YAMAHA

OWNER'S SERVICE MANUAL

TT-R90R

LIT-11626-16-27

5HN-28199-13

⚠ 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

TT-R90R
OWNER'S SERVICE MANUAL

1st Edition, April 2002

Printed in Japan
P/N. LIT-11626-16-27

INTRODUCTION

Congratulations on your purchase of a Yamaha TT-R90R. 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As improvements are made on this model, some data in this manual may become outdated.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

- **READ THIS MANUAL CAREFULLY FOR INSTRUCTIONS ON HOW TO PROPERLY OPERATE THIS MACHINE.**
- **ADULT INSTRUCTION AND SUPERVISION ARE REQUIRED.**
- **WEIGHT OF THE RIDER SHOULD NOT EXCEED 40 kg (88 lb).**
- **ALWAYS WEAR A HELMET AND SUITABLE PROTECTIVE CLOTHING WHEN RIDING.**
- **DO NOT TOUCH ANY MOVING PARTS OR HEATED AREAS.**
- **ALWAYS PERFORM PRE-OPERATION CHECKS. REFER TO PAGE 15.**
- **THIS MACHINE IS DESIGNED TO CARRY THE OPERATOR ONLY.**
  NO PASSENGERS.
- **THIS MACHINE IS DESIGNED OFF-ROAD USE ONLY.**
  IT IS NOT SUITABLE FOR ON-ROAD USE.

YAMAHA MOTOR CORPORATION, U.S.A.
OFF-ROAD MOTORCYCLE LIMITED WARRANTY

Yamaha Motor Corporation, U.S.A. hereby warrants that each new Yamaha off-road motorcycle purchased from an authorized Yamaha motorcycle dealer in the continental United States will be free from defects in material and workmanship for the period of time stated herein, subject to certain stated limitations.

THE PERIOD OF WARRANTY for Yamaha off-road motorcycles shall be ninety (90) days from the date of purchase, with no mileage limitation.

MODELS EXCLUDED FROM WARRANTY include those machines 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. Competition or racing use (except TY models used for sanctioned trials).
b. Installation of parts or accessories that are not qualitatively equivalent to genuine Yamaha parts.
c. Abnormal strain, neglect, or abuse.
d. Lack of proper maintenance.
e. Accident or collision damage.
f. Modification to original parts.
g. 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 motorcycle as specified in the appropriate Owner's 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.

WARRANTY TRANSFER: To transfer the warranty from the original purchaser to any subsequent purchaser, it is imperative that the machine be inspected and registered for warranty by an authorized Yamaha motorcycle dealer. In order for this warranty to remain in effect, this inspection and registration must take place within ten (10) days after transfer. An inspection and registration fee will be charged for this service.

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.
P. O. 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 out of oil; sustained high-rpm, full-throttle use; operating the machine with a broken or damaged part which causes another part to fail; damage or failure due to improper or careless transporation and or tie down; and so on. If you have any specific questions on operation or maintenance, please contact your dealer for advice.

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

Q. May I perform any or all of the recommended maintenance shown in the Owner's 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 and Service Manual. We do recommend, however, that items requiring special tools or equipment be done by a Yamaha motorcycle dealer.

Q. Will the warranty be void or cancelled if I do not operate or maintain my new motorcycle exactly as specified in the Owner's 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 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. Is the warranty transferable to second owners?
A. Yes. The remainder of the existing warranty can be transferred upon request. The unit has to be inspected and re-registered by an authorized Yamaha motorcycle dealer for the warranty coverage to remain effective.

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.

IMPORTANT NOTICE

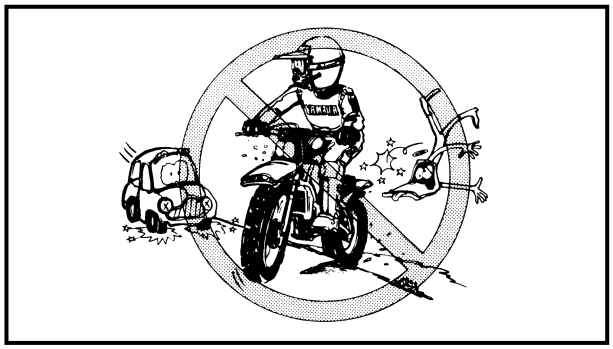
This machine is designed for off-road use only by young operators under adult instruction and supervision. It is illegal for this machine to be operated on any public street, road, or highway.
Off-road use on public lands may be illegal. Please check local regulations before riding.

⚠ SAFETY INFORMATION

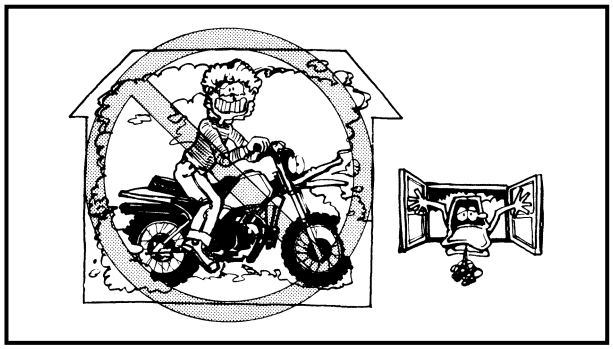
1. **GASOLINE IS HIGHLY FLAMMABLE:**
   - *** Always turn off the engine when refueling.**
   - *** Take care not to spill on the engine or exhaust pipe/muffler, when refueling.**
   - *** Never refuel while smoking or in the vicinity of an open flame.**
2. **If you should swallow some gasoline or inhale a lot of gasoline vapor, or allow some gasoline to get in your eye(s), see your doctor immediately. If any gasoline spills on your skin or clothing, immediately wash it with soap and water, and change your clothes.**
3. **Always turn off the engine before leaving the machine unattended. When parking the machine, note the following:**
   - *** The engine and exhaust pipe(s)/ muffler(s) may be hot. Park the machine in a place where pedestrians or children are not likely to touch the machine.**
   - *** Do not park the machine on a slope or soft ground; the machine may overturn.**

4. **When transporting the machine in another vehicle, be sure is kept upright and that the fuel cock is turned to the "OFF". If it should lean over, gasoline may leak out of the carburetor or fuel tank.**
5. **Never start your engine or let it run for any length of time in a closed area. The exhaust fumes are poisonous and may cause loss of consciousness and death within a short time. Always operate your machine in an area with adequate ventilation.**
6. **Always wear a helmet, gloves, boots, trousers, and jacket for motocross riding.**

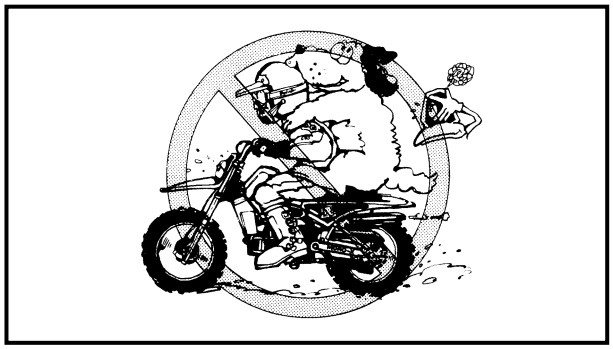
⚠ SAFETY INFORMATION



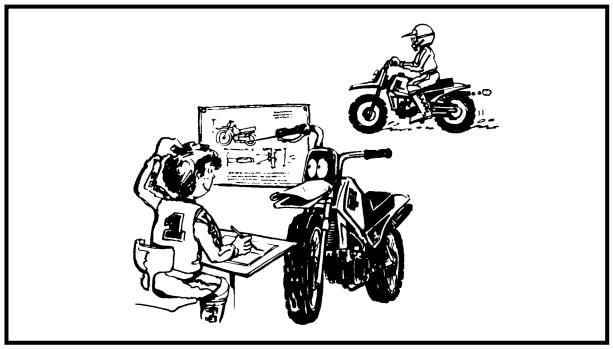
1. Don't ride it on the street.



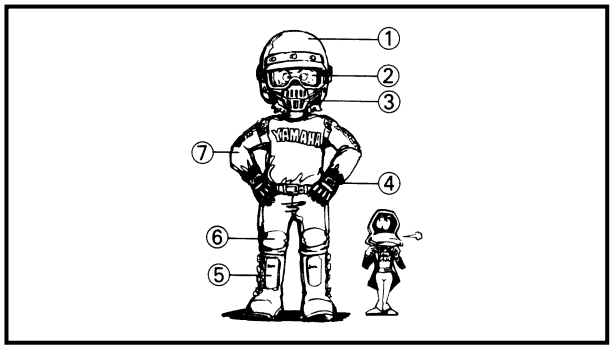
2. Don't run the engine inside a building.



3. This is a one-seater motorbike. Don't give any person a ride.

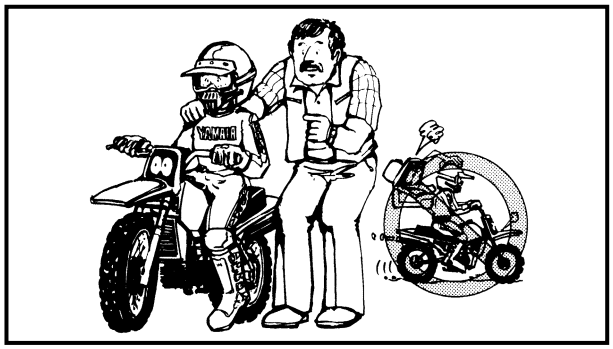


4. Let's learn how to ride properly. Ask your parents for any question.



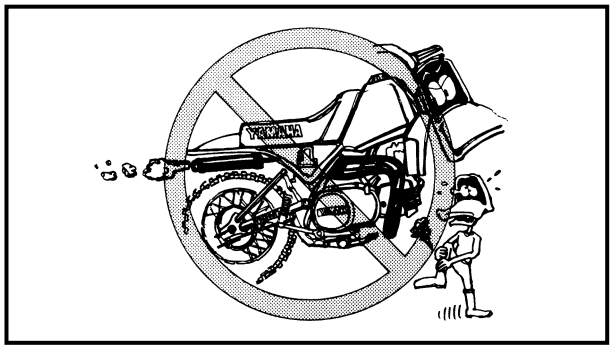
5. When riding the machine, be sure to wear the protective apparel as illustrated.

① Helmet
② Goggles
③ Mouth guard
④ Gloves
⑤ Boots
⑥ Motocross pants
⑦ Long sleeved trainer

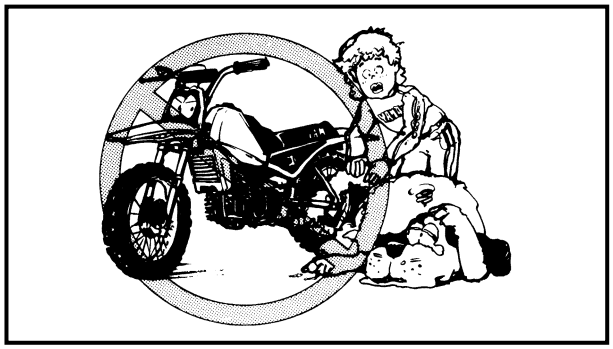


6. When going for riding, be sure to be with your family.
   Never go alone.

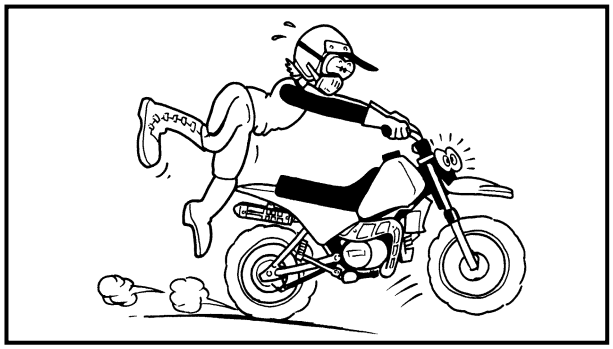
7. Before riding the machine, ask your parents to check the machine very carefully.



8. Don't touch the areas shown, or you'll get burnt in the hand.



9. Don't touch rotating or moving parts.



10. Before starting the engine, be sure to shift the transmission into neutral.

EC080000

HOW TO USE THIS MANUAL

EC081000

PARTICULARLY IMPORTANT INFORMATION

⚠

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

⚠ WARNING

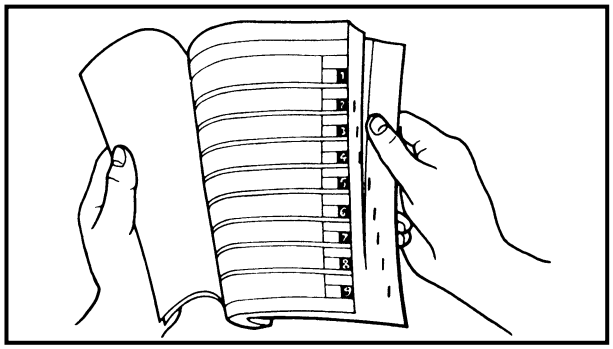
Failure to follow WARNING instructions could result in severe injury or death to the machine operator, a bystander, or a person inspecting or repairing the machine.

CAUTION:

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

NOTE:

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



EC082000

FINDING THE REQUIRED PAGE

1. This manual consists of six chapters; “General Information”, “Specifications”, “Regular inspection and adjustments”, “Engine”, “Chassis” and “Electrical”.
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

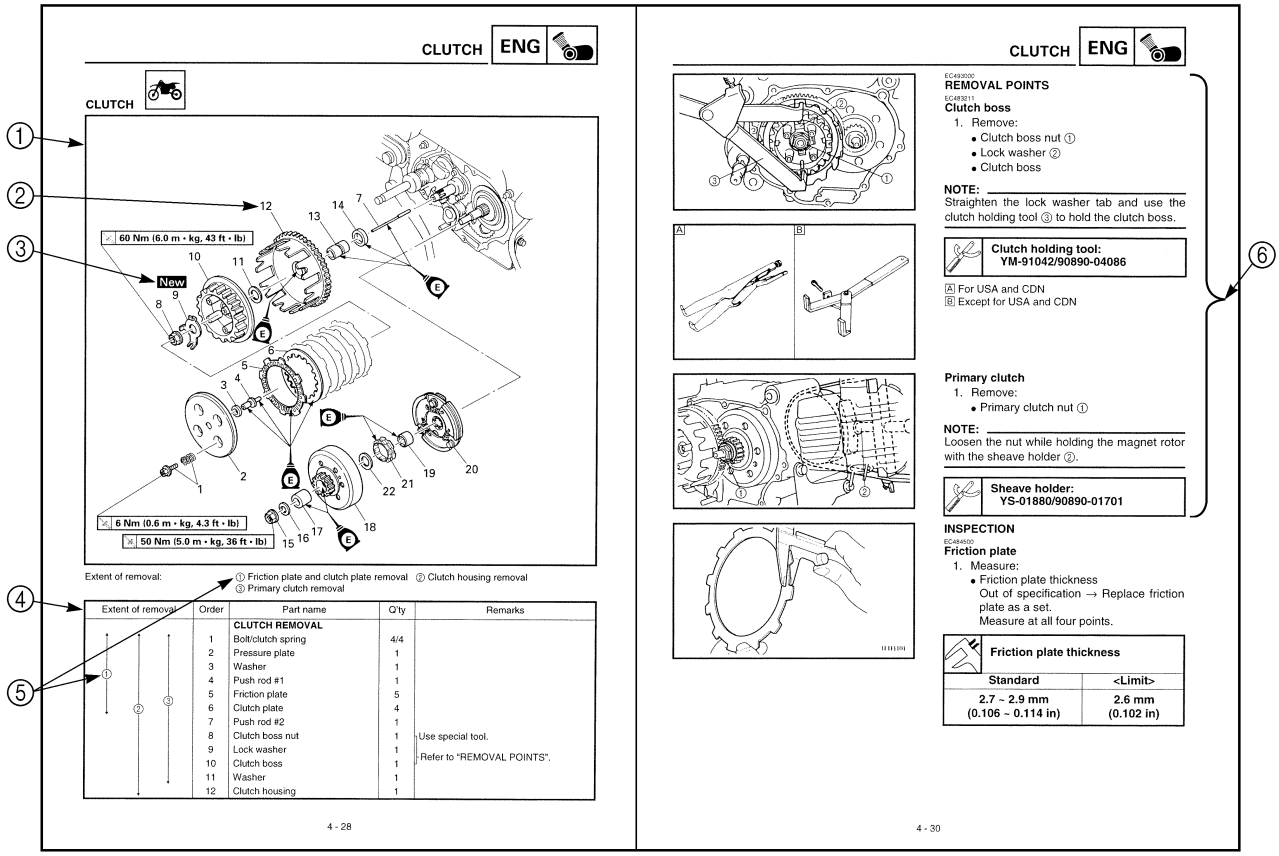
All of the procedures in this manual are organized in a sequential, step-by-step format. The information has been complied to provide the mechanic with an easy to read, handy reference that contains comprehensive explanations of all disassembly, repair, assembly, and inspection operations.
In this revised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

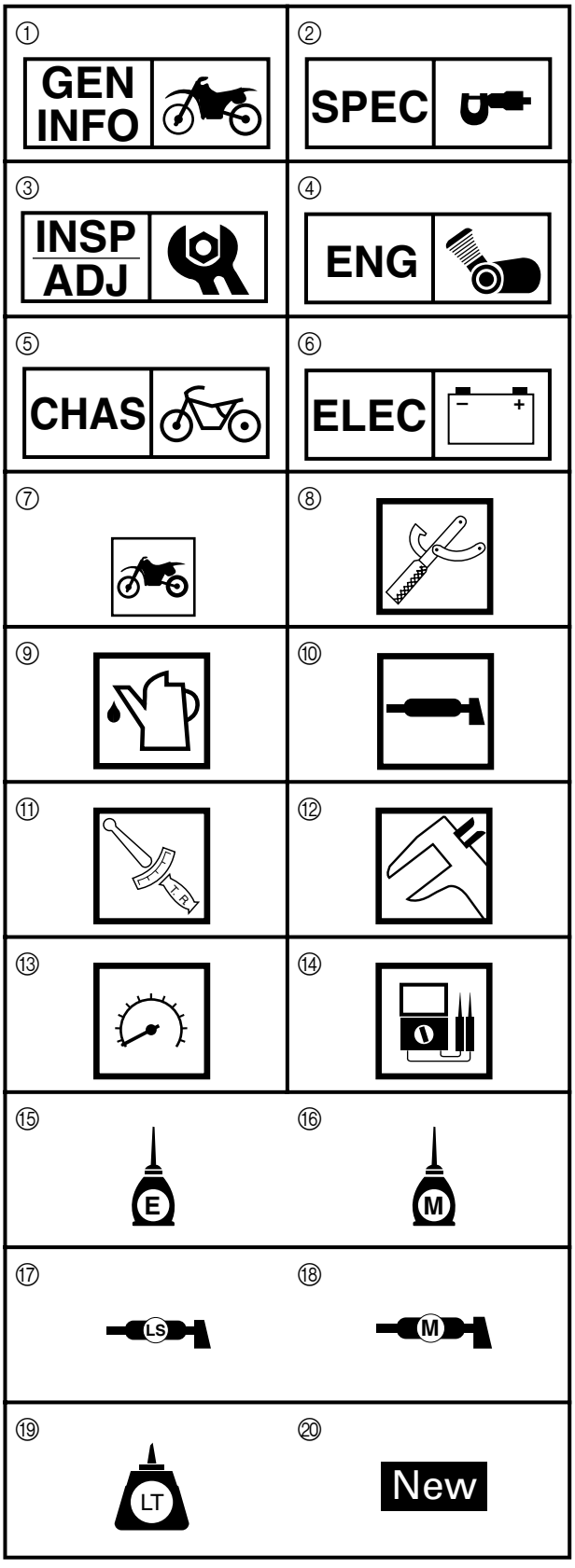
- Bearings
  Pitting/damage → Replace.

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.





ILLUSTRATED SYMBOLS (Refer to the illustration)

Illustrated symbols ① to ⑥ 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

Illustrated symbols ⑦ to ⑭ are used to identify the specifications appearing in the text.

⑦ With engine mounted
⑧ Special tool
⑨ Filling fluid
⑩ Lubricant
⑪ Tightening
⑫ Specified value, Service limit
⑬ Engine speed
⑭ Resistance (Ω), Voltage (V), Electric current (A)

Illustrated symbols ⑮ to ⑱ in the exploded diagram indicate grade of lubricant and location of lubrication point.

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

Illustrated symbols ⑲ to ⑳ in the exploded diagrams indicate where to apply a locking agent and when to install new parts.

⑲ Apply locking agent (LOCTITE®)
⑳ Use new one

INDEX

CONTENTS

CHAPTER 1
GENERAL INFORMATION

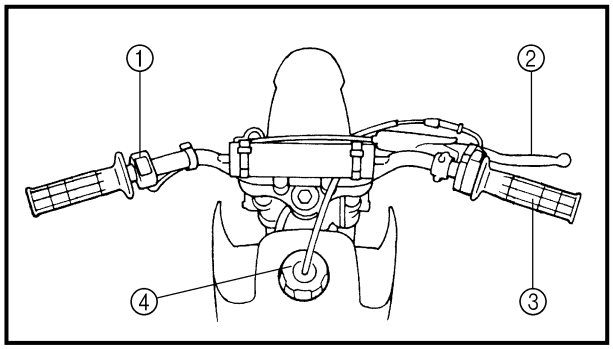
CHAPTER 2
SPECIFICATIONS

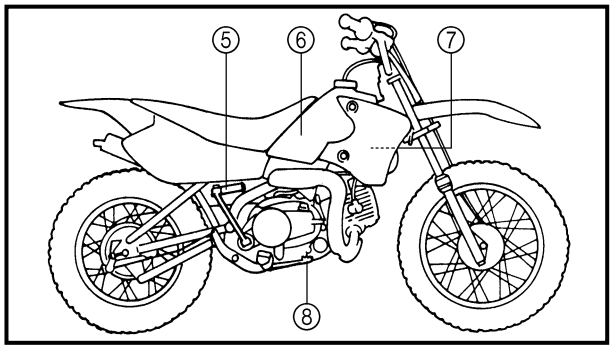
CHAPTER 3
REGULAR INSPECTION AND ADJUSTMENTS

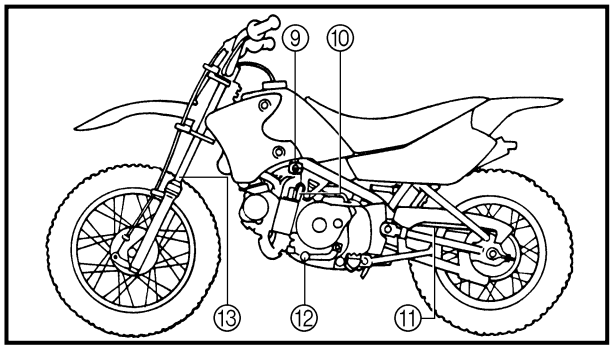
CHAPTER 4
ENGINE

CHAPTER 5
CHASSIS

CHAPTER 6
ELECTRICAL







EC100000
GENERAL INFORMATION

EC110000
DESCRIPTION

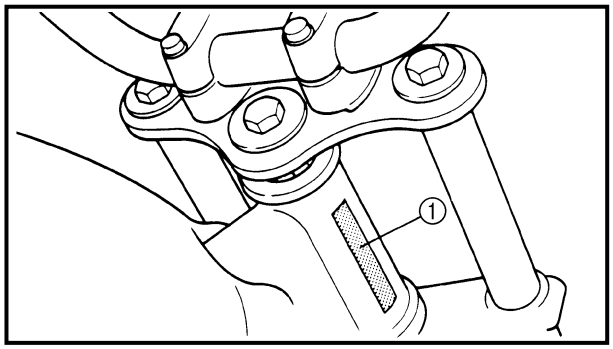
① "ENGINE STOP" button
② Front brake lever
③ Throttle grip
④ Fuel tank cap
⑤ Kick starter
⑥ Fuel tank
⑦ Air cleaner
⑧ Rear brake pedal
⑨ Fuel cock
⑩ Starter lever (choke)
⑪ Drive chain
⑫ Shift pedal
⑬ Front fork

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

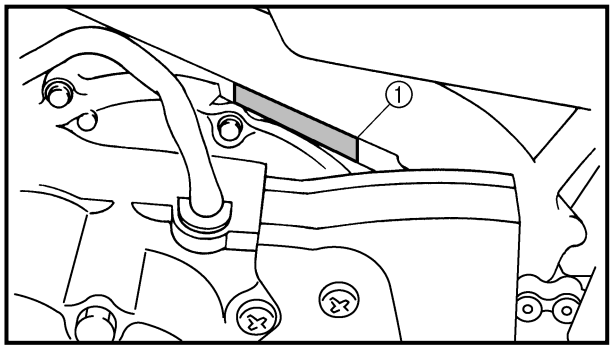
There are two significant reasons for knowing the serial number of your machine:

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.



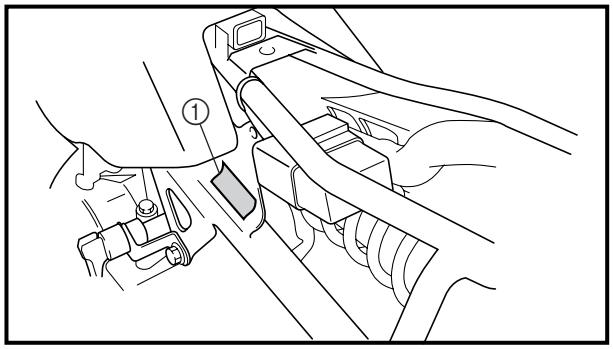
EC121001
VEHICLE IDENTIFICATION NUMBER

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



ENGINE SERIAL NUMBER

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



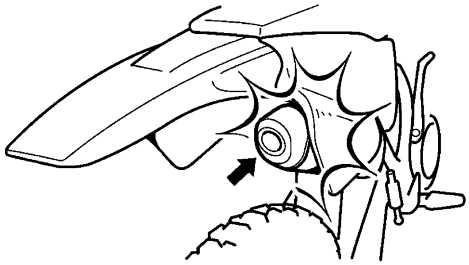
EC124000
MODEL LABEL

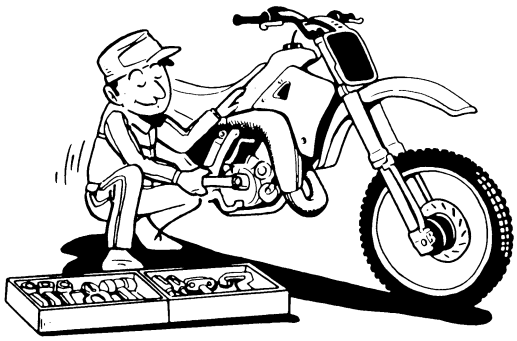
The model label ① is affixed to the frame under the rider's seat. This information will be needed to order spare parts.

EC130000
IMPORTANT INFORMATION

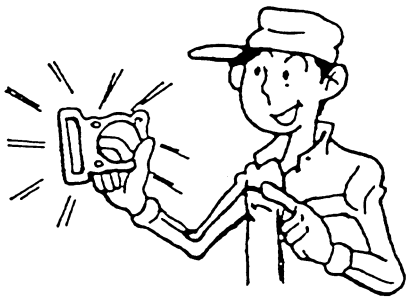
EC131002
PREPARATION FOR REMOVAL AND DISASSEMBLY

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





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.

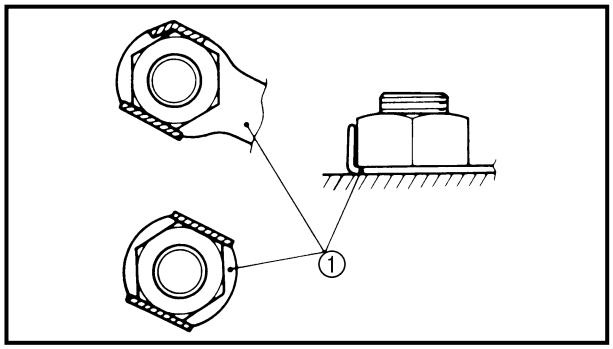
5. Keep away from fire.

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.

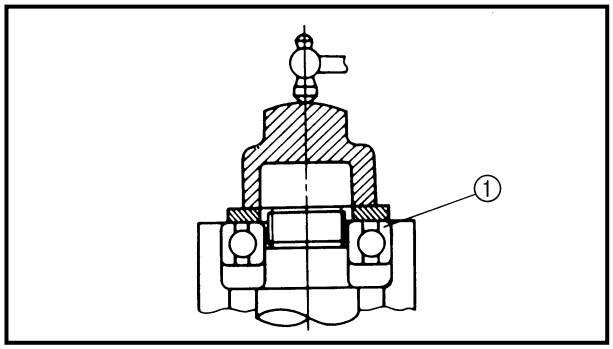
EC133000
GASKETS, OIL SEALS AND O-RINGS

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.



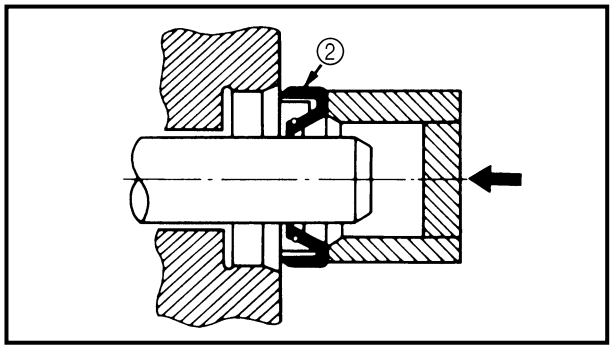
EC134000
LOCK WASHERS/PLATES AND COTTER PINS

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.



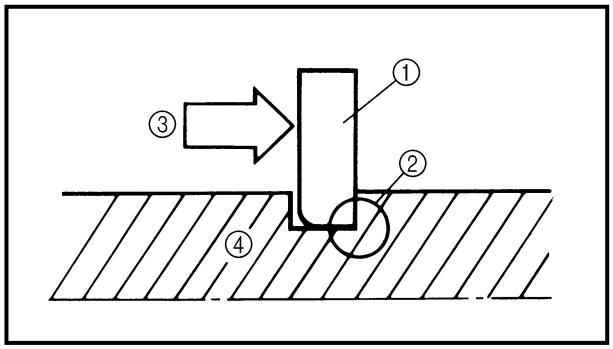
EC135001
BEARINGS AND OIL SEALS

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 lightweight lithium base grease to the seal lip(s). Oil the bearings liberally when installing.



CAUTION:

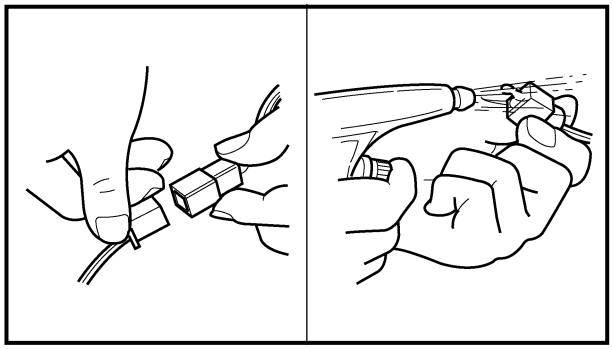
Do not use compressed air to spin the bearings dry. This causes damage to the bearing surfaces.



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.

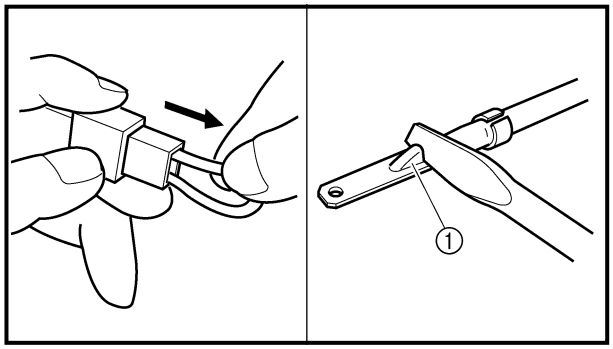
④ Shaft



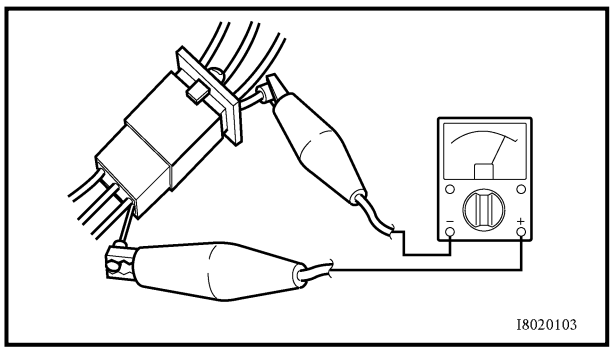
CHECKING OF CONNECTION

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

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



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.

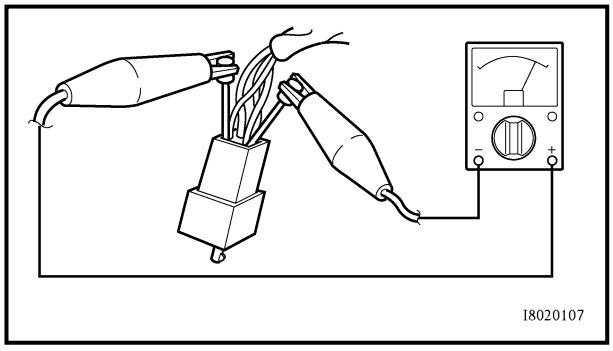


6. Connect:
   - Connector

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.

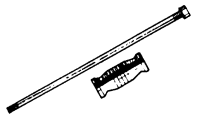
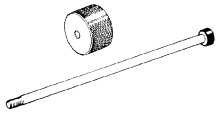
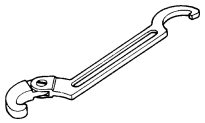
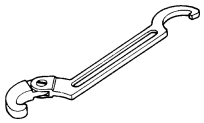
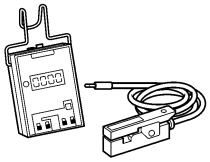
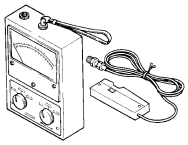
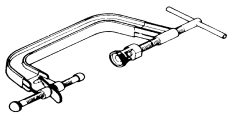
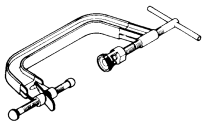
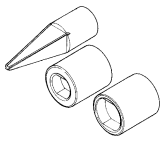
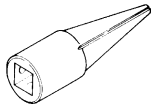
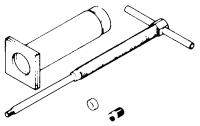
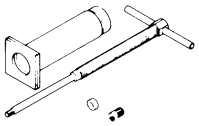


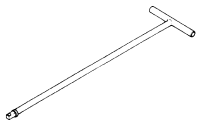
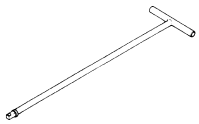
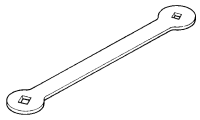
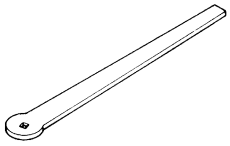
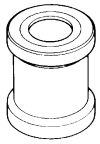
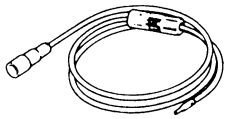
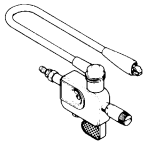
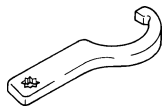
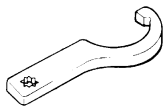
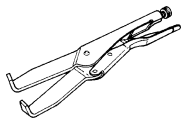
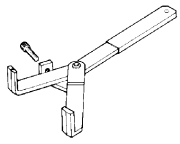
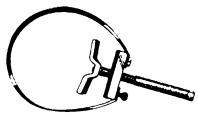
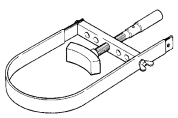
SPECIAL TOOLS

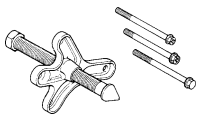
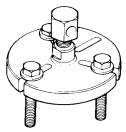
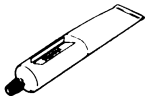
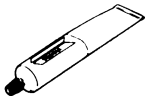
The proper special tools are necessary for complete and accurate tune-up and assembly. Using the correct special tool will help prevent damage caused by the use of improper tools or improvised techniques. The shape and part number used for the special tool differ by country, so two types are provided.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

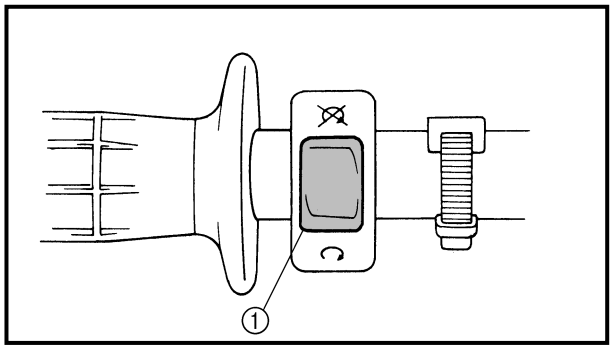
NOTE:

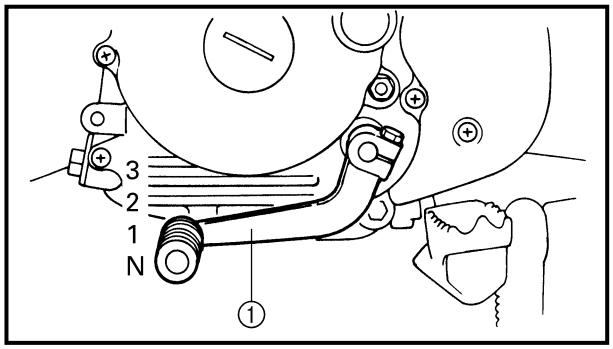
- For U.S.A. and Canada, use part number starting with "YM-", "YU-", "YS-" or "ACC-".
- For others, use part number starting with "90890-".

Part number	Tool name/How to use	Illustration	
YU-1083-A 90890-01084 90890-01085	Slide hammer set Weight Slide hammer bolt These tools are used when removing or installing the rocker arm shafts.	YU-1083-A 	90890-01084 90890-01085 
YU-1268, 90890-01268	Ring nut wrench This tool is used when loosen the steering ring nut to specification.	YU-1268 	90890-01268 
YU-3112-C, 90890-03112	Pocket tester Use this tool to inspect the coil resistance, output voltage and amperage.	YU-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-4019, 90890-04019	Valve spring compressor This tool is needed to remove and install the valve assemblies.	YM-4019 	90890-04019 
YM-1300 90890-01294	Damper rod holder set Damper rod holder Use this tool to remove and install the damper rod.	YM-1300 	90890-01294 
YU-1304, 90890-01304	Piston pin puller set This tool is used to remove the piston pin.	YU-1304 	90890-01304 

Part number	Tool name/How to use	Illustration	
YM-1312-A, 90890-01312	Fuel level gauge This gauge is used to measure the fuel level in the float chamber.	YM-1312-A 	90890-01312 
YM-1326, 90890-01326	T-handle This tool is used for holding the damper rod holder when removing or installing the damper rod holder.	YM-1326 	90890-01326 
90890-01186	Fork seal driver attachment This tool is used to installing the oil seal.		90890-01186 
YM-8035, 90890-01311	Valve adjusting tool This tool is necessary for adjusting valve clearance.	YM-8035 	90890-01311 
YM-33963, 90890-01184	Fork seal driver weight This tool is used to installing the oil seal.	YM-33963 	90890-01184 
YM-34487 90890-06754	Dynamic spark tester Ignition checker This instrument is necessary for checking the ignition system components.	YM-34487 	90890-06754 
YM-33975, 90890-01403	Ring nut wrench This tool is used when tighten the steering ring nut to specification.	YM-33975 	90890-01403 
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 
YS-1880-A, 90890-01701	Sheave holder This tool is used for when loosening or tightening the flywheel magneto securing nut.	YS-1880-A 	90890-01701 

Part number	Tool name/How to use	Illustration	
YU-33270-B, 90890-01362	Flywheel puller This tool is used to remove the rotor.	YU-33270-B 	90890-01362 
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

"ENGINE STOP" SWITCH

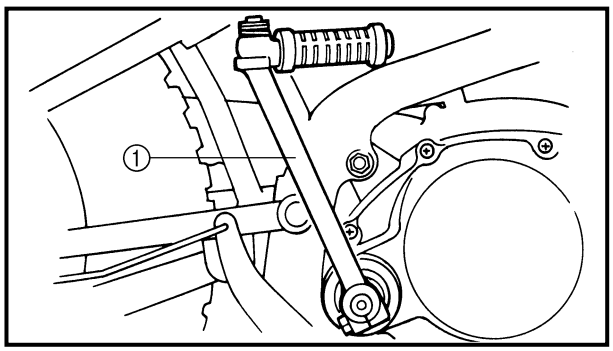
Make sure that the engine stop switch ① is positioned to "". The engine stop switch has been equipped to ensure safety in an emergency such when the machine is up set or trouble takes place in the throttle system. The engine will not start or run when the engine stop switch is turned to "".

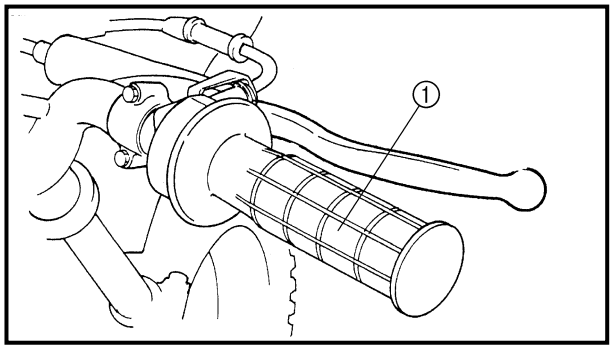
SHIFT PEDAL

The gear ratios of the constant-mesh 3 speed transmission are ideally spaced. The gears can be shifted by using the shift pedal ① on the left side of the engine.

⚠ WARNING

When starting out on the machine, shift the transmission into 1st after pulling in the front brake lever and closing the throttle grip.





KICK STARTER

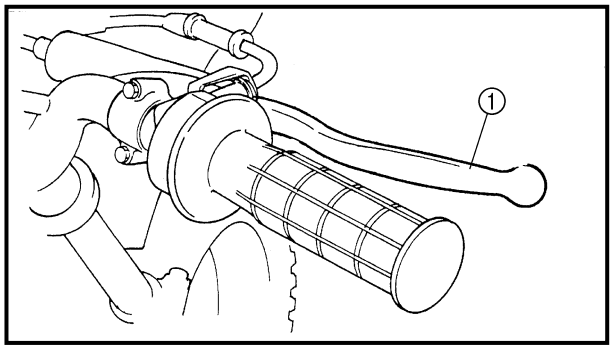
⚠ WARNING

Before starting the engine, be sure to shift the transmission into neutral.

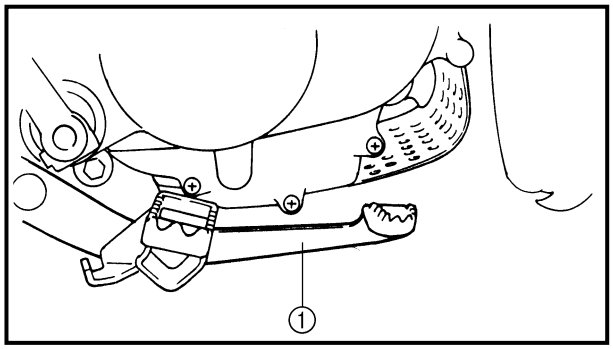
Rotate the kick starter ① away from the engine. Push the starter down lightly with your foot until the gears engage, then kick smoothly and forcefully to start the engine.

EC155001
THROTTLE GRIP

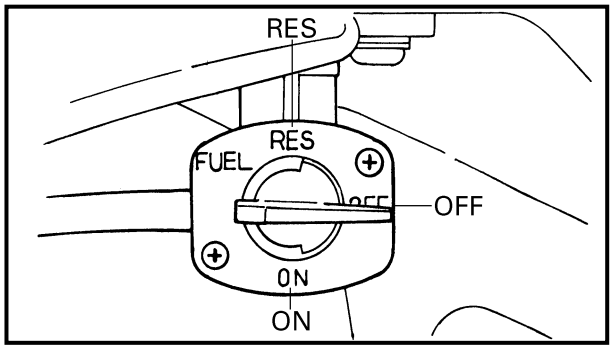
The throttle grip ① is located on the right handlebar; it accelerates or decelerates the engine. For acceleration, turn the grip toward you; for deceleration, turn it away from you.



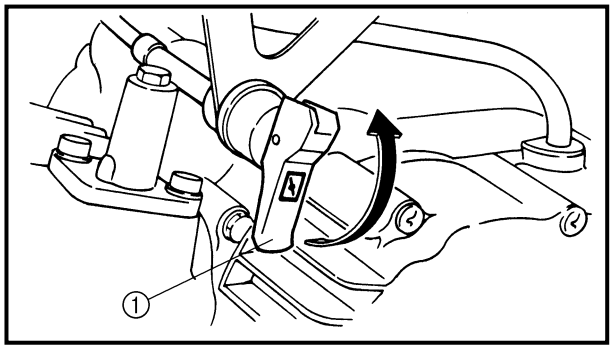
EC156000
FRONT BRAKE LEVER
The front brake lever ① is located on the right handlebar. Pull it toward the handlebar to activate the front brake.



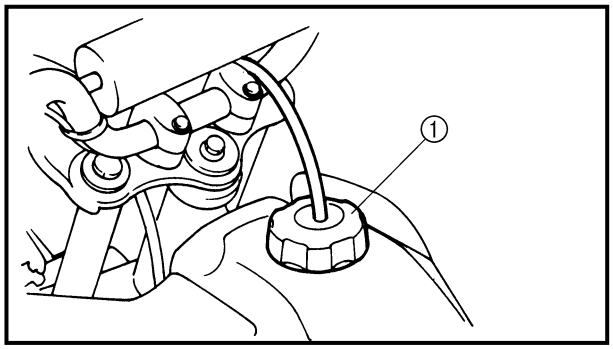
EC157000
REAR BRAKE PEDAL
The rear brake pedal ① is located on the right side of the machine. Press down on the brake pedal to activate the rear brake.



FUEL COCK
The fuel cock supplies fuel from the tank to carburetor while filtering the fuel. The fuel cock has the three 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.
RES: This indicates reserve. If you run out of fuel while riding, move the lever to this position. FILL THE TANK AT THE FIRST OPPORTUNITY. BE SURE TO SET THE LEVER TO “ON” AFTER REFUELING.



STARTER LEVER (CHOKE)
When cold, the engine requires a richer air/fuel mixture for starting. A separate starter circuit, which is controlled by the starter lever ①, supplies this mixture.
Pull the lever out to open the circuit (for starting) and push the lever in to close the circuit.

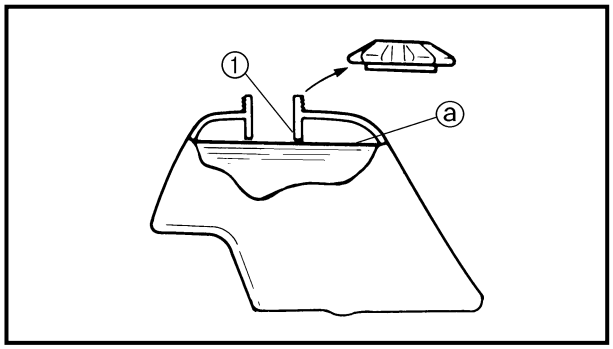


FUEL TANK CAP

Remove the fuel tank cap ① by turning counter-clockwise.

⚠ WARNING

Do not overfill the fuel tank. Avoid spilling fuel on the hot engine.



FUEL

Use regular gasoline. Always use fresh, name brand gasoline.

⚠ WARNING

Do not overfill the fuel tank. Avoid spilling fuel on the hot engine. Do not fill the fuel tank above the bottom of the filler tube ① as shown in the illustration or it may overflow when the fuel heats up later and expands.

ⓐ Fuel level

Recommended fuel:
For USA, AUS and NZ:
Unleaded gasoline only
For CDN and EUROPE:
Regular unleaded gasoline only
For ZA:
Regular gasoline
Fuel tank capacity:
Total:
4.1 L (0.90 Imp gal, 1.08 US gal)
Reserve:
0.5 L (0.11 Imp gal, 0.13 US gal)

CAUTION:

Use only unleaded gasoline. The use of leaded gasoline will cause severe damage to the engine internal parts such as valves, piston rings, and exhaust system, etc.

STARTING AND OPERATION

CAUTION:

Prior to operating the machine, perform steps listed in pre-operation check list.

⚠ WARNING

Never start your engine or let it run for any length of time in a closed area. The exhaust fumes are poisonous and can cause loss of consciousness and death within a short time. Always operate your machine in an area with adequate ventilation.

STARTING A COLD ENGINE

⚠ WARNING

Before starting the engine, be sure to shift the transmission into neutral.

1. Turn the fuel cock to “ON”.
2. Operate the starter (choke) and completely close the throttle grip.
3. Slide the “ENGINE STOP” switch to the “◯”.
4. Kick the kick starter with full strength to start the engine.
5. After the engine starts, warm up for one or two minutes. Make sure the stater (choke) is returned to the original position before riding.

STARTING A WARM ENGINE

To start a warm engine, refer to the “Starting a cold engine” section. The starter (choke) should not be used. The throttle should be opened slightly.

CAUTION:

See “Engine break-in Section” prior to operating engine for the first time.

WARMING UP

To get maximum engine life, always “warm-up” the engine before starting off. Never accelerate hard with a cold engine! To see whether or not the engine is warm, see if it responds to throttle normally with the stater (choke) turned off.

⚠ WARNING

Before starting off, be sure to turn up or remove the side stand.

Failure to retract the side stand completely can result in a serious accident when you try to turn a corner.

ENGINE BREAK-IN

Brake-in is important to better fit the moving and sliding parts as well as the installed parts. It is also important to accustom the rider to the machine better.

Avoid full-throttle run on a new machine for the first 5 hours.

After the trial run, check for loose parts, oil leakage and other problems.

Make full inspection and adjustment especially of slack cables and drive chain and loose spokes.

CAUTION:

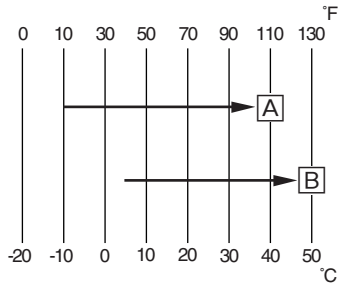
After the break-in period, check every fitting and fastener for looseness.

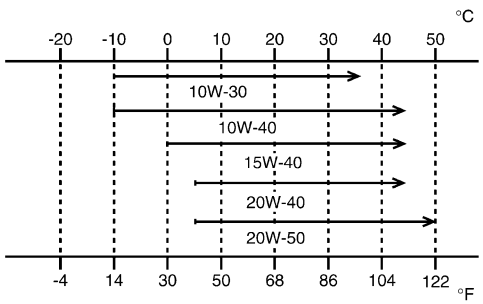
If any loose is found, retighten it securely.

EC200000
SPECIFICATIONS

EC211000
GENERAL SPECIFICATIONS

Model name:	TT-R90R (USA, CDN, AUS, NZ) TT-R90 (Europe, ZA)
Model code number:	5HNB (USA) 5HNC (Europe, AUS, NZ, ZA) 5HND (CDN)
Dimensions:	
Overall length	1,525 mm (57.0 in)
Overall width	605 mm (23.8 in)
Overall height	865 mm (34.1 in)
Seat height	625 mm (24.6 in)
Wheelbase	1,040 mm (40.9 in)
Minimum ground clearance	160 mm (6.3 in)
Basic weight:	
With oil and full fuel tank	64 kg (141 lb)
Engine:	
Engine type	Air cooled 4-stroke, SOHC
Cylinder arrangement	Single cylinder, forward inclined
Displacement	89 cm^3 (5.43 cu.in)
Bore × stroke	47.0 × 51.8 mm (1.85 × 2.04 in)
Compression ratio	8.5 : 1
Compression pressure (STD)	1,000 kPa (10 kg/cm^2, 145 psi) at 1,000 r/min
Starting system	Kick starter
Lubrication system:	Wet sump
Oil type or grade:	
Engine oil	(For USA and CDN) At –10 ˚C (10 ˚F) or higher A Yamalube 4 (10W-30) or SAE 10W-30 type SE/SF motor oil At 5 ˚C (40 ˚F) or higher B Yamalube 4 (20W-40) or SAE 20W-40 type SE/SF motor oil (Except for USA and CDN) API “SE/SF” or higher grade



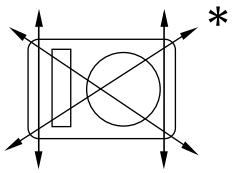
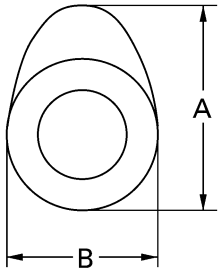
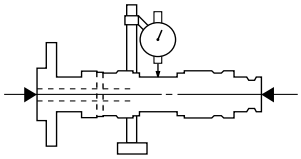


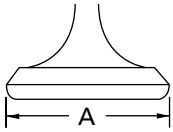
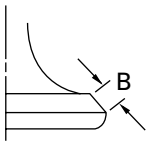
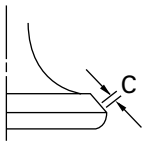
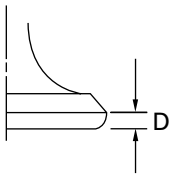
Oil capacity:		
Engine oil		
Periodic oil change		0.8 L (0.70 Imp qt, 0.85 US qt)
Total amount		1.0 L (0.88 Imp qt, 1.06 US qt)
Air filter:		Wet type element
Fuel:		
Type		Unleaded gasoline only (USA, AUS and NZ) Regular unleaded gasoline only (CDN, Europe) Regular gasoline (ZA)
Tank capacity		4.1 L (0.90 Imp gal, 1.08 US gal)
Reserve amount		0.5 L (0.11 Imp gal, 0.13 US gal)
Carburetor:		
Type		VM16SH
Manufacturer		MIKUNI
Spark plug:		
Type		CR6HSA/U20FSR-U
Manufacturer		NGK/DENSO
Gap		0.6 ~ 0.7 mm (0.02 ~ 0.03 in)
Clutch type:		Wet, multiple-disc and centrifugal automatic
Transmission:		
Primary reduction system		Spur gear
Primary reduction ratio		67/18 (3.722)
Secondary reduction system		Chain drive
Secondary reduction ratio		35/14 (2.500)
Transmission type		Constant mesh, 3-speed
Operation		Left foot operation
Gear ratio:	1st	37/13 (2.846)
	2nd	33/19 (1.736)
	3rd	28/23 (1.217)
Chassis:		
Frame type		Double cradle
Caster angle		24.83˚
Trail		56.0 mm (2.2 in)
Tire:		
Type		With tube
Size (front)		2.50-14 4PR
Size (rear)		3.00-12 4PR
Manufacturer (front and rear)		CHENG SHIN
Type (front and rear)		KNOBBY
Tire pressure (front and rear)		100 kPa (1.00 kgf/cm^2, 14.5 psi)

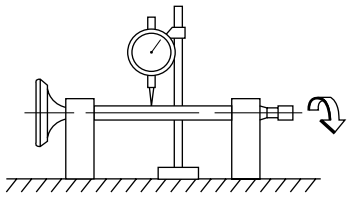
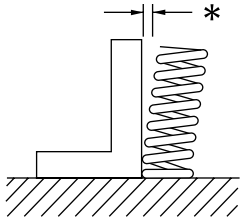
Brake:	
Front brake type	Drum brake
Operation	Right hand operation
Rear brake type	Drum brake
Operation	Right foot operation
Suspension:	
Front suspension	Telescopic fork
Rear suspension	Swingarm (monocross suspension)
Shock absorber:	
Front shock absorber	Coil spring/oil damper
Rear shock absorber	Coil spring/gas, oil damper
Wheel travel:	
Front wheel travel	110 mm (4.33 in)
Rear wheel travel	93 mm (3.66 in)
Electrical:	
Ignition system	CDI magneto

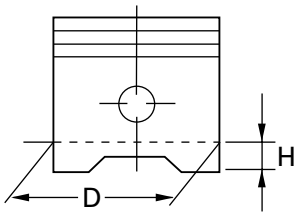
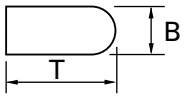
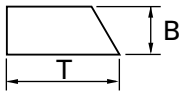
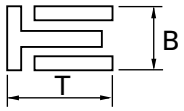
MAINTENANCE SPECIFICATIONS

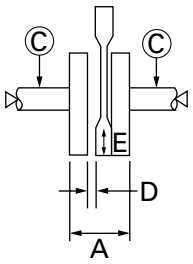
ENGINE

Item	Standard	Limit
Cylinder head:		
Warp limit 	----	0.03 mm (0.0012 in)
Cylinder:		
Bore size	47.000 ~ 47.005 mm (1.8504 ~ 1.8506 in)	47.05 mm (1.8524 in)
Out of round limit	----	0.05 mm (0.0020 in)
Camshaft:		
Drive method	Chain drive (left)	----
Cam dimensions 		
Intake “A”	25.428 ~ 25.528 mm (1.0011 ~ 1.0050 in)	25.398 mm (0.9999 in)
“B”	21.034 ~ 21.134 mm (0.8281 ~ 0.8320 in)	21.004 mm (0.8269 in)
Exhaust “A”	25.286 ~ 25.386 mm (0.9955 ~ 0.9994 in)	25.256 mm (0.9943 in)
“B”	21.047 ~ 21.147 mm (0.8286 ~ 0.8326 in)	21.017 mm (0.8274 in)
Camshaft runout limit 	----	0.03 mm (0.0012 in)

Item		Standard	Limit
Cam chain:			
Cam chain type/No. of links		92RH2005-84M/84	----
Cam chain adjustment method		Automatic	----
Rocker arm/rocker arm shaft:			
Shaft outside diameter		9.981 ~ 9.991 mm (0.3930 ~ 0.3933 in)	9.95 mm (0.3917 in)
Rocker arm inside diameter		10.000 ~ 10.015 mm (0.3937 ~ 0.3943 in)	10.03 mm (0.3949 in)
Valve, valve seat, valve guide:			
Valve clearance (cold)	IN	0.05 ~ 0.09 mm (0.0020 ~ 0.0035 in)	----
	EX	0.08 ~ 0.12 mm (0.0031 ~ 0.0047 in)	----
Valve dimensions:			
 Head Diameter	 Face Width	 Seat Width	 Margin Thickness	
"A" head diameter	IN	22.9 ~ 23.1 mm (0.9016 ~ 0.9094 in)	----
	EX	19.9 ~ 20.1 mm (0.7835 ~ 0.7913 in)	----
"B" face width	IN	1.19 ~ 2.51 mm (0.0469 ~ 0.0989 in)	----
	EX	1.49 ~ 3.07 mm (0.0587 ~ 0.1209 in)	----
"C" seat width	IN	0.9 ~ 1.1 mm (0.0354 ~ 0.0433 in)	1.6 mm (0.0630 in)
	EX	0.9 ~ 1.1 mm (0.0354 ~ 0.0433 in)	1.6 mm (0.0630 in)
"D" margin thickness	IN	0.5 ~ 0.9 mm (0.0197 ~ 0.354 in)	----
	EX	0.8 ~ 1.2 mm (0.0315 ~ 0.0472 in)	----
Stem outside diameter	IN	4.475 ~ 4.490 mm (0.1762 ~ 0.1768 in)	4.450 mm (0.1752 in)
	EX	4.460 ~ 4.475 mm (0.1756 ~ 0.1762 in)	4.435 mm (0.1746 in)
Guide inside diameter	IN	4.500 ~ 4.512 mm (0.1772 ~ 0.1776 in)	4.542 mm (0.1788 in)
	EX	4.500 ~ 4.512 mm (0.1772 ~ 0.1776 in)	4.542 mm (0.1788 in)
Stem-to-guide clearance	IN	0.010 ~ 0.037 mm (0.0004 ~ 0.0015 in)	0.08 mm (0.003 in)
	EX	0.025 ~ 0.052 mm (0.0010 ~ 0.0020 in)	0.10 mm (0.004 in)

Item		Standard	Limit
Stem runout limit		----	0.02 mm (0.0008 in)
			
Valve seat width	IN	0.9 ~ 1.1 mm (0.0354 ~ 0.0433 in)	1.6 mm (0.0630 in)
	EX	0.9 ~ 1.1 mm (0.0354 ~ 0.0433 in)	1.6 mm (0.0630 in)
Valve spring:			
Free length	IN	28.32 mm (1.11 in)	26.9 mm (1.06 in)
	EX	28.32 mm (1.11 in)	26.9 mm (1.06 in)
Set length (valve closed)	IN	24.2 mm (0.95 in)	----
	EX	24.2 mm (0.95 in)	----
Compressed pressure (installed)	IN	90.4 ~ 104.1 N (9.22 ~ 10.62 kg, 20.33 ~ 23.41 lb)	----
	EX	90.4 ~ 104.1 N (9.22 ~ 10.62 kg, 20.33 ~ 23.41 lb)	----
Tilt limit*	IN	----	2.5˚/1.2 mm (2.5˚/0.05 in)
	EX	----	2.5˚/1.2 mm (2.5˚/0.05 in)
			
Direction of winding (top view)	IN	Clockwise	----
	EX	Clockwise	----

Item	Standard	Limit
Piston:		
Piston to cylinder clearance	0.025 ~ 0.045 mm (0.0010 ~ 0.0018 in)	0.15 mm (0.0059 in)
Piston size "D"	46.960 ~ 46.975 mm (1.8488 ~ 1.8494 in)	----
		
Piston over size (2nd)	47.5 mm (1.8701 in)	----
(4th)	48.0 mm (1.8898 in)	----
Measuring point "H"	4 mm (0.16 in)	----
Piston off-set	0.75 mm (0.0295 in)	----
Piston pin bore inside diameter	13.002 ~ 13.013 mm (0.5119 ~ 0.5123 in)	13.045 mm (0.5136 in)
Piston pin outside diameter	12.996 ~ 13.000 mm (0.5117 ~ 0.5118 in)	12.976 mm (0.5109 in)
Piston rings:		
Top ring		
		
Type	Barrel	----
Dimensions (B × T)	1.0 × 2.0 mm (0.04 × 0.08 in)	----
End gap (installed)	0.10 ~ 0.25 mm (0.004 ~ 0.010 in)	0.4 mm (0.016 in)
Side clearance (installed)	0.030 ~ 0.065 mm (0.0012 ~ 0.0026 in)	0.12 mm (0.005 in)
2nd ring		
		
Type	Taper	----
Dimensions (B × T)	1.0 × 2.0 mm (0.04 × 0.08 in)	----
End gap (installed)	0.10 ~ 0.25 mm (0.004 ~ 0.010 in)	0.4 mm (0.016 in)
Side clearance	0.020 ~ 0.055 mm (0.0008 ~ 0.0022 in)	0.12 mm (0.005 in)
Oil ring		
		
Dimensions (B × T)	2.0 × 2.3 mm (0.08 × 0.09 in)	----
End gap (installed)	0.2 ~ 0.7 mm (0.01 ~ 0.03 in)	----

Item		Standard	Limit
Crankshaft:			
Crank width "A"		42.95 ~ 43.00 mm (1.691 ~ 1.693 in)	----
Runout limit C		----	0.03 mm (0.0012 in)
Big end side clearance "D"		0.10 ~ 0.40 mm (0.0039 ~ 0.0157 in)	0.50 mm (0.02 in)
Big end radial clearance "E"		0.010 ~ 0.025 mm (0.0004 ~ 0.0010 in)	0.05 mm (0.002 in)
Clutch:			
Friction plate thickness		2.7 ~ 2.9 mm (0.106 ~ 0.114 in)	2.6 mm (0.102 in)
Quantity		5	----
Clutch plate thickness		1.1 ~ 1.3 mm (0.043 ~ 0.051 in)	----
Quantity		4	----
Warp limit		----	0.2 mm (0.008 in)
Clutch spring free length		26.2 mm (1.03 in)	24.2 mm (0.95 in)
Quantity		4	----
Clutch release method		Inner push, cam push	----
Push rod bending limit		----	0.5 mm (0.02 in)
Automatic centrifugal clutch:			
Clutch-in revolution		2,160 ~ 2,560 r/min	----
Clutch-stall revolution		3,300 ~ 3,800 r/min	----
Shifter:			
Shifter type		Cam drum and guide bar	----
Kick starter:			
Type		Ratchet type	----
Kick clip friction force		5.8 ~ 14.7 N (0.59 ~ 1.50 kg, 1.3 ~ 3.3 lb)	----
Carburetor:			
I. D. mark		5HN1 01	----
Main jet	(M.J)	#90	----
Main air jet	(M.A.J)	ø 1.1	----
Jet needle	(J.N)	4E9-2	----
Cutaway	(C.A)	2.5	----
Pilot outlet	(P.O)	ø 1.0 × 2.0	----
Pilot jet	(P.J)	#12.5	----
Valve seat size	(V.S)	ø 1.5	----
Starter jet 1	(G.S.1)	#37.5	----
Pilot air screw		1-3/4 turns out	----
Float height	(F.H)	15.5 ~ 16.5 mm (0.61 ~ 0.65 in)	----
Fuel level	(F.L)	2 ~ 3 mm (0.08 ~ 0.1 in)	----
Engine idle speed		1,400 ~ 1,600 r/min	----

Item	Standard	Limit
Lubrication system:		
Oil filter type	Wire mesh type	----
Oil pump type	Trochoid type	----
Tip clearance “A” or “B”	0.15 mm (0.0059 in)	0.2 mm (0.0079 in)
Side clearance	0.13 ~ 0.18 mm (0.0051 ~ 0.0071 in)	0.23 mm (0.0091 in)
Housing and rotor clearance	0.06 ~ 0.10 mm (0.0024 ~ 0.0039 in)	0.15 mm (0.0059 in)

Part to be tightened	Thread size	Q'ty	Tightening torque		
			Nm	m•kg	ft•lb
Cylinder head nut	M8 × 1.25	4	22	2.2	16
Cylinder head bolt	M6 × 1.0	2	10	1.0	7.2
Spark plug	M10 × 1.0	1	13	1.3	9.4
Camshaft sprocket cover bolt	M6 × 1.0	2	7	0.7	5.1
Tappet cover	M45 × 1.5	2	18	1.8	13
Exhaust pipe stud bolt	M6 × 1.0	2	7	0.7	5.1
Rotor nut	M12 × 1.25	1	48	4.8	35
Timing chain guide (rear)	M6 × 1.0	2	10	1.0	7.2
Valve clearance adjust screw locknut	M5 × 0.5	2	7	0.7	5.1
Camshaft sprocket	M8 × 1.25	1	20	2.0	14
Camshaft bearing retainer	M6 × 1.0	1	10	1.0	7.2
Timing chain tensioner cap bolt	M8 × 1.25	1	8	0.8	5.8
Timing chain tensioner	M6 × 1.0	2	10	1.0	7.2
Oil pump	M6 × 1.0	2	7	0.7	5.1
Drain bolt	M12 × 1.5	1	20	2.0	14
Carburetor joint (cylinder head side)	M6 × 1.0	2	7	0.7	5.1
Carburetor joint (carburetor side)	M6 × 1.0	2	7	0.7	5.1
Air filter case	M6 × 1.0	2	7	0.7	5.1
Exhaust pipe	M6 × 1.0	2	7	0.7	5.1
Exhaust pipe protector	M6 × 1.0	7	7	0.7	5.1
Silencer	M8 × 1.25	1	24	2.4	17
Silencer protector	M5 × 0.8	2	4	0.4	2.9
Crankcase	M6 × 1.0	9	10	1.0	7.2
Crankcase cover (left)	M6 × 1.0	8	7	0.7	5.1
Drive sprocket cover	M6 × 1.0	2	7	0.7	5.1
Crankcase cover (right)	M6 × 1.0	9	7	0.7	5.1
Timing plug	M14 × 1.5	1	7	0.7	5.1
Crankshaft end cover	M32 × 1.5	1	7	0.7	5.1
Cylinder head stud bolt	M8 × 1.25	4	13	1.3	9.4
Kick crank	M6 × 1.0	1	10	1.0	7.2
Primary drive gear	M12 × 1.0	1	50	5.0	36
Pressure plate	M5 × 0.8	4	6	0.6	4.3
Clutch boss	M14 × 1.0	1	70	7.0	50
Main axle bearing retainer	M6 × 1.0	1	10	1.0	7.2
Shift pedal	M6 × 1.0	1	8	0.8	5.8
Clutch adjust screw locknut	M6 × 1.0	1	8	0.8	5.8
Pickup coil	M6 × 1.0	2	10	1.0	7.2
Stator assembly	M6 × 1.0	3	10	1.0	7.2

CHASSIS

Item	Standard	Limit
Steering system:		
Steering bearing type	Angular bearing	----
Front suspension:		
Front fork travel	110 mm (4.33 in)	----
Fork spring free length	425.1 mm (16.74 in)	417 mm (16.4 in)
Fork spring fitting length	415.1 mm (16.34 in)	----
Spring rate, STD	K = 3.4 N/mm (0.35 kg/mm, 19.41 lb/in)	----
Optional spring/spacer	No	----
Oil capacity	64 cm^3 (2.26 lmp oz, 2.16 US oz)	----
Oil level	185 mm (7.28 in)	----
Oil grade	Fork oil 15W or equivalent	----
Rear suspension:		
Shock absorber travel	48 mm (1.89 in)	----
Spring free length	169 mm (6.65 in)	----
Fitting length	165 mm (6.5 in)	----
Spring rate, STD	K = 45.6 N/mm (4.65 kg/mm, 260 lb/in)	----
Optional spring	No	----
Enclosed gas pressure	2,000 kPa (20 kg/cm^2, 290 psi)	----
Swingarm:		
Swingarm free play limit		
End	----	1.0 mm (0.04 in)
Side clearance	----	0.3 mm (0.01 in)
Wheel:		
Front wheel type	Spoke wheel	----
Rear wheel type	Spoke wheel	----
Front rim size/material	14 × 1.40/steel	----
Rear rim size/material	12 × 1.60/steel	----
Rim runout limit:		
Radial	----	2.0 mm (0.08 in)
Lateral	----	2.0 mm (0.08 in)
Drive chain:		
Type/manufacturer	DID420(I)/DAIDO	----
Number of links	86 links	----
Chain slack	40 ~ 53 mm (1.6 ~ 2.1 in)	----
Chain length (10 links)	----	121.9 mm (4.80 in)

Item	Standard	Limit
Drum brake:		
Front drum brake type	Leading, trailing	----
Rear drum brake type	Leading, trailing	----
Front drum inside diameter	95 mm (3.74 in)	96 mm (3.78 in)
Rear drum inside diameter	110 mm (4.33 in)	111 mm (4.37 in)
Front lining thickness	3 mm (0.12 in)	2 mm (0.08 in)
Rear lining thickness	4 mm (0.16 in)	2 mm (0.08 in)
Front shoe spring free length	32.7 mm (1.29 in)	----
Rear shoe spring free length	50.5 mm (1.99 in)	----
Brake lever and brake pedal:		
Brake lever free play (lever end)	10 ~ 20 mm (0.39 ~ 0.79 in)	----
Brake pedal free play	10 ~ 20 mm (0.39 ~ 0.79 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
	Engine mounting:					
△	Engine and frame (front-upper)	M8 × 1.25	1	30	3.0	22
△	Engine and frame (rear-upper)	M8 × 1.25	1	26	2.6	19
△	Engine and frame (rear-lower)	M10 × 1.25	1	40	4.0	29
	Starter cable and frame	M11 × 1.25	1	1	0.1	0.7
△	Pivot shaft and nut	M10 × 1.25	1	30	3.0	22
△	Handle crown and steering shaft	M10 × 1.25	1	40	4.0	29
△	Front fork cap bolt	M20 × 1.0	2	40	4.0	29
△	Under bracket and front fork	M10 × 1.25	2	33	3.3	24
	Damper rod bolt	M8 × 1.25	2	20	2.0	14
△	Handle crown and handlebar holder (lower)	M10 × 1.25	2	40	4.0	29
	Handlebar holder (upper)	M6 × 1.0	4	13	1.3	9.4
	Front brake cable holder and front fork	M6 × 1.0	2	7	0.7	5.1
△	Steering ring nut	M25	1	Refer to NOTE.		
△	Fuel tank and fuel cock	M6 × 1.0	2	7	0.7	5.1
	Fuel tank and frame	M6 × 1.0	2	7	0.7	5.1
	Grab bar and frame	M6 × 1.0	4	13	1.3	9.4
△	Front brake camshaft lever and camshaft	M6 × 1.0	1	7	0.7	5.1
△	Rear brake camshaft lever and camshaft	M6 × 1.0	1	7	0.7	5.1
△	Front wheel axle nut	M10 × 1.25	1	35	3.5	25
△	Rear brake shoe plate tension bar	M8 × 1.25	2	26	2.6	19
△	Wheel drive hub and driven sprocket	M8 × 1.25	4	25	2.5	18
△	Rear wheel axle nut	M12 × 1.25	1	60	6.0	43
	Wheel nipple (spoke)	—	64	2	0.2	1.4
	Drive chain guard	M5 × 0.8	2	4	0.4	2.9
	Drive chain support	M5 × 0.8	3	4	0.4	2.9
	Chain puller locknut	M6 × 1.0	2	3	0.3	2.2
	Footrest and frame	M8 × 1.25	2	30	3.0	22

NOTE:

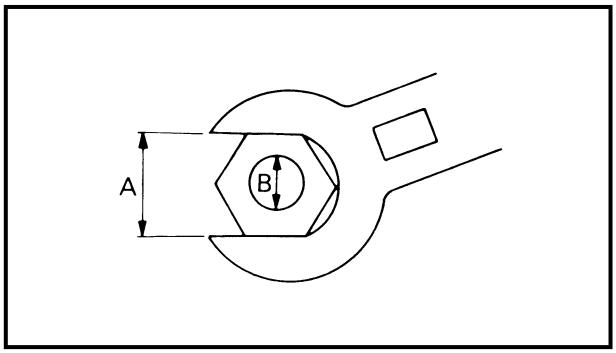
- 1. First, tighten the ring nut approximately 38 Nm (3.8 m • kg, 27 ft • lb) by using the ring nut wrench and turn the steering right and left a few times; then loosen the ring nut one turn.
  2. Retighten the ring nut 1 Nm (0.1 m • kg, 0.7 ft • lb).
- △-marked portion shall be checked for torque tightening after break-in or before each ride.

EC212300
ELECTRICAL

Item	Standard	Limit
CDI:		
Magneto-model/manufacturer	F5HN 00/YAMAHA	----
Source coil resistance (color)	688 ~ 1,032 Ω at 20 ˚C (68 ˚F) (Brown – Green)	----
Pickup coil resistance (color)	248 ~ 372 Ω at 20 ˚C (68 ˚F) (Red – White)	----
CDI unit-model/manufacturer	4GL-20/YAMAHA	----
Ignition coil:		
Model/manufacturer	2JN-00/YAMAHA	----
Minimum spark gap	6 mm (0.24 in)	----
Primary winding resistance	0.18 ~ 0.28 Ω at 20 ˚C (68 ˚F)	----
Secondary winding resistance	6.3 ~ 9.5 kΩ at 20 ˚C (68 ˚F)	----
Spark plug cap:		
Type	Resin	----
Resistance	10 kΩ at 20 ˚C (68 ˚F)	----

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 between 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

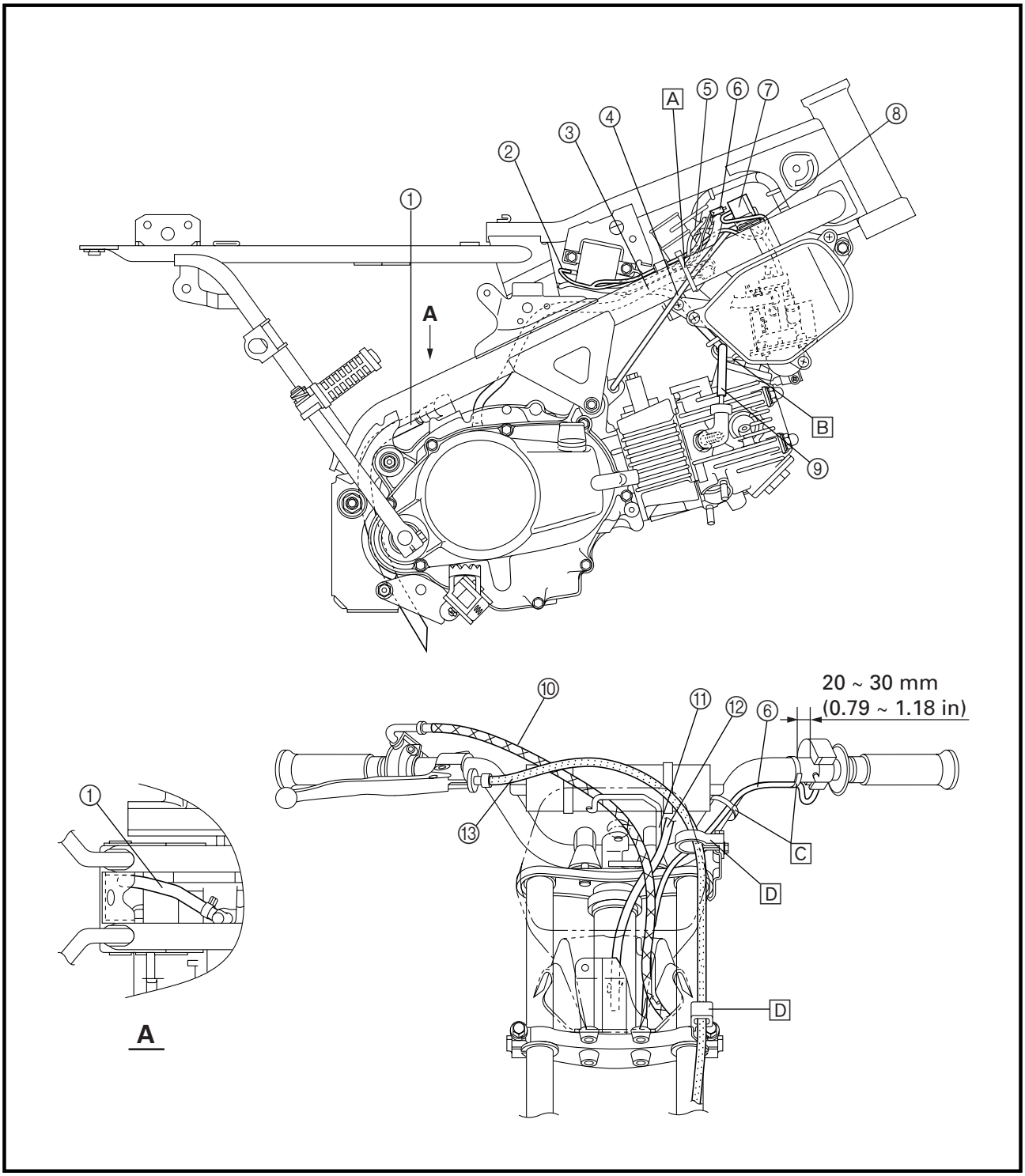
EC230000
DEFINITION OF UNITS

Unit	Read	Definition	Measure
mm cm	millimeter 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 kilogram	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

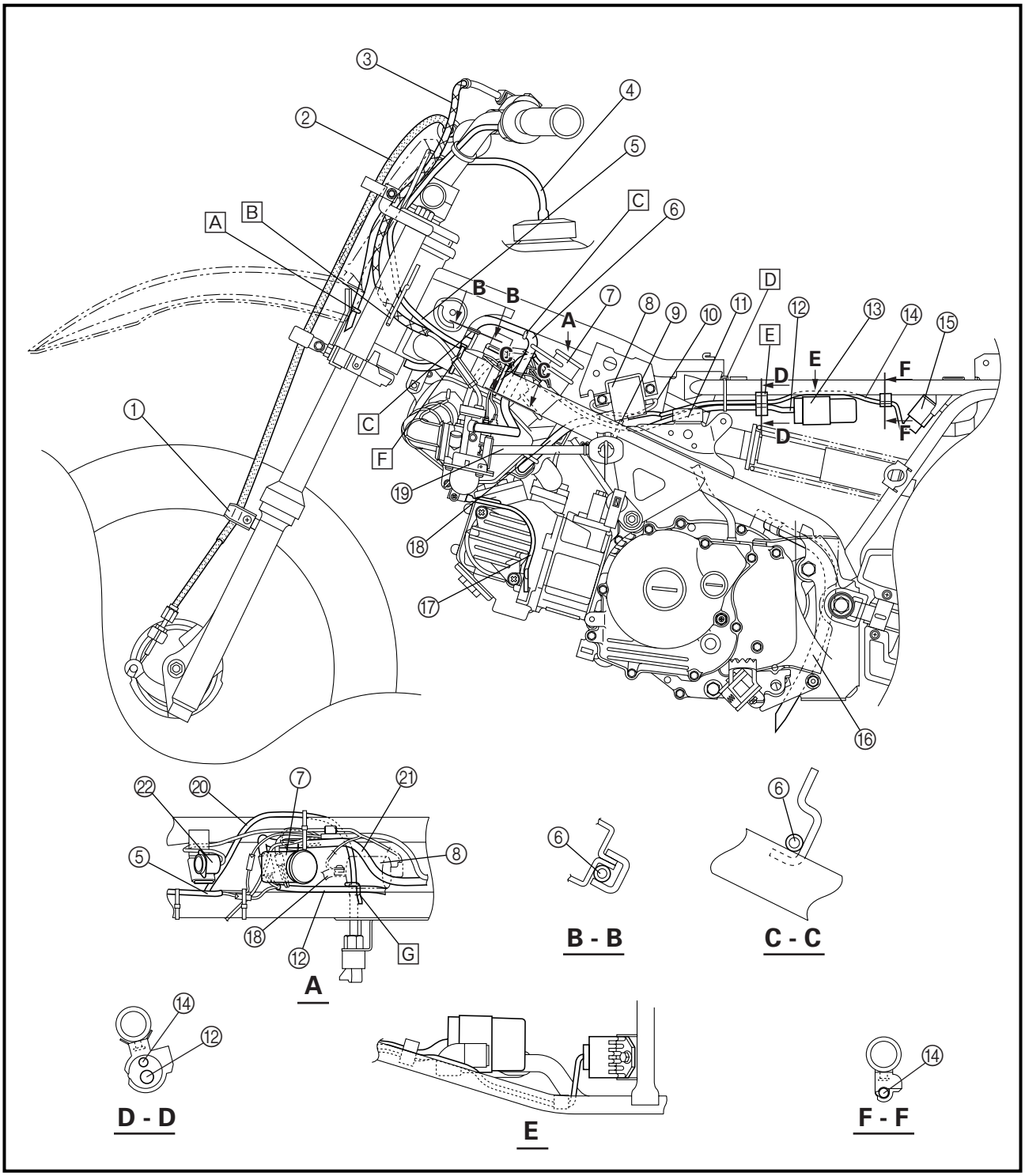
CABLE ROUTING DIAGRAM

① Crankcase breather hose
② Wire harness
③ CDI magneto lead
④ Starter cable
⑤ Carburetor heating lead
⑥ Engine stop switch lead
⑦ Thermo switch
⑧ Thermo switch lead
⑨ Spark plug lead
⑩ Throttle cable
⑪ Cable holder
⑫ Fuel tank breather hose
⑬ Brake cable

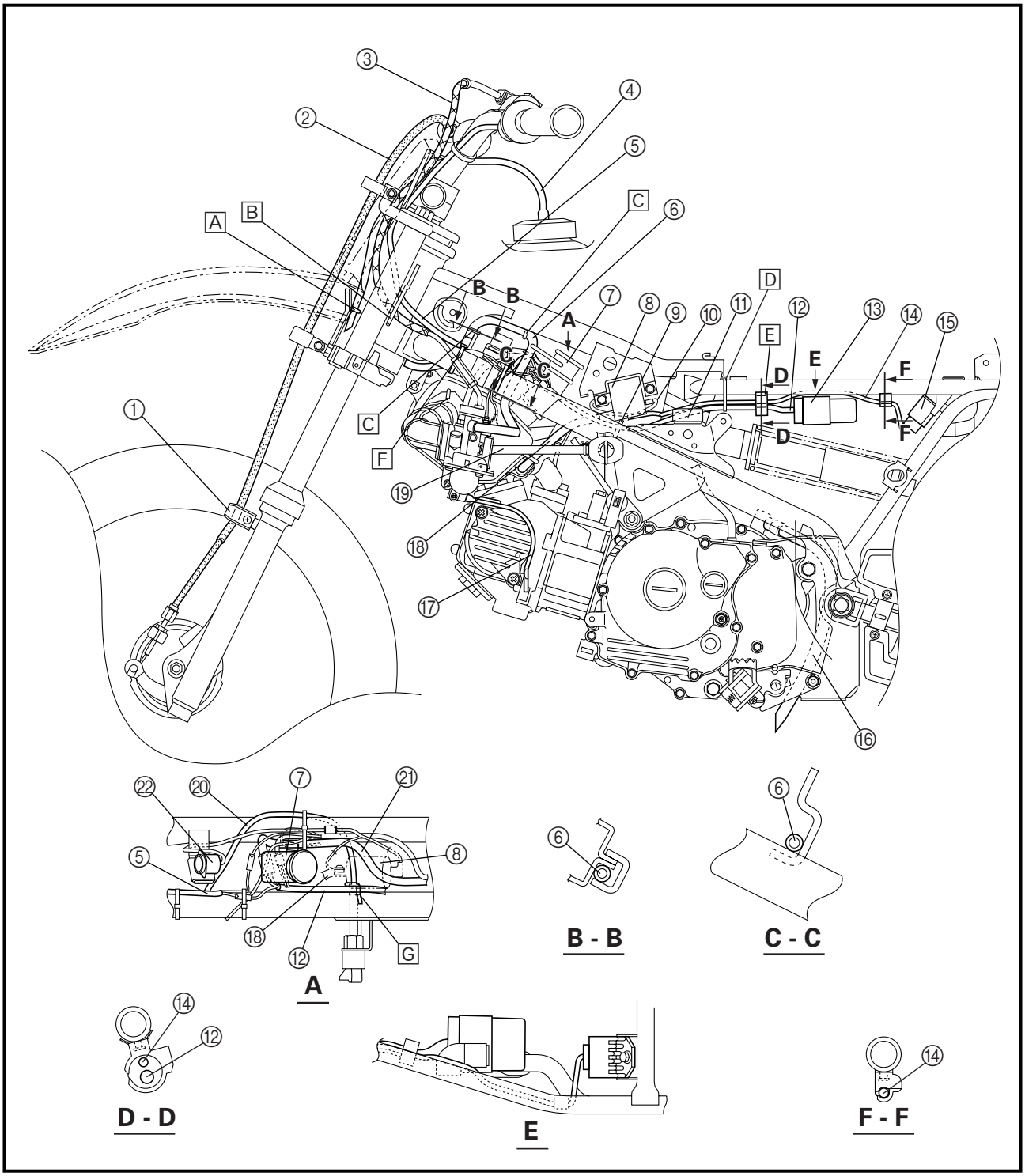
A After fastening the starter cable, CDI magneto lead, wire harness and thermo switch lead, cut off any excess from the plastic locking tie end.
B Pass the ignition coil lead through the lead guide.
C Fasten the engine stop switch lead with the plastic bands.
D Pass the brake cable through the cable guides.



① Cable guide
② Brake cable
③ Throttle cable
④ Fuel tank breather hose
⑤ Engine stop switch lead
⑥ Air vent hose
⑦ Air intake duct
⑧ Ignition coil
⑨ Cable guide
⑩ Wire harness
⑪ Damper
⑫ CDI unit lead
⑬ CDI unit
⑭ Rectifier/regulator lead
⑮ Rectifier/regulator
⑯ Crankcase breather hose
⑰ Carburetor breather hose
⑱ Spark plug lead
⑲ Fuel hose
⑳ Starter cable
㉑ CDI magneto lead
㉒ Thermo switch



[A] Pass the fuel tank breather hose through the cable guide.
[B] Pass the throttle cable and engine stop switch lead through the cable guide.
[C] Pass the air vent hose through the hose guide.
[D] Fasten the CDI unit lead and rectifier/regulator lead with the plastic clamp.
[E] Align the tape on the rectifier/regulator lead with the plastic clamp.
[F] After fastening the engine stop switch lead, cut off any excess from the plastic locking tie end.
[G] Pass the CDI unit lead through the lead guide.



EC300000

REGULAR INSPECTION AND ADJUSTMENTS

MAINTENANCE INTERVALS

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

PERIODIC MAINTENANCE AND LUBRICATION

Dealer Note	Item	Checks and maintenance jobs	Initial	Every	
			10 hours (1 month)	60 hours (6 months)	120 hours (12 months)
*	Fuel line	Check fuel hoses for cracks or damage. Replace if necessary.		○	○
	Spark plug	Check condition. Clean, regap or replace if necessary.		○	○
*	Valves	Check valve clearance. Adjust if necessary.			○
	Air filter	Clean or replace if necessary.		○	○
*	Carburetor	Check engine idling speed and starter operation. Adjust if necessary.	○	○	○
	Exhaust systems	Check for leakage. Retighten if necessary. Replace gasket if necessary.		○	○
	Engine oil	Check oil level and vehicle for oil leakage. Correct if necessary. Change. (Warm engine before draining.)	○	○	○
	Clutch	Check operation. Adjust or replace cable.	○	○	○
*	Front brake	Check operation. Adjust brake lever free play and replace brake shoes if necessary.	Every ride		
*	Rear brake	Check operation. Adjust brake pedal free play and replace brake shoes if necessary.	Every ride		
*	Wheels	Check balance, runout, spoke tightness and for damage. Tighten spokes and rebalance, replace if necessary.	○	○	○
*	Tires	Check tread depth and for damage. Replace if necessary. Check air pressure. Correct if necessary.		○	○
*	Wheel bearings	Check bearing for looseness or damage. Replace if necessary.		○	○
*	Swingarm	Check swingarm pivoting point for play. Correct if necessary. Lubricate with lithium soap base grease.	○	○	○
	Drive chain	Check chain slack. Adjust if necessary. Make sure that the rear wheel is properly aligned. Clean and lubricate.	Every ride		
*	Steering bearings	Check bearing play and steering for roughness. Correct accordingly. Lubricate with lithium soap base grease every 120 hours.	○		○

Dealer Note	Item	Checks and maintenance jobs	Initial	Every	
			10 hours (1 month)	60 hours (6 months)	120 hours (12 months)
*	Chassis fasteners	Make sure that all nuts, bolts and screws are properly tightened. Tighten if necessary.	○	○	○
	Sidestand	Check operation. Lubricate and repair if necessary.	○		○
*	Spark arrester*1	Clean.			○
*	Front fork	Check operation and for oil leakage. Correct accordingly.		○	○
*	Rear shock absorber assembly	Check operation and shock absorber for oil leakage. Replace shock absorber assembly if necessary.		○	○

*: Since these items requires special tools data and technical skills, they should be serviced.
*1: For USA

SERVICE NOTES:

No. 1. DRIVE CHAIN: In addition to tension and alignment, chain must be lubricated every 0.5 ~ 1.0 hour. If unit is subjected to extremely hard usage and wet weather riding, chain must be checked constantly. See “Lubrication Intervals” for additional details.

No. 2. AIR FILTER: Remove and clean filter every 20 ~ 40 hours.

3

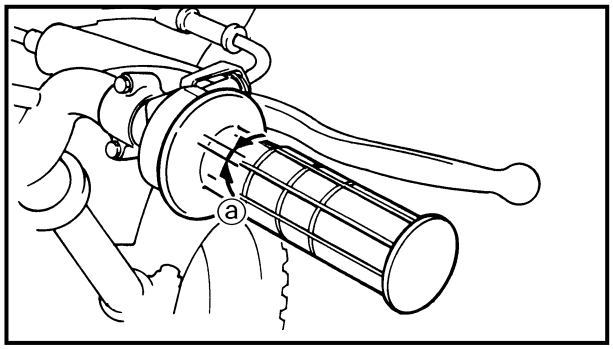
PRE-OPERATION INSPECTION AND MAINTENANCE

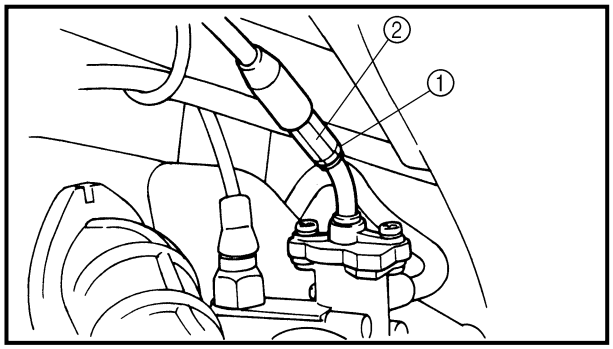
Before riding for break-in operation, practice or a race, make sure the machine is in good operating condition.

Before using this machine, check the following points.

GENERAL INSPECTION AND MAINTENANCE

Item	Routine	Page
Brake	Check operation/adjustment.	P3-11
Engine oil	Change oil as required.	P3-5 ~ 7
Drive chain	Check alignment/adjustment/lubrication.	P3-12 ~ 13
Spark plug	Check color/condition.	P3-19
Throttle	Check for proper throttle cable operation.	P3-3
Air filter	Foam type – must be clean and damp oil always	P3-3 ~ 4
Wheels and tires	Check pressure/runout/spoke tightness/bead stopper/axle nuts.	P3-14 ~ 17
Fittings/fasteners	Check all – tighten as necessary.	P2-13





EC350000
ENGINE

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:

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

- Loosen the locknut ① on throttle cable.
- Turn the adjuster ② in or out until the specified free play is obtained.

Turning in:	**Free play is increased.**
Turning out:	**Free play is decreased.**

- Tighten the locknut.

⚠ WARNING

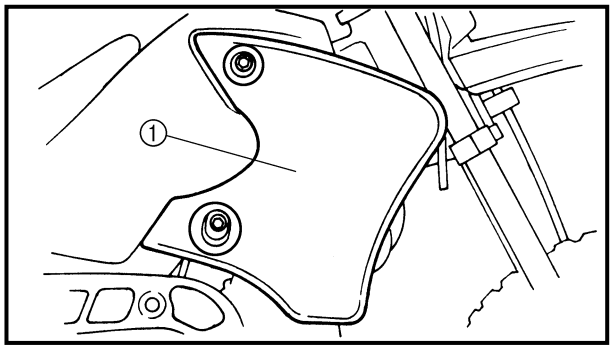
After adjusting, turn the handlebar to right and left and make sure that the engine idling does not run faster.

AIR FILTER CLEANING

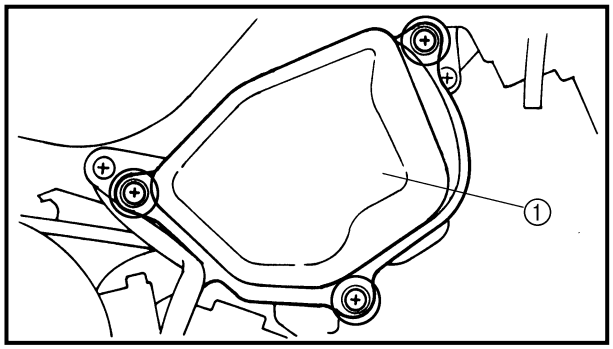
NOTE:
Proper air filter maintenance is the biggest key to preventing premature engine wear and damage.

CAUTION:

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

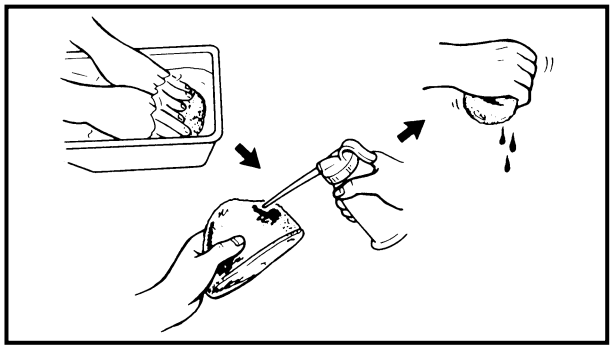


1. Install:
   - Air scoop (right) ①



2. Install:
   - Air filter case cover ①

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

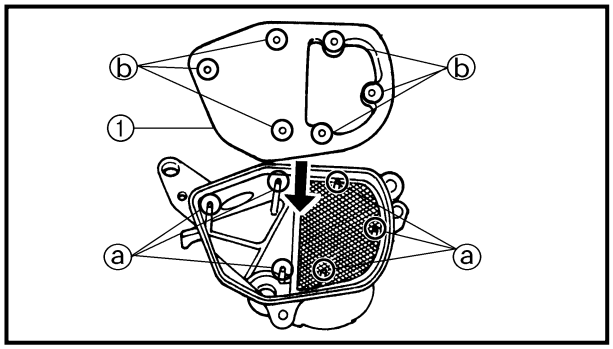


NOTE:
After cleaning, remove the remaining solvent by squeezing the element.

CAUTION:
- **Do not twist the element when squeezing the element.**
- **Leaving too much of solvent in the element may result in poor starting.**

4. Inspect:
   - Air filter element
     Damage → Replace.
5. Apply:
   - Foam-air-filter oil or engine mixing oil
     To the element.

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



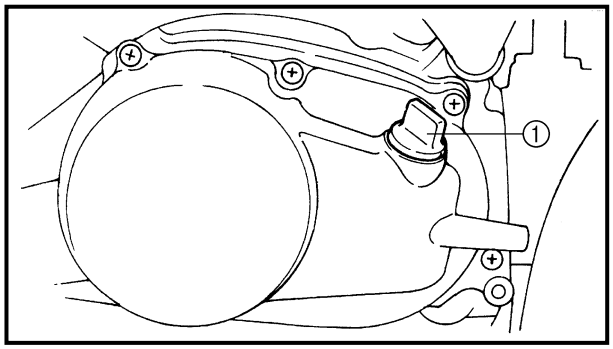
6. Install:
   - Air filter element ①

NOTE:
Align the projection ⓐ on the air filter case with the hole ⓑ in the air filter element.

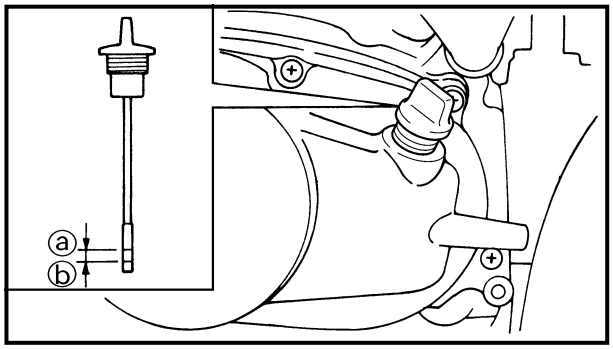
7. Install:
   - Air filter case cover
8. Install:
   - Air scoop (right)

ENGINE OIL LEVEL INSPECTION

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. Remove:
   - Dipstick ①



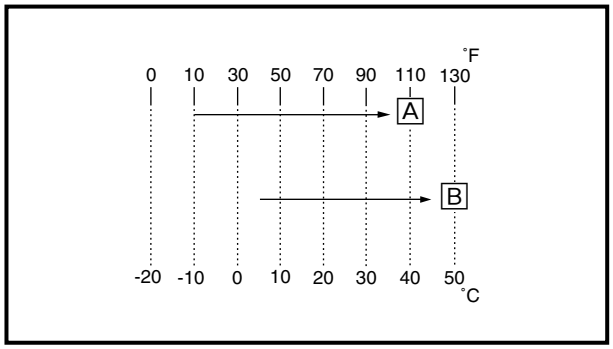
4. Check:
   - Oil level

   Oil level should be between maximum ⓐ and minimum ⓑ marks.

   Oil level is low → Add oil to proper level.

NOTE:

When inspecting the oil level, do not screw the dipstick into the oil tank. Insert the gauge lightly.

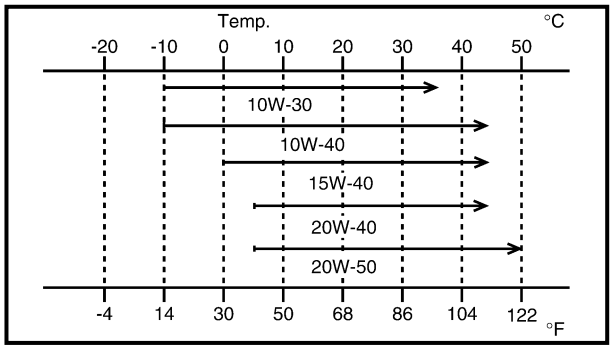


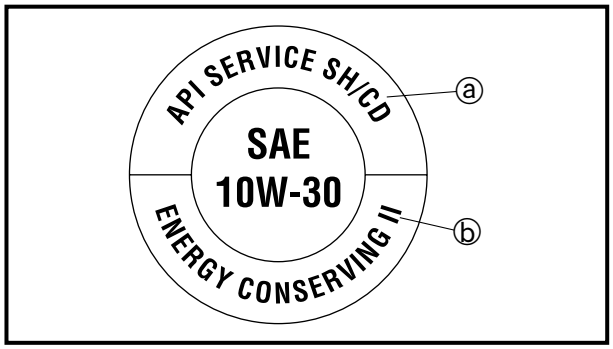
(For USA and CDN)

Recommended oil:
At –10 ˚C (10 ˚F) or higher A:
Yamalube 4 (10W-30) or SAE 10W-30 type SE/SF motor oil
At 5 ˚C (40 ˚F) or higher B:
Yamalube 4 (20W-40) or SAE 20W-40 type SE/SF motor oil

CAUTION:

- **Do not add any chemical additives. Engine oil also lubricates the clutch and additives could cause clutch slippage.**
- **Do not allow foreign material to enter the crankcase.**





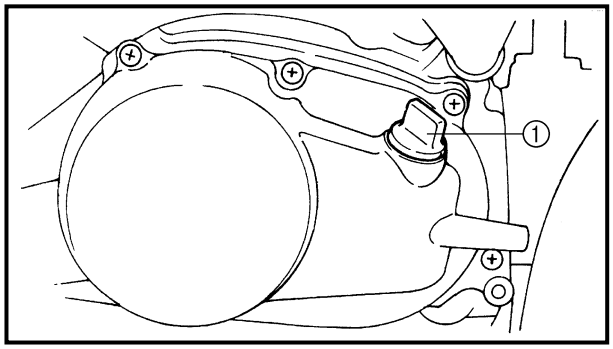
(Except for USA and CDN)

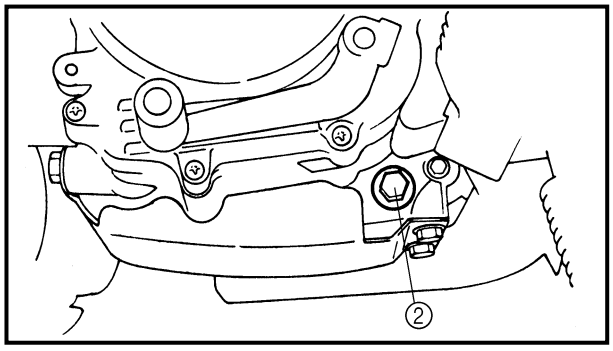
Recommended oil:
Refer to the following chart for selection of oils which are suited to the atmospheric temperatures.
Recommended engine oil classification:
API STANDARD:
API "SE/SF" or higher grade (Designed primarily for motorcycles)

CAUTION:
- **Do not add any chemical additives or use oils with a grade of CD ⓐ or higher.**
- **Do not use oils labeled "ENERGY CONSERVING II" ⓑ or higher. Engine oil also lubricates the clutch and additives could cause clutch slippage.**
- **Do not allow foreign materials to enter the crankcase.**

5. Install:
   - Dipstick
6. Start the engine and let it warm up for several minutes.
7. Turn off the engine and inspect the oil level once again.

NOTE:
Wait a few minutes until the oil settles before inspecting the oil level.





ENGINE OIL REPLACEMENT

1. Start the engine and warm it up for several minutes and wait for five minutes.
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:
   - Dipstick ①
   - Drain bolt (with gasket) ②

   Drain the crankcase of its oil.

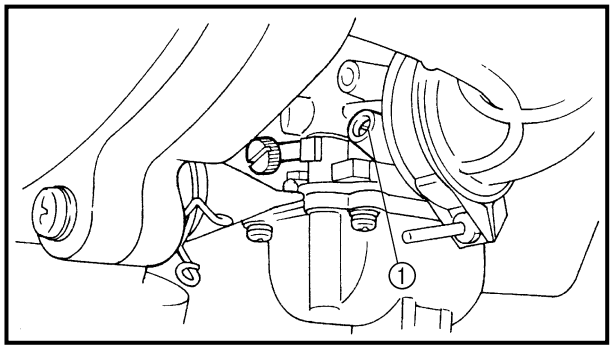
5. Install:
   - Gasket New
   - Drain bolt

20 Nm (2.0 m · kg, 14 ft · lb)

6. Fill:
   - Crankcase

Oil quantity:
Periodic oil change:
0.8 L (0.70 Imp qt, 0.85 US qt)

7. Install:
   - Dipstick
8. Inspect:
   - Engine (for oil leaks)
   - Oil level
     Refer to "ENGINE OIL LEVEL INSPECTION".

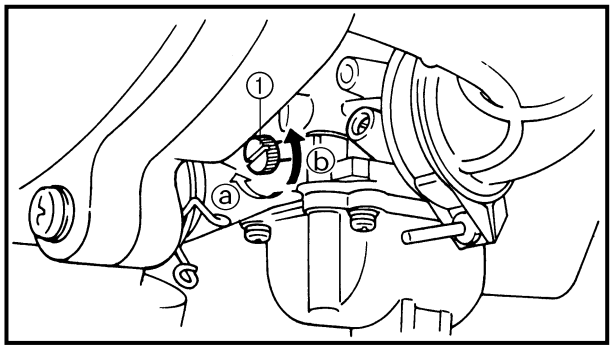


PILOT AIR SCREW ADJUSTMENT

1. Adjust:
   - Pilot air screw ①

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

Pilot air screw:
1-3/4 turns out



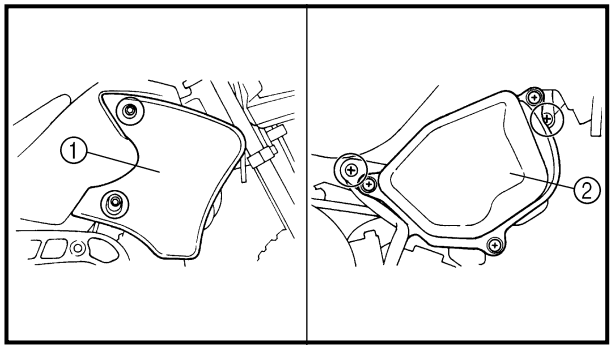
IDLE SPEED ADJUSTMENT

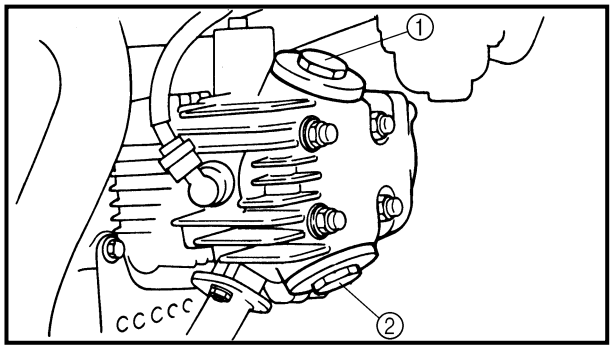
1. Start the engine and thoroughly warm it up.
2. Attach:
   - Inductive tachometer
     To spark plug lead.
3. Adjust:
   - Idle speed

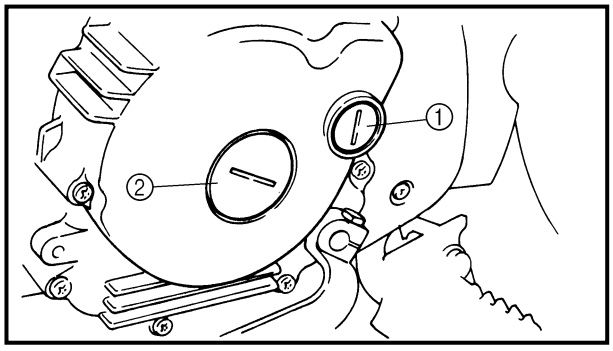
Adjustment steps:
- Adjust the pilot screw.
  Refer to "PILOT AIR SCREW ADJUSTMENT" section.
- Turn the throttle stop screw ① until the engine runs at the lowest possible speed.

To increase idle speed →
Turn the throttle stop screw ① in ⓐ.
To decrease idle speed →
Turn the throttle stop screw ① out ⓑ.

	Inductive tachometer: **YU-8036-B/90890-03113**
	Engine idling speed: **1,400 ~ 1,600 r/min**







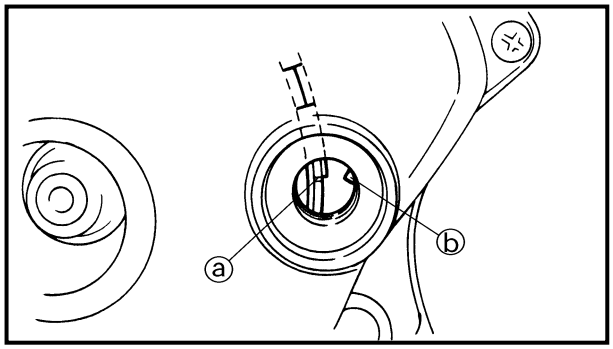
VALVE CLEARANCE ADJUSTMENT

NOTE:
- The valve clearance should be adjusted when the engine is cool to the touch.
- The piston must be at Top Dead Center (T.D.C.) on compression stroke to check or adjust the valve clearance.

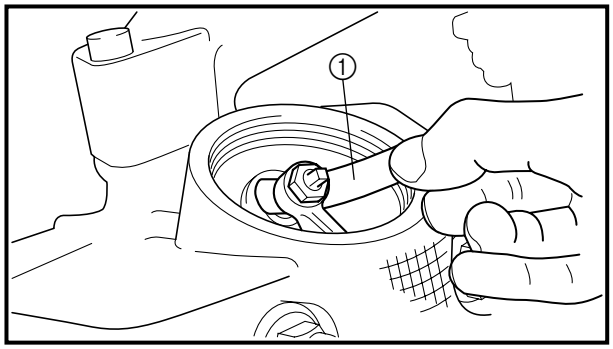
1. Remove:
   - Air scoop (right) ①
   - Air filter case ②
2. Remove:
   - Spark plug
   - Tappet cover (intake side) ①
   - Tappet cover (exhaust side) ②
3. Remove:
   - Timing plug ①
   - Crankshaft end cover ②
   - O-rings

4. Check:
   - Valve clearance
     Out of specification → Adjust.

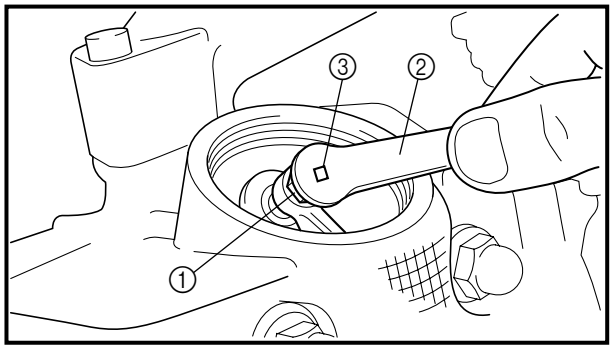
Valve clearance (cold):
Intake valve:
0.05 ~ 0.09 mm
(0.0020 ~ 0.0035 in)
Exhaust valve:
0.08 ~ 0.12 mm
(0.031 ~ 0.047 in)



Checking steps:
- Turn the crankshaft counterclockwise with a wrench.
- Align the T.D.C. mark ⓐ on the rotor with the align mark ⓑ on the crankcase cover when piston is at T.D.C. on compression stroke.
- Measure the valve clearance using a feeler gauge ①.
  Out of specification → Adjust clearance.



5. Adjust:
   - Valve clearance

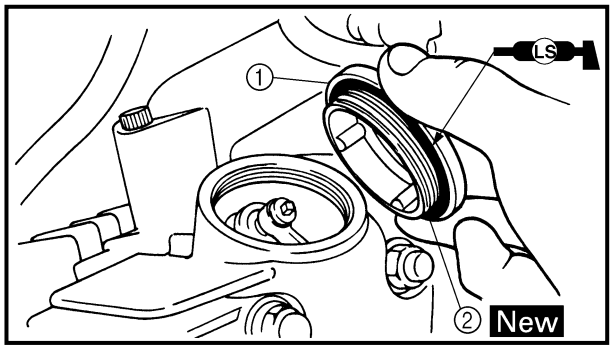


Adjustment steps:
- Loosen the locknut ①.
- Turn the adjuster ③ in or out with the valve adjusting tool ② until specified clearance is obtained.

Turning in →
Valve clearance is decreased.
Turning out →
Valve clearance is increased.

Valve adjusting tool:
YM-8035/90890-01311

- Hold the adjuster to prevent it from moving and tighten the locknut.
  7 Nm (0.7 m · kg, 5.1 ft · lb)
- Measure the valve clearance.
- If the clearance is incorrect, repeat above steps until specified clearance is obtained.



6. Install:
   - Tappet cover (intake side) ①
     18 Nm (1.8 m · kg, 13 ft · lb)
   - O-ring ② New

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

7. Install:
   - Tappet cover (exhaust side)
     18 Nm (1.8 m · kg, 13 ft · lb)
   - O-ring New
   - Spark plug
     13 Nm (1.3 m · kg, 9.4 ft · lb)
   - Timing plug
     7 Nm (0.7 m · kg, 5.1 ft · lb)
   - Crankshaft end cover
     7 Nm (0.7 m · kg, 5.1 ft · lb)

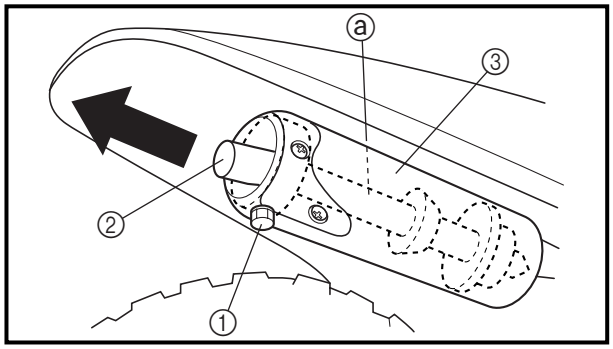
NOTE:
Apply the lithium soap base grease on the O-ring.

8. Install:
   - Air filter case
   - Air scoop (right)

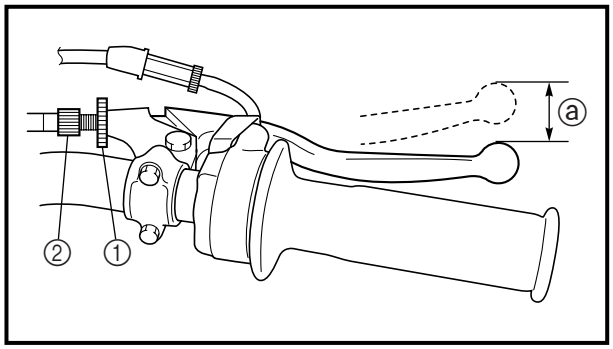
SPARK ARRESTER CLEANING (For USA)

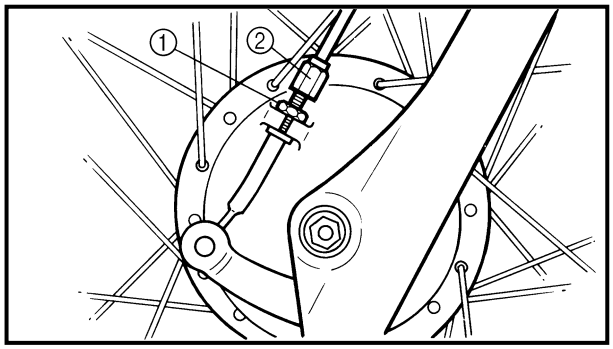
⚠ WARNING

- **Be sure the exhaust pipe and muffler are cool before cleaning the spark arrester.**
- **Do not start the engine when cleaning the exhaust system.**



1. Remove:
   - Bolt (tailpipe) ①
2. Remove:
   - Tailpipe ②
     Pull the tailpipe out of the muffler.
3. Clean:
   - Spark arrester
     Use a wire brush to remove any carbon deposits from the spark arrester portion of the muffler body ③ inner surface.
     Tap the tailpipe lightly and remove the carbon deposits from the outside portion ⓐ of the tailpipe.
4. Install:
   - Tailpipe
     Insert the tailpipe into the muffler and align the bolt hole.
   - Bolt (tailpipe)
     7 Nm (0.7 m · kg, 5.1 ft · lb)





CHASSIS

FRONT BRAKE ADJUSTMENT

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

Free play (brake lever):
10 ~ 20 mm (0.39 ~ 0.79 in)
(at brake lever end)

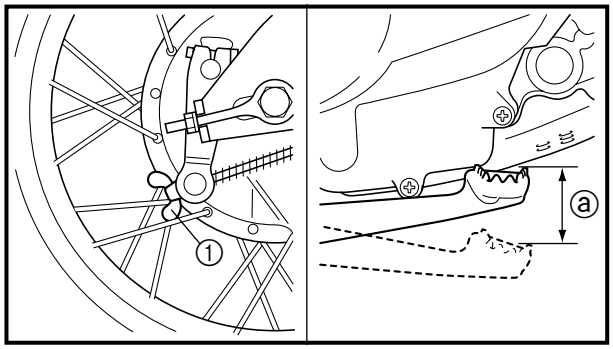
2. Adjust:
   - Brake lever free play

Adjustment steps:
- Loosen the locknuts ①.
- Turn the adjusters ② in or out until the specified free play is obtained.

Turning in:	**Free play is increased.**
Turning out:	**Free play is decreased.**

- Tighten the locknuts.

CAUTION:
Make sure that there is no brake drag after adjusting the front brake lever free play.



REAR BRAKE ADJUSTMENT

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

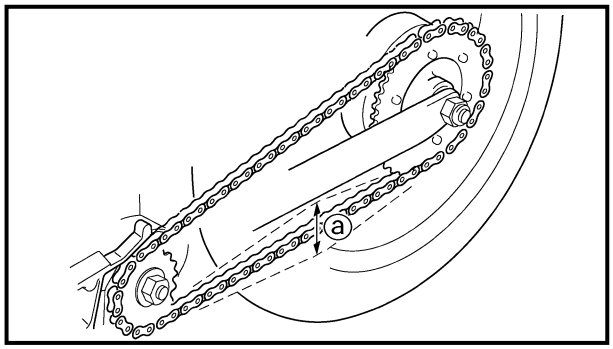
Free play:
10 ~ 20 mm (0.39 ~ 0.79 in)

2. Adjust:
   - Brake pedal free play

Adjustment steps:
- Turn the adjuster ① in or out until the specified free play is obtained.

Turning in:	**Free play is decreased.**
Turning out:	**Free play is increased.**

CAUTION:
Make sure that the brake does not drag after adjusting it.

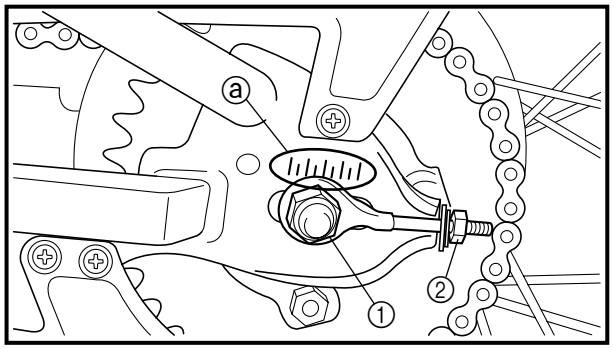


DRIVE CHAIN SLACK ADJUSTMENT

1. Elevate the rear wheel by placing the suitable stand under the engine.
2. Check:
   - Drive chain slack ⓐ
     In the center between the drive axle and rear wheel axle.
     Out of specification → Adjust.

Drive chain slack:
40 ~ 53 mm (1.6 ~ 2.1 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 wheel axle nut ①.
- Adjust chain slack by turning the adjusters ②.

To tighten → Turn adjuster ② clockwise.
To loosen → Turn adjuster ② counterclockwise and push wheel forward.

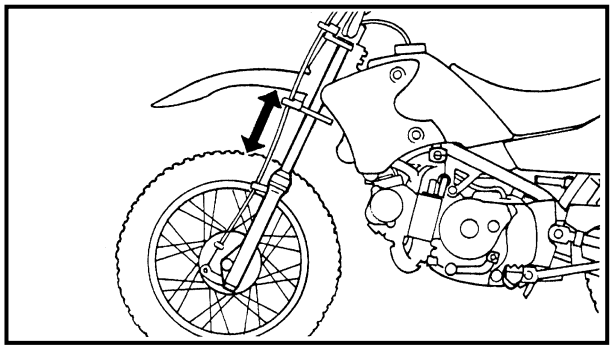
- Turn each adjuster exactly the same amount to maintain correct axle alignment. (There are marks ⓐ on each side of chain puller alignment.)

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.

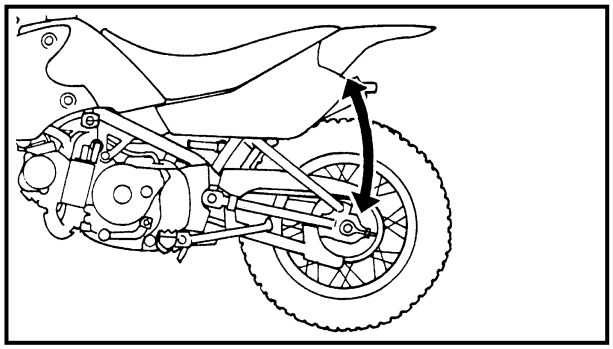
- Tighten the wheel axle nut while pushing down the drive chain.

Axle nut:
60 Nm (6.0 m • kg, 43 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.

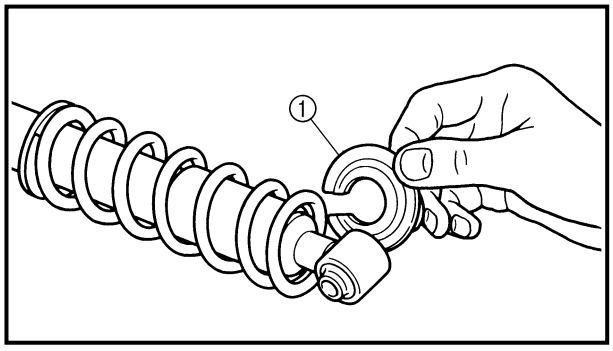


EC36K000
REAR SHOCK ABSORBER INSPECTION

1. Inspect:
   - Swingarm smooth action
     Abnormal noise/unsmooth action → Grease the pivoting points or repair the pivoting points.
     Damage/oil leakage → Replace.

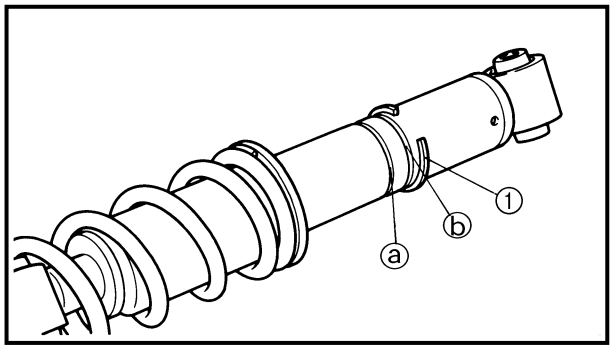
REAR SHOCK ABSORBER SPRING PRELOAD ADJUSTMENT

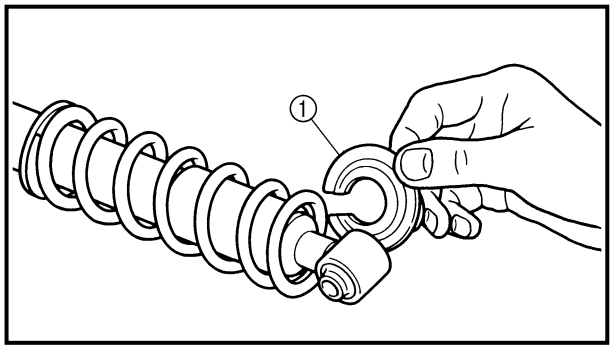
1. Elevate the rear wheel by placing the suitable stand under the engine.
2. Remove:
   - Rear shock absorber
     Refer to “SWINGARM” section in the CHAPTER 5.



3. Remove:
   - Spring guide ①

NOTE:
While compressing the spring, remove the spring guide.





4. To stiffen the spring preload, install the circlip ① into the groove ⓐ. To soften the spring preload, install the circlip into the groove ⓑ.

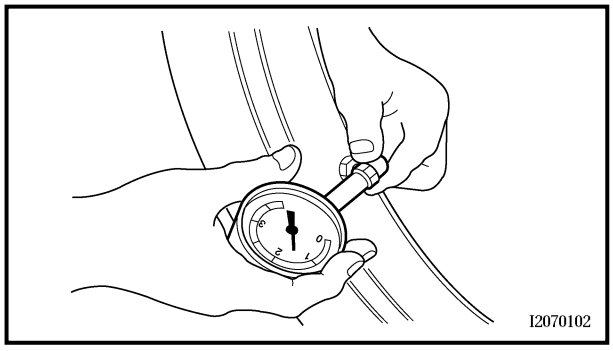
NOTE:
Do not spread the circlip too much.

Standard installation position:
Groove ⓑ

5. Install:
   - Spring guide ①

NOTE:
While compressing the spring, install the spring guide.

6. Install:
   - Rear shock absorber
     Refer to "SWINGARM" section in the CHAPTER 5.

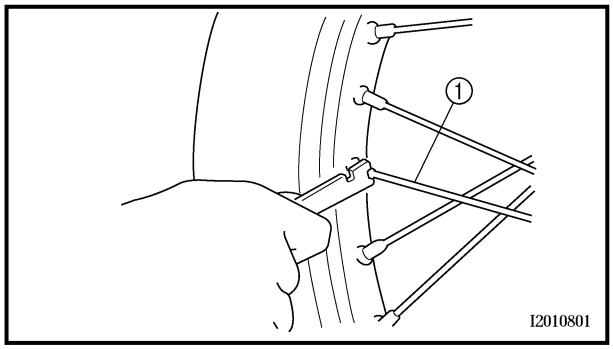


EC36Q000
TIRE PRESSURE CHECK

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

Standard tire pressure:
100 kPa (1.00 kgf/cm², 14.5 psi)

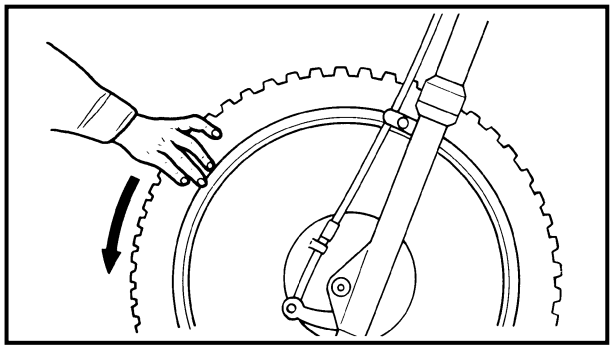
NOTE:
- Check the tire while it is cold.
- Loose bead stoppers allow the tire to slip off its position on the rim when the tire pressure is low.
- A tilted tire valve stem indicates that the tire slips off its position on the rim.
- If the tire valve stem is found tilted, the tire is considered to be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



SPOKES INSPECTION AND TIGHTENING

1. Inspect:
   - Spokes ①
     Bend/damage → Replace.
     Loose spoke → Retighten.
2. Tighten:
   - Spokes **2 Nm (0.2 m · kg, 1.4 ft · lb)**

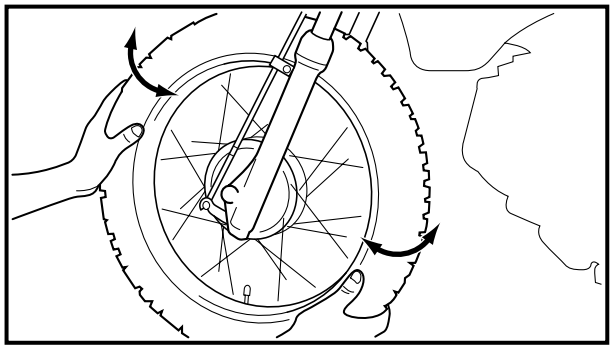
NOTE:
Be sure to retighten these spokes before and after break-in. After a practice or a race check spokes for looseness.



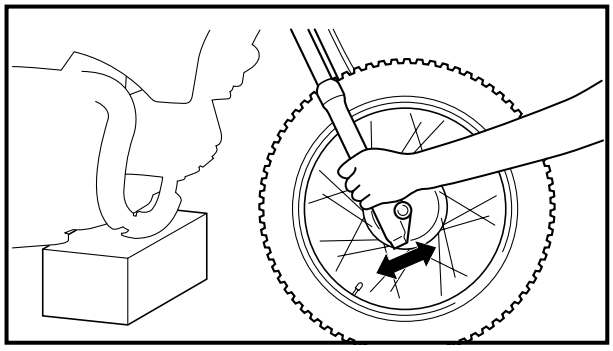
EC36T000

WHEEL INSPECTION

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

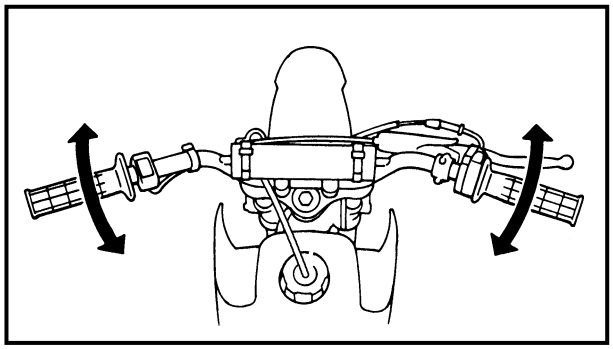


2. Inspect:
   - Bearing free play
     Exist play → Replace.

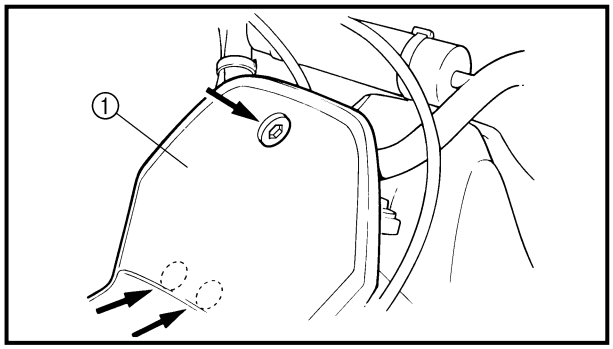


STEERING HEAD INSPECTION AND ADJUSTMENT

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.



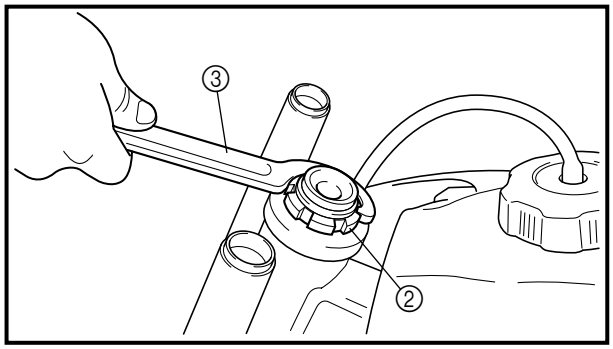
3. Check:
   - Steering smooth action
     Turn the handlebar lock to lock.
     Unsmooth action → Adjust steering ring nut.



4. Adjust:
   - Steering ring nut

Steering ring nut adjustment steps:
- Remove the front fender ①.
- Remove the handlebar and handle crown.
- Loosen the ring nut ② using the ring nut wrench ③.

Ring nut wrench:
YU-1268/90890-01268

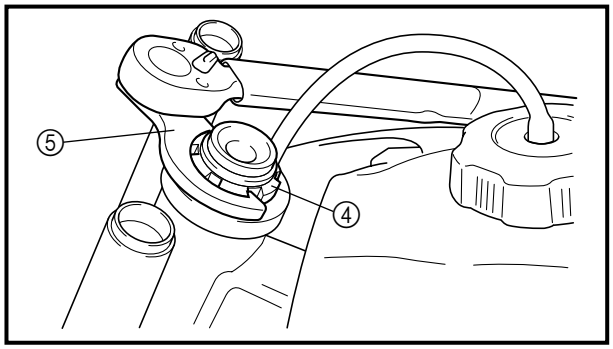


- Tighten the ring nut ④ using ring nut wrench ⑤ and turn the steering right and left a few times.

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

Ring nut wrench:
YM-33975/90890-01403

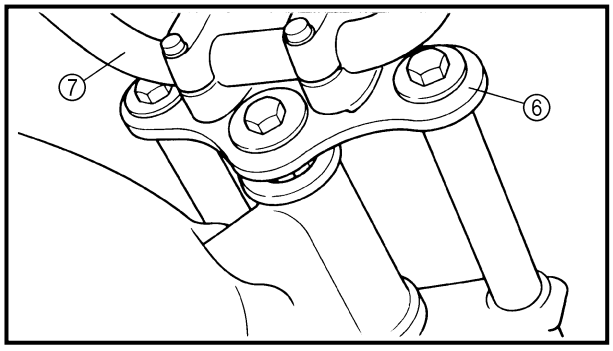
Ring nut (initial tightening):
38 Nm (3.8 m • kg, 27 ft • lb)



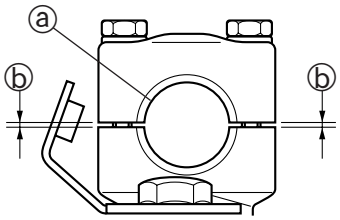
- Loosen the ring nut one turn.
- Retighten the ring nut using the ring nut wrench.

⚠ WARNING
Avoid over-tightening.

Ring nut (final tightening):
1 Nm (0.1 m • kg, 0.7 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 ⑥, handlebar ⑦, and front fender.



CAUTION:

Install the handlebar holder with its groove ⓐ facing outward, and tighten the bolts so that the gaps ⓑ are equal.

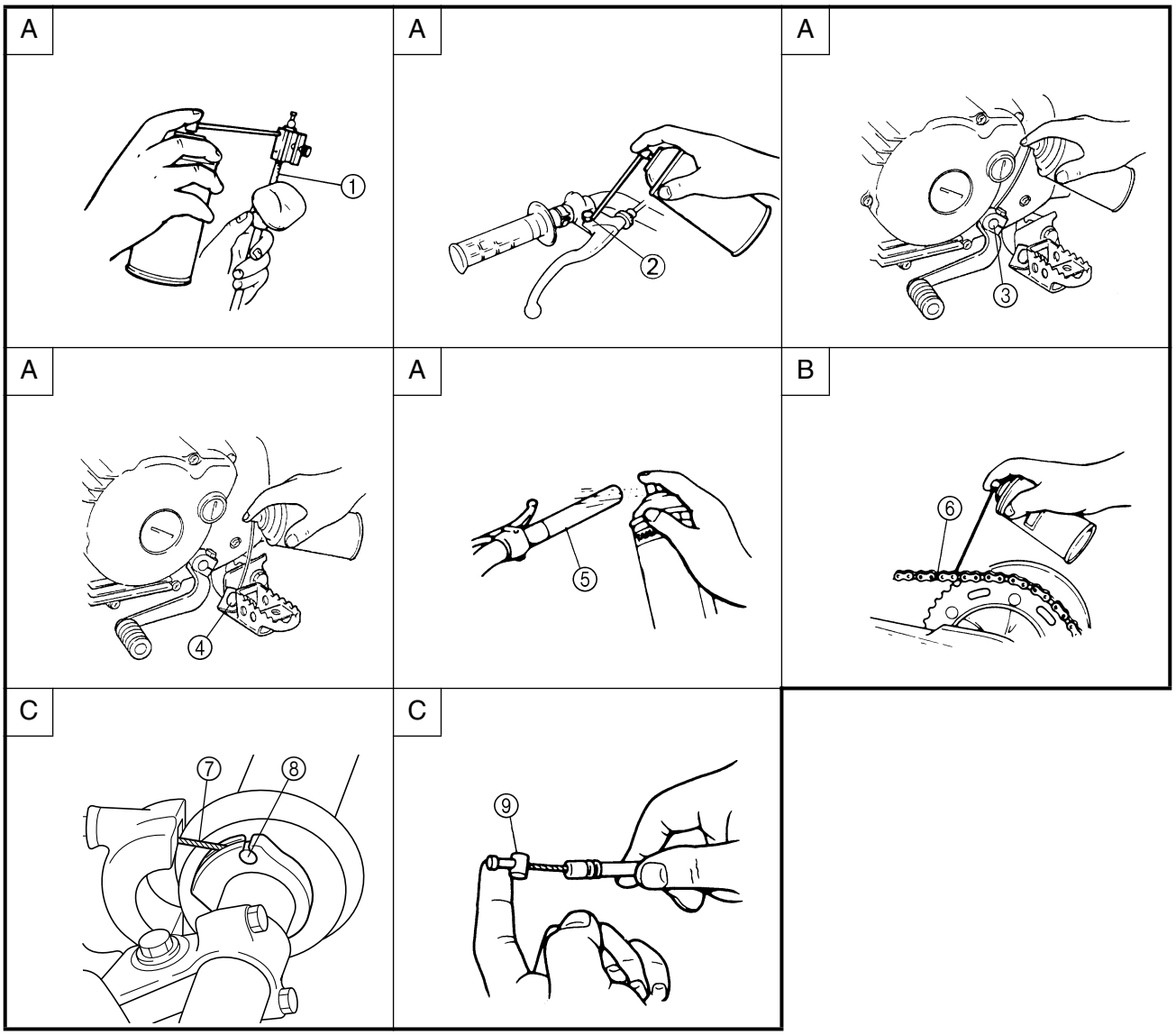
Steering stem bolt:
40 Nm (4.0 m • kg, 2.9 ft • lb)
Front fork cap bolt:
40 Nm (4.0 m • kg, 2.9 ft • lb)
Handlebar upper holder:
13 Nm (1.3 m • kg, 9.4 ft • lb)

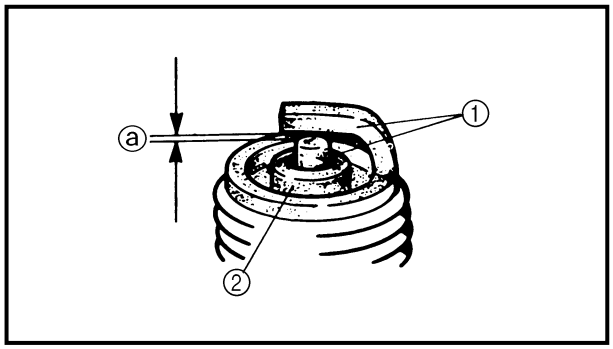
LUBRICATION

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

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

A Use Yamaha cable lube or equivalent on these areas.
B Use SAE 10W-30 motor oil or suitable chain lubricants.
C Lubricate the following areas with high quality, lightweight lithium-soap base grease.





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.

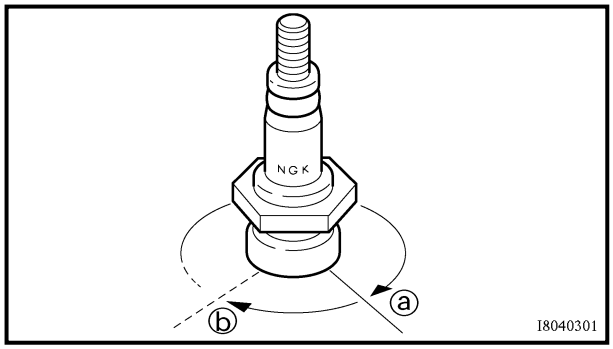
NOTE:
When the engine runs for many hours at low speeds, the spark plug insulator will become sooty, even if the engine and carburetor are in good operating condition.

3. Measure:
   - Plug gap ⓐ
     Use a wire gauge or thickness gauge.
     Out of specification → Regap.

Spark plug gap:
0.6 ~ 0.7 mm (0.02 ~ 0.03 in)

Standard spark plug:
CR6HSA (NGK)
U20FSR-U (DENSO)

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



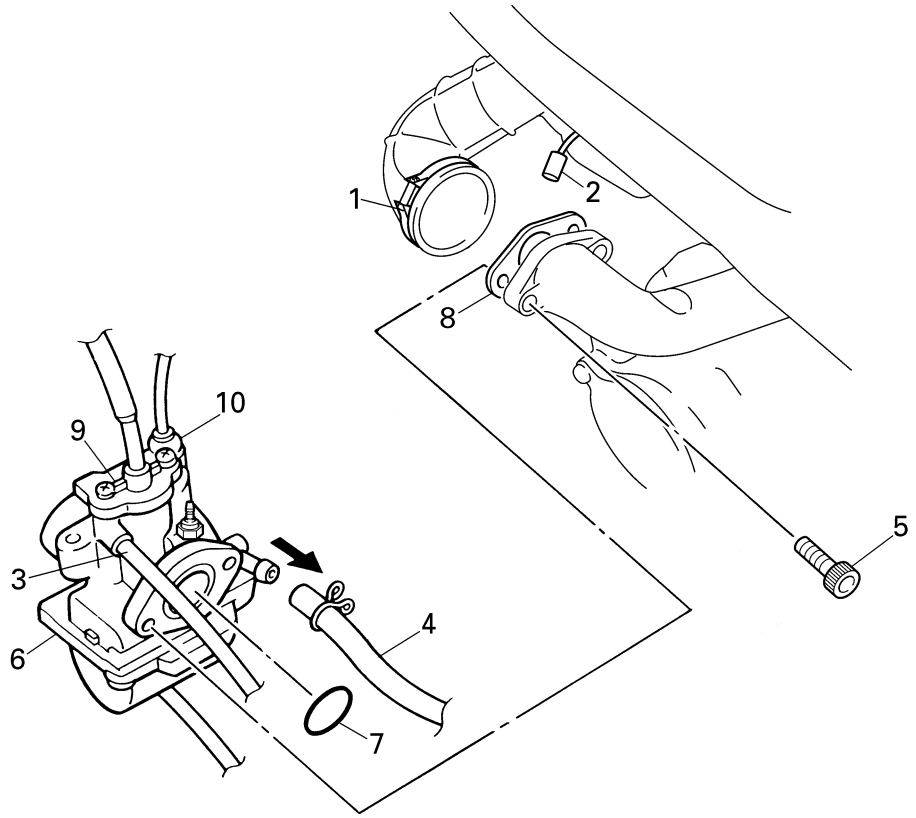
5. Tighten:
   - Spark plug

13 Nm (1.3 m · kg, 9.4 ft · lb)

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

ENGINE

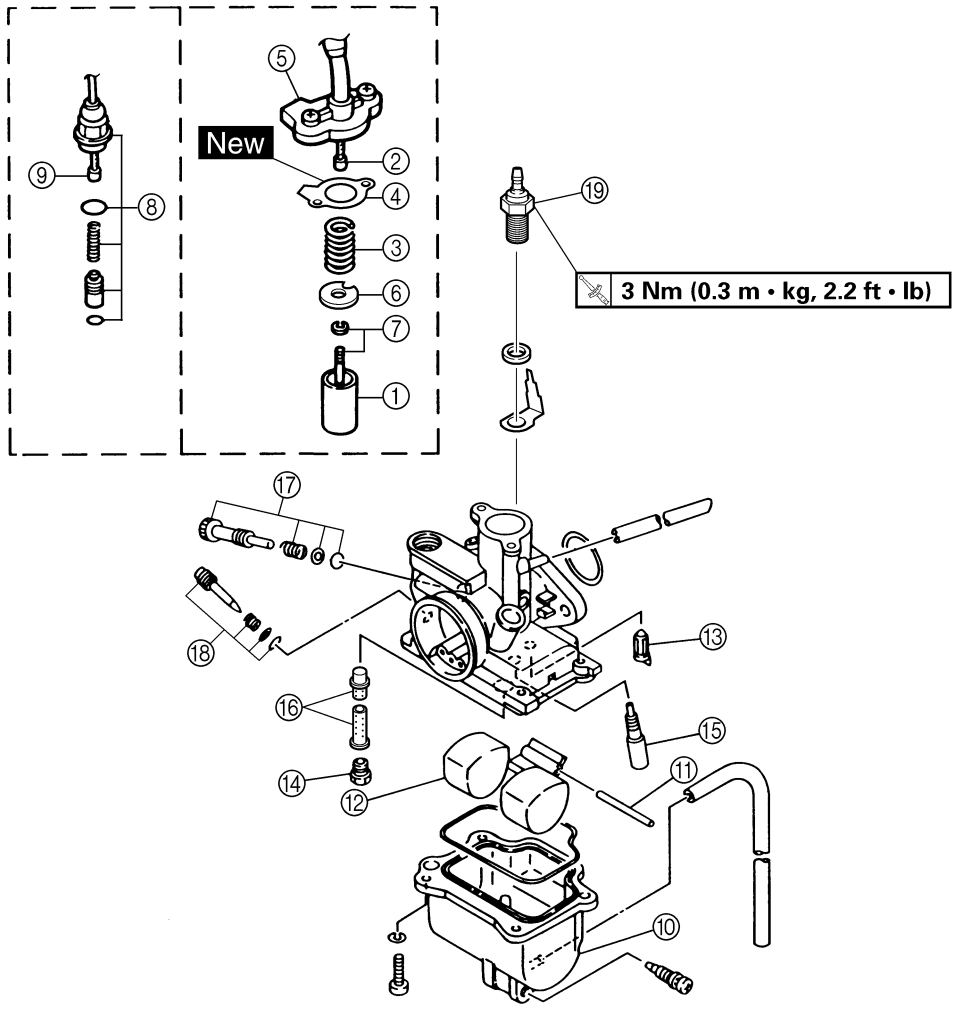
CARBURETOR



Extent of removal: ① Carburetor removal

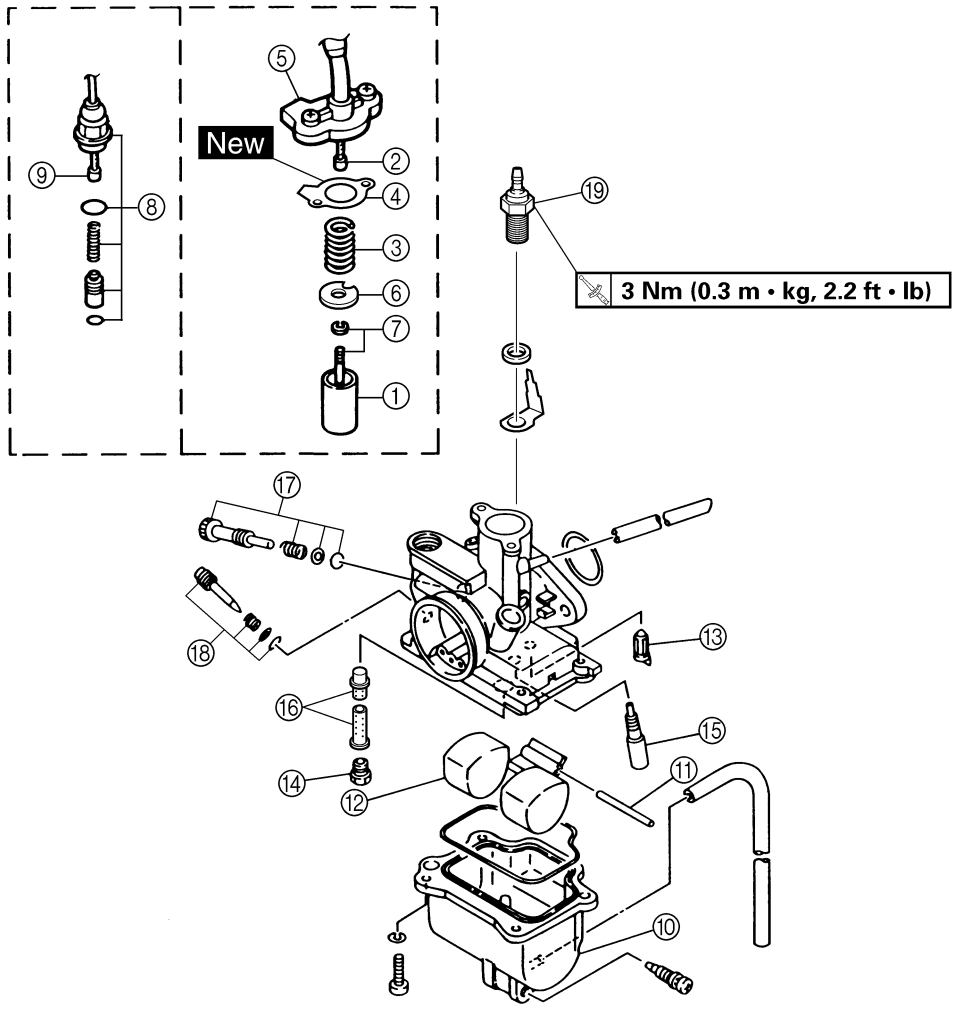
Extent of removal	Order	Part name	Q'ty	Remarks
		CARBURETOR REMOVAL		
Preparation for removal		Fuel tank		
①	1	Clamp (air filter joint)	1	Loosen the screw (air filter joint).
	2	Carburetor heater lead	1	
	3	Air vent hose	1	
	4	Fuel hose	1	
	5	Bolt	2	
	6	Carburetor assembly	1	
	7	O-ring	1	
	8	Spacer	1	
	9	Carburetor top	1	
	10	Starter plunger assembly	1	

EC468000
CARBURETOR DISASSEMBLY

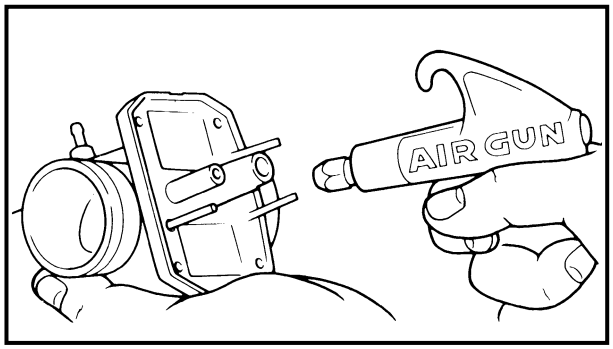


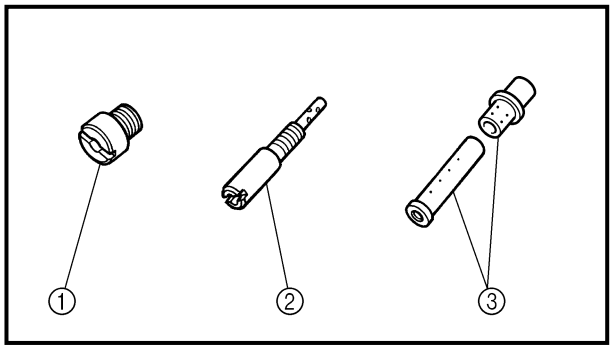
Extent of removal: ① Carburetor disassembly

Extent of removal	Order	Part name	Q'ty	Remarks
		CARBURETOR DISASSEMBLY		
①	①	Throttle valve	1	
	②	Throttle cable	1	
	③	Spring	1	
	④	Gasket	1	
	⑤	Carburetor top cover	1	
	⑥	Jet needle stopper	1	
	⑦	Jet needle assembly	1	
	⑧	Starter plunger assembly	1	
	⑨	Starter cable	1	
	⑩	Float chamber	1	



Extent of removal	Order	Part name	Q'ty	Remarks
①	⑪	Float pin	1	
	⑫	Float	1	
	⑬	Needle valve	1	
	⑭	Main jet	1	
	⑮	Pilot jet	1	
	⑯	Needle jet	1	
	⑰	Throttle stop screw assembly	1	
	⑱	Pilot air screw assembly	1	
	⑲	Carburetor heater	1	





EC464000
INSPECTION

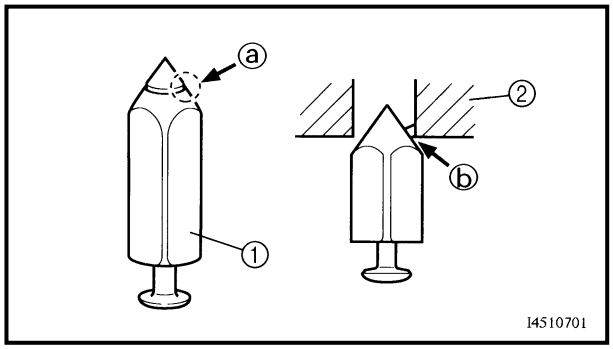
Carburetor

1. Inspect:
   - Carburetor body
     Contamination → Clean.

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

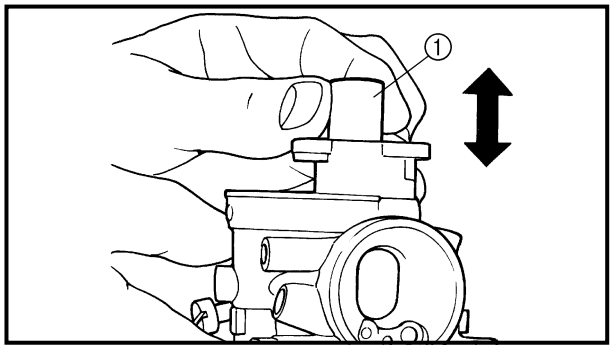
2. Inspect:
   - Main jet ①
   - Pilot jet ②
   - Needle jet ③
     Damage → Replace.
     Contamination → Clean.

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



Needle valve

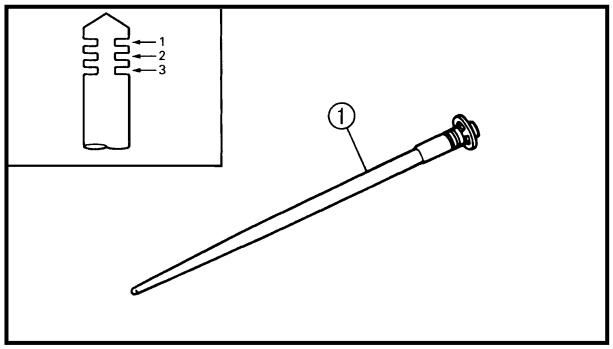
1. Inspect:
   - Needle valve ①
   - Valve seat ②
     Grooved wear ⓐ → Replace.
     Dust ⓑ → Clean.

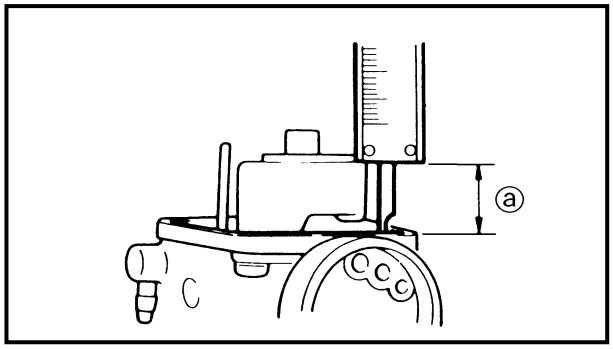


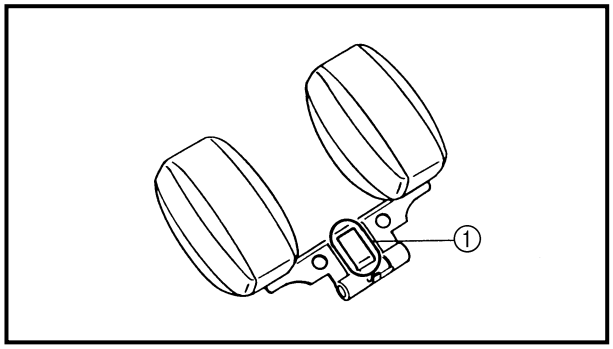
EC464301
Throttle valve

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

NOTE:
Insert the throttle valve ① into the carburetor body, 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

Float height

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

Float height:
15.5 ~ 16.5 mm (0.61 ~ 0.65 in)

Measurement and adjustment steps:

- Hold the carburetor in an upside down position.

NOTE:

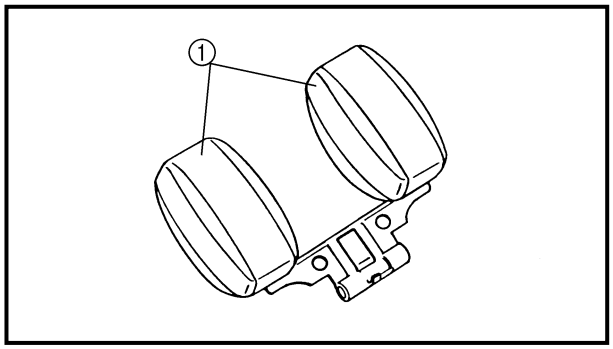
- Slowly tilt the carburetor in the opposite direction, then take the measurement when the needle valve aligns with the float arm.
- If the carburetor is level, the weight of the float will push in the needle valve, resulting in an incorrect measurement.

- Measure the distance between the mating surface of the float chamber and top of the float using a vernier calipers.

NOTE:

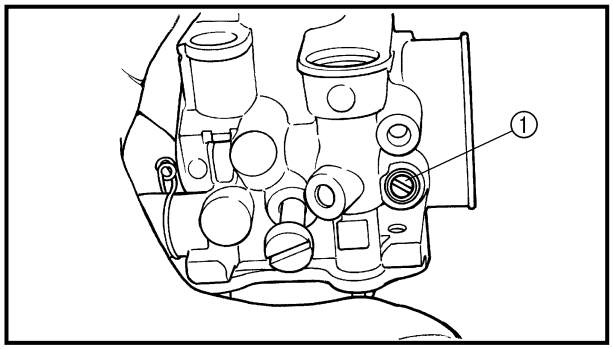
The float arm should be resting on the needle valve, but not compressing the needle valve.

- 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 ① on the float.
- Recheck the float height.



EC464600
Float

1. Inspect:
   - Float ①
     Damage → Replace.



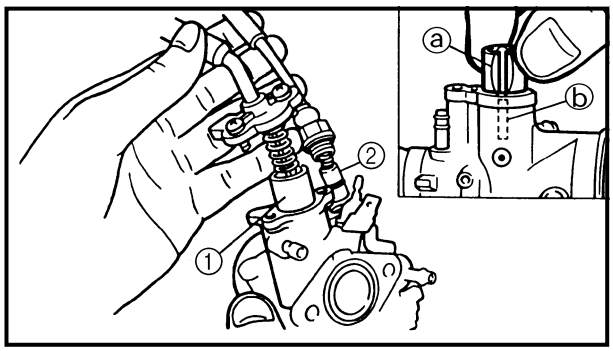
ASSEMBLY AND INSTALLATION

Carburetor

1. Install:
   - Pilot air screw ①

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

Pilot air screw:
1-3/4 turns out



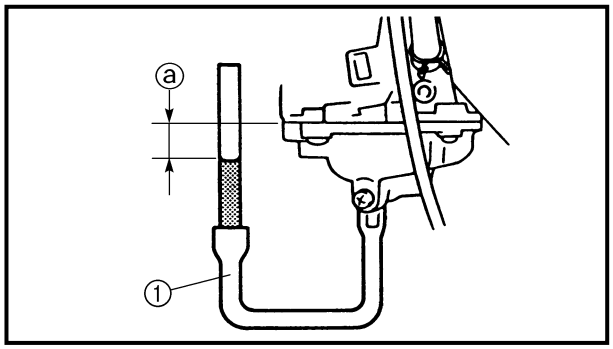
2. Install:
   - Throttle valve ①
   - Starter plunger ②

NOTE:
Align the slit ⓐ of the throttle valve with the tab ⓑ of the carburetor top.

FUEL LEVEL ADJUSTMENT

⚠ WARNING

Gasoline (fuel) and its vapors are highly flammable and explosive. Keep away from sparks, cigarettes, flames or other sources of ignition.

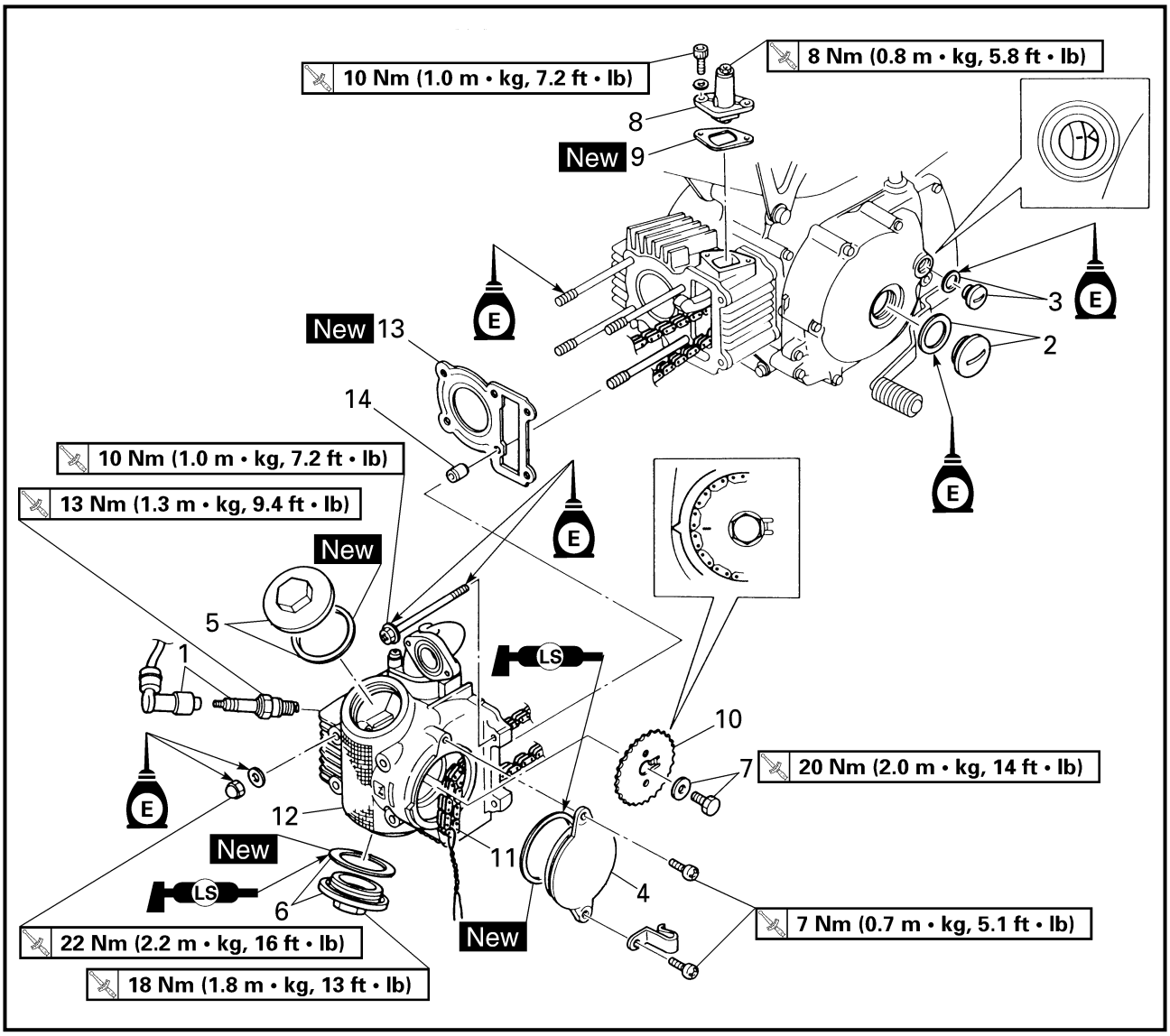


1. Measure:
   - Fuel level ⓐ
     Use a fuel level gauge ①.
     Out of specification → Adjust.

Fuel level gauge:
YM-1312-A/90890-01312

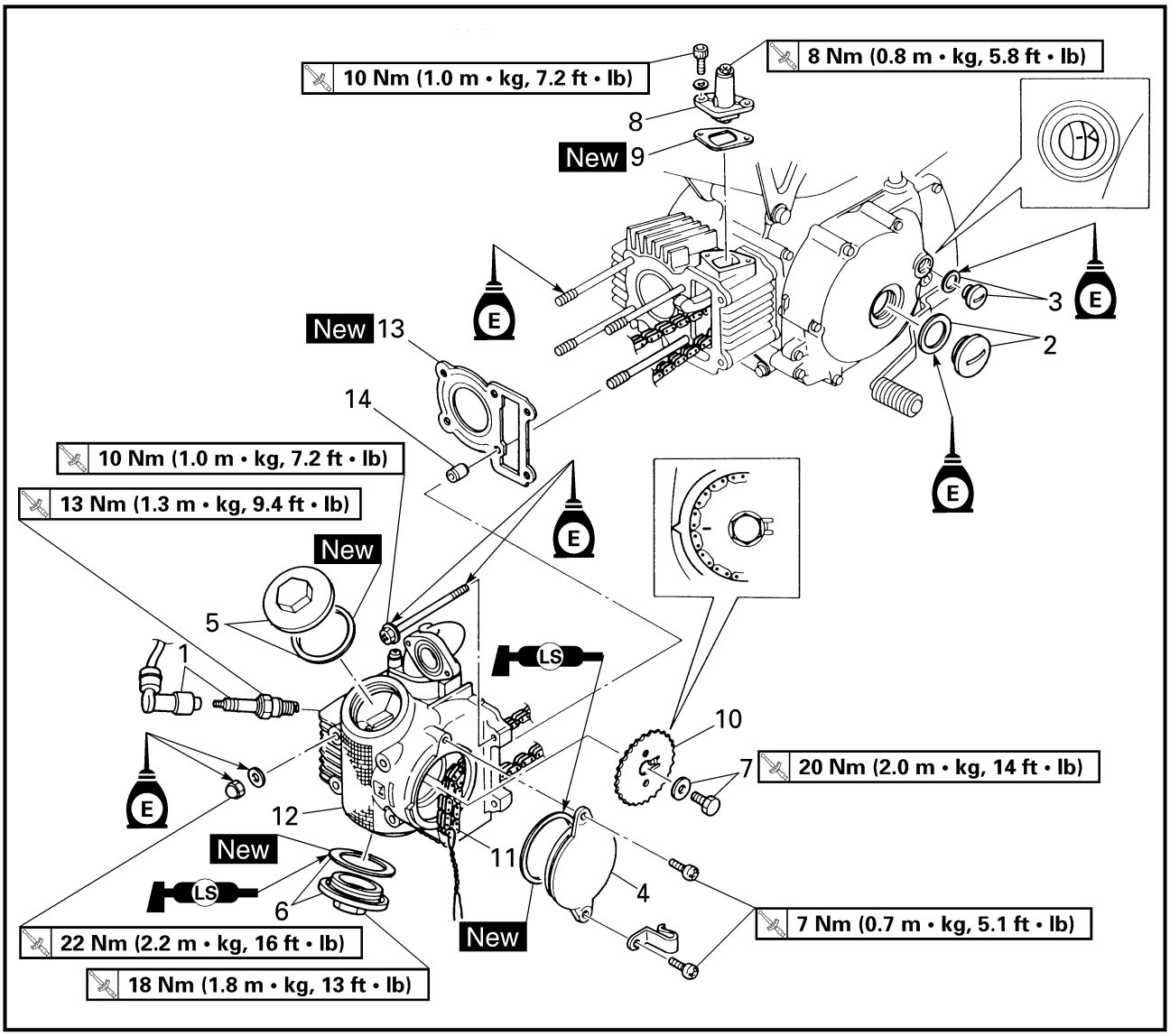
Fuel level:
2 ~ 3 mm (0.08 ~ 0.12 in) below the float chamber line

CYLINDER HEAD

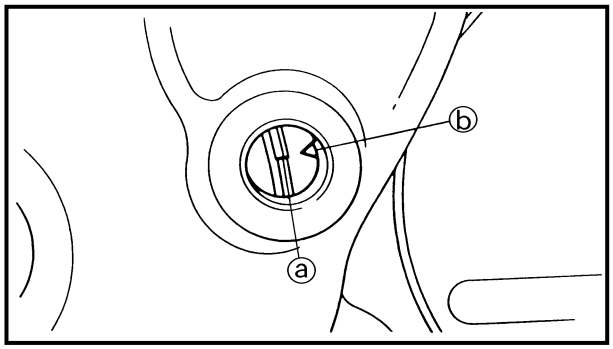


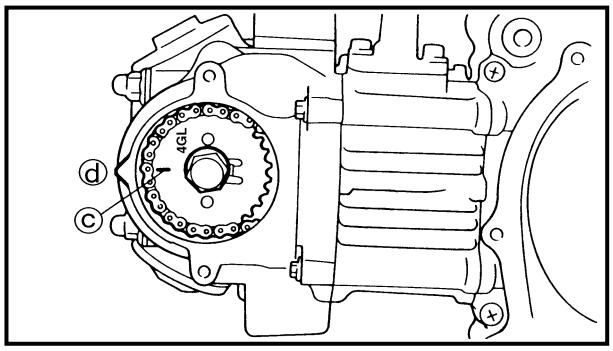
Extent of removal: ① Cylinder head removal

Extent of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		**CYLINDER HEAD REMOVAL** Seat, fuel tank and rear fender Exhaust pipe Carburetor Air filter case and starter lever		Refer to "CARBURETOR" section.
①	1	Plug cap/spark plug	1/1	
	2	Crankshaft end cover/O-ring	1/1	
	3	Timing plug/O-ring	1/1	
	4	Camshaft sprocket cover/O-ring	1/1	
	5	Tappet cover (intake)/O-ring	1/1	
	6	Tappet cover (exhaust)/O-ring	1/1	
	7	Camshaft sprocket bolt/washer	1/1	
	8	Timing chain tensioner	1	Refer to "REMOVAL POINTS".
	9	Gasket	1	



Extent of removal	Order	Part name	Q'ty	Remarks
①	10	Camshaft sprocket	1	Refer to "REMOVAL POINTS".
	11	Timing chain	1	
	12	Cylinder head	1	
	13	Gasket	1	
	14	Dowel pin	2	





REMOVAL POINTS

Cylinder head

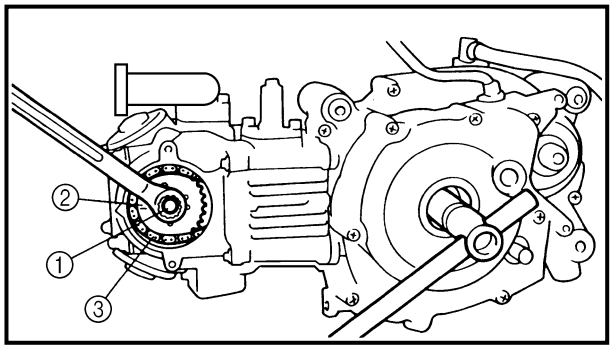
1. Align:
   - "I" mark (with stationary pointer)

Checking steps:

- Turn the crankshaft counterclockwise with a wrench.
- Align the "I" mark ⓐ on the rotor with the stationary pointer ⓑ on the crankcase cover. When the "I" mark is aligned with the stationary pointer, the piston is at the Top Dead Center (T.D.C.).

NOTE:

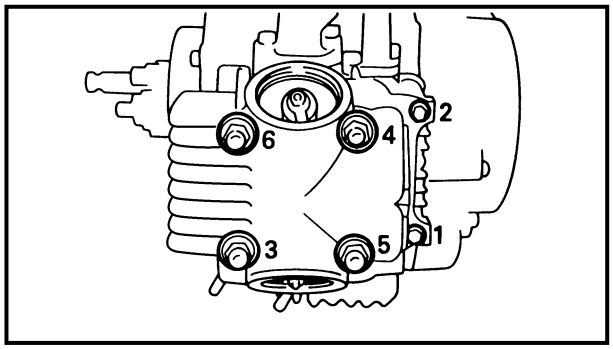
- In order to be sure that the piston is at Top Dead Center, the match mark ⓒ on the camshaft sprocket must align with the stationary pointer ⓓ on the cylinder head as shown in the illustration.
- If there is no valve clearance, rotate the crankshaft counterclockwise one turn.



2. Loosen:
   - Camshaft sprocket bolt ①
3. Remove:
   - Timing chain tensioner
   - Camshaft sprocket ②

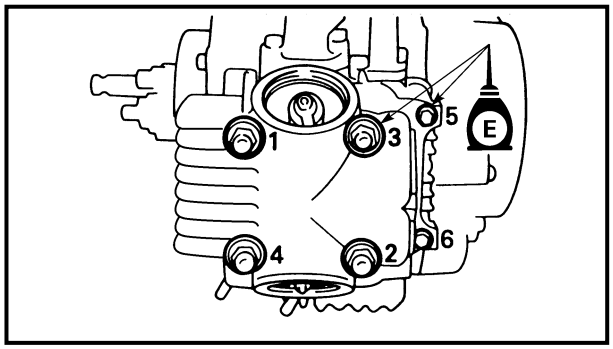
NOTE:

- Fasten a safety wire to the timing chain ③ to prevent it from falling into the crankcase.
- Remove the bolt ① while holding the rotor nut with a wrench.



4. Remove:
   - Cylinder head

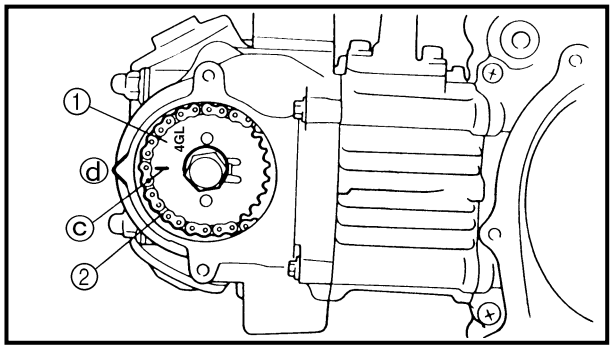
NOTE:
- Loosen the bolts and nuts in their proper loosening sequence.
- Start by loosening each bolt and nut 1/2 turn until all are loose.

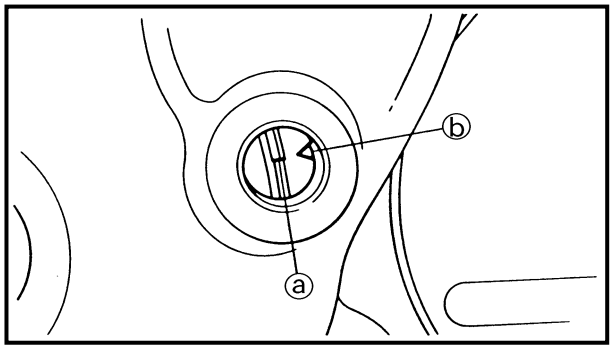


ASSEMBLY AND INSTALLATION

1. Install:
   - Cylinder head
2. Tighten:
   - Nuts — **22 Nm (2.2 m · kg, 16 ft · lb)**
   - Bolts — **10 Nm (1.0 m · kg, 7.2 ft · lb)**

NOTE:
- Apply the engine oil on the contact surfaces of the nuts, bolts and copper washers.
- Follow the numerical order shown in the illustration. Tighten the bolts and nuts in two stages.





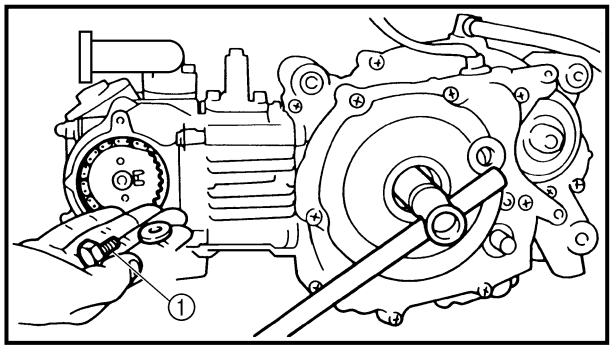
3. Install:
   - Camshaft sprocket ①

Installation steps:
- Turn the crankshaft counterclockwise until the "I" mark ⓐ on the rotor is aligned with the stationary pointer ⓑ on the crankcase cover.
- Align the "I" mark ⓒ on the camshaft sprocket with the stationary pointer ⓓ on the cylinder head.
- Fit the timing chain ② onto camshaft sprocket and install the camshaft sprocket on the camshaft.

NOTE:
When installing the camshaft sprocket, keep the timing chain as tense as possible on the exhaust side.

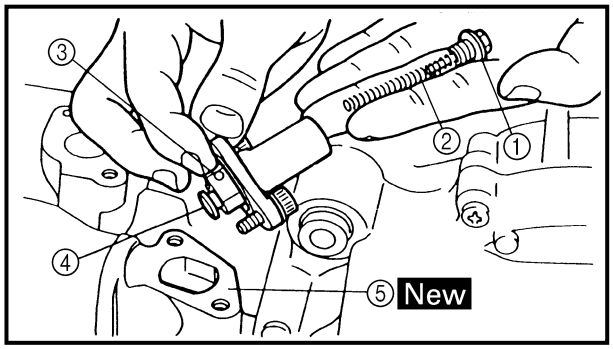
CAUTION:
Do not turn the crankshaft during installation of the camshaft. Damage or improper valve timing will result.

- Remove the safety wire from the timing chain.



4. Install:
   - Washer
   - Bolt ① **20 Nm (2.0 m · kg, 14 ft · lb)**

NOTE:
Install the bolt ① while holding the rotor nut with a wrench.



5. Install:
   - Timing chain tensioner

Installation steps:
- Remove the tensioner cap bolt ① and spring ②.
- Release the timing chain tensioner one-way cam ③ and push the tensioner rod ④ all the way in.
- Install the tensioner with a new gasket ⑤ onto the cylinder.

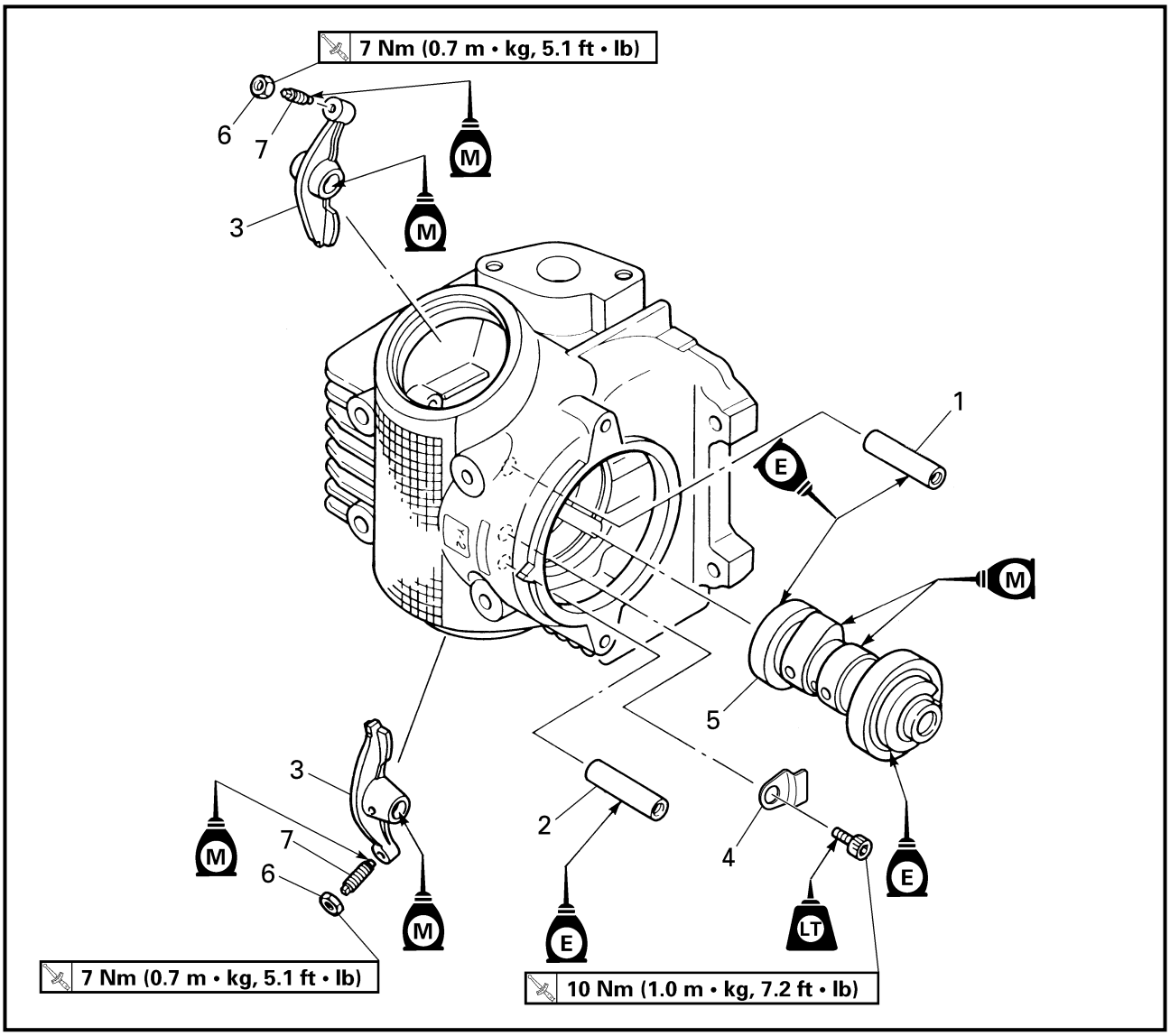
Timing chain tensioner bolt:
10 Nm (1.0 m • kg, 7.2 ft • lb)

- Install the spring ② and cap bolt ①.
- Tighten the bolt (with gasket) to the specified torque.

Cap bolt:
8 Nm (0.8 m • kg, 5.8 ft • lb)

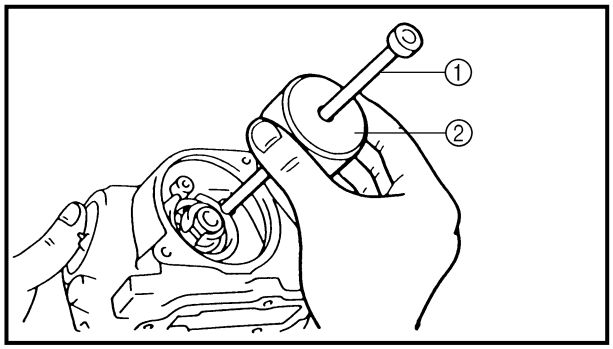
6. Check:
   - Rotor "I" mark
     Align with the crankcase stationary pointer.
   - Valve clearance
     Out of specification → Adjust.
     Refer to the "VALVE CLEARANCE ADJUSTMENT" section in CHAPTER 3.

CAMSHAFT AND ROCKER ARMS



Extent of removal: ① Rocker arm ② Camshaft removal

Extent of removal	Order	Part name	Q'ty	Remarks
		CAMSHAFT AND ROCKER ARMS		
Preparation for removal		Cylinder head		Refer to "CYLINDER HEAD" section.
①	1	Rocker arm shaft (intake)	1	Use special tool.
	2	Rocker arm shaft (exhaust)	1	Refer to "REMOVAL POINTS".
	3	Rocker arm	2	
②	4	Camshaft bearing retainer	1	
	5	Camshaft	1	
	6	Valve clearance adjust screw locknut	2	
	7	Valve clearance adjust screw	2	



REMOVAL POINTS

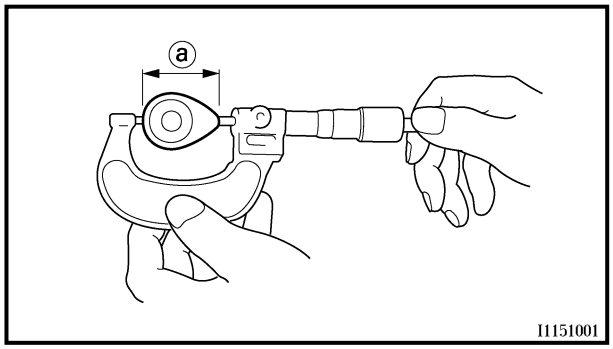
Rocker arm shaft

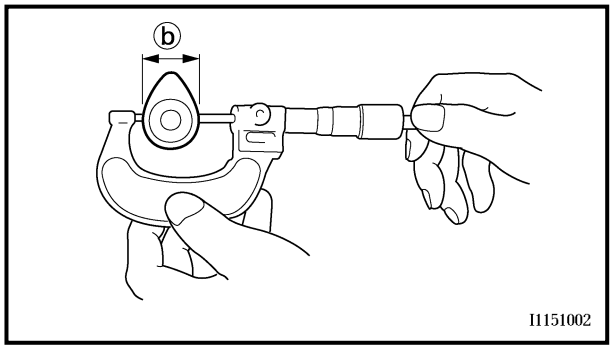
1. Remove:
   - Rocker arm shafts

NOTE:

Use a slide hammer bolt ① and weight ② to slide out the rocker arm shafts.

Slide hammer set:
YU-1083-A
Slide hammer bolt:
90890-01085
Weight:
90890-01084



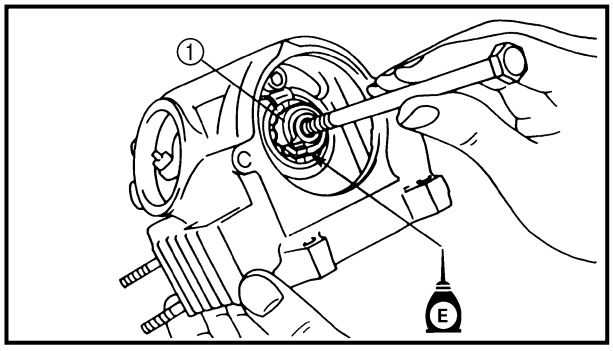


INSPECTION

Camshaft

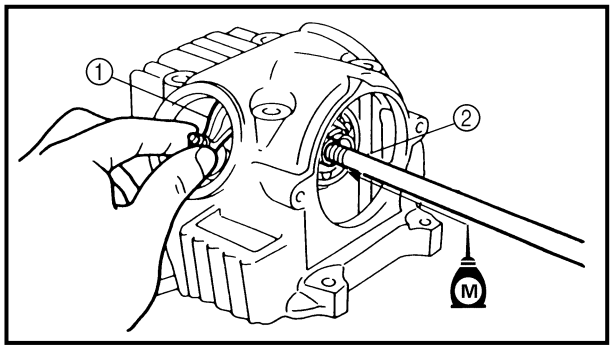
1. Measure:
   - Cam lobes length ⓐ and ⓑ
     Out of specification → Replace.

Cam lobes length limit:
Intake:
ⓐ 25.398 mm (0.9999 in)
ⓑ 21.004 mm (0.8269 in)
Exhaust:
ⓐ 25.256 mm (0.9943 in)
ⓑ 21.017 mm (0.8274 in)



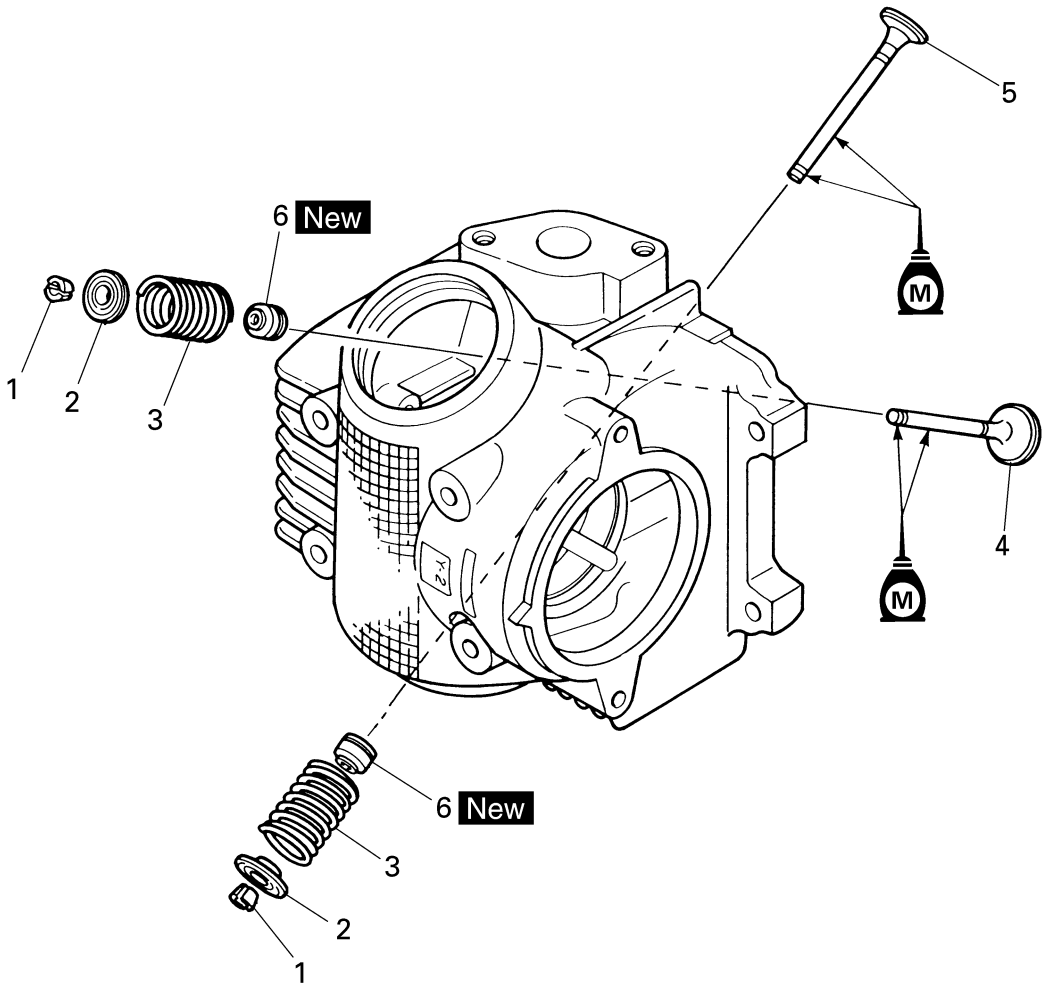
ASSEMBLY AND INSTALLATION

1. Apply:
   - Molybdenum disulfide oil
     (onto the camshaft cam lobe)
   - Engine oil
     (onto the camshaft bearing)
2. Install:
   - Camshaft ①



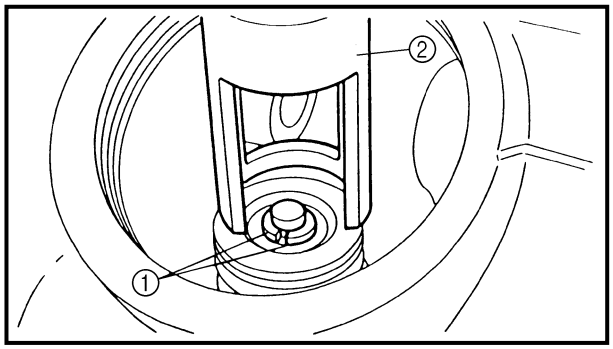
3. Apply:
   - Molybdenum disulfide oil
     (onto the rocker arm and rocker arm shaft)
4. Install:
   - Rocker arm ①
   - Rocker arm shaft ②

VALVES AND VALVE SPRINGS



Extent of removal: ① Valves removal

Extent of removal	Order	Part name	Q'ty	Remarks
		VALVES AND VALVE SPRINGS REMOVAL		
Preparation for removal		Cylinder head		Refer to "CYLINDER HEAD" section.
		Rocker arm and camshaft		Refer to "CAMSHAFT AND ROCKER ARMS" section.
①	1	Valve cotter	4	Use special tool. Refer to "REMOVAL POINTS".
	2	Spring retainer	2	
	3	Valve spring	2	
	4	Intake valve	1	
	5	Exhaust valve	1	
	6	Valve stem seal	2	



REMOVAL POINTS

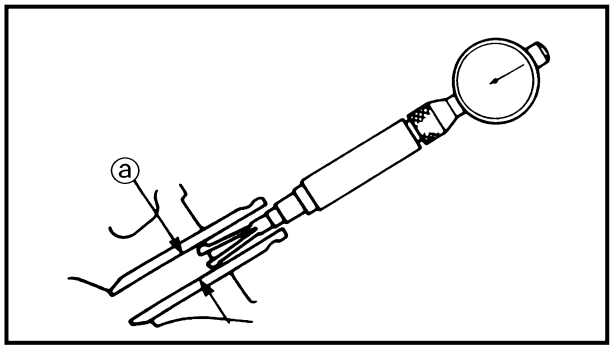
Valve removal

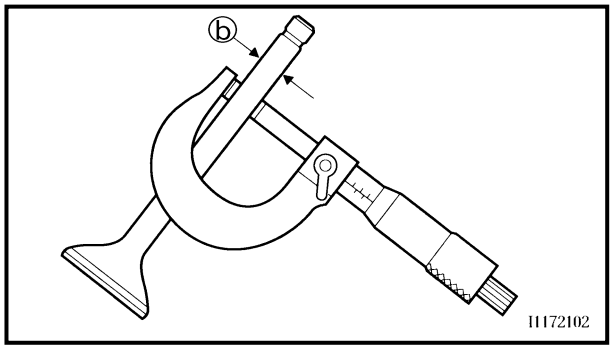
1. Remove:
   - Valve cotters ①

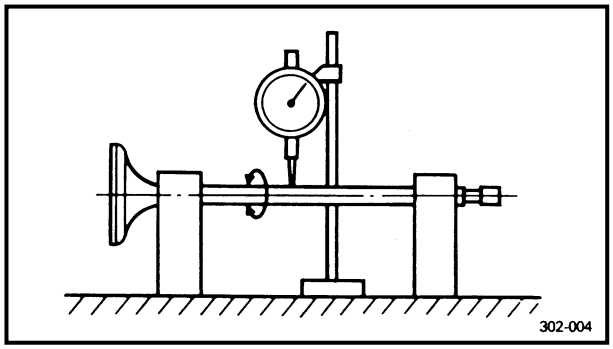
NOTE:

Attach a valve spring compressor ② between the valve spring retainer and the cylinder head to remove the valve cotters.

Valve spring compressor:
YM-4019/90890-04019







INSPECTION

Valve

1. Measure:
   - Stem-to-guide clearance

Stem-to-guide clearance =
valve guide inside diameter ⓐ –
valve stem diameter ⓑ

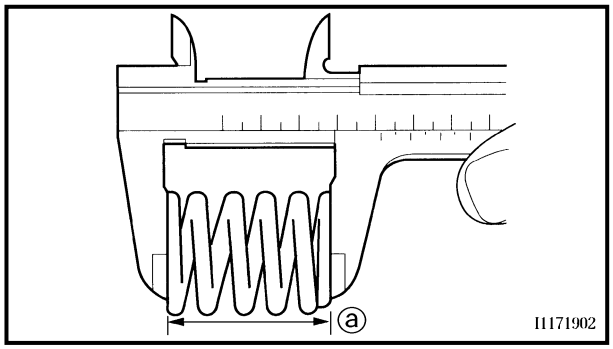
Out of specification → Replace the valve guide.

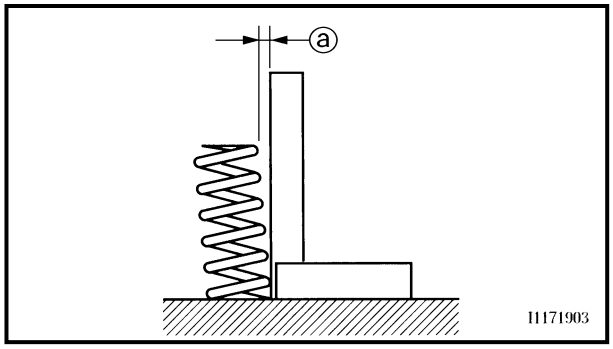
Clearance (stem to guide):
Intake:
0.010 ~ 0.037 mm
(0.0004 ~ 0.0015 in)
<Limit>: 0.08 mm (0.003 in)
Exhaust:
0.025 ~ 0.052 mm
(0.0010 ~ 0.0020 in)
<Limit>: 0.10 mm (0.004 in)

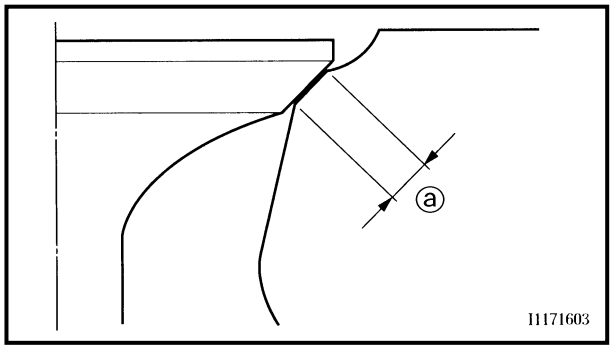
2. Measure:
   - Runout (valve stem)

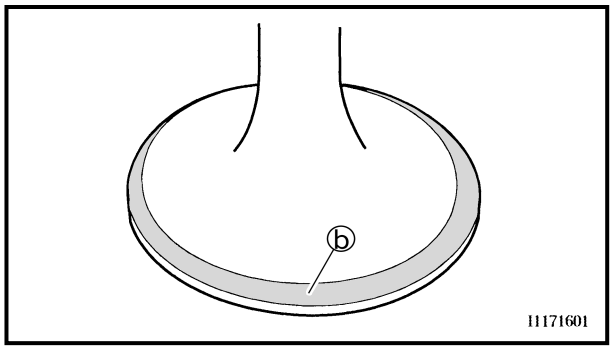
   Out of specification → Replace.

Runout limit:
0.02 mm (0.0008 in)









Valve spring

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

Free length (valve spring):
Intake:
28.32 mm (1.11 in)
<Limit>: 26.9 mm (1.06 in)
Exhaust:
28.32 mm (1.11 in)
<Limit>: 26.9 mm (1.06 in)

2. Measure:
   - Spring tilt ⓐ
     Out of specification → Replace.

Spring tilt limit:
Intake:
2.5°/1.2 mm (0.05 in)
Exhaust:
2.5°/1.2 mm (0.05 in)

Valve seat

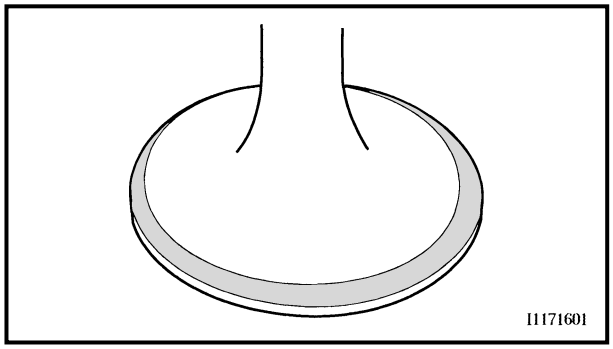
1. Measure:
   - Valve seat width ⓐ
     Out of specification → Reface the valve seat.

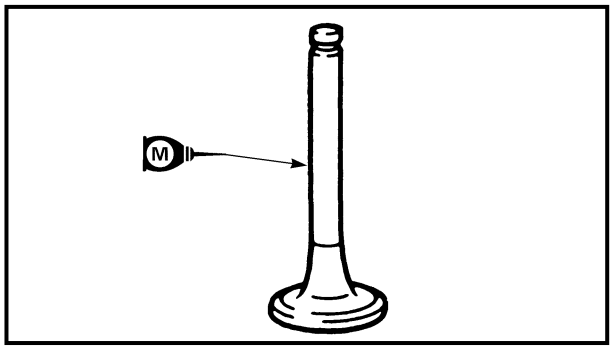
Valve seat width:
Intake:
0.9 ~ 1.1 mm (0.0354 ~ 0.0433 in)
<Limit>: 1.6 mm (0.0630 in)
Exhaust:
0.9 ~ 1.1 mm (0.0354 ~ 0.0433 in)
<Limit>: 1.6 mm (0.0630 in)

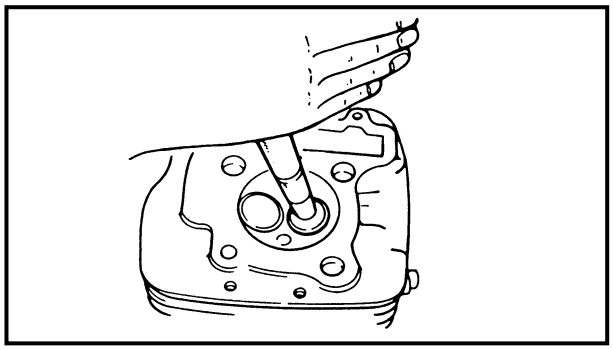
Measurement steps:
- Apply Mechanic's blueing dye (Dykem) ⓑ to the valve face.
- Install the valve into the cylinder head.
- Press the valve through the valve guide and onto the valve seat to make a clear pattern.
- Measure the valve seat width. Where the valve seat and valve face made contact, blueing will have been removed.
- If the valve seat is too wide, too narrow, or the seat is not centered, the valve seat must be refaced.

2. Lap:
   - Valve face
   - Valve seat

NOTE:
After refacing the valve seat or replacing the valve and valve guide, the valve seat and valve face should be lapped.







Lapping steps:
- Apply a coarse lapping compound to the valve face.

CAUTION:
Do not let the compound enter the gap between the valve stem and the guide.

- Apply molybdenum disulfide oil to the valve stem.
- Install the valve into the cylinder head.
- Turn the valve until the valve face and valve seat are evenly polished, then clean off all of the compound.

NOTE:
For best lapping results, lightly tap the valve seat while rotating the valve back and forth between your hands.

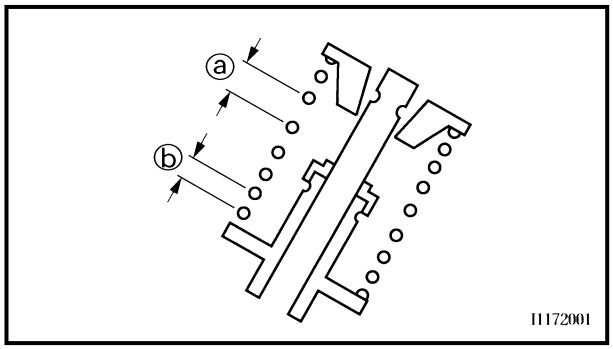
- Apply a fine lapping compound to the valve face and repeat the above steps.

NOTE:
After every lapping operation be sure to clean off all of the compound from the valve face and valve seat.

- Apply Mechanic's blueing dye (Dykem) to the valve face.
- Install the valve into the cylinder head.
- Press the valve through the valve guide and onto the valve seat to make a clear pattern.
- Measure the valve seat width again. If the valve seat width is out of specification, reface and relap the valve seat.

ASSEMBLY AND INSTALLATION

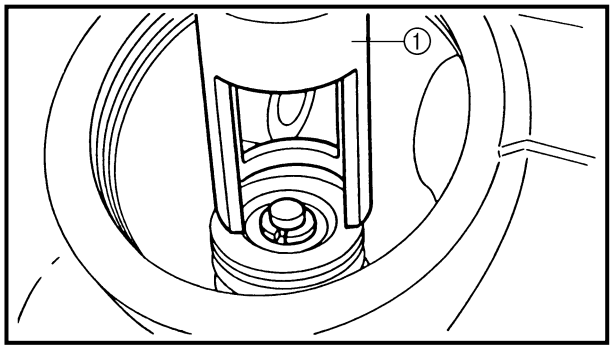
1. Apply:
   - Molybdenum disulfide oil (onto the valve stem and valve stem seal)
2. Install:
   - Valve stem seats New
   - Valves
   - Valve springs
   - Valve spring retainers



NOTE:

- Make sure that each valve is installed in its original place, also referring to the embossed mark as follows.
  Intake: "G"
  Exhaust: "L"
- Install the valve springs with the larger pitch ⓐ facing upwards.

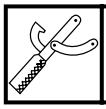
ⓑ Smaller pitch



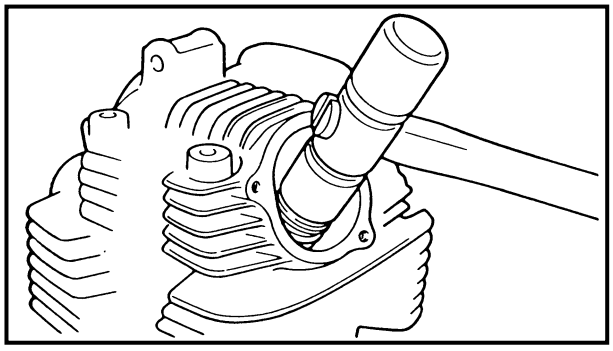
3. Install:
   - Valve cotters

NOTE:

While compressing the valve spring with a valve spring compressor and attachment ① install the valve cotters.



Valve spring compressor:
YM-4019/90890-04019

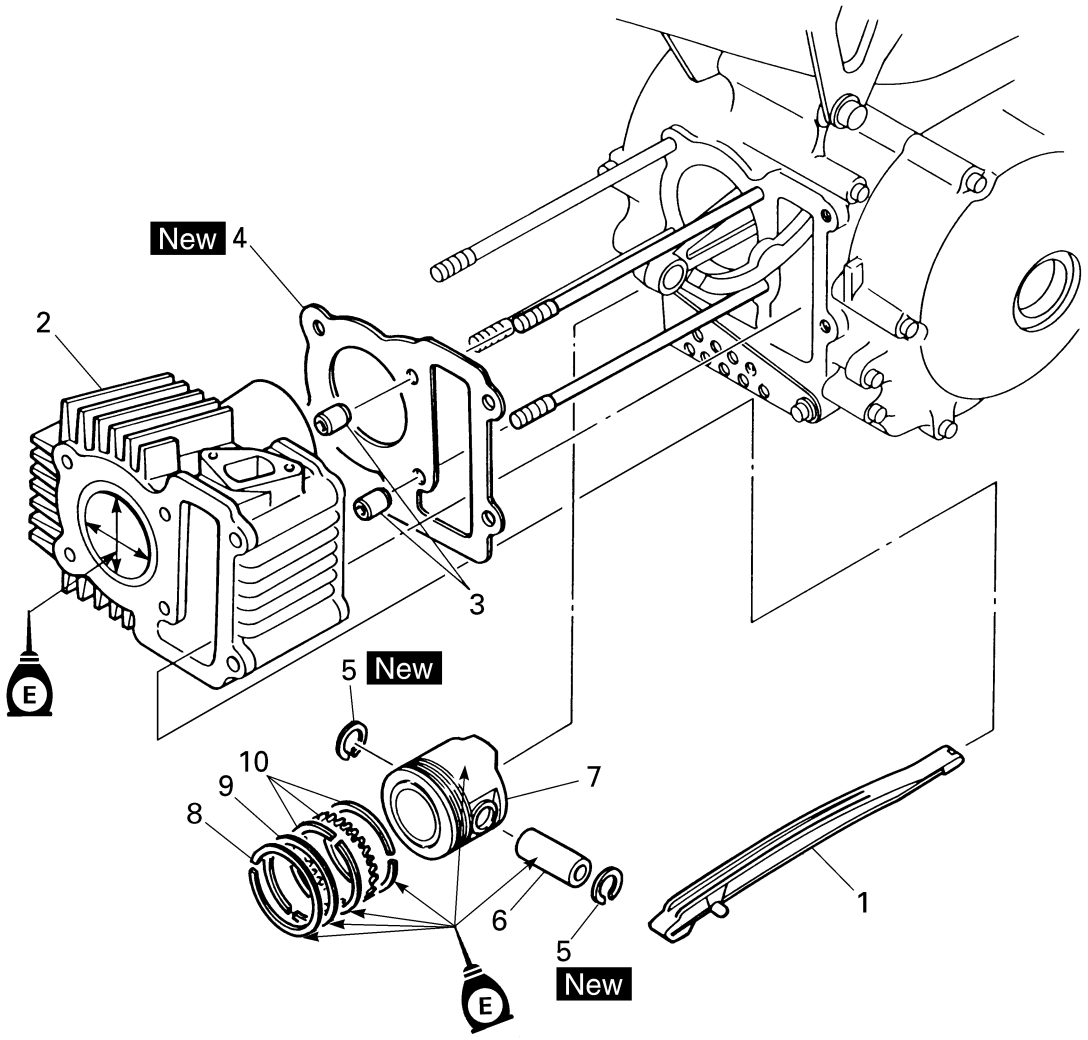


4. To secure the valve cotters onto the valve stem, lightly tap the valve tip with a piece of wood.

CAUTION:

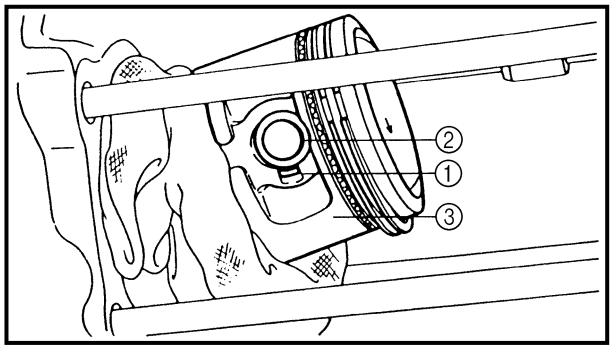
Hitting the valve tip with excessive force could damage the valve.

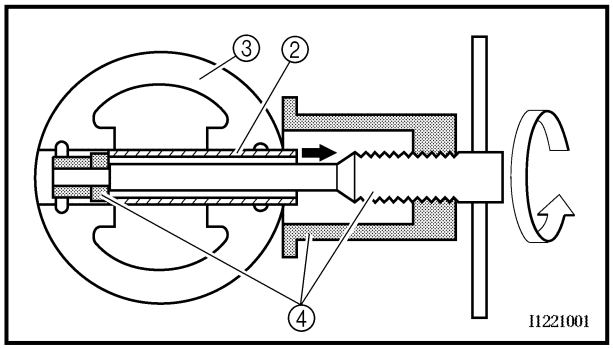
CYLINDER AND PISTON

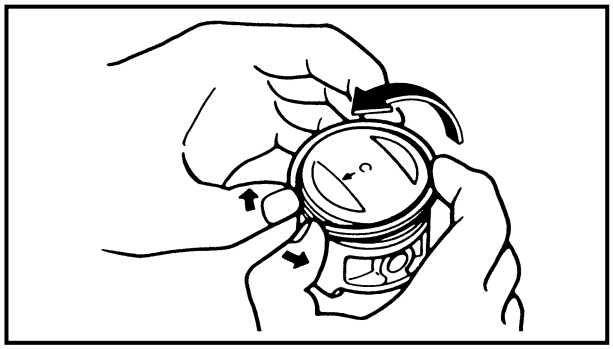


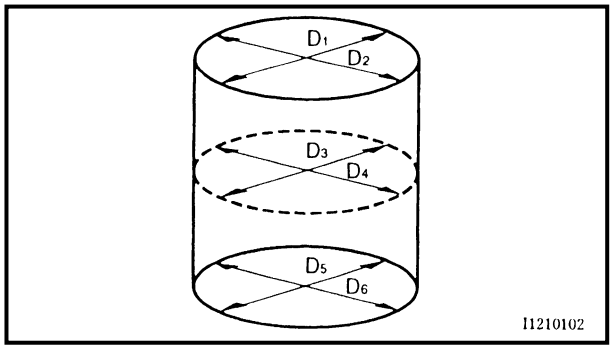
Extent of removal: ① Cylinder removal ② Piston removal

Extent of removal	Order	Part name	Q'ty	Remarks
		CYLINDER AND PISTON REMOVAL		
Preparation for removal		Cylinder head		Refer to "CYLINDER HEAD" section.
①	1	Timing chain guide (exhaust)	1	
	2	Cylinder	1	
	3	Dowel pin	2	
	4	Gasket	1	
②	5	Piston pin clip	2	
	6	Piston pin	1	Use special tool. Refer to "REMOVE POINTS".
	7	Piston	1	
	8	Piston ring (top)	1	
	9	Piston ring (2nd)	1	Refer to "REMOVAL POINTS".
	10	Side rail/spacer	2/1	









REMOVAL POINTS

Piston

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

NOTE:

- Before removing the piston pin clip, cover the crankcase opening with a clean towel or rag to prevent the clip from falling into the crankcase cavity.
- Before removing each piston pin, deburr the clip groove and pin hole area. If the piston pin groove is deburred and the piston pin is still difficult to remove, use the piston pin puller set ④.

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

Piston ring

1. Remove:
   - Piston rings

NOTE:

Spread the end gaps apart while at the same time lifting the piston ring over the top of the piston crown, as shown in the illustration.

INSPECTION

Cylinder and piston

1. Inspect:
   - Cylinder and piston walls
     Vertical scratches → Replace cylinder and piston.

2. Measure:
   - Piston-to-cylinder clearance

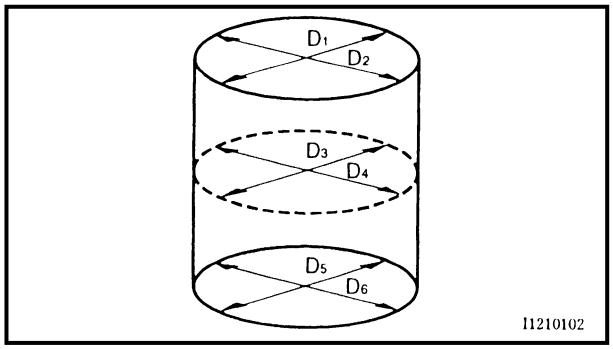
Measurement steps:

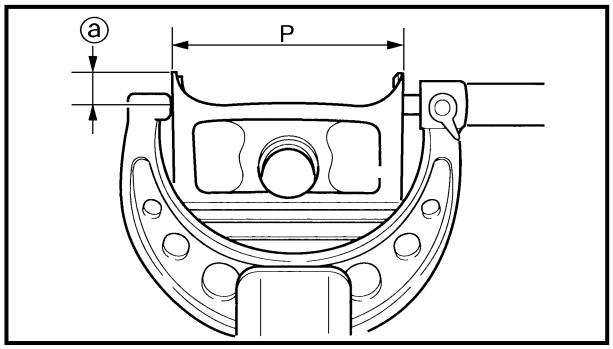
1st step:

- Measure the cylinder bore “C” with a cylinder bore gauge.

NOTE:

Measure the cylinder bore “C” in parallel to and at right angles to the crankshaft. Then, find the average of the measurements.





Cylinder bore "C"	**47.000 ~ 47.005 mm (1.8504 ~ 1.8506 in)**
Taper limit "T"	**0.05 mm (0.002 in)**
Out of round "R"	**0.05 mm (0.002 in)**

"C" = Maximum D

"T" = (Maximum D_1 or D_2) – (Maximum D_5 or D_6)

"R" = (Maximum D_1, D_3 or D_5) – (Minimum D_2, D_4 or D_6)

- If out of specification, replace the cylinder, and replace the piston and piston rings as set.

2nd step:

- Measure the piston skirt diameter "P" with a micrometer.

ⓐ 4 mm (0.16 in) from the piston bottom edge.

	Piston size P
Standard	**46.960 ~ 46.975 mm (1.8488 ~ 1.8494 in)**

- If out of specification, replace the piston and piston rings as a set.

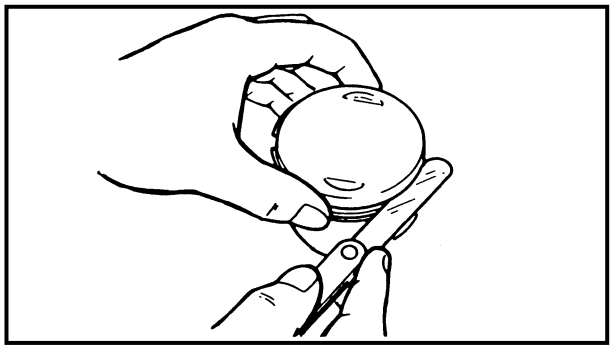
3rd step:

- Calculate the piston-to-cylinder clearance with following formula:

Piston-to-cylinder clearance = Cylinder bore "C" – Piston skirt diameter "P"

Piston-to-cylinder clearance: 0.025 ~ 0.045 mm (0.0010 ~ 0.0018 in) <Limit>: 0.15 mm (0.0059 in)

- If out of specification, replace the cylinder, and replace the piston and piston rings as set.



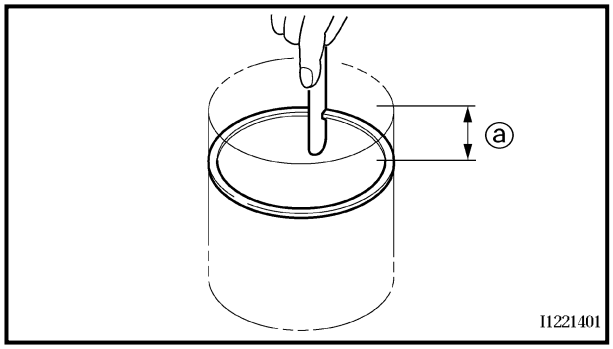
Piston ring

1. Measure:
   - Ring side clearance
     Use a feeler gauge.
     Out of specification → Replace the piston and rings as a set.

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

	Side clearance	
	Standard	**Limit**
Top ring	**0.030 ~ 0.065 mm (0.0012 ~ 0.0026 in)**	**0.12 mm (0.005 in)**
2nd ring	**0.020 ~ 0.055 mm (0.0008 ~ 0.0022 in)**	**0.12 mm (0.005 in)**

2. Position:
   - Piston ring
     (in cylinder)



NOTE:
Insert a ring into the cylinder and push it approximately 5 mm (0.20 in) into the cylinder. Push the ring with the piston crown so that the ring will be at a right angle to the cylinder bore.

ⓐ 5 mm (0.20 in)

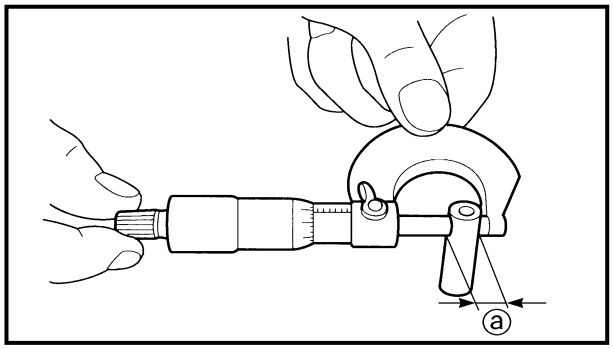
3. Measure:
   - Ring end gap
     Out of specification → Replace.

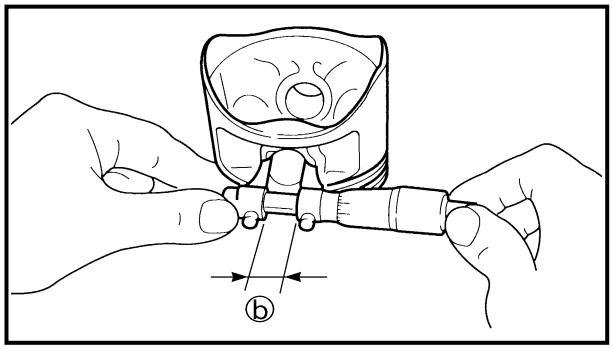
NOTE:
You cannot measure the end gap on the expander spacer of the oil control ring. If the oil control ring rails show excessive gap, replace all three rings.

	End gap	
	Standard	**Limit**
Top ring	**0.10 ~ 0.25 mm (0.004 ~ 0.010 in)**	**0.4 mm (0.016 in)**
2nd ring	**0.10 ~ 0.25 mm (0.004 ~ 0.010 in)**	**0.4 mm (0.016 in)**
Oil ring	**0.2 ~ 0.7 mm (0.01 ~ 0.03 in)**	**—**

Piston pin

1. Inspect:
   - Piston pin
     Blue discoloration/grooves →
     Replace, then inspect the lubrication system.





2. Measure:
   - Piston pin outside diameter
   - Piston pin bore inside diameter

Measurement steps:

- Measure the piston pin outside diameter ⓐ.
  If out of specification, replace the piston pin

Outside diameter (piston pin):
12.996 ~ 13.000 mm
(0.5117 ~ 0.5118 in)
<Limit>:12.976 mm (0.5109 in)

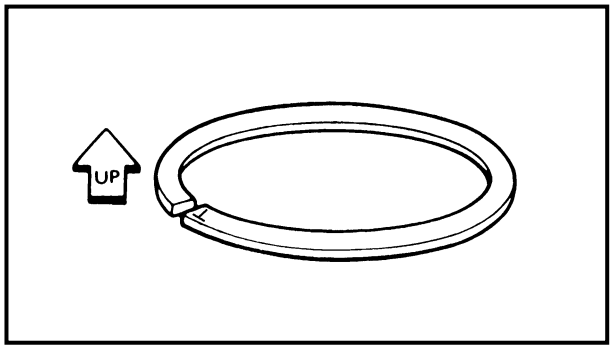
- Measure the piston inside diameter ⓑ.
  If out of specification, replace the piston.

Inside diameter (piston):
13.002 ~ 13.013 mm
(0.5119 ~ 0.5123 in)
<Limit>: 13.045 mm (0.5136 in)

ASSEMBLY AND INSTALLATION

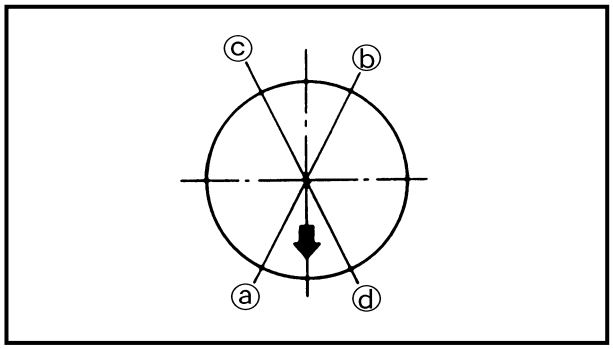
Piston

1. Install:
   - Piston rings
     (onto the piston)



NOTE:

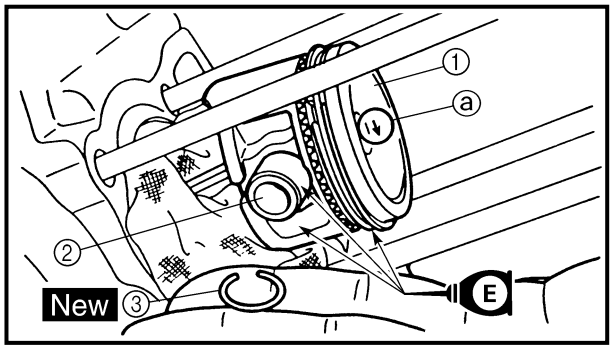
- Be sure to install the piston rings so that the manufacturer's marks or numbers are located on the upper side of the rings.
- Lubricate the piston and piston rings liberally with engine oil.



2. Position:
   - Top ring
   - 2nd ring
   - Oil ring

   Offset the piston ring end gaps as shown.

ⓐ Top ring end
ⓑ Oil ring end (lower)
ⓒ Oil ring end (upper)
ⓓ 2nd ring end

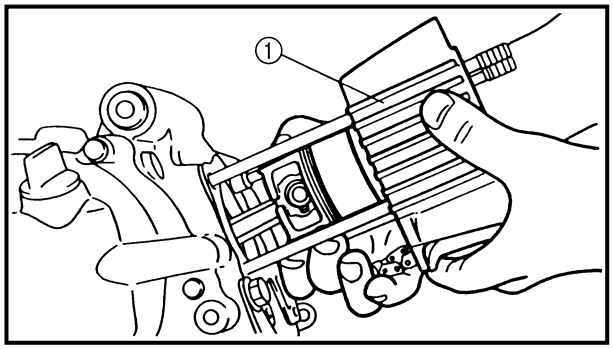


3. Install:
   - Piston ①
   - Piston pin ②
   - Piston pin clips ③ New

NOTE:
- Apply engine oil onto the piston pin, piston ring and piston.
- Be sure that the arrow mark ⓐ on the piston points to the exhaust side of the engine.
- Before installing the piston pin clip, cover the crankcase with a clean rag to prevent the piston pin clip from falling into the crankcase.

4. Lubricate:
   - Piston
   - Piston rings
   - Cylinder

NOTE:
Apply a liberal coating of engine oil.



Cylinder

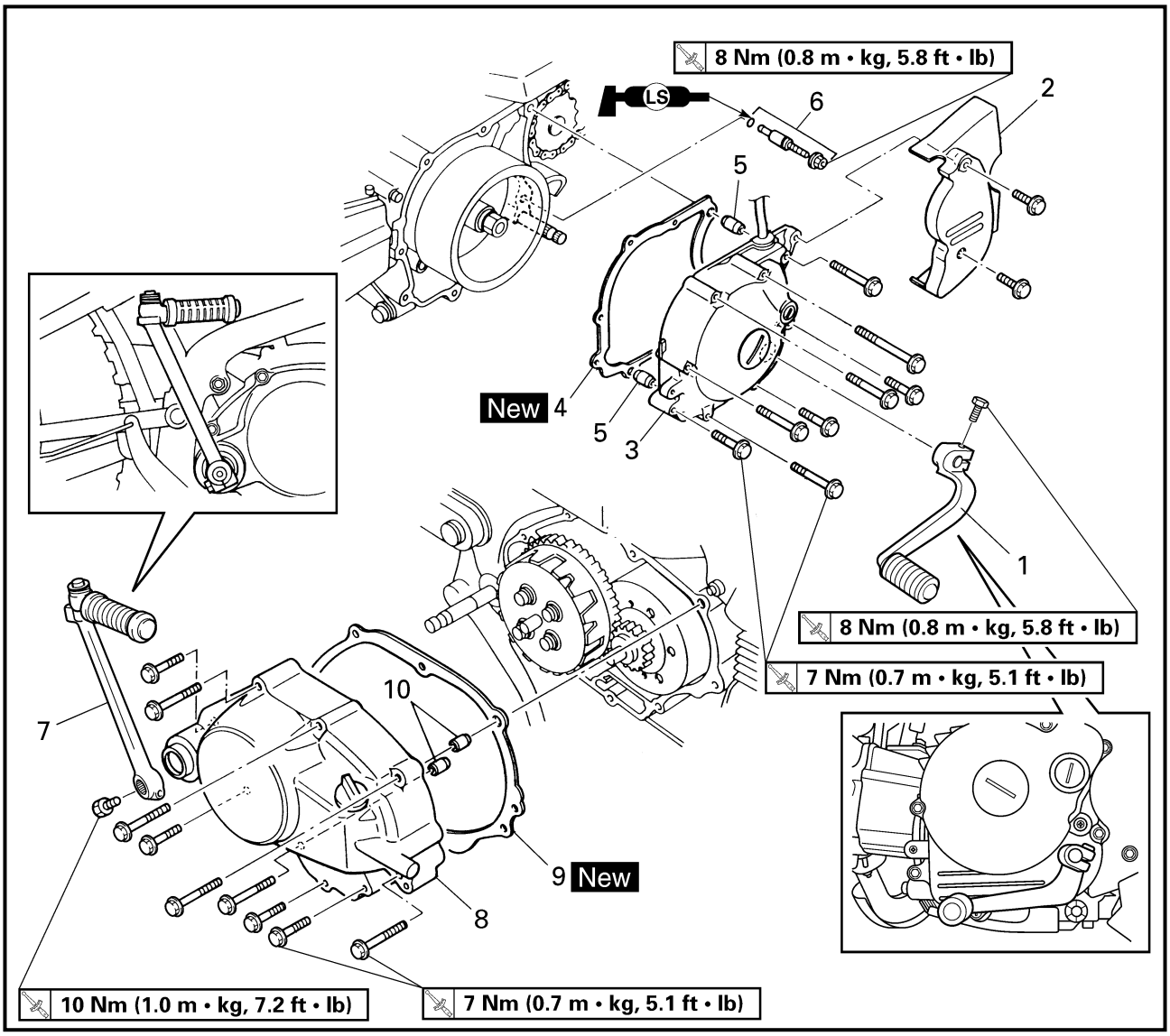
1. Install:
   - Dowel pins
   - Gasket New
   - Cylinder ①

NOTE:
Install the cylinder with one hand while compressing the piston rings with the other hand.

CAUTION:
- **Be careful not to damage the timing chain damper during installation.**
- **Pass the timing chain through the timing chain cavity.**

CLUTCH

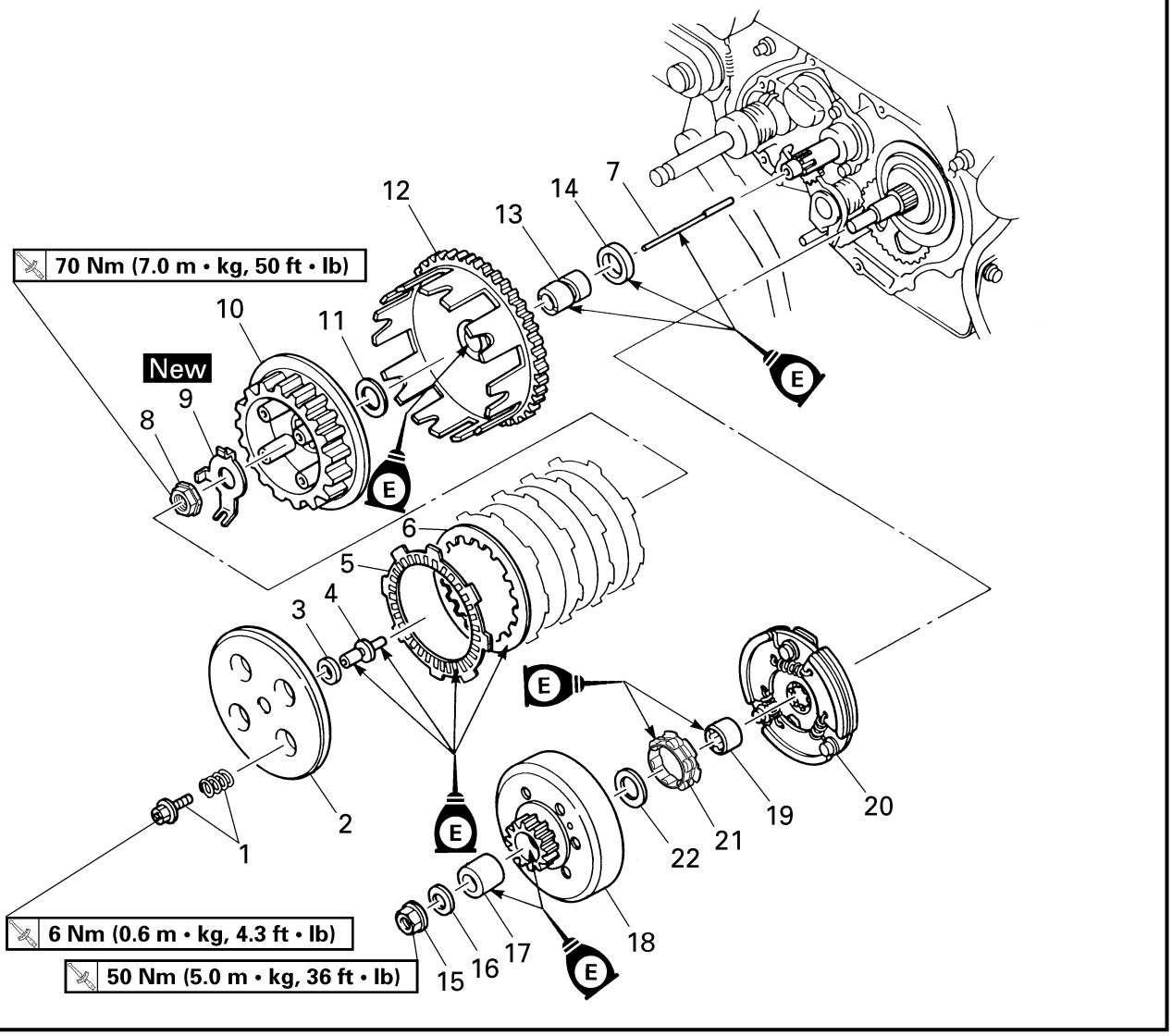
CRANKCASE COVER (LEFT AND RIGHT)



Extent of removal: ① Crankcase cover (left) removal ② Crankcase cover (right) removal

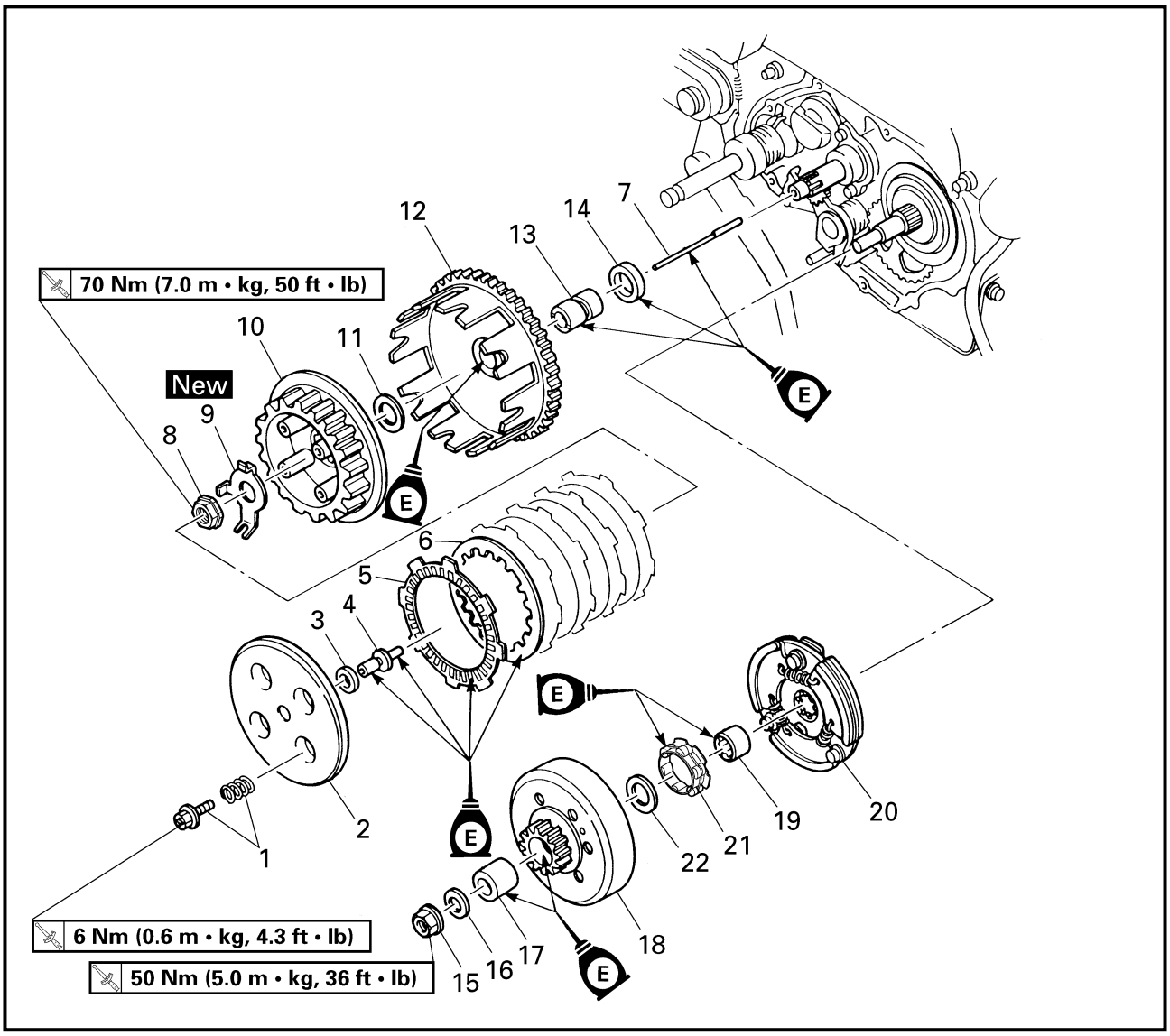
Extent of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		**CRANKCASE COVER (LEFT AND RIGHT) REMOVAL** Drain the engine oil.		Refer to "ENGINE OIL REPLACEMENT" section in the CHAPTER 3.
①	1	Shift pedal	1	
	2	Drive sprocket cover	1	
	3	Crankcase cover (left)	1	
	4	Gasket	1	
	5	Dowel pin	2	
	6	Clutch adjusting screw	1	
	7	Kick crank	1	
②	8	Crankcase cover (right)	1	
	9	Gasket	1	
	10	Dowel pin	2	

CLUTCH

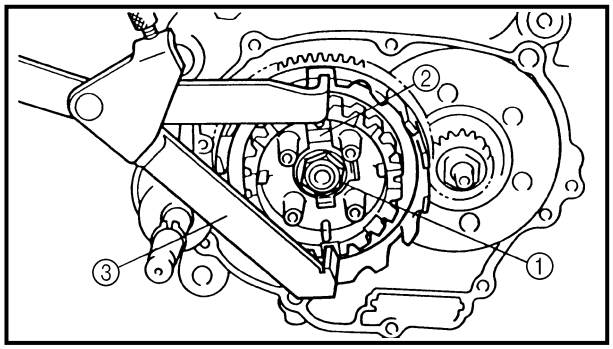


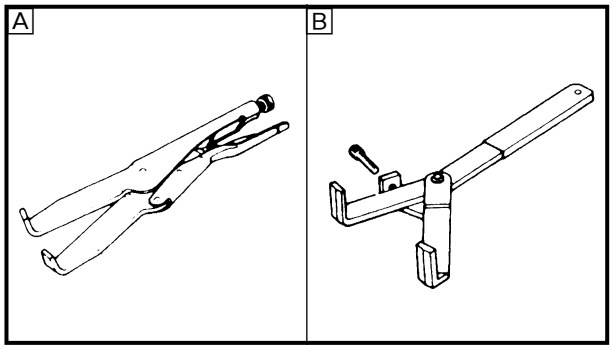
Extent of removal: ① Friction plate and clutch plate removal ② Clutch housing removal ③ Primary clutch removal

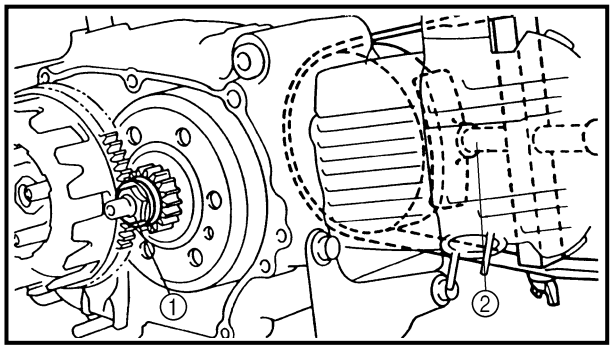
Extent of removal	Order	Part name	Q'ty	Remarks
		CLUTCH REMOVAL		
①	1	Bolt/clutch spring	4/4	
	2	Pressure plate	1	
	3	Washer	1	
	4	Push rod #1	1	
	5	Friction plate	5	
② ③	6	Clutch plate	4	
	7	Push rod #2	1	
	8	Clutch boss nut	1	Use special tool.
	9	Lock washer	1	Refer to "REMOVAL POINTS".
	10	Clutch boss	1	
	11	Washer	1	
	12	Clutch housing	1	

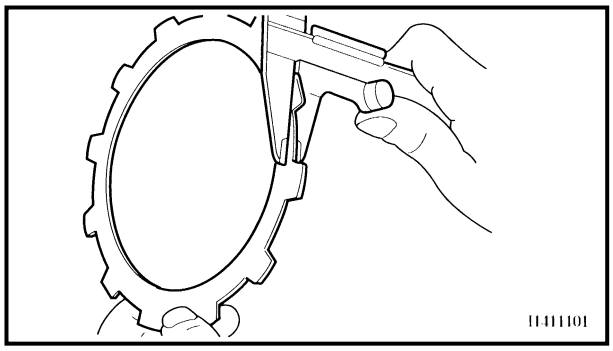


Extent of removal	Order	Part name	Q'ty	Remarks
②	13	Spacer	1	
	14	Spacer	1	
	15	Primary clutch nut	1	Use special tool. Refer to "REMOVAL POINTS".
	16	Washer	1	
③	17	Spacer	1	
	18	Primary clutch housing	1	
	19	Primary clutch boss	1	
	20	Clutch carrier	1	
	21	One-way clutch assembly	1	
	22	Washer	1	









REMOVAL POINTS

Clutch boss

1. Remove:
   - Clutch boss nut ①
   - Lock washer ②
   - Clutch boss

NOTE:

Straighten the lock washer tab and use the clutch holding tool ③ to hold the clutch boss.

	Clutch holding tool: YM-91042/90890-04086

A For USA and CDN
B Except for USA and CDN

Primary clutch

1. Remove:
   - Primary clutch nut ①

NOTE:

Loosen the nut while holding the magnet rotor with the sheave holder ②.

	Sheave holder: YS-1880-A/90890-01701

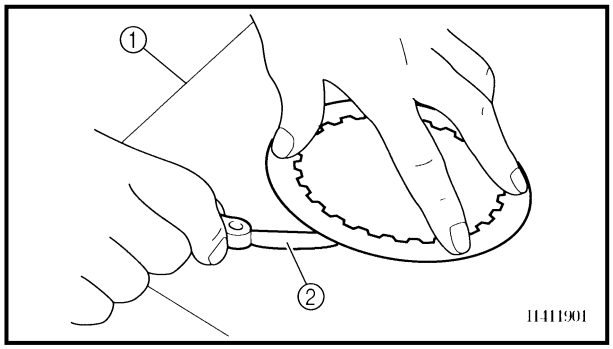
INSPECTION

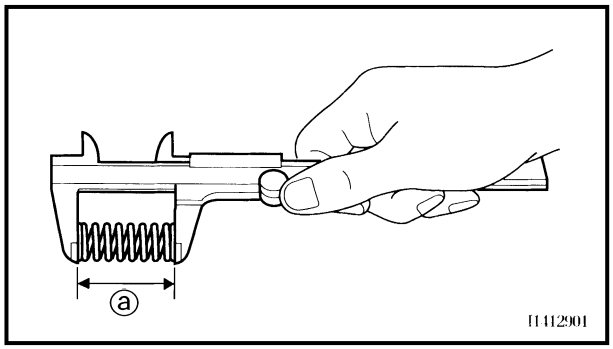
EC484500

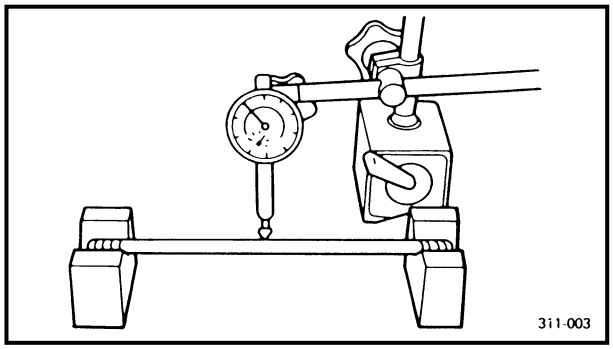
Friction plate

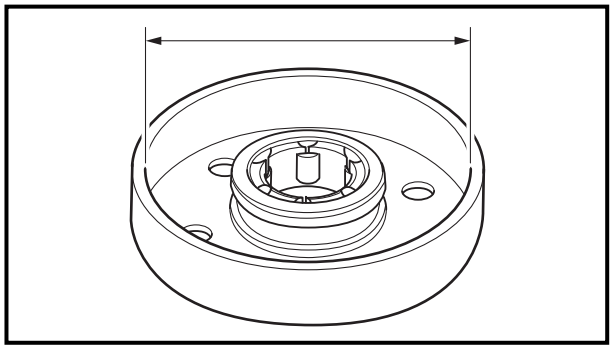
1. Measure:
   - Friction plate thickness
     Out of specification → Replace friction plate as a set.
     Measure at all four points.

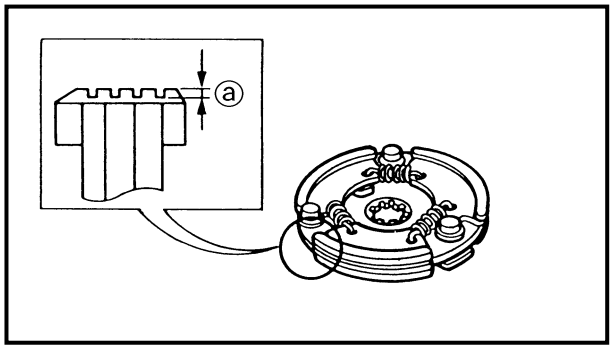
Friction plate thickness	
Standard	**Limit**
2.7 ~ 2.9 mm (0.106 ~ 0.114 in)	**2.6 mm (0.102 in)**











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)**

EC484400
Clutch spring

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

Clutch spring free length	
Standard	**Limit**
26.2 mm (1.03 in)	**24.2 mm (0.95 in)**

Push rod

1. Measure:
   - Push rod #2 bend
     Out of specification → Replace.

	Bending limit: **0.5 mm (0.02 in)**

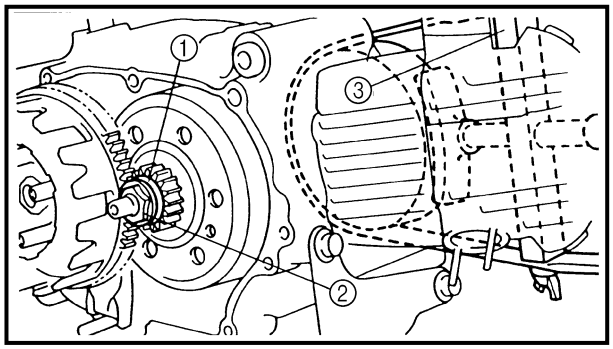
Primary clutch

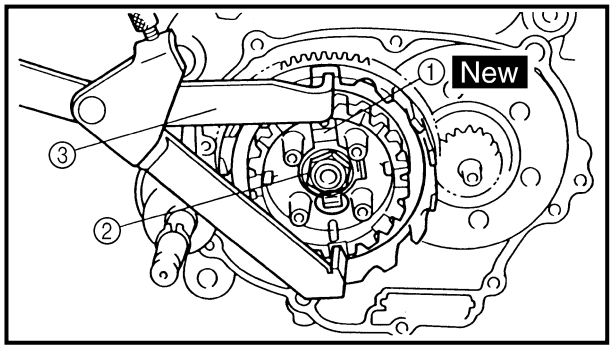
1. Measure:
   - Primary clutch housing inside diameter
     Out of specification → Replace.

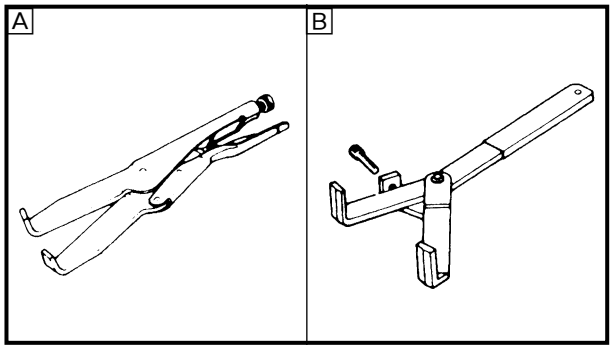
	Primary clutch housing inside diameter: **105 mm (4.13 in)** **<Limit>: 106 mm (4.17 in)**

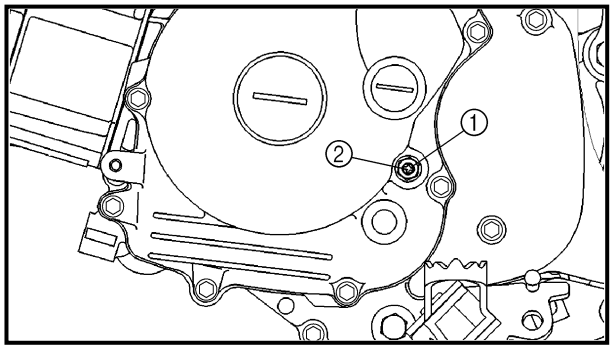
2. Measure:
   - Clutch shoe groove depth ⓐ
     Out of specification → Replace.

	Clutch shoe groove depth: **1.0 ~ 1.3 mm (0.039 ~ 0.051 in)** **<Limit>: 0.1 mm (0.004 in)**









ASSEMBLY AND INSTALLATION

Primary clutch

1. Install:
   - Washer ①
   - Nut (primary clutch) ②

	50 Nm (5.0 m · kg, 36 ft · lb)

NOTE:
Tighten the nut while holding the magneto rotor with the sheave holder ③.

	Sheave holder: **YS-1880-A/90890-01701**

Clutch

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

	70 Nm (7.0 m · kg, 50 ft · lb)

NOTE:
Use the clutch holding tool ③ to hold the clutch boss.

	Clutch holding tool: **YM-91042/90890-04086**

A For USA and CDN
B Except for USA and CDN

2. Bend:
   - Lock washer tab

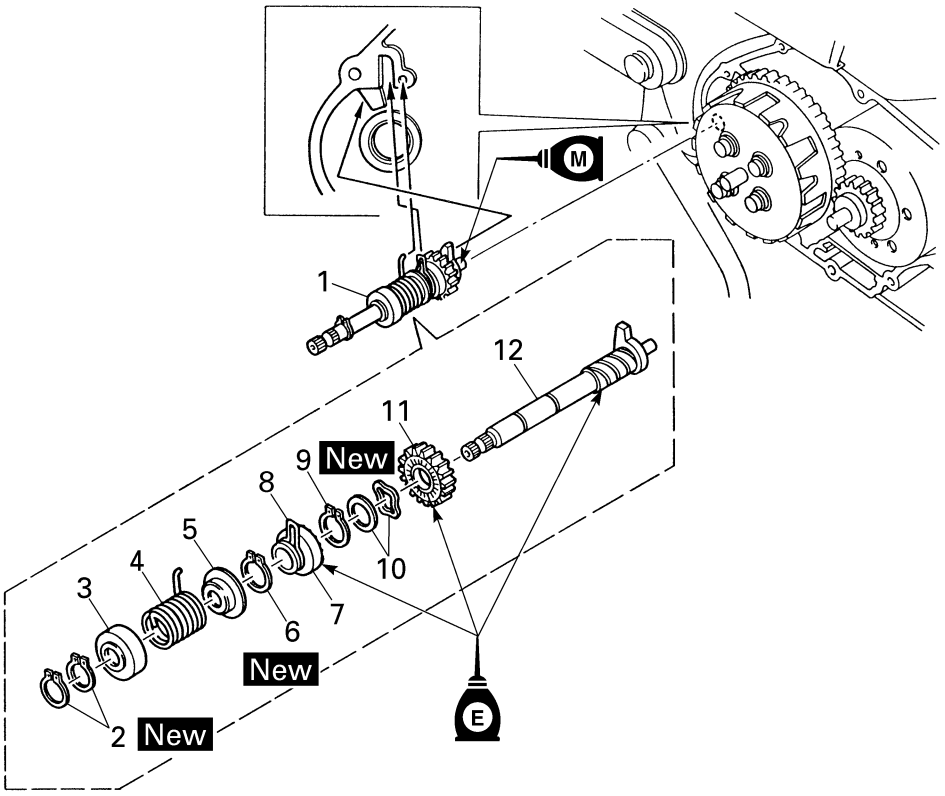
Clutch release adjustment

1. Adjust:
   - Clutch release

Adjustment steps:
- Loosen the locknut ①.
- Turn in the adjuster ② until it is lightly seated.
- Turn out by 1/8 turn.
- Tighten the locknut.

	Locknut: **8 Nm (0.8 m • kg, 5.8 ft • lb)**

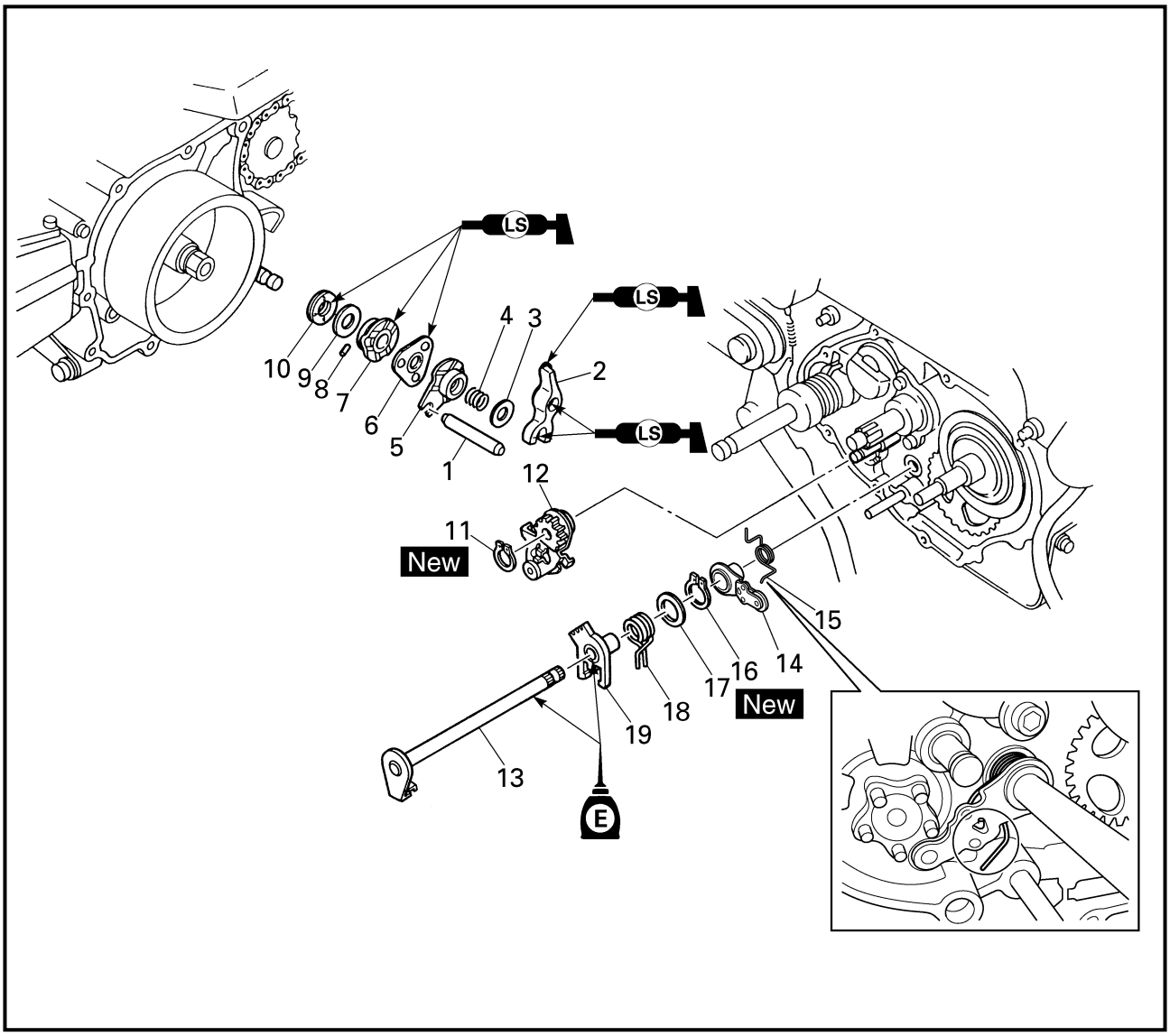
KICK AXLE



Extent of removal: ① Kick axle removal ② Kick axle disassembly

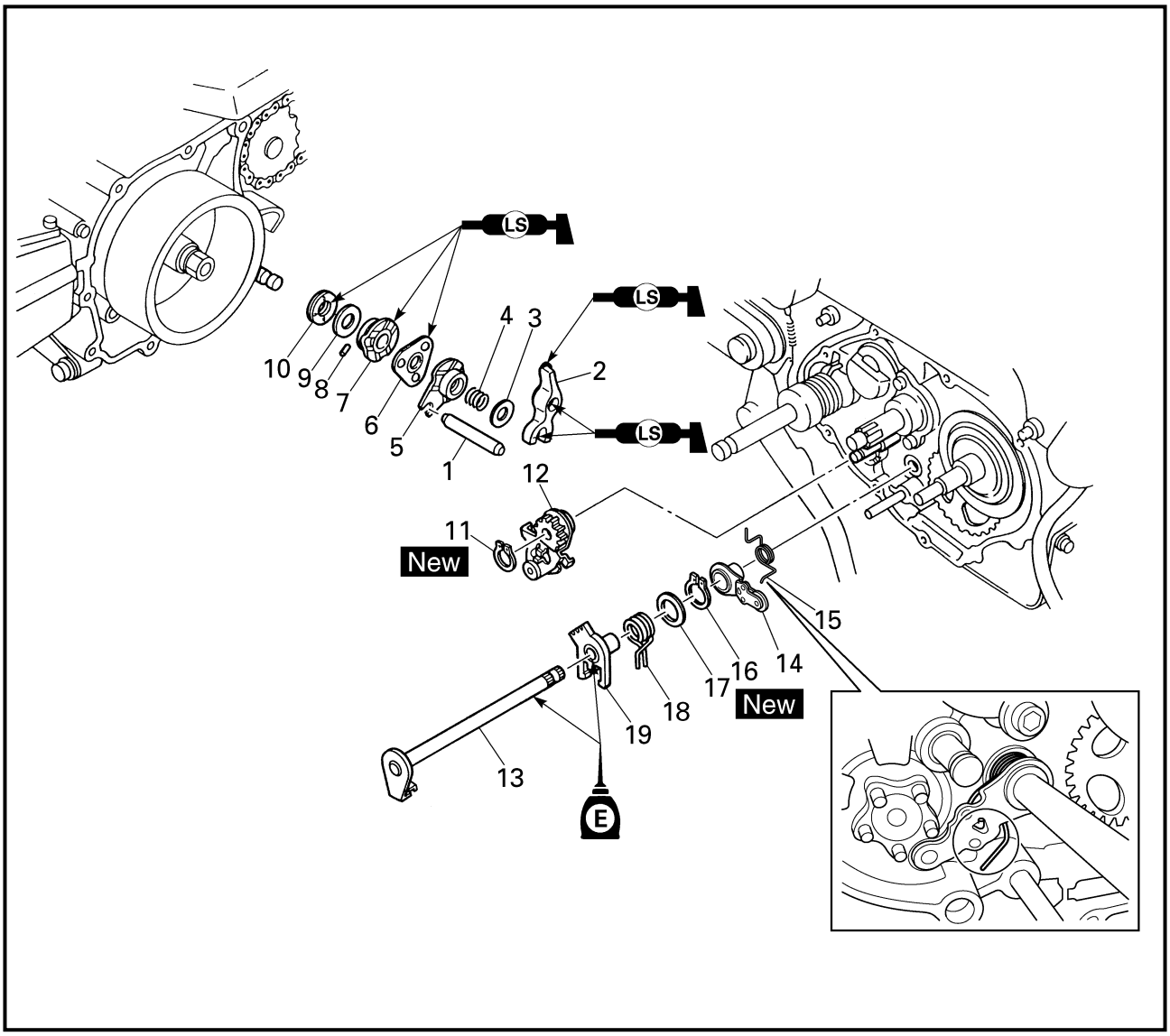
Extent of removal	Order	Part name	Q'ty	Remarks
		KICK AXLE REMOVAL AND DISASSEMBLY		
Preparation for removal		Crankcase cover (right)		Refer to "CLUTCH" section.
①	1	Kick axle assembly	1	
	2	Circlip	2	
	3	Spring cover	1	
	4	Torsion spring	1	
	5	Spring guide	1	
②	6	Circlip	1	
	7	Ratchet wheel	1	
	8	Clip	1	
	9	Circlip	1	
	10	Washer/wave washer	1/1	
	11	Kick gear	1	
	12	Kick axle	1	

SHIFT SHAFT



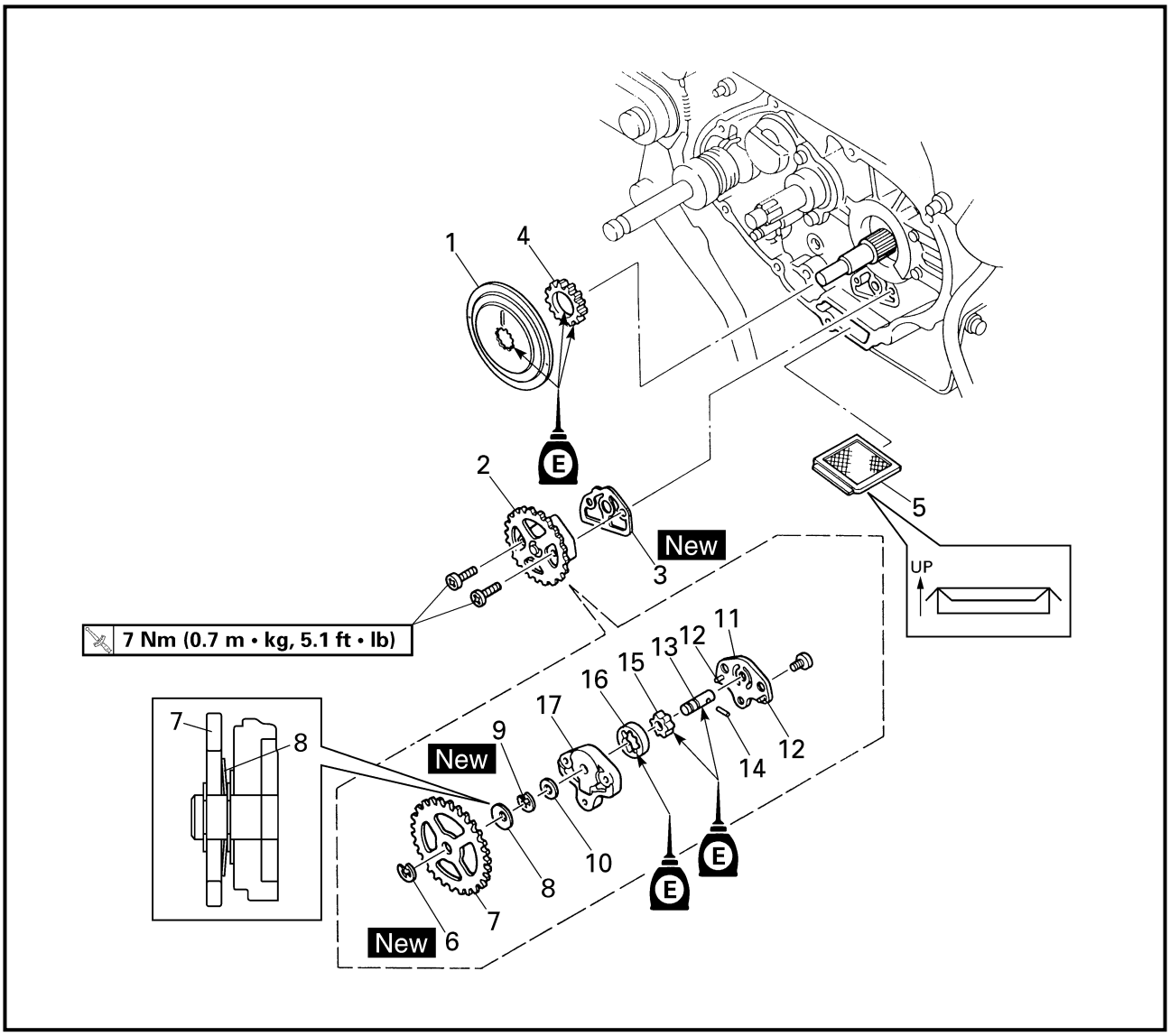
Extent of removal: ① Shift shaft removal

Extent of removal	Order	Part name	Q'ty	Remarks
		SHIFT SHAFT REMOVAL		
Preparation for removal		Clutch housing and clutch carrier		Refer to "CLUTCH" section.
①	1	Shift fork guide bar	1	
	2	Shift arm 3	1	
	3	Plate washer	1	
	4	Compression spring	1	
	5	Shift guide	1	
	6	Ball holder	1	
	7	Guide	1	
	8	Dowel pin	1	
	9	Plate washer	1	
	10	Thrust bearing	1	
	11	Circlip	1	
	12	Shift lever assembly	1	
	13	Shift shaft	1	



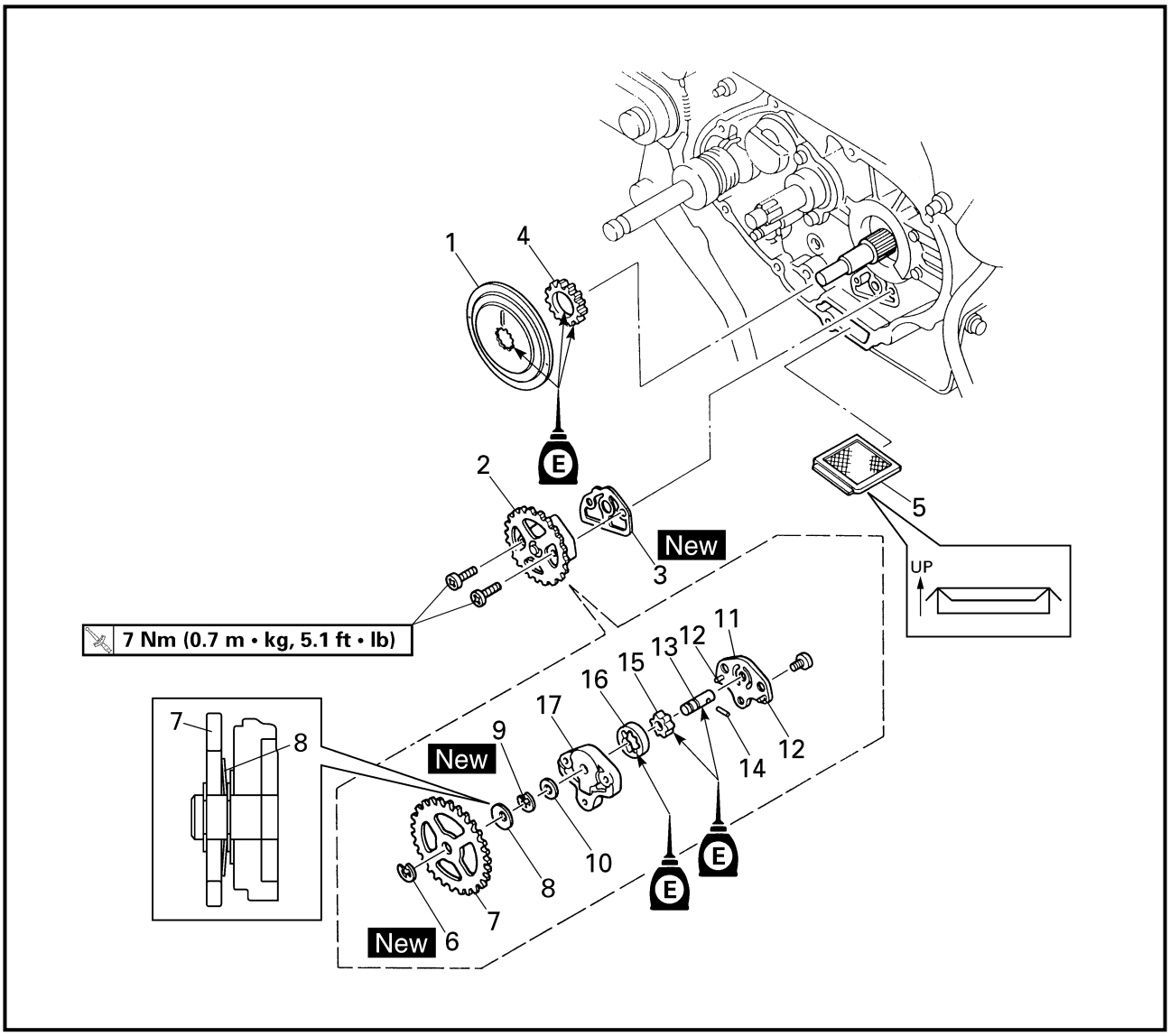
Extent of removal	Order	Part name	Q'ty	Remarks
①	14	Stopper lever	1	
	15	Torsion spring	1	
	16	Circlip	1	
	17	Plate washer	1	
	18	Torsion spring	1	
	19	Shift lever	1	

OIL PUMP

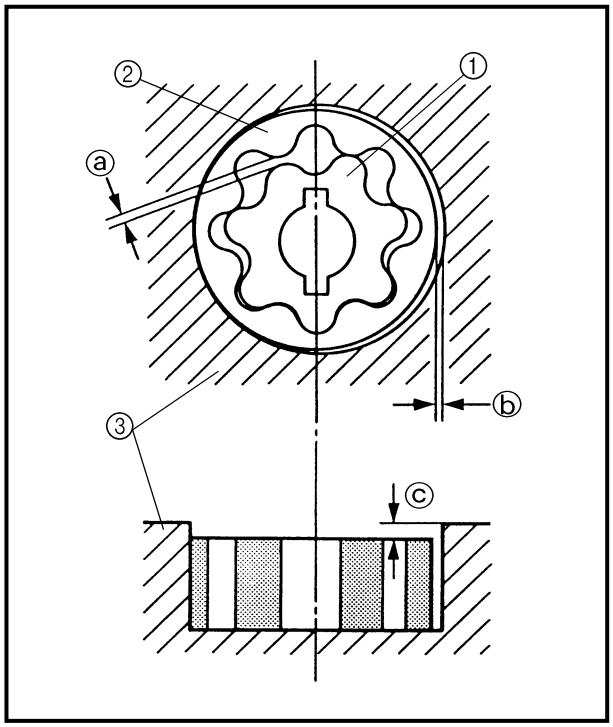


Extent of removal: ① Oil pump removal ② Oil strainer removal ③ Oil pump disassembly

Extent of removal	Order	Part name	Q'ty	Remarks
		OIL PUMP REMOVAL AND DISASSEMBLY		
Preparation for removal		Clutch housing and clutch carrier		Refer to "CLUTCH" section.
		Shift shaft		Refer to "SHIFT SHAFT" section.
①	1	Rotary filter	1	
	2	Oil pump assembly	1	
②	3	Gasket	1	
	4	Oil pump drive gear	1	
	5	Oil strainer	1	
	6	Circlip	1	
	7	Oil pump driven gear	1	
③	8	Spring washer	1	
	9	Circlip	1	
	10	Washer	1	



Extent of removal	Order	Part name	Q'ty	Remarks
③	11	Oil pump cover	1	
	12	Dowel pin	2	
	13	Oil pump drive shaft	1	
	14	Pin	1	
	15	Inner rotor	1	
	16	Outer rotor	1	
	17	Rotor housing	1	

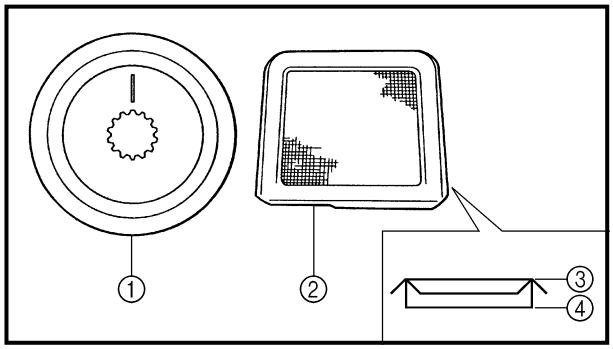


INSPECTION

Oil pump

1. Measure:
   - Tip clearance ⓐ
     (between the inner rotor ① and the outer rotor ②)
   - Side clearance ⓑ
     (between the outer rotor ② and the rotor housing ③)
     Out of specification → Replace the oil pump assembly.
   - Rotor housing and rotor clearance ⓒ
     (between the rotor housing ③ and the rotors ① ②)
     Out of specification → Replace the oil pump assembly.

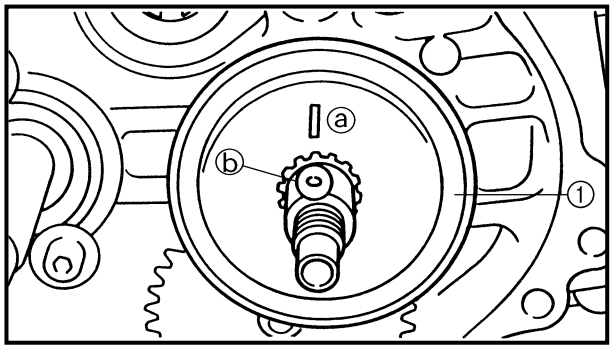
Tip clearance ⓐ:
0.15 mm (0.0059 in)
<Limit>: 0.2 mm (0.0079 in)
Side clearance ⓑ:
0.13 ~ 0.18 mm
(0.0051 ~ 0.0071 in)
<Limit>: 0.23 mm (0.0091 in)
Rotor housing and rotor clearance ⓒ:
0.06 ~ 0.10 mm
(0.0024 ~ 0.0039 in)
<Limit>: 0.15 mm (0.006 in)



Rotary filter and oil strainer

1. Inspect:
   - Rotary filter ①
   - Oil strainer ②
     Damage → Replace.

③ Upper side
④ Lower side



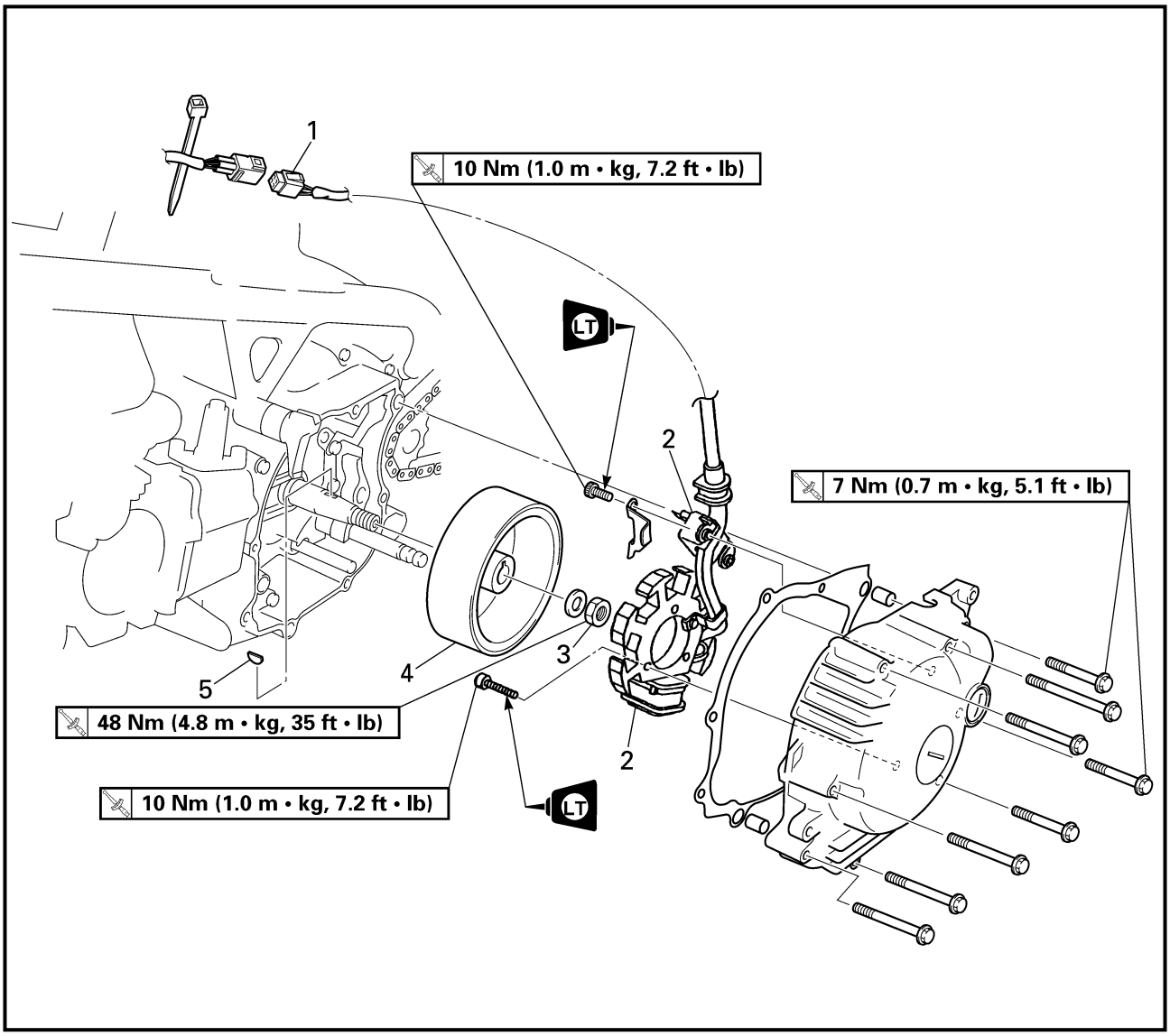
ASSEMBLY AND INSTALLATION

Rotary filter

1. Install:
   - Rotary filter ①

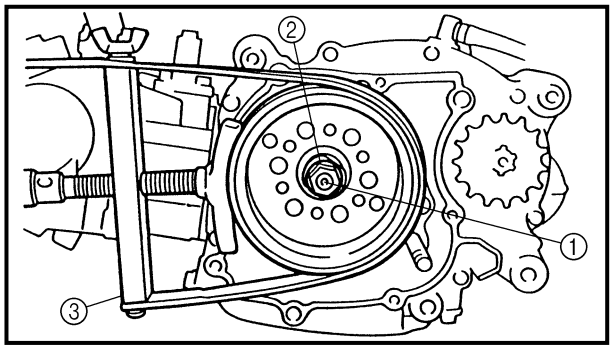
NOTE:
When installing the rotary filter, align the match mark ⓐ on the rotary filter with the hole ⓑ of the crankshaft.

CDI MAGNETO



Extent of removal: ① Pickup coil/stator assembly removal ② Rotor removal

Extent of removal	Order	Part name	Q'ty	Remarks
		CDI MAGNETO AND STATOR REMOVAL		
Preparation for removal		Fuel tank		
		Crankcase cover (left)		Refer to "CLUTCH" section.
①	1	CDI magneto coupler	1	
	2	Pickup coil/stator assembly	1	
②	3	Rotor nut	1	Use special tool. Refer to "REMOVAL POINTS".
	4	Rotor	1	
	5	Woodruff key	1	



REMOVAL POINTS

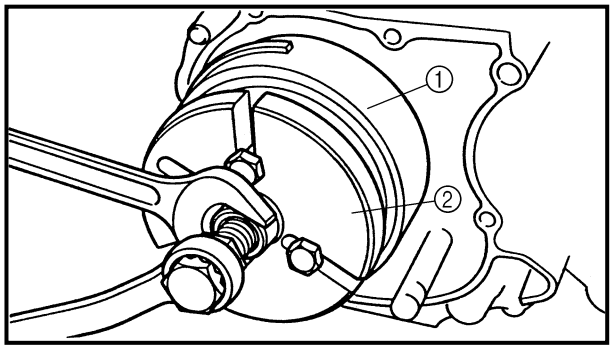
Rotor

1. Remove:
   - Rotor nut ①
   - Washer ②

NOTE:

- Loosen the rotor nut while holding the rotor with sheave holder ③.
- Do not allow the sheave holder to touch the projection on the rotor.

	Sheave holder: **YS-1880-A/90890-01701**



2. Remove:
   - Rotor ①
   - Woodruff key

NOTE:

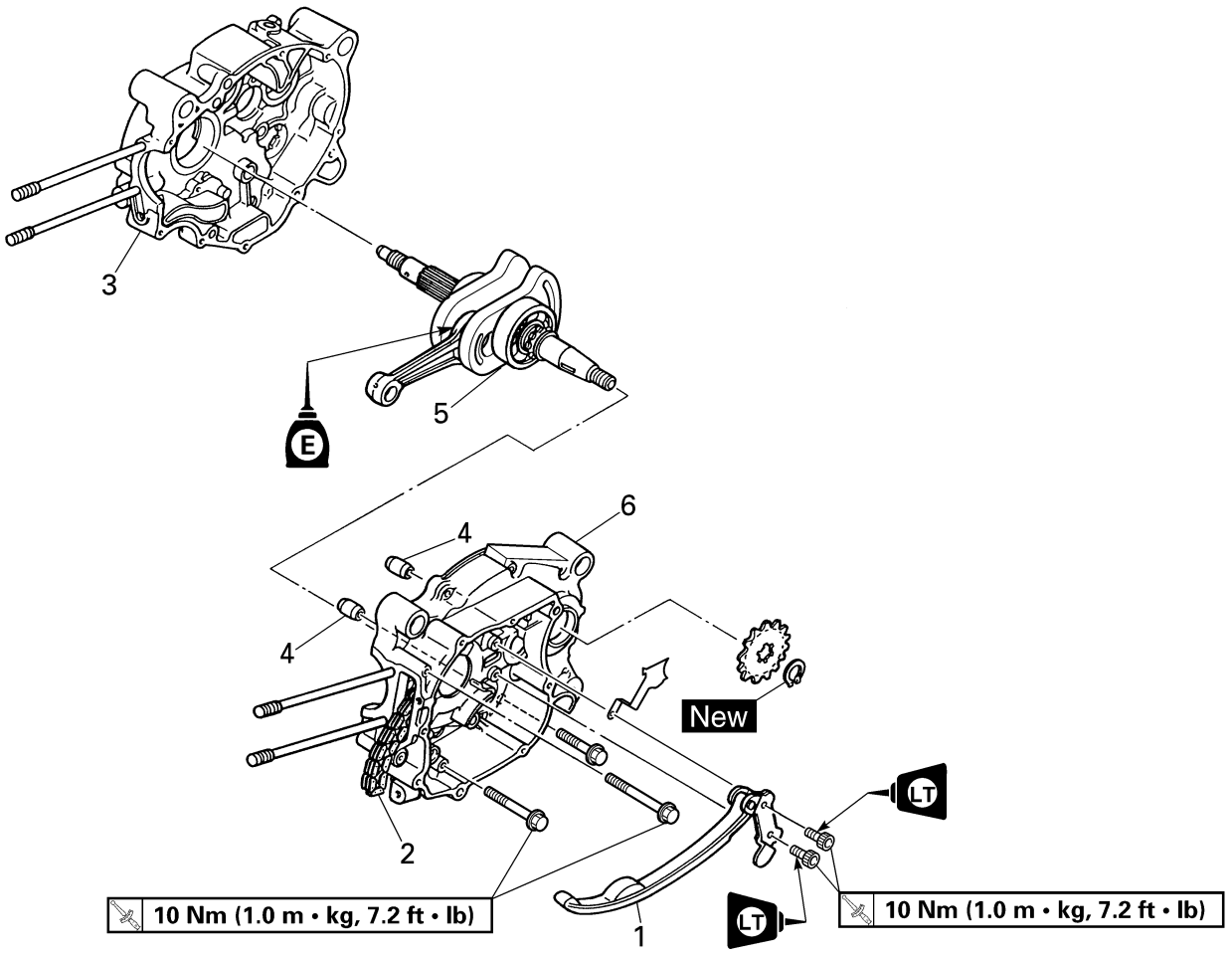
- Use the flywheel puller ②.
- Center the flywheel puller over the rotor. Make sure after installing the holding bolts that the clearance between the flywheel puller and the rotor is the same everywhere. If necessary, one holding bolt may be turned out slightly to adjust the flywheel puller's position.

CAUTION:

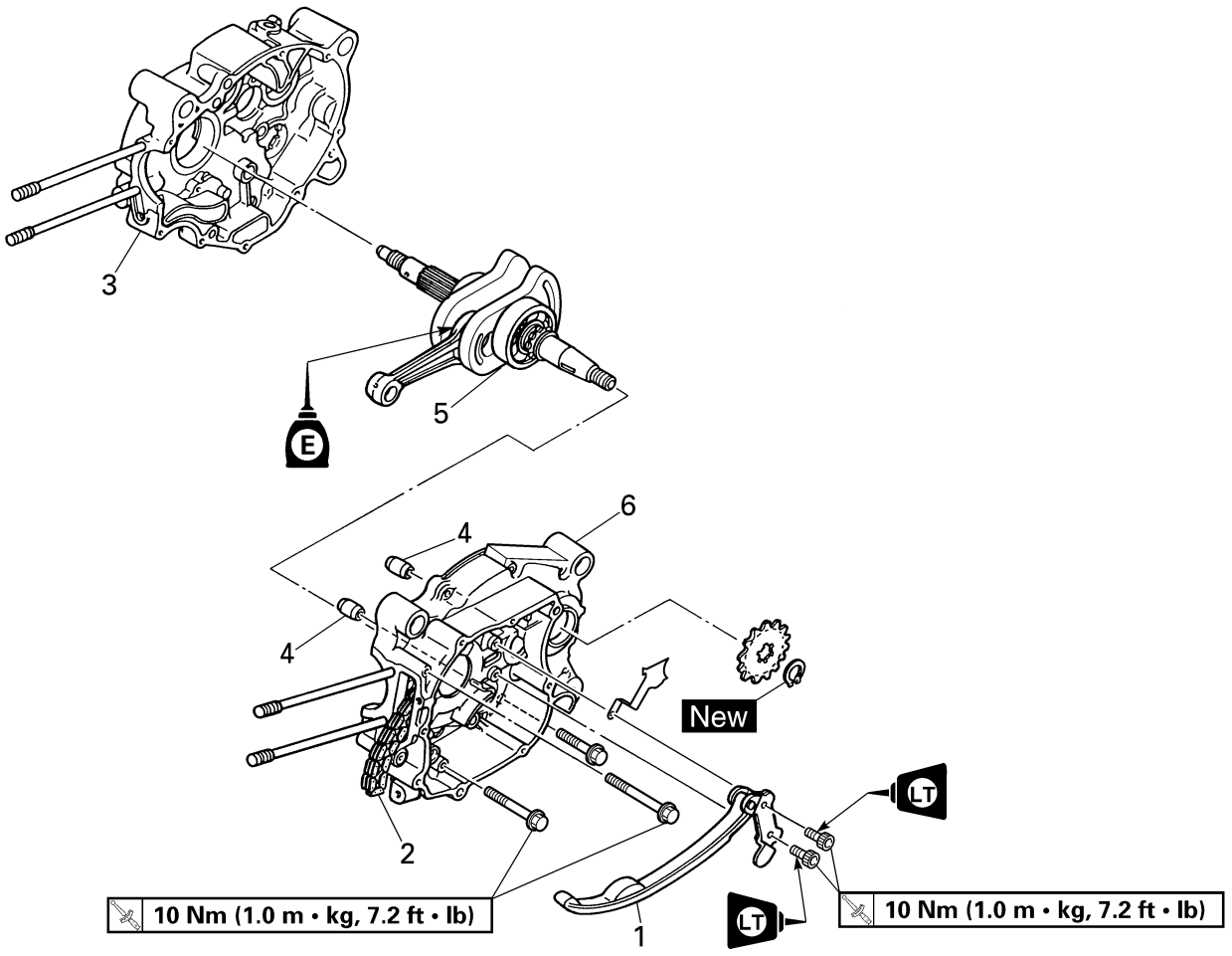
Cover the crankshaft end with the box wrench for protection.

	Flywheel puller: **YU-33270-B/90890-01362**

CRANKCASE AND CRANKSHAFT

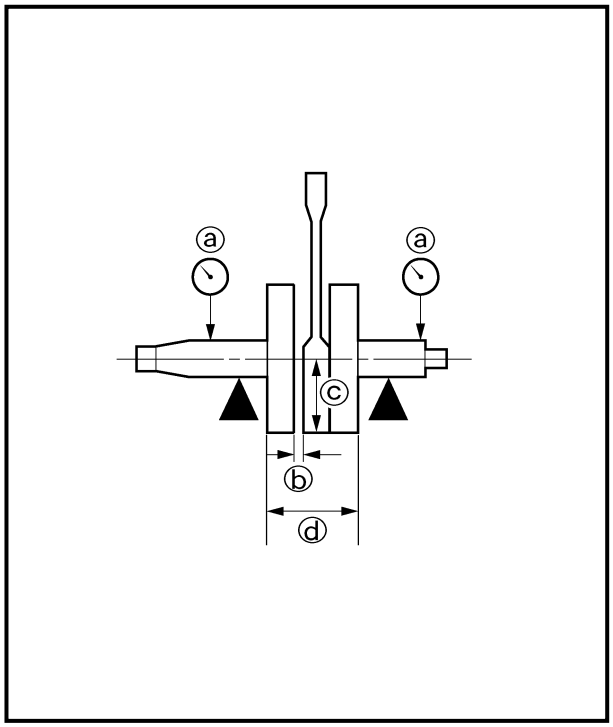


Extent of removal	Order	Part name	Q'ty	Remarks
		CRANKCASE SEPARATION AND CRANKSHAFT REMOVAL		
Preparation for removal		Seat, fuel tank and rear fender		
		Exhaust pipe		
		Air filter case		
		Carburetor		Refer to "CARBURETOR" section.
		Drain the engine oil		Refer to "ENGINE OIL REPLACEMENT" section in the CHAPTER 3.
		Engine guard and drive sprocket		
		Engine assembly		From the chassis.
		Cylinder head		Refer to "CYLINDER HEAD" section.
		Cylinder and piston		Refer to "CYLINDER AND PISTON" section.
		Clutch housing and clutch carrier		Refer to "CLUTCH" section.
		Kick axle assembly		Refer to "KICK AXLE" section.



Extent of removal: ① Timing chain removal ② Crankcase separation ③ Crankshaft removal

Extent of removal	Order	Part name	Q'ty	Remarks
		Shift shaft		Refer to "SHIFT SHAFT" section.
		Oil pump and oil strainer		Refer to "OIL PUMP" section.
		Rotor		Refer to "CDI MAGNETO" section.
① ② ③	1	Timing chain guide (intake)	1	
	2	Timing chain	1	
	3	Crankcase (right)	1	
	4	Dowel pin	2	
	5	Crankshaft	1	
	6	Crankcase (left)	1	



INSPECTION

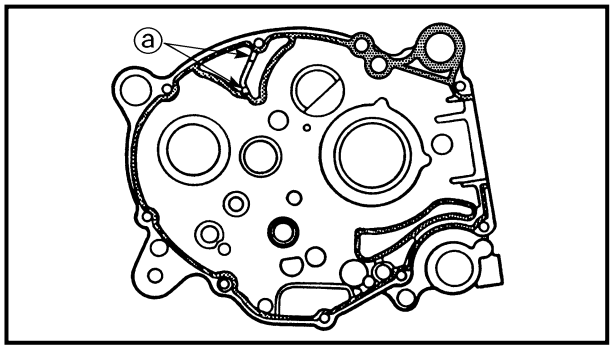
Crankshaft

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

   Out of specification → Replace.

   Use the dial gauge and a thickness gauge.

	Standard	Limit
Runout limit	—	0.03 mm (0.0012 in)
Side clearance	0.10 ~ 0.40 mm (0.0039 ~ 0.0157 in)	—
Radial clearance	0.010 ~ 0.025 mm (0.0004 ~ 0.0010 in)	0.05 mm (0.002 in)
Crack width	42.95 ~ 43.00 mm (1.691 ~ 1.693 in)	—



ASSEMBLY AND INSTALLATION

Crankcase

1. Apply:
   - Sealant

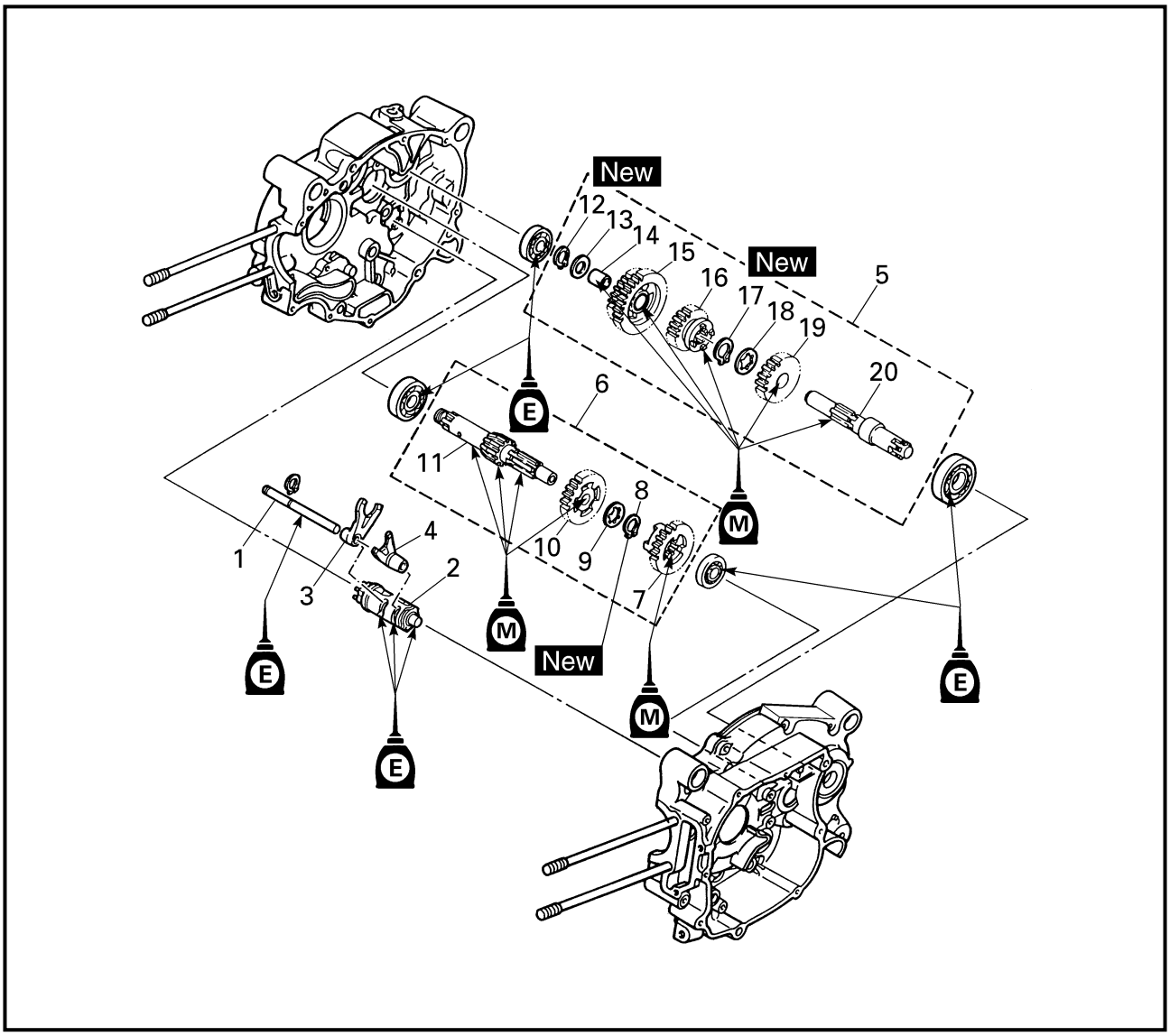
   On the crankcase (left).

Quick gasket®:
ACC-QUICK-GS-KT
YAMAHA Bond No. 1215:
90890-85505

NOTE:

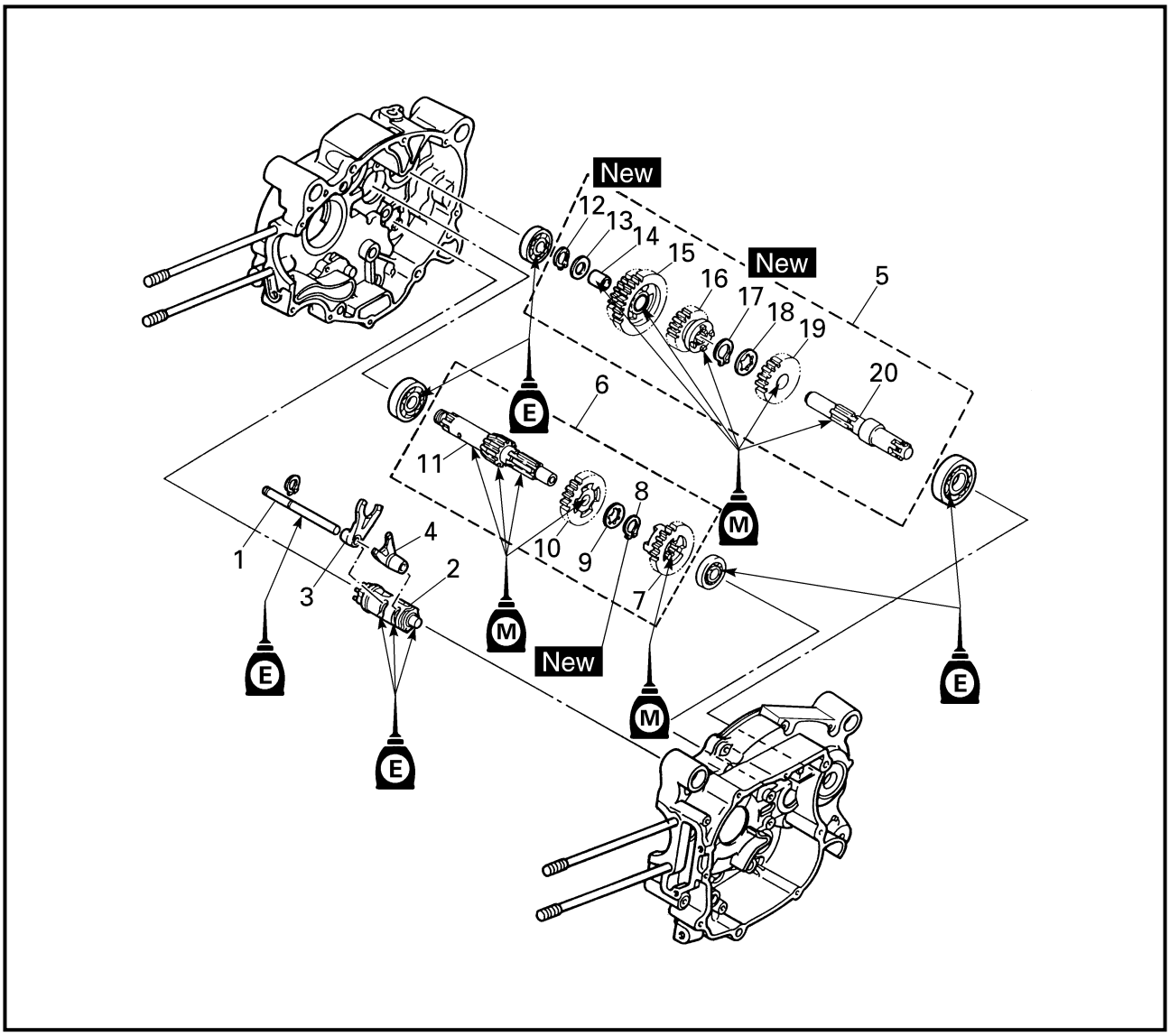
- Clean the contacting surface of crankcase (left and right) before applying the sealant.
- DO NOT ALLOW any sealant to come in contact with the oil gallery ⓐ.

SHIFT FORK, SHIFT CAM AND TRANSMISSION

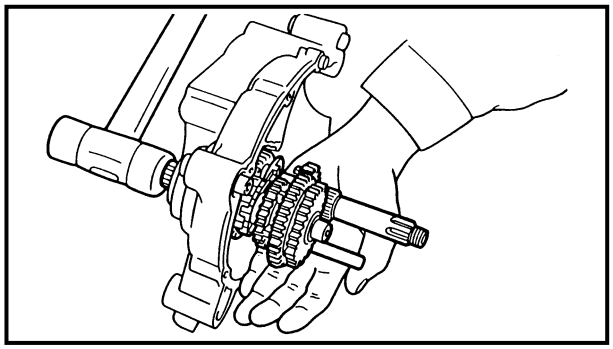


Extent of removal: ① Shift fork, shift cam, main axle and drive axle removal
② Main axle disassembly ③ Drive axle disassembly

Extent of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		**SHIFT FORK, SHIFT CAM TRANSMISSION REMOVAL** Engine assembly Separate the crankcase.		Refer to "CRANKCASE AND CRANKSHAFT" section.
①	1	Guide bar	1	Refer to "REMOVAL POINTS".
	2	Shift cam	1	
	3	Shift fork 2 "R"	1	
	4	Shift fork 1 "L"	1	
	5	Drive axle assembly	1	
	6	Main axle assembly	1	
②	7	2nd pinion gear	1	
	8	Circlip	1	
	9	Washer	1	

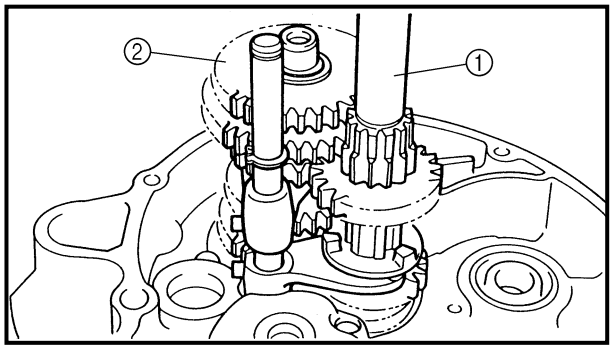


Extent of removal	Order	Part name	Q'ty	Remarks
②	10	3th pinion gear	1	
	11	Main axle	1	
	12	Circlip	1	
	13	Washer	1	
	14	Collar	1	
	15	1st wheel gear	1	
③	16	3rd wheel gear	1	
	17	Circlip	1	
	18	Washer	1	
	19	2nd wheel gear	1	
	20	Drive axle	1	

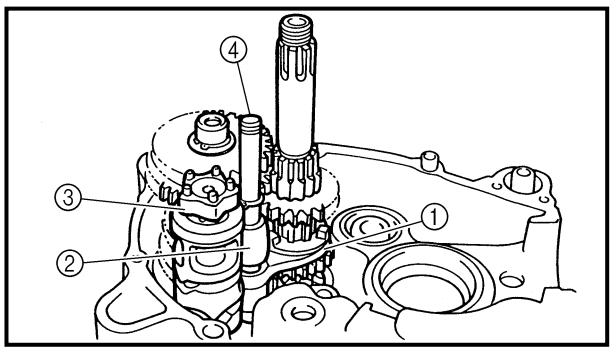


EC4H3000
REMOVAL POINTS
Shift fork, shift cam and transmission
1. Remove:
   - Shift forks
   - Shift cam
   - Drive axle assembly
   - Main axle assembly

NOTE:
- Tap lightly on the transmission drive axle and shift cam with a soft hammer to remove.
- Remove assembly carefully. Note the position of each part. Pay particular attention to the location and direction of shift forks.

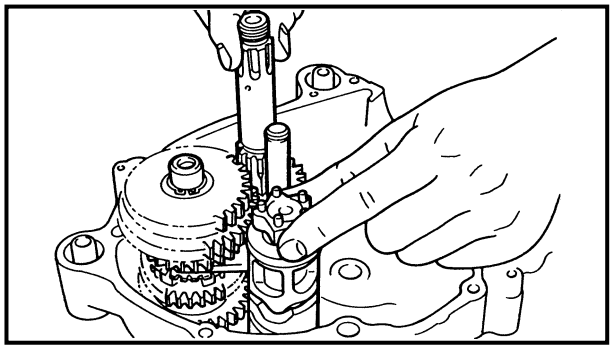


ASSEMBLY AND INSTALLATION
Transmission, shift cam shift fork
1. Install:
   - Main axle assembly ①
   - Drive axle assembly ②



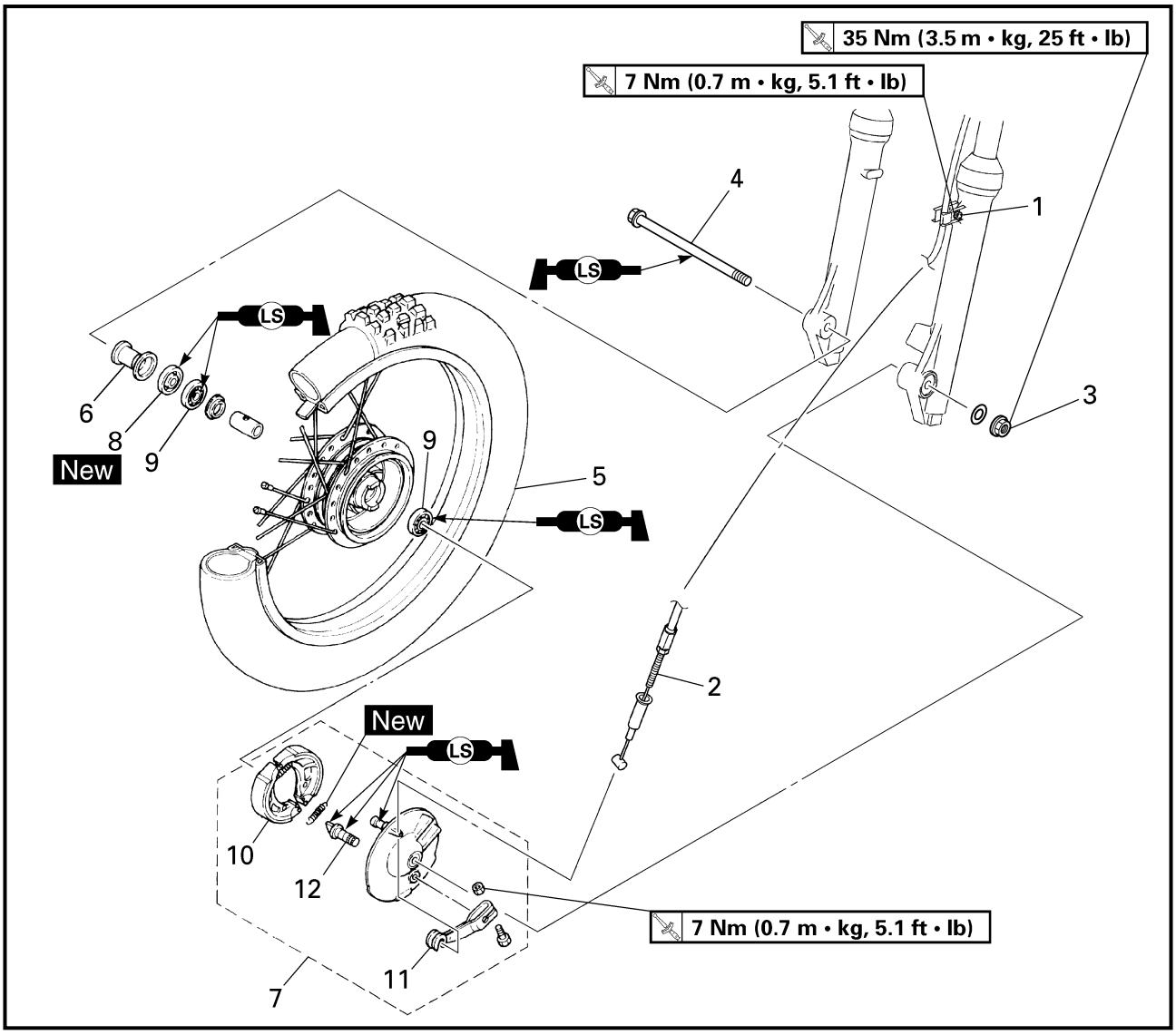
2. Install:
   - Shift fork 1 “L” ①
   - Shift fork 2 “R” ②
   - Shift cam ③
   - Guide bar ④

NOTE:
The embossed marks on the shift forks should face towards the right side of the engine and be in the following sequence: “R”, “L”.



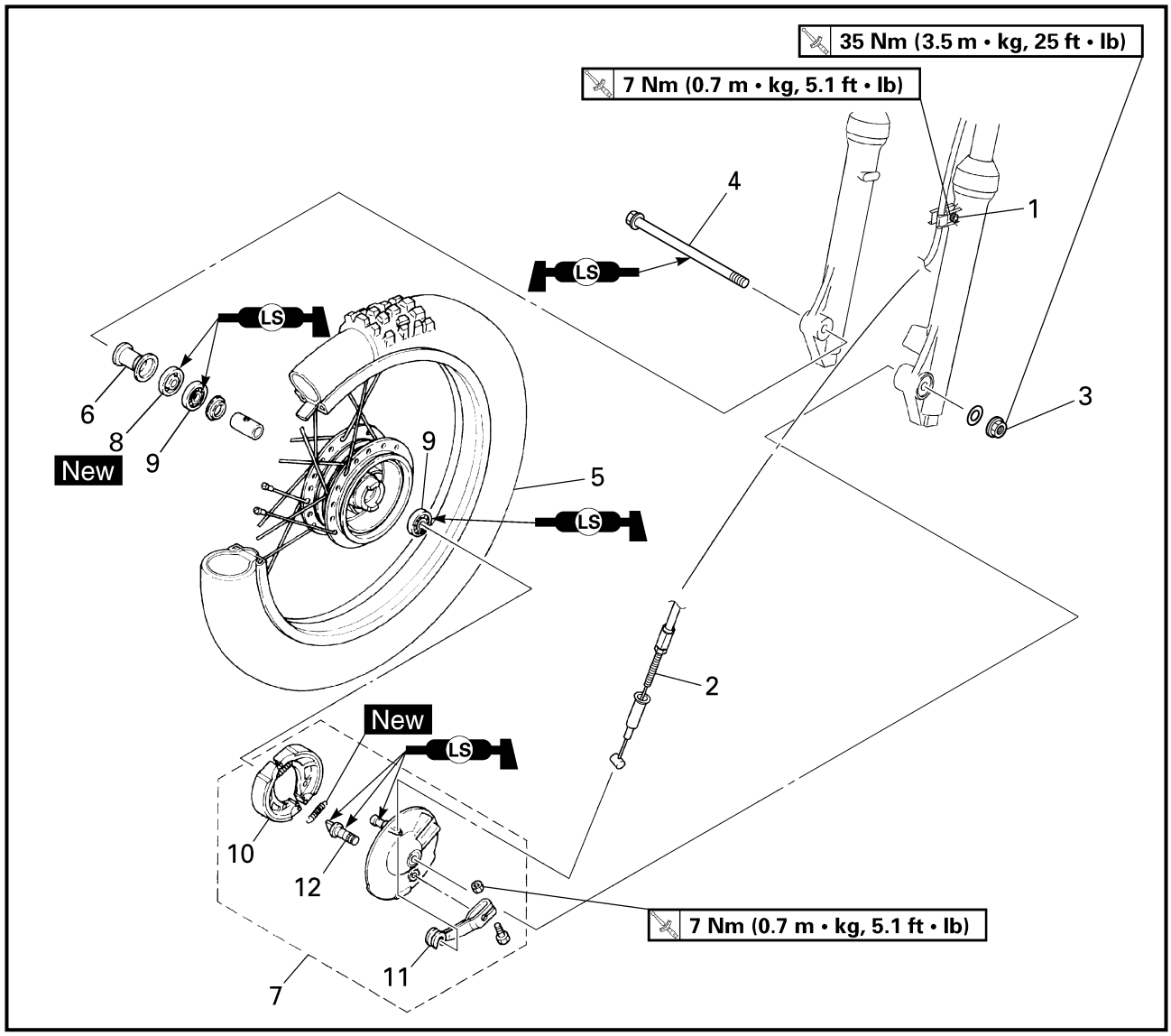
3. Check:
   - Shifter operation
   - Transmission operation
     Unsmooth operation → Repair.

EC500000
CHASSIS
FRONT WHEEL AND REAR WHEEL
FRONT WHEEL AND FRONT BRAKE



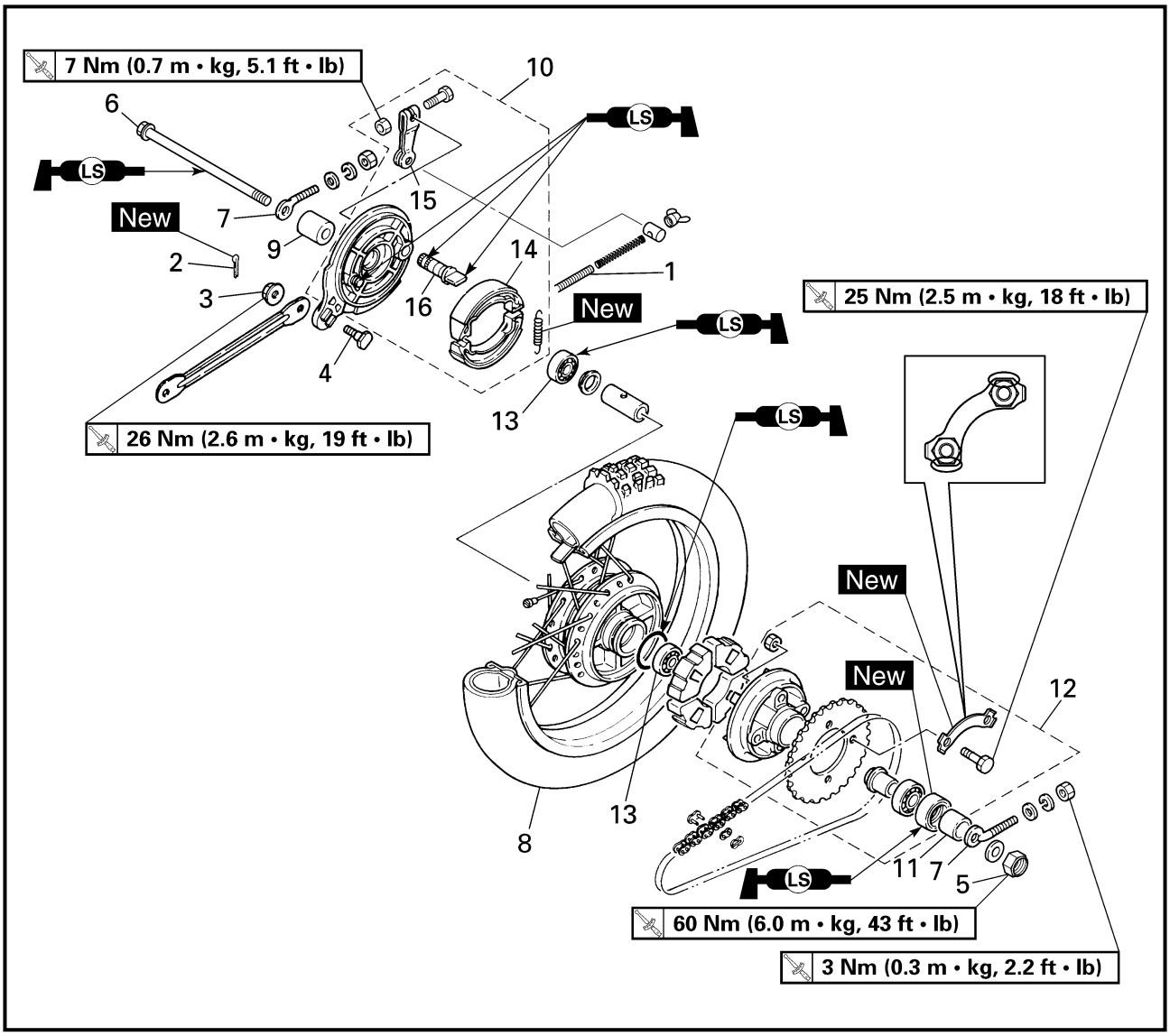
Extent of removal: ① Front wheel removal ② Wheel bearing removal ③ Brake shoe plate assembly removal and disassembly

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 ③ ② ③	1	Bolt (brake cable holder)	1	Only loosening.
	2	Brake cable	1	Disconnect at the lever side.
	3	Wheel axle nut	1	
	4	Front wheel axle	1	
	5	Front wheel	1	
	6	Collar set	1	
	7	Brake shoe plate assembly	1	
	8	Oil seal	1	
	9	Bearing	2	Refer to "REMOVAL POINTS".



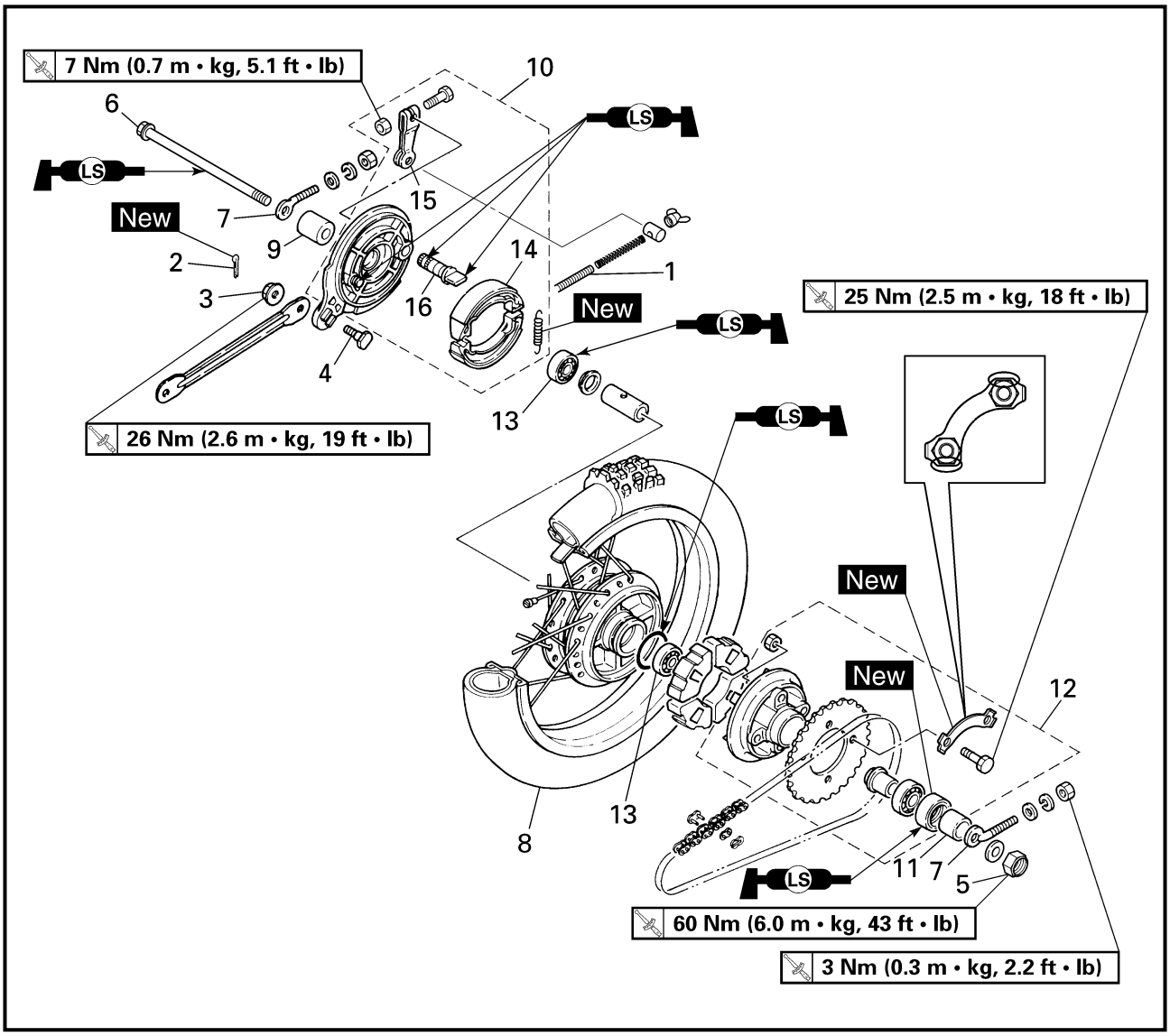
Extent of removal	Order	Part name	Q'ty	Remarks
↑ ③ ↓	10	Brake shoe	2	
	11	Brake camshaft lever	1	
	12	Brake camshaft	1	

REAR WHEEL AND REAR BRAKE

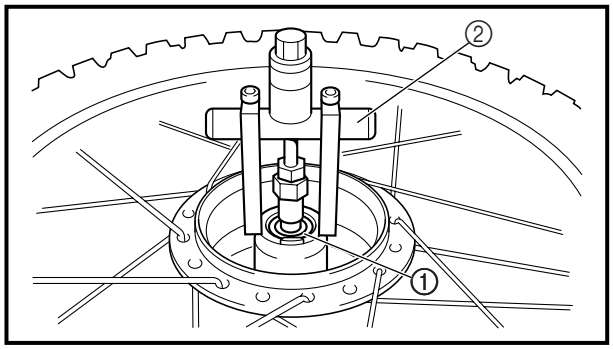


Extent of removal: ① Rear wheel removal ② Wheel bearing removal ③ Brake shoe plate assembly removal and disassembly

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	Brake rod	1	
	2	Cotter pin	1	
	3	Nut (tension bar)	1	
	4	Bolt (tension bar)	1	
	5	Wheel axle nut	1	
	6	Rear wheel axle	1	
	7	Drive chain puller	2	
	8	Rear wheel	1	
	9	Collar (right)	1	
	10	Brake shoe plate assembly	1	

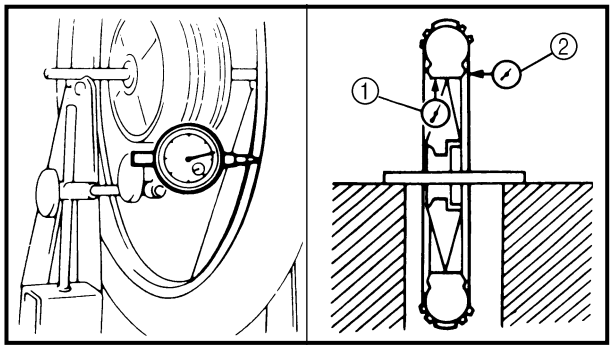


Extent of removal	Order	Part name	Q'ty	Remarks
②	11	Collar (left)	1	
	12	Wheel drive hub assembly	1	
	13	Bearing	2	Refer to "REMOVAL POINTS".
③	14	Brake shoe	2	
	15	Brake camshaft lever	1	
	16	Brake camshaft	1	



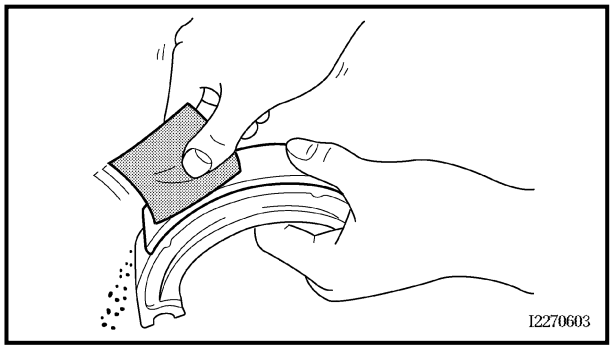
EC593000
REMOVAL POINTS
EC513201
Wheel bearing (if necessary)
1. Remove:
   - Bearing ①

NOTE:
Remove the bearing using a general bearing puller ②.



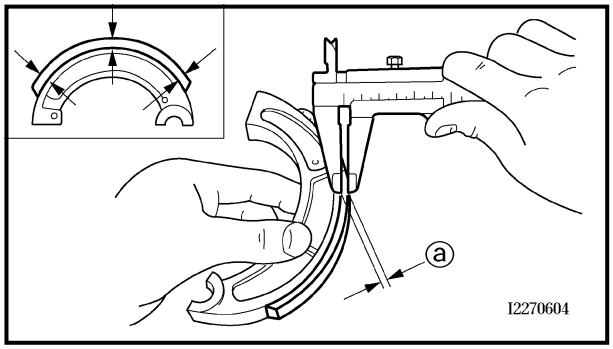
EC594000
INSPECTION
EC514100
Wheel
1. Measure:
   - Wheel runout
     Out of limit → Repair/replace.

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



Brake lining
1. Inspect:
   - Brake shoe lining surface
     Glazed areas → Polish.
     Use coarse sand paper.

NOTE:
After polishing, wipe the polished particles with a cloth.



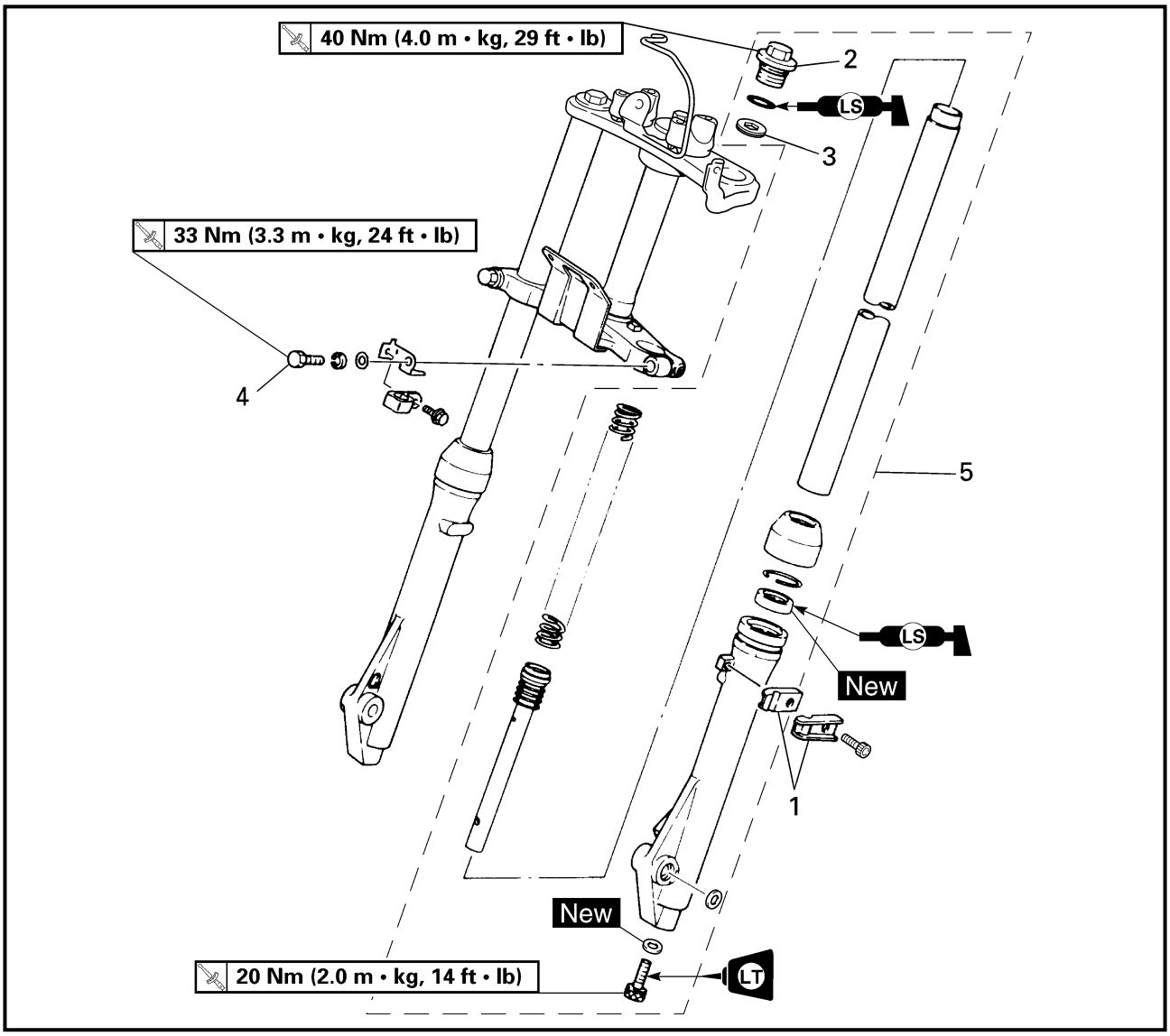
2. Measure:
   - Brake shoe lining thickness

Brake shoe lining thickness ⓐ:
Standard:
Front: 3.0 mm (0.12 in)
Rear: 4.0 mm (0.16 in)
Limit:
2.0 mm (0.08 in)

Out of specification → Replace.

NOTE:
Replace the brake shoes and springs as a set if either is worn to the limit.

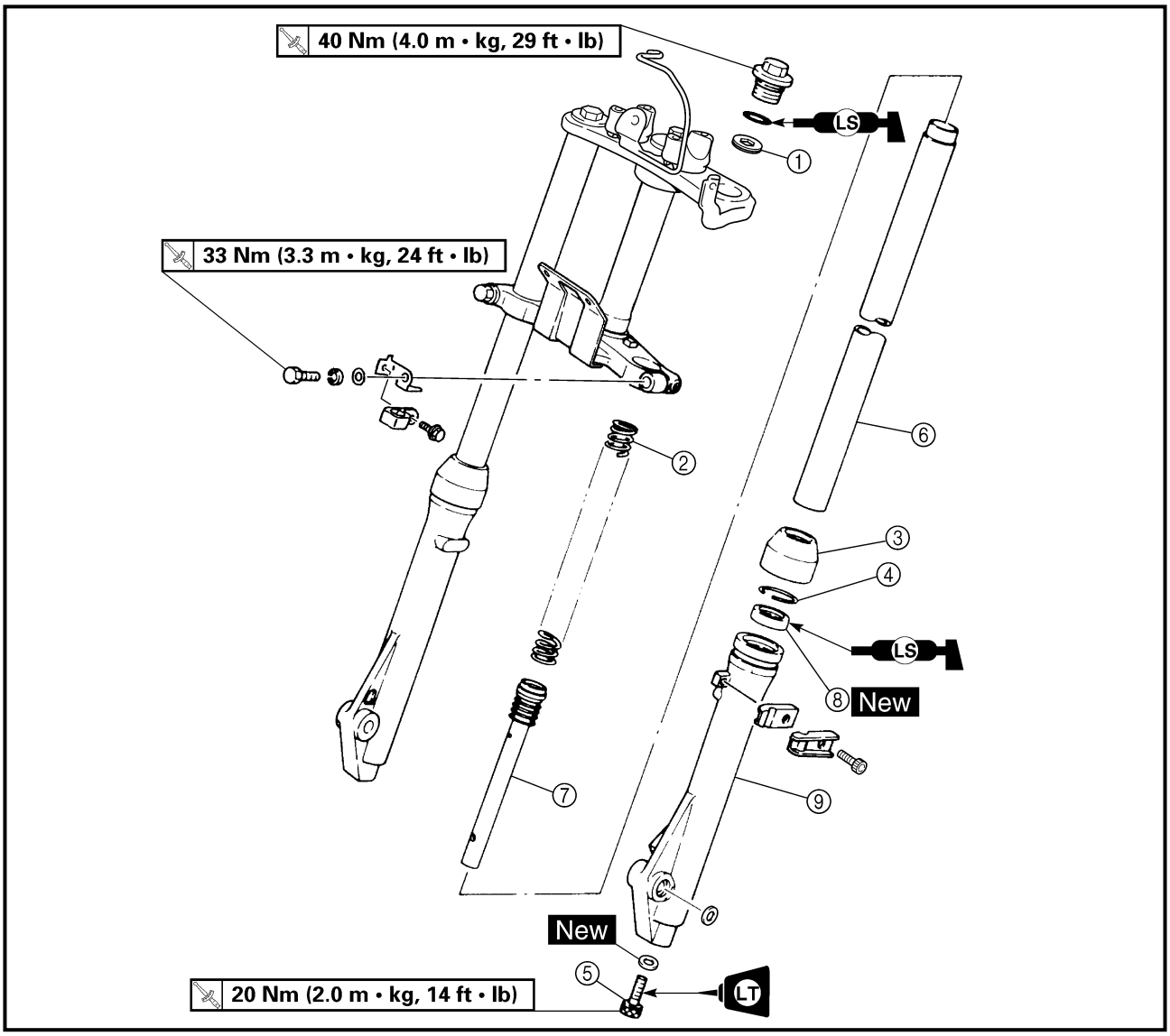
EC550000
FRONT FORK



Extent of removal: ① Front fork removal

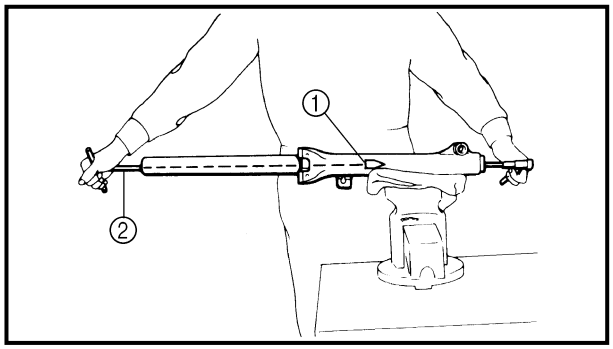
Extent of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		**FRONT FORK REMOVAL** Hold the machine by placing the suitable stand under the engine. Front wheel Handlebar Front fender		**⚠ WARNING** **Support the machine securely so there is no danger of it falling over.** Refer to "FRONT WHEEL AND REAR WHEEL" section. Refer to "HANDLEBAR" section.
①	1	Brake cable holder	1	
	2	Cap bolt	1	
	3	Adjuster	1	Only loosening.
	4	Pinch bolt (under bracket)	1	Only loosening.
	5	Front fork	1	

EC558000
FRONT FORK DISASSEMBLY



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

Extent of removal	Order	Part name	Q'ty	Remarks
Preparation for disassembly		**FRONT FORK DISASSEMBLY** Drain the fork oil.		
① ②	①	Adjuster	1	
	②	Fork spring	1	
	③	Dust cover	1	
	④	Stopper ring	1	
	⑤	Bolt (damper rod)	1	Use special tool. Refer to "REMOVAL POINTS".
	⑥	Inner tube	1	
	⑦	Damper rod	1	
	⑧	Oil seal	1	
	⑨	Outer tube	1	



REMOVAL POINTS

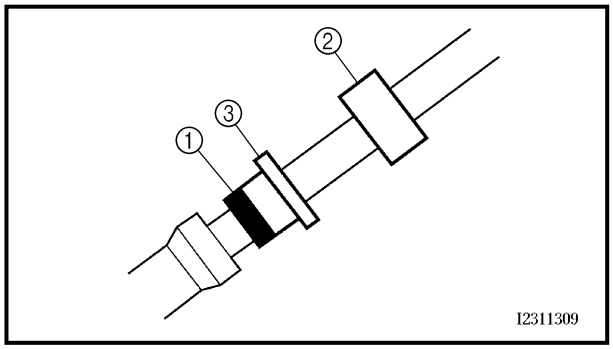
Inner tube

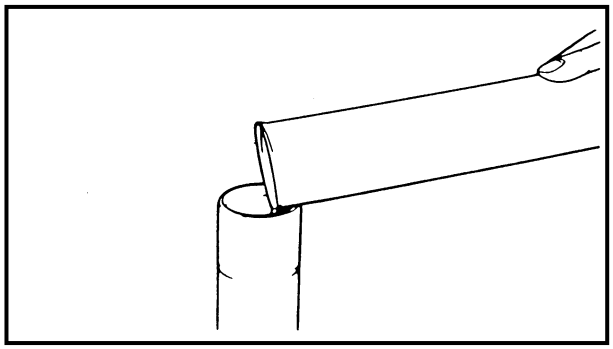
1. Remove:
   - Bolt (damper rod)

NOTE:

While holding the damper rod with the damper rod holder ① and T-handle ②, loosen the bolt (damper rod).

Damper rod holder:
YM-1300/90890-01294
T-handle:
YM-1326/90890-01326





EC555000

ASSEMBLY AND INSTALLATION

Front fork assembly

1. Install:
   - Oil seal ①

NOTE:

Press the oil seal into the outer tube with fork seal driver weight ② and fork seal driver attachment ③.

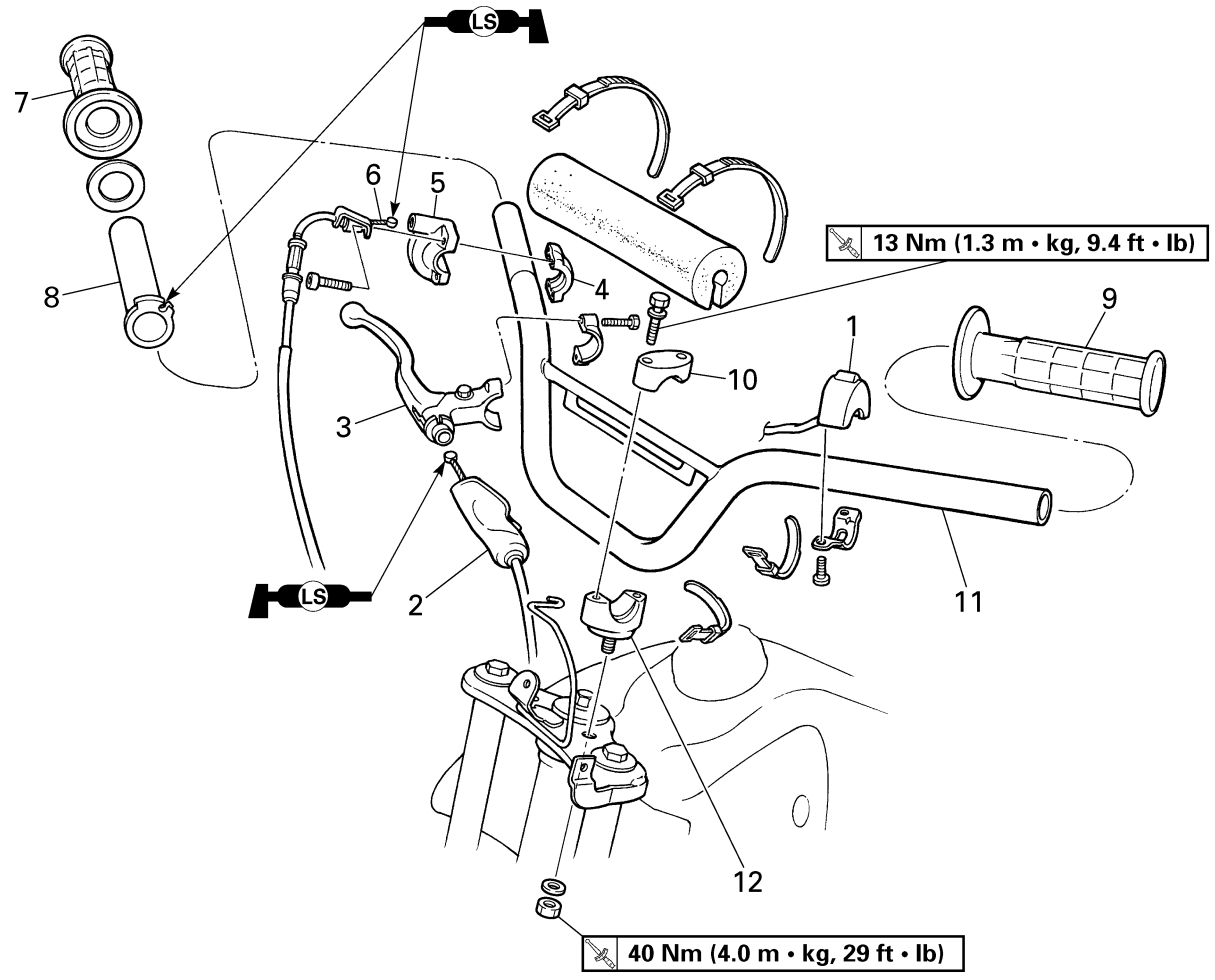
Fork seal driver weight:
YM-33963/90890-01184
Fork seal driver attachment:
90890-01186

2. Fill:
   - Fork oil

Oil quantity:
64 cm³ (2.26 Imp oz, 2.16 US oz)
Recommended oil:
Fork oil 15W or equivalent

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

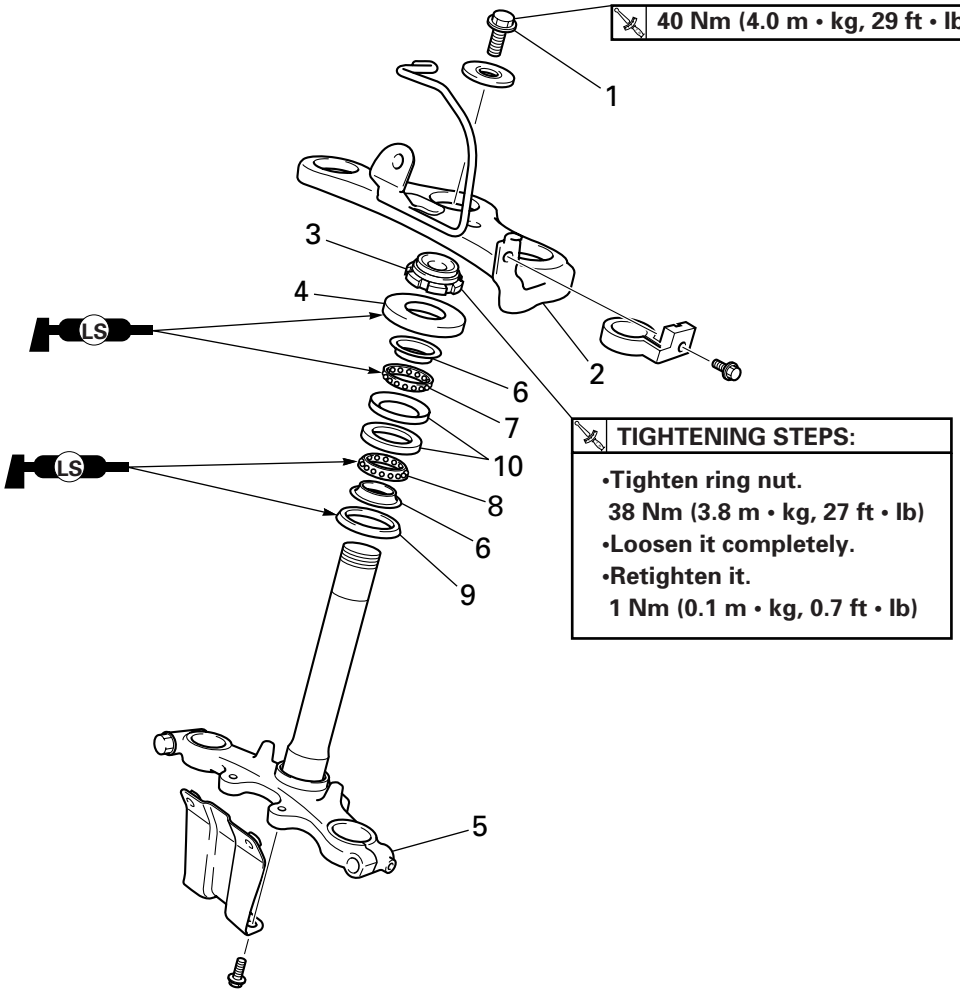
EC5B0000
HANDLEBAR



Extent of removal: ① Handlebar removal

Extent of removal	Order	Part name	Q'ty	Remarks
		HANDLEBAR REMOVAL		
①	1	"ENGINE STOP" switch	1	
	2	Brake lever cable	1	Disconnect at the lever side.
	3	Brake lever	1	
	4	Grip cap (lower)	1	
	5	Grip cap (upper)	1	
	6	Throttle cable	1	Disconnect at the throttle side.
	7	Grip (right)	1	
	8	Tube guide	1	
	9	Grip (left)	1	
	10	Handlebar holder (upper)	2	
	11	Handlebar	1	
	12	Handlebar holder (lower)	2	

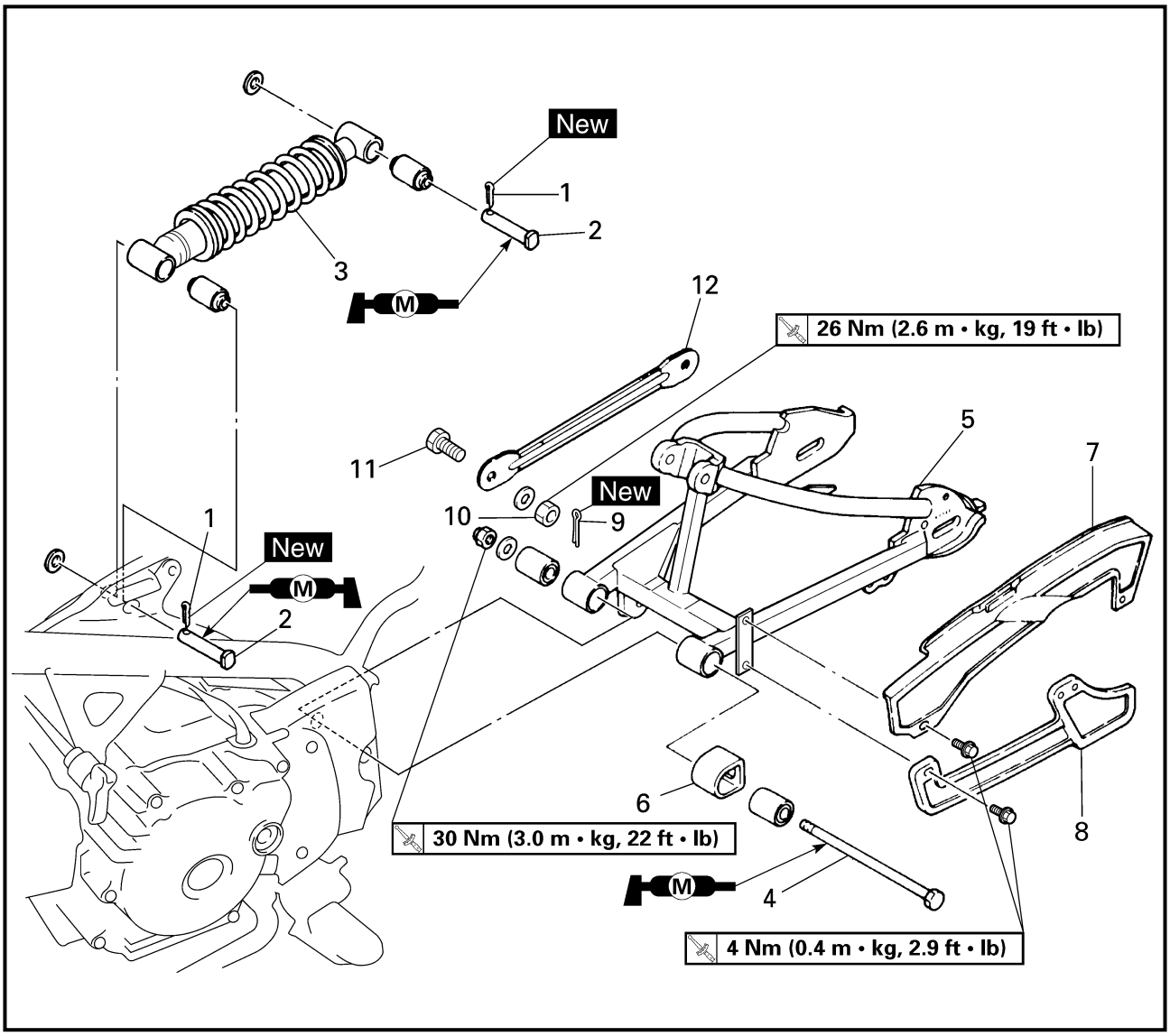
EC560000
STEERING



Extent of removal: ① Under bracket removal ② Bearing removal

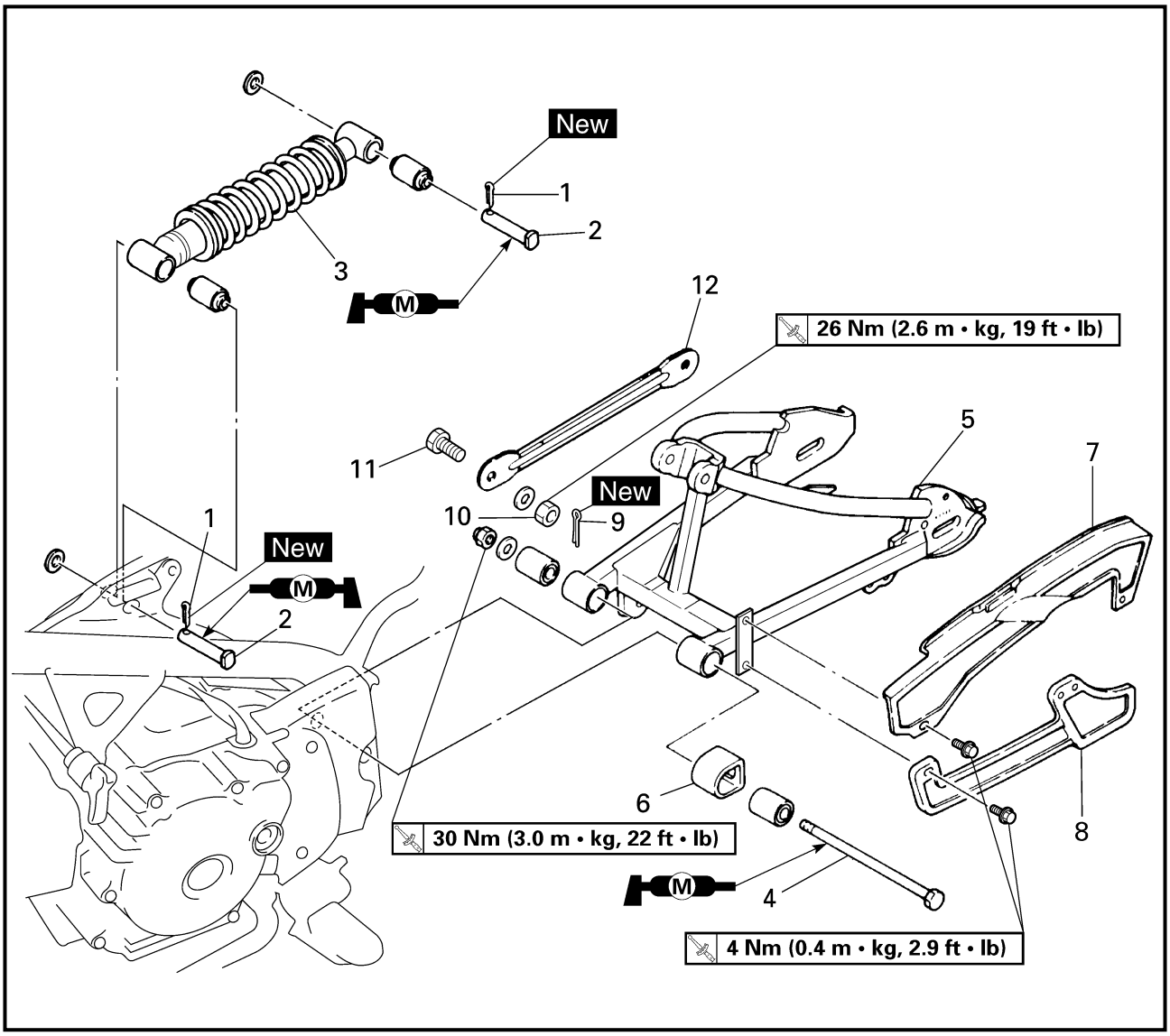
Extent of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		**STEERING REMOVAL** Hold the machine by placing the suitable stand under the engine.		**⚠ WARNING** **Support the machine securely so there is no danger of it falling over.**
		Front fork		Refer to "FRONT FORK" section.
① ②	1	Steering stem bolt	1	
	2	Handle crown	1	
	3	Ring nut	1	Use special tool. Refer to "STEERING HEAD INSPECTION AND ADJUSTMENT" section in the CHAPTER 3.
	4	Ball race cover	1	
	5	Under bracket	1	
	6	Bearing inner race	2	
	7	Upper bearing ball	19	
	8	Lower bearing ball	16	
	9	Dust seal	1	
	10	Bearing outer race	2	

EC570000
SWINGARM



Extent of removal: ① Swingarm removal ② Rear shock absorber 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. Rear wheel Rear fender Drive chain		**⚠ WARNING** **Support the machine securely so there is no danger of it falling over.** Refer to "FRONT WHEEL AND REAR WHEEL" section.
② ①	1 2 3 4 5 6 7 8	Cotter pin Pin Rear shock absorber Pivot shaft Swing arm Drive chain guide Drive chain guard Drive chain support	2 2 1 1 1 1 1 1	Hold the swingarm.



Extent of removal	Order	Part name	Q'ty	Remarks
①	9	Cotter pin	1	
	10	Nut (tension bar)	1	
	11	Bolt (tension bar)	1	
	12	Tension bar	1	

EC600000
ELECTRICAL

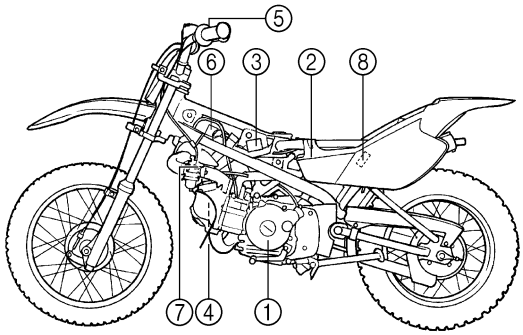
EC610000
ELECTRICAL COMPONENTS AND WIRING DIAGRAM

EC611000
ELECTRICAL COMPONENTS

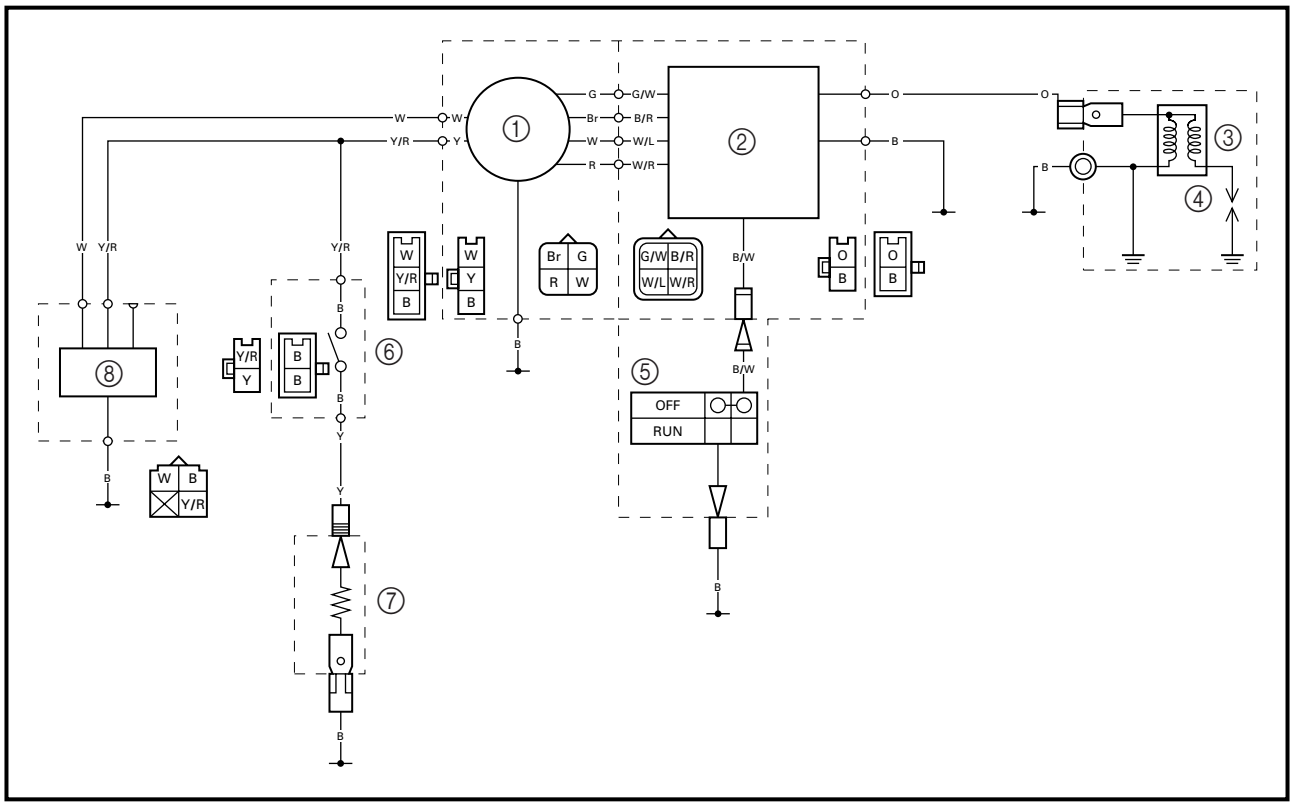
① CDI magneto
② CDI unit
③ Ignition coil
④ Spark plug
⑤ “ENGINE STOP” switch
⑥ Thermo switch
⑦ Carburetor heater
⑧ Rectifier/regulator

COLOR CODE

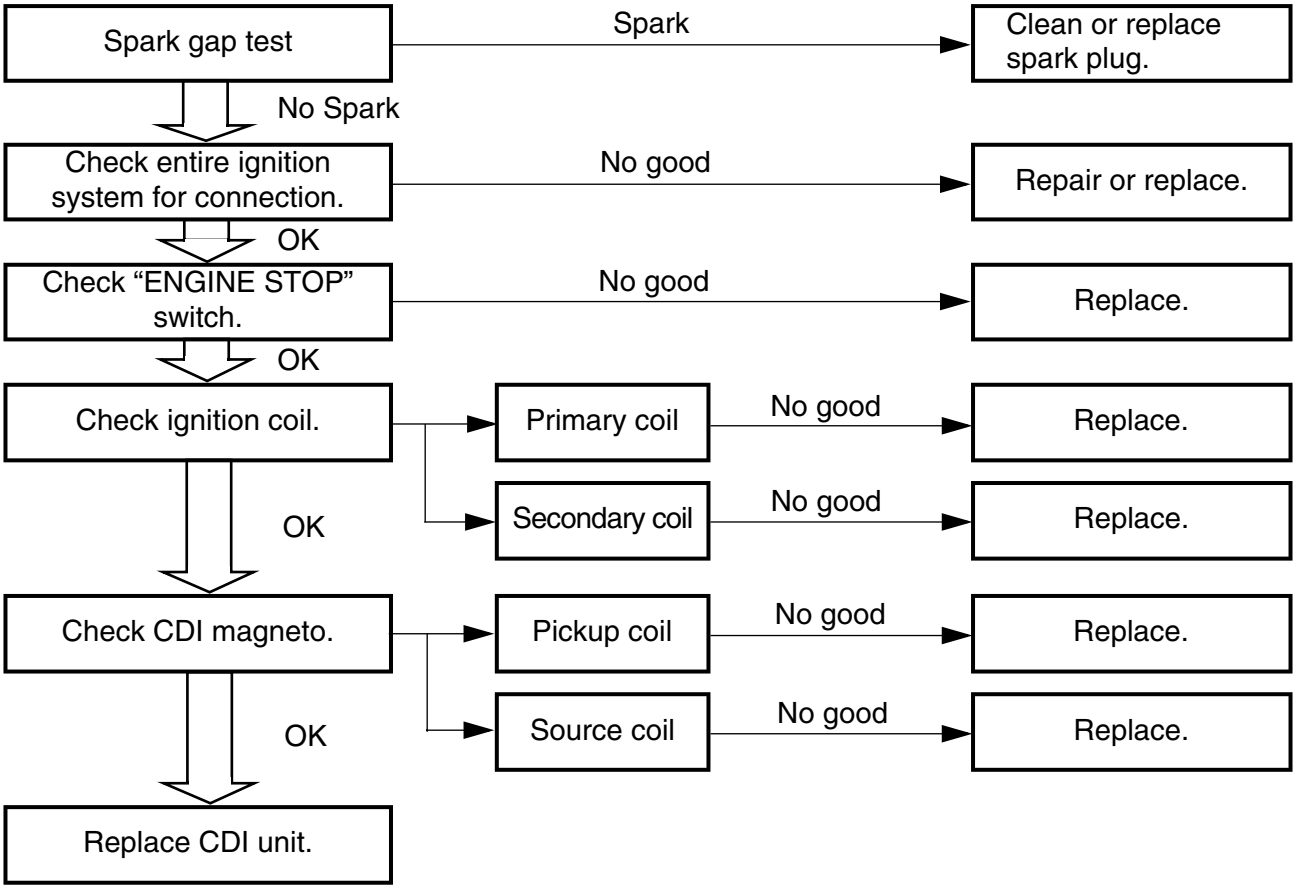
B	Black
Br	Brown
G	Green
O	Orange
R	Red
W	White
B/R	Black/Red
B/W	Black/White
G/W	Green/White
W/L	White/Blue
W/R	White/Red



EC612000
WIRING DIAGRAM

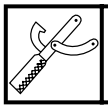


EC620000
IGNITION SYSTEM
INSPECTION STEPS
Use the following steps for checking the possibility of the malfunctioning engine being attributable to ignition system failure and for checking the spark plug which will not spark.

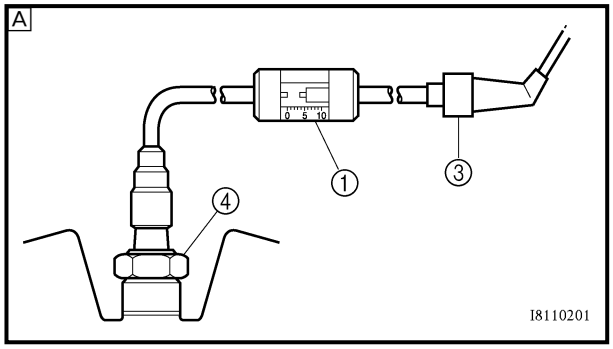


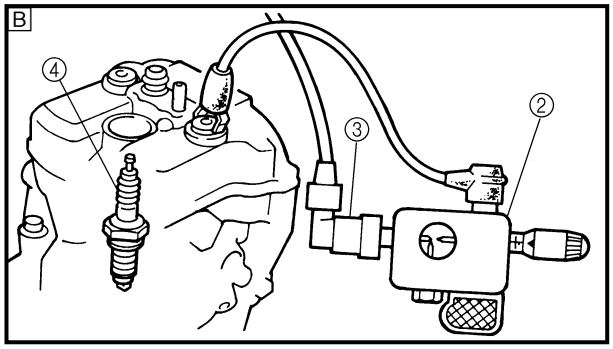
NOTE:
- Remove the following parts before inspection.
  1) Seat
  2) Fuel tank
- Use the following special tools in this inspection.

Dynamic spark tester:
YM-34487
Ignition checker:
90890-06754



Pocket tester:
YU-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

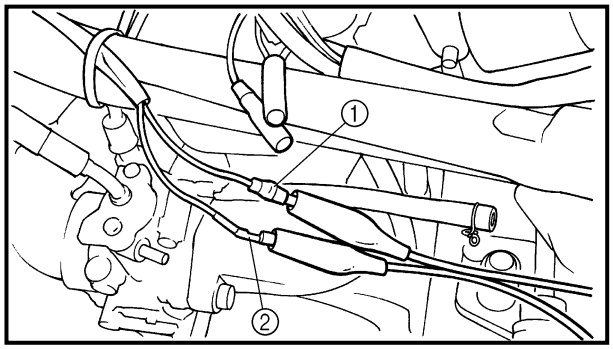
A For USA and CDN
B Except for USA and CDN

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.



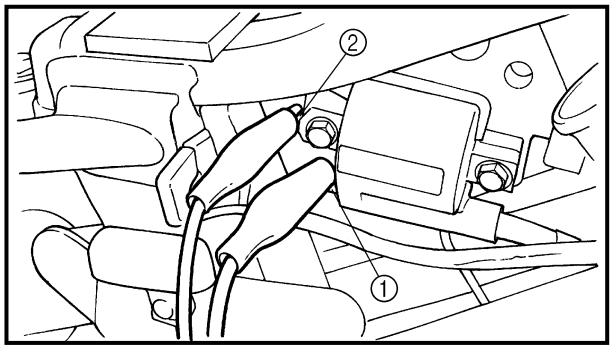
"ENGINE STOP" SWITCH INSPECTION

1. Inspect:
   - "ENGINE STOP" switch continuity

Tester (+) lead → Black/White lead ①
Tester (–) lead → Black lead ②

		B/W ①	B ②	Tester selector position
	⊗	○—○		Ω×1
	↻			

No continuous while being pushed "⊗" → Replace.
Continuous while being pushed "↻" → Replace.

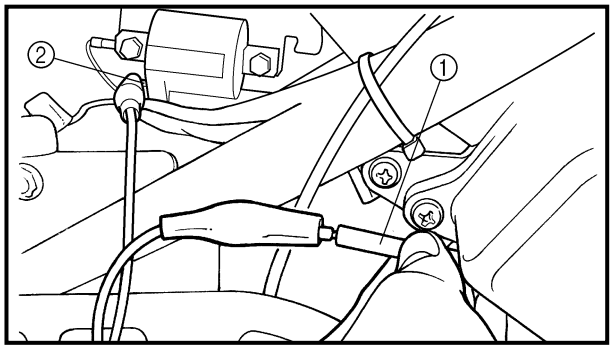


EC626002
IGNITION COIL INSPECTION

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
	0.18 ~ 0.28 Ω at 20 ˚C (68 ˚F)	**Ω × 1**



2. Inspect:
   - Secondary coil resistance
     Out of specification → Replace.

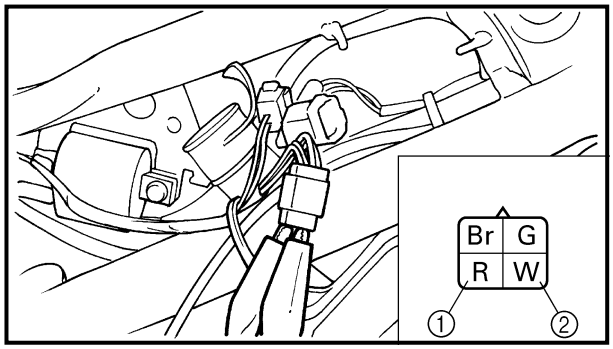
Tester (+) lead → Spark plug lead ①
Tester (–) lead → Orange lead ②

	Secondary coil resistance	Tester selector position
	6.3 ~ 9.5 kΩ at 20 ˚C (68 ˚F)	**kΩ × 1**

NOTE:
When inspecting the secondary coil resistance, remove the spark plug cap.

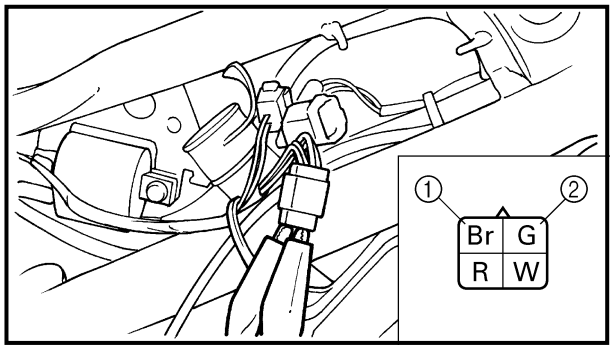
CDI MAGNETO INSPECTION

1. Inspect:
   - Pickup coil resistance
     Out of specification → Replace.



Tester (+) lead → Red lead ①
Tester (–) lead → White lead ②

	Pickup coil resistance	Tester selector position
	248 ~ 372 Ω at 20 ˚C (68 ˚F)	**Ω × 100**



2. Inspect:
   - Source coil resistance
     Out of specification → Replace.

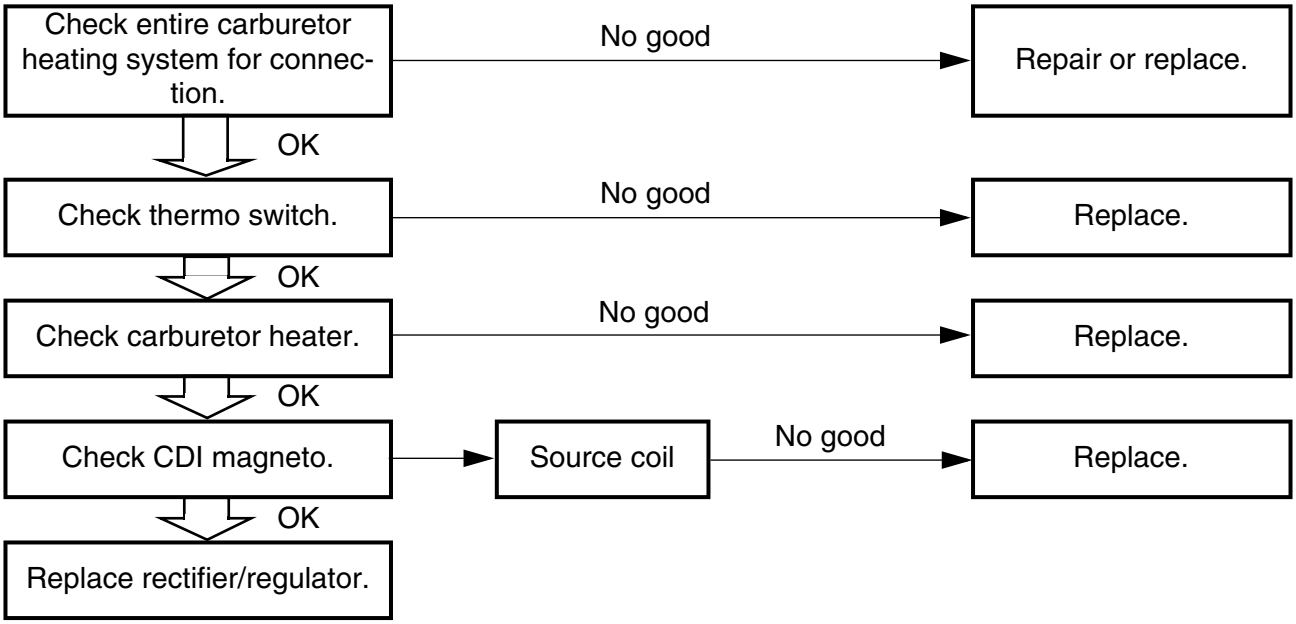
Tester (+) lead → Brown lead ①
Tester (–) lead → Green lead ②

	Source coil resistance	Tester selector position
	688 ~ 1,032 Ω at 20 ˚C (68 ˚F)	**Ω × 100**

CARBURETOR HEATING SYSTEM

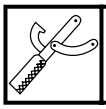
INSPECTION STEPS

Use the following steps for checking the possibility of the malfunctioning carburetor heating system.



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

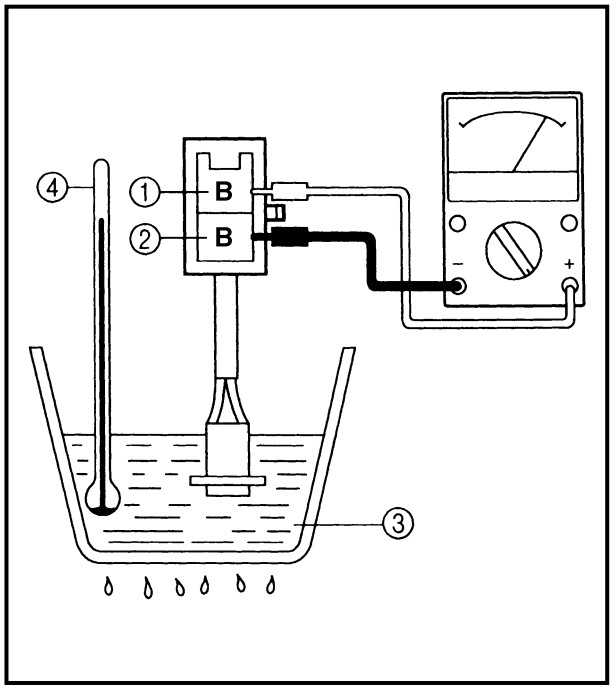
EC624000

COUPLERS AND LEADS CONNECTION INSPECTION

1. Check:
   - Couplers and leads connection
     Rust/dust/looseness/short-circuit → Repair or replace.

CDI MAGNETO INSPECTION

1. Inspect:
   - Source coil resistance
     Refer to “IGNITION SYSTEM” section.



THERMO SWITCH INSPECTION

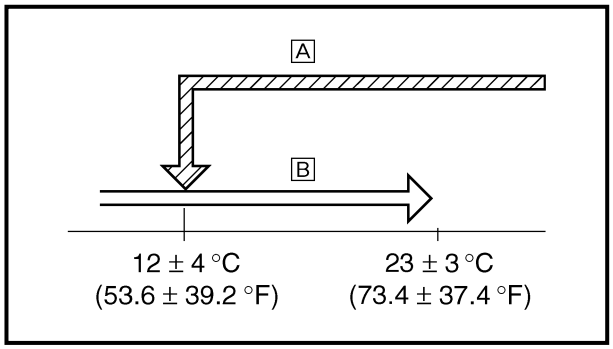
1. Inspect:
   - Thermo switch operation
     Faulty operation → Replace.

Inspection steps:

- Remove the thermo switch.
- Connect the pocket tester to the thermo switch coupler as shown.

Tester (+) lead → Black ①
Tester (–) lead → Black ②

- Immerse the thermo switch in a container filled with water ③.
- Place a thermometer ④ in the water.
- Slowly heat the water, and then let it cool to the specified temperature as indicated in the table.
- Check the thermo switch for continuity at the temperatures indicated in the table.



A The thermo switch circuit is open.
B The thermo switch circuit is closed.

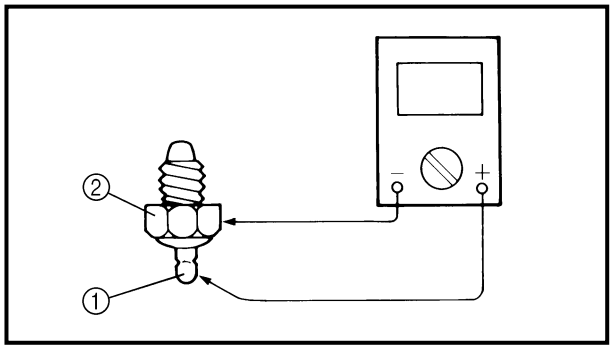
Test step	Water temperature	Continuity
1	Less than 23 ± 3 ˚C (73.4 ± 5.4 ˚F)	YES
2	More than 23 ± 3 ˚C (73.4 ± 5.4 ˚F)	NO
3	More than 12 ± 4 ˚C (53.6 ± 7.2 ˚F)	NO
4	Less than 12 ± 4 ˚C (53.6 ± 7.2 ˚F)	YES

Test steps 1 & 2: Heating phase
Test steps 3 & 4: Cooling phase

⚠ WARNING

- **Handle the thermo switch with special care.**
- **Never subject the thermo switch to strong shocks. If the thermo switch is dropped, replace it.**

- Check the thermo switch operation.



CARBURETOR HEATER INSPECTION

1. Inspect:
   - Carburetor heater resistance
     Out of specification → Replace.

Tester (+) probe →
Carburetor heater terminal ①
Tester (–) probe →
Carburetor heater body ②

	Carburetor heater resistance	Tester selector position
	6 ~ 10 Ω at 20 ˚C (68 ˚F)	Ω × 1

NOISE REGULATION

TAMPERING WITH NOISE CONTROL SYSTEM PROHIBITED:

Federal law prohibits the following acts or the causing thereof: (1)
The removal or rendering inoperative by any person other than for purposes of maintenance, repair, or replacement of any device or element of design incorporated into any new vehicle for the purpose of noise control prior to its sale or delivery to the ultimate purchaser or while it is in use or (2) the use of the vehicle after such device or element of design has been removed or rendered inoperative by any person.

"AMONG THOSE ACTS PRESUMED TO CONSTITUTE TAMPERING ARE THE ACTS LISTED BELOW."

These acts include tampering with the following systems; i.e., modification, removal, etc.

Exhaust system	Muffler Exhaust pipe Silencer
Intake system	Air cleaner case Air cleaner element Intake duct

MAINTENANCE RECORD

Copies of work orders and/or receipts for parts you purchase and install will be required to document maintenance done in accordance with the emission warranty. The chart below is printed only as a reminder to you that the maintenance work is required. It is not acceptable proof of maintenance work.

MAINTE-NANCE INTERVAL	DATE OF SERVICE	MILEAGE	SERVICING DEALER NAME AND ADDRESS	REMARKS
1 Month				
4 Months				
7 Months				
13 Months				
19 Months				
25 Months				
31 Months				
37 Months				
43 Months				
49 Months				
55 Months				
61 Months				

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