YAMAHA

YZ250D1

OWNER'S SERVICE MANUAL

LIT-11626-07-91

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YZ250D1
OWNER'S SERVICE MANUAL

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INTRODUCTION

Congratulations on your purchase of a Yamaha YZ series. This model is the culmination of Yamaha's vast experience in the production of pacesetting racing machines. It represents the highest grade of craftsmanship and reliability that have made Yamaha a leader.

This manual explains operation, inspection, basic maintenance and tuning of your machine. If you have any questions about this manual or your machine, please contact your Yamaha dealer.

NOTE:

As improvements are made on this model, some data in this manual may become outdated. If you have any questions, please consult your Yamaha dealer.

⚠ WARNING

PLEASE READ THIS MANUAL CAREFULLY AND COMPLETELY BEFORE OPERATING THIS MACHINE. DO NOT ATTEMPT TO OPERATE THIS MACHINE UNTIL YOU HAVE ATTAINED A SATISFACTORY KNOWLEDGE OF ITS CONTROLS AND OPERATING FEATURES AND UNTIL YOU HAVE BEEN TRAINED IN SAFE AND PROPER RIDING TECHNIQUES. REGULAR INSPECTIONS AND CAREFUL MAINTENANCE, ALONG WITH GOOD RIDING SKILLS, WILL ENSURE THAT YOU SAFELY ENJOY THE CAPABILITIES AND THE RELIABILITY OF THIS MACHINE.

YAMAHA MOTOR CORPORATION, U.S.A.
YZ/WR MOTORCYCLE LIMITED WARRANTY

Yamaha Motor Corporation, U.S.A. hereby warrants to the original retail purchaser that the follcwing components equipped on new Yamaha YZ or WR motorcycles purchased from an authorized Yamaha motorcycle dealer in the continental United States will be free from defects in material and workmanship for the period of time stated herein, subject to certain stated limitations. YZ or WR components included under this warranty are the engine, frame, swingarm, and monoshock. It is understood that the balance of the YZ or WR components are not covered by any warranty, expressed or implied. The balance of the components equipped on the unit are sold on an "as is" basis. This warranty applies to the original purchaser only and is not transferable.

THE PERIOD OF WARRANTY for the above-listed Yamaha YZ or WR components as originally installed on the unit shall be thirty (30) days from the date of purchase.

MODELS EXCLUDED FROM WARRANTY include those used for non-Yamaha-authorized renting, leasing, or other commercial purposes.

DURING THE PERIOD OF WARRANTY any authorized Yamaha motorcycle dealer will, free of charge, repair or replace, at Yamaha's option, any part adjudged defective by Yamaha due to faulty workmanship or material from the factory. Parts used in warranty repairs will be warranted for the balance of the product's warranty period. All parts replaced under warranty become property of Yamaha Motor Corporation U.S.A.

GENERAL EXCLUSIONS from this warranty shall include any failures caused by:

a. Installation of parts or accessories that are not qualitatively equivalent to genuine Yamaha parts.
b. Abnormal strain, neglect, or abuse.
c. Accident or collision damage.
d. Modification to original parts.
e. Lack of proper maintenance.
f. Damage due to improper transportation.

SPECIFIC EXCLUSIONS from this warranty shall include parts replaced due to normal wear or routine maintenance.

THE CUSTOMER'S RESPONSIBILITY under this warranty shall be to:

1. Operate and maintain the YZ or WR as specified in the appropriate Owner's Service Manual, and
2. Give notice to an authorized Yamaha motorcycle dealer of any and all apparent defects within ten (10) days after discovery, and make the machine available at that time for inspection and repairs at such dealer's place of business.

YAMAHA MOTOR CORPORATION, U.S.A. MAKES NO OTHER WARRANTY OF ANY KIND, EXPRESSED OR IMPLIED. ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHICH EXCEED THE OBLIGATIONS AND TIME LIMITS STATED IN THIS WARRANTY ARE HEREBY DISCLAIMED BY YAMAHA MOTOR CORPORATION, U.S.A. AND EXCLUDED FROM THIS WARRANTY.

SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU. ALSO EXCLUDED FROM THIS WARRANTY ARE ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES INCLUDING LOSS OF USE. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE EXCLUSION MAY NOT APPLY TO YOU.

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.

YAMAHA MOTOR CORPORATION, U.S.A.
Post Office Box 6555
Cypress, California 90630

WARRANTY QUESTIONS AND ANSWERS

Q. What costs are my responsibility during the warranty period?
A. The customer's responsibility includes all costs of normal maintenance services, non-warranty repairs, accident and collision damage, and oil, oil filters, air filters, spark plugs, and brake shoes or pads.

Q. What are some examples of "abnormal" strain, neglect, or abuse?
A. These terms are general and overlap each other in areas. Specific examples include: Running the machine without oil; operating the machine with a broken or damaged part which causes another part to fail, damage or failure due to improper or careless transporation and or tie down; and so on. If you have any specific questions on operation or maintenance, please contact your dealer for advice.

Q. Does the warranty cover incidental costs such as towing or transportation due to a failure?
A. No. The warranty is limited to repair of the machine itself.

Q. May I perform any or all of the recommended maintenance shown in the Owner's Service Manual instead of having the dealer do them?
A. Yes, if you are a qualified mechanic and follow the procedures specified in the Owner's Service Manual. We do recommend, however, that items requiring special tools or equipment be done by a Yamaha motorcycle dealer.

Q. Will the warranty be void or cancelled if I do not operate or maintain my new YZ or WR exactly as specified in the Owner's Service Manual?
A. No. The warranty on a new motorcycle cannot be "voided" or "cancelled." **However, if a particular failure is caused by operation or maintenance other than as shown in the Owner's Service Manual, that failure may not be covered under warranty.**

Q. What responsibility does my dealer have under this warranty?
A. Each Yamaha motorcycle dealer is expected to:
1. Completely set up every new machine before sale.
2. Explain the operation, maintenance, and warranty requirements to your satisfation at the time of sale, and upon your request at any later date.
In addition, each Yamaha motorcycle dealer is held responsible for his setup, service and warranty repair work.

Q. Does the warranty on the engine include the carburetor, air filter, air box, and exhaust pipe?
A. No. The warranty covers only the engine components.

CUSTOMER SERVICE

If your machine requires warranty service, you must take it to any authorized Yamaha motorcycle dealer within the continental United States. Be sure to bring your warranty registration identification or other valid proof of the original date of purchase. If a question or problem arises regarding warranty, first contact the owner of the dealership. Since all warranty matters are handled at the dealer level, this person is in the best position to help you. If you are still not satisfied and require additional assistance, please write:

YAMAHA MOTOR CORPORATION U.S.A.
CUSTOMER RELATIONS DEPARTMENT
P.O. Box 6555
Cypress, California 90630

When contacting Yamaha Motor Corporation, U.S.A. don't forget to include any important information such as names, addresses, model, engine serial number, dates, and receipts.

CHANGE OF ADDRESS

The federal government requires each manufacturer of a motor vehicle to maintain a complete, up-to-date list of all first purchasers against the possibility of a safety-related defect and recall. This list is compiled from the purchase registrations sent to Yamaha Motor Corporation, U.S.A. by the selling dealer at the time of your purchase.

If you should move after you have purchased your new motorcycle, please advise us of your new address by sending a postcard listing your motorcycle model name, engine serial number, dealer number (or dealer's name) as it is shown on your warranty identification, your name and new mailing address. Mail to:

YAMAHA MOTOR CORPORATION, U.S.A.
WARRANTY DEPARTMENT
P.O. Box 6555
Cypress, California 90630

This will ensure that Yamaha Motor Corporation, U.S.A. has an up-to-date registration record in accordance with federal law.

IMPORTANT NOTICE

THIS MACHINE IS DESIGNED STRICTLY FOR COMPETITION USE, ONLY ON A CLOSED COURSE. It is illegal for this machine to be operated on any public street, road, or highway. Off-road use on public lands may also be illegal. Please check local regulations before riding.

⚠ SAFETY INFORMATION

1. **THIS MACHINE IS TO BE OPERATED BY AN EXPERIENCED RIDER ONLY.**
   Do not attempt to operate this machine at maximum power until you are totally familiar with its characteristics.
2. **THIS MACHINE IS DESIGNED TO BE RIDDEN BY THE OPERATOR ONLY.**
   Do not carry passengers on this machine.
3. **ALWAYS WEAR PROTECTIVE APPAREL.**
   When operating this machine, always wear an approved helmet with goggles or a face shield. Also wear heavy boots, gloves, and protective clothing. Always wear proper fitting clothing that will not be caught in any of the moving parts or controls of the machine.
4. **ALWAYS MAINTAIN YOUR MACHINE IN PROPER WORKING ORDER.**
   For safety and reliability, the machine must be properly maintained.
   Always perform the pre-operation checks indicated in this manual.
   Correcting a mechanical problem before you ride may prevent an accident.

5. GASOLINE IS HIGHLY FLAMMABLE.
   Always turn off the engine while refueling. Take care to not spill any gasoline on the engine or exhaust system. Never refuel in the vicinty of an open flame, or while smoking.
6. GASOLINE CAN CAUSE INJURY.
   If you should swallow some gasoline, inhale excess gasoline vapors, or allow any gasoline to get into your eyes, contact a doctor immediately. If any gasoline spills onto your skin or clothing, immediately wash skin areas with soap and water, and change your clothes.
7. ONLY OPERATE THE MACHINE IN AN AREA WITH ADEQUATE VENTILATION.
   Never start the engine or let it run for any length of time in an enclosed area. Exhaust fumes are poisonous. These fumes contain carbon monoxide, which by itself is odorless and colorless. Carbon monoxide is a dangerous gas which can cause unconsciousness or can be lethal.
8. PARK THE MACHINE CAREFULLY; TURN OFF THE ENGINE.
   Always turn off the engine if you are going to leave the machine. Do not park the machine on a slope or soft ground as it may fall over.
9. PROPERLY SECURE THE MACHINE BEFORE TRANSPORTING IT.
   When transporting the machine in another vehicle, always be sure it is properly secured and in an upright position and that the fuel cock is in the "OFF" position. Otherwise, fuel may leak out of the carburetor or fuel tank.

TO THE NEW OWNER

This manual will provide you with a good basic understanding of features, operation, and basic maintenance and inspection items of this machine. Please read this manual carefully and completely before operating your new machine. If you have any questions regarding the operation or maintenance of your machine, please consult your Yamaha dealer.

NOTE:

This manual should be considered a permanent part of this machine and should remain with it even if the machine is subsequently sold.

NOTICE

Some data in this manual may become outdated due to improvements made to this model in the future. If there is any question you have regarding this manual or your machine, please consult your Yamaha dealer.

F.I.M MACHINE WEIGHTS:

Weights of machines without fuel

The minimum weights for motocross machines are:

for the class 125 cc .....minimum 88 kg (194 lb)

for the class 250 cc .....minimum 98 kg (216 lb)

for the class 500 cc .....minimum 102 kg (225 lb)

In modifying your machine (e.g., for weight reduction), take note of the above limits of weight.

HOW TO USE THIS MANUAL

PARTICULARLY IMPORTANT INFORMATION

⚠

The Safety Alert Symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

⚠ WARNING

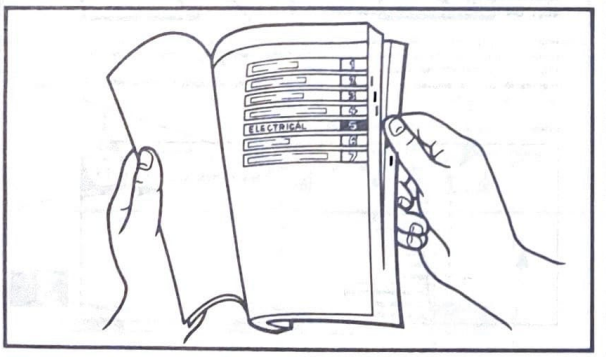
Failure to follow WARNING instructions could result in severe injury or death to the machine operator, a bystander, or a person inspecting or repairing the machine.

CAUTION:

A CAUTION indicates special precautions that must be taken to avoid damage to the machine.

NOTE:

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



FINDING THE REQUIRED PAGE

1. This manual consists of seven chapters; "General Information", "Specifications", "Regular inspection and adjustments", "Engine", "Chassis", "Electrical" and "Tuning".
2. The table of contents is at the beginning of the manual. Look over the general layout of the book before finding then required chapter and item.
   Bend the book at its edge, as shown, to find the required fore edge symbol mark and go to a page for required item and description.

MANUAL FORMAT

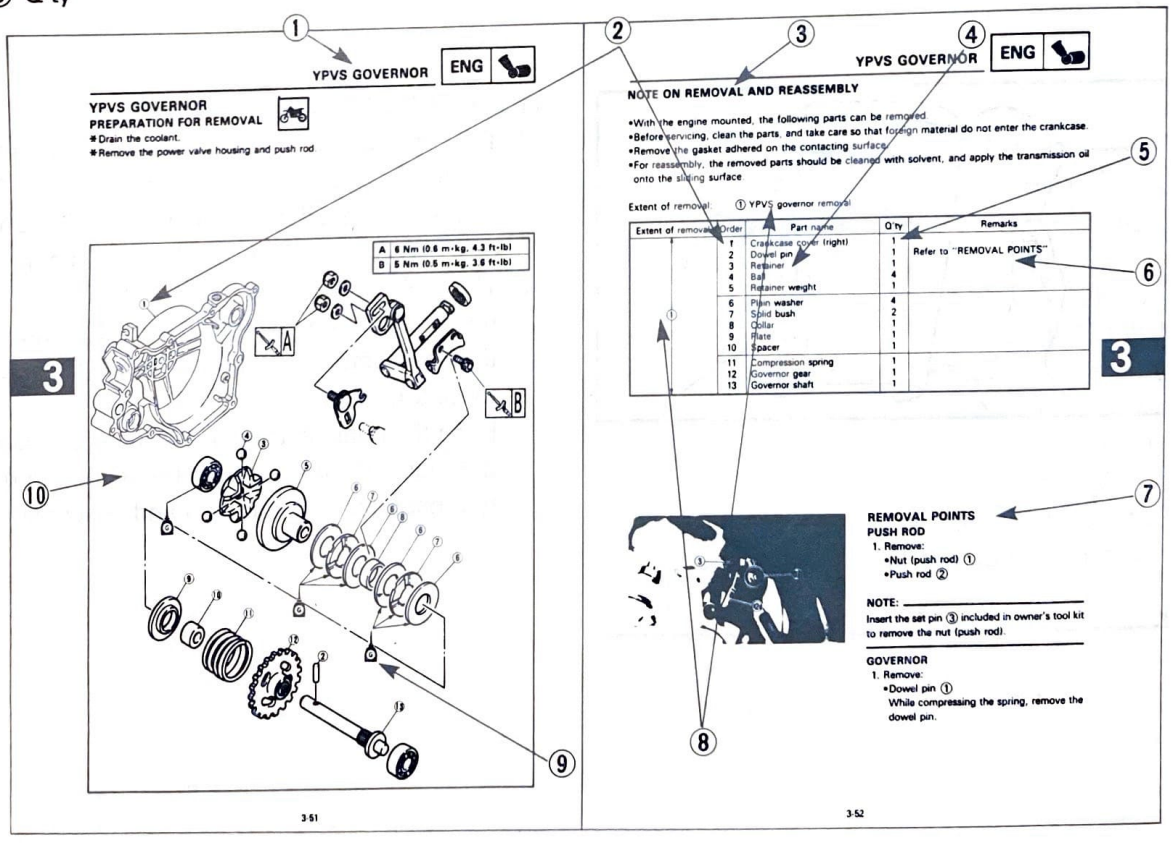
All of the procedures in this manual are organized in a sequential, step-by-step format. The information has been complied to provide the mechanic with an easy to read, handy reference that contains comprehensive explanations of all disassembly, repair, assembly, and inspection operations.
In this revised format, the condition of a faulty component will precede an arrow symbol and the course of action required will follow the symbol, e.g.,

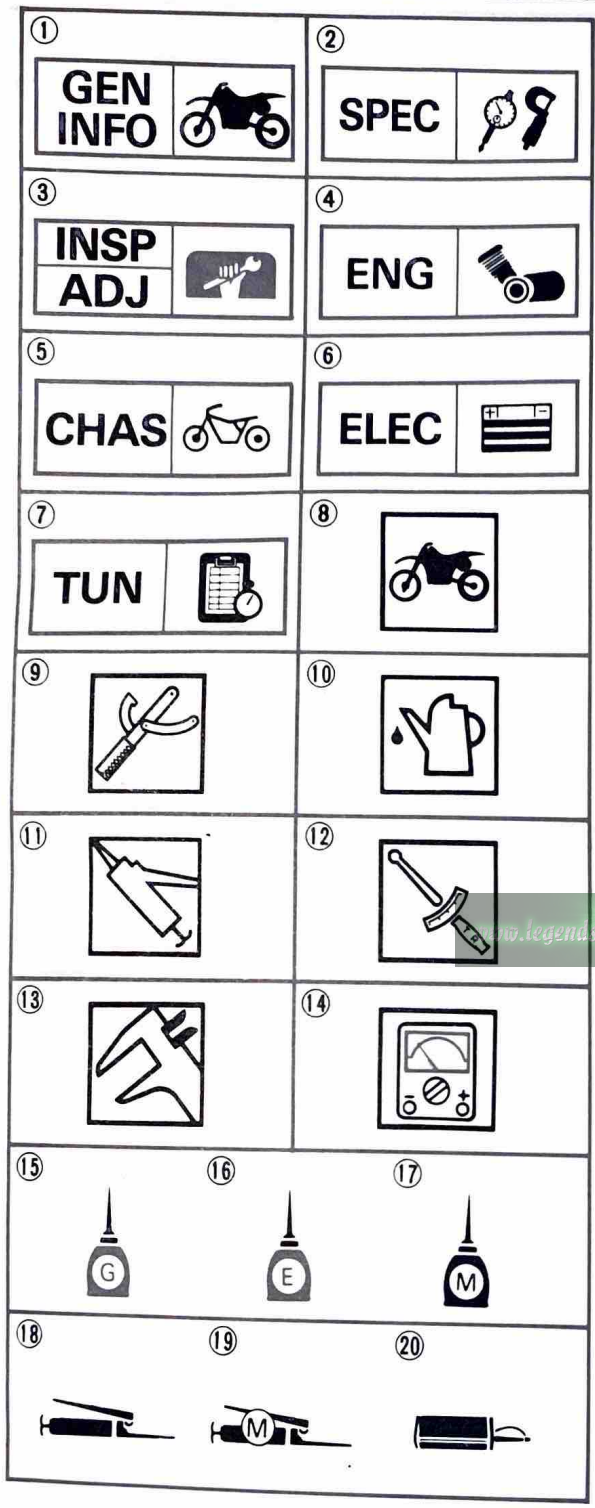
•Bearings
Pitting/Damage→Replace.

HOW TO READ DESCRIPTIONS

1. An easy-to-see disassembly illustration is mainly provided for a disassembly job.
2. Numbers are given in the order of a disassembly job in the disassembly illustration.
3. An explanation of jobs and notes is presented in an easy-to-read way by the use of symbol marks. The meanings of the symbol marks are given on the next page.
4. A job instruction chart accompanies the assembly illustration, providing the order of jobs, names of parts, notes in jobs, etc.
5. In addition to the disassembly illustration, "Points for Removal" is provided to supplement in detail the explanation which does or cannot necessarily cover the main jobs.
6. Jobs necessary before and after those which are not included in the disassebly illustration are explained before the same illustration as related jobs.

① Section
② Order of removal
③ Note on removal and reassembly
④ Part name
⑤ Q'ty
⑥ Remarks
⑦ Removal point
⑧ Extent of removal
⑨ Symbol mark
⑩ Exploded diagram





ILLUSTRATED SYMBOLS (Refer to the illustration)

Illustrated symbols ① to ⑦ are designed as thumb tabs to indicate the chapter's number and content.

① General information
② Appendices
③ Regular inspection and adjustment
④ Engine
⑤ Chassis
⑥ Electrical
⑦ Tuning

Illustrated symbols ⑧ to ⑭ are used to identify the specifications appearing in the text.

⑧ With engine mounted
⑨ Special tool
⑩ Filling fluid
⑪ Lubricant
⑫ Tightening
⑬ Wear limit, clearance
⑭ Resistance (Ω), Voltage (V), Electric current (A)

Illustrated symbols ⑮ to ⑳ in the exploded diagram indicate grade of lubricant and location of lubrication point.

⑮ Apply gear oil
⑯ Apply engine mixing oil
⑰ Apply molybdenum disulfide oil
⑱ Apply lightweight lithium-soap base grease
⑲ Apply molybdenum disulfide grease
⑳ Apply locking agent (LOCTITE®)

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CHAPTER 6
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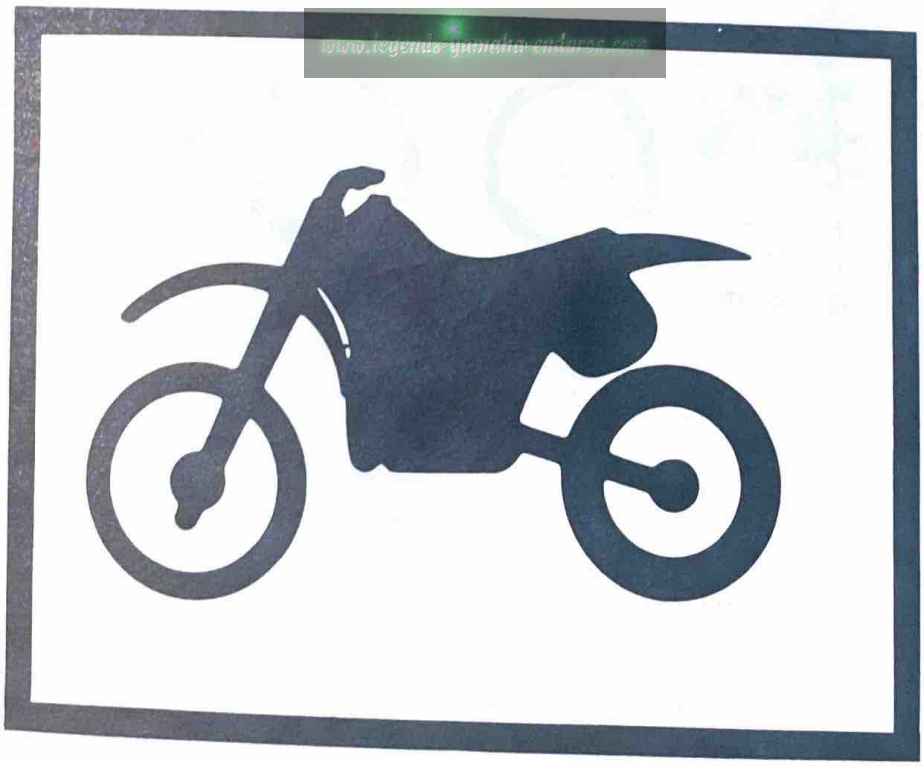
CHAPTER 7
TUNING

CHAPTER 1
GENERAL INFORMATION

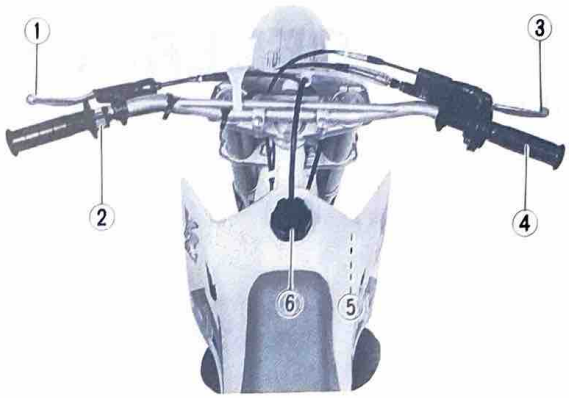


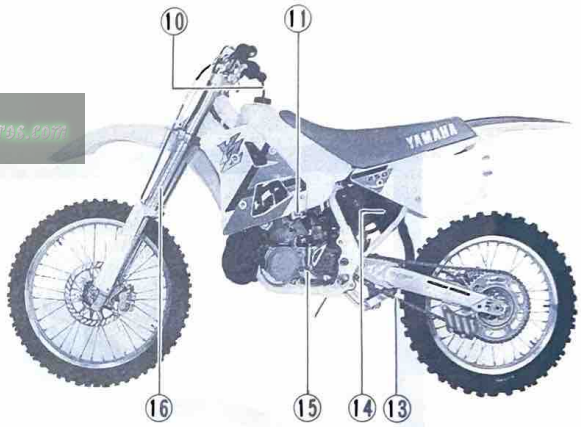
DESCRIPTION

① Clutch lever
② "ENGINE STOP" button
③ Front brake lever
④ Throttle grip
⑤ Radiator cap
⑥ Fuel tank cap
⑦ Kick starter
⑧ Fuel tank
⑨ Radiator
⑩ Valve joint
⑪ Fuel cock
⑫ Starter lever
⑬ Drive chain
⑭ Air cleaner
⑮ Shift pedal
⑯ Front fork
⑰ Coolant drain bolt
⑱ Rear brake pedal
⑲ Check bolt (Transmission oil level)

NOTE:

- The machine you have purchased may differ slightly from those shown in the photographs.
- Designs and specifications are subject to change without notice.

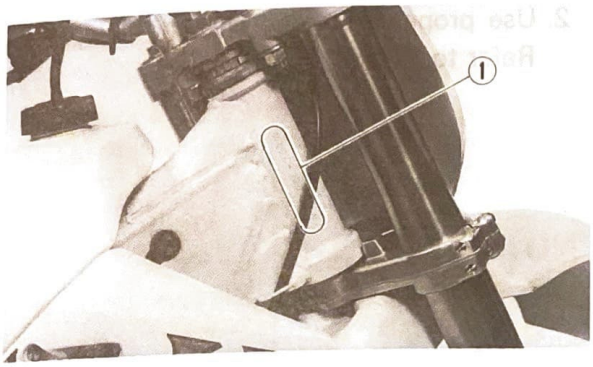




MACHINE IDENTIFICATION

There are two significant reasons for knowing the serial number of your machine:

1. When ordering parts, you can give the number to your Yamaha dealer for positive identification of the model you own.
2. If your bike is stolen, the authorities will need the number to search for and identify your machine.



VEHICLE IDENTIFICATION NUMBER (For USA, CDN and AUS)

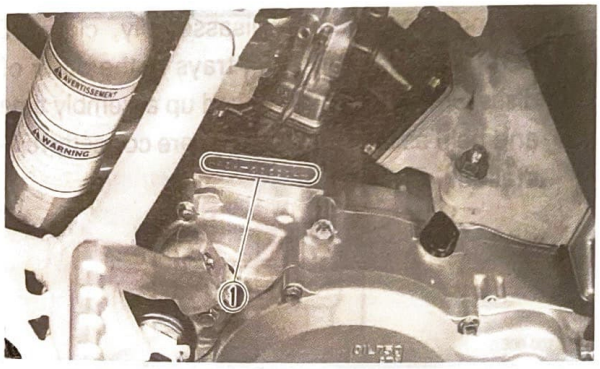
The vehicle identification number ① is stamped on the right of the steering head pipe.

Starting Serial Number:
JYA4DAW0*NA006101 (USA, CDN)
JYA4DAT0*NA013101 (AUS)

FRAME SERIAL NUMBER (Except for USA, CDN and AUS)

The frame serial number ① is stamped on the right of the steering head pipe.

Starting Serial Number:
4DA-000101 (EUROPE)
4DA-006101 (OTHERS)
4DA-013101 (NZ)



ENGINE SERIAL NUMBER

The engine serial number ① is stamped into the elevated part of the right rear section of the engine.

NOTE:

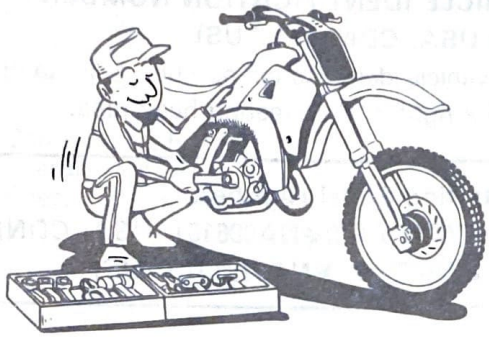
The first three didits of these numbers are for model identifications; the remaining digits are the unit production number.

Starting Serial Number:
4DA-000101 (EUROPE)
4DA-006101 (USA, CDN, OTHERS)
4DA-013101 (AUS, NZ)

IMPORTANT INFORMATION

PREPARATION FOR REMOVAL AND DISASSEMBLY

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



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

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

4. During the machine 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.

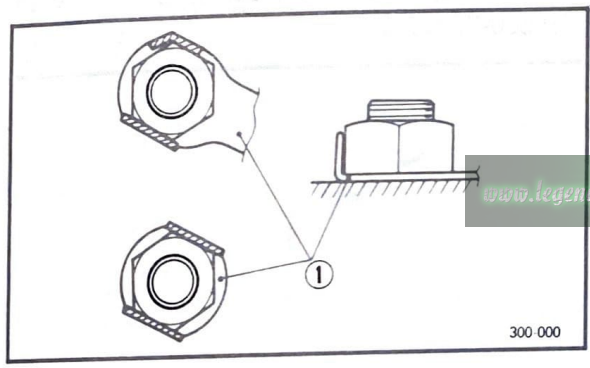
5. Keep away from fire.

ALL REPLACEMENT PARTS

1. We recommend to use Yamaha genuine parts for all replacements. Use oil and/or grease recommended by Yamaha for assembly and adjustment.

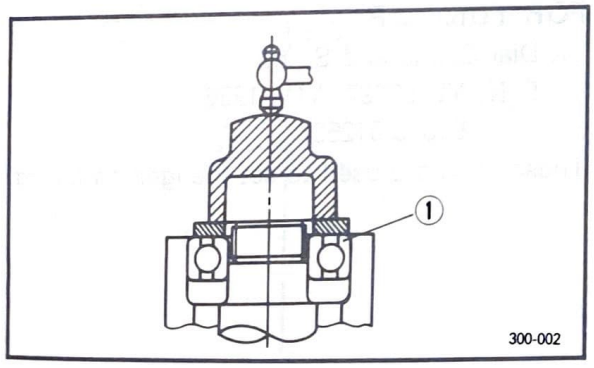
GASKETS, OIL SEALS AND O-RINGS

1. All gaskets, oil 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.



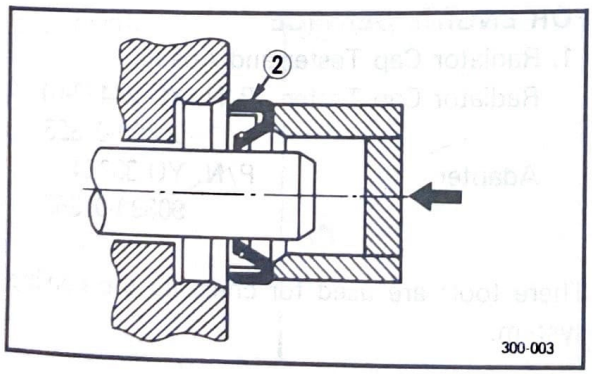
LOCK WASHERS/PLATES AND COTTER PINS

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.



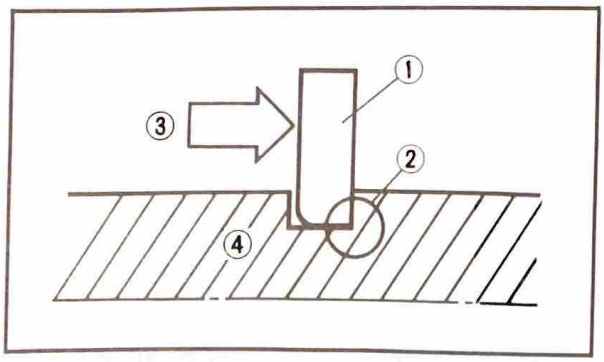
BEARINGS AND OIL SEALS

1. Install the bearing(s) ① and oil seal(s) ② 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.



CAUTION:

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



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.

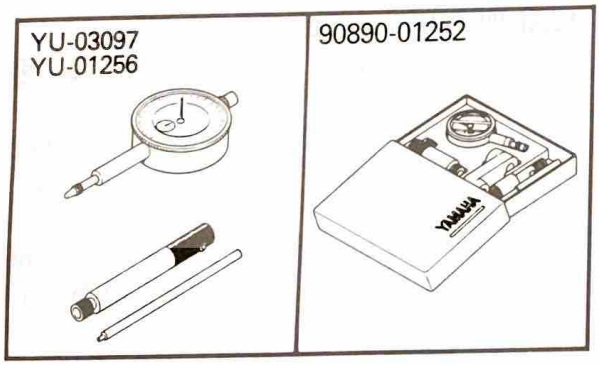
④ Shaft

SPECIAL TOOLS

The following special tools are required to perform maintenance, adjustments, and repairs on your machine. These tools can be obtained through your Yamaha dealer.

NOTE:

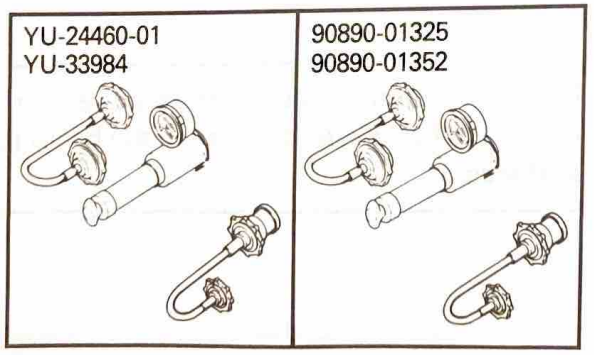
- For U.S.A. and Canada, use part number starting with "YM-" or "YU-".
- For others, use part number starting with "90890-".



FOR TUNE UP

1. Dial Gauge and Stand
   P/N. YU-03097, YU-01256
   90890-01252

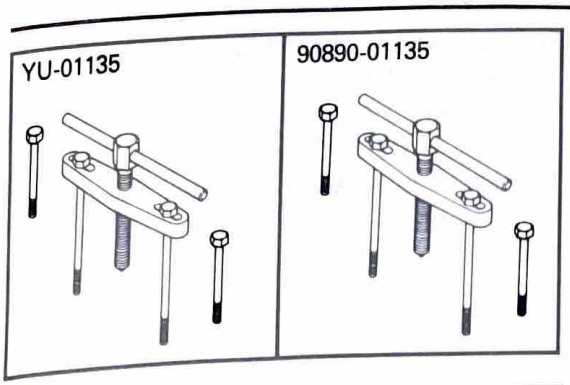
These tools are used to set the ignition timing.



FOR ENGINE SERVICE

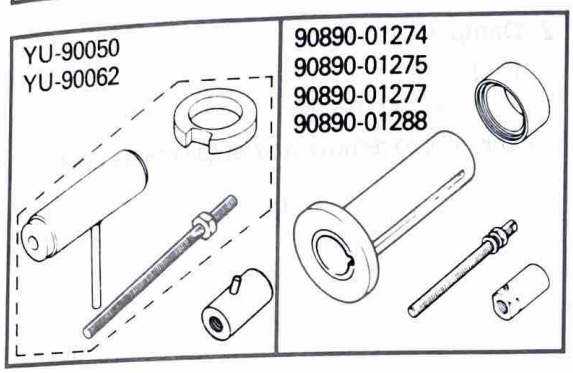
1. Radiator Cap Tester and Adapter
   Radiator Cap Tester P/N. YU-24460-01
   90890-01325
   Adapter P/N. YU-33984
   90890-01352

There tools are used for checking the cooling system.



2. Crankcase Separating Tool
   P/N. YU-01135
        90890-01135

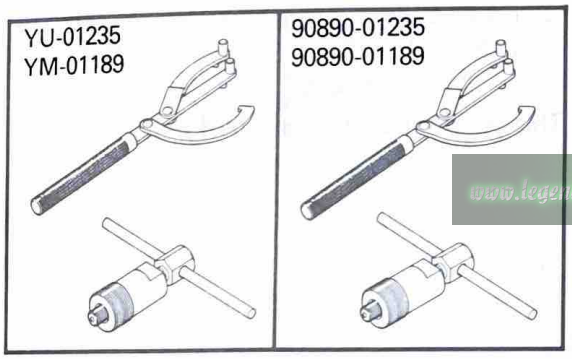
This tool is used to split the crankcases as well as remove the crankshaft from either case.



3. Crankshaft Installing Tool

Pot	P/N. YU-90050, 90890-01274
Bolt	P/N. YU-90050, 90890-01275
Spacer	P/N. YU-90050, 90890-01288
Adapter	P/N. YU-90062, 90890-01277

These tools are used to install the crankshaft.

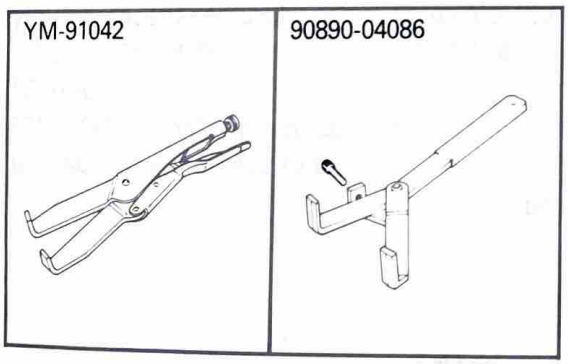


4. Rotor Holder and Rotor Puller
   Holder P/N. YU-01235
   90890-01235

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

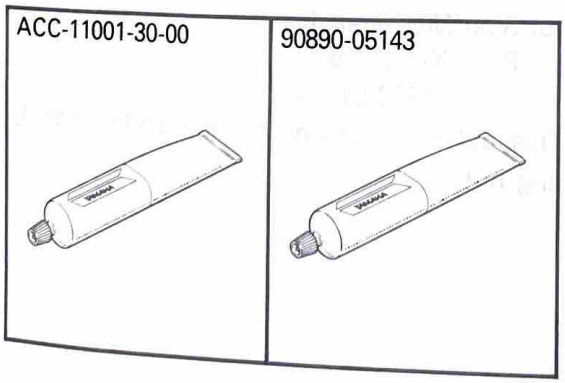
   Puller P/N. YM-01189
   90890-01189

This tool is used to remove the magneto.



5. Clutch Holder
   P/N. YM-91042
   90890-04086

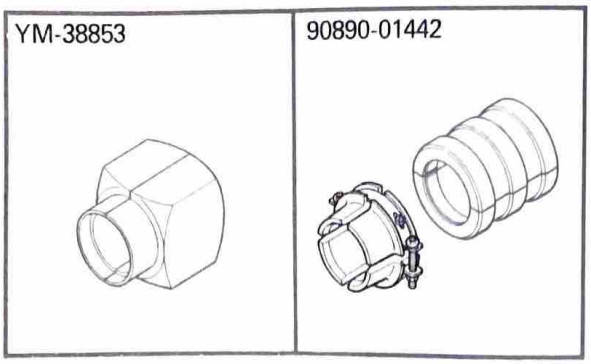
This tool is used to hold the clutch when removing or installing the clutch boss securing nut.



6. Quick Gasket®
   P/N. ACC-11001-30-00
   YAMAHA Bond No. 4
   P/N. 90890-05143

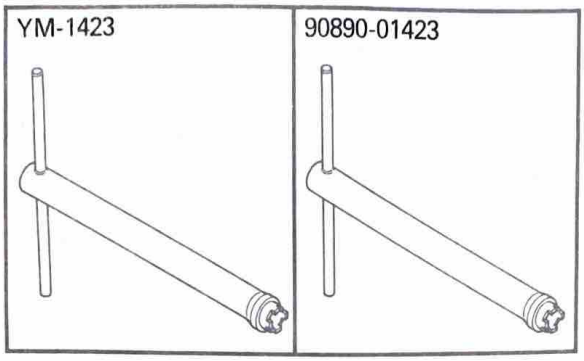
This sealant (Bond) is used for crankcase mating surfaces, etc.

FOR CHASSIS SERVICE



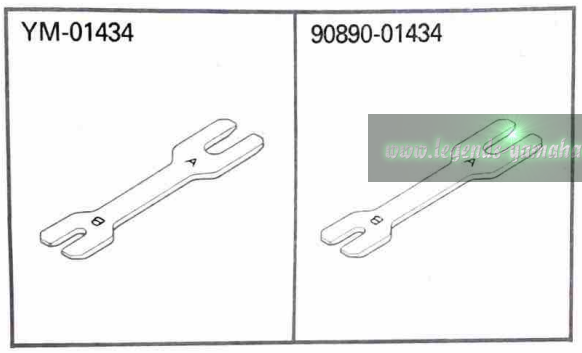
1. Fork Seal Driver
   P/N. YM-38853
   90890-01442

This tool is used when install the fork oil seal.



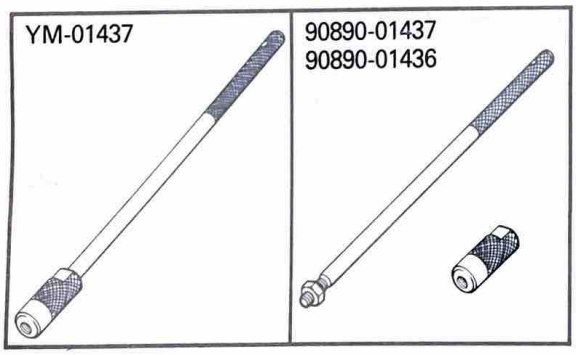
2. Damper Rod Holder
   P/N. YM-1423
   90890-01423

Use this tool to remove and isntall the damper rod.



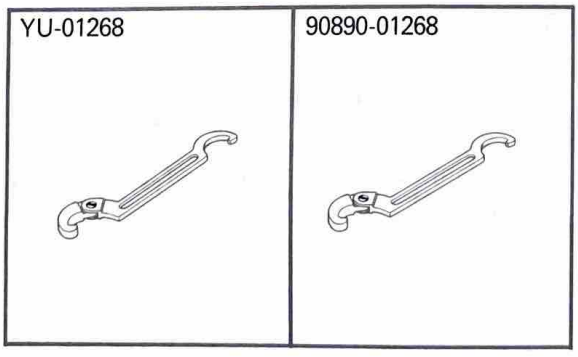
3. Rod Holder
   P/N. YM-01434
   90890-01434

This tool is used to hold the fork spring.



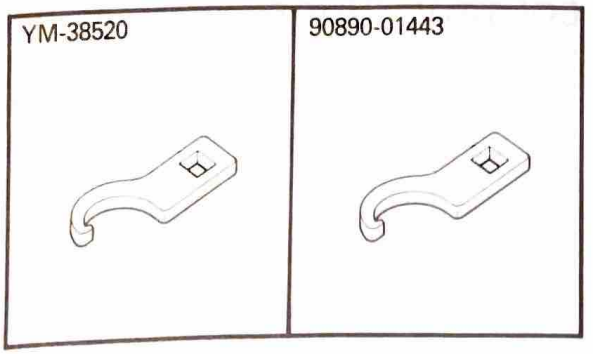
4. Rod Puller and Rod Puller Attachment
   Rod Puller P/N. YM-01437
   90890-01437
   Rod Puller Attachment P/N. 90890-01436

These tools are used to pull up the fork damper rod.



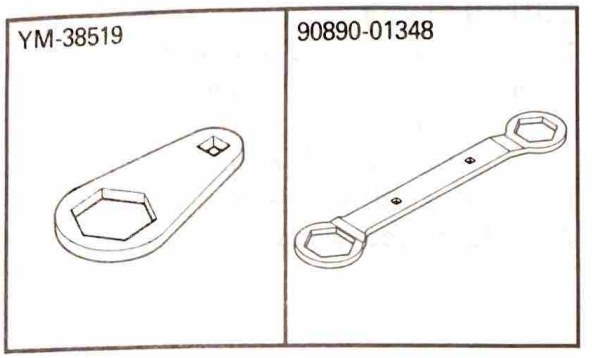
5. Ring Nut Wrench
   P/N. YU-01268
   90890-01268

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



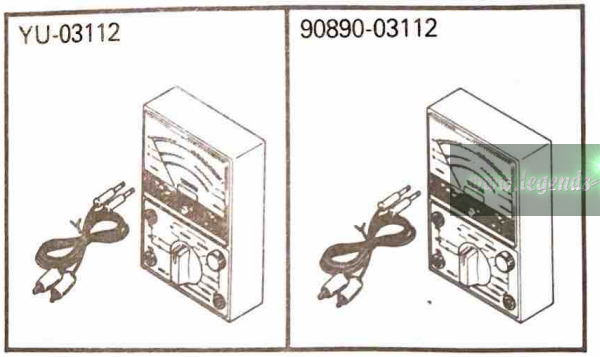
6. Ring Nut Wrench
   P/N. YM-38520
   90890-01443

This tool is used when tighten the steering ring nut to specification.



7. Locknut Wrench
   P/N. YM-38519
   90890-01348

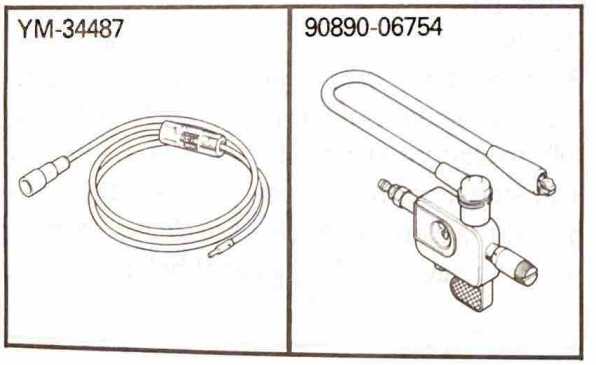
Use this wrench to remove and install the stearing stem nut.



FOR ELECTRICAL SERVICE

1. Yamaha Pocket Tester
   P/N. YU-03112
   90890-03112

Use this tool to inspect the coil resistance, output voltage and amperage.



2. Dynamic Spark Tester
   P/N. YM-34487
   Ignition Checker
   P/N. 90890-06754

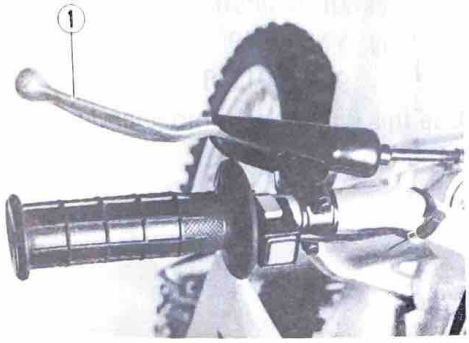
This instrument is necessary for checking the ignition system components.

CONTROL FUNCTIONS

"ENGINE STOP" BUTTON

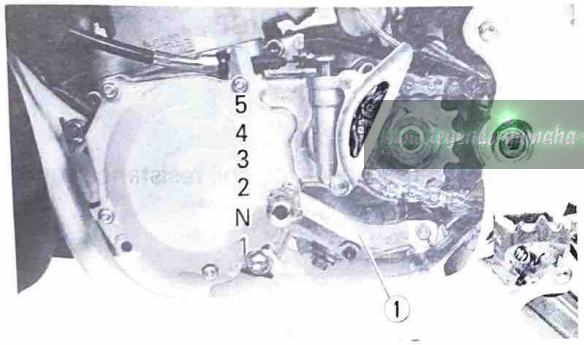
The "ENGINE STOP" button ① is located on the left handlebar. Continue pushing the "ENGINE STOP" button till the engine comes to a stop.

CLUTCH LEVER



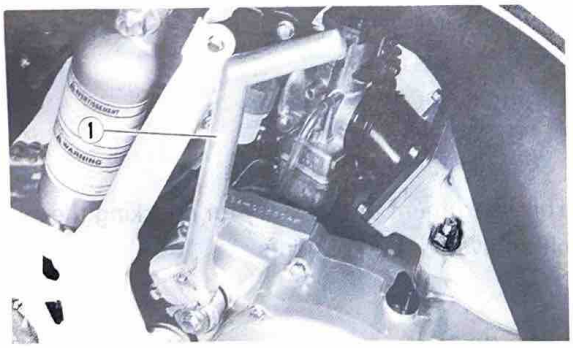
The clutch lever ① is located on the left handlebar; it disengages or engages the clutch. Pull the clutch lever to the handlebar to disengage the clutch, and release the lever to engage the clutch. The lever should be pulled rapidly and released slowly for smooth starts.

SHIFT PEDAL

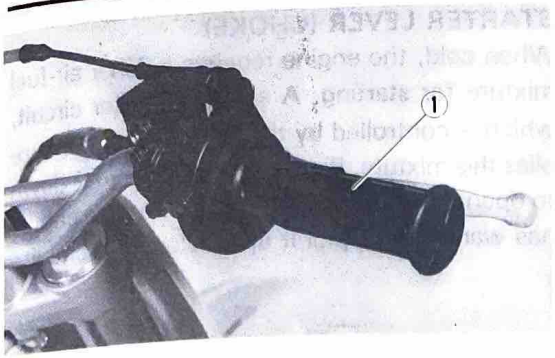


The gear ratios of the constant-mesh 5 speed transmission are ideally spaced. The gears can be shifted by using the shift pedal ① on the left side of the engine.

KICK STARTER

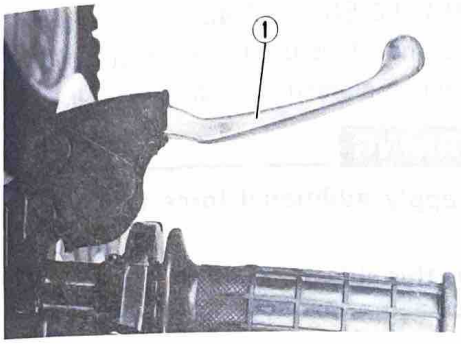


Rotate the kick starter ① away from the engine. Push the starter down lightly with your foot until the gears engage, then kick smoothly and forcefully to start the engine. This model has a primary kick starter so the engine can be started in any gear if the clutch is disengaged. In normal practices, however, shift to neutral before starting.



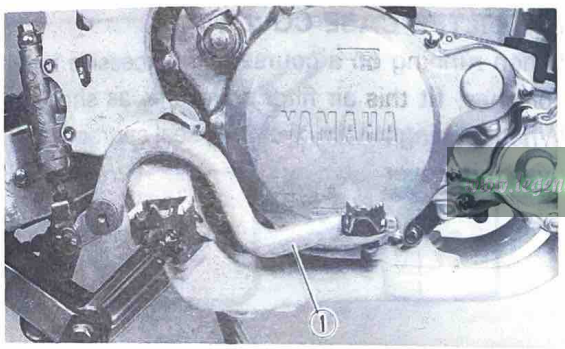
THROTTLE GRIP

Throttle grip ① is located on the right handlebar; it accelerates or decelerates the engine. For acceleration, turn the grip toward you; for deceleration, turn it away from you.



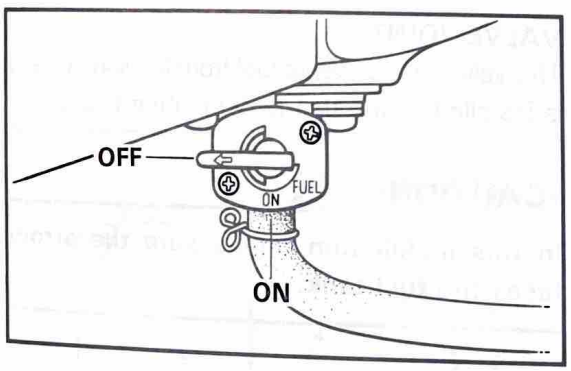
FRONT BRAKE LEVER

The front brake lever ① is located on the right handlebar. Pull it toward the handlebar to activate the front brake.



REAR BRAKE PEDAL

The rear brake pedal ① is located on the right side of the machine. Press down on the brake pedal to activate the rear brake.

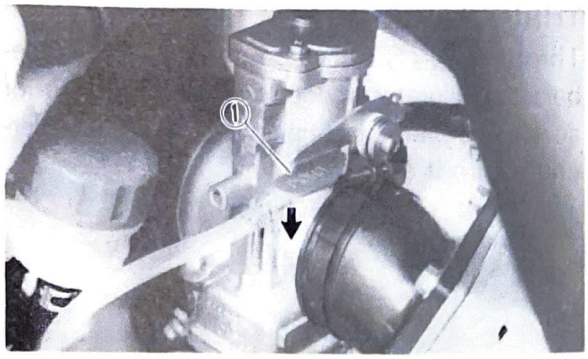


FUEL COCK

The fuel cock supplys fuel from the tank to carburetor while filtering the fuel. The fuel cock has the two positions:

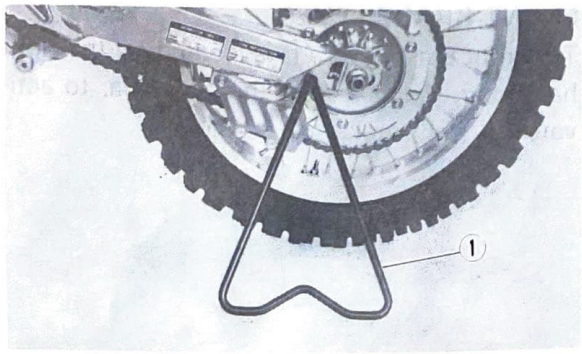
OFF: With the lever in this position, fuel will not flow. Always return the lever to this position when the engine is not running.

ON: With the lever in this position, fuel flows to the carburetor. Normal riding is done with the lever in this position.



STARTER LEVER (CHOKE)

When cold, the engine requires a richer air-fuel mixture for starting. A separate starter circuit, which is controlled by the starter lever ①, supplies this mixture. Push the starter lever ① down to open the circuit for starting. When the engine has warmed up, pull it up to close the circuit.

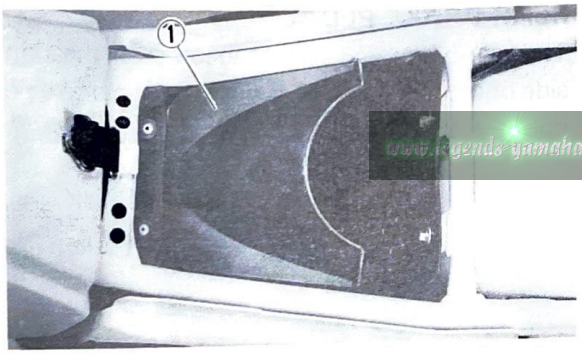


DETACHABLE SIDESTAND

This sidestand ① is used to support only the machine when standing or transporting it.

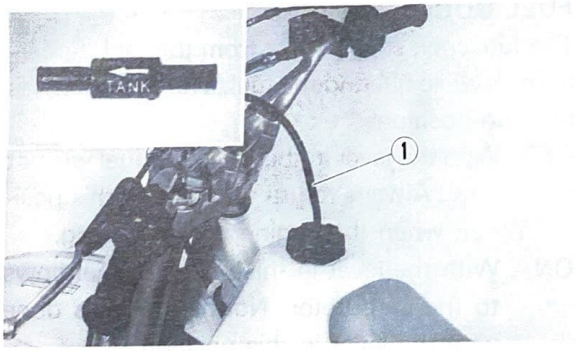
⚠ WARNING

- **Never apply additional force to the side stand.**
- **Remove this sidestand before starting out.**



AIR FILTER CASE COVER

When running on a course with excessive mud splashes, fit this air filter cover ①, as shown. When running in rainy weather, seal appropriately over this cover



VALVE JOINT

This valve joint prevents fuel from flowing out and is installed to the fuel tank breather hose.

CAUTION:

In this installation, make sure the arrow faces the fuel tank.

FUEL AND ENGINE MIXING OIL

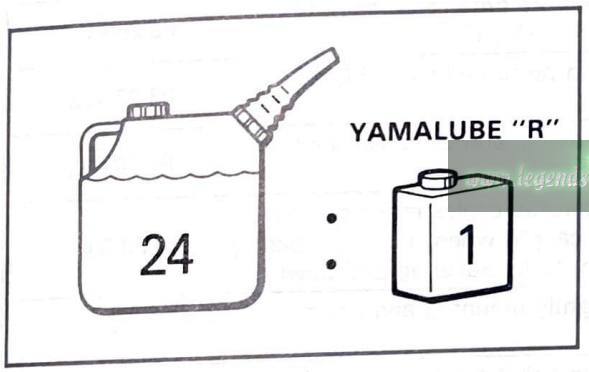
Mix oil with the gas at the ratio specified below. Always use fresh, name-brand gasoline, and mix the oil and gas the day of the race. Do not use premix that is more than a few hours old.

Recommended Fuel:
Except for AUS:
Premium unleaded fuel with a research octane number of 95 or higher.
For AUS:
Unleaded fuel only

NOTE:

Except for AUS:

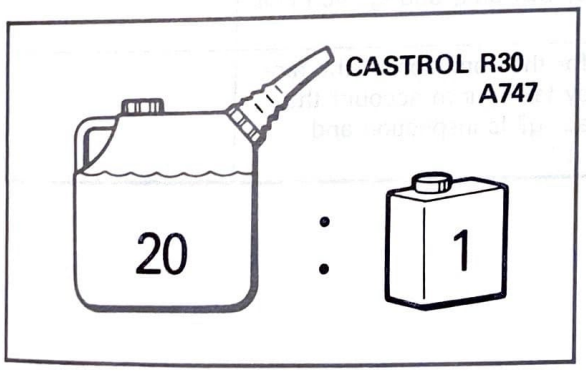
1. If knocking or pinging occurs, use a different brand of gasoline or higher octane grade.
2. If unleaded gasoline is not available, then leaded gasoline can be used.



CAUTION:

Never mix two types of oil in the same batch; clotting of the oil could result. If you wish to change oil types, be sure to drain the fuel tank and the carburetor float bowl of old premix prior to filling with the new type.

Fuel Tank Capacity:
8.5 L (1.87 Imp gal, 2.25 US gal)



Mixing Oil
Recommended Oil:
Yamalube "R"
(Yamalube Racing 2-cycle Oil)
Mixing Ratio: 24 : 1
If for any reason you should use another type, select from the following list.
Mixing ratio: 20 : 1
•Castrol R30
•Castrol A747

PRE-OPERATION CHECK LIST

Before riding for break-in operation, practice or a race, make sure the machine is in good operating condition.

Before using this machine, check the following points.

Item	Routine	Page
Coolant	Check that coolant is filled up to the radiator filler cap. Check the cooling system for leakage.	P3-4 ~ 8
Fuel	Check that a fresh mixture of oil and gasoline is filled in the fuel tank. Check the fuel line for leakage.	P1-12
Transmission Oil	Check that the oil level is correct. Check the crankcase for leakage.	P3-11 ~ 12
Gear Shifter and Clutch	Check that gears can be shifted correctly in order and that the clutch operates smoothly.	P3-8
Throttle grip/Housing	Check for smooth operation, Lubricate/Adjust if necessary.	P3-9
Brakes	Check the play of front brake and effect of front and rear brake.	P3-14 ~ 17
Chain	Check chain slack and alignment. Check that the chain is lubricated properly.	P3-17 ~ 19
Wheels	Check for excessive wear and tire pressure. Check for loose spokes and have no excessive play.	P3-26 ~ 27
Steering	Check that the handlebar can be turned smoothly and have no excessive play.	P3-27 ~ 28
Front Forks and Rear Shock	Check that they operate smoothly and there is no oil leakage.	P3-20 ~ 25
Cables (Wires)	Check that the clutch and throttle cables move smoothly. Check that they are not caught when the handlebars are turned or when the front forks travel up and down.	P3-30
Muffler	Check that the muffler is tightly mounted and has no cracks.	—
Sprocket	Check that the rear wheel sprocket tightening bolt is not loose.	P3-17
Bolts and Nuts	Check the chassis and engine for loose bolts and nuts.	P1-17 ~ 18
Lead Connectors	Check that the CDI magneto, CDI unit, and ignition coil are connected tightly.	—
Settings	Is the machine set suitably for the condition of the racing course and weather or by taking into account the results of test-runs before racing? Is inspection and maintenance completely done?	—

STARTING AND BREAK-IN

CAUTION:

Before starting the machine, perform the checks in the pre-operation check list.

⚠ WARNING

Never start or run the engine in a closed area. The exhaust fumes are poisonous; they can cause loss of consciousness and death in a very short time. Always operate the machine in a well-ventilated area.

STARTING A COLD ENGINE

1. Shift the transmission into neutral.
2. Turn the fuel cock to "ON" and full open the starter lever (CHOKE).
3. With the throttle completely closed start the engine by kicking the kick starter forthly with firm stroke.
4. Run the engine at idle or slightly higher until it warms up: this usually takes about one or two minutes.
5. The engine is warmed up when it responds normally to the throttle with the starter lever (CHOKE) turned off.

CAUTION:

Do not warm up the engine for extended periods.

STARTING A WARM ENGINE

Do not operate the starter. Open the throttle slightly and start the engine by kicking the kick starter forthly with firm stroke.

CAUTION:

Observe the following break-in procedures during initial operation to ensure optimum performance and avoid engine damage.

BREAK-IN PROCEDURES

1. Before starting the engine, fill the fuel tank with a break-in oil-fuel mixture as follows.

Mixing Oil:	Mixing Ratio:
Yamalube "R"	14 : 1
Castrol A747	12 : 1

2. Perform the pre-operation checks on the machine.
3. Start and warm up the engine. Check the idle speed, and check the operation of the controls and the "ENGINE STOP" button.
4. Operate the machine in the lower gears at moderate throttle openings for five to eight minutes. Stop and check the spark plug condition; it will show a rich condition during break-in.
5. Allow the engine to cool. Restart the engine and operate the machine as in the step above for five minutes. Then, very briefly shift to the higher gears and check full-throttle response. Stop and check the spark plug.
6. After again allowing the engine to cool, restart and run the machine for five more minutes. Full throttle and the higher gears may be used, but sustained full-throttle operation should be avoided. Check the spark plug condition.
7. Allow the engine to cool, remove the top end, and inspect the piston and cylinder. Remove any high spots on the piston with 600-grit, wet sandpaper. Clean all components and carefully reassemble the top end.
8. Drain the break-in oil-fuel mixture from the fuel tank and refill with the specified mix.
9. Restart the engine and check the operation of the machine throughout its entire operating range. Stop and check the spark plug condition. Restart the machine and operate it for about 10 to 15 more minutes. The machine will now be ready to race.

CAUTION:

- After the break-in or before each race, you must check the entire machine for loose fittings and fasteners as per "TORQUE-CHECK POINTS".
  Tighten all such fasteners as required.
- When any of the following parts have been replaced, they must be broken in.
  CYLINDER AND CRANKSHAFT:
  About one hour of break-in operation is necessary.
  PISTON, RING AND GEARS:
  These parts require about 30 minutes of break-in operation at half-throttle or less.
  Observe the condition of the engine carefully during operation.

TORQUE CHECK POINTS

- Frame Construction
  - Frame to Under Tube
  - Frame to Seat Rail
  - Combined Seat and Tank
    - Fuel Tank to Frame
- Engine Mounting
  - Frame to Engine
- Steering
  - Steering Shaft to Handlebar
    - Steering Shaft to Handlebar
    - Steering Shaft to Handle Crown
    - Handle Crown to Handlebar
- Suspension
  - Front
    - Steering Shaft to Front Fork
      - Front Fork to Handle Crown
      - Front fork to Under Bracket
    - Front Fork to Wheel
      - Front Fork to Front Axle
      - Tightening of Front Axle
  - Rear
    - For Link Type
      - Assembly of Links
      - Link to Frame
      - Link to Shock Absorber
      - Link to Swingarm
  - Rear
    - Installation of Shock Absorber
      - Shock Absorber to Frame
      - Shock Absorber to Swingarm
      - Shock Absorber to Crankcase (Engine)
  - Rear
    - Installation of Swingarm
      - Tightening of Pivot Shaft
- Wheel
  - Installation of Wheel
    - Front
      - Tightening of Front Axle
      - Tightening of Fork End
    - Rear
      - Tightening of Rear Axle
      - Tightening of Swingarm End
      - Wheel to Sprocket
- Brake
  - Hydraulic Type
    - Front
      - Caliper to Front Fork
      - Brake Disc to Wheel
      - Tightening of Union Bolt
      - Master Cylinder to Handlebar
      - Tension Bar to Front Fork
      - Compression Bar to Front Fork
      - Tightening of Air Bleeder
    - Rear
      - Caliper to Swingarm
      - Brake Disc to Wheel
      - Tightening of Union Bolt
      - Master Cylinder to Frame
      - Tension Bar to Swingarm
      - Compression Bar to Swingarm
      - Tightening of Air Bleeder
  - Mechanical Type
    - Front
      - Brake Cam to Lever
      - Tension Bar to Front Fork
      - Compression Bar to Front Fork
    - Rear
      - Brake Cam to Lever
      - Tension Bar to Swingarm
      - Compression Bar to Swingarm
- Fuel System
  - Fuel Tank to Fuel Cock
  - Fuel Tank to Fuel Sender

NOTE:

- Concerning the tightening torque, refer to the MAINTENANCE SPECIFICATIONS in CHAPTER 2 SPECIFICATIONS.
- The above chart indicates the TORQUE-CHECK POINTS for all models. Refer to only those items relate to your machine.

CLEANING AND STORAGE

CLEANING

Frequent cleaning of your machine will enhance its appearance, maintain good overall performance, and extend the life of many components.

1. Before washing the machine, block off the end of the exhaust pipe to prevent water from entering. A plastic bag secured with a rubber band may be used for this purpose.
2. If the engine is excessively greasy, apply some degreaser to it with a paint brush. Do not apply degreaser to the chain, sprockets, or wheel axles.
3. Rinse the dirt and degreaser off with a garden hose; use only enough pressure to do the job.

CAUTION:

Excessive hose pressure may cause water seepage and contamination of wheel bearings, front forks, brakes and transmission seals. Many expensive repair bills have resulted from improper high pressure detergent applications such as those available in coin-operated car washers.

4. After the majority of the dirt has been hosed off, wash all surfaces with warm water and a mild detergent. Use an old toothbrush to clean hard-to-reach places.
5. Rinse the machine off immediately with clean water, and dry all surfaces with a soft towel or cloth.
6. Immediately after washing, remove excess water from the chain with a paper towel and lubricate the chain to prevent rust.
7. Clean the seat with a vinyl upholstery cleaner to keep the cover pliable and glossy.
8. Automotive wax may be applied to all painted or chromed surfaces. Avoid combination cleaner-waxes, as they may contain abrasives.
9. After completing the above, start the engine and allow it to idle for several minutes.

STORAGE

If your machine is to be stored for 60 days or more, some preventive measures must be taken to avoid deterioration. After cleaning the machine thoroughly, prepare it for storage as follows:

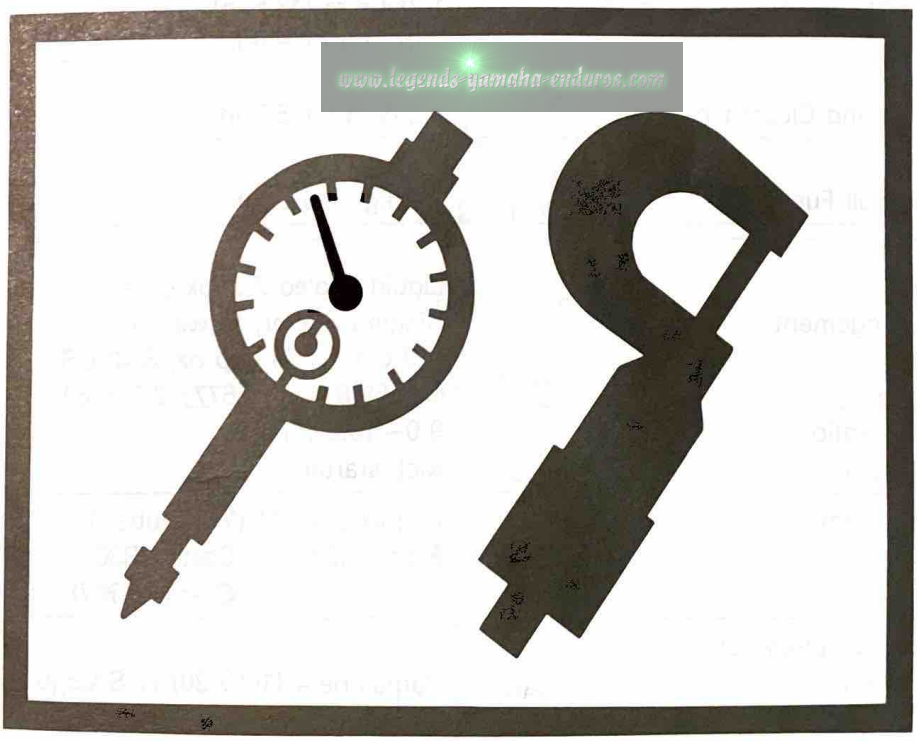
1. Drain the fuel tank, fuel lines, and the carburetor float bowl.
2. Remove the spark plug, pour a tablespoon of SAE 10W30 motor oil in the spark plug hole, and reinstall the plug. With the engine stop switch pushed in, kick the engine over several times to coat the cylinder walls with oil.
3. Remove the drive chain, clean it thoroughly with solvent, and lubricate it. Reinstall the chain or store it in a plastic bag tied to the frame.
4. Lubricate all control cables.
5. Block the frame up to raise the wheels off the ground.
6. Tie a plastic bag over the exhaust pipe outlet to prevent moisture from entering.
7. If the machine is to be stored in a humid or salt-air environment, coat all exposed metal surfaces with a film of light oil. Do not apply oil to rubber parts or the seat cover.

NOTE:

Make any necessary repairs before the machine is stored.

MEMO

CHAPTER 2
SPECIFICATIONS



SPECIFICATIONS

GENERAL SPECIFICATIONS

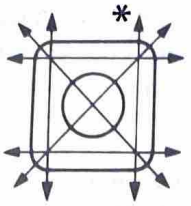
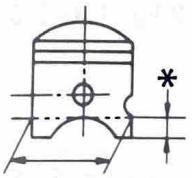
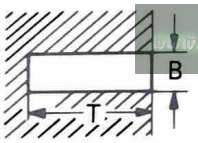
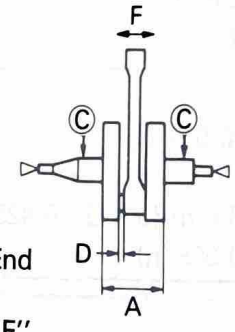
Model	YZ250
Model Name:	YZ250LC (EUROPE) YZ250D1 (USA) YZ250(D) (OTHERS)
Model Code Number:	4DA1 (EUROPE) 4DA2 (USA, CDN, OTHERS) 4DA4 (AUS, NZ)
Frame Starting Number:	4DA-000101 (EUROPE) 4DA-006101 (OTHERS) 4DA-013101 (NZ)
Vehicle Identification Number:	JYA4DAW0*NA006101 (USA, CDN) JYA4DATO*NA013101 (AUS)
Engine Starting Number	4DA-000101 (EUROPE) 4DA-006101 (USA, CDN, OTHERS) 4DA-013101 (AUS, NZ)
Dimensions: Overall Length Overall Width Overall Height Seat Height Wheelbase Minimum Ground Clearance	 2,195 mm (86.4 in) 850 mm (33.5 in) 1,233 mm (48.5 in) 978 mm (38.5 in) 1,495 mm (58.9 in) 398 mm (15.7 in)
Basic Weight: With Oil and Full Fuel Tank	104 kg (229.3 lb)
Engine: Engine Type Cylinder Arrangement Displacement Bore × Stroke Compression Ratio Starting System	 Liquid cooled 2-stroke, gasoline Single cylinder, forward inclined 249 cm^3 (8.76 Imp oz, 8.42 US oz) 68 × 68.8 mm (2.677 × 2.709 in) 9.0 ~ 10.9 : 1 Kick starter
Lubrication System:	Premix (24 : 1) (Yamalube R) Premix (20 : 1) (Castrol R30) (Castrol A747)
Oil Type or Grade (2-Cycle): Transmission Oil Periodic Oil Change Total Amount	 Yamalube 4 (10W-30) or SAE 10W30 type SE motor oil 0.75 L (0.66 Imp qt, 0.79 US qt) 0.80 L (0.70 Imp qt, 0.85 US qt)
Coolant Capacity (Including All Routes):	1.1 L (0.97 Imp qt, 1.16 US qt)
Air Filter:	Wet type element

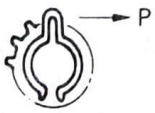
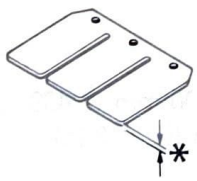
Model	YZ250
Fuel:	
Type	Except for AUS: Premium unleaded fuel with a research octane number of 95 or higher For AUS: Unleaded fuel only
Tank Capacity	8.5 L (1.87 Imp gal, 2.25 US gal)
Carburetor:	
Type/Manufacturer	TM38SS/MIKUNI
Spark plug:	
Type/Manufacturer	B8EG/NGK (Except for CDN and ZA) BR8EG/NGK (For CDN and ZA)
Gap	0.5~0.6 mm (0.020~0.024 in)
Clutch Type	Wet, multiple-disc
Transmission:	
Primary Reduction System	Gear
Primary Reduction Ratio	62/22 (2.818)
Secondary Reduction System	Chain drive
Secondary Reduction Ratio	49/14 (3.500) (Except for Europe) 51/14 (3.643) (For Europe)
Transmission Type	Constant mesh, 5-speed
Operation	Left foot operation
Gear Ratio: 1st	31/15 (2.067)
2nd	29/17 (1.706)
3rd	22/16 (1.375)
4th	22/19 (1.158)
5th	23/23 (1.000)
Chassis:	
Frame Type	Semi double cradle
Caster Angle	27.5°
Trail	122 mm (4.80 in)
Tire:	
Type	With tube
Size (F)	80/100-21 51M
Size (R)	110/90-19 62M
Tire Pressure (Front and Rear)	100 kPa (1.0 kg/cm^2, 15 psi)
Brake:	
Front Brake Type	Single disc brake
Operation	Right hand operation
Rear Brake Type	Single disc brake
Operation	Right foot operation
Suspension:	
Front Suspension	Telescopic fork
Rear Suspension	Swingarm (Link type monocross suspension)
Shock Absorber:	
Front Shock Absorber	Air, coil spring/oil damper
Rear Shock Absorber	Gas, coil spring/oil damper

Model	YZ250
Wheel Travel:	
Front Wheel Travel	310 mm (12.2 in)
Rear Wheel Travel	325 mm (12.8 in)
Electrical:	
Ignition System	CDI Magneto

MAINTENANCE SPECIFICATIONS

ENGINE

Model	YZ250
Cylinder Head: Warp Limit 	<0.03 mm (0.0012 in)> *Lines indicate straightedge measurement.
Cylinder Bore Size Wear Limit Taper Limit Out of Round Limit	68.000~68.014 mm (2.6772~2.6777 in) 68.1 mm (2.681 in) <0.05 mm (0.0020 in)> <0.01 mm (0.0004 in)>
Piston: Piston Size/ Measuring Point*  Piston Clearance <Limit> Piston Offset	67.952~67.967 mm (2.6753~2.6759 in)/ 5~10 mm (0.20~0.39 in) 0.045~0.050 mm (0.0018~0.0020 in) <0.1 mm (0.004 in)> 1.5 mm (0.059 in)/EX-side
Piston Pin: Piston Pin Outside Diameter/<Limit>	17.995~18.000 mm (0.7085~0.7087 in)/ <17.975 mm (0.7077 in)>
Piston Ring: Sectional Sketch  End Gap (Installed)/<Limit> Side Clearance (Installed)/<Limit>	Plain B=1.2 mm (0.047 in) T=2.85 mm (0.112 in) 0.55~0.70 mm (0.022~0.028 in)/ <1.0 mm (0.039 in)> 1st: 0.045~0.080 mm (0.0018~0.0031 in)/ 2nd: 0.035~0.070 mm (0.0014~0.0028 in)/ <0.1 mm (0.04 in)>
Crankshaft:  Crank Width "A" Runout Limit "C" Connecting Rod Big End Side Clearance "D" Small End Free Play "F" <Limit>	61.95~62.00 mm (2.439~2.441 in) <0.03 mm (0.0012 in)> 0.25~0.75 mm (0.010~0.030 in) 0.4~1.0 mm (0.016~0.039 in) <2.0 mm (0.08 in)>
Clutch: Friction Plate Thickness/Quantity <Wear Limit> Cluth Plate Thickness/Quantity <Warp Limit>	2.9~3.1 mm (0.114~0.122 in)×7 <2.7 mm (0.106 in)> 1.6 mm (0.063 in)×6 <0.1 mm (0.004 in)>

Model	YZ250	
Clutch Spring Free Length/Quantity	40.1 mm (1.58 in) × 6	
<Limit>	<37.1 mm (1.46 in)>	
Clutch Housing Thrust Clearance	0.17 ~ 0.23 mm (0.007 ~ 0.009 in)	
Clutch Housing Radial Clearance	0.03 ~ 0.55 mm (0.001 ~ 0.022 in)	
Clutch Release Method	Inner push, cam push	
Transmission:		
Main Axle Deflection Limit	<0.01 mm (0.0004 in)>	
Drive Axle Deflection Limit	<0.01 mm (0.0004 in)>	
Shifter:		
Shifting Type	Cam drum and guide bar	
Guide Bar Bending Limit	<0.05 mm (0.0020 in)>	
Kick Starter Type	Kick and mesh type	
Kick Clip Friction Force 	P = 0.8 ~ 1.2 kg (1.8 ~ 2.6 lb)	
Air Filter Oil Grade (Oiled Filter)	Foam-air-filter oil or SAE 10W30SE	
Carburetor:	Except for Europe	For Europe
Type/Manufacturer	TM38SS/MIKUNI	←
I.D. Mark	4DA00	4DA10
Main Jet (M.J.)	#350	←
Jet Needle-clip Position (J.N.)	6EJ33-61-3	6DJ8-57-4
Needle Jet (N.J.)	R-1	←
Cutaway (C.A.)	4.0	←
Pilot Jet (P.J.)	#45	←
Pilot Air Screw (P.A.S.)	1-1/2	1
Valve Seat Size (V.S.)	φ3.5	←
Starter Jet (G.S.)	#80	←
Float Lever Height (F.H.)	15.2 ~ 17.2 mm (0.60 ~ 0.68 in)	←
Reed Valve:		
Thickness* 	0.42 mm (0.017 in)	
Valve Stopper Height	10.4 ~ 10.8 mm (0.409 ~ 0.425 in)	
Valve Bending Limit	0.2 mm (0.008 in)	
Cooling:		
Radiator Core Size:		
Width	110 mm (4.33 in)	
Height (Left)	220 mm (8.66 in)	
(Right)	200 mm (7.87 in)	
Thickness	32 mm (1.26 in)	
Radiator Cap Opening Pressure	95 ~ 125 kPa (0.95 ~ 1.25 kg/cm^2, 13.5 ~ 17.8 psi)	
Radiator Capacity (Total)	0.61 L (0.54 Imp qt, 0.64 US qt)	
Water Pump:		
Type	Single-suction centrifugal pump	

Part to be tightened	Thread size	Q'ty	Tightening torque		
			Nm	m•kg	ft•lb
Spark plug	M14×1.25	1	25	2.5	18
Cylinder head (Nut)	M 8×1.25	6	30	3.0	22
(Stud)	M 8×1.25	6	13	1.3	9.4
Cylinder (Nut)	M10×1.25	4	35	3.5	25
(Stud)	M10×1.25	4	13	1.3	9.4
Power valve (Bolt)	M 5×0.8	1	8	0.8	5.8
Holder	M 5×0.8	2	5	0.5	3.6
Thrust plate	M 5×0.8	1	5	0.5	3.6
Lever-Push rod	M 5×0.8	1	5	0.5	3.6
Governor fork-Push rod	M 4×0.7	2	5	0.5	3.6
Housing	M 5×0.8	4	5	0.5	3.6
Water pump housing	M 6×1.0	3	12	1.2	8.7
Coolant drain bolt	M 6×1.0	1	12	1.2	8.7
Joint 1	M 6×1.0	1	12	1.2	8.7
Carburetor joint	M 6×1.0	4	12	1.2	8.7
Reed valve	M 3×0.5	6	1	0.1	0.7
Crankcase	M 6×1.0	10	12	1.2	8.7
Crankcase cover (Right)	M 6×1.0	7	10	1.0	7.2
Crankcase cover (Left)	M 6×1.0	5	8	0.8	5.8
Chain cover	M 6×1.0	2	10	1.0	7.2
Plate bearing cover	M 6×1.0	1	10	1.0	7.2
Plate cover	M 6×1.0	2	10	1.0	7.2
Holder	M 6×1.0	1	10	1.0	7.2
Oil check bolt	M 6×1.0	1	10	1.0	7.2
Oil drain bolt	M12×1.5	1	20	2.0	14
Kick starter	M 8×1.25	1	30	3.0	22
Clutch cover	M 6×1.0	7	10	1.0	7.2
Primary drive gear	M18×1.0	1	75	7.5	54
Clutch	M20×1.0	1	75	7.5	54
Clutch spring	M 6×1.0	6	10	1.0	7.2
Drive sprocket	M20×1.0	1	75	7.5	54
Shift pedal	M 6×1.0	1	10	1.0	7.2
Shift guide	M 6×1.0	2	10	1.0	7.2
Stopper lever	M 6×1.0	1	14	1.4	10
Segment	M 8×1.25	1	30	3.0	22
Magneto rotor	M10×1.25	1	48	4.8	35
Stator	M 6×1.0	2	8	0.8	5.8

CHASSIS

Model	YZ250	
Steering System:		
Steering Bearing Type	Taper roller bearing	
Front Suspension	Except for Europe	For Europe
Front Fork Travel	310 mm (12.2 in)	←
Fork Spring Free Length	490 mm (19.29 in)	←
Spring Rate, STD	K = 3.90 N/mm (0.390 kg/mm, 21.8 lb/in)	←
Optional Spring/Spacer	Yes	←
Oil Capacity	542 cm^3 (19.1 Imp oz, 18.3 US oz)	546 cm^3 (19.2 Imp oz, 18.5 US oz)
Oil Level <Min. ~ Max.> (From top of outer tube with inner tube and damper rod fully compressed without spring.)	110 mm (4.33 in) 80 ~ 130 mm (3.15 ~ 5.12 in)	105 mm (4.13 in) ←
Oil Grade	Suspension oil "01"	←
Inner Tube Outer Diameter	43 mm (1.69 in)	←
Front Fork Top End	Zero mm (Zero in)	←
Rear Suspension:		
Shock Absorber Travel	132 mm (5.20 in)	
Spring Free Length	265 mm (10.43 in)	
Fitting Length <Min. ~ Max.>	247 mm (9.72 in) 241.5 ~ 260.5 mm (9.51 ~ 10.26 in)	
Spring Rate, STD	K = 50 N/mm (5.0 kg/mm, 280 lb/in)	
Optional Spring	Yes	
Enclosed Gas Pressure	1,000 kPa (10 kg/cm^2, 142 psi)	
Rear Arm:		
Swingarm Free Play Limit		
End	<1.0 mm (0.04 in)>	
Side Clearance	<0.4 ~ 0.7 mm (0.016 ~ 0.028 in)>	
Wheel:		
Front Wheel Type	Spoke wheel	
Rear Wheel Type	Spoke wheel	
Front Rim Size/Material	1.60 × 21/Aluminum	
Rear Rim Size/Material	2.15 × 19/Aluminum	
Rim Runout Limit:		
Vertical	<2.0 mm (0.08 in)>	
Lateral	<2.0 mm (0.08 in)>	

Model	YZ250
Drive Chain:	
Type/Manufacturer	DID520DS/DAIDO
Number of Links	115 links + Joint
Chain Slack	30 ~ 35 mm (1.2 ~ 1.4 in)
Front Disc Brake:	
Disc Outside Dia. × Thickness	245 × 3.0 mm (9.65 × 0.12 in)
Pad Thickness	4.4 mm (0.17 in)
<Limit>	<1.6 mm (0.06 in)>
Master Cylinder Inside Dia.	11.0 mm (0.433 in)
Caliper Cylinder Inside Dia.	27.0 mm (1.063 in) × 2
Brake Fluid Type	DOT #4
Rear Disc Brake:	
Disc Outside Dia. × Thickness	220 × 4.5 mm (8.66 × 0.18 in)
Pad Thickness	4.7 mm (0.19 in)
<Limit>	<1.0 mm (0.04 in)>
Master Cylinder Inside Dia	12.7 mm (0.500 in)
Caliper Cylinder Inside Dia	30.23 mm (1.190 in)
Brake Lever & Brake Pedal:	
Brake Lever Free Play	10 ~ 20 mm (0.4 ~ 0.8 in) (at lever end)
Brake Pedal Free Play/Position	10 ~ 20 mm (0.4 ~ 0.8 in)/Zero mm (Zero in) (Vertical height below footrest top)
Clutch Lever Free Play/Position	2 ~ 3 mm (0.08 ~ 0.12 in)/at lever pivot

	Part to be tightened	Thread size	Q'ty	Tightening torque		
				Nm	m•kg	ft•lb
△	Handle crown and outer tube	M 8×1.25	4	23	2.3	17
△	Under bracket and outer tube	M 8×1.25	4	20	2.0	14
△	Handle crown and steering shaft	M36×1.0	1	115	11.5	85
△	Handlebar holder (Upper)	M 8×1.25	4	23	2.3	17
△	Handlebar holder (Lower)	M10×1.25	2	40	4.0	29
△	Steering ring nut (Lower)	M28×1.5	1	Refer to NOTE		
	Front fork and cap bolt	M46×1.0	2	30	3.0	22
	Front fork and base valve	M22×1.0	2	55	5.5	40
	Cap bolt and damper rod (Front fork)	M10×1.0	2	15	1.5	11
	Front fork and hose cover	M 6×1.0	4	7	0.7	5.1
	Front fork and protector	M 6×1.0	6	7	0.7	5.1
△	Front brake master cylinder and bracket	M 6×1.0	2	9	0.9	6.5
	Front brake master cylinder cap	M 4×0.7	2	2	0.2	1.4
△	Front brake master cylinder and joint bolt	M10×1.25	1	26	2.6	19
△	Brake hose (Front and rear) and joint bolt	M10×1.25	1	14	1.4	10
△	Front brake hose union bolt (Caliper)	M10×1.25	1	26	2.6	19
△	Front brake caliper and axle bracket	M 8×1.25	2	23	2.3	17
△	Brake caliper (Front and rear) and pad pin	M10×1.25	2	18	1.8	13
△	Brake caliper (Front and rear) and bleed screw	M 8×1.25	1	6	0.6	4.3
△	Front wheel axle	M14×1.5	1	59	5.9	43
△	Front wheel axle holder	M 6×1.0	4	9	0.9	6.5
△	Brake disk (Front and rear) and wheel hub	M 6×1.0	6	12	1.2	8.7
	Rear brake pedal mounting	M 8×1.25	1	19	1.9	13
△	Rear brake master cylinder and frame	M 6×1.0	2	10	1.0	7.2
	Rear brake reservoir tank and frame	M 6×1.0	1	4	0.4	2.9
△	Rear brake caliper and caliper bracket	M 8×1.25	2	23	2.3	17
△	Rear brake caliper and joint bolt	M10×1.25	1	26	2.6	19
△	Rear brake hose union bolt (Master cylinder)	M10×1.25	1	26	2.6	19
△	Rear wheel axle and nut	M18×1.5	1	115	11.5	85
△	Rear wheel sprocket and wheel hub	M 8×1.25	6	30	3.0	22
	Engine mounting:					
△	Engine and frame (Front)	M 8×1.25	1	32	3.2	23
△	Engine and frame (Lower)	M10×1.25	1	64	6.4	46
△	Engine bracket (Upper) and frame	M 8×1.25	2	32	3.2	23
△	Engine bracket (Upper) and engine	M10×1.25	1	32	3.2	23
△	Pivot shaft and nut	M16×1.5	1	85	8.5	61
△	Relay arm and frame	M10×1.25	1	59	5.9	43
△	Relay arm and connecting rod	M14×1.5	1	59	5.9	43
△	Connecting rod and swingarm	M14×1.5	1	59	5.9	43
△	Rear shock absorber and frame	M10×1.25	1	56	5.6	40
△	Rear shock absorber and relay arm	M10×1.25	1	32	3.2	23

NOTE:

1. First, tighten the ring nut approximately 38 Nm (3.8 m•kg, 27 ft•lb) by using the torque wrench, then loosen the ring nut one turn.
2. Retighten the ring nut 4 Nm (0.4 m•kg, 2.9 ft•lb).

Part to be tightened	Thread size	Q'ty	Tightening torque		
			Nm	m•kg	ft•lb
Back stay	M 8×1.25	2	19	1.9	13
Drive chain tensioner mounting	M 8×1.25	2	19	1.9	13
Seal guard and swingarm	M 6×1.0	2	5	0.5	3.6
Support chain and protector chain	M 6×1.0	2	3	0.3	2.2
Protector and swingarm	M 6×1.0	2	12	1.2	8.7
△ Fuel tank mounting	M 6×1.0	2	10	1.0	7.2
Radiator mounting	M 6×1.0	6	5	0.5	3.6
Radiator and side cover 3, 4	M 5×0.8	4	4	0.4	2.9
Side cover 3, 4 and fuel tank	M 6×1.0	4	3	0.3	2.2
Front fender and under braket	M 6×1.0	4	6	0.6	4.3
Rear fender mounting	M 6×1.0	4	7	0.7	5.1
Guard flap mounting	M 6×1.0	2	5	0.5	3.6
Side cover 1, 2 mounting	M 6×1.0	2	3	0.3	2.2
Seat mounting	M 8×1.25	2	16	1.6	11

NOTE:

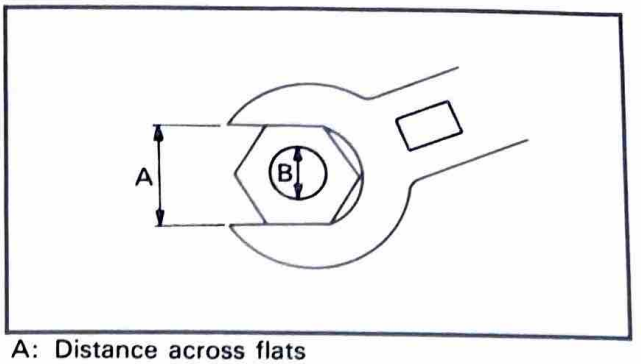
△ - marked portion shall be checked for torque tightening after break-in or before each race.

ELECTRICAL

Model	YZ250
Ignition System:	
Ignition Timing (B.T.D.C.)	13.5°/8,500 r/min 1.2 mm (0.047 in)
Advancer Type	Electrical
CDI:	
Magneto-Model/Manufacturer	3SP/YAMAHA
Charging Coil 1 Resistance (Color)	256 ~ 384Ω at 20°C (68°F) (Black-Brown)
Charging Coil 2 Resistance (Color)	36 ~ 54Ω at 20°C (68°F) (Black-Black/Red)
Pickup Coil Resistance (Color)	104 ~ 156Ω at 20°C (68°F) (Black-Green/White)
CDI Unit-Model/Manufacturer	3RB-10/YAMAHA
Ignition Coil:	
Model/Manufacturer	F6T537/MITSUBISHI
Minimum Spark Gap	6 mm (0.24 in)
Primary Winding Resistance	0.26 ~ 0.36Ω at 20°C (68°F)
Secondary Winding Resistance	3.5 ~ 4.7kΩ at 20°C (68°F)

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: Distance across flats
B: Outside thread diameter

A (Nut)	B (Bolt)	TORQUE SPECIFICATION		
		Nm	m•kg	ft•lb
10 mm	6 mm	6	0.6	4.5
12 mm	8 mm	15	1.5	11.0
14 mm	10 mm	30	3.0	22.0
17 mm	12 mm	55	5.5	40.0
19 mm	14 mm	85	8.5	61.0
22 mm	16 mm	130	13.0	94.0

DEFINITION OF UNITS

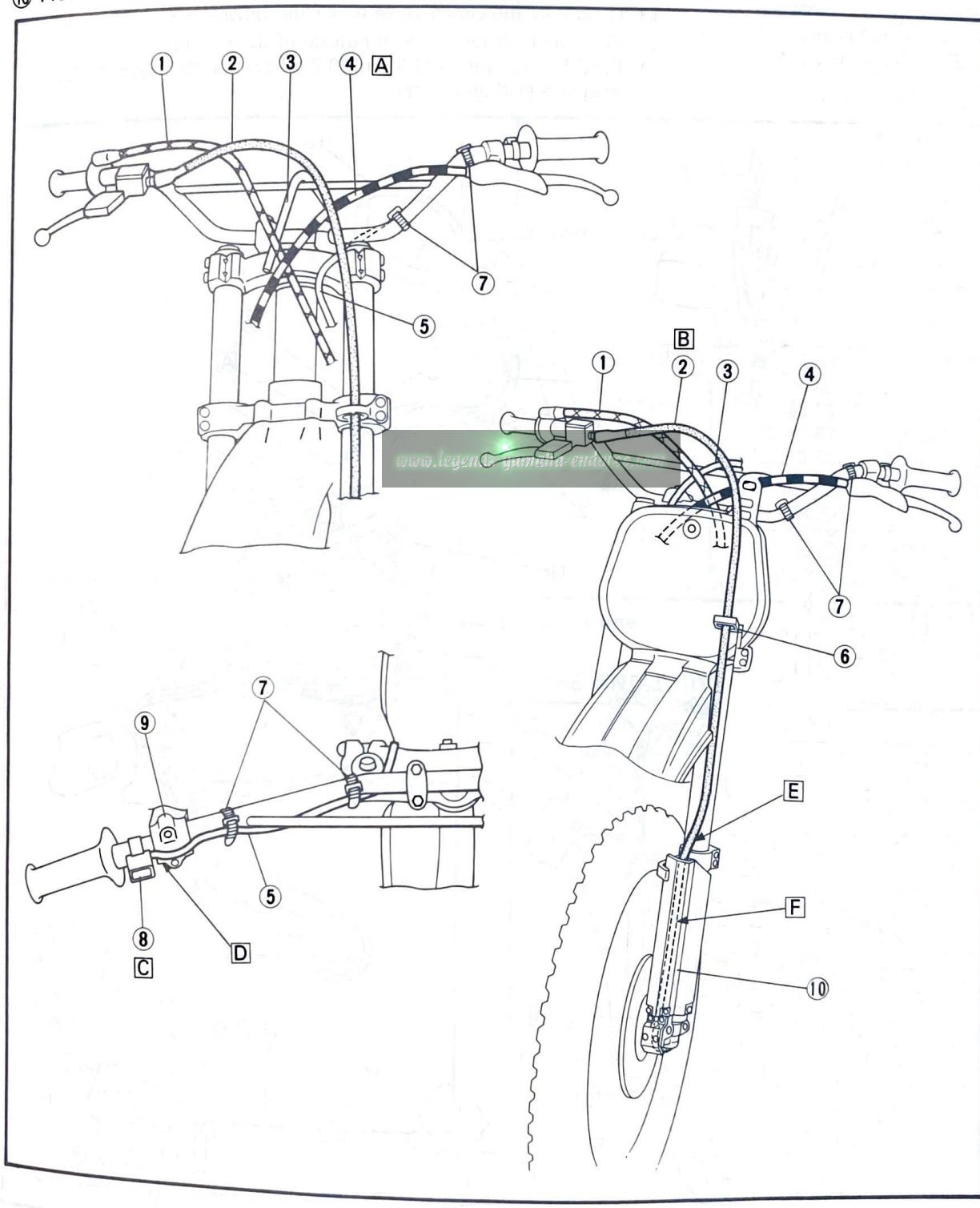
Unit	Read	Definition	Measure
mm	millimeter	10^{-3} meter	Length
cm	centimeter	10^{-2} meter	Length
kg	kilogram	10^{3} gram	Weight
N	Newton	1 kg × m/sec^2	Force
Nm	Newton meter	N × m	Torque
m•kg	Meter kilogram	m × kg	Torque
Pa	Paskal	N/m^2	Pressure
N/mm	Newtom per millimeter	N/mm	Spring rate
L	Liter	—	Volume or Capacity
cm^3	Cubic centimeter	—	Volume or Capacity
r/min	Revolution per minute	—	Engine speed

MEMO

CABLE ROUTING DIAGRAM

① Throttle cable
② Brake hose
③ Fuel tank breather hose
④ Clutch cable
⑤ "ENGINE STOP" button lead
⑥ Cable guide
⑦ Band
⑧ "ENGINE STOP" button
⑨ Lever holder
⑩ Protector

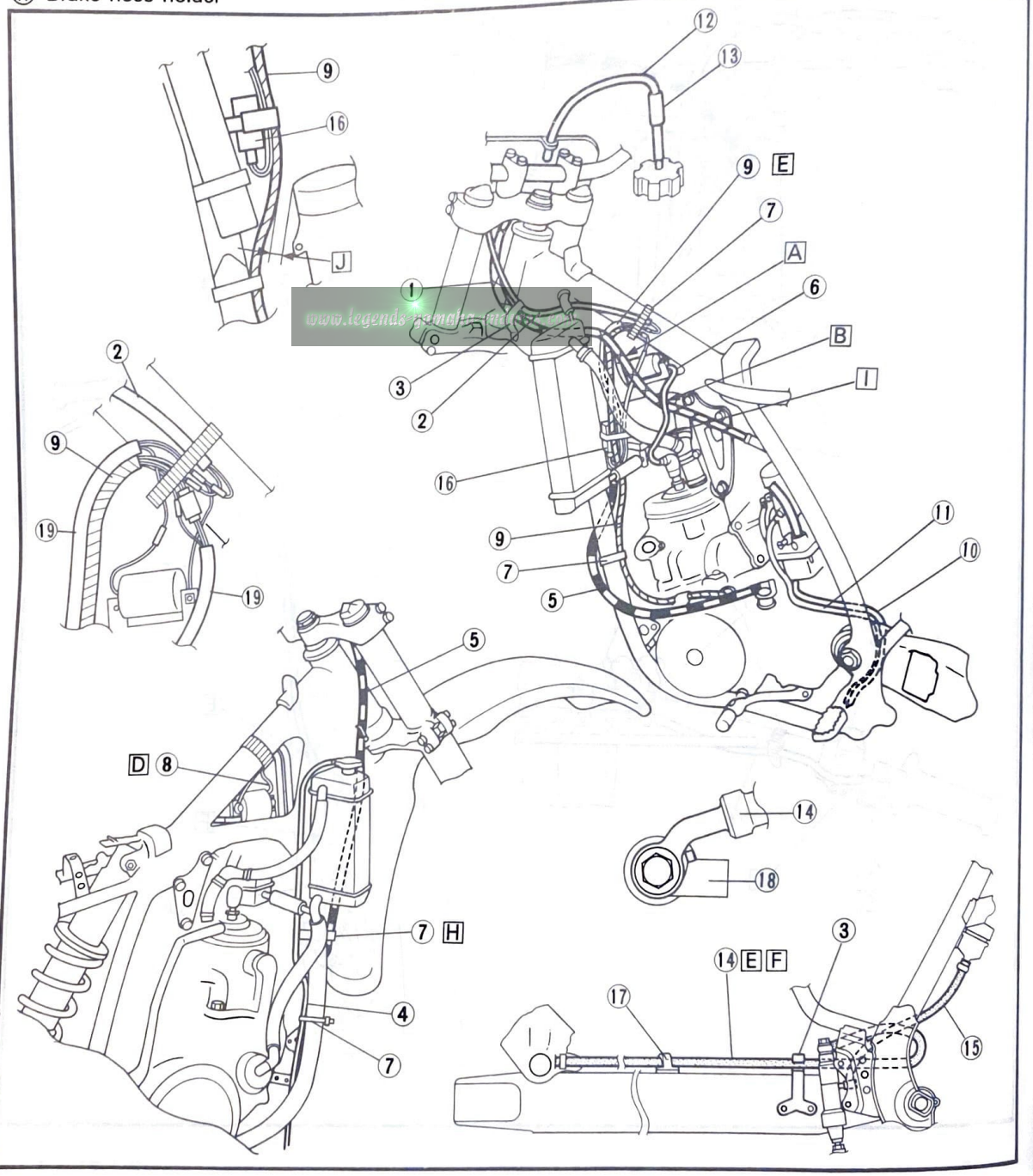
Ⓐ Pass the clutch cable between the brake hose and throttle cable.
Ⓑ Brake hose routing:
Master cylinder→Throttle cable (out side)→Cable guide (left of under bracket)→Guide (protector)→Protecter (behind)→Hose cover→Caliper
Ⓒ Keep the clearance between the "Engine stop" button and lever holder.
Ⓓ Do not pinch the "Engine stop" button lead.
Ⓔ Insert the brake hose into ring of protector.
Ⓕ Pass the brake hose behind the protector.



CABLE ROUTING DIAGRAM

① Throttle cable
② "ENGINE STOP" button lead
③ Clamp
④ Radiator breather hose
⑤ Clutch cable
⑥ High tension cord
⑦ Band
⑧ Earth lead
⑨ CDI magneto lead
⑩ Transmission breather hose
⑪ Carburetor breather hose
⑫ Tank cap breather hose
⑬ Valve joint
⑭ Rear brake hose
⑮ Reservoir tank hose
⑯ CDI unit
⑰ Brake hose holder
⑱ Rear brake master cylinder
⑲ CDI unit lead

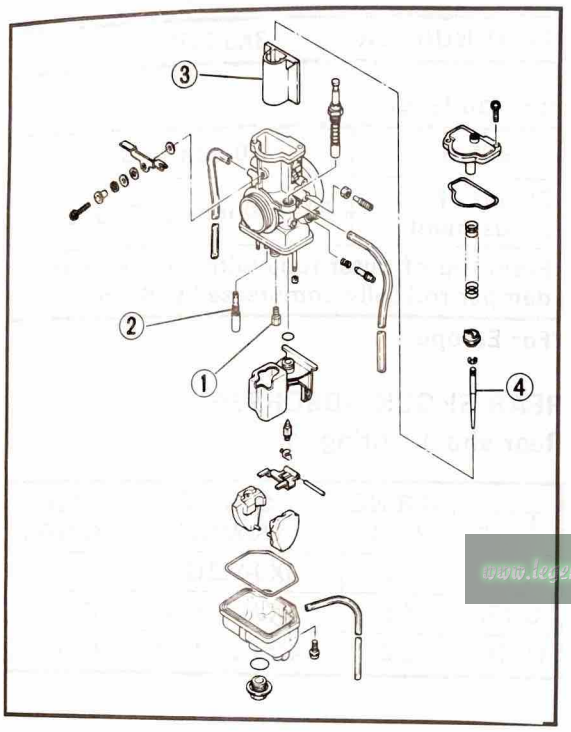
[A] Pass the throttle cable over the fuel tank mounting bolt.
[B] Pass the throttle cable inside of the high tension cord.
[C] Do not contact the exhaust pipe.
Band the CDI magneto lead only.
[D] Do not contact the high tension cord and earth lead.
[E] Pass the brake hose inside of the reservoir tank hose.
[F] Brake hose routing: Master cylinder→Inside of rear arm bracket→Clamp→Brake hose holder→Caliper
[G] Pass the CDI magneto lead inside of the throttle cable.
[H] Band only the clutch cable under the down-tube.
[I] Pass the high tension lead outside of the radiator hose.
[J] Provide a clearance of 5 mm (0.2 in) or more between the CDI magneto lead and engine.



SETTING PARTS

NOTE:

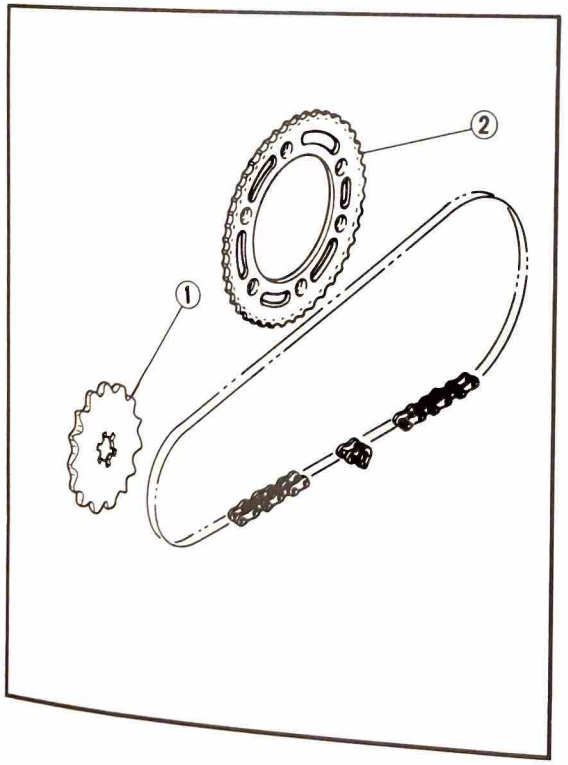
For details of machine setting, refer to "CHAPTER 7 (TUNING)".



CARBURETOR

Part name		Size	Part number
Main Jet ①		#370	137-14143-74
		#360	137-14143-72
	(STD)	#350	137-14143-70
		#340	137-14143-68
		#330	137-14143-66
Pilot Jet ②		#35	3H1-14142-35
		#40	3H1-14142-40
	(STD)	#45	3H1-14142-45
		#50	3H1-14142-50
		#55	3H1-14142-55
Throttle Valve ③		3.0	3JD-14112-30
		3.5	3JD-14112-35
	(STD)	4.0	3JD-14112-40
		4.5	3JD-14112-45
		5.0	3JD-14112-50
Jet needle ④	Rich	6EJ33-59	3JD-14116-F9
		6EJ33-60	3JD-14116-F0
	(STD)	6EJ33-61	3JD-14116-F1
		6EJ33-62	3JD-14116-F2
	Lean	6EJ33-63	3JD-14116-F3
*Jet needle ④	Rich	6DJ8-55	275-14116-E8
		6DJ8-56	275-14116-E7
	(STD)	6DJ8-57	275-14116-E6
		6DJ8-58	275-14116-E3
	Lean	6DJ8-59	275-14116-A6

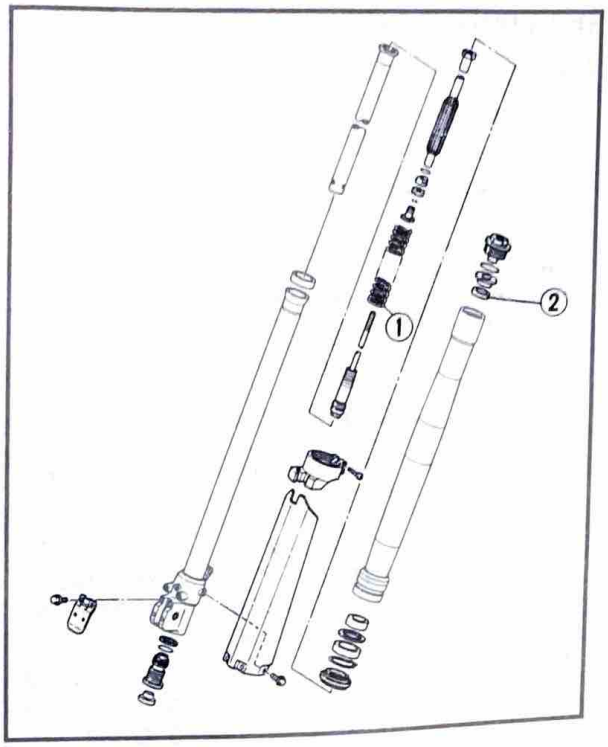
*For Europe



DRIVE AND DRIVEN SPROCKETS

Part name		Size	Part number
Drive sprocket ①		13T	93834-13029
	(STD)	14T	93834-14049
		15T	93834-15075
Driven sprocket ②		44T	39W-25444-01
		45T	39W-25445-01
		46T	39W-25446-01
		48T	39W-25448-00
	(STD)	49T	2HH-25449-00
		50T	39W-25450-00
	*(STD)	51T	3JD-25451-01
		52T	39W-25452-01

*For Europe



FRONT FORK

Front fork spring ①

TYPE	SPRING RATE	SPRING PART NUMBER	I.D. MARK
STD	0.390	4DA-23141-L0	—
SOFT	0.380	4DA-23141-30	1-1 slit
HARD	0.400	4DA-23141-50	1-3 slit

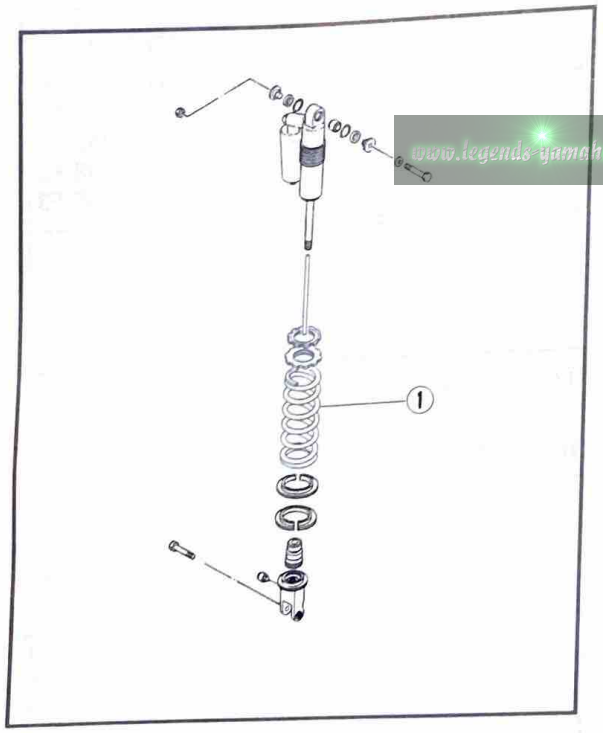
Spring adjustment washer ②

PART NUMBER	3XJ-23364-L0

Fork oil level

Standard	110 mm (4.33 in)
Extent of Adjustment	80 ~ 130 mm (3.15 ~ 5.12 in)
From top of outer tube with inner tube and damper rod fully compressed without spring.	

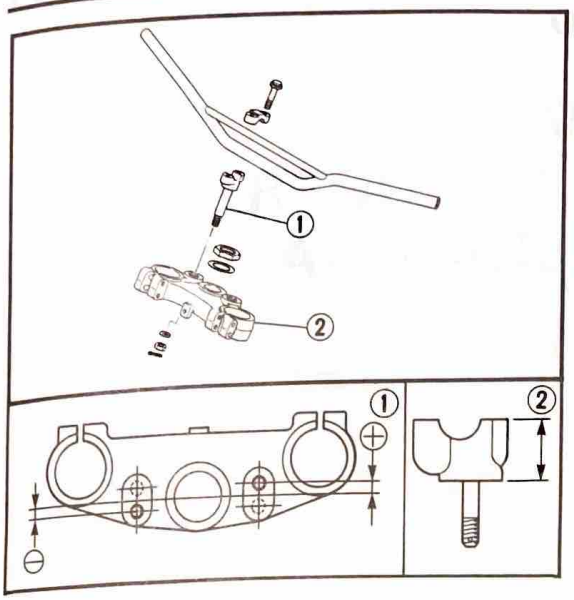
*For Europe



REAR SHOCK ABSORBER

Rear shock spring ①

TYPE	SPRING RATE	SPRING NUMBER	I.D. COLOR
STD	4.8	3XJ-22212-11	—
SOFT	4.6	3XJ-22212-01	Green
HARD	5.0	4DA-22212-20	Red

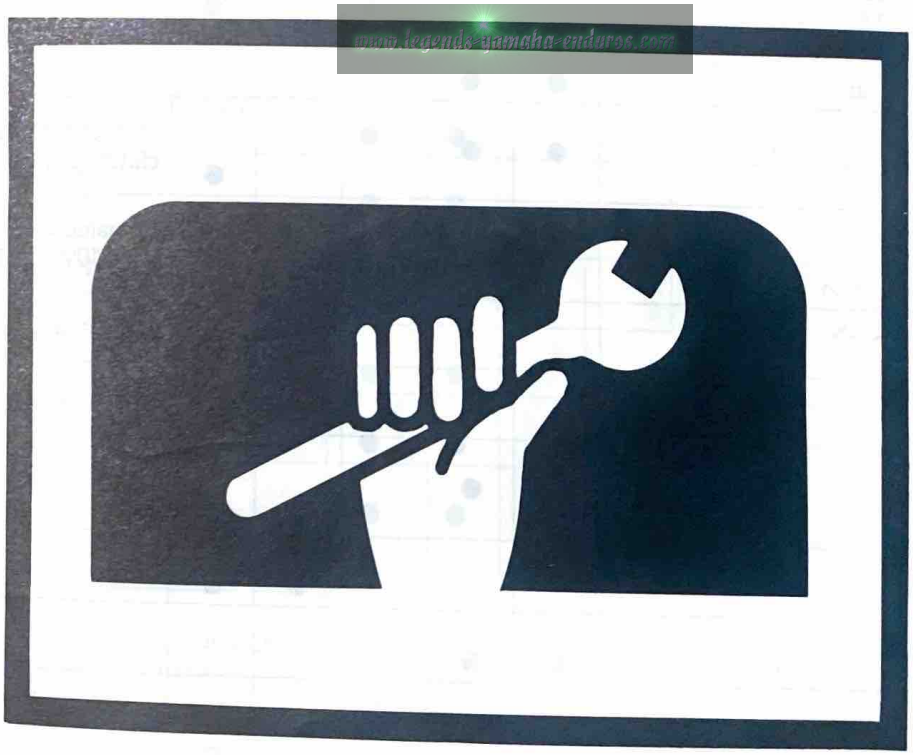


HANDLE CROWN AND LOWER HOLDER

Part name	Type	Part number	Dimension
Handle crown ①	YZ125	4DB-23435-00	+7.5 mm (0.30 in)
	YZ250 (WR250Z)	4DA-23435-00	−4.5 mm (0.18 in)
Handle lower holder ②	YZ125	3SR-23442-00	25.6 mm (1.01 in)
	WR250Z (YZ250)	3SP-23442-00	34 mm (1.34 in)

MEMO

CHAPTER 3
REGULAR INSPECTION AND ADJUSTMENTS



MAINTENANCE INTERVALS

The following schedule is intended as a general guide to maintenance and lubrication. Bear in mind that such factors as weather, terrain, geographical location, and individual usage will alter the required maintenance and lubrication intervals. If you are a doubt as to what intervals to follow in maintaining and lubricating your machine, consult your Yamaha dealer.

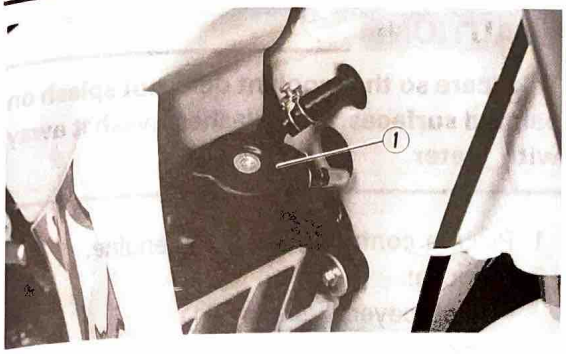
Item	After break-in	Every race	Every third	Every fifth	As required	Remarks
PISTON Inspect and clean Replace	●	●		●	●	Inspect crack Remove carbon
PISTON RING Inspect Replace	●	●	●		●	Check ring end gap
PISTON PIN, SMALL END BEARING Inspect Replace		●			●	
CYLINDER HEAD Inspect and clean Retighten	● ●	● ●				Remove carbon Check gasket
CYLINDER Inspect and clean Replace	●	●			●	Seizure Wear
Y.P.V.S. Inspect and clean	●	●				
CLUTCH Inspect and adjust Replace	●	●			●	Inspect friction plate, clutch plate and spring
TRANSMISSION Replace oil Inspect transmission	●			●	●	Yamalube 4 (10W-30) or SAE 10W30 SE motor oil
SHIFT CAM, FORK Inspect					●	Inspect wear
ROTOR NUT Retighten	●			●		
MUFFLER Inspect Clean	●	●		●		
CRANK Inspect and clean				●	●	
CARBURETOR Inspect, adjust and clean	●	●				
SPARK PLUG Inspect and clean Replace	●	●			●	
DRIVE CHAIN Lubricate, slack, alignment Replace	●	●			●	Use chain lube Chain slack: 30 ~ 35 mm (1.2 ~ 1.4 in)

MAINTENANCE INTERVALS

INSP ADJ

Item	After break-in	Every race	Every third	Every fifth	As required	Remarks
COOLING SYSTEM						
Check coolant level and leakage	●	●				
Check radiator cap operation					●	
Replace coolant					●	Every two years
Inspect hoses		●				
OUTSIDE NUTS AND BOLTS						Refer to the "STARTING AND BREAK-IN" in CHAPTER 1. GENERAL INFORMATION.
Retighten	●	●				
AIR FILTER						Use foam air-filter oil
Clean and lubricate	●	●				
Replace					●	
FRAME						
Clean and inspect	●	●				
FUEL TANK, COCK						
Clean and inspect	●		●			
BRAKES						
Adjust free play	●	●				
Lubricate pivot point	●	●				
Check fluid level and leakage	●	●				
Retighten brake disc bolts, caliper bolts and union bolts	●	●				
Replace pads					●	
FRONT FORKS						
Inspect and adjust	●	●				
Replace oil	●			●		Suspension oil "01"
Replace oil seal					●	
FRONT FORK OIL SEAL AND DUST SEAL						
Clean and lube	●	●				Lithium base grease
REAR SHOCK						
Inspect and adjust	●	●				
Lube and retighten	●	●				Lithium base grease
CHAIN GUARD AND ROLLERS						
Inspect	●	●				
SWINGARM						
Inspect and retighten	●	●				
RELAY ARM, CONNECTING ROD						
Inspect and lube	●	●				Lithium base grease
STEERING HEAD						
Inspect free play and retighten	●	●				
Clean and lube				●		Lithium base grease
Replace bearing					●	
TIRE, WHEELS						
Inspect air pressure, wheel run-out, tire wear and spoke looseness	●	●				
Retighten sprocket bolt	●	●				
Inspect bearings			●			
Replace bearings					●	
Lubricate			●			Lithium base grease
THROTTLE, CONTROL CABLE						
Check routing and connection	●	●				Yamaha cable lube or SAE 10W30 motor oil
Lubricate	●	●				

MEMO



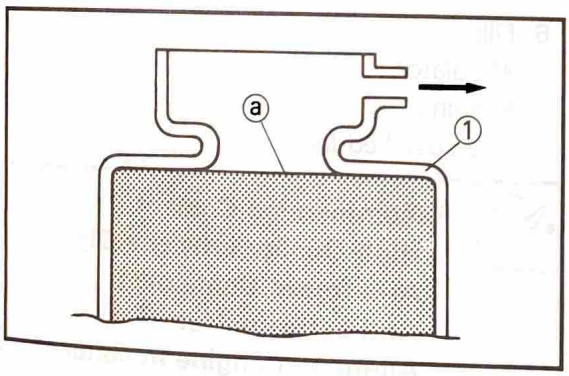
COOLANT LEVEL INSPECTION

CAUTION:

Hard water or salt water is harmful to the engine parts. You may use distilled water, if you can't get soft water.

⚠ WARNING

Do not remove the radiator cap ①, drain bolt and hoses when the engine and radiator are hot. Scalding hot fluid and steam may be blown out under pressure, which could cause serious injury.
When the engine has cooled, place a thick towel over the radiator cap, slowly rotate the cap counterclockwise to the detent. This procedure allows any residual pressure to escape. When the hissing sound has stopped, press down on the cap while turning counterclockwise and remove it.



1. Place the machine on a level place, and hold it in an upright position.
2. Remove:
   • Radiator cap
3. Check:
   • Coolant level ⓐ
     Coolant level low→Add coolant.

① Radiator

COOLANT REPLACEMENT

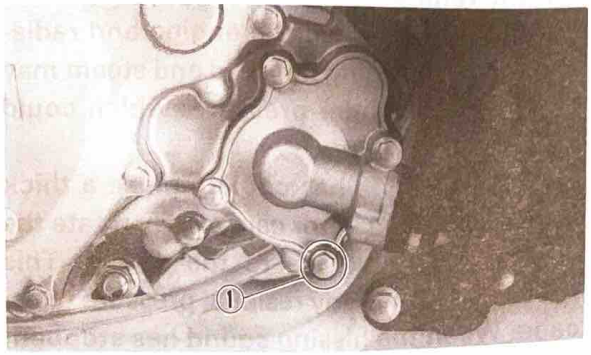
⚠ WARNING

Do not remove the radiator cap when the engine is hot.

INSP ADJ

CAUTION:

Take care so that coolant does not splash on painted surfaces. If it splashes, wash it away with water.

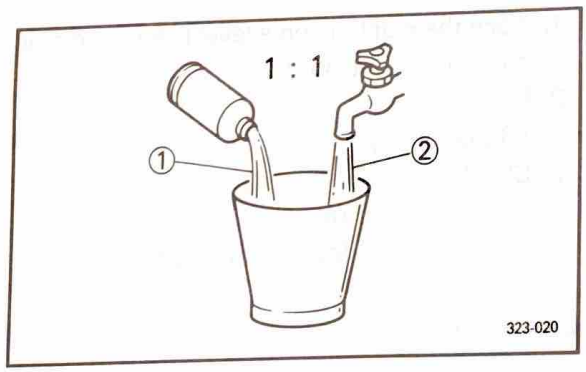


1. Place a container under the engine.
2. Remove:
   - Pump cover drain bolt ①
3. Remove:
   - Radiator cap

   Drain the coolant completely.
4. Clean:
   - Cooling system

   Thoroughly flush the cooling system with clean tap water.
5. Install:
   - Drain bolts (with copper washer)

Drain Bolt:
12 Nm (1.2 m•kg, 8.7 ft•lb)



6. Fill:
   - Radiator
   - Engine

   To specified level.

Recommended Coolant:
High Quality Ethylene Glycol Anti-freeze Containing Anti-corrosion for Aluminum Engine Inhibitors
Coolant ① and Water (Soft Water) ②
Mixed Ratio:
50%/50%
1.1 L (0.97 Imp qt, 1.16 US qt)

CAUTION:

- **Do not mix more than one type of ethylene glycol antifreeze containing corrosion inhibitors for aluminum engine.**
- **Do not use water containing impurities or oil.**

Handling notes of coolant:
The coolant is harmful so it should be handled with special care.

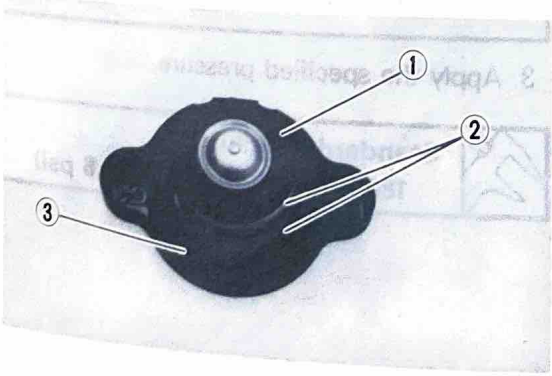
⚠ WARNING

- **When coolant splashes to your eye. Thoroughly wash your eye with water and see your doctor.**
- **When coolant splashes to your clothes. Quickly wash it away with water and then with soap.**
- **When coolant is swallowed. Quickly make him vomit and take him to a doctor.**

7. Install:
   - Radiator cap

   Start the engine and warm it up for a several minute.
8. Check:
   - Coolant level

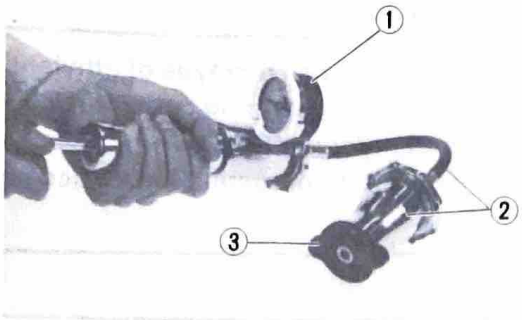
   Coolant level low→Add coolant.



RADIATOR CAP INSPECTION

1. Inspect:
   - Seal (radiator cap) ①
   - Valve and valve seat ②

   Crack/Damage→Replace.
   Exist fur deposits ③→Clean or replace.



RADIATOR CAP OPENING PRESSURE INSPECTION

1. Attach:
   - Radiator cap tester ① and adapter ②

Radiator Cap Tester:
YU-24460-01/90890-01325
Adapter:
YU-33984/90890-01352

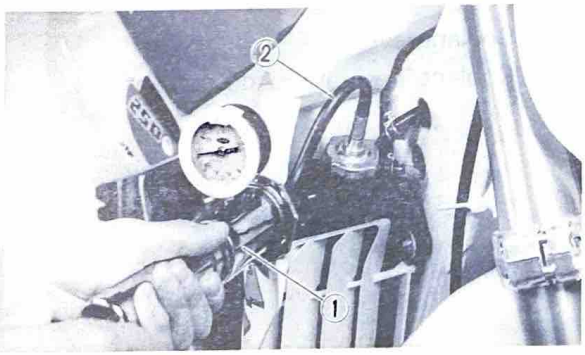
NOTE:
Apply water on the radiator cap seal.

③ Radiator cap

2. Apply the specified pressure.

Valve Opening Pressure:
95 ~ 125 kPa (0.95 ~ 1.25 kg/cm², 13.5 ~ 17.8 psi)

3. Inspect:
   - Pressure
     Impossible to maintain the specified pressure for 10 seconds → Replace.



COOLING SYSTEM INSPECTION

1. Inspect:
   - Coolant level
2. Attach:
   - Radiator cap tester ① and adapter ②

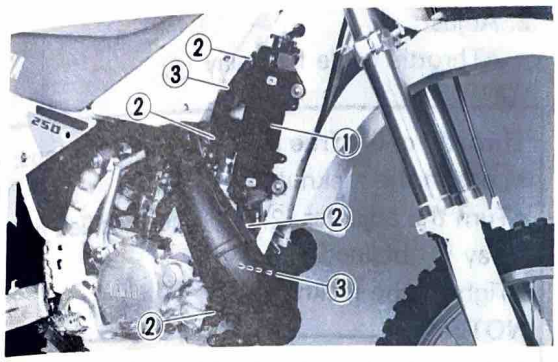
Radiator Cap Tester:
YU-24460-01/90890-01325
Adapter:
YU-33984/90890-01352

3. Apply the specified pressure.

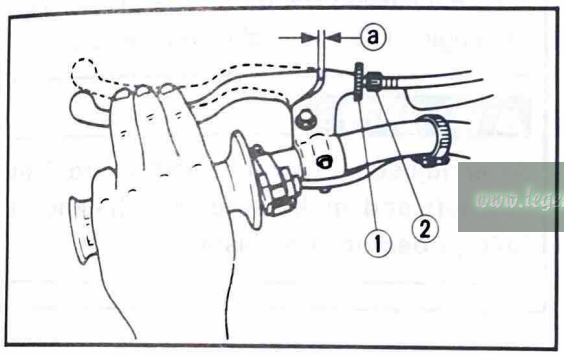
Standard Pressure:
180 kPa (1.8 kg/cm², 25.6 psi)

NOTE:

- Do not apply pressure more than specified pressure.
- Radiator should be filled fully.



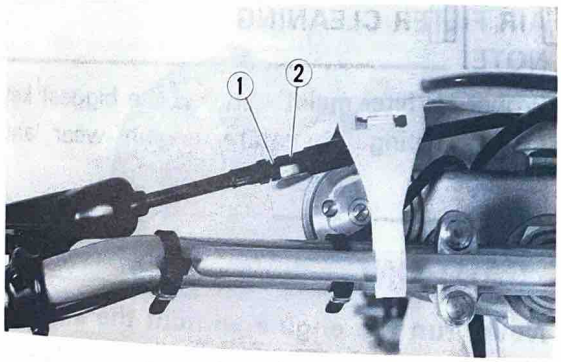
4. Inspect:
   - Pressure
     Impossible to maintain the specified pressure for 10 seconds→Repair.
   - Radiator ①
   - Radiator hoses joint ②
     Coolant leakage→Repair or replace.
   - Radiator hoses ③
     Swelling→Replace.



CLUTCH ADJUSTMENT

1. Check:
   - Clutch lever free play ⓐ
     Out of specification→Adjust

Clutch Lever Free Play ⓐ:
2~3 mm (0.08~0.12 in)



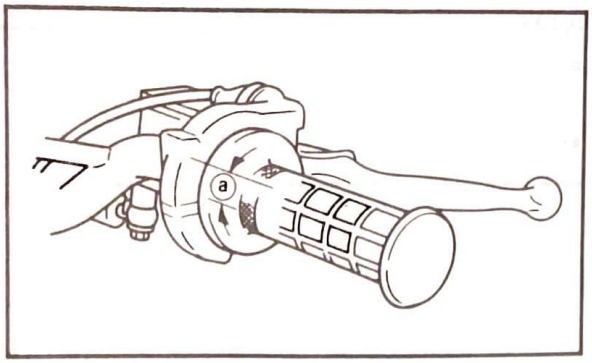
2. Adjust:
   - Clutch lever free play

Clutch lever free play adjustment steps:

- Loosen the looknut ①.
- Turn the adjuster ② until free play ⓐ is within the specified limits.
- Tighten the locknut.

NOTE:

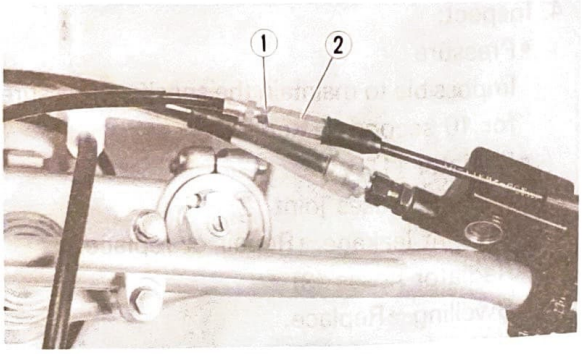
After adjustment, check proper operation of clutch lever.



THROTTLE CABLE ADJUSTMENT

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

Free Play ⓐ:
3 ~ 5 mm (0.12 ~ 0.20 in)



2. Adjust:
   - Throttle cable free play ⓐ

Throttle cable free play adjustment steps:
- Loosen the locknut ①.
- Turn the adjuster ② until the specified free play is obtained.
- Tighten the locknut.

NOTE:

Before adjusting the throttle cable free play, the engine idle speed should be adjusted.

⚠ WARNING

After adjusting, turn the handlebar to right and left and make sure that the engine idling does not run faster.

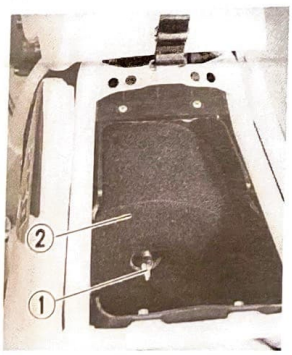
AIR FILTER CLEANING

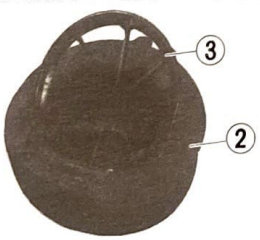
NOTE:

Proper air filter maintenance is the biggest key to preventing premature engine wear and damage.

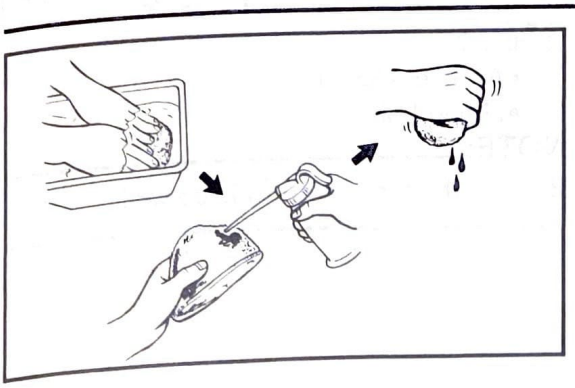
CAUTION:

Never run the engine without the air filter element in place; this would allow dirt and dust to enter the engine and cause rapid wear and possible engine damage.





1. Remove:
   - Seat
   - Fitting bolt ①
   - Air filter element ②
   - Spring washer
   - Washer
   - Filter guide ③



2. Clean:
   - Air filter element
     Clean them with solvent.

NOTE:

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

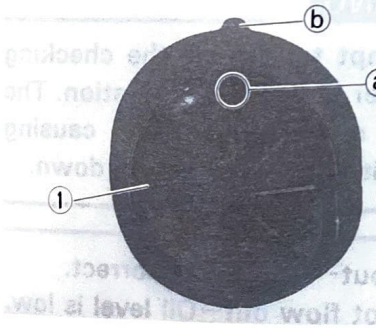
CAUTION:

Do not twist the element when squeezing the element.

3. Inspect:
   - Air filter element
     Damage→Replace.
4. Apply:
   - Foam-air-filter oil
     To the element.

NOTE:

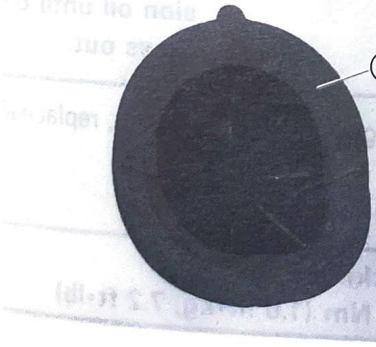
Squeeze out the excess oil. Element should be wet but not dripping.



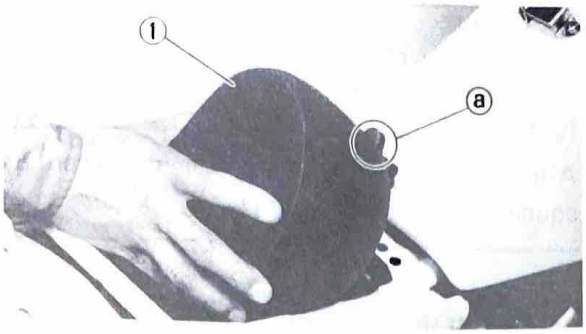
5. Install:
   - Filter guide ①

NOTE:

Align the top mark ⓐ on filter guide with the projection ⓑ on air filter element.



6. Apply:
   - Lithium soap base grease
     On-to the matching surface ⓐ on air filter element.

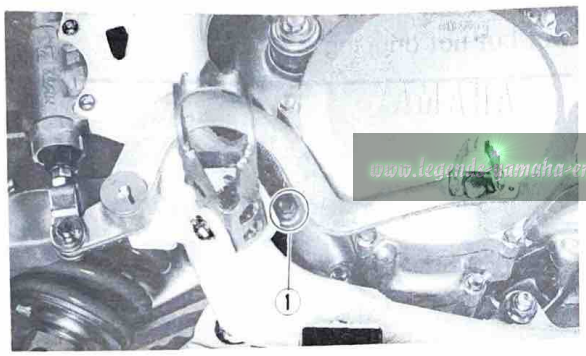


9. Install:
   - Air filter element ①
   - Fitting bolt

NOTE:
Be sure the projection ⓐ is upward.

TRANSMISSION OIL LEVEL CHECK

1. Start the engine, warm it up for several minutes and wait for five minutes.
2. Place the machine on a level place and hold it up on upright position by placing the suitable stand under the engine.



3. Check:
   - Transmission oil level

Transmission oil level checking steps:
- Remove the checking bolt ①.
- Inspect the oil level.

NOTE:
Be sure the machine is positioned straight up when inspecting the oil level.

⚠ WARNING

Never attempt to remove the checking bolt just after high speed operation. The heated oil could spout out, causing danger. Wait until the oil cools down.

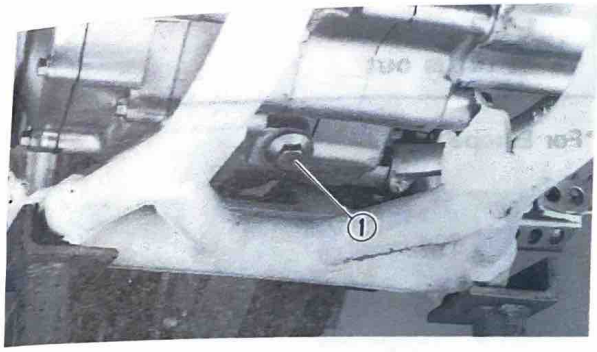
Oil flows out→Oil level is correct.
Oil does not flow out→Oil level is low. Add transmission oil until oil flows out.

- Inspect the gasket (checking bolt), replace if damaged.
- Tighten the checking bolt.

Checking Bolt:
10 Nm (1.0 m•kg, 7.2 ft•lb)

TRANSMISSION OIL REPLACEMENT

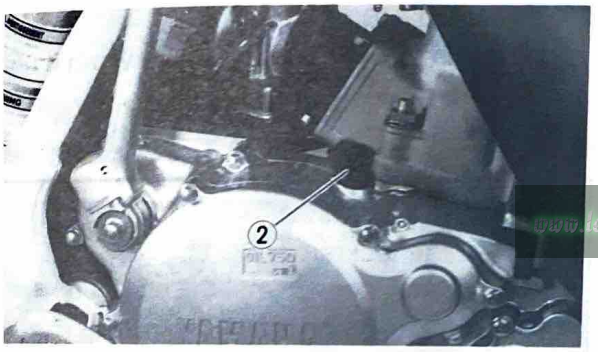
1. Start the engine and warm it up for several minutes and wait for five minute.
2. Place the machine on a level place and hold it on upright position by placing the suitable stand under the engine.
3. Place a suitable container under the engine.



4. Remove:
   - Drain bolt ①
   - Oil filler cap ②

   Drain the transmission oil.
5. Install:
   - Drain bolt ①

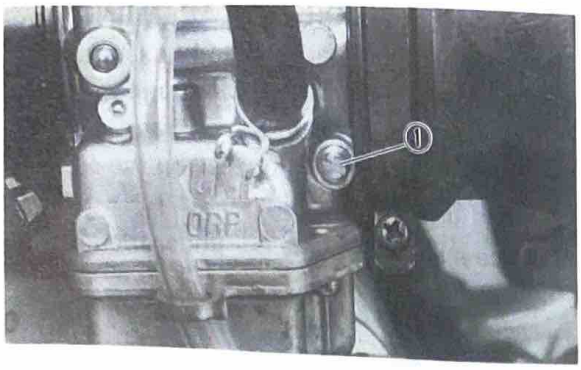
Drain Bolt:
20 Nm (2.0 m•kg, 14 ft•lb)



6. Fill:
   - Transmission oil

Recommended Oil:
Yamalube 4 (10W-30) or 10W-30 Type SE Motor Oil
Oil Capacity
(Periodic Oil Change):
0.75 L (0.66 Imp qt, 0.79 US qt)

7. Check:
   - Oil leakage
8. Check:
   - Transmission oil level
9. Install:
   - Oil filler cap ②



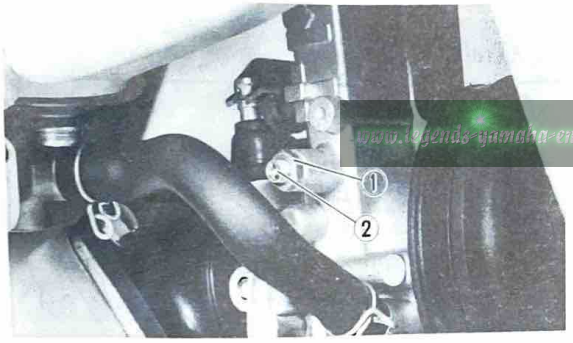
AIR SCREW ADJUSTMENT

1. Adjust:
   - Air screw

Adjusting steps:
- Screw in the pilot air screw ① until it is lightly seated.
- Back out by the specified number of turns.

Pilot Air Screw:
1-1/2 turns out
***1 turns out**

*For Europe



IDLE SPEED ADJUSTMENT

1. Start the engine and thoroughly warm it up.
2. Adjust:
   - Idle speed

Adjustment steps:
- Loosen the locknut ①.
- Turn the adjuster ② until the engine runs at the lowest possible speed.
- Tighten the locknut.

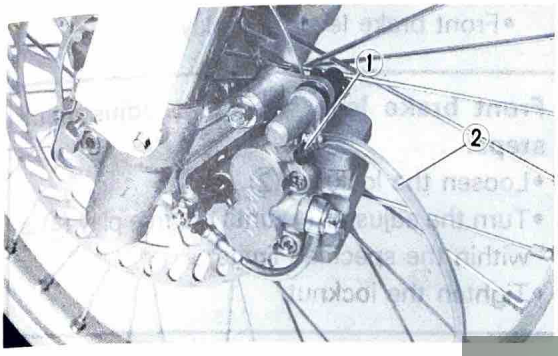
BRAKE SYSTEM AIR BLEEDING

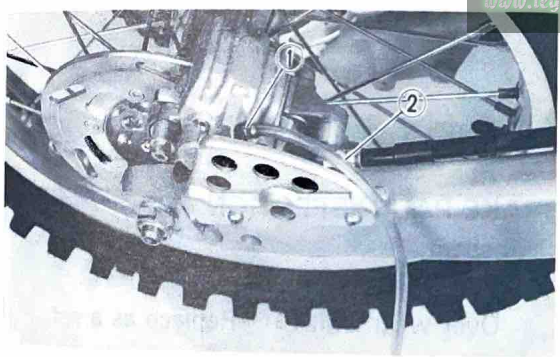
⚠ WARNING

Bleed the brake system if:
- **The system has been disassembled.**
- **A brake hose has been loosened or removed.**
- **The brake fluid is very low.**
- **The brake operation is faulty.**

A dangerous loss of braking performance may occur if the brake system is not properly bled.

1. Bleed:
   - Brake fluid





Air bleeding steps:

a. Add proper brake fluid to the reservoir.
b. Install the diaphragm. Be careful not to spill any fluid or allow the reservoir to overflow.
c. Connect the clear plastic tube ② tightly to the caliper bleed screw ①.
d. Place the other end of the tube into a container.
e. Slowly apply the brake lever or pedal several times.
f. Pull the lever in or push down on the pedal. Hold the lever or pedal in position.
g. Loosen the bleed screw and allow the lever or pedal to travel towards its limit.
h. Tighten the bleed screw when the lever or pedal limit has been reached; then release the lever or pedal.

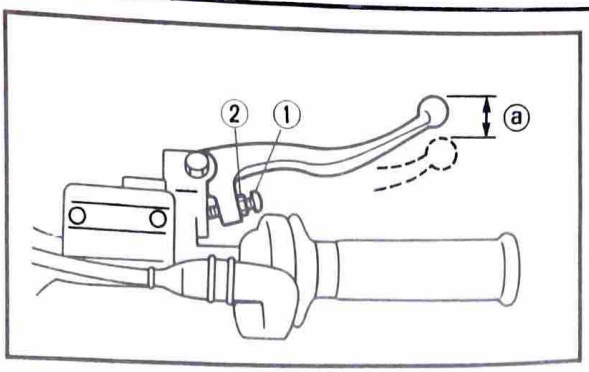
Bleed Screw:
6 Nm (0.6 m•kg, 4.3 ft•lb)

i. Repeat steps (e) to (h) until of 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 disappered.

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



FRONT BRAKE ADJUSTMENT

CAUTION:

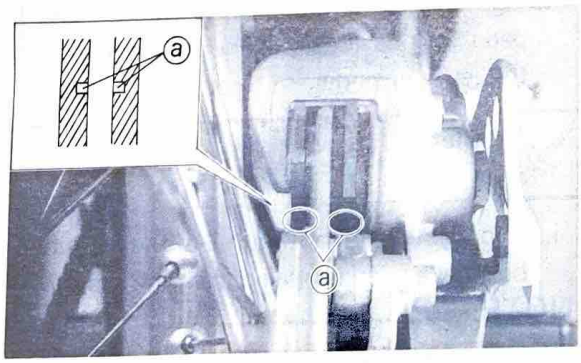
Proper lever free play is essential to avoid excessive brake drag.

1. Check:
   - Front brake lever free play ⓐ
     Out of specification→Adjust.

Front Brake Lever Free Play ⓐ:
10~20 mm (0.4~0.8 in)

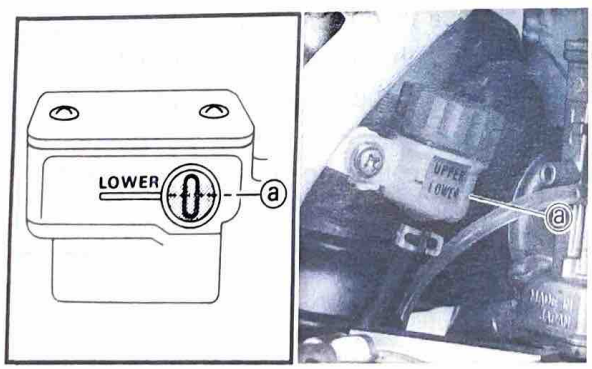
2. Adjust:
   - Front brake lever free play

Front brake lever free play adjustment steps:
- Loosen the locknut ②.
- Turn the adjuster ① until the free play ⓐ is within the specified limits.
- Tighten the locknut.



BRAKE PAD INSPECTION

1. Inspect:
   - Brake pads
     Over wear limit ⓐ→Replace as a set.



BRAKE FLUID LEVEL INSPECTION

1. Place the master cylinder so that its top is in a horizontal position.
2. Inspect:
   - Brake fluid level
     Fluid at lower level→Fill up.

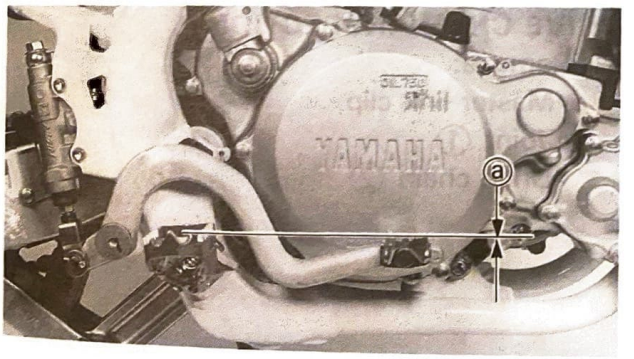
ⓐ Lower level

Recommended Brake Fluid:
DOT #4

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

⚠ WARNING

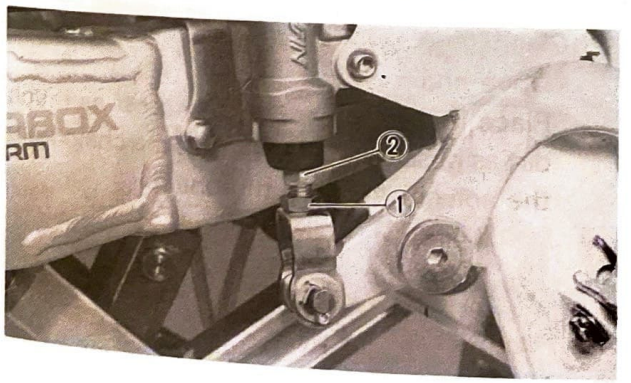
- **Use only designated quality brake fluid to avoid poor brake performance.**
- **Refill with same type and brand of brake fluid; mixing fluids could result in poor brake performance.**
- **Be sure that water or other contaminants do not enter master cylinder when refilling.**
- **Clean up spilled fluid immediately to avoid erosion of painted surfaces or plastic parts.**



REAR BRAKE ADJUSTMENT

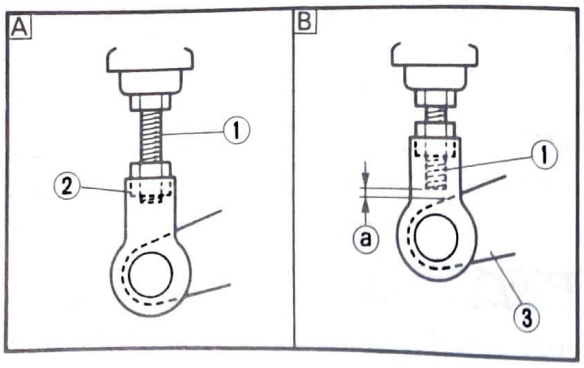
1. Check:
   - Brake pedal height
     Out of specification→Adjust.

Brake Pedal Height ⓐ:
Zero mm (Zero in)



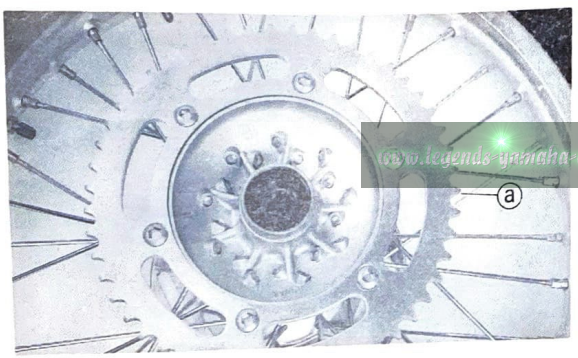
2. Adjust:
   - Brake pedal height

Pedal height adjustment steps:
- Loosen the locknut ①.
- Turn the adjusting nut ② until the pedal height ⓐ is within specified height.
- Tighten the locknut.



⚠ WARNING

- **Adjust the pedal height between the Maximum [A] and the Minimum [B] as shown. (In this adjustment the bolt ① end should protrude out of the lower adjusting nut ② but not be less than 2 mm (0.08 in) away from the brake pedal ③).**
- **After the pedal height adjustment, make sure that the rear brake does not drag.**

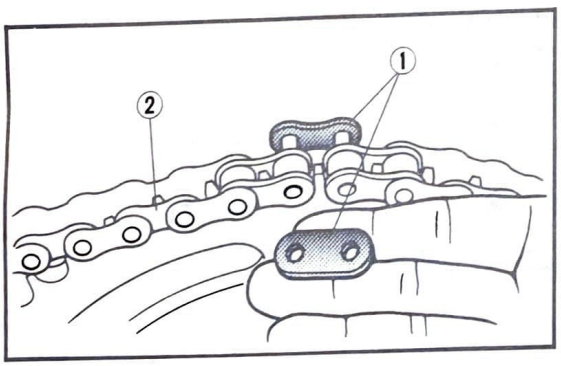


SPROCKETS INSPECTION

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

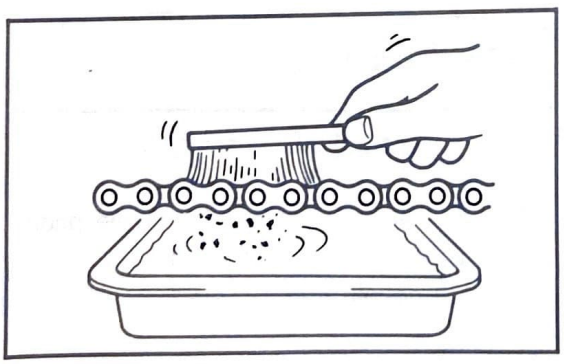
NOTE:

Replace the drive, driven sprockets and drive chain as a set.

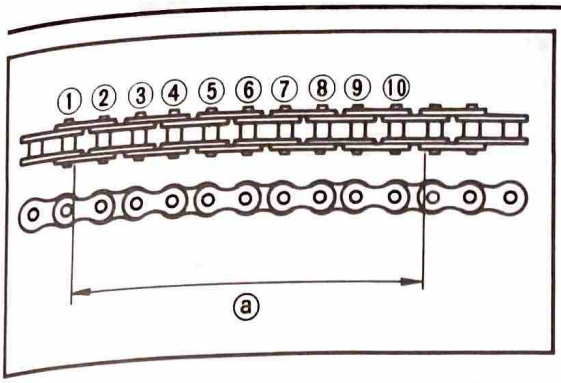


DRIVE CHAIN INSPECTION

1. Remove:
   - Master link clip
   - Joint ①
   - Drive chain ②

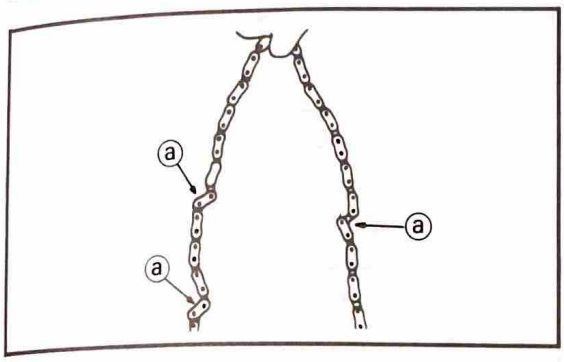


2. Clean:
   - Drive chain
     Place it in solvent, and brush off as much dirt as possible. Then remove the chain from the solvent and dry the chain.

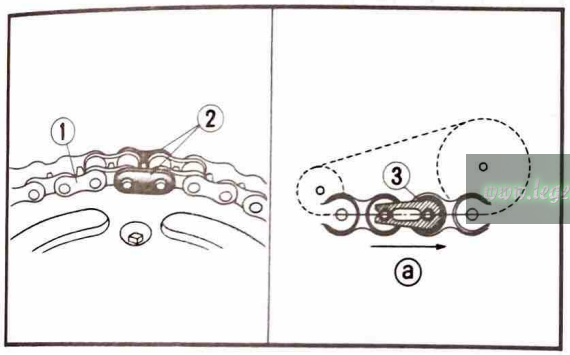


3. Measure:
   • Drive chain length (10 links) ⓐ
   Out of specification → Replace.

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



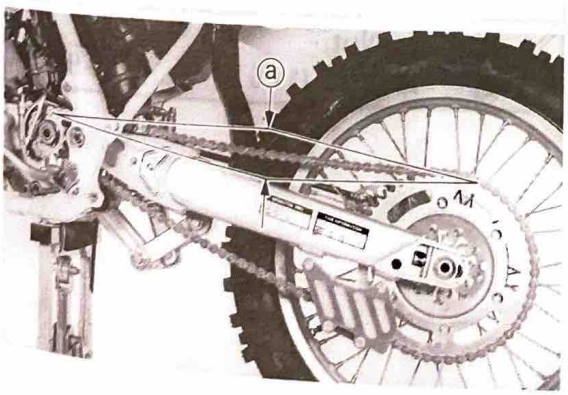
4. Check:
   • Drive chain stiffness ⓐ
   Clean and oil the chain and hold as illustrated.
   Stiff → Replace drive chain.



5. Install:
   • Drive chain ①
   • Joint ②
   • Master link clip ③

NOTE:
During reassembly, the master link clip must be installed with the rounded end facing the direction of travel.

ⓐ Turning direction

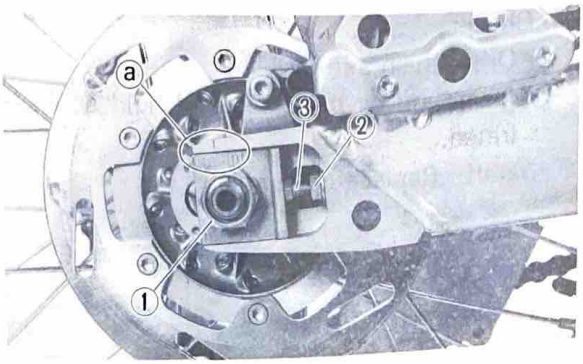


DRIVE CHAIN SLACK ADJUSTMENT

1. Eleveate the rear wheel by placing the suitable stand under the engine.
2. Check:
   • Drive chain slack ⓐ
   Out of specification → Adjust.

Drive Chain Slack:
30 ~ 35 mm (1.2 ~ 1.4 in)

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



3. Adjust:
   • Drive chain slack

Drive chain slack adjustment steps:
- Loosen the axle nut ① and locknut ②.
- Adjust chain slack by turning the adjuster ③.

To Tighten → Turn adjuster ③ counter-clockwise.
To Loosen → Turn adjuster ③ clockwise and push wheel forward.

- Turn each adjuster exactly the same amount to maintain correct axle alignment. (There are marks ⓐ on each side of chain puller alignment.)

NOTE:
Turn the adjuster so that the chain is in line with the sprocket, as viewed from the rear.

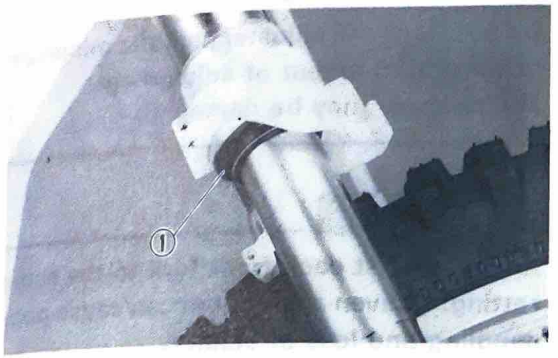
CAUTION:
Too small chain slack will overload the engine and other vital parts; keep the slack within the specified limits.

- Tighten the axle nut while pushing down the drive chain and locknuts.

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

FRONT FORK INSPECTION

1. Inspect:
   - Front fork smooth action
     Operate the front brake and stroke the front fork.
     Unsmooth action/oil leakage→Repair or replace.

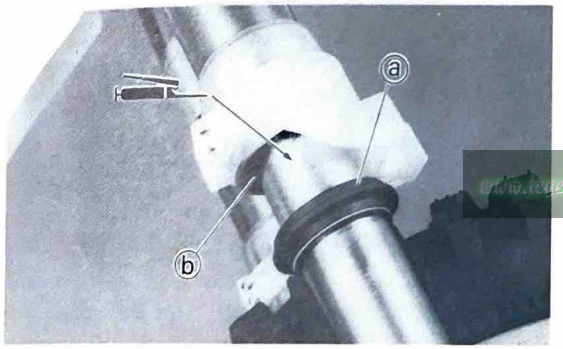


FRONT FORK OIL SEAL AND DUST SEAL CLEANING

1. Remove:
   - Protector
   - Dust seal ①

NOTE:

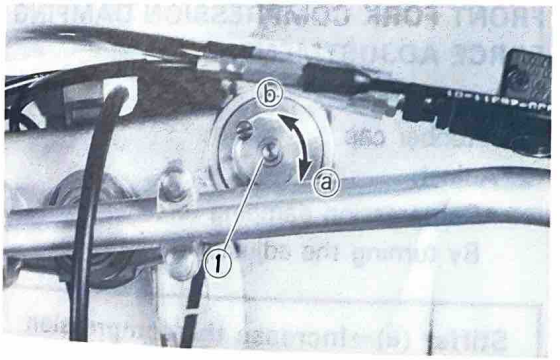
Use a thin screw driver, and be careful not to damage the inner fork tube and dust seal.



2. Clean:
   - Dust seal ⓐ
   - Oil seal ⓑ

NOTE:

Apply the lithium soap base grease on the inner tube.



FRONT FORK REBOUND DAMPING FORCE ADJUSTMENT

1. Adjust:
   - Rebound damping force
     By turning the adjuster ①.

Stiffer ⓐ→	**Increase the rebound damping force. (Turn the adjuster ① in.)**
Softer ⓑ→	**Decrease the rebound damping force. (Turn the adjuster ① out.)**

Extent of Adjustment:	
Maximum	**Minimum**
Fully turned in position	**20 clicks out (From maximum position**

•STANDARD POSITION:
This is the position which is back by the specific number of clicks from the fully turned-in position.

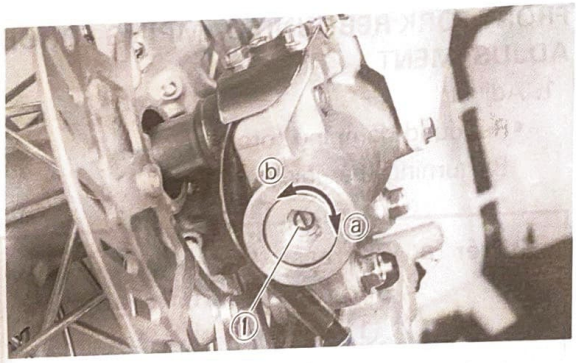
STANDARD POSITION:
13 Clicks Out

CAUTION:

Do not force the adjuster past the minimum or maximum extent of adjustment. The adjuster may be damaged.

⚠ WARNING

Always adjust each front fork to the same setting. Uneven adjustment can cause poor handling and loss of stability.



FRONT FORK COMPRESSION DAMPING FORCE ADJUSTMENT

1. Remove:
   •Rubber cap
2. Adjust:
   •Compression damping force
   By turning the adjuster ①.

Stiffer ⓐ → Increase the compression damping force. (Turn the adjuster ① in.)
Softer ⓑ → Decrease the compression damping force. (Turn the adjuster ① out.)

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Extent of Adjustment:	
Maximum	Minimum
Fully turned in position	20 clicks out (From maximum position)

•STANDARD POSITION:
This is the position which is back by the specific number of clicks from the fully turned-in position.

STANDARD POSITION:
10 Clicks Out
*11 Clicks Out

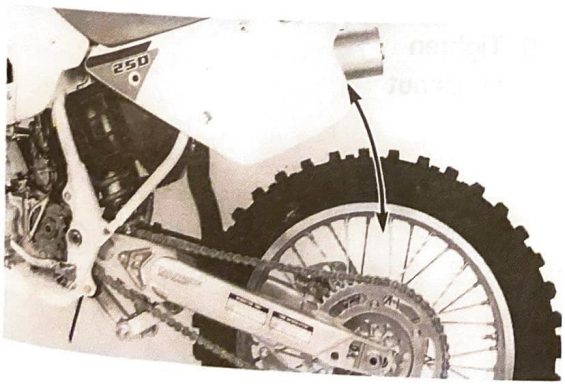
*For Europe

CAUTION:

Do not force the adjuster past the minimum or maximum extent of adjustment. The adjuster may be damaged.

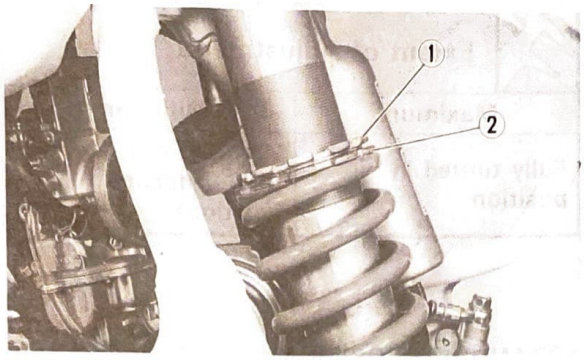
⚠ WARNING

Always adjust each front fork to the same setting. Uneven adjustment can cause poor handling and loss of stability.



REAR SHOCK ABSORBER INSPECTION

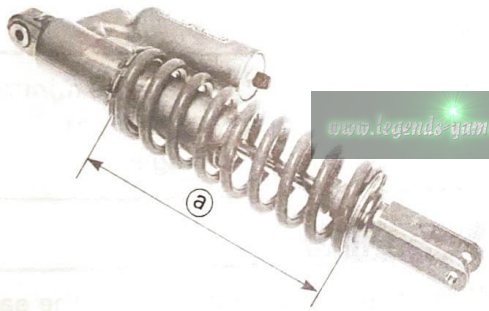
1. Inspect:
   •Swingarm smooth action
   Abnormal noise/Unsmooth action→
   Grease the pivoting points or repair the pivoting points.
   Damage/Oil leakage→Replace.



REAR SHOCK ABSORBER SPRING PRELOAD ADJUSTMENT

1. Remove:
   - Back stay
   - Air cleaner case
2. Elevate the rear wheel by placing the suitable stand under the engine.
3. Loosen:
   - Locknut ①
4. Adjust:
   - Spring preload
     By turning the adjuster ②.

Stiffer→Increase the spring preload. (Turn the adjuster ② in.)
Softer→Decrease the spring preload. (Turn the adjuster ② out.)



Spring Length (Installed):

Standard position ⓐ	Extent of adjustment
247 mm (9.72 in)	241.5 ~ 260.5 mm (9.51 ~ 10.26 in)

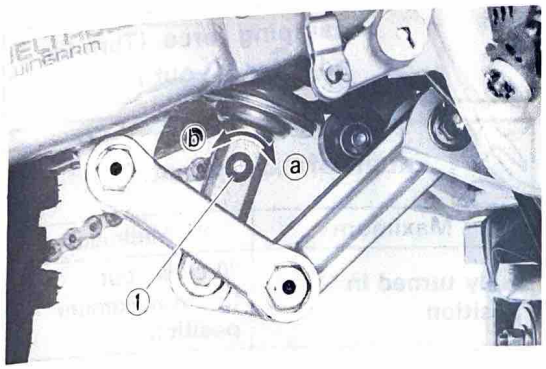
NOTE:

The length of the spring (installed) changes 1.5 mm (0.06 in) per turn of the adjuster.

CAUTION:

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

5. Tighten
   - Locknut



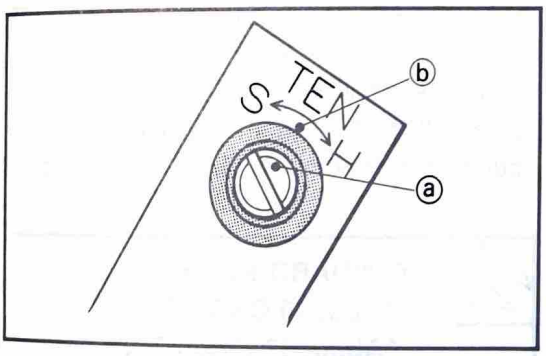
REAR SHOCK ABSORBER REBOUND DAMPING FORCE ADJUSTMENT

1. Adjust:
   - Rebound damping force
     By turning the adjuster ①.

Stiffer ⓐ → Increase the rebound damping force. (Turn the adjuster ① in.)
Softer ⓑ → Decrease the rebound damping force. (Turn the adjuster ① out.)

Extent of Adjustment:

Maximum	Minimum
Fully turned in position	20 clicks out (From maximum position)



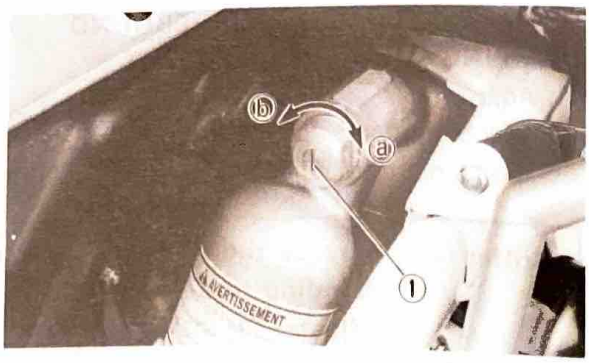
- STANDARD POSITION:
  This is the position which align the punch mark ⓐ on adjuster with punch mark ⓑ on the bracket. (Which is back by the specific number of clicks from the fully turned-in position.)

STANDARD POSITION:
About 8 Clicks Out
***About 7 Clicks Out**

*For Europe

CAUTION:

Do not turn out (in) the adjuster from the damping force minimum (maximum) setting.



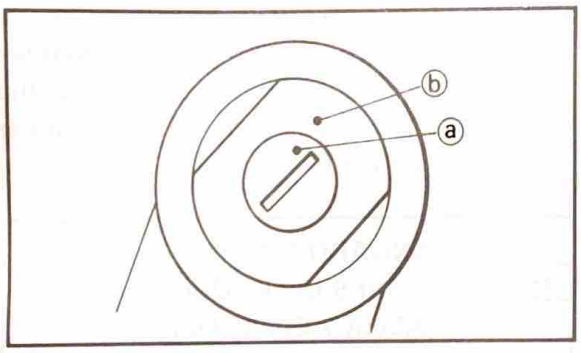
REAR SHOCK ABSORBER COMPRESSION DAMPING FORCE ADJUSTMENT

1. Adjust:
   - Compression damping force
     By turning the adjuster ①.

Stiffer ⓐ → Increase the compression damping force. (Turn the adjuster ① in.)
Softer ⓑ → Decrease the compression damping force. (Turn the adjuster ① out.)

Extent of Adjustment:

Maximum	Minimum
Fully turned in position	20 clicks out (From maximum position



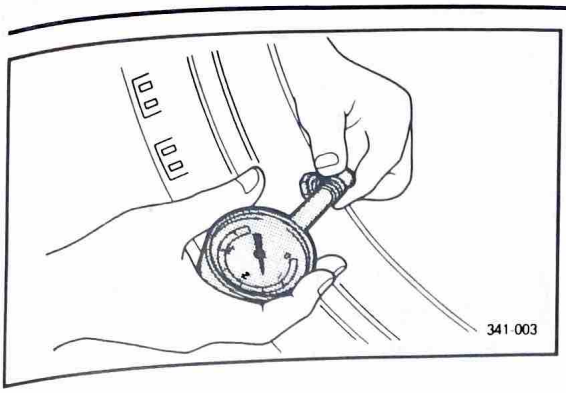
- STANDARD POSITION:
  This is the position which is back by the specific number of clicks from the fully turned-in position. (Which align the punch mark ⓐ on adjuster with punch mark ⓑ on the bracket.)

STANDARD POSITION:
About 10 Clicks Out
***About 19 Clicks Out**

*For Europe

CAUTION:

Do not turn out (in) the adjuster from the damping force minimum (maximum) setting.



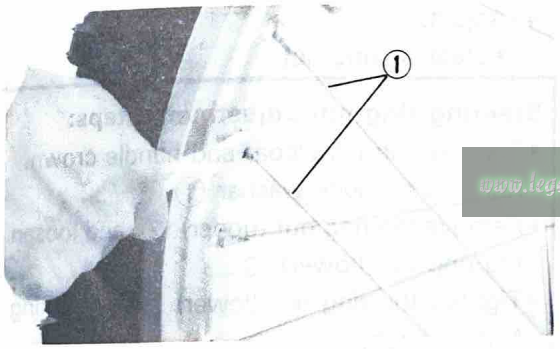
TIRE PRESSURE CHECK

1. Measure:
   - Tire pressure
     Out of specification→Adjust.

Standard Tire Pressure:
100 kPa (1.0 kg/cm², 15 psi)

NOTE:

- Check the tire while it is cold.
- Loose bead stoppers allow the tire to slip off its position on the rim when the tire pressure is low.
- A tilted tire valve stem indicates that the tire slips off its position on the rim.
- If the tire valve stem is found tilted, the tire is considered to be slipping off its position. Correct the tire position.



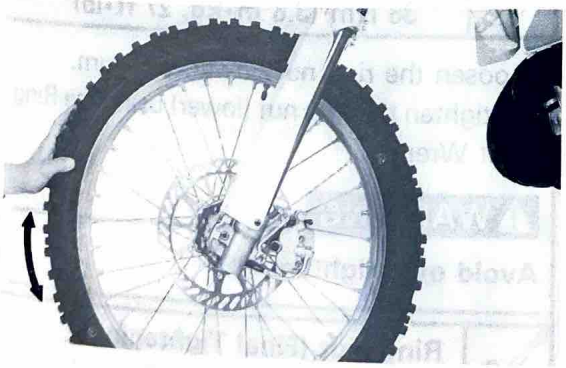
SPOKES INSPECTION AND TIGHTENING

1. Inspect:
   - Spokes ①
     Bend/Damage→Replace.
     Loose spoke→Retighten.
2. Tighten:
   - Spokes

NOTE:

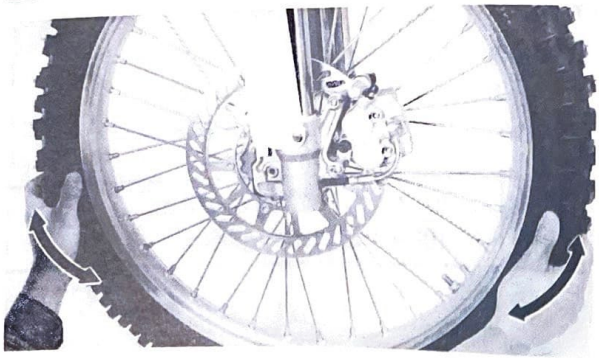
Be sure to retighten these spokes before and after Break-in.
After a practice or a race check spokes for looseness.

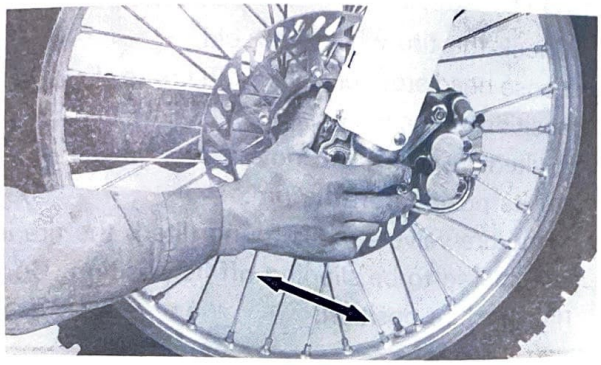
Nipple:
6 Nm (0.6 m•kg, 4.3 ft•lb)

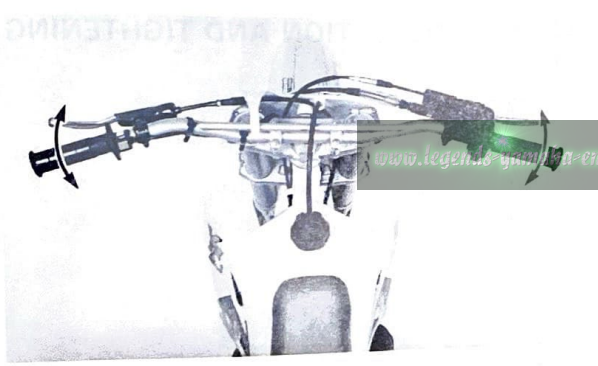


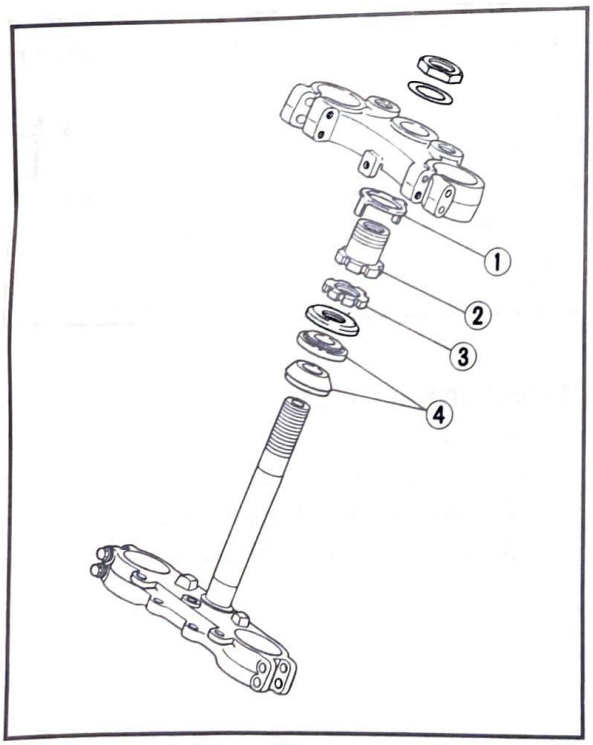
WHEEL INSPECTION

1. Inspect:
   - Wheel runout
     Elevate the wheel and turn it.
     Abnormal runout→Replace.









2. Inspect:
   - Bearing free play
     Exist play → Replace.

STEERING HEAD INSPECTION AND ADJUSTMENT

1. Elevate the front wheel by placing a suitab stand under the engine.
2. Check:
   - Steering stem
     Grasp the bottom of the forks and gently rock the fork assembly back and forth.
     Free play → Adjust steering head.
3. Check:
   - Steering smooth action
     Turn the handlebar lock to lock.
     Unsmooth action → Adjust steering ring nut.
4. Adjust:
   - Steering ring nut

Steering ring nut adjustment steps:
- Remove the handlebar and handle crown.
- Remove the lock washer ①.
- Remove the ring nut (upper) ②, and loosen the ring nut (lower) ③.
- Tighten the ring nut (lower) ③ using Ring Nut Wrench.

NOTE:
Set the torque wrench to the Ring Nut Wrench so that they form a right angle.

④ Steering bearing

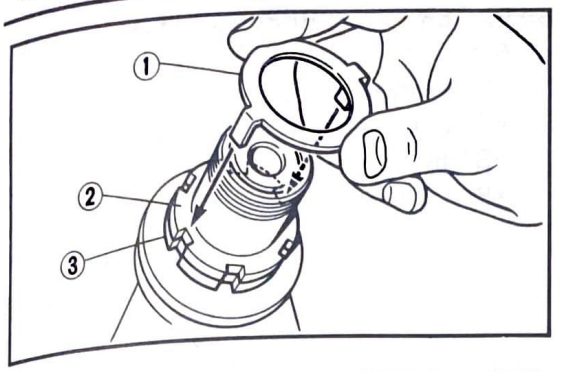
Ring Nut Wrench:
YU-01268/90890-01268
YM-38520/90890-01443

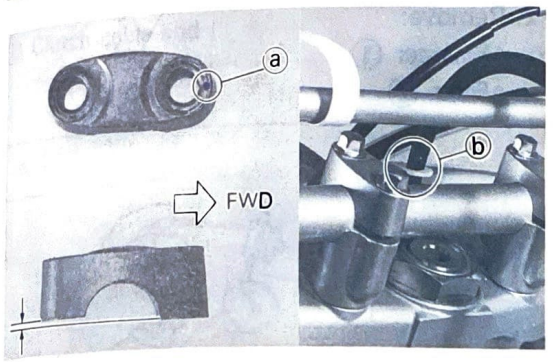
Ring Nut (Initial Tightening):
38 Nm (3.8 m•kg, 27 ft•lb)

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

⚠ WARNING
Avoid over-tightening.

Ring Nut (Final Tightening):
4 Nm (0.4 m•kg, 2.9 ft•lb)





- Check the steering stem by turning it lock to lock. If there is any binding, remove the steering stem assembly and inspect the steering bearings.
- Install the ring nut (upper).
- Finger tighten the ring nut (upper) ②, then align the slots of both ring nuts. If not aligned, hold the ring nut (lower) ③ and tighten the other until they are aligned.
- Install the lock washer ①.

NOTE:

Make sure the lock washer tab is placed in the slots.

- Install the handle crown and handlebar.

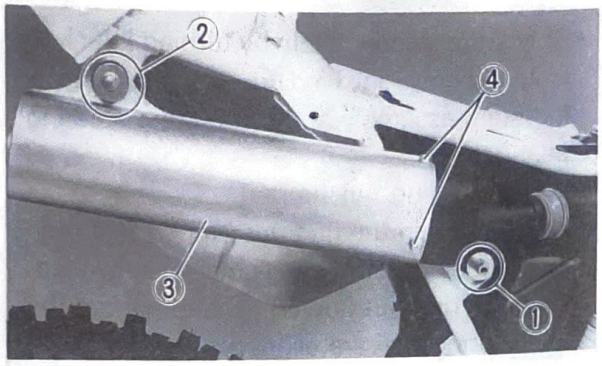
NOTE:

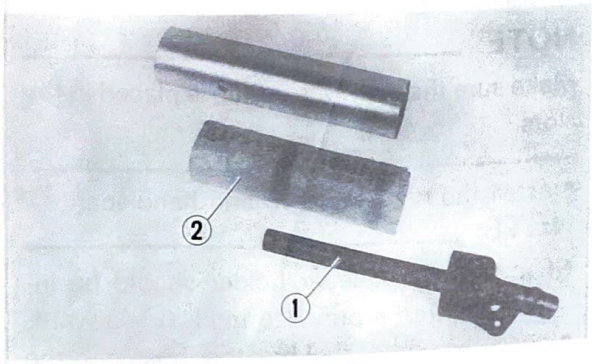
- The upper handlebar holder should be installed with the punched mark ⓐ forward.
- Insert the end of fuel breather hose into the hole of number plate ⓑ.

CAUTION:

First tighten the bolts on the front side of the handlebar holder, and then tighten the bolts on the rear side.

Steering Stem Nut:
115 Nm (11.5 m•kg, 85 ft•lb)
Handlebar Upper Holder:
23 Nm (2.3 m•kg, 17 ft•lb)
Pinch Bolt (Handle Crown):
23 Nm (2.3 m•kg, 17 ft•lb)





SILENCER FIBER REPLACEMENT

1. Remove:
   - Side cover (right)
   - Bolt ①, ②
   - Silencer ③
   - Bolt (silencer) ④

2. Remove:
   - Silencer ①
   - Fiber ②

LUBRICATION

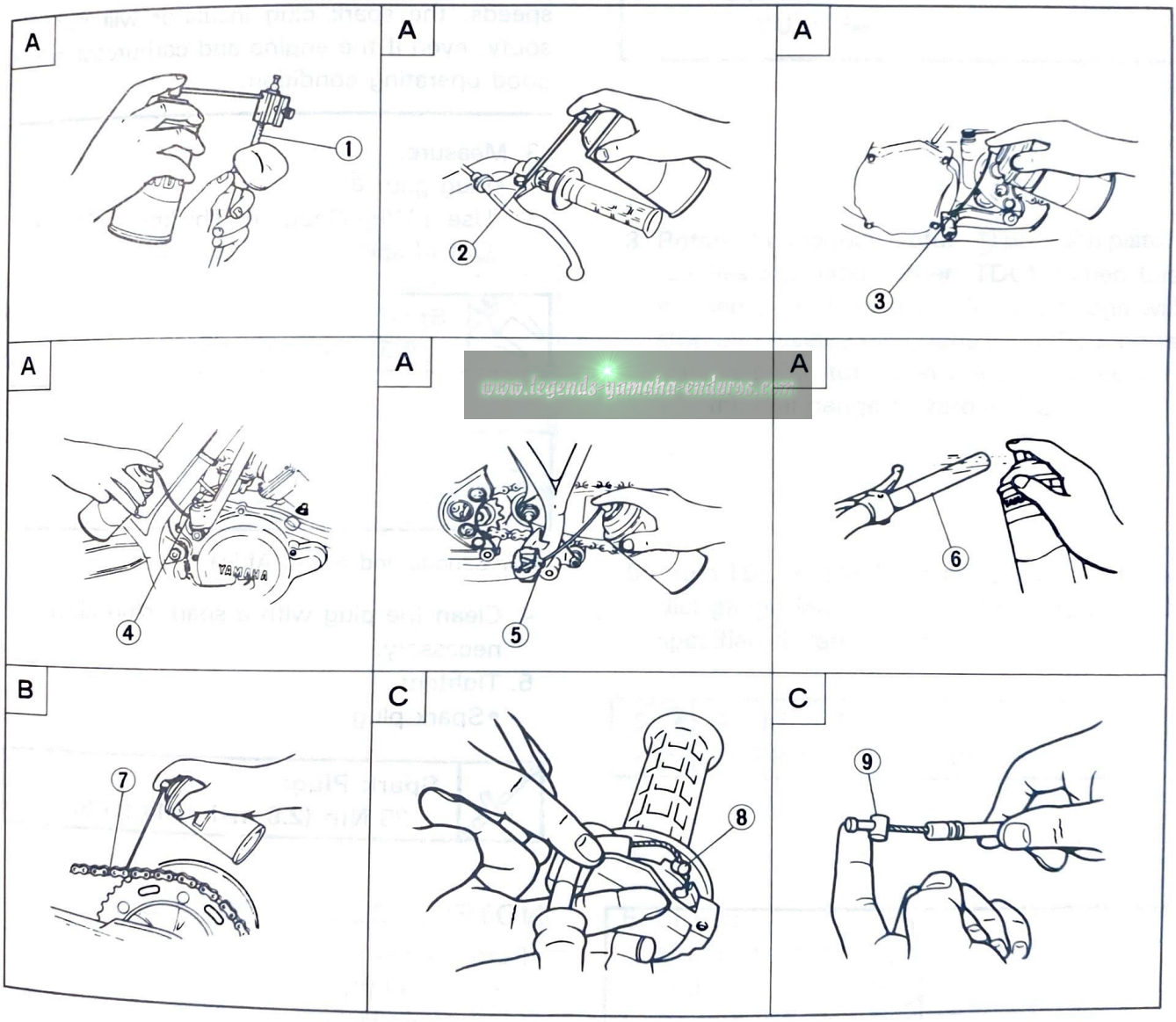
To ensure smooth operation of all components, lubricate your machine during setup, after break-in, and after every race.

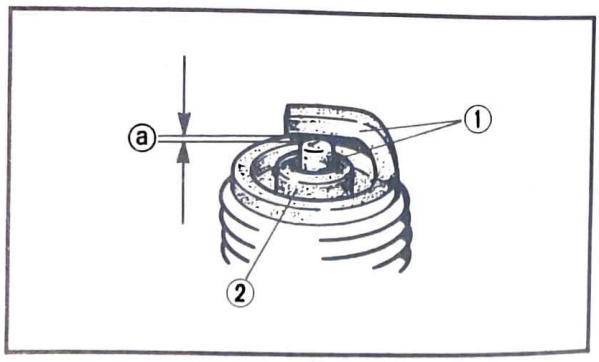
① All control cable
② Brake and clutch lever pivots
③ Shift pedal pivot
④ Kick axle pivot
⑤ Footrest pivot
⑥ Throttle-to-handlebar contact
⑦ Drive chain
⑧ Throttle guide and cable end
⑨ Clutch cable end

[A] Use Yamaha cable lube or equivalent on these areas.
[B] Use Yamaha chain lube or equivalent.
[C] Lubricate the following areas with highquality, lightweight lithium-soap base grease.

CAUTION:

Wipe off any excess grease, and avoid getting grease on the brake discs.





SPARK PLUG INSPECTION

1. Remove:
   - Spark plug
2. 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.

NOTE:
When the engine runs for many hours at low speeds, the spark plug insulator will become sooty, even if the engine and carburetor are in good operating condition.

3. Measure:
   - Plug gap ⓐ
     Use a Wire Gauge or Thickness Gauge.
     Out of specification→Regap.

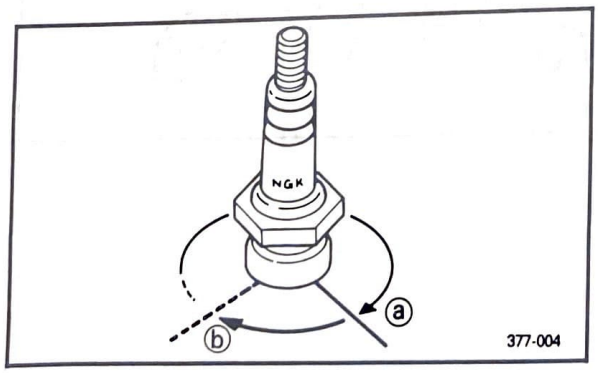
Spark Plug Gap:
0.5~0.6 mm (0.020~0.024 in)

Standard Spark Plug:
B8EG, *BR8EG (NGK)

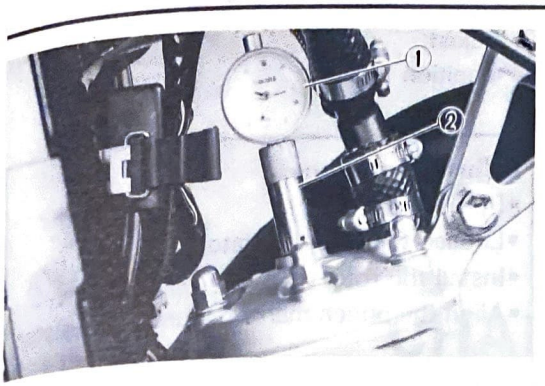
*For Canada and South Africa

4. Clean the plug with a spark plug cleaner if necessary.
5. Tighten:
   - Spark plug

Spark Plug:
25 Nm (2.5 m•kg, 18 ft•lb)



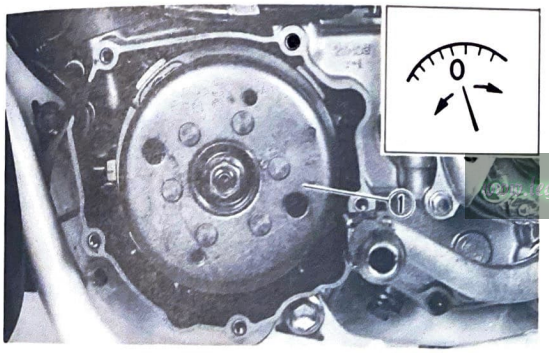
NOTE:
- Before installing a spark plug, clean the gasket surface and plug surface.
- Finger-tighten ⓐ the spark plug before torquing to specification ⓑ.



IGNITION TIMING CHECK

1. Remove:
   - Spark plug
   - Crankcase cover (left)
2. Attach:
   - Dial gauge ①
   - Dial gauge stand ②

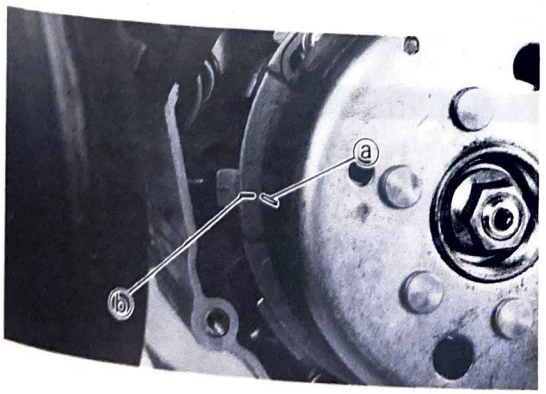
Dial Gauge:
YU-03097/90890-01252
Stand:
YU-01256



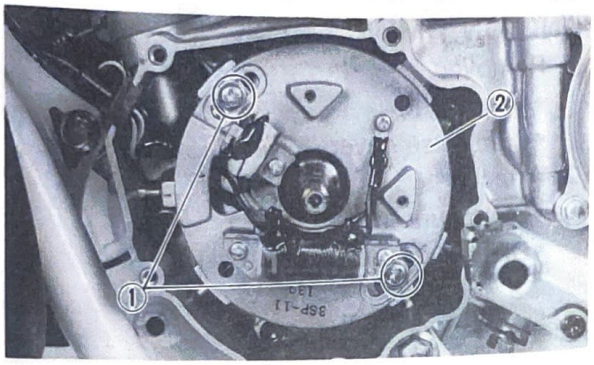
3. Rotate the magneto rotor ① until the piston reaches top dead center (TDC). When this happens, the needle on the dial gauge will stop and reverse directions even though the rotor is being turned in the same direction.
4. Set the dial gauge to zero at TDC.

5. From TDC, rotate the rotor clockwise until the dial gauge indicates that the piston is at a specified distance from TDC.

Ignition Timing:
1.2 mm (0.047 in)



6. Check:
   - Ignition timing
     Punch mark ⓐ on rotor should be aligned with punch mark ⓑ on stator.
     No. alignment→Adjust.

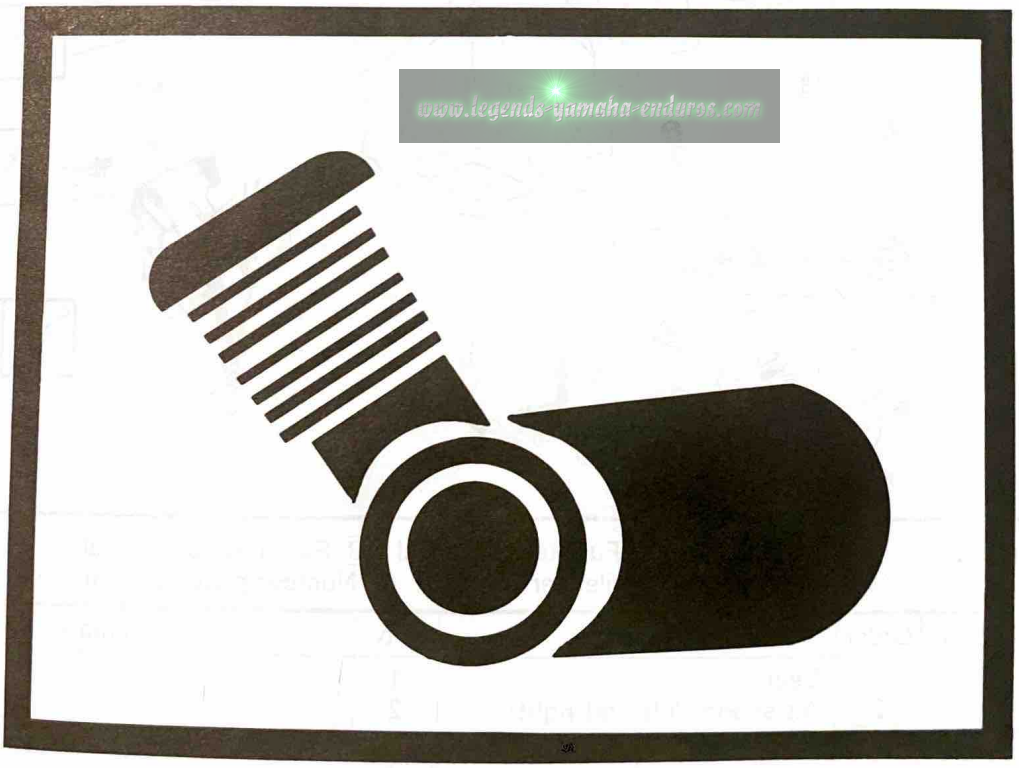


7. Adjust:
   • Ignition timing

Adjustment steps:
- Remove the rotor.
- Loosen the screws (stator) ①.
- Install the rotor.
- Align the punch marks by turning the stator ②.
- Remove the rotor.
- Tighten the screws (stator) ①.
- Install the rotor.

Screw (Stator):
8 Nm (0.8 m•kg, 5.8 ft•lb)
Rotor (Nut):
48 Nm (4.8 m•kg, 35 ft•lb)

CHAPTER 4
ENGINE

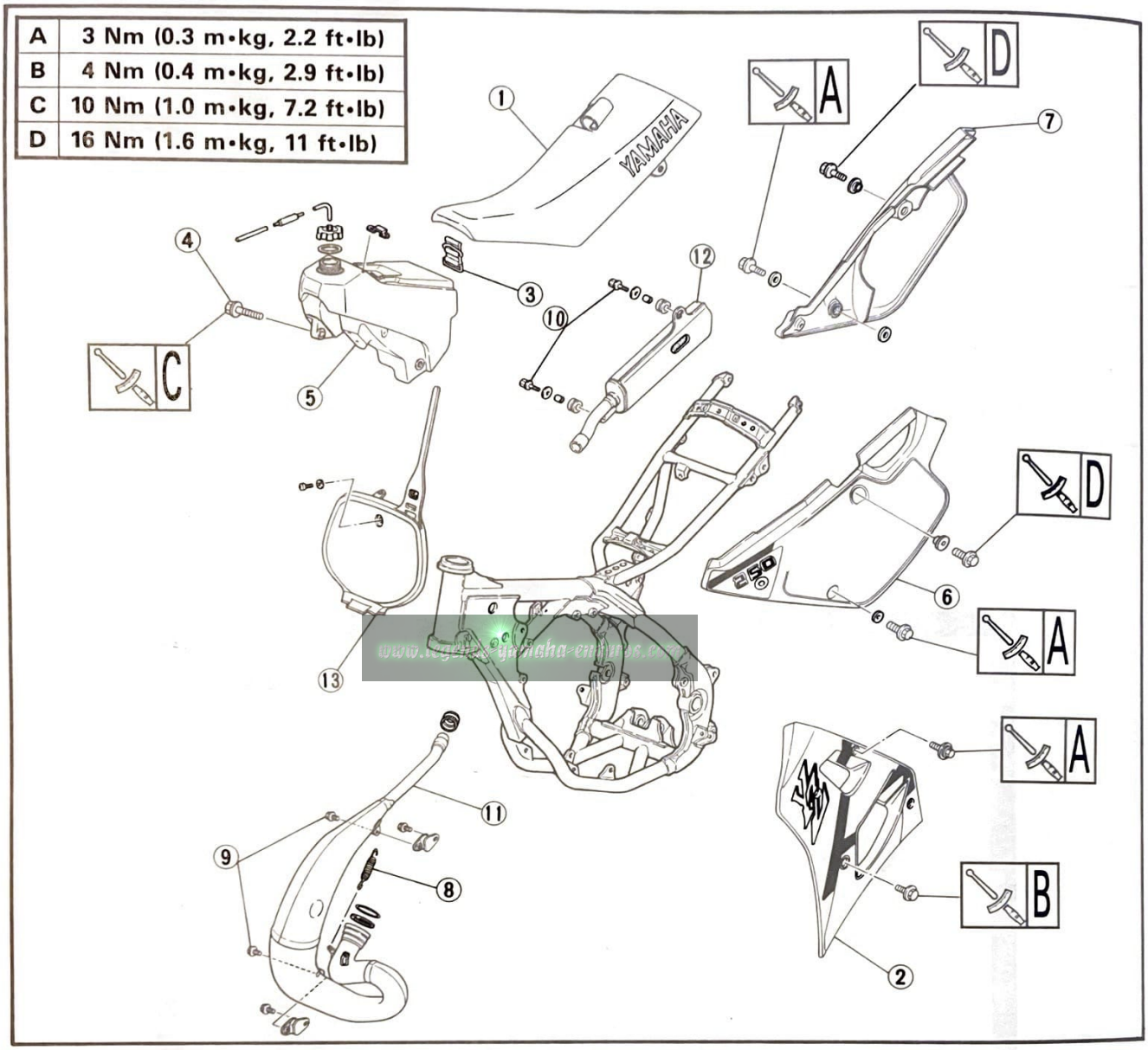


SEAT, FUEL TANK, SIDE COVERS, EXHAUST PIPE AND SILENCER

PREPARATION FOR REMOVAL

*Turn the fuel cock to "OFF".
*Disconnect the fuel hose.

A	3 Nm (0.3 m•kg, 2.2 ft•lb)
B	4 Nm (0.4 m•kg, 2.9 ft•lb)
C	10 Nm (1.0 m•kg, 7.2 ft•lb)
D	16 Nm (1.6 m•kg, 11 ft•lb)



Extent of removal: ① Seat removal ② Fuel tank removal ③ Side covers removal ④ Exhaust pipe and silencer removal ⑤ Number plate removal

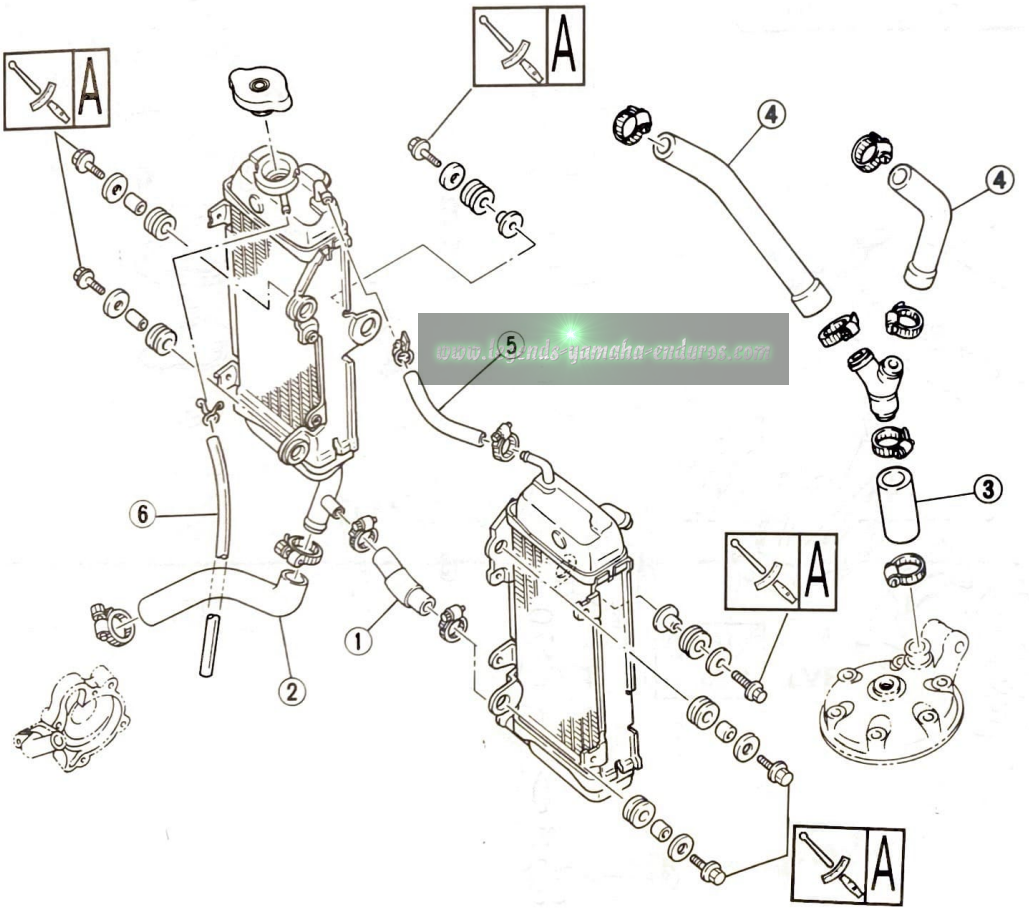
Extent of removal	Order	Part name	Q'ty	Remarks
①, ②, ③, ④, ⑤	1	Seat	1	
	2	Air scoop (left and right)	2	
	3	Fitting band	1	Remove on fuel tank side.
	4	Bolt (fuel tank)	2	
	5	Fuel tank	1	
	6	Side cover (left)	1	
	7	Side cover (right)	1	
	8	Tension spring	3	
	9	Bolt (exhaust pipe)	2	
	10	Bolt (silencer)	2	
	11	Exhaust pipe	1	
	12	Silencer	1	
	13	Number plate	1	

RADIATOR HOSES

PREPARATION FOR REMOVAL

*Drain the coolant.
*Remove the following parts:
•Air scoop (left and right)

RADIATOR CAPACITY: 0.61 L (0.54 Imp qt, 0.64 US qt)	
RADIATOR CAP OPENING PRESSURE: 95 ~ 125 kPa (0.95 ~ 1.25 kg/cm², 13.5 ~ 17.8 psi)	
A	5 Nm (0.5 m•kg, 3.6 ft•lb)



Extent of removal: ① Radiator hose removal

Extent of removal	Order	Part name	Q'ty	Remarks
①	1	Radiator hose 2	1	
	2	Radiator hose 3	1	
	3	Radiator hose 5	1	
	4	Radiator hose 6	2	
	5	Radiator hose 8	1	
	6	Radiator breather hose	1	

CARBURETOR AND REED VALVE

PREPARATION FOR REMOVAL

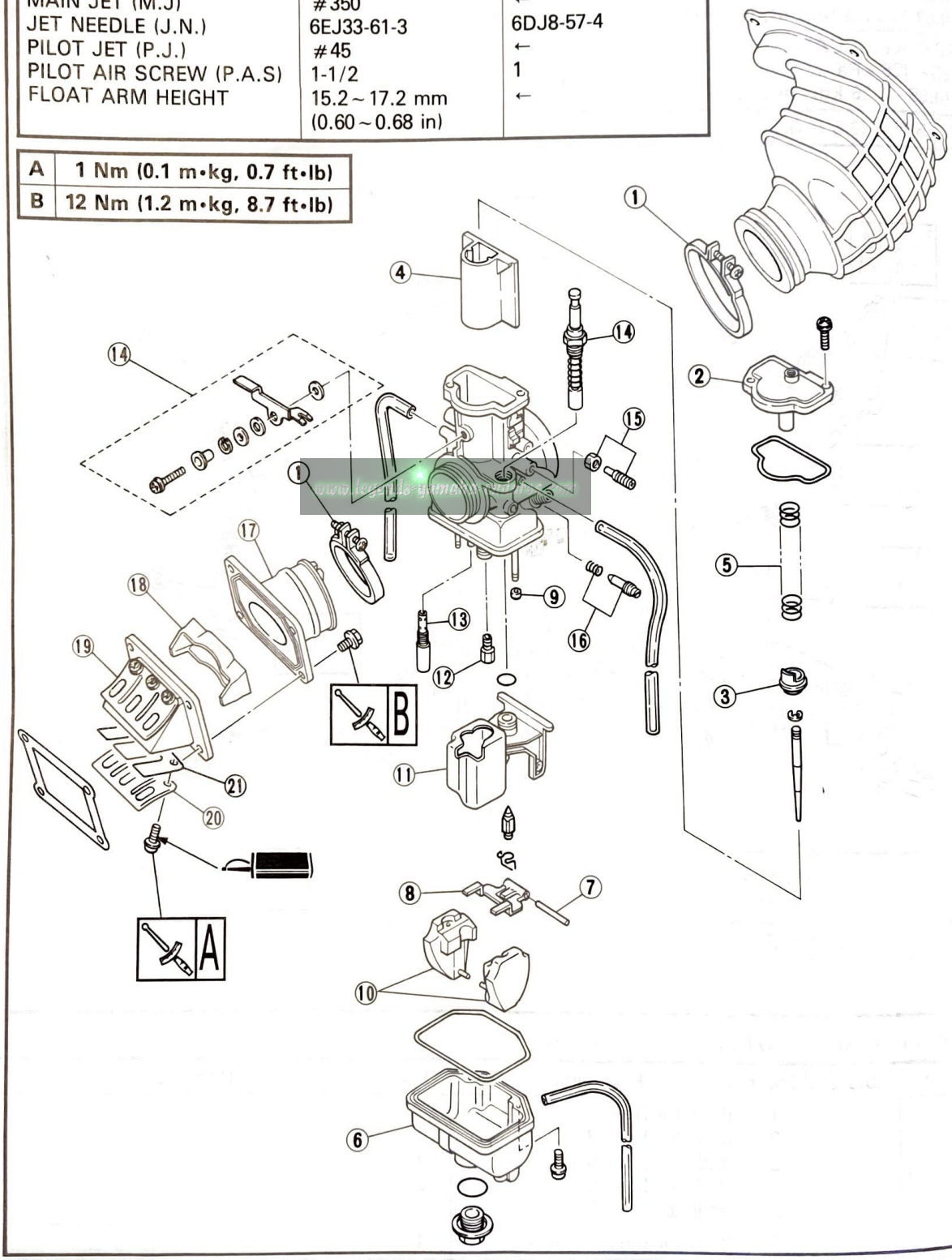
*Turn the fuel cock to "OFF".

*Disconnect the fuel hose at carburetor side.

*Remove the fuel tank.

SPECIFICATIONS	Except for Europe	For Europe
MAIN JET (M.J)	#350	←
JET NEEDLE (J.N.)	6EJ33-61-3	6DJ8-57-4
PILOT JET (P.J.)	#45	←
PILOT AIR SCREW (P.A.S)	1-1/2	1
FLOAT ARM HEIGHT	15.2 ~ 17.2 mm (0.60 ~ 0.68 in)	←

A	1 Nm (0.1 m•kg, 0.7 ft•lb)
B	12 Nm (1.2 m•kg, 8.7 ft•lb)

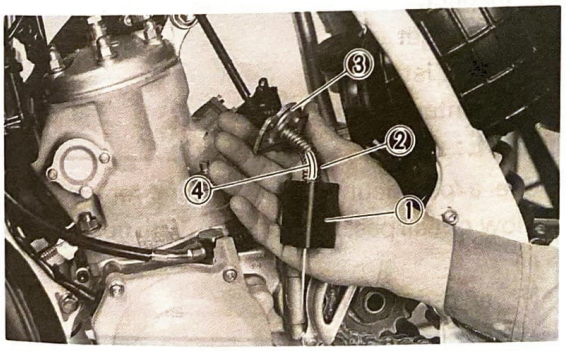


NOTE ON REMOVAL AND REASSEMBLY

- With the engine mounted, the following parts can be removed.
- Before servicing, clean the machine and take care so that foreign material do not enter the engine.
- Remove the gasket adhered on the contacting surface.
- Before inspection, the removed parts should be cleaned and blow out all passages and jets with compressed air.
- After removing the carburetor, cover the carburetor joint not to enter foreign material.

Extent of removal: ① Carburetor removal ② Carburetor disassembly
③ Reed valve removal and disassembly

Extent of removal	Order	Part name	Q'ty	Remarks
① ↕	1	Clamp (carbretor joint)	2	Loosen the screws (carbretor joint).
② ↕	2	Mixing chamber top	1	
	3	Ring	1	Refer to "REMOVAL POINTS".
	4	Throttle valve	1	
	5	Spring (throttle valve)	1	
	6	Float chamber	1	
	7	Pin (float)	1	
	8	Float arm	1	
	9	Cap	2	
	10	Float	2	
	11	Needle jet cover	1	
	12	Main jet	1	
	13	Pilot jet	1	
	14	Starter lever	1	
	15	Throttle stop screw	1	
③ ↕	16	Air screw	1	
	17	Carburetor joint	1	
	18	Reed valve spacer	1	
	19	Reed valve assembly	1	
	20	Stopper (reed valve)	2	
	21	Reed valve	2	



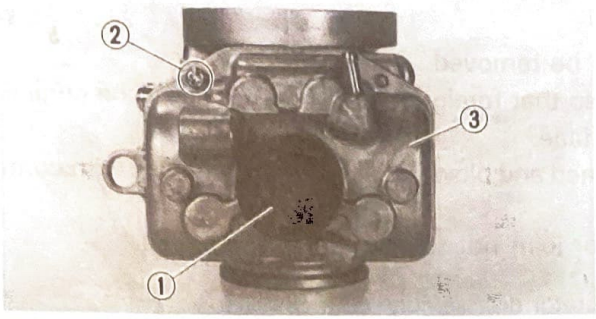
REMOVAL POINTS

THROTTLE VALVE

1. Remove:
   - Throttle valve ①
   - Spring (throttle valve) ②
   - Mixing chamber top ③
   - Throttle cable ④

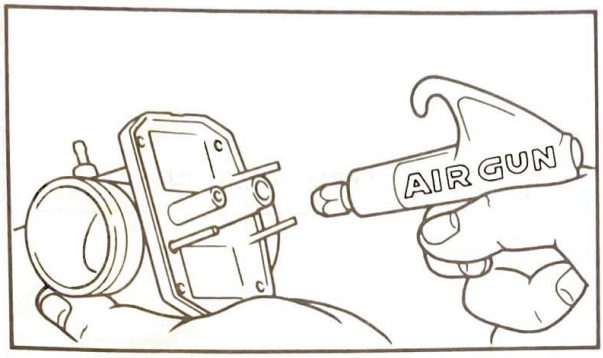
NOTE:

While compressing the spring (throttle valve), disconnect the throttle cable.



FLOAT CHAMBER

1. Remove:
   - Drain plug ①
   - Screw ②
   - Float chamber ③



INSPECTION

CARBURETOR

1. Inspect:
   - Carburetor body
     Contamination → Clean.

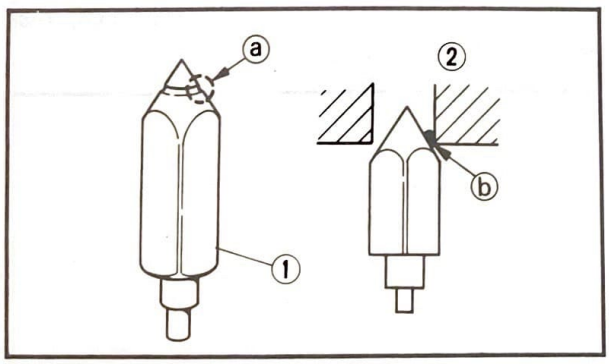
NOTE:

- Use a petroleum based solvent for cleaning. Blow out all passages and jets with compressed air.
- Never use a wire.

2. Inspect:
   - Main jet ①
   - Pilot jet ②
     Contamination → Clean.

NOTE:

- Use a petroleum based solvent for cleaning. Blow out all passages and jets with compressed air.
- Never use a wire.

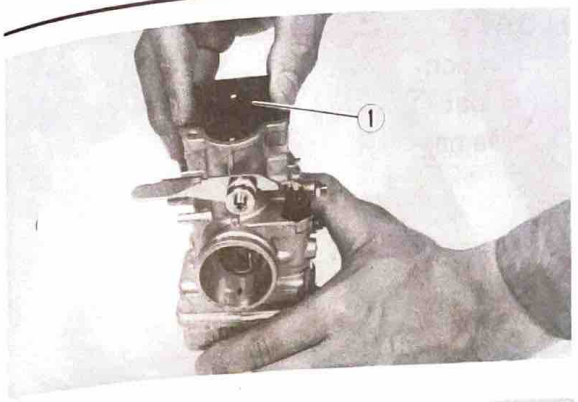


NEEDLE VALVE

1. Inspect:
   - Needle valve ①
   - Valve seat ②
     Grooved wear ⓐ → Replace.
     Dust ⓑ → Clean.

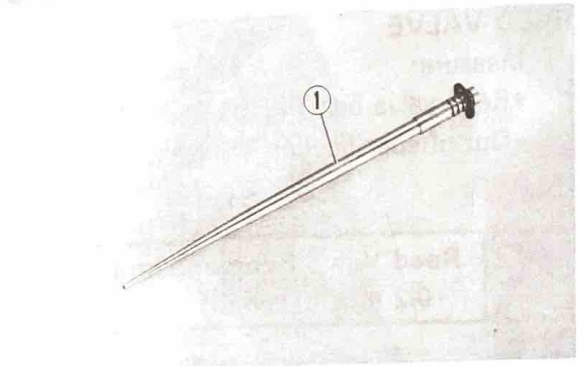
NOTE:

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



THROTTLE VALVE

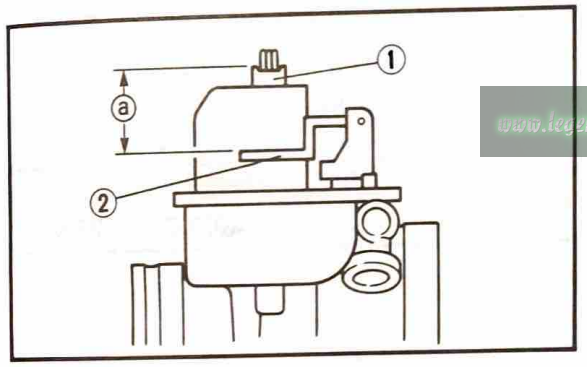
1. Check:
   - Free movement
     Stick → Repair or replace.
     Insert the throttle valve ① into the carburetor body, and check for free movement.



2. Inspect:
   - Jet needle ①
     Bends/Wear → Replace.
   - Clip position

Standard Clip Position:
No. 3 Groove
***No. 4 Groove**

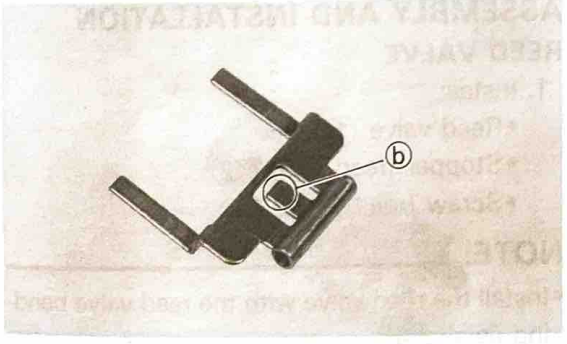
*For Europe



FLOAT ARM HEIGHT

1. Measure:
   - Float arm height ⓐ
     Out of specification → Adjust.

Float Arm Height.
15.2 ~ 17.2 mm (0.60 ~ 0.68 in)



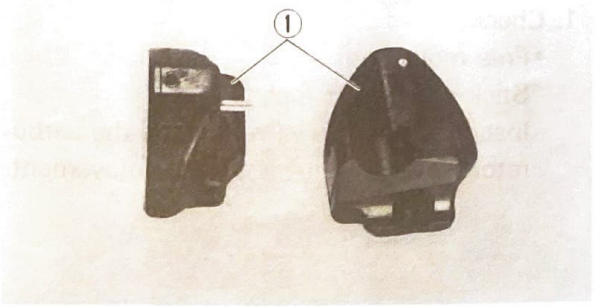
Measurement and adjustment steps:

- Hold the carburetor in an upside down position.
- Measure the distance between the top surface of the main nozzle ① and the top surface of the float arm ② using vernier calipers.

NOTE:

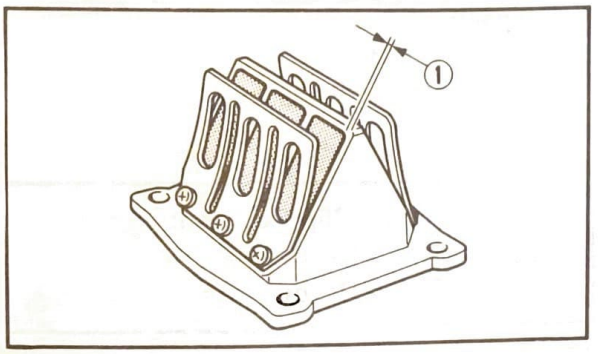
The float arm should be resting on the needle valve, but not compressing the needle valve.

- 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 tab ⓑ on the float arm.
- Recheck the float height.



FLOAT

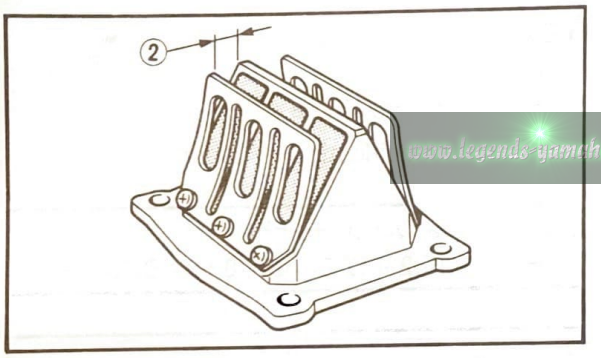
1. Inspect:
   - Float ①
     Damage → Replace.



REED VALVE

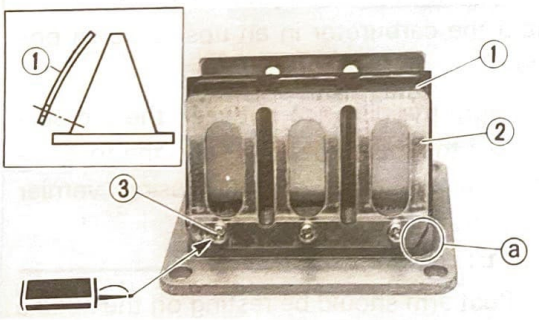
1. Measure:
   - Reed valve bending ①
     Out of specification → Replace.

Reed Valve Bending Limit:
0.2 mm (0.008 in)



- Valve Stopper Height ②
  Out of specification → Adjsut stopper/Replace valve stopper.

Valve Stopper Height:
10.4 ~ 10.8 mm (0.409 ~ 0.425 in)



ASSEMBLY AND INSTALLATION

REED VALVE

1. Install:
   - Reed valve ①
   - Stopper (reed valve) ②
   - Screw (read velve) ③

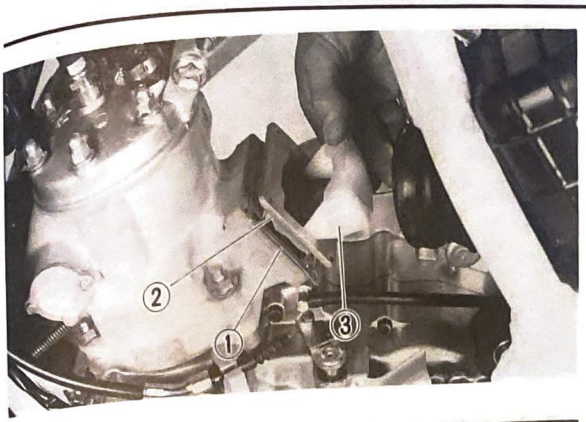
NOTE:

- Install the reed valve with the reed valve bending as shown.
- Note the cut ⓐ in the lower corner of the reed and stopper plate.

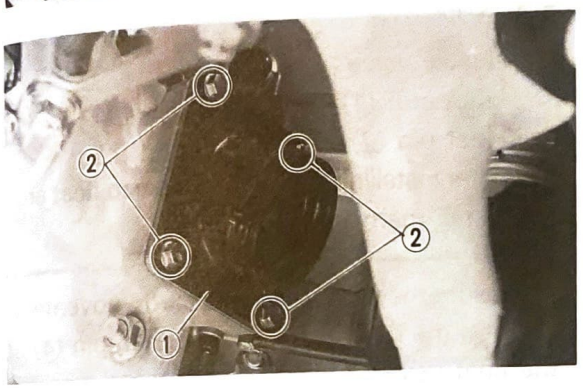
Screw (Reed Valve):
1 Nm (0.1 m•kg, 0.7 ft•lb)
LOCTITE®

CAUTION:

Tighten each screw gradually to avoid warping.



2. Install:
   - Gasket (reed valve assembly) ①
   - Reed valve assembly ②
   - Reed valve spacer ③

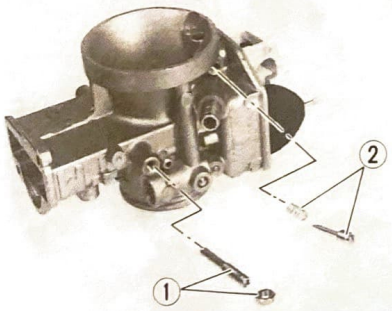


3. Install:
   - Carburetor joint ①
   - Bolt (carburetor joint) ②

NOTE:
Always use a new gasket.

	Bolt (Carburetor Joint): **12 Nm (1.2 m•kg, 8.7 ft•lb)**

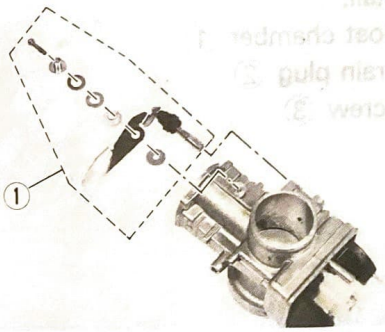
CARBURETOR



1. Install:
   - Throttle stop screw ①
   - Air screw ②

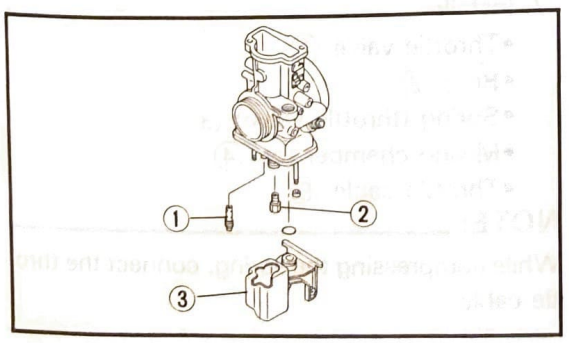
Note the following installation points:
- Screw in the pilot air screw ② until it is lightly seated.
- Back out it by the specified number of turns.

	Pilot Air Screw: **1-1/2 turns out** ***1 turns out**

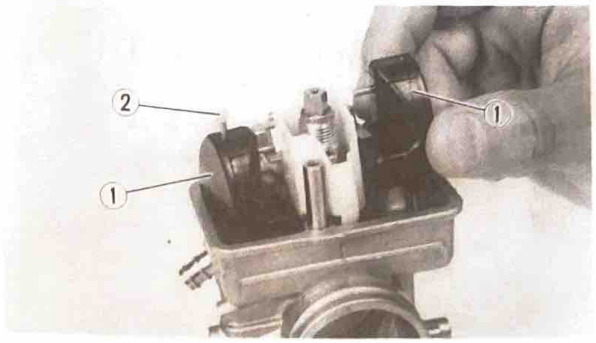


*For Europe

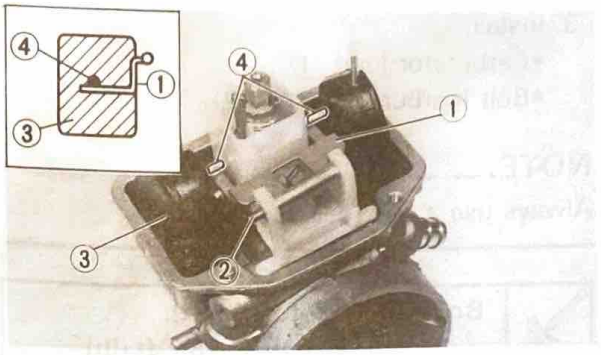
2. Install:
   - Starter lever ①



3. Install:
   - Pilot jet ①
   - Main jet ②
   - Needle jet cover ③



4. Install:
   - Float ①
   - Cap ②

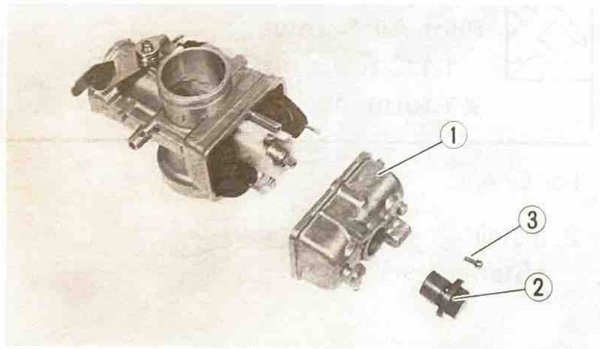


5. Install:
   - Needle valve
   - Float arm ①
   - Float pin ②

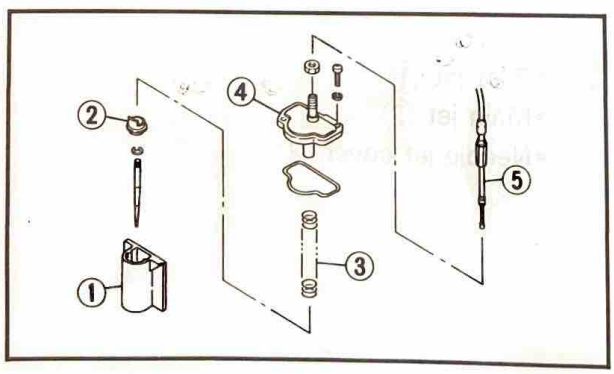
   After installing the needle valve to float arm, install them to the carburetor.

NOTE:

- Make sure the float arm for smooth movement.
- Position the float arm ① lower than pin ④ of the float ③.



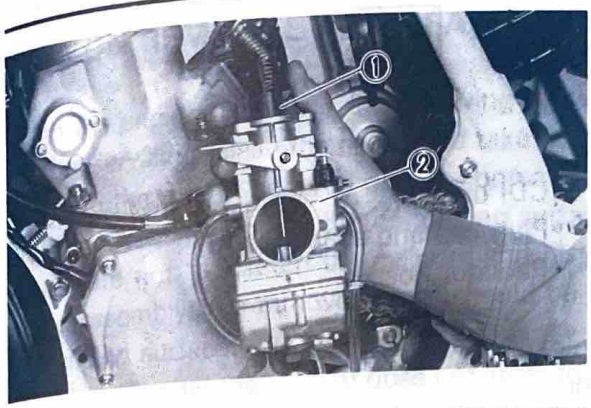
6. Install:
   - Float chamber ①
   - Drain plug ②
   - Screw ③



7. Install:
   - Throttle valve ①
   - Ring ②
   - Spring (throttle valve) ③
   - Mixing chamber top ④
   - Throttle cable ⑤

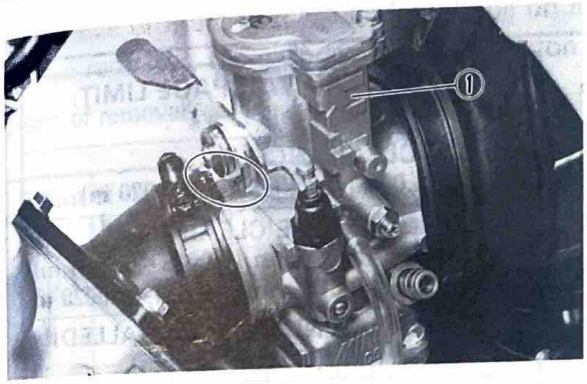
NOTE:

While compressing the spring, connect the throttle cable.



CARBURETOR INSTALLATION

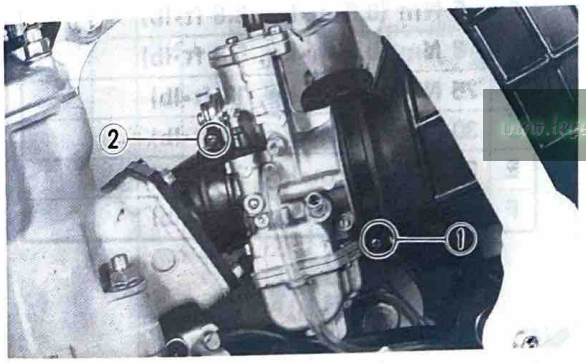
1. Install:
   - Throttle valve ①
     To carburetor ②.



2. Install:
   - Carburetor ①

NOTE:

Install the projection between the carburetor joint slots.



3. Tighten:
   - Screw (air cleaner joint) ①
   - Screw (carburetor joint) ②

CYLINDER HEAD, CYLINDER AND PISTON

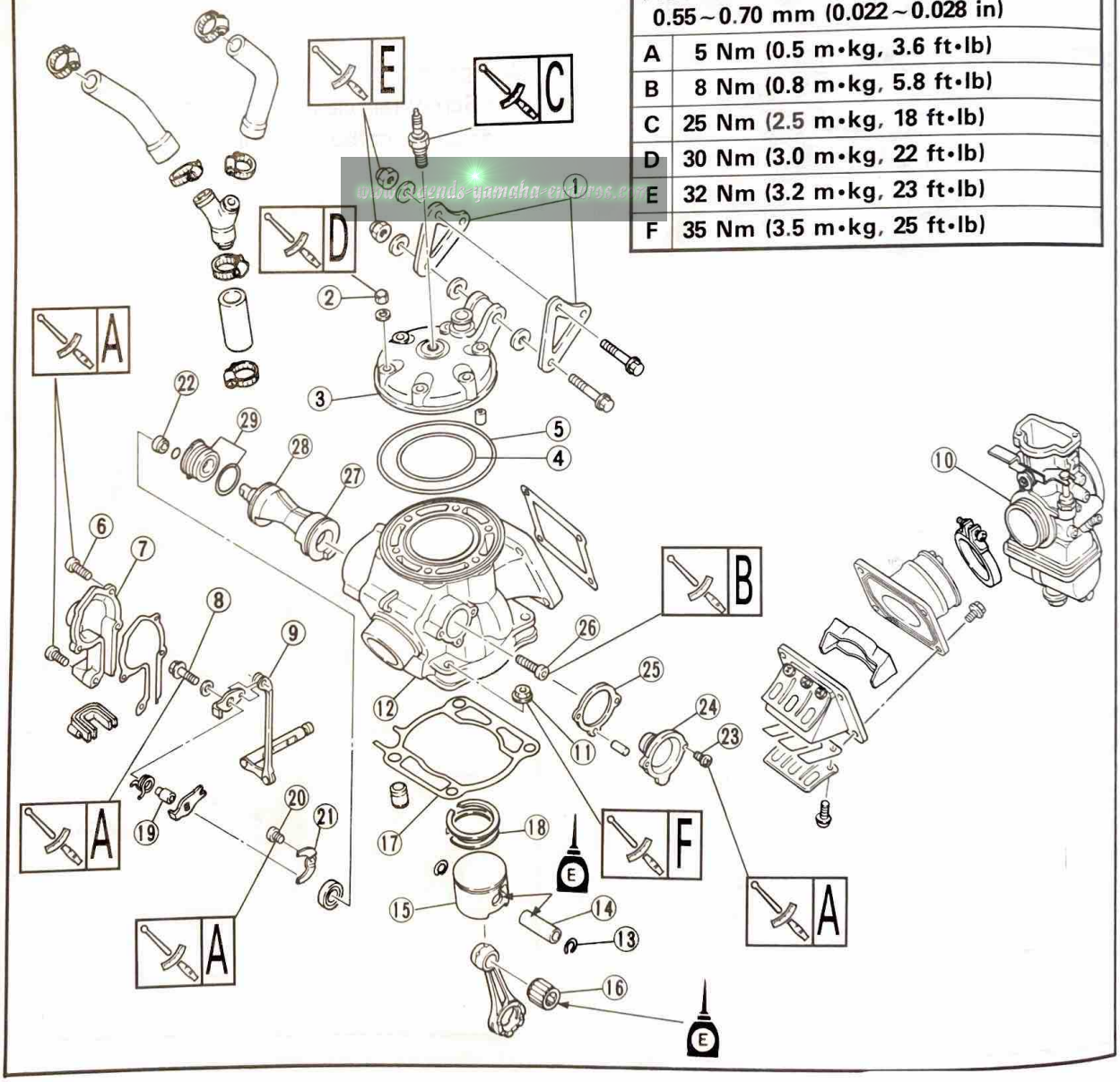
PREPARATION FOR REMOVAL

* Drain the coolant.
* Remove the following parts:
  - Seat
  - Air scoop (left and right)
  - Fuel tank
  - Exhaust pipe and silencer
  - CDI unit
  - Plug cap and spark plug
  - Radiator hose 5
* Remove the radiator installation bolts.
* Disconnect the radiator hose 2 at right side radiator.

SPARK PLUG:
B8EG/NGK
*BR8EG/NGK
SPARK PLUG GAP:
0.5 ~ 0.6 mm (0.020 ~ 0.024 in)

*For CDN and ZA

CYLINDER HEAD WARPAGE LIMIT:	
0.03 mm (0.0012 in)	
PISTON CLEARANCE:	
0.045 ~ 0.050 mm (0.0018 ~ 0.0020 in)	
PISTON RING SIDE CLEARANCE:	
1st: 0.045 ~ 0.080 mm (0.0018 ~ 0.0031 in)	
2nd: 0.035 ~ 0.070 mm (0.0014 ~ 0.0028 in)	
PISTON RING END GAP (INSTALLED):	
0.55 ~ 0.70 mm (0.022 ~ 0.028 in)	
A	5 Nm (0.5 m•kg, 3.6 ft•lb)
B	8 Nm (0.8 m•kg, 5.8 ft•lb)
C	25 Nm (2.5 m•kg, 18 ft•lb)
D	30 Nm (3.0 m•kg, 22 ft•lb)
E	32 Nm (3.2 m•kg, 23 ft•lb)
F	35 Nm (3.5 m•kg, 25 ft•lb)

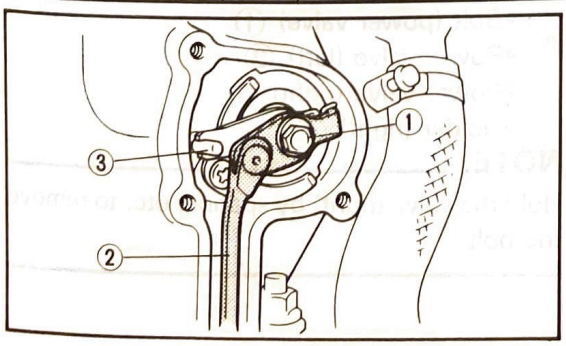


NOTE ON REMOVAL AND REASSEMBLY

•With the engine mounted, the following parts can be removed.
•Before servicing, clean the parts, and take care so that foreign material do not enter the crankcase.
•Remove the gasket adhered on the contacting surface.
•Take care not to scratch the contacting surface when removing the cylinder and cylinder head.
•Take care not to scratch the cylinder and piston surface.
•For reassembly, the removed parts should be cleaned with solvent, and apply the engine oil onto the sliding surface.
•Take care so that the coolant does not enter the crankcase. If the coolant enter the crankcase, clean the inside of the crankcase and apply oil on it.
•When removing the cylinder head, the piston should be positioned at TDC (top dead center).

Extent of removal: ① Cylinder head removal ② Cylinder removal
③ Piston and piston ring removal ④ Power valve removal

Extent of removal	Order	Part name	Q'ty	Remarks
①	1	Rear upper bracket	2	
	2	Nut (cylinder head)	6	Loosen the each nut 1/4 turn, and remove them after all nuts are loosened.
	3	Cylinder head	1	
	4	O-ring	1	
	5	O-ring	1	
② ④	6	Bolt (power valve housing)	4	
	7	Power valve housing	1	
	8	Bolt (push rod)	1	Use set pin included in owner's tool kit. Refer to "REMOVAL POINTS".
③	9	Push rod	1	
	10	Carburetor	1	
	11	Nut (cylinder)	4	
	12	Cylinder	1	
	13	Clip (piston pin)	1	Refer to "REMOVAL POINTS".
	14	Piston pin	1	
	15	Piston	1	
	16	Small end bearing	1	
	17	Cylinder gasket	1	
	18	Piston ring	1	Refer to "REMOVAL POINTS".
	19	Lever boss	1	
	20	Screw (thrust plate)	1	
④	21	Thrust plate	1	
	22	Collar	1	
	23	Screw (holder left)	2	
	24	Holder (left)	1	
	25	Gasket	1	
	26	Bolt (power valve)	1	Refer to "REMOVAL POINTS".
	27	Power valve (left)	1	
	28	Power valve (right)	1	
	29	Holder (right)	1	



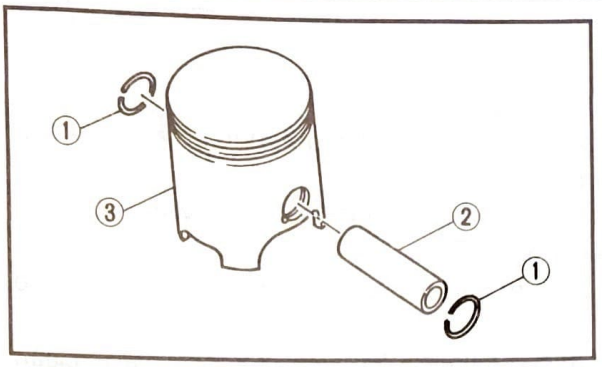
REMOVAL POINTS

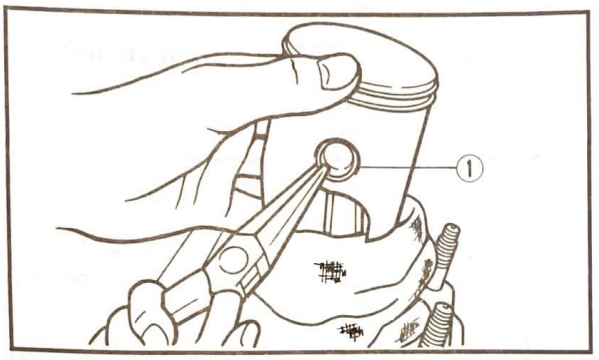
PUSH ROD

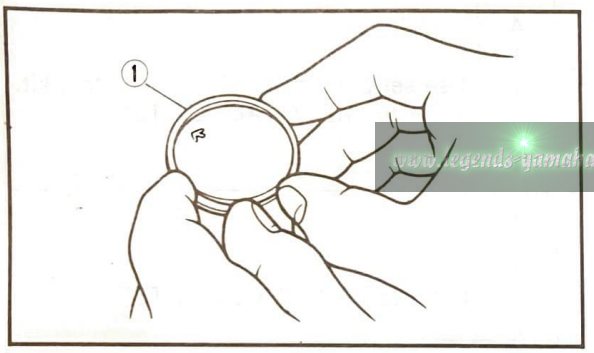
1. Remove:
   - Power valve housing
   - Bolt (push rod) ①
   - Push rod ②

NOTE:

Insert the set pin ③ included in owner's tool kit to remove the bolt (push rod).







PISTON AND PISTON RING

1. Remove:
   - Piston pin clip ①
   - Piston pin ②
   - Piston ③

NOTE:

- Before removing piston pin clip, cover crankcase with a clean rag to prevent piston pin clip from falling into crankcase cavity.
- Before removing the piston pin, deburr the clip groove and pin hole area. If the piston pin groove is deburred and piston pin is still difficult to remove, use the Piston Pin Puller.

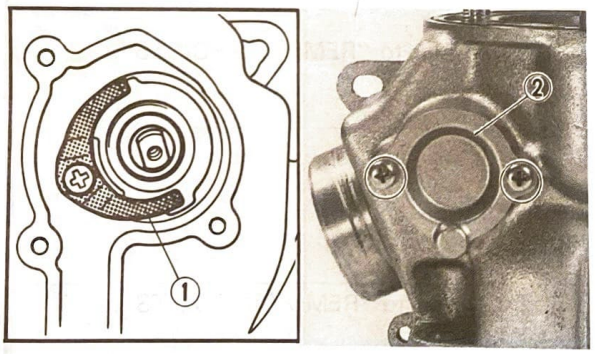
CAUTION:

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

2. Remove:
   - Piston ring ①

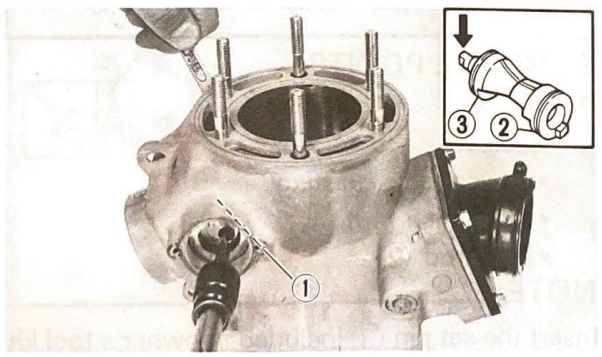
NOTE:

Take care not to scratch the piston and damage the piston ring.



POWER VALVE

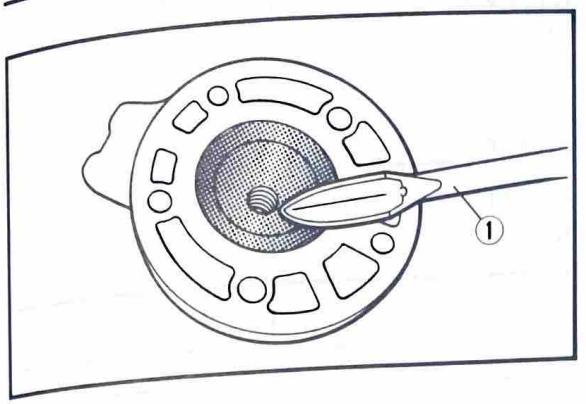
1. Remove:
   - Thrust plate ①
   - Holder (left) ②



2. Remove:
   - Bolt (power valve) ①
   - Power valve (left) ②
   - Power valve (right) ③
   - Holder (right) ④

NOTE:

Hold the valve (right) by spanner etc. to remove the bolt.



INSPECTION

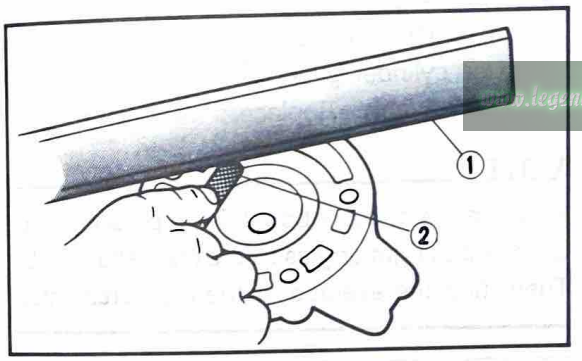
CYLINDER HEAD

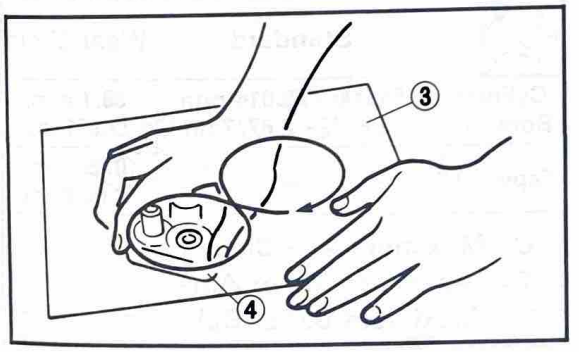
1. Remove:
   - Carbon deposits
     Use a rounded scraper ①.

NOTE:

Take care to avoid damaging the spark plug threads. Do not use a sharp instrument. Avoid scratching the aluminum.

2. Inspect:
   - Cylinder head water jacket
     Crust of minerals/Rust→Remove.
   - Cylinder head warpage
     Out of specification→Re-surface.





Warpage measurement and re-surfacement steps:

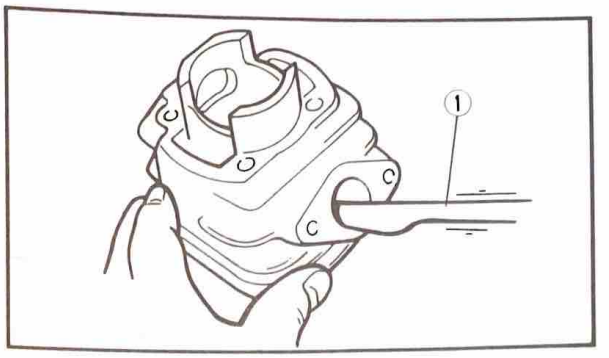
- Attach a straightedge ① and a thickness gauge ② on the cylinder head.
- Measure the warpage.

Warpage Limit:
0.03 mm (0.0012 in)

- If the warpage is out of specification, resurface the cylinder head.
- Place a 400 ~ 600 grit wet sandpaper ③ on the surface plate, and re-surface the head ④ using a figure-eight sanding pattern.

NOTE:

Rotate the head several times to avoid removing too much material from one side.

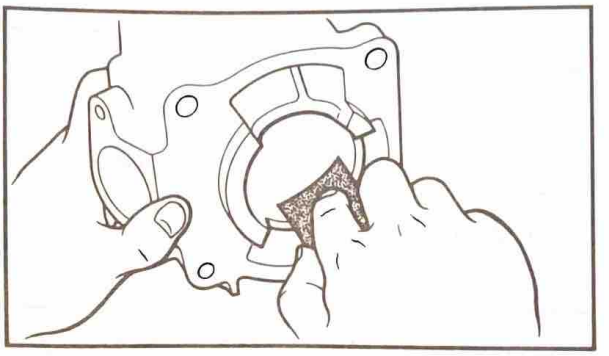


CYLINDER

1. Remove:
   - Carbon deposits
     Use a rounded scraper ①.

NOTE:

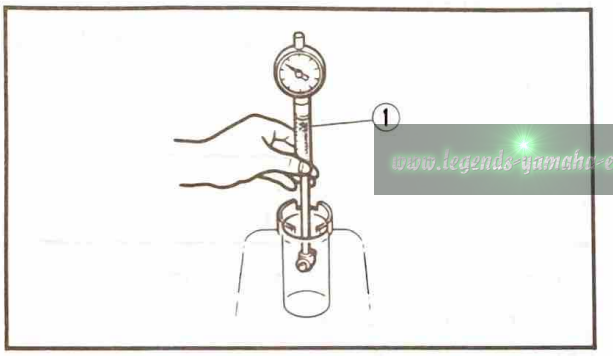
Do not use a sharp instrument. Avoid scratching the aluminum.



2. Inspect:
   - Cylinder inner surface
     Score marks→Repair or replace.
     Use #600 ~ 800 grit wet sandpaper.

CAUTION:

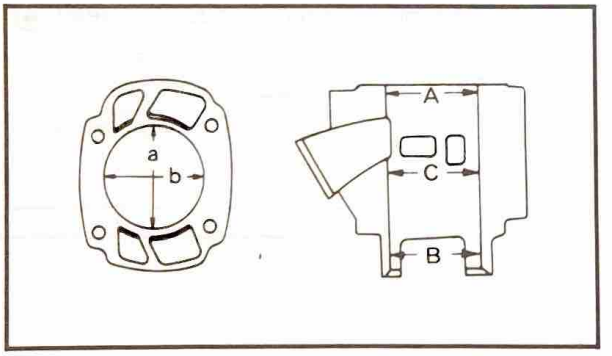
Do not rebore the cylinder.



3. Measure:
   - Cylinder bore "C"
     Use cylinder gauge ①.
     Out of limit→Replace.

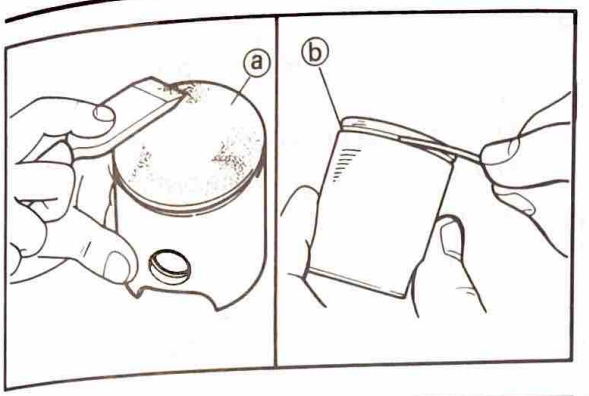
NOTE:

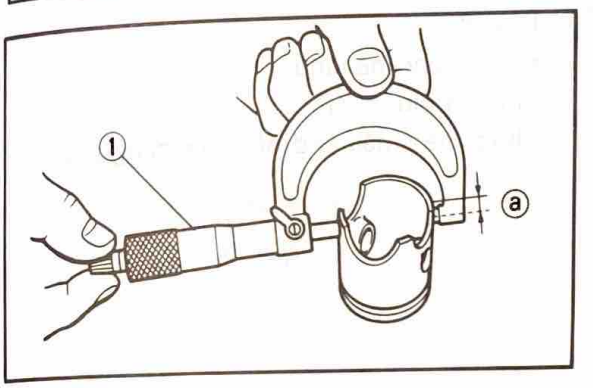
Measure the cylinder bore "C" in parallel (A, B, C) to and at right angles to the crankshaft (a, b). Then, find the average of the measurements.



	Standard	Wear Limit
Cylinder Bore "C"	68.000 ~ 68.014 mm (2.6772 ~ 2.6777 in)	68.1 mm (2.681 in)
Taper "T"	—	0.05 mm (0.0020 in)

C = Maximum Aa ~ Cb
T = (Maximum Aa, or Ab) − (Maximum Ba, or Bb)





PISTON

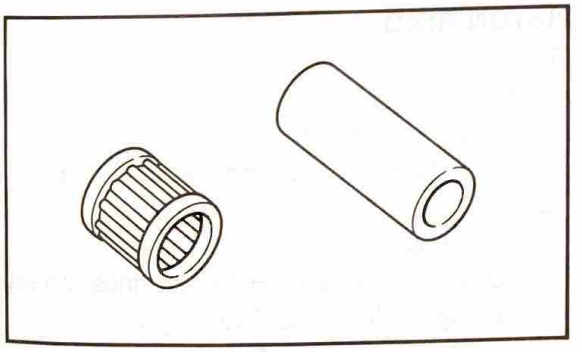
1. Remove:
   - Carbon deposits

   From the piston crown ⓐ and ring groove ⓑ.
2. Inspect:
   - Piston wall

   Score marks → Repair or replace.
3. Measure:
   - Piston skirt diameter

   Use Micrometer ①.
   Measure specific distance ⓐ from the bottom edge.
   Out of specification → Replace.

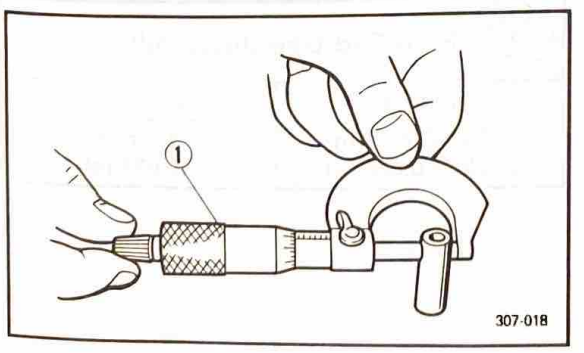
Distance ⓐ	Piston DIA.
5 ~ 10 mm (0.20 ~ 0.39 in)	67.952 ~ 67.967 mm (2.6753 ~ 2.6759 in)



PISTON PIN AND SMALL END BEARING

1. Inspect:
   - Piston pin
   - Small end bearing

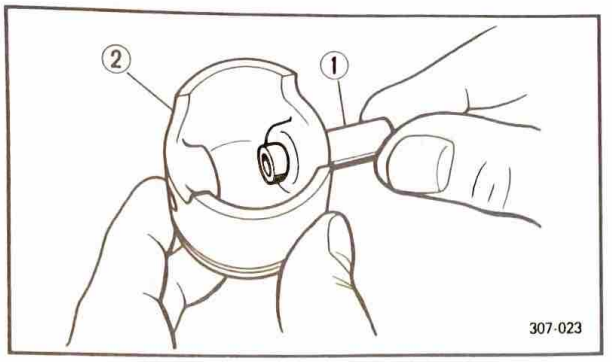
   Signs of heat discoloration → Replace.



2. Measure:
   - Piston pin outside diameter

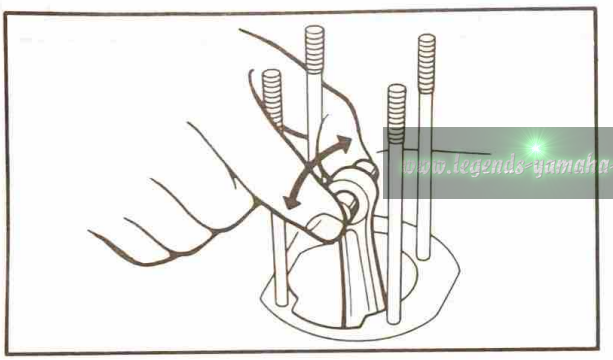
   Use micrometer ①.
   Out of limit → Replace.

Piston Pin Outside Diameter:	
Standard	<Limit>
17.995 ~ 18.000 mm (0.7085 ~ 0.7087 in)	17.975 mm (0.7077 in)

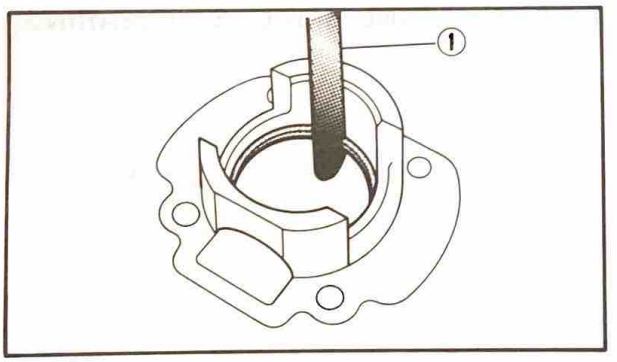


3. Check:
   • Free play (when the piston pin ① is in place in the piston ②)
   There should be no noticeable for the play.
   Free play exists → Replace piston pin and/or piston.

4. Install:
   • Small end bearing
   • Piston pin
   Into the small end of connecting rod.



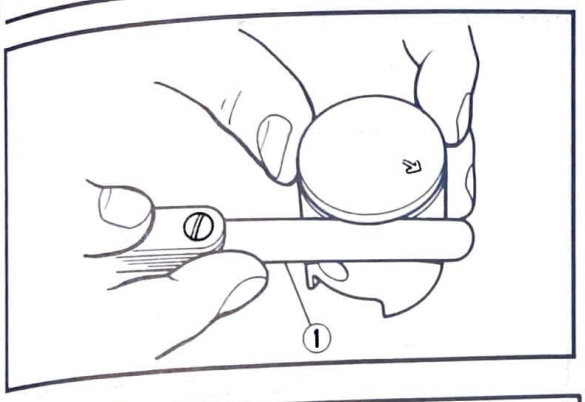
5. Check:
   • Free play
   There should be no noticeable free play.
   Free play exists → Inspect the connecting rod for wear/Replace the pin and/or connecting rod as required.



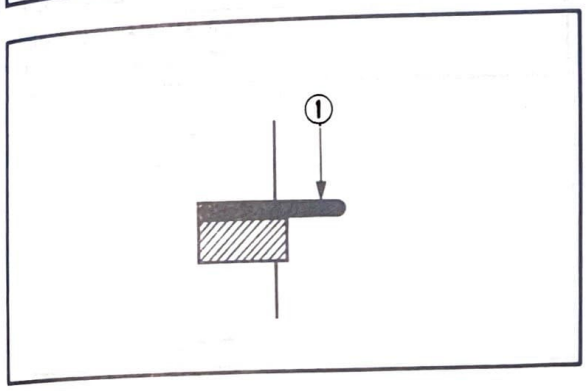
PISTON RING

1. Install:
   • Piston ring
   Into the cylinder.
   Push the ring with the piston crown.
2. Measure:
   • End gap
   Out of specification → Replace rings as a set.
   Using a Thickness Gauge ①.

Ring End Gap (Installed):	
Standard	<Limit>
0.55 ~ 0.70 mm (0.022 ~ 0.028 in)	1.0 mm (0.039 in)



3. Measure:
   • Side clearance
   Use a Thickness Gauge ①.
   Out of limit→Replace piston and/or ring.



Side Clearance:

	Standard	<Limit>
1st	0.045 ~ 0.080 mm (0.0018 ~ 0.0031 in)	0.1 mm (0.004 in)
2nd	0.035 ~ 0.070 mm (0.0014 ~ 0.0028 in)	0.1 mm (0.004 in)

NOTE:
Check at several points.

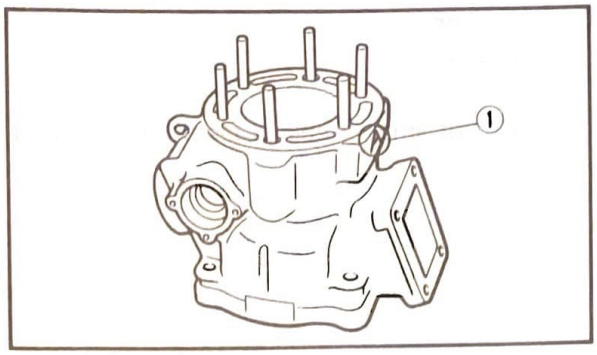
PISTON CLEARANCE

1. Calculate:
   • Piston clearance
   Out of limit→Replace piston, and piston ring and/or cylinder.
   Refer to "CYLINDER" and "PISTON".

PISTON CLEALANCE	=	CYLINDER BORE	-	PISTON DIAMETER

Piston Clearance:

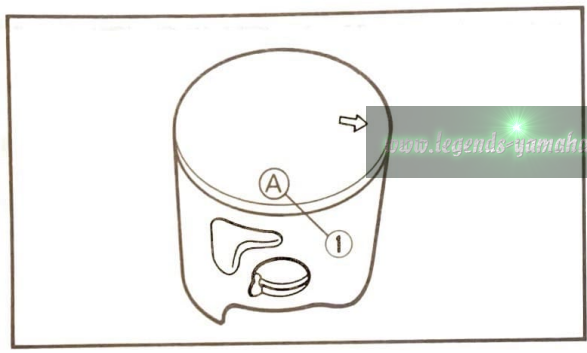
Standard	<Limit>
0.045 ~ 0.050 mm (0.0018 ~ 0.0020 in)	0.1 mm (0.004 in)



COMBINATION OF PISTON AND CYLINDER

1. Cylinder mark:

Cylinder mark ①	Cylinder size
A	68.000 ~ 68.002 mm (2.6772 ~ 2.6772 in)
B	68.004 ~ 68.006 mm (2.6773 ~ 2.6774 in)
C	68.008 ~ 68.010 mm (2.6775 ~ 2.6776 in)
D	68.012 ~ 68.014 mm (2.6776 ~ 2.6777 in)



2. Piston mark:

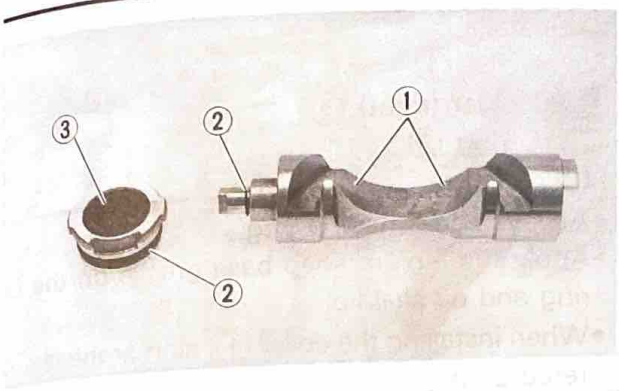
Piston mark ①	Piston size
A	67.952 ~ 67.955 mm (2.6753 ~ 2.6754 in)
B	67.956 ~ 67.959 mm (2.6754 ~ 2.6756 in)
C	67.960 ~ 67.963 mm (2.6756 ~ 2.6757 in)
D	67.964 ~ 67.967 mm (2.6757 ~ 2.6759 in)

3. Combination:
Combine the piston and cylinder by the following chart.

Cylinder mark	Piston mark
A	A
B	B
C	C
D	D

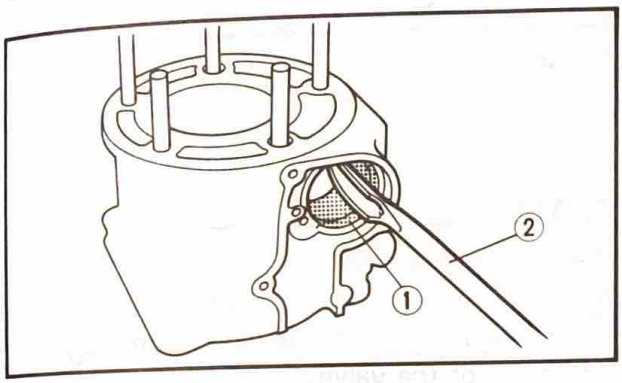
NOTE:

When you purchase a cylinder, you cannot designate its size. Choose the piston that matches the above chart.



POWER VALVE

1. Inspect:
   - Power valve (left and right) ①
     Wear/Damage→Replace.
     Carbon deposits→Remove.
   - O-ring ②
   - Oil seal ③
     Wear/Damage→Replace.

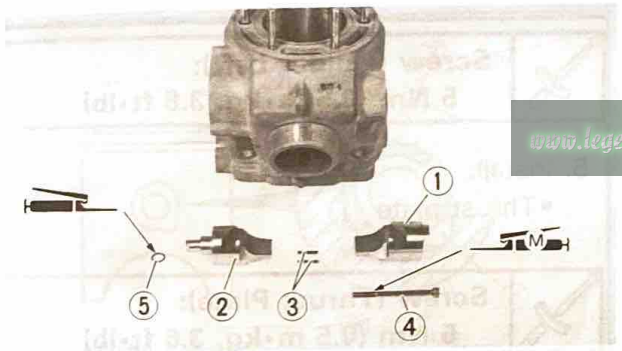


POWER VALVE HOLE ON CYLINDER

1. Remove:
   - Carbon deposits
     From power valve hole surface ①.
     Use a rounded scraper ②.

NOTE:

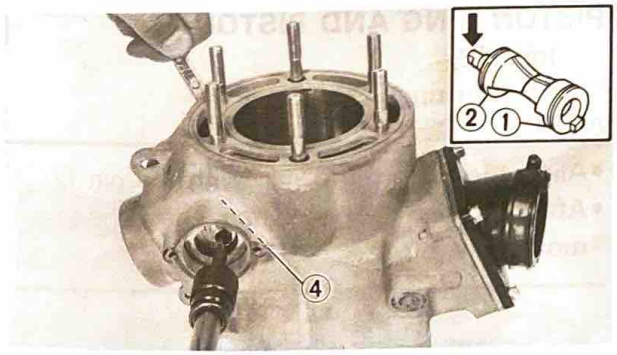
Do not use a sharp instrument. Avoid scratching the aluminum.



ASSEMBLY AND INSTALLATION

POWER VALVE

1. Install:
   - Power valve (left) ①
   - Power valve (right) ②
   - Dowel pin ③
   - Bolt (power valve) ④
   - O-ring ⑤

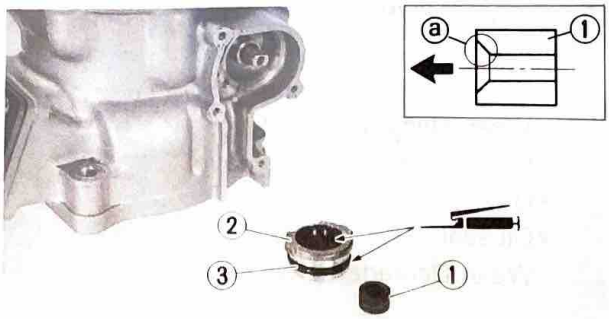


	Bolt (Power Valve): 8 Nm (0.8 m•kg, 5.8 ft•lb)

NOTE:

- Always use a new O-ring.
- Apply the lithium soap base grease on the O-ring.
- Apply the molybdenum disulfide grease on the bolt (power valve).
- Hold the valve (right) by spanner etc. to install the bolt.

2. Check:
   - Power valve smooth movement
     Sticks→Repair.
     Use #600~800 grit wet sandpaper.



3. Install:
   - Collar ①
   - Holder (right) ②
   - O-ring ③

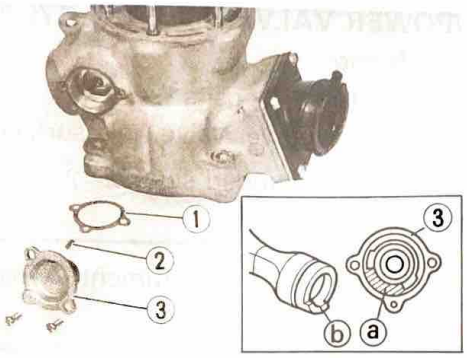
NOTE:

- Always use a new O-ring.
- Apply the lithium soap base grease on the O-ring and oil seal lip.
- When installing the collar ①, start at the chamfered area ⓐ.

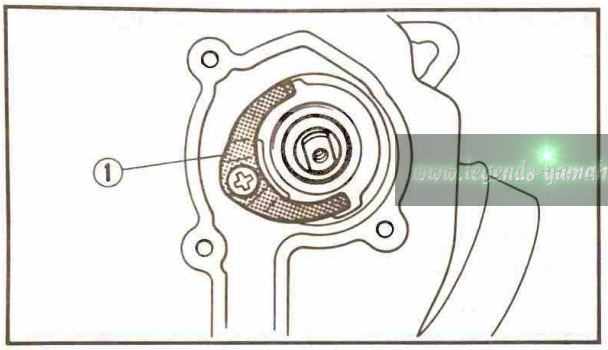
4. Install:
   - Gasket (holder) ①
   - Dowel pin ②
   - Holder (left) ③

NOTE:

- Always use a new gesket.
- When installing the holder (left) ③, make sure the groove ⓐ in the holder fits on the projection ⓑ of the valve.



	Screw (Holder Left): **5 Nm (0.5 m•kg, 3.6 ft•lb)**



5. Install:
   - Thrust plate ①

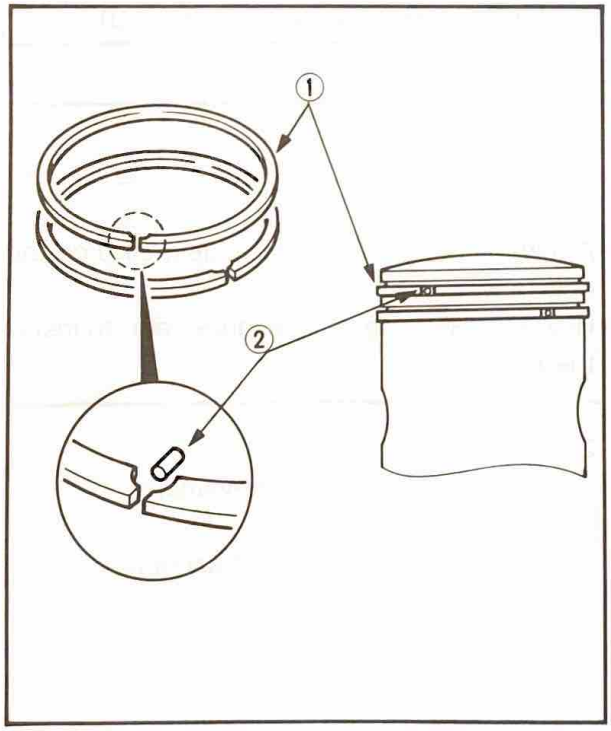
	Screw (Thrust Plate): **5 Nm (0.5 m•kg, 3.6 ft•lb)**

PISTON RING AND PISTON

1. Install:
   - Piston rings ①

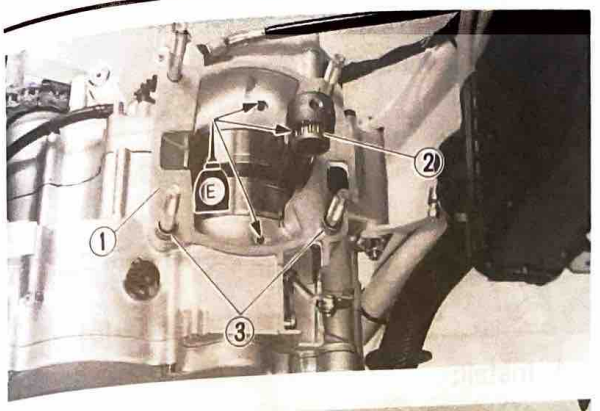
NOTE:

- Align the piston ring gap with the pin ②.
- After installing the piston ring, check the smooth movement of it.



CAUTION:

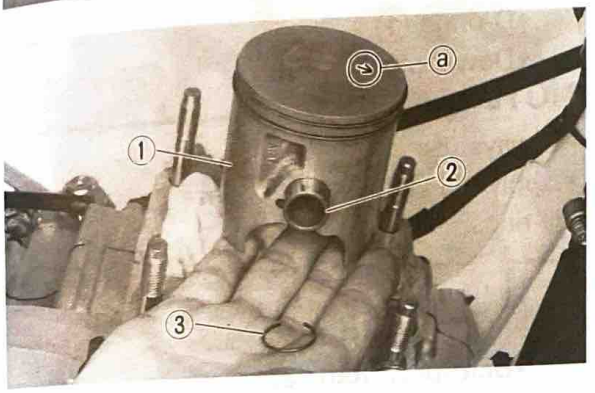
Take care not to scratch the piston and damage the piston ring.



2. Install:
   - Gasket (cylinder) ①
   - Small end bearing ②
   - Dowel pin ③

NOTE:

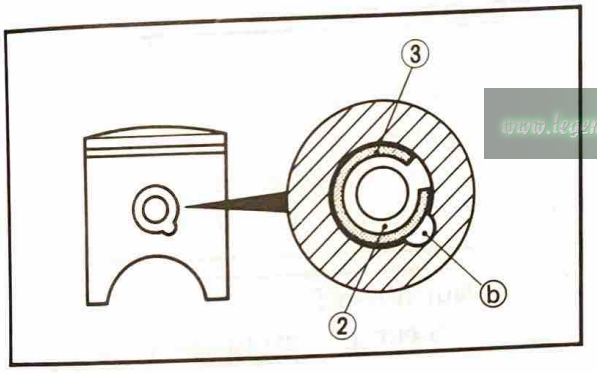
- Apply the engine mixing oil onto the bearing (crankshaft and connecting rod).
- Always use a new gasket.



3. Install:
   - Piston ①
   - Piston pin ②
   - Piston pin clip ③

NOTE:

- The arrow ⓐ on piston dome must face forward.
- Before installing piston pin clip, cover crankcase with a clean rag to prevent piston pin clip from falling into crankcase cavity.



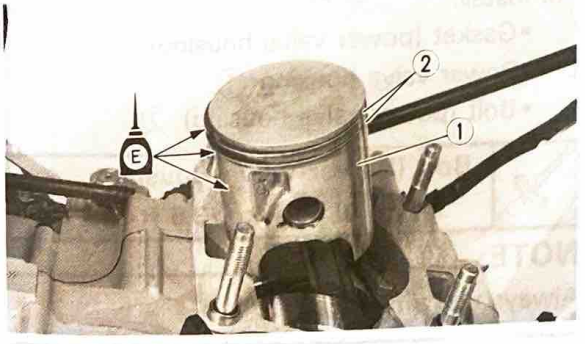
CAUTION:

- **Do not allow the clip open ends to meet the piston slot ⓑ.**
- **Always use a new piston pin clip.**

CYLINDER HEAD AND CYLINDER

1. Apply:
   - Engine oil

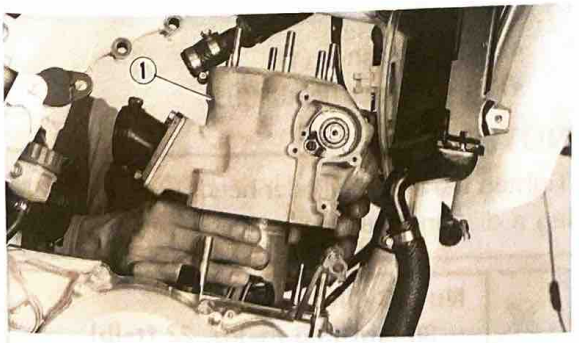
   To piston ①, piston ring ② and cylinder surface.



2. Install:
   - Cylinder ①

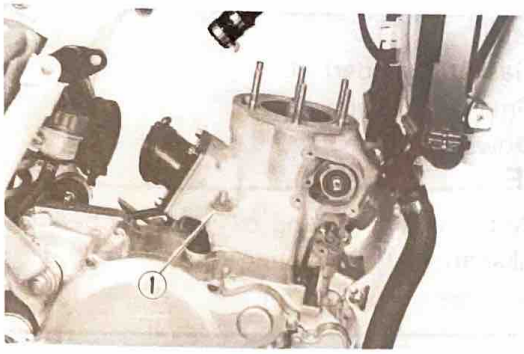
CAUTION:

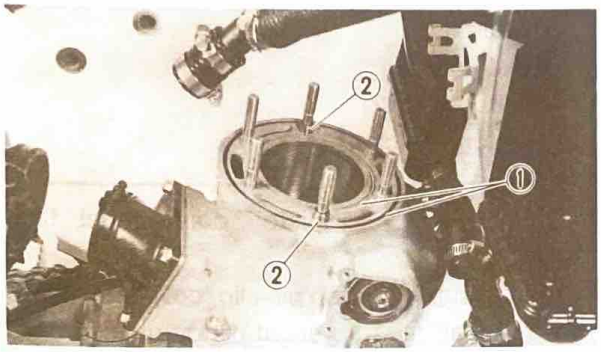
Make sure the rings are properly positioned. Install the cylinder with one hand while compressing the piston ring with the other hand.

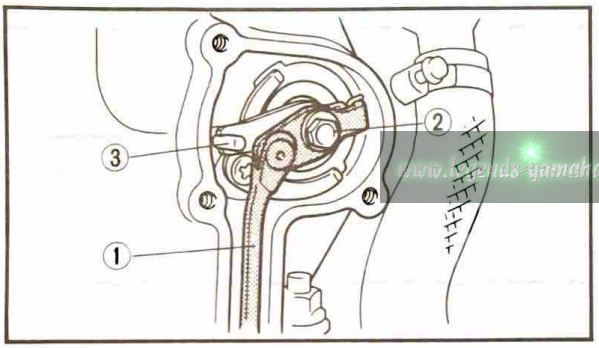


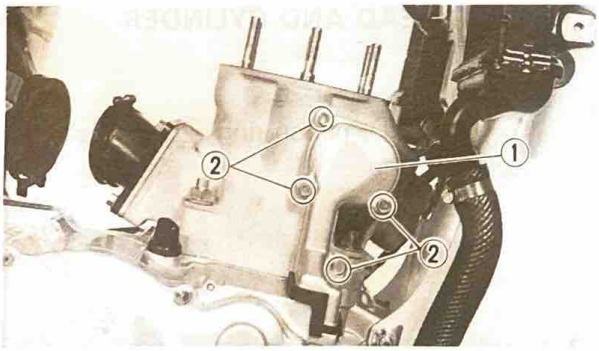
NOTE:

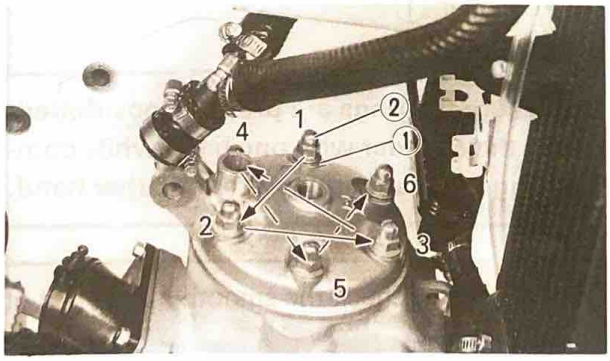
After installing, check the smooth movement of the piston.











3. Install:
   - Nut (cylinder) ①

NOTE:

Tighten the nuts in stage, using a diagonal pattern.

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

4. Install:
   - O-rings ①
   - Dowel pin ②

NOTE:

- Always use a new O-ring.
- Apply the lithium soap base grease on the O-rings.

5. Install:
   - Push rod ①
   - Bolt (push rod) ②

NOTE:

- Insert the set pin ③ included in owner's tool kit to install the bolt (push rod).
- Don't forget to remove the locating pin, or it will adversely affect valve operation, and the engine will lack power at high speeds.

	Nut (Push Rod): **5 Nm (0.5 m•kg, 3.6 ft•lb)**

6. Install:
   - Gasket (power valve housing)
   - Power valve housing ①
   - Bolt (power valve housing) ②

	Bolt (Power Valve Housing): **5 Nm (0.5 m•kg, 3.6 ft•lb)**

NOTE:

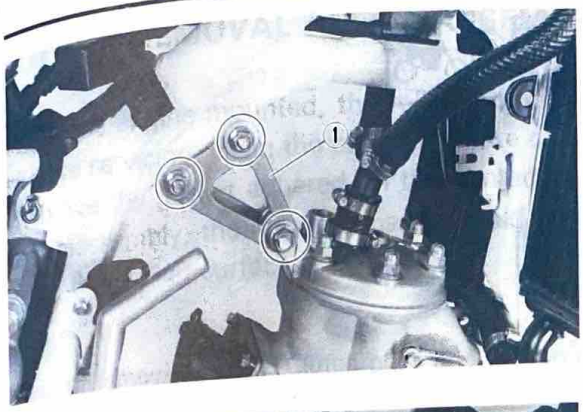
Always use a new gasket.

7. Install:
   - Copper washer ①
   - Nut (cylinder head) ②

NOTE:

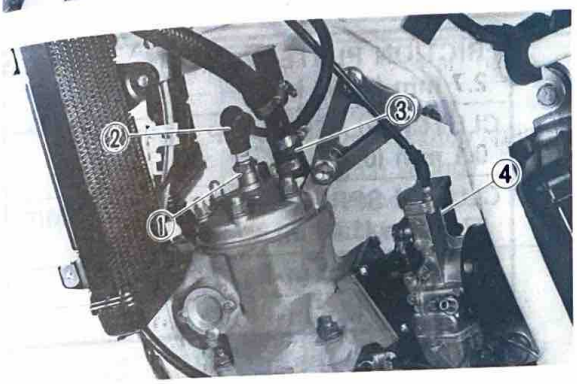
Tighten the nuts (cylinder head) ② in stage, using a diagonal pattern.

	Nut (Cylinder Head): **30 Nm (3.0 m•kg, 22 ft•lb)**



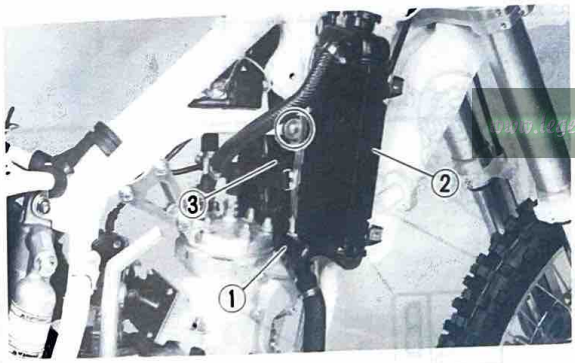
8. Install:
   - Rear upper bracket ①

	Bolt (Rear Upper Bracket—Frame): 32 Nm (3.2 m•kg, 23 ft•lb) **Bolt (Rear Upper Bracket—Engine): 32 Nm (3.2 m•kg, 23 ft•lb)**



9 Install:
   - Spark plug ①
   - Spark plug cap ②
   - Radiator hose 5 ③
   - Carburetor ④

	Spark Plug: 25 Nm (2.5 m•kg, 18 ft•lb)



10. Install:
   - Radiator hose 2 ①
   - Radiator ②
   - CDI unit ③

NOTE:

Install the CDI unit ③ with its manufacture's mark or numbers facing outward.

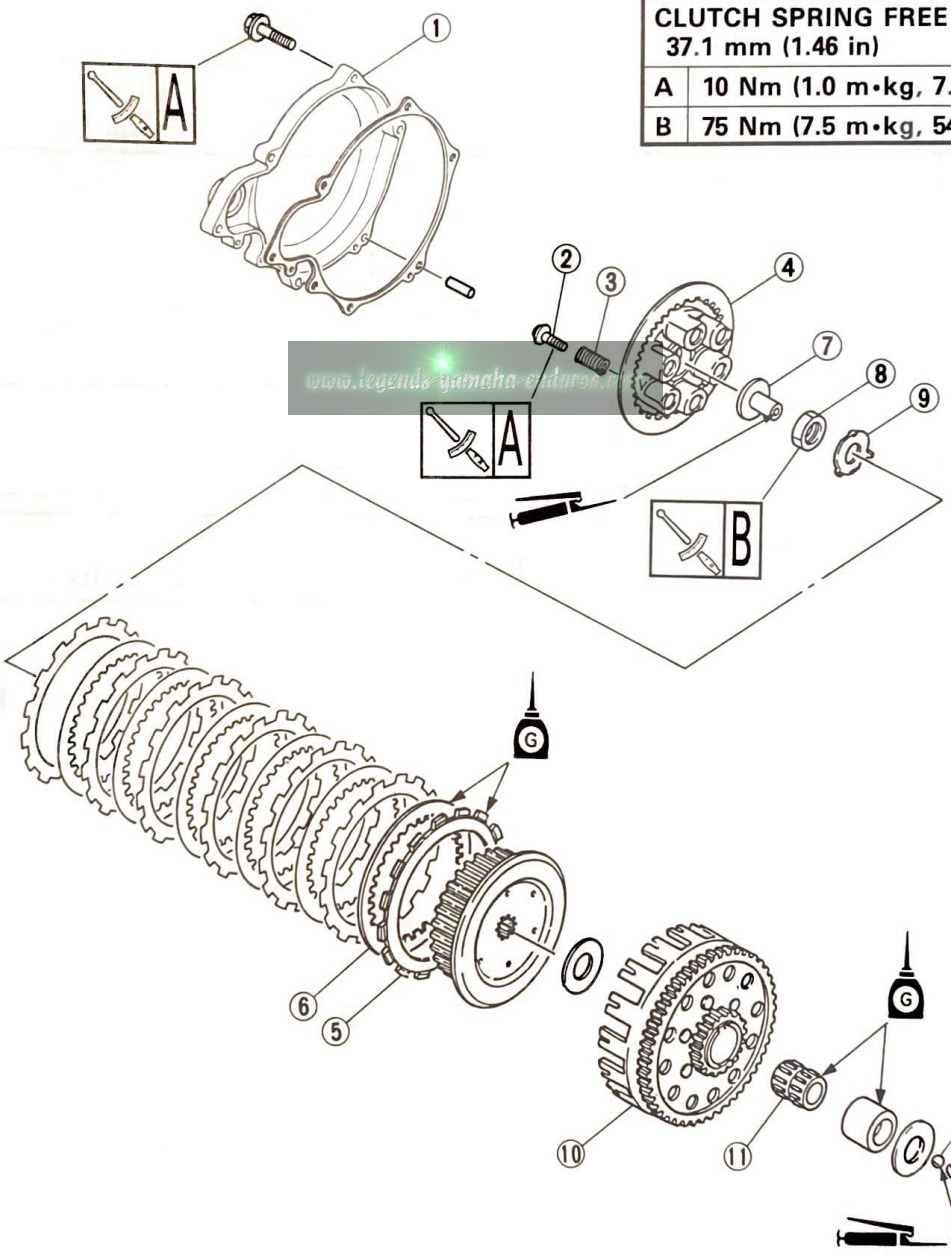
	Radiator (Bolt): 5 Nm (0.5 m•kg, 3.6 ft•lb)

CLUTCH AND PRIMARY DRIVEN GEAR

PREPARATION FOR REMOVAL

* Drain the transmission oil.
* Remove the brake installation bolt.
* Remove the brake pedal installation bolt.

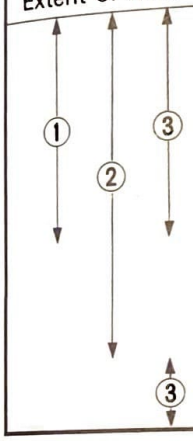
FRICTION PLATE WEAR LIMIT: 2.7 mm (0.106 in)	
CLUTCH PLATE WARP LIMIT: 0.1 mm (0.004 in)	
CLUTCH SPRING FREE LENGTH LIMIT: 37.1 mm (1.46 in)	
A	10 Nm (1.0 m•kg, 7.2 ft•lb)
B	75 Nm (7.5 m•kg, 54 ft•lb)

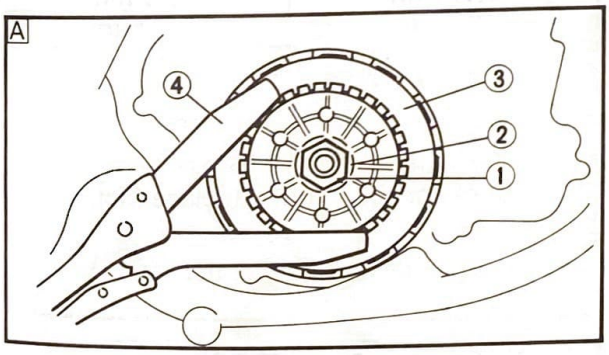


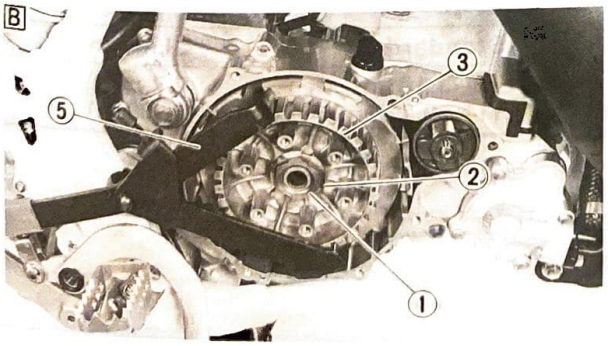
NOTE ON REMOVAL AND REASSEMBLY

•Wtih the engine mounted, the following parts can be removed.
•Before servicing, clean the parts, and take care so that foreign material do not enter the crankcase.
•Remove the gasket adhered on the contacting surface.
•For reassembly, the removed parts should be cleaned with solvent, and apply the transmission oil onto the sliding surface.

Extent of removal: ① Clutch plate and friction plate ② Primary driven gear ③ Push rod

Extent of removal	Order	Part name	Q'ty	Remarks
	1	Clutch cover	1	
	2	Screw (clutch spring)	6	
	3	Clutch spring	6	
	4	Pressure plate	1	
	5	Friction plate	7	
	6	Clutch plate	6	
	7	Push rod 1	1	
	8	Nut (clutch boss)	1	Use special tool. Refer to "REMOVAL POINTS".
	9	Lock washer	1	
	10	Primary driven gear	1	
	11	Bearing	1	
	12	Ball	1	
	13	Push rod 2	1	

A


B


REMOVAL POINTS

CLUTCH BOSS

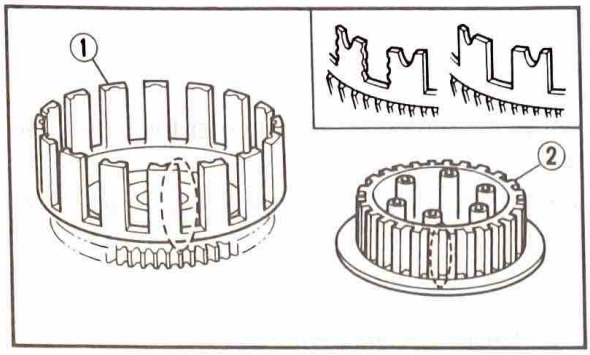
1. Remove:
   - Nut ①
   - Lock washer ②
   - Clutch boss ③

NOTE:

Straighten the lock washer tab and use the Clutch Holder ④, ⑤ to hold the clutch boss.

Clutch Holder:
YM-91042 ..... ④
90890-04086 ..... ⑤

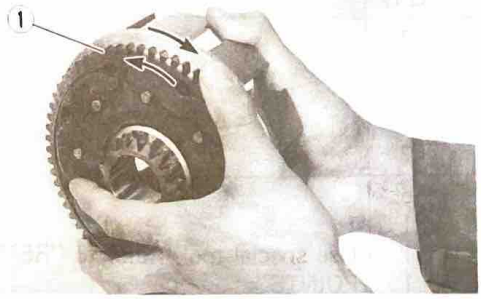
A For USA and CDN
B Except for USA and CDN



INSPECTION

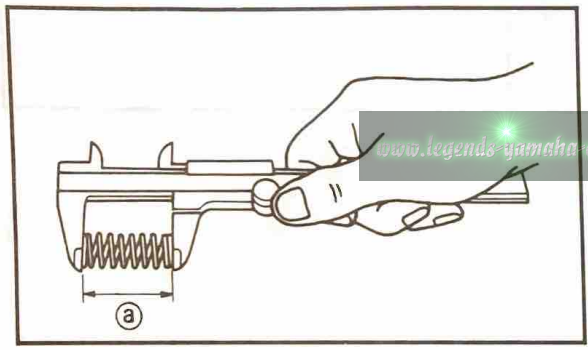
CLUTCH HOUSING AND BOSS

1. Inspect:
   - Clutch housing ①
     Cracks/Wear/Damage → Replace.
   - Clutch boss ②
     Scoring/Wear/Damage → Replace.



PRIMARY DRIVEN GEAR

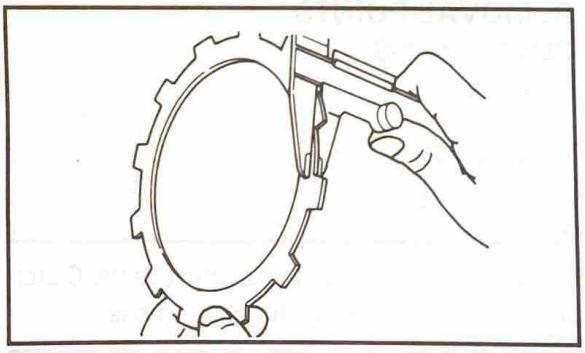
1. Check:
   - Circumferential play
     Free play exists → Replace.
   - Gear teeth ①
     Wear/Damage → Replace.



CLUTCH SPRING

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

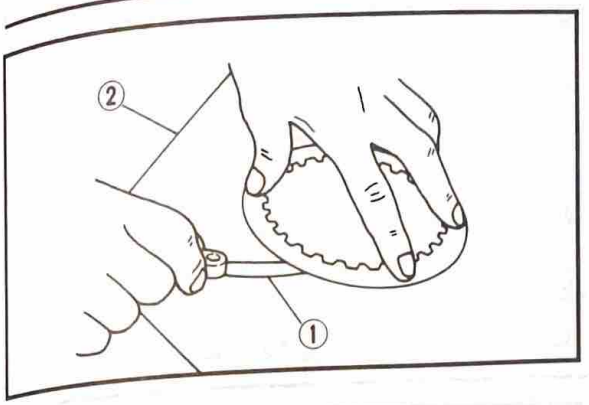
Clutch Spring Free Length:	
Standard	<Limit>
40.1 mm (1.58 in)	37.1 mm (1.46 in)



FRICTION PLATE

1. Measure:
   - Friction plate thickness
     Out of specification → Replace friction plate as a set.
     Measure at all four points.

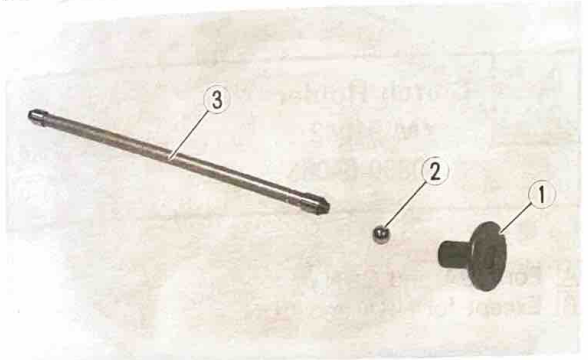
Friction Plate Thickness:	
Standard	<Limit>
2.9 ~ 3.1 mm (0.114 ~ 0.122 in)	2.7 mm (0.106 in)



CLUTCH PLATE

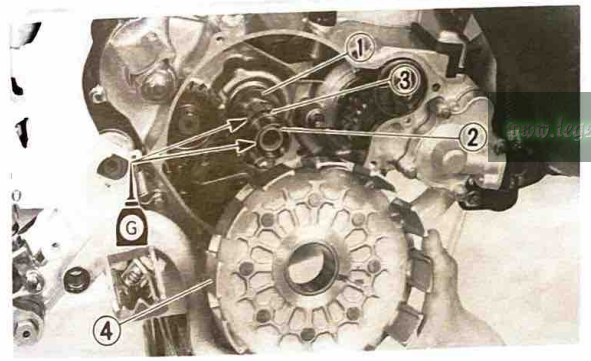
1. Measure:
   - Clutch plate warpage
     Out of specification→Replace clutch plate as a set.
     Use a surfacce plate ② and thickness gauge ①.

	Warp Limit: 0.1 mm (0.004 in)



PUSH ROD AXLE

1. Inspect:
   - Push rod 1 ①
   - Ball ②
   - Push rod 2 ③
     Wear/Damage/Bend→Replace.

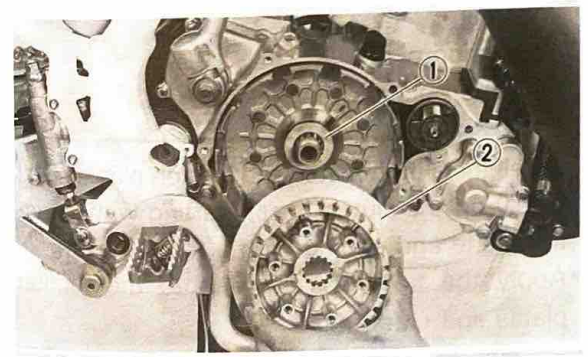


ASSEMBLY AND INSTALLATION

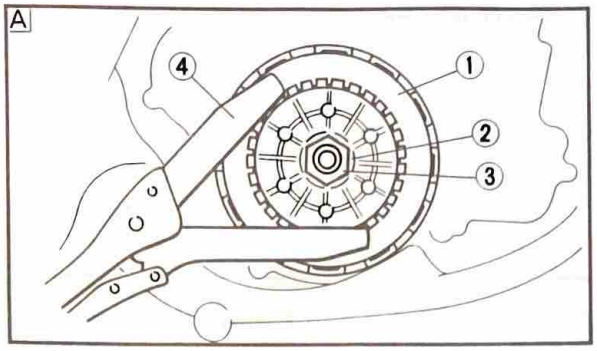
CLUTCH

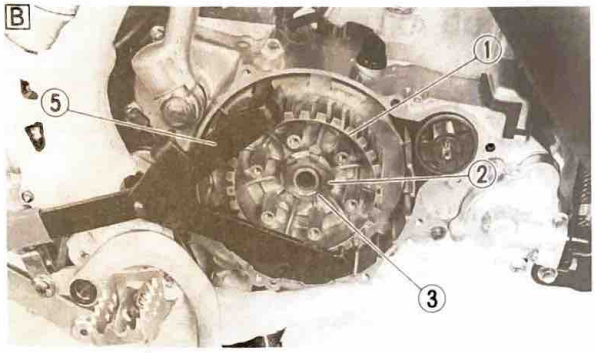
1. Install:
   - Thrust plate [T=3 mm (0.12 in)] ①
   - Spacer ②
   - Bearing ③
   - Primary driven gear ④

NOTE:
Apply the transmission oil onto the bearing.



2. Inatall:
   - Plain washer [T=2 mm (0.08 in)] ①
   - Clutch boss ②





3. Install:
   - Clutch boss ①
   - Lock washer ②
   - Nut (clutch boss) ③

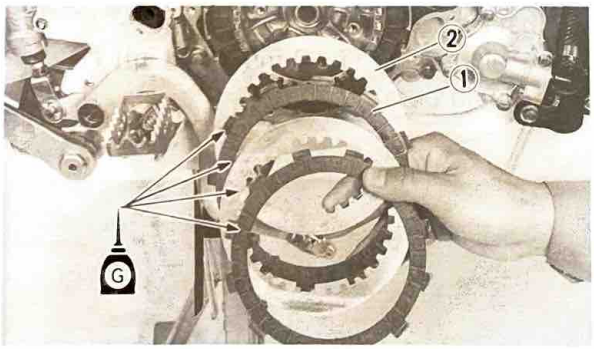
NOTE:
- Always use a new lock washer.
- Straighten the lock washer tab and use the Clutch Holder ④, ⑤ to hold the clutch boss.

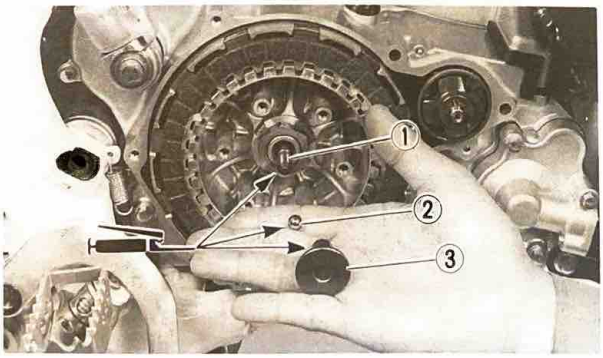
Clutch Holder:
YM-91042 ..... ④
90890-04086 ..... ⑤

A For USA and CDN
B Except for USA and CDN

Nut (Clutch Boss):
75 Nm (7.5 m•kg, 54 ft•lb)

4. Bend the lock washer tab.



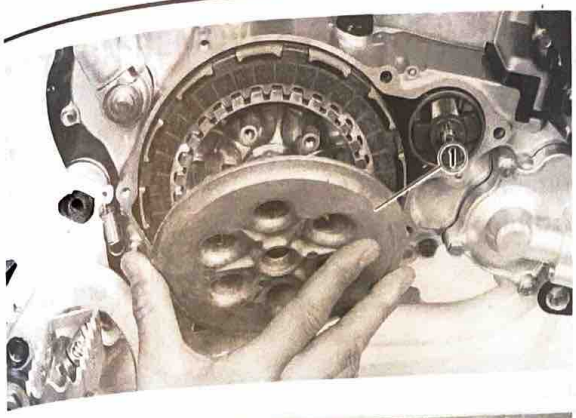


5. Install:
   - Friction plates ①
   - Clutch plates ②

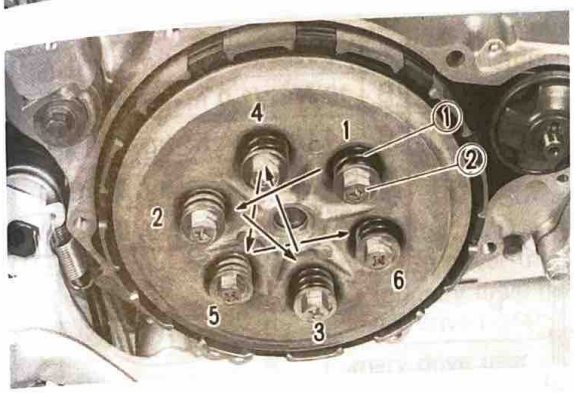
NOTE:
- Install the clutch plates and friction plates alternately on the clutch boss, starting with a friction plate and ending with a friction plate.
- Apply the transmission oil onto the friction plates and clutch plates.

6. Install:
   - Push rod 2 ①
   - Ball ②
   - Push rod 1 ③

NOTE:
Apply the lithium soap base grease the push rod 1,2 and ball.



7. Install:
   - Pressure plate ①

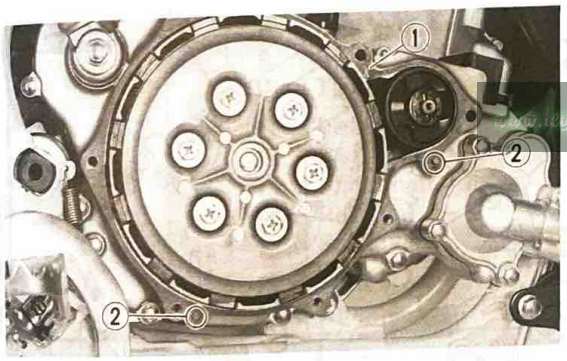


8. Install:
   - Clutch spring ①
   - Screw (clutch spring) ②

NOTE:

Tighten the screws in stage, using a diagonal pattern.

	Screws (Clutch Spring): **10 Nm (1.0 m•kg, 7.2 ft•lb)**



9. Install:
   - Gasket (clutch cover) ①
   - Dowel pin ②

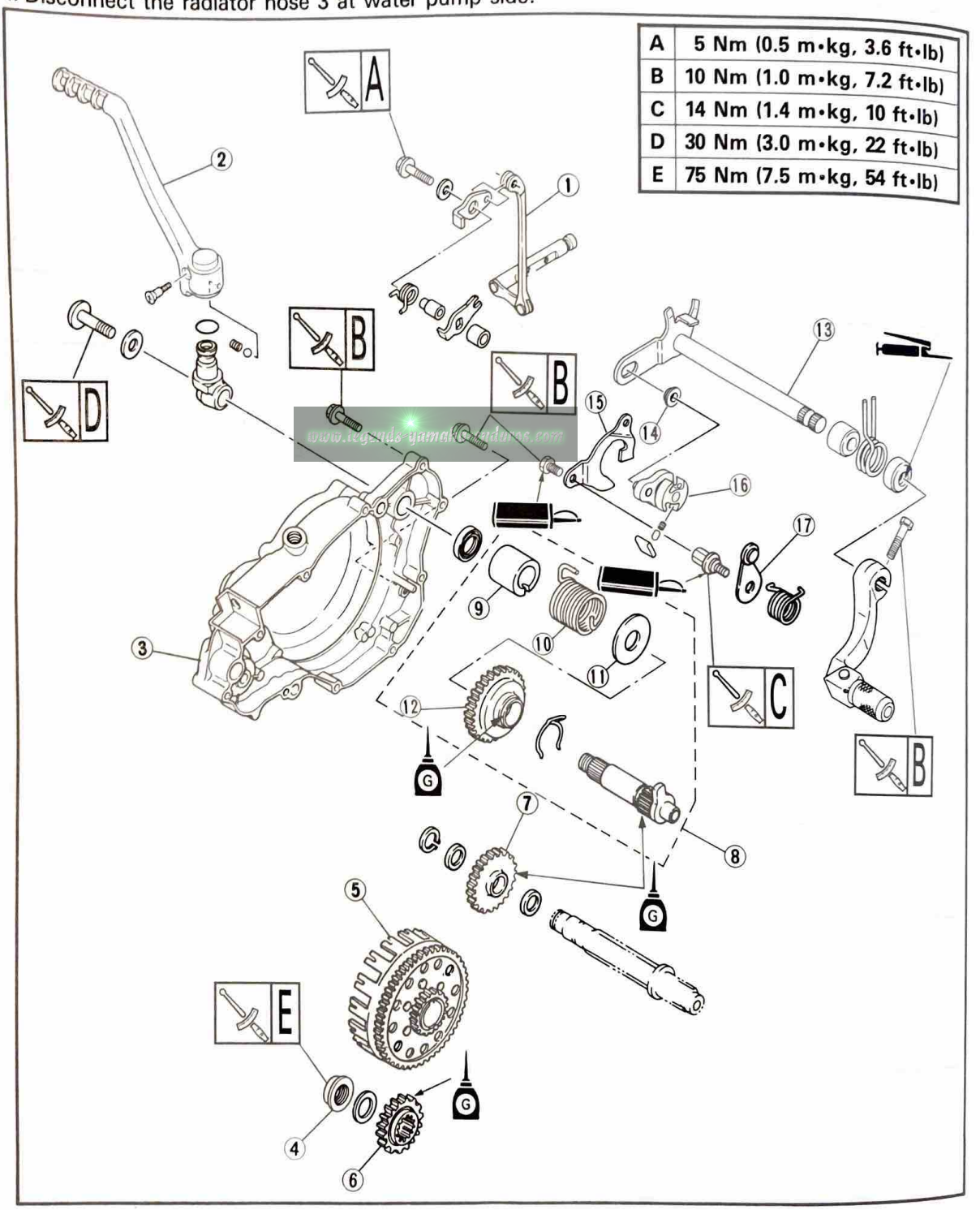
10. Install:
    - Clutch cover ①
    - Bolt ②

	Bolts (Clutch Cover): **10 Nm (1.0 m•kg, 7.2 ft•lb)**

KICK AXLE, SHIFT SHAFT AND PRIMARY DRIVE GEAR

PREPARATION FOR REMOVAL

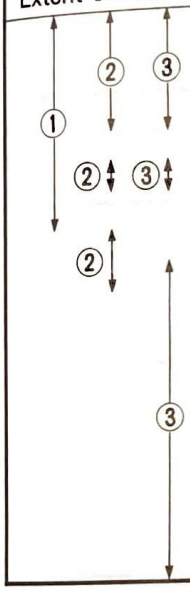
* Drain the transmission oil.
* Drain the coolant.
* Remove the following parts.
  - Exhaust pipe and silencer
  - Shift pedal
  - Brake pedal
* Disconnect the radiator hose 3 at water pump side.

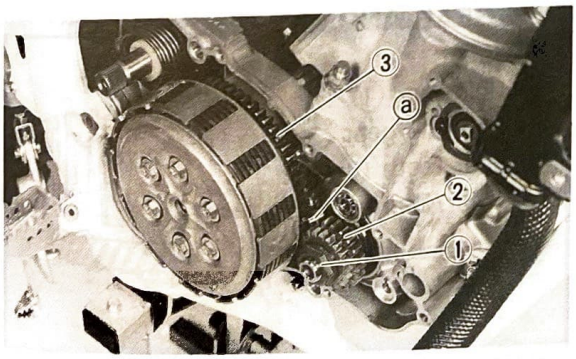


NOTE ON REMOVAL AND REASSEMBLY

- With the engine mounted, the following parts can be removed.
- Before servicing, clean the parts, and take care so that foreign material do not enter the crankcase.
- Remove the gasket adhered on the contacting surface.
- For reassembly, the removed parts should be cleaned with solvent, and apply the transmission oil onto the sliding surface.

Extent of removal: ① Primary drive gear removal ② Kick axle and kick idle gear removal ③ Shift shaft and stopper lever removal

Extent of removal	Order	Part name	Q'ty	Remarks
	1	Push rod	1	Refer to "CYLINDER HEAD, CYLINDER AND PISTON" section.
	2	Kick starter	1	Refer to "REMOVAL POINTS".
	3	Crankcase cover (right)	1	
	4	Nut (primary drive gear)	1	
	5	Primary driven gear	1	
	6	Primary drive gear	1	Refer to "REMOVAL POINTS".
	7	Kick idle gear	1	
	8	Kick axle assembly	1	
	9	Spring guide	1	
	10	Torsion spring	1	
	11	Plain washer	1	Refer to "REMOVAL POINTS".
	12	Kick gear	1	
	13	Shift shaft	1	
	14	Roller	1	
	15	Shift guide	1	
	16	Shift lever	1	
	17	Stopper lever	1	



REMOVAL POINTS

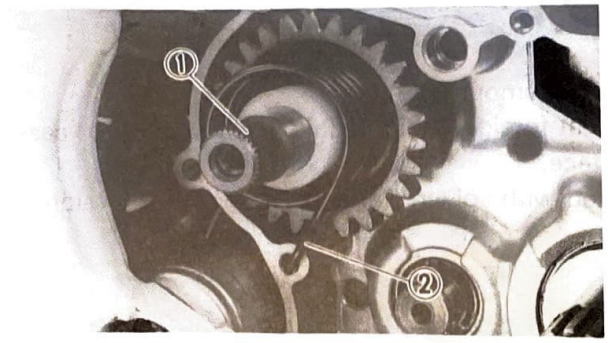
PRIMARY DRIVE GEAR

1. Loosen:
   - Nut (primary drive gear) ①

NOTE:

Place an alminum plate ⓐ between the teeth of the primary drive gear ② and driven gear ③.

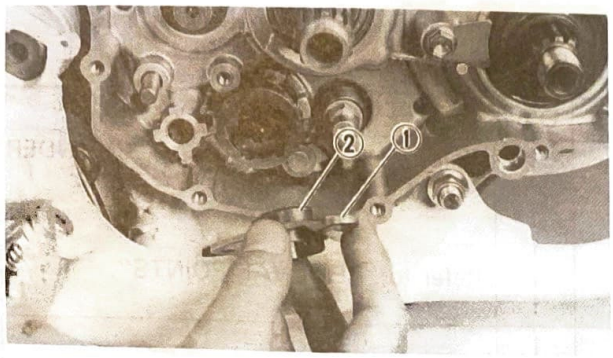
2. Remove:
   - Primary drive gear ②
   - Primary driven gear ③



KICK AXLE ASSEMBLY

1. Remove:
   - Kick axle assembly ①

   Unhook the torsion spring ② from the stopper.



SHIFT GUIDE AND SHIFT LEVER ASSEMBLY

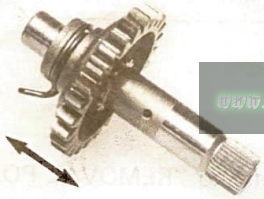
1. Remove:
   - Bolt (shift guide)
   - Shift guide ①
   - Shift lever assembly ②

NOTE:

The shift lever assembly is disassembled at the same time as the shift guide.

INSPECTION

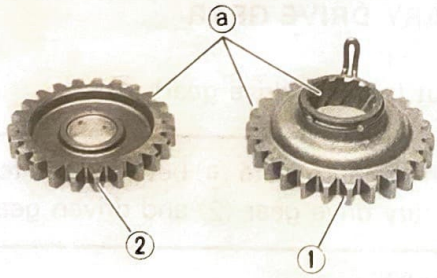
KICK AXLE AND KICK GEAR



1. Check:
   - Kick gear smooth movement

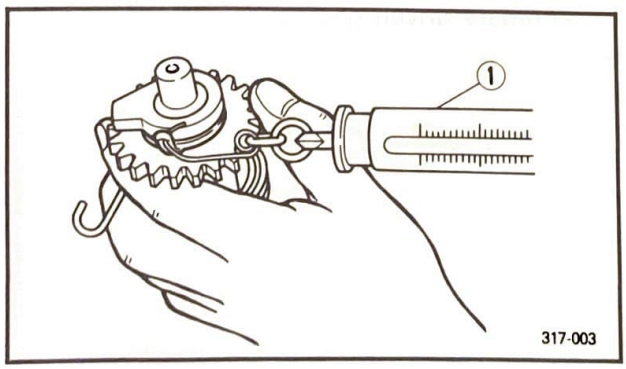
   Unsmooth movement → Replace.

KICK GEAR AND KICK IDLE GEAR



1. Inspect:
   - Kick gear ①
   - Kick idle gear ②
   - Gear teeth ⓐ

   Wear/Damage → Replace.



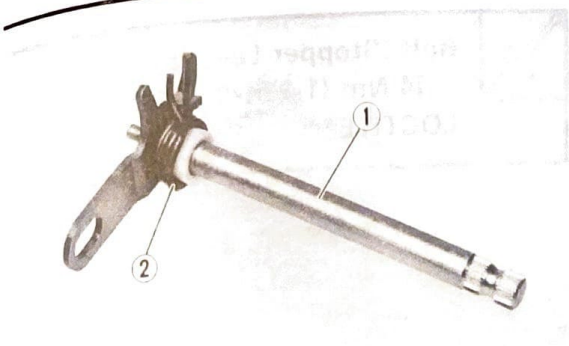
KICK GEAR CLIP

1. Measure:
   - Kick clip friction force

   Out of specification → Replace.

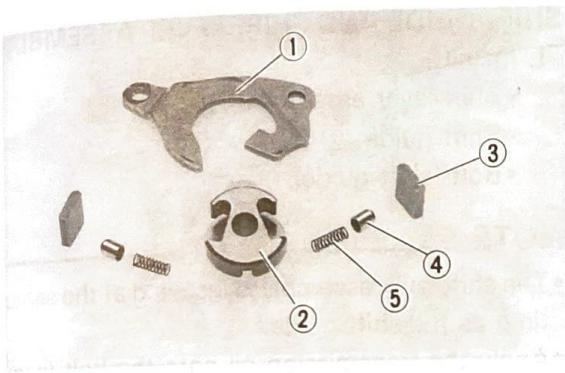
   Use a spring gauge ①.

Kick Clip Friction Force:
0.8 ~ 1.2 kg (1.8 ~ 2.6 lb)



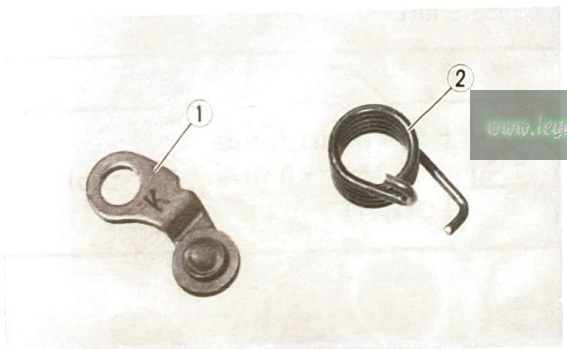
SHIFT SHAFT

1. Inspect:
   - Shift shaft ①
     Bend/Damage→Replace.
   - Spring ②
     Broken→Replace.



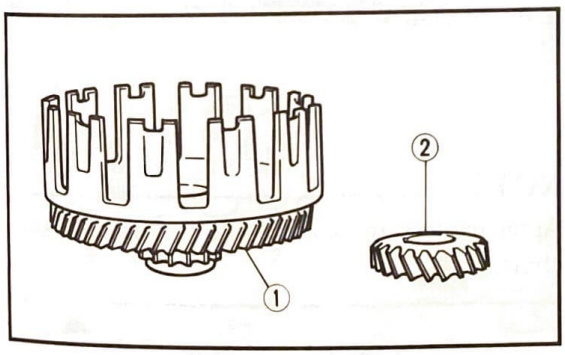
SHIFT GUIDE AND SHIFT LEVER ASSEMBLY

1. Inspect:
   - Shift guide ①
   - Shift lever ②
   - Pawl ③
   - Pawl pin ④
   - Spring ⑤
     Wear/Damage→Replace.



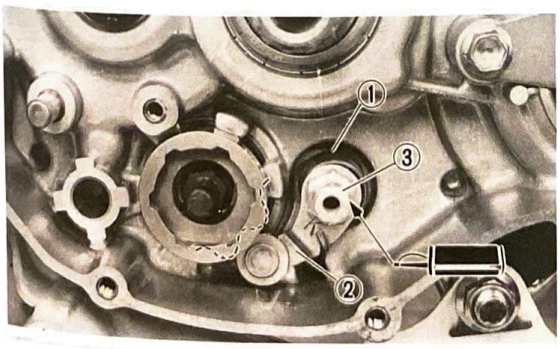
STOPPER LEVER

1. Inspect:
   - Stopper lever ①
     Wear/Damage→Replace.
   - Torsion spring ②
     Broken→Replace.



PRIMARY DRIVE GEAR AND DRIVEN GEAR

1. Inspect:
   - Primary driven gear ①
   - Primary drive gear ②
     Wear/Damage→Replace.



ASSEMBLY AND INSTALLATION

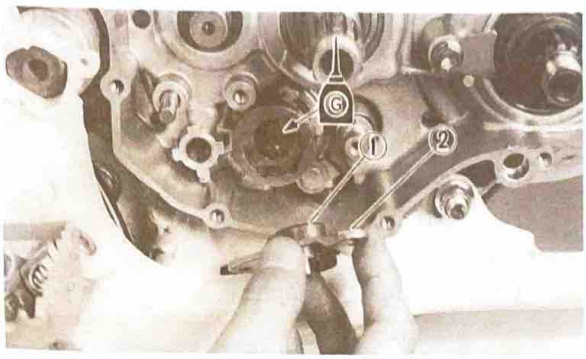
STOPPER LEVER

1. Install:
   - Torsion spring ①
   - Stopper lever ②
   - Bolt (stopper lever) ③

NOTE:

Align the stopper lever roller with the slot on segment.

Bolt (Stopper Lever):
14 Nm (1.4 m•kg, 10 ft•lb)
LOCTITE®

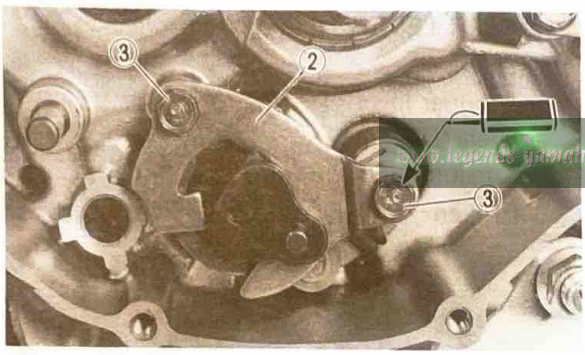


SHIFT GUIDE AND SHIFT LEVER ASSEMBLY

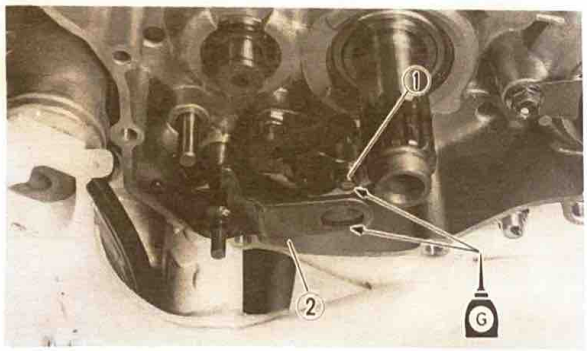
1. Install:
   - Shift lever assembly ①
   - Shift guide ②
   - Bolt (shift guide) ③

NOTE:

- The shift lever assembly is installed at the same time as the shift guide.
- Apply the transmission oil onto the bolt (segment) shaft.



Bolts (Shift Guide):
10 Nm (1.0 m•kg, 7.2 ft•lb)
LOCTITE®

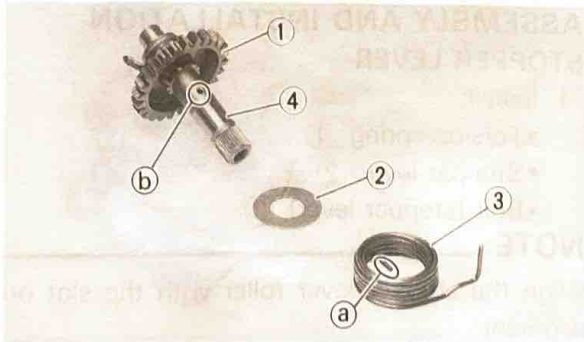


SHIFT SHAFT

1. Install:
   - Roller ①
   - Shift shaft ②

NOTE:

Apply the transmission oil onto the roller and shift shaft.

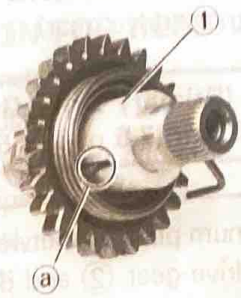


KICK AXLE ASSEMBLY

1. Install:
   - Kick gear ①
   - Plain washer ②
   - Torsion spring ③
     To kick axle ④.

NOTE:

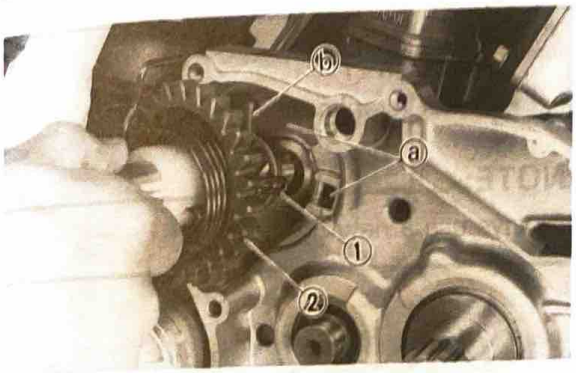
Make sure the stopper ⓐ of the torsion spring fits into the hole ⓑ on the kick axle.



2. Install:
   - Spring guide ①

NOTE:

Slide the spring guide ① into the kick axle, make sure the groove ⓐ in the spring guide fits on the stopper of the torsion spring.

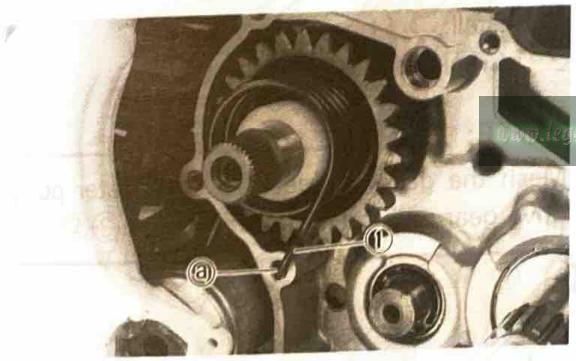


KICK AXLE

1. Install:
   - Clip (kick axle) ①
   - Kick axle assembly ②

NOTE:

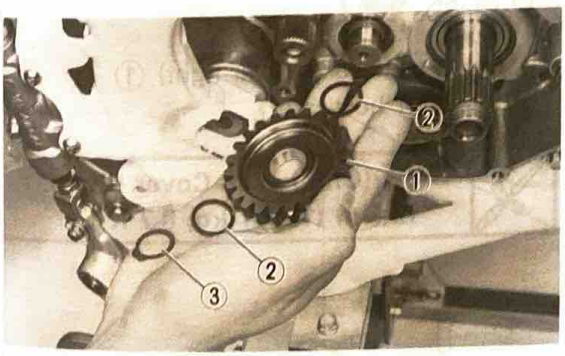
Slide the kick axle assembly into the case, make sure the clip ① and kick axle stopper ⓑ fit into their home positions ⓐ.



2. Hook:
   - Torsion spring ①

NOTE:

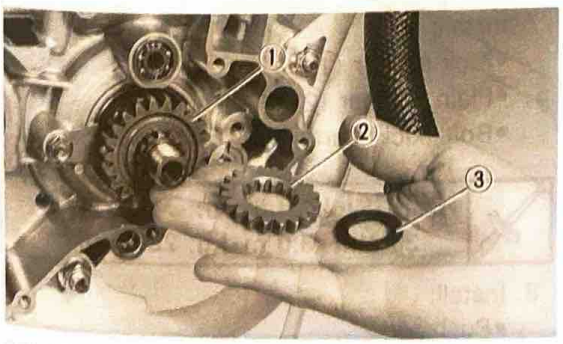
Turn the kick starter return spring clockwise and hook into the proper hole ⓐ in the crankcase.



3. Install:
   - Kick idle gear ①
   - Plain washer ②
   - Circlip ③

NOTE:

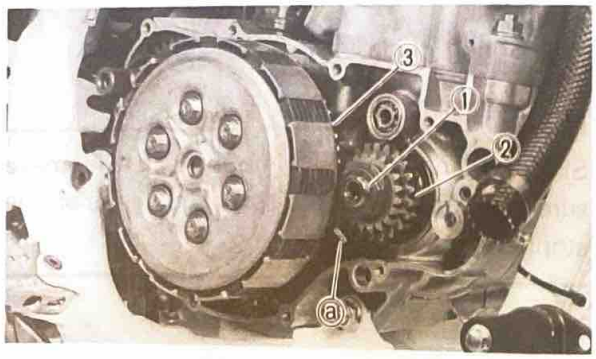
Always use a new circlip.



PRIMARY DRIVE GEAR

1. Install:
   - Primary drive gear ①
   - Governor drive gear ②
   - Plain washer ③
2. Install:
   - Primary driven gear

   Refer to the "CLUTCH AND PRIMARY DRIVEN GEAR" section in the CHAPTER 4.

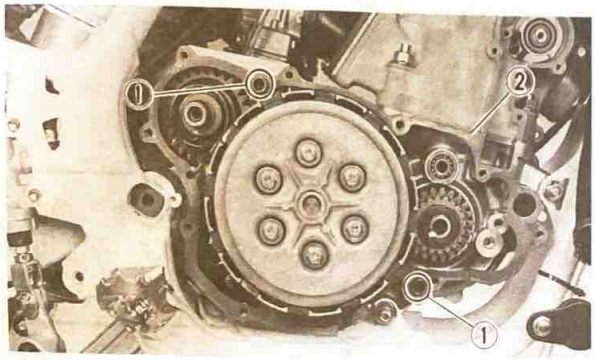


3. Tighten:
   - Nut (primary drive gear) ①

	Nut (Primary Drive Gear): **75 Nm (7.5 m•kg, 54 ft•lb)**

NOTE:

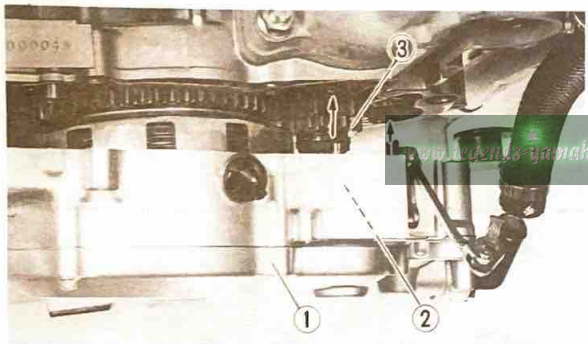
Place an alminum plate ⓐ between the teeth of the primary drive gear ② and driven gear ③.



4. Install:
   - Dowel pin ①
   - Gasket (crankcase cover right) ②

NOTE:

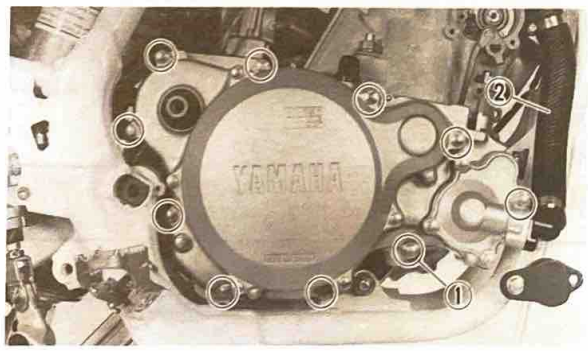
Always use a new gasket.



5. Install:
   - Crankcase cover (right) ①

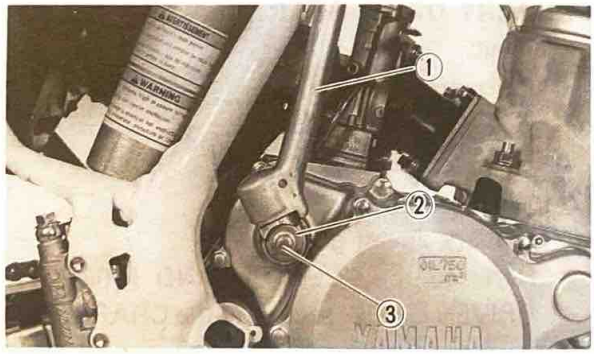
NOTE:

Mesh the governor gear ② and water pump drive gear with governor drive gear ③.



6. Install:
   - Bolt (crankcase cover right) ①
   - Radiator hose 3 ②

	Bolts (Crankcase Cover Right): **12 Nm (1.2 m•kg, 8.7 ft•lb)**



7. Install:
   - Kick starter ①
   - Plain washer ②
   - Bolt (kick starter) ③

	Bolt (Kick Starter): **30 Nm (3.0 m•kg, 22 ft•lb)**

8. Install:
   - Push rod

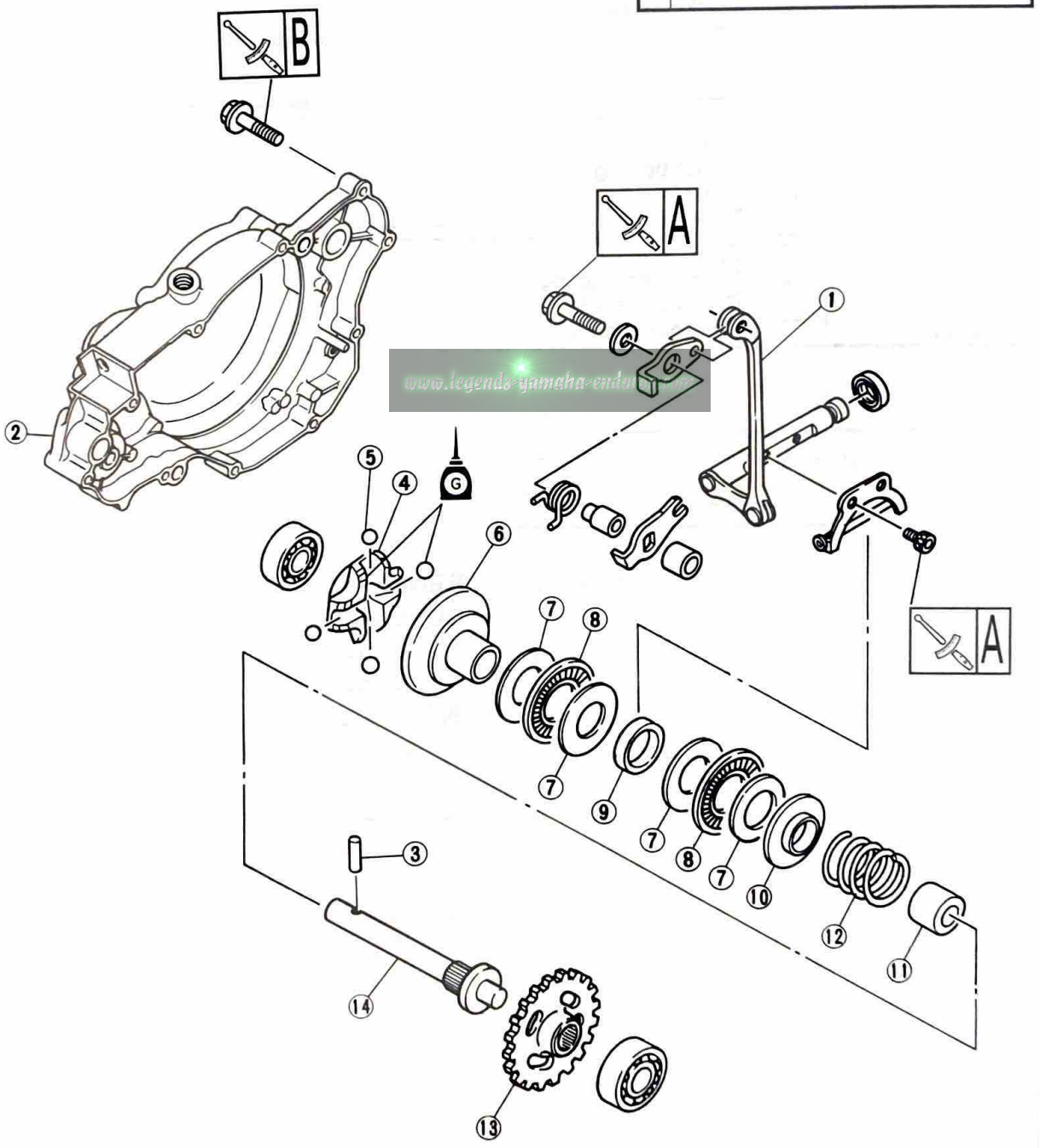
   Refer to the "CYLINDER HEAD, CYLINDER AND PISTON" section in the CHAPTER 4.

YPVS GOVERNOR

PREPARATION FOR REMOVAL

*Drain the transmission oil.
*Drain the coolant.
*Remove the following parts.
  •Exhaust pipe and silencer
  •Brake pedal
  •Kick starter

A	5 Nm (0.5 m•kg, 3.6 ft•lb)
B	10 Nm (1.0 m•kg, 7.2 ft•lb)

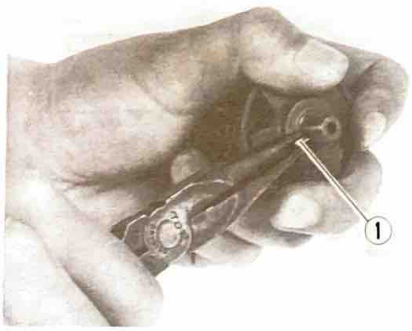


NOTE ON REMOVAL AND REASSEMBLY

- With the engine mounted, the following parts can be removed.
- Before servicing, clean the parts, and take care so that foreign material do not enter the crankcase.
- Remove the gasket adhered on the contacting surface.
- For reassembly, the removed parts should be cleaned with solvent, and apply the transmission oil onto the sliding surface.

Extent of removal: ① YPVS governor removal

Extent of removal	Order	Part name	Q'ty	Remarks
①	1	Push rod	1	Refer to "CYLINDER HEAD, CYLINDER AND PISTON" section.
	2	Crankcase cover (right)	1	
	3	Dowel pin	1	Refer to "REMOVAL POINTS".
	4	Retainer	1	
	5	Ball	4	
	6	Retainer weight	1	
	7	Plain washer	4	
	8	Thrust bearing	2	
	9	Collar	1	
	10	Plate	1	
	11	Spacer	1	
	12	Compression spring	1	
	13	Governor gear	1	
	14	Governor shaft	1	



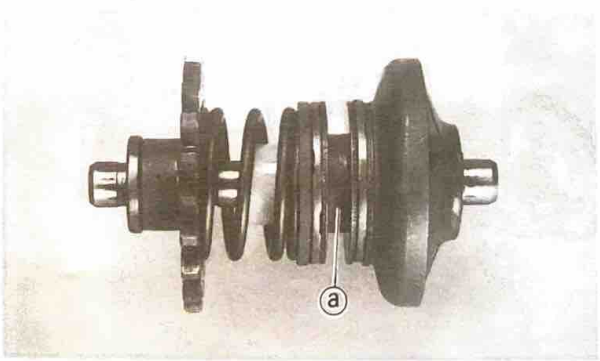
REMOVAL POINTS

GOVERNOR

1. Remove:
   - Dowel pin ①

NOTE:

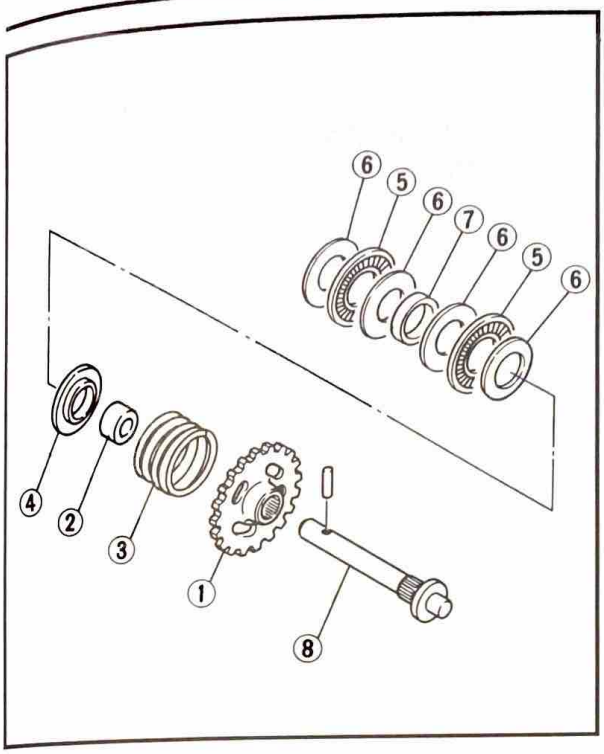
While compressing the spring, remove the dowel pin.



INSPECTION

GOVERNOR GROOVE

1. Inspect:
   - Governor groove ⓐ
     Wear/Damage → Replace plain washer.

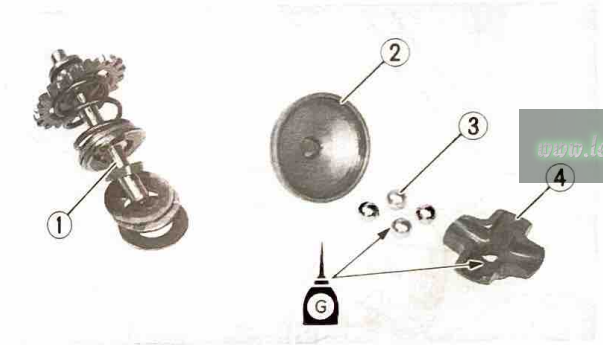


ASSEMBLY AND INSTALLATION

GOVERNOR

1. Install:
   - Governor gear ①
   - Spacer ②
   - Compression spring ③
   - Plate ④
   - Thrust bearing ⑤
   - Plain washer ⑥
   - Collar ⑦

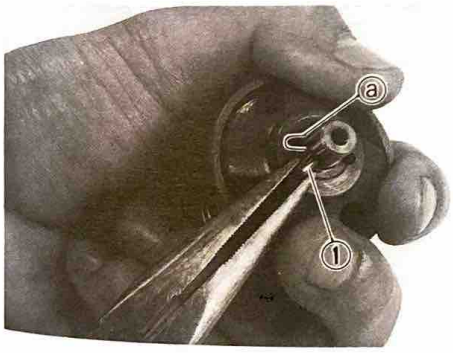
   To governor shaft ⑧.



2. Install:
   - Governor shaft ①
   - Retainer weight ②
   - Ball ③
   - Retainer ④

NOTE:

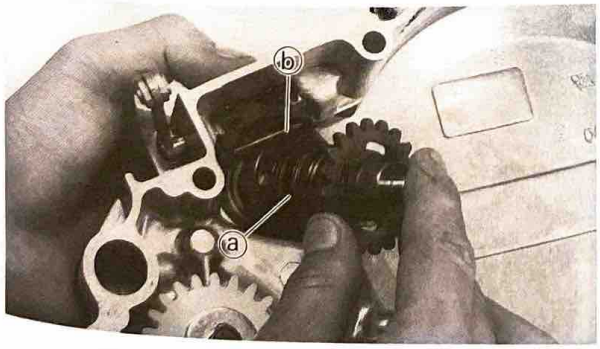
Apply the transmission oil onto the retainer and ball.



3. Install:
   - Dowel pin ①

NOTE:

- While compressing the spring, install the dowel pin.
- Make sure the dowel pin ① fits into the groove ⓐ in the retainer.



4. Install:
   - Governor assembly

NOTE:

Align the groove ⓐ in the governor with the fork ⓑ and set the governor in the case.

5. Install:
   • Crankcase cover (right)
   Refer to the "KICK AXLE, SHIFT SHAFT AND PRIMARY DRIVE GEAR" section in the CHAPTER 4.

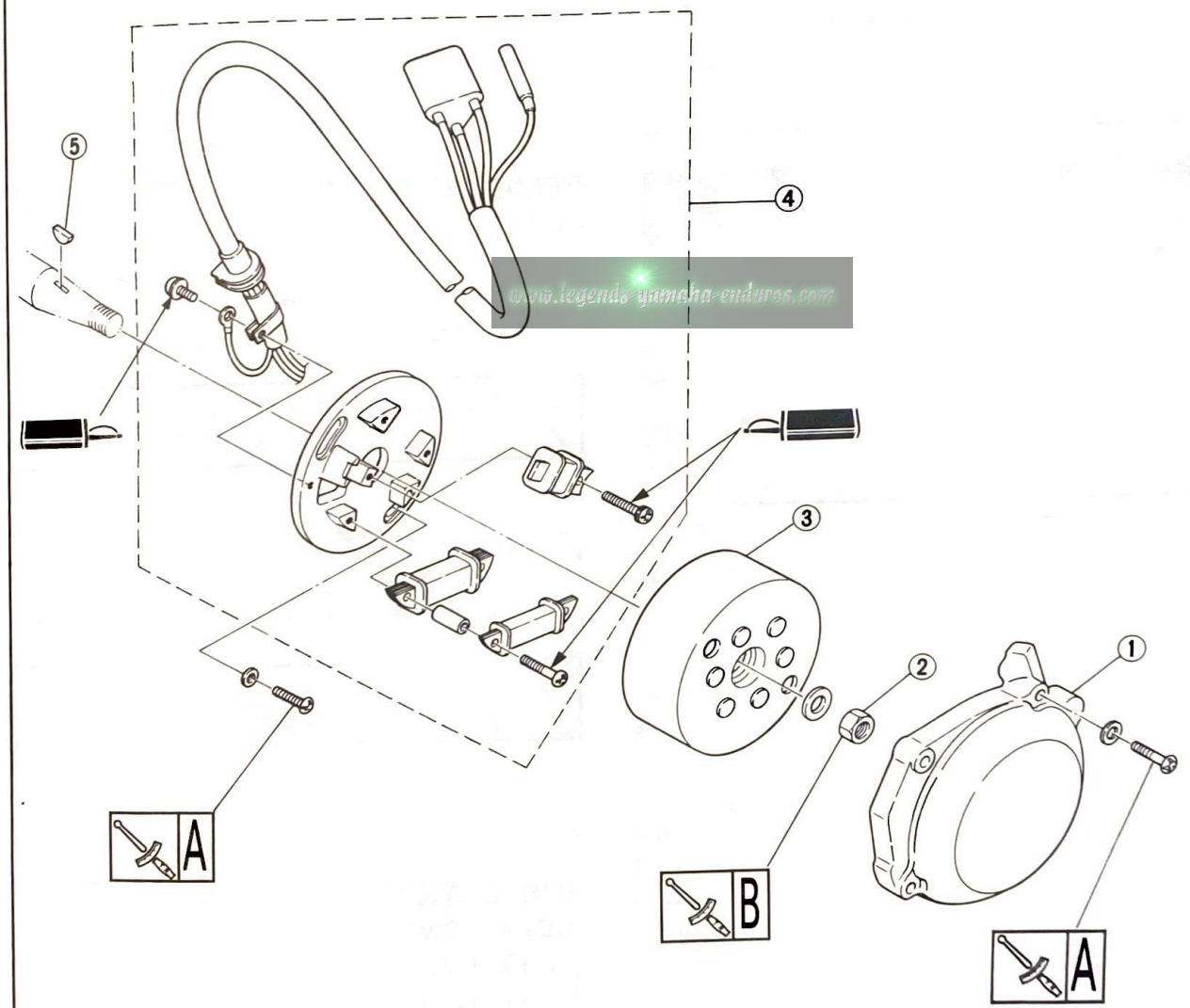
CDI MAGNETO

PREPARATION FOR REMOVAL

*Remove the following parts.
- Seat
- Air scoop (left and right)
- Fuel tank

*Disconnect the CDI magneto lead.

IGNITION TIMING: 1.2 mm (0.047 in)	
A	8 Nm (0.8 m•kg, 5.8 ft•lb)
B	48 Nm (4.8 m•kg, 35 ft•lb)

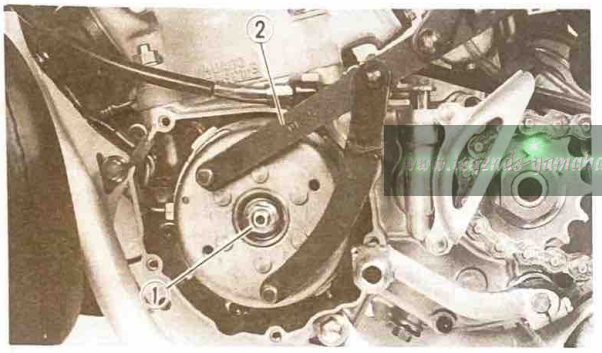


NOTE ON REMOVAL AND REASSEMBLY

- With the engine mounted, the following parts can be removed.
- Before servicing, clean the parts, and take care so that foreign material do not enter the crankcase.
- Remove the gasket adhered on the contacting surface.

Extent of removal: ① CDI magneto removal

Extent of removal	Order	Part name	Q'ty	Remarks
①	1	Crankcase cover (left)	1	
	2	Nut (rotor)	1	Use special tool. Refer to "REMOVAL POINTS".
	3	Rotor	1	
	4	Stator	1	
	5	Woodruff key	1	



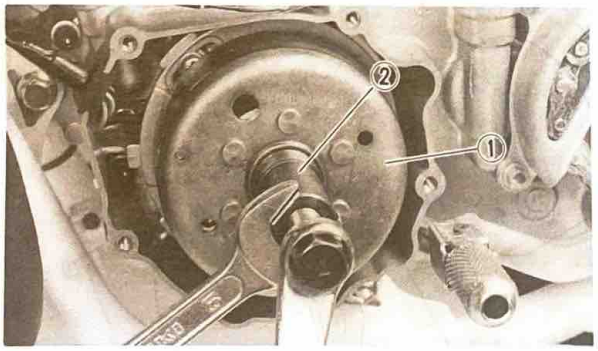
REMOVAL POINTS

ROTOR

1. Remove:
   - Nut (rotor) ①

   Use the Rotor Holding Tool ②.

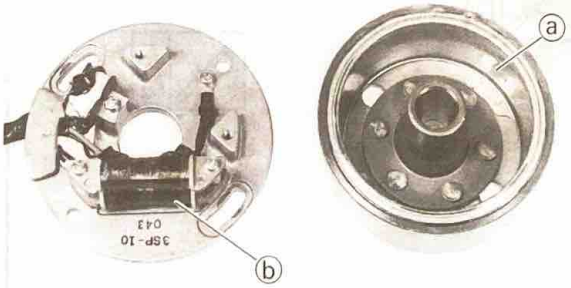
	Rotor Holding Tool: YU-01235/90890-01235



2. Remove:
   - Rotor ①

   Use the Rotor Puller ②.

	Rotor Puller: YM-01189/90890-01189

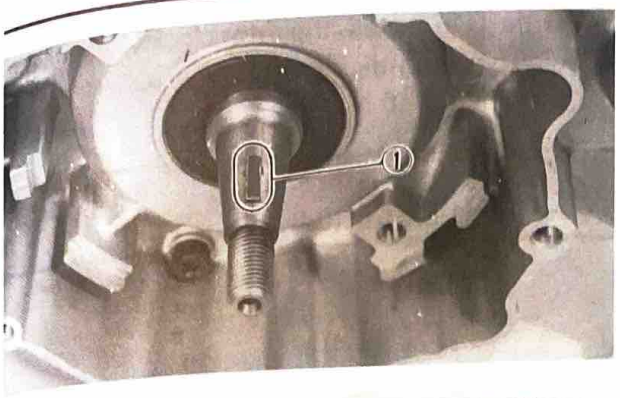


INSPECTION

CDI MAGNETO

1. Inspect:
   - Rotor inner surface ⓐ
   - Stator outer surface ⓑ

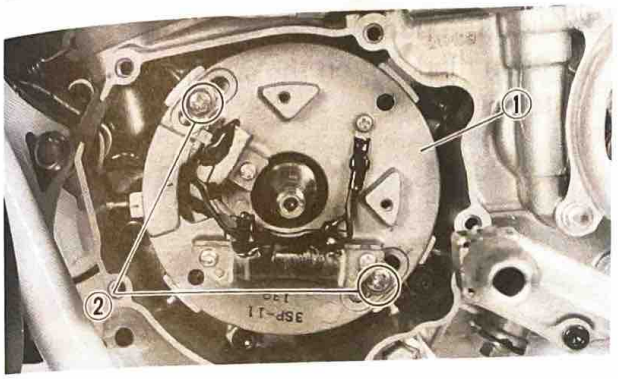
   Damage→Inspect the crankshaft runout and crankshaft bearing.
   If necessary, replace CDI magneto/stator.



2. Inspect:
   - Woodruff key ①
     Damage → Replace.

ASSEMBLY AND INSTALLATION

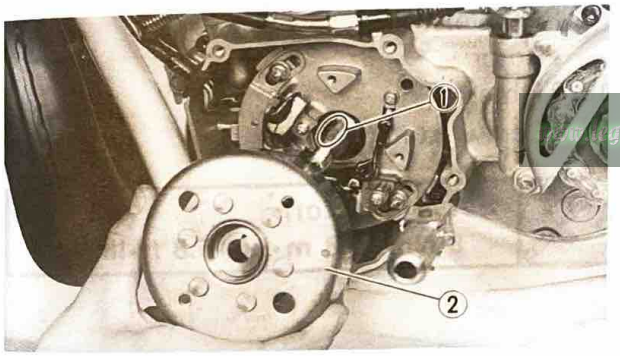
CDI MAGNETO



1. Install:
   - Stator ①
   - Screw (stator) ②

NOTE:

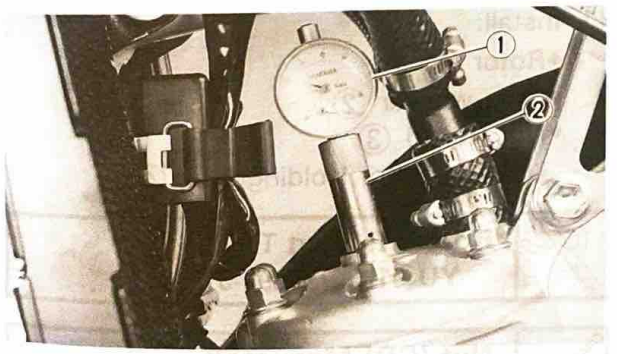
Temporarily tighten the screw (stator) at this point.



2. Install:
   - Woodruff key ①
   - Rotor ②

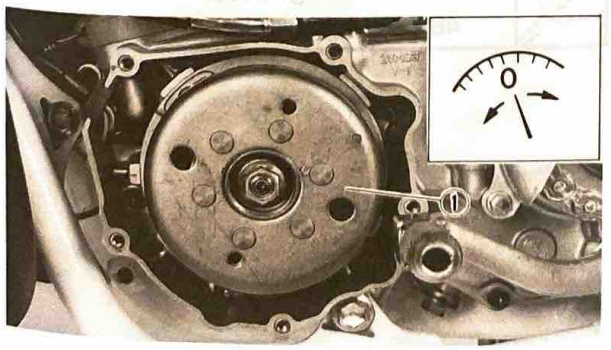
NOTE:

- Clean the tapered portions of the crankshaft and rotor.
- When installing the rotor ② make sure the woodruff key ① is properly seated in the key-way of the crankshaft.



3. Remove:
   - Spark plug
4. Attach:
   - Dial gauge ①
   - Dial gauge stand ②

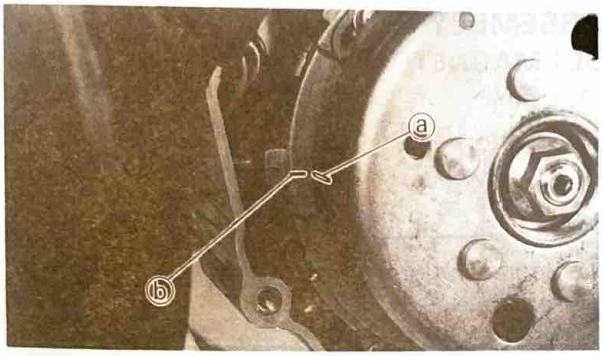
Dial Gauge:
YU-03097/90890-01252
Stand:
YU-01256



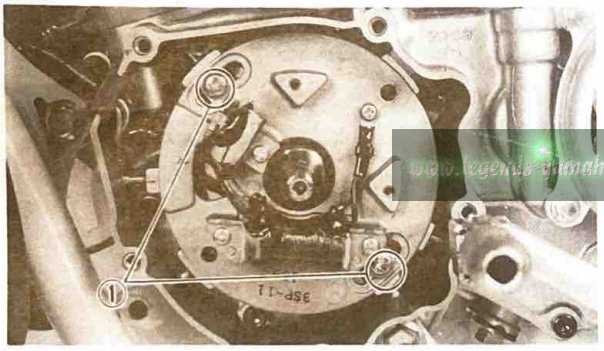
5. Rotate the magneto rotor ① until the piston reaches top dead center (TDC). When this happens, the needle on the dial gauge will stop and reverse directions even though the rotor is being turned in the same direction.
6. Set the dial gauge to zero at TDC.

7. From TDC, rotate the rotor clockwise until the dial gauge indicates that the piston is at a specified distance from TDC.

Ignition Timing:
1.2 mm (0.047 in)

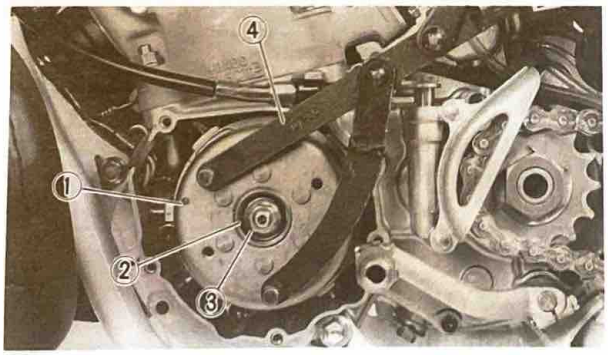


8. Align the punch mark ⓐ on the rotor with punch mark ⓑ on the stator by moving the stator ①.



9. Remove:
   - Rotor
10. Tighten:
    - Screw (stator) ①

Screw (Stator):
8 Nm (0.8 m•kg, 5.8 ft•lb)

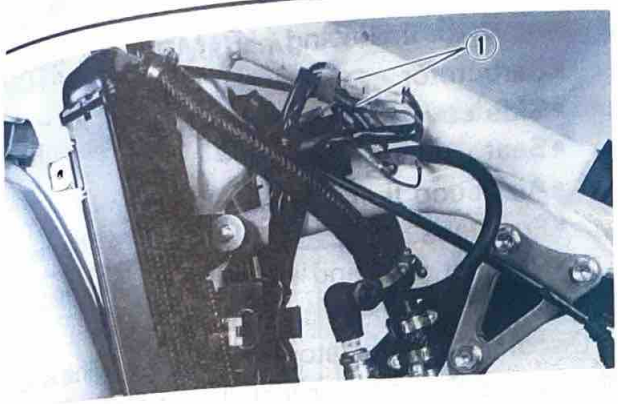


11. Install:
    - Rotor ①
    - Plain washer ②
    - Nut (rotor) ③

    Use the Rotor Holding Tool ④.

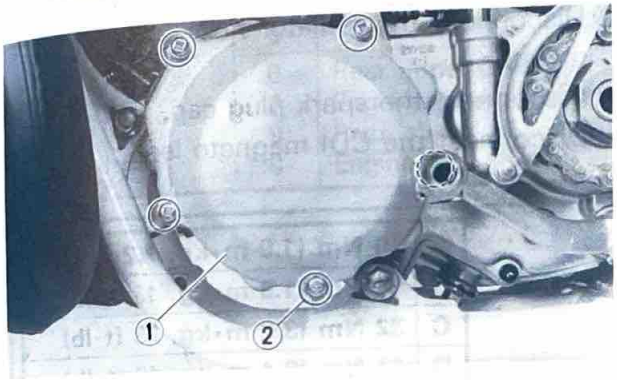
Rotor Holding Tool:
YU-01235/90890-01235

Nut (CDI Magneto):
48 Nm (4.8 m•kg, 35 ft•lb)



12. Connect:
    - CDI magneto lead ①

    Refer to the "CABLE ROUTING DIAGRAM" section in the CHAPTER 2.



13. Install:
    - Gasket (crankcase cover left)
    - Crankcase cover (left) ①
    - Screw (crankcase cover left) ②

NOTE:

Always use a new gasket.

	Screws (Crankcase Cover Left): 8 Nm (0.8 m•kg, 5.8 ft•lb)

ENGINE REMOVAL

PREPARATION FOR REMOVAL

*Hold the machine by placing the suitable stand under the engine.

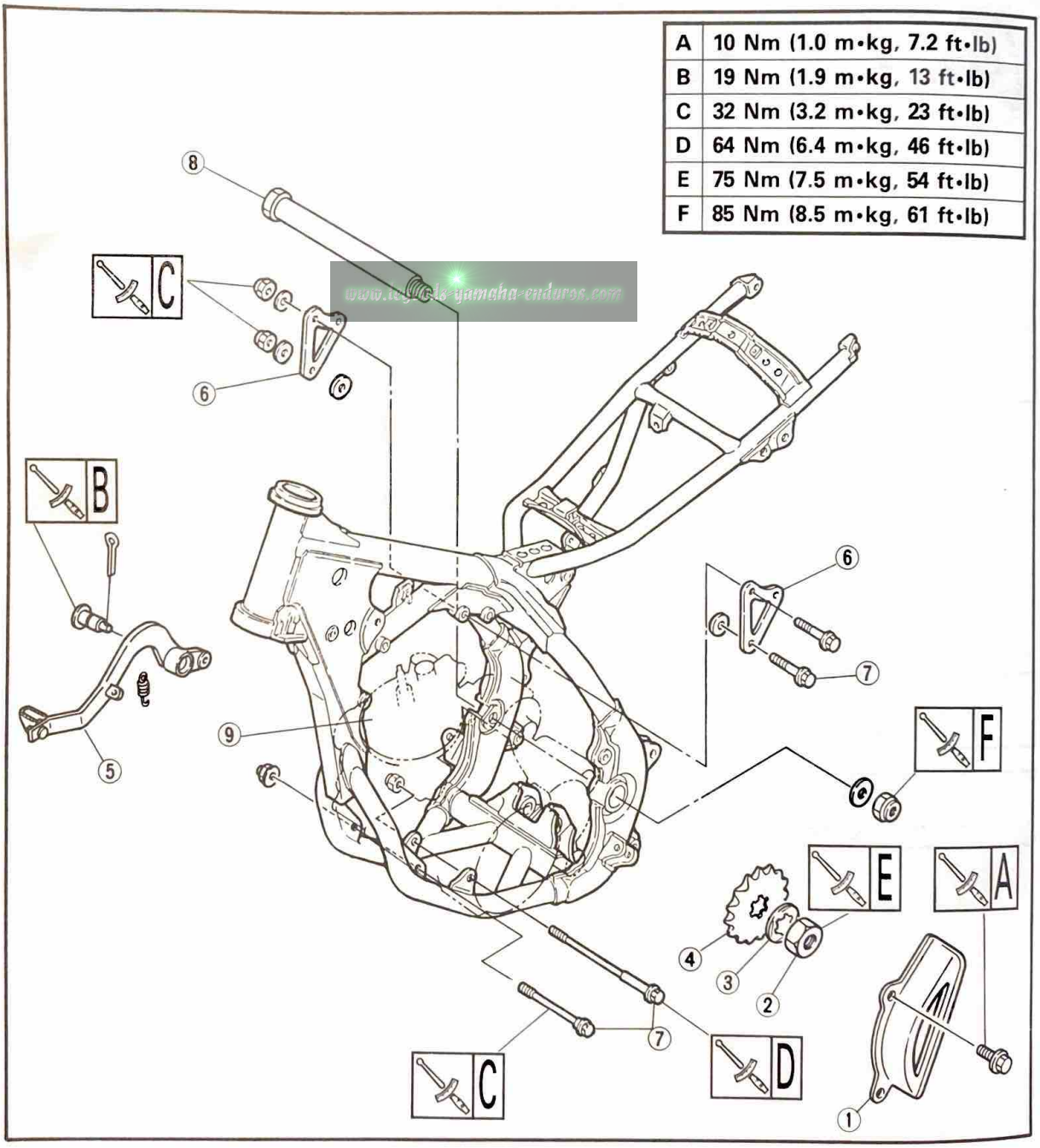
⚠ WARNING

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

*Drain the coolant.
*Drain the transmission oil.
*Disconnect the clutch cable at engine side.
*Remove the following parts:
- Carburetor
- Side cover (right)
- Seat
- Air scoop (left and right)
- Fuel tank
- Exhaust pipe and silencer
- CDI unit

*Disconnect the radiator hose 3, 5 at engine side.
*Remove the radiator installation bolts.
*Disconnect the radiator hose 2 at right side radiator.
*Disconnect the spark plug cap.
*Disconnect the CDI magneto lead.

A	10 Nm (1.0 m•kg, 7.2 ft•lb)
B	19 Nm (1.9 m•kg, 13 ft•lb)
C	32 Nm (3.2 m•kg, 23 ft•lb)
D	64 Nm (6.4 m•kg, 46 ft•lb)
E	75 Nm (7.5 m•kg, 54 ft•lb)
F	85 Nm (8.5 m•kg, 61 ft•lb)

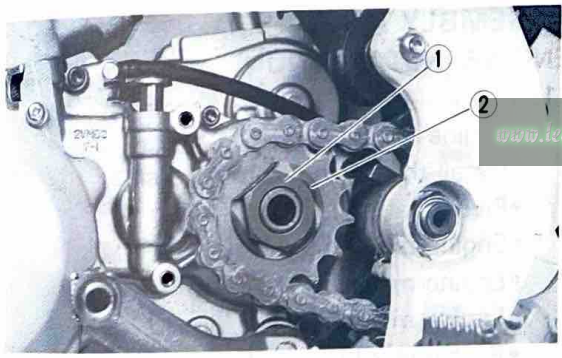


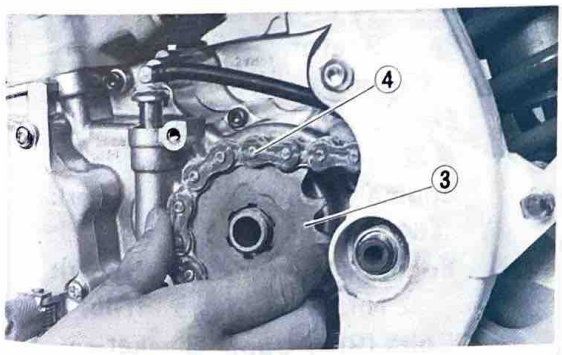
NOTE ON REMOVAL AND REASSEMBLY

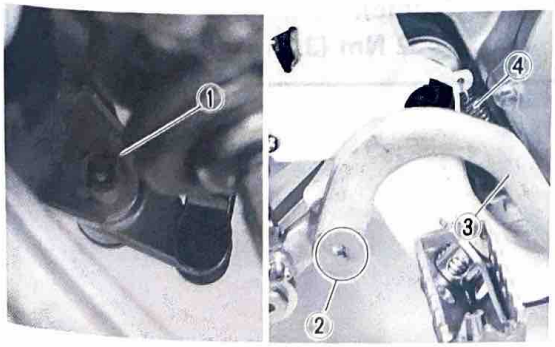
•Before servicing, clean the parts, and take care so that foreign material do not enter the crankcase.

Extent of removal: ① Engine removal

Extent of removal	Order	Part name	Q'ty	Remarks
①	1	Chain cover	1	
	2	Nut (drive sprocket)	1	Refer to "REMOVAL POINTS".
	3	Lock washer	1	
	4	Drive sprocket	1	
	5	Brake pedal	1	Refer to "REMOVAL POINTS".
	6	Rear upper bracket	2	
	7	Engine mounting bolt	5	
	8	Pivot shaft	1	Refer to "REMOVAL POINTS".
	9	Engine	1	







REMOVAL POINTS
DRIVE SPROCKET

1. Remove:
   - •Nut (drive sprocket) ①
   - •Lock washer ②
   - •Drive sprocket ③
   - •Drive chain ④

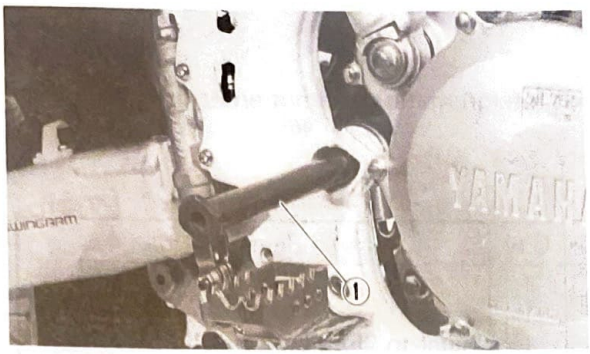
   Straighten the lock washer.

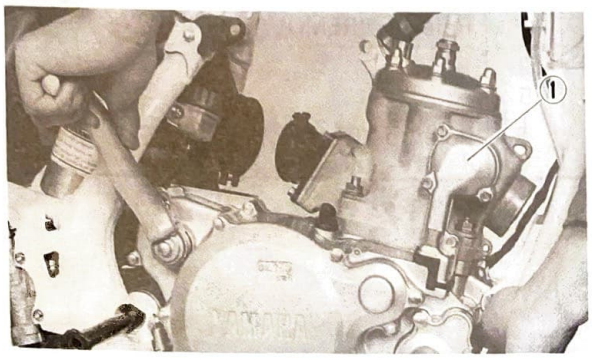
NOTE:

Remove the drive sprocket ③ together with the drive chain ④.

BRAKE PEDAL

1. Remove:
   - •Cotter pin ①
   - •Bolt (brake pedal) ②
   - •Brake pedal ③
   - •Tension spring ④





ENGINE REMOVAL

1. Remove:
   - Pivot shaft ①

NOTE:

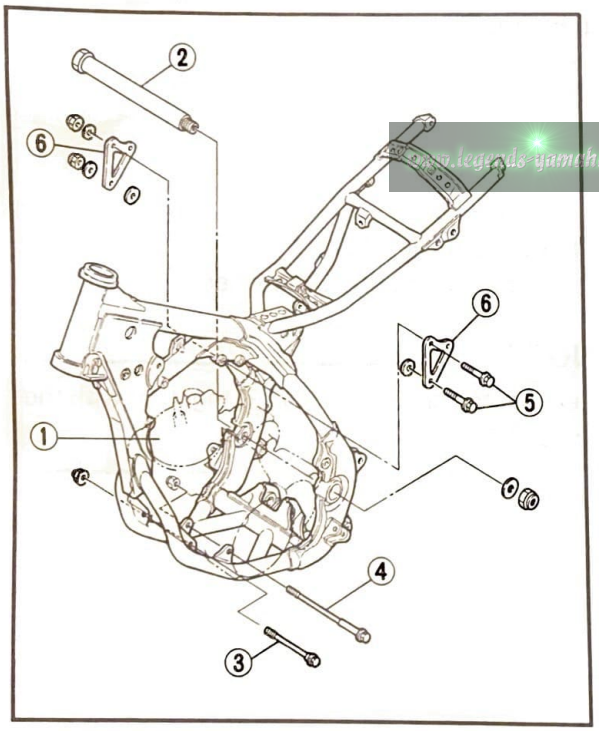
If the shaft ① is pulled all the way out, the swingarm will come loose. If possible, insert a shaft of similar diameter into the other side of the swingarm to support it.

2. Remove:
   - Engine ①

   From right side.

NOTE:

Make sure that the couplers, hoses and cables are disconnected.



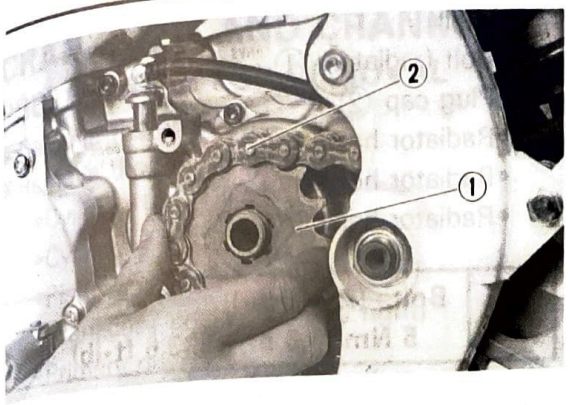
ASSEMBLY AND INSTALLATION

ENGINE INSTALLATION

1. Install:
   - Engine ①

     Install the engine from right side.
   - Pivot shaft ②
   - Engine mounting bolt (front) ③
   - Engine mounting bolt (lower) ④
   - Engine mounting bolt (upper) ⑤
   - Rear upper blacket ⑥

Pivot Shaft:
85 Nm (8.5 m•kg, 61 ft•lb)
Engine Mounting Bolt (Front):
32 Nm (3.2 m•kg, 23 ft•lb)
Engine Mounting Bolt (Lower):
64 Nm (6.4 m•kg, 46 ft•lb)
Engine Mounting Bolt (Upper):
32 Nm (3.2 m•kg, 23 ft•lb)
Bolts (Rear Upper Blacket—Frame):
32 Nm (3.2 m•kg, 23 ft•lb)

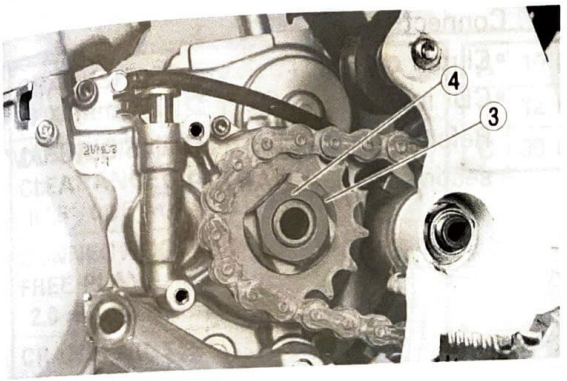


2. Install:
   - Drive sprocket ①
   - Drive chain ②
   - Lock washer ③
   - Nut (drive sprocket) ④

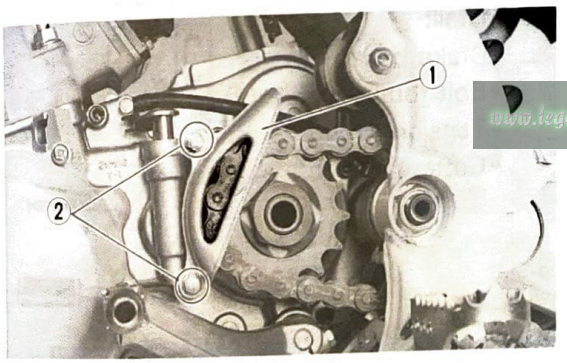
NOTE:

- Install the drive sprocket ① together with the drive chain ②.
- Always use a new lock washer.

	Nut (Drive Sprocket): **75 Nm (7.5 m•kg, 54 ft•lb)**

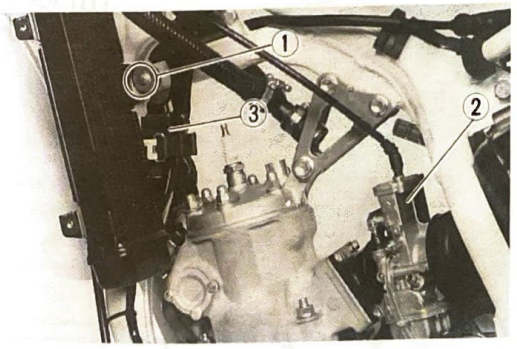


3. Bend the lock washer tab to lock the locknut.



4. Install:
   - Chain cover ①
   - Bolt (chain cover) ②

	Bolts (Chain Cover): **10 Nm (1.0 m•kg, 7.2 ft•lb)**

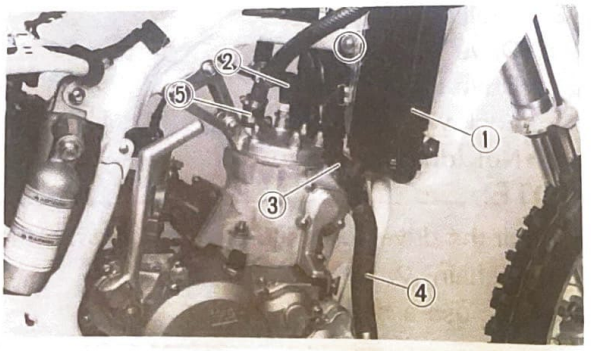


5. Install:
   - Bolt (radiator) ①
   - Carburetor ②
   - CDI unit ③

NOTE:

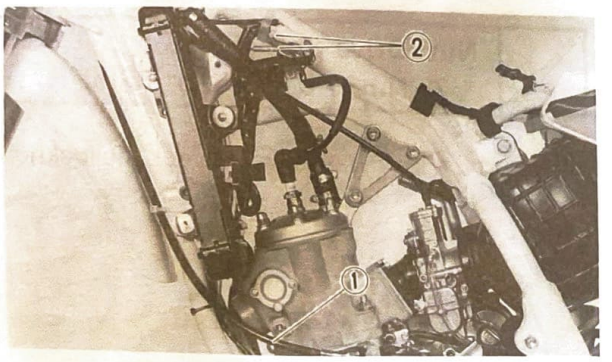
Install the CDI unit ③ with its manufacture's marks or numbers facing outward.

	Bolts (Radiator): **5 Nm (0.5 m•kg, 3.6 ft•lb)**



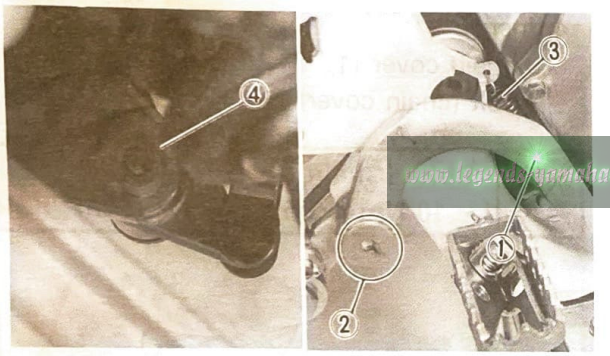
6. Install:
   - Bolt (radiator) ①
   - Plug cap ②
   - Radiator hose 2 ③
   - Radiator hose 3 ④
   - Radiator hose 5 ⑤

Bolts (Radiator):
5 Nm (0.5 m•kg, 3.6 ft•lb)



7. Connect:
   - Clutch cable ①
   - CDI magneto lead ②

   Refer to the "CABLE ROUTING DIAGRAM" section in the CHAPTER 2.



8. Install:
   - Brake pedal ①
   - Bolt (brake pedal) ②
   - Tension spring ③
   - Cotter pin ④

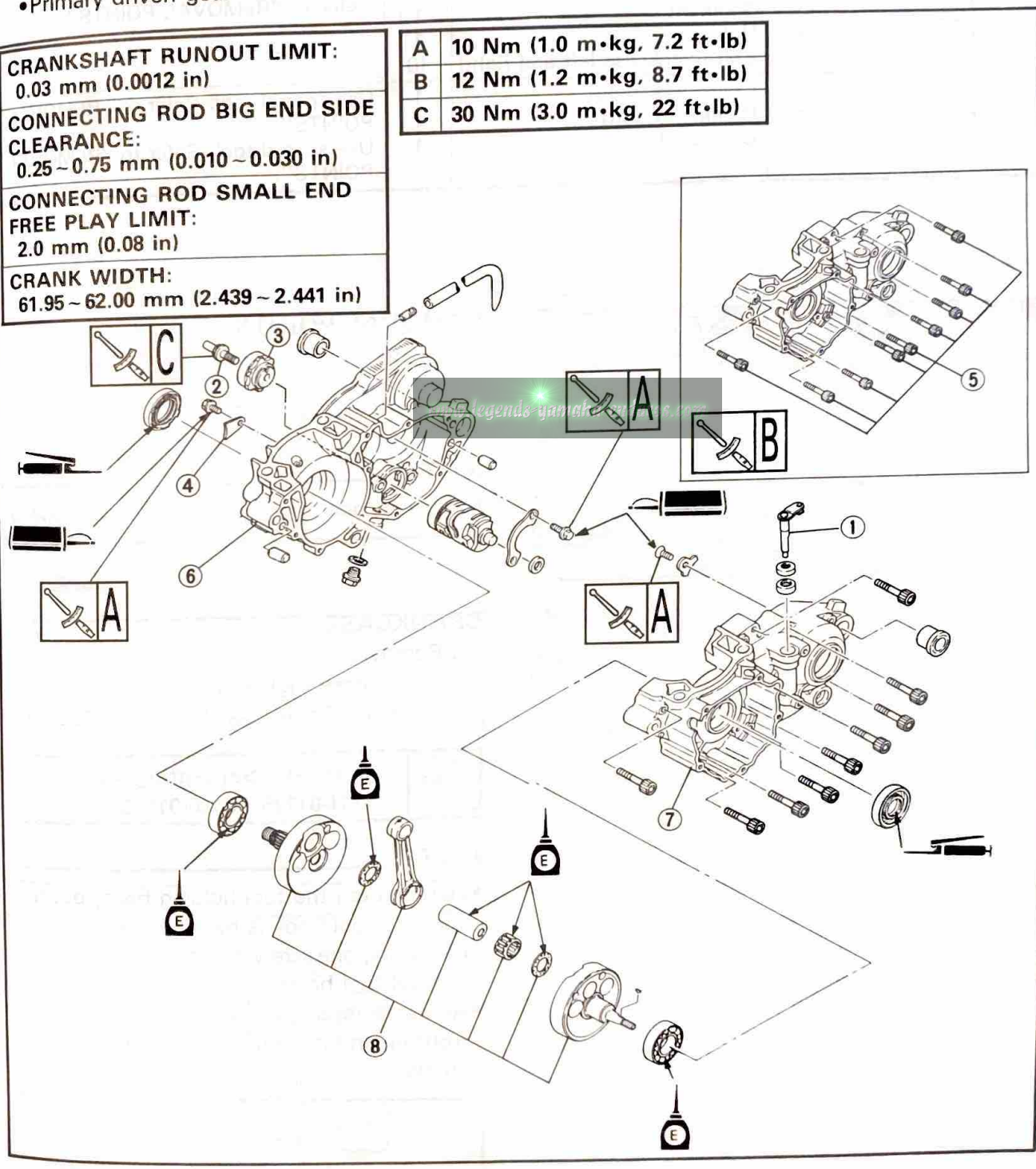
CRANKCASE AND CRANKSHAFT

PREPARATION FOR REMOVAL

*Remove the engine.
*Remove the following parts:
- Cylinder head
- Cylinder
- Piston
- Crankcase cover (left and right)
- Primary drive gear
- Primary driven gear
- Kick axle
- Kick idle gear
- Shift shaft
- Stopper lever
- Rotor and stator

CRANKSHAFT RUNOUT LIMIT: 0.03 mm (0.0012 in)
CONNECTING ROD BIG END SIDE CLEARANCE: 0.25 ~ 0.75 mm (0.010 ~ 0.030 in)
CONNECTING ROD SMALL END FREE PLAY LIMIT: 2.0 mm (0.08 in)
CRANK WIDTH: 61.95 ~ 62.00 mm (2.439 ~ 2.441 in)

A	10 Nm (1.0 m•kg, 7.2 ft•lb)
B	12 Nm (1.2 m•kg, 8.7 ft•lb)
C	30 Nm (3.0 m•kg, 22 ft•lb)

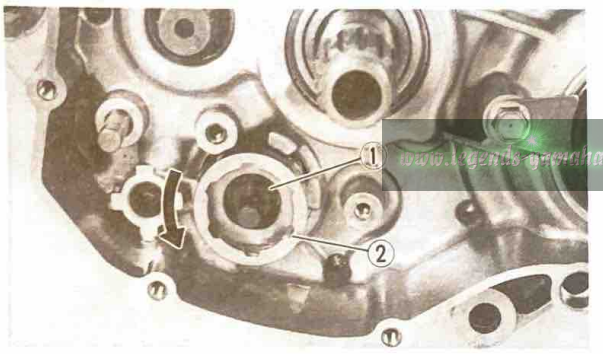


NOTE ON REMOVAL AND REASSEMBLY

- Before servicing, clean the parts, and take care so that foreign material do not enter the crankcase.
- Remove the gasket adhered on the contacting surface.
- For reassembly, the removed parts should be cleaned and apply the transmission oil onto the sliding surface.

Entent of removal: ① Separating crankcase ② Crankshaft removal

Extent of removal	Order	Part name	Q'ty	Remarks
① ②	1	Push lever axle	1	Refer to "REMOVAL POINTS".
	2	Bolt (segment)	1	
	3	Segment	1	
	4	Holder	1	
	5	Bolt (crankcase left and right)	10	
	6	Crankcase (right)	1	Use special tool. Refer to "REMOVAL POINTS".
	7	Crankcase (left)	1	
	8	Crankshaft	1	Use special tool. Refer to "REMOVAL POINTS".



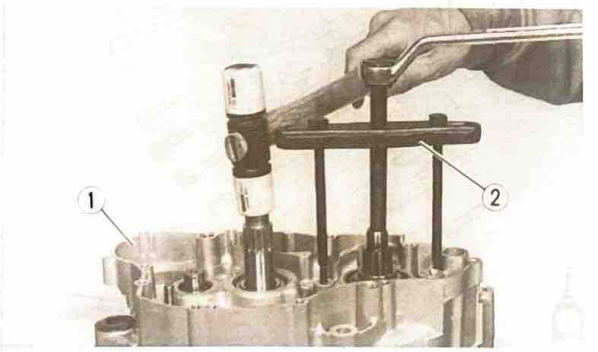
REMOVAL POINTS

SEGMENT

1. Remove:
   - Bolt (Segment) ①
   - Segment ②

NOTE:

Loosen the bolt with shift cam to be in 5th speeds.



CRANKCASE

1. Remove:
   - Crankcase (right) ①

   Use the Crankcase Separating Tool ②.

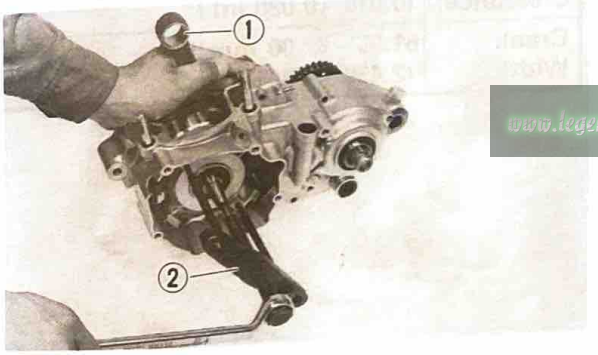
	Crankcase Separating Tool: YU-01135/90890-01135

NOTE:

- Fully tighten the tool holding bolts, but make sure the tool body is parallel with the case. If necessary, one screw may be backed out slightly to level tool body.
- As pressure is applied, alternately tap on the front engine mounting boss and transmission shafts.

CAUTION:

Use soft hammer to tap on the case half. Tap only on reinforced portions of case. Do not tap on gasket mating surface. Work slowly and carefully. Make sure the case halves separate evenly. If one end "hangs up," take pressure off the push screw, realign, and start over. If the cases do not separate, check for a remaining case screw or fitting. Do not force.



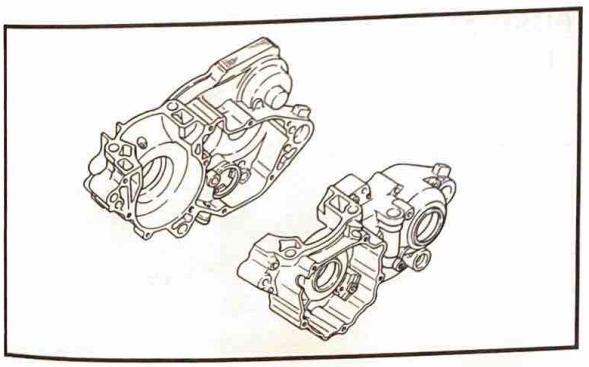
2. Remove:
   - Crankshaft ①

   Use the Crankcase Separating Tool ②.

Crankcase Separating Tool:
YU-01135/90890-01135

CAUTION:

Do not use a hammer to drive out the crankshaft.



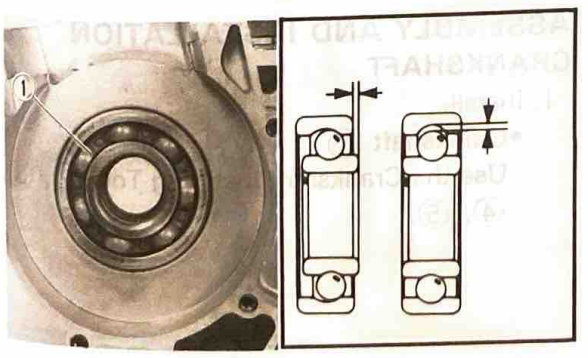
INSPECTION

CRANKCASE

1. Inspect:
   - Contacting surface

     Scratches→Replace.
   - Crankcase

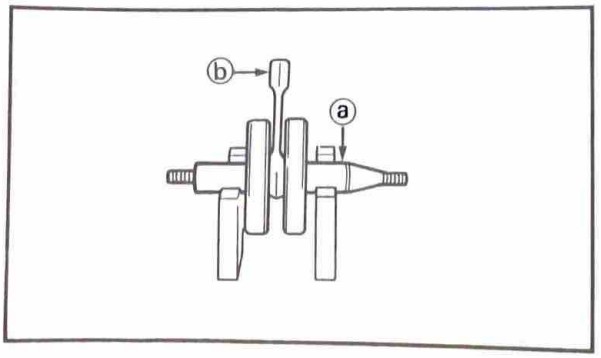
     Cracks/Damage→Replace.

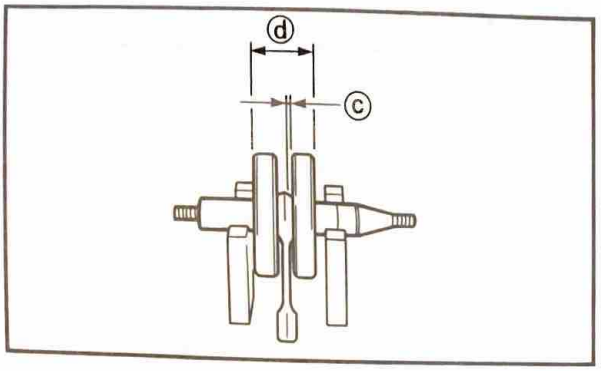


2. Check:
   - Bearings ①

     Rotate inner race with a finger.

     Rough spot/Seizure→Replace.





CRANKSHAFT

1. Measure:
   - Runout limit ⓐ
   - Small end free play limit ⓑ
   - Connecting rod big end side clearance ⓒ
   - Crank width ⓓ

   Out of specification → Replace.
   Use a V-Blocks, the Dial Gauge and a thickness gauge.

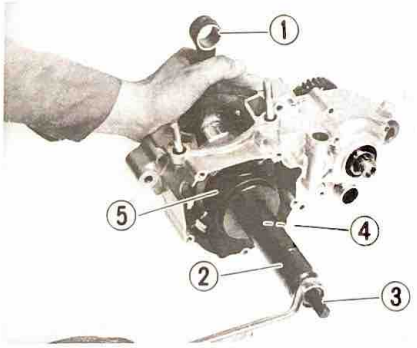
	Dial Gauge: **YU-03097/90890-03097**

	Standard	<Limit>
Runout Limit:	—	0.03 mm (0.0012 in)
Small End Free Play:	0.4 ~ 1.0 mm (0.016 ~ 0.039 in)	2.0 mm (0.08 in)
Side Clearance:	0.25 ~ 0.75 mm (0.010 ~ 0.030 in)	←
Crank Width:	61.95 ~ 62.00 mm (2.439 ~ 2.441 in)	←

PUSH AXLE

1. Inspect:
   - Push axle ①

   Wear/Damage → Replace.



ASSEMBLY AND INSTALLATION
CRANKSHAFT

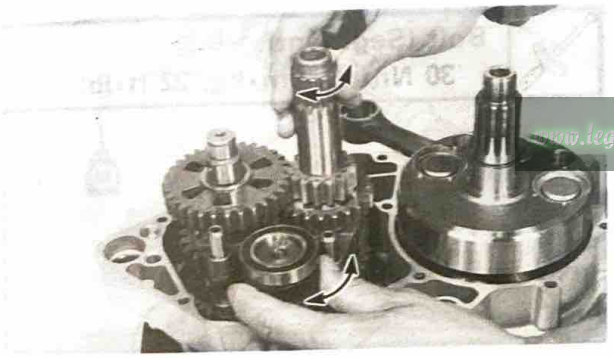
1. Install:
   - Crankshaft ①

   Use the Crankshaft Installing Tool ②, ③, ④, ⑤.

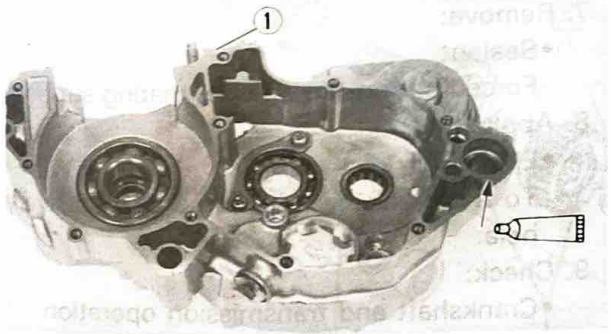
Crankshaft Installing Tool:
(Pot): YU-90050/90890-01274
(Bolt): YU-90050/90890-01275
(Spacer): YU-90050/90890-01288
(Adapter): YU-90062/90890-01277

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.
- Before installing the crankshaft, clean the contacting surface of crankcase.
- Apply the lithium soap base grease onto the oil seal lip.



2. Check:
   - Shifter operation
   - Transmission operation
   Unsmooth operation → Repair.



3. Apply:
   - Sealant
   Onto the crankcase (right) ①

Quick gasket®:
ACC-11001-30-00
Yamaha bond No. 4:
90890-05143

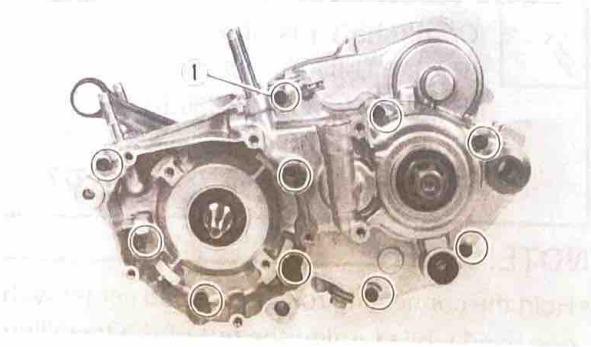
NOTE:

Clean the contacting surface of crankcase (left and right) before applying the sealant.

4. Install:
   - Dowel pins
   - Crankcase (left)
   - Crankcase (right)

NOTE:

Fit the crankcase (right) onto the crankcase (left). Tap lightly on the case with soft hammer.



5. Tighten:
   - Bolt (Crankcase) ①

NOTE:

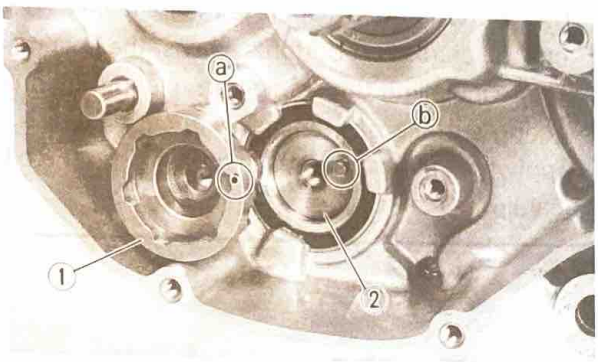
Tighten the crankcase tightening screws in stage, using a crisscross pattern.

Bolts (Crankcase):
12 Nm (1.2 m•kg, 8.7 ft•lb)

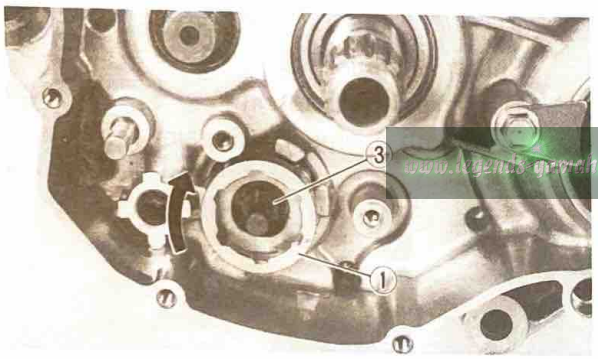
6. Tighten:
   - Segment ①
   - Bolt (segment) ③

NOTE:

- When installing the segment ① onto the shift cam ②, align the punch mark ⓐ with the dowel pin ⓑ.
- Tighten the bolt with shift cam to be in 1st speeds.



Bolt (Segment):
30 Nm (3.0 m•kg, 22 ft•lb)



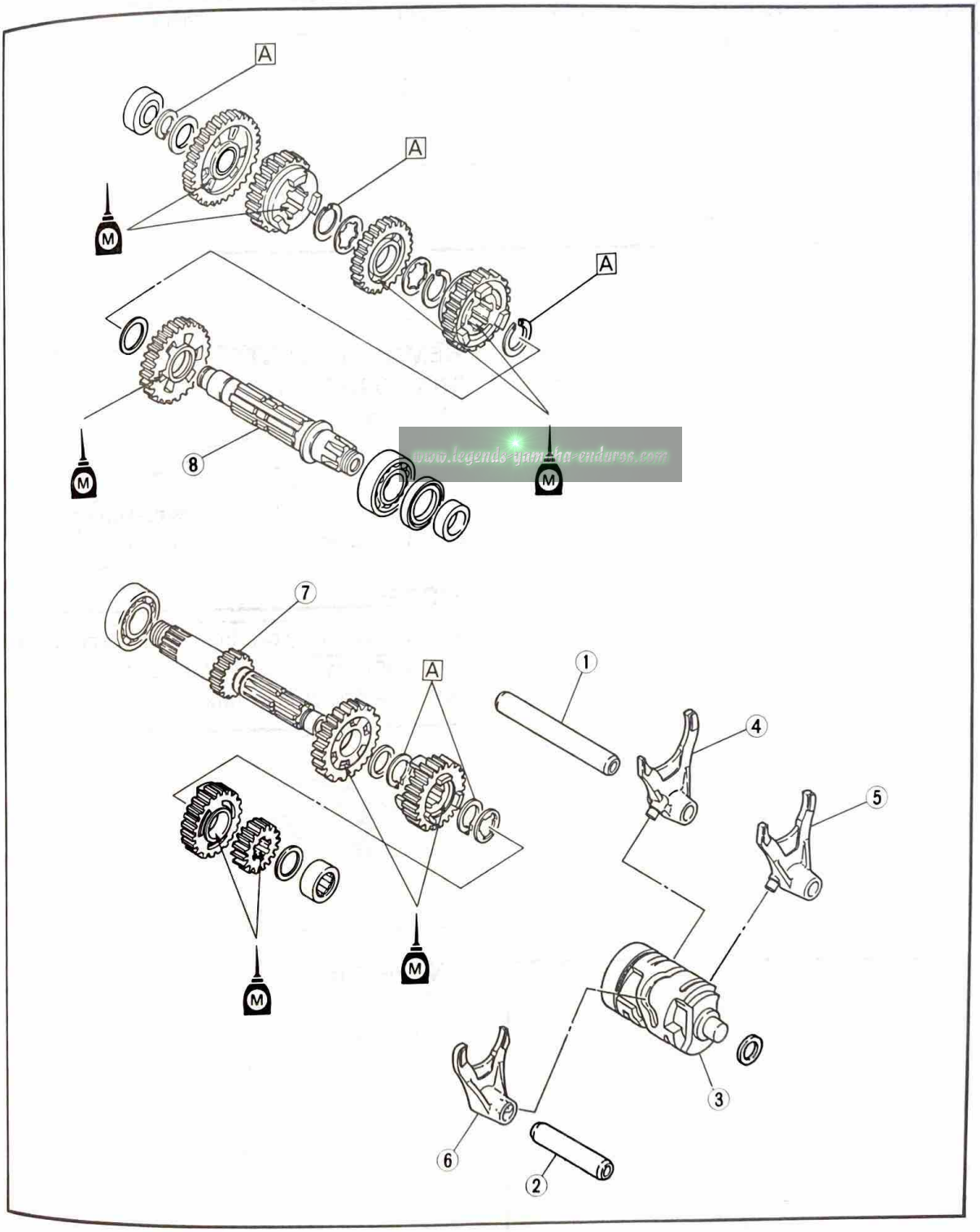
7. Remove:
   - Sealant
     Forced out on-the cylinder mating surface.
8. Apply:
   - Engine oil
     To the crank pin, bearing and oil delivery hole.
9. Check:
   - Crankshaft and transmission operation
     Unsmooth operation→Repair.

TRANSMISSION, SHIFT CAM AND SHIFT FORK

PREPARATION FOR REMOVAL

*Remove the engine.
*Separate the crankcase.

A USE NEW ONE

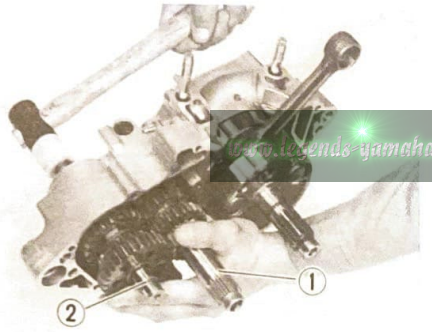


NOTE ON REMOVAL AND REASSEMBLY

- Before servicing, clean the parts, and take care so that foreign material do not enter the crankcase.
- Remove the gasket adhered on the contacting surface.
- For reassembly, the removed parts should be cleaned and apply the transmission oil onto the sliding surface.

Extent of removal: ① Shift cam
② Main axle and drive axle removal

Extent of removal	Order	Part name	Q'ty	Remarks
① ②	1	Guide bar (long)	1	
	2	Guide bar (short)	1	
	3	Shift cam	1	
	4	Shift fork 3	1	
	5	Shift fork 1	1	
	6	Shift fork 2	1	
	7	Main axle	1	Refer to "REMOVAL POINTS".
	8	Drive axle	1	



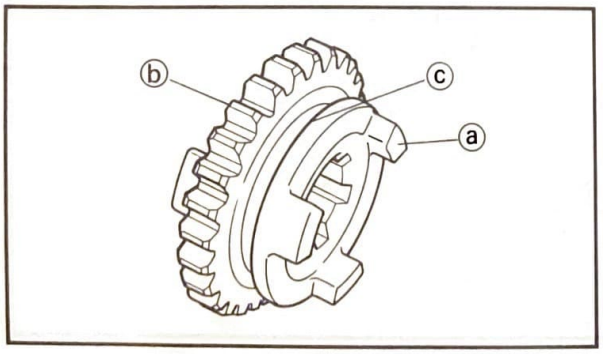
REMOVAL POINTS
TRANSMISSION

1. Remove:
   - Main axle ①
   - Drive axle ②

   Tap lightly on the transmission drive axle with a soft hammer to remove.

NOTE:

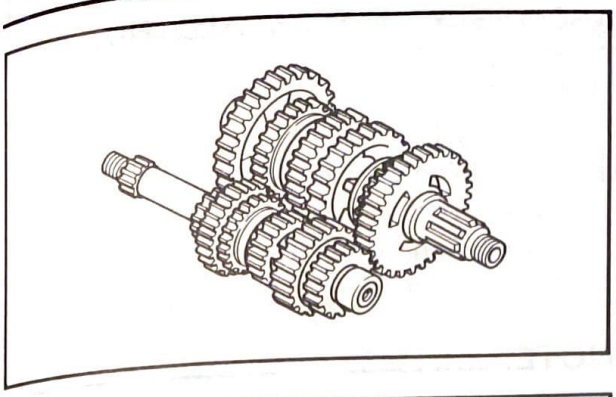
Remove assembly carefully. Note the position of each part. Pay particular attention to the location and direction of shift forks.



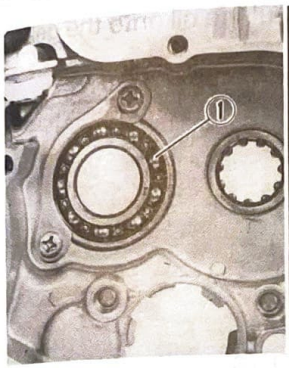
INSPECTION
GEARS

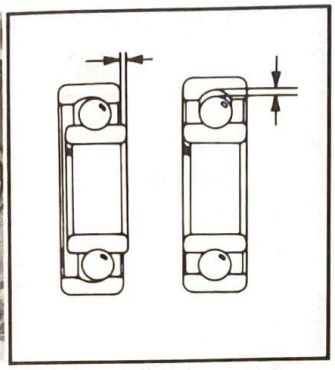
1. Inspect:
   - Matching dog ⓐ
   - Gear teeth ⓑ
   - Shift fork groove ⓒ

   Wear/Damage → Replace.



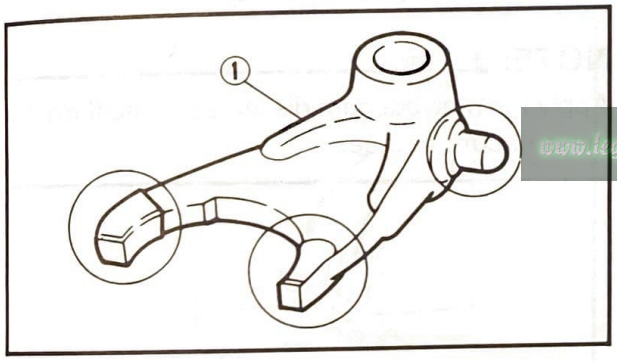
2. Check:
   - Gears movement
     Unsmooth movement → Repair or replace.





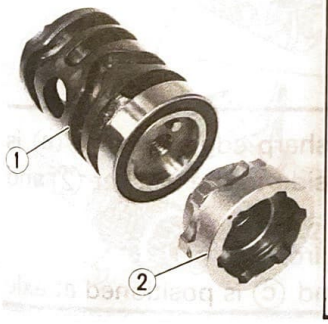
BEARING

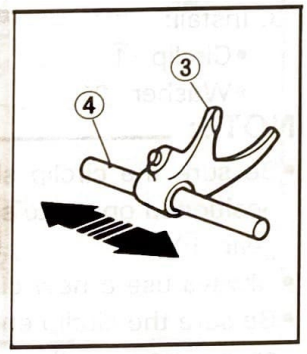
1. Inspect:
   - Bearing ①
     Rotate inner race with a finger.
     Rough spot/Seizure → Replace.



SHIFT FORK, SHIFT CAM AND SEGMENT

1. Inspect:
   - Shift fork ①
     Wear/Damage/Scratches → Replace.



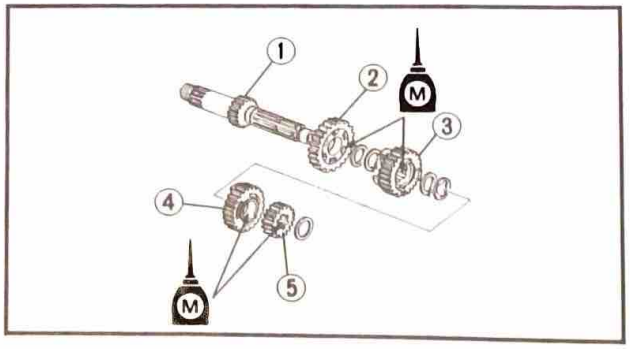


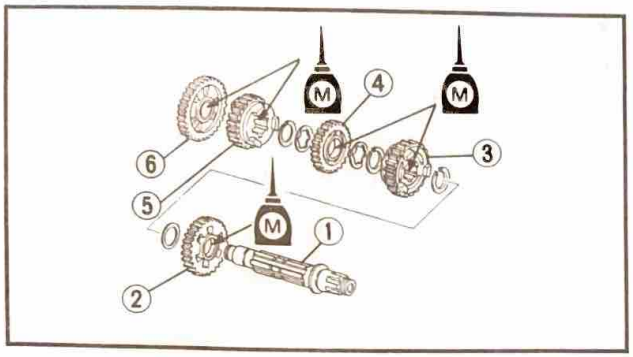
2. Inspect:
   - Shift cam ①
   - Segment ②
   - Shift fork ③
     Wear/Damage/Scratches → Replace.
   - Guide bar ④
     Bend/Wear/Damage → Replace.

3. Check:
   - Shift fork movement
     On its guide bar.
     Unsmooth operation → Replace.
     Shift fork and/or guide bar.

NOTE:

For a malfunctioning shift fork, replace not only the shift fork itself but the two gears each adjacing the shift fork.





ASSEMBLY AND INSTALLATION

TRANSMISSION

1. Install:
   - Main axle ①
   - 5th pinion gear (23T) ②
   - 3rd pinion gear (16T) ③
   - 4th pinion gear (19T) ④
   - 2nd pinion gear (17T) ⑤

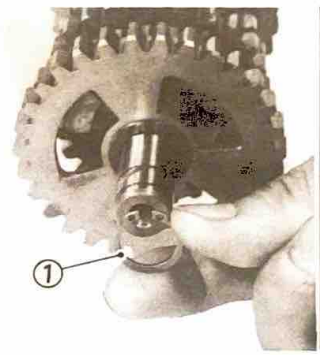
NOTE:

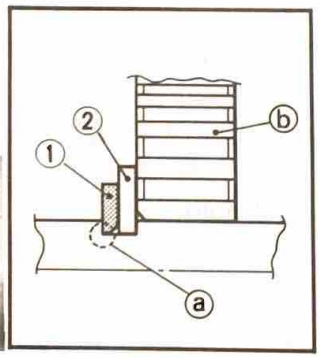
Apply the molybdenum disulfide oil onto the gears inner circumference.

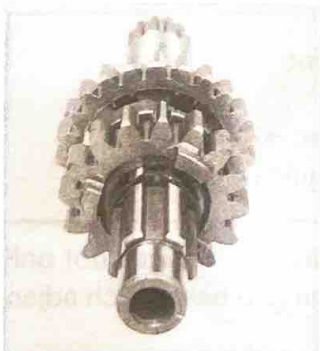
2. Install:
   - Drive axle ①
   - 2nd wheel gear (29T) ②
   - 4th wheel gear (22T) ③
   - 3rd wheel gear (22T) ④
   - 5th wheel gear (23T) ⑤
   - 1st wheel gear (31T) ⑥

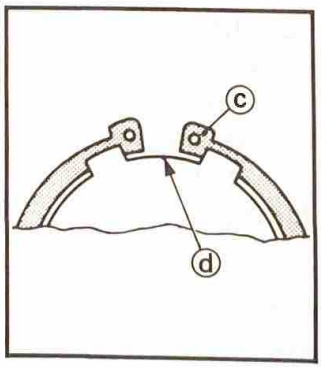
NOTE:

Apply the molybdenum disulfide oil onto the gears inner circumference.









3. Install:
   - Circlip ①
   - Washer ②

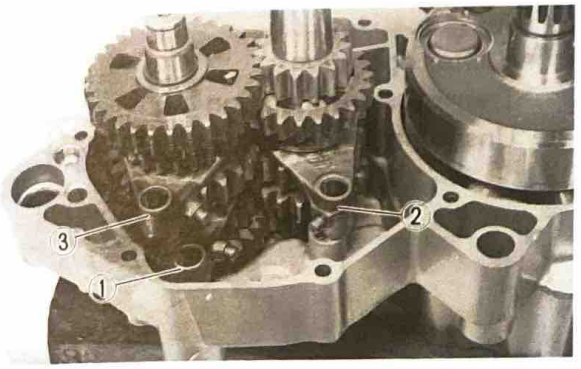
NOTE:

- Be sure the circlip sharp-edged corner ⓐ is positioned opposite side to the washer ② and gear ⓑ.
- Always use a new circlip.
- Be sure the circlip end ⓒ is positioned at axle spline groove ⓓ.

4. Install:
   - Main axle ①
   - Drive axle ②

NOTE:

When installing the drive axle into the crankcase, pay careful attention to the crankcase oil seal lip.

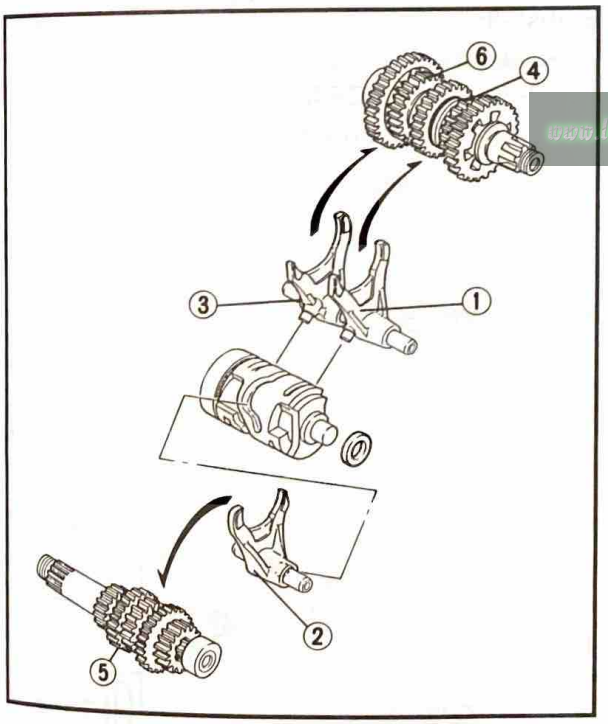


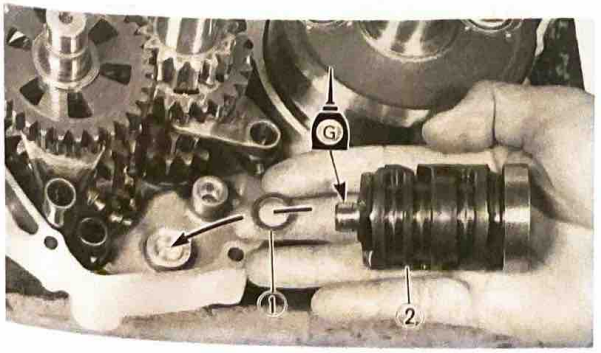
SHIFT CAM AND SHIFT FORK

1. Install:
   - Shift fork 1 ①
   - Shift fork 2 ②
   - Shift fork 3 ③

NOTE:

- Mesh the shift fork #1 ① with the 4th wheel gear ④ and #3 ③ with the 5th wheel gear ⑥ on the drive axle.
- Mesh the shift fork #2 ② with the 3rd pinion gear ⑤ on the main axle.

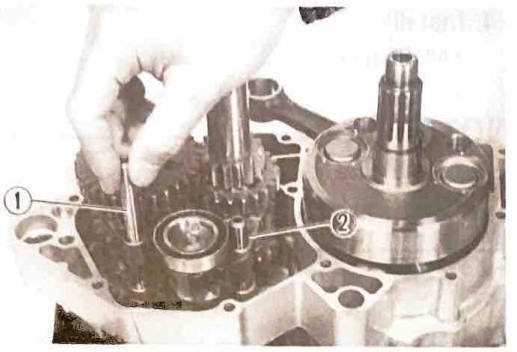




2. Install:
   - Plain washer ①
   - Shift cam ②

NOTE:

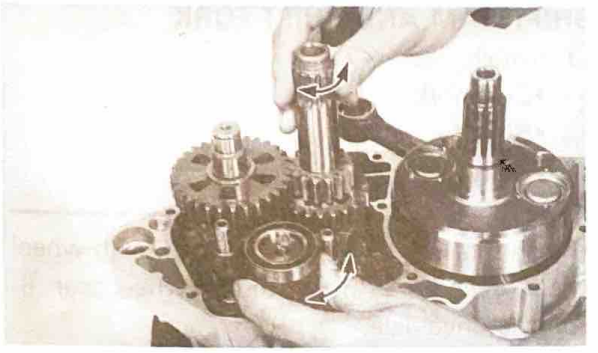
Apply the transmission oil onto the shift cam.



3. Install:
   - Guide bar (longer) ①
   - Guide bar (shorter) ②

NOTE:

Be sure the long bar ① is inserted into the shift forks #1 and #3 and the short one ② into #2.



4. Check:
   - Shifter operation
   - Transmission operation

   Unsmooth operation→Repair.

5. Install:
   - Crankcase (right)

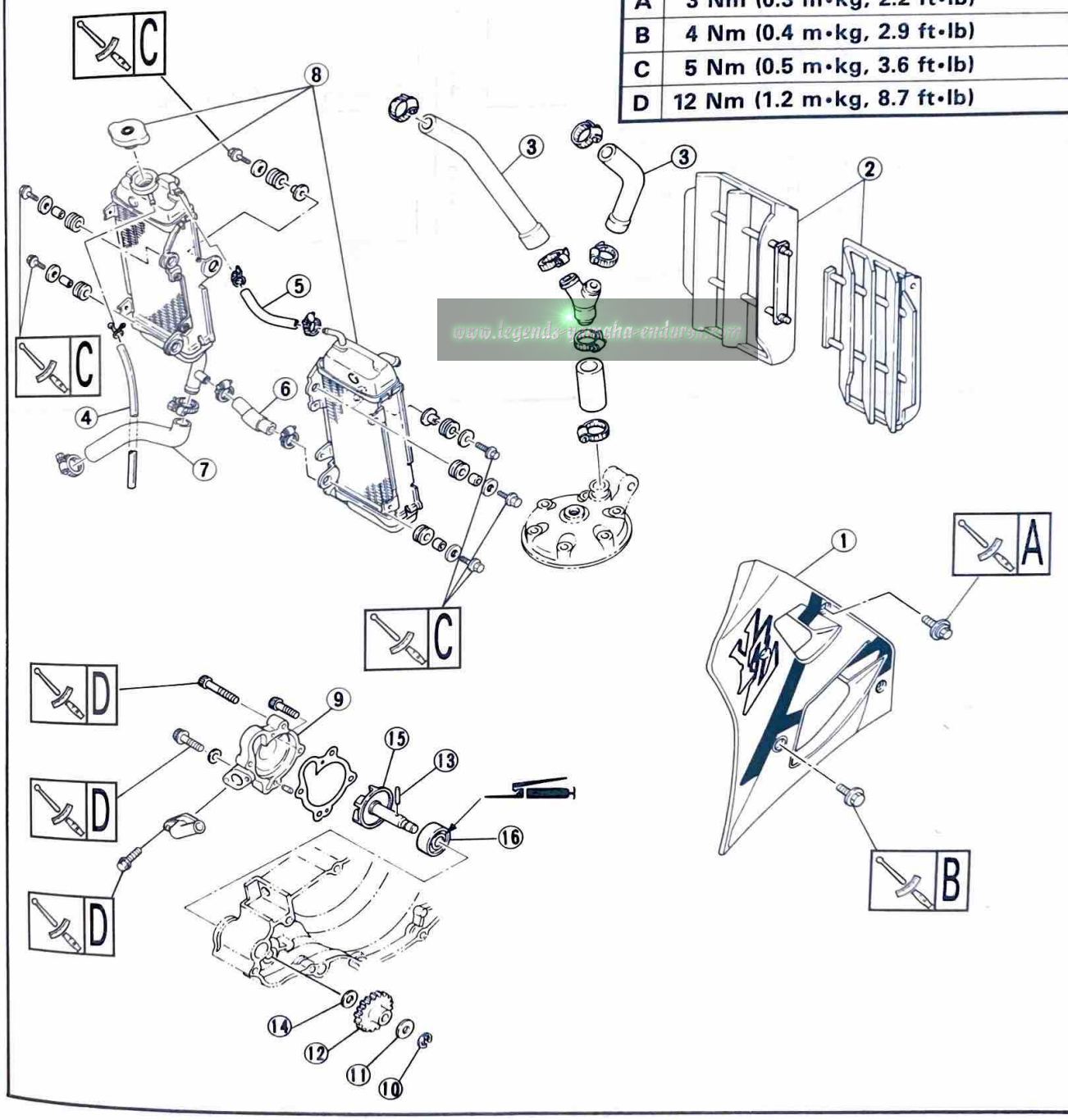
   Refer to the "CRANKCASE AND CRANKSHAFT" section in the CHAPTER 4.

RADIATOR AND WATER PUMP

PREPARATION FOR REMOVAL

*Drain the coolant.
*Remove the following parts:
- Exhaust pipe and silencer
- Crankcase cover (right)

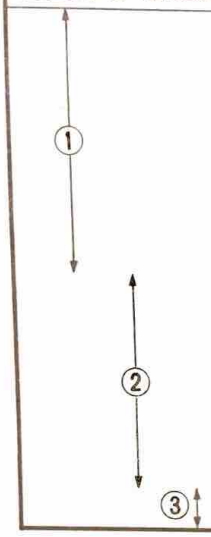
RADIATOR CAPACITY: 0.61 L (0.54 Imp qt, 0.64 US qt)	
RADIATOR CAP OPENING PRESSURE: 95 ~ 125 kPa (0.95 ~ 1.25 kg/cm², 13.5 ~ 17.8 psi)	
A	3 Nm (0.3 m•kg, 2.2 ft•lb)
B	4 Nm (0.4 m•kg, 2.9 ft•lb)
C	5 Nm (0.5 m•kg, 3.6 ft•lb)
D	12 Nm (1.2 m•kg, 8.7 ft•lb)



NOTE ON REMOVAL AND REASSEMBLY

- With the engine mounted, following parts can be removed.
- Before servicing, clean the parts, and take care so that foreign material do not enter the crankcase.
- Remove the gasket adhered on the contacting surface.
- For reassembly, the removed parts should be cleaned with solvent, and apply the transmission oil onto the sliding surface.

Extent of removal: ① Radiator removal
② Impeller shaft removal
③ Oil seal removal

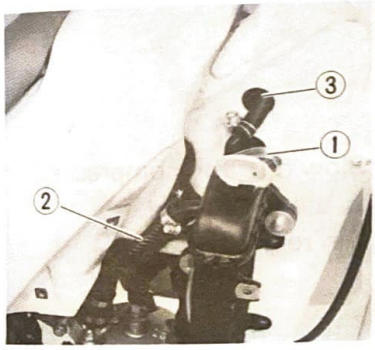
Extent of removal	Order	Part name	Q'ty	Remarks
	1	Air scoop (left and right)	2	
	2	Panel	2	
	3	Radiator hose 6	2	
	4	Breather hose	1	
	5	Radiator hose 8	1	Refer to "REMOVAL POINTS".
	6	Radiator hose 2	1	
	7	Radiator hose 3	1	
	8	Radiator	2	
	9	Housing cover	1	
	10	Circlip	1	
	11	Plain washer	1	
	12	Impeller shaft gear	1	Refer to "REMOVAL POINTS".
	13	Dowel pin	1	
	14	Plain washer	1	
	15	Impeller shaft	1	
	16	Oil seal	1	Refer to "REMOVAL POINTS".

REMOVAL POINTS

⚠ WARNING

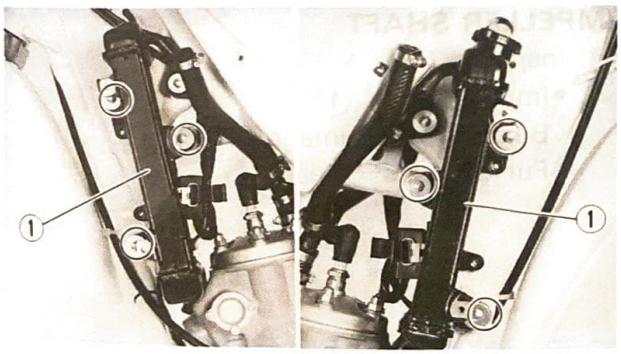
Do not remove the radiator cap when the engine and radiator are hot. Scalding hot fluid and steam may be blown out under pressure, which could cause serious injury.
When the engine has cooled, open the radiator cap by the following procedure:
Remove the radiator cover by removing the screw. Place a thick rag, like a towel, over the radiator cap, slowly rotate the cap counterclockwise to the detent. This procedure allows any residual pressure to escape. When the hissing sound has stopped, press down on the cap while turning counterclockwise and remove it.

RADIATOR



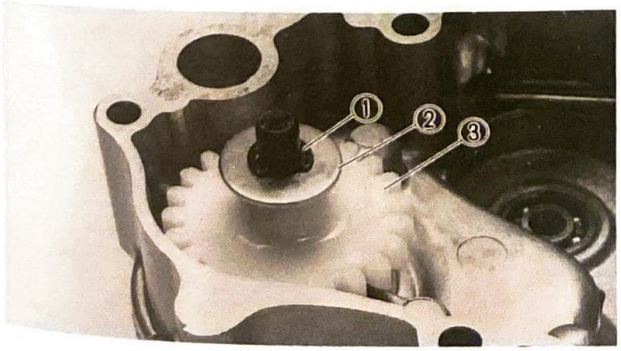
1. Remove:
   - Breather hose ①
   - Radiator hose 6 ②
   - Radiator hose 8 ③
   - Radiator hose 3 ④
   - Radiator hose 2 ⑤

   Remove at right radiator side.

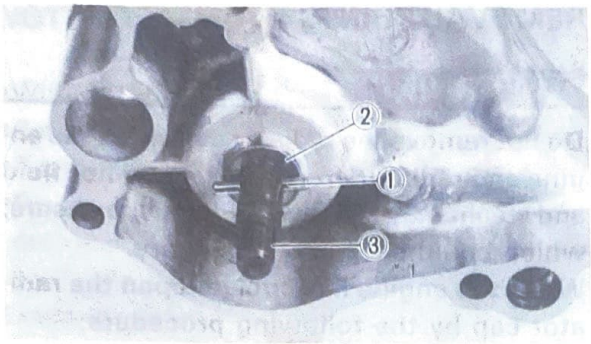


2. Remove:
   - Radiator ①

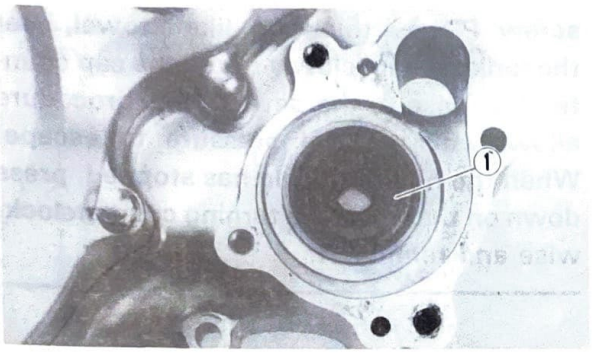
IMPELLER SHAFT



1. Remove:
   - Circlip ①
   - Plain washer ②
   - Impeller shaft gear ③



2. Remove:
   - Dowel pin ①
   - Plain washer ②
   - Impeller shaft ③

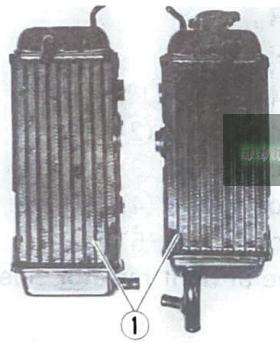


OIL SEAL

NOTE:

It is not necessary to disassemble the water pump, unless there is an abnormality such as excessive change in coolant level, discoloration of coolant, or milky transmission oil.

1. Remove:
   - Oil seal ①

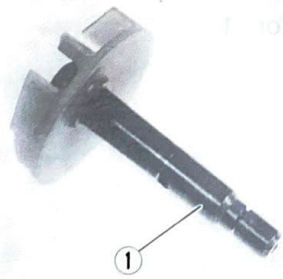


INSPECTION

RADIATOR

1. Inspect:
   - Radiator core ①

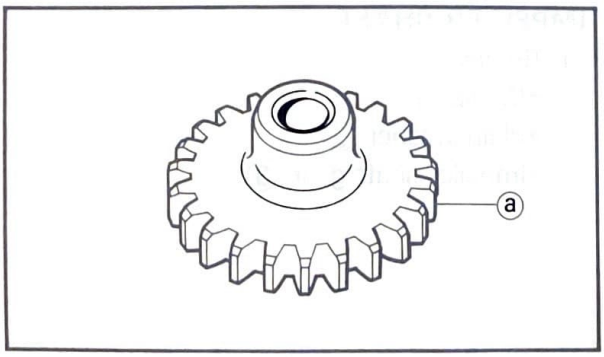
   Obstruction → Blow out with compressed air through rear or the radiator.
   Bent fin → Repair/replace.



IMPELLER SHAFT

1. Inspect:
   - Impeller shaft ①

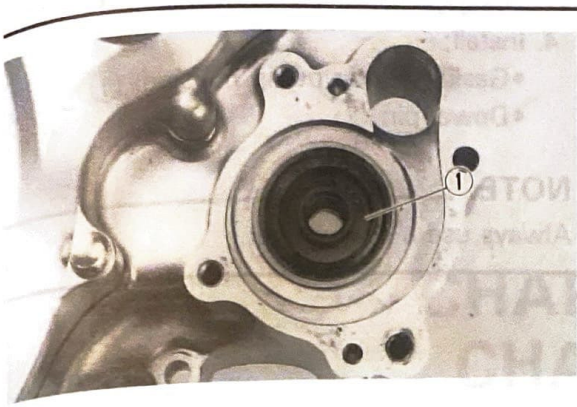
   Bend/Wear/Damage → Replace.
   Fur deposits → Clean.



IMPELLER SHAFT GEAR

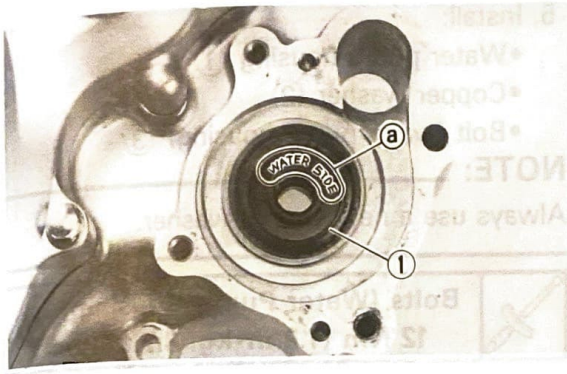
1. Inspect:
   - Gear teeth ⓐ

   Wear/Damage → Replace.



OIL SEAL

1. Inspect:
   - Oil seal ①
     Wear/Damage → Replace.



ASSEMBLY AND INSTALLATION

OIL SEAL

1. Install:
   - Oil seal ①

NOTE:

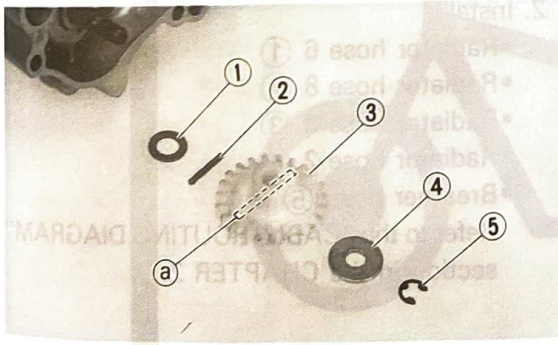
- Always use a new oil seal.
- Install the oil seal with the "WATER SIDE" mark ⓐ on the outside.

IMPELLER SHAFT

1. Install:
   - Impeller shaft ①

NOTE:

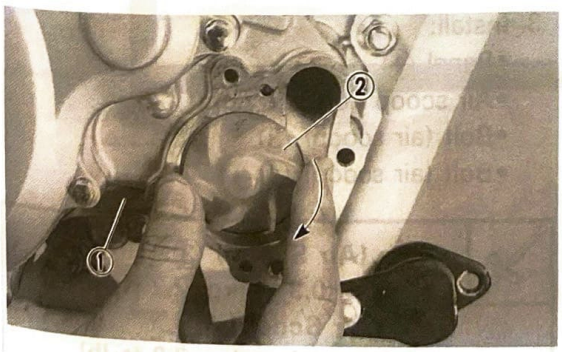
- Take care so that the oil seal lip is not damaged or the spring does not slip off its position.
- When installing the impeller shaft, apply the lithium soap base grease on the oil seal lip and impeller shaft. And install the shaft while turning it.



2. Install:
   - Plain washer ①
   - Dowel pin ②
   - Impeller shaft gear ③
   - Plain washer ④
   - Circlip ⑤

NOTE:

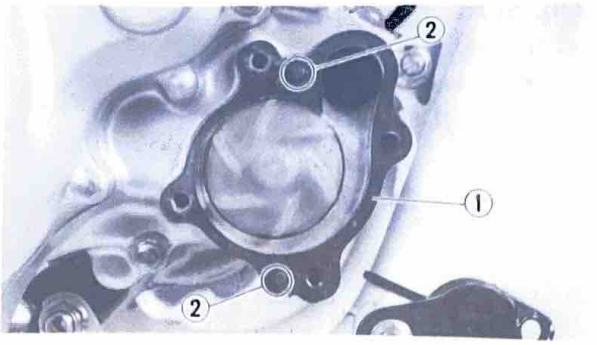
- Make sure the dowel pin ② fits into the groove ⓐ in the impeller shaft gear ③.
- Always use a new circlip.



3. Install:
   - Crankcase cover (right) ①

NOTE:

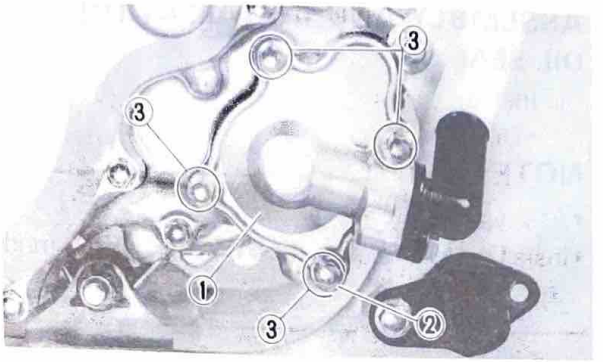
Mesh the impeller shaft gear and oil pump drive gear by turning the impeller shaft ②.



4. Install:
   - Gasket (water pump housing) ①
   - Dowel pin ②

NOTE:

Always use a new gasket.

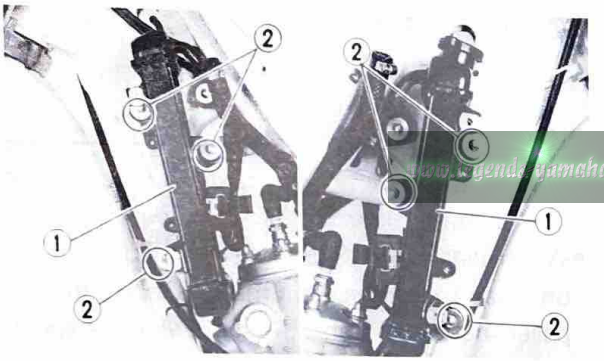


5. Install:
   - Water pump housing ①
   - Copper washer ②
   - Bolt (water pump housing) ③

NOTE:

Always use a new copper washer.

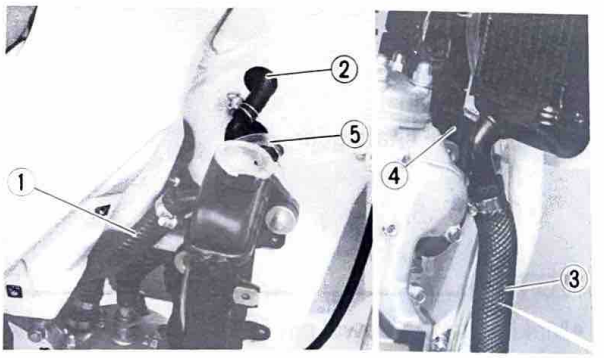
Bolts (Water Pump Housing):
12 Nm (1.2 m•kg, 8.7 ft•lb)



RADIATOR

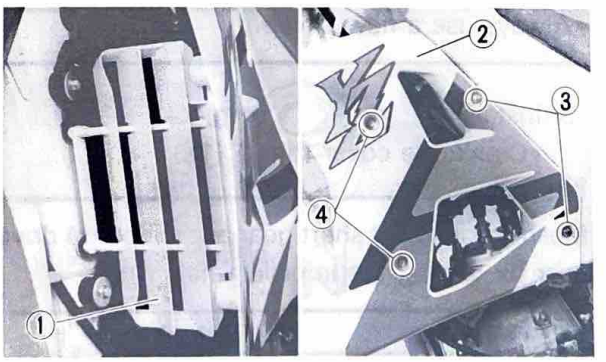
1. Install:
   - Radiator ①
   - Bolt (radiator) ②

Bolts (Radiator):
5 Nm (0.5 m•kg, 3.6 ft•lb)



2. Install:
   - Radiator hose 6 ①
   - Radiator hose 8 ②
   - Radiator hose 3 ③
   - Radiator hose 2 ④
   - Breather hose ⑤

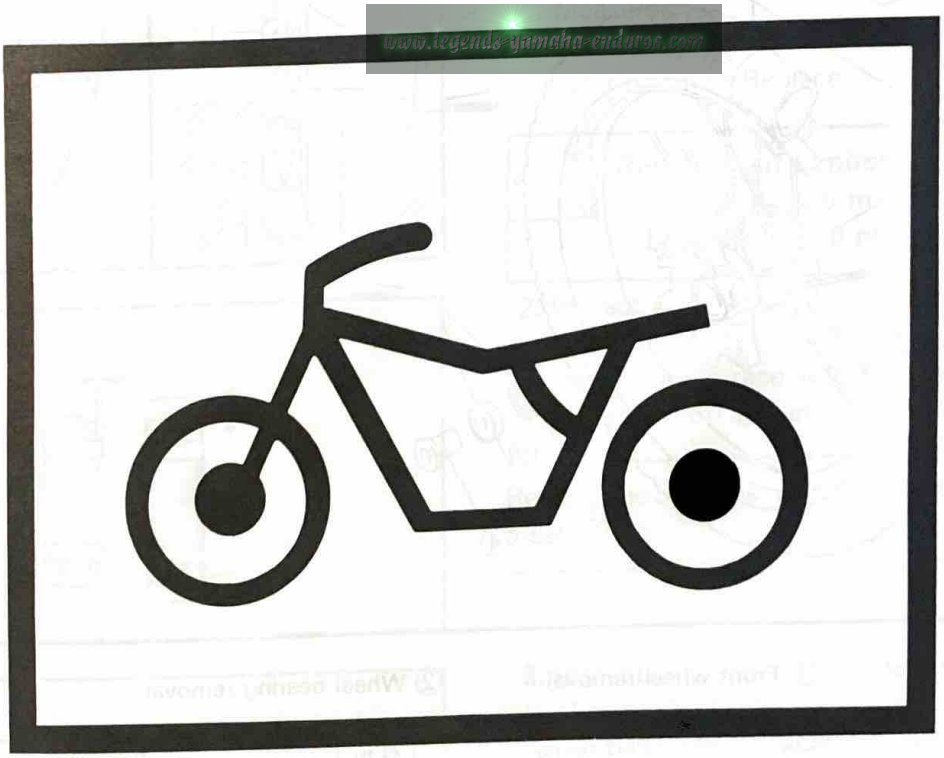
   Refer to the "CABLE ROUTING DIAGRAM" section in the CHAPTER 2.



3. Install:
   - Panel ①
   - Air scoop (left and right) ②
   - Bolt (air scoop) ③
   - Bolt (air scoop) ④

Bolts (Air Scoop) ③:
3 Nm (0.3 m•kg, 2.2 ft•lb)
Bolt (Air Scoop) ④:
4 Nm (0.4 m•kg, 2.9 ft•lb)

CHAPTER 5
CHASSIS



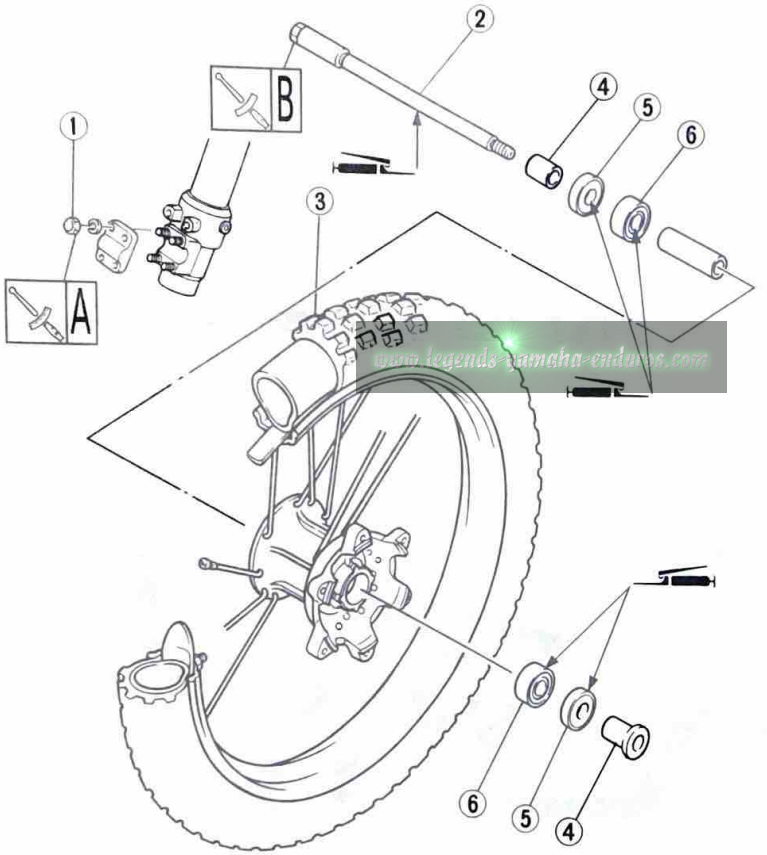
FRONT WHEEL

PREPARATION FOR REMOVAL

*Hold the machine by placing the suitable stand under the engine.

⚠ WARNING

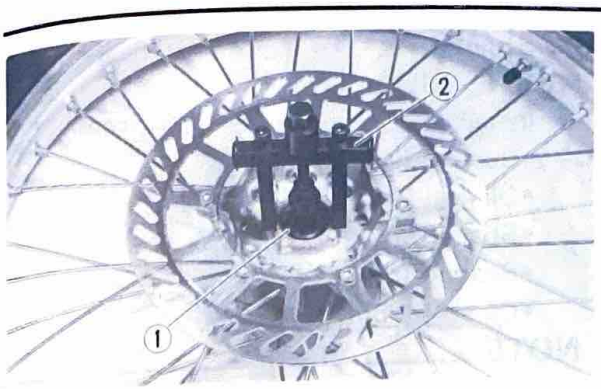
Support the machine securely so there is no danger of it falling over.



WHEEL RUNOUT LIMIT:	
VERTICAL	
2.0 mm (0.08 in)	
LATERAL	
2.0 mm (0.08 in)	
WHEEL AXLE BENDING LIMIT:	
0.5 mm (0.020 in)	
COLD TIRE PRESSURE:	
100 kPa (1.0 kg/cm², 15 psi)	
A	**9 Nm (0.9 m•kg, 6.5 ft•lb)**
B	**59 Nm (5.9 m•kg, 43 ft•lb)**

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

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



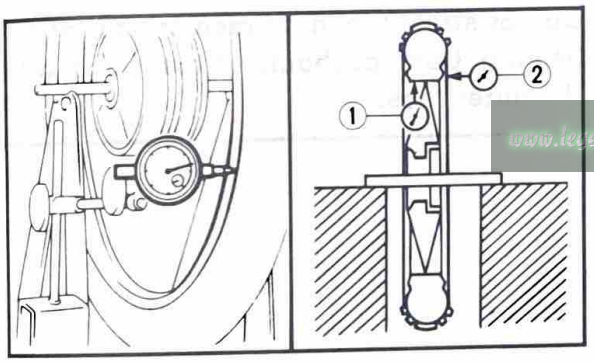
REMOVAL POINTS

WHEEL BEARING (IF NECESSARY)

1. Remove:
   - Bearing ①

NOTE:

Remove the bearing ① using a general bearing puller ②.



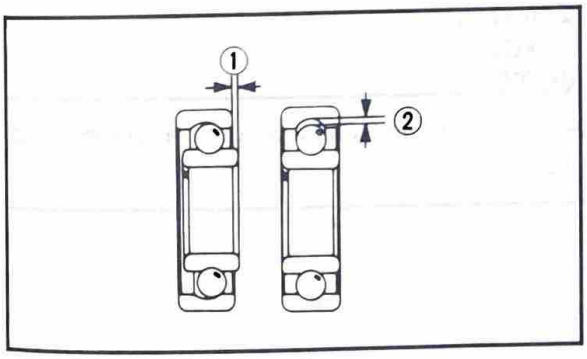
INSPECTION

FRONT WHEEL

1. Measure:
   - Wheel runout

   Out of limit → Replace.

Rim Runout Limits:
Radial ①: 2.0 mm (0.08 in)
Lateral ②: 2.0 mm (0.08 in)

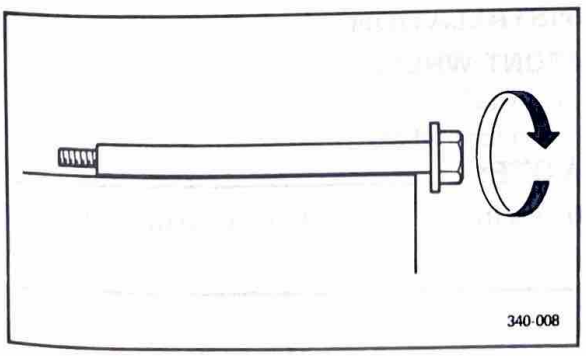


2. Inspect:
   - Bearing

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

NOTE:

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

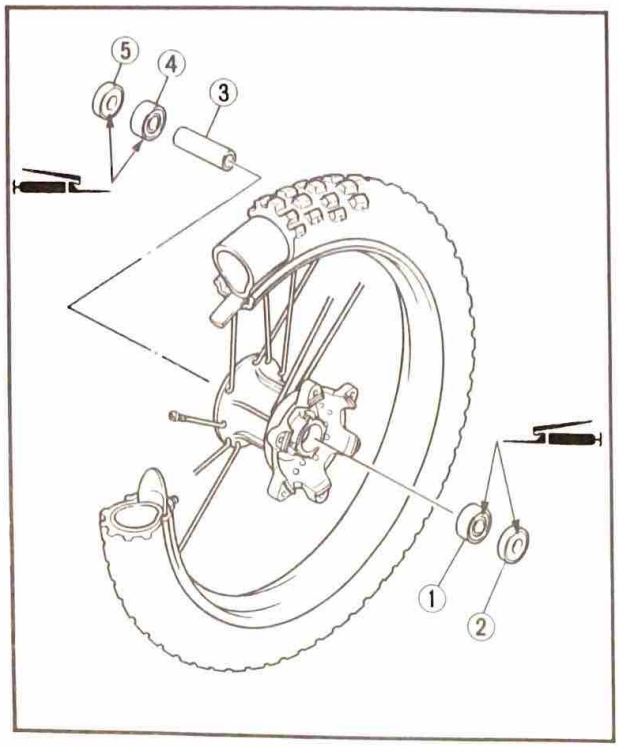


3. Inspect:
   - Front wheel axle

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

⚠ WARNING

Do not attempt to straighten a bent axle.



ASSEMBLY

FRONT WHEEL

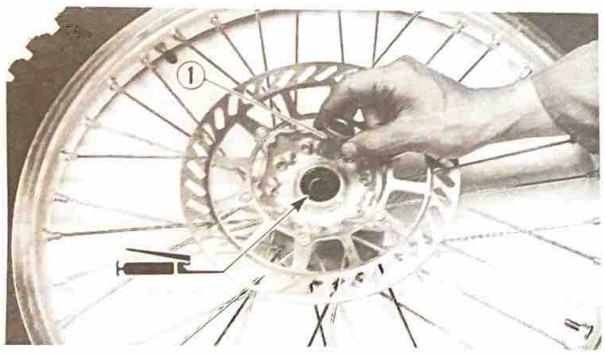
1. Install:
   - Bearing (left) ①
   - Oil seal (left) ②
   - Spacer ③
   - Bearing (right) ④
   - Oil seal (right) ⑤

NOTE:

- Apply the lithium soap base grease on the bearing and oil seal lip when installing.
- Use a socket that matches the outside diameter of the race of the bearing.
- Left side of bearing shall be installed first.
- Always use a new oil seal.
- Install the oil seal with its manufacture's marks or numbers facing outward.

CAUTION:

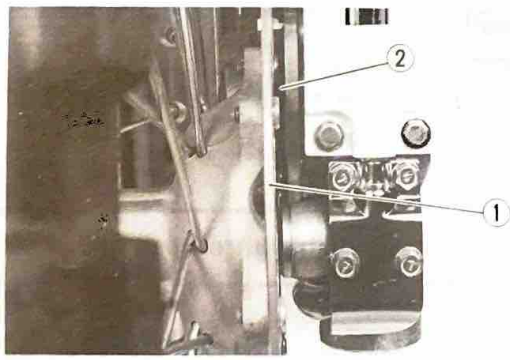
Do not strike the inner race of balls of the bearing. Contact should be made only with the outer race.



2. Install:
   - Collar ①

NOTE:

Apply the lithium soap base grease on the oil seal lip.



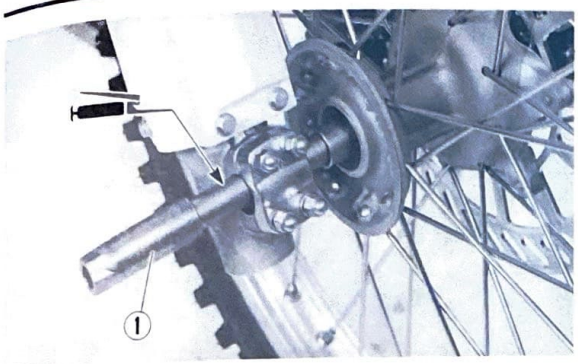
INSTALLATION

FRONT WHEEL

1. Install:
   - Front wheel

NOTE:

Install the brake disc ① between the brake pads ② correctly.

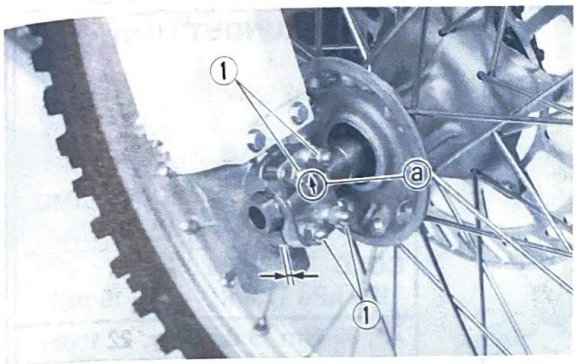


2. Install:
   • Front wheel axle ①

	Front Wheel Axle: **59 Nm (5.9 m•kg, 43 ft•lb)**

NOTE:

Apply the lithium soap base grease on the wheel axle.



3. Tighten:
   • Nut (axle holder) ①

	Nut (Axle Holder): **9 Nm (0.9 m•kg, 6.5 ft•lb)**

NOTE:

- Face the arrow mark ⓐ upward.
- When tightening the axle holder nuts, first, tighten the nuts on the upper side of axle holder.

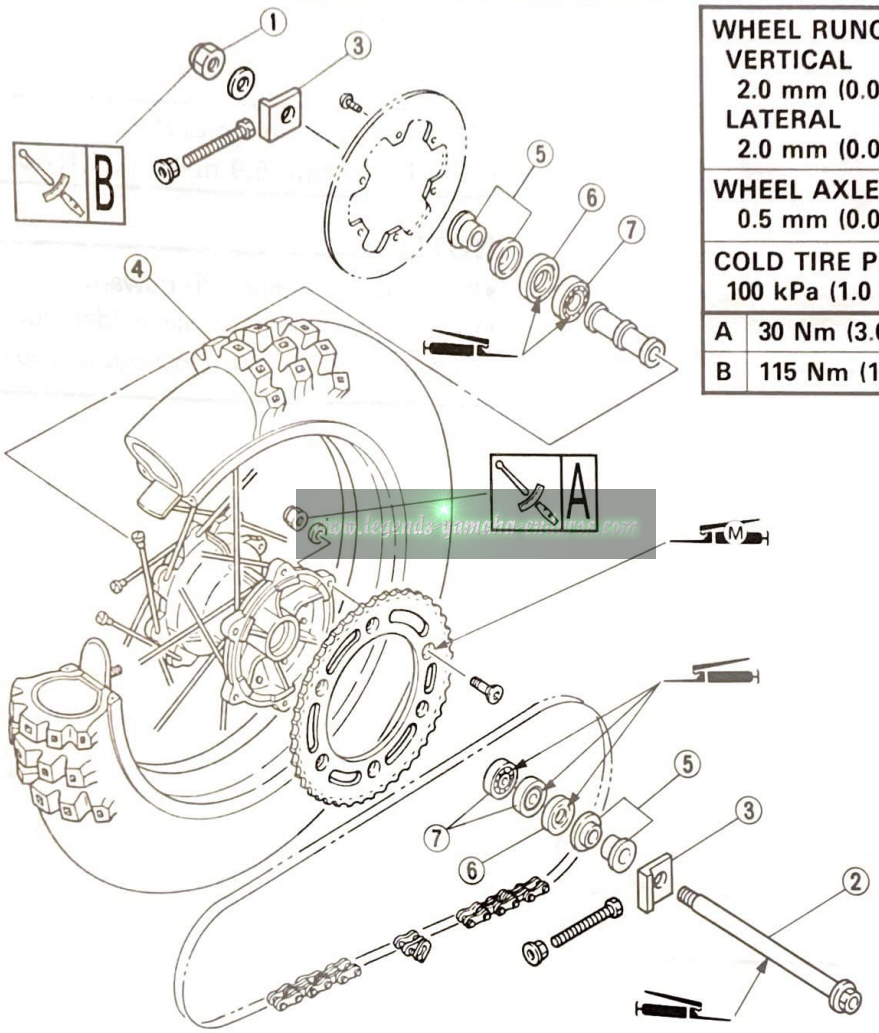
REAR WHEEL

PREPARATION FOR REMOVAL

* Hold the machine by placing the suitable stand under the engine.

⚠ WARNING

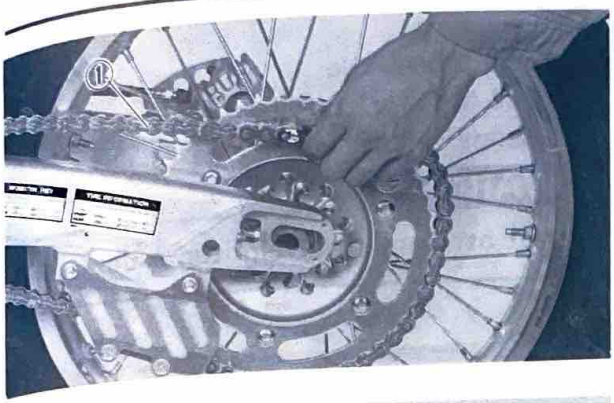
Support the machine securely so there is no danger of it falling over.



WHEEL RUNOUT LIMIT: VERTICAL 2.0 mm (0.08 in) LATERAL 2.0 mm (0.08 in)	
WHEEL AXLE BENDING LIMIT: 0.5 mm (0.020 in)	
COLD TIRE PRESSURE: 100 kPa (1.0 kg/cm², 15 psi)	
A	30 Nm (3.0 m•kg, 22 ft•lb)
B	115 Nm (11.5 m•kg, 85 ft•lb)

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

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



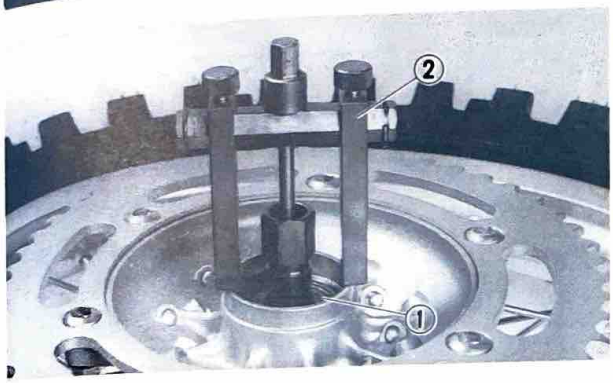
REMOVAL POINTS

REAR WHEEL

1. Remove:
   - Drive chain ①

NOTE:

Push the rear wheel forward and remove the drive chain.

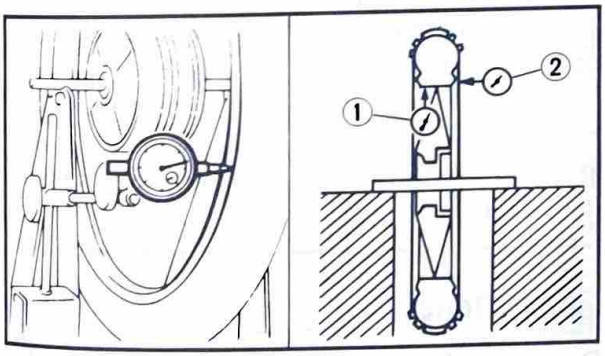


WHEEL BEARING (IF NECESSARY)

1. Remove:
   - Bearing ①

NOTE:

Remove the bearing ① using a general bearing puller ②.



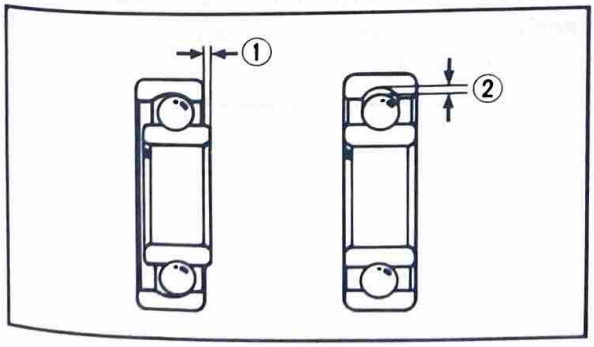
INSPECTION

REAR WHEEL

1. Measure:
   - Wheel runout

   Out of limit→Replace.

Rim Runout Limits:
Radial ①: 2.0 mm (0.08 in)
Lateral ②: 2.0 mm (0.08 in)



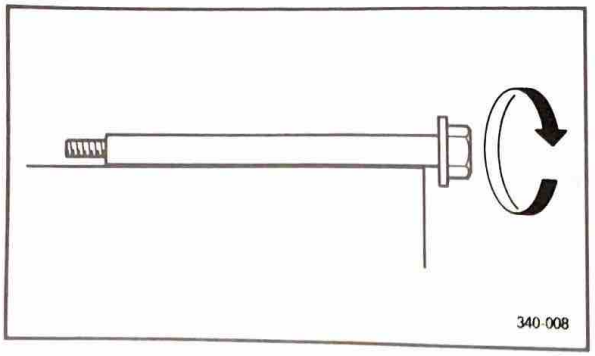
2. Inspect:
   - Bearing

   Rotate inner race with a finger.

   Rough spot/Seizure→Replace.

NOTE:

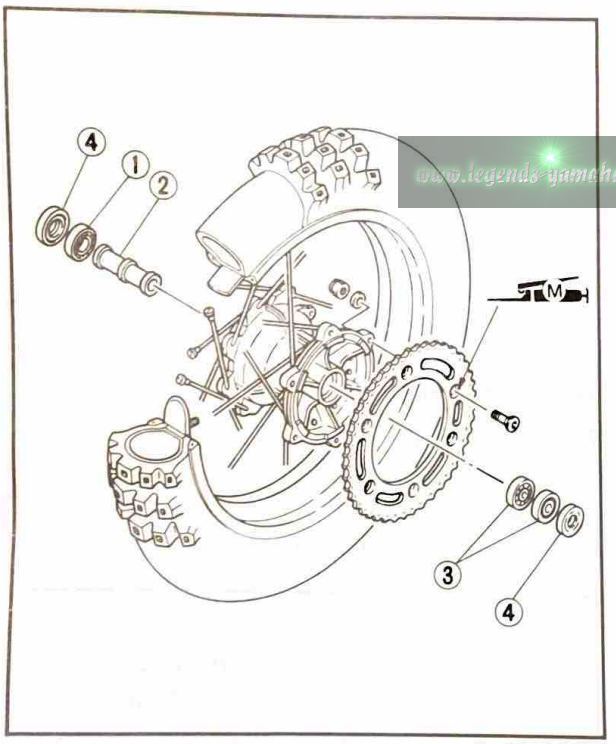
Replace the bearings, oil seal and wheel collar as a set.



3. Inspect:
   - Rear wheel axle
     Roll the axle on a flat surface.
     Bends → Replace.

⚠ WARNING

Do not attempt to straighten a bent axle.



ASSEMBLY AND INSTALLATION

REAR WHEEL

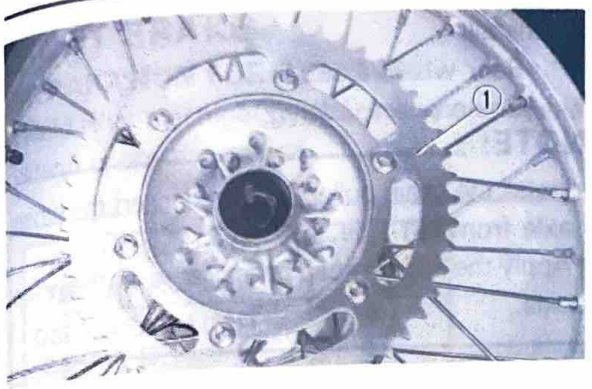
1. Install:
   - Bearing (right) ①
   - Spacer ②
   - Bearing (left) ③
   - Oil seal ④

NOTE:

- Apply the lithium soap base grease on the bearing and oil seal lip when installing.
- Use a socket that matches the outside diameter of the race of the bearing.
- Right side of bearing shall be installed first.
- Always use a new oil seal.
- Install the oil seal with its manufacture's marks or numbers facing outward.

CAUTION:

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

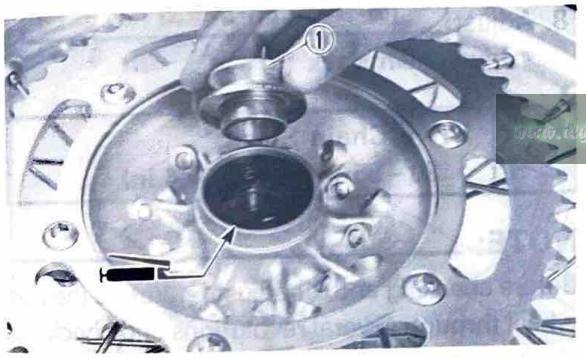


2. Install:
   • Driven sprocket ①

NOTE:

- Apply the molybdenum disulfide grease on the chamfered face of sprocket.
- Tighten the bolts in stage, using a diagonal pattern.

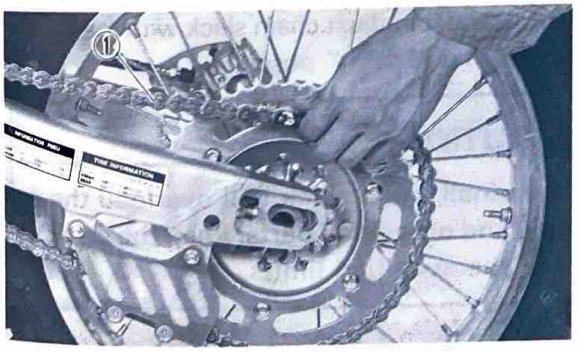
	Bolt (Drive Sprocket): 30 Nm (3.0 m•kg, 22 ft•lb)



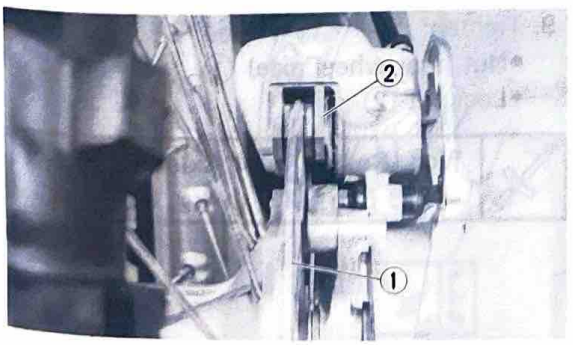
3. Install:
   • Collar ①

NOTE:

Apply the lithium soap base grease on the oil seal lip.



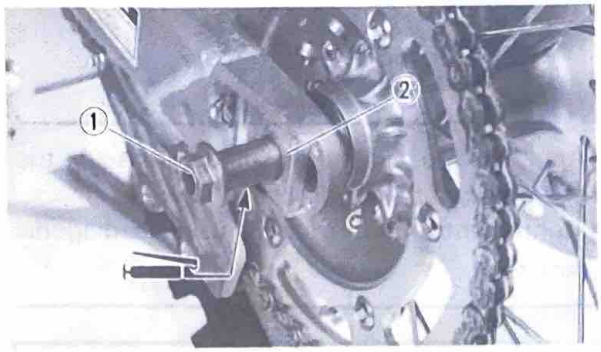
4. Install:
   • Drive chain ①
   To driven sprocket.



5. Install:
   • Rear wheel

NOTE:

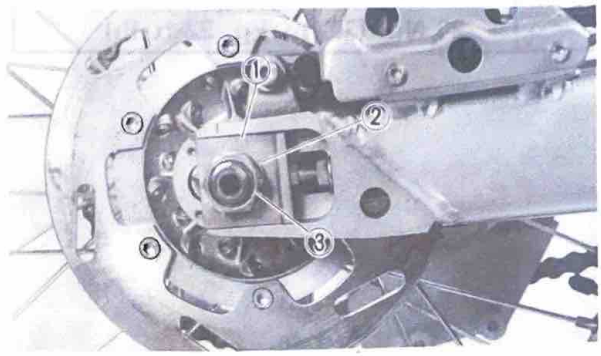
Install the brake disc ① between the brake pads ② correctly.



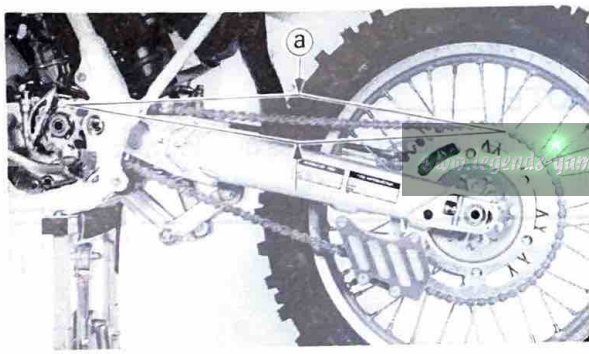
6. Install:
   - Rear wheel axle ①
   - Chain puller (left) ②

NOTE:

- Install the chain puller (left), and insert the wheel axle from left side.
- Apply the lithium soap base grease on the wheel axle.



7. Install:
   - Chain puller (right) ①
   - Plain washer ②
   - Nut (rear wheel axle) ③



8. Adjust:
   - Drive chain slack ⓐ

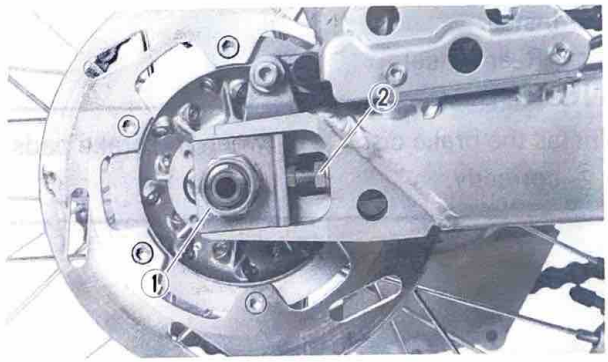
Drive Chain Slack:
30 ~ 35 mm (1.2 ~ 1.4 in)

NOTE:

Before checking and/or adjusting, rotate the rear wheel through several revolutions and check the slack several times to find the tightest point. Check and/or adjust chain slack with rear wheel in this "tight chain" position.

CAUTION:

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



9. Tighten:
   - Nut (rear wheel axle) ①
   - Locknut ②

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

FRONT BRAKE

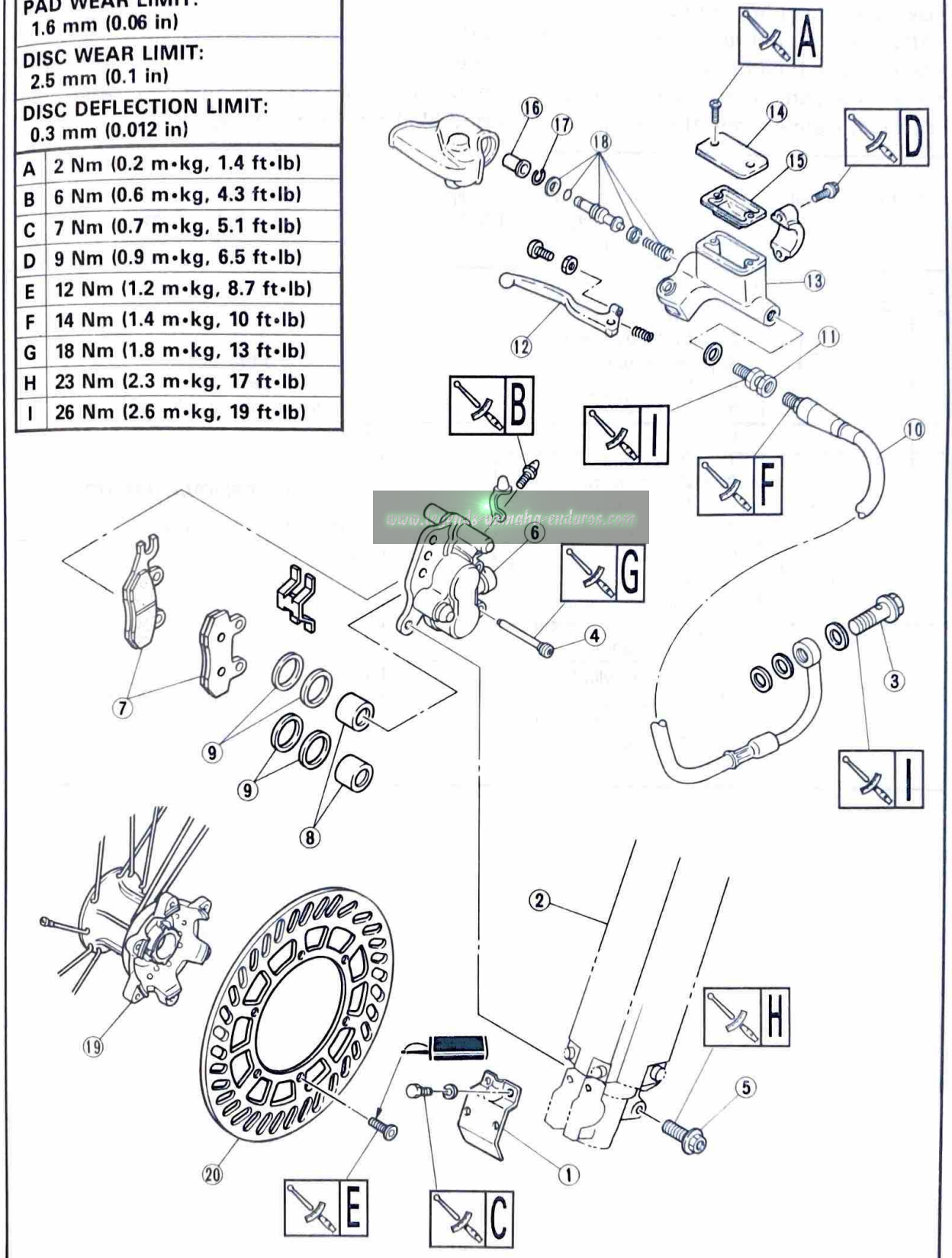
PREPARATION FOR REMOVAL

*Hold the machine by placing the suitable stand under the engine.

⚠ WARNING

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

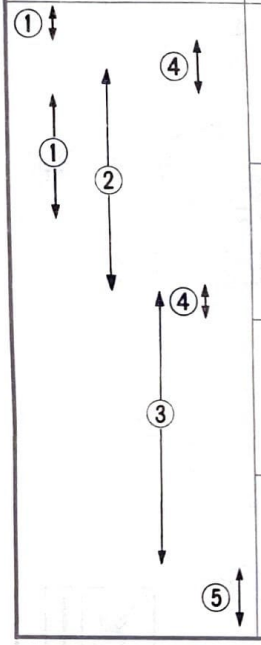
PAD WEAR LIMIT: 1.6 mm (0.06 in)	
DISC WEAR LIMIT: 2.5 mm (0.1 in)	
DISC DEFLECTION LIMIT: 0.3 mm (0.012 in)	
A	2 Nm (0.2 m•kg, 1.4 ft•lb)
B	6 Nm (0.6 m•kg, 4.3 ft•lb)
C	7 Nm (0.7 m•kg, 5.1 ft•lb)
D	9 Nm (0.9 m•kg, 6.5 ft•lb)
E	12 Nm (1.2 m•kg, 8.7 ft•lb)
F	14 Nm (1.4 m•kg, 10 ft•lb)
G	18 Nm (1.8 m•kg, 13 ft•lb)
H	23 Nm (2.3 m•kg, 17 ft•lb)
I	26 Nm (2.6 m•kg, 19 ft•lb)

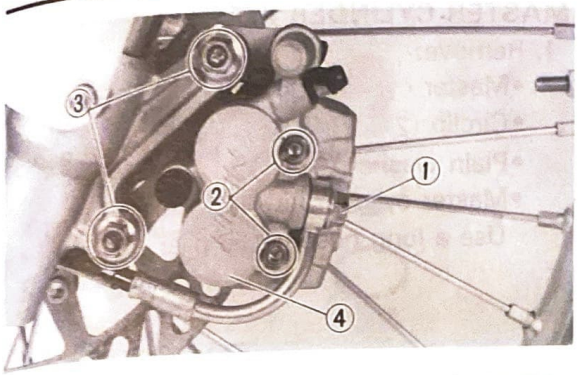


CAUTION:

Disc brake components rarely require disassembly. DO NOT:
- **Disassemble components unless absolutely necessary.**
- **Use solvents on internal brake component.**
- **Use contaminated brake fluid for cleaning.**
- **Use only clean brake fluid.**
- **Allow brake fluid to come in contact with the eyes otherwise eye injury may occur.**
- **Allow brake fluid to contact painted surfaces or plastic parts otherwise damage may occur.**
- **Disconnect any hydraulic connection otherwise the entire system must be disassembled, drained, cleaned, and then properly filled and bled after reassembly.**

Extent of removal: ① Brake pads removal ② Caliper removal and disassembly ③ Master cylinder removal and disassembly ④ Brake hose removal ⑤ Brake disc removal

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



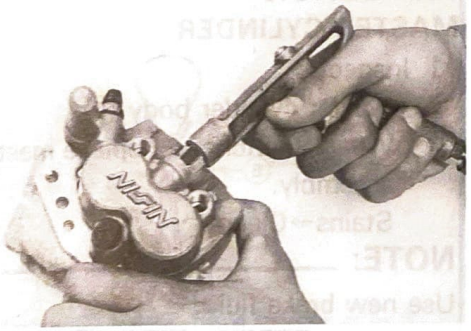
REMOVAL POINTS

CALIPER

1. Remove:
   - Union bolt ①
   - Pad pin ②
   - Bolt (caliper) ③
   - Caliper ④

NOTE:

Before removing the caliper from the front fork, loosen the pad pin.



CALIPER PISTON

1. Remove:
   - Caliper piston

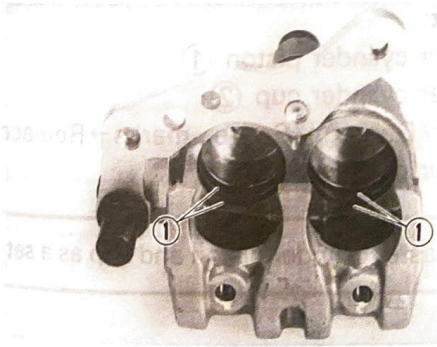
   Use compressed air and proceed carefully.

⚠ WARNING

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

Caliper piston removal steps:

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



PISTON SEAL KIT

1. Remove:
   - Piston seal ①

NOTE:

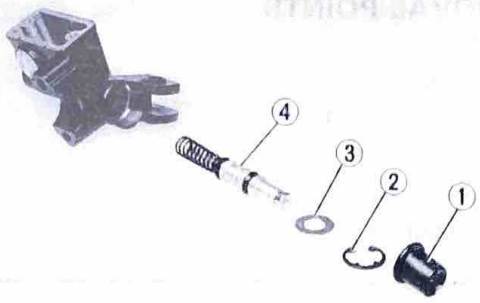
Remove the piston seal by pushing it with a finger.

CAUTION:

Never attempt to pry out piston seals.

⚠ WARNING

Replace the piston seals whenever a caliper is disassembled.



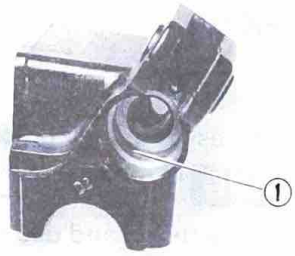
MASTER CYLINDER KIT

1. Remove:
   - Master cylinder boot ①
   - Circlip ②
   - Plain washer ③
   - Master cylinder kit ④

   Use a long nose circlip plier.

INSPECTION

MASTER CYLINDER

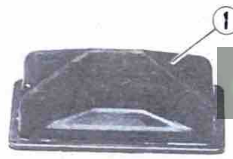


1. Inspect:
   - Master cylinder body ①

   Wear/Scratches→Replace master cylinder assembly.
   Stains→Clean.

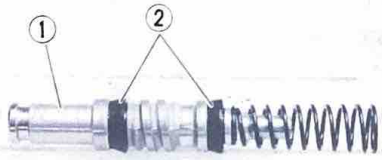
NOTE:

Use new brake fluid.



2. Inspect:
   - Diaphragm ①

   Crack/Damage→Replace.

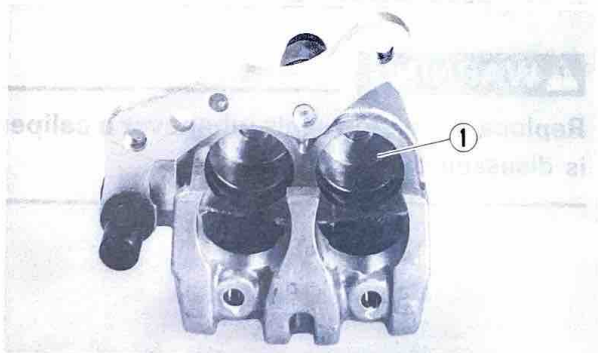


3. Inspect:
   - Master cylinder piston ①
   - Master cylinder cup ②

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

NOTE:

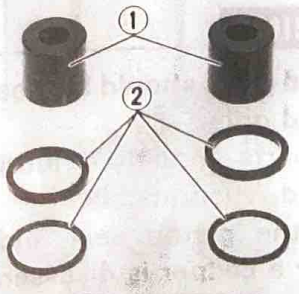
Replace master cylinder piston and cup as a set.



CALIPER

1. Inspect:
   - Caliper cylinder ①

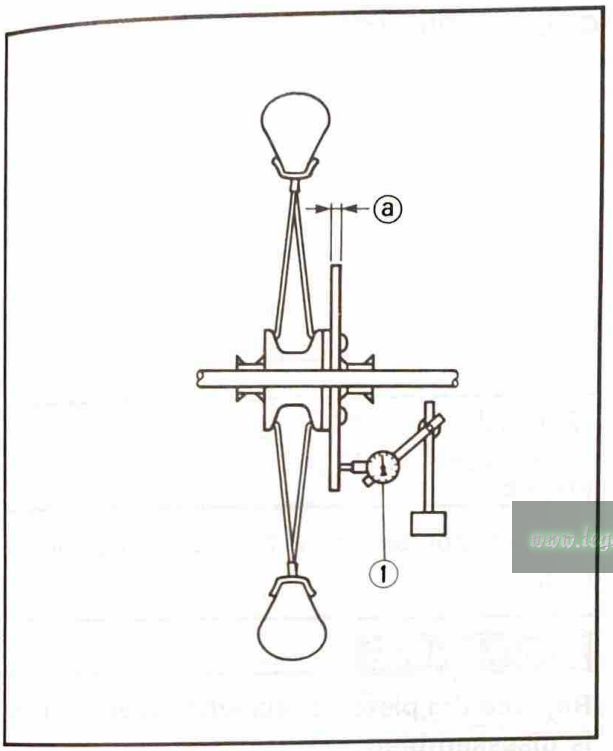
   Wear/Score marks→Replace caliper assembly.



2. Inspect:
   • Caliper piston ①
   Wear/Score marks → Replace caliper assembly.

⚠ WARNING

Replace the piston seals ② whenever a caliper is disassembled.



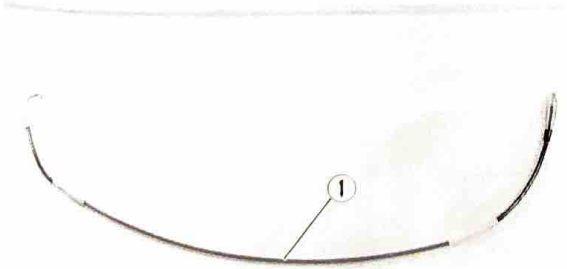
BRAKE DISC

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

Maximum Deflection:
0.3 mm (0.01 in)

   • Brake disc thickness ⓐ
   Out of limit → Replace.

Disc Wear Limit:	
Standard	Limit
3.0 mm (0.12 in)	2.5 mm (0.10 in)



BRAKE HOSE

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

ASSEMBLY AND INSTALLATION

⚠ WARNING

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

CALIPER PISTON

1. Clean:
   - Caliper
   - Piston seal
   - Caliper piston

   Clean them with brake fluid.

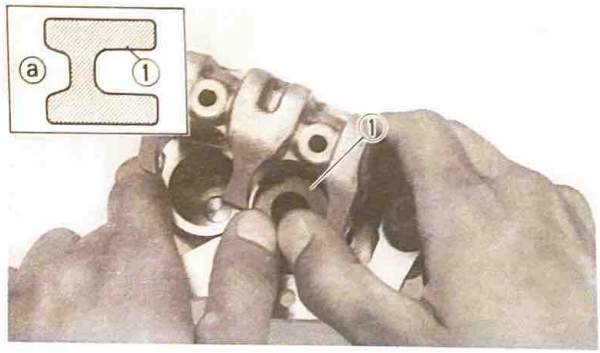
2. Install:
   - Piston seal ①

NOTE:

Fit the piston seal onto the slot on caliper correctly.

⚠ WARNING

Replace the piston seals whenever a caliper is disassembled.



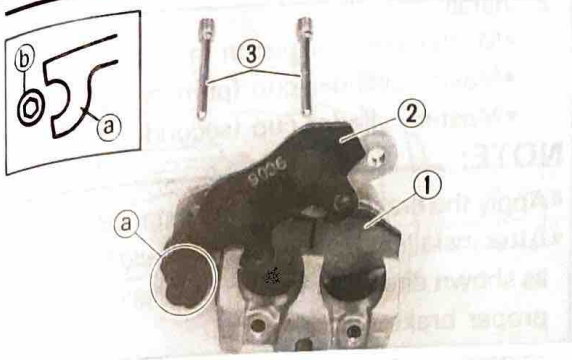
3. Install:
   - Caliper piston ①

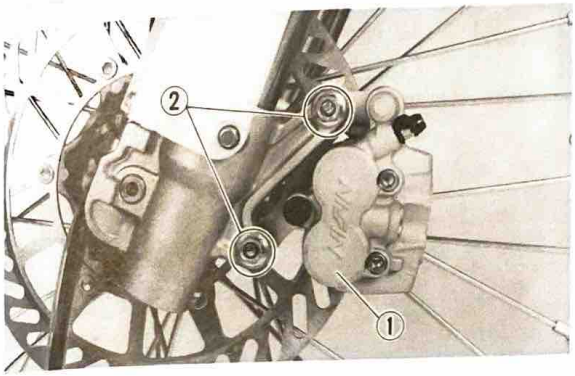
NOTE:

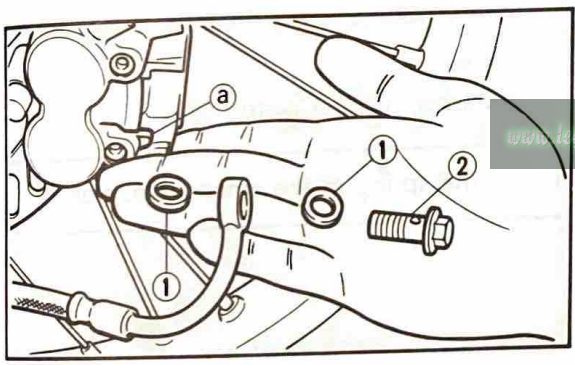
Apply the brake fluid on the piston wall.

CAUTION:

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







CALIPER

1. Install:
   - Brake pad 1 ①
   - Brake pad 2 ②
   - Pad pin ③

NOTE:

Fit the brake pad receptacle ⓐ on the brake pad 2 around the projection ⓑ on the caliper.

	Pad Pin: **18 Nm (1.8 m•kg, 13 ft•lb)**

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

	Bolts (caliper): **23 Nm (2.3 m•kg, 17 ft•lb)**

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

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

NOTE:

Always use a new copper washer.

CAUTION:

When installing the brake hose to the caliper, lightly touch the brake pipe with the projection ⓐ on the caliper.

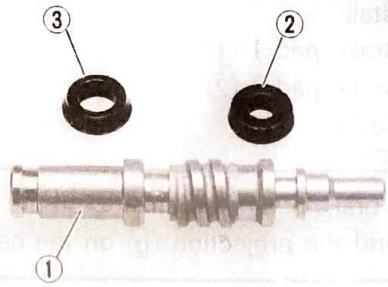
4. Air bleed:
   - Brake system

   Refer to CHAPTER 3. — "BRAKE SYSTEM AIR BLEEDING" section.

MASTER CYLINDER KIT

1. Clean:
   - Master cylinder
   - Master cylinder kit

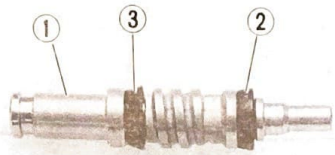
   Clean them with brake fluid.



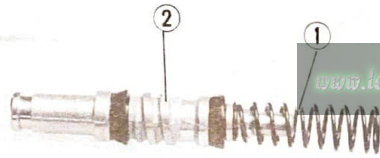
2. Install:
   - Master cylinder piston ①
   - Master cylinder cup (primary) ②
   - Master cylinder cup (secondary) ③

NOTE:

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

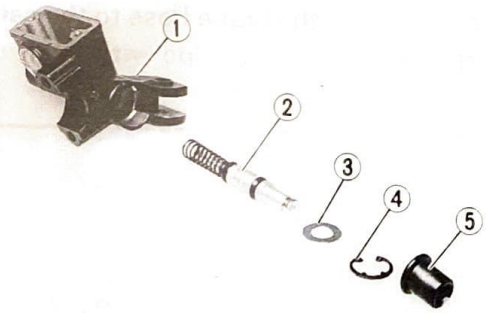


3. Install:
   - Spring ①
   - Master cylinder piston ②



NOTE:

Install the spring at the smaller dia. side.

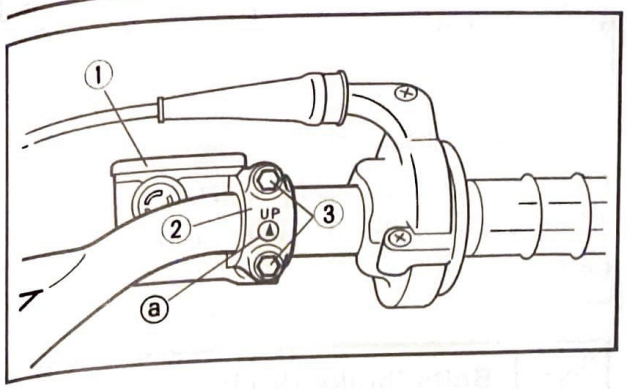


4. Install:
   - Master cylinder ①
   - Master cylinder kit ②
   - Plain washer ③
   - Circlip ④
   - Master cylinder boot ⑤

   Use a long nose circlip plier.

NOTE:

Apply the brake fluid on the master cylinder kit.



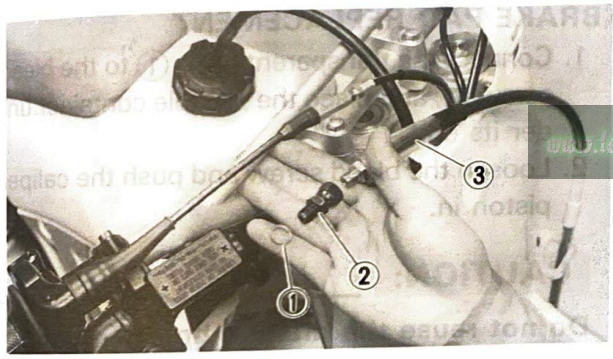
MASTER CYLINDER

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

NOTE:

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

	Bolts (Master Cylinder Bracket): 9 Nm (0.9 m•kg, 6.5 ft•lb)

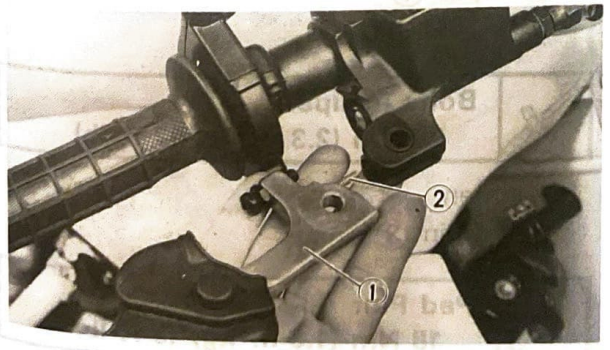


2. Install:
   - Copper washer ①
   - Joint bolt ②
   - Brake hose ③

NOTE:

Always use a new copper washer.

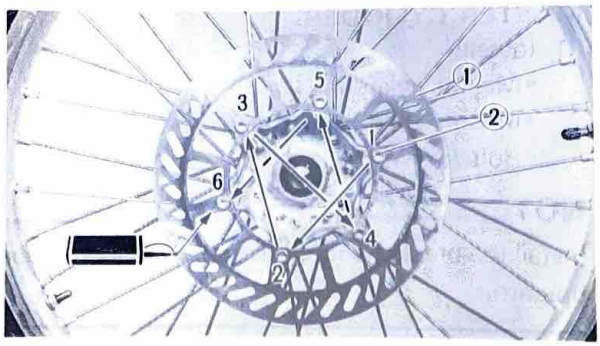
	Joint Bolt: 26 Nm (2.6 m•kg, 19 ft•lb) **Brake Hose: 14 Nm (1.4 m•kg, 10 ft•lb)**



3. Install:
   - Brake lever ①
   - Spring ②

NOTE:

Apply the lithium soap base grease on the sliding surfase.



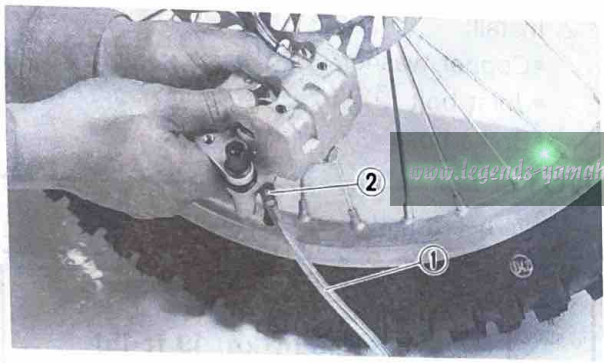
BRAKE DISC

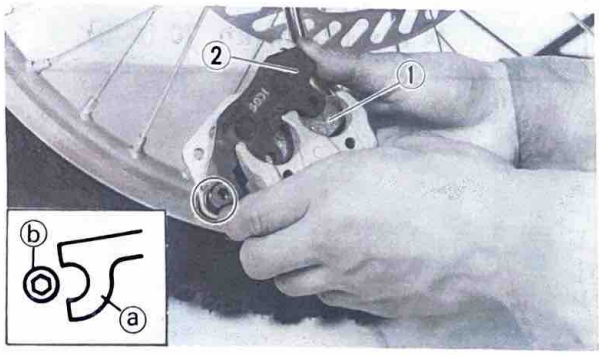
1. Install:
   - Brake disc ①
   - Bolt (brake disc) ②

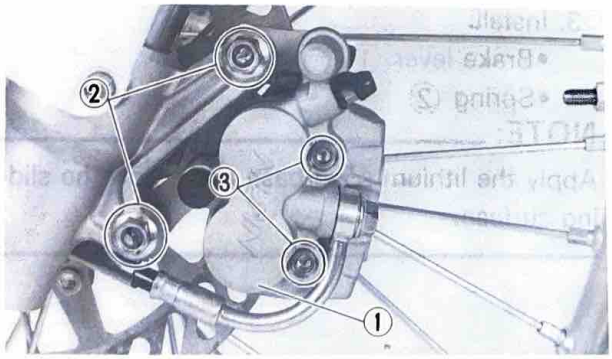
NOTE:

Tighten the bolts in stage, using a diagonal pattern.

Bolts (brake disc):
12 Nm (1.2 m•kg, 8.7 ft•lb)
LOCTITE®







BRAKE PAD REPLACEMENT

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

CAUTION:

Do not reuse the drained brake fluid.

3. Install:
   - Brake pad 1 ①
   - Brake pad 2 ②
   - Pad pin

NOTE:

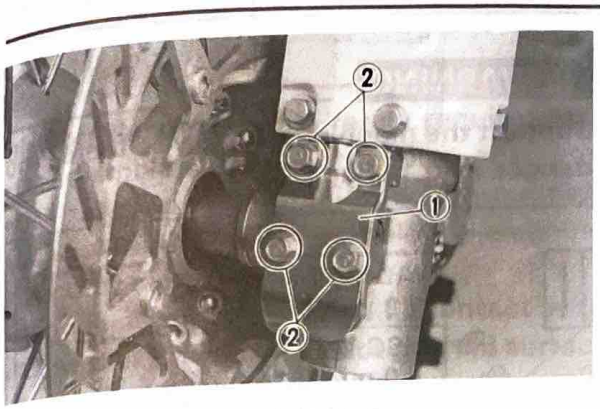
Fit the brake pad receptacle ⓐ around the projection ⓑ on the caliper.

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

Bolts (caliper):
23 Nm (2.3 m•kg, 17 ft•lb)

5. Tighten:
   - Pad pin ③

Pad Pin:
18 Nm (1.8 m•kg, 13 ft•lb)



6. Install:
   - Hose cover ①
   - Bolt (hose cover) ②

Bolts (Hose Cover):
7 Nm (0.7 m•kg, 5.1 ft•lb)

BRAKE FLUID

1. Fill:
   - Brake fluid

Recommended Brake Fluid:
DOT #4

NOTE:

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

CAUTION:

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

⚠ WARNING

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

2. Air bleed:
   - Brake system

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

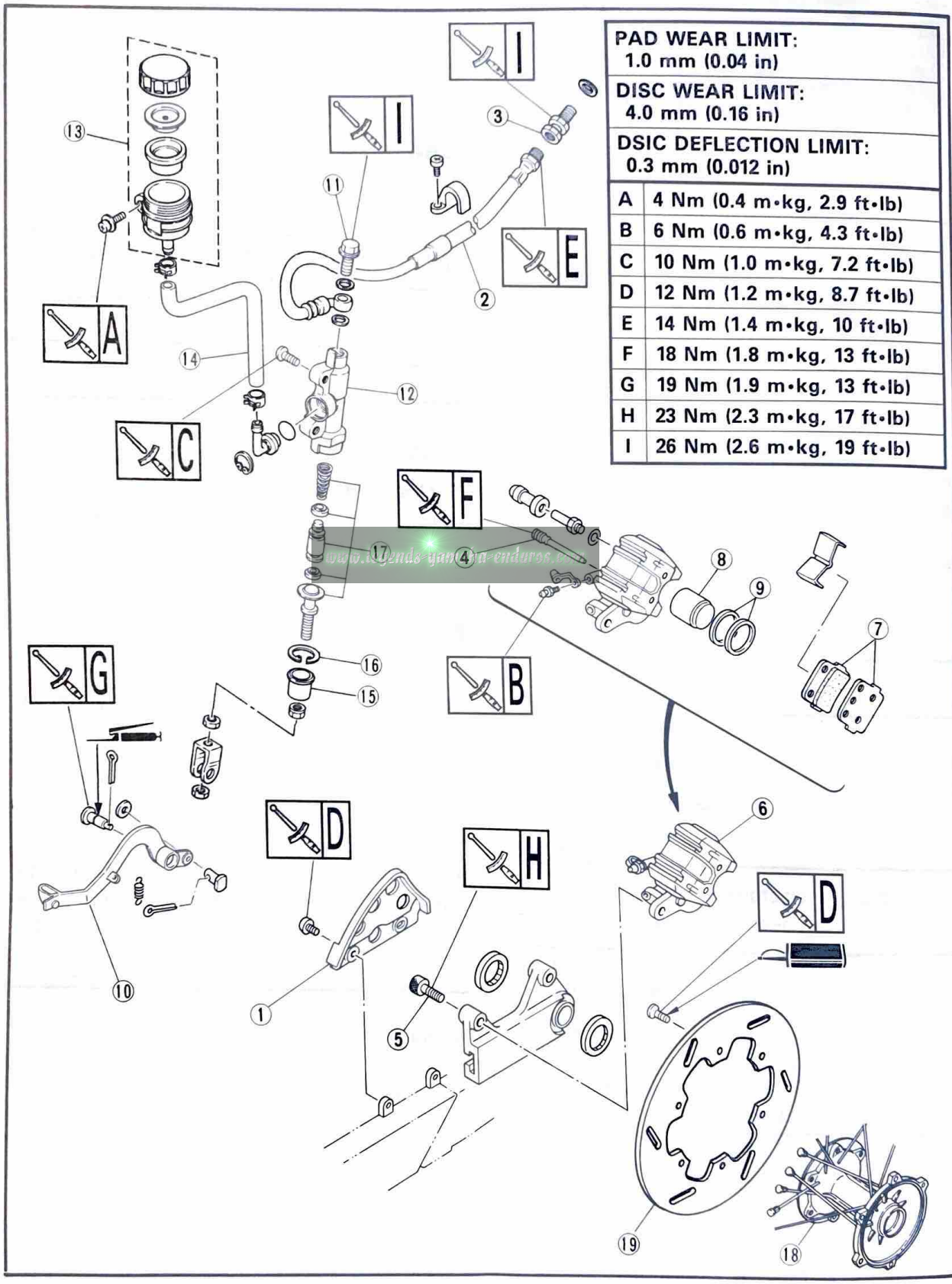
REAR BRAKE

PREPARATION FOR REMOVAL

* Hold the machine by placing the suitable stand under the engine.

⚠ WARNING

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

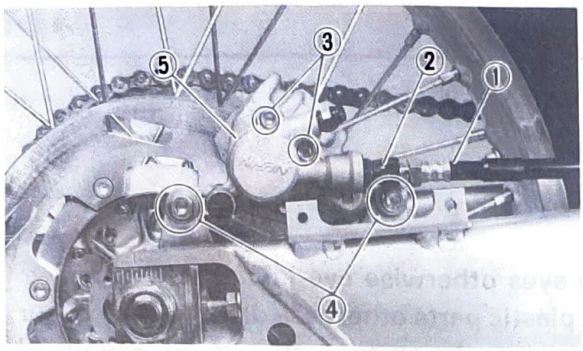


CAUTION:

Disc brake components rarely require disassembly. DO NOT:
- **Disassemble components unless absolutely necessary.**
- **Use solvents on internal brake component.**
- **Use contaminated brake fluid for cleaning.**
  Use only clean brake fluid.
- **Allow brake fluid to come in contact with the eyes otherwise eye injury may occur.**
- **Allow brake fluid to contact painted surfaces or plastic parts otherwise damage may occur**
- **Disconnect any hydraulic connection otherwise the entire system must be disassembled drained, cleaned, and then properly filled and bled after reassembly.**

Extent of removal: ① Brake pad removal ② Caliper removal and disassembly ③ Master cylinder removal and disassembly ④ Brake hose removal ⑤ Brake disc removal

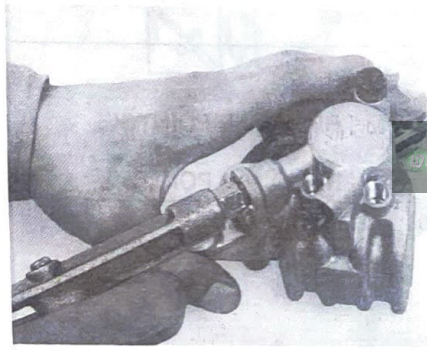
Extent of removal	Order	Part name	Q'ty	Remarks
①	1	Protector	1	
④	2	Brake hose	1	Drain the brake fluid.
	3	Joint bolt	1	Only loosening.
②	4	Pad pin	2	Refer to "REMOVAL POINTS".
①	5	Bolt (caliper)	2	
	6	Caliper	1	
	7	Brake pad	2	
	8	Caliper piston	2	Refer to "REMOVAL POINTS".
	9	Piston seal	2	
	10	Brake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



REMOVAL POINTS
CALIPER
1. Remove:
   - Brake hose ①
   - Joint bolt ②
   - Pad pin ③
   - Bolt (caliper) ④
   - Caliper ⑤

NOTE:

Before removing the caliper from the swingarm, loosen the pad pin.



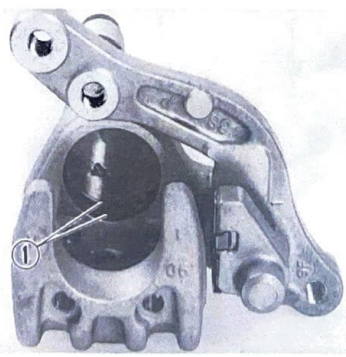
CALIPER PISTON
1. Remove:
   - Caliper piston

   Use compressed air and proceed carefully.

⚠ WARNING

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

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



PISTON SEAL KIT
1. Remove:
   - Piston seal ①

NOTE:

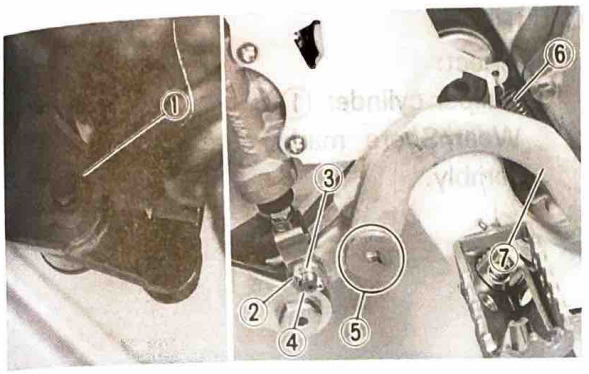
Remove the piston seal by pushing it with a finger.

CAUTION:

Never attempt to pry out piston seals.

⚠ WARNING

Replace the piston seals whenever a caliper is disassembled.



BRAKE PEDAL

1. Remove:
   - Cotter pin (Brake pedal mounting bolt) ①
   - Cotter pin ②
   - Plain washer ③
   - Pin ④
   - Bolt (brake pedal) ⑤
   - Spring ⑥
   - Brake pedal ⑦

MASTER CYLINDER KIT

1. Remove:
   - Master cylinder boot ①
   - Circlip ②
   - Master cylinder kit ③

   Use a long nose circlip plier.

INSPECTION

MASTER CYLINDER

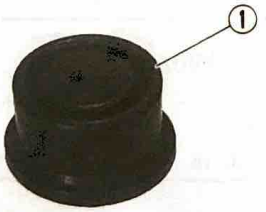
1. Inspect:
   - Master cylinder body ①

   Wear/Scratches→Replace master cylinder assembly.

   Stains→Clean.

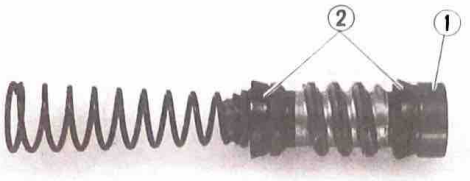
NOTE:

Use new brake fluid.



2. Inspect:
   - Diaphragm ①

   Crack/Damage→Replace.

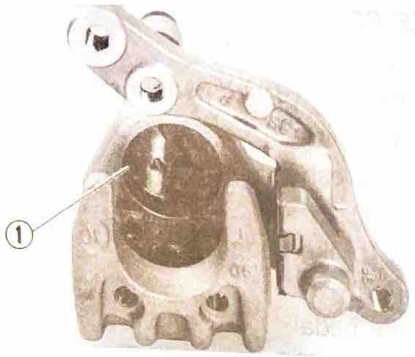


3. Inspect:
   - Master cylinder piston ①
   - Master cylinder cup ②

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

NOTE:

Replace master cylinder piston and cup as a set.



CALIPER

1. Inspect:
   - Caliper cylinder ①

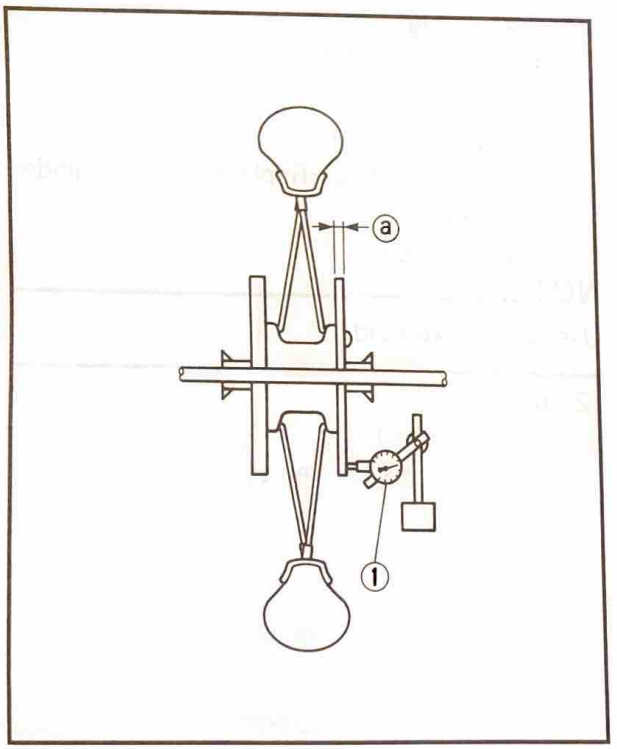
   Wear/Score marks→Replace caliper assembly.

2. Inspect:
   - Caliper piston ①

   Wear/Score marks→Replace caliper assembly.

⚠ WARNING

Replace the piston seals ② whenever a caliper is disassembled.



BRAKE DISC

1. Measure:
   - Brake disc deflection

   Use Dial Gauge ①.

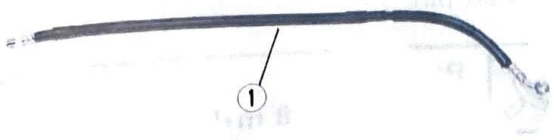
   Out of specification→Inspect wheel runout. If wheel runout is in good condition, replace.

Maximum Deflection:
0.3 mm (0.01 in)

   - Brake disc thickness ⓐ

   Out of limit→Replace.

Disc Wear Limit:	
Standard	Limit
4.5 mm (0.18 in)	4.0 mm (0.16 in)



BRAKE HOSE

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

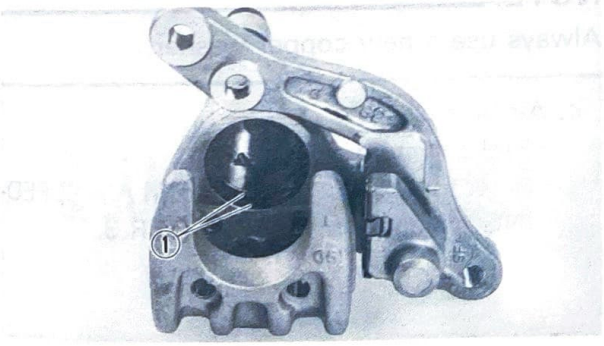
ASSEMBLY AND INSTALLATION

⚠ WARNING

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

CALIPER PISTON

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



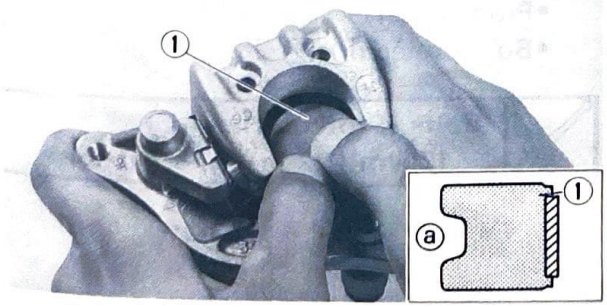
2. Install:
   - Piston seal ①

NOTE:

Fit the piston seal onto the slot on caliper correctly.

⚠ WARNING

Replace the piston seals whenever a caliper is disassembled.



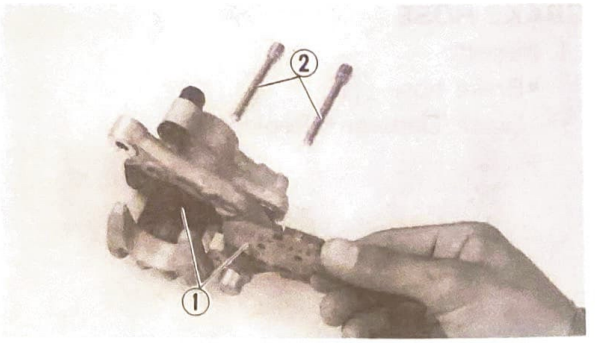
3. Install:
   - Caliper piston ①

NOTE:

Apply the brake fluid on the piston wall.

CAUTION:

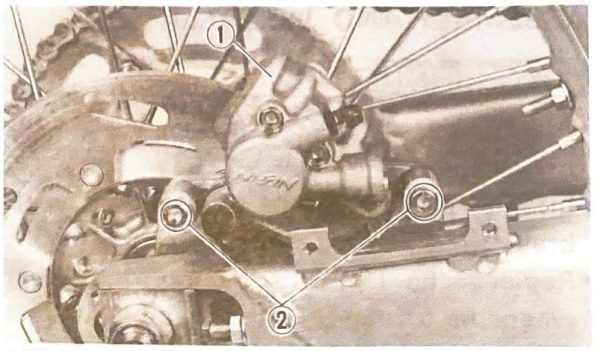
- **Be sure that the depressed side ⓐ face the caliper side.**
- **Never force to insert.**



CALIPER

1. Install:
   - Brake pad ①
   - Pad pin ②

Pad Pin:
18 Nm (1.8 m•kg, 13 ft•lb)



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

Bolt (Caliper):
23 Nm (2.3 m•kg, 17 ft•lb)

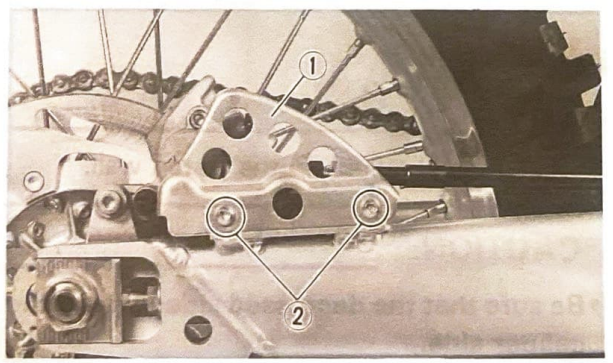
3. Install:
   - Copper washer ①
   - Joint bolt ②
   - Brake hose ③

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

NOTE:
Always use a new copper washer.

4. Air bleed:
   - Brake system

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



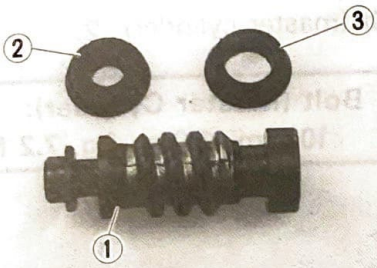
5. Install:
   - Protector ①
   - Bolt (protector) ②

Bolts (Protector):
12 Nm (1.2 m•kg, 8.7 ft•lb)

MASTER CYLINDER KIT

1. Clean:
   - Master cylinder
   - Master cylinder kit

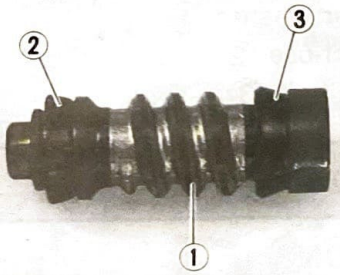
   Clean them with brake fluid.

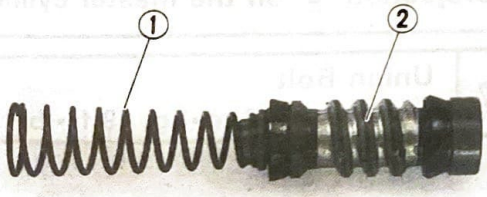


2. Install:
   - Master cylinder piston ①
   - Master cylinder cup (primary) ②
   - Master cylinder cup (secondary) ③

NOTE:

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

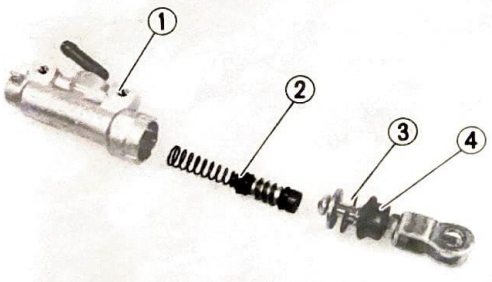




3. Install:
   - Spring ①
   - Master cylinder piston ②

NOTE:

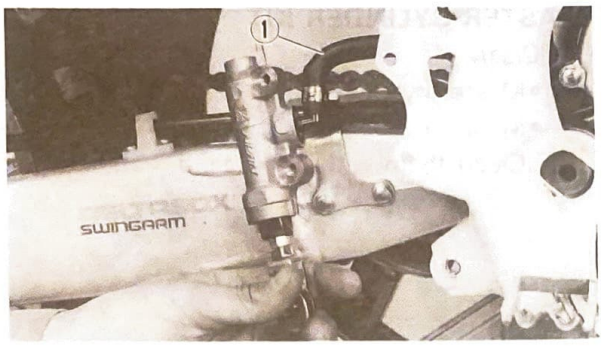
Install the spring at the smaller dia. side.



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

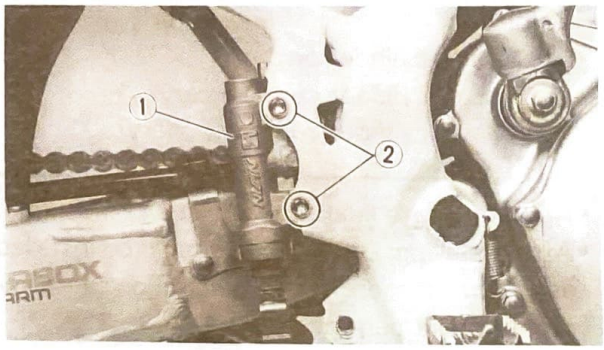
NOTE:

Apply the brake fluid on the master cylinder kit.



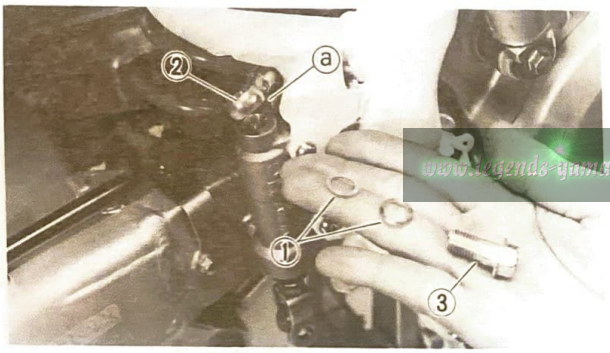
MASTER CYLINDER

1. Install:
   - Reservoir hose ①



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

	Bolt (Master Cylinder): **10 Nm (1.0 m•kg, 7.2 ft•lb)**



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

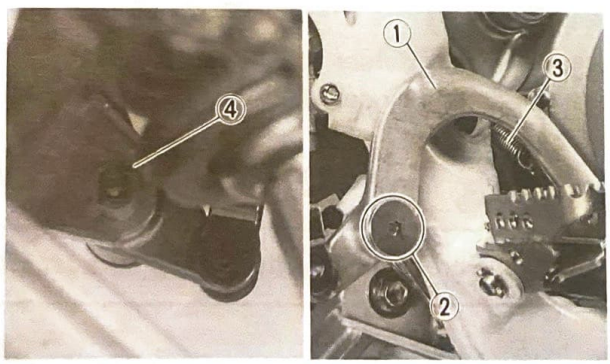
NOTE:

Always use a new copper washer.

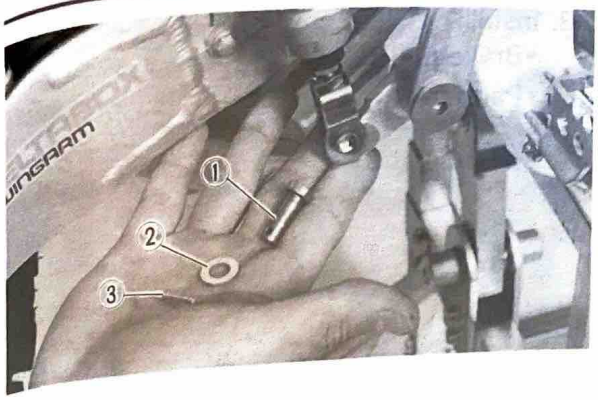
CAUTION:

When installing the brake hose to the master cylinder, lightly touch the brake pipe with the projection ⓐ on the master cylinder.

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



4. Install:
   - Brake pedal ①
   - Bolt (brake pedal) ②
   - Spring ③
   - Cotter pin ④



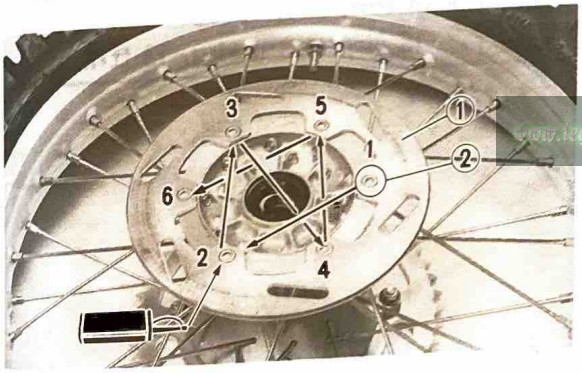
5. Install:
   - Pin ①
   - Plain washer ②
   - Cotter pin ③

⚠ WARNING

Always use new cotter pin.

NOTE:

After installing, check the brake pedal height. Refer to the "REAR BRAKE ADJUSTMENT" section in the CHAPTER 3.



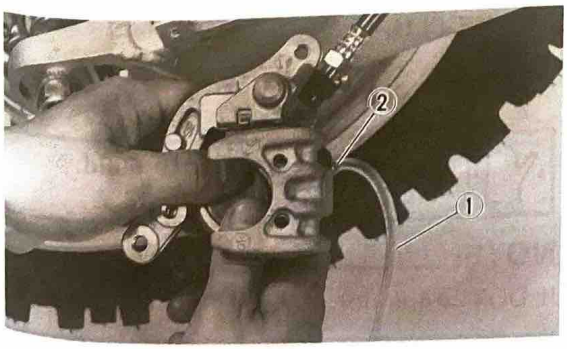
BRAKE DISC

1. Install:
   - Brake disc ①
   - Bolt (brake disc) ②

NOTE:

Tighten the bolts in stage, using a diagonal pattern.

Bolts (Brake Disc):
12 Nm (1.2 m•kg, 8.7 ft•lb)
LOCTITE®

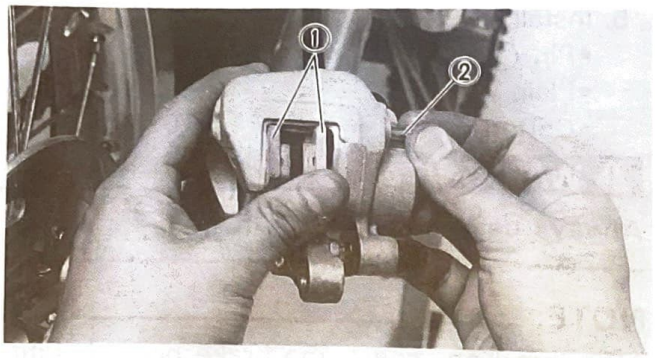


BRAKE PAD REPLACEMENT

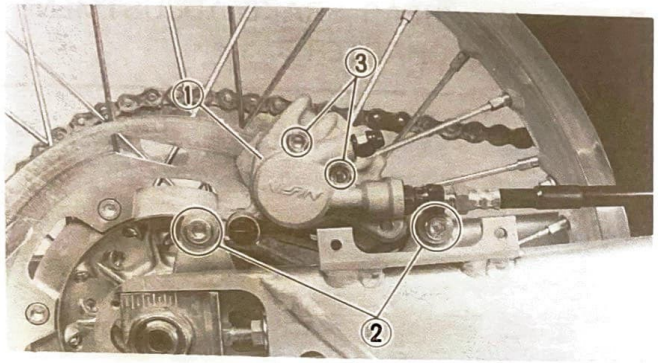
1. Connect the transparent hose ① to the bleed screw ② and place the suitable container under its end.
2. Loosen the bleed screw and push the caliper piston in.

CAUTION:

Do not reuse the drained brake fluid.



3. Install:
   - Brake pad ①
   - Pad pin ②

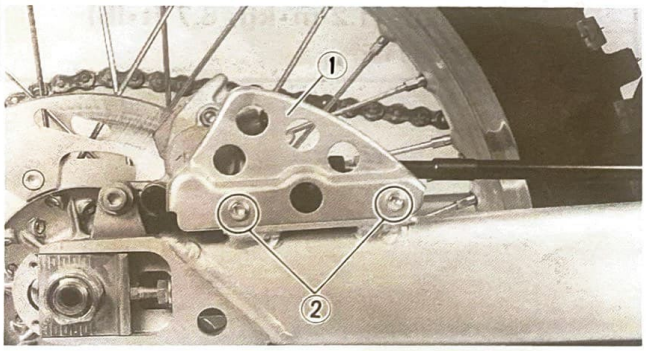


4. Install:
   - Caliper ①
   - Bolt (caliper) ②

Bolt (Caliper):
23 Nm (2.3 m•kg, 17 ft•lb)

5. Tighten:
   - Pad pin ③

Pad Pin:
18 Nm (1.8 m•kg, 13 ft•lb)



6. Install:
   - Protector ①
   - Bolt (protector) ②

Bolts (Protector):
12 Nm (1.2 m•kg, 8.7 ft•lb)

BRAKE FLUID

1. Fill:
   - Brake fluid

Recommended Brake Fluid:
DOT #4

NOTE:

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

CAUTION:

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

⚠ WARNING

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

2. Air bleed:
   - Brake system

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

FRONT FORK

PREPARATION FOR REMOVAL

*Remove the following parts:

- Front wheel
- Caliper
- Handlebar
- Number plate

*Hold the machine by placing the suitable stand under the engine.

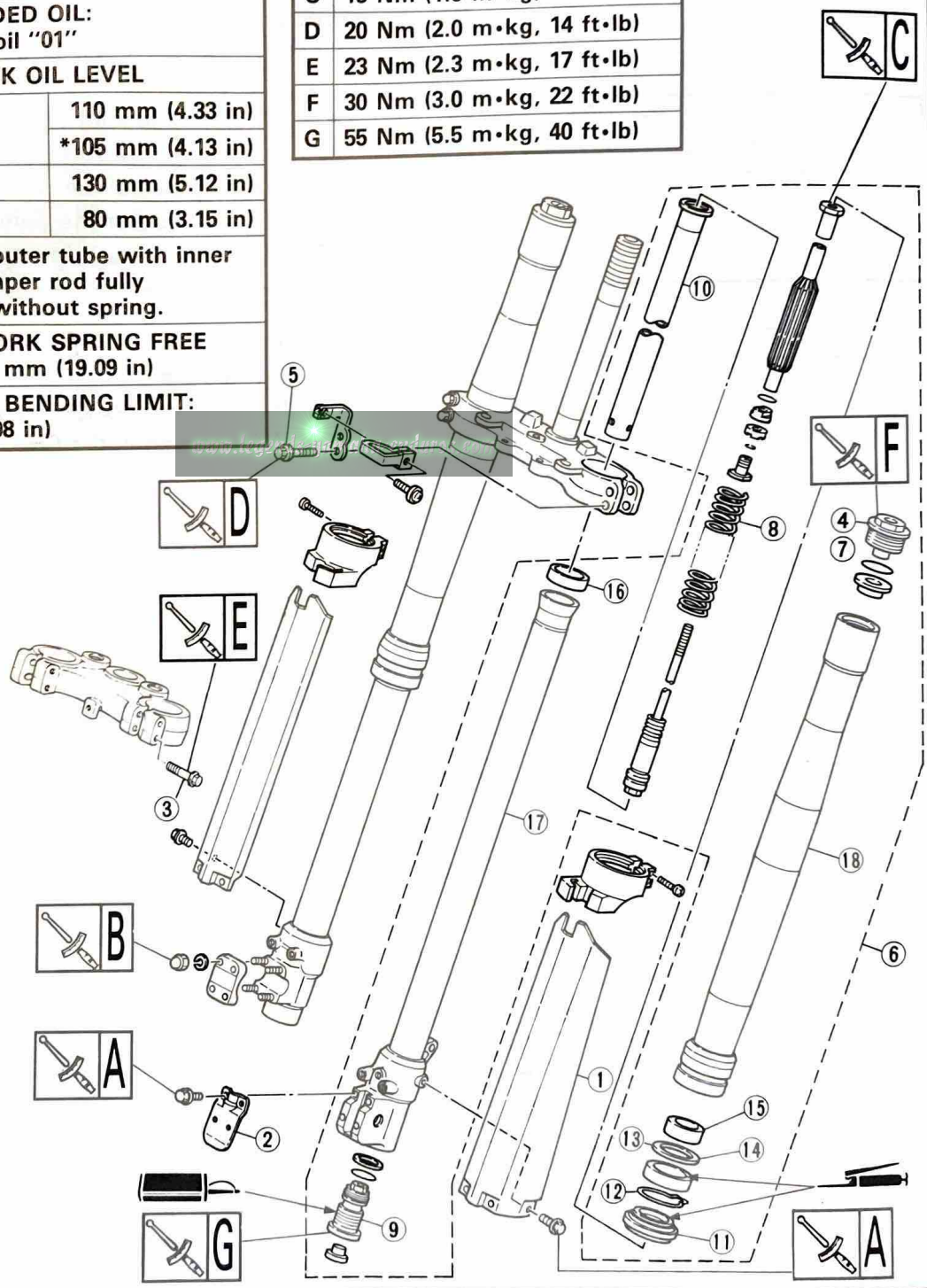
⚠ WARNING

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

FORK OIL (EACH FORK) CAPACITY:	
542 cm³ (19.1 Imp oz, 18.3 US oz)	
*546 cm³ (19.2 Imp oz, 18.5 US oz)	
RECOMMENDED OIL:	
Suspension oil "01"	
FORK OIL LEVEL	
STANDARD	110 mm (4.33 in)
	*105 mm (4.13 in)
MINIMUM	130 mm (5.12 in)
MAXIMUM	80 mm (3.15 in)
From top of outer tube with inner tube and damper rod fully compressed without spring.	
MINIMUM FORK SPRING FREE LENGTH: 485 mm (19.09 in)	
INNER TUBE BENDING LIMIT: 0.2 mm (0.008 in)	

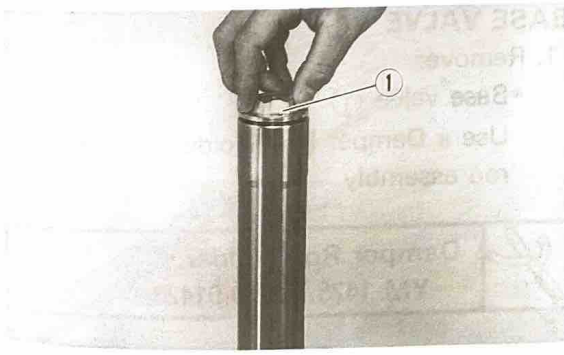
*For Europe

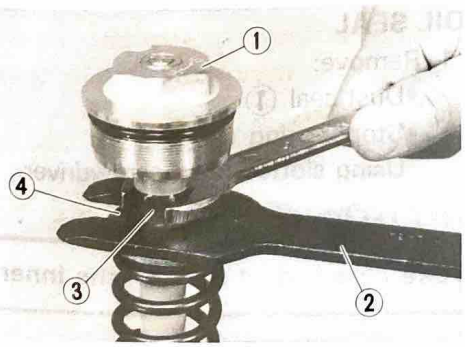
A	7 Nm (0.7 m•kg, 5.1 ft•lb)
B	9 Nm (0.9 m•kg, 6.5 ft•lb)
C	15 Nm (1.5 m•kg, 11 ft•lb)
D	20 Nm (2.0 m•kg, 14 ft•lb)
E	23 Nm (2.3 m•kg, 17 ft•lb)
F	30 Nm (3.0 m•kg, 22 ft•lb)
G	55 Nm (5.5 m•kg, 40 ft•lb)



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

Extent of removal	Order	Part name	Q'ty	Remarks
①	1	Protector	1	
	2	Hose cover	1	
	3	Pinch bolt (handle crown)	2	Only loosening
	4	Cap bolt	1	Only loosening
① ②	5	Pinch bolt (under bracket)	2	Only loosening
	6	Front fork	1	
	7	Cap bolt	1	Refer to "REMOVAL POINTS". Use special tool.
	8	Fork spring	1	Drain the fork oil.
③	9	Base valve	1	Use special tool. Refer to "REMOVAL POINTS".
	10	Damper rod	1	
	11	Dust seal	1	
②	12	Stopper ring	1	Refer to "REMOVAL POINTS".
	13	Oil seal	1	Refer to "REMOVAL POINTS".
	14	Plain washer	1	
	15	Slide metal	1	
	16	Piston metal	1	
	17	Inner tube	1	
	18	Outer tube	1	





REMOVAL POINTS

CAP BOLT

1. Remove:
   - Cap bolt ①

   From the outer tube.

NOTE:

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

2. Remove:
   - Cap bolt ①

NOTE:

- Set the Rod Holder ② between the locknut ③ and spring guide ④.
- Hold the locknut ③ and remove the cap bolt ①.

Rod Holder:
YM-01434/90890-01434

HANDLING NOTE

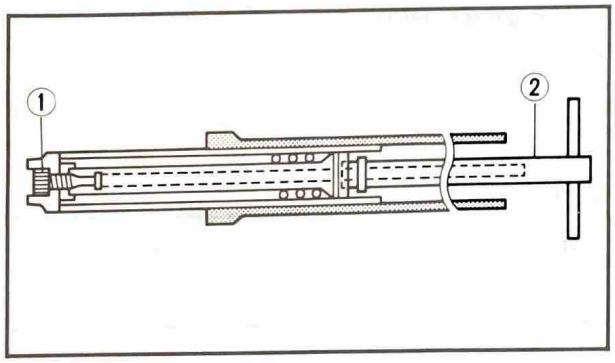
NOTE:

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

CAUTION:

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

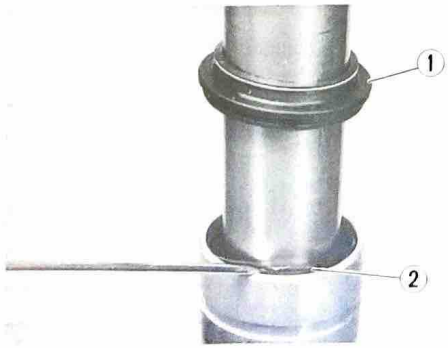
- **The front fork with a built-in piston rod has a very sophisticated internal construction and is particularly sensitive to foreign material.**
  Use enough care not to allow any foreign material to come in when the oil is replaced or when the front fork is disassembled and reassembled.
- **Before removing the cap bolts or front forks, be sure to extract the air from the air chamber completely.**



BASE VALVE

1. Remove:
   - Base valve ①
     Use a Damper Rod Holder ② to lock the rod assembly.

	**Damper Rod Holder: YM-1423/90890-01423**

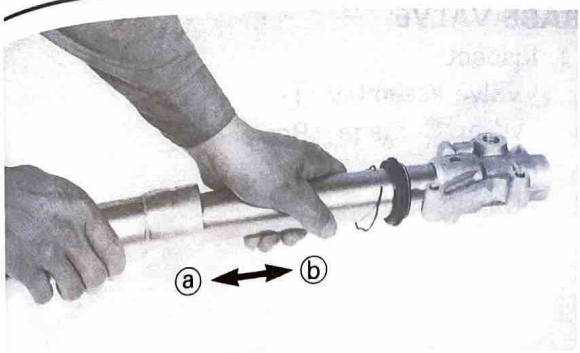


OIL SEAL

1. Remove:
   - Dust seal ①
   - Stopper ring ②
     Using slotted-head screwdriver.

CAUTION:

Take care not to scratch the inner tube.

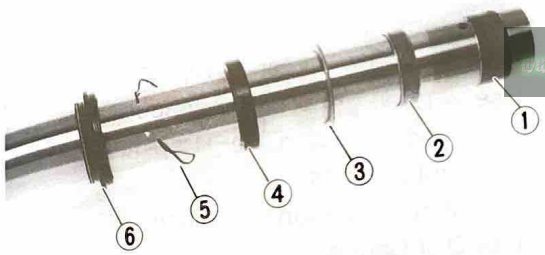


2. Remove:
   - Oil seal

Oil seal removal steps:
- Push in slowly ⓐ the inner tube just before it bottoms out and then pull it back quickly ⓑ.
- Repeat this step until the inner tube can be pulled out from the outer tube.

CAUTION:

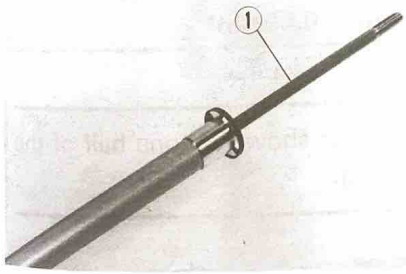
Don't bottom out the inner tube in the above step, or the oil lock piece will be damaged.



3. Remove:
   - Piston metal ①
   - Slide metal ②
   - Oil seal washer ③
   - Oil seal ④
   - Stopper ring ⑤
   - Dust seal ⑥

INSPECTION

ROD ASSEMBLY



1. Inspect:
   - Rod assembly ①

   Bend/Damage → Replace rod assembly.

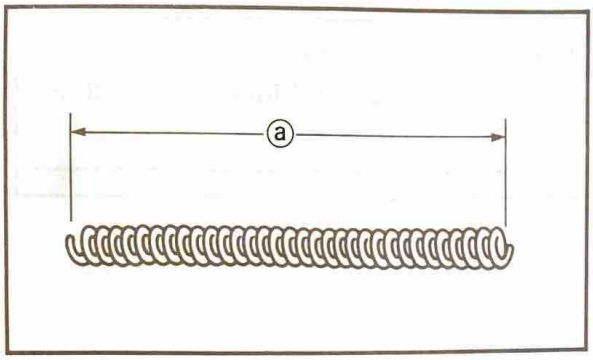
CAUTION:

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

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

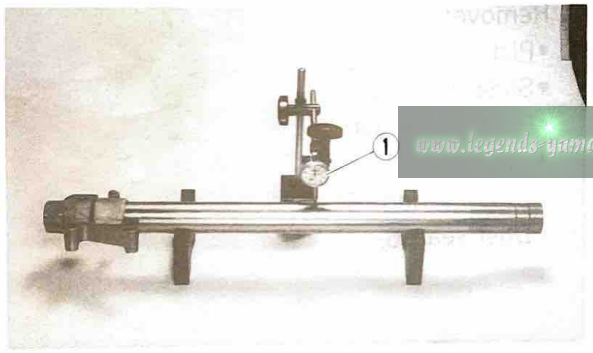
BASE VALVE

1. Inspect:
   - Valve assembly ①
     Wear/Damage → Replace.
   - O-ring ②
     Damage → Replace.



2. Measure:
   - Fork spring free length ⓐ
     Out of specification → Replace.

Fork Spring Free Length:	
Standard	**Limit**
490 mm (19.29 in)	**485 mm (19.09 in)**



INNER TUBE

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

Inner Tube Bending Limit:
0.2 mm (0.008 in)

NOTE:

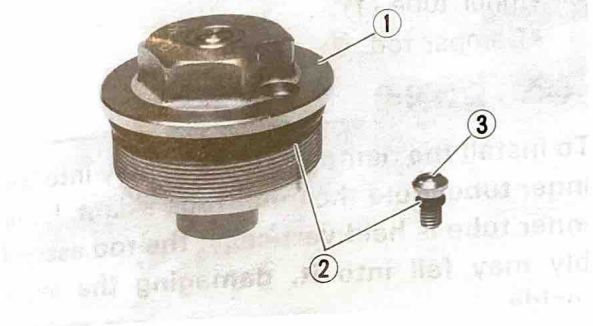
The bending value is shown by one half of the Dial Gauge reading.

⚠ WARNING

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

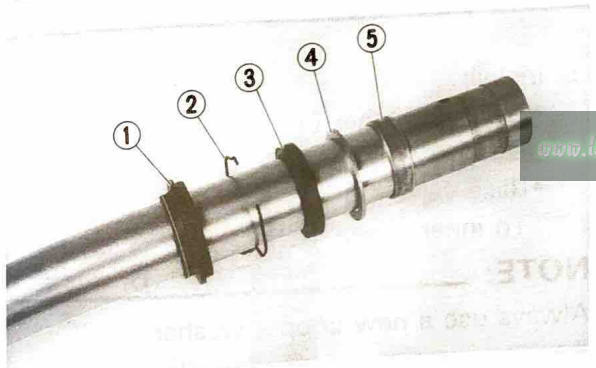
OUTER TUBE

1. Inspect:
   - Outer tube ①
     Score marks/Wear/Damage→Replace.



CAP BOLT

1. Inspect:
   - Cap bolt ①
   - O-ring ②
   - Air bleed screw ③
     Wear/Damage→Replace.



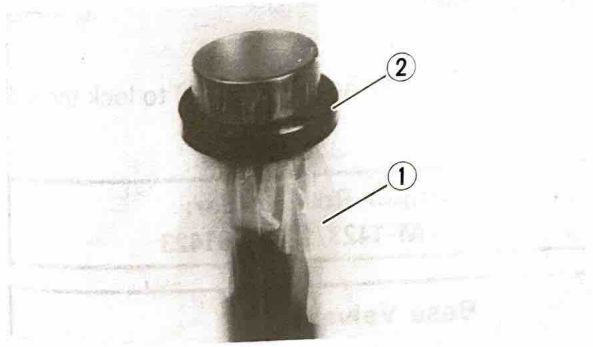
ASSEMBLY AND INSTALLATION

FRONT FORK ASSEMBLY

1. Wash the all parts in a clean solvent.
2. Install:
   - Dust seal ①
   - Stopper ring ②
   - Oil seal ③
   - Plain washer ④
   - Slide metal ⑤

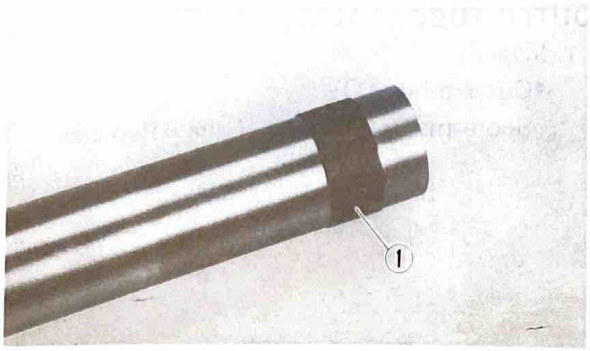
NOTE:

- Apply the fork oil on the inner tube.
- When installing the oil seal ②, use vinyl seat ① with fork oil applied to protect the oil seal lip.
- Install the oil seal with its manufacture's marks or number facing the axle holder side.



CAUTION:

Always use a new oil seal and slide metal.



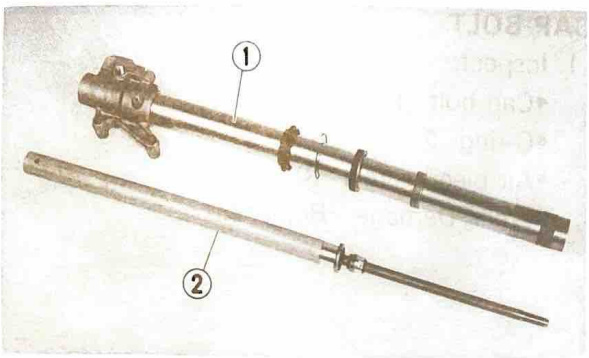
3. Install:
   - Piston metal ①

NOTE:

Install the piston metal onto the slot on inner tube.

CAUTION:

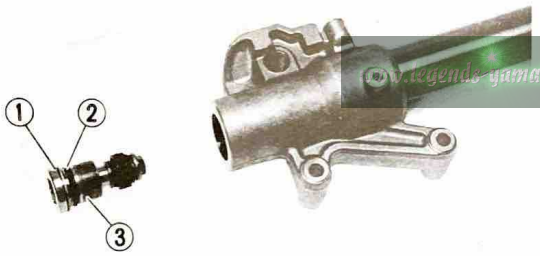
Always use a new piston metal.



4. Install:
   - Inner tube ①
   - Damper rod ②

CAUTION:

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

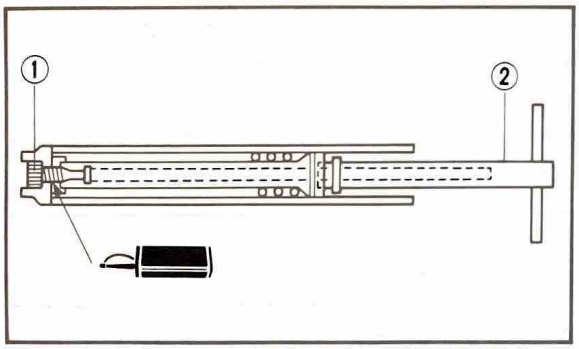


5. Install:
   - Copper washer ①
   - O-ring ②
   - Base valve ③

   To inner tube.

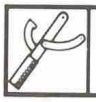
NOTE:

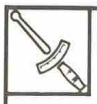
Always use a new copper washer.



6. Tighten:
   - Base valve ①

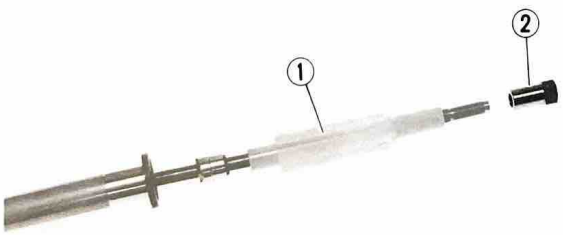
   Use Damper Rod Holder ② to lock the rod assembly.

	**Damper Rod Holder: YM-1423/90890-01423**

	**Base Valve: 55 Nm (5.5 m•kg, 40 ft•lb) LOCTITE®**

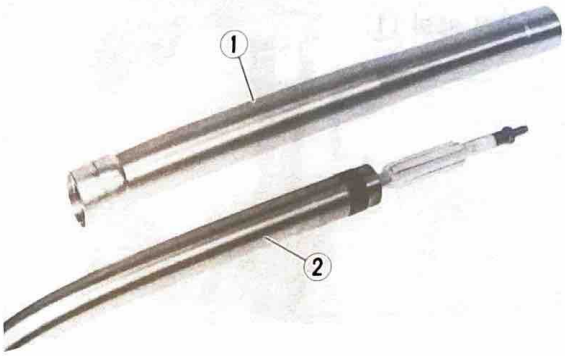
NOTE:

Apply the LOCTITE® onto the base valve thread.

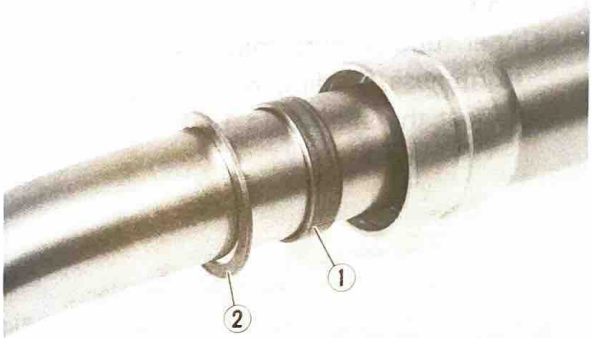


7. Install:
   - Spring guide ①
   - Locknut ②

   To piston rod.



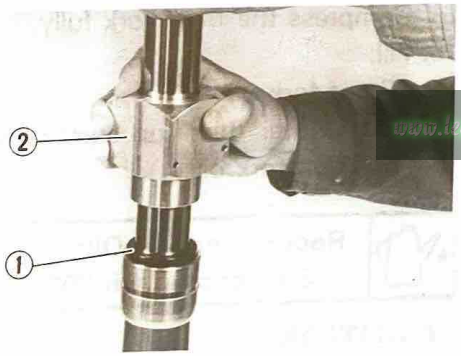
8. Install:
   - Outer tube ①
   - Inner tube ②



9. Install:
   - Slide metal ①
   - Plain washer ②

   To outer tube slot.

A



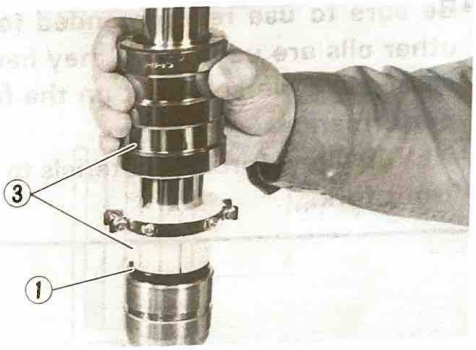
10. Install:
    - Oil seal ①

NOTE:

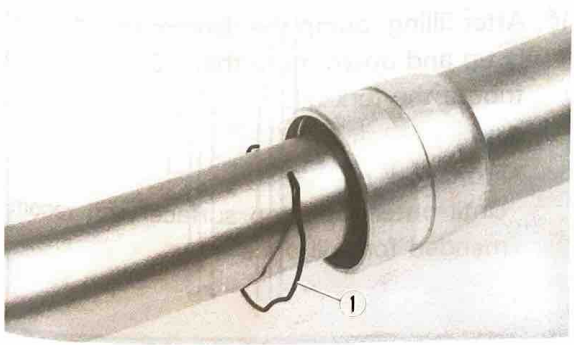
Press the oil seal into the outer tube with Fork Seal Driver ②, ③.

Fork Seal Driver:	
YM-38853	②
90890-01442	③

B



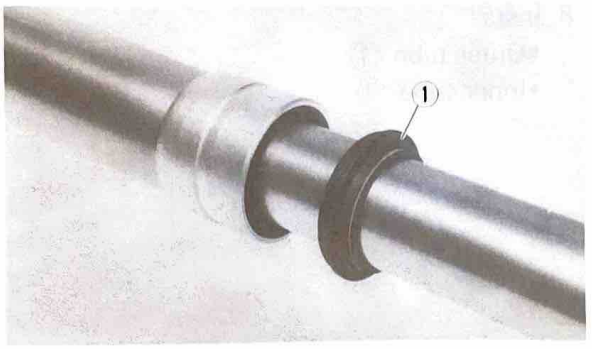
A For USA and CDN
B Except for USA and CDN



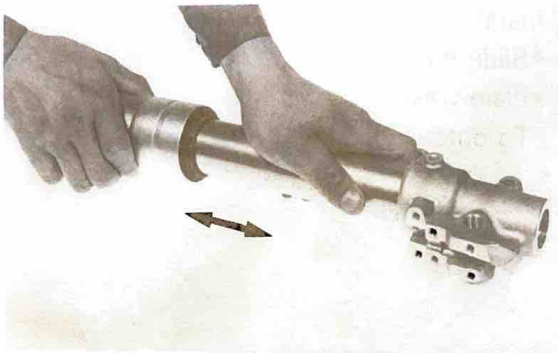
11. Install:
    - Stopper ring ①

NOTE:

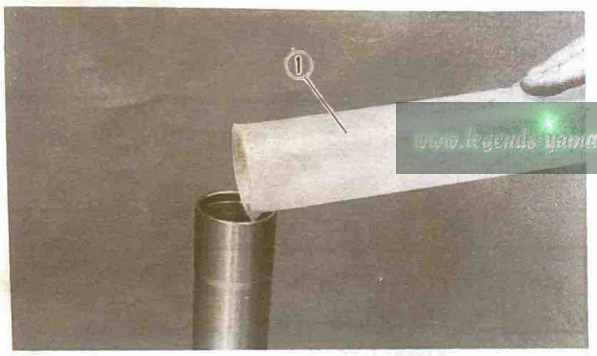
Fit the stopper ring correctly in the groove in the outer tube.



12. Install:
    - Dust seal ①



13. Check:
    - Inner tube smooth movement
      Tighteness/Binding/Rough spots→
      Repeat the steps 2 to 12.

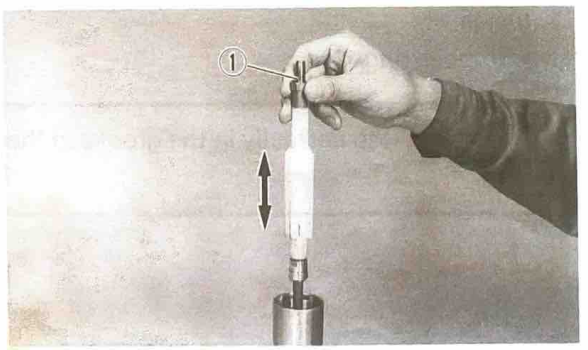


14. Compress the front fork fully.
15. Fill:
    - Front fork oil
      Until outer tube top surface with recommended fork oil ①.

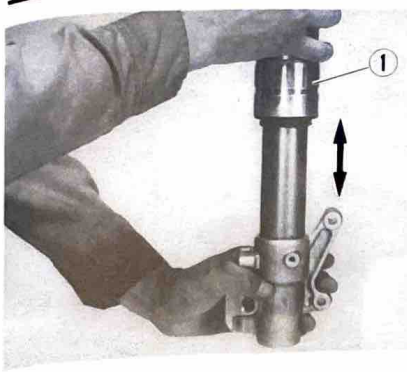
Recommended Oil:
Suspension Oil "01"

CAUTION:

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



16. After filling, pump the damper rod ① slowly up and down more than 10 times to distribute the fork oil.
17. Fill:
    - Front fork oil
      Until outer tube top surface with recommended fork oil once more.



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

NOTE:

Be careful not to excessive full stroke. A stroke of 200 mm (7.9 in) or more will cause air to enter. In this case, repeat the steps 15 to 18.

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

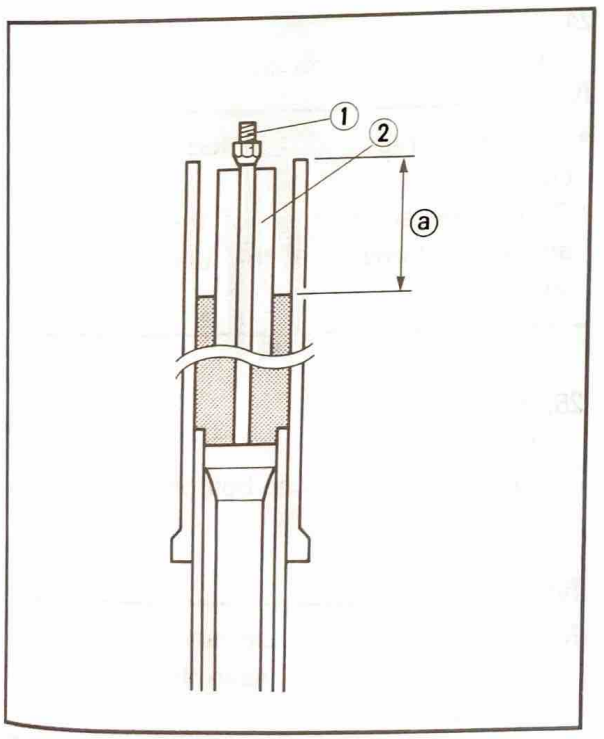
NOTE:

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

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

Fork Oil Level:	
Standard	110 mm (4.33 in)
	*105 mm (4.13 in)
Minimum	130 mm (5.12 in)
Maximum	80 mm (3.15 in)
From top of outer tube with inner tube and damper rod ① fully compressed without spring.	

*For Europe

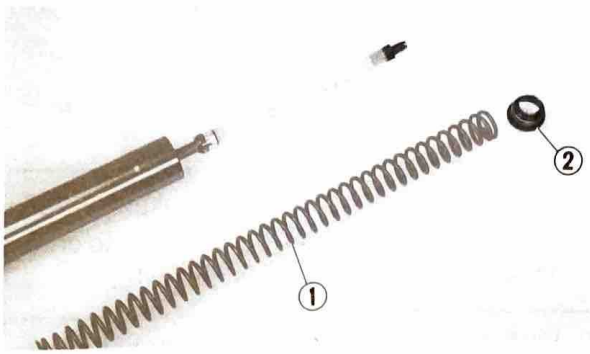


NOTE:

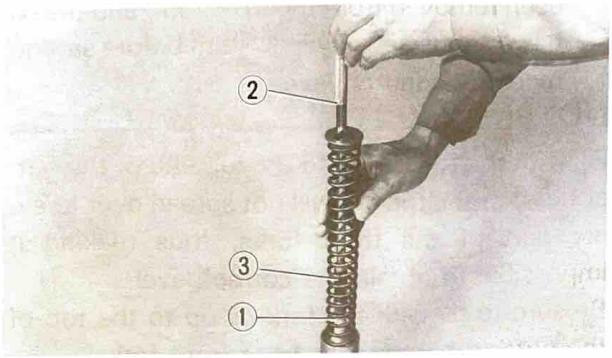
Be sure to install the spring guide ② when checking the oil level.

⚠ WARNING

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

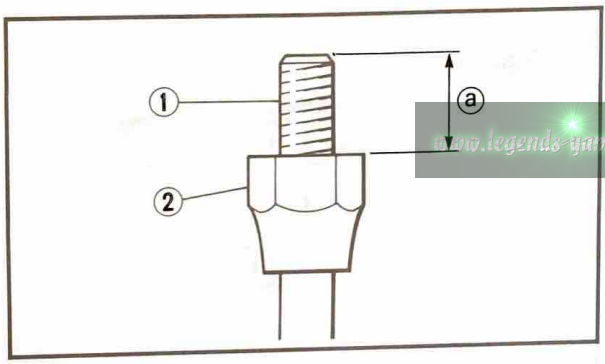


21. Install:
    - Fork spring ①
    - Spring guide ②



22. Pull up the damper rod ① with Rod Puller ② and Rod Puller Attachment ③.

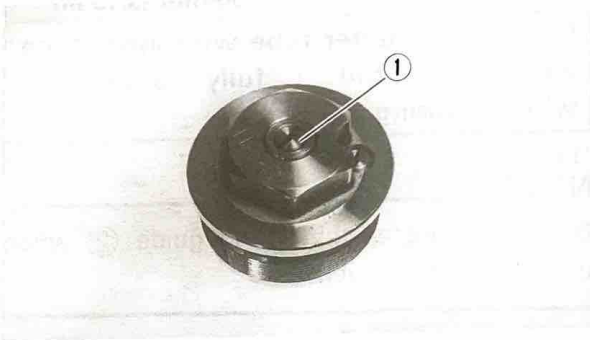
Rod Puller:
YM-01437/90890-01437
Rod Puller Attachment:
90890-01436



23. Measure:
    - Distance ⓐ

    Out of specification → Turn into the locknut.

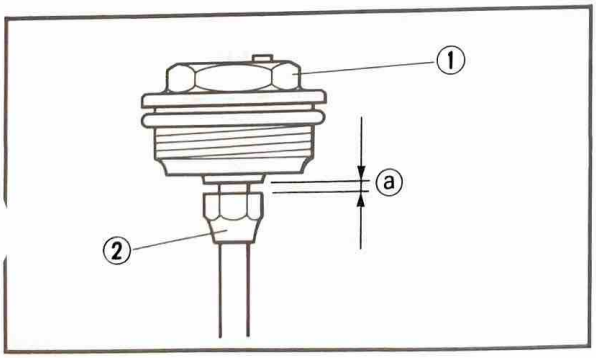
Distance ⓐ:
18 mm (0.71 in) or more
Between damper rod top ①
and locknut top ②.



24. Loosen:
    - Rebound damping adjuster ①

NOTE:

- Loosen the rebound damping adjuster finger tight.
- Record the set position of the adjuster (the amount of turning out the fully turned in position).

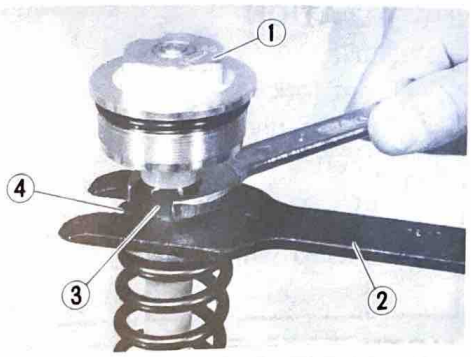


25. Install:
    - Cap bolt ①

    Fully tighten the cap bolt onto the damper rod by hand.

NOTE:

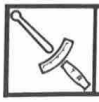
Make sure that there is a clearance ⓐ of Zero ~ 1 mm (Zero ~ 0.04 in) between the cap bolt and locknut ②.

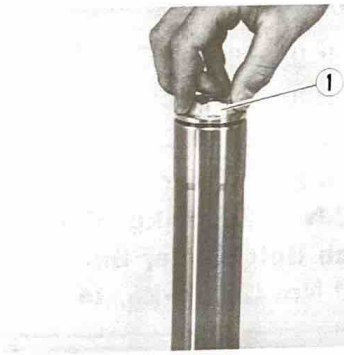


26. Tighten:
    - Cap bolt ①

NOTE:

- Set the Rod Holder ② between the locknut ③ and spring guide ④.
- Hold the locknut ③ and tighten the cap bolt ① with specified torque.

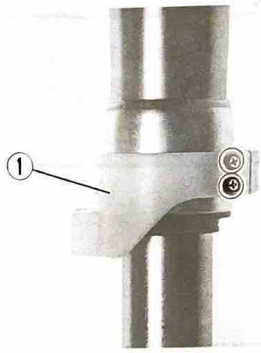
	**Rod Holder:** **YM-01434/90890-01434**
	**Cap Bolt:** **15 Nm (1.5 m•kg, 11 ft•lb)**



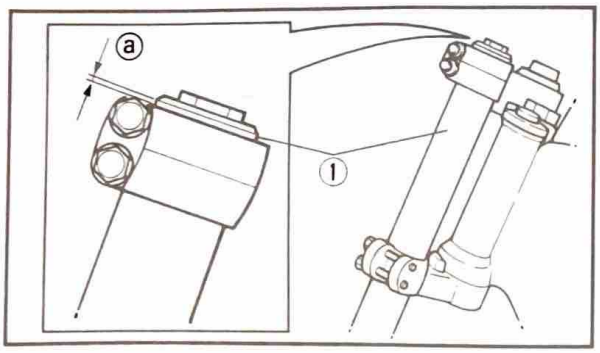
27. Install:
    - Cap bolt ①

    To outer tube.

    Temporarily tighten the cap bolt.



28. Install:
    - Protector guide ①



INSTALLATION

1. Install:
   - Front fork ①

   Temporarily tighten the pinch bolts (lower).
2. Tighten:
   - Cap bolt

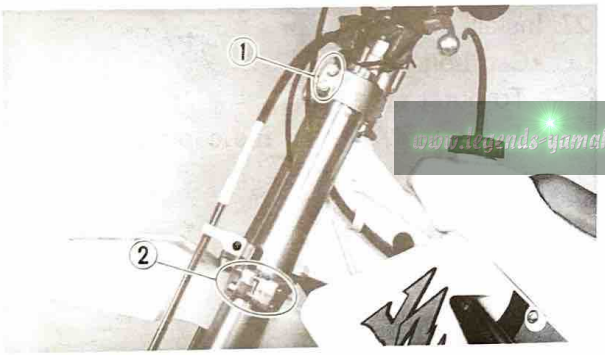
	Cap Bolt: **30 Nm (3.0 m•kg, 22 ft•lb)**

NOTE:

Do not tighten the pinch bolt (upper) yet.

3. Adjust:
   - Front fork top end ⓐ

	Front Fork Top End (Standard) ⓐ: **Zero mm (Zero in)**

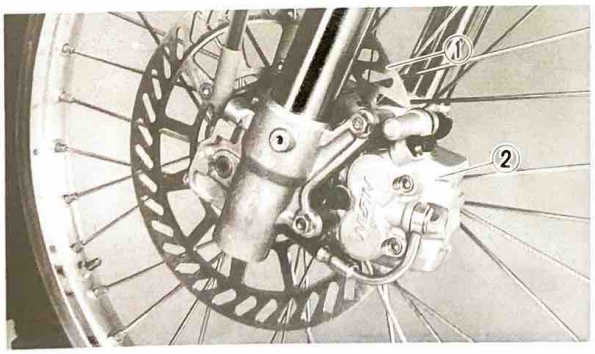


4. Tighten:
   - Pinch bolt (handle crown) ①
   - Pinch bolt (under bracket) ②

	Pinch Bolt (Handle Crown): **23 Nm (2.3 m•kg, 17 ft•lb)** **Pinch Bolt (Under Bracket)** **20 Nm (2.0 m•kg, 14 ft•lb)**

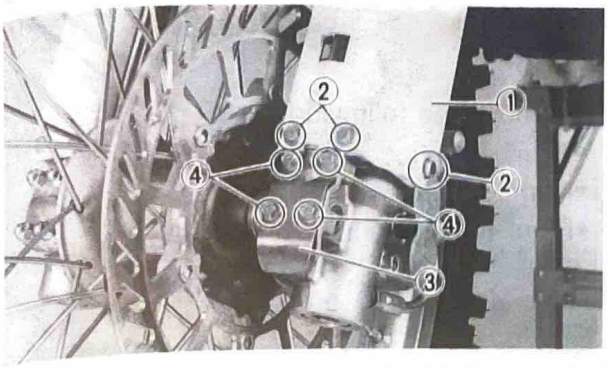
CAUTION:

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



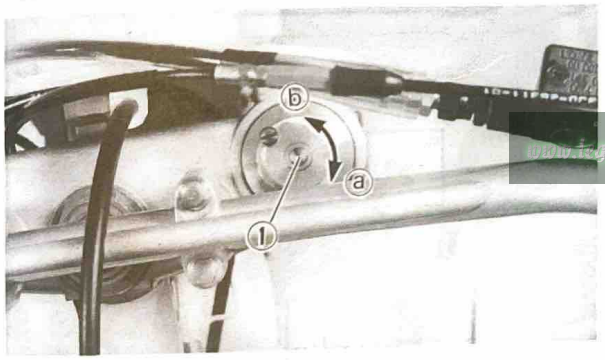
5. Install:
   - Front wheel ①
   - Caliper ②

   Refer to the "FRONT WHEEL" and "FRONT BRAKE" section in the CHAPTER 5.



6. Install:
   - Protector ①
   - Bolt (protector) ②
   - Hose cover ③
   - Bolt (hose cover) ④

Bolts (Protector):
7 Nm (0.7 m•kg, 5.1 ft•lb)
Bolts (Hose Cover):
7 Nm (0.7 m•kg, 5.1 ft•lb)



7. Adjust:
   - Rebound damping adjuster ①

NOTE:

Turn in the damping adjuster finger-tight and then turn out to the originally set position.

STEERING

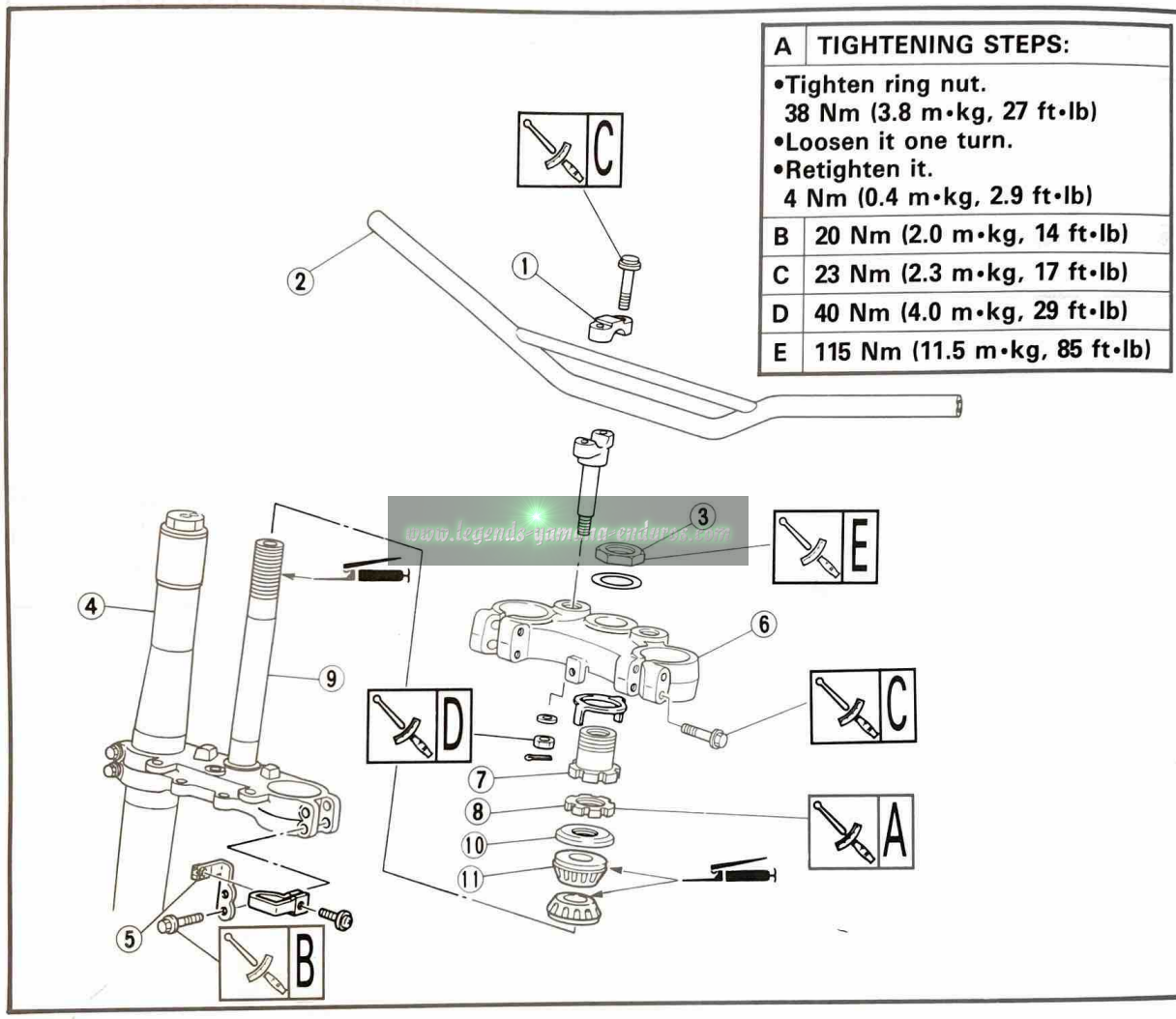
PREPARATION FOR REMOVAL

* Hold the machine by placing the suitable stand under the engine.

⚠ WARNING

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

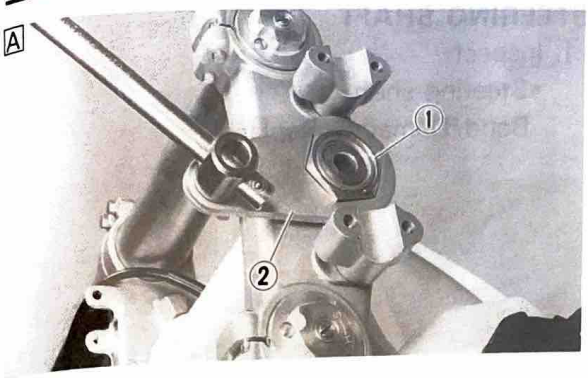
* Remove the following parts:
  - Front wheel
  - Number plate
  - Front fender



Extent of removal: ① Handlebar removal ② Under bracket removal

Extent of removal	Order	Part name	Q'ty	Remarks
①	1	Handlebar holder (upper)	2	
	2	Handlebar	1	
	3	Steering shaft nut	1	Use special tool. Refer to "REMOVAL POINTS".
	4	Front fork	2	Refer to "FRONT FORK" section.
	5	Guide	1	
②	6	Handle crown	1	Refer to "REMOVAL POINTS".
	7	Ring nut (upper)	1	
	8	Ring nut (lower)	1	
	9	Steering shaft	1	
	10	Ball race cover	1	
	11	Bearing	1	

A



REMOVAL POINTS

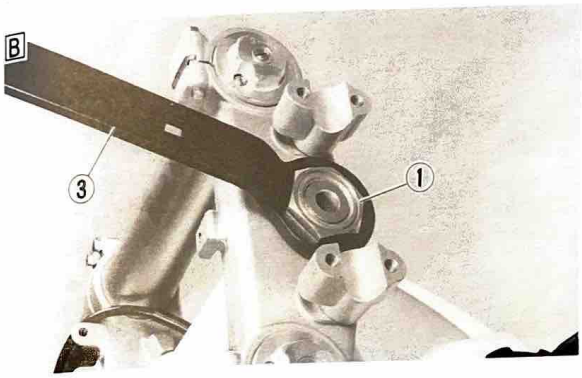
STEERING SHAFT NUT

1. Remove:
   - Steering shaft nut ①
     Use the Locknut Wrench ②, ③

	Locknut Wrench: **YM-38519** ..... ② **90890-01348** ..... ③

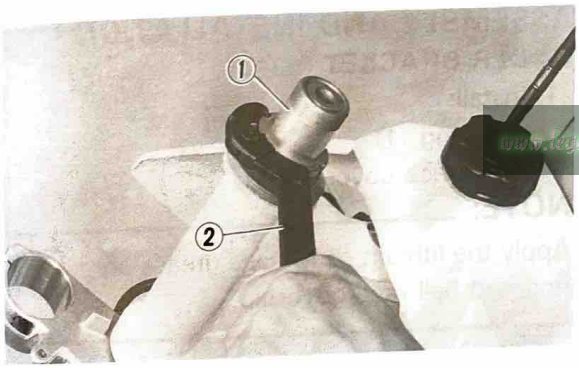
A For USA and CDN
B Except for USA and CDN

B



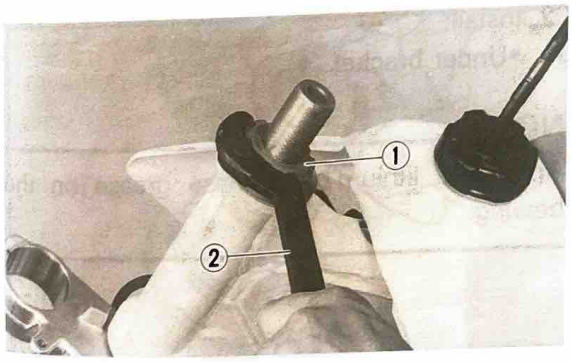
RING NUT

1. Remove:
   - Ring nut (upper) ①
     Use the Ring Nut Wrench ②.



	Ring Nut Wrench: **YU-01268/90890-01268**

2. Remove:
   - Ring nut (lower) ①
     Use the Ring Nut Wrench ②.



	Ring Nut Wrench: **YU-01268/90890-01268**

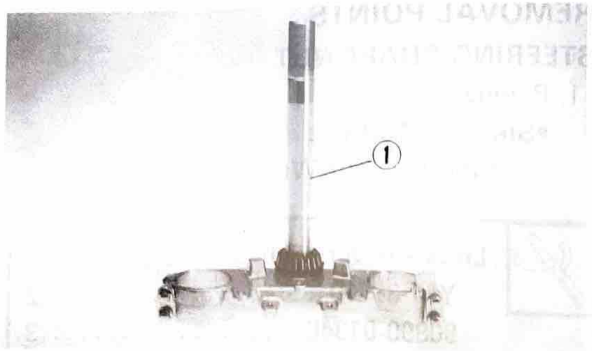
⚠ WARNING

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

INSPECTION

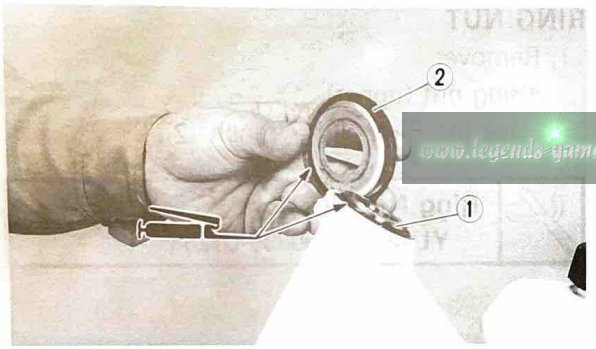
BEARING

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



STEERING SHAFT

1. Inspect:
   - Steering shaft ①
     Bend/Damage → Replace.



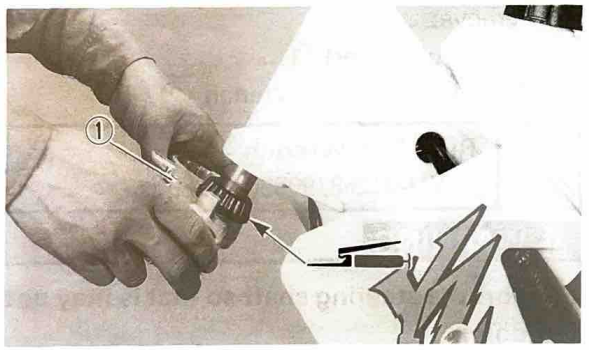
ASSEMBLY AND INSTALLATION

UNDER BRACKET

1. Install:
   - Bearing ①
   - Ball race cover ②

NOTE:

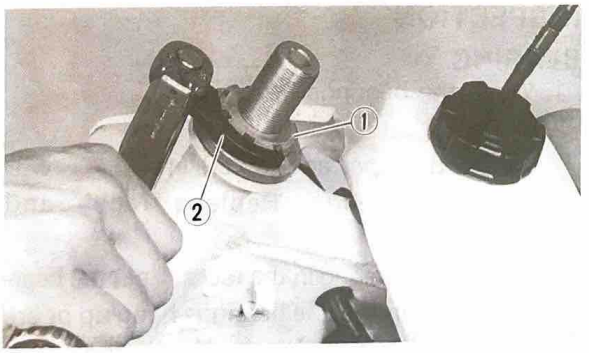
Apply the lithium soap base grease on the bearing and ball race cover lip.



2. Install:
   - Under bracket ①

NOTE:

Apply the lithium soap base grease on the bearing.



3. Install:
   - Ring nut (lower) ①
     Use the Ring Nut Wrench ②.

	Ring Nut Wrench: **YM-38520/90890-01443**

NOTE:

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

Ring nut tightening steps:

NOTE:

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

- Tighten the ring nut using the Ring Nut Wrench.

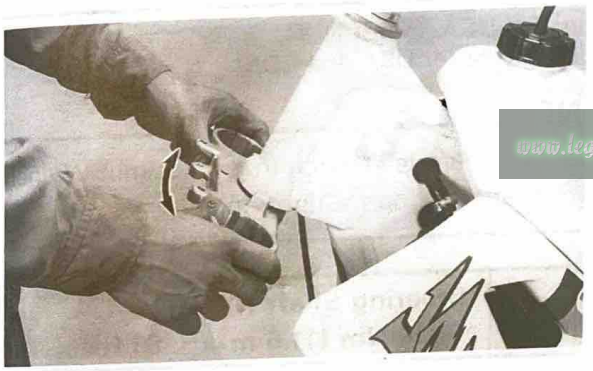
Ring Nut (Lower) (Initial Tightening):
38 Nm (3.8 m•kg, 27 ft•lb)

- Loosen the ring nut ① completely and retighten it to specification.

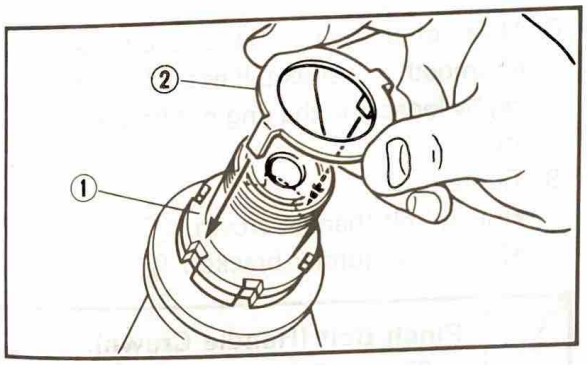
⚠ WARNING

Do not over-tightening.

Ring Nut (Lower) (Final Tightening):
4 Nm (0.4 m•kg, 2.9 ft•lb)



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



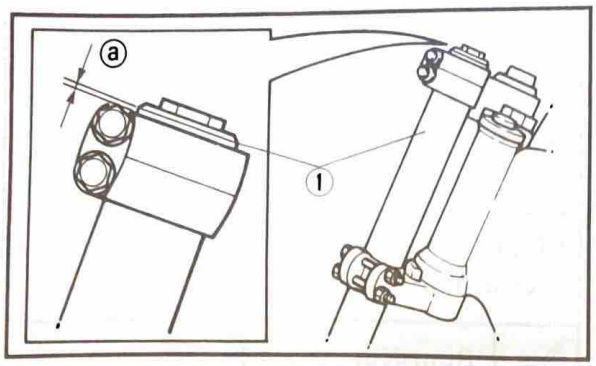
5. Install:
   - Ring nut (upper) ①
   - Lock washer ②

Installation steps:

- Install the ring nut (upper) ①.
- Finger tighten the ring nut (upper), then align the slots of both ring nuts. If not aligned, hold the ring nut (lower) and tighten the other until they are aligned.
- Install the lock washer ②.

NOTE:

Make sure the lock washer tab is placed in the slots.



6. Install:
   - Handlle crown
   - Front fork (left and right) ①

Front Fork Top End
(Standard) ⓐ:
Zero mm (Zero in)

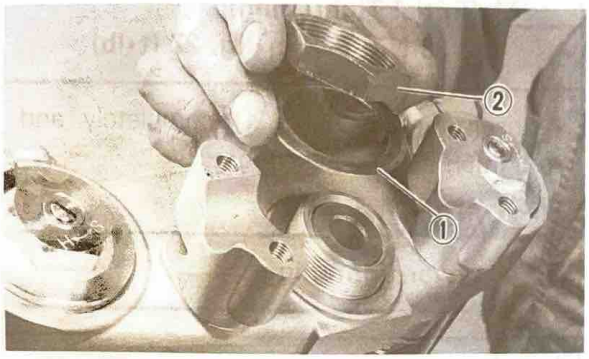
NOTE:

Temporarily install at the lower pinch bolt end to keep at position.

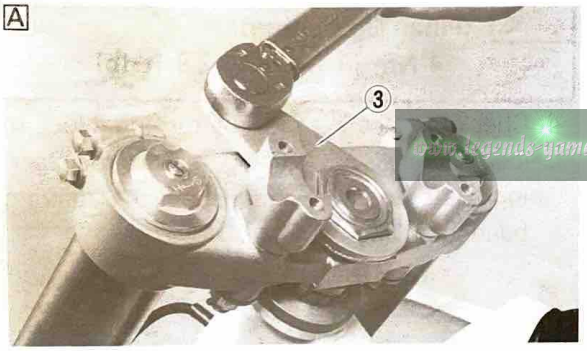
7. Install:
   - Plain washer ①
   - Steering shaft nut ②

   Use the Locknut Wrench ③, ④.

Locknut Wrench:
YM-38519 ..... ③
90890-01348 ..... ④



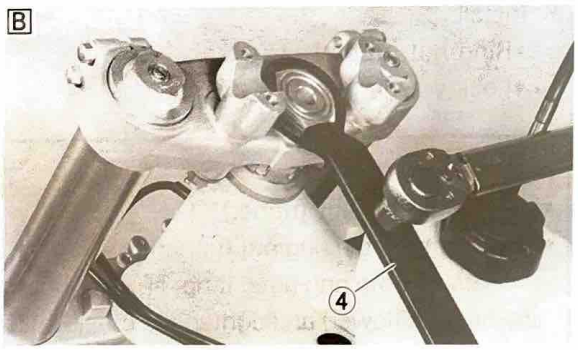
A For USA and CDN
B Except for USA and CDN



NOTE:

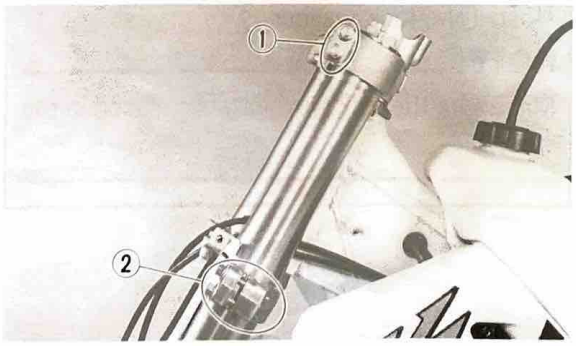
Set the Torque Wrench to the Locknut Wrench so that they form a right angle.

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



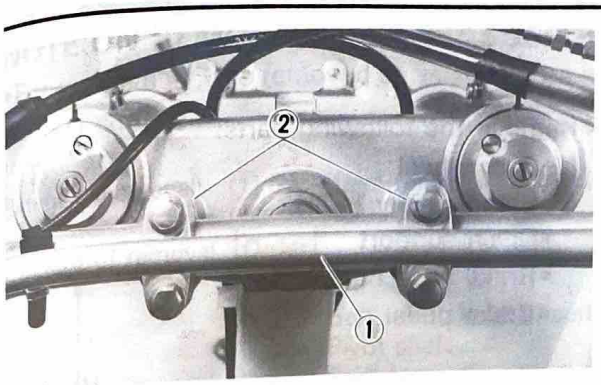
8. After tightening the nut, check the steering for smooth movement. If not, adjust the steering by loosening the ring nut (lower) little by little.
9. Tighten:
   - Pinch bolt (handle crown) ①
   - Pinch bolt (under bracket) ②

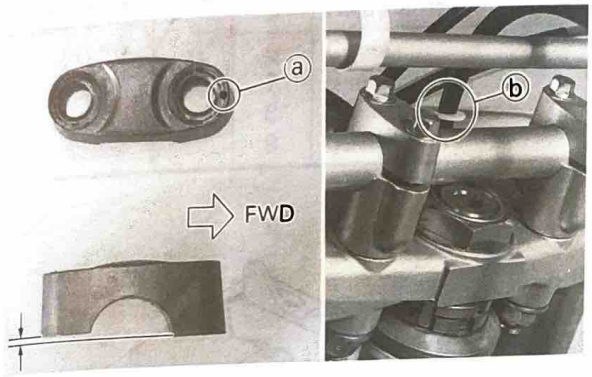
Pinch Bolt (Handle Crown):
23 Nm (2.3 m•kg, 17 ft•lb)
Pinch Bolt (Under Bracket):
20 Nm (2.0 m•kg, 14 ft•lb)

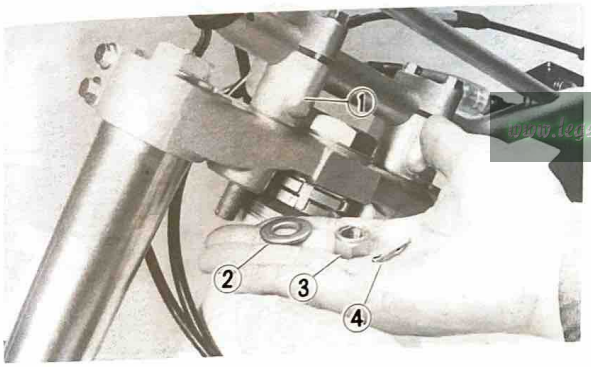


CAUTION:

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







10. Install:
    - Handlebar ①
    - Handlebar holder ②

	Bolt (Handlebar Holder): 23 Nm (2.3 m•kg, 17 ft•lb)

NOTE:

- The upper handlebar holder should be installed with the punched mark ⓐ forward.
- Insert the end of the fuel breather hose into the hole of the number plate ⓑ.

CAUTION:

First tighten the bolts on the front side of the handlebar holder, and then tighten the bolts on the rear side.

HANDLEBAR LOWER HOLDER

1. Install:
    - Handlebar lower holder ①
    - Plain washer ②
    - Nut ③
    - Cotter pin ④

	Nut (Handlebar Lower Holder): 40 Nm (4.0 m•kg, 29 ft•lb)

⚠ WARNING

Always use a new cotter pin.

SWINGARM

PREPARATION FOR REMOVAL

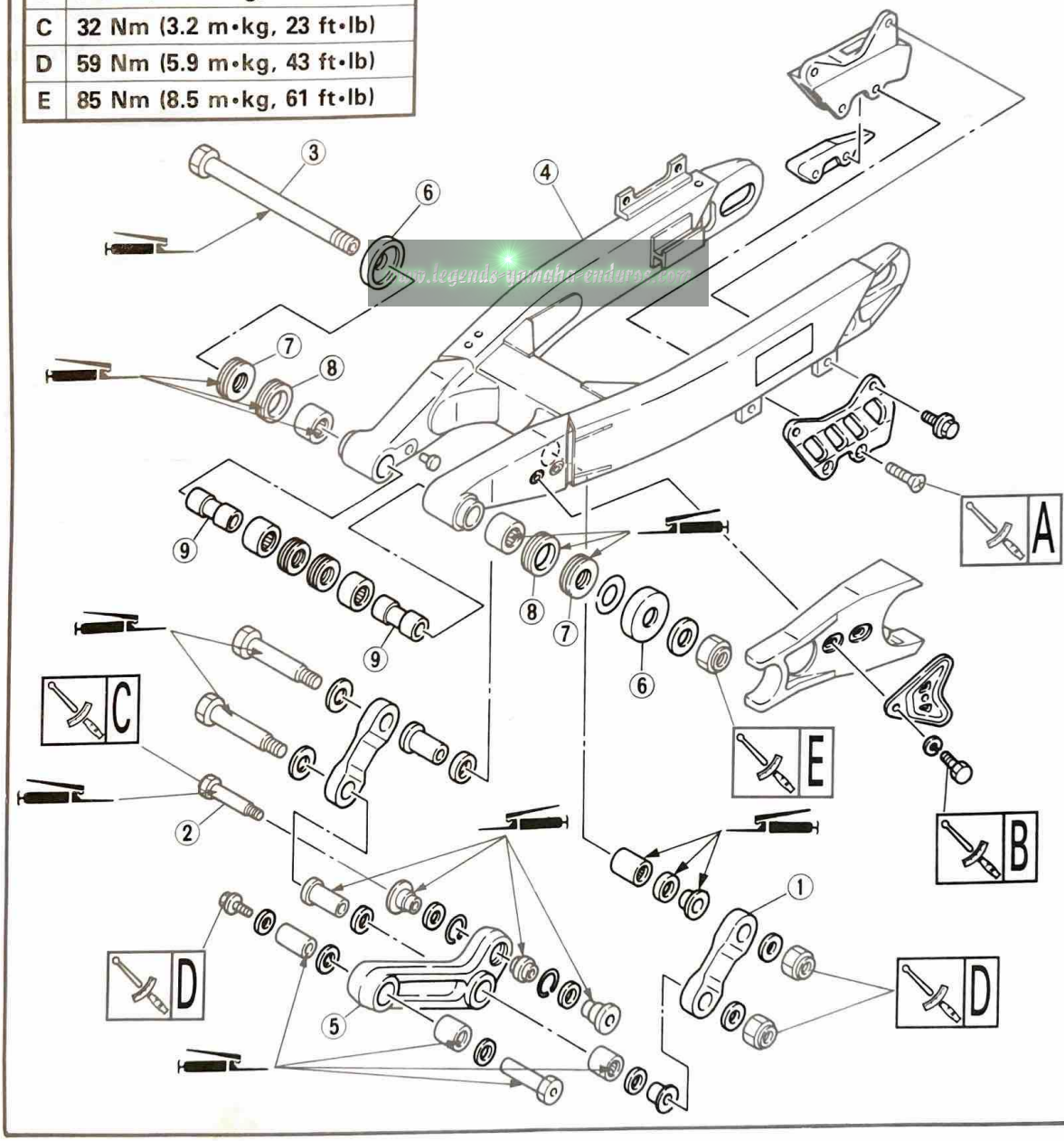
* Hold the machine by placing the suitable stand under the engine.

⚠ WARNING

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

* Remove the following parts:
  - Rear wheel
  - Brake caliper (rear)
  - Chain support
  - Brake hose holder
  - Brake pedal

SWINGARM FREE PLAY LIMIT END: 1.0 mm (0.04 in) SIDE CLEARANCE: 0.4~0.7 mm (0.016~0.028 in)	
A	3 Nm (0.3 m•kg, 2.2 ft•lb)
B	5 Nm (0.5 m•kg, 3.6 ft•lb)
C	32 Nm (3.2 m•kg, 23 ft•lb)
D	59 Nm (5.9 m•kg, 43 ft•lb)
E	85 Nm (8.5 m•kg, 61 ft•lb)

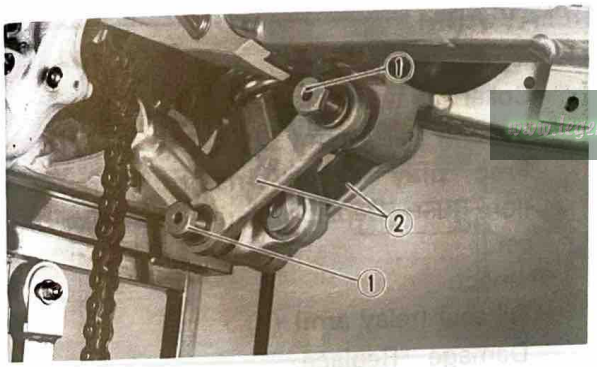


NOTE ON REMOVAL AND REASSEMBLY

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

Extent of removal: ① Swingarm removal ② Swingarm disassembly

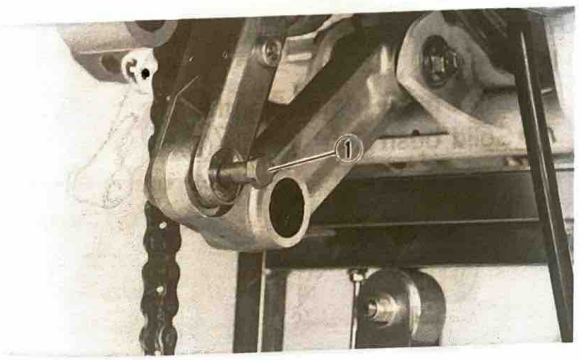
Extent of removal	Order	Part name	Q'ty	Remarks
①	1	Connecting rod	2	Refer to "REMOVAL POINTS".
	2	Bolt (rear shock absorber)	1	
	3	Pivot shaft	1	
	4	Swingarm	1	
	5	Relay arm	1	
②	6	Cover	2	
	7	Bearing	2	
	8	Oil seal	2	
	9	Solid bush	2	



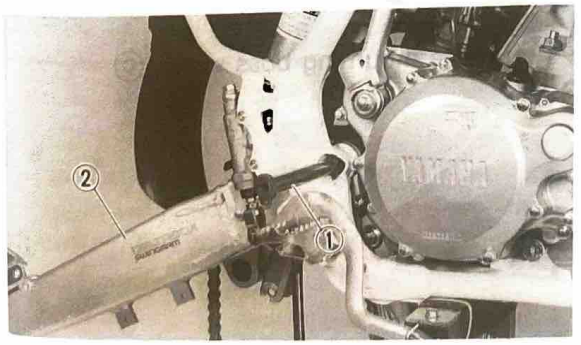
REMOVAL POINTS

SWINGARM

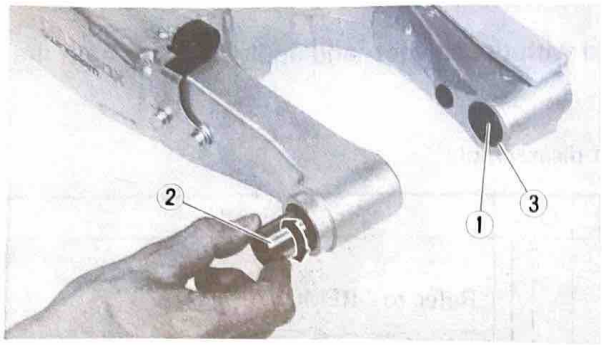
1. Remove:
   •Union bolt (connecting rod) ①
   •Connecting rod ②



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



3. Remove:
   •Pivot shaft ①
   •Swingarm ②



INSPECTION

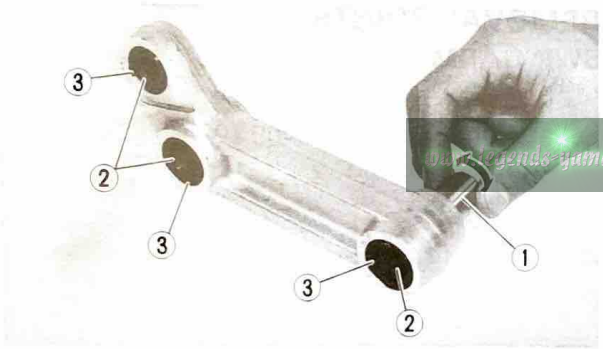
Wash the bearings, bushes, collars, and thrust covers in a solvent.

SWINGARM

1. Inspect:
   - Bearing (Swingarm) ①
   - Solid bush (Swingarm) ②

   Free play exists/Unsmooth revolution/Rust→Replace bearing and solid bush as a set.
2. Inspect:
   - Oil seal ③

   Damage→Replace.

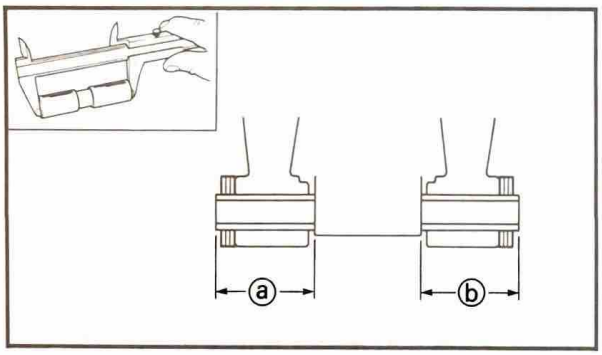


RELAY ARM

1. Inspect:
   - Collar (relay arm) ①
   - Bearing (relay arm) ②

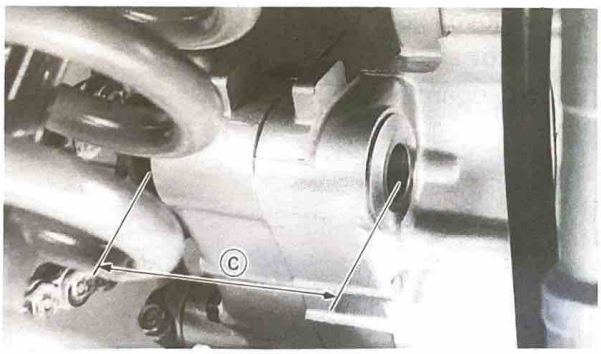
   Free play exists/Unsmooth revolution/Rust→Replace bearing and collar as a set.
2. Inspect:
   - Oil seal (relay arm) ③

   Damage→Replace.

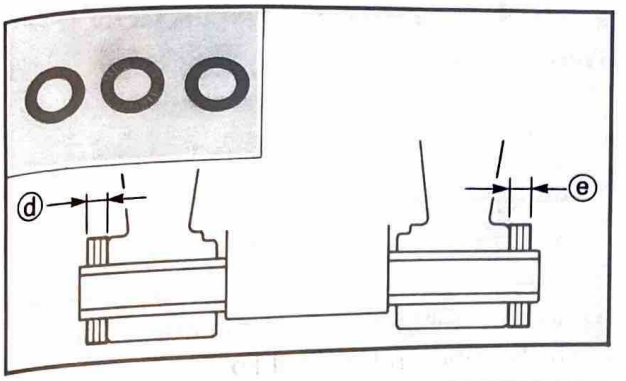


SWINGARM SIDE CLEARANCE

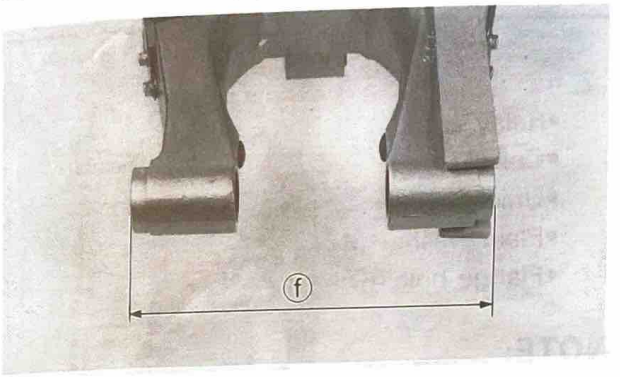
1. Measure:
   - Solid bush (right) length ⓐ
   - Solid bush (left) length ⓑ



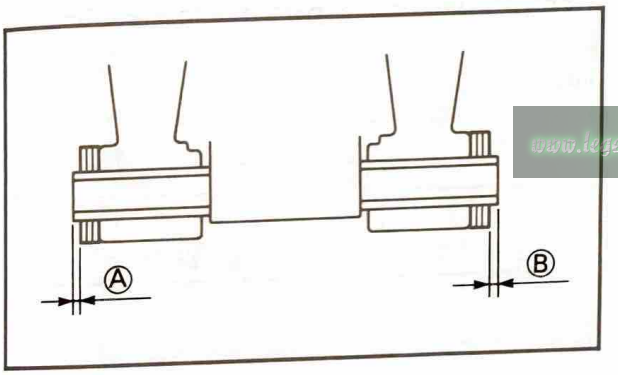
2. Measure:
   - Engine mounting boss width ⓒ



3. Measure:
   - Bearing (right) thickness ⓓ
   - Bearing (left) thickness ⓔ



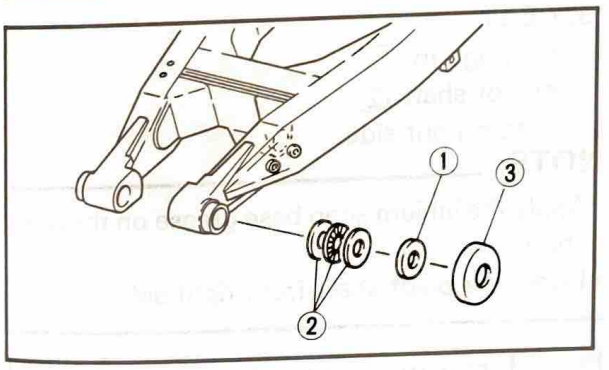
4. Measure:
   - Swingarm head pipe length ⓕ



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

"Ⓐ+Ⓑ" = (ⓐ + ⓑ + ⓒ) − (ⓓ + ⓔ + ⓕ)

Side Clearance "A + B":
0.4 ~ 0.7 mm (0.016 ~ 0.028 in)

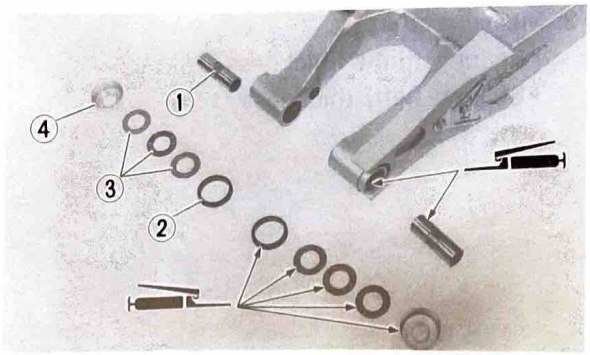


If the thrust clearance is out of specification, adjust it to specification by installing the adjust shim ① at position, Ⓐ and Ⓑ.

NOTE:

- The adjust shim is available only in the 0.3 mm (0.012 in)-thick type.
- When only one shim is required, install it on the left side, and when two shims are necessary, install them on both right and left sides.

- Adjust shim ①
- Bearing ②
- Cover ③



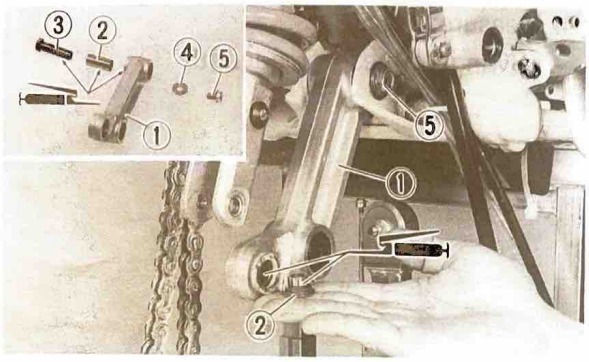
ASSEMBLY AND INSTALLATION

SWINGARM

1. Install:
   - Solid bush ①
   - Oil seal ②
   - Bearing ③
   - Cover ④

NOTE:

Apply the lithium soap base grease on the solid bush, bearing and oil seal lip.

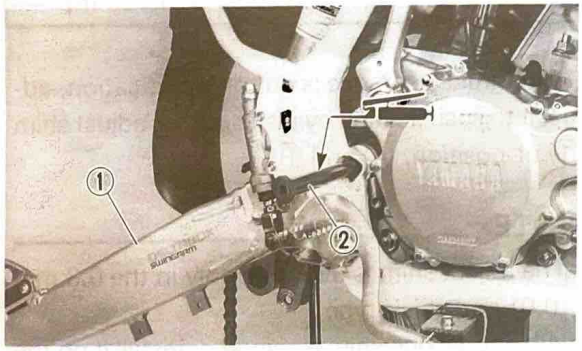


2. Install:
   - Relay arm ①
   - Collar ②
   - Union nut ③
   - Plain washer ④
   - Flange bolt ⑤

NOTE:

- Apply the lithium soap base grease on the sliding surface of the union nut, collar and oil seal lip.
- Insert the union nut from right side.

	Flange Bolt: **59 Nm (5.9 m•kg, 43 ft•lb)**



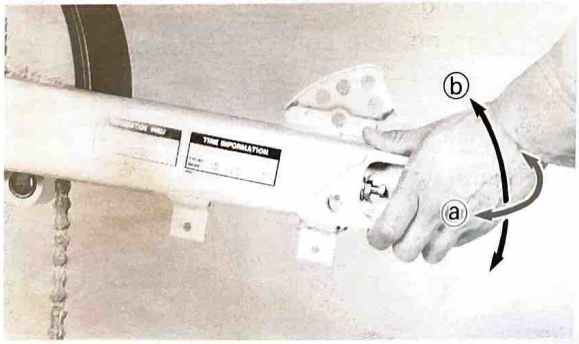
3. Install:
   - Swingarm ①
   - Pivot shaft ②

   From right side.

NOTE:

- Apply the lithium soap base grease on the pivot shaft.
- Insert the pivot shaft from right side.

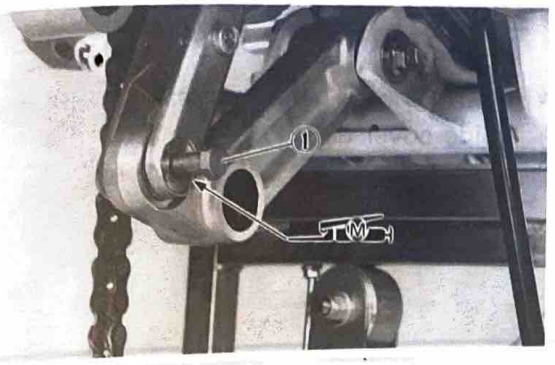
	Nut (Pivot Shaft): **85 Nm (8.5 m•kg, 61 ft•lb)**



4. Check:
   - Swingarm side play ⓐ

     Free play exists→Check side clearance.
   - Swingarm up and down movement ⓑ

     Unsmooth movement/Binding/Rough spots→Grease or replace bearings, solid bushes and collars.

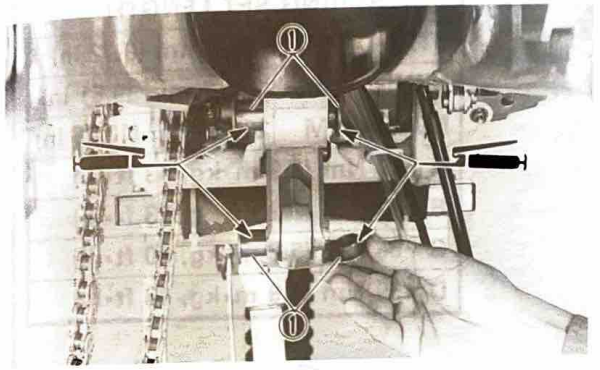


5. Install:
   • Bolt (rear shock absorber—relay arm) ①

NOTE:

- Apply the molybdenum disulfide grease on the bolt.
- Insert the bolt from right side.

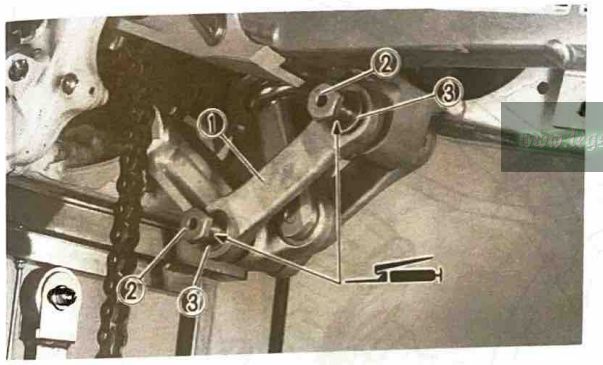
	Bolt (Rear Shock Absorber—Relay Arm): **32 Nm (3.2 m•kg, 23 ft•lb)**



6. Install:
   • Collar ①

NOTE:

Apply the lithium soap base grease on the collars and oil seal lip.



7. Install:
   • Connecting rod ①
   • Union bolt ②
   • Plain washer ③
   • Nut

NOTE:

Apply the lithium soap base grease on the bolt.

	Nuts (Connecting Rod): **59 Nm (5.9 m•kg, 43 ft•lb)**

REAR SHOCK ABSORBER

PREPARATION FOR REMOVAL

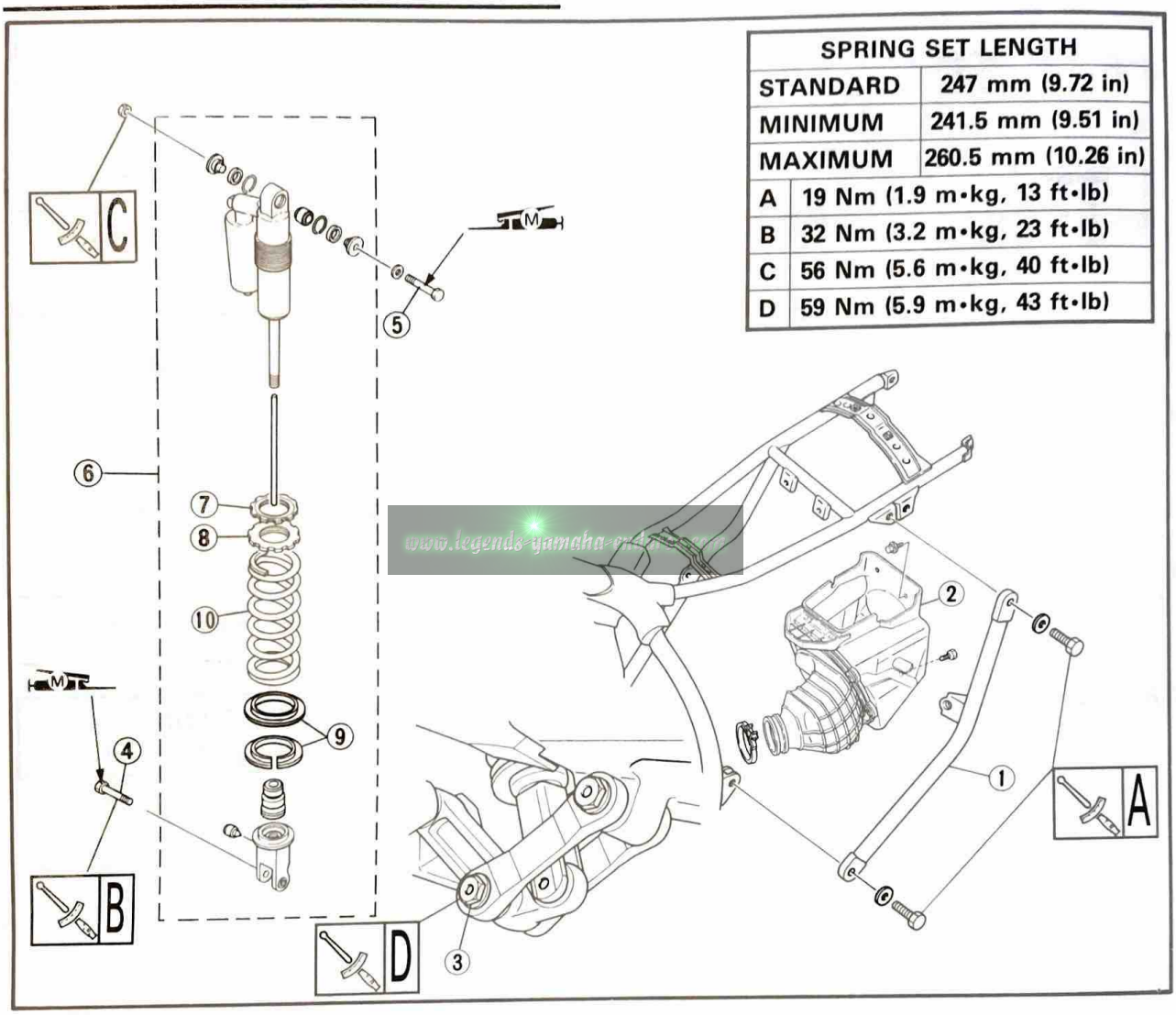
* Hold the machine by placing the suitable stand under the engine.

⚠ WARNING

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

* Remove the following parts:
  - Side cover (left)
  - Seat

SPRING SET LENGTH	
STANDARD	247 mm (9.72 in)
MINIMUM	241.5 mm (9.51 in)
MAXIMUM	260.5 mm (10.26 in)
A	19 Nm (1.9 m•kg, 13 ft•lb)
B	32 Nm (3.2 m•kg, 23 ft•lb)
C	56 Nm (5.6 m•kg, 40 ft•lb)
D	59 Nm (5.9 m•kg, 43 ft•lb)



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

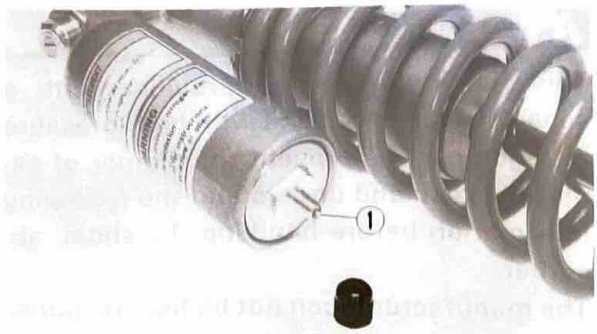
Extent of removal	Order	Part name	Q'ty	Remarks
① ②	1	Back stay	1	Refer to "REMOVAL POINTS".
	2	Air cleaner case	1	
	3	Bolt (connecting rod)	1	
	4	Bolt (rear shock absorber—relay arm)	1	
	5	Bolt (rear shock absorber—frame)	1	
	6	Rear shock absorber	1	Refer to "REMOVAL POINTS".
	7	Locknut	1	
	8	Adjuster	1	
	9	Spring guides	2	
	10	Spring (rear shock absorber)	1	

⚠ WARNING

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

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

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

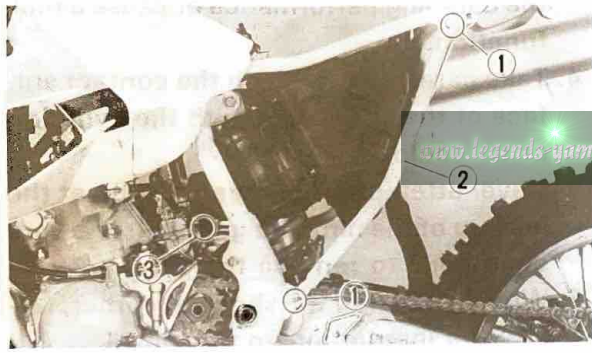


NOTES ON DISPOSAL (YAMAHA DEALERS ONLY)

Before disposing the shock absorber, be sure to extract the nitrogen gas from valve ①. Wear eye protection to prevent eye damage from escaping gas and/or metal chips.

⚠ WARNING

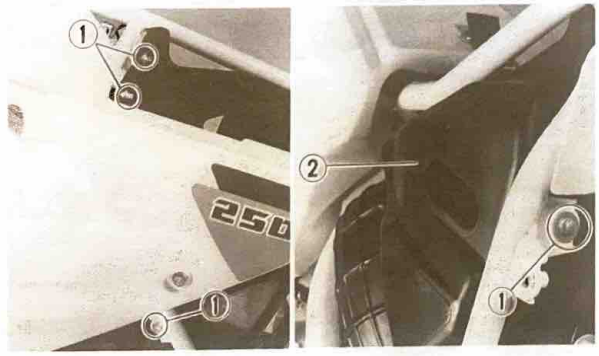
To dispose of a damaged or worn-out shock absorber, take the unit to your Yamaha dealer for this disposal procedure.



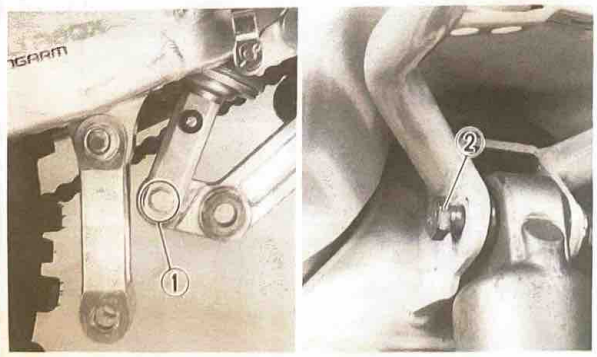
REMOVAL POINTS

REAR SHOCK ABSORBER

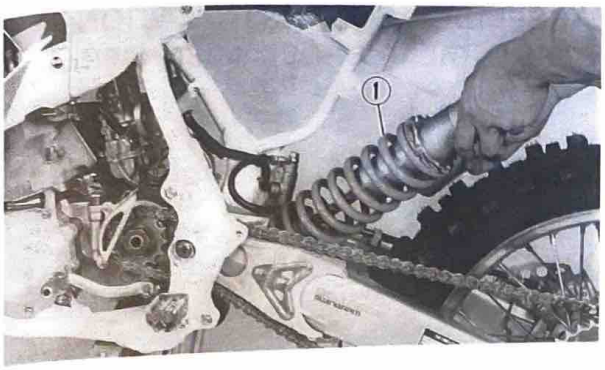
1. Remove:
   - Bolt (back stay) ①
   - Back stay ②
2. Loosen:
   - Screw (air cleaner joint) ③



3. Remove:
   - Bolt (air cleaner case) ①
   - Air cleaner case ②



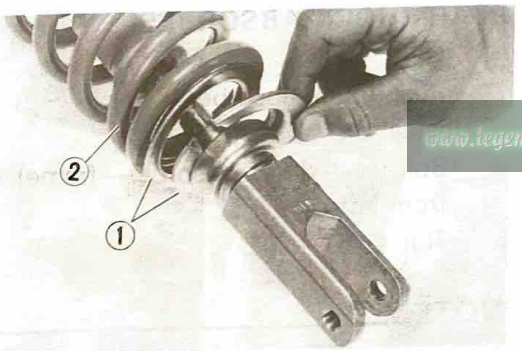
4. Remove:
   - Bolt (connecting rod—relay arm)
   - Bolt (rear shock absorber—relay arm) ①
   - Bolt (rear shock absorber—frame) ②



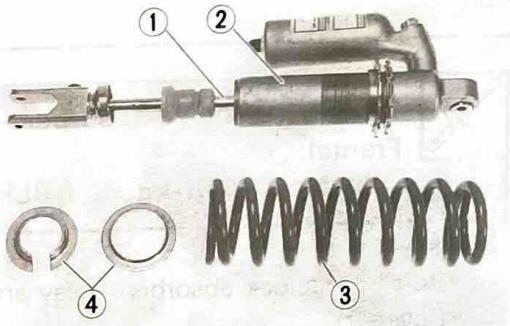
5. Remove:
   - Rear shock absorber ①
     From left side.

SPRING (REAR SHOCK ABSORBER)

1. Loosen:
   - Locknut ①
   - Adjuster ②



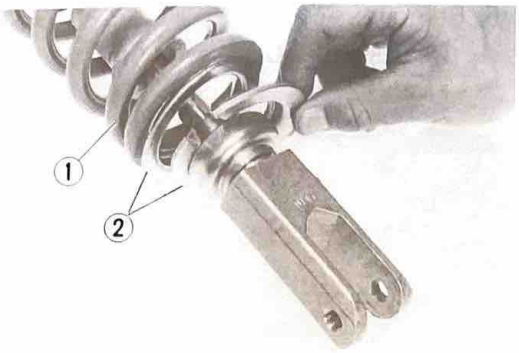
2. Remove:
   - Spring guide ①
   - Spring ②



INSPECTION

DAMPER ROD/SHOCK ABSORBER/ SPRING/SPRING GUIDE

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



ASSEMBLY AND INSTALLATION

SPRING (REAR SHOCK ABSORBER)

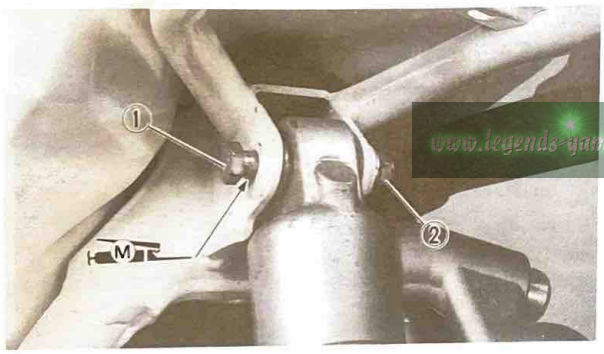
1. Install:
   - Spring ①
   - Spring guide ②

2. Install:
   - Adjuster ①
   - Locknut ②

CAUTION:

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

REAR SHOCK ABSORBER



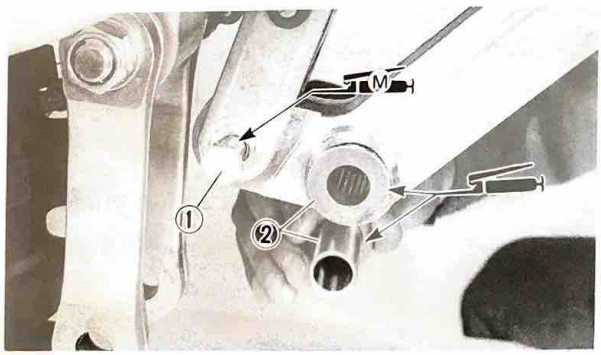
1. Install:
   - Rear shock absorber
2. Install:
   - Bolt (rear shock absorber—frame) ① from left side.
   - Nut ②

NOTE:

Apply the molybdenum disulfide grease on the bolt.

	**Bolt (Rear Shock Absorber—Frame): 56 Nm (5.6 m•kg, 40 ft•lb)**

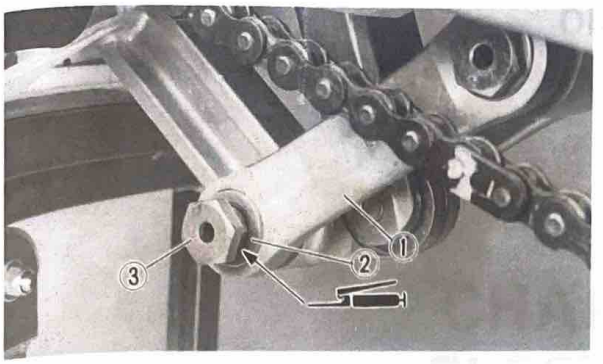
3. Install:
   - Bolt (rear shock absorber—relay arm) ①
   - Collar ②



NOTE:

- Apply the molybdenum disulfide grease on the bolt.
- Apply the lithium soap base grease on the collars and oil seal lip.

	**Bolt (Rear Shock Absorber—Relay Arm): 32 Nm (3.2 m•kg, 23 ft•lb)**

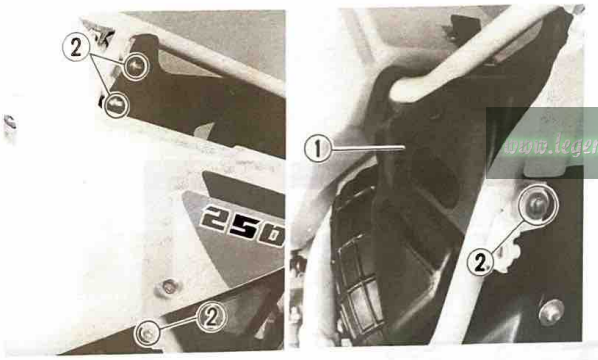


4. Install:
   - Connecting rod ①
   - Plain washer ②
   - Bolt (connecting rod—relay arm) ③
   - Nut (connecting rod—relay arm)

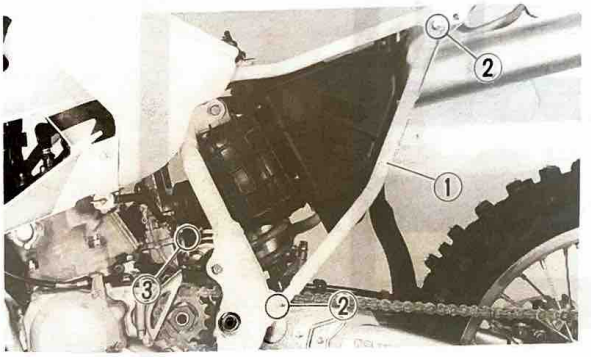
NOTE:

Apply the lithium soap base grease on the bolt.

	Nut (Connecting Rod—Relay Arm): **59 Nm (5.9 m•kg, 43 ft•lb)**



5. Install:
   - Air cleaner case ①
   - Bolt (air cleaner case) ②



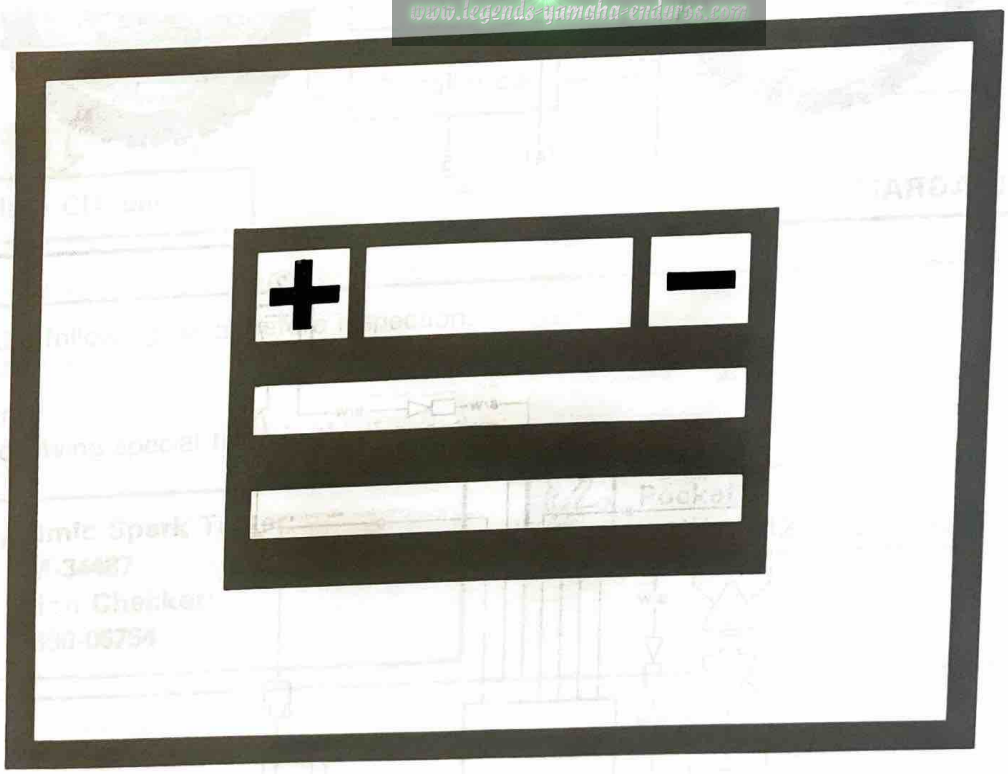
6. Install:
   - Back stay ①
   - Bolt (back stay) ②

	Bolts (Back Stay): **19 Nm (1.9 m•kg, 13 ft•lb)**

7. Tighten:
   - Screw (air cleaner joint) ③

MEMO

CHAPTER 6
ELECTRICAL



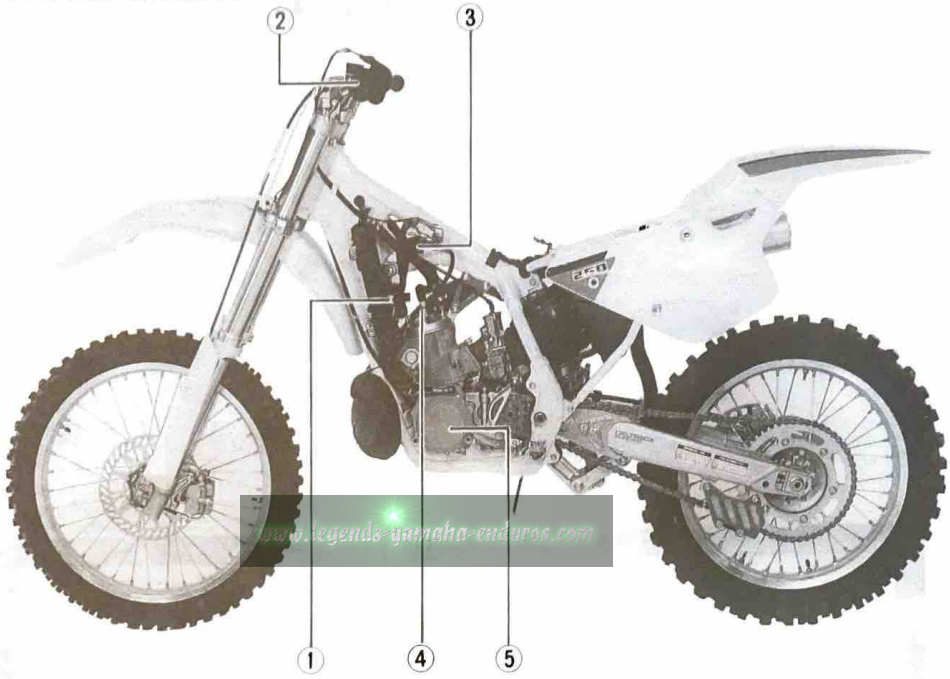
ELECTRICAL COMPONENTS AND WIRING DIAGRAM

① CDI unit
② "ENGINE STOP" button
③ Ignition coil
④ Spark plug
⑤ CDI magneto

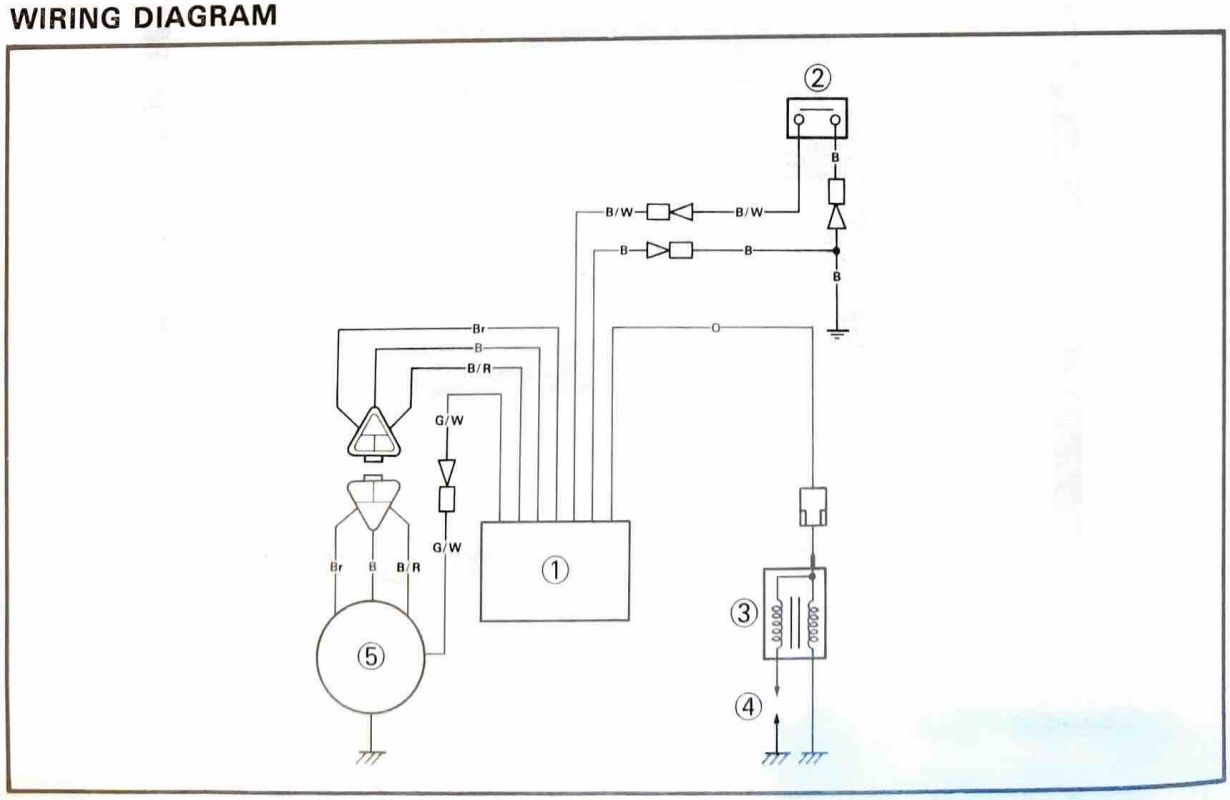
COLOR CODE

Br	Brown
O	Orange
B	Black
B/W	Black/White
W/R	White/Red
G/W	Green/White
B/R	Black/Red
W/G	White/Green
Y	Yellow

ELECTRICAL COMPONENTS



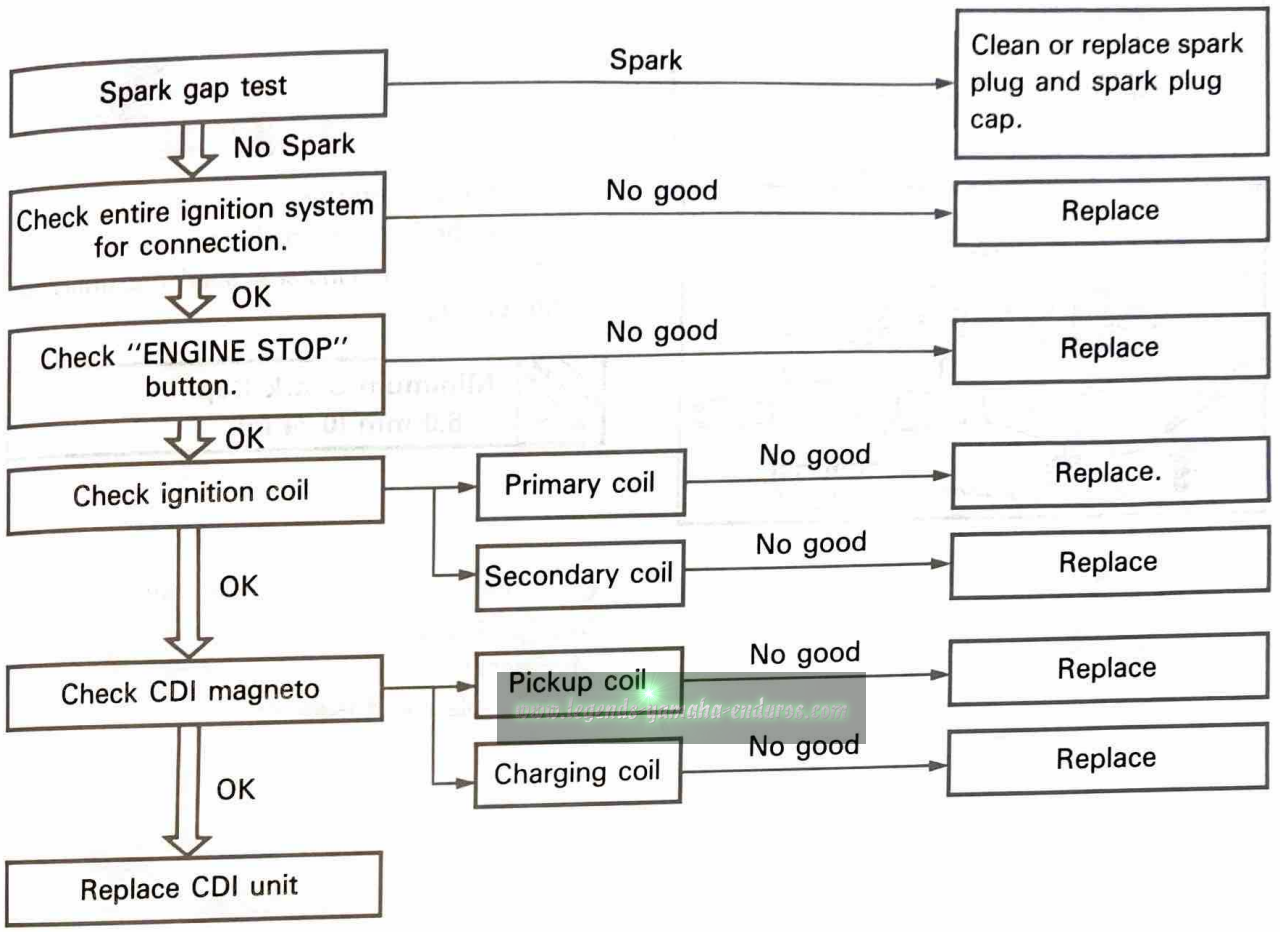
WIRING DIAGRAM



IGNITION SYSTEM

INSPECTION STEPS

Use the following steps for checking the possibility of the malfunctioning engine being attributable to ignition system failure and for checking the spark plug which will not spark.

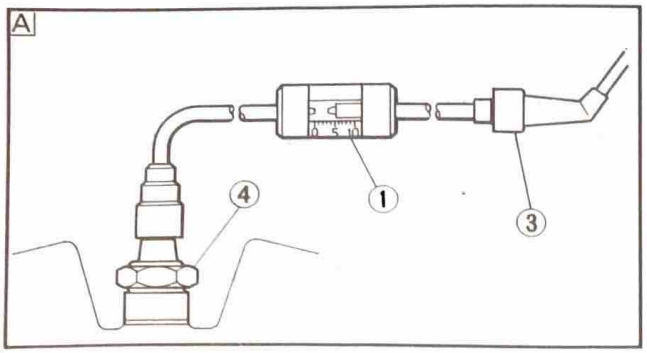


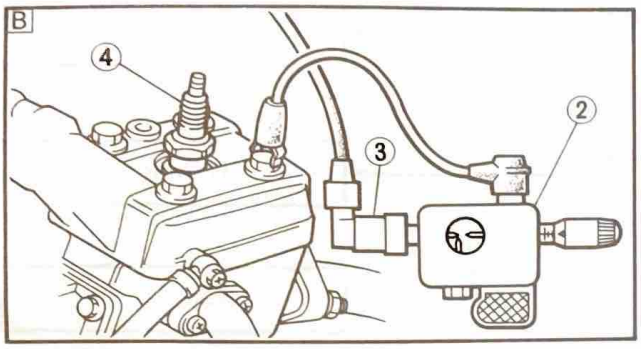
NOTE:

- Remove the following parts before inspection.
  1) Seat
  2) Fuel tank
- Use the following special tools in this inspection.

Dynamic Spark Tester:
YM-34487
Ignition Checker:
90890-06754

Pocket Tester:
YU-03112/90890-03112





SPARK GAP TEST

1. Disconnect the spark plug cap from spark plug.
2. Connect the Dynamic Spark Tester ① (Ignition Checker ②) as shown.
   - Spark plug cap ③
   - Spark plug ④

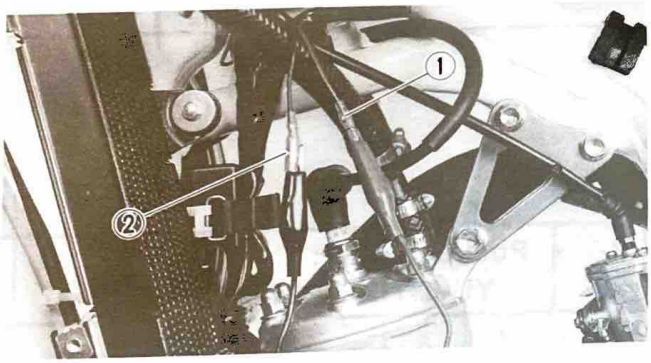
A For USA and CDN
B Except for USA and CDN

3. Kick the kick starter.
4. Check the ignition spark gap.
5. Start engine, and increase spark gap until misfire occurs.

Minimum Spark Gap:
6.0 mm (0.24 in)

COUPLERS AND LEADS CONNECTION INSPECTION

1. Check:
   - Couplers and leads connection
   Rust/Dust/Looseness/Short-circuit→Repair or replace.



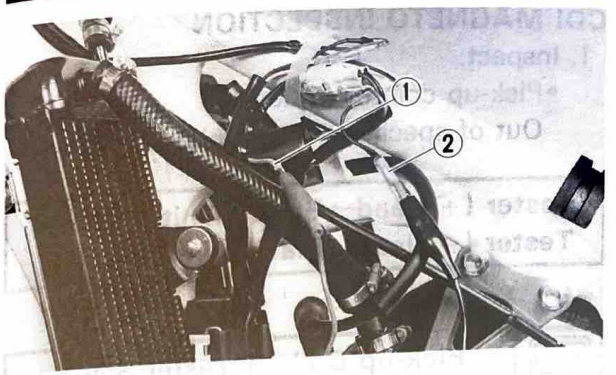
"ENGINE STOP" BUTTON INSPECTION

1. Inspect:
   - "ENGINE STOP" button conduct

Tester (+) lead→Black/White lead ①
Tester (−) lead→Black lead ②

		B/W ①	B ②	Tester Selector Position
	PUSH IN	○	○	Ω×1
	FREE			

No continuity while being pushed→Replace.
Continuity while being freed→Replace.

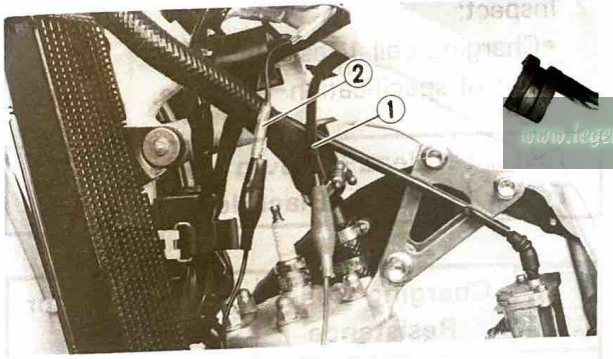


IGNITION COIL INSPECTION

1. Inspect:
   - Primary coil resistance
     Out of Specification→Replace.

Tester (+) lead→Orange lead ①
Tester (−) lead→Black lead ②

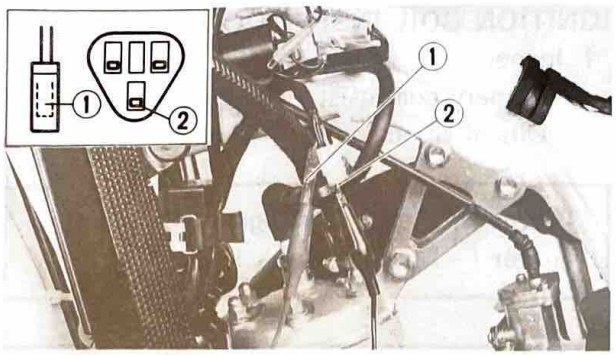
	Primary Coil Resistance	Tester Selector Position
	0.26~0.36Ω at 20°C (68°F)	Ω×1



2. Inspect:
   - Secondary coil resistance
     Out of specification→Replace.

Tester (+) lead→Spark plug lead ①
Tester (−) lead→Black lead ②

	Secondary Coil Resistance	Tester Selector Position
	3.5~4.7kΩ at 20°C (68°F)	kΩ×1

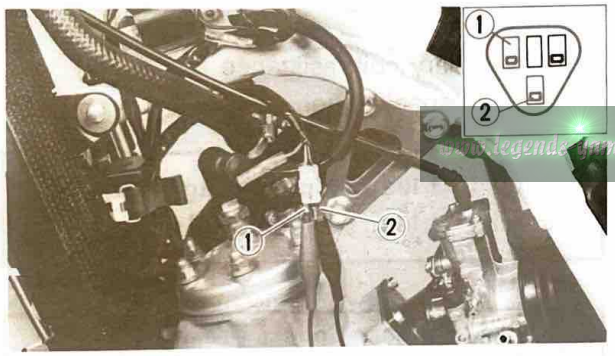


CDI MAGNETO INSPECTION

1. Inspect:
   - Pick-up coil resistance
     Out of specification→Replace.

Tester (+) lead→Green/White ①
Tester (−) lead→Black lead ②

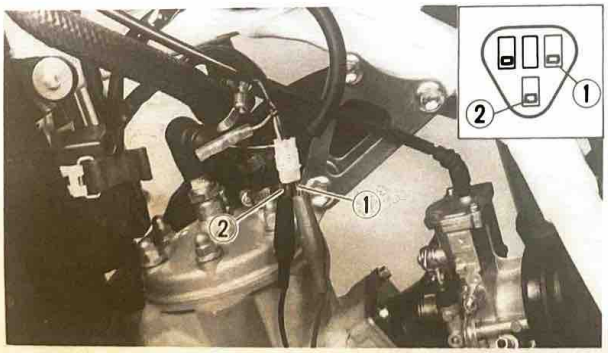
Pick-up Coil Resistance	Tester Selector Position
104 ~ 156Ω at 20°C (68°F)	Ω × 100



2. Inspect:
   - Charging coil 1 resistance
     Out of specification→Replace.

Tester (+) lead→Brown lead ①
Tester (−) lead→Black lead ②

Charging Coil 1 Resistance	Tester Selector Position
256 ~ 348Ω at 20°C (68°F)	Ω × 100



3. Inspect:
   - Charging coil 2 resistance
     Out of specification→Replace.

Tester (+) lead→Black/Red lead ①
Tester (−) lead→Black lead ②

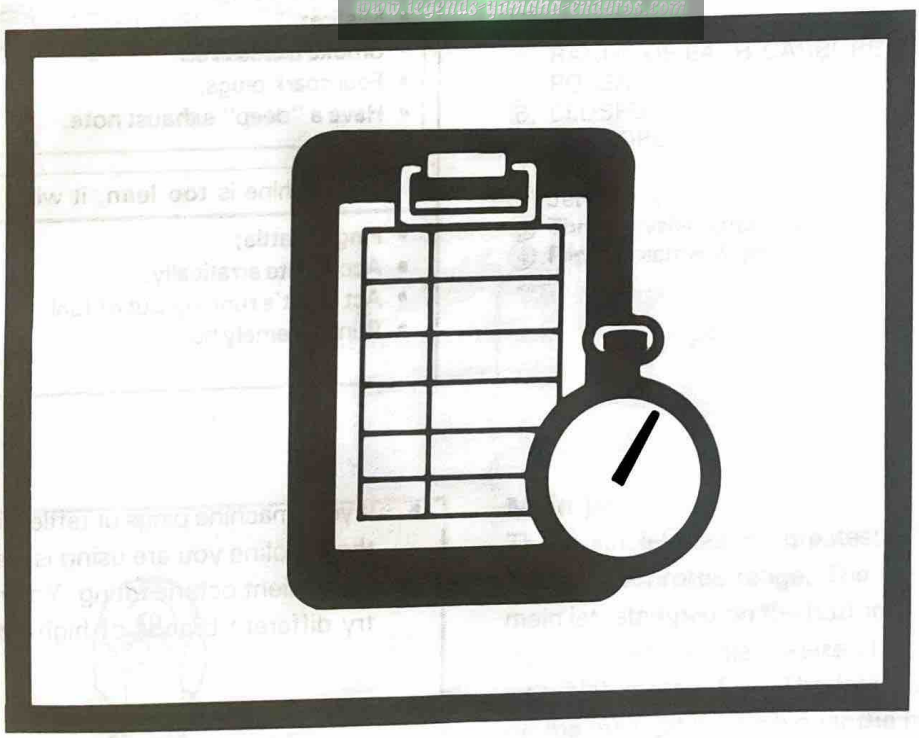
Charging Coil 2 Resistance	Tester Selector Position
36 ~ 54Ω at 20°C (68°F)	Ω × 10

CDI UNIT INSPECTION

Check all electrical components. If no fault is found, replace the CDI unit. Then check the electrical components again.

MEMO

CHAPTER 7
TUNING



CARBURETOR TUNING

Symptoms of improper settings

If your machine exhibits one or more of the symptoms listed below, it may need carb tuning changes. Before attempting any changes, however, make sure that everything else is in good shape and tuned properly. Check the condition of the spark plug, make sure the ignition timing is correct, service the air filter properly, decarbonize the muffler and spark arrestor, etc. If your machine has run properly at a certain track in the past and then starts running poorly with the same carb settings, the problem is almost certain to be elsewhere; changing the carb settings in such a case would be a waste of time.

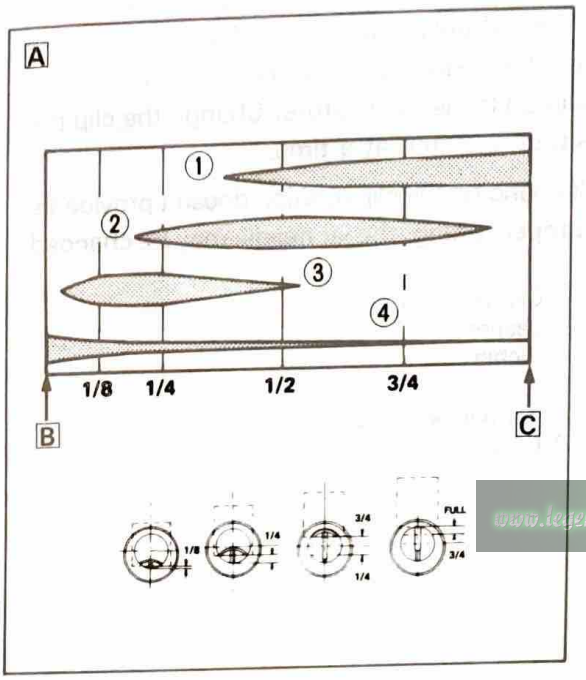
If your machine is **too rich**, it will:
• Accelerate poorly; • Misfire; • Smoke excessively; • Foul spark plugs; • Have a "deep" exhaust note.
If your machine is **too lean**, it will:
• Ping or rattle; • Accelerate erratically; • Act like it's running out of fuel; • Run extremely hot.

- If your machine pings or rattles, make sure the gasoline you are using is fresh and of a sufficient octane rating. You might also try different brands of high-octane gas.

Making setting changes

Carb setting changes are made by changing or adjusting following five carburetor components.

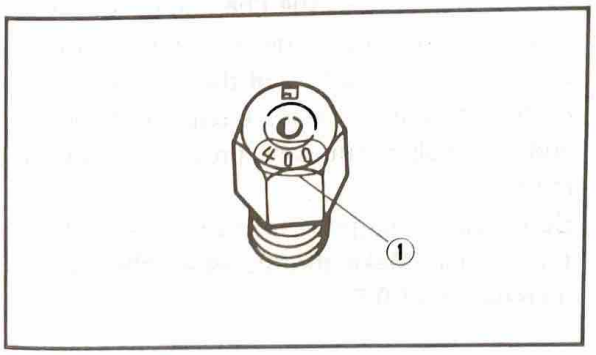
- Pilot air screw
- Main jet
- Pilot jet
- Throttle valve
- Jet needle



Four of the components, the jet needle, needle jet, main jet, and pilot jet, regulate the flow of fuel; the throttle valve and pilot air screw requlate the flow of air. The following chart indicates the working range of each component. Note how the working ranges overlap each other as the throttle valve moves from closed to fully open.

If you note a particular symptom of rich or lean running in a specific range, use the chart to determine which component needs changing. Use the following information to decide what changes to make.

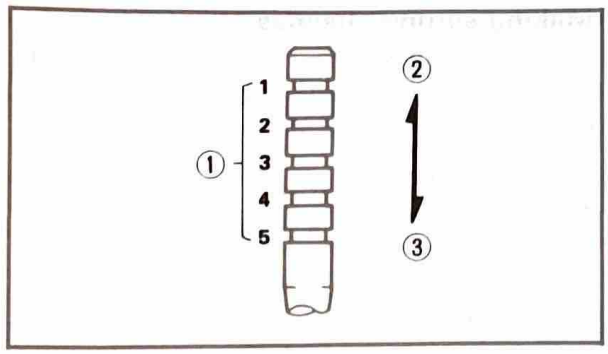
A SLIDE VALVE CARBURETOR WARKING RANGE OF EACH CARBURETOR COMPONENT
B CLOSED
C FULL OPEN
① Main jet
② Jet needle
③ Throttle valve cutaway
④ Pilot air screw & jet

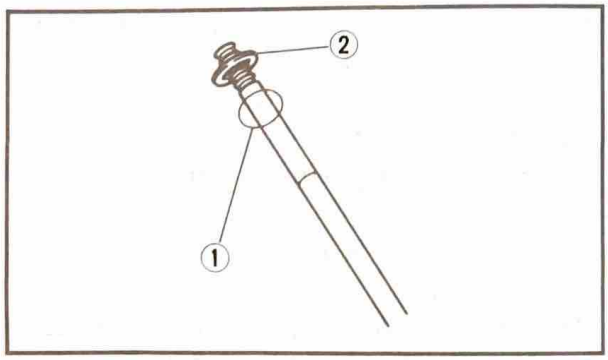


Main jet

The main jet has its greatest effect in the 3/4-to-full-throttle range. The number of the main jet, stamped on the bottom or side of the jet, indicates the relative size of the hole in the jet which meters fuel. The larger the number on the main jet is, the bigger the hole and the more fuel it will pass; hence, larger numbers mean richer jetting. Smaller numbers, of course, mean leaner jetting. Make main-jet changes one step (#10) at a time.

① Jet number





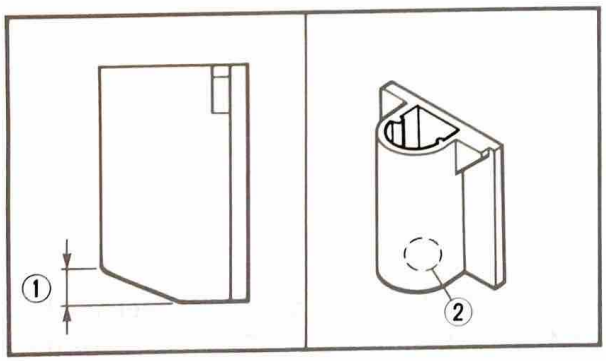
Jet needle

The jet needle has its greatest effect in the 1/4-to-3/4-throttle range. The needle moves in and out of the needle jet; since the needle is tapered, its position in the jet determines the amount of fuel allowed through. There are five grooves in the top of the needle in which a circlip fits. This clip locates the needle in the slide and, therefore, determines its position relative to the needle jet. Moving the clip down has the effect of pulling the needle further out of the jet; the mixture is thereby richened. Moving the clip up leans the mixture. Change the clip position one step at a time.

If changing the clip position doesn't provide the proper setting, the jet needle may be changed.

① Clip position
② Leaner
③ Richer

① Jet needle number
② Circlip

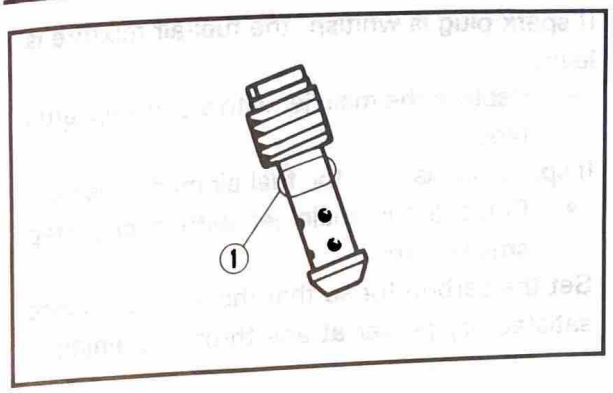


Throttle valve

The throttle valve may be changed to affect the mixture in the 1/8-to-1/2-throttle range. The bottom portion of the throttle valve which faces the rear of the carb is cut at an angle; this is called the cutaway. The height of the cutaway determines the characteristic of the airflow. The height is indicated by the number stamped on the bottom of the throttle valve. A smaller number means a smaller cutaway, and a smaller cutaway provides a richer mixture.

Conversely, a larger cutaway makes the mixture leaner. Make throttle valve changes in increments of 0.5.

① Cutaway
② Cutaway number



Pilot jet and pilot air screw

The pilot jet and pilot screw control the mixture in the closed-to-1/8-throttle range. To adjust the mixture in this range, the pilot air screw can be turned to change the airflow through the circuit, or the pilot jet can be changed to provide more or less fuel. Start by turning the pilot air screw. Screwing it in richens the mixture, and turning it out leans the mixture. Pilot air screw specs indicate the turns out from a lightly seated position. Make changes in 1/4-turn increments. If turning the screw between one and two-and-a-half turns doesn't provide the desired results, change the pilot jet. This jet has a number stamped on it which indicates its size; the larger the number is, the richer the jet. Make one-step (#5) changes in the pilot jet, and fine-tune with the pilot screw.

① Pilot jet number

TEST RUNS

Warm up the engine with the carburetor at the standard settings, and run two or three laps of the course while examining the operating condition of the spark plug.

Test-ride the machine by varying the throttle opening.

Condition of spark plug	
Correct	Insulator is dry and light tan color.
Too hot	Insulator is whitish.
Too cold	Insulator is wet and sooty.

If spark plug is whitish, the fuel-air mixture is lean.

- Replace the main jet with a one step large type.

If spark plug is wet, the fuel-air mixture is rich.

- Replace the main jet with a one step smaller type.

Set the carburetor so that the engine delivers satisfactory power at any throttle opening.

If the air-fuel mixture is too lean, the engine tends to overheat and seize up, and on the contrary, if too rich, the spark plug easily gets wet, thus causing misfires.

The proper setting of the mixture varies depending on atmospheric conditions (pressure, humidity, and temperature).

Taking these conditions into consideration, adjust the carburetor settings properly.

- Take a note of carburetor settings as well as weather conditions, course conditions, and lap times so they can be utilized as reference data for future races.

SPARK PLUG

Spark plug reading

Proper spark plug reading is essential to achieve optimum performance and engine reliability. In order to achieve a proper plug reading, it will be necessary to perform the following: Install a new standard spark plug, warm up the engine, and run two or three laps of a course at maximum power output (on main jet circuit), then run at wide open throttle for approximately 15 seconds, stop the engine before closing the throttle and simultaneously disengage the clutch while braking to a stop. Also, establish a consistency in the gas and oil premix used, making sure it's within the manufacturer's specifications. The insulator tip color and deposits will vary depending on the different brands of gas and oil you use.

Do not allow the engine to run at idle speeds, or it may erase the true plug reading.

When removing the spark plug, make note of its torque (loose, correct or over tightened). The color and type of deposits on the spark plug insulator tip will give you a good indication of how this particular engine is operating.

Don't forget that a darker-than-normal color is quite common during the break-in period.

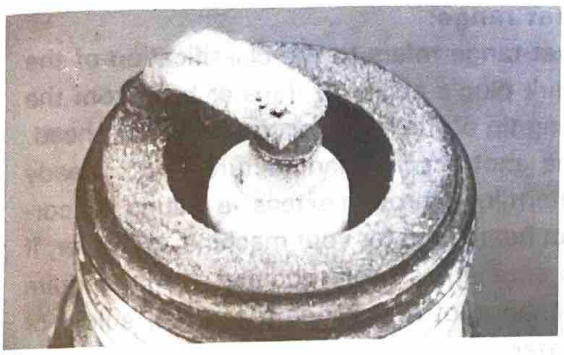
Even at part-throttle operation, the spark plug may get oily indicating that fuel is rich.

The following are some of the more common spark plug symptomos and how they relate to engine operating to operate.

Normal:
Dark-brown-to-light-tan color with slight deposits and slight electrode wear. This indicates the engine has been running the way it has been designed to operate.

Rich:
Dry, sooty black, carbon deposits. Possible cause: Rich air-fuel mixture, dirty air filter, excessive low-speed operation, weak ignition or incorrect heat range.

Oil fouled:
Wet, black and oily deposits. Possible cause: Excessive low-speed operation, using an oil that is not recommended and/or an incorrect premix ratio, transmission oil entering the crankcase, rich air-fuel mixture, dirty air filter, low compression, weak ignition, incorrect heat range and/or spark gap or excessive exhaust carbon buildup.



Overheating:
Light gray or white color. Insulator nose blistered, glazed, cracked or shows signs of aluminum speckles, and the electrodes are burned. May be accompanied by an audible "pinging/rattling." Possible cause: Lean air-fuel mixture or air leak, incorrect timing, insufficient cooling, incorrect spark plug heat range or improper spark plug installation (the tightening torque is too loose or the threads are dirty). Tiny aluminum speckles on the insulator nose indicate an extremely high operating temperature due to preignition/detonation and melting of the piston crown. If this condition exists, it is vital the piston be inspected and the cause corrected before any future operation.

Gap bridging:
Carbon deposits lodged between the side and center electrode. Possible cause: An excessive amount of carbon buildup, using an oil that is not recommended and/or an incorrect premix ratio, high-speed operation after excessive low-speed operation or dirt bypassing the air filter.

NOTE:
If a darker-or-lighter-than-normal plug color still exists after tuning, it may be necessary to make an adjustment to the main jet. If the plug shows symptoms of being rich (darker-than-normal), change to the next smaller main jet. If the plug shows symptoms of being lean (lighter-than-normal), change to a larger main jet. Make a test run after each change.

Additional information on spark plug is available from spark plug manufacturers.

Heat range:
Heat range refers to the classification of the spark plug's ability to transfer heat from the firing tip of the insulator to the cylinder head. The motorcycle manufacturer has already determined through extensive testing the correct heat range for your machine. However, if an engine has been modified, it may require a change of heat range (one step) colder or hotter.

CAUTION:

Select a spark plug with a colder or hotter heat range carefully and cautiously. A spark plug with too hot of a heat range may lead to preignition and possible engine damage. A spark plug with too cold a heat range may foul as the result of too much carbon buildup.

GEARING

Selection of the secondary reduction ratio (Sprocket)

$$\text{Standard secondary gear ratio} = \frac{\text{Number of driven sprocket teeth}}{\text{Number of drive sprocket teeth}}$$

Preconditions

- For instance, if 48T sprocket is used for the standard gear ratio:

Course condition	Reduction ratio
• Fast course	Small (46T)
• Many curves • Sandy or soft ground	Large (50T)

- If the straight portion of a course is longer, the secondary reduction ratio should be reduced so that the machine speed can be increased.

- When the course has many corners or uphills or is wet, the secondary reduction ratio should be increased so that gear shifting is possible with smooth acceleration.

Actually, the speed must be changed depending on the ground condition on the day of race and therefore, be sure to run through the racing circuit prior to a race and set the machine suitable for the entire course of the circuit.

[A]

[B] \ [C]	40	42	44	45	46	48	49	50	51	52
11	3.636	3.818	4.000	4.091	4.182	4.364	4.455	4.545	4.636	4.727
12	3.333	3.500	3.666	3.750	3.833	4.000	4.083	4.167	4.250	4.333
13	3.077	3.231	3.385	3.462	3.538	3.692	3.769	3.846	3.923	4.000
14	2.857	3.000	3.143	3.214	3.286	3.429	3.500	3.571	3.643	3.714
15	2.667	2.800	2.933	3.000	3.067	3.200	3.267	3.333	3.400	3.467

[A] Secondary reduction ratio
[B] Drive sprocket
[C] Driven sprocket

- If the straight portion of a course on which the machine can be run at maximum speed is longer, the machine should be so set that the maximum machine speed can be developed toward the end of the straight course, but care should be taken not to over-rev the engine.

- As a matter of fact, it is difficult to set the machine so as to best suit the entire course of the circuit. That is, some portions will have to be set with importance placed on the area where the result of the race is most affected. Also in this case, run through the entire course first and select the reduction ratio while taking a note of lap times so that the overall result is the best.

NOTE:

The technique of riding varies from rider to rider, and machine setting and power will also differ from machine to machine. Therefore, it is not clever to copy your machine setting from other riders at the beginning. Be sure to select the machine setting so that it matches your level of riding technique.

SUSPENSION TUNING

INTRODUCTION

No area of machine maintenance is more critical than proper suspension tuning. An improperly tuned suspension will keep even the best rider from attaining the full benefit of his machine's ability. Hence follow the instructions in this chapter to adjust the suspension to the rider's specifications and course conditions.

WHILE TUNING THE SUSPENSION, YOU MUST BEAR SOME IMPORTANT POINTS IN MIND:

- If the machine is new, break in the suspension with at least four hours of riding before making any setting evaluations or changes.

Break-in:
To afford better riding comfort, the rebound damping is set on a two steps softer side. After the break-in period, return the suspension unit to the standard position.

- The three major factors which must be considered in suspension tuning are RIDER WEIGHT, RIDER ABILITY, and TRACK CONDITIONS. Additional influences include the RIDER'S STYLE and POSITIONING on the machine.

- If you have any problem,make tests by changing your riding posture or position so that the cause of problem can be found out.

- It is a wise practice to adjust settings so as to best suit to straight lines, corners, or gaps, whatsoever you can most skillfully handle the machine in racing courses.

- Make setting changes in small increments; a little bit goes a long way, and it is very easy to overadjust a setting.

- The front and rear suspension should be balanced; when one is changed, the other might need to be changed similarly.

- When evaluating suspension performance the rider must make every effort to ride consistently and recognize the effects of his input; such things as changes in rider position and increasing fatigue may lead to incorrect judgments about necessary setting adjustments.

- If you have lost confidence in your suspension setting, reset it to the standard, and readjust it.

- When the proper settings have been determined for a particular track, they should be written down for reference upon returning to that track.

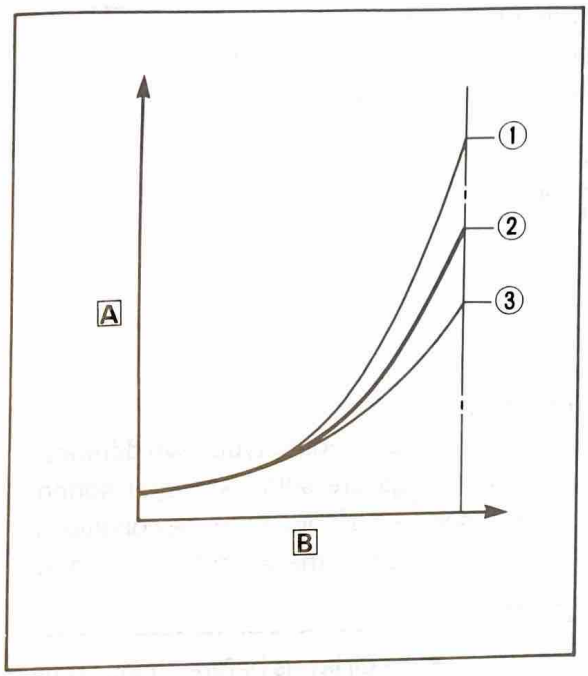
- Lubricate the shock mounting-eye pivots after break-in and after every race to prevent excess friction from affecting suspension performance.

FRONT FORK

Fork oil level

NOTE:

Compared with conventional type front forks, the up-side down front forks are very sensitive to variations in the oil level. Therefore, adjust the oil level with special care.



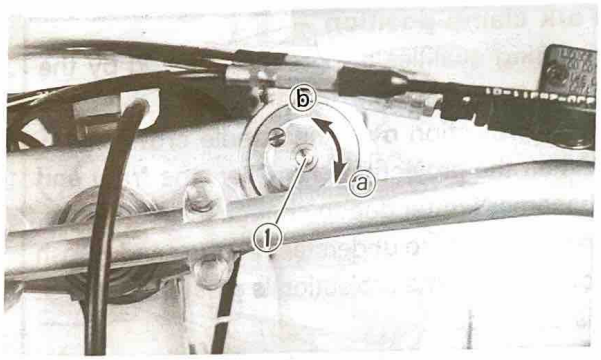
A change in the fork oil level will not affect the damping force at the early stage of fork travel, but it will have a great effect at the later stage.

- When the oil level is raised:
  The air spring in the later half stage of travel is stronger, and thus the front fork is harder.

- When the oil level is lowered:
  The air spring in the later half stage of travel is lessened, and thus the front fork is softer.

The oil level works most effectively at the end of fork travel.

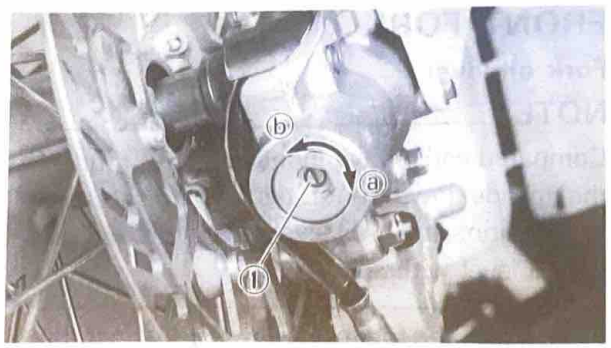
A WEIGHT
B FORK STROKE
1 High oil level
2 Std oil level
3 Low oil level



Rebound damping

The rebound damping can be adjusted by turning the adjuster 1 at the top of the fork.
Turning the adjuster clockwise increases the rebound damping.
Turning the adjuster counterclockwise decreases the rebound damping.

a Stiffer
b Softer



Compression damping

The compression damping can be adjusted by turning the adjuster ① at the bottom of the fork. Turning the adjuster clockwise increase the compression damping.

ⓐ Stiffer
ⓑ Softer

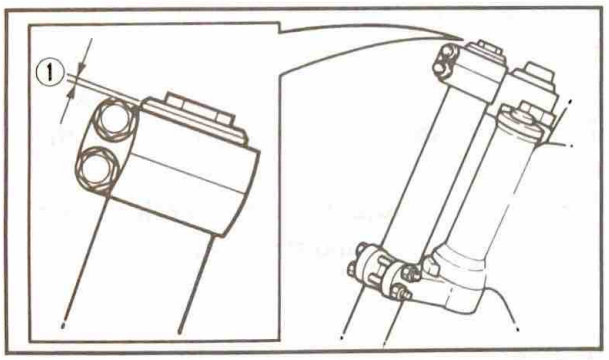
Fork spring

In addition to the standard type, two different type fork springs are sold. A proper spring should be selected according to the conditions of a racing course or the weight of the rider.

NOTE:

Always check the oil levels before changing or re-installing springs.

- Using the hard spring:
  Increases the preload; the fork becomes stiffer and rebounds more quickly.
- Using the soft spring:
  Decreases the preload; the fork becomes softer and rebounds more slowly.



Fork clamp position

Steering qualities are greatly affected by the fork clamp position (the amount of the inner tube projection over the handle crown).
When the projection is smaller, the front end becomes lighter due to change in weight bias. Also, it tends to understeer in turns and "wash out." When the projection is greater, the result is converse.
Be sure the front tire doesn't rub the fender when the fork tubes compress fully. Make this adjustment in 5 mm (0.2 in) increments.

① Tube height

CAUTION:

The inner tubes, both right and left, should be projected evenly.

REAR SHOCK

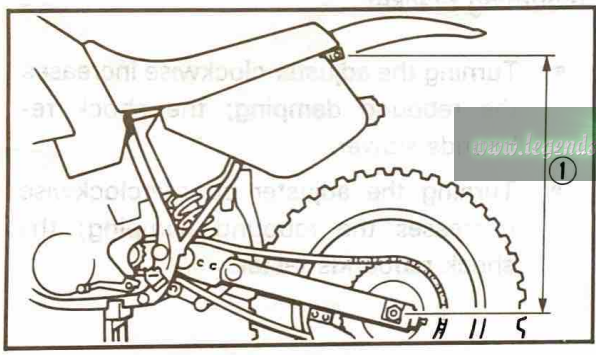
Spring preload

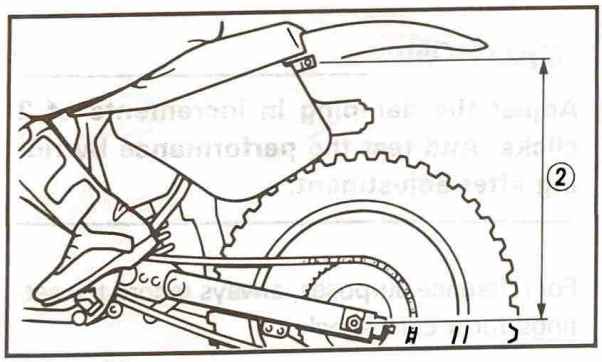
The preload is adjusted by changing the set length of the spring.

- Shortening the set length: increases the preload; the shock becomes stiffer and rebounds more quickly.
- Lengthening the set length: decreases the preload; the shock becomes softer and rebounds more slowly.

NOTE:

The suspension spring preload adjustment varies depending on the rider's level of technique, weight, or preference, but the standard setting is that the suspension sinks one-third of the rear wheel travel with the rider sitting astride the seat.





Adjustment steps

1. Elevate the rear wheel by placing the suitable stand.
2. Measure the distance ① between bolt (rear wheel axle) center and bolt (rear fender mounting) center.
3. Remove the stand and sit on seat.
4. Measure the distance ② between bolt (rear wheel axle) center and bolt (rear fender mounting).
5. Calculate:
   Difference = ① − ②

Standard Difference:
90 ~ 100 mm (3.5 ~ 4.0 in)

6. Turn the spring preload adjuster so that specific difference is obtained.

Spring replacement

In addition to the standard spring, heavy and light springs are available. If the standard spring is improper for your purpose, select a proper one according to the rider's weight or course conditions.

- Using the hard spring:
  The spring rate is higher; the spring is stiffer and rebounds more quickly.
- Using the soft spring:
  The spring rate is lower; the spring is softer and rebounds more slowly.

Rebound damping

The rebound damping is adjustable by turning the adjusting ring next to the shock's lower mounting bracket.

- Turning the adjuster clockwise increases the rebound damping; the shock rebounds slower.
- Turning the adjuster counterclockwise decreases the rebound damping; the shock rebounds faster.

CAUTION:

Adjust the damping in increments of 2 clicks. And test the performance by riding after adjustment.

For reference purposes, always record the settings for a cold shock.

Compression damping

The compression damping can be adjusted by turning the adjuster at the shock reservoir (right side).

- Turning the adjuster clockwise increases the compression damping. That is, the rear shock is hard to sink and therefore, the cushion is felt hard.
- Turning the adjuster counterclockwise decreases the compression damping. That is, the rear shock sinks easily and therefore, the cushion is felt soft.

CAUTION:

Adjust the damping in increments of 2 clicks. And test the performance by riding after adjustment.

TROUBLESHOOTING IMPROPER SETTINGS

Listed below are some symptoms of improper suspension settings and the most likely means of correcting them.
The proper settings can be achieved by applying the information in this chapter in a scientific, methodical manner; this does not mean, however, that you must be a scientist or trained technician to succeed. Simply take time to think about the changes you believe are necessary, check them against the symptoms and cures described here, make the changes in small increments, and take notes on the changes and their effects.

SYMPTOMS OF THE FRONT FORKS

Too hard

1. The front forks are too stiff
   . . . the springs are too strong or compression damping is too high.
2. The front forks stiffens up at the end of stroke
   .... the fork oil level is too high.
3. The front forks operate but a hard ride is felt
   .... the spring preload is too high or air is built up in fork.

NOTE:

Release any air pressure that may build up air each fork.

Too soft

The front forks dive much when the brake or throttle is not applied.

1. Fork oil level is low.
2. Springs are too soft.
3. Spring preload is low.

NOTE:

Keep the oil level and compression damping constant on right and left.

SYMPTOMS OF THE REAR SHOCK

Too hard

1. The suspension is too stiff
   .... compression damping is too high.
   .... spring is too hard.
2. The suspension operates but a hard ride is felt
   .... unbalance between the spring and rebound damping.
3. Spring preload is too hard.

NOTE:

Apply the molybdenum disulfide grease to pivot points of the rear shock.

Too soft

On landing after a big jump, bottoming occurs (Normally OK)

.... spring preload is too soft or compression damping is too soft.
.... spring is too soft.

READJUSTMENT OF THE SUSPENSION

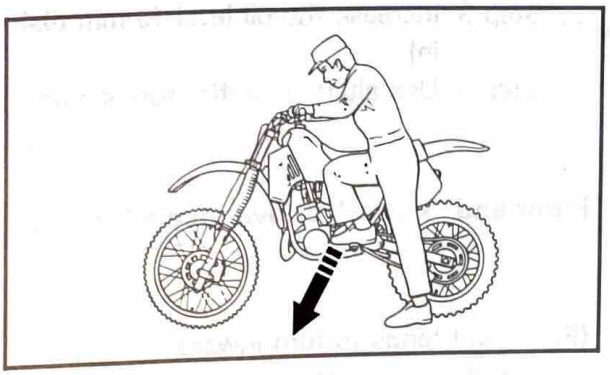
Type of course

Many corners	Lower the front end slightly. (Increase the fork tube height 5 mm (0.2 in))
Fast course with many jumps	Raise the front end slightly. (Decrease the fork tube height 5 mm (0.2 in)) Slower steering gives greater stability at high speed.
Deep sandy whoops	Raise the front end slightly. To gain stability

After making such preliminary adjustments, begin the actual on-track testing and evaluation.

Remember

1. Always make changes in small increments.
2. Make sure the rider is consistent in his evaluation of improper suspension performance.
3. A change in the front suspension might require a change in the rear, and vice versa.



FRONT AND REAR COMPATIBILITY

Use this procedure to determine if the suspension is balanced reasonably well: Hold the bike upright (remove the sidestand). While standing next to the machine, lightly pull on the front brake, place one foot on the footpeg closest to you, and push down hard. If the bike maintains its level attitude as the suspension is compressed, the bike is rather well balanced. Sit astride the bike and take a riding posture. Next check to see that the bike is in a horizontal position. If one end drops noticeably more than the other, however, the front and rear are not compatible and must be readjusted to achieve better balance.

GENERAL SYMPTOMS AND REMEDY

This is one of the most effective adjustment procedures but suspension settings should vary depending on the condition of racing courses or the rider's preference.

NOTE:

If you have lost confidence in your suspension setting, reset it to the standard, and readjust it.

Front end searching during down hill or acceleration at out of corner:

Front fork is soft.

.... Step 1 Decrease the tube height 5 mm (0.2 in).

...Step 2 Increase compression damping 2 clicks.

...Step 3 Increase the oil level 10 mm (0.4 in).
...Step 4 Use alternate stiffer fork spring.

Front end "knifes" or oversteers in turns:

(Front end tends to turn inward)
Front fork is too soft.

.... Step 1 Increase oil level 10 mm (0.4 in).
...Step 2 Increase compression damping 2 clicks.
...Step 3 Decrease tube height 5 mm (0.2 in).

NOTE:
Heavier or expert riders may need the heavy spring.

Front end pushes or "washes out" in turns:

(When a front wheel tends to push outward rather than "bite" in a turn)
Front fork is too stiff.

...Step 1 Bleed air.
...Step 2 Decrease compression damping 2 clicks.
...Step 3 Decrease oil level 5~10 mm (0.2~0.4 in).
...Step 4 Increase tube height 5 mm (0.2 in).

NOTE:
The softer spring may be required for lighter or less experienced riders.

Front fork doesn't respond to small bumps in sweeping turns:

Front fork is too hard.

.... Step 1 Decrease oil level 10 mm (0.4 in).

... Step 2 Increase the rebound damping 2 clicks.

... Step 3 Use soft spring.

Rear end "kicks" when braking over bumps:

The shock probably has too little rebound damping.

... Step 1 Check the operation of the brake actuated suspension.

... Step 2 Increase the rebound damping 2 clicks.

Rear tire won't "hook up" out of corners:

(A lack of traction coming out of turns)

The shock may be too stiff.

.... Step 1 Decrease the rear shock spring preload 2 mm (0.08 in).

....Step 2 Decrease the rebound damping 2 clicks.

.... Step 3 Use soft spring (In case of a lightweight rider).

Bike lands on the front wheel off high speed jumps:

(This may be due to improper riding posture)
Rebound damping is too fast (or spring is too hard).

.... Step 1 Increase rebound damping by 2 clicks each time.

.... Step 2 Decrease the shock spring preload 2~3 mm (0.08~0.12 in).

.... Step 3 Decrease the compression damping 2 clicks.

Front and rear of the bike bottom off high-speed jumps:

(If harsh bottoming occurs once or twice per lap of the race)
Front and rear suspension system are too soft

.... Step 1 F/F: Increase oil level 10 mm (0.4 in).
R/S: Increase spring preload in 2 mm (0.08 in) increments.

.... Step 2 F/F: Increase compression damping by 2 clicks or use hard spring.
R/S: Increase compression damping by 2 clicks or use hard spring.

NOTE:

After making adjustments, check front and rear compatibility.

Adjustment depending on bottoming condition: (Rear shock)

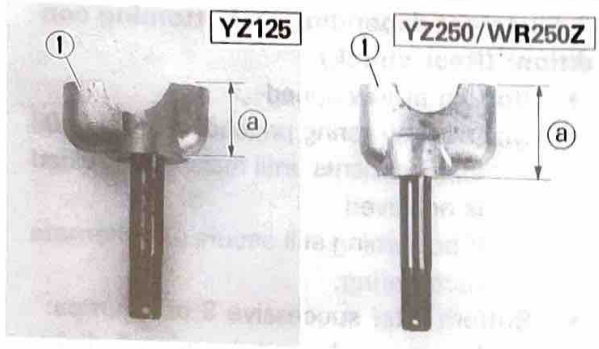
- Bottom at low speed
  .... Increase spring preload in 2 mm (0.08 in) increments until maximum preload is achieved.
  If bottoming still occurs use alternate hard spring.
- Bottom after successive 3 or 4 jumps:
  .... Decrease rebound damping 2 clicks.

NOTE:

The rear shock on this machine may mislead some riders.

a. The rear shock bottoms when the spring and damping are overcome by the total weight of the machine and rider (due to full stroke).
b. A bottoming sensation may actually be the inability of rider and machine weight to overcome an overly stiff spring or excessive damping.

Observe the rear end off jumps; if it doesn't approach bottoming, try lowering the spring preload and damping.



HANDLEBAR POSITION

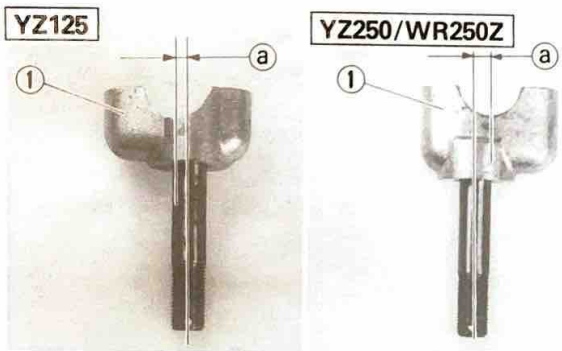
The handle position can be set so as to suit the rider's constitution.

1. Up-and-down Adjustment
   - Use of the handlebar lower holder ① from the YZ125 or YZ250/WR250Z enables a height ⓐ from the handle crown to the handlebar to be changed.

Handlebar Height ⓐ:
YZ125: 25.6 mm (1.0 in)
YZ250/WR250Z: 34 mm (1.3 in)

⚠ WARNING

Always adjust each lower holder to the came height. Uneven adjustment can cause poor handling and loss of stability.

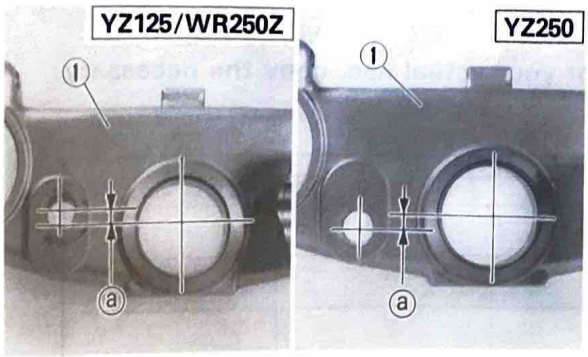


2. Back-and-forth Adjustment
   a. Installation of the handlebar lower holder ① in the reverse direction enables a change in the offset ⓐ of the handlebar.

Offset ⓐ:
4.5 mm (0.18 in)

⚠ WARNING

Always adjust each lower holder to the same setting. Uneven adjustment can cause poor handling and loss of stability.



b. Use of the handle crown ① from the YZ125/WR250Z or YZ250 enables a change in the handlebar lower holder fitting hole and in the offset ⓐ of the steering shaft.

Offset ⓐ
YZ125/WR250Z: 7.5 mm (0.3 in)
YZ250: 4.5 mm (0.2 in)

SETTING RECORD TABLE

The data shown here is an example of entry. For your actual use, copy the necessary data from the Owner's Manual.

Event name	Supercross			
Date	Aug/19			
Weather	Fine/25°C (77°F)			
Place	Anaheim			

Setting specs.

Ignition timing	1.1 mm (0.043 in)			
Spark plug	B9EG (0.5 mm)			
Carburetor Main jet Jet needle Needle jet Cutaway Pilot jet Air screw	 #310 6EN15-56-3 R-1 6.0 #20 1 and 1/2			
Gearing	50/14 (3.571)			
Front fork Spring type Tube height Oil quantity level weight Rebound damping Compression damping	 k = 0.390 0 mm (0 in) 420 cm^3 (14.7 Imp oz, 14.2 US oz) 120 mm (4.72 in) Fork oil "01" 5 7			
Rear shock Spring type Preload Rebound damping Compression damping	 k = 5.20 240 mm (9.45 in) 6 11			
Front tire (pressure) Rear tire (pressure)	Dunlop k139, 96.6 kPa (1.0 kg/cm^2, 14 psi) Dunlop K690A, 96.6 kPa (1.0 kg/cm^2, 14 psi)			

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