



YAMAHA

OWNER'S SERVICE MANUAL

TZ250N1/(N)

LIT-11626-14-44

5KE-28199-11

EC010000

**TZ250N1/(N)
OWNER'S SERVICE MANUAL
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INTRODUCTION

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

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

NOTE:

As improvements are made on this model, some data in this manual may become outdated.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

⚠WARNING

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

WARRANTY INFORMATION

This model is sold AS IS, WITHOUT ANY WARRANTIES EXPRESSED OR IMPLIED REGARDLESS OF THE INTENDED USE.

THE PURCHASER OF THIS MACHINE, which is intended for competition purposes, IS RESPONSIBLE FOR ALL COSTS, SERVICE AND/OR REPAIR.

IMPORTANT NOTICE

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

⚠ SAFETY INFORMATION

- 1. THIS MACHINE IS TO BE OPERATED BY AN EXPERIENCED RIDER ONLY.**
Do not attempt to operate this machine at maximum power until you are totally familiar with its characteristics.
- 2. THIS MACHINE IS DESIGNED TO BE RIDDEN BY THE OPERATOR ONLY.**
Do not carry passengers on this machine.
- 3. ALWAYS WEAR PROTECTIVE APPAREL.**
When operating this machine, always wear an approved helmet with goggles or a face shield. Also wear heavy boots, gloves, and protective clothing. Always wear proper fitting clothing that will not be caught in any of the moving parts or controls of the machine.
- 4. ALWAYS MAINTAIN YOUR MACHINE IN PROPER WORKING ORDER.**
For safety and reliability, the machine must be properly maintained. Always perform the pre-operation checks indicated in this manual. Correcting a mechanical problem before you ride may prevent an accident.
- 5. GASOLINE IS HIGHLY FLAMMABLE.**
Always turn off the engine while refueling. Take care to not spill any gasoline on the engine or exhaust system. Never refuel in the vicinity of an open flame, or while smoking.

6. GASOLINE CAN CAUSE INJURY.

If you should swallow some gasoline, inhale excess gasoline vapors, or allow any gasoline to get into your eyes, contact a doctor immediately. If any gasoline spills onto your skin or clothing, immediately wash skin areas with soap and water, and change your clothes.

7. ONLY OPERATE THE MACHINE IN AN AREA WITH ADEQUATE VENTILATION.

Never start the engine or let it run for any length of time in an enclosed area. Exhaust fumes are poisonous. These fumes contain carbon monoxide, which by itself is odorless and colorless. Carbon monoxide is a dangerous gas which can cause unconsciousness or can be lethal.

8. PARK THE MACHINE CAREFULLY; TURN OFF THE ENGINE.

Always turn off the engine if you are going to leave the machine. Do not park the machine on a slope or soft ground as it may fall over.

9. PROPERLY SECURE THE MACHINE BEFORE TRANSPORTING IT.

When transporting the machine in another vehicle, always be sure it is properly secured and in an upright position and that the fuel cock is in the "OFF" position. Otherwise, fuel may leak out of the carburetor or fuel tank.

EC050000

TO THE NEW OWNER

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

NOTE:

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

EC060000

NOTICE

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

EC070011

F.I.M. MACHINE WEIGHTS:

Weights of machines without fuel

The minimum weights for road race machines are:

for the class 125 ccminimum
70 kg (154 lb)

for the class 250 ccminimum
95 kg (209 lb)

for the class 500 ccminimum
131 kg (289 lb)

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

HOW TO USE THIS MANUAL

PARTICULARLY IMPORTANT INFORMATION



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

⚠ WARNING

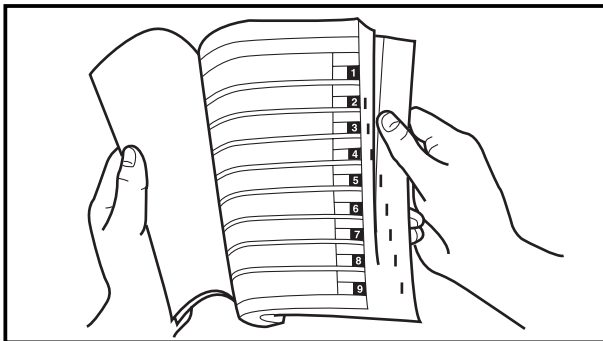
Failure to follow WARNING instructions could result in severe injury or death to the machine operator, a bystander, or a person inspecting or repairing the machine.

CAUTION:

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

NOTE:

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



FINDING THE REQUIRED PAGE

1. This manual consists of seven chapters; "General Information", "Specifications", "Regular inspection and adjustments", "Engine", "Chassis", "Electrical" and "Tuning".
2. The table of contents is at the beginning of the manual. Look over the general layout of the book before finding then required chapter and item.

Bend the book at its edge, as shown, to find the required fore edge symbol mark and go to a page for required item and description.

MANUAL FORMAT

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

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

• Bearings

Pitting/Damage → Replace.

HOW TO READ DESCRIPTIONS

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

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

CLUTCH ENG

EC043000
CLUTCH HOUSING AND PUSH LEVER AXLE

①

②

③

④

⑤

Extend of removal: ① Clutch housing removal ② Push lever axle removal

Extend of removal	Order	Part name	Q'ty	Remarks
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">①</div> <div style="margin-bottom: 10px;">②</div> </div>	1	CLUTCH HOUSING AND PUSH LEVER AXLE REMOVAL		
	2	Nut (clutch boss)	1	Use special tool. Refer to "REMOVAL POINTS".
	3	Lock washer	1	
	4	Clutch boss	1	
	5	Spacer Z	1	
	6	O-ring (small)	1	
	7	Clutch housing	1	
	8	O-ring (large)	1	
	9	Bearing	1	
	10	Spacer 1	1	
	11	Ball	1	
	12	Push rod	1	
	13	Bolt (seat plate)	1	
	14	Seat plate	1	
14	Push lever axle	1		

CLUTCH ENG

EC043000
REMOVAL POINTS

EC043011
Clutch boss

1. Remove:

- Nut ①
- Lock washer ②
- Clutch boss ③

NOTE:

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

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

Ⓐ For USA and CDN
Ⓑ Except for USA and CDN

EC044000
INSPECTION

EC044005
Clutch housing and boss

1. Inspect:

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

EC044010
Clutch housing

1. Check:

- Circumferential play
- Free play exists → Replace.
- Gear teeth ③
- Wear/Damage → Replace.
- O-ring ④
- Damage → Replace.

EC044020
Clutch spring

1. Measure:

- Clutch spring free length ⑥
- Out of specification → Replace springs as a set.

	Clutch spring free length:
	Standard <Limit>
	36.0 mm (1.417 in) 35.0 mm (1.378 in)

ILLUSTRATED SYMBOLS











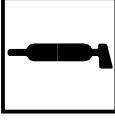

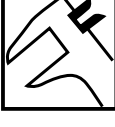
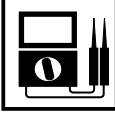







(Refer to the illustration)

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

- ① General information
- ② Specifications
- ③ Regular inspection and adjustments
- ④ Engine
- ⑤ Chassis
- ⑥ Electrical
- ⑦ Tuning

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

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

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

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








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

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

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

MEMO

INDEX

GENERAL INFORMATION	
	GEN INFO 1
SPECIFICATION	
	SPEC 2
REGULAR INSPECTION AND ADJUSTMENTS	
	INSP ADJ 3
ENGINE	
	ENG 4
CHASSIS	
	CHAS 5
ELECTRICAL	
	ELEC 6
TUNING	
	TUN 7

CONTENTS

CHAPTER 1 GENERAL INFORMATION

DESCRIPTION.....	1-1
MACHINE IDENTIFICATION.....	1-2
IMPORTANT INFORMATION.....	1-3
CHECKING OF CONNECTION.....	1-5
SPECIAL TOOLS.....	1-6
CONTROL FUNCTIONS.....	1-8
FUEL AND ENGINE MIXING OIL.....	1-14
INFORMATION BEFORE PRE-OPERATION.....	1-15
STARTING AND BREAK-IN.....	1-16
TORQUE-CHECK POINTS.....	1-19
CLEANING AND STORAGE.....	1-21

CHAPTER 2 SPECIFICATIONS

GENERAL SPECIFICATIONS.....	2-1
MAINTENANCE SPECIFICATIONS.....	2-3
GENERAL TORQUE SPECIFICATIONS.....	2-12
DEFINITION OF UNITS.....	2-12
CABLE ROUTING DIAGRAM.....	2-13

CHAPTER 3 REGULAR INSPECTION AND ADJUSTMENTS

MAINTENANCE INTERVALS.....	3-1
PRE-OPERATION INSPECTION AND MAINTENANCE.....	3-4
LOCKING WIRE INSTALLATION GUIDE.....	3-5
ENGINE.....	3-6
CHASSIS.....	3-17
ELECTRICAL.....	3-42

CHAPTER 4 ENGINE

COWLING, INDUCTION GUIDE, SEAT AND FUEL TANK	4-1
EXHAUST PIPE AND SILENCER	4-3
RADIATOR	4-4
CARBURETOR AND REED VALVE	4-7
CYLINDER HEAD, CYLINDER AND PISTON	4-18
CLUTCH	4-31
PRIMARY DRIVEN GEAR, PRIMARY DRIVE GEAR AND BALANCER SHAFT	4-38
SHIFT SHAFT	4-44
WATER PUMP	4-51
TRANSMISSION, SHIFT CAM AND SHIFT FORK	4-55
OIL PUMP	4-64
CDI MAGNETO	4-68
ENGINE REMOVAL	4-71
CRANKCASE AND CRANKSHAFT	4-76

CHAPTER 5 CHASSIS

FRONT WHEEL AND REAR WHEEL	5-1
FRONT BRAKE AND REAR BRAKE	5-10
FRONT FORK	5-26
HANDLEBAR	5-40
STEERING	5-46
SWINGARM	5-53
REAR SHOCK ABSORBER	5-60

CHAPTER 6 ELECTRICAL

ELECTRICAL COMPONENTS AND WIRING DIAGRAM	6-1
IGNITION SYSTEM	6-2
CHARGING SYSTEM	6-7
YPVS SYSTEM	6-10
SOLENOID VALVE SYSTEM	6-12
THERMO UNIT SYSTEM	6-14
FUEL PUMP SYSTEM	6-16

CHAPTER 7
TUNING

ENGINE 7-1
CHASSIS 7-14



EC100000

GENERAL INFORMATION

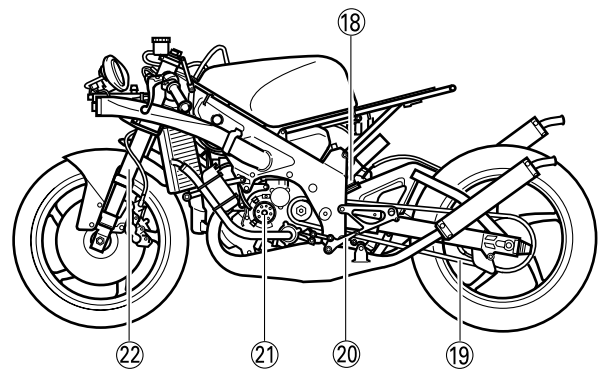
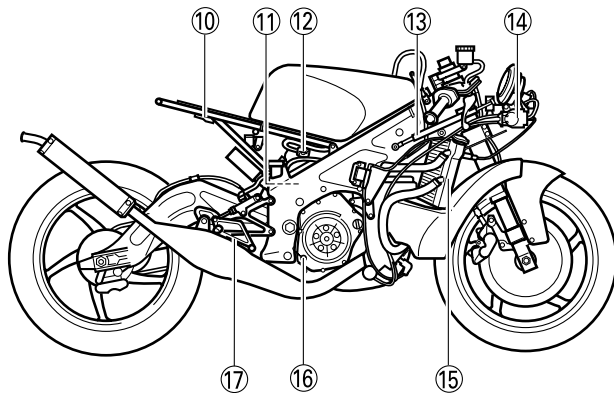
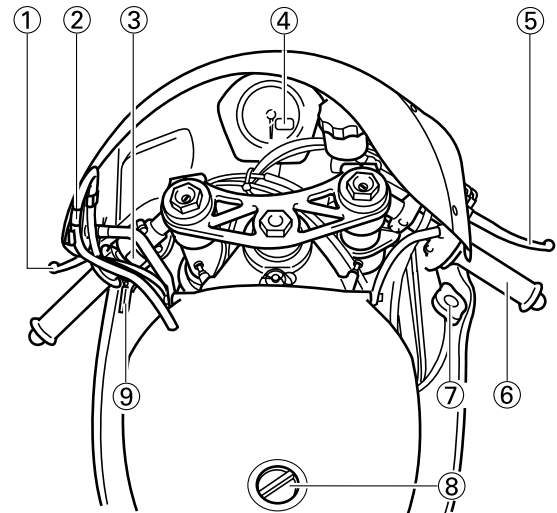
EC110000

DESCRIPTION

- ① Clutch lever
- ② Valve joint
- ③ Main switch
- ④ Water temperature gauge
- ⑤ Front brake lever
- ⑥ Throttle grip
- ⑦ Radiator cap
- ⑧ Fuel tank cap
- ⑨ Starter lever (Choke)
- ⑩ Battery
- ⑪ Fuel pump
- ⑫ Fuel cock
- ⑬ Steering damper
- ⑭ Servomotor
- ⑮ Radiator
- ⑯ Check bolt (Transmission oil level)
- ⑰ Rear brake pedal
- ⑱ Rear shock absorber
- ⑲ Drive chain
- ⑳ Shift pedal
- ㉑ CDI magneto
- ㉒ Front fork

NOTE:

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

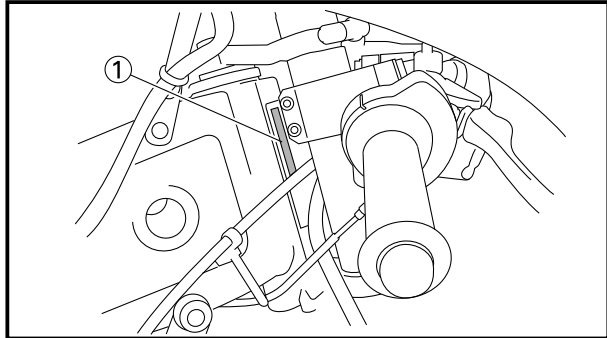


EC120001

MACHINE IDENTIFICATION

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

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



EC121001

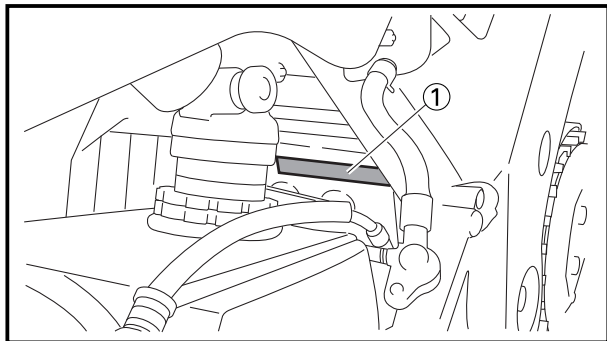
**VEHICLE IDENTIFICATION NUMBER
(For USA, CDN, AUS, NZ and E)**

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

EC122001

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

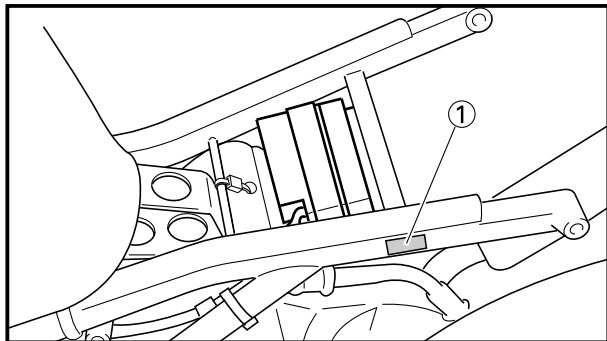
The frame serial number ① is stamped on the right of the steering head pipe.



EC123020

ENGINE SERIAL NUMBER

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



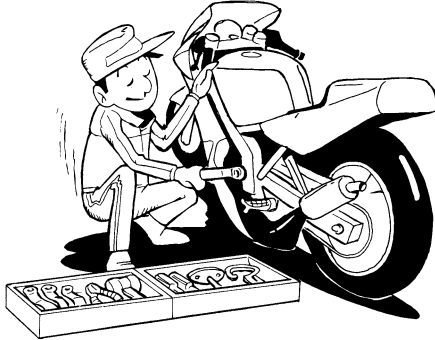
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IMPORTANT INFORMATION

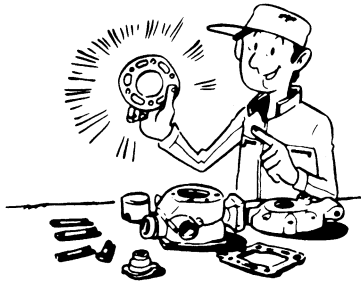
EC131002

PREPARATION FOR REMOVAL AND DIS-ASSEMBLY

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



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



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



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



5. Keep away from fire.

EC132000

ALL REPLACEMENT PARTS

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

EC133000

GASKETS, OIL SEALS AND O-RINGS

1. All gaskets, oil seals, and O-rings should be replaced when an engine is overhauled. All gasket surfaces, oil seal lips, and O-rings must be cleaned.
2. Properly oil all mating parts and bearings during reassembly. Apply grease to the oil seal lips.

EC134000

LOCK WASHERS/PLATES AND COTTER PINS

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

EC135001

BEARINGS AND OIL SEALS

1. Install the bearing(s) ① and oil seal(s) ② with their manufacturer's marks or numbers facing outward. (In other words, the stamped letters must be on the side exposed to view.) When installing oil seal(s), apply a light coating of light-weight lithium base grease to the seal lip(s). Oil the bearings liberally when installing.

CAUTION: _____

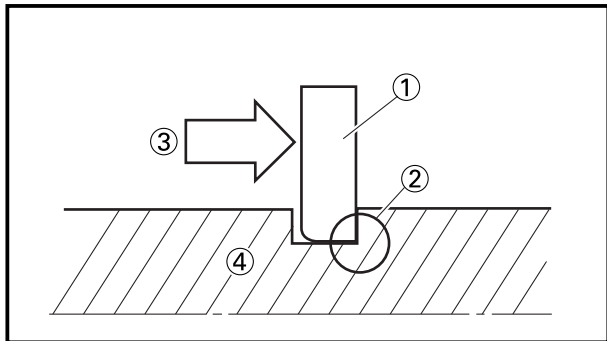
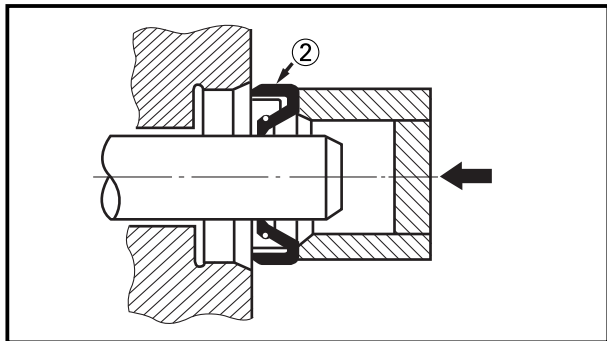
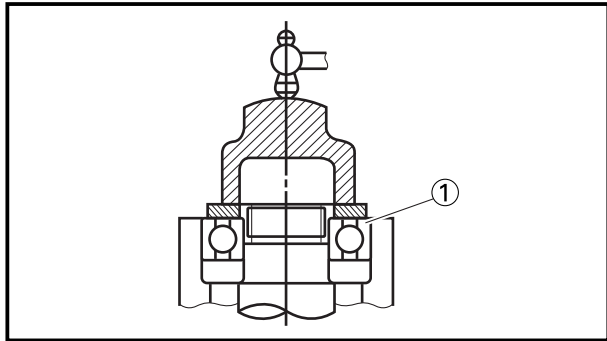
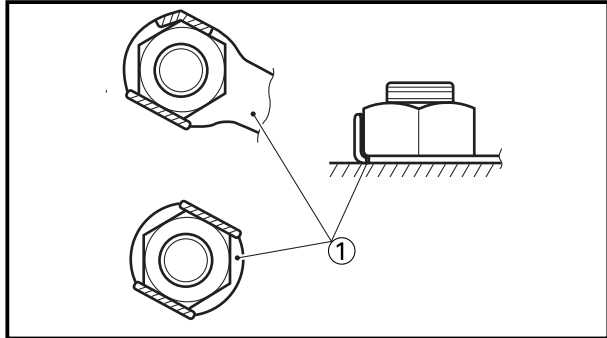
Do not use compressed air to spin the bearings dry. This causes damage to the bearing surfaces.

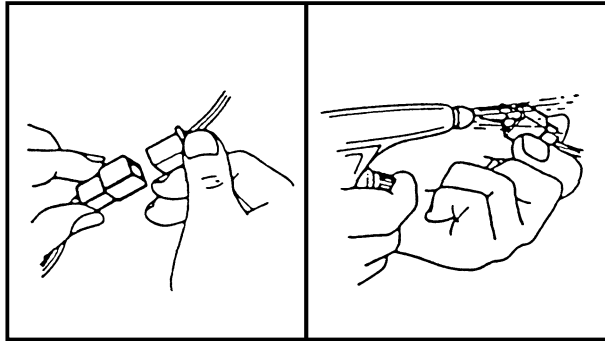
EC136000

CIRCLIPS

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

④ Shaft



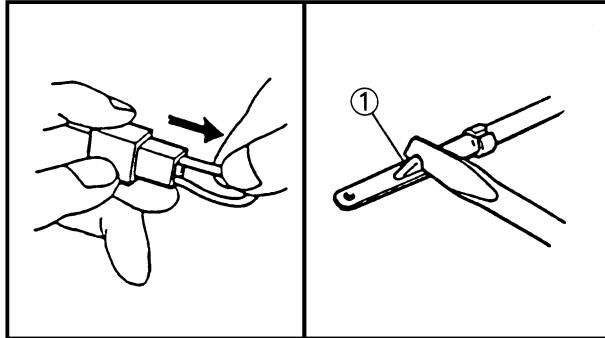


EC1C0001

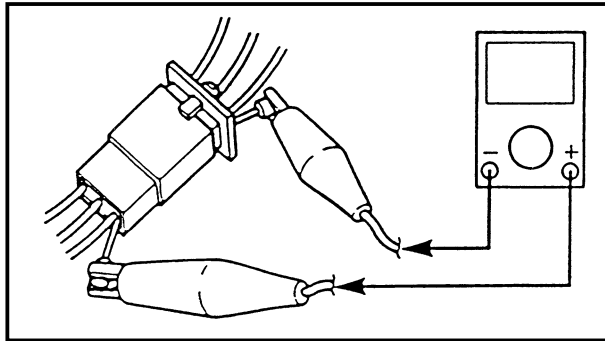
CHECKING OF CONNECTION

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

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



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



6. Connect:
 - Connector

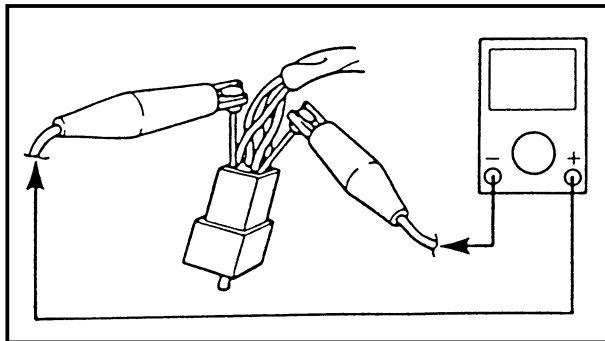
NOTE: _____

The two connectors “click” together.

7. Check for continuity with a tester.

NOTE: _____

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



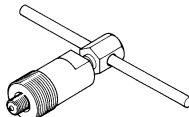
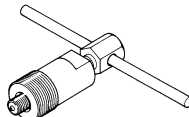
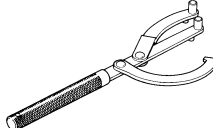
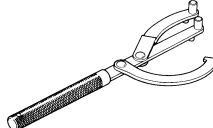
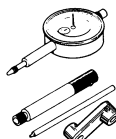

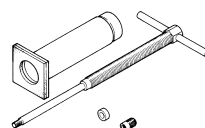
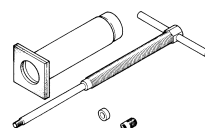
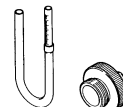
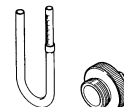
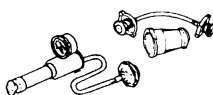
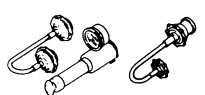
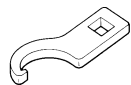
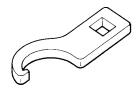
EC140002

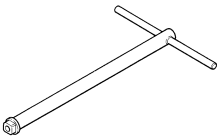
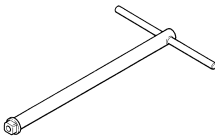
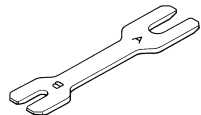
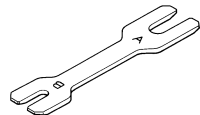


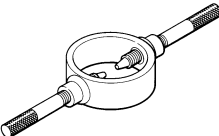
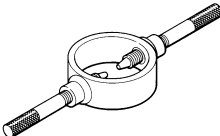
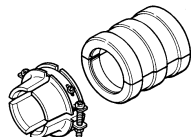
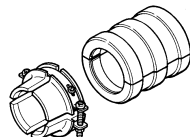
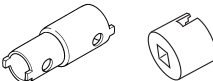
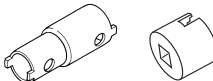

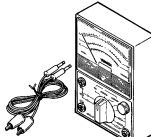
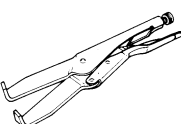
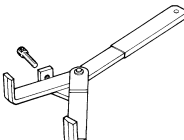
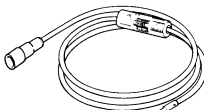
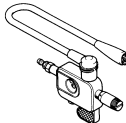
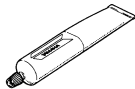
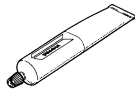
SPECIAL TOOLS

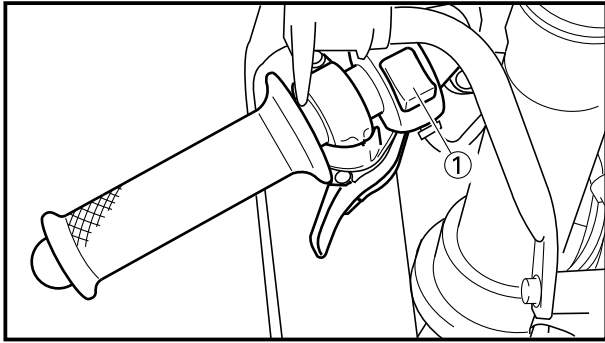
The proper special tools are necessary for complete and accurate tune-up and assembly. Using the correct special tool will help prevent damage caused by the use of improper tools or improvised techniques. The shape and part number used for the special tool differ by country, so two types are provided.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

NOTE:

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

Part number	Tool name / How to use	Illustration	
YM-1189, 90890-01189	Flywheel puller This tool is used to remove the flywheel magneto.	YM-1189 	90890-01189 
YU-1235, 90890-01235	Rotor holding tool This tool is used when loosening or tightening the flywheel magneto securing nut.	YU-1235 	90890-01235 
YU-3097, 90890-01252 YU-1256 YU-1037	Dial gauge and stand Spark plug hole dial stand Offset dial stand These tools are used to set the ignition timing.	YU-3097 YU-1256 YU-1037 	90890-01252 
YU-1304, 90890-01304	Piston pin puller This tool is used to remove the piston pin.	YU-1304 	90890-01304 
YM-1312-A, 90890-01312 YM-1470, 90890-01470	Fuel level gauge Fuel level gauge adapter This gauge is used to measure the fuel level in the float chamber.	YM-1312-A YM-1470 	90890-01312 90890-01470 
YU-24460-01, 90890-01325 YU-33984, 90890-01352	Radiator cap tester Adapter These tools are used for checking the cooling system.	YU-24460-01 YU-33984 	90890-01325 90890-01352 
YU-33975, 90890-01403	Ring nut wrench This tool is used when tighten the steering ring nut to specification.	YU-33975 	90890-01403 

Part number	Tool name / How to use	Illustration	
YM-1425, 90890-01425	<p>Damper rod holder</p> <p>Use this tool to remove and install the damper rod.</p>	<p>YM-1425</p> 	<p>90890-01425</p> 
YM-1434, 90890-01434	<p>Rod holder</p> <p>This tool is used to hold the fork spring.</p>	<p>YM-1434</p> 	<p>90890-01434</p> 
<p>90890-01435</p> <p>YM-1437, 90890-01437</p>	<p>Rod puller attachment</p> <p>Rod puller</p> <p>These tools are used to pull up the fork damper rod.</p>	<p>YM-1437</p> 	<p>90890-01435</p> <p>90890-01437</p> 
YM-1441, 90890-01441	<p>Fork spring compressor</p> <p>This tool is used to compress the fork spring.</p>	<p>YM-1441</p> 	<p>90890-01441</p> 
YM-1442, 90890-01442	<p>Fork seal driver</p> <p>This tool is used when install the fork oil seal.</p>	<p>YM-1442</p> 	<p>90890-01442</p> 
<p>YM-1455, 90890-01455</p> <p>YM-1476, 90890-01476</p>	<p>Pivot shaft wrench</p> <p>Pivot shaft wrench adapter</p> <p>These tools are used to loosen or tighten the pivot adjust bolt.</p>	<p>YM-1455</p> <p>YM-1476</p> 	<p>90890-01455</p> <p>90890-01476</p> 
YU-3112-C, 90890-03112	<p>Yamaha pocket tester</p> <p>Use this tool to inspect the coil resistance, output voltage and amperage.</p>	<p>YU-3112-C</p> 	<p>90890-03112</p> 
YM-91042, 90890-04086	<p>Clutch holding tool</p> <p>This tool is used to hold the clutch when removing or installing the clutch boss securing nut.</p>	<p>YM-91042</p> 	<p>90890-04086</p> 
<p>YM-34487</p> <p>90890-06754</p>	<p>Dynamic spark tester</p> <p>Ignition checker</p> <p>This instrument is necessary for checking the ignition system components.</p>	<p>YM-34487</p> 	<p>90890-06754</p> 
<p>ACC-YAMAB-ON-D4</p> <p>90890-05143</p>	<p>Quick gasket®</p> <p>YAMAHA Bond No.4</p> <p>This sealant (Bond) is used for crankcase mating surface, etc.</p>	<p>ACC-YAMAB-ON-D4</p> 	<p>90890-05143</p> 



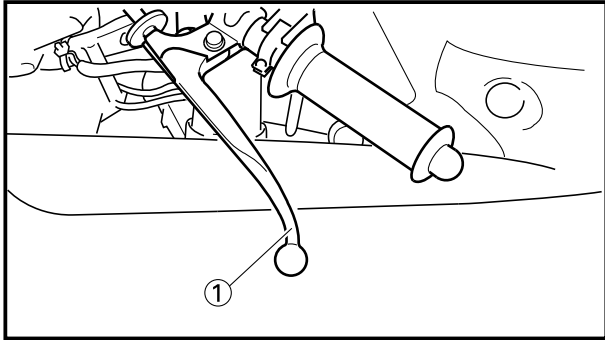
EC150000

CONTROL FUNCTIONS

EC15W000

MAIN SWITCH

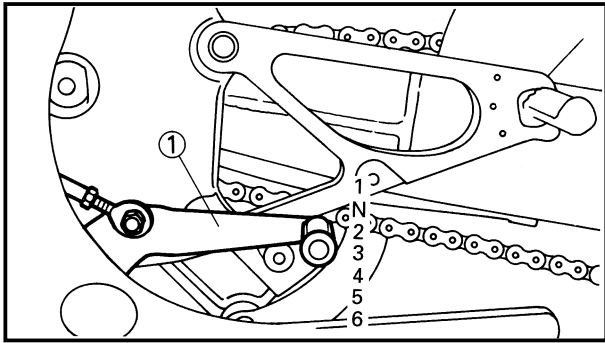
While the battery is connected, moving the main switch ① to “RUN” causes the tachometer, servomotor, fuel pump and solenoid valves to be initially activated. To prevent the battery from being discharge, do not move the main switch to “RUN” except when the engine is started or when electric parts are checked.



EC152000

CLUTCH LEVER

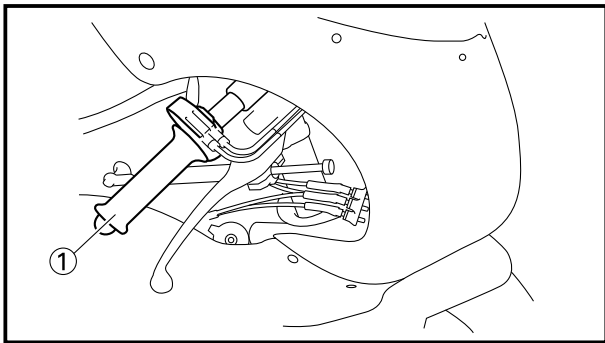
The clutch lever ① is located on the left handlebar; it disengages or engages the clutch. Pull the clutch lever to the handlebar to disengage the clutch, and release the lever to engage the clutch. The lever should be pulled rapidly and released slowly for smooth starts.



EC153000

SHIFT PEDAL

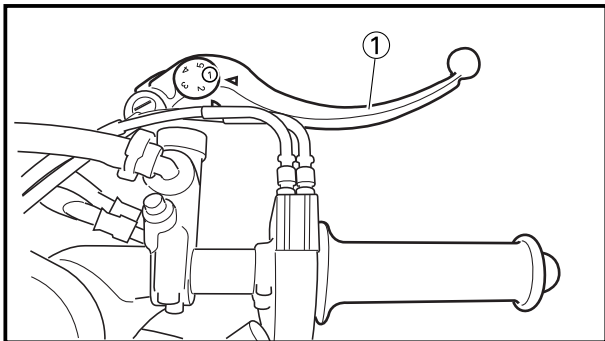
The gear ratios of the constant-mesh 6 speed transmission are ideally spaced. The gears can be shifted by using the shift pedal ① on the left side of the engine.



EC155001

THROTTLE GRIP

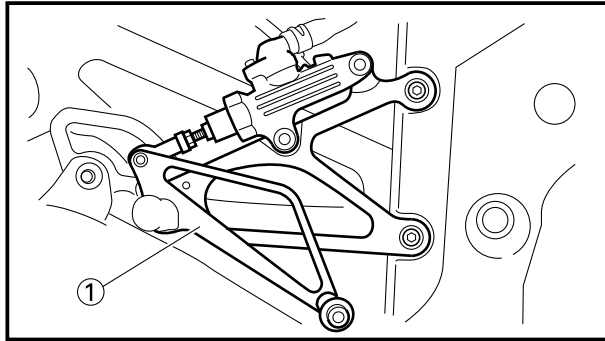
The throttle grip ① is located on the right handlebar; it accelerates or decelerates the engine. For acceleration, turn the grip toward you; for deceleration, turn it away from you.



EC156000

FRONT BRAKE LEVER

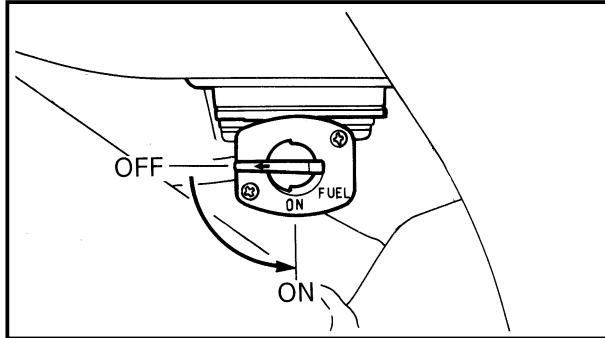
The front brake lever ① is located on the right handlebar. Pull it toward the handlebar to activate the front brake.



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.



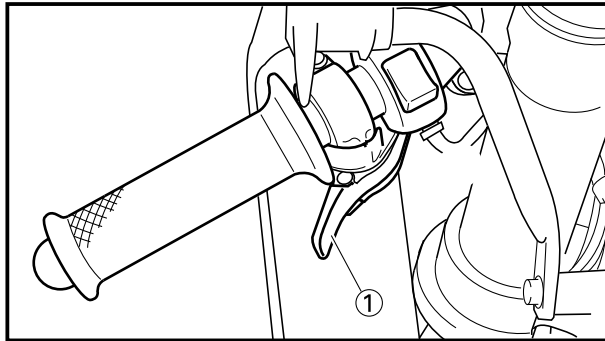
EC158001

FUEL COCK

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

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

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



EC15A020

STARTER LEVER (CHOKE)

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

EC15V011

TACHOMETER

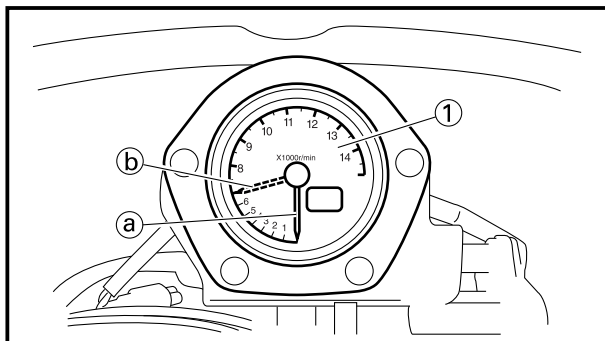
A stepping motor type tachometer with greater accuracy and response is provide for the tachometer ①. This tachometer features the following:

Sweeping:

Moving the main switch to "RUN", the tachometer hand sweeps widely once over the tachometer face and then returns to the zero position, as initial operation. This is called "sweeping". When the engine is started during sweeping, the tachometer indicates the correct revolutions after sweeping is over.

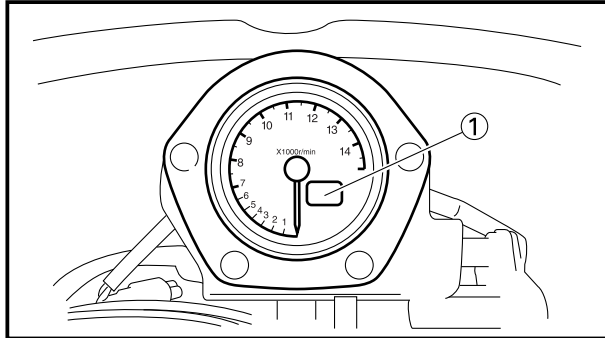
Out-of-step indication:

If this tachometer is subjected to impact, etc, it may allow its hand to point to the position ② stepping out of the position ③ where the hand should be for correct indication. This is called an "out-of-step" indication. A similar phenomenon may take place when the main switch is moved to "OFF" during sweeping or at high rpm (as in a plug chop) or while the machine is transported, though it never happens in normal riding.



NOTE:

- If an out-of-step indication takes place, moving the main switch to “OFF” once and then to “RUN”, brings the tachometer back to a normal indication through its corrective action.
- There is no functional problem involved with the out-of-step indication, which can be brought back to a normal indication through the corrective action of the tachometer.



EC15B010

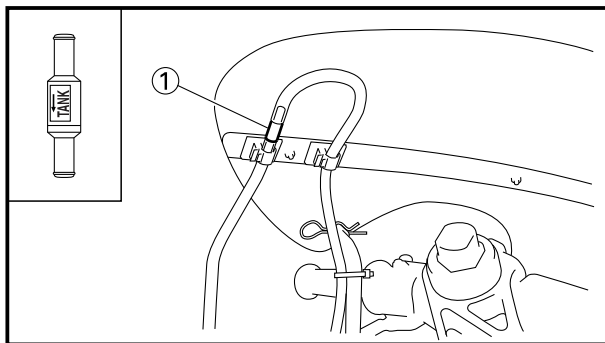
WATER TEMPERATURE GAUGE

The water temperature gauge ① displays different indications according to the change in the water temperature.

NOTE:

Water temperature may be 70 °C (158 °F) when engine is operated in good conditions.

Cooling water temp.	Display	Conditions
~19 °C (~66 °F)	LO	“LO” is display.
20~119 °C (68~247 °F)	70	Temperature is displayed.
120~140 °C (248~284 °F)	130	Temperature flash.
141 °C~ (285 °F~)	HI	Message “HI” flash.



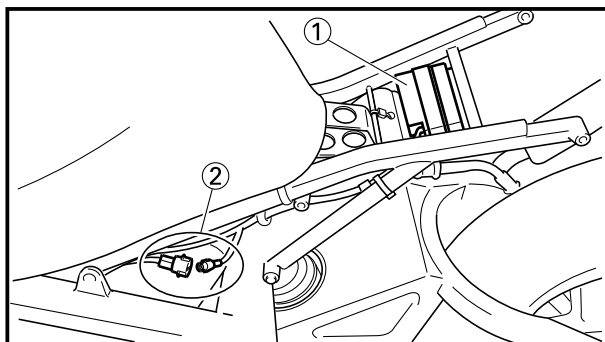
EC15F000

VALVE JOINT

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

CAUTION:

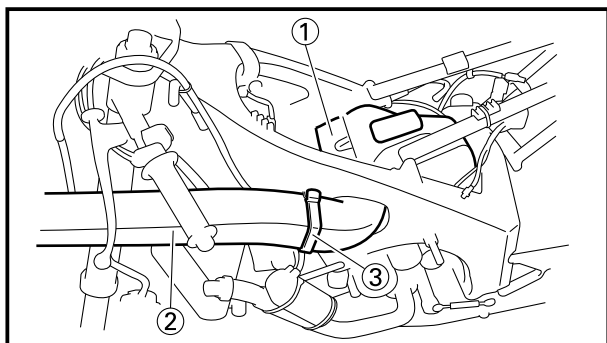
In this installation, make sure the arrow faces the fuel tank and also downward.



EC15X000

BATTERY

The battery ① is provided as power supply for the electric parts. Except when the machine is run, disconnect the power supply coupler ② of the wireharness to prevent battery discharge.



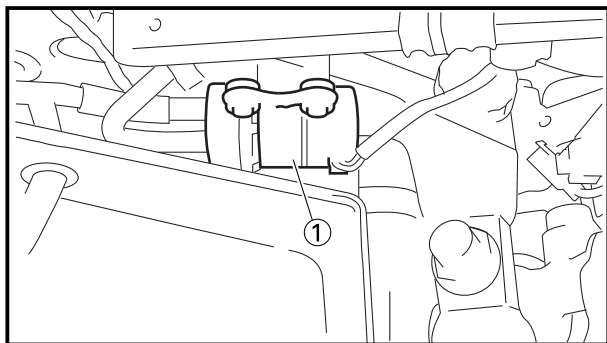
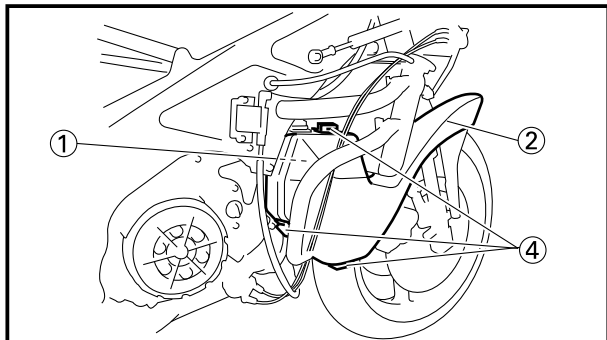
EC15Y000

INDUCTION BOX INTAKE SYSTEM

The induction boxes ① and induction guides ② are provided for the purpose of applying pressure inside the carburetor float chamber and thereby improving the intake performance. If the machine is run without them, the carburetor settings will become faulty.

NOTE: _____

Be sure to fix the induction guides with band ③ or hooks ④ so that they do not come off by wind pressure while running.



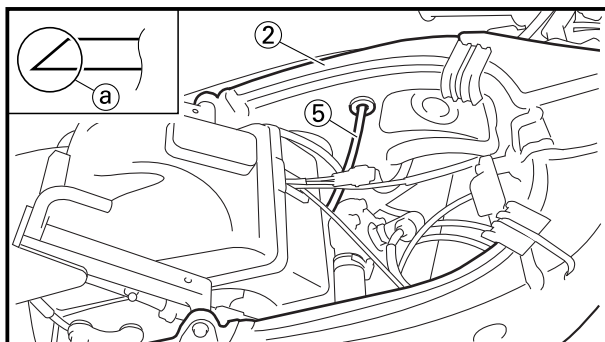
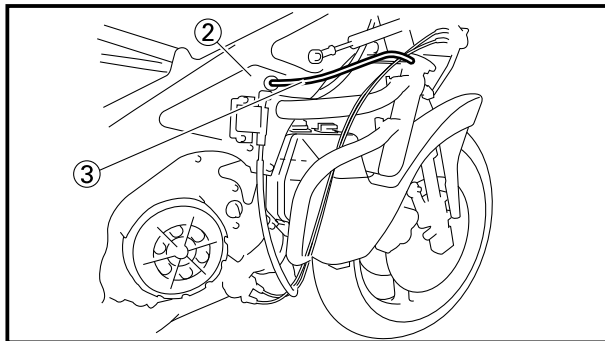
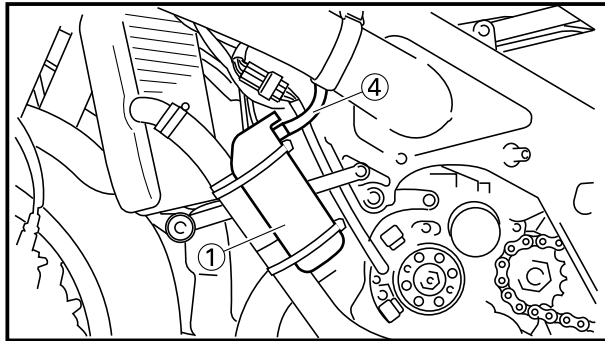
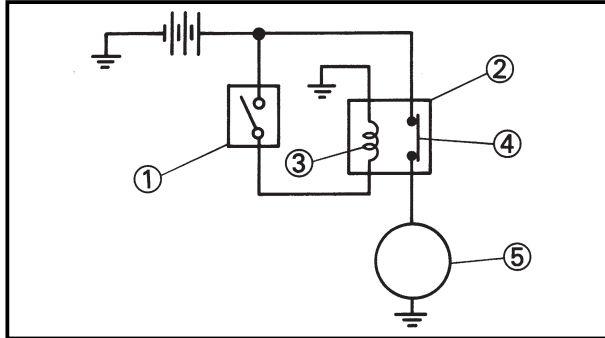
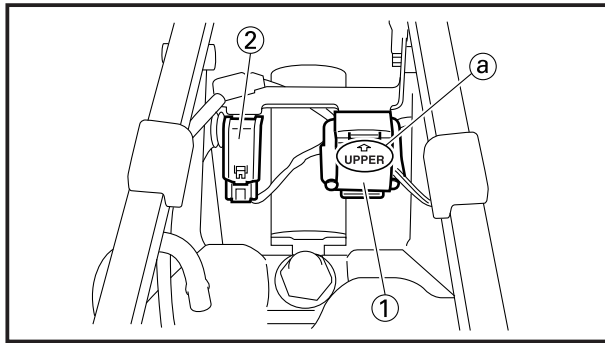
EC15Z000

FUEL PUMP

The fuel pump ①, is provided in order to provide steady supply of fuel even when the pressure inside the carburetor float chamber becomes higher than inside the fuel tank because of the induction box intake system. If the fuel level is not up to the specified level in the float chamber, this pump is activated (with an operation sound) and stops operating when the specified level is reached.

CAUTION: _____

Do not idle run the fuel pump with no fuel flowing as when the fuel tank is empty or when the fuel cock is "OFF". It may damage the fuel pump.



EC15a000

FUEL PUMP STOP SWITCH, FUEL PUMP RELAY

The fuel pump stop switch ① and fuel pump relay ② are provided so as to control the fuel pump and prevent the carburetor overflowing during a turnover.

If the machine is turned over, the fuel pump stop switch is turned “ON” which allow electric current to flow in the coil ③ inside the relay, causing the relay switch ④ to turn “OFF” and shutting of the electric current flow to the fuel pump ⑤. Thus, the pump comes to a stop.

	Fuel pump stop switch ①	Fuel pump relay switch ④	Fuel pump ⑤
During run	OFF	ON	ON
During turnover	ON	OFF	OFF

NOTE:

- When the machine is picked up from turnover, the fuel pump is restored to an operation condition.
- Install the fuel pump stop switch so that “UPPER” mark (a) faces upward.

EC15M011

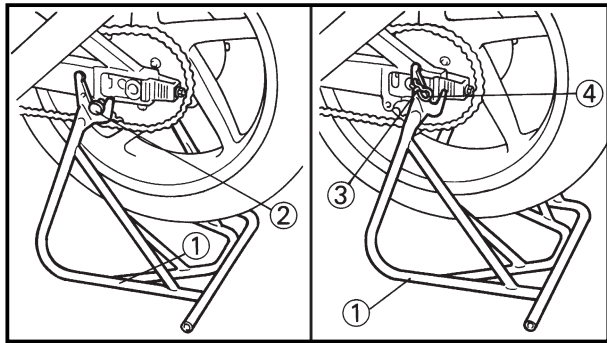
CATCH TANK

Put the tip of the breather hose into the catch tank ① and frame ②. Take care not to allow the fuel, oil and cooling water to spill on the course.

- ③ Radiator breather hose
- ④ Fuel tank breather hose
- ⑤ Transmission oil breather hose

NOTE:

When putting in the transmission oil breather hose, its tip having a cut (a) should be on the frame side.



EC15Q001

DETACHABLE MAINSTAND

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

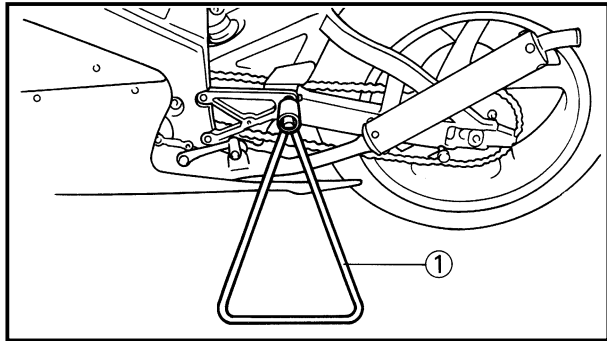
NOTE:

The mainstand can be used to support the machine two ways.

1. Hook the bracket of the mainstand onto the swingarm hooks ②.
2. Stand shaft (with supplying parts):
Insert the stand shaft ③ through the hole of the mainstand and rear wheel axle. Be sure to install the clip ④ in the end of the stand shaft.

⚠WARNING

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



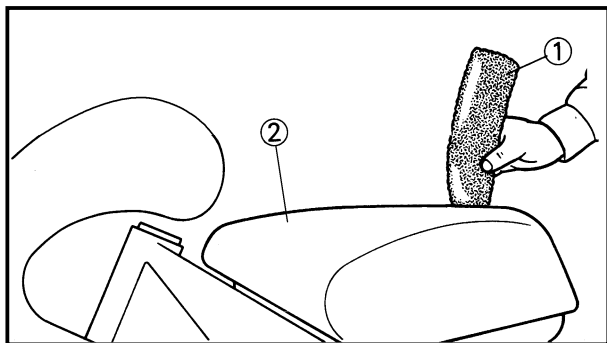
EC15R001

DETACHABLE SIDESTAND

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

⚠WARNING

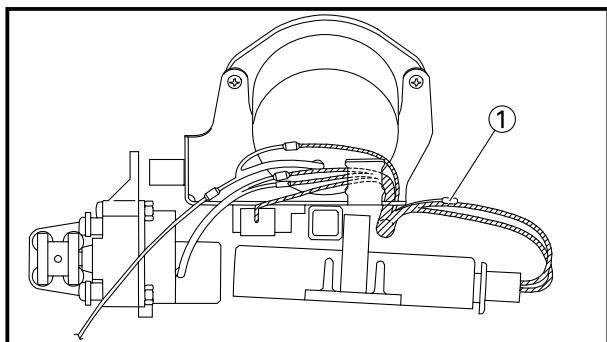
- Never apply additional force to the sidestand.
- Remove this sidestand before starting out.



EC15T003

FIRE RETARDANT MATERIAL

For racing, be sure to fill the fuel tank ② completely with fire retardant material (with supplying parts) ①.



EC15b000

COUPLER FOR SPEED SHIFT

If an after-marked speed shift is installed, the coupler ① should be used.

NOTE:

If the speed shift is not installed, be sure to fix the coupler to the wireharness using a vinyl tape, for protection against water entry as well because if the coupler contacts the frame, sparks will be shut off, causing the engine to stop.



EC160040

FUEL AND ENGINE MIXING OIL

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

	<p>Recommended fuel: Except for AUS: Premium unleaded fuel with a research octane number of 95 or higher. For AUS: Unleaded fuel only</p>
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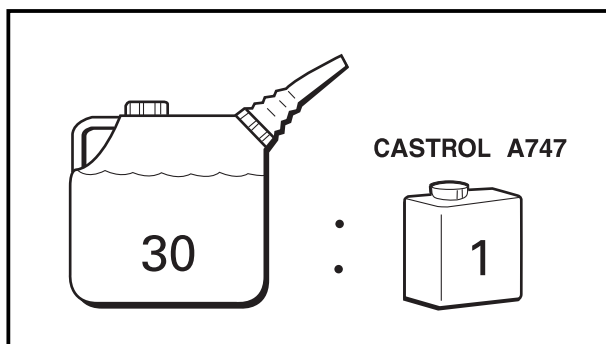
NOTE: _____

Except for AUS:

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

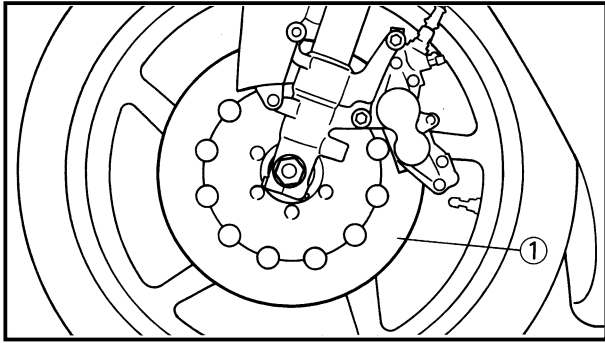
CAUTION: _____

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



	<p>Fuel tank capacity: 23.0 L (5.06 Imp gal, 6.08 US gal)</p>
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	<p>Mixing oil Recommended oil: Castrol A747 Mixing ratio: 30 : 1</p>
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EC170011

INFORMATION BEFORE PRE-OPERATION

1. The brake disc ① is coated with a rust inhibitor. Before riding the machine, thoroughly remove it using a lacquer thinner.

⚠WARNING

- **LACQUER THINNER IS HIGHLY FLAMMABLE.**

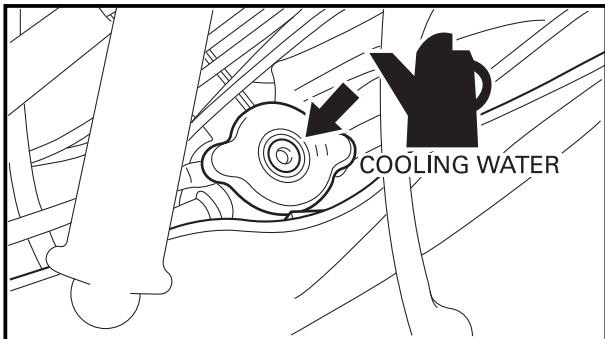
Always turn off the engine while using lacquer thinner. Take care not to spill any lacquer thinner on the engine or exhaust system.

Never use it in the vicinity of an open flame, or while smoking.

- **LACQUER THINNER CAN CAUSE INJURY.** Always use lacquer thinner in a well ventilated area. If you should swallow some lacquer thinner, inhale excess lacquer thinner vapors, or allow any lacquer thinner to get into your eyes, contact a doctor immediately.

NOTE:

- When the machine is not in use for a long time, apply a rust inhibitor to the brake disc.
- After riding in the rainy weather, wipe the moisture completely off the disc.
- If rust appears on the brake disc, carefully remove it using #400 sand paper.



2. The cooling system is filled with coolant at the factory to prevent rusting. Be sure to replace coolant with soft water before riding.

CAUTION:

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

EC190000

STARTING AND BREAK-IN**CAUTION:** _____

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

⚠ WARNING _____

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

EC191032

STARTING A COLD ENGINE

1. Connect the power supply coupler.
2. Turn the fuel cock to "ON" and push the starter lever (CHOKE).
3. Move the main switch to "RUN".
4. Shift the transmission into "1st" gear.
5. Apply the clutch lever and push the machine.
6. After gaining some momentum, release the clutch lever.
7. As soon as the engine starts, quickly apply the clutch lever again and open the throttle grip slightly at the same time so as to sustain idling of the engine. Then, shift the transmission into neutral.
8. After applying full-throttle a few times, turn the starter lever (CHOKE) to the original position. Take some time to allow the engine to warm up.

EC192000

WARMING UP

Run the engine at varying speeds 5,000~6,000 r/min for 1~2 minutes. Fully warm up until the water temperature gauge reads 70 °C (158 °F) or so.

CAUTION: _____

Do not warm up the engine for extended periods.

EC193031

STARTING A WARM ENGINE

Do not push the starter lever (CHOKE). Open the throttle slightly and start the engine.

CAUTION: _____

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

EC194020

BREAK-IN PROCEDURES

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

	Mixing oil Recommended oil: Castrol A747 Mixing ratio: 30 : 1
---	--

2. Perform the pre-operation checks on the machine.
3. Start and warm up the engine. Check the operation of the controls and check that the engine comes to a stop when moving the main switch to "OFF".

NOTE: _____

During break-in, mask part of the radiator core so that the water temperature is 55 ~ 65°C (131 ~ 149°F).

4. Operate the machine under 8,000 r/min and run on a course about 10 km (6 miles). While making a straight-line run, open the throttle from time to time, taking care not to exceed the revolution limit.
5. Go back to the pit to check for looseness, leakage, and other failures in installation.
6. Next, operate the machine under 9,000 r/min and run about 10 km (6 miles). (While running in this way, get an idea of the riding position and approximate settings.)
7. Go back to the pit again, check the machine fully for looseness, leakage, and other failures in installation, especially for loose cables and wires, excessive brake free play, and a chain slack. Also make adjustment for a riding position according to your preference.

CAUTION:

After the break-in or before each race, you must check the entire machine for loose fittings and fasteners as per “TORQUE-CHECK POINTS”.

Tighten all such fasteners as required.

8. Increase the engine speed up to 10,000 r/min and run about 10 km (6 miles).
9. Increase the engine speed up to 11,000 r/min and run about 10 km (6 miles).
10. Increase the engine speed up to 12,000 r/min and run about 10 km (6 miles). Then do the plug chop. Check the piston head for burning to see if there is any problem. Refer to “SETTING” section in the CHAPTER 7.
11. Run about 10 km (6 miles) in a usual manner. Then do the plug chop. Check the piston head for burning to see if there is any problem.

EC195001

BREAKING IN AFTER REPLACEMENT

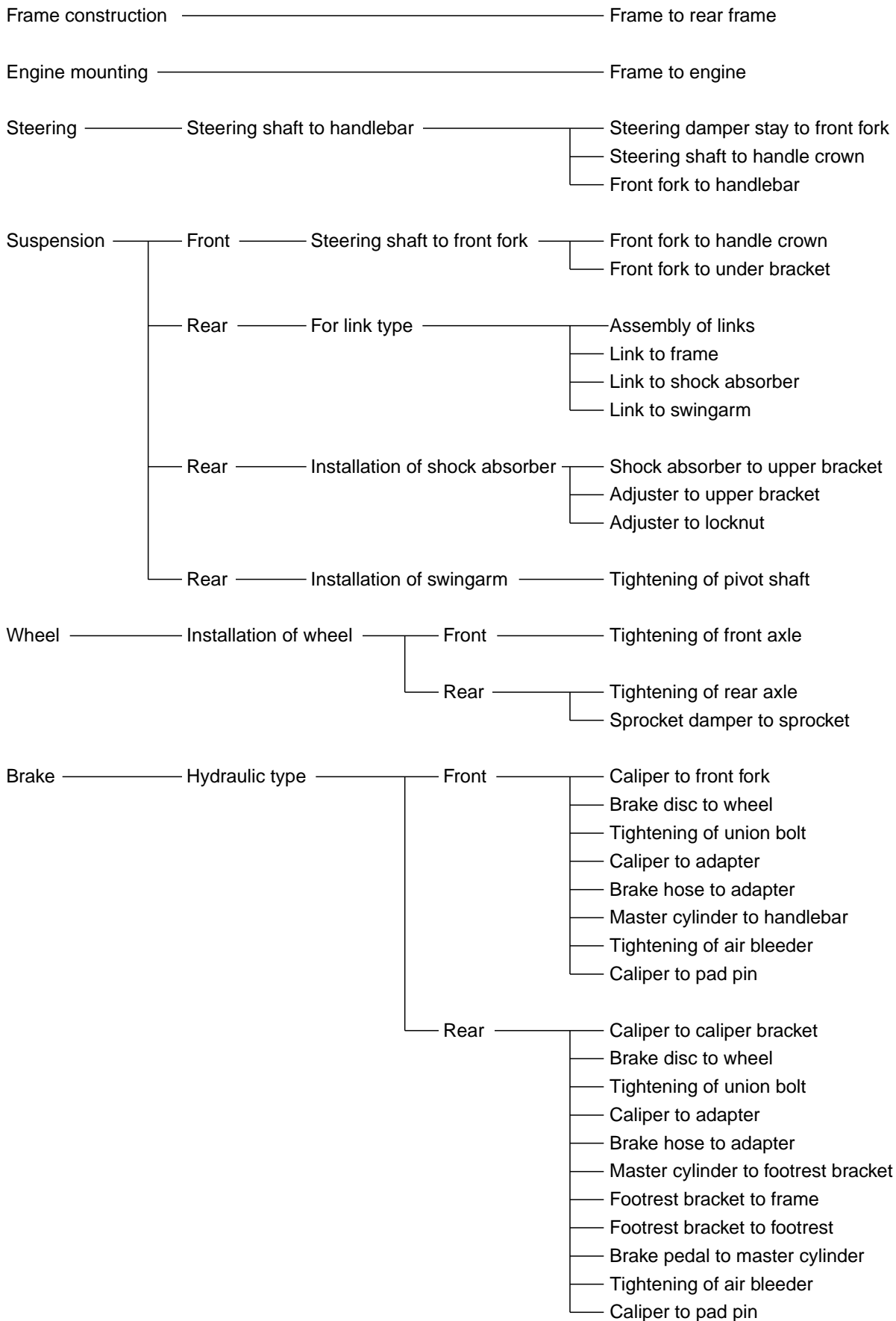
After a part is replaced with a new one, it is necessary to break it in as in a new machine. This is required especially when the following engine-related parts are replaced.

- Cylinder
- Piston
- Piston ring
- Crankshaft
- Clutch
- Transmission gear
- Shift fork

※ For warming up and inspection during break-in, refer to “PRE-OPERATION CHECK LIST” and if there is any problem, stop the engine immediately and check.

EC1A0060

TORQUE-CHECK POINTS



Fuel system ————— Fuel tank to fuel cock

NOTE: _____
Concerning the tightening torque, refer to
“MAINTENANCE SPECIFICATIONS” section
in the CHAPTER 2.

EC1B0000

CLEANING AND STORAGE

EC1B1000

CLEANING

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

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

CAUTION:

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

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

EC1B2010

STORAGE

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

1. Drain the fuel tank, fuel lines, and the carburetor float chambers.
2. Remove the spark plugs, pour a tablespoon of SAE 10W30 motor oil in the spark plug hole, and reinstall the plug. With the engine stop switch pushed in, kick the engine over several times to coat the cylinder walls with oil.
3. Remove the drive chain, clean it thoroughly with solvent, and lubricate it. Reinstall the chain or store it in a plastic bag tied to the frame.
4. Lubricate all control cables.
5. Block the frame up to raise the wheels off the ground.
6. Tie a plastic bag over the exhaust pipe outlet to prevent moisture from entering.
7. If the machine is to be stored in a humid or salt-air environment, coat all exposed metal surfaces with a film of light oil. Do not apply oil to rubber parts or the seat cover.
8. Drain the cooling water completely. And then fill the coolant and water (50%:50%) in the engine and radiator.

NOTE: _____

Make any necessary repairs before the machine is stored.



EC200000

SPECIFICATIONS

EC211000

GENERAL SPECIFICATIONS

Model name:	TZ250N1 (USA) TZ250(N) (OTHERS)
Model code number:	5KE2
Dimensions:	
Overall length	1,955 mm (77.0 in)
Overall width	650 mm (25.6 in)
Overall height	1,083 mm (42.6 in)
Seat height	788 mm (31.0 in)
Wheelbase	1,342 mm (52.8 in)
Minimum ground clearance	112 mm (4.4 in)
Basic weight:	
With oil and full fuel tank	119.5 kg (263 lb)
Engine:	
Engine type	Liquid cooled 2-stroke, gasoline
Cylinder arrangement	V-type, 2-cylinder
Displacement	249 cm ³ (8.76 Imp oz, 8.42 US oz)
Bore × Stroke	54 × 54.5 mm (2.126 × 2.146 in)
Compression ratio	7.2 : 1
Starting system	Push to start
Lubrication system:	Premix (30 : 1) (Castrol A747)
Oil type or grade (2-Cycle) :	
Transmission oil	Castrol R30
Periodic oil change	0.5 L (0.44 Imp qt, 0.53 US qt)
Total amount	0.5 L (0.44 Imp qt, 0.53 US qt)
Cooling water capacity (including all routes) :	1.4 L (1.23 Imp qt, 1.48 US qt)
Fuel:	
Type	Except for AUS: Premium unleaded fuel with a research octane number of 95 or higher For AUS: Unleaded fuel only
Tank capacity	23.0 L (5.06 Imp gal, 6.08 US gal)
Carburetor:	
Type/Manufacturer	TMX χ 38/MIKUNI
Spark plug:	
Type/Manufacturer	R6179A-105P/NGK
Gap	0.5~0.6 mm (0.020~0.024 in)
Clutch type:	Dry, multiple-disc

GENERAL SPECIFICATIONS

SPEC



<p>Transmission:</p> <p>primary reduction system</p> <p>Primary reduction ratio</p> <p>Secondary reduction system</p> <p>Secondary reduction ratio</p> <p>Transmission type</p> <p>Operation</p> <p>Gear ratio: 1st</p> <p style="padding-left: 20px;">2nd</p> <p style="padding-left: 20px;">3rd</p> <p style="padding-left: 20px;">4th</p> <p style="padding-left: 20px;">5th</p> <p style="padding-left: 20px;">6th</p>	<p>Spur gear</p> <p>53/21 (2.524)</p> <p>Chain drive</p> <p>36/14 (2.571)</p> <p>Constant mesh, 6-speed</p> <p>Left foot operation</p> <p>34/18 (1.889)</p> <p>31/21 (1.476)</p> <p>29/23 (1.261)</p> <p>27/25 (1.080)</p> <p>26/27 (0.963)</p> <p>20/22 (0.909)</p>
<p>Chassis:</p> <p>Frame type</p> <p>Caster angle</p> <p>Trail</p>	<p>Delta box</p> <p>22°</p> <p>82 mm (3.23 in)</p>
<p>Tire:</p> <p>Type</p> <p>Size (front)</p> <p>Size (rear)</p> <p>Tire pressure (front and rear)</p>	<p>Tubeless</p> <p>3.10/4.80 R17</p> <p>165/55 R17</p> <p>200 kPa (2.0 kg/cm², 29 psi)</p>
<p>Brake:</p> <p>Front brake type</p> <p>Operation</p> <p>Rear brake type</p> <p>Operation</p>	<p>Dual disc brake</p> <p>Right hand operation</p> <p>Single disc brake</p> <p>Right foot operation</p>
<p>Suspension:</p> <p>Front suspension</p> <p>Rear suspension</p>	<p>Telescopic fork</p> <p>Swingarm (link type monocross suspension)</p>
<p>Shock absorber:</p> <p>Front shock absorber</p> <p>Rear shock absorber</p>	<p>Coil spring/oil damper</p> <p>Coil spring/gas, oil damper</p>
<p>Wheel travel:</p> <p>Front wheel travel</p> <p>Rear wheel travel</p>	<p>113 mm (4.45 in)</p> <p>118 mm (4.65 in)</p>
<p>Electrical:</p> <p>Ignition system</p>	<p>CDI magneto</p>

2

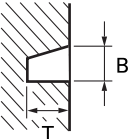
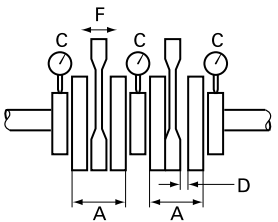


EC212000

MAINTENANCE SPECIFICATIONS

EC212112

ENGINE

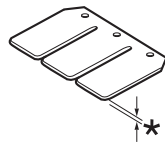
Item	Standard	Limit
Cylinder head: Combustion chamber capacity	9.0 cm ³ (0.317 Imp oz, 0.304 US oz)	...
Piston: Piston clearance Piston offset	0.090~0.100 mm (0.0035~0.0039 in) 1.0 mm (0.039 in)/EX-side	.........
Piston pin: Piston pin outside diameter	14.995~15.000 mm (0.5904~0.5906 in)	14.975 mm (0.5896 in)
Piston ring: Sectional sketch End gap (installed) Side clearance (installed)	 Keystone B=1.0 mm (0.039 in) T=2.2 mm (0.087 in) 0.22~0.37 mm (0.009~0.015 in) Zero~0.06 mm (Zero~0.0024 in)	... ... ... 0.59 mm (0.023 in) ...
Crankshaft: Crank width "A" Runout limit "C" Connecting rod big end side clearance "D" Small end free play "F"	 49.975~50.025 mm (1.968~1.969 in) 0.03 mm (0.0012 in) 0.45~0.95 mm (0.018~0.037 in) 0.8~1.0 mm (0.031~0.039 in)	... 0.05 mm (0.0020 in) ... 2.0 mm (0.08 in)
Clutch: Friction plate thickness Quantity Clutch plate thickness Quantity Warp limit Clutch spring free length Quantity Clutch housing thrust clearance Clutch housing radial clearance Clutch release method Push rod bending limit	2.9~3.1 mm (0.114~0.122 in) 6 2.2~2.4 mm (0.087~0.094 in) 5 ... 30.6 mm (1.205 in) 6 0.07~0.18 mm (0.003~0.007 in) 0.009~0.071 mm (0.0004~0.0028 in) Inner push, cam push ...	2.7 mm (0.106 in) 0.1 mm (0.004 in) 29.6 mm (1.165 in) 0.2mm (0.008 in)
Transmission: Main axle deflection limit Drive axle deflection limit	... ...	0.01 mm (0.0004 in) 0.01 mm (0.0004 in)
Shifter: Shifting type Guide bar bending limit	Cam drum and guide bar ...	... 0.04 mm (0.0016 in)

MAINTENANCE SPECIFICATIONS

SPEC



Item	Standard	Limit
Carburetor:		
Type/Manufacturer	TMX _x 38/MIKUNI	...
I.D. mark (left side/right side)	5KE2 10L/5KE2 10R	...
Main jet (M.J.)	#560	...
Jet needle (J.N.)	6DGJ1	...
Main nozzle (N.J.)	S-4	...
Cutaway (C.A.)	5.0	...
Pilot jet (P.J.)	#40	...
Pilot air screw (P.A.S.)	1-1/2	...
Valve seat size (V.S.)	1.5	...
Starter jet (G.S.)	#80	...
Power jet (P.W.J.)	#55	...
Float height (F.H.)	6.0~7.0 mm (0.24~0.28 in)	...
Reed valve:		
Thickness* reed valve 1	0.42 mm (0.017 in)	...
reed valve 2	0.34 mm (0.013 in)	...
Valve stopper height	6.5~6.9 mm (0.256~0.272 in)	...
Valve bending limit	...	0.2 mm (0.008 in)
Cooling:		
Radiator core size:		
Width	380 mm (14.96 in)	...
Height	198 mm (7.80 in)	...
Thickness	24 mm (0.94 in)	...
Radiator cap opening pressure	95~125 kPa (0.95~1.25 kg/cm ² , 13.5~17.8 psi)	...
Radiator capacity	0.5 L (0.44 Imp qt, 0.53 US qt)	...
Water pump:		
Type	Single-suction centrifugal pump	...



MAINTENANCE SPECIFICATIONS

SPEC

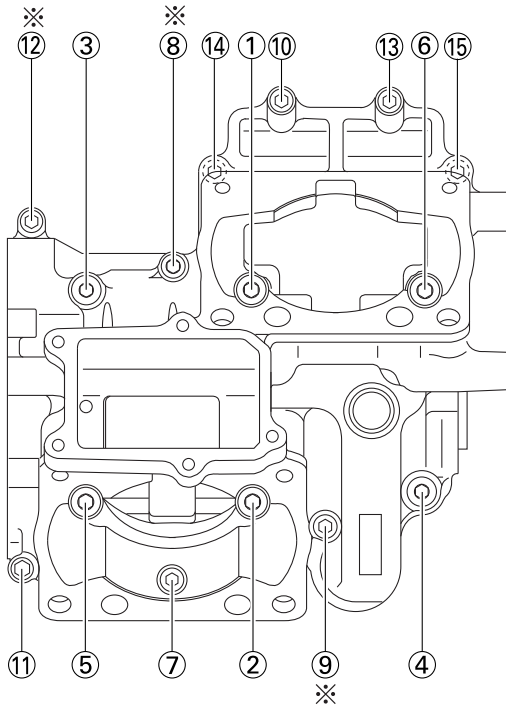


Part to be tightened	Thread size	Q'ty	Tightening torque		
			Nm	m•kg	ft•lb
Spark plug	M14S × 1.25	2	19	1.9	13
Cylinder head (bolt)	M 6 × 1.0	12	11	1.1	8.0
Cylinder (nut)	M 8 × 1.25	8	20	2.0	14
(stud)	M 8 × 1.25	8	15	1.5	11
Power valve:					
Cover	M 5 × 0.8	8	4	0.4	2.9
Holder (power valve)	M 5 × 0.8	2	9	0.9	6.5
Pulley	M 5 × 0.8	2	4	0.4	2.9
Cable stay	M 5 × 0.8	4	7	0.7	5.1
Air bleeding bolt (cylinder)	M 6 × 1.0	2	12	1.2	8.7
Balance weight gear	M14 × 1.0	1	50	5.0	36
Water pump housing cover	M 6 × 1.0	4	11	1.1	8.0
Air bleeding bolt (water pump)	M 6 × 1.0	1	11	1.1	8.0
Radiator	M 6 × 1.0	3	7	0.7	5.1
Radiator and thermo unit	M16 × 1.5	1	11	1.1	8.0
Radiator hose clamp	—	6	2	0.2	1.4
Oil pump cover	M 5 × 0.8	3	8	0.8	5.8
Oil strainer	M 6 × 1.0	4	7	0.7	5.1
Carburetor joint	M 6 × 1.0	9	11	1.1	8.0
Clamp (carburetor joint)	M 4 × 0.7	2	2	0.2	1.4
Reed valve	M 3 × 0.5	12	1	0.1	0.7
Mixing chamber top	M 4 × 0.7	2	2	0.2	1.4
Exhaust pipe	M 8 × 1.25	2	21	2.1	15
Silencer	M 6 × 1.0	4	11	1.1	8.0
Crankcase	M 8 × 1.25	6			
Crankcase	M 6 × 1.0	9	Refer to NOTE		
Transmission housing	M 6 × 1.0	6	16	1.6	11
Oil check bolt	M 6 × 1.0	1	9	0.9	6.5
Oil drain bolt	M12 × 1.25	1	23	2.3	17
Crankcase cover (right)	M 6 × 1.0	10	11	1.1	8.0
Crankcase cover (left)	M 6 × 1.0	3	11	1.1	8.0
Primary drive gear	M10 × 1.25	1	55	5.5	40
Clutch boss	M20 × 1.0	1	75	7.5	54
Clutch spring	M 6 × 1.0	6	9	0.9	6.5
Push rod adjuster	M 6 × 1.0	1	6	0.6	4.3
Seat plate (push lever)	M 5 × 0.8	1	7	0.7	5.1
Clutch cable holder	M 6 × 1.0	2	8	0.8	5.8
Bearing plate cover	M 6 × 1.0	3	10	1.0	7.2
Oil seal plate cover	M 5 × 0.8	2	7	0.7	5.1
Drive sprocket	M20 × 1.0	1	75	7.5	54
Bearing plate cover (shift cam)	M 5 × 0.8	1	4	0.4	2.9
Segment	M 8 × 1.25	1	23	2.3	17
Shift guide	M 6 × 1.0	2	11	1.1	8.0
Shift lever adjuster and locknut	M 6 × 1.0	1	9	0.9	6.5
Stopper bolt (torsion spring)	M 8 × 1.25	1	8	0.8	5.8
Shift arm	M 6 × 1.0	1	14	1.4	10



Part to be tightened	Thread size	Q'ty	Tightening torque		
			Nm	m•kg	ft•lb
Joint rod 1 and shift rod	M 6 × 1.0	1	9	0.9	6.5
Joint rod 2 and shift rod	M 6 × 1.0	1	9	0.9	6.5
Joint rod 1,2	M 6 × 1.0	2	11	1.1	8.0
Shift pedal pivot bolt	M 8 × 1.25	1	22	2.2	16
Front pedal	M 6 × 1.0	1	10	1.0	7.2

Crankcase tightening sequence



CAUTION:

The M6 bolt comes in two lengths. Use the correct one for installation.

$l=30$ mm (1.18 in) (green) ⑦ ⑩ ⑪ ⑬ ⑭ ⑮

Mark ※: $l=35$ mm (1.38 in) (silver) ⑧ ⑨ ⑫

NOTE:

Tighten all bolts in 2 steps as follows and be sure to tighten in numbered order as shown.

•First: ①~⑥ (M8) 11 Nm (1.1 m•kg, 8.0 ft•lb)

⑦~⑮ (M6) 6 Nm (0.6 m•kg, 4.3 ft•lb)

•Final: ①~⑥ (M8) 26 Nm (2.6 m•kg, 19 ft•lb)

⑦~⑮ (M6) 11 Nm (1.1 m•kg, 8.0 ft•lb)



EC212201

CHASSIS

Item	Standard	Limit
Steering system: Steering bearing type	Taper roller bearing	...
Front suspension: Front fork travel Fork spring free length Spring rate, STD Optional spring Oil capacity Oil level <Min.-Max.> (From top of outer tube with inner tube and damper rod fully compressed without spring.) Oil grade Inner tube outer diameter Front fork top end	113 mm (4.45 in) 212.5 mm (8.37 in) K=7.00 N/mm (0.700 kg/mm, 39 lb/in) No 386 cm ³ (13.6 Imp oz, 13.1 US oz) 135 mm (5.31 in) 80~140 mm (3.15~5.51 in) Suspension oil "01" 41 mm (1.61 in) 13 mm (0.51 in)	... ... 210.5 mm (8.29 in)
Rear suspension: Shock absorber travel Spring free length Fitting length <Min.-Max.> Spring rate, STD Optional spring Enclosed gas pressure	53 mm (2.09 in) 150 mm (5.91 in) 137 mm (5.39 in) 133~142 mm (5.24~5.59 in) K=72 N/mm (7.2 kg/mm, 403 lb/in) No 1,200 kPa (12 kg/cm ³ , 171 psi)	... ... ... ... ... ... ... ...
Swingarm: Swingarm free play limit End Side clearance	... ... ...	1.0 mm (0.04 in) 0.05~0.35 mm (0.002~0.014 in)
Wheel: Front wheel type Rear wheel type Front rim size/Material Rear rim size/Material Wheel runout limit: Radial Lateral	Cast wheel Cast wheel MT 3.75×17/Magnesium MT 5.50×17/Magnesium ... ... ...	... ... ... ... 1.0 mm (0.04 in) 0.5 mm (0.02 in)
Drive chain Type/Manufacturer Number of links Chain slack Chain length (10 links)	RKGB520TRU/RK EXCEL 109 links + joint 40~50 mm (1.6~2.0 in) ...	... ... ... 150.1 mm (5.909 in)

MAINTENANCE SPECIFICATIONS

SPEC



Item	Standard	Limit
Front disc brake: Disc outside dia. × Thickness Pad thickness Master cylinder inside dia. Caliper cylinder inside dia. Brake fluid type	298×5.0 mm (11.73×0.20 in) 5.3 mm (0.21 in) 15.87 mm (0.625 in) 33.96 + 30.23 mm (1.337 + 1.190 in) DOT #4	... 1.0 mm (0.04 in)
Rear disc brake: Disc outside dia. × Thickness Deflection limit Pad thickness Master cylinder inside dia. Caliper cylinder inside dia. Brake fluid type	185×4.0 mm (7.28×0.16 in) ... 4.0 mm (0.16 in) 12.7 mm (0.500 in) 25.4 mm (1.000 in) DOT #4	... 0.15 mm (0.006 in) 1.0 mm (0.04 in)
Brake lever & brake pedal: Brake pedal position Clutch lever free play (at lever pivot) Throttle grip free play	148~152 mm (5.8~6.0 in) 2~3 mm (0.08~0.12 in) 2~4 mm (0.08~0.16 in)	... ... ...

MAINTENANCE SPECIFICATIONS

SPEC



	Part to be tightened	Thread size	Q'ty	Tightening torque		
				Nm	m•kg	ft•lb
Δ	Handle crown and outer tube	M 8 × 1.25	2	20	2.0	14
Δ	Under bracket and outer tube	M 8 × 1.25	4	23	2.3	17
Δ	Steering shaft and steering shaft nut	M22 × 1.0	1	80	8.0	58
Δ	Handlebar and outer tube	M 6 × 1.0	4	7	0.7	5.1
	Steering ring nut	M25 × 1.0	1	Refer to NOTE		
	Steering damper and fame	M 8 × 1.25	1	23	2.3	17
	Steering damper and damper bracket	M 6 × 1.0	1	5	0.5	3.6
Δ	Steering damper stay and outer tube	M 6 × 1.0	1	10	1.0	7.2
	Steering damper stay and pin	M 5 × 0.8	1	5	0.5	3.6
	Steering stopper bolt and locknut	M 6 × 1.0	2	11	1.1	8.0
	Fuel tank fitting bolt and locknut	M 8 × 1.25	1	20	2.0	14
	Clutch lever holder	M 5 × 0.8	2	5	0.5	3.6
Δ	Front master cylinder and master cylinder bracket	M 6 × 1.0	2	8	0.8	5.8
	Front brake reservoir tank and stay	M 6 × 1.0	1	5	0.5	3.6
	Brake lever (bolt)	M 6 × 1.0	1	1	0.1	0.7
	Brake lever (nut)	M 6 × 1.0	1	6	0.6	4.3
	Main switch and handleber	M 4 × 0.7	2	2	0.2	1.4
	Front fork and cap bolt	M44 × 1.0	2	23	2.3	17
	Front fork and damper rod	M12 × 1.25	2	40	4.0	29
	Cap bolt and damper rod	M12 × 1.25	2	29	2.9	21
	Front fork and front fender	M 6 × 1.0	4	8	0.8	5.8
	Brake hose holder and swingarm	M 6 × 1.0	2	8	0.8	5.8
Δ	Brake hose (front and rear) and union bolt (master cylinder)	M10 × 1.25	2	30	3.0	22
Δ	Brake hose (front and rear) and adapter	M10 × 1.25	3	14	1.4	10
Δ	Brake caliper (front and rear) and adapter	M10 × 1.25	3	26	2.6	19
Δ	Front brake caliper and front fork	M10 × 1.25	4	35	3.5	25
Δ	Front master cylinder and bleed screw	M 8 × 1.25	1	6	0.6	4.3
Δ	Brake caliper (front and rear) and pad pin	M10 × 1.25	3	18	1.8	13
Δ	Brake caliper (front and rear) and bleed screw	M 8 × 1.25	4	6	0.6	4.3
Δ	Front wheel axle and nut	M18 × 1.5	1	80	8.0	58
	Front wheel axle holder	M 6 × 1.0	4	11	1.1	8.0
Δ	Front brake disc and wheel hub	M 8 × 1.25	12	20	2.0	14
Δ	Footrest bracket and frame	M 8 × 1.25	4	20	2.0	14
	Footrest bracket and plate (left and right)	M 5 × 0.8	4	8	0.8	5.8
Δ	Footrest and footrest bracket	M 6 × 1.0	2	10	1.0	7.2
Δ	Brake pedal and master cylinder	M 6 × 1.0	1	12	1.2	8.7
Δ	Rear master cylinder and footrest bracket	M 8 × 1.25	2	20	2.0	14
	Rear master cylinder and reservoir connector	M 4 × 0.7	1	2	0.2	1.4
	Rear brake reservoir tank and bolt (rear frame)	M 6 × 1.0	1	7	0.7	5.1

NOTE:

1. First, tighten the ring nut approximately 46 Nm (4.6 m•kg, 33 ft•lb) by using the ring nut wrench, then loosen the ring nut one turn.
2. Retighten the ring nut 1 Nm (0.1 m•kg, 0.7 ft•lb).

MAINTENANCE SPECIFICATIONS

SPEC



	Part to be tightened	Thread size	Q'ty	Tightening torque		
				Nm	m•kg	ft•lb
Δ	Rear brake caliper and caliper bracket	M 8 × 1.25	2	23	2.3	17
Δ	Rear wheel axle and nut	M18 × 1.5	1	80	8.0	58
Δ	Driven sprocket and sprocket damper	M 8 × 1.25	5	32	3.2	23
Δ	Rear brake disc and wheel hub	M 8 × 1.25	3	23	2.3	17
	Chain puller adjust bolt and locknut	M 8 × 1.25	2	16	1.6	11
	Chain puller adjust bolt	M 8 × 1.25	2	2	0.2	1.4
	Engine mounting:					
Δ	Engine and frame (upper)	M10 × 1.25	1	30	3.0	22
Δ	Engine and frame (lower)	M10 × 1.25	1	30	3.0	22
Δ	Engine bracket and frame	M10 × 1.25	2	30	3.0	22
Δ	Engine bracket and engine	M 8 × 1.25	4	23	2.3	17
Δ	Pinch bolt (engine mounting collar)	M 6 × 1.0	2	11	1.1	8.0
	Engine mounting adjust bolt	M16 × 1.0	2	8	0.8	5.8
	Pivot adjust bolt	M25 × 1.0	1	5	0.5	3.6
Δ	Pivot shaft and nut	M18 × 1.5	1	115	11.5	85
Δ	Relay arm and frame	M10 × 1.25	1	34	3.4	24
Δ	Relay arm and connecting rod	M10 × 1.25	1	34	3.4	24
Δ	Connecting rod and swingarm	M10 × 1.25	1	34	3.4	24
Δ	Rear shock absorber and upper bracket	M10 × 1.25	1	34	3.4	24
Δ	Rear shock absorber and relay arm	M10 × 1.25	1	34	3.4	24
	Seal guard and swingarm	M 6 × 1.0	4	8	0.8	5.8
	Swingarm and hook	M 6 × 1.0	2	10	1.0	7.2
	Swingarm and chain guard	M 6 × 1.0	2	8	0.8	5.8
	Rear shock absorber and locknut (preload)	M52 × 1.5	1	20	2.0	14
Δ	Seat height adjuster and locknut	M22 × 1.0	1	38	3.8	27
Δ	Seat height adjuster and upper bracket	M10 × 1.25	1	40	4.0	29
	Radiator stay and frame	M 6 × 1.0	1	8	0.8	5.8
	Cowling stay bracket and frame	M 6 × 1.0	2	8	0.8	5.8
	Cowling stay and cowling stay bracket	M 6 × 1.0	2	8	0.8	5.8
	Cowling stay (left and right) and frame	M 6 × 1.0	2	8	0.8	5.8
	Upper cowl and screen	M 4 × 0.7	6	4	0.4	2.9
Δ	Fuel tank and fuel cock	M 6 × 1.0	2	7	0.7	5.1
	Seat and rear frame	M 6 × 1.0	4	8	0.8	5.8
Δ	Rear frame and frame	M 6 × 1.0	4	11	1.1	8.0

NOTE:

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



EC212300

ELECTRICAL

Item	Standard	Limit
Ignition system: Ignition timing (B.T.D.C) Advancer type	2.4 mm (0.094 in) Electrical	......
CDI: Magneto-model/Manufacturer Source coil resistance (color) Pickup coil resistance (left cylinder) (color) (right cylinder) CDI unit-model/Manufacturer	5KE-00 (TLGZ06)/DENSO 2.3~3.5 Ω at 20°C (68°F) (White-White) 94~140 Ω at 20°C (68°F) (White/Black-White/Blue) 94~140 Ω at 20°C (68°F) (White/Black-White/Green) 5KE-10/DENSO	...............
Ignition coil: Model/Manufacturer (left cylinder) (right cylinder) Minimum spark gap Primary winding resistance Secondary winding resistance	TJ0285/DENSO TJ0277/DENSO 5 mm (0.20 in) 0.14~0.18 Ω at 20°C (68°F) 5.0~7.4 kΩ at 20°C (68°F)	... ... ... ... ...
Battery: Model/Manufacturer Capacity Voltage when charged	PE12V0.8/ JAPAN STORAGE BATTERY 12V0.8Ah 12.8V or more	.........
Fuel pump: Model/Manufacturer Coil resistance	UC-Z6V/MITSUBISHI 1~3 Ω at 20°C (68°F)	... ...
Fuel pump relay: Model/Manufacturer Coil resistance	1UY-92/MATSUSHITADENKO 72~88 Ω at 20°C (68°F)	... ...
Circuit breaker: Type Main	Fuse 10A × 1	......

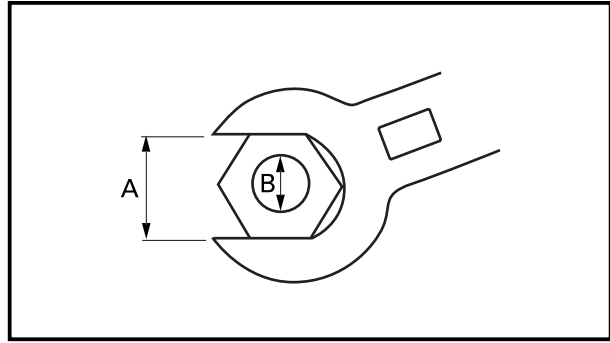
Part to be tightened	Thread size	Q'ty	Tightening torque		
			Nm	m•kg	ft•lb
Stator	M 6 × 1.0	2	7	0.7	5.1
Rotor	M12 × 1.25	1	53	5.3	38
CDI unit	M 6 × 1.0	2	8	0.8	5.8
Servomotor pulley	M 5 × 0.8	1	8	0.8	5.8
Servomotor	M 6 × 1.0	2	7	0.7	5.1
Voltage regulator	M 6 × 1.0	2	7	0.7	5.1
Fuel pump and bracket	M 5 × 0.8	1	5	0.5	3.6



EC220001

GENERAL TORQUE SPECIFICATIONS

This chart specifies torque for standard fasteners with standard I.S.O. pitch threads. Torque specifications for special components or assemblies are included in the applicable sections of this book. To avoid warpage, tighten multi-fastener assemblies in a crisscross fashion, in progressive stages, until full torque is reached. Unless otherwise specified, torque specifications call for clean, dry threads. Components should be at room temperature.



A: Distance across flats
B: Outside thread diameter

A (Nut)	B (Bolt)	TORQUE SPECIFICATION		
		Nm	m•kg	ft•lb
10 mm	6 mm	6	0.6	4.3
12 mm	8 mm	15	1.5	11
14 mm	10 mm	30	3.0	22
17 mm	12 mm	55	5.5	40
19 mm	14 mm	85	8.5	61
22 mm	16 mm	130	13	94

EC230000

DEFINITION OF UNITS

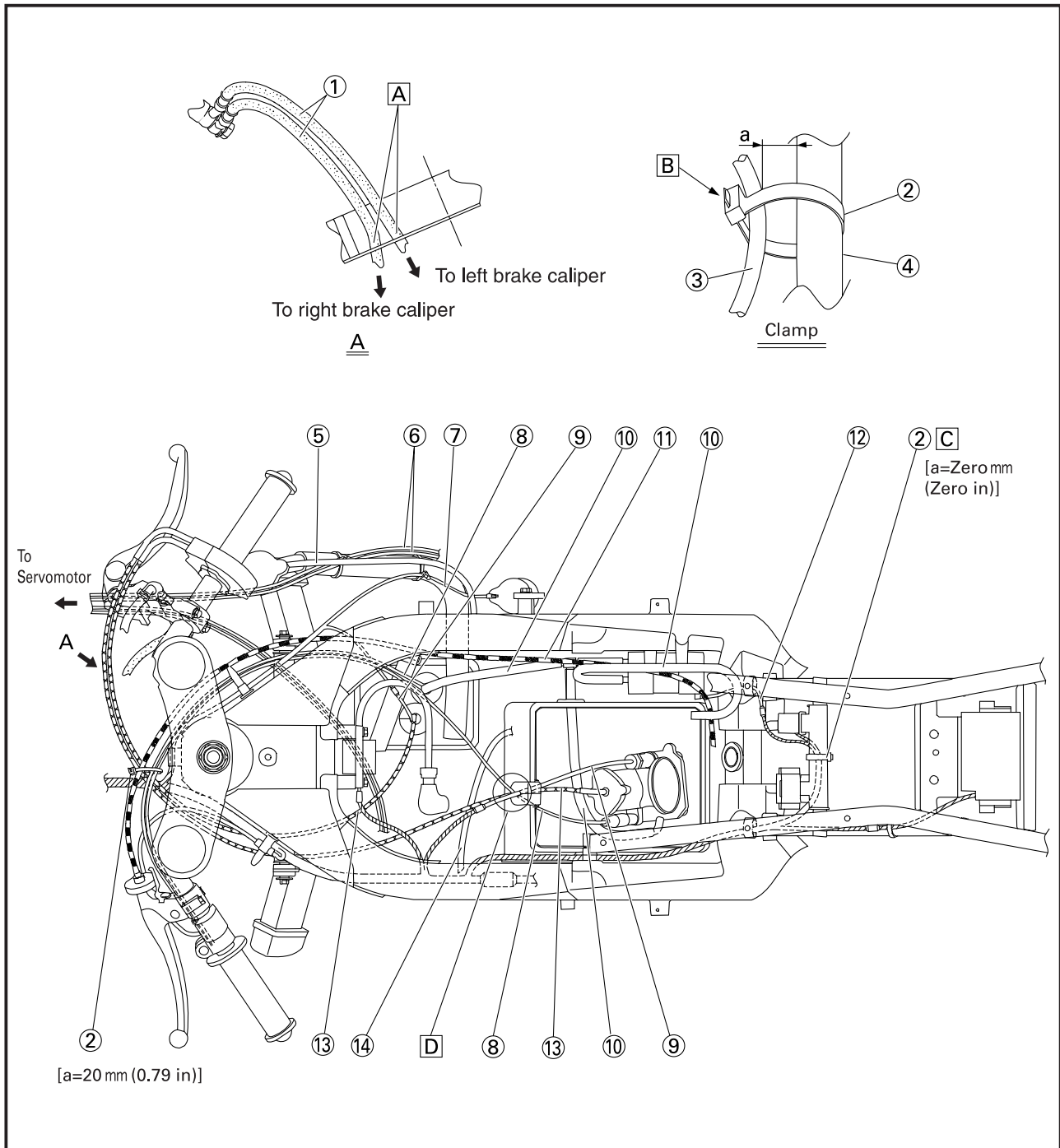
Unit	Read	Definition	Measure
mm	millimeter	10^{-3} meter	Length
cm	centimeter	10^{-2} meter	Length
kg	kilogram	10^3 gram	Weight
N	Newton	$1 \text{ kg} \times \text{m}/\text{sec}^2$	Force
Nm	Newton meter	$\text{N} \times \text{m}$	Torque
m•kg	Meter kilogram	$\text{m} \times \text{kg}$	Torque
Pa	Pascal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



EC240000

CABLE ROUTING DIAGRAM

- | | |
|------------------------------------|--|
| ① Brake hose | ⑬ Throttle cable |
| ② Clamp | ⑭ Transmission oil breather hose |
| ③ Cable | A Pass the brake hose through the hole in the inner fender. |
| ④ Frame | B Cut the clamp so that the protruding portion is less than 5 mm (0.20 in). |
| ⑤ Radiator breather hose | C Install the clamp with its ends facing backward. |
| ⑥ YPVS cable 1, 2 (right cylinder) | D Position the cable from bottom to top in the following order. |
| ⑦ Ignition coil lead | • Starter cable |
| ⑧ Starter cable | • Throttle cable |
| ⑨ Solenoid valve lead | • Solenoid valve lead |
| ⑩ Fuel hose | |
| ⑪ Clutch cable | |
| ⑫ Fuel pump lead | |



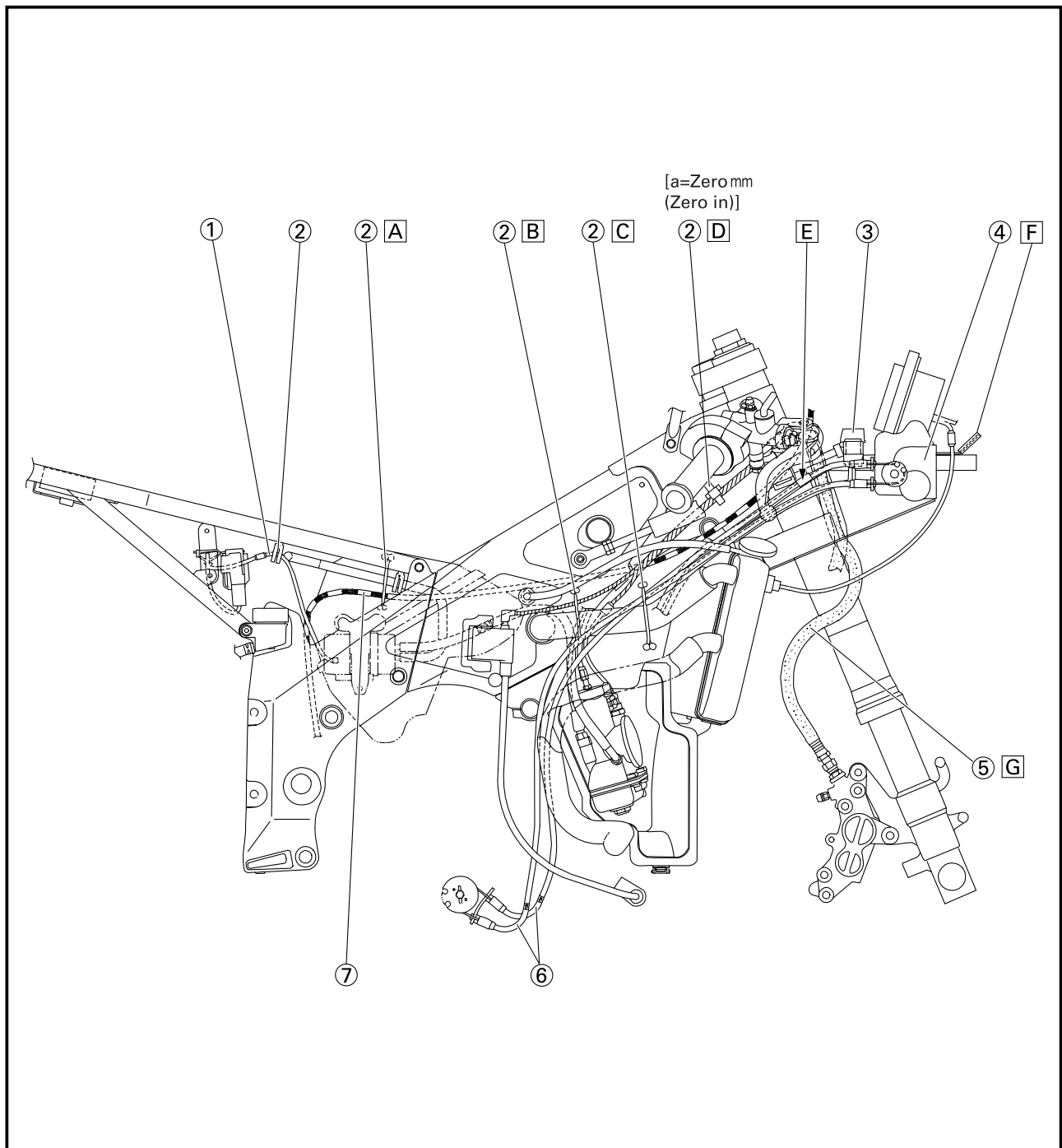
CABLE ROUTING DIAGRAM

SPEC



- ① Fuel pump lead
- ② Clamp
- ③ Fuse holder
- ④ Servomotor
- ⑤ Front brake hose (right)
- ⑥ YPVS cable 1, 2 (right cylinder)
- ⑦ Clutch cable

- Ⓐ Clamp the fuel hose and clutch cable. Position the upside ends of the clamp inside of the seat rail.
- Ⓑ Clamp the radiator hose 3 and ignition coil lead.
- Ⓒ Clamp the radiator hose 3 and YPVS cable (right cylinder).
- Ⓓ Do not cut the end of the clamp.
- Ⓔ Connect the left cylinder YPVS cables (silver cables) to the inner YPVS servomotor pulley and right cylinder YPVS cables (black cables) to the outer. The sleeved cables must be connected to the top side (open side) of the YPVS servomotor.
- Ⓕ Align the end of the cover with that of the meter stay.
- Ⓖ Be sure the brake hose is not twisted.



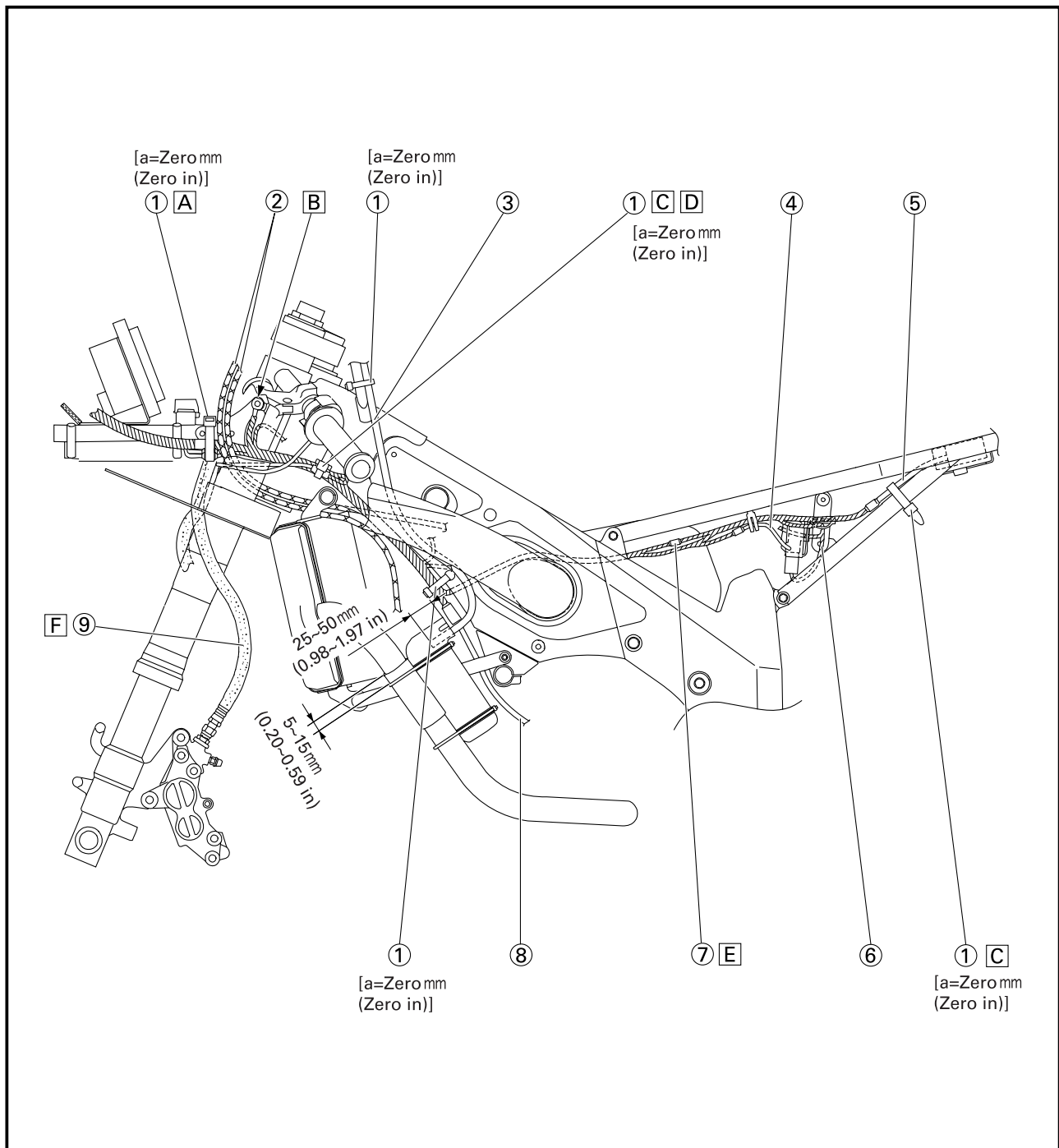
CABLE ROUTING DIAGRAM

SPEC



- ① Clamp
- ② Throttle cable
- ③ Fuel tank breather hose
- ④ Fuel pump stop switch lead
- ⑤ Battery lead
- ⑥ Fuel pump relay lead
- ⑦ Power supply coupler
- ⑧ CDI magneto lead
- ⑨ Front brake hose (left)

- Ⓐ Clamp the wireharness together with couplers of the fuse lead under the cowling stay mounting bolt so that the tape on the wireharness aligns with the bolt.
- Ⓑ Fasten the primary ground lead together with the cowling stay bracket mounting bolt.
- Ⓒ Do not cut the end of the clamp.
- Ⓓ Clamp the couplers of the main switch lead together with the wireharness.
- Ⓔ Disconnect the power supply coupler except when the engine is started or when electric parts are checked.
- Ⓕ Be sure the brake hose is not twisted.



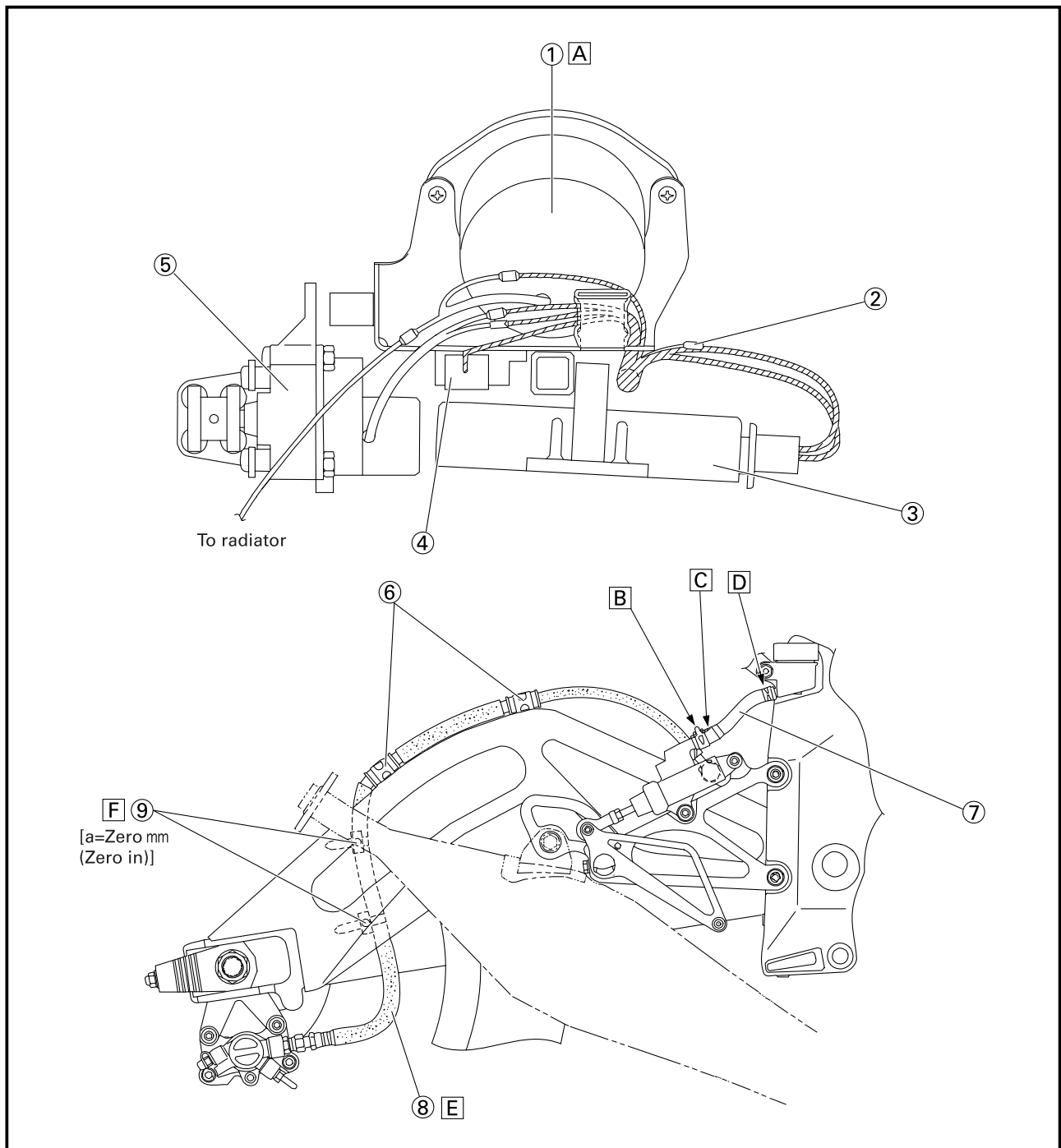
CABLE ROUTING DIAGRAM

SPEC



- ① Tachometer assembly
- ② Coupler for speed shift
- ③ CDI unit
- ④ Voltage regulator
- ⑤ Servomotor
- ⑥ Brake hose holder
- ⑦ Reservoir hose
- ⑧ Rear brake hose
- ⑨ Clamp

- A Install the tachometer assembly with its figures standing upright.
- B Do not make the clamp grip face outside of the chassis.
- C Position the reservoir hose with its paint mark upward.
- D Make the clamp grip face inside of the chassis.
- E Be sure the brake hose is not twisted.
- F Do not cut the end of the clamp.



EC300000

REGULAR INSPECTION AND ADJUSTMENTS

EC310070

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.

NOTE:

Replace earlier depending on the operating condition.

Item	After break-in	Every race	Every 500km	Every 1,000 km	As re-quired	Remarks
PISTON Inspect and clean Replace	●	●	●		●	Inspect crack
PISTON PIN, SMALL END BEARING Inspect Replace	●	●	●		●	
PISTON RING Inspect Replace	●	●	●		●	Check ring end gap
CYLINDER HEAD Inspect and clean Retighten	● ●	● ●				Remove carbon Check O-ring
CYLINDER Inspect and clean Replace Retighten	● ●	● ●		(3,000 km) ●	●	Inspect score marks Inspect wear
YPVS Inspect Retighten	● ●	● ●				
CLUTCH Inspect and adjust Replace	●	●			●	Inspect housing, friction plate, clutch plate and spring
TRANSMISSION Replace oil Inspect transmission Replace bearing	●		●		● ●	Castrol R30
SHIFT FORK, SHIFT CAM, GUIDE BAR Inspect					●	Inspect wear
ROTOR NUT Retighten				●		
MUFFLER Inspect Clean	●	●			●	Inspect crack
CRANK Inspect and replace				(1,500 km) ●	●	
CARBURETOR Inspect, adjust and clean	●	●				Inspect jet needle clip groove

MAINTENANCE INTERVALS

INSP
ADJ



Item	After break-in	Every race	Every 500km	Every 1,000 km	As required	Remarks
SPARK PLUG Inspect and clean Replace	●	●			●	
PLUG CAP Inspect and replace				(1,500 km) ●	●	
COOLING SYSTEM Check cooling level and leakage Check radiator cap operation Replace cooling water Replace hoses	●	●			● ● ●	Use soft water
OUTSIDE NUTS AND BOLTS Retighten	●	●				Refer to "STARTING AND BREAK-IN" section in the CHAPTER 1.
OIL PUMP STRAINER Clean	●		●			
REED VALVE Inspect Replace	●	●			●	
FRAME Clean and inspect	●	●				
FUEL TANK, COCK Clean and inspect	●	●				
BRAKES Adjust lever position and pedal position Check brake disc surface Check brake fluid level and leakage Retighten brake disc bolts, caliper bolts and master cylinder bolts Replace pads Replace brake fluid	● ● ● ●	● ● ●			● ●	Every one year
FRONT FORKS Inspect and adjust Replace oil Replace oil seal	●	●		●	●	Suspension oil "01"
REAR SHOCK ABSORBER Inspect and adjust Lube Retighten	● ●	● ●			(After rain race) ●	Molybdenum disulfide grease
CHAIN GUARD Replace					●	
SWINGARM Inspect and retighten	●	●				
RELAY ARM, CONNECTING ROD Inspect and retighten	●	●				
STEERING HEAD Inspect free play and retighten Clean and lube Replace bearings	●	●		●	●	Lithium base grease

3

MAINTENANCE INTERVALS



Item	After break-in	Every race	Every 500km	Every 1,000 km	As required	Remarks
TIRE, WHEELS Inspect air pressure, wheel run-out and tire wear Inspect bearings Replace bearings Lubricate	●	●			●	Lithium base grease
DRIVE CHAIN Lubricate, slack, alignment Replace	●	●		●		Use chain lube Chain slack: 40~50 mm (1.6~2.0 in)
DRIVE, DRIVEN SPROCKET Inspect and replace					●	Inspect wear
DRIVEN SPROCKET DAMPER Inspect and retighten Replace	●	●			●	
THROTTLE, CONTROL CABLE Check routing and connection Lubricate	●	●				Yamaha cable lube or SAE 10W30 motor oil
BATTERY Check battery voltage Replace	●	●			●	12.5V or more

EC320010

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.

NOTE:

- The brake disc is coated with a rust inhibitor. Before pre-operation thoroughly remove it using a lacquer thinner.
- For storage, a coolant is used. Before riding the machine remove it with cooling water. Refer to "INFORMATION BEFORE PRE-OPERATION".

EC321020

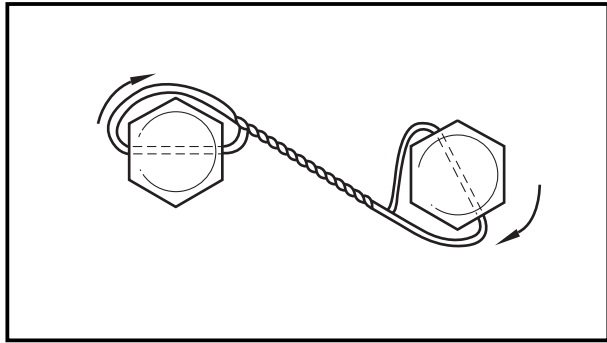
GENERAL INSPECTION AND MAINTENANCE

Item	Routine	Page
Cooling water	Check that cooling water is filled up to the radiator filler cap. Check the cooling system for leakage.	P3-6~9
Fuel	Check that a fresh mixture of oil and gasoline is filled in the fuel tank. Check the fuel line for leakage.	P1-14
Transmission oil	Check that the oil level is correct. Check the crankcase for leakage.	P3-13~15
YPVS	Check operation.	P3-12~13
Gear shifter and clutch	Check that gears can be shifted correctly in order and that the clutch operates smoothly.	P3-9~10
Throttle grip/Housing	Check that the throttle grip operation and free play are correctly adjusted. Lubricate the throttle grip and housing, if necessary.	P3-10~11
Brakes	Check the effect of front and rear brake. Check brake disc surface.	P3-17~22
Chain	Check chain slack and alignment. Check that the chain is lubricated properly.	P3-23~25
Wheels	Check for excessive wear, tire pressure and tire wear.	P3-36
Steering	Check that the handlebars can be turned smoothly and have no excessive play.	P3-37~38
Front forks and rear shock absorber	Check that they operate smoothly and there is no oil leakage.	P3-27~35
Cables (wires)	Check that the clutch and throttle cables move smoothly. Check that they are not caught when the handlebars are turned or when the front forks travel up and down.	P3-39
Muffler	Check that the muffler is tightly mounted and has no cracks.	P3-16
Sprocket	Check that the driven sprocket damper is not loose.	P3-22
Lubrication	Check for smooth operation. Lubricate if necessary.	P3-41
Bolts and nuts	Check the chassis and engine for loose bolts and nuts. Check that the locking wire is correct.	P1-19~20
Lead connectors	Check that the CDI magneto, CDI unit, and ignition coil are connected tightly.	P1-5
Battery	Check the battery voltage.	P3-44~46
Cowling	Check that the cowling is tightly mounted and has no cracks in it. Check that it does not contact other parts by stroking. Check that the screen is clean.	P3-39
Settings	Is the machine set suitably for the condition of the racing course and weather or by taking into account the results of test runs before racing? Are inspection and maintenance completely done?	P7-1~22

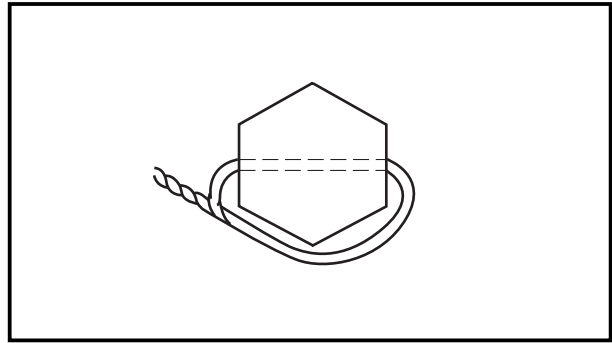


EC340000

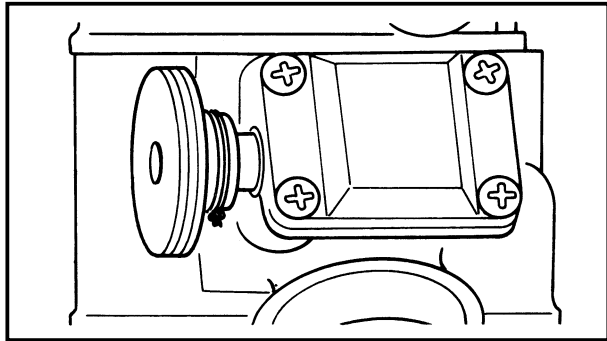
LOCKING WIRE INSTALLATION GUIDE



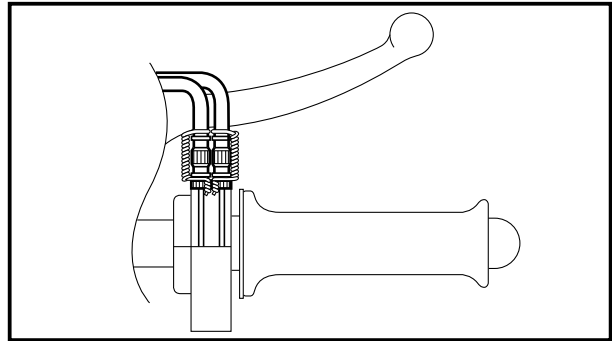
Bolt to bolt



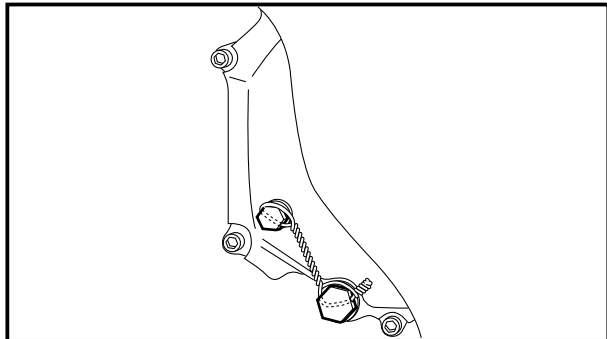
Bolt



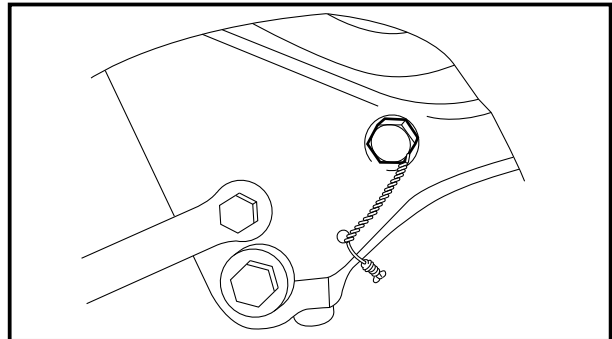
YPVS pulley



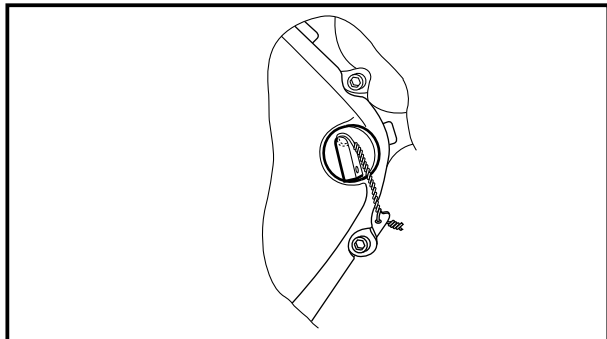
Throttle cable adjuster



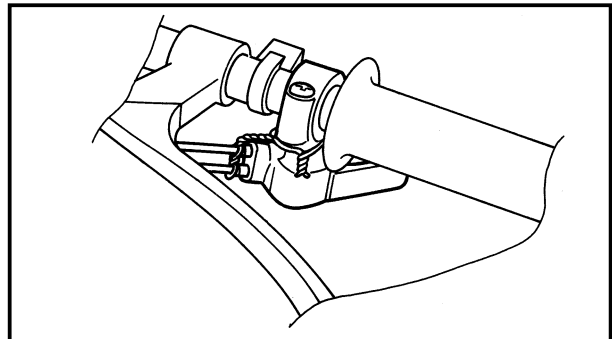
Oil drain bolt and check bolt



Tank rail drain bolt



Oil filler cap



Starter cable

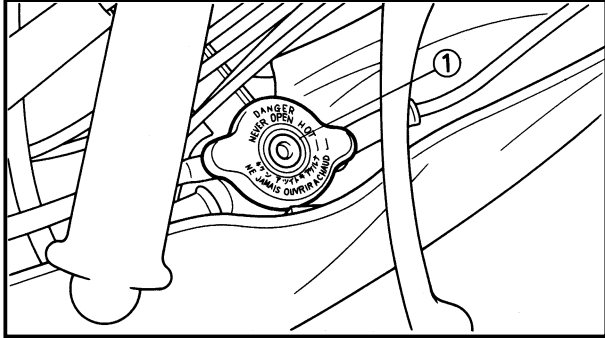


EC350011

ENGINE

CAUTION:

- The cooling system is filled with coolant at the factory to prevent rusting. Be sure to replace coolant with soft water before riding.
- Take care so that coolant does not splash on painted surfaces. If it splashes, wash it away with water.



EC352000

COOLING WATER LEVEL INSPECTION

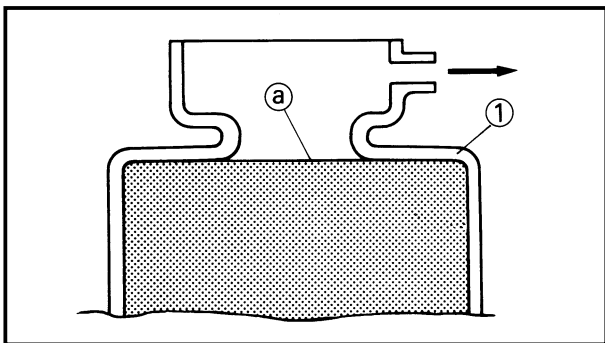
WARNING

Do not remove the radiator cap ①, drain bolt and hoses when the engine and radiator are hot. Scalding hot fluid and steam may be blown out under pressure, which could cause serious injury.

When the engine has cooled, place a thick towel over the radiator cap, slowly rotate the cap counterclockwise to the detent. This procedure allows any residual pressure to escape. When the hissing sound has stopped, press down on the cap while turning counterclockwise and remove it.

CAUTION:

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



1. Place the machine on a level place, and hold it in an upright position.
 2. Remove:
 - Radiator cap
 3. Check:
 - Cooling water level (a)
Cooling water level low → Add cooling water.
- ① Radiator

EC354013

COOLING WATER REPLACEMENT

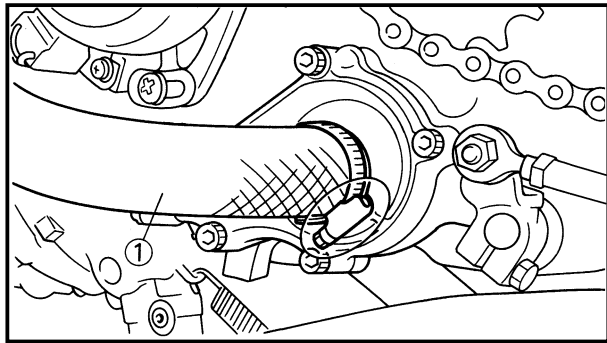
WARNING

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


1. Remove the lower cowl.
2. Place a container under the radiator hose.

COOLING WATER REPLACEMENT

INSP
ADJ



3. Disconnect:
 - Radiator hose 2 ①
4. Remove:
 - Radiator capDrain the cooling water completely.
5. Clean:
 - Cooling systemThoroughly flush the cooling system with clean tap water.
6. Connect:
 - Radiator hose 2

 2 Nm (0.2 m•kg, 1.4 ft•lb)

7. Fill:
 - Radiator
 - EngineTo specified level.

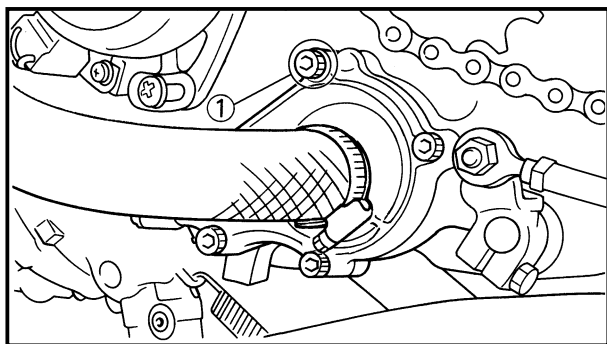
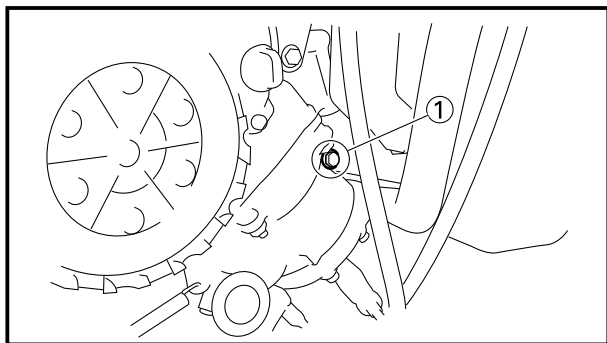
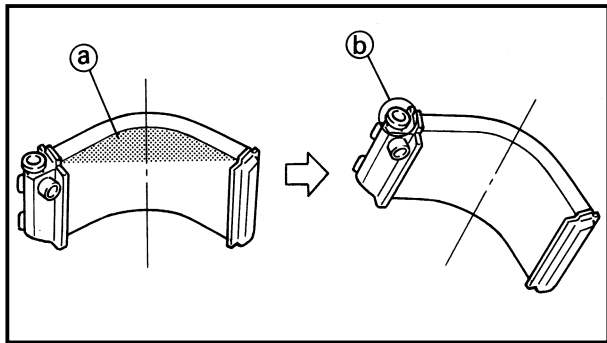


Recommended cooling water:

Soft water

Cooling water capacity:


1.4 L (1.23 Imp qt, 1.48 US qt)




CAUTION:

- When filling the radiator with anti-freeze, tilt the motorcycle so that the filler hole ② is at the highest position. If the radiator is positioned upright, air ① is difficult to escape which may result in excessive engine heating.
- Hard water or salt water is harmful to the engine parts. You may use distilled water, if you can't get soft water.

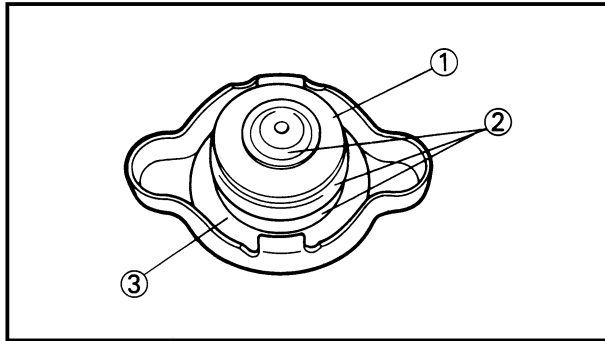
8. Remove:
 - Air bleeding bolt (right cylinder) ①Bleeding the air until coming out the cooling water.
9. Install:
 - Copper washer **New**
 - Air bleeding bolt (right cylinder)

 12 Nm (1.2 m•kg, 8.7 ft•lb)

10. Remove:
 - Air bleeding bolt (water pump) ①Bleeding the air until coming out the cooling water.
11. Install:
 - Copper washer **New**
 - Air bleeding bolt (water pump)

 11 Nm (1.1 m•kg, 8.0 ft•lb)

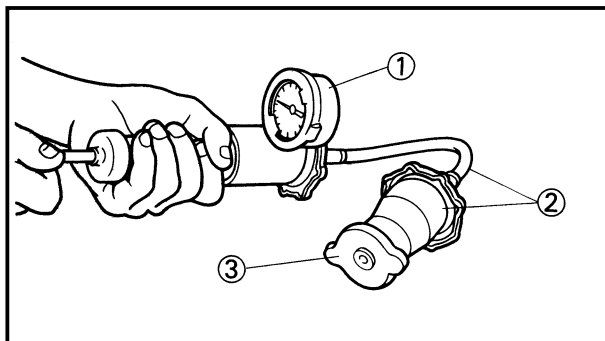
12. Fill:
 - Radiator
 - Engine
 - To specified level.
13. Install:
 - Radiator cap
 - Start the engine and warm it up for a several minute.
14. Check:
 - Cooling water level
 - Cooling water level low → Add cooling water.
15. Install the lower cowl.



EC355000

RADIATOR CAP INSPECTION

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



EC356002

RADIATOR CAP OPENING PRESSURE INSPECTION

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



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

NOTE: _____

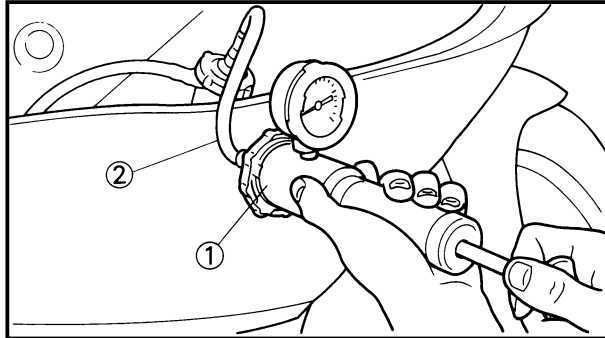
Apply water on the radiator cap seal.

- ③ Radiator cap
2. Apply the specified pressure.



Radiator cap opening pressure:
95~125 kPa (0.95~1.25 kg/cm²,
13.5~17.8 psi)

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



EC357003

COOLING SYSTEM INSPECTION

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



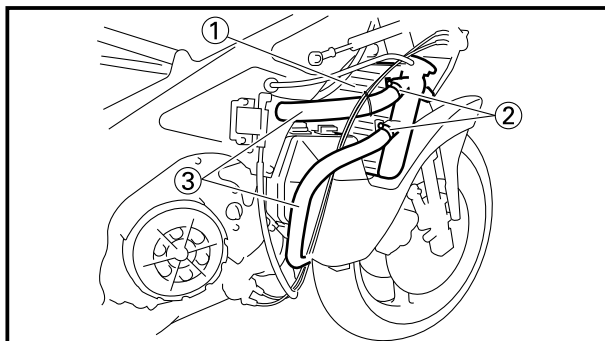
Radiator cap tester:
YU-24460-01/90890-01325
Adapter:
YU-33984/90890-01352

3. Apply the specified pressure.

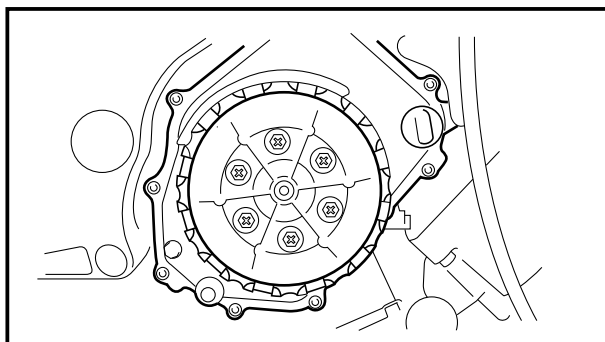


Standard pressure:
180 kPa (1.8 kg/cm², 25.6 psi)

- NOTE:** _____
- Do not apply pressure more than specified pressure.
 - Radiator should be filled fully.



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



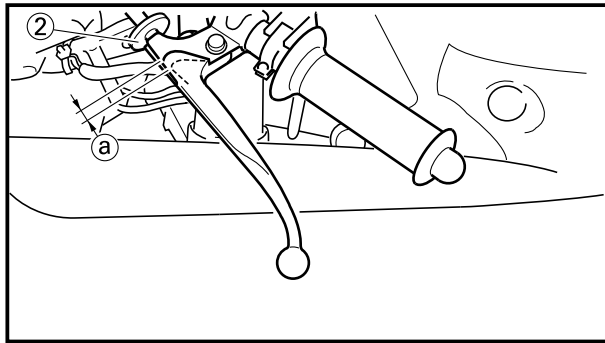
EC358000

CLUTCH CARE

- NOTE:** _____
- This machine is equipped with a dry type clutch. Be sure to clean with solvent or replace if grease or oil contacts either clutch or friction plates.

CLUTCH ADJUSTMENT/ THROTTLE CABLE ADJUSTMENT

INSP
ADJ



EC359001

CLUTCH ADJUSTMENT

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



Clutch lever free play (a):
2~3 mm (0.08~0.12 in)

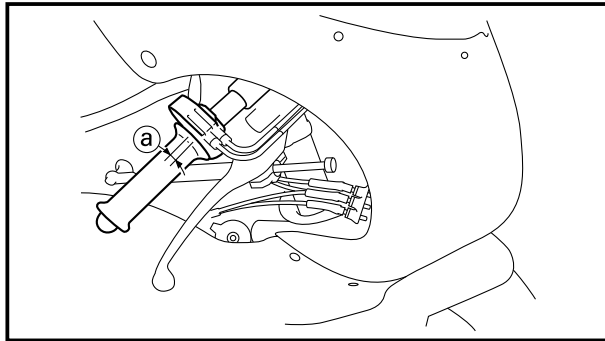
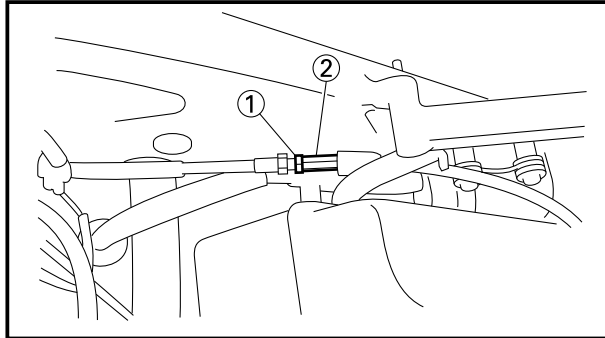
2. Adjust:
 - Clutch lever free play

Clutch lever free play adjustment steps:

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

NOTE:

After adjustment, check proper operation of clutch lever.



EC35A040

THROTTLE CABLE ADJUSTMENT

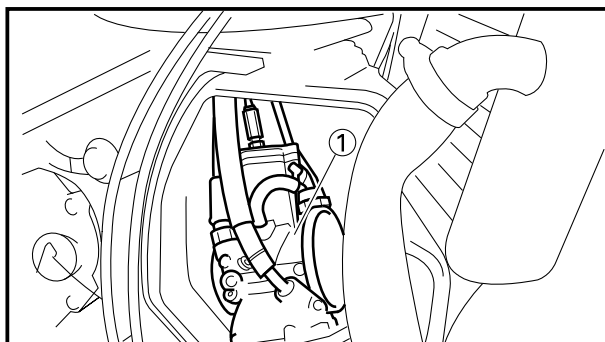
1. Check:
 - Throttle grip free play (a)Out of specification → Adjust.

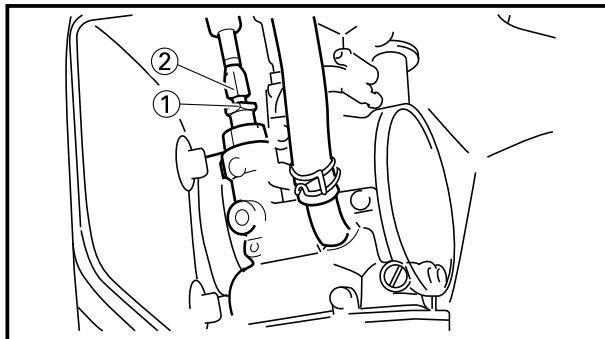
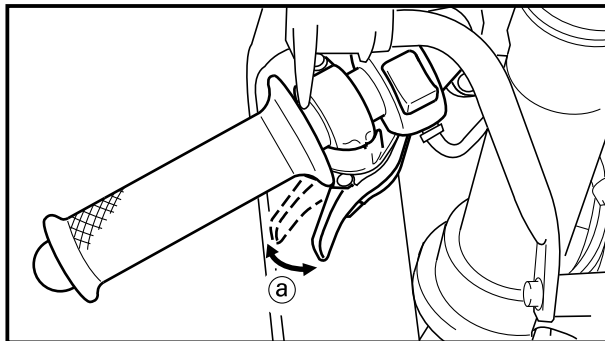
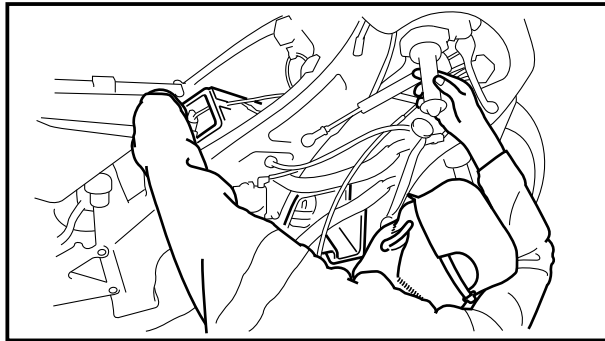
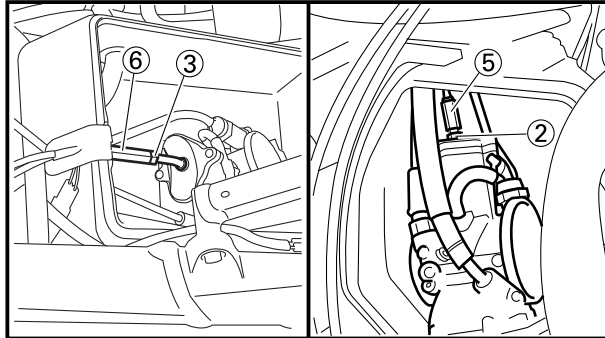
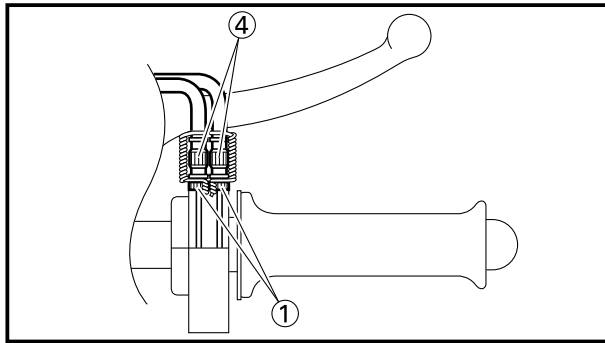


Throttle grip free play (a):
2~4 mm (0.08~0.16 in)

2. Remove:
 - Lower cowl
 - Fuel tank
 - Induction guide (right cylinder)

3. Loosen the screw (right carburetor joint clamp), then take out the carburetor (1).





4. Adjust:
- Throttle grip free play

Throttle grip free play adjustment steps:

- Loosen the locknuts ①, ②, ③.
- Turn the adjusters ④, ⑤, ⑥ fully in.
- Turn out the right carburetor adjuster ⑤ until the specified free play is obtained.
- Tighten the right carburetor locknut ②.
- Turn out the left carburetor adjuster ⑥ until the left throttle valve moves together with the right throttle valve.

NOTE:

- When adjusting left throttle cable, watch the right throttle valve and touch the left throttle valve.
- After adjusting the throttle cables, open the throttle grip and check that both throttle valves are completely open.
- Tighten the left carburetor locknut ③.
- Tighten the locknuts ①.

⚠WARNING

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

EC35B002

STARTER CABLE ADJUSTMENT

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

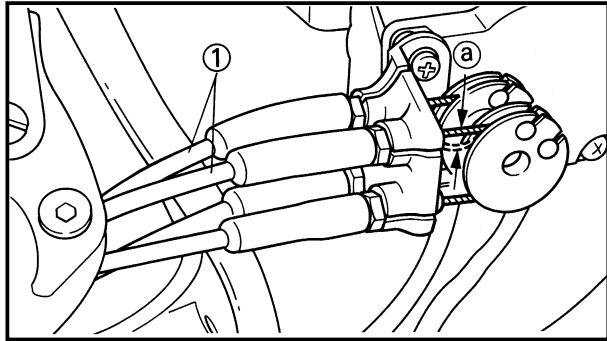


Starter lever free play ①:
5~10 mm (0.20~0.39 in)

2. Adjust:
- Starter lever free play

Starter lever free play adjustment steps:

- Loosen the locknuts ①.
- Turn the adjusters ② until the specified free play is obtained.
- Tighten the locknuts.



EC35D012

YPVS OPEN SIDE CABLE ADJUSTMENT

1. Disconnect the fuel pump coupler to prevent the fuel pump operation.
2. Check:
 - YPVS open side cable free play (a)

Checking steps:

- Move the main switch to "RUN".
- The servomotor will be fully opened.

NOTE:

After the main switch is moved to "RUN", the servomotor will be operated as follows.

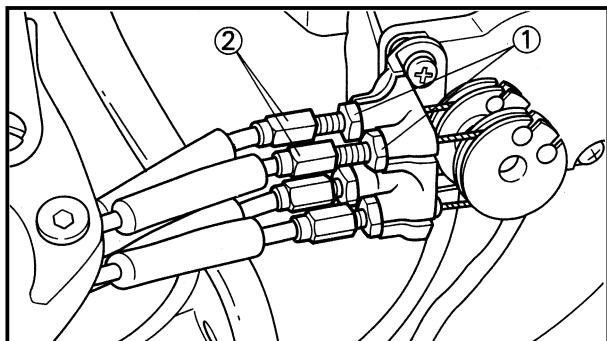
1. The servomotor will be fully closed about 1 second.
2. And then, it will be kept fully opened.

- Check the free play (a) for the YPVS open side cables (1).

Out of specification → Adjust.



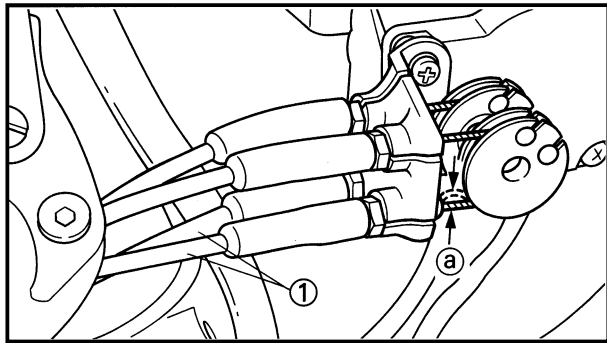
YPVS open side cable free play (a):
2~3 mm (0.08~0.12 in)



3. Adjust:
 - YPVS open side cable free play

Adjusting steps:

- Fully open the servomotor.
- Loosen the locknuts (1).
- Turn the adjusters (2) until the specified free play is obtained.
- Tighten the locknuts.



EC35E011

YPVS CLOSE SIDE CABLE ADJUSTMENT

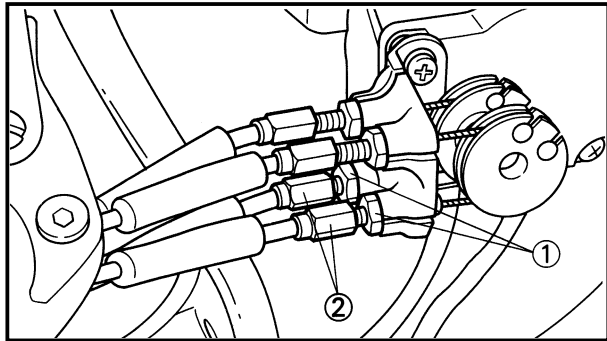
1. Disconnect the fuel pump coupler to prevent the fuel pump operation.
2. Check:
 - YPVS close side cable free play (a)

Checking steps:

- Move the main switch to “RUN”.
 - The servomotor will be fully closed about 1 second.
 - During this 1 second, move the main switch to “OFF”.
 - The servomotor will be kept fully closed.
 - Check the free play (a) for the YPVS close side cables (1).
- Out of specification → Adjust.



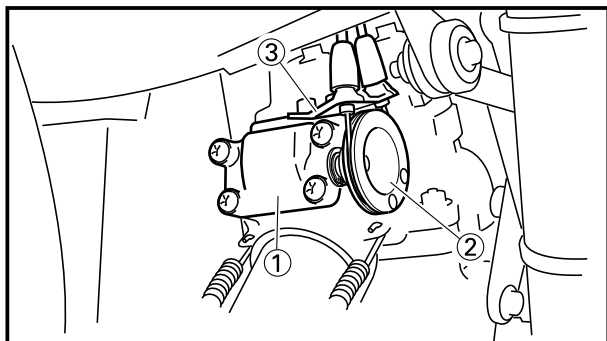
YPVS close side cable free play (a):
2~3 mm (0.08~0.12 in)



3. Adjust:
 - YPVS close side cable free play

Adjusting steps:

- Fully close the servomotor.
- Loosen the locknuts (1).
- Turn the adjusters (2) until the specified free play is obtained.
- Tighten the locknuts.



EC35F000

YPVS COMPONENTS RETIGHTENING

NOTE: Before riding the machine, retighten all YPVS components.

1. Retighten:

- Valve cover (1)

	4 Nm (0.4 m•kg, 2.9 ft•lb)
---	-----------------------------------
- Pulley (2)

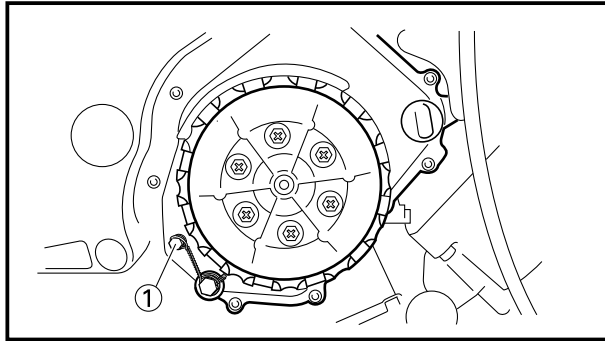
	4 Nm (0.4 m•kg, 2.9 ft•lb)
---	-----------------------------------
- Cable stay (3)

	7 Nm (0.7 m•kg, 5.1 ft•lb)
---	-----------------------------------

EC35H030

TRANSMISSION OIL LEVEL CHECK

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



3. Check:
 - Transmission oil level

Transmission oil level checking steps:

- Remove the oil check bolt ①.
- Inspect the oil level.

NOTE: _____

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

⚠ WARNING _____

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

Oil flows out → Oil level is correct.

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



Recommended oil:
Castrol R30

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



Oil check bolt:
9 Nm (0.9 m•kg, 6.5 ft•lb)

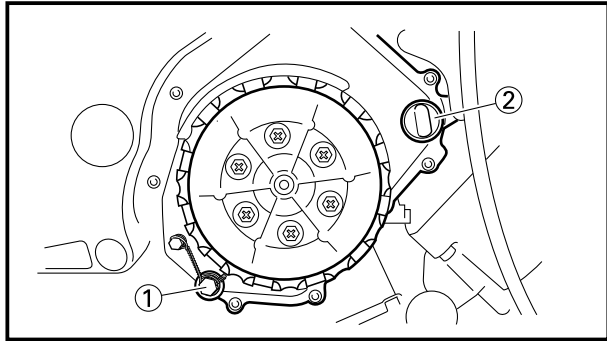
EC35K021

TRANSMISSION 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.
3. Place a suitable container under the engine.

PILOT AIR SCREW ADJUSTMENT

INSP
ADJ



4. Remove:
 - Oil drain bolt ①
 - Oil filler cap ②Drain the transmission oil.
5. Install:
 - Copper washer **New**
 - Oil drain bolt ①

 **23 Nm (2.3 m•kg, 17 ft•lb)**

NOTE:

After tightening the oil drain bolt to specified torque, lock it using a wire.

6. Fill:
 - Transmission oil



Recommended oil:

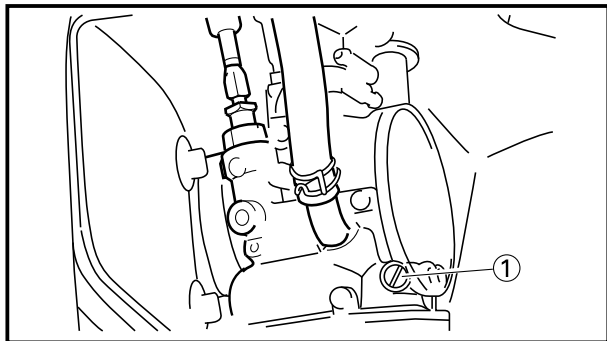
Castrol R30

Oil capacity

(periodic oil change):

0.50 L (0.44 Imp qt, 0.53 US qt)

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



EC35L002

PILOT AIR SCREW ADJUSTMENT

1. Adjust:
 - Pilot air screw ①

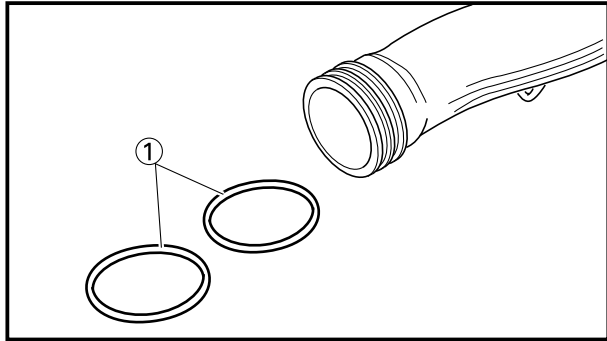
Adjustment steps:

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



Pilot air screw:

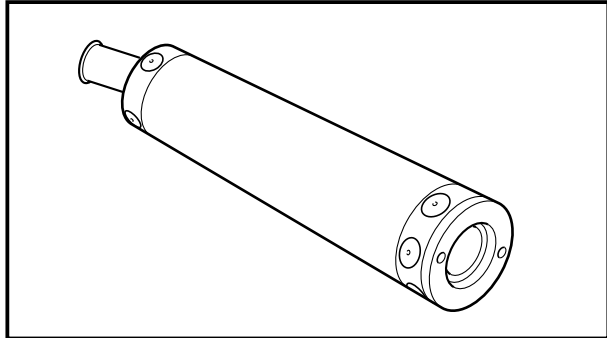
1-1/2 turns out



EC35P010

MUFFLER INSPECTION

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



EC35Q001

SILENCER INSPECTION

1. Inspect:
 - SilencerInside of silencer loose → Repair.

Silencer repair steps:

- Drill the silencer for riveting.
- Rivet the silencer using the rivet.

NOTE:

Rivet the silencer in a different area than previously riveted.



EC360000

CHASSIS

EC361002

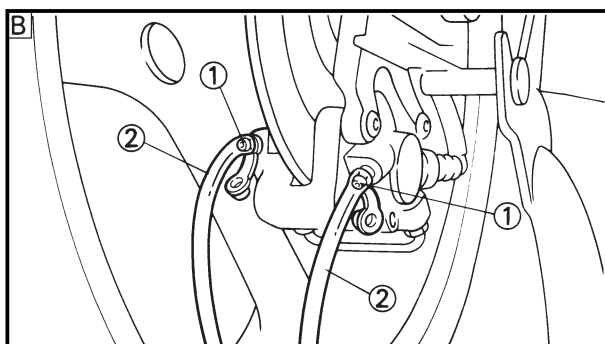
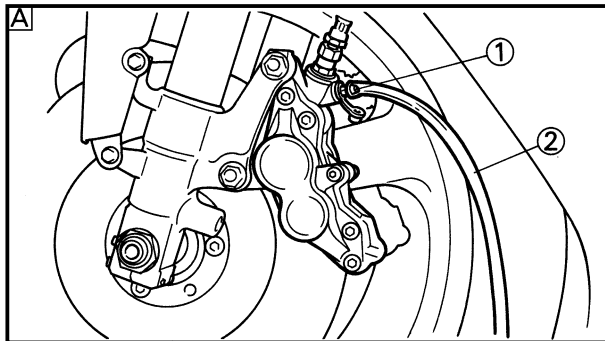
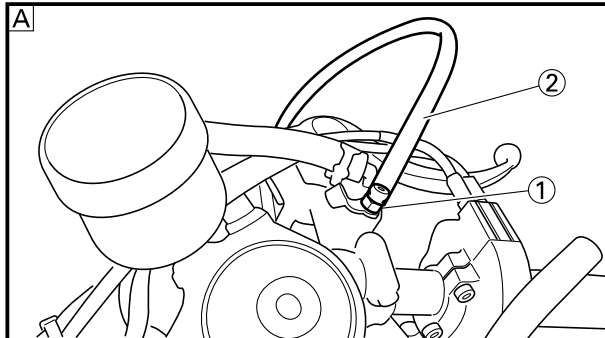
BRAKE SYSTEM AIR BLEEDING

⚠WARNING

Bleed the brake system if:

- The system has been disassembled.
- A brake hose has been loosened or removed.
- The brake fluid is very low.
- The brake operation is faulty.

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



1. Remove:
 - Reservoir tank cap
 - Diaphragm
2. Bleed:
 - Brake fluid

A Front

B Rear

Air bleeding steps:

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



Bleed screw:

6 Nm (0.6 m•kg, 4.3 ft•lb)

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



NOTE: _____

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

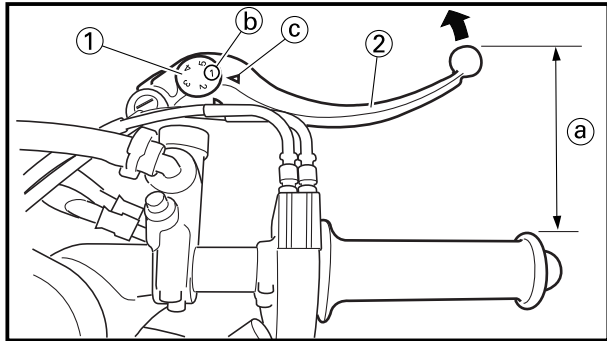
- j. Add brake fluid to the level line on the reservoir.

⚠ WARNING _____

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

3. Install:

- Diaphragm
- Reservoir tank cap



EC363020

FRONT BRAKE ADJUSTMENT

1. Adjust:

- Brake lever position (a)

Adjustment steps:

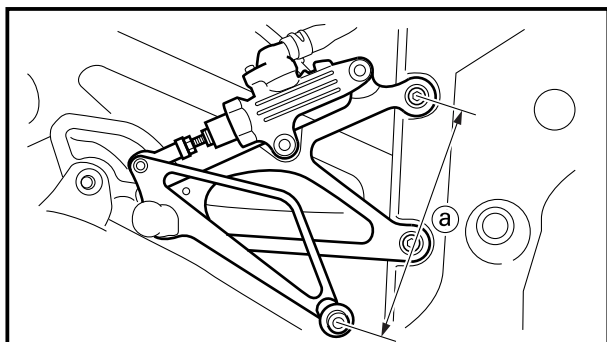
- Turn the adjuster (1) while pushing the brake lever (2) forward until the desired lever position is obtained.

Closer → Turn the adjuster to a larger number.

Farther → Turn the adjuster to a smaller number.

NOTE: _____

Align the number (b) on the adjuster with the mark (c) on the brake lever.



EC364011

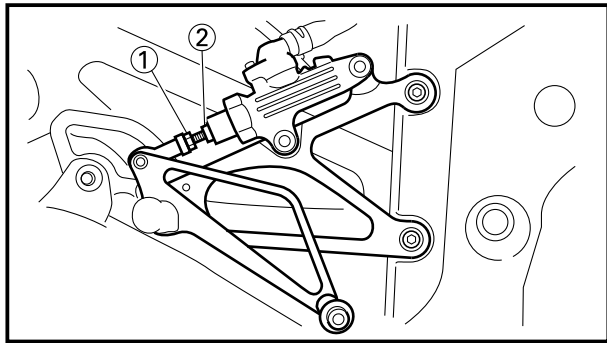
REAR BRAKE ADJUSTMENT

1. Check:

- Brake pedal height (a)
- Out of specification → Adjust.



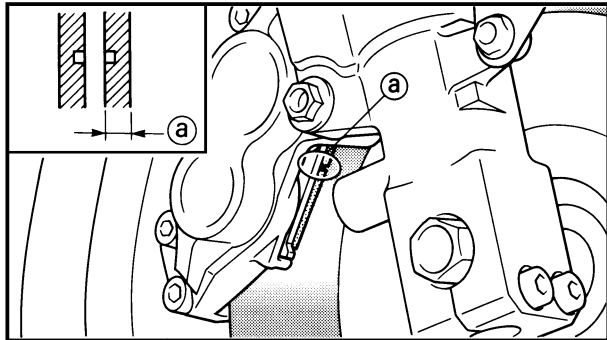
Brake pedal height (a):
148~152 mm (5.8~6.0 in)



2. Adjust:
- Brake pedal height

Pedal height adjustment steps:

- Loosen the locknut ①.
- Turn the adjusting nut ② until the pedal height is within specified height.
- Tighten the locknut.



EC365050

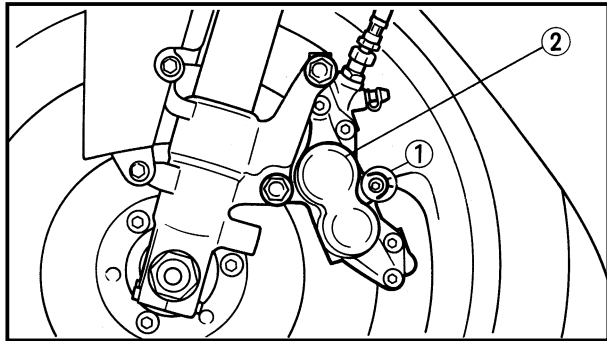
FRONT BRAKE PAD INSPECTION AND REPLACEMENT

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



Brake pad thickness ①:

Standard	<Limit>
5.3 mm (0.21 in)	1.0 mm (0.04 in)



2. Replace:
- Brake pad

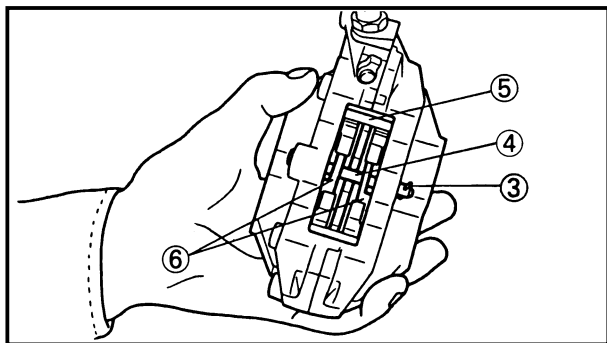
Brake pad replacement steps:

- Loosen the pad pin ① and remove the caliper ②.
- Remove the cotter pin ③, pad pin ④, pad support ⑤ and brake pads ⑥.
- Connect the transparent hose ⑦ to the bleed screw ⑧ and place the suitable container under its end.
- Loosen the bleed screw and push the caliper piston in.

CAUTION:

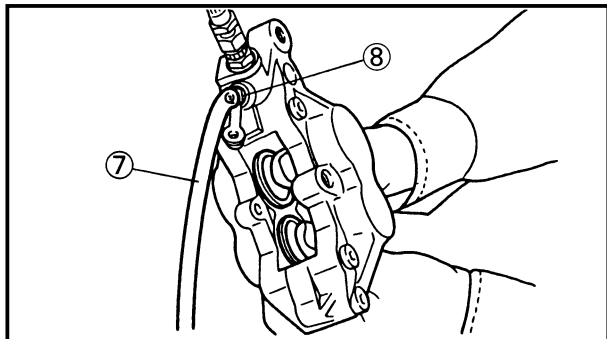
Do not reuse the drained brake fluid.

- Tighten the bleed screw.

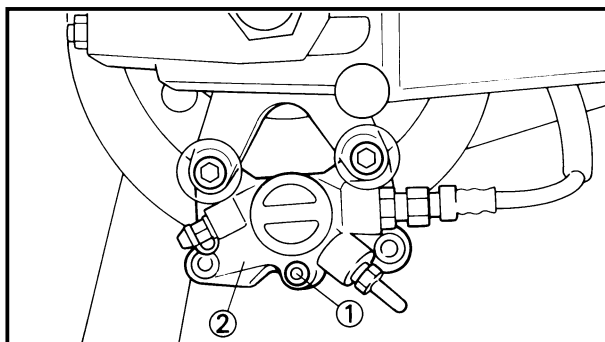
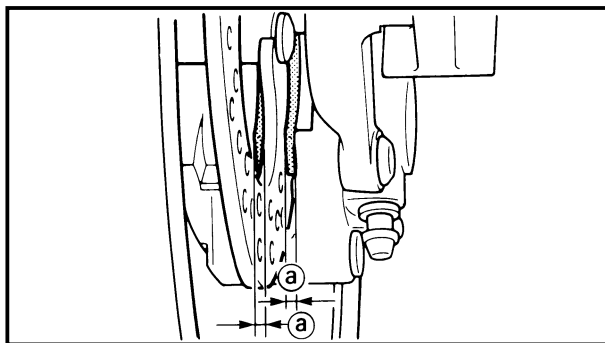
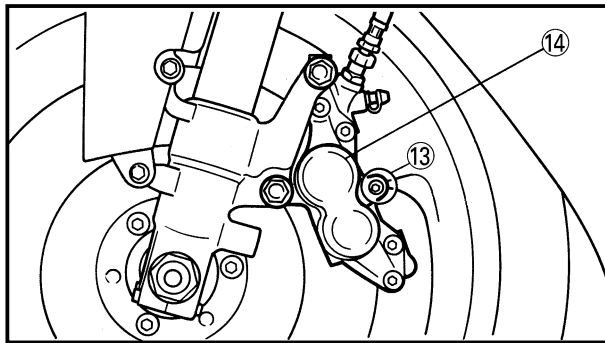
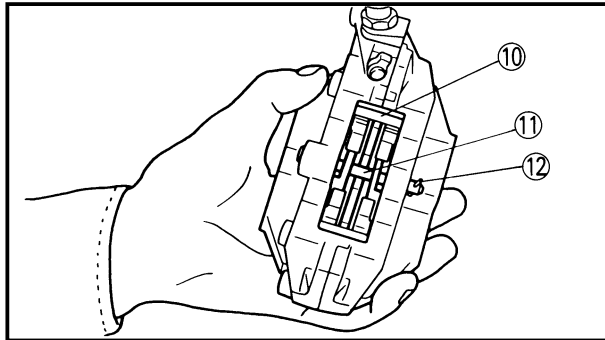
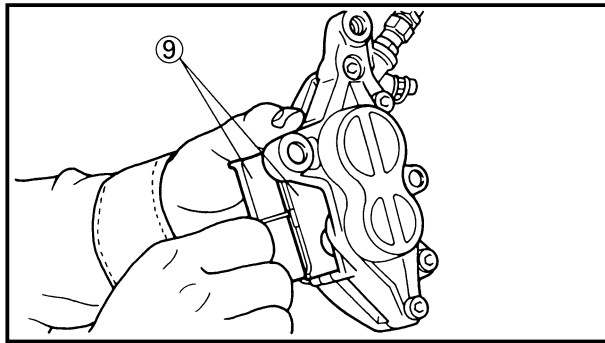


Bleed screw:

6 Nm (0.6 m•kg, 4.3 ft•lb)



REAR BRAKE PAD INSPECTION AND REPLACEMENT



- Install the brake pads ⑨, pad support ⑩, pad pin ⑪ and cotter pin ⑫.

NOTE: _____

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

- Install the caliper ⑬ and tighten the pad pin ⑭.



Bolt (caliper):

35 Nm (3.5 m•kg, 25 ft•lb)

Pad pin:

18 Nm (1.8 m•kg, 13 ft•lb)

3. Inspect:
 - Brake fluid level
Refer to “BRAKE FLUID LEVEL INSPECTION” section.
4. Check:
 - Brake lever operation
A softy or spongy feeling → Bleed brake system.
Refer to “BRAKE SYSTEM AIR BLEEDING” section.

EC366031

REAR BRAKE PAD INSPECTION AND REPLACEMENT

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



Brake pad thickness ①:

Standard	<Limit>
4.0 mm (0.16 in)	1.0 mm (0.04 in)

2. Replace:
 - Brake pad

Brake pad replacement steps:

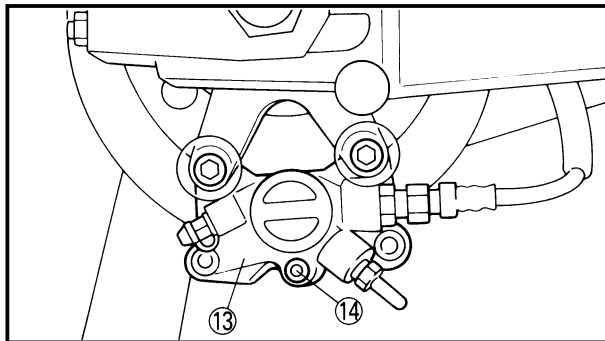
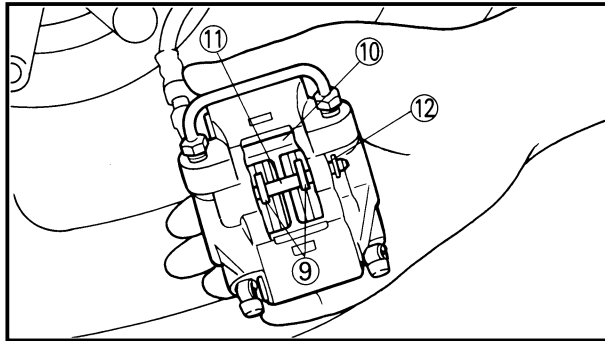
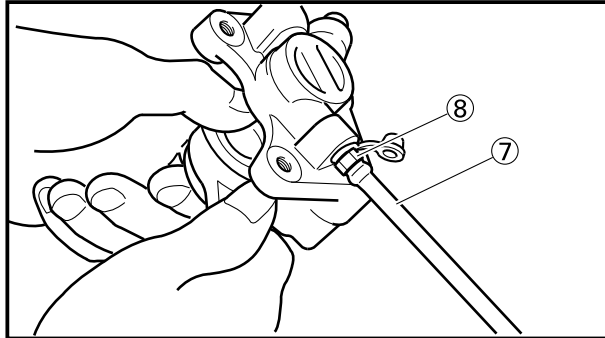
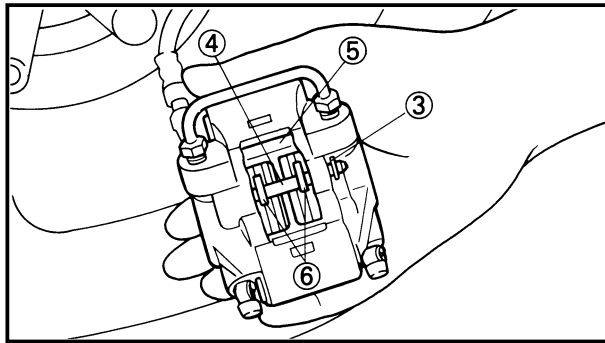
- Loosen the pad pin ① and remove the caliper ②.

NOTE: _____

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

REAR BRAKE PAD INSPECTION AND REPLACEMENT

INSP
ADJ



- Remove the cotter pin ③, pad pin ④, pad support ⑤ and brake pads ⑥.
- Connect the transparent hose ⑦ to the bleed screw ⑧ and place the suitable container under its end.
- Loosen the bleed screw and push the caliper piston in.

CAUTION:

Do not reuse the drained brake fluid.

- Tighten the bleed screw.



Bleed screw:

6 Nm (0.6 m•kg, 4.3 ft•lb)

- Install the brake pads ⑨, pad support ⑩, pad pin ⑪ and cotter pin ⑫.

NOTE:

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

- Install the caliper ⑬ and tighten the pad pin ⑭.



Bolt (caliper):

23 Nm (2.3 m•kg, 17 ft•lb)

Pad pin:

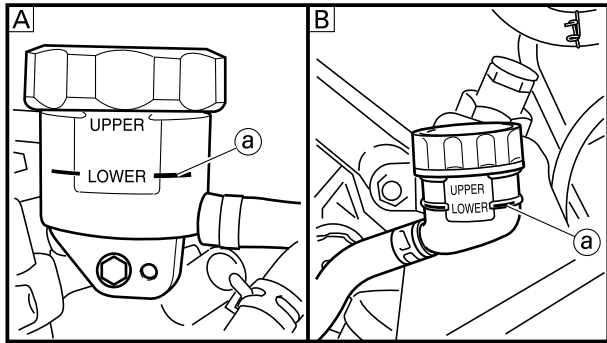
18 Nm (1.8 m•kg, 13 ft•lb)

3. Inspect:

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

4. Check:

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



EC367001

BRAKE FLUID LEVEL INSPECTION

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

Ⓐ Lower level

Ⓐ Front

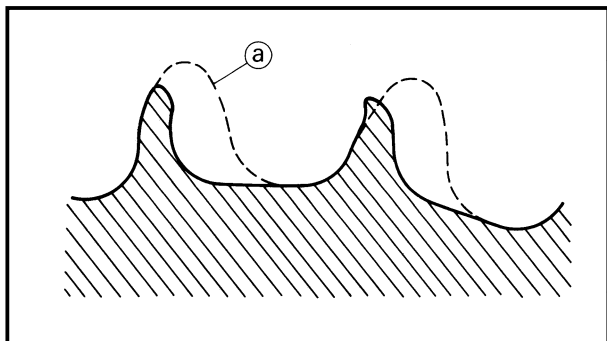
Ⓑ Rear



Recommended brake fluid:
DOT #4

⚠ WARNING

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



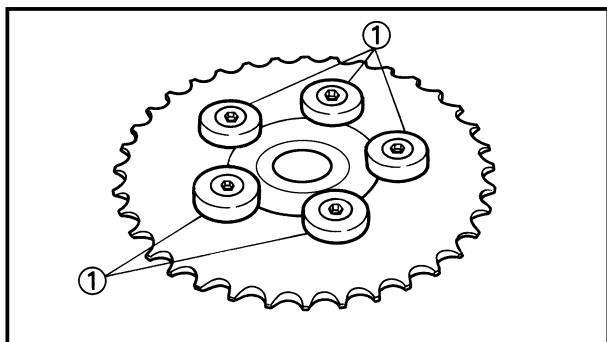
EC368011

SPROCKETS INSPECTION

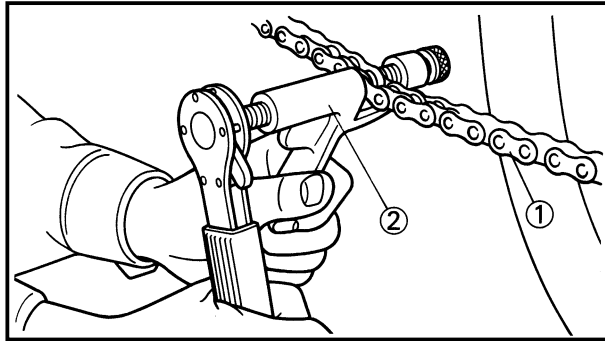
1. Inspect:
 - Sprocket teeth Ⓐ
Excessive wear → Replace.

NOTE:

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



2. Inspect:
 - Sprocket damper ①
Wear/Damage → Replace.

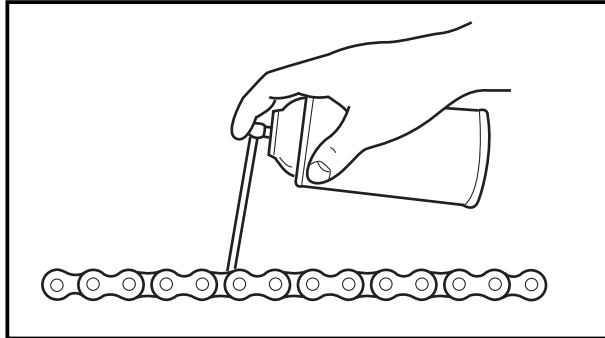


EC369040

DRIVE CHAIN INSPECTION

1. Remove:
 - Drive chain ①

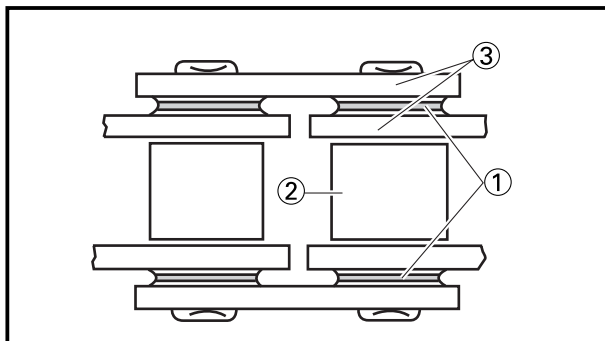
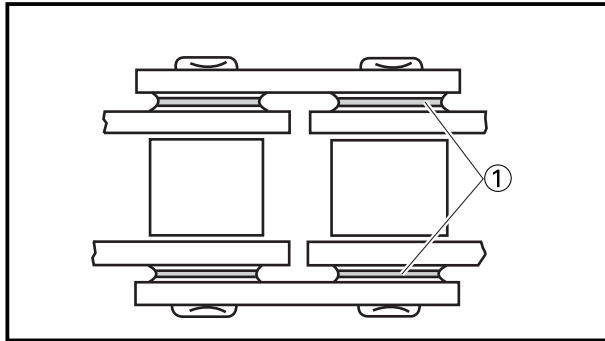
NOTE: _____
 Remove the drive chain using a chain cutter ②.



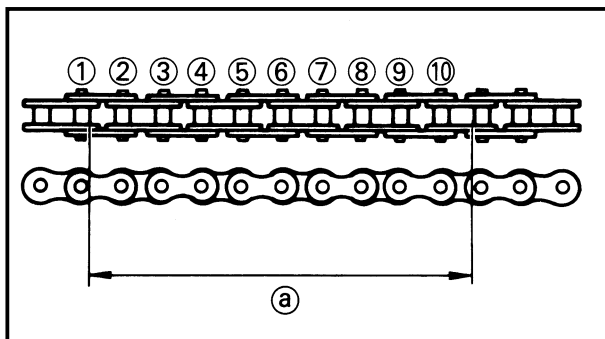
2. Clean:
 - Drive chain
 - Brush off as much dirt as possible. Then clean the chain using the chain cleaner.

CAUTION: _____


This machine has a drive chain with small rubber O-rings ① between the chain plates. Steam cleaning, high-pressure washes, certain solvent and kerosene can damage these O-rings.



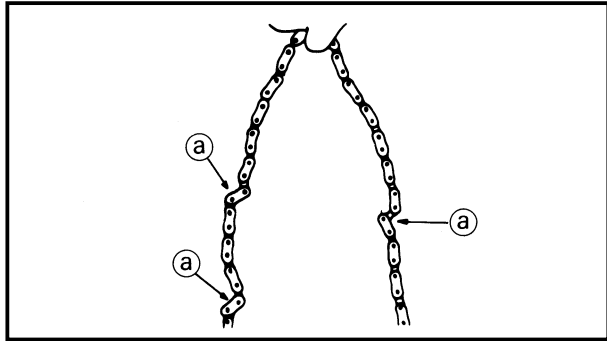
3. Inspect:
 - O-rings ① (drive chain)
Damage → Replace drive chain.
 - Rollers ②
 - Side plates ③
Damage/Wear → Replace drive chain.



4. Measure:
 - Drive chain length (10 links) ④
Out of specification → Replace.

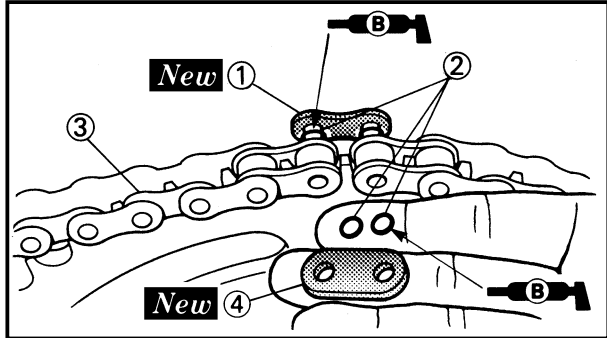
	Drive chain length (10 links):
	Limit: 150.1 mm (5.909 in)

DRIVE CHAIN SLACK ADJUSTMENT



5. Check:

- Drive chain stiffness **a**
Clean and oil the chain and hold as illustrated.
Stiff → Replace drive chain.

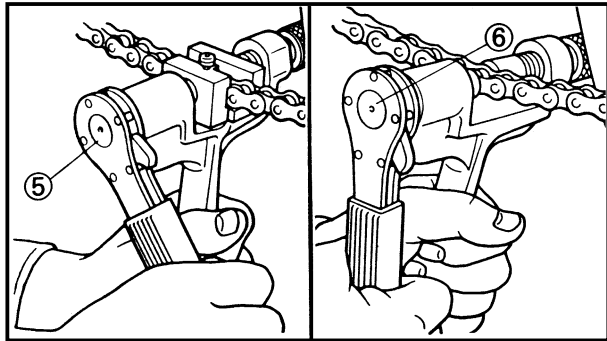


6. Install:

- Chain joint **1** **New**
- O-ring **2**
- Drive chain **3**

NOTE:

When installing the drive chain, apply the lithium soap base grease on the chain joint and O-rings.

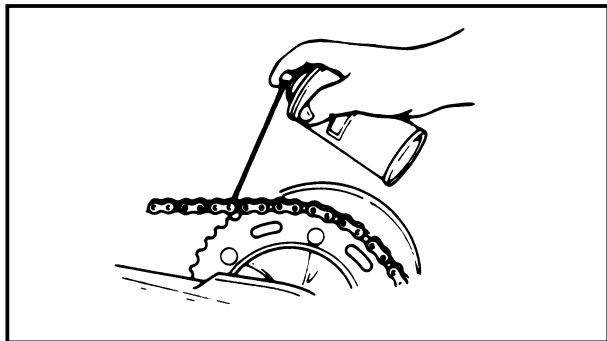


7. Install:

- Link plate **4** **New**


NOTE:

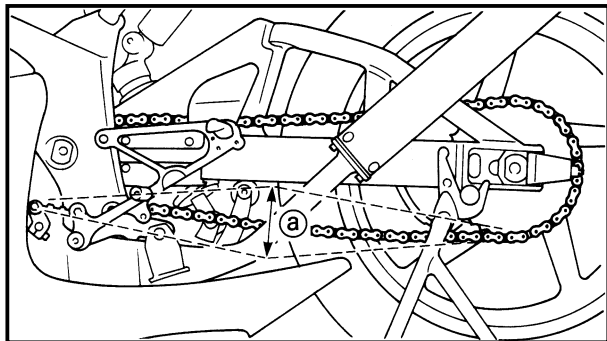
- Press the link plate onto the chain joint using a chain rivetter **5**.
- Rivet the end of the chain joint using a chain rivetter **6**.
- After rivetting the chain joint, make sure its movement is smooth.



8. Lubricate:

- Drive chain


 **Drive chain lubricant:**
SAE 30~50W motor oil or chain lubricants suitable for "O-ring" chains



EC36A042

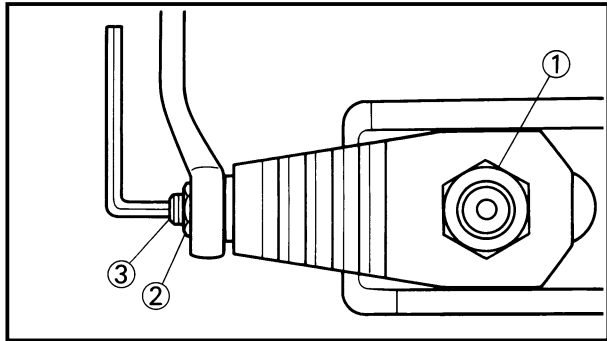
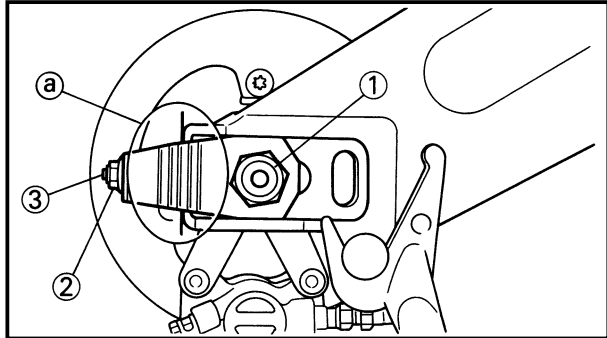
DRIVE CHAIN SLACK ADJUSTMENT

1. Hold the machine on upright position by placing the suitable stand.
2. Check:
 - Drive chain slack **a**
Out of specification → Adjust.

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

NOTE:

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



3. Adjust:
- Drive chain slack

Drive chain slack adjustment steps:

- Loosen the axle nut ① and locknuts ②.
- Adjust chain slack by turning the adjusters ③.

To tighten → Turn adjuster ③ counter-clockwise.

To loosen → Turn adjuster ③ clockwise.

- Turn each adjuster exactly the same amount to maintain correct axle alignment. (There are marks ① on each side of chain puller alignment.)


NOTE:

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


CAUTION:

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


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

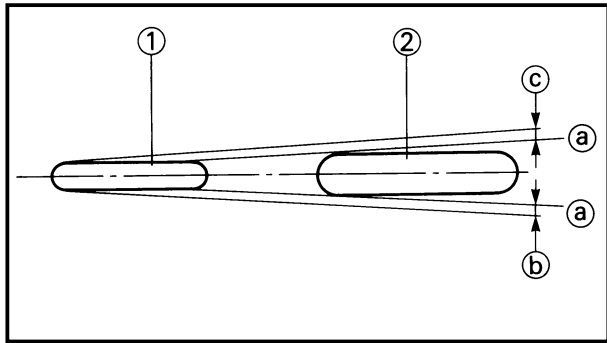
	<p>Axle nut: 80 Nm (8.0 m•kg, 58 ft•lb)</p>
---	--

- Turn out the adjusters to the specified torque.

	<p>Adjuster: 2 Nm (0.2 m•kg, 1.4 ft•lb)</p>
---	--

- Tighten the locknuts.

	<p>Locknut: 16 Nm (1.6 m•kg, 11 ft•lb)</p>
---	---



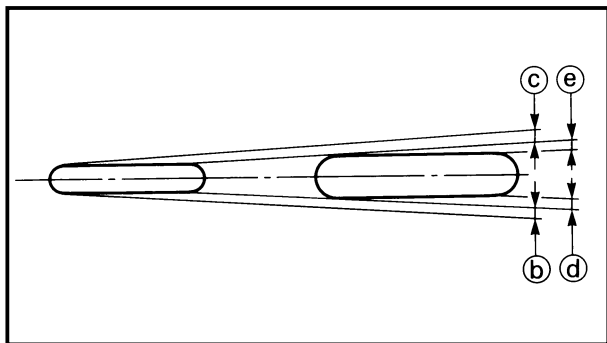
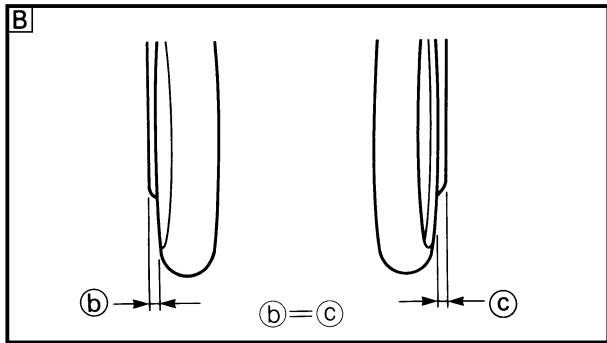
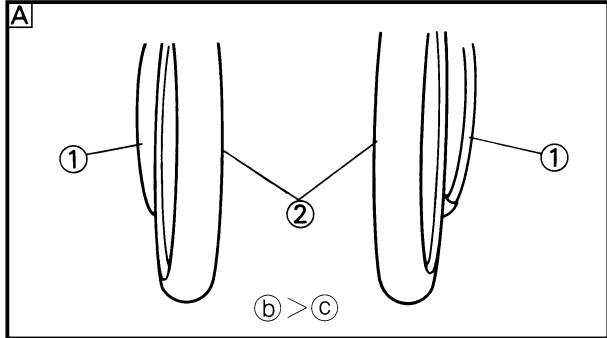
EC36B000

WHEEL ALIGNMENT ADJUSTMENT

1. Remove:
 - Lower cowl
2. Place the machine on a level place and hold it up on upright position.
3. Sit 1~2 m (3.3~6.6 ft) behind the machine and look at both sides of the wheels below the rear wheel axle.
4. Turn the handlebar left and right to make the front wheel straight.

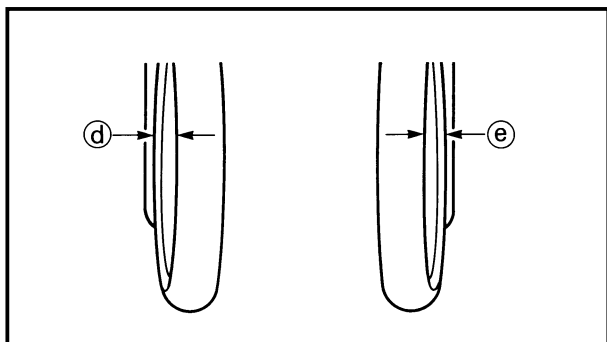
NOTE:

- To make the front wheel straight, provide ⑥ and ⑦ with the same distance as seen along the extension of the line ③ connecting the rear end of the front wheel ① and the front end of the rear wheel ②.
- Figure A shows that the front wheel is turned clockwise ($b > c$).
- Figure B shows that the front wheel is straight ($b = c$).



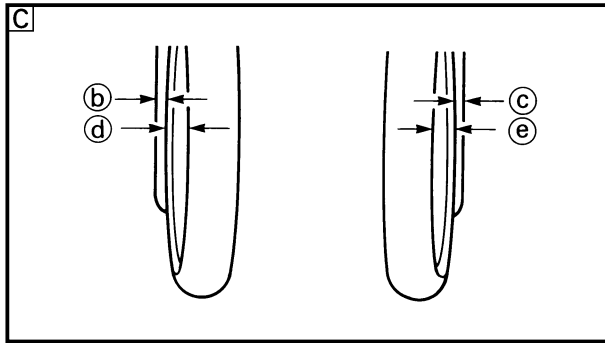
5. Check:

- Wheel alignment
 With the front wheel straight ($b = c$), check whether the distances ④ and ⑤ are equal.
 If not → Adjust.



FRONT FORK INSPECTION/ FRONT FORK TOP END ADJUSTMENT

INSP
ADJ



6. Adjust:

- Wheel alignment

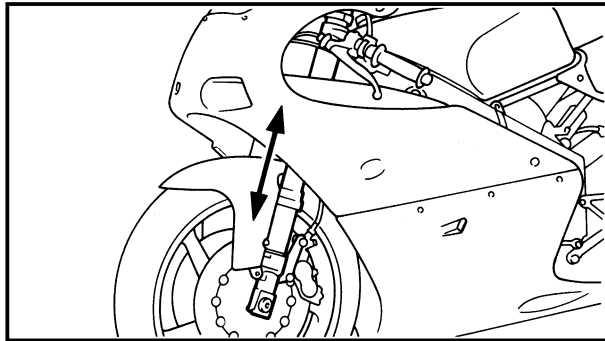
Turn the chain puller adjuster while paying attention to the drive chain slack and make adjustment while moving the rear wheel.

NOTE:

- Figure C shows that the wheel alignment has been correctly made (b = c and d = e).
- After the adjustment, record the difference in the graduation between the left and right chain pullers as it will provide convenience in your future similar adjustment.

7. Install:

- Lower cowl



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.

EC36E021

FRONT FORK TOP END ADJUSTMENT

1. Hold the machine on upright position by placing the suitable stand.

2. Remove:

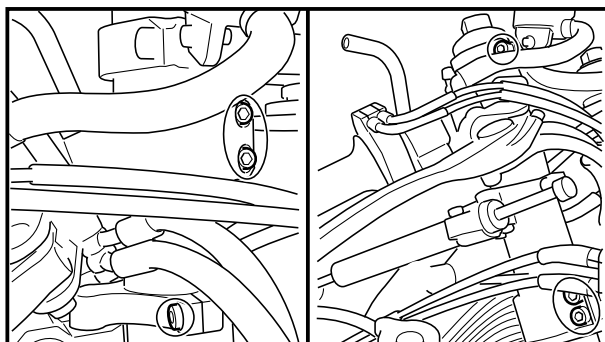
- Cowling
- Induction guide (left cylinder)
- Front wheel
- Front fender

3. Adjust:

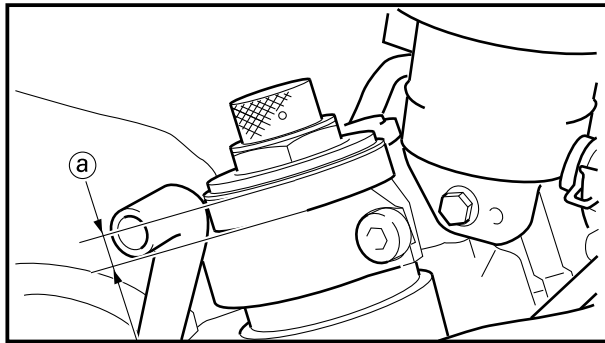
- Front fork top end

Adjustment steps:

- Loosen the pinch bolts (handlebar and steering damper stay).
- Loosen the pinch bolts (handle crown and under bracket).



FRONT FORK TOP END ADJUSTMENT



- Adjust the front fork top end (a).



Front fork top end (a):

Standard	Extent of adjustment
13 mm (0.51 in)	Zero~13 mm (Zero~0.51 in)

CAUTION:

Never attempt to install the front fork beyond the maximum or minimum setting.

WARNING

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

- Tighten the pinch bolts (handle crown and under bracket).



Pinch bolt (handle crown):
20 Nm (2.0 m•kg, 14 ft•lb)
Pinch bolt (under bracket):
23 Nm (2.3 m•kg, 17 ft•lb)

CAUTION:

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

- Adjust the handlebar position (b) and steering damper stay position (c).

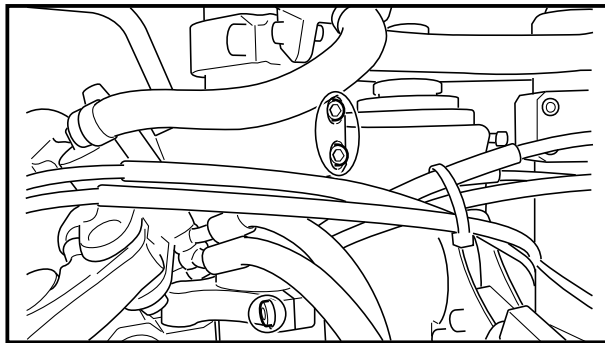
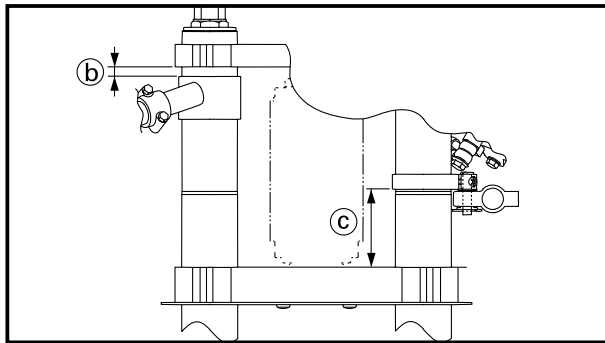
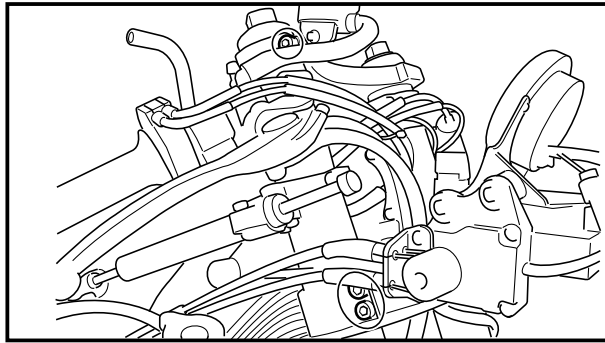


Handlebar position (b):
9 mm (0.35 in)
Steering damper stay position (c):
73 mm (2.87 in)

- Tighten the pinch bolts (handlebar and steering damper stay).

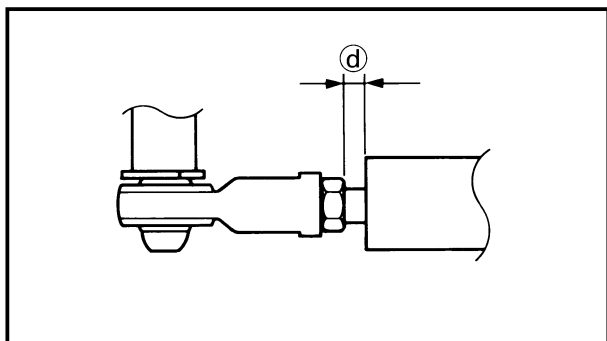


Pinch bolt (handlebar):
7 Nm (0.7 m•kg, 5.1 ft•lb)
Pinch bolt (steering damper stay):
10 Nm (1.0 m•kg, 7.2 ft•lb)



FRONT FORK SPRING PRELOAD ADJUSTMENT

**INSP
ADJ**

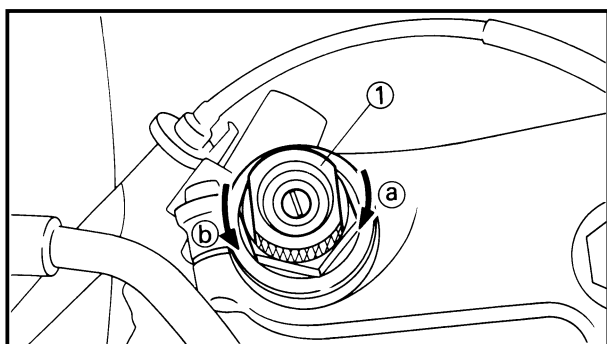
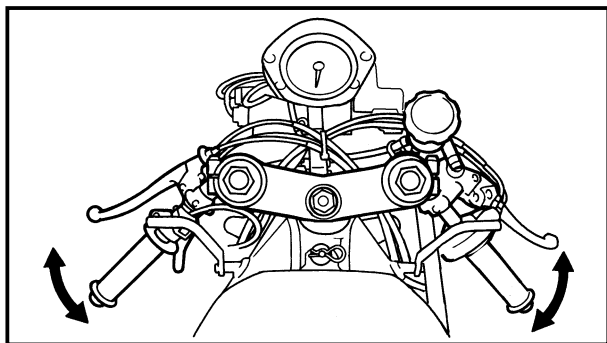


CAUTION:

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

NOTE:

Adjust the installation angle of the steering damper stay so that the dimension ④ is between 3 mm (0.12 in) and 5 mm (0.20 in) when the handlebar is turned fully to the right.



4. Check:
 - Steering smooth action
Turn the handlebar to make sure no parts are being contacted with others.
Contact → Repair.
5. Install:
 - Front fender
 - Front wheel
 - Induction guide (left cylinder)
 - Cowling

EC36F012

FRONT FORK SPRING PRELOAD ADJUSTMENT

1. Adjust:
 - Spring preload
By turning the adjuster ①.

**Stiffer ① → Increase the spring preload.
(Turn the adjuster ① in.)**

**Softer ② → Decrease the spring preload.
(Turn the adjuster ① out.)**



Extent of adjustment:

Maximum	Minimum
Fully turned-in position	Fully turned-out position

FRONT FORK REBOUND DAMPING FORCE ADJUSTMENT

**INSP
ADJ**



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



**Standard position:
6 clicks in**

NOTE: _____

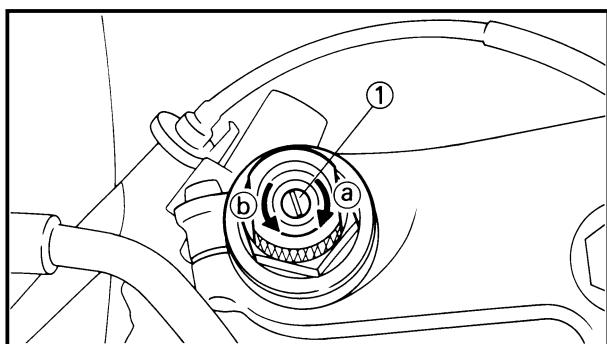
- Fully turn out the adjuster and then turn it in. Specify the position in which the first click is heard as the zero position. If a click is heard just when the adjuster is fully turned out, this position is zero.
- Preload is 0.5 mm (0.02 in) changed per click of the adjuster.

CAUTION: _____

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

WARNING _____

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



EC36H010

FRONT FORK REBOUND DAMPING FORCE ADJUSTMENT

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

Stiffer ① → Increase the rebound damping force. (Turn the adjuster ① in.)
Softer ② → Decrease the rebound damping force. (Turn the adjuster ① out.)



Extent of adjustment:

Maximum	Minimum
Fully turned-in position	Fully turned-out position

FRONT FORK COMPRESSION DAMPING FORCE ADJUSTMENT

**INSP
ADJ**



• **STANDARD POSITION:**

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



**Standard position:
12 clicks out**

NOTE:

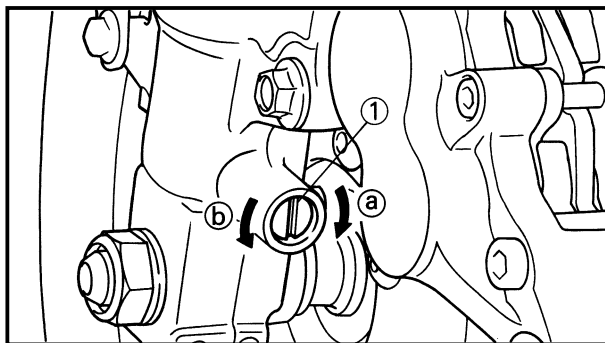
Fully turn in the adjuster and then turn it out. Specify the position in which the first click is heard as the zero position. If a click is heard just when the adjuster is fully turned in, this position is zero.

CAUTION:

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

⚠ WARNING

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



EC36J030

FRONT FORK COMPRESSION DAMPING FORCE ADJUSTMENT

1. Adjust:

- Compression damping force
By turning the adjuster ①.

Stiffer ① → Increase the compression damping force. (Turn the adjuster ① in.)

Softer ② → Decrease the compression damping force. (Turn the adjuster ① out.)



Extent of adjustment:

Maximum	Minimum
Fully turned-in position	Fully turned-out position



• **STANDARD POSITION:**

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



Standard position:
12 clicks out

NOTE:

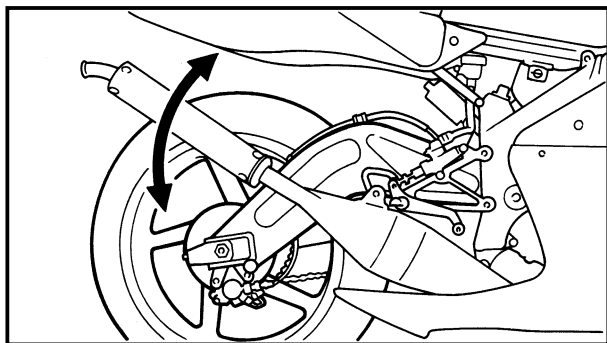
Fully turn in the adjuster and then turn it out. Specify the position in which the first click is heard as the zero position. If a click is heard just when the adjuster is fully turned in, this position is zero.

CAUTION:

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

WARNING

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



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.

EC36L001

SEAT HEIGHT ADJUSTMENT

1. Remove:

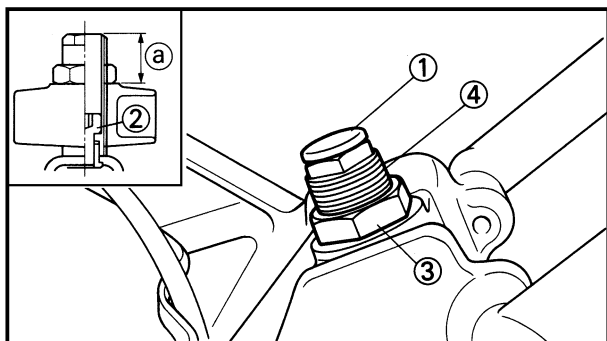
- Fuel tank

2. Adjust:

- Seat height

REAR SHOCK ABSORBER SPRING PRELOAD ADJUSTMENT

INSP
ADJ



Seat height adjustment steps:

- Remove the cap ①.
- Loosen the lock bolt ② and locknut ③.
- Turn the adjuster ④ in or out.



Adjuster set length ①a:

Standard length	Extent of adjustment
27 mm (1.06 in)	21~33 mm (0.83~1.30 in)

NOTE:

If the adjuster set length ①a is changed, the seat height will be increased or decreased by twice the change.

CAUTION:

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

- Tighten the lock bolt and locknut.



Lock bolt:

40 Nm (4.0 m•kg, 29 ft•lb)

Locknut:

38 Nm (3.8 m•kg, 27 ft•lb)

- Install the cap.

3. Install:

- Fuel tank

EC36M051

REAR SHOCK ABSORBER SPRING PRELOAD ADJUSTMENT

1. Hold the machine on upright position by placing the suitable stand.
2. Loosen:
 - Locknut ①

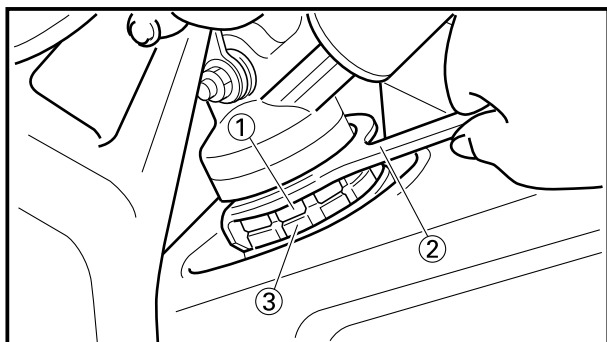
NOTE:

When loosening the locknut, use the special tool ② which is included in the owner's tool kit.

3. Adjust:

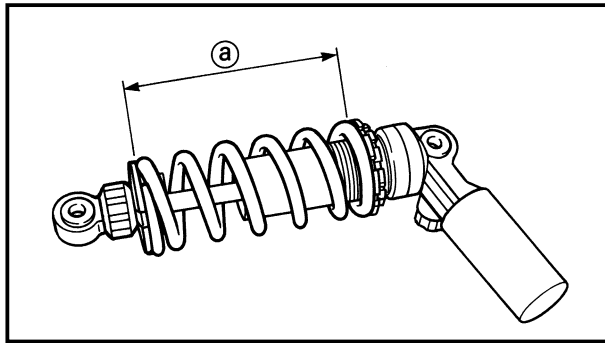
- Spring preload
By turning the adjuster ③.


Stiffer → Increase the spring preload.
(Turn the adjuster ③ in.)
Softer → Decrease the spring preload.
(Turn the adjuster ③ out.)



REAR SHOCK ABSORBER REBOUND DAMPING FORCE ADJUSTMENT

INSP
ADJ




 Spring length (installed) ①:	
Standard length	Extent of adjustment
137 mm (5.39 in)	133~142 mm (5.24~5.59 in)

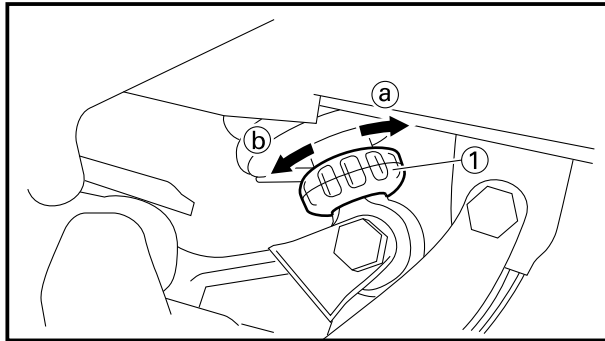
NOTE: _____
The length of the spring (installed) changes 1.5 mm (0.06 in) per turn of the adjuster.

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

4. Tighten:

- Locknut

 20 Nm (2.0 m•kg, 14 ft•lb)




EC36N040

REAR SHOCK ABSORBER REBOUND DAMPING FORCE ADJUSTMENT

1. Adjust:

- Rebound damping force
By turning the adjuster ①.

Stiffer ① → Increase the rebound damping force. (Turn the adjuster ① in.)
Softer ② → Decrease the rebound damping force. (Turn the adjuster ① out.)

 Extent of adjustment:	
Maximum	Minimum
Fully turned-in position	Fully turned-out position

• STANDARD POSITION:

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

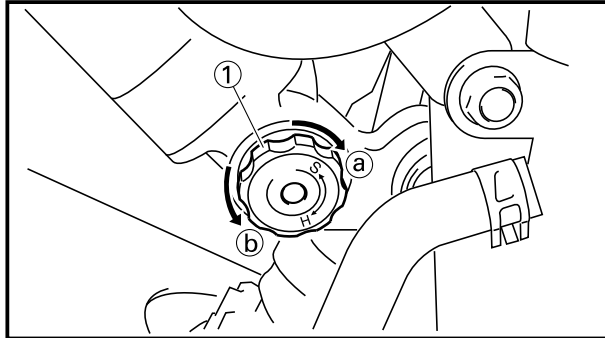
 **Standard position:**
20 clicks out

NOTE: _____

Fully turn in the adjuster and then turn it out. Specify the position in which the first click is heard as the zero position. If a click is heard just when the adjuster is fully turned in, this position is zero.

CAUTION: _____

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



EC36P040

REAR SHOCK ABSORBER COMPRESSION DAMPING FORCE ADJUSTMENT

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

Stiffer (a) → Increase the compression damping force. (Turn the adjuster ① in.)

Softer (b) → Decrease the compression damping force. (Turn the adjuster ① out.)



Extent of adjustment:

Maximum	Minimum
Fully turned-in position	Fully turned-out position

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



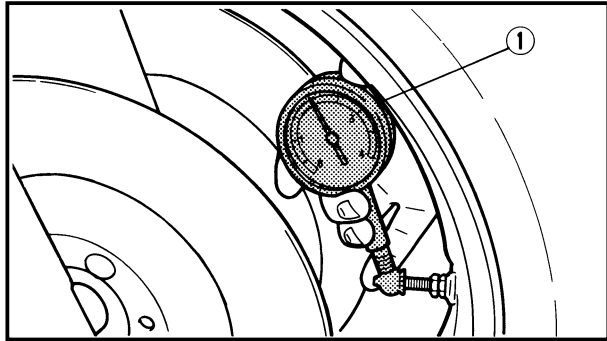
Standard position:
12 clicks out

NOTE: _____

Fully turn in the adjuster and then turn it out. Specify the position in which the first click is heard as the zero position. If a click is heard just when the adjuster is fully turned in, this position is zero.

CAUTION: _____


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



EC36Q011

TIRE PRESSURE CHECK

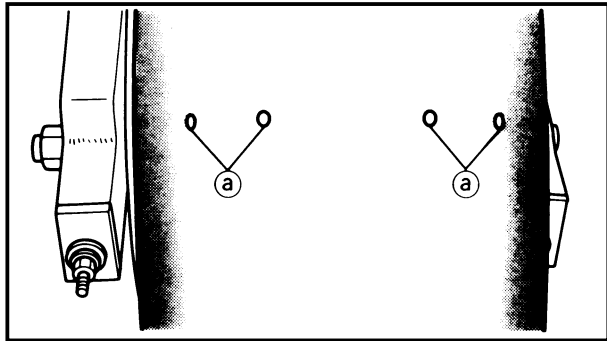
1. Measure:
 - Tire pressure
 Out of specification → Adjust.

	Standard tire pressure:	
	Front	Rear
	200 kPa (2.0 kg/cm², 29 psi)	200 kPa (2.0 kg/cm², 29 psi)

NOTE:

Check the tire while it is cold.


① Air gauge

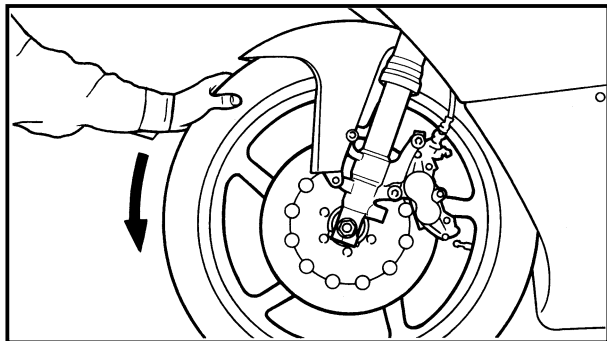


EC36R000

TIRE INSPECTION

1. Inspect:
 - Tire surfaces
 Wear/Damage → Replace.

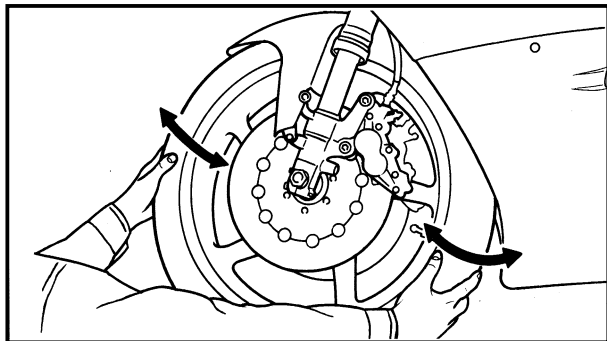
	Minimum tire tread depth (a): 2 mm (0.08 in)
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EC36T000

WHEEL INSPECTION

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

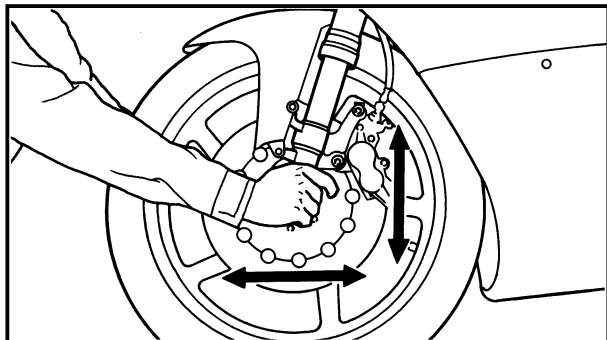


2. Inspect:
 - Bearing free play
 Exist play → Replace.

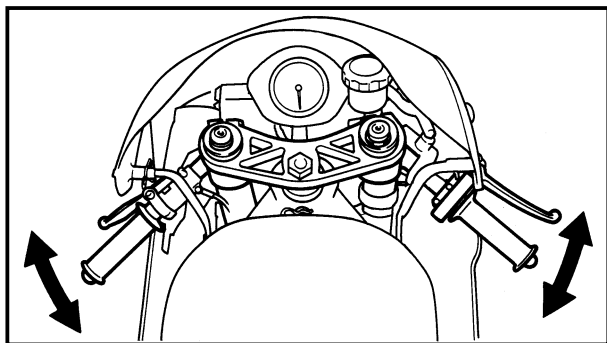
EC36U060

STEERING HEAD INSPECTION AND ADJUSTMENT

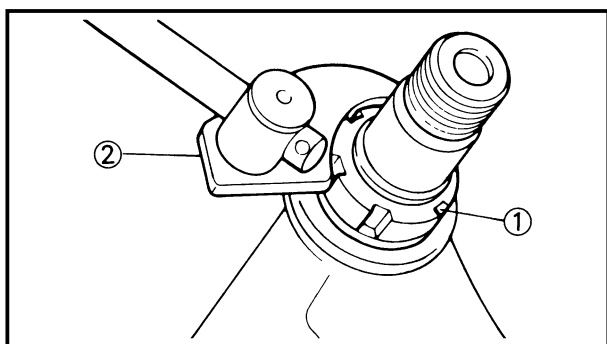
1. Remove the steering damper at front fork side.
2. Elevate the front wheel by placing a suitable stand.



3. Check:
 - Steering stem
Grasp the bottom of the forks and gently rock the fork assembly back and forth.
Free play → Adjust steering head.



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



5. Adjust:
 - Steering ring nut

Steering ring nut adjustment steps:

- Remove the cowling.
- Remove the reservoir tank and handle crown.
- Loosen the ring nut ① using ring nut wrench ②.

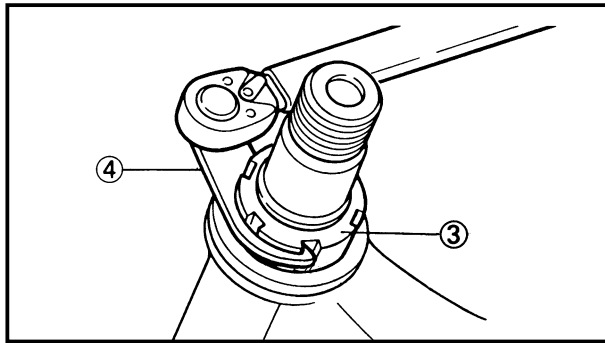


Ring nut wrench:

YU-33975/90890-01403

STEERING DAMPER ADJUSTMENT

**INSP
ADJ**



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

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



Ring nut wrench:
YU-33975/90890-01403



Ring nut (initial tightening):
46 Nm (4.6 m•kg, 33 ft•lb)

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

⚠ WARNING _____
Avoid over-tightening.



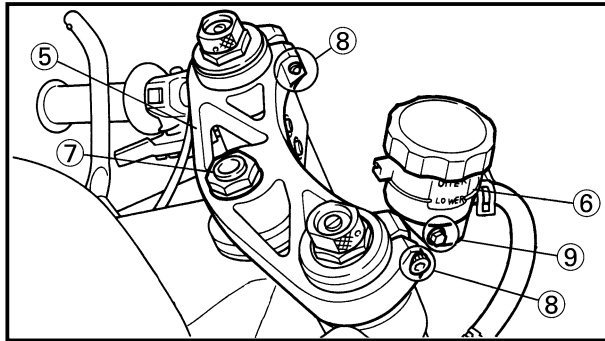
Ring nut (final tightening):
1 Nm (0.1 m•kg, 0.7 ft•lb)

- 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 ⑤ and reservoir tank ⑥.



Steering shaft nut ⑦:
80 Nm (8.0 m•kg, 58 ft•lb)
Pinch bolt (front fork) ⑧:
20 Nm (2.0 m•kg, 14 ft•lb)
Bolt (reservoir tank) ⑨:
5 Nm (0.5 m•kg, 3.6 ft•lb)

- Install the cowling.

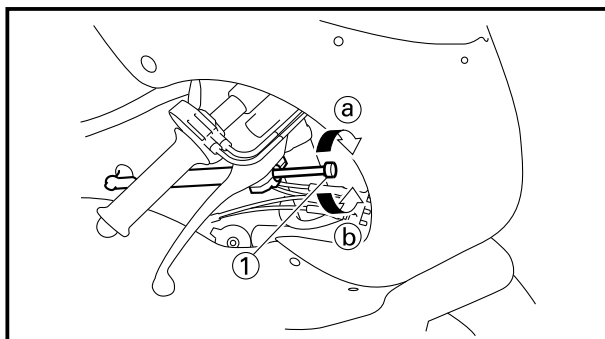


6. Install:
- Steering damper

EC36V002

STEERING DAMPER ADJUSTMENT

1. Adjust:
- Damping force
By turning the adjuster ①.



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



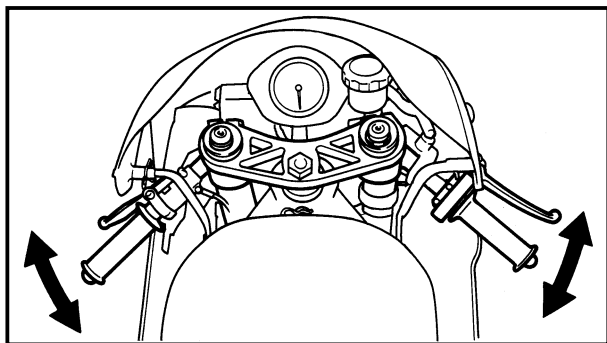
	Extent of adjustment:	
	Maximum	Minimum
	Fully turned-in position	Fully turned-out position

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

	Standard position:
	0 click in

NOTE: _____
Fully turn out the adjuster and then turn it in. Specify the position in which the first click is heard as the zero position. If a click is heard just when the adjuster is fully turned out, this position is zero.

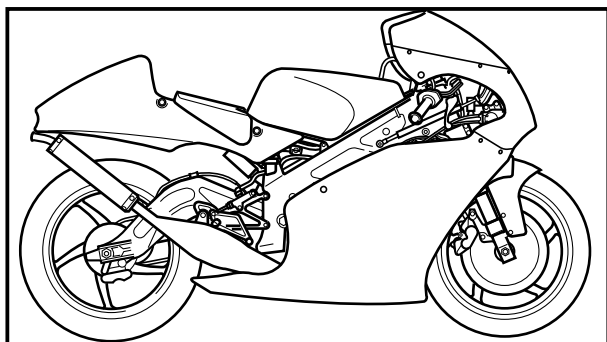
CAUTION: _____
Do not force the adjuster past the minimum or maximum extent of adjustment. The adjuster may be damaged.



EC36X001

WIRES, CABLES

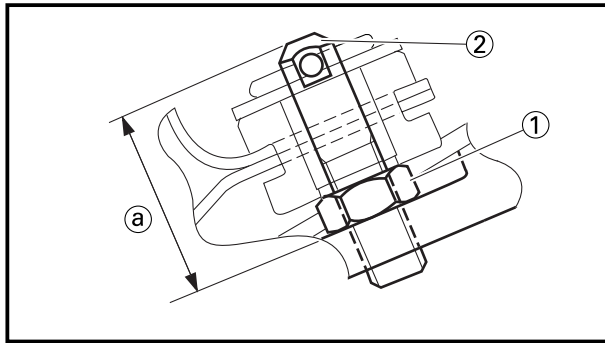
1. Inspect:
 - Smooth movement for steering handle
By turning the handlebar lock to lock.
If any caught/rubbed → Repair/Replace.



EC36Z001

COWLING INSTALLATION INSPECTION

1. Inspect:
 - Cowling
Loose → Tighten.
Stroke the front fork to make sure no parts are being contacted with others.
Contact → Repair or replace.
 - Screen
Scratches/fogging → Clean or replace.



EC36e000

FUEL TANK INSTALLATION INSPECTION

1. Inspect:
 - Looseness in the installed fuel tank
Loose → Adjust.
2. Loosen the nut ① and screw in the bolt ② a half turn. Then fasten the bolt with the nut. Repeat this until tight.

CAUTION:

Take care so that the bolt protruding length ① is not 29 mm (1.14 in) or over.

EC36a023

LUBRICATION

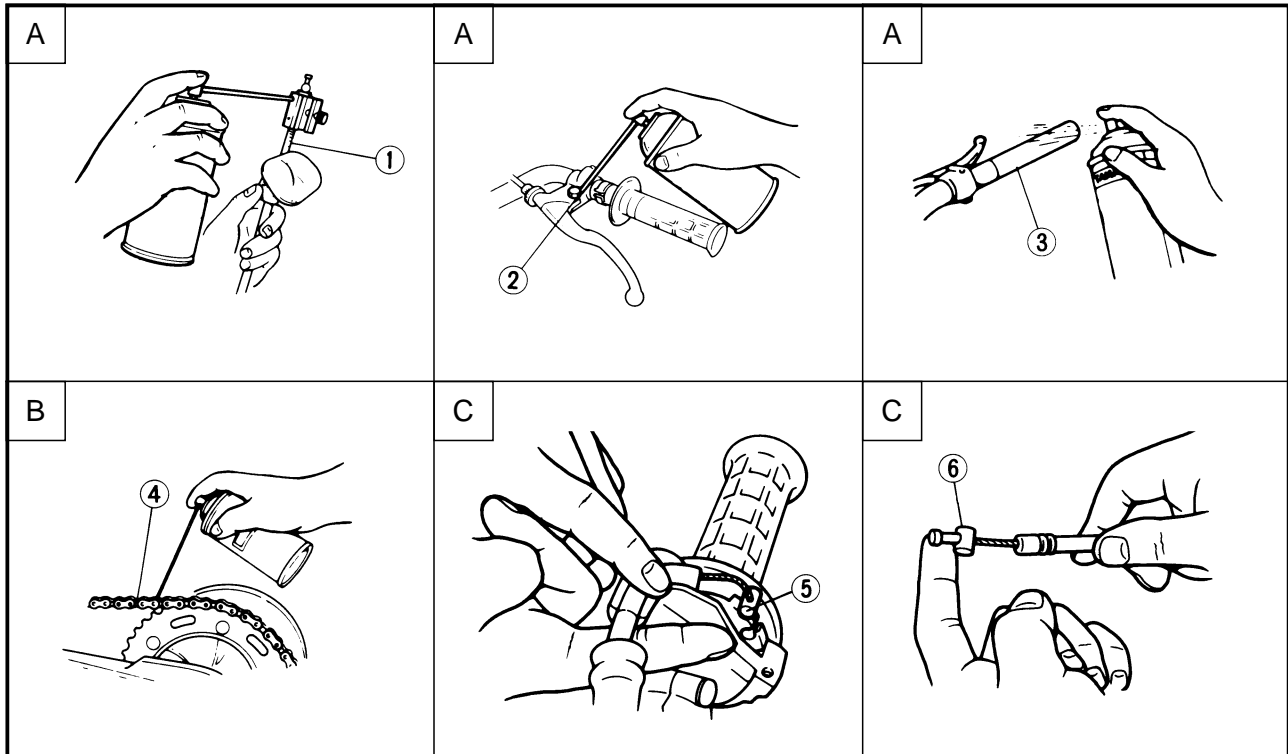
To ensure smooth operation of all components lubricate your machine during setup, after break-in, and after every race.

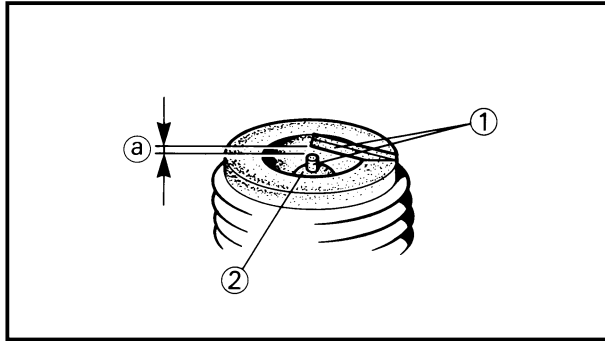
- ① All control cable
- ② Brake and clutch lever pivots
- ③ Throttle-to-handlebar contact
- ④ Drive chain
- ⑤ Throttle cable end
- ⑥ Clutch cable end

- A** Use Yamaha cable lube or equivalent on these areas.
- B** Use SAE 10W30 motor oil or suitable chain lubricants.
- C** Lubricate the following areas with high quality, lightweight lithium-soap base grease.

CAUTION: _____

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





EC370000

ELECTRICAL

EC371001

SPARK PLUG INSPECTION

1. Remove:
 - Spark plug
2. Inspect:
 - Electrode ①
Wear/Damage → Replace.
 - Insulator color ②
Normal condition is a medium to light tan color.
Distinctly different color → Check the engine condition.

NOTE: _____

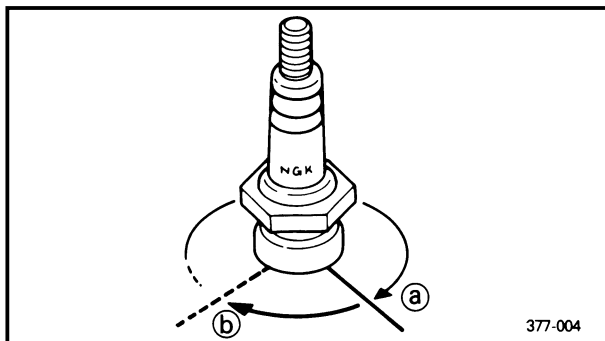
When the engine runs for many hours at low speeds, the spark plug insulator will become sooty, even if the engine and carburetor are in good operating condition.


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



Spark plug gap:
0.5~0.6 mm (0.020~0.024 in)

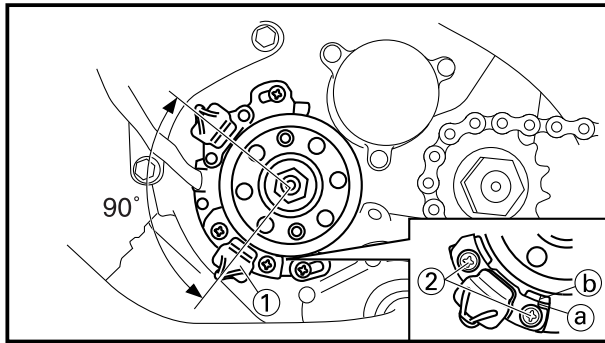
Standard spark plug:
R6179A-105P



4. Clean the plug with a spark plug cleaner if necessary.
5. Tighten:
 - Spark plug  **19 Nm (1.9 m•kg, 13 ft•lb)**

NOTE: _____

- Before installing a spark plug, clean the gasket surface and plug surface.
- Finger-tighten ④ the spark plug before torquing to specification ⑤.



EC372071

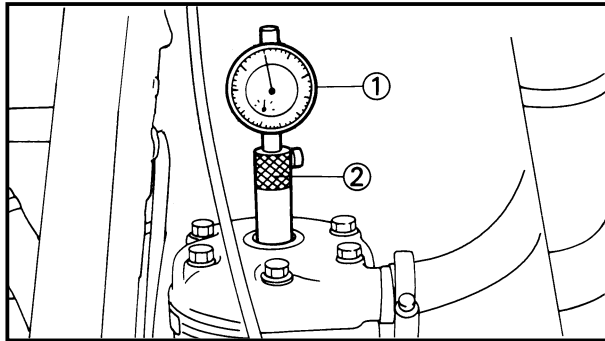
IGNITION TIMING CHECK

NOTE:

- The right pick-up coil ① is provided so that ignition timing can be set for both cylinders by adjusting for the left cylinder only. Therefore, do not loosen the screws (right pick-up coil) ②.
- When the portion ① of the right pick-up coil aligns with the punch mark ② on the stator, the right pick-up coil forms an angle of 90° with the left pick-up coil, indicating that the ignition timing is the same for both cylinders.

1. Remove:

- Cowling
- Fuel tank
- Spark plugs (left and right cylinder)



2. Attach:

- Dial gauge ①
 - Dial gauge stand ②
- To left cylinder head.

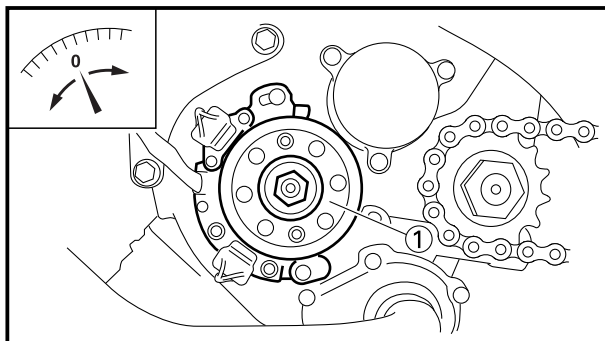


Dial gauge:

YU-3097/90890-01252

Stand:

YU-1256



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

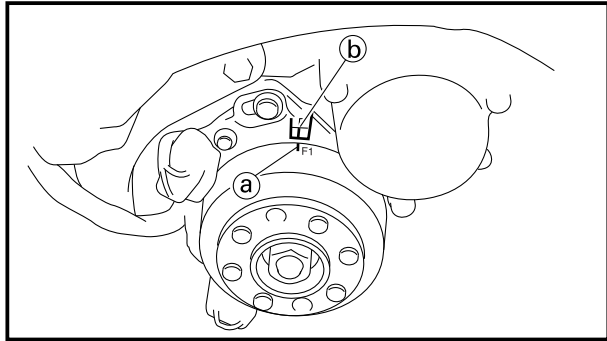
4. Set the dial gauge to zero at TDC.

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



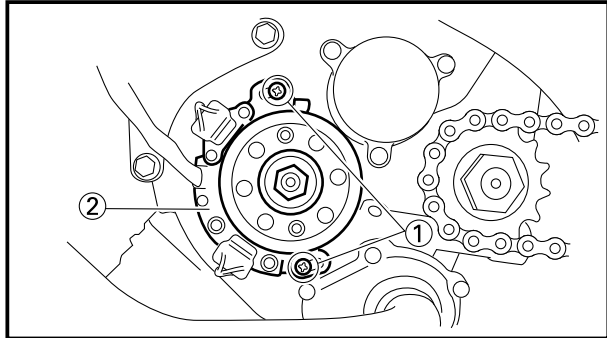
Ignition timing:

2.4 mm (0.094 in)



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

NOTE: _____
Be sure to use the punch mark "F1".



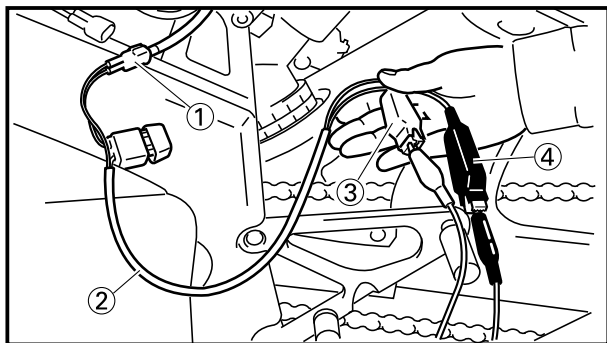
7. Adjust:
- Ignition timing

Adjustment steps:

- Loosen the screws (stator) ①.
- Align the punch marks by turning the stator ②.
- Tighten the screws (stator).



Screw (stator):
7 Nm (0.7 m•kg, 5.8 ft•lb)



EC375000

BATTERY INSPECTION

⚠ WARNING _____

To prevent danger, read the battery label carefully before handling the battery.

1. Connect the checking lead (supplying parts) ② to the power supply coupler ①.
2. Check:
 - Battery voltage
Out of specification → Replace.

Tester (+) lead → Red lead ③
Tester (-) lead → Black lead ④

	Battery voltage	Tester selector position
	12.5V or more	DCV-20

EC376000

RECHARGING BATTERY

⚠ WARNING

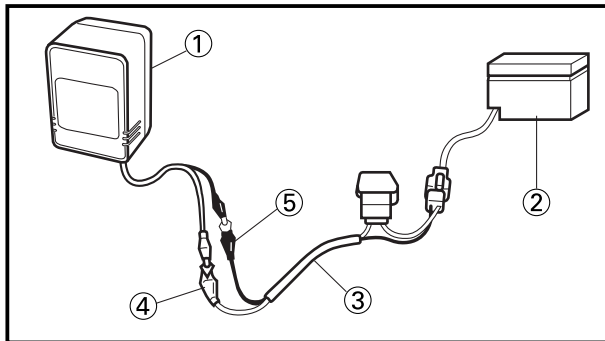
- Keep the battery away from fire.
- When charging the battery, be sure to remove it from the chassis and use the checking lead (supplying parts).
- Be sure to use the specific charging current and voltage when charging the battery.
- Do not quick charge the battery.
- For battery replacement, be sure to use a sealed type specified for the TZ250.

NOTE:




Battery can be recharged using either an MF battery devoted charger or automobile battery.

[Using the MF battery devoted charger]

1. Remove:
 - Seat
 - Battery
2. Connect the battery charger ① for MF batteries to the battery ② using the checking lead (supplying parts) ③, and recharge the battery.



<p>Battery charger (+) lead → Red lead ④ Battery charger (-) lead → Black lead ⑤</p>

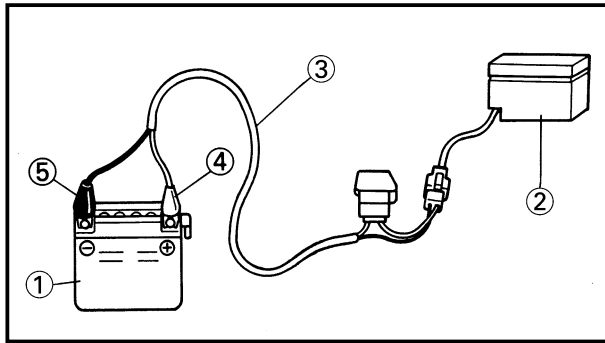
	<p>Battery charger for MF batteries: GS TYPE BC-601-12V</p>
	<p>Charging time: 5 hours</p>
	<p>Voltage when charged: 12.8V or more</p>

CAUTION:

Make sure that the red and black leads do not contact each other during recharge.

RECHARGING BATTERY

INSP
ADJ



[Using the automobile battery]

1. Remove:
 - Seat
 - Battery
2. Connect an automobile battery ① to the battery ② using the checking lead (supplying parts) ③, and recharge the battery.

Automobile battery (+) lead →

Red lead ④

Automobile battery (-) lead →

Black lead ⑤



Charge time:
3 hours



Voltage when charged:

12.8V or more

(or 12.5V or more)

**Voltage of the automobile battery
for power supply:**

12.8~13.8V (maximum 14.9V)

NOTE:

If the battery is recharging using an automobile battery, the charge may not exceed 12.8V. Then, 12.5V or more will be OK.

CAUTION:

- For an automobile battery for supply, use a battery with a capacity of 12V20Ah or more with a voltage 12.8 to 13.2.
- During the battery recharge, do not recharge the power supply battery by starting or running the engine.
- Connect only one battery for recharge.

COWLING, INDUCTION GUIDE, SEAT AND FUEL TANK

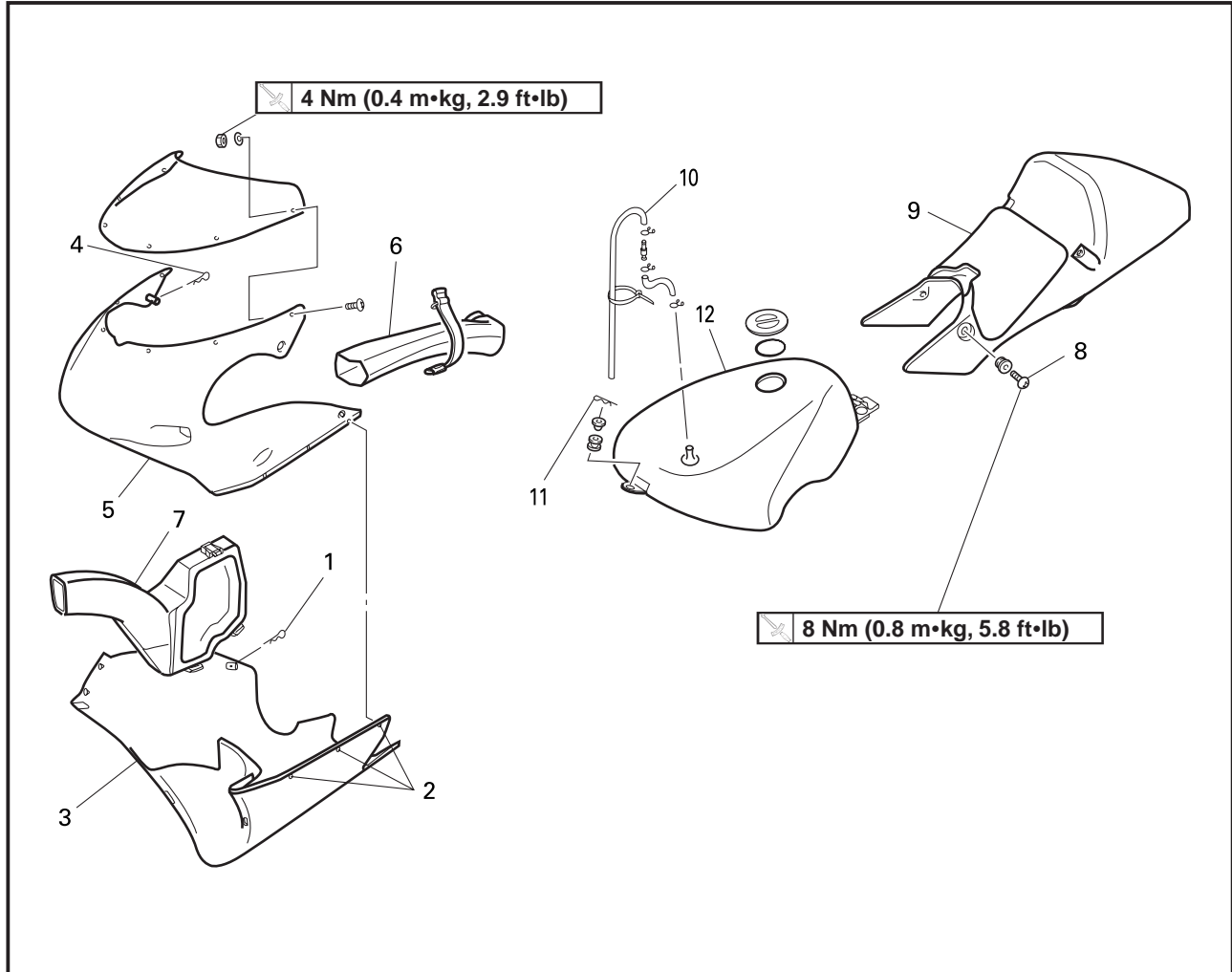


EC400000

ENGINE

EC4V0000

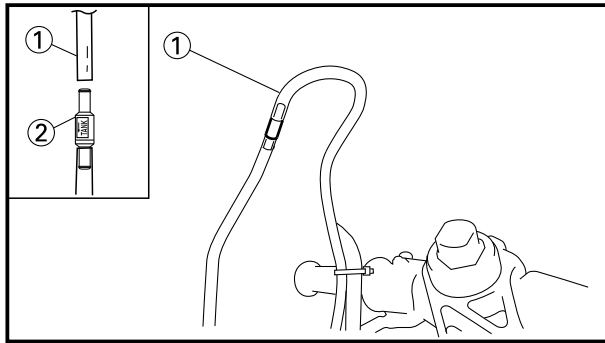
COWLING, INDUCTION GUIDE, SEAT AND FUEL TANK



4

- Extend of removal: ① Cowling removal ② Induction guide removal
 ③ Seat removal ④ Fuel tank removal

Extend of removal	Order	Part name	Q'ty	Remarks
COWLING, INDUCTION GUIDE, SEAT AND FUEL TANK REMOVAL				
Preparation for removal Turn the fuel cock to "OFF". Disconnect the fuel hose.				
	1	Clip (lower cowl)	1	Refer to "REMOVAL POINTS".
	2	Quick fastener	5	
	3	Lower cowl	1	
	4	Clip (upper cowl)	3	
	5	Upper cowl	1	
	6	Induction guide (left cylinder)	1	
	7	Induction guide (right cylinder)	1	
	8	Screw (seat)	4	
	9	Seat	1	
	10	Fuel tank breather hose	1	
	11	Clip (fuel tank)	1	
	12	Fuel tank	1	



EC4V3000

REMOVAL POINTS

EC4U3100

Fuel tank breather hose

1. Disconnect:

- Fuel tank breather hose ①

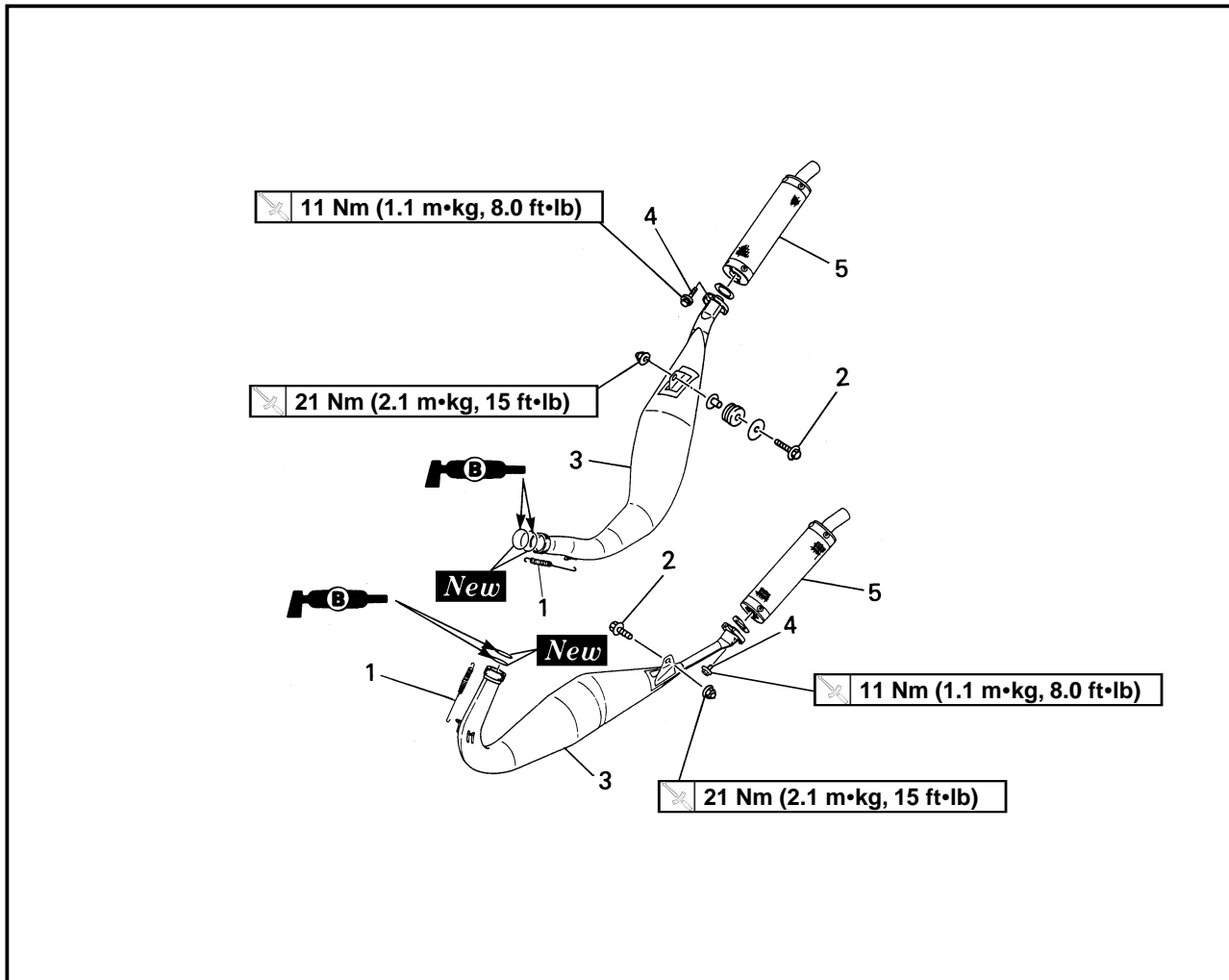
NOTE:

Disconnect the fuel tank breather hose with the valve joint ② remaining on the fuel tank side so as to prevent fuel from spurting out by the tank inner pressure.



EC4S0000

EXHAUST PIPE AND SILENCER

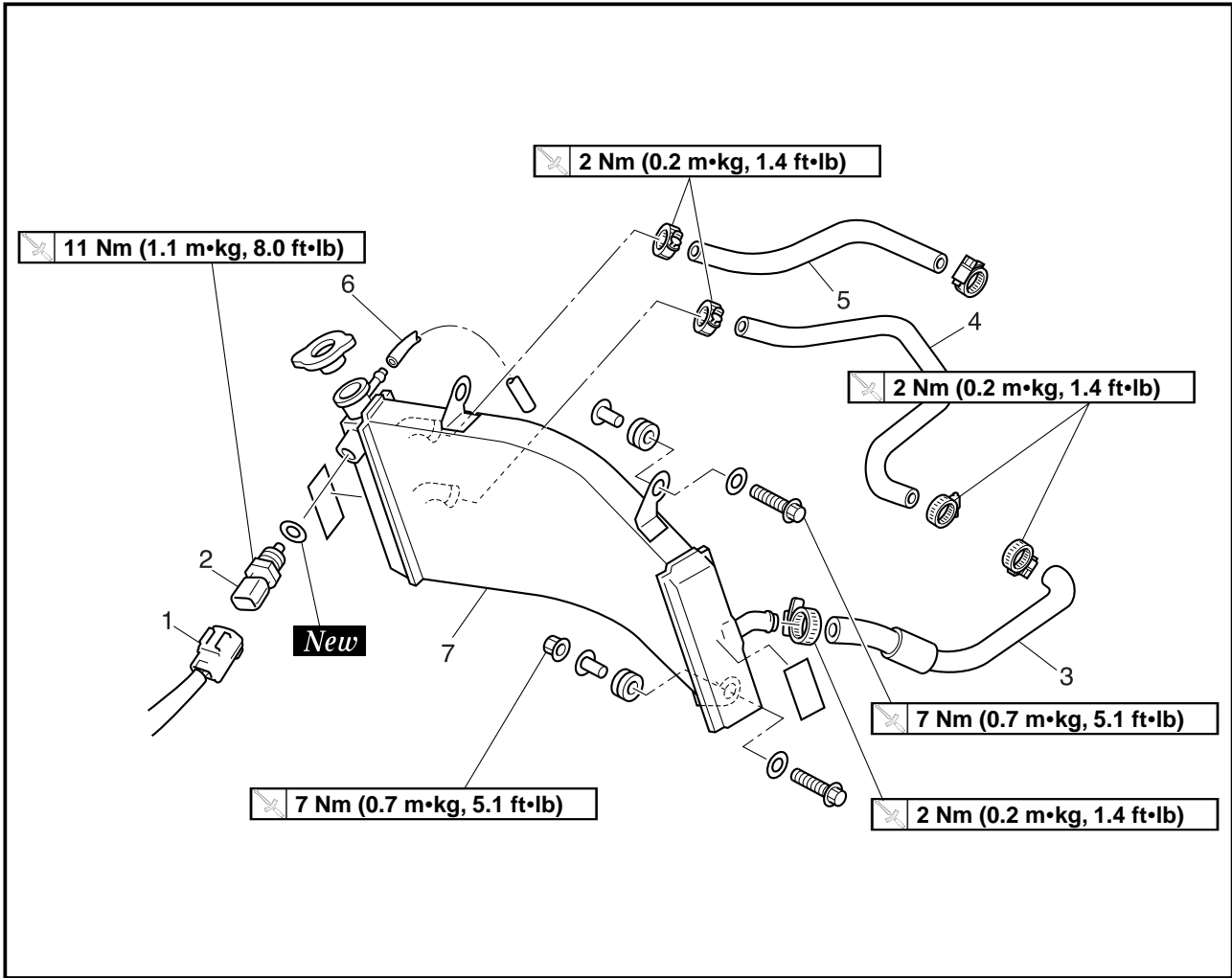


Extend of removal: ① Exhaust pipe removal ② Silencer removal

Extend of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		EXHAUST PIPE AND SILENCER REMOVAL Lower cowl		Refer to "COWLING, INDUCTION GUIDE, SEAT AND FUEL TANK" section.
↑ ① ↓	1 2 3	Tension spring Bolt (exhaust pipe) Exhaust pipe	2ea. 1ea. 1ea.	
↑ ② ↓	4 5	Bolt (silencer) Silencer	2ea. 1ea.	

EC450001

RADIATOR



Extend of removal: ① Radiator removal

Extend of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		RADIATOR REMOVAL Cowling, induction guide and fuel tank Drain the cooling water.		Refer to "COWLING, INDUCTION GUIDE, SEAT AND FUEL TANK" section. Refer to "COOLANT REPLACEMENT" section in the CHAPTER 3.
↑ ① ↓	1	Water temperature gauge lead	1	
	2	Thermo unit	1	
	3	Radiator hose 2	1	
	4	Radiator hose 4	1	
	5	Radiator hose 3	1	
	6	Radiator breather hose	1	
	7	Radiator	1	



EC456000

HANDLING NOTE**⚠ WARNING**

Do not remove the radiator cap when the engine and radiator are hot. Scalding hot fluid and steam may be blown out under pressure, which could cause serious injury.

When the engine has cooled, open the radiator cap by the following procedure:

Place a thick rag, like a towel, over the radiator cap, slowly rotate the cap counterclockwise to the detent. This procedure allows any residual pressure to escape. When the hissing sound has stopped, press down on the cap while turning counterclockwise and remove it.



EC454000

INSPECTION

EC444100

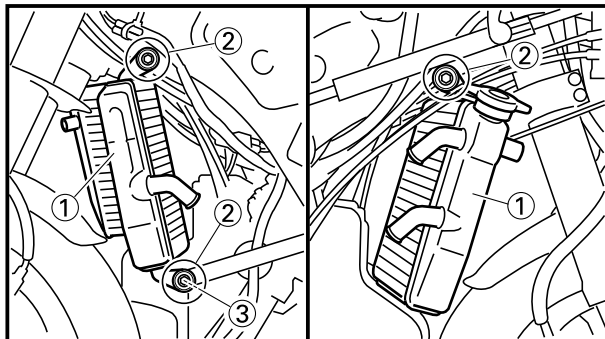
Radiator

1. Inspect:

- Radiator core ①

Obstruction → Blow out with compressed air through rear of the radiator.

Bent fin → Repair/replace.



EC455000


ASSEMBLY AND INSTALLATION

EC455141


Radiator

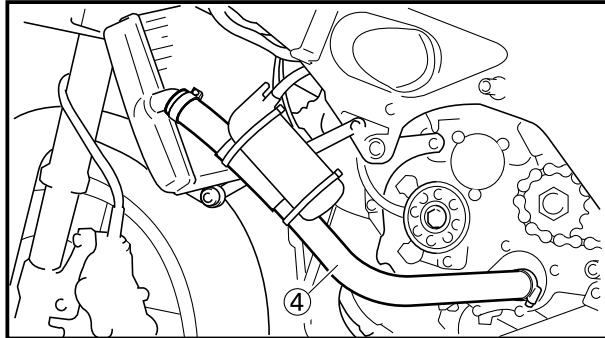
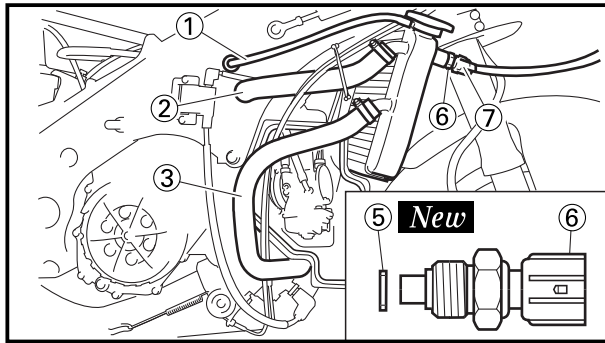
1. Install:

- Radiator ①
- Bolt (radiator) ②

 7 Nm (0.7 m•kg, 5.1 ft•lb)

- Nut (radiator) ③

 7 Nm (0.7 m•kg, 5.1 ft•lb)



2. Install:

- Radiator breather hose ①
- Radiator hose 3 ②
 - ✖ 2 Nm (0.2 m•kg, 1.4 ft•lb)
- Radiator hose 4 ③
 - ✖ 2 Nm (0.2 m•kg, 1.4 ft•lb)
- Radiator hose 2 ④
 - ✖ 2 Nm (0.2 m•kg, 1.4 ft•lb)
- Gasket ⑤ **New**
- Thermo unit ⑥ ✖ 11 Nm (1.1 m•kg, 8.0 ft•lb)
- Water temperature gauge lead ⑦

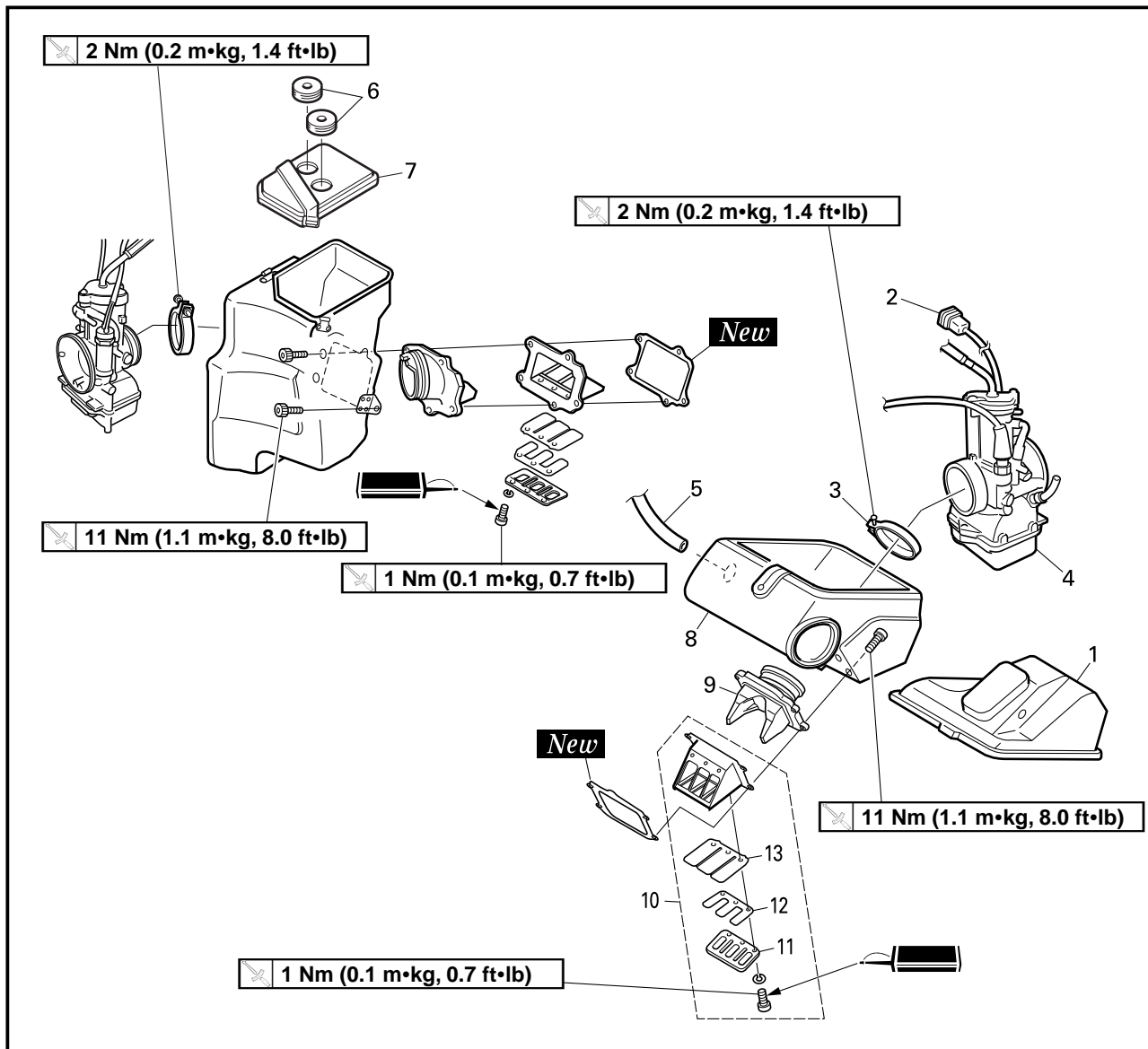
NOTE:

Insert the end of the radiator breather hose into the frame. Refer to "CONTROL FUNCTION" section in the CHAPTER 1.

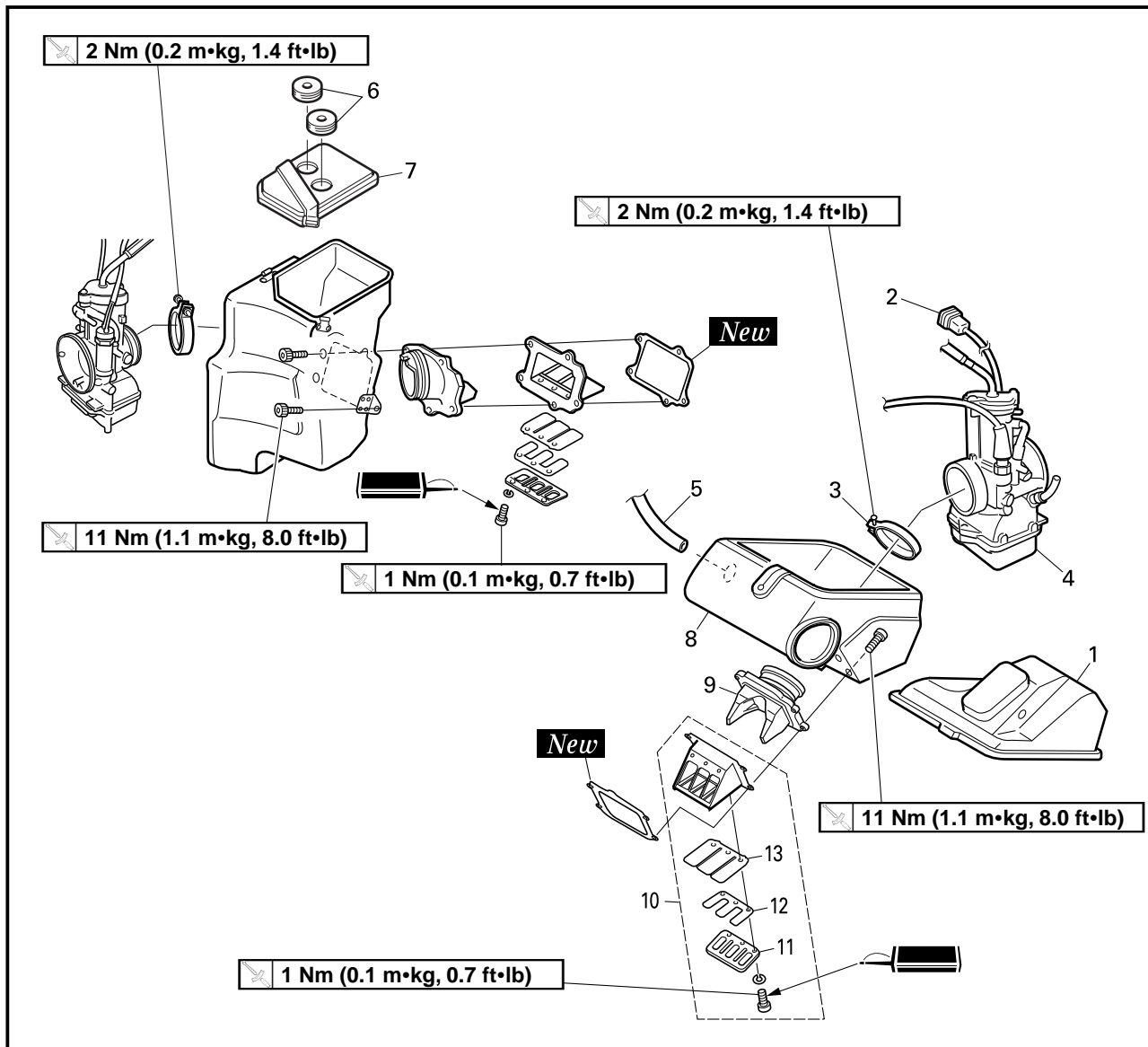


EC460000

CARBURETOR AND REED VALVE



Extend of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		CARBURETOR AND REED VALVE REMOVAL Cowling, induction guide and fuel tank Spark plug cap (left cylinder) Radiator hose 3 Bolt (radiator stay) Tension spring [exhaust pipe (left cylinder)]		Refer to "COWLING, INDUCTION GUIDE, SEAT AND FUEL TANK" section. Refer to "RADIATOR" section. Shift the radiator forward.
				} Servicing the right cylinder



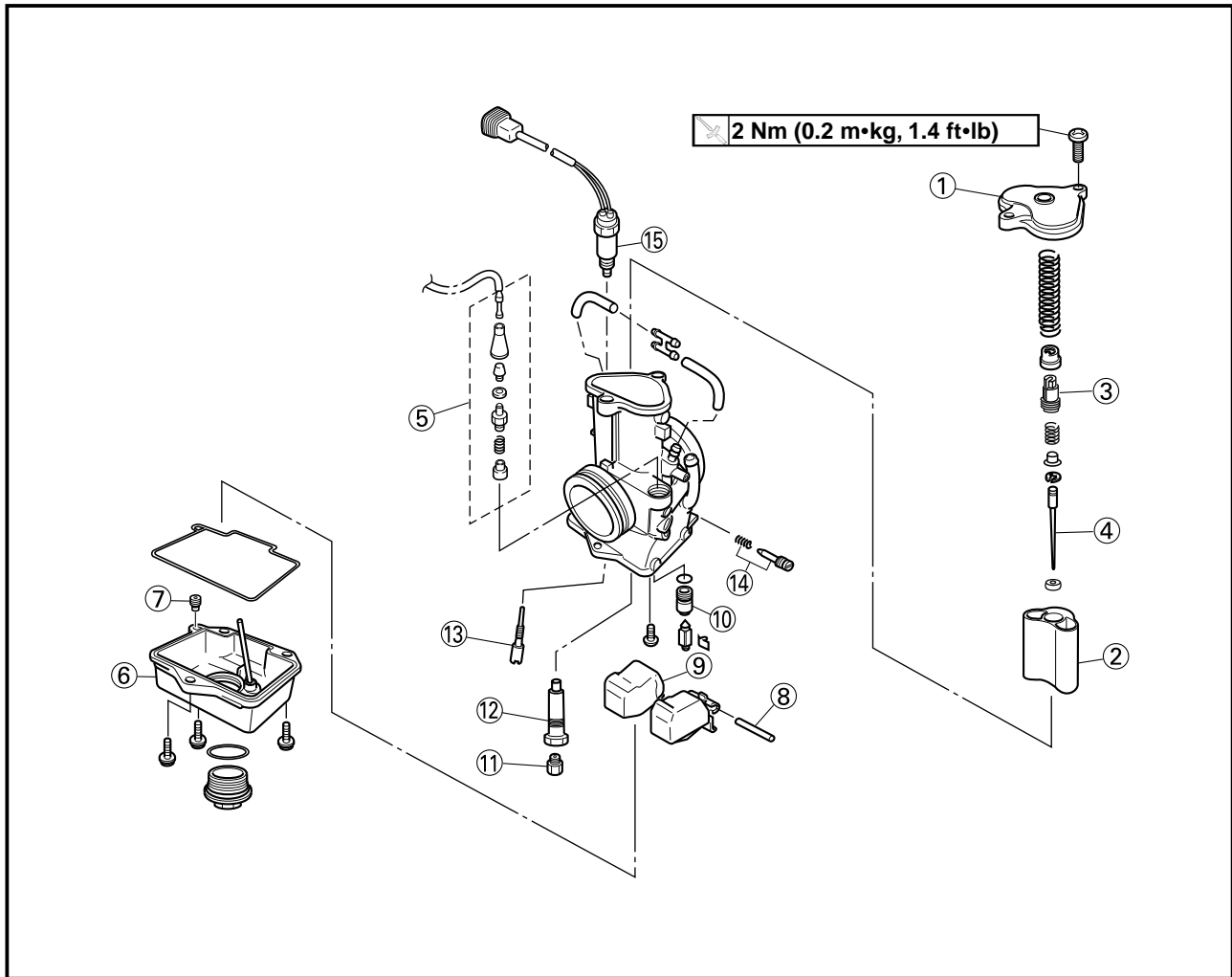
Extend of removal: ① Carburetor removal ② Reed valve removal

Extend of removal	Order	Part name	Q'ty	Remarks	
↑ ① ↓	↑ ② ↓	1 Induction cap (left cylinder)	1	Servicing the left cylinder	
		2 Solenoid valve lead	1ea.		Disconnect the solenoid valve lead. Loosen the screw (carburetor joint).
		3 Clamp (carburetor joint)	1ea.		
		4 Carburetor	1ea.		
		5 Fuel hose	1ea.	Pull up by slit end. } Servicing the right cylinder	
		6 Grommet	2		
		7 Induction cap (right cylinder)	1		
		8 Induction box	1ea.		
		9 Carburetor joint	1ea.		
	↑ ② ↓	10 Reed valve assembly	1ea.		
		11 Stopper (reed valve)	2ea.		
		12 Reed valve 2	2ea.		
		13 Reed valve 1	2ea.		



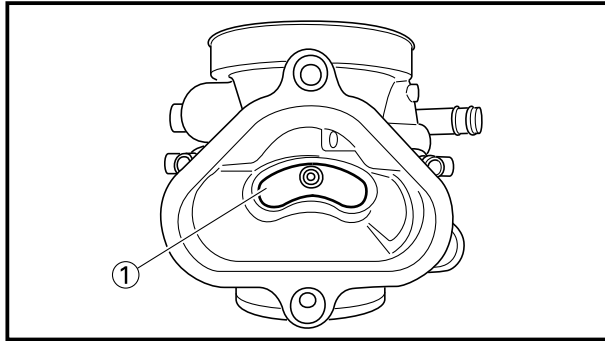
EC468000

CARBURETOR DISASSEMBLY



Extend of removal: ① Carburetor disassembly

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

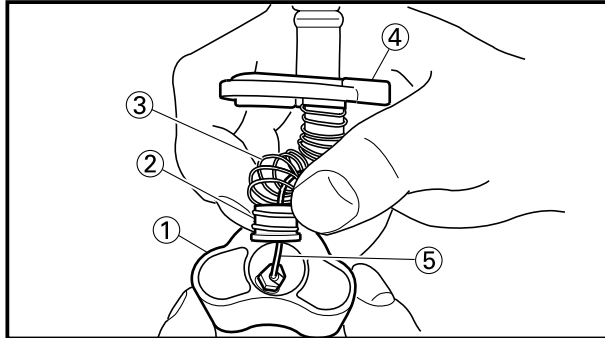


EC466010

HANDLING NOTE

CAUTION:

Do not disassemble the venturi block ① because it will cause a drop in carburetor performance.



EC463000

REMOVAL POINTS

EC463110

Throttle valve

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

NOTE:

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



EC464000

INSPECTION

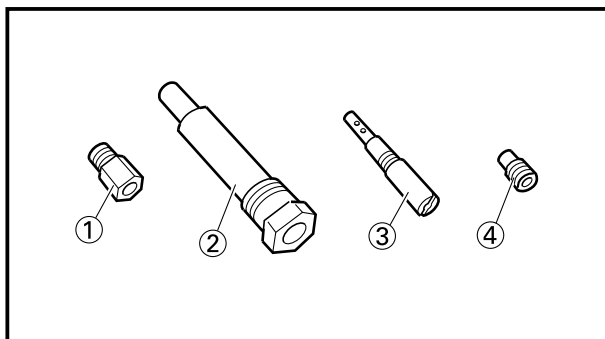
EC464120

Carburetor

- 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.

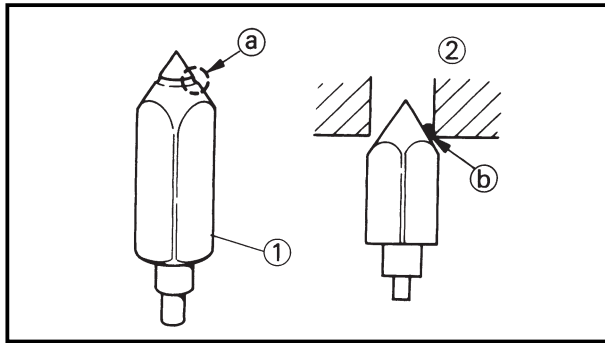


- Inspect:

- Main jet ①
- Main nozzle ②
- Pilot jet ③
- Power jet ④
- Contamination → Clean.

NOTE:

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



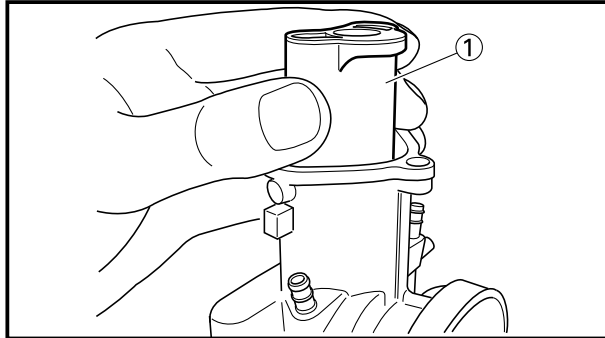
EC464200

Needle valve

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

NOTE:

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



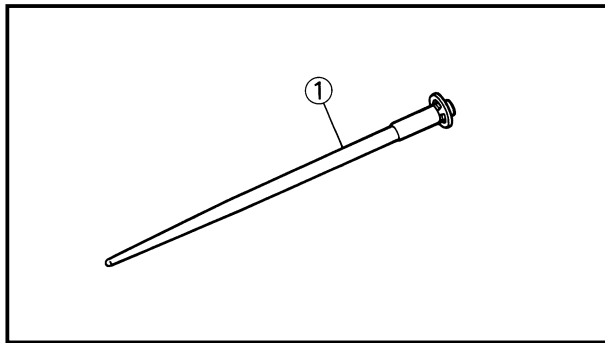
EC464301

Throttle valve

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

NOTE:

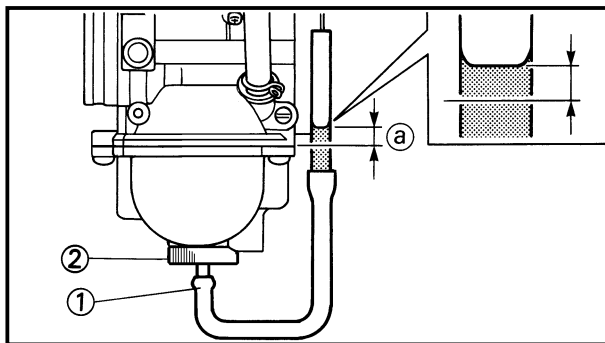
Insert the throttle valve ① into the carburetor body, and check for free movement.



EC464420

Jet needle

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



EC464802

FUEL LEVEL

- Measure:
 - Fuel level ①
- Out of specification → Adjust.



Fuel level:

6.0~7.0 mm (0.24~0.28 in)

Above the float chamber mating surface



Measurement and adjustment steps:

- Remove the drain plug.
- Connect the fuel level gauge adapter ② and fuel level gauge ① to the float chamber.



Fuel level gauge adapter:

YM-1470/90890-01470

Fuel level gauge:

YM-1312-A/90890-01312

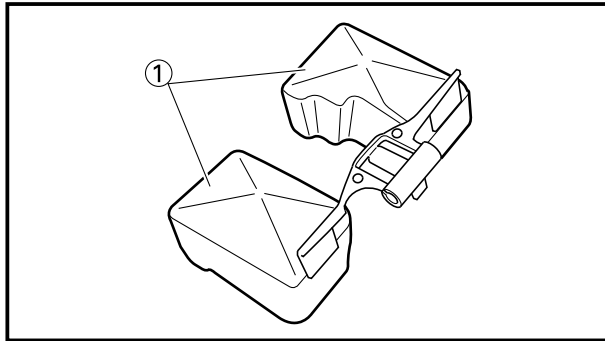
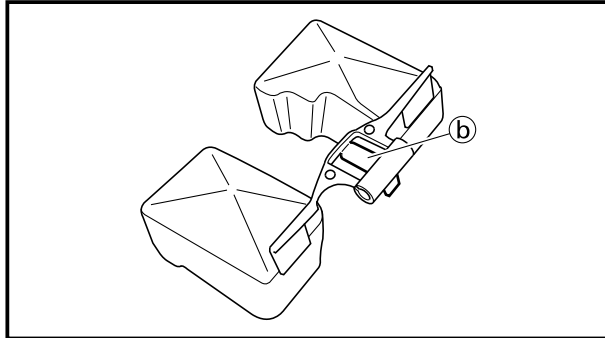


- Hold the fuel level gauge vertically next to the float chamber mating surface.
- Measure the fuel level with the fuel level gauge.

NOTE: _____

Keep the carburetor and fuel level gauge vertically when measuring the fuel level.

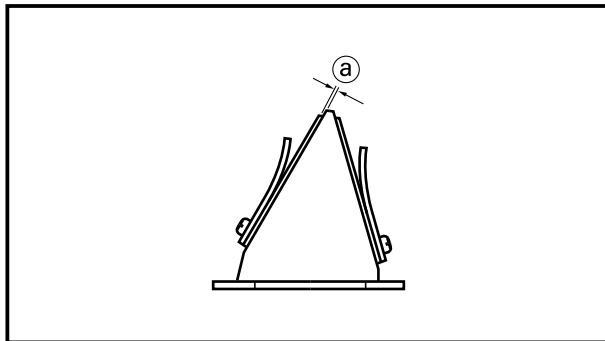
- If the fuel level is not within specification, inspect the valve seat and needle valve.
- If either is worn, replace them both.
- If both are fine, adjust the fuel level by bending the float tab (b) on the float.
- Recheck the fuel level.



EC464600

Float

1. Inspect:
 - Float ①
 - Damage → Replace.



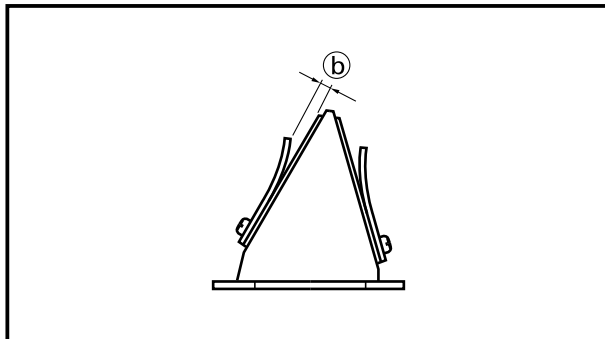
EC464701

Reed valve

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



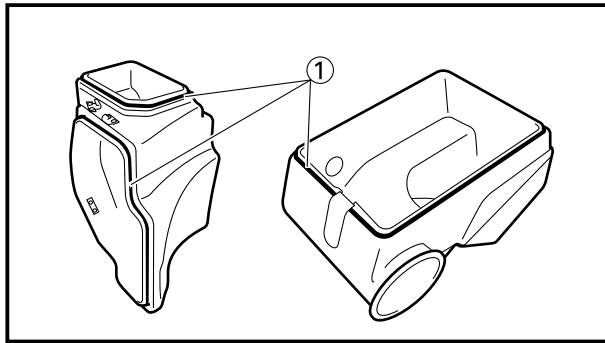
Reed valve bending limit:
0.2 mm (0.008 in)



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



Valve stopper height:
6.5~6.9 mm (0.256~0.272 in)



EC464900

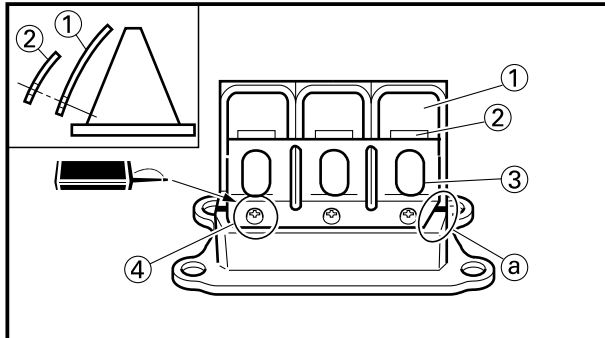
Induction box

1. Inspect:

- Seal ①

Peeled → Stick using the instantaneous adhesive

Crack/Wear/Damage → Replace.



EC465000

ASSEMBLY AND INSTALLATION

EC465180

Reed valve

1. Install:

- Reed valve 1 ①
- Reed valve 2 ②
- Stopper (reed valve) ③
- Screw (reed valve) ④

1 Nm (0.1 m•kg, 0.7 ft•lb)

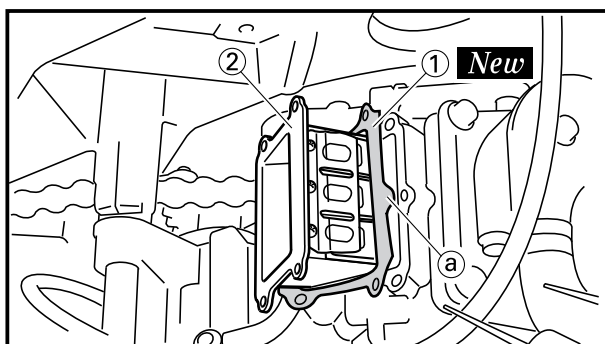
NOTE:

• Install the reed valve with the reed valve bending as shown.

• Note the cut ① in the lower corner of the reed and stopper plate.

CAUTION:

Tighten each screw gradually to avoid warping.

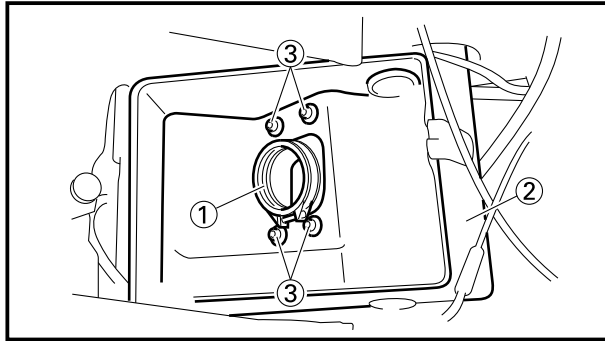


2. Install:

- Gasket (reed valve assembly) ① **New**
- Reed valve assembly ②

NOTE:

Install the gasket (left cylinder) with its projection ① facing upward and the seal print side toward the crankcase.



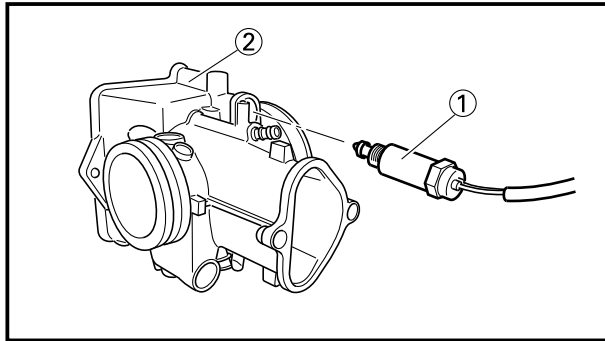
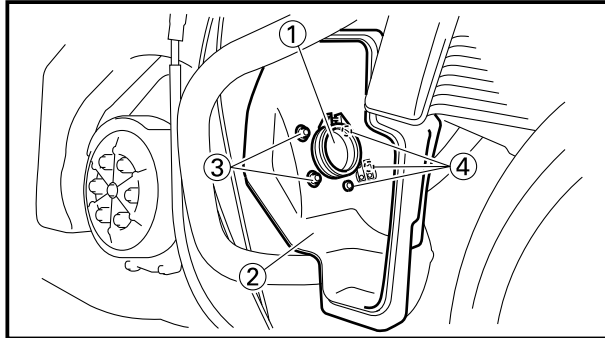
3. Install:

- Carburetor joint ①
- Induction box ②
- Bolt {carburetor joint [$l=25$ mm (0.98 in)]} ③

11 Nm (1.1 m•kg, 8.0 ft•lb)

- Bolt {carburetor joint [$l=20$ mm (0.79 in)]} ④

11 Nm (1.1 m•kg, 8.0 ft•lb)

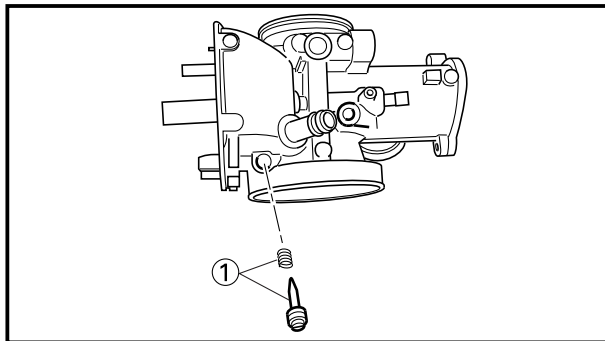


EC4652E0

Carburetor

1. Install:

- Solenoid valve ①
To carburetor ②.



2. Install:

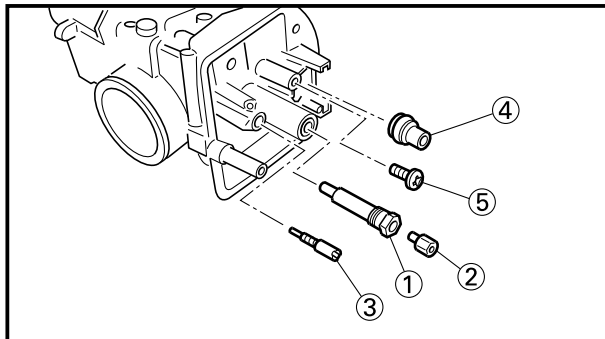
- Pilot air screw ①

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.

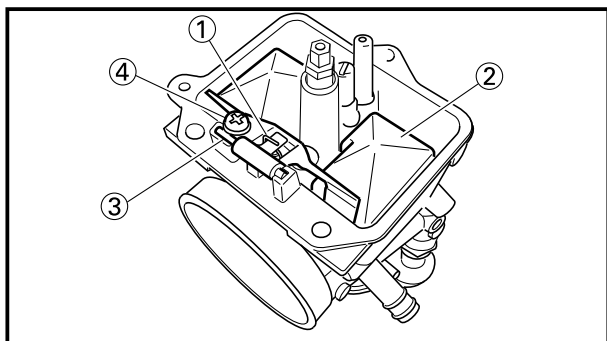


**Pilot air screw:
1-1/2 of turns out**



3. Install:

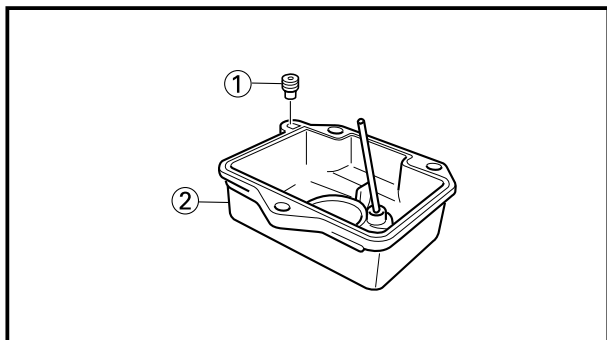
- Main nozzle ①
- Main jet ②
- Pilot jet ③
- Valve seat ④
- Screw (valve seat) ⑤



4. Install:
- Needle valve ①
 - Float ②
 - Float pin ③
 - Screw (float pin) ④

NOTE:

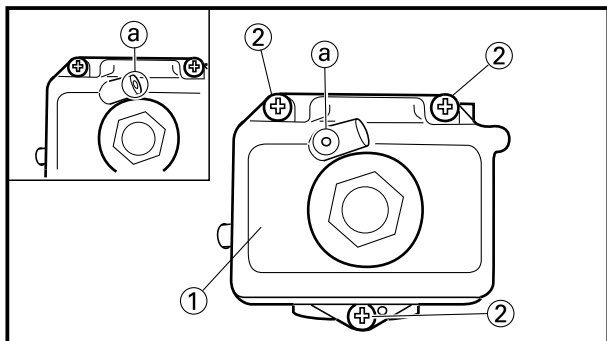
- After installing the needle valve to the float, install them to the carburetor.
- Check the float for smooth movement.



5. Install:
- Power jet ①
To float chamber ②.

CAUTION:

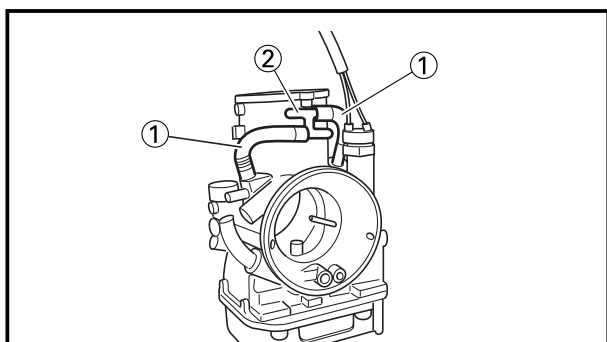
Do not tighten the power jet too hard, or you may not remove it when checking and replacing it.



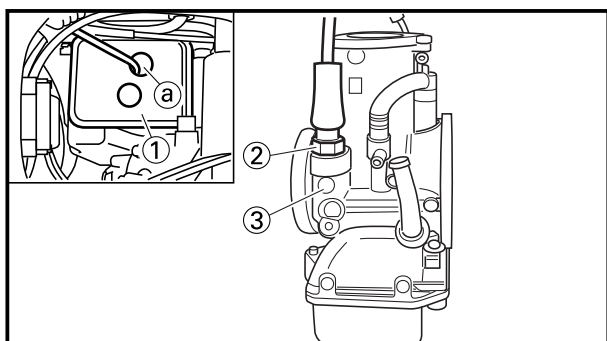
6. Install:
- Float chamber ①
 - Screw (float chamber) ②

CAUTION:

Do not confuse the left and right float chambers in installation because they are different from each other. The overflow hole ① is in the bottom of the float chamber for the left cylinder and for the right one in the side.



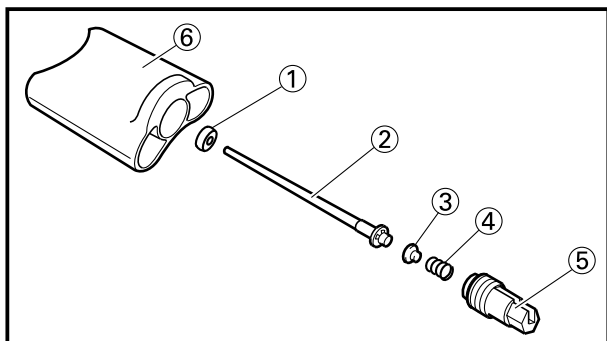
7. Install:
- Air vent hose ①
 - Joint ②



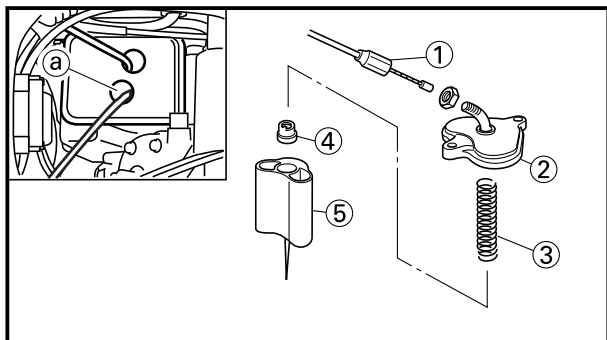
8. Install:
- Induction cap ① (right cylinder only)
 - Starter plunger ②
To carburetor ③.

NOTE:

Install the stater plunger (right cylinder) after passing it through the hole ① of the induction cap. Refer to "CABLE ROUTING DIAGRAM" section in the CHAPTER 2.



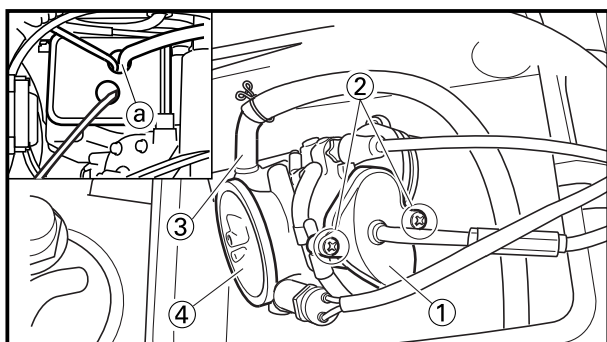
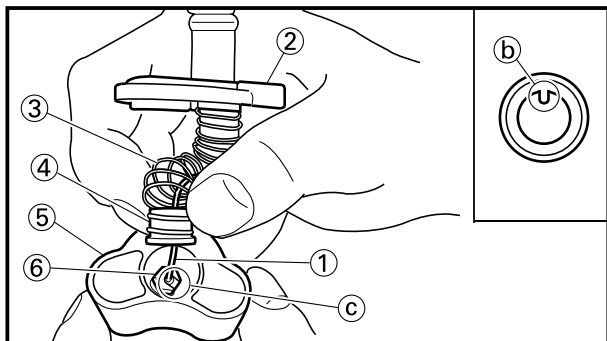
9. Install:
- Collar ①
 - Jet needle ②
 - Spring guide ③
 - Spring ④
 - Needle holder ⑤
- To throttle valve ⑥.



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

NOTE:

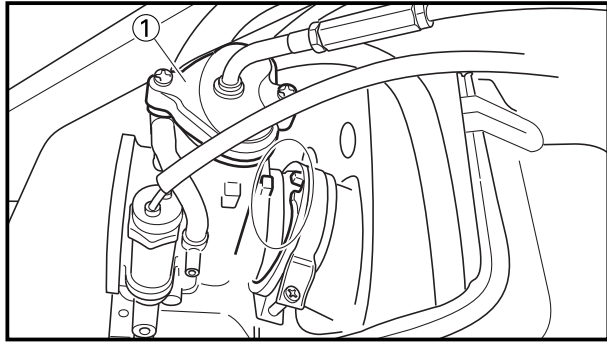
- Install the throttle cable (right cylinder) after passing it through the hole (a) of the induction cap. Refer to “CABLE ROUTING DIAGRAM” section in the CHAPTER 2.
- While compressing the spring, connect the throttle cable.
- Align the projection (b) on the ring with the groove (c) in the needle holder ⑥.



11. Install:
- Mixing chamber top ①
 - Screw (mixing chamber top) ②
- 2 Nm (0.2 m•kg, 1.4 ft•lb)**
- Fuel hose ③
- To carburetor ④.

NOTE:

- Install the fuel hose (right cylinder) after passing it through the hole (a) of the induction cap. Refer to “CABLE ROUTING DIAGRAM” section in the CHAPTER 2.
- After installing, check the throttle grip for smooth movement.



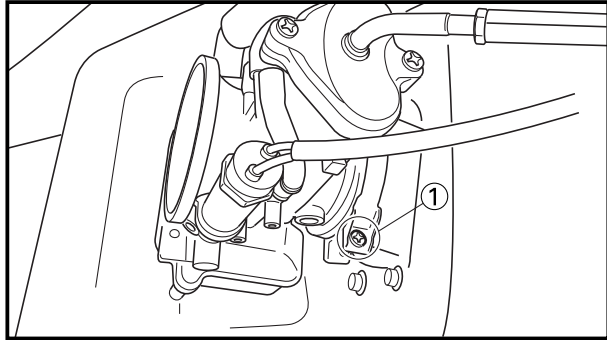
EC465370

Carburetor installation

1. Install:
 - Carburetor ①

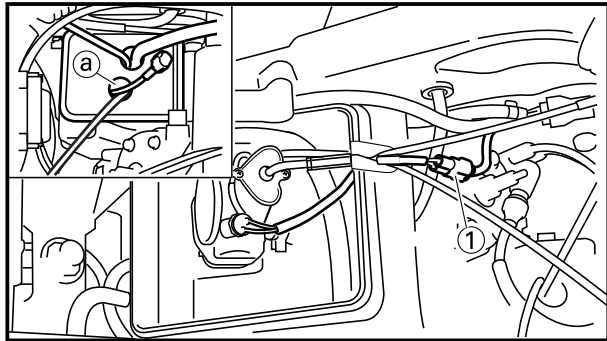
NOTE:

Install the projection between the carburetor joint slots.



2. Tighten:
 - Clamp (carburetor joint) ①

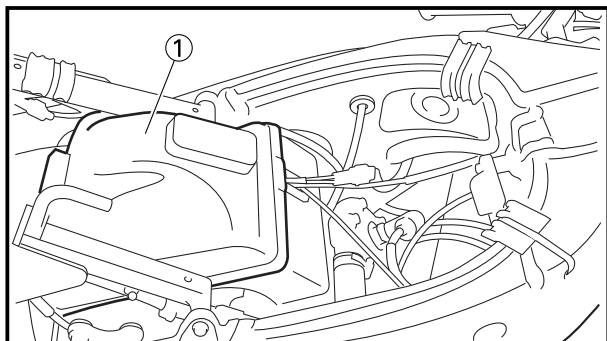
2 Nm (0.2 m•kg, 1.4 ft•lb)



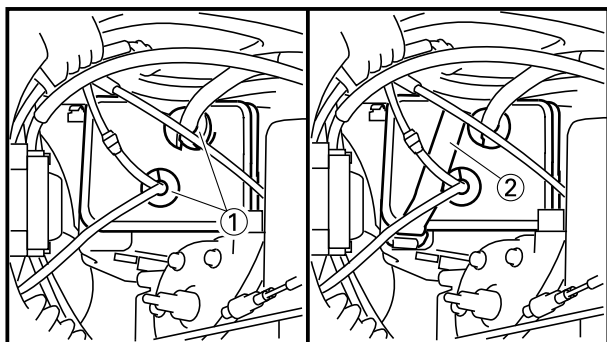
3. Connect:
 - Solenoid valve lead ①

NOTE:

Install the solenoid valve lead (right cylinder) after passing it through the hole ② of the induction cap. Refer to "CABLE ROUTING DIAGRAM" section in the CHAPTER 2.



4. Install:
 - Induction cap ① (left cylinder only)



5. Install:
 - Grommet ① (right cylinder only)
 - Band ② (right cylinder only)



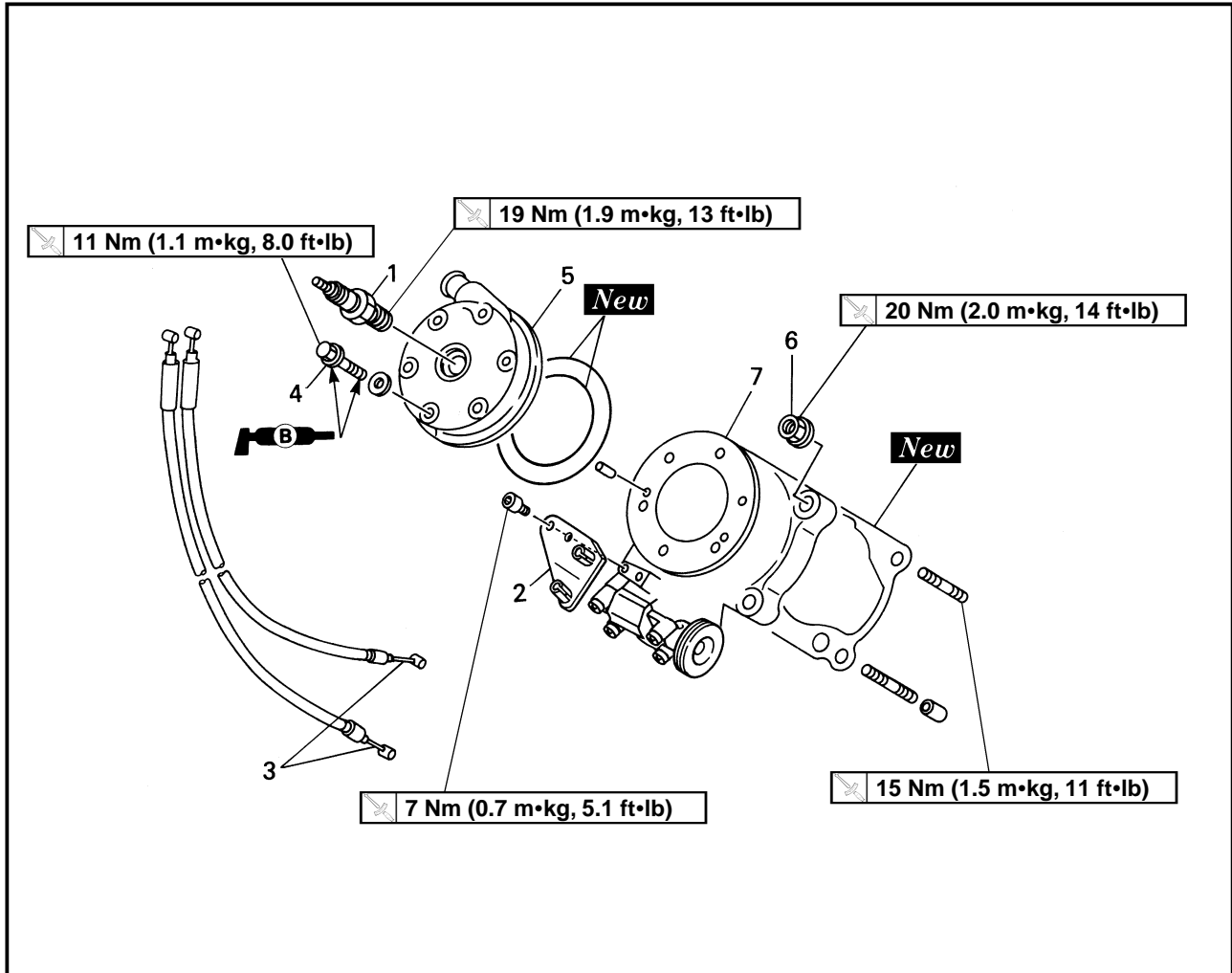
EC470000

CYLINDER HEAD, CYLINDER AND PISTON



EC478000

CYLINDER HEAD AND CYLINDER



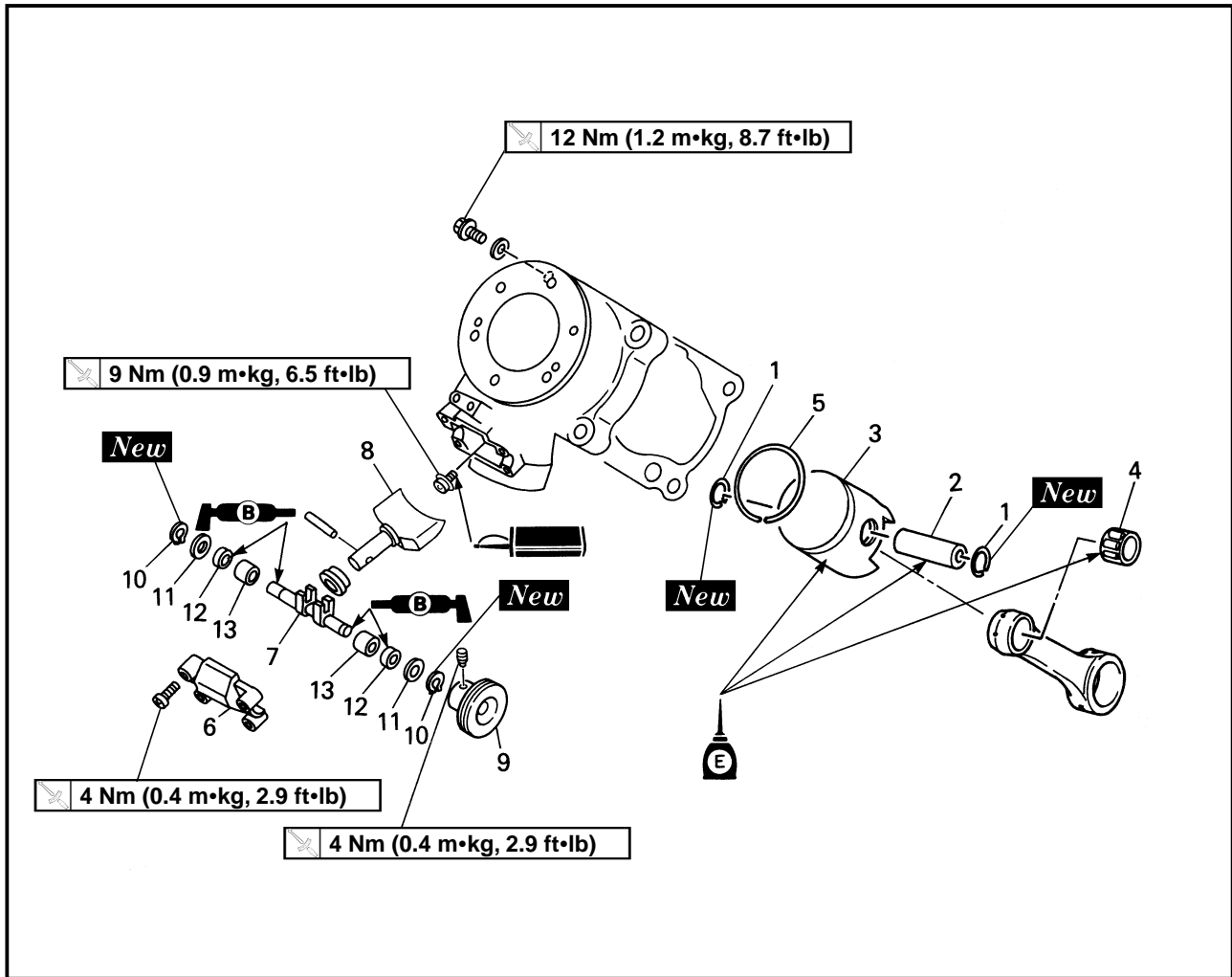
Extend of removal: ① Cylinder head removal ② Cylinder removal

Extend of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		CYLINDER HEAD AND CYLINDER REMOVAL		Refer to "COWLING, INDUCTION GUIDE, SEAT AND FUEL TANK" section. Refer to "EXHAUST PIPE AND SILENCER" section. Disconnect at cylinder head side. } Servicing the left cylinder
		Cowling and fuel tank		
		Exhaust pipe		
		Radiator hose 3, 4 Carburetor (left cylinder) Induction guide (left cylinder)		
① ↑ ↓ ② ↑ ↓	1	Spark plug	1ea.	} Refer to "REMOVAL POINTS". Loosen each bolt 1/4 turn, and remove them after all bolts are loosened.
	2	Cable stay	1ea.	
	3	YPVS cable	2ea.	
	4	Bolt (cylinder head)	6ea.	
	5	Cylinder head	1ea.	
	6	Nut (cylinder)	4ea.	
	7	Cylinder	1ea.	



EC478100

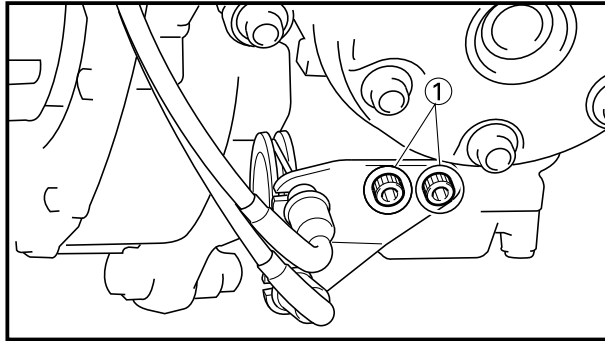
PISTON AND POWER VALVE



Extend of removal: ① Piston and piston ring removal

② Power valve removal

Extend of removal	Order	Part name	Q'ty	Remarks
<div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> ↑ ① ↓ </div> <div style="margin-right: 20px;"> ↑ ② ↓ </div> </div>	PISTON REMOVAL			
	1	Piston pin clip	2ea.	} Refer to "REMOVAL POINTS".
	2	Piston pin	1ea.	
	3	Piston	1ea.	
	4	Small end bearing	1ea.	
	5	Piston ring	1ea.	
	6	Valve cover	1ea.	
	7	Valve shaft	1ea.	
	8	Power valve	1ea.	
	9	Valve pulley	1ea.	
	10	Circlip	2ea.	
	11	Plain washer	2ea.	
	12	Oil seal	2ea.	
13	Solid bush	2ea.		



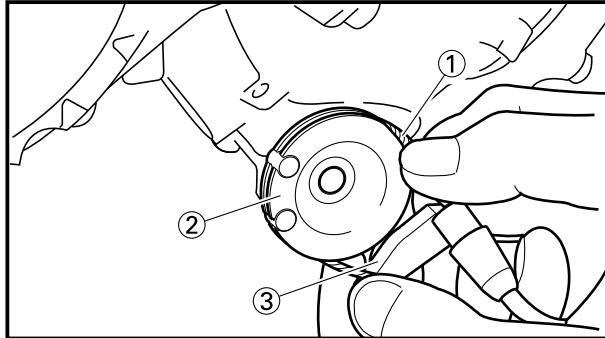
EC473000

REMOVAL POINTS

EC473310

YPVS cable

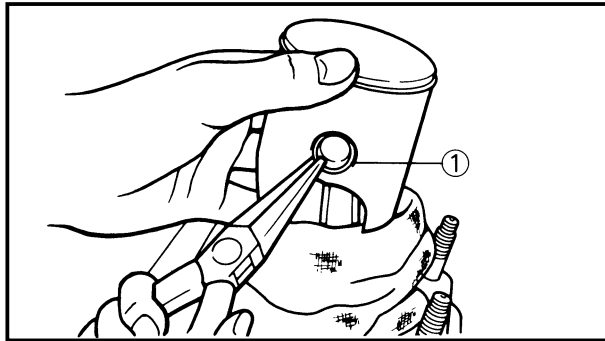
- Remove:
 - Bolt (cable stay) ①



- Remove:
 - YPVS cable ①
 - From the valve pulley ②.

NOTE:

Remove the YPVS cable together with the cable stay ③.



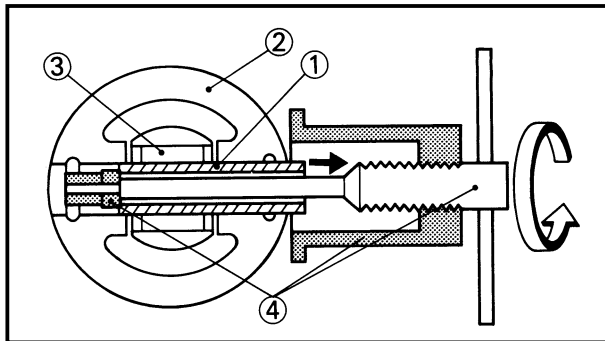
EC473402

Piston and piston ring

- Remove:
 - Piston pin clip ①

NOTE:

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



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

NOTE:

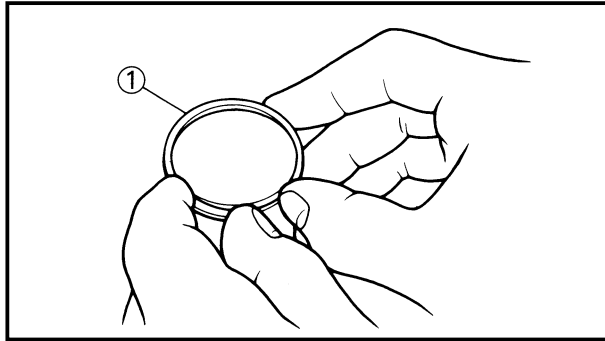
Before removing the piston pin, deburr the clip groove and pin hole area. If the piston pin groove is deburred and piston pin is still difficult to remove, use the piston pin puller ④.



Piston pin puller:
YU-1304/90890-01304

CAUTION:

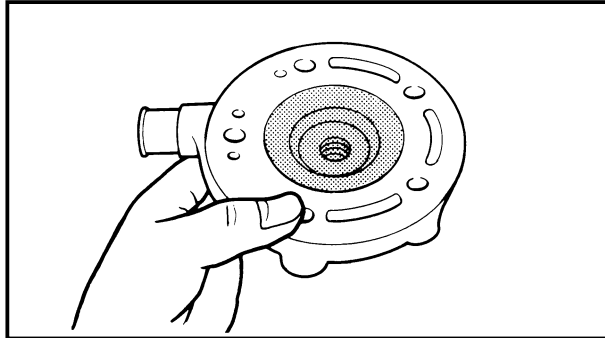
Do not use a hammer to drive the piston pin out.



3. Remove:
 - Piston ring ①

NOTE:

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



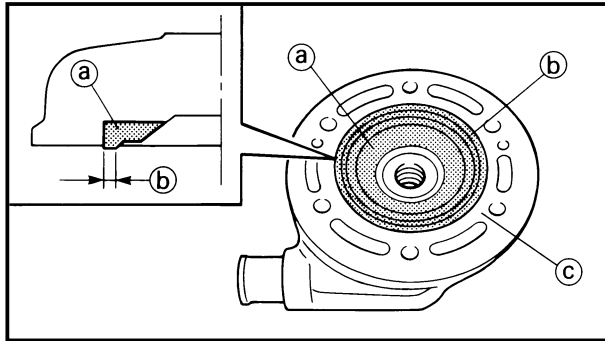
EC474000

INSPECTION

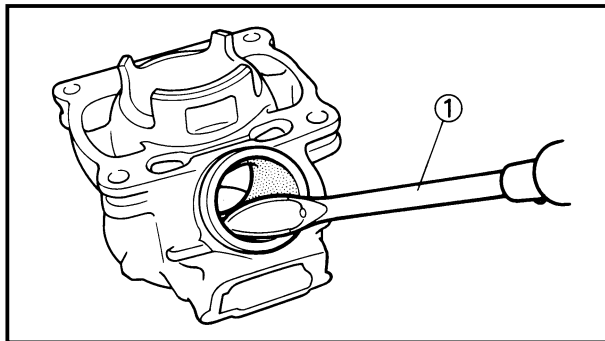
EC474110

Cylinder head

1. Remove:
 - Carbon deposits
Use #400~600 grit wet sandpaper.



2. Inspect:
 - Cylinder head water jacket
Crust of minerals/Rust → Remove.
 - Cylinder head contact surface
Wear/Damage → Replace.
 - Recess of insert portion ①
The contact surface ② of the insert portion is recessed below the aluminum portion ③ → Replace.



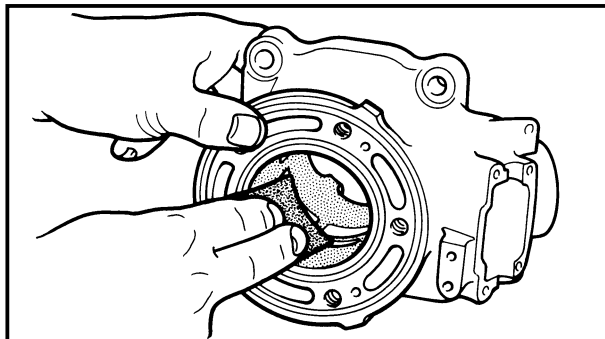
EC474211

Cylinder

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

NOTE:

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



2. Inspect:
 - Cylinder inner surface
Score marks → Repair or replace.
Using wet sandpaper (#240), repair in the same crisscross patterns as the honed ones.

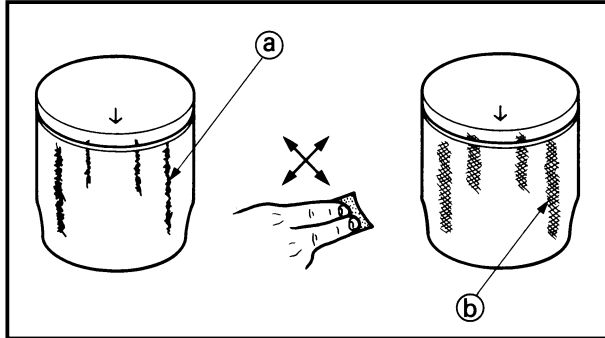
CAUTION:

- Do not rebore the cylinder.
- Minimize modification by wet sandpaper.
Do not rub too much.



3. Inspect:

- Travel distance for cylinder
3,000 km (1,800 miles) or more → Replace.



EC474B00

Piston

1. Inspect:

- Piston crown
Damage and crack due to detonation → Replace.
- Piston pin hole
Crack → Replace.
- Contact with cylinder
Excessive scuffing, score (a) → Use #240~320 grit wet sandpaper in a criss-cross manner (b).
- Heat discoloration → Replace.

2. Inspect:

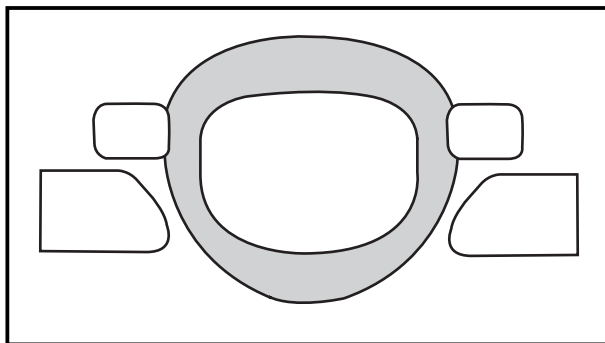
- Travel distance for piston
500 km (300 miles) or more → Replace.

EC474A00

Contact surface roughening for piston replacement

NOTE: _____

- Roughening the cylinder wall for a replaced piston helps toward smoother contact surfaces and prevents trouble that would otherwise occur.
- If a new piston is installed to a cylinder without honed patterns, the contact surfaces will not fit properly because of eccentric wear caused by sliding motion.

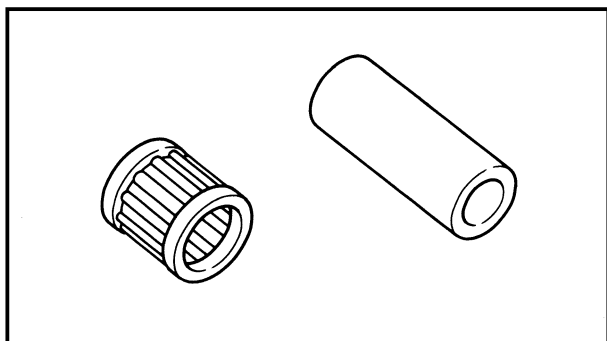


1. Inspect:

- Honed patterns on the cylinder wall
Using wet sandpaper (#240), rub the area without honed patterns in the same criss-cross patterns as the honed ones (especially, along the periphery of the exhaust port).

CAUTION: _____

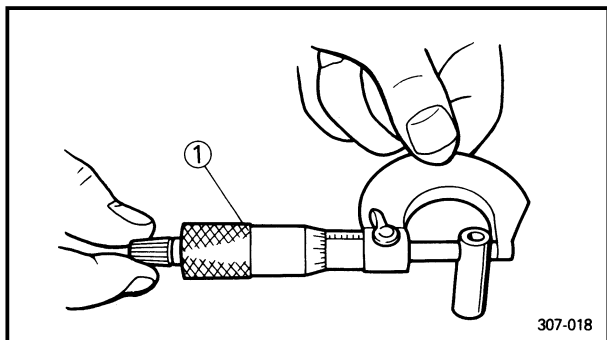
Minimize modification by wet sandpaper. Do not rub too much.



EC474402

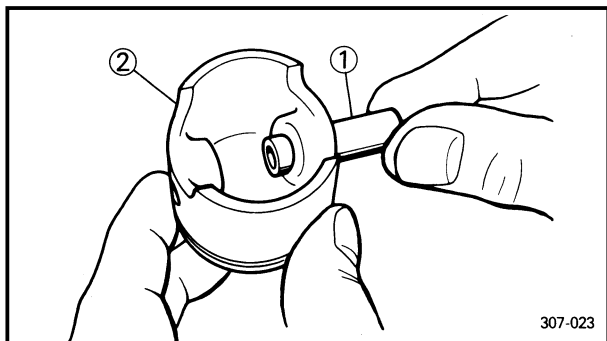
Piston pin and small end bearing

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



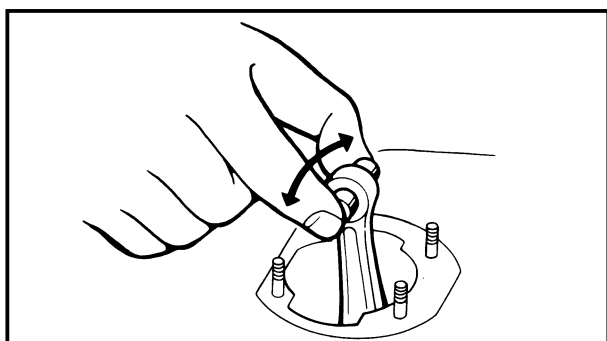
2. Measure:
 - Piston pin outside diameter
 Use micrometer ①.
 Out of limit → Replace.

Piston pin outside diameter:	
Standard	<Limit>
14.995~15.000 mm (0.5904~0.5906 in)	14.975 mm (0.5896 in)

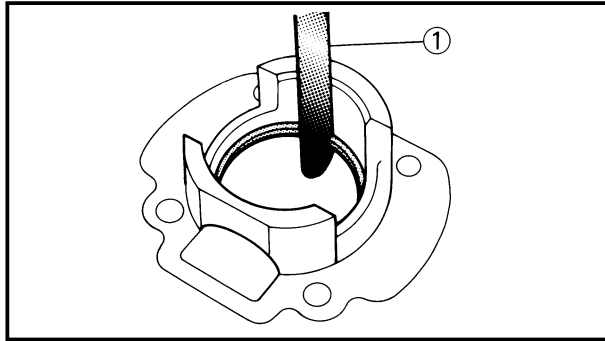


3. Check:
 - Free play (when the piston pin ① is in place in the piston ②)
 There should be no noticeable for the play.
 Free play exists → Replace piston pin and/or piston.

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



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



EC474530

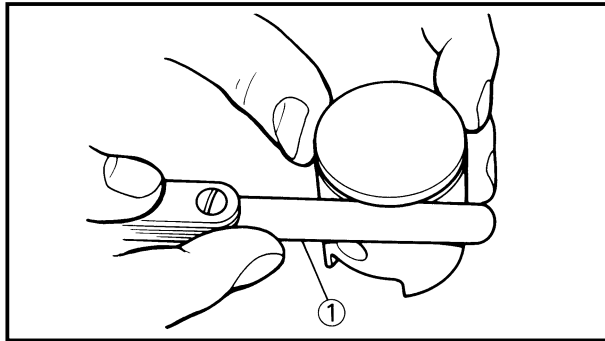
Piston ring

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



Ring end gap (installed):

Standard	<Limit>
0.22~0.37 mm (0.009~0.015 in)	0.59 mm (0.023 in)

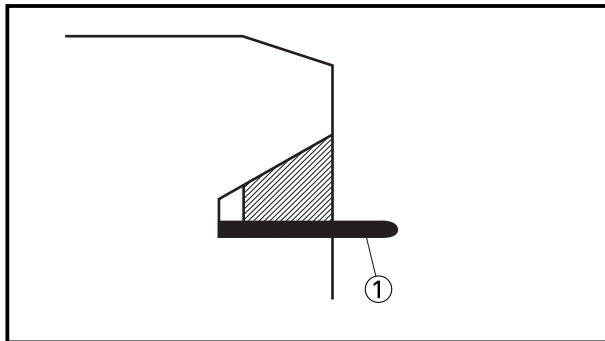


3. Measure:
 - Side clearance
Use a thickness gauge (1).
Out of specification → Replace piston and/or ring.



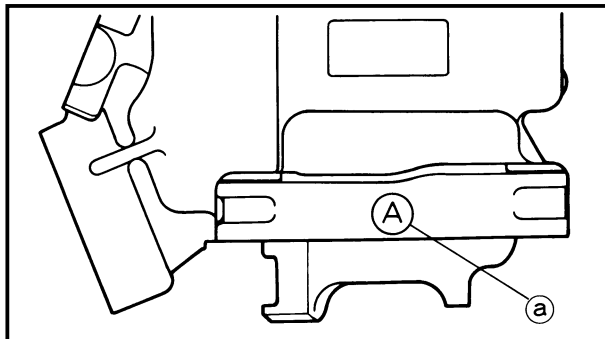
Side clearance:

Standard	<Limit>
Zero~0.06 mm (Zero~0.0024 in)	-



NOTE:

- Insert the thickness gauge deep in the piston ring groove. Then measure the clearance with both sliding surfaces being flush with each other.
- Check at several points.

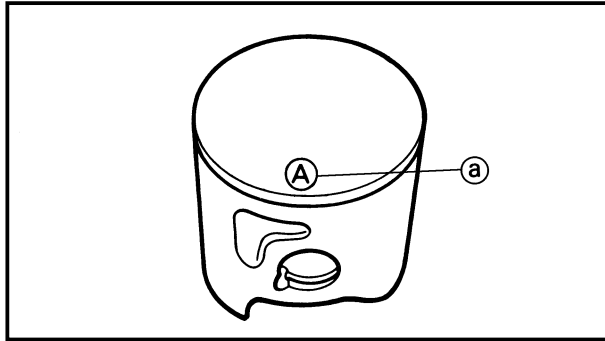


EC474720

Combination of piston and cylinder

1. Check:
 - Cylinder mark (a)

Cylinder mark (a)
A
B
C



2. Check:

- Piston mark (a)

Piston mark (a) (color)
A (red)
B (orange)
C (green)

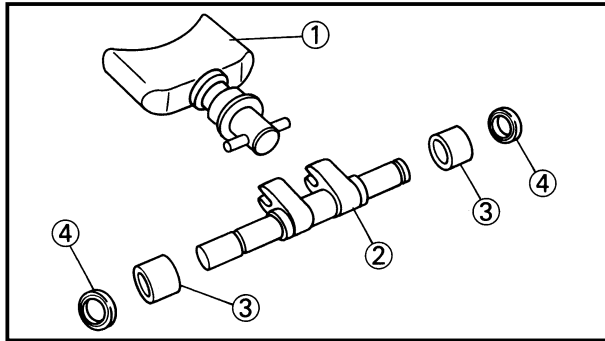
3. Combination:

Combine the piston and cylinder by the following chart.

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

NOTE:

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

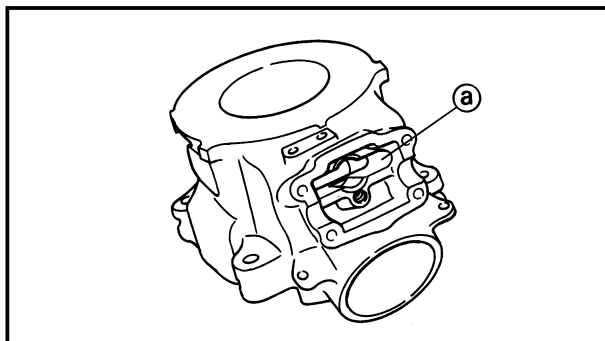


EC474821

Power valve

1. Inspect:

- Power valve ①
Wear/Damage → Replace.
Carbon deposits → Remove.
- Valve shaft ②
- Solid bush ③
- Oil seal ④
Wear/Damage → Replace.



EC474901

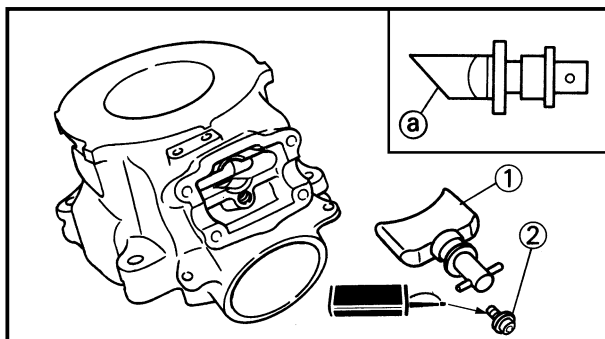
Power valve hole on cylinder

1. Remove:

- Carbon deposits
From power valve hole surface (a).

NOTE:

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



EC475000

ASSEMBLY AND INSTALLATION

EC475181

Power valve

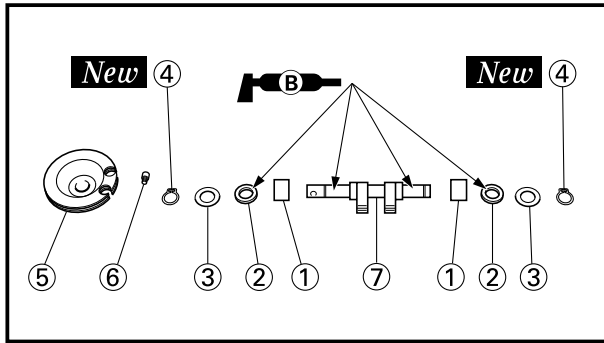
1. Install:

- Power valve ①
- Bolt (power valve) ②

9 Nm (0.9 m•kg, 6.5 ft•lb)

NOTE:

Install the power valve at cut-away faced (a) for down side.



2. Install:

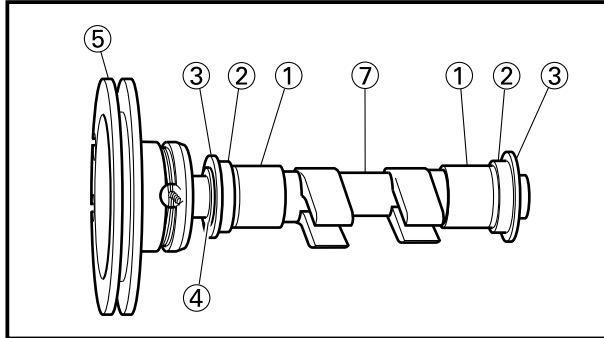
- Solid bush ①
- Oil seal ②
- Plain washer ③
- Circlip ④ **New**
- Valve pulley ⑤
- Screw (valve pulley) ⑥

4 Nm (0.4 m•kg, 2.9 ft•lb)

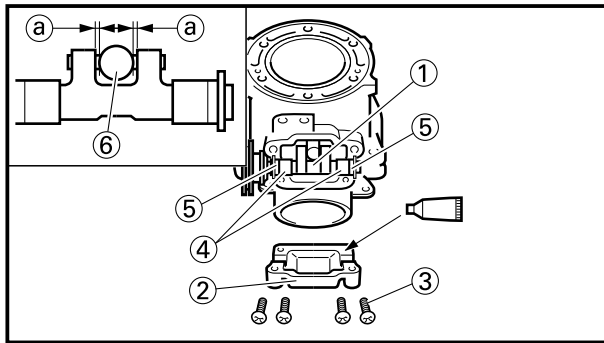
To valve shaft ⑦.

NOTE:

Apply the lithium soap base grease on the valve shaft and oil seal lip.



3. Lock the pulley holding screw using an appropriate wire around the groove on the valve pulley.



4. Install:

- Valve shaft ①
- Valve cover ②
- Screw (valve cover) ③

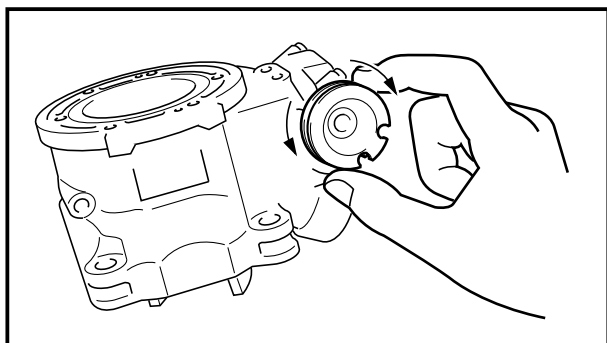
4 Nm (0.4 m•kg, 2.9 ft•lb)

NOTE:

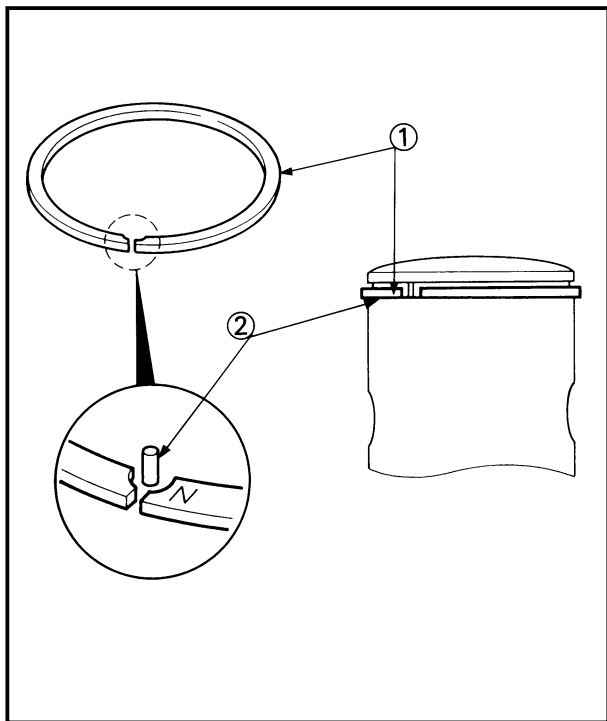
- Install the valve shaft so that its pulley faces left of the chassis for the left cylinder and right of the chassis for the right cylinder.
- When installing the valve shaft into the cylinder, lightly touch the solid bush ④ with the oil seal ⑤ and provide an equal gap ① for the power valve ⑥ and valve shaft.
- Clean the contacting surface of the valve cover and cylinder before applying the sealant.



Quick gasket®
ACC-YAMAB-ON-D4
YAMAHA Bond No.4
90890-05143



5. Check:
- Power valve smooth movement
Unsmooth movement → Repair or replace.



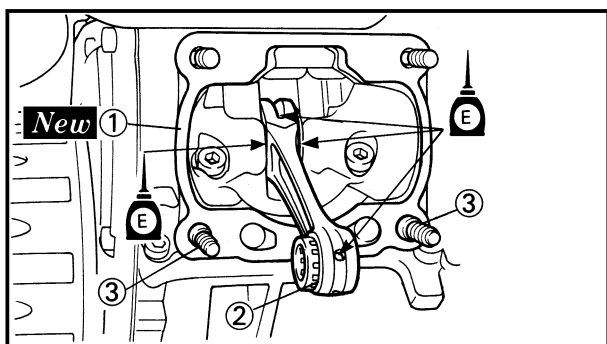
EC475271

Piston ring and piston

1. Install:
- Piston ring ①

NOTE:

- Take care not to scratch the piston or damage the piston ring by expanding it more than necessary.
- Install the piston ring with its mark "N" upward.
- Align the piston ring gap with the pin ②.
- After installing the piston ring, check the smooth movement of it.



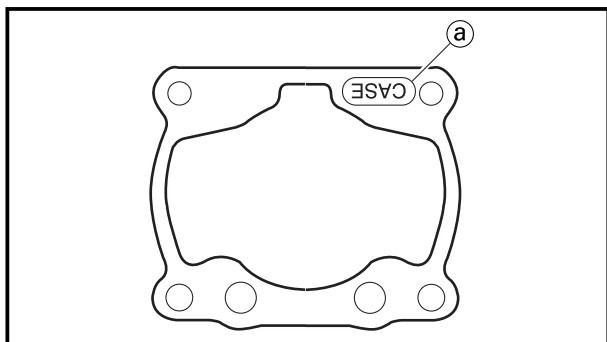
2. Install:
- Gasket (cylinder) ① **New**
 - Small end bearing ②
 - Dowel pin ③

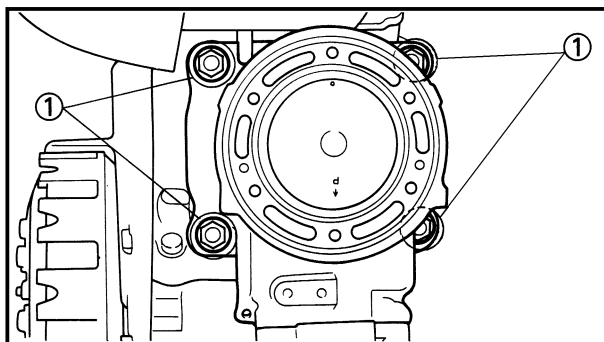
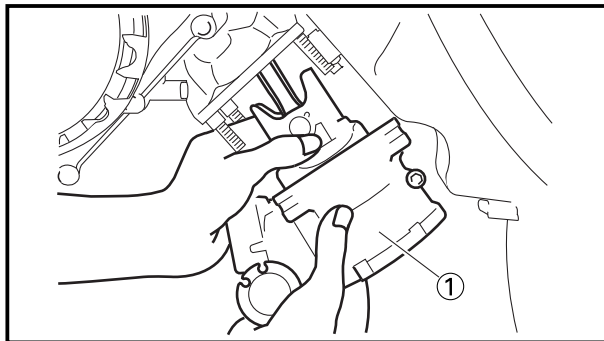
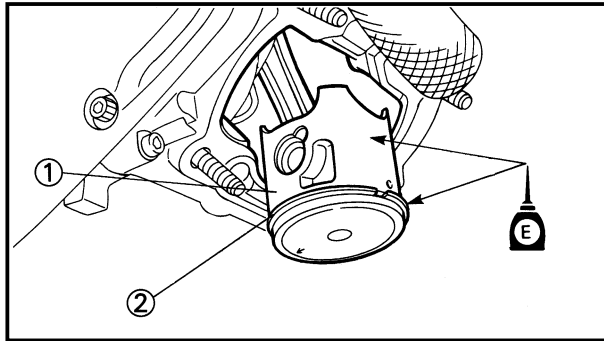
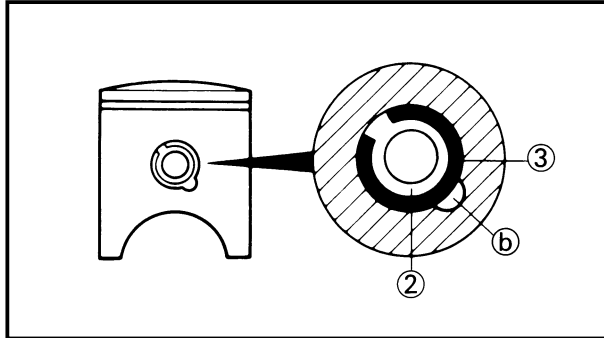
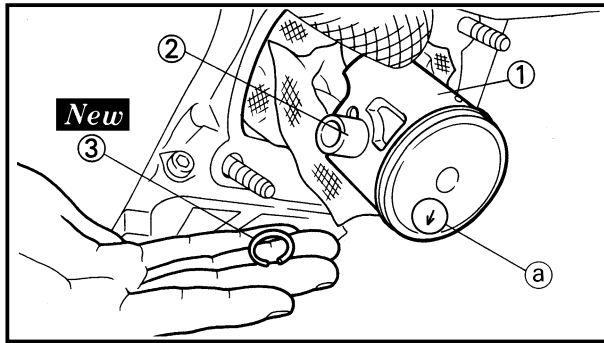
NOTE:

Apply the engine oil on the bearing (crankshaft and connecting rod) and connecting rod big end washers.

CAUTION:

Install the gasket with the letter "CASE" ④ on it toward the crankcase.





3. Install:

- Piston ①
- Piston pin ②
- Piston pin clip ③ **New**

NOTE:

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

CAUTION:

- When installing the piston pin clip, use the hand so that it may not be distorted.
- Do not allow the clip open ends to meet the piston pin slot (b).

EC475351

Cylinder head and cylinder

1. Apply:

- Engine oil
To piston ①, piston ring ② and cylinder inner surface.

2. Install:

- Cylinder ①

CAUTION:

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

NOTE:

After installing, check the smooth movement of the piston.

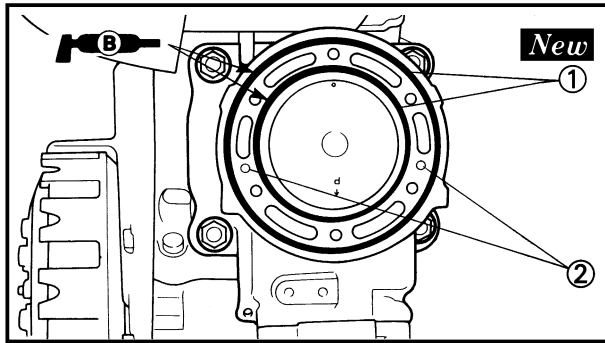
3. Install:

- Nut (cylinder) ①

20 Nm (2.0 m•kg, 14 ft•lb)

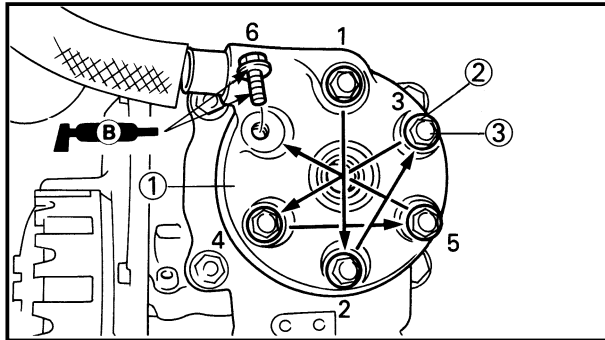
NOTE:

Tighten the nuts in stages, using a crisscross pattern.



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

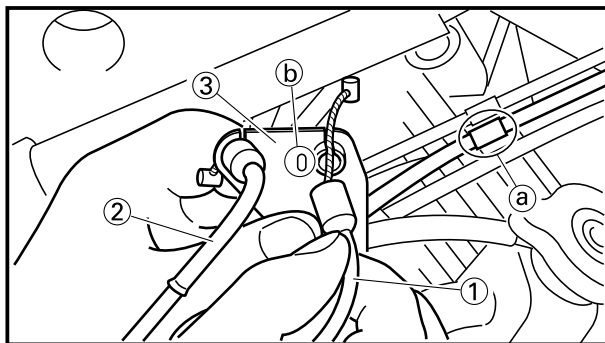
NOTE: _____
Apply the lithium soap base grease on the O-rings.



5. Install:
- Cylinder head ①
 - Copper washer ②
 - Bolt (cylinder head) ③

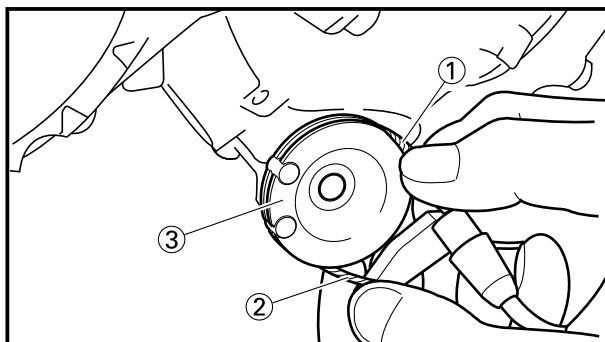
11 Nm (1.1 m•kg, 8.0 ft•lb)

NOTE: _____
• Apply the lithium soap base grease on the thread and contact surface of the bolt (cylinder head).
• Tighten the bolts (cylinder head) in stage, using a crisscross pattern.



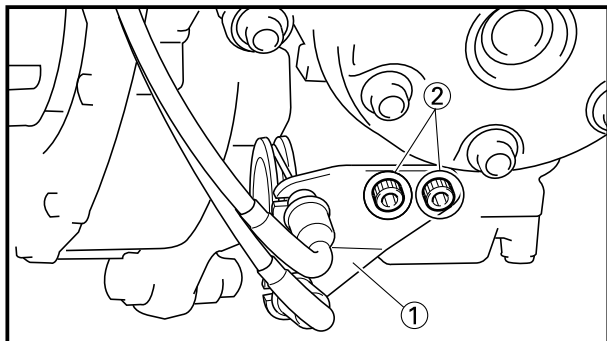
6. Install:
- YPVS cable 2, 4 (open side) ①
 - YPVS cable 1, 3 (close side) ②
 - To cable stay ③.

NOTE: _____
Install the open side cables (sleeve @ cables) to the "0" marked (b) side of the cable stay.



7. Connect:
- YPVS cable 2, 4 (open side) ①
 - YPVS cable 1, 3 (close side) ②
 - To valve pulley ③.

NOTE: _____
Connect the silver cables to the left side cylinder and the black cables to the right cylinder. Refer to "CABLE ROUTING DIAGRAM" section in the CHAPTER 2.



8. Install:

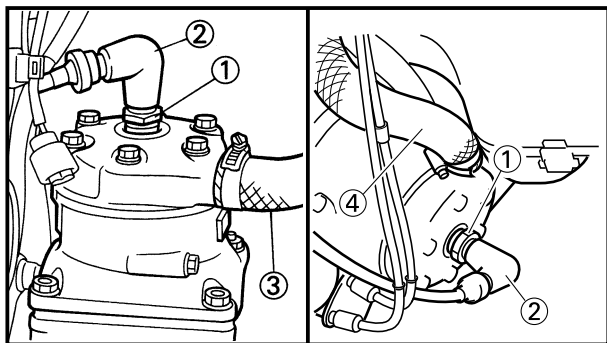
- Cable stay ①
- Bolt (cable stay) ②

7 Nm (0.7 m•kg, 5.1 ft•lb)

9. Adjust:

- YPVS cable

Refer to “YPVS OPEN SIDE CABLE ADJUSTMENT” and “YPVS CLOSE SIDE CABLE ADJUSTMENT” section in the CHAPTER 3.



10. Install:

- Spark plug ① 19 Nm (1.9 m•kg, 13 ft•lb)

- Spark plug cap ②

- Radiator hose 3 ③

2 Nm (0.2 m•kg, 1.4 ft•lb)

- Radiator hose 4 ④

2 Nm (0.2 m•kg, 1.4 ft•lb)



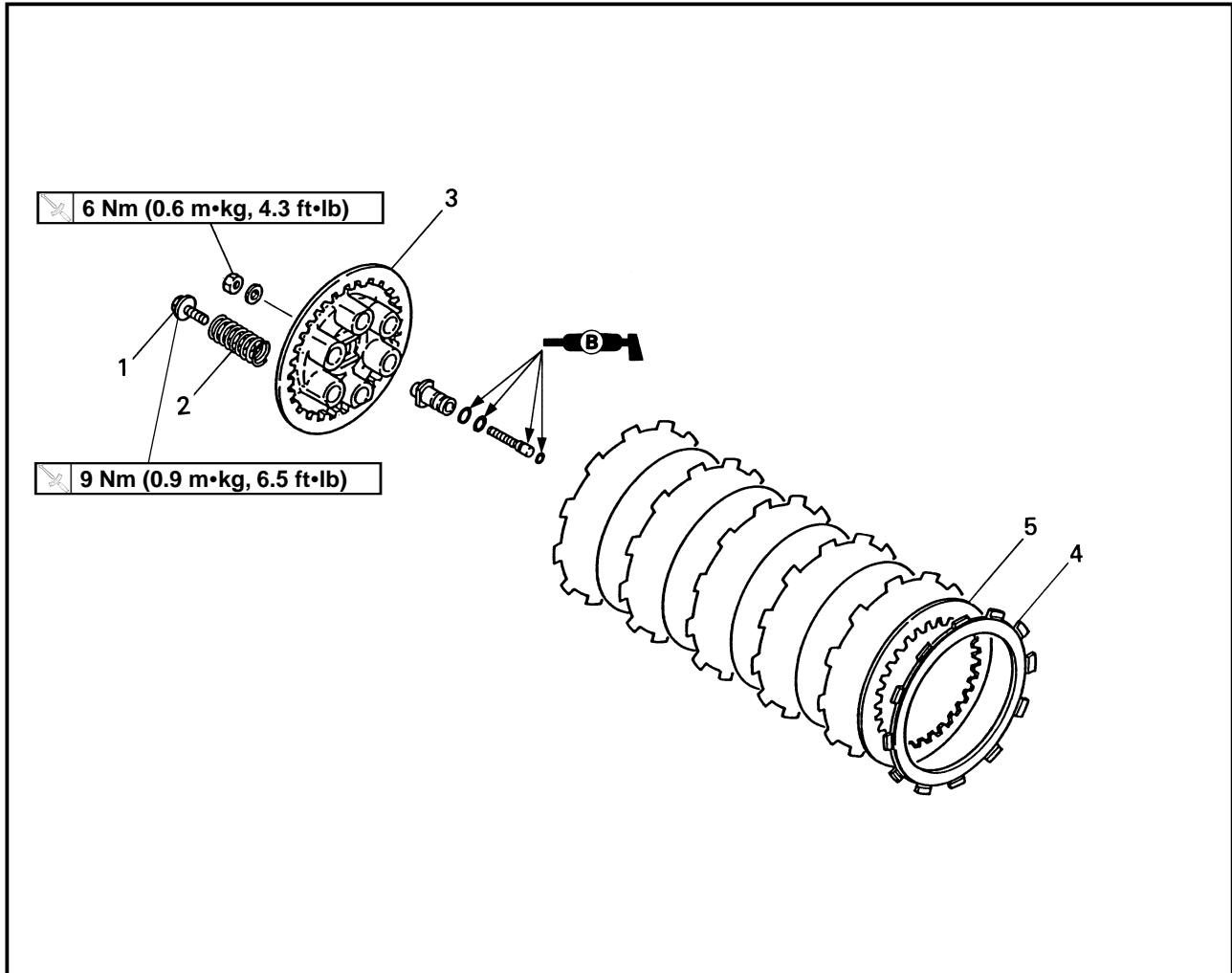
EC4A0000

CLUTCH



EC4A8000

CLUTCH PLATE AND FRICTION PLATE



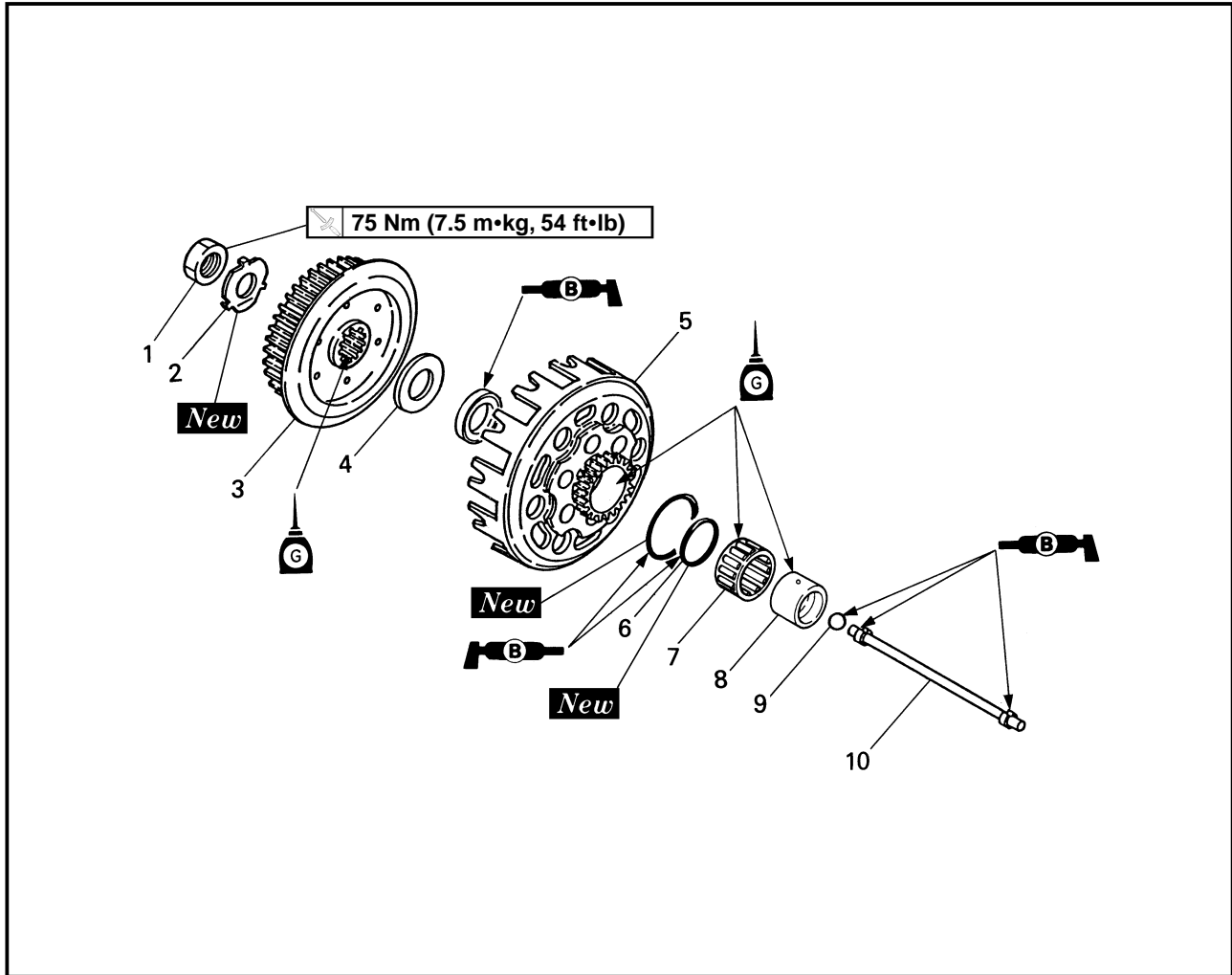
Extend of removal: ① Clutch plate and friction plate removal

Extend of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		CLUTCH PLATE AND FRICTION PLATE REMOVAL		Refer to "COWLING, SEAT AND FUEL TANK" section.
		Lower cowl		
<div style="text-align: center;"> ↑ ① ↓ </div>	1	Screw (clutch spring)	6	
	2	Clutch spring	6	
	3	Pressure plate	1	
	4	Friction plate	6	
	5	Clutch plate	5	



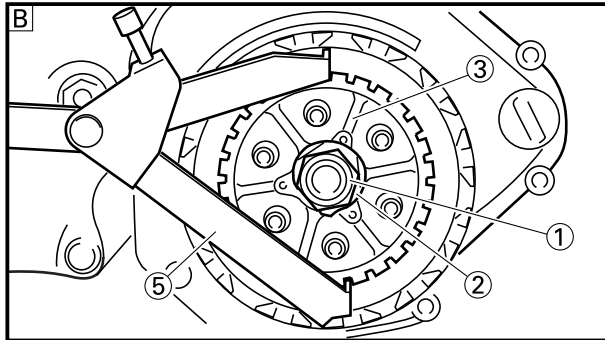
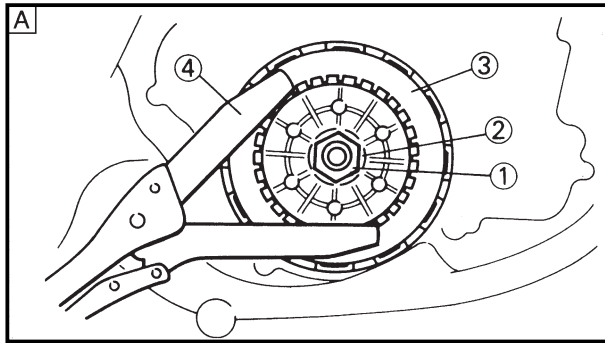
EC4A8200

CLUTCH HOUSING AND PUSH ROD



Extend of removal: ① Clutch housing removal ② Push rod removal

Extend of removal	Order	Part name	Q'ty	Remarks
① ↑ ↓ ② ↑ ↓	CLUTCH HOUSING AND PUSH ROD REMOVAL			
	1	Nut (clutch boss)	1	} Use special tool. Refer to "REMOVAL POINTS".
	2	Lock washer	1	
	3	Clutch boss	1	
	4	Plain washer	1	
	5	Clutch housing	1	
	6	O-ring	1	
	7	Bearing	1	
	8	Spacer 1	1	
	9	Ball	1	
10	Push rod	1		



EC4A3000

REMOVAL POINTS

EC483211

Clutch boss

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

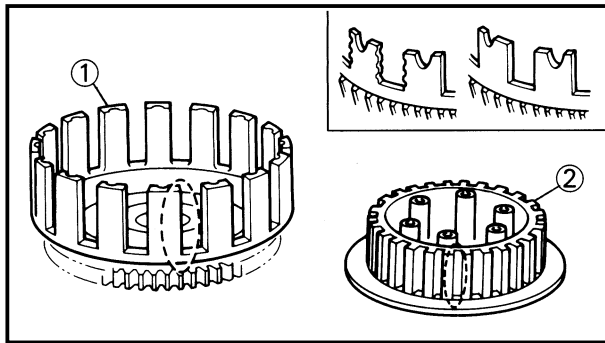
NOTE:

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

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

Ⓐ For USA and CDN

Ⓑ Except for USA and CDN



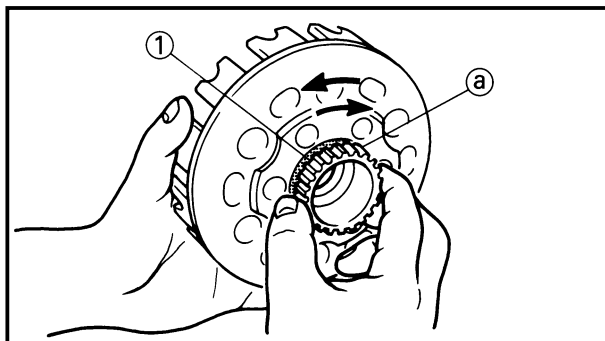
EC4A4000

INSPECTION

EC484100

Clutch housing and boss

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



EC4A4100

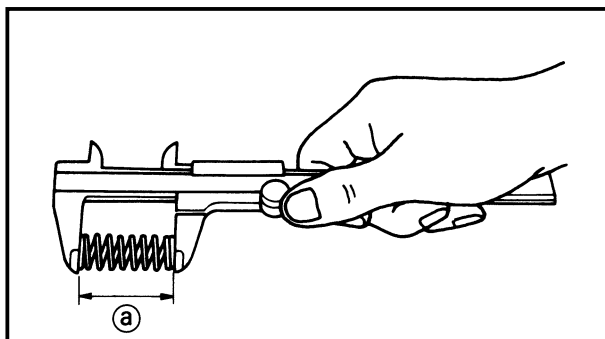
Clutch housing

1. Check:
 - Circumferential play
Free play exists → Replace.
 - Gear teeth ②
Wear/Damage → Replace.
 - O-ring ①
Damage → Replace.

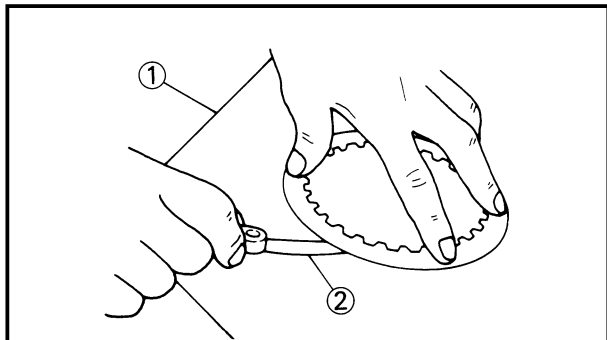
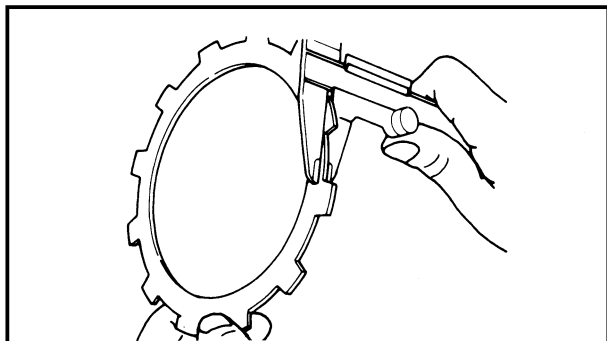
EC484400

Clutch spring

1. Measure:
 - Clutch spring free length ②
Out of specification → Replace springs as a set.



	Clutch spring free length:	
	Standard	<Limit>
	30.6 mm (1.205 in)	29.6 mm (1.165 in)



EC484500

Friction plate

1. Measure:

- Friction plate thickness

Out of specification → Replace friction plate as a set.

Measure at all four points.

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

EC484600

Clutch plate

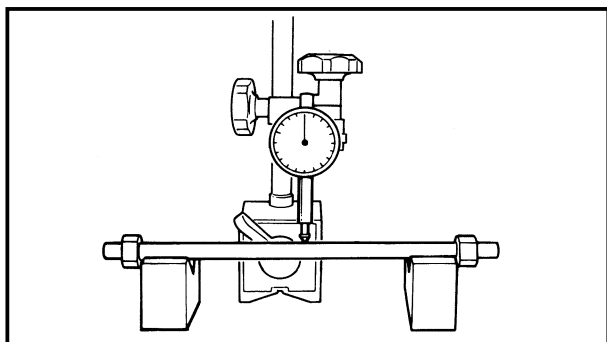
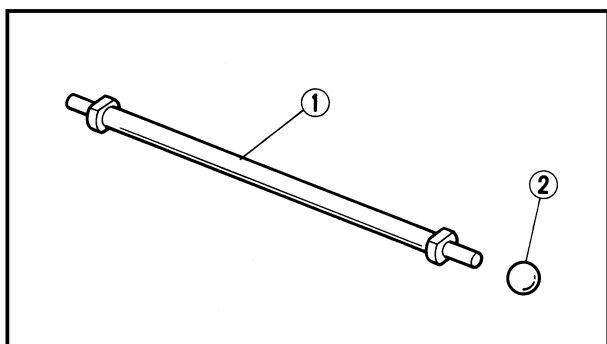
1. Measure:

- Clutch plate warpage

Out of specification → Replace clutch plate as a set.

Use a surface plate ① and thickness gauge ②.

Warp limit: 0.1 mm (0.004 in)
--



EC4A4301

Push rod

1. Inspect:

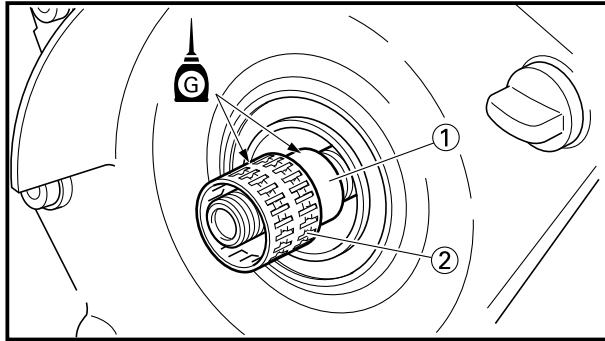
- Push rod ①
- Ball ②

Wear/Damage/Bend → Replace.

Bending limit: 0.2 mm (0.008 in)

NOTE: _____

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



EC4A5000

ASSEMBLY AND INSTALLATION

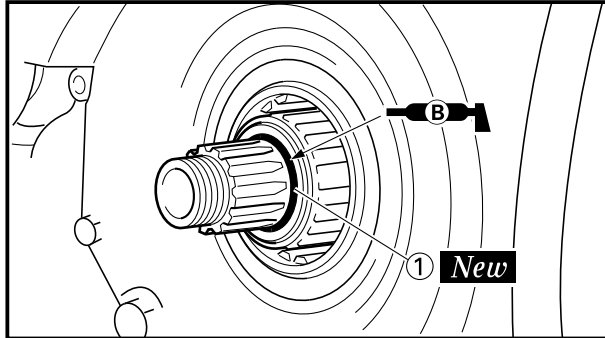
EC4A5213

Clutch

1. Install:
 - Spacer 1 ①
 - Bearing ②

NOTE: _____

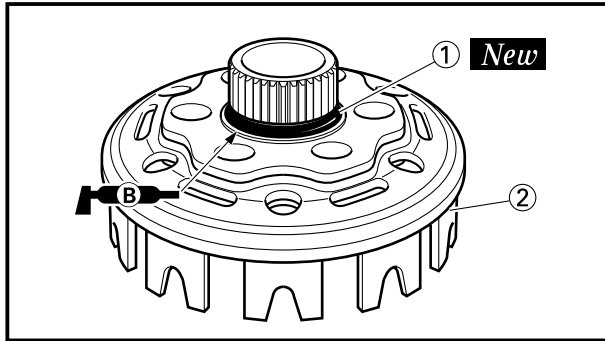
Apply the transmission oil on the spacer 1 and bearing.



2. Install:
 - O-ring ① **New**

NOTE: _____

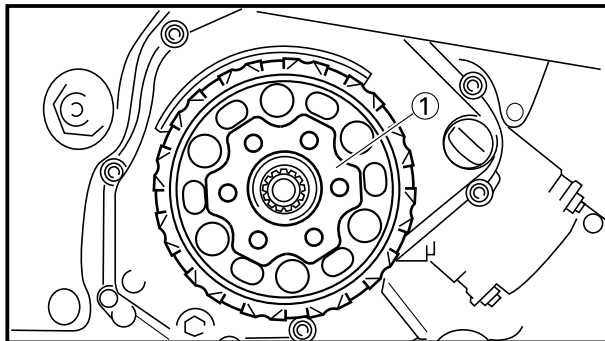
Apply the lithium soap base grease on the O-ring.



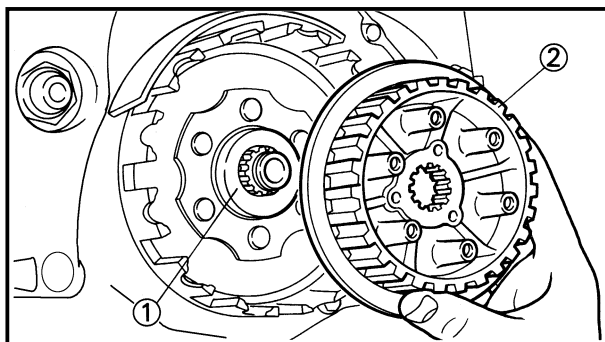
3. Install:
 - O-ring ① **New**
 - To clutch housing ②.

NOTE: _____

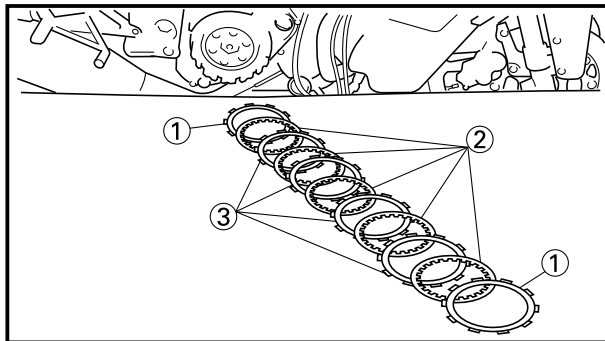
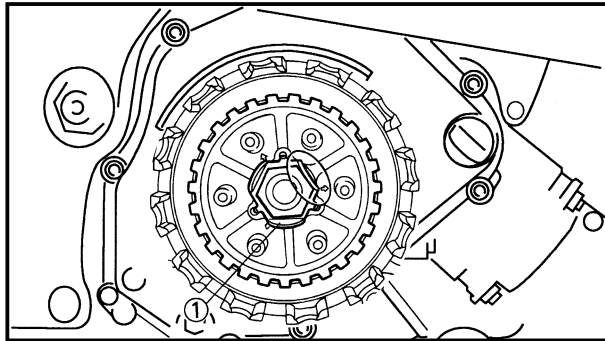
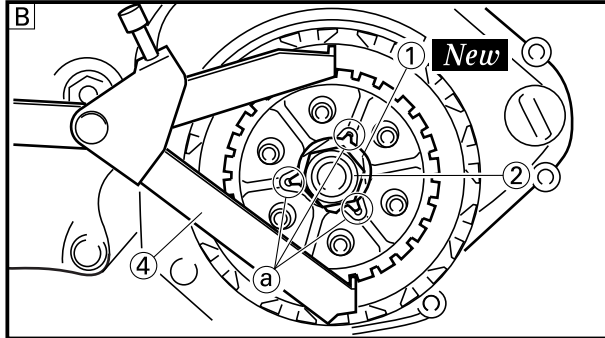
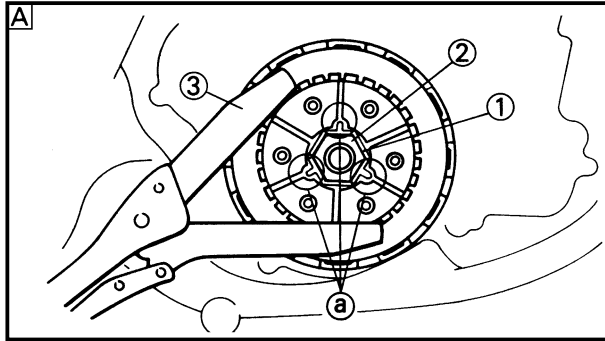
Apply the lithium soap base grease on the O-ring.



4. Install:
 - Clutch housing ①



5. Install:
 - Plain washer ①
 - Clutch boss ②



6. Install:

- Lock washer ① **New**
- Nut (clutch boss) ②

75 Nm (7.5 m•kg, 54 ft•lb)

NOTE: _____

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

CAUTION: _____

Align the projections on the lock washer with the holes (a) in the clutch boss.



Clutch holding tool:

- YM-91042③
- 90890-04086④

A For USA and CDN

B Except for USA and CDN

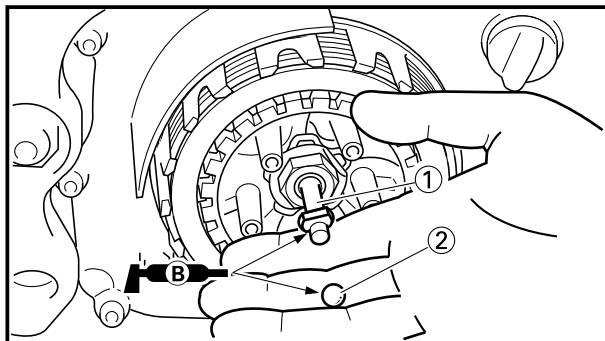
7. Bend the lock washer ① tab.

8. Install:

- Friction plate (yellow) ①
- Clutch plate ②
- Friction plate (brown) ③

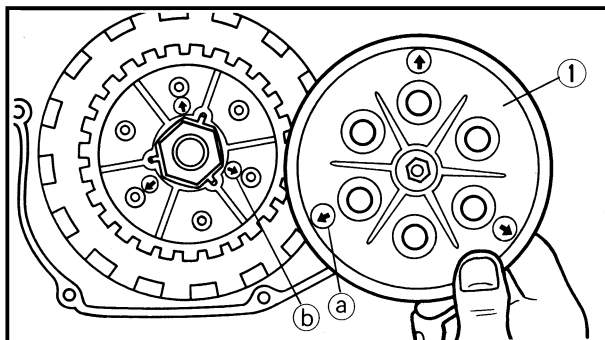
NOTE: _____

- Install the clutch plates and friction plates alternately on the clutch boss, starting with a friction plate and ending with a friction plate.
- Yellow colored friction plates are used for the first and final.
- This machine is equipped with a dry type clutch. Be sure to clean with solvent or replace if grease or oil contacts either clutch or friction plates.



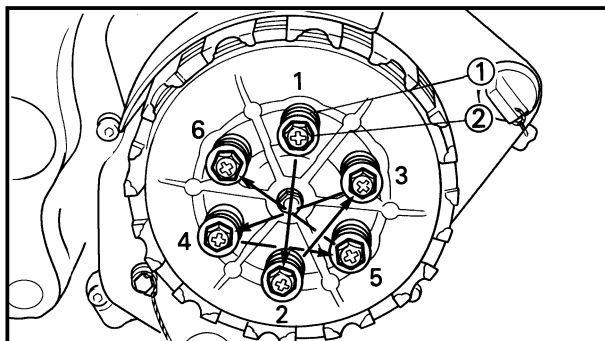
9. Install:
- Push rod ①
 - Ball ②

NOTE: _____
Apply the lithium soap base grease on the push rod and ball.



10. Install:
- Pressure plate ①

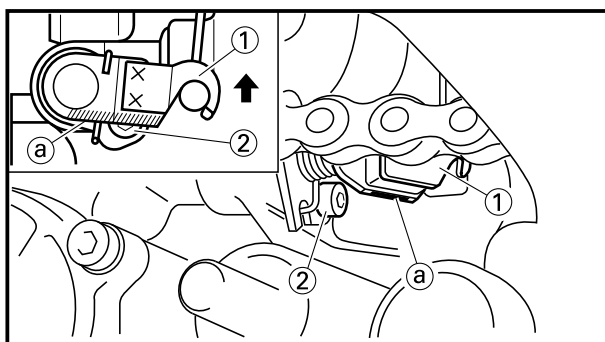
NOTE: _____
Align the arrow marks ③ on the pressure plate the arrow marks ④ on the clutch boss.



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

9 Nm (0.9 m•kg, 6.5 ft•lb)

NOTE: _____
Tighten the screws in stages, using a criss-cross pattern.



12. Check:
- Push lever position
Push the push lever ① upward until it stops. With the push lever in this position, the rear edge ③ of the push lever should be aligned with the center of the push lever installation bolt ②.
 - Not aligned → Adjust.

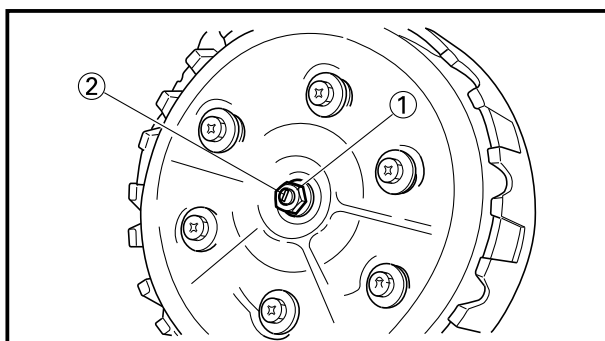
13. Adjust:
- Push lever position

Push lever position adjustment steps:

- Loosen the locknut ①.
- Turn the adjuster ② to align the rear edge of the push lever with the center of the push lever installation bolt.
- Tighten the locknut.



Locknut:
6 Nm (0.6 m•kg, 4.3 ft•lb)



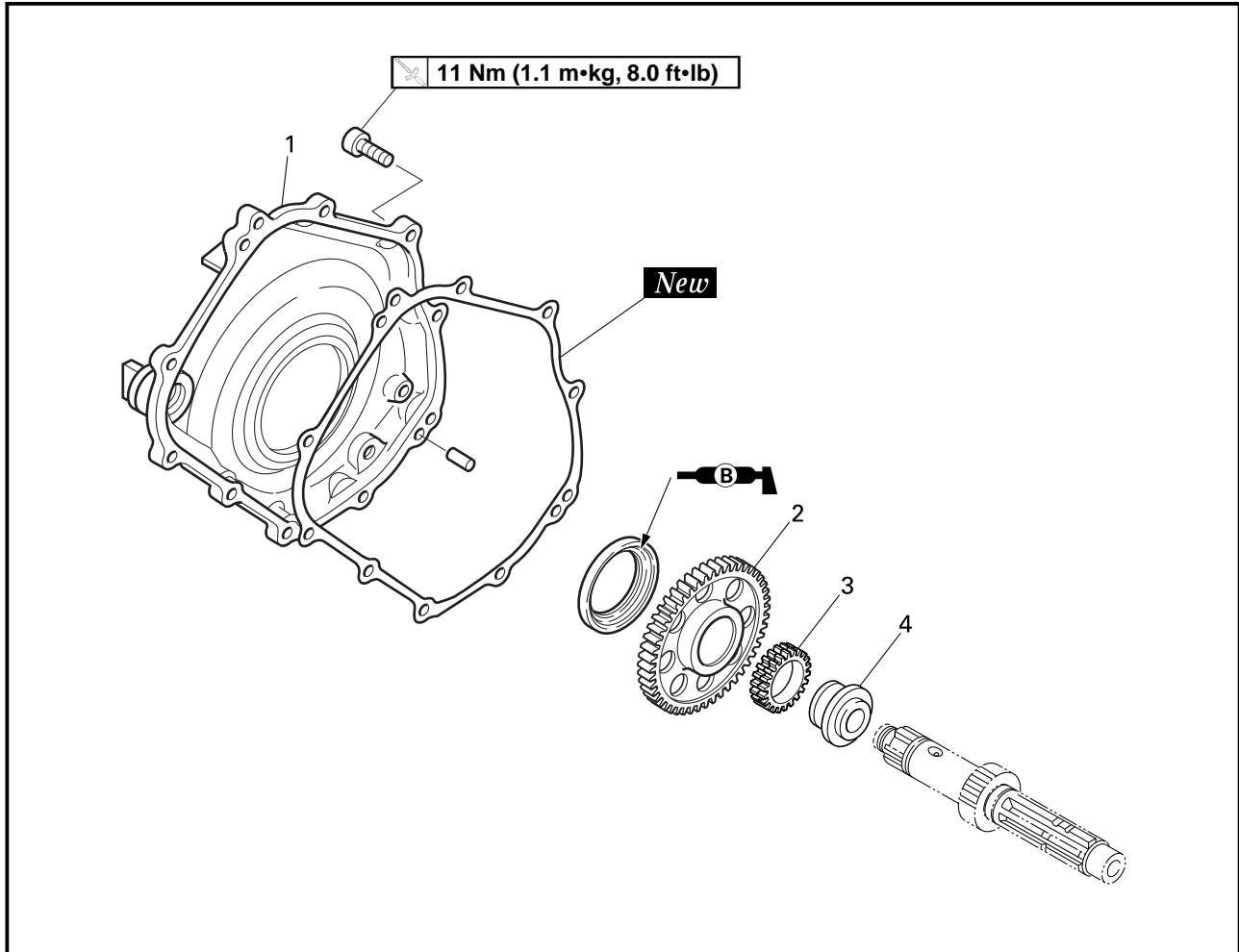


EC4D0002

PRIMARY DRIVEN GEAR, PRIMARY DRIVE GEAR
AND BALANCER SHAFT

EC4D8000

PRIMARY DRIVEN GEAR



Extend of removal: ① Primary driven gear removal

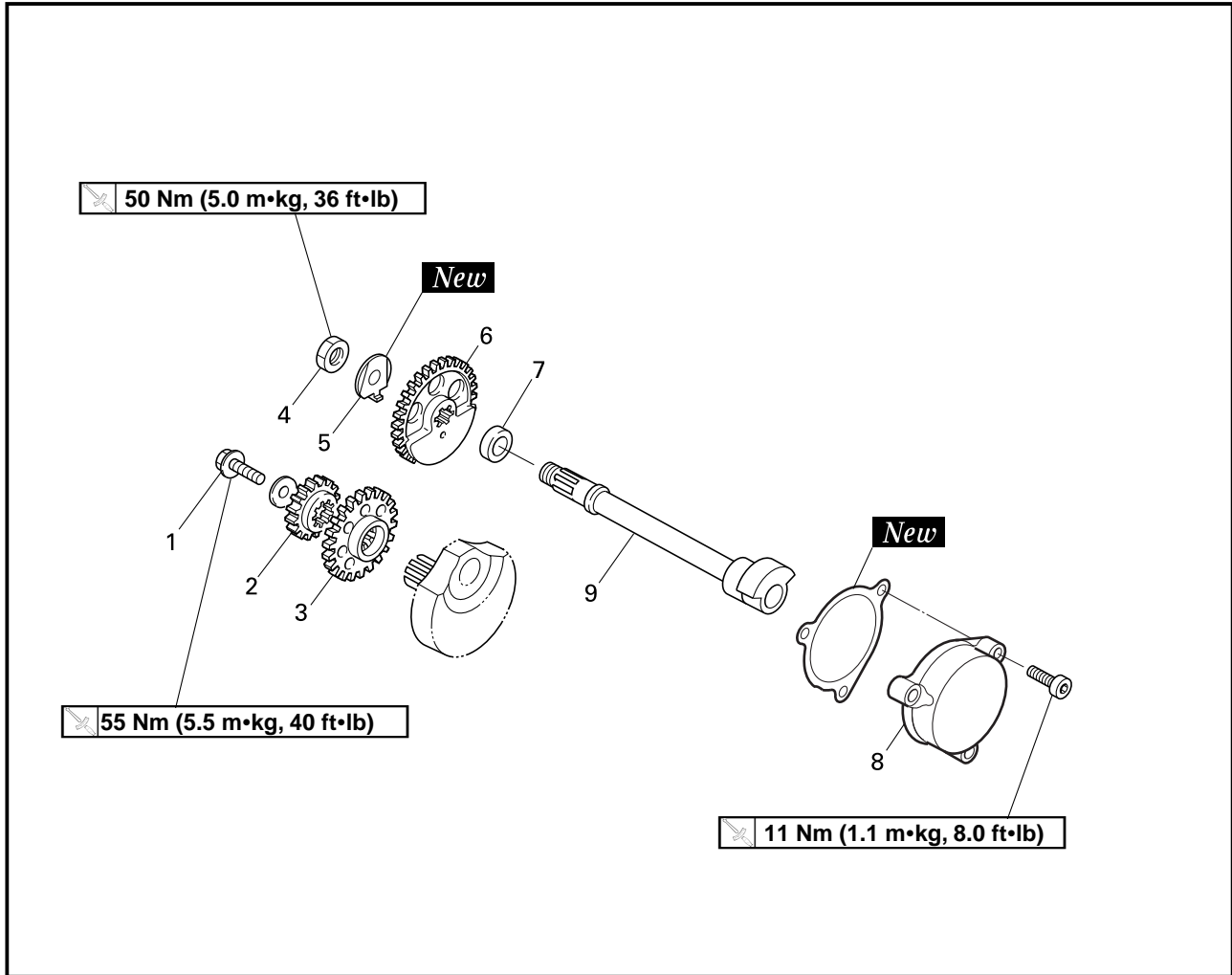
Extend of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		PRIMARY DRIVEN GEAR REMOVAL Cowling Clutch Drain the transmission oil.		Refer to "COWLING, INDUCTION GUIDE, SEAT AND FUEL TANK" section. Refer to "CLUTCH" section. Refer to "TRANSMISSION OIL REPLACEMENT" section in the CHAPTER 3.
①	1	Crankcase cover (right)	1	
	2	Primary driven gear	1	
	3	Oil pump drive gear	1	
	4	Thrust plate	1	

PRIMARY DRIVEN GEAR, PRIMARY DRIVE GEAR AND BALANCER SHAFT



EC4D8100

PRIMARY DRIVE GEAR AND BALANCER SHAFT

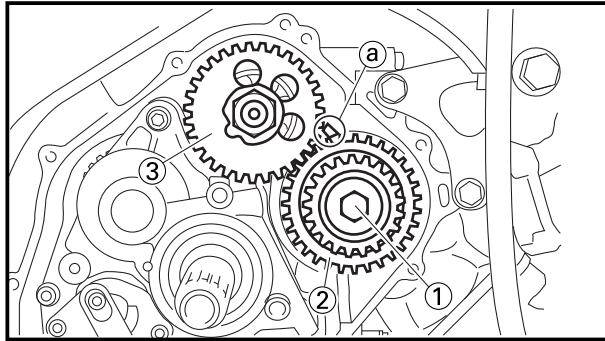


Extend of removal: ① Primary drive gear removal ② Balancer shaft removal

Extend of removal	Order	Part name	Q'ty	Remarks
<div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <p>①</p> <p>↑</p> <p>↓</p> </div> <div style="margin-right: 20px;"> <p>↑</p> <p>↓</p> <p>②</p> </div> </div>	PRIMARY DRIVE GEAR AND BALANCER SHAFT REMOVAL			
	1	Bolt (primary drive gear)	1	} Refer to "REMOVAL POINTS".
	2	Primary drive gear	1	
	3	Balancer drive gear	1	
	4	Nut (balancer weight gear)	1	
	5	Lock washer	1	
	6	Balancer weight gear	1	
	7	Collar	1	
	8	Crankcase cover (left)	1	
9	Balancer shaft	1		

PRIMARY DRIVEN GEAR, PRIMARY DRIVE GEAR AND BALANCER SHAFT

ENG



EC4D3000

REMOVAL POINTS

EC4D3101

Primary drive gear and balancer weight gear

1. Loosen:

- Bolt (primary drive gear) ①

NOTE:

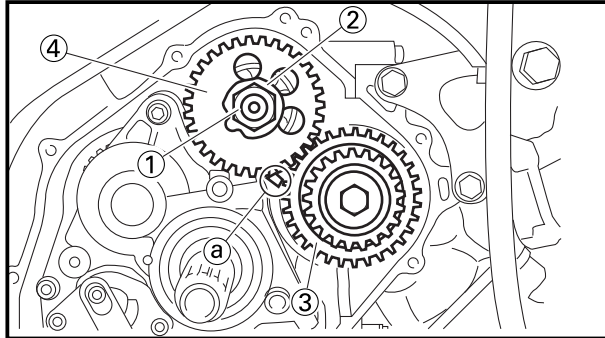
Place an aluminum plate (a) between the teeth of the balancer drive gear (2) and balancer weight gear (3).

2. Loosen:

- Nut (balancer weight gear) ①

NOTE:

Straighten the lock washer (2) tab and place an aluminum plate (a) between the teeth of the balancer drive gear (3) and balancer weight gear (4).

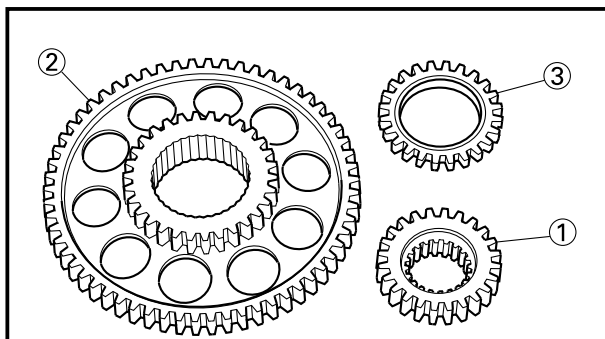
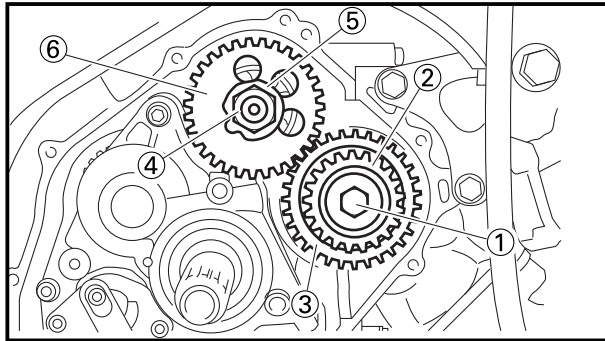


3. Remove:

- Bolt (primary drive gear) ①
- Primary drive gear (2)
- Balancer drive gear (3)
- Nut (balancer weight gear) ④
- Lock washer (5)
- Balancer weight gear (6)

NOTE:

It may sometimes happens that the primary drive gear and balancer drive gear are fitted too tight as in force fitting. In that case, use a general gear puller to remove them without too much force on the crankshaft.



EC4D4000

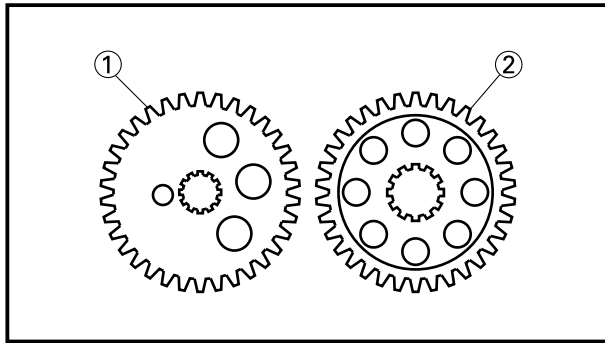
INSPECTION

EC4D4100

Primary drive gear, primary driven gear and oil pump drive gear

1. Inspect:

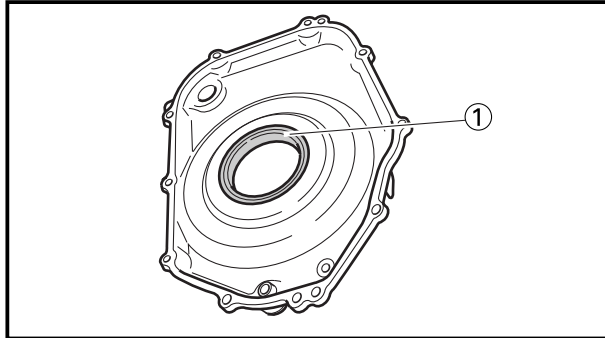
- Primary drive gear ①
 - Primary driven gear ②
 - Oil pump drive gear ③
- Wear/Damage → Replace.



EC4D4200

Balancer weight gear and balancer drive gear

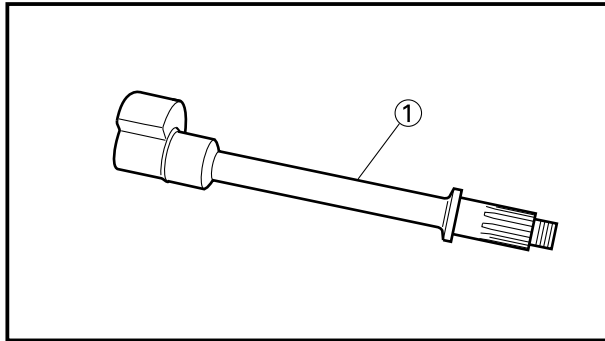
- Inspect:
 - Balancer weight gear ①
 - Balancer drive gear ②
 Wear/Damage → Replace.



EC4D4300

Crankcase cover (right)

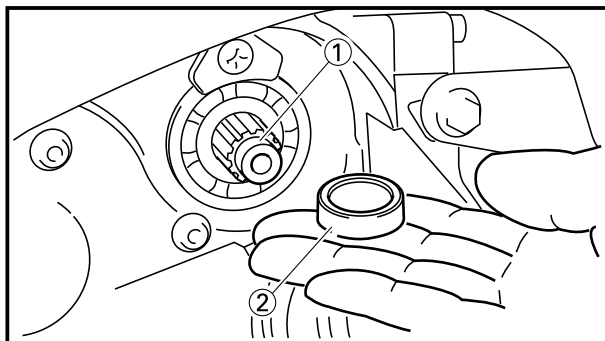
- Inspect:
 - Contacting surface
Scratches → Replace.
 - Crankcase cover (right)
Cracks/Damage → Replace.
 - Oil seal ①
Wear/Damage → Replace.



EC4D4500

Balancer shaft

- Inspect:
 - Balancer shaft ①
Bend/Wear/Damage → Replace.



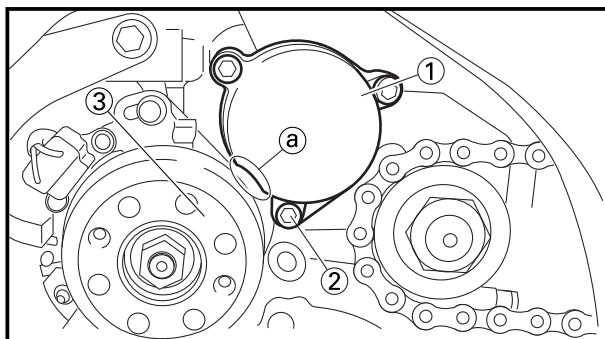
EC4D5000

ASSEMBLY AND INSTALLATION

EC4D5130

Balancer shaft and primary drive gear

- Install:
 - Balancer shaft ①
 - Collar ②



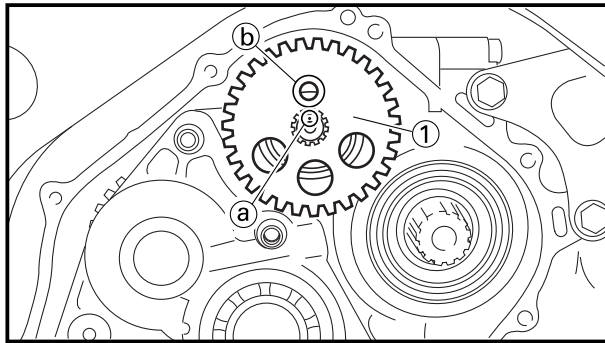
- Install:
 - Gasket [crankcase cover (left)] **New**
 - Crankcase cover (left) ①
 - Bolt [crankcase cover (left)] ②

11 Nm (1.1 m•kg, 8.0 ft•lb)

NOTE: _____
Install the gasket and crankcase cover (left) with their recesses (a) facing the rotor (3).

PRIMARY DRIVEN GEAR, PRIMARY DRIVE GEAR AND BALANCER SHAFT

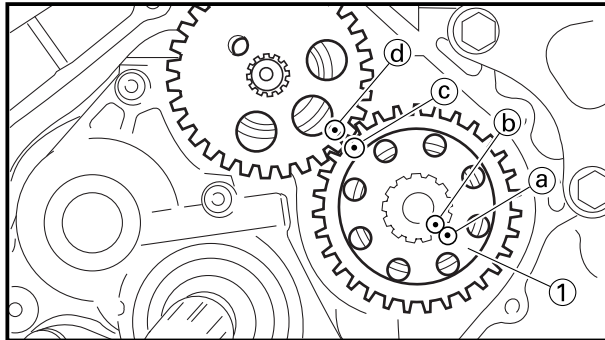
ENG



3. Install:
- Balancer weight gear ①

NOTE: _____

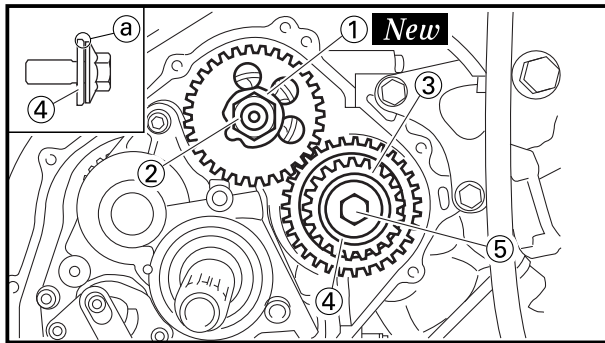
Align the punch mark ① on the balancer shaft with the hole ② of the balancer weight gear.



4. Install:
- Balancer drive gear ①

NOTE: _____

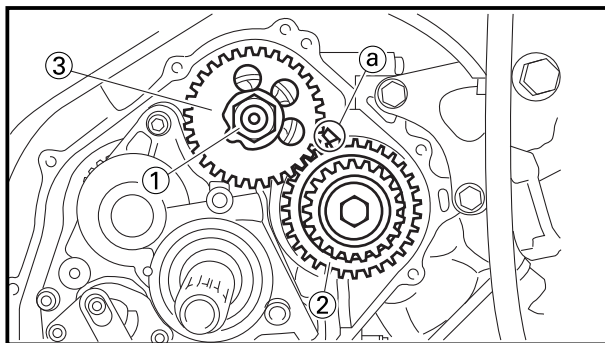
Align the punch marks, ① (balancer drive gear) with ② (crankshaft) and ③ (balancer drive gear) with ④ (balancer weight gear) as shown.



5. Install:
- Lock washer ① **New**
 - Nut (balancer weight gear) ②
 - Primary drive gear ③
 - Plain washer ④
 - Bolt (primary drive gear) ⑤

NOTE: _____

Install the plain washer with its chamfered portion ① toward you.

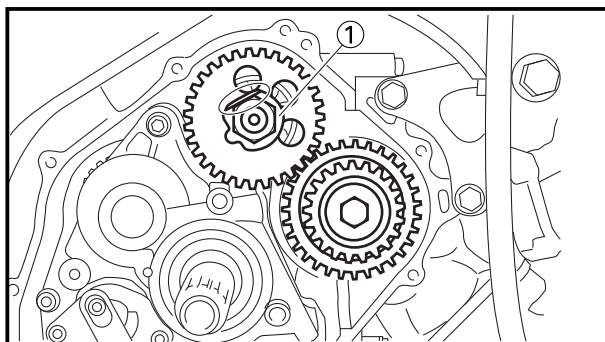


6. Tighten:
- Nut (balancer weight gear) ①

50 Nm (5.0 m•kg, 36 ft•lb)

NOTE: _____

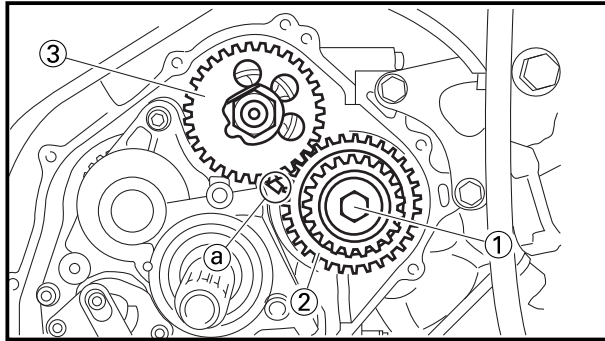
Place an aluminum plate ① between the teeth of the balancer drive gear ② and balancer weight gear ③.



7. Bend the lock washer ① tab.

PRIMARY DRIVEN GEAR, PRIMARY DRIVE GEAR AND BALANCER SHAFT

ENG



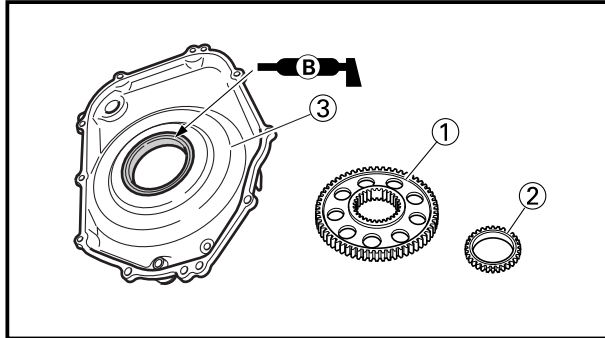
8. Tighten:

- Bolt (primary drive gear) ①

55 Nm (5.5 m•kg, 40 ft•lb)

NOTE: _____

Place an aluminum plate ① between the teeth of the balancer drive gear ② and balancer weight gear ③.



EC4D5212

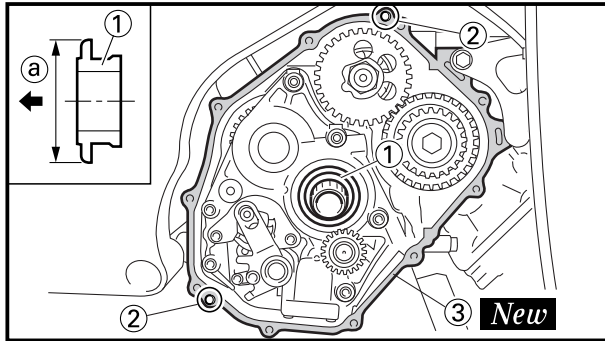
Primary driven gear

1. Install:

- Primary driven gear ①
- Oil pump drive gear ②
- To crankcase cover (right) ③.

NOTE: _____

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

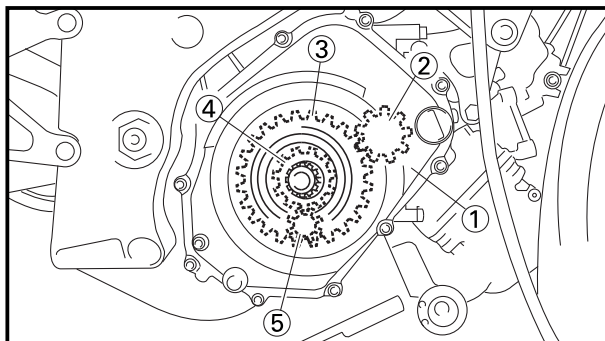


2. Install:

- Thrust plate ①
- Dowel pin ②
- Gasket [crankcase cover (right)] ③ **New**

NOTE: _____

Install the thrust plate with its larger diameter side ① toward the transmission.

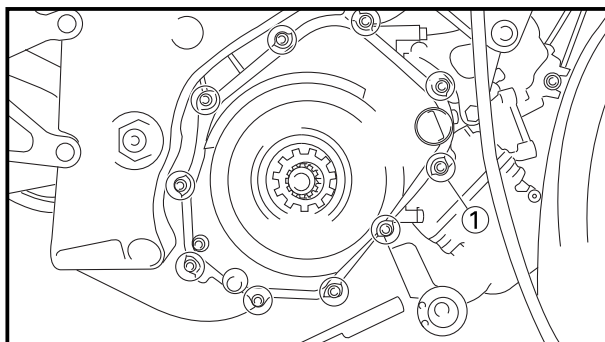


3. Install:

- Crankcase cover (right) ①

NOTE: _____

Mesh the primary drive gear ② with the primary driven gear ③, and the oil pump drive gear ④ with the oil pump driven gear ⑤ by turning the rotor.



4. Install:

- Bolt [crankcase cover (right)] ①

11 Nm (1.1 m•kg, 8.0 ft•lb)

NOTE: _____

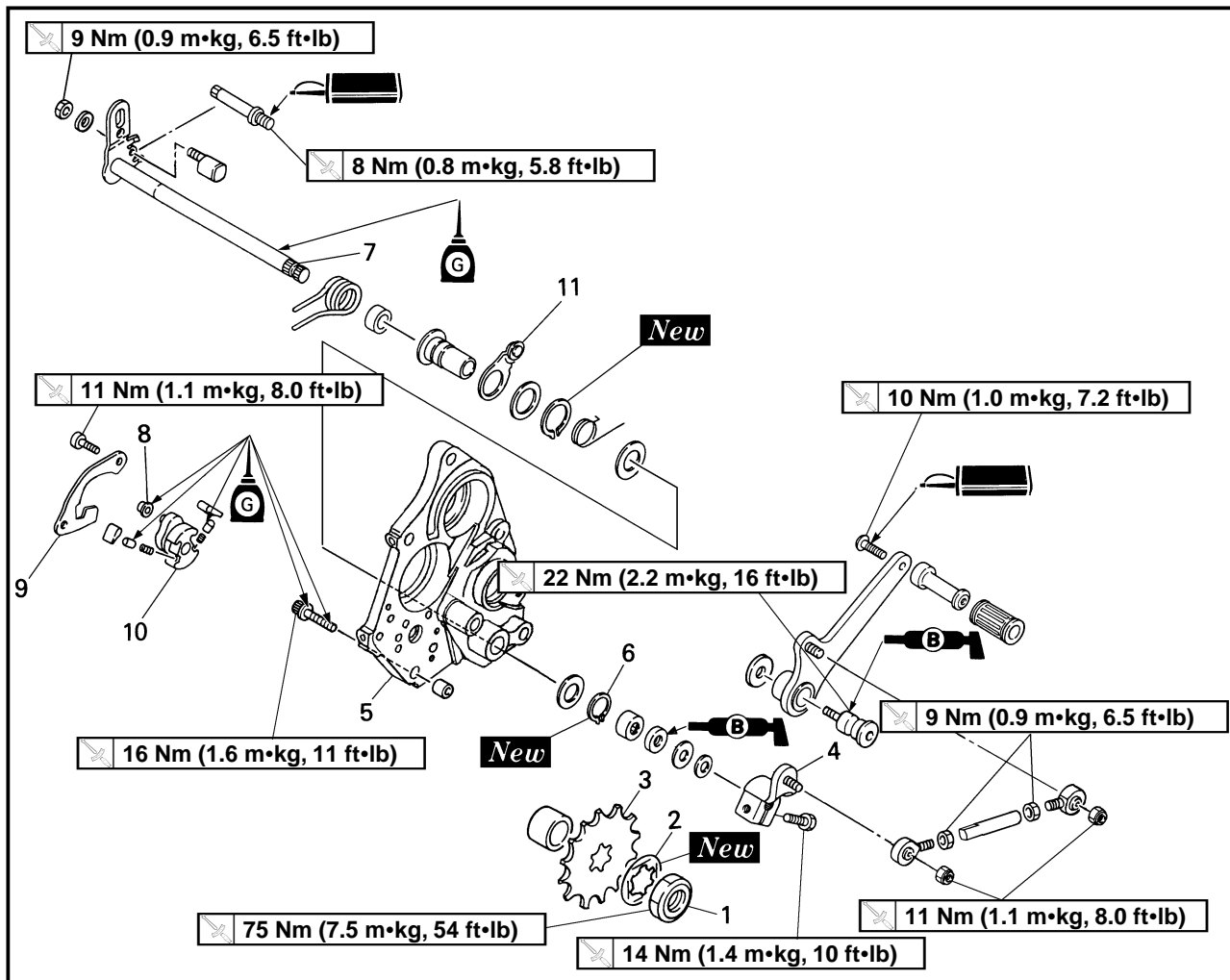
Tighten the bolts in stages, using a crisscross pattern.



EC4F0000

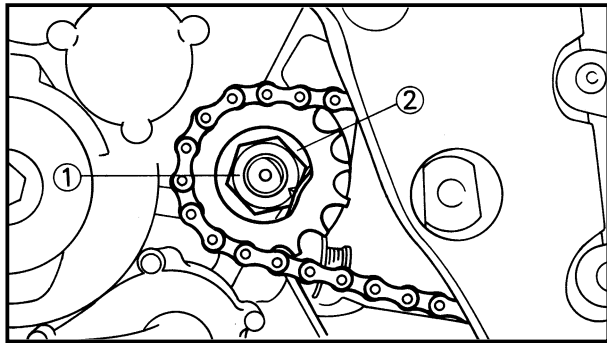


SHIFT SHAFT



Extend of removal: ① Shift shaft removal ② Stopper lever removal

Extend of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		SHIFT SHAFT REMOVAL Crankcase cover (right)		Refer to "PRIMARY DRIVEN GEAR, PRIMARY DRIVE GEAR AND BALANCER SHAFT" section.
<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>①</p> </div> <div style="text-align: center;"> <p>②</p> </div> </div>	1	Nut (drive sprocket)	1	} Refer to "REMOVAL POINTS".
	2	Lock washer	1	
	3	Drive sprocket	1	
	4	Shift arm	1	
	5	Transmission housing	1	} Refer to "REMOVAL POINTS".
	6	Circlip	1	
	7	Shift shaft	1	
	8	Roller	1	} Refer to "REMOVAL POINTS".
	9	Shift guide	1	
	10	Shift lever assembly	1	
	11	Stopper lever	1	



EC4F3000

REMOVAL POINTS

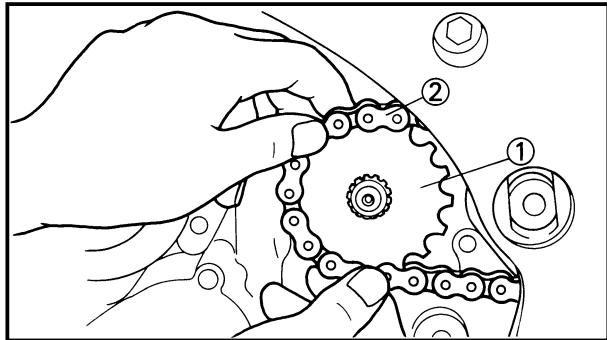
EC4F3100

Drive sprocket

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

NOTE:

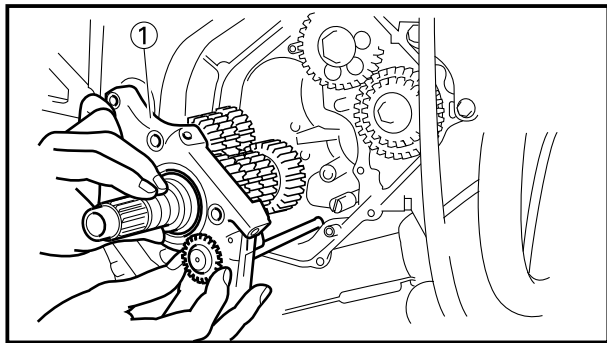
- Straighten the lock washer tab.
- Loosen the nut while applying the rear brake.



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

NOTE:

Remove the drive sprocket together with the drive chain.



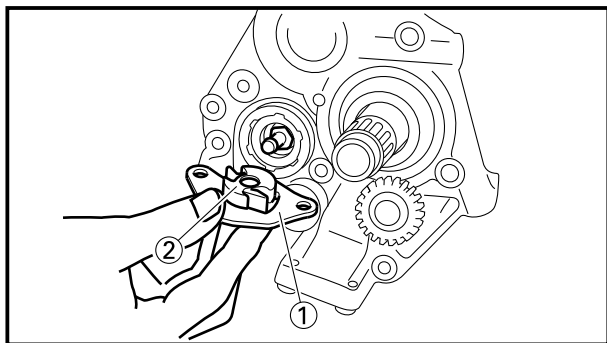
EC4F3201

Transmission housing

1. Remove:
 - Bolt (transmission housing)
 - Transmission housing ①

NOTE:

Remove the transmission housing together with the transmission, shift cam, shift fork and shift shaft.



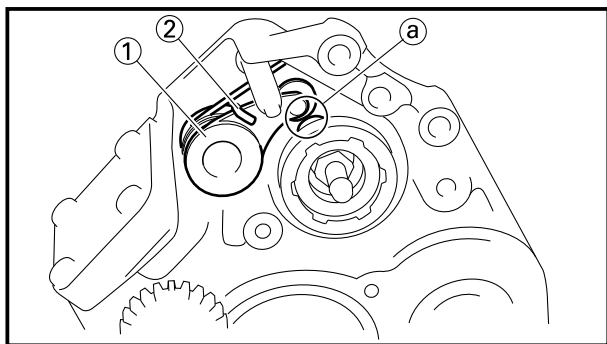
EC4C3101

Shift guide and shift lever assembly

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

NOTE:

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



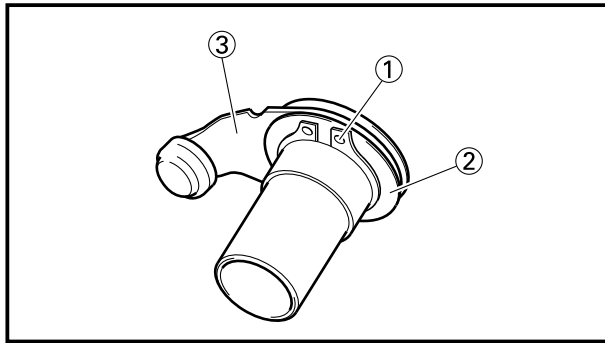
EC4F3401

Stopper lever

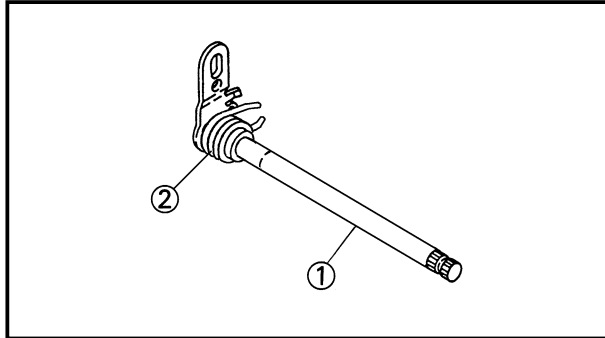
1. Remove:
 - Stopper lever assembly ①
 - Torsion spring ②
 - Plain washer

NOTE:

Remove the stopper lever assembly with its roller aligning with the top ① of the segment.



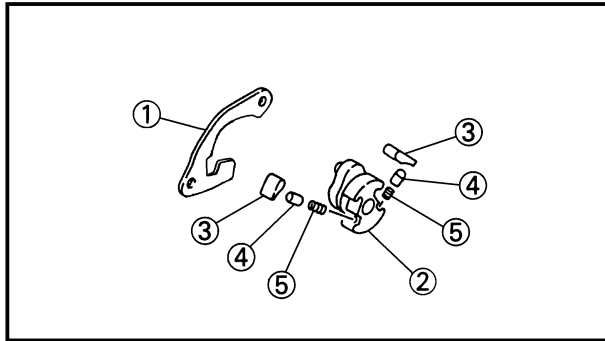
2. Remove:
- Circlip ①
 - Plain washer ②
 - Stopper lever ③



EC4F4000
INSPECTION

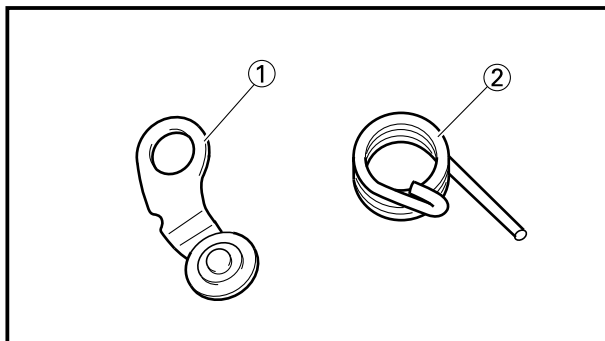
EC4B4400
Shift shaft

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



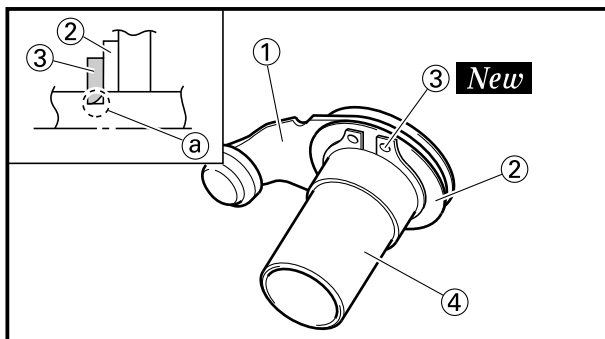
EC4C4100
Shift guide and shift lever assembly

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



EC4B4500
Stopper lever

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

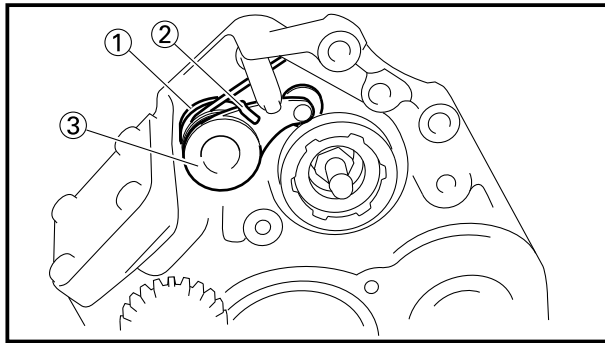


EC4F5000
ASSEMBLY AND INSTALLATION

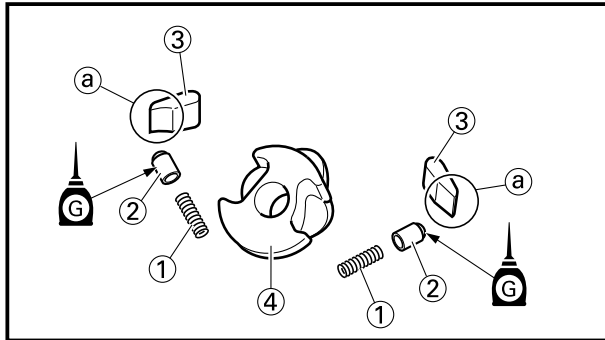
EC4F5100
Stopper lever

1. Install:
- Stopper lever ①
 - Plain washer ②
 - Circlip ③ **New**
To collar ④.

NOTE: _____
Be sure the circlip sharp-edged corner ③ is positioned opposite side to the plain washer.



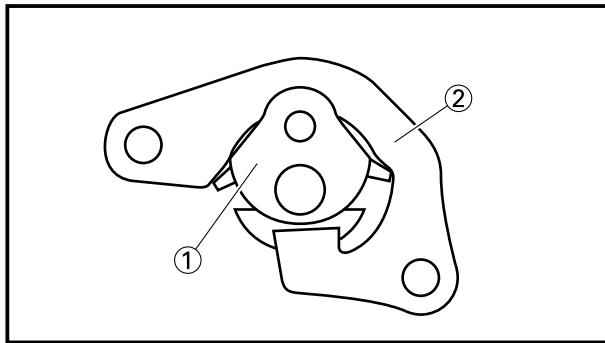
2. Install:
- Plain washer ①
 - Torsion spring ②
 - Stopper lever assembly ③



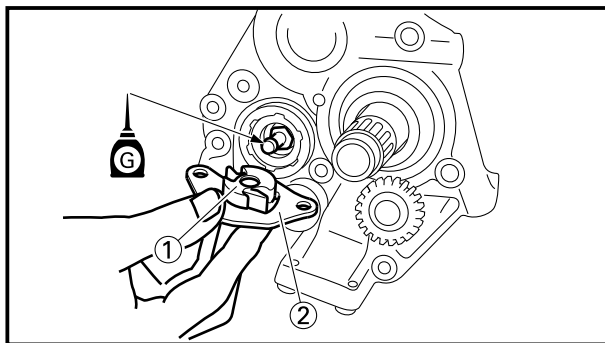
EC4F5202
Shift guide and shift lever assembly

1. Install:
- Spring ①
 - Pawl pin ②
 - Pawl ③
- To shift lever ④.

- NOTE:**
- When installing the pawl into the shift lever, make sure the chamfered side ① face the pawl pin side.
 - Apply the transmission oil on the pawl pin.

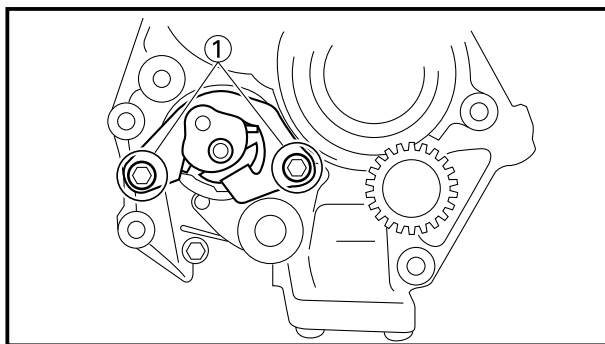


2. Install:
- Shift lever assembly ①
- To shift guide ②.



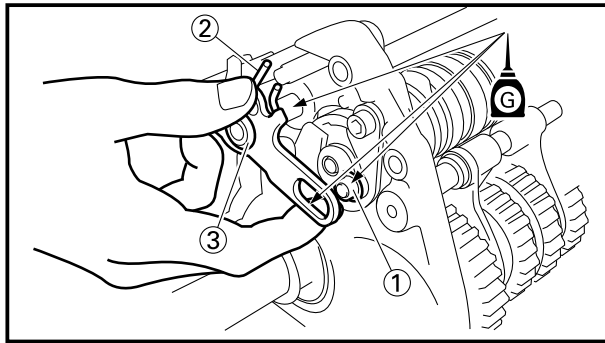
3. Install:
- Shift lever assembly ①
 - Shift guide ②

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



4. Install:
- Bolt (shift guide) ①

11 Nm (1.1 m•kg, 8.0 ft•lb)



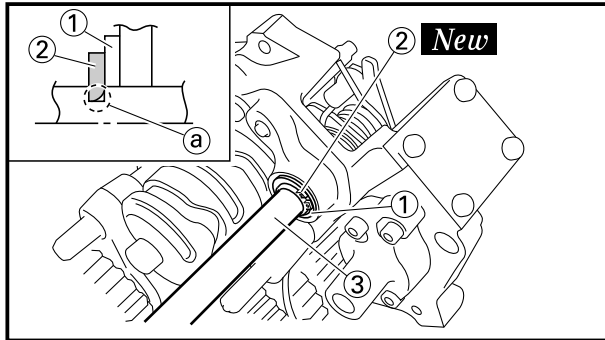
EC4F5302

Shift shaft

1. Install:
 - Roller ①
 - Torsion spring ②
 - Shift shaft ③

NOTE:

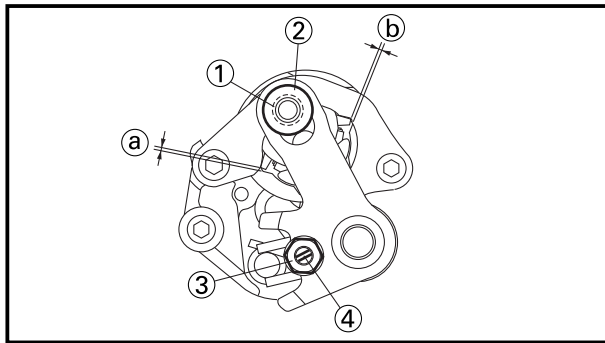
Apply the transmission oil on the roller and shift shaft.



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

NOTE:

Be sure the circlip sharp-edged corner (a) is positioned opposite side to the plain washer.



3. Check:
 - Shift lever position

Checking steps:

- Attach the collar (with supplying parts) ② onto the roller ①.
- Check the shift lever position.
- Gaps (a) and (b) are not equal → Adjust.

4. Adjust:
 - Shift lever position

Adjusting steps:

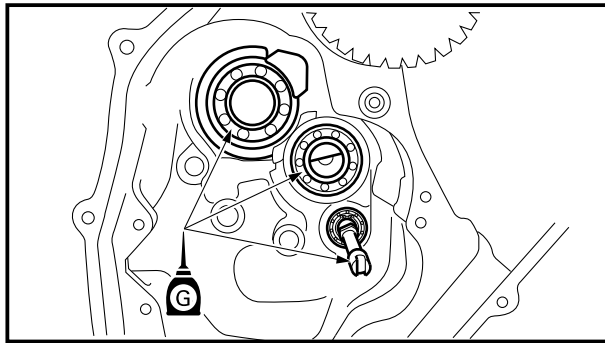
- Loosen the locknut ③.
- Turn the adjuster ④ in or out.
- Tighten the locknut.



Locknut:

9 Nm (0.9 m•kg, 6.5 ft•lb)

- Remove the collar.

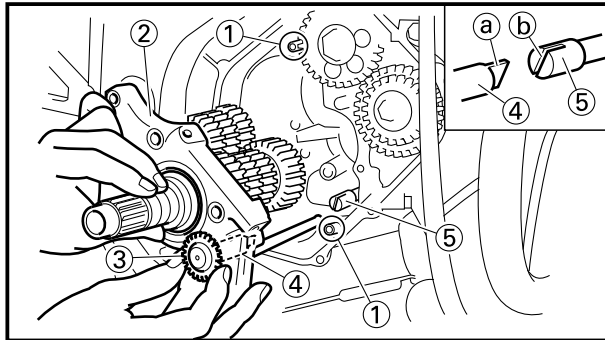


EC4F5411

Transmission housing

1. Apply:

- Transmission oil
On the bearing (crankcase lower) and impeller shaft.

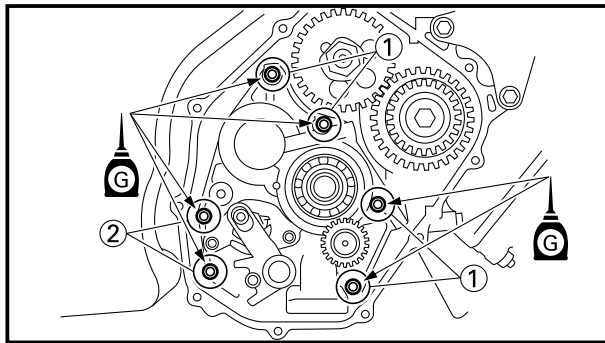


2. Install:

- Dowel pin ①
- Transmission housing ②

NOTE:

When installing the transmission housing, turn the oil pump driven gear ③ until the key end ④ of the oil pump gear shaft ④ is in the recess ⑤ of the impeller shaft ⑤.



3. Install:

- Bolt (transmission housing [$l=40$ mm (1.57 in)]) ①

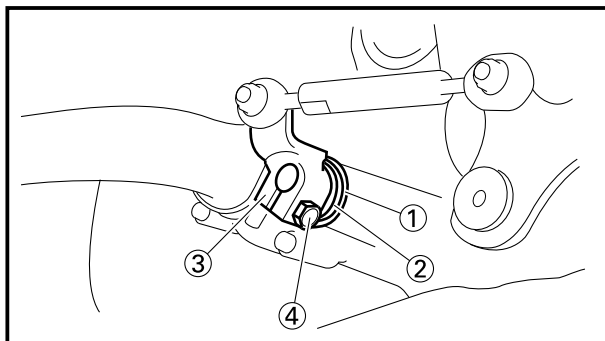
16 Nm (1.6 m•kg, 11 ft•lb)

- Bolt (transmission housing [$l=30$ mm (1.18 in)]) ②

16 Nm (1.6 m•kg, 11 ft•lb)

NOTE:

- Tighten the bolts in stages, using a criss-cross pattern.
- Apply the transmission oil on the thread and contact surface of the bolt (transmission housing).



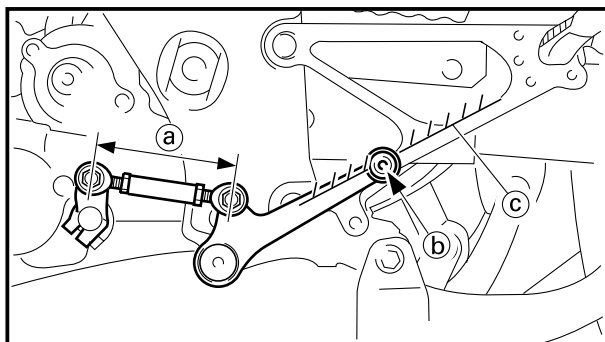
4. Install:

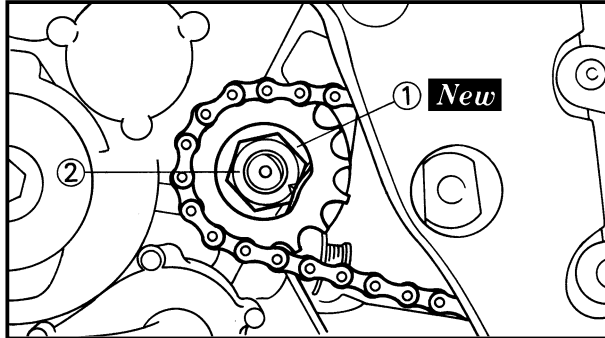
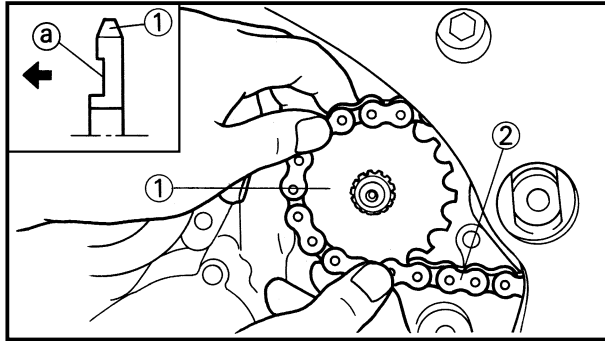
- Plain washer ①
- Spacer ②
- Shift arm ③
- Bolt (shift arm) ④

14 Nm (1.4 m•kg, 10 ft•lb)

NOTE:

- Make sure that the joint rod distance ① is 104.5~106.5 mm (4.1~4.2 in).
- Install the shift arm so that the shift pedal center ② is highest without exceeding the inside line ③ of the footrest bracket.





EC4F5510

Drive sprocket


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

NOTE:

- Install the drive sprocket with its depressed side (a) facing the engine.
- Install the drive sprocket together with the drive chain.

2. Install:

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

 75 Nm (7.5 m•kg, 54 ft•lb)
--

NOTE:

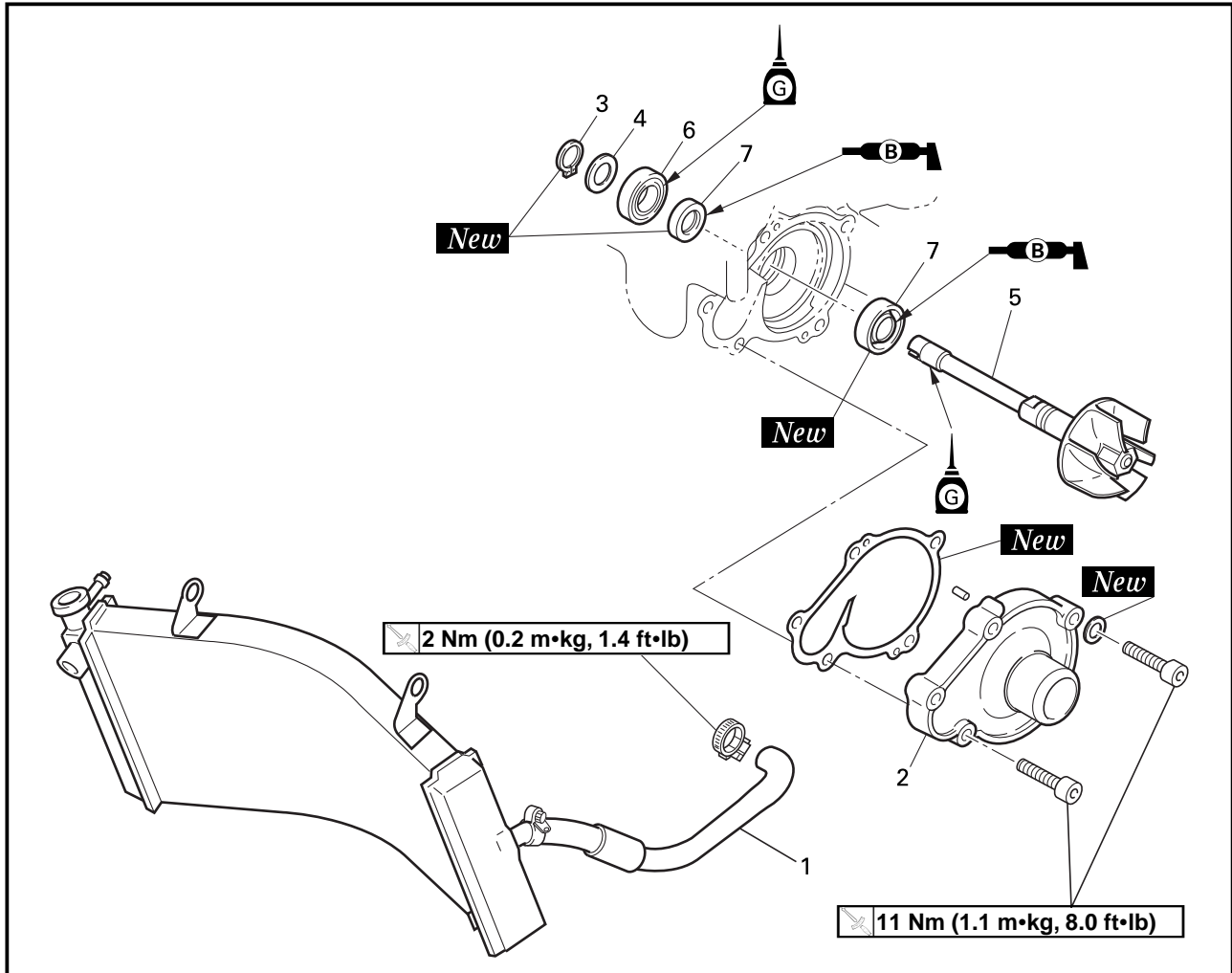
Tighten the nut while applying the rear brake.

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



EC4G0000

WATER PUMP



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

Extend of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		WATER PUMP DISASSEMBLY		Refer to "COWLING, INDUCTION GUIDE, SEAT AND FUEL TANK" section. Refer to "COOLING WATER REPLACEMENT" section in the CHAPTER 3. Refer to "SHIFT SHAFT" section.
		Cowling		
		Drain the cooling water.		
		Transmission housing		
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> ↑ ① ↓ </div> <div style="text-align: center;"> ↑ ② ↓ </div> </div>	1	Radiator hose 2	1	} Refer to "REMOVAL POINTS".
	2	Water pump housing cover	1	
	3	Circlip	1	
	4	Plain washer	1	
	5	Impeller shaft	1	
	6	Bearing	1	
	7	Oil seal	2	



EC4G3000

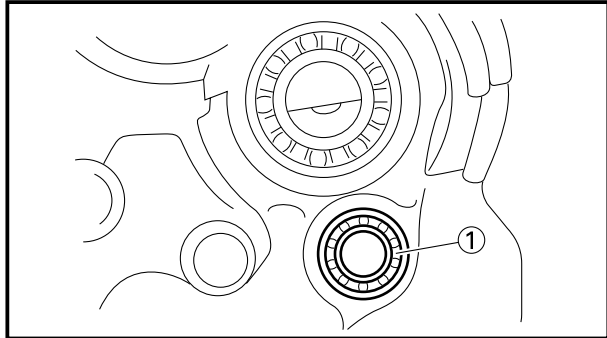
REMOVAL POINTS

EC4G3210

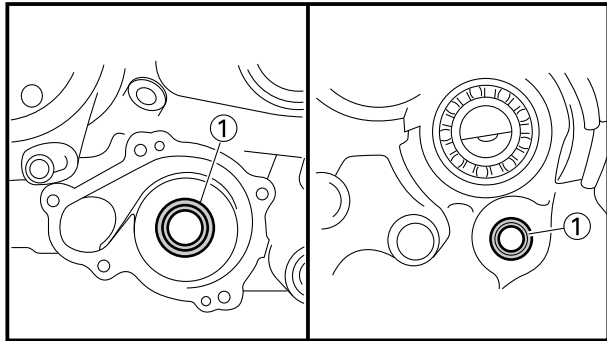
Oil seal

NOTE:

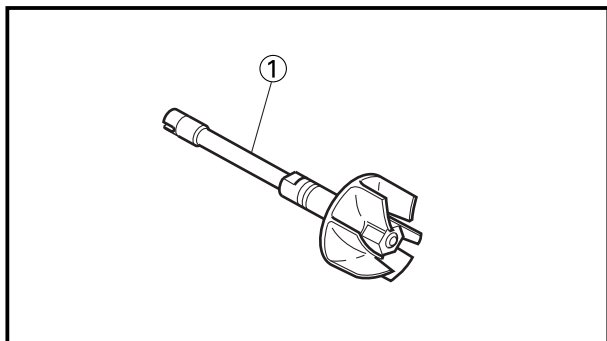
It is not necessary to disassemble the water pump, unless there is an abnormality such as excessive change in coolant level, discoloration of coolant, or milky transmission oil.



1. Remove:
 - Bearing ①



2. Remove:
 - Oil seal ①



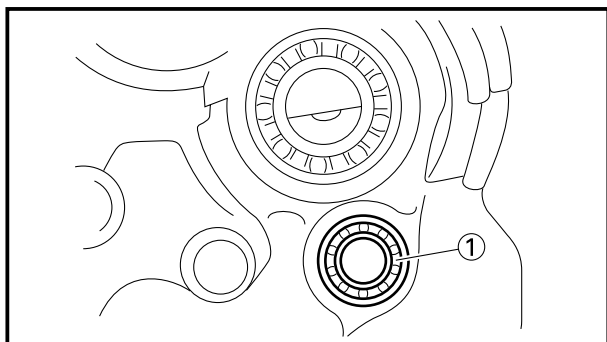
EC4G4000

INSPECTION

EC444200

Impeller shaft

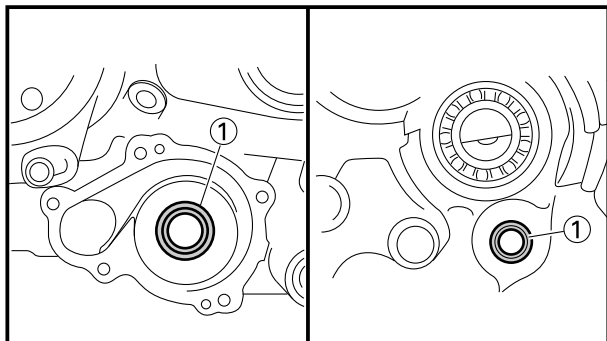
1. Inspect:
 - Impeller shaft ①
 - Bend/Wear/Damage → Replace.
 - Fur deposits → Clean.



EC4H4600

Bearing

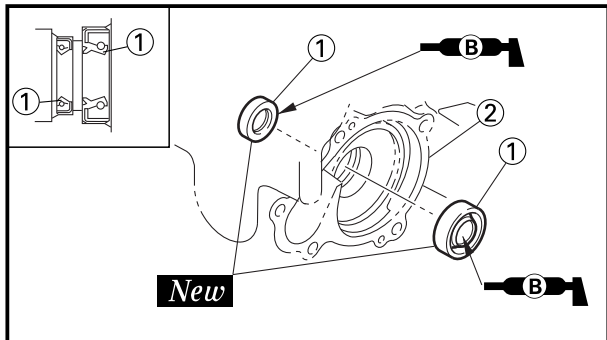
1. Inspect:
 - Bearing ①
 - Rotate inner race with a finger.
 - Rough spot/Seizure → Replace.



EC444400

Oil seal

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



EC4G5000

ASSEMBLY AND INSTALLATION

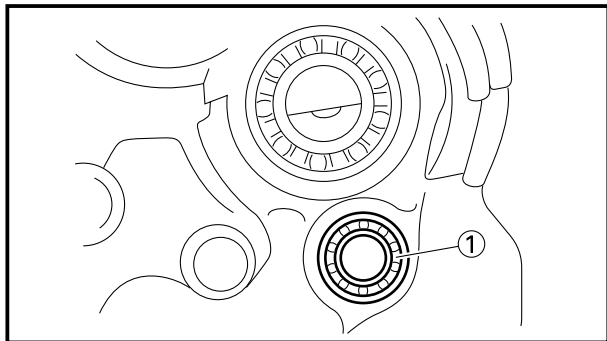
EC4G5120

Oil seal

- Install:
 - Oil seal ① **New**

NOTE:

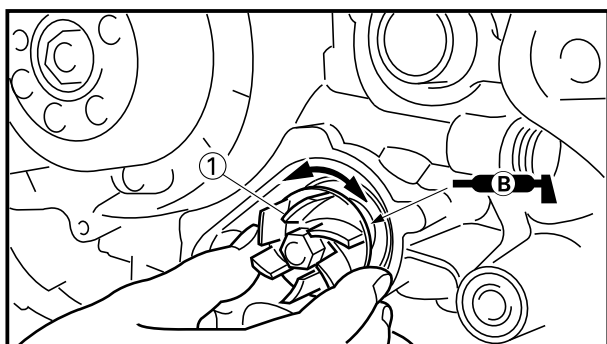
- Apply the lithium soap base grease on the oil seal lip.
- Install the oil seal with its manufacture's marks or numbers facing the crankcase ②.



- Install:
 - Bearing ①

NOTE:

Install the bearing by pressing its outer race parallel.



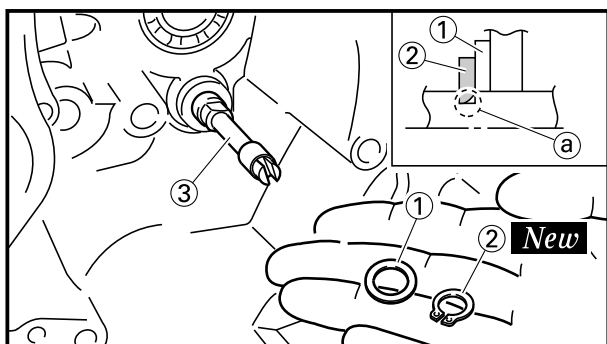
EC4G5203

Impeller shaft

- Install:
 - Impeller shaft ①

NOTE:

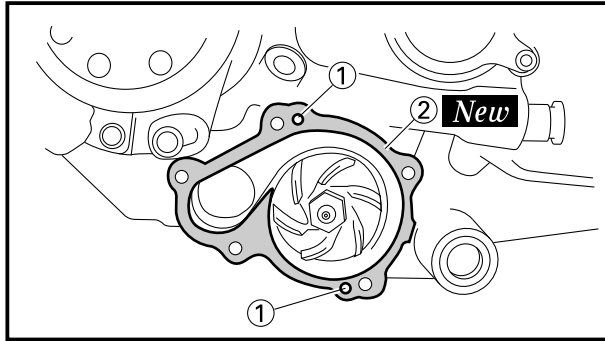
- Take care so that the oil seal lip is not damaged or the spring does not slip off its position.
- When installing the impeller shaft, apply the lithium soap base grease on the oil seal lip and impeller shaft. And install the shaft while turning it.



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

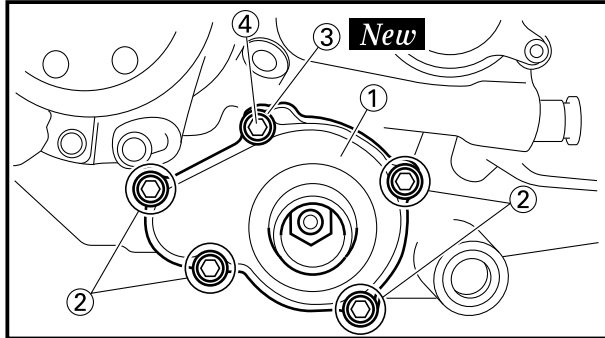
NOTE:

Be sure the circlip sharp-edged corner ① is positioned opposite side to the plain washer.



3. Install:

- Dowel pin ①
- Gasket (water pump housing cover) ② **New**

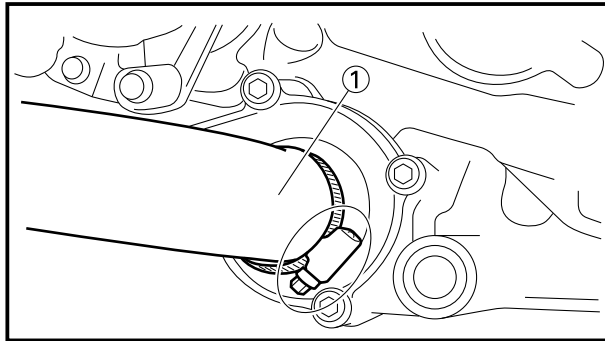


4. Install:

- Water pump housing cover ①
- Bolt (water pump housing cover) ②
- Copper washer ③ **New**
- Air bleeding bolt (water pump) ④

11 Nm (1.1 m•kg, 8.0 ft•lb)

11 Nm (1.1 m•kg, 8.0 ft•lb)



5. Install:

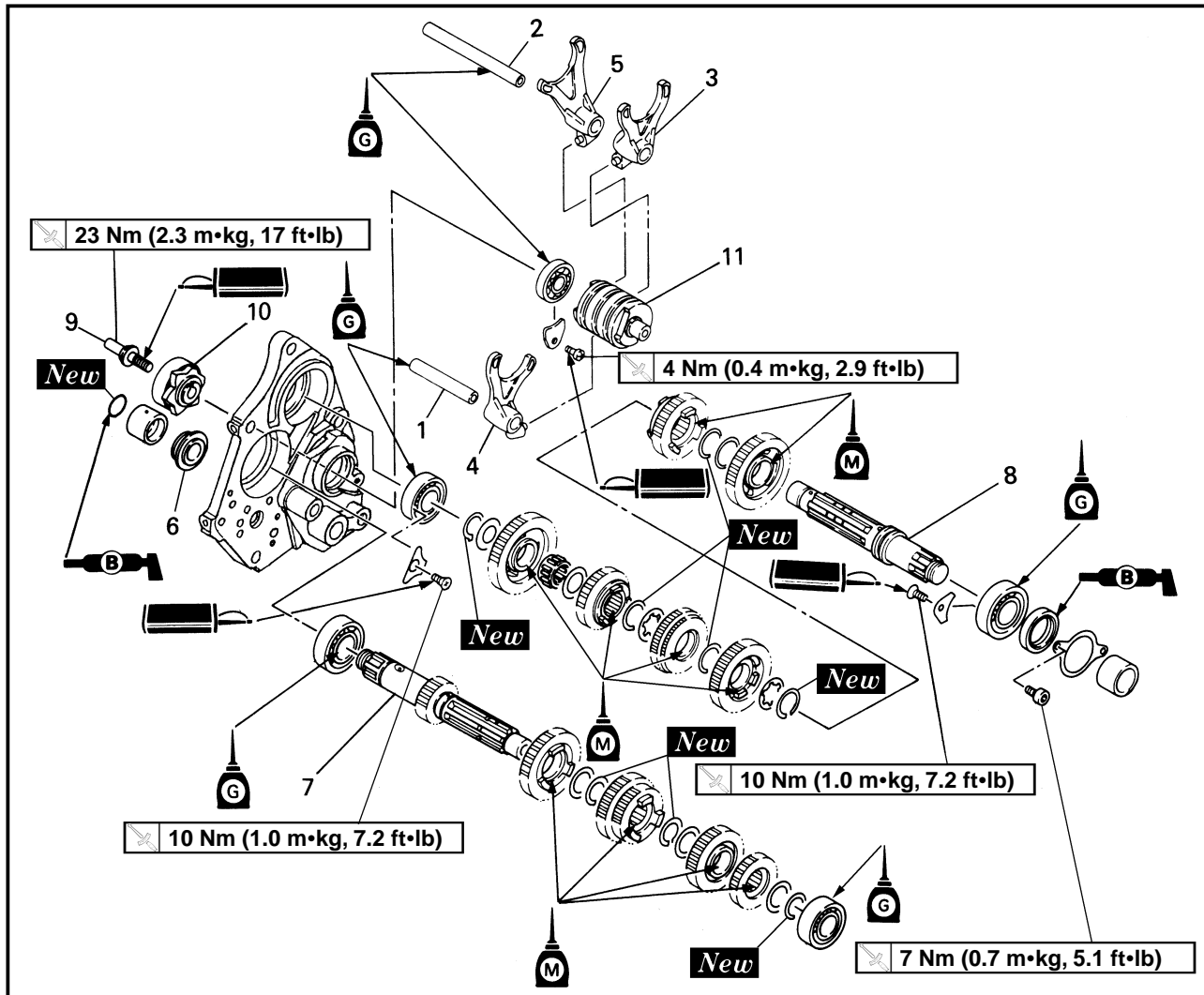
- Radiator hose 2 ①

2 Nm (0.2 m•kg, 1.4 ft•lb)

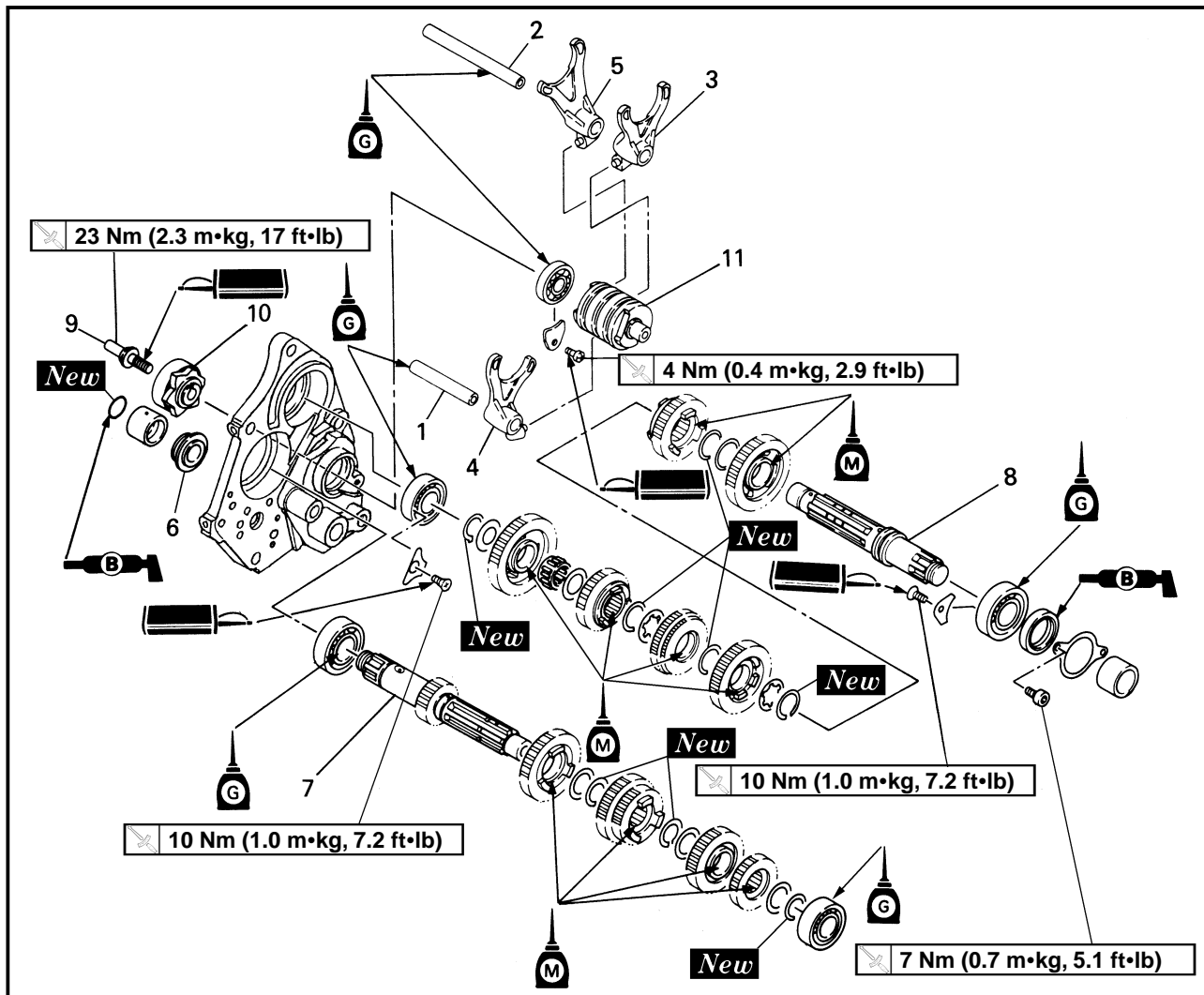


EC4H0000

TRANSMISSION, SHIFT CAM AND SHIFT FORK

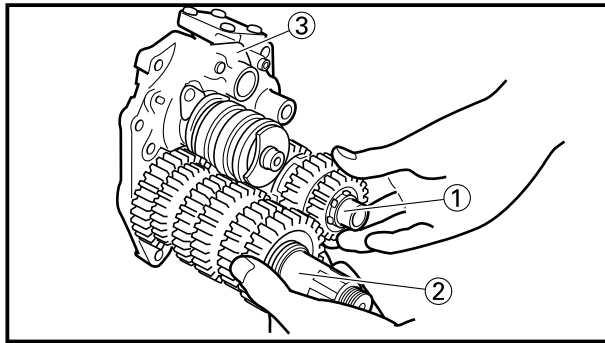


Extend of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		TRANSMISSION, SHIFT CAM AND SHIFT FORK REMOVAL Cowling Transmission housing Shift shaft and shift lever assembly Stopper lever		Refer to "COWLING, INDUCTION GUIDE, SEAT AND FUEL TANK" section. Refer to "SHIFT SHAFT" section.



Extend of removal: ① Shift fork removal
 ② Main axle and drive axle removal
 ③ Shift cam removal

Extend of removal	Order	Part name	Q'ty	Remarks
	1	Guide bar 1 (short)	1	} Refer to "REMOVAL POINTS". } Refer to "REMOVAL POINTS".
	2	Guide bar 2 (long)	1	
	3	Shift fork 1	1	
	4	Shift fork 2	1	
	5	Shift fork 3	1	
	6	Thrust plate	1	
	7	Main axle	1	
	8	Drive axle	1	
	9	Bolt (segment)	1	
	10	Segment	1	
	11	Shift cam	1	



EC4H3000

REMOVAL POINTS

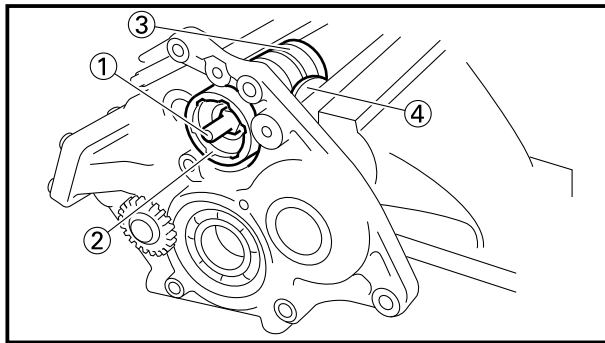
EC4H3210

Transmission

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

NOTE:

- Remove the main axle together with the drive axle from the transmission housing ③.
- Remove assembly carefully. Note the position of each part. Pay particular attention to the location and direction of shift forks.



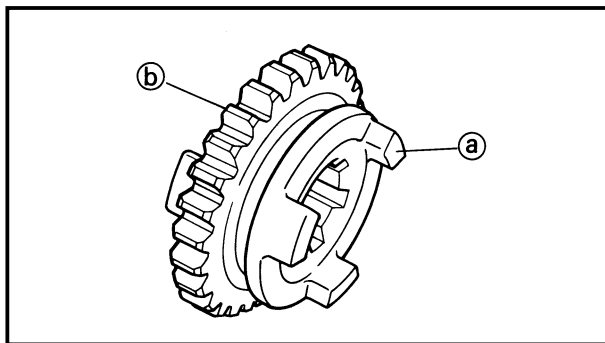
EC4H3400

Segment

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

NOTE:

- Clamp the shift cam ③ securely in a vise, using soft protecting material ④ to loosen the bolt (segment).



EC4H4000

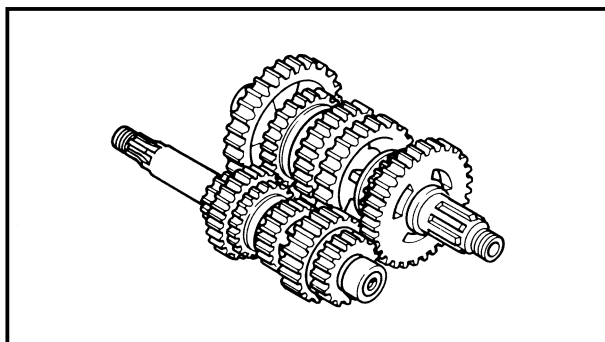
INSPECTION

EC4H4210

Gears

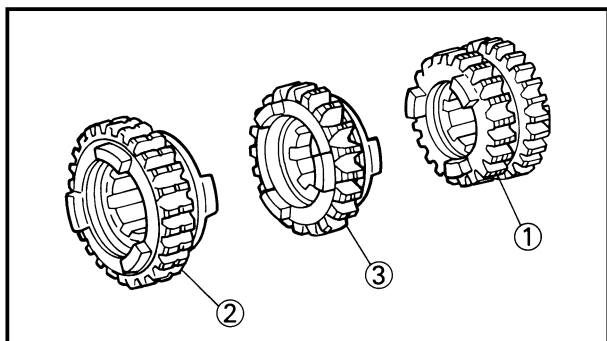
1. Inspect:
 - Matching dog ①
 - Gear teeth ②

Wear/Damage → Replace.



2. Check:
 - Gears movement

Unsmooth movement → Repair or replace.



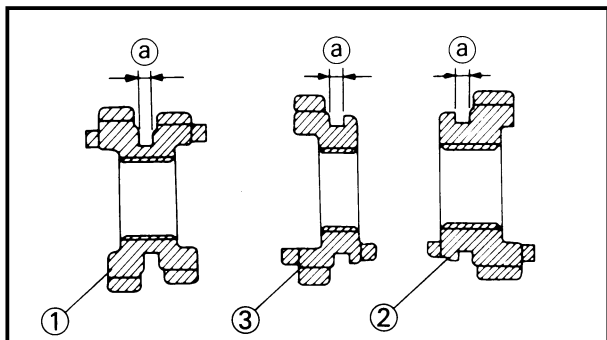
EC4H4300

Shift fork groove

1. Measure:

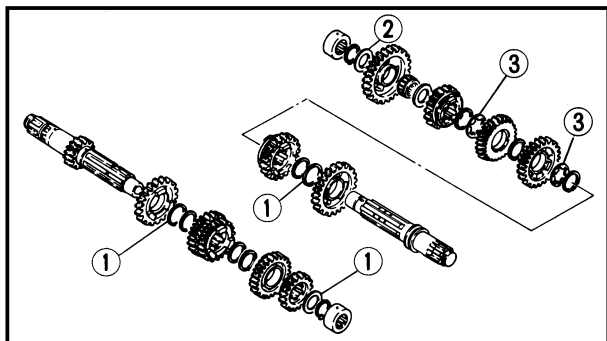
- 3rd/4th pinion gear ①
- 5th wheel gear ②
- 6th wheel gear ③
- Shift fork groove ④

Out of specification → Replace.



Shift fork groove ④:

Standard	<Limit>
5.05~5.18 mm (0.199~0.204 in)	5.35 mm (0.211 in)



EC4H4400

Thrust clearance

1. Check:

- After assembling the transmission, check whether the idle gear turns smoothly without a thrust.

If the thrust clearance is too large or the idle gear moves with difficulty → Replace the shim ①, ② and ③.

Choose the shims by the following chart.

Part name	Size (thickness)	Part number
Shim ① STD	t=1.0 mm (0.039 in)	90201-253K0
	t=0.9 mm (0.035 in)	90201-256E6
Shim ② STD	t=1.0 mm (0.039 in)	90201-20276
	t=0.9 mm (0.035 in)	90201-206E5
Shim ③ STD	t=0.7 mm (0.028 in)	5F7-17136-00
	t=0.5 mm (0.020 in)	90209-22082

NOTE:

It is necessary to adjust the thrust clearance when the transmission gear, axle, washer, cir-clip, bearing or crankcase is replaced.



EC4H4501

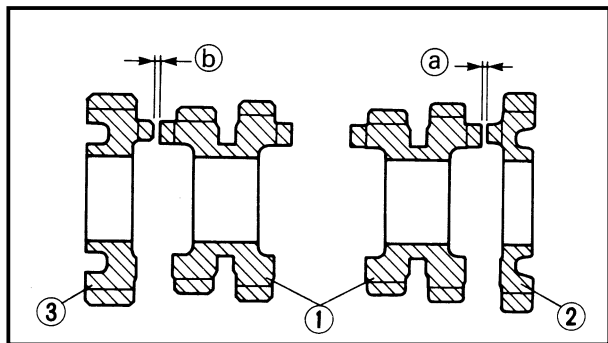
Dog clearance

NOTE:

- It is necessary to adjust the dog clearance when the transmission gear, axle, washer, circlip, bearing or crankcase is replaced.
- If there is any shifting trouble, it is necessary to check the shift fork, shift cam, shift lever and gears. But if there are in good condition, the dog clearance should be inspected.

1. Install the transmission, shift cam and shift fork into the transmission housing.
2. Position the transmission is neutral.
3. Pull the main axle toward the clutch side.
4. Bring the 3rd/4th pinion gear ① into light contact with the 6th pinion gear ② to the extent that they are not engaged, and measure the clearance ③ between 3rd/4th pinion gear and 6th pinion gear.

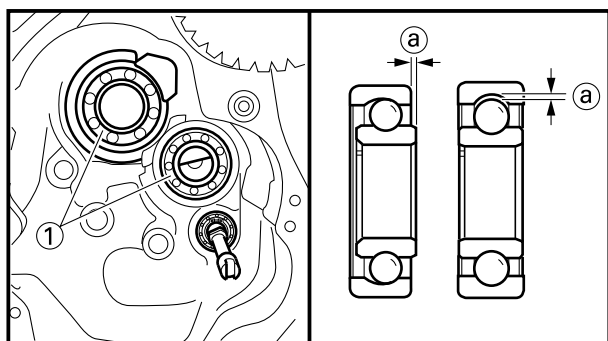
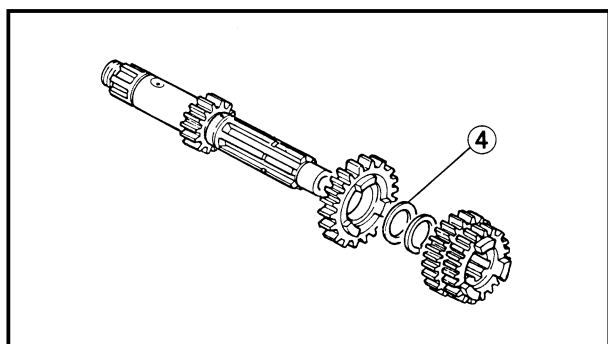
Bring the 3rd/4th pinion gear into light contact with the 5th pinion gear ③ to the extent that they are not engaged and measure the clearance ④ between 3rd/4th pinion gear and 5th pinion gear.



Dog clearance ③, ④:
0.5 mm (0.020 in) or more

Out of specification or clearance ③ and ④ are not equal → Replace the shim ④.
Choose the shim by the following chart.

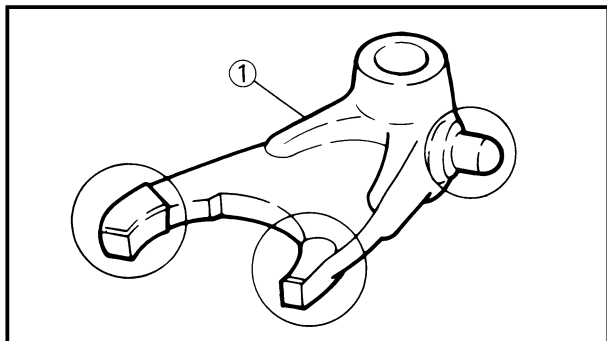
Part name	Size (thickness)	Part number
Shim ④ STD	t=1.0 mm (0.039 in)	90201-253K0
	t=0.9 mm (0.035 in)	90201-256E6



EC4H4600

Bearing

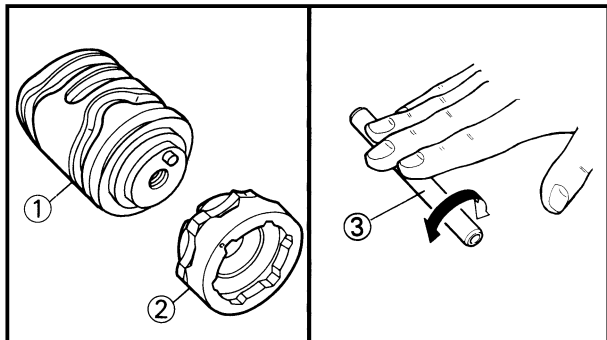
1. Inspect:
 - Bearing ①
Rotate inner race with a finger.
Rough spot/Seizure → Replace.



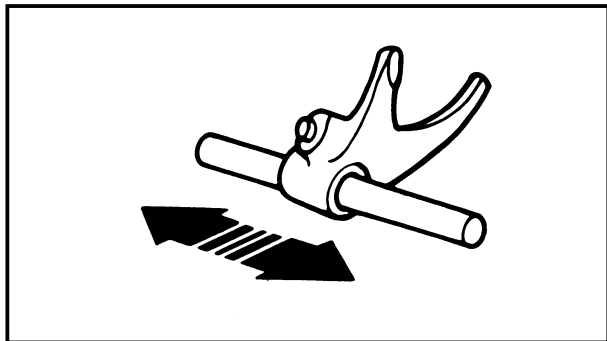
EC4H4801

Shift fork, shift cam and segment

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

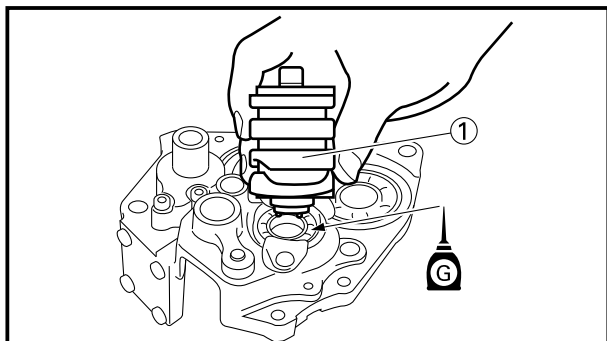


2. Inspect:
 - Shift cam ①
 - Segment ②
 - Guide bar ③
 - Bend/Wear/Damage → Replace.



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

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



EC4H5000

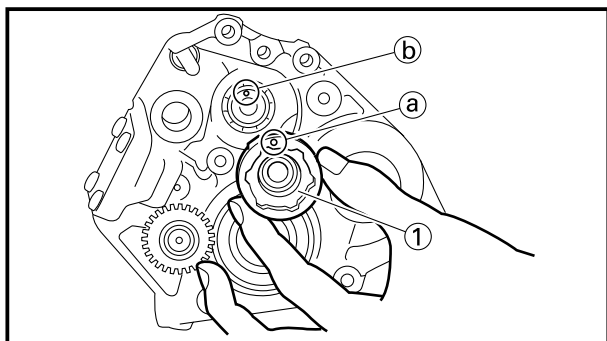
ASSEMBLY AND INSTALLATION

EC4H5112

Shift cam

1. Install:
 - Shift cam ①

NOTE: _____
 Apply the transmission oil on the shift cam bearing.



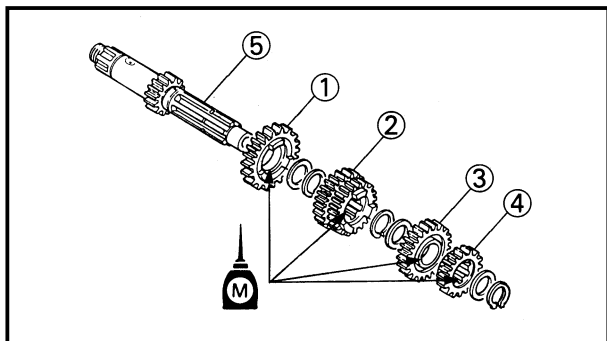
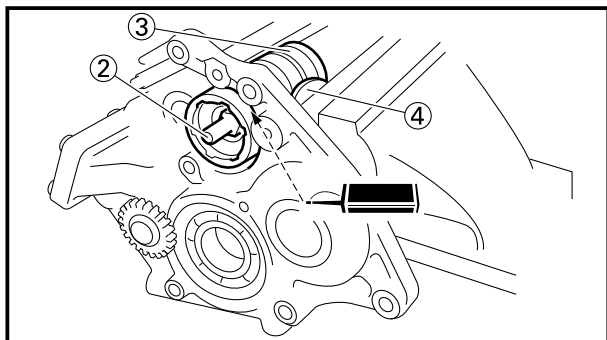
2. Install:

- Segment ①
- Bolt (segment) ②

23 Nm (2.3 m•kg, 17 ft•lb)

NOTE:

- When installing the segment onto the shift cam, align the punch mark ① with the dowel pin ②.
- Clamp the shift cam ③ securely in a vise, using soft protecting material ④ to tighten the bolt (segment).



EC4H5232

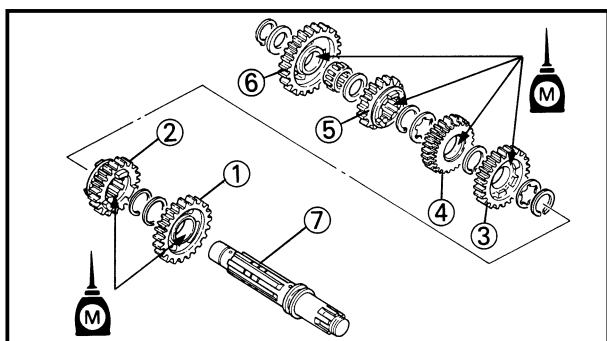
Transmission

1. Install:

- 6th pinion gear (22T) ①
- 3rd/4th pinion gear (23T/25T) ②
- 5th pinion gear (27T) ③
- 2nd pinion gear (21T) ④
- To main axle ⑤.

NOTE:

Apply the molybdenum disulfide oil on the gears inner circumference.

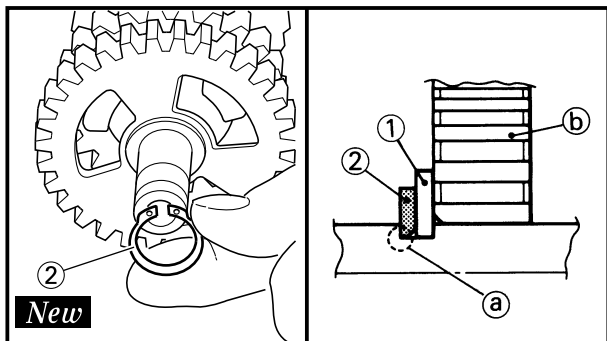
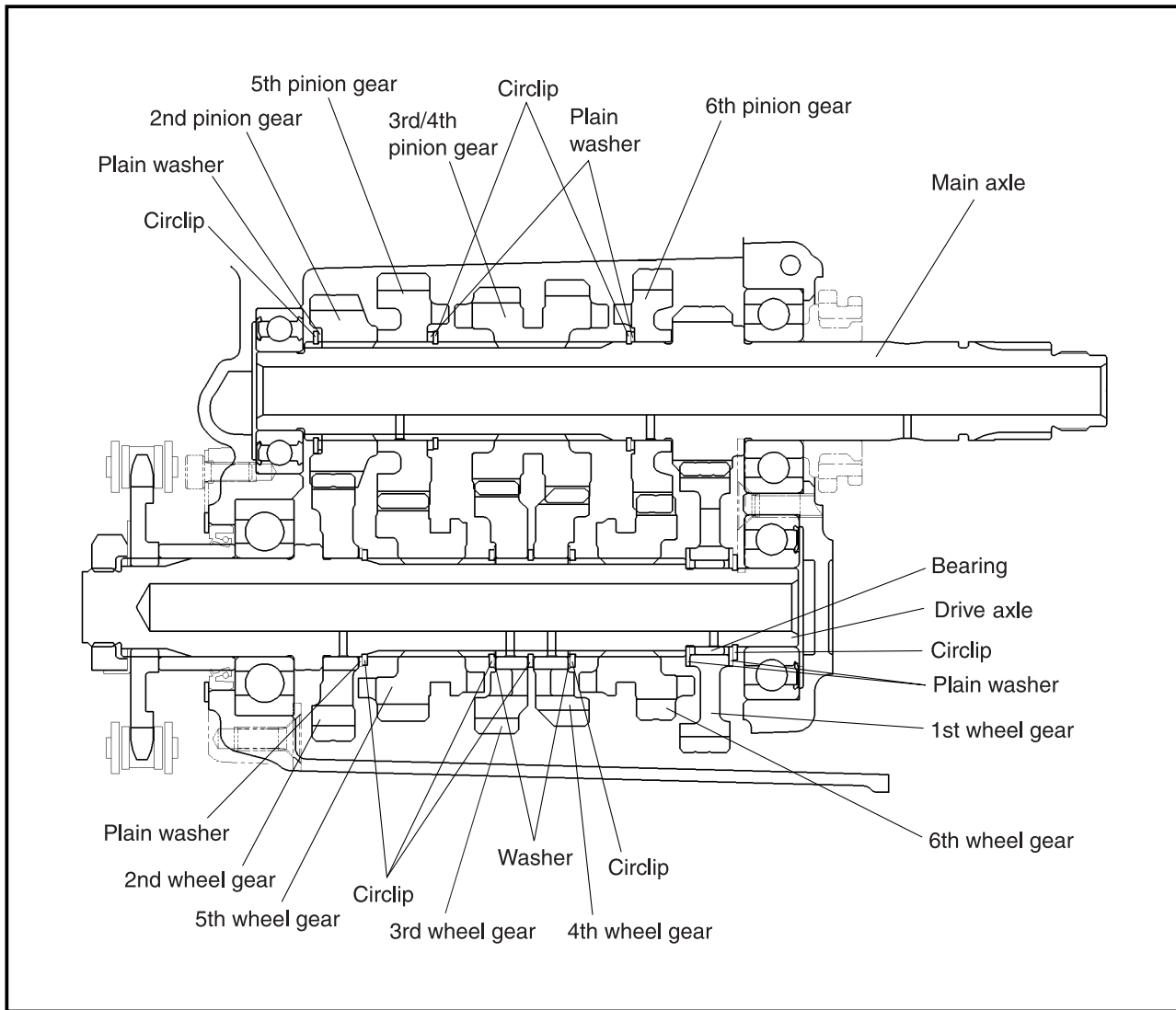


2. Install:

- 2nd wheel gear (31T) ①
- 5th wheel gear (26T) ②
- 3rd wheel gear (29T) ③
- 4th wheel gear (27T) ④
- 6th wheel gear (20T) ⑤
- 1st wheel gear (34T) ⑥
- To drive axle ⑦.

NOTE:

Apply the molybdenum disulfide oil on the gears inner circumference.

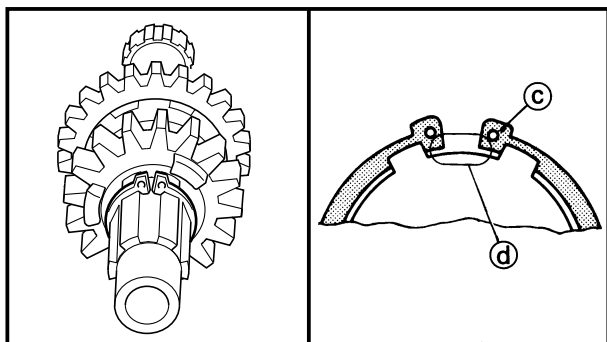


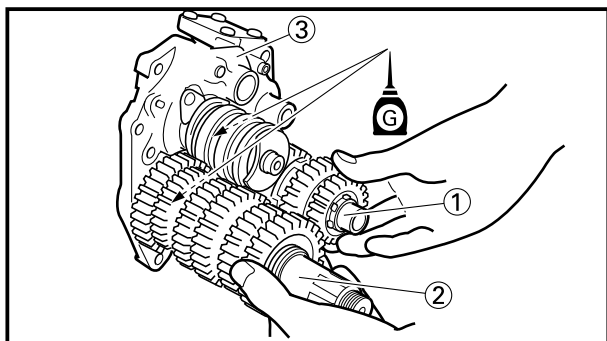
3. Install:

- Plain washer ①
- Circlip ② **New**

NOTE:

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

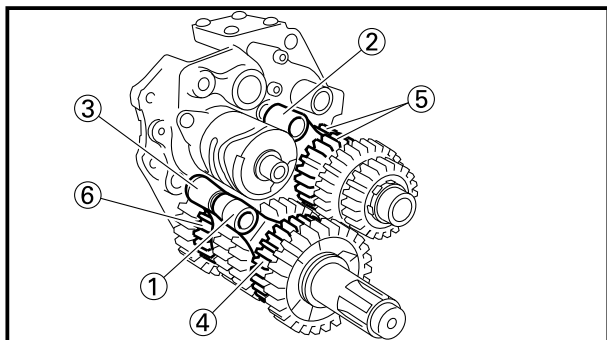




4. Install:
- Main axle ①
 - Drive axle ②

NOTE: _____

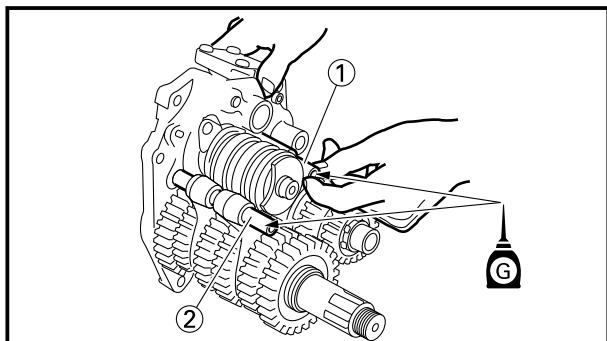
- Apply the transmission oil on the main axle and drive axle bearings.
- Install the main axle together with the drive axle into the transmission housing ③.



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

NOTE: _____

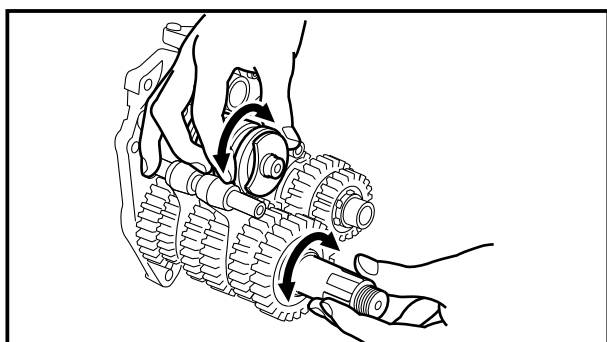
- Mesh the shift fork #1 with the 5th wheel gear ④ and #3 with the 6th gear ⑥ on the drive axle.
- Mesh the shift fork #2 with the 3rd/4th pinion gear ⑤ on the main axle.



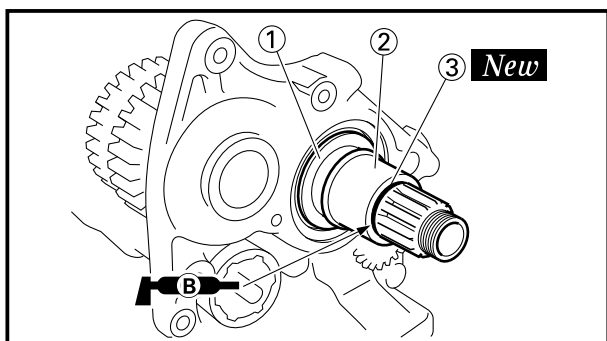
6. Install:
- Guide bar 1 (short) ①
 - Guide bar 2 (long) ②

NOTE: _____

- Apply the transmission oil on the guide bars.
- Be sure the short bar is inserted into the shift fork #2 and the long one into #1 and #3.



7. Check:
- Shift operation
 - Transmission operation
- Unsmooth operation → Repair.



8. Install:
- Thrust plate ①
 - Spacer 1 ②
 - O-ring ③ **New**

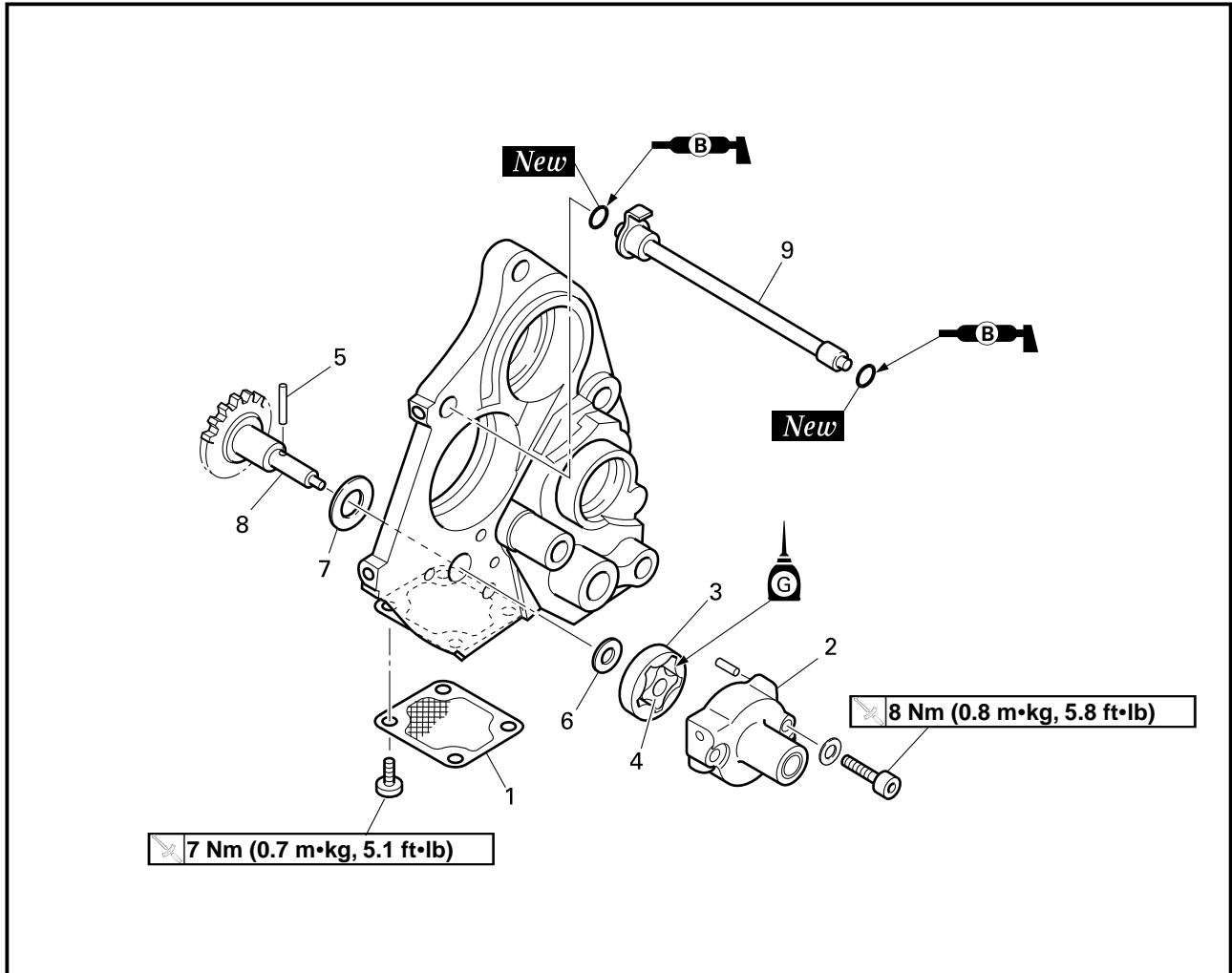
NOTE: _____

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



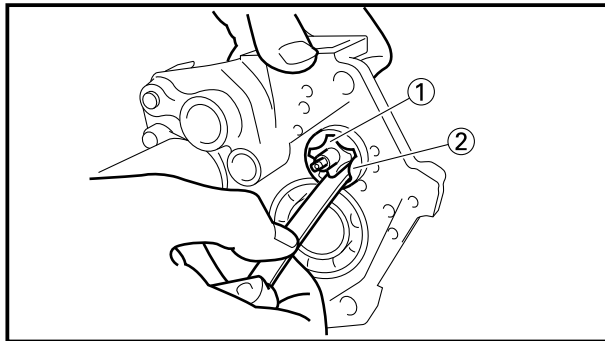
EC4J0000

OIL PUMP



Extend of removal: ① Oil pump removal and disassembly

Extend of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		OIL PUMP REMOVAL Transmission housing Shift shaft and Stopper lever Transmission and shift fork		} Refer to "SHIFT SHAFT" section. Refer to "TRANSMISSION, SHIFT CAM AND SHIFT FORK" section.
①	1	Strainer	1	
	2	Oil pump cover	1	
	3	Outer rotor	1	
	4	Inner rotor	1	
	5	Dowel pin	1	
	6	Plain washer [D=ø15 mm (0.59 in)]	1	
	7	Plain washer [D=ø22 mm (0.87 in)]	1	
	8	Oil pump gear shaft	1	
	9	Oil delivery pipe	1	



EC4J4000

INSPECTION

EC4J4100

Oil pump

1. Measure:

- Tip clearance

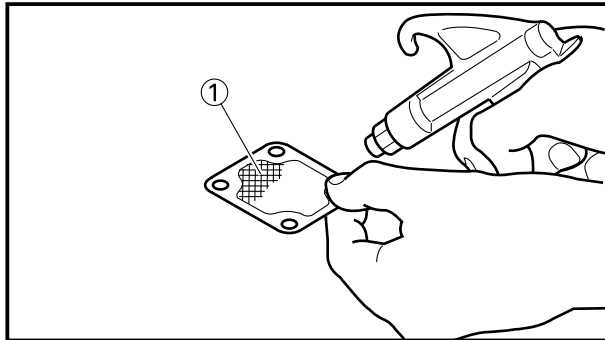
Measure the clearance between the inner rotor ① and outer rotor ②.

Out of limit → Replace the inner rotor and outer rotor as a set.



Tip clearance limit:

0.15 mm (0.0059 in)



EC4E4310

Strainer

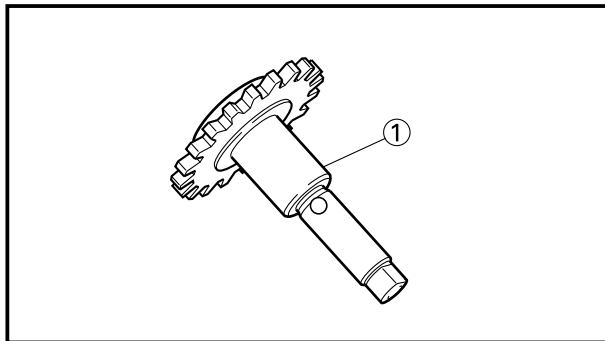
1. Clean:

- Strainer ①

Use compressed air.

NOTE:

- Clean the strainer every 500 km (300 miles).
- If a lot of metallic dust is noticed, disassemble the engine and check.



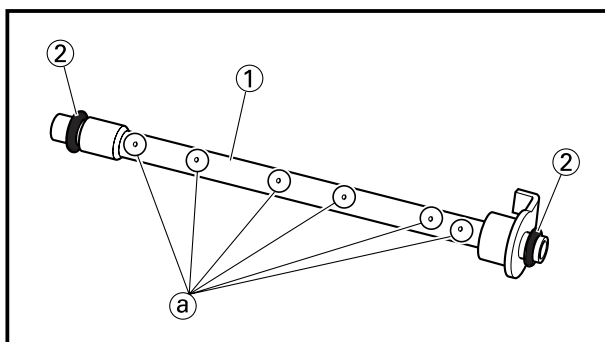
EC4J4200

Oil pump gear shaft

1. Inspect:

- Oil pump gear shaft ①

Wear/Damage → Replace.



EC4H4100

Oil delivery pipe

1. Inspect:

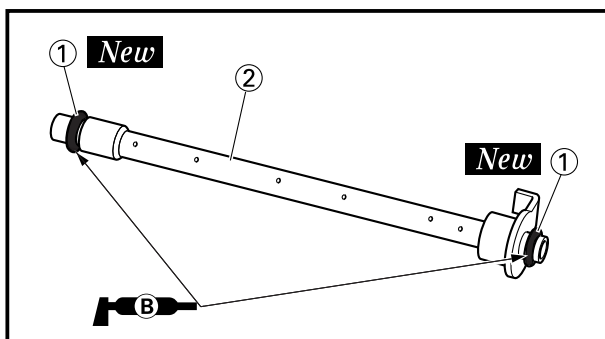
- Oil delivery pipe ①

- O-ring ②

Damage → Replace.

- Oil orifice (a)

Clogged → Blow.



EC4J5000

ASSEMBLY AND INSTALLATION

EC4J5102

Oil pump

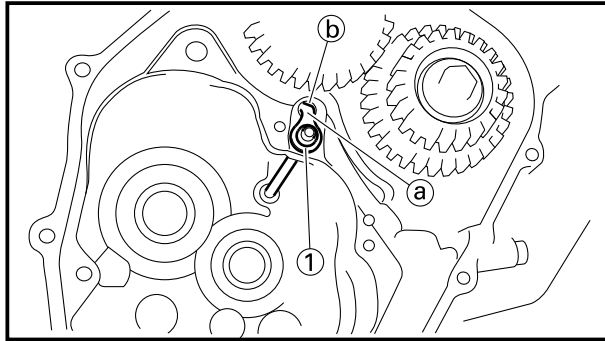
1. Install:

- O-ring ① **New**

To oil delivery pipe ②.

NOTE:

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

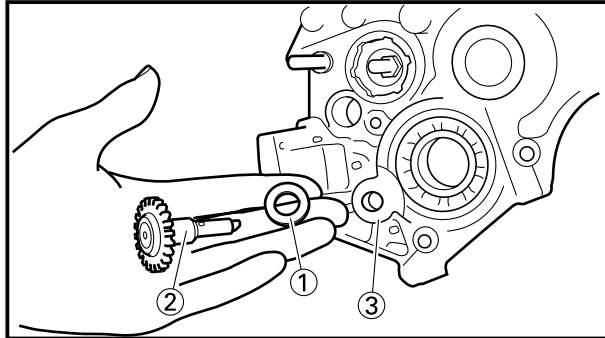


2. Install:

- Oil delivery pipe ①

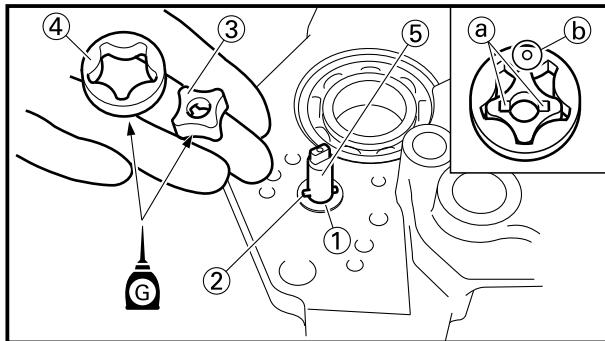
NOTE:

When installing the oil delivery pipe, fit the projection ① of the oil delivery pipe into the hole ② on the crankcase.



3. Install:

- Plain washer [D=ø22 mm (0.87 in)] ①
- Oil pump gear shaft ②
- To transmission housing ③.

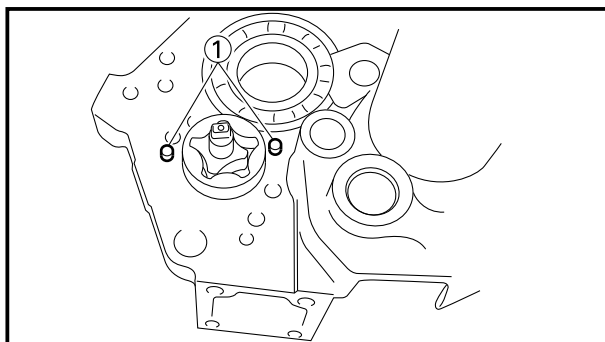


4. Install:

- Plain washer [D=ø15 mm (0.87 in)] ①
- Dowel pin ②
- Inner rotor ③
- Outer rotor ④
- To oil pump gear shaft ⑤.

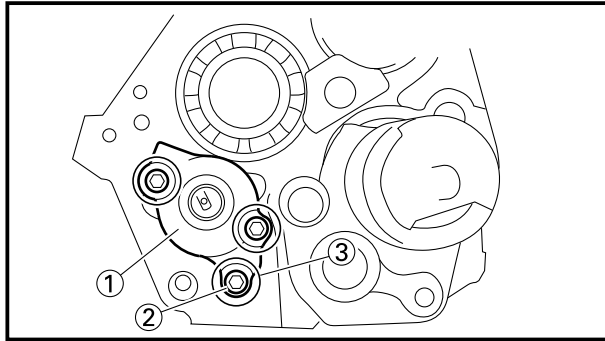
NOTE:

- Apply the transmission oil on the inner rotor and outer rotor.
- Make sure the dowel pin fits into the groove ① in the inner rotor.
- When installing the outer rotor, make sure the punch mark ② on the outer rotor face the transmission housing side.




5. Install:

- Dowel pin ①

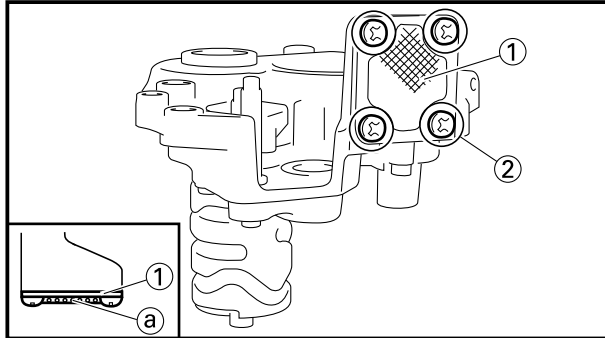


6. Install:
- Oil pump cover ①
 - Plain washer ②
 - Bolt (oil pump cover) ③


 **8 Nm (0.8 m•kg, 5.8 ft•lb)**

NOTE: _____

While turning the oil pump gear shaft, install the oil pump cover.



7. Install:
- Strainer ①
 - Screw (strainer) ②

 **7 Nm (0.7 m•kg, 5.1 ft•lb)**

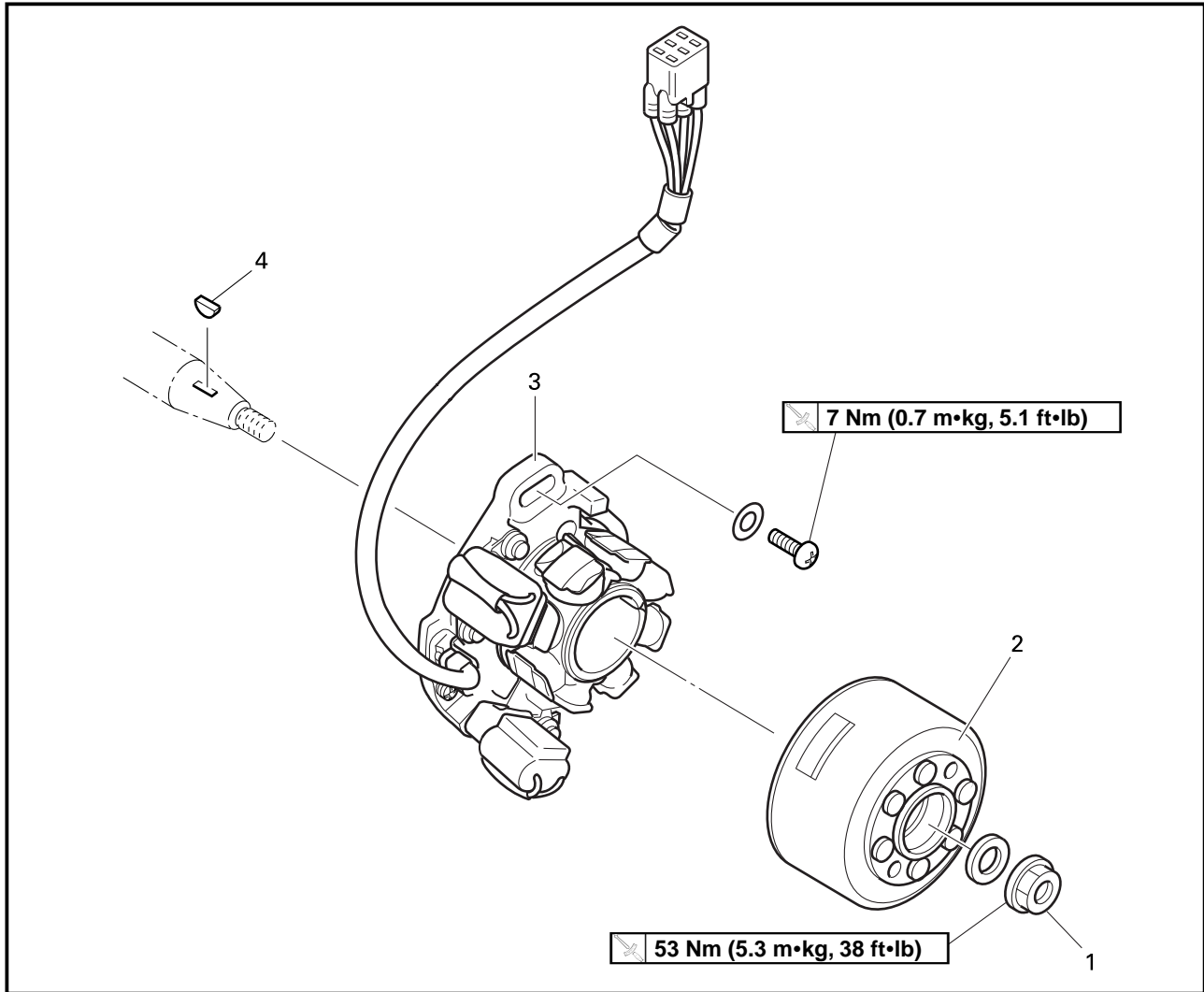
NOTE: _____

Strainer is installed with the mesh ① facing outward.




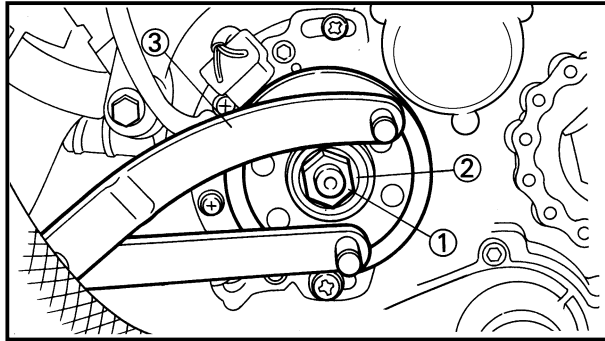
EC4L0000

CDI MAGNETO



Extend of removal: ① CDI magneto removal

Extend of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		CDI MAGNETO REMOVAL Cowling and fuel tank		Refer to "COWLING, INDUCTION GUIDE, SEAT AND FUEL TANK" section.
		Disconnect the CDI magneto lead.		
	1	Nut (rotor)	1	Use special tool. Refer to "REMOVAL POINTS".
	2	Rotor	1	
	3	Stator	1	
	4	Woodruff key	1	



EC4L3000

REMOVAL POINTS

EC4L3102

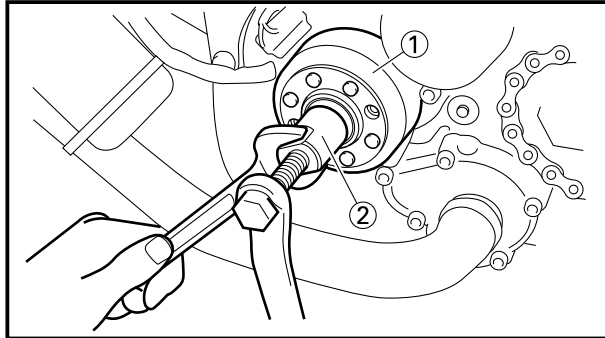
Rotor

1. Remove:
 - Nut (rotor) ①
 - Plain washer ②
 Use the rotor holding tool ③.



Rotor holding tool:

YU-1235/90890-01235



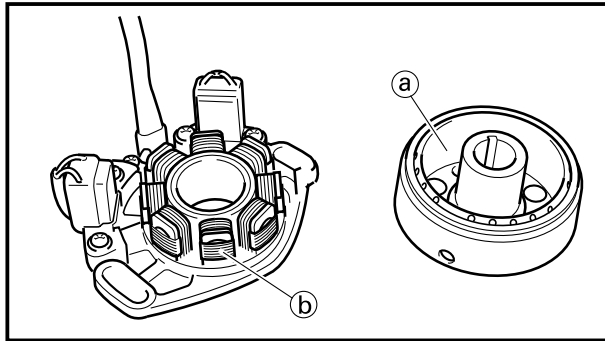
2. Remove:
 - Rotor ①
 Use the flywheel puller ②.



Flywheel puller:

YM-1189/90890-01189

NOTE: _____
 When installing the flywheel puller, turn it counterclockwise.



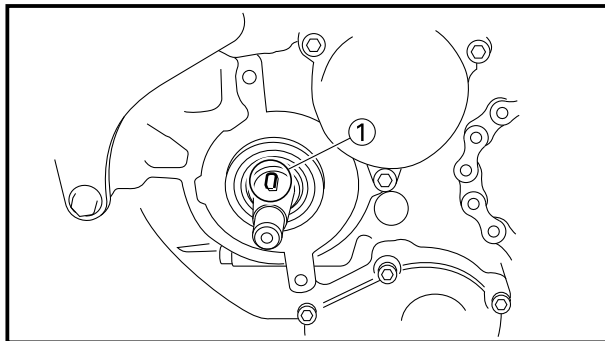
EC4L4000

INSPECTION

EC4L4101

CDI magneto

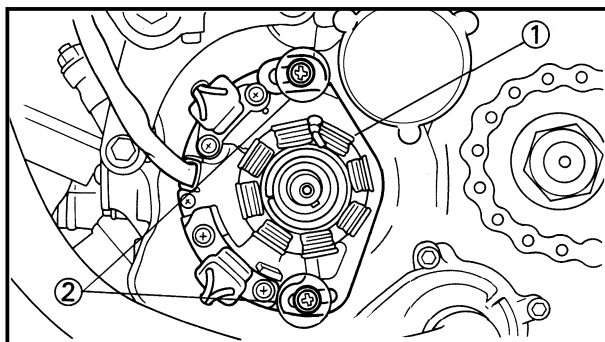
1. Inspect:
 - Rotor inner surface ①
 - Stator outer surface ②
 Damage → Inspect the crankshaft runout and crankshaft bearing.
 If necessary, replace CDI magneto and/or stator.



EC4L4200

Woodruff key

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



EC4L5000

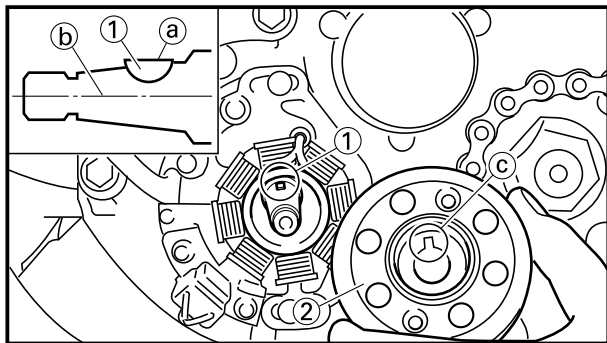
ASSEMBLY AND INSTALLATIO

EC4L5191

CDI magneto

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

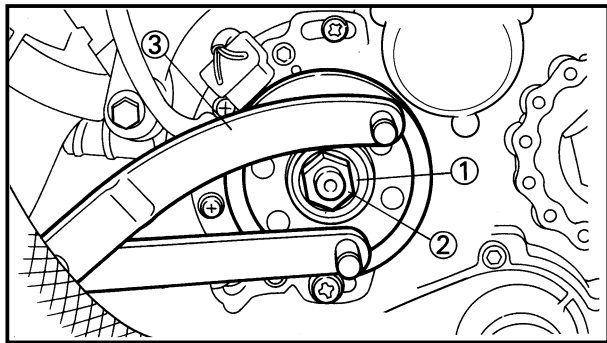
NOTE: _____
 Temporarily tighten the screw (stator) at this point.



2. Install:
- Woodruff key ①
 - Rotor ②

NOTE:

- Clean the tapered portions of the crankshaft and rotor.
- When installing the woodruff key, make sure that its flat surface ① is in parallel with the crankshaft center line ②.
- When installing the rotor, align the keyway ③ of the rotor with the woodruff key.



3. Install:
- Plain washer ①
 - Nut (rotor) ② **53 Nm (5.3 m•kg, 38 ft•lb)**
- Use the rotor holding tool ③.



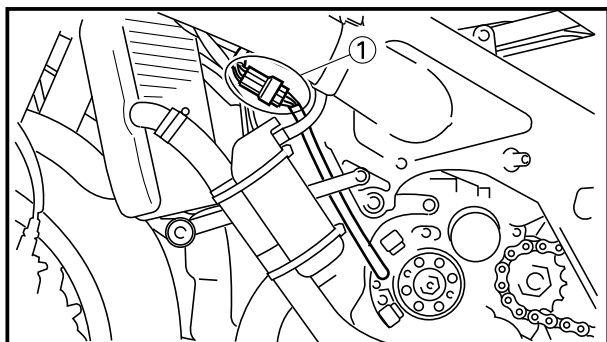
Rotor holding tool:
YU-1235/90890-01235

4. Adjust:
- Ignition timing



Ignition timing:
2.4 mm (0.094 in)

Refer to “IGNITION TIMING CHECK” section in the CHAPTER 3.

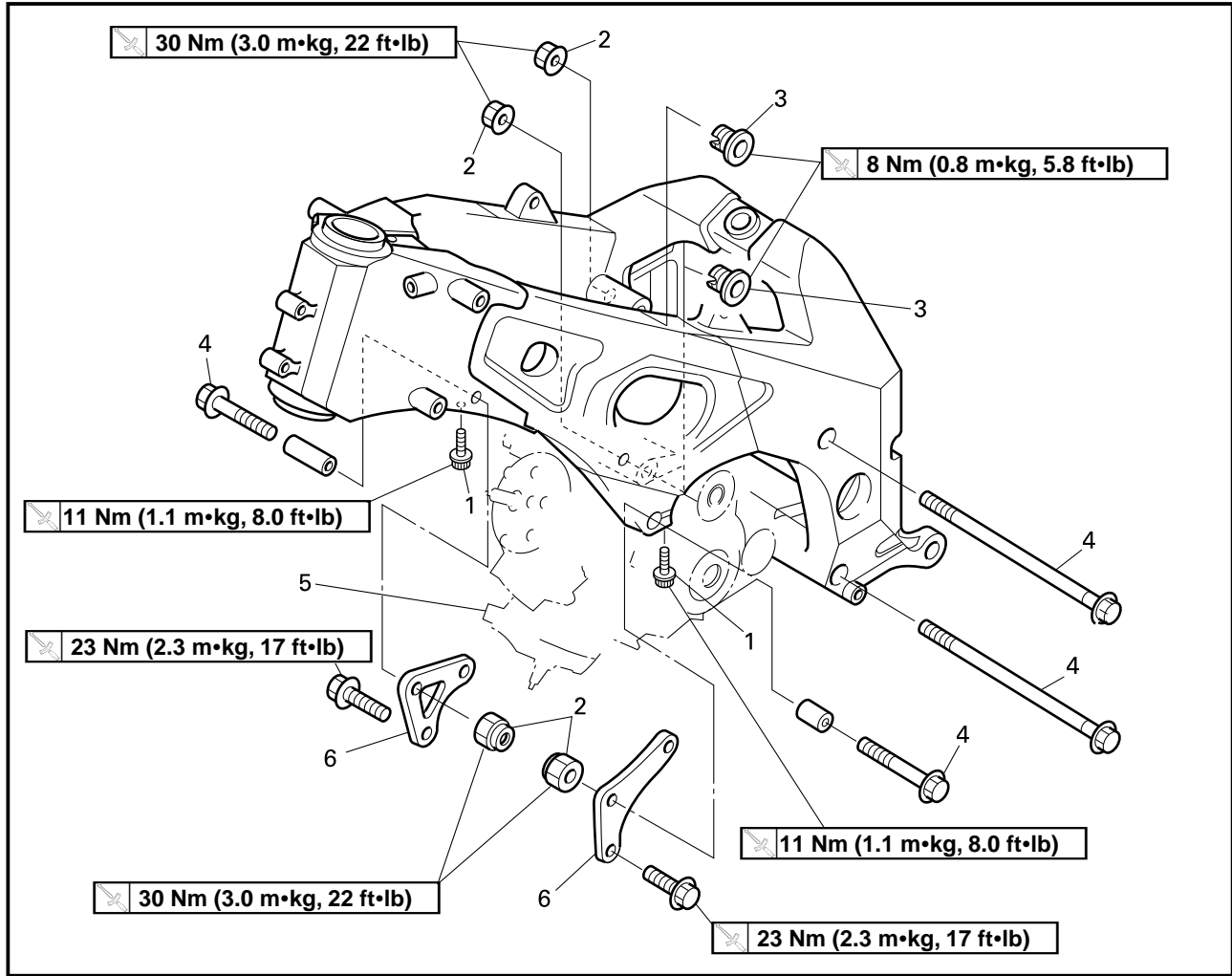


5. Connect:
- CDI magneto lead ①
- Refer to “CABLE ROUTING DIAGRAM” section in the CHAPTER 2.

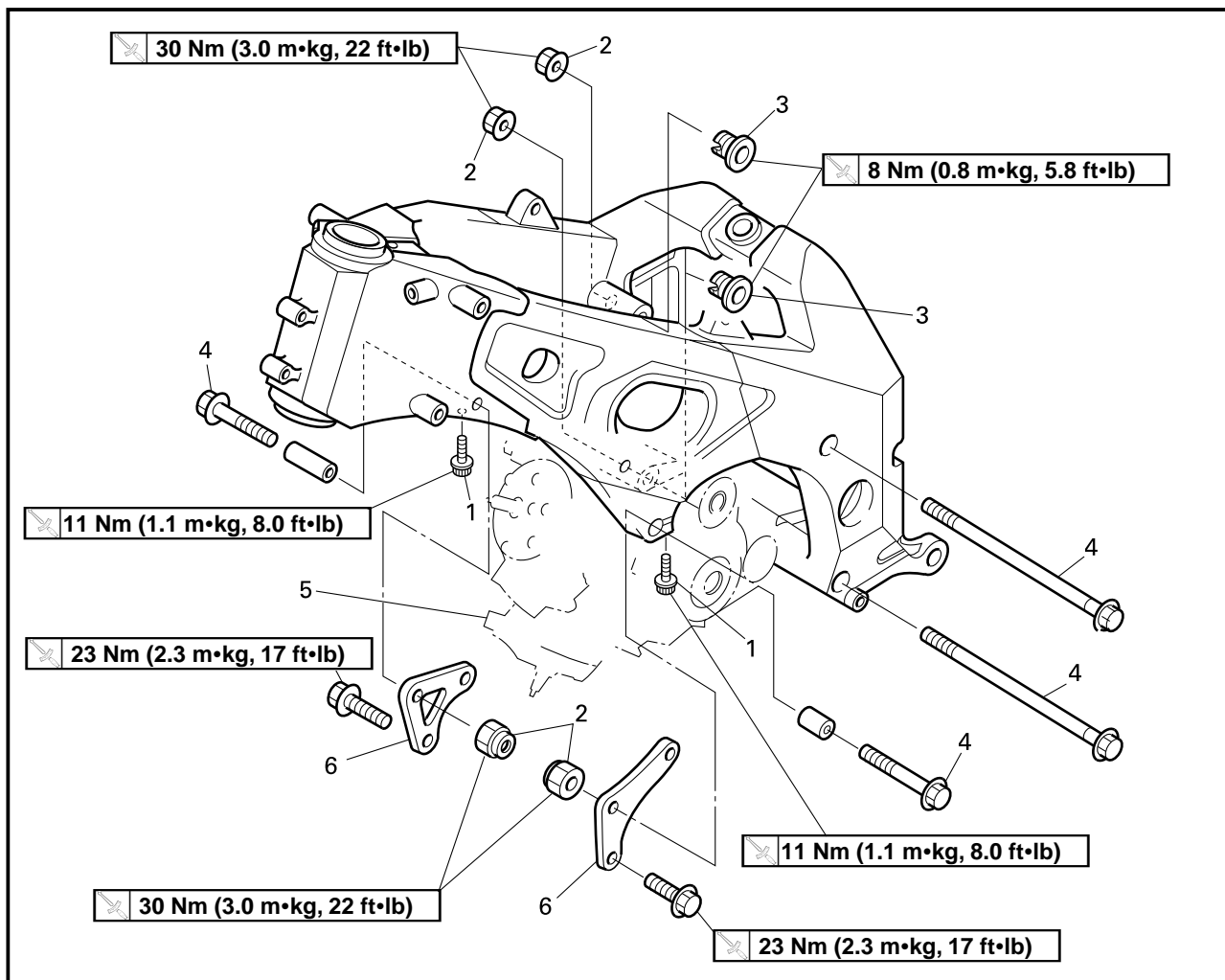


EC4M0000

ENGINE REMOVAL

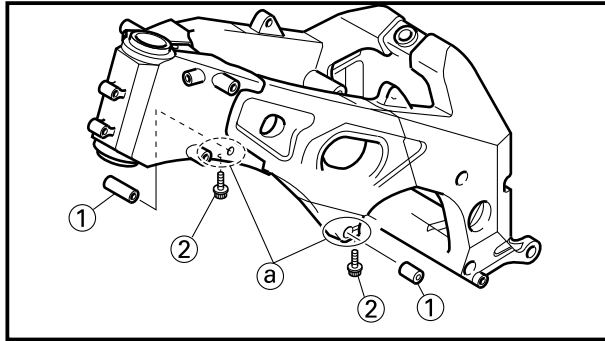


Extend of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		<p>ENGINE REMOVAL</p> <p>Hold the machine by placing the suitable stand. Cowling and fuel tank</p> <p>Carburetor and carburetor box</p> <p>Exhaust pipe</p> <p>Clutch cable</p> <p>Radiator hose 2</p> <p>Radiator hose 3, 4</p> <p>Drive sprocket</p> <p>Shift arm</p> <p>Spark plug cap</p> <p>YPVS cable</p> <p>Disconnect the CDI magneto lead.</p>		<p>⚠WARNING</p> <p>Support the machine securely so there is no danger of it falling over.</p> <p>Refer to "COWLING, INDUCTION GUIDE, SEAT AND FUEL TANK" section.</p> <p>Refer to "CARBURETOR AND REED VALVE" section.</p> <p>Refer to "EXHAUST PIPE AND SILENCER" section.</p> <p>Disconnect at engine side.</p> <p>Disconnect at water pump side.</p> <p>Disconnect at cylinder head side.</p> <p>} Refer to "SHIFT SHAFT" section.</p>



Extend of removal: ① Engine removal

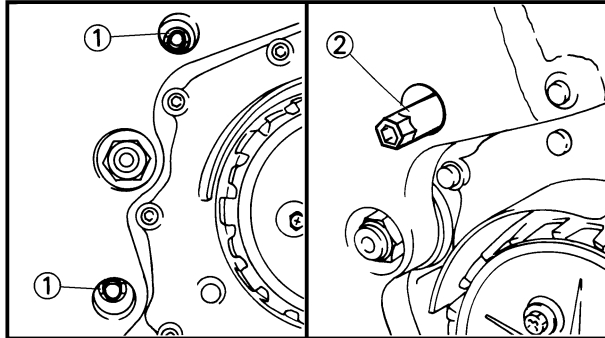
Extend of removal	Order	Part name	Q'ty	Remarks
↑ ① ↓	1	Pinch bolt (engine mounting collar)	2	Only loosening. } Refer to "REMOVAL POINTS."
	2	Nut (engine mounting bolt)	4	
	3	Engine mounting adjust bolt	2	
	4	Engine mounting bolt	4	
	5	Engine	1	
	6	Engine bracket	2	



EC4M6000

HANDLING NOTE

When the frame alone is stored, insert the engine mounting collars ① into the brackets and tighten them with the pinch bolts ② to 6 Nm (0.6 m•kg, 4.3 ft•lb) in order to prevent the brackets ③ from damage.



EC4M3000

REMOVAL POINTS

EC4M3331

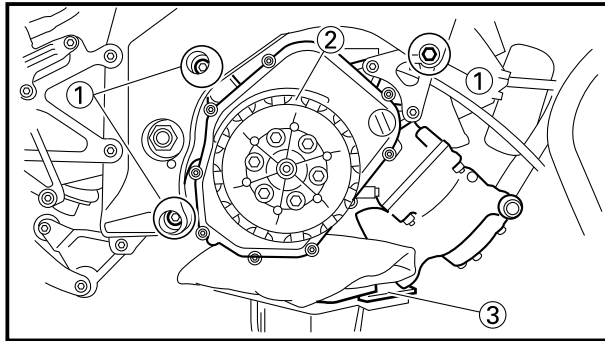
Engine removal

1. Loosen:

- Engine mounting adjust bolt ①

NOTE:

Use the adjust bolt wrench ② to loosen the engine mounting adjust bolt.

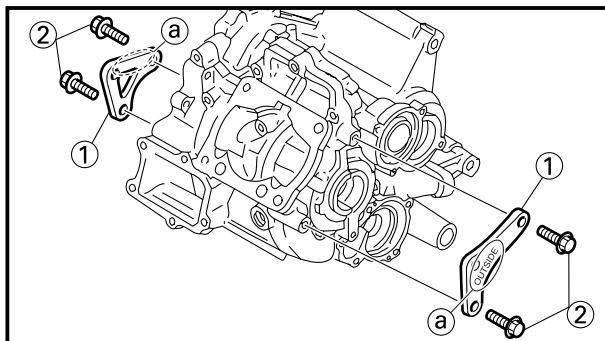


2. Remove:

- Engine mounting bolt ①
- Engine ②

NOTE:

- Before removing the engine, make sure that the couplers, hoses and cables are disconnected.
- Remove the engine by lowering it with a jack ③.



EC4M5000

ASSEMBLY AND INSTALLATION

EC4M5190

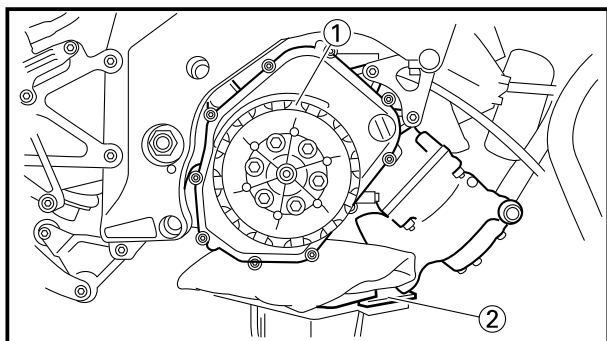
Engine installation

1. Install:

- Engine bracket ①
- Bolt (engine bracket) ②

NOTE:

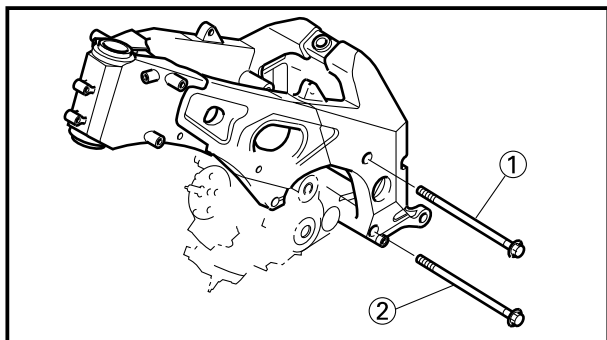
- Install the engine brackets with their "OUTSIDE" marks ③ facing outward.
- Tighten the bolts (engine brackets) to 23 Nm (2.3 m•kg, 17 ft•lb), then loosen them by 1/4 turn, for temporary fitting.



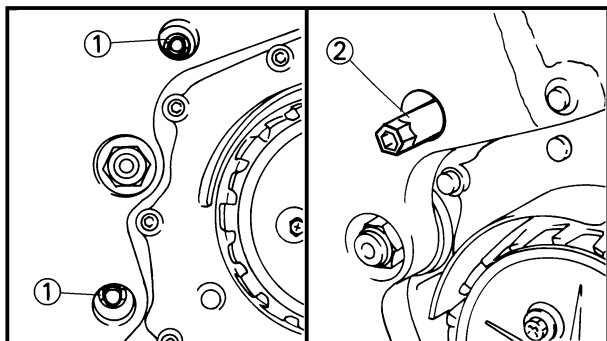
2. Install:
- Engine ①

NOTE:

Install the engine by raising it into the frame with a jack ②.



3. Install:
- Engine mounting bolt (upper) ①
 - Engine mounting bolt (lower) ②

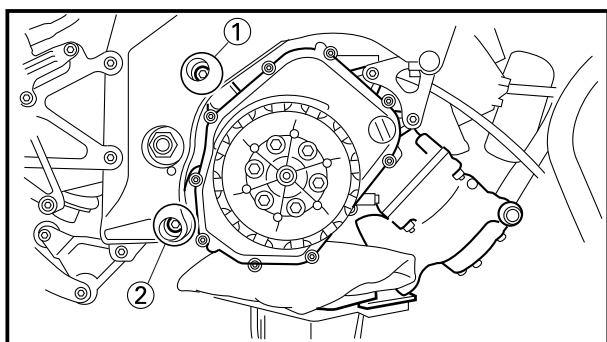


4. Tighten:
- Engine mounting adjust bolt ①

8 Nm (0.8 m•kg, 5.8 ft•lb)

NOTE:

- Use the adjust bolt wrench ② to tighten the engine mounting adjust bolts.
- Tighten the adjust bolts to specified torque alternately two times.

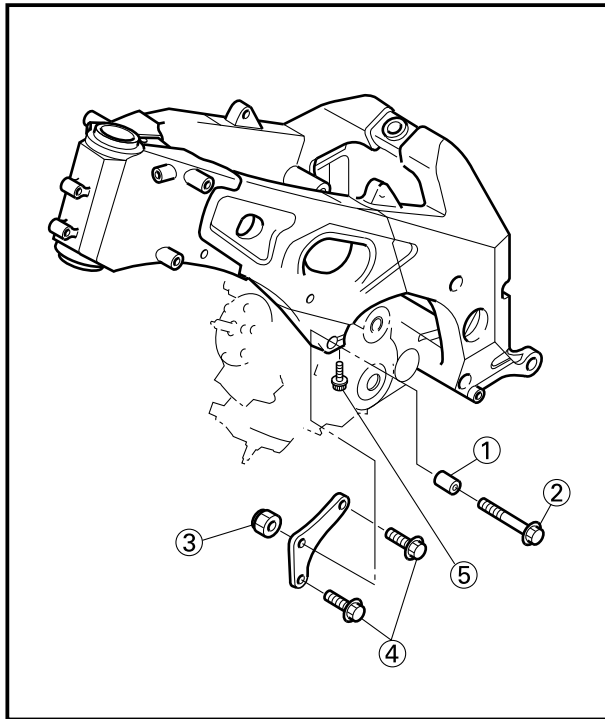


5. Install:
- Nut (engine mounting bolt) (upper) ①

30 Nm (3.0 m•kg, 22 ft•lb)

- Nut (engine mounting bolt) (lower) ②

30 Nm (3.0 m•kg, 22 ft•lb)



6. Install:

- Engine mounting collar (left) ①
- Engine mounting bolt (left) ②
- Engine mounting nut (left) ③

30 Nm (3.0 m•kg, 22 ft•lb)

7. Tighten:

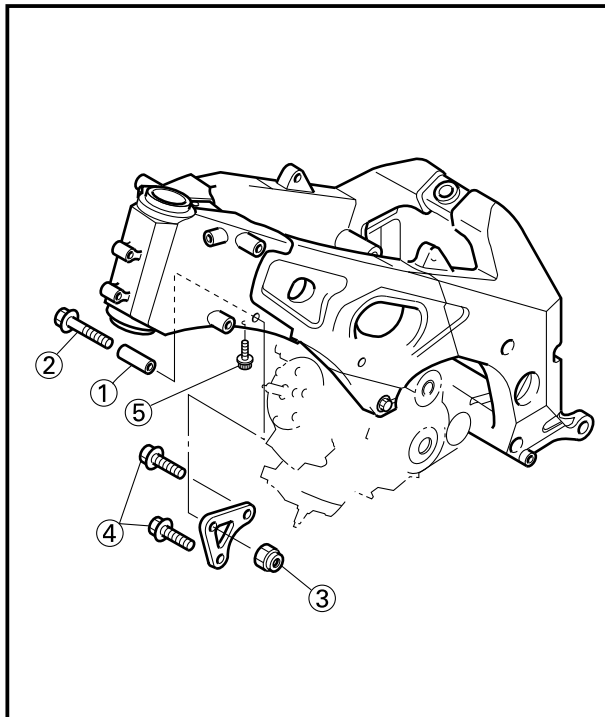
- Bolt (engine bracket) (left) ④

23 Nm (2.3 m•kg, 17 ft•lb)

8. Tighten:

- Pinch bolt (engine mounting collar) (left) ⑤

11 Nm (1.1 m•kg, 8.0 ft•lb)



9. Install:

- Engine mounting collar (right) ①
- Engine mounting bolt (right) ②
- Engine mounting nut (right) ③

30 Nm (3.0 m•kg, 22 ft•lb)

10. Tighten:

- Bolt (engine bracket) (right) ④

23 Nm (2.3 m•kg, 17 ft•lb)

11. Tighten:

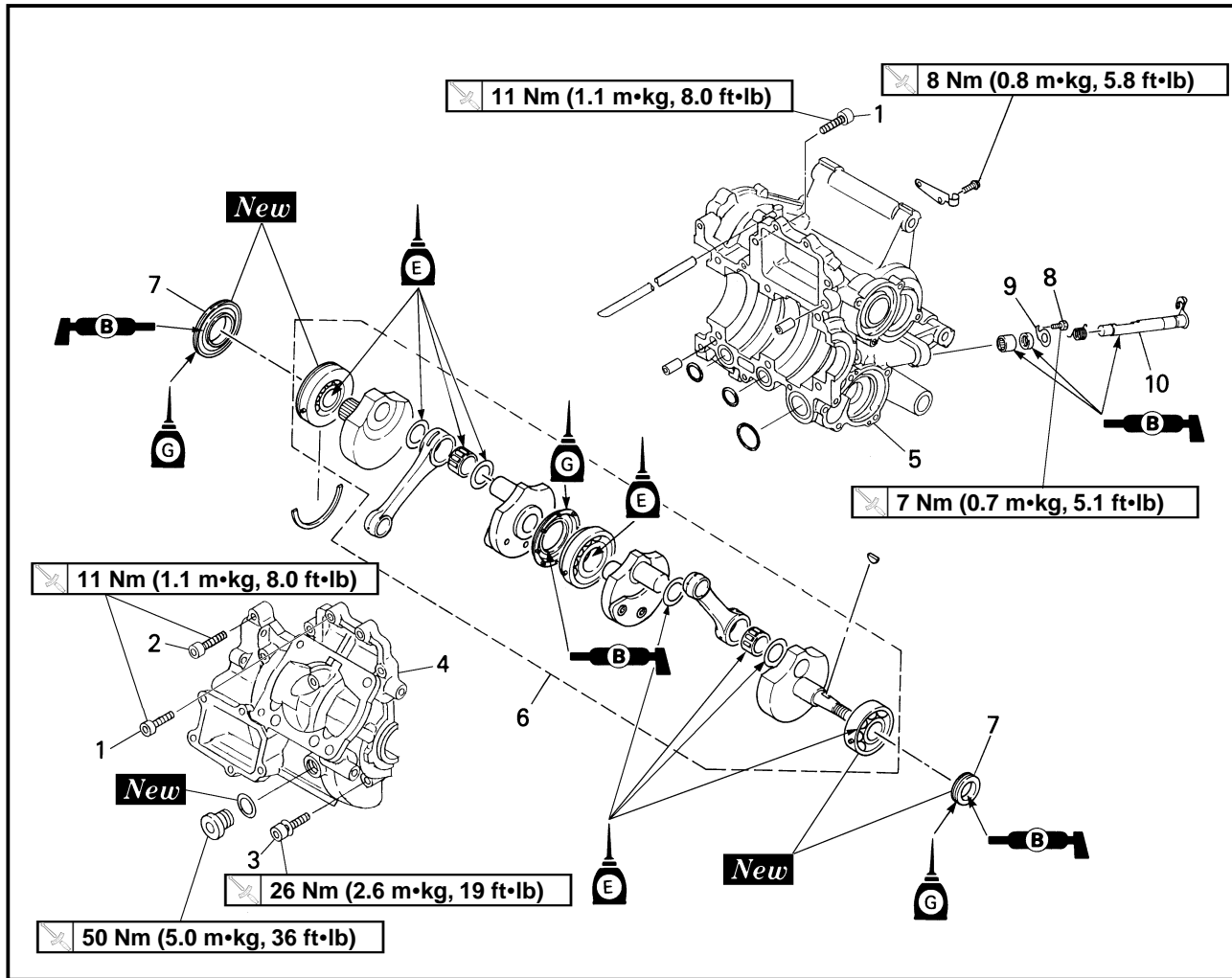
- Pinch bolt (engine mounting collar) (right) ⑤

11 Nm (1.1 m•kg, 8.0 ft•lb)



EC4N0000

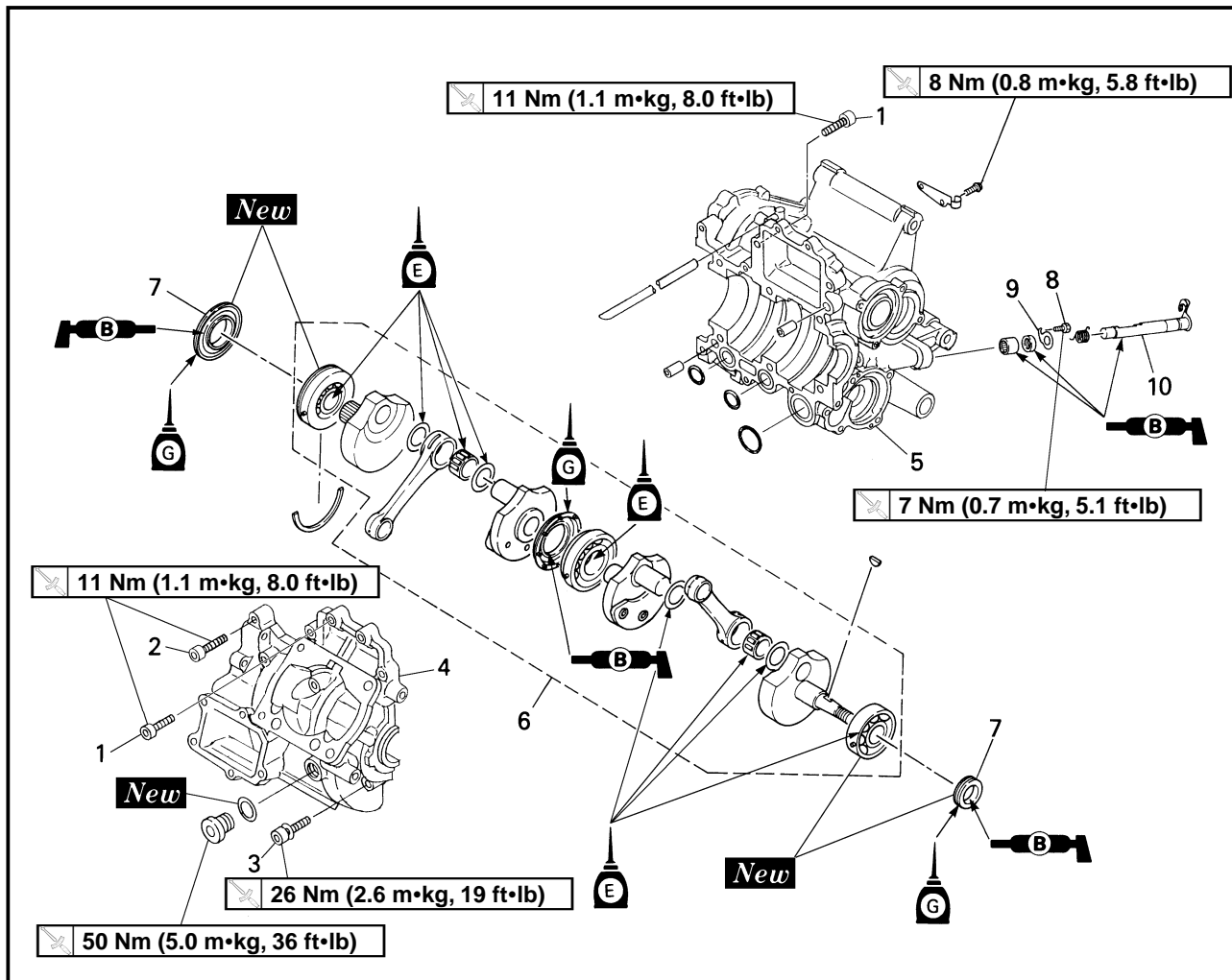
CRANKCASE AND CRANKSHAFT



Extend of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		CRANKCASE AND CRANK SHAFT REMOVAL		
		Engine		Refer to "ENGINE REMOVAL" section.
		Reed valve		Refer to "CARBURETOR AND REED VALVE" section.
		Piston		Refer to "CYLINDER HEAD, CYLINDER AND PISTON" section.
		Primary drive gear		Refer to "PRIMARY DRIVEN GEAR, PRIMARY DRIVE GEAR AND BALANCER SHAFT" section.
		Rotor and stator Engine bracket		Refer to "CDI MAGNETO" section.

CRANKCASE AND CRANKSHAFT

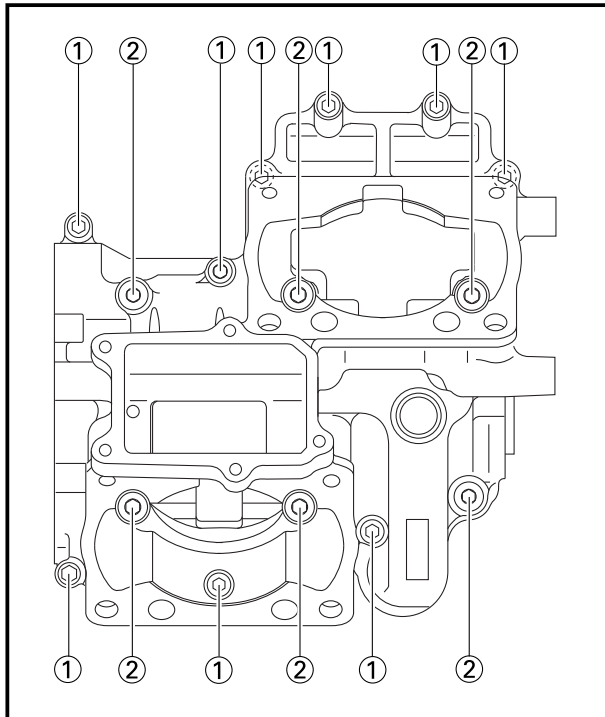
ENG



Extend of removal: ① Crankcase separation
③ Oil seal removal

② Crankshaft removal
④ Push lever axle removal

Extend of removal	Order	Part name	Q'ty	Remarks
①	1	Bolt [crankcase (M6)] [ℓ=30 mm (1.18 in)]	6	Refer to "REMOVAL POINTS".
	2	Bolt [crankcase (M6)] [ℓ=35 mm (1.38 in)]	3	
	3	Bolt [crankcase (M8)] [ℓ=45 mm (1.77 in)]	6	
②	4	Crankcase (upper)	1	
③	5	Crankcase (lower)	1	
	6	Crankshaft	1	
	7	Oil seal (crankshaft)	2	
	8	Bolt (seat plate)	1	
	9	Seat plate	1	
④	10	Push lever axle	1	



EC4N3000

REMOVAL POINTS

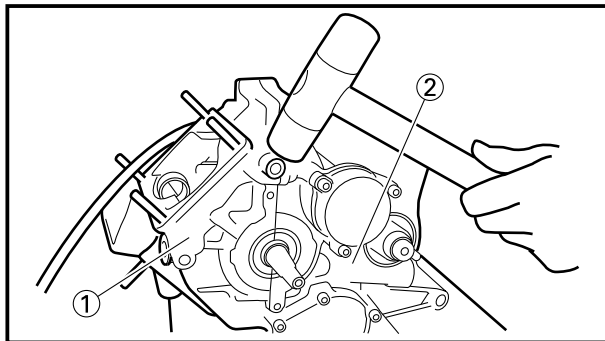
EC4N3230

Crankcase

1. Remove:
 - Bolt [crankcase (M6)] ①
 - Bolt [crankcase (M8)] ②

NOTE:

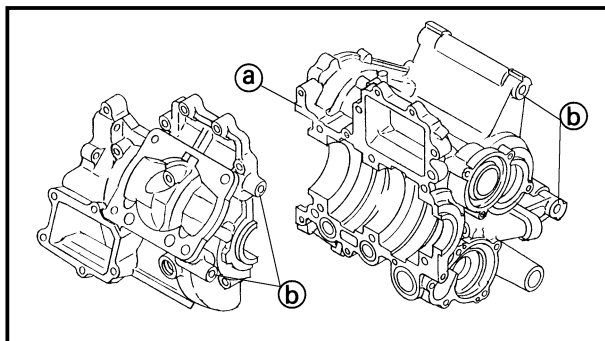
- The M6 size bolts should be removed first.
- Loosen the bolts from the outer sides inward.



2. Remove:
 - Crankcase (upper) ①
 - From crankcase (lower) ②.

CAUTION:

Use soft hammer to tap on the case half. Tap only on reinforced portions of case. Do not tap on gasket mating surface. Work slowly and carefully. If the cases do not separate, check for a remaining case screw or fitting. Do not force.



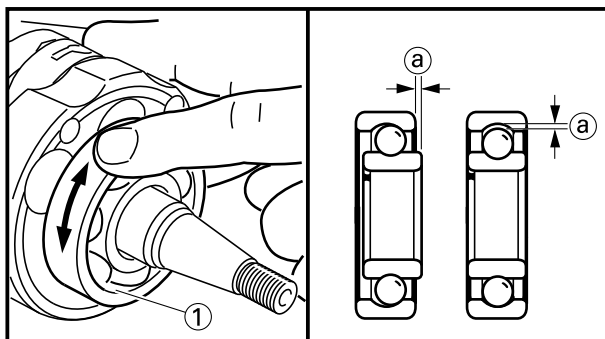
EC4N4000

INSPECTION

EC4N4112

Crankcase

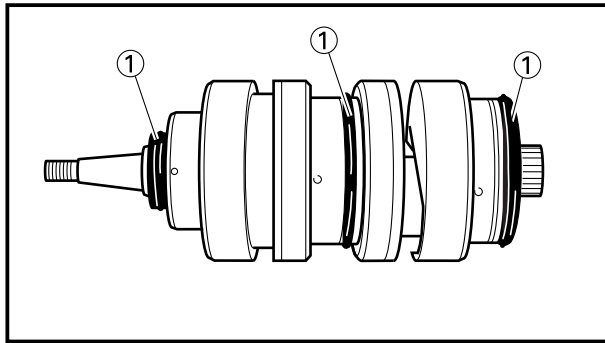
1. Inspect:
 - Contacting surface (a)
Scratches → Replace crankcase assembly.
 - Engine mounting boss (b), crankcase
Cracks/Damage → Replace crankcase assembly.



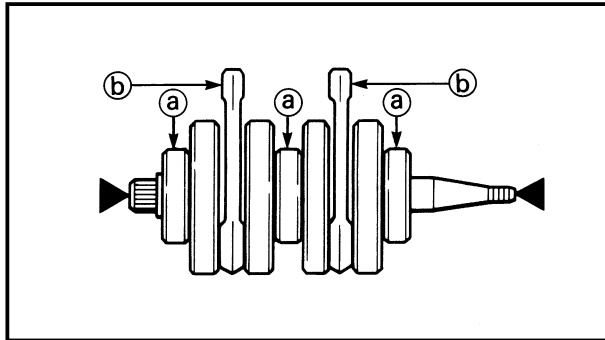
EC4N4214

Crankshaft

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



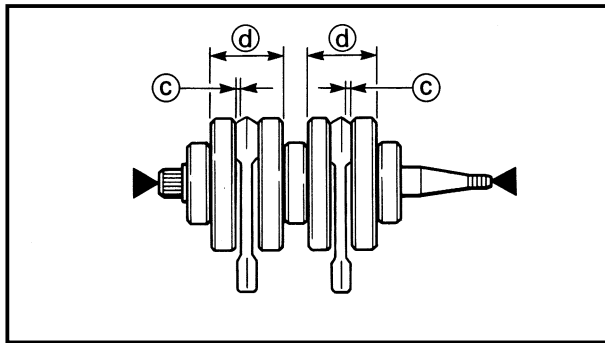
2. Inspect:
- Oil seal ①
Wear/Damage → Replace.



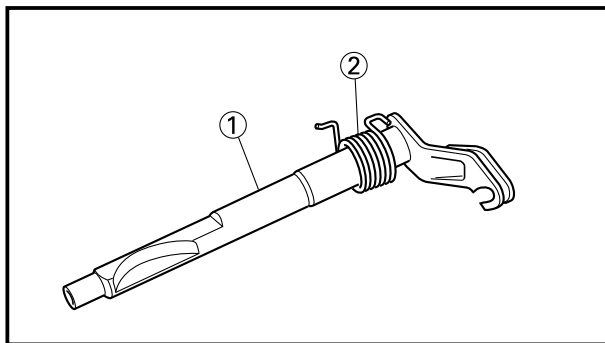
3. Measure:
- Runout limit ③
 - Small end free play limit ④
 - Connecting rod big end side clearance ⑤
 - Crank width (crank pin side) ⑥
Out of specification → Replace.
Use the dial gauge and thickness gauge.



Dial gauge:
YU-3097/90890-01252



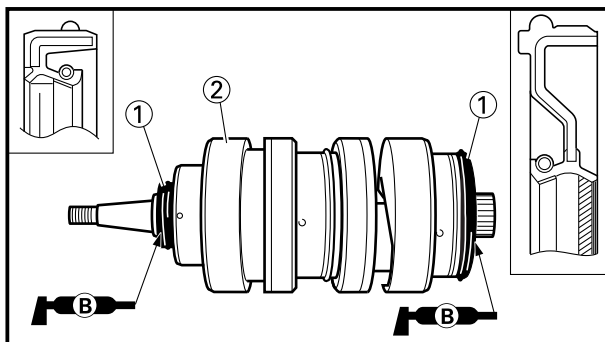
	Standard	<Limit>
Runout limit	0.03 mm (0.0012 in)	0.05 mm (0.0020 in)
Small end free play	0.8~1.0 mm (0.031~0.039 in)	2.0 mm (0.08 in)
Side clearance	0.45~0.95 mm (0.018~0.037 in)	—
Crank width	49.975~50.025 mm (1.968~1.969 in)	—



EC4A4200

Push lever axle

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



EC4N5000

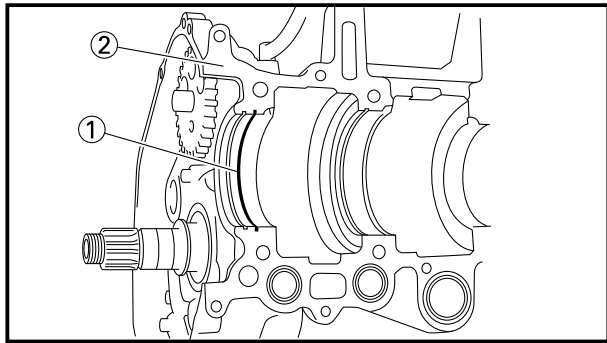
ASSEMBLY AND INSTALLATION

EC4N5291

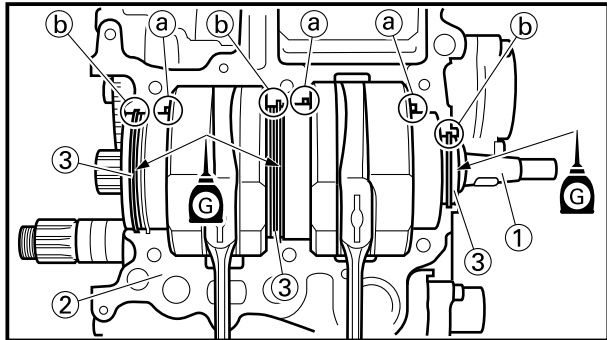
Crankshaft

1. Install:
- Oil seal ①
To crankshaft ②.

NOTE: _____
Apply the lithium soap base grease on the oil seal lip.

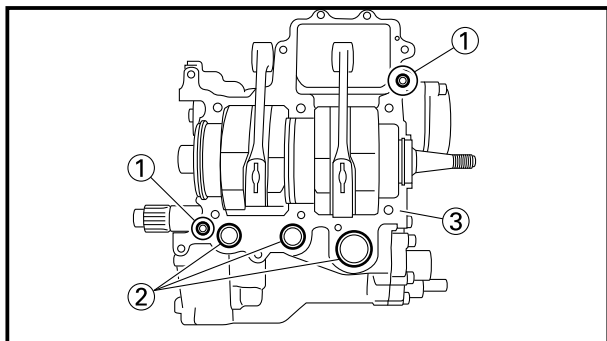


2. Install:
- Circlip ①
To crankcase (lower) ②.

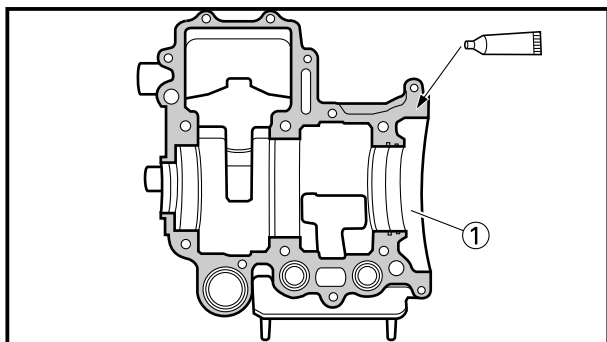


3. Install:
- Crankshaft ①
To crankcase (lower) ②.

- NOTE:**
- When installing the crankshaft into the crankcase (lower), apply the transmission oil on the oil seal ③ outer circumference.
 - Align the bearing knock pin with the pin slot ① in the crankcase (lower) and the projection of oil seal with the groove ② in the crankcase (lower).
 - After installing the crankshaft, push the oil seal to the crankcase (lower).



4. Install:
- Dowel pin ①
 - O-ring ②
To crankcase (lower) ③.

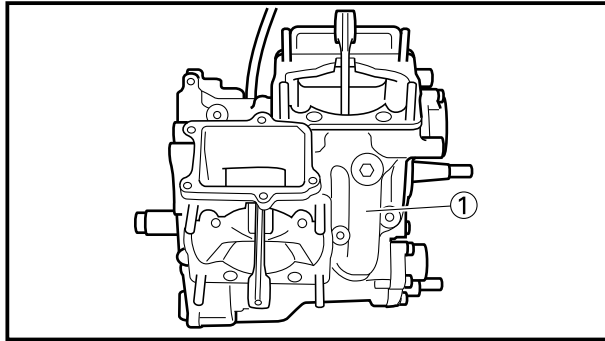


5. Apply:
- Sealant
On the crankcase (upper) ①.



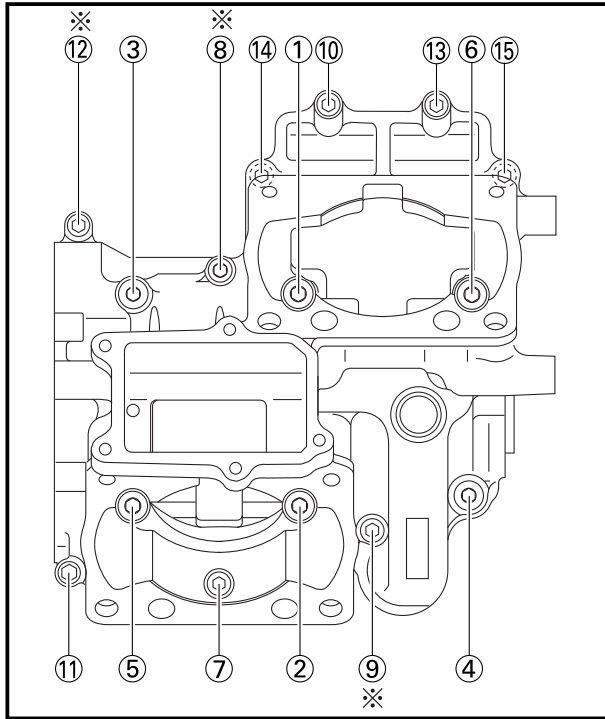
Quick gasket®:
ACC-YAMAB-ON-D4
YAMAHA Bond No.4
90890-05143

- NOTE:**
- Clean the contacting surface of crankcase (upper and lower) before applying the sealant.



6. Install:
- Crankcase (upper) ①
To crankcase (lower).

NOTE: _____
After installation, tap the crankcase (upper) with a soft hammar to settle it.



7. Tighten:
- Bolt [crankcase (M8)] ①~⑥
 - Bolt [crankcase (M6)] ⑦~⑮

CAUTION: _____
The M6 bolt comes in two lengths. Use the correct one for installation.

$l=30$ mm (1.18 in) (green) ⑦ ⑩ ⑪ ⑬ ⑭ ⑮

Mark ※: $l=35$ mm (1.38 in) (silver) ⑧ ⑨ ⑫

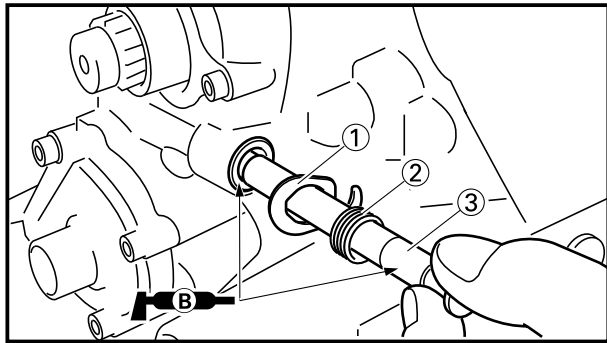
NOTE: _____
Tighten all bolts in 2 steps as follows and be sure to tighten in numbered order as shown.

- First: ①~⑥ (M8) 11 Nm (1.1 m•kg, 8.0 ft•lb)
⑦~⑮ (M6) 6 Nm (0.6 m•kg, 4.3 ft•lb)
- Final: ①~⑥ (M8) 26 Nm (2.6 m•kg, 19 ft•lb)
⑦~⑮ (M6) 11 Nm (1.1 m•kg, 8.0 ft•lb)

8. Remove:
- Sealant
Forced out on the crankcase mating surface.

CAUTION: _____
If any sealant remains, especially where the stator is installed, it may cause the stator to be installed improperly, resulting in an electrical problem.

9. Apply:
- Engine oil
To the crank pin, bearing and oil delivery hole.
10. Check:
- Crankshaft operation
Unsmooth operation → Repair.



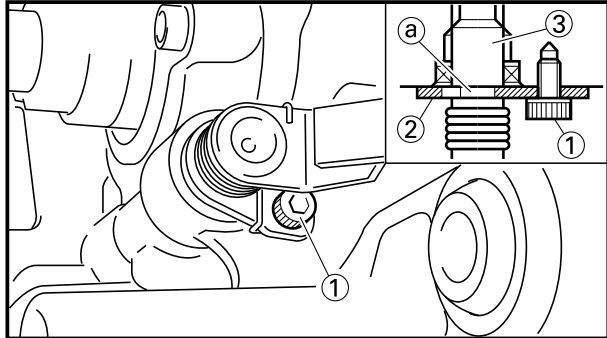
EC4A5101

Push lever axle

1. Install:
 - Seat plate ①
 - Torsion spring ②
 - Push lever axle ③

NOTE: _____

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



2. Install:
 - Bolt (seat plate) ①

7 Nm (0.7 m•kg, 5.1 ft•lb)

NOTE: _____

Fit the seat plate ② in the groove ① of the push lever axle ③ and tighten the bolt (seat plate).

EC500000

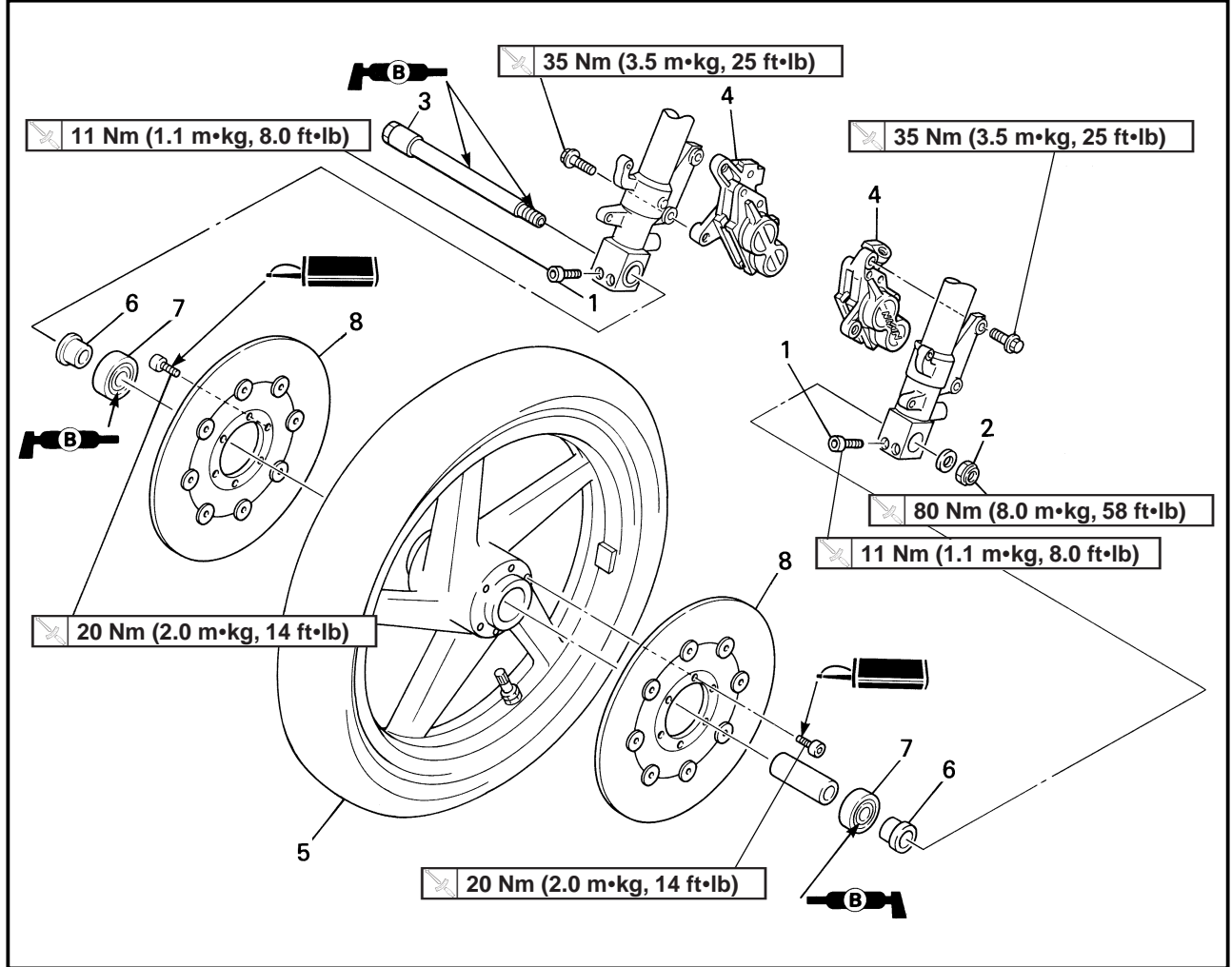
CHASSIS

EC590000

FRONT WHEEL AND REAR WHEEL

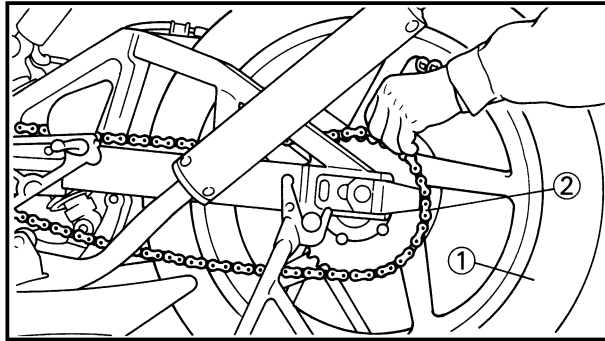
EC598000

FRONT WHEEL



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

Extend of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		FRONT WHEEL REMOVAL Hold the machine by placing the suitable stand.		⚠WARNING Support the machine securely so there is no danger of it falling over.
	1	Bolt (axle holder)	4	Only loosening. Refer to "REMOVAL POINTS". Refer to "REMOVAL POINTS".
	2	Nut (front wheel axle)	1	
	3	Front wheel axle	1	
	4	Caliper	2	
	5	Front wheel	1	
	6	Collar	2	
	7	Bearing	2	
	8	Brake disk	2	



EC593000

REMOVAL POINTS

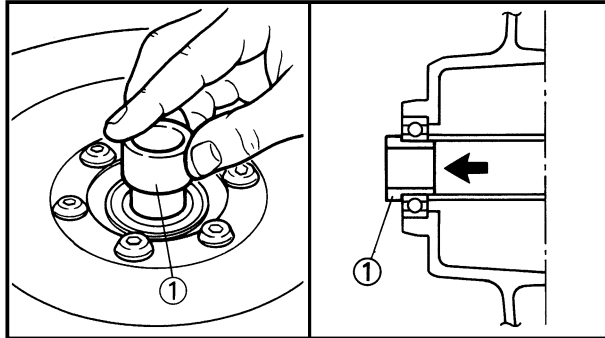
EC523101

Rear wheel

1. Remove:
 - Wheel ①

NOTE:

Push the wheel forward and remove the drive chain ②.



EC513300

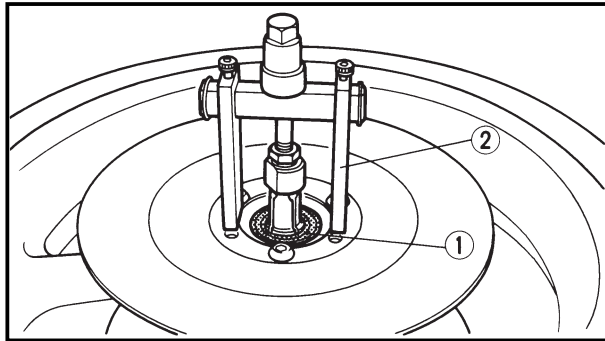
Collar

1. Remove:
 - Collar ①

Knock out of wheel on inside.

NOTE:

Knock the collar out of the wheel gradually not to deform it.



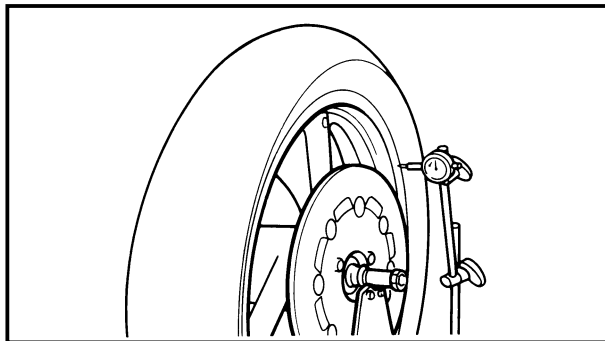
EC513201

Wheel bearing (if necessary)

1. Remove:
 - Bearing ①

NOTE:

Remove the bearing using a general bearing puller ②.



EC594000

INSPECTION

EC514110

Wheel

1. Measure:
 - Wheel runout

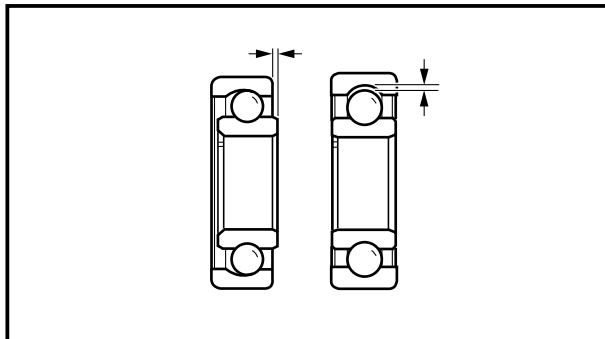
Out of limit → Replace.



Wheel runout limit:

Radial: 1.0 mm (0.04 in)

Lateral: 0.5 mm (0.02 in)

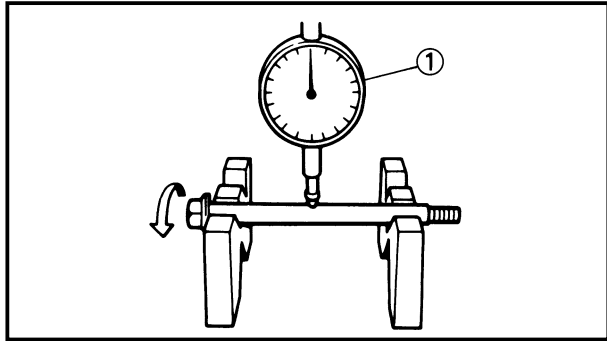


2. Inspect:
 - Bearing

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

NOTE:

Replace the bearings and wheel collar as a set.



EC514200

Wheel axle

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



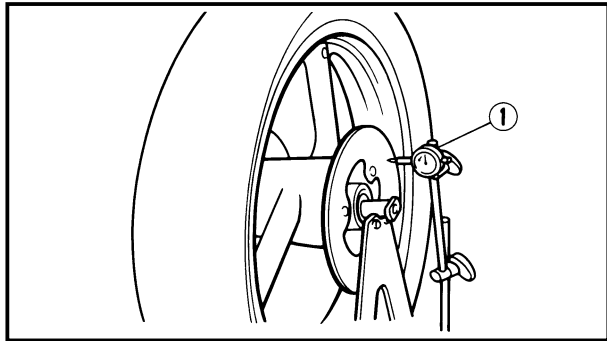
Wheel axle bending limit:
0.25 mm (0.010 in)

NOTE:

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

⚠ WARNING

Do not attempt to straighten a bent axle.



EC594100

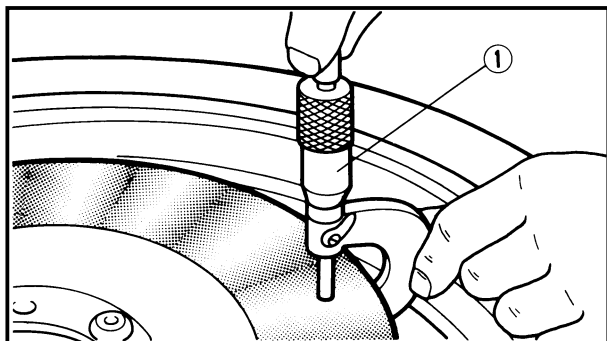
Brake disc

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



Disc deflection limit:

	Standard	<Limit>
Rear	–	0.15 mm (0.006 in)



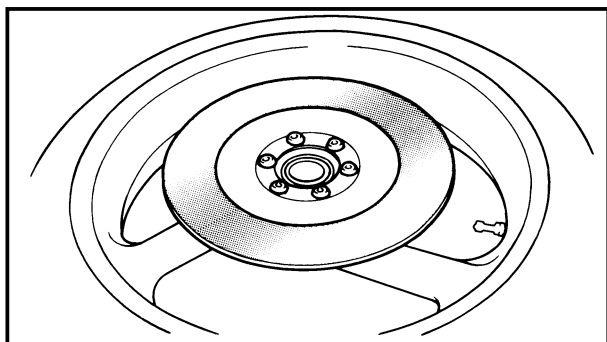
2. Measure:

- Brake disc thickness
Use the micrometer ①.
Out of limit → Replace.



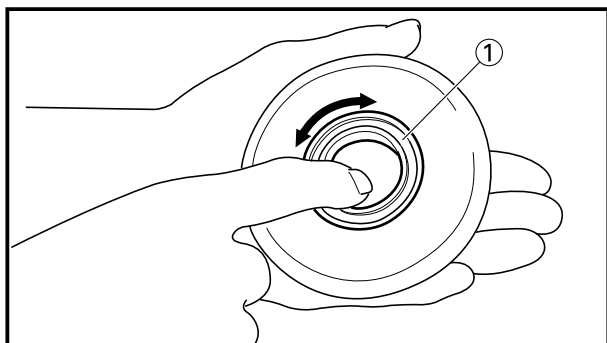
Disc wear limit:

	Standard	<Limit>
Front	5.0 mm (0.20 in)	4.5 mm (0.18 in)
Rear	4.0 mm (0.16 in)	3.5 mm (0.14 in)



3. Inspect:

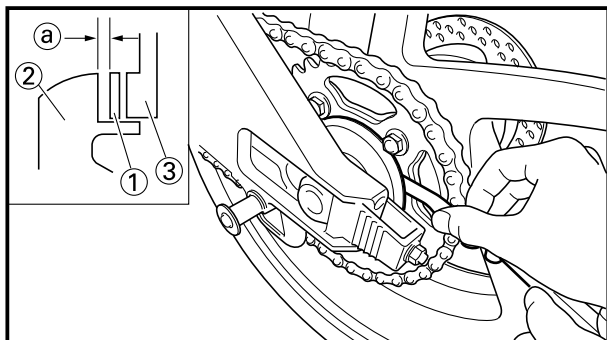
- Brake disc surface
Score marks/Damage → Replace.



EC524100

Clutch hub

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



EC594300

Clutch hub clearance

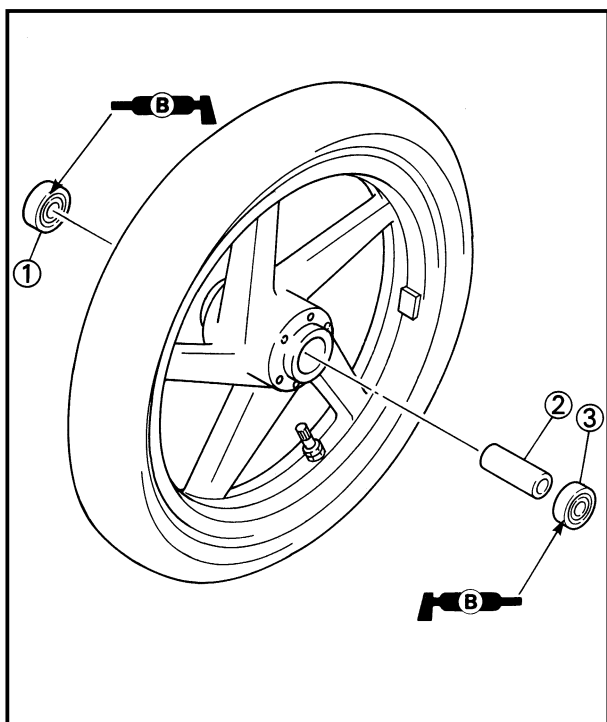
- Inspect:
 - Clutch hub clearance ①
Out of specification → Adjust by adding the supplied shim [0.3 mm (0.012 in)].



Clutch hub clearance:
Zero~0.3 mm (Zero~0.012 in)

NOTE:

- When inspecting the clutch hub clearance, measure it as it is assembled to the body at specified torque.
- Measurement may be made of the clearance either between the shim ① and clutch hub ② or between the shim and sprocket ③.



EC595000

ASSEMBLY AND INSTALLATION

EC515172

Front wheel

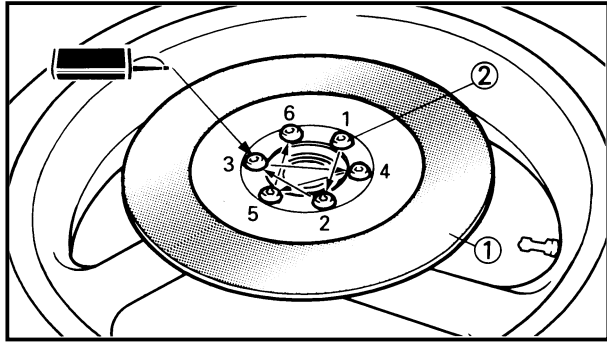
- Install:
 - Bearing (right) ①
 - Spacer ②
 - Bearing (left) ③

NOTE:

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

CAUTION:

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



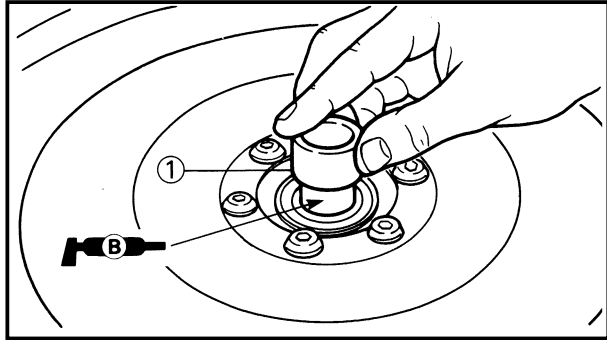
2. Install:

- Brake disc ①
- Bolt (brake disc) ②

20 Nm (2.0 m•kg, 14 ft•lb)

NOTE: _____

Tighten the bolts in stage, using a crisscross pattern.

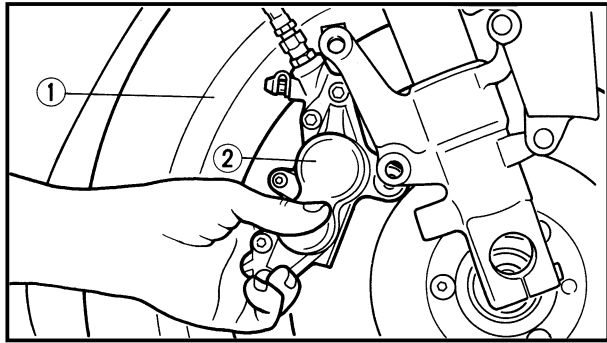


3. Install:

- Collar ①

NOTE: _____

If the collar is hard to install, apply the lithium soap base grease on the collar and press it in.



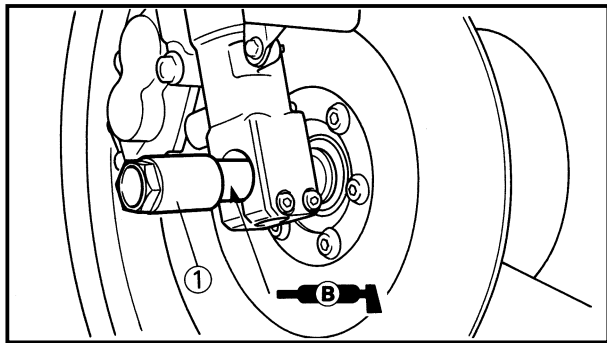
4. Install:

- Wheel ①
- Caliper ②
- Bolt (caliper)

35 Nm (3.5 m•kg, 25 ft•lb)

NOTE: _____

Before installing the wheel axle, install the caliper.

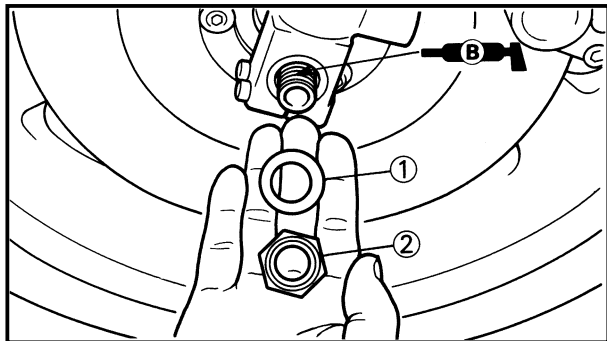


5. Install:

- Wheel axle ①

NOTE: _____

- Apply the lithium soap base grease on the wheel axle.
- Insert the wheel axle from right side.



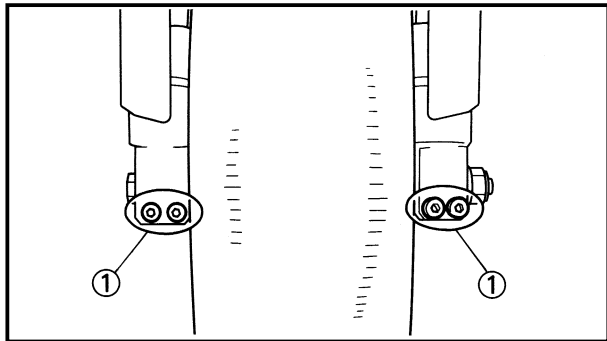
6. Install:

- Plain washer ①
- Nut (wheel axle) ②

80 Nm (8.0 m•kg, 58 ft•lb)

NOTE: _____

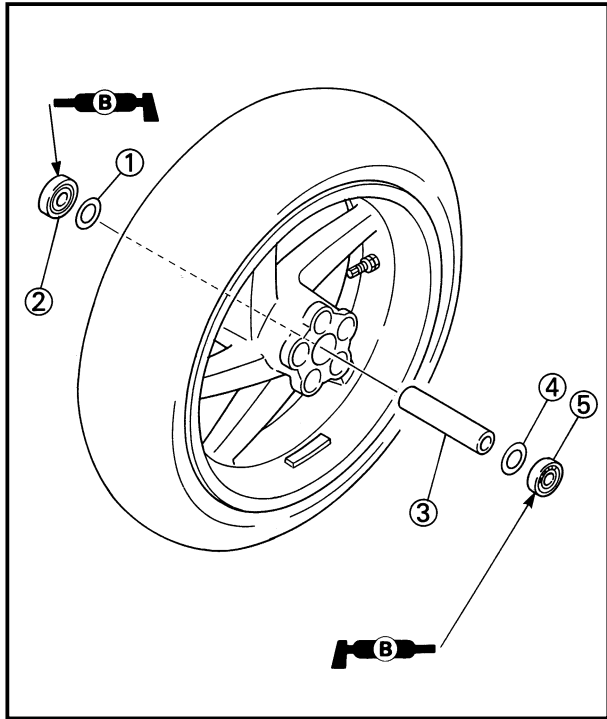
Apply the lithium soap base grease on the wheel axle thread.



7. Tighten:

- Bolt (axle holder) ①

11 Nm (1.1 m•kg, 8.0 ft•lb)



EC5251C0

Rear wheel

1. Install:

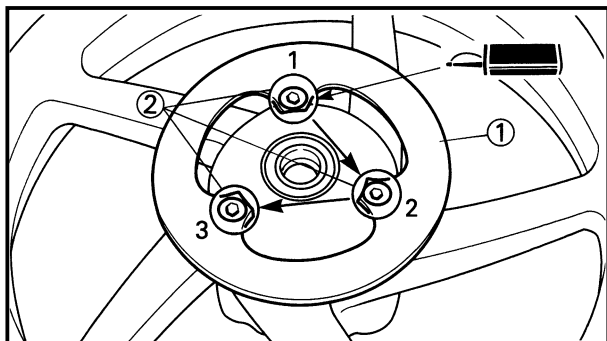
- Fitting plate (right) ①
- Bearing (right) ②
- Spacer ③
- Fitting plate (left) ④
- Bearing (left) ⑤

NOTE:

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

CAUTION:

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



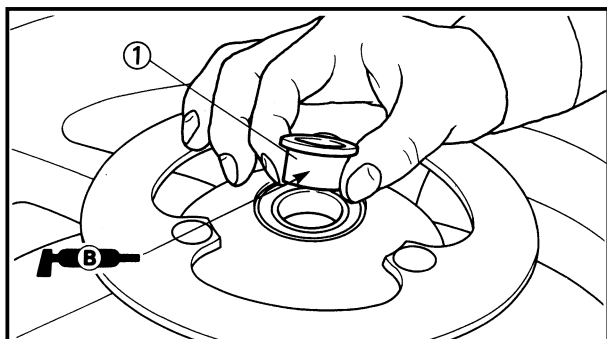
2. Install:

- Brake disc ①
- Bolt (brake disc) ②

23 Nm (2.3 m•kg, 17 ft•lb)

NOTE:

Tighten the bolts in stage, using a crisscross pattern.

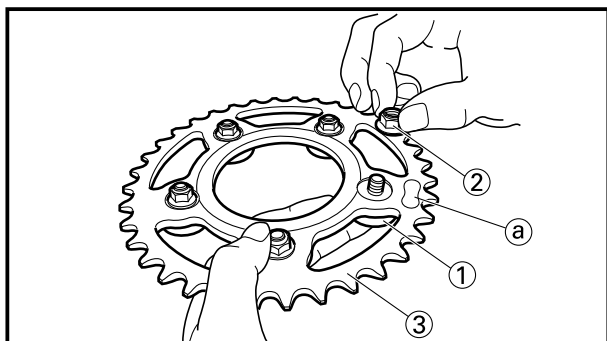


3. Install:

- Collar ①

NOTE:

If the collar is hard to install, apply the lithium soap base grease on the collar and press it in.



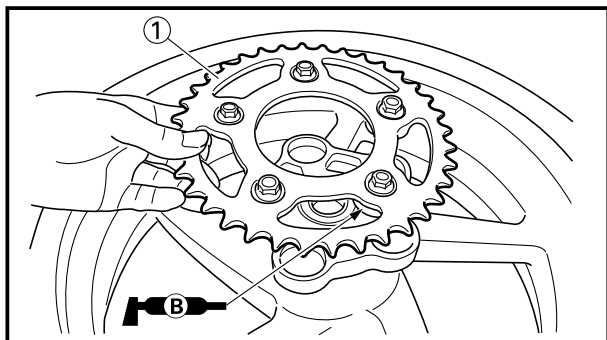
4. Install:
- Sprocket damper ①
 - Nut (sprocket damper) ②

32 Nm (3.2 m•kg, 23 ft•lb)

To driven sprocket ③.

NOTE: _____

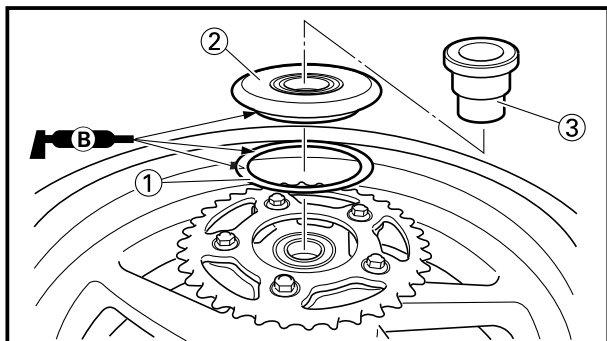
Make sure that the nut is on the side of the sprocket bearing the manufacturer's mark (a).



5. Install:
- Driven sprocket ①
- To wheel.

NOTE: _____

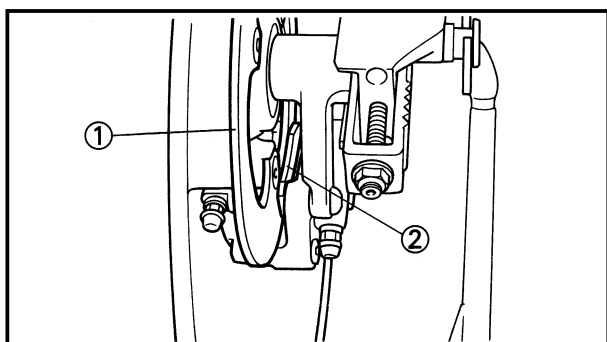
Apply the lithium soap base grease on the sprocket damper.



6. Install:
- Shim ①
 - Clutch hub ②
 - Collar ③

NOTE: _____

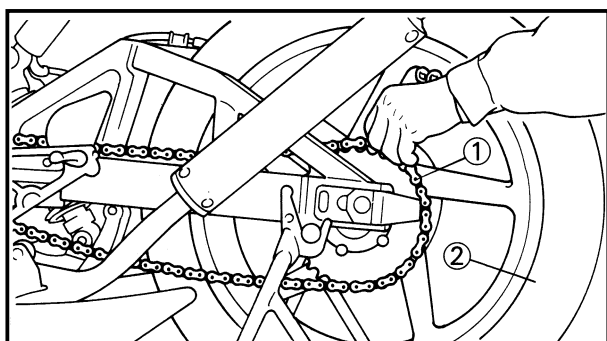
Apply the lithium soap base grease on the shim and clutch hub outer circumference.



7. Install:
- Wheel

NOTE: _____

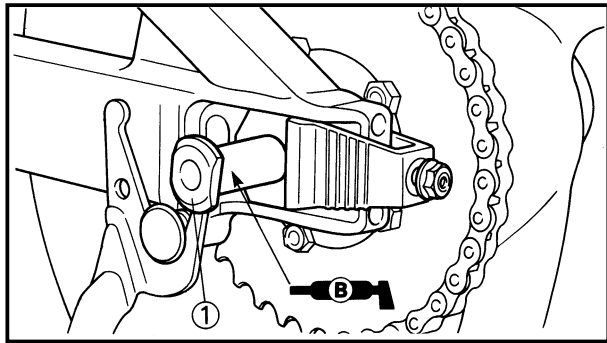
Install the brake disc ① between the brake pads ② correctly.



8. Install:
- Drive chain ①

NOTE: _____

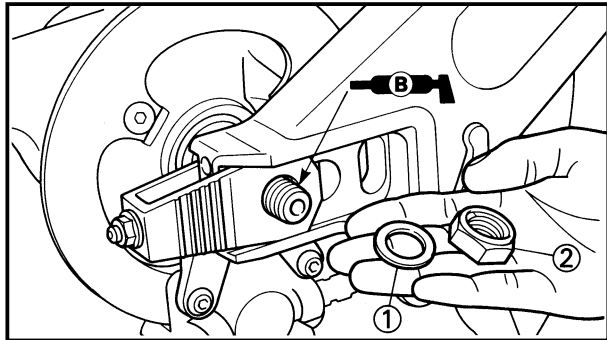
Push the wheel ② forward and install the drive chain.



9. Install:
- Wheel axle ①

NOTE:

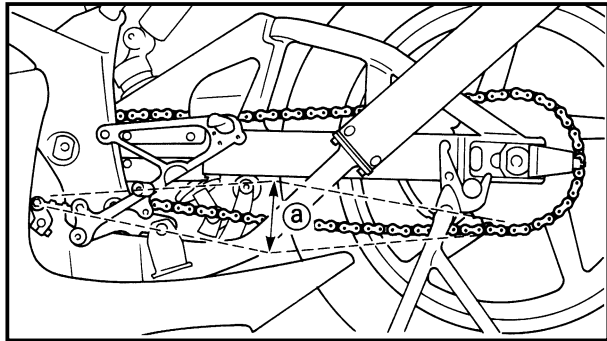
- Apply the lithium soap base grease on the wheel axle.
- Insert the wheel axle from left side.



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

NOTE:

- Apply the lithium soap base grease on the wheel axle thread.
- Temporarily tighten the nut (wheel axle) at this point.



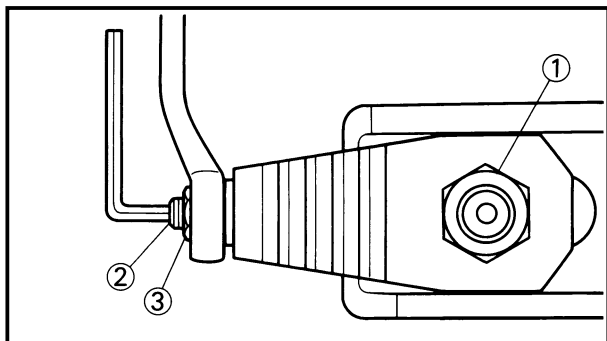
11. Adjust:
- Drive chain slack (a)



Drive chain slack:

40~50 mm (1.6~2.0 in)

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



12. Tighten:
- Nut (wheel axle) ①

- Adjuster ②
- Locknut ③

	80 Nm (8.0 m•kg, 58 ft•lb)
--	-----------------------------------

	2 Nm (0.2 m•kg, 1.4 ft•lb)
--	-----------------------------------

	16 Nm (1.6 m•kg, 11 ft•lb)
--	-----------------------------------

NOTE:

- Tighten the axle nut while pushing down the drive chain.
- After tightening the axle nut, tighten the locknut with the turned out the adjuster.

13. Adjust:

- Wheel alignment

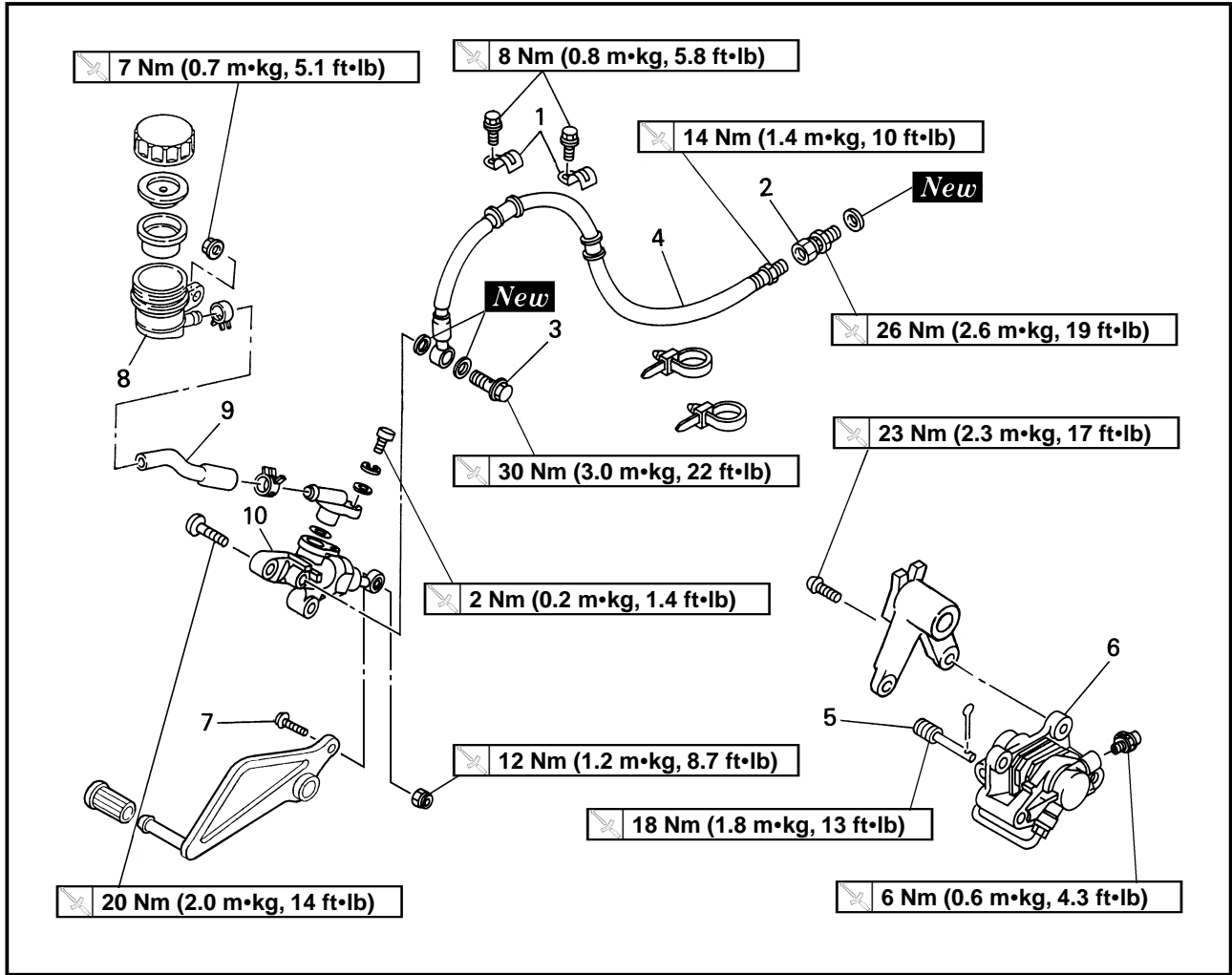
Refer to “WHEEL ALIGNMENT ADJUSTMENT” section in the CHAPTER 3.

FRONT BRAKE AND REAR BRAKE



EC5A8100

REAR BRAKE



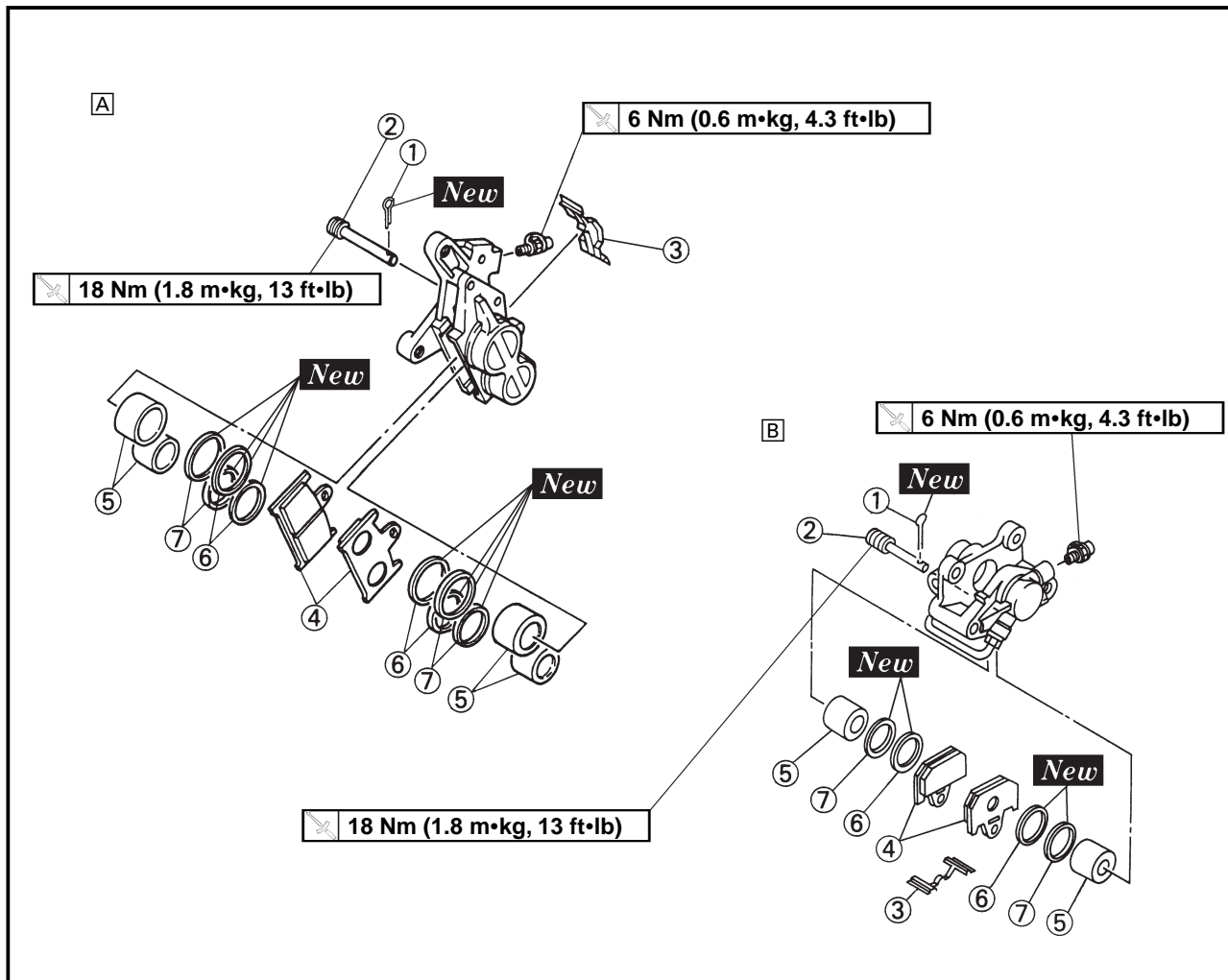
Extend of removal: ① Brake hose removal ② Caliper removal
 ③ Master cylinder removal

Extend of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		REAR BRAKE REMOVAL Hold the machine by placing the suitable stand. Drain the brake fluid.		⚠WARNING Support the machine securely so there is no danger of it falling over. Refer to "REMOVAL POINTS".
	1	Brake hose holder	2	Loosen when disassembling the caliper.
	2	Adapter	1	
	3	Union bolt	1	
	4	Brake hose	1	
	5	Pad pin	1	
	6	Caliper	1	
	7	Brake pedal connecting bolt	1	
	8	Reservoir tank	1	
	9	Reservoir hose	1	
	10	Master cylinder	1	



EC5A8200

CALIPER DISASSEMBLY



A Front

B Rear

Extend of removal: ① Front caliper disassembly

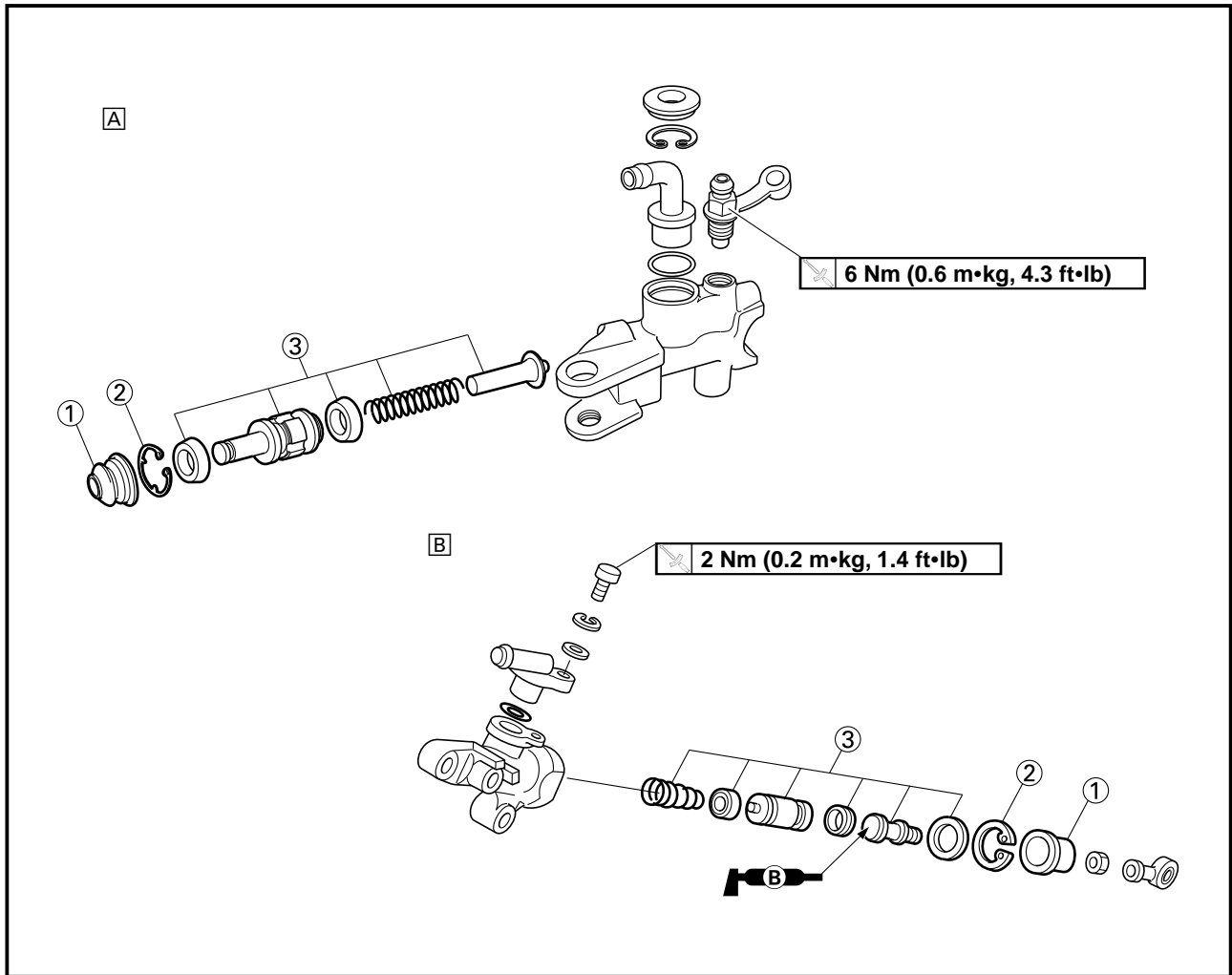
② Rear caliper disassembly

Extend of removal	Order	Part name	Q'ty		Remarks
			A	B	
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">↑ ① ↓</div> <div style="text-align: center;">↑ ② ↓</div> </div>	CALIPER DISASSEMBLY				
	①	Cotter pin	1ea.	1	Refer to "REMOVAL POINTS". Refer to "REMOVAL POINTS".
	②	Pad pin	1ea.	1	
	③	Pad support	1ea.	1	
	④	Brake pad	2ea.	2	
	⑤	Caliper piston	4ea.	2	
	⑥	Dust seal	4ea.	2	
⑦	Piston seal	4ea.	2		



EC5A8300

MASTER CYLINDER DISASSEMBLY



A Front

B Rear

Extend of removal: ① Front master cylinder disassembly

② Rear master cylinder disassembly

Extend of removal	Order	Part name	Q'ty	Remarks
		MASTER CYLINDER DISASSEMBLY		
↑ ① ↓	①	Master cylinder boot	1	
↑ ② ↓	②	Circlip	1	
	③	Master cylinder kit	1	

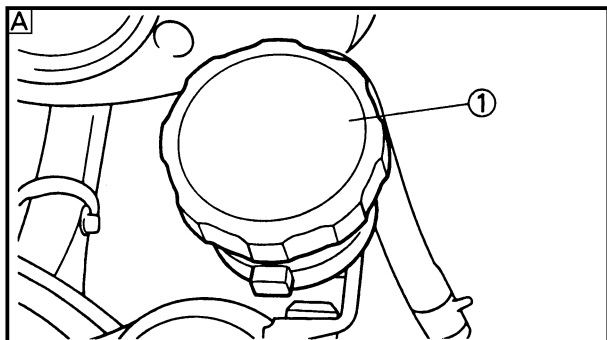


EC536000

HANDLING NOTE

⚠ WARNING

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



EC5A3000

REMOVAL POINTS

EC5A3200

Brake fluid

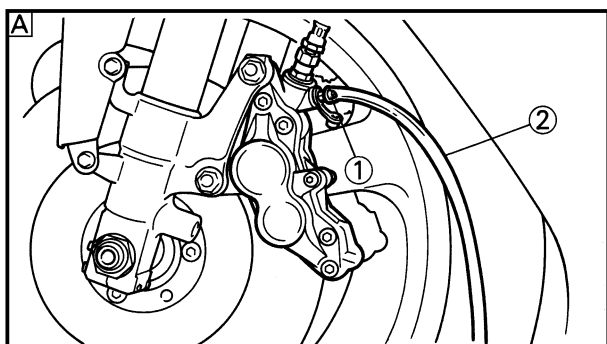
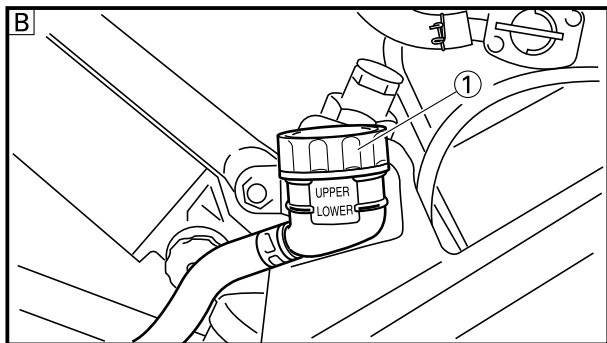
- Remove:
 - Reservoir tank cap ①

NOTE:

Do not remove the diaphragm.

A Front

B Rear



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

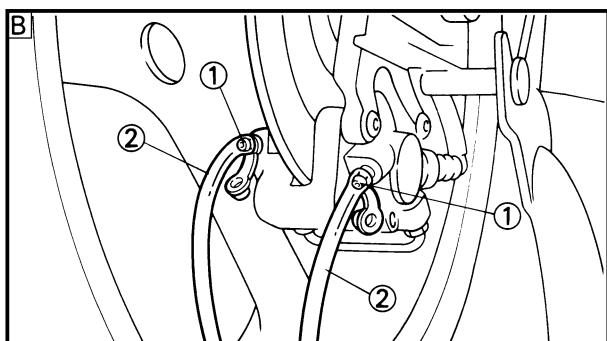
A Front

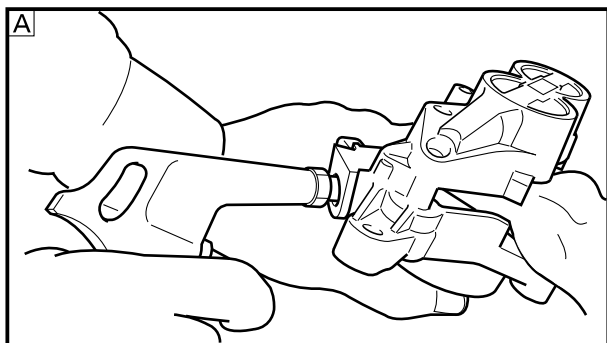
B Rear

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

CAUTION:

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





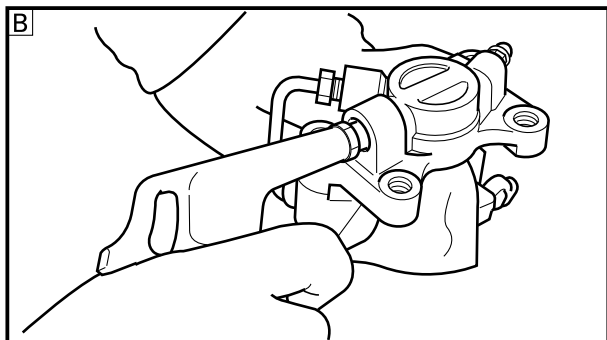
EC533301

Caliper piston

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

⚠WARNING

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

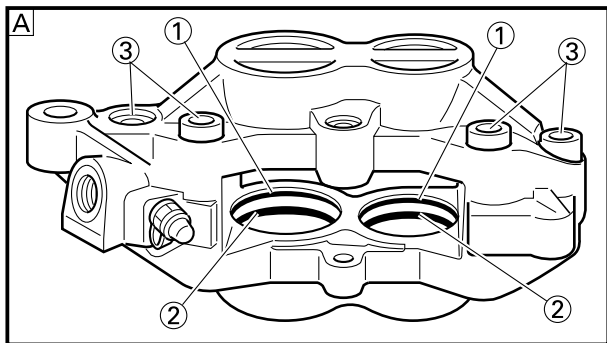


Caliper piston removal steps:

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

A Front

B Rear



EC543411

Piston seal kit

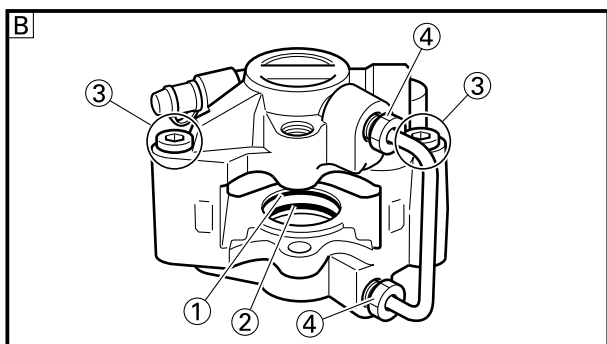
- Remove:
 - Dust seal ①
 - Piston seal ②

NOTE:

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

CAUTION:

- Never attempt to pry out piston seals and dust seals.
- Do not loosen the bolts ③ and nuts ④.

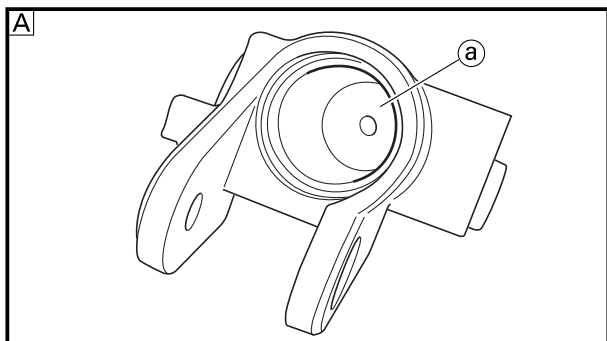


⚠WARNING

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

A Front

B Rear



EC5A4000

INSPECTION

EC534112

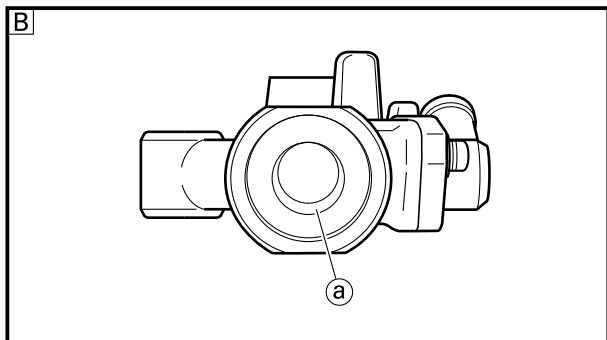
Master cylinder

1. Inspect:

- Master cylinder inner surface (a)
Wear/Scratches → Replace master cylinder assembly.
Stains → Clean.

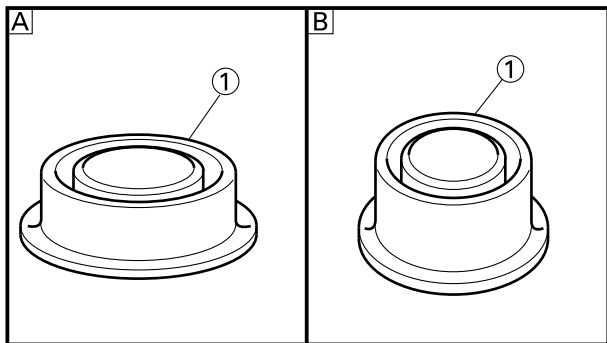
⚠WARNING

Use only new brake fluid.



A Front

B Rear

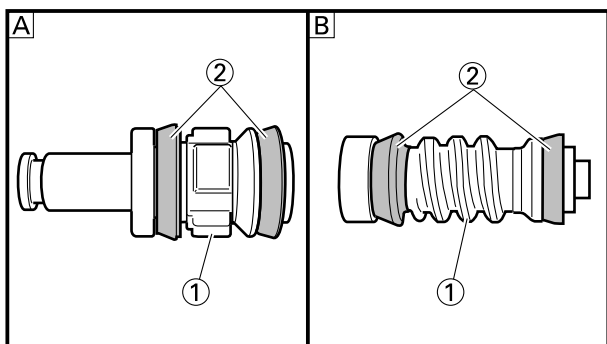


2. Inspect:

- Diaphragm (1)
Crack/Damage → Replace.

A Front

B Rear

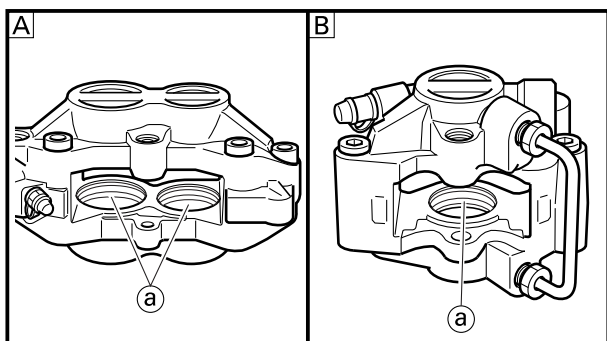


3. Inspect:

- Master cylinder piston (1)
- Master cylinder cup (2)
Wear/Damage/Score marks → Replace master cylinder kit.

A Front

B Rear



EC534214

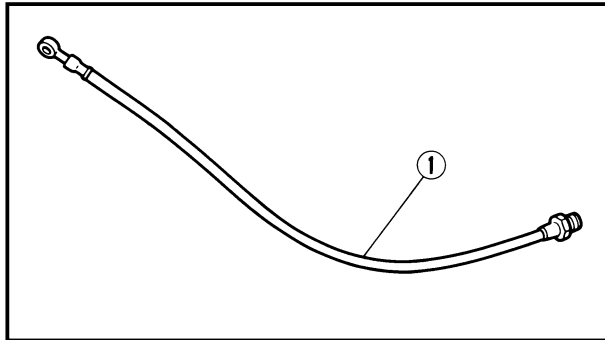
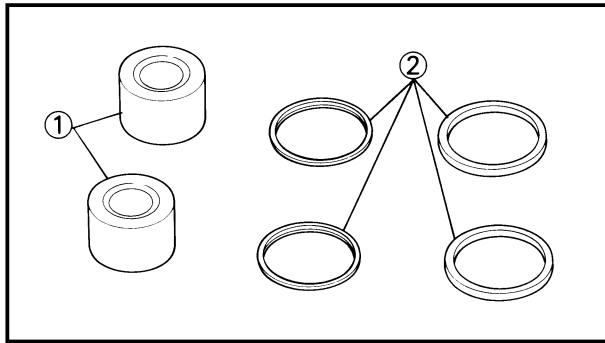
Caliper

1. Inspect:

- Caliper cylinder inner surface (a)
Wear/Score marks → Replace caliper assembly.

A Front

B Rear



2. Inspect:

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

⚠WARNING

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

EC534301

Brake hose

1. Inspect:

- Brake hose ①
Crack/Damage → Replace.

EC5A5000

ASSEMBLY AND INSTALLATION

⚠WARNING

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

EC535113

Caliper piston

1. Clean:

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

2. Install:

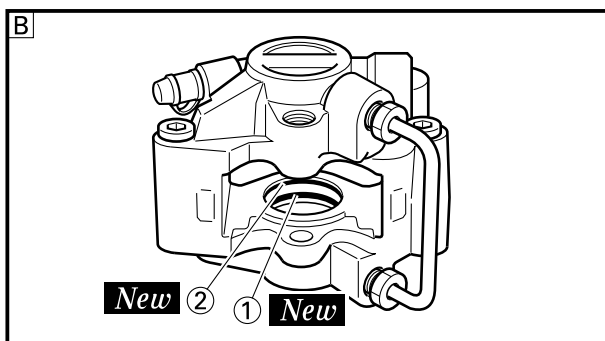
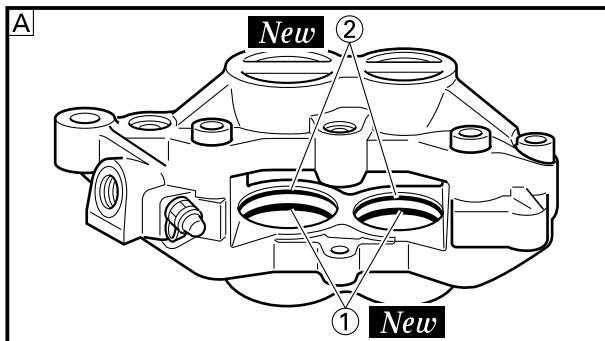
- Piston seal ① **New**
- Dust seal ② **New**

⚠WARNING

Always use new piston seals and dust seals.

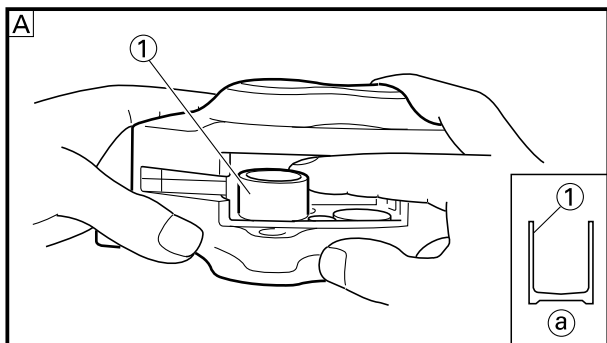
NOTE:

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



Ⓐ Front

Ⓑ Rear

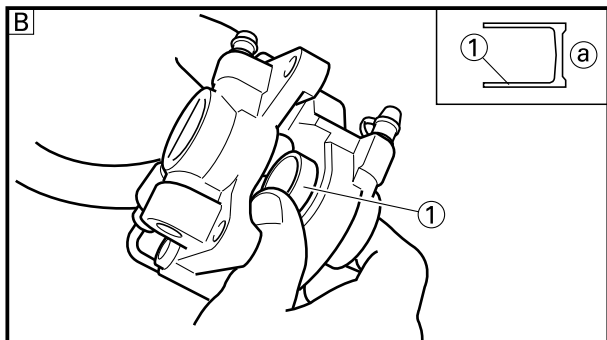


3. Install:
- Caliper piston ①

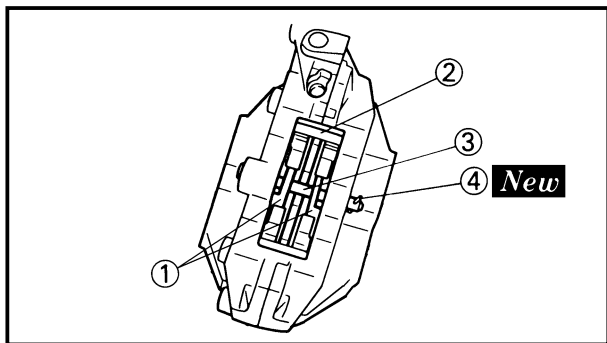
NOTE: Apply the brake fluid on the piston wall.

CAUTION:

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



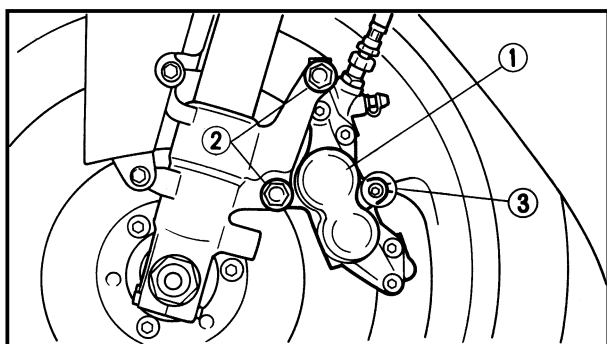
- A Front
B Rear



EC535241
Front caliper

1. Install:
- Brake pad ①
 - Pad support ②
 - Pad pin ③
 - Cotter pin ④ **New**

NOTE: Temporarily tighten the pad pin at this point.

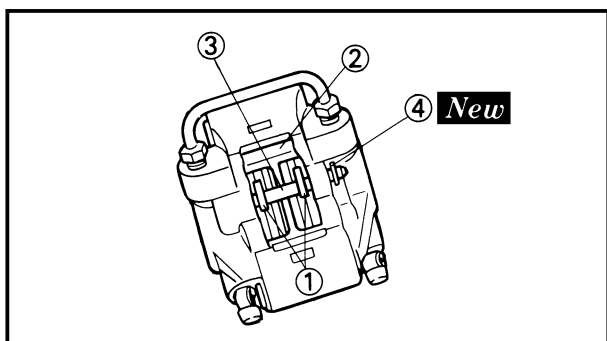


2. Install:
- Caliper ①
 - Bolt (caliper) ②

35 Nm (3.5 m•kg, 25 ft•lb)

3. Tighten:
- Pad pin ③

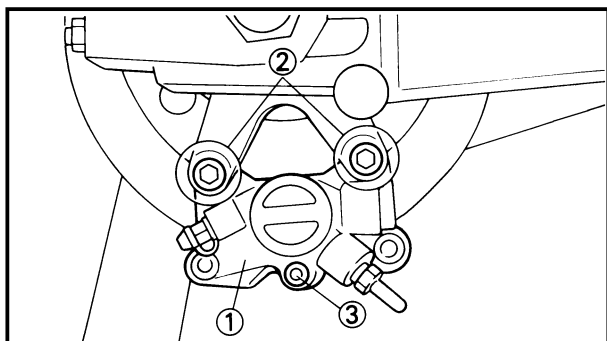
18 Nm (1.8 m•kg, 13 ft•lb)



EC545141
Rear caliper

1. Install:
- Brake pad ①
 - Pad support ②
 - Pad pin ③
 - Cotter pin ④ **New**

NOTE: Temporarily tighten the pad pin at this point.



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

23 Nm (2.3 m•kg, 17 ft•lb)

3. Tighten:
 - Pad pin ③

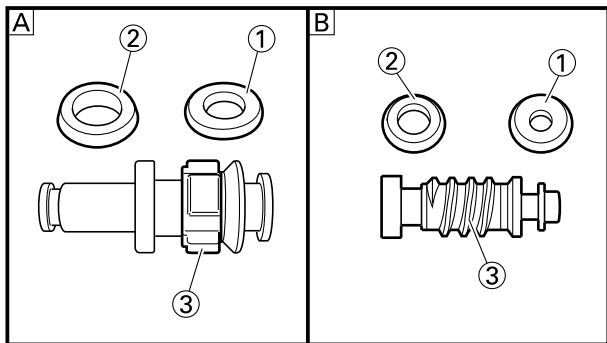
18 Nm (1.8 m•kg, 13 ft•lb)

EC5A5230

Master cylinder kit

1. Clean:
 - Master cylinder
 - Master cylinder kit

Clean them with brake fluid.

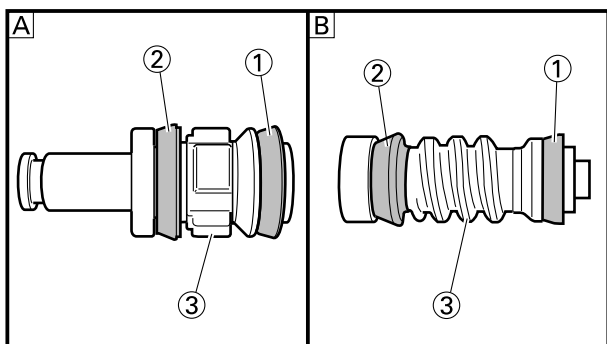


2. Install:
 - Master cylinder cup (primary) ①
 - Master cylinder cup (secondary) ②

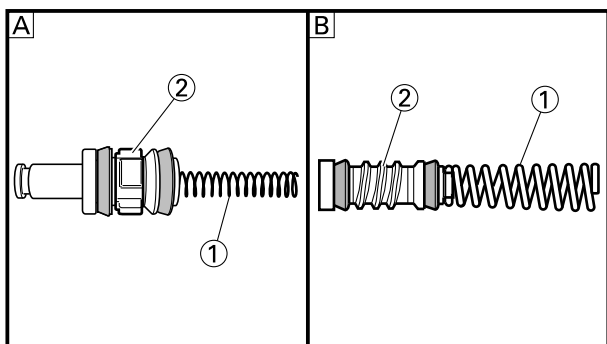
To master cylinder piston ③.

NOTE: _____
Apply the brake fluid on the master cylinder cup.

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



- A** Front
- B** Rear

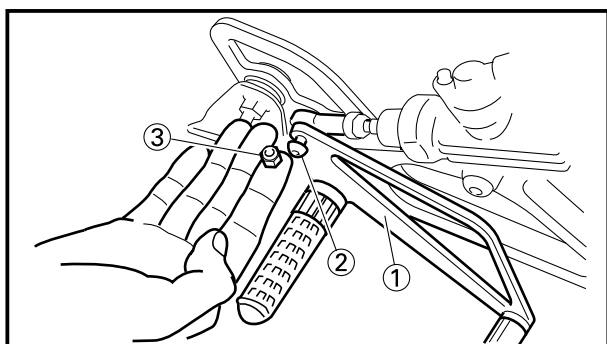
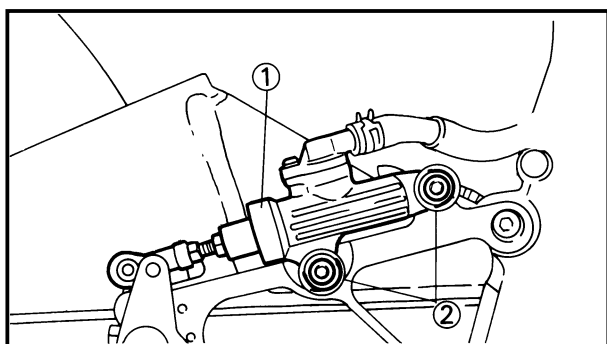
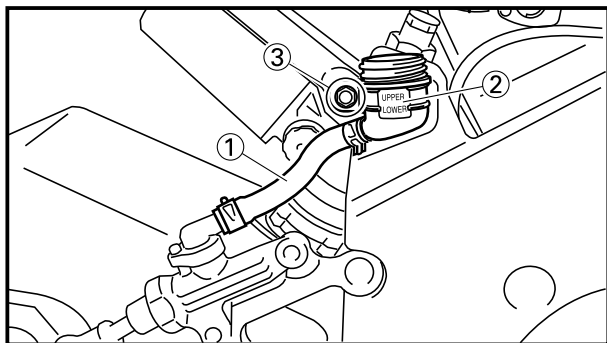
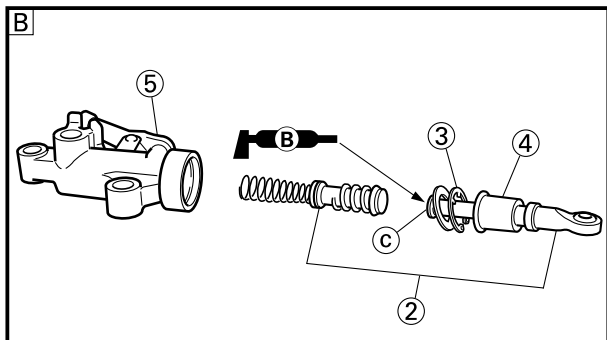
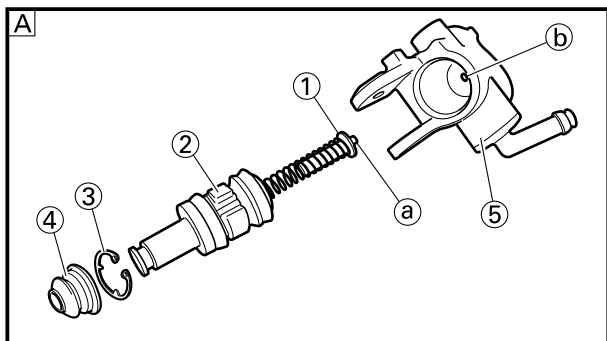


3. Install:
 - Spring ①

To master cylinder piston ②.

NOTE: _____
Install the spring at the smaller dia. side.

- A** Front
- B** Rear



4. Install:
- Spring guide ①
 - Master cylinder kit ②
 - Circlip ③
 - Master cylinder boot ④
 - To master cylinder ⑤.

NOTE:

- Apply the brake fluid on the master cylinder kit.
- Install the spring guide with the projection (a) aligning with the master cylinder hole (b).
- Apply the lithium soap base grease on the tip (c) of the push rod.
- When installing the circlip, use a long nose circlip pliers.

- A Front
- B Rear

EC545270

Rear master cylinder

1. Install:
- Reservoir hose ①
 - Reservoir tank ②
 - Nut (reservoir tank) ③

7 Nm (0.7 m•kg, 5.1 ft•lb)

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

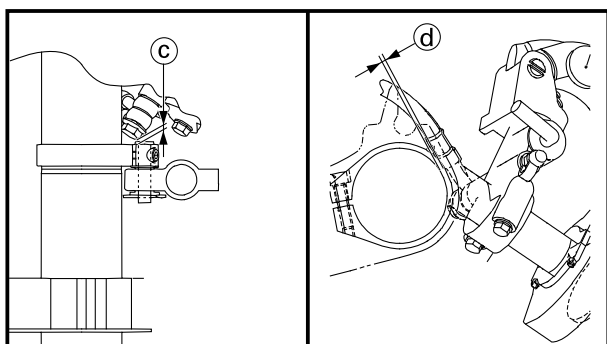
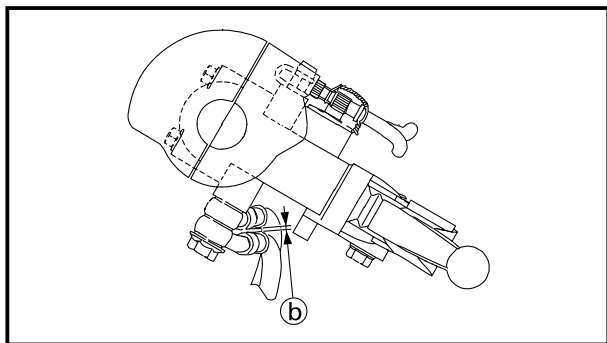
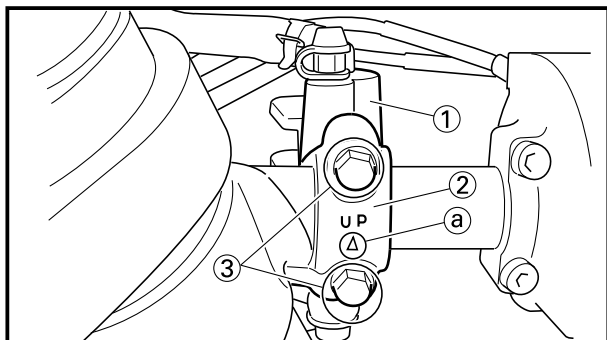
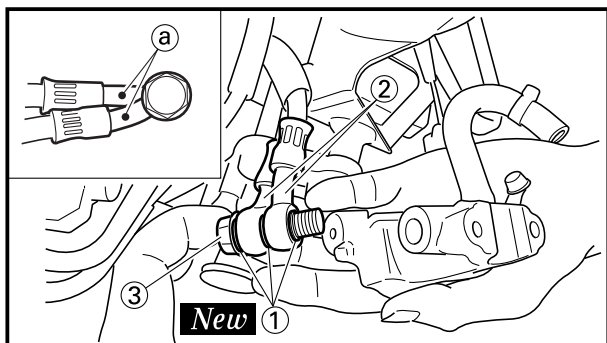
20 Nm (2.0 m•kg, 14 ft•lb)

3. Install:
- Brake pedal ①
 - Brake pedal connecting bolt ②
 - Nut (brake pedal connecting bolt) ③

12 Nm (1.2 m•kg, 8.7 ft•lb)

NOTE:

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



EC5A5A00

Front brake hose and master cylinder

1. Install:

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

⚠WARNING

Always use new copper washers.

NOTE:

- Position the brake hoses with their paint marks ⓐ downward.
- Temporarily tighten the union bolt.

2. Install:

- Master cylinder ①
- Master cylinder bracket ②
- Bolt (master cylinder bracket) ③

NOTE:

- Install the bracket so that the arrow mark ⓐ face upward.
- Temporarily tighten the bolt (master cylinder bracket).

CAUTION:

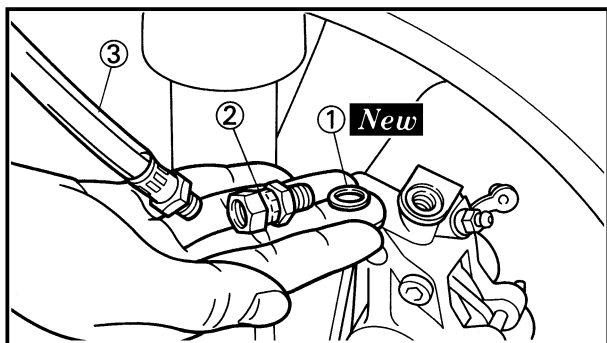
- **Take care not to allow the brake hose metal fittings and union bolts to contact with other parts. If they are installed in contact with other parts, it will result in brake failure.**
- **Install the brake hoses with a clearance ⓑ of 2 mm (0.008 in) provided between their metal fittings.**
- **Install the brake hoses with a clearance ⓒ of 3 mm (0.012 in) between the union bolt and steering damper stay and a clearance ⓓ of 3 mm (0.012 in) between the brake hose (for the left caliper) and front fork.**

3. Tighten:

- Union bolt

🔧	30 Nm (3.0 m•kg, 22 ft•lb)
---	----------------------------
- Bolt (master cylinder bracket)

🔧	8 Nm (0.8 m•kg, 5.8 ft•lb)
---	----------------------------



4. Install:

- Copper washer ① **New**
- Adapter ②

⌘	26 Nm (2.6 m•kg, 19 ft•lb)
---	----------------------------
- Brake hose ③

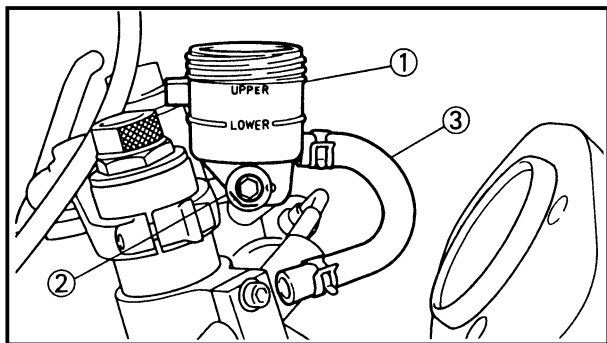
⌘	14 Nm (1.4 m•kg, 10 ft•lb)
---	----------------------------

⚠WARNING

Always use a new copper washer.

NOTE:

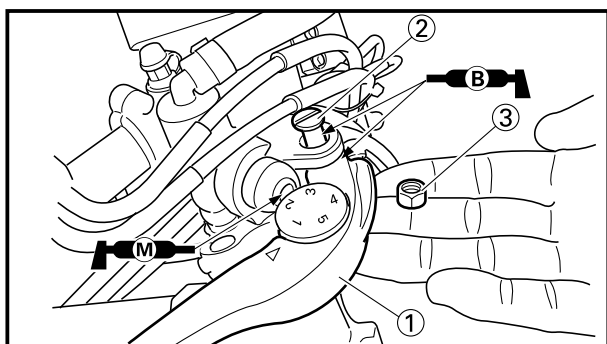
When turning the adapter over the brake hose, hold the brake hose so that it may not be twisted.



5. Install:

- Reservoir tank ①
- Bolt (reservoir tank) ②

⌘	5 Nm (0.5 m•kg, 3.6 ft•lb)
---	----------------------------
- Reservoir hose ③



6. Install:

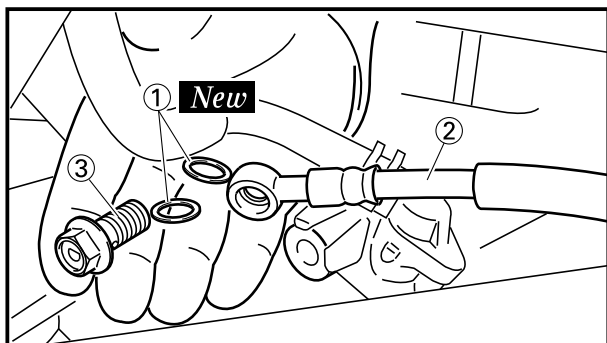
- Brake lever ①
- Bolt (brake lever) ②

⌘	1 Nm (0.1 m•kg, 0.7 ft•lb)
---	----------------------------
- Nut (brake lever) ③

⌘	6 Nm (0.6 m•kg, 4.3 ft•lb)
---	----------------------------

NOTE:

- Apply the lithium soap base grease on the bolt.
- When installing the brake lever, apply the molybdenum disulfide grease on the contacting surface of the master cylinder piston.



EC545451

Rear brake hose

1. Install:

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

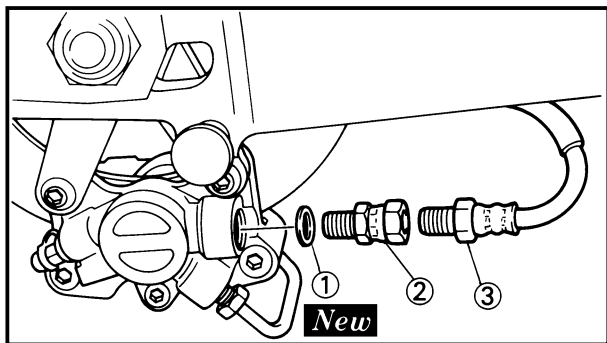
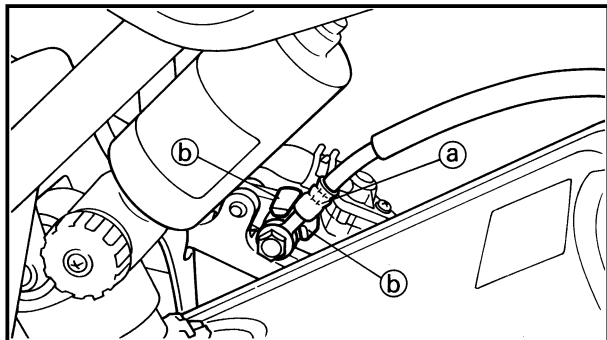
	30 Nm (3.0 m•kg, 22 ft•lb)
--	----------------------------

⚠WARNING

Always use new copper washers.

CAUTION:

When installing the brake hose to the master cylinder, lightly touch the brake pipe ① with the projection ② on the master cylinder.



2. Install:

- Copper washer ① **New**
- Adapter ②

	26 Nm (2.6 m•kg, 19 ft•lb)
--	----------------------------
- Brake hose ③

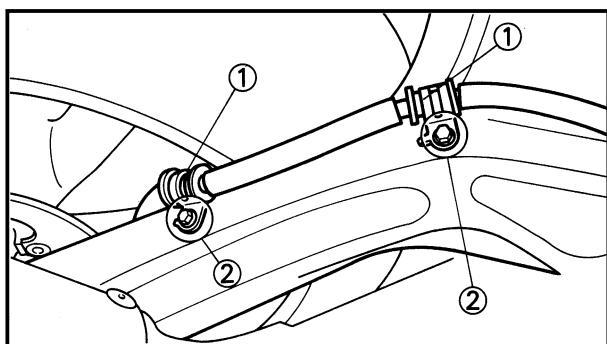
	14 Nm (1.4 m•kg, 10 ft•lb)
--	----------------------------

⚠WARNING

Always use a new copper washer.

NOTE:

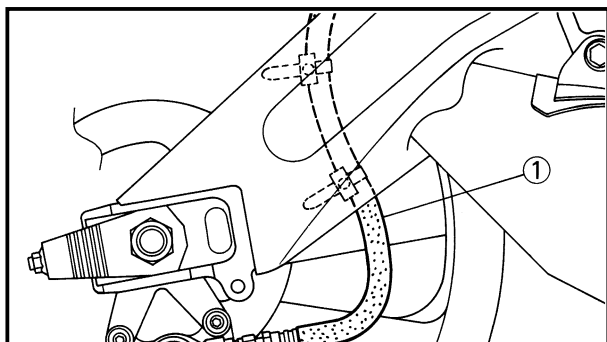
When turning the adapter over the brake hose, hold the brake hose so that it may not be twisted.



3. Install:

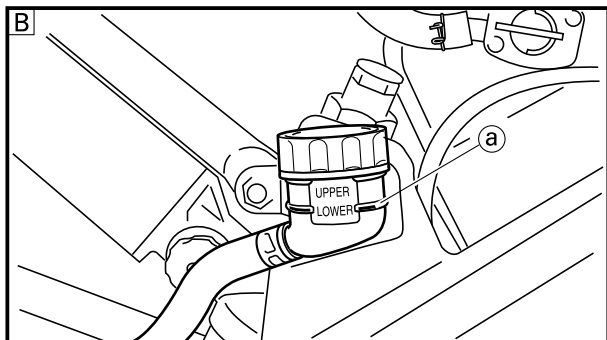
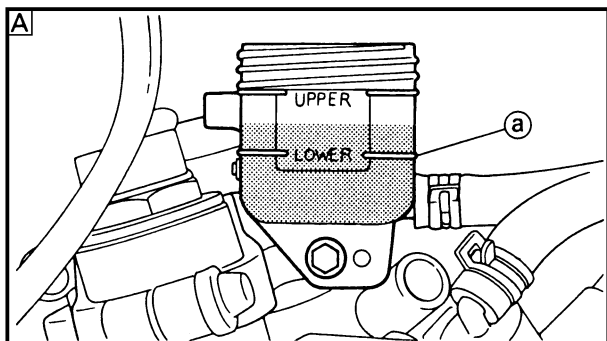
- Brake hose holder ①
- Bolt (brake hose holder) ②

	8Nm (0.8 m•kg, 5.8 ft•lb)
--	---------------------------



4. Install:

- Brake hose ①
- Refer to "CABLE ROUTING DIAGRAM" section in the CHAPTER 2.



EC5A5610

Brake fluid

1. Fill:

- Brake fluid

Until the fluid level reaches “LOWER” level line ①.



Recommended brake fluid:
DOT #4

⚠WARNING

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

CAUTION:

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

Ⓐ Front

Ⓑ Rear

2. Air bleed:

- Brake system

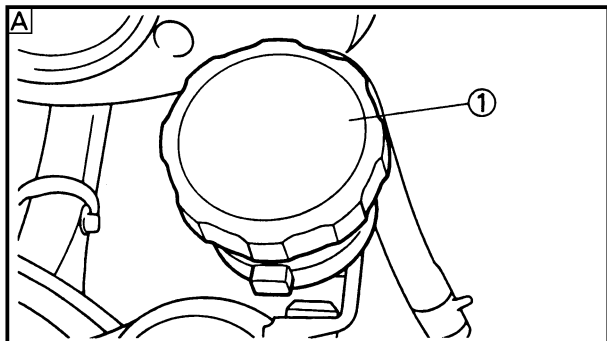
Refer to “BRAKE SYSTEM AIR BLEEDING” section in the CHAPTER 3.

3. Inspect:

- Brake fluid level

Fluid at lower level → Fill up.

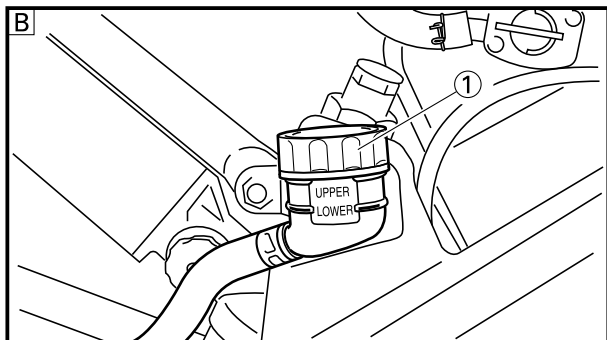
Refer to “BRAKE FLUID LEVEL INSPECTION” section in the CHAPTER 3.



4. Install:
- Diaphragm
 - Reservoir tank cap ①

CAUTION: _____

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

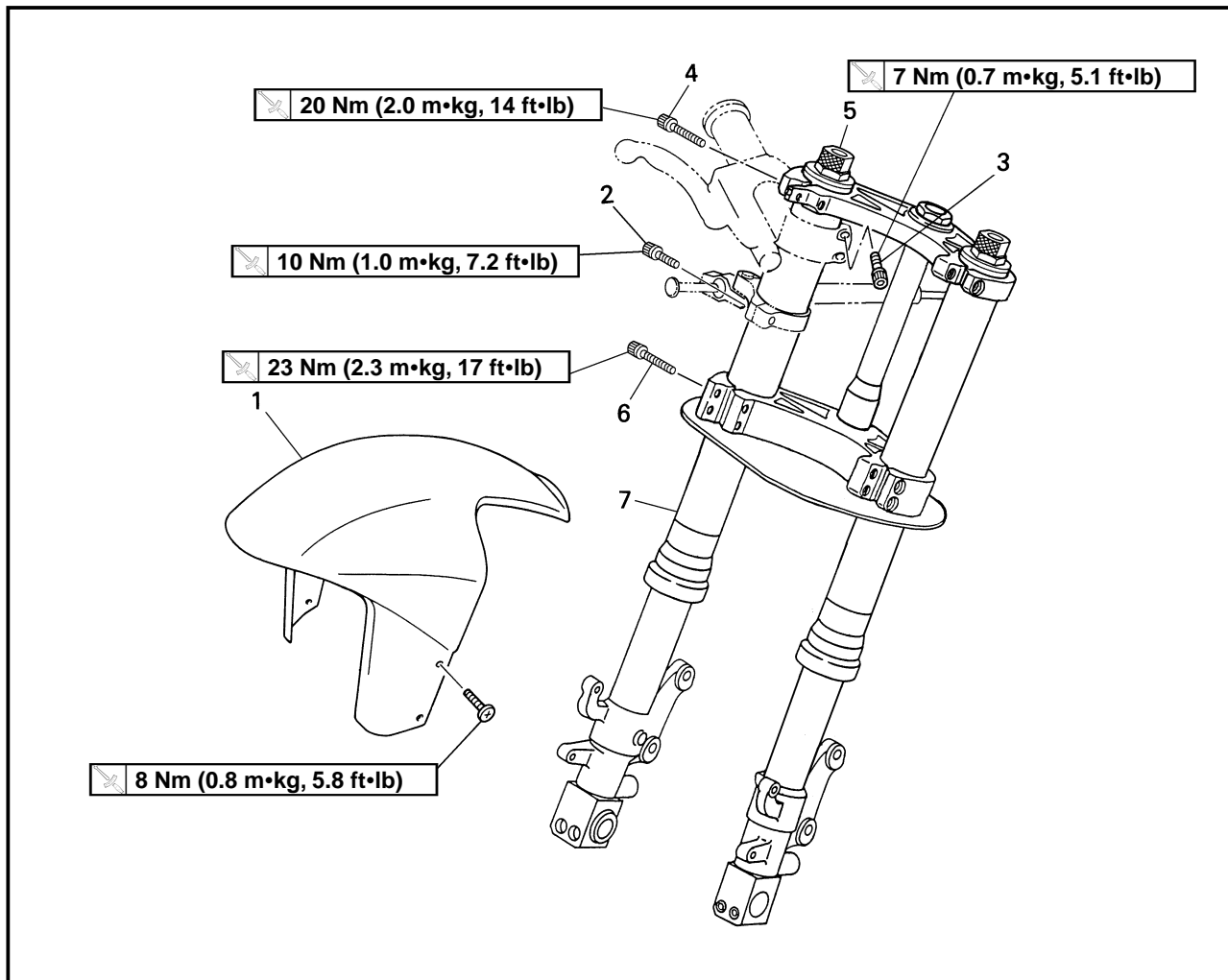


- A Front
- B Rear



EC550000

FRONT FORK

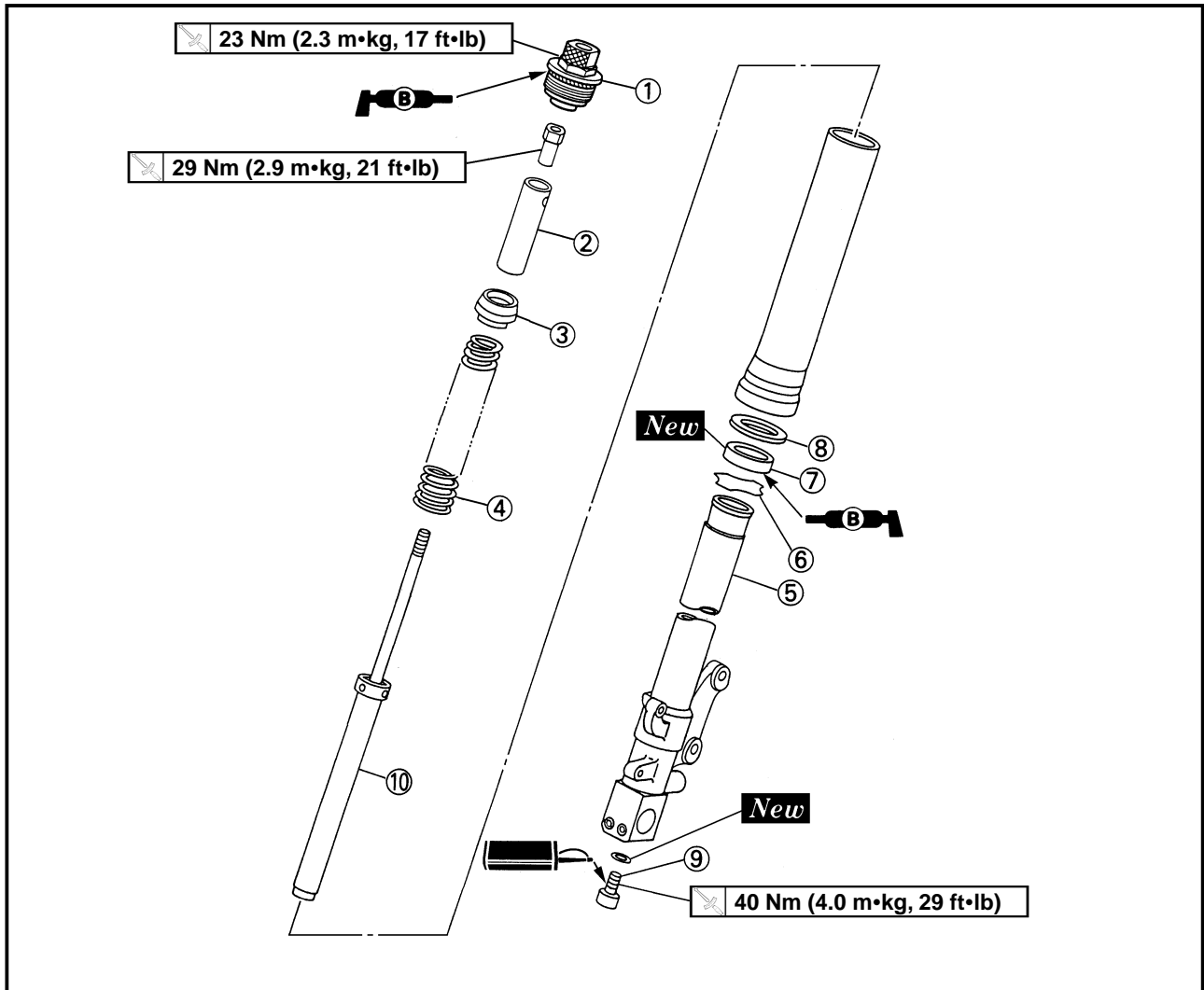


Extend of removal: ① Front fork removal

Extend of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		FRONT FORK REMOVAL Hold the machine by placing the suitable stand. Cowling Induction guide (left cylinder) Front caliper Front wheel		⚠WARNING Support the machine securely so there is no danger of it falling over. Refer to "COWLING, INDUCTION GUIDE, SEAT AND FUEL TANK" section in the CHAPTER 4. Refer to "FRONT BRAKE AND REAR BRAKE" section. Refer to "FRONT WHEEL AND REAR WHEEL" section.
	1	Front fender	1	Only loosening. (right side only) Only loosening. Only loosening. Loosen when disassembling the front fork. Only loosening.
	2	Pinch bolt (steering damper stay)	1	
	3	Pinch bolt (handlebar)	2	
	4	Pinch bolt (handle crown)	1	
	5	Cap bolt	1	
	6	Pinch bolt (under bracket)	2	
	7	Front fork	1	

EC558000

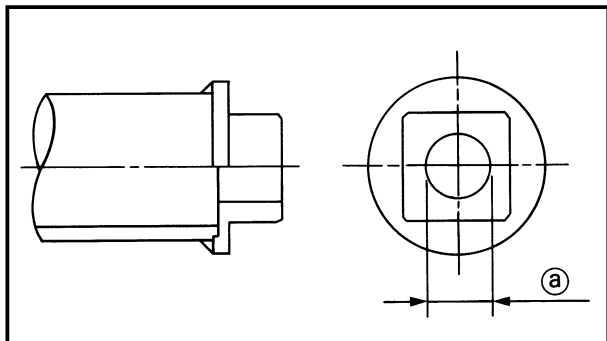
FRONT FORK DISASSEMBLY



Extend of removal: ① Oil seal removal

② Damper rod removal

Extend of removal	Order	Part name	Q'ty	Remarks	
		FRONT FORK DISASSEMBLY			
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>↑</p> <p>①</p> <p>↓</p> </div> <div style="text-align: center;"> <p>↑</p> <p>②</p> <p>↓</p> </div> </div>	①	Cap bolt	1	Use special tool. Refer to "REMOVAL POINTS".	
	②	Spacer	1		
		③	Spacer guide	1	
		④	Fork spring	1	Drain the fork oil.
		⑤	Inner tube	1	
		⑥	Stopper ring	1	Refer to "REMOVAL POINTS".
		⑦	Oil seal	1	
		⑧	Oil seal washer	1	
		⑨	Bolt (damper rod)	1	Use special tool.
		⑩	Damper rod	1	Refer to "REMOVAL POINTS".



EC556010

HANDLING NOTE

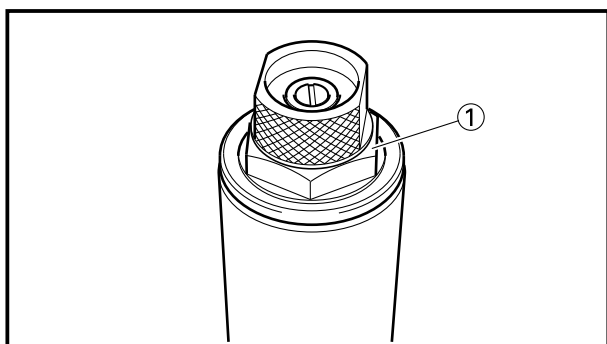
NOTE:

- With the 97 or later models, the damper rod diameter is 12.5 mm (0.49 in). If the dimension (a) of your damper rod holders is 12 mm (0.47 in), drill it to expand its diameter to 14 mm (0.55 in).
- The front fork requires careful attention. So it is recommended that the front fork be maintained at the dealers.

CAUTION:

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

- The front fork with a built-in piston rod has a very sophisticated internal construction and is particularly sensitive to foreign material. Use enough care not to allow any foreign material to come in when the oil is replaced or when the front fork is disassembled and reassembled.
- Before removing the cap bolts or front forks, be sure to extract the air from the air chamber completely.



EC553000

REMOVAL POINTS

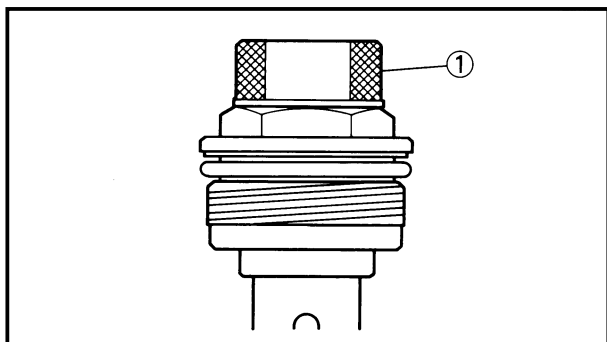
EC553144

Cap bolt

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

NOTE:

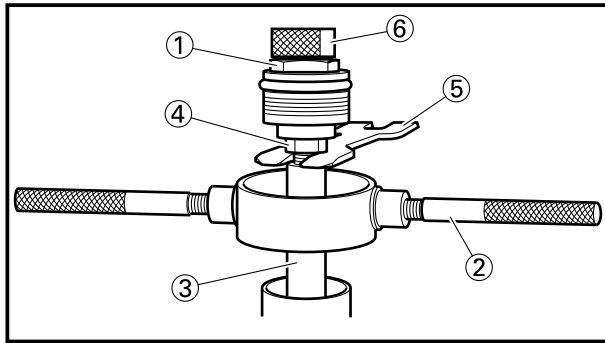
Before removing the front fork from the machine, loosen the cap bolt.



2. Loosen:
 - Spring preload adjuster ①

NOTE:

Record the set position of the adjuster (the amount of turning out the adjuster to the fully turned out position) before loosening it.



3. Remove:
- Cap bolt ①

NOTE:

- While pressing down the spacer ③ with the fork spring compressor ②, set the rod holder ⑤ between the locknut ④ and spacer.
- Hold the locknut and remove the cap bolt by turning the spring preload adjuster ⑥.

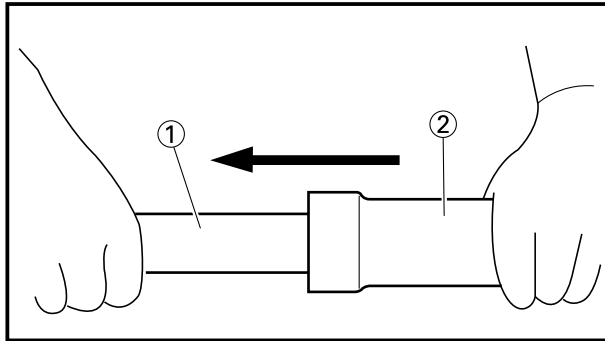


Fork spring compressor:

YM-1441/90890-01441

Rod holder:

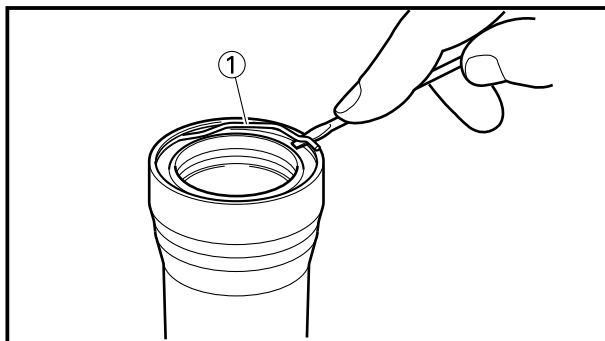
YM-1434/90890-01434



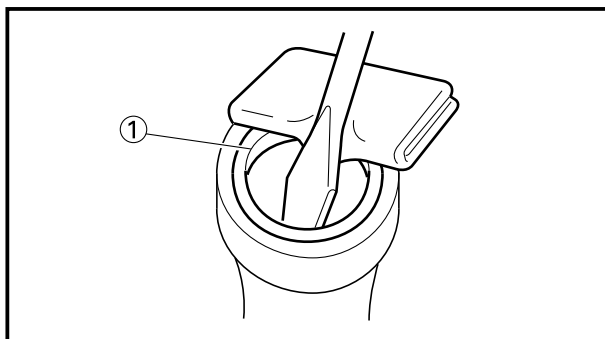
EC553212

Oil seal

1. Remove:
- Inner tube ①
- Pull out the inner tube from the outer tube ②.



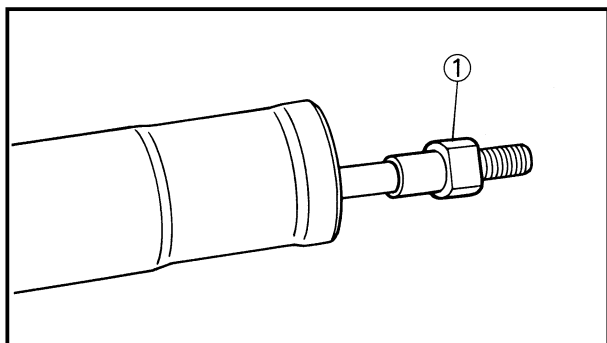
2. Remove:
- Stopper ring ①
- Using slotted-head screwdriver.



3. Remove:
- Oil seal ①
 - Oil seal washer
- Using slotted-head screwdriver.

CAUTION:

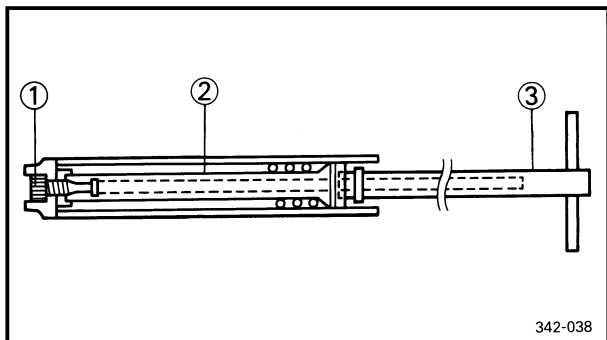
- Take care not to scratch the outer tube inner surface.
- Replace the oil seal whenever removed.



EC553322

Damper rod

1. Remove:
 - Locknut ①

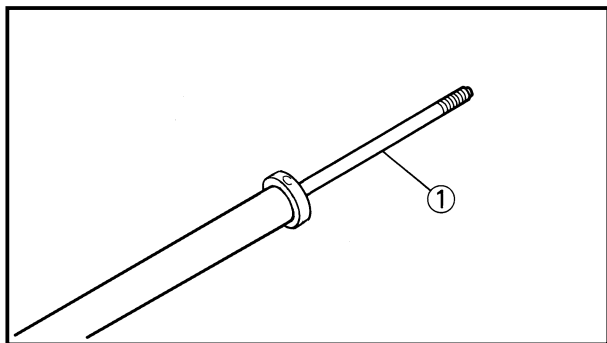


2. Remove:
 - Bolt (damper rod) ①
 - Damper rod ②

NOTE: _____
 Use a damper rod holder ③ to lock the damper rod.



Damper rod holder:
 YM-1425/90890-01425



EC554000

INSPECTION

EC554100

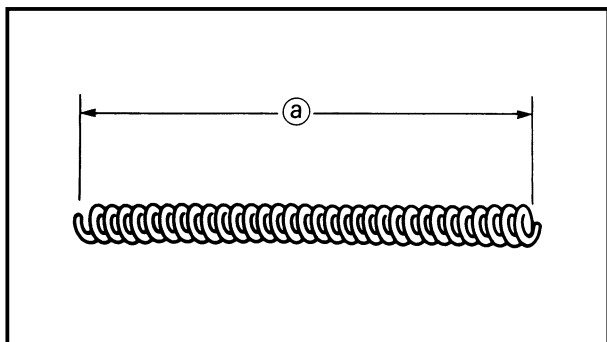
Damper rod

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

CAUTION: _____

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

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



EC554400

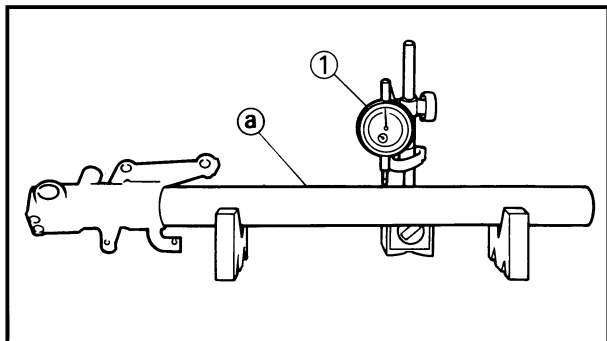
Fork spring

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



Fork spring free length:

Standard	<Limit>
212.5 mm (8.37 in)	210.5 mm (8.29 in)



EC554502

Inner tube

1. Inspect:

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



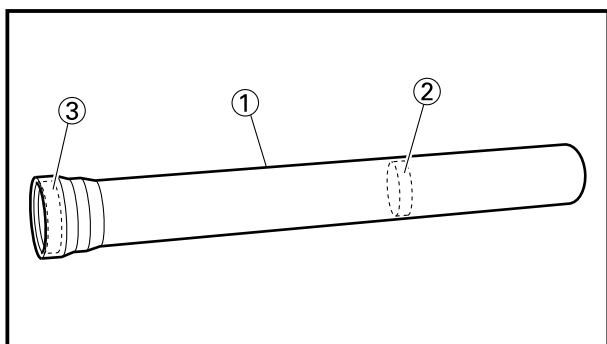
Inner tube bending limit:
0.2 mm (0.008 in)

NOTE:

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

WARNING

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

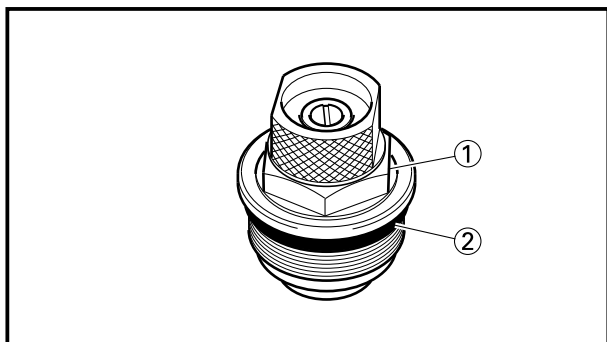


EC554611

Outer tube

1. Inspect:

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

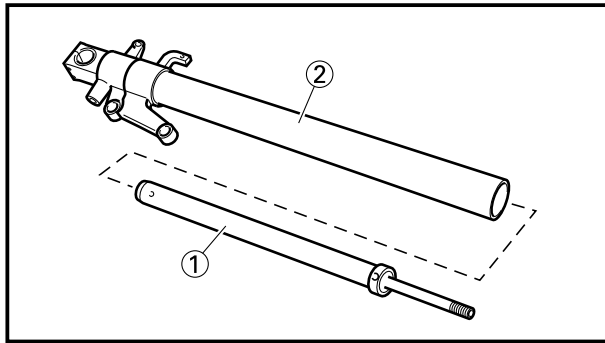


EC554710

Cap bolt

1. Inspect:

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



EC555000

ASSEMBLY AND INSTALLATION

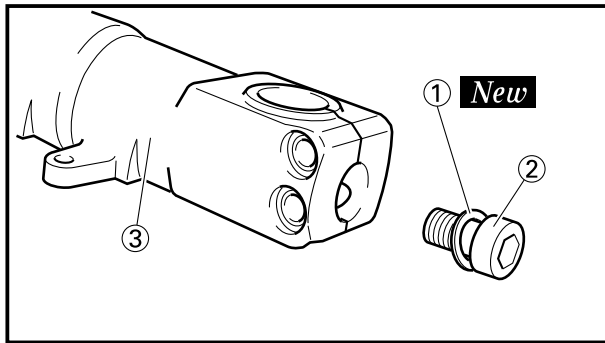
EC555191

Front fork assembly

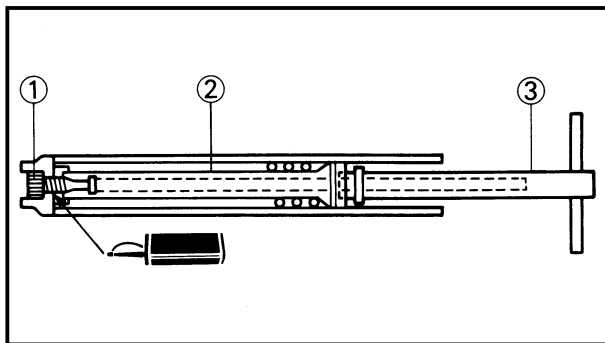
1. Wash the all parts in a clear solvent.
2. Install:
 - Damper rod ①
 - To inner tube ②.

CAUTION: _____

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



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



4. Tighten:
 - Bolt (damper rod) ①

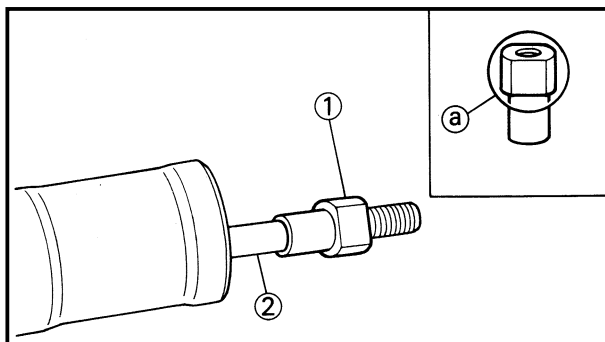
40 Nm (4.0 m•kg, 29 ft•lb)

NOTE: _____

Use a damper rod holder ③ to lock the damper rod ②.



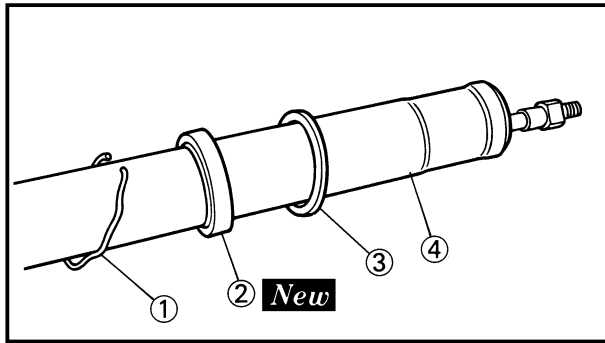
Damper rod holder:
YM-1425/90890-01425



5. Install:
 - Locknut ①
 - To damper rod ②.

NOTE: _____

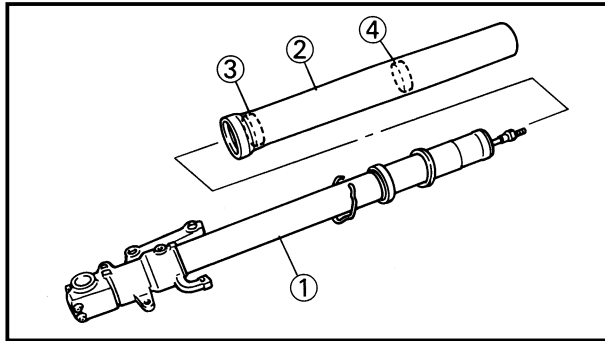
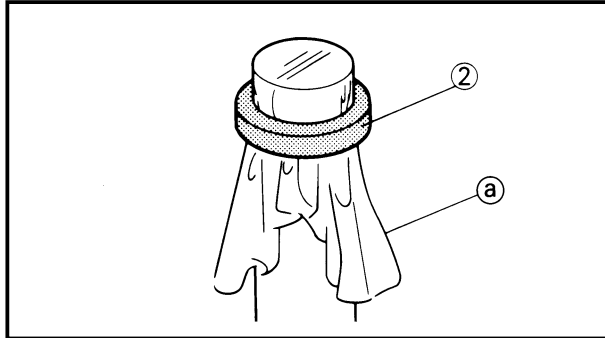
Install the locknut with its width across flat ② facing upward.



6. Install:
- Stopper ring ①
 - Oil seal ② **New**
 - Oil seal washer ③
 - To inner tube ④.

NOTE:

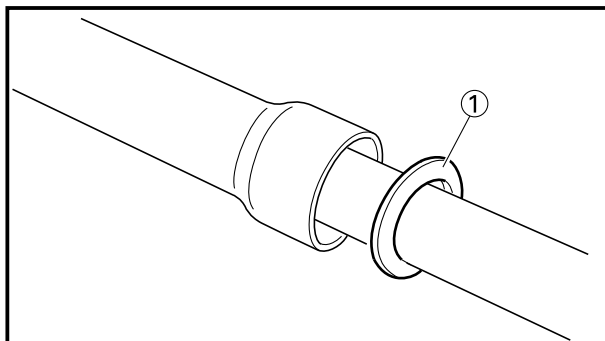
- Apply the fork oil on the inner tube.
- When installing the oil seal, use vinyl seat (a) with fork oil applied to protect the oil seal lip.
- Install the oil seal with its manufacture's marks or number facing the axle holder side.



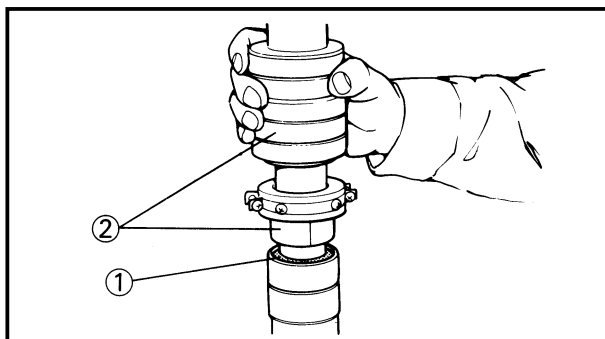
7. Install:
- Inner tube ①
 - To outer tube ②.

CAUTION:

When installing the inner tube, slowly and take care to insert it carefully so that the slide metal ③ and piston metal ④ will not be scratched.



8. Install:
- Oil seal washer ①
 - To outer tube slot.



9. Install:
- Oil seal ①

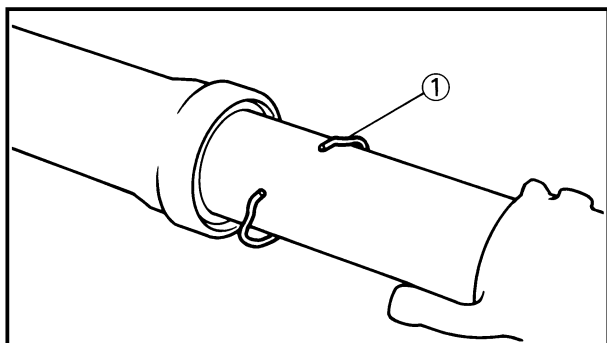
NOTE:

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



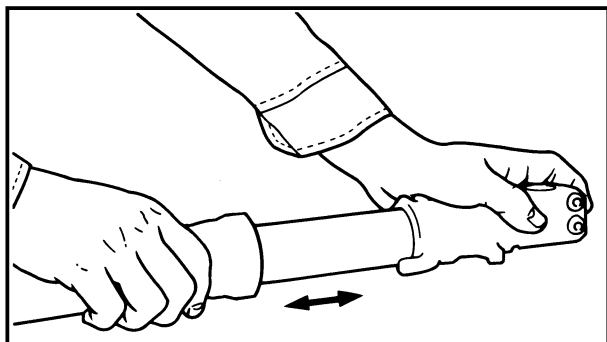
Fork seal driver:

YM-1442/90890-01442

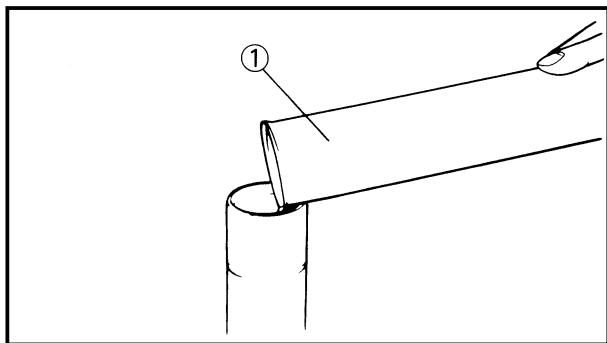


10. Install:
- Stopper ring ①

NOTE: _____
Fit the stopper ring correctly in the groove in the outer tube.



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



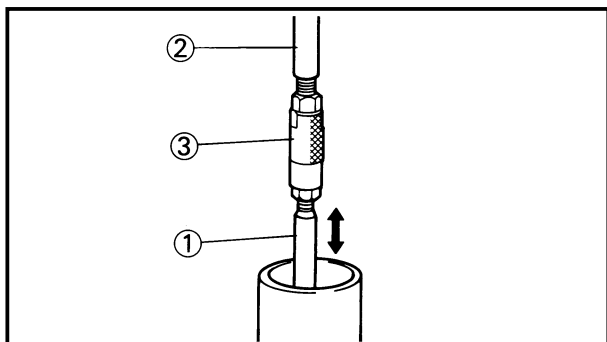
12. Compress the front fork fully.
13. Fill:
- Front fork oil
 - Until outer tube top surface with recommended fork oil ①.



Recommended oil:
Suspension oil "01"

CAUTION: _____

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

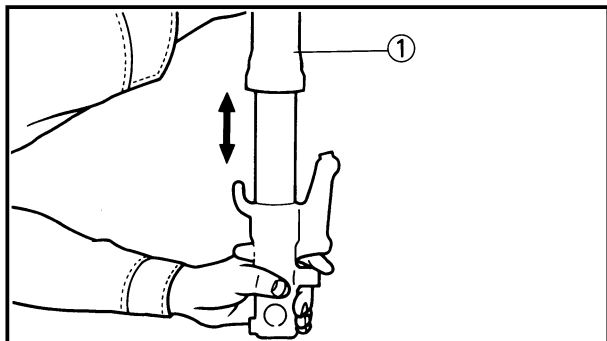


14. After filling, pump the damper rod ① slowly up and down more than 10 times to distribute the fork oil.

NOTE: _____
Use the rod puller ② and rod puller attachment ③ to pull up and down the damper rod.



Rod puller ②:
YM-1437/90890-01437
Rod puller attachment ③:
90890-01435



15.Fill:

- Front fork oil

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

16.After filling, pump the outer tube ① slowly up and down (about 60 mm (2.4 in) stroke) to distribute the fork oil once more.

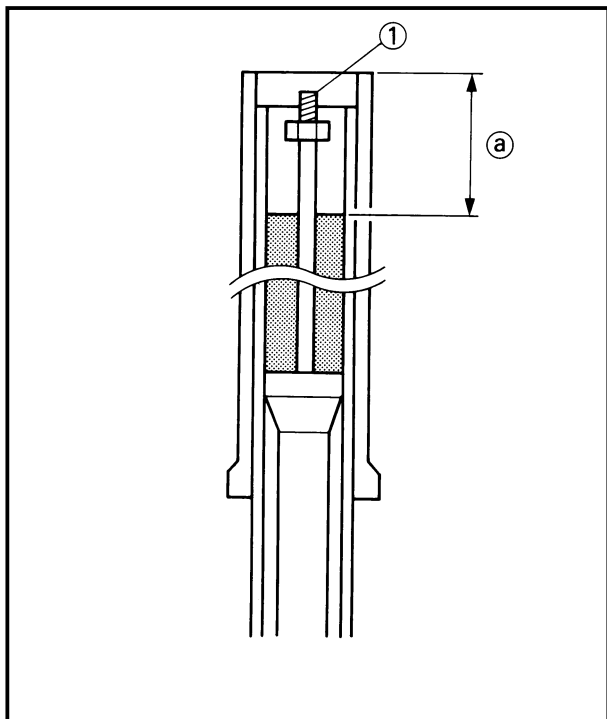
NOTE:

Be careful not to excessive full stroke. A stroke of 60 mm (2.4 in) or more will cause air to enter. In this case, repeat the steps 13 to 16.

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

NOTE:

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



18.Measure:

- Oil level (left and right) ②

Out of specification → Adjust.



Standard oil level:

135 mm (5.31 in)

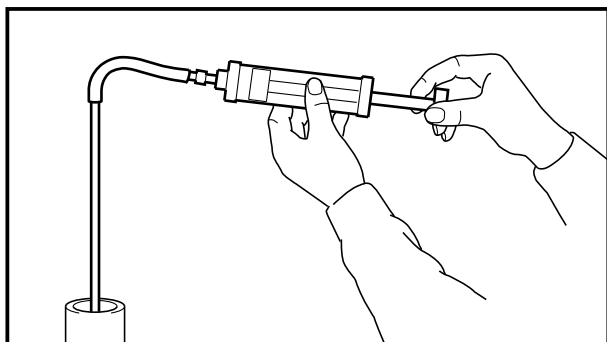
Extent of adjustment:

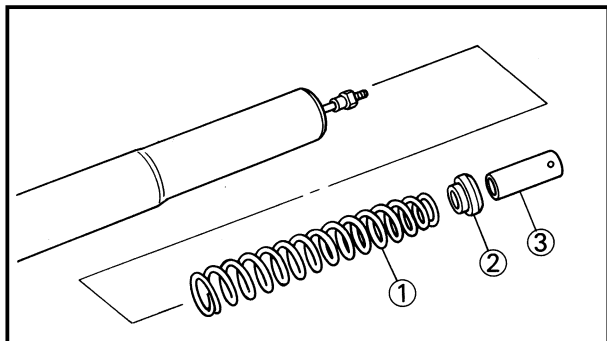
97~157 mm (3.82~6.18 in)

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

⚠WARNING

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



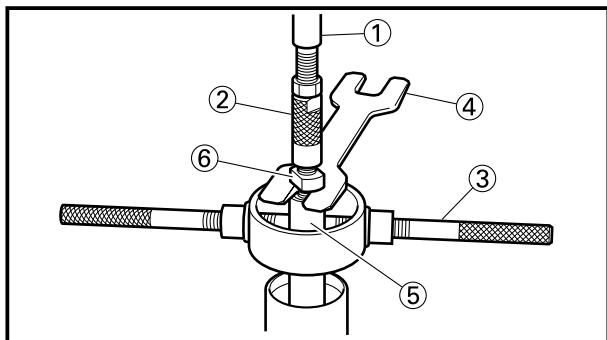


19. Install:

- Fork spring ①
- Spacer guide ②
- Spacer ③

NOTE:

Install the fork spring with its smaller dia. portion upward.



20. Attach:

- Rod puller ①
- Rod puller attachment ②
- Fork spring compressor ③
- Rod holder ④

NOTE:

- Pull up the damper rod with the rod puller and rod puller attachment.
- While pressing down the spacer ⑤ with the fork spring compressor, set the rod holder between the locknut ⑥ and spacer.



Rod puller ①:

YM-1437/90890-01437

Rod puller attachment ②:

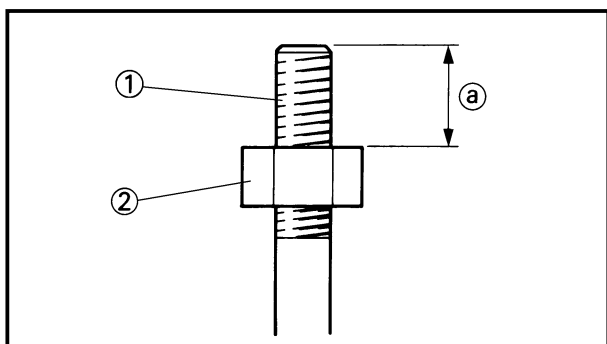
90890-01435

Fork spring compressor ③:

YM-1441/90890-01441

Rod holder ④:

YM-1434/90890-01434



21. Adjust:

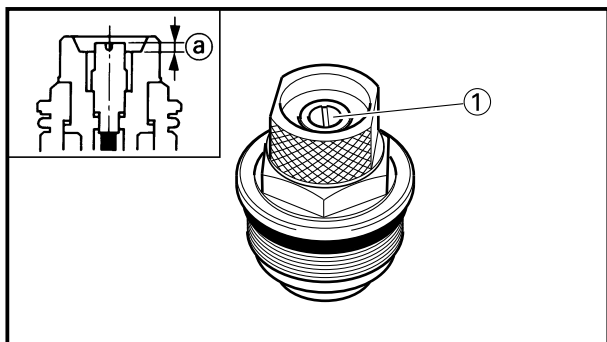
- Distance ①
- Out of specification → Turn the locknut ② until the specified distance is obtained.



Distance ①:

13 mm (0.51 in)

Between damper rod ① top and locknut ② top.



22. Adjust:

- Rebound damping adjuster position ①
- Out of specification → Turn the adjuster ① until the specified position is obtained.



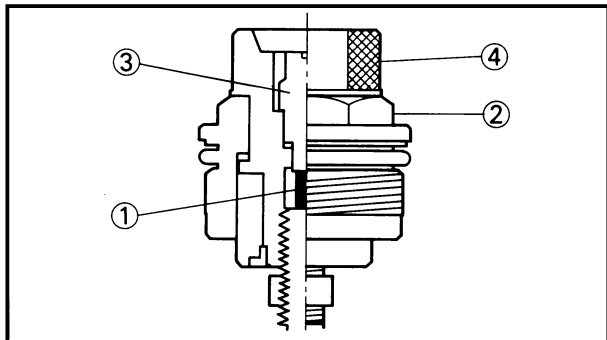
Rebound damping adjuster position ①:

Zero mm (Zero in)



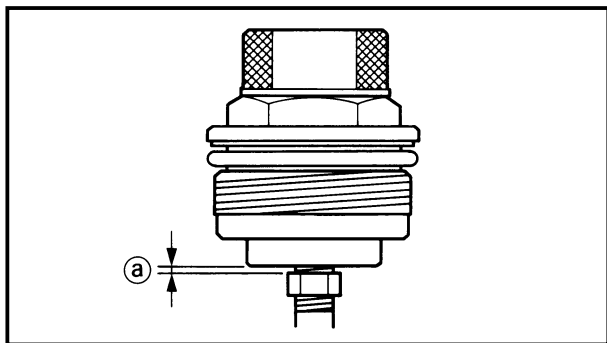
NOTE:
Record the set position of the adjuster (the amount of turning in the adjuster to the fully turned in position) before adjusting it.

CAUTION:
If the rebound damping adjuster position is out of specification, proper damping force cannot be obtained.



23. Install:
- Push rod ①
 - Cap bolt ②

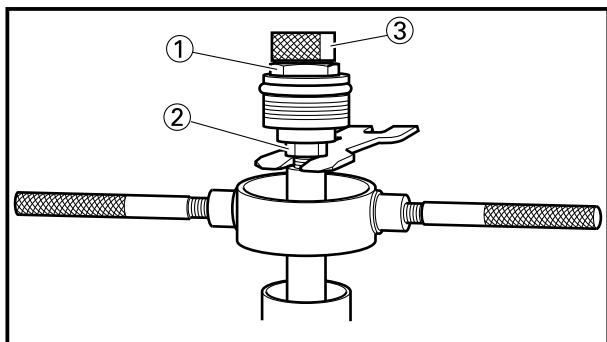
NOTE:
Turn in the cap bolt fully by holding the spring preload adjuster ④ with your hand until the rebound damping adjuster ③ hits the push rod tip.



24. Check:
- Cap bolt clearance ①
- Out of specification → Repeat the steps 21 to 23.

Cap bolt clearance ①:
Zero~2 mm (Zero~0.08 in)

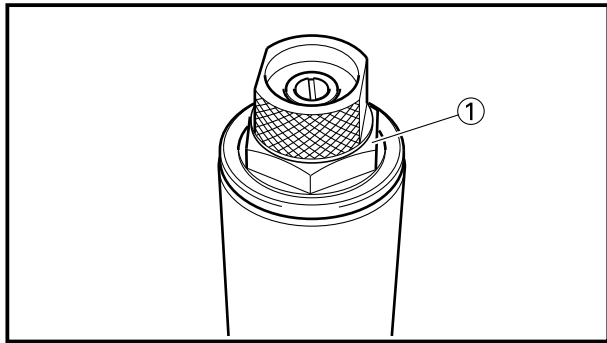
CAUTION:
If the cap bolt is installed out of specification, proper damping force cannot be obtained.



25. Install:
- Cap bolt (locknut) ①
- 29 Nm (2.9 m•kg, 21 ft•lb)**

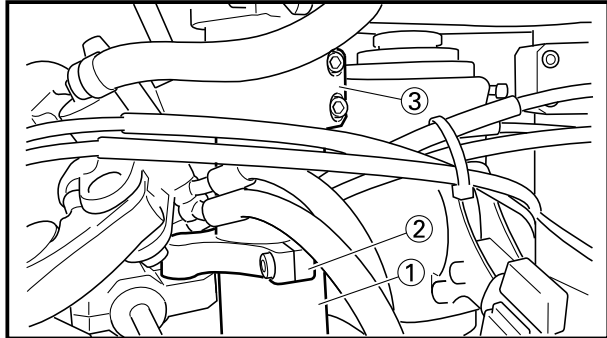
NOTE:
Hold the locknut ② and tighten the cap bolt by turning the spring preload adjuster ③ with specified torque.

CAUTION:
Do not tighten the cap bolt. It may cause damage to the spring preload adjuster.



26. Install:
- Cap bolt ①
To outer tube.

NOTE: _____
Temporarily tighten the cap bolt.

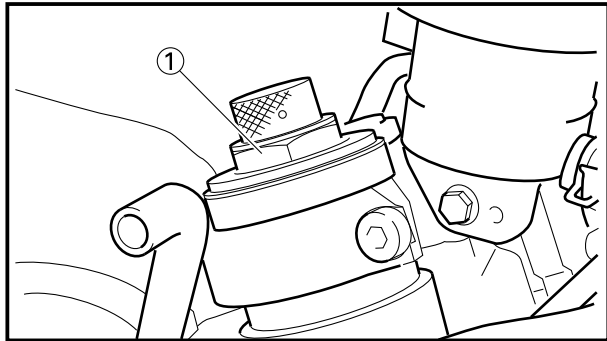


EC555290

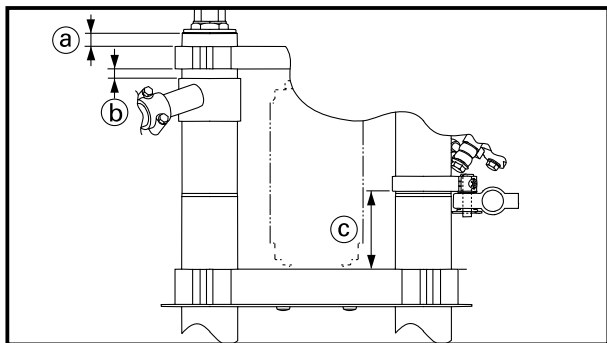
Installation

1. Install:
- Front fork ①
 - Steering damper stay ② (right side only)
 - Handlebar ③

NOTE: _____
• Temporarily tighten the pinch bolt (under bracket).
• Do not tighten the pinch bolts (handle crown, steering damper stay and handlebar) yet.



2. Tighten:
- Cap bolt ① 🔧 23 Nm (2.3 m•kg, 17 ft•lb)

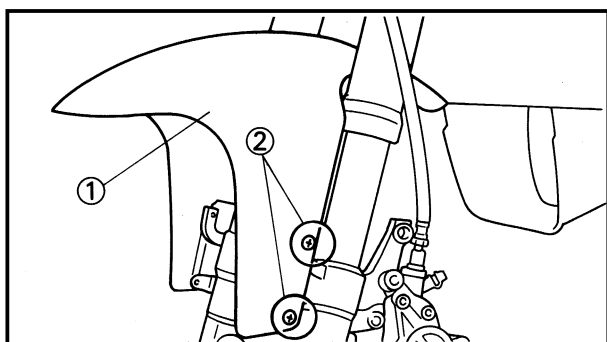
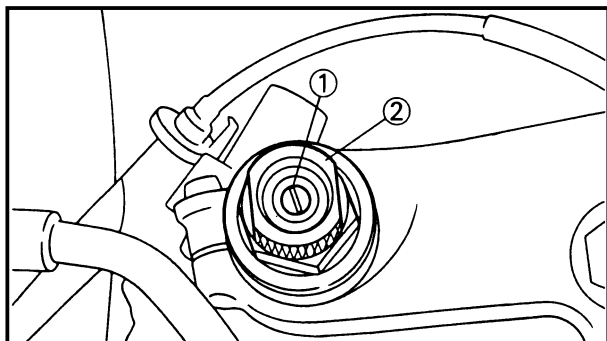
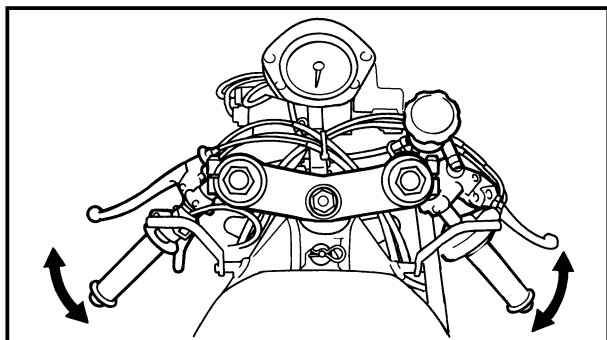
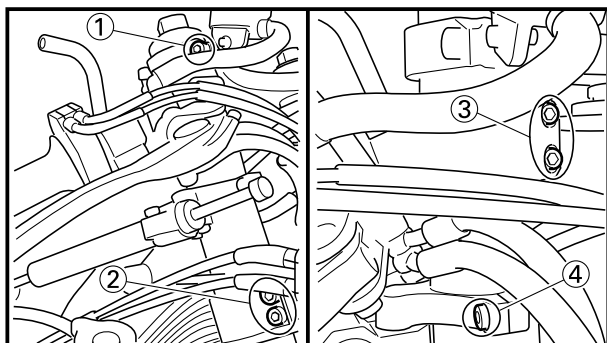


3. Adjust:
- Front fork top end ①
 - Handlebar position ②
 - Steering damper stay position ③ (left side only)



Front fork top end:
13 mm (0.51 in)
Handlebar position:
9 mm (0.35 in)
Steering damper stay position:
73 mm (2.87 in)

Refer to “FRONT FORK TOP END ADJUSTMENT” in the CHAPTER 3.



4. Tighten:

- Pinch bolt (handle crown) ①
20 Nm (2.0 m•kg, 14 ft•lb)
- Pinch bolt (under bracket) ②
23 Nm (2.3 m•kg, 17 ft•lb)
- Pinch bolt (handlebar) ③
7 Nm (0.7 m•kg, 5.1 ft•lb)
- Pinch bolt (steering damper stay) ④ (right side only)
10 Nm (1.0 m•kg, 7.2 ft•lb)

Refer to “FRONT FORK TOP END ADJUSTMENT” in the CHAPTER 3.

5. Check:

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

6. Adjust:

- Rebound damping force
- Spring preload

NOTE:

- Turn in the rebound damping adjuster ① fully, then turn out it to the originally set position.
- Turn in the spring preload adjuster ② to the originally set position.

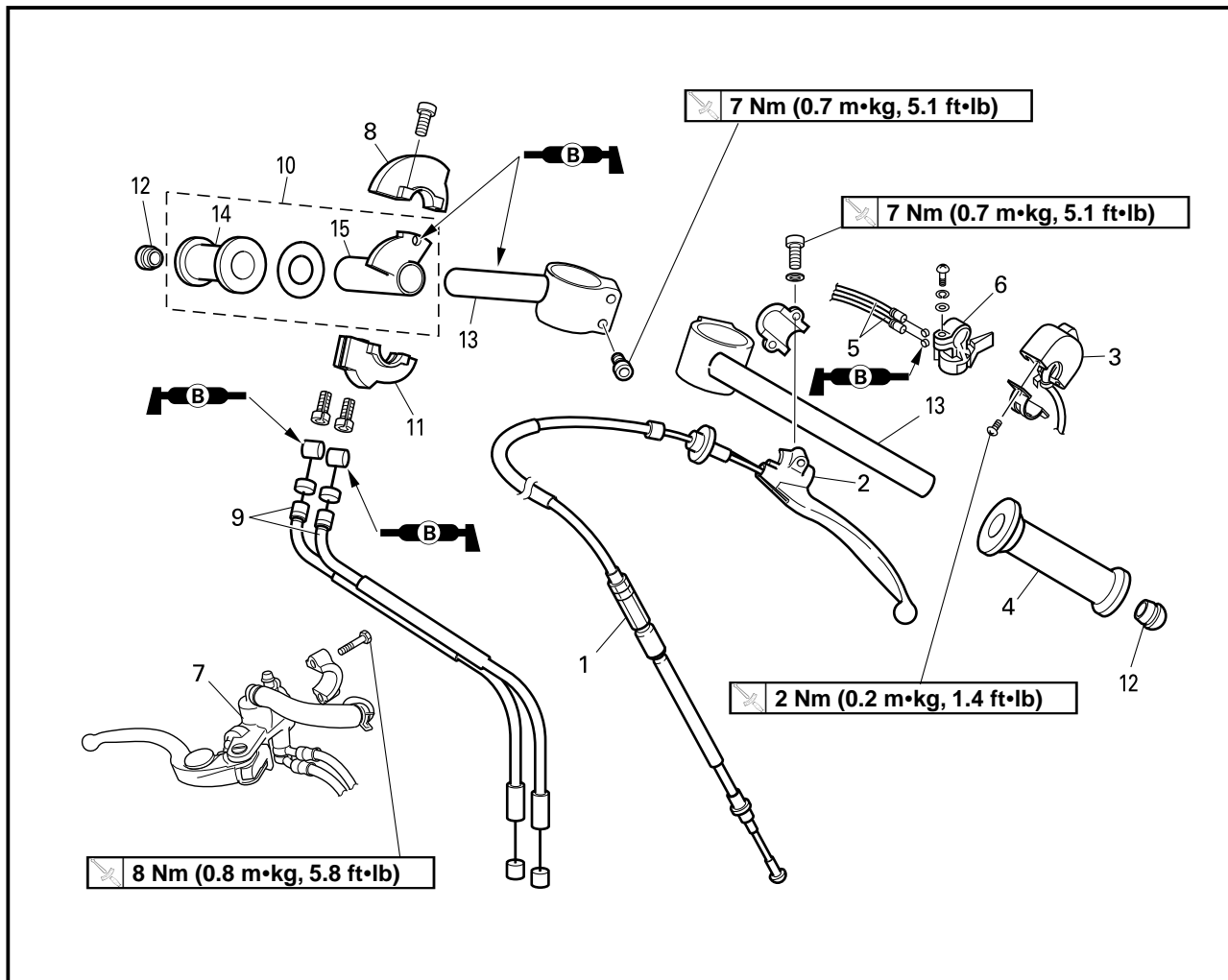
7. Install:

- Front fender ①
- Bolt (front fender) ②
8 Nm (0.8 m•kg, 5.8 ft•lb)



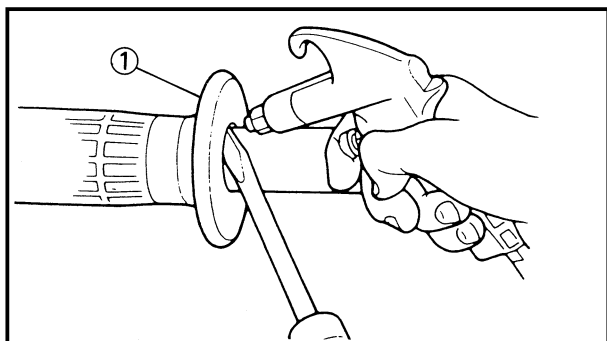
EC5B0000

HANDLEBAR



Extend of removal: ① Handlebar removal ② Throttle disassembly

Extend of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		HANDLEBAR REMOVAL		
		Cowling		Refer to "COWLING, INDUCTION GUIDE, SEAT AND FUEL TANK" section in the CHAPTER 4. Refer to "STEERING" section.
		Induction guide (left cylinder)		
	Handle crown			
<div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> ↑ ① ↓ </div> <div style="margin-right: 20px;"> ↑ ② ↓ </div> <div style="margin-right: 20px;"> ↑ ② ↓ </div> </div>	1	Clutch cable	1	Disconnect at the lever side. Refer to "REMOVAL POINTS". Disconnect at the lever side.
	2	Clutch lever holder	1	
	3	Main switch	1	
	4	Grip (left)	1	
	5	Starter cable	2	
	6	Starter lever	1	
	7	Master cylinder	1	
	8	Grip cap (upper)	1	
	9	Throttle cable	2	
	10	Throttle	1	
	11	Grip cap (lower)	1	
	12	Grip end	2	
	13	Handlebar	2	
	14	Grip (right)	1	
	15	Tube guide	1	



EC5B3000

REMOVAL POINTS

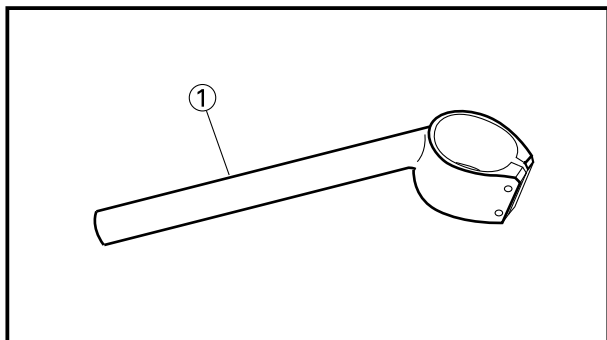
EC5B3200

Grip

- Remove:
 - Grip ①

NOTE:

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



EC5B4000

INSPECTION

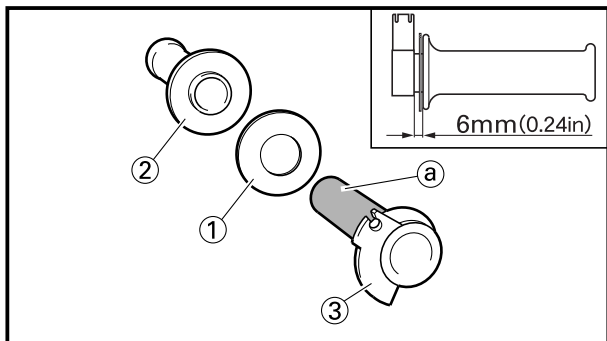
EC5B4100

Handlebar

- Inspect:
 - Handlebar ①
 Bends/Cracks /Damage → Replace.

⚠WARNING

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



EC5B5000

ASSEMBLY AND INSTALLATION

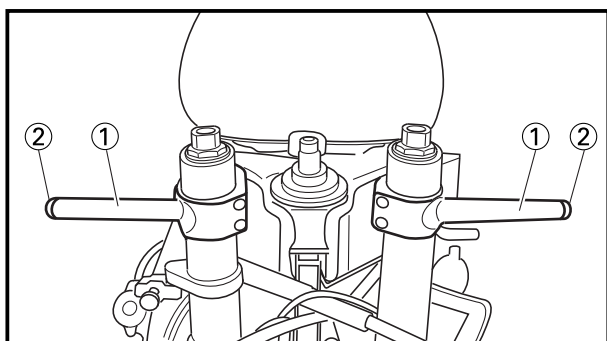
EC5B5110

Throttle assembly

- Install:
 - Ring plate ①
 - Grip (right) ②
 Apply the adhesive on the tube guide ③.

NOTE:

Before applying the adhesive, wipe off grease or oil on the tube guide surface ③ with a lacquer thinner.



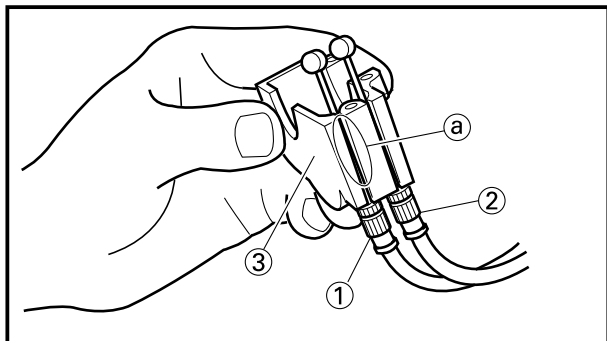
EC5B5230

Handlebar

- Install:
 - Handlebar ①
 - Grip end ②

NOTE:

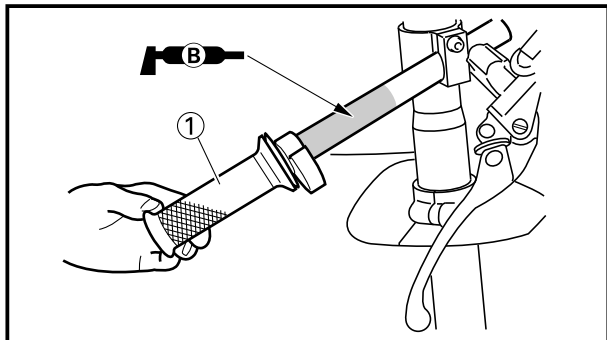
Temporarily tighten the bolts (handlebar).



2. Install:
- Throttle cable [carburetor (left cylinder)] ①
 - Throttle cable [carburetor (right cylinder)] ②
 - To grip cap (lower) ③.

NOTE:

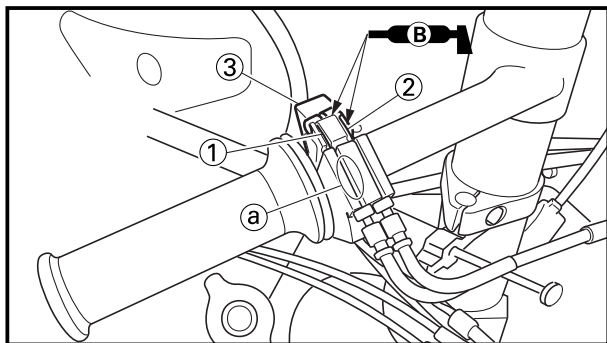
Install the throttle cable [carburetor (left cylinder)] in the grip side slit ① in the grip cap (lower).



3. Install:
- Throttle ①

NOTE:

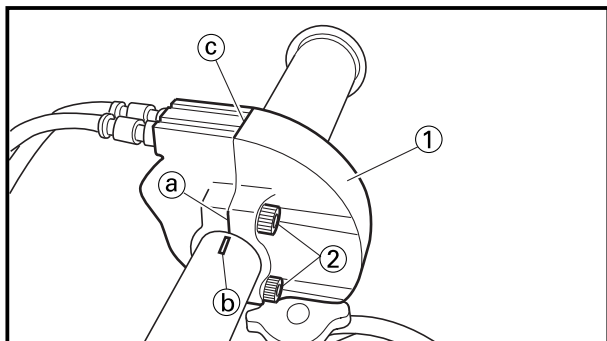
Apply the lithium soap base grease on the throttle grip sliding surface.



4. Install:
- Throttle cable [carburetor (left cylinder)] ①
 - Throttle cable [carburetor (right cylinder)] ②
 - To tube guide ③.

NOTE:

- Apply the lithium soap base grease on the throttle cable ends and tube guide cable widening portions.
- Install the throttle cable [carburetor (left cylinder)] in the grip side slit ① in the tube guide.

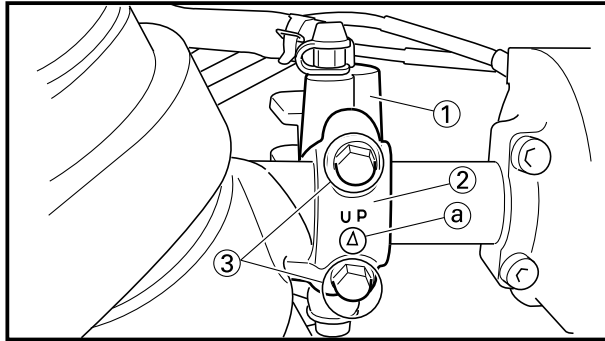


5. Install:
- Grip cap (upper) ①
 - Bolt (grip cap) ②

NOTE:

- Align the contacting surface ① of the grip cap (upper) with the punch mark ② on the handlebar.
- Tighten the bolts so that the upper side contacting surface ③ is closed.

6. Adjust:
- Throttle grip free play
- Refer to "THROTTLE CABLE ADJUSTMENT" section in the CHAPTER 3.



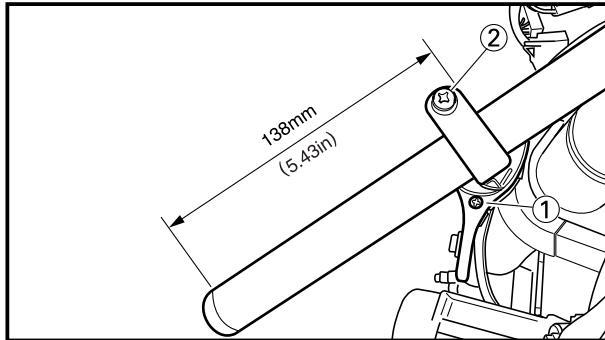
7. Install:

- Master cylinder ①
- Master cylinder bracket ②
- Bolt (master cylinder bracket) ③

8 Nm (0.8 m•kg, 5.8 ft•lb)

NOTE:

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

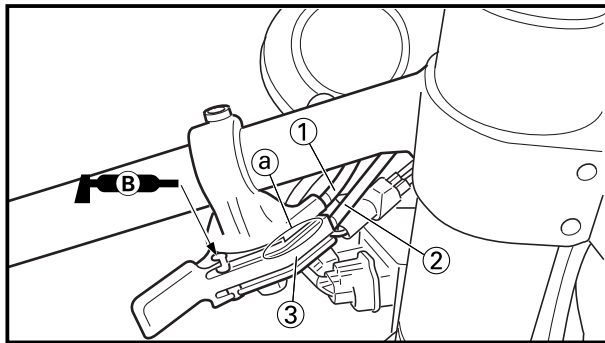


8. Install:

- Starter lever ①
- Screw (starter lever) ②

NOTE:

The starter lever should be installed according to the dimension shown.

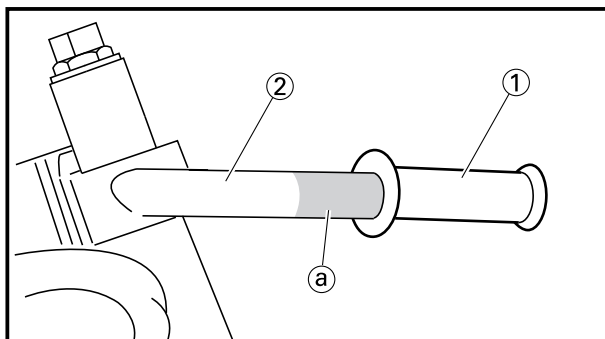


9. Install:

- Starter cable [carburetor (left cylinder)] ①
- Starter cable [carburetor (right cylinder)] ②
- To starter lever ③.

NOTE:

- Apply the lithium soap base grease on the starter lever ends.
- Install the starter cable [carburetor (left cylinder)] in the upper side slit (a) in the starter lever.

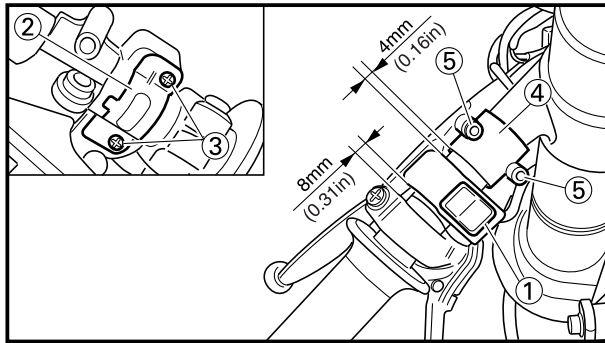


10. Install:

- Grip (left) ①
- Apply the adhesive to the handlebar ②.

NOTE:

Before applying the adhesive, wipe off grease or oil on the handlebar surface (a) with a lacquer thinner.



11. Install:

- Main switch ①
- Main switch holder ②
- Screw (main switch holder) ③

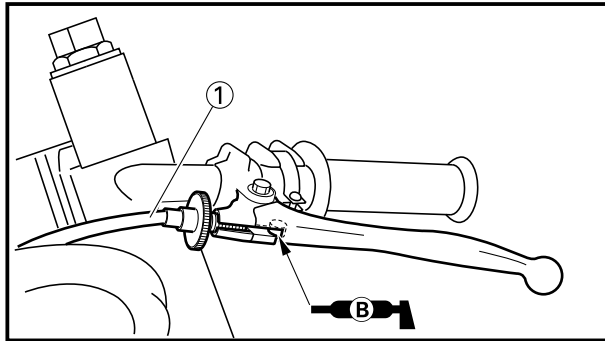
2 Nm (0.2 m•kg, 1.4 ft•lb)

- Clutch lever holder ④
- Bolt (clutch lever holder) ⑤

5 Nm (0.5 m•kg, 3.6 ft•lb)

NOTE:

The main switch and clutch lever holder should be installed according to the dimensions shown.

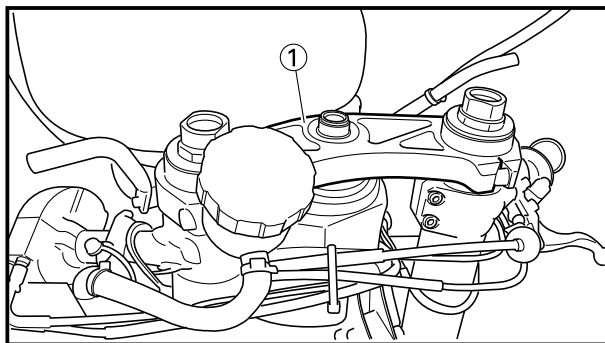


12. Install:

- Clutch cable ①

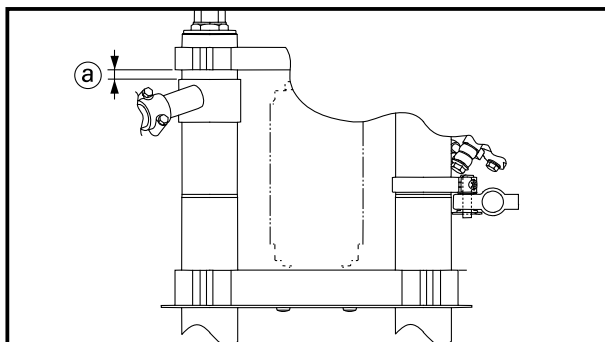
NOTE:

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



13. Install:

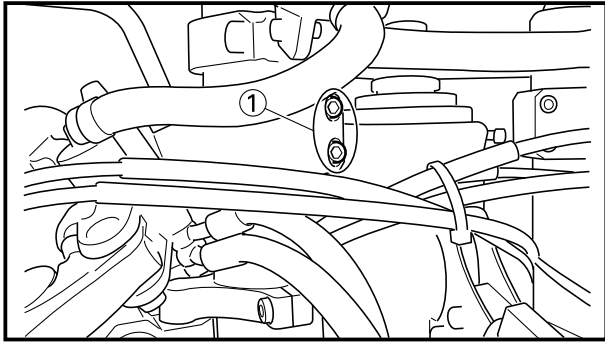
- Handle crown ①
- Refer to "STEERING" section.



14. Adjust:


- Handlebar position ②

**Handlebar position:
9 mm (0.35 in)**



15. Tighten:

- Pinch bolt (handlebar) ①

 7 Nm (0.7 m•kg, 5.1 ft•lb)

CAUTION:

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

16. Adjust:

- Clutch lever free play

Refer to “CLUTCH ADJUSTMENT” section in the CHAPTER 3.

17. Lock the throttle cables and starter cables using a locking wire.

Refer to “LOCKING WIRE INSTALLATION GUIDE” section in the CHAPTER 3.

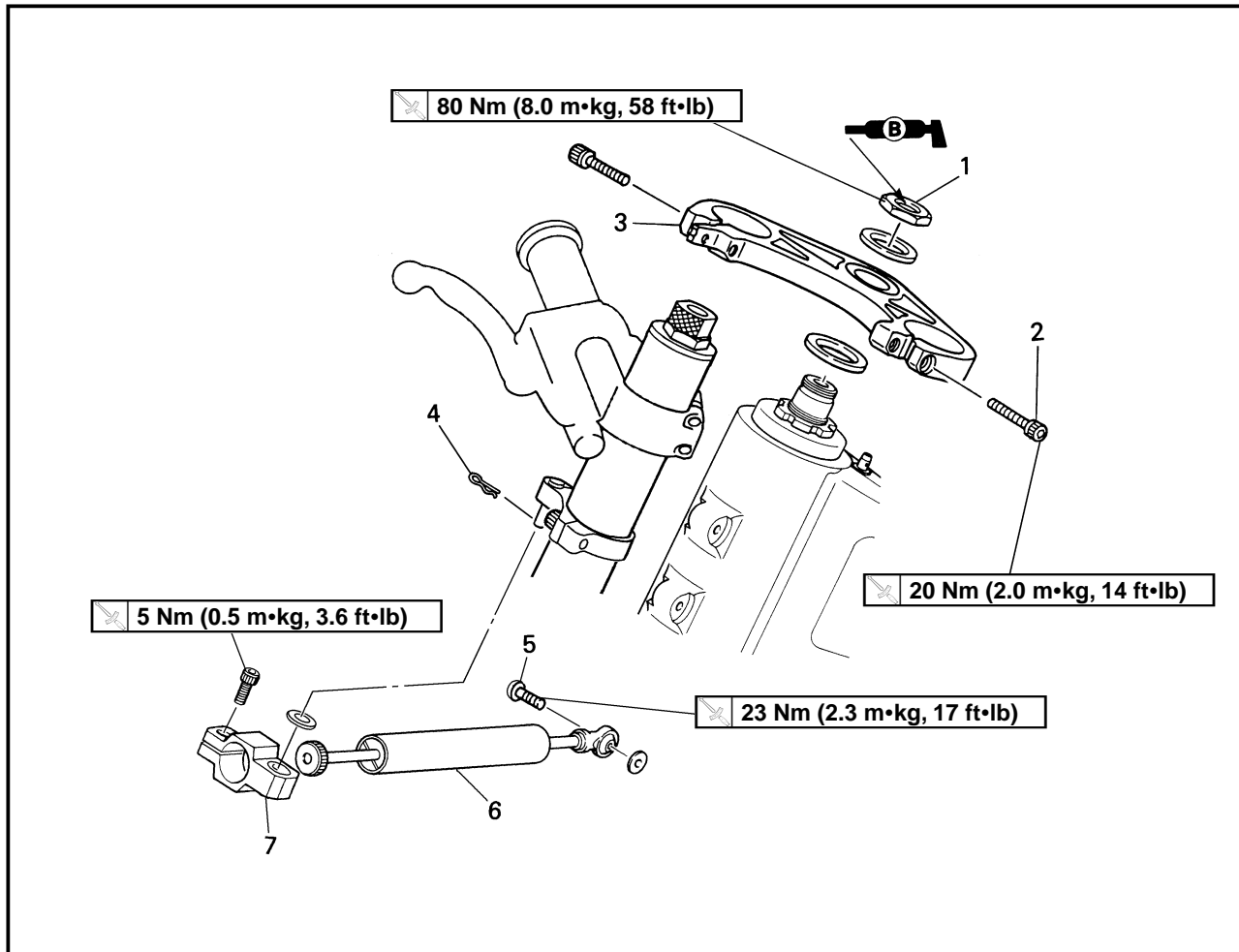


EC560000

STEERING

EC568000

HANDLE CROWN AND STEERING DAMPER



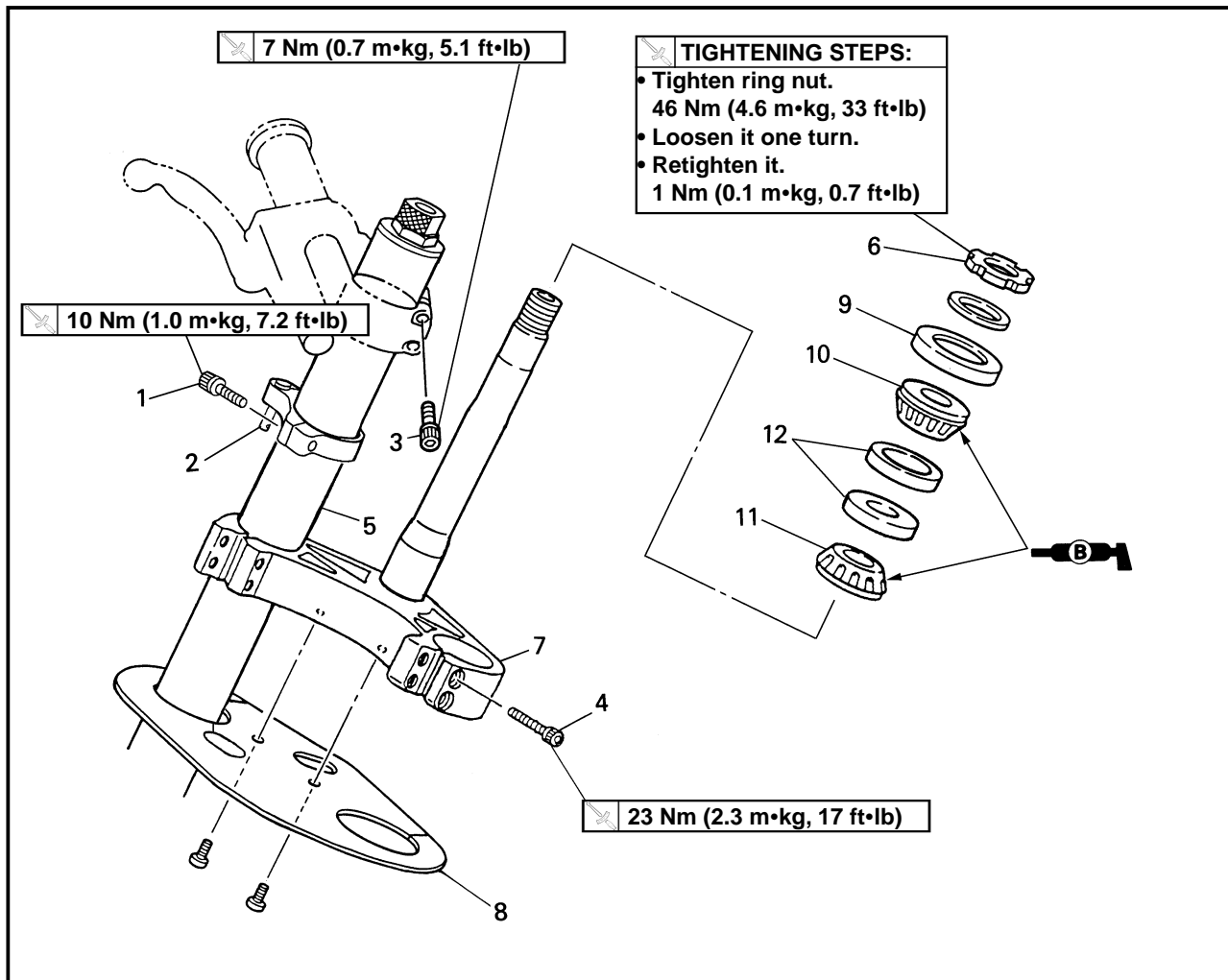
Extend of removal: ① Handle crown removal ② Steering damper removal

Extend of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		HANDLE CROWN AND STEERING DAMPER REMOVAL Hold the machine by placing the suitable stand.		<p>▲WARNING _____ Support the machine securely so there is no danger of it falling over.</p> <p>Refer to "COWLING, INDUCTION GUIDE, SEAT AND FUEL TANK" section in the CHAPTER 4.</p> <p>Refer to "FRONT BRAKE AND REAR BRAKE" section.</p> <p>Refer to "FRONT WHEEL AND REAR WHEEL" section.</p>
		Cowling		
		Induction guide (left cylinder)		
		Bolt (Front brake reservoir tank) Front brake caliper		
		Front wheel		
		Front fender		
①	1	Steering shaft nut	1	Only loosening.
	2	Pinch bolt (handle crown)	2	
	3	Handle crown	1	
	4	Clip	1	
	5	Bolt (steering damper)	1	
	6	Steering damper	1	
	7	Steering damper bracket	1	



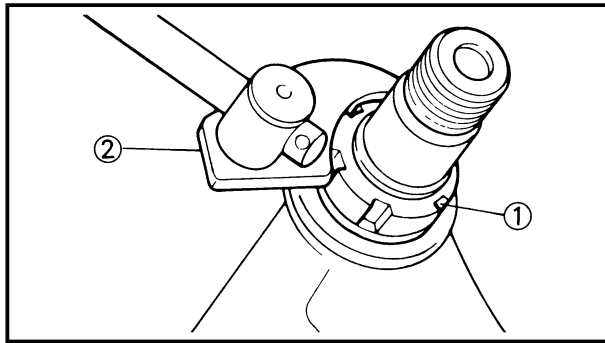
EC568100

UNDER BRACKET



Extend of removal: ① Under bracket removal ② Bearing removal

Extend of removal	Order	Part name	Q'ty	Remarks	
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>↑</p> <p>①</p> <p>↓</p> </div> <div style="text-align: center;"> <p>↑</p> <p>②</p> <p>↓</p> </div> </div>	UNDER BRACKET REMOVAL				
	1	Pinch bolt (steering damper stay)	1	Only loosening.	
	2	Pin	1		
	3	Pinch bolt (handlebar)	4	Only loosening.	
	4	Pinch bolt (under bracket)	4	Only loosening.	
	5	Front fork	2	Refer to "FRONT FORK" section.	
	6	Ring nut	1	Use special tool. Refer to "REMOVAL POINTS".	
	7	Under bracket	1		
	8	Inner fender	1		
	9	Ball race cover	1		
	10	Bearing (upper)	1		
	11	Bearing (lower)	1	Refer to "REMOVAL POINTS".	
12	Ball race	2	Refer to "REMOVAL POINTS".		



EC563000

REMOVAL POINTS

EC563202

Ring nut

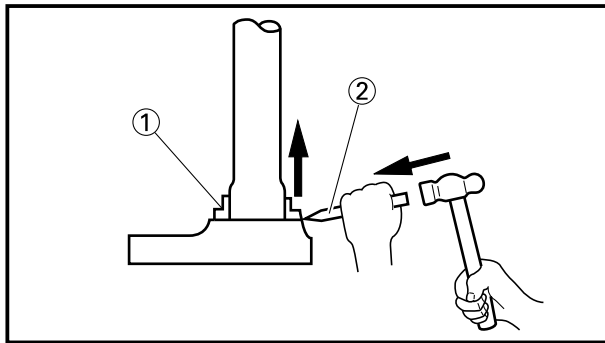
1. Remove:
 - Ring nut ①
 - Use the ring nut wrench ②.



Ring nut wrench:
YU-33975/90890-01403

⚠WARNING

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



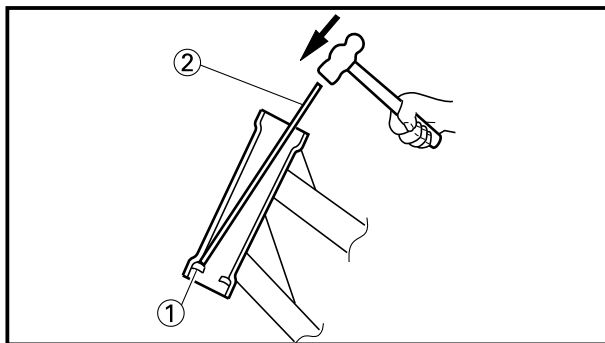
EC563300

Bearing (lower)

1. Remove:
 - Bearing (lower) ①
 - Use the floor chisel ②.

CAUTION:

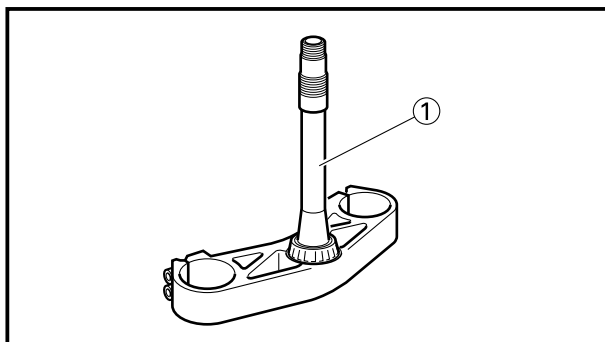
Take care not to damage the steering shaft thread.



EC563400

Ball race

1. Remove:
 - Ball race ①
 - Remove the ball race using long rod ② and the hammer.



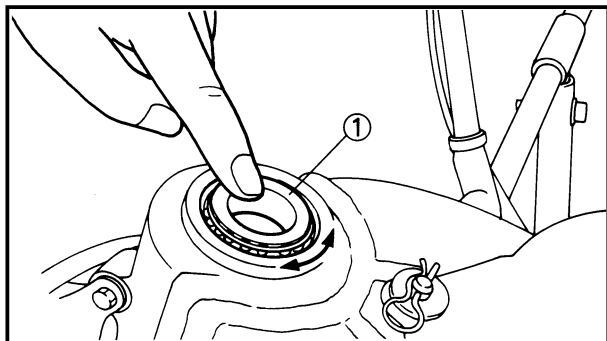
EC564000

INSPECTION

EC564200

Steering shaft

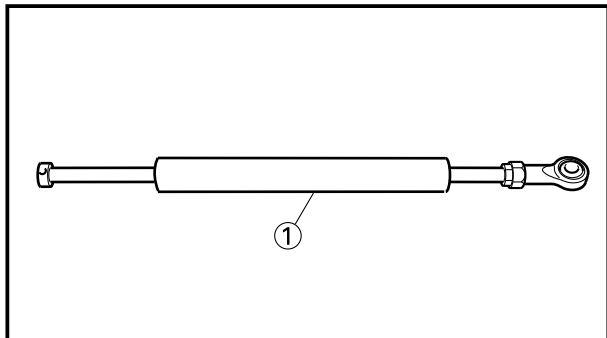
1. Inspect:
 - Steering shaft ①
 - Bend/Damage → Replace.



EC564101

Bearing and ball race

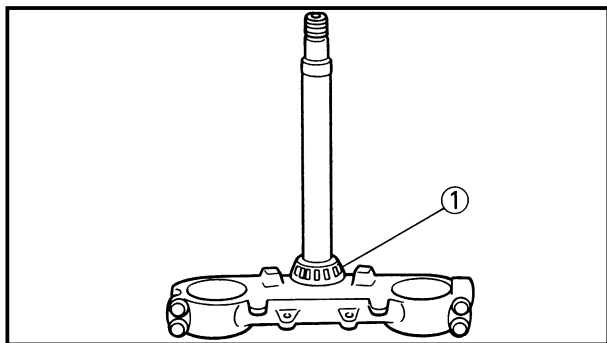
1. Wash the bearings and ball races with a solvent.
2. Inspect:
 - Bearing ①
 - Ball race
 Pitting/Damage → Replace bearings and ball races as a set.
 Install the bearing in the ball races. Spin the bearings by hand. If the bearings hang up or are not smooth in their operation in the ball races, replace bearings and ball races as a set.



EC564300

Steering damper

1. Inspect:
 - Steering damper ①
 Bend/Damage → Replace.
 Oil leaks/Unsmooth movement → Replace.



EC565000

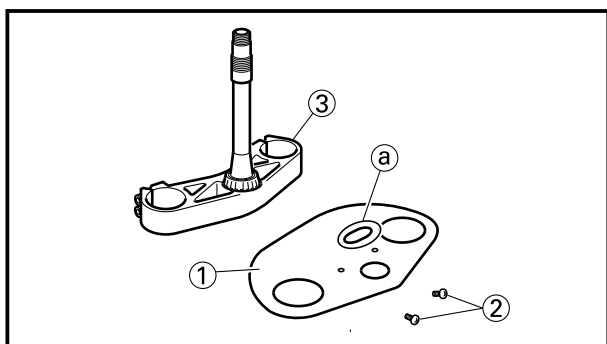
ASSEMBLY AND INSTALLATION

EC565190

Under bracket

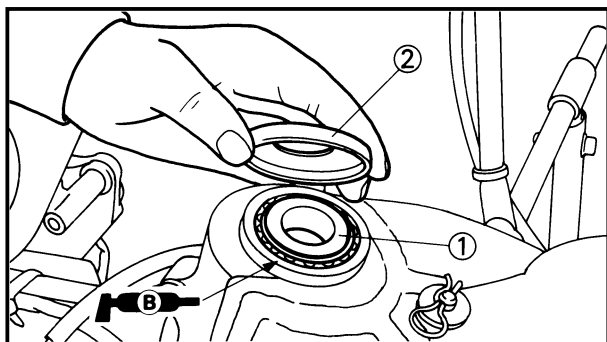
1. Install:
 - Bearing (lower) ①

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



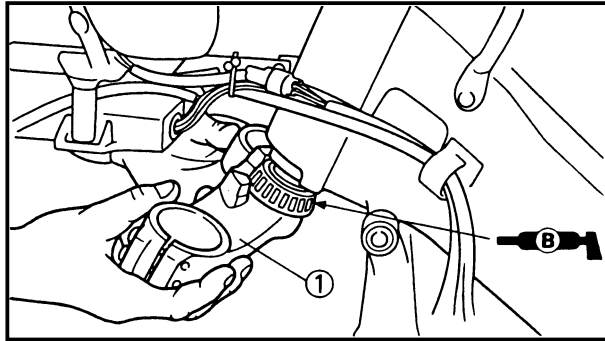
2. Install:
 - Inner fender ①
 - Screw (inner fender) ②
 To under bracket ③.

NOTE: _____
 Install the inner fender with its brake hose through hole (a) facing to the right.



3. Install:
 - Ball race
 - Bearing ①
 - Ball race cover ②

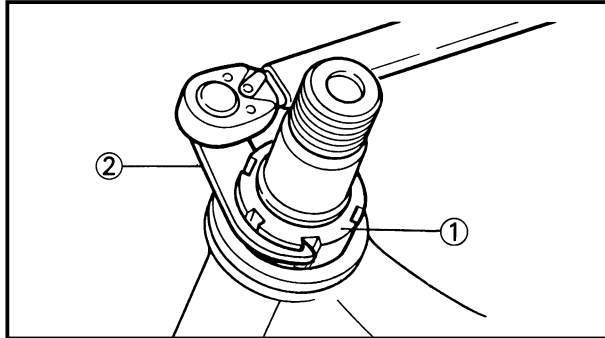
NOTE: _____
 Apply the lithium soap base grease on the bearing.



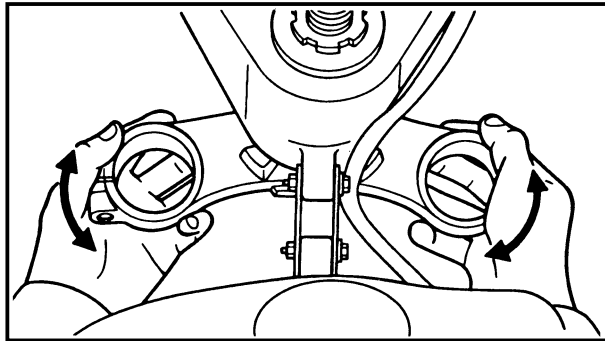
4. Install:
- Under bracket ①

NOTE:

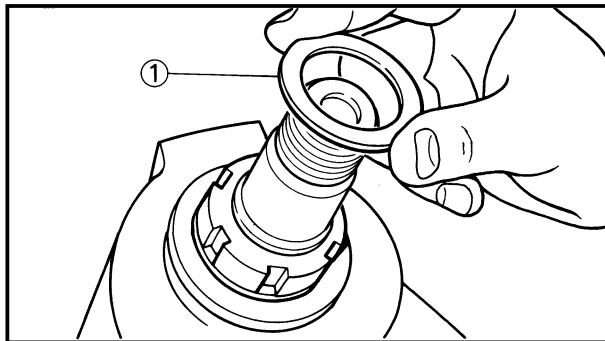
Apply the lithium soap base grease on the bearing.



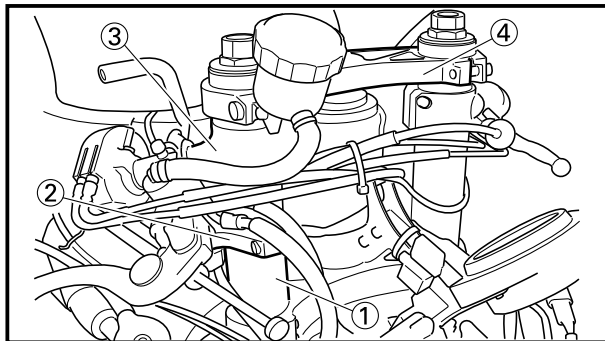
5. Install:
- Ring nut ① 1 Nm (0.1 m•kg, 0.7 ft•lb)
- Tighten the ring nut using the ring nut wrench ②.
- Refer to “STEERING HEAD INSPECTION AND ADJUSTMENT” section in the CHAPTER 3.



6. 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.



7. Install:
- Plain washer ①

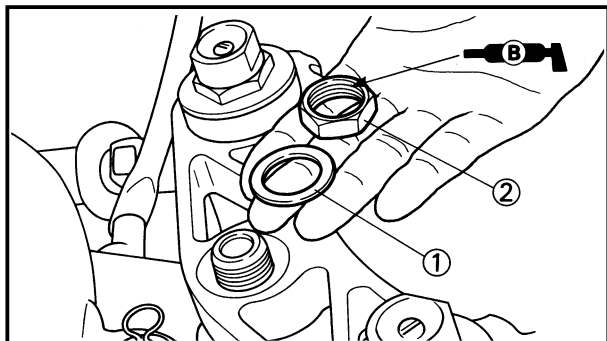


8. Install:
- Front fork ①
 - Steering damper stay ② (right side only)
 - Handlebar ③
 - Handle crown ④

NOTE:

• Temporarily tighten the pinch bolts (under bracket).

• Do not tighten the pinch bolts (handle crown, steering damper stay and handlebar) yet.

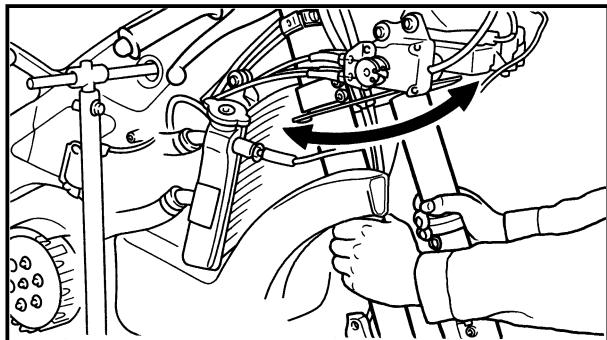


9. Install:
- Plain washer ①
 - Steering shaft nut ②

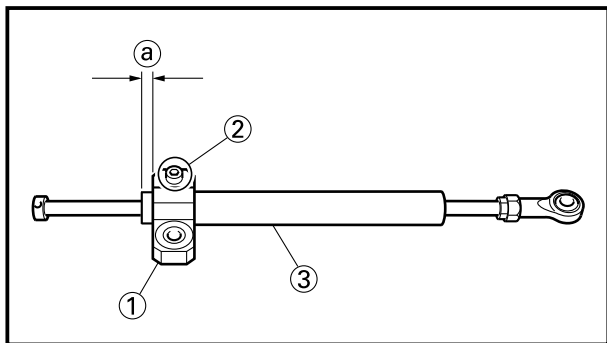
80 Nm (8.0 m•kg, 58 ft•lb)

NOTE:

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



10. After tightening the nut, check the steering for smooth movement. If not, adjust the steering by loosening the ring nut little by little.



11. Install:
- Steering damper bracket ①
 - Pinch bolt (steering damper bracket) ②

5 Nm (0.5 m•kg, 3.6 ft•lb)

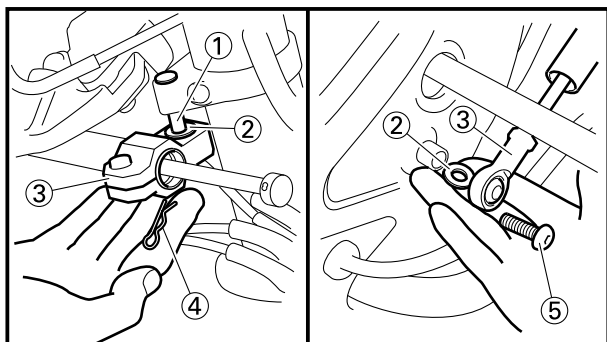
To steering damper ③.

NOTE:

When installing the steering damper bracket, provide a distance ① of 9 mm (0.35 in) from its edge.

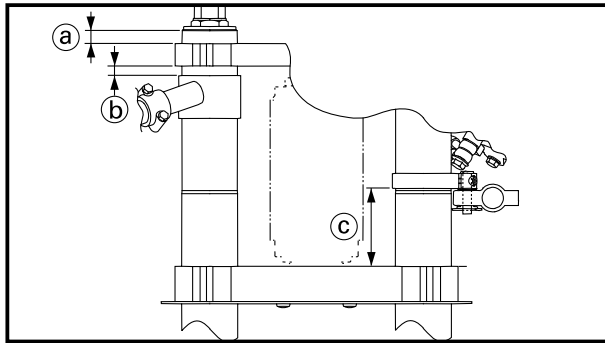
CAUTION:

Tighten the pinch bolt to specified torque. If torqued too much, it may cause the steering damper to malfunction.



12. Install:
- Pin ①
 - Plain washer ②
 - Steering damper ③
 - Clip ④
 - Bolt (steering damper) ⑤

23 Nm (2.3 m•kg, 17 ft•lb)



13.Adjust:

- Front fork top end ①
- Handlebar position ②
- Steering damper stay position ③ (right side only)



Front fork top end:

13 mm (0.51 in)

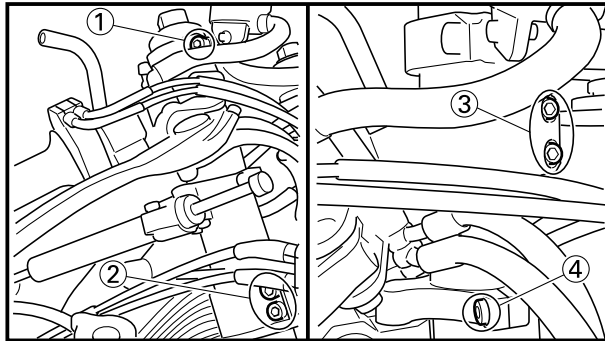
Handlebar position:

9 mm (0.35 in)

Steering damper stay position:

73 mm (2.87 in)

Refer to “FRONT FORK TOP END ADJUSTMENT” in the CHAPTER 3.



14.Tighten:

- Pinch bolt (handle crown) ①

20 Nm (2.0 m•kg, 14 ft•lb)

- Pinch bolt (under bracket) ②

23 Nm (2.3 m•kg, 17 ft•lb)

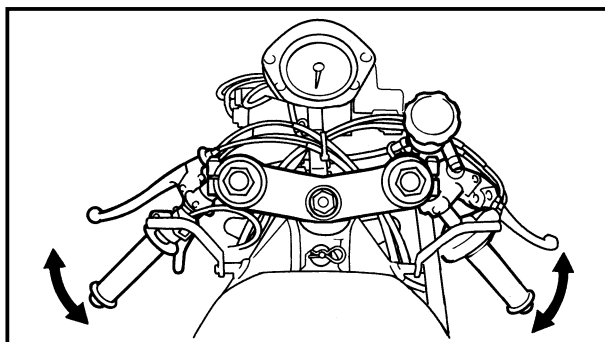
- Pinch bolt (handlebar) ③

7 Nm (0.7 m•kg, 5.1 ft•lb)

- Pinch bolt (steering damper stay) ④ (right side only)

10 Nm (1.0 m•kg, 7.2 ft•lb)

Refer to “FRONT FORK TOP END ADJUSTMENT” in the CHAPTER 3.



15.Check:

- Steering smooth action

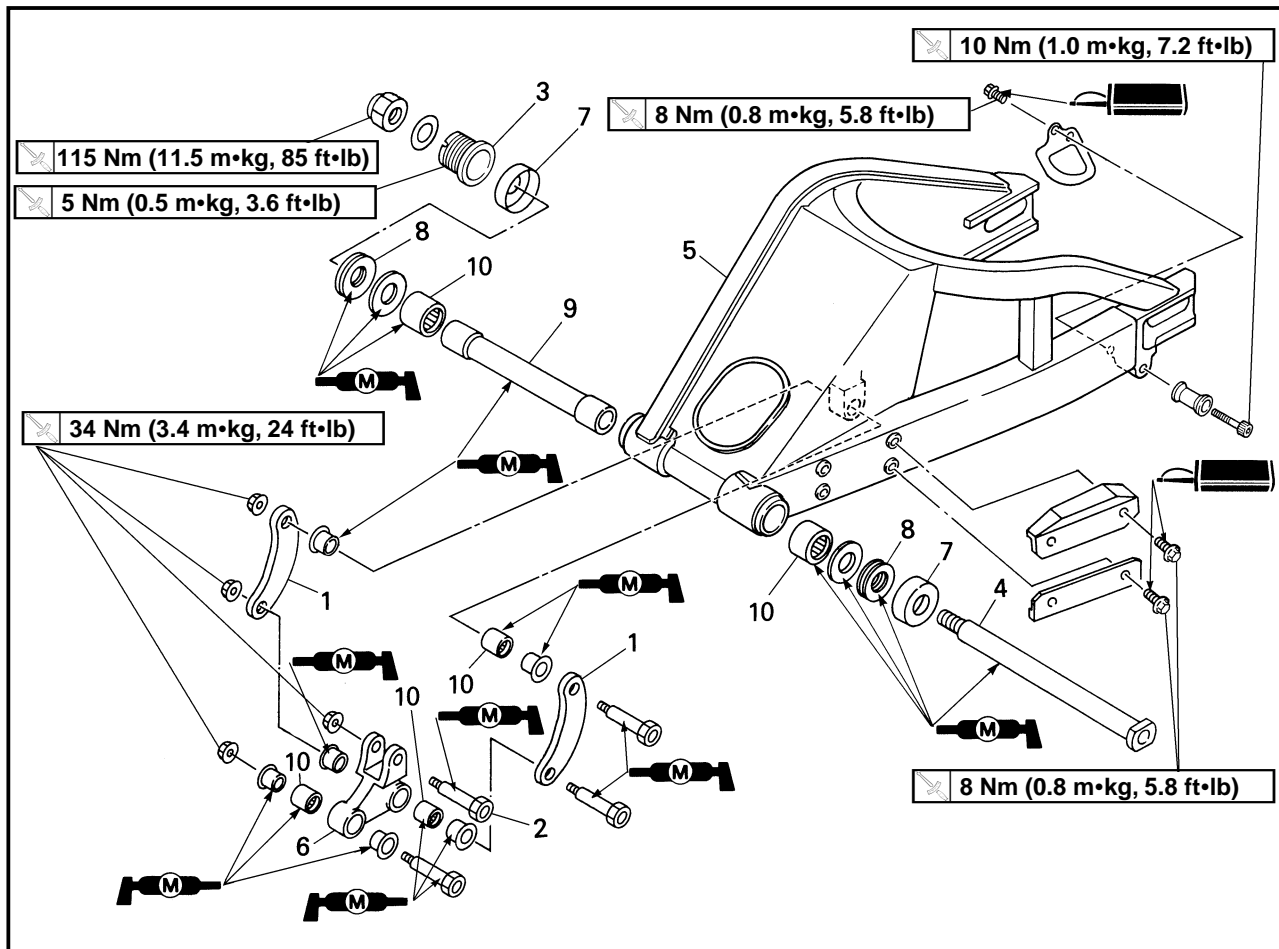
Turn the handlebar to make sure no parts are being contacted with others.

Contact → Repair.



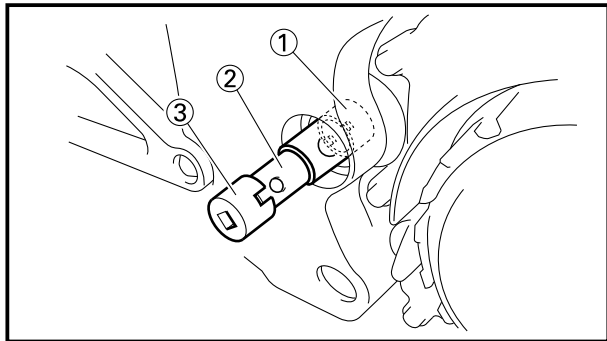
EC570000

SWINGARM



Extend of removal: ① Swingarm removal ② Swingarm disassembly

Extend of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		SWINGARM REMOVAL Hold the machine by placing the suitable stand. Lower cowl and fuel tank Exhaust pipe Brake hose holder Drive chain Rear wheel		⚠WARNING Support the machine securely so there is no danger of it falling over. Refer to "COWLING, INDUCTION GUIDE, SEAT AND FUEL TANK" section in the CHAPTER 4. Refer to "EXHAUST PIPE AND SILENCER" section. Refer to "FRONT BRAKE AND REAR BRAKE" section. Refer to "FRONT WHEEL AND REAR WHEEL" section.
<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> ↑ ① ↓ </div> <div style="text-align: center;"> ↑ ② ↓ </div> </div>	1 2 3 4 5 6 7 8 9 10	Connecting rod Bolt (rear shock absorber – relay arm) Pivot shaft adjust bolt Pivot shaft Swingarm Relay arm Cover Thrust bearing Bush Bearing	2 1 1 1 1 1 2 2 1 5	Hold the swingarm. } Use special tool. Refer to "REMOVAL POINTS". Refer to "REMOVAL POINTS".



EC573000

REMOVAL POINTS

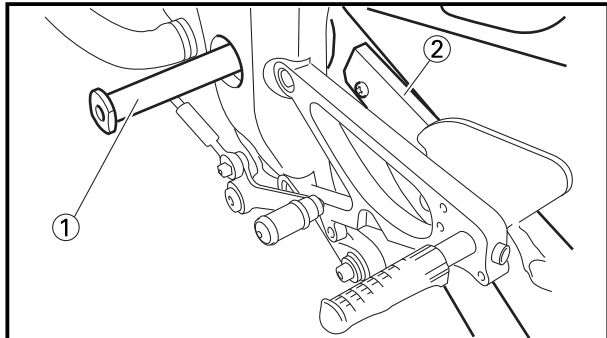
EC573153

Swingarm

1. Loosen:
 - Pivot shaft adjust bolt ①

NOTE:

Loosen the pivot shaft adjust bolt using the pivot shaft wrench ② and pivot shaft wrench adapter ③.



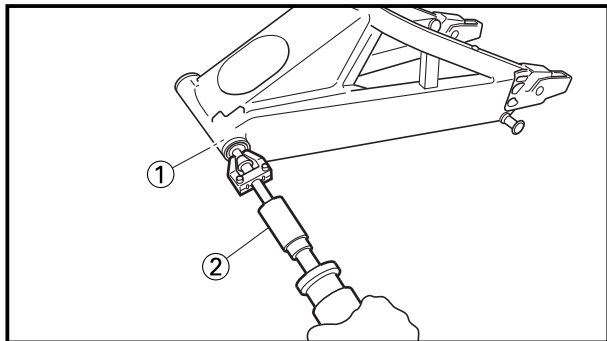
Pivot shaft wrench:

YM-1455/90890-01455

Pivot shaft wrench adapter:

YM-1476/90890-01476

2. Remove:
 - Pivot shaft ①
 - Swingarm ②

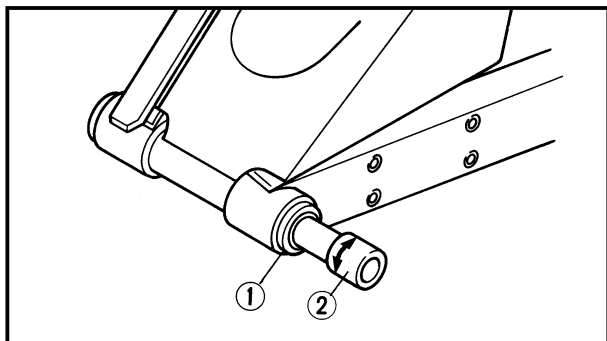


EC573210

Bearing

1. Remove:
 - Bearing ①

Use a general bearing puller ②.



EC574010

INSPECTION

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

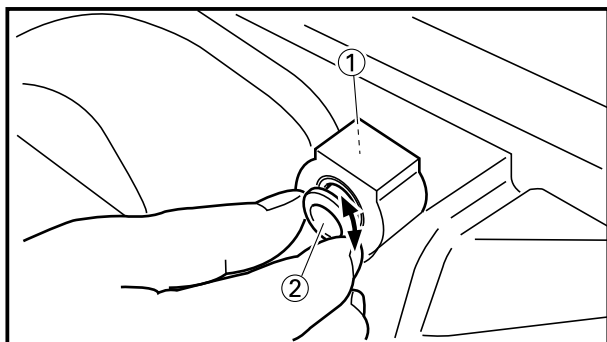
EC574131

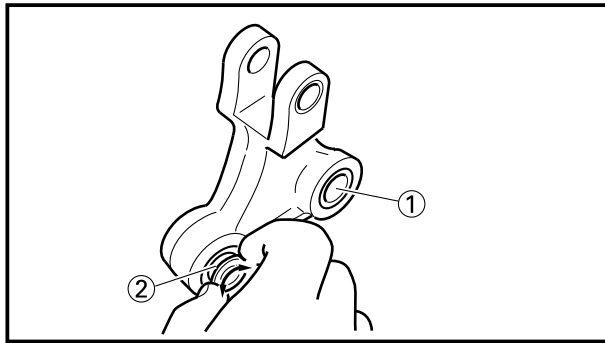
Swingarm

1. Inspect:
 - Bearing ①
 - Bush ②

Free play exists/Unsmooth revolution/Rust
→ Replace bearing and bush as a set.
2. Inspect:
 - Bearing ①
 - Collar ②

Free play exists/Unsmooth revolution/Rust
→ Replace bearing and collar as a set.





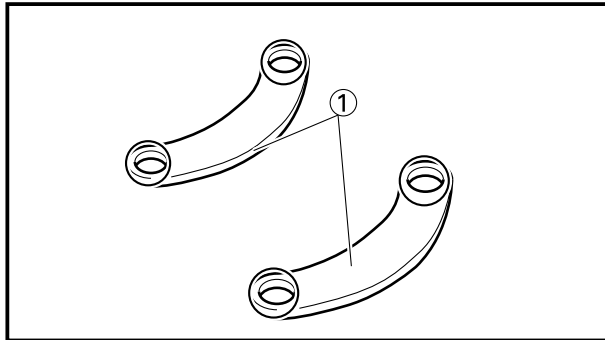
EC574220

Relay arm

1. Inspect:

- Bearing ①
- Collar ②

Free play exists/Unsmooth revolution/Rust
→ Replace bearing and collar as a set.



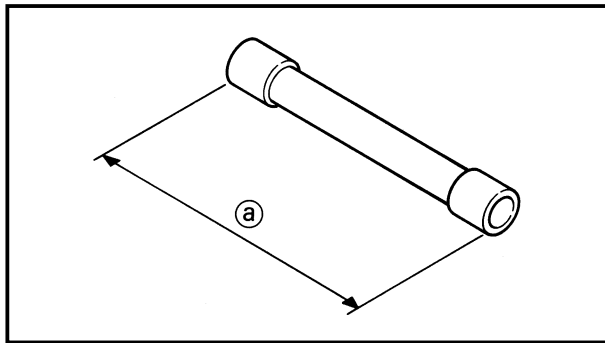
EC574320

Connecting rod

1. Inspect:

- Connecting rod ①

Wear/Damage → Replace.

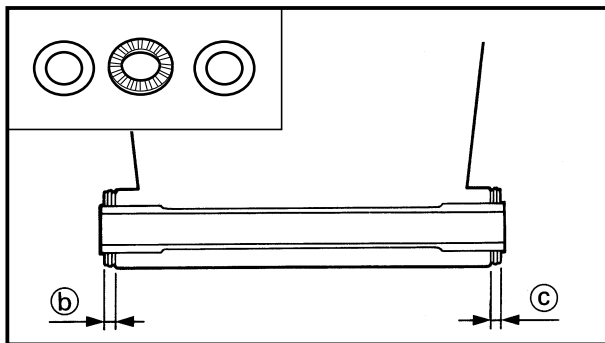


EC574520

Swingarm side clearance

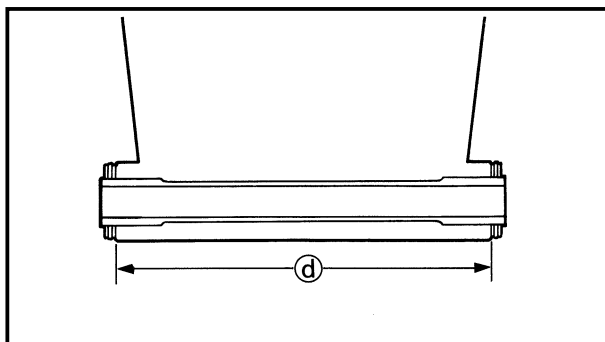
1. Measure:

- Bush length ①



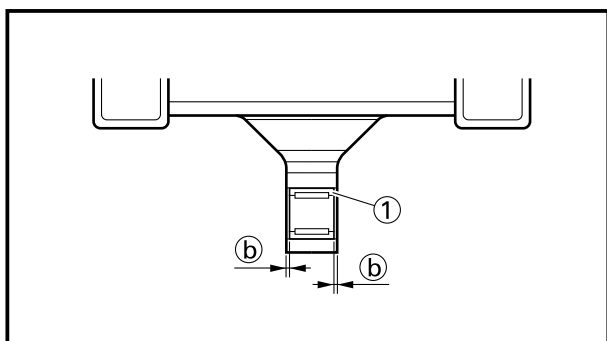
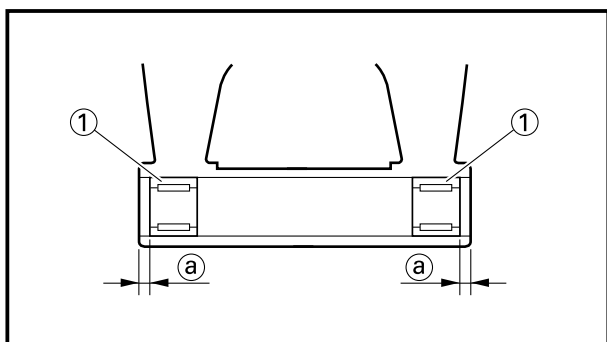
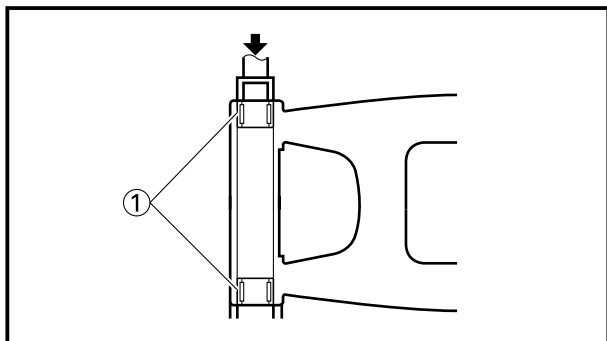
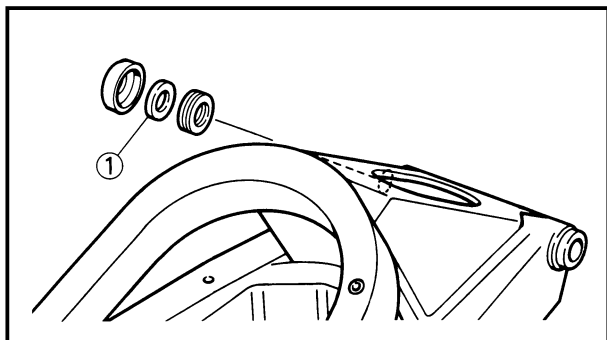
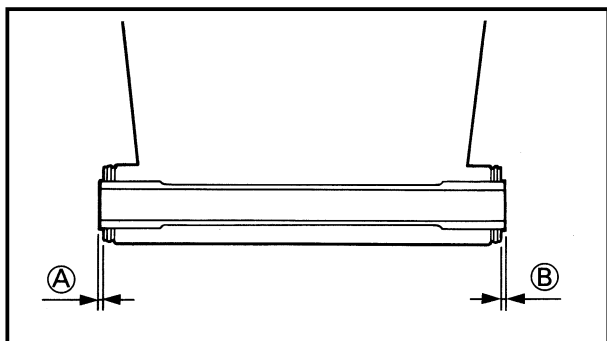
2. Measure:

- Thrust bearing (right) thickness ②
- Thrust bearing (left) thickness ③



3. Measure:


- Swingarm head pipe length ④



4. Calculate:

- Swingarm side clearance “(A + B)”
Out of specification → Adjust side clearance using shim.
By using formula given below.

$$“(A + B)” = a - (b + c + d)$$

 **Side clearance “(A + B)”:**
0.05~0.35 mm (0.002~0.014 in)

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

NOTE:

- The adjust shim is available only in the 0.3 mm (0.012 in)-thick type.
- When only one shim is required, install it on the left side, and when two shims are necessary, install them on both right and left sides.

EC575000

ASSEMBLY AND INSTALLATION


EC575300

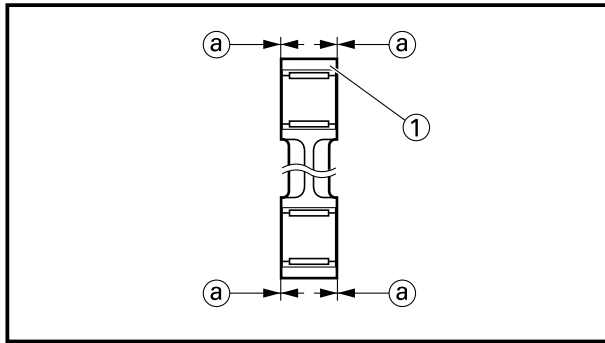
Bearing

1. Install:
 - Bearing ①
To swingarm.

NOTE:

- Apply the lithium soap base grease on the bearing when installing.
- Install the bearing by pressing it on the side having the manufacture’s marks or numbers.

 **Installed depth of bearings:**
For head pipe (a):
1.0 mm (0.04 in)
For connecting rod bracket (b):
0.5 mm (0.02 in)



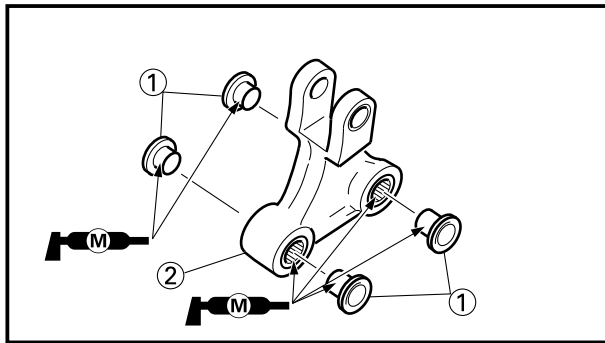
2. Install:
- Bearing ①
To relay arm.

NOTE:

- Apply the lithium soap base grease on the bearing when installing.
- Install the bearing by pressing it on the side having the manufacture's marks or numbers.



Installed depth of bearings ②:
Zero mm (Zero in)

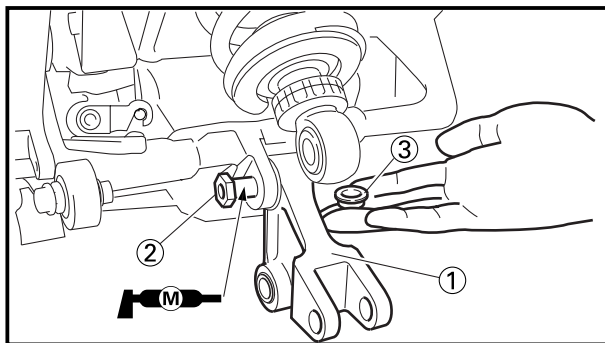


EC575142
Swingarm

1. Install:
- Collar ①
To relay arm ②.

NOTE:

Apply the molybdenum disulfide grease on the collars and bearings.

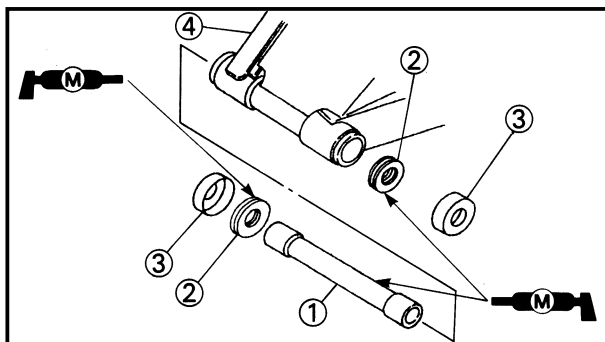


2. Install:
- Relay arm ①
 - Bolt (relay arm) ②
 - Nut (relay arm) ③

34 Nm (3.4 m•kg, 24 ft•lb)

NOTE:

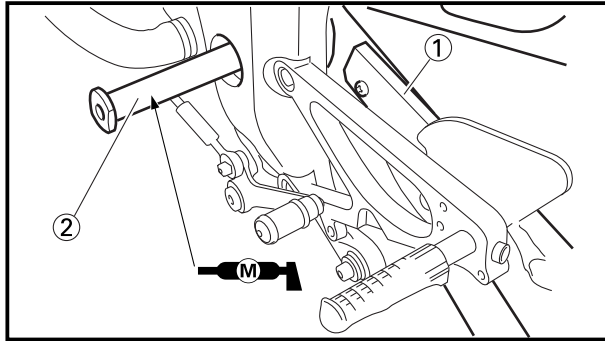
Apply the molybdenum disulfide grease on the bolt.



3. Install:
- Bush ①
 - Thrust bearing ②
 - Cover ③
To swingarm ④.

NOTE:

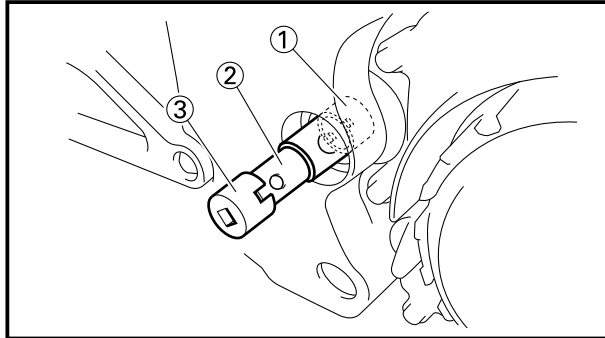
Apply the molybdenum disulfide grease on the bush, bearings and cover lips.



4. Install:
- Swingarm ①
 - Pivot shaft ②

NOTE:

- Apply the molybdenum disulfide grease on the pivot shaft.
- Insert the pivot shaft from left side.



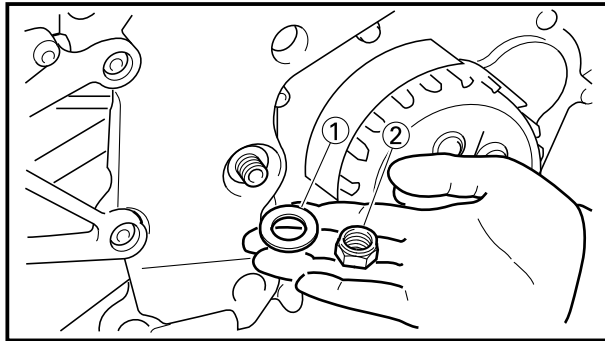
5. Tighten:

- Pivot adjust bolt ①

5 Nm (0.5 m•kg, 3.6 ft•lb)

NOTE:

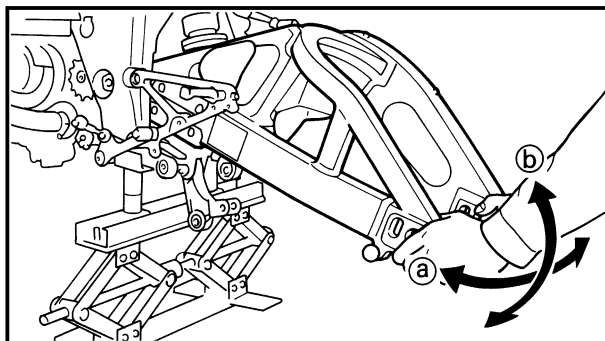
Use the pivot shaft wrench ② and pivot shaft wrench adapter ③ to tighten the pivot adjust bolt.



6. Install:

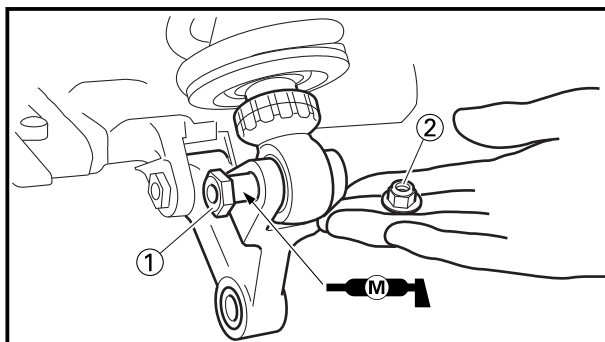
- Plain washer ①
- Nut (pivot shaft) ②

115 Nm (11.5 m•kg, 85 ft•lb)



7. Check:

- Swingarm side play (a)
Free play exists → Check side clearance.
- Swingarm up and down movement (b)
Unsmooth movement/Binding/Rough spots
→ Grease or replace bearings, bushes and collars.



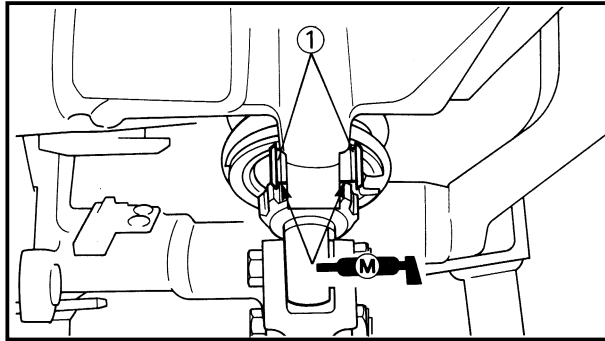
8. Install:

- Bolt (rear shock absorber – relay arm) ①
- Nut (rear shock absorber – relay arm) ②

34 Nm (3.4 m•kg, 24 ft•lb)

NOTE:

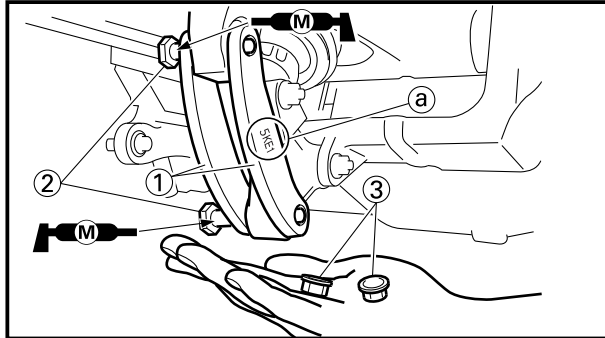
Apply the molybdenum disulfide grease on the bolt.



9. Install:
- Collar (swingarm) ①

NOTE:

Apply the molybdenum disulfide grease on the collars and bearings.



10. Install:
- Connecting rod ①
 - Bolt (connecting rod) ②
 - Nut (connecting rod) ③

34 Nm (3.4 m•kg, 24 ft•lb)

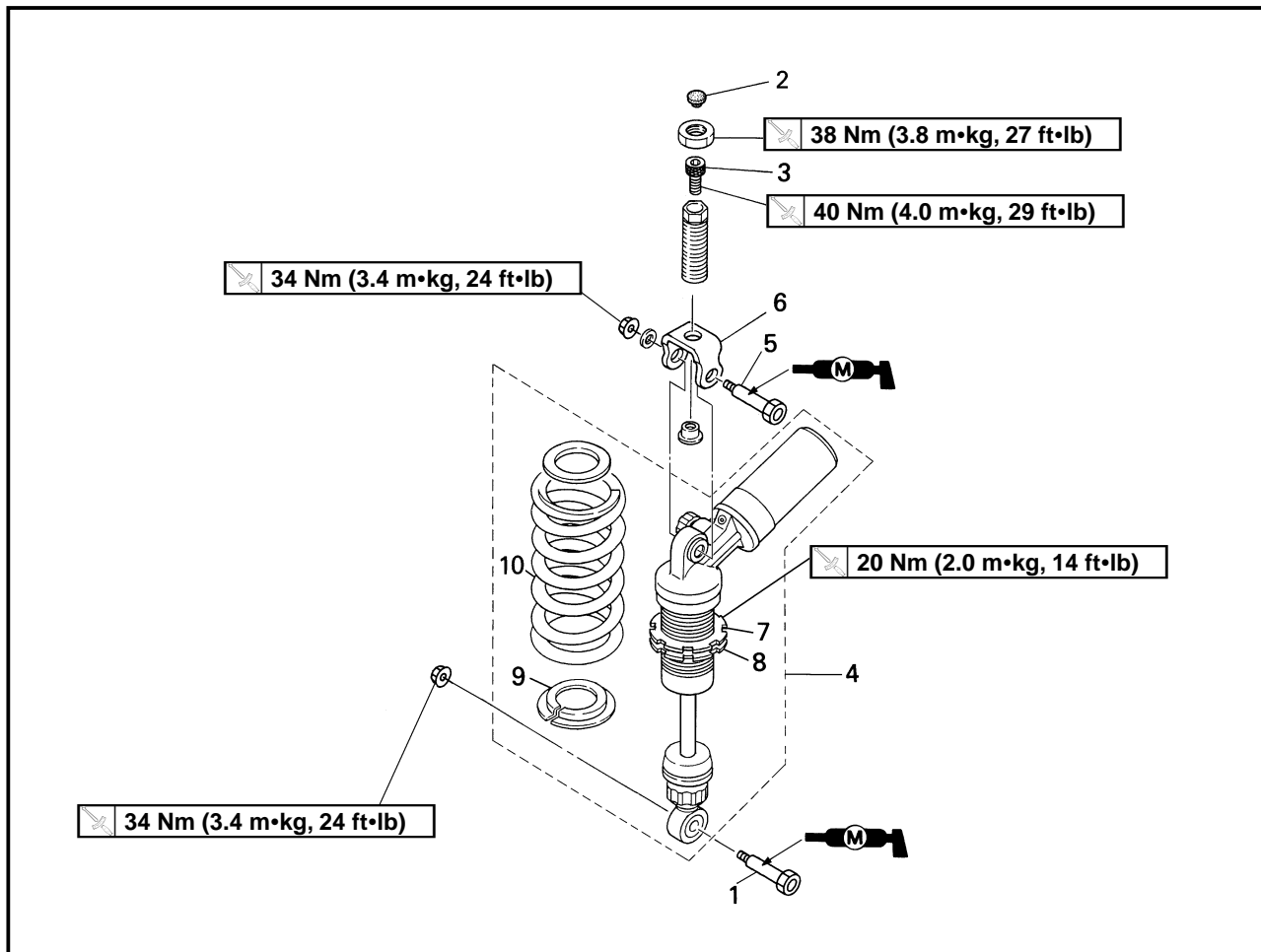
NOTE:

- Install the connecting rods with the mark ① outward of the chassis.
- Apply the molybdenum disulfide grease on the bolts.



EC580000

REAR SHOCK ABSORBER



Extend of removal: ① Rear shock absorber removal ② Rear shock absorber disassembly

Extend of removal	Order	Part name	Q'ty	Remarks
Preparation for removal		REAR SHOCK ABSORBER REMOVAL Hold the machine by placing the suitable stand. Lower cowl, seat and fuel tank Exhaust pipe		⚠WARNING Support the machine securely so there is no danger of it falling over. Refer to "COWLING, INDUCTION GUIDE SEAT AND FUEL TANK" section in the CHAPTER 4. Refer to "EXHAUST PIPE AND SILENCER" section in the CHAPTER 4.
	①	1 Bolt (rear shock absorber – relay arm) 2 Cap 3 Bolt (Upper bracket) 4 Rear shock absorber 5 Bolt (rear shock absorber – upper bracket) 6 Upper bracket 7 Locknut 8 Adjuster 9 Spring guide 10 Spring (rear shock absorber)	1 1 1 1 1 1 1 1 1 1	Hold the swingarm. Refer to "REMOVAL POINTS". Loosen. Loosen.



EC586000

HANDLING NOTE

⚠WARNING

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

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

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

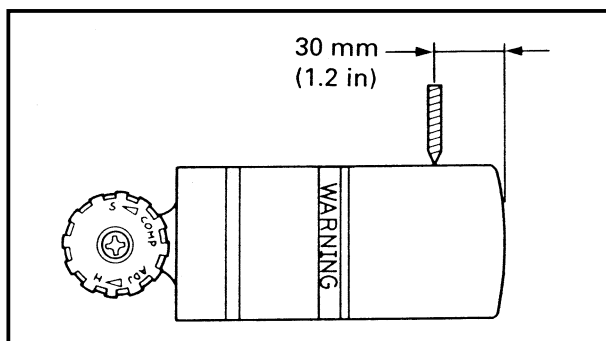
EC587011

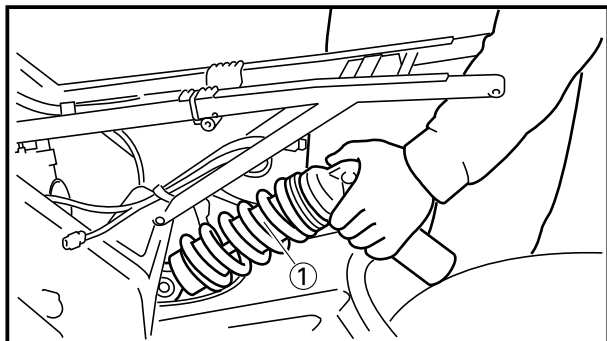
NOTES ON DISPOSAL (YAMAHA DEALERS ONLY)

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

⚠WARNING

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





EC583000

REMOVAL POINTS

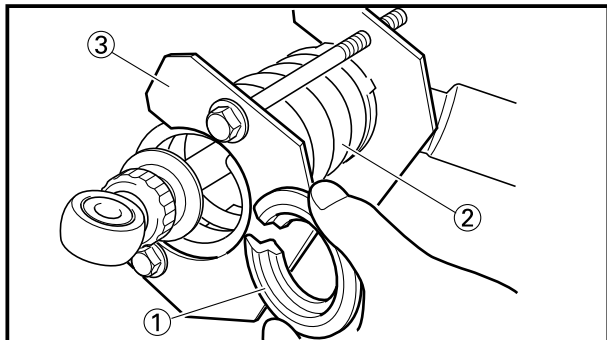
EC583160

Rear shock absorber

1. Remove:
 - Rear shock absorber ①

NOTE:

Remove the rear shock absorber between the rear frame and swingarm.



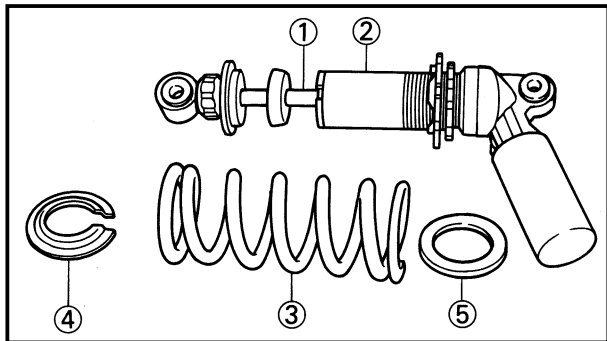
EC583221

Spring (rear shock absorber)

1. Remove:
 - Spring guide ①
 - Spring ②

NOTE:

Remove the spring guide while compressing the spring by using the spring compressor ③.



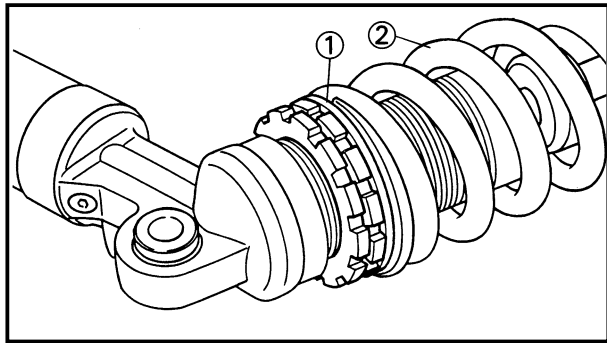
EC584000

INSPECTION

EC584130

Rear shock absorber

1. Inspect:
 - Damper rod ①
Bends/Damage → Replace absorber assembly.
 - Shock absorber ②
Oil leaks → Replace absorber assembly.
Gas leaks → Replace absorber assembly.
 - Spring ③
Damage → Replace spring.
Fatigue → Replace spring.
Move spring up and down.
 - Spring guide ④
Wear/Damage → Replace spring guide.
 - Plate ⑤
Wear/Damage → Replace plate.



EC585000

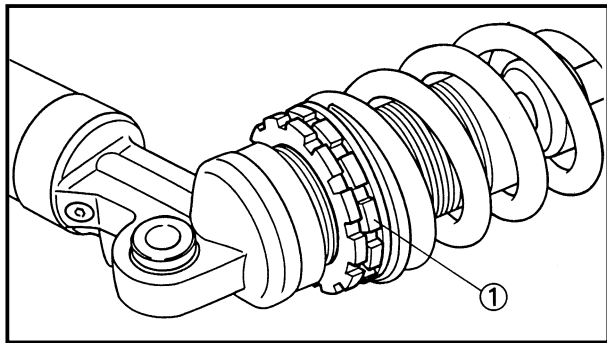
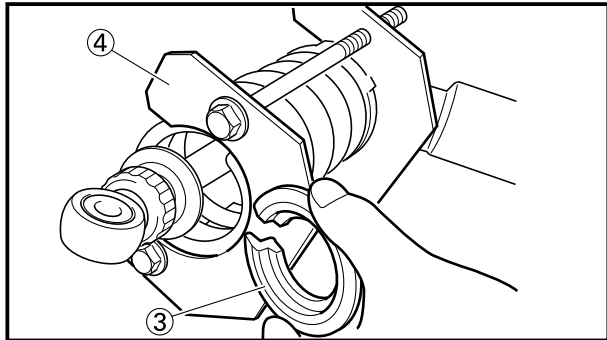
ASSEMBLY AND INSTALLATION

EC585143

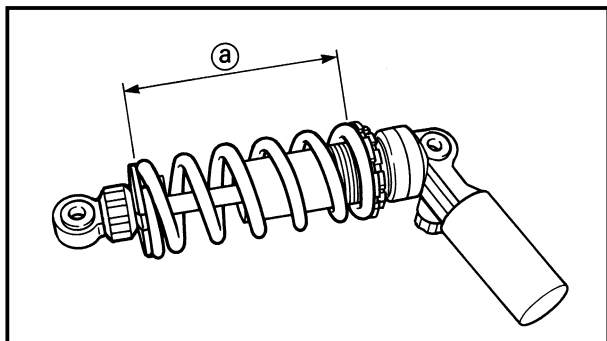
Spring (rear shock absorber)

1. Install:
 - Plate ①
 - Spring ②
 - Spring guide ③

NOTE: _____
 Install the spring guide while compressing the spring by using the spring compressor ④.



2. Tighten:
 - Adjuster ①

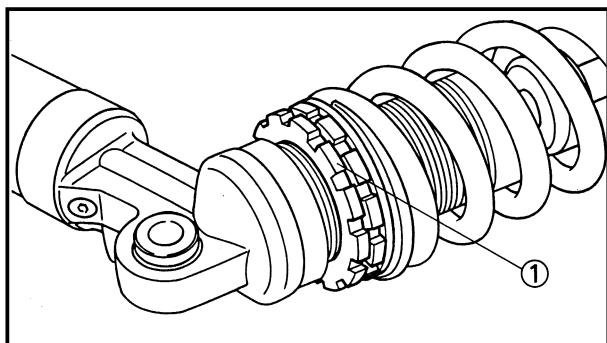


3. Adjust:
 - Spring length (installed) ①

Spring length (installed) ①:	
Standard length	Extent of adjustment
137 mm (5.39 in)	133~142 mm (5.24~5.59 in)

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

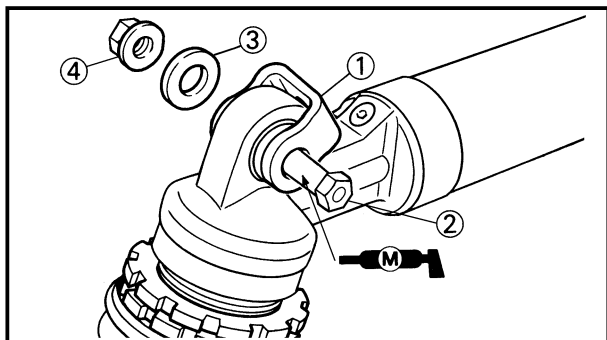
CAUTION: _____
Never attempt to turn the adjuster beyond the maximum or minimum setting.



4. Tighten:

- Locknut ①

20 Nm (2.0 m•kg, 14 ft•lb)



EC5852A1

Rear shock absorber

1. Install:

- Upper bracket ①
- Bolt (rear shock absorber – upper bracket) ②
- Plain washer (rear shock absorber – upper bracket) ③
- Nut (rear shock absorber – upper bracket) ④

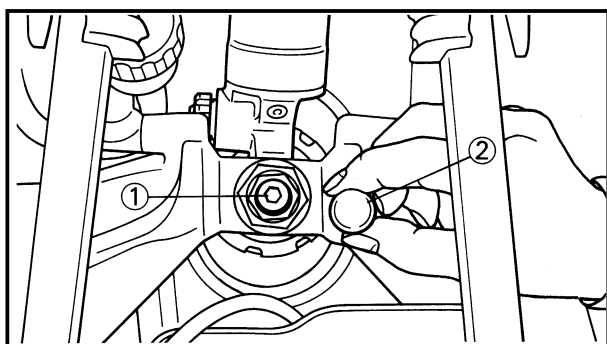
34 Nm (3.4 m•kg, 24 ft•lb)

NOTE:

Apply the molybdenum disulfide grease on the bolt.

2. Install:

- Rear shock absorber

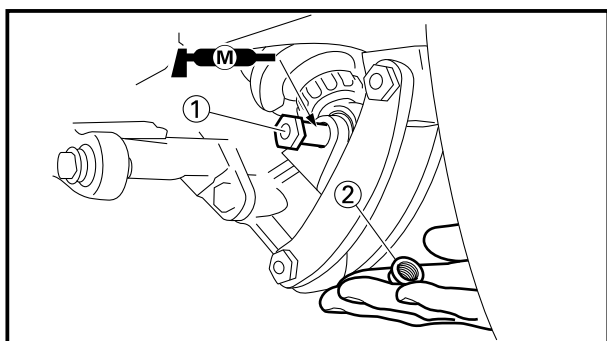


3. Install:

- Bolt (upper bracket) ①

40 Nm (4.0 m•kg, 29 ft•lb)

- Cap ②



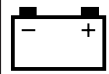
4. Install:

- Bolt (rear shock absorber – relay arm) ①
- Nut (rear shock absorber – relay arm) ②

34 Nm (3.4 m•kg, 24 ft•lb)

NOTE:

Apply the molybdenum disulfide grease on the bolt.



EC600000

ELECTRICAL

EC610000

ELECTRICAL COMPONENTS AND WIRING DIAGRAM

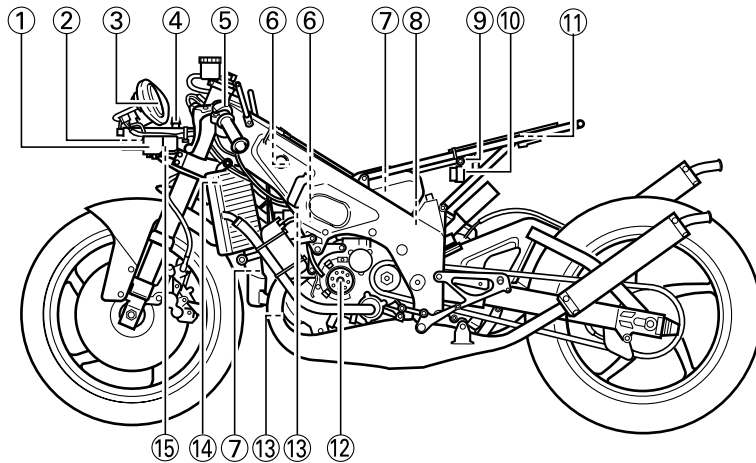
EC611000

ELECTRICAL COMPONENTS

- | | |
|-----------------------|-------------------------|
| ① CDI unit | ⑨ Fuel pump relay |
| ② Voltage regulator | ⑩ Fuel pump stop switch |
| ③ Tachometer assembly | ⑪ Battery |
| ④ Fuse | ⑫ CDI magneto |
| ⑤ Main switch | ⑬ Spark pulg |
| ⑥ Ignition coil | ⑭ Thermo unit |
| ⑦ Solenoid valve | ⑮ Servomotor |
| ⑧ Fuel pump | |

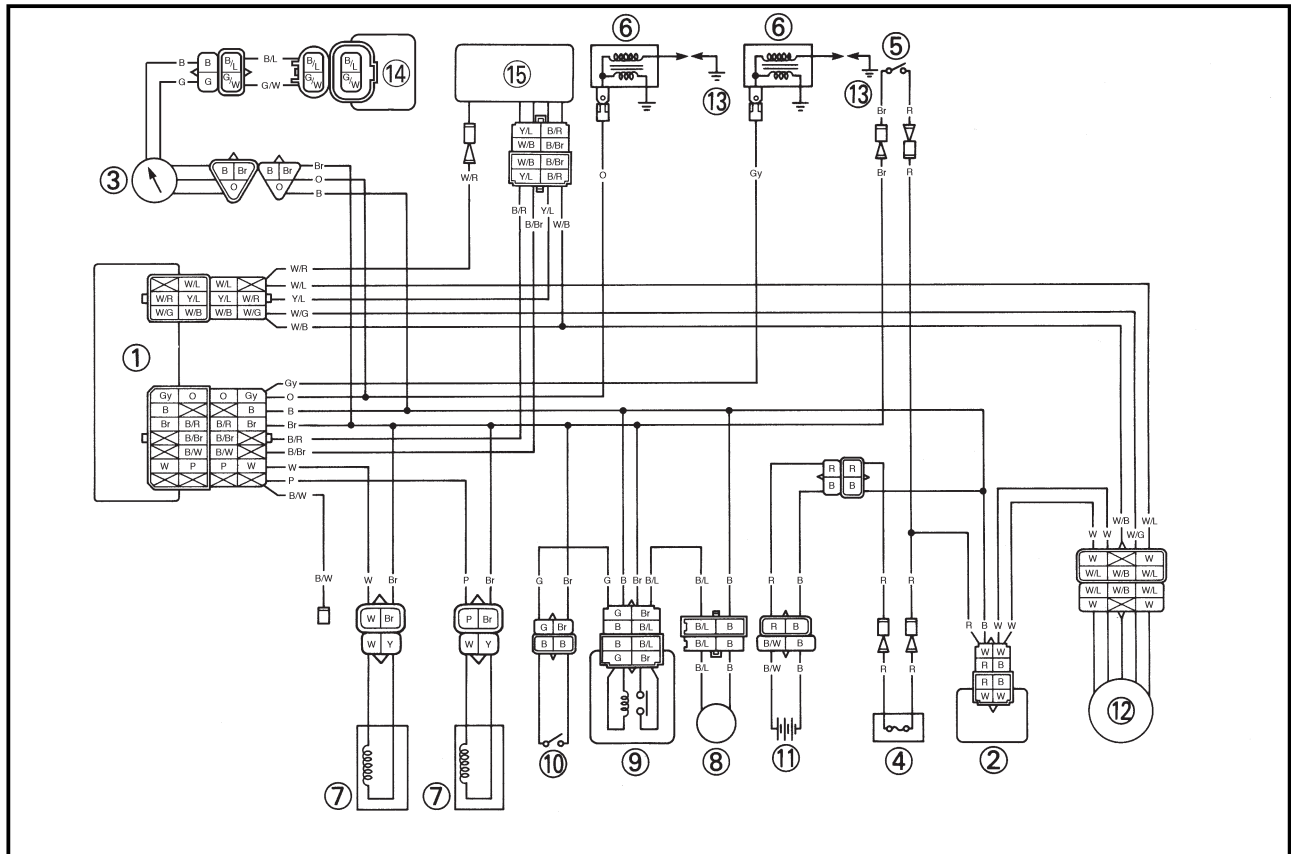
COLOR CODE

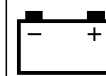
- | | |
|-------------------------|------------------------|
| BBlack | B/LBlack/Blue |
| BrBrown | B/RBlack/Red |
| GGreen | B/WBlack/White |
| GyGray | G/WGreen/White |
| OOrange | W/BWhite/Black |
| PPink | W/GWhite/Green |
| RRed | W/LWhite/Blue |
| YYellow | W/RWhite/Red |
| WWhite | Y/LYellow/Blue |
| B/BrBlack/Brown | |



EC612000

WIRING DIAGRAM





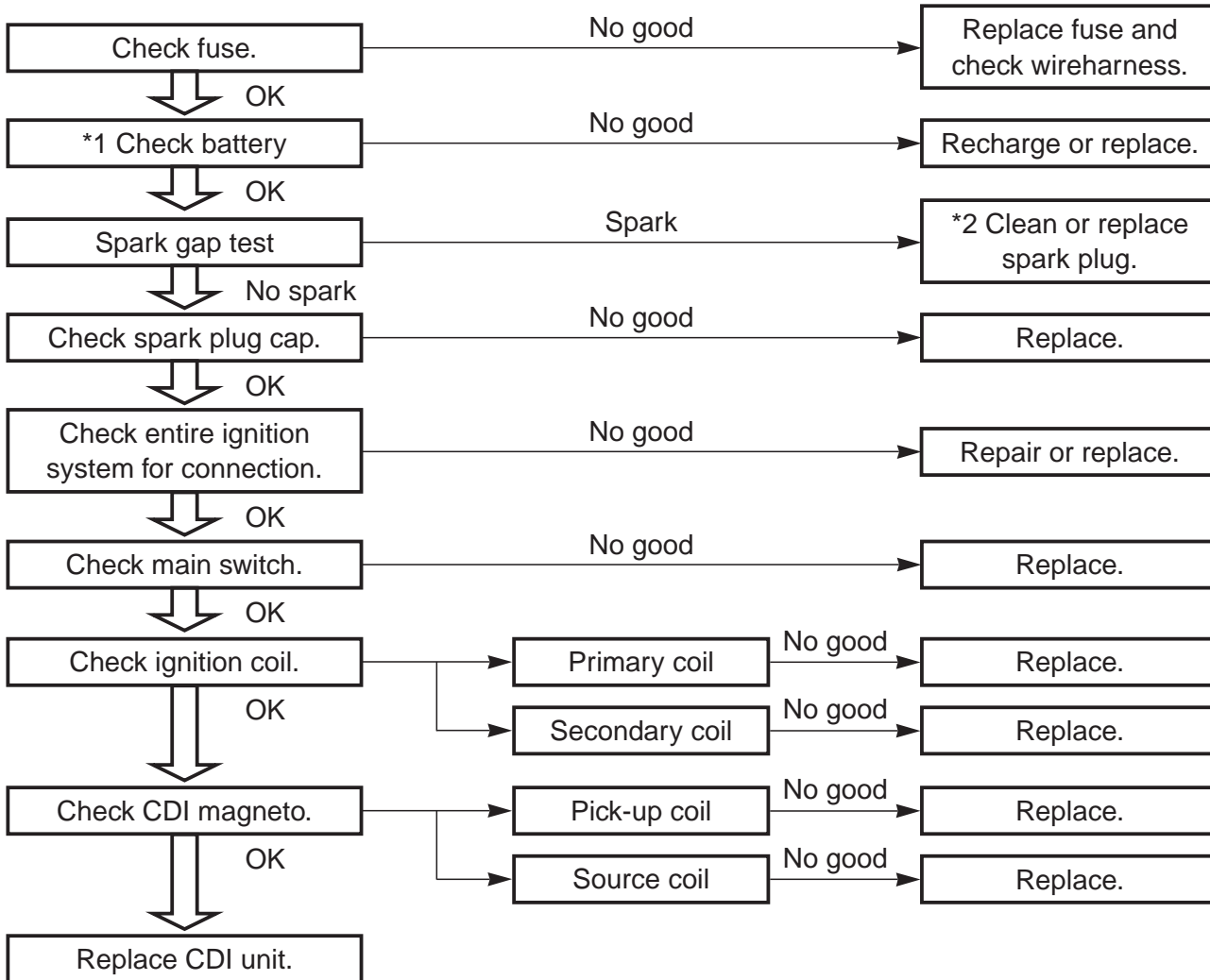
EC620000

IGNITION SYSTEM

EC621031

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.



***1 marked : Refer to “BATTERY INSPECTION” section in the CHAPTER 3.**

***2 marked : Only when the ignition checker is used.**

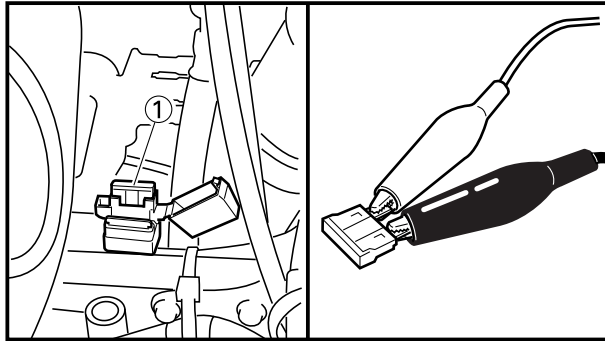
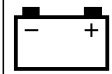
NOTE:

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

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

	Pocket tester: YU-3112-C/90890-03112
--	---

6



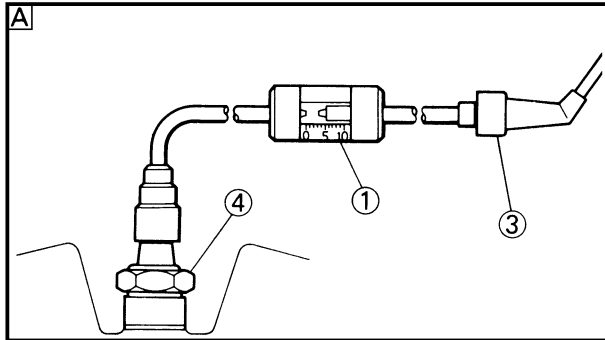
EC629000

FUSE INSPECTION

1. Remove:
 - Fuse ①
2. Check:
 - Fuse conduct

Use pocket tester (tester selector position $\Omega \times 1$).

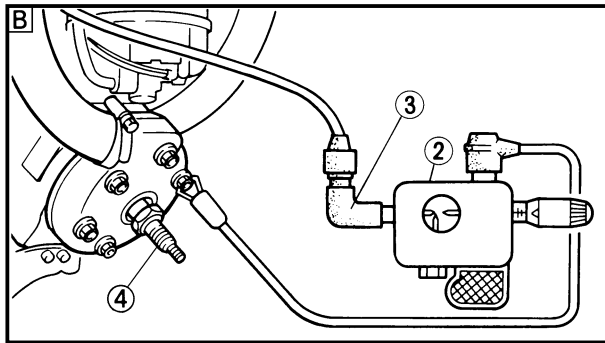
Not continuous → Replace fuse and check that the wireharness is not shorted.



EC622020

SPARK GAP TEST

1. Disconnect the fuel pump coupler to prevent the fuel pump operating.
2. Disconnect the spark plug cap from spark plug.
3. Connect the dynamic spark tester ① (ignition checker ②) as shown.
 - Spark plug cap ③
 - Spark plug ④



Ⓐ For USA and CDN

Ⓑ Except for USA and CDN

4. Start the engine and increase the spark gap until misfire occurs. (for USA and CDN)
5. Move the main switch to "RUN" and rotate the rear wheel with gear in 3rd and check the spark gap. (except for USA and CDN)



Minimum spark gap:
5.0 mm(0.20 in)

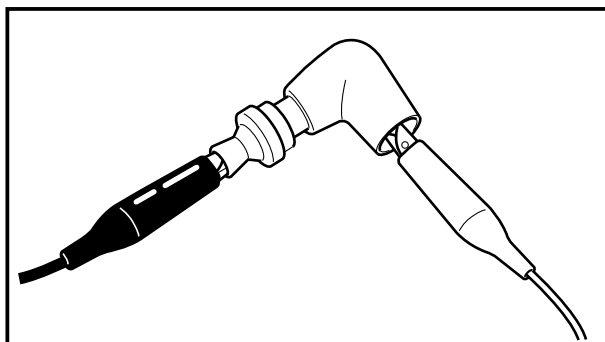
EC623001

SPARK PLUG CAP INSPECTION

1. Remove:
 - Spark plug cap


CAUTION:

Do not pull the spark plug lead out of the spark plug cap. Turn the spark plug cap counterclockwise to remove it and clockwise to install it.



2. Check:
 - Spark plug cap resistance

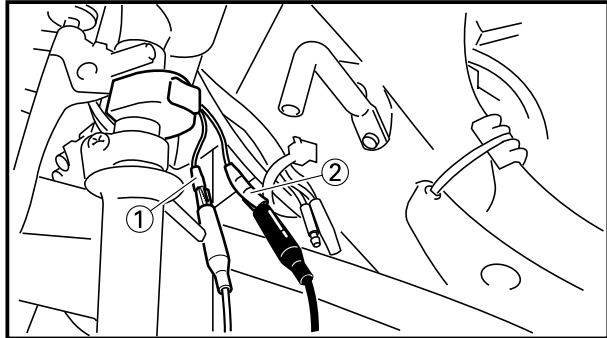
Out of specification → Replace.

	Spark plug cap resistance	Tester selector position
	4~6 k Ω at 20°C (68°F)	k $\Omega \times 1$

EC624000

COUPLERS AND LEADS CONNECTION INSPECTION

1. Check:
 - Couplers and leads connection
Rust/ Dust/ Looseness/Short-circuit → Repair or replace.




EC62A000

MAIN SWITCH INSPECTION

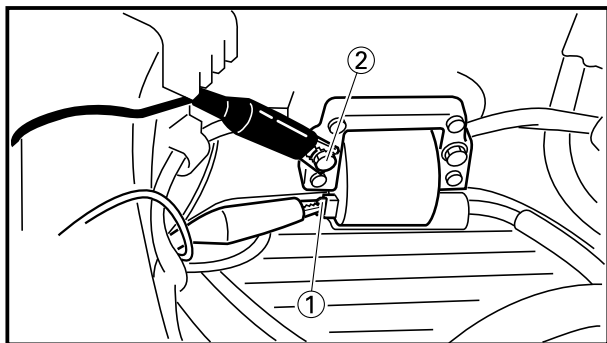
1. Inspect:
 - Main switch conduct

Tester (+) lead → Red lead ①
Tester (-) lead → Brown lead ②

	R ①	Br ②	Tester selector position
	○ — ○		$\Omega \times 1$
	RUN		
	OFF		

Continuous while the main switch is moved to "OFF" → Replace.

Not continuous while the main switch is moved to "RUN" → Replace.




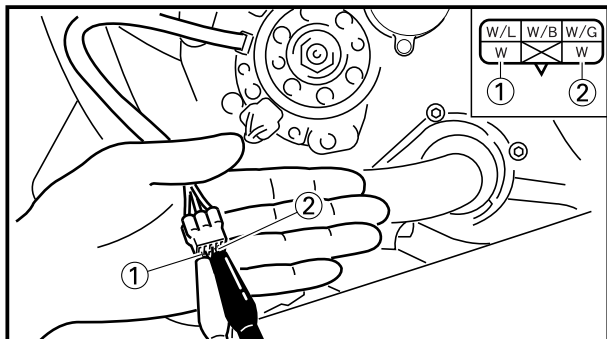
EC626002

IGNITION COIL INSPECTION

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

Tester (+) lead → Orange (Gray) lead ①
Tester (-) lead → Black lead ②

	Primary coil resistance	Tester selector position
	0.14~0.18 Ω at 20°C (68°F)	$\Omega \times 1$



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

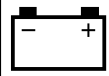
Tester (+) lead → White lead ①
Tester (-) lead → White lead ②

	Source coil resistance	Tester selector position
	2.3~3.5 Ω at 20°C (68°F)	Ω × 1

EC628000

CDI UNIT INSPECTION

Check all electrical components. If no fault is found, replace the CDI unit. Then check the electrical components again.



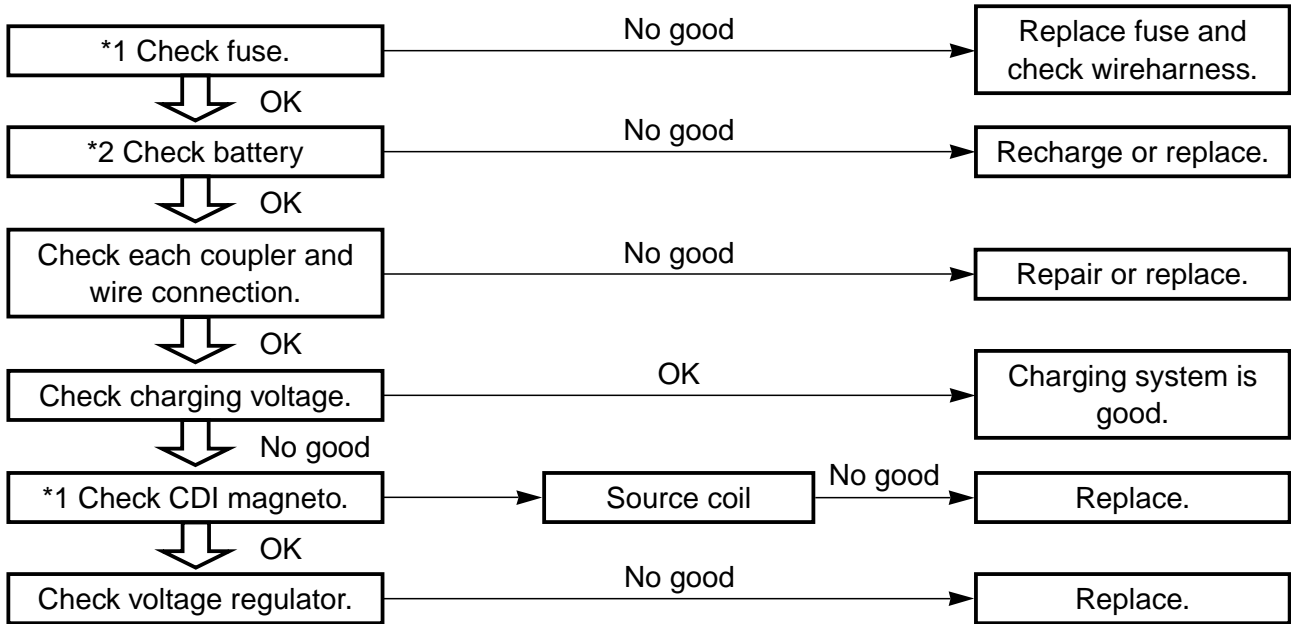
EC680000

CHARGING SYSTEM

EC681001

INSPECTION STEPS

If the battery is not charged, use the following inspection steps.



***1 marked : Refer to "IGNITION SYSTEM" section.**

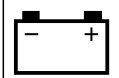
***2 marked : Refer to "BATTERY INSPECTION" section in the CHAPTER 3.**

NOTE:

- Remove the following parts before inspection.
 - 1) Cowling
 - 2) Fuel tank
- Use the following special tool in this inspection.

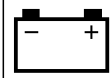


Pocket tester:
YU-3112-C/90890-03112



NOTE: _____

If nothing is wrong with the continuity of the voltage regulator and with all the others in the charging system, replace the voltage regulator.



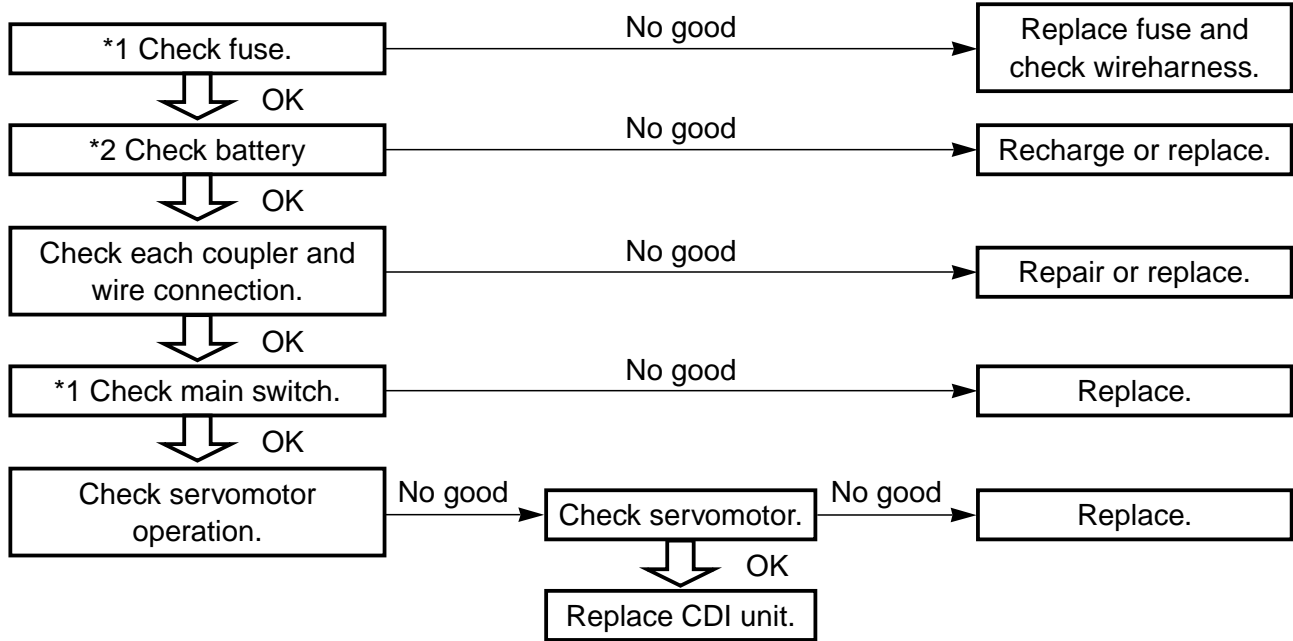
EC640000

YPVS SYSTEM

EC641021

INSPECTION STEPS

If the servomotor will not turn, use the following inspection steps.



***1 marked :** Refer to “IGNITION SYSTEM” section.

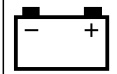
***2 marked :** Refer to “BATTERY INSPECTION” section in the CHAPTER 3.

NOTE:

- Remove the following parts before inspection.
 - 1) Cowling
 - 2) Fuel tank
- Use 12V battery in this inspection.
- Use the following special tool in this inspection.



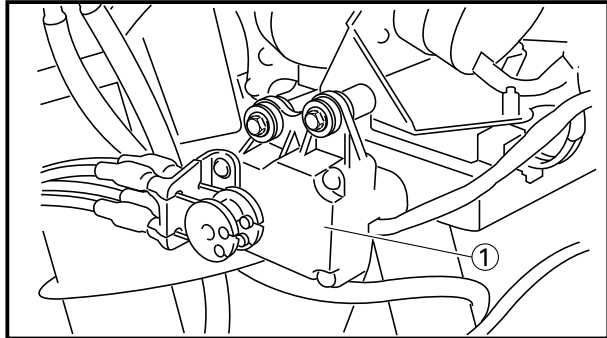
Pocket tester:
YU-3112-C/90890-03112



EC624000

COUPLERS AND LEADS CONNECTION INSPECTION

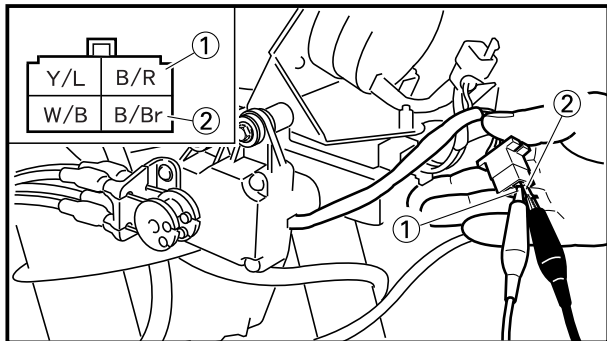
1. Check:
 - Couplers and leads connection
Rust/ Dust/ Looseness/Short-circuit →
Repair or replace.



EC642020

SERVOMOTOR OPERATION

1. Disconnect the fuel pump coupler to prevent the fuel pump operating.
2. Inspect:
 - Servomotor ①
Operative when the main switch is moved to "RUN" → OK

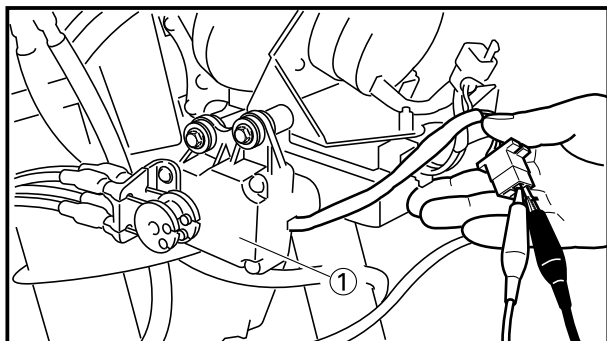


EC643001

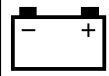
SERVOMOTOR INSPECTION

1. Disconnect the YPVS cable from the servomotor.
2. Disconnect the servomotor lead.
3. Connect 12V battery to the servomotor lead.

Battery (+) lead → Black/Red lead ①
Battery (-) lead → Black/Brown lead ②



4. Inspect:
 - Servomotor ①
Not operate → Replace servomotor.



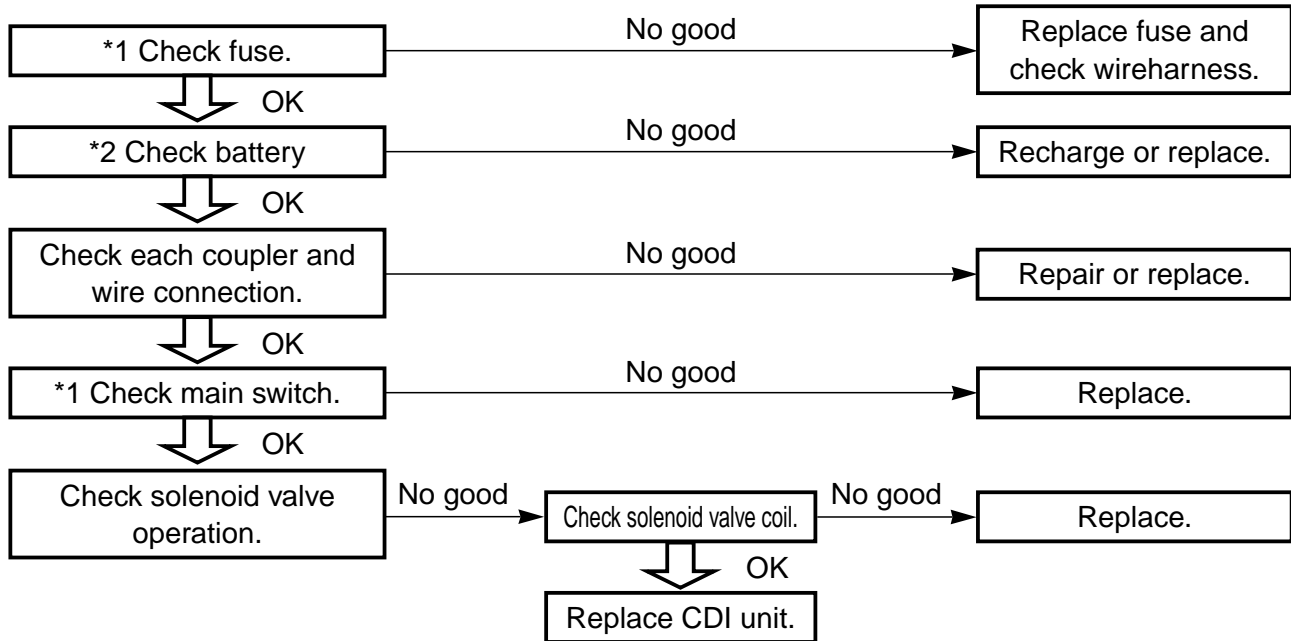
EC650001

SOLENOID VALVE SYSTEM

EC651021

INSPECTION STEPS

If the solenoid valve will not operate, use the following inspection steps.



*1 marked : Refer to "IGNITION SYSTEM" section.

*2 marked : Refer to "BATTERY INSPECTION" section in the CHAPTER 3.

NOTE:

• Remove the following parts before inspection.

1) Cowling

2) Fuel tank

3) Induction cap (left cylinder)

4) Induction guide (right cylinder)

5) Seat

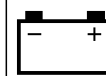
• Use 12V battery in this inspection.

• Use the following special tools in this inspection.



Pocket tester:

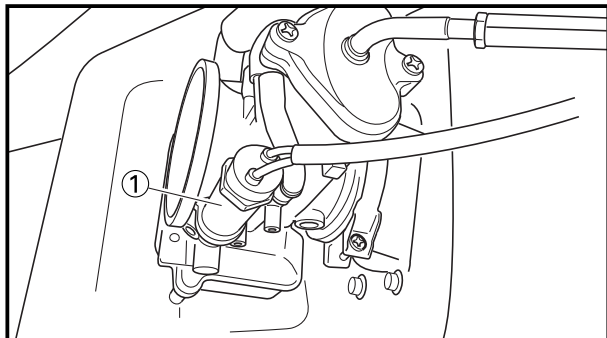
YU-3112-C/90890-03112



EC624000

COUPLERS AND LEADS CONNECTION INSPECTION

1. Check:
 - Couplers and leads connection
Rust/ Dust/ Looseness/Short-circuit → Repair or replace.



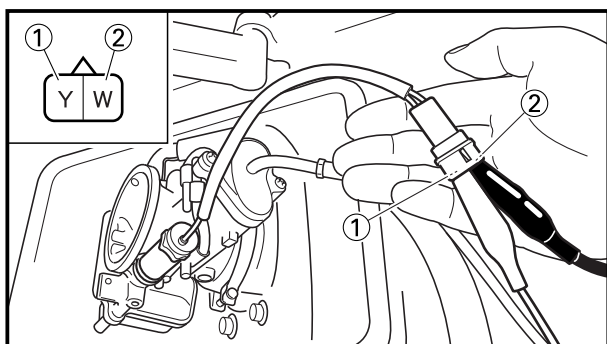
EC652020

SOLENOID VALVE OPERATION

1. Disconnect the fuel pump and servomotor coupler to prevent the fuel pump and servomotor operating.
2. Inspect:
 - Solenoid valve ①
Click when the main switch is moved to "RUN" → OK

NOTE:

Before checking the solenoid valve, disconnect the other solenoid valve lead.




EC653002

SOLENOID VALVE COIL INSPECTION

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

Tester (+) lead → Yellow lead ①
Tester (-) lead → White lead ②

	Solenoid resistance	Tester selector position
	52.0~63.6 Ω at 20°C (68°F)	Ω × 10

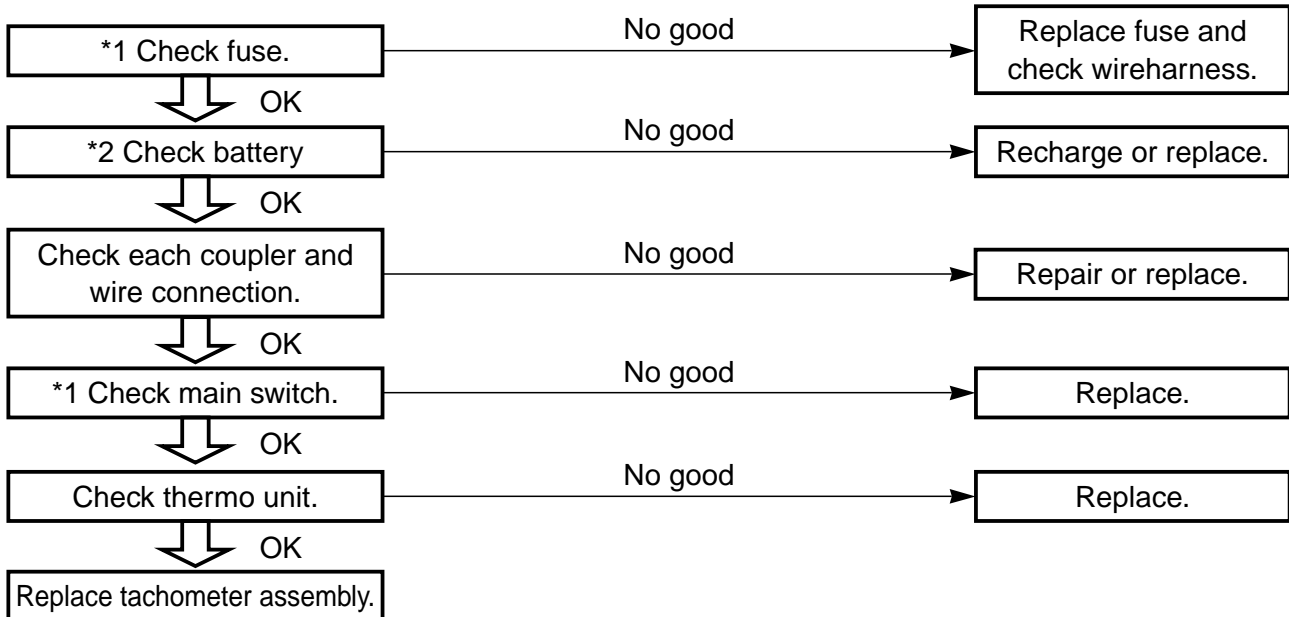
EC6A0000

THERMO UNIT SYSTEM

EC6A1011

INSPECTION STEPS

If the water temperature gauge (thermo unit) will not operate, use the following inspection steps.



*1 marked : Refer to “IGNITION SYSTEM” section.

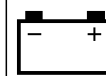
*2 marked : Refer to “BATTERY INSPECTION” section in the CHAPTER 3.

NOTE:

- Remove the following parts before inspection.
 - 1) Cowling
- Use the following special tools in this inspection.



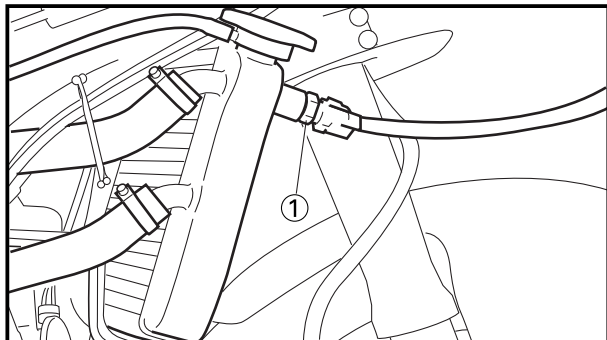
Pocket tester:
YU-3112-C/90890-03112



EC624000

COUPLERS AND LEADS CONNECTION INSPECTION

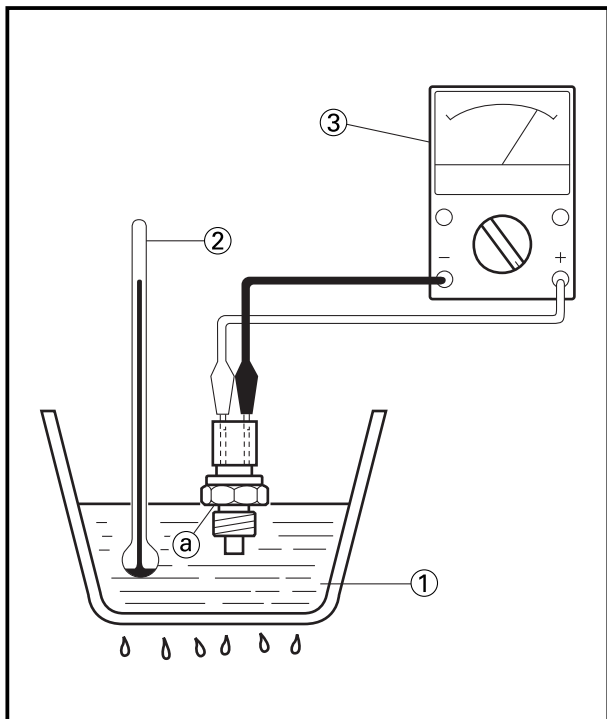
1. Check:
 - Couplers and leads connection
Rust/ Dust/ Looseness/Short-circuit → Repair or replace.




EC6A2000

THERMO UNIT INSPECTION

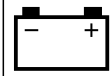
1. Drain the cooling water.
2. Remove:
 - Thermo unit ①



3. Immerse the thermo unit with a tester lead connected in a container containing cooling (tap) water ① down to the upper threaded portion ③.
 - ② Water temperature gauge
 - ③ Poket tester
4. Inspect:
 - Thermo unit resistance
Measure the resistance while gradually heating the cooling water.
Out of specification → Replace .

	Cooling water temperature	Thermo unit resistance	Tester selector position
	50°C (122°F)	9.72~11.4 kΩ	kΩ × 1
	80°C (176°F)	3.41~4.01 kΩ	

NOTE: Do not allow the thermo unit to contact the test container bottom.



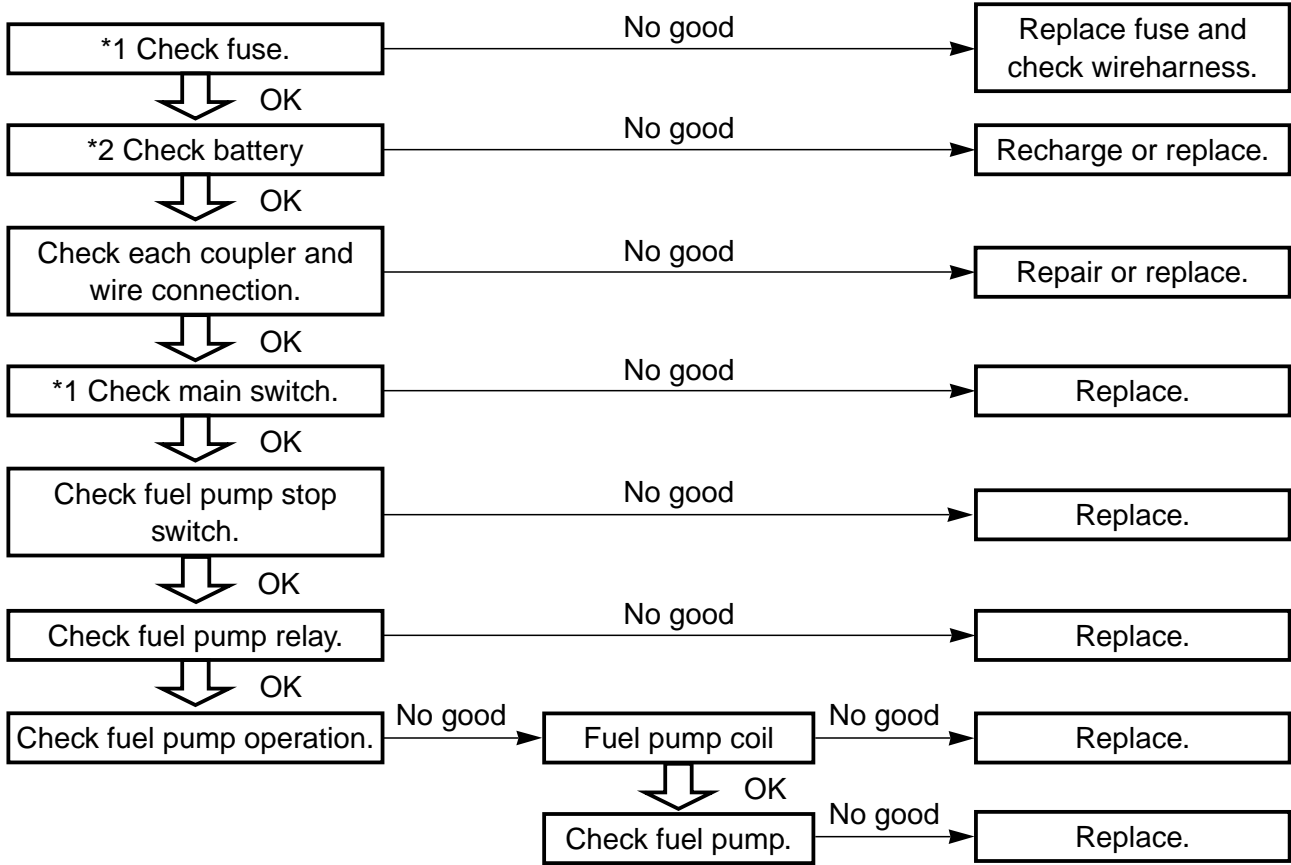
EC670000

FUEL PUMP SYSTEM

EC671001

INSPECTION STEPS

If the fuel pump will not operate, use the following inspection steps.



*1 marked : Refer to “IGNITION SYSTEM” section.

*2 marked : Refer to “BATTERY INSPECTION” section in the CHAPTER 3.

NOTE:

• Remove the following parts before inspection.

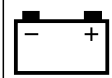
- 1) Cowling
- 2) Fuel tank
- 3) Seat
- 4) Induction cap (left cylinder)

• Use 12V battery in this inspection.

• Use the following special tool in this inspection.



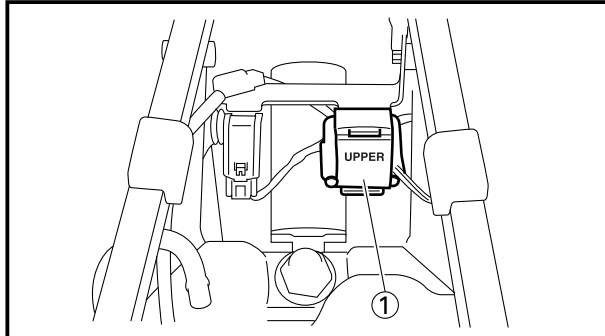
Pocket tester:
YU-3112-C/90890-03112



EC624000

COUPLERS AND LEADS CONNECTION INSPECTION

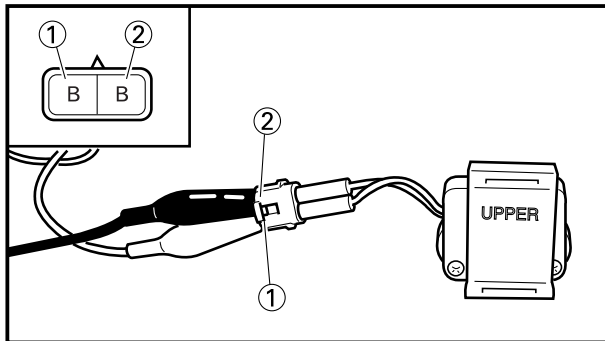
- Check:
 - Couplers and leads connection
Rust/ Dust/ Looseness/Short-circuit → Repair or replace.



EC672000

FUEL PUMP STOP SWITCH INSPECTION

- Remove:
 - Fuel pump stop switch ①

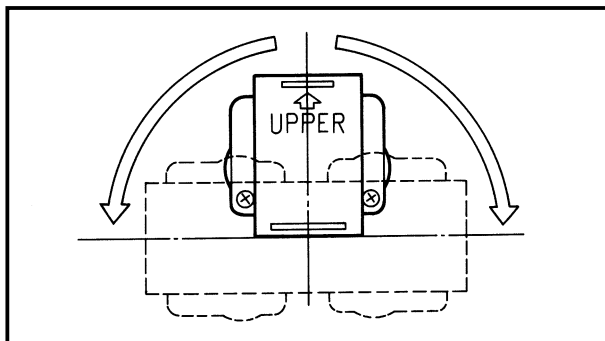


- Inspect:
 - Fuel pump stop switch conduct
To inspect, tilt the fuel pump stop switch to the right and left.

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

		B ①	B ②	Tester selector position
	Tilted 90°	○	○		Ω × 1
Normal				

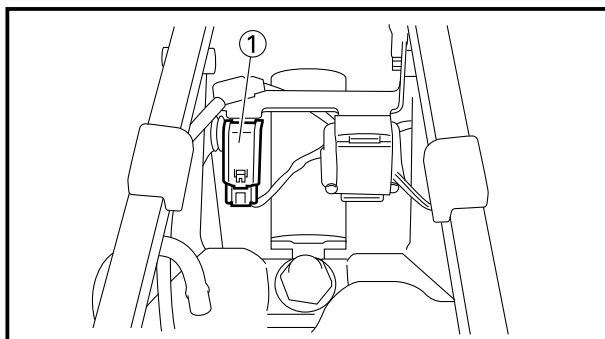
Continuous if normal → Replace.
 Not continuous if tilted 90° → Replace.

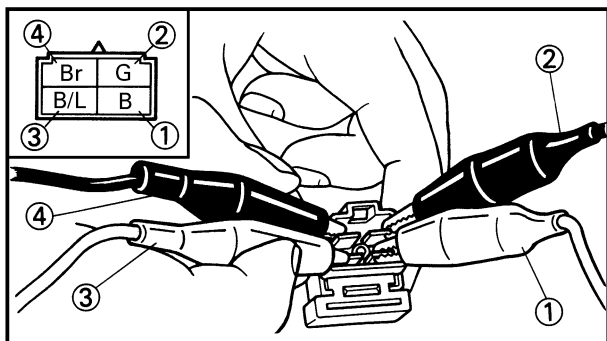


EC673000

FUEL PUMP RELAY INSPECTION

- Remove:
 - Fuel pump relay ①






2. Inspect:

- Fuel pump relay conduct
Use 12V battery.

Battery (+) lead → **Black lead ①**
Battery (-) lead → **Green lead ②**
Tester (+) lead → **Black/Blue lead ③**
Tester (-) lead → **Brown lead ④**

		B/L ③	Br ④	Tester selector position
	Connected to battery			Ω × 1
	Not connected to battery	○	○	


Continuous while connected to the battery → Replace.

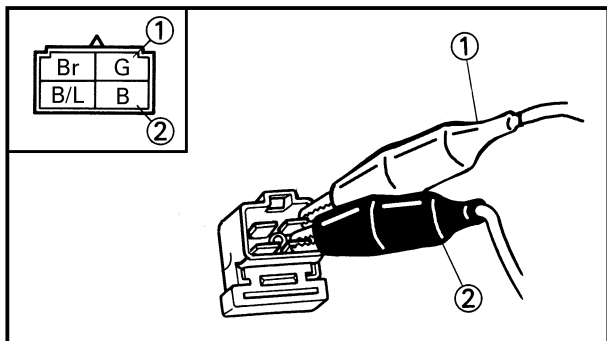
Not continuous while not connected to the battery → Replace.

3. Inspect:

- Fuel pump relay resistance
Out of specification → Replace.

Tester (+) lead → **Green lead ①**
Tester (-) lead → **Black lead ②**

	Fuel pump relay resistance	Tester selector position
	72~80 Ω at 20°C (68°F)	Ω × 10



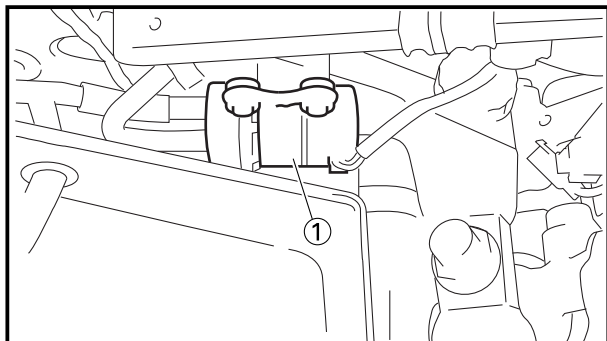
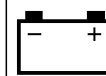
EC674000

FUEL PUMP OPERATION

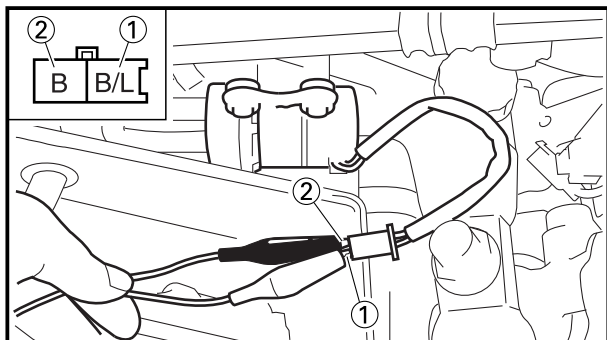
CAUTION:

Do not operate the fuel pump on an empty fuel tank because it may damage the pump.

- Loosen the drain plug (carburetor) and drain the fuel from the float chamber.



2. Install:
 - Drain plug
3. Turn the fuel cock to "ON".
4. Inspect:
 - Fuel pump ①
 Operation sound when the main switch is moved to "RUN" → OK




EC675000

FUEL PUMP COIL INSPECTION

1. Disconnect the fuel pump coupler.
2. Inspect:
 - Fuel pump coil resistance
 Out of specification → Replace.

Tester (+) lead → Black/Blue lead ①
Tester (-) lead → Black lead ②

	Fuel pump coil resistance	Tester selector position
	1~3 Ω at 20°C (68°F)	Ω × 1

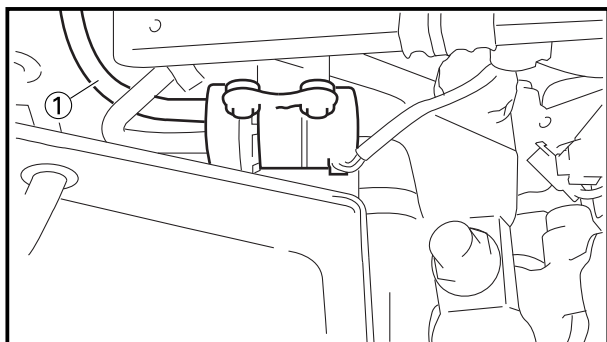
EC676000

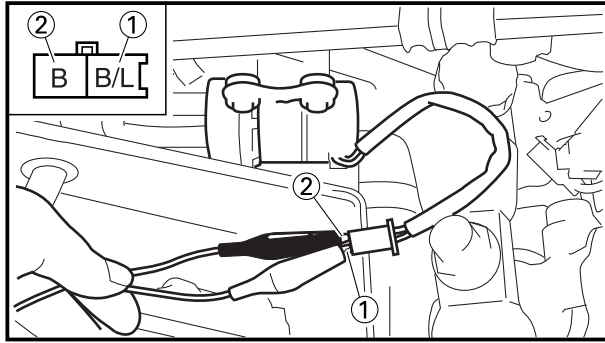
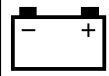
FUEL PUMP INSPECTION

CAUTION:

Do not operate the fuel pump on an empty fuel tank because it may damage the pump.

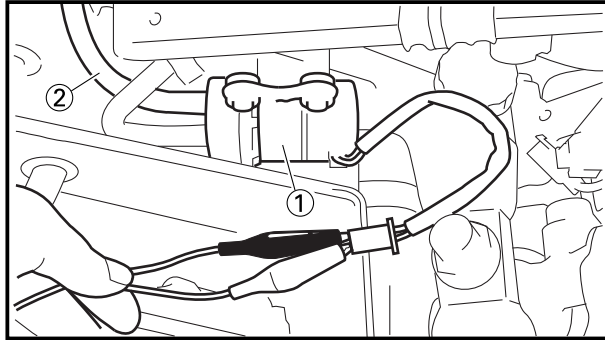
1. Remove the fuel outlet hose from the fuel pump.
2. Connect another plastic hose ① to the fuel pump and place its other end into a container.





3. Turn the fuel cock to "ON".
4. Disconnect the fuel pump coupler.
5. Connect 12V battery to the fuel pump coupler.

Battery (+) lead → Black/Blue lead ①
Battery (-) lead → Black lead ②



6. Inspect:
 - Fuel pump ①
 No fuel flows from the plastic hose ② → Replace.



EC700000

TUNING

EC710000

ENGINE

EC711011

Carburetor setting

- The role of fuel is not only to produce motive power but also to cool the engine and, in the case of a 2-stroke engine, to lubricate it. Therefore, too lean a mixture (of air and fuel) tends to cause an abnormal combustion (i.e., detonation), whereas too rich a mixture makes it difficult for the engine to develop its full performance, with the result that in some cases the spark plug may be fouled, causing the engine to stop running.
- The richness of the air-fuel mixture required for the engine will vary with atmospheric conditions of the day and therefore, the settings of the carburetor must be properly suited to the atmospheric conditions (air pressure, humidity and temperature).
- As a basic setting method, only the factory set main jet is first changed to check for the discoloration of the spark plug(s) and piston(s) at full throttle in 6th and then the setting is determined at mid-open throttle.
- ※ Recording and storing the data on the settings, weather conditions, road surface conditions of the circuit, lap times, etc. will enable quick setting under different conditions at a later time.

EC712000

Atmospheric conditions and carburetor setting

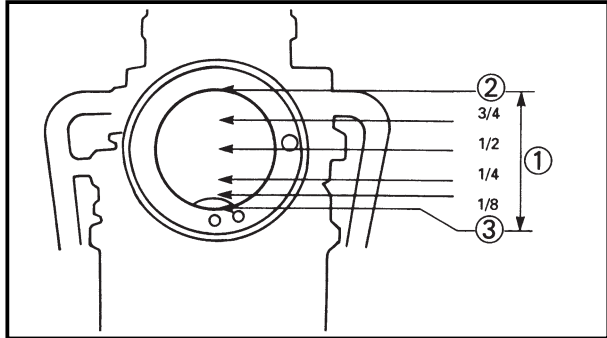
Air temp.	Humidity	Air pressure (altitude)	Mixture	Setting
High	High	Low (high)	Richer	Leaner
Low	Low	High (low)	Leaner	Richer

The reason for the above tendency is that the richness or leanness of a fuel mixture depends on the density of the air (i.e. the concentration of oxygen in it).



That is:

- Higher temperature expands the air with its resultant reduced density.
- Higher humidity reduces the amount of oxygen in the air by so much of the water vapor in the same air.
- Lower atmospheric pressure (at a high altitude) reduces the density of the air.

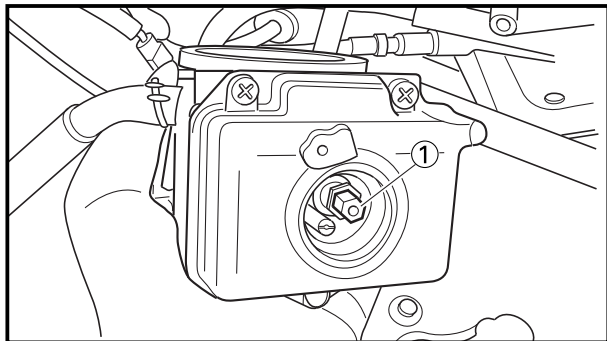


EC714000

Effects of setting parts in relation to throttle valve opening

Setting parts	Throttle valve opening							
	0	1/8	1/4	1/2	3/4	7/8	1/1	
Pilot air screw	[Graph showing a small black trapezoidal area that increases slightly from 0 to 1/1]							
Pilot jet	[Graph showing a black trapezoidal area that increases from 0 to 1/1]							
Main nozzle Jet needle	[Graph showing a black trapezoidal area that is relatively flat across the range]							
Main jet	[Graph showing a black trapezoidal area that increases from 0 to 1/1]							
Power jet	[Graph showing a black trapezoidal area that increases from 0 to 1/1]							

- ① Throttle valve opening
- ② Full-open
- ③ Full-closed



EC71E003

Basic process of carburetor setting

Ex-factory setting is on the richer side, which should basically have no problems with the brake-in procedure.

Refer to “STARTING AND BREAK-IN” section in the CHAPTER 1.

1. Adjustment of main jet

Use a main jet ① with a smaller calibration number if the engine does not develop more than 12,000 rpm after a few laps of the circuit when the water temperature becomes stable [55°C (131°F) or more].

Example:#560 → #540

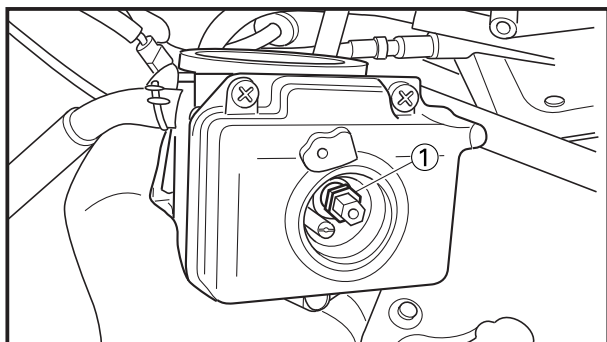


Next run a few laps of the circuit with this setting and check for any difference in engine revolutions. If no difference is noticed, use a main jet with a much smaller calibration number.

Example: #540 → #500

Factory-set main jet

#560



2. Checking of spark plug and piston for discoloration

Repeat the adjustment in the above “1” several times. If the engine begins to run at more than 12,000 rpm at full throttle, proceed to the “spark plug chopping” step (refer to P7-9) to check for the discoloration of the spark plug(s) and piston(s).

Refer to the photo for judgment on the discoloration.

As a novice will find it difficult to determine how much smaller number main jet can be used just by looking at discoloration, he should consult an experienced person for his own experience, too.

Whether the setting is proper or not can be judged by engine revolutions.

Approximate criteria for such judgment are given below, on condition that the secondary reduction ratio is fit for conditions of the circuit.

- 13,000 rpm in 1st and 2nd
- 12,500 rpm in 5th and 6th

- A** Normal
- B** Over burned (too lean)
- C** Oil fouled (too rich)

3. Adjustment of main nozzle

The main nozzle ① adjustment follows the completion of the adjustment of the main jet. Check that engine revolutions smoothly respond to throttle opening from where throttle is about to be opened to 1/2 throttle opening. Use a main nozzle of a smaller size if engine revolutions appear to falter at the beginning of throttle opening and then suddenly respond to further throttle opening.

Example:S-4 → S-3



If the main jet is fully adjusted with not much allowance for discoloration, use a main jet which is approximately #20 larger. Run a few laps of the circuit to check the engine for response to revolutions. Also check for the discoloration of the spark plug(s) and piston(s).

Use a main jet of a smaller size if good response to engine revolutions is achieved with an allowance for the discoloration of the spark plug(s) and piston(s).

On the other hand, if the use of a different main nozzle appears to produce less power, change to a main nozzle of a larger size.

Example: S-1 → S-2

Factory-set main nozzle	S-4
-------------------------	-----

NOTE: _____

Difference between individual riders or difference between circuit layouts greatly affect the main nozzle setting.

1. Rider who frequently uses mid-open throttle
2. Circuit that requires frequent throttle opening and closing
3. Wet environment

Conditions as mentioned above require a longer period of throttle closing, resulting in the drawn in mixture staying longer in the crankcase. Such setting in turn will inevitably cause the mixture to be richer at the next throttle opening, a main nozzle of a smaller size has to be used.



EC71F002

Carburetor settings by correction coefficient

Now you should be able to understand the essentials of basic carburetor setting from an explanation given under “Basic process of carburetor setting” (P7-2).

Next is an explanation of how to select a main jet to deal with changes in weather conditions by means of a correction coefficient.

NOTE:

- Before this correction coefficient can be used, satisfactory carburetor setting must have been made.
- This correction coefficient can not be used if there is a change in specification (e.g., ignition timing, compression ratio, etc.).

Illustration:

Suppose the best setting was represented by a #450 main jet at an air pressure of 1013 hPa (760 mmHg) and an air temperature of 20°C (68°F) in the previous riding.

In this riding, there has been a substantial change in conditions; namely, an air pressure of 1007 hPa (755 mmHg) and an air temperature of 30°C (86°F).

1. Refer to a table of correction coefficients (P7-6) to find the correction coefficient for the previous riding.

The correction coefficient A=100.0

2. Find the correction coefficient for this time.

The correction coefficient B=96.1

3. Use the following equation to calculate the size of a main jet needed in this particular case.

$$\text{Previous main jet size} \times B/A \\ = \text{Currently required main jet size}$$

$$450 \times 96.1/100 = 432.5$$

Thus, a #430 main jet can be selected.



CAUTION:

If a change in conditions require a main jet of a larger size, use the size to which #20 is added for safety.

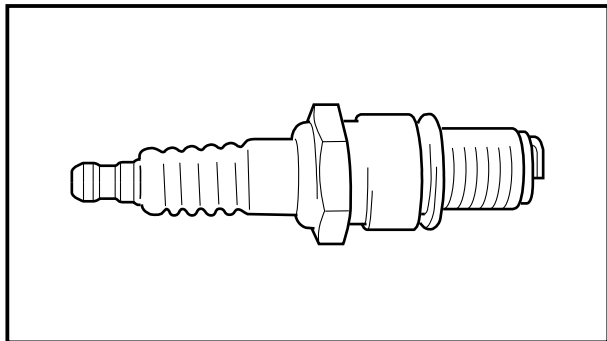
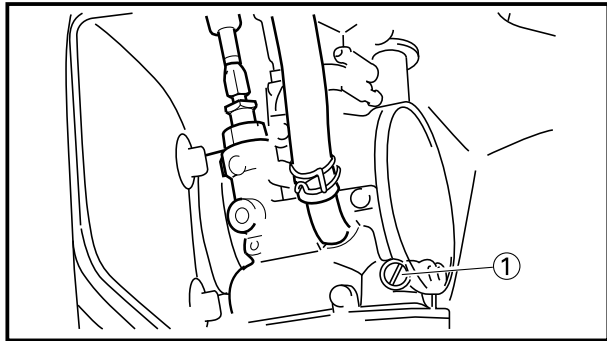
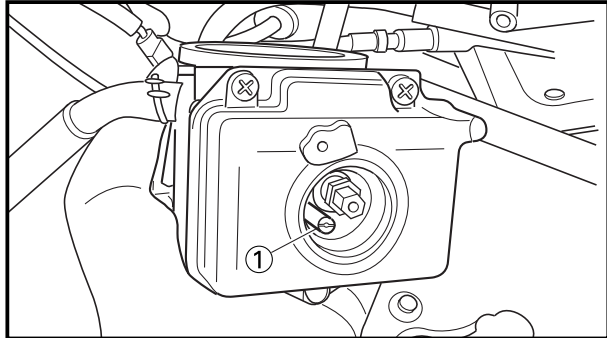
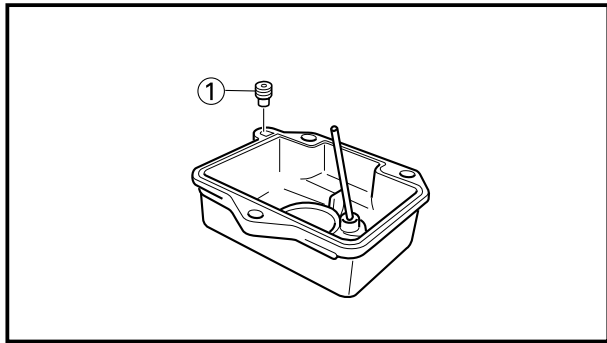
NOTE:

- Since this correction coefficient table lacks a column for humidity, it is advisable to check the degree of discoloration of the spark plug(s) for final selection according to an explanation under “Atmospheric conditions and carburetor setting” (P7-1).
- As the main nozzle is more susceptible to other than atmospheric conditions, no correction coefficient is used for main nozzle setting.

EC71G002

Table of correction coefficients for carburetor setting

Air pressure hPa (mmHg)	Air temperature °C (°F)										Altitude m (ft)
	-5 (23)	Zero (32)	5 (41)	10 (50)	15 (59)	20 (68)	25 (77)	30 (86)	35 (95)	40(104)	
1040 (780)	112.2	110.2	108.2	106.3	104.4	102.6	100.9	99.3	97.7	96.1	-220 (-722)
1033 (775)	111.5	109.4	107.5	105.6	103.7	102.0	100.3	98.6	97.0	95.5	-165 (-541)
1027 (770)	110.8	108.7	106.8	104.9	103.1	101.3	99.6	98.0	96.4	94.8	-110 (-361)
1020 (765)	110.0	108.0	106.1	104.2	102.4	100.7	99.0	97.3	95.8	94.2	-55 (-180)
1013 (760)	109.3	107.3	105.4	103.5	101.7	100.0	98.3	96.7	95.1	93.6	Zero (Zero)
1007 (755)	108.6	106.6	104.7	102.9	101.1	99.3	97.7	96.1	94.5	93.0	56 (184)
1000 (750)	107.9	105.9	104.0	102.2	100.4	98.7	97.0	95.4	93.9	92.4	112 (367)
993 (745)	107.2	105.2	103.3	101.5	99.7	98.0	96.4	94.8	93.3	91.8	168 (551)
987 (740)	106.5	104.5	102.6	100.8	99.1	97.4	95.7	94.2	92.6	91.1	224 (735)
980 (735)	105.7	103.8	101.9	100.1	98.4	96.7	95.1	93.5	92.0	90.5	281 (922)
973 (730)	105.0	103.1	101.2	99.4	97.7	96.1	94.4	92.9	91.4	89.9	338 (1,109)
967 (725)	104.3	102.4	100.5	98.8	97.1	95.4	93.8	92.2	90.7	89.3	396 (1,299)
960 (720)	103.6	101.7	99.8	98.1	96.4	94.7	93.1	91.6	90.1	88.7	453 (1,486)
953 (715)	102.9	101.0	99.2	97.4	95.7	94.1	92.5	91.0	89.5	88.1	512 (1,680)
947 (710)	102.1	100.3	98.5	96.7	95.0	93.4	91.9	90.3	88.9	87.5	570 (1,870)
940 (705)	101.4	99.6	97.8	96.0	94.4	92.8	91.2	89.7	88.2	86.8	629 (2,064)
933 (700)	100.7	98.9	97.1	95.4	93.7	92.1	90.6	89.1	87.6	86.2	688 (2,257)
927 (695)	100.0	98.1	96.4	94.7	93.0	91.4	89.9	88.4	87.0	85.6	747 (2,451)
920 (690)	99.3	97.4	95.7	94.0	92.4	90.8	89.3	87.8	86.4	85.0	807 (2,648)
913 (685)	98.5	96.7	95.0	93.3	91.7	90.1	88.6	87.2	85.7	84.4	867 (2,845)
907 (680)	97.8	96.0	94.3	92.6	91.0	89.5	88.0	86.5	85.1	83.8	928 (3,045)
900 (675)	97.1	95.3	93.6	92.0	90.4	88.8	87.3	85.9	84.5	83.1	989 (3,245)
893 (670)	96.4	94.6	92.9	91.3	89.7	88.2	86.7	85.2	83.9	82.5	1,050 (3,445)
887 (665)	95.7	93.9	92.2	90.6	89.0	87.5	86.0	84.6	83.2	81.9	1,111 (3,645)
880 (660)	94.9	93.2	91.5	89.9	88.3	86.8	85.4	84.0	82.6	81.3	1,173 (3,848)
873 (655)	94.2	92.5	90.8	89.2	87.7	86.2	84.7	83.2	82.0	80.7	1,236 (4,055)
867 (650)	93.5	91.8	90.1	88.5	87.0	85.5	84.1	82.7	81.4	80.1	1,299 (4,262)
860 (645)	92.8	91.1	89.4	87.9	86.3	84.9	83.4	82.1	80.7	79.4	1,362 (4,469)
853 (640)	92.1	90.4	88.8	87.2	85.7	84.2	82.8	81.4	80.1	78.8	1,425 (4,675)
847 (635)	91.3	89.7	88.1	86.5	85.0	83.6	82.2	80.8	79.5	78.2	1,489 (4,885)
840 (630)	90.6	89.0	87.4	85.8	84.3	82.9	81.5	80.2	78.9	77.6	1,554 (5,099)



EC71H040

Other setting parts

1. Power jet ①

Power jet is not basically changed. Since the areas of the main jet and main nozzle overlap each other, special knowledge is required for a setting change.

A larger size results in a richer mixture and a smaller size in a leaner mixture.

Factory-set power jet	#55
------------------------------	------------

2. Pilot jet ①

The pilot jet is used in relation to the engine response at small throttle opening. This is changed when the main nozzle setting is not enough.

A larger size results in a richer mixture and a smaller size in a leaner mixture.

Factory-set pilot jet	#40
------------------------------	------------

3. Pilot air screw ①

The pilot air screw relates to the engine response at a smaller opening than for the pilot jet.

This setting may be changed for want of time or in emergency, but it is basically set at the factory-set pilot air screw position.

Factory-set pilot air screw position	1-1/2 turns out
---	------------------------

4. Spark plug

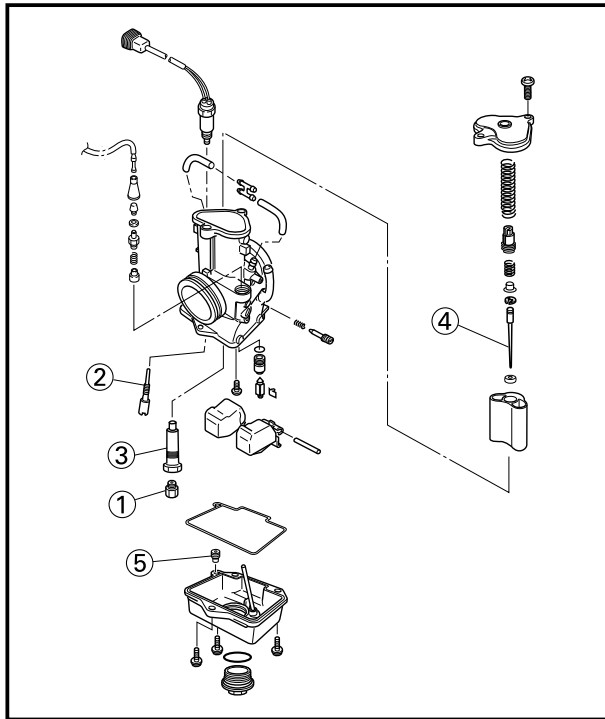
The spark plug heat range is not basically changed.

Constant attention to the discoloration of the spark plug and piston head will enable you to tell to some extent whether the setting is good or bad.

Standard spark plug	R6179A-105P/NGK
----------------------------	------------------------

NOTE: _____

For the effects each setting part has, refer to "Effects of setting parts in relation to throttle valve opening" (P7-2).



EC71Q021

Carburetor setting parts

Part name	Size	Part number
Main jet ①	Lean	#350 137-14143-70
		#360 137-14143-72
		#370 137-14143-74
		#380 137-14143-76
		#390 137-14143-78
		#400 137-14143-80
		#410 137-14143-82
		#420 137-14143-84
		#430 137-14143-86
		#440 137-14143-88
		#450 137-14143-90
		#460 137-14143-92
		#470 137-14143-94
		#480 137-14143-96
		#490 137-14143-98
	#500 137-1414K-00	
	#540 137-1414K-08	
	* Rich	#560 137-1414K-12
Pilot jet ②	Lean	#25 4KM-14142-25
		#30 4KM-14142-30
		#35 4KM-14142-35
	* Rich	#40 4KM-14142-40
Main nozzle ③	Lean	R-7 5KE-14141-R7
		R-8 5KE-14141-R8
		R-9 5KE-14141-R9
		S-0 5KE-14141-S0
		S-1 5KE-14141-S1
		S-2 5KE-14141-S2
		S-3 5KE-14141-S3
	* Rich	S-4 5KE-14141-S4
Jet needle ④ *	6DGJ1-63	275-14116-R0
Power jet ⑤	Lean	#50 830-14231-10
	* Rich	#55 830-14231-11

* Factory installed

NOTE:

Use a #500 main jet when selecting a next smaller size jet than a #540.



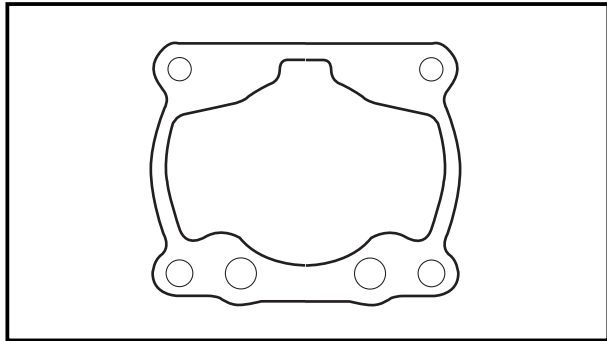
EC71J010

Plug chop

When checking the discoloration of the spark plug and piston head, move the main switch to “OFF” while running along a straight lane at full throttle, disengage the clutch at the same time and stop the engine. Then let your machine go back to the pit by inertia. This is called a “plug chop”.

CAUTION:

- **When you do a “plug chop”, pay attention to your surrounding environment to avoid interference with other riders.**
- **Do not shift down while riding your machine by inertia (as it may cause a seizure of the clutch push rod and ball).**



EC71K010

Setting of cylinder gasket

The use of the supplied gaskets of different thicknesses makes it possible to change the combustion chamber volume.

Not much torque is felt with slow engine acceleration → Reduce the combustion chamber volume.

Torque is felt with no higher revolutions → Expand the combustion chamber volume.

Thickness	Actual combustion chamber volume	Type
0.6 mm (0.024 in)	Approx. 9.66 cm ³ (0.340 Imp oz, 0.327 US oz)	STD
0.5 mm (0.020 in)	Approx. 9.43 cm ³ (0.332 Imp oz, 0.319 US oz)	Supplying parts
0.38 mm (0.015 in)	Approx. 9.20 cm ³ (0.324 Imp oz, 0.311 US oz)	
0.3 mm (0.012 in)	Approx. 8.98 cm ³ (0.316 Imp oz, 0.304 US oz)	
0.2 mm (0.008 in)	Approx. 8.75 cm ³ (0.308 Imp oz, 0.296 US oz)	



NOTE:

- Finish the break-in before changing the gasket.
- A change of 0.1 mm (0.004 in) for the gasket causes a change of approximately 0.23 cm³ (0.008 Imp oz, 0.008 US oz) of the combustion chamber volume.
- After break-in, change to an appropriate gasket to allow the piston protrusion to be -0.15 mm (-0.006 in) to 0.05 mm (0.002 in).

CAUTION:

- **Piston protruding amount must be a maximum 0.15 mm (0.006 in). Above this value, the piston and cylinder head may contact each other.**
- **Too much random piston protrusion at low temperature may develop an abnormal combustion (detonation), which may adversely affect the intended performance of the engine.**

A Air temperature

B Piston protruding amount

EC71T000

Cylinder gasket setting parts

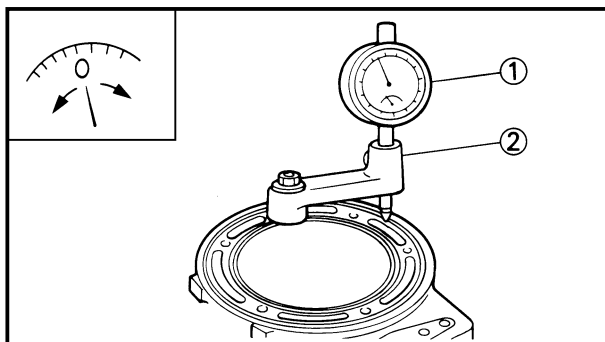
Part number	Size (thickness)
5KE-11351-60 *	t=0.6 mm (0.024 in)
5KE-11351-50	t=0.5 mm (0.020 in)
5KE-11351-40	t=0.38 mm (0.015 in)
5KE-11351-30	t=0.3 mm (0.012 in)
5KE-11351-20	t=0.2 mm (0.008 in)

* Factory installed

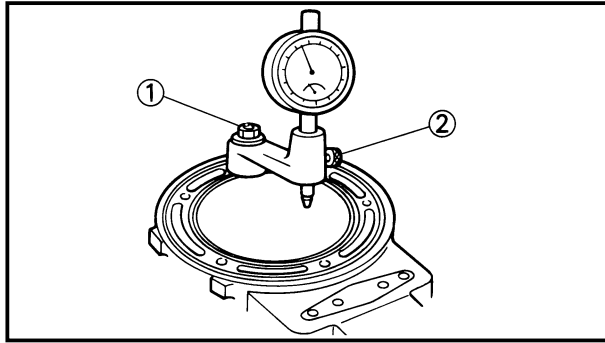
EC71L003

Measuring piston protrusion

1. Install the dial gauge ① and dial gauge stand ② to the cylinder contact surface and set the scale of the dial gauge to zero.



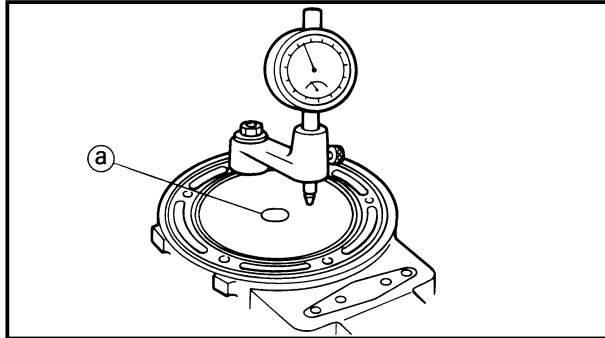
Dial gauge and stand:
YU-3097/90890-01252
Offset dial stand:
YU-1037



2. Loosen the stand installation bolt ①, then rotate the dial gauge stand and set it close to the center of the piston. Tighten the stand installation bolt again.

NOTE: _____

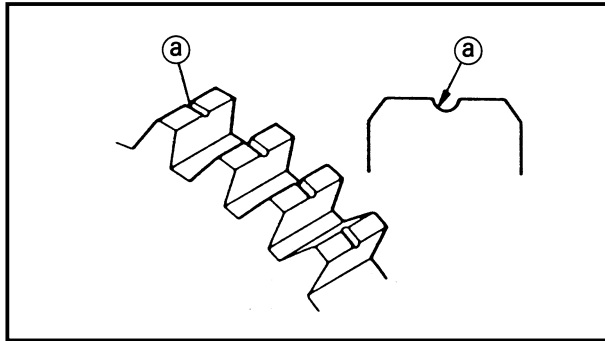
Do not loosen the dial gauge installation bolt ② while doing the above.



3. Set the piston at top dead center (TDC), then measure the piston protrusion.

NOTE: _____

For measurement, avoid the top center projected area ① on the piston head but measure several positions above the piston pin as close to the center as possible. The average of these measurements indicates the piston protrusion.



EC71N001

Selection of transmission gear ratio

The following gear sets are contained in the packing (or optional) to allow the rider to change the gear ratios according to the circuit condition or rider's preference.

CAUTION: _____

Select the transmission gears so that the number of grooves in the wheel gear match that of the pinion gear as shown below. Trouble may be occurred if the selection is different than that listed below.

① Groove

1st gear

	Gear ratio	Part number	Number of groove
Factory installed	34/18 (1.889)	5KE-17211-20/5KE-17411-20	2
Supplying part	28/14 (2.000)	5KE-17211-10/5KE-17411-10	1

2nd gear

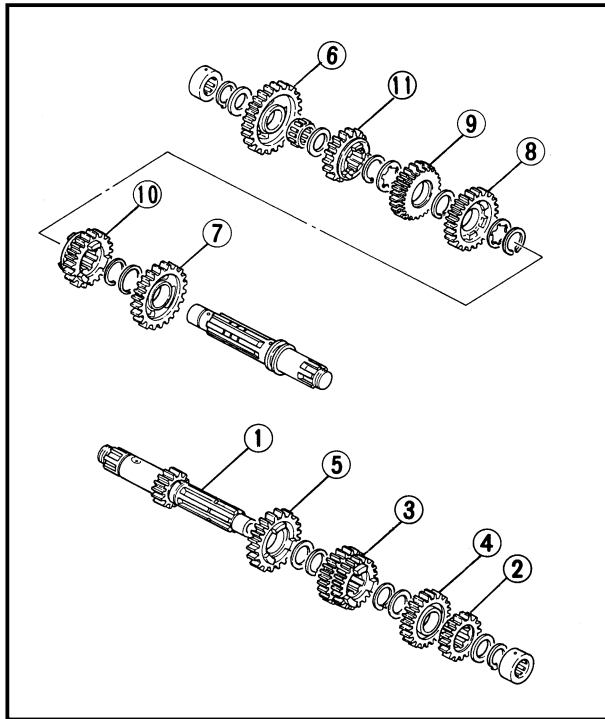
	Gear ratio	Part number	Number of groove
Factory installed	31/21 (1.476)	4DP-17221-11/4DP-17121-11	1
Optional part	27/19 (1.421)	5F7-17221-21/5F7-17121-21	2
Optional part	28/18 (1.556)	5F7-17221-00/5F7-17121-00	-

**3rd gear**

	Gear ratio	Part number	Number of groove
Factory installed	29/23 (1.261)	5KE-17231-00/5KE-17131-00	–
Optional part/ Supplying part	25/21 (1.190)	5KE-17231-20/5KE-17131-10	2/1
Supplying part	26/21 (1.238)	5KE-17231-10/5KE-17131-10	1

6th gear

	Gear ratio	Part number	Number of groove
Factory installed	20/22 (0.909)	5KE-17261-00/5KE-17191-00	1
Supplying part	22/25 (0.880)	5KE-17261-10/5KE-17161-10	2



EC71U011

Transmission setting parts

Part name	Size	Part number
Main axle ①	*	14T 5KE-17411-10
	*	18T 5KE-17411-20
2nd pinion gear ②	Δ	18T 5F7-17121-00
	Δ	19T 5F7-17121-21
	*	21T 4DP-17121-11
3rd/4th pinion gear ③	*	21T/25T 5KE-17131-10
	*	23T/25T 5KE-17131-00
5th pinion gear ④	*	27T 5F7-17151-01
6th pinion gear ⑤	*	22T 5KE-17161-00
	*	25T 5KE-17161-10
1st wheel gear ⑥	*	28T 5KE-17211-10
	*	34T 5KE-17211-20
2nd wheel gear ⑦	Δ	27T 5F7-17221-21
	Δ	28T 5F7-17221-00
	*	31T 4DP-17221-11
3rd wheel gear ⑧	Δ	25T 5KE-17231-20
	*	26T 5KE-17231-10
	*	29T 5KE-17231-00
4th wheel gear ⑨	*	27T 5KE-17241-00
5th wheel gear ⑩	*	26T 3YL-17251-00
6th wheel gear ⑪	*	20T 5KE-17261-00
	*	22T 5KE-17261-10

* Factory installed

NOTE:

- The mark Δ shows that this part is not supplied together and that it is available on order as a YAMAHA genuine part.
- 3rd/4th pinion gear 5KE-17131-10 allows for a combination of 3rd wheel gear 5KE-17231-10 or 5KE-17231-20. No combination can be selected for the factory installed 5KE-17231-00.



EC720000

CHASSIS

EC72J001

Chassis setting

How to go about setting the chassis

- Measure the stroke of the front and rear suspension to get an idea of the operation.
- If the time increases, the stroke increases.
- If the tire grip becomes firmer, the stroke increases.

(On the other hand, the stroke decreases on rainy weather.)

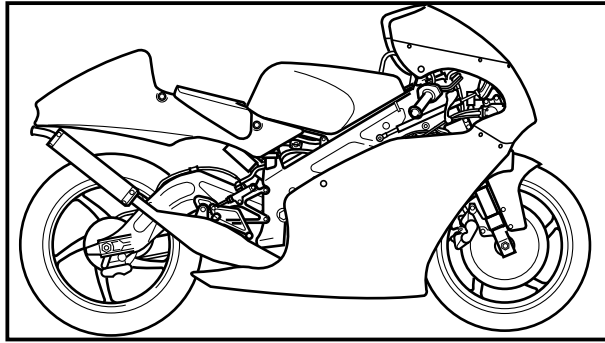
- Rider's position and posture affect the stroke.
- Be careful not to allow the suspension to bottom out.
- Start the setting with the preload.

Next, go to the damping force adjustment, and if this not enough, then adjust the machine height.

(On the side where the machine height is greater the stroke increases; whereas it decreases on the side with a smaller machine height.)

- If the damping force is increased either on the compression or the expansion side, it results in less smooth movement, so do not depart too far from the standard settings.
- Adjust the machine height in an increment of mm (in).
- If you lose your way while doing the setting, go back to the standard settings.
- Oil level adjustment in the front fork produces a greater effect in further stroke than in mid stroke.

(Increase or decrease the oil level in an approximately 5~10 mm (0.20~0.39 in) interval.)



EC72M001

Tire and machine's posture

If a non-designated tire is used, the difference in radius between the front and the rear tire may affect the machine's posture.

To keep the machine in a proper posture, adjust the front fork top end or seat height.

Basically, with a larger radius tire, lower the machine's posture and vice versa.

[Front]

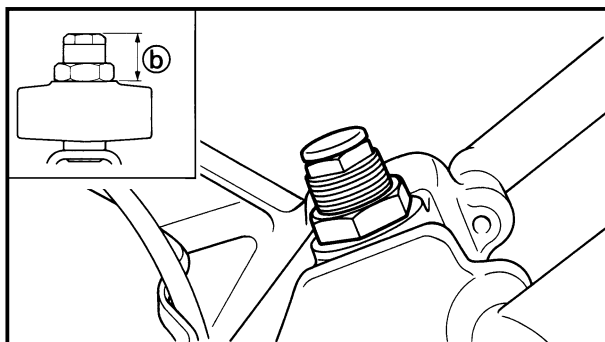
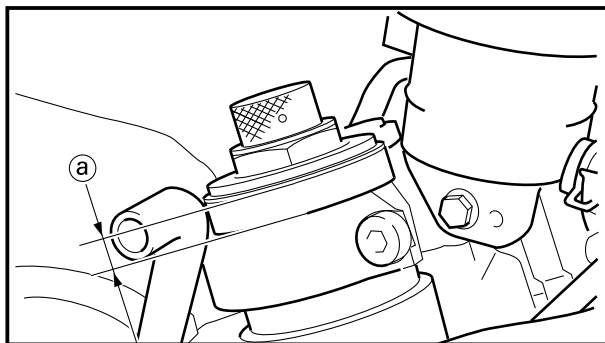
Tire brand	Tire circumference	Tire radius	Front fork top end
*3.10/4.80 R17 DUNLOP KR106	About 1,875 mm (73.8 in)	About 298.5 mm (11.8 in)	13 mm (0.51 in)
120/70 R17 DUNLOP MR977	About 1,885 mm (74.2 in)	About 300 mm (11.8 in)	11.5 mm (0.45 in)

*Designated tire

[Rear]

Tire brand	Tire circumference	Tire radius	Seat height
*165/55 R17 DUNLOP KR108	About 1,975 mm (77.8 in)	About 314.5 mm (12.4 in)	24 mm (0.94 in)
165/50 R17 DUNLOP KR244	About 1,957 mm (77.0 in)	About 311.5 mm (12.3 in)	25.5 mm (1.00 in)

*Designated tire



Example:

If the front tire radius is 1 mm (0.04 in) larger, lower the front posture by 1 mm (0.04 in) by increasing the front fork top end ① by 1 mm (0.04 in). If the rear tire radius is 2 mm (0.08 in) smaller, raise the rear posture by 2 mm (0.08 in) by decreasing the adjuster set length ② by 1 mm (0.04 in).

NOTE:

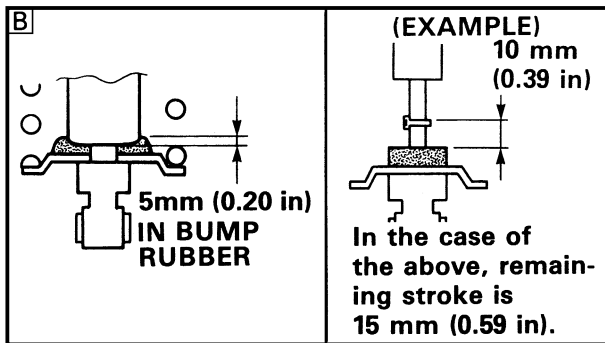
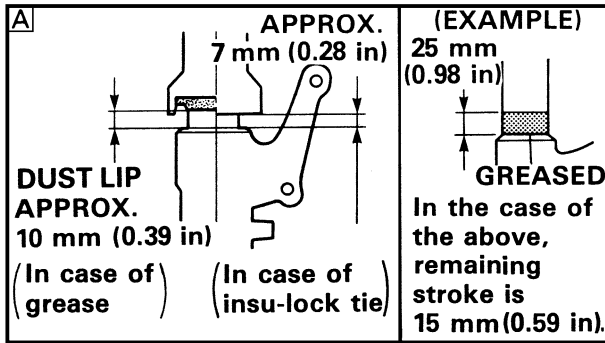
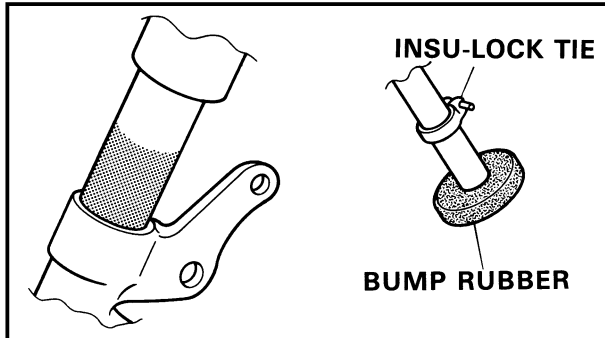
- Find the tire radius by calculating the measured circumference of the tire.
- A change of 1 mm (0.04 in) in the front fork top end results in a change of about 1 mm (0.04 in) in the front posture. A change of 1 mm (0.04 in) in the adjuster set length results in a change of about 2 mm (0.08 in) in the rear posture.



EC72K014

Settings

For full use of engine performance and safe riding, set the suspension as follows. (Ex-factory settings are intended for a rider approximately 170 cm (66.9 in) in height and approximately 60 kg (132 lb) in weight.)



1. Preparations

To check for the remaining stroke in the front and rear suspension, either install a thin insu-lock tie or apply a small amount of grease at the front fork inner tube and at the rear shock absorber rod.

2. Settings

At the beginning of the break-in period, always record the remaining stroke as data.

To judge front and rear balance in relation to the machine height, the usual way is to shift from full braking to turning and get the feel when the clipper riding.

After making an actual run, proceed to the settings for a target of a 5~10 mm (0.20~0.39 in) remaining stroke for front and a 10 ~ 20 mm (0.39~0.79 in) remaining stroke for rear.

Basically, the best settings can be obtained by repeating the following steps.

NOTE: _____

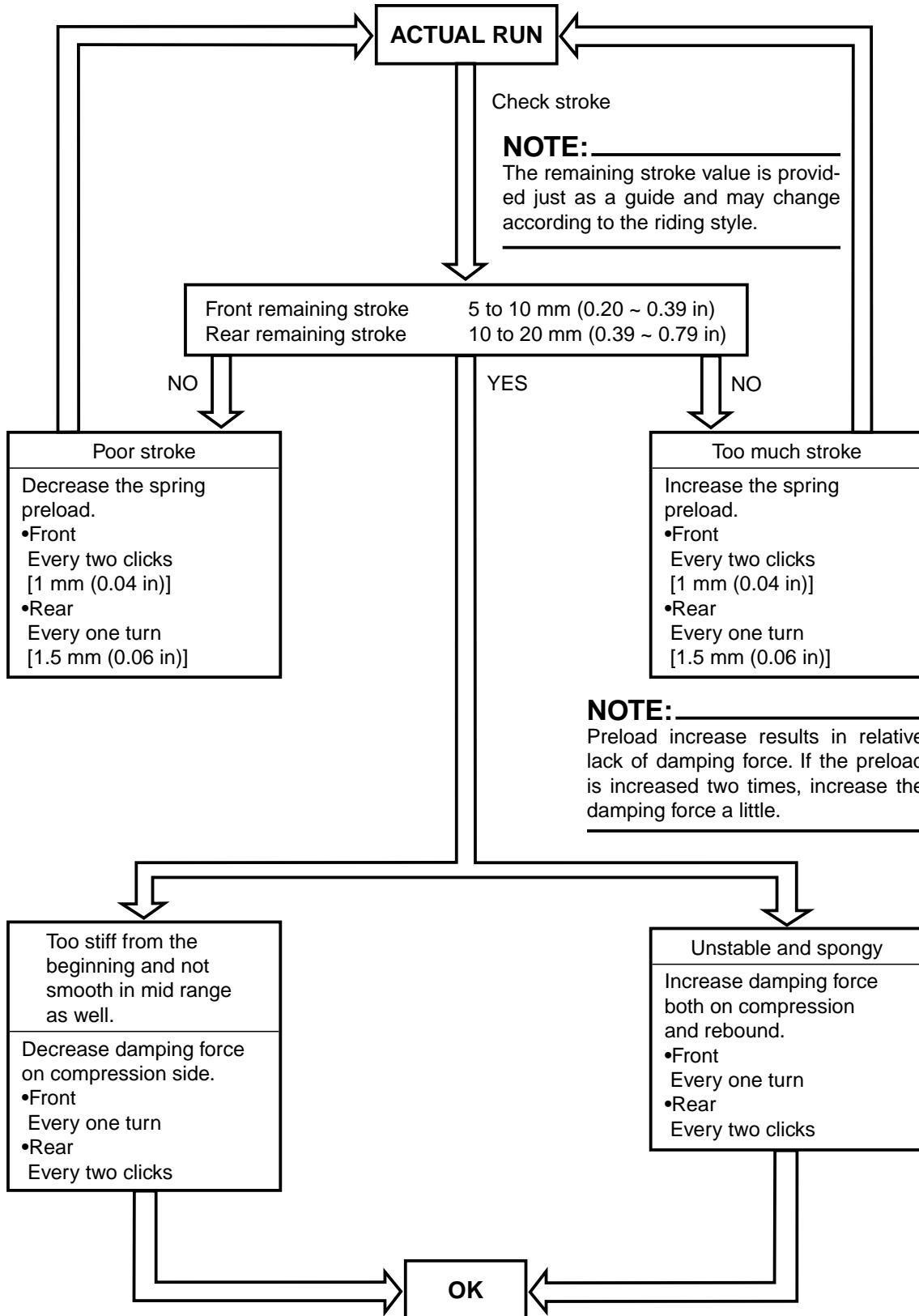
The figures show the bottom-out positions of the front and rear suspension.

A Front

B Rear



SETTING CHART





EC71P011

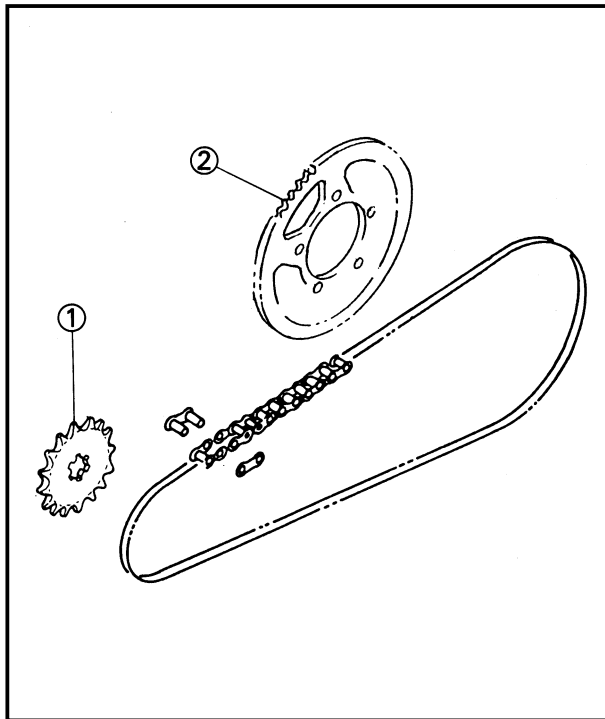
Selection of the secondary reduction ratio (Sprocket)

$$\text{Secondary reduction ratio} = \frac{\text{Number of driven sprocket teeth}}{\text{Number of drive sprocket teeth}}$$

Factory-set secondary reduction ratio	36/14 (2.571)
--	----------------------

Drive sprocket \ Driven sprocket	35T	36T	37T	38T	39T	40T
14T	2.500	2.571	2.643	2.714	2.786	2.857
15T	2.333	2.400	2.467	2.534	2.600	2.666
16T	2.188	2.250	2.313	2.375	2.438	2.500

The larger value, the higher speed ratio
 The smaller value, the lower speed ratio



EC72N000

Drive and driven sprockets setting parts

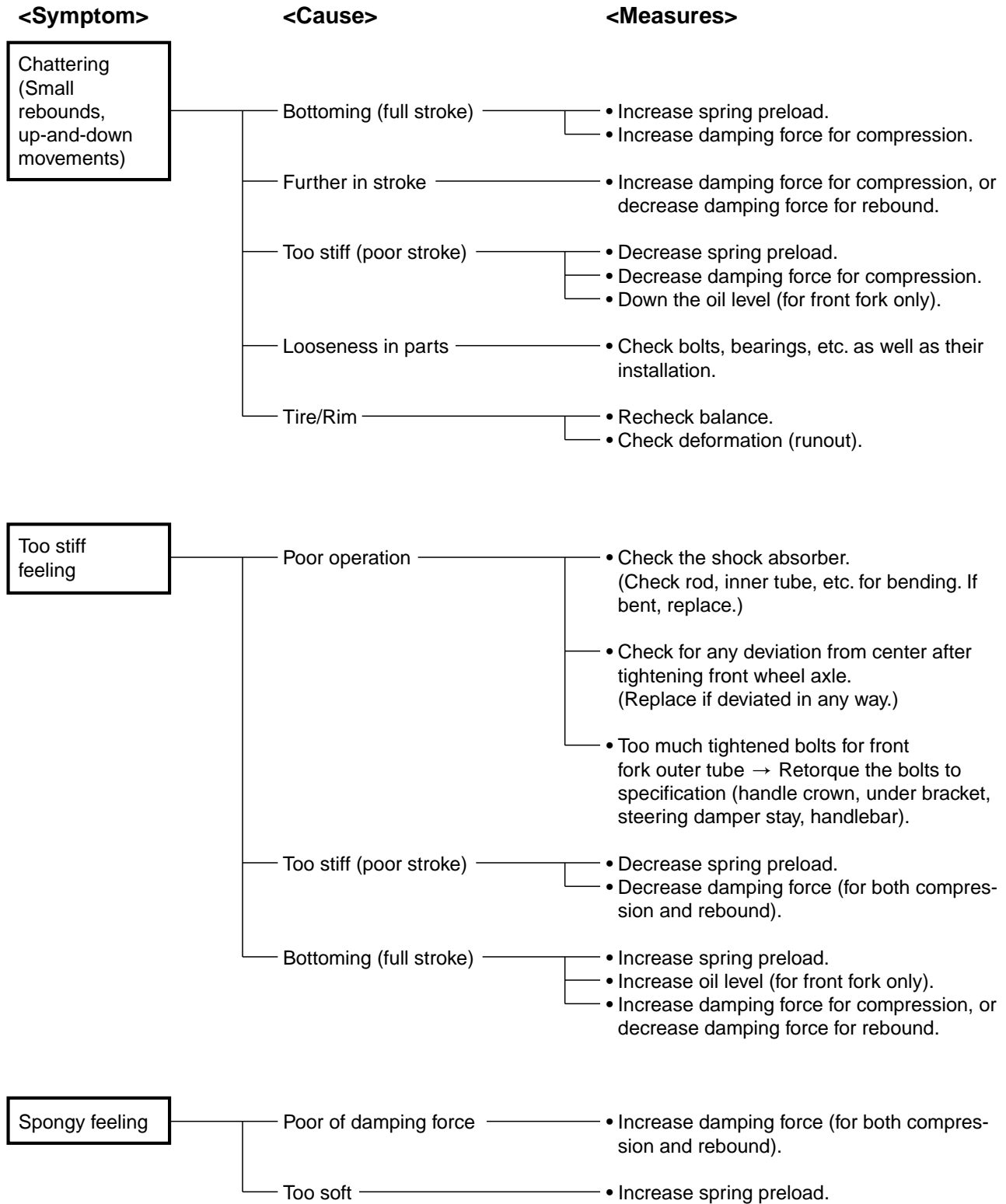
Part name	Size	Part number
Drive sprocket ① *	14T	93834-14178
	15T	93834-15079
	16T	93834-16104
Driven sprocket ② *	35T	5KE-25435-10
	36T	5KE-25436-10
	37T	5KE-25437-10
	38T	5KE-25438-10
	39T	5KE-25439-10
	40T	5KE-25440-10

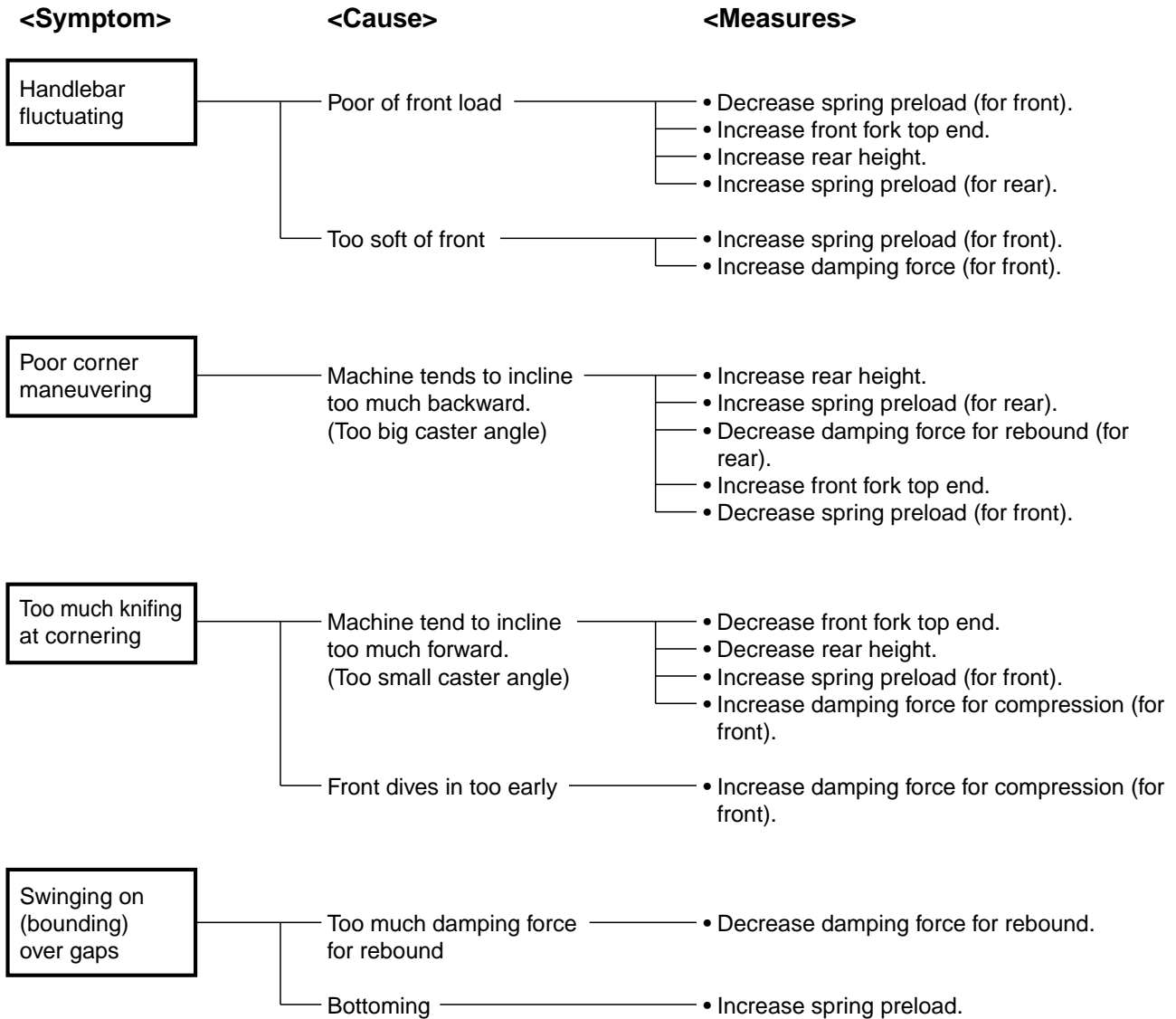
* Factory installed



EC72L003

Chassis setting troubleshooting







EC740002

Setting record table

The data shown here is an example of entry. For your actual use, copy the necessary data.

Event name				
Date				
Weather				
Place				

Setting specs:

Ignition timing				
Spark plug				
Carburetor Main jet Power jet Jet needle Main nozzle Pilot jet Pilot air screw Float height				
Gearing 1st 2nd 3rd 4th 5th 6th Secondary				
Front fork Spring rate Spring preload Rebound damping Compression damping Top end Oil capacity Oil level				
Rear shock Spring fitting length Spring rate Rebound damping Compression damping Seat height				
Front tire (pressure)				
Rear tire (pressure)				
Fuel consumption				



Event name				
Date				
Weather				
Place				

Setting specs:

Ignition timing				
Spark plug				
Carburetor Main jet Power jet Jet needle Main nozzle Pilot jet Pilot air screw Float height				
Gearing 1st 2nd 3rd 4th 5th 6th Secondary				
Front fork Spring rate Spring preload Rebound damping Compression damping Top end Oil capacity Oil level				
Rear shock Spring fitting length Spring rate Rebound damping Compression damping Seat height				
Front tire (pressure)				
Rear tire (pressure)				
Fuel consumption				

NOTE:

1. Make setting changes in small increments.
2. When the proper settings have been determined for a particular track, they should be written down for reference upon returning to that track.
3. Always make adjustment in cold state.

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