YAMAHA

OWNER'S SERVICE MANUAL

YZ250R

LIT-11626-16-31

5UP-28199-10

⚠ WARNING

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

YAMAHA LIT-CALIF-65-01

EC010000

YZ250R
OWNER'S SERVICE MANUAL

1st Edition, May 2002

Printed in Japan
P/N. LIT-11626-16-31

EC020000

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As improvements are made on this model, some data in this manual may become outdated.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.

EC030002

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 following 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 materiel 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 transportation 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 canceled 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 satisfaction 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, V.I.N.(frame 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, V.I.N.(frame 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.

EC040001

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 vicinity 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.

EC050000

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.

EC060000

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.

EC070001

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.

EC080000

HOW TO USE THIS MANUAL

EC081000

PARTICULARLY IMPORTANT IN FORMATION

⚠

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

⚠WARNING

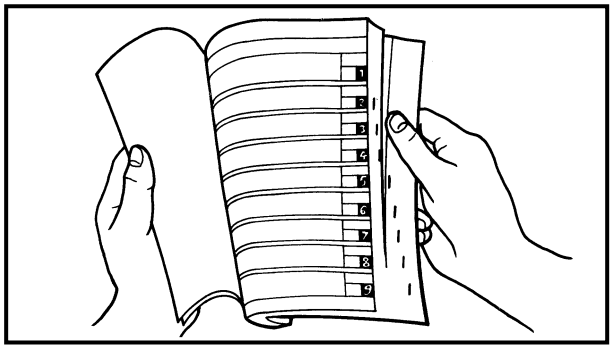
Failure to follow WARNING instructions could result in severe injury or death to the machine operator, a bystander, or a person inspecting or repairing the machine.

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.



EC082000

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.

EC083000

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

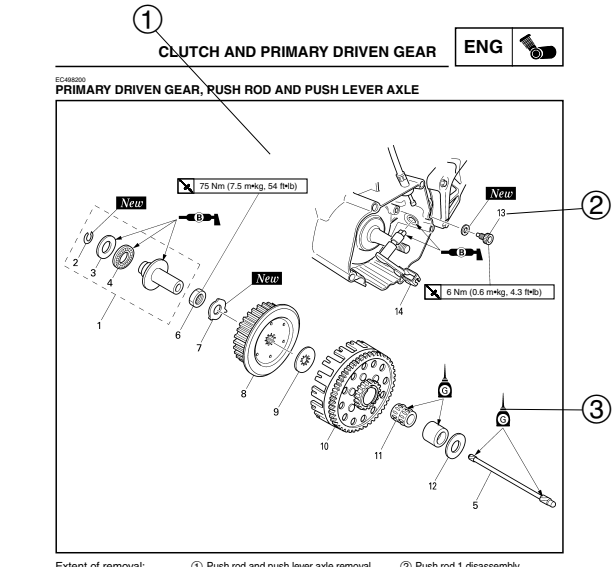
Pitting/Damage→ Replace.

EC084002

HOW TO READ DESCRIPTIONS

To help identify parts and clarify procedure steps, there are exploded diagrams at the start of each removal and disassembly section.

1. An easy-to-see exploded diagram ① is provided for removal and disassembly jobs.
2. Numbers ② are given in the order of the jobs in the exploded diagram. A number that is enclosed by a circle indicates a disassembly step.
3. An explanation of jobs and notes is presented in an easy-to-read way by the use of symbol marks ③. The meanings of the symbol marks are given on the next page.
4. A job instruction chart ④ accompanies the exploded diagram, providing the order of jobs, names of parts, notes in jobs, etc.
5. Extent of removal ⑤ is provided in the job instruction chart to save the trouble of an unnecessary removal job.
6. For jobs requiring more information, the step-by-step format supplements ⑥ are given in addition to the exploded diagram and job instruction chart.



CLUTCH AND PRIMARY DRIVEN GEAR ENG

EC498200
PRIMARY DRIVEN GEAR, PUSH ROD AND PUSH LEVER AXLE

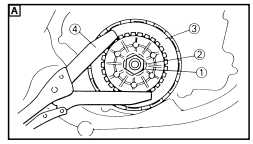
Extent of removal: ① Push rod and push lever axle removal ② Push rod 1 disassembly ③ Primary driven gear removal

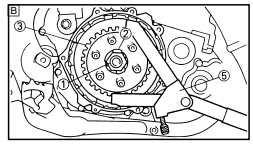
④

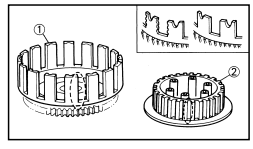
Extent of removal	Order	Part name	Q'ty	Remarks
		PRIMARY DRIVEN GEAR, PUSH ROD AND PUSH LEVER AXLE REMOVAL		
①↕ ③↕	1	Push rod 1	1	
②	2	Circlip	1	
	3	Plain washer	1	
①↕	4	Bearing	1	
	5	Push rod 2	1	
	6	Nut (clutch boss)	1	Use special tool. Refer to "REMOVAL POINTS".
	7	Lock washer	1	
⑤	8	Clutch boss	1	
	9	Thrust plate [D=ø44mm (1.73 in)]	1	
	10	Primary driven gear	1	
	11	Bearing	1	
	12	Thrust plate [D=ø42mm (1.65 in)]	1	
①	13	Bolt (push lever axle)	1	
	14	Push lever axle	1	

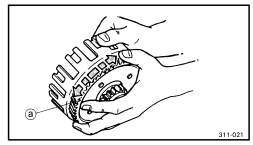
4-33

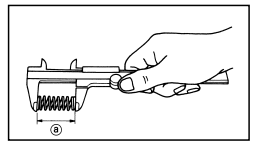
CLUTCH AND PRIMARY DRIVEN GEAR ENG











EC493000
REMOVAL POINTS

EC483211
Clutch boss

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

NOTE:

Straighten the lock washer tab and use the clutch holding tool ④, ⑤ to hold the clutch boss.

⑥

Clutch holding tool:
YM-91042.....④
90890-04086.....⑤

A For USA and CDN
B Except for USA and CDN

EC494000
INSPECTION

EC484100
Clutch housing and boss

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

EC484201
Primary driven gear

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

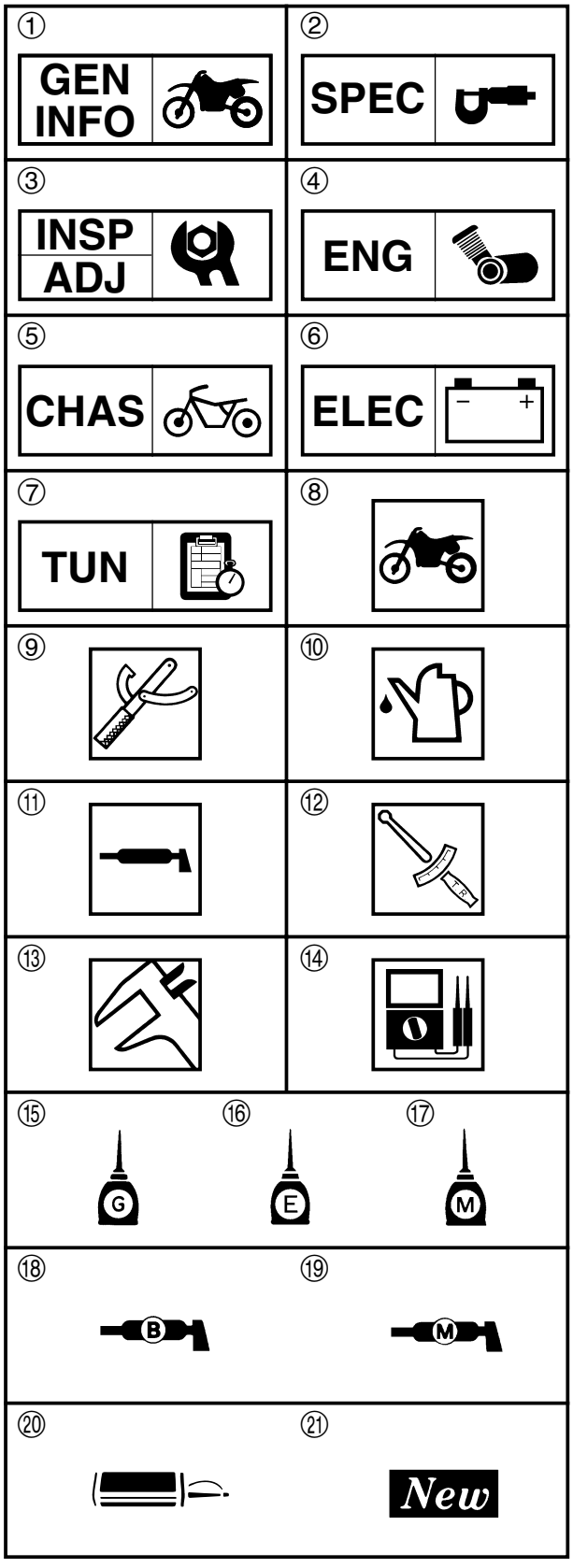
EC484400
Clutch spring

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

Clutch spring free length:

Standard	<Limit>
44.0 mm (1.732 in)	42.0 mm (1.654 in)

4-34



EC085002

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 Specifications
③ Regular inspection and adjustments
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 Specified value, Service limit
⑭ Resistance (Ω), Voltage (V), Electric current (A)

Illustrated symbols ⑮ to ⑲ in the exploded diagrams indicate grade of lubricant and location of lubrication point.

⑮ Apply transmission oil
⑯ Apply engine mixing oil
⑰ Apply molybdenum disulfide oil
⑱ Apply lightweight lithium-soap base grease
⑲ Apply molybdenum disulfide grease

Illustrated symbols ⑳ to ㉑ in the exploded diagrams indicate where to apply a locking agent and where to install new parts.

⑳ Apply locking agent (LOCTITE®)
㉑ Use new one

MEMO

EC090000

INDEX

EC0A0000

CONTENTS

CHAPTER 1
GENERAL INFORMATION

CHAPTER 2
SPECIFICATIONS

CHAPTER 3
REGULAR INSPECTION AND ADJUSTMENTS

CHAPTER 4
ENGINE

CHAPTER 5
CHASSIS

CHAPTER 6
ELECTRICAL

CHAPTER 7
TUNING

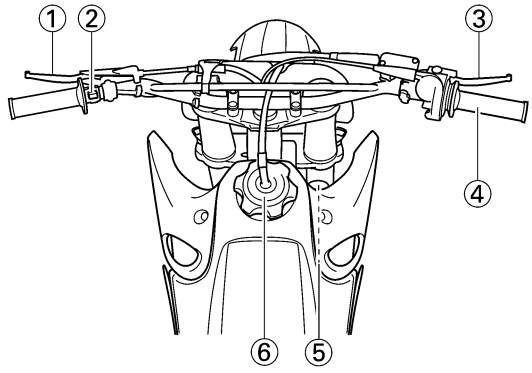
EC100000
GENERAL INFORMATION

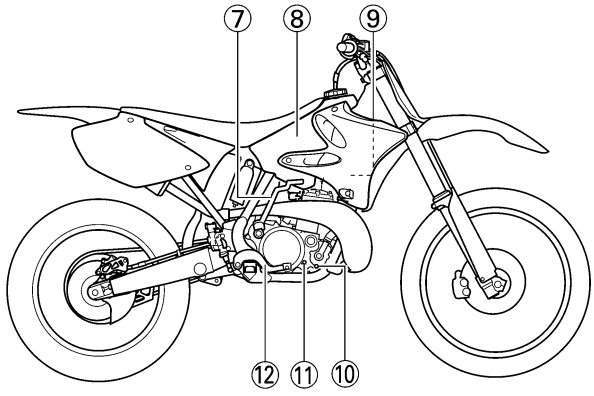
EC110000
DESCRIPTION

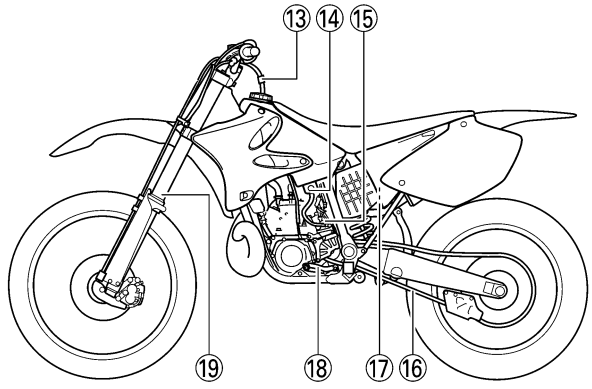
① Clutch lever
② “ENGINE STOP” button
③ Front brake lever
④ Throttle grip
⑤ Radiator cap
⑥ Fuel tank cap
⑦ Kick starter
⑧ Fuel tank
⑨ Radiator
⑩ Coolant drain bolt
⑪ Check bolt (Transmission oil level)
⑫ Rear brake pedal
⑬ Valve joint
⑭ Fuel cock
⑮ Starter knob
⑯ Drive chain
⑰ Air cleaner
⑱ Shift pedal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

NOTE:

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



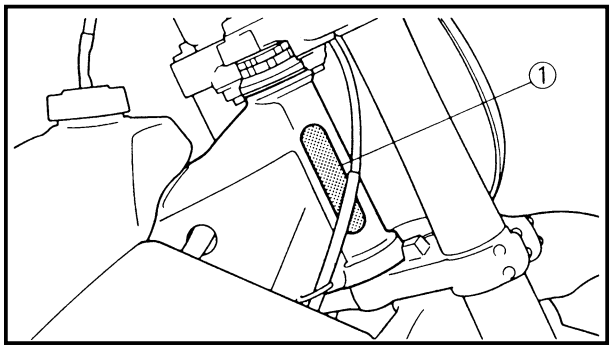




EC120001
MACHINE IDENTIFICATION

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 machine is stolen, the authorities will need the number to search for and identify your machine.

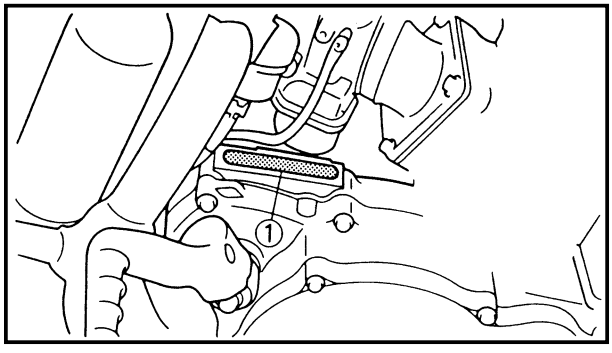


EC121001
VEHICLE IDENTIFICATION NUMBER (For USA, CDN, AUS, NZ and E)

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

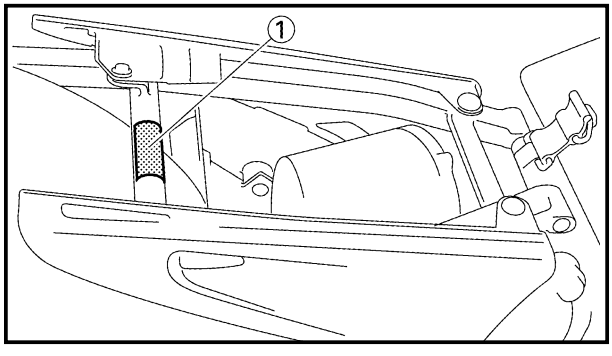
EC122001
FRAME SERIAL NUMBER (For F, D, GB, I and ZA)

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



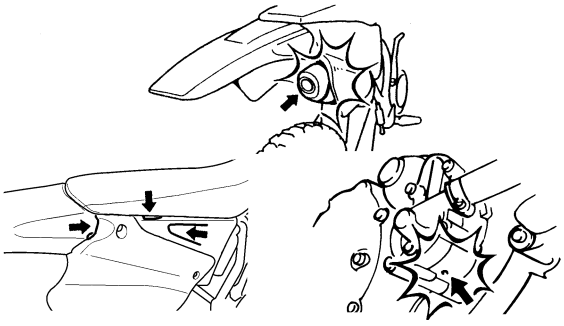
EC123001
ENGINE SERIAL NUMBER

The engine serial number ① is stamped into the elevated part of the right-side of the engine.



EC124000
MODEL LABEL

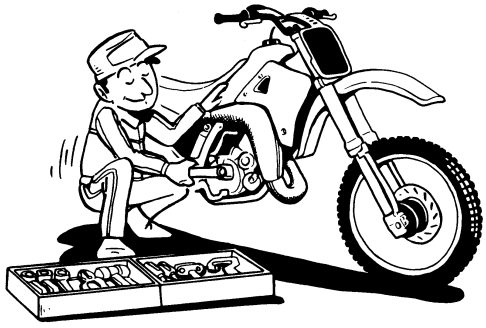
The model label ① is affixed to the frame under the rider's seat. This information will be needed to order spare parts.



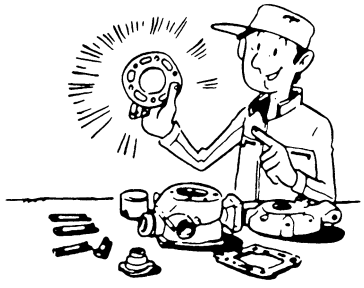
EC130000
IMPORTANT INFORMATION

EC131010
PREPARATION FOR REMOVAL AND DIS ASSEMBLY

1. Remove all dirt, mud, dust, and foreign material before removal and disassembly.
   When washing the machine with high pressured water, cover the parts as follows.
   - Silencer exhaust port
   - Side cover air intake port
   - Water pump housing hole at the bottom



2. Use proper tools and cleaning equipment. Refer to “SPECIAL TOOLS” section.



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.

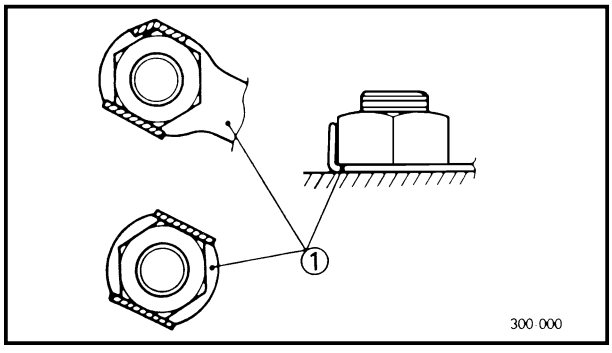
5. Keep away from fire.

EC132000
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.

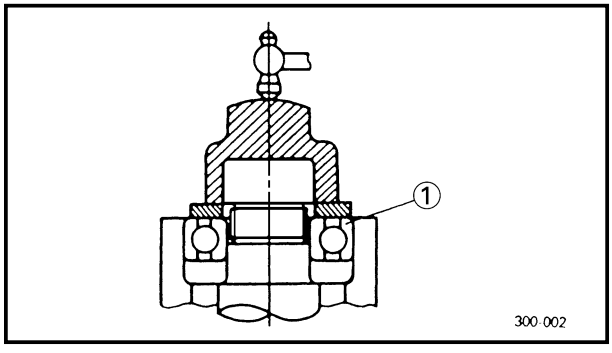
EC133000
GASKETS, OIL SEALS AND O-RINGS

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.



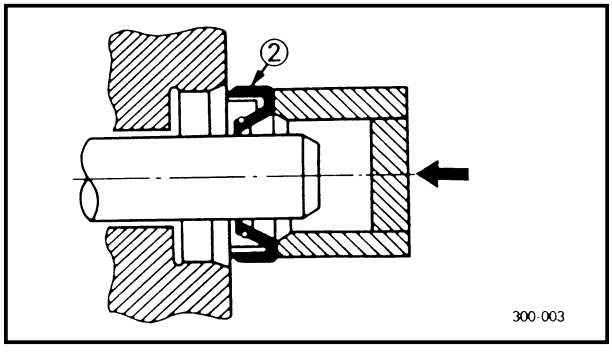
EC134000
LOCK WASHERS/PLATES AND COTTER PINS

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.



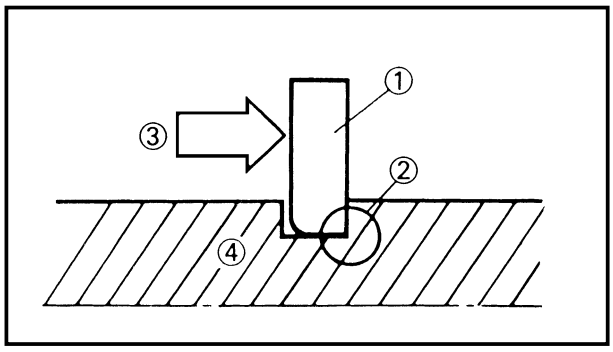
EC135001
BEARINGS AND OIL SEALS

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:

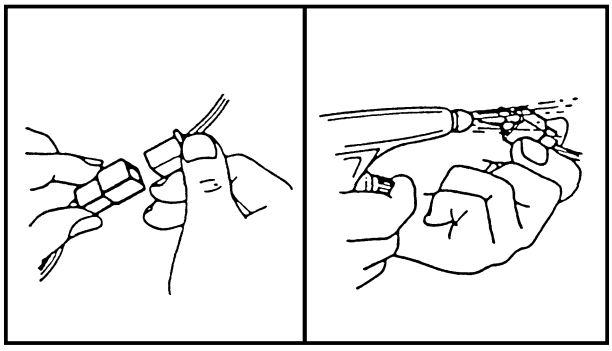
Do not use compressed air to spin the bearings dry. This causes damage to the bearing surfaces.



EC136000
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

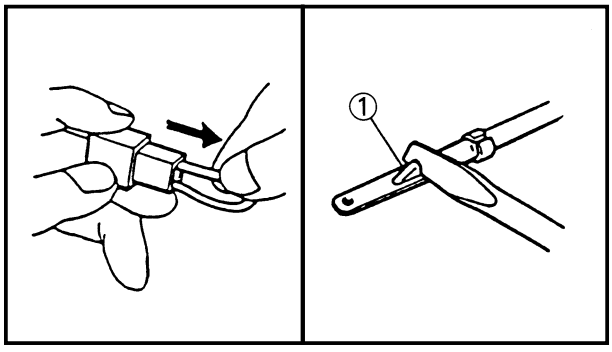


EC1C0001

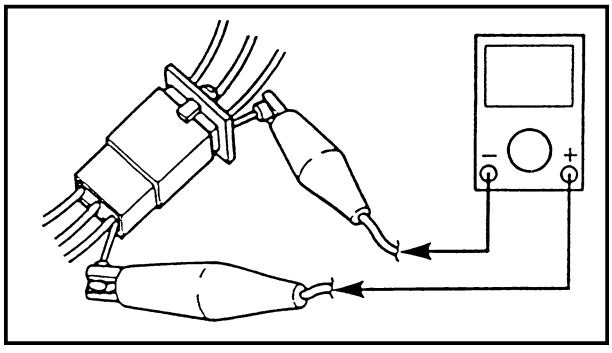
CHECKING OF CONNECTION

Dealing with stains, rust, moisture, etc. on the connector.

1. Disconnect:
   - Connector
2. Dry each terminal with an air blower.



3. Connect and disconnect the connector two or three times.
4. Pull the lead to check that it will not come off.
5. If the terminal comes off, bend up the pin ① and reinsert the terminal into the connector.

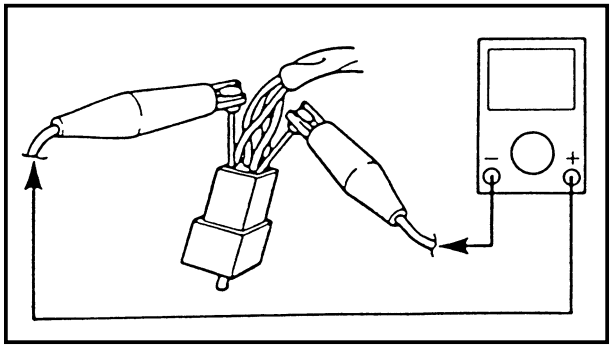


6. Connect:
   - Connector

NOTE:

The two connectors “click” together.

7. Check for continuity with a tester.



NOTE:

- If there in no continuity, clean the terminals.
- Be sure to perform the steps 1 to 7 listed above when checking the wireharness.
- For a field remedy, use a contact revitalizer available on the market.
- Use the tester on the connector as shown.

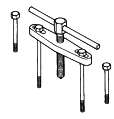
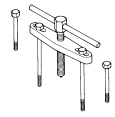
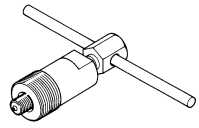
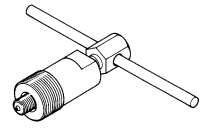
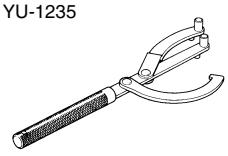
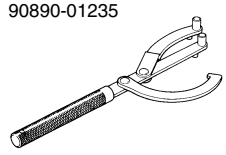
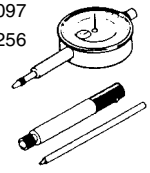
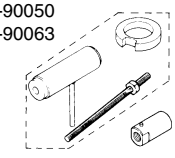
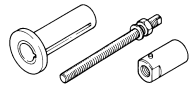
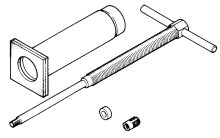
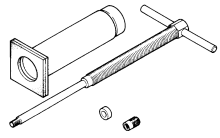
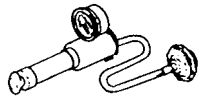
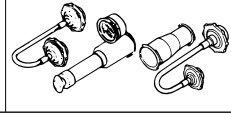
EC140002

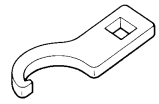
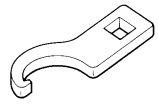
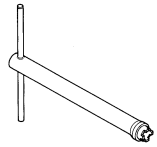
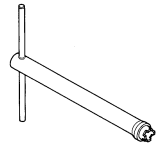
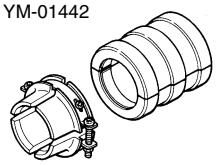
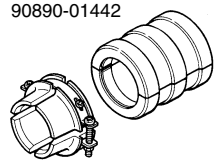
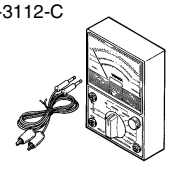
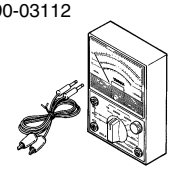
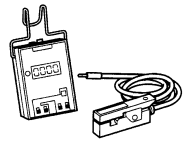
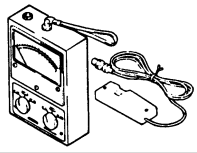
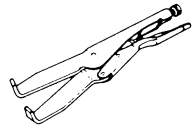
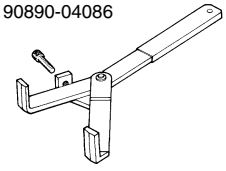
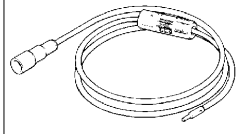
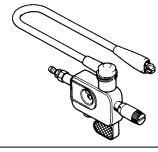
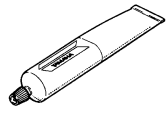
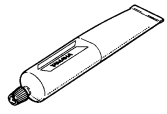
SPECIAL TOOLS

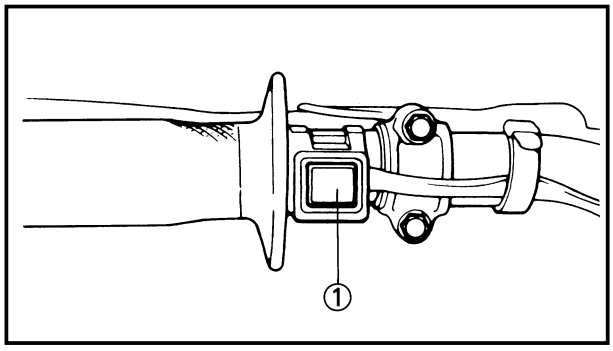
The proper special tools are necessary for complete and accurate tune-up and assembly. Using the correct special tool will help prevent damage caused by the use of improper tools or improvised techniques. The shape and part number used for the special tool differ by country, so two types are provided. Refer to the list provided to avoid errors when placing an order.

NOTE:

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

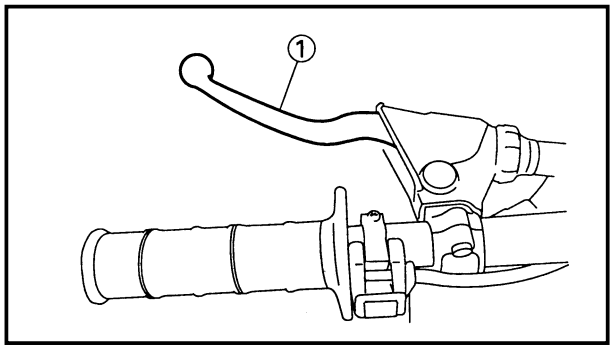
Part number	Tool name / How to use	Illustration	
YU-1135-A, 90890-01135	Crankcase separating tool This tool is used to split the crankcase as well as remove the crankshaft from either case.	YU-1135-A 	90890-01135 
YM-1189, 90890-01189	Flywheel puller This tool is used to remove the flywheel magneto.	YM-1189 	90890-01189 
YU-1235, 90890-01235	Rotor holding tool This tool is used when loosening or tightening the flywheel magneto securing nut.	YU-1235 	90890-01235 
YU-3097, 90890-01252 YU-1256	Dial gauge and stand Spark plug hole dial stand These tools are used to set the ignition timing.	YU-3097 YU-1256 	90890-01252 
YU-90050, 90890-01274 YU-90050, 90890-01275 YU-90063, 90890-01278	Crankcase installing tool Pot Bolt Adapter These tools are used to install the crankshaft.	YU-90050 YU-90063 	90890-01274 90890-01275 90890-01278 
YU-1304, 90890-01304	Piston pin puller This tool is used to remove the piston pin.	YU-1304 	90890-01304 
YU-24460-01,90890-01325 YU-33984, 90890-01352	Radiator cap tester Adapter These tools are used for checking the cooling system.	YU-24460-01 YU-33984 	90890-01325 90890-01352 

Part number	Tool name / How to use	Illustration	
YU-33975, 90890-01403	Ring nut wrench This tool is used when tighten the steering ring nut to specification.	YU-33975 	90890-01403 
YM-1423, 90890-01423	Damper rod holder Use this tool to remove and install the damper rod.	YM-1423 	90890-01423 
YM-01442, 90890-01442	Fork seal driver This tool is used when install the fork oil seal.	YM-01442 	90890-01442 
YU-3112-C, 90890-03112	Yamaha pocket tester Use this tool to inspect the coil resistance, output voltage and amperage.	YM-3112-C 	90890-03112 
YU-8036-B 90890-03113	Inductive tachometer Engine tachometer This tool is needed for observing engine rpm.	YU-8036-B 	90890-03113 
YM-91042, 90890-04086	Clutch holding tool This tool is used to hold the clutch when removing or installing the clutch boss securing nut.	YM-91042 	90890-04086 
YM-34487 90890-06754	Dynamic spark tester Ignition checker This instrument is necessary for checking the ignition system components.	YM-34487 	90890-06754 
ACC-QUICK-GS-KT 90890-85505	Quick gasket ® YAMAHA Bond No. 1215 This sealant (Bond) is used for crankcase mating surface, etc.	ACC-QUICK-GS-KT 	90890-85505 

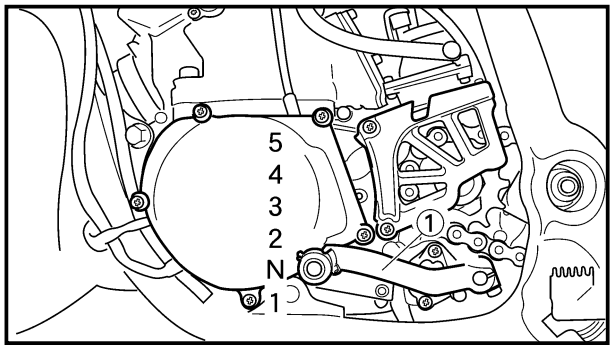


EC150000
CONTROL FUNCTIONS

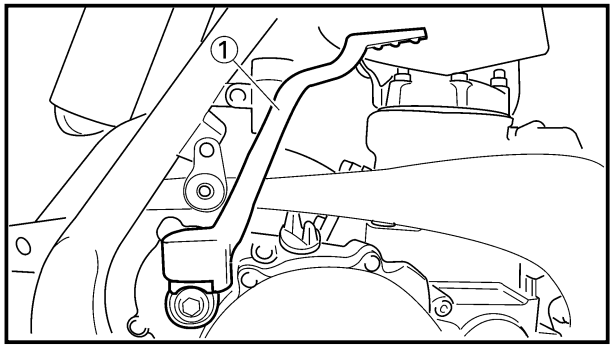
EC151000
"ENGINE STOP" BUTTON
The "ENGINE STOP" button ① is located on the left handlebar. Continue pushing the "ENGINE STOP" button till the engine comes to a stop.



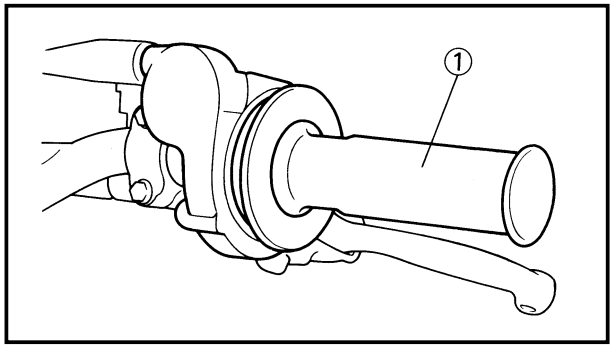
EC152000
CLUTCH LEVER
The clutch lever ① is located on the left handlebar; it disengages or engages the clutch. Pull the clutch lever to the handlebar to disengage the clutch, and release the lever to engage the clutch. The lever should be pulled rapidly and released slowly for smooth starts.



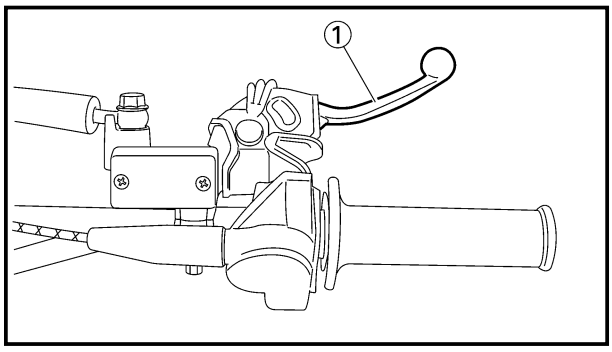
EC153000
SHIFT PEDAL
The gear ratios of the constant-mesh 5 speed transmission are ideally spaced. The gears can be shifted by using the shift pedal ① on the left side of the engine.



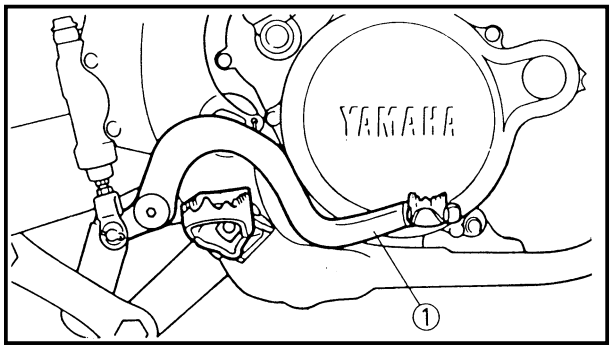
EC154000
KICK STARTER
Rotate the kick starter ① away from the engine. Push the starter down lightly with your foot until the gears engage, then kick smoothly and forcefully to start the engine. This model has a primary kick starter so the engine can be started in any gear if the clutch is disengaged. In normal practices, however, shift to neutral before starting.



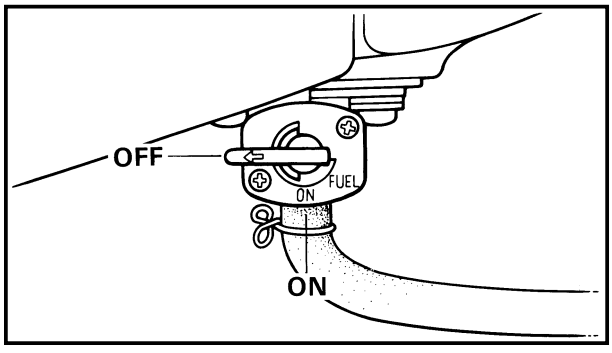
EC155001
THROTTLE GRIP
The throttle grip ① is located on the right handlebar; it accelerates or decelerates the engine. For acceleration, turn the grip toward you; for deceleration, turn it away from you.



EC156000
FRONT BRAKE LEVER
The front brake lever ① is located on the right handlebar. Pull it toward the handlebar to activate the front brake.



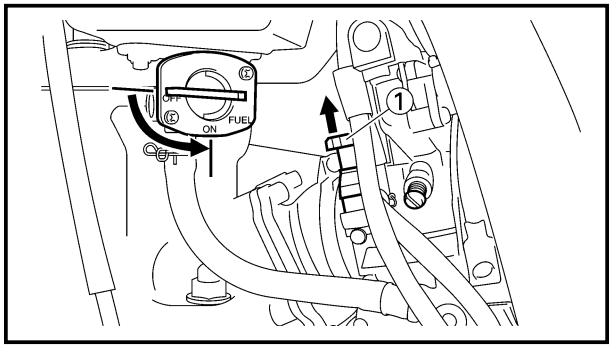
EC157000
REAR BRAKE PEDAL
The rear brake pedal ① is located on the right side of the machine. Press down on the brake pedal to activate the rear brake.



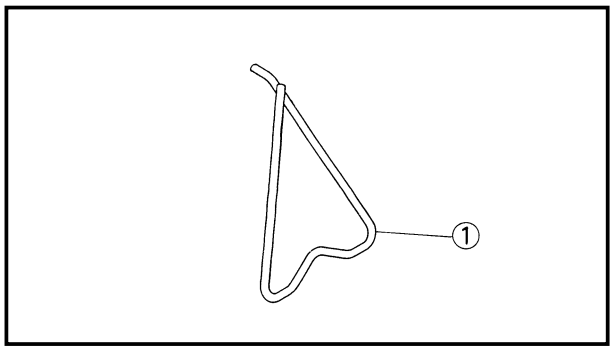
EC158001
FUEL COCK
The fuel cock supplies fuel from the tank to carburetor while filtering the fuel. The fuel cock has the two positions:

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.



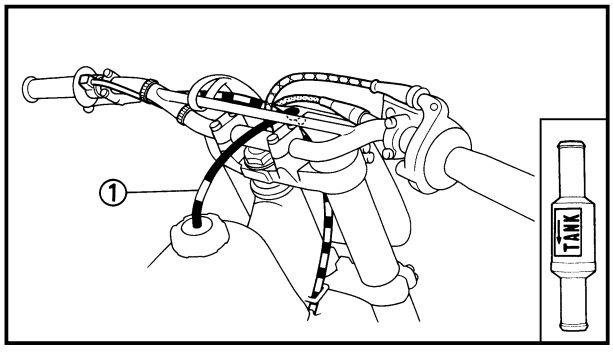
EC159000
STARTER KNOB (CHOKE)
When cold, the engine requires a richer air-fuel mixture for starting. A separate starter circuit, which is controlled by the starter knob ①, supplies this mixture. Pull the starter knob out to open the circuit for starting. When the engine has warmed up, push it in to close the circuit.



EC15R001
DETACHABLE SIDESTAND
This sidestand ① is used to support only the machine when standing or transporting it.

⚠WARNING

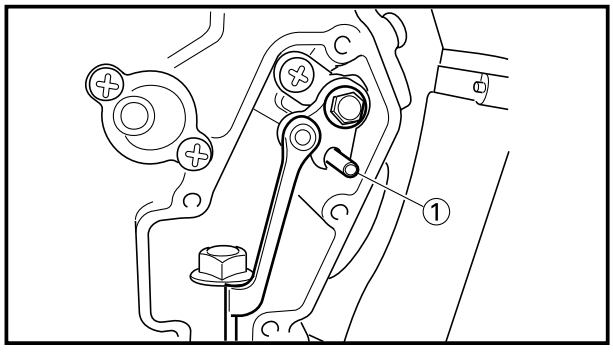
- **Never apply additional force to the sidestand.**
- **Remove this sidestand before starting out.**



EC15F000
VALVE JOINT
This valve joint ① prevents fuel from flowing out and is installed to the fuel tank breather hose.

CAUTION:

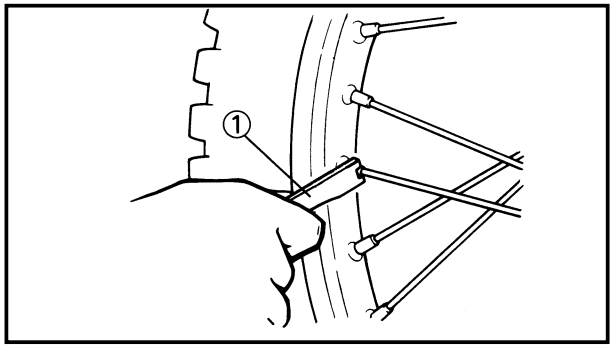
In this installation, make sure the arrow faces the fuel tank and also downward.



EC15f000
SET PIN
This set pin ① is used to remove and install the push rod of the engine.

CAUTION:

Be sure to use the set pin. If the set pin is not used, the power valve constituent parts will result in damage.



EC15e000
NIPPLE WRENCH
This nipple wrench ① is used to tighten the spoke.

EC160051

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 ZA:
Premium unleaded gasoline only with a research octane number of 95 or higher.
For ZA:
Premium gasoline

NOTE:

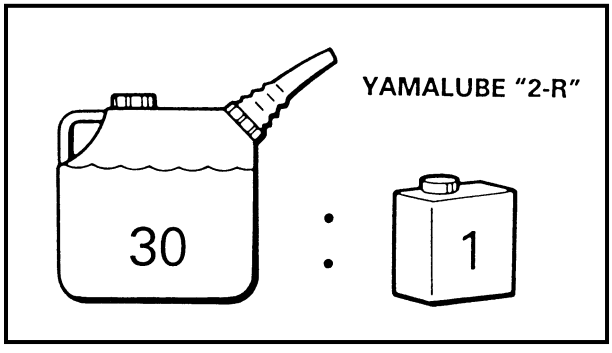
If knocking or pinging occurs, use a different brand of gasoline or higher octane grade.

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:
8.0 L (1.76 Imp gal, 2.11 US gal)

Mixing oil
Recommended oil:
Yamalube "2-R"
(Yamalube racing 2-cycle oil)
Mixing ratio: 30 : 1
If unavailable, use an equivalent type of oil.



EC190000
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.

EC191001
STARTING A COLD ENGINE

1. Shift the transmission into neutral.
2. Turn the fuel cock to “ON” and full open the starter knob (CHOKE).
3. With the throttle completely closed start the engine by kicking the kick starter forcefully 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 knob (CHOKE) turned off.

CAUTION:

Do not warm up the engine for extended periods.

EC193001
STARTING A WARM ENGINE

Do not operate the starter knob (CHOKE). Open the throttle slightly and start the engine by kicking the kick starter forcefully with firm stroke.

CAUTION:

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

EC194001
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 “2-R”	15:1

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.

EC1A0013

TORQUE-CHECK POINTS

- Frame construction
  - Frame to rear frame
  - Combined seat and tank
    - Fuel tank to frame
- Engine mounting
  - Frame to engine
  - Engine bracket to engine
  - Engine bracket to frame
- Steering
  - Steering shaft to handlebar
    - Steering shaft to frame
    - 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
  - 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
  - Rear
    - Installation of swingarm
      - Tightening of pivot shaft
- Wheel
  - Installation of wheel
    - Front
      - Tightening of front axle
      - Tightening of axle holder
    - Rear
      - Tightening of rear axle
      - Wheel to sprocket
- Brake
  - Front
    - Caliper to front fork
    - Brake disc to wheel
    - Tightening of union bolt
    - Master cylinder to handlebar
    - Tightening of air bleeder
  - Rear
    - Brake pedal to frame
    - Brake disc to wheel
    - Tighening of union bolt
    - Master cylinder to frame
    - Tightening of air bleeder
- Fuel system
  - Fuel tank to fuel cock

NOTE:

Concerning the tightening torque, refer to " MAINTENANCE SPECIFICATIONS" section in the CHAPTER 2.

EC1B0000
CLEANING AND STORAGE

EC1B1000
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.

EC1B2001
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 10W-30 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.

EC200000
SPECIFICATIONS
EC211000
GENERAL SPECIFICATIONS

Model name:	YZ250LC (EUROPE) YZ250R (USA) YZ250(R) (CDN, AUS, NZ, ZA)			
Model code number:	5UP1 (USA, CDN, ZA) 5UP2 (EUROPE) 5UP4 (AUS, NZ)			
Dimensions:	USA, ZA	AUS, NZ	EUROPE	CDN
Overall length	2,183 mm (85.9 in)	←	2,182 mm (85.9 in)	←
Overall width	827 mm (32.6 in)	←	←	←
Overall height	1,309 mm (51.5 in)	1,296 mm (51.0 in)	1,302 mm (51.3 in)	1,307 mm (51.5 in)
Seat height	991 mm (39.0 in)	←	990 mm (39.0 in)	←
Wheelbase	1,481 mm (58.3 in)	←	1,485 mm (58.5 in)	←
Minimum ground clearance	395 mm (15.6 in)	←	393 mm (15.5 in)	←
Basic weight: With oil and full fuel tank	104.5 kg (230.4 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) 66.4 × 72 mm (2.614 × 2.835 in) 9.1~10.9 : 1 (For USA, CDN and ZA) 9.0~10.6 : 1 (For EUROPE, AUS and NZ) Kick starter			
Lubrication system:	Premix (30 : 1)(Yamalube 2-R)			
Oil type or grade (2-Cycle): Transmission oil Periodic oil change Total amount	 Yamalube 4 (10W-30) or SAE 10W-30 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):	1.20 L (1.06 Imp qt, 1.27 US qt)			
Air filter:	Wet type element			
Fuel: Type Tank capacity	 Except for ZA: Premium unleaded gasoline only with a research octane number of 95 or higher For ZA: Premium gasoline 8.0 L (1.76 Imp gal, 2.11 US gal)			

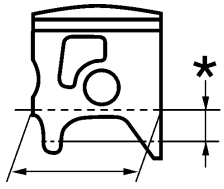
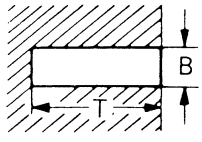
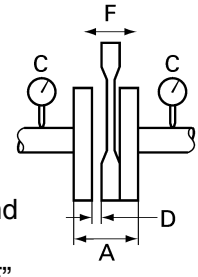
Carburetor:		
Type/Manufacturer	PWK38S/KEIHIN	
Spark plug:		
Type/Manufacturer	BR8EG/NGK (resistance type)	
Gap	0.5~0.6 mm (0.020~0.024 in)	
Clutch type:	Wet, multiple-disc	
Transmission:	USA, ZA, AUS, NZ	EUROPE, CDN
Primary reduction system	Gear	←
Primary reduction ratio	63/21 (3.000)	←
Secondary reduction system	Chain drive	←
Secondary reduction ratio	50/14 (3.571)	49/14 (3.500)
Transmission type	Constant mesh, 5-speed	←
Operation	Left foot operation	←
Gear ratio: 1st	27/14 (1.929)	←
2nd	23/15 (1.533)	←
3rd	23/18 (1.278)	←
4th	24/22 (1.091)	←
5th	20/21 (0.952)	←
Chassis:	USA, ZA, AUS, NZ	EUROPE, CDN
Frame type	Semi double cradle	←
Caster angle	27.0°	26.8°
Trail	118 mm (4.65 in)	114 mm (4.49 in)
Tire:		
Type	With tube	
Size (front)	80/100-21 51M	
Size (rear)	110/90-19 62M	
Tire pressure (front and rear)	100 kPa (1.0 kgf/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	Coil spring/oil damper	
Rear shock absorber	Coil spring/Gas, oil damper	
Wheel travel:		
Front wheel travel	300 mm (11.8 in)	
Rear wheel travel	315 mm (12.4 in)	
Electrical:		
Ignition system	CDI magneto	

EC212000

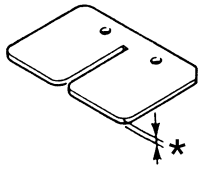
MAINTENANCE SPECIFICATIONS

EC212100

ENGINE

Item	Standard		Limit
Cylinder head:	USA, CDN, ZA, AUS, NZ	EUROPE	
Combustion chamber capacity	21.0 cm³ (0.739 Imp oz, 0.710 US oz)	21.5 cm³ (0.757 Imp oz, 0.727 US oz)	…
Warp limit	…	…	0.03 mm (0.0012 in)
Cylinder:			
Bore size	66.400~66.414 mm (2.6142~2.6147 in)		66.5 mm (2.618 in)
Taper limit	…		0.05 mm (0.0020 in)
Out of round limit	…		0.01 mm (0.0004 in)
Piston:			
Piston size/ 	66.352~66.367 mm (2.6120~2.6129 in)		…
Measuring point*	17.5 mm (0.69 in)		…
Piston clearance	0.045~0.050 mm (0.0018~0.0020 in)		0.1 mm (0.004 in)
Piston offset	1.5 mm (0.059 in)/EX-side		…
Piston pin:			
Piston pin outside diameter	17.995~18.000 mm (0.7085~0.7087 in)		17.975 mm (0.7077 in)
Piston ring:			
Sectional sketch 	Plain		…
	B=1.0 mm (0.039 in)		…
	T=2.55 mm (0.100 in)		…
End gap (installed)	0.40~0.55 mm (0.016~0.022 in)		0.95 mm (0.037 in)
Side clearance (installed) : 1st	0.030~0.065 mm (0.0012~0.0026 in)		0.1 mm (0.004 in)
: 2nd	0.030~0.065 mm (0.0012~0.0026 in)		0.1 mm (0.004 in)
Crankshaft: 			
Crank width “A”	59.95~60.00 mm (2.360~2.362 in)		…
Runout limit “C”	0.03 mm (0.0012 in)		0.05 mm (0.0020 in)
Connecting rod big end side clearance “D”	0.25~0.75 mm (0.010~0.030 in)		…
Small end free play “F”	0.4~1.0 mm (0.016~0.039 in)		2.0 mm (0.08 in)
Clutch:			
Friction plate thickness	2.9~3.1 mm (0.114~0.122 in)		2.8 mm (0.110 in)
Quantity	8		…
Clutch plate thickness	1.5~1.7 mm (0.059~0.067 in)		…
Quantity	7		…
Warp limit	…		0.2 mm (0.008 in)
Clutch spring free length	50.0 mm (1.969 in)		48.0 mm (1.890 in)
Quantity	6		…

Item		Standard		Limit
Clutch housing thrust clearance		0.17~0.23 mm (0.007~0.009 in)		…
Clutch housing radial clearance		0.030~0.055 mm (0.001~0.002 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 ratchet type		…
Air filter oil grade (oiled filter):		Foam-air-filter oil or equivalent oil		…
Carburetor:		USA, CDN, ZA, AUS, NZ	EUROPE	
Type/Manufacturer		PWK38S/KEIHIN	←	…
I.D. mark		5NX1 00	5UP2 10	…
Main jet	(M.J.)	#178	#180	…
Main air jet	(M.A.J)	#200	←	…
Jet needle-clip position	(J.N.)	N3EJ-2	N3EW-3	…
Main nozzle	(N.J.)	ø2.9	←	…
Cutaway	(C.A.)	#7	←	…
Pilot jet	(P.J.)	#50	#52	…
Pilot air screw (for reference only)	(P.A.S.)	1	7/8	…
Valve seat size	(V.S.)	ø3.8 mm (0.15 in)	←	…
Starter jet	(G.S.)	#85	←	…
Power jet	(P.W.J.)	#50	←	…
Float arm height	(F.H.)	5.5~7.5 mm (0.22~030 in)	←	…
Reed valve:				
Thickness*		0.42 mm (0.017 in)		…
Valve stopper height		10.3~10.7 mm (0.406~0.421 in)		…
Valve bending limit		…		0.2 mm (0.008 in)
Cooling:				
Radiator core size:				
Width		107.8 mm (4.24 in)		…
Height		240 mm (9.45 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)		0.63 L (0.55 Imp qt, 0.67 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	20	2.0	14
Cylinder head (nut)	M 8 × 1.25	6	25	2.5	18
(stud)	M 8 × 1.25	6	13	1.3	9.4
Cylinder (nut)	M10 × 1.25	4	42	4.2	30
(stud)	M10 × 1.25	4	13	1.3	9.4
Power valve :					
Holder	M 5 × 0.8	2	6	0.6	4.3
Link rod	M 5 × 0.8	2	6	0.6	4.3
Push rod	M 5 × 0.8	1	5	0.5	3.6
Thrust plate	M 5 × 0.8	1	6	0.6	4.3
Side holder	M 5 × 0.8	4	4	0.4	2.9
Link lever	M 4 × 0.7	1	4	0.4	2.9
Pulley	M 4 × 0.7	2	4	0.4	2.9
Cover	M 5 × 0.8	4	4	0.4	2.9
Governor fork	M 4 × 0.7	2	5	0.5	3.6
Housing	M 5 × 0.8	4	5	0.5	3.6
Impeller	M 8 × 1.25	1	14	1.4	10
Water pump housing cover	M 6 × 1.0	4	10	1.0	7.2
Coolant drain bolt	M 6 × 1.0	1	10	1.0	7.2
Radiator	M 6 × 1.0	6	10	1.0	7.2
Radiator panel	M 6 × 1.0	2	10	1.0	7.2
Radiator hose clamp	M 6 × 1.0	8	1	0.1	0.7
Air filter element	M 6 × 1.0	1	2	0.2	1.4
Carburetor joint	M 6 × 1.0	5	10	1.0	7.2
Air filter case	M 6 × 1.0	4	8	0.8	5.8
Air filter guide clamp	M 5 × 0.8	1	1	0.1	0.7
Reed valve	M 3 × 0.5	4	1	0.1	0.7
Exhaust pipe (front)	M 6 × 1.0	1	14	1.4	10
Exhaust pipe (rear)	M 6 × 1.0	1	12	1.2	8.7
Exhaust pipe stay (front)	M 8 × 1.25	1	25	2.5	18
Exhaust pipe stay (rear)	M 6 × 1.0	1	12	1.2	8.7
Silencer (front)	M 6 × 1.0	1	12	1.2	8.7
Silencer (rear)	M 6 × 1.0	1	11	1.1	8.0
Fiber (silencer)	M 6 × 1.0	2	10	1.0	7.2
Crankcase	M 6 × 1.0	11	14	1.4	10
Crankcase cover (left)	M 6 × 1.0	5	8	0.8	5.8
Chain cover	M 6 × 1.0	2	8	0.8	5.8
Crankcase cover (right)	M 6 × 1.0	9	10	1.0	7.2
Bearing plate cover (drive axle left)	M 6 × 1.0	2	10	1.0	7.2
Bearing plate cover (main axle right)	M 6 × 1.0	2	10	1.0	7.2
Holder	M 6 × 1.0	2	10	1.0	7.2
Oil drain bolt	M12 × 1.5	1	20	2.0	14
Oil check bolt	M 6 × 1.0	1	10	1.0	7.2
Kick starter	M 8 × 1.25	1	30	3.0	22
Ratchet wheel stopper	M 6 × 1.0	2	10	1.0	7.2
Clutch cover	M 6 × 1.0	6	10	1.0	7.2

Part to be tightened	Thread size	Q'ty	Tightening torque		
			Nm	m•kg	ft•lb
Primary drive gear	M10 × 1.25	1	55	5.5	40
Clutch boss	M20 × 1.0	1	75	7.5	54
Clutch spring	M 6 × 1.0	6	10	1.0	7.2
Push lever axle	M 5 × 0.8	1	6	0.6	4.3
Drive sprocket	M20 × 1.0	1	75	7.5	54
Shift guide	M 6 × 1.0	2	10	1.0	7.2
Stopper lever	M 6 × 1.0	1	10	1.0	7.2
Torsion spring (shift shaft) stopper bolt	M 8 × 1.25	1	22	2.2	16
Segment	M 8 × 1.25	1	30	3.0	22
Bearing plate cover (shift cam right)	M 6 × 1.0	2	10	1.0	7.2
Shift pedal	M 6 × 1.0	1	10	1.0	7.2

EC212201
CHASSIS

Item	Standard		Limit
Steering system:			
Steering bearing type	Taper roller bearing		…
Front suspension:	USA, CDN, ZA, AUS, NZ	EUROPE	
Front fork travel	300 mm (11.8 in)	←	…
Fork spring free length	460 mm (18.1 in)	←	455 mm (17.9 in)
Spring rate, STD	K=4.22 N/mm (0.430 kg/mm, 24.1 lb/in)	K=Approx. 4.22 N/mm (0.430 kg/mm) 24.1 lb/in	…
Optional spring/Spacer	Yes	←	…
Oil capacity	568 cm^3 (20.0 Imp oz, 19.2 US oz)	←	…
Oil level	135 mm (5.31 in)	←	…
<Min.~Max.> (From top of outer tube with inner tube and damper rod fully compressed without spring.)	80~150 mm (3.15~5.91 in)	←	…
Oil grade	Suspension oil “01”	←	…
Inner tube outer diameter	46 mm (1.81 in)	←	…
Front fork top end	Zero mm (Zero in)	←	…
Rear suspension:	USA, CDN, ZA, AUS,NZ	EUROPE	
Shock absorber travel	132 mm (5.20 in)	←	…
Spring free length	260 mm (10.24 in)	275 mm (10.83 in)	…
Fitting length	251 mm (9.88 in)	261 mm (10.28 in)	…
<Min.~Max.>	240.5~258.5 mm (9.47~10.18 in)	255.5~273.5 mm (10.06~10.77 in)	…
Spring rate, STD	K=48 N/mm (4.9 kg/mm, 274.4 lb/in)	K=Approx. 48 N/mm (4.9 kg/mm, 274.4 lb/in)	…
Optional spring	Yes	←	…
Enclosed gas pressure	1,000 kPa (10 kg/cm^2, 142 psi)	←	…
Swingarm:			
Swingarm free play limit			
End	…		1.0 mm (0.04 in)
Side clearance	…		0.2~0.9 mm (0.008~0.035 in)

Item	Standard	Limit
Wheel:		
Front wheel type	Spoke wheel	…
Rear wheel type	Spoke wheel	…
Front rim size/Material	21 × 1.60/Aluminum	…
Rear rim size/Material	19 × 2.15/Aluminum	…
Rim runout limit:		
Radial	…	2.0 mm (0.08 in)
Lateral	…	2.0 mm (0.08 in)
Drive chain		
Type/Manufacturer	DID520DMA2 SDH/DAIDO	…
Number of links	113 links + joint	…
Chain slack	40~50 mm (1.6~2.0 in)	…
Chain length (10 links)	…	152.5 mm (6.004 in)
Front disc brake:		
Disc outside dia. × Thickness	250 × 3.0 mm (9.84 × 0.12 in)	250 × 2.5 mm (9.84 × 0.10 in)
Pad thickness	4.4 mm (0.17 in)	1.0 mm (0.04 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	245 × 4.0 mm (9.65 × 0.16 in)	245 × 3.5 mm (9.65 × 0.14 in)
Deflection limit	…	0.15 mm (0.006 in)
Pad thickness	6.4 mm (0.25 in)	1.0 mm (0.04 in)
Master cylinder inside dia.	11.0 mm (0.433 in)	…
Caliper cylinder insdie dia.	25.4 mm (1.000 in)	…
Brake fluid type	DOT #4	…
Brake lever & brake pedal:		
Brake lever position	95 mm (3.74 in)	…
Brake pedal height (vertical height above footrest top)	Zero mm (Zero in)	…
Clutch lever free play (lever end)	8~13 mm (0.31~0.51 in)	…
Throttle grip free play	3~5 mm (0.12~0.20 in)	…

	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	M24 × 1.0	1	145	14.5	105
△	Handlebar holder (upper)	M 8 × 1.25	4	28	2.8	20
△	Steering ring nut	M28 × 1.0	1	Refer to NOTE.		
	Front fork and cap bolt	M48 × 1.0	2	30	3.0	22
	Front fork and base valve	M30 × 1.0	2	55	5.5	40
	Cap bolt and damper rod (front fork)	M12 × 1.25	2	29	2.9	21
	Bleed screw (front fork) and cap bolt	M 5 × 0.8	2	1	0.1	0.7
	Front fork and protector	M 6 × 1.0	6	10	1.0	7.2
	Front fork and brake hose holder	M 6 × 1.0	2	10	1.0	7.2
	Front fork and hose cover	M 8 × 1.25	1	16	1.6	11
	Front fork and hose cover	M 6 × 1.0	1	7	0.7	5.1
	Throttle cable cap	M 4 × 0.7	2	1	0.1	0.7
	Grip cap upper and lower	M 6 × 1.0	2	4	0.4	2.9
	Clutch lever (bolt)	M 6 × 1.0	1	2	0.2	1.4
	Clutch lever holder	M 5 × 0.8	2	4	0.4	2.9
△	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
	Brake lever mounting (bolt)	M 6 × 1.0	1	6	0.6	4.3
	Brake lever mounting (nut)	M 6 × 1.0	1	6	0.6	4.3
	Brake lever position locknut	M 6 × 1.0	1	5	0.5	3.6
	Cable guide (front brake hose) and guide stay	M 5 × 0.8	1	4	0.4	2.9
△	Front brake hose union bolt (master cylinder)	M10 × 1.25	1	30	3.0	22
△	Front brake hose union bolt (caliper)	M10 × 1.25	1	30	3.0	22
△	Front brake caliper and front fork	M 8 × 1.25	2	23	2.3	17
	Brake caliper (front and rear) and pad pin plug	M10 × 1.0	1	3	0.3	2.2
△	Brake caliper (front and rear) and pad pin	M10 × 1.0	1	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 and nut	M16 × 1.5	1	105	10.5	75
△	Front wheel axle holder	M 8 × 1.25	4	23	2.3	17
△	Front brake disc and wheel hub	M 6 × 1.0	6	12	1.2	8.7
△	Rear brake disc and wheel hub	M 6 × 1.0	6	14	1.4	10
△	Brake pedal mounting	M 8 × 1.25	1	26	2.6	19
△	Rear brake master cylinder and frame	M 6 × 1.0	2	10	1.0	7.2

NOTE:

1. First, tighten the ring nut approximately 38 Nm (3.8 m•kg, 27 ft•lb) by using the ring nut wrench, then loosen the ring nut one turn.
2. Retighten the ring nut 7 Nm (0.7 m•kg, 5.1 ft•lb).

	Part to be tightened	Thread size	Q'ty	Tightening torque		
				Nm	m•kg	ft•lb
	Rear brake master cylinder cap	M 4 × 0.7	2	2	0.2	1.4
△	Rear brake hose union bolt (caliper)	M10 × 1.25	1	30	3.0	22
△	Rear brake hose union bolt (master cylinder)	M10 × 1.25	1	30	3.0	22
△	Rear wheel axle and nut	M20 × 1.5	1	125	12.5	90
△	Driven sprocket and wheel hub	M 8 × 1.25	6	42	4.2	30
△	Nipple (spoke)	–	72	3	0.3	2.2
	Disc cover and rear brake caliper	M 6 × 1.0	2	7	0.7	5.1
	Protector and rear brake caliper	M 6 × 1.0	2	7	0.7	5.1
	Chain puller adjust bolt and locknut	M 8 × 1.25	2	16	1.6	11
	Engine mounting:					
△	Engine bracket and frame	M 8 × 1.25	2	34	3.4	24
△	Engine and frame (front)	M10 × 1.25	1	69	6.9	50
△	Engine and frame (upper)	M10 × 1.25	1	69	6.9	50
△	Engine and frame (lower)	M10 × 1.25	1	69	6.9	50
△	Pivot shaft and nut	M16 × 1.5	1	85	8.5	61
△	Relay arm and swingarm	M14 × 1.5	1	80	8.0	58
△	Relay arm and connecting rod	M14 × 1.5	1	80	8.0	58
△	Connecting rod and frame	M14 × 1.5	1	80	8.0	58
△	Rear shock absorber and frame	M10 × 1.25	1	56	5.6	40
△	Rear shock absorber and relay arm	M10 × 1.25	1	53	5.3	38
△	Rear frame and frame (upper)	M 8 × 1.25	1	32	3.2	23
△	Rear frame and frame (lower)	M 8 × 1.25	2	29	2.9	21
	Swingarm and brake hose holder	M 5 × 0.8	4	1	0.1	0.7
	Swingarm and patch	M 4 × 0.7	4	2	0.2	1.4
	Drive chain tensioner mounting	M 8 × 1.25	2	19	1.9	13
	Chain support and swingarm	M 6 × 1.0	3	7	0.7	5.1
	Seal guard and swingarm	M 5 × 0.8	4	6	0.6	4.3
△	Fuel tank mounting	M 6 × 1.0	2	10	1.0	7.2
△	Fuel tank and fuel cock	M 6 × 1.0	2	7	0.7	5.1
	Fuel tank and seat set bracket	M 6 × 1.0	1	7	0.7	5.1
	Fuel tank and hooking screw (fitting band)	M 6 × 1.0	1	7	0.7	5.1
	Fuel tank and fuel tank bracket	M 6 × 1.0	4	7	0.7	5.1
	Seat mounting	M 8 × 1.25	2	19	1.9	13
	Side cover mounting	M 6 × 1.0	2	7	0.7	5.1
	Air scoop mounting	M 6 × 1.0	6	4	0.4	2.9
	Front fender mounting	M 6 × 1.0	4	7	0.7	5.1
	Rear fender mounting (front)	M 6 × 1.0	2	7	0.7	5.1
	Rear fender mounting (rear)	M 6 × 1.0	2	11	1.1	8.0
	Number plate	M 6 × 1.0	1	7	0.7	5.1

NOTE:

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

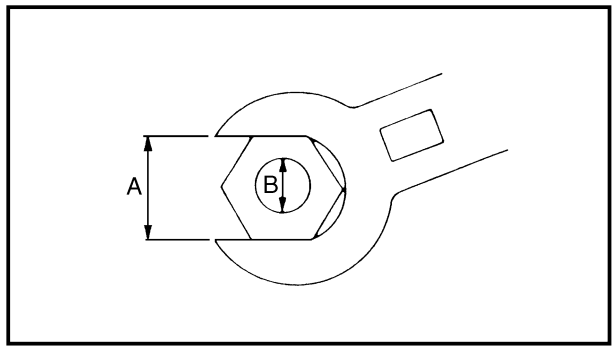
EC212300
ELECTRICAL

Item	Standard	Limit
Ignition system:		
Ignition timing (B.T.D.C.)	0.18 mm (0.007 in)	…
Advancer type	Electrical	…
CDI:		
Magneto-model (stator)/Manufacturer	5CU-02/YAMAHA	…
Source coil 1 resistance (color)	720~1,080 Ω at 20°C (68°F) (Black-Black/Red)	…
Source coil 2 resistance (color)	44~66 Ω at 20°C (68°F) (Green/Blue-Green/White)	…
Pickup coil resistance (color)	248~372 Ω at 20°C (68°F) (White/Blue-White/Red)	…
CDI unit-model/Manufacturer	5NX-00/YAMAHA	…
Ignition coil:		
Model/Manufacturer	4MX-00/YAMAHA	…
Minimum spark gap	6 mm (0.24 in)	…
Primary winding resistance	0.20~0.30 Ω at 20°C (68°F)	…
Secondary winding resistance	9.5~14.3 kΩ at 20°C (68°F)	…
Spark plug cap:		
Resistance	4~6 kΩ at 20°C (68°F)	…

Part to be tightened	Thread size	Q'ty	Tightening torque		
			Nm	m•kg	ft•lb
Stator	M 6 × 1.0	3	8	0.8	5.8
Rotor	M12 × 1.25	1	56	5.6	40
Ignition coil	M 6 × 1.0	2	7	0.7	5.1

EC220001
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	4.3
12 mm	8 mm	15	1.5	11
14 mm	10 mm	30	3.0	22
17 mm	12 mm	55	5.5	40
19 mm	14 mm	85	8.5	61
22 mm	16 mm	130	13	94

EC230000
DEFINITION OF UNITS

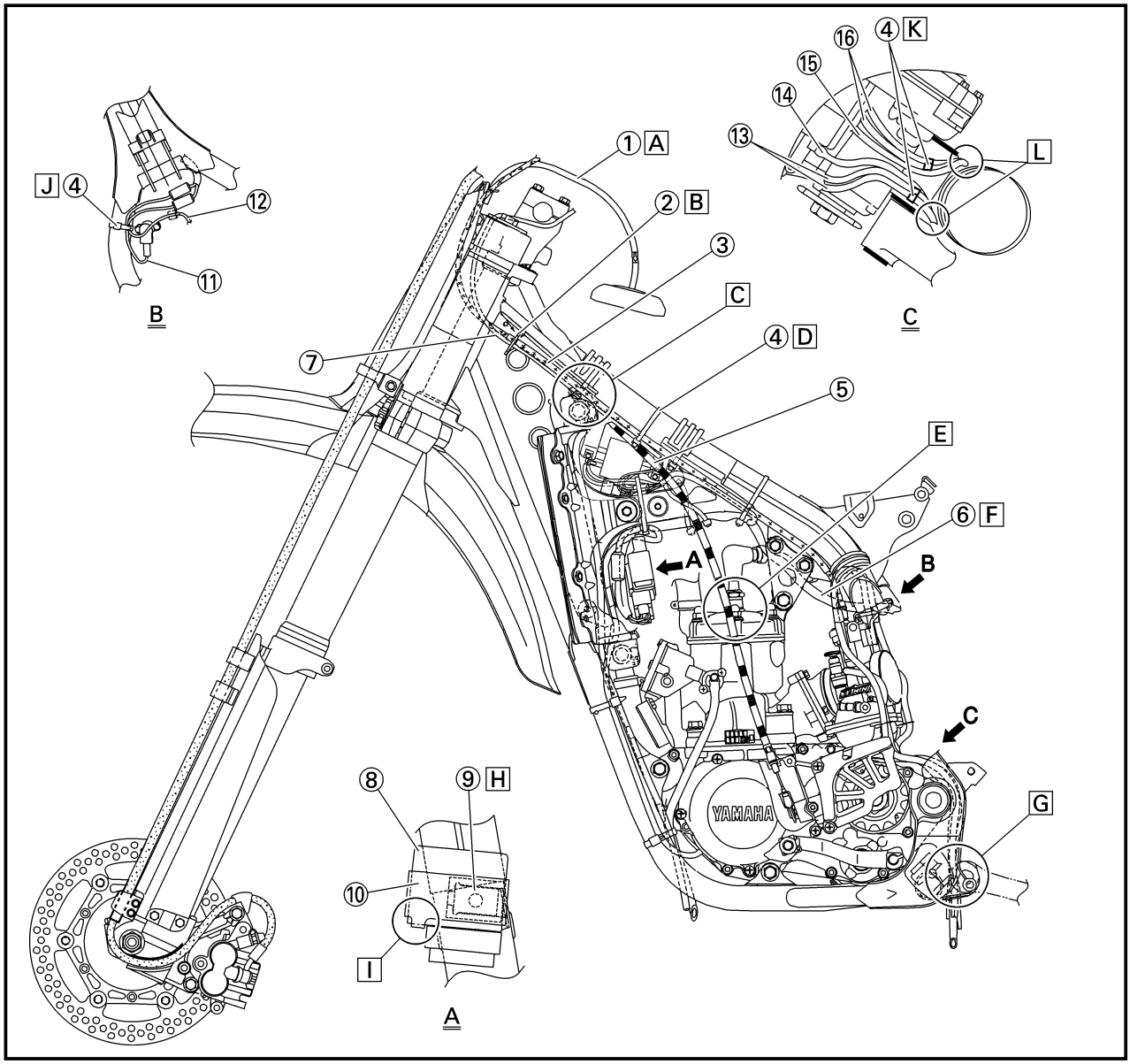
Unit	Read	Definition	Measure
mm cm	milimeter centimeter	10^{-3} meter 10^{-2} meter	Length Length
kg	kilogram	10^{3} gram	Weight
N	Newton	1 kg $\times$ m/sec^{2}	Force
Nm m•kg	Newton meter Meter kilogrma	N $\times$ m m $\times$ kg	Torque Torque
Pa	Pascal	N/m^{2}	Pressure
N/mm	Newton per millimeter	N/mm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

EC240000

CABLE ROUTING DIAGRAM

① Fuel tank breather hose
② Cable guide
③ Throttle cable
④ Clamp
⑤ Clutch cable
⑥ Wireharness
⑦ “ENGINE STOP” button lead
⑧ CDI unit
⑨ CDI unit stay
⑩ CDI unit band
⑪ TPS (throttle position sensor) lead
⑫ Solenoid valve lead
⑬ Air vent hose (left)
⑭ Transmission oil breather hose
⑮ Overflow hose
⑯ Air vent hose (right)

[A] Pass the fuel tank breather hose between the handlebar and tension bar, then insert its end into the hole of the number plate.
[B] Pass the throttle cable and “ENGINE STOP” button lead into the cable guide. Align with the cable guide the front end of the tape on the throttle cable.
[C] Pass the throttle cable and “ENGINE STOP” button lead over the radiator hose.
[D] Clamp the throttle cable and “ENGINE STOP” button lead with the clamp ends downward.
[E] Pass the clutch cable a little forward of the extreme left nut that holds the cylinder head.
[F] Pass the wireharness between the engine brackets.
[G] Pass the air vent hoses, overflow hose and transmission oil breather hose between the frame and connecting rod.
[H] Fit the CDI unit band into the CDI unit stay till it stops.
[I] Insert the CDI unit into the CDI unit band till it stops.
[J] Clamp the TPS (throttle position sensor) lead and solenoid valve lead at the side of the TPS with the clamp ends backward.
[K] Clamp the air vent hoses.
[L] Pass the air vent hoses, overflow hose and transmission oil breather hose so that all these hoses do not contact the rear shock absorber.



① Ground lead
② Ignition coil lead
③ Clamp
④ Wireharness
⑤ CDI magneto lead
⑥ YPVS breather hose
⑦ Radiator breather hose
⑧ Cable guide
⑨ "ENGINE STOP" button lead
⑩ Brake hose

[A] Pass the "ENGINE STOP" button lead on the inside of the ignition coil lead and ground lead.

[B] Clamp the "ENGINE STOP" button lead, ground lead, ignition coil lead, wireharness and CDI magneto lead with the clamp ends downward.
In so doing, clamp the "ENGINE STOP" button lead at its coupler and do not allow the CDI magneto lead to slacken.

[C] Pass the radiator breather hose outside the engine bracket and inside the down-tube.Pass the radiator breather hose inside the CDI magneto lead.

[D] Clamp the CDI magneto lead, radiator breather hose and YPVS breather hose. In so doing, clamp the CDI magneto lead at the rear of the down-tube with the clamp ends outward.

[E] Clamp the radiator breather hose and CDI magneto lead at the rear of the down-tube with the clamp ends outward.

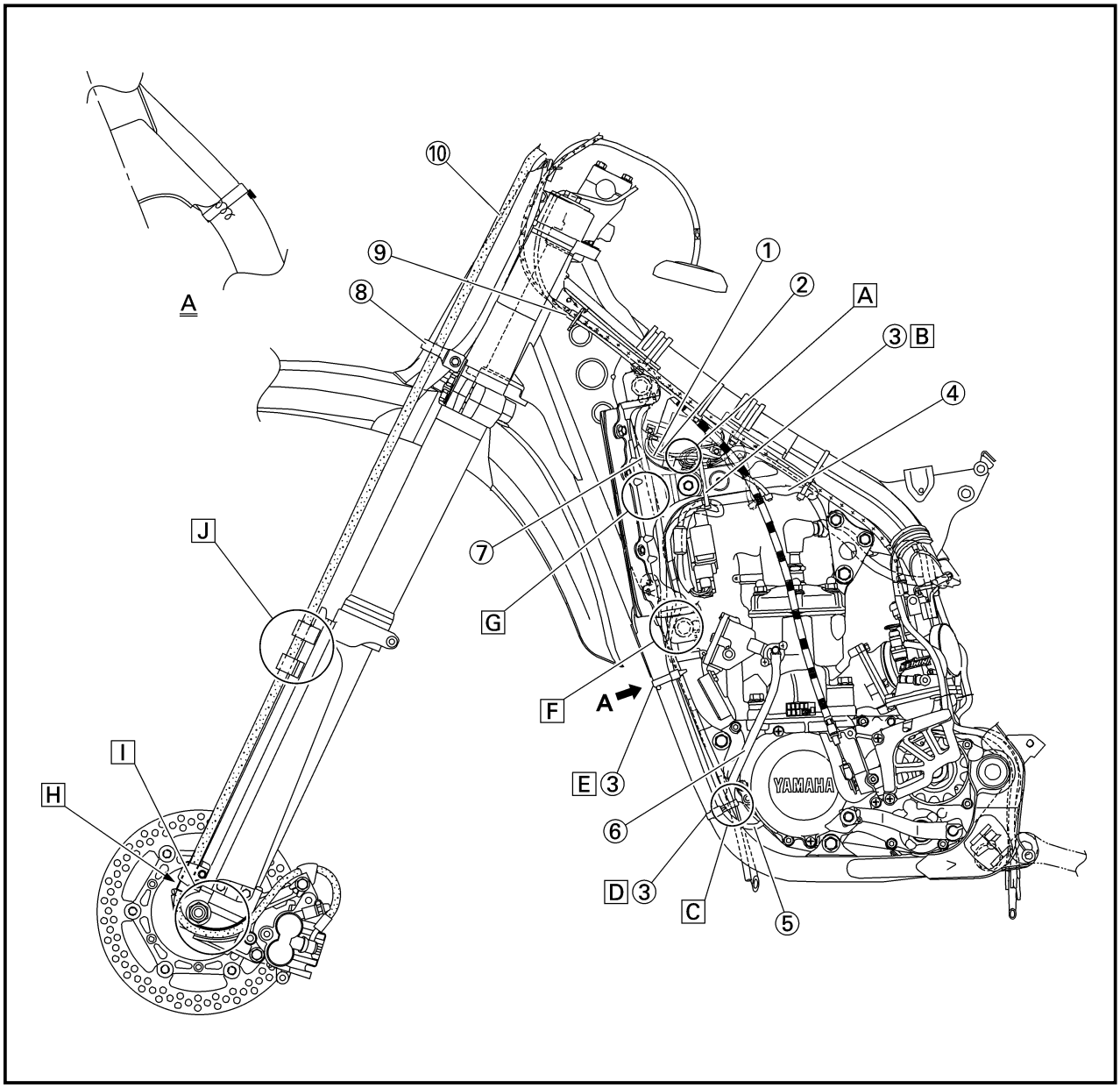
[F] Pass the radiator breather hose and CDI magneto lead in front of the radiator hose.

[G] Pass the radiator breather hose between the frame and radiator.

[H] Align the top of the brake hose neck with the brake hose holder bottom.

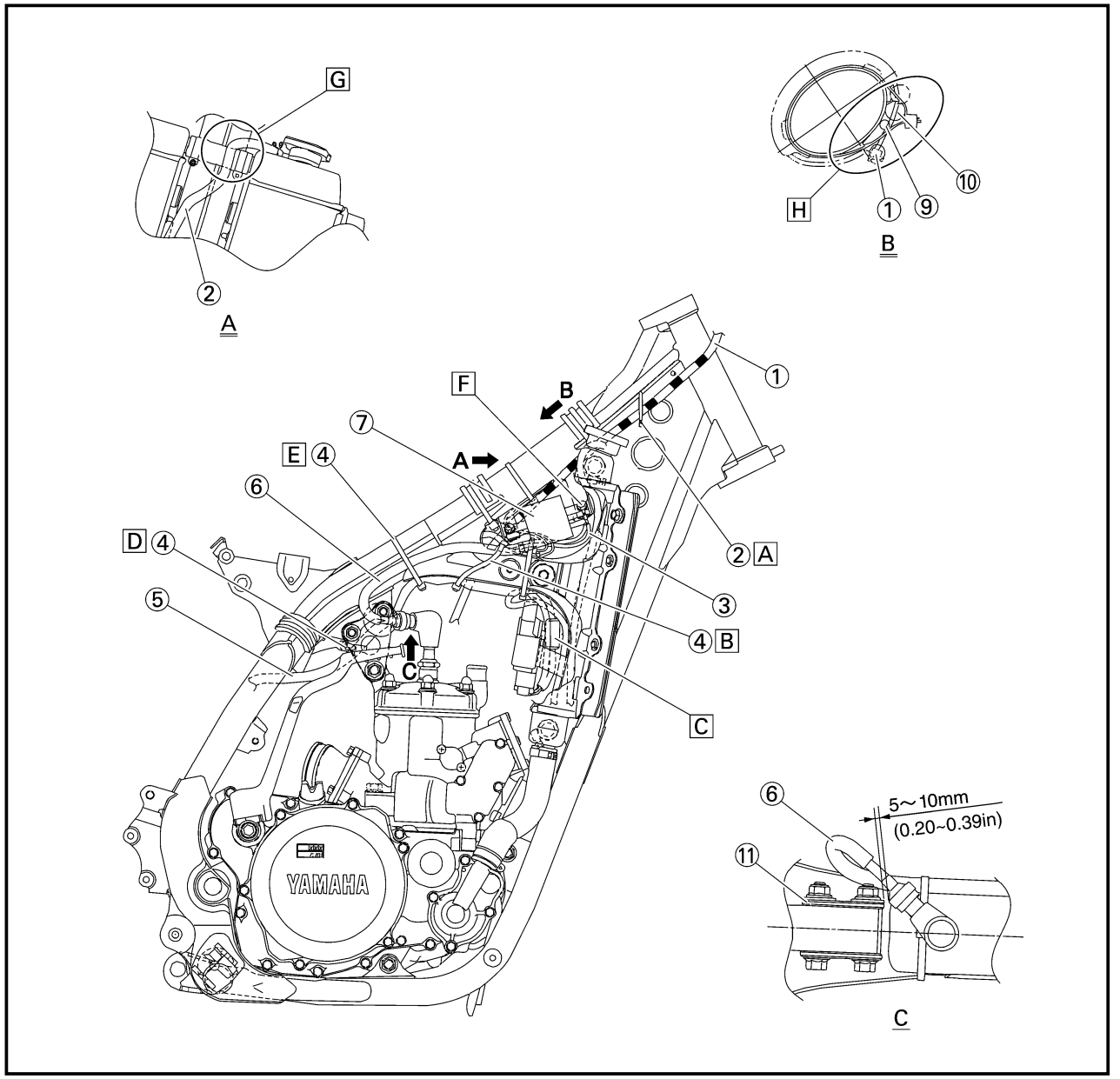
[I] Pass the brake hose in front of the axle boss,then fit it into the hose groove so that the brake hose does not contact the nut (wheel axle).

[J] Fit the brake hose into the guide on the protector.



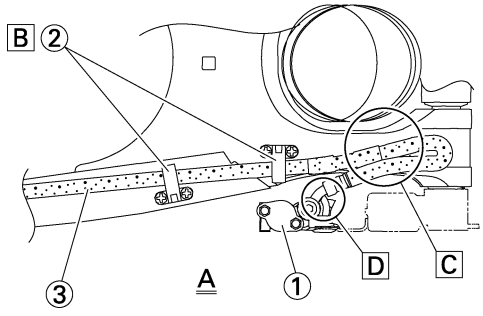
① Clutch cable
② Cable guide
③ Ground lead
④ Clamp
⑤ Wireharness
⑥ High tension cord
⑦ Ignition coil
⑧ Radiator breather hose
⑨ “ENGINE STOP” button lead
⑩ Throttle cable
⑪ Engine bracket

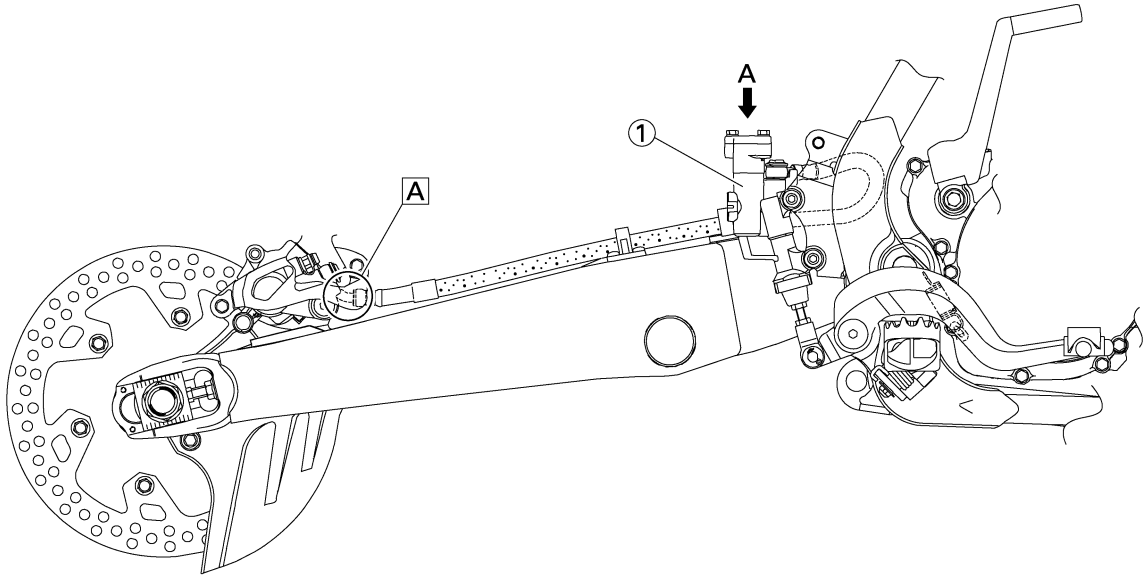
[A] Pass the clutch cable into the cable guide.
[B] Clamp the clutch cable, high tension cord and wireharness at the protector of the high tension cord so that the clamp passes with its ends downward, as shown.
[C] Position the CDI magneto lead coupler between the radiators.
[D] Clamp the wireharness to the right engine bracket.
[E] Clamp the high tension cord, throttle cable and wireharness with the clamp ends downward, so that the high tension cord does not contact the engine bracket installation nuts.
[F] Fasten the ground lead together with the front installation portion of the ingnition coil.
[G] Pass the radiator breather hose at the rear of the radiator hose and in front of the ignition coil bracket.
[H] Position the throttle cable, “ENGINE STOP” button lead and clutch cable as shown.



① Master cylinder
② Brake hose holder
③ Brake hose

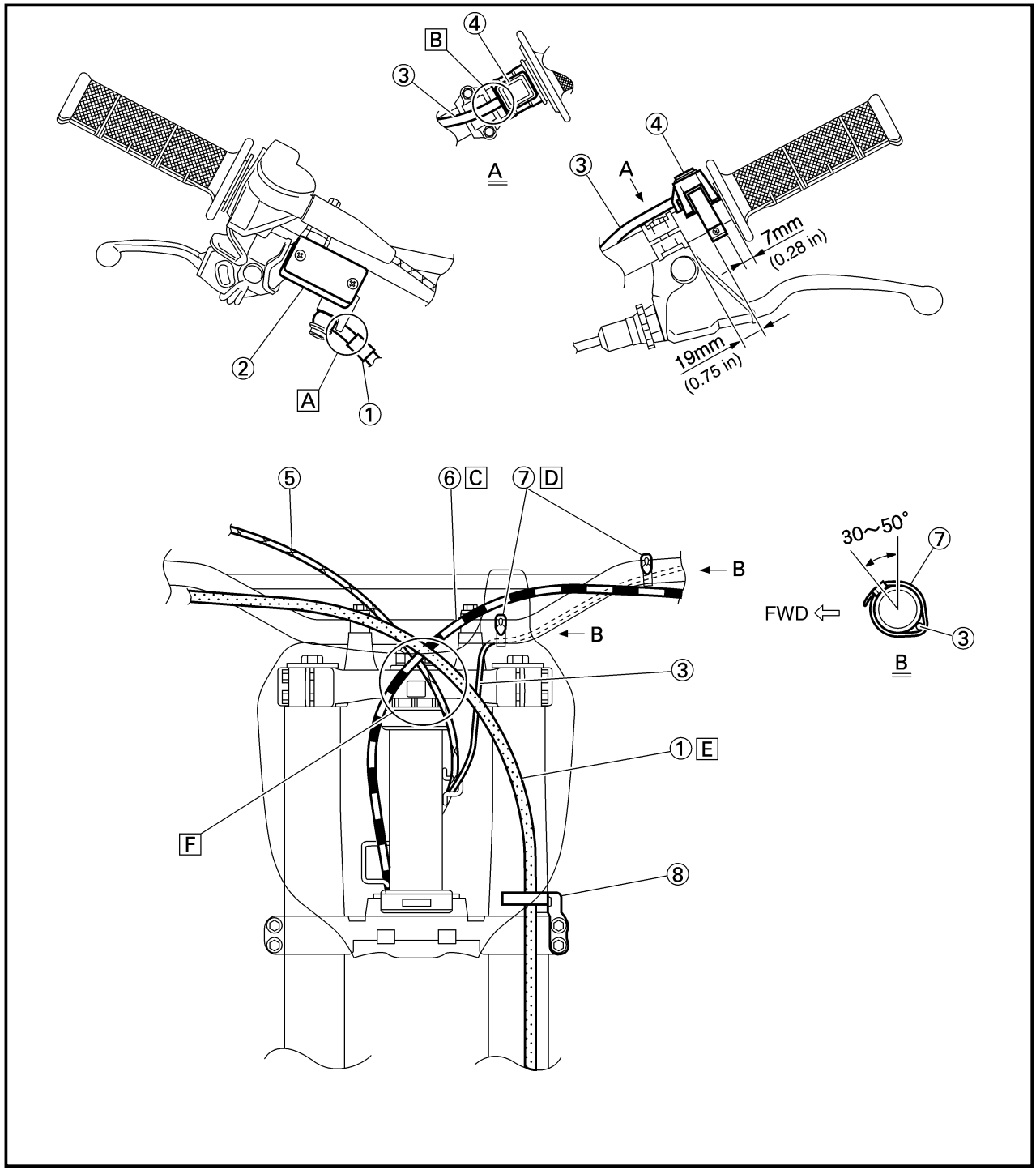
A Install the brake hose so that its pipe portion directs as shown and lightly touches the projection on the caliper.
B Pass the brake hose into the brake hose holders.
C If the brake hose contacts the spring (rear shock absorber), correct its twist.
D Install the brake hose so that its pipe portion directs as shown and lightly touches the projection on the master cylinder.





① Brake hose
② Master cylinder
③ “ENGINE STOP” button lead
④ “ENGINE STOP” button
⑤ Throttle cable
⑥ Clutch cable
⑦ Clamp
⑧ Cable guide

[A] Install the brake hose so that its pipe portion directs as shown and lightly touches the projection on the master cylinder.
[B] Pass the “ENGINE STOP” button lead in the middle of the clutch holder.
[C] Pass the clutch cable in front of the throttle cable.
[D] Clamp the “ENGINE STOP” button lead to the handlebar to 3 clicks.
[E] Pass the brake hose in front of the number plate and through the cable guide.
[F] Cross the clutch cable and throttle cable over the number plate boss.



EC300000
REGULAR INSPECTION AND ADJUSTMENTS
EC310013
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 Inspect carbon deposits and eliminate them
PISTON RING Inspect Replace	●	●	●		●	Check ring end gap
PISTON PIN, SMALL END BEARING Inspect Replace		●			●	
CYLINDER HEAD Inspect and clean Retighten	● ●	● ●				Inspect carbon deposits and eliminate them Check gasket
CYLINDER Inspect and clean Replace	●	●			●	Inspect score marks Inspect wear
YPVS Inspect and clean	●	●				Inspect carbon deposits and eliminate them
CLUTCH Inspect and adjust Replace	●	●			●	Inspect housing, friction plate, clutch plate and spring
TRANSMISSION Replace oil Inspect Replace bearing	●			●	● ●	Yamalube 4 (10W-30) or SAE 10W-30 SE motor oil
SHIFT FORK, SHIFT CAM, GUIDE BAR 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: 40~50 mm (1.6~2.0 in)

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 “STARTING AND BREAK-IN” section in the CHAPTER 1.
Retighten	●	●				
AIR FILTER						
Clean and lubricate	●	●				Use foam air-filter oil or equivalent oil
Replace					●	
FRAME						
Clean and inspect	●	●				
FUEL TANK, COCK						
Clean and inspect	●		●			
BRAKES						
Adjust lever position and pedal height	●	●				
Lubricate pivot point	●	●				
Check brake disc surface	●	●				
Check fluid level and leakage	●	●				
Retighten brake disc bolts, caliper bolts, master cylinder bolts and union bolts	●	●				
Replace pads					●	
Replace brake fluid					●	Every one year
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 ABSORBER						
Inspect and adjust	●	●			(After rain ride)	
Lube			●		●	Molybdenum disulfide grease
Retighten	●	●				
CHAIN GUARD AND ROLLERS						
Inspect	●	●				
SWINGARM						
Inspect, lube and retighten	●	●				Molybdenum disulfide grease
RELAY ARM, CONNECTING ROD						
Inspect, lube and retighten	●	●				Molybdenum disulfide 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 10W-30 motor oil
Lubricate	●	●				

3

MEMO

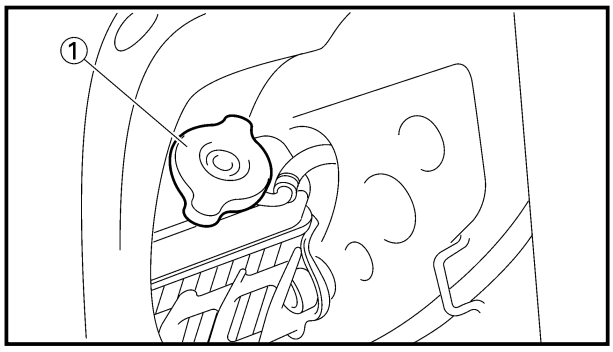
EC320000
PRE-OPERATION INSPECTION AND MAINTENANCE

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.

EC321000
GENERAL INSPECTION AND MAINTENANCE

Item	Routine	Page
Coolant	Check that coolant is filled up to the radiator filler cap. Check the cooling system for leakage.	P3-5~9
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.	P3-12~14
Gear shifter and clutch	Check that gears can be shifted correctly in order and that the clutch operates smoothly.	P3-9
Throttle grip/Housing	Check that the throttle grip operation and free play are correctly adjusted. Lubricate the throttle grip and housing, if necessary.	P3-10~11
Brakes	Check the play of front brake and effect of front and rear brake.	P3-17~23
Chain	Check chain slack and alignment. Check that the chain is lubricated properly.	P3-24~26
Wheels	Check for excessive wear and tire pressure. Check for loose spokes and have no excessive play.	P3-34~35
Steering	Check that the handlebar can be turned smoothly and have no excessive play.	P3-35~36
Front forks and rear shock absorber	Check that they operate smoothly and there is no oil leakage.	P3-26~33
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.	—
Muffler	Check that the muffler is tightly mounted and has no cracks.	P3-15~16
Sprocket	Check that the driven sprocket tightening bolt is not loose.	P3-24
Lubrication	Check for smooth operation. Lubricate if necessary.	P3-37
Bolts and nuts	Check the chassis and engine for loose bolts and nuts.	P1-16
Lead connectors	Check that the CDI magneto, CDI unit, and ignition coil are connected tightly.	P1-6
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? Are inspection and maintenance completely done?	P7-1~24



EC350000
ENGINE

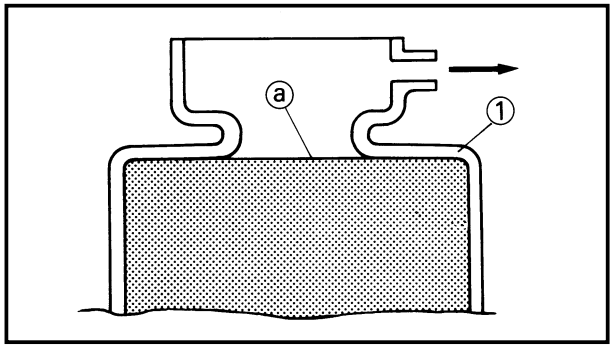
EC351011
COOLANT LEVEL INSPECTION

⚠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.

CAUTION:

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



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

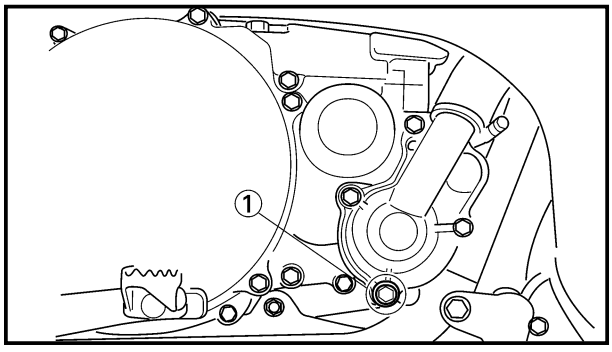
EC353011
COOLANT REPLACEMENT

⚠WARNING

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

CAUTION:

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

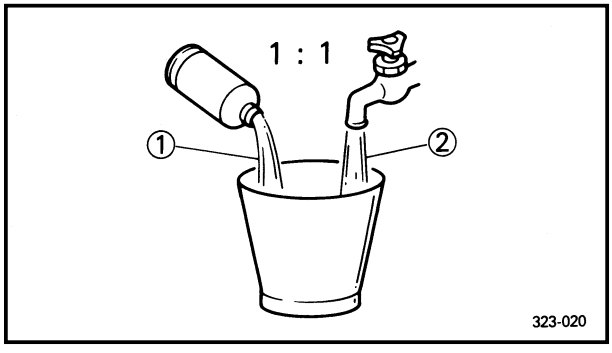


1. Place a container under the engine.
2. Remove:
   - Coolant drain bolt ①
3. Remove:
   - Radiator cap

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

   Thoroughly flush the cooling system with clean tap water.
5. Install:
   - Copper washer ***New***
   - Coolant drain bolt

10 Nm (1.0 m•kg, 7.2 ft•lb)



6. Fill:
   - Radiator
   - Engine

   To specified level.

Recommended coolant:
High quality ethylene glycol anti-freeze containing anti-corrosion for aluminum engine
Coolant ① and water (soft water) ② mixing ratio:
50%/50%
Coolant capacity:
1.20 L (1.06 Imp qt, 1.27 US qt)

CAUTION:

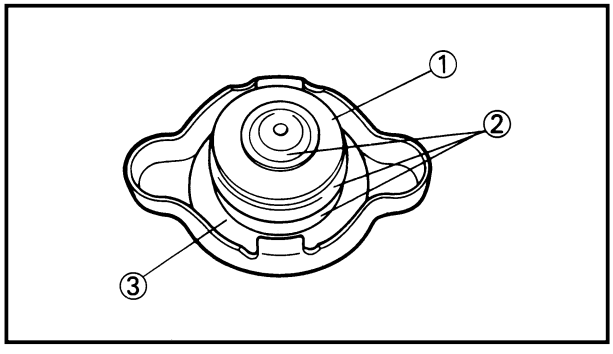
- **Do not mix more than one type of ethylene glycol antifreeze containing corrosion inhibitors for aluminum engine.**
- **Do not use water containing impurities or oil.**

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

⚠WARNING

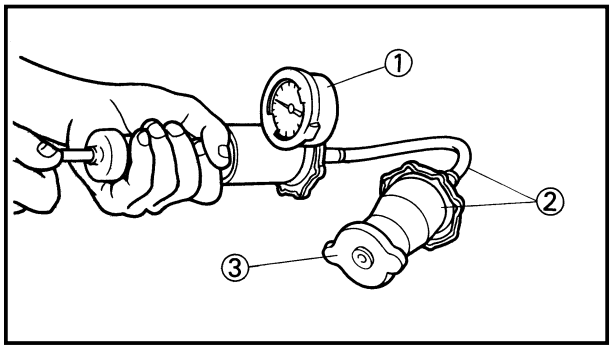
- **When coolant splashes to your eye. Thoroughly wash your eye with water and see your doctor.**
- **When coolant splashes to your clothes. Quickly wash it away with water and then with soap.**
- **When coolant is swallowed. Quickly make him vomit and take him to a doctor.**

7. Install:
   - Radiator cap
   Start the engine and warm it up for a several minutes.
8. Check:
   - Coolant level
   Coolant level low→Add coolant.



EC355000
RADIATOR CAP INSPECTION

1. Inspect:
   - Seal (radiator cap) ①
   - Valve and valve seat ②
   Crack/Damage→Replace.
   Exist fur deposits ③→Clean or replace.



EC356002
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.

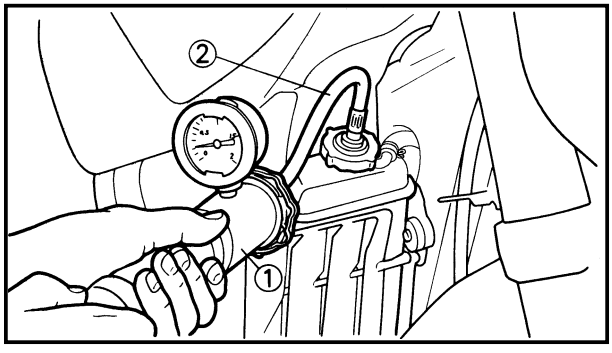
③ Radiator cap

2. Apply the specified pressure.

Radiator cap 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.



EC357003
COOLING SYSTEM INSPECTION

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

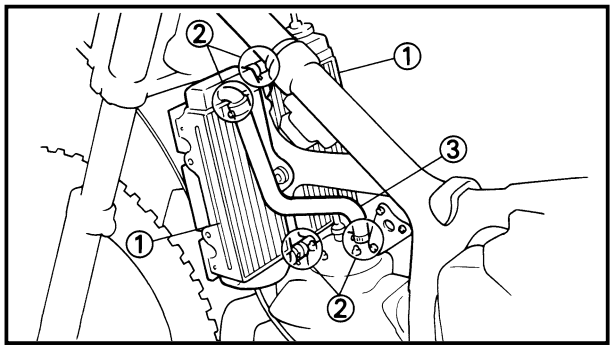
Radiator cap tester:
YU-24460-01/90890-01325
Adapter:
YU-33984/90890-01352

3. Apply the specified pressure.

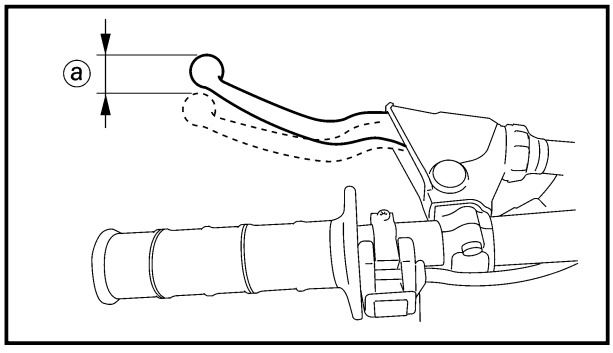
Standard pressure:
180 kPa (1.8 kg/cm², 25.6 psi)

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 hose joint ②
     Coolant leakage→Repair or replace.
   - Radiator hose ③
     Swelling→Replace.

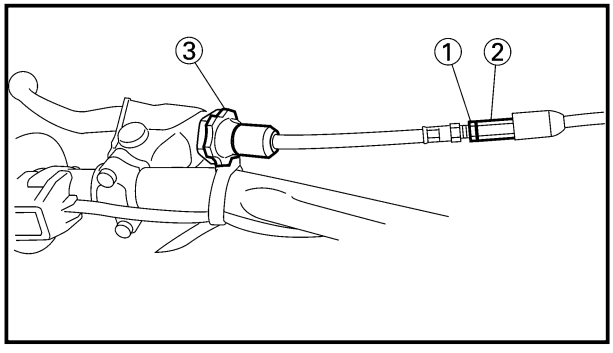


EC359020

CLUTCH ADJUSTMENT

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

Clutch lever free play ⓐ:
8~13 mm (0.31~0.51 in)



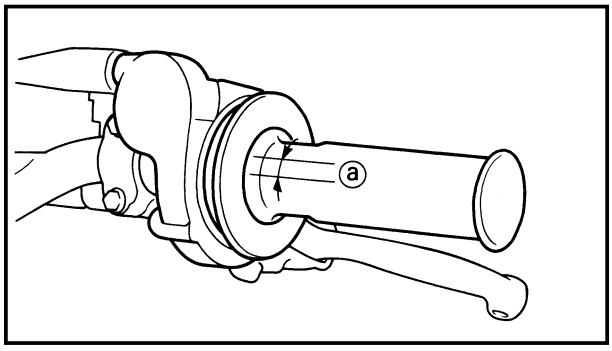
2. Adjust:
   - Clutch lever free play

Clutch lever free play adjustment steps:

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

NOTE:

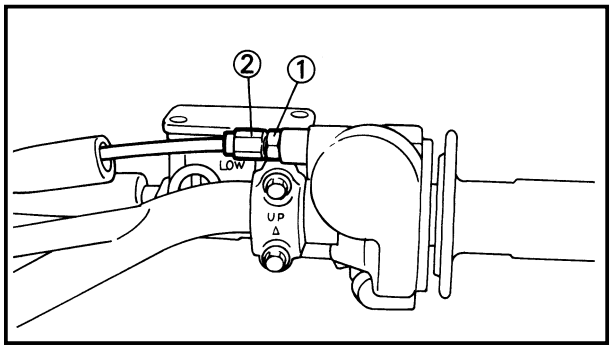
- Make minute adjustment on the lever side using the adjuster ③.
- After adjustment, check proper operation of clutch lever.



EC35A001
THROTTLE CABLE ADJUSTMENT

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

Throttle grip free play ⓐ:
3~5 mm (0.12~0.20 in)



2. Adjust:
   - Throttle grip free play

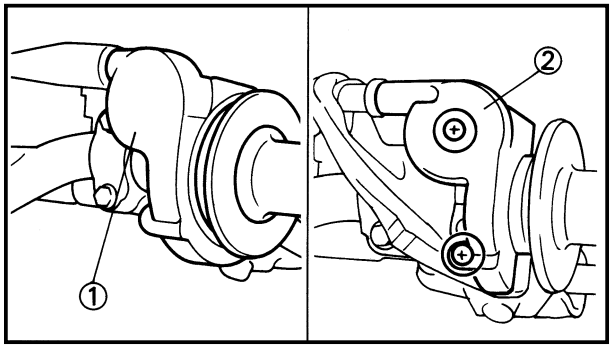
Throttle grip free play adjustment steps:
- Loosen the locknut ①.
- Turn the adjuster ② until the specified free play is obtained.
- Tighten the locknut.

NOTE:

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

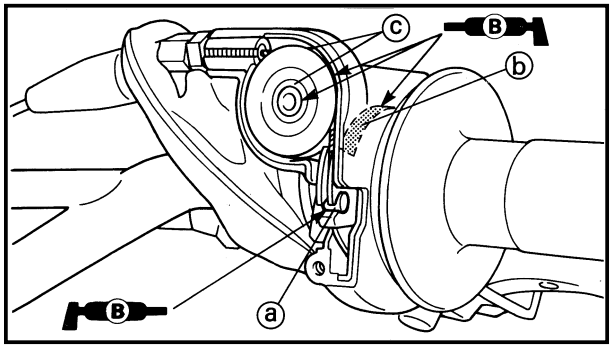
⚠WARNING

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



EC35S002
THROTTLE LUBRICATION

1. Remove:
   - Cap cover ①
   - Throttle cable cap ②



2. Apply:
   - Lithium soap base grease
     On the throttle cable end ⓐ, tube guide cable winding portion ⓑ and roller sliding surface ⓒ.

3. Install:
   - Throttle cable cap

     1 Nm (0.1 m•kg, 0.7 ft•lb)
   - Cap cover

EC35G041

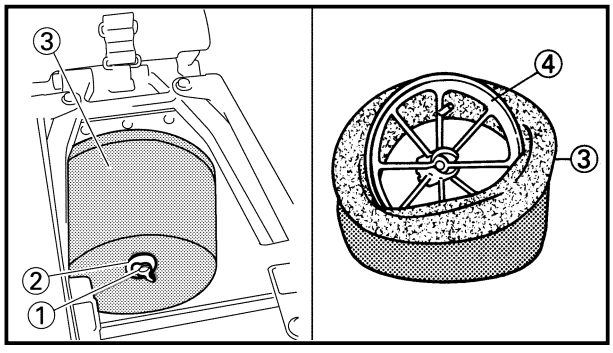
AIR FILTER CLEANING

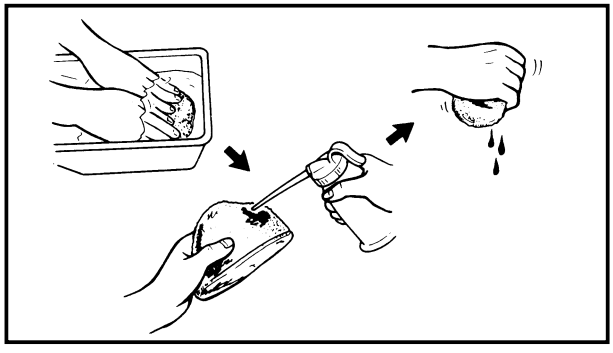
NOTE:

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
   - Washer ②
   - Air filter element ③
   - Filter guide ④

2. Clean:
   - Air filter element

     Clean them with solvent.

NOTE:

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

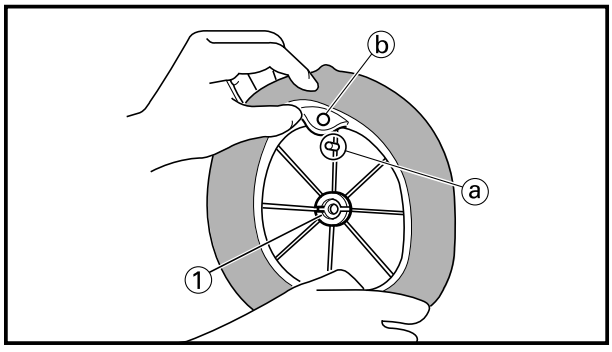
CAUTION:

Do not twist the element when squeezing the element.

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

NOTE:

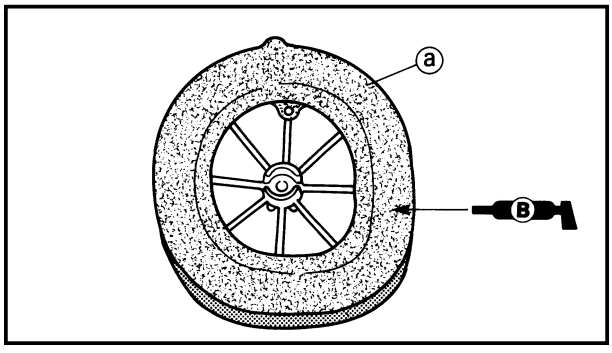
Squeeze out the excess oil. Element should be wet but not dripping.



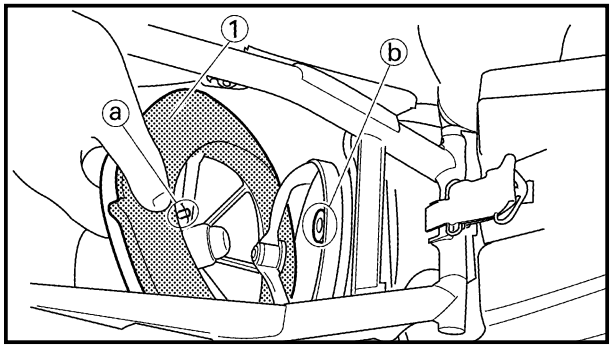
5. Install:
   • Filter guide ①

NOTE:

Align the projection ⓐ on filter guide with the hole ⓑ in air filter element.



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



7. Install:
   • Air filter element ①
   • Washer
   • Fitting bolt — **2 Nm (0.2 m•kg, 1.4 ft•lb)**

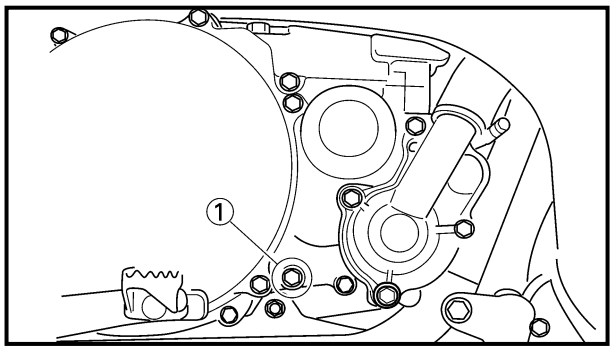
NOTE:

Align the projection ⓐ on filter guide with the hole ⓑ in air filter case.

EC35H002

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 oil check 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 oil check 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.

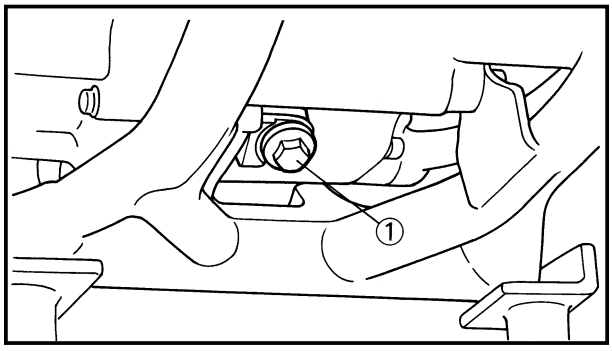
Recommended oil:
Yamalube 4 (10W-30) or SAE 10W-30 type SE motor oil

• Inspect the gasket (oil check bolt), replace if damaged.
• Tighten the oil check bolt.

Oil check bolt:
10 Nm (1.0 m•kg, 7.2 ft•lb)

EC35K002
TRANSMISSION OIL REPLACEMENT

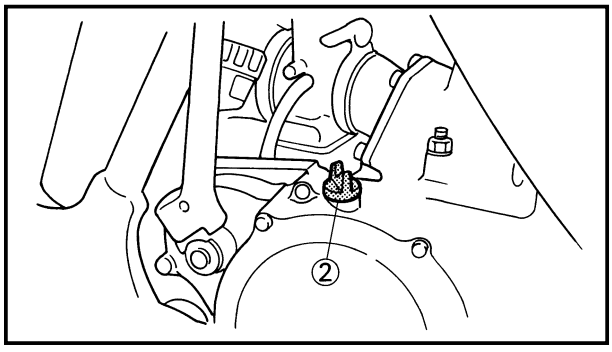
1. Start the engine and warm it up for several minutes and wait for five minute.
2. Place the machine on a level place and hold it on upright position by placing the suitable stand under the engine.
3. Place a suitable container under the engine.



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

   Drain the transmission oil.
5. Install:
   - Aluminum washer ***New***
   - Oil drain bolt ①

20 Nm (2.0 m•kg, 14 ft•lb)



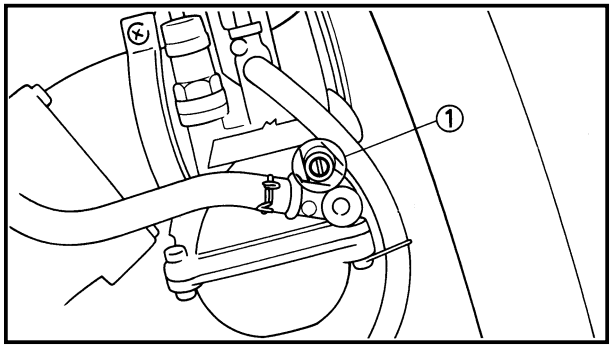
6. Fill:
   - Transmission oil

Recommended oil:
Yamalube 4 (10W-30) or SAE 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

EC35L021

PILOT AIR SCREW ADJUSTMENT



1. Adjust:
   - Pilot air screw ①

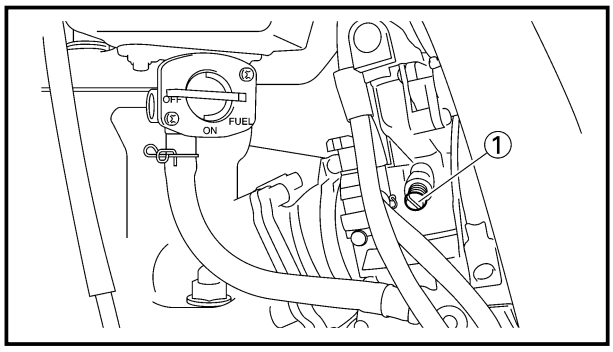
Adjusting steps:
- Turn in the pilot air screw until it is lightly seated.
- Turn out the pilot air screw by the factory-set number of turns.

NOTE:

To optimize the fuel flow at a smaller throttle opening, each machine's pilot air screw has been individually set at the factory. Before adjusting the pilot air screw, turn it in fully and count the number of turns. Record this number as the factory-set number of turns out.

Pilot air screw:
1 turn out
***7/8 turns out**
(for reference only)

*For EUROPE



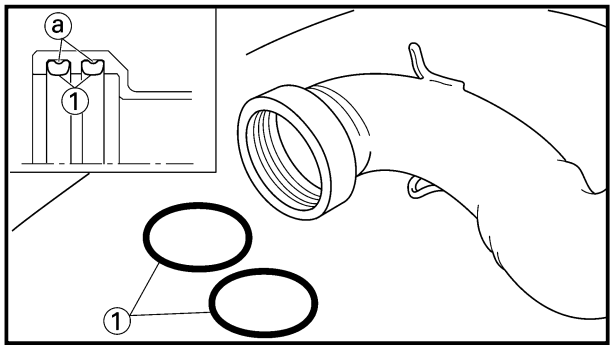
EC35M001
IDLE SPEED ADJUSTMENT

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

Adjustment steps:
Turn the throttle stop screw ① until the engine runs at the lowest possible speed.

To increase idle speed → Turn the throttle stop screw ① in.

To decrease idle speed → Turn the throttle stop screw ① out.

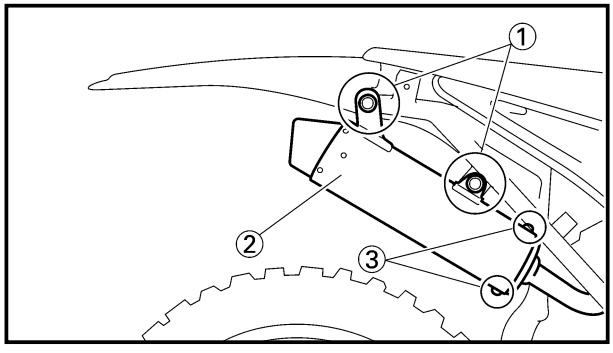


EC35P030
MUFFLER INSPECTION

1. Inspect:
   - O-ring ①
     Damage → Replace.

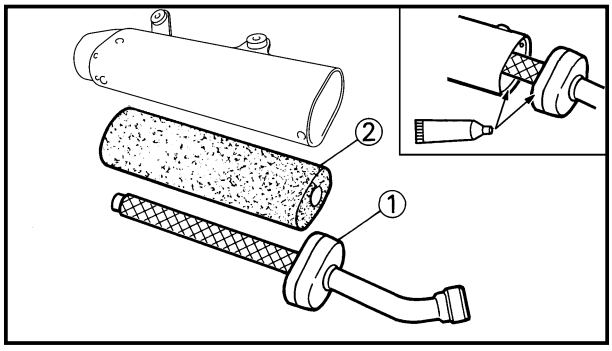
NOTE:

Install the O-rings with their depressed ⓐ facing outward.



EC35R051
SILENCER FIBER REPLACEMENT

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

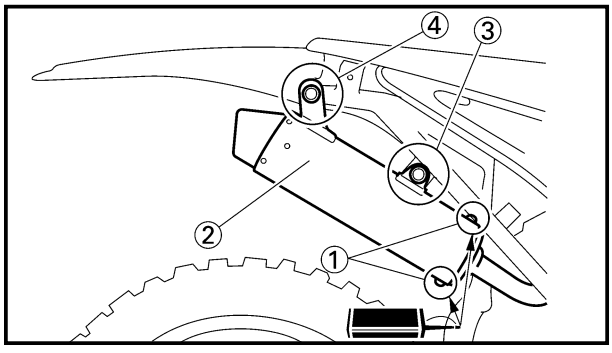


2. Remove:
   - Inner pipe ①
3. Replace:
   - Fiber ②
4. Install:
   - Inner pipe

NOTE:

Fully apply Quick gasket® (Yamaha bond No. 1215) or equivalent as shown.

Quick gasket®:
ACC-QUICK-GS-KT
Yamaha bond No. 1215:
90890-85505



5. Install:
   - Bolt (fiber) ①

     10 Nm (1.0 m•kg, 7.2 ft•lb)
   - Silencer ②
   - Bolt [silencer (front)] ③

     12 Nm (1.2 m•kg, 8.7 ft•lb)
   - Bolt [silencer (rear)] ④

     11 Nm (1.1 m•kg, 8.0 ft•lb)
   - Side cover (right)

     7 Nm (0.7 m•kg, 5.1 ft•lb)

EC360000
CHASSIS

EC361012
BRAKE SYSTEM AIR BLEEDING

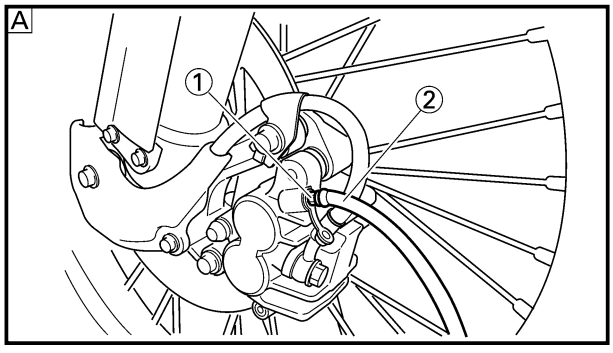
⚠WARNING

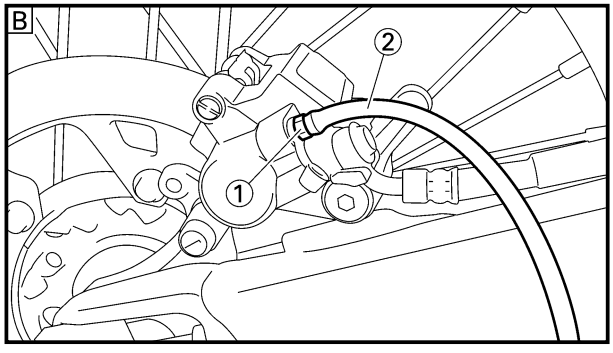
Bleed the brake system if:
- **The system has been disassembled.**
- **A brake hose has been loosened or removed.**
- **The brake fluid is very low.**
- **The brake operation is faulty.**

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

1. Remove:
   - Master cylinder cap
   - Diaphragm
   - Protector (rear brake)
2. Bleed:
   - Brake fluid

A Front
B Rear





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 disappeared.

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

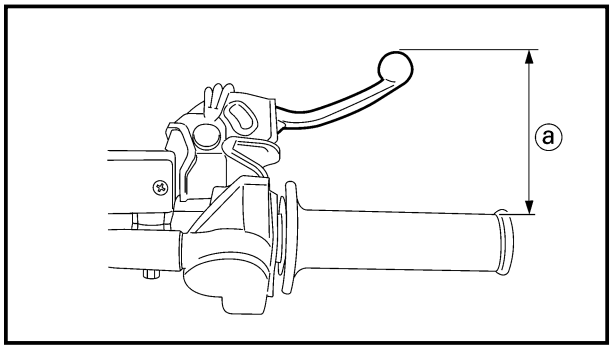
⚠WARNING

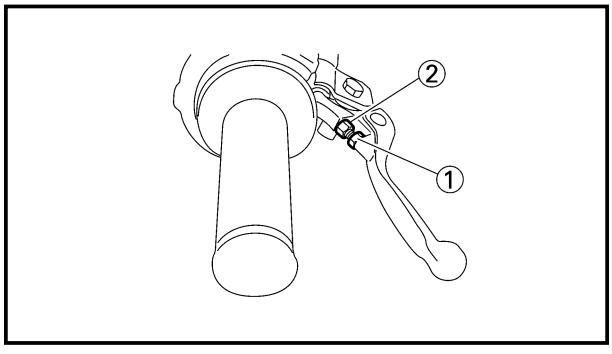
Check the operation of the brake after bleeding the brake system.

3. Install:
   - Protector (rear brake)
   - Diaphragm
   - Master cylinder cap

EC362041

FRONT BRAKE ADJUSTMENT





1. Check:
   - Brake lever position ⓐ

Brake lever position ⓐ:

Standard position	Extent of adjutment
95 mm (3.74 in)	76 ~ 97 mm (2.99 ~ 3.82 in)

2. Remove:
   - Lever cover
3. Adjust:
   - Brake lever position

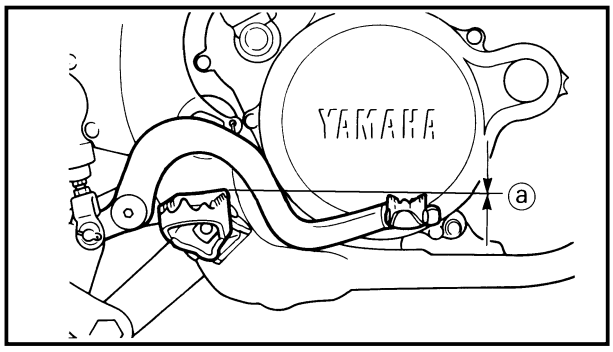
Brake lever position adjustment steps:
- Loosen the locknut ①.
- Turn the adjusting bolt ② until the lever position ⓐ is within specified position.
- Tighten the locknut.

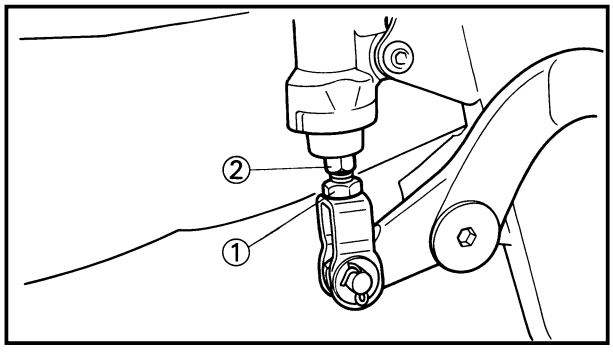
Locknut:
5 Nm (0.5 m•kg, 3.6 ft•lb)

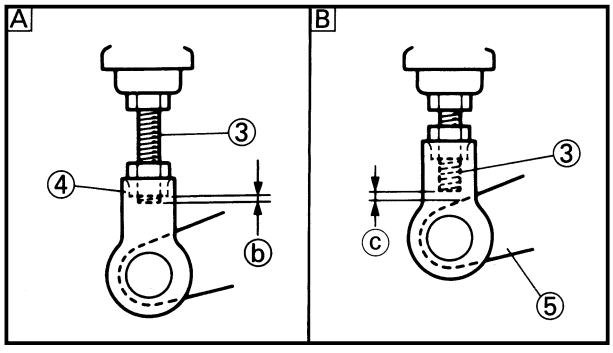
CAUTION:

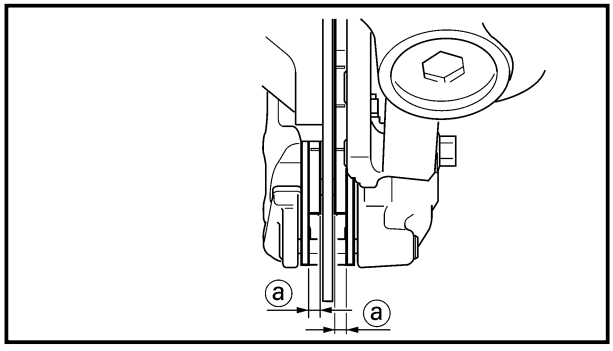
Be sure to tighten the locknut, as it will cause poor brake performance.

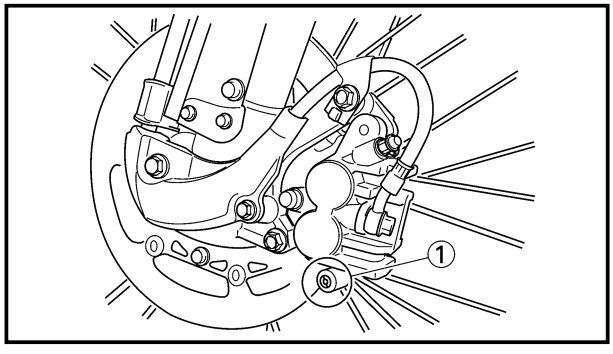
4. Install:
   - Lever cover











EC364004

REAR BRAKE ADJUSTMENT

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

	Brake pedal height ⓐ: Zero mm (Zero in)

NOTE:

The brake pedal height is the vertical distance from the inside top end of the footrest.

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 Ⓐ and the minimum Ⓑ as shown. (In this adjustment the bolt ③ end ⓑ should protrude out of the threaded portion ④ but not be less than 2 mm (0.08 in) ⓒ away from the brake pedal ⑤).**
- **After the pedal height adjustment, make sure that the rear brake does not drag.**

EC365080

FRONT BRAKE PAD INSPECTION AND REPLACEMENT

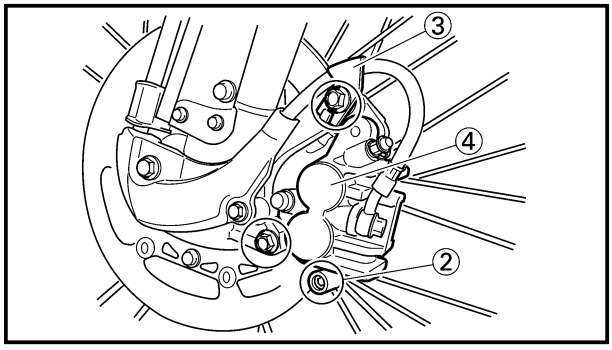
1. Inspect:
   - Brake pad thickness ⓐ
     Out of specification → Replace as a set.

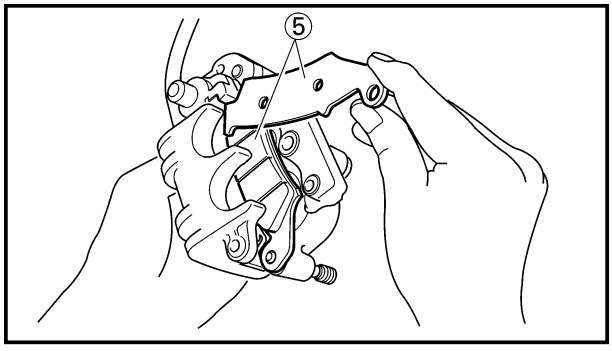
	Brake pad thickness ⓐ:

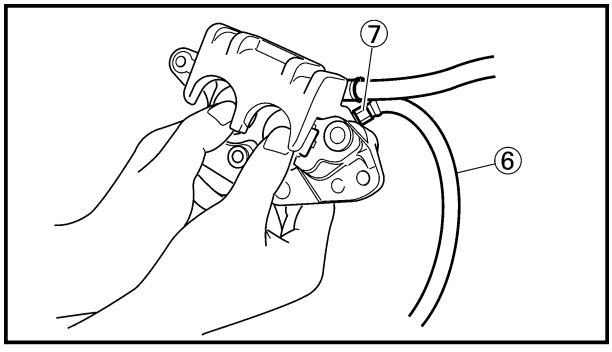
Standard	<Limit>
4.4 mm (0.17 in)	1.0 mm (0.04 in)

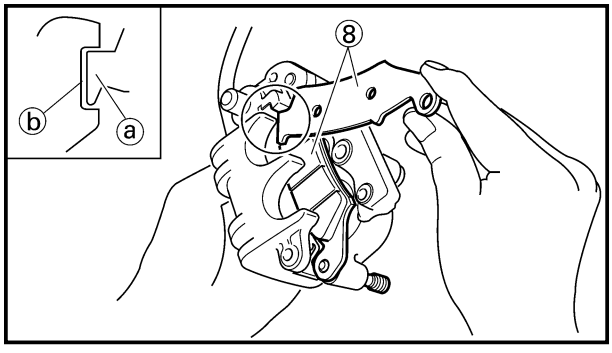
2. Replace:
   - Brake pad

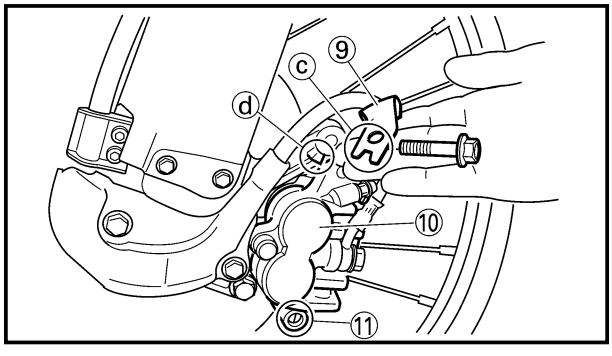
Brake pad replacement steps:
- Remove the pad pin plug ①.











- Loosen the pad pin ②.
- Remove the brake hose holder ③ and caliper ④ from the front fork.
- Remove the pad pin and brake pads ⑤.
- Connect the transparent hose ⑥ to the bleed screw ⑦ and place the suitable container under its end.
- Loosen the bleed screw and push the caliper piston in.

CAUTION:

Do not reuse the drained brake fluid.

- Tighten the bleed screw.

Bleed screw:
6 Nm (0.6 m•kg, 4.3 ft•b)

- Install the brake pads ⑧ and pad pin.

NOTE:

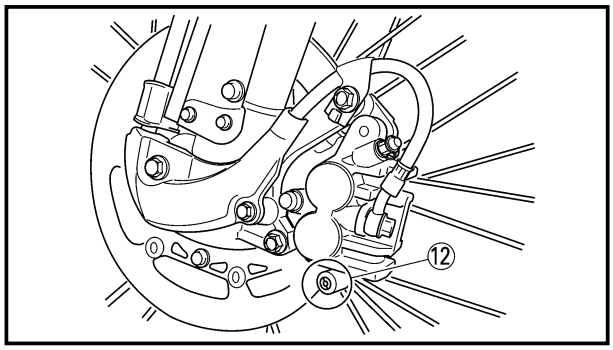
- Install the brake pads with their projections ⓐ into the caliper recesses ⓑ.
- Temporarily tighten the pad pin at this point.

- Install the brake hose holder ⑨ and caliper ⑩ and tighten the pad pin ⑪.

NOTE:

Fit the brake hose holder cut ⓒ over the projection ⓓ on the front fork and clamp the brake hose.

Bolt (caliper):
23 Nm (2.3 m•kg, 17 ft•lb)
Pad pin:
18 Nm (1.8 m•kg, 13 ft•lb)

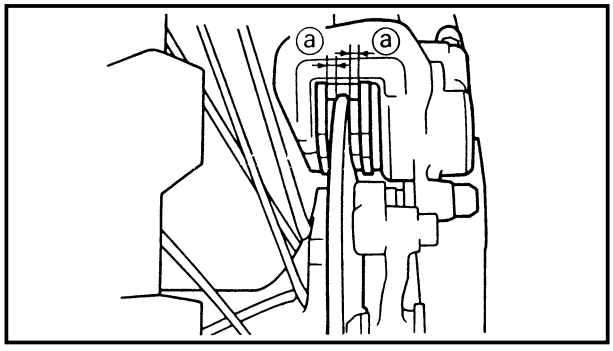


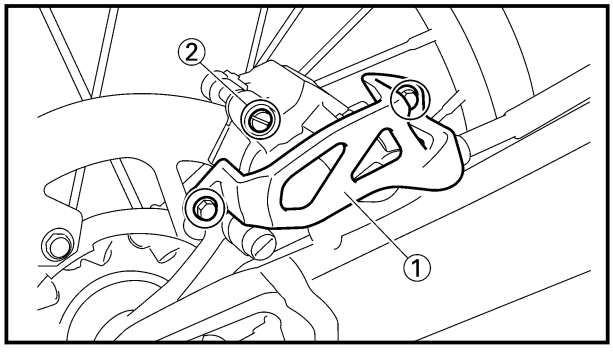
•Install the pad pin plug ⑫.

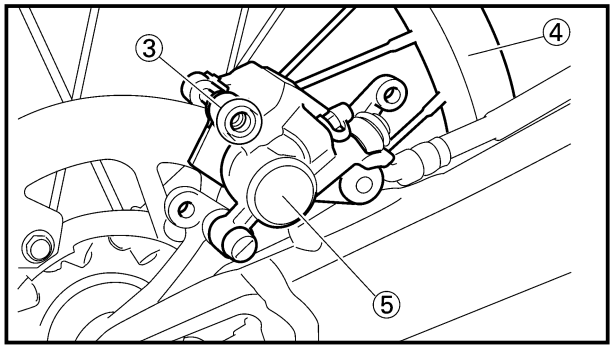
Pad pin plug:
3 Nm (0.3 m•kg, 2.2 ft•lb)

3. Inspect:
   •Brake fluid level
   Refer to "BRAKE FLUID LEVEL INSPECTION" section.

4. Check:
   •Brake lever operation
   A softy or spongy feeling → Bleed brake system.
   Refer to "BRAKE SYSTEM AIR BLEEDING" section.







EC366060
REAR BRAKE PAD INSPECTION AND REPLACEMENT

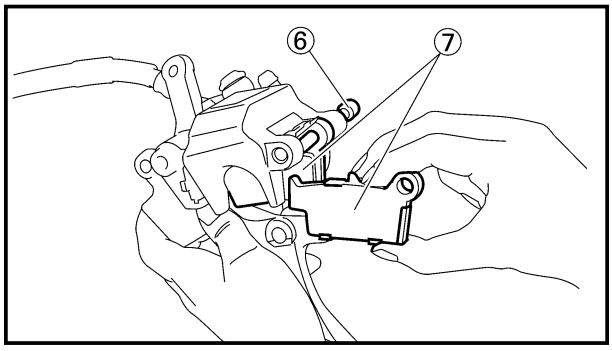
1. Inspect:
   •Brake pad thickness ⓐ
   Out of specification → Replace as a set.

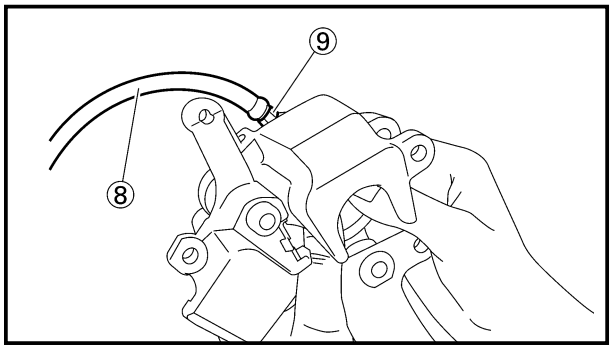
Brake pad thickness ⓐ:

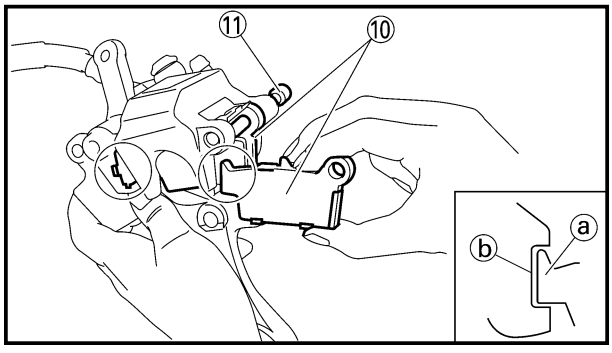
Standard	<Limit>
6.4 mm (0.25 in)	1.0 mm (0.04 in)

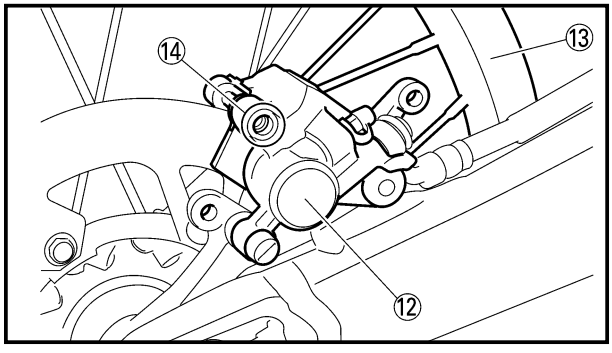
2. Replace:
   •Brake pad

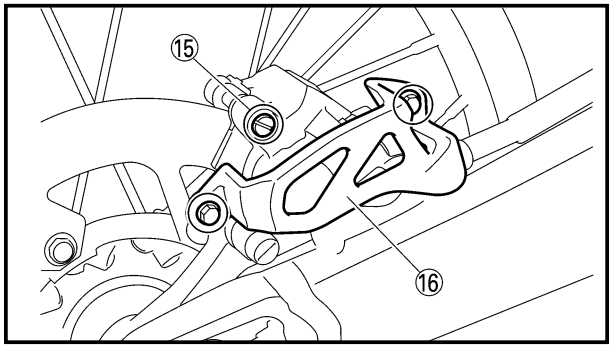
Brake pad replacement steps:
- •Remove the protector ① and pad pin plug ②.
- •Loosen the pad pin ③.
- •Remove the rear wheel ④ and caliper ⑤.
  Refer to "FRONT WHEEL AND REAR WHEEL" section in the CHAPTER 5.











- Remove the pad pin ⑥ and brake pads ⑦.
- Connect the transparent hose ⑧ to the bleed screw ⑨ and place the suitable container under its end.
- Loosen the bleed screw and push the caliper piston in.

CAUTION:

Do not reuse the drained brake fluid.

- Tighten the bleed screw.

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

- Install the brake pads ⑩ and pad pin ⑪.

NOTE:

- Install the brake pads with their projections ⓐ into the caliper recesses ⓑ.
- Temporarily tighten the pad pin at this point.

- Install the caliper ⑫ and rear wheel ⑬.
  Refer to "FRONT WHEEL AND REAR WHEEL" section in the CHAPTER 5.
- Tighten the pad pin ⑭.

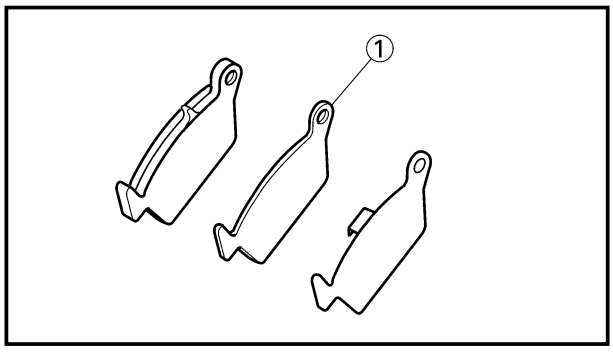
Pad pin:
18 Nm (1.8 m•kg, 13 ft•lb)

- Install the pad pin plug ⑮ and protector ⑯.

Pad pin plug:
3 Nm (0.3 m•kg, 2.2 ft•lb)
Bolt (protector):
7 Nm (0.7 m•kg, 5.1 ft•lb)

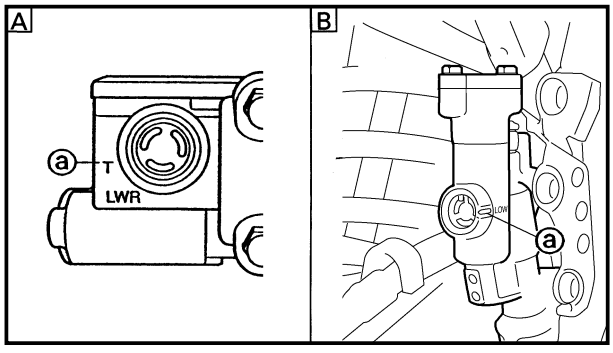
3. Inspect:
   - Brake fluid level
     Refer to "BRAKE FLUID LEVEL INSPECTION" section.

4. Check:
   - Brake pedal operation
     A softy or spongy feeling → Bleed brake system.
     Refer to "BRAKE SYSTEM AIR BLEEDING" section.



EC36b000
REAR BRAKE PAD INSULATOR INSPECTION

1. Remove:
   - Brake pad
     Refer to "REAR BRAKE PAD INSPECTION AND REPLACEMENT" section.
2. Inspect:
   - Rear brake pad insulator ①
     Damage → Replace.



EC367001
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.

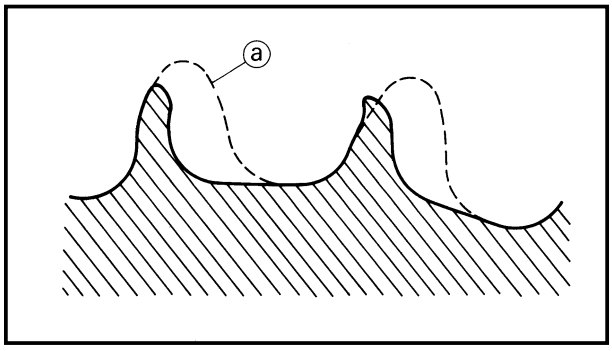
ⓐ Lower level

A Front
B Rear

Recommended brake fluid:
DOT #4

⚠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.**

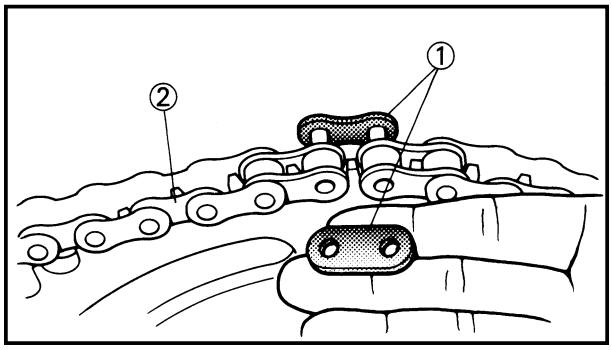


EC368000
SPROCKETS INSPECTION

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

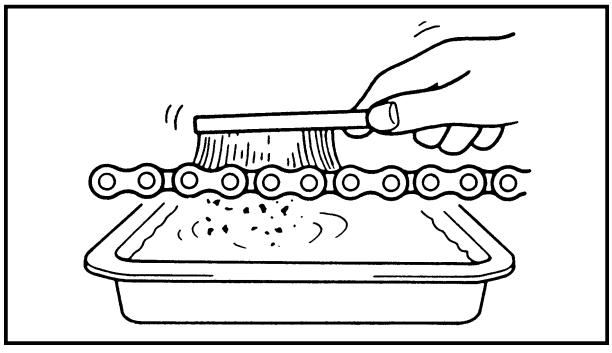
NOTE:

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

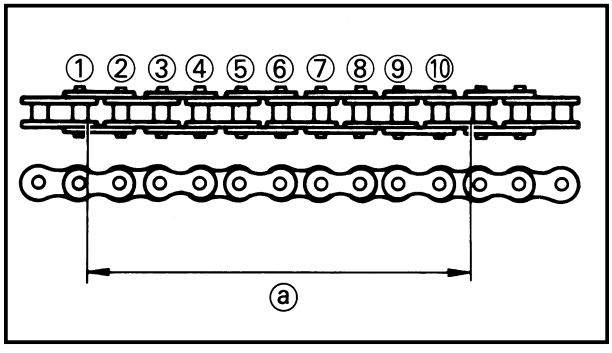


EC369002
DRIVE CHAIN INSPECTION

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

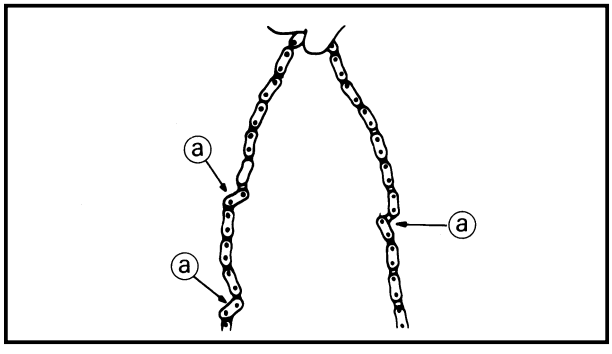


2. Clean:
   - Drive chain
     Place it in kerosene, and brush off as much dirt as possible. Then remove the chain from the kerosene and dry the chain.

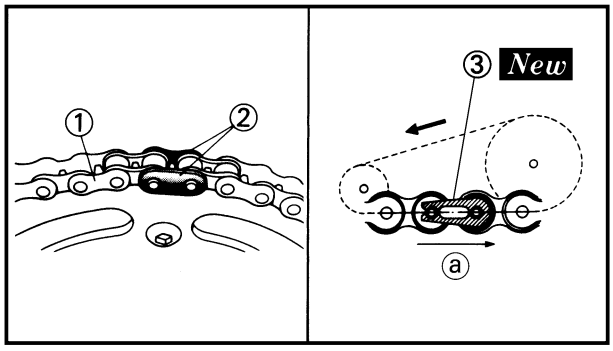


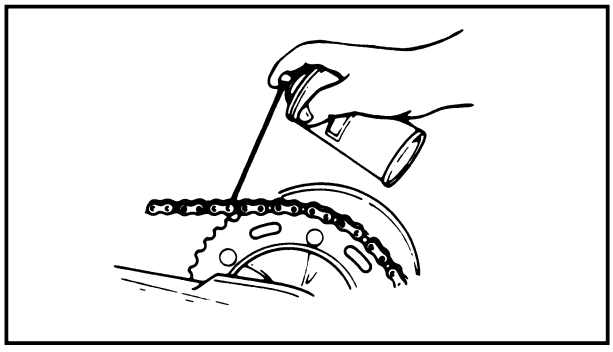
3. Measure:
   - Drive chain length (10 links) ⓐ
     Out of specification→Replace.

Drive chain length (10 links):
Limit: 152.5 mm (6.004 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 ***New***

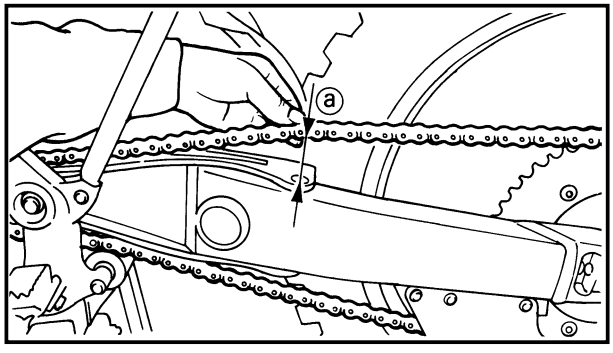
CAUTION:

Be sure to install the master link clip to the direction as shown.

ⓐ Turning direction

6. Lubricate:
   - Drive chain

Drive chain lubricant:
SAE 10W-30 motor oil or suitable chain lubricants



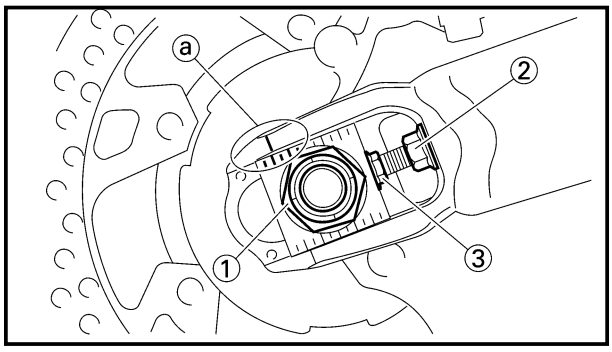
EC36A061
DRIVE CHAIN SLACK ADJUSTMENT

1. Elevate the rear wheel by placing the suitable stand under the engine.
2. Check:
   - Drive chain slack ⓐ
     Above the seal guard installation bolt.
     Out of specification → Adjust

Drive chain slack:
40~50 mm (1.6~2.0 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 locknuts ②.
- Adjust chain slack by turning the adjusters 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:

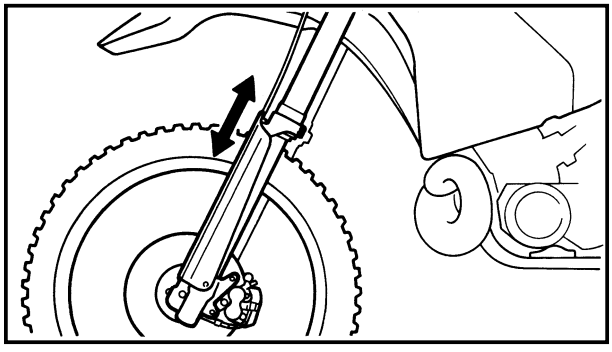
Too small chain slack will overload the engine and other vital parts; keep the slack within the specified limits.

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

Axle nut:
125 Nm (12.5 m•kg, 90 ft•lb)

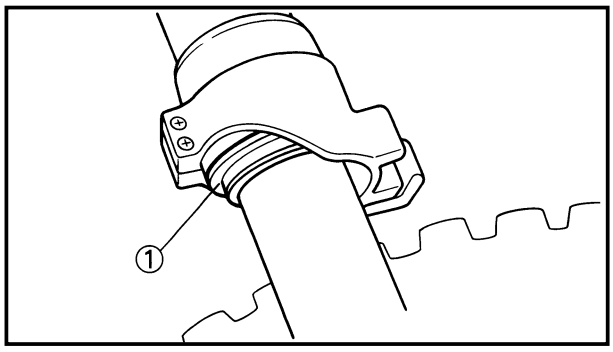
- Tighten the locknuts.

Locknut:
16 Nm (1.6 m•kg, 11 ft•lb)



EC36C000
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.



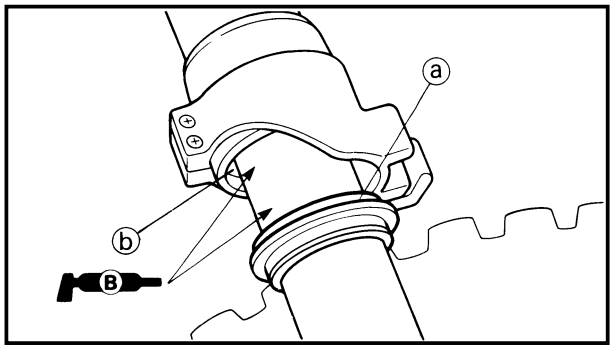
EC36D001

FRONT FORK OIL SEAL AND DUST SEAL CLEANING

1. Remove:
   - Protector
   - Dust seal ①

NOTE:

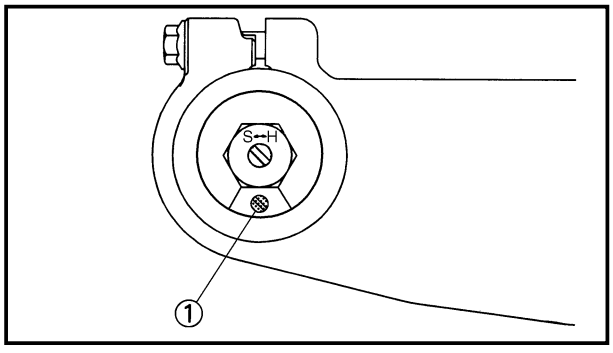
Use a thin screw driver, and be careful not to damage the inner fork tube and dust seal.



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

NOTE:

- Clean the dust seal and oil seal after every run.
- Apply the lithium soap base grease on the inner tube.



EC36f000

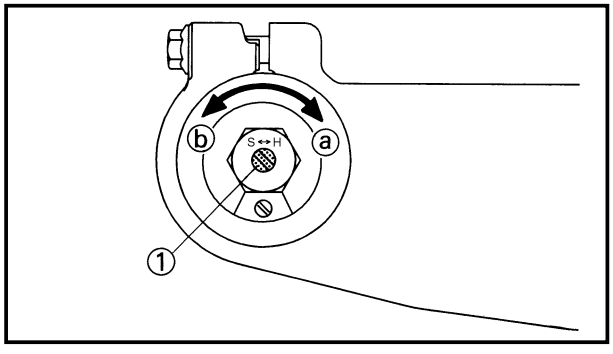
FRONT FORK INTERNAL PRESSURE RELIEVING

NOTE:

If the front fork initial movement feels stiff during a run, relieve the front fork internal pressure.

1. Elevate the front wheel by placing a suitable stand under the engine.
2. Remove the air bleed screw ① and release the internal pressure from the front fork.
3. Install:
   - Air bleed screw

	1 Nm (0.1 m•kg, 0.7 ft•lb)



EC36H002

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:
11 clicks out
***10 clicks out**

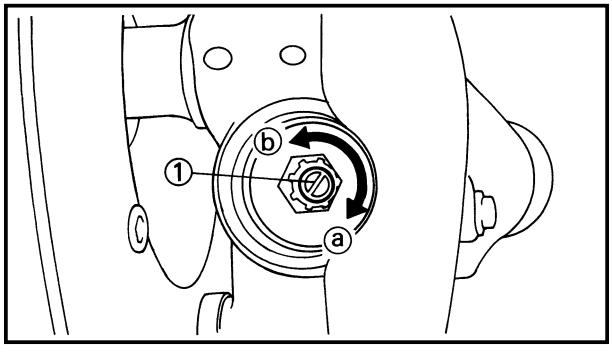
*For EUROPE

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.



EC36J001

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.)**

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:
11 clicks out
***8 clicks out**

*For EUROPE

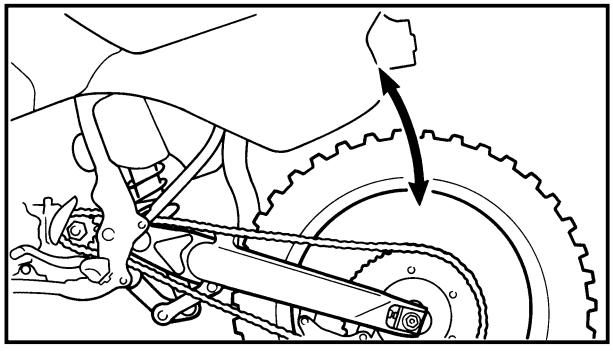
CAUTION:

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

⚠WARNING

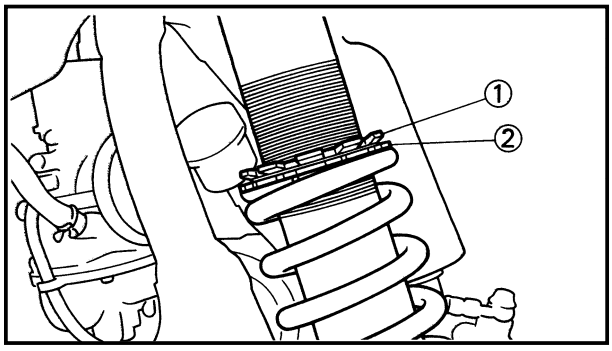
Always adjust each front fork to the same setting. Uneven adjustment can cause poor handling and loss of stability.

3. Install:
   •Rubber cap



EC36K000
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.



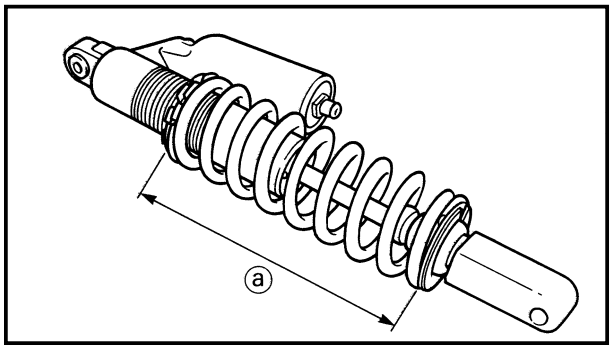
EC36M014

REAR SHOCK ABSORBER SPRING PRELOAD ADJUSTMENT

1. Elevate the rear wheel by placing the suitable stand under the engine.
2. Remove:
   - Rear frame
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 length	Extent of adjustment
251 mm (9.88 in)	240.5~258.5 mm (9.47~10.18 in)
*261 mm (10.28 in)	*255.5~273.5 mm (10.06~10.77 in)

*For EUROPE

NOTE:

- Be sure to remove all dirt and mud from around the locknut and adjuster before adjustment.
- 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
6. Install:
   - Rear frame (upper)

     32 Nm (3.2 m•kg, 23 ft•lb)
   - Rear frame (lower)

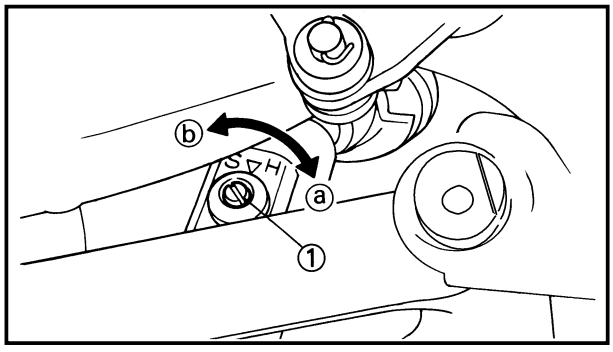
     29 Nm (2.9 m•kg, 21 ft•lb)

EC36N014

REAR SHOCK ABSORBER REBOUND DAMPING FORCE ADJUSTMENT

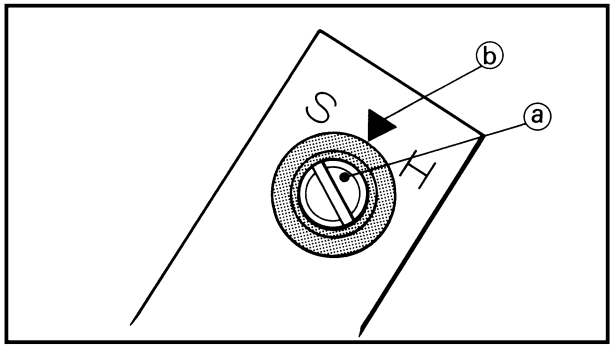
1. Adjust:
   - Rebound damping force
     By turning the adjuster ①.

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)



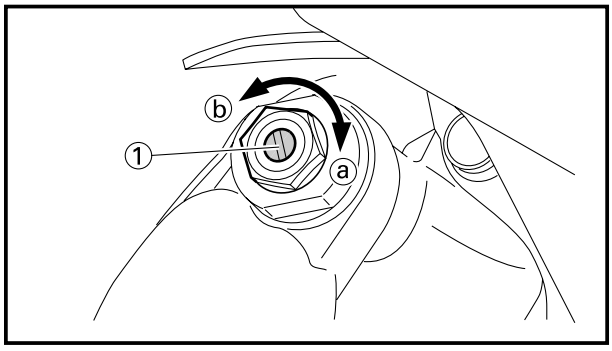
- STANDARD POSITION:
  This is the position which is back by the specific number of clicks from the fully turned-in position. (Which align the punch mark ⓐ on the adjuster with the punch mark ⓑ on the bracket.)

Standard position:
About 12 clicks out
***About 8 clicks out**

*For EUROPE

CAUTION:

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



EC36c000

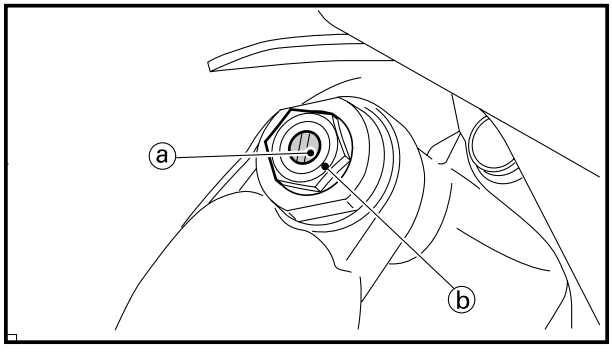
REAR SHOCK ABSORBER LOW COMPRESSION DAMPING FORCE ADJUSTMENT

1. Adjust:
   - Low compression damping force
     By turning the adjuster ①.

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

Extent of adjustment:

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



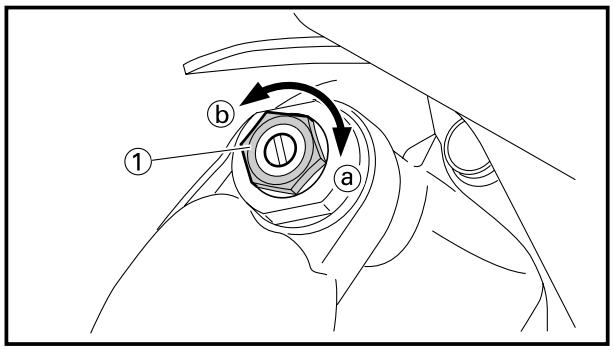
- STANDARD POSITION:
  This is the position which is back by the specific number of clicks from the fully turned-in position. (Which align the punch mark ⓐ on the adjuster with the punch mark ⓑ on the high compression damping adjuster.)

Standard position:
About 13 clicks out
***About 9 clicks out**

*For EUROPE

CAUTION:

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



EC36d000

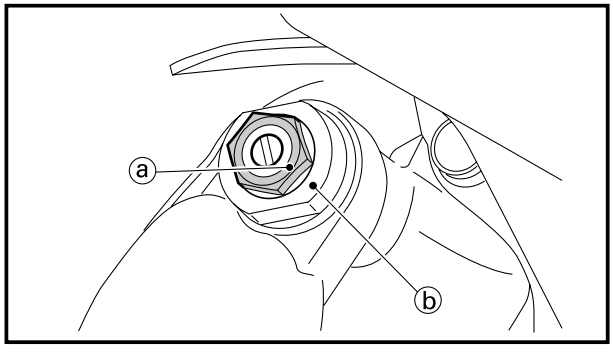
REAR SHOCK ABSORBER HIGH COMPRESSION DAMPING FORCE ADJUSTMENT

1. Adjust:
   - High compression damping force
     By turning the adjuster ①.

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

Extent of adjustment:

Maximum	Minimum
Fully turned in position	**2 turns out (from maximum position)**



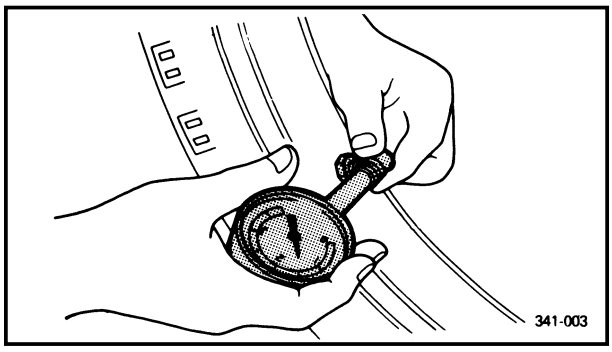
- STANDARD POSITION:
  This is the position which is back by the specific number of turns from the fully turned-in position. (Which align the punch mark ⓐ on the adjuster with the punch mark ⓑ on the adjuster body.)

Standard position:
About 1-1/8 turns out
***About 1-1/4 turns out**

*For EUROPE

CAUTION:

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



EC36Q001

TIRE PRESSURE CHECK

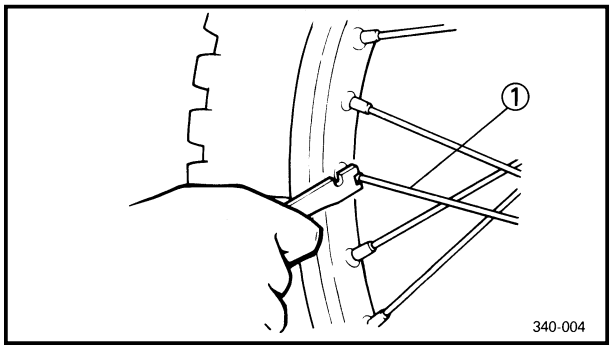
1. Measure:
   - Tire pressure

   Out of specification → Adjust.

Standard tire pressure:
100 kPa (1.0 kgf/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.



EC36S002

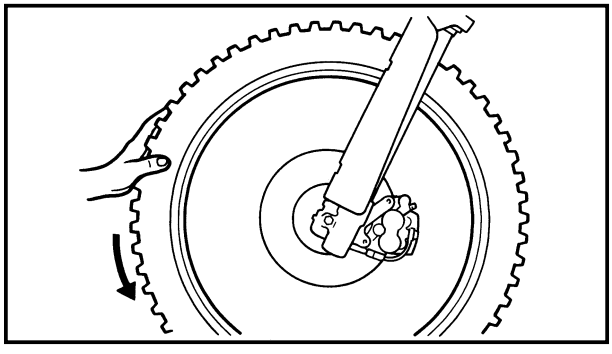
SPOKES INSPECTION AND TIGHTENING

1. Inspect:
   - Spokes ①

   Bend/Damage → Replace.
   Loose spoke → Retighten.
2. Tighten:
   - Spokes — **3 Nm (0.3 m•kg, 2.2 ft•lb)**

NOTE:

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

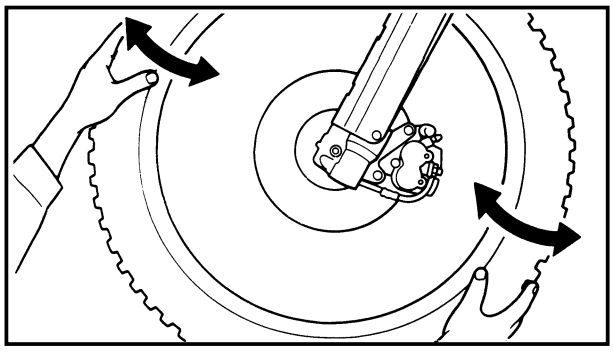


EC36T000

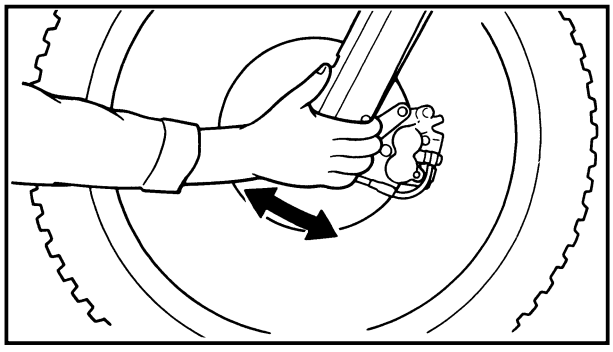
WHEEL INSPECTION

1. Inspect:
   - Wheel runout

   Elevate the wheel and turn it.
   Abnormal runout → Replace.



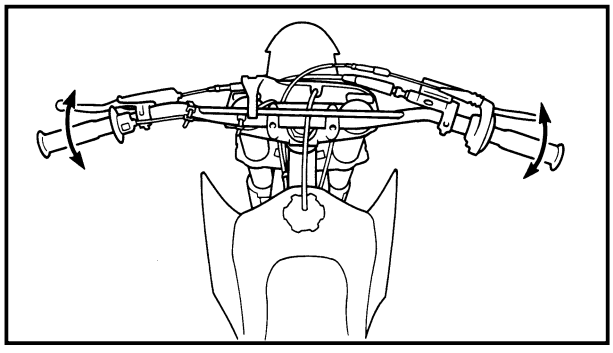
2. Inspect:
   - Bearing free play
     Exist play → Replace.



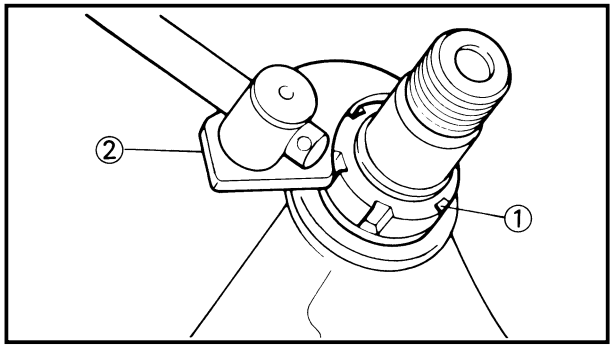
EC36U014

STEERING HEAD INSPECTION AND ADJUSTMENT

1. Elevate the front wheel by placing a suitable stand under the engine.
2. Check:
   - Steering shaft
     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

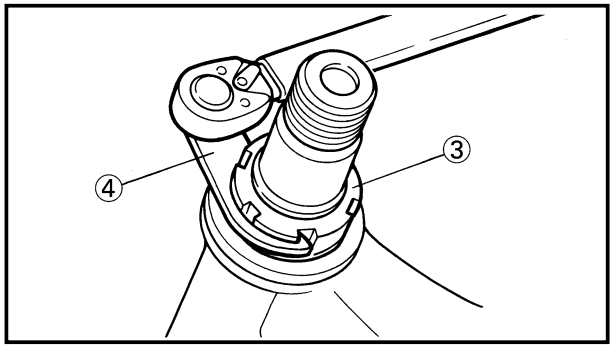
Steering ring nut adjustment steps:
- Remove the number plate.
- Remove the handlebar and handle crown.
- Loosen the ring nut ① using the ring nut wrench ②.

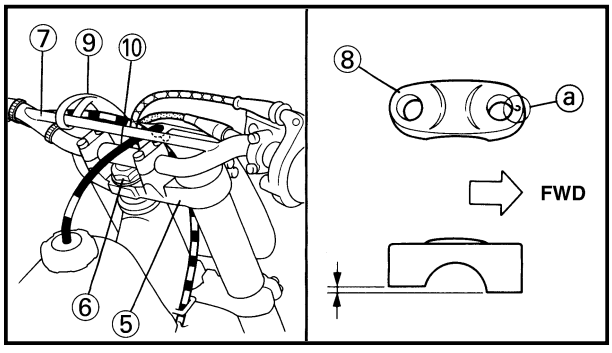
Ring nut wrench:
YU-33975/90890-01403

- Tighten the ring nut ③ using ring nut wrench ④.

NOTE:

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





Ring nut wrench:
YU-33975/90890-01403

Ring nut (initial tightening):
38 Nm (3.8 m•kg, 27ft•lb)

- Loosen the ring nut one turn.
- Retighten the ring nut using the ring nut wrench.

⚠WARNING

Avoid over-tightening.

Ring nut (final tightening):
7 Nm (0.7 m•kg, 5.1 ft•lb)

- 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.
- Install the handle crown ⑤, plain washer, steering shaft nut ⑥, handlebar ⑦, handlebar holder ⑧ and number plate ⑨.

NOTE:

- The upper handlebar holder should be installed with the punched mark ⓐ forward.
- Insert the end of fuel breather hose ⑩ 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.

Steering shaft nut:
145 Nm (14.5 m•kg, 105 t•lb)
Handlebar upper holder:
28 Nm (2.8 m•kg, 20 ft•lb)
Pinch bolt (handle crown):
23 Nm (2.3 m•kg, 17 ft•lb)
Number plate:
7 Nm (0.7 m•kg, 5.1 ft•lb)

EC36a042
LUBRICATION

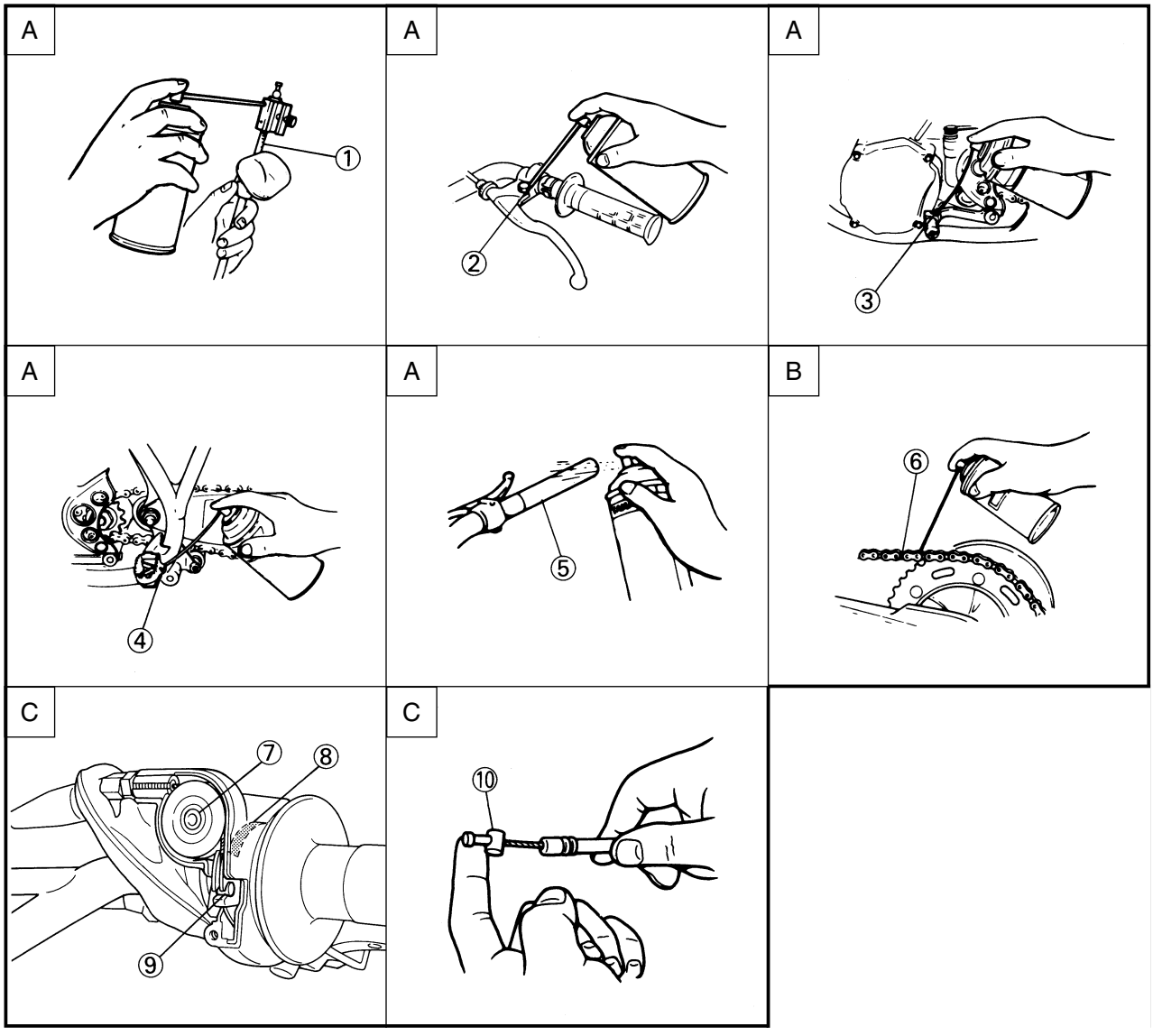
To ensure smooth operation of all components, lubricate your machine during setup, after break-in, and after every race.

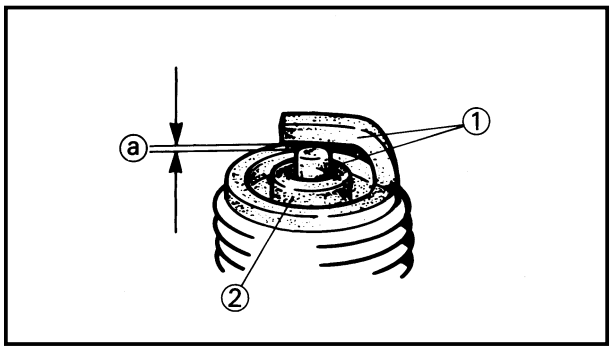
① All control cable
② Clutch lever pivot
③ Shift pedal pivot
④ Footrest pivot
⑤ Throttle-to-handlebar contact
⑥ Drive chain
⑦ Throttle roller sliding surface
⑧ Tube guide cable winding portion
⑨ Throttle cable end
⑩ Clutch cable end

A Use Yamaha cable lube or equivalent on these areas.
B Use SAE10W-30 motor oil or suitable chain lubricants.
C Lubricate the following areas with high quality, lightweight lithium-soap base grease.

CAUTION:

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





EC370000
ELECTRICAL

EC371001
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:

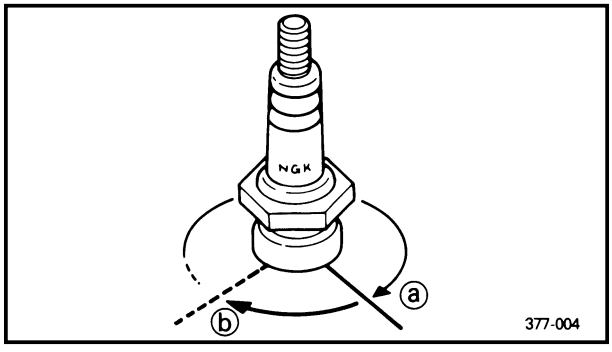
When the engine runs for many hours at low speeds, the spark plug insulator will become sooty, even if the engine and carburetor are in good operating condition.

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:
BR8EG (NGK)

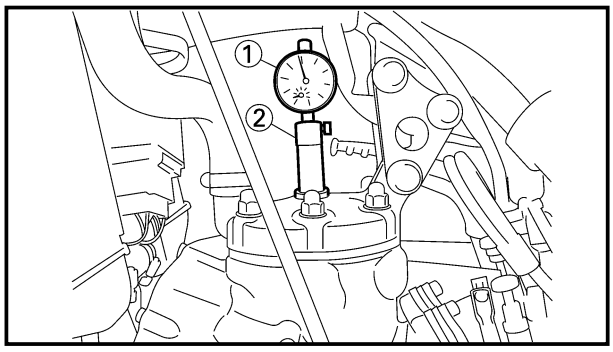
4. Clean the plug with a spark plug cleaner if necessary.



5. Tighten:
   - Spark plug — **20 Nm (2.0 m•kg, 14 ft•lb)**

NOTE:

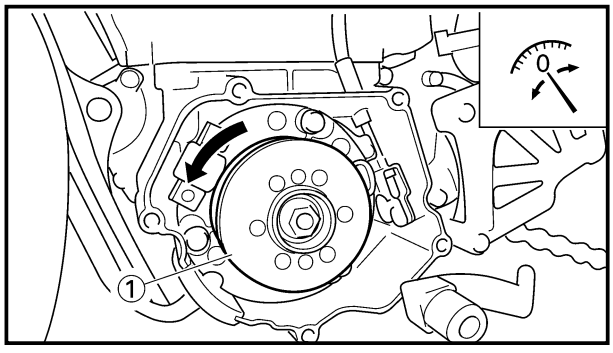
- Before installing a spark plug, clean the gasket surface and plug surface.
- Finger-tighten ⓐ the spark plug before torquing to specification ⓑ.



EC372012
IGNITION TIMING CHECK

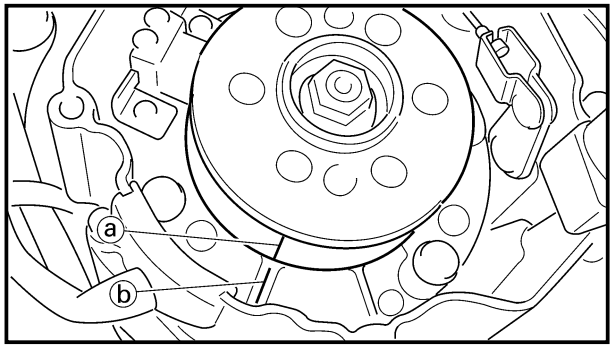
1. Remove:
   - Fuel tank
     Refer to "SEAT, FUEL TANK AND SIDE COVERS" section in the CHAPTER 4.
   - Spark plug
   - Crankcase cover (left)
2. Attach:
   - Dial gauge ①
   - Spark plug hole dial stand ②

Dial gauge:
YU-3097/90890-01252
Spark plug hole dial stand:
YU-1256

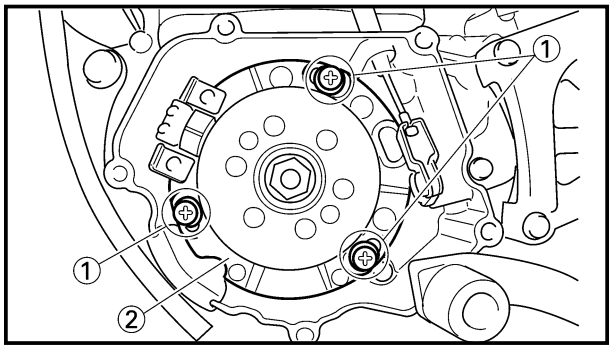


3. Rotate the magneto rotor ① until the piston reaches top dead center (TDC). When this happens, the needle on the dial gauge will stop and reverse directions even though the rotor is being turned in the same direction.
4. Set the dial gauge to zero at TDC.
5. From TDC, rotate the rotor clockwise until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

Ignition timing (B.T.D.C.):
0.18 mm (0.007 in)



6. Check:
   - Ignition timing
     Punch mark ⓐ on rotor should be aligned with punch mark ⓑ on stator.
     Not aligned → Adjust.



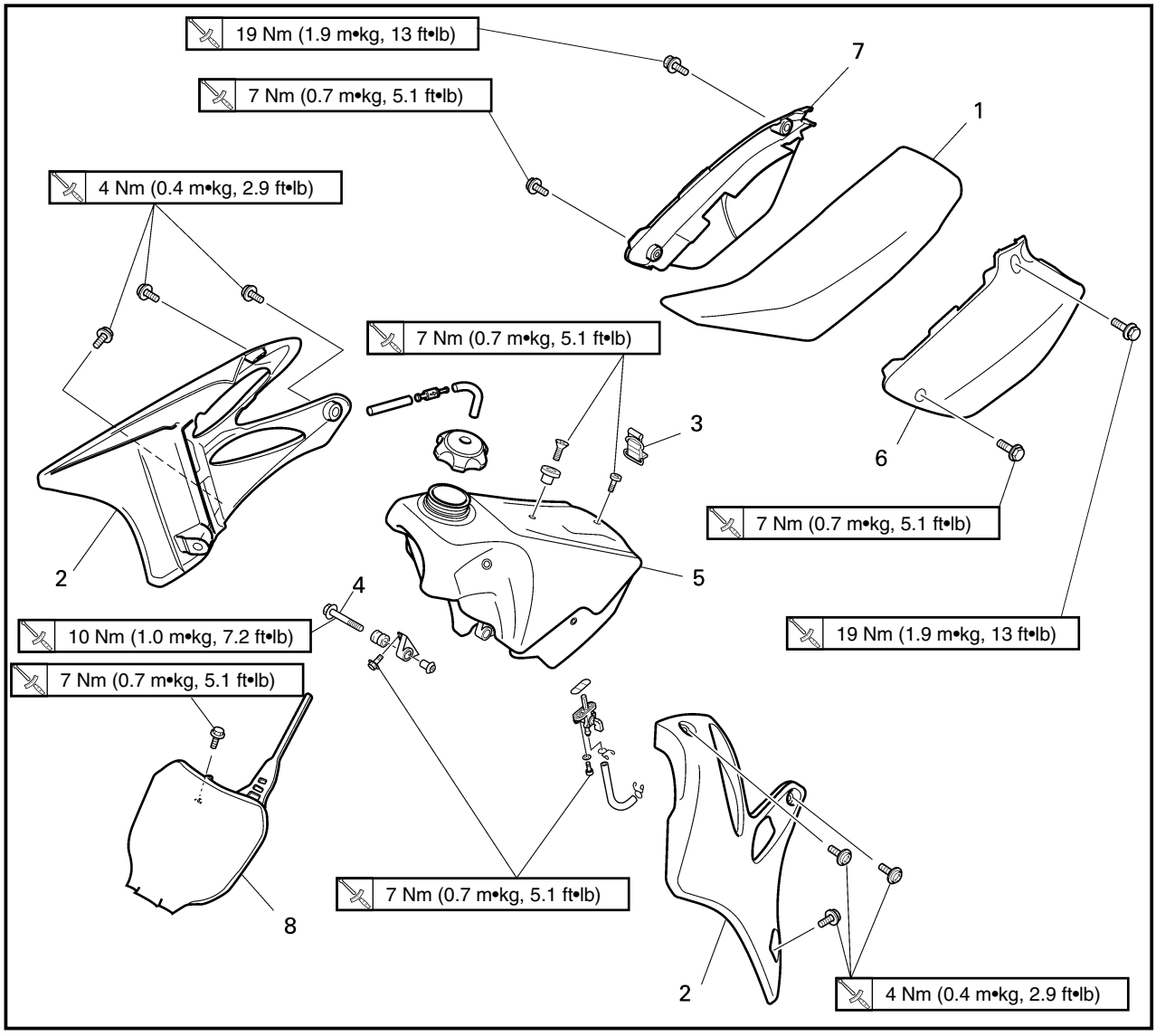
7. Adjust:
   - Ignition timing

Adjustment steps:
- Loosen the screws (stator) ①.
- Align the punch mark on the rotor with punch mark on the stator ② by moving the stator.
- Tighten the screws (stator).

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

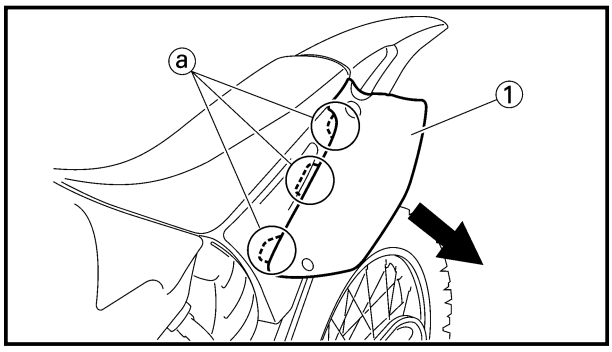
EC400000
ENGINE

EC4R0000
SEAT, FUEL TANK AND SIDE COVERS



Extent of removal:
① Seat removal
② Fuel tank removal
③ Side covers removal
④ Number plate removal

Extent of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		**SEAT, FUEL TANK AND SIDE COVERS REMOVAL** Turn the fuel cock to "OFF". Disconnect the fuel hose.		
①	1	Seat	1	
	2	Air scoop (left and right)	2	
②	3	Fitting band	1	Remove on fuel tank side.
	4	Bolt (fuel tank)	2	
	5	Fuel tank	1	
③	6	Side cover (left)	1	Refer to "REMOVAL POINTS".
	7	Side cover (right)	1	
④	8	Number plate	1	



EC4R3000
REMOVAL POINTS

EC413110
Side cover

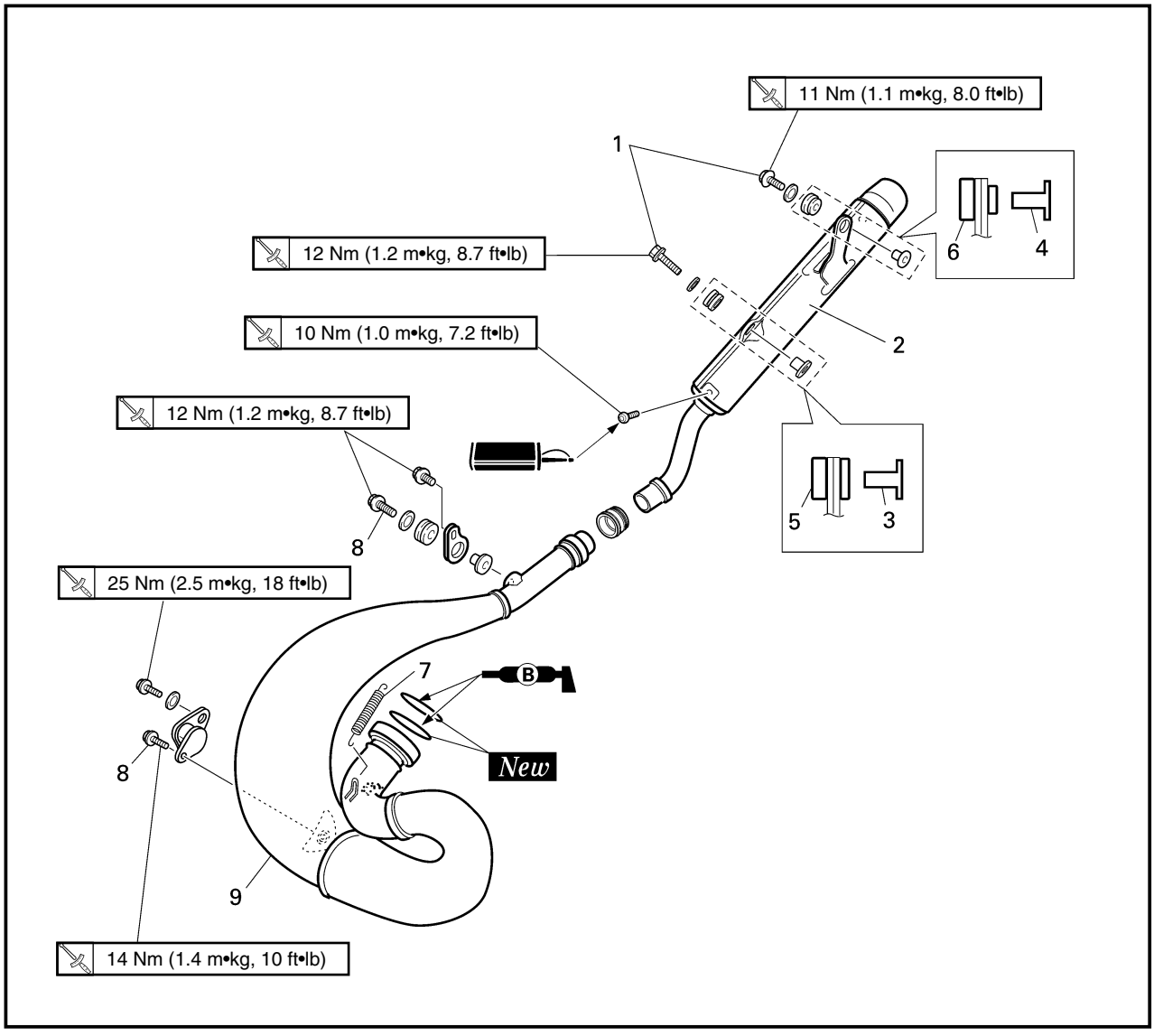
1. Remove:
   - Bolt (side cover)
   - Side cover (left and right) ①

NOTE:

Draw the side cover downward to remove it because its claws ⓐ are inserted in the air cleaner case.

EC4S0000

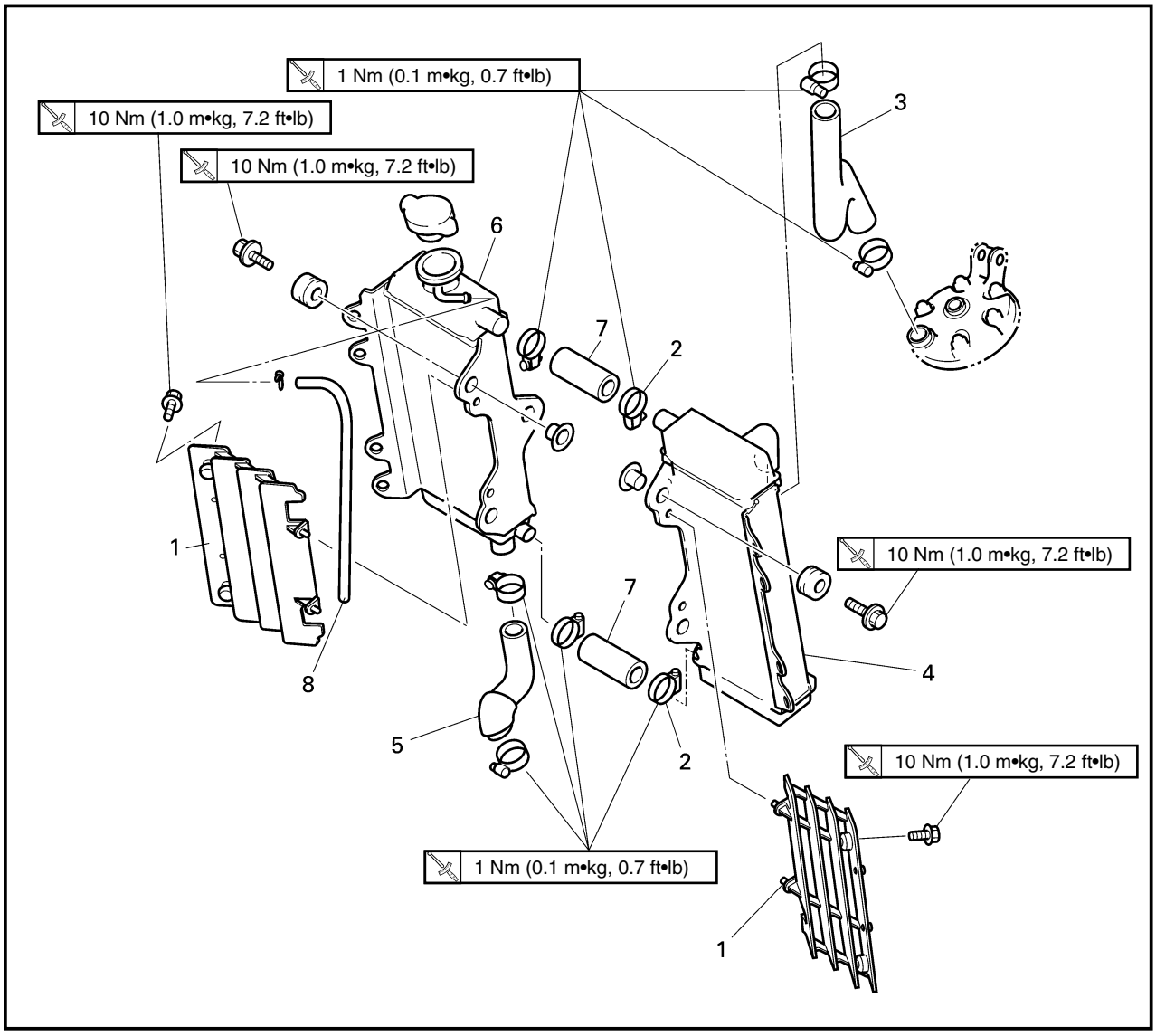
EXHAUST PIPE AND SILENCER



Extent of removal: ① Silencer removal ② Exhaust pipe removal

Extent of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		**EXHAUST PIPE AND SILENCER REMOVAL** Side cover (right)		Refer to "SEAT, FUEL TANK AND SIDE COVERS" section.
② ① ②	1	Bolt (silencer)	2	
	2	Silencer	1	
	3	Collar [D=ø10.5 mm (0.41 in)]	1	
	4	Collar [D=ø10.0 mm (0.39 in)]	1	
	5	Grommet (front)	1	
	6	Grommet (rear)	1	
	7	Tension spring	2	
	8	Bolt (exhaust pipe)	2	
	9	Exhaust pipe	1	

EC450001
RADIATOR



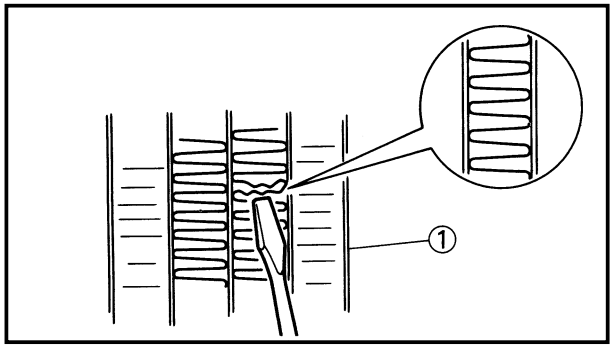
Extent of removal: ① Radiator removal

Extent of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		**RADIATOR REMOVAL** Drain the coolant. Seat and fuel tank		Refer to "COOLANT REPLACEMENT" section in the CHAPTER 3. Refer to "SEAT, FUEL TANK AND SIDE COVERS" section.
①	1	Panel	2	
	2	Clamp (radiator hose 2)	2	Only loosening.
	3	Radiator hose 1	1	
	4	Radiator (left)	1	
	5	Radiator hose 4	1	
	6	Radiator (right)	1	
	7	Radiator hose 2	2	
	8	Radiator breather hose	1	

EC456000
HANDLING NOTE

⚠WARNING

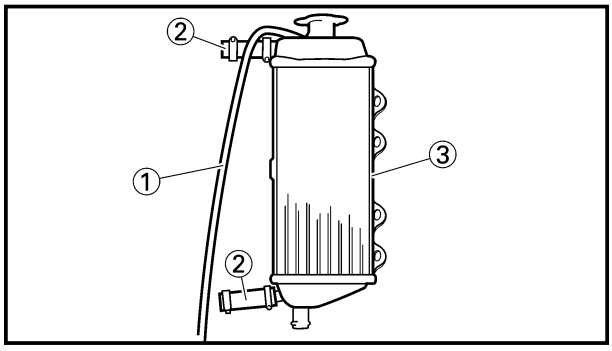
Do not remove the radiator cap when the engine and radiator are hot. Scalding hot fluid and steam may be blown out under pressure, which could cause serious injury.
When the engine has cooled, open the radiator cap by the following procedure:
Place a thick rag, like a towel, over the radiator cap, slowly 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.

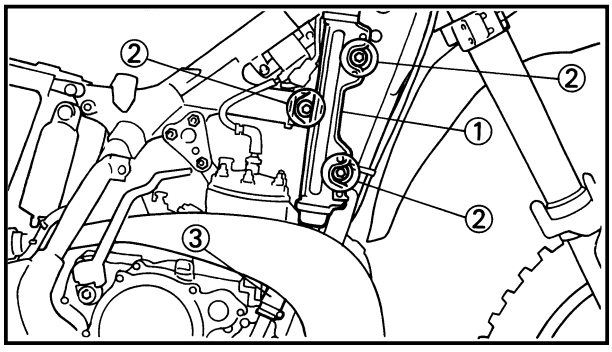


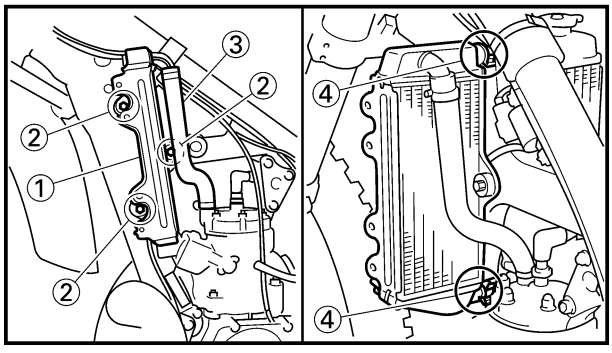
EC454000
INSPECTION

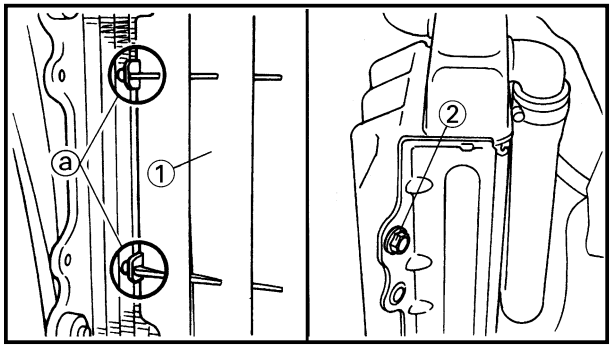
EC444100
Radiator

1. Inspect:
   - Radiator core ①
     Obstruction → Blow out with compressed air through rear of the radiator.
     Bent fin → Repair/replace.









EC455000
ASSEMBLY AND INSTALLATION

EC445353
Radiator

1. Install:
   - Radiator breather hose ①
   - Radiator hose 2 ②

     1 Nm (0.1 m•kg, 0.7 ft•lb)

   To radiator (right) ③.

2. Install:
   - Radiator (right) ①
   - Bolt [radiator (right)] ②

     10 Nm (1.0 m•kg, 7.2 ft•lb)
   - Radiator hose 4 ③

     1 Nm (0.1 m•kg, 0.7 ft•lb)

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

3. Install:
   - Radiator (left) ①
   - Bolt [radiator (left)] ②

     10 Nm (1.0 m•kg, 7.2 ft•lb)
   - Radiator hose 1 ③

     1 Nm (0.1 m•kg, 0.7 ft•lb)

   Refer to "CABLE ROUTING DIAGRAM" section in the CHAPTER 2.
4. Tighten:
   - Clamp (radiator hose 2) ④

     1 Nm (0.1 m•kg, 0.7 ft•lb)

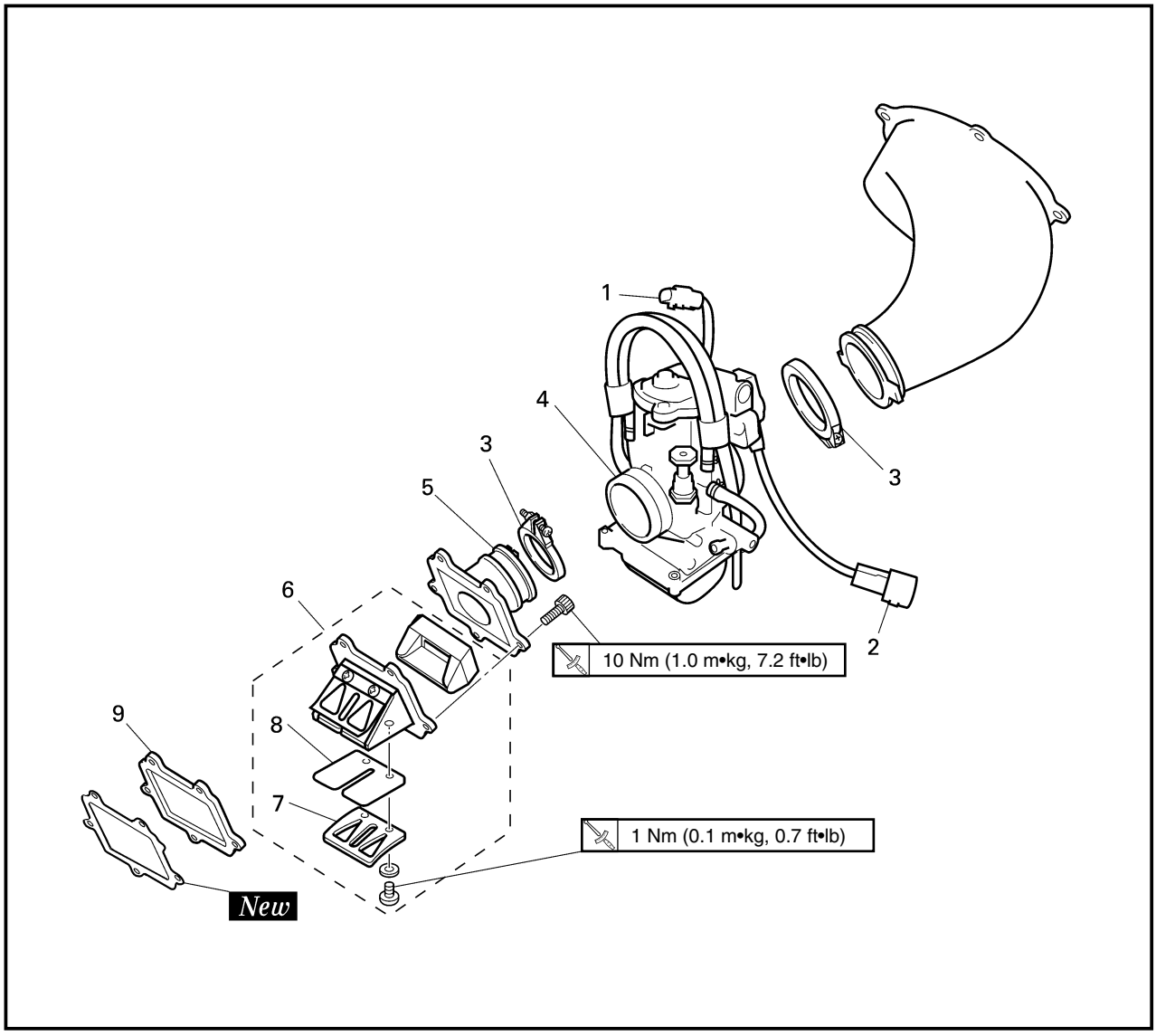
5. Install:
   - Panel ①
   - Bolt (panel) ②

     10 Nm (1.0 m•kg, 7.2 ft•lb)

NOTE:

Fit the hook ⓐ on the inner side first into the radiator.

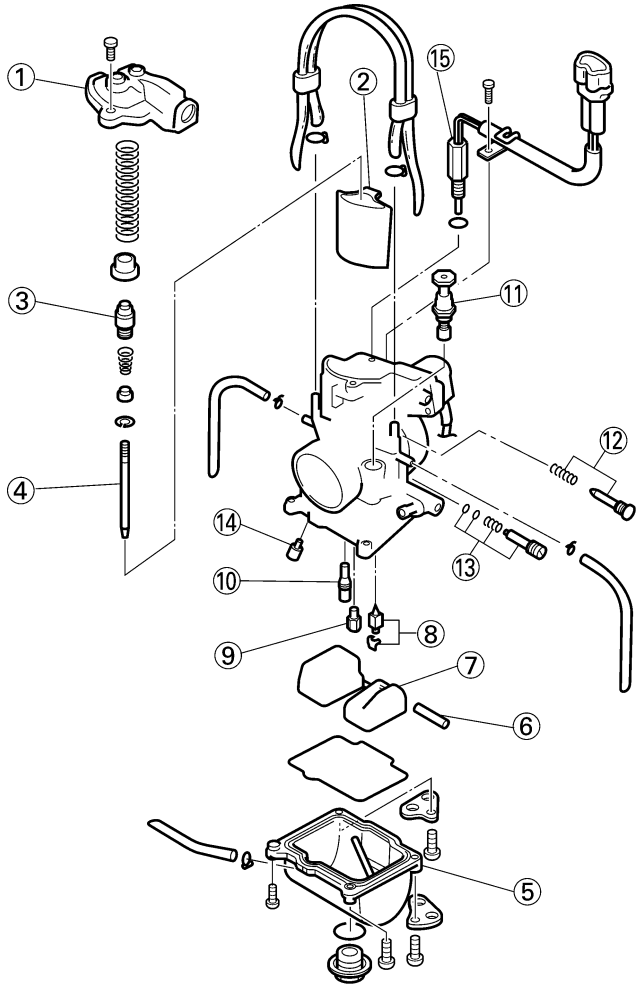
EC460000
CARBURETOR AND REED VALVE



Extent of removal: ① Carburetor removal ② Reed valve removal

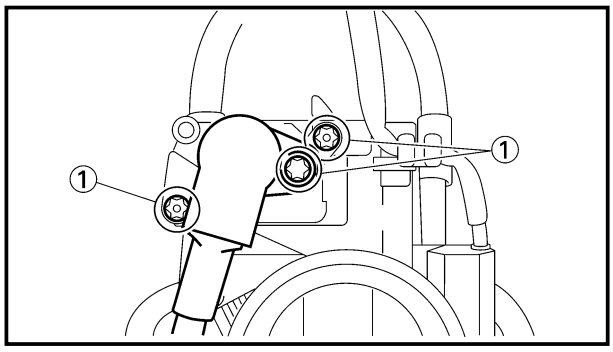
Extent of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		**CARBURETOR AND REED VALVE REMOVAL** Fuel tank		Refer to "SEAT, FUEL TANK AND SIDE COVERS" section.
① ②	1	Solenoid valve lead	1	Disconnect the solenoid valve lead.
	2	TPS (throttle position sensor) lead	1	Disconnect the TPS (throttle position sensor) lead.
	3	Clamp (carburetor joint)	2	Loosen the screws (carburetor joint).
	4	Carburetor	1	
	5	Carburetor joint	1	
	6	Reed valve assembly	1	
	7	Stopper (reed valve)	2	
	8	Reed valve	2	
	9	Plate (reed valve)	1	

EC468000
CARBURETOR DISASSEMBLY



Extent of removal: ① Carburetor disassembly

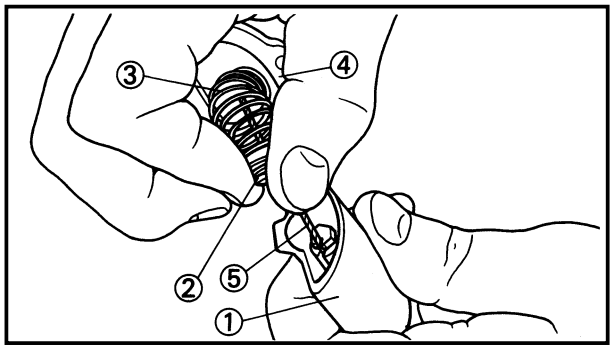
Extent of removal	Order	Part name	Q'ty	Remarks
		CARBURETOR DISASSEMBLY		
①	①	Mixing chamber top	1	
	②	Throttle valve	1	Refer to "REMOVAL POINTS".
	③	Needle holder	1	
	④	Jet needle	1	
	⑤	Float chamber	1	
	⑥	Float pin	1	
	⑦	Float	1	
	⑧	Needle valve	1	
	⑨	Main jet	1	
	⑩	Pilot jet	1	
	⑪	Starter plunger	1	
	⑫	Throttle stop screw	1	
	⑬	Pilot air screw	1	Refer to "REMOVAL POINTS".
	⑭	Power jet	1	
	⑮	Solenoid valve	1	



EC466020
HANDLING NOTE

CAUTION:

Do not loosen the screws {TPS (throttle position sensor)} except when changing the TPS (throttle position sensor) due to failure because it will cause a drop in engine performance.



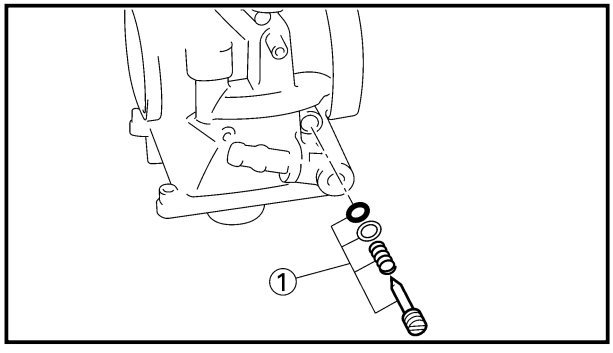
EC463000
REMOVAL POINTS

EC463110
Throttle valve

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

NOTE:

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

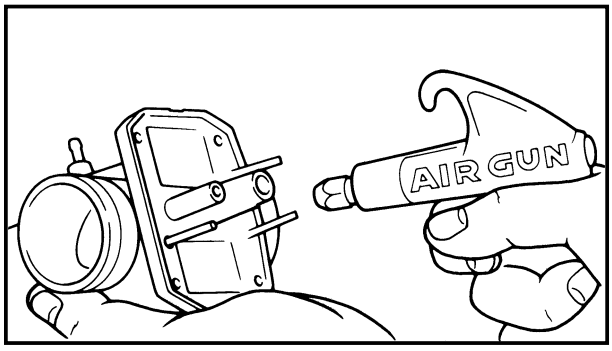


EC463401
Pilot air screw

1. Remove:
   - Pilot air screw ①

NOTE:

To optimize the fuel flow at a smaller throttle opening, each machine's pilot air screw has been individually set at the factory. Before removing the pilot air screw, turn it in fully and count the number of turns. Record this number as the factory-set number of turns out.



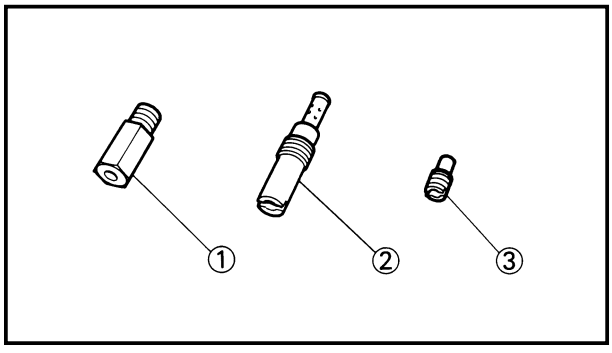
EC464000
INSPECTION

EC464130
Carburetor

1. Inspect:
   - Carburetor body
     Contamination → Clean.

NOTE:

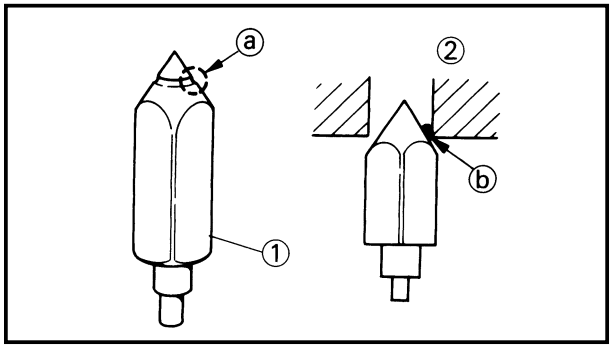
- Use a petroleum based solvent for cleaning. Blow out all passages and jets with compressed air.
- Never use a wire.



2. Inspect:
   - Main jet ①
   - Pilot jet ②
   - Power jet ③
     Contamination → Clean.

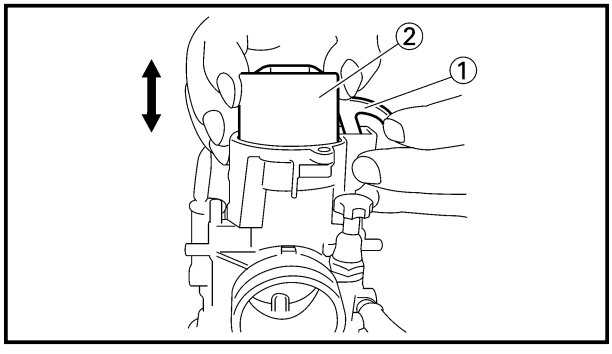
NOTE:

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



EC464210
Needle valve

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

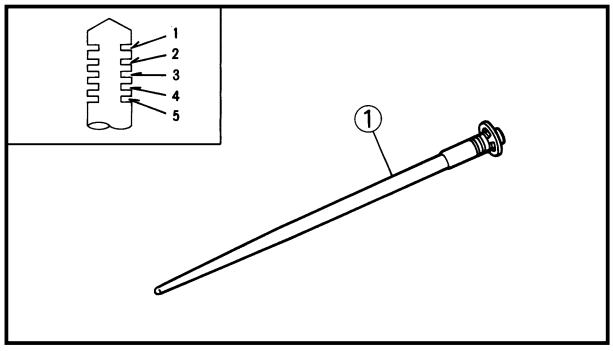


EC464310
Throttle valve

1. Check:
   - Free movement
     Stick → Repair or replace.

NOTE:

Insert the throttle valve ② into the carburetor body while pulling up the lever ①, and check for free movement.

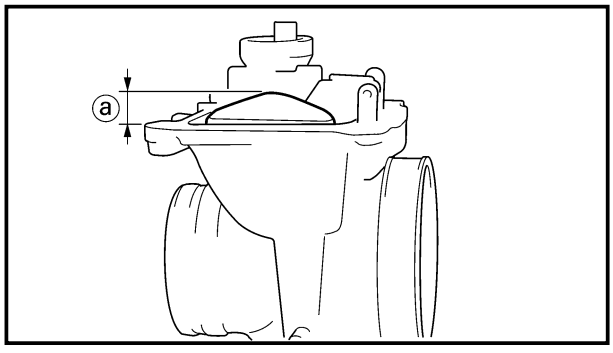


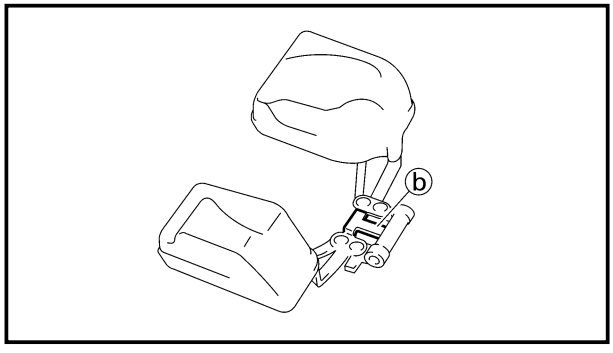
EC464401
Jet needle

1. Inspect:
   - Jet needle ①
     Bends/Wear → Replace.
   - Clip groove
     Free play exists/Wear → Replace.
   - Clip position

Standard clip position:
No.2 Groove
***No.3 Groove**

*For EUROPE





EC464511
Float height

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

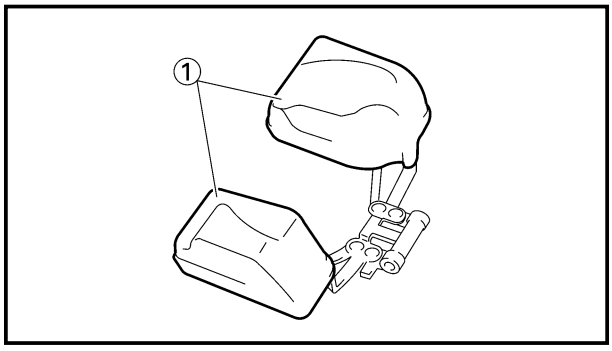
Float height:
5.5~7.5 mm (0.22~0.30 in)

Measurement and adjustment steps:
- Hold the carburetor in an upside down position.
- Measure the distance between the mating surface of the float chamber and top of the float using a vernier calipers.

NOTE:

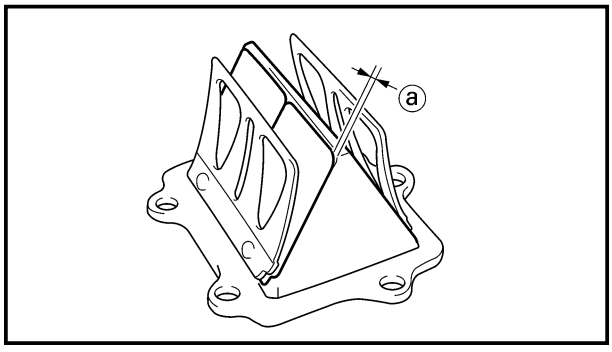
The float arm should be resting on the needle valve, but not compressing the needle valve.

- 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.
- Recheck the float height.



EC464600
Float

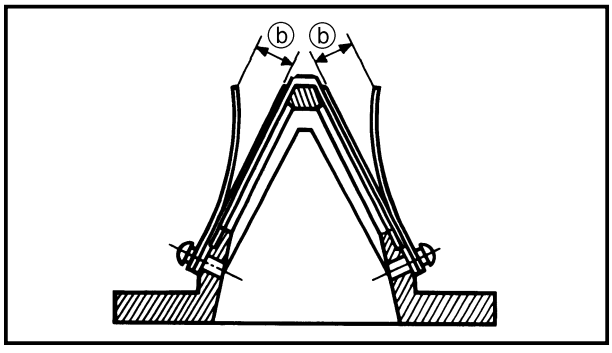
1. Inspect:
   - Float ①
     Damage → Replace.



EC464701
Reed valve

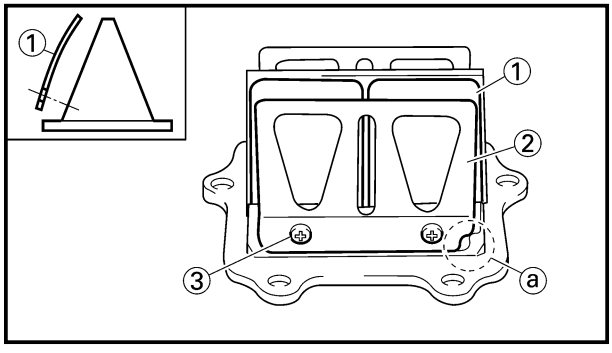
1. Measure:
   - Reed valve bending ⓐ
     Out of specification → Replace.

Reed valve bending limit:
0.2 mm (0.008 in)



- Valve stopper height ⓑ
  Out of specification → Adjust stopper/
  Replace valve stopper.

Valve stopper height:
10.3 ~10.7 mm (0.406~0.421 in)



EC465000
ASSEMBLY AND INSTALLATION

EC465172
Reed valve

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

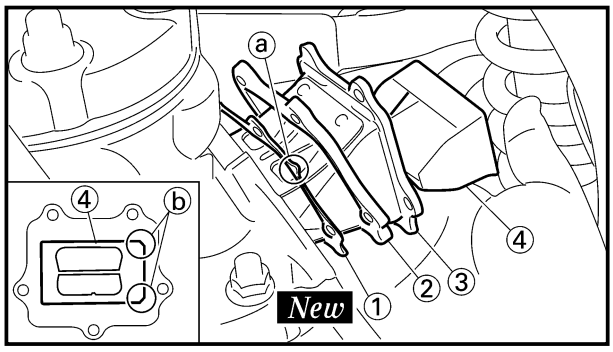
1 Nm (0.1 m•kg, 0.7 ft•lb)

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.

CAUTION:

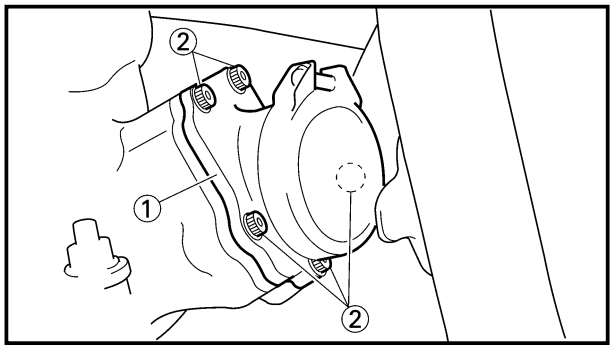
Tighten each screw gradually to avoid warping.



2. Install:
   - Gasket (reed valve) ① ***New***
   - Plate (reed valve) ②
   - Reed valve assembly ③
   - Reed valve spacer ④

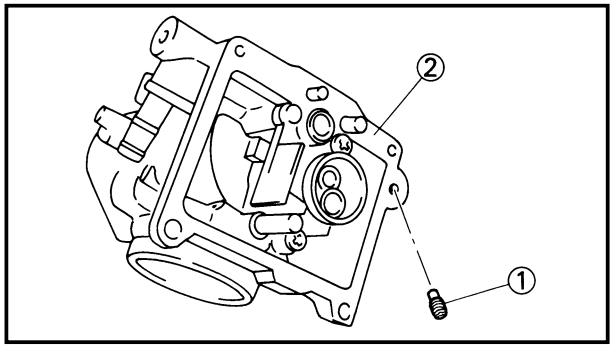
NOTE:

- Install the gasket (reed valve) with its projection ⓐ to the left.
- Install the reed valve spacer with its chamfered side ⓑ to the right.



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

10 Nm (1.0 m•kg, 7.2 ft•lb)

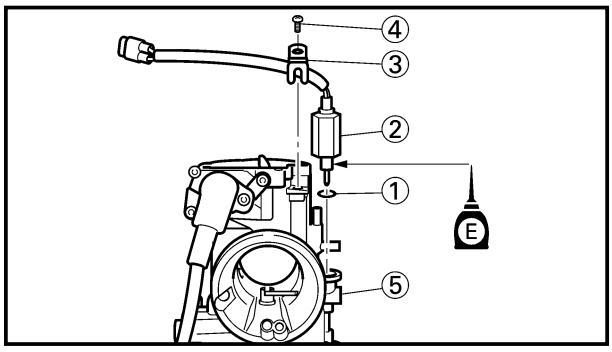


EC4652F0

Carburetor

1. Install:
   - Power jet ①

   To carburetor ②.

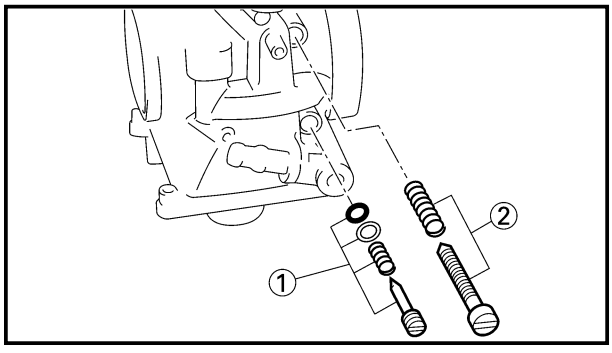


2. Install:
   - O-ring ①
   - Solenoid valve ②
   - Clamp ③
   - Screw (clamp) ④

   To carburetor ⑤.

CAUTION:

- **Before installing the solenoid valve, blow air on the solenoid valve and its installing location on the carburetor in order to remove any foreign particles such as chips etc.**
- **Apply the engine oil on the solenoid valve thread.**

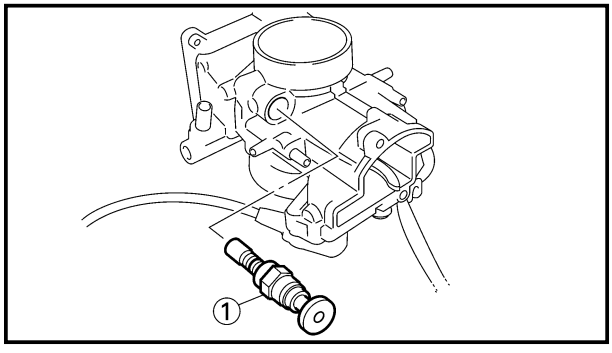


3. Install:
   - Pilot air screw ①
   - Throttle stop screw ②

Note the following installation points:

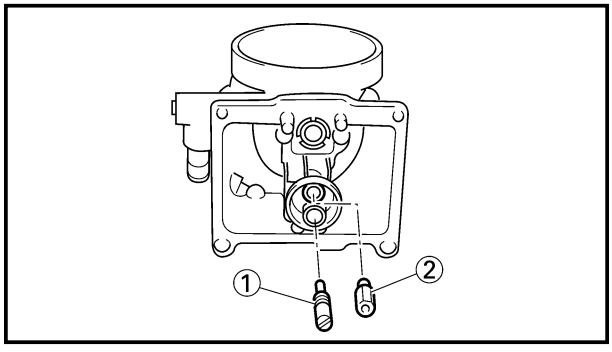
- Turn in the pilot air screw until it is lightly seated.
- Turn out the pilot air screw by the number of turns recorded before removing.

Pilot air screw:
1 turn out
***7/8 turns out**
(for reference only)

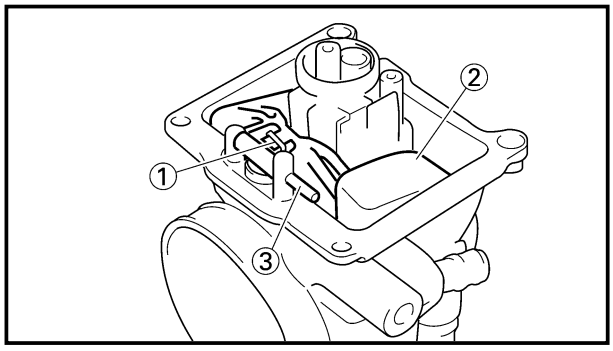


*For EUROPE

4. Install:
   - Starter plunger ①



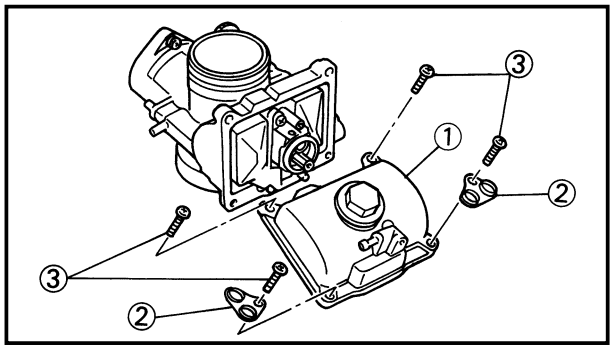
5. Install:
   - Pilot jet ①
   - Main jet ②



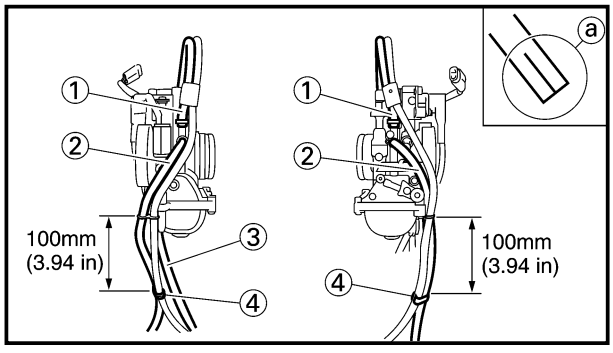
6. Install:
   - Needle valve ①
   - Float ②
   - Float pin ③

NOTE:

- After installing the needle valve to the float, install them to the carburetor.
- Check the float for smooth movement.



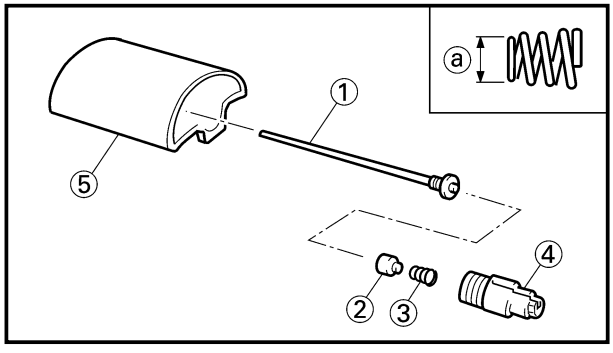
7. Install:
   - Float chamber ①
   - Plate ②
   - Screw (float chamber) ③



8. Install:
   - Air vent hose [ℓ=580 mm (22.8 in)] ①
   - Air vent hose [ℓ=400mm (15.7 in)] ②
   - Overflow hose [ℓ=280mm (11.0 in)] ③
   - Clamp ④

NOTE:

Install the air vent hoses and overflow hose to the carburetor with their ends not having the cuts ⓐ toward the carburetor.

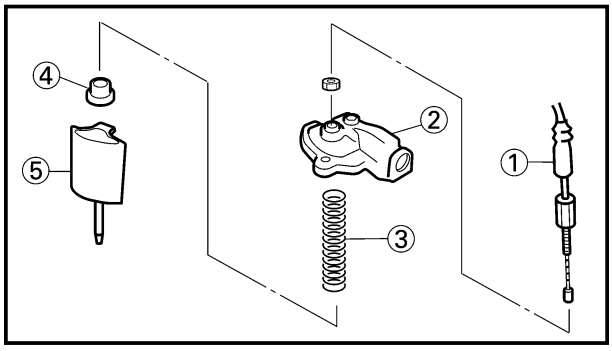


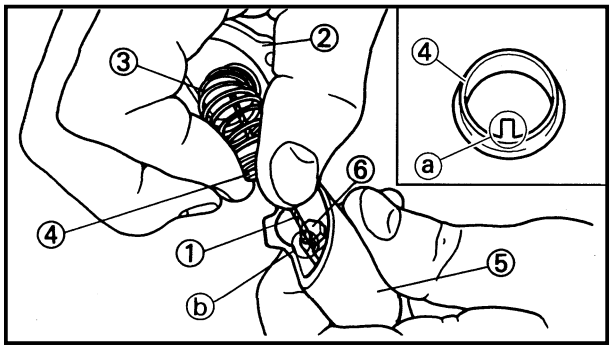
9. Install:
   - Jet needle ①
   - Collar ②
   - Spring ③
   - Needle holder ④

   To throttle valve ⑤.

NOTE:

Install the spring with its smaller dia. ⓐ facing the collar.

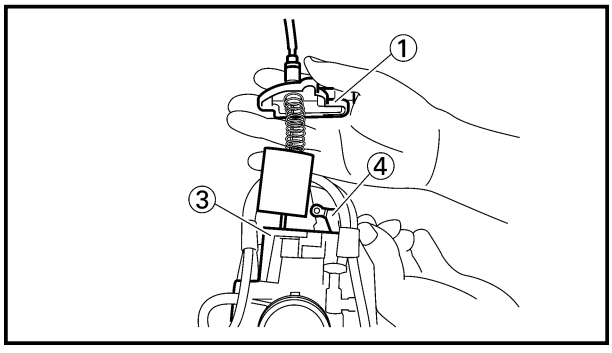




10. Install:
    - Throttle cable ①
    - Mixing chamber top ②
    - Spring (throttle valve) ③
    - Ring ④
    - Throttle valve ⑤

NOTE:

- While compressing the spring, connect the throttle cable.
- Align the projection ⓐ on the ring with the groove ⓑ in the needle holder ⑥.

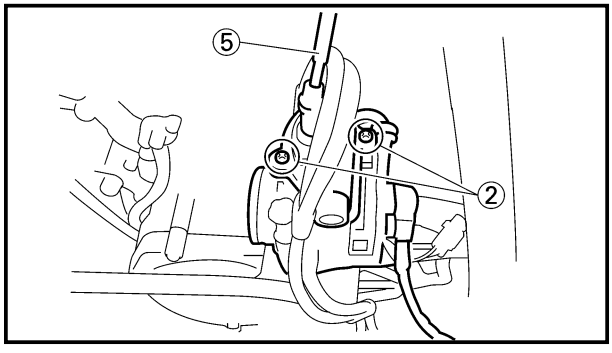


11. Install:
    - Mixing chamber top ①
    - Screw(mixing chamber top) ②

    To carburetor ③.

NOTE:

- Insert the throttle valve into the carburetor body while pulling up the lever ④.
- Pass the throttle cable ⑤ at the front (on the cylinder side) of the air vent hose.
- After installing, check the throttle grip for smooth movement.



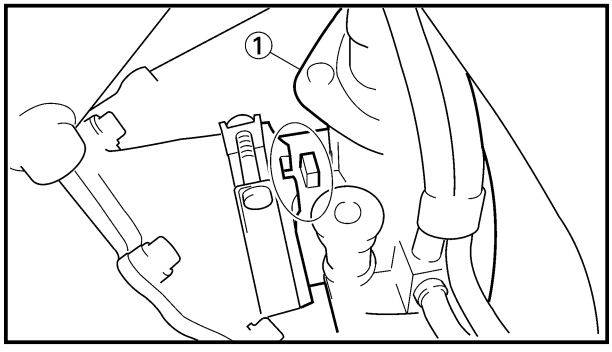
EC465391

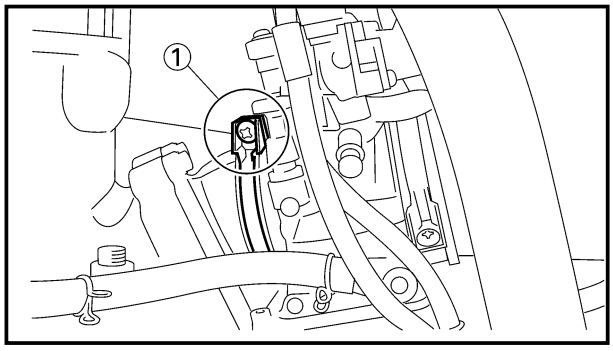
Carburetor installation

1. Install:
    - Carburetor ①

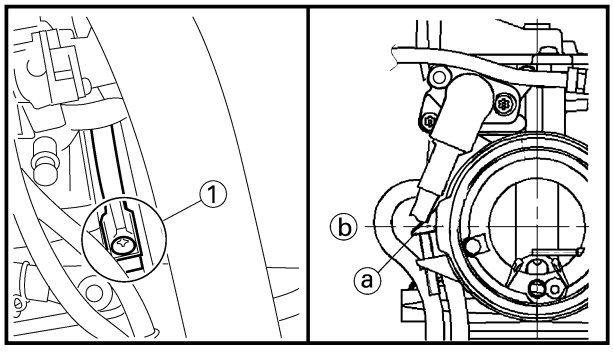
NOTE:

Install the projection between the carburetor joint slots.





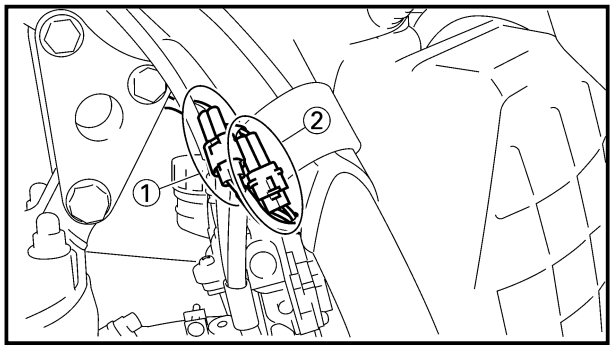
2. Tighten:
   • Screw (carburetor joint) ①



3. Tighten:
   • Screw (air cleaner joint) ①

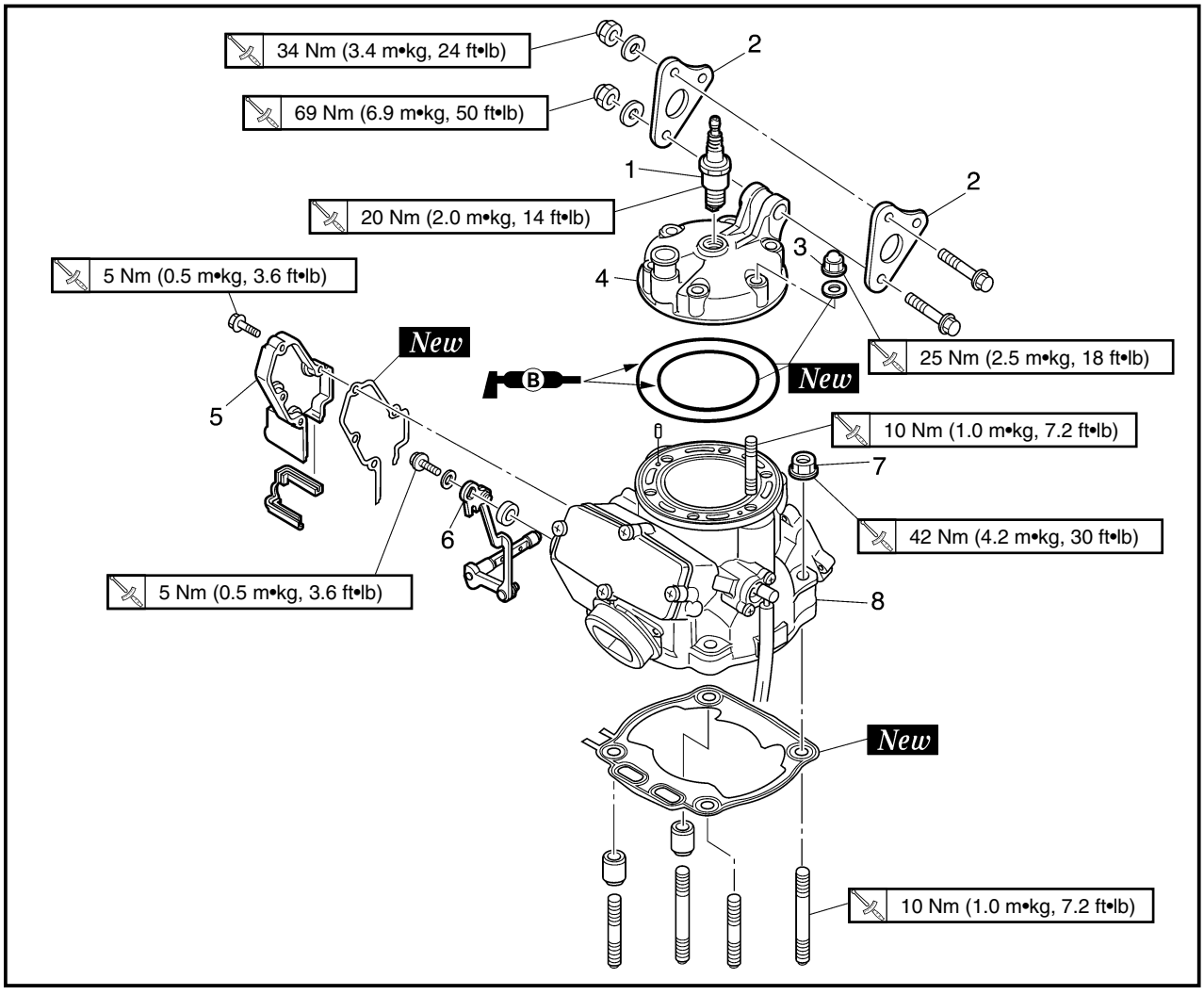
NOTE:

Place the screw head ⓐ with its top as shown and secure the clamp in alignment with the horizontal line ⓑ that passes the center of the carburetor bore.



4. Connect:
   • TPS (throttle position sensor) lead ①
   • Solenoid valve lead ②
   Refer to "CABLE ROUTING DIAGRAM" section in the CHAPTER 2.
5. Adjust:
   • Idle speed
   Refer to "IDLE SPEED ADJUSTMENT" section in the CHAPTER 3.

EC470000
CYLINDER HEAD, CYLINDER AND PISTON
EC478000
CYLINDER HEAD AND CYLINDER

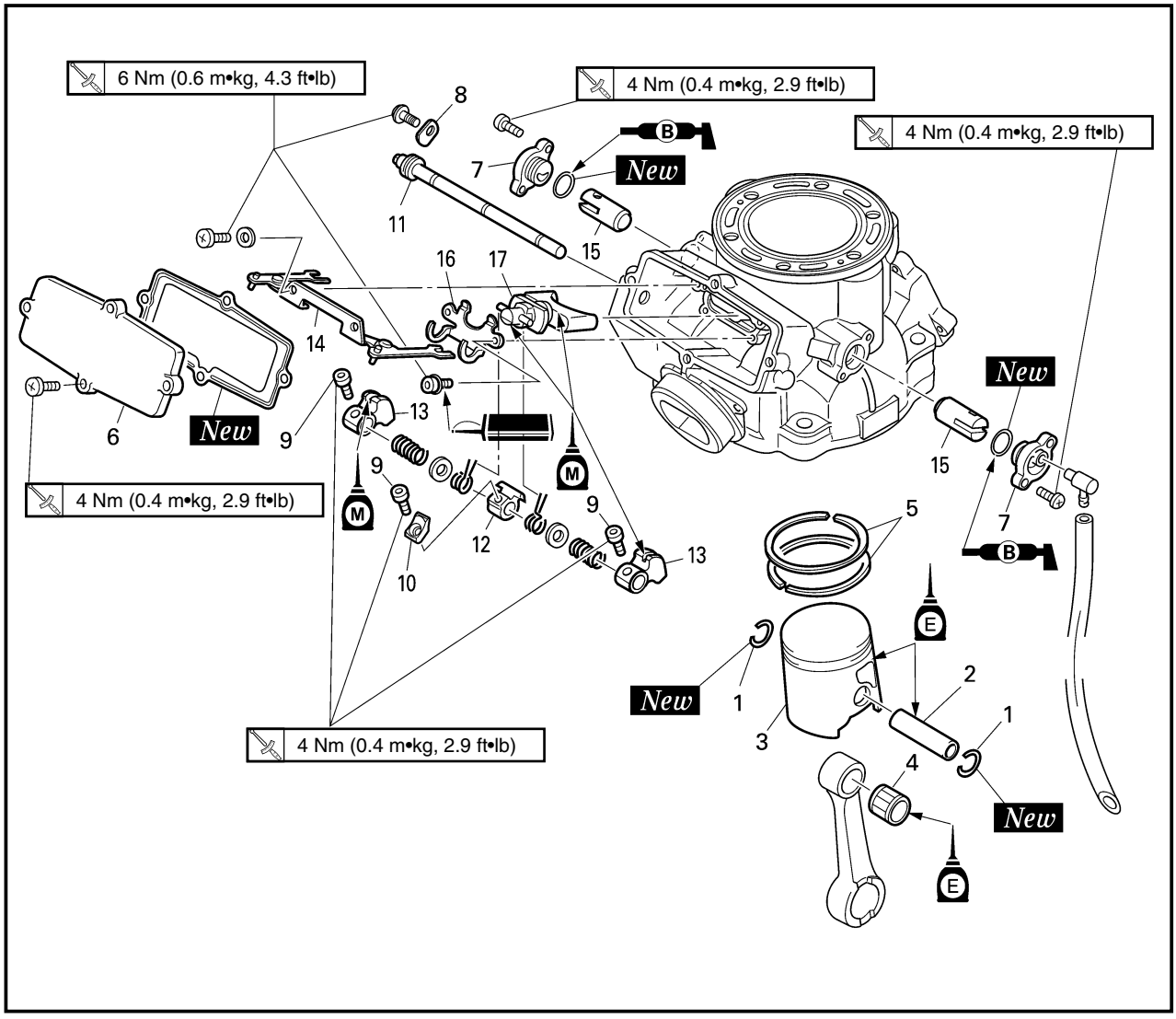


Extent of removal: ① Cylinder head removal ② Cylinder removal

Extent of removal	Order	Part name	Q'ty	Remarks
		CYLINDER HEAD AND CYLINDER REMOVAL		
Preparation for removal		Seat and fuel tank		Refer to "SEAT, FUEL TANK AND SIDE COVERS" section.
		Exhaust pipe and silencer		Refer to "EXHAUST PIPE AND SILENCER" section.
		Radiator hose 1		Disconnect at cylinder head side.
		Carburetor		Refer to "CARBURETOR AND REED VALVE" section.
①	1	Spark plug	1	
①	2	Engine bracket	2	
①	3	Nut (cylinder head)	6	Loosen each nut 1/4 turn, and remove them after all nuts are loosened.
②	4	Cylinder head	1	
②	5	Power valve housing	1	
②	6	Push rod	1	Refer to "REMOVAL POINTS".
②	7	Nut (cylinder)	4	
②	8	Cylinder	1	

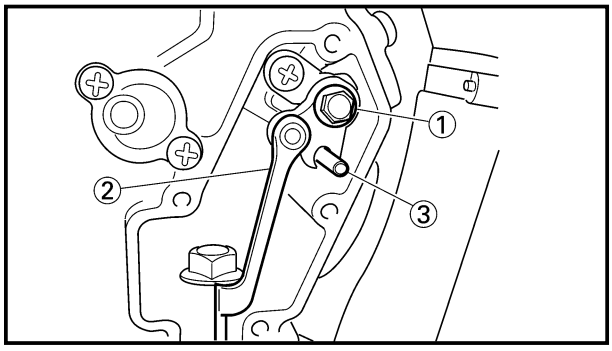
EC478100

PISTON AND POWER VALVE



Extent of removal: ① Piston and piston ring removal ② Power valve removal

Extent of removal	Order	Part name	Q'ty	Remarks
		PISTON AND POWER VALVE REMOVAL		
①	1	Piston pin clip	2	Refer to "REMOVAL POINTS".
	2	Piston pin	1	
	3	Piston	1	
	4	Small end bearing	1	
	5	Piston ring	2	
②	6	Power valve cover	1	
	7	Side holder	2	
	8	Thrust plate	1	
	9	Bolt	3	
	10	Valve holder 1	1	
	11	Valve shaft	1	
	12	Link lever	1	
	13	Pulley	2	
	14	Link rod	1	
	15	Power valve 2	2	
	16	Valve holder 2	1	
	17	Power valve 1	1	



EC473000
REMOVAL POINTS

EC473220
Push rod

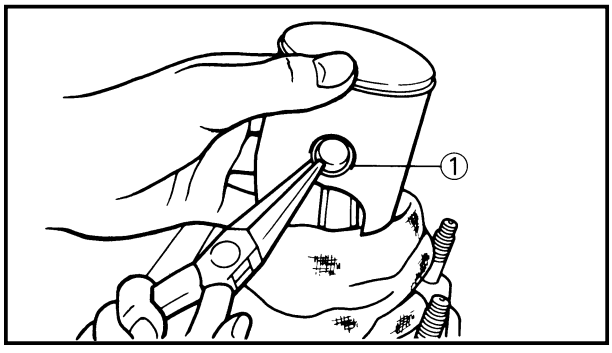
1. Remove:
   - Bolt (push rod) ①
   - Push rod ②

NOTE:

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

CAUTION:

Be sure to use the set pin. If the set pin is not used, the power valve constituent parts will result in damage.

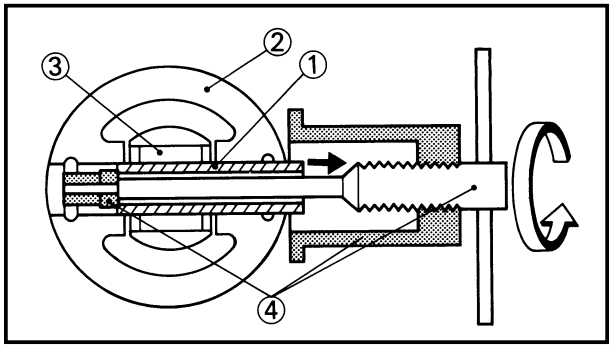


EC473402
Piston and piston ring

1. Remove:
   - Piston pin clip ①

NOTE:

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



2. Remove:
   - Piston pin ①
   - Piston ②
   - Small end bearing ③

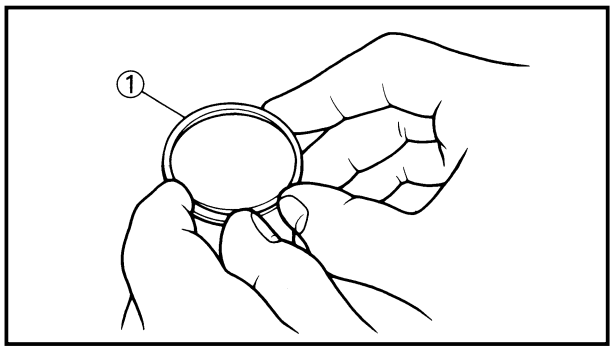
NOTE:

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 ④.

	Piston pin puller: **YU-1304/90890-01304**

CAUTION:

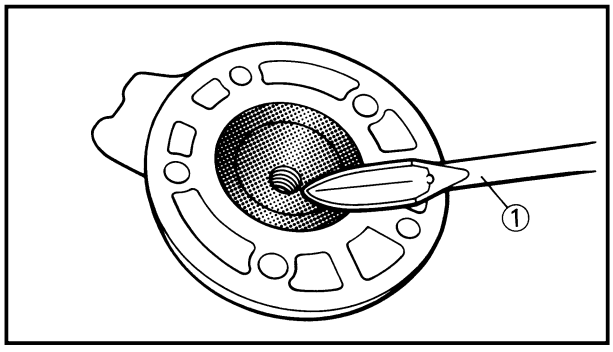
Do not use a hammer to drive the piston pin out.



3. Remove:
   •Piston ring ①

NOTE:

Take care not to scratch the piston or damage the piston ring by expanding it more than necessary.



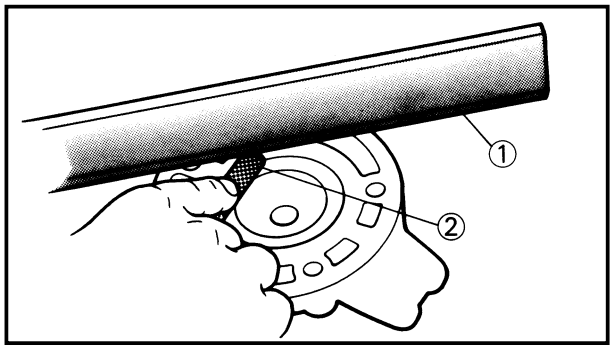
EC474000
INSPECTION

EC474102
Cylinder head

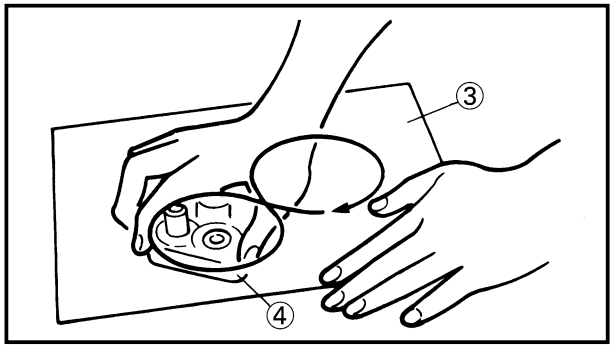
1. Eliminate:
   •Carbon deposits
   Use a rounded scraper ①.

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.



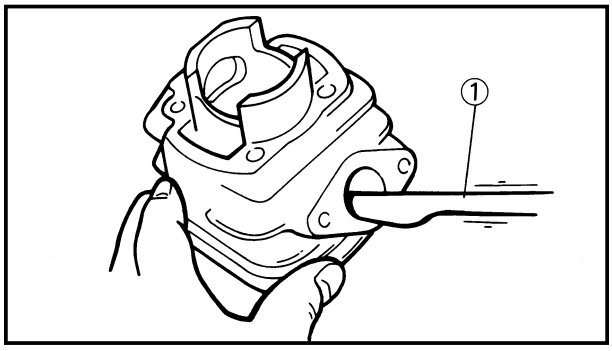
Warpage measurement and re-surfacement steps:
•Attach a straightedge ① and a thickness gauge ② on the cylinder head.
•Measure the warpage.

Warpage limit:
0.03 mm(0.0012 in)

•If the warpage is out of specification, resurface the cylinder head.
•Place # 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 cylinder head several times to avoid removing too much material from one side.



EC474201

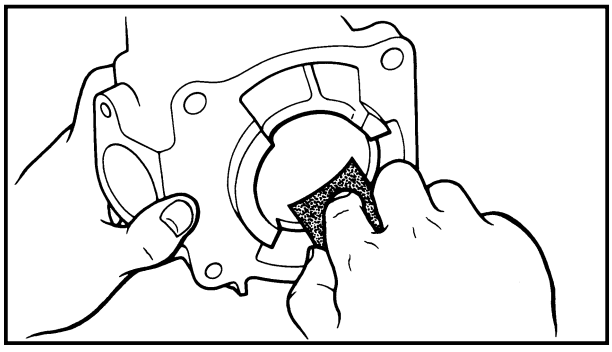
Cylinder

1. Eliminate:
   - Carbon deposits

   Use a rounded scraper ①.

NOTE:

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

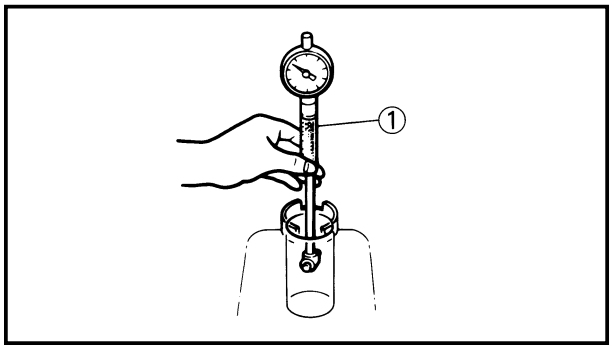


2. Inspect:
   - Cylinder inner surface

   Score marks → Repair or replace.
   Use #400~600 grit wet sandpaper.

CAUTION:

Do not rebore the cylinder.

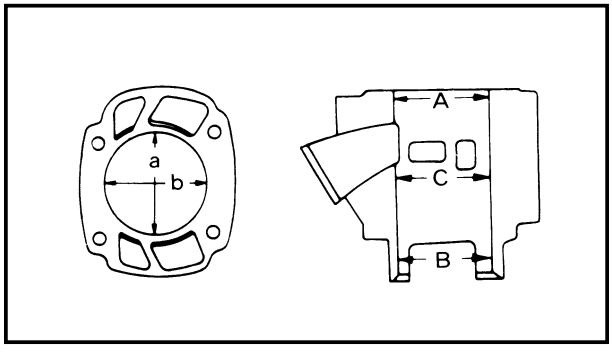


3. Measure:
   - Cylinder bore "C"

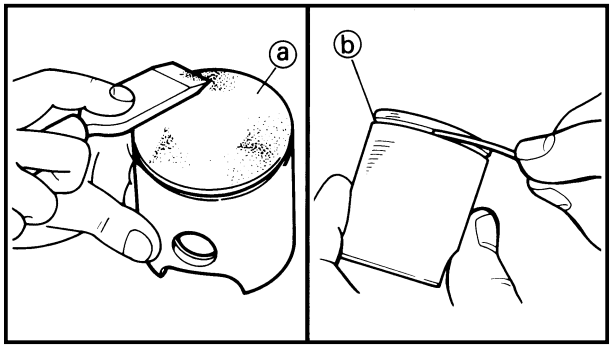
   Use cylinder gauge ①.
   Out of limit → Replace.

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"	66.400~66.414mm (2.6142~2.6147 in)	66.5 mm (2.618 in)
Taper "T"	—	0.05 mm (0.0020 in)
C=Maximum Aa~Cb T=(Maximum Aa, or Ab) — (Maximum Ba, or Bb)		



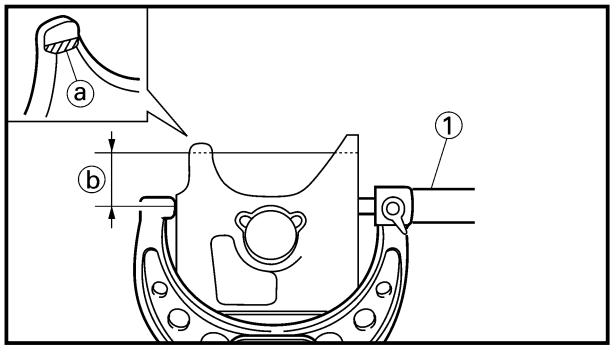
EC474321

Piston

1. Eliminate:
   - Carbon deposits

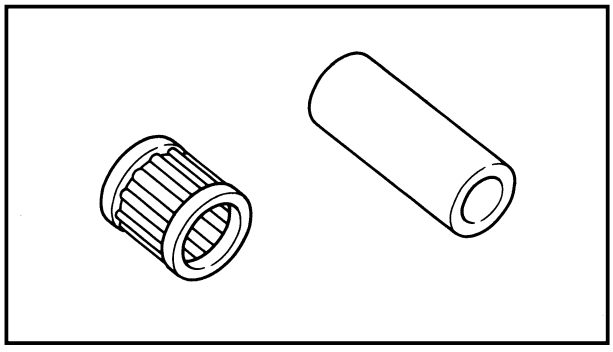
   From the piston crown ⓐ and ring groove ⓑ.
2. Inspect:
   - Piston wall

   Score marks → Repair or replace.



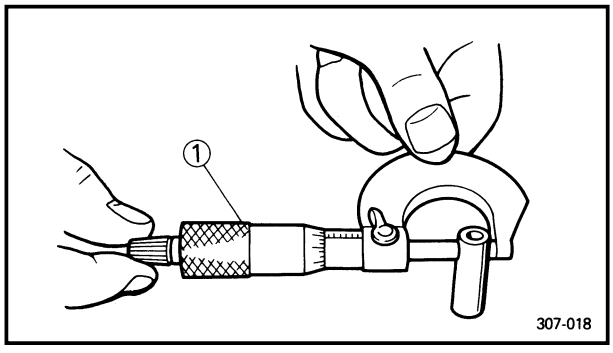
3. Measure:
   • Piston skirt diameter
   Use micrometer ①.
   Measure the specific distance ⓑ from the stepped surface ⓐ on inside of the piston.
   Out of specification → Replace.

Distance ⓑ	Piston dia.
17.5 mm (0.69 in)	66.352~66.367 mm (2.6120~2.6129 in)



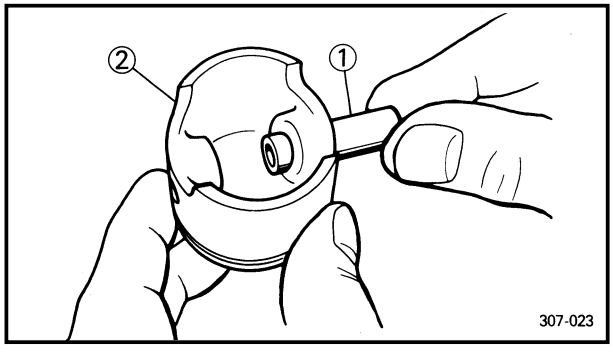
EC474402
Piston pin and small end bearing

1. Inspect:
   • Piston pin
   • Small end bearing
   Signs of heat discoloration → Replace.



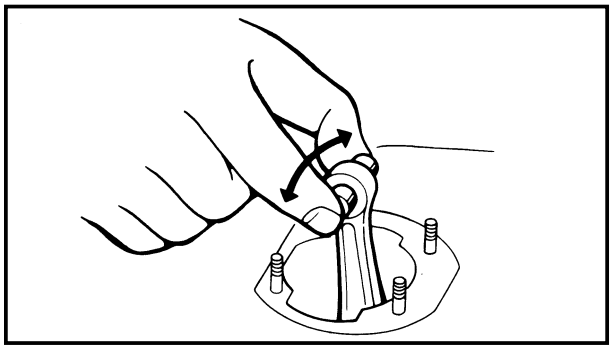
2. Measure:
   • Piston pin outside diameter
   Use micrometer ①.
   Out of limit → Replace.

Piston pin outside diameter:	
Standard	<Limit>
17.995~18.000 mm (0.7085~0.7087 in)	17.975 mm (0.7077 in)

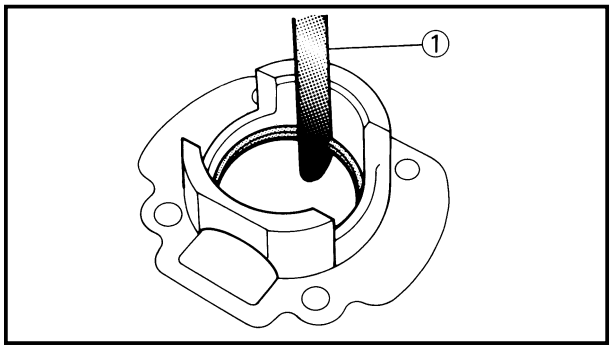


3. Check:
   • Free play (when the piston pin ① is in place in the piston ②)
   There should be no noticeable for the play.
   Free play exists → Replace piston pin and/or piston.

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



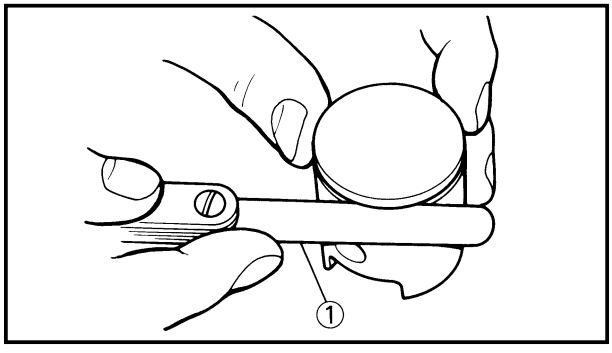
5. Check:
   •Free play
   There should be no noticeable free play.
   Free play exists → Inspect the connecting rod for wear/Replace the pin and/or connecting rod as required.



EC474502
Piston ring

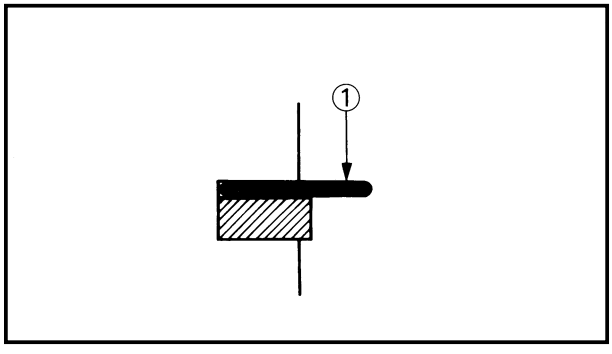
1. Install:
   •Piston ring
   Into the cylinder.
   Push the ring with the piston crown.
2. Measure:
   •End gap
   Use a thickness gauge ①.
   Out of limit → Replace.

Ring end gap (installed):	
Standard	**<Limit>**
0.40~0.55 mm (0.016~0.022 in)	**0.95 mm (0.037 in)**



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

Side clearance:	
Standard	**<Limit>**
0.030~0.065 mm (0.0012~0.0026 in)	**0.1 mm (0.004 in)**



NOTE:

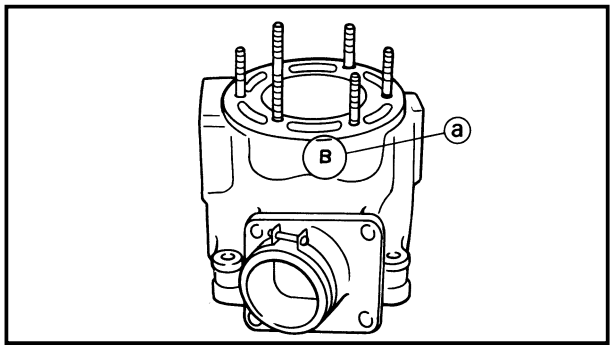
Check at several points.

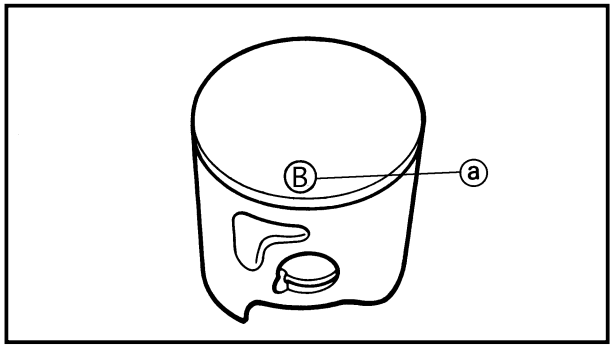
EC474602
Piston clearance

1. Calculate:
   • Piston clearance
   Out of limit → Replace piston, and piston ring and/or cylinder.
   Refer to “Cylinder” and “Piston”.

PISTON CLEARANCE	=	CYLINDER BORE	–	PISTON DIAMETER

Piston clearance:	
Standard	**<Limit>**
0.045~0.050 mm (0.0018~0.0020 in)	**0.1 mm (0.004 in)**





EC474700
Combination of piston and cylinder

1. Check:
   • Cylinder mark ⓐ

Cylinder mark ⓐ	Cylinder size
A	**66.400~66.402 mm (2.61417~2.61425 in)**
B	**66.404~66.406 mm (2.61433~2.61441 in)**
C	**66.408~66.410 mm (2.61449~2.61457 in)**
D	**66.412~66.414 mm (2.61465~2.61472 in)**

2. Check:
   • Piston mark ⓐ

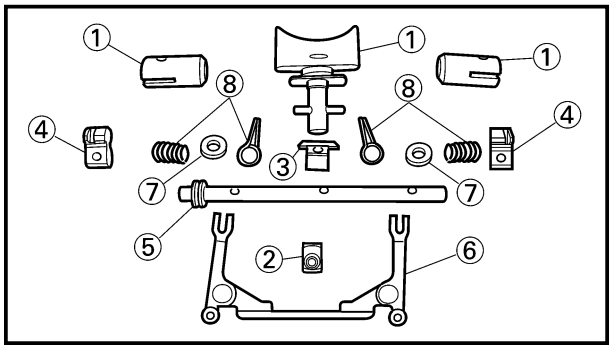
Piston mark ⓐ (color)	Piston size
A (red)	**66.352~66.355 mm (2.61228~2.61240 in)**
B (orange)	**66.356~66.359 mm (2.61244~2.61256 in)**
C (green)	**66.360~66.363 mm (2.61260~2.61272 in)**
D (purple)	**66.364~66.367 mm (2.61276~2.61287 in)**

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

Cylinder mark	Piston mark (color)
A	A (red)
B	B (orange)
C	C (green)
D	D (purple)

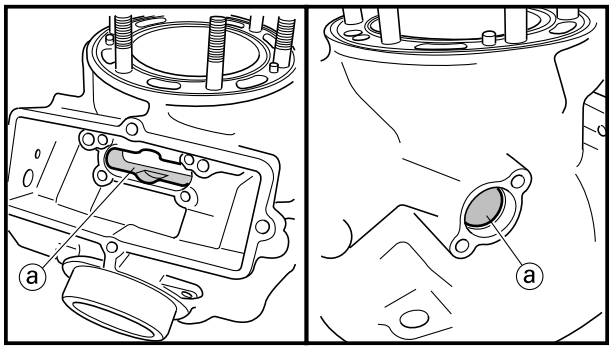
NOTE:

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



EC474841
Power valve

1. Inspect:
   - Power valve 1, 2 ①
     Wear/Damage → Replace.
     Carbon deposits → Remove.
   - Valve holder 1 ②
   - Link lever ③
   - Pulley ④
   - Valve shaft ⑤
   - Link rod ⑥
   - Plain washer ⑦
     Wear/Damage → Replace.
   - Spring 1, 2 ⑧
     Broken → Replace.

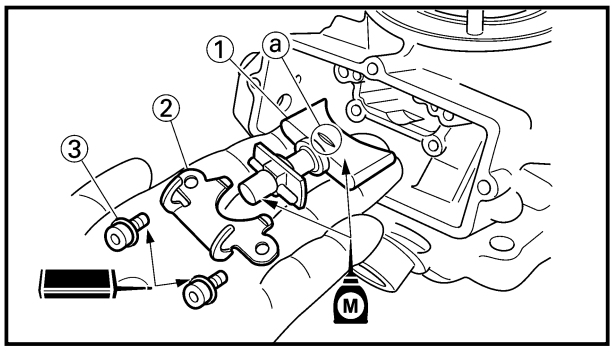


EC474901
Power valve hole on cylinder

1. Remove:
   - Carbon deposits
     From power valve hole surface ⓐ.

NOTE:

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



EC475000
ASSEMBLY AND INSTALLATION

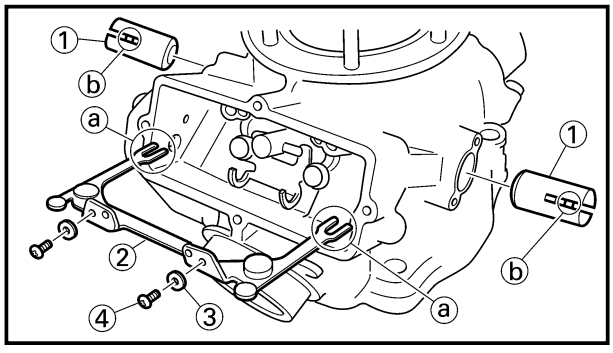
EC475193
Power valve

1. Install:
   - Power valve 1 ①
   - Valve holder 2 ②
   - Bolt (valve holder 2) ③

6 Nm (0.6 m•kg, 4.3 ft•lb)

NOTE:

- Install the power valve 1 with its gouge ⓐ facing upside.
- Apply the molybdenum disulfide oil on the power valve 1.

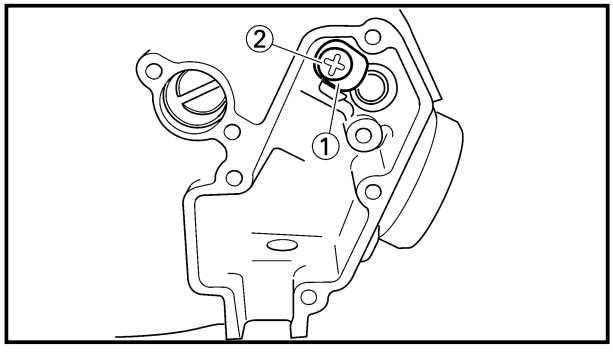


2. Install:
   - Power valve 2 ①
   - Link rod ②
   - Plain washer ③
   - Screw (link rod) ④

6 Nm (0.6 m•kg, 4.3 ft•lb)

NOTE:

Install the link rod with the cuts ⓐ in its arm ends fitting over the pins ⓑ on the power valves 2.

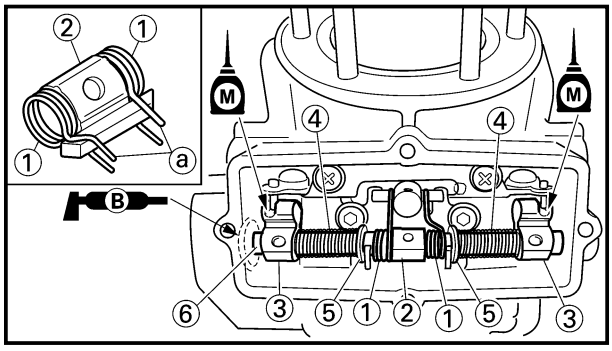


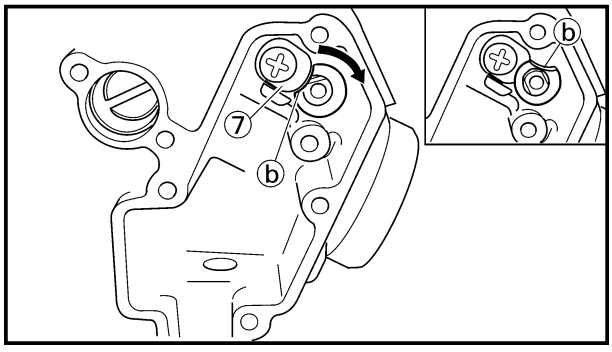
3. Install:
   - Thrust plate ①
   - Screw (thrust plate) ②

6 Nm (0.6 m•kg, 4.3 ft•lb)

NOTE:

Be sure to install the thrust plate to the cylinder before installing the valve shaft.

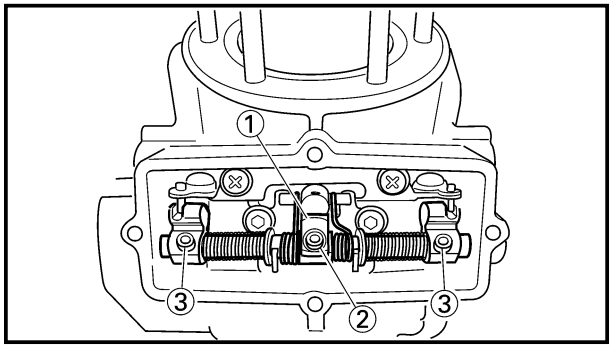


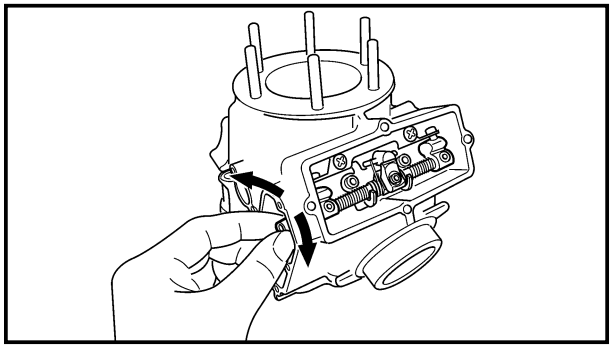


4. Install:
   - Spring 1 ①
   - Link lever ②
   - Pulley ③
   - Spring 2 ④
   - Plain washer ⑤
   - Valve shaft ⑥

NOTE:

- Install the spring 1 to the link lever, and then to the cylinder.
- Install the spring 1 with its stopper portion ⓐ facing inward.
- Apply the molybdnum disulfide oil on the grooves in the pulleys.
- Apply the lithium soap base grease on the oil seal lip.
- Install the valve shaft with its cut ⓑ aligning with the thrust plate ⑦, and then rotate the valve shaft so that its cut faces upward.





5. Install:
   - Valve holder 1 ①
   - Bolt (link lever) ②

     4 Nm (0.4 m•kg, 2.9 ft•lb)
   - Bolt (pulley) ③

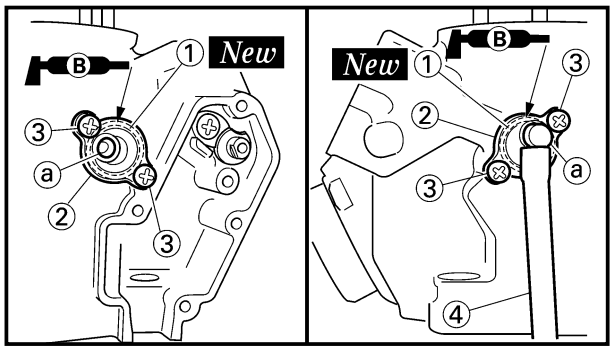
     4 Nm (0.4 m•kg, 2.9 ft•lb)

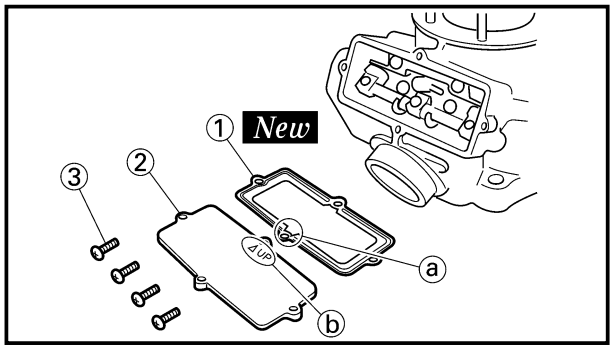
NOTE:

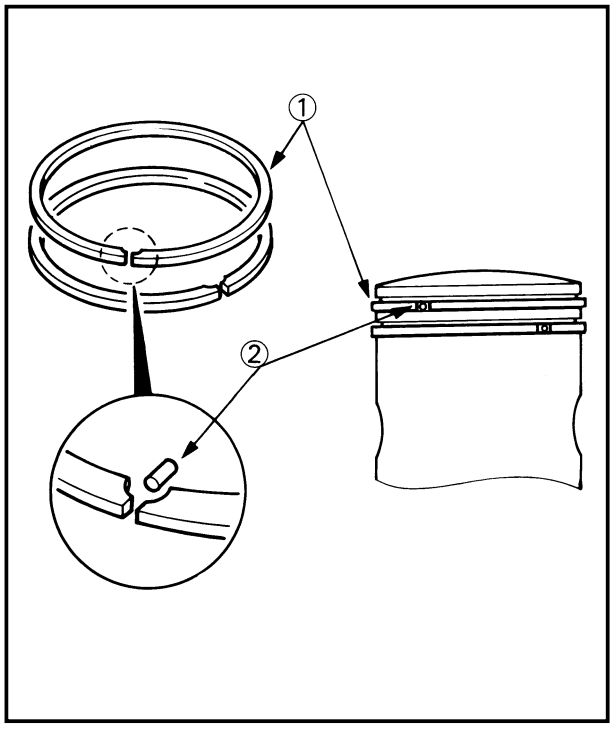
First tighten the bolt (link lever), and then tighten the bolts (pulleys).

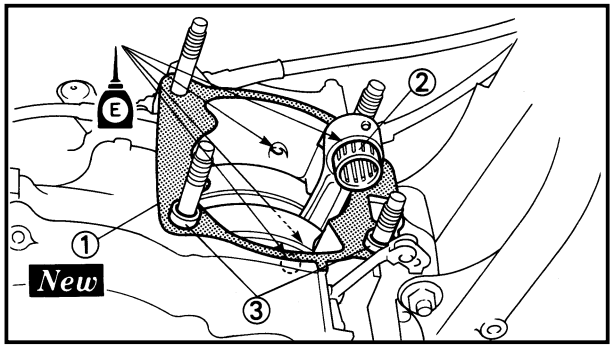
6. Check:
   - Power valve 1 smooth movement

     Unsmooth movement → Repair or replace.









7. Install:
   - O-ring ① **New**
   - Side holder ②
   - Screw (side holder) ③

   4 Nm (0.4 m•kg, 2.9 ft•lb)
   - YPVS breather hose ④

NOTE:

- Apply the lithium soap base grease on the O-rings.
- Install the side holder with its projection ⓐ facing upward.

8. Install:
   - Gasket (power valve cover) ① **New**
   - Power valve cover ②
   - Screw (power valve cover) ③

   4 Nm (0.4 m•kg, 2.9 ft•lb)

NOTE:

- Install the gasket with its cut ⓐ facing downward and the seal print side toward the power valve cover.
- Install the power valve cover so that the arrow mark ⓑ faces upward.

EC475233

Piston ring and piston

1. Install:
   - Piston ring ①

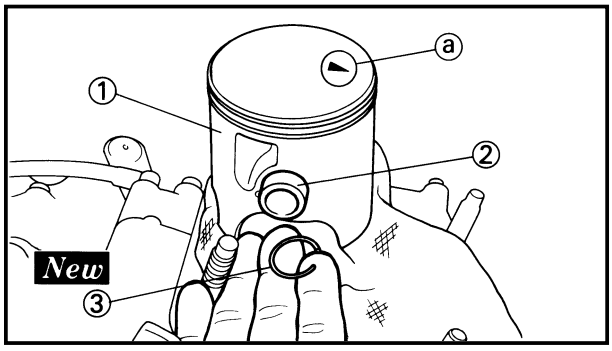
NOTE:

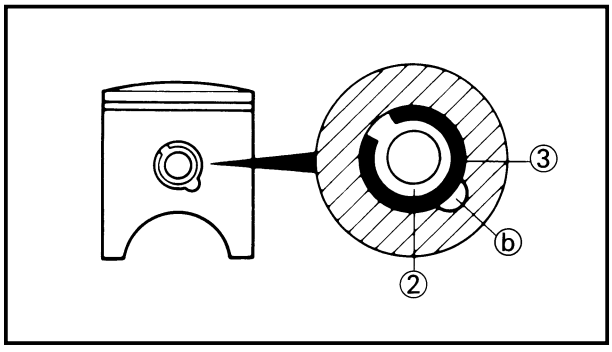
- Take care not to scratch the piston or damage the piston ring.
- Align the piston ring gap with the pin ②.
- After installing the piston ring, check the smooth movement of it.

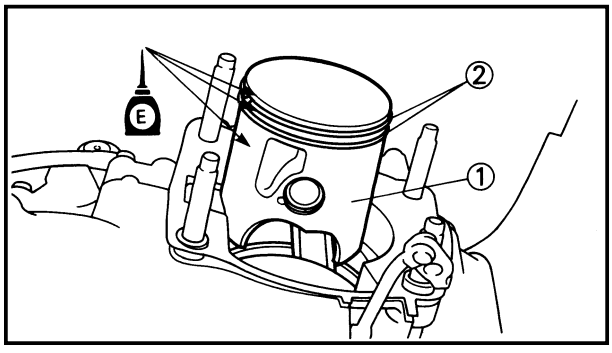
2. Install:
   - Gasket (cylinder) ① **New**
   - Small end bearing ②
   - Dowel pin ③

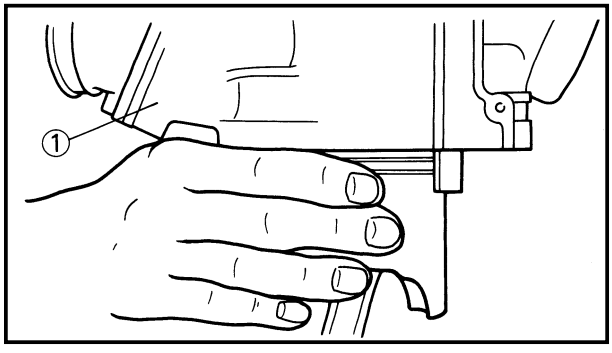
NOTE:

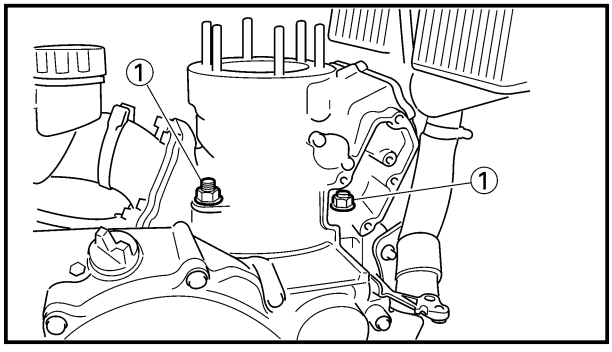
- Apply the engine oil onto the bearing (crankshaft and connecting rod) and connecting rod big end washers.
- Install the gasket with the seal print side toward the crankcase.











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

NOTE:

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

CAUTION:

Do not allow the clip open ends to meet the piston pin slot ⓑ.

EC475383

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

NOTE:

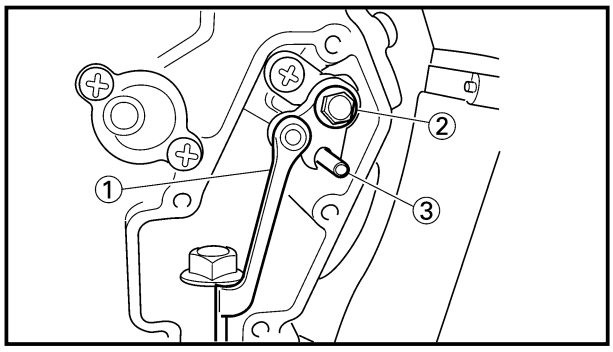
After installing, check the smooth movement of the piston.

3. Install:
   - Nut (cylinder) ①

42 Nm (4.2 m•kg, 30 ft•lb)

NOTE:

Tighten the nuts in stage, using a crisscross pattern.



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

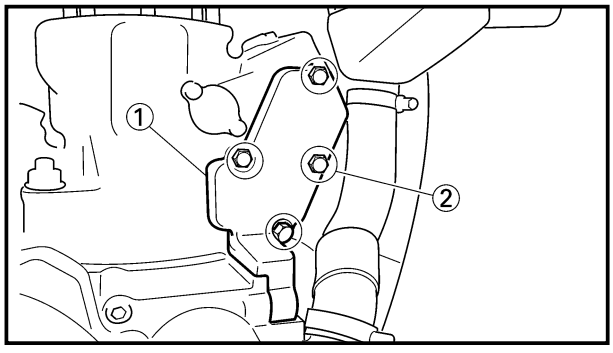
5 Nm (0.5 m•kg, 3.6 ft•lb)

NOTE:

- Insert the set pin ③ included in owner's tool kit to install the bolt (push rod).
- Do not forget to remove the set pin.

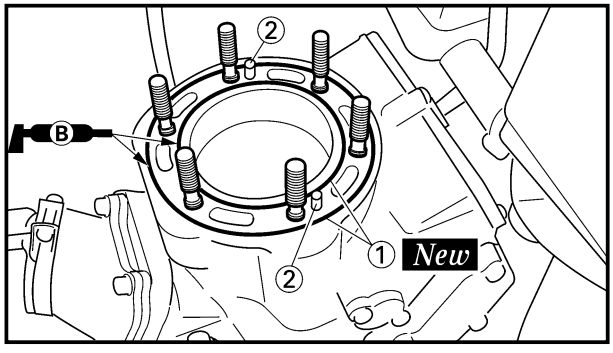
CAUTION:

Be sure to use the set pin. If the set pin is not used, the power valve constituent parts will result in damage.



5. Install:
   - Gasket (power valve housing) ***New***
   - Power valve housing ①
   - Bolt (power valve housing) ②

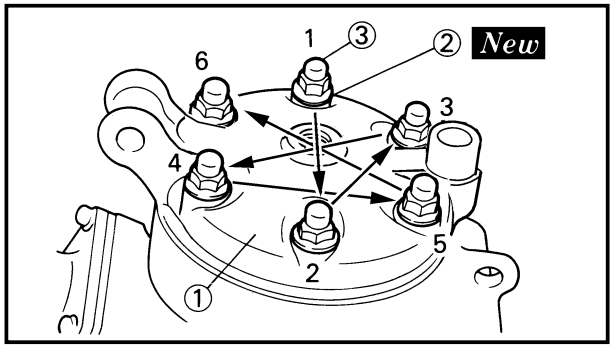
5 Nm (0.5 m•kg, 3.6 ft•lb)



6. Install:
   - O-ring ① ***New***
   - Dowel pin ②

NOTE:

Apply the lithium soap base grease on the O-rings.

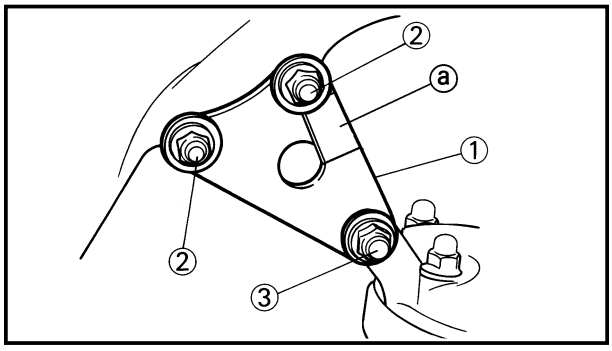


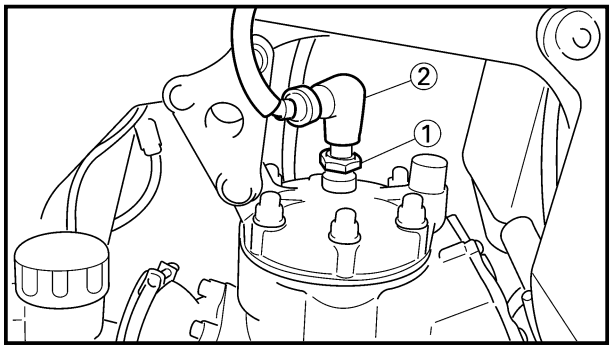
7. Install:
   - Cylinder head ①
   - Copper washer ② ***New***
   - Nut (cylinder head) ③

25 Nm (2.5 m•kg, 18 ft•lb)

NOTE:

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





8. Install:
   - Engine bracket ①
   - Bolt (engine bracket) ②

     34 Nm (3.4 m•kg, 24 ft•lb)
   - Engine mounting bolt (upper) ③

     69 Nm (6.9 m•kg, 50 ft•lb)

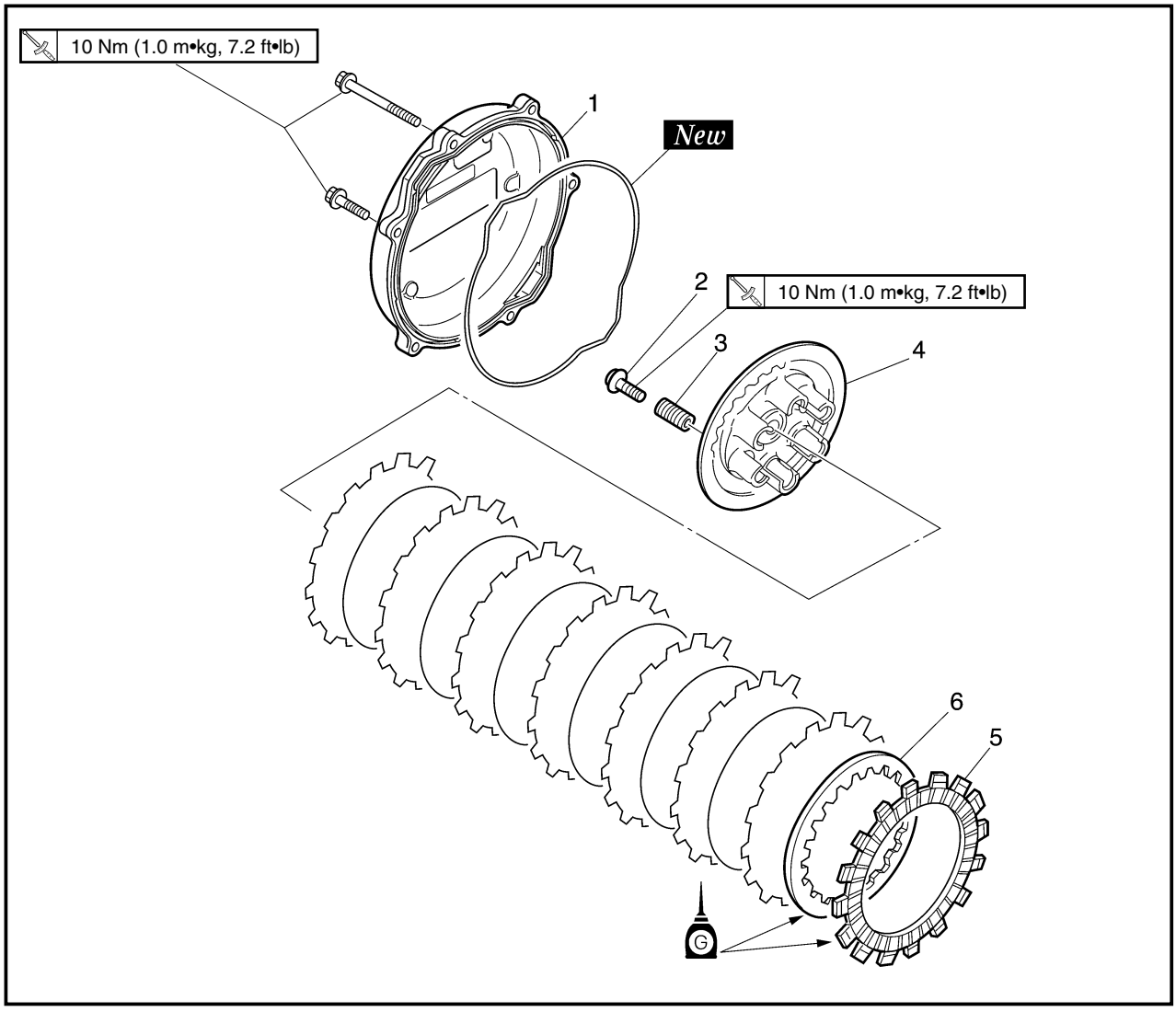
NOTE:

Install the engine bracket with its damper ⓐ on the right side of the body.

9. Install:
   - Spark plug ①

     20 Nm (2.0 m•kg, 14 ft•lb)
   - Spark plug cap ②

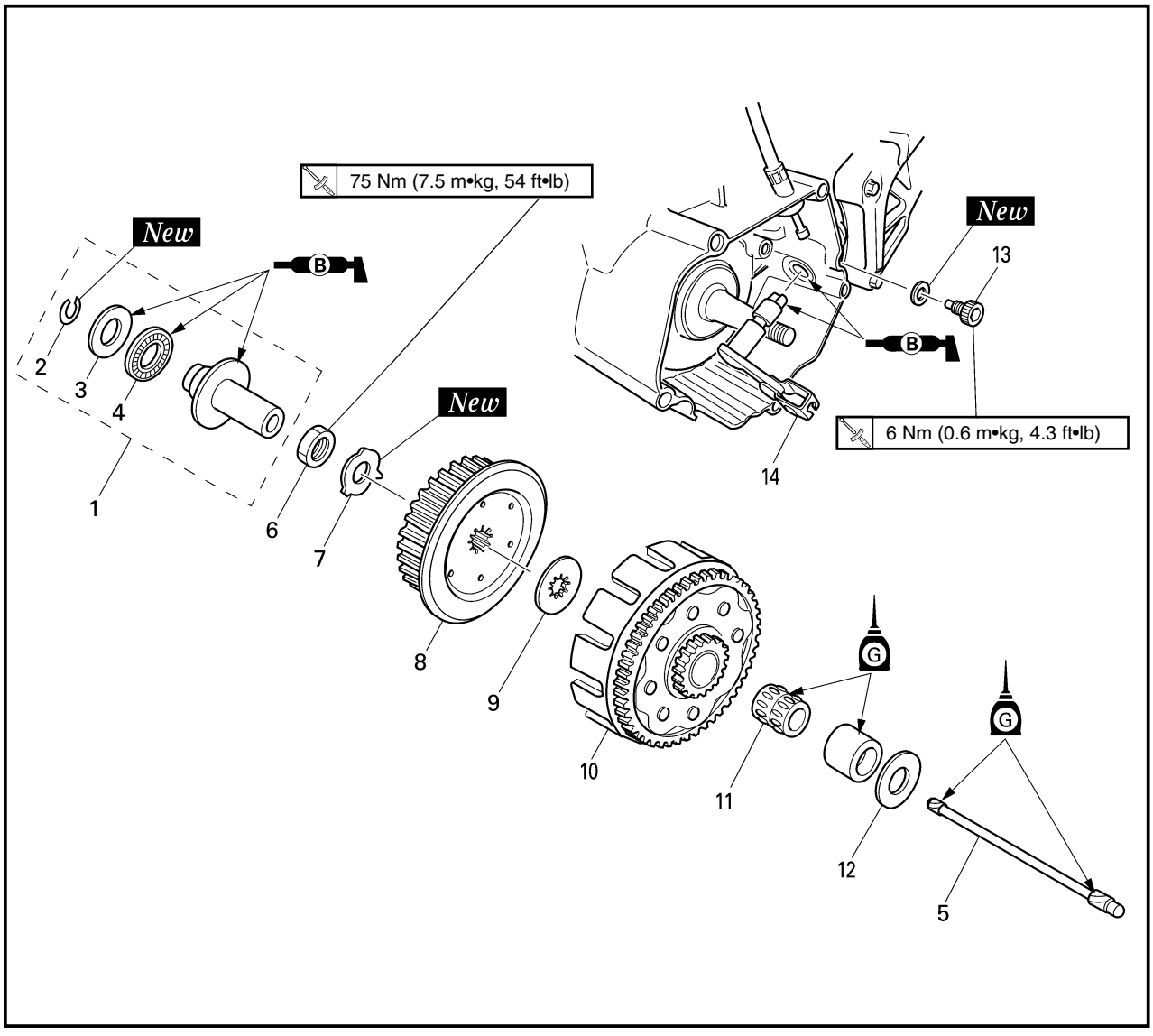
EC490000
CLUTCH AND PRIMARY DRIVEN GEAR
EC498000
CLUTCH PLATE AND FRICTION PLATE



Extent of removal: ① Clutch plate and friction plate removal

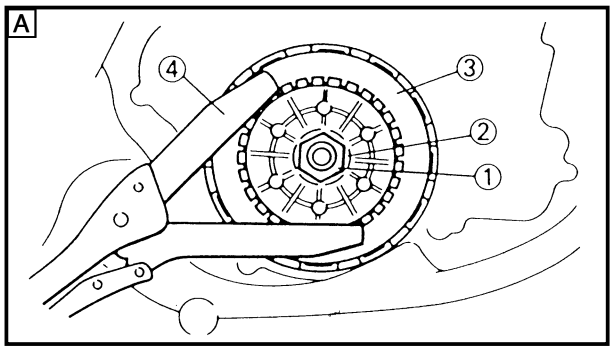
Extent of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		**CLUTCH PLATE AND FRICTION PLATE REMOVAL** Drain the transmission oil. Bolt (brake pedal) Rotor and stator Clutch cable		Refer to "TRANSMISSION OIL REPLACEMENT" section in the CHAPTER 3. Shift the brake pedal downward. Refer to"CDI MAGNETO"section. Disconnect at engine side.
①	1 2 3 4 5 6	Clutch cover Screw (clutch spring) Clutch spring Pressure plate Friction plate Clutch plate	1 6 6 1 8 7	

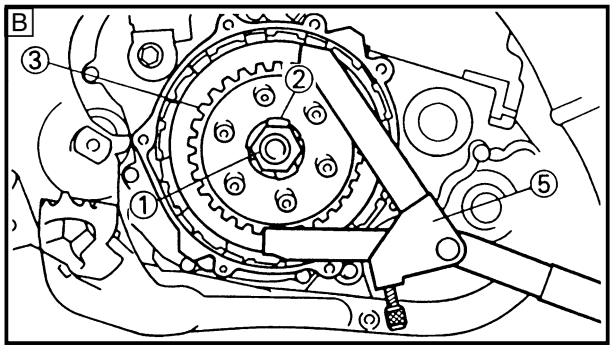
EC498200
PRIMARY DRIVEN GEAR, PUSH ROD AND PUSH LEVER AXLE



Extent of removal: ① Push rod and push lever axle removal ② Push rod 1 disassembly ③ Primary driven gear removal

Extent of removal	Order	Part name	Q'ty	Remarks
		PRIMARY DRIVEN GEAR, PUSH ROD AND PUSH LEVER AXLE REMOVAL		
①↕ ②↕ ③↕	1	Push rod 1	1	
	2	Circlip	1	
	3	Plain washer	1	
	4	Bearing	1	
①↕	5	Push rod 2	1	
③↕	6	Nut (clutch boss)	1	Use special tool. Refer to "REMOVAL POINTS".
	7	Lock washer	1	
	8	Clutch boss	1	
	9	Thrust plate [D=ø44mm (1.73 in)]	1	
	10	Primary driven gear	1	
	11	Bearing	1	
	12	Thrust plate [D=ø42mm (1.65 in)]	1	
①↕	13	Bolt (push lever axle)	1	
	14	Push lever axle	1	





EC493000
REMOVAL POINTS

EC483211
Clutch boss

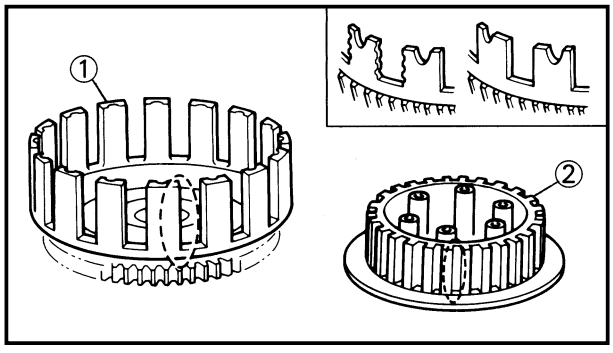
1. Remove:
   - Nut ①
   - Lock washer ②
   - Clutch boss ③

NOTE:

Straighten the lock washer tab and use the clutch holding tool ④, ⑤ to hold the clutch boss.

Clutch holding tool:
YM-91042..... ④
90890-04086.....⑤

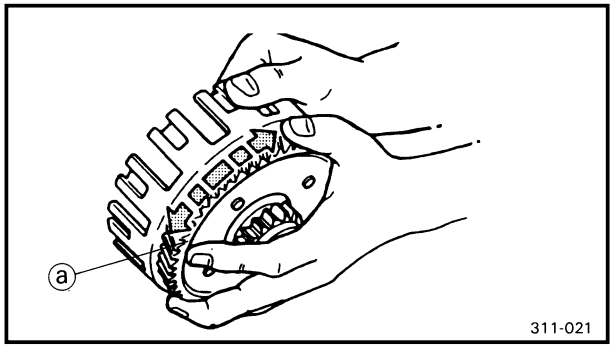
A For USA and CDN
B Except for USA and CDN



EC494000
INSPECTION

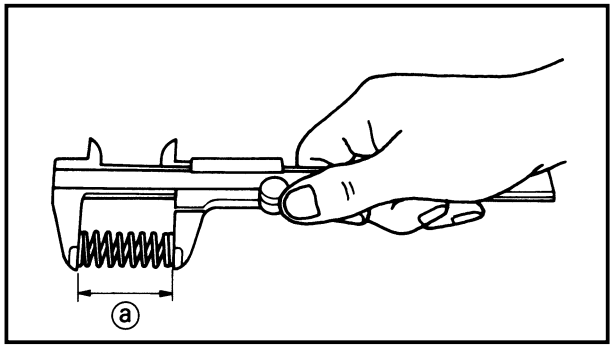
EC484100
Clutch housing and boss

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



EC484201
Primary driven gear

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

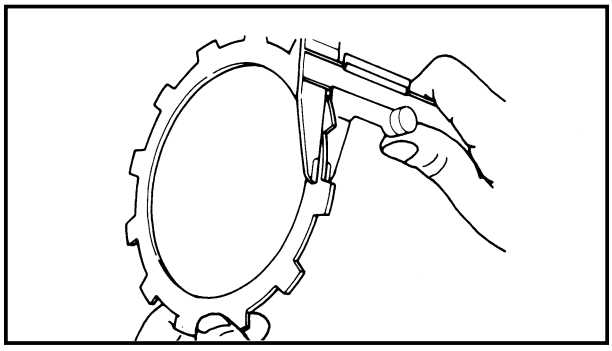


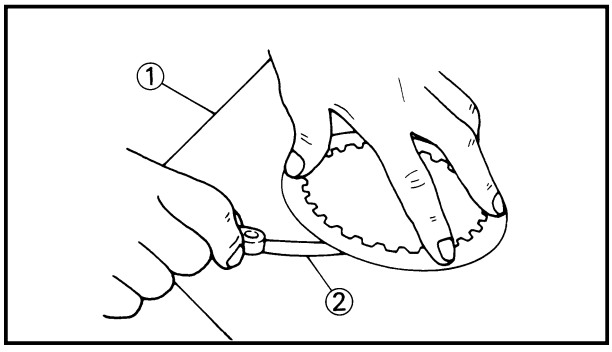
EC484400
Clutch spring

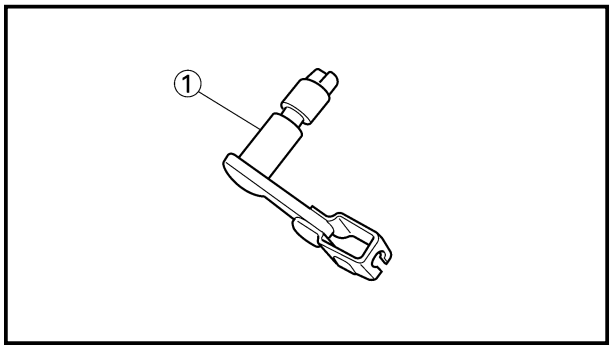
1. Measure:
   - Clutch spring free length ⓐ
     Out of specification → Replace springs as a set.

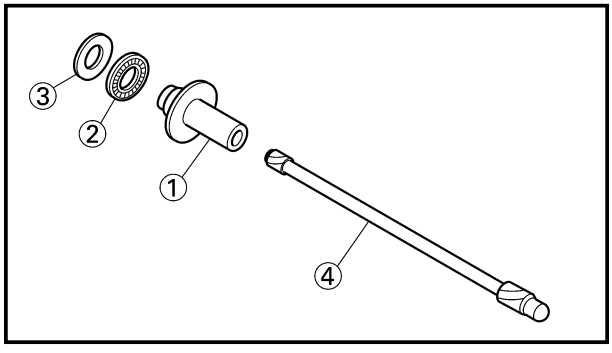
Clutch spring free length:

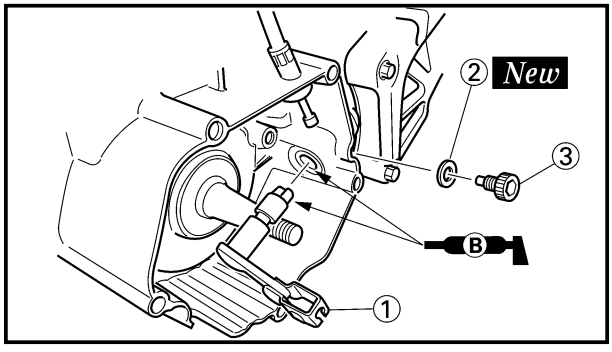
Standard	<Limit>
50.0 mm (1.969 in)	48.0 mm (1.890 in)











EC484500
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)	**2.8 mm (0.110 in)**

EC484600
Clutch plate

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

Warp limit:
0.2 mm (0.008 in)

EC484700
Push lever axle

1. Inspect:
   - Push lever axle ①
     Wear/Damage → Replace.

EC484810
Push rod

1. Inspect:
   - Push rod 1 ①
   - Bearing ②
   - Plain washer ③
   - Push rod 2 ④
     Wear/Damage/Bend → Replace.

EC495000
ASSEMBLY AND INSTALLATION

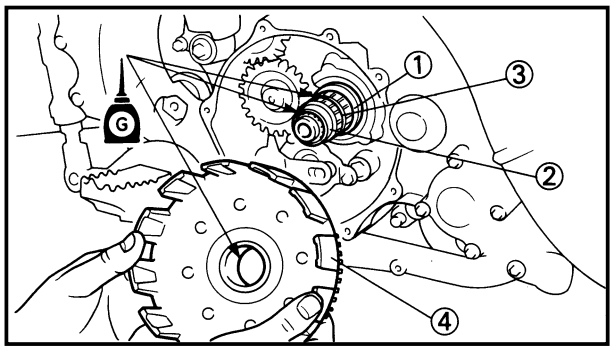
EC485120
Push lever axle

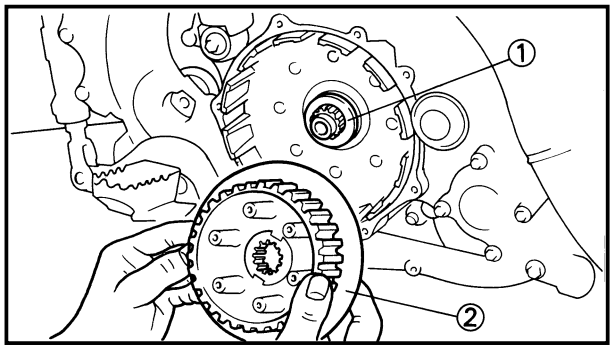
1. Install:
   - Push lever axle ①
   - Copper washer ② ***New***
   - Bolt (push lever axle) ③

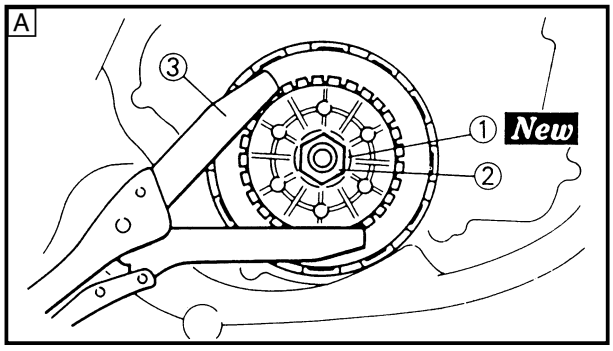
6 Nm (0.6 m•kg, 4.3ft•lb)

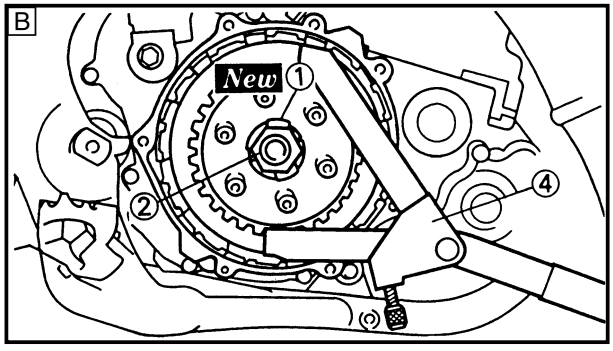
NOTE:

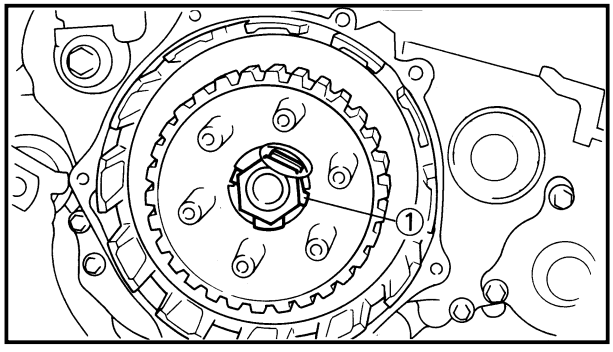
Apply the lithium soap base grease on the oil seal lip and push lever axle.











EC495230

Clutch

1. Install:
   - Thrust plate [D=ø 42 mm (1.65 in)] ①
   - Spacer ②
   - Bearing ③
   - Primary driven gear ④

NOTE:

Apply the transmission oil on the bearing, spacer and primary driven gear inner circumference.

2. Install:
   - Thrust plate [D=ø 44 mm (1.73 in)] ①
   - Clutch boss ②

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

75 Nm (7.5 m•kg, 54 ft•lb)

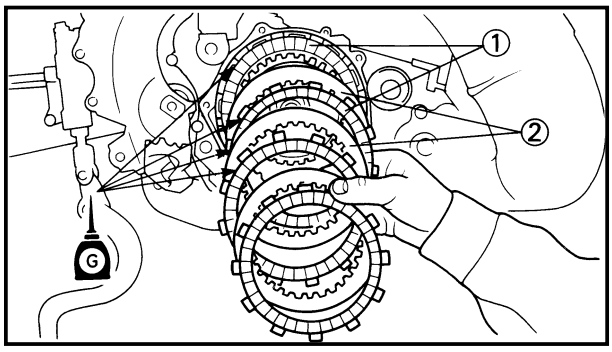
NOTE:

Use the clutch holding tool ③, ④ to hold the clutch boss.

Clutch holding tool:
YM-91042 .....③
90890-04086.....④

A For USA and CDN
B Except for USA and CDN

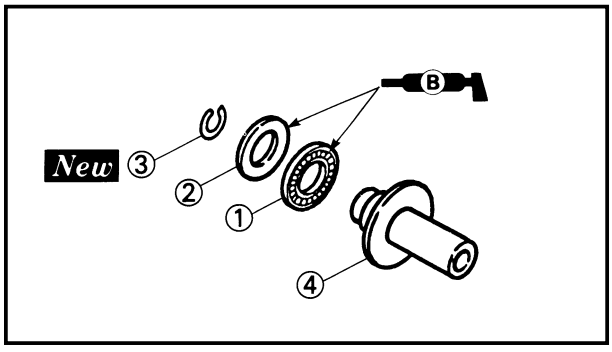
4. Bend the lock washer ① tab.



5. Install:
   - Friction plate ①
   - Clutch plate 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 on the friction plates and clutch plates.

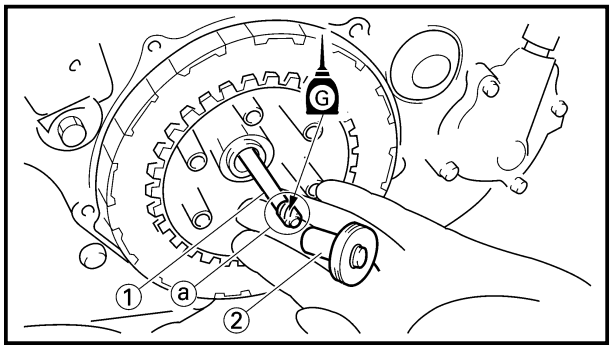


6. Install:
   - Bearing ①
   - Plain washer ②
   - Circlip ③ **New**

   To push rod 1 ④.

NOTE:

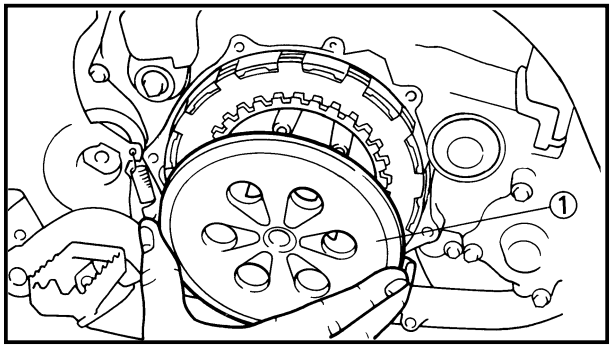
Apply the lithium soap base grease on the bearing and plain washer.



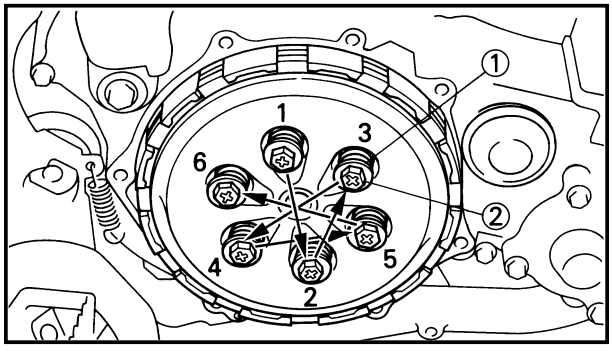
7. Install:
   - Push rod 2 ①
   - Push rod 1 ②

NOTE:

- Apply the transmission oil on the ends of the push rod 2.
- Install the push rod 2 with its smaller end ⓐ toward you.



8. Install:
   - Pressure plate ①

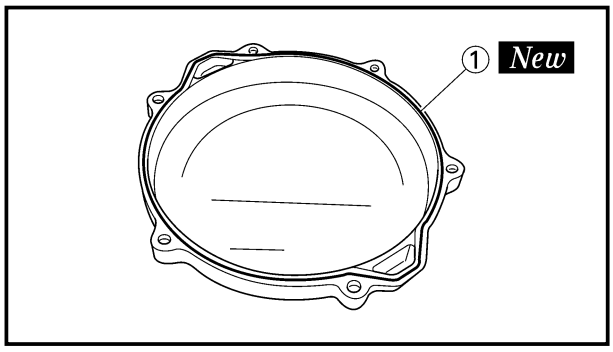


9. Install:
   - Clutch spring ①
   - Screw (clutch spring) ②

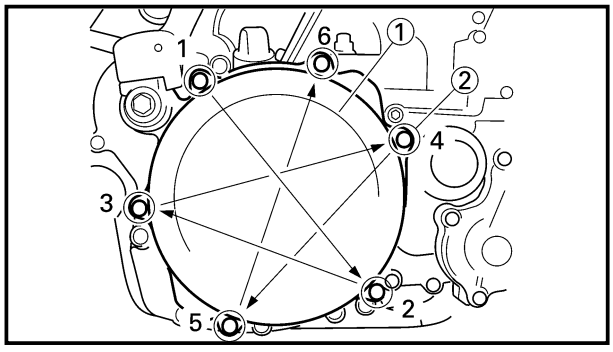
10 Nm (1.0 m•kg, 7.2 ft•lb)

NOTE:

Tighten the screws in stage, using a crisscross pattern.



10. Install:
    - O-ring ① New
      To clucth cover.

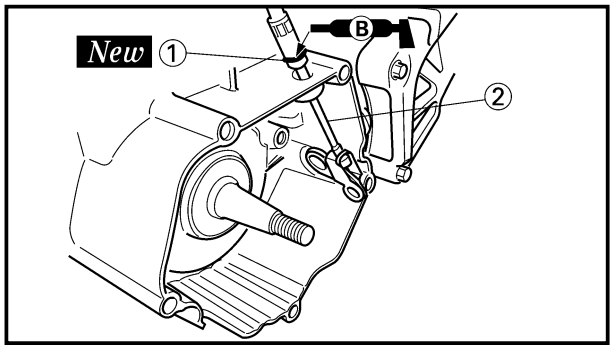


11. Install:
    - Clutch cover ①
    - Bolt (clutch cover) ②

10 Nm (1.0 m•kg, 7.2 ft•lb)

NOTE:

Tighten the bolts in stage, using a crisscross pattern.

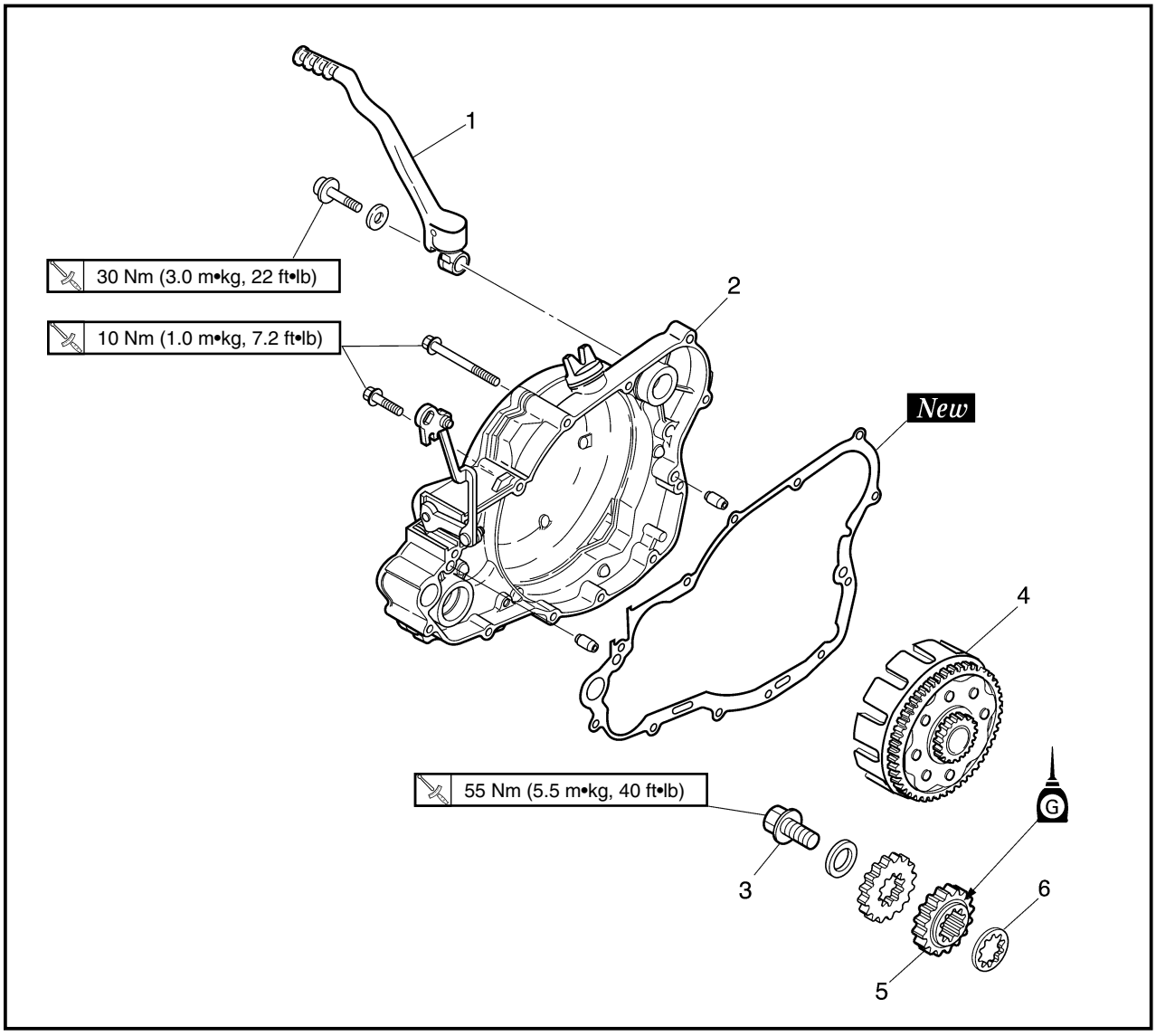


12. Install:
    - O-ring ① New
    - Clutch cable ②

NOTE:

Apply the lithium soap base grease on the O-ring.

EC4C0000
KICK AXLE, SHIFT SHAFT AND PRIMARY DRIVE GEAR
EC4C8000
PRIMARY DRIVE GEAR

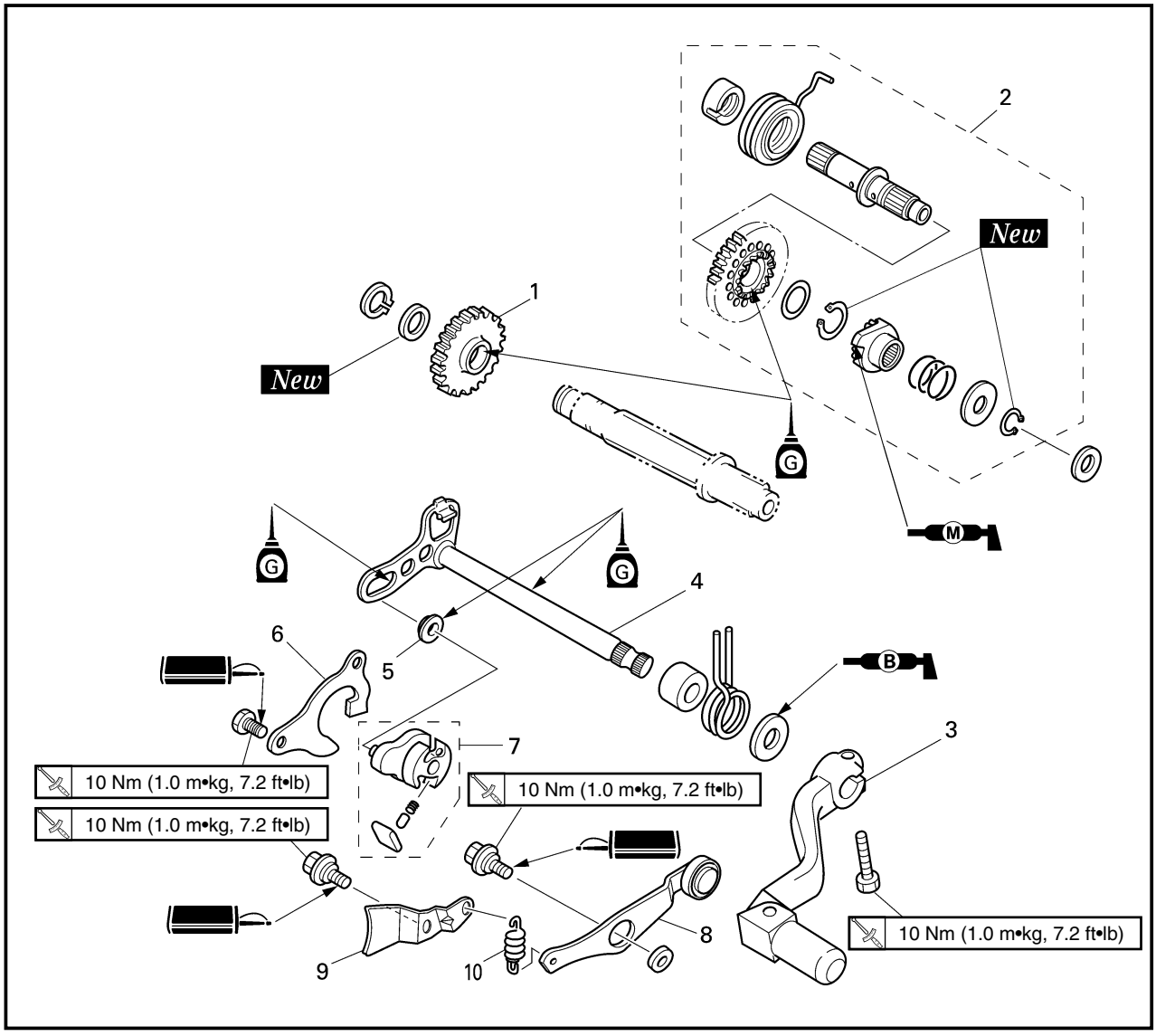


Extent of removal: ① Primary drive gear removal

Extent of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		**RPIMARY DRIVE GEAR REMOVAL** Drain the transmission oil. Bolt (brake pedal) Radiator hose 4 Bolt (push rod)		Refer to "TRANSMISSION OIL REPLACEMENT" section in the CHAPTER 3. Shift the brake pedal downward. Disconnect at water pump side. Refer to "CYLINDER HEAD, CYLINDER AND PISTON" section.
①	1 2 3 4 5 6	Kick starter Crankcase cover (right) Bolt (Primary drive gear) Primary driven gear Primary drive gear Thrust plate	1 1 1 1 1 1	 Only loosening Refer to "REMOVAL POINTS". Refer to "CLUTCH AND PRIMARY DRIVEN GEAR"section.

EC4C8100

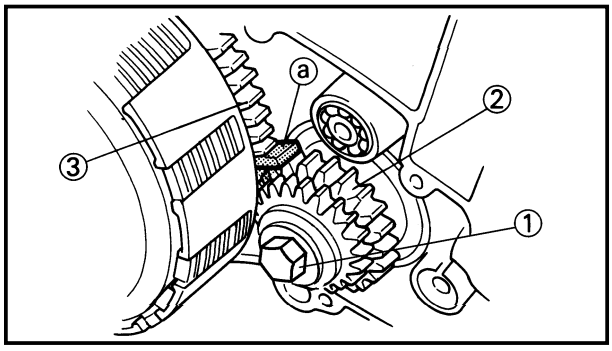
KICK AXLE AND SHIFT SHAFT



Extent of removal: ① Kick axle and kick idle gear removal

② Shift shaft and stopper lever removal

Extent of removal	Order	Part name	Q'ty	Remarks
		KICK AXLE AND SHIFT SHAFT REMOVAL		
①	1	Kick idle gear	1	
	2	kick axle assembly	1	Refer to "REMOVAL POINTS".
	3	Shift pedal	1	
	4	Shift shaft	1	
	5	Roller	1	
②	6	Shift guide	1	Refer to "REMOVAL POINTS".
	7	Shift lever assembly	1	
	8	Stopper lever	1	
	9	Holder	1	
	10	Tension spring	1	



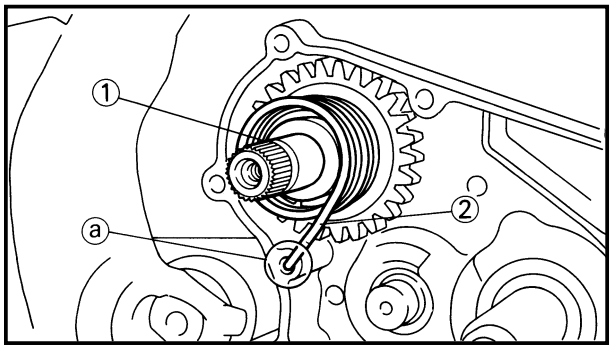
EC4C3000
REMOVAL POINTS

EC483111
Primary drive gear

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

NOTE:

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

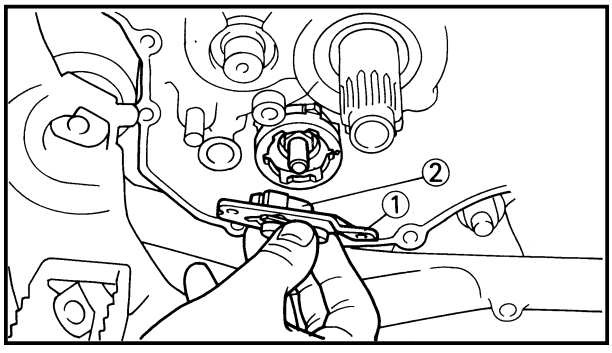


EC4B3101
Kick axle assembly

1. Remove:
   - Kick axle assembly ①

NOTE:

Unhook the torsion spring ② from the hole ⓐ in the crankcase.

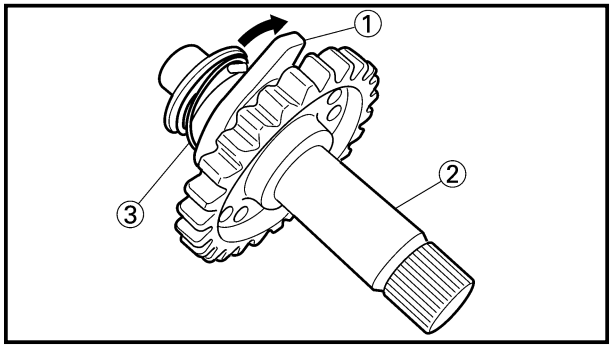


EC4C3101
Shift guide and shift lever assembly

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

NOTE:

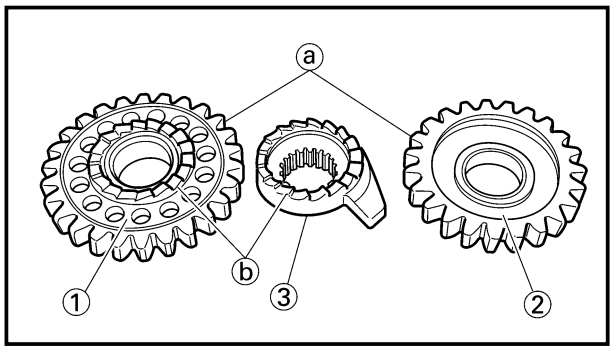
The shift lever assembly is disassembled at the same time as the shift guide.



EC4C4000
INSPECTION

EC4C4200
Kick axle and ratchet wheel

1. Check:
   - Ratchet wheel ① smooth movement
     Unsmooth movement → Replace.
   - Kick axle ②
     Wear/Damage → Replace.
   - Spring ③
     Broken → Replace.

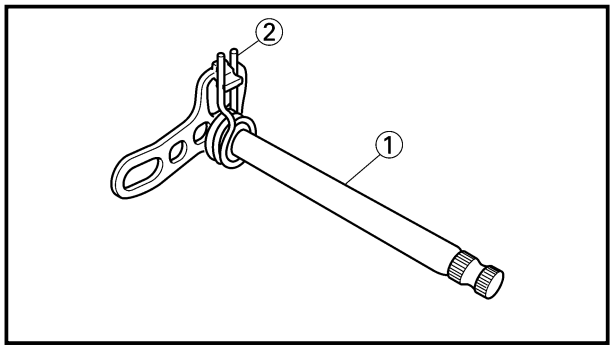


EC4C4300

Kick gear, kick idle gear and ratchet wheel

1. Inspect:
   - Kick gear ①
   - Kick idle gear ②
   - Ratchet wheel ③
   - Gear teeth ⓐ
   - Ratchet teeth ⓑ

   Wear/Damage → Replace.



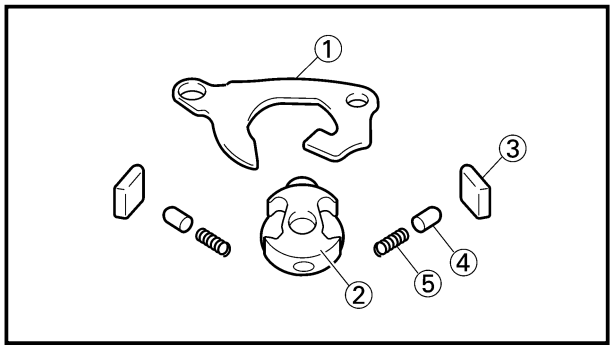
EC4B4400

Shift shaft

1. Inspect:
   - Shift shaft ①

   Bend/Damage → Replace.
   - Spring ②

   Broken → Replace.

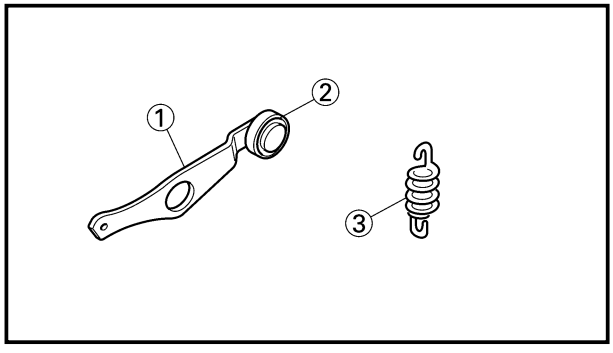


EC4C4100

Shift guide and shift lever assembly

1. Inspect:
   - Shift guide ①
   - Shift lever ②
   - Pawl ③
   - Pawl pin ④
   - Spring ⑤

   Wear/Damage → Replace.



EC4C4400

Stopper lever

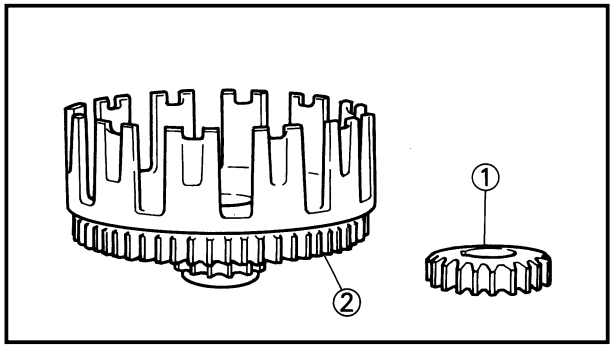
1. Inspect:
   - Stopper lever ①

   Wear/Damage → Replace.
   - Bearing ②

   Rotate outer race with a finger.

   Rough spot/Seizure → Replace the stopper lever.
   - Tension spring ③

   Broken → Replace.

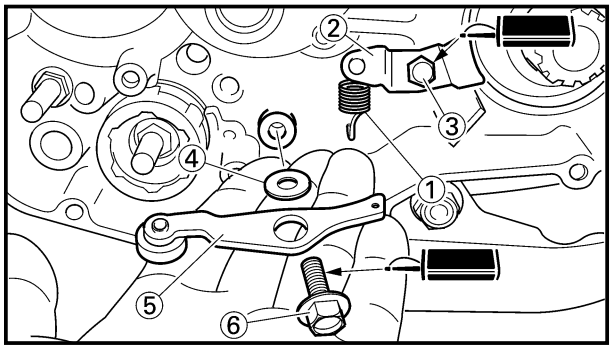


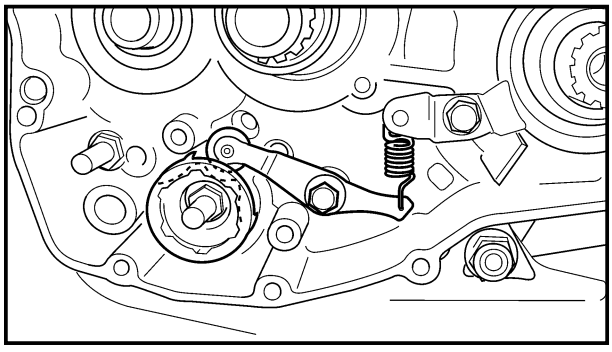
EC484300

Primary drive gear and primary driven gear

1. Inspect:
   - Primary drive gear ①
   - Primary driven gear ②

   Wear/Damage → Replace.





EC4C5000
ASSEMBLY AND INSTALLATION

EC4C5130
Stopper lever

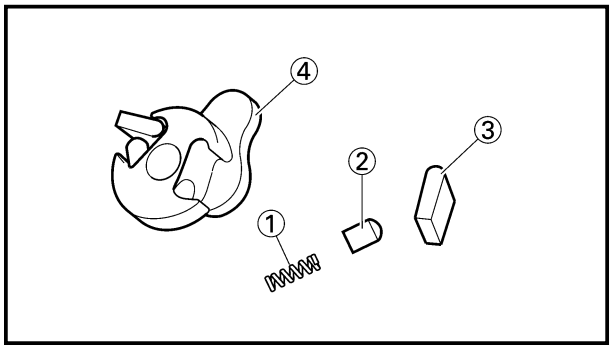
1. Install:
   - Tension spring ①
   - Holder ②
   - Bolt (holder) ③

     10 Nm (1.0 m•kg, 7.2 ft•lb)
   - Plain washer ④
   - Stopper lever ⑤
   - Bolt (stopper lever) ⑥

     10 Nm (1.0 m•kg, 7.2 ft•lb)

NOTE:

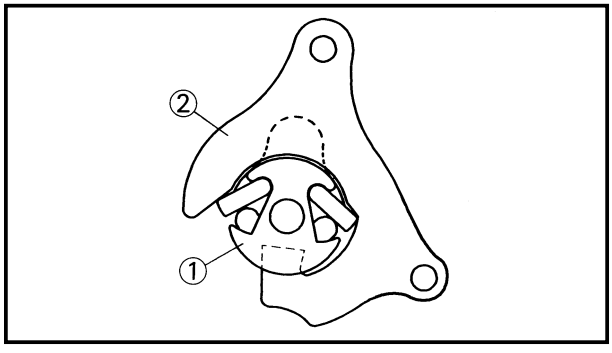
Align the stopper lever roller with the slot on segment.



EC4C5202
Shift guide and shift lever assembly

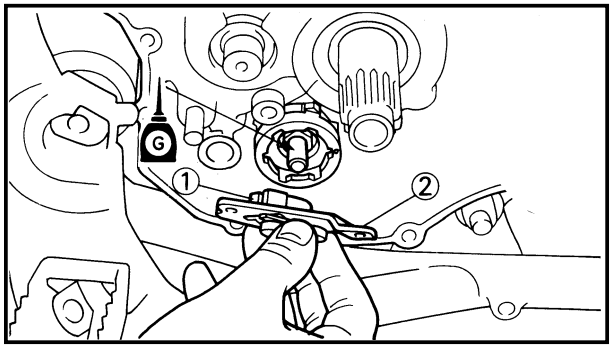
1. Install:
   - Spring ①
   - Pawl pin ②
   - Pawl ③

     To shift lever ④.



2. Install:
   - Shift lever assembly ①

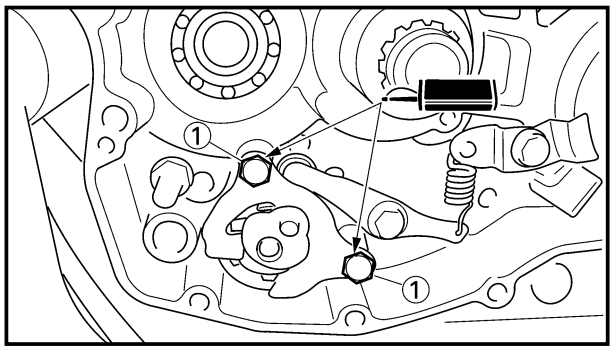
     To shift guide ②.



3. Install:
   - Shift lever assembly ①
   - Shift guide ②

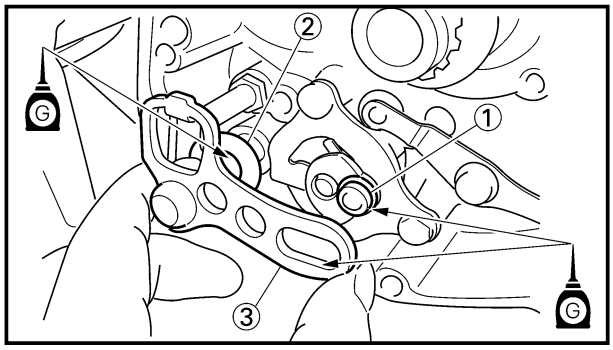
NOTE:

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



4. Install:
   - Bolt (shift guide) ①

10 Nm (1.0 m•kg, 7.2 ft•lb)



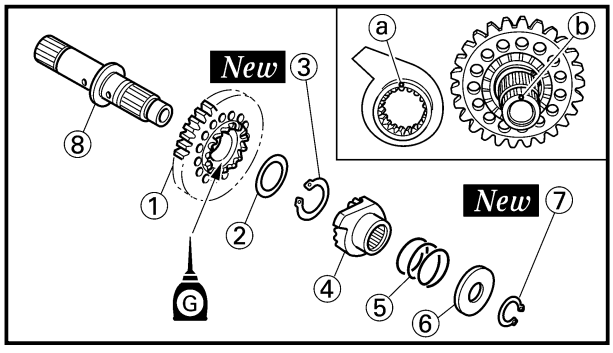
EC4C5310

Shift shaft

1. Install:
   - Roller ①
   - Plain washer ②
   - Shift shaft ③

NOTE:

Apply the transmission oil on the roller and shift shaft.



EC4C5602

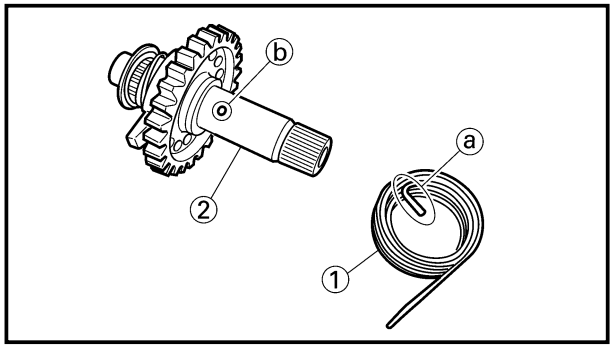
Kick axle assembly

1. Install:
   - Kick gear ①
   - Plain washer ②
   - Circlip ③ ***New***
   - Ratchet wheel ④
   - Spring ⑤
   - Plain washer ⑥
   - Circlip ⑦ ***New***

   To kick axle ⑧.

NOTE:

- Apply the transmission oil on the kick gear inner circumference.
- Align the punch mark ⓐ on the ratchet wheel with the punch mark ⓑ on the kick axle.

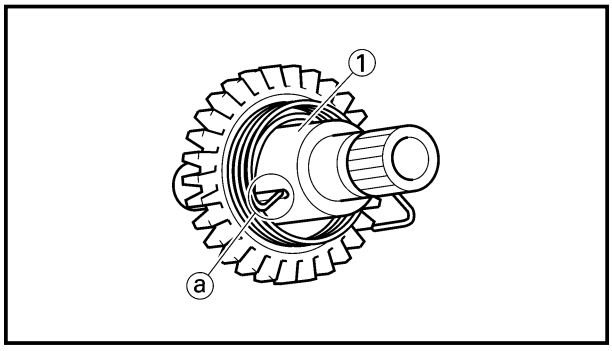


2. Install:
   - Torsion spring ①

   To kick axle ②.

NOTE:

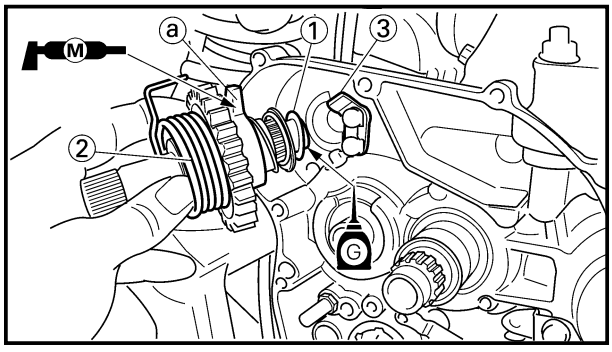
Make sure the stopper ⓐ of the torsion spring fits into the hole ⓑ on the kick axle.



3. Install:
   - Spring guide ①

NOTE:

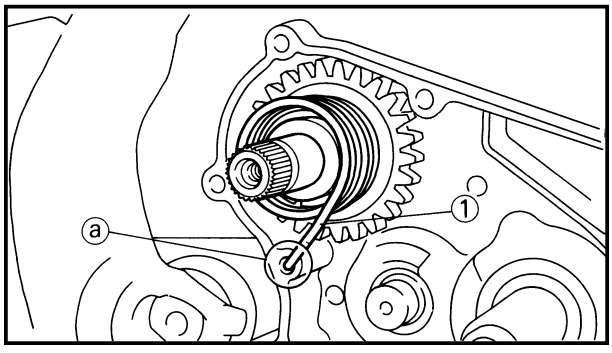
Slide the spring guide into the kick axle, make sure the groove ⓐ in the spring guide fits on the stopper of the torsion spring.



4. Install:
   - Plain washer ①
   - Kick axle assembly ②

NOTE:

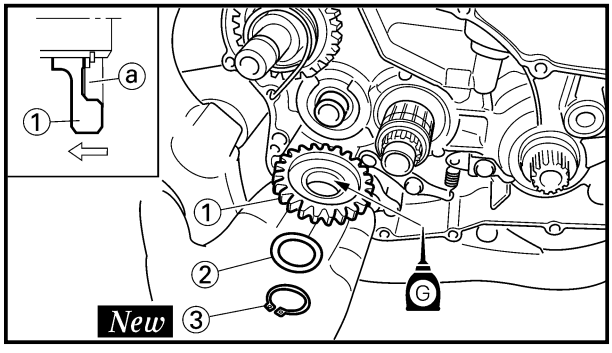
- Apply the molybdenum disulfide grease on the contacting surfaces of the kick axle stopper ⓐ and stopper plate ③.
- Apply the transmission oil on the kick axle.
- Slide the kick axle assembly into the crankcase and make sure the kick axle stopper fits into the stopper plate.



5. Hook:
   - Torsion spring ①

NOTE:

Turn the torsion spring clockwise and hook into the proper hole ⓐ in the crankcase.



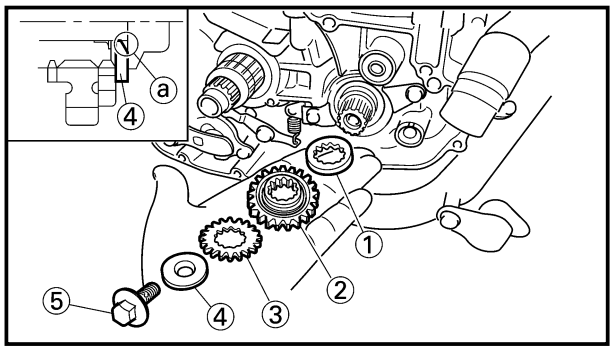
EC4C5420

Kick idle gear

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

NOTE:

- Apply the transmission oil on the kick idle gear inner circumference.
- Install the kick idle gear with its depressed side ⓐ toward you.



EC4C5531

Primary drive gear

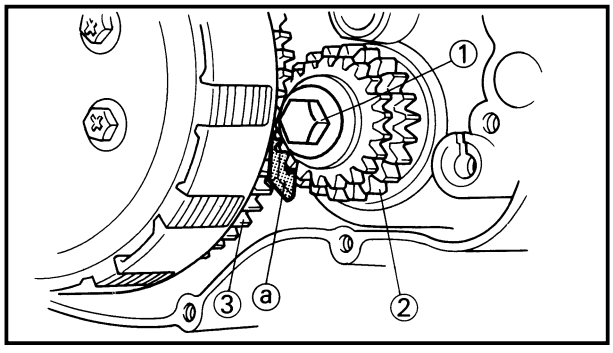
1. Install:
   - Thrust plate ①
   - Primary drive gear ②
   - Governor drive gear ③
   - Plain washer ④
   - Bolt (primary drive gear) ⑤

NOTE:

- Install the plain washer with its chamfered side ⓐ toward you.
- Temporarily tighten the bolt at this point.

2. Install:
   - Primary driven gear

   Refer to "CLUTCH AND PRIMARY DRIVEN GEAR" section.

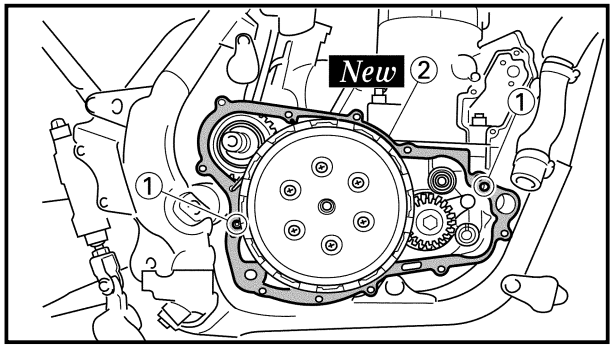


3. Tighten:
   - Bolt (primary drive gear) ①

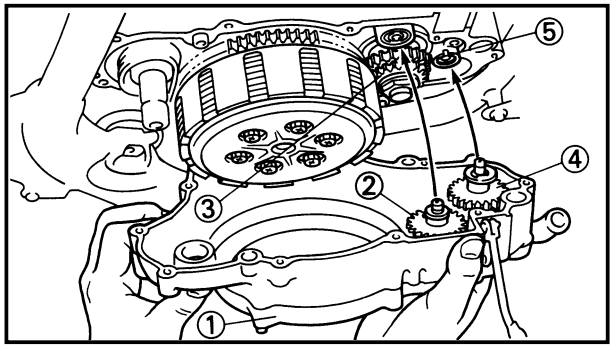
55 Nm (5.5 m•kg, 40 ft•lb)

NOTE:

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



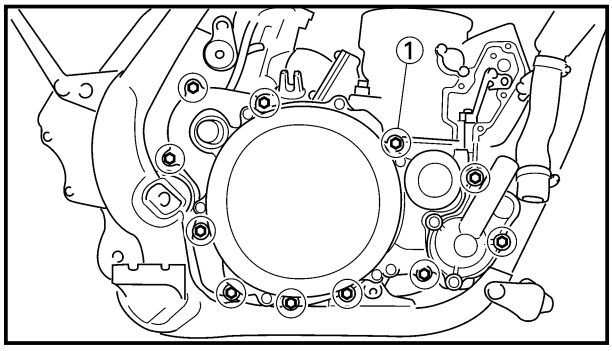
4. Install:
   - Dowel pin ①
   - Gasket [crankcase cover (right)] ② ***New***



5. Install:
   - Crankcase cover (right) ①

NOTE:

Mesh the governor gear ② with the governor drive gear ③ and the impeller shaft gear ④ with the primary drive gear ⑤.

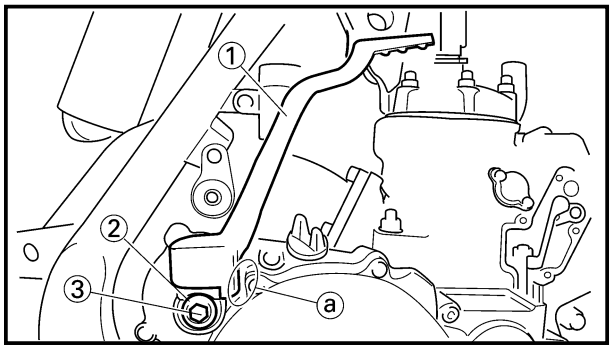


6. Install:
   - Bolt [crankcase cover (right)] ①

10 Nm (1.0 m•kg, 7.2 ft•lb)

NOTE:

Tighten the bolts in stage, using a crisscross pattern.

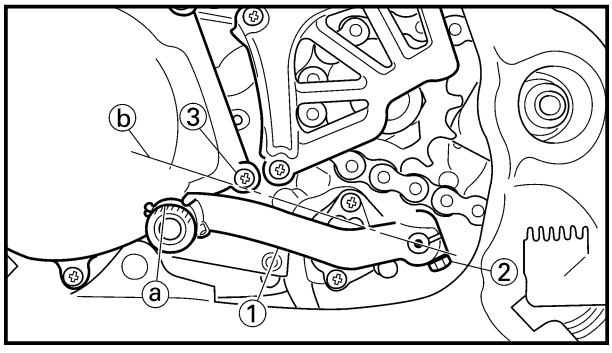


7. Install:
   - Kick starter ①
   - Plain washer ②
   - Bolt (kick starter) ③

30 Nm (3.0 m•kg, 22 ft•lb)

NOTE:

Install the kick starter closest to but not contacting the clutch cover mounting boss ⓐ.



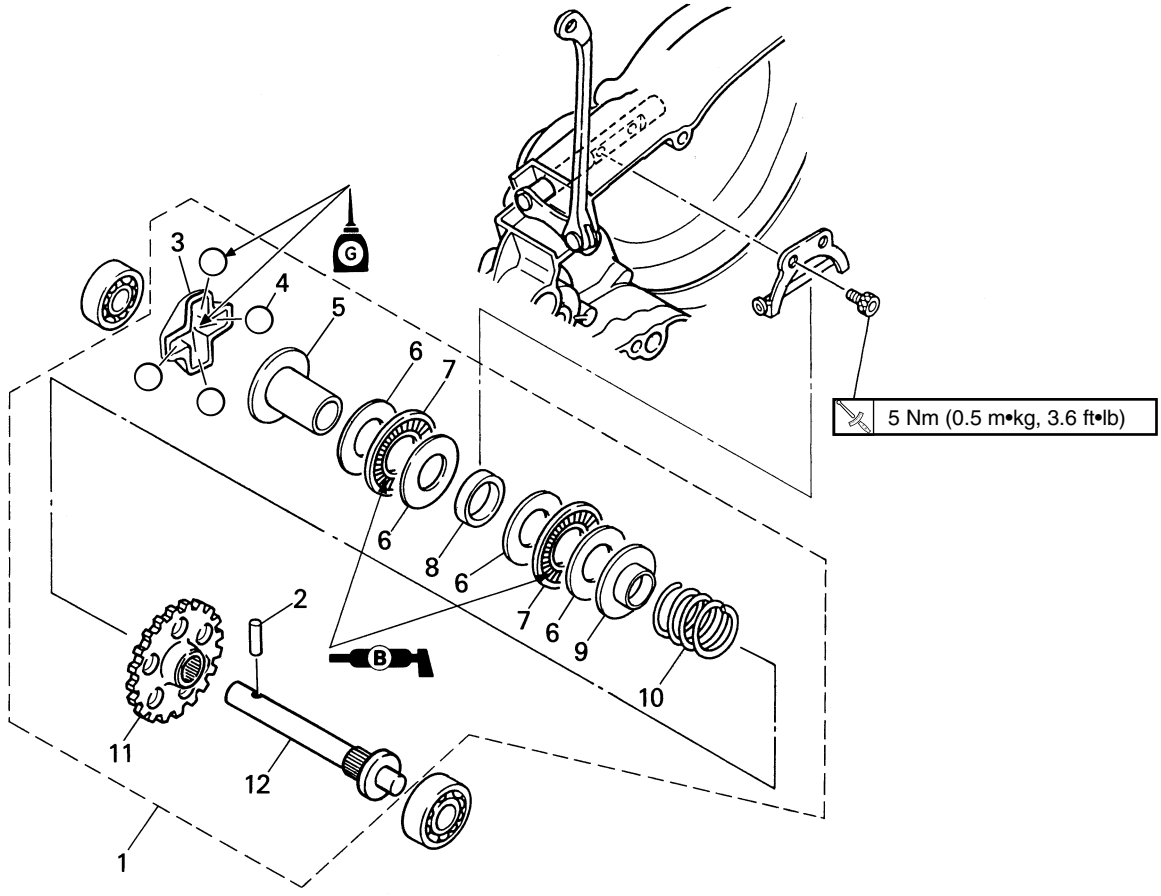
8. Install:
   - Shift pedal ①
   - Bolt (shift pedal) ②

10 Nm (1.0 m•kg, 7.2 ft•lb)

NOTE:

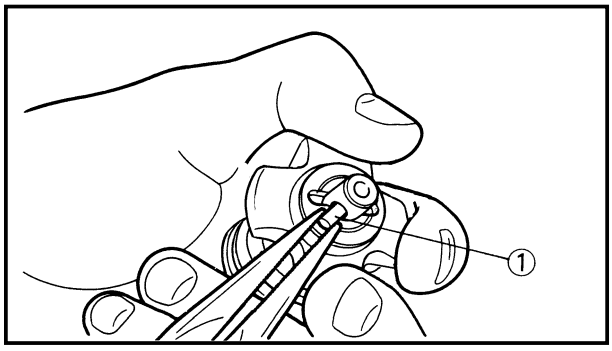
Install the shift pedal so that the top of the shift pedal outer diameter ⓐ is highest without exceeding the line ⓑ connecting the center of the shift shaft and bottom of the screw [crankcase cover (left)] ③.

EC4K0000
YPVS GOVERNOR



Extent of removal: ① YPVS governor removal and disassembly

Extent of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		**YPVS GOVERNOR REMOVAL** Crankcase cover (right)		Refer to "KICK AXLE, SHIFT SHAFT AND PRIMARY DRIVE GEAR" section.
①	1	Governor assembly	1	Refer to "REMOVAL POINTS".
	2	Dowel pin	1	
	3	Retainer	1	
	4	Ball	4	
	5	Retainer weight	1	
	6	Plain washer	4	
	7	Thrust bearing	2	
	8	Collar	1	
	9	Plate	1	
	10	Compression spring	1	
	11	Governor gear	1	
	12	Governor shaft	1	



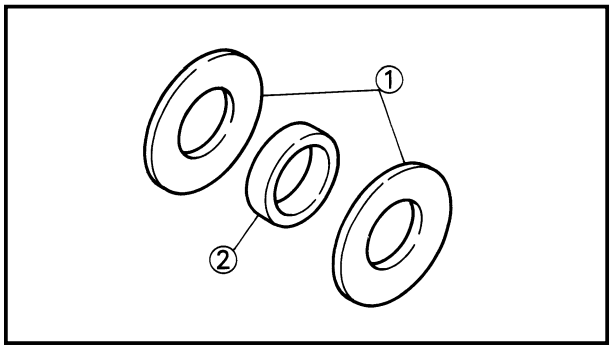
EC4K3000
REMOVAL POINTS

EC4K3100
Governor

1. Remove:
   - Dowel pin ①

NOTE:

While compressing the spring, remove the dowel pin.

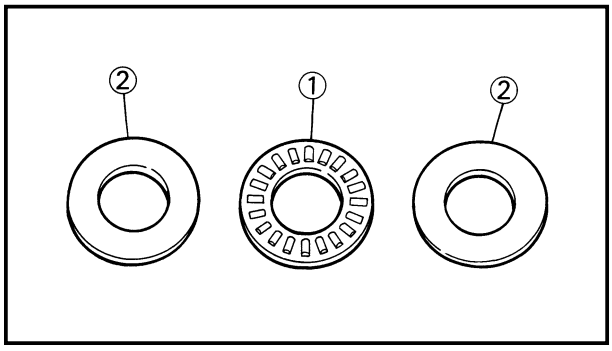


EC4K4000
INSPECTION

EC4K4100
Governor groove

1. Inspect:
   - Plain washer ①
   - Collar ②

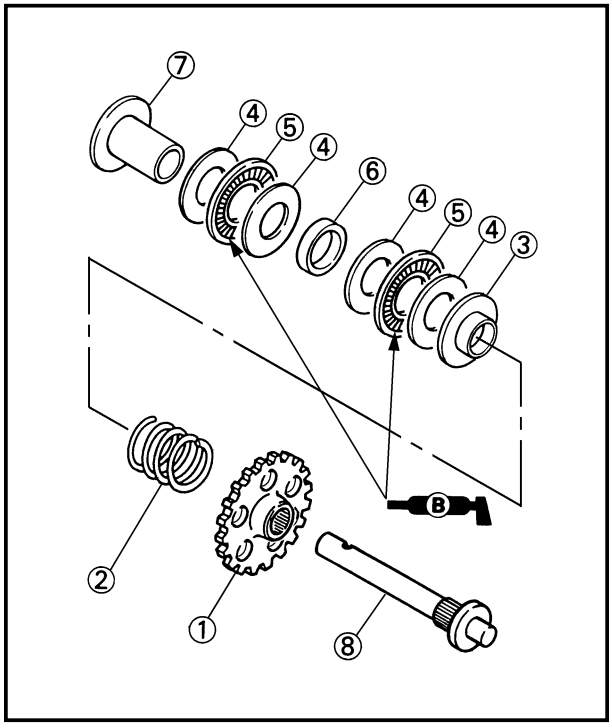
   Wear/Damage → Replace.



EC4K4200
Bearing

1. Inspect:
   - Thrust bearing ①
   - Plain washer ②

   Wear/Damage → Replace.



EC4K5000
ASSEMBLY AND INSTALLATION

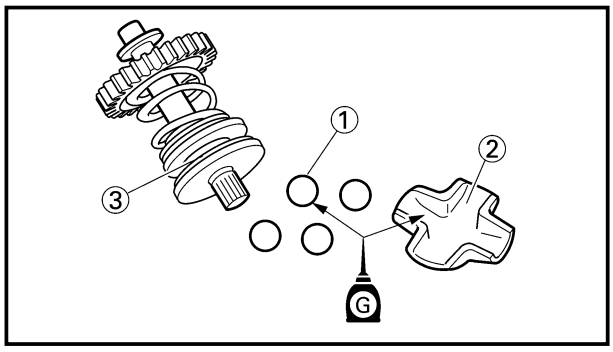
EC4K5130
Governor

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

   To governor shaft ⑧.

NOTE:

Apply the lithium soap base grease on the thrust bearing.

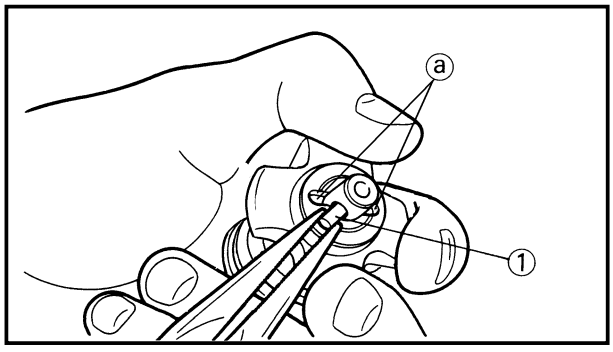


2. Install:
   - Ball ①
   - Retainer ②

   To governor shaft ③.

NOTE:

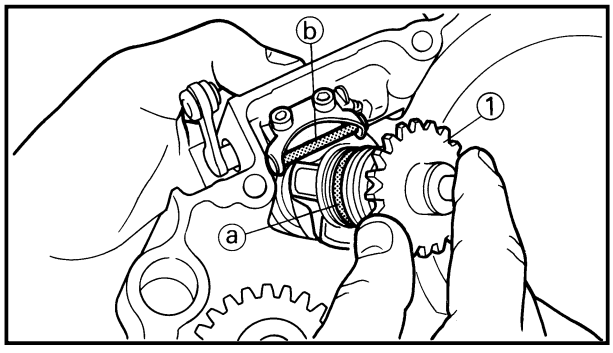
Apply the transmission oil on the retainer and ball.



3. Install:
   - Dowel pin ①

NOTE:

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

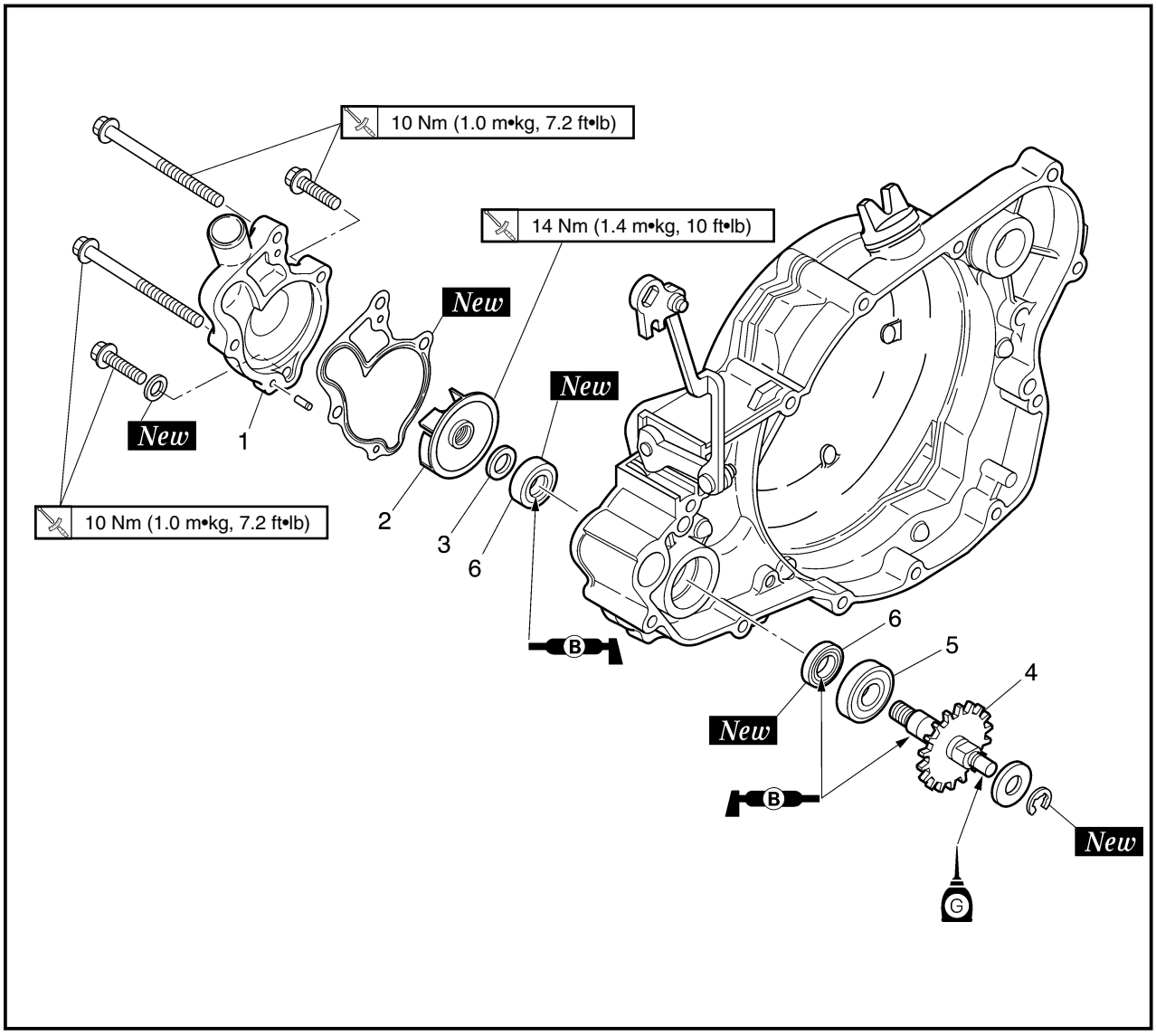


4. Install:
   - Governor assembly ①

NOTE:

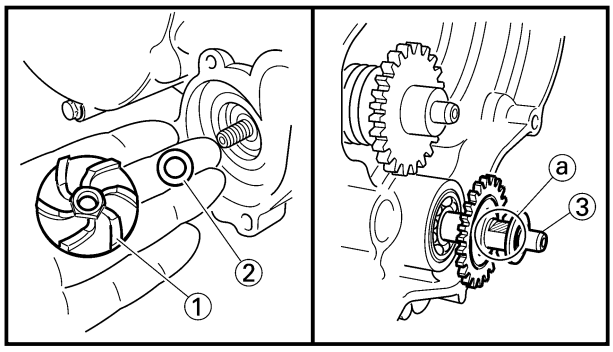
Align the groove ⓐ in the governor with the fork ⓑ and set the governor in the crankcase cover.

EC4G0000
WATER PUMP



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

Extent of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		**WATER PUMP DISASSEMBLY** Crankcase cover (right)		Refer to "KICK AXLE, SHIFT SHAFT AND PRIMARY DRIVE GEAR" section.
① ②	1	Water pump housing cover	1	
	2	Impeller	1	Refer to "REMOVAL POINTS".
	3	Plain washer	1	
	4	Impeller shaft	1	
	5	Bearing	1	Refer to "REMOVAL POINTS".
	6	Oil seal	2	



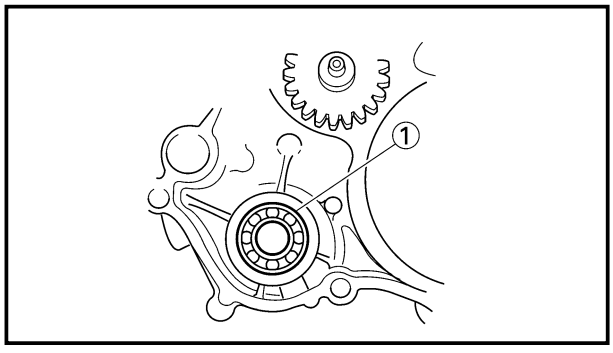
EC4G3000
REMOVAL POINTS

EC4G3110
Impeller shaft

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

NOTE:

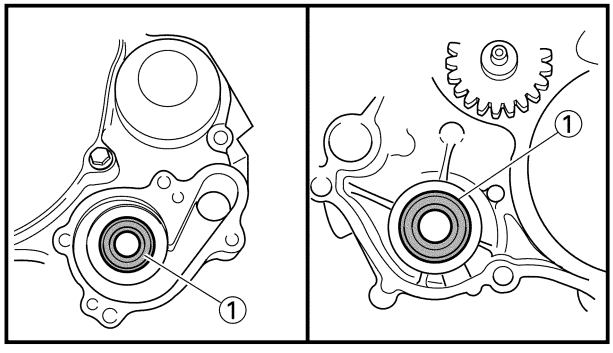
Hold the impeller shaft on its width across the flats ⓐ with spanners, etc. and remove the impeller.



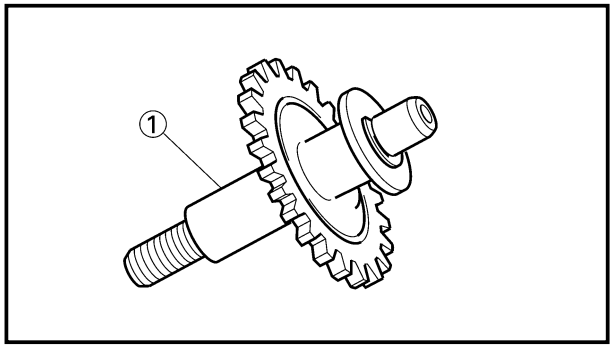
EC4G3210
Oil seal

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:
   - Bearing ①
2. Remove:
   - Oil seal ①

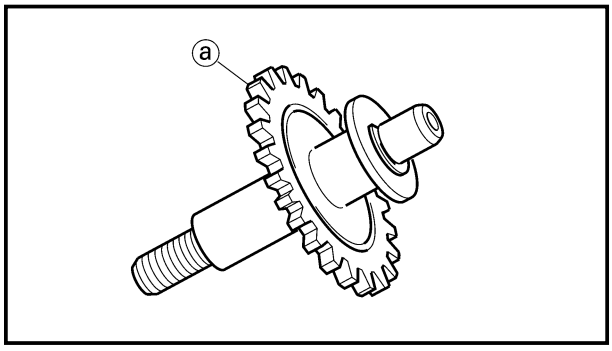


EC4G4000
INSPECTION

EC444200
Impeller shaft

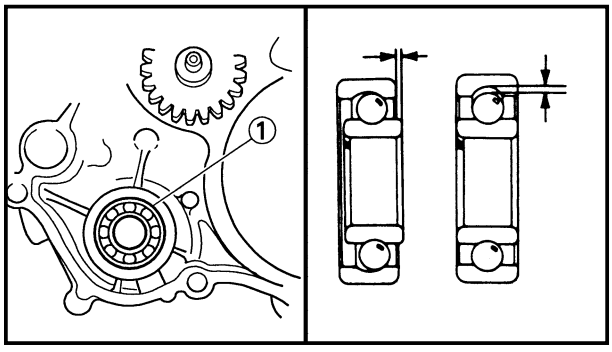
1. Inspect:
   - Impeller shaft ①

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



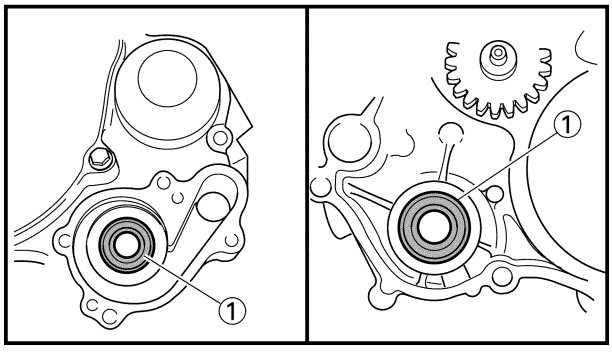
EC444300
Impeller shaft gear

1. Inspect:
   - Gear teeth ⓐ
     Wear/Damage → Replace.



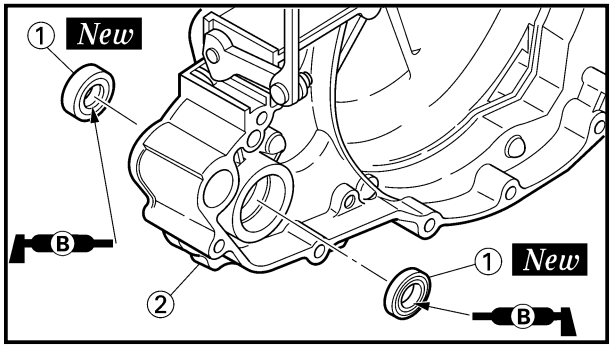
EC4H4600
Bearing

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



EC444400
Oil seal

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



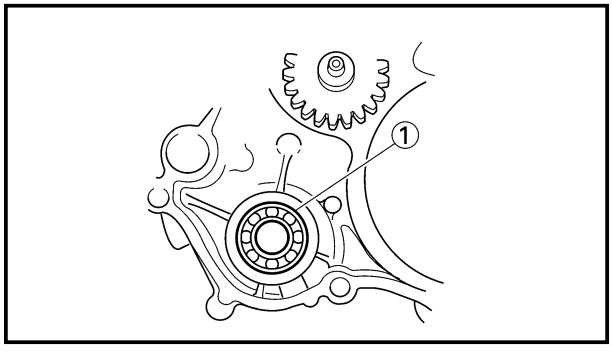
EC4G5000
ASSEMBLY AND INSTALLATION

EC4G5111
Oil seal

1. Install:
   - Oil seal ① ***New***

NOTE:

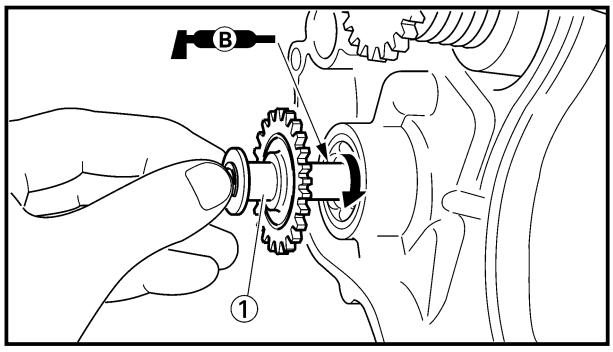
- Apply the lithium soap base grease on the oil seal lip.
- Install the oil seal with its manufacture's marks or numbers facing the crankcase cover (right) ②.

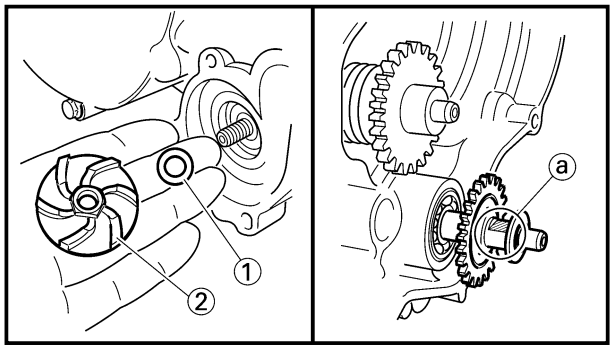


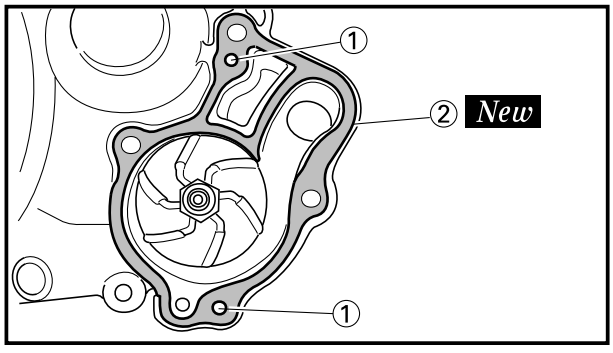
2. Install:
   - Bearing ①

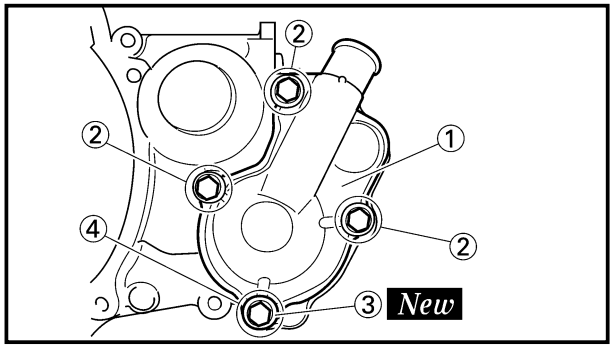
NOTE:

Install the bearing by pressing its outer race parallel.









EC4G5220

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
   - Impeller ② **14 Nm (1.4 m•kg, 10 ft•lb)**

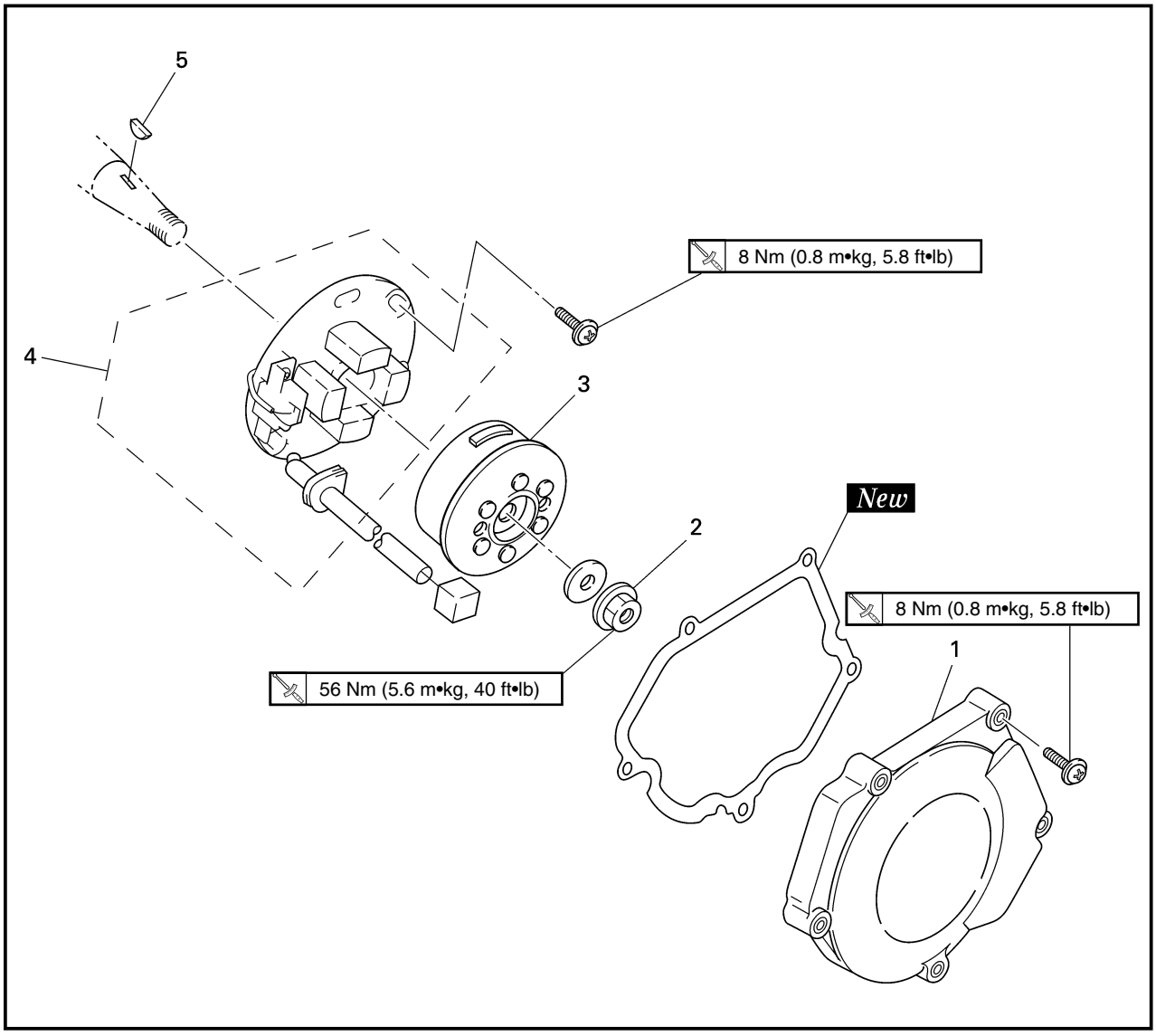
NOTE:

Hold the impeller shaft on its width across the flats ⓐ with spanners, etc. and install the impeller.

3. Install:
   - Dowel pin ①
   - Gasket (water pump housing cover) ② ***New***

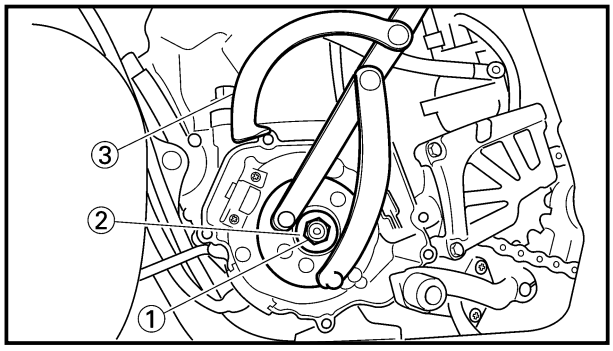
4. Install:
   - Water pump housing cover ①
   - Bolt (water pump housing cover) ② **10 Nm (1.0 m•kg, 7.2 ft•lb)**
   - Copper washer (coolant drain bolt) ③ ***New***
   - Coolant drain bolt ④ **10 Nm (1.0 m•kg, 7.2 ft•lb)**

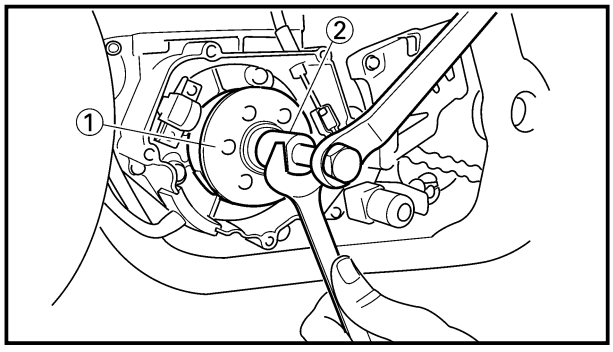
EC4L0000
CDI MAGNETO

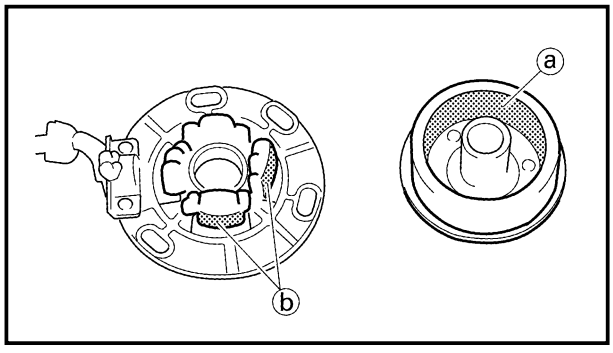


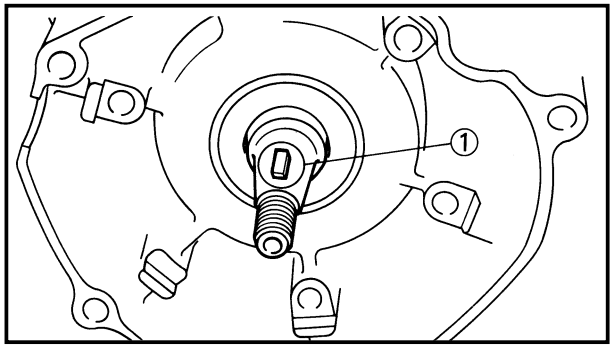
Extent of removal: ① CDI magneto removal

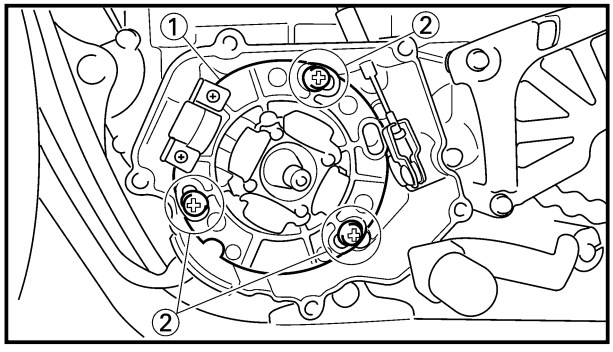
Extent of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		**CDI MAGNETO REMOVAL** Seat and fuel tank Bolt [radiator (left)] Disconnect the CDI magneto lead.		Refer to "SEAT, FUEL TANK AND SIDE COVERS" section. Refer to "RADIATOR" section.
①	1	Crankcase cover (left)	1	
	2	Nut (rotor)	1	Use special tool.
	3	Rotor	1	Refer to "REMOVAL POINTS".
	4	Stator	1	
	5	Woodruff key	1	











EC4L3000
REMOVAL POINTS

EC4L3102
Rotor

1. Remove:
   - Nut (rotor) ①
   - Plain washer ②

   Use the rotor holding tool ③.

	Rotor holding tool: **YU-1235/90890-01235**

2. Remove:
   - Rotor ①

   Use the flywheel puller ②.

	Flywheel puller: **YM-1189/90890-01189**

NOTE:

When installing the flywheel puller, turn it counterclockwise.

EC4L4000
INSPECTION

EC4L4101
CDI magneto

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

   Damage → Inspect the crankshaft runout and crankshaft bearing.

   If necessary, replace CDI magneto and/or stator.

EC4L4200
Woodruff key

1. Inspect:
   - Woodruff key ①

   Damage → Replace.

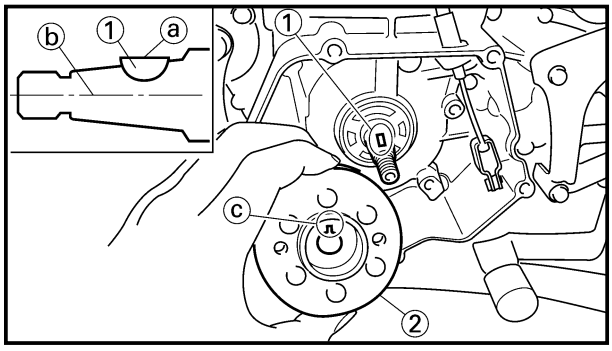
EC4L5000
ASSEMBLY AND INSTALLATION

EC4L5172
CDI magneto

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

NOTE:

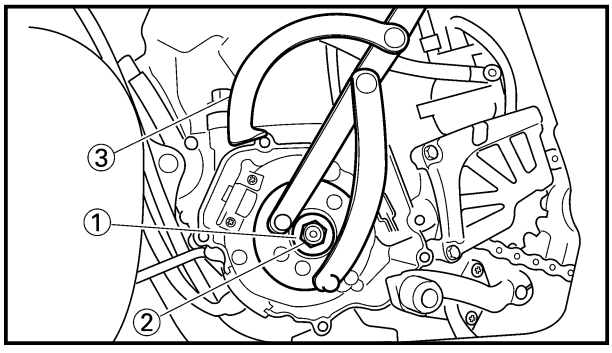
Temporarily tighten the screw (stator) at this point.



2. Install:
   - Woodruff key ①
   - Rotor ②

NOTE:

- Clean the tapered portions of the crankshaft and rotor.
- When installing the woodruff key, make sure that its flat surface ⓐ is in parallel with the crankshaft center line ⓑ.
- When installing the rotor, align the keyway ⓒ of the rotor with the woodruff key.



3. Install:
   - Plain washer ①
   - Nut (rotor) ② **56 Nm (5.6 m•kg, 40 ft•lb)**

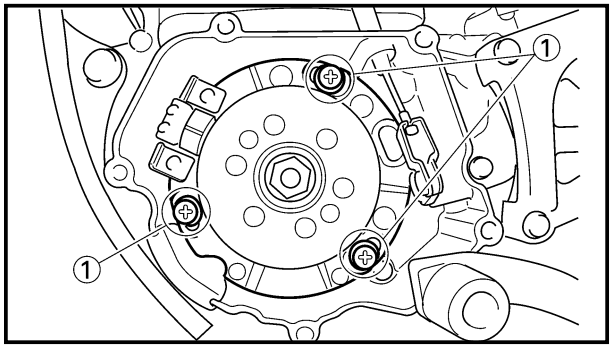
   Use the rotor holding tool ③.

Rotor holding tool:
YU-1235/90890-01235

4. Adjust:
   - Ignition timing

Ignition timing (B.T.D.C.):
0.18 mm (0.007 in)

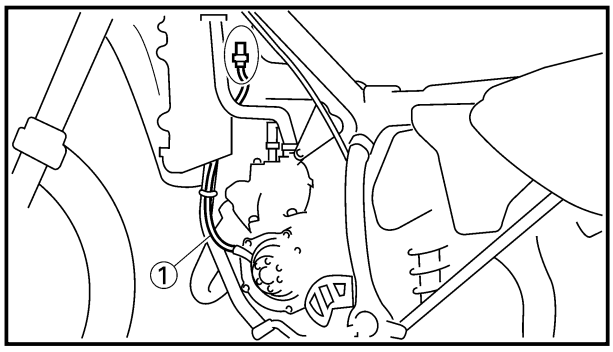
Refer to "IGNITION TIMING CHECK" section in the CHAPTER 3.



5. Tighten:
   - Screw (stator) ① **8 Nm (0.8 m•kg, 5.8 ft•lb)**

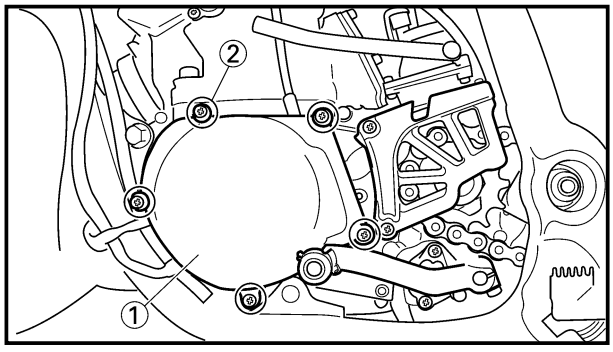
6. Check:
   - Ignition timing

   Re-check the ignition timing.



7. Connect:
   - CDI magneto lead ①

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



8. Install:
   - Gasket [crankcase cover (left)] ***New***
   - Crankcase cover (left) ①
   - Screw [crankcase cover (left)] ②

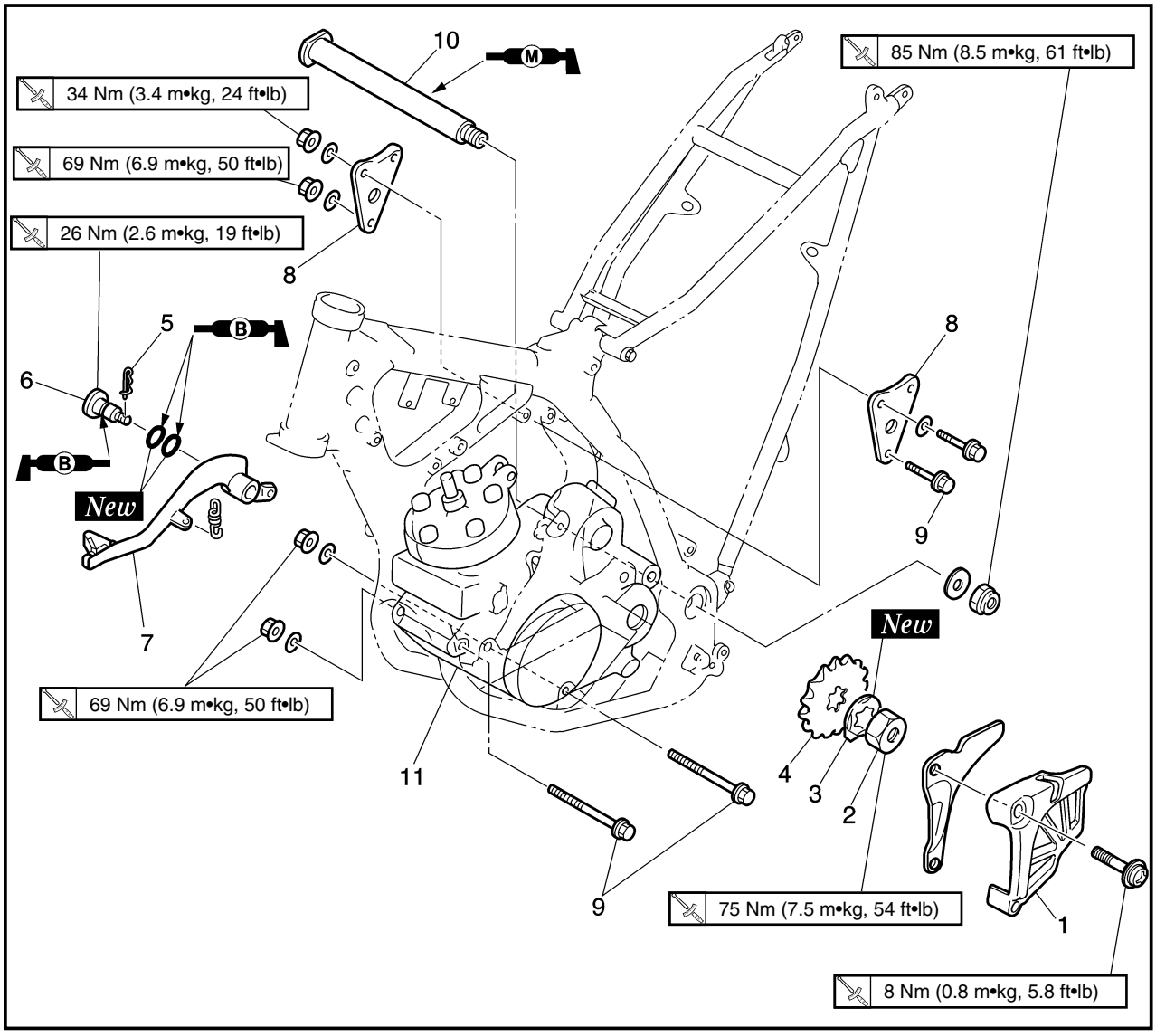
8 Nm (0.8 m•kg, 5.8 ft•lb)

NOTE:

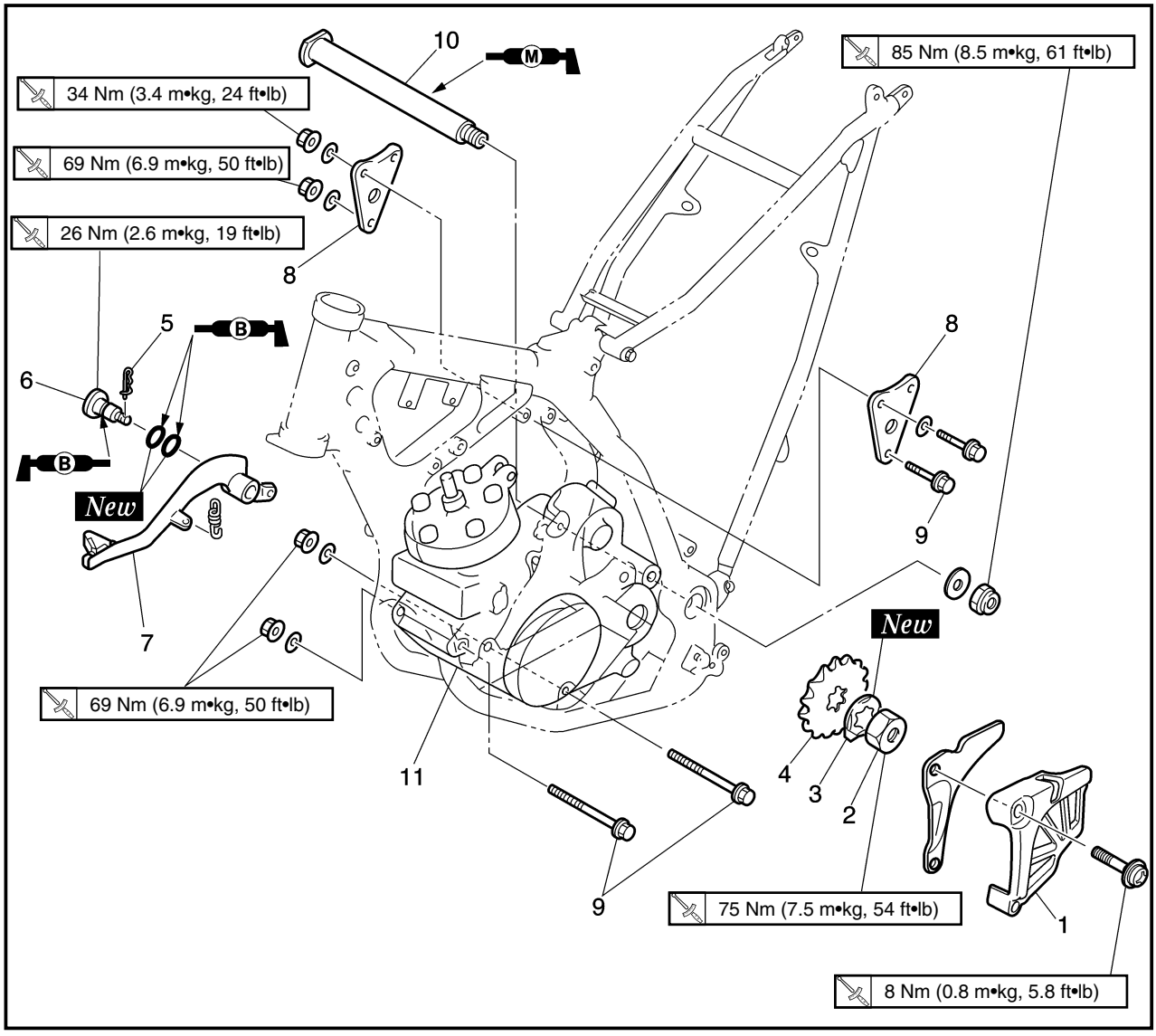
Tighten the screws in stage, using a crisscross pattern.

EC4M0000

ENGINE REMOVAL

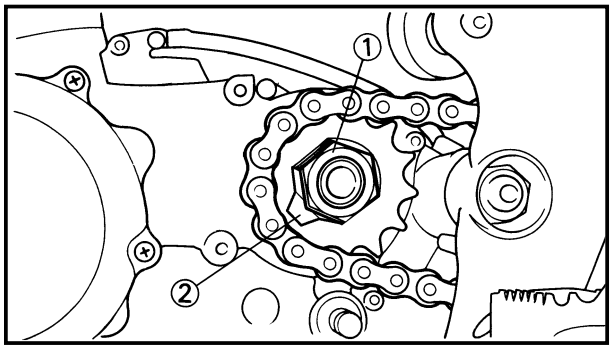


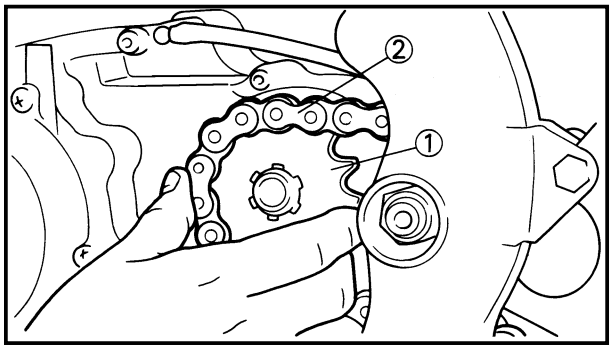
Extent of removal	Order	Part name	Q'ty	Remarks
		ENGINE REMOVAL		
Preparation for removal		Hold the machine by placing the suitable stand under the engine.		**⚠WARNING** **Support the machine securely so there is no danger of it falling over.**
		Seat and fuel tank		Refer to "SEAT, FUEL TANK AND SIDE COVERS" section.
		Carburetor and carburetor joint		Refer to "CARBURETOR AND REED VALVE" section.
		Exhaust pipe and silencer Exhaust pipe stay (rear)		Refer to "EXHAUST PIPE AND SILENCER" section.
		Clutch cable		Disconnect at engine side.
		Radiator		Refer to "RADIATOR" section.
		Spark plug		
		Disconnect the CDI magneto lead.		
		CDI unit		
		Reservoir tank (rear brake)		Refer to "FRONT BRAKE AND REAR BRAKE" section in the CHAPTER 5.

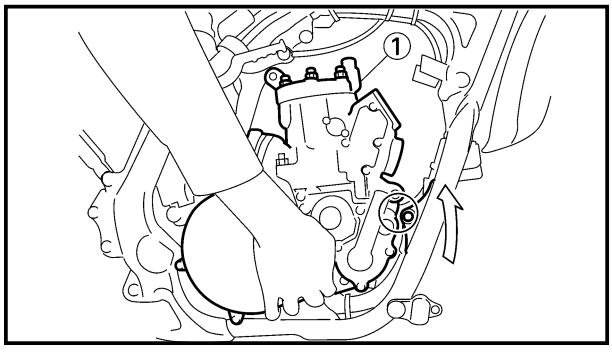


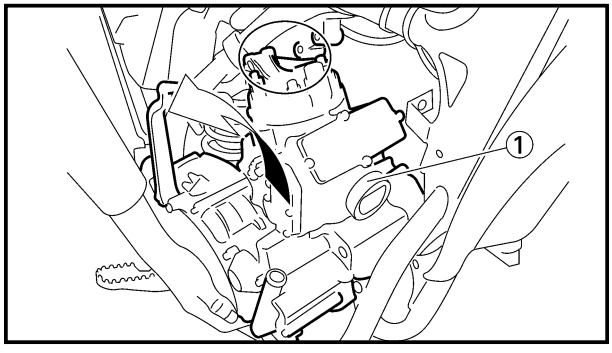
Extent of removal: ① Engine removal

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	Clip	1	
	6	Bolt (brake pedal)	1	
	7	Brake pedal	1	
	8	Engine bracket	2	
	9	Engine mounting bolt	3	
	10	Pivot shaft	1	Remove completely.
	11	Engine	1	Refer to "REMOVAL POINTS".









EC4M3000
REMOVAL POINTS

EC4F3100
Drive sprocket

1. Remove:
   - Nut (drive sprocket) ①
   - Lock washer ②

NOTE:

- Straighten the lock washer tab.
- Loosen the nut while applying the rear brake.

2. Remove:
   - Drive sprocket ①
   - Drive chain ②

NOTE:

Remove the drive sprocket together with the drive chain.

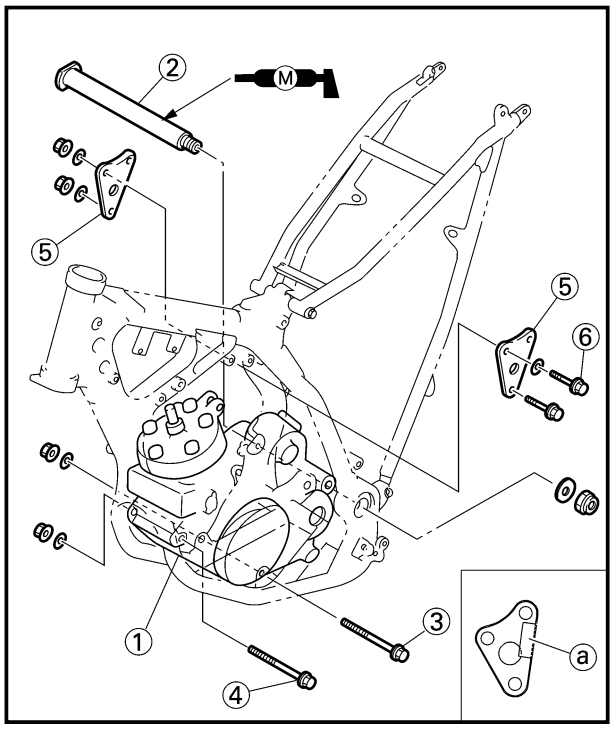
EC4M3340
Engine removal

NOTE:

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

1. Lift the engine ① up to the point where the engine's mounting front does not contact the bracket on the frame.

2. Remove the engine ① aslant and upward while inclining it toward the kick crank side so that the engine's mounting top does not contact the bracket on the frame.



EC4M5000
ASSEMBLY AND INSTALLATION
EC4M5124
Engine installation
1. Install:
   - Engine ①
     Install the engine from right side.
   - Pivot shaft ②

     85 Nm (8.5 m•kg, 61 ft•lb)
   - Engine mounting bolt (lower) ③

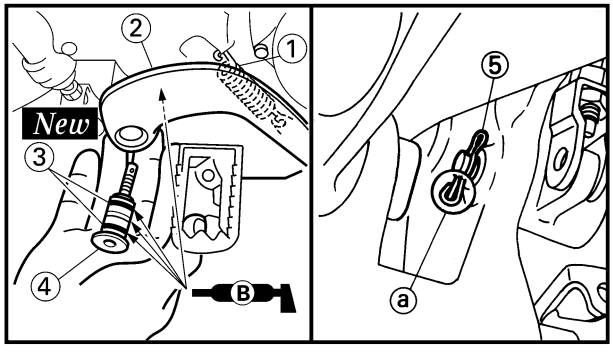
     69 Nm (6.9 m•kg, 50 ft•lb)
   - Engine mounting bolt (front) ④

     69 Nm (6.9 m•kg, 50 ft•lb)
   - Engine bracket ⑤
   - Bolt (engine bracket) ⑥

     34 Nm (3.4 m•kg, 24 ft•lb)
   - Engine mounting bolt (upper) ⑦

     69 Nm (6.9 m•kg, 50 ft•lb)

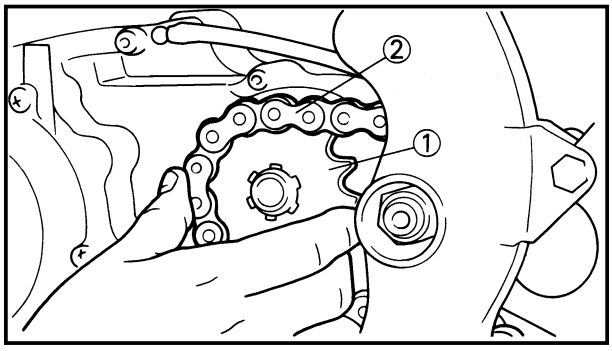
NOTE:
- Apply the molybdenum disulfide grease on the pivot shaft.
- Install the engine bracket with its damper ⓐ on the right side of the body.



EC4M5211
Brake pedal
1. Install:
   - Spring ①
   - Brake pedal ②
   - O-ring ③ New
   - Bolt (brake pedal) ④

     26 Nm (2.6 m•kg, 19 ft•lb)
   - Clip ⑤

NOTE:
- Apply the lithium soap base grease on the bolt, O-rings and brake pedal bracket.
- Install the clip with its stopper portion ⓐ facing inward.

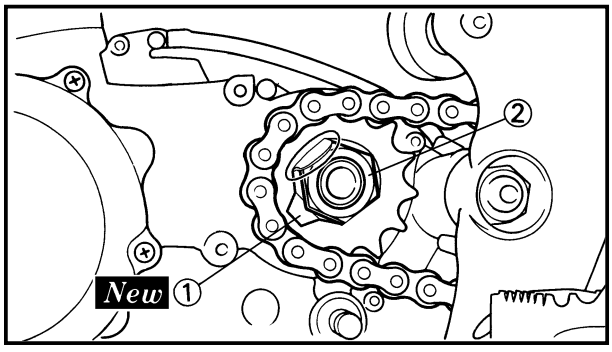


EC4M5341
Drive sprocket

1. Install:
   - Drive sprocket ①
   - Drive chain ②

NOTE:

Install the drive sprocket together with the drive chain.



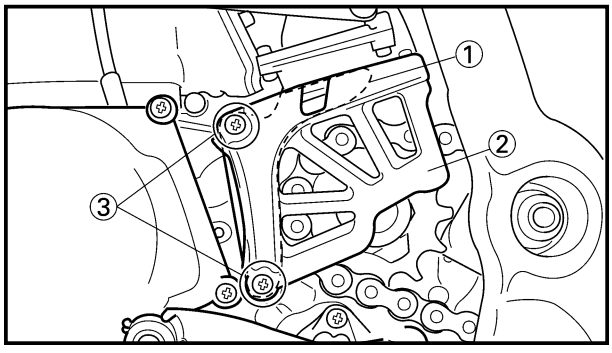
2. Install:
   - Lock washer ① ***New***
   - Nut (drive sprocket) ②

75 Nm (7.5 m•kg, 54 ft•lb)

NOTE:

Tighten the nut while applying the rear brake.

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

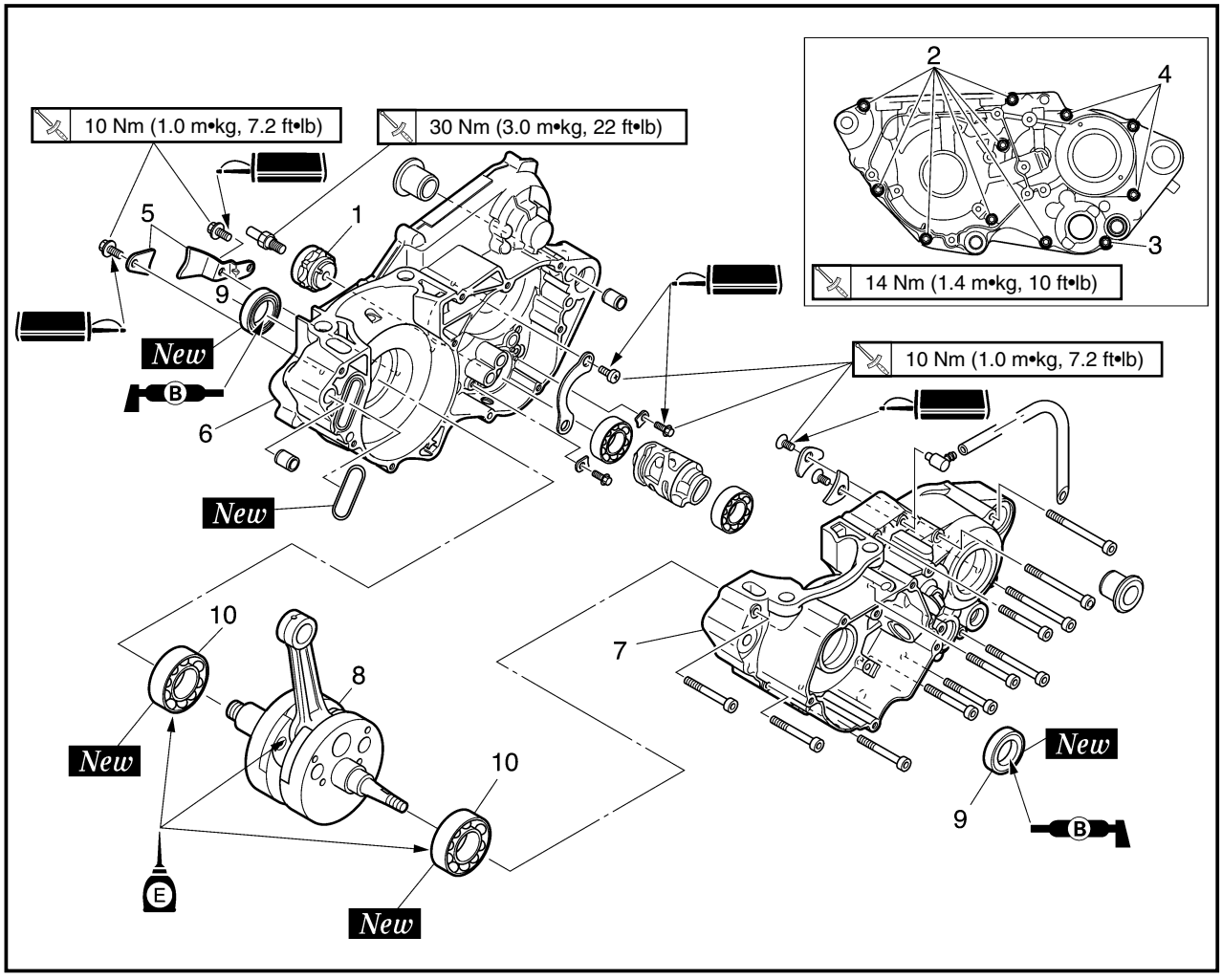


4. Install:
   - Chain guide ①
   - Chain cover ②
   - Screw (chain cover) ③

8 Nm (0.8 m•kg, 5.8 ft•lb)

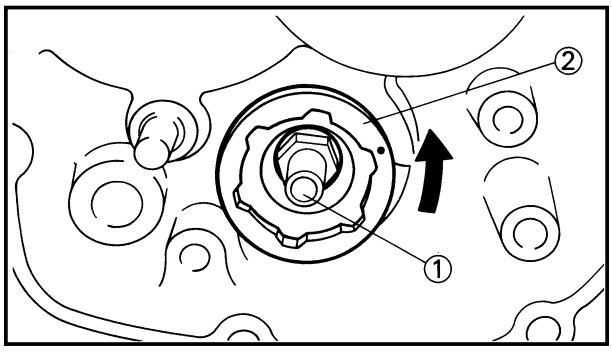
EC4N0000

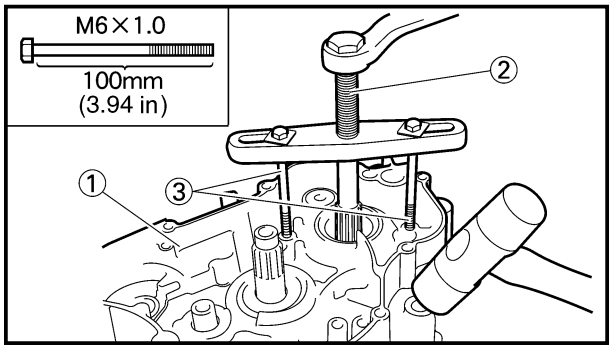
CRANKCASE AND CRANKSHAFT



Extent of removal: ① Crankcase separation ② Crankshaft removal ③ Crankshaft bearing removal

Extent of removal	Order	Part name	Q'ty	Remarks
		CRANKCASE AND CRANKSHAFT REMOVAL		
Preparation for removal		Engine		Refer to "ENGINE REMOVAL" section.
		Piston		Refer to "CYLINDER HEAD, CYLINDER AND PISTON" section.
		Primary drive gear		Refer to "KICK AXLE, SHIFT SHAFT AND PRIMARY DRIVE GEAR" section.
		Kick idle gear		
		Stopper lever		
		Rotor and stator		Refer to "CDI MAGNETO" section.
① ② ③	1	Segment	1	Refer to "REMOVAL POINTS".
	2	Bolt [L=50 mm (1.97 in)]	7	
	3	Bolt [L=60 mm (2.36 in)]	1	
	4	Bolt [L=70 mm (2.76 in)]	3	
	5	Holder	2	
	6	Crankcase (right)	1	Use special tool.
	7	Crankcase (left)	1	Refer to "REMOVAL POINTS".
	8	Crankshaft	1	Use special tool. Refer to "REMOVAL POINTS".
	9	Oil seal	2	
	10	Bearing	2	Refer to "REMOVAL POINTS".





EC4N3000
REMOVAL POINTS

EC4N3100
Segment

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

NOTE:

Turn the segment counterclockwise until it stops and loosen the bolt.

EC4N3212
Crankcase

1. Remove:
   - Crankcase (right) ①

   Use the crankcase separating tool ②.

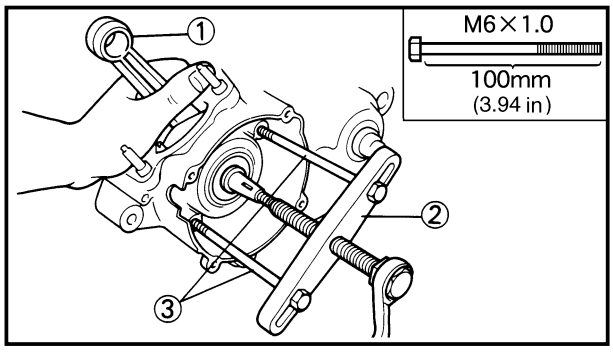
	Crankcase separating tool: YU-1135-A/90890-01135

NOTE:

- Make appropriate bolts ③ as shown available by yourself and attach the tool with them.
- 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.



EC4N3302
Crankshaft

1. Remove:
   - Crankshaft ①

   Use the crankcase separating tool ②.

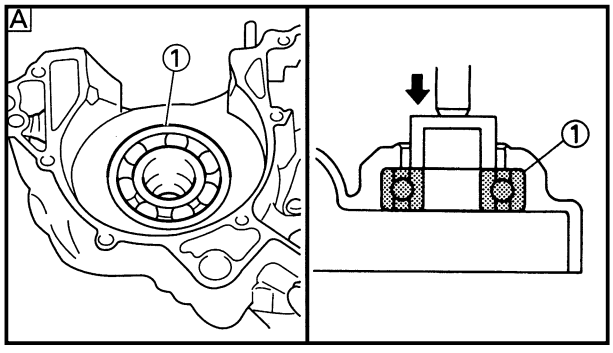
	Crankcase separating tool: YU-1135-A/90890-01135

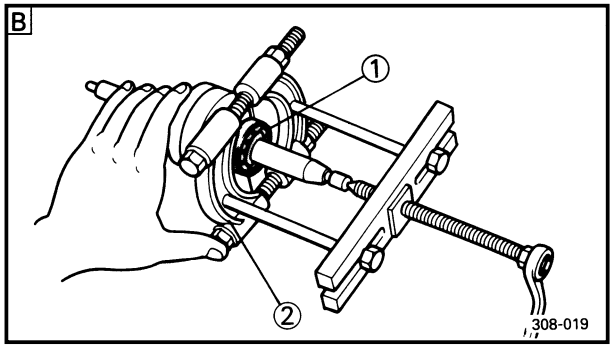
NOTE:

Make appropriate bolts ③ as shown available by yourself and attach the tool with them.

CAUTION:

Do not use a hammer to drive out the crankshaft.



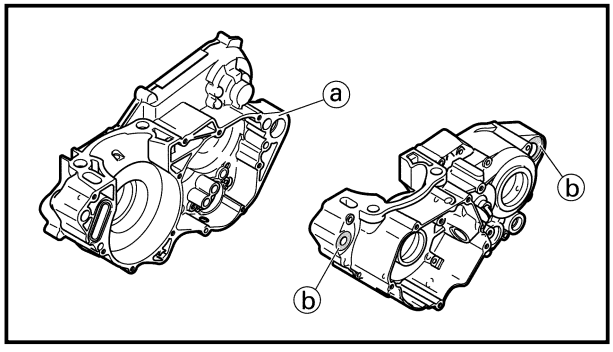


EC4N3401
Crankshaft bearing

1. Remove:
   - Bearing ①

NOTE:

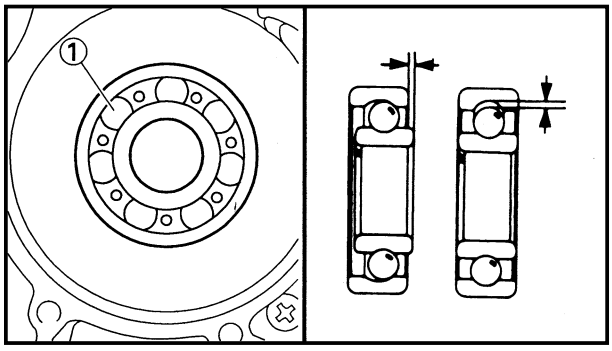
- Remove the bearing from the crankcase by pressing its inner race as shown in A.
- If the bearing is removed together with the crankshaft, remove the bearing using a general bearing puller ② as shown in B.
- Do not use the removed bearing.



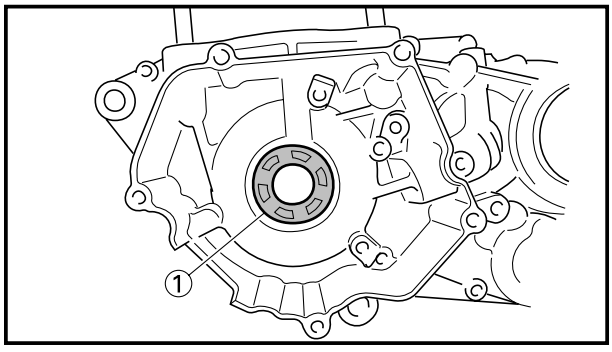
EC4N4000
INSPECTION

EC4N4101
Crankcase

1. Inspect:
   - Contacting surface ⓐ
     Scratches → Replace.
   - Engine mounting boss ⓑ, crankcase
     Cracks/Damage → Replace.



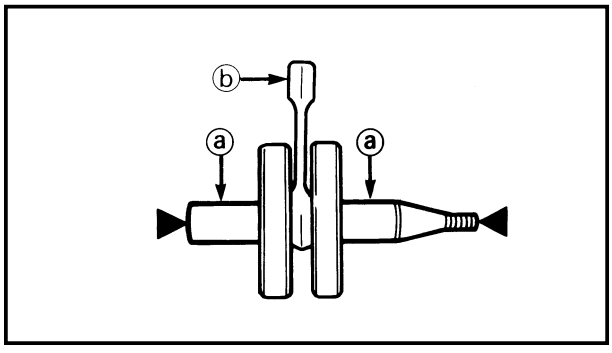
2. Inspect:
   - Bearings ①
   Rotate inner race with a finger.
   Rough spot/Seizure → Replace.

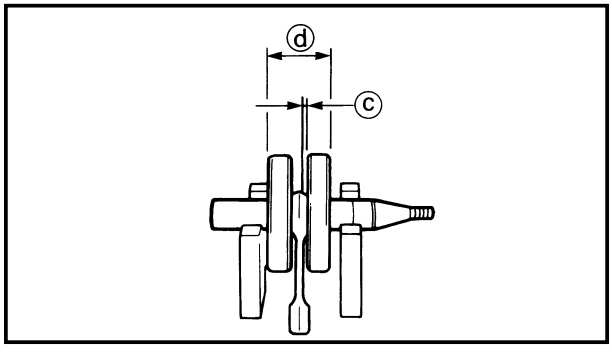


3. Inspect:
   - Oil seal ①
   Damage → Replace.

EC4N4202
Crankshaft

1. Measure:
   - Runout limit ⓐ
   - Small end free play limit ⓑ
   - Connecting rod big end side clearance ⓒ
   - Crank width ⓓ
   Out of specification → Replace.
   Use the dial gauge and a thickness gauge.



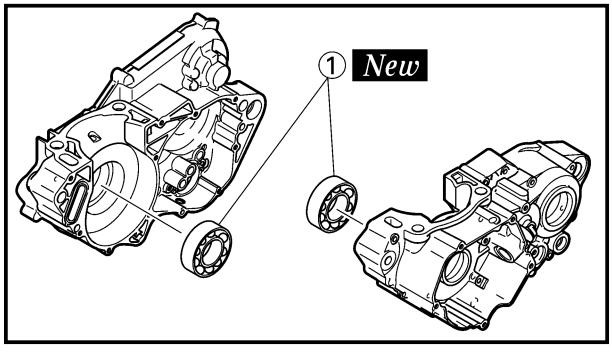


Dial gauge:	**YU-3097/90890-01252**

	Standard	<Limit>
Runout limit:	**0.03 mm (0.0012 in)**	**0.05 mm (0.0020 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 (0.010~0.030in)**	**—**
Crank width:	**59.95~60.00 mm (2.360~2.362 in)**	**—**

EC4N5000
ASSEMBLY AND INSTALLATION

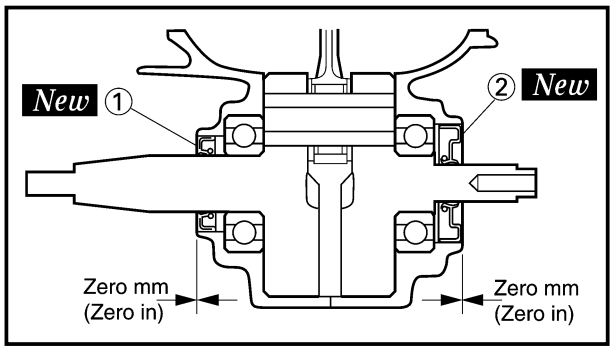
EC4N5300
Crankshaft bearing



1. Install:
   - Bearing ① ***New***
   To crankcase (left and right).

NOTE:

Install the bearing by pressing its outer race parallel.

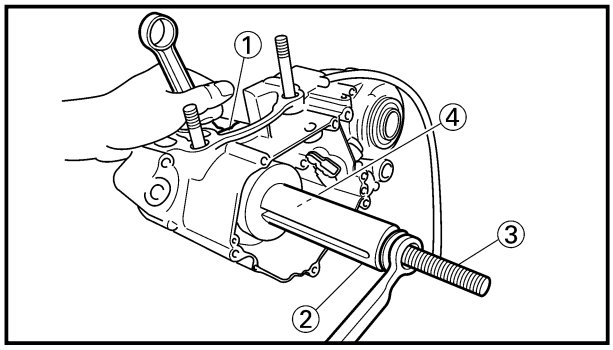


EC4N5102
Oil seal

1. Install:
   - Oil seal (left) ① ***New***
   - Oil seal (right) ② ***New***

NOTE:

- Apply the lithium soap base grease on the oil seal lip.
- Install the oil seal with its manufacture's marks or numbers facing outward.

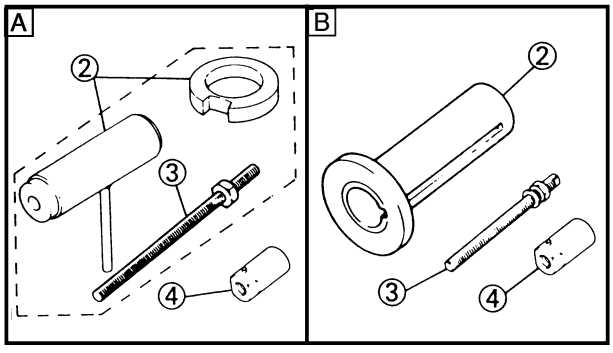


EC4N5283
Crankshaft

1. Install:
   - Crankshaft ①

   Use the crankshaft installing tool ②, ③, ④.

Crankshaft installing tool:
Pot ②: YU-90050/90890-01274
Bolt ③: YU-90050/90890-01275
Adapter ④: YU-90063/90890-01278



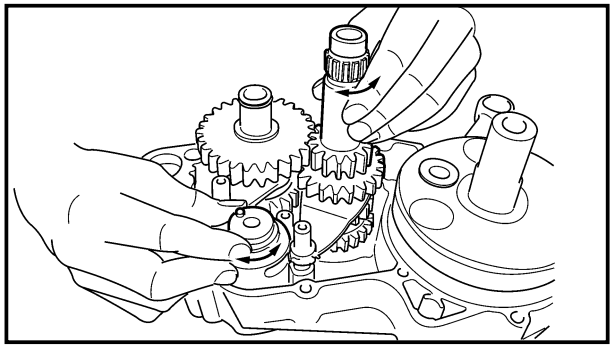
A For USA and CDN
B Except for USA and CDN

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 on the oil seal lip.

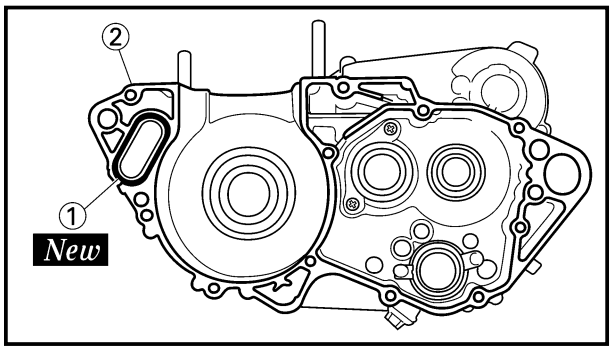
CAUTION:

Do not use a hammer to drive in the crankshaft.

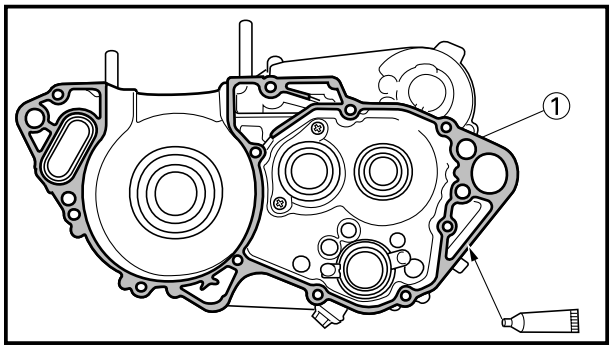


2. Check:
   - Shifter operation
   - Transmission operation

   Unsmooth operation → Repair.



3. Install:
   - O-ring ① *New*
     To crankcase (right) ②.

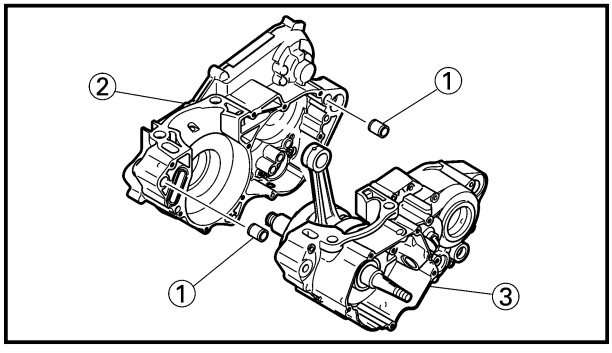


4. Apply:
   - Sealant
     On the crankcase (right) ①.

Quick gasket®:
ACC-QUICK-GS-KT
Yamaha bond No. 1215:
90890-85505

NOTE:

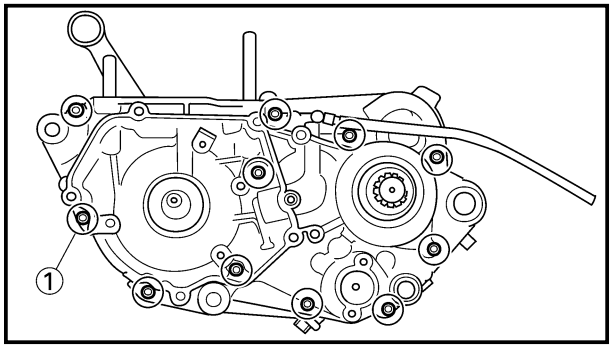
Clean the contacting surface of crankcase (left and right) before applying the sealant.



5. Install:
   - Dowel pin ①
   - Crankcase (right) ②
     To crankcase (left) ③.

NOTE:

- Fit the crankcase (right) onto the crankcase (left). Tap lightly on the case with soft hammer.
- When installing the crankcase, the connecting rod should be positioned at TDC (top dead center).

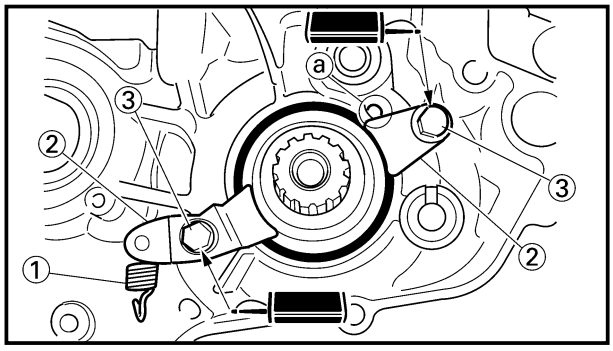


6. Install:
   - Bolt (crankcase) ①

14 Nm (1.4 m•kg, 10 ft•lb)

NOTE:

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

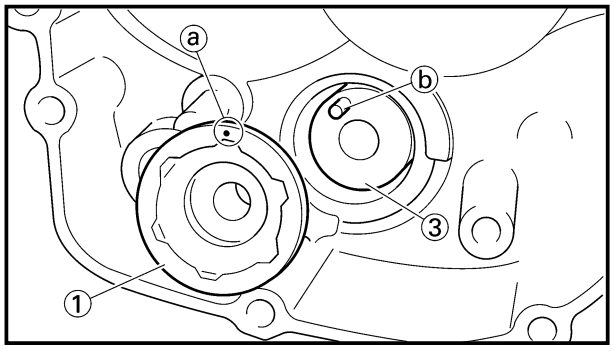


7. Install:
   - Tension spring ①
   - Holder ②
   - Bolt (holder) ③

   10 Nm (1.0 m•kg, 7.2 ft•lb)

NOTE:

Install the holder so that it contacts the projection ⓐ on the crankcase (right).

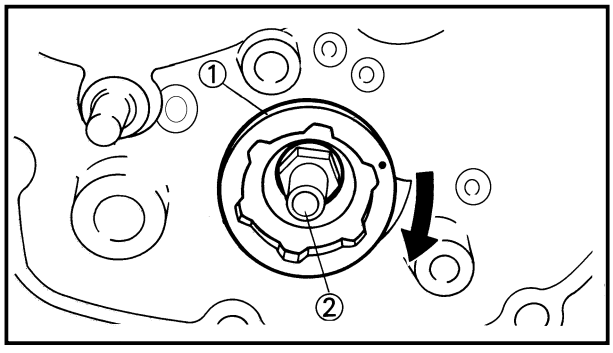


8. Tighten:
   - Segment ①
   - Bolt (segment) ②

   30 Nm (3.0 m•kg, 22 ft•lb)

NOTE:

- When installing the segment onto the shift cam ③, align the punch mark ⓐ with the dowel pin ⓑ.
- Turn the segment clockwise until it stops and tighten the bolt.



9. Remove:
   - Sealant

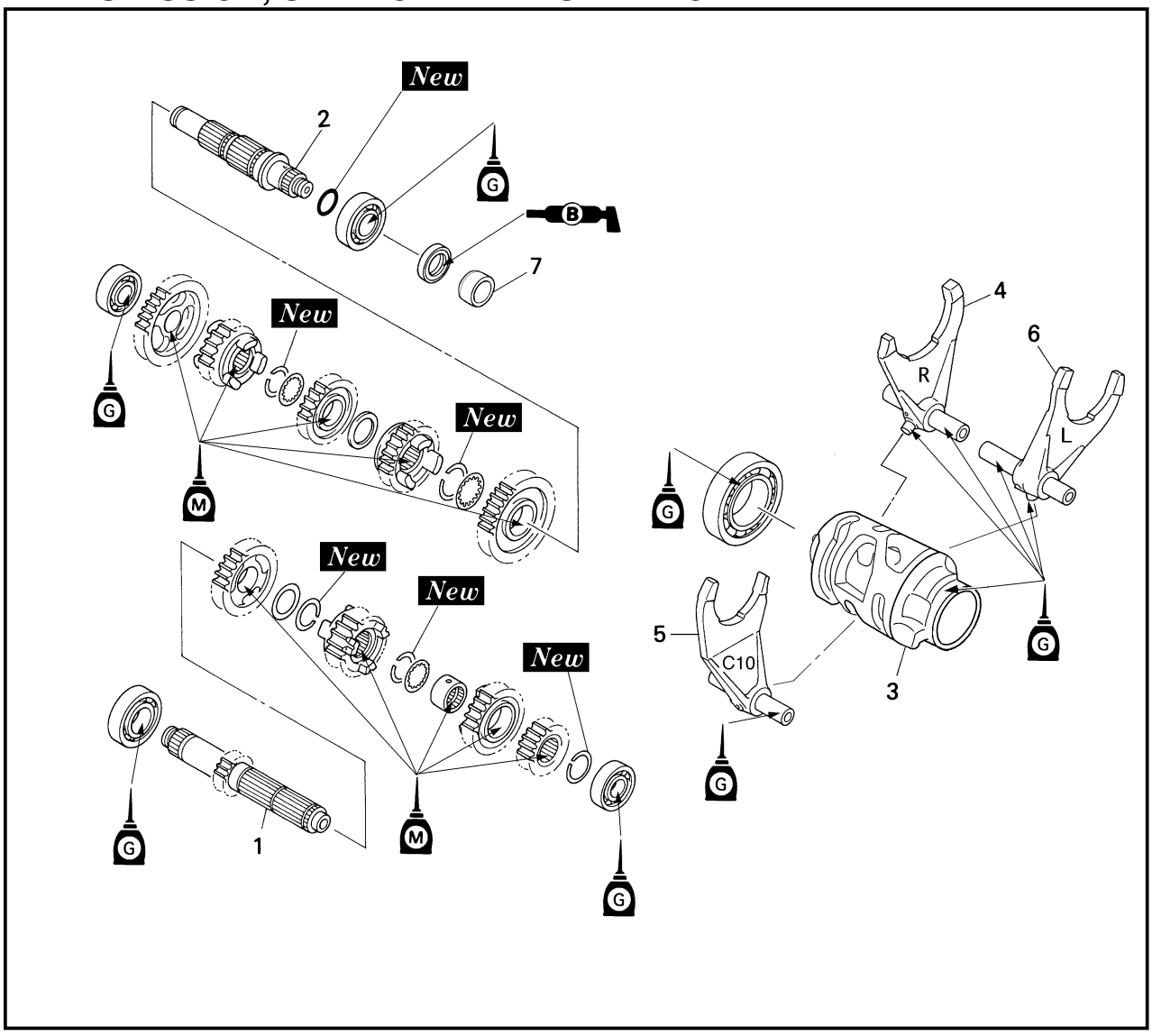
   Forced out on the cylinder mating surface.
10. Apply:
    - Engine oil

    To the crank pin, bearing, oil delivery hole and connecting rod big end washer.
11. Check:
    - Crankshaft and transmission operation

    Unsmooth operation → Repair.

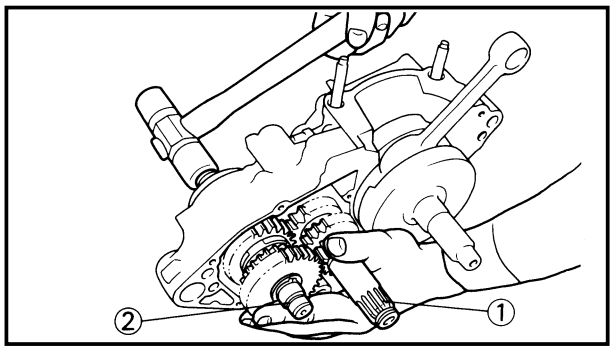
EC4H0000

TRANSMISSION, SHIFT CAM AND SHIFT FORK



Extent of removal: ① Main axle, drive axle, shift cam and shift fork removal

Extent of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		**TRANSMISSION, SHIFT CAM AND SHIFT FORK REMOVAL** Engine Separate the crankcase.		Refer to "ENGINE REMOVAL" section. Refer to "CRANKCASE AND CRANK SHAFT" section.
①	1	Main axle	1	Refer to "REMOVAL POINTS".
	2	Drive axle	1	
	3	Shift cam	1	
	4	Shift fork 3	1	
	5	Shift fork 2	1	
	6	Shift fork 1	1	
	7	Spacer	1	



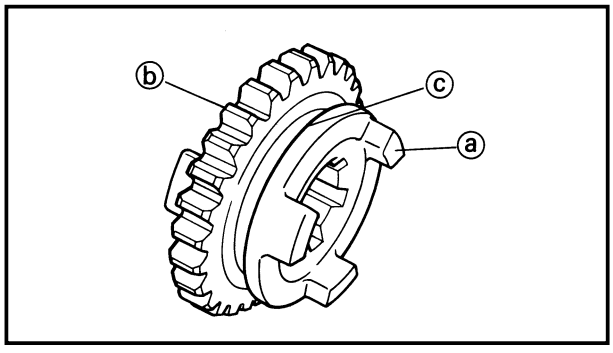
EC4H3000
REMOVAL POINTS

EC4H3230
Transmission

1. Remove:
   - Main axle ①
   - Drive axle ②
   - Shift cam
   - Shift fork 3
   - Shift fork 2
   - Shift fork 1

NOTE:

- Remove assembly carefully. Note the position of each part. Pay particular attention to the location and direction of shift forks.
- Remove the main axle, drive axle, shift cam and shift fork all together by tapping lightly on the transmission drive axle with a soft hammer.

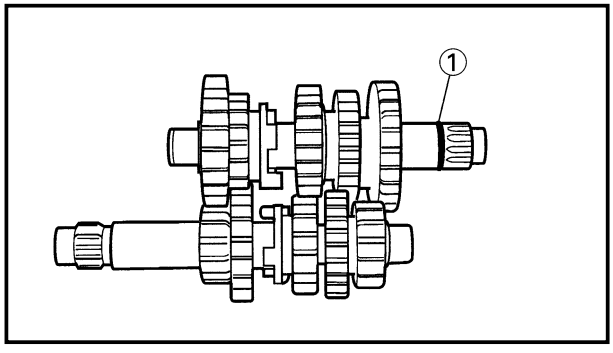


EC4H4000
INSPECTION

EC4H4230
Gears

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

   Wear/Damage → Replace.

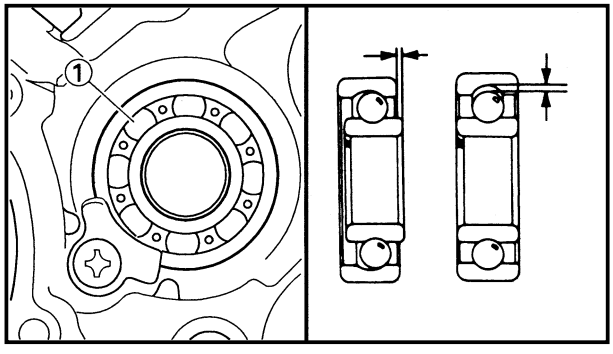


2. Inspect:
   - O-ring ①

   Damage → Replace.

3. Check:
   - Gears movement

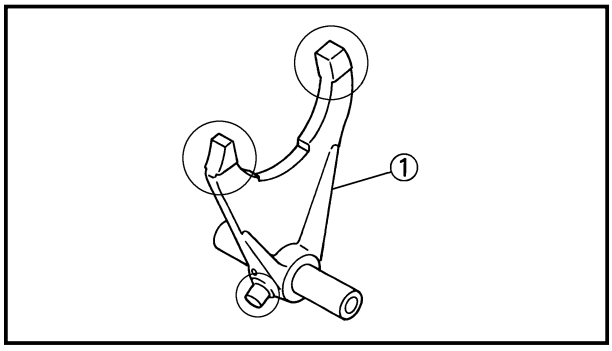
   Unsmooth movement → Repair or replace.



EC4H4600
Bearing

1. Inspect:
   - Bearing ①

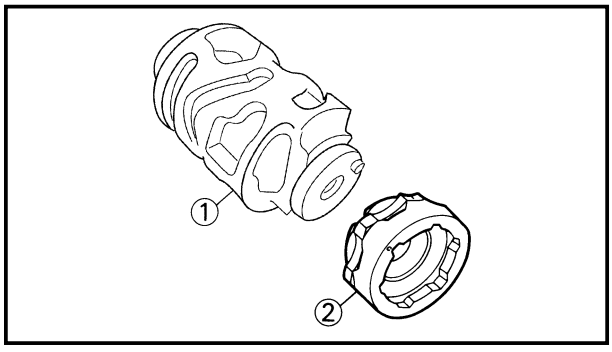
   Rotate inner race with a finger.
   Rough spot/Seizure → Replace.



EC4H4810
Shift fork, shift cam and segment

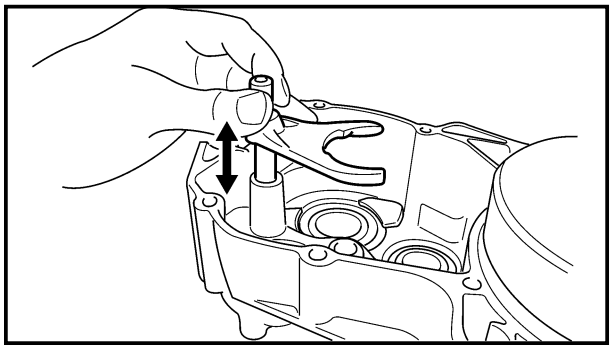
1. Inspect:
   - Shift fork ①

   Wear/Damage/Scratches → Replace.



2. Inspect:
   - Shift cam ①
   - Segment ②

   Wear/Damage → Replace.

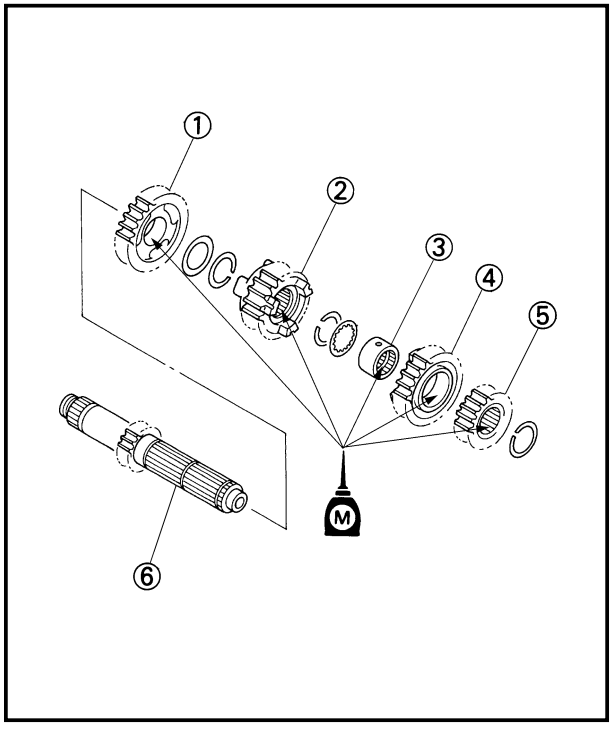


3. Check:
   - Shift fork movement

   Unsmooth operation → Replace shift fork.

NOTE:

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



EC4H5000
ASSEMBLY AND INSTALLATION

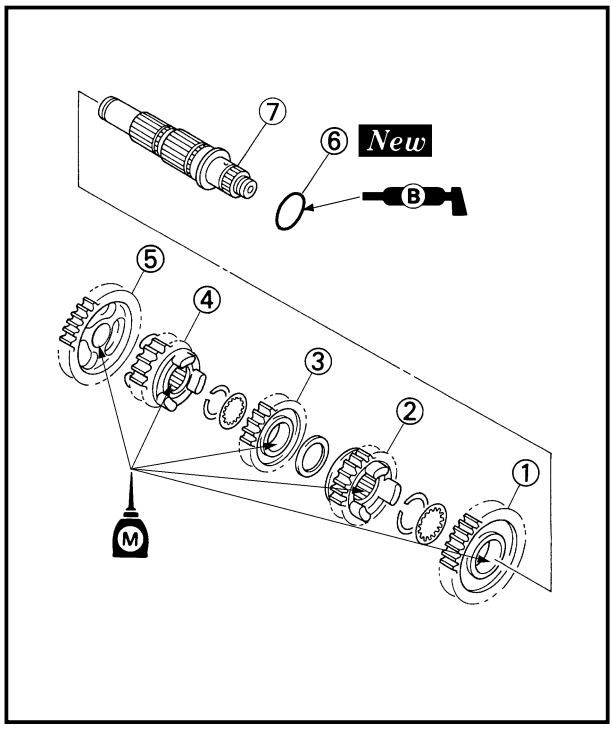
EC4H5242
Transmission

1. Install:
   - 5th pinion gear (21T) ①
   - 3rd pinion gear (18T) ②
   - Collar ③
   - 4th pinion gear (22T) ④
   - 2nd pinion gear (15T) ⑤

   To main axle ⑥.

NOTE:

- Apply the molybdenum disulfide oil on the 4th and 5th pinion gears inner circumference and on the end surface.
- Apply the molybdenum disulfide oil on the 2nd and 3rd pinion gears inner circumference.

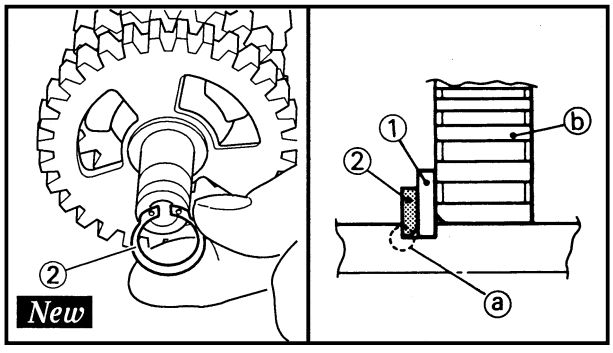


2. Install:
   - 2nd wheel gear (23 T) ①
   - 4th wheel gear (24 T) ②
   - 3rd wheel gear (23 T) ③
   - 5th wheel gear (20 T) ④
   - 1st wheel gear (27 T) ⑤
   - O-ring ⑥ ***New***

   To drive axle ⑦.

NOTE:

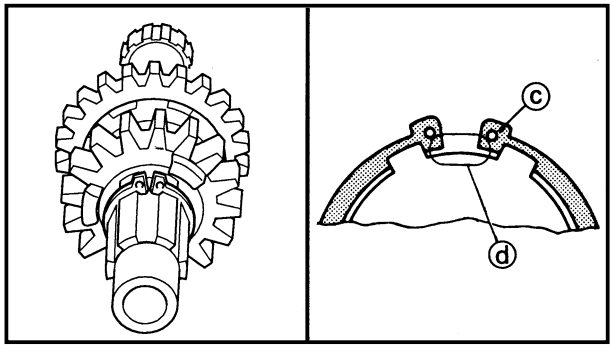
- Apply the molybdenum disulfide oil on the 1st, 2nd and 3rd wheel gears inner circumference and on the end surface.
- Apply the molybdenum disulfide oil on the 4th and 5th wheel gears inner circumference.
- Apply the lithium soap base grease on the O-ring.



3. Install:
   - Plain washer ①
   - Circlip ② ***New***

NOTE:

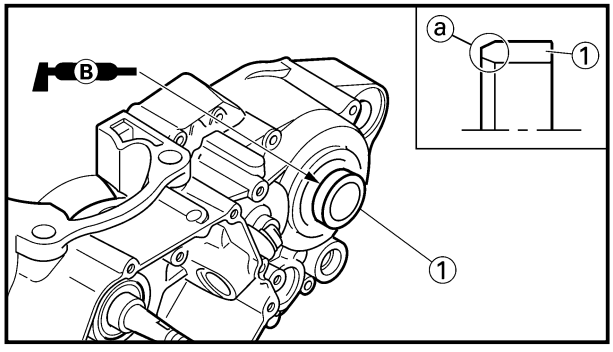
- Be sure the circlip sharp-edged corner ⓐ is positioned opposite side to the plain washer and gear ⓑ.
- Be sure the circlip end ⓒ is positioned at axle spline groove ⓓ.

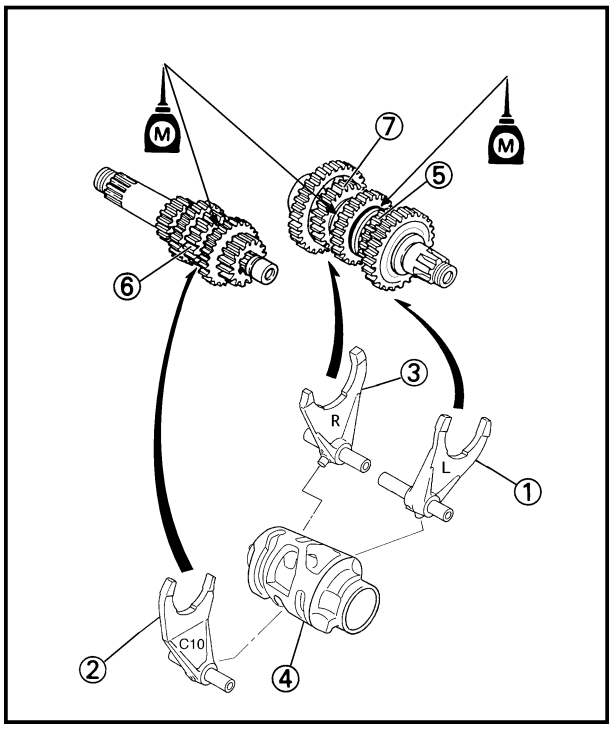


4. Install:
   - Spacer ①

NOTE:

- Apply the lithium soap base grease on the oil seal lip.
- When installing the spacer into the crankcase, pay careful attention to the crankcase oil seal lip.
- Install the spacer with its chamfered side ⓐ facing the crankcase.



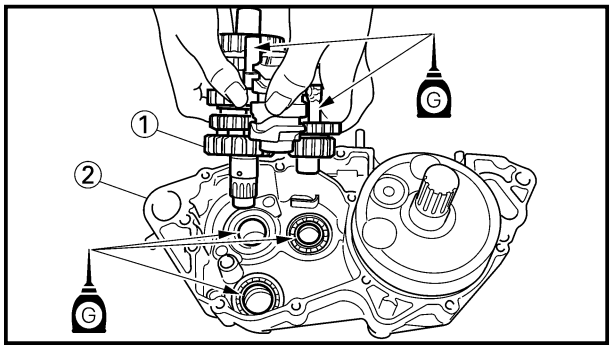


5. Install:
   - Shift fork 1 (L) ①
   - Shift fork 2 (C10) ②
   - Shift fork 3 (R) ③
   - Shift cam ④

   To main axle and drive axle.

NOTE:

- Apply the molybdenum disulfide oil on the shift fork grooves.
- Mesh the shift fork #1 (L) with the 4th wheel gear ⑤ and #3 (R) with the 5th wheel gear ⑦ on the drive axle.
- Mesh the shift fork #2 (C10) with the 3rd pinion gear ⑥ on the main axle.

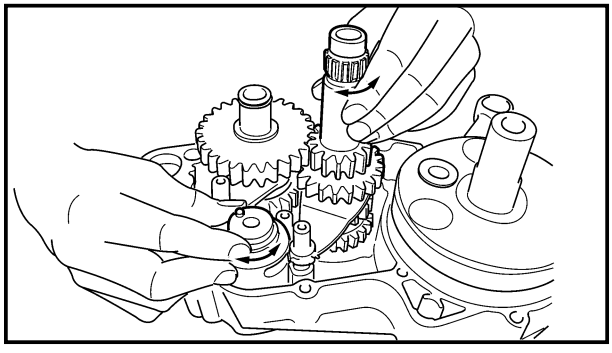


6. Install:
   - Transmission assembly ①

   To crankcase (left) ②.

NOTE:

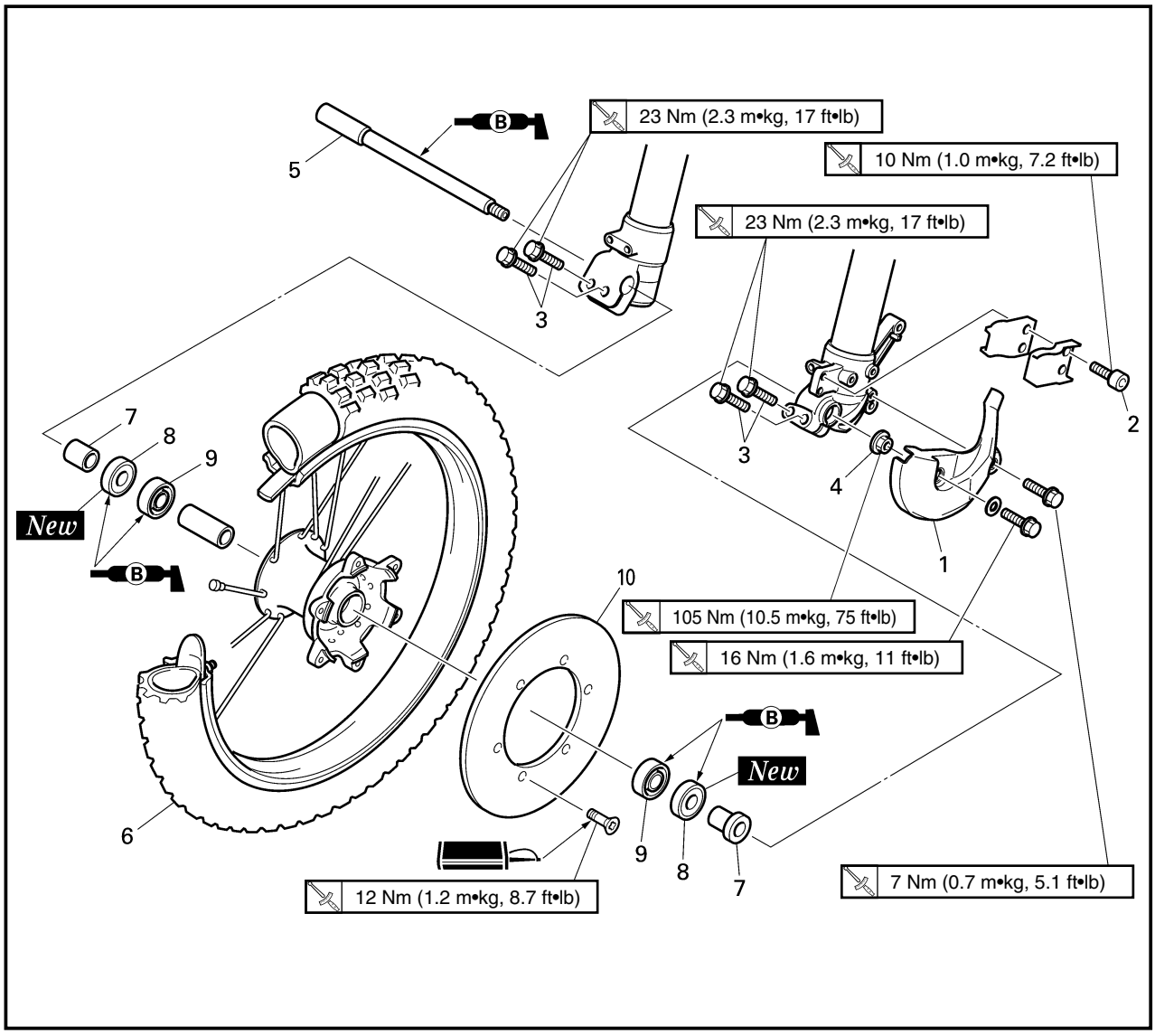
Apply the transmission oil on the bearings and guide bars.



7. Check:
   - Shifter operation
   - Transmission operation

   Unsmooth operation → Repair.

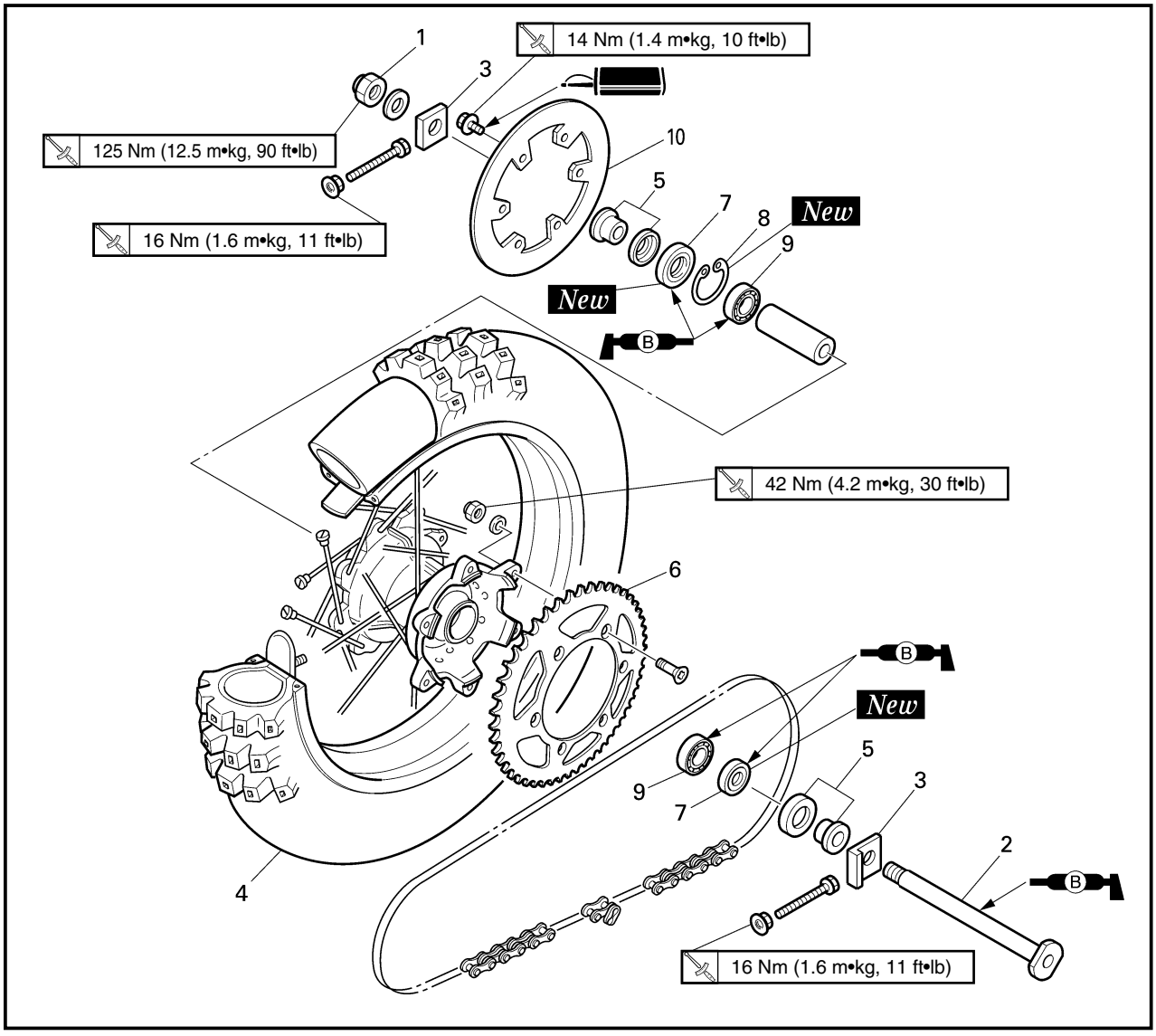
EC500000
CHASSIS
EC590000
FRONT WHEEL AND REAR WHEEL
EC598000
FRONT WHEEL



Extent of removal: ① Front wheel removal ② Wheel bearing removal ③ Brake disc removal

Extent of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		**FRONT WHEEL 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.**
①, ②, ③	1	Hose cover	1	
	2	Bolt (brake hose holder)	2	Only loosening.
	3	Bolt (axle holder)	4	Only loosening.
	4	Nut (front wheel axle)	1	
	5	Front wheel axle	1	
	6	Front wheel	1	
	7	Collar	2	
	8	Oil seal	2	
	9	Bearing	2	Refer to "REMOVAL POINTS".
③	10	Brake disc	1	

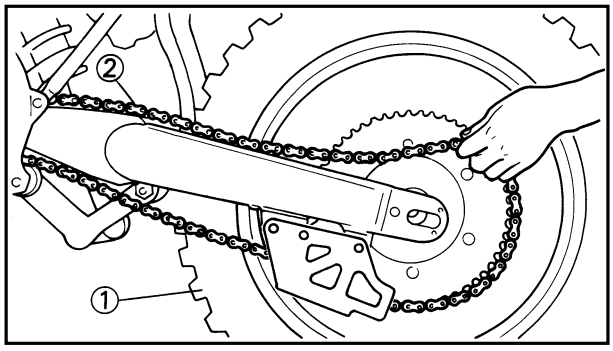
EC598100
REAR WHEEL



Extent of removal: ① Rear wheel removal ② Wheel bearing removal ③ Brake disc removal

Extent of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		**REAR WHEEL 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.**
①, ②, ③	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	Driven sprocket	1	
	7	Oil seal	2	
	8	Circlip	1	
	9	Bearing	2	Refer to "REMOVAL POINTS".
③	10	Brake disc	1	

5



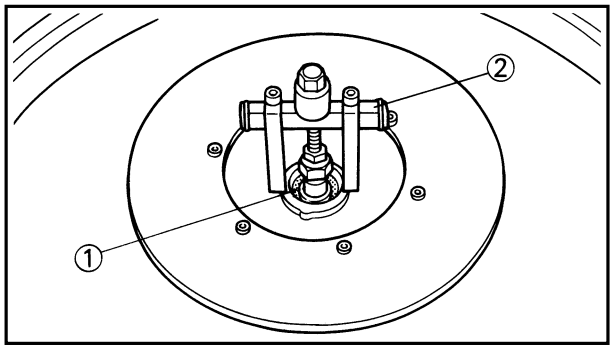
EC593000
REMOVAL POINTS

EC523101
Rear wheel

1. Remove:
   •Wheel ①

NOTE:

Push the wheel forward and remove the drive chain ②.

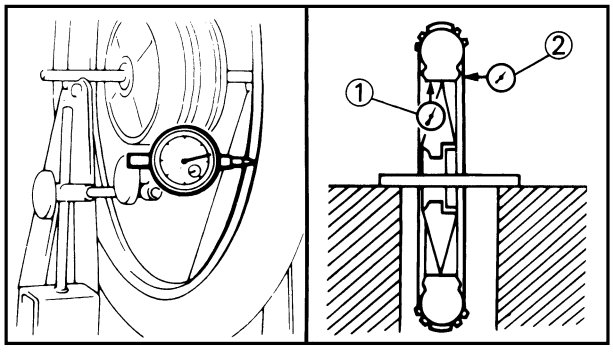


EC513201
Wheel bearing (if necessary)

1. Remove:
   •Bearing ①

NOTE:

Remove the bearing using a general bearing puller ②.

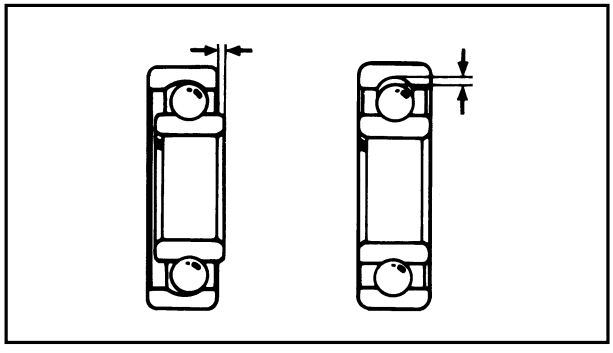


EC594000
INSPECTION

EC514100
Wheel

1. Measure:
   •Wheel runout
   Out of limit→Repair/Replace.

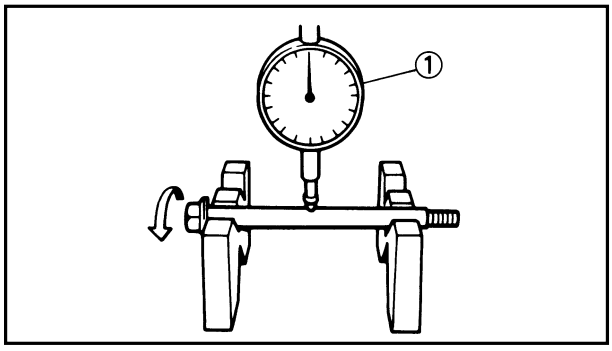
Wheel runout limit:
Radial ①: 2.0mm (0.08 in)
Lateral ②: 2.0mm (0.08 in)



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.



EC514200
Wheel axle

1. Measure:
   •Wheel axle bends
   Out of specification → Replace.
   Use the dial gauge ①.

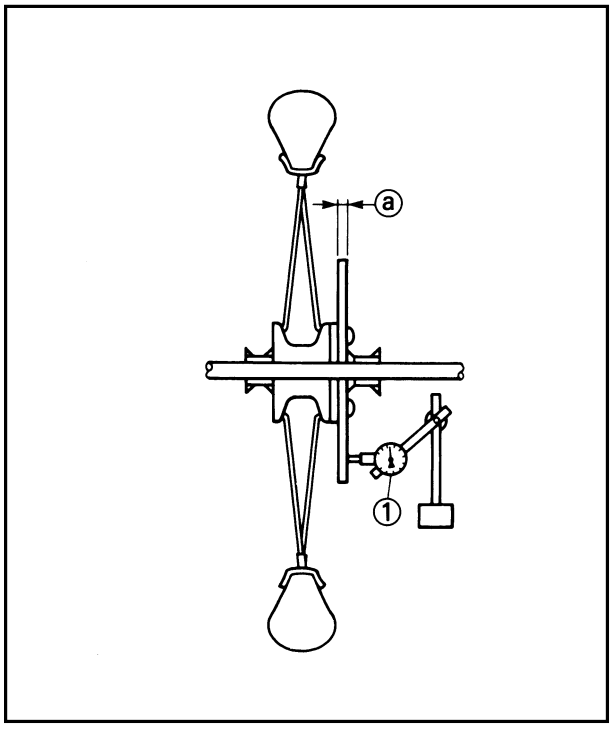
	Wheel axle bending limit: **0.5 mm (0.020 in)**

NOTE:

The bending value is shown by one half of the dial gauge reading.

⚠WARNING

Do not attempt to straighten a bent axle.



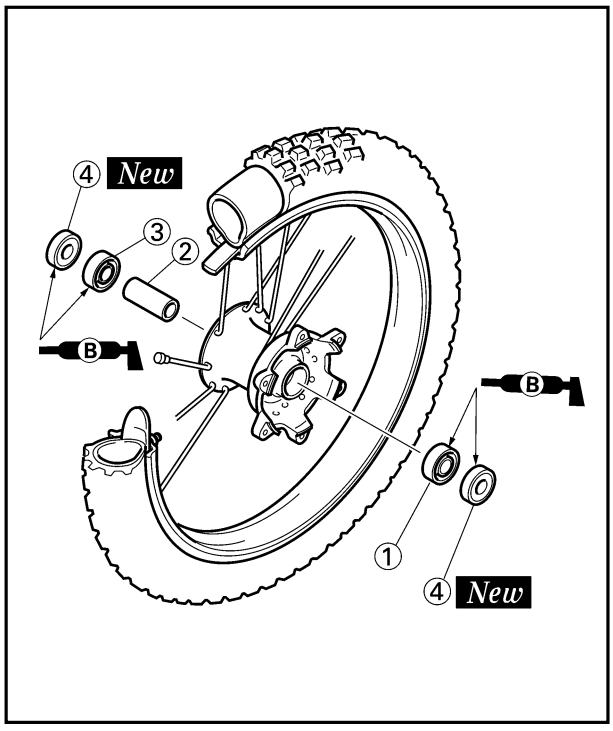
EC594200
Brake disc

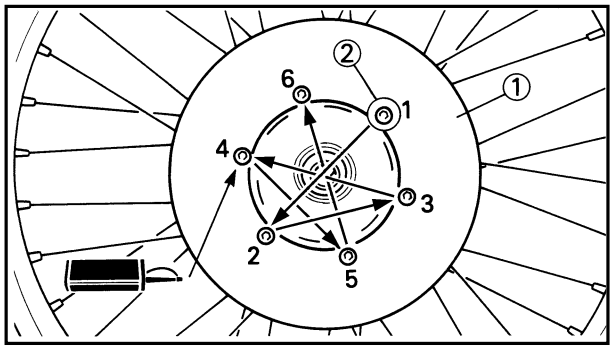
1. Measure:
   •Brake disc deflection (only rear brake disc)
   Use the dial gauge ①.
   Out of specification→Inspect wheel runout.
   If wheel runout is in good condition, replace the brake disc.

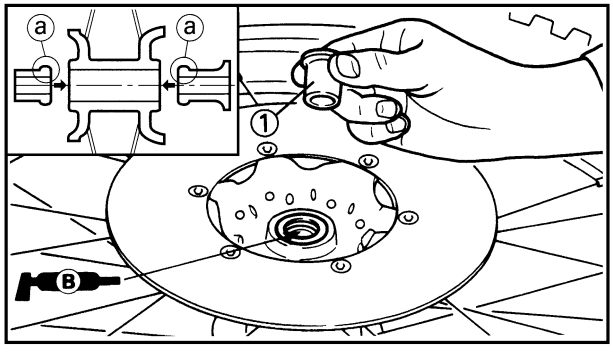
	Disc deflection limit:	
	Standard	**<Limit>**
Rear	**—**	**0.15 mm (0.006 in)**

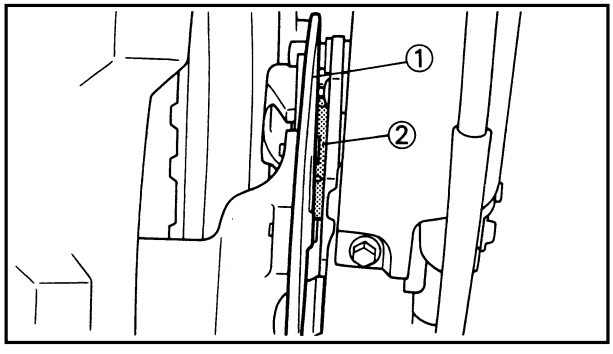
2. Measure:
   •Brake disc thickness ⓐ
   Out of limit→Replace.

	Disc wear limit:	
	Standard	**<Limit>**
Front	**3.0 mm (0.12 in)**	**2.5 mm (0.10 in)**
Rear	**4.0 mm (0.16 in)**	**3.5 mm (0.14 in)**









EC595000
ASSEMBLY AND INSTALLATION

EC595101
Front wheel

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

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.
- Install the oil seal with its manufacture's marks or numbers facing outward.

CAUTION:

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

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

12 Nm (1.2 m•kg, 8.7 ft•lb)

NOTE:

Tighten the bolts in stage, using a crisscross pattern.

3. Install:
   - Collar ①

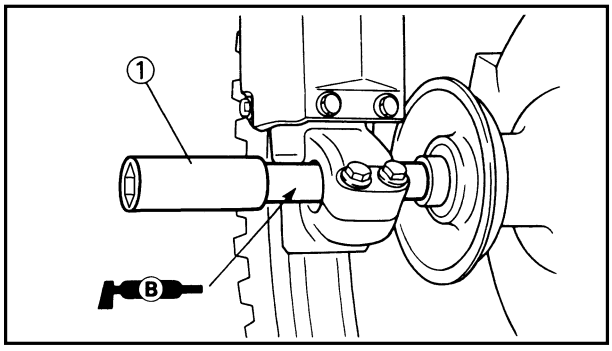
NOTE:

- Apply the lithium soap base grease on the oil seal lip.
- Install the collars with their projections ⓐ facing the wheel.

4. Install:
   - Wheel

NOTE:

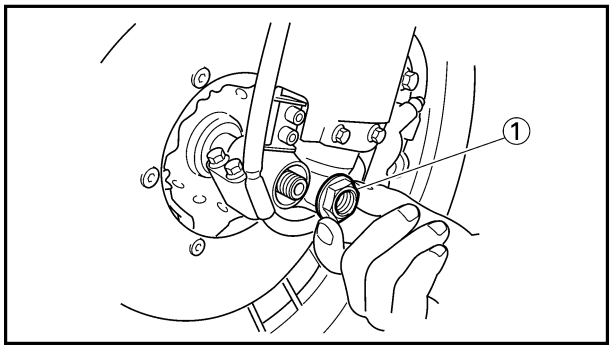
Install the brake disc ① between the brake pads ② correctly.



5. Install:
   •Wheel axle ①

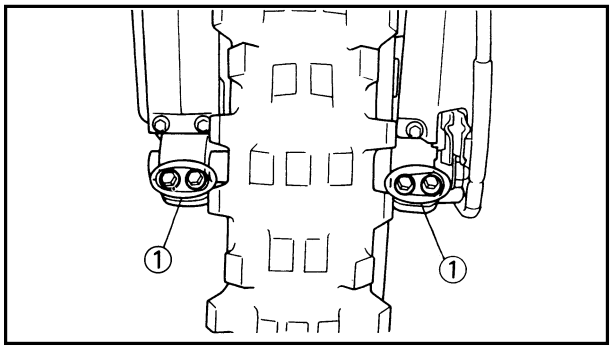
NOTE:

Apply the lithium soap base grease on the wheel axle.



6. Install:
   •Nut (wheel axle) ①

105 Nm (10.5 m•kg, 75 ft•lb)

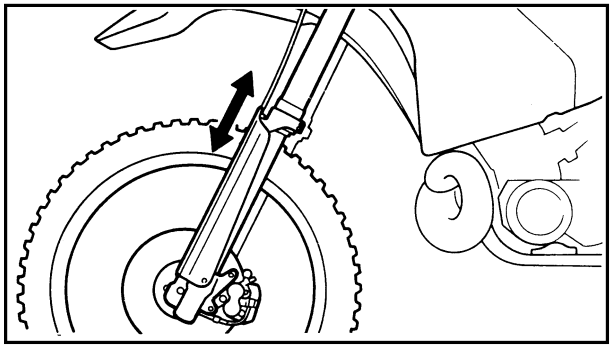


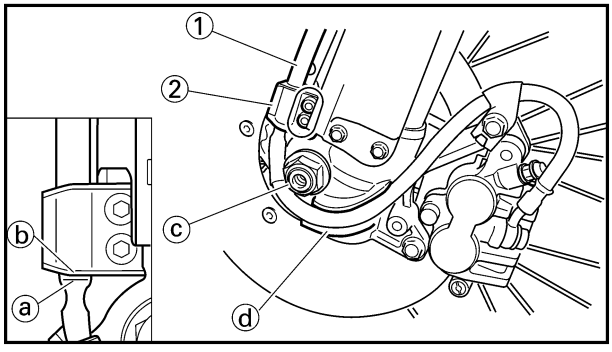
7. Tighten:
   •Bolt (axle holder) ①

23 Nm (2.3 m•kg, 17 ft•lb)

NOTE:

Before tightening the bolt, fit the wheel axle to the axle holder by stroking the front fork several times with the front brake applied.





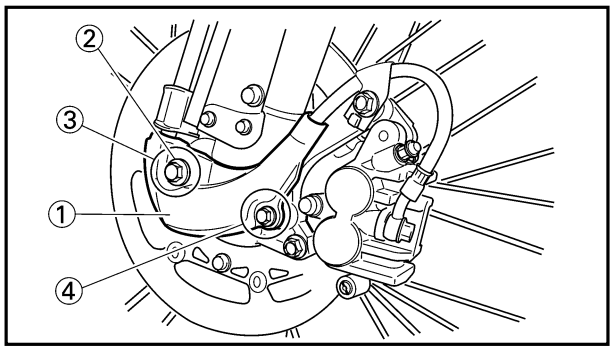
8. Install:
   •Brake hose ①

10 Nm (1.0 m•kg, 7.2 ft•lb)

To brake hose holder ②.

NOTE:

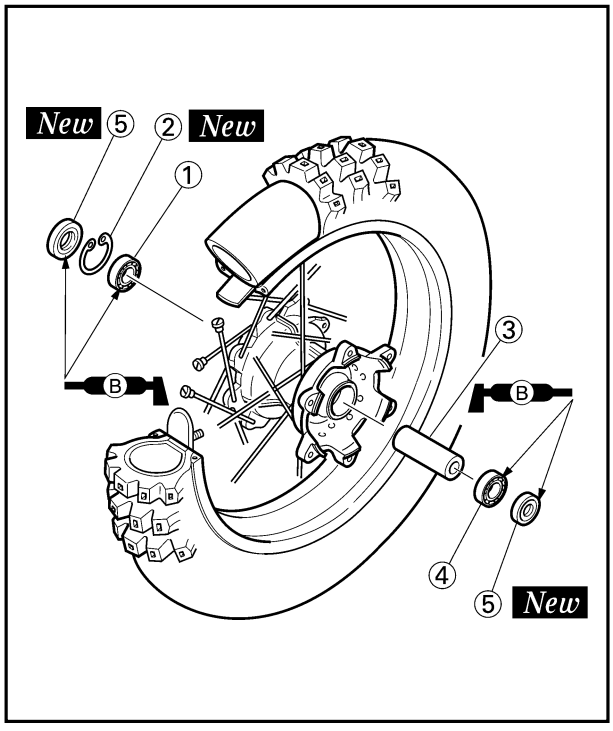
Before tightening the bolt (brake hose holder), align the top ⓐ of the brake hose neck with the brake hose holder bottom ⓑ. Then pass the brake hose in front of the axle boss ⓒ and fit it into the hose groove ⓓ so that the brake hose does not contact the nut (wheel axle).



9. Install:
   - Hose cover ①
   - Plain washer ②
   - Bolt [hose cover (M8)] ③

     16 Nm (1.6 m•kg, 11 ft•lb)
   - Bolt [hose cover (M6)] ④

     7 Nm (0.7 m•kg, 5.1 ft•lb)



EC5251A1

Rear wheel

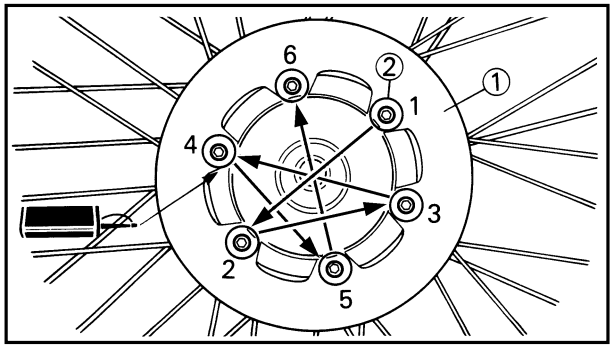
1. Install:
   - Bearing (right) ①
   - Circlip ② ***New***
   - Spacer ③
   - Bearing (left) ④
   - Oil seal ⑤ ***New***

NOTE:

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

CAUTION:

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

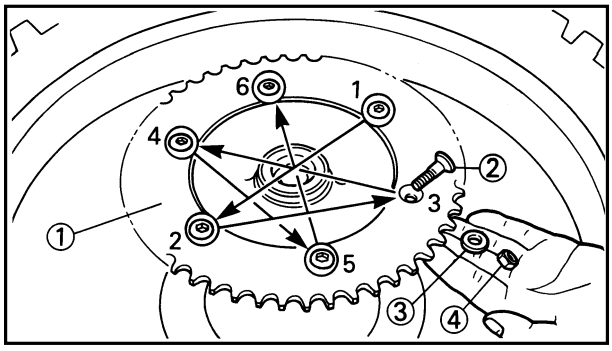


2. Install:
   - Brake disc ①
   - Bolt (brake disc) ②

     14 Nm (1.4 m•kg, 1.0 ft•lb)

NOTE:

Tighten the bolts in stage, using a crisscross pattern.

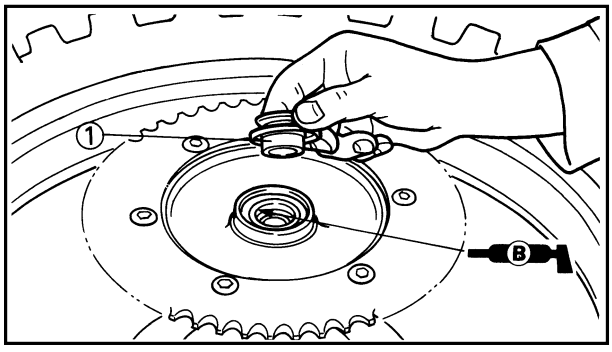


3. Install:
   - Driven sprocket ①
   - Bolt (driven sprocket) ②
   - Plain washer (driven sprocket) ③
   - Nut (driven sprocket) ④

42 Nm (4.2 m•kg, 30 ft•lb)

NOTE:

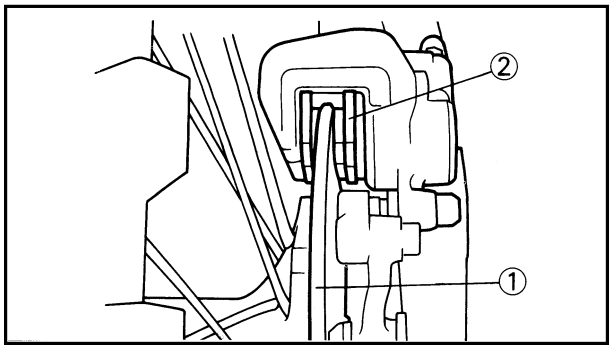
Tighten the nuts in stage, using a crisscross pattern.



4. Install:
   - Collar ①

NOTE:

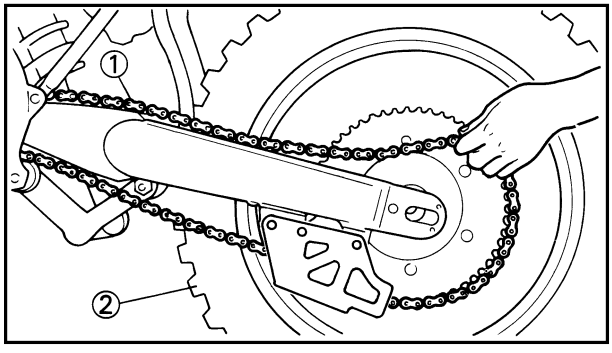
Apply the lithium soap base grease on the oil seal lip.



5. Install:
   - Wheel

NOTE:

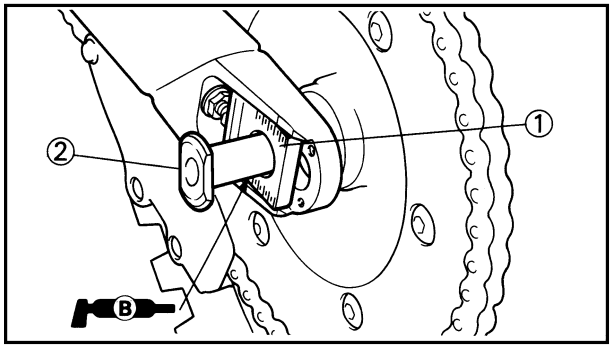
Install the brake disc ① between the brake pads ② correctly.



6. Install:
   - Drive chain ①

NOTE:

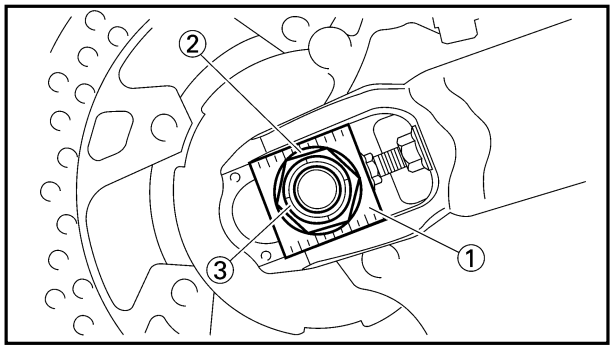
Push the wheel ② forward and install the drive chain.



7. Install:
   - Chain puller (left) ①
   - Wheel axle ②

NOTE:

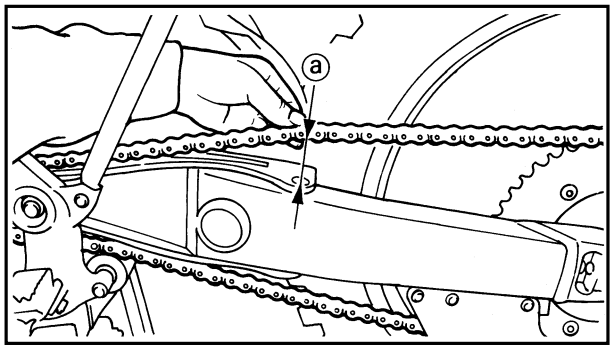
- Install the chain puller (left), and insert the wheel axle from left side.
- Apply the lithium soap base grease on the wheel axle.



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

NOTE:

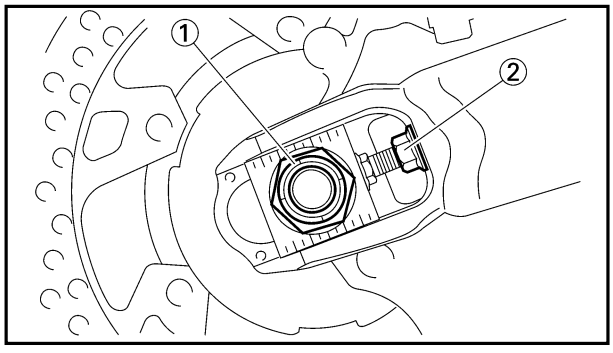
Temporarily tighten the nut (wheel axle) at this point.



9. Adjust:
   - Drive chain slack ⓐ

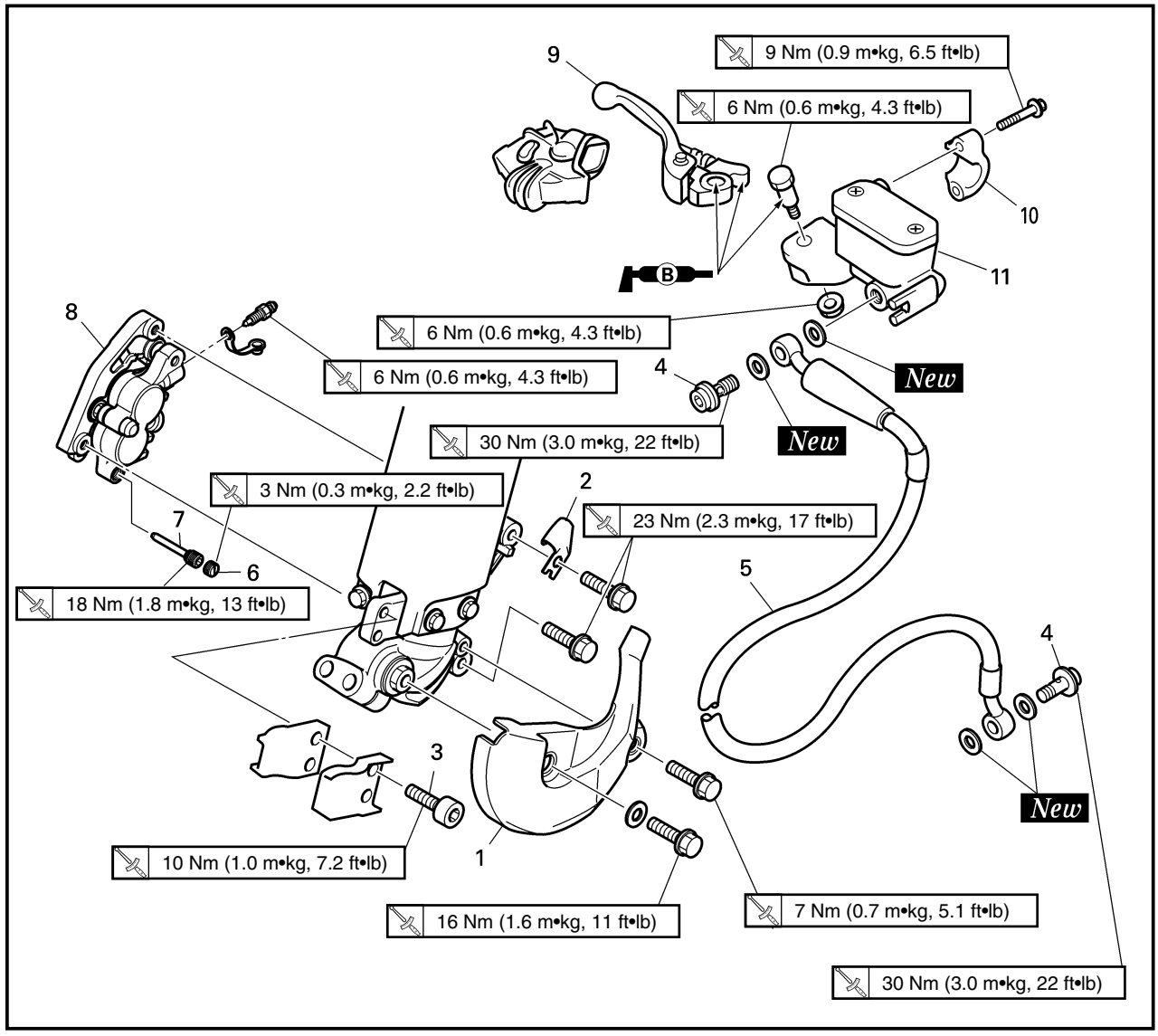
Drive chain slack :
40~50 mm (1.6~2.0 in)

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



10. Tighten:
    - Nut (wheel axle) ①
      125 Nm (12.5 m•kg, 90 ft•lb)
    - Locknut ②
      16 Nm (1.6 m•kg, 11 ft•lb)

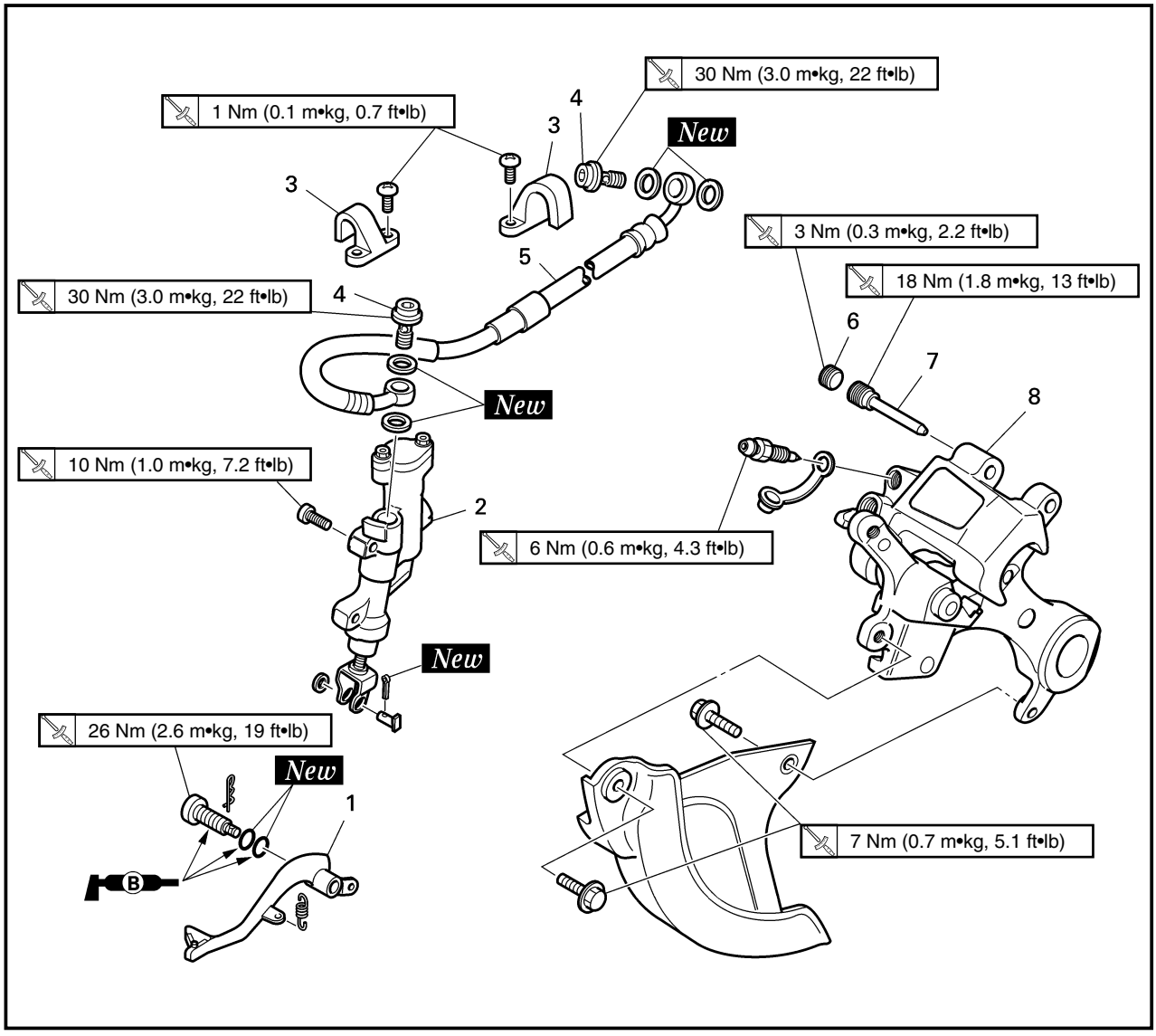
EC5A0000
FRONT BRAKE AND REAR BRAKE
EC5A8000
FRONT BRAKE



Extent of removal: ① Brake hose removal ② Caliper removal ③ Master cyilinder removal

Extent of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		**FRONT BRAKE REMOVAL** Hold the machine by placing the suitable stand under the engine. Drain the brake fluid.		**⚠WARNING** **Support the machine securely so there is no danger of it falling over.** Refer to "REMOVAL POINTS".
②	1	Hose cover	1	
	2	Brake hose holder	1	
①	3	Bolt (brake hose holder)	2	Only loosening.
③	4	Union bolt	2	
	5	Brake hose	1	
②	6	Pad pin plug	1	Remove when loosening the pad pin.
	7	Pad pin	1	Loosen when disassembling the caliper.
	8	Caliper	1	
	9	Brake lever	1	
③	10	Master cylinder bracket	1	
	11	Master cylinder	1	

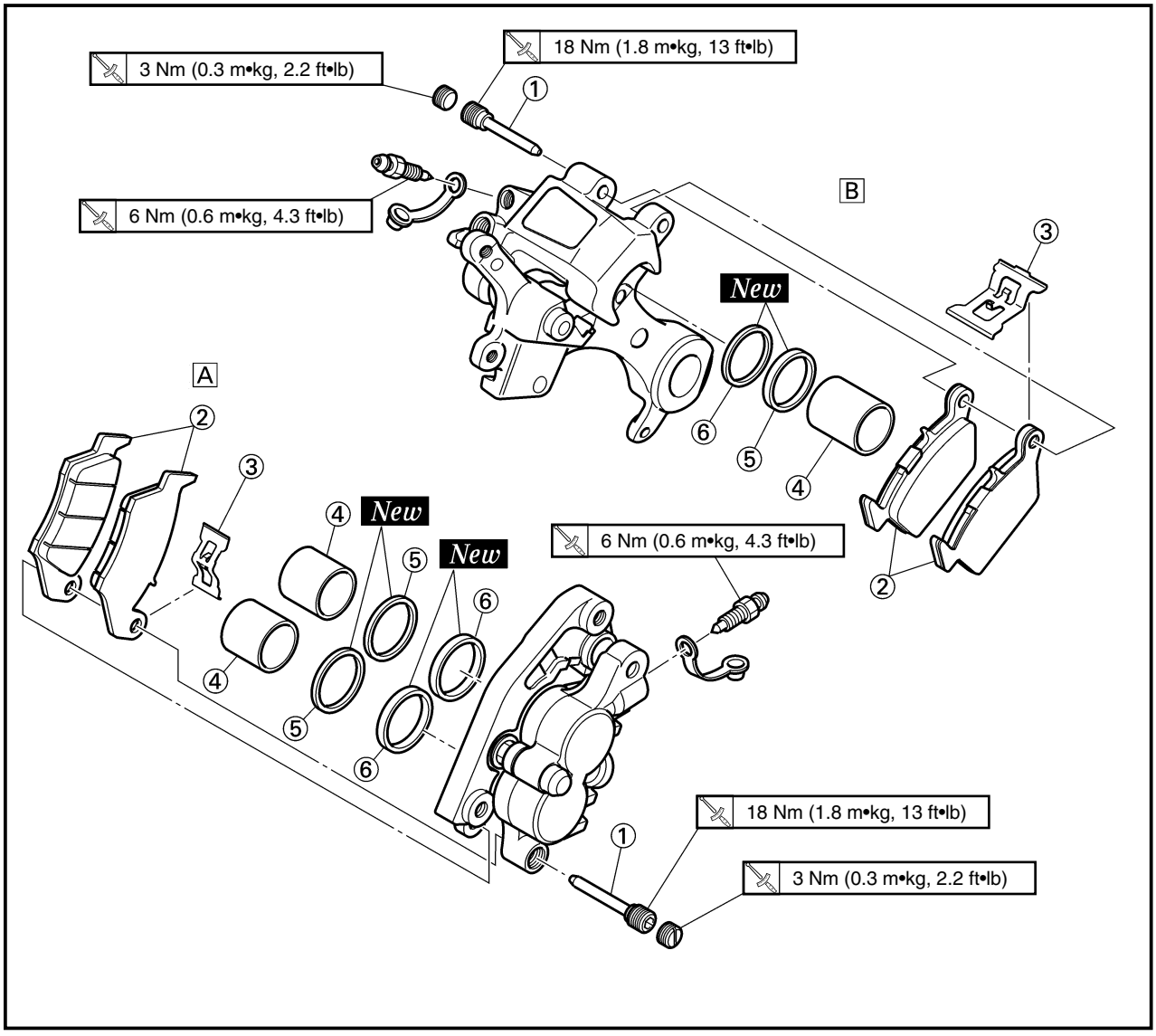
EC5A8100
REAR BRAKE



Extent of removal: ① Master cylinder removal ② Brake hose removal ③ Caliper removal

Extent of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		**REAR BRAKE REMOVAL** Hold the machine by placing the suitable stand under the engine. Rear wheel Drain the brake fluid.		**⚠WARNING** **Support the machine securely so there is no danger of it falling over.** Refer to "FRONT WHEEL AND REAR WHEEL" section. Refer to "REMOVAL POINTS".
①	1	Brake pedal	1	
	2	Master cylinder	1	
	3	Brake hose holder	2	
① ② ③	4	Union bolt	2	
	5	Brake hose	1	
③	6	Pad pin plug	1	Remove when loosening the pad pin.
③	7	Pad pin	1	Loosen when disassembling the caliper.
	8	Caliper	1	

EC5A8200
CALIPER DISASSEMBLY

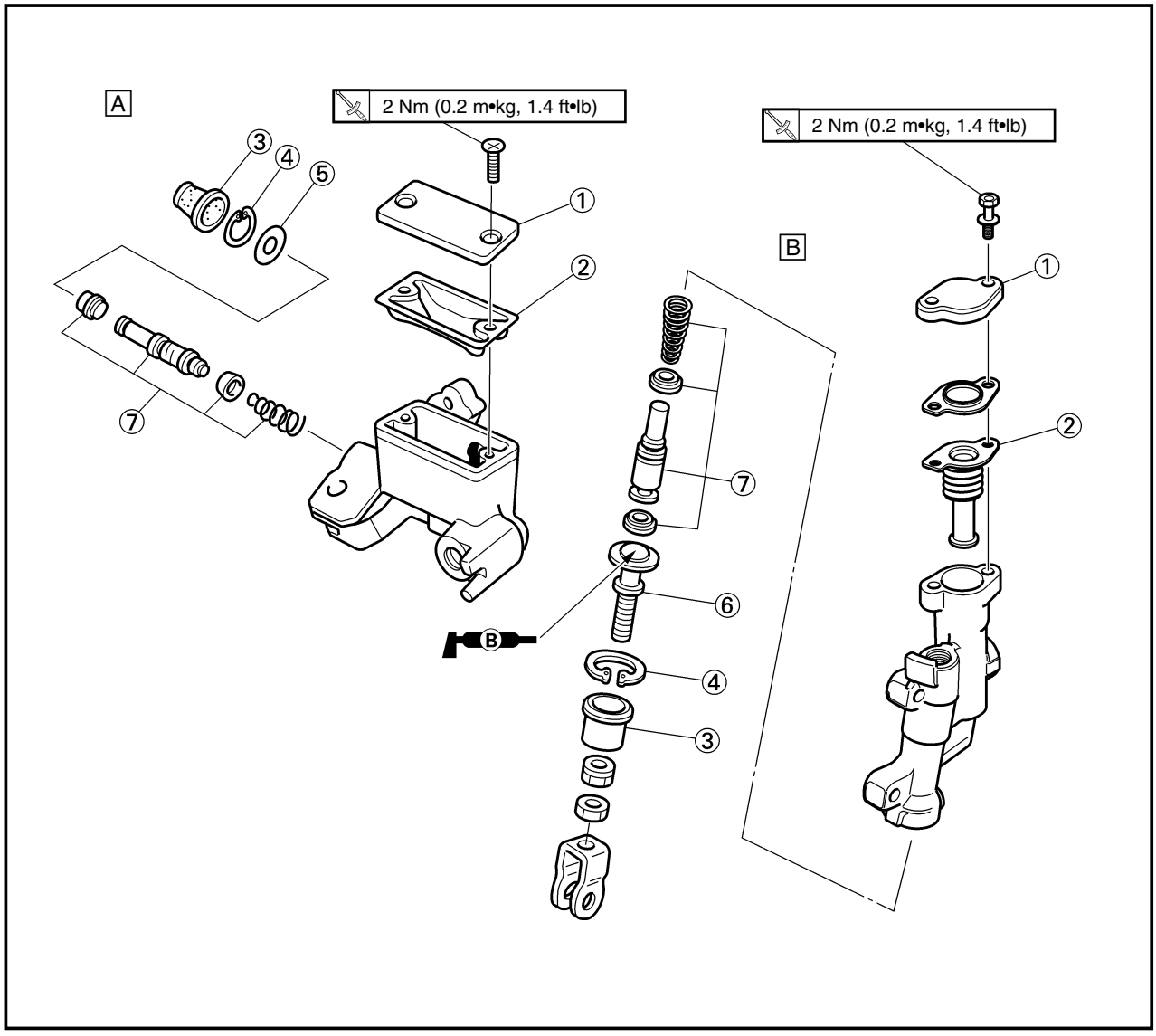


A Front
B Rear

Extent of removal: ① Front caliper disassembly ② Rear caliper disassembly

Extent of removal	Order	Part name	Q'ty A	Q'ty B	Remarks
		CALIPER DISASSEMBLY			
① ②	①	Pad pin	1	1	
	②	Brake pad	2	2	
	③	Pad support	1	1	
	④	Caliper piston	2	1	Refer to "REMOVAL POINTS".
	⑤	Dust seal	2	1	Refer to "REMOVAL POINTS".
	⑥	Piston seal	2	1	

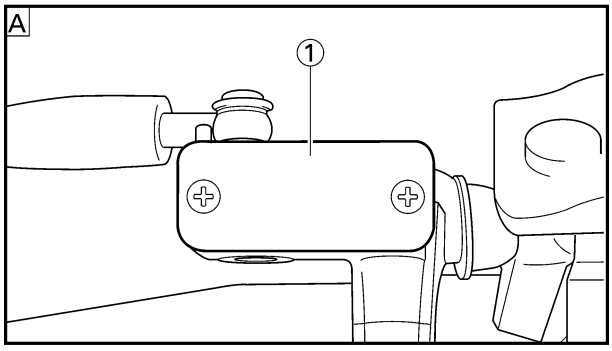
EC5A8300
MASTER CYLINDER DISASSEMBLY

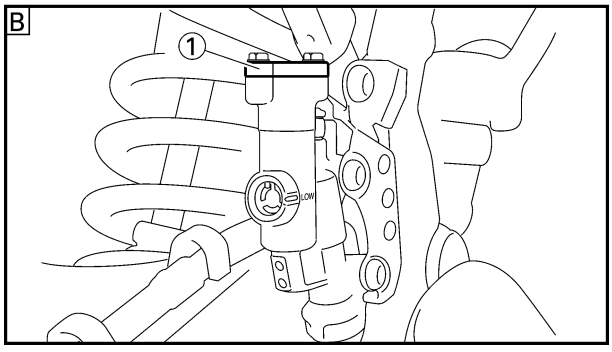


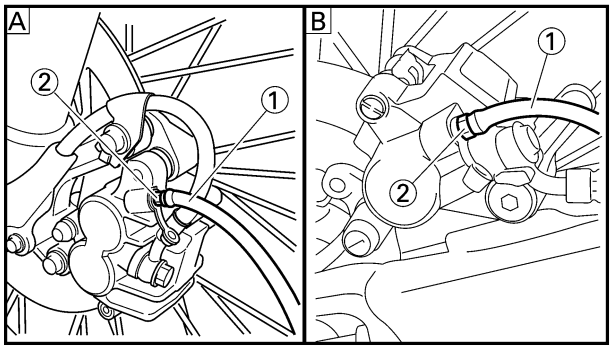
A Front
B Rear

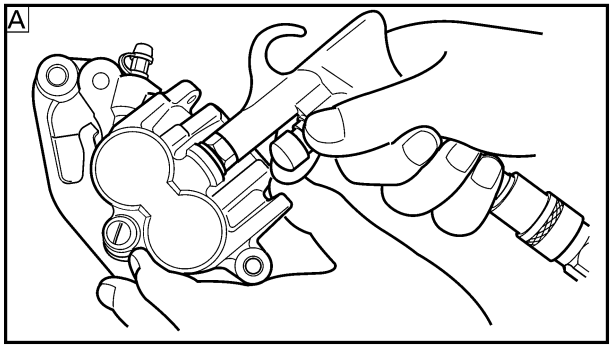
Extent of removal: ① Front master cylinder disassembly ② Rear master cylinder disassembly

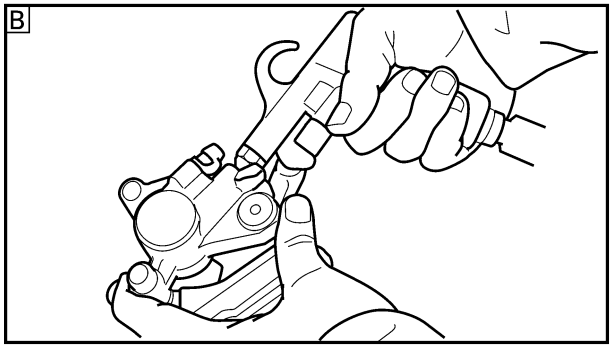
Extent of removal	Order	Part name	Q'ty	Remarks
		MASTER CYLINDER DISASSEMBLY		
① ②	①	Master cylinder cap	1	
	②	Diaphragm	1	
	③	Master cylinder boot	1	
	④	Circlip	1	Use a long nose circlip pliers.
	⑤	Plain washer	1	
① ②	⑥	Push rod	1	
	⑦	Master cylinder kit	1	











EC5A3000
REMOVAL POINTS

EC5A3101
Brake fluid

1. Remove:
   [Front]
   •Master cylinder cap ①
   [Rear]
   •Master cylinder cap ①
   •Protector

NOTE:

Do not remove the diaphragm.

A Front
B Rear

2. Connect the transparent hose ① to the bleed screw ② and place a suitable container under its end.

A Front
B Rear

3. Loosen the bleed screw and drain the brake fluid while pulling the lever in or pushing down on the pedal.

CAUTION:

- **Do not reuse the drained brake fluid.**
- **Brake fluid may erode painted surfaces or plastic parts. Always clean up spilled fluid immediately.**

EC533301
Caliper piston

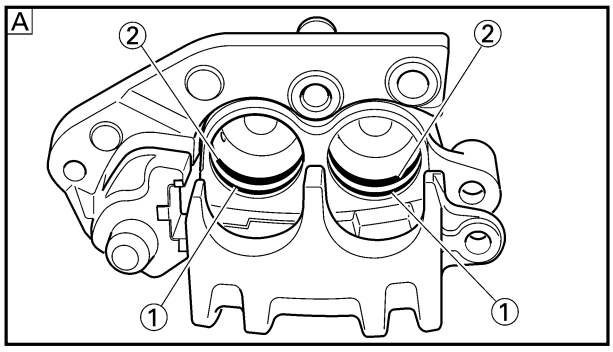
1. Remove:
   •Caliper piston
   Use compressed air and proceed carefully.

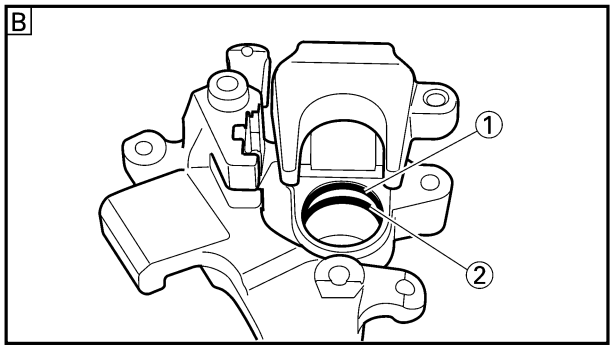
⚠WARNING

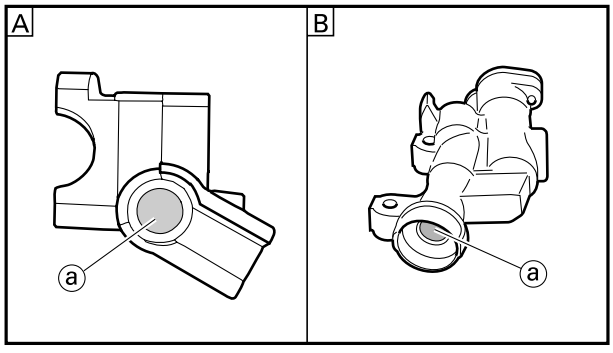
- **Cover piston with rag and use extreme caution when expelling piston from cylinder.**
- **Never attempt to pry out piston.**

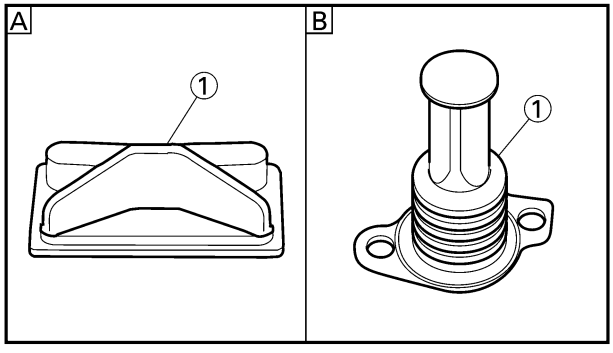
Caliper piston removal steps:
- Insert a piece of rag into the caliper to lock one caliper.
- Carefully force the piston out of the caliper cylinder with compressed air.

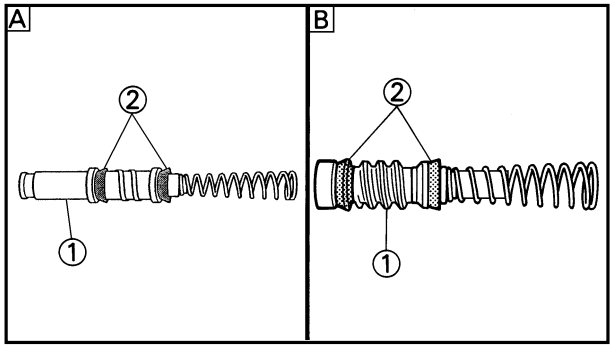
A Front
B Rear











EC533402
Piston seal kit

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

NOTE:

Remove the piston seals and dust seals by pushing them with a finger.

CAUTION:

Never attempt to pry out piston seals and dust seals.

⚠WARNING

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

A Front
B Rear

EC5A4000
INSPECTION

EC534112
Master cylinder

1. Inspect:
   - Master cylinder inner surface ⓐ
     Wear/Scratches→Replace master cylinder assembly.
     Stains→Clean.

⚠WARNING

Use only new brake fluid.

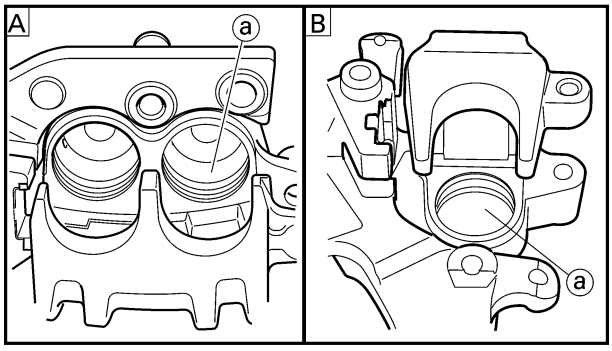
A Front
B Rear

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

A Front
B Rear

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

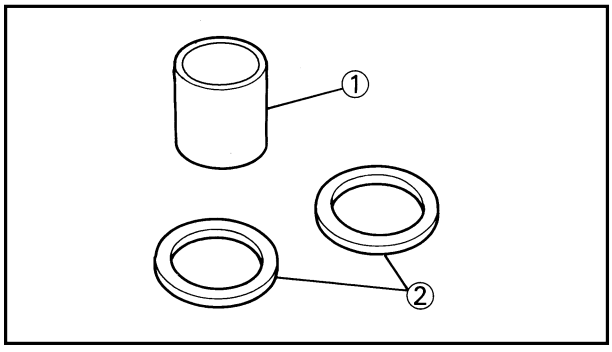
A Front
B Rear



EC534214
Caliper

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

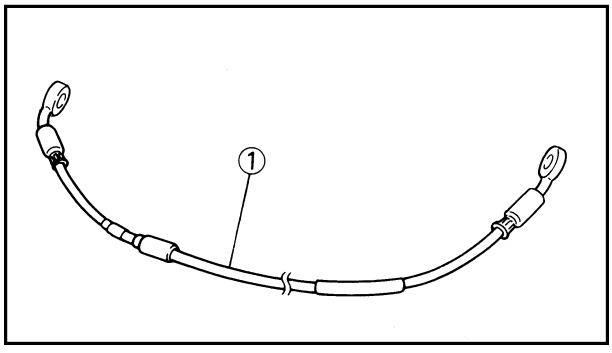
A Front
B Rear



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

⚠WARNING

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



EC534301
Brake hose

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

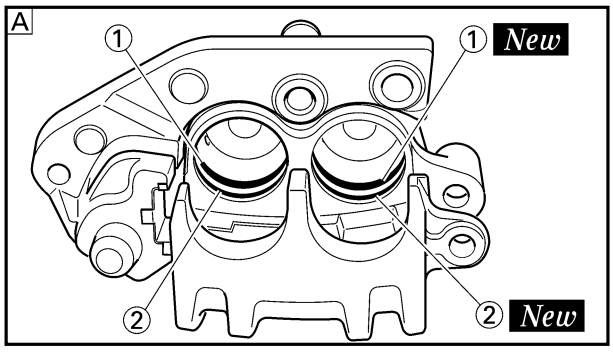
EC5A5000
ASSEMBLY AND INSTALLATION

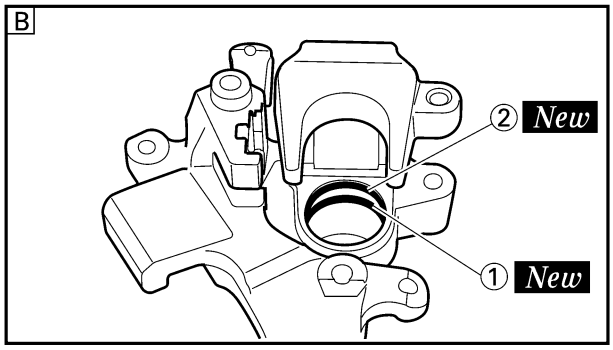
⚠WARNING

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

EC5A5801
Caliper piston

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





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

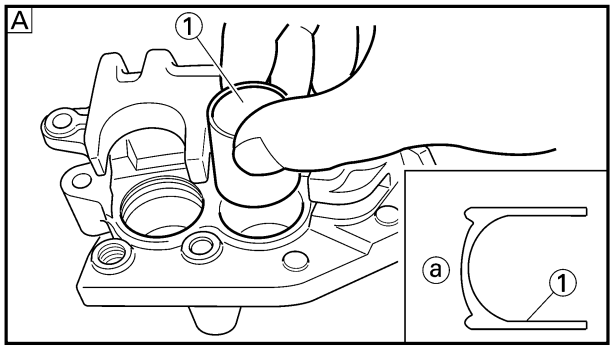
⚠WARNING

Always use new piston seals and dust seals.

NOTE:

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

A Front
B Rear



3. Install:
   - Caliper piston ①

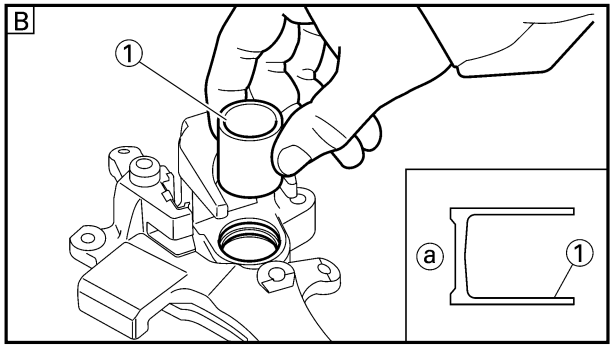
NOTE:

Apply the brake fluid on the piston wall.

CAUTION:

- **Install the piston with its shallow depressed side ⓐ facing the caliper.**
- **Never force to insert.**

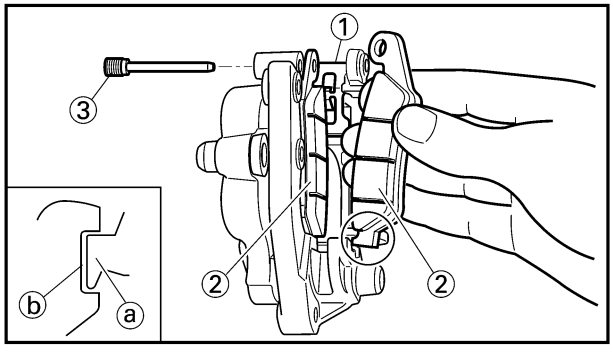
A Front
B Rear



EC5A5700

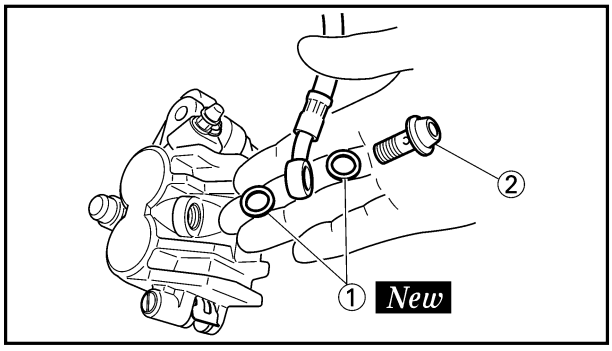
Front caliper

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



NOTE:

- Install the brake pads with their projections ⓐ into the caliper recesses ⓑ.
- Temporarily tighten the pad pin at this point.



2. Install:
   - Copper washer ① **New**
   - Union bolt ②

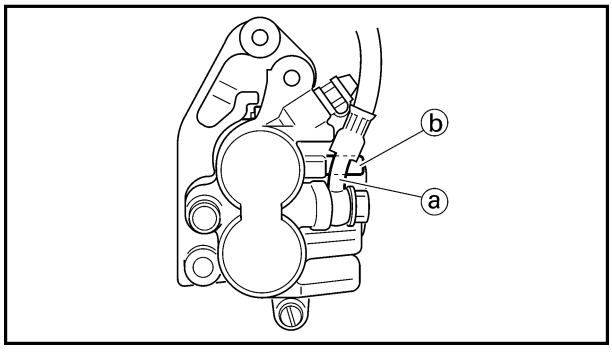
30 Nm (3.0 m•kg, 22 ft•lb)

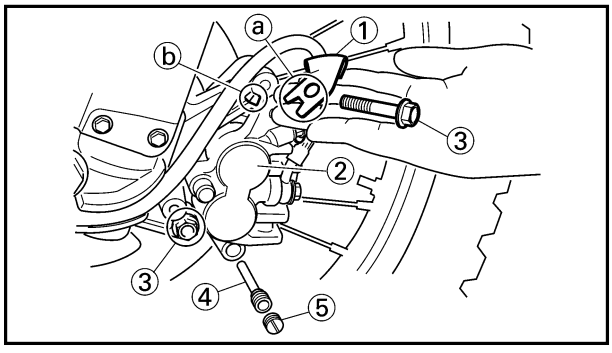
⚠WARNING

Always use new copper washers.

CAUTION:

Install the brake hose so that its pipe portion ⓐ directs as shown and lightly touches the projection ⓑ on the caliper.





3. Install:
   - Brake hose holder ①
   - Caliper ②
   - Bolt (caliper) ③

23 Nm (2.3 m•kg, 17 ft•lb)

NOTE:

Fit the brake hose holder cut ⓐ over the projection ⓑ on the front fork and clamp the brake hose.

4. Tighten:
   - Pad pin ④

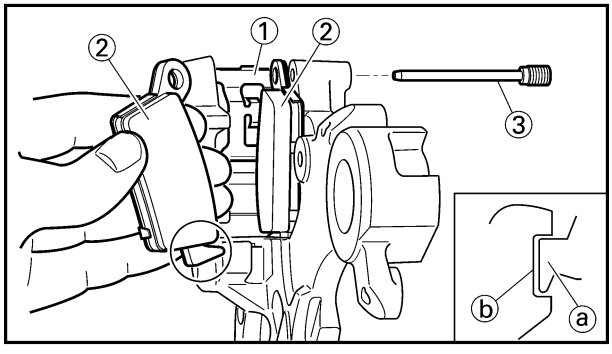
18 Nm (1.8 m•kg, 13 ft•lb)

5. Install:
   - Pad pin plug ⑤

3 Nm (0.3 m•kg, 2.2 ft•lb)

EC5A5121

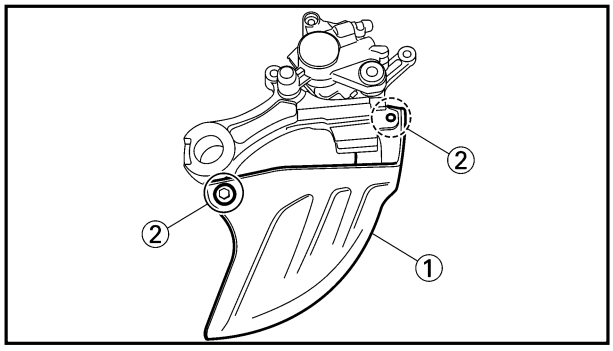
Rear caliper



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

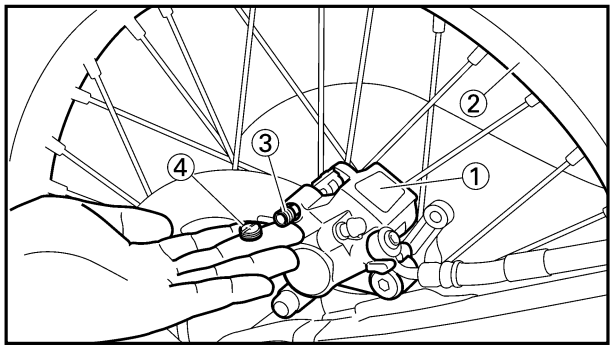
NOTE:

- Install the brake pads with their projections ⓐ into the caliper recesses ⓑ.
- Temporarily tighten the pad pin at this point.



2. Install:
   - Disc cover ①
   - Bolt (disc cover) ②

7 Nm (0.7 m•kg, 5.1 ft•lb)



3. Install:
   - Caliper ①
   - Rear wheel ②

   Refer to "FRONT WHEEL AND REAR WHEEL" section.
4. Tighten:
   - Pad pin ③

18 Nm (1.8 m•kg, 13 ft•lb)

5. Install:
   - Pad pin plug ④

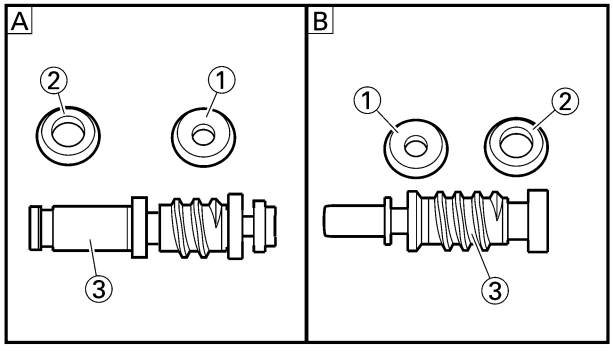
3 Nm (0.3 m•kg, 2.2 ft•lb)

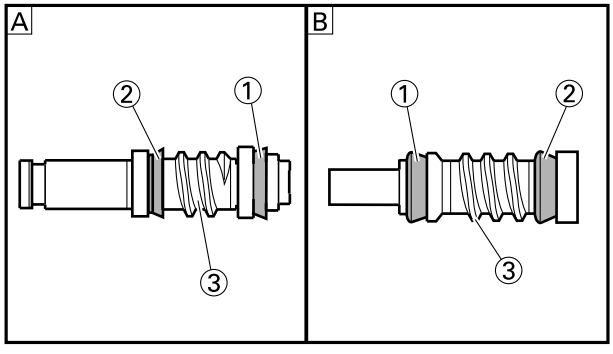
EC5A5220

Master cylinder kit

1. Clean:
   - Master cylinder
   - Master cylinder kit

   Clean them with brake fluid.





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

   To master cylinder piston ③.

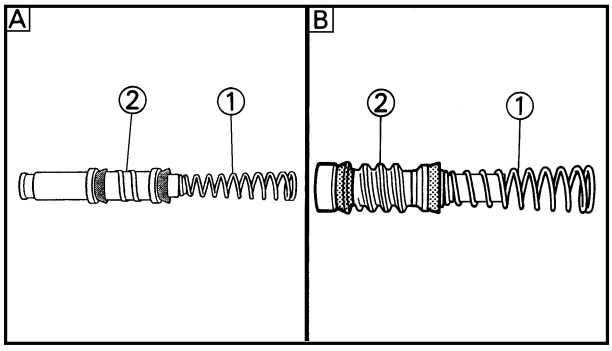
NOTE:

Apply the brake fluid on the master cylinder cup.

⚠WARNING

After installing, cylinder cup should be installed as shown direction. Wrong installation cause improper brake performance.

A Front
B Rear

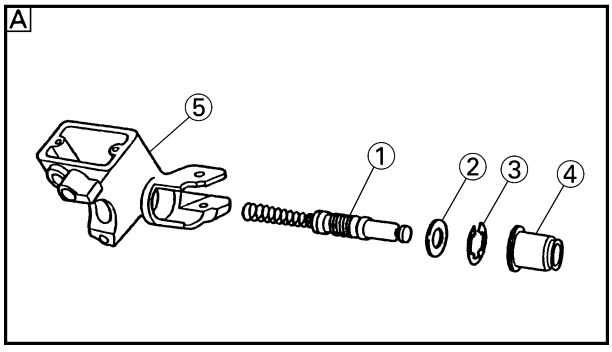


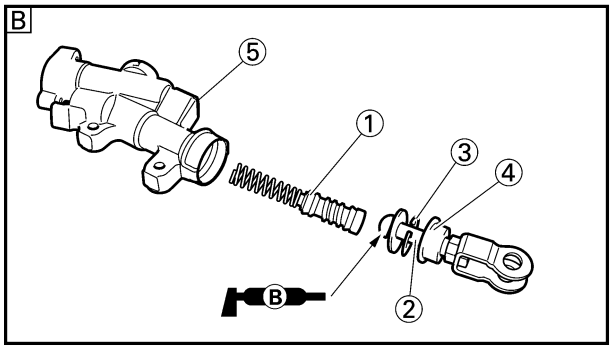
3. Install:
   •Spring ①
   To master cylinder piston ②.

NOTE:

Install the spring at the smaller dia. side.

A Front
B Rear





4. Install:
   [Front]
   •Master cylinder kit ①
   •Plain washer ②
   •Circlip ③
   •Master cylinder boot ④
   To master cylinder ⑤.
   [Rear]
   •Master cylinder kit ①
   •Push rod ②
   •Circlip ③
   •Master cylinder boot ④
   To master cylinder ⑤.

NOTE:

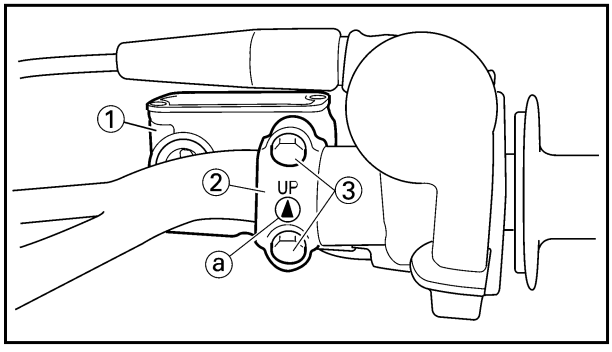
- Apply the brake fluid on the master cylinder kit.
- Apply the lithium soap base grease on the tip of the push rod.
- When installing the circlip, use a long nose circlip pliers.

A Front
B Rear

EC5A5310
Front master cylinder

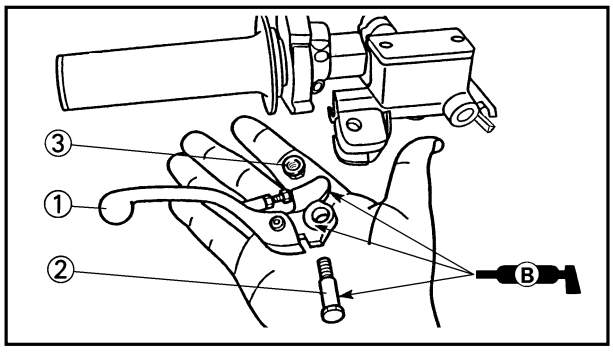
1. Install:
   •Master cylinder ①
   •Master cylinder bracket ②
   •Bolt (master cylinder bracket) ③

9 Nm (0.9 m•kg, 6.5 ft•lb)



NOTE:

- Install the bracket so that the arrow mark ⓐ face upward.
- First tighten the bolts on the upper side of the master cylinder bracket, and then tighten the bolts on the lower side.



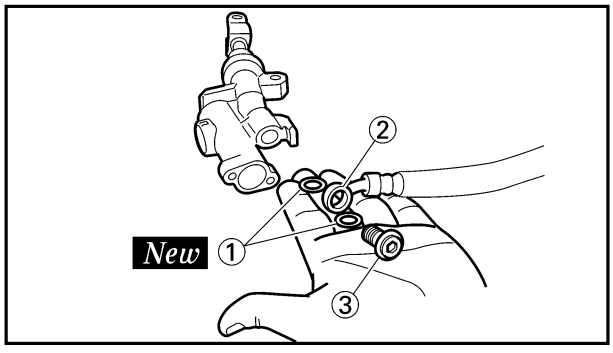
2. Install:
   - Brake lever ①
   - Bolt (brake lever) ②

     6 Nm (0.6 m•kg, 4.3 ft•lb)
   - Nut (brake lever) ③

     6 Nm (0.6 m•kg, 4.3 ft•lb)

NOTE:

Apply the lithium soap base grease on the brake lever sliding surface, bolt and contacting surface of the master cylinder piston.



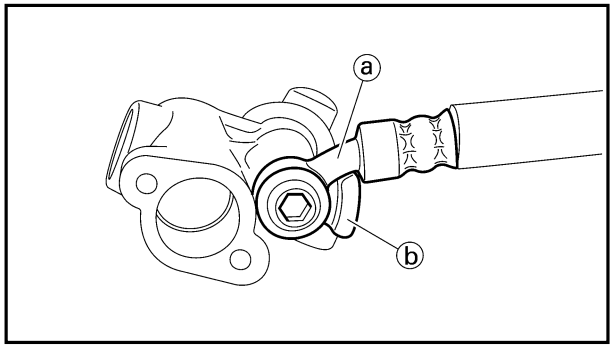
EC5A5401

Rear master cylinder

1. Install:
   - Copper washer ① ***New***
   - Brake hose ②
   - Union bolt ③ **30 Nm (3.0 m•kg, 22 ft•lb)**

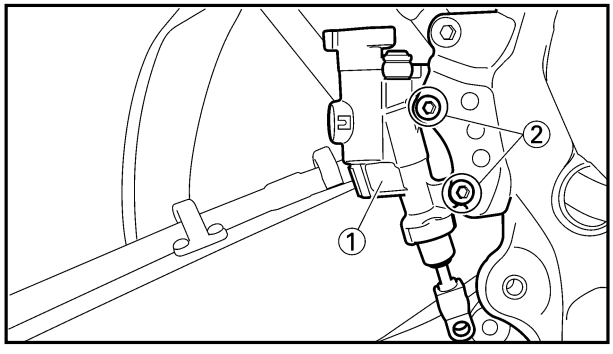
⚠WARNING

Always use new copper washers.



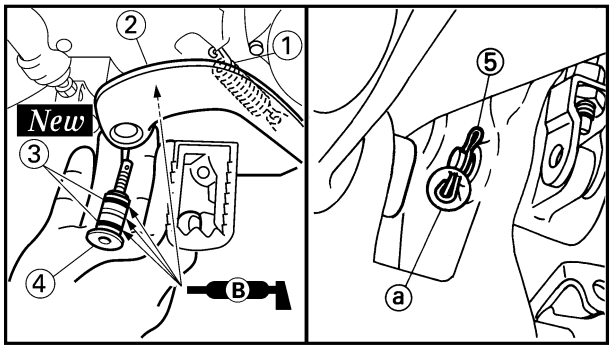
CAUTION:

Install the brake hose so that its pipe portion ⓐ directs as shown and lightly touches the projection ⓑ on the master cylinder.



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

     10 Nm (1.0 m•kg, 7.2 ft•lb)

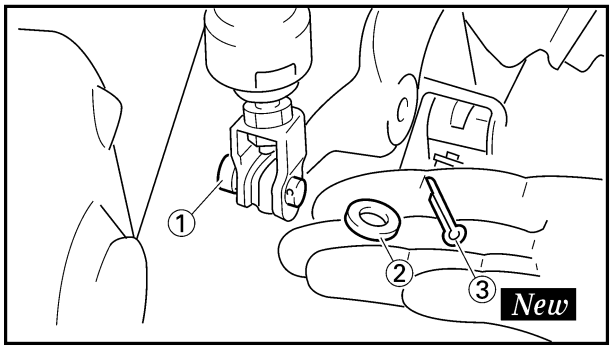


3. Install:
   - Spring ①
   - Brake pedal ②
   - O-ring ③ **New**
   - Bolt (brake pedal) ④

     26 Nm (2.6 m•kg, 19 ft•lb)
   - Clip ⑤

NOTE:

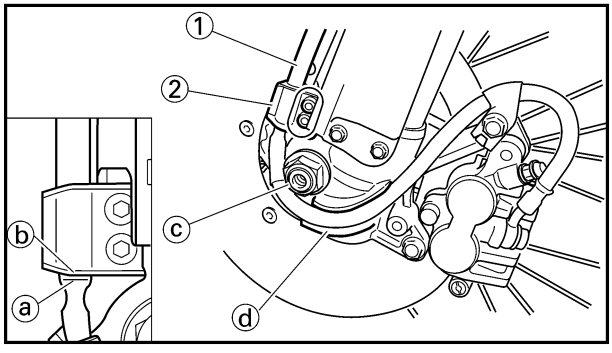
- Apply the lithium soap base grease on the bolt, O-ring and brake pedal bracket.
- Install the clip with its stopper portion ⓐ facing inward.



4. Install:
   - Pin ①
   - Plain washer ②
   - Cotter pin ③ **New**

NOTE:

After installing, check the brake pedal height. Refer to "REAR BRAKE ADJUSTMENT" section in the CHAPTER 3.



EC5A5911

Front brake hose

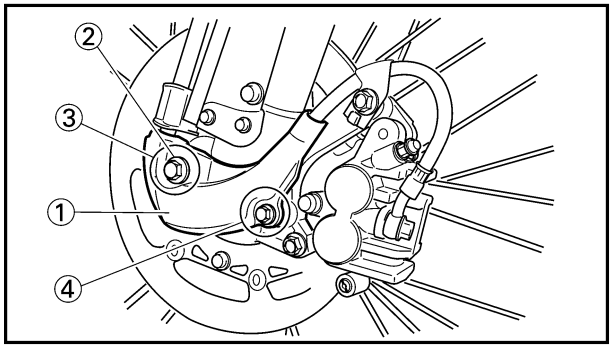
1. Install:
   - Brake hose ①

     10 Nm (1.0 m•kg, 7.2 ft•lb)

     To brake hose holder ②.

NOTE:

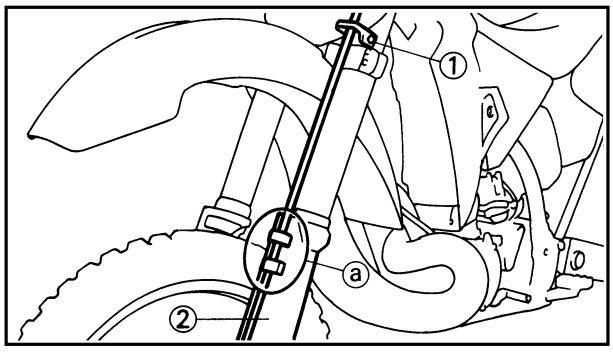
Before tightening the bolt (brake hose holder), align the top ⓐ of the brake hose neck with the brake hose holder bottom ⓑ. Then pass the brake hose in front of the axle boss ⓒ and fit it into the hose groove ⓓ so that the brake hose does not contact the nut (wheel axle).



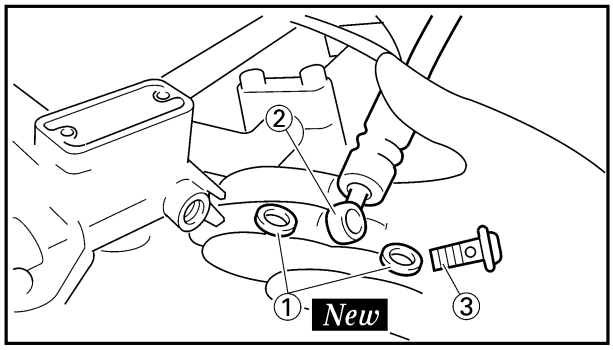
2. Install:
   - Hose cover ①
   - Plain washer ②
   - Bolt [hose cover (M8)] ③

     16 Nm (1.6 m•kg, 11 ft•lb)
   - Bolt [hose cover (M6)] ④

     7 Nm (0.7 m•kg, 5.1 ft•lb)



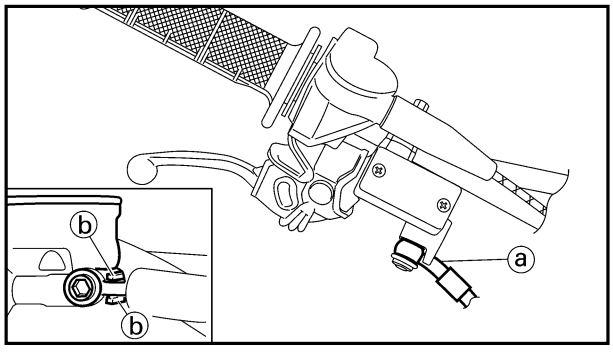
3. Pass the brake hose through the cable guide ①, then through the guide ⓐ on the protector ②.



4. Install:
   - Copper washer ① ***New***
   - Brake hose ②
   - Union bolt ③ **30 Nm (3.0 m•kg, 22 ft•lb)**

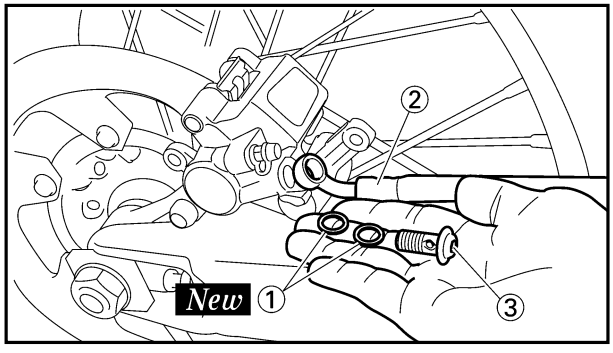
⚠WARNING

Always use new copper washers.



CAUTION:

Install the brake hose so that its pipe portion ⓐ directs as shown and lightly touches the projection ⓑ on the master cylinder.



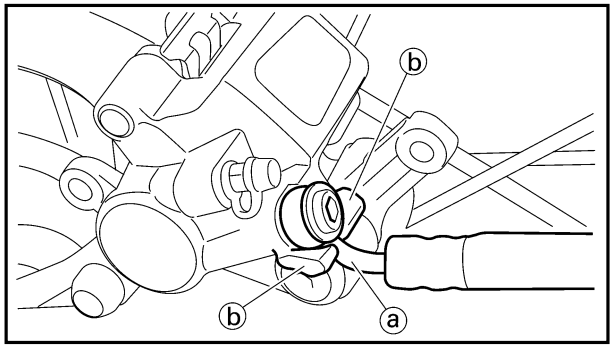
EC5A5502

Rear brake hose

1. Install:
   - Copper washer ① ***New***
   - Brake hose ②
   - Union bolt ③ **30 Nm (3.0 m•kg, 22 ft•lb)**

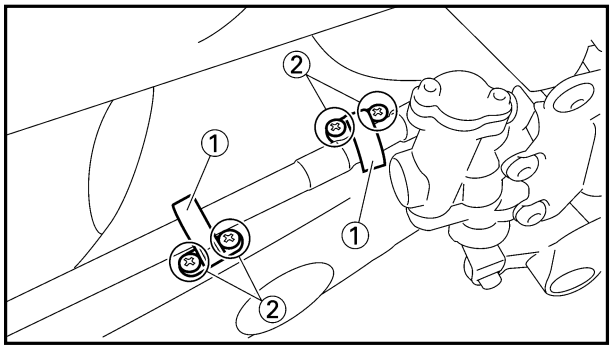
⚠WARNING

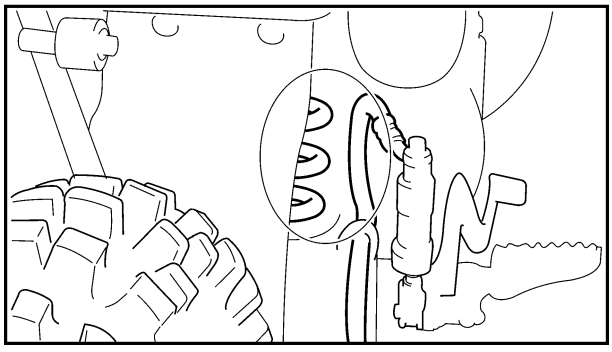
Always use new copper washers.

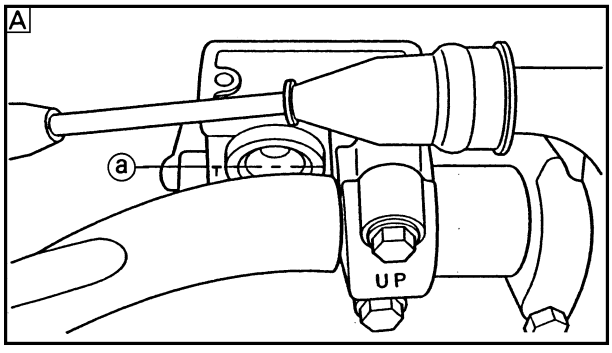


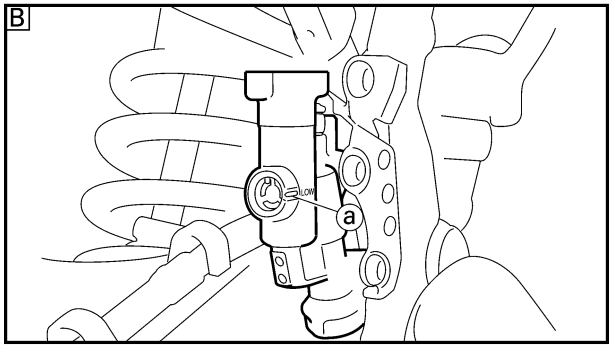
CAUTION:

Install the brake hose so that its pipe portion ⓐ directs as shown and lightly touches the projection ⓑ on the caliper.









2. Install:
   - Brake hose holder ①
   - Screw (brake hose holder) ②

	1 Nm (0.1 m•kg, 0.7 ft•lb)

CAUTION:

After installing the brake hose holders, make sure the brake hose does not contact the spring (rear shock absorber). If it does, correct its twist.

EC5A5601

Brake fluid

1. Fill:
   - Brake fluid

   Until the fluid level reaches "LOWER" level line ⓐ.

	Recommended brake fluid: **DOT #4**

⚠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.**

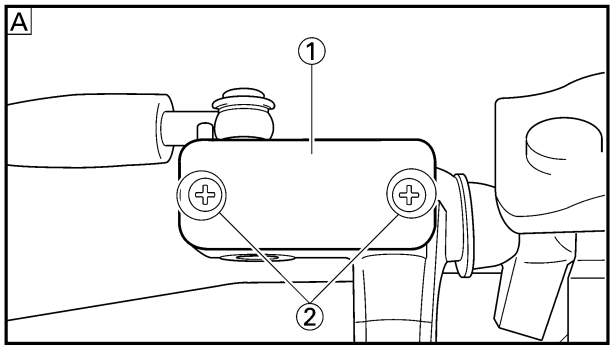
CAUTION:

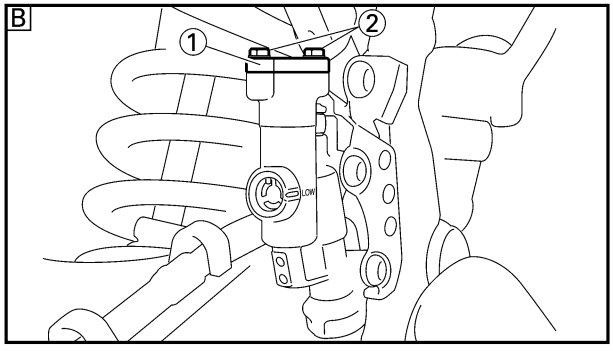
Brake fluid may erode painted surfaces or plastic parts. Always clean up spilled fluid immediately.

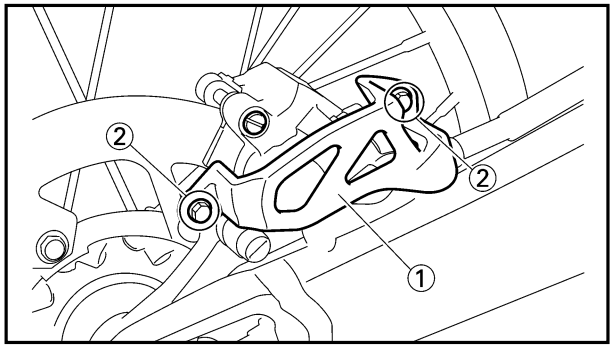
A Front
B Rear

2. Air bleed:
   •Brake system
   Refer to "BRAKE SYSTEM AIR BLEEDING" section in the CHAPTER 3.

3. Inspect:
   •Brake fluid level
   Fluid at lower level→Fill up.
   Refer to "BRAKE FLUID LEVEL INSPECTION" section in the CHAPTER 3.







4. Install:
   [Front]
   •Diaphragm
   •Master cylinder cap ①
   •Screw (master cylinder cap) ②

   2 Nm (0.2 m•kg, 1.4 ft•lb)

   [Rear]
   •Diaphragm
   •Master cylinder cap ①
   •Bolt (master cylinder cap) ②

   2 Nm (0.2 m•kg, 1.4 ft•lb)

CAUTION:

After installation, while pulling the lever in or pushing down on the pedal, check whether there is any brake fluid leaking where the union bolts are installed respectively at the master cylinder and caliper.

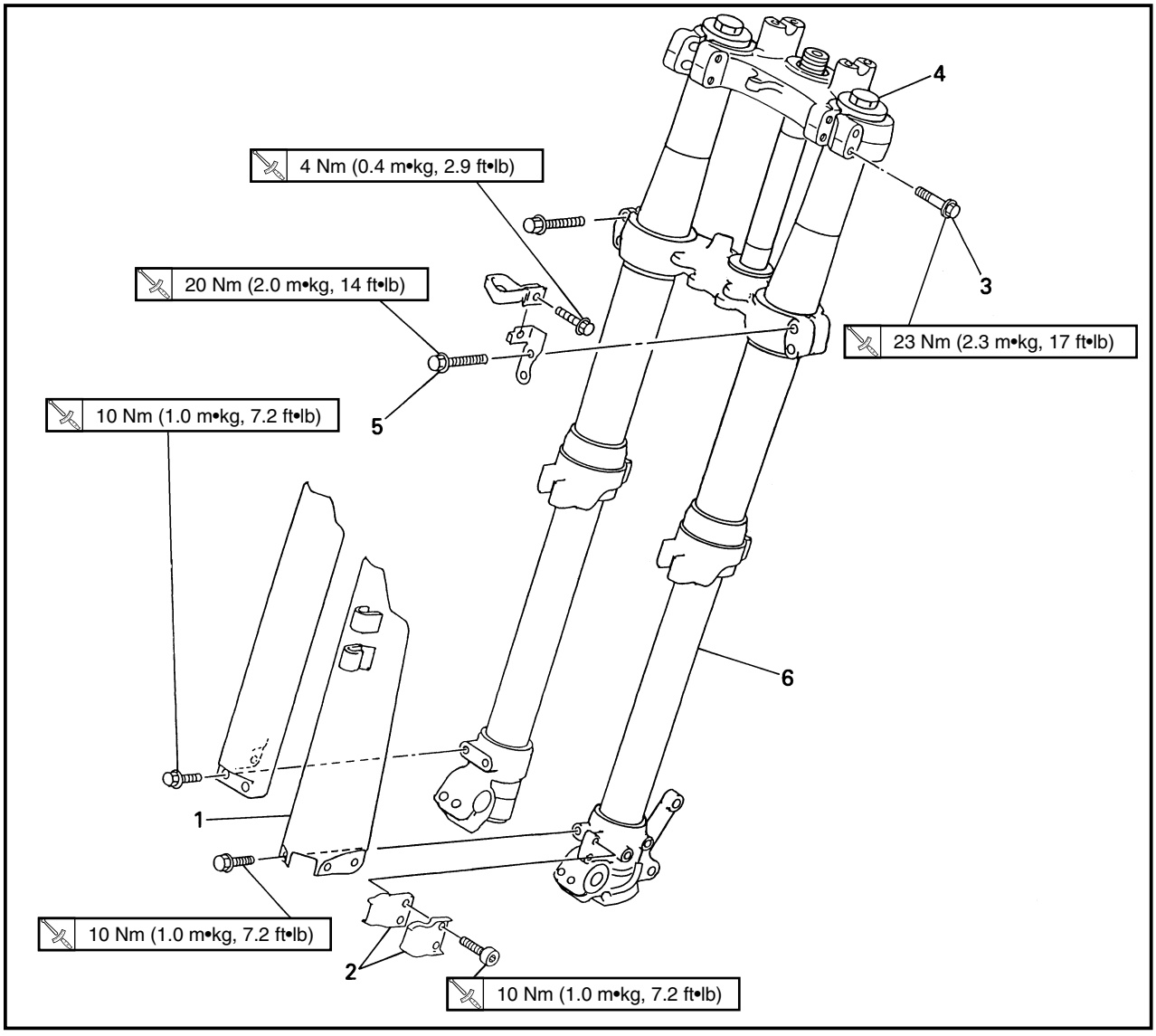
A Front
B Rear

5. Install: (rear brake only)
   •Protector ①
   •Bolt (protector) ②

   7 Nm (0.7 m•kg, 5.1 ft•lb)

EC550000

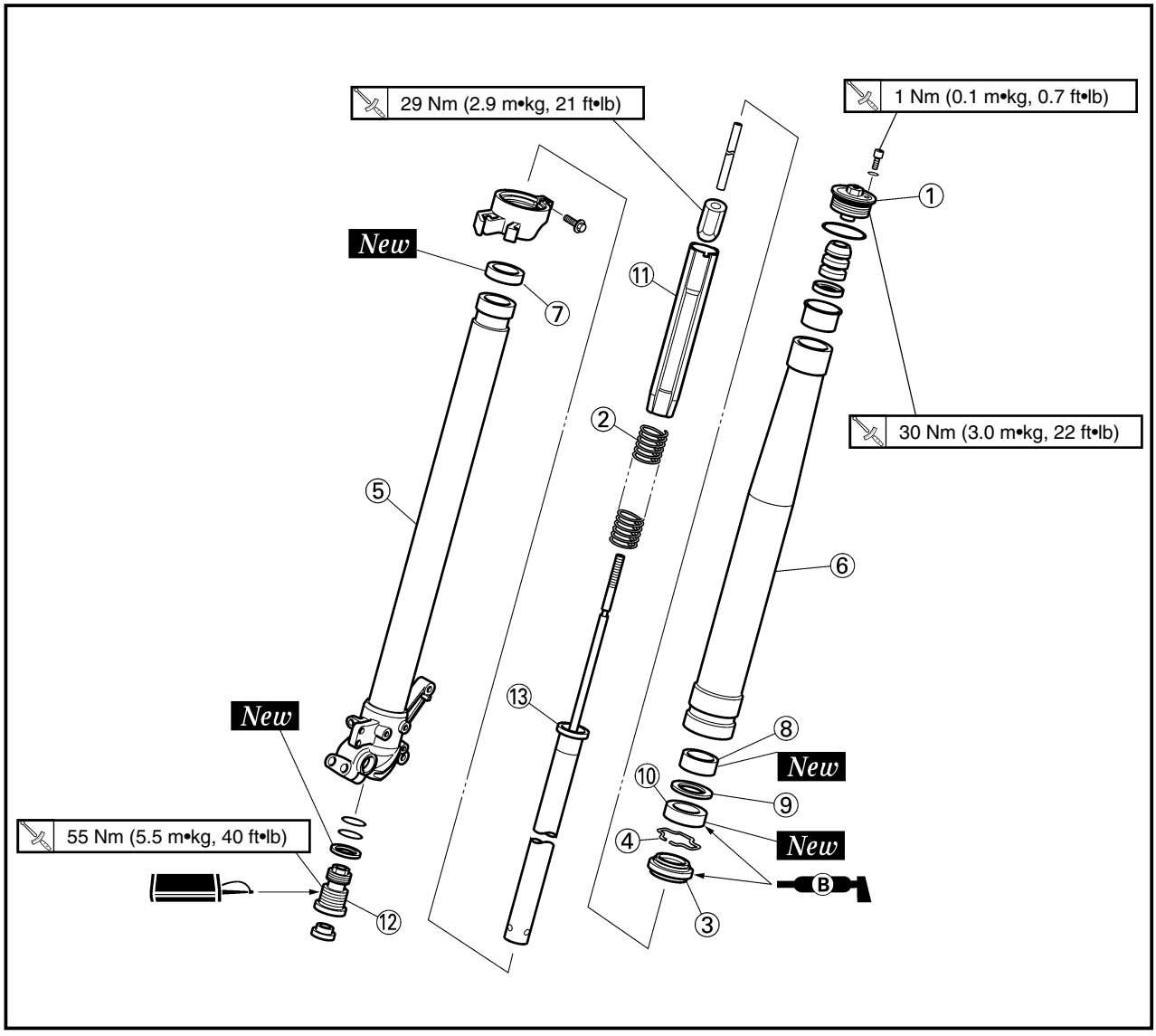
FRONT FORK



Extent of removal: ① Front fork removal

Extent of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		**FRONT FORK REMOVAL** Hold the machine by placing the suitable stand under the engine. Front wheel Front caliper Number plate		**⚠WARNING** **Support the machine securely so there is no danger of it falling over.** Refer to "FRONT WHEEL AND REAR WHEEL"section. Refer to "FRONT BRAKE AND REAR BRAKE"section.
①	1 2 3 4 5 6	Protector Brake hose holder Pinch bolt (handle crown) Cap bolt Pinch bolt (under bracket) Front fork	1 2 2 1 2 1	 Only loosening. Loosen when disassembling the front fork. Only loosening.

EC558000
FRONT FORK DISASSEMBLY



Extent of removal: ① Oil seal removal ② Damper rod removal

Extent of removal	Order	Part name	Q'ty	Remarks
		FRONT FORK DISASSEMBLY		
① ②	①	Cap bolt	1	Refer to "REMOVAL POINTS".
	②	Fork spring	1	Drain the folk oil.
	③	Dust seal	1	Refer to "REMOVAL POINTS".
	④	Stopper ring	1	
	⑤	Inner tube	1	
	⑥	Outer tube	1	
	⑦	Piston metal	1	
	⑧	Slide metal	1	
	⑨	Plain washer	1	
	⑩	Oil seal	1	
	⑪	Spring guide	1	
	⑫	Base valve	1	Use special tool.
	⑬	Damper rod	1	Refer to "REMOVAL POINTS".

EC556000
HANDLING NOTE

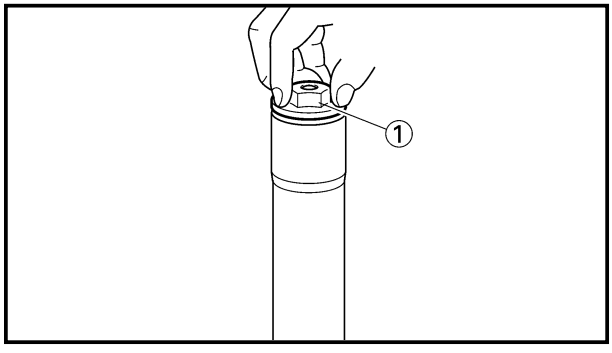
NOTE:

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.**

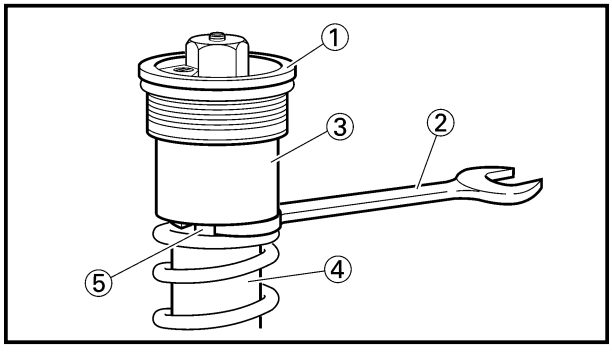


EC553000
REMOVAL POINTS
EC553151
Cap bolt

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

NOTE:

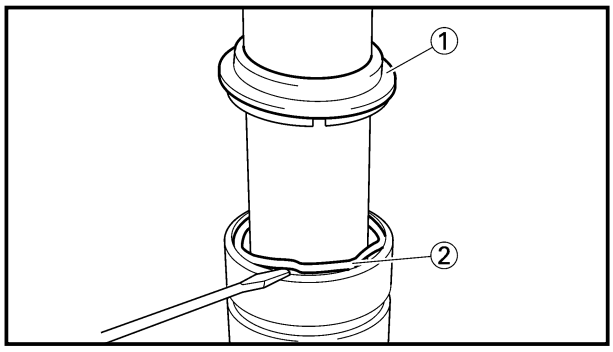
Before removing the front fork from the machine, loosen the cap bolt.



2. Remove:
   - Cap bolt ①

NOTE:

- While compressing the fork spring, set the thin type spanners ② between the spacer ③ and spring guide ④.
- Hold the locknut ⑤ and remove the cap bolt.



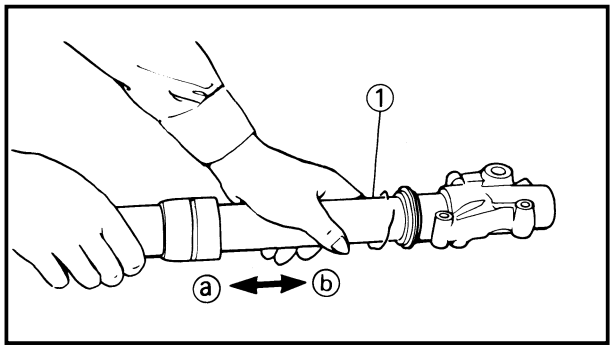
EC553201
Inner tube

1. Remove:
   - Dust seal ①
   - Stopper ring ②

   Using slotted-head screwdriver.

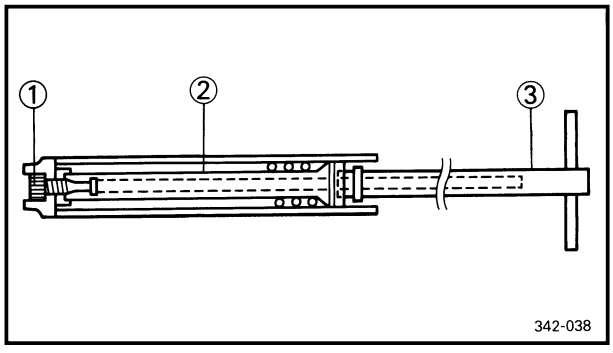
CAUTION:

Take care not to scratch the inner tube.



2. Remove:
   - Inner tube ①

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.

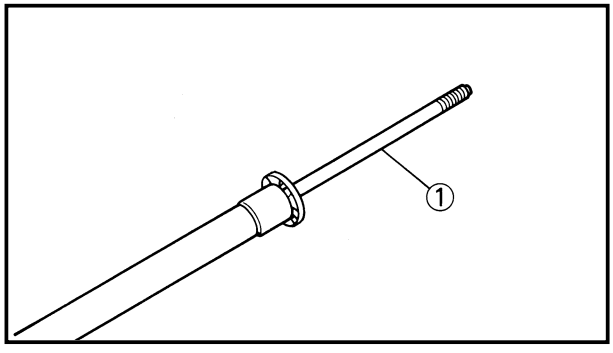


EC553311
Damper rod

1. Remove:
   - Base valve ①
   - Damper rod ②

NOTE:

Use a damper rod holder ③ to lock the damper rod.



Damper rod holder:
YM-1423/90890-01423

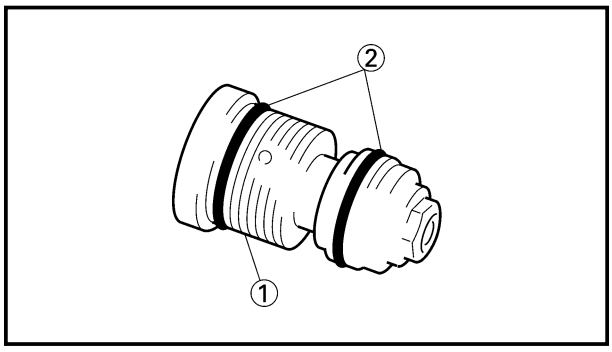
EC554000
INSPECTION
EC554100
Damper rod

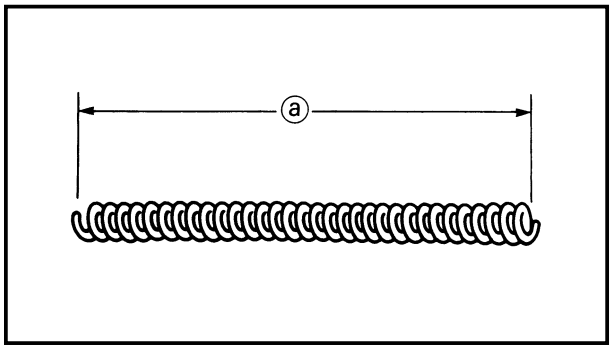
1. Inspect:
   - Damper rod ①

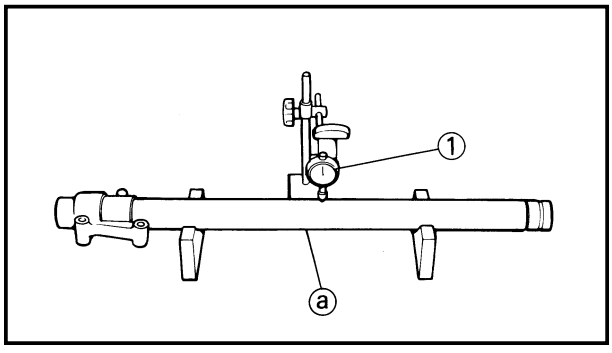
   Bend/Damage→Replace damper rod.

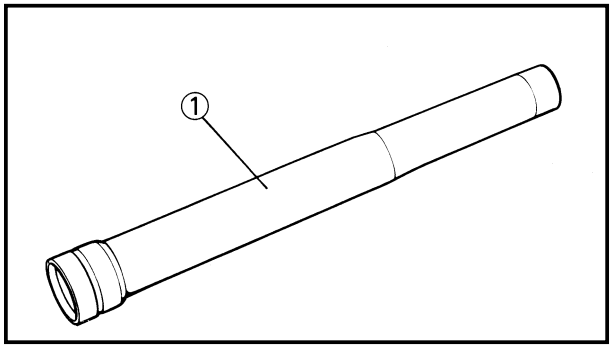
CAUTION:

The front fork with a built-in piston rod has a very sophisticated internal construction and is particularly sensitive to foreign material.
Use enough care not to allow any foreign material to come in when the oil is replaced or when the front fork is disassembled and reassembled.









EC554200
Base valve

1. Inspect:
   - Valve assembly ①
     Wear/Damage→Replace.
   - O-ring ②
     Damage→Replace.

EC554400
Fork spring

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

Fork spring free length:

Standard	<Limit>
460 mm (18.1 in)	455 mm (17.9 in)

EC554502
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 the dial gauge ①.

Inner tube bending limit:
0.2 mm (0.008 in)

NOTE:

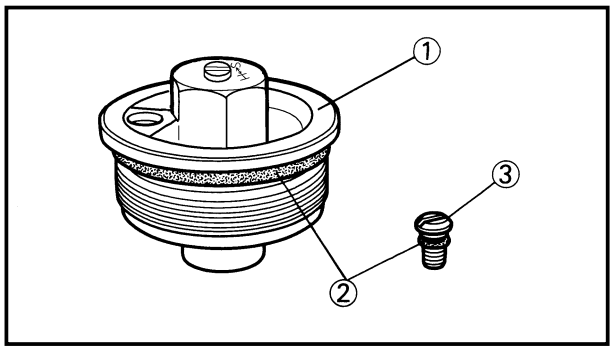
The bending value is shown by one half of the dial gauge reading.

⚠WARNING

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

EC554600
Outer tube

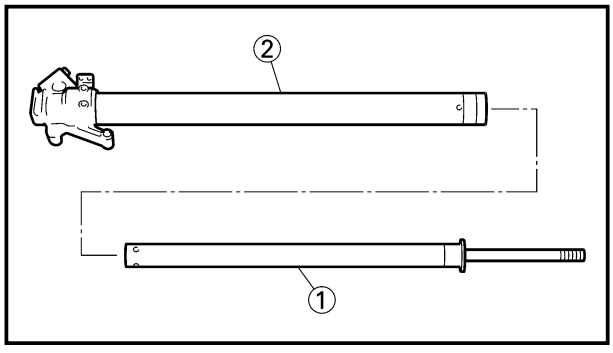
1. Inspect:
   - Outer tube ①
     Score marks/Wear/Damage→Replace.



EC554700
Cap bolt
1. Inspect:
   - Cap bolt ①
   - O-ring ②
   - Air bleed screw ③

   Wear/Damage→Replace.

EC555000
ASSEMBLY AND INSTALLATION
EC5551A1
Front fork assembly
1. Wash the all parts in a clean solvent.

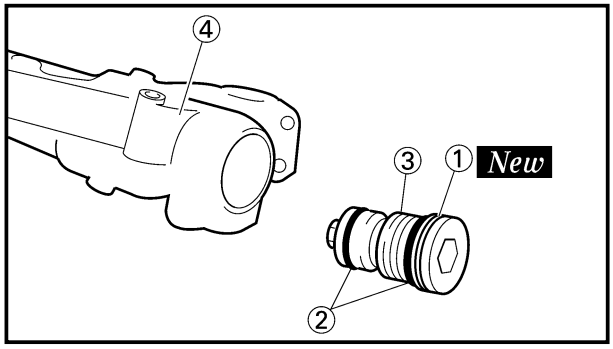


2. Install:
   - Damper rod ①

   To inner tube ②.

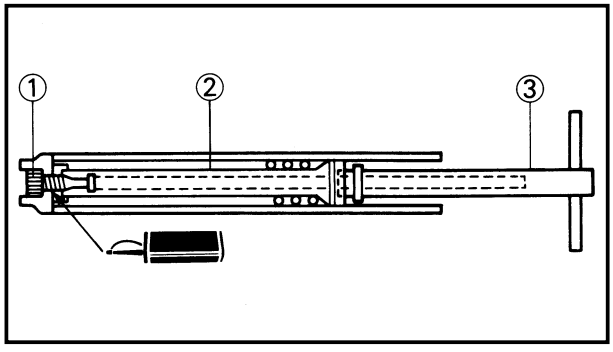
CAUTION:

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



3. Install:
   - Copper washer ① **New**
   - O-ring ②
   - Base valve ③

   To inner tube ④.



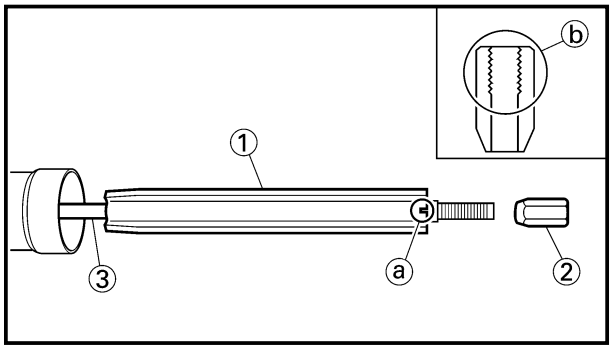
4. Tighten:
   - Base valve ①

	55 Nm (5.5 m•kg, 40 ft•lb)

NOTE:

- Use a damper rod holder ② to lock the damper rod ③.
- Apply the LOCTITE® on the base valve thread.

	Damper rod holder: YM-1423/90890-01423

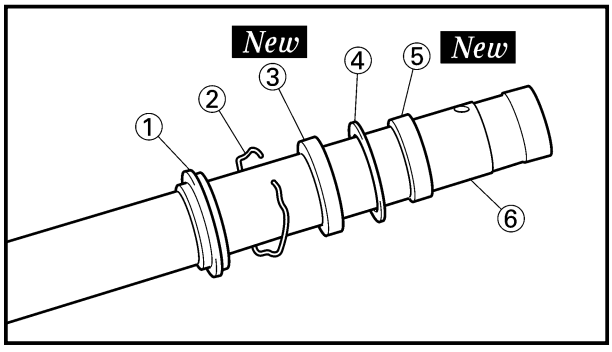


5. Install:
   - Spring guide ①
   - Locknut ②

   To damper rod ③.

NOTE:

- Install the spring guide with its cut ⓐ facing upward.
- With its thread ⓑ facing upward, fully finger tighten the locknut onto the damper rod.

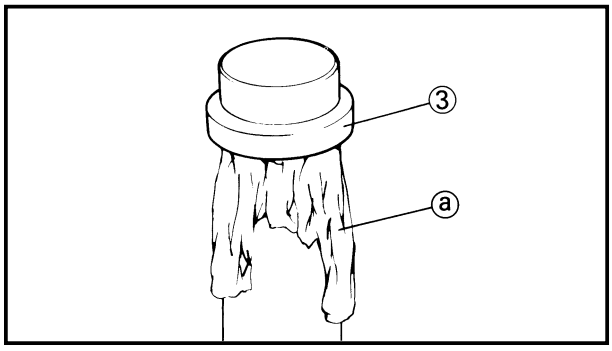


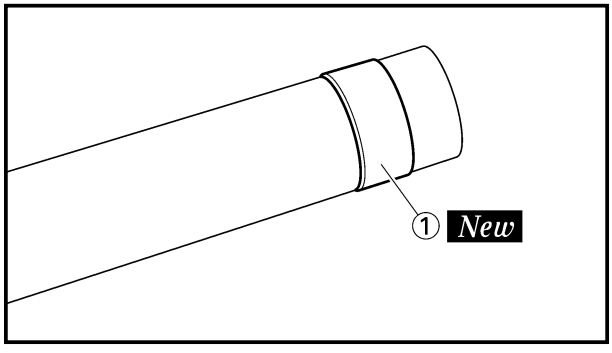
6. Install:
   - Dust seal ①
   - Stopper ring ②
   - Oil seal ③ ***New***
   - Plain washer ④
   - Slide metal ⑤ ***New***

   To inner tube ⑥.

NOTE:

- Apply the fork oil on the inner tube.
- When installing the oil seal, use vinyl seat ⓐ 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.

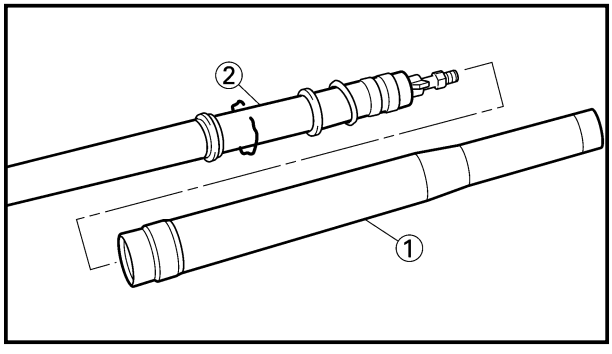




7. Install:
   - Piston metal ① ***New***

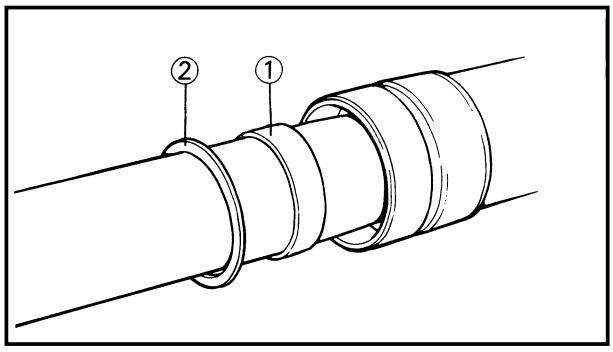
NOTE:

Install the piston metal onto the slot on inner tube.



8. Install:
   - Outer tube ①

   To inner tube ②.



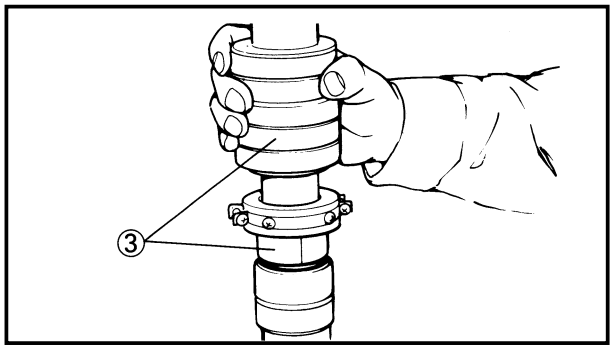
9. Install:
   - Slide metal ①
   - Plain washer ②

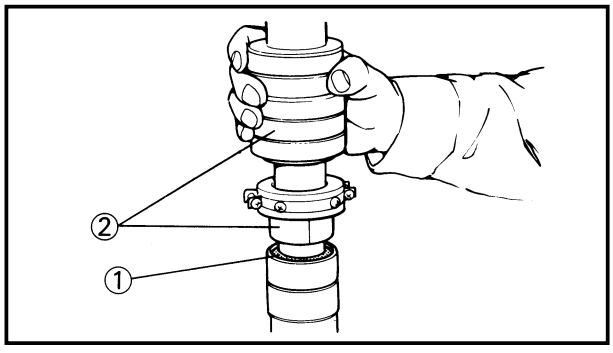
   To outer tube slot.

NOTE:

Press the slide metal into the outer tube with fork seal driver ③.

	Fork seal driver: **YM-01442/90890-01442**



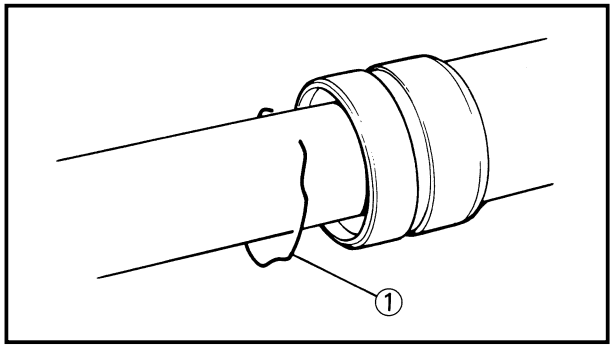


10. Install:
    - Oil seal ①

NOTE:

Press the oil seal into the outer tube with fork seal driver ②.

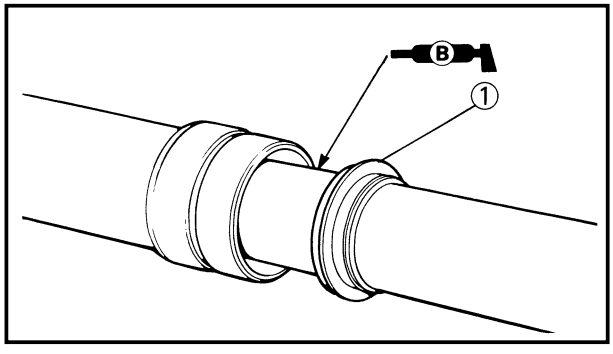
	Fork seal driver: **YM-01442/90890-01442**



11. Install:
    - Stopper ring ①

NOTE:

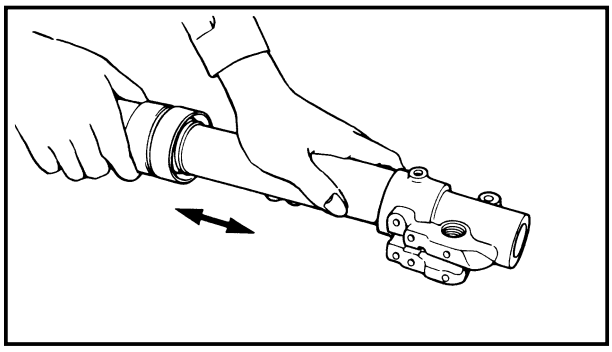
Fit the stopper ring correctly in the groove in the outer tube.



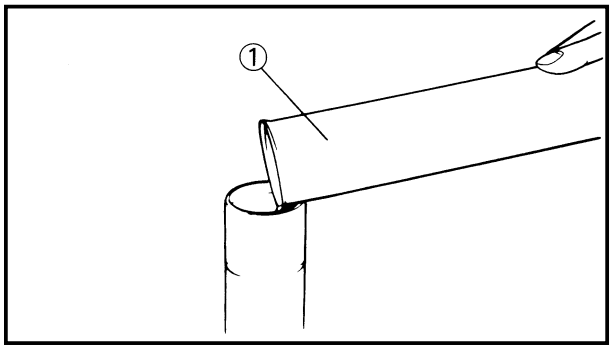
12. Install:
    - Dust seal ①

NOTE:

Apply the lithium soap base grease on the inner tube.



13. Check:
    - Inner tube smooth movement
      Tightness/Binding/Rough spots → Repeat the steps 2 to 12.

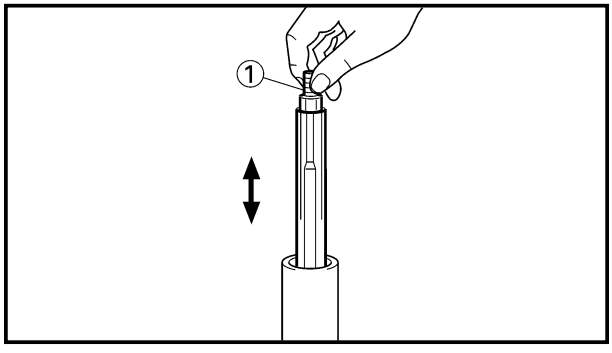


14. Compress the front fork fully.
15. Fill:
    - Front fork oil
      Until outer tube top surface with recommended fork oil ①.

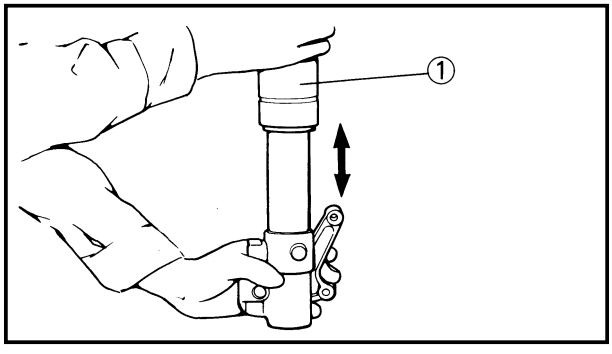
Recommended oil:
Suspension oil "01"

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.

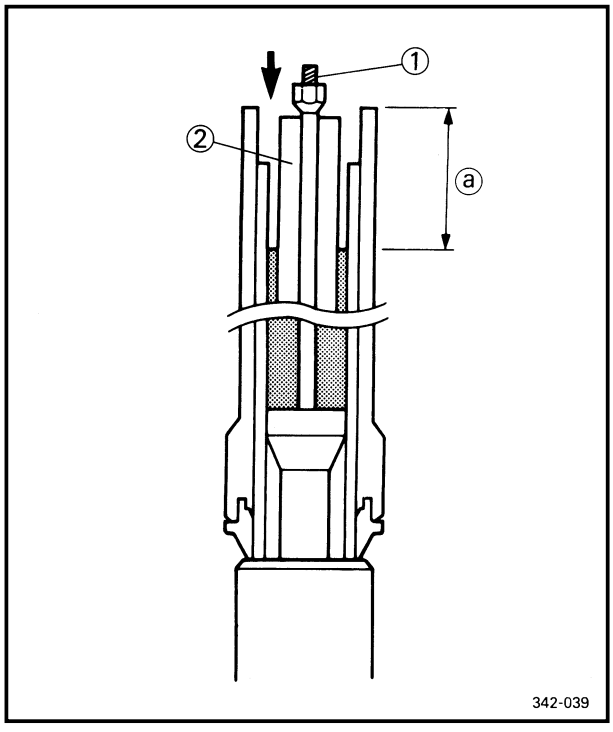
NOTE:

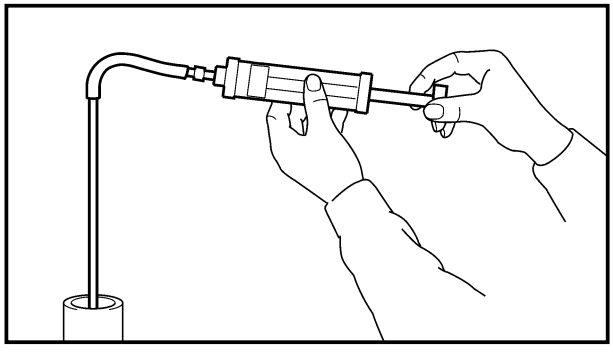
Be careful not to excessive full stroke. A stroke of 200 mm (7.9 in) or more will cause air to enter. In this case, repeat the steps 15 to 18.

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.

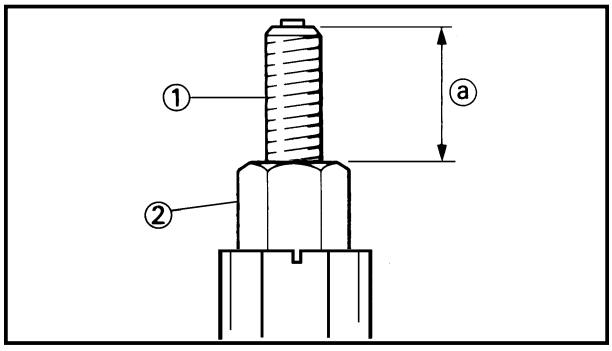
Standard oil level:
135 mm (5.31 in)
Extent of adjustment:
80~150 mm (3.15~5.91 in)
From top of outer tube with inner tube and damper rod ① fully compressed without spring.

NOTE:

Be sure to install the spring guide ② when checking the oil level.

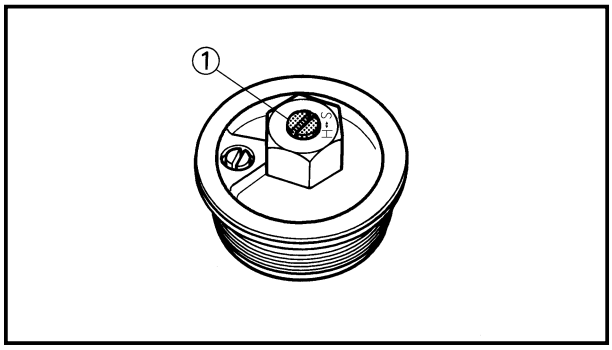
⚠WARNING

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. Measure:
    - Distance ⓐ
      Out of specification→Turn into the locknut.

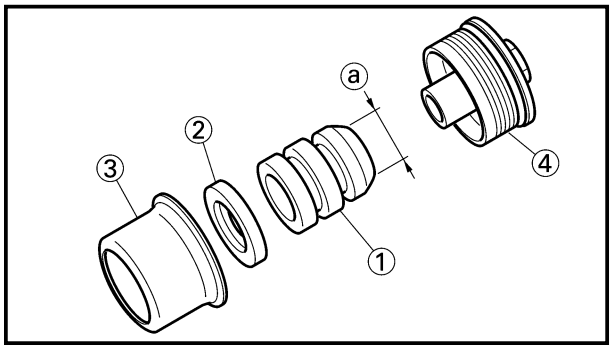
Distance ⓐ:
20 mm (0.79 in) or more
Between damper rod ① top and locknut ② top.



22. Loosen:
    - Rebound damping adjuster ①

NOTE:

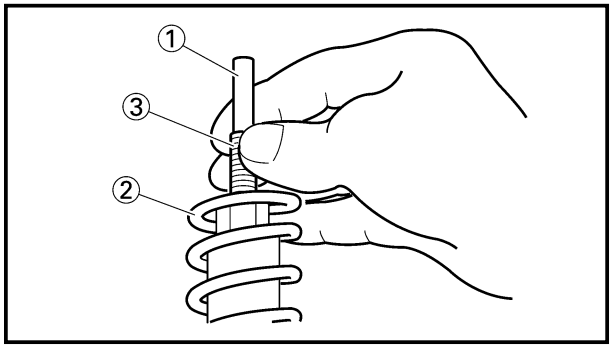
- Loosen the rebound damping adjuster finger tight.
- Record the set position of the adjuster (the amount of turning out the fully turned in position).



23. Install:
    - Cushion rubber ①
    - Washer ②
    - Spacer ③
      To cap bolt ④.

NOTE:

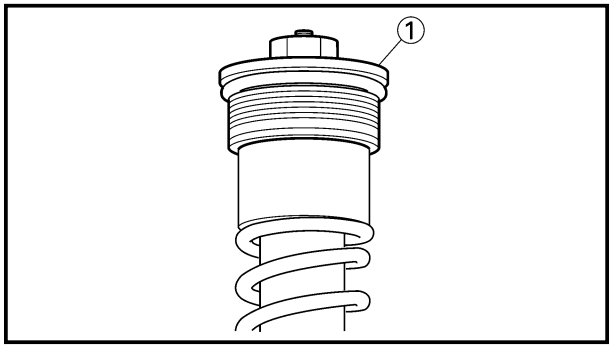
Install the cushion rubber with its smaller dia.end ⓐ facing the cap bolt.



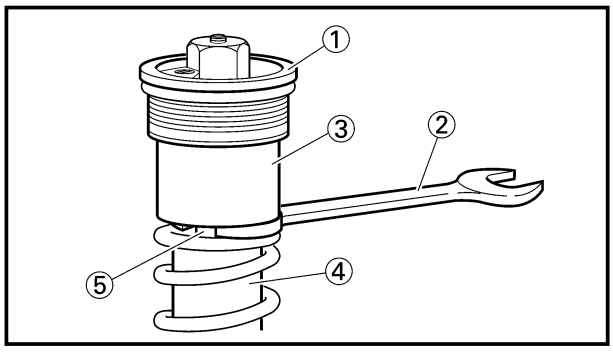
24. Install:
    - Push rod ①
    - Fork spring ②

NOTE:

- Install the fork spring with the damper rod ③ pulled up.
- Install the fork spring with its smaller pitch end facing the cap bolt. (For EUROPE)
- After installing the fork spring , hold the damper rod end so that it will not go down.



25. Install:
    - Cap bolt ①
      Fully tighten the cap bolt onto the damper rod by hand.

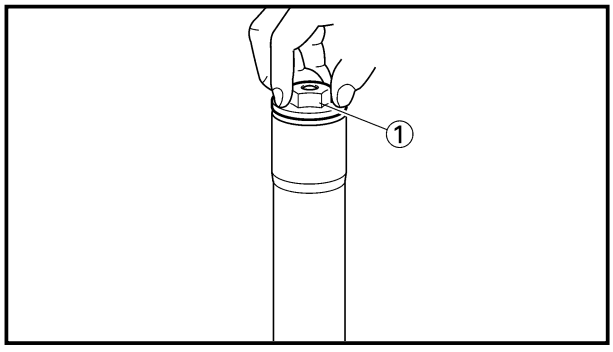


26. Tighten:
    - Cap bolt (locknut) ①

29 Nm (2.9 m•kg, 21 ft•lb)

NOTE:

- While compressing the fork spring, set the thin type spanners ② between the spacer ③ and spring guide ④.
- Hold the locknut ⑤ and tighten the cap bolt with specified torque.

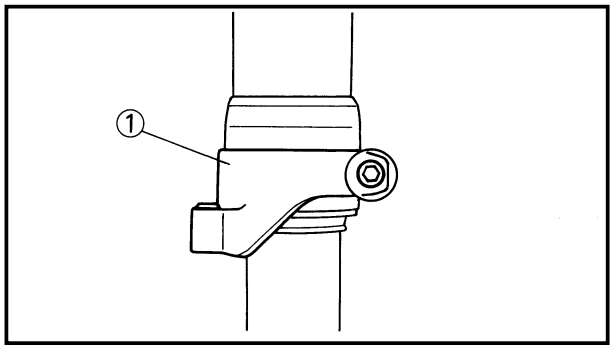


27. Install:
    - Cap bolt ①

      To outer tube.

NOTE:

Temporarily tighten the cap bolt.



28. Install:
    - Protector guide ①

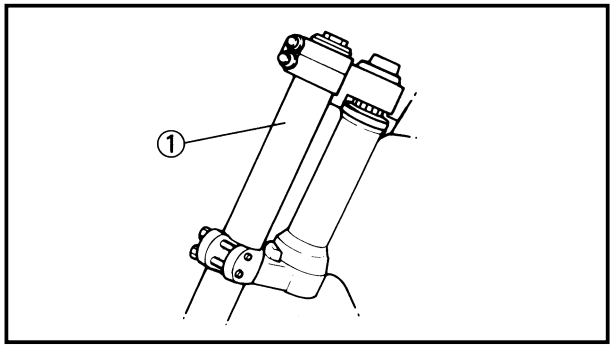
EC5552A1

Installation

1. Install:
    - Front fork ①

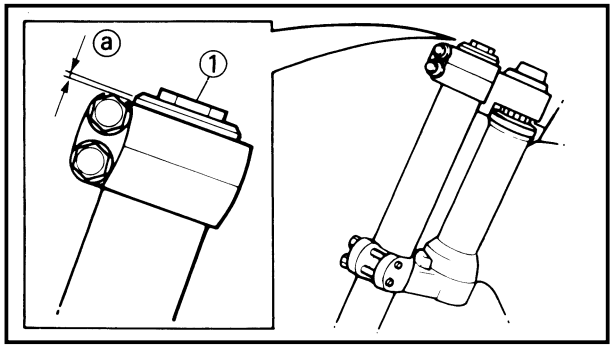
NOTE:

- Temporarily tighten the pinch bolts (under bracket).
- Do not tighten the pinch bolts (handle crown) yet.



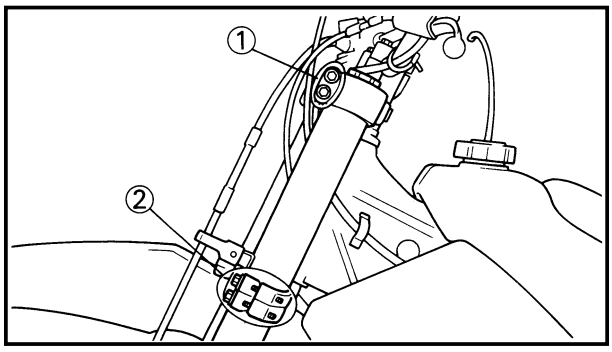
2. Tighten:
    - Cap bolt ①

30 Nm (3.0 m•kg, 22 ft•lb)



3. Adjust:
    - Front fork top end ⓐ

Front fork top end (standard) ⓐ:
Zero mm (Zero in)



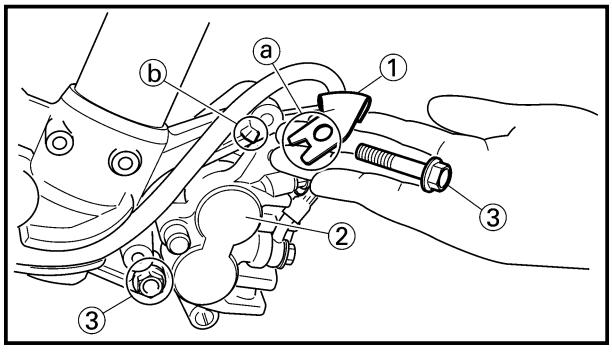
4. Tighten:
   - Pinch bolt (handle crown) ①

     23 Nm (2.3 m•kg, 17 ft•lb)
   - Pinch bolt (under bracket) ②

     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.

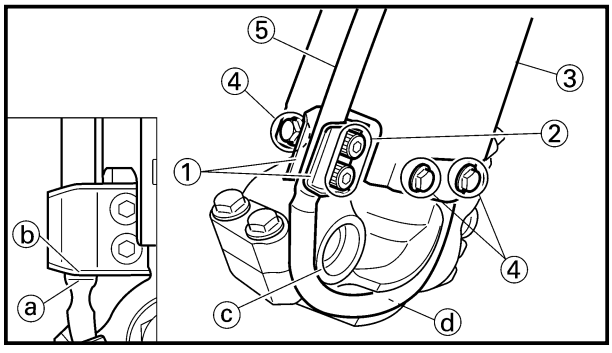


5. Install:
   - Brake hose holder ①
   - Caliper ②
   - Bolt (caliper) ③

     23 Nm (2.3 m•kg, 17 ft•lb)

NOTE:

Fit the brake hose holder cut ⓐ over the projection ⓑ on the front fork and clamp the brake hose.



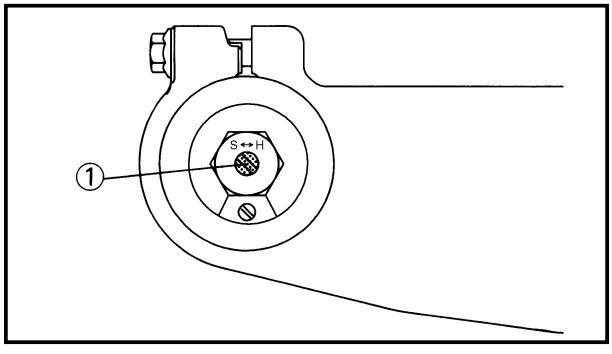
6. Install:
   - Brake hose holder ①
   - Bolt (brake hose holder) ②

     10 Nm (1.0 m•kg, 7.2 ft•lb)
   - Protector ③
   - Bolt (protector) ④

     10 Nm (1.0 m•kg, 7.2 ft•lb)

NOTE:

When installing the brake hose holder, align the top ⓐ of the brake hose neck with the brake hose holder bottom ⓑ. Then pass the brake hose ⑤ in front of the axle boss ⓒ and fit it into the hose groove ⓓ so that the brake hose does not contact the nut (wheel axle).



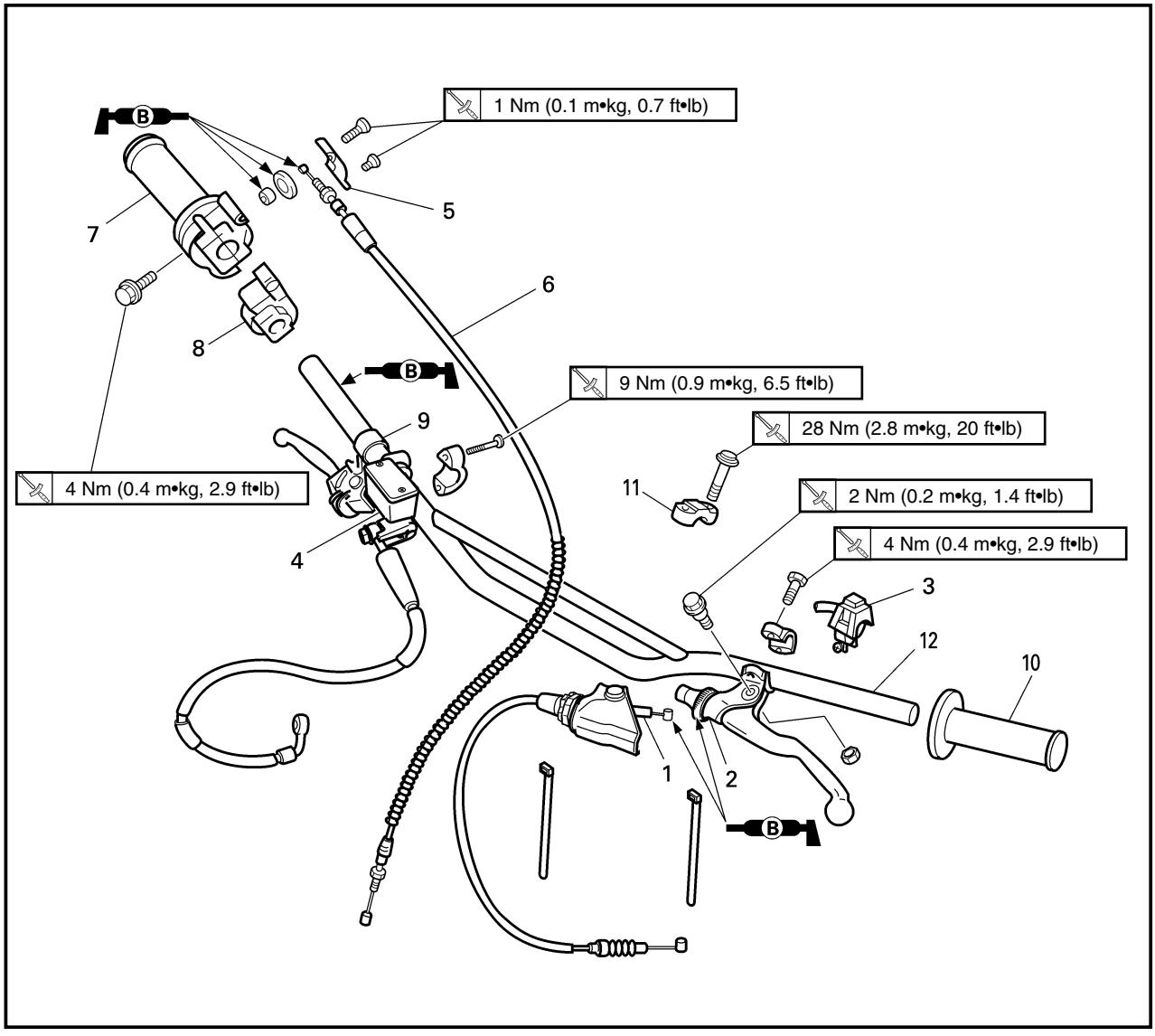
7. Adjust:
   - Rebound damping force

NOTE:

Turn in the damping adjuster ① finger-tight and then turn out to the originally set position.

EC5B0000

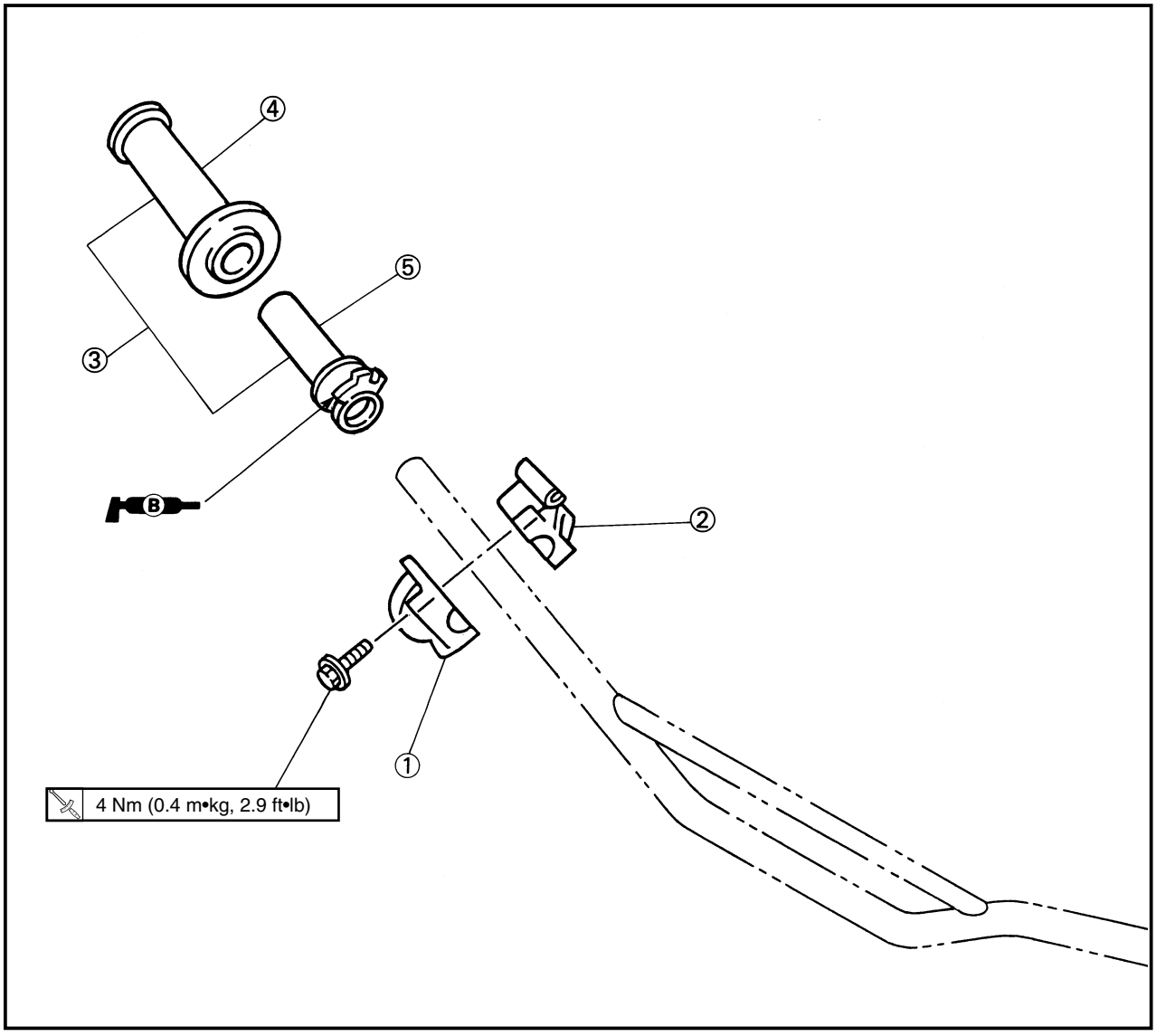
HANDLEBAR



Extent of removal: ① Handlebar removal

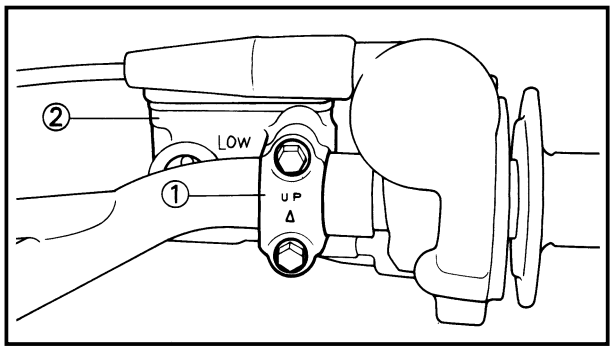
Extent of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		**HANDLEBAR REMOVAL** Number plate		Remove the clamp portion only.
①	1	Clutch cable	1	Disconnect at the lever side.
	2	Clutch lever holder	1	
	3	"ENGINE STOP" button	1	
	4	Master cylinder	1	Refer to "REMOVAL POINTS".
	5	Throttle cable cap	1	Turn over the cap cover.
	6	Throttle cable	1	Disconnect at the throttle side.
	7	Throttle	1	Loosen the bolts.
	8	Cap cover	1	
	9	Collar	1	
	10	Grip (left)	1	Refer to "REMOVAL POINTS".
	11	Handlebar holder (upper)	2	
	12	Handlebar	1	

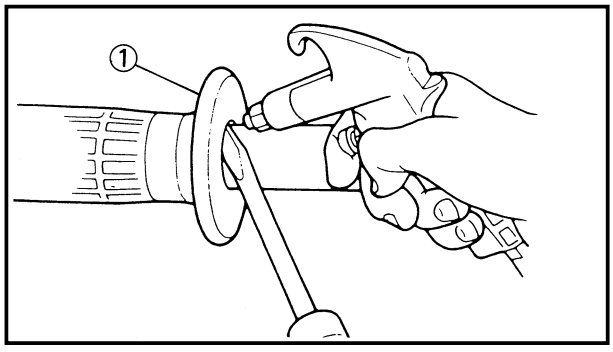
EC5B8000
THROTTLE DISASSEMBLY

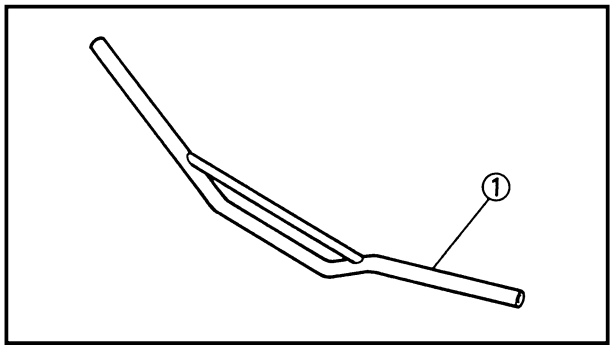


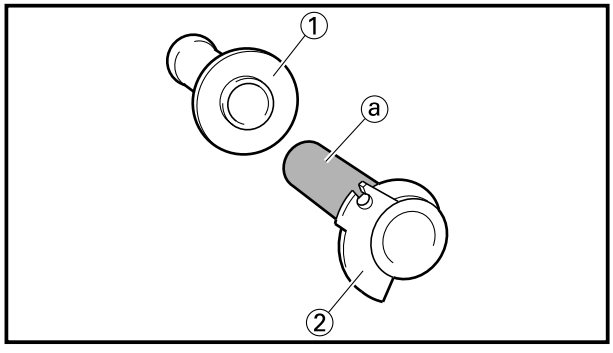
Extent of removal: ① Throttle disassembly

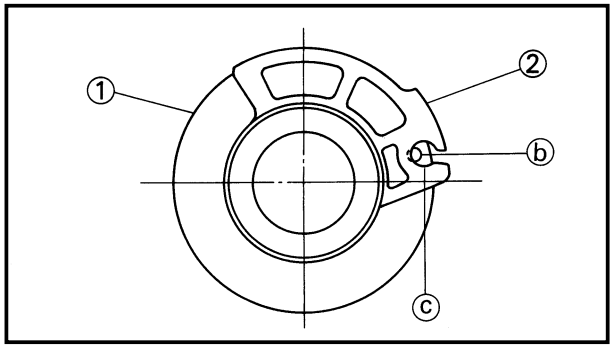
Extent of removal	Order	Part name	Q'ty	Remarks
		THROTTLE DISASSEMBLY		
①	①	Grip cap (lower)	1	
	②	Grip cap (upper)	1	
	③	Grip assembly	1	
	④	Grip (right)	1	Refer to "REMOVAL POINTS".
	⑤	Tube guide	1	











EC5B3000
REMOVAL POINTS

EC5B3100
Master cylinder

1. Remove:
   - Master cylinder bracket ①
   - Master cylinder ②

CAUTION:

- **Do not let the master cylinder hang on the brake hose.**
- **Keep the master cylinder cap side horizontal to prevent air from coming in.**

EC5B3200
Grip

1. Remove:
   - Grip ①

NOTE:

Blow in air between the handlebar or tube guide and the grip. Then remove the grip which has become loose.

EC5B4000
INSPECTION

EC5B4100
Handlebar

1. Inspect:
   - Handlebar ①

   Bends/Cracks /Damage→Replace.

⚠WARNING

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

EC5B5000
ASSEMBLY AND INSTALLATION

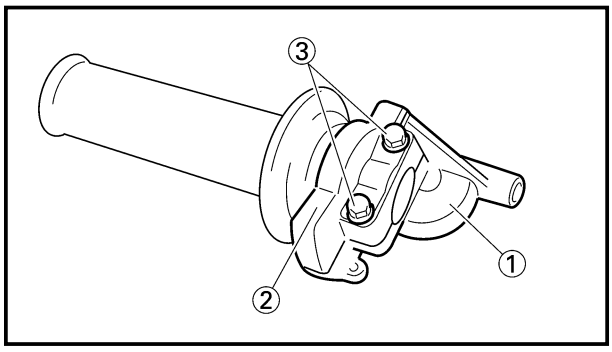
EC5B5100
Throttle assembly

1. Install
   - Grip (right) ①

   Apply the adhesive on the tube guide ②.

NOTE:

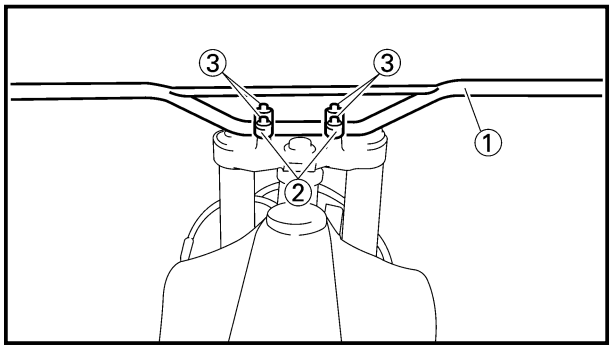
- Before applying the adhesive, wipe off grease or oil on the tube guide surface ⓐ with a lacquer thinner.
- Align the mating mark ⓑ on the grip (right) with the slot ⓒ in the tube guide.



2. Install:
   - Grip cap (upper) ①
   - Grip cap (lower) ②
   - Bolt (grip cap) ③

NOTE:

Temporarily tighten the bolts (grip cap).



EC5B5210

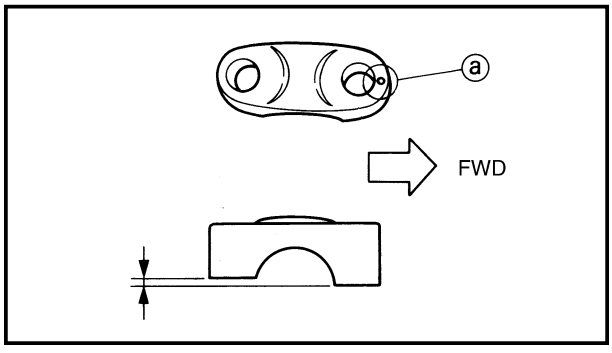
Handlebar

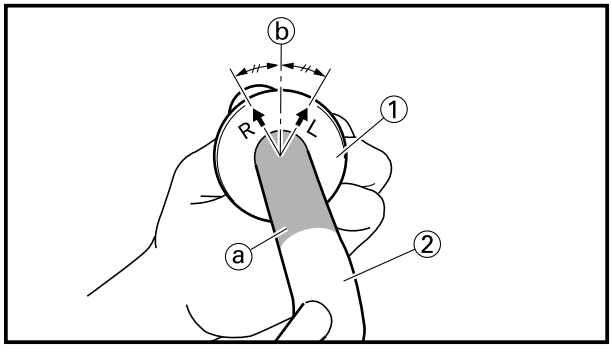
1. Install:
   - Handlebar ①
   - Handlebar holder ②
   - Bolt (handlebar holder) ③

28 Nm (2.8 m•kg, 20 ft•lb)

NOTE:

- The upper handlebar holder should be installed with the punched mark ⓐ forward.
- First tighten the bolts on the front side of the handlebar holder, and then tighten the bolts on the rear side.



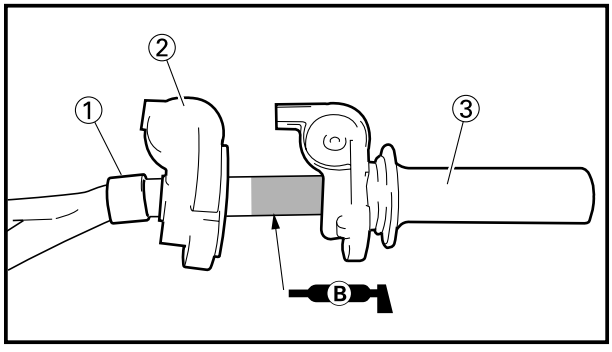


2. Install:
   - Grip (left) ①

   Apply the adhesive to the handlebar ②.

NOTE:

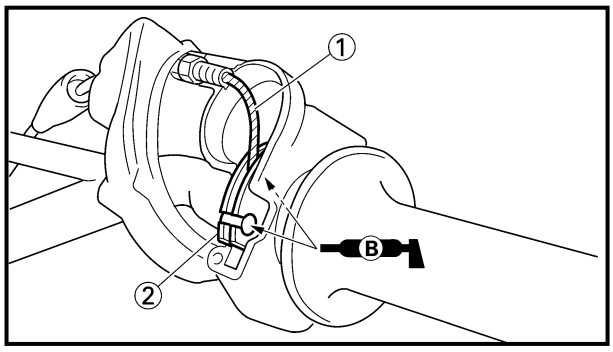
- Before applying the adhesive, wipe off grease or oil on the handlebar surface ⓐ with a lacquer thinner.
- Install the grip (left) to the handlebar so that the line ⓑ between the two arrow marks faces straight upward.



3. Install:
   - Collar ①
   - Cap cover ②
   - Throttle ③

NOTE:

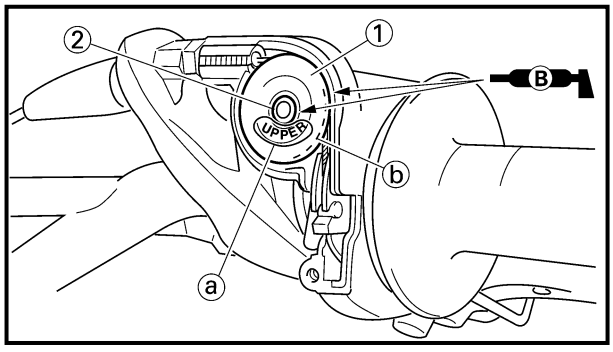
- Apply the lithium soap base grease on the throttle grip sliding surface.
- Tighten the grip cap bolts temporarily without the throttle being fixed to the handlebar.



4. Install:
   - Throttle cable ①
     To tube guide ②.

NOTE:

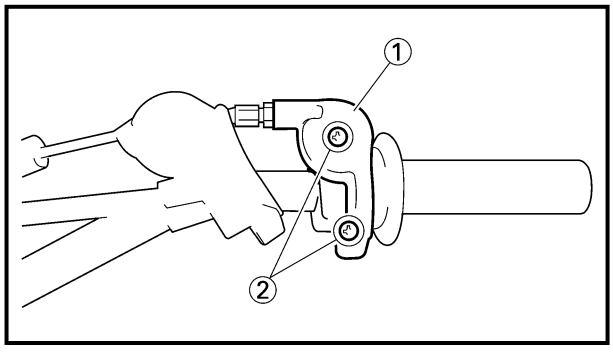
Apply the lithium soap base grease on the throttle cable end and tube guide cable winding portion.



5. Install:
   - Roller ①
   - Collar ②

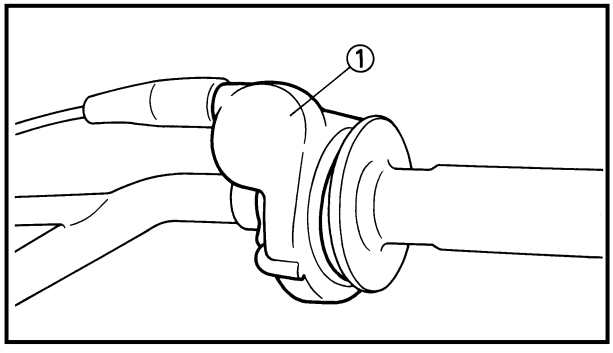
NOTE:

- Apply the lithium soap base grease on the roller sliding surface.
- Install the roller so that the “UPPER” mark ⓐ faces upward.
- Pass the throttle cable in the groove ⓑ in the roller

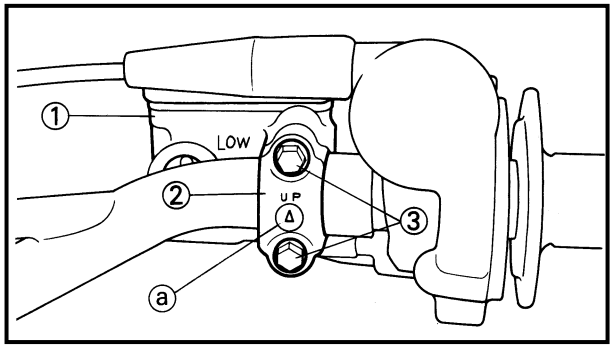


6. Install:
   - Throttle cable cap ①
   - Screw (throttle cable cap) ②

1 Nm (0.1 m•kg, 0.7 ft•lb)



7. Adjust:
   - Throttle grip free play
     Refer to ”THROTTLE CABLE ADJUSTMENT” section in the CHAPTER 3.
8. Install:
   - Cap cover ①

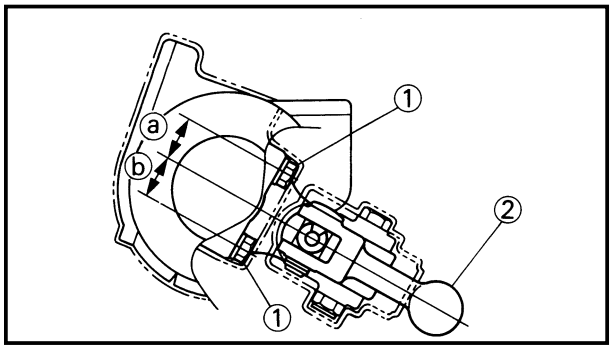


9. Install:
   - Master cylinder ①
   - Master cylinder bracket ②
   - Bolt (master cylinder bracket) ③

9 Nm (0.9 m•kg, 6.5 ft•lb)

NOTE:

- Install the bracket so that the arrow mark ⓐ faces upward.
- First tighten the bolt on the upper side of the master cylinder bracket, and then tighten the bolt on the lower side.

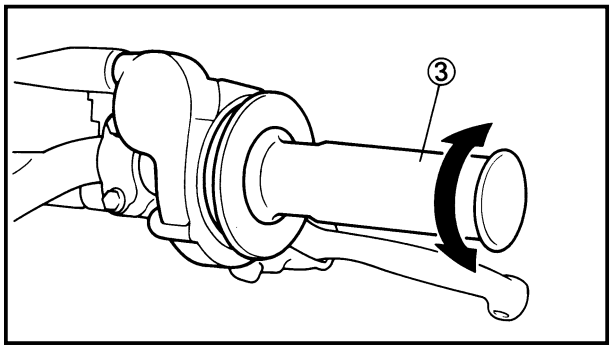


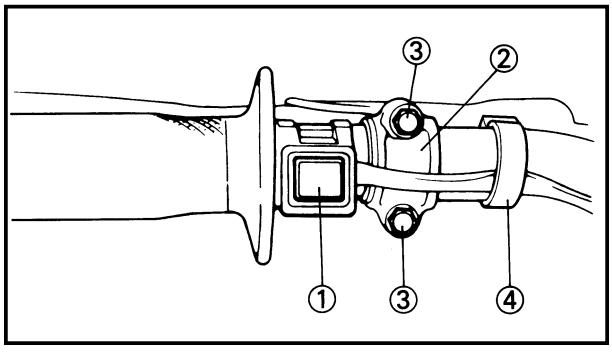
10. Install:
    - Bolt (grip cap) ①

4 Nm (0.4 m•kg, 2.9 ft•lb)

⚠WARNING

- **Install the grip cap so that the gaps ⓐ and ⓑ between the bolt (grip cap) and brake lever ② are equal. If you make a mistake in the grip cap installation position, the brake lever may contact the grip cap, resulting in poor brake performance.**
- **After tightening the bolts, check that the throttle grip ③ moves smoothly. If it does not, retighten the bolts for adjustment.**





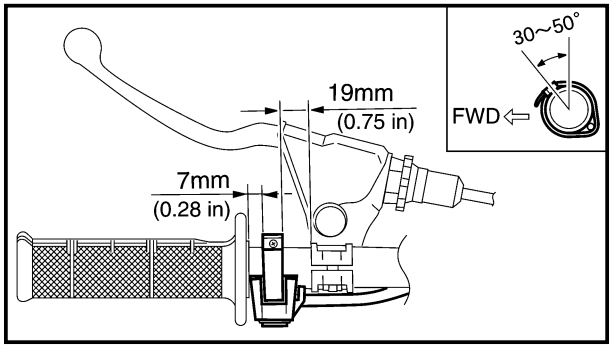
11. Install:
    - "ENGINE STOP" button ①
    - Clutch lever holder ②
    - Bolt (clutch lever holder) ③

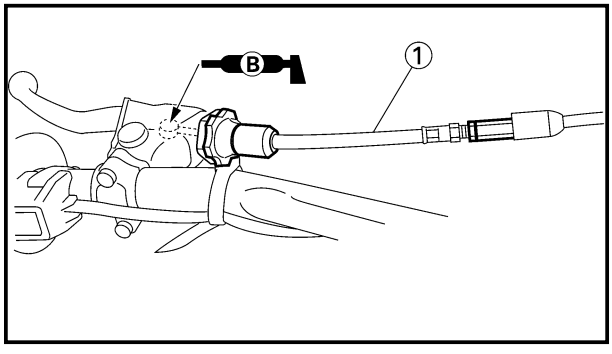
4 Nm (0.4 m•kg, 2.9 ft•lb)

    - Clamp ④

NOTE:

- The "ENGINE STOP" button, clutch lever holder and clamp should be installed according to the dimensions shown.
- Pass the "ENGINE STOP" button lead in the middle of the clutch holder.





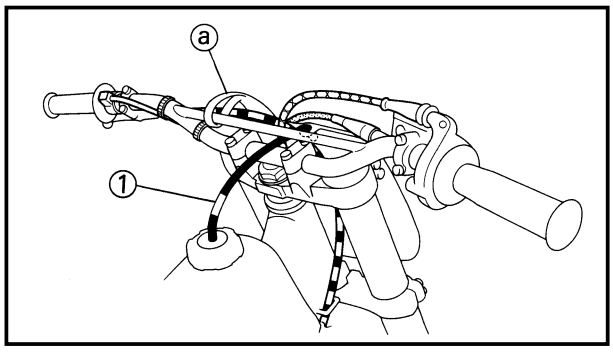
12. Install:
    - Clutch cable ①

NOTE:

Apply the lithium soap base grease on the clutch cable end.

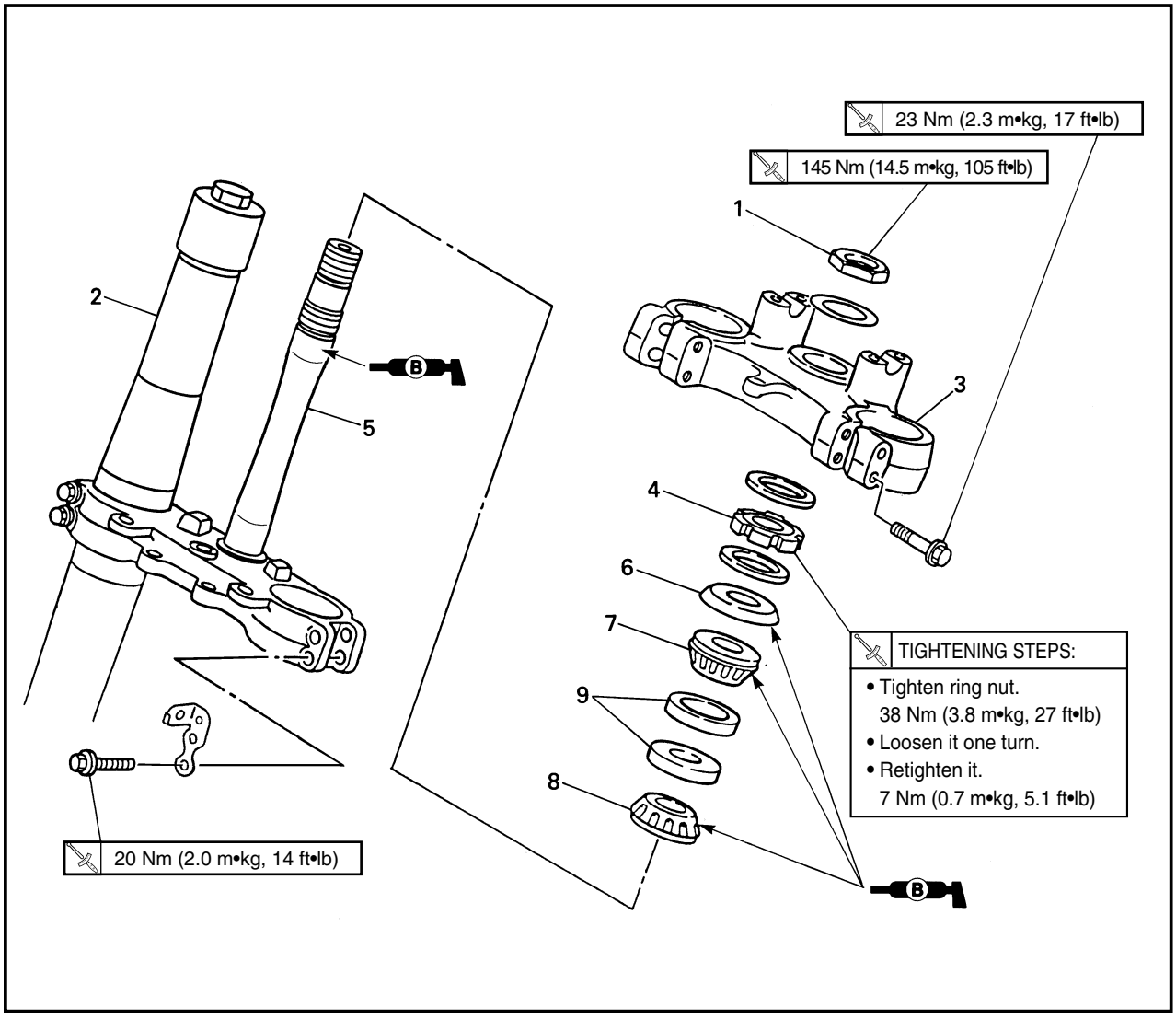
13. Adjust:
    - Clutch lever free play

      Refer to "CLUTCH ADJUSTMENT" section in the CHAPTER 3.



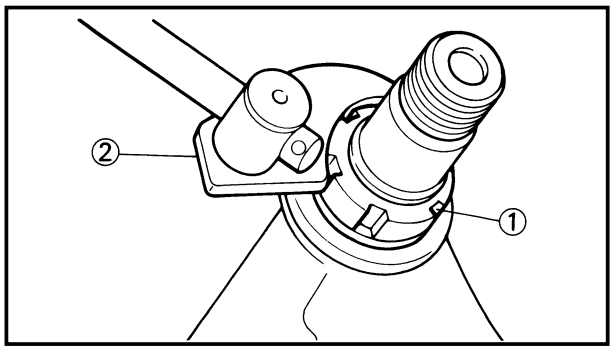
14. Clamp the clamp portion ⓐ of the number plate to the handlebar.
15. Insert the end of the fuel breather hose ① into the hole of the number plate.

EC560000
STEERING



Extent of removal: ① Under bracket removal ② Bearing removal

Extent of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		**STEERING REMOVAL** Hold the machine by placing the suitable stand under the engine. Number plate Handlebar Cable guide Front fender		**⚠WARNING** **Support the machine securely so there is no danger of it falling over.** Refer to "HANDLEBAR" section.
① ②	1	Steering shaft nut	1	
	2	Front fork	2	Refer to "FRONT FORK" section.
	3	Handle crown	1	
	4	Ring nut	1	Use special tool. Refer to "REMOVAL POINTS".
	5	Under bracket	1	
	6	Ball race cover	1	
	7	Bearing (upper)	1	
	8	Bearing (lower)	1	Refer to "REMOVAL POINTS".
	9	Ball race	2	Refer to "REMOVAL POINTS".



EC563000
REMOVAL POINTS

EC563202
Ring nut

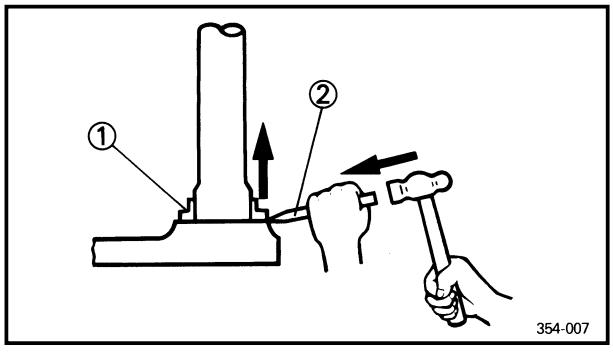
1. Remove:
   - Ring nut ①

   Use the ring nut wrench ②.

	Ring nut wrench: **YU-33975/90890-01403**

⚠WARNING

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



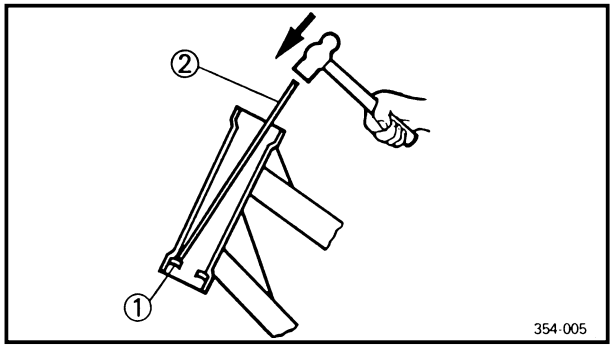
EC563300
Bearing (lower)

1. Remove:
   - Bearing (lower) ①

   Use the floor chisel ②.

CAUTION:

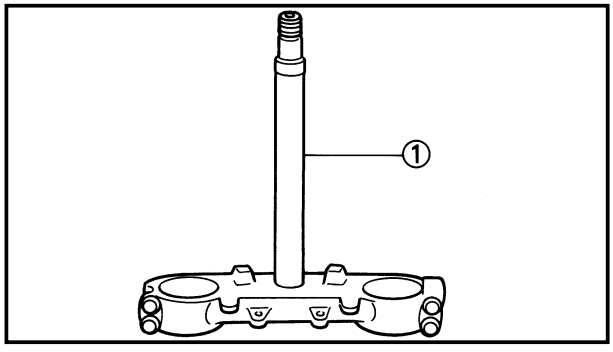
Take care not to damage the steering shaft thread.



EC563400
Ball race

1. Remove:
   - Ball race ①

   Remove the ball race using long rod ② and the hammer.

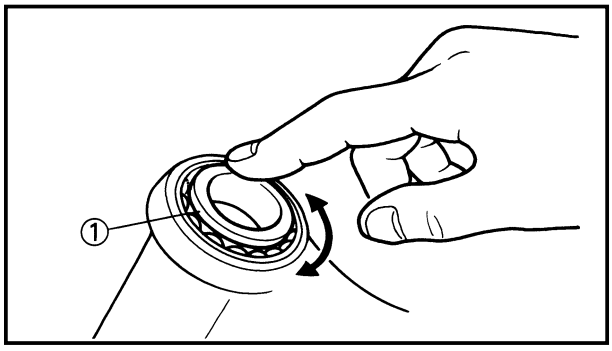


EC564000
INSPECTION

EC564200
Steering shaft

1. Inspect:
   - Steering shaft ①

   Bend/Damage → Replace.

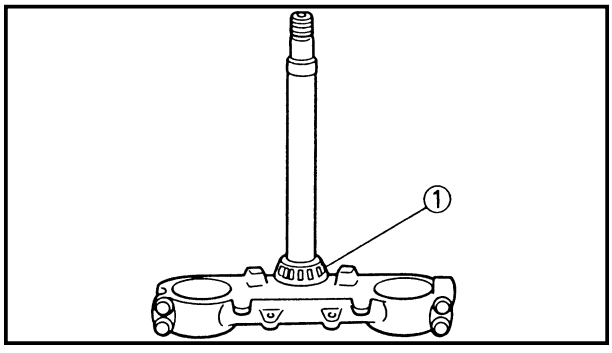


EC564101
Bearing and ball race

1. Wash the bearings and ball races with a solvent.
2. Inspect:
   - •Bearing ①
   - •Ball race

   Pitting/Damage → Replace bearings and ball races as a set.

   Install the bearing in the ball races. Spin the bearings by hand. If the bearings hang up or are not smooth in their operation in the ball races, replace bearings and ball races as a set.



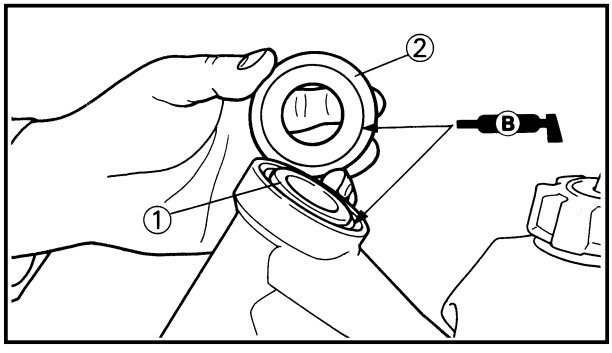
EC565000
ASSEMBLY AND INSTALLATION

EC565113
Under bracket

1. Install:
   - •Bearing (lower) ①

NOTE:

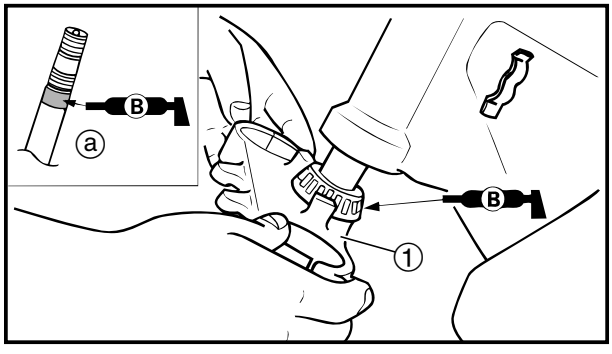
Apply the lithium soap base grease on the dust seal lip and bearing inner circumference.



2. Install:
   - •Ball race
   - •Bearing (upper) ①
   - •Ball race cover ②

NOTE:

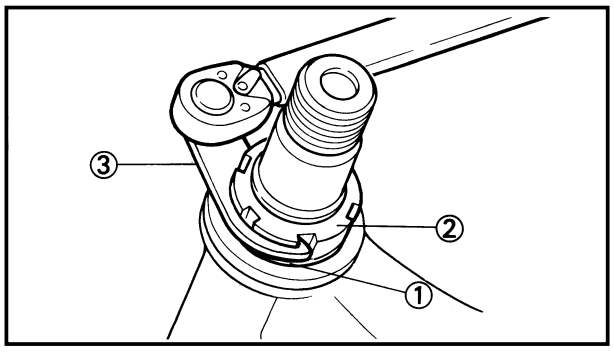
Apply the lithium soap base grease on the bearing and ball race cover lip.



3. Install:
   - •Under bracket ①

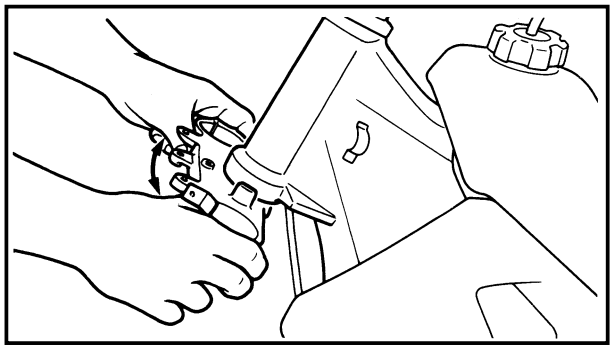
NOTE:

Apply the lithium soap base grease on the bearing and the portion ⓐ of the steering shaft.

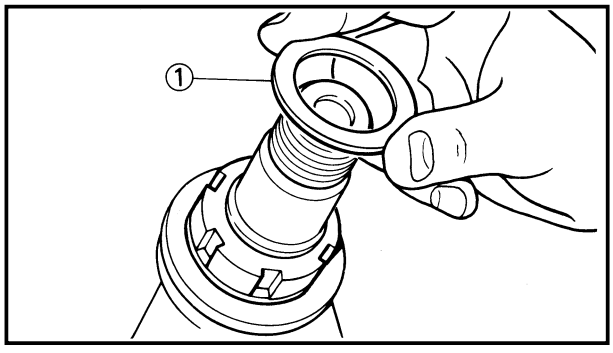


4. Install:
   - Plain washer ①
   - Ring nut ② **7 Nm (0.7 m•kg, 5.1 ft•lb)**

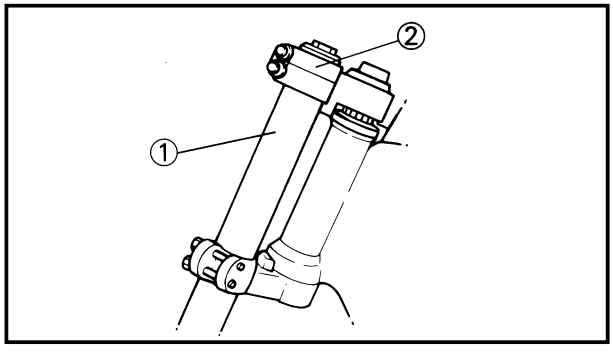
   Tighten the ring nut using the ring nut wrench ③.
   Refer to "STEERING HEAD INSPECTION AND ADJUSTMENT" section in the CHAPTER 3.



5. 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.



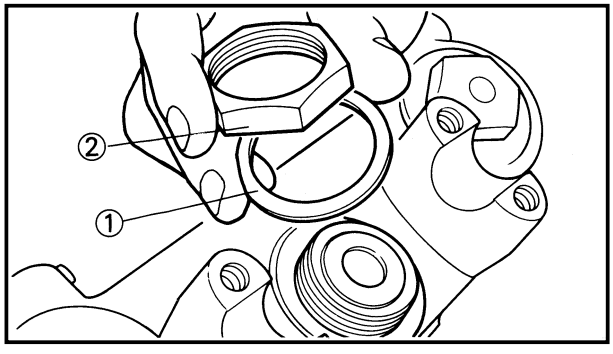
6. Install:
   - Plain washer ①



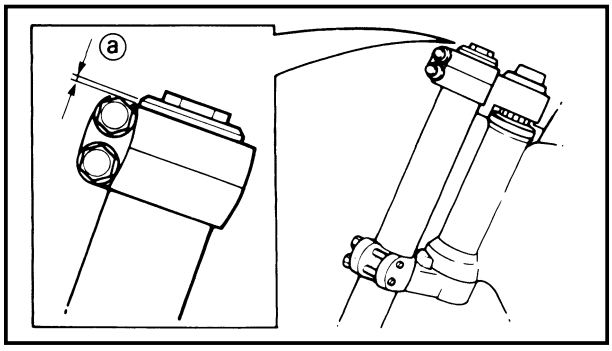
7. Install:
   - Front fork ①
   - Handle crown ②

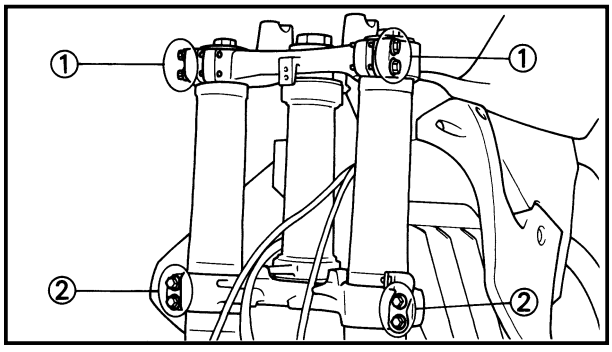
NOTE:

- Temporarily tighten the pinch bolts (under bracket).
- Do not tighten the pinch bolts (handle crown) yet.



8. Install:
   - Plain washer ①
   - Steering shaft nut ② **145 Nm (14.5 m•kg, 105 ft•lb)**





9. After tightening the nut, check the steering for smooth movement. If not, adjust the steering by loosening the ring nut little by little.
10. Adjust:
    - Front fork top end ⓐ

Front fork top end (standard) ⓐ:
Zero mm (Zero in)

11. Tighten:
    - Pinch bolt (handle crown) ①

23 Nm (2.3 m•kg, 17 ft•lb)

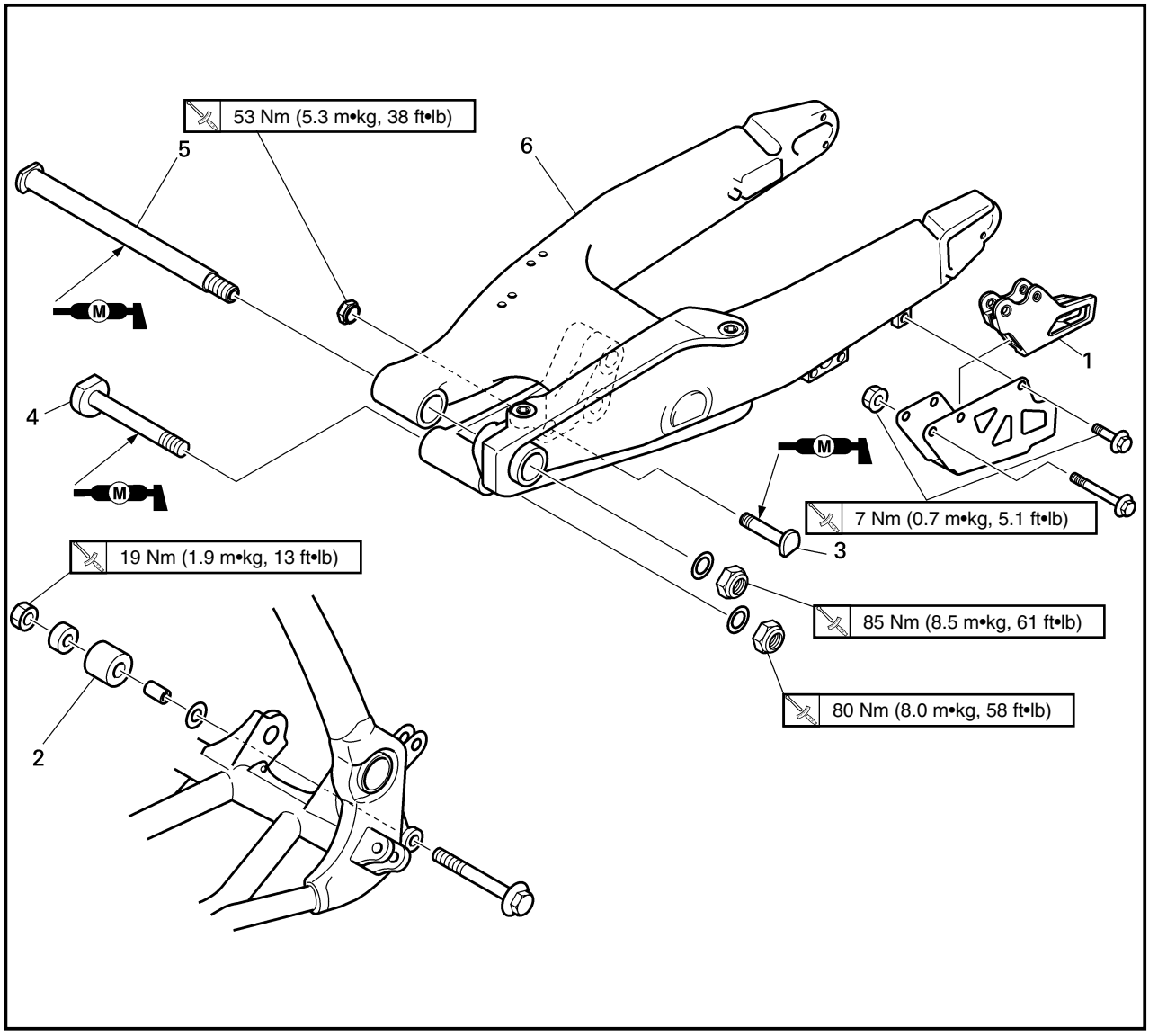
    - Pinch bolt (under bracket) ②

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.

EC570000
SWINGARM

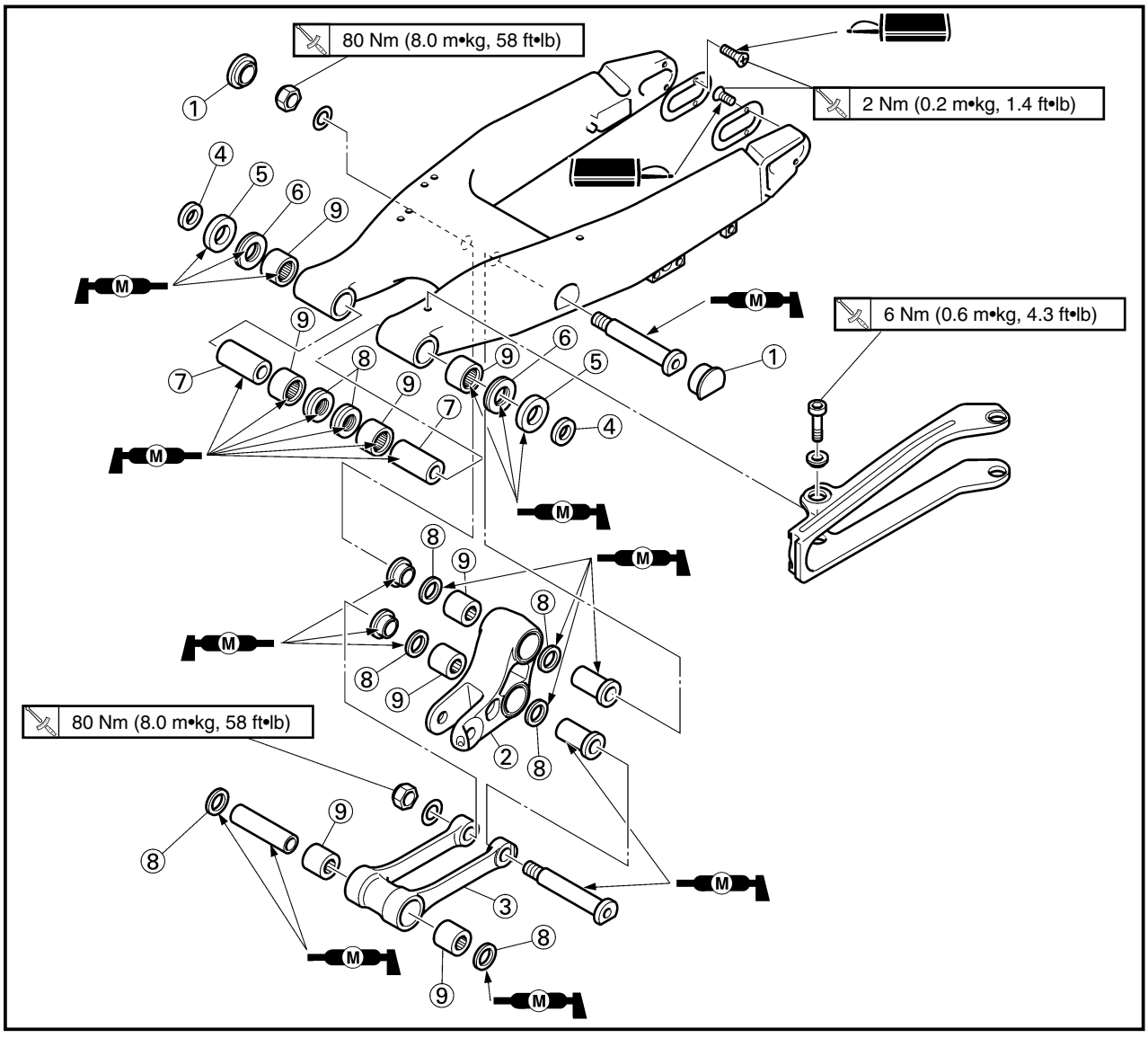


Extent of removal: ① Swingarm removal

Extent of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		**SWINGARM REMOVAL** Hold the machine by placing the suitable stand under the engine. Brake hose holder Rear caliper Bolt (brake pedal) Drive chain		**⚠WARNING** **Support the machine securely so there is no danger of it falling over.** Refer to "FRONT BRAKE AND REAR BRAKE"section. Shift the brake pedal backward.
①	1 2 3 4 5 6	Chain support Chain tensioner (lower) Bolt (rear shock absorber-relay arm) Bolt (connecting rod) Pivot shaft Swingarm	1 1 1 1 1 1	Hold the swingarm.

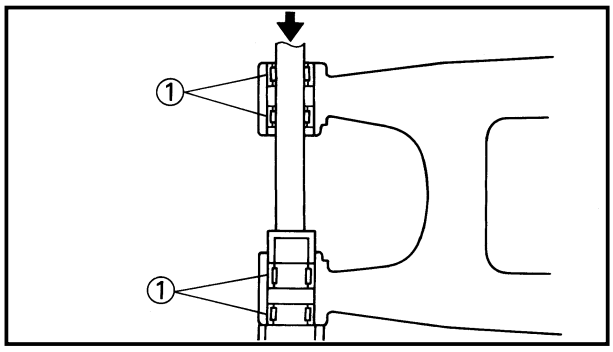
EC578000

SWINGARM DISASSEMBLY



Extent of removal: ① Swingarm disassembly ② Connecting rod removal and disassembly
③ Relay arm removal and disassembly

Extent of removal	Order	Part name	Q'ty	Remarks
		SWINGARM DISASSEMBLY		
③	①	Cap	2	
	②	Relay arm	1	
②	③	Connecting rod	1	
	④	Collar	2	
①	⑤	Oil seal	2	
	⑥	Thrust bearing	2	
	⑦	Bush	2	
	⑧	Oil seal	8	
② ③	⑨	Bearing	8	Refer to "REMOVAL POINTS".



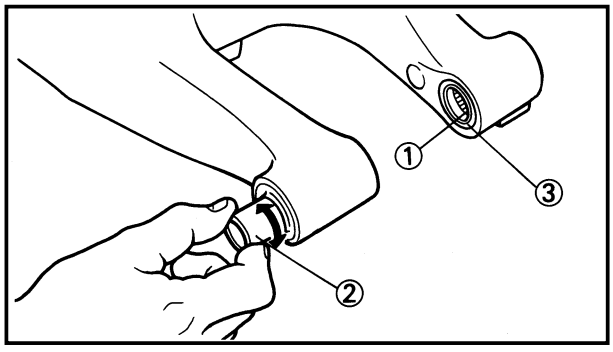
EC573000
REMOVAL POINTS

EC573201
Bearing

1. Remove:
   - Bearing ①

NOTE:

Remove the bearing by pressing its outer race.



EC574010
INSPECTION

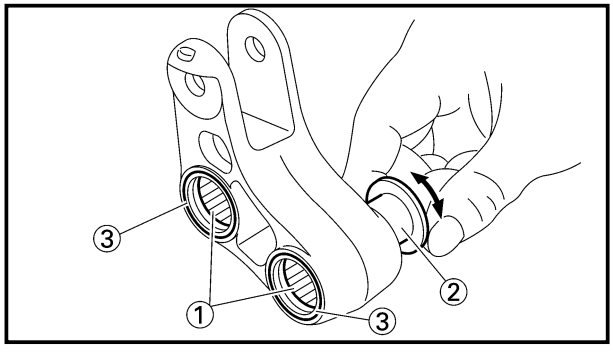
Wash the bearings, bushes, collars, and covers in a solvent.

EC574111
Swingarm

1. Inspect:
   - Bearing ①
   - Bush ②

   Free play exists/Unsmooth revolution/Rust → Replace bearing and bush as a set.
2. Inspect:
   - Oil seal ③

   Damage → Replace.



EC574211
Relay arm

1. Inspect:
   - Bearing (polylube bearing) ①
   - Collar ②

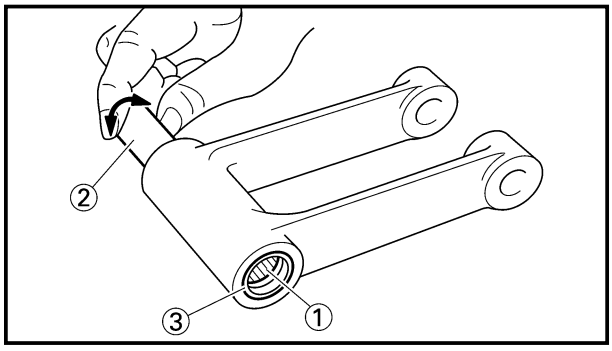
   Free play exists/Unsmooth revolution/Rust → Replace bearing and collar as a set.
2. Inspect:
   - Bearing (polylube bearing) ①

   Loss of solid lubrication → Replace.
   - Oil seal ③

   Damage → Replace.

NOTE:

Polylube bearings, with solid lubrication, have been adopted with the intent to make the needle bearings, used in this model, maintenance free. With polylube bearings, no grease nipple and regular lubrication is necessary. However, grease should be applied to all oil seals and collars when removed or installed.



EC574311
Connecting rod

1. Inspect:
   - Bearing (polylube bearing) ①
   - Collar ②

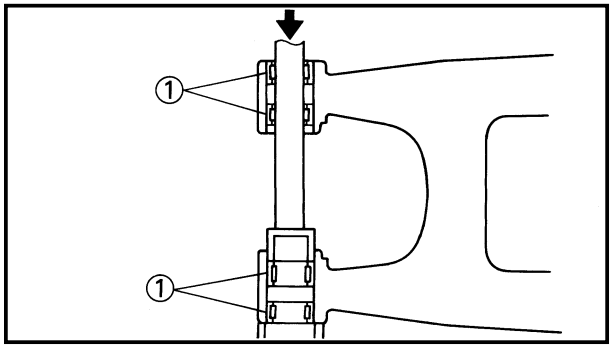
   Free play exists/Unsmooth revolution/Rust → Replace bearing and collar as a set.
2. Inspect:
   - Bearing (polylube bearing) ①

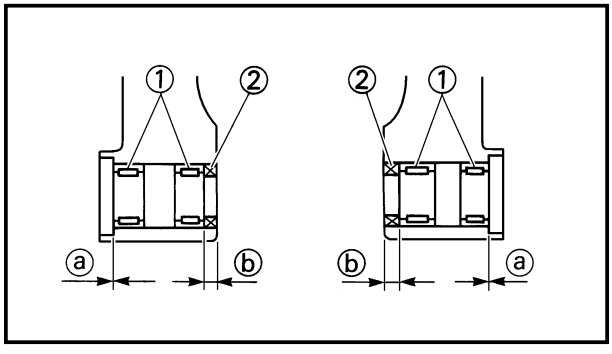
   Loss of solid lubrication → Replace.
   - Oil seal ③

   Damage → Replace.

NOTE:

Polylube bearings, with solid lubrication, have been adopted with the intent to make the needle bearings, used in this model, maintenance free. With polylube bearings, no grease nipple and regular lubrication is necessary. However, grease should be applied to all oil seals and collars when removed or installed.





EC575000
ASSEMBLY AND INSTALLATION

EC575202
Bearing and oil seal

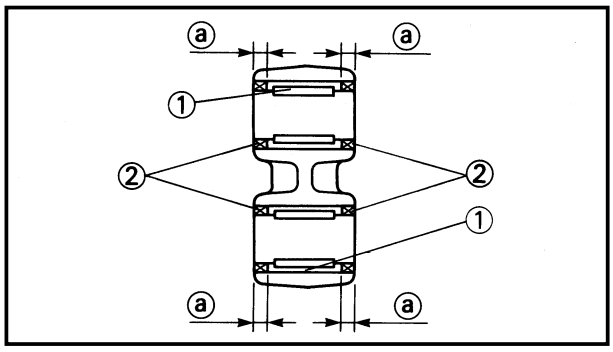
1. Install:
   - Bearing ①
   - Oil seal ②

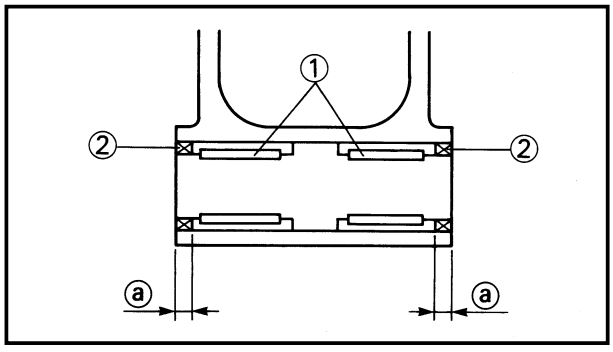
   To swingarm.

NOTE:

- Apply the molybdenum disulfide grease on the bearing when installing.
- Install the bearing by pressing it on the side having the manufacture's marks or numbers.
- First install the outer and then the inner bearings to a specified depth from inside.

Installed depth of bearings:
Outer ⓐ: Zero mm (Zero in)
Inner ⓑ: 8.5 mm (0.33 in)





2. Install:
   - Bearing ①
   - Oil seal ②

   To relay arm.

NOTE:

- Apply the molybdenum disulfide grease on the bearing when installing.
- Install the bearing by pressing it on the side having the manufacture's marks or numbers.

Installed depth of bearings ⓐ:
5 mm (0.20 in)

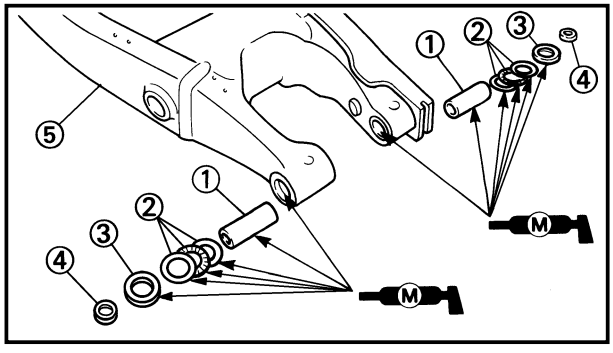
3. Install:
   - Bearing ①
   - Oil seal ②

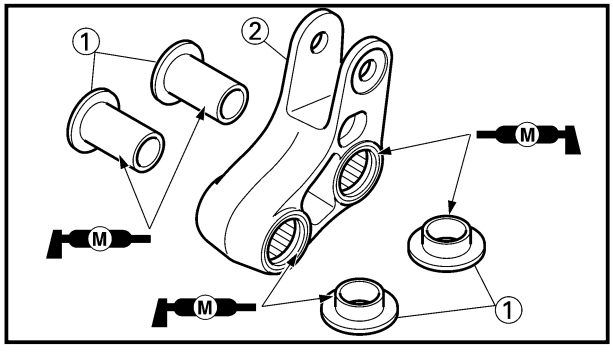
   To connecting rod.

NOTE:

- Apply the molybdenum disulfide grease on the bearing when installing.
- Install the bearing by pressing it on the side having the manufacture's marks or numbers.

Installed depth of bearings ⓐ:
5 mm (0.20 in)





EC5751B3

Swingarm

1. Install:
   - Bush ①
   - Thrust bearing ②
   - Oil seal ③
   - Collar ④

   To swingarm ⑤.

NOTE:

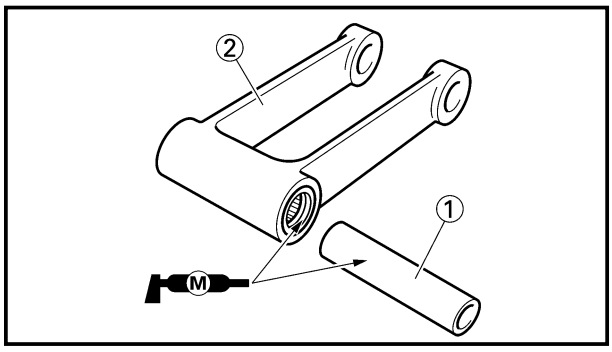
Apply the molybdenum disulfide grease on the bushes, thrust bearings and oil seal lips.

2. Install:
   - Collar ①

   To relay arm ②.

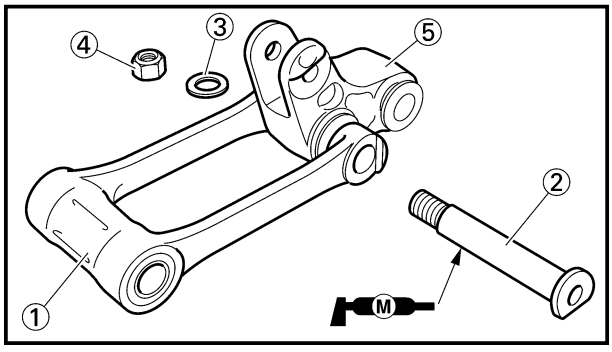
NOTE:

Apply the molybdenum disulfide grease on the collars and oil seal lips.



3. Install:
   - Collar ①
     To connecting rod ②.

NOTE:
Apply the molybdenum disulfide grease on the collar and oil seal lips.

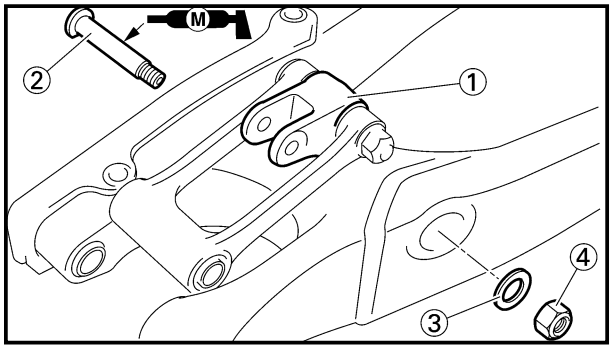


4. Install:
   - Connecting rod ①
   - Bolt (connecting rod) ②
   - Plain washer ③
   - Nut (connecting rod) ④

     80 Nm (8.0 m•kg, 58 ft•lb)

     To relay arm ⑤.

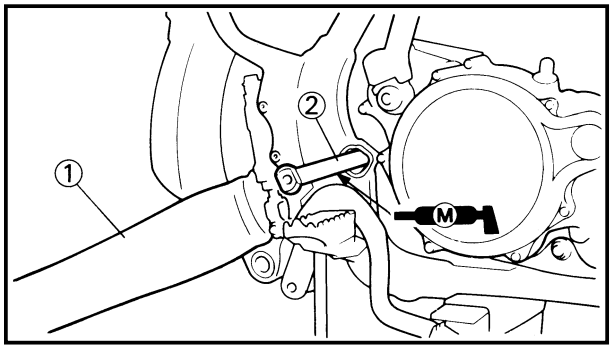
NOTE:
Apply the molybdenum disulfide grease on the bolt.



5. Install:
   - Relay arm ①
   - Bolt (relay arm) ②
   - Plain washer ③
   - Nut (relay arm) ④

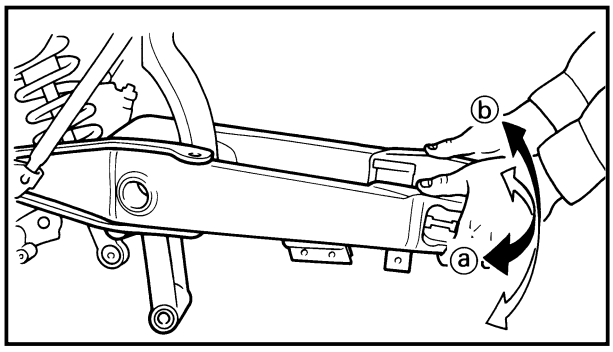
     To swingarm.

NOTE:
- Apply the molybdenum disulfide grease on the bolt.
- Do not tighten the nut yet.

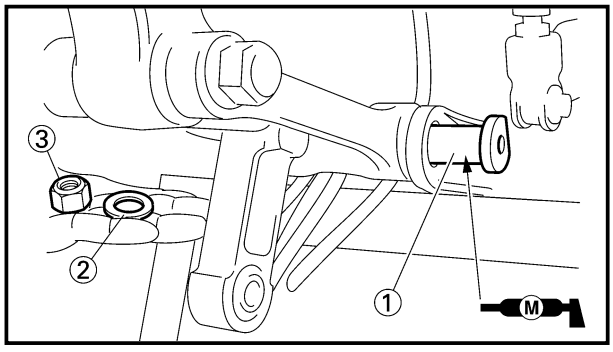


6. Install:
   - Swingarm ①
   - Pivot shaft ② **85 Nm (8.5 m•kg, 61 ft•lb)**

NOTE:
- Apply the molybdenum disulfide grease on the pivot shaft.
- Insert the pivot shaft from right side.

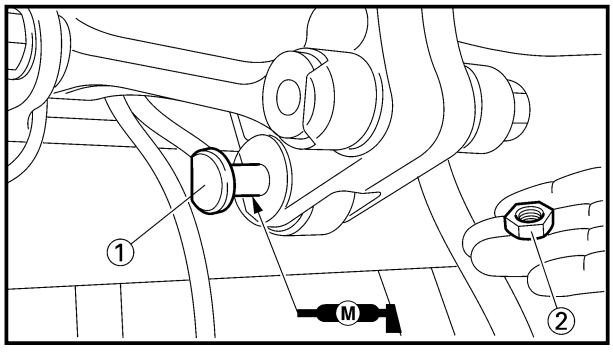


7. Check:
   - Swingarm side play ⓐ
     Free play exists → Replace thrust bearing.
   - Swingarm up and down movement ⓑ
     Unsmooth movement/Binding/Rough spots→Grease or replace bearings, bushes and collars.



8. Install:
   - Bolt (connecting rod) ①
   - Plain washer ②
   - Nut (connecting rod) ③

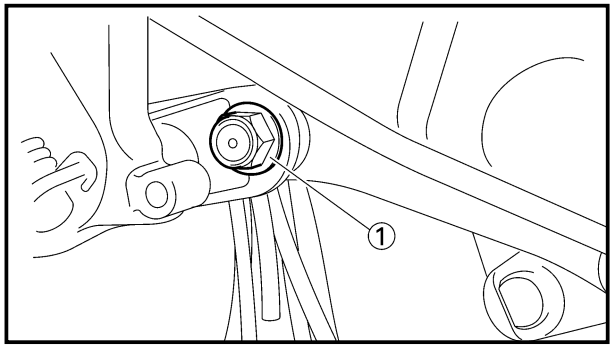
NOTE:
- Apply the molybdenum disulfide grease on the bolt.
- Do not tighten the nut yet.



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

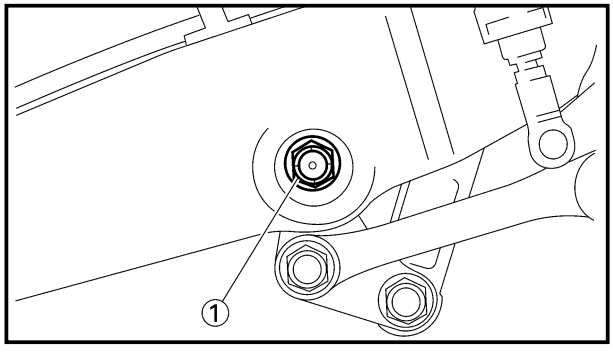
53 Nm (5.3 m•kg, 38 ft•lb)

NOTE:
Apply the molybdenum disulfide grease on the bolt.



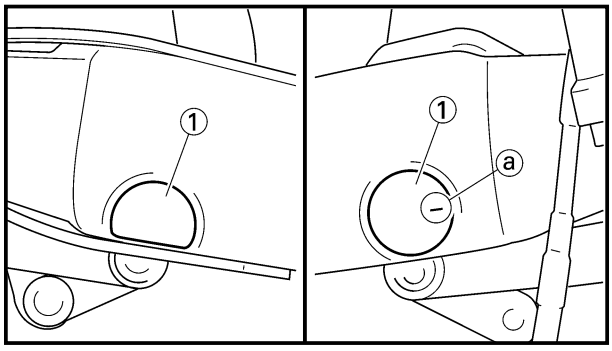
10. Tighten:
    - Nut (connecting rod) ①

80 Nm (8.0 m•kg, 58 ft•lb)



11. Tighten:
    - Nut (relay arm) ①

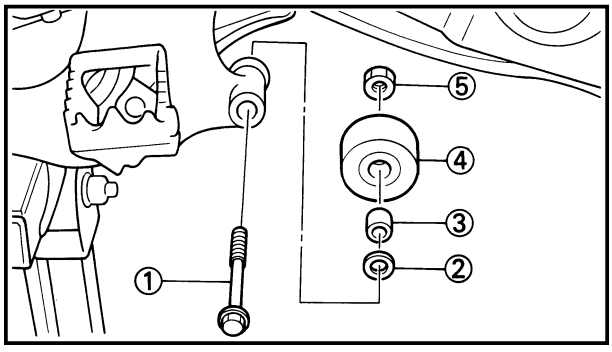
80 Nm (8.0 m•kg, 58 ft•lb)



12. Install:
    - Cap ①

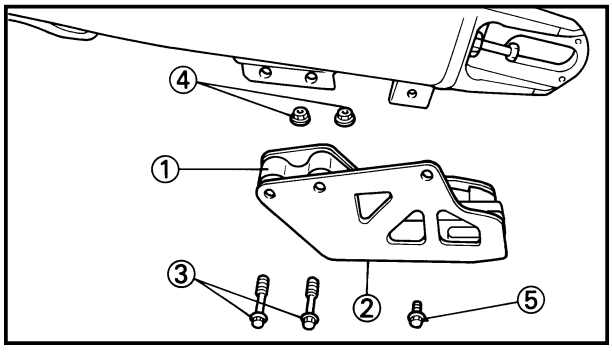
NOTE:

Install the cap (right) with its mark ⓐ facing forward.



13. Install:
    - Bolt [chain tensioner (lower)] ①
    - Plain washer ②
    - Collar ③
    - Chain tensioner ④
    - Nut [chain tensioner (lower)] ⑤

19 Nm (1.9 m•kg, 13 ft•lb)



14. Install:
    - Chain support ①
    - Support cover ②
    - Bolt {chain support [ℓ=50mm (1.97in)]} ③
    - Nut (chain support) ④

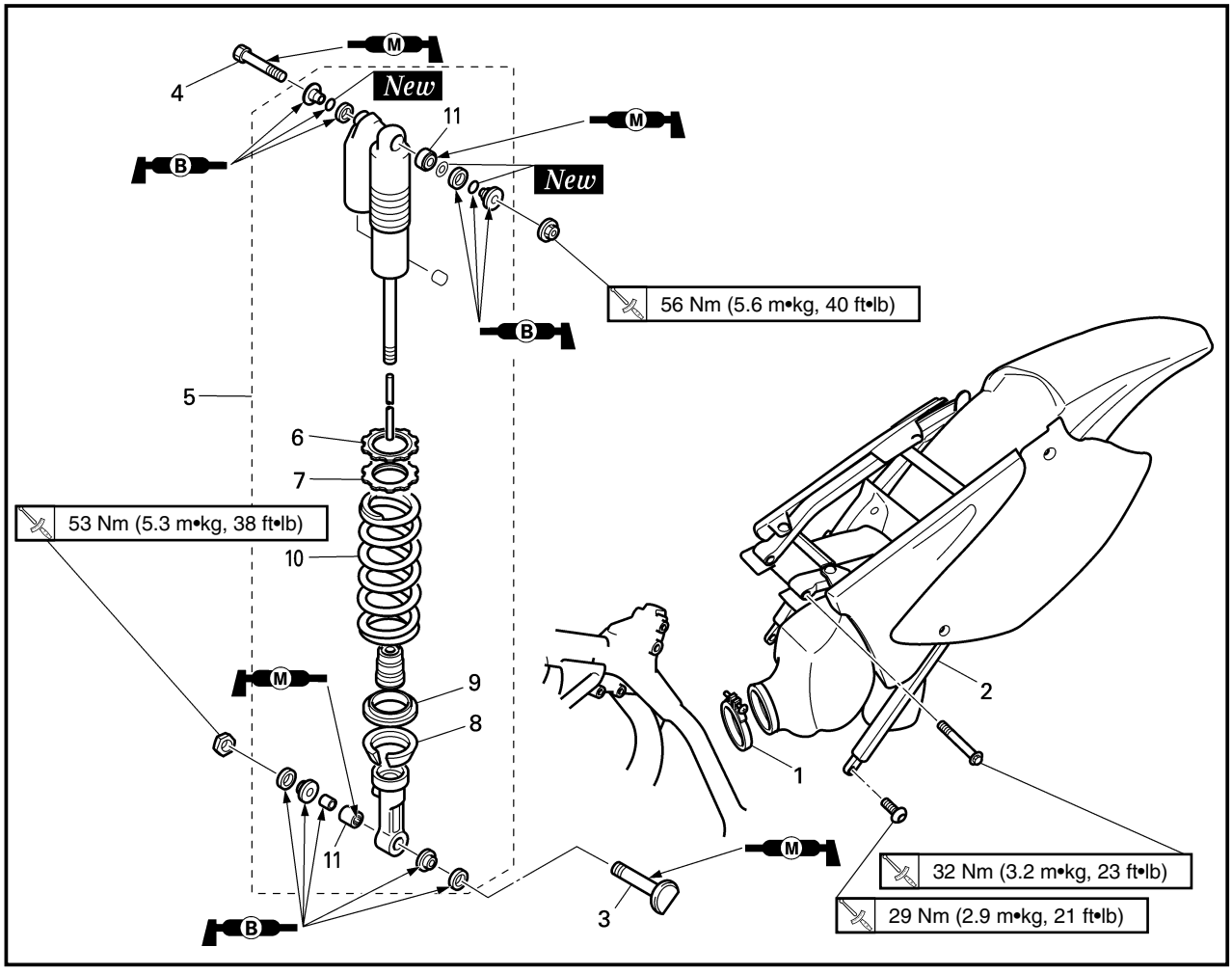
7 Nm (0.7 m•kg, 5.1 ft•lb)

    - Bolt { support cover [ℓ=10mm (0.39in)]} ⑤

7 Nm (0.7 m•kg, 5.1 ft•lb)

EC580000

REAR SHOCK ABSORBER



Extent of removal: ① Rear shock absorber removal ② Rear shock absorber disassembly

Extent of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		**REAR SHOCK ABSORBER REMOVAL** Hold the machine by placing the suitable stand under the engine. Seat Silencer		**⚠WARNING** **Support the machine securely so there is no danger of it falling over.** Refer to "SEAT, FUEL TANK AND SIDE COVERS" section. Refer to "EXHAUST PIPE AND SILENCER" section.
① ②	1	Clamp (air cleaner joint)	1	Loosen the screw (air cleaner joint).
	2	Rear frame	1	
	3	Bolt (rear shock absorber-relay arm)	1	Hold the swingarm.
	4	Bolt (rear shock absorber-frame)	1	
	5	Rear shock absorber	1	
	6	Locknut	1	
	7	Adjuster	1	
	8	Spring guide (lower)	1	
	9	Spring guide (upper)	1	
	10	Spring (rear shock absorber)	1	
	11	Bearing	2	Refer to "REMOVAL POINTS".

EC586000
HANDLING NOTE

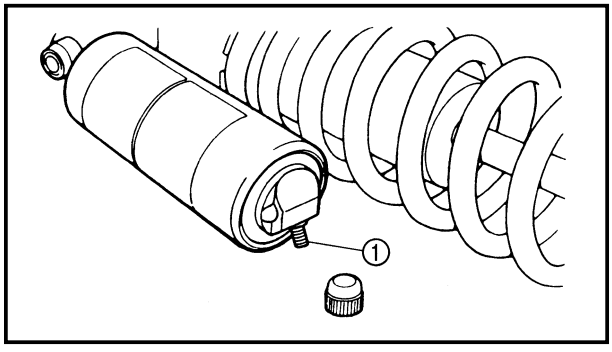
⚠WARNING

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.**

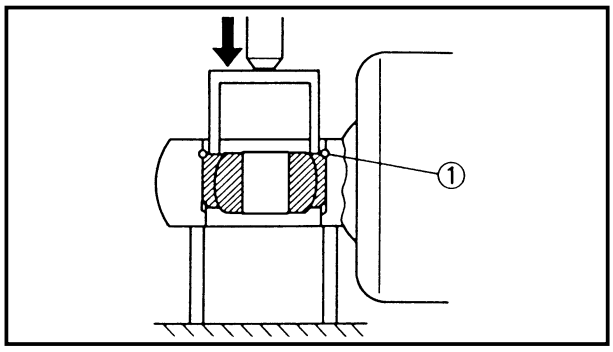
EC587000
NOTES ON DISPOSAL (YAMAHA DEALERS ONLY)

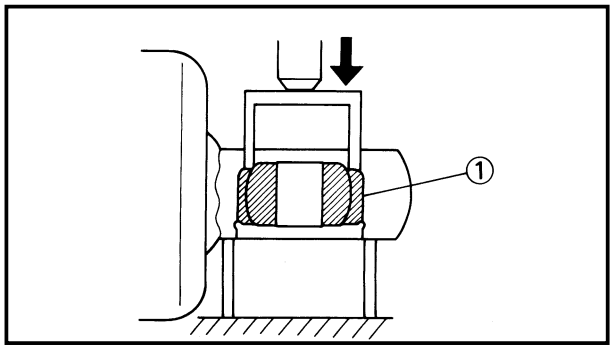
Before disposing the shock absorber, be sure to extract the nitrogen gas from valve ①. Wear eye protection to prevent eye damage from escaping gas and/or metal chips.

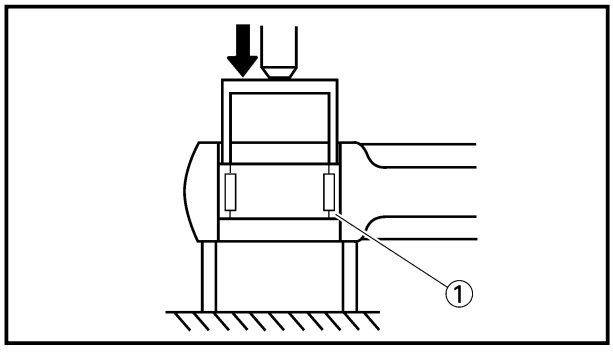


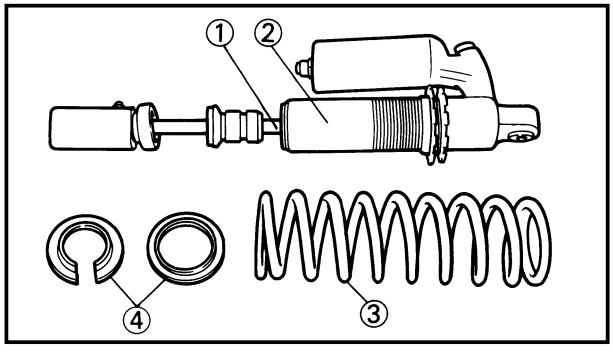
⚠WARNING

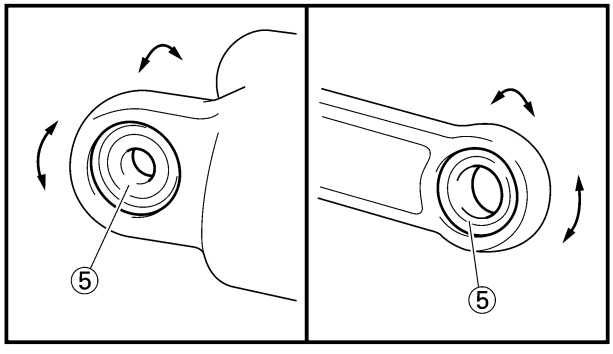
To dispose of a damaged or worn-out shock absorber, take the unit to your Yamaha dealer for this disposal procedure.











EC583000
REMOVAL POINTS

EC583320
Bearing

1. Remove:
   - Stopper ring (upper bearing) ①

NOTE:

Press in the bearing while pressing its outer race and remove the stopper ring.

2. Remove:
   - Upper bearing ①

NOTE:

Remove the bearing by pressing its outer race.

3. Remove:
   - Lower bearing ①

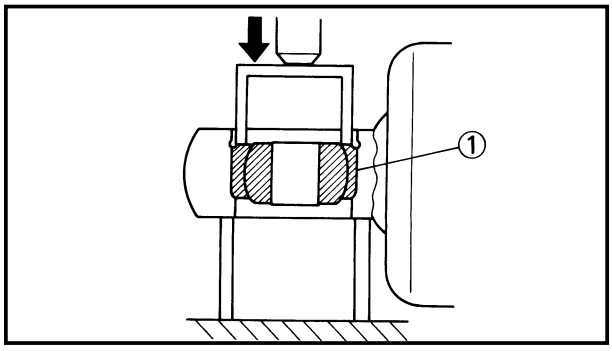
NOTE:

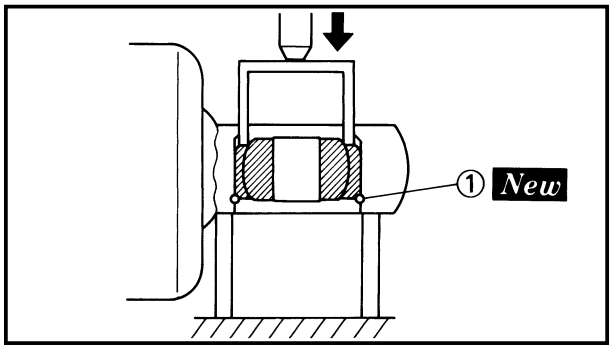
Remove the bearing by pressing its outer race.

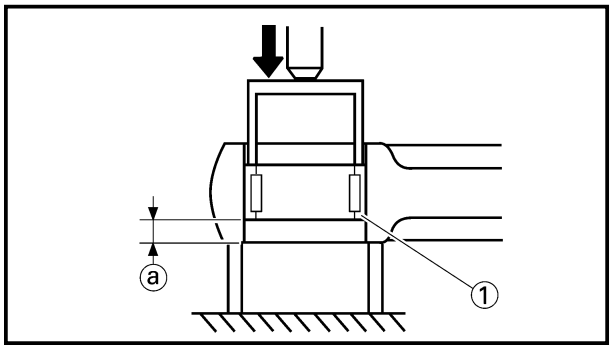
EC584000
INSPECTION

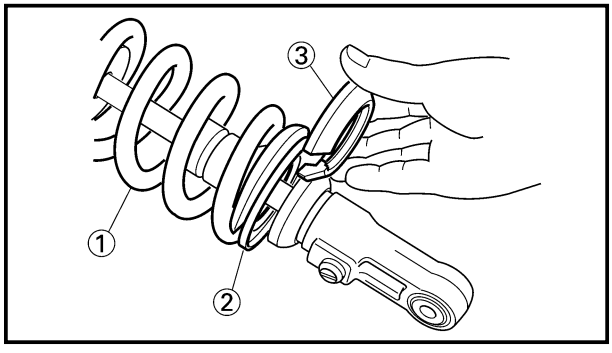
EC584110
Rear shock absorber

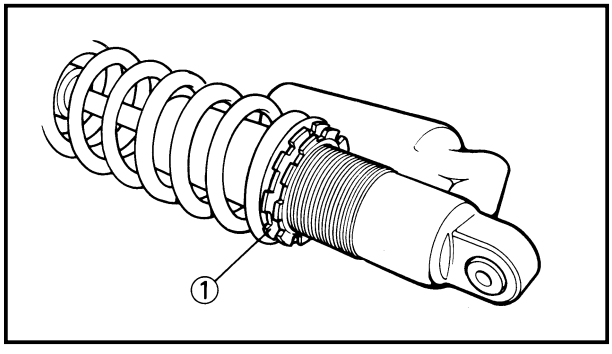
1. Inspect:
   - Damper rod ①
     Bends/Damage → Replace absorber assembly.
   - Shock absorber ②
     Oil leaks → Replace absorber assembly.
     Gas leaks → Replace absorber assembly.
   - Spring ③
     Damage → Replace spring.
     Fatigue → Replace spring.
     Move spring up and down.
   - Spring guide ④
     Wear/Damage → Replace spring guide.
   - Bearing ⑤
     Free play exists/Unsmooth revolution/ Rust → Replace.











EC585000
ASSEMBLY AND INSTALLATION

EC585320
Bearing

1. Install:
   - Upper Bearing ①

NOTE:

Install the bearing parallel until the stopper ring groove appears by pressing its outer race.

CAUTION:

Do not apply the grease on the bearing outer race because it will wear the rear shock absorber surface on which the bearing is press fitted.

2. Install:
   - Stopper ring (upper bearing) ① ***New***

NOTE:

After installing the stopper ring, push back the bearing until it contacts the stopper ring.

3. Install:
   - Lower bearing ①

NOTE:

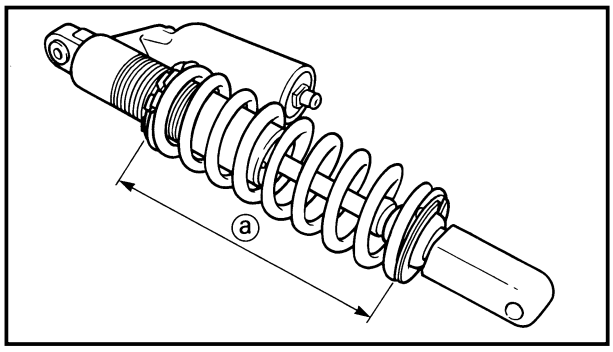
Install the bearing by pressing it on the side having the manufacture's marks or numbers.

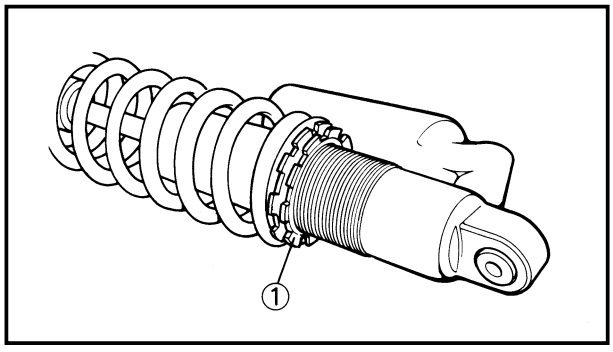
Installed depth of the bearing ⓐ:
4 mm (0.16 in)

EC585111
Spring (rear shock absorber)

1. Install:
   - Spring ①
   - Spring guide (upper) ②
   - Spring guide (lower) ③

2. Tighten:
   - Adjuster ①





3. Adjust:
   - Spring length (installed) ⓐ

Spring length (installed) ⓐ:	
Standard length	**Extent of adjustment**
251 mm (9.88 in)	**240.5~258.5 mm (9.47~10.18 in)**
***261 mm (10.28 in)**	***255.5~273.5 mm (10.06~10.77 in)**

*For EUROPE

NOTE:

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

CAUTION:

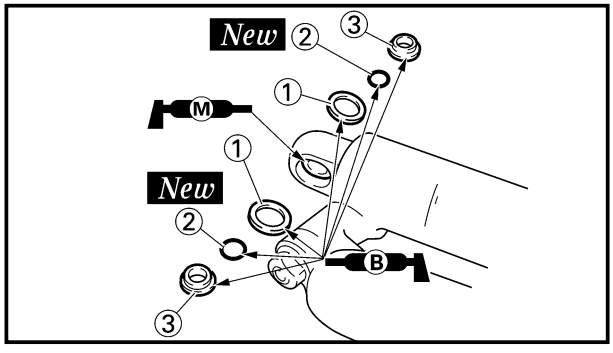
Never attempt to turn the adjuster beyond the maximum or minimum setting.

4. Tighten:
   - Locknut ①

EC5852B5

Rear shock absorber

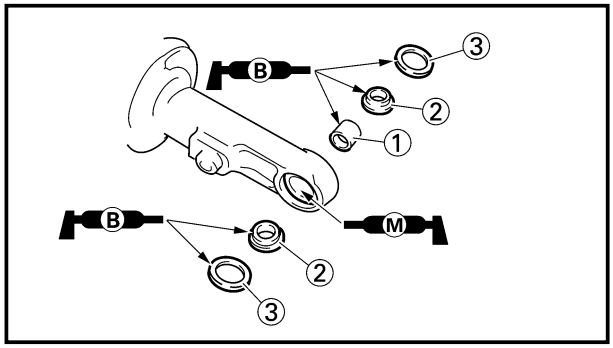
1. Install:
   - Dust seal ①
   - O-ring ② *New*
   - Collar ③



NOTE:

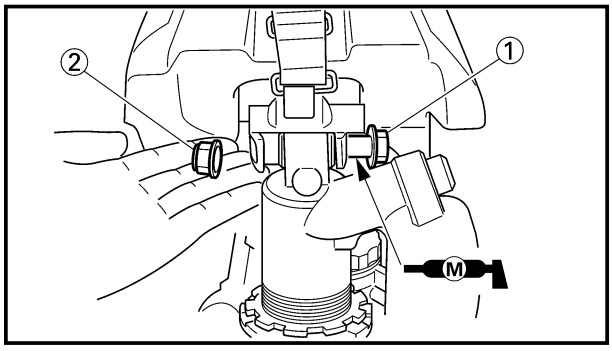
- Apply the molybdenum disulfide grease on the bearing.
- Apply the lithium soap base grease on the dust seals, O-rings and collars.

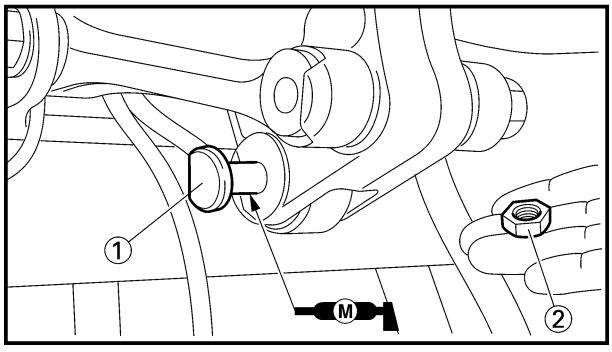
2. Install:
   - Bush ①
   - Collar ②
   - Dust seal ③

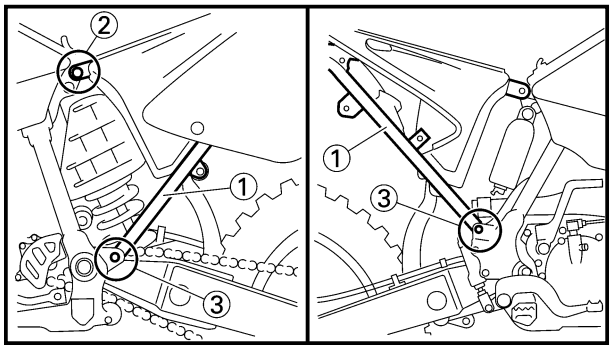


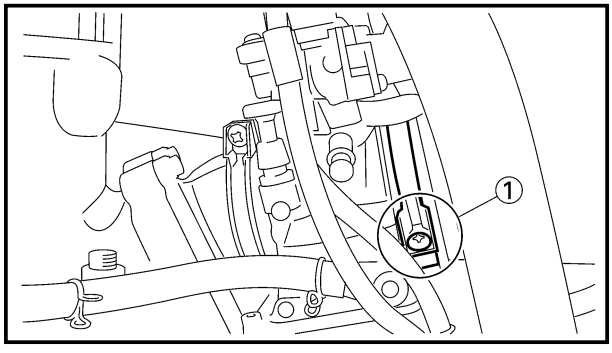
NOTE:

- Apply the molybdenum disulfide grease on the bearing.
- Apply the lithium soap base grease on the bush, collars and dust seals.
- Install the dust seals with their lips facing outward.









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

56 Nm (5.6 m•kg, 40 ft•lb)

NOTE:

Apply the molybdenum disulfide grease on the bolt.

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

53 Nm (5.3 m•kg, 38 ft•lb)

NOTE:

Apply the molybdenum disulfide grease on the bolt.

6. Install:
   - Rear frame ①
   - Bolt [rear frame (upper)] ②

32 Nm (3.2 m•kg, 23 ft•lb)

   - Bolt [rear frame (lower)] ③

29 Nm (2.9 m•kg, 21 ft•lb)

7. Tighten:
   - Screw (air cleaner joint) ①

EC600000
ELECTRICAL

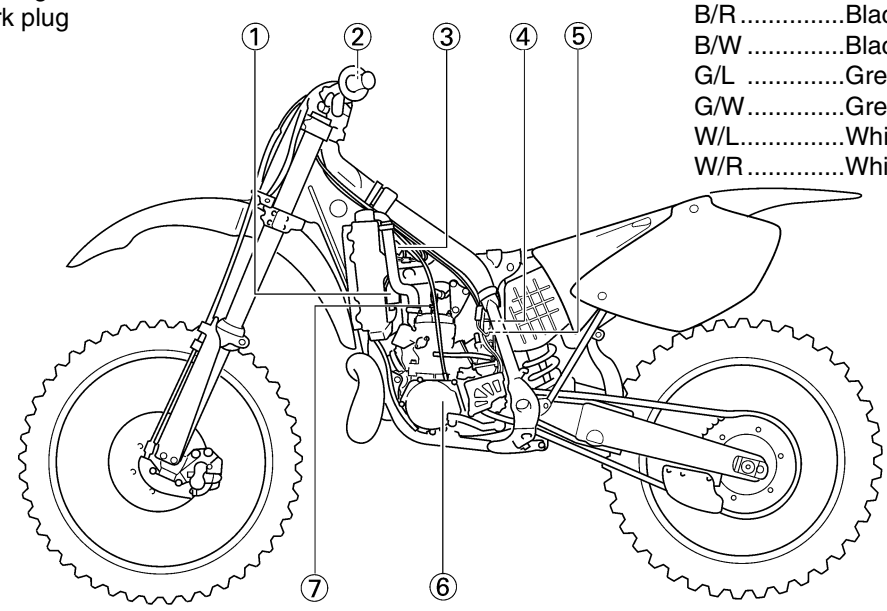
EC610000
ELECTRICAL COMPONENTS AND WIRING DIAGRAM

EC611000
ELECTRICAL COMPONENTS

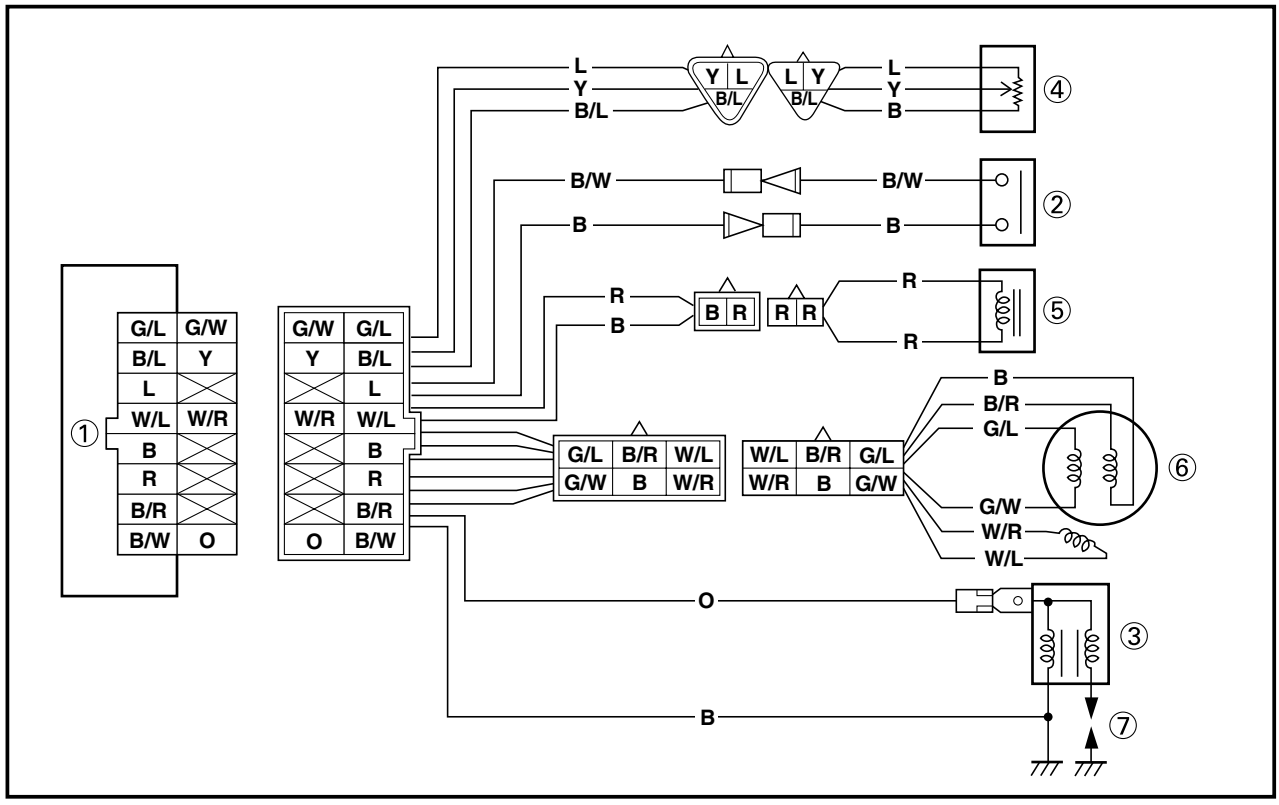
① CDI unit
② “ENGINE STOP” button
③ Ignition coil
④ TPS (throttle position sensor)
⑤ Solenoid valve
⑥ CDI magneto
⑦ Spark plug

COLOR CODE

B.....Black
L.....Blue
O.....Orange
R.....Red
Y.....Yellow
B/L.....Black/Blue
B/R.....Black/Red
B/W.....Black/White
G/L.....Green/Blue
G/W.....Green/White
W/L.....White/Blue
W/R.....White/Red



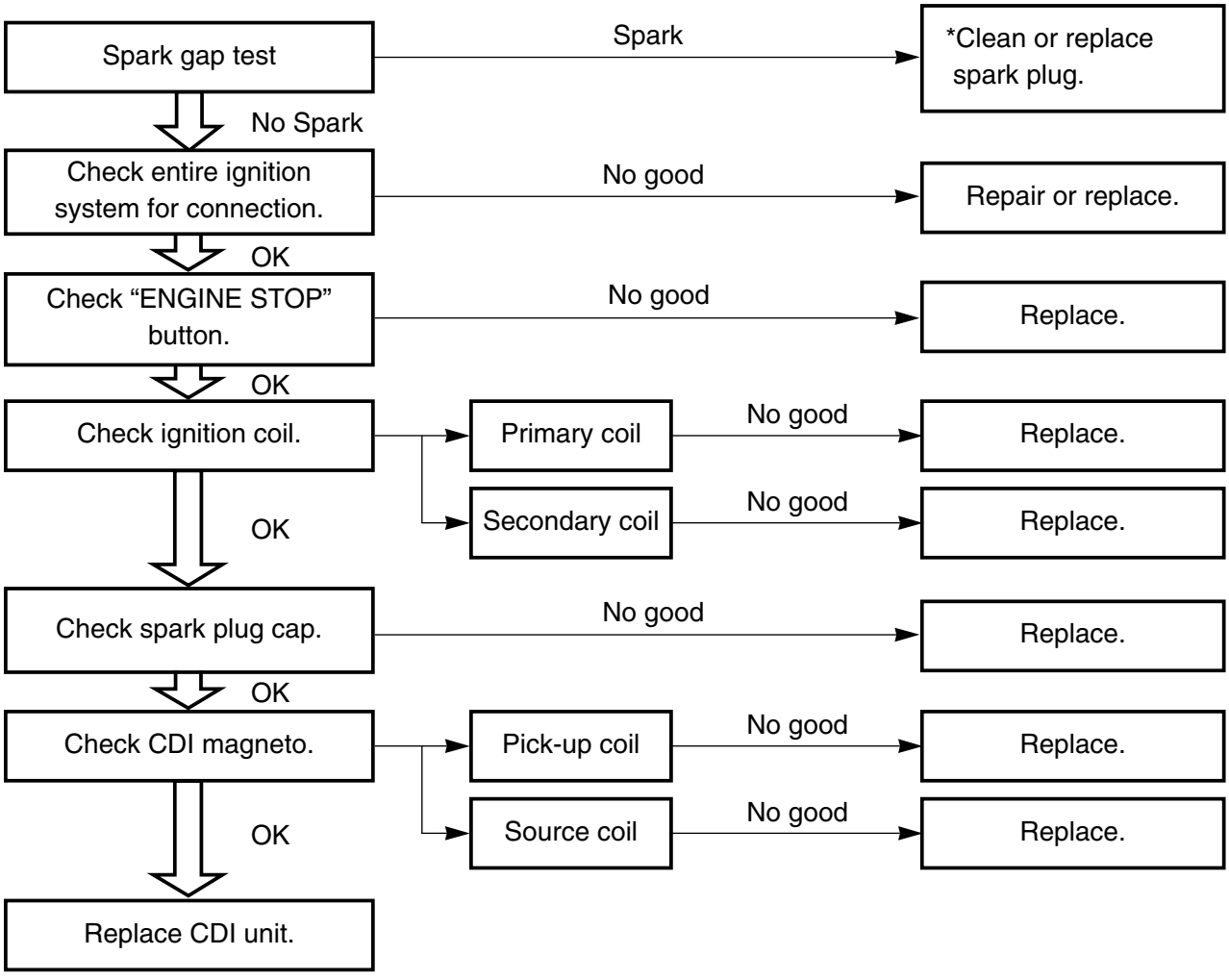
EC612000
WIRING DIAGRAM



EC620000
IGNITION SYSTEM

EC621003
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.



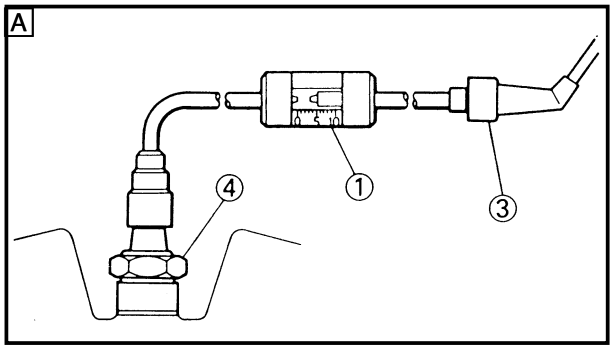
***marked: Only when the ignition checker is used.**

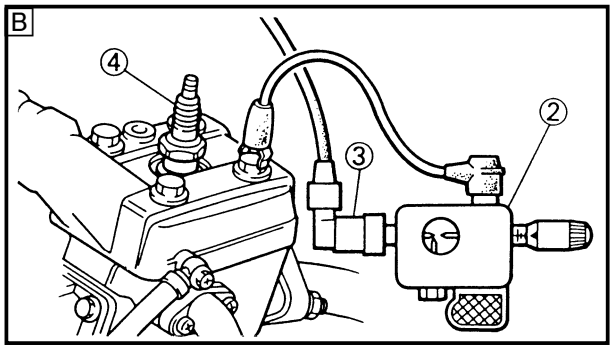
NOTE:

- 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-3112-C/90890-03112





EC622001
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

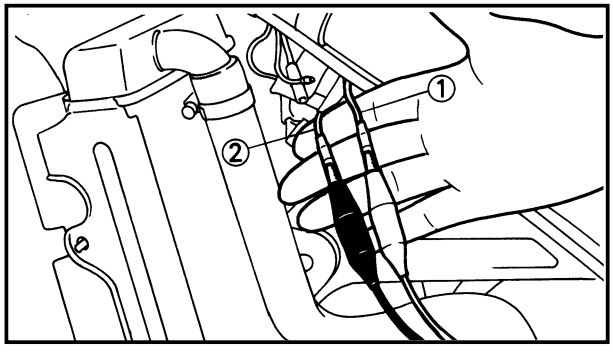
A For USA and CDN
B Except for USA and CDN

3. Kick the kick starter.
4. Check the ignition spark gap.
5. Start engine, and increase spark gap until misfire occurs. (for USA and CDN only)

Minimum spark gap:
6.0 mm (0.24 in)

EC624000
COUPLERS AND LEADS CONNECTION INSPECTION

1. Check:
   - Couplers and leads connection
     Rust/ Dust/ Looseness/Short-circuit → Repair or replace.



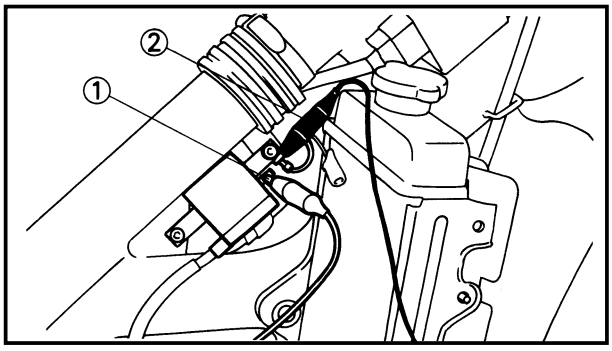
EC625002
"ENGINE STOP" BUTTON INSPECTION

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			

Not continuous while being pushed → Replace.
Continuous while being freed → Replace.

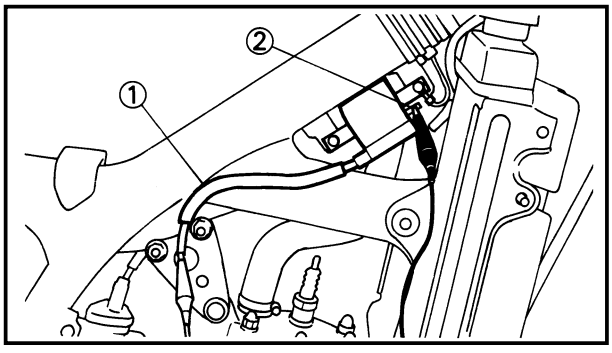


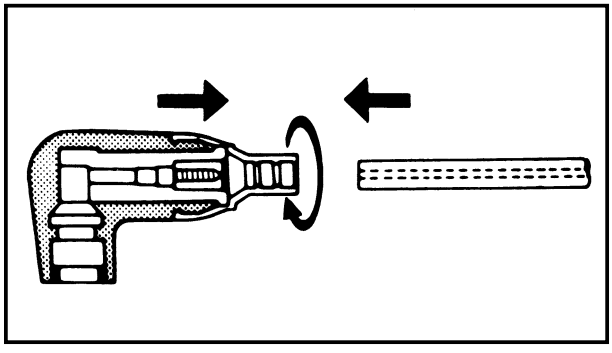
EC626003
IGNITION COIL INSPECTION

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
	0.20~0.30Ω at 20°C (68°F)	Ω × 1





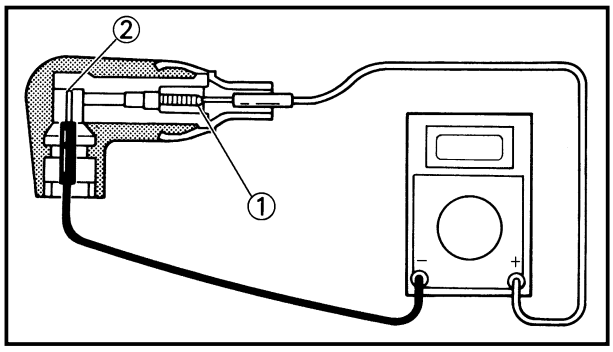
2. Inspect:
   - Secondary coil resistance
     Out of specification → Replace.

Tester (+) lead→Spark plug lead ①
Tester (–) lead→Orange lead ②

	Secondary coil resistance	Tester selector position
	9.5~14.3kΩ at 20°C (68°F)	kΩ × 1

NOTE:

- Remove the spark plug cap by turning it counterclockwise and inspect.
- Install the spark plug cap by turning it clockwise until it is tight.



EC62B000

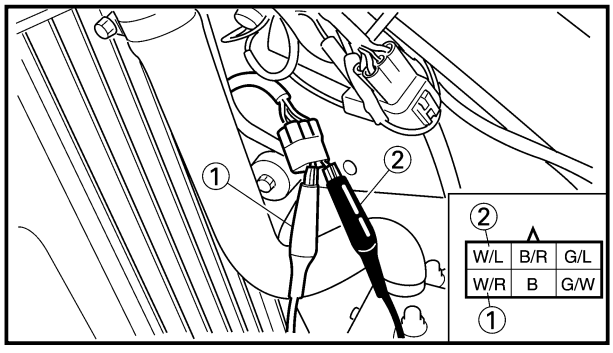
SPARK PLUG CAP INSPECTION

1.Inspect:

- Spark plug cap
  Loose connection → Tighten.
  Deteriorated/Damaged → Replace.
- Spark plug cap resistance
  Out of specification → Replace.

Tester (+) lead→Spark plug lead terminal ①
Tester (–) lead→Spark plug terminal ②

	Spark plug cap resistance	Tester selector position
	4~6kΩ at 20°C (68°F)	kΩ × 1



EC627011

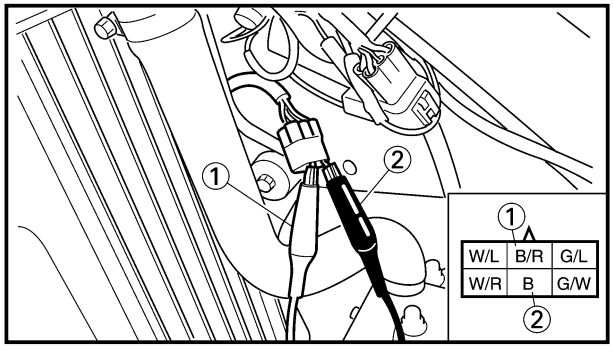
CDI MAGNETO INSPECTION

1. Inspect:
   - Pick-up coil resistance
     Out of specification → Replace.

Tester (+) lead→White/Red lead ①
Tester (–) lead→White/Blue lead ②

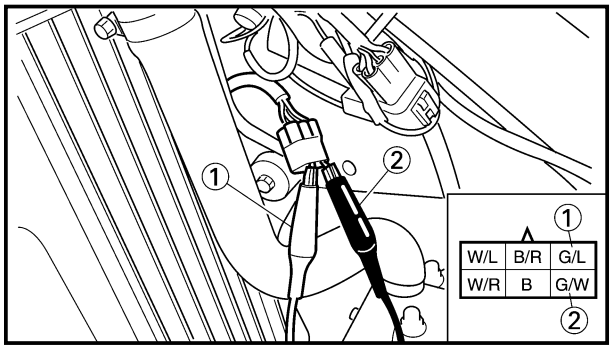
	Pick–up coil resistance	Tester selector position
	248~372Ω at 20°C (68°F)	Ω × 100

2. Inspect:
   - Source coil 1 resistance
     Out of specification → Replace.



Tester (+) lead→Black/Red lead ①
Tester (–) lead→Black lead ②

	Source coil 1 resistance	Tester selector position
	720~1,080Ω at 20°C (68°F)	Ω × 100



3. Inspect:
   - Source coil 2 resistance
     Out of specification → Replace.

Tester (+) lead→Green/Blue lead ①
Tester (–) lead→Green/White lead ②

	Source coil 2 resistance	Tester selector position
	44~66Ω at 20°C (68°F)	**Ω × 10**

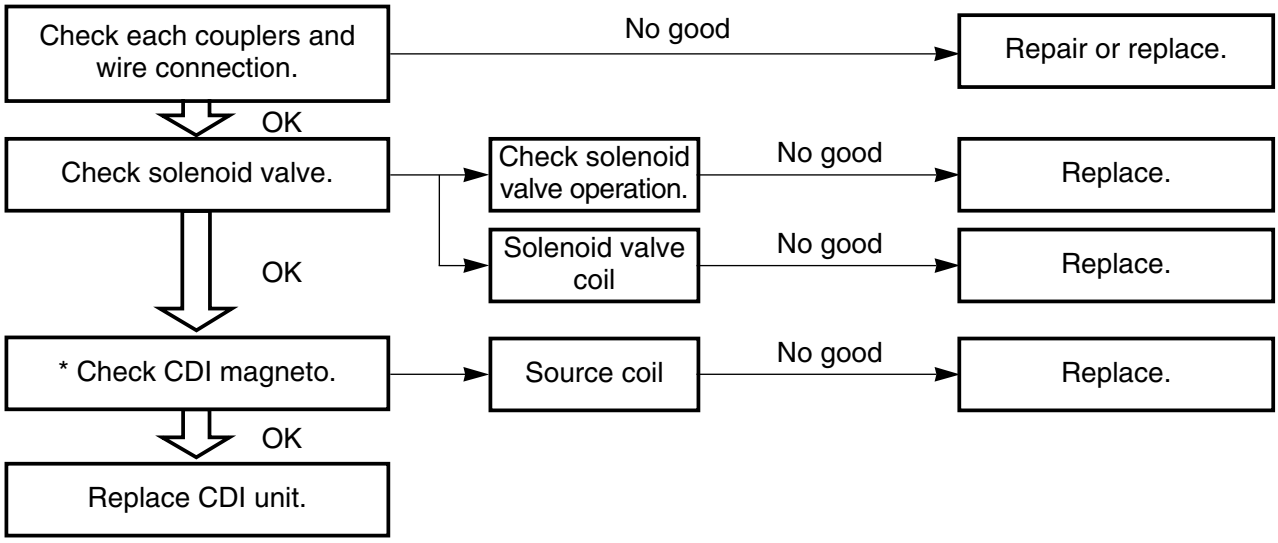
EC628000
CDI UNIT INSPECTION

Check all electrical components. If no fault is found, replace the CDI unit. Then check the electrical components again.

EC650001
SOLENOID VALVE SYSTEM

EC651032
INSPECTION STEPS

If the solenoid valve will not operate, use the following inspection steps.



*** marked: Refer to "IGNITION SYSTEM" section.**

NOTE:

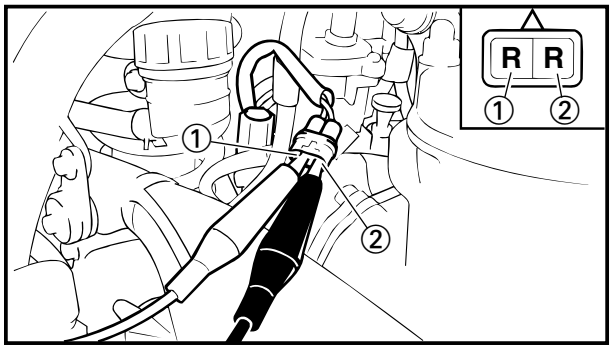
- Remove the following parts before inspection.
  1) Seat
  2) Fuel tank
- Use l2V battery in this inspection.
- Use the following special tools in this inspection.

Pocket tester:
YU-3112-C/90890-03112

EC624000

COUPLERS AND LEADS CONNECTION INSPECTION

1. Check:
   - Couplers and leads connection
     Rust/ Dust/ Looseness/Short-circuit → Repair or replace.

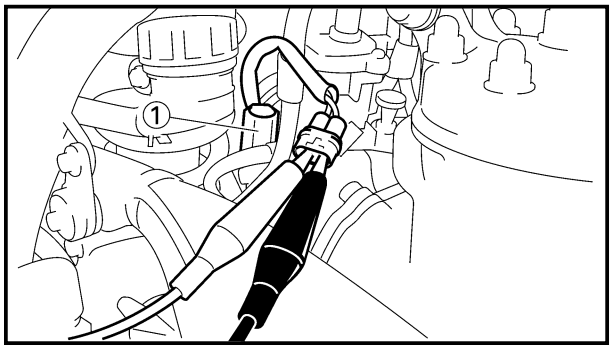


EC652040

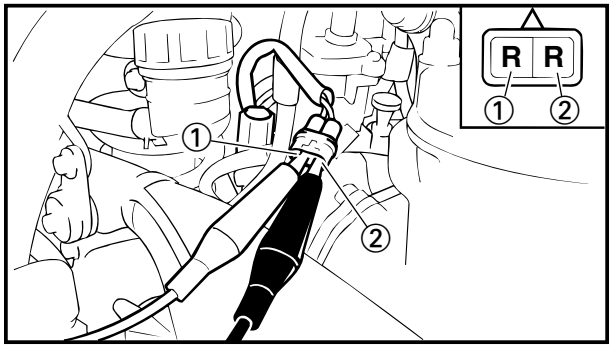
SOLENOID VALVE OPERATION

1. Disconnect the solenoid valve coupler.
2. Connect 12V battery to the solenoid valve coupler.

Battery (+) lead→Red lead ①
Battery (–) lead→Red lead ②



3. Inspectt:
   - Solenoid valve ①
     No click when connecting the battery → Replace.



EC653002

SOLENOID VALVE COIL INSPECTION

1. Inspect:
   - Solenoid valve coil resistance
     Out of specification → Replace.

Tester (+) lead→Red lead ①
Tester (–) lead→Red lead ②

	Solenoid resistance	Tester selector position
	22.8~27.8Ω at 20°C (68°F)	**Ω × 10**

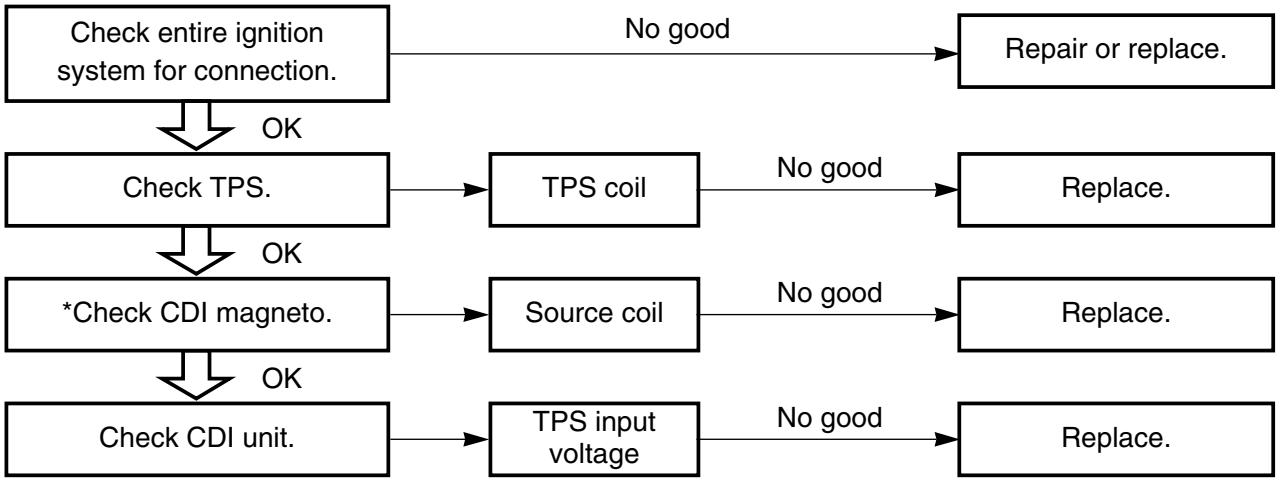
EC690000

TPS (THROTTLE POSITION SENSOR) SYSTEM

EC691001

INSPECTION STEPS

If the TPS will not operate, use the following inspection steps.



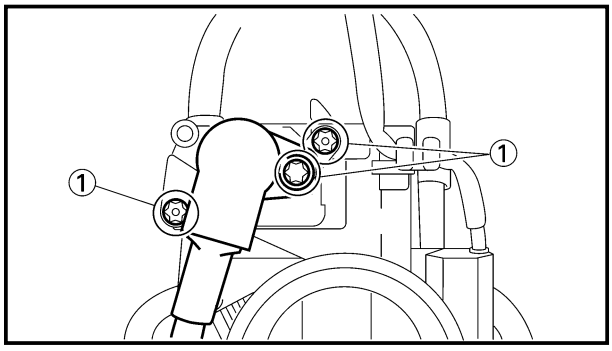
***marked: Refer to "IGNITION SYSTEM" section.**

NOTE:

- Remove the following parts before inspection.
  1) Seat
  2) Fuel tank
- Use the following special tools in this inspection.

Pocket tester:
YU-3112-C/90890-03112

Inductive tachometer:
YU-8036-B
Engine tachometer:
90890-03113



EC69A000

HANDLING NOTE

CAUTION:

Do not loosen the screws {TPS (throttle position sensor)} except when changing the TPS (throttle position sensor) due to failure because it will cause a drop in engine performance.

EC624000

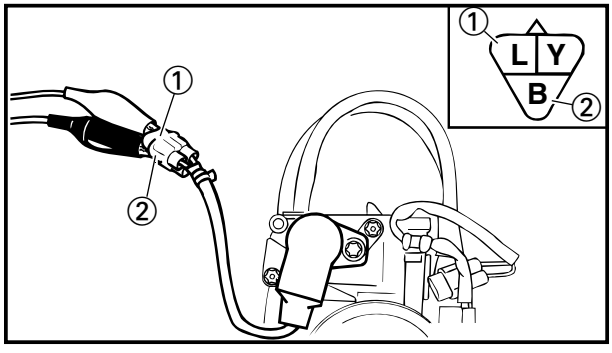
COUPLERS AND LEADS CONNECTION INSPECTION

1. Check:
   - Couplers and leads connection
     Rust/ Dust/ Looseness/Short-circuit → Repair or replace.

EC692000

TPS COIL INSPECTION

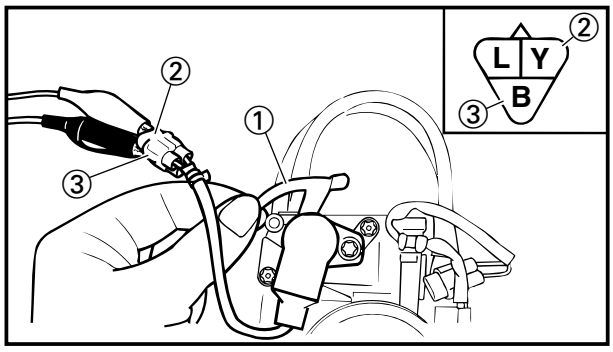
1. Remove:
   - Carburetor
   - Mixing chamber top
     Refer to "CARBURETOR AND REED VALVE" section in the CHAPTER 4.



2. Inspect:
   - TPS coil resistance
     Out of specification → Replace.

Tester (+) lead→Blue lead ①
Tester (–) lead→Black lead ②

	TPS coil resistance	Tester selector position
	4~6kΩ at 20°C (68°F)	kΩ × 1



3. Inspect:
   - TPS coil variable resistance

   Check that the resistance in increased as the lever ① is moved from the full close position to the full open position.
   Out of specification → Replace.

Tester (+) lead→Yellow lead ②
Tester (–) lead→Black lead ③

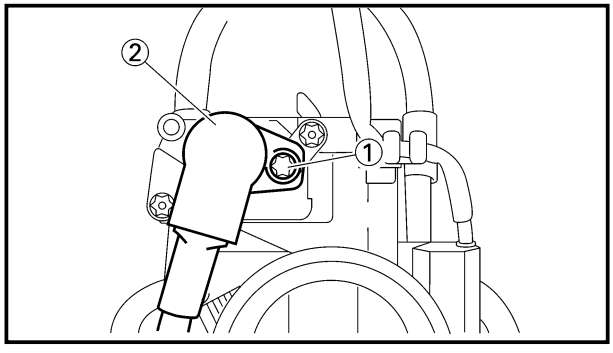
	TPS coil variable resistance		Tester selector position
	Full closed	Full opened	kΩ × 1
	Zero~2kΩ at 20°C (68°F)	4~6kΩ at 20°C (68°F)	

EC693001

TPS REPLACEMENT AND ADJUSTMENT

1. Remove:
   - Carburetor
   - Mixing chamber top

   Refer to "CARBURETOR AND REED VALVE" section in the CHAPTER 4.

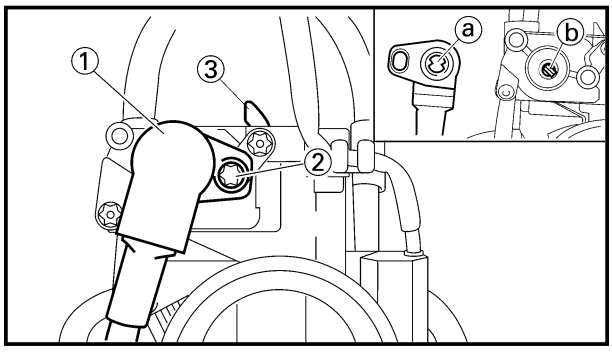


2. Remove:
   - Screw (TPS) ①
   - TPS ②

NOTE:

Loosen the screws using the T25 bit.

3. Replace:
   - TPS



4. Install:
   - TPS ①
   - Screw (TPS) ②

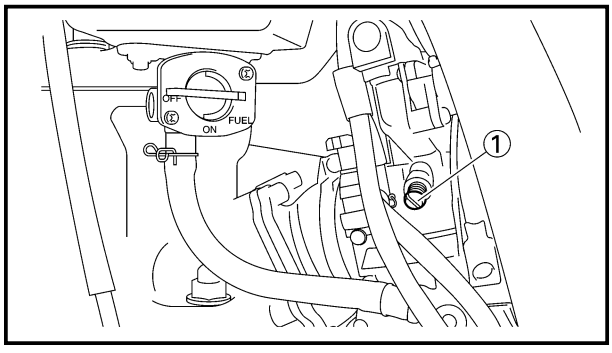
NOTE:

- Align the slot ⓐ in the TPS with the projection ⓑ on the carburetor while the lever ③ is held down.
- Temporarily tighten the screws (TPS).

5. Install:
   - Mixing chamber top
   - Carburetor

   Refer to "CARBURETOR AND REED VALVE" section in the CHAPTER 4.

6. Adjust:
   - Idle speed for TPS adjustment

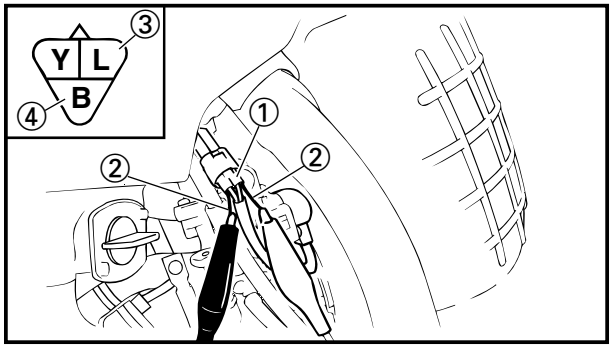


Adjustment steps:

- Set the inductive tachometer (engine tachometer) to the high tension cord.
- Turn the throttle stop screw ① until the specified idle speed.

  Refer to "IDLE SPEED ADJUSTMENT" section in the CHAPTER 3.

Idle speed for TPS adjustment:
1,700~1,900 rpm

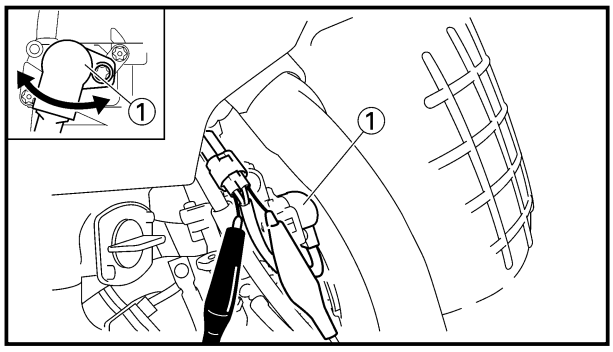


7. Insert the thin electric conductors ② (lead wire) into the TPS coupler ①, as shown, and connect the tester to them.

Tester (+) lead→Yellow lead ③
Tester (–) lead→Black lead ④

CAUTION:

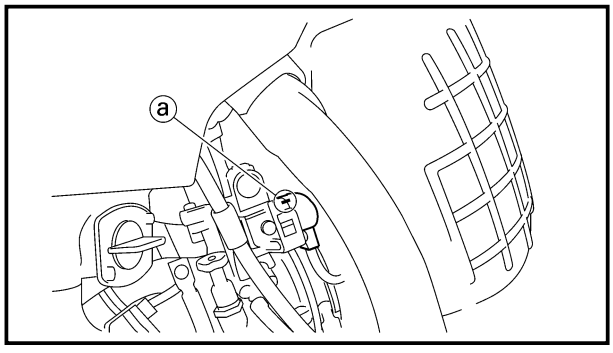
- **Do not insert the electric conductors more than required because it may reduce the waterproof function of the coupler.**
- **Make sure that a short-circuit does not develop between the terminals because it may cause damage to electrical components.**



8. Start the engine.
9. Adjust:
   - TPS output voltage

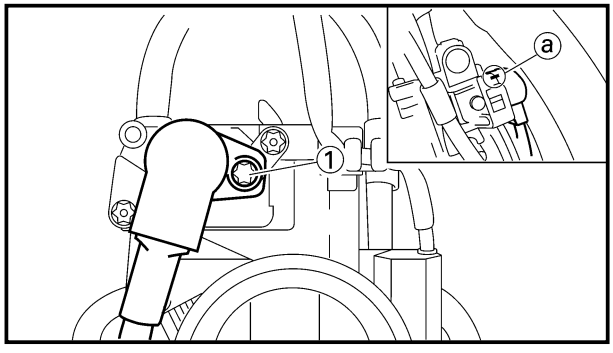
Adjustment steps:
Adjust the installation angle of the TPS ① to obtain the specified output voltage.

	TPS output voltage	Tester selector position
	0.5~0.7V	DCV-20



10. Put the aligning marks ⓐ on the TPS and carburetor.
11. Stop the engine.
12. Remove:
    - Carburetor

    Refer to "CARBURETOR AND REED VALVE" section in the CHAPTER 4.



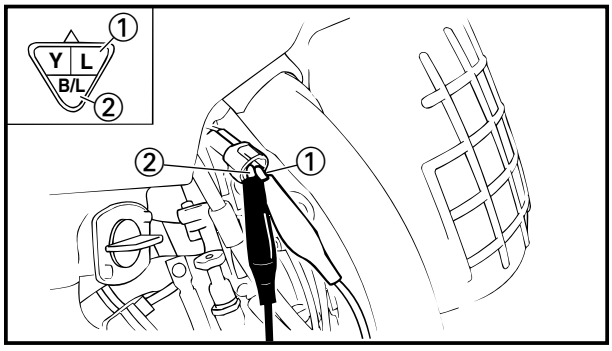
13. Tighten:
    - Screw (TPS) ①

NOTE:

Tighten the screws (TPS) using the T20 bit (tamper resistant fastener type) by aligning the marks ⓐ that were put before removal.

14. Install:
    - Carburetor

    Refer to "CARBURETOR AND REED VALVE" section in the CHAPTER 4.



EC694000

TPS INPUT VOLTAGE INSPECTION

1. Disconnect the TPS coupler.
2. Start the engine.
3. Inspect:
   - TPS input voltage

   Out of specification → Replace the CDI unit.

Tester (+) lead→Blue lead ①
Tester (–) lead→Black/Blue lead ②

	TPS input voltage	Tester selector position
	4~6V	DCV-20

EC700000
TUNING
EC710000
ENGINE
EC711001
Carburetor setting

- The role of fuel is to cool the engine, and in the case of a 2-stroke engine, to lubricate the engine in addition to power generation. Accordingly, if a mixture of air and fuel is too lean, abnormal combustion will occur, and engine seizure may result. If the mixture is too rich, spark plugs will get wet with oil, thus making it impossible to bring the engine into full play or if the worst comes to the worst, the engine may stall.
- The richness of the air-fuel mixture required for the engine will vary with atmospheric conditions of the day and therefore, the settings of the carburetor must be properly suited to the atmospheric conditions (air pressure, humidity and temperature).
- Finally, the rider himself must make a test-run and check his machine for conditions (pick-up of engine speed, road surface conditions) and for the discoloration of the spark plug(s). After taking these into consideration, he must select the best possible carburetor settings.

※ It is advisable to make a note of settings, atmospheric conditions, road surface condition, lap-time, etc. so that the memorandum can be used as a reference useful for future.

EC712000
Atmospheric conditions and carburetor setting

Air temp.	Humidity	Air pressure (altitude)	Mixture	Setting
High	High	Low (high)	Richer	Leaner
Low	Low	High (low)	Leaner	Richer

The reason for the above tendency is that the richness or leanness of a fuel mixture depends on the density of the air (i.e. the concentration of oxygen in it).

That is:
- Higher temperature expands the air with its resultant reduced density.
- Higher humidity reduces the amount of oxygen in the air by so much of the water vapor in the same air.
- Lower atmospheric pressure (at a high altitude) reduces the density of the air.

A


B


C

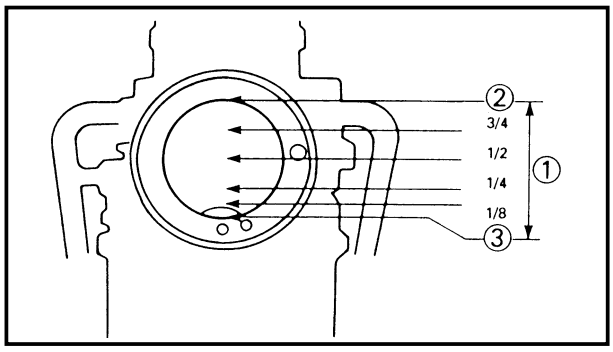

EC713001
Test run

After warming up the engine equipped with the standard type carburetor(s) and spark plug(s), run two or three laps of the circuit and check the smooth operation of the engine and discoloration of spark plug(s).

Discoloration	Condition of spark plug
Normal	Insulator is dry and burnt brown.
Over burned (too lean)	Insulator is whitish.
Oil fouled (too rich)	Insulator is sooty and wet.

A Normal
B Over burned (too lean)
C Oil fouled (too rich)

7



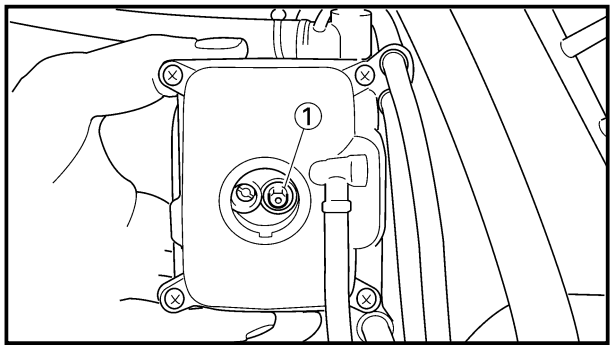
EC714032

Effects of setting parts in relation to throttle valve opening

Setting part		Throttle valve opening Full-closed 1/4 1/2 3/4 Full-open
Pilot jet Pilot air screw		
Jet needle	Diameter of straight portion	
Jet needle	Clip position	
Throttle valve		
Power jet		
Main jet		

NOTE:

The power jet closes at 8,500 rpm of the engine, after which only the main jet dominates.



① Throttle valve opening
② Full-open
③ Full-closed

EC715002

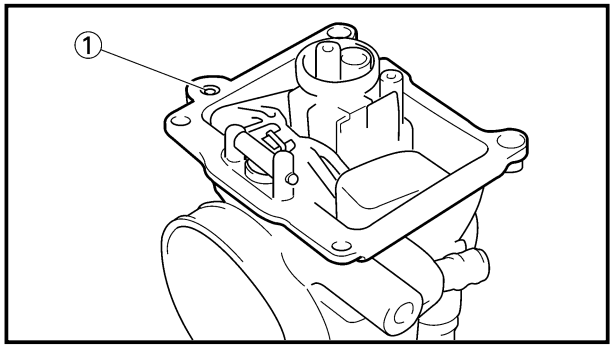
Main jet adjustment

The richness of air-fuel mixture with 3/4~4/4 throttle can be set by changing the main jet ①.

Standard main jet	#178 *#180

*For EUROPE

1. Spark plug is too hot.
   Select a main jet having higher calibrating No. than standard. (To be enriched)
2. Spark plug is wet.
   Select a main jet having lower calibrating No. than standard. (To be leaned out)

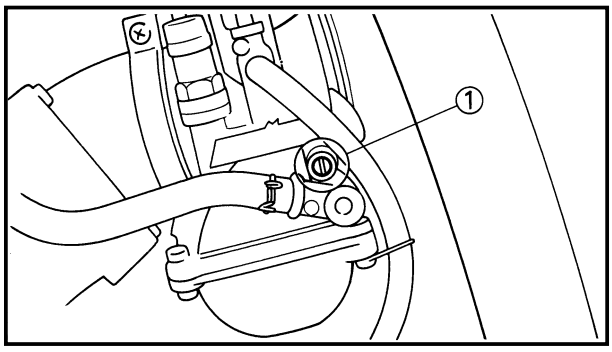


EC71V000

Power jet adjustment

The richness of air-fuel mixture under 8,500 rpm to the extent of 1/2 to full opened throttle can be set by changing the power jet ①. A larger size jet results in a richer mixture, and a smaller size in a leaner mixture.

Standard power jet	#50



EC716001

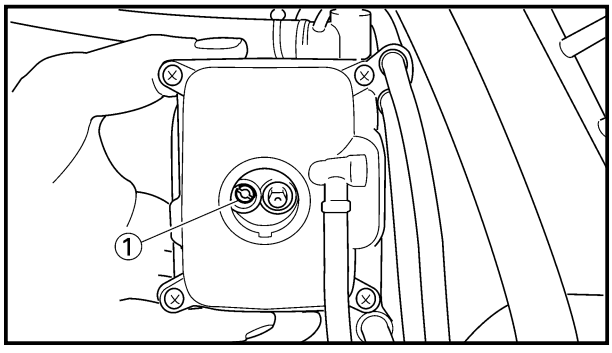
Pilot air screw adjustment

The richness of air-fuel mixture with full closed to 1/8 throttle can be set by turning the pilot air screw ①.

Turning in the pilot air screw will enrich the mixture at low speeds, and turning out it will lean out the mixture.

Standard pilot air screw position	**1 turn out *7/8 turns out (for reference only)**

*For EUROPE



EC71R010

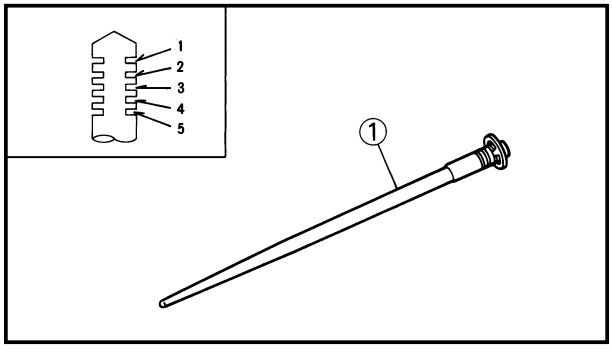
Pilot jet adjustment

The richness of air - fuel mixture with the throttle fully closed to 1/2 open can be set by turning the pilot jet ①.

It is changed when adjustment cannot be made by the pilot air screw alone.

Standard pilot jet	**#50 *#52**

*For EUROPE



EC718001

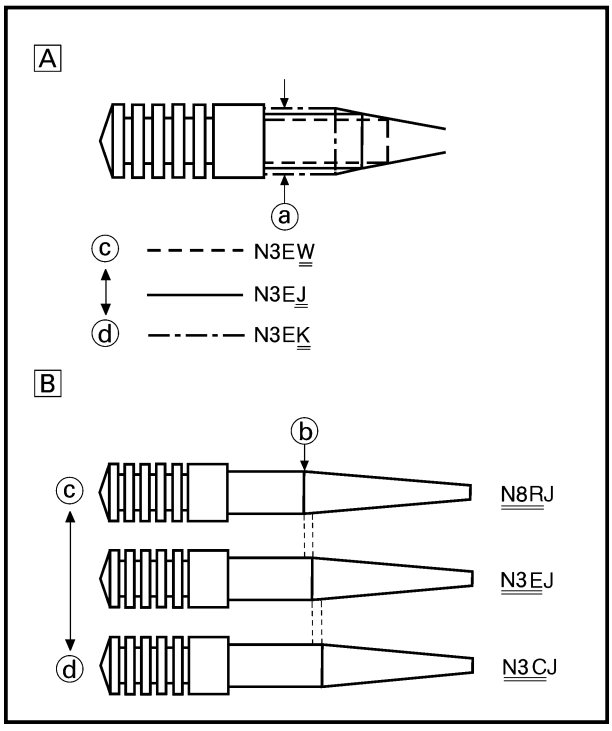
Jet needle groove position adjustment

Should the engine be hard to run smoothly at intermediate speeds, the jet needle ① must be adjusted. If the mixture is too rich or too lean at intermediate speed operation, irregular engine operation and poor acceleration will result. Whether or not the richness of the mixture is proper is hard to be determined by means of the spark plug and therefore, it should be judged from your feeling of actual engine operation.

Standard clip position	**No.2 groove *No 3 groove**

*For EUROPE

1. Too rich at intermediate speeds
   Rough engine operation is felt and the engine will not pick up speed smoothly. In this case, step up the jet needle clip by one groove and move down the needle to lean out the mixture.
2. Too lean at intermediate speeds
   The engine breathes hard and will not pick up speed quickly.
   Step up the jet needle clip by one groove and move up the needle to enrich the mixture.



EC719081

Jet needle adjustment
(For USA, CDN, ZA, AUS and NZ)

On the carburetors used in the YZ250, the main nozzle is press-fitted, so it can not be replaced. Therefore, carburetor setting requires the change of the jet needle.

1. The jet needle setting parts, having the same taper angle, are available in different straight portion diameters and in different taper starting positions.

Standard jet needle	N3EJ

<Example>

N3EJ - 2

- 2 — Clip position
- EJ — Diameter ⓐ of straight portion
- N3 — Taper starting position ⓑ

A Difference in straight portion dia.
B Difference in taper starting position
ⓒ Rich
ⓓ Lean

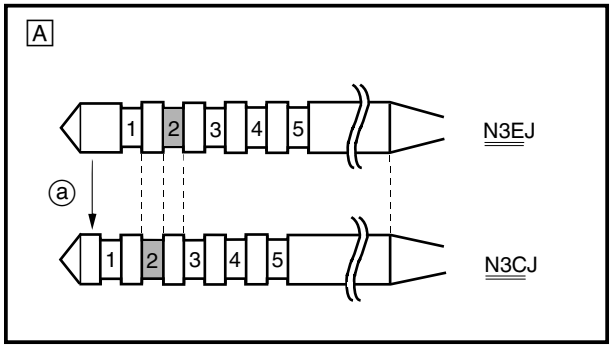
2. Effects of changing the jet needle (reference)
   - Diameter of straight portion
     Changing the diameter of the straight portion adjusts the air-fuel mixture when the throttle is 1/8 to 1/4 open.
   - Taper starting position
     <Difference of 0.5 groove>

     Rich N3EJ-3rd groove ┐ 0.5
     N3CJ-3rd groove ┘ ┐ 0.5
     N3EJ-2nd groove ┐ 0.5
     N3CJ-2nd groove ┘ ┐ 0.5
     Lean N3EJ-1st groove ┘

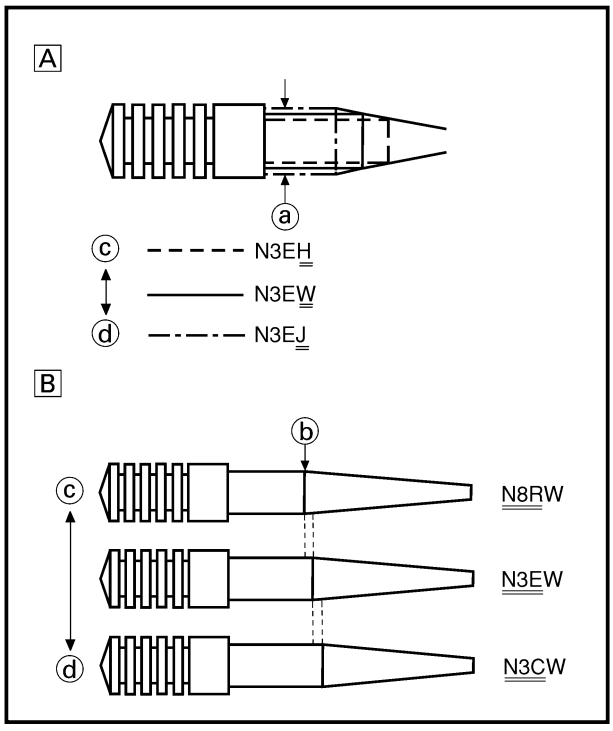
     Changing the taper starting position produces the same effect as changing the clip position by 0.5 groove.

     <Example>

     In case of being 0.5 groove leaner in relation to N3EJ-2nd groove, choose N3CJ-2nd groove.



A In case of being 0.5 groove leaner in relation to N3EJ-2nd groove.
ⓐ Difference of 0.5 groove



EC719081

Jet needle adjustment (For EUROPE)

On the carburetors used in the YZ250, the main nozzle is press-fitted, so it can not be replaced. Therefore, carburetor setting requires the change of the jet needle.

1. The jet needle setting parts, having the same taper angle, are available in different straight portion diameters and in different taper starting positions.

Standard jet needle	N3EW

<Example>

N3EW - 3

- 3: Clip position
- 2nd: Diameter ⓐ of straight portion
- N3EW: Taper starting position ⓑ

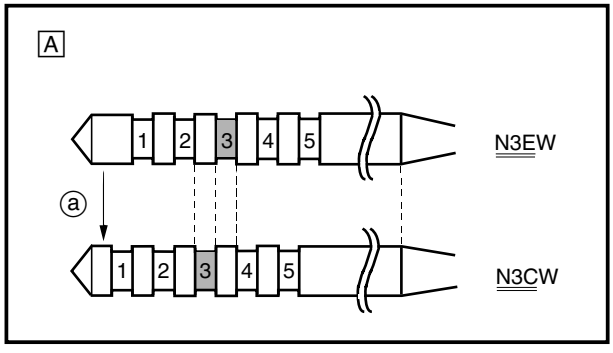
A Difference in straight portion dia.
B Difference in taper starting position
ⓒ Rich
ⓓ Lean

2. Effects of changing the jet needle (reference)
   - Diameter of straight portion
     Changing the diameter of the straight portion adjusts the air-fuel mixture when the throttle is 1/8 to 1/4 open.
   - Taper starting position
     <Difference of 0.5 groove>

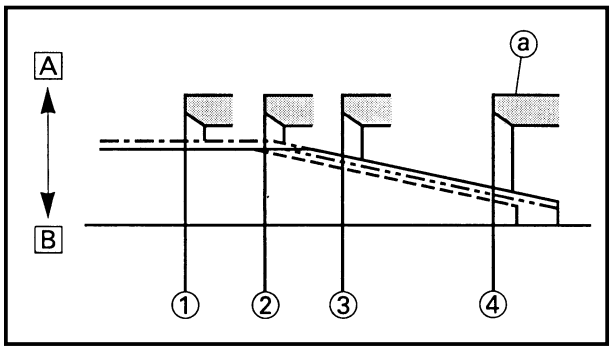
     Rich
     - N3EW-4th groove ┐ 0.5
     - N3CW-4th groove ┘
     - N3EW-3rd groove ┐ 0.5
     - N3CW-3rd groove ┘
     - N3EW-2nd groove ┐ 0.5

     Lean

     Changing the taper starting position produces the same effect as changing the clip position by 0.5 groove.
     <Example>
     In case of being 0.5 groove leaner in relation to N3EW-3rd groove, choose N3CW-3rd groove.



A In case of being 0.5 groove leaner in relation to N3EW-3rd groove.
ⓐ Difference of 0.5 groove



EC71B011

Relationship with throttle opening

The flow of the fuel through the carburetor main system is controlled by the main jet and then, it is further regulated by the area between the main nozzle and the jet needle. On the relationship between the fuel flow and the throttle opening, the fuel flow relates to the jet needle straight portion diameter around 1/8 to 1/4 throttle opening, whereas around 1/4 to 1/1 throttle opening it relates to the taper starting position and to the clip position.

Therefore, the fuel flow is balanced at each stage of throttle opening by the combination of the jet needle straight portion diameter, taper starting position and clip position.

<Example>

(For USA, CDN, ZA, AUS and NZ)

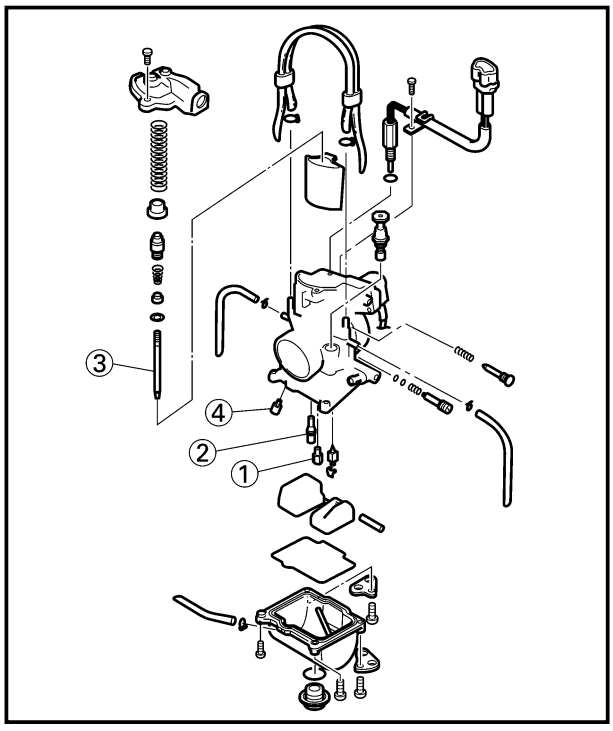
———————— N3EJ-2nd groove
———————— N3EJ-3rd groove
—·—·—·—·— N3EK-2nd groove
—··——··——··— N8RJ-2nd groove

(For EUROPE)

———————— N3EW-3rd groove
———————— N3EW-4th groove
—·—·—·—·— N3EJ-3rd groove
—··——··——··— N8RW-3rd groove

A Lean (larger diameter)
B Rich (smaller diameter)
① 1/8 throttle
② 1/4 throttle
③ 1/2 throttle
④ 1/1 throttle

ⓐ Main nozzle



EC71Q000

Carburetor setting parts

Part name		Size	Part number
Main jet ①	Rich	#190	4MX-14943-45
		#188	4MX-14943-95
		#185	4MX-14943-44
		#182	4MX-14943-94
*(STD)		#180	4MX-14943-43
(STD)		#178	4MX-14943-93
		#175	4MX-14943-42
		#172	4MX-14943-92
		#170	4MX-14943-41
		#168	4MX-14943-91
		#165	4MX-14943-40
	Lean	#162	4MX-14943-90
Pilot jet ②	Rich	#62	4MX-14948-12
		#60	4MX-14948-11
		#58	4MX-14948-10
		#55	4MX-14948-09
*(STD)		#52	4MX-14948-08
(STD)		#50	4MX-14948-07
		#48	4MX-14948-06
		#45	4MX-14948-05
		#42	4MX-14948-04
		#40	4MX-14948-03
	Lean	#38	4MX-14948-02
Jet needle ③	Rich	N8RW	4SR-14916-RW
		N3EW	4SR-14916-EW
		N8RJ	4SR-14916-RJ
(STD)		N3EJ	4SR-14916-EJ
		N3CJ	4SR-14916-CJ
		N3EK	4SR-14916-EK
	Lean	N3CK	4SR-14916-CK
*Jet needle ③	Rich	N8RH	4SR-14916-RH
		N3EH	4SR-14916-EH
		N8RW	4SR-14916-RW
(STD)		N3EW	4SR-14916-EW
		N3CW	4SR-14916-CW
		N3EJ	4SR-14916-EJ
	Lean	N3CJ	4SR-14916-CJ
Power jet ④	Rich	#65	4JT-1494F-13
		#60	4JT-1494F-11
		#55	4JT-1494F-09
(STD)		#50	4JT-1494F-07
	Lean	#40	4JT-1494F-03

*For EUROPE

EC71C030
Road condition and examples of carburetor setting

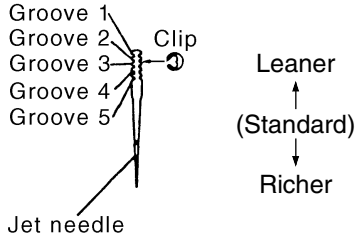
Conditions / Parts	General condition			Sandy condition		
	Under 10°C (50°F) (Winter)	10~25°C (50~77°F) (Spring, Autumn)	Over 25°C (77°F) (Summer)	Under 10°C (50°F) (Winter)	10~25°C (50~77°F) (Spring, Autumn)	Over 25°C (77°F) (Summer)
Main jet	#178 *#180	#178	#178	#180 *#182	#178 *#180	#178
Jet needle	N3EW-3	N3EJ-2 *N3CW-3	N3CJ-2 *N3EW-2	N3CW-3 *N3CW-4	N3CW-3 *N3EW-3	N3CW-3 *N3EW-3
Pilot jet	#50	#50	#50	#52	#52	#52
Pilot air screw	-1/4	Zero	Zero	Zero *-1/4	Zero	+1/4
Power jet	#50	#50	#50	#50	#50	#50

*For EUROPE

NOTE:

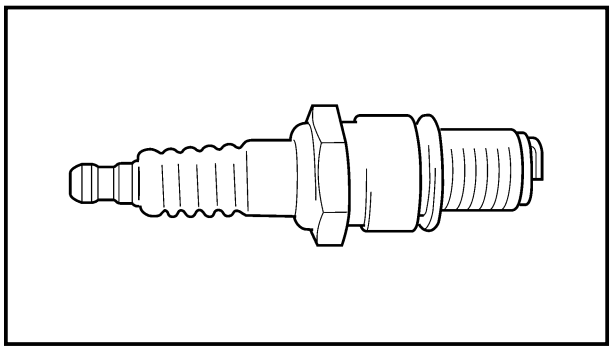
Optimum pilot air screw setting can be abtained by adding the ex-factory number of the same screw back-out turns to any required value provided in the chart.
For example, if the ex-factory number is “1”, add “1” to the value chosen in the chart.

EC71D021
Examples of carburetor setting depending on symptom

Symptom	Setting	Checking
At full throttle Hard breathing Shearing noise Whitish spark plug ↓ Lean mixture	Increase main jet calibration No. (Gradually)	Discoloration of spark plug → If tan color, it is in good condition. If can not be normalized: Clogged float valve seat Clogged fuel hose Clogged fuel cock
At full-throttle Stop of speed pick-up Slow speed pick-up Slow response Sooty spark plug ↓ Rich mixture	Decrease main jet calibration No. (Gradually) *In case of racing slight enrichment of mixture reduces engine trouble.	Discoloration of spark plug → If tan color, it is in good condition. If not effect: Clogged air cleaner Fuel overflow from carburetor
Lean mixture	Lower jet needle clip position. (1 groove down)	 Clip position indicates the position of jet needle groove, to which the clip is fitted. The position is numbered from the top.
Rich mixture	Raise jet needle clip position. (1 groove up)	
1/4~3/4 throttle Hard breathing Lack of speed	Lower jet needle clip position. (1 groove down)	
1/4~1/2 throttle Slow speed pick-up White smoke Poor acceleration	Raise jet needle clip position. (1 groove up)	

Symptom	Setting	Checking
0~1/4 throttle Hard breathing Speed down	Use jet needle having a smaller diameter.	Number of turns-back → Correct properly Overflow from carburetor
0~1/4 throttle Poor acceleration White smoke	Use jet needle having a larger diameter.	
Unstable at low speeds Pinking noise	Lower jet needle clip position. (1 groove down) Turn in pilot air screw.	
Poor response at extremely low speed	Reduce pilot jet calibration No. Turn out pilot air screw. If not effect, reverse the above procedures.	Dragging brake Overflow from carburetor
Poor response in the range of low to intermediate speeds	Raise jet needle clip position. If no effect, reverse the above procedures.	
Poor response when throttle is opened quickly	Check overall settings. Use main jet having lower calibration No. Raise jet needle clip position. (1 groove up) If no effect, reverse the above procedures.	Check air cleaner for fouling.
Poor engine operation	Turn in pilot air screw.	Check throttle valve operation.

※ This should be taken simply for an example. It is necessary to set the carburetor while checking the operating conditions of the engine and discoloration of spark plugs.
Normally, carburetor setting is made by means of the main jet, needle clip position, pilot jet and pilot air screw. If the result of setting is still unsatisfactory, it is advisable to change the sizes of the jet needle.



EC71M010

Change of the heat range of spark plugs

Judging from the discoloration of spark plugs, if they are found improper, it can be corrected by the following two methods; changing carburetor settings and changing the heat range of spark plug.

Standard spark plug	**BR8EG/NGK (resistance type)**

- In principle, it is advisable to first use spark plugs of standard heat range, and judging from the discoloration of spark plugs, adjust carburetor settings.
- If the calibration No. of the main jet must be changed by ±15, it is advisable to change the heat range of spark plugs and newly select the proper main jet.

NOTE:

- When checking the discoloration of spark plugs, be sure to stop the engine immediately after a run and check.
- Avoid racing.
- When changing the heat range of spark plugs, never attempt to change it more than ±1 rank.
- When using a spark plug other than standard, check its heat range against the standard and check that it is a resistance type.
- Note that even if the discoloration seems proper, it may slightly vary with the spark plug maker and oil in use.

EC720000
CHASSIS
EC71P002
Selection of the secondary reduction ratio (Sprocket)

$$\text{Secondary reduction ratio} = \frac{\text{Number of driven sprocket teeth}}{\text{Number of drive sprocket teeth}}$$

Standard secondary reduction ratio	**50/14 (3.571)** ***49/14 (3.500)**

*For EUROPE and CDN

<Requirement for selection of secondary gear reduction ratio>

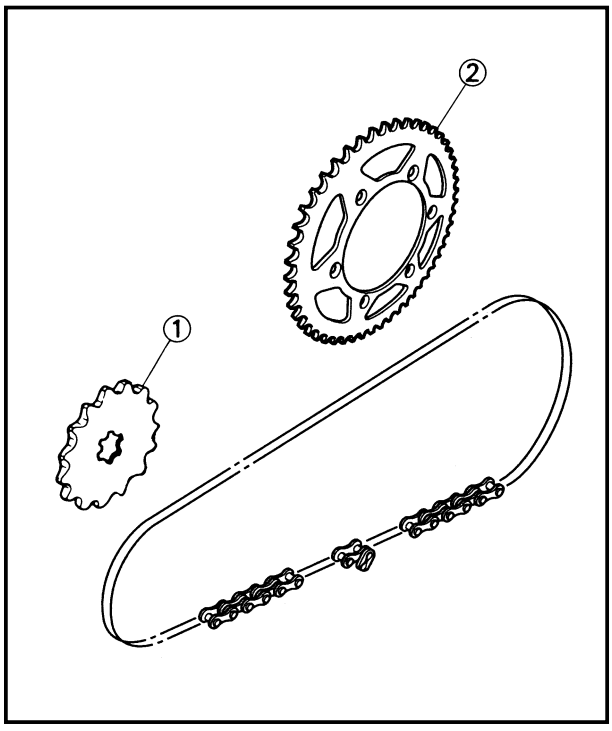
- It is generally said that the secondary gear ratio should be reduced for a longer straight portion of a speed course and should be increased for a course with many corners. Actually, however, as the speed depends on the ground condition of the day of the race, be sure to run through the circuit to set the machine suitable for the entire course.

- In actuality, it is very difficult to achieve settings suitable for the entire course and some settings may be sacrificed. Thus, the settings should be matched to the portion of the course that has the greatest effect on the race result. In such a case, run through the entire course while making notes of lap times to find the best balance; then, determine the secondary reduction ratio.

- If a course has a long straight portion where a machine can run at maximum speed, the machine is generally set such that it can develop its maximum revolutions toward the end of the straight line, with care taken to avoid the engine over-revving.

NOTE:

Riding technique varies from rider to rider and the performance of a machine also vary from machine to machine. Therefore, do not imitate other rider's settings from the beginning but choose your own setting according to the level of your riding technique.



EC72N000

Drive and driven sprockets setting parts

Part name	Size	Part number
Drive sprocket ①	13T	9383E-13144
(STD)	14T	9383E-14215
Driven sprocket ②	47T	5ET-25447-00
	48T	5NY-25448-00
*(STD)	49T	5NY-25449-00
(STD)	50T	5NY-25450-00
	51T	5NY-25451-00
	52T	5NY-25452-00

*For EUROPE and CDN

EC721003

Tire pressure

Tire pressure should be adjust to suit the road surface condition of the circuit.

Standard tire pressure:
100 kPa (1.0 kgf/cm², 15 psi)

- Under a rainy, muddy, sandy, or slippery condition, the tire pressure should be lower for a larger area of contact with the road surface.

Extent of adjustment:
60~80 kPa
(0.6~0.8 kgf/cm², 9.0~12 psi)

- Under a stony or hard road condition, the tire pressure should be higher to prevent a flat tire.

Extent of adjustment:
100~120 kPa
(1.0~1.2 kgf/cm², 15~18 psi)

EC722011
Front fork setting
The front fork setting should be made depending on the rider's feeling of an actual run and the circuit conditions.
The front fork setting includes the following three factors:

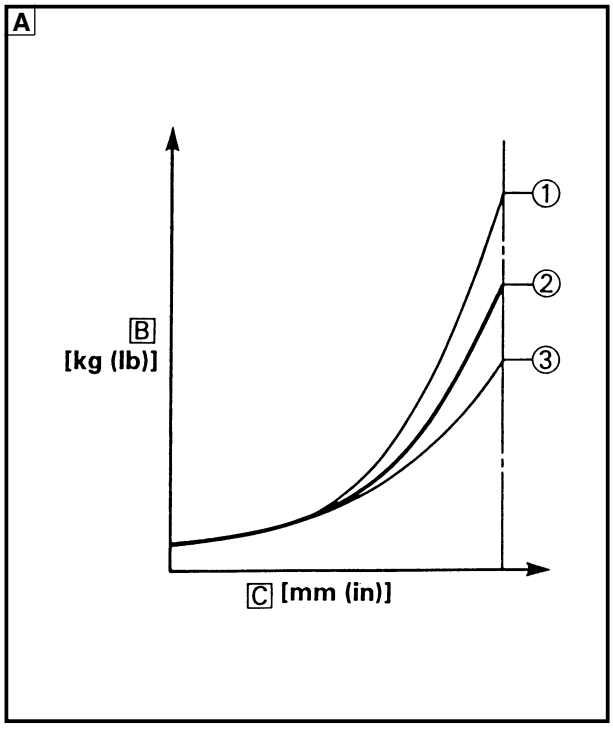
1. Setting of air spring characteristics
   - Change the fork oil level.
2. Setting of spring preload
   - Change the spring.
   - Install the adjustment washer.
3. Setting of damping force
   - Change the compression damping.
   - Change the rebound damping.

   The spring acts on the load and the damping force acts on the cushion travel speed.

EC723001
Change in level and characteristics of fork oil
Damping characteristic near the final stroke can be changed by changing the fork oil amount.

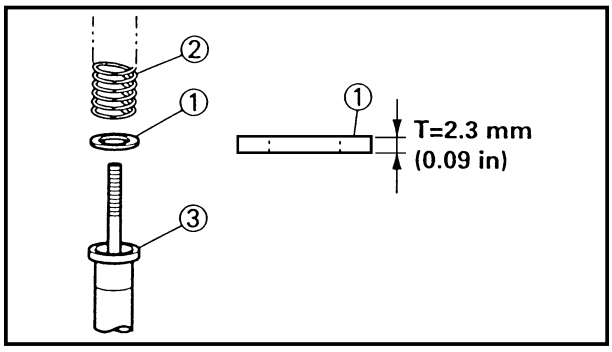
CAUTION:

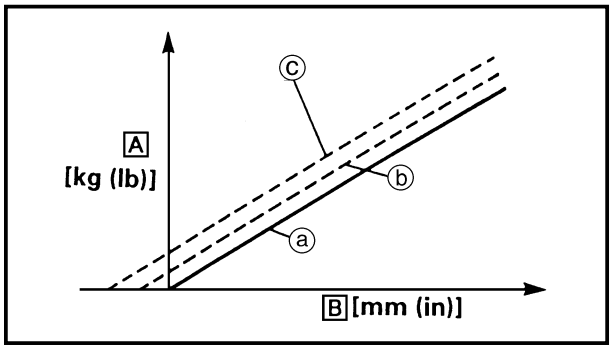
Adjust the oil level in 5 mm (0.2 in) increments or decrements. Too low oil level causes the front fork to produce a noise at full rebound or the rider to feel some pressure on his hands or body. Alternatively, too high oil level will develop unexpectedly early oil lock with the consequent shorter front fork travel and deteriorated performance an characteristics. Therefore, adjust the front fork within the specified range.



Standard oil level:
135 mm (5.31 in)
Extent of adjustment:
80~150 mm (3.15~5.91 in)
From top of outer tube with inner tube and damper rod fully compressed without spring.

A Air spring characteristics in relation to oil level change
B Load
C Stroke
① Max. oil level
② Standard oil level
③ Min. oil level





EC727021

Spring preload adjustment

The spring preload is adjusted by installing the adjustment washer ① between the fork spring ② and damper rod ③.

CAUTION:

Do not install three or more adjustment washers for each front fork.

⚠WARNING

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

Standard washer quantity:
Zero adjustment washers
Extent of adjustment:
Zero ~ 2 adjustment washers

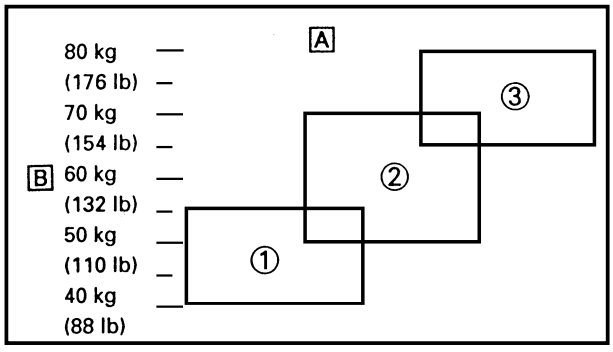
A Load
B Fork stroke
ⓐ Without adjustment washer (standard)
ⓑ 1 adjustment washer
ⓒ 2 adjustment washers

EC72A001

Setting of spring after replacement

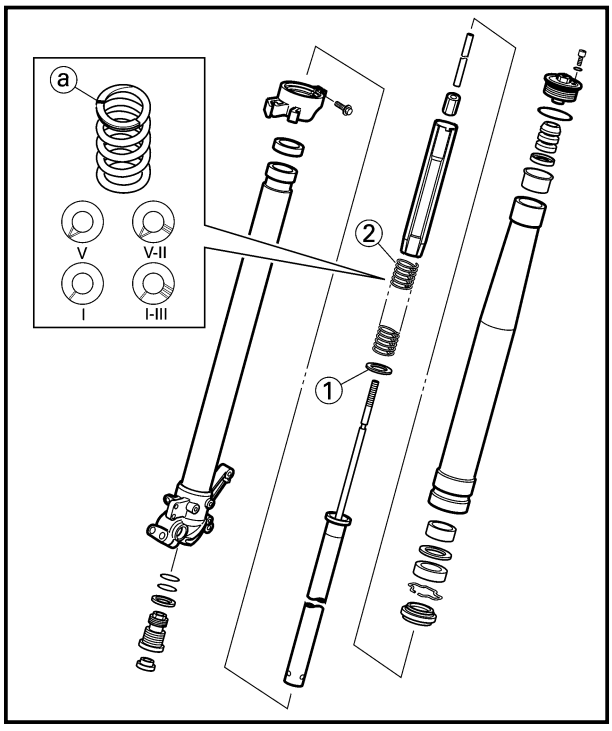
As the front fork setting can be easily affected by rear suspension, take care so that the machine front and rear are balanced (in position, etc.) when setting the front fork.

1. Use of soft spring
   Generally a soft spring gives a soft riding feeling. Rebound damping tends to become stronger and the front fork may sink deeply over a series of gaps.
   To set a soft spring:
   - Change the rebound damping.
     Turn out one or two clicks.
   - Change the compression damping.
     Turn in one or two clicks.



2. Use of stiff spring
   Generally a stiff spring gives a stiff riding feeling. Rebound damping tends to become weaker, resulting in lack of a sense of contact with the road surface or in a vibrating handlebar.
   To set a stiff spring:
   - Change the rebound damping.
     Turn in one or two clicks.
   - Change the compression damping.
     Turn out one or two clicks.

A Coverage of spring by weight
B Rider weight
① Soft
② Standard
③ Stiff



EC72P010

Front fork setting parts

•Adjustment washer ①

TYPE (thickness)	PART NUMBER
T=2.3 mm (0.09 in)	4SS-23364-L0

•Front fork spring ②

[Equal pitch spring]

TYPE	SPRING RATE	SPRING PART NUMBER	I.D. MARK (slits)
SOFT	0.380	4SS-23141-10	I-I
	0.390	4SS-23141-20	I-II
	0.400	4SS-23141-30	I-III
	0.410	4SS-23141-40	I
	0.420	4SS-23141-50	II
STD	0.430	4XL-23141-L0	—
STIFF	0.440	4SS-23141-70	IIII

[Unequal pitch spring]

TYPE	SPRING RATE (approx.)	SPRING PART NUMBER	I.D. MARK (slits)
SOFT	0.400	5ET-23141-20	V
	0.410	5ET-23141-00	V-I
	0.420	5ET-23141-30	V-II
*STD	0.430	5CU-23141-L0	—
STIFF	0.440	5ET-23141-40	V-IIII

*For EUROPE

NOTE:

•The unequal pitch spring is softer in initial characteristic than the equal pitch spring and is difficult to bottom out under full compression.

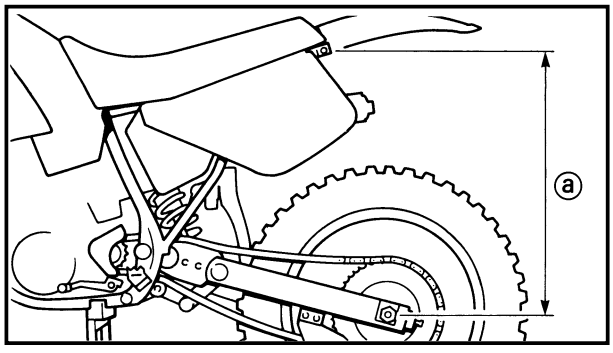
•The I.D. mark (slits) ⓐ is proved on the end of the spring.

EC72B000
Rear suspension setting

The rear suspension setting should be made depending on the rider's feeling of an actual run and the circuit conditions.

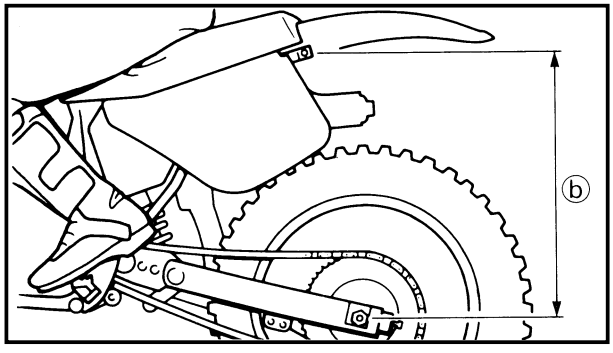
The rear suspension setting includes the following two factors:

1. Setting of spring preload
   - Change the set length of the spring.
   - Change the spring.
2. Setting of damping force
   - Change the rebound damping.
   - Change the compression damping.

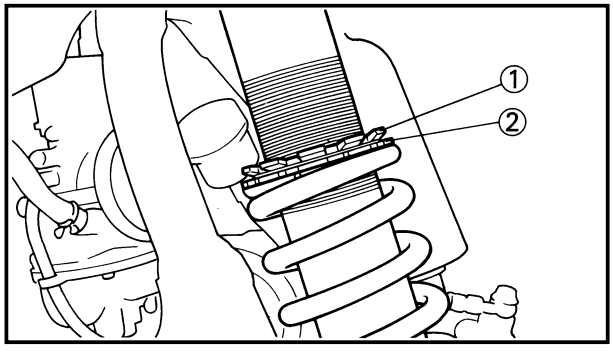


EC72C001
Choosing set length

1. Place a stand or block under the engine to put the rear wheel above the floor, and measure the length ⓐ between the rear wheel axle center and the rear fender holding bolt.



2. Remove the stand or block from the engine and with a rider astride the seat, measure the sunken length ⓑ between the rear wheel axle center and the rear fender holding bolt.



3. Loosen the locknut ① and make adjustment by turning the spring adjuster ② to achieve the standard figure from the subtraction of the length ⓑ from the length ⓐ.

Standard figure:
90~100 mm (3.5~3.9 in)

NOTE:

- If the machine is new and after it is broken in, the same set length of the spring may change because of the initial fatigue, etc. of the spring. Therefore, be sure to make re-evaluation.
- If the standard figure cannot be achieved by adjusting the spring adjuster and changing the spring set length, replace the spring with an optional one and make re-adjustment.

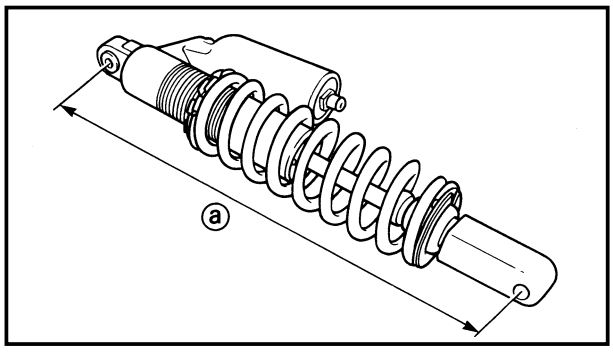
EC72G020

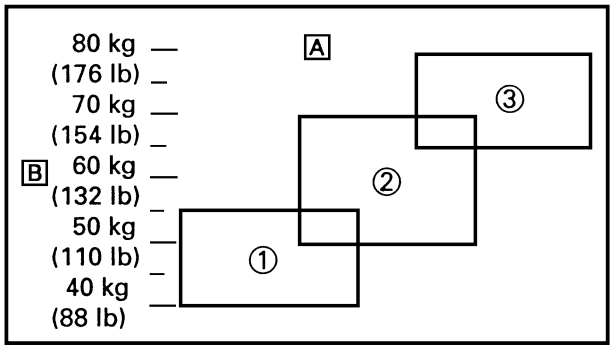
Setting of spring after replacement

After replacement, be sure to adjust the spring to the set length [sunken length 90~100 mm (3.5~3.9 in)] and set it.

1. Use of soft spring
   - Set the soft spring for less rebound damping to compensate for its less spring load. Run with the rebound damping adjuster one or two clicks on the softer side and readjust it to suit your preference.
2. Use of stiff spring
   - Set the soft spring for more rebound damping to compensate for its greater spring load. Run with the rebound damping adjuster one or two clicks on the stiffer side and readjust it to suit your preference.

※ Adjusting the rebound damping will be followed more or less by a change in the compression damping. For correction, turn the low compression damping adjuster on the softer side.



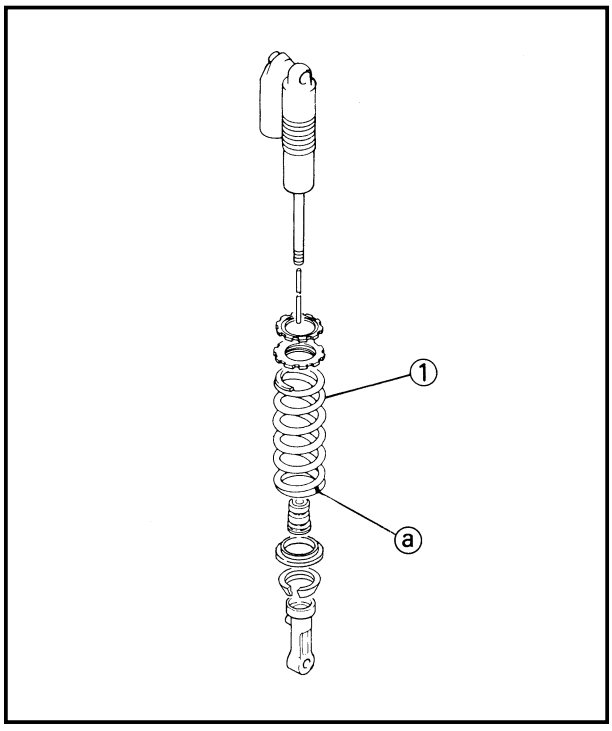


CAUTION:

When using a rear cushion other than currently installed, use the one whose overall length ⓐ does not exceed the standard as it may result in faulty performance. Never use one whose overall length is greater than standard.

Length ⓐ of standard shock:
490.5 mm (19.31 in)

A Coverage of spring by weight
B Rider weight
① Soft
② Standard
③ Stiff



EC72Q011

Rear shock absorber setting parts

•Rear shock spring ①

[Equal pitch spring]

TYPE	SPRING RATE	SPRING PART NUMBER	I.D. COLOR /POINT	SPRING FREE LENGTH
SOFT	4.3	5UN-22212-00	Brown/1	260
	4.5	5UN-22212-10	Green/1	260
	4.7	5UN-22212-20	Red/1	260
STD	4.9	5UN-22212-30	Black/1	260
STIFF	5.1	5UN-22212-40	Blue/1	260
	5.3	5UN-22212-50	Yellow/1	260
	5.5	5UN-22212-60	Pink/1	260
	5.7	5UN-22212-70	White/1	260

[Unequal pitch spring]

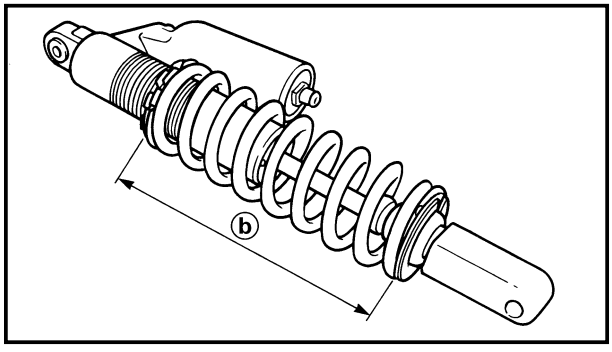
TYPE	SPRING RATE (approx.)	SPRING PART NUMBER	I.D. COLOR /POINT	SPRING FREE LENGTH
SOFT	4.5	5UN-22212-A0	Green/2	275
	4.7	5UN-22212-B0	Red/2	275
*STD	4.9	5UN-22212-C0	Black/2	275
STIFF	5.1	5UN-22212-D0	Blue/2	275
	5.3	5UN-22212-E0	Yellow/2	275
	5.5	5UN-22212-F0	Pink/2	275
	5.7	5UN-22212-G0	White/2	275

*For EUROPE

NOTE:

•The unequal pitch spring is softer in initial characteristic than the equal pitch spring and is difficult to bottom out under full compression.

•The I.D. color ⓐ is marked at the end of the spring.



•Extent of adjustment (spring length)

SPRING FREE LENGTH	EXTENT OF ADJUSTMENT ⓑ
260mm (10.24in)	240.5~258.5mm (9.47~10.18in)
275mm (10.83in)	255.5~273.5mm (10.06~10.77in)

EC72H010

Suspension setting

- Front fork

NOTE:

- If any of the following symptoms is experienced with the standard position as the base, make resetting by reference to the adjustment procedure given in the same chart.
- Before any change, set the rear shock absorber sunken length to the standard figure 90~100 mm (3.5~3.9 in).

Symptom	Section				Check	Adjust
	Jump	Large gap	Medium gap	Small gap		
Stiff over entire range	○	○	○		Compression damping Oil level (oil amount) Spring	Turn adjuster counterclockwise (about 2 clicks) to decrease damping. Decrease oil level by about 5~10 mm (0.2~0.4 in). Replace with soft spring.
Unsmooth movement over entire range	○	○	○	○	Outer tube Inner tube Under bracket tightening torque	Check for any bends, dents, and other noticeable scars, etc. If any, replace affected parts. Retighten to specified torque.
Poor initial movement				○	Rebound damping Oil seal	Turn adjuster counterclockwise (about 2 clicks) to decrease damping. Apply grease in oil seal wall.
Soft over entire range, bottoming out	○	○			Compression damping Oil level (oil amount) Spring	Turn adjuster clockwise (about 2 clicks) to increase damping. Increase oil level by about 5~10 mm (0.2~0.4 in). Replace with stiff spring.
Stiff toward stroke end	○				Oil level (oil amount)	Decrease oil level by about 5 mm (0.2 in).
Soft toward stroke end, bottoming out	○				Oil level (oil amount)	Increase oil level by about 5 mm (0.2 in).
Stiff initial movement	○	○	○	○	Compression damping	Turn adjuster counterclockwise (about 2 clicks) to decrease damping.
Low front, tending to lower front posture			○	○	Compression damping Rebound damping Balance with rear end Oil level (oil amount)	Turn adjuster clockwise (about 2 clicks) to increase damping. Turn adjuster counterclockwise (about 2 clicks) to decrease damping. Set sunken length for 95~100 mm (3.7~3.9 in) when one passenger is astride seat (lower rear posture). Increase oil level by about 5 mm (0.2 in).
"Obtrusive" front, tending to upper front posture			○	○	Compression damping Balance with rear end Spring Oil lever (oil amount)	Turn adjuster counterclockwise (about 2 clicks) to decrease damping. Set sunken length for 90~95 mm (3.5~3.7 in) when one passenger is astride seat (upper rear posture). Replace with soft spring. Decrease oil level by about 5~10 mm (0.2~0.4 in).

•Rear shock absorber

NOTE:

•If any of the following symptoms is experienced with the standard position as the base, make resetting by reference to the adjustment procedure given in the same chart.
•Adjust the rebound damping in 2-click increments or decrements.
•Adjust the low compression damping in 1-click increments or decrements.
•Adjust the hight compression damping in 1/6 turn increments or decrements.

Symptom	Section				Check	Adjust
	Jump	Large gap	Medium gap	Small gap		
Stiff, tending to sink			○	○	Rebound damping Spring set length	Turn adjuster counterclockwise (about 2 clicks) to decrease damping. Set sunken length for 90~100 mm (3.5~3.9 in) when one passenger is astride seat.
Spongy and unstable			○	○	Rebound damping Low compression damping Spring	Turn adjuster clockwise (about 2 clicks) to increase damping. Turn adjuster clockwise (about 1 click) to increase damping. Replace with stiff spring.
Heavy and dragging			○	○	Rebound damping Spring	Turn adjuster counterclockwise (about 2 clicks) to decrease damping. Replace with soft spring.
Poor road gripping				○	Rebound damping Low compression damping High compression damping Spring set length Spring	Turn adjuster counterclockwise (about 2 clicks) to decrease damping. Turn adjuster clockwise (about 1 click) to increase damping. Turn adjuster clockwise (about 1/6 turn) to increase damping. Set sunken length for 90~100 mm (3.5~3.9 in) when one passenger is astride seat. Replace with soft spring.
Bottoming out	○	○			High compression damping Spring set length Spring	Turn adjuster clockwise (about 1/6 turn) to increase damping. Set sunken length for 90~100 mm (3.5~3.9 in) when one passenger in astride seat. Replace with stiff spring.
Bouncing	○	○			Rebound damping Spring	Turn adjuster clockwise (about 2 clicks) to increase damping. Replace with soft spring.
Stiff travel	○	○			High compression damping Spring set length Spring	Turn adjuster counterclockwise (about 1/6 turn) to decrease damping. Set sunken length for 90~100 mm (3.5~3.9 in) when one passenger is astride seat. Replace with soft spring.

MEMO

PROTECT YOUR INVESTMENT

Use Genuine YAMAHA Parts And Accessories

YAMAHA MOTOR CO., LTD.
2500 SHINGAI IWATA SHIZUOKA JAPAN

PRINTED ON RECYCLED PAPER

PRINTED IN JAPAN
2002.5—2.9 × 1
(E)