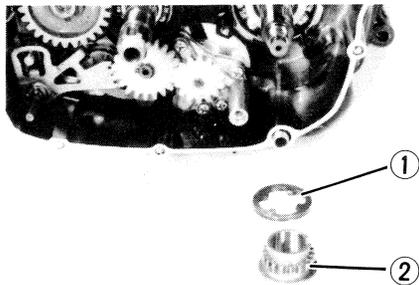
**NOTE:**

Make sure that ratchet wheel pawl ② is stopped at the ratchet wheel stopper ③ .



3. Install:

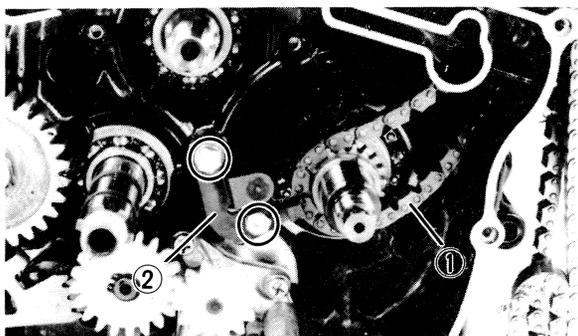
- Kick spring  
(onto spring stopper)



**CAM CHAIN AND INTAKE SIDE CHAIN GUIDE**

1. Install:

- Washer ①
- Chain drive gear ②

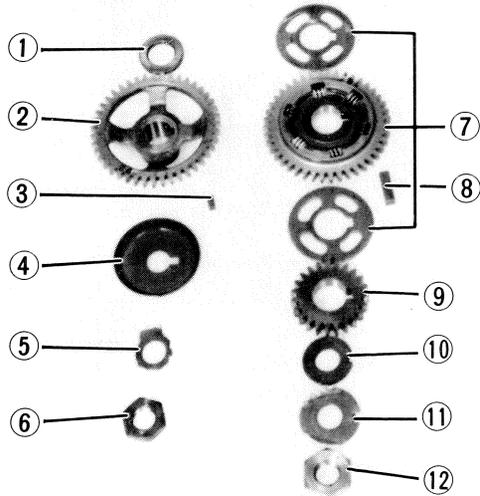
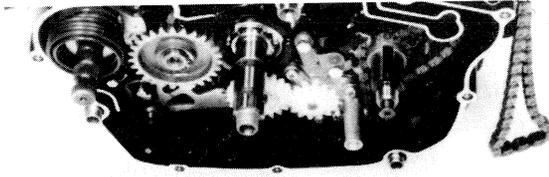


2. Install:

- Cam chain ①
- Intake side chain guide ②



**Chain Guide Bolt:**  
8 Nm (0.8 m·kg, 5.8 ft·lb)



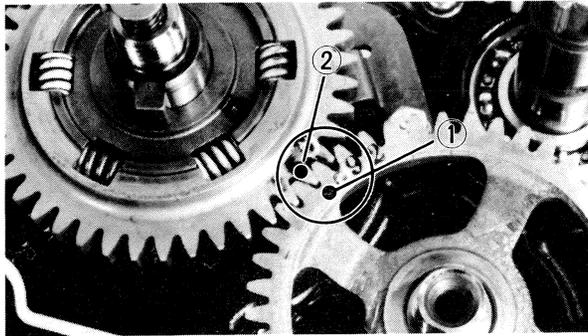
**BALANCER DRIVEN GEAR AND PRIMARY DRIVE GEAR**

1. Install:

- Washer ①
- Balancer driven gear ②
- Key ③
- Breather plate ④
- Lock washer (New) ⑤
- Nut ⑥
- Balancer drive gear assembly ⑦
- Key ⑧
- Primary drive gear ⑨
- Washer ⑩
- Lock washer (New) ⑪
- Nut ⑫

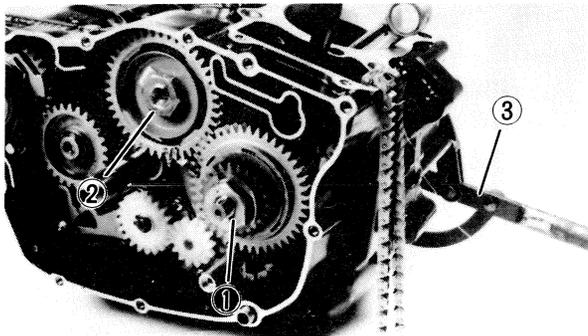
**NOTE:**

Align the balancer drive gear mark ① with the balancer driven gear mark ② .



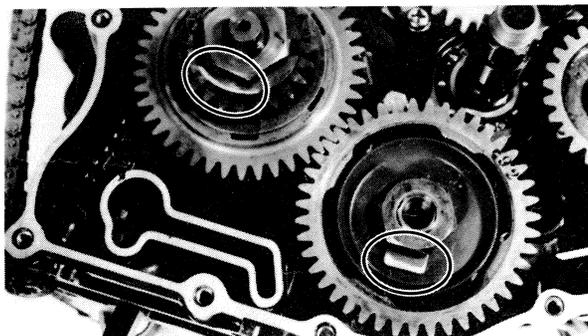
2. Tighten:

- Primary drive gear securing nut ①
- Balancer driven gear securing nut ②
- Use Rotor Holding Tool ③ (YU-01235).



**Primary Drive Gear Nut:**  
80 Nm (8.0 m·kg, 58 ft·lb)  
**Balancer Driven Gear Nut:**  
60 Nm (6.0 m·kg, 43 ft·lb)

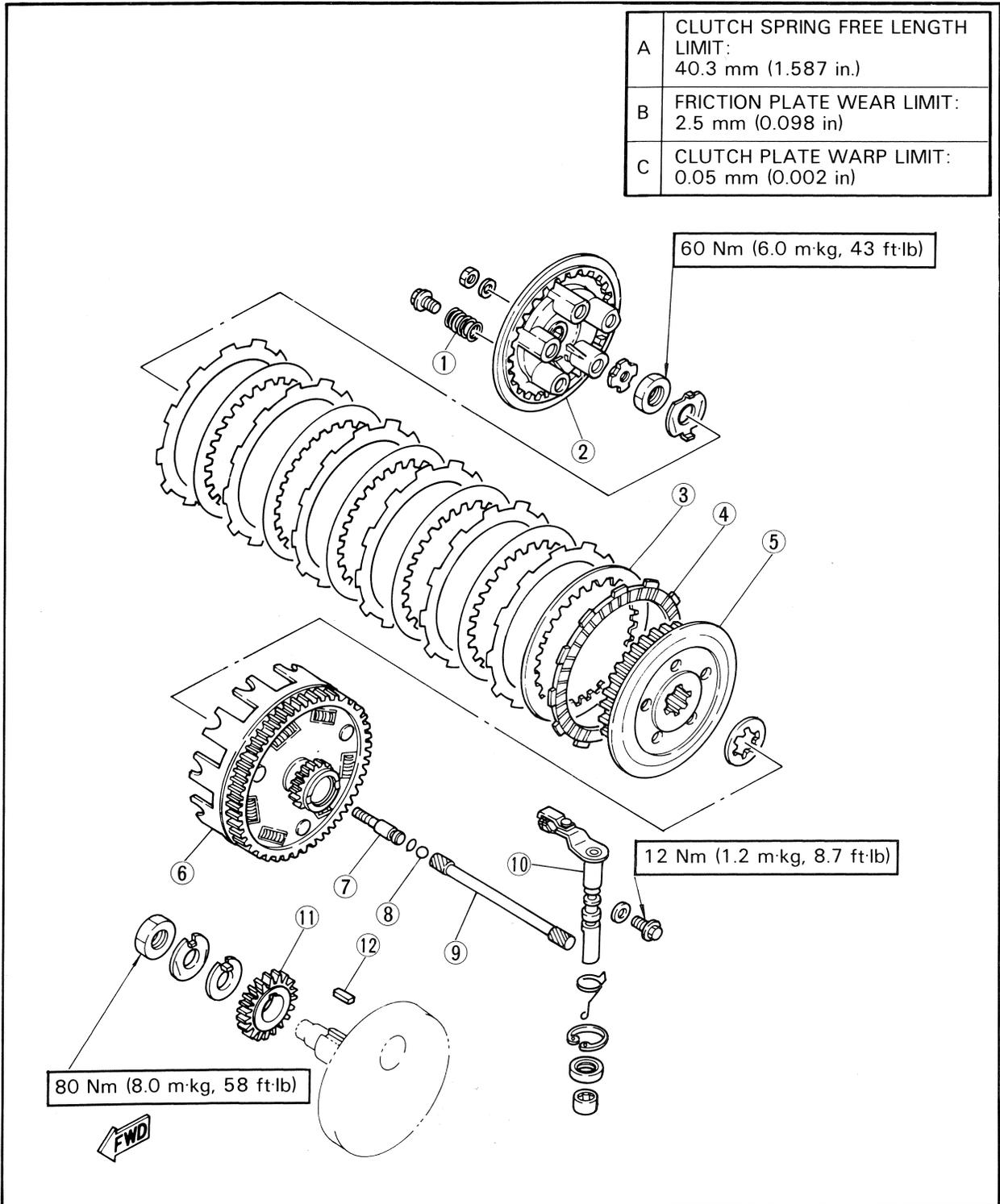
3. Bend both lock washer tabs along both nuts flats.

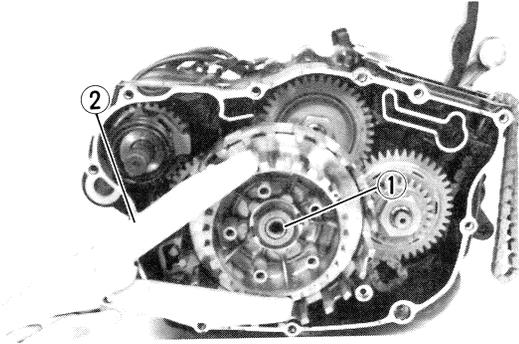
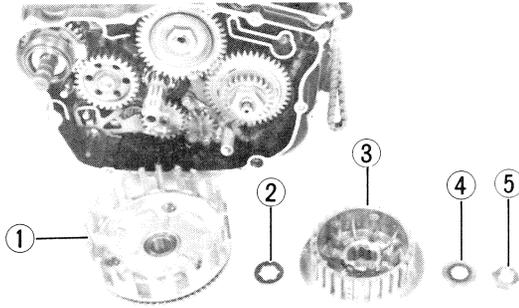




**CLUTCH**

- ① Clutch spring
- ② Pressure plate
- ③ Clutch plate
- ④ Friction plate
- ⑤ Clutch boss
- ⑥ Primary driven gear
- ⑦ Push rod # 1
- ⑧ Push rod ball
- ⑨ Push rod # 2
- ⑩ Push lever axle
- ⑪ Primary drive gear
- ⑫ Key



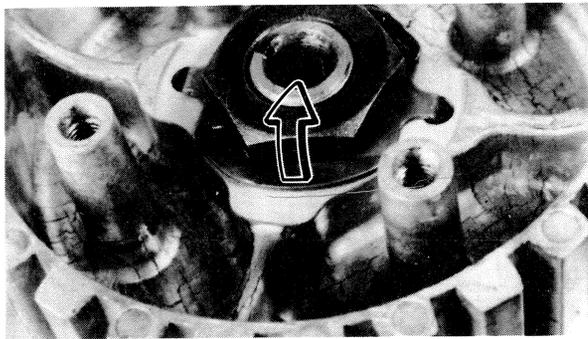
**CLUTCH**

## 1. Install:

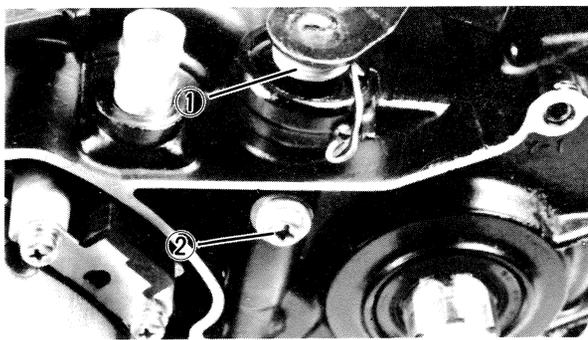
- Primary driven gear assembly ①
- Washer ②
- Clutch boss ③
- Lock washer (New) ④
- Clutch boss securing nut ⑤

## 2. Tighten:

- Clutch boss securing nut ①
- Use Universal Clutch Holder ② (YM-91042).

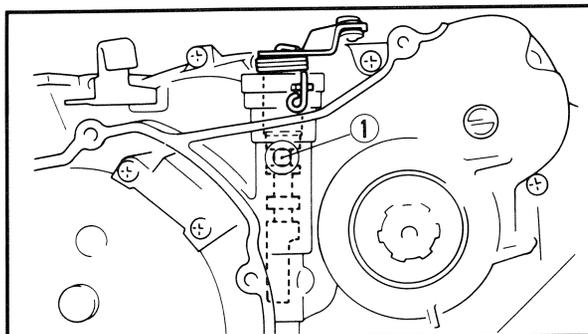
**Clutch Boss Nut:****60 Nm (6.0 m·kg, 43 ft·lb)**

## 3. Bend the lock washer tab along the nut flats.

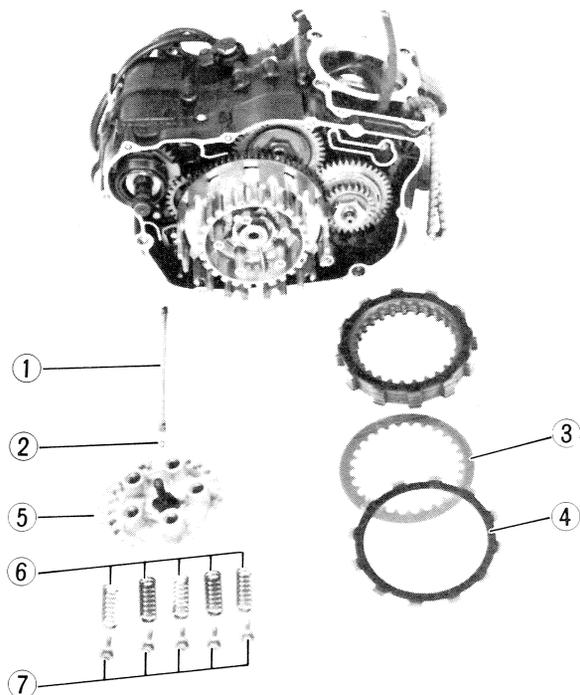


## 4. Install:

- Push lever axle assembly ①
- Screw ②

**Push Lever Axle Screw:****12 Nm (1.2 m·kg, 8.7 ft·lb)****NOTE:**

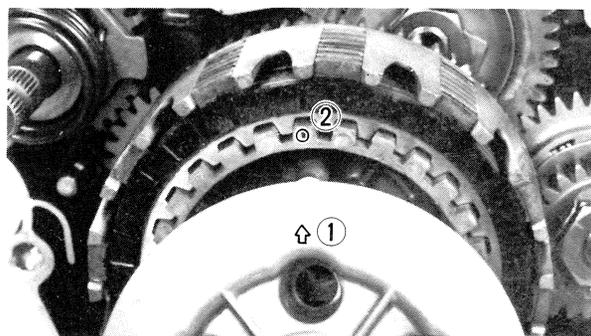
The push lever axle screw should lock the top groove ① of the push lever axle.



5. Install:

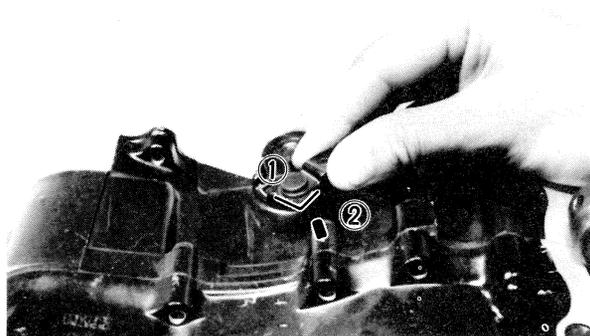
- Push rod #2 ①
- Push rod ball ②
- Clutch plates ③
- Friction plates ④
- Pressure plate assembly ⑤
- Clutch springs ⑥
- Clutch spring holding screws ⑦

 **Clutch Spring Screw:**  
8 Nm (0.8 m·kg, 5.8 ft·lb)



**NOTE:**

Align the pressure plate arrow mark ① with the clutch boss mark ② .



6. Turn:

- Push lever  
(To align the push lever pointer ① with the crankcase embossed mark ② )

7. Turn:

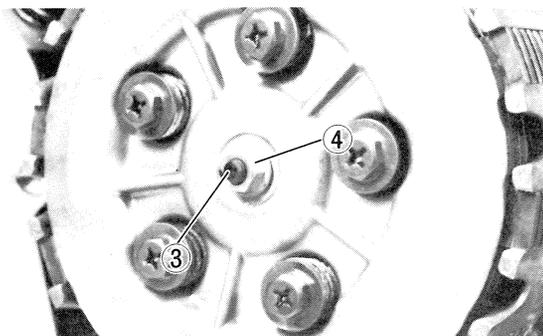
- Push rod #1  
(in or out until it lightly seats against a push rod ball)

③ Push rod #1

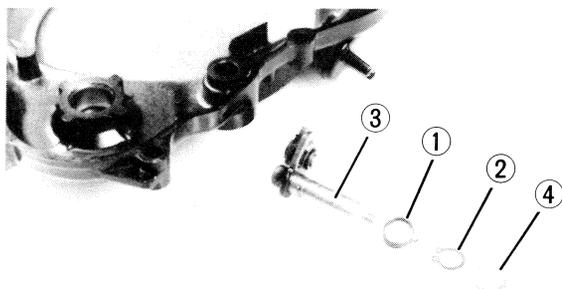
④ Locknut

8. Tighten:

- Locknut

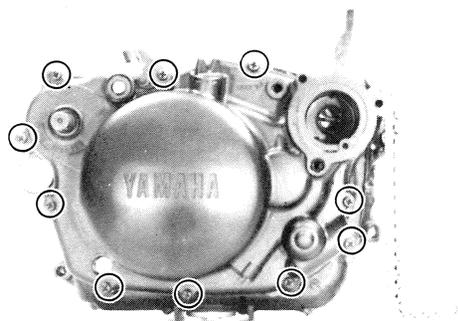


 **Push Rod Locknut:**  
8 Nm (0.8 m·kg, 5.8 ft·lb)



**RIGHT CRANKCASE COVER**

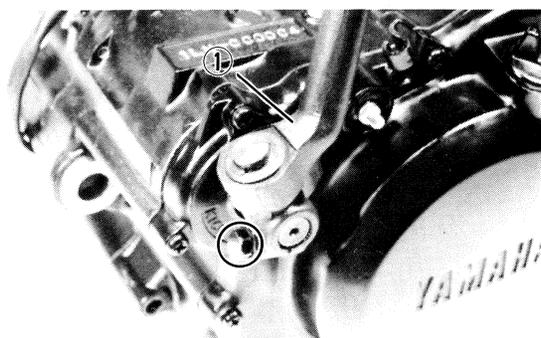
1. Install:
  - Torsion sprig ①
  - Circlip ②  
(onto decompression lever ③ )
  - Washer ④
  - Decompression lever assembly



2. Install:
  - Dowels
  - Gasket
  - Right crankcase cover



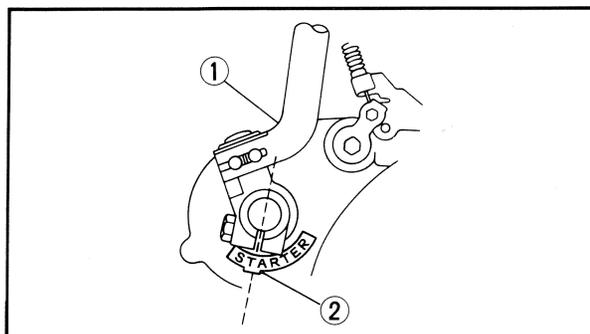
**Right Crankcase Cover Screw:**  
7 Nm (0.7 m·kg, 5.1 ft·lb)



3. Install:
  - Kick crank assembly ①
  - Bolt



**Bolt (Kick crank assembly):**  
20 Nm (2.0 m·kg, 14 ft·lb)

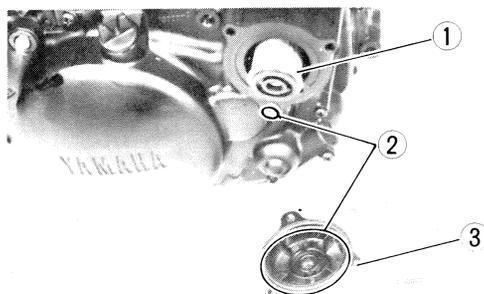


**NOTE:** \_\_\_\_\_  
Install the kick crank onto the kick axle as shown in the illustration.  
\_\_\_\_\_

- ① Kick Crank
- ② Mark

**OIL FILTER**

1. Install:
  - Oil filter ①
  - O-ring ②
  - Oil filter cover ③



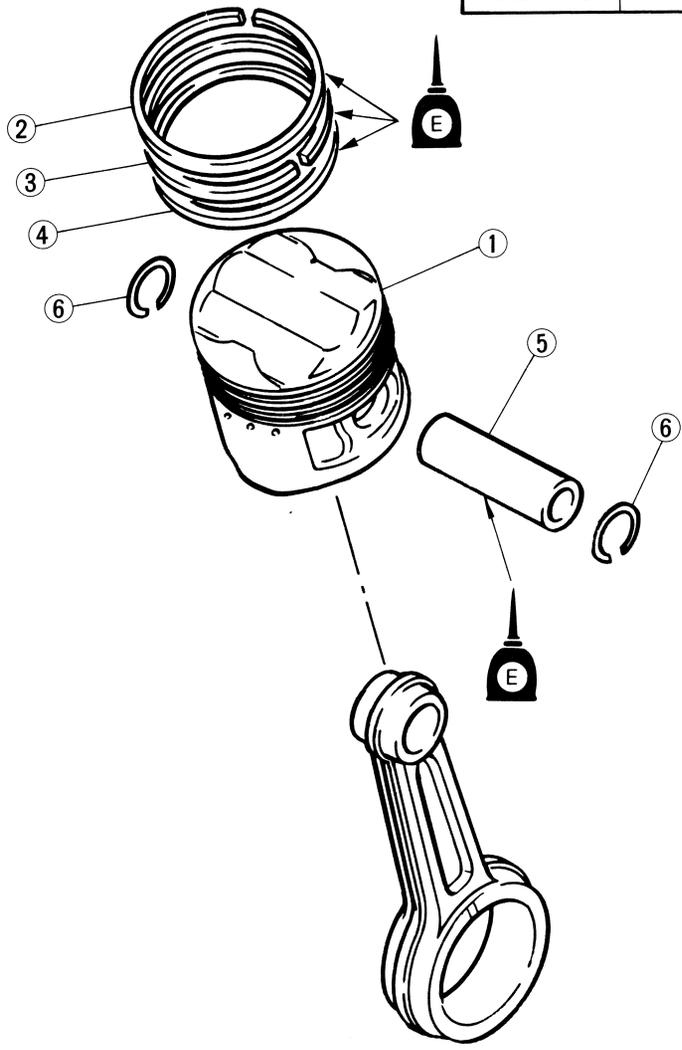
**Oil Filter Cover Screw:**  
7 Nm (0.7 m·kg, 5.1 ft·lb)



**PISTON**

- ① Piston
- ② Piston ring (Top)
- ③ Piston ring (2nd)
- ④ Oil ring
- ⑤ Piston pin
- ⑥ Piston pin clip

A PISTON TO CYLINDER CLEARANCE:	
0.04 ~ 0.06 mm (0.00157 ~ 0.00246 in)	
B PISTON RING END GAP:	
TOP RING	0.25 ~ 0.40 mm (0.010 ~ 0.016 in)
2ND	0.25 ~ 0.40 mm (0.010 ~ 0.016 in)
OIL RING	0.20 ~ 0.70 mm (0.008 ~ 0.028 in)
C PISTON RING SIDE CLEARANCE:	
TOP RING	0.04 ~ 0.08 mm (0.0016 ~ 0.0031 in)
2ND	0.03 ~ 0.07 mm (0.0012 ~ 0.0028 in)
OIL RING	0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in)

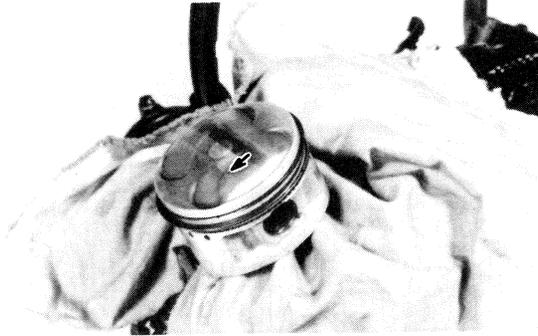


**PISTON**

## 1. Apply:

- Engine oil

To the piston pin, bearing, piston ring grooves and piston skirt areas.



## 2. Install:

- Piston
- Piston pin
- Piston pin clip

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

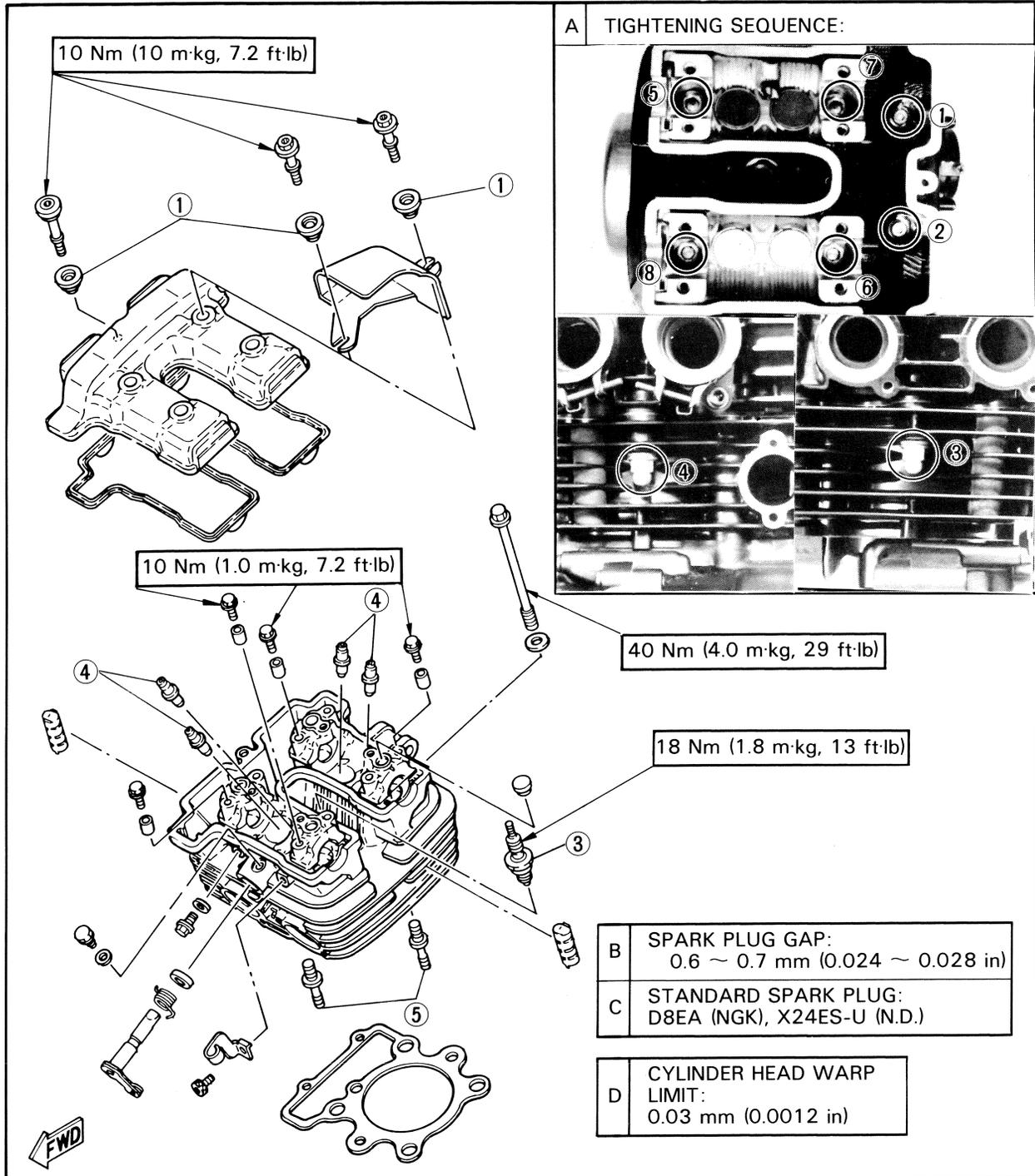
- The arrow on the piston must point to the front of the engine.
  - Before installing the piston pin clip, cover the crankcase with a clean towel or rag so you will not accidentally drop the pin clip and material into the crankcase.
  - Always use a new piston pin clip.
-



CYLINDER, CYLINDER HEAD AND CAMSHAFT

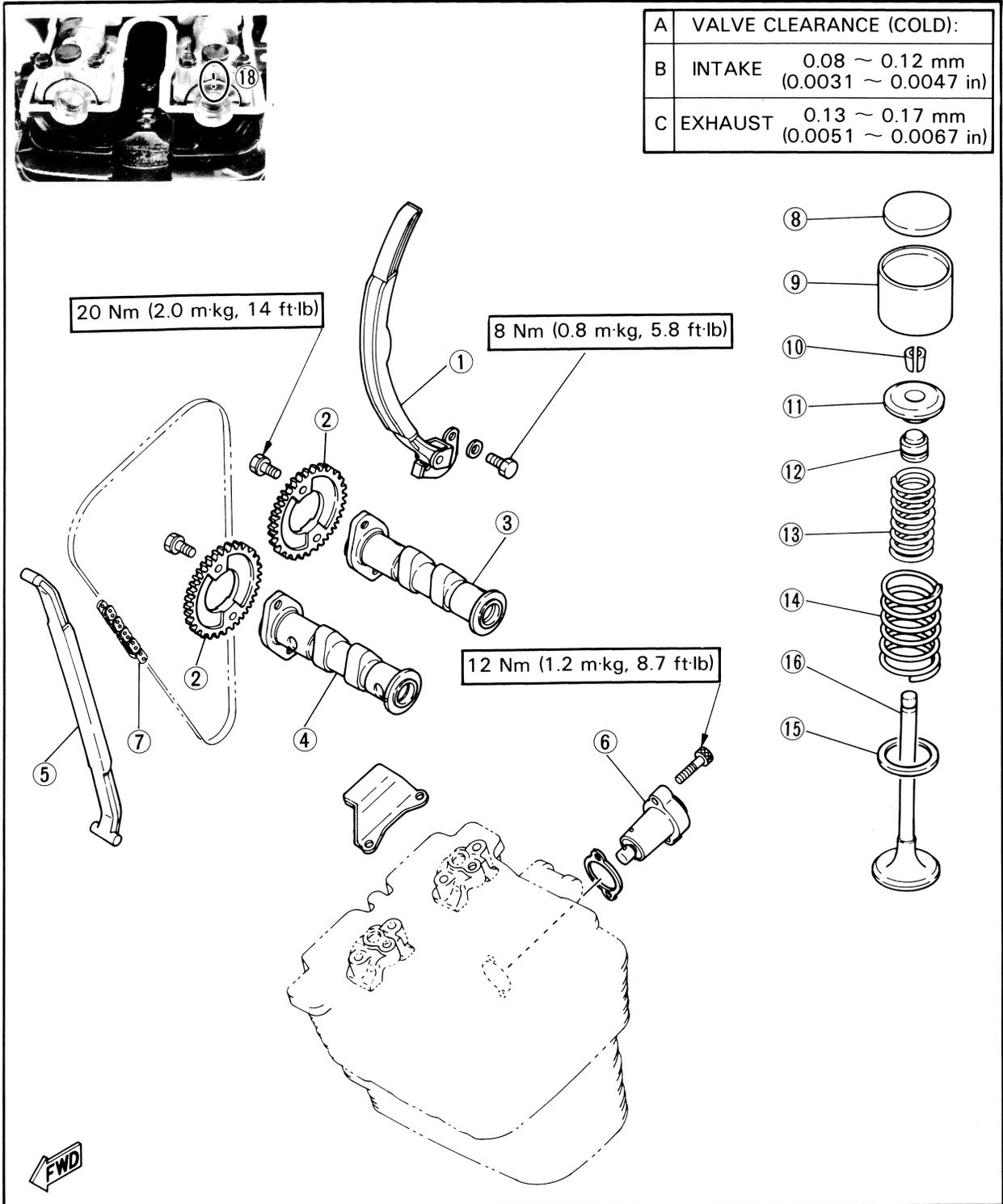
Cylinder and Cylinder Head

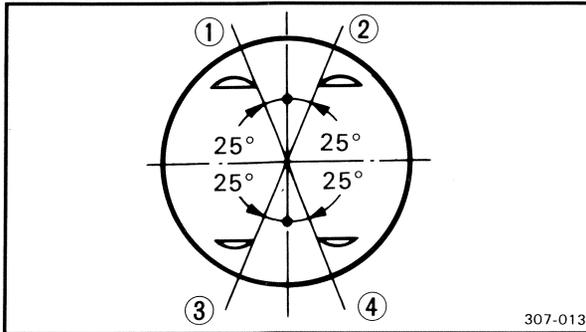
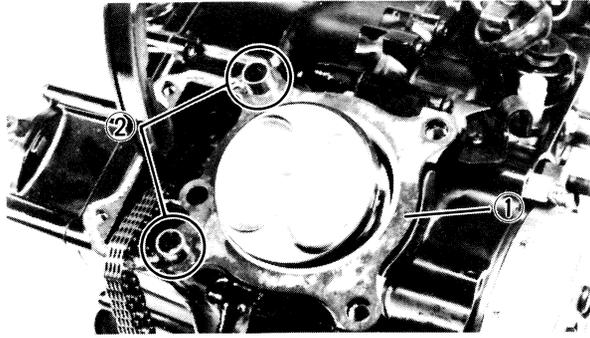
- ① Rubber washer
- ② Gasket
- ③ Spark plug
- ④ Valve guide
- ⑤ Stud bolt



**Camshaft**

- |                            |                  |                     |
|----------------------------|------------------|---------------------|
| ① Intake side chain guide  | ⑦ Cam chain      | ⑬ Inner spring      |
| ② Cam sprocket             | ⑧ Adjusting pad  | ⑭ Outer spring      |
| ③ Camshaft (Intake)        | ⑨ Valve lifter   | ⑮ Spring spring     |
| ④ Camshaft (Exhaust)       | ⑩ Valve retainer | ⑯ Valve             |
| ⑤ Exhaust side chain guide | ⑪ Spring seat    | ⑰ Upper chain guide |
| ⑥ Chain tensioner body     | ⑫ Oil seal       | ⑱ Match mark        |





## CYLINDER AND CYLINDER HEAD

1. Install:

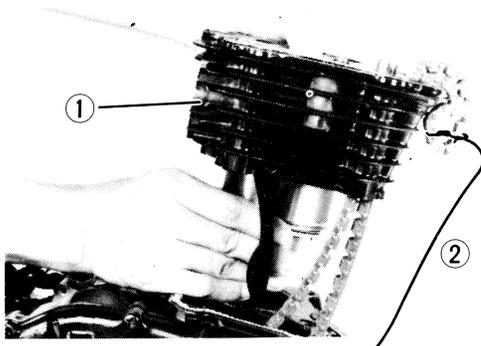
- Cylinder gasket ①
- Dowel pins ②

2. Offset the piston ring end gaps as shown.

### NOTE:

- Be sure to check the manufacturer's marks or numbers stamped on the rings are on the top side of the rings.
- Before installing the cylinder, apply a liberal coating of 4-stroke engine oil to the piston rings.

- ① Top ring end
- ② Oil ring end (lower rail)
- ③ Oil ring end (upper rail)
- ④ 2nd ring end

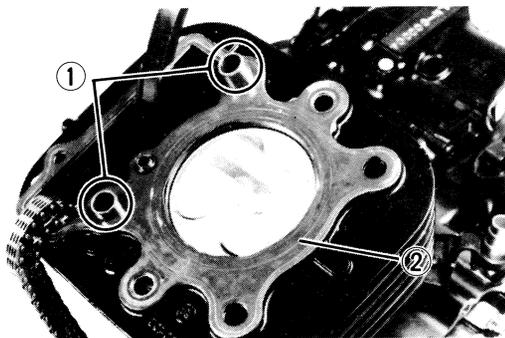


3. Install:

- Cylinder ①

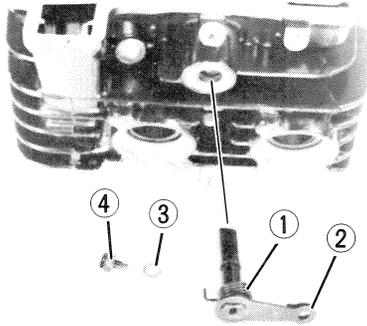
### NOTE:

- Install the cylinder with one hand while compressing the piston rings with the other hand.
- Tie the cam chain with a piece of mechanics wire ②, and feed it through the chain opening.



4. Install:

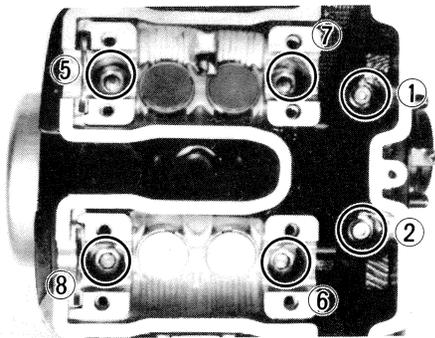
- Dowel pins ①
- Cylinder head gasket ②



5. Install:
- Spring ①
  - Decompression cam ②
  - Washer ③
  - Bolt ④
6. Tighten:
- Bolt

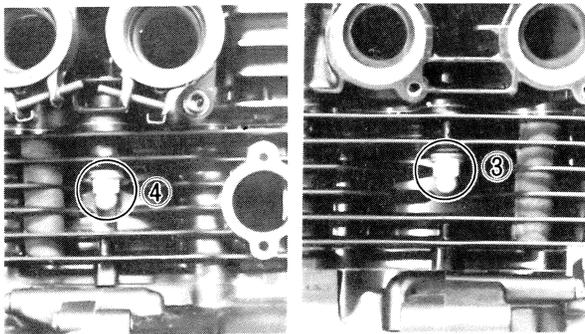


**Decompression Cam Stopper Bolt:**  
8 Nm (0.8 m·kg, 5.8 ft·lb)

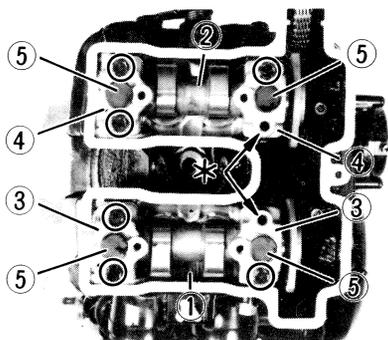


7. Install:
- Cylinder head

**NOTE:** Tighten the bolts and nuts in their proper tightening sequence.

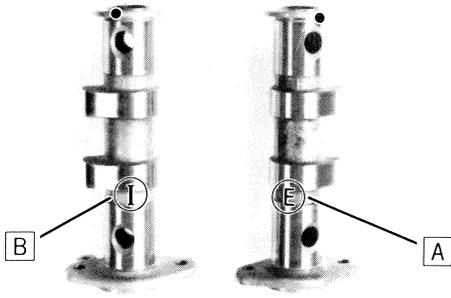


**Cylinder Head Bolt (10 mm):**  
40 Nm (4.0 m·kg, 29 ft·lb)  
**Cylinder Head Bolt (6 mm):**  
10 Nm (1.0 m·kg, 7.2 ft·lb)  
**Cylinder Head Nut:**  
20 Nm (2.0 m·kg, 14 ft·lb)



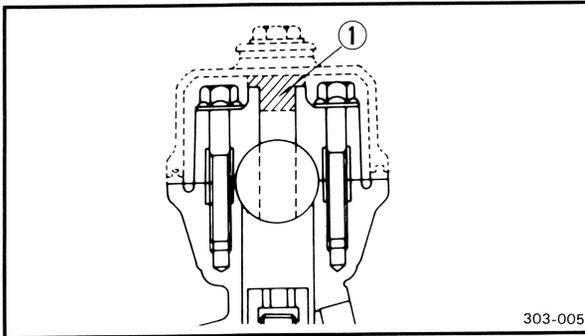
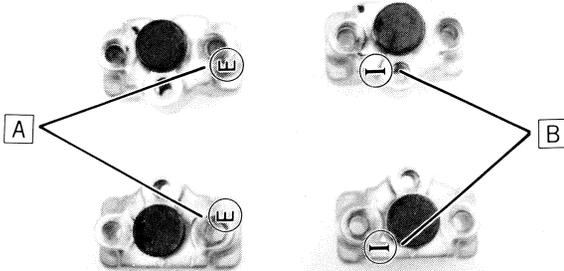
**CAMSHAFT**

1. Install:
- Intake camshaft ①
  - Exhaust camshaft ②
  - Dowel pins
  - Intake cam caps ③
  - Exhaust cam caps ④
  - Oil plugs ⑤
  - Bolts



**NOTE:**

- "I" mark **B** for intake camshaft
- "E" mark **A** for exhaust camshaft
- Make sure the timing mark **1** on the camshaft faces upward.
- Apply engine oil to camshaft bearing surfaces before installing camshafts.
- Do not install the bolts at \* marked places in this stage.



**CAUTION:**

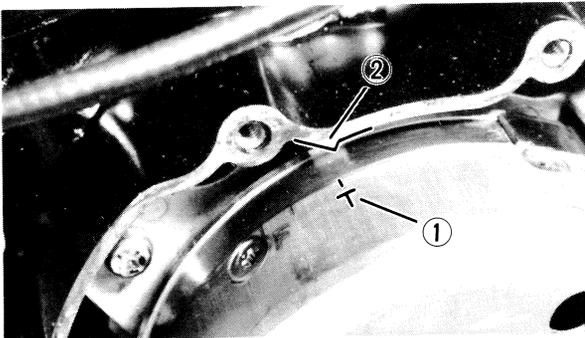
The oil plugs **1** must be installed in each camshaft hole to ensure that an adequate supply of oil will be distributed along the camshafts.

2. Tighten:
  - Cap bolts



**Cap Bolts:**

10 Nm (1.0 m·kg, 7.2 ft·lb)



3. Rotate:
  - Crankshaft  
Counter clockwise.
4. Align:
  - Flywheel "T" mark **1**  
(with the crankcase mark **2**)
5. Rotate:
  - Exhaust camshaft
6. Align:
  - Exhaust camshaft timing mark  
(with the left side exhaust cam cap mark)

**CAUTION:**

Do not rotate the camshaft over 1/2 turn or damage to the piston and valve will result.



## 7. Position:

- Cam chain  
(onto sprockets)

## 8. Install:

- Sprockets  
(onto exhaust camshafts)

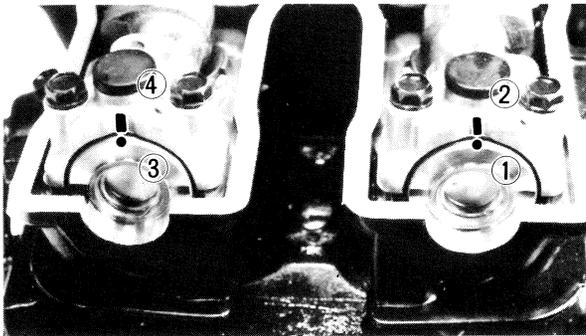
## 9. Force the exhaust sprocket clockwise (viewing from left side engine) to remove all cam chain slack.

## 10. Align:

- Sprocket, hole  
(with the exhaust camshaft thread hole)

**NOTE:**

If the sprocket hole do not align with the camshaft hole, adjust chain links between crankshaft and exhaust camshaft.



## 11. Install:

- Exhaust sprocket bolt  
(temporarily tighten)

## 12. Rotate:

- Intake camshaft

## 13. Align:

- Intake camshaft timing mark (1)  
(with the left side cam cap mark (2) )

③ Exhaust camshaft timing mark

④ Left side exhaust cam cap mark

**CAUTION:**

**Do not rotate the camshaft over 1/2 turn or damage to the piston and valve will result.**

## 14. Force the intake sprocket clockwise (viewing from left side engine) to remove all cam chain slack.

## 15. Align:

- Intake sprocket hole  
(with the intake camshaft thread hole)

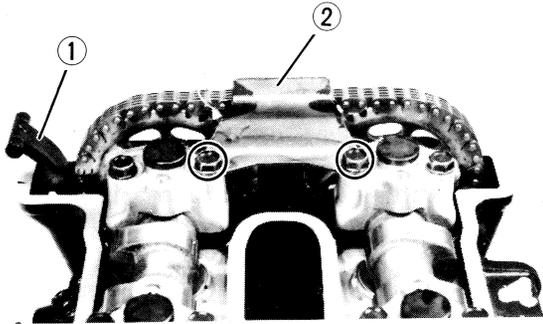
**NOTE:**

If the sprocket hole do not align with the camshaft thread hole, adjust chain links between exhaust and intake camshafts.

16. Install:
- Intake sprocket bolt (temporarily tighten)

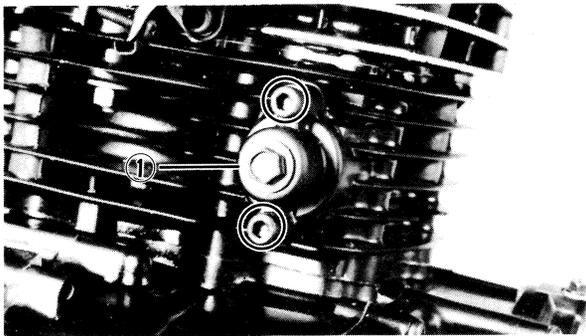
**NOTE:**

- Be sure the camshaft timing marks align with the cam cap arrow mark.
- Be sure the "T" mark on the rotor align with the stationary pointer.



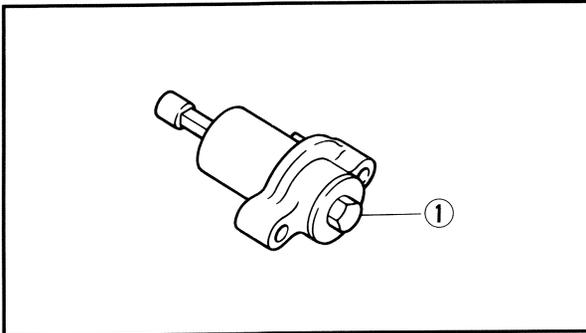
17. Install:
- Exhaust side chain guide ①
  - Upper chain guide ②

 **Upper Chain Guide Bolt:**  
10 Nm (1.0 m·kg, 7.2 ft·lb)



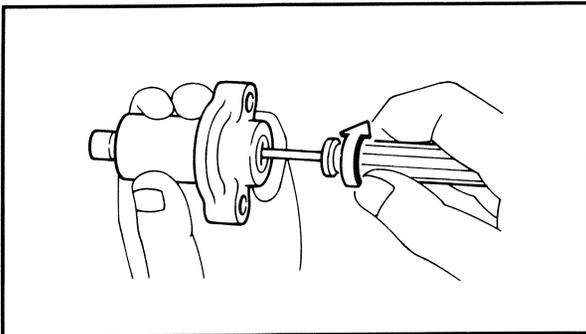
18. Install:
- Tensioner assembly ①

 **Tensioner Screw:**  
12 Nm (1.2 m·kg, 5.8 ft·lb)



**Cam chain tensioner installation steps:**

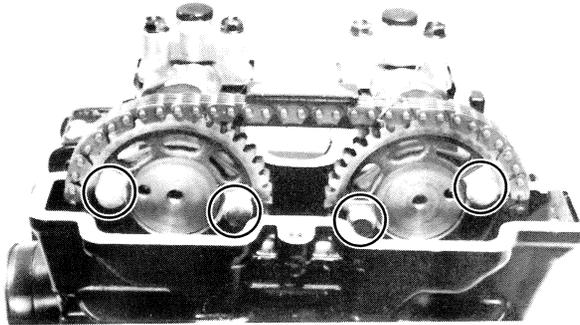
- Remove the blind bolt ① from the tensioner body.
- Insert the small screw driver into blind bolt hole.
- Turn the screw driver clockwise until it stops completely; then, keep the screw driver at this position.
- Install the tensioner with a new gasket onto the cylinder. Torque the bolts to specification.



 **Tensioner Body:**  
12 Nm (1.2 m·kg, 8.7 ft·lb)

- Release the tension rod by pulling out the screw driver. Torque the blind bolts to specification.

 **Blind Bolt:**  
6 Nm (0.6 m·kg, 4.3 ft·lb)



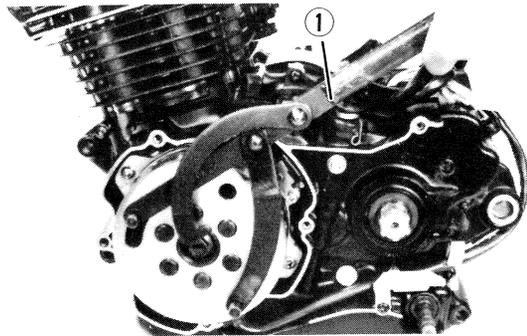
19. Rotate:
- Crankshaft  
Counterclockwise

20. Install:
- Sprocket bolts



**Sprocket Bolts:**  
20 Nm (2.0 m·kg, 14 ft·lb)

**NOTE:** \_\_\_\_\_  
If difficult to tighten the cam sprocket securing bolts; hold the flywheel magneto with the rotor holding tool ① (YU-01235).  
\_\_\_\_\_

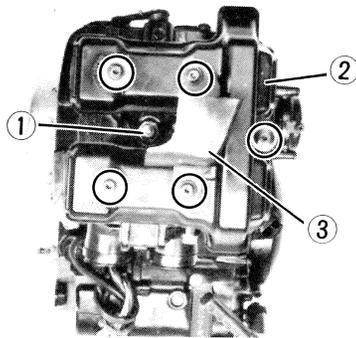


21. Install:
- Spark plug ①



**Spark plug:**  
18 Nm (1.8 m·kg, 13 ft·lb)

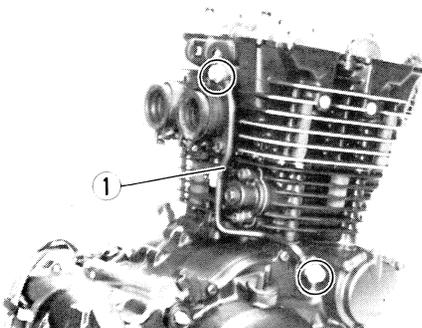
- Cylinder head cover gasket
- Cylinder head cover ②

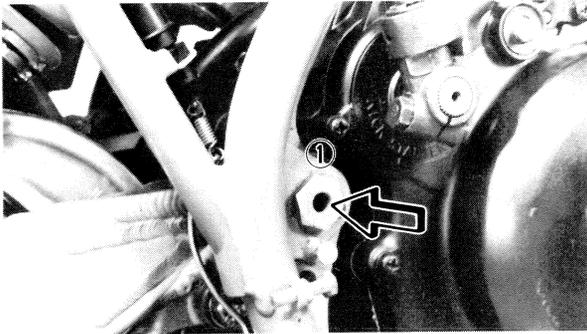


**Cylinder Head Cover Bolt:**  
10 Nm (1.0 m·kg, 7.2 ft·lb)

- Air baffle plate ③

22. Install:
- Oil Pipe ①





**REMountING ENGINE**

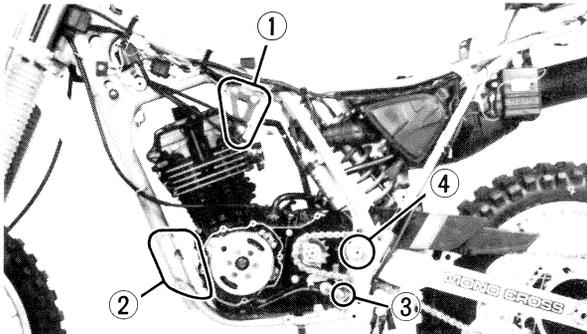
When remounting the engine, reverse the removal procedure. Note the following points.

**1. Install:**

- Engine
- Pivot shaft ①

**NOTE:**

Apply the grease to the pivot shaft.

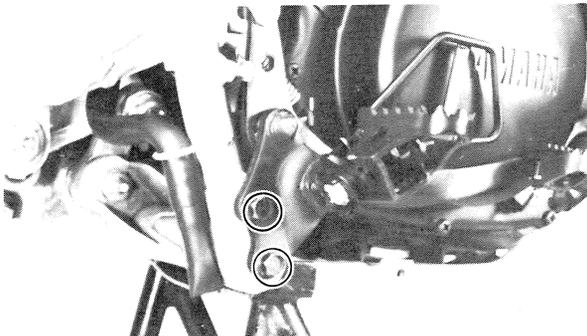


**2. Install:**

- Engine mounting bolt (Rear)
- Engine mounting stays (Upper)
- Engine mounting stays (Front)



- Upper Mounting Bolts ① :**  
 33 Nm (3.3 m·kg, 24 ft·lb)  
**Front Mounting Bolts ② :**  
 33 Nm (3.3 m·kg, 24 ft·lb)  
**Rear Mounting Bolts ③ :**  
 33 Nm (3.3 m·kg, 24 ft·lb)  
**Rear Arm Pivot Shaft ④ :**  
 85 Nm (8.5 m·kg, 61 ft·lb)

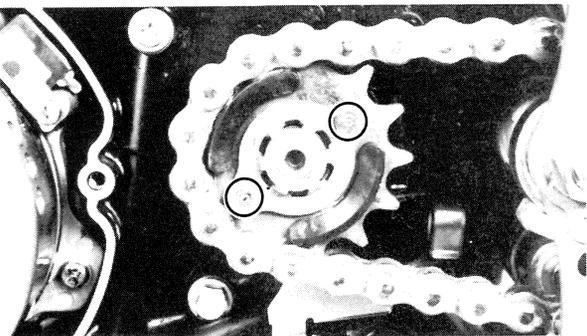


**3. Install:**

- Footrest (with brake pedal)



- Footrest Mounting Bolts:**  
 33 Nm (3.3 m·kg, 24 ft·lb)



**4. Install:**

- Drive sprocket



- Drive Chain Sprocket Bolt:**  
 10 Nm (1.0 m·kg, 7.2 ft·lb)



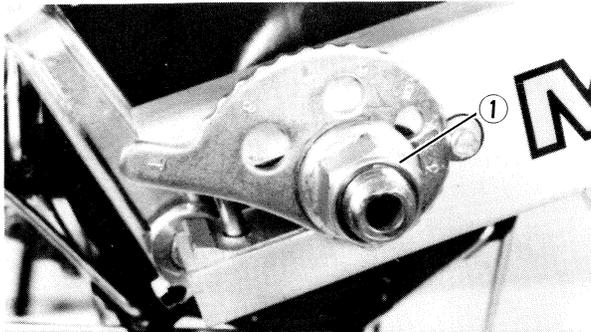
## 5. Adjust:

- Drive chain slack

Refer to "CHAPTER 2-DRIVE CHAIN SLACK ADJUSTMENT" section.

**Drive Chain Slack:**

40 ~ 45 mm (1.6 ~ 1.8 in)

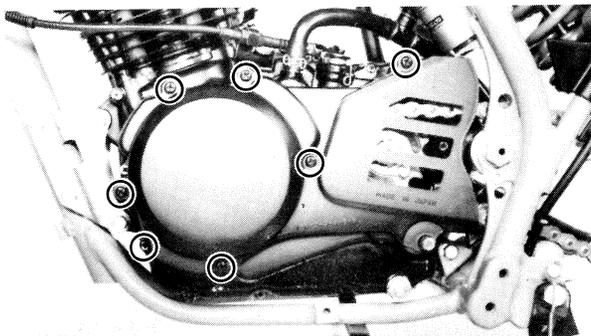


## 6. Tighten:

- Rear wheel axle nut ①

**Rear wheel axle nut:**

100 Nm (10.0 m·kg, 72 ft·lb)

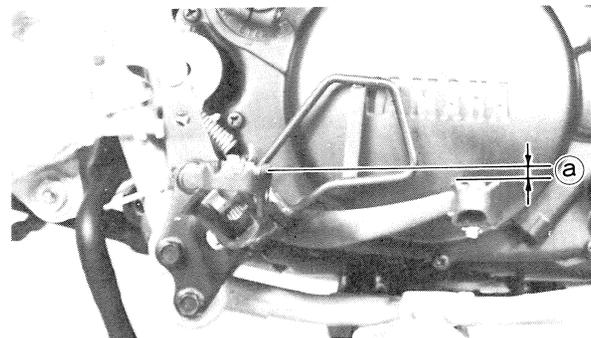


## 7. Install:

- Crankcase cover (Left)

**Left Crankcase Cover Screw:**

7 Nm (0.7 m·kg, 5.1 ft·lb)



## 8. Adjust:

- Rear brake pedal position ①
- Rear brake free play ②

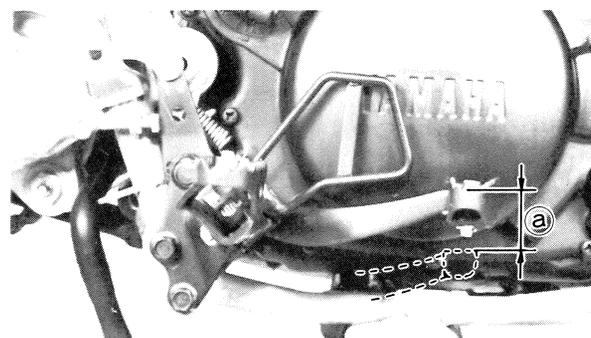
Refer to "CHAPTER 2-REAR BRAKE ADJUSTMENT" section.

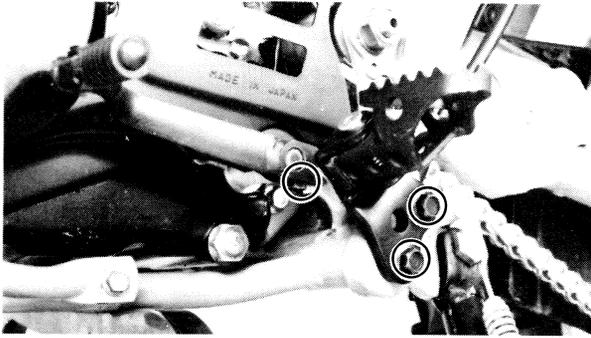
**Rear brake pedal position:**

Zero mm (Zero in)

**Rear brake free play:**

20 ~ 30 mm (0.8 ~ 1.2 in)



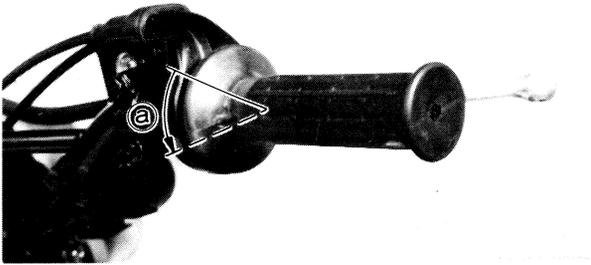


9. Install:

- Change pedal
- Footrest (Left)



**Bolt (Change pedal):**  
 10 Nm (1.0 m·kg, 7.2 ft·lb)  
**Bolt (Footrest):**  
 33 Nm (3.3 m·kg, 24 ft·lb)

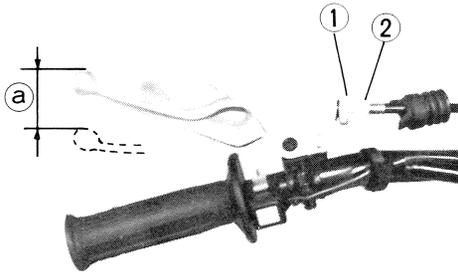


10. Adjust:

- Throttle cable free play (a)
- Refer to "CHAPTER 2-THROTTLE CABLE ADJUSTMENT" section.



**Throttle cable free play:**  
 2 ~ 5 mm (0.08 ~ 0.20 in)

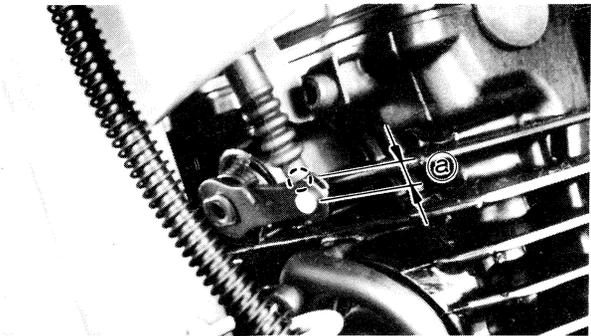


11. Adjust:

- Clutch free play (a)
- Refer to "CHAPTER 2-CLUTCH ADJUSTMENT" Section.



**Clutch free play (At lever end):**  
 8 ~ 13 mm (0.3 ~ 0.5 in)

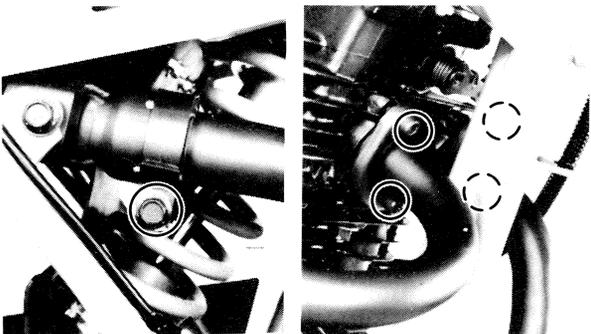


12. Adjust:

- Decompression cable free play (a)
- Refer to "CHAPTER 2-DECOMPRESSION CABLE ADJUSTMENT" Section.



**Free play:**  
 2 ~ 3 mm (0.008 ~ 0.12 in)

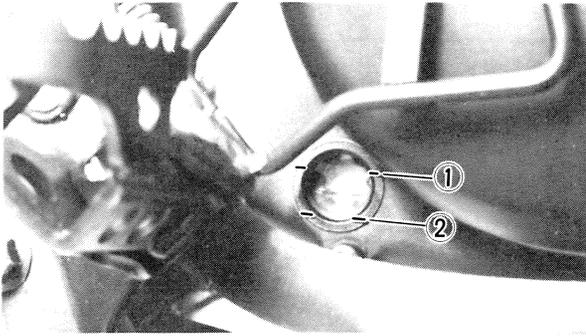


13. Install:

- Exhaust pipe



**Exhaust Pipe Mounting Bolts:**  
 12 Nm (1.2 m·kg, 8.7 ft·lb)  
**Muffer Clamp Bolts:**  
 20 Nm (2.0 m·kg, 14 ft·lb)



## 14. Fill:

- Crankcase

Refer to "CHAPTER 2-ENGINE OIL REPLACEMENT" Section.

**Engine Oil:**

1.6 L (1.4 Imp qt, 1.7 US qt)

Yamalube 4,

SAE10E30 type SE Motor oil or

SAE20W40 type SE Motor oil.

- ① Maximum level
- ② Minimum level

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## **CHAPTER 4. CARBURETION**

<b>COASTING ENRICHER</b> .....	4-1
OPERATION OF ENRICHER .....	4-1
MAINTENANCE .....	4-2
<b>CARBURETOR</b> .....	4-3
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DISASSEMBLY .....	4-5
INSPECTION .....	4-8
ASSEMBLY .....	4-9
INSTALLATION .....	4-10
ADJUSTMENT .....	4-11



## CARBURETION

### COASTING ENRICHER

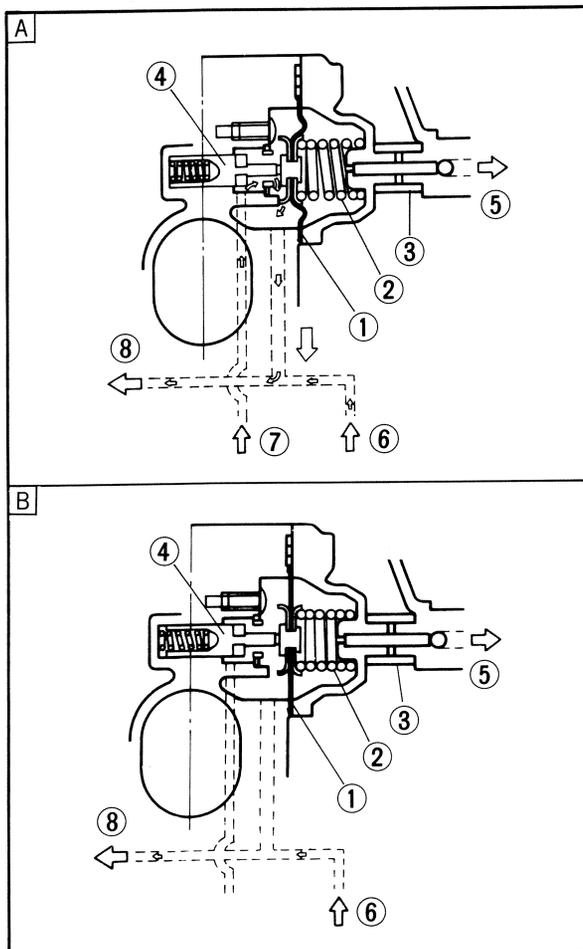
This model is equipped with an afterburning protection device (coasting enricher).

Afterburning is a phenomenon typical of the internal combustion engine. If throttle is precipitously closed on an engine revolving at high speed, a large amount of air mixed fuel spurts out of the pilot outlet (P.O.), resulting in incomplete burning in the combustion chamber. Such unburned elements are expelled together with exhaust gases and build up in the exhaust pipe or muffler. These elements, accumulated to the point of being inflammable, suddenly gets ignited and burned in contact with expelled gases of high temperature.

This phenomenon is referred to "afterburning", which is basically accompanied with a loud explosive sound.

### OPERATION OF ENRICHER

In the illustration, the air valve is pulled left by the negative pressure developed as the result of the sudden closing of the throttle valve. Thus, the enricher air passage is closed at the air valve seat and the air which flows into the pilot air passage is stopped, enabling only the air from the slow air jet to flow into the pilot air passage. This makes the air-fuel mixture flow to the pilot outlet and bypass port now relatively richer.



**A** Normal operation

**B** Closing the throttle at high engine revolution

- ① Diaphragm
- ② Spring
- ③ Rubber joint
- ④ Air valve
- ⑤ Vacuum from Secondary Carburetor
- ⑥ From main air jet
- ⑦ From enricher air jet
- ⑧ To pilot jet

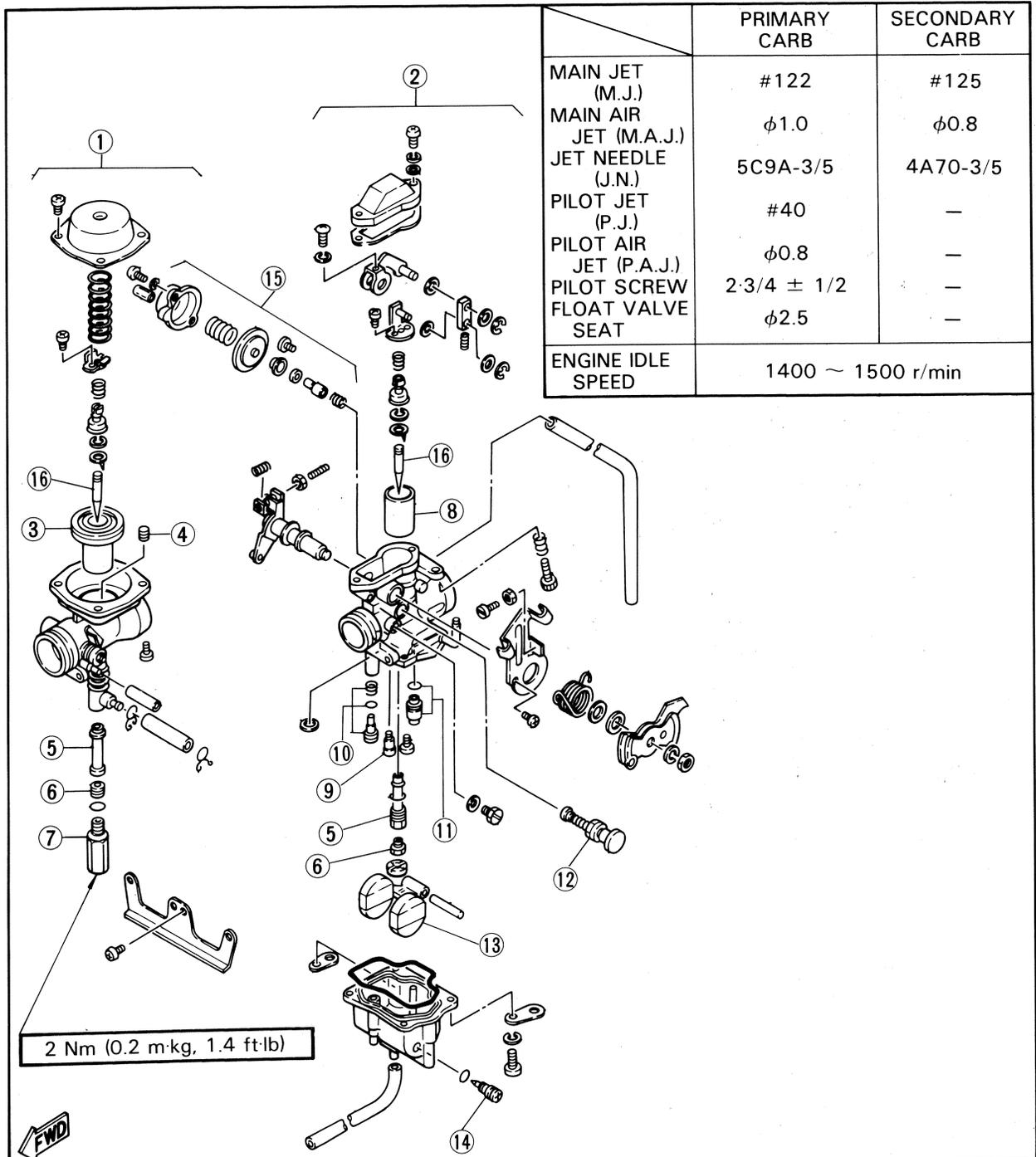
**MAINTENANCE**

Each individual spring is rigorously tested for its preload and therefore must not be broken down or adjusted in any way. If an afterburning sound is heard during normal riding, clean the pilot air jet, and bypass port by blowing air into them.



**CARBURETOR**

- ① Secondary carburetor
- ② Primary carburetor
- ③ Vacuum piston
- ④ Main air jet
- ⑤ Main nozzle
- ⑥ Main jet
- ⑦ Blind pulg
- ⑧ Throttle valve
- ⑨ Pilot jet
- ⑩ Pilot screw
- ⑪ Valve seat assembly
- ⑫ Starter plunger assembly
- ⑬ Float
- ⑭ Drain screw
- ⑮ Coasting enricher assembly
- ⑯ Jet needle

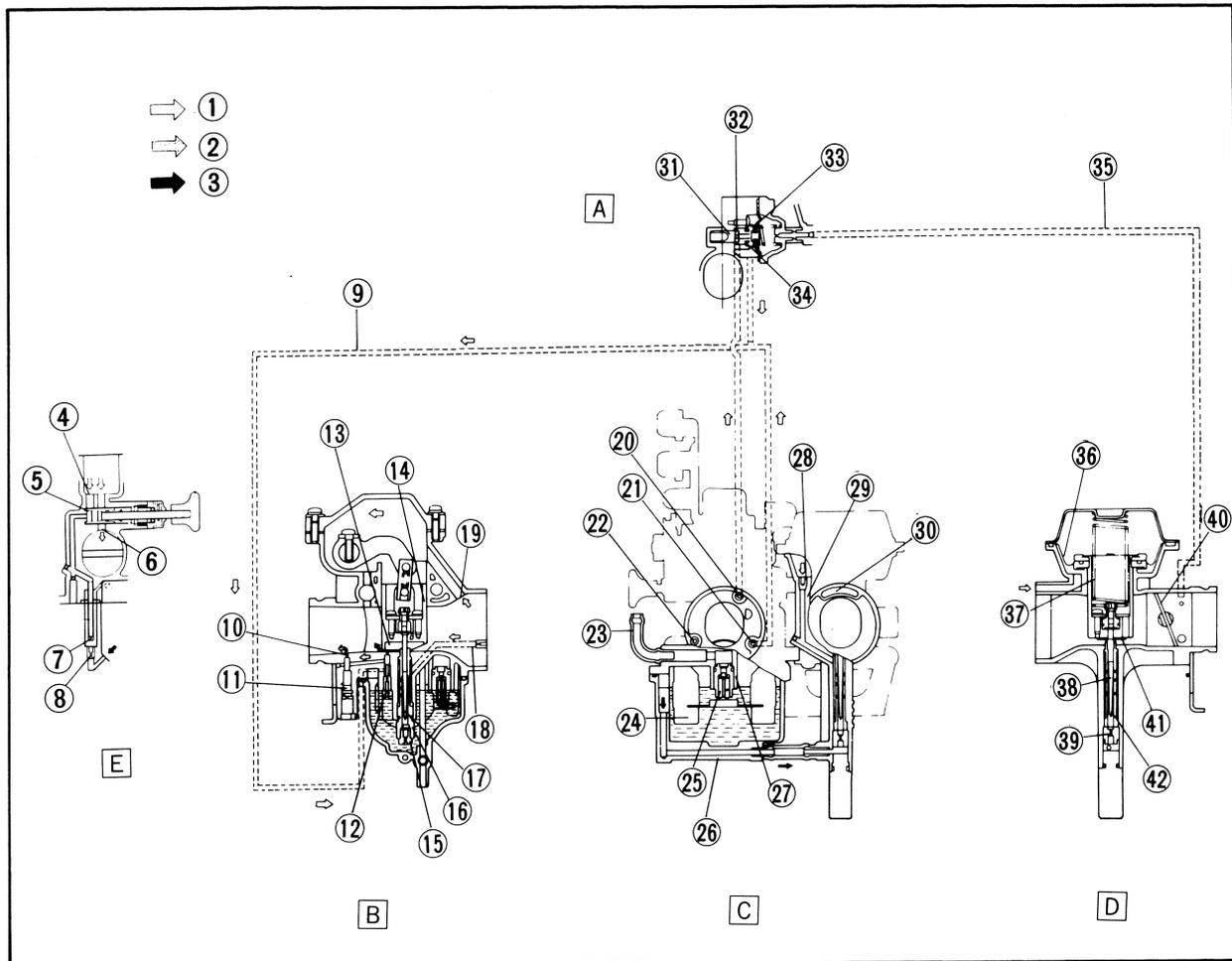


SECTION VIEW

- ① Air
- ② Fuel
- ③ Mixture
- ④ Air inlet
- ⑤ Starter valve
- ⑥ Mixture outlet
- ⑦ Starter jet #1
- ⑧ Starter jet #2
- ⑨ Pilot air circuit
- ⑩ Pilot outlet
- ⑪ Pilot screw
- ⑫ Pilot jet
- ⑬ Bypass hole
- ⑭ Throttle valve
- ⑮ Main air jet
- ⑯ Main nozzle
- ⑰ Jet needle
- ⑱ Primary main air circuit
- ⑲ Air inlet for starter
- ⑳ Enricher air jet
- ㉑ Pilot air jet

- ㉒ Main air jet
- ㉓ Fuel joint
- ㉔ Float
- ㉕ Needle valve
- ㉖ Secondary fuel circuit
- ㉗ Valve seat
- ㉘ Main air jet
- ㉙ Secondary main air circuit
- ㉚ Air inlet
- ㉛ Rod
- ㉜ Valve
- ㉝ Diaphragm assembly
- ㉞ Valve seat
- ㉟ Vacuum circuit
- ㊱ Diaphragm
- ㊲ Vacuum piston
- ㊳ Main nozzle
- ㊴ Main jet
- ㊵ Throttle valve
- ㊶ Vacuum hole
- ㊷ Jet needle

- A COASTING ENRICHER SYSTEM
- B PRIMARY SYSTEM
- C FUEL SYSTEM
- D SECONDARY SYSTEM
- E STARTER SYSTEM





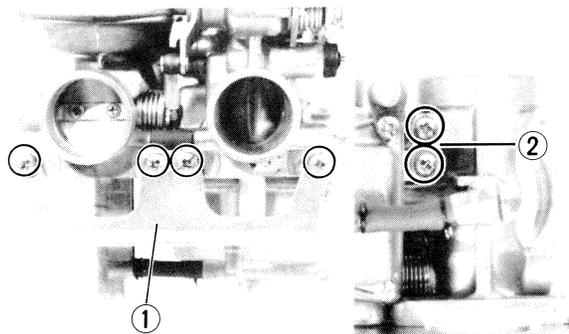
**REMOVAL**

1. Remove:
  - Carburetor assembly
 Refer to engine removal section.

**NOTE:**

The following parts can be cleaned and inspected without carburetor separation.

- Piston valve
- Vacuum piston
- Starter plunger
- Float chamber components
- Coasting enricher



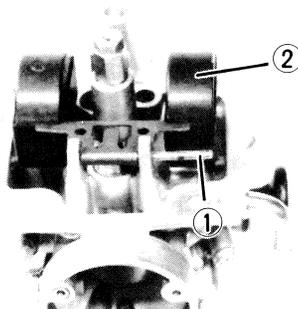
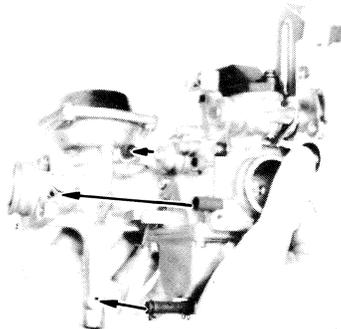
**DISASSEMBLY**

**Primary and Secondary Carburetors**

1. Remove:
  - Stay plate (front) ①
  - Stay plate (rear) ②
2. Sparate:
  - Primary carburetor
  - Secondary carburetor

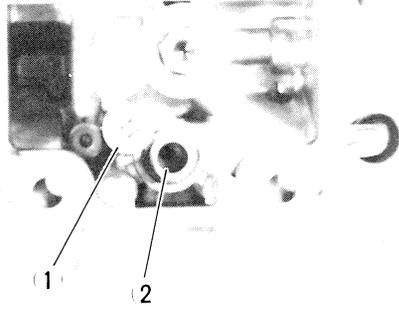
**NOTE:**

The primary and secondary carburetors are connected by the rubber balance pipe, the fuel line and the vacuum pipe. To separate the carburetors, pull them apart, applying an equal amount of force on each carburetor.

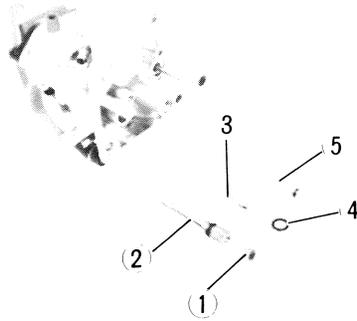


**Primary Carburetor**

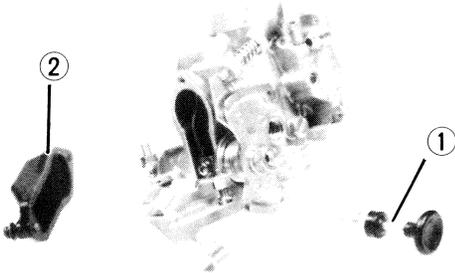
1. Remove:
  - Float chamber
  - Float pin ①
  - Float ②



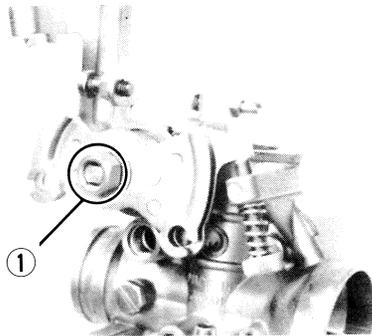
2. Remove:
- Screw ① (Valve seat)
  - Valve seat assembly ②
- Pull out the valve seat assembly



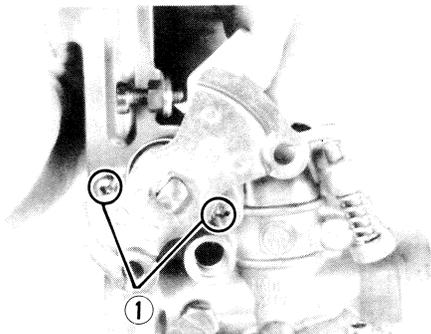
3. Remove:
- Main jet ①
  - Main nozzle ②
  - Pilot jet ③
  - O-rings ④
  - Pilot screw ⑤



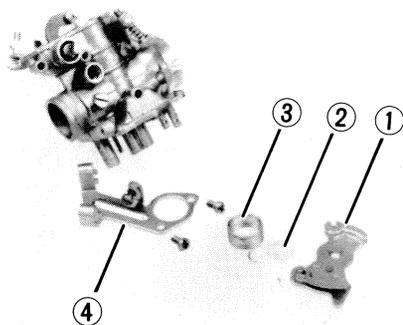
4. Remove:
- Starter plunger ①
  - Primary carburetor cap ②



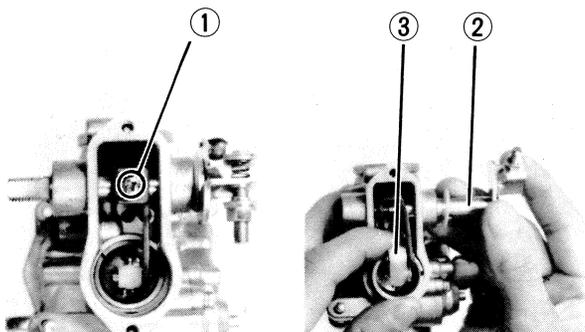
5. Remove:
- Nut ①
  - Spring washer



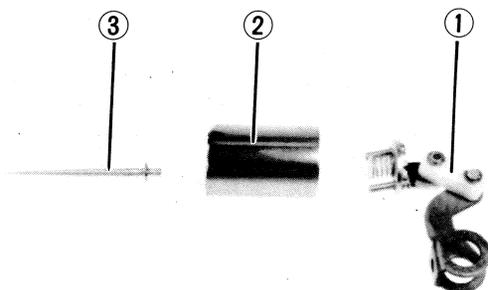
6. Remove:
- Screws ① (Throttle cable holder)



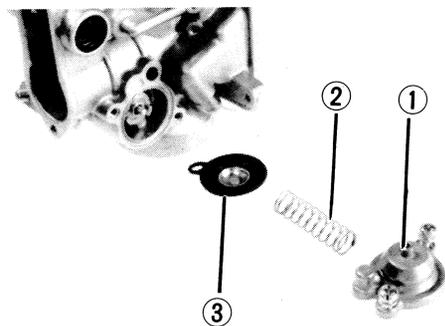
7. Remove:
- Throttle lever ①
  - Washer ② (Plastic)
  - Spring ③
  - Throttle cable holder ④



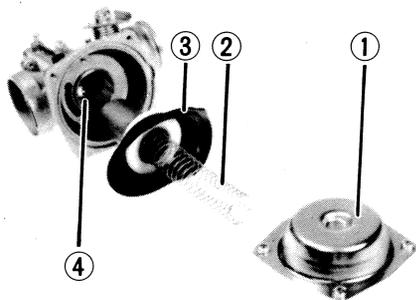
8. Remove:
- Screw ① (Connection arm)
  - Throttle shaft ②
  - Throttle valve assembly ③



9. Remove:
- Connection arm ①
  - Throttle valve ②
  - Jet needle ③

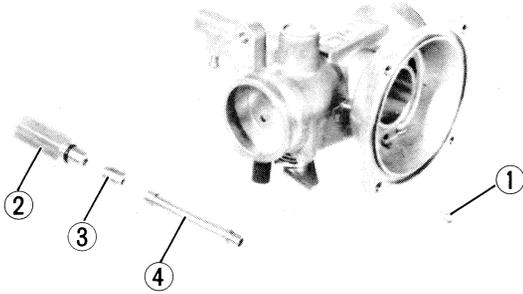


10. Remove:
- Coasting enricher cover ①
  - Spring ②
  - Diaphragm ③



**Secondary Carburetor**

1. Remove:
- Vacuum piston cover ①
  - Spring ②
  - Diaphragm ③
  - Jet needle ④



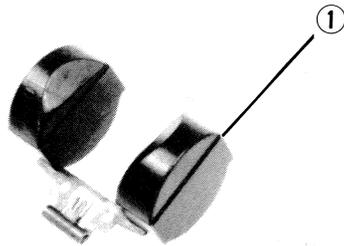
2. Remove:
- Main air jet ①
  - Blind plug ②
  - Main jet ③
  - Main nozzle ④

**INSPECTION**

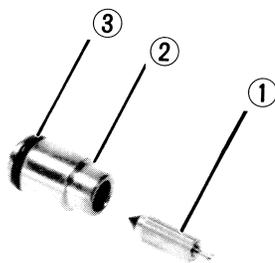
1. Inspect:
- Carburetor body
  - Fuel passage  
Contamination → Clean as indicated.

**Carburetor cleaning steps:**

- Wash carburetor in petroleum based solvent. (Do not use any caustic carburetor cleaning solution).
- Blow out all passages and jets with compressed air.



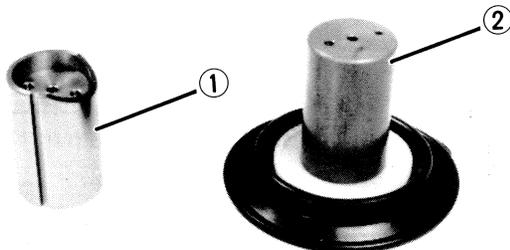
2. Inspect:
- Floats ①  
Damage → Replace.
  - Gasket/O-ring  
Damage → Replace.



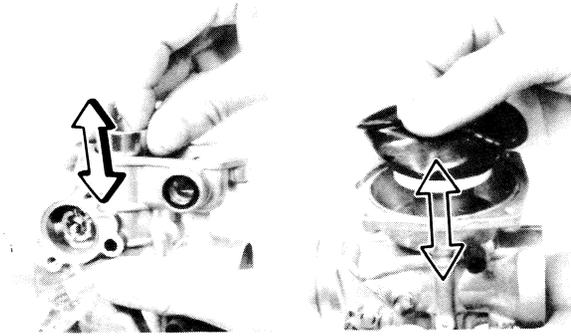
3. Inspect:
- Float needle valve ①
  - Seat ②
  - O-ring ③  
Damage/Wear/Contamination → Replace.

**NOTE:**

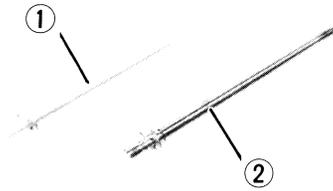
Always replace the needle valve and valve seat as a set.



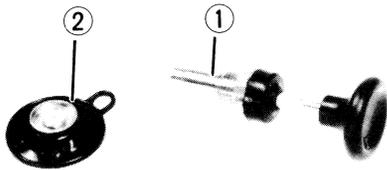
4. Inspect:
- Throttle valve (primary) ①
  - Vacuum piston ②  
Wear/Damage → Replace.



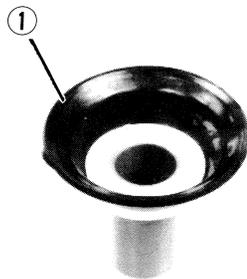
5. Check:
- Free movement  
Stick→Replace.
- Insert the throttle valve and piston into the primary and secondary carburetor bodys, and check for free movement.



6. Inspect:
- Jet needle (primary) ①
  - Jet needle (secondary) ②
- Bends/Wear→Replace.



7. Inspect:
- Starter plunger ①  
Wear/Contamination→Replace.
  - Diaphragm (coasting enricher) ②  
Damage→Replace.



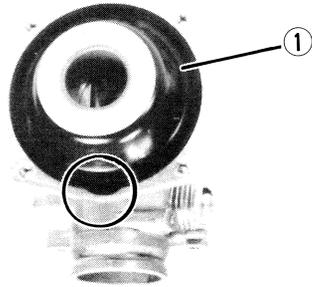
8. Inspect:
- Diaphragm (Vacuum piston) ①  
Damage→Replace.

**ASSEMBLY**

To assemble the carburetors, reverse the disassembly procedures. Note the following points.

**CAUTION:**

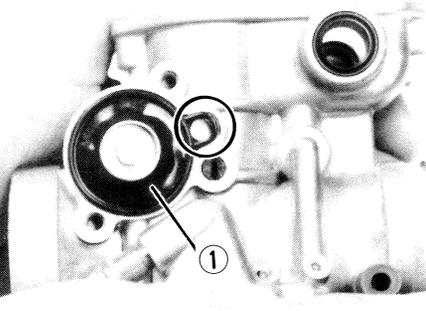
- Before reassembling, wash all parts in clean gasoline.
- Always use a new gasket.



**Secondary Carburetor**

1. Install:
  - Diaphragm ①

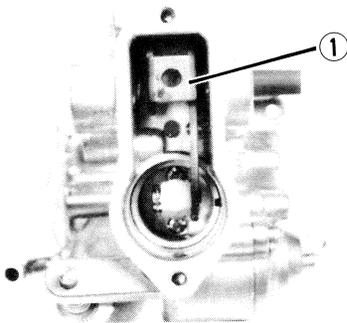
**NOTE:** \_\_\_\_\_  
 Match the tab on the diaphragm to the matching recess in the secondary carburetor.



**Primary Carburetor**

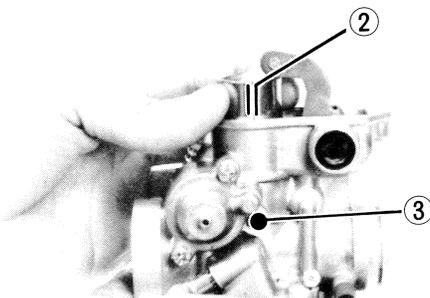
1. Install:
  - Diaphragm ①

**NOTE:** \_\_\_\_\_  
 Match the tab on the diaphragm to the matching recess in the coasting enricher.



2. Install:
  - Throttle valve assembly

**NOTE:** \_\_\_\_\_  
 • Make sure that the connection arm assembly ① is at the illustrated position.  
 • Align the groove ② of the throttle valve with the projection ③ of the carburetor body.



**INSTALLATION**

1. Install:
  - Carburetor assembly
 Reserve the removal procedures



## ADJUSTMENT

### NOTE:

Before adjusting the fuel level, the float height should be adjusted.

### Float Height Adjustment

#### 1. Measure:

- Float height (a)  
Out of specification → Adjust.  
By the following steps.



**Float Height (a) :**

**$26.0 \pm 2.5$  mm ( $1.02 \pm 0.10$  in)**

### Float height measurement and adjustment steps:

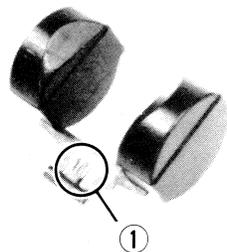
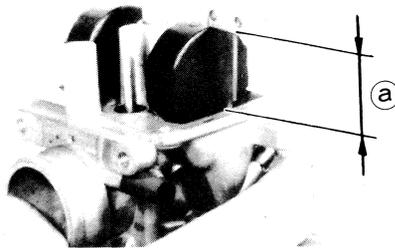
- Hold the carburetor in an upside down position.
- Measure the distance between the mating surface of the float chamber (gasket removed) and top of the float using a gauge.

### NOTE:

The float arm should be resting on the needle valve, but not compressing the needle valve.

#### (a) Float height

- If the float height is not within specification, inspect the valve seat and needle valve.
- If either is worn, replace them both.
- If both are fine, adjust the float height by bending the float tang (1) on the float.
- Recheck the float height.



### Fuel Level Adjustment

#### 1. Measure:

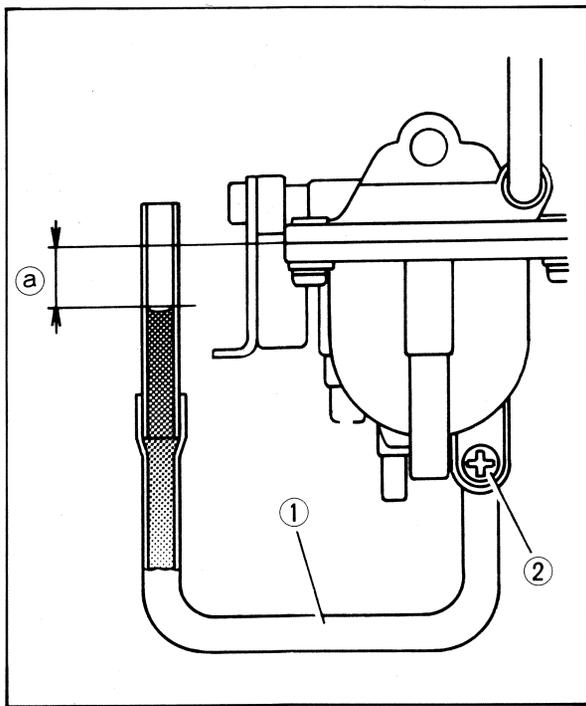
- Fuel level (a)  
Out of specification → Adjust.  
By the following measurement steps.



**Fuel Level (a) :**

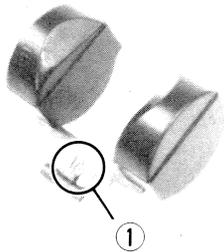
**$6.0 \pm 0.5$  mm ( $0.24 \pm 0.02$  in)**

**Below the carburetor body edge**



**Fuel level measurement steps:**

- Place the machine on a level place.
- Use a garage jack under the engine to ensure that the carburetor is positioned vertically.
- Attach the Fuel Level Gauge ① (YM-01312) to the float chamber nozzle.
- Loosen the drain screw ②, and warm up the engine for several minutes.
- Measure the fuel level a with the gauge.
- If the fuel level is incorrect, adjust the fuel level.



2. Adjust:

- Fuel level

By the following adjustment steps.

**Fuel level adjustment steps:**

- Remove the carburetor.
- Inspect the valve seat and needle valve.
- If either is worn, replace them both.
- If both are fine, adjust the float height by bending the float tang ① on the float.
- Recheck the fuel level.

**Primary Carburetor Full-open Adjustment**

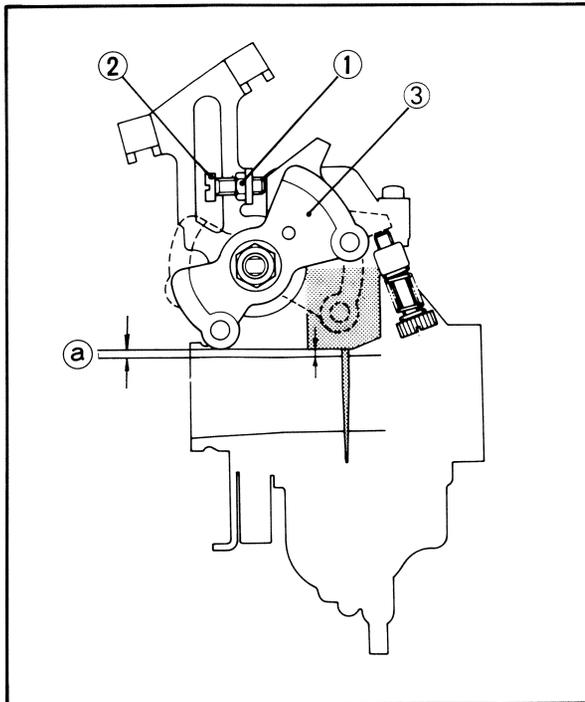
1. Adjust:

- Throttle valve position

By the following adjustment steps.

**Throttle valve position adjustment steps:**

- Loosen the locknut ①.
- Turn the throttle grip to the full-throttle position.

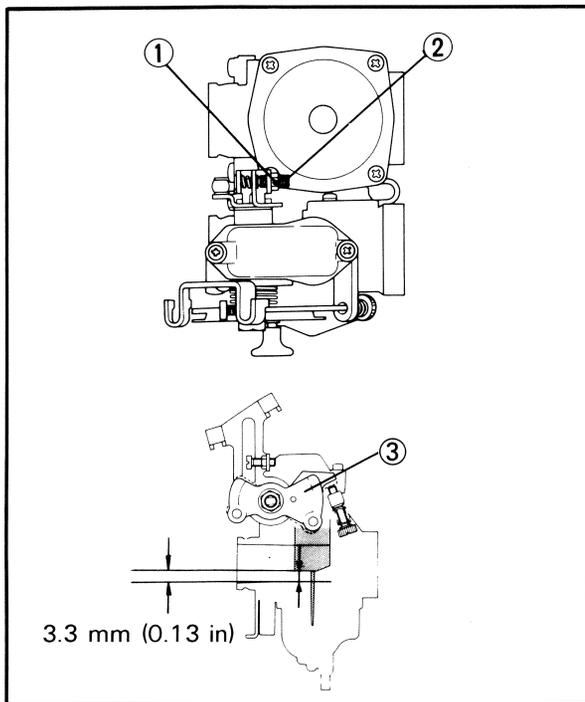


- Turn the adjuster ② in or out so that carburetor valve bottom is positioned within the limits as specified.



**Throttle Valve Position ① :**  
 0~0.1 mm (0~0.04 in)

- Tighten the locknut.



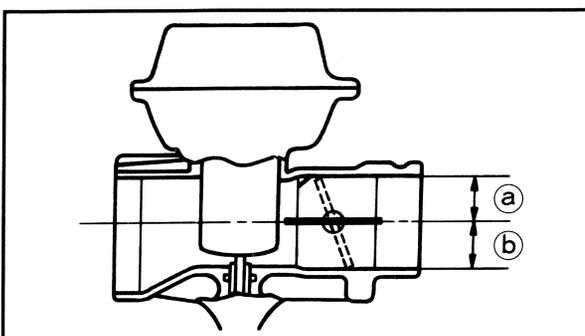
**Secondary Carburetor Synchronization**

1. Adjust:

- Secondary carburetor synchronization  
 By the following adjustment steps.

**Secondary carburetor synchronization adjustment steps:**

- Loosen the lock nut ① .
- Raise the primary throttle valve to a height of 3.3 mm (0.13 in) as indicated.
- Turn the synchronizing screw ② in or out so that secondary throttle valve is begun to open.
- Tighten the lock nut.
- Make sure that the secondary valve is opened horizontally ( ① = ② ) when the primary carburetor valve is fully opened.





## CHAPTER 5. CHASSIS

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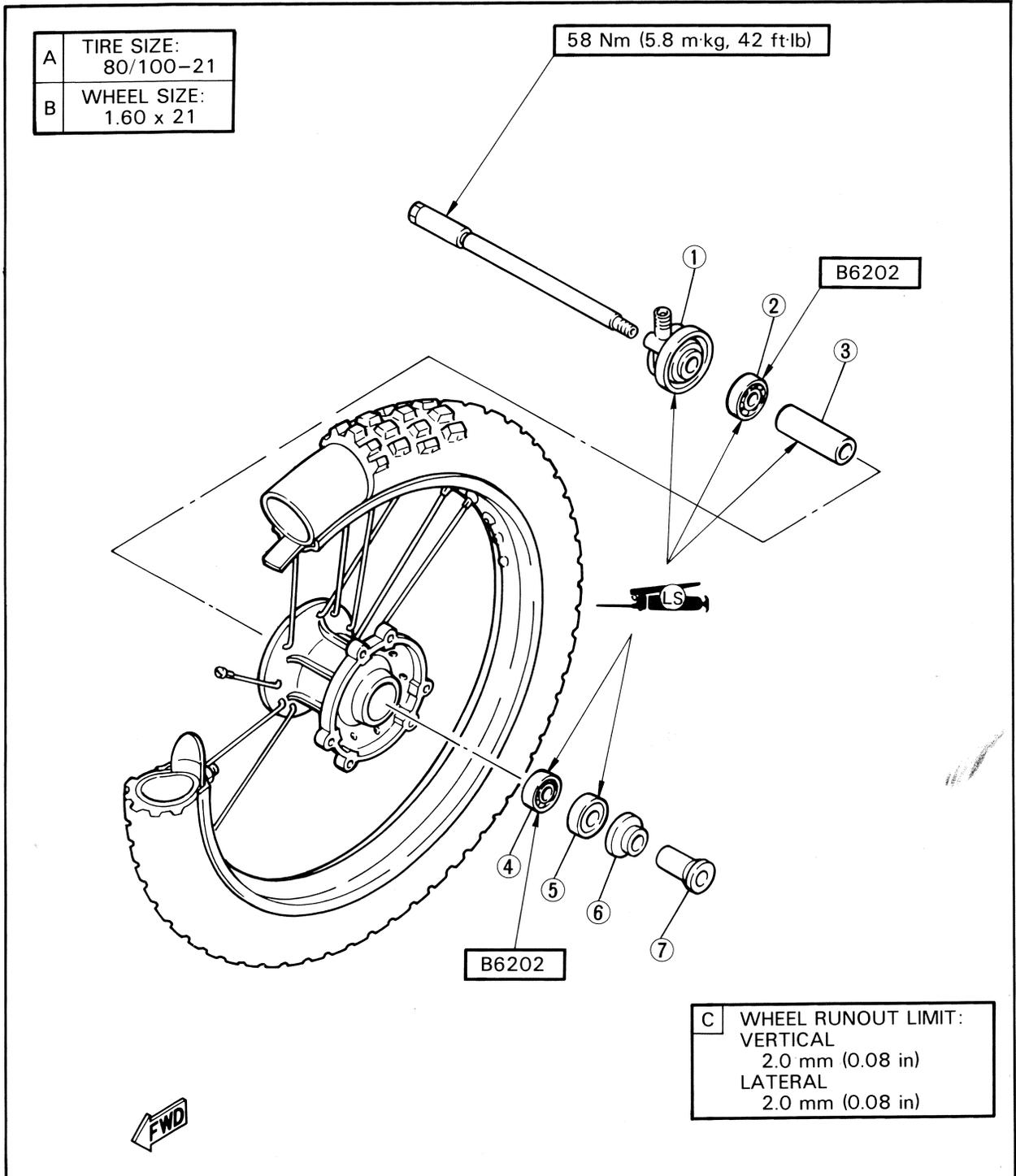
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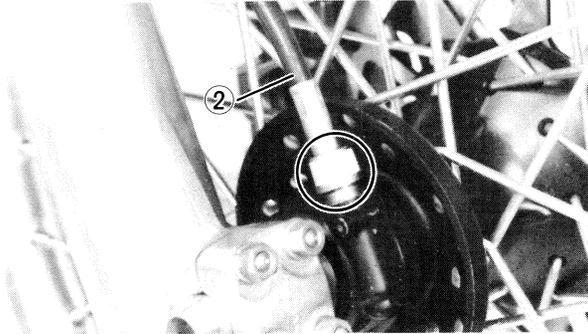
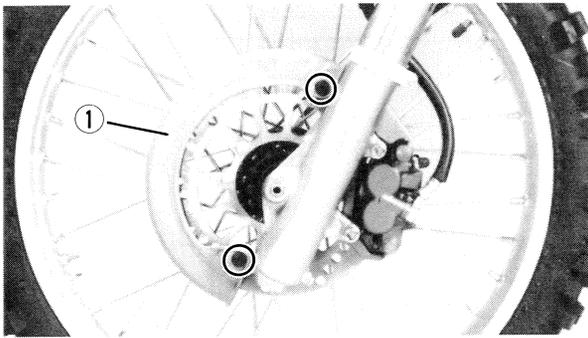
**CHASSIS**

**FRONT WHEEL**

- ① Gear unit assembly
- ② Bearing
- ③ Spacer
- ④ Bearing
- ⑤ Oil seal
- ⑥ Dust cover
- ⑦ Collar

TIRE AIR PRESSURE		
COLD TIRE PRESSURE	FRONT	REAR
OFF-ROAD RIDING	98 kPa (1.0 kg/cm <sup>2</sup> , 14 psi)	98 kPa 1.0 kg/cm <sup>2</sup> , 14 psi)

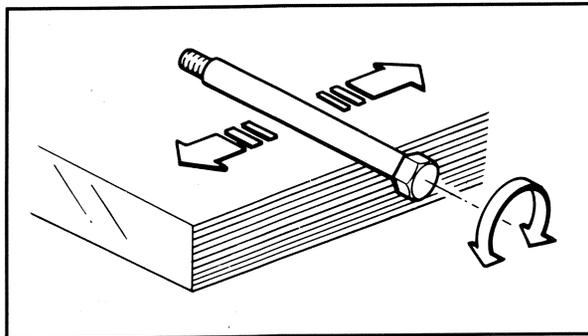


**REMOVAL**

1. Remove:
  - Disc cover ①
2. Disconnect:
  - Speedometer cable ②
3. Loosen:
  - Nuts (axle holder)
  - Front axle
4. Place the machine on a level place.
5. Elevate the front wheel by placing a suitable stand under the engine.
6. Remove:
  - Front axle
  - Front wheel

**NOTE:**

Do not depress the brake lever when the wheel is off the machine as the brake pads will be forced shut.

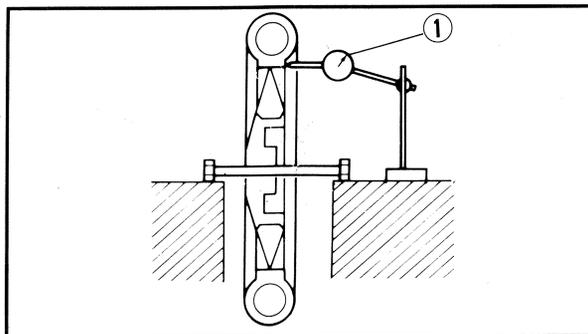
**INSPECTION**

1. Inspect:
  - Front axle

Roll the axle on a flat surface.  
Bends → Replace.

**WARNING:**

Do not attempt to straighten a dent axle.



2. Inspect:
    - Wheel

Cracks/Bends/Warpage → Replace.
  3. Measure:
    - Wheel runout

Out of specification → Replace.
- ① Dial gauge



**Rim Runout Limit:**  
 Vertical: 2.0 mm (0.08 in)  
 Lateral: 2.0 mm (0.08 in)

4. Check:
- Wheel balance  
 Out of balance → Adjust.

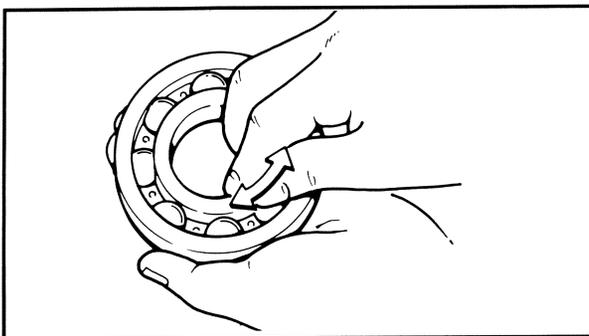
**NOTE:** \_\_\_\_\_  
 Balance wheels with the brake disc installed.

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

Be sure the valve stem locknut is tightened securely after repairing or replacing a tire and/or wheel.

**WARNING:** \_\_\_\_\_

Ride conservatively after installing a tire to allow the tire to seat itself correctly on the rim.



5. Check:
- Wheel bearings  
 Bearings allow play in the wheel hub or wheel turns roughly → Replace.  
 By the following replacement steps.

**Wheel bearing replacement steps:**

- Clean the outside of the wheel hub.
- Drive out the bearing.

**WARNING:** \_\_\_\_\_

Eye protection is recommended when using striking tools.

- Install the new bearing by reversing the previous steps.

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

Use a socket that matches the outside diameter of the race of the bearing.

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

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

## 6. Inspect/check:

- Brake disc

Wear/Over specified limit → Replace.



**Maximum Deflection:**

**0.15 mm (0.006 in)**

**Minimum Disc Thickness:**

**2.5 mm (0.10 in)**

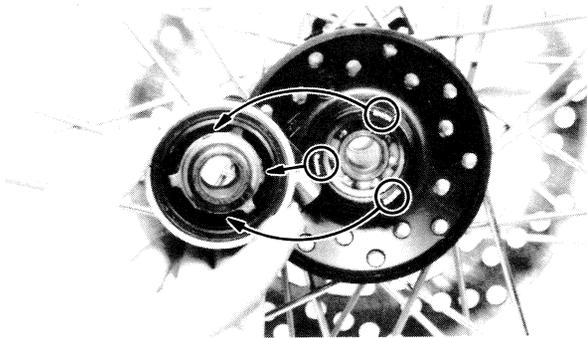
**INSTALLATION**

When installing the front wheel, reserve the removal procedure. Note the following points.

## 1. Apply:

- Lithium base grease

Lightly grease to the oil seal and gear unit.

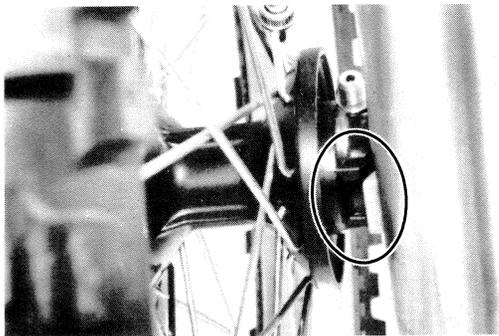


## 2. Install:

- Gear unit assembly

**NOTE:**

Make sure the projections inside the gear unit are meshed with the flats in the wheel hub.



## 3. Install:

- Front wheel assembly

**NOTE:**

Be sure the boss on the outer fork tube correctly engages with the locating slot on the gear unit assembly.

## 4. Tighten:

- Nuts (axle holder)
- Front axle



**Nuts (Axle Holder):**

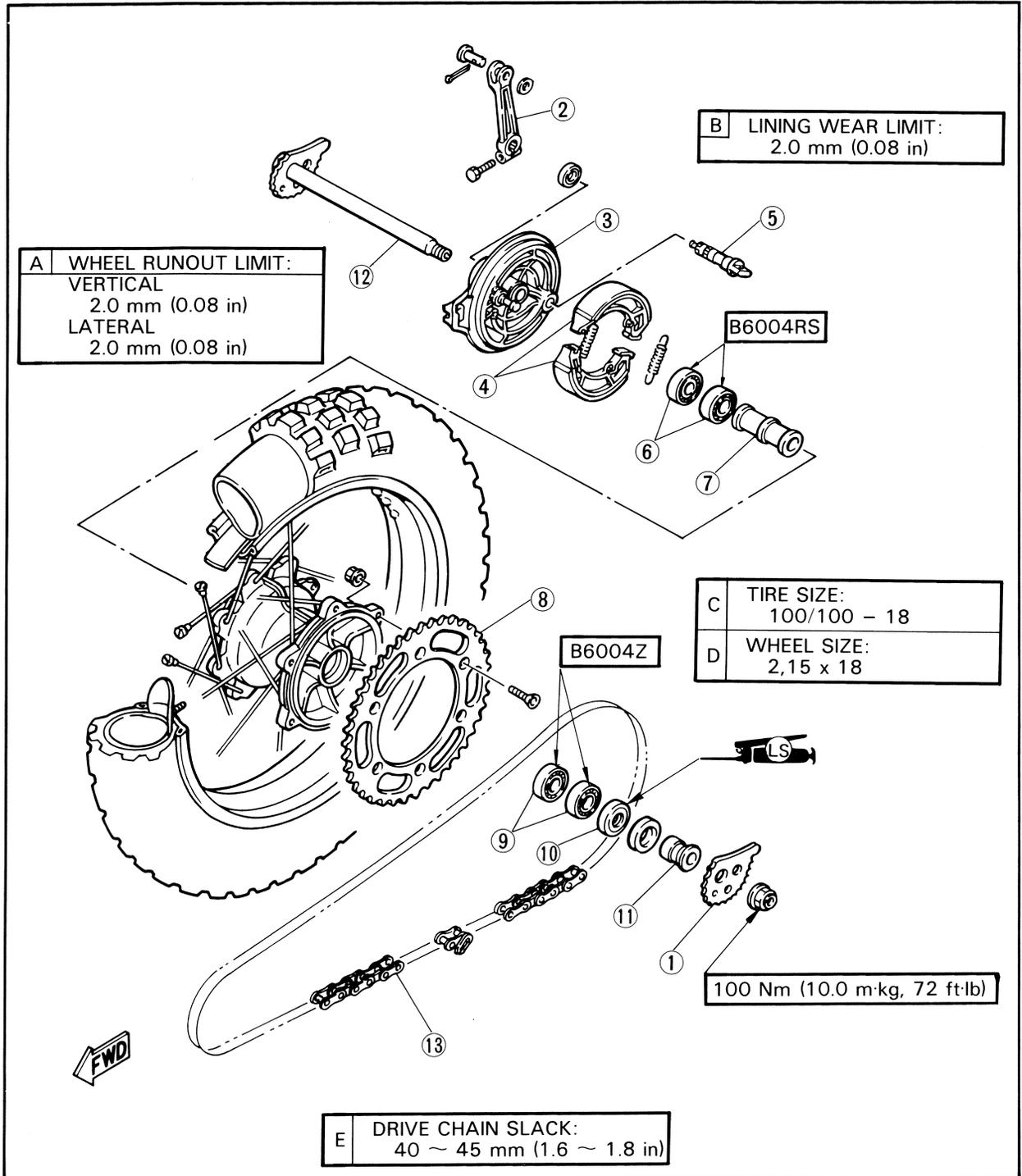
**8 Nm (0.8 m·kg, 5.8 ft·lb)**

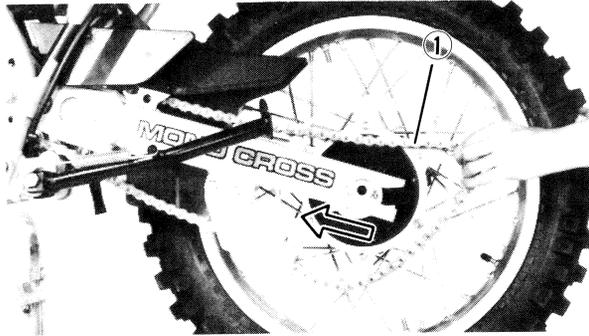
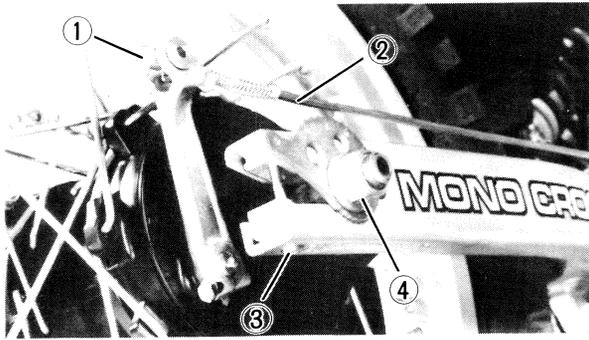
**Front Axle:**

**58 Nm (5.8 m·kg, 42 ft·lb)**

**REAR WHEEL**

- ① Chain puller (Right)
- ② Camshaft lever
- ③ Brake shoe plate
- ④ Brake shoe lining
- ⑤ Camshaft
- ⑥ Bearing
- ⑦ Spacer
- ⑧ Driven sprocket (50T)
- ⑨ Bearing
- ⑩ Oil seal
- ⑪ Wheel collar
- ⑫ Chain puller (Left)
- ⑬ Drive chain





**REMOVAL**

1. Remove:
  - Adjuster ①
  - Brake rod ②
  - Bolts ③ (Swing arm ends)
2. Loosen:
  - Axle nut ④
3. Place the machine on a level place.
4. Elevate the rear wheel by placing a suitable stand under the engine.
5. Remove:
  - Drive chain ①

**NOTE:**

- Before removing the drive chain push the wheel forward.
- A special tool is usually required for separating the chain; however, it is usually not necessary to unlink the chain to remove or reinstall the rear wheel.

6. Remove:
  - Rear wheel assembly

**INSPECTION**

1. Inspect
  - Rear axle
  - Wheel

Refer to "FRONT WHEEL-INSPECTION" section.
2. Measure:
  - Wheel runout

Refer to "FRONT WHEEL-INSPECTION" section.
3. Check:
  - Wheel balance

Refer to "FRONT WHEEL-INSPECTION" section.
4. Check:
  - Wheel bearings

Refer to "FRONT WHEEL-INSPECTION" section.

5. Inspect:

- Brake lining surface  
Glazed areas → Remove.  
Use a coarse sand paper.

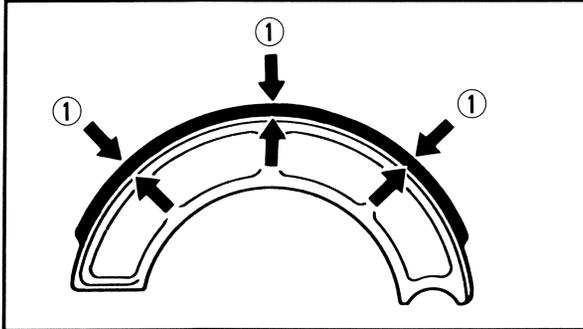
**NOTE:** \_\_\_\_\_

After using the sand paper, clean of the polished particles with cloth.

6. Measure:

- Brake lining thickness  
Out of specification → Replace.

① Measuring points



	<b>Brake Lining Thickness:</b>
	<b>4 mm (0.16 in)</b>
	<b>Wear Limit:</b>
	<b>2 mm (0.08 in)</b>

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

Replace the brake shoes as a set if either is found to be worn to the wear limit.

7. Inspect:

- Brake drum inner surface  
Oil/Scratches → Remove.

<b>Oil</b>	<b>Use a rag soaked in lacquer thinner or solvent.</b>
<b>Scratches</b>	<b>Use a emery cloth (lightly and evenly polishing)</b>

8. Inspect:

- Camshaft face  
Wear → Replace.

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

Before removing the cam lever, put a match mark (punches) on the cam lever and camshaft to indicate their positions for easy assembly.

**INSTALLATION**

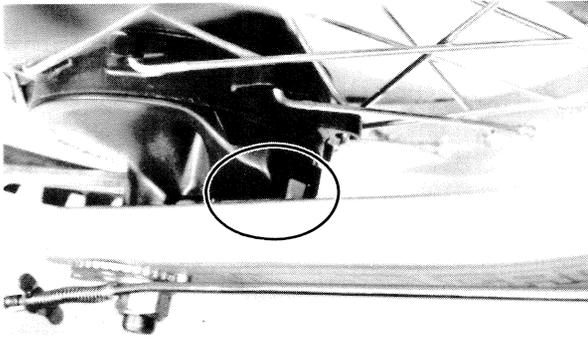
When installing the rear wheel, reverse the removal procedure. Note the following points.

1. Apply:

- Lithium base grease  
Lightly grease to the oil seal lips.

2. Install:

- Rear wheel assembly



**NOTE:**

- Be sure the swingarm boss correctly engages the locating slot on the brake shoe plate.
- Make sure the rear wheel axle is inserted on the left-hand side and that the chain pullers are installed with the punched side outward.

3. Tighten:

- Axle nut



**Axle Nut:**

**100 Nm (10.0 m·kg, 72 ft·lb)**

4. Adjust:

- Drive chain slack
- Rear brake free play

Refer to "CHAPTER 2. DRIVE CHAIN SLACK ADJUSTMENT and REAR BRAKE ADJUSTMENT" section.



**Drive chain slack:**

**40 ~ 45 mm (1.6 ~ 1.8 in)**

**Rear brake free play:**

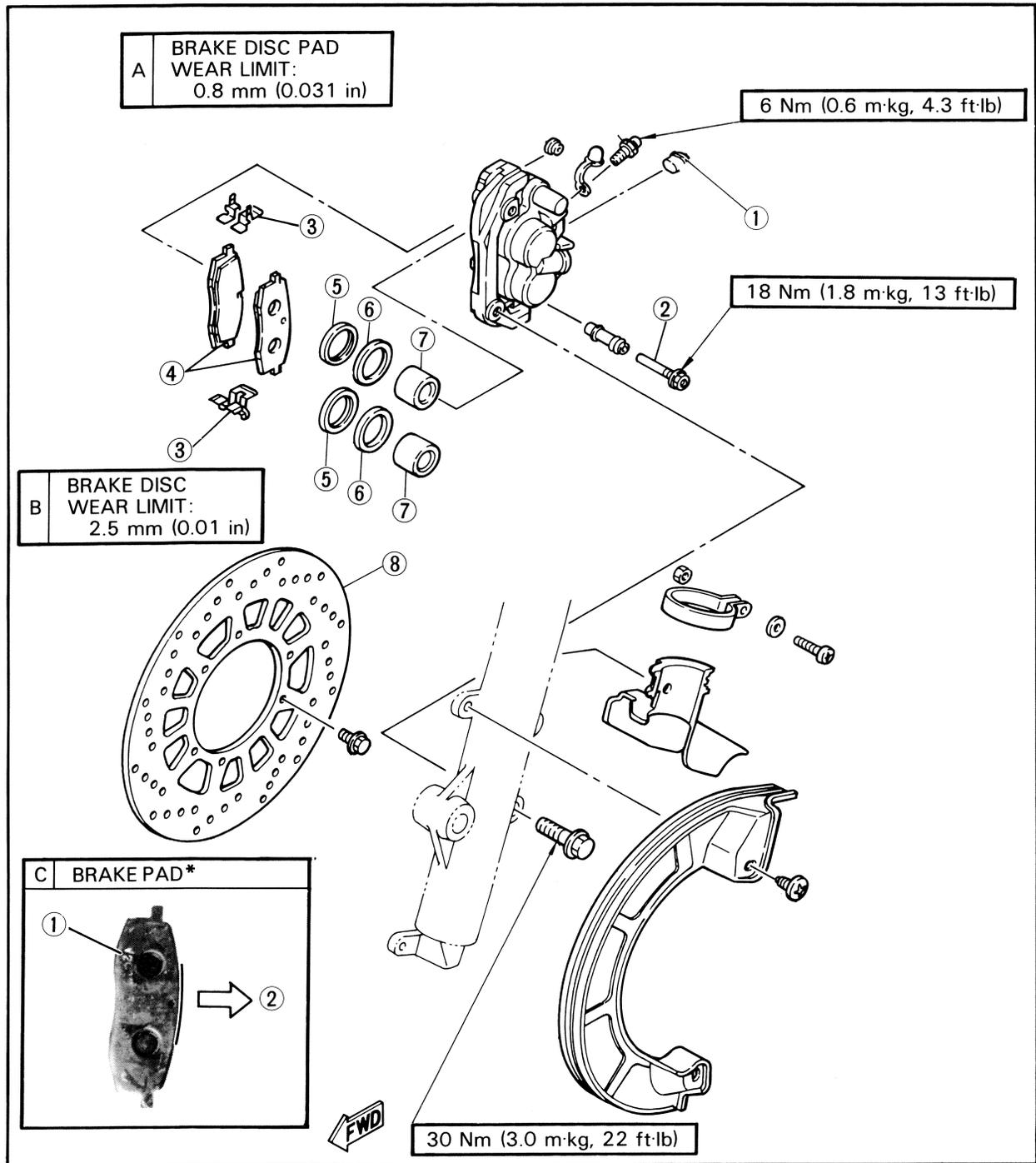
**20 ~ 30 mm (0.8 ~ 1.2 in)**

**FRONT BRAKE**

**Caliper and disc**

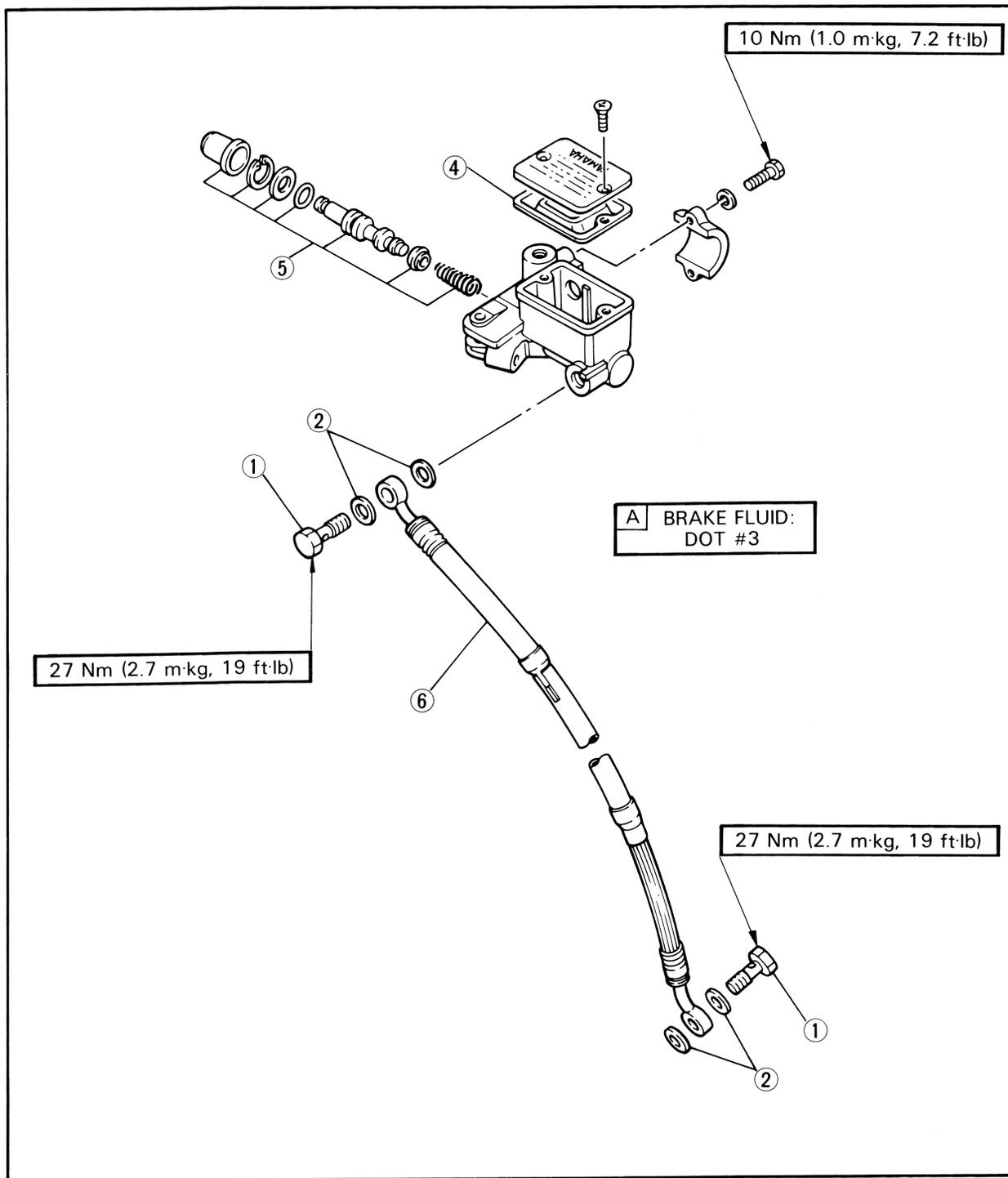
- ① Air bleed screw
- ② Retaining bolt
- ③ Pad spring
- ④ Brake pads
- ⑤ Dust seal
- ⑥ Piston seal
- ⑦ Piston
- ⑧ Brake disc

\*Be sure to position the pad so that its round side ① is backward ② .



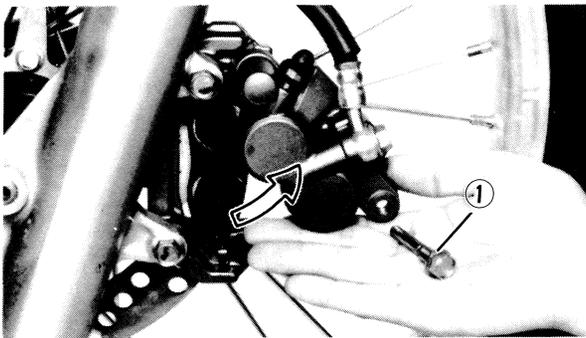
**Master cylinder**

- ① Union bolt
- ② Copper washer
- ③ Master cylinder
- ④ Diaphragm
- ⑤ Master cylinder kit
- ⑥ Brake hose



**CAUTION:**

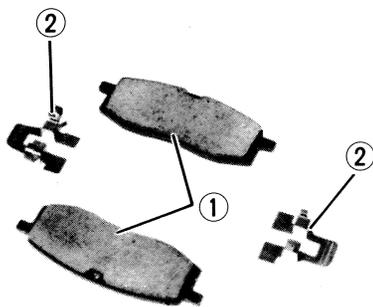
Disc brake components rarely require disassembly. Do not disassemble components unless absolutely necessary. If any hydraulic connection in the system is opened, the entire system should be disassembled, drained, cleaned and then properly filled and bled upon reassembly. Do not use solvents on brake internal components. Solvents will cause seals to swell and distort. Use only clean brake fluid for cleaning. Use care with brake fluid. Brake fluid is injurious to eyes and will damage painted surfaces and plastic parts.



**CALIPER PAD REPLACEMENT**

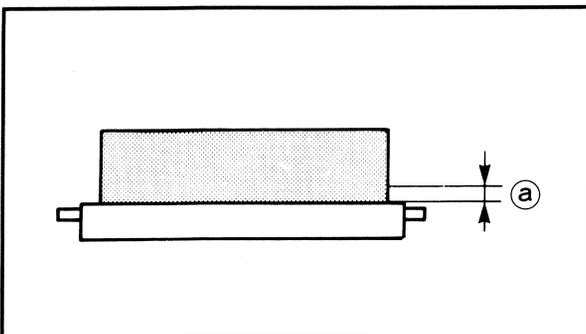
If it is not necessary to disassemble the brake caliper and brake hose to replace the brake pads.

1. Remove:
  - Caliper cover
  - Retaining bolt ①
2. Turn the caliper body counterclockwise.
3. Remove:
  - Pads ①
  - Pad springs ②

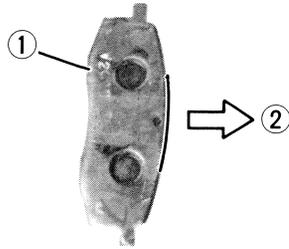


**NOTE:**

- Replace the pad springs as a set if pad replacement is required.
- Replace the pads as a set if either is found to be worn to the wear limit (a).



 **Wear Limit (a) :**  
0.8 mm (0.031 in)



4. Install:
  - Pad springs (new)
  - Pads (new)

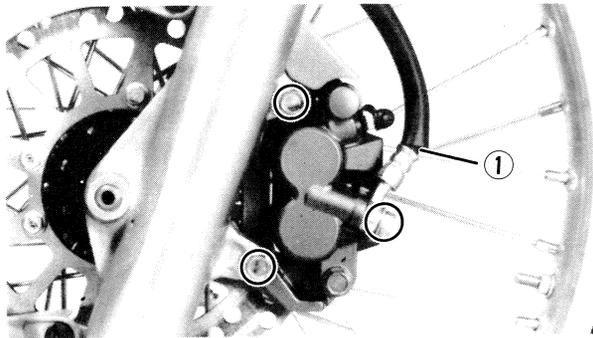
**NOTE:** \_\_\_\_\_  
 Be sure to position the pad so that its round side ① is backward ② .

5. Apply:
  - Lithium base grease  
 Apply a light coating of grease to the retaining bolt.
6. Set the caliper body at the original position.
7. Install:
  - Retaining bolt

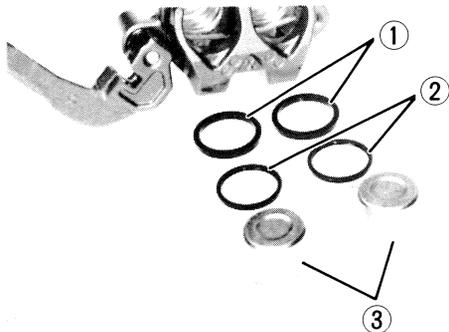
 **Retaining Bolt:**  
 18 Nm (1.8 m·kg, 13 ft·lb)

**CALIPER DISASSEMBLY**

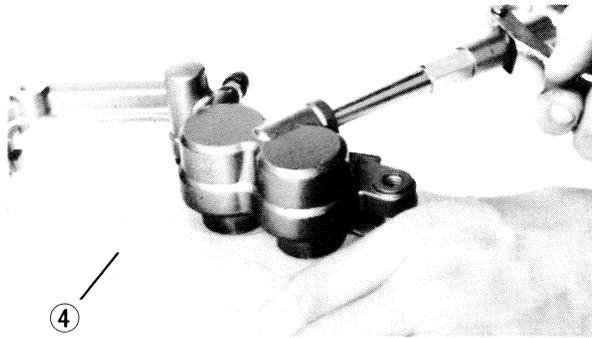
1. Remove:
  - Retaining bolt
  - Pads
  - Pad springs  
 Refer to "CALIPER PAD REPLACEMENT" section.



2. Remove:
  - Brake hose ①  
 Place the open hose end into a container and pump the old fluid out carefully.
  - Caliper body



3. Remove:
  - Dust seals ①
  - Piston seals ②
  - Pistons ③  
 By the following removal steps.

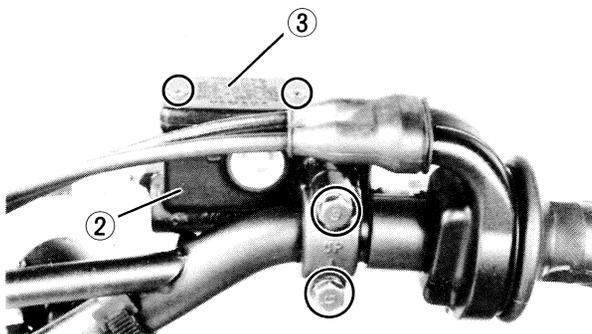
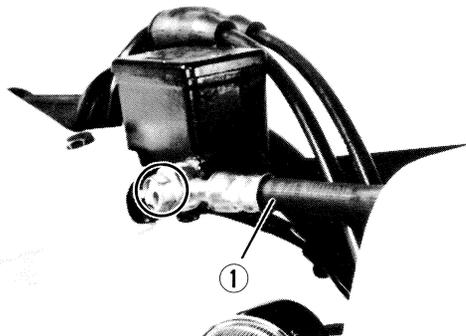


**Caliper piston removal steps:**

- Place a piece of wooden board ④ [Thickness: 5 mm (0.20 in)] into the caliper.
- Blow compressed air into the hose joint opening to force out both pistons from the caliper body.
- Remove the dust and piston seals.

**WARNING:**

- Never try to pry out the caliper piston.
- Cover the piston with a rag. Use care so that piston does not cause injury as it is expelled from the cylinder.



**MASTER CYLINDER DISASSEMBLY**

**NOTE:**

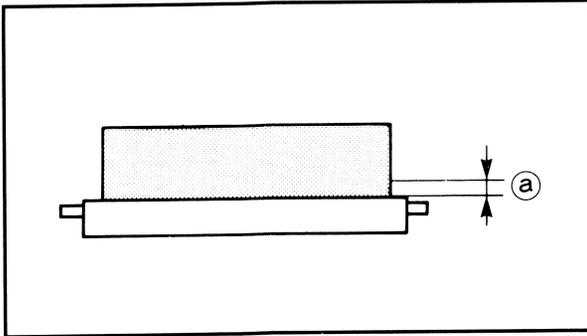
Drain the brake fluid before remaining the master cylinder.

1. Remove:

- Brake light switch
- Brake lever
- Lever spring
- Brake hose ①
- Master cylinder ②
- Master cylinder cap ③
- Dust boot
- Circlip
- Master cylinder cup assembly

**BRAKE INSPECTION AND REPAIR**

Recommended Brake Component Replacement Schedule:	
Brake Pads	As required
Piston Seal Dust Seal	Every two years
Brake Hoses	Every four years
Brake Fluid	Replace only when brakes are disassembled



- Inspect:
  - Brake pads  
Over specified limit → Replace.

	<b>Wear Limit (a) :</b> <b>0.8 mm (0.031 in)</b>
---	---

- Inspect:
  - Caliper piston  
Rust/Wear/Damage → Replace.
  - Dust seal/Piston seal  
Damage → Replace.

**WARNING:** \_\_\_\_\_

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

- Master cylinder body  
Scratches/Wear → Replace.

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

Clean all passages with new brake fluid.

- Brake hose  
Cracks/Wear/Damage → Replace.

**BRAKE REASSEMBLY**

**Caliper**

When assembling the caliper, reserve the disassembly procedure. Note the following points.

**WARNING:** \_\_\_\_\_

- All internal parts should be cleaned in new brake fluid only.

•Internal parts should be lubricated with brake fluid when installed.

	<b>Brake Fluid:</b> DOT #3
---	-------------------------------

1. Install:
  - Caliper body
  - Brake hose

	<b>Caliper Body:</b> 30 Nm (3.0 m·kg, 22 ft·lb)
	<b>Brake Hose:</b> 27 Nm (2.7 m·kg, 19 ft·lb)

**Master cylinder**

When assembling the master cylinder, reserve the disassembly procedure. Note the following points.

1. Install:
  - Master cylinder cup

**NOTE:** \_\_\_\_\_  
The cylinder cups are installed with the larger diameter (lips) inserted first.

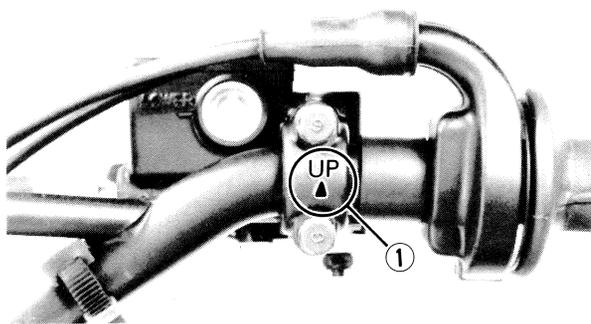
2. Install:
  - Master cylinder
  - Brake hose

	<b>Master Cylinder:</b> 10 Nm (1.0 m·kg, 7.2 ft·lb)
	<b>Brake Hose:</b> 27 Nm (2.7 m·kg, 19 ft·lb)

**NOTE:** \_\_\_\_\_  
The master cylinder bracket should be installed with the "UP" mark  unit on top.

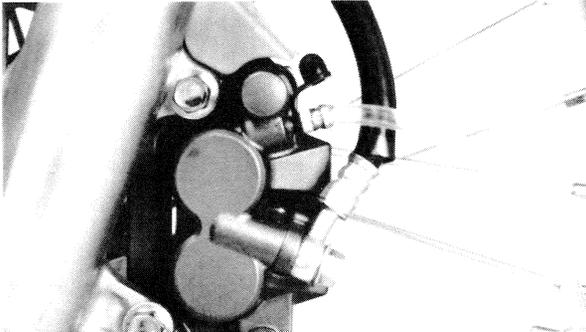
3. Fill:
  - Master cylinder

	<b>Brake Fluid:</b> DOT #3
---	-------------------------------



**AIR BLEEDING****WARNING:**

If the brake system is disassembled or if any brake hose has been loosened or removed, the brake system must be bled to remove air from the brake fluid. If the brake fluid level is very low or brake operation is incorrect, bleed the brake system. A dangerous loss of braking performance may occur if the brake system is not bled.



## 1. Bleed:

- Brake fluid

By the following steps.

**Air bleeding steps:**

- Add proper brake fluid to the reservoir.
- Install the diaphragm. Be careful not to spill or overflow the reservoir.
- Connect the clear plastic tube tightly to the caliper bleed screw.
- Put the end of the tube into a container.
- Slowly apply the brake lever several times.
- Pull in lever. Hold the lever in "on" position.
- Loosen the bleed screw. Allow the lever to travel slowly toward its limit.
- When the limit is reached, tighten the bleed screw.

**Bleed Screw:**

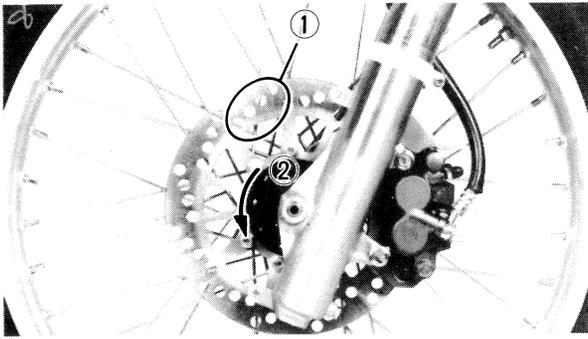
**6 Nm (0.6 m·kg, 4.3 ft·lb)**

- Repeat steps (e) to (h) until the air bubbles have been removed from the system.

**NOTE:**

If bleeding is difficult, it may be necessary to let the brake fluid system stabilize for a few hours. Repeat the bleeding procedure when the tiny bubbles in the system have disappeared.

- Add brake fluid to the level line on the reservoir.



**BRAKE DISC INSTALLATION**

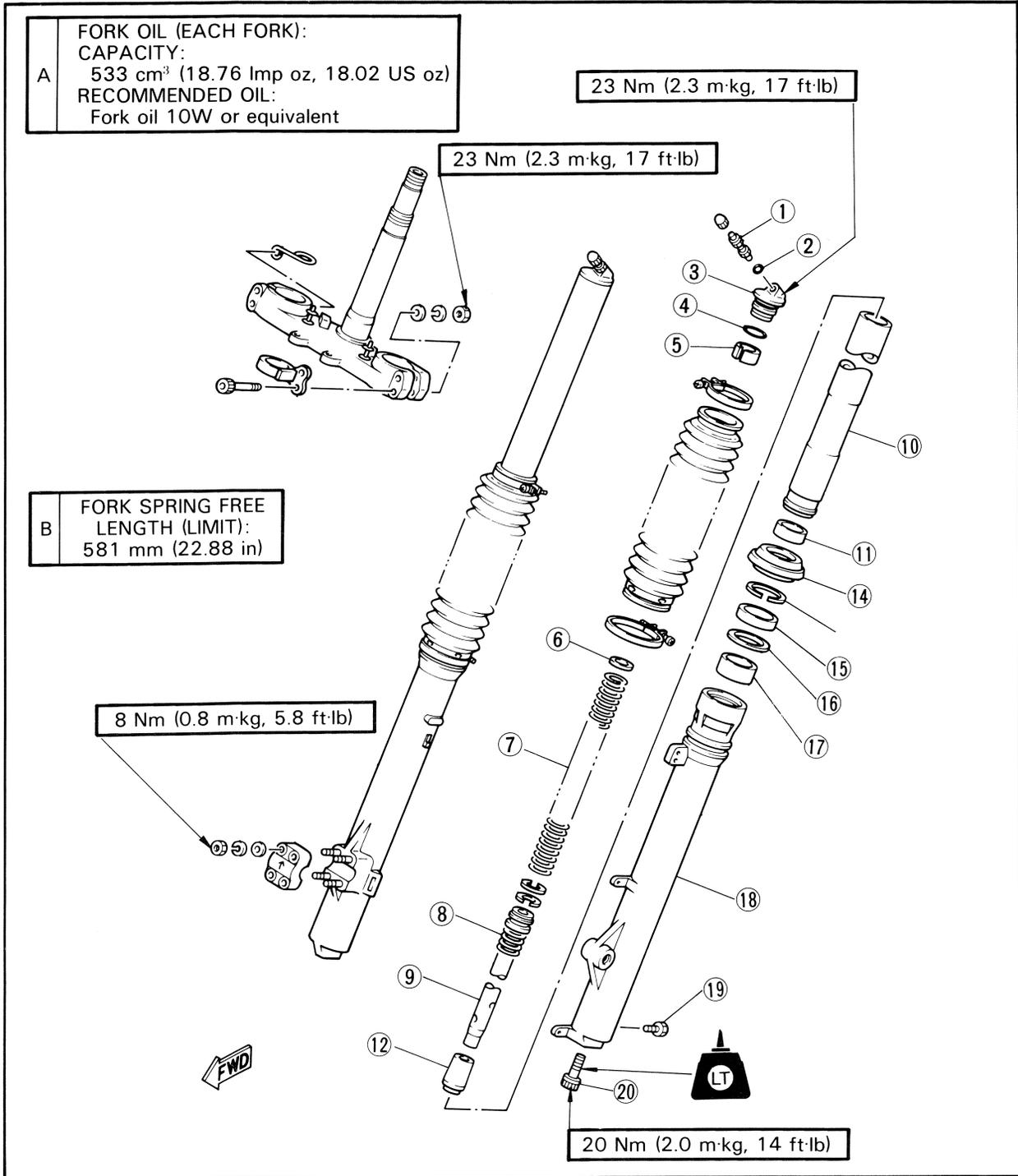
1. Install:
- Brake disc

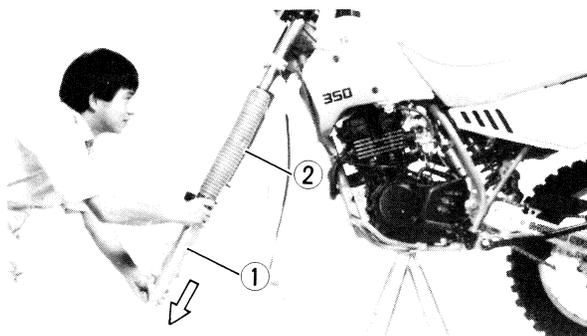
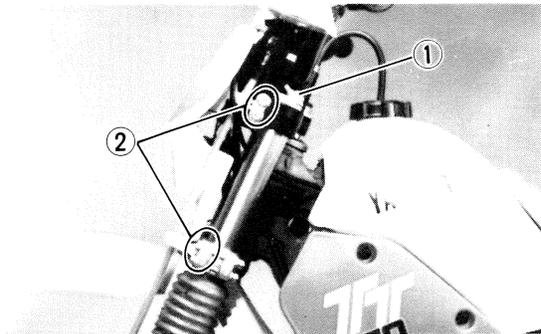
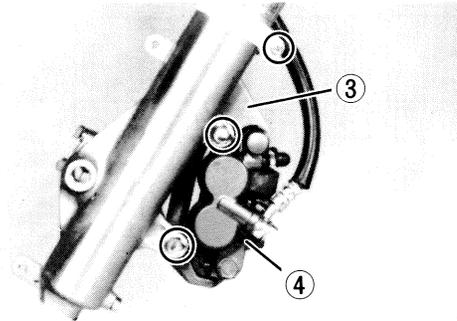
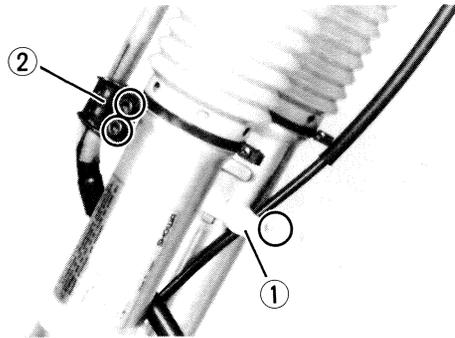
**NOTE:** \_\_\_\_\_  
When installing the brake disc, the slots on the disc should be positioned as shown.  
\_\_\_\_\_

- ① Slot
- ② Rotating direction

**FRONT FORK**

- ① Air valve
- ② O-ring
- ③ Cap bolt
- ④ O-ring
- ⑤ Spacer
- ⑥ Spring seat (Upper)
- ⑦ Fork spring
- ⑧ Rebound spring
- ⑨ Damper rod (cylinder complete)
- ⑩ Inner tube
- ⑪ Guide bush
- ⑫ Oil lock piece
- ⑬ Retaining clip
- ⑭ Dust seal
- ⑮ Oil seal
- ⑯ Seal spacer
- ⑰ Slide bush
- ⑱ Outer tube
- ⑲ Drain screw
- ⑳ Securing bolt





**REMOVAL**

**WARNING:**

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

1. Remove:
  - Front wheel
  - Brake hose holder ①
  - Speedometer cable holder ②

2. Remove:
  - Caliper cover ③
  - Brake caliper assembly ④

**NOTE:**

Do not depress the brake lever when the wheel is off the machine as brake pads will be forced shut.

3. Remove:
  - Air valve cap

**NOTE:**

Keep the valve open by pressing it for several seconds so that the air can be let out of the inner tube.

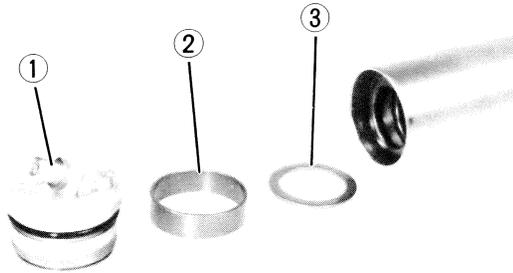
4. Loosen:
  - Cap bolt ①
  - Pinch bolts (steering crown and under bracket) ②

5. Remove:
  - Front fork ①
  - Rubber boot ②

**DISASSEMBLY**

1. Remove:

- Cap bolt ①
- Spacer ②
- Spring seat ③

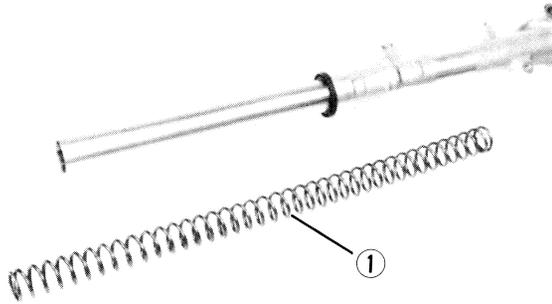


2. Drain:

- Fork oil

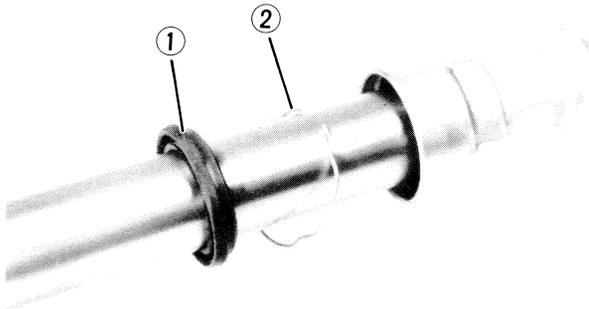
3. Remove:

- Fork spring ①



4. Remove:

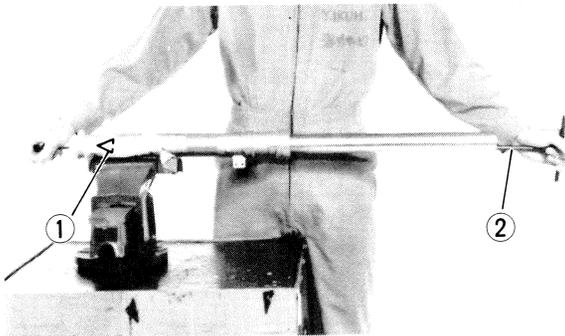
- Dust seal ①
- Retaining clip ②

**NOTE:**

Use a thin screwdriver, and be careful not to scratch the inner fork tube.

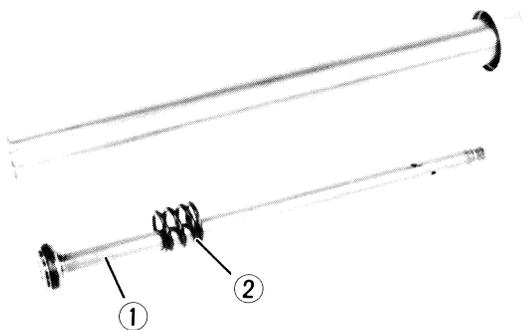
5. Remove:

- Bolt (cylinder complete)
- Use a Damper Rod Holder ① (YM-01300-1) and T-Handle ② (YM-01326) to lock the damper rod.



6. Remove:

- Damper rod (cylinder complete) ①
- Rebound spring ②



7. Remove:

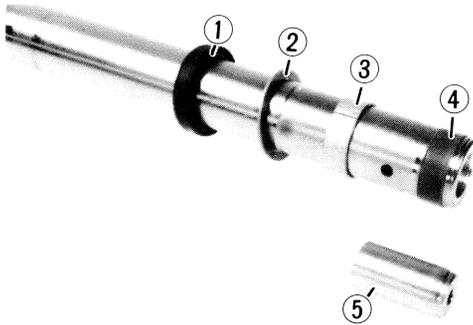
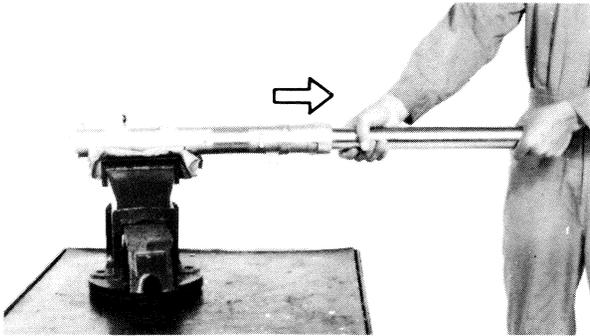
- Inner fork tube
- By the following removal steps.

**Inner fork tube removal steps:**

- Hold the fork leg horizontally.
- Clamp the caliper mounting boss of the outer fork tube securely in a vise having soft jaws.
- Pull out the inner fork tube from the outer tube by forceful, but carefully, withdrawing the inner fork tube.

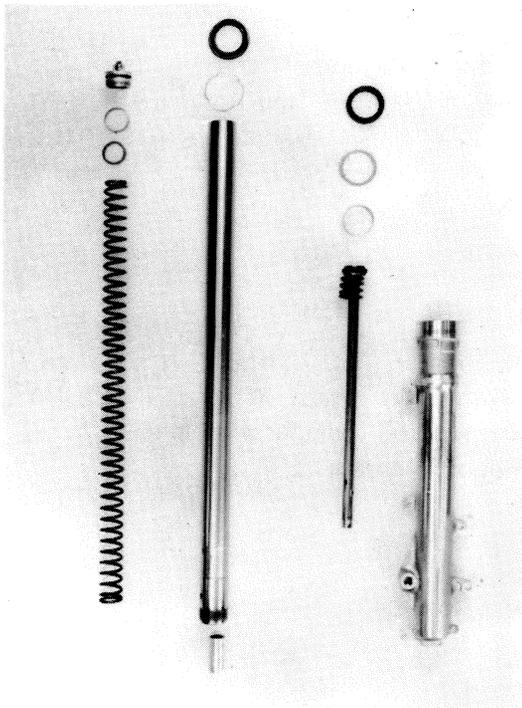
**NOTE:**

- Excessive force will damage the oil seal and seal spacer. The oil seal must be replaced.
- Avoid bottoming the inner tube in the outer tube during the above procedure, as the oil lock piece will be damaged.



8. Remove:

- Oil seal ①
- Seal spacer ②
- Slide bush ③
- Guide bush ④
- Oil lock piece ⑤



**INSPECTION**

1. Inspect:

- Inner fork tube
- Scratches/Bends → Replace.

**WARNING:**

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

2. Inspect:

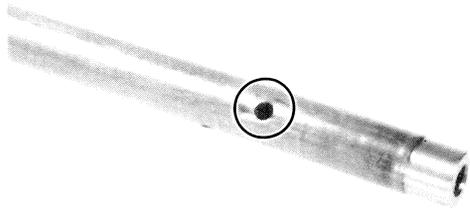
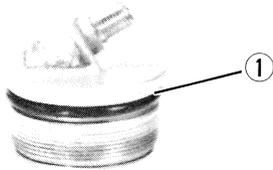
- Outer fork tube
- Scratches/Bends/Damage → Replace.
- Fork spring
- Over specified limit → Replace.



**Fork Spring Free Length Limit:**  
581 mm (22.88 in)

## 3. Inspect:

- O-ring (cap bolt) ①  
Damage → Replace.
- Damper rod  
Wear/Damage → Replace.  
Contamination → Blow out all oil passages with compressed air.
- Seals  
Wear/Damage → Replace.
- Oil lock piece  
Damage → Replace.

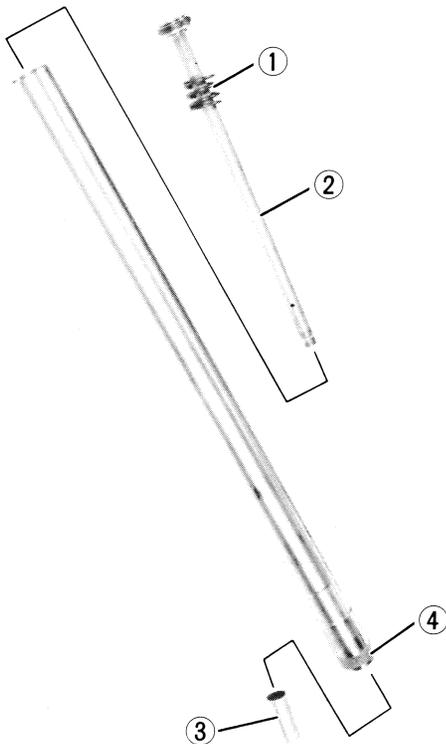
**ASSEMBLY**

Before assembling, clean and inspect all parts and replace when necessary.

**NOTE:**

In front fork assembly, be sure to use following new parts. Do not reuse them.

- Slide bush
- Guide bush
- Oil seal
- Dust seal



## 1. Install:

- Rebound spring ①
- Damper rod ②  
Slide the damper rod into inner fork tube from its top.
- Oil lock piece ③  
Fit oil lock piece over damper rod sticking out of inner fork tube.
- Guide bush ④ (New)

## 2. Install:

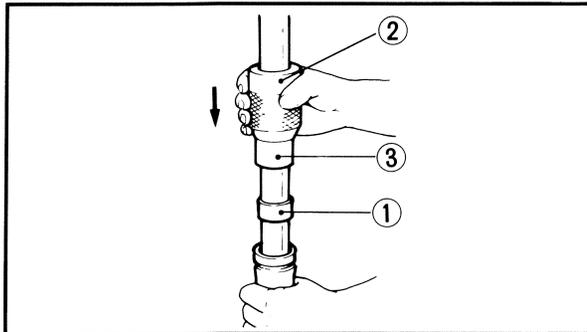
- Inner fork tube  
Into outer tube.

3. Tighten:

- Bolt (cylinder complete)  
Use a Damper Rod Holder (YM-01300-1) and T-Handle (YM-01326) to lock the damper rod.

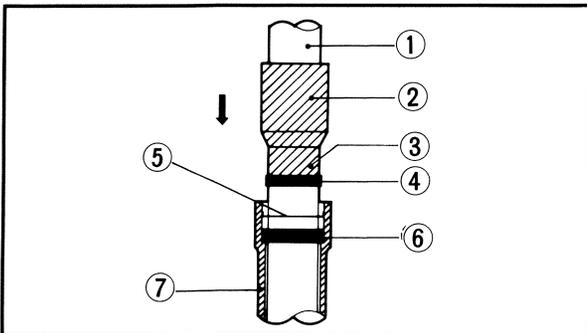


**Bolt (Cylinder Complete):**  
**20 Nm (2.0 m·kg, 14 ft·lb)**  
**LOCTITE®**



4. Install:

- Slide bush ①  
Into outer tube.  
Use a Fork Seal Driver Weight ② (YM-33963) and Adapter ③ (YM-33968).

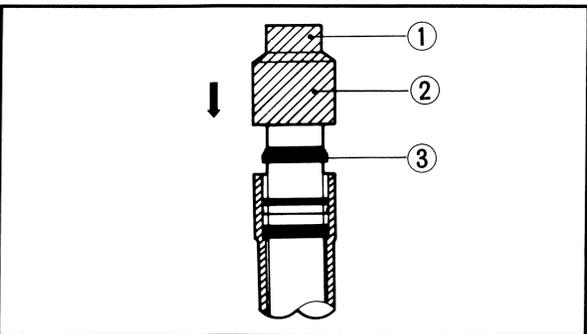


5. Apply:

- Oil  
To oil seal ④ .

6. Install:

- Seal spacer ⑤
- Oil seal
- Use the Special Tools ② , ③ (YM-33963, YM-33968).



- ① Inner tube
- ⑥ Slide bush
- ⑦ Outer tube

7. Install:

- Retaining clip
- Dust seal ③
- Use the Special Tools ① , ② (YM-33963, YM-33968).

8. Fill:

- Front fork



**Each Fork:**  
**533 cm<sup>3</sup> (18.76 Imp oz,**  
**18.02 US oz)**

**Recommended Oil:**

**Fork Oil 10 W or equivalent**

**After filling slowly pump the forks up and down to distribute the oil**

9. Install:
- Fork spring
  - Spring seat
  - Spacer
  - Cap bolt (Temporarily)
  - Rubber boot

### INSTALLATION

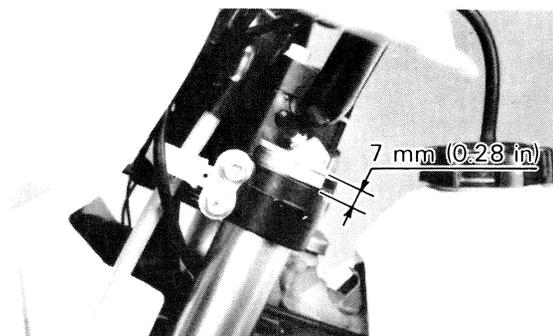
1. Install:

- Front fork(s)

Temporarily tighten the pinch bolts.

#### NOTE:

Hold the inner tube with its top 7 mm (0.28 in) above the top of the steering crown.



2. Tighten:

- Pinch bolts (under bracket)



**Pinch Bolt (Under bracket)**  
23 Nm (2.3 m·kg, 17 ft·lb)

#### NOTE:

Do not tighten the steering crown pinch bolt.

3. Tighten:

- Cap bolts

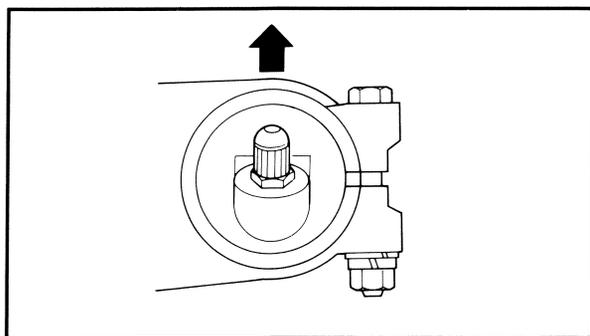
#### NOTE:

Be sure to install the cap bolt so that its air valve top points straight forward.

- Pinch bolts (Steering crown)



**Cap Bolt:**  
23 Nm (2.3 m·kg, 17 ft·lb)  
**Pinch Bolt (Steering Crown):**  
23 Nm (2.3 m·kg, 17 ft·lb)



4. Adjust:

- Front fork air pressure

Refer to "CHAPTER 2. FRONT FORK ADJUSTMENT" section.

5. Install:

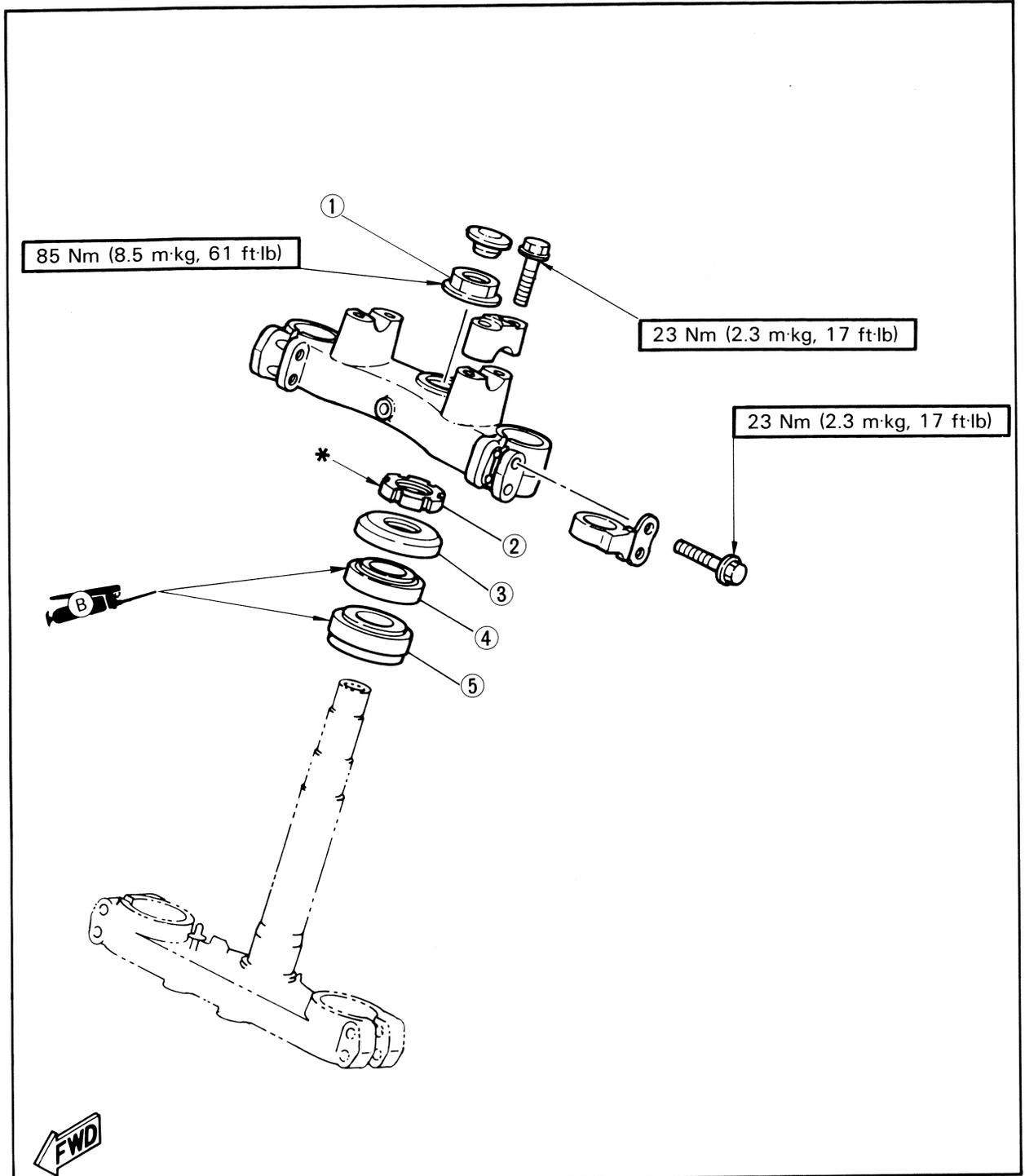
- Air valve cap
- Front fender
- Front wheel
- Brake caliper
- Refer to "FRONT WHEEL and FRONT BRAKE" section.

**STEERING HEAD**

- ① Steering fitting nut
- ② Ring nut
- ③ Bearing cover
- ④ Bearing (Upper)
- ⑤ Bearing (Lower)

\*Ring nut tightening steps:

- 1) First, tighten the ring nut 37 Nm (3.7 m·kg, 27 ft·lb) by using the torque wrench, then loosen the ring nut one turn.
- 2) Retighten the ring nut 10 Nm (1.0 m·kg, 7.2 ft·lb)



## REMOVAL

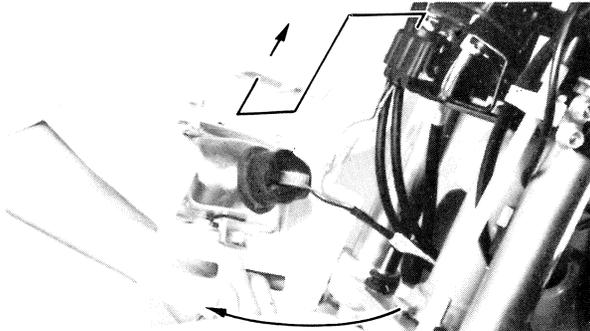
**WARNING:**

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

1. Elevate the front wheel by placing a suitable stand under the engine.

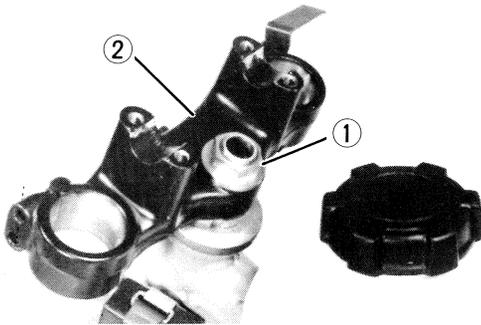
2. Remove:

- Handlebars
- Front wheel
- Front forks
- Headlight
- Front fender
- Meter



3. Remove:

- Bolt cap
- Steering fitting nut ①
- Steering crown ②



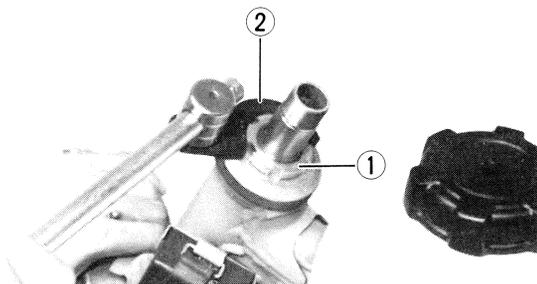
4. Remove:

- Ring nut ①

Use a Ring Nut Wrench ② (YU-33975).

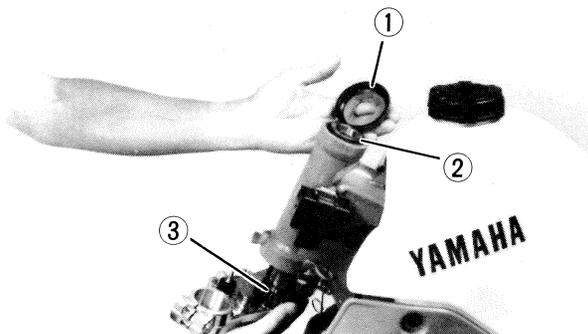
**WARNING:**

Support the under bracket so that it may not fall down.



5. Remove:

- Bearing cover ①
- Bearing (upper) ②
- Bearing (lower) ③



**INSPECTION**

1. Wash the bearings in a solvent.
2. Inspect:
  - Bearings  
Pitting/Damage → Replace.
  - Bearing race  
Pitting/Damage → Replace.

**NOTE:** \_\_\_\_\_  
Always replace bearing and race as a set.



**ASSEMBLY**

1. Install:
  - Bearing (lower)  
To the under bracket.
2. Apply:
  - Grease  
To the bearings (upper and lower).



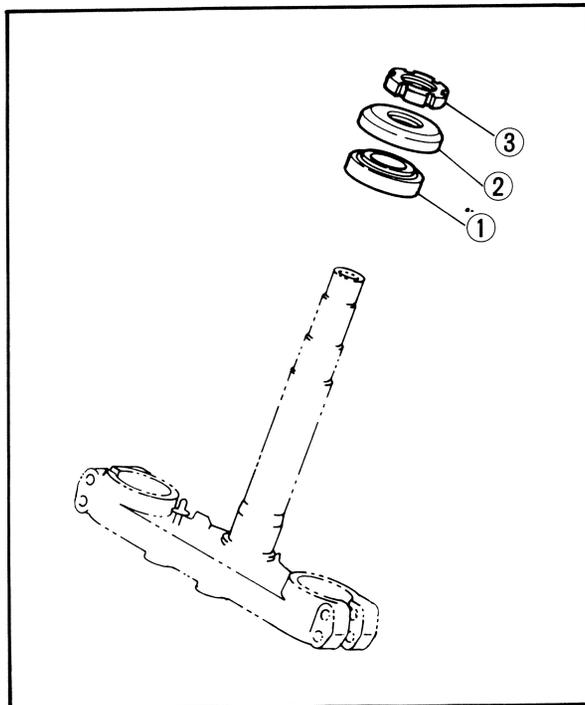
3. Install:
  - Under bracket

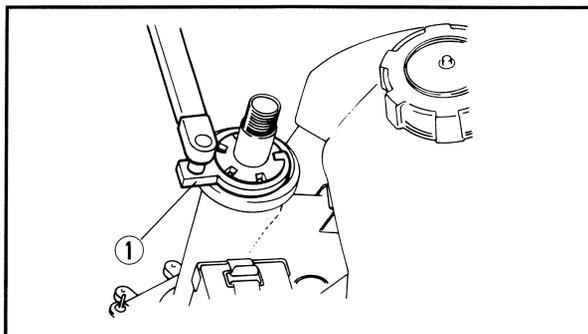
**CAUTION:** \_\_\_\_\_  
**Hold the under bracket until it is secured.**

- Bearing (upper) ①
- Bearing cover ②
- Ring nut ③

**NOTE:** \_\_\_\_\_  
The tapered side of ring nut must face downward.

4. Tighten:
  - Ring nut  
By the following steps.



**Ring nut tightening steps:**

- Tighten the ring nut using the Ring Nut Wrench ① (YU-33975).

**NOTE:**

Set the torque wrench to the ring nut wrench so that they form a right angle.



**Ring Nut (Initial Tightening):**  
37 Nm (3.7 m·kg, 27 ft·lb)

- Loosen the ring nut one turn.
- Retighten the ring nut using the Ring Nut Wrench.

**WARNING:**

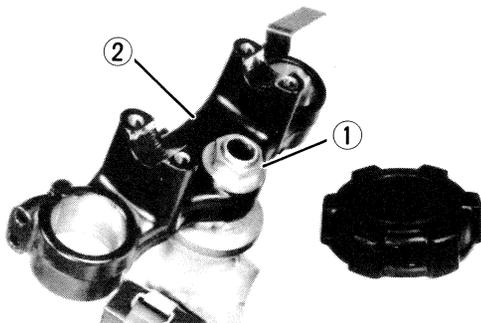
Avoid over-tightening.



**Ring Nut (Final Tightening):**  
10 Nm (1.0 m·kg, 7.2 ft·lb)

## 5. Install:

- Steering crown ②
- Steering fitting nut ①
- Bolt cap



**Steering Fitting Nut:**  
85 Nm (8.5 m·kg, 61 ft·lb)

## 6. Check:

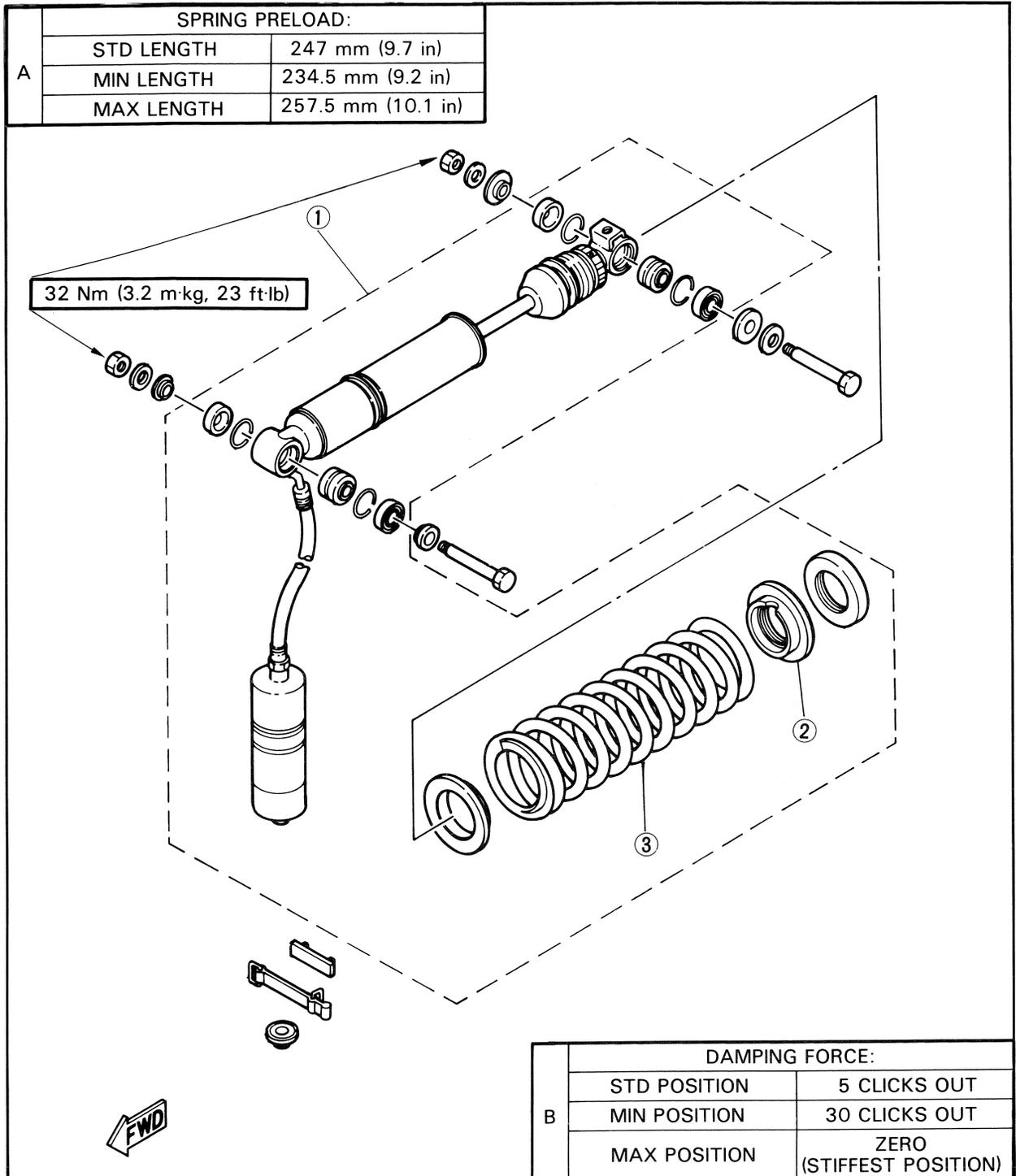
- Steering operation  
Turn the steering from lock to lock.

## 7. Install:

- Components in above list (Removal step "2")  
Refer to "FRONT WHEEL", "FRONT FORK" and "STEERING HEAD ADJUSTMENT" section.

**REAR SHOCK ABSORBER  
(MONOCROSS SUSPENSION  
"DE CARBN" SYSTEM)**

- ① Rear shock absorber assembly
- ② Spring retainer (Upper)
- ③ Spring

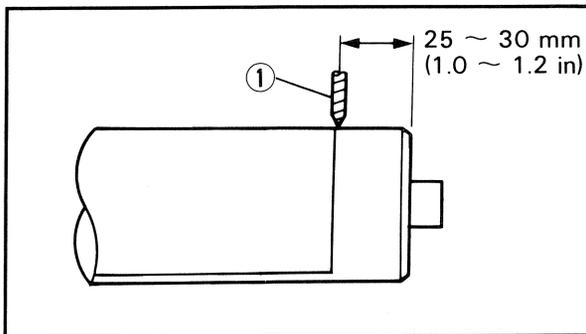


## HANDLING NOTES

**WARNING:**

This shock absorber contains highly pressurized nitrogen gas. Read and understand the following information before handling the shock absorber. The manufacturer cannot be held responsible for property damage or personal injury that may result from improper handling.

- Do not tamper with or attempt to open the cylinder assembly.
- Do not subject shock absorber to an open flame or other high heat source. This may cause the unit to explode due to excessive gas pressure.
- Do not deform or damage the cylinder in any way. Cylinder damage will result in poor damping performance.
- Take care not to scratch the contact surface of the piston rod with the cylinder; or oil could leak out.
- When scrapping the shock absorber, follow the instructions on disposal.



## NOTES ON DISPOSAL

**Shock absorber disposal steps:**

Gas pressure must be released before disposing of shock absorber. To do so, drill ① a 2 ~ 3 mm (0.08 ~ 0.12 in) hole through the cylinder wall at a point 25 ~ 30 mm (1.0 ~ 1.2 in) from the bottom end of the gas chamber.

**CAUTION:**

Wear eye protection to prevent eye damage from escaping gas and/or metal chips.

**REMOVAL**

1. Place the suitable stand under the engine.

**WARNING:**

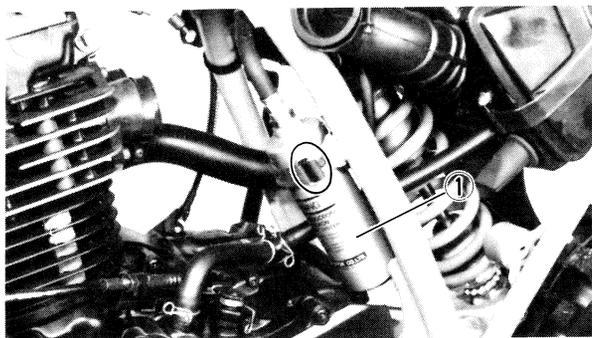
**Securely support the machine so there is no danger of it falling over.**

2. Remove:

- Side covers
- Seat
- Carburetor

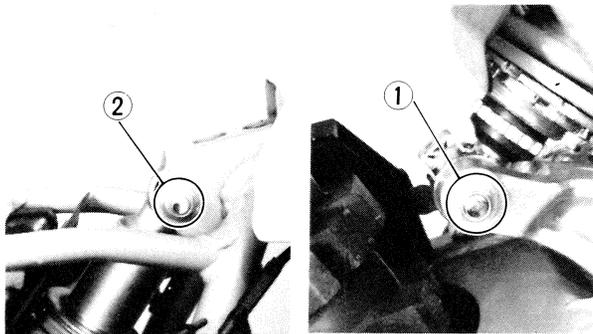
3. Remove:

- Rear shock absorber gas chamber ①



4. Remove:

- Dust guard
- Nut ① (Shock absorber bottom)
- Nut ② (Shock absorber top)

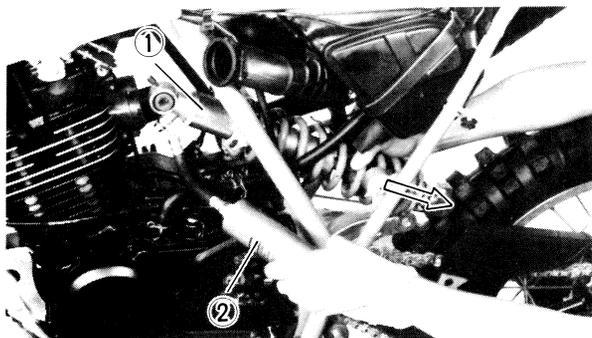


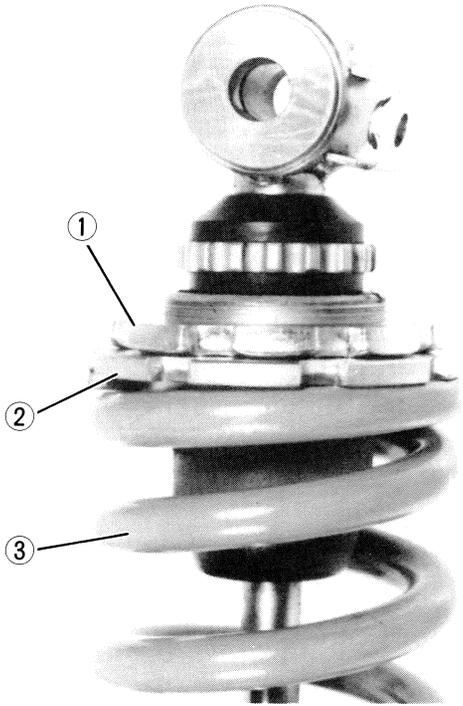
5. Remove:

- Rear shock absorber ①

**CAUTION:**

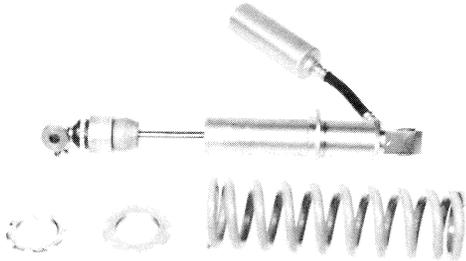
**Avoid damaging the rubber hose and shock absorber gas chamber ② .**





6. Loosen:
  - Locknut (spring preload) ①
  - Adjuster (spring preload) ②
7. Push down the spring.

8. Remove:
  - Locknut (spring preload) ①
  - Adjuster (spring preload) ②
  - Spring ③



### INSPECTION

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

### ASSEMBLY

When assembling the rear shock absorber, reverse the removal procedure. Note the following points.

1. Apply:
  - Lithium base grease
    - (To pivot points)

## 2. Install:

- Rear shock absorber assembly

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

**Avoid damaging the rubber hose and shock absorber gas chamber.**

---

## 3. Tighten:

- Nuts (shock absorber top and bottom)

**Nuts (Top and Bottom):****32 Nm (3.2 m·kg, 23 ft·lb)**

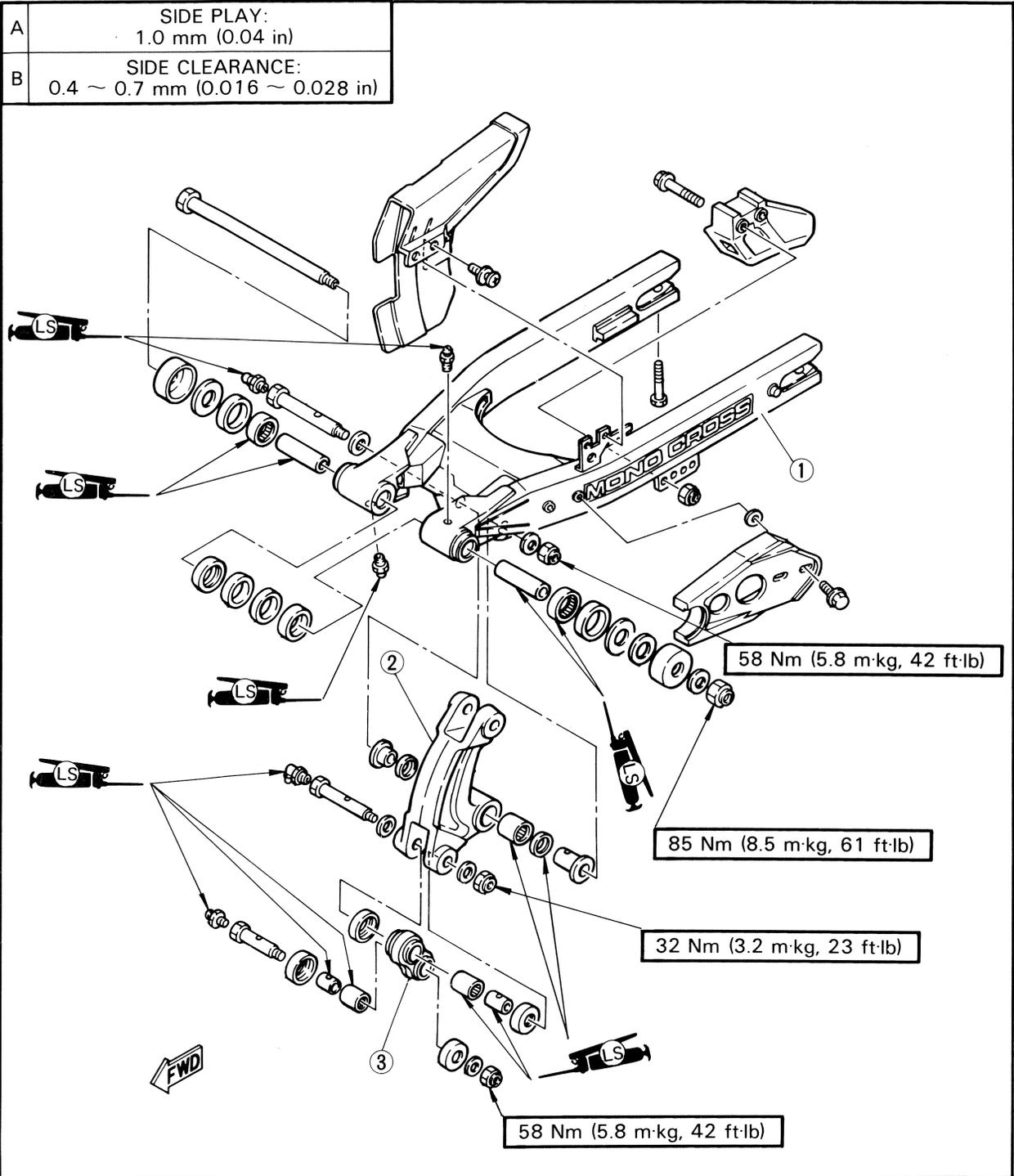
## 4. Adjust:

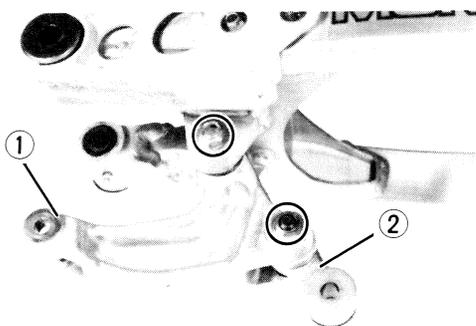
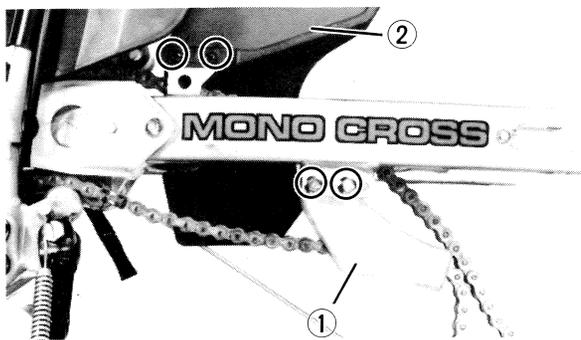
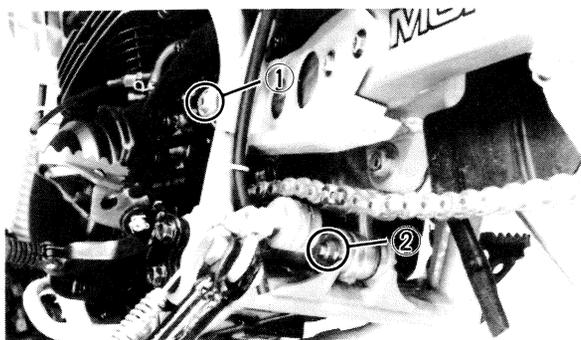
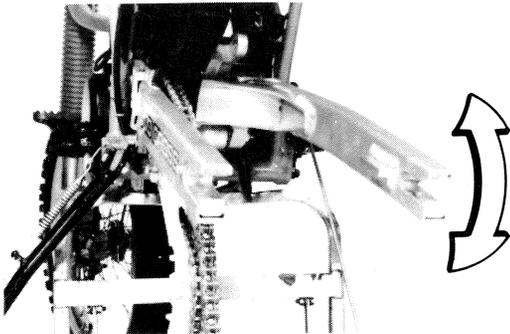
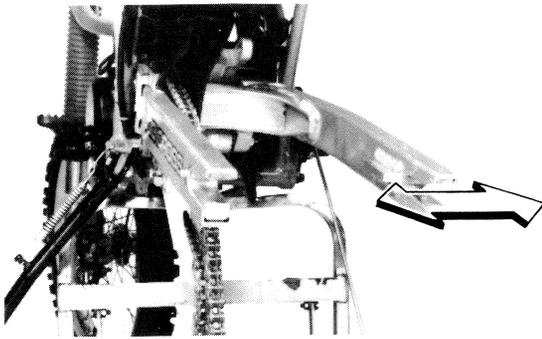
- Spring preload
- Damping force

Refer to "CHAPTER 2. REAR SHOCK ABSORBER ADJUSTMENT" section.

# SWINGARM

- ① Swing arm
- ② Relay arm
- ③ Relay arm connecting rod





**INSPECTION**

1. Remove:
  - Rear wheel
  - Rear shock absorber
2. Check:
  - Swingarm (side play)  
Over specified limit → Replace bushing or bearings.  
Move swingarm from side to side.

 **Side Play (At End of Swingarm):**  
1.0 mm (0.04 in)

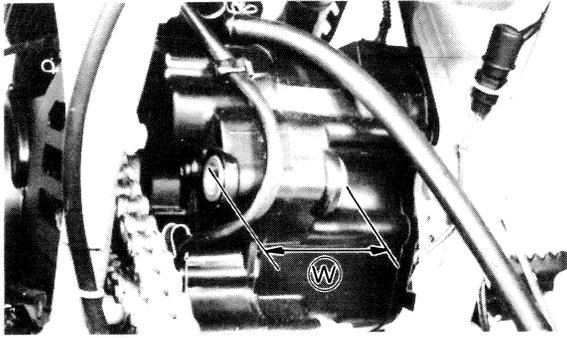
3. Check:
  - Swingarm (vertical movement)  
Tightness/Binding/Rough Spots → Replace bearings.  
Move swingarm up and down.

**REMOVAL**

1. Remove:
  - Pivot shaft ①
  - Bolt (relay arm connecting rod) ②

2. Remove:
  - Chain guide ①
  - Chain guard ②
  - Swingarm assembly

3. Remove:
  - Relay arm ①
  - Relay arm connecting rod ②

**ADJUSTMENT**

## 1. Measure:

- Engine mounting boss width "W"

## 2. Measure:

- Bushing length "A<sub>1</sub>" and "A<sub>2</sub>"
- Out of specification → Replace bushings.

**Specified Length:**

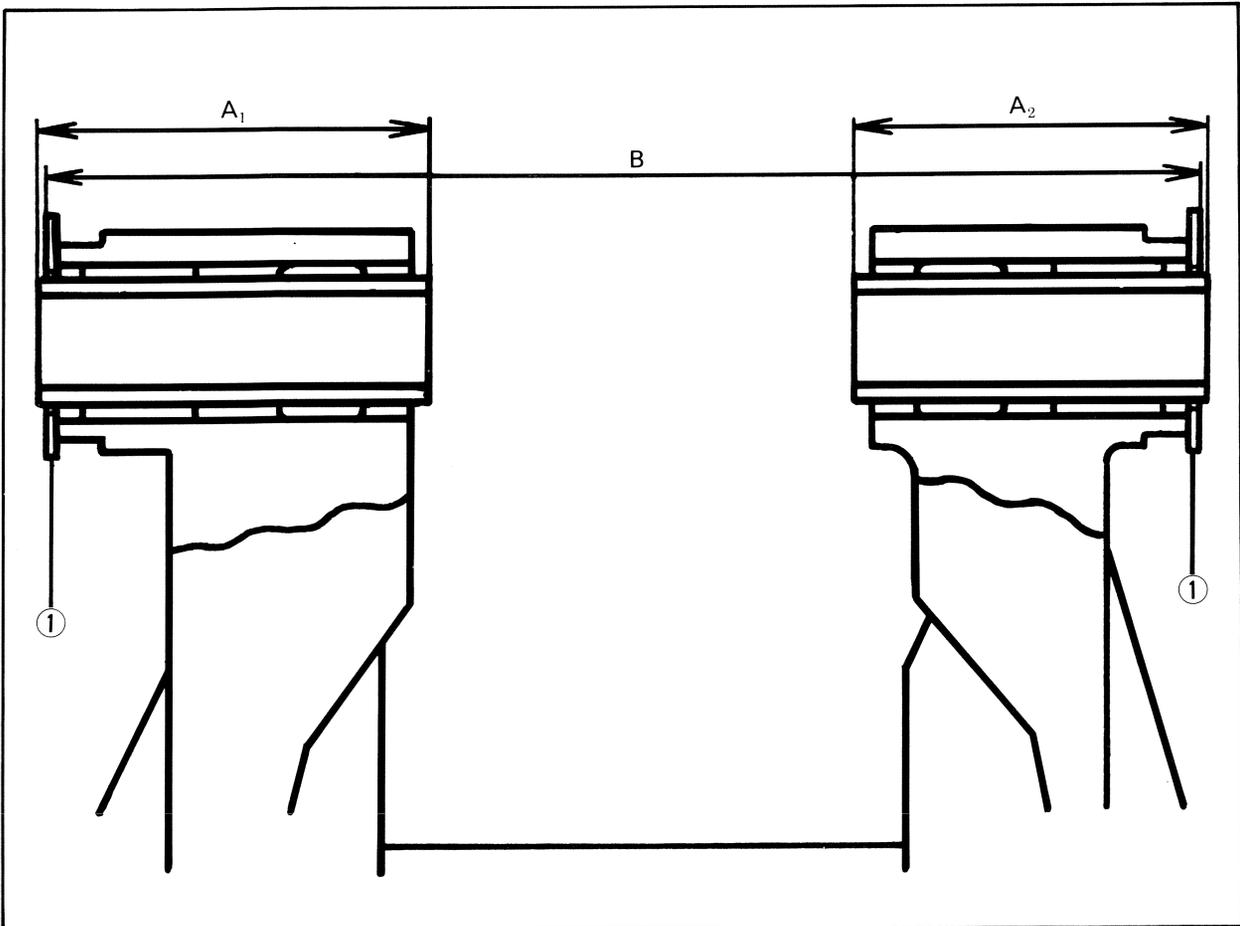
A<sub>1</sub>: 67.2 ~ 67.3 mm  
(2.646 ~ 2.650 in)

A<sub>2</sub>: 62.2 ~ 62.3 mm  
(2.449 ~ 2.453 in)

## 3. Measure:

- Length "B"

- ① Plain washer



3. Calculate:

- Swingarm side clearance "C"

Out of specification → Adjust side clearance using shim.

By using formula given below.

$$C = (A_1 + A_2 + W) - B$$

 **Side Clearance "C":**  
0.4 ~ 0.7 mm (0.016 ~ 0.028 in)

**Example:**

a. If the bushing length  $A_1$ ,  $A_2$  and the engine mounting boss width "W" are below.

$A_1$  ..... 67.2 mm (2,646 in)  
 $A_2$  ..... 62.2 mm (2,449 in)  
 $W$  ..... 77.3 mm (3,043 in)

b. If the length  $B$  is below.  
 $B$  ..... 205.5 mm (8,091 in)

**Side Clearance "C"**  
 $= (67.2 + 62.2 + 77.3) - 205.5$   
 $= 1.2 \text{ mm (0.047 in)}$

Then, install the two shims.

 **Shim thickness:**  
0.3 mm (0.012 in)

**NOTE:** \_\_\_\_\_  
 If only one shim is used, install it on the right side. Two shims must be installed both sides.  
 \_\_\_\_\_

**INSPECTION AND LUBRICATION**

1. Inspect:

- Thrust covers and oil seals  
Damage → Replace.
- Bushings  
Scratches/Damage → Replace.
- Bearings  
Pitting/Damage → Replace.

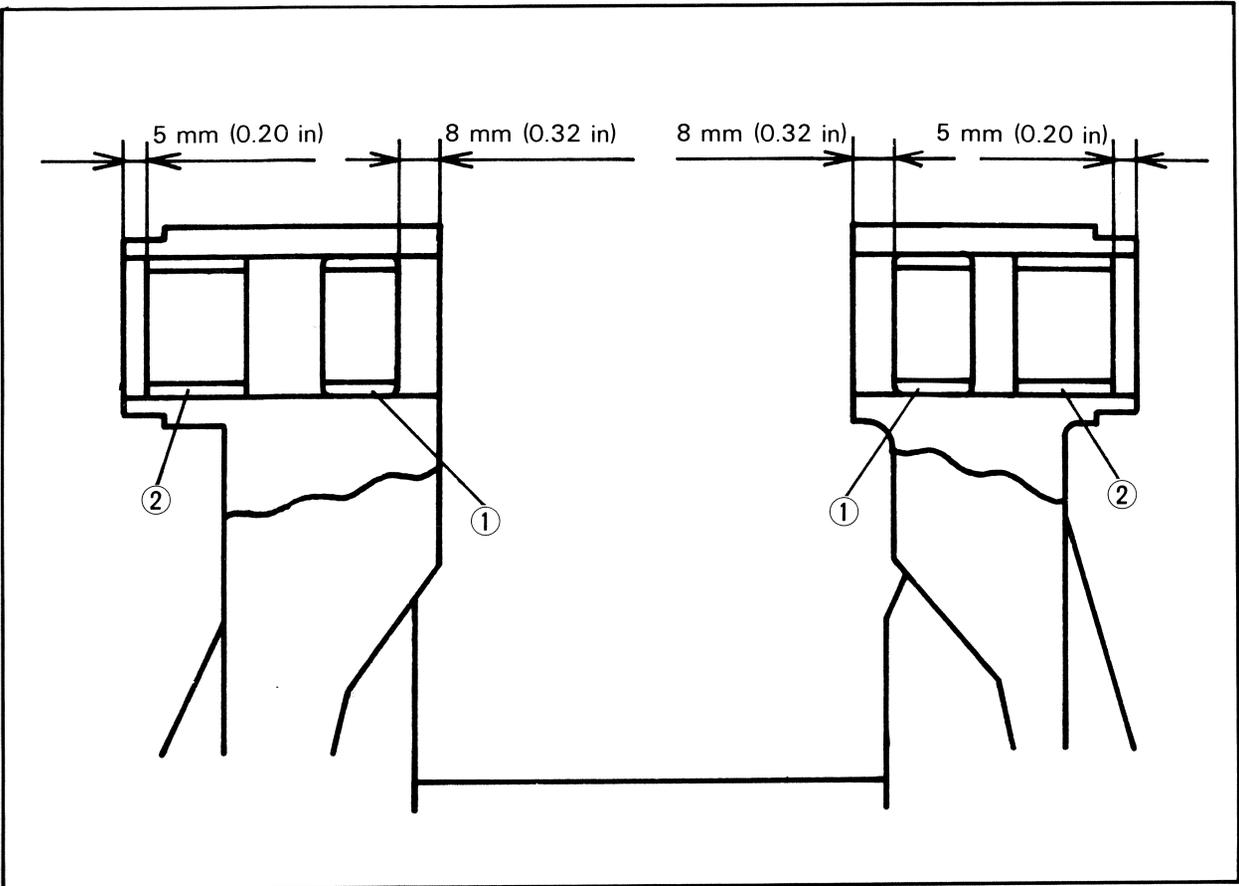
## 2. Install:

- Bushings (New) ①
- Bearings (New) ②

**NOTE:**

When installing the new bushings and bearings, note attention to the following points;

- Bushings and bearings should be exactly located as shown in the illustration.
- Grease them liberally with lithium base waterproof wheel bearing grease.

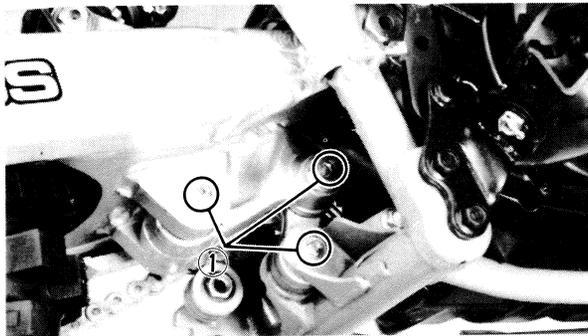


**ASSEMBLY**

When assembling the swingarm, reverse the removal procedure. Note the following points.

1. Tighten:
  - Nuts

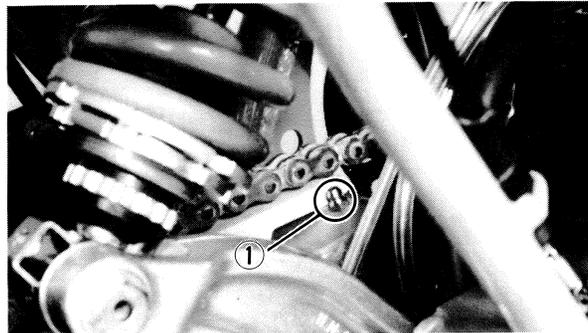
	<b>Relay Arm and Relay Arm Connecting Rod (M10):</b>
	32 Nm (3.2 m·kg, 23 ft·lb)
	<b>Swingarm and Relay Arm (M12):</b>
	58 Nm (5.8 m·kg, 42 ft·lb)
	<b>Relay Arm Connecting Rod and Frame (M10):</b>
58 Nm (5.8 m·kg, 42 ft·lb)	
<b>Pivot Shaft (M14):</b>	
85 Nm (8.5 m·kg, 61 ft·lb)	



2. Lubricate:
  - Pivot points ① (swingarm and relay arm)

Use a Grease gun.

	<b>Lithium Base Grease</b>
--	----------------------------



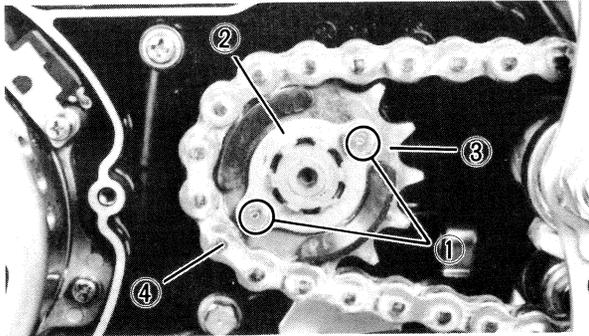
3. Check:
  - Swingarm movement

**DRIVE CHAIN AND SPROCKETS**

**REMOVAL**

**Drive sprocket**

1. Removal:
  - Footrest (Left)
  - Change pedal
  - Crankcase cover (Left)



2. Remove:
  - Bolts (drive sprocket) ①
  - Apply the rear brake.
  - Holding plate ②
  - Drive sprocket ③
  - Drive chain ④

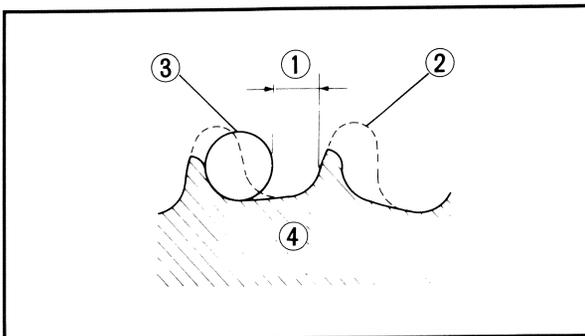
**Driven Sprocket**

1. Remove:
  - Rear wheel
2. Remove:
  - Nuts (drive sprocket)
  - Driven sprocket

**INSPECTION**

**Drive Chain**

1. Inspect:
  - O-rings  
Damage/Miss → Replace.
  - Rollers and side plates  
Damage/Wear → Replace.



**Drive and Driven Sprockets**

1. Inspect:
  - Drive and driven sprockets  
Wear/Damage → Replace.

- ① 1/4 tooth
- ② Correct
- ③ Roller
- ④ Sprocket

**ASSEMBLY**

When assembling the sprockets, reverse the removal procedure. Note the following points.

## 1. Tighten:

- Bolts (drive sprocket)
- Nuts (drive sprocket)



**Bolts (Drive Sprocket):**  
10 Nm (1.0 m·kg, 7.2 ft·lb)  
**Nuts (Drive Sprocket):**  
30 Nm (3.0 m·kg, 22 ft·lb)

## 2. Adjust:

- Drive chain slack
- Rear brake free play

Refer to “CHAPTER 2. DRIVE CHAIN SLACK ADJUSTMENT and REAR BRAKE ADJUSTMENT” section.



**Drive Chain Slack:**  
40 ~ 45 mm (1.6 ~ 1.8 in)  
**Rear Brake Free Play:**  
20 ~ 30 mm (0.8 ~ 1.2 in)

**CHAPTER 6.  
ELECTRICAL**

**TT350S CIRCUIT DIAGRAM** ..... 6-1

**ELECTRICAL COMPONENTS** ..... 6-3

**IGNITION SYSTEM** ..... 6-5

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    PICK-UP COIL RESISTANCE TEST ..... 6-10

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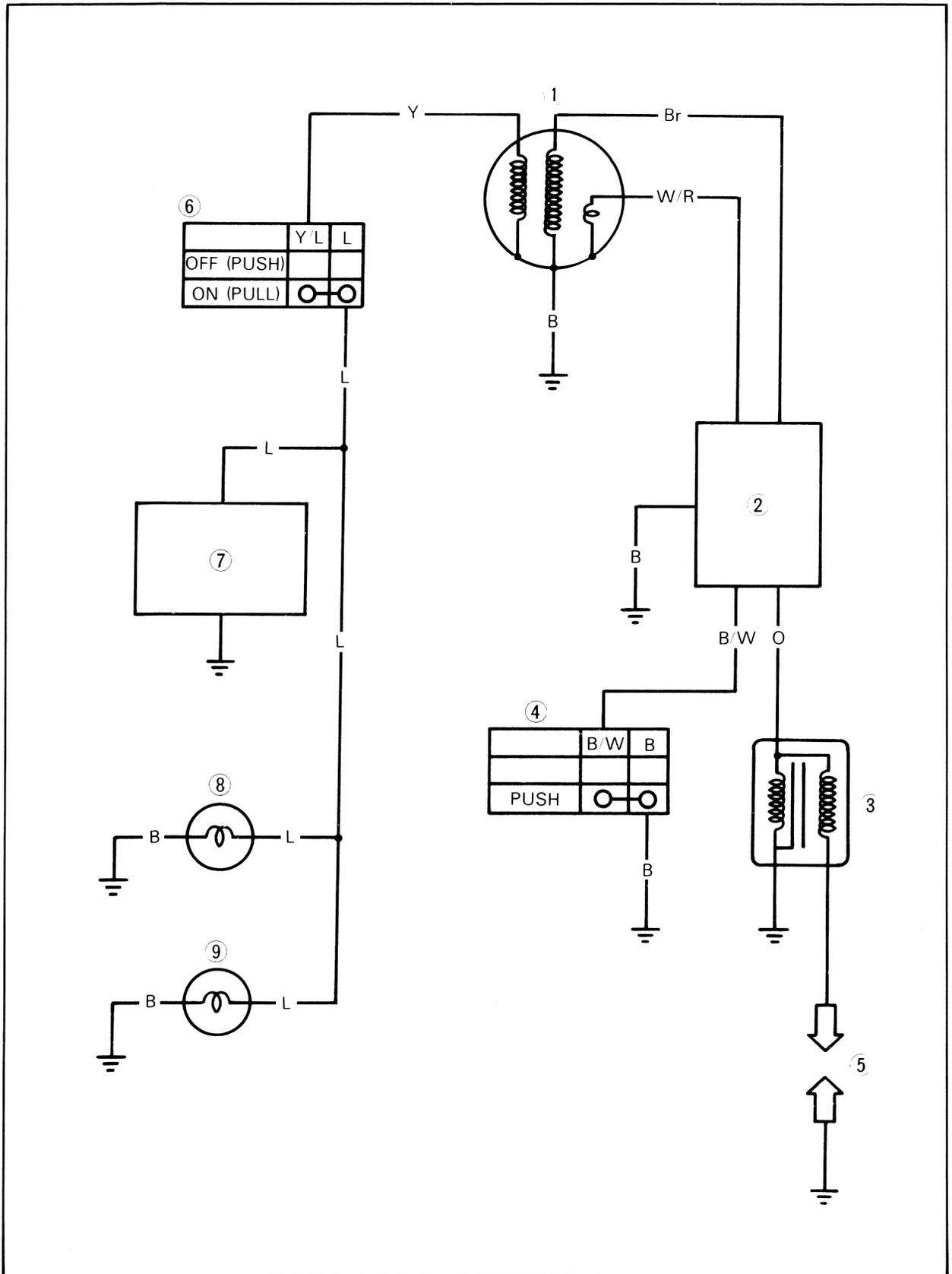
    TROUBLESHOOTING ..... 6-13

    A.C. LIGHTING CIRCUIT OUTPUT TEST ..... 6-14

    LIGHTING COIL RESISTANCE TEST ..... 6-14

**ELECTRICAL**

**TT350S CIRCUIT DIAGRAM**





- ① CDI magneto
- ② CDI unit
- ③ Ignition coil
- ④ Engine stop switch
- ⑤ Spark plug
- ⑥ Lighting switch
- ⑦ Voltage regulator
- ⑧ Headlight
- ⑨ Taillight

**COLOR COAD**

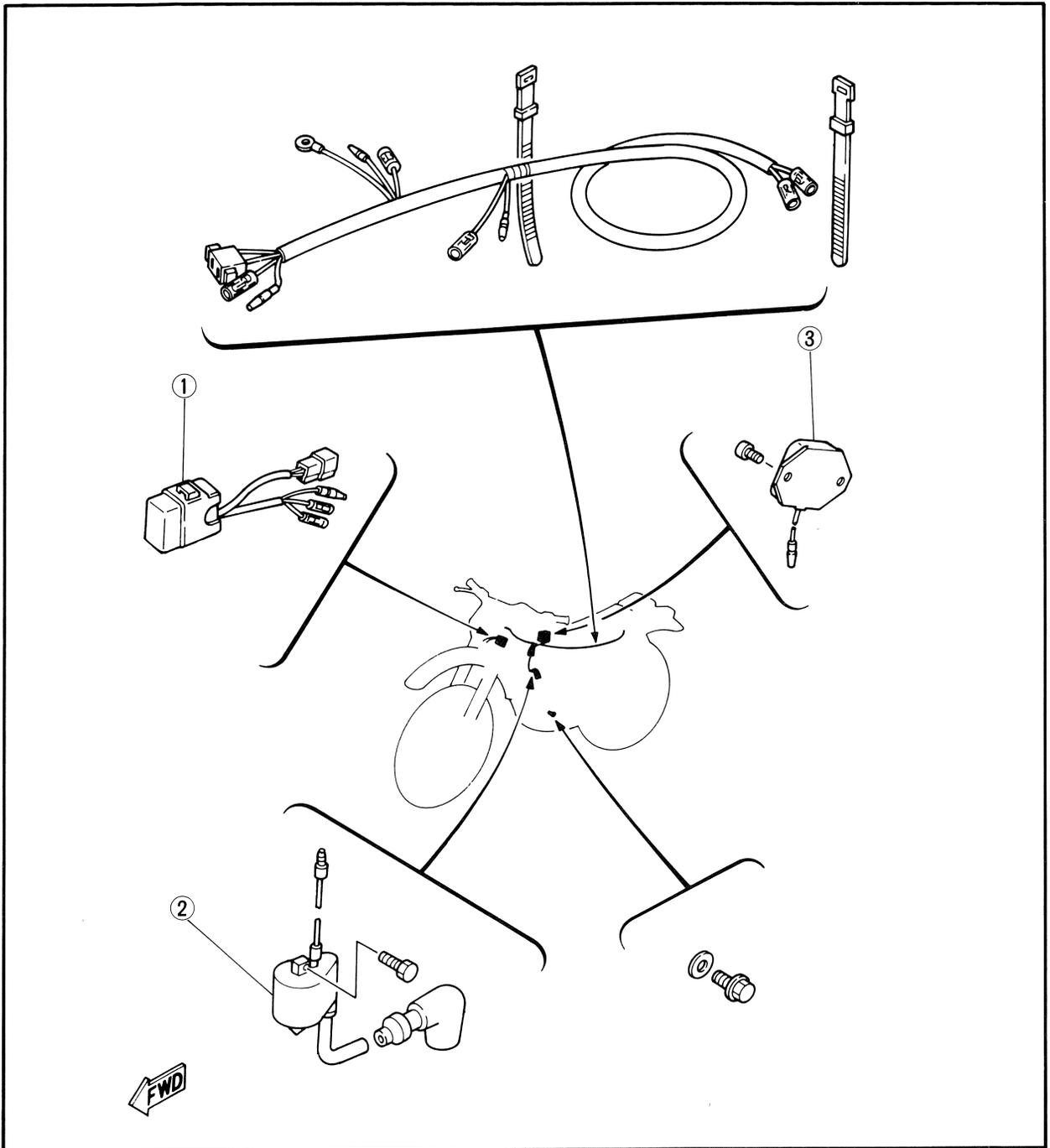
B	Black
O	Orange
Br	Brown
Y	Yellow
L	Blue
B/W	Black/White
W/R	White/Red
Y/R	Yellow/Red



**ELECTRICAL COMPONENTS**

- ① C.D.I. unit
- ② Ignition Coil
- ③ Voltage regulator

A	CDI MAGNETO	B	IGNITION COIL
	Pick-up coil resistance: 199 ~ 243 Ω at 20°C (68°F) Source coil resistance: 400 ~ 488 Ω at 20°C (68°F) Lighting coil resistance: 0.43 ~ 0.53 Ω at 20°C (68°F)		Primary coil resistance: 0.67 ~ 0.91 Ω at 20°C (68°F) Secondary coil resistance: 5.02 ~ 6.79 kΩ at 20°C (68°F)
C			VOLTAGE REGULATOR
			Type: Semi conduction short circuit No Load Regulated voltage: 13.2 ~ 13.8 V

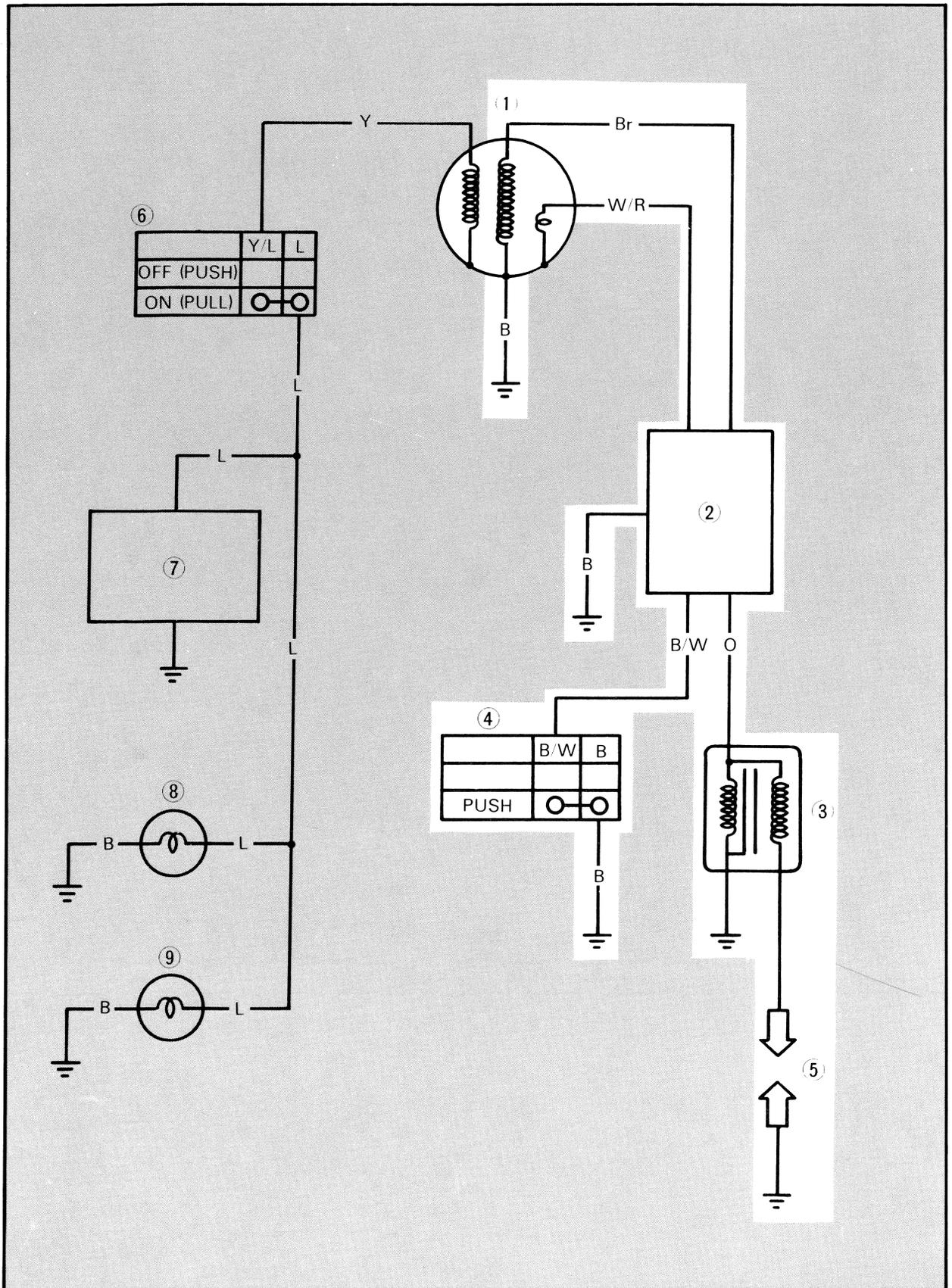




— MEMO —

**IGNITION SYSTEM**

**CIRCUIT DIAGRAM**



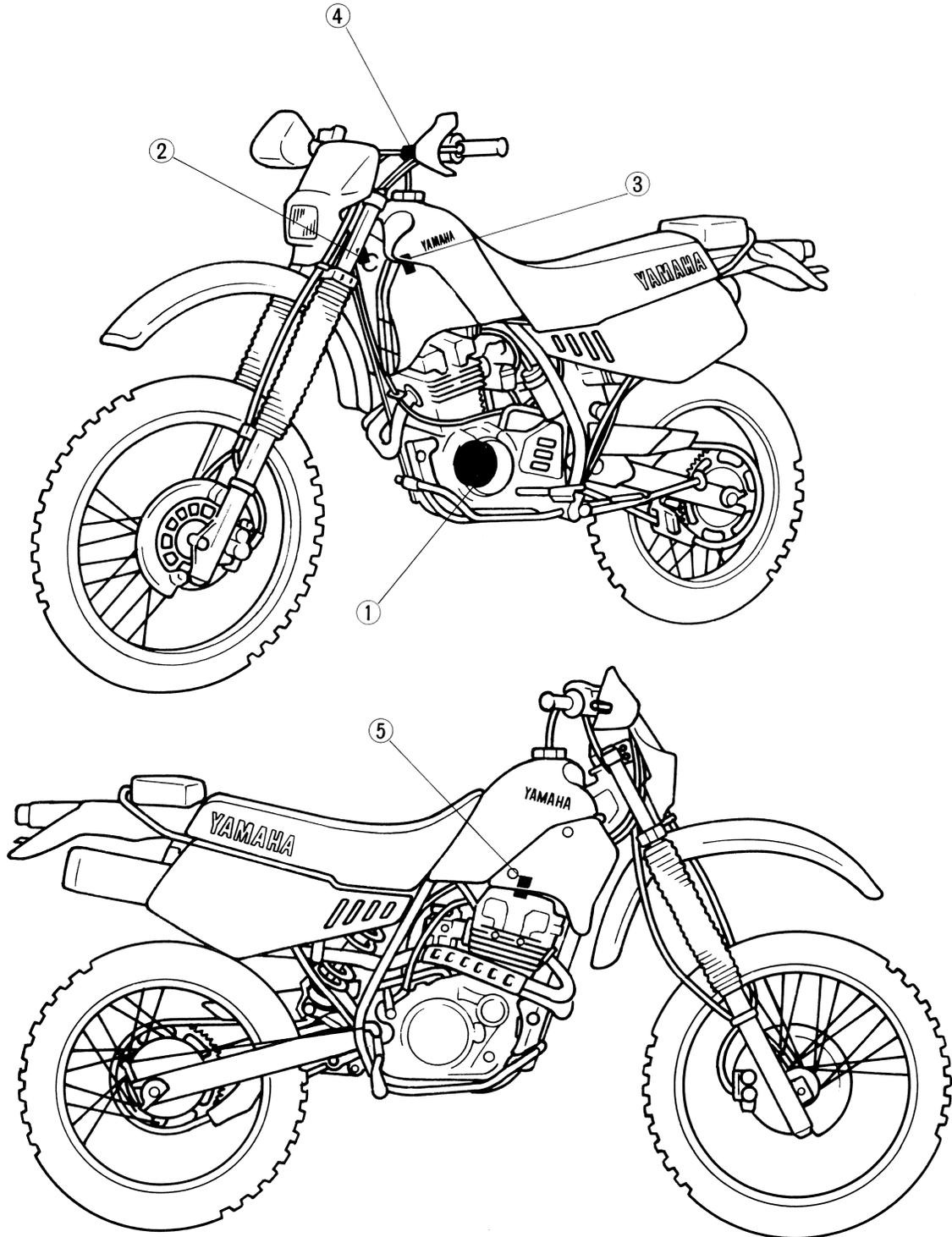


Aforementioned circuit diagram shows ignition circuit in wiring diagram.

**NOTE:**

For the encircled numbers and color codes, see page 6-2.

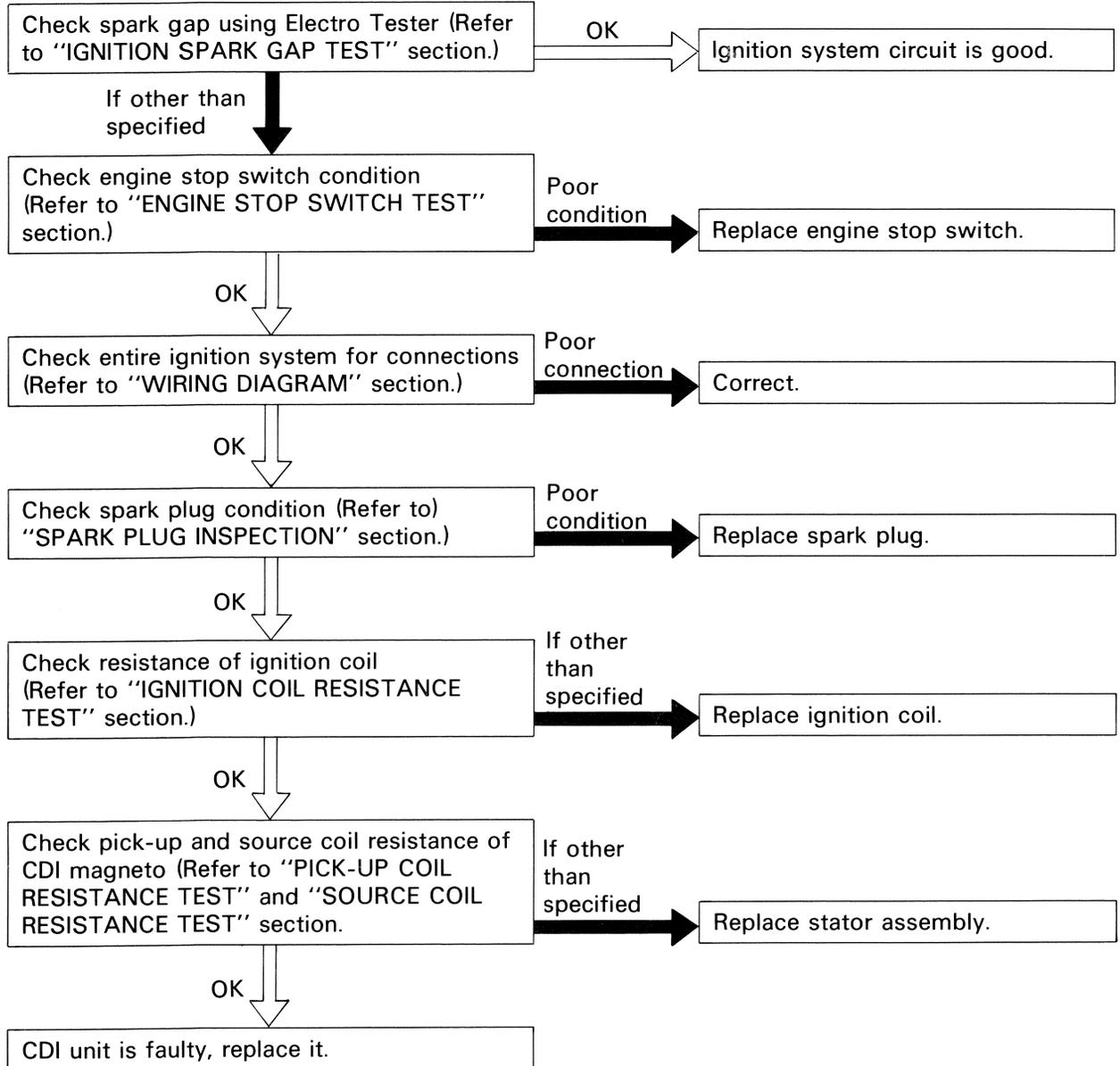
- ① CDI magneto
- ② CDI unit
- ③ Ignition coil
- ④ Engine stop switch
- ⑤ Ignition coil





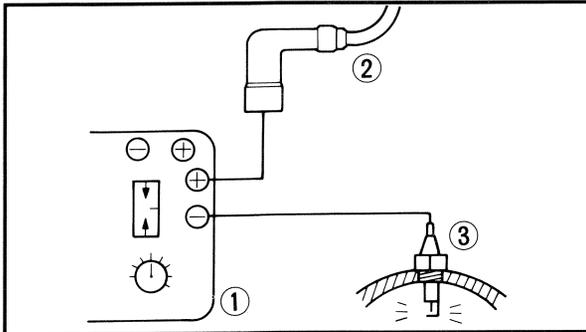
**TROUBLESHOOTING**

If the ignition system should become inoperative (No spark or intermittent spark), the troubleshooting aids will be useful.



**IGNITION TIMING CHECK**

Refer to "CHAPTER 2. IGNITION TIMING CHECK" section.

**IGNITION SPARK GAP TEST**

1. Warm up engine thoroughly so that all electrical components are at operating temperature.
2. Connect:
  - Electro Tester (1) (YU-33260)
3. Check:
  - Minimum spark gap
 Start the engine, and increase the spark gap until misfire occurs (Test at various revolution between 1,300 ~ 8,000 r/min.)

① Spark plug lead

② Spark plug

**CAUTION:**

**Do not run the engine in neutral above 6,000 r/min for more than 1 or 2 seconds.**



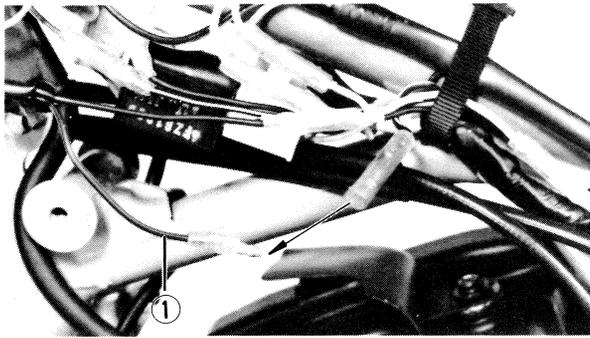
**Minimum Spark Gap:**

**6 mm (0.24 in)**

Faulty ignition system operation (at the minimum spark gap or smaller) → Follow the troubleshooting chart until the source of the problem is located.

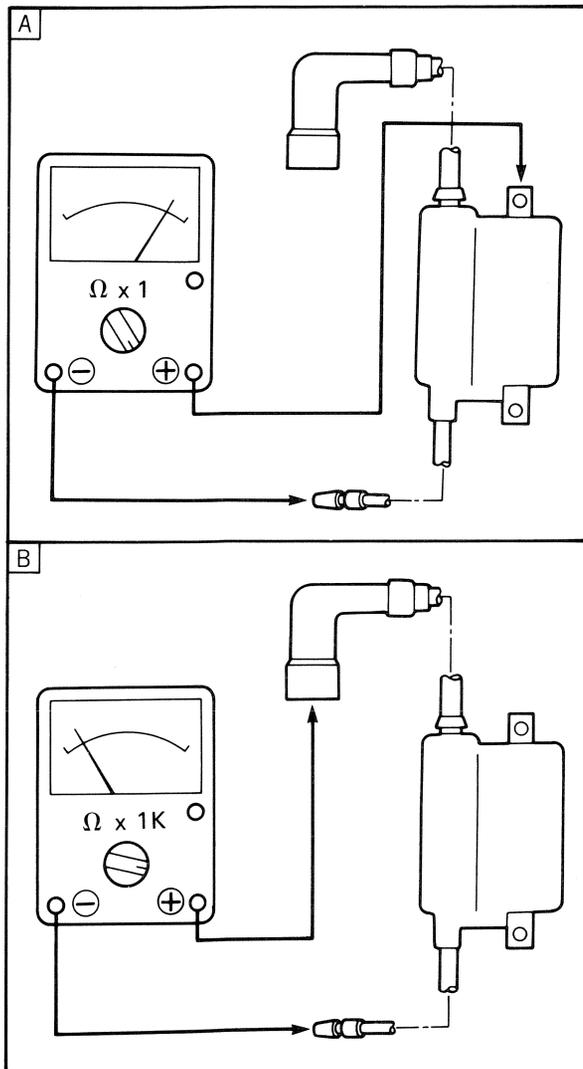
**SPARK PLUG INSPECTION**

Refer to "CHAPTER 2. SPARK PLUG INSPECTION" section.



**ENGINE STOP SWITCH TEST**

1. Remove:
  - Side covers
  - Seat
  - Air scoops
  - Fuel tank
2. Disconnect:
  - Engine stop switch lead (Black/White) ①
3. Start the engine.
4. Check:
  - Engine condition
  - Not starts → Switch is good.
  - Engine starts → Replace switch.



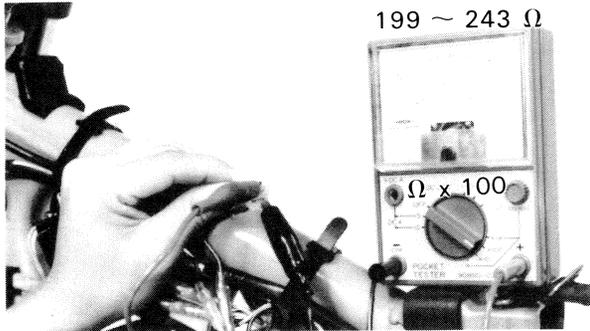
**IGNITION COIL RESISTANCE TEST**

1. Remove:
  - Side covers
  - Seat
  - Air scoops
  - Fuel tank
2. Disconnect:
  - Ignition coil lead
  - Spark plug lead
3. Connect:
  - Pocket Tester (YU-03112)
  - Set the tester selector to "Ohm x 1" (For primary winding resistance check) or "Ohm x 1K" (For secondary winding resistance check) position.
4. Measure:
  - Primary coil resistance **A**
  - Secondary coil resistance **B**
  - Out of specification → Replace.

	<b>Primary Coil Resistance:</b>
	<b>0.67 ~ 0.91 Ω at 20°C (68°F)</b>
	<b>Secondary Coil Resistance:</b>
	<b>5.02 ~ 6.79 kΩ at 20°C (68°F)</b>

**PICK-UP COIL RESISTANCE TEST**

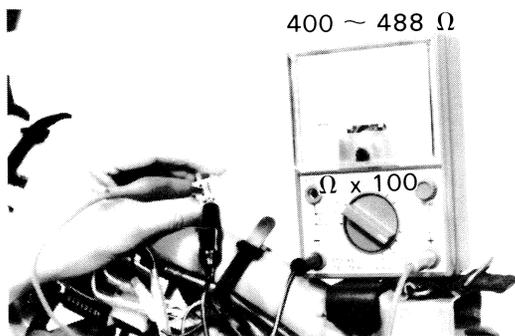
1. Remove:
  - Side covers
  - Seat
  - Air scoops
  - Fuel tank
2. Disconnect:
  - CDI magneto leads (Black, Brown and White/Red)
3. Connect:
  - Pocket Tester (YU-03112)
 Set the tester selector to "Ohm x 100" position.
4. Measure:
  - Pick-up coil resistance
 Out of specification → Replace.

**Pick-up Coil Resistance:**

**199 ~ 243 Ω at 20°C (68°F)**  
**(Black – White/Red)**

**SOURCE COIL RESISTANCE TEST**

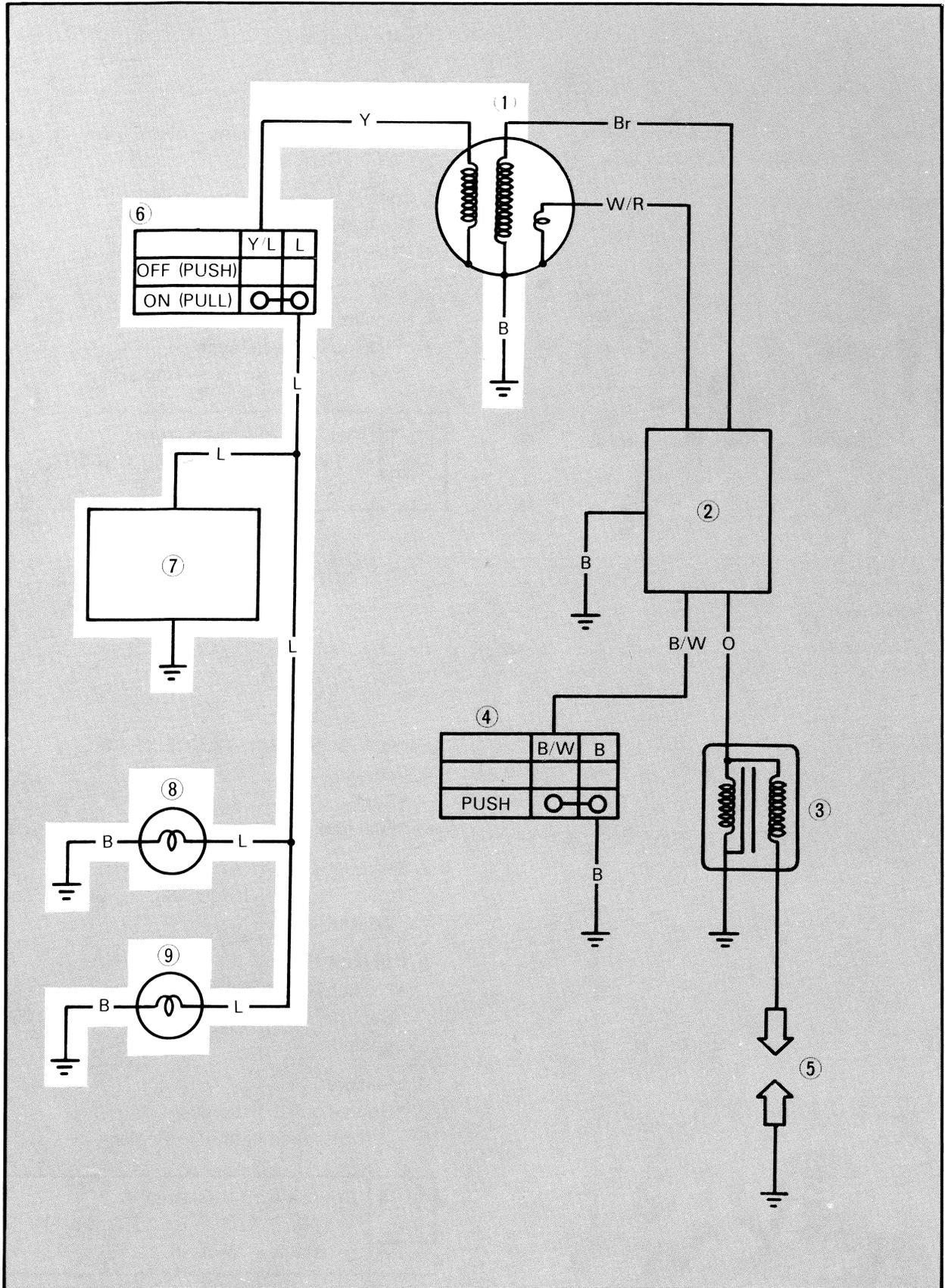
1. Remove:
  - Seat
  - Fuel tank
2. Disconnect:
  - CDI magneto leads (Black, Brown and White/Red)
3. Connect:
  - Pocket Tester (YU-03112)
 Set the tester selector to "Ohm x 100" position.
4. Measure:
  - Source coil resistance
 Out of specification → Replace.

**Source Coil Resistance:**

**400 ~ 488 Ω at 20°C (68°F)**  
**(Black – Brown)**

**LIGHTING SYSTEM**

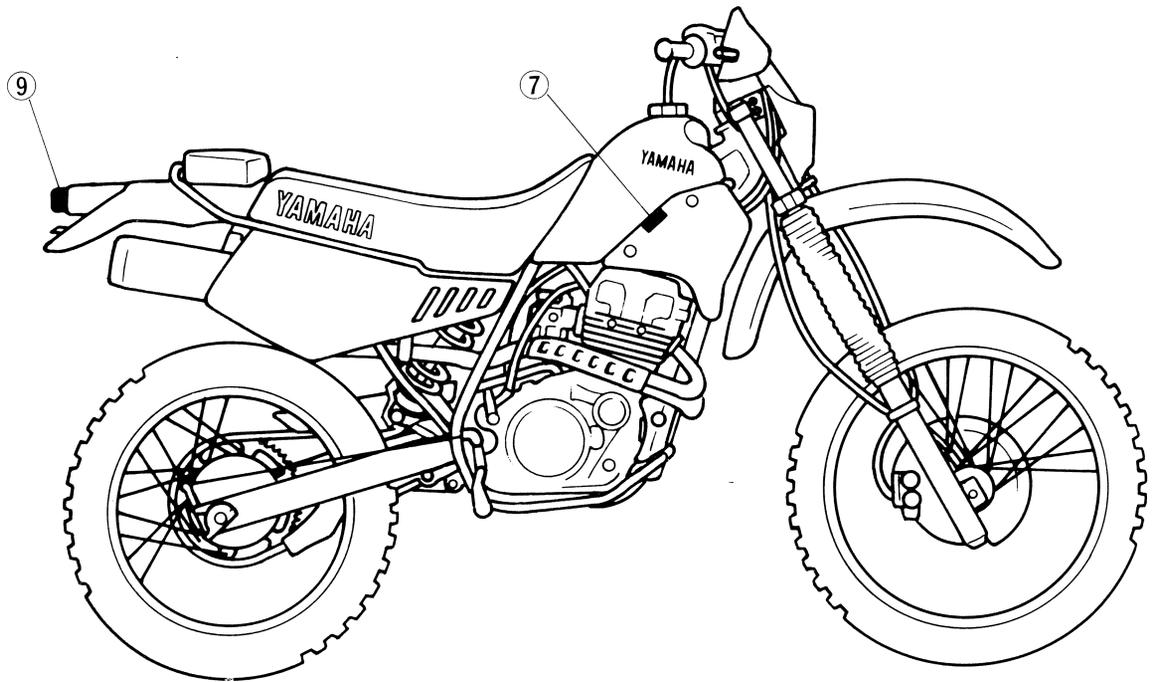
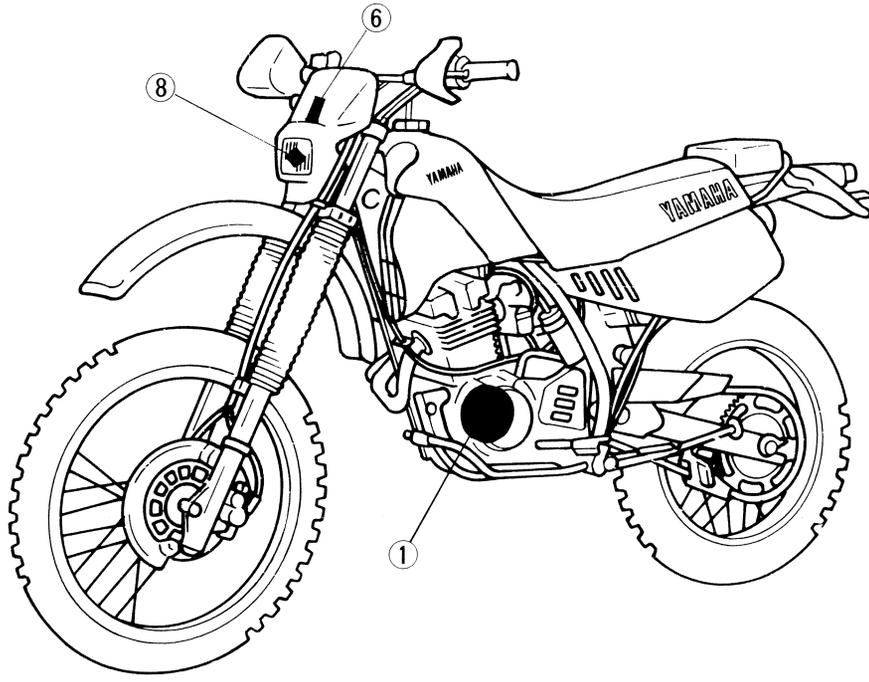
**CIRCUIT DIAGRAM**



Aforementioned circuit diagram shows lighting circuit in wiring diagram.

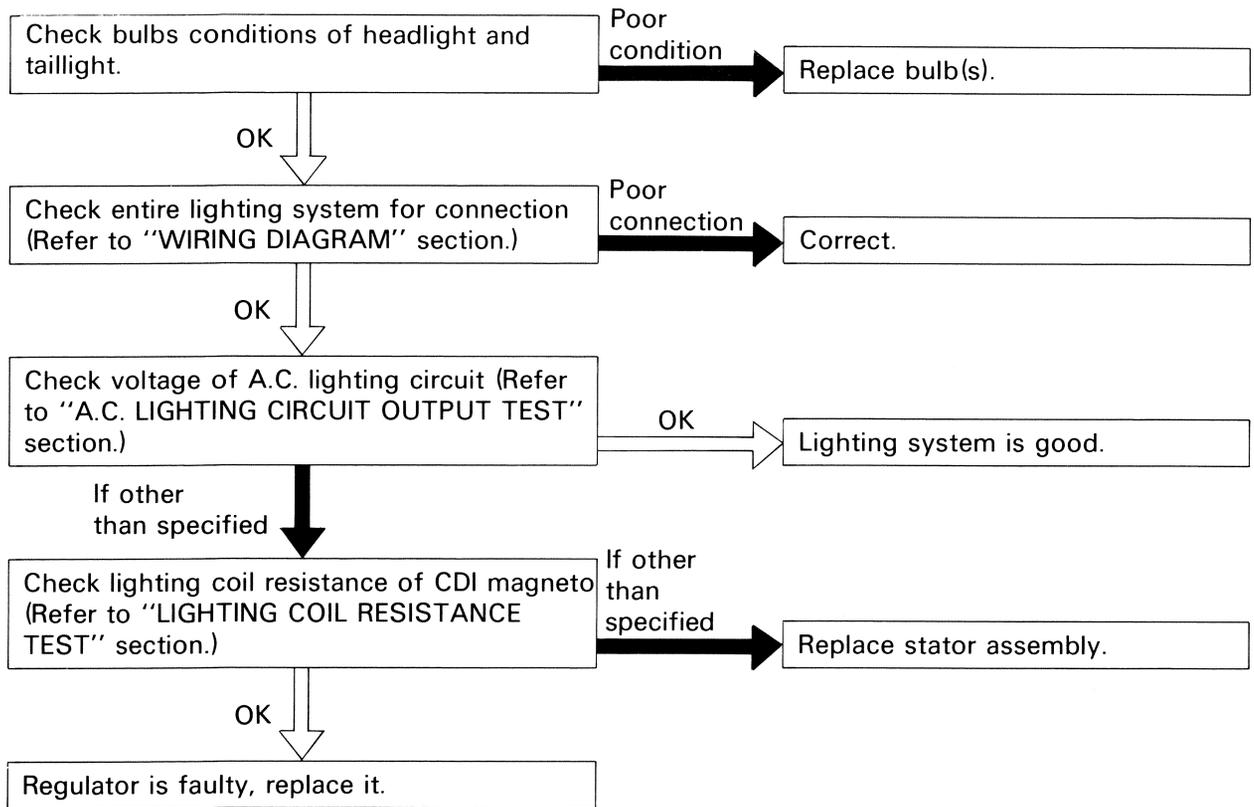
**NOTE:** \_\_\_\_\_  
For the encircled numbers and color codes, see page 6-2.

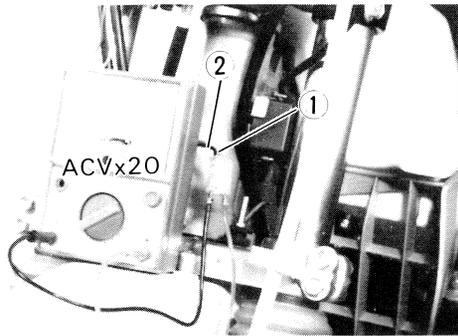
- ① CDI magneto
- ⑥ Lighting switch
- ⑦ Voltage regulator
- ⑧ Headlight
- ⑨ Taillight



**TROUBLESHOOTING**

If the lighting system should become inoperative, the troubleshooting aids will be useful.



**A.C. LIGHTING CIRCUIT OUTPUT TEST**

1. Remove:
  - Headlight body
2. Disconnect:
  - Headlight lens unit leads (Blue and Black)
3. Connect:
  - Pocket Tester (YU-03112)
  - Set the tester selector to "AC20V" position.

- ① Blue
- ② Black

4. Start the engine.
5. Accelerate the engine to specifications and check the output voltage.

**CAUTION:**

**Do not run the engine in neutral above 6,000 r/min for more than 1 or 2 seconds.**

6. Measure:
  - Lighting voltage
  - Out of specification → Perform the next test.

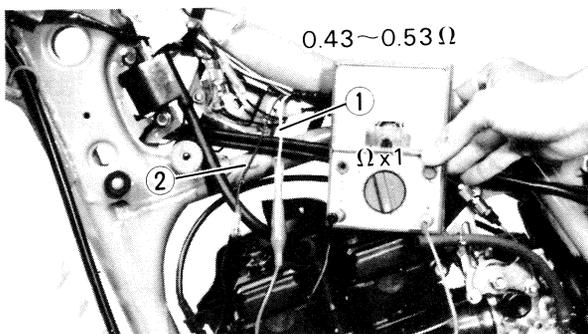


**Lighting Voltage:**  
**11 V or more at 2,500 r/min**

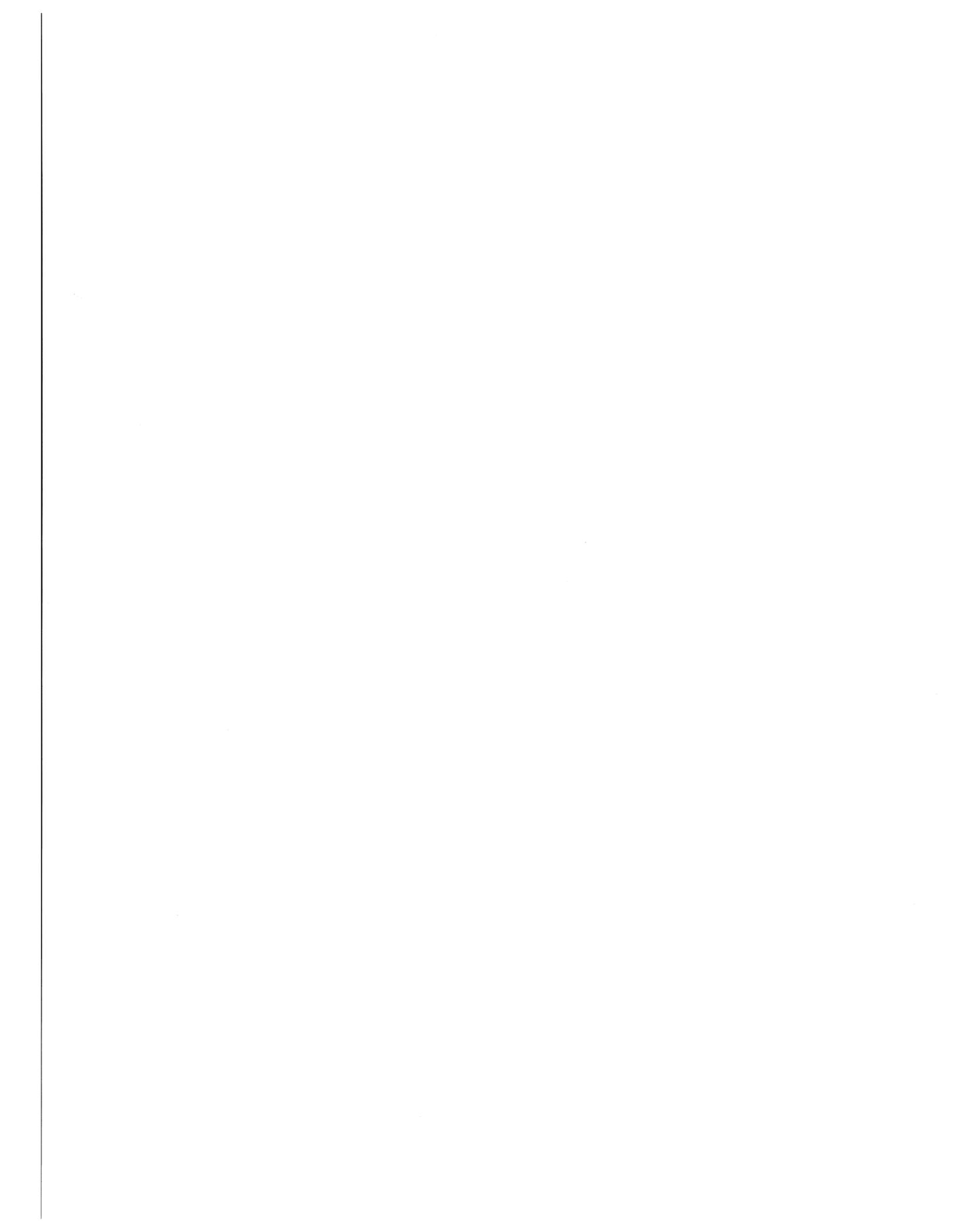
**LIGHTING COIL RESISTANCE TEST**

1. Remove:
  - Seat
  - Fuel tank
2. Disconnect:
  - Two leads (Black and Yellow)
  - From the CDI magneto
3. Connect:
  - Pocket Tester (YU-03112)
  - Set the tester selector to "Ohm x 1" position.
4. Measure:
  - Lighting coil resistance
  - Out of specification → Replace.

- ① Yellow
- ② Black



**Lighting Coil Resistance:**  
**0.43 ~ 0.53 Ω at 20°C (68°F)**  
**(Yellow – Black)**



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**CHAPTER 7  
APPENDICES**

**SPECIFICATIONS** ..... 7-1  
    GENERAL SPECIFICATIONS..... 7-1  
    MAINTENANCE SPECIFICATIONS..... 7-4

**GENERAL TORQUE SPECIFICATIONS** ..... 7-17

**DEFINITION OF UNITS** ..... 7-17

**LUBRICATION DIAGRAM**..... 7-18

**CABLE ROUTING** ..... 7-20

**TT350S WIRING DIAGRAM**



**APPENDICES**

**SPECIFICATIONS**

**GENERAL SPECIFICATIONS**

Model	TT350S
Model Code Number	1RG
Vehicle Identification Number	JYA1RG00*GA000101
Engine Starting Number	1RG-000101
Dimensions:	
Overall Length	2175 mm (85.63 in)
Overall Width	870 mm (34.25 in)
Overall Height	1235 mm (48.62 in)
Seat Height	920 mm (36.22 in)
Wheelbase	1440 mm (56.69 in)
Minimum Ground Clearance	310 mm (12.20 in)
Basic Weight:	
With Oil and Full Fuel Tank	123 kg (271.2 lb)
Engine:	
Engine Type	Air Cooled 4-Stroke, DOHC
Cylinder Arrangement	Forward Inclined Single Cylinder
Displacement	346 cm <sup>3</sup>
Bore x Stroke	86.0 x 59.6 mm (3.386 x 2.346 in)
Compression Ratio	9 : 1
Compression Pressure < Min ~ Max >	882 ~ 1176 kPa (9 ~ 12 kg/cm <sup>2</sup> , 128 ~ 170 psi)
Starting System	Kick Starter
Lubrication System	Wet Sump
Oil Type or Grade Engine Oil	Yamalube 4, SAE 20W40 Type SE motor oil or SAE 10W30 type SE motor oil
Oil Capacity:	
Engine Oil	
Periodic Oil Change	1.3 L (1.14 Imp qt, 1.37 US qt)
With Oil Filter Replacement	1.3 L (1.14 Imp qt, 1.37 US qt)
Total Amount	1.6 L (1.41 Imp qt, 1.69 US qt)
Air Filter	Wet Type Element



Model	TT350S	
Fuel:		
Type	Regular Gasoline	
Tank Capacity	9.5 L (2.09 Imp gal, 2.51 US gal)	
Reserve Amount	1.0 L (0.22 Imp gal, 0.26 US gal)	
Carburetor:		
Type/Manufacturer	Y24PV/TEIKEI	
Spark Plug:		
Type/Manufacturer	D8EA/NGK, X24ES-U/N.D.	
Gap	0.6 ~ 0.7 mm (0.024 ~ 0.028 in)	
Clutch Type	Wet, Multiple-disc	
Transmission:		
Primary Reduction System	Spur Gear	
Primary Reduction Ratio	70/24 (2.916)	
Secondary Reduction System	Chain Drive	
Secondary Reduction Ratio	50/14 (3.571)	
Transmission Type	Constant Mesh 6-speed	
Operation	Left Foot Operation	
Gear Ratio	1st	37/15 (2.466)
	2nd	29/16 (1.812)
	3rd	26/19 (1.368)
	4th	27/25 (1.080)
	5th	24/27 (0.889)
	6th	22/29 (0.759)
Chassis:		
Frame Type	Semi Double Cradle	
Caster Angle	27.5°	
Trail	115 mm (4.53 in)	
Tire:		
Type	With Tube	
Size (F)	80/100-21	
Size (R)	100/100-18	
Cold Tire Pressure	FRONT	REAR
OFF-Road Riding	98 kPa (1.0 kg/cm <sup>2</sup> , 14 psi)	98 kPa (1.0 kg/cm <sup>2</sup> , 14 psi)

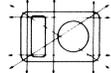
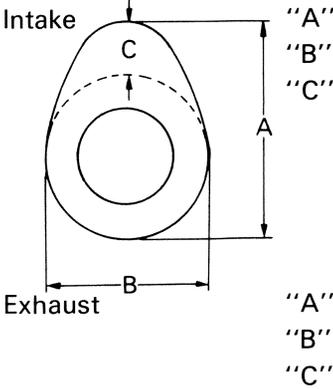
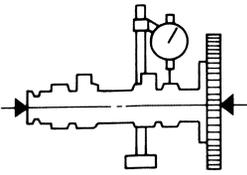


Model	TT350S
<b>Brake:</b> Front Brake Type Operation Rear Brake Type Operation	Single Disc Brake Right Hand Operation Drum Brake Right Foot Operation
<b>Suspension:</b> Front Suspension Rear Suspension	Telescopic Fork Swingarm (Link Suspension)
<b>Shock Absorber:</b> Front Shock Absorber Rear Shock Absorber	Coil – Air Spring/Oil Damper Coil – Gas Spring/Oil Damper
<b>Wheel Travel:</b> Front Wheel Travel Rear Wheel Travel	280 mm (11.02 in) 280 mm (11.02 in)
<b>Electrical:</b> Ignition System Generator System	C.D.I. Flywheel Magneto
<b>Headlight Type</b>	Quartz Bulb (Halogen)
<b>Bulb Wattage x Quantity:</b> Headlight Taillight	12V 55W x 1 12V 8W x 1



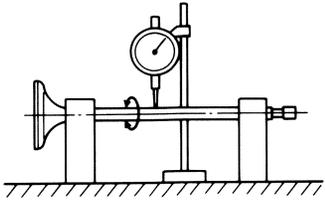
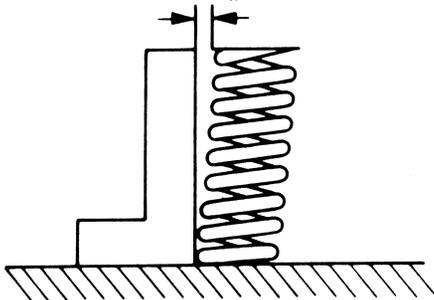
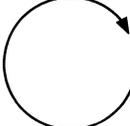
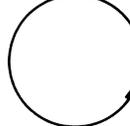
**MAINTENANCE SPECIFICATIONS**

**Engine**

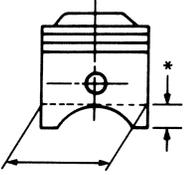
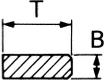
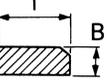
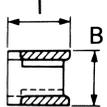
Model	TT350S
Cylinder Head: Warp Limit 	0.03 mm (0.0012 in) *Lines indicate straightedge measurement
Cylinder: Bore Size Taper Limit Out of Round Limit	85.97 ~ 86.02 mm (3.384 ~ 3.505 in) 0.008 mm (0.0003 in) 0.008 mm (0.0003 in)
Camshaft: Drive Method Cam Cap Inside Diameter Camshaft Outside Diameter Cap Clearance Cam Dimensions Intake  Exhaust "A" "B" "C"	Chain Drive (Right) 25.000 ~ 25.021 mm (0.984 ~ 0.985 in) 24.967 ~ 24.980 mm (0.982 ~ 0.983 in) 0.020 ~ 0.054 mm (0.0008 ~ 0.0021 in)  35.75 ~ 35.85 mm (1.407 ~ 1.411 in) 27.998 ~ 28.098 mm (1.102 ~ 1.106 in) 7.8 mm (0.307 in)  35.75 ~ 35.85 mm (1.407 ~ 1.411 in) 27.998 ~ 28.098 mm (1.102 ~ 1.106 in) 7.8 mm (0.307 in)
Camshaft Runout Limit  Cam Chain Type/Number of Links Cam Chain Adjustment Method	0.03 mm (0.0012 in)  79 - 010M/136 Automatic



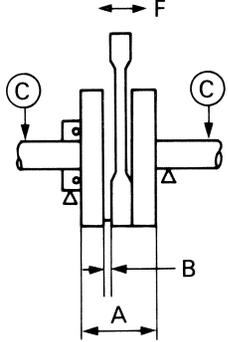
Model	TT350S	
Valve, Valve Seat, Valve Guide:		
Valve Clearance (Cold)	IN.	0.08 ~ 0.12 mm (0.0031 ~ 0.0047 in)
	EX.	0.13 ~ 0.17 mm (0.0051 ~ 0.0067 in)
Valve Dimensions:		
"A" Head Dia.	IN.	28.90 ~ 29.10 (1.138 ~ 1.146 in)
	EX.	24.90 ~ 25.10 mm (0.980 ~ 0.988 in)
"B" Face Width	IN.	2.26 mm (0.089 in)
	EX.	2.26 mm (0.089 in)
"C" Seat Width	IN.	0.9 ~ 1.1 mm (0.035 ~ 0.043 in)
	EX.	0.9 ~ 1.1 mm (0.035 ~ 0.043 in)
<Limit>	IN.	1.8 mm (0.07 in)
	EX.	1.8 mm (0.07 in)
"D" Margin Thickness	IN.	0.8 ~ 1.2 mm (0.031 ~ 0.047 in)
	EX.	0.8 ~ 1.2 mm (0.031 ~ 0.047 in)
Stem Outside Diameter	IN.	5.475 ~ 5.490 mm (0.215 ~ 0.216 in)
	EX.	5.460 ~ 5.475 mm (0.214 ~ 0.215 in)
Guide Inside Diameter	IN.	5.500 ~ 5.512 mm (0.216 ~ 0.217 in)
	EX.	5.500 ~ 5.512 mm (0.216 ~ 0.217 in)
<Limit>	IN.	5.6 mm (0.22 in)
	EX.	5.6 mm (0.22 in)
Stem-to-guide Clearance	IN.	0.010 ~ 0.037 mm (0.0004 ~ 0.0014 in)
	EX.	0.025 ~ 0.040 mm (0.0010 ~ 0.0016 in)
<Limit>	IN.	0.1 mm (0.004 in)
	EX.	0.1 mm (0.004 in)

<p>Model</p>	<p>TT350S</p>	
<p>Stem Runout Limit</p>  <p>Valve Seat Width Standard IN.EX.</p>	<p>0.01 mm (0.0004 in)</p> <p>0.9 ~ 1.1 mm (0.035 ~ 0.043 in)</p>	
<p>Valve Spring:</p> <p>Free Length</p> <p>Inner Spring      IN.                             EX.</p> <p>Outer Spring      IN.                             EX.</p> <p>Set Length (Valve Closed)</p> <p>Inner Spring      IN.                             EX.</p> <p>Outer Spring      IN.                             EX.</p>	<p>38.1 mm (1.50 in) 38.1 mm (1.50 in)</p> <p>41.2 mm (1.62 in) 41.2 mm (1.62 in)</p> <p>31.8 mm (1.25 in) 31.8 mm (1.25 in)</p> <p>33.8 mm (1.33 in) 33.8 mm (1.33 in)</p>	
<p>Tilt Limit*</p> <p>Inner Spring      IN. &amp; EX. Outer Spring      IN. &amp; EX.</p> 	<p>2.5°/1.7 mm (0.067 in) 2.5°/1.8 mm (0.071 in)</p>	
<p>Direction of Winding (Top view)</p>	<p>Inner Spring</p>	<p>Outer Spring</p>
	<p>Clockwise</p> 	<p>Counter Clockwise</p> 



Model	TT350S
<p>Piston:</p> <p>Piston Size/Measuring Point*</p>  <p>Piston Clearance &lt;Limit&gt;</p> <p>Oversize     2nd                   4th</p>	<p>85.92 ~ 85.97 mm (3.383 ~ 3.385 in) /2.0 mm (0.08 in)</p> <p>0.04 ~ 0.06 mm (0.00157 ~ 0.00246 in) &lt;0.1 mm (0.004 in) &gt;</p> <p>86.5 mm (3.406 in) 87.0 mm (3.425 in)</p>
<p>Piston Ring:</p> <p>Sectional Sketch</p> <p>Top Ring</p>  <p>2nd Ring</p>  <p>Oil Ring</p> 	<p>Barrel</p> <p>1.2 mm (0.047 in) 3.5 mm (0.138 in)</p> <p>Taper</p> <p>1.2 mm (0.047 in) 3.5 mm (0.138 in) 2.5 mm (0.098 in) 3.4 mm (0.134 in)</p>
<p>End Gap (Installed)</p> <p>Top Ring &lt;Limit&gt;</p> <p>2nd Ring &lt;Limit&gt;</p> <p>Oil Ring</p> <p>Side Clearance</p> <p>Top Ring &lt;Limit&gt;</p> <p>2nd Ring &lt;Limit&gt;</p> <p>Oil Ring</p>	<p>0.25 ~ 0.40 mm (0.010 ~ 0.016 in) 0.8 mm (0.032 in)</p> <p>0.25 ~ 0.40 mm (0.010 ~ 0.016 in) 0.8 mm (0.032 in)</p> <p>0.20 ~ 0.70 mm (0.008 ~ 0.028 in)</p> <p>0.04 ~ 0.08 mm (0.0016 ~ 0.0031 in) 0.15 mm (0.006 in)</p> <p>0.03 ~ 0.07 mm (0.0012 ~ 0.0028 in) 0.15 mm (0.006 in)</p> <p>0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in)</p>



Model	TT350S
<p>Crankshaft:</p>  <p>Crank Width "A" Big End Side Clearance "B" Runout Limit "C" Small End Free Play Limit "F"</p>	<p>58.95 ~ 59.00 mm (2.321 ~ 2.323 in) 0.35 ~ 0.85 mm (0.014 ~ 0.033 in) 0.03 mm (0.0012 in) 0.8 mm (0.031 in)</p>
<p>Balancer Drive Method</p>	<p>Gear</p>
<p>Clutch: Friction Plate Thickness/Quantity Wear Limit Clutch Plate Thickness/Quantity Warp Limit Clutch Spring Free Length/Quantity Clutch Spring Minimum Free Length Clutch Housing Thrust Clearance Clutch Release Method Push Rod Bending Limit</p>	<p>2.7 ~ 2.9 mm (0.106 ~ 0.114 in)/7 pcs. 2.5 mm (0.098 in) 1.1 ~ 1.3 mm (0.043 ~ 0.051 in)/1 pcs. 1.5 ~ 1.7 mm (0.059 ~ 0.067 in)/5 pcs. 0.05 mm (0.002 in) 41.2 mm (1.622 in)/5 pcs. 40.3 mm (1.587 in) 0.08 ~ 0.33 mm (0.003 ~ 0.013 in) Inner Push, Cam Push 0.5 mm (0.02 in)</p>
<p>Transmission: Main Axle Deflection Limit Drive Axle Deflection Limit</p>	<p>0.08 mm (0.0031 in) 0.08 mm (0.0031 in)</p>
<p>Shifter: Type</p>	<p>Cam Drum and Guide Bar</p>
<p>Kick Starter: Kick Starter Type</p>	<p>Ratchet Type</p>
<p>Decompression Device: Type Cable Free Play</p>	<p>Kick Synchronous 2 ~ 3 mm (0.078 ~ 0.118 in)</p>
<p>Air Filter Oil Grade (Oiled Filter)</p>	<p>Foam Air Filter Oil or SAE 10W30 SE</p>



# SPECIFICATIONS

Model	TT350S	
<b>Carburetor:</b> Type/Manufacturer/Quantity I.D. Mark  Main Jet (M.J.) Main Air Jet (M.A.J.) Jet Needle-clip Position (J.N.) Pilot Jet (P.J.) Pilot Air Jet (P.A.J.) Pilot Screw (turns out) (P.S.) Valve Seat (V.S.) Starter Jet (G.S. <sub>1</sub> ) (G.S. <sub>2</sub> )  Fuel Level (F.L.) Floot Height Engine Idling Speed Vacuum Pressure at Idling Speed	Y24PV/TEIKEI/1 pcs. 1RG-00	
	Primary carb.	Secondary cabr.
	#122 $\phi 1.0$ 5C9A - 3/5 #40 $\phi 0.8$ 2-3/4 $\pm$ 1/2 $\phi 2.5$ #70 $\phi 0.8$	#125 $\phi 0.8$ 4A70 - 3/5 — — — — —
	60 $\pm$ 0.5 mm (0.24 $\pm$ 0.02 in) 26.0 $\pm$ 2.5 mm (1.02 $\pm$ 0.10 in) 1400 ~ 1500 r/min 27.3 ~ 30.0 kPa (205 ~ 225 mmHg, 8.07 ~ 8.86 inHg)	
<b>Lubrication System:</b> Oil Filter Type Oil Pump Type Tip Clearance Housing and Outer Rotor Clearance Side Clearance	Wire Mesh Type Trochoid Type 0.15 mm (0.006 in) 0.03 ~ 0.09 mm (0.001 ~ 0.004 in) 0.03 ~ 0.09 mm (0.001 ~ 0.004 in)	

# SPECIFICATIONS

**APPX**



Tightening torque:		Thread Size	Q'ty	Nm	m·kg	ft·lb	Remarks	
Cylinder head	Flange bolt	M10 x 1.25	4	40	4.0	29		
Cylinder head	Bolt	M 6 x 1.0	2	10	1.0	7.2		
Cylinder head	Nut	M 8 x 1.25	2	20	2.0	14		
Spark plug	—	M12 x 1.25	1	18	1.8	13		
Camshaft cap	Flange bolt	M 6 x 1.0	8	10	1.0	7.2		
Cylinder head cover	Bolt	M 6 x 1.0	5	10	1.0	7.2		
Primary drive gear	Nut	M16 x 1.0	1	80	8.0	58		Use lock washer
Balancer shaft driven gear	Nut	M16 x 1.0	1	60	6.0	43		Use lock washer
Flywheel magneto	Bolt	M10 x 1.25	1	60	6.0	43		
Cam sprocket	Bolt	M 7 x 1.0	4	20	2.0	14		
Cam chain tensioner	Bolt	M 6 x 1.0	2	12	1.2	8.7		
Rear cam chain guide	Bolt	M 6 x 1.0	2	8	0.8	5.8		
Oil pump assembly	Screw	M 6 x 1.0	3	7	0.7	5.1		
Oil pump cover	Screw	M 6 x 1.0	1	7	0.7	5.1		
Oil strainer plug	—	M35 x 1.5	1	32	3.2	23		
Oil filter cover	Bolt	M 6 x 1.0	1	10	1.0	7.2		
Oil filter cover	Screw	M 6 x 1.0	2	7	0.7	5.1		
Oil filter cover air bleed	Screw	M 5 x 0.8	1	5	0.5	3.6		
Drain plug	Bolt	M14 x 1.25	1	43	4.3	31		
Carburetor joint	Bolt	M 6 x 1.0	4	12	1.2	8.7		
Air filter body	Bolt	M 6 x 1.0	4	8	0.8	5.8		
Exhaust pipe flange	Bolt	M 6 x 1.0	4	12	1.2	8.7		
Exhaust pipe protector	Screw	M 6 x 1.0	2	10	1.0	7.2		Apply LOCTITE
Muffler protector	Screw	M 6 x 1.0	2	7	0.7	5.1		Apply LOCTITE
Muffler clamp	Flange bolt	M 8 x 1.25	1	20	2.0	14		
Muffler mount	Bolt	M 8 x 1.25	2	27	2.7	19		
Crankcase	Screw	M 6 x 1.0	14	7	0.7	5.1		
Left crankcase cover	Screw	M 6 x 1.0	6	7	0.7	5.1		
Right crankcase cover	Screw	M 6 x 1.0	9	7	0.7	5.1		
Clutch cable bracket	Screw	M 6 x 1.0	1	7	0.7	5.1		
Balancer bearing retainer	Screw	M 6 x 1.0	2	7	0.7	5.1	Apply LOCTITE	
Kick crank	Bolt	M 8 x 1.25	1	2	2.0	14		
Clutch spring	Screw with washer	M 6 x 1.0	4	8	0.8	5.8		
Clutch boss	Nut	M16 x 1.0	1	60	6.0	43		
Push lever stopper	Screw	M 8 x 1.25	1	12	1.2	8.7		



## SPECIFICATIONS

Tightening torque:		Thread Size	Q'ty	Nm	m·kg	ft·lb	Remarks
Clutch adjuster lock	Nut	M 6 x 1.0	1	8	0.8	5.8	Apply LOCTITE®
Drive chain sprocket (Front)	Bolt	M 6 x 1.0	2	10	1.0	7.2	
Shift cam segment	Torx	M 6 x 1.0	1	12	1.2	8.7	
Change pedal	Bolt	M 6 x 1.0	1	8	0.8	5.8	
CDI magneto base	Screw	M 6 x 1.0	2	7	0.7	5.1	
Neutral switch	—	M10 x 1.25	1	20	2.0	14	
Decompression lever stopper	Bolt	M 6 x 1.0	1	8	0.8	5.8	
Tensioner cap	Flange bolt	M 6 x 1.0	1	6	0.6	4.3	
Oil pipe	Union bolt	M10 x 1.25	2	20	2.0	14	
Decompression bracket	Bolt	M 6 x 1.0	1	8	0.8	5.8	
Decompression lever	Nut	M 6 x 1.0	1	8	0.8	5.8	



**Chassis**

Model	TT350S
Steering System: Steering Bearing Type	Taper Roller Bearing
Front Suspension: Front Fork Travel Fork Spring Free Length <Limit> Spring Rate/Stroke  Oil Capacity or Oil Level  Oil Grade Enclosed Air Pressure: STD MAX	280 mm (11.02 in) 586.9 mm (23.11 in) 581 mm (22.88 in) 3.09 N/mm (0.315 kg/mm, 17.35 lb/in)/ Zero ~ 280.0 mm (Zero ~ 11.0 in) 533 cm <sup>3</sup> (18.76 Imp oz, 18.02 US oz) 125 mm (4.92 in) (From top of inner tube fully compressed without spring) Fork Oil 10W or Equivalent Zero kPa (Zero kg/cm <sup>2</sup> , Zero psi) 118 kPa (1.2 kg/cm <sup>2</sup> , 17 psi)
Rear Suspension: Shock Absorber Travel Spring Free Length <Limit> Fitting Length Spring Rate/Stroke  Enclosed Gas Pressure (STD)	100 mm (3.94 in) 260 mm (10.24 in) 257.4 mm (10.13 in) 247 mm (9.72 in) 53.94 N/mm (5.5 kg/mm, 302.94 lb/in) 0.0 ~ 100.0 mm (0.0 ~ 3.94 in) 1471 kPa (15 kg/cm <sup>2</sup> , 212 psi)
Swing Arm: Swingarm Free Play Limit: End Side	1.0 mm (0.039 in) 0.2 mm (0.008 in)
Wheel: Front Wheel Type Rear Wheel Type Rim Size/Material: Front Rear Rim Runout Limit: Vertical Lateral	Spoke Wheel Spoke Wheel 1.60 x 21/Aluminum 2.15 x 18/Aluminum 2.0 mm (0.08 in) 2.0 mm (0.08 in)
Drive Chain: Type/Manufacturer Number of Links Chain Slack	520VS/DAIDO 108 40 ~ 45 mm (1.6 ~ 1.8 in)



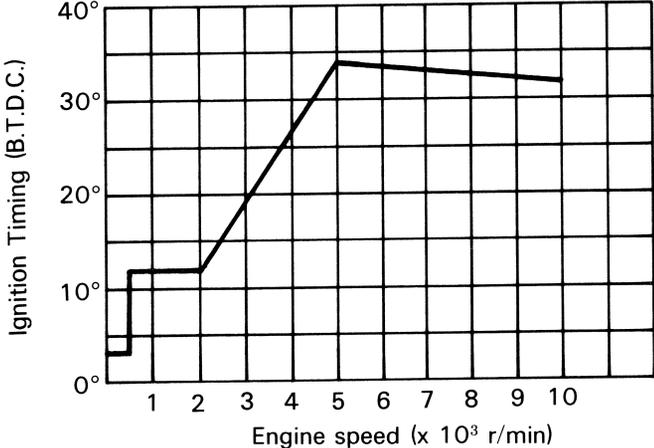
Model	TT350S
<b>Disc Brake:</b> Type Outside Diameter x Thickness <Limit> Pad Thickness <Limit>	Single 230 x 3 mm (9.06 x 0.12 in) 2.5 mm (0.10 in) 4.0 mm (0.16 in) 0.8 mm (0.03 in)
Master Cylinder Inside Diameter Caliper Cylinder Inside Diameter Brake Fluid Type	11.0 mm (0.43 in) 26.99 mm (1.06 in) DOT #3
<b>Drum Brake:</b> Type Drum Inside Diameter <Limit> Lining Thickness <Limit> Shoe Spring Free Length	Leading, Trailing 130 mm (5.12 in) 131 mm (5.16 in) 4 mm (0.16 in) 2 mm (0.08 in) 36.5 mm (1.44 in)
<b>Brake Lever &amp; Brake Pedal:</b> Brake Lever Free Play (Position) Brake Pedal Position Brake Pedal Free Play	5 ~ 8 mm (0.2 ~ 0.3 in) (At lever end) Zero mm (Zero in) 20 ~ 30 mm (0.8 ~ 1.2 in)
Clutch Lever Free Play (Position)	8 ~ 13 mm (0.3 ~ 0.5 in) (At lever end)

Tightening Torque						
Parts to be tightened	Thread size	Q'ty	Tightening torque			Remarks
			Nm	m·kg	ft·lb	
Front wheel axle and nut	M14 x 1.5	1	58	5.8	42	Refer to "NOTE"
Handle crown and inner tube	M 8 x 1.25	4	23	2.3	17	
Handle crown and steering shaft	M22 x 1.0	1	85	8.5	61	
Handle crown and handlebar holder	M 8 x 1.25	4	23	2.3	17	
Ring nut (Steering shaft)	M25 x 1.0	1	10	1.0	7.2	
Engine stay and frame	M 8 x 1.25	4	33	3.3	24	
Engine stay and engine	M 8 x 1.25	3	33	3.3	24	
Engine (Rear) and frame	M 8 x 1.25	1	33	3.3	24	
Rear wheel axle and nut	M18 x 1.5	1	100	10.0	72	
Front fork and axle holder	M 6 x 1.0	4	8	0.8	5.8	
Rear shock absorber and frame	M10 x 1.25	1	32	3.2	23	
Pivot shaft and frame	M14 x 1.5	1	85	8.5	61	
Relay arm and swing arm	M12 x 1.25	1	58	5.8	42	
Relay arm and rear shock absorber	M10 x 1.25	1	32	3.2	23	
Relay arm and connecting rod	M10 x 1.25	1	32	3.2	23	
Frame and connecting rod	M10 x 1.25	1	58	5.8	42	
Footrest and frame	M 8 x 1.25	4	34	3.4	24	
Caliper and front fork	M 8 x 1.25	2	30	3.0	22	
Master cylinder and brake hose	M10 x 1.25	1	27	2.7	19	
Caliper and brake hose	M10 x 1.25	1	27	2.7	19	

**NOTE:**

1. First, tighten the ring nut approximately 37 Nm (3.7 m·kg, 27 ft·lb) by using the torque wrench, then loosen the ring nut one turn.
2. Retighten the ring nut to specification.

**Electrical**

Model	TT350S
Voltage	12 V
Ignition System: Ignition Timing (B.T.D.C.) Advanced Timing (B.T.D.C.) Advancer Type	12° ± 1.5°/1200 r/min 34° ± 2°/5500 r/min Electrical
 <p>Ignition Timing (B.T.D.C.)</p> <p>Engine speed (x 10<sup>3</sup> r/min)</p>	
C.D.I.: Magneto-Model/Manufacturer Pickup Coil Resistance (Color)  Source Coil Resistance (Color)  C.D.I. Unit-Model/Manufacturer	F3T371/MITSUBISHI 199 ~ 243 Ω at 20°C (68°F) (Black - White/Red) 400 ~ 488 Ω at 20°C (68°F) (Black - Brown) F8T075/MITSUBISHI
Ignition Coil: Model/Manufacturer Minimum Spark Gap Primary Winding Resistance Secondary Winding Resistance Spark Plug Cap Resistance	F6T510/MITSUBISHI 6 mm (0.24 in) 0.67 ~ 0.91 Ω at 20°C (68°F) 5.02 ~ 6.79 kΩ at 20°C (68°F) 10 kΩ
Charging System	A.C. Magneto generator
F.W. Magneto: Lighting Voltage (Minimum) Charging Current (Minimum) (Day) (Night)	6 V or more at 2500 r/min 1.2 A or more at 3000 r/min 1.0 A or more at 3000 r/min

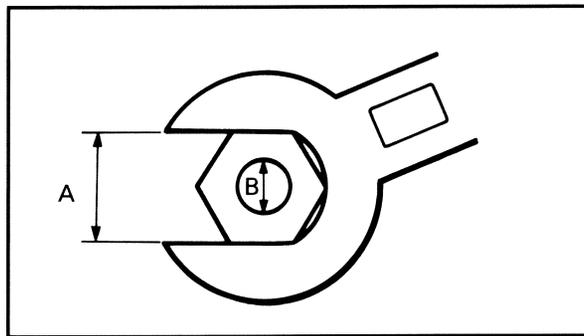


Model	TT350S																						
<p>F.W Magneto:</p> <p>Lighting Voltage (Minimum)</p> <p>Lighting Coil Resistance (Color)</p>	<p>11 V or more at 2500 r/min</p> <p>0.43 ~ 0.53 Ω at 20°C (68°F)</p> <p>(Yellow - Black)</p> <div data-bbox="418 331 1010 934"> <table border="1"> <caption>Approximate data points from the graph</caption> <thead> <tr> <th>Engine Speed (x 10<sup>3</sup> r/min)</th> <th>Lighting Voltage (V)</th> </tr> </thead> <tbody> <tr><td>1</td><td>6.5</td></tr> <tr><td>2</td><td>10.5</td></tr> <tr><td>3</td><td>13.5</td></tr> <tr><td>4</td><td>14.0</td></tr> <tr><td>5</td><td>14.0</td></tr> <tr><td>6</td><td>14.0</td></tr> <tr><td>7</td><td>14.0</td></tr> <tr><td>8</td><td>14.0</td></tr> <tr><td>9</td><td>14.0</td></tr> <tr><td>10</td><td>14.0</td></tr> </tbody> </table> </div>	Engine Speed (x 10 <sup>3</sup> r/min)	Lighting Voltage (V)	1	6.5	2	10.5	3	13.5	4	14.0	5	14.0	6	14.0	7	14.0	8	14.0	9	14.0	10	14.0
Engine Speed (x 10 <sup>3</sup> r/min)	Lighting Voltage (V)																						
1	6.5																						
2	10.5																						
3	13.5																						
4	14.0																						
5	14.0																						
6	14.0																						
7	14.0																						
8	14.0																						
9	14.0																						
10	14.0																						

**GENERAL TORQUE SPECIFICATIONS**

This chart specifies torque for standard fasteners with standard I.S.O. pitch threads. Torque specifications for special components or assemblies are included in the applicable sections of this book. To avoid warpage, tighten multi-fastener assemblies in a crisscross fashion, in progressive stages, until full torque is reached. Unless otherwise specified, torque specifications call for clean, dry threads. Components should be at room temperature.

A (Nut)	B (Bolt)	General torque specifications		
		Nm	m·kg	ft·lb
10 mm	6 mm	6	0.6	4.3
12 mm	8 mm	15	1.5	11
14 mm	10 mm	30	3.0	22
17 mm	12 mm	55	5.5	40
19 mm	14 mm	85	8.5	6.1
22 mm	16 mm	130	13.0	94

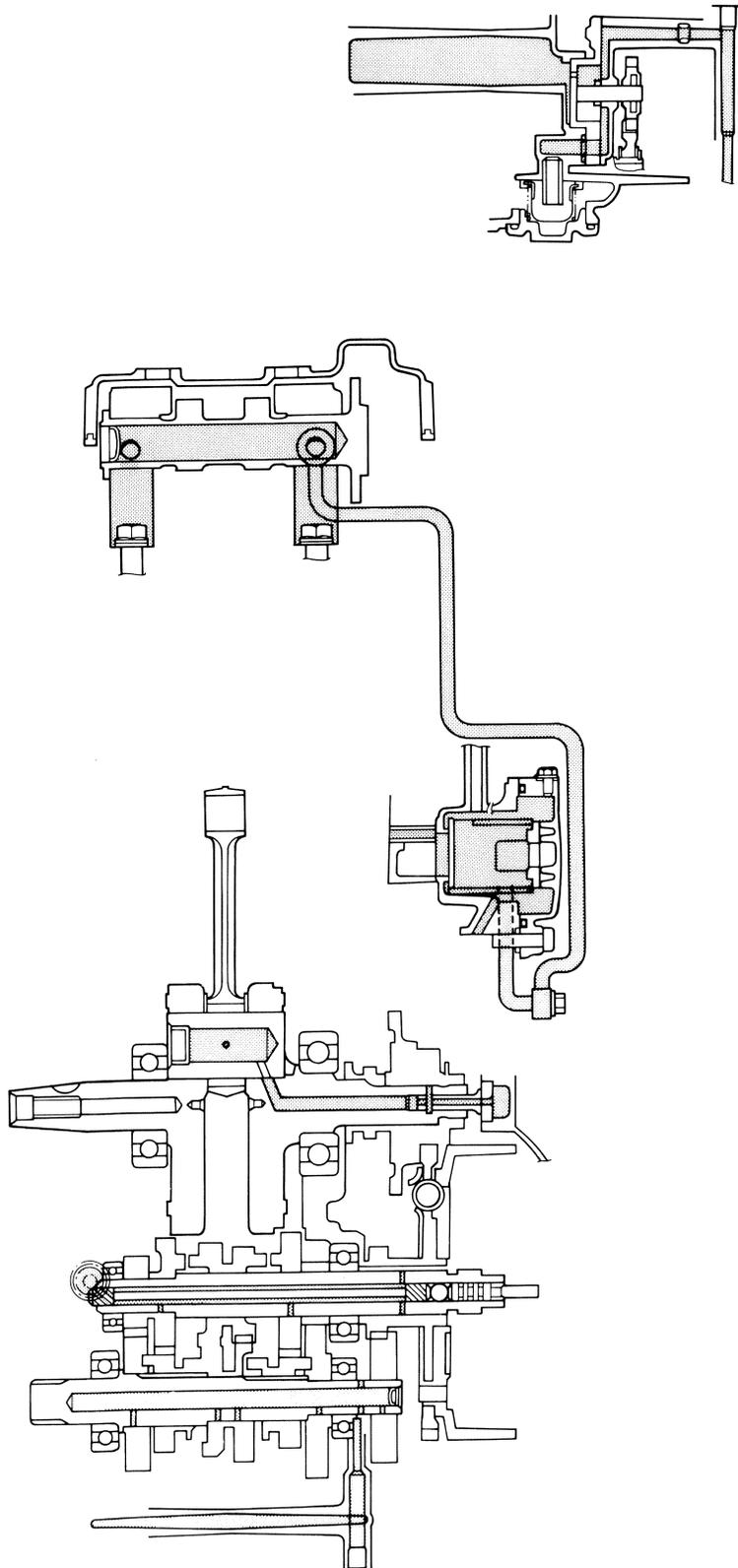


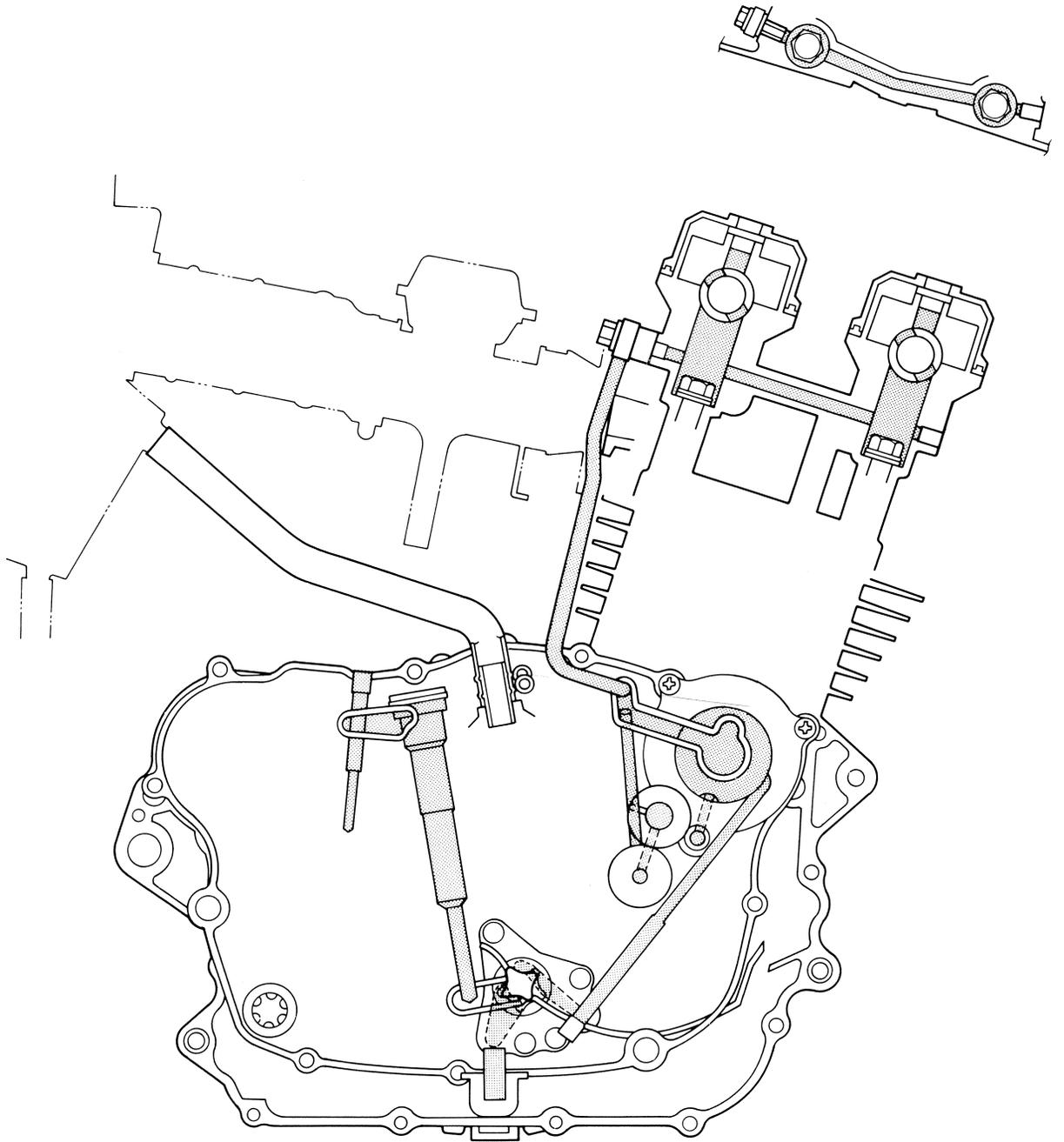
A: Distance across flats  
B: Outside thread diameter

**DEFINITION OF UNITS**

Unit	Read	Definition	Measure
mm cm	millimeter centimeter	10 <sup>-3</sup> meter 10 <sup>-2</sup> meter	Length Length
kg	kilogram	10 <sup>3</sup> gram	Weight
N	Newton	1 kg x m/sec <sup>2</sup>	Force
Nm m·kg	Newton meter Meter kilogram	N x m m x kg	Torque Torque
Pa N/mm	Pascal Newton per millimeter	N/m <sup>2</sup> N/mm	Pressure Spring rate
L cm <sup>3</sup>	Liter Cubic centimeter	—	Volume or Capacity
r/min	Rotation per minute	—	Engine Speed

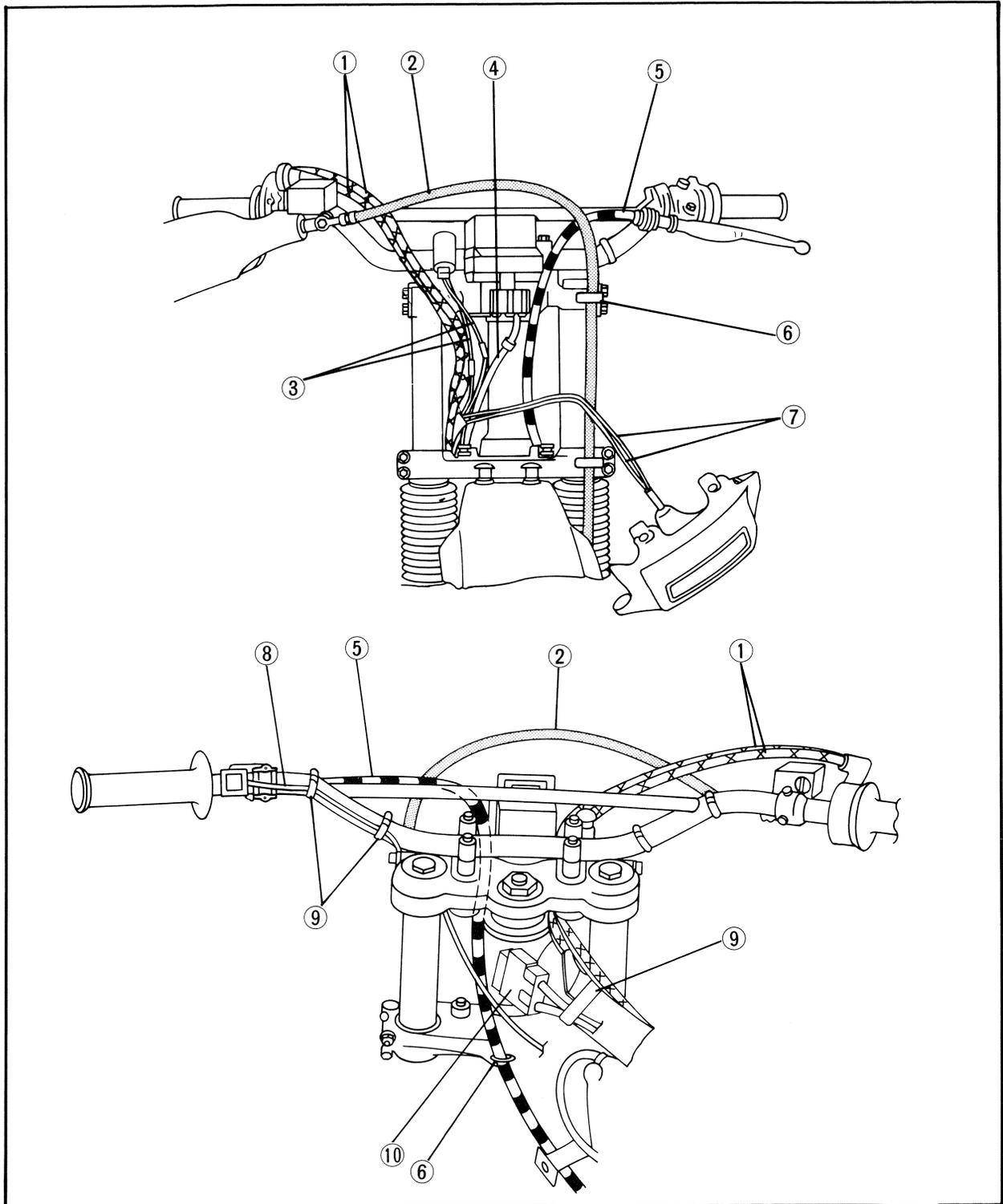
LUBRICATION DIAGRAM





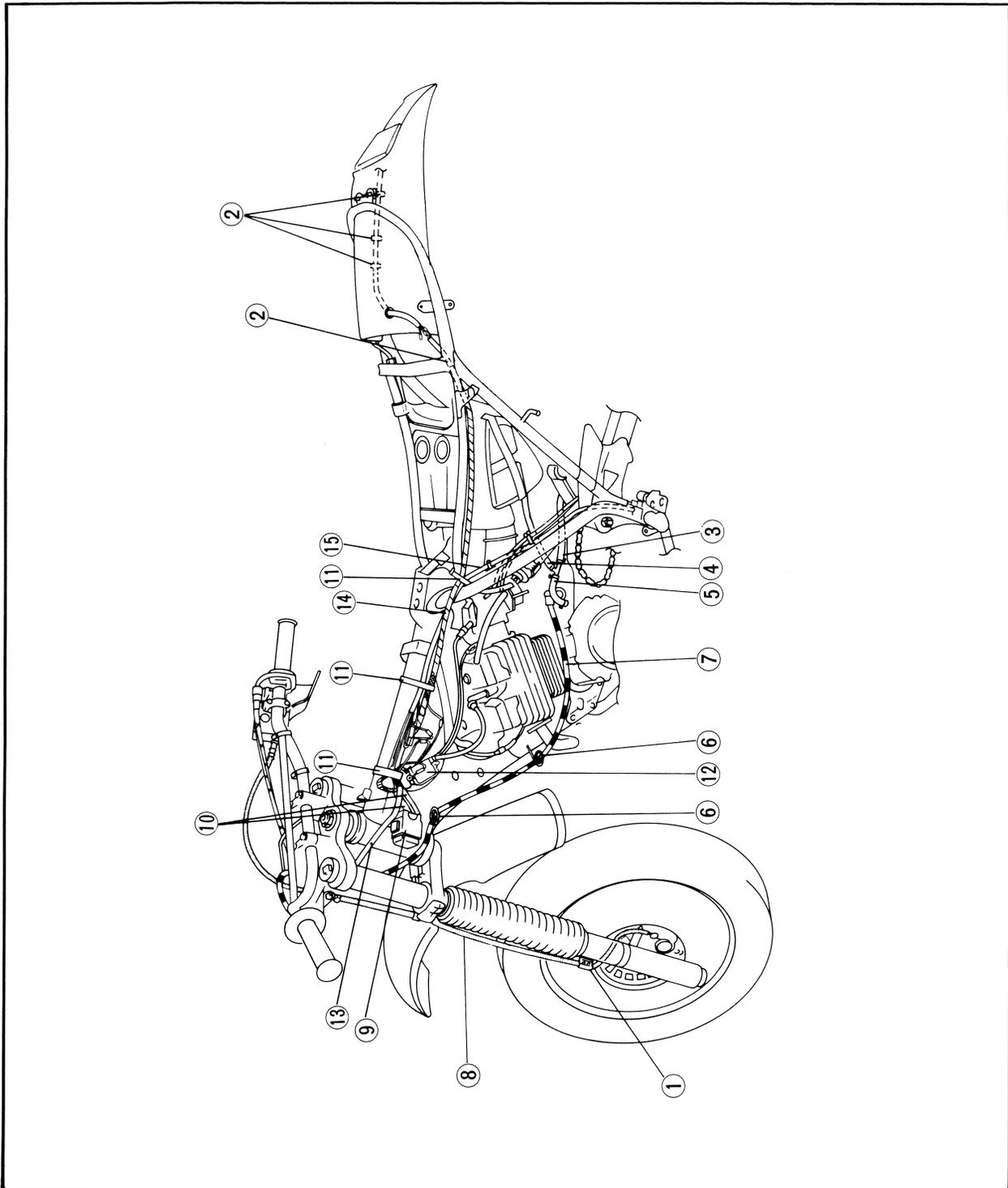
**CABLE ROUTING**

- ① Throttle cables
- ② Brake hose
- ③ Headlight switch leads
- ④ Speedometer cable
- ⑤ Clutch cable
- ⑥ Cable guide
- ⑦ Headlight leads
- ⑧ Engine stop switch lead
- ⑨ Band
- ⑩ CDI unit





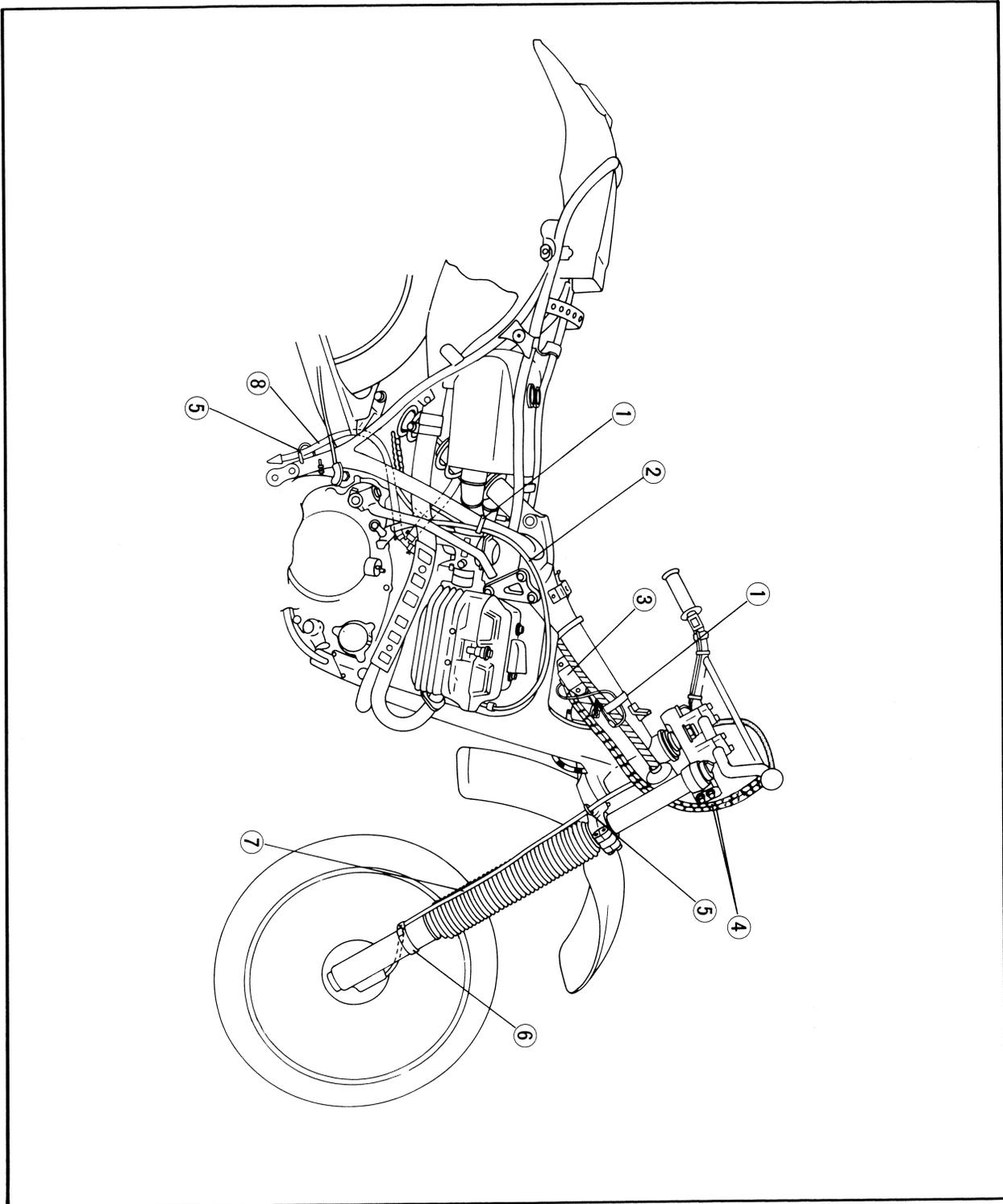
- |                   |                           |
|-------------------|---------------------------|
| ① Clamp           | ⑨ CDI unit                |
| ② Band            | ⑩ CDI unit leads          |
| ③ Breather pipe 3 | ⑪ Band                    |
| ④ Breather pipe 2 | ⑫ Ignition coil           |
| ⑤ Breather pipe 1 | ⑬ Engine stop switch lead |
| ⑥ Cable guide     | ⑭ Wire harness            |
| ⑦ Clutch cable    | ⑮ CDI magneto lead        |
| ⑧ Brake hose      |                           |



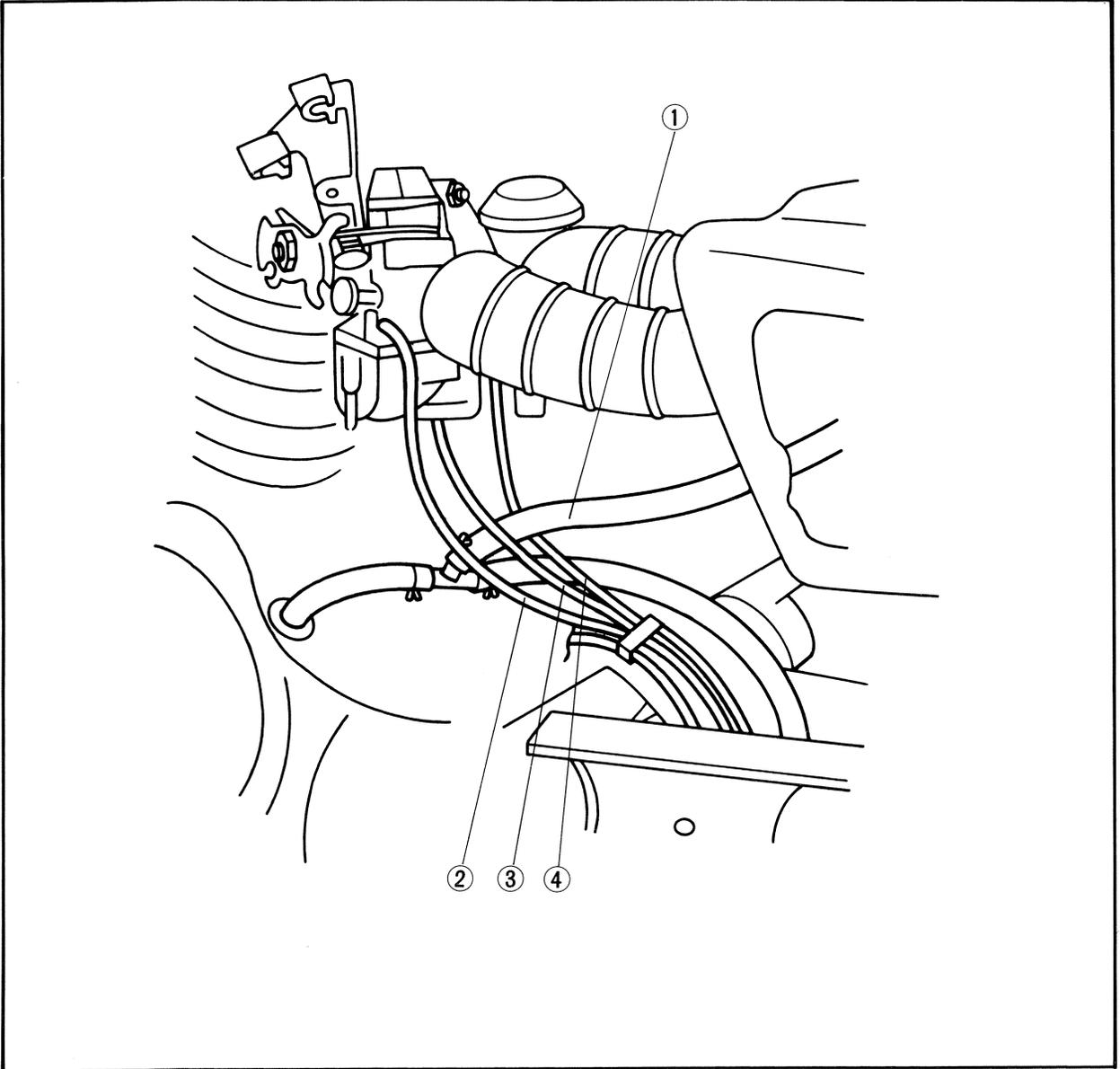


- ① Band
- ② Decompression cable
- ③ Voltage regulator
- ④ Throttle cables

- ⑤ Cable guide
- ⑥ Cable holder
- ⑦ Speedometer cable
- ⑧ Breather pipe 3



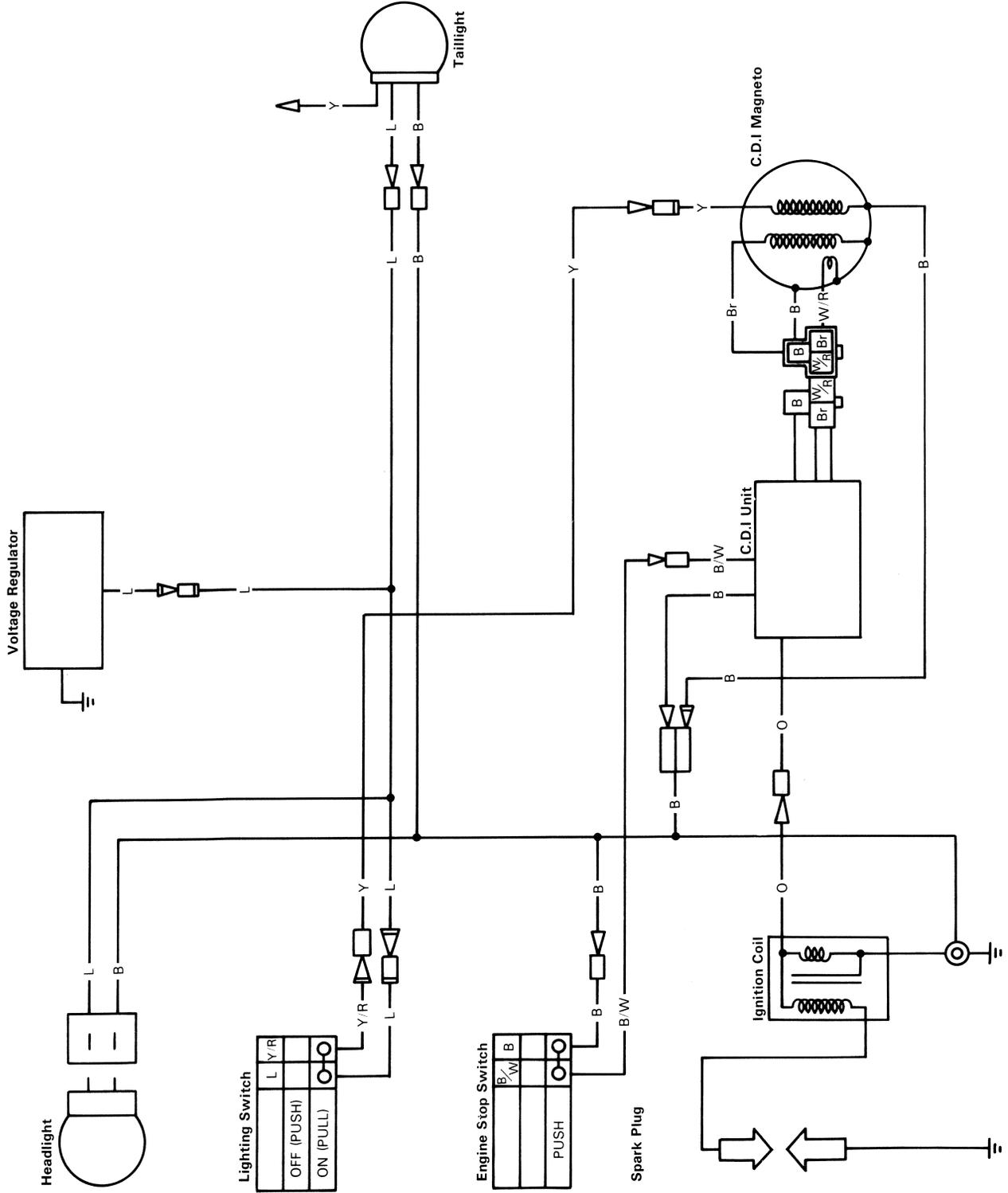
- ① Breather pipe 2  
Pass the breather pipe 2 between  
the over flow pipe and air ventilation  
pipe
- ② Air ventilation pipe
- ③ Over flow pipe
- ④ Air ventilation pipe



# TT350S WIRING DIAGRAM

## COLOR CODE

B	Black
O	Orange
Br	Brown
Y	Yellow
L	Blue
B/W	Black/White
W/R	White/Red
Y/R	Yellow/Red





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