Read this manual carefully before operating this vehicle.

Il convient de lire attentivement ce manuel avant la première utilisation du véhicule.

Bitte lesen Sie diese Bedienungsanleitung sorgfältig durch, bevor Sie das Fahrzeug in Betrieb nehmen.

Leggere attentamente questo manuale prima di utilizzare questo veicolo.
Read this manual carefully before operating this vehicle. This manual should stay with this vehicle if it is sold.

Il convient de lire attentivement ce manuel avant la première utilisation du véhicule. Le manuel doit être remis avec le véhicule en cas de vente de ce dernier.

Bitte lesen Sie diese Bedienungsanleitung sorgfältig durch, bevor Sie das Fahrzeug in Betrieb nehmen. Diese Bedienungsanleitung muss, wenn das Fahrzeug verkauft wird, beim Fahrzeug verbleiben.

Leggere attentamente questo manuale prima di utilizzare il veicolo. Questo manuale dovrebbe accompagnare il veicolo se viene venduto.
OWNER’S SERVICE MANUAL

YZ250(A)/A1

1P8-28199-36-E0

Read this manual carefully before operating this vehicle.
⚠️ Read this manual carefully before operating this vehicle. This manual should stay with this vehicle if it is sold.
FOREWORD

INTRODUCTION

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

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

TIP

Yamaha continually seeks advancements in product design and quality. Therefore, while this manual contains the most current product information available at the time of printing, there may be minor discrepancies between your machine and this manual. If you have any questions concerning this manual, 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.

IMPORTANT MANUAL INFORMATION

Particularly important information is distinguished in this manual by the following notations.

WARNING

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

A WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

A NOTICE indicates special precautions that must be taken to avoid damage to the vehicle or other property.

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

SAFETY INFORMATION

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.

• THIS MACHINE IS TO BE OPERATED BY AN EXPERIENCED RIDER ONLY.
• THIS MACHINE IS DESIGNED TO BE RIDEN BY THE OPERATOR ONLY
• 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.

• 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.

• GASOLINE IS HIGHLY FLAMMABLE.

Always turn off the engine while re-fueling. 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.

• 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.

• 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.

• 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.

• THE ENGINE, EXHAUST PIPE, MUFFLER, AND OIL TANK WILL BE VERY HOT AFTER THE ENGINE HAS BEEN RUN.

Be careful not to touch them or to allow any clothing item to contact them during inspection or repair.

• 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.

TIP

This tip provides key information to make procedures easier or clearer.

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TIP

This tip provides key information to make procedures easier or clearer.
HOW TO USE THIS MANUAL

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. MNumbers "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. For jobs requiring more information, the step-by-step format supplements "5" are given in addition to the exploded diagram and job instruction chart.

ILLUSTRATED SYMBOLS (Refer to the illustration)
Illustrated symbols "1" to "7" are used to identify the specifications appearing in the text.
1. With engine mounted
2. Filling fluid
3. Lubricant
4. Special tool
5. Tightening
6. Specified value, Service limit
7. Resistance (Ω), Voltage (V), Electric current (A)
Illustrated symbols "8" to "14" in the exploded diagrams indicate grade of lubricant and location of lubrication point.
8. Apply engine mixing oil
9. Apply transmission oil
10. Apply molybdenum disulfide oil
11. Apply brake fluid
12. Apply lightweight lithium-soap base grease
13. Apply molybdenum disulfide grease
14. Apply silicone grease
15. Apply locking agent (LOC-TITE®)
16. Use new one
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GENERAL INFORMATION
LOCATION OF IMPORTANT LABELS
Please read the following important labels carefully before operating this vehicle.

CANADA

1

Use premium unleaded gasoline/oil premix only

2

Utiliser de préférence un mélange huile/super sans plomb.

3

THE VEHICLE IS A COMPETITION MOTORCYCLE AND IS FOR USE EXCLUSIVELY IN CLOSED COURSE COMPETITION AND IS NOT INTENDED FOR USE ON PUBLIC HIGHWAYS.

4

MFD. BY YAMAHA MOTOR CO., LTD. MM / YY MADE IN JAPAN
COMPETITION MOTORCYCLE

FABRICATION YAMAHA MOTOR CO., LTD. MM / YY FABRICE AU JAPON
MOTOCYCLETTE DE COMPETITION

5

This spark ignition system meets all requirements of the Canadian Konference Causing Equipment Regulations. Ce système d'allumage par étincelle de véhicule respecte toutes les exigences du Règlement sur le matériel brûleur du Canada.

7

⚠️ WARNING
This unit contains high pressure nitrogen gas. Mishandling can cause explosion.
- Read owner’s manual for instructions.
- Do not incinerate, puncture or open.

⚠️ AVERTISSEMENT
Cette unité contient de l'azote à haute pression. Une mauvaise manipulation peut entraîner d'explosion.
- Voir le manuel d'utilisateur pour les instructions.
- Ne pas brûler ni perforer ni ouvrir.
LOCATION OF IMPORTANT LABELS

9

WARNING

- BEFORE YOU OPERATE THIS VEHICLE, READ THE OWNER'S MANUAL AND ALL LABELS.
- NEVER CARRY A PASSENGER. You increase your risk of losing control if you carry a passenger.
- NEVER OPERATE THIS VEHICLE ON PUBLIC ROADS. You can collide with another vehicle if you operate this vehicle on a public road.
- ALWAYS WEAR AN APPROVED MOTORCYCLE HELMET, eye protection, and protective clothing.
- EXPERIENCED RIDER ONLY.

10

AVERTISSEMENT

- LIRE LE MANUEL DU PROPRIÉTAIRE AINSI QUE TOUTES LES ÉTIQUETTES AVANT D'UTILISER CE VÉHICULE.
- NE JAMAIS TRANSPORTER DE PASSAGER. La conduite avec passager augmente les risques de perte de contrôle.
- NE JAMAIS ROULER SUR DES CHEMINS PUBLICS. Vous pourriez entrer en collision avec un autre véhicule.
- TOUJOURS PORTER UN CASQUE DE MOTO CYCLISTE APPROUVÉ, des lunettes et des vêtements de protection.
- EXCLUSIVEMENT POUR L'USAGE D'UN CONDUCTEUR EXPERIMENTÉ.

11


12

TIRE INFORMATION

Cold tire normal pressure should be set as follows.
FRONT: 100 kPa (1.00 kgf/cm²), 15 psi
REAR: 100 kPa (1.00 kgf/cm²), 15 psi

13

INFORMATION SUR LES PNEUS

La pression des pneus à froid doit normalement être réglée comme suit.
AVANT: 100 kPa (1.00 kgf/cm²), 15 psi
ARRIÈRE: 100 kPa (1.00 kgf/cm²), 15 psi
LOCATION OF IMPORTANT LABELS

AUS, NZ, ZA

8

9

WARNING

- BEFORE YOU OPERATE THIS VEHICLE, READ THE OWNER'S MANUAL AND ALL LABELS.
- NEVER CARRY A PASSENGER. You increase your risk of losing control if you carry a passenger.
- NEVER OPERATE THIS VEHICLE ON PUBLIC ROADS. You can collide with another vehicle if you operate this vehicle on a public road.
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12

TIRE INFORMATION

Cold tire normal pressure should be set as follows:
FRONT : 100kPa, (1.00kgf/cm²), 15psi
REAR : 100kPa, (1.00kgf/cm²), 15psi

1-3
Familiarize yourself with the following pictograms and read the explanatory text.

| ![Book Icon] | Read Owner’s service manual. |
| ![Warning Icon] | This unit contains high-pressure nitrogen gas. Mishandling can cause explosion. Do not incinerate, puncture or open. |
| ![Off Icon] | Turn off the main switch after riding to avoid draining the battery. |
| ![Gas Pump Icon] | Use unleaded gasoline only. |
| ![Tire Pressure Icon] | Measure tire pressure when tires are cold. |
| ![Adjust Pressure Icon] | Adjust tire pressure. Improper tire pressure can cause loss of control. Loss of control can result in severe injury or death. |
• The machine you have purchased may differ slightly from those shown in the following.
• Designs and specifications are subject to change without notice.
CONSUMER INFORMATION

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.

VEHICLE IDENTIFICATION NUMBER
The vehicle identification number "1" is stamped on the right of the steering head pipe.

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

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.

INCLUDED PARTS
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.

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

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

IMPORTANT INFORMATION
PREPARATION FOR REMOVAL AND DISASSEMBLY
1. Remove all dirt, mud, dust, and foreign material before removal and disassembly.
• When washing the machine with high pressured water, cover the parts follows.

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

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

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

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

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.

CHECKING OF CONNECTION
Dealing with stains, rust, moisture, etc. on the connector.
1. Disconnect:
   • Connector

TIP
The two connectors "click" together.
2. Dry each terminal with an air blower.

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

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.

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

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

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<tr>
<th>Tool name/Part number</th>
<th>How to use</th>
<th>Illustration</th>
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<tr>
<td>Crankcase separating tool YU-1135-A, 90890-01135</td>
<td>These tool is used to remove the crankshaft from either case.</td>
<td>![Illustration of Crankcase Separating Tool]</td>
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<td>Flywheel puller YM-1189, 90890-01189</td>
<td>This tool is used to remove the flywheel magneto.</td>
<td>![Illustration of Flywheel Puller]</td>
</tr>
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<td>Rotor holding tool YU-1235, 90890-01235</td>
<td>This tool is used when loosening or tightening the flywheel magneto securing nut.</td>
<td>![Illustration of Rotor Holding Tool]</td>
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<tr>
<td>Dial gauge and stand YU-3097, 90890-01252 Stand YU-1256</td>
<td>These tools are used to check each part for runout or bent.</td>
<td>![Illustration of Dial Gauge and Stand]</td>
</tr>
<tr>
<td>Crankshaft installing tool Crankshaft installing pot YU-90050, 90890-01274 Crankshaft installing bolt YU-90050, 90890-01275 Adapter YU-90063, 90890-01278</td>
<td>These tools are used to install the crankshaft.</td>
<td>![Illustration of Crankshaft Installing Tool]</td>
</tr>
<tr>
<td>Piston pin puller set YU-1304, 90890-01304</td>
<td>This tool is used to remove the piston pin.</td>
<td>![Illustration of Piston Pin Puller Set]</td>
</tr>
<tr>
<td>Tool name/Part number</td>
<td>How to use</td>
<td>Illustration</td>
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<tr>
<td>---------------------------------------------</td>
<td>----------------------------------------------------------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td><strong>Radiator cap tester</strong></td>
<td>These tools are used for checking the cooling system.</td>
<td><img src="image1" alt="Radiator Cap Tester" /></td>
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<tr>
<td>YU-24460-01, 90890-01325</td>
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<tr>
<td><strong>Radiator cap tester adapter</strong></td>
<td></td>
<td><img src="image2" alt="Radiator Cap Tester Adapter" /></td>
</tr>
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<td>YU-33984, 90890-01352</td>
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<td><strong>Steering nut wrench</strong></td>
<td>This tool is used when tighten the steering ring nut to specification.</td>
<td><img src="image3" alt="Steering Nut Wrench" /></td>
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<td>YU-33975, 90890-01403</td>
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<td></td>
</tr>
<tr>
<td><strong>Cap bolt wrench</strong></td>
<td>This tool is used to loosen or tighten the base valve.</td>
<td><img src="image4" alt="Cap Bolt Wrench" /></td>
</tr>
<tr>
<td>YM-01500, 90890-01500</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cap bolt ring wrench</strong></td>
<td>This tool is used to loosen or tighten the damper assembly.</td>
<td><img src="image5" alt="Cap Bolt Ring Wrench" /></td>
</tr>
<tr>
<td>YM-01501, 90890-01501</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fork seal driver</strong></td>
<td>This tool is used when install the fork oil seal.</td>
<td><img src="image6" alt="Fork Seal Driver" /></td>
</tr>
<tr>
<td>YM-A0948, 90890-01502</td>
<td></td>
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</tr>
<tr>
<td><strong>Spoke nipple wrench</strong></td>
<td>This tool is used to tighten the spoke.</td>
<td><img src="image7" alt="Spoke Nipple Wrench" /></td>
</tr>
<tr>
<td>YM-01521, 90890-01521</td>
<td></td>
<td></td>
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<tr>
<td><strong>Pocket tester</strong></td>
<td>Use this tool to inspect the coil resistance, output voltage and amper-</td>
<td><img src="image8" alt="Pocket Tester" /></td>
</tr>
<tr>
<td>YU-3112-C, 90890-03112</td>
<td>age.</td>
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<tr>
<td>Tool name/Part number</td>
<td>How to use</td>
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<tr>
<td>Clutch holding tool YM-91042, 90890-04086</td>
<td>This tool is used to hold the clutch when removing or installing the clutch boss securing nut.</td>
<td><img src="image1" alt="Clutch holding tool illustration" /></td>
</tr>
<tr>
<td>Dynamic spark tester YM-34487 Ignition checker 90890-06754</td>
<td>This instrument is necessary for checking the ignition system components.</td>
<td><img src="image2" alt="Dynamic spark tester illustration" /></td>
</tr>
<tr>
<td>Digital tachometer YU-39951-B, 90890-06760</td>
<td>This tool is needed for observing engine rpm.</td>
<td><img src="image3" alt="Digital tachometer illustration" /></td>
</tr>
<tr>
<td>YAMAHA Bond No. 1215 (Three-Bond® No. 1215) 90890-85505</td>
<td>This sealant (Bond) is used for crankcase mating surface, etc.</td>
<td><img src="image4" alt="YAMAHA Bond No. illustration" /></td>
</tr>
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CONTROL FUNCTIONS

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

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

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

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

THROTTLE GRIP
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.

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

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

FUEL COCK
The fuel cock supplies fuel from the tank to carburetor and also filters the fuel. The fuel cock has the two positions:

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

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

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

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

Recommended fuel: Premium unleaded gasoline only with a research octane number of 95 or higher.

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

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

Fuel tank capacity: 8.0 L (1.76 Imp gal, 2.11 US gal)
STARTING AND BREAK-IN

HANDLING NOTE

**NOTICE**
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.

AIR FILTER MAINTENANCE
According to "CLEANING THE AIR FILTER ELEMENT" section in the CHAPTER 3, apply the foam-air-filter oil or its equivalent to the element. (Excess oil in the element may adversely affect engine starting.)

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

**NOTICE**
Do not warm up the engine for extended periods of time.

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

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

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

| Mixing oil: | Yamalube "2-R" |
| Mixing ratio: | 30:1 |

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

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

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

<table>
<thead>
<tr>
<th>Frame construction</th>
<th>Frame to rear frame</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combined seat and fuel tank</td>
<td>Fuel tank to frame</td>
</tr>
<tr>
<td>Exhaust system</td>
<td>Silencer to rear frame</td>
</tr>
<tr>
<td>Engine mounting</td>
<td>Frame to engine</td>
</tr>
<tr>
<td></td>
<td>Engine bracket to engine</td>
</tr>
<tr>
<td></td>
<td>Engine bracket to frame</td>
</tr>
<tr>
<td>Steering</td>
<td>Steering stem to handlebar</td>
</tr>
<tr>
<td></td>
<td>Steering stem to frame</td>
</tr>
<tr>
<td></td>
<td>Steering stem to upper bracket</td>
</tr>
<tr>
<td></td>
<td>Upper bracket to handlebar</td>
</tr>
<tr>
<td>Suspension</td>
<td>Steering stem to front fork</td>
</tr>
<tr>
<td></td>
<td>Front fork to upper bracket</td>
</tr>
<tr>
<td></td>
<td>Front fork to lower bracket</td>
</tr>
<tr>
<td>Rear</td>
<td>For link type</td>
</tr>
<tr>
<td></td>
<td>Assembly of links</td>
</tr>
<tr>
<td></td>
<td>Link to frame</td>
</tr>
<tr>
<td></td>
<td>Link to rear shock absorber</td>
</tr>
<tr>
<td></td>
<td>Link to swingarm</td>
</tr>
<tr>
<td></td>
<td>Installation of rear shock absorber</td>
</tr>
<tr>
<td></td>
<td>Rear shock absorber to frame</td>
</tr>
<tr>
<td></td>
<td>Installation of swingarm</td>
</tr>
<tr>
<td></td>
<td>Tightening of pivot shaft</td>
</tr>
<tr>
<td>Wheel</td>
<td>Installation of wheel</td>
</tr>
<tr>
<td></td>
<td>Front</td>
</tr>
<tr>
<td></td>
<td>Tightening of wheel axle</td>
</tr>
<tr>
<td></td>
<td>Front</td>
</tr>
<tr>
<td></td>
<td>Tightening of wheel axle</td>
</tr>
<tr>
<td></td>
<td>Rear</td>
</tr>
<tr>
<td></td>
<td>Wheel to rear wheel sprocket</td>
</tr>
<tr>
<td>Brake</td>
<td>Front</td>
</tr>
<tr>
<td></td>
<td>Brake caliper to front fork</td>
</tr>
<tr>
<td></td>
<td>Brake disc to wheel</td>
</tr>
<tr>
<td></td>
<td>Tightening of union bolt</td>
</tr>
<tr>
<td></td>
<td>Brake master cylinder to handlebar</td>
</tr>
<tr>
<td></td>
<td>Tightening of bleed screw</td>
</tr>
<tr>
<td></td>
<td>Tightening of brake hose holder</td>
</tr>
<tr>
<td>Rear</td>
<td>Brake pedal to frame</td>
</tr>
<tr>
<td></td>
<td>Brake disc to wheel</td>
</tr>
<tr>
<td></td>
<td>Tightening of union bolt</td>
</tr>
<tr>
<td></td>
<td>Brake master cylinder to frame</td>
</tr>
<tr>
<td></td>
<td>Tightening of bleed screw</td>
</tr>
<tr>
<td></td>
<td>Tightening of brake hose holder</td>
</tr>
<tr>
<td>Fuel system</td>
<td>Fuel tank to fuel cock</td>
</tr>
</tbody>
</table>

**TIP**

Concerning the tightening torque, refer to "TIGHTENING TORQUES" section in the CHAPTER 2.
CLEANING AND STORAGE

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

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

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

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

1. Drain the fuel tank, fuel lines, and the carburetor float bowl.
2. Remove the spark plug, pour a tablespoon of SAE 10W-40 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.

TIP
Make any necessary repairs before the machine is stored.
# GENERAL SPECIFICATIONS

## SPECIFICATIONS

**Model name:**
- YZ250A1 (USA, CDN)
- YZ250 (EUROPE, ZA)
- YZ250A (AUS, NZ)

**Model code number:**
- 1P8S (USA, CDN)
- 1P8T (EUROPE)
- 1P8V (AUS, NZ, ZA)

**Dimensions:**

<table>
<thead>
<tr>
<th></th>
<th>USA, AUS, NZ, ZA</th>
<th>EUROPE, CDN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall length</td>
<td>2,178 mm (85.7 in)</td>
<td>2,184 mm (86.0 in)</td>
</tr>
<tr>
<td>Overall width</td>
<td>827 mm (32.6 in)</td>
<td>---</td>
</tr>
<tr>
<td>Overall height</td>
<td>1,306 mm (51.4 in)</td>
<td>1,309 mm (51.5 in)</td>
</tr>
<tr>
<td>Seat height</td>
<td>994 mm (39.1 in)</td>
<td>997 mm (39.3 in)</td>
</tr>
<tr>
<td>Wheelbase</td>
<td>1,481 mm (58.3 in)</td>
<td>---</td>
</tr>
<tr>
<td>Minimum ground clearance</td>
<td>382 mm (15.0 in)</td>
<td>385 mm (15.2 in)</td>
</tr>
</tbody>
</table>

**Weight:**
- With oil and fuel: 103 kg (227 lb)

**Engine:**
- **Engine type:** Liquid cooled 2-stroke, gasoline
- **Cylinder arrangement:** Single cylinder, forward inclined
- **Displacement:** 249 cm³ (8.76 Imp oz, 8.42 US oz)
- **Bore x stroke:** 66.4 x 72 mm (2.614 x 2.835 in)
- **Compression ratio:** 8.9–10.6 : 1
- **Starting system:** Kick starter

**Lubrication system:**
- Premix (30 : 1)(Yamalube 2-R)

**Oil type or grade (2-stroke):**
- Transmission oil: Recommended brand: YAMALUBE SAE10W-40, API service SG type or higher, JASO standard MA
- **Periodic oil change:** 0.75 L (0.66 Imp qt, 0.79 US qt)
- **Total amount:** 0.80 L (0.70 Imp qt, 0.85 US qt)

**Coolant capacity (including all routes):**
- 1.20 L (1.06 Imp qt, 1.27 US qt)

**Air filter:**
- Wet type element

**Fuel:**
- **Type:** Premium unleaded gasoline only with a research octane number of 95 or higher.
- **Tank capacity:** 8.0 L (1.76 Imp gal, 2.11 US gal)

**Carburetor:**
- **Type/Manufacturer:** PWK38S/KEIHIN

**Spark plug:**
- **Type/Manufacturer:** BR8EG/NGK (resistance type)
- **Gap:** 0.5–0.6 mm (0.020–0.024 in)

**Clutch type:**
- Wet, multiple-disc
## GENERAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Transmission:</th>
<th>USA, ZA, AUS, NZ</th>
<th>EUROPE, CDN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary reduction system</td>
<td>Gear</td>
<td></td>
</tr>
<tr>
<td>Primary reduction ratio</td>
<td>63/21 (3.000)</td>
<td></td>
</tr>
<tr>
<td>Secondary reduction system</td>
<td>Chain drive</td>
<td></td>
</tr>
<tr>
<td>Secondary reduction ratio</td>
<td>50/14 (3.571)</td>
<td></td>
</tr>
<tr>
<td>Transmission type</td>
<td>Constant mesh, 5-speed</td>
<td></td>
</tr>
<tr>
<td>Operation</td>
<td>Left foot operation</td>
<td></td>
</tr>
<tr>
<td>Gear ratio:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st</td>
<td>27/14 (1.929)</td>
<td></td>
</tr>
<tr>
<td>2nd</td>
<td>23/15 (1.533)</td>
<td></td>
</tr>
<tr>
<td>3rd</td>
<td>23/18 (1.278)</td>
<td></td>
</tr>
<tr>
<td>4th</td>
<td>24/22 (1.091)</td>
<td></td>
</tr>
<tr>
<td>5th</td>
<td>20/21 (0.952)</td>
<td></td>
</tr>
<tr>
<td>Chassis:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frame type</td>
<td>Semi double cradle</td>
<td></td>
</tr>
<tr>
<td>Caster angle</td>
<td>26.9 °</td>
<td>27.1 °</td>
</tr>
<tr>
<td>Trail</td>
<td>115 mm (4.53 in)</td>
<td>118 mm (4.65 in)</td>
</tr>
<tr>
<td>Tire:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>With tube</td>
<td></td>
</tr>
<tr>
<td>Size (front)</td>
<td>80/100-21 51M</td>
<td></td>
</tr>
<tr>
<td>Size (rear)</td>
<td>110/90-19 62M</td>
<td></td>
</tr>
<tr>
<td>Tire pressure (front and rear)</td>
<td>100 kPa (1.0 kgf/cm², 15 psi)</td>
<td></td>
</tr>
<tr>
<td>Brake:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Front brake type</td>
<td>Single disc brake</td>
<td></td>
</tr>
<tr>
<td>Operation</td>
<td>Right hand operation</td>
<td></td>
</tr>
<tr>
<td>Rear brake type</td>
<td>Single disc brake</td>
<td></td>
</tr>
<tr>
<td>Operation</td>
<td>Right foot operation</td>
<td></td>
</tr>
<tr>
<td>Suspension:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Front suspension</td>
<td>Telescopic fork</td>
<td></td>
</tr>
<tr>
<td>Rear suspension</td>
<td>Swingarm (link type monocross suspension)</td>
<td></td>
</tr>
<tr>
<td>Shock absorber:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Front shock absorber</td>
<td>Coil spring/oil damper</td>
<td></td>
</tr>
<tr>
<td>Rear shock absorber</td>
<td>Coil spring/gas, oil damper</td>
<td></td>
</tr>
<tr>
<td>Wheel travel:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Front wheel travel</td>
<td>300 mm (11.8 in)</td>
<td></td>
</tr>
<tr>
<td>Rear wheel travel</td>
<td>315 mm (12.4 in)</td>
<td></td>
</tr>
<tr>
<td>Electrical:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ignition system</td>
<td>CDI magneto</td>
<td></td>
</tr>
</tbody>
</table>
## ENGINE

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cylinder head:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Combustion chamber capacity</td>
<td>21.5 cm³ (0.757 Imp oz, 0.727 US oz)</td>
<td>----</td>
</tr>
<tr>
<td>Warp limit</td>
<td>----</td>
<td>0.03 mm (0.0012 in)</td>
</tr>
<tr>
<td>Cylinder:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bore size</td>
<td>66.400–66.414 mm (2.6142–2.6147 in)</td>
<td>66.5 mm (2.1618 in)</td>
</tr>
<tr>
<td>Taper limit</td>
<td>----</td>
<td>0.05 mm (0.0020 in)</td>
</tr>
<tr>
<td>Out of round limit</td>
<td>----</td>
<td>0.01 mm (0.0004 in)</td>
</tr>
<tr>
<td>Piston:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Piston size/</td>
<td>66.352–66.367 mm (2.6120–2.6129 in)</td>
<td>----</td>
</tr>
<tr>
<td>Measuring point &quot;H&quot;</td>
<td>17.5 mm (0.69 in)</td>
<td>----</td>
</tr>
<tr>
<td>Piston clearance</td>
<td>0.045–0.050 mmm (0.0018–0.0020 in)</td>
<td>0.1 mm (0.004 in)</td>
</tr>
<tr>
<td>Piston offset</td>
<td>1.5 mm (0.059 in)/EX-side</td>
<td>----</td>
</tr>
<tr>
<td>Piston pin:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Piston pin outside diameter</td>
<td>17.995–18.000 mm (0.7085–0.7087 in)</td>
<td>17.975 mm (0.7077 in)</td>
</tr>
<tr>
<td>Piston ring:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sectional sketch</td>
<td>Plain</td>
<td>----</td>
</tr>
<tr>
<td>B=1.0 mm (0.039 in)</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>T=2.55 mm (0.100 in)</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>End gap (installed)</td>
<td>0.40–0.55 mm (0.016–0.022 in)</td>
<td>0.95 mm (0.037 in)</td>
</tr>
<tr>
<td>Side clearance (installed) :1st</td>
<td>0.030–0.065 mm (0.0012–0.0026 in)</td>
<td>0.1 mm (0.004 in)</td>
</tr>
<tr>
<td>Side clearance (installed) :2nd</td>
<td>0.030–0.065 mm (0.0012–0.0026 in)</td>
<td>0.1 mm (0.004 in)</td>
</tr>
</tbody>
</table>
## MAINTENANCE SPECIFICATIONS

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Crankshaft:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crank width &quot;A&quot;</td>
<td>59.95–60.00 mm (2.360–2.362 in)</td>
<td>0.05 mm (0.002 in)</td>
</tr>
<tr>
<td>Runout limit &quot;C&quot;</td>
<td>0.03 mm (0.0012 in)</td>
<td>0.05 mm (0.0020 in)</td>
</tr>
<tr>
<td>Connecting rod big end side clearance &quot;D&quot;</td>
<td>0.25–0.75 mm (0.010–0.030 in)</td>
<td>2.0 mm (0.08 in)</td>
</tr>
<tr>
<td>Small end free play &quot;F&quot;</td>
<td>0.4–1.0 mm (0.016–0.039 in)</td>
<td></td>
</tr>
<tr>
<td><strong>Clutch:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friction plate thickness</td>
<td>2.9–3.1 mm (0.114–0.122 in)</td>
<td>2.8 mm (0.110 in)</td>
</tr>
<tr>
<td>Quantity</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Clutch plate thickness</td>
<td>1.5–1.7 mm (0.059–0.067 in)</td>
<td></td>
</tr>
<tr>
<td>Quantity</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Warp limit</td>
<td></td>
<td>0.2 mm (0.008 in)</td>
</tr>
<tr>
<td>Clutch spring free length</td>
<td>50.0 mm (1.969 in)</td>
<td>48.0 mm (1.890 in)</td>
</tr>
<tr>
<td>Quantity</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Clutch housing thrust clearance</td>
<td>0.17–0.23 mm (0.007–0.009 in)</td>
<td></td>
</tr>
<tr>
<td>Clutch housing radial clearance</td>
<td>0.030–0.055 mm (0.001–0.002 in)</td>
<td></td>
</tr>
<tr>
<td>Clutch release method</td>
<td>Inner push, cam push</td>
<td></td>
</tr>
<tr>
<td><strong>Transmission:</strong></td>
<td></td>
<td>0.01 mm (0.0004 in)</td>
</tr>
<tr>
<td>Main axle deflection limit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drive axle deflection limit</td>
<td></td>
<td>0.01 mm (0.0004 in)</td>
</tr>
<tr>
<td><strong>Shifter:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shifting type</td>
<td>Cam drum and guide bar</td>
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</tr>
<tr>
<td>Guide bar bending limit</td>
<td></td>
<td>0.05 mm (0.0020 in)</td>
</tr>
<tr>
<td><strong>Kick starter type:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air filter oil grade (oiled filter):</td>
<td>Foam-air-filter oil or equivalent oil</td>
<td></td>
</tr>
<tr>
<td>Kick and ratchet type</td>
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## MAINTENANCE SPECIFICATIONS

<table>
<thead>
<tr>
<th>Item</th>
<th>USA, CDN</th>
<th>EUROPE</th>
<th>AUS, NZ, ZA</th>
<th>Limit</th>
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<tbody>
<tr>
<td>Carburetor:</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Type/Manufacturer</td>
<td>PWK38S/</td>
<td>KEIHIN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I.D. mark</td>
<td>1P87 50</td>
<td>1P86 40</td>
<td></td>
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<tr>
<td>Main jet (M.J.)</td>
<td>#178</td>
<td>#180</td>
<td></td>
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<tr>
<td>Main air jet (M.A. J.)</td>
<td>#200</td>
<td></td>
<td></td>
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<tr>
<td>Jet needle-clip position (J.N.)</td>
<td>N3EW-2</td>
<td>N3EW-3</td>
<td></td>
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</tr>
<tr>
<td>Main nozzle (N.J.)</td>
<td>ø2.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cutaway (C.A.)</td>
<td>#7</td>
<td></td>
<td></td>
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<tr>
<td>Pilot jet (P.J.)</td>
<td>#50</td>
<td>#52</td>
<td></td>
<td></td>
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<tr>
<td>Pilot air screw (P.A.S.) (for reference only)</td>
<td>1-1/4</td>
<td>2-1/4</td>
<td></td>
<td></td>
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<tr>
<td>Valve seat size (V.S.)</td>
<td>ø3.8 mm (0.15 in)</td>
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<td></td>
<td></td>
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<tr>
<td>Starter jet (G.S.)</td>
<td>#85</td>
<td></td>
<td></td>
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<tr>
<td>Power jet (P.W.J.)</td>
<td>#50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Float arm height (F.H.)</td>
<td>5.5–7.5 mm (0.22–0.30 in)</td>
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<tr>
<td>Reed valve:</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Thickness</td>
<td>0.42 mm (0.017 in)</td>
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<tr>
<td>Valve stopper height</td>
<td>10.3–10.7 mm (0.406–0.421 in)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Valve bending limit</td>
<td>----</td>
<td></td>
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<tr>
<td>Cooling:</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Radiator core size:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Width</td>
<td>107.8 mm (4.24 in)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Height</td>
<td>240 mm (9.45 in)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thickness</td>
<td>32 mm (1.26 in)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Radiator cap opening pressure</td>
<td>95–125 kPa (0.95–1.25 kg/cm², 13.5–17.8 psi)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Radiator capacity (total)</td>
<td>0.63 L (0.55 Imp qt, 0.67 US qt)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water pump:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Single-suction centrifugal pump</td>
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## MAINTENANCE SPECIFICATIONS

### CHASSIS

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<thead>
<tr>
<th>Item</th>
<th>Standard</th>
<th>Limit</th>
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<tbody>
<tr>
<td><strong>Steering system:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Steering bearing type</td>
<td>Taper roller bearing</td>
<td></td>
</tr>
<tr>
<td><strong>Front suspension:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Front fork travel</td>
<td>300 mm (11.8 in)</td>
<td></td>
</tr>
<tr>
<td>Fork spring free length</td>
<td>454 mm (17.9 in)</td>
<td>449 mm (17.7 in)</td>
</tr>
<tr>
<td>Spring rate, STD</td>
<td>K=4.3 N/mm (0.438 kg/mm, 24.5 lb/in)</td>
<td></td>
</tr>
<tr>
<td>Optional spring</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Oil capacity</td>
<td>521 cm³ (18.3 Imp oz, 17.6 US oz)</td>
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</tr>
<tr>
<td>Oil grade</td>
<td>Suspension oil &quot;S1&quot;</td>
<td></td>
</tr>
<tr>
<td>Inner tube outer diameter</td>
<td>48 mm (1.89 in)</td>
<td></td>
</tr>
<tr>
<td><strong>Rear suspension:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shock absorber travel</td>
<td>131.5 mm (5.18 in)</td>
<td></td>
</tr>
<tr>
<td>Spring free length</td>
<td>Approx. 265 mm (10.43 in)</td>
<td></td>
</tr>
<tr>
<td>Fitting length*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I.D. mark (Black/1)</td>
<td>253 mm (9.96 in)</td>
<td>252 mm (9.92 in)</td>
</tr>
<tr>
<td>I.D. mark (Black/2)</td>
<td>259 mm (10.20 in)</td>
<td>258 mm (10.16 in)</td>
</tr>
<tr>
<td>I.D. mark (Black/3)</td>
<td>250.5 mm (9.86 in)</td>
<td>249.5 mm (9.82 in)</td>
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<tr>
<td>Preload length</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;Min.–Max.&gt;</td>
<td>1.5–18 mm (0.06–0.71 in)</td>
<td></td>
</tr>
<tr>
<td>Spring rate, STD</td>
<td>K=48.0 N/mm (4.90 kg/mm, 274.4 lb/in)</td>
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<tr>
<td>Optional spring</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Enclosed gas pressure</td>
<td>1,000 kPa (10 kg/cm², 142 psi)</td>
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</tr>
<tr>
<td><em>Spring specification varies according to the difference in the production lot.</em></td>
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<td></td>
</tr>
<tr>
<td><strong>Swingarm:</strong></td>
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<td></td>
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<tr>
<td>Swingarm free play limit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>End</td>
<td>----</td>
<td>1.0 mm (0.04 in)</td>
</tr>
<tr>
<td>Side clearance</td>
<td>----</td>
<td>0.2–0.9 mm (0.008–0.035 in)</td>
</tr>
<tr>
<td><strong>Wheel:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Front wheel type</td>
<td>Spoke wheel</td>
<td></td>
</tr>
<tr>
<td>Rear wheel type</td>
<td>Spoke wheel</td>
<td></td>
</tr>
<tr>
<td>Front rim size/material</td>
<td>21 × 1.60/Aluminum</td>
<td></td>
</tr>
<tr>
<td>Rear rim size/material</td>
<td>19 × 2.15/Aluminum</td>
<td></td>
</tr>
<tr>
<td>Rim runout limit:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radial</td>
<td>----</td>
<td>2.0 mm (0.08 in)</td>
</tr>
<tr>
<td>Lateral</td>
<td>----</td>
<td>2.0 mm (0.08 in)</td>
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</tbody>
</table>
## Drive chain:

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type/manufacturer</td>
<td>DID520DMA2 SDH G&amp;B/DAIDO</td>
<td></td>
</tr>
<tr>
<td>Number of links</td>
<td>113 links + joint</td>
<td></td>
</tr>
<tr>
<td>Chain slack</td>
<td>48–58 mm (1.9–2.3 in)</td>
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</tr>
<tr>
<td>Chain length (15 links)</td>
<td>242.9 mm (9.563 in)</td>
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</tr>
</tbody>
</table>

## Front disc brake:

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disc outside dia. x Thickness</td>
<td>250 x 3.0 mm (9.84 x 0.12 in)</td>
<td>250 x 2.5 mm (9.84 x 0.10 in)</td>
</tr>
<tr>
<td>Pad thickness</td>
<td>4.4 mm (0.17 in)</td>
<td>1.0 mm (0.04 in)</td>
</tr>
<tr>
<td>Master cylinder inside dia.</td>
<td>9.52 mm (0.375 in)</td>
<td></td>
</tr>
<tr>
<td>Caliper cylinder inside dia.</td>
<td>22.65 mm (0.892 in) x 2</td>
<td></td>
</tr>
<tr>
<td>Brake fluid type</td>
<td>DOT #4</td>
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</tr>
</tbody>
</table>

## Rear disc brake:

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disc outside dia. x Thickness</td>
<td>245 x 4.0 mm (9.65 x 0.16 in)</td>
<td>245 x 3.5 mm (9.65 x 0.14 in)</td>
</tr>
<tr>
<td>Deflection limit</td>
<td>----</td>
<td>0.15 mm (0.006 in)</td>
</tr>
<tr>
<td>Pad thickness</td>
<td>6.4 mm (0.25 in)</td>
<td>1.0 mm (0.04 in)</td>
</tr>
<tr>
<td>Master cylinder inside dia.</td>
<td>11.0 mm (0.433 in)</td>
<td></td>
</tr>
<tr>
<td>Caliper cylinder inside dia.</td>
<td>25.4 mm (1.000 in) x 1</td>
<td></td>
</tr>
<tr>
<td>Brake fluid type</td>
<td>DOT #4</td>
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## Brake lever and brake pedal:

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brake lever position</td>
<td>95 mm (3.74 in)</td>
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</tr>
<tr>
<td>Brake pedal height (vertical height above footrest top)</td>
<td>Zero mm (Zero in)</td>
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</tr>
<tr>
<td>Clutch lever free play (lever end)</td>
<td>8–13 mm (0.31–0.51 in)</td>
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</tr>
<tr>
<td>Throttle grip free play</td>
<td>3–5 mm (0.12–0.20 in)</td>
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</table>

## ELECTRICAL

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
<th>Limit</th>
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</thead>
<tbody>
<tr>
<td>Ignition system:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ignition timing (B.T.D.C.)</td>
<td>0.18 mm (0.007 in)</td>
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<tr>
<td>Advancer type</td>
<td>Electrical</td>
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<tr>
<td>CDI:</td>
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<td></td>
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<tr>
<td>Magneto-model (stator)/Manufacturer</td>
<td>5CU-20/YAMAHA</td>
<td></td>
</tr>
<tr>
<td>Charging coil 1 resistance (color)</td>
<td>720–1,080 Ω at 20 °C (68 °F) (Black-Black/Red)</td>
<td></td>
</tr>
<tr>
<td>Charging coil 2 resistance (color)</td>
<td>44–66 Ω at 20 °C (68 °F) (Green/Blue-Green/White)</td>
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<tr>
<td>Pickup coil resistance (color)</td>
<td>248–372 Ω at 20 °C (68 °F) (White/Blue-White/Red)</td>
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<tr>
<td>CDI unit-model/manufacturer</td>
<td>1P8-00/YAMAHA</td>
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</table>
### TIGHTENING TORQUES

#### ENGINE

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

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard Limit</th>
<th>Limit</th>
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</thead>
<tbody>
<tr>
<td>Ignition coil:</td>
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<tr>
<td>Model/manufacturer</td>
<td>1P8-00/YAMAHA</td>
<td>----</td>
</tr>
<tr>
<td>Minimum spark gap</td>
<td>6 mm (0.24 in)</td>
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<tr>
<td>Primary winding resistance</td>
<td>0.20–0.30 Ω at 20 °C (68 °F)</td>
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<tr>
<td>Secondary winding resistance</td>
<td>9.5–14.3 kΩ at 20 °C (68 °F)</td>
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<tr>
<td>Spark plug cap:</td>
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</tr>
<tr>
<td>Resistance</td>
<td>4–6 kΩ at 20 °C (68 °F)</td>
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<table>
<thead>
<tr>
<th>Item</th>
<th>Part to be tightened</th>
<th>Q'ty</th>
<th>Tightening torque</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Thread size</td>
<td></td>
<td>Nm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>m•kg</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ft•lb</td>
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<tr>
<td>Spark plug</td>
<td>M14S × 1.25</td>
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<td>20</td>
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<tr>
<td>Cylinder head (nut)</td>
<td>M8 × 1.25</td>
<td>6</td>
<td>25</td>
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<tr>
<td>Cylinder head (stud)</td>
<td>M8 × 1.25</td>
<td>6</td>
<td>13</td>
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<tr>
<td>Cylinder (nut)</td>
<td>M10 × 1.25</td>
<td>4</td>
<td>42</td>
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<tr>
<td>Cylinder (stud)</td>
<td>M10 × 1.25</td>
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<td>13</td>
</tr>
<tr>
<td>Power valve:</td>
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</tr>
<tr>
<td>Holder</td>
<td>M5 × 0.8</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Link rod</td>
<td>M5 × 0.8</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Push rod</td>
<td>M5 × 0.8</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Thrust plate</td>
<td>M5 × 0.8</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Side holder</td>
<td>M5 × 0.8</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Link lever</td>
<td>M4 × 0.7</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Pulley</td>
<td>M4 × 0.7</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Cover</td>
<td>M5 × 0.8</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Governor fork</td>
<td>M4 × 0.7</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Housing</td>
<td>M5 × 0.8</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Impeller</td>
<td>M8 × 1.25</td>
<td>1</td>
<td>14</td>
</tr>
<tr>
<td>Water pump housing cover</td>
<td>M6 × 1.0</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>Coolant drain bolt</td>
<td>M6 × 1.0</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Radiator</td>
<td>M6 × 1.0</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>Radiator panel</td>
<td>M6 × 1.0</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>Radiator hose clamp</td>
<td>M6 × 1.0</td>
<td>8</td>
<td>2</td>
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<tr>
<td>Air filter element</td>
<td>M6 × 1.0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Carburetor joint</td>
<td>M6 × 1.0</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Air filter case</td>
<td>M6 × 1.0</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Air filter guide clamp</td>
<td>M5 × 0.8</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Reed valve</td>
<td>M3 × 0.5</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Throttle cable adjust bolt and locknut</td>
<td>M8 × 1.25</td>
<td>1</td>
<td>7</td>
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<tr>
<td>Throttle cable</td>
<td>M6 × 0.75</td>
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<td>4</td>
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</table>
### TIGHTENING TORQUES

<table>
<thead>
<tr>
<th>Part to be tightened</th>
<th>Thread size</th>
<th>Q'ty</th>
<th>Tightening torque</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Nm</td>
</tr>
<tr>
<td>Exhaust pipe (front)</td>
<td>M6 × 1.0</td>
<td>1</td>
<td>14</td>
</tr>
<tr>
<td>Exhaust pipe (rear)</td>
<td>M6 × 1.0</td>
<td>1</td>
<td>12</td>
</tr>
<tr>
<td>Exhaust pipe stay (front)</td>
<td>M8 × 1.25</td>
<td>1</td>
<td>25</td>
</tr>
<tr>
<td>Exhaust pipe stay (rear)</td>
<td>M6 × 1.0</td>
<td>1</td>
<td>12</td>
</tr>
<tr>
<td>Silencer:</td>
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### CHASSIS

**TIP**

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

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<th>Q'ty</th>
<th>Tightening torque</th>
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<tr>
<td>Steering ring nut</td>
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Refer to TIP.
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<th>Part to be tightened</th>
<th>Thread size</th>
<th>Q'ty</th>
<th>Tightening torque</th>
<th>Nm</th>
<th>m•kg</th>
<th>ft•lb</th>
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### TIGHTENING TORQUES

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<th>Q'ty</th>
<th>Tightening torque</th>
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<td>Triangle Swingarm and brake hose holder</td>
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<td>Triangle Swingarm and patch</td>
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<td>Triangle Fuel tank and hooking screw (fitting band)</td>
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### ELECTRICAL

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<th>Tightening torque</th>
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TIP
1. First, tighten the steering ring nut approximately 38 Nm (3.8 m•kg, 27 ft•lb) by using the steering nut wrench, then loosen the steering ring nut one turn.
2. Retighten the steering ring nut 7 Nm (0.7 m•kg, 5.1 ft•lb).
TIGHTENING TORQUES

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.

<table>
<thead>
<tr>
<th>A (Nut)</th>
<th>B (Bolt)</th>
<th>TORQUE SPECIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 mm</td>
<td>6 mm</td>
<td>Nm m•kg ft•lb</td>
</tr>
<tr>
<td>12 mm</td>
<td>8 mm</td>
<td></td>
</tr>
<tr>
<td>14 mm</td>
<td>10 mm</td>
<td></td>
</tr>
<tr>
<td>17 mm</td>
<td>12 mm</td>
<td></td>
</tr>
<tr>
<td>19 mm</td>
<td>14 mm</td>
<td></td>
</tr>
<tr>
<td>22 mm</td>
<td>16 mm</td>
<td></td>
</tr>
</tbody>
</table>

A. Distance between flats
B. Outside thread diameter

DEFINITION OF UNITS

<table>
<thead>
<tr>
<th>Unit</th>
<th>Read</th>
<th>Definition</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm</td>
<td>millimeter</td>
<td>(10^{-3}) meter</td>
<td>Length</td>
</tr>
<tr>
<td>cm</td>
<td>centimeter</td>
<td>(10^{-2}) meter</td>
<td>Length</td>
</tr>
<tr>
<td>kg</td>
<td>kilogram</td>
<td>(10^3) gram</td>
<td>Weight</td>
</tr>
<tr>
<td>N</td>
<td>Newton</td>
<td>(1\ kg \times \text{m/sec}^2)</td>
<td>Force</td>
</tr>
<tr>
<td>Nm</td>
<td>Newton meter</td>
<td>(N \times \text{m})</td>
<td>Torque</td>
</tr>
<tr>
<td>m•kg</td>
<td>Meter kilogram</td>
<td>(m \times \text{kg})</td>
<td>Torque</td>
</tr>
<tr>
<td>Pa</td>
<td>Pascal</td>
<td>(N/m^2)</td>
<td>Pressure</td>
</tr>
<tr>
<td>N/mm</td>
<td>Newton per millimeter</td>
<td>N/mm</td>
<td>Spring rate</td>
</tr>
<tr>
<td>L</td>
<td>Liter</td>
<td>—</td>
<td>Volume or capacity</td>
</tr>
<tr>
<td>cm³</td>
<td>Cubic centimeter</td>
<td>—</td>
<td>Volume or capacity</td>
</tr>
<tr>
<td>r/min</td>
<td>Revolution per minute</td>
<td>—</td>
<td>Engine speed</td>
</tr>
</tbody>
</table>
1. "ENGINE STOP" button lead
2. Throttle cable
3. Clutch cable
4. Clamp
5. Wireharness
6. Radiator breather hose
7. Air vent hose
8. Crankcase breather hose
9. Overflow hose

A. Pass the clutch cable on the outside of the throttle cable and "ENGINE STOP" button lead.
B. Align the throttle cable locating tape with the cable guide.
C. Pass the throttle cable, clutch cable and "ENGINE STOP" button lead above the radiator hose.
D. Clamp the "ENGINE STOP" button lead to the frame. Tighten the clamp so that the "ENGINE STOP" button lead is not pulled when the handlebar is turned to the right and left.
E. Clamp the throttle cable, clutch cable and wireharness to the frame.
F. Clamp the throttle cable and wireharness to the frame.
G. Pass the clutch cable in front of the center of the cylinder head tightening nut.
H. Pass the air vent hose, overflow hose and crankcase breather hose between the frame and connecting rod.
I. Locate the clamp ends in the arrowed range.
J. Pass the throttle cable behind the air vent hose.
K. Pass the air vent hose, overflow hose and crankcase breather hose so that they do not contact the rear shock absorber.
L. Clamp the air vent hoses.
1. Ignition coil lead
2. Clamp
3. CDI magneto lead
4. Neutral switch lead
5. Radiator breather hose
6. YPVS breather hose
7. Connector cover

A. Clamp the ignition coil lead to the frame at its locating tape. Clamp it in front of the radiator fitting boss.

B. Clamp the CDI magneto lead to the frame at its locating tape. Clamp it at the rear of the radiator fitting boss.

C. Do not allow the neutral switch lead to slacken except over the radiator hose.

D. Pass the neutral switch lead through the holder.

E. Pass the radiator breather hose outside the engine bracket and inside the down tube. Then pass the radiator breather hose inside the CDI magneto lead.

F. Clamp the CDI magneto lead, radiator breather hose, YPVS breather hose and neutral switch lead to the frame.
G. Clamp the radiator breather hose, CDI magneto lead and neutral switch lead to the frame.

H. Pass the CDI magneto lead, radiator breather hose and neutral switch lead in front of the radiator hose. Then pass the radiator breather hose inside the CDI magneto lead and neutral switch lead.

I. Pass the radiator breather hose and ignition coil lead between the frame and the radiator (left).

J. Locate the clamp ends in the arrowed range.

K. Bring the connector cover into contact with the coupler.
1. Clamp  
2. Wireharness  
3. High tension cord  
4. CDI unit band  
5. CDI unit  
6. CDI unit lead  
7. Connector cover  
8. Radiator hose  
9. Radiator breather hose  
10. CDI unit stay

A. Clamp the wireharness protecting tube to the right engine bracket.  
B. Pass the high tension cord to the right of the radiator hose so that the high tension cord does not contact the radiator hose.  
C. Pass the CDI unit lead between the frame and the radiator (right) and then above the radiator fitting boss.  
D. Bring the connector cover into contact with the coupler.  
E. Pass the radiator breather hose behind the radiator hose.  
F. Insert the CDI unit band until it stops at the CDI unit stay.
1. Master cylinder
2. Brake hose holder
3. Brake hose

A. Install the brake hose so that its pipe portion directs as shown and lightly touches the projection on the caliper.
B. Pass the brake hose into the brake hose holders.
C. If the brake hose contacts the spring (rear shock absorber), correct its twist.
D. Install the brake hose so that its pipe portion directs as shown and lightly touches the projection on the master cylinder.
1. Brake hose
2. Master cylinder
3. "ENGINE STOP" button lead
4. "ENGINE STOP" button
5. Throttle cable
6. Clutch cable
7. Clamp
8. Cable guide

A. Install the brake hose so that its pipe portion directs as shown and lightly touches the projection on the master cylinder.
B. Pass the "ENGINE STOP" button lead in the middle of the clutch holder.
C. Clamp the "ENGINE STOP" button lead to the handlebar.
D. Pass the brake hose in front of the number plate and through the cable guide.
E. Pass the clutch cable through the cable guide on the number plate.
### REGULAR INSPECTION AND ADJUSTMENTS

#### MAINTENANCE INTERVALS

**TIP**
- 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 in doubt as to what intervals to follow in maintaining and lubricating your machine, consult your Yamaha dealer.
- Periodic inspection is essential in making full use of the machine performance. The service life of the parts varies substantially according to the environment in which the machine runs (e.g., rain, dirt, etc.). Therefore, earlier inspection is required by reference to the list below.

<table>
<thead>
<tr>
<th>Item</th>
<th>After break-in</th>
<th>Every race (about 2.5 hours)</th>
<th>Every third (about 7.5 hours)</th>
<th>Every fifth (about 12.5 hours)</th>
<th>As required</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PISTON</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inspect and clean</td>
<td>●</td>
<td>●</td>
<td></td>
<td>●</td>
<td>●</td>
<td>Inspect crack.</td>
</tr>
<tr>
<td>Replace</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Inspect carbon deposits and eliminate them.</td>
</tr>
<tr>
<td><strong>PISTON RING</strong></td>
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<td>●</td>
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<tr>
<td>Inspect</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td>●</td>
<td>Check ring end gap.</td>
</tr>
<tr>
<td>Replace</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>PISTON PIN, SMALL END BEARING</strong></td>
<td></td>
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<td></td>
<td></td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Inspect</td>
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<td>●</td>
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<tr>
<td>Replace</td>
<td></td>
<td></td>
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<td>●</td>
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<tr>
<td><strong>CYLINDER HEAD</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>●</td>
<td>Inspect carbon deposits and eliminate them.</td>
</tr>
<tr>
<td>Inspect and clean</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td>●</td>
<td>Check gasket.</td>
</tr>
<tr>
<td>Retighten</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>●</td>
<td></td>
</tr>
<tr>
<td><strong>CYLINDER</strong></td>
<td></td>
<td></td>
<td></td>
<td>●</td>
<td>●</td>
<td>Inspect score marks.</td>
</tr>
<tr>
<td>Inspect and clean</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>Inspect wear.</td>
</tr>
<tr>
<td>Replace</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>●</td>
<td></td>
</tr>
<tr>
<td><strong>YPVS</strong></td>
<td></td>
<td></td>
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<td>●</td>
<td>Inspect carbon deposits and eliminate them.</td>
</tr>
<tr>
<td>Inspect and clean</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
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<tr>
<td><strong>CLUTCH</strong></td>
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<td></td>
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<td>●</td>
<td></td>
</tr>
<tr>
<td>Inspect and adjust</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>Inspect housing, friction plate, clutch plate and spring.</td>
</tr>
<tr>
<td>Replace</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>●</td>
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<td><strong>TRANSMISSION</strong></td>
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<td>●</td>
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<td>●</td>
<td>Recommended brand: YAMALUBE SAE10W-40 API service SG type or higher JASO standard MA</td>
</tr>
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<td>Replace oil</td>
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<td>●</td>
<td>●</td>
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</tr>
<tr>
<td>Inspect</td>
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<td></td>
<td>●</td>
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</tr>
<tr>
<td>Replace bearing</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>SHIFT FORK, SHIFT CAM, GUIDE BAR</strong></td>
<td></td>
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<td></td>
<td></td>
<td>●</td>
<td>Inspect wear</td>
</tr>
<tr>
<td>Inspect</td>
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</table>

3-1
## MAINTENANCE INTERVALS

<table>
<thead>
<tr>
<th>Item</th>
<th>After break-in</th>
<th>Every race (about 2.5 hours)</th>
<th>Every third (about 7.5 hours)</th>
<th>Every fifth (about 12.5 hours)</th>
<th>As required</th>
<th>Remarks</th>
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<tbody>
<tr>
<td>Rotor Nut</td>
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<tr>
<td>Retighten</td>
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<td></td>
<td></td>
<td>●</td>
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<tr>
<td>Muffler</td>
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<tr>
<td>Inspect</td>
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<td>Clean</td>
<td>●</td>
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<td></td>
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</tr>
<tr>
<td>Retighten</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Replace fiber</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>* When the exhaust sound becomes louder or when a performance drop is felt</td>
<td></td>
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<td>CRANK</td>
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<td>Inspect and clean</td>
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<td>CARBURETOR</td>
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<tr>
<td>Inspect, adjust and clean</td>
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<td>Spark Plug</td>
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<tr>
<td>Inspect and clean</td>
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<td></td>
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</tr>
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<td>Replace</td>
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<td>Drive Chain</td>
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<tr>
<td>Lubricate, slack, alignment</td>
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<td>Replace</td>
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<td></td>
<td></td>
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<tr>
<td>Use chain lube, chain slack: 48–58 mm (1.9–2.3 in)</td>
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<td>Cooling System</td>
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<tr>
<td>Check radiator cap operation</td>
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<td></td>
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<tr>
<td>Replace coolant</td>
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</tr>
<tr>
<td>Inspect hoses</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Every two years</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Outside Nuts and Bolts</td>
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<td>●</td>
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</tr>
<tr>
<td>Retighten</td>
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<td></td>
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<tr>
<td>Refer to “STARTING AND BREAK-IN” section in the CHAPTER 1.</td>
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<td>Air Filter</td>
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<tr>
<td>Clean and lubricate</td>
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<tr>
<td>Replace</td>
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<tr>
<td>Use foam air-filter oil or equivalent oil.</td>
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<td>Frame</td>
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</tr>
<tr>
<td>Clean and inspect</td>
<td>●</td>
<td></td>
<td></td>
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<td>●</td>
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<tr>
<td>Fuel Tank, Cock</td>
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</tr>
<tr>
<td>Clean and inspect</td>
<td>●</td>
<td></td>
<td></td>
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<tr>
<td>Brakes</td>
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<tr>
<td>Adjust lever position and pedal height</td>
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<td>Lubricate pivot point</td>
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<td>Check brake disc surface</td>
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<tr>
<td>Check fluid level and leakage</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Retighten brake disc bolts, caliper bolts, master cylinder bolts and union bolts</td>
<td>●</td>
<td></td>
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</tbody>
</table>

* Remarks: Refer to “STARTING AND BREAK-IN” section in the CHAPTER 1.
<table>
<thead>
<tr>
<th>Item</th>
<th>After break-in</th>
<th>Every race (about 2.5 hours)</th>
<th>Every third (about 7.5 hours)</th>
<th>Every fifth (about 12.5 hours)</th>
<th>As required</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replace pads</td>
<td></td>
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<td>●</td>
<td>Every one year</td>
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<tr>
<td>Replace brake fluid</td>
<td></td>
<td></td>
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<tr>
<td>FRONT FORKS</td>
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<td>●</td>
<td>Suspension oil &quot;S1&quot;</td>
</tr>
<tr>
<td>Inspect and adjust</td>
<td>●</td>
<td>●</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Replace oil</td>
<td>●</td>
<td></td>
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</tr>
<tr>
<td>Replace oil seal</td>
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<tr>
<td>FRONT FORK OIL SEAL AND DUST SEAL</td>
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<td></td>
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<td>Lithium base grease</td>
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<tr>
<td>Clean and lube</td>
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<td>PROTECTOR GUIDE</td>
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<tr>
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<td>●</td>
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<td>Lube</td>
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<td>(After rain ride) ●</td>
<td>Molybdenum disulfide grease Every one year</td>
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<td>DRIVE CHAIN GUIDE AND ROLLERS</td>
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<td>SWINGARM</td>
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<td>Clean and lube</td>
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<td>Replace bearing</td>
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<td>TIRE, WHEELS</td>
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<td>THROTTLE, CONTROL CABLE</td>
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<td>●</td>
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<tr>
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</tbody>
</table>
PRE-OPERATION INSPECTION AND MAINTENANCE

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

**GENERAL INSPECTION AND MAINTENANCE**

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ENGINE

CHECKING THE COOLANT LEVEL

**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.

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

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

CHANGING THE COOLANT

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

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

1. Place a container under the engine.
2. Remove:
   - Coolant drain bolt "1"
3. Remove:
   - Radiator cap
   - Drain the coolant completely.
4. Clean:
   - Cooling system
   - Thoroughly flush the cooling system with clean tap water.
5. Install:
   - Copper washer
   - Coolant drain bolt
6. Fill:
   - Radiator
   - Engine
   - To specified level.

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

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

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

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

CHECKING THE RADIATOR CAP OPENING PRESSURE

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

**TIP**
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.

CHECKING THE COOLING SYSTEM
1. Inspect:
   • Coolant level
2. Attach:
   • Radiator cap tester “1” and adapter “2”

3. Apply the specified pressure.

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

TIP
   • 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.

ADJUSTING THE CLUTCH CABLE FREE PLAY
1. Check:
   • Clutch lever free play "a"
     Out of specification → Adjust.

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

2. Adjust:
   • Clutch lever free play

   Clamp lever free play adjustment steps:
   a. Loosen the locknuts "1".
   b. Turn the adjuster "2" until free play "a" is within the specified limits.
   c. Tighten the locknuts.

   Locknut:
   4 Nm (0.4 m•kg, 2.9 ft•lb)

   TIP
   • Before adjustment, expose the adjuster by moving the boot "3" and cap "4" away.
   • Make minute adjustment on the lever side using the adjuster "5".
   • After adjustment, check proper operation of clutch lever.

   3. Install:
      • Gap "1"
      • Boot "2"

   TIP
   Place the tip "a" of the cap in the boot.

ADJUSTING THE THROTTLE CABLE FREE PLAY
1. Check:
   • Throttle grip free play "a"
     Out of specification → Adjust.

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

2. Adjust:
   • Throttle grip free play

   Throttle grip free play adjustment steps:
   a. Slide the adjuster cover.
   b. Loosen the locknut "1".
   c. Turn the adjuster "2" until the specified free play is obtained.
   d. Tighten the locknut.

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

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

   WARNING
   After adjusting the throttle cable free play, start the engine and turn the handlebar to right and left and make sure that the engine idling does not run faster.

TIP
   Place the tip "a" of the cap in the boot.
LUBRICATING THE THROTTLE
1. Remove:
   • Cap cover "1"
   • Throttle cable cap "2"

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

3. Install:
   • Throttle cable cap

   Throttle cable cap:
   1 Nm (0.1 m•kg, 0.7 ft•lb)

   • Cap cover

CLEANING THE AIR FILTER ELEMENT

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

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

1. Remove:
   • Seat
   • Fitting bolt "1"
   • Washer "2"
   • Air filter element "3"
   • Air filter guide "4"

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

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

   NOTICE
   • Do not twist the element when
     squeezing the element.
   • Leaving too much of solvent in
     the element may result in poor
     starting.

3. Inspect:
   • Air filter element
     Damage → Replace.

4. Apply:
   • Foam-air-filter oil or equivalent oil
to the element

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

5. Install:
   • Air filter guide "1"

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

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

7. Install:
   • Air filter element "1"
   • Washer
   • Fitting bolt

   Fitting bolt:
   2 Nm (0.2 m•kg, 1.4 ft•lb)

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

CHECKING THE TRANSMISSION OIL LEVEL
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 po-
sition by placing the suitable
stand under the engine.

3. Check:
   • Transmission oil level

   Transmission oil level checking
   steps:
   a. Remove the oil check bolt "1".
   b. Inspect the oil level.

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

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

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

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

   Recommended brand:
   YAMALUBE

   Recommended engine oil type
   SAE10W-40

   Recommended engine oil grade
   API service SG type or
   higher, JASO standard MA
c. Inspect the gasket (oil check bolt), replace if damaged.
d. Tighten the oil check bolt.

CHANGING THE TRANSMISSION OIL
1. Start the engine and warm it up for several minutes and wait for five minute.
2. Place the machine on a level place and hold it on upright position by placing the suitable stand under the engine.
3. Place a suitable container under the engine.
4. Remove:
   • Oil drain bolt "1"
   • Oil filler cap "2"
Drain the transmission oil.

5. Install:
   • Aluminum washer
   • Oil drain bolt "1"

6. Fill:
   • Transmission oil

   Recommended brand: YAMALUBE
   Recommended engine oil type
   SAE10W-40
   Recommended engine oil grade
   API service SG type or higher, JASO standard MA
   Oil capacity (periodic oil change):
   0.75 L (0.66 imp qt, 0.79 US qt)

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

ADJUSTING THE PILOT AIR SCREW
1. Adjust:
   • Pilot air screw "1"

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

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

TIP
To increase idle speed — Turn the throttle stop screw "1" in.
To decrease idle speed — Turn the throttle stop screw "1" out.

CHASSIS
BLEEDING THE HYDRAULIC BRAKE SYSTEM

WARNING
Bleed the brake system if:
• The system has been disassembled.
• A brake hose has been loosened or removed.
• The brake fluid is very low.
• The brake operation is faulty.
A dangerous loss of braking performance may occur if the brake system is not properly bled.

1. Remove:
   • Brake master cylinder cap
   • Diaphragm
   • Reservoir float (front brake)
   • Protector (rear brake)
2. Bleed:
   • Brake fluid

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

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

3. Install:
   • Protector (rear brake)
   • Reservoir float (front brake)
   • Diaphragm
   • Brake master cylinder cap

ADJUSTING THE FRONT BRAKE
1. Check:
   • Brake lever position "a"

<table>
<thead>
<tr>
<th>Brake lever position &quot;a&quot;:</th>
</tr>
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<tbody>
<tr>
<td>Standard position</td>
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<td>95 mm (3.74 in)</td>
</tr>
</tbody>
</table>

2. Remove:
   • Brake lever cover
3. Adjust:
   • Brake lever position

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

ADJUSTING THE REAR BRAKE
1. Check:
   • Brake pedal height "a"
   Out of specification → Adjust.

2. Adjust:
   • Brake pedal height

**WARNING**
• Adjust the pedal height between the maximum "A" and the minimum "B" as shown. (In this adjustment, the bolt "3" end "b" should protrude out of the threaded portion "4" but not be less than 2 mm (0.08 in) "c" away from the brake pedal "5").
• After the pedal height adjustment, make sure that the rear brake does not drag.
**CHECKING AND REPLACING THE FRONT BRAKE PADS**

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

   ![Brake pad thickness: 4.4 mm (0.17 in) <Limit>: 1.0 mm (0.04 in)]

2. Replace:
   - Brake pad

   ![Brake pad replacement steps:]
   a. Remove the pad pin plug "1".
   b. Loosen the pad pin "2".
   c. Remove the brake caliper "3" from the front fork.
   d. Remove the pad pin and brake pads "4".
   e. Connect the transparent hose "5" to the bleed screw "6" and place the suitable container under its end.

   ![f. Loosen the bleed screw and push the brake caliper piston in.]

   **WARNING**
   Do not reuse the drained brake fluid.

   g. Tighten the bleed screw.

   ![h. Install the brake pads "7" and pad pin.]

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

   ![i. Install the brake caliper "8" and tighten the pad pin "9".]

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

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

**CHECKING AND REPLACING THE REAR BRAKE PADS**

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

   ![Brake pad thickness: 6.4 mm (0.25 in) <Limit>: 1.0 mm (0.04 in)]

2. Replace:
   - Brake pad

   ![Brake pad replacement steps:]
   a. Remove the protector "1" and pad pin plug "2".
   b. Loosen the pad pin "3".
   c. Remove the brake caliper "4" from the rear fork.
   d. Remove the pad pin and brake pads "5".
   e. Connect the transparent hose "6" to the bleed screw "7" and place the suitable container under its end.

   ![f. Loosen the bleed screw and push the brake caliper piston in.]

   **WARNING**
   Do not reuse the drained brake fluid.

   g. Tighten the bleed screw.

   ![h. Install the brake pads "8" and pad pin.]

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

   ![i. Install the brake caliper "9" and tighten the pad pin "10".]

   ![Bolt (brake caliper):
   28 Nm (2.8 m•kg, 20 ft•lb)
   Pad pin:
   18 Nm (1.8 m•kg, 13 ft•lb)]
c. Remove the rear wheel "4" and brake caliper "5". Refer to "FRONT WHEEL AND REAR WHEEL" section in the CHAPTER 5.

d. Remove the pad pin "6" and brake pads "7".

e. Connect the transparent hose "8" to the bleed screw "9" and place the suitable container under its end.

f. Loosen the bleed screw and push the brake caliper piston in.

**WARNING**
Do not reuse the drained brake fluid.

g. Tighten the bleed screw.

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

h. Install the brake pad "10" and pad pin "11".

i. Install the brake caliper "12" and rear wheel "13". Refer to "FRONT WHEEL AND REAR WHEEL" section in the CHAPTER 5.

j. Tighten the pad pin "14".

k. Install the pad pin plug "15" and protector "16".

**CHECKING THE REAR BRAKE PAD INSULATOR**
1. Remove:
   - Brake pad
   Refer to "CHECKING AND REPLACING THE REAR BRAKE PADS" section.

2. Inspect:
   - Rear brake pad insulator "1"
   Damage → Replace.

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

**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.

**CHECKING THE SPROCKET**
1. Inspect:
   - Sprocket teeth "a"
   Excessive wear → Replace.

**TIP**
Replace the drive sprocket, rear wheel sprocket and drive chain as a set.
CHECKING THE DRIVE CHAIN

1. Measure:
   • Drive chain length (15 links) "a"
     Out of specification → Replace.

   ![Drive chain length (15 links): <Limit>: 242.9 mm (9.563 in)]

   TIP
   • While measuring the drive chain length, push down on the drive chain to increase its tension.
   • Measure the length between drive chain roller "1" and "16" as shown.
   • Perform this measurement at two or three different places.

2. Remove:
   • Master link clip
   • Joint "1"
   • Drive chain "2"

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

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

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

   ![WARNING]
   Be sure to install the master link clip to the direction as shown.

   ![Drive chain lubricant: SAE 10W-40 motor oil or suitable chain lubricants]

6. Lubricate:
   • Drive chain

   ADJUSTING THE DRIVE CHAIN SLACK

1. Elevate the rear wheel by placing the suitable stand under the engine.

2. Check:
   • Drive chain slack "a"
     Above the seal guard installation bolt.
     Out of specification → Adjust.

   ![Drive chain slack: 48–58 mm (1.9–2.3 in)]

   TIP
   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 the drive chain slack with the rear wheel in this "tight chain" position.

3. Adjust:
   • Drive chain slack

   ![Drive chain slack adjustment steps: a. Loosen the axle nut "1" and lock-nuts "2". b. Adjust the drive chain slack by turning the adjusters "3".]

   a. Turning direction

   6. Lubricate:
   • Drive chain

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

   ![Locknut: 19 Nm (1.9 m•kg, 13 ft•lb)]

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

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

   e. Tighten the locknuts.
CHECKING THE FRONT FORK
1. Inspect:
   • Front fork smooth action
     Operate the front brake and
     stroke the front fork.
     Unsmooth action/oil leakage →
     Repair or replace.

   3. Install:
      • Air bleed screw

        ![Air bleed screw diagram]

        Air bleed screw:
        1 Nm (0.1 m•kg, 0.7 ft•lb)

   ![Front fork diagram]

   ![Front brake diagram]

   ![Front wheel diagram]

CLEANING THE FRONT FORK OIL SEAL AND DUST SEAL
1. Remove:
   • Protector
   • Dust seal "1"

   TIP
   Use a thin screw driver, and be care-
   ful not to damage the inner fork tube
   and dust seal.

   2. Clean:
      • Dust seal "a"
      • Oil seal "b"

   TIP
   • Clean the dust seal and oil seal af-
     ter every run.
   • Apply the lithium soap base grease
     on the inner tube.

ADJUSTING THE FRONT FORK REBOUND DAMPING FORCE
1. Adjust:
   • Rebound damping force
     By turning the adjuster "1".

   ![Rebound damping force diagram]

   Extent of adjustment:

<table>
<thead>
<tr>
<th>Maximum</th>
<th>Minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 clicks out</td>
<td>Fully turned in position</td>
</tr>
</tbody>
</table>

   STIFFER "a" → Increase the rebound damping force. (Turn the adjuster "1" in.)
   SOFTER "b" → Decrease the rebound damping force. (Turn the adjuster "1" out.)

   ![Standard position diagram]

   Standard position:
   14 clicks out
   * 8 clicks out

   * For EUROPE

   NOTICE
   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.

   ![WARNING]

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

   ![STANDARD POSITION]

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

   Standard position:
   14 clicks out
   * 10 clicks out

   * For EUROPE

   NOTICE
   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.

   ![WARNING]
CHECKING THE REAR SHOCK ABSORBER

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

ADJUSTING THE REAR SHOCK ABSORBER SPRING PRELOAD

1. Elevate the rear wheel by placing the suitable stand under the engine.
2. Remove:
   - Rear frame
3. Measure:
   - Spring fitting length

   **Standard fitting length:**

<table>
<thead>
<tr>
<th>I.D. MARK/ Q'TY</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black/1</td>
<td>253 mm (9.96 in)</td>
</tr>
<tr>
<td></td>
<td>*252 mm (9.92 in)</td>
</tr>
<tr>
<td></td>
<td>259 mm (10.20 in)</td>
</tr>
<tr>
<td></td>
<td>*258 mm (10.16 in)</td>
</tr>
<tr>
<td>Black/2</td>
<td>250.5 mm (9.86 in)</td>
</tr>
<tr>
<td></td>
<td>*249.5 mm (9.82 in)</td>
</tr>
<tr>
<td>Black/3</td>
<td></td>
</tr>
</tbody>
</table>

*For EUROPE

4. Adjust:
   - Spring preload

   **Adjustment steps:**
   a. Loosen the locknut "1".
   b. Loosen the adjuster "2" until there is some clearance between the spring and adjuster.
   c. Measure the spring free length "a".
   d. Turn the adjuster "2".

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

   **TIP**
   - The I.D. mark "a" is marked at the end of the spring.
   - Spring specification varies according to the difference in the production lot.

5. Install:
   - Rear frame (upper)
   - Rear frame (lower)

   **Rear frame (upper):**
   - 32 Nm (3.2 m•kg, 23 ft•lb)
   - Rear frame (lower):
   - 29 Nm (2.9 m•kg, 21 ft•lb)

ADJUSTING THE REAR SHOCK ABSORBER REBOUND DAMPING FORCE

1. Adjust:
   - Rebound damping force
   By turning the adjuster "1".
   - Stiffer "a" → Increase the rebound damping force. (Turn the adjuster "1" in.)
   - Softer "b" → Decrease the rebound damping force. (Turn the adjuster "1" out.)

   **Extent of adjustment:**

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

   **Minimum**
   - 20 clicks in (from fully turned in position)

   **TIP**
   - Be sure to remove all dirt and mud from around the locknut and adjuster before adjustment.
   - The length of the spring (installed) changes 1.5 mm (0.06 in) per turn of the adjuster.

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

   e. Tighten the locknut.

   **Locknut:**
   - 30 Nm (3.0 m•kg, 22 ft•lb)

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

   **Standard position:**
   - About 10 clicks out
   - *About 6 clicks out

   * For EUROPE

**NOTICE**
Do not force the adjuster past the minimum or maximum extent of adjustment. The adjuster may be damaged.
ADJUSTING THE REAR SHOCK ABSORBER LOW COMPRESSION DAMPING FORCE
1. Adjust:
   • Low compression damping force
     By turning the adjuster "1".

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

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

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

CHECKING THE TIRE PRESSURE
1. Measure:
   • Tire pressure
     Out of specification → Adjust.

<table>
<thead>
<tr>
<th>Standard tire pressure:</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 kPa (1.0 kgf/cm², 15 psi)</td>
</tr>
</tbody>
</table>

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

CHECKING AND TIGHTENING THE SPOKES
The following procedure applies to all of the spokes.
1. Check:
   • Spokes
     Bend/damage → Replace.
     Loose spoke → Retighten.
     Tap the spokes with a screwdriver.

**TIP**
A tight spoke will emit a clear, ringing tone; a loose spoke will sound flat.
2. Tighten:
   • Spokes
     (with a spoke nipple wrench "1")

**TIP**
Be sure to tighten the spokes before and after break-in.

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

e. Loosen the steering ring nut one turn.

f. Retighten the steering ring nut using the steering nut wrench.

**WARNING**
Avoid over-tightening.

### CHECKING THE WHEELS
1. Inspect:
   • Wheel runout
     Elevate the wheel and turn it. Abnormal runout → Replace.

### CHECKING AND ADJUSTING THE STEERING HEAD
1. Place a stand under the engine to raise the front wheel off the ground. **WARNING!** Securely support the vehicle so that there is no danger of it falling over.

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

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

d. Tighten the steering ring nut "3" using steering nut wrench "4".

**TIP**
• Apply the lithium soap base grease on the thread of the steering stem.
• Set the torque wrench to the steering nut wrench so that they form a right angle.

4. Adjust:
   • Steering ring nut

<table>
<thead>
<tr>
<th>Steering ring nut adjustment steps:</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Remove the number plate.</td>
</tr>
<tr>
<td>b. Remove the handlebar and upper bracket.</td>
</tr>
<tr>
<td>c. Loosen the steering ring nut &quot;1&quot; using the steering nut wrench &quot;2&quot;.</td>
</tr>
</tbody>
</table>

**TIP**
• The handlebar upper holder should be installed with the punched mark "a" forward.
• Install the handlebar so that the marks "b" are in place on both sides.
• Install the handlebar so that the projection "c" of the handlebar upper holder is positioned at the mark on the handlebar as shown.
• Insert the end of the fuel breather hose "12" into the hole in the steering stem.

### Spoke nipple wrench:
YM-01521/90980-01521

### Spokes:
3 Nm (0.3 m•kg, 2.2 ft•lb)

### Steering nut wrench:
YU-33975/90890-01403

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

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

**NOTICE**
First tighten the bolts on the front side of the handlebar upper holder, and then tighten the bolts on the rear side.
Steering stem nut:
145 Nm (14.5 m\(\cdot\)kg, 105 ft\(\cdot\)lb)
Handlebar upper holder:
28 Nm (2.8 m\(\cdot\)kg, 20 ft\(\cdot\)lb)
Pinch bolt (upper bracket):
21 Nm (2.1 m\(\cdot\)kg, 15 ft\(\cdot\)lb)
Number plate:
7 Nm (0.7 m\(\cdot\)kg, 5.1 ft\(\cdot\)lb)
To ensure smooth operation of all components, lubricate your machine during setup, after break-in, and after every race.

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

A. Use Yamaha cable lube or equivalent on these areas.

B. Use SAE 10W-40 motor oil or suitable chain lubricants.

C. Lubricate the following areas with high quality, lightweight lithium-soap base grease.

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

CHECKING THE SPARK PLUG

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.

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

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

   Standard spark plug:
     BR8EG/NGK (resistance type)

4. Clean the plug with a spark plug cleaner if necessary.
5. Tighten:
   • Spark plug
     Spark plug:
     20 Nm (2.0 m•kg, 14 ft•lb)

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

CHECKING THE IGNITION TIMING

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

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.

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

7. Adjust:
   • Ignition timing

\[ \begin{array}{c}
\text{Screw (stator):} \\
7 \text{Nm (0.7 m•kg, 5.1 ft•lb)}
\end{array} \]

\[ \begin{array}{c}
\text{Ignition timing (B.T.D.C.):} \\
0.18 \text{ mm (0.007 in)}
\end{array} \]
ENGINE

TIP
This section is intended for those who have basic knowledge and skill concerning the servicing of Yamaha motorcycles (e.g., Yamaha dealers, service engineers, etc.) Those who have little knowledge and skill concerning servicing are requested not to undertake inspection, adjustment, disassembly, or reassembly only by reference to this manual. It may lead to servicing trouble and mechanical damage.

SEAT, FUEL TANK AND SIDE COVERS

REMOVING THE SEAT, FUEL TANK AND SIDE COVERS

<table>
<thead>
<tr>
<th>Order</th>
<th>Part name</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Seat</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Air scoop (left and right)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Fitting band</td>
<td>1</td>
<td>Remove on fuel tank side.</td>
</tr>
<tr>
<td>4</td>
<td>Bolt (fuel tank)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Fuel tank</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Left side cover</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>7</td>
<td>Right side cover</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>8</td>
<td>Number plate</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
</tbody>
</table>
REMOVING THE SIDE COVER
1. Remove:
   • Bolt (side cover)
   • Side cover (left and right) "1"

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

REMOVING THE NUMBER PLATE
1. Remove:
   • Bolt (number plate)
   • Number plate "1"

TIP
   • The projection "a" is inserted into the band of the number plate. Pull the band off the projection before removal.
   • Remove the clutch cable "2" from the cable guide "b" on the number plate.
   • The projection "c" on the lower bracket is inserted into the number plate. Remove the number plate by pulling it off the projection.
EXHAUST PIPE AND SILENCER

REMOVING THE EXHAUST PIPE AND SILENCER

<table>
<thead>
<tr>
<th>Order</th>
<th>Part name</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bolt (silencer)</td>
<td>2</td>
<td>Refer to &quot;SEAT, FUEL TANK AND SIDE COVERS&quot; section.</td>
</tr>
<tr>
<td>2</td>
<td>Washer [ø=26 mm (1.02 in)]</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Washer [ø=22 mm (0.87 in)]</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Silencer</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Collar [L=15.5 mm (0.61 in)]</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Collar [L=13.5 mm (0.53 in)]</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Grommet (front)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Grommet (rear)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Tension spring</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Bolt (exhaust pipe)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Exhaust pipe</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
CHANGING THE SILENCER FIBER

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

2. Remove:
   • Inner pipe "1"

3. Replace:
   • Fiber "2"

4. Install:
   • Inner pipe

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

Yamaha bond No.1215
(Three Bond® No.1215):
90890-85505

5. Install:
   • Bolt (fiber) "1" 10 Nm (1.0 m•kg, 7.2 ft•lb)
   • Silencer "2"
   • Bolt [silencer (front)] "3" 12 Nm (1.2 m•kg, 8.7 ft•lb)
   • Bolt [silencer (rear)] "4" 12 Nm (1.2 m•kg, 8.7 ft•lb)
   • Side cover (right) 7 Nm (0.7 m•kg, 5.1 ft•lb)
RADIATOR

REMOVING THE RADIATOR

Order | Part name | Q'ty | Remarks
--- | --- | --- | ---
Drain the coolant. | Refer to "CHANGING THE COOLANT" section in the CHAPTER 3. | |
Seat and fuel tank | Refer to "SEAT, FUEL TANK AND SIDE COVERS" section. | |
1 | Radiator guard | 2 | |
2 | Radiator hose clamp (radiator hose 2) | 2 | Only loosening. |
3 | Radiator hose 1 | 1 | |
4 | Left radiator | 1 | |
5 | Radiator hose 4 | 1 | |
6 | Right radiator | 1 | |
7 | Radiator hose 2 | 2 | |
8 | Radiator breather hose | 1 | |
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.

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

INSTALLING THE RADIATOR
1. Install:
   - Radiator breather hose "1"
   - Radiator hose 2 "2"

   **Radiator hose 2:**
   2 Nm (0.2 m•kg, 1.4 ft•lb)

   To right radiator "3".

2. Install:
   - Right radiator "1"
   - Washer "2"
   - Bolt (right radiator) "3"

   **Bolt (right radiator):**
   10 Nm (1.0 m•kg, 7.2 ft•lb)

   **Radiator hose 1:**
   2 Nm (0.2 m•kg, 1.4 ft•lb)

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

3. Install:
   - Left radiator "1"
   - Washer "2"
   - Bolt (left radiator) "3"

   **Bolt (left radiator):**
   10 Nm (1.0 m•kg, 7.2 ft•lb)

   **Radiator hose 4:**
   2 Nm (0.2 m•kg, 1.4 ft•lb)

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

4. Tighten:
   - Radiator hose clamp 2 "5"

   **Radiator hose clamp 2:**
   2 Nm (0.2 m•kg, 1.4 ft•lb)

5. Install:
   - Radiator guard "1"
   - Bolt (radiator guard) "2"

   **Bolt (radiator guard):**
   10 Nm (1.0 m•kg, 7.2 ft•lb)

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

TIP
Fit the hook "a" on the inner side first into the radiator.
### CARBURETOR AND REED VALVE

#### REMOVING THE CARBURETOR AND REED VALVE

<table>
<thead>
<tr>
<th>Order</th>
<th>Part name</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fuel tank</td>
<td>1</td>
<td>Refer to &quot;SEAT, FUEL TANK AND SIDE COVERS&quot; section.</td>
</tr>
<tr>
<td>2</td>
<td>Solenoid valve lead</td>
<td>1</td>
<td>Disconnect the solenoid valve lead.</td>
</tr>
<tr>
<td>3</td>
<td>Throttle position sensor lead</td>
<td>1</td>
<td>Disconnect the throttle position sensor lead.</td>
</tr>
<tr>
<td>5</td>
<td>Clamp (carburetor joint)</td>
<td>2</td>
<td>Loosen the screw (carburetor joint).</td>
</tr>
<tr>
<td>4</td>
<td>Carburetor</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Carburetor joint</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Reed valve assembly</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Stopper (reed valve)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Reed valve</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Plate (reed valve)</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Order Part name**

- **Fuel tank**: Refer to "SEAT, FUEL TANK AND SIDE COVERS" section.
- **Solenoid valve lead**: Disconnect the solenoid valve lead.
- **Throttle position sensor lead**: Disconnect the throttle position sensor lead.
- **Clamp (carburetor joint)**: Loosen the screw (carburetor joint).
## DISASSEMBLING THE CARBURETOR

![Carburetor Diagram]

<table>
<thead>
<tr>
<th>Order</th>
<th>Part name</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mixing chamber top</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Throttle valve</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>3</td>
<td>Needle holder</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Jet needle</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Float chamber</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Float pin</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Float</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Needle valve</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Main jet</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Pilot jet</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Starter plunger</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Throttle stop screw</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Pilot air screw</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>14</td>
<td>Pilot jet</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Starter plunger</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

| 4 Nm (0.4 m·kg, 2.9 ft·lb) |
HANDLING NOTE

Do not loosen the screw (throttle position sensor) “1” except when changing the throttle position sensor due to failure because it will cause a drop in engine performance.

REMOVING THE THROTTLE VALVE

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

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

REMOVING THE PILOT AIR SCREW

1. Remove:
   • Pilot air screw “1”

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

CHECKING THE CARBURETOR

1. Inspect:
   • Carburetor body
     Contamination → Clean.

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

2. Inspect:
   • Main jet “1”
   • Pilot jet “2”
   • Power jet “3”
     Contamination → Clean.

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

CHECKING THE NEEDLE VALVE

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

TIP
• Clip groove
   Free play exists/wear → Replace.
• Clip position

CHECKING THE JET NEEDLE

1. Inspect:
   • Jet needle “1”
     Bends/wear → Replace.
   • Clip groove
     Free play exists/wear → Replace.
   • Clip position

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

* Except for USA and CDN

CHECKING THE THROTTLE VALVE

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

TIP
Insert the throttle valve “2” into the carburetor body while pulling up the lever “1”, and check for free movement.
MEASURING AND ADJUSTING THE FLOAT HEIGHT
1. Measure:
   • Float height "a"
     Out of specification → Adjust.

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

CHECKING THE REED VALVE
1. Measure:
   • Reed valve bending "a"
     Out of specification → Replace.

Reed valve bending limit: 0.2 mm (0.008 in)

2. Measure:
   • Valve stopper height "a"
     Out of specification → Adjust stopper/Replace valve stopper.

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

INSTALLING THE REED VALVE
1. Install:
   • Reed valve "1"
   • Stopper (reed valve) "2"
   • Screw (reed valve) "3"
   • Install the reed valve with the reed valve bending as shown.
   • Note the cut "a" in the lower corner of the reed and stopper plate.

Screw (reed valve): 1 Nm (0.1 m•kg, 0.7 ft•lb)

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

ASSEMBLING THE CARBURETOR
1. Install:
   • Power jet "1"
   • To carburetor "2".

2. Install:
   • O-ring "1"
   • Solenoid valve "2"
   • To carburetor.

NOTICE
   • Before installing the solenoid valve, blow air on the solenoid valve and its installing location on the carburetor in order to remove any foreign particles such as chips etc.
   • Apply the engine oil on the solenoid valve thread.
3. Install:
   • Pilot air screw "1"
   • Throttle stop screw "2"

Note the following installation points:
   a. Turn in the pilot air screw until it is lightly seated.
   b. Turn out the pilot air screw by the number of turns recorded before removing.

4. Install:
   • Starter plunger "1"

5. Install:
   • Pilot jet "1"
   • Main jet "2"

6. Install:
   • Needle valve "1"
   • Float "2"
   • Float pin "3"

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

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

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

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

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

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

   To throttle valve "5".

   **TIP**
   • Insert the spring with its smaller dia. "a" facing the collar.

10. Install:
    • Throttle cable "1"
    • Locknut "2"

    **Locknut:**
    - 4 Nm (0.4 m•kg, 2.9 ft•lb)

    • Mixing chamber top "3"
    • Spring (throttle valve) "4"
    • Ring "5"
    • Throttle valve "6"

    **TIP**
    • While compressing the spring, connect the throttle cable.
    • Align the projection "a" on the ring with the groove "b" in the needle holder "7".

11. Install:
    • Mixing chamber top "1"
    • Screw(mixing chamber top) "2"
    To carburetor "3".

    **TIP**
    • Insert the throttle valve into the carburetor body while pulling up the lever "4".
    • After installing, check the throttle grip for smooth movement.
INSTALLING THE CARBURETOR
1. Install:
   • Carburetor “1”

   **TIP**
   Install the projection between the carburetor joint slots.

2. Tighten:
   • Screw (carburetor joint) “1”

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

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

4. Connect:
   • Throttle position sensor lead “1”
   • Solenoid valve lead “2”
   Refer to "CABLE ROUTING DIAGRAM" section in the CHAPTER 2.

5. Adjust:
   • Idle speed
   Refer to "ADJUSTING THE ENGINE IDLING SPEED" section in the CHAPTER 3.
## CYLINDER HEAD, CYLINDER AND PISTON

### REMOVING THE CYLINDER HEAD AND CYLINDER

<table>
<thead>
<tr>
<th>Order</th>
<th>Part name</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Spark plug</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Engine bracket</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Nut (cylinder head)</td>
<td>6</td>
<td>Loosen each nut 1/4 turn, and remove them after all nuts are loosened.</td>
</tr>
<tr>
<td>4</td>
<td>Cylinder head</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Power valve housing</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Push rod</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>7</td>
<td>Nut (cylinder)</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Cylinder</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

### Torque Values
- 34 Nm (3.4 m·kg, 24 ft·lb)
- 64 Nm (6.4 m·kg, 46 ft·lb)
- 20 Nm (2.0 m·kg, 14 ft·lb)
- 5 Nm (0.5 m·kg, 3.6 ft·lb)
- 13 Nm (1.3 m·kg, 9.4 ft·lb)
- 42 Nm (4.2 m·kg, 30 ft·lb)
- 25 Nm (2.5 m·kg, 18 ft·lb)
- 13 Nm (1.3 m·kg, 9.4 ft·lb)

### Parts Referenced
- Seat and fuel tank: Refer to "SEAT, FUEL TANK AND SIDE COVERS" section.
- Exhaust pipe and silencer: Refer to "EXHAUST PIPE AND SILENCER" section.
- Radiator hose 1: Disconnect at cylinder head side.
- Caruretoretor: Refer to "CARBURETOR AND REED VALVE" section.
## CYLINDER HEAD, CYLINDER AND PISTON

### REMOVING THE PISTON AND POWER VALVE

<table>
<thead>
<tr>
<th>Order</th>
<th>Part name</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Piston pin clip</td>
<td>2</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>2</td>
<td>Piston pin</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>3</td>
<td>Piston</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>4</td>
<td>Small end bearing</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>5</td>
<td>Piston ring</td>
<td>2</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>6</td>
<td>Power valve cover</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Side holder</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Thrust plate</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Bolt</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Valve holder 1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Valve shaft</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Link lever</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Pulley</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Link rod</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Power valve 2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Valve holder 2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Power valve 1</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Torque Specifications**

- 4 Nm (0.4 m·kg, 2.9 ft·lb)
- 6 Nm (0.6 m·kg, 4.3 ft·lb)

**New**
**REMOVING THE PUSH ROD**

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

**TIP**

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

**NOTICE**

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

![Diagram of cylinder head components](image)

3. Remove:
   - Piston ring "1"

**TIP**

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

**REMOVING THE PISTON AND PISTON RING**

1. Remove:
   - Piston pin clip "1"

**TIP**

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

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

**TIP**

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

![Diagram of piston removal](image)

**CHECKING THE CYLINDER HEAD**

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

**TIP**

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

2. Inspect:
   - Cylinder head water jacket
   - Crust of minerals/Rust → Replace.

3. Measure:
   - Cylinder head warpage
   - Out of specification → Resurface.

<table>
<thead>
<tr>
<th>Cylinder head warpage:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 0.03 mm</td>
</tr>
<tr>
<td>(0.0012 in)</td>
</tr>
</tbody>
</table>

**Warpage measurement and resurfacing steps:**

a. Attach a straightedge "1" and a thickness gauge "2" on the cylinder head.

b. Measure the warpage.

c. If the warpage is out of specification, resurface the cylinder head.

**NOTICE**

Do not rebore the cylinder.

**CHECKING THE CYLINDER**

1. Eliminate:
   - Carbon deposits
   - Use a rounded scraper "1".

**TIP**

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

2. Inspect:
   - Cylinder inner surface
   - Score marks → Repair or replace.
   - Use #400–600 grit wet sandpaper.

**Piston pin puller set:**

- YU-1304/90890-01304

**Cylinder head warpage:**

Less than 0.03 mm (0.0012 in)
3. Measure:
   • Cylinder bore "C"
     Use cylinder gauge "1".
     Out of limit → Replace.

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

<table>
<thead>
<tr>
<th>Cylinder bore &quot;C&quot;</th>
<th>Standard</th>
<th>Wear limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>66.400–66.414 mm</td>
<td>66.5 mm</td>
<td>(2.6142–2.618 in)</td>
</tr>
</tbody>
</table>

| Taper "T" | — | 0.05 mm (0.0020 in) |

"C" = Maximum Aa–Cb
"T" = (Maximum Aa, or Ab) - (Maximum Ba, or Bb)

CHECKING THE PISTON
1. Eliminate:
   • Carbon deposits
     From the piston crown "a" and ring groove "b".

2. Inspect:
   • Piston wall
     Score marks → Repair or replace.

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

<table>
<thead>
<tr>
<th>Distance &quot;b&quot;</th>
<th>Piston dia.</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.5 mm (0.69 in)</td>
<td>66.352–66.367 mm (2.6120–2.6129 in)</td>
</tr>
</tbody>
</table>

CHECKING THE 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.

<table>
<thead>
<tr>
<th>Piston pin outside diameter:</th>
<th>Standard</th>
<th>&lt;Limit&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.995–18.000 mm (0.7085–0.7087 in)</td>
<td>17.975 mm (0.7077 in)</td>
<td></td>
</tr>
</tbody>
</table>

CHECKING THE 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.

<table>
<thead>
<tr>
<th>Ring end gap (installed):</th>
<th>Standard</th>
<th>&lt;Limit&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.40–0.55 mm (0.016–0.022 in)</td>
<td>0.95 mm (0.037 in)</td>
<td></td>
</tr>
</tbody>
</table>
3. Measure:
   • Side clearance
     Use a thickness gauge "1".
     Out of limit → Replace piston and/or ring.

   Side clearance:

   \[
   \begin{array}{|c|c|}
   \hline
   \text{Standard} & \text{<Limit>} \\
   \text{0.030–0.065 mm (0.0012–0.0026 in)} & 0.1 \text{ mm (0.004 in)} \\
   \hline
   \end{array}
   \]

   TIP
   Check at several points.

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

   PISTON CLEARANCE = CYLINDER BORE - PISTON DIAMETER

   \[
   \begin{array}{|c|c|}
   \hline
   \text{Standard} & \text{<Limit>} \\
   \text{0.045–0.050 mm (0.0018–0.0020 in)} & 0.1 \text{ mm (0.004 in)} \\
   \hline
   \end{array}
   \]

CHECKING THE COMBINATION OF PISTON AND CYLINDER
1. Check:
   • Cylinder mark "a"

   Cylinder mark "a"  Cylinder size
   \[
   \begin{array}{|c|c|}
   \hline
   \text{A} & 66.400–66.402 \text{ mm (2.61417–2.614 in)} \\
   \hline
   \text{B} & 66.404–66.406 \text{ mm (2.61433–2.614 in)} \\
   \hline
   \text{C} & 66.408–66.410 \text{ mm (2.61449–2.614 in)} \\
   \hline
   \text{D} & 66.412–66.414 \text{ mm (2.61455–2.614 in)} \\
   \hline
   \end{array}
   \]

   2. Check:
      • Piston mark "a"

   Piston mark "a" (color)  Piston size
   \[
   \begin{array}{|c|c|}
   \hline
   \text{A (red)} & 66.352–66.355 \text{ mm (2.61228–2.612 in)} \\
   \hline
   \text{B (orange)} & 66.356–66.359 \text{ mm (2.61244–2.612 in)} \\
   \hline
   \text{C (green)} & 66.360–66.363 \text{ mm (2.61260–2.612 in)} \\
   \hline
   \text{D (purple)} & 66.364–66.367 \text{ mm (2.61276–2.612 in)} \\
   \hline
   \end{array}
   \]

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

   Cylinder mark  Piston mark (color)
   \[
   \begin{array}{|c|c|}
   \hline
   \text{A} & \text{A (red)} \\
   \hline
   \text{B} & \text{B (orange)} \\
   \hline
   \text{C} & \text{C (green)} \\
   \hline
   \text{D} & \text{D (purple)} \\
   \hline
   \end{array}
   \]

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

CHECKING THE POWER VALVE
1. Inspect:
   • Power valve 1, 2 "1"
     Wear/Damage → Replace.
     Carbon deposits → Remove.
   • Valve holder 1 "2"
   • Link lever "3"
   • Pulley "4"
   • Valve shaft "5"
   • Link rod "6"
   • Washer "7"
     Wear/Damage → Replace.
   • Spring 1, 2 "8"
     Broken → Replace.

CHECKING THE POWER VALVE HOLE ON CYLINDER
1. Remove:
   • Carbon deposits
     From power valve hole surface "a".

   TIP
   Do not use a sharp instrument. Avoid scratching the aluminum.
INSTALLING THE POWER VALVE

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

   Bolt (valve holder 2):
   6 Nm (0.6 m•kg, 4.3 ft•lb)

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

2. Install:
   • Power valve 2 "1"
   • Link rod "2"
   • Washer "3"
   • Screw (link rod) "4"

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

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

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

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

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

4. Check:
   • Spring 1 "1"
   • Link lever "2"
   • Pulley "3"
   • Spring 2 "4"
   • Washer "5"
   • Valve shaft "6"

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

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

   Bolt (link lever):
   4 Nm (0.4 m•kg, 2.9 ft•lb)

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

6. Check:
   • Power valve 1 smooth movement
   • Unsmooth movement → Repair or replace.

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

   Screw (side holder):
   4 Nm (0.4 m•kg, 2.9 ft•lb)

   • YPVS breather hose "4"

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

8. Install:
   • Gasket (power valve cover) "1"
   • Power valve cover "2"
   • Screw (power valve cover) "3"

   Screw (power valve cover):
   4 Nm (0.4 m•kg, 2.9 ft•lb)

   TIP
   • Install the gasket with its cut "a" facing downward and the seal print side toward the power valve cover.
   • Install the power valve cover so that the arrow mark "b" faces upward.
INSTALLING THE PISTON RING AND PISTON

1. Install:
   • Piston ring “1”

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

2. Install:
   • Gasket (cylinder) “1” New
   • Small end bearing “2”
   • Dowel pin “3”

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

3. Install:
   • Piston “1”
   • Piston pin “2”
   • Piston pin clip “3” New

TIP
   • 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.

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

INSTALLING THE CYLINDER HEAD AND CYLINDER

1. Apply:
   • Engine oil
   To piston “1”, piston ring “2” and cylinder surface.

2. Install:
   • Cylinder “1”

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

TIP
   After installing, check the smooth movement of the piston.

3. Install:
   • Nut (cylinder) “1”

   Nut (cylinder):
   42 Nm (4.2 m•kg, 30 ft•lb)

TIP
Tighten the nuts in stage, using a crisscross pattern.

4. Install:
   • Push rod “1”
   • Bolt (push rod) “2”

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

TIP
   • Insert the set pin “3” included in owner’s tool kit to install the bolt (push rod).
   • Do not forget to remove the set pin.

NOTICE
Be sure to use the set pin. If the set pin is not used, the power valve constituent parts will result in damage.
5. Install:
• Gasket (power valve housing) *New*
• Power valve housing "1"
• Bolt (power valve housing) "2"

**Bolt (power valve housing):**
5 Nm (0.5 m•kg, 3.6 ft•lb)

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

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

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

**Nut (cylinder head):**
25 Nm (2.5 m•kg, 18 ft•lb)

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

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

**Bolt (engine bracket):**
34 Nm (3.4 m•kg, 24 ft•lb)

• Engine mounting bolt (upper) "3"

**Engine mounting bolt (upper):**
64 Nm (6.4 m•kg, 46 ft•lb)

9. Install:
• Spark plug "1"

**Spark plug:**
20 Nm (2.0 m•kg, 14 ft•lb)

• Spark plug cap "2"
REMOVING THE CLUTCH

Order | Part name | Q'ty | Remarks
---|---|---|---
1 | Clutch cover | 1 | Disconnect at engine side.
2 | Bolt (clutch spring) | 6 |
3 | Clutch spring | 6 |
4 | Pressure plate | 1 |
5 | Friction plate | 8 |
6 | Clutch plate | 7 |

Drain the transmission oil. Refer to "CHANGING THE TRANSMISSION OIL" section in the CHAPTER 3.

Bolt (brake pedal) Shift the brake pedal downward.

Rotor and stator Refer to "CDI MAGNETO" section.

Clutch cable Disconnect at engine side.

10 Nm (1.0 m·kg, 7.2 ft·lb)

10 Nm (1.0 m·kg, 7.2 ft·lb)
## REMOVING THE CLUTCH BOSS

<table>
<thead>
<tr>
<th>Order</th>
<th>Part name</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Push rod 1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Circlip</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Washer</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Bearing</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Push rod 2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Nut (clutch boss)</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>7</td>
<td>Lock washer</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>8</td>
<td>Clutch boss</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>9</td>
<td>Thrust washer [D=ø44mm (1.73 in)]</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Primary driven gear</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Bearing</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Thrust washer [D=ø42mm (1.65 in)]</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Bolt (push lever shaft)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Push lever shaft</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

- **75 Nm (7.5 m·kg, 54 ft·lb)**
- **6 Nm (0.6 m·kg, 4.3 ft·lb)**
REMOVING THE CLUTCH BOSS
1. Remove:
   • Nut "1"
   • Lock washer "2"
   • Clutch boss "3"

TIP
Straighten the lock washer tab and use the clutch holding tool "4" to hold the clutch boss.

CHECKING THE CLUTCH SPRINGS
1. Measure:
   • Clutch spring free length "a"
     Out of specification → Replace springs as a set.

   ! Clutch spring free length:
      50.0 mm (1.969 in)
      <Limit>: 48.0 mm (1.890 in)

CHECKING THE PRIMARY DRIVEN GEAR
1. Check:
   • Circumferential play
     Free play exists → Replace.
   • Gear teeth "a"
     Wear/damage → Replace.

CHECKING THE CLUTCH PLATES
1. Measure:
   • Clutch plate warpage
     Out of specification → Replace clutch plate as a set.
     Use a surface plate "1" and thickness gauge "2".

   ! Warp limit:
      0.2 mm (0.008 in)

CHECKING THE PUSH LEVER SHAFT
1. Inspect:
   • Push lever shaft "1"
   • Copper washer "2" New
   • Bolt (push lever shaft) "3"

   ! Bolt (push lever shaft):
      6 Nm (0.6 m•kg, 4.3 ft•lb)

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

INSTALLING THE CLUTCH
1. Install:
   • Thrust washer [D=ø42 mm (1.65 in)] "1"
   • Spacer "2"
   • Bearing "3"
   • Primary driven gear "4"

TIP
Apply the transmission oil on the bearing, spacer and primary driven gear inner circumference.
2. Install:
   • Thrust washer [D=ø44 mm (1.73 in)] “1”
   • Clutch boss “2”

3. Install:
   • Lock washer “1” New
   • Nut (clutch boss) “2”

TIP
Use the clutch holding tool “3” to hold the clutch boss.

Nut (clutch boss): 75 Nm (7.5 m•kg, 54 ft•lb)

4. Bend the lock washer “1” tab.

5. Install:
   • Friction plate “1”
   • Clutch plate “2”

TIP
Install the clutch plates and friction plates alternately on the clutch boss, starting with a friction plate and ending with a friction plate.

6. Install:
   • Bearing “1”
   • Washer “2”
   • Circlip “3” New
   To push rod 1 “4”.

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

7. Install:
   • Push rod 2 “1”
   • Push rod 1 “2”

TIP
Apply the transmission oil on the ends of the push rod 2.

8. Install:
   • Pressure plate “1”

9. Install:
   • Clutch spring “1”
   • Bolt (clutch spring) “2”

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

TIP
Tighten the bolts in stage, using a crisscross pattern.

10. Install:
    • O-ring “1” New
    To clutch cover.

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

TIP
Tighten the bolts in stage, using a crisscross pattern.

11. Install:
    • Clutch cover “1”
    • Bolt (clutch cover)

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

TIP
Apply the lithium soap base grease on the O-ring.
## KICK SHAFT AND SHIFT SHAFT

### REMOVING THE PRIMARY DRIVE GEAR

**Order Part name Q'ty Remarks**

<table>
<thead>
<tr>
<th>Order</th>
<th>Part name</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kickstarter crank</td>
<td>1</td>
<td>Refer to &quot;CHANGING THE TRANSMISSION OIL&quot; section in the CHAPTER 3.</td>
</tr>
<tr>
<td>2</td>
<td>Crankcase cover (right)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Bolt (Primary drive gear)</td>
<td>1</td>
<td>Only loosening. Refer to removal section.</td>
</tr>
<tr>
<td>4</td>
<td>Primary driven gear</td>
<td>1</td>
<td>Refer to &quot;CLUTCH&quot; section.</td>
</tr>
<tr>
<td>5</td>
<td>Primary drive gear</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Thrust plate</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

- **Drain the transmission oil.** Refer to "CHANGING THE TRANSMISSION OIL" section in the CHAPTER 3.
- **Bolt (brake pedal)** Shift the brake pedal downward.
- **Radiator hose 4** Disconnect at water pump side.
- **Bolt (push rod)** Refer to "CYLINDER HEAD, CYLINDER AND PISTON" section.

**Tightening Torque**

- **30 Nm (3.0 m·kg, 22 ft·lb)**
- **10 Nm (1.0 m·kg, 7.2 ft·lb)**
- **55 Nm (5.5 m·kg, 40 ft·lb)**
## KICK SHAFT AND SHIFT SHAFT

### REMOVING THE KICK SHAFT AND SHIFT SHAFT

<table>
<thead>
<tr>
<th>Order</th>
<th>Part name</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kick idle gear</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>kick shaft assembly</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>3</td>
<td>Shift pedal</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Shift shaft</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Roller</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Shift guide</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>7</td>
<td>Shift lever assembly</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>8</td>
<td>Stopper lever</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Holder</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Tension spring</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

*Torque: 10 Nm (1.0 m·kg, 7.2 ft·lb)*
REMOVING THE PRIMARY DRIVE GEAR
1. Loosen:
   • Bolt (primary drive gear) "1"

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

REMOVING THE PRIMARY DRIVE GEAR AND PRIMARY DRIVEN GEAR
1. Inspect:
   • Primary drive gear "1"
   • Primary driven gear "2"

Wear/Damage → Replace.

CHECKING THE PRIMARY DRIVE GEAR AND PRIMARY DRIVEN GEAR
1. Inspect:
   • Primary drive gear "1"
   • Primary driven gear "2"

Wear/Damage → Replace.

CHECKING THE PRIMARY DRIVE GEAR AND PRIMARY DRIVEN GEAR ASSEMBLY
1. Install:
   • Torsion spring "1"
   • Holder "2"
   • Bolt (holder) "3"
   • Washer "4"
   • Stopper lever "5"
   • Bolt (stopper lever) "6"

Align the stopper lever roller with the slot on segment.

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

Washer "4"
Stopper lever "5"
Bolt (stopper lever) "6"

Bolt (holder) "3"

CHECKING THE PRIMARY DRIVE GEAR AND PRIMARY DRIVEN GEAR ASSEMBLY
1. Install:
   • Torsion spring "1"
   • Holder "2"
   • Bolt (holder) "3"

CHECKING THE KICK SHAFT AND RATCHET WHEEL
1. Check:
   • Ratchet wheel "1" smooth movement
     Unsmooth movement → Replace.
   • Kick shaft "2"
     Wear/damage → Replace.
   • Spring "3"
     Broken → Replace.

CHECKING THE KICK GEAR, KICK IDLE GEAR AND RATCHET WHEEL
1. Inspect:
   • Kick gear "1"
   • Kick idle gear "2"
   • Ratchet wheel "3"
   • Gear teeth "a"
   • Ratchet teeth "b"

   Wear/damage → Replace.

CHECKING THE STOPPER LEVER
1. Inspect:
   • Stopper lever "1"
   • Bearing "2"
   • Torsion spring "3"

   Replace.

INSTALLING THE STOPPER LEVER
1. Install:
   • Torsion spring "1"
   • Holder "2"
   • Bolt (holder) "3"

TIP Align the stopper lever roller with the slot on segment.

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

Washer "4"
Stopper lever "5"
Bolt (stopper lever) "6"
Installing the Shift Guide and Shift Lever Assembly

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

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

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

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

Installing the Shift Shaft

1. Install:
   - Roller "1"
   - Washer "2"
   - Shift shaft "3"

TIP
Apply the transmission oil on the roller and shift shaft.

2. Install:
   - Torsion spring "1"
   To kick shaft "2".
   Make sure the stopper "a" of the torsion spring fits into the hole "b" on the kick shaft.

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

3. Install:
   - Spring guide "1"

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

4. Install:
   - Washer "1"
   - Kick shaft assembly "2"

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

5. Hook:
   - Torsion spring "1"

TIP
Turn the torsion spring clockwise and hook into the proper hole "a" in the crankcase.
INSTALLING THE KICK IDLE GEAR
1. Install:
   - Kick idle gear "1"
   - Washer "2"
   - Circlip "3"

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

INSTALLING THE PRIMARY DRIVE GEAR
1. Install:
   - Thrust plate "1"
   - Primary drive gear "2"
   - Governor drive gear "3"
   - Washer "4"
   - Bolt (primary drive gear) "5"

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

2. Install:
   - Primary driven gear
   Refer to "CLUTCH" section.

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

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

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

5. Install:
   - Crankcase cover (right) "1"

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

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

    Bolt [crankcase cover (right)]:
    10 Nm (1.0 m•kg, 7.2 ft•lb)

TIP
Tighten the bolts in stage, using a crisscross pattern.

7. Install:
   - Kick starter "1"
   - Washer "2"
   - Bolt (kick starter) "3"

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

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

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

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

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

Bolt (primary drive gear): 55 Nm (5.5 m•kg, 40 ft•lb)
## YPVS GOVERNOR

### REMOVING THE YPVS GOVERNOR

<table>
<thead>
<tr>
<th>Order</th>
<th>Part name</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Crankcase cover (right)</td>
<td></td>
<td>Refer to &quot;KICK SHAFT AND SHIFT SHAFT&quot; section.</td>
</tr>
<tr>
<td>1</td>
<td>Governor assembly</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Dowel pin</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>3</td>
<td>Retainer</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Ball</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Retainer weight</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Washer</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Thrust bearing</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Collar</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Plate</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Compression spring</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Governor gear</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Governor shaft</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
REMOVING THE GOVERNOR
1. Remove:
   • Dowel pin "1"

TIP
While compressing the spring, remove the dowel pin.

CHECKING THE GOVERNOR GROOVE
1. Inspect:
   • Washer "1"
   • Collar "2"
   Wear/Damage → Replace.

CHECKING THE BEARING
1. Inspect:
   • Thrust bearing "1"
   • Washer "2"
   Wear/Damage → Replace.

INSTALLING THE GOVERNOR
1. Install:
   • Governor gear "1"
   • Compression spring "2"
   • Plate "3"
   • Washer "4"
   • Thrust bearing "5"
   • Collar "6"
   • Retainer weight "7"
   To governor shaft "8".

TIP
Apply the lithium soap base grease on the thrust bearing.

2. Install:
   • Ball "1"
   • Retainer "2"
   To governor shaft "3".

TIP
Apply the transmission oil on the retainer and ball.

3. Install:
   • Dowel pin "1"

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

4. Install:
   • Governor assembly "1"

TIP
Align the groove "a" in the governor with the fork "b" and set the governor in the crankcase cover.
# Disassembling the Water Pump

<table>
<thead>
<tr>
<th>Order</th>
<th>Part Name</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Crankcase cover (right)</td>
<td></td>
<td>Refer to &quot;KICK SHAFT AND SHIFT SHAFT&quot; section.</td>
</tr>
<tr>
<td>1</td>
<td>Water pump housing cover</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Impeller</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>3</td>
<td>Washer</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>4</td>
<td>Impeller shaft</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>5</td>
<td>Bearing</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>6</td>
<td>Oil seal</td>
<td>2</td>
<td>Refer to removal section.</td>
</tr>
</tbody>
</table>

**Torque Specifications:**
- 10 Nm (1.0 m·kg, 7.2 ft·lb)
- 14 Nm (1.4 m·kg, 10 ft·lb)
**WATER PUMP**

**REMOVING THE IMPELLER SHAFT**

1. Remove:
   - Impeller "1"
   - Washer "2"
   - Impeller shaft "3"

**TIP**

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

**CHECKING THE IMPELLER SHAFT GEAR**

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

**CHECKING THE IMPELLER SHAFT GEARS**

1. Inspect:
   - Bearing "1"

**CHECKING THE BEARING**

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

**REM UNG THE OIL SEAL**

1. Remove:
   - Bearing "1"

**CHECKING THE OIL SEAL**

1. Inspect:
   - Oil seal "1"
   - Wear/damage → Replace.

**INSTALLING THE OIL SEAL**

1. Install:
   - Oil seal "1" New

**TIP**

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

**INSTALLING THE IMPELLER SHAFT**

1. Install:
   - Impeller shaft "1"

**TIP**

- 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.

**CHECKING THE IMPELLER SHAFT**

1. Inspect:
   - Impeller shaft "1"
   - Bend/wear/damage → Replace.
   - Fur deposits → Clean.

2. Install:
   - Washer "1"
   - Impeller "2"

**TIP**

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

**Installing the Oil Seal**

1. Install:
   - Oil seal "1" New

**TIP**

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

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

**TIP**

![Image](4-33)
4. Install:
- Water pump housing cover "1"
- Bolt (water pump housing cover) "2"
- Copper washer (coolant drain bolt) "3" New
- Coolant drain bolt "4"

Bolt (water pump housing cover):
10 Nm (1.0 m•kg, 7.2 ft•lb)

Coolant drain bolt:
10 Nm (1.0 m•kg, 7.2 ft•lb)
CDI MAGNETO

REMOVING THE CDI MAGNETO

<table>
<thead>
<tr>
<th>Order</th>
<th>Part name</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Seat and fuel tank</td>
<td></td>
<td>Refer to &quot;SEAT, FUEL TANK AND SIDE COVERS&quot; section.</td>
</tr>
<tr>
<td>2</td>
<td>Bolt (Radiator)</td>
<td></td>
<td>Refer to &quot;RADIATOR&quot; section.</td>
</tr>
<tr>
<td>3</td>
<td>Disconnect the CDI magneto lead.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Left crankcase cover</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Nut (rotor)</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>3</td>
<td>Rotor</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>4</td>
<td>Stator</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Woodruff key</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
REMOWING THE ROTOR
1. Remove:
   • Nut (rotor) "1"
   • Washer "2"
   Use the rotor holding tool "3".

2. Remove:
   • Rotor "1"
   Use the flywheel puller "2".

CHECKING THE CDI MAGNETO
1. Inspect:
   • Rotor inner surface "a"
   • Stator outer surface "b"
   Damage → Inspect the crankshaft runout and crankshaft bearing.
   If necessary, replace CDI magneto and/or stator.

CHECKING THE WOODRUFF KEY
1. Inspect:
   • Woodruff key "1"
   Damage → Replace.

INSTALLING THE CDI MAGNETO
1. Install:
   • Stator "1"
   • Screw (stator) "2"
   TIP
   Temporarily tighten the screw (stator) at this point.

2. Install:
   • Woodruff key "1"
   • Rotor "2"
   TIP
   • Clean the tapered portions of the crankshaft and rotor.
   • When installing the woodruff key, make sure that its flat surface "a" is in parallel with the crankshaft center line "b".
   • When installing the rotor, align the keyway "c" of the rotor with the woodruff key.

3. Install:
   • Washer "1"
   • Nut (rotor) "2"

4. Adjust:
   • Ignition timing
   Refer to "CHECKING THE IGNITION TIMING" section in the CHAPTER 3.

5. Tighten:
   • Screw (stator) "1"

6. Check:
   • Ignition timing
   Re-check the ignition timing.

7. Connect:
   • CDI magneto lead "1"
   Refer to "CABLE ROUTING DIAGRAM” section in the CHAPTER 2.

8. Install:
   • Gasket [crankcase cover (left)]
   • Crankcase cover (left) "1"
   • Screw [crankcase cover (left)] "2"

   NEW

   Screw [crankcase cover (left)]:
   5 Nm (0.5 m•kg, 3.6 ft•lb)

   TIP
   Tighten the screws in stage, using a crisscross pattern.

---

Rotor holding tool:
YU-1235/90890-01235

Flywheel puller:
YM-1189/90890-01189

Nut (rotor):
56 Nm (5.6 m•kg, 40 ft•lb)

Use the rotor holding tool "3".

Screw (stator):
7 Nm (0.7 m•kg, 5.1 ft•lb)

Screw [crankcase cover (left)]:
5 Nm (0.5 m•kg, 3.6 ft•lb)

---

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

### REMOVING THE ENGINE

**Order** | **Part name** | **Q'ty** | **Remarks**
--- | --- | --- | ---
Hold the machine by placing the suitable stand under the frame. |  | Refer to "HANDLING NOTE". |
Drain the transmission oil. |  | Refer to "CHANGING THE TRANSMISSION OIL" section in the CHAPTER 3. |
Seat and fuel tank |  | Refer to "SEAT, FUEL TANK AND SIDE COVERS" section |
Carburetor |  | Refer to "CARBURETOR AND REED VALVE" section. |
Exhaust pipe and silencer |  | Refer to "EXHAUST PIPE AND SILENCER" section. |
Exhaust pipe stay (rear) |  | Refer to "EXHAUST PIPE AND SILENCER" section. |
Clutch cable | Disconnect at engine side. |
Radiator | Refer to "RADIATOR" section. |
Spark plug |  |  |
Disconnect the CDI magneto lead. | 1 |  |
Neutral switch | 1 | Disconnect the neutral switch lead. |
Drive chain sprocket cover | 2 |  |
3 Nut (drive sprocket) 1 Refer to removal section.
4 Lock washer 1 Refer to removal section.
5 Drive sprocket 1 Refer to removal section.
6 Clip 1
7 Bolt (brake pedal) 1
8 Brake pedal 1
9 Engine bracket 2
10 Engine mounting bolt 3
11 Pivot shaft 1 Remove completely.
12 Engine 1 Refer to removal section.

<table>
<thead>
<tr>
<th>Order</th>
<th>Part name</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Nut (drive sprocket)</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>4</td>
<td>Lock washer</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>5</td>
<td>Drive sprocket</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>6</td>
<td>Clip</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Bolt (brake pedal)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Brake pedal</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Engine bracket</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Engine mounting bolt</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Pivot shaft</td>
<td>1</td>
<td>Remove completely.</td>
</tr>
<tr>
<td>12</td>
<td>Engine</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
</tbody>
</table>
ENGINE REMOVAL

HANDLING NOTE

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

**REMOVING THE DRIVE SPROCKET**
1. Remove:
   - Nut (drive sprocket) "1"
   - Lock washer "2"

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

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

**TIP**
Remove the drive sprocket together with the drive chain.

**REMOVING THE ENGINE**

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

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

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

**INSTALLING THE ENGINE**

1. Install:
   - Engine "1"
   - Pivot shaft "2"

   **Pivot shaft:**
   85 Nm (8.5 m•kg, 61 ft•lb)

2. Install:
   - Engine mounting bolt (lower) "3"
   - Engine mounting bolt (front) "4"
   - Engine mounting bolt (upper) "7"

   **Engine mounting bolt (lower):**
   64 Nm (6.4 m•kg, 46 ft•lb)

   **Engine mounting bolt (front):**
   64 Nm (6.4 m•kg, 46 ft•lb)

   **Engine mounting bolt (upper):**
   64 Nm (6.4 m•kg, 46 ft•lb)

**TIP**
Apply the molybdenum disulfide grease on the pivot shaft.

**INSTALLING THE BRAKE PEDAL**

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

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

   **TIP**
   Apply the lithium soap base grease on the bolt, O-rings and brake pedal bracket.

**INSTALLING THE DRIVE SPROCKET**

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

   **TIP**
   Install the drive sprocket together with the drive chain.

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

   **Nut (drive sprocket):**
   75 Nm (7.5 m•kg, 54 ft•lb)

   **TIP**
   Tighten the nut while applying the rear brake.

**Pivot shaft:**
85 Nm (8.5 m•kg, 61 ft•lb)

**Engine mounting bolt (lower):**
64 Nm (6.4 m•kg, 46 ft•lb)

**Engine mounting bolt (front):**
64 Nm (6.4 m•kg, 46 ft•lb)

**Bolt (engine bracket):**
34 Nm (3.4 m•kg, 24 ft•lb)

**Engine mounting bolt (upper):**
64 Nm (6.4 m•kg, 46 ft•lb)

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

**Nut (drive sprocket):**
75 Nm (7.5 m•kg, 54 ft•lb)
3. Bend the lock washer tab to lock the nut.

4. Install:
   - Drive chain sprocket guide "1"
   - Drive chain sprocket cover "2"
   - Screw (drive chain sprocket cover) "3"

5. Connect:
   - Neutral switch lead

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

Screw (drive chain sprocket cover):
5 Nm (0.5 m•kg, 3.6 ft•lb)
### CRANKCASE AND CRANKSHAFT

**REMOVING THE CRANKSHAFT**

<table>
<thead>
<tr>
<th>Order</th>
<th>Part name</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Segment</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>2</td>
<td>Holder</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Bolt (Neutral switch lead holder)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Bolt [L=50 mm (1.97 in)]</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Bolt [L=60 mm (2.36 in)]</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Bolt [L=70 mm (2.76 in)]</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Holder</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Crankcase (right)</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
</tbody>
</table>

**Torque Specifications**

- **10 Nm (1.0 m·kg, 7.2 ft·lb)**
- **30 Nm (3.0 m·kg, 22 ft·lb)**
- **14 Nm (1.4 m·kg, 10 ft·lb)**
CRANKCASE AND CRANKSHAFT

<table>
<thead>
<tr>
<th>Order</th>
<th>Part name</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Crankcase (left)</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>10</td>
<td>Crankshaft</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>11</td>
<td>Oil seal</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Bearing</td>
<td>2</td>
<td>Refer to removal section.</td>
</tr>
</tbody>
</table>

**Order Part name Q'ty Remarks**

- **Part 7**:
  - 10 Nm (1.0 m · kg, 7.2 ft · lb)

- **Part 8**:
  - 30 Nm (3.0 m · kg, 22 ft · lb)

- **Part 9**:
  - 14 Nm (1.4 m · kg, 10 ft · lb)

- **Part 10**:
  - 10 Nm (1.0 m · kg, 7.2 ft · lb)
REMOVING THE SEGMENT
1. Remove:
   • Bolt (segment) "1"
   • Segment "2"

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

NOTICE
If the segment gets an impact, it may be damaged. Take care not to give an impact to the segment when removing the bolt.

DISASSEMBLING THE CRANKCASE
1. Remove:
   • Crankcase (right) "1"
   Use the crankcase separating tool "2".
   • Make appropriate bolts "3" as shown available by yourself and attach the tool with them.
   • Fully tighten the tool holding bolts, but make sure the tool body is parallel with the case. If necessary, one screw may be backed out slightly to level tool body.
   • As pressure is applied, alternately tap on the engine mounting boss and transmission shafts.

TIP
• Make appropriate bolts "3" as shown available by yourself and attach the tool with them.
• Fully tighten the tool holding bolts, but make sure the tool body is parallel with the case. If necessary, one screw may be backed out slightly to level tool body.
• As pressure is applied, alternately tap on the engine mounting boss and transmission shafts.

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

REMOVING THE CRANKSHAFT
1. Remove:
   • Crankshaft "1"
   Use the crankcase separating tool "2".

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

CHECKING THE CRANKCASE
1. Inspect:
   • Contacting surface "a" Scratches → Replace.
   • Engine mounting boss "b", crankcase Cracks/damage → Replace.

2. Inspect:
   • Bearing "1" Rotate inner race with a finger. Rough spot/seizure → Replace.

3. Inspect:
   • Oil seal "1" Damage → Replace.

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

<table>
<thead>
<tr>
<th>Runout limit:</th>
<th>Standard</th>
<th>&lt;Limit&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.03 mm (0.0012 in)</td>
<td>0.05 mm (0.002 in)</td>
<td></td>
</tr>
<tr>
<td>Small end free play:</td>
<td>0.4–1.0 mm (0.016–0.039 in)</td>
<td>2.0 mm (0.08 in)</td>
</tr>
<tr>
<td>Side clearance:</td>
<td>0.25–0.75 mm (0.010–0.030 in)</td>
<td>—</td>
</tr>
<tr>
<td>Crack width:</td>
<td>59.95–60.00 mm (2.360–2.362 in)</td>
<td>—</td>
</tr>
</tbody>
</table>

---

**INSTALLING THE CRANKCASE BEARING**
1. Install:
   - Bearing "1"  
     To left and right crankcase.

**TIP**
Install the bearing by pressing its outer race parallel.

---

**INSTALLING THE OIL SEAL**
1. Install:
   - Oil seal (left) "1"  
     New  
     To left crankcase.
   - Oil seal (right) "2"  
     New

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

---

**Installing the crankshaft**
1. Install:
   - Crankshaft "1"  
     Use the crankshaft installing tool "2", "3", "4".

**TIP**
- Hold the connecting rod at top dead center with one hand while turning the nut of the installing tool with the other. Operate the installing tool until the crankshaft bottoms against the bearing.
- Before installing the crankshaft, clean the contacting surface of crankcase.
- Apply the lithium soap base grease on the oil seal lip.

---

**NOTICE**
Do not use a hammer to drive in the crankshaft.

---

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

---

**Installing**
3. Install:
   - O-ring "1"  
     To right crankcase "2".

---

**Applying**
4. Apply:
   - Sealant
     To left crankcase "2".

---

**Installing**
5. Install:
   - Dowel pin "1"  
     New  
     To right crankcase "2".
   - Right crankcase "2"  
     To right crankcase "3".

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

**NOTICE**
In order to prevent the oil seal lip "a" from being turned up or damaged, wrap a vinyl tape or the like "b" around the right end of the crankshaft and apply the lithium soap base grease over the tape.
6. Install:
   • Holder “1”
   • Bolt (holder) “2”
   • Bolt (crankcase)

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

7. Install:
   • Tension spring “1”
   • Holder “2”
   • Bolt (holder) “3”

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

8. Install:
   • Segment “1”
   • Bolt (segment) “2”

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

TIP
If the segment gets an impact, it may be damaged. Take care not to give an impact to the segment when tightening the bolt.

Bolt (holder):
14 Nm (1.4 m•kg, 10 ft•lb)

Bolt (crankcase):
14 Nm (1.4 m•kg, 10 ft•lb)

TIP
Install the holder so that it contacts the projection “a” on the right crankcase.

9. Remove:
   • Sealant
   Forced out on the cylinder mating surface.

10. Apply:
   • Engine oil
   To the crank pin, bearing, oil delivery hole and connecting rod big end washer.

11. Check:
   • Crankshaft and transmission operation.
   Unsmooth operation → Repair.

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

Bolt (crankcase):
14 Nm (1.4 m•kg, 10 ft•lb)
REMOVING THE TRANSMISSION, SHIFT CAM AND SHIFT FORK

<table>
<thead>
<tr>
<th>Order</th>
<th>Part name</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Engine</td>
<td></td>
<td>Refer to &quot;ENGINE REMOVAL&quot; section.</td>
</tr>
<tr>
<td></td>
<td>Separate the crankcase.</td>
<td></td>
<td>Refer to &quot;CRANKCASE AND CRANK-SHAFT&quot; section.</td>
</tr>
<tr>
<td>1</td>
<td>Main axle</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>2</td>
<td>Drive axle</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>3</td>
<td>Shift cam</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>4</td>
<td>Shift fork 3</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>5</td>
<td>Shift fork 2</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>6</td>
<td>Shift fork 1</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>7</td>
<td>Collar</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
REMOVING THE TRANSMISSION
1. Remove:
   • Main axle "1"
   • Drive axle "2"
   • Shift cam
   • Shift fork "3"
   • Shift fork "2"
   • Shift fork "1"

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

CHECKING THE GEARs
1. Inspect:
   • Matching dog "a"
   • Gear teeth "b"
   • Shift fork groove "c"
   Wear/damage → Replace.

   2. Inspect:
      • O-ring "1"
      Damage → Replace.

   3. Check:
      • Gears movement
      Unsmooth movement → Repair or replace.

CHECKING THE BEARING
1. Inspect:
   • Bearing "1"
     Rotate inner race with a finger.
   Rough spot/seizure → Replace.

CHECKING THE SHIFT FORK,
SHIFT CAM AND SEGMENT
1. Inspect:
   • Shift fork "1"
     Wear/damage/scratches → Replace.

   2. Inspect:
      • Shift cam "1"
      • Segment "2"
      Wear/damage → Replace.

   3. Check:
      • Shift fork movement
      Unsmooth operation → Replace shift fork.

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

INSTALLING THE TRANSMISSION
1. Install:
   • 5th pinion gear (21T) "1"
   • 3rd pinion gear (18T) "2"
   • Collar "3"
   • 4th pinion gear (22T) "4"
   • 2nd pinion gear (15T) "5" To main axle "6".

   TIP
   Apply the molybdenum disulfide oil on the inner and end surface of the idler gear and on the inner surface of the sliding gear, then install.

   2. Install:
      • 2nd wheel gear (23T) "1"
      • 4th wheel gear (24T) "2"
      • 3rd wheel gear (23T) "3"
      • 5th wheel gear (20T) "4"
      • 1st wheel gear (27T) "5"
      • O-ring "6" New
      To drive axle "7".

   TIP
   • Apply the molybdenum disulfide oil on the inner and end surface of the idler gear and on the inner surface of the sliding gear, then install.
   • Apply the lithium soap base grease on the O-ring.
TRANSMISSION, SHIFT CAM AND SHIFT FORK

3. Install:
   • Washer “1”
   • Circlip “2” **New**

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

4. Install:
   • Collar “1”

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

5. Install:
   • Shift fork 1 (L) “1”
   • Shift fork 2 (C10) “2”
   • Shift fork 3 (R) “3”
   • Shift cam “4”
   To main axle and drive axle.

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

6. Install:
   • Transmission assembly “1”
   To left crankcase “2”.

**TIP**
Apply the transmission oil on the bearings and guide bars.

7. Check:
   • Shifter operation
   • Transmission operation
   Unsmooth operation → Repair.
TIP
This section is intended for those who have basic knowledge and skill concerning the servicing of Yamaha motorcycles (e.g., Yamaha dealers, service engineers, etc.) Those who have little knowledge and skill concerning servicing are requested not to undertake inspection, adjustment, disassembly, or reassembly only by reference to this manual. It may lead to servicing trouble and mechanical damage.

FRONT WHEEL AND REAR WHEEL
REMOVING THE FRONT WHEEL

<table>
<thead>
<tr>
<th>Order</th>
<th>Part name</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bolt (axle holder)</td>
<td>4</td>
<td>Only loosening.</td>
</tr>
<tr>
<td>2</td>
<td>Nut (front wheel axle)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Front wheel axle</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Front wheel</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Collar</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Oil seal</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Bearing</td>
<td>2</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>8</td>
<td>Brake disc</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
# REMOVING THE REAR WHEEL

**Order** | **Part name** | **Q'ty** | **Remarks**  
---|---|---|---
1 | Nut (rear wheel axle) | 1 | Refer to "HANDLING NOTE".  
2 | Rear wheel axle | 1 |  
3 | Drive chain puller | 2 |  
4 | Rear wheel | 1 | Refer to removal section.  
5 | Collar | 2 |  
6 | Rear wheel sprocket | 1 |  
7 | Oil seal | 2 |  
8 | Circlip | 1 |  
9 | Bearing | 2 | Refer to removal section.  
10 | Brake disc | 1 |
FRONT WHEEL AND REAR WHEEL

HANDLING NOTE

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

REMOVING THE REAR WHEEL
1. Remove:
   • Wheel "1"

TIP
Push the wheel forward and remove the drive chain "2".

REMOVING THE WHEEL BEARING
1. Remove:
   • Bearing "1"

TIP
Remove the bearing using a general bearing puller "2".

CHECKING THE WHEEL
1. Measure:
   • Wheel runout
     Out of limit → Repair/replace.

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

2. Inspect:
   • Bearing
     Rotate inner race with a finger.
     Rough spot/seizure → Replace.

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

CHECKING THE WHEEL AXLE
1. Measure:
   • Wheel axle bends
     Out of specification → Replace.
     Use the dial gauge "1".

   Wheel axle bending limit:
   0.5 mm (0.020 in)

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

CHECKING THE 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.

   Brake disc deflection limit:
   Rear:
   <Limit>: 0.15 mm (0.006 in)

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

   Brake disc thickness:
   Front:
   3.0 mm (0.12 in)
   <Limit>: 2.5 mm (0.10 in)
   Rear:
   4.0 mm (0.16 in)
   <Limit>: 3.5 mm (0.14 in)

INSTALLING THE FRONT WHEEL
1. Install:
   • Bearing (left) "1"
   • Spacer "2"
   • Bearing (right) "3"
   • Oil seal "4"

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

NOTICE
Do not strike the inner race of the bearing. Contact should be made only with the outer race.
FRONT WHEEL AND REAR WHEEL

2. Install:
   • Brake disc "1"
   • Bolt (brake disc) "2"

   **TIP**
   Tighten the bolts in stage, using a crisscross pattern.

   **Bolt (brake disc):**
   12 Nm (1.2 m•kg, 8.7 ft•lb)

3. Install:
   • Collar "1"

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

4. Install:
   • Wheel

   **TIP**
   Install the brake disc "1" between the brake pads "2" correctly.

5. Install:
   • Wheel axle "1"

   **TIP**
   Apply the lithium soap base grease on the wheel axle.

6. Install:
   • Nut (wheel axle) "1"

   **Nut (wheel axle):**
   105 Nm (10.5 m•kg, 75 ft•lb)

7. Tighten:
   • Bolt (axle holder) "1"

   **Bolt (axle holder):**
   21 Nm (2.1 m•kg, 15 ft•lb)

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

---

INSTALLING THE REAR WHEEL

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

   **TIP**
   - Apply the lithium soap base grease on the bearing and oil seal lip when installing.
   - Install the bearing with seal facing outward.
   - Use a socket that matches the outside diameter of the race of the bearing.
   - Right side of bearing shall be installed first.

   **Bolt (brake disc):**
   14 Nm (1.4 m•kg, 10 ft•lb)

2. Install:
   • Brake disc "1"
   • Bolt (brake disc) "2"

   **TIP**
   Tighten the bolts in stage, using a crisscross pattern.

   **Bolt (brake disc):**
   14 Nm (1.4 m•kg, 10 ft•lb)

3. Install:
   • Rear wheel sprocket "1"
   • Bolt (rear wheel sprocket) "2"
   • Washer (rear wheel sprocket) "3"
   • Nut (rear wheel sprocket) "4"

   **Nut (rear wheel sprocket):**
   42 Nm (4.2 m•kg, 30 ft•lb)

   **TIP**
   - Install the oil seal with its manufacturer's marks or numbers facing outward.

   **NOTICE**
   Do not strike the inner race of the bearing. Contact should be made only with the outer race.
4. Install:
   • Collar "1"

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

5. Install:
   • Wheel

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

6. Install:
   • Drive chain "1"

TIP
Push the wheel "2" forward and install the drive chain.

7. Install:
   • Left drive chain puller "1"
   • Wheel axle "2"

TIP
• Install the left drive chain puller, and insert the wheel axle from left side.
• Apply the lithium soap base grease on the wheel axle.

8. Install:
   • Right drive chain puller "1"
   • Washer "2"
   • Nut (wheel axle) "3"

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

9. Adjust:
   • Drive chain slack "a"

Drive chain slack:
48–58 mm (1.9–2.3 in)

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

10. Tighten:
    • Nut (wheel axle) "1"
    • Locknut "2"

Nut (wheel axle):
125 Nm (12.5 m•kg, 90 ft•lb)

Locknut:
19 Nm (1.9 m•kg, 13 ft•lb)
FRONT BRAKE AND REAR BRAKE

REMOVING THE FRONT BRAKE

<table>
<thead>
<tr>
<th>Order</th>
<th>Part name</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hold the machine by placing the suitable stand under the engine.</td>
<td></td>
<td>Refer to &quot;HANDLING NOTE&quot;.</td>
</tr>
<tr>
<td></td>
<td>Drain the brake fluid.</td>
<td></td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>1</td>
<td>Brake hose holder (protector)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Union bolt</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Brake hose</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Pad pin plug</td>
<td>1</td>
<td>Remove when loosening the pad pin.</td>
</tr>
<tr>
<td>5</td>
<td>Pad pin</td>
<td>1</td>
<td>Loosen when disassembling the brake caliper.</td>
</tr>
<tr>
<td>6</td>
<td>Brake caliper</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Brake lever</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Brake master cylinder bracket</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Brake master cylinder</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
REMOVING THE REAR BRAKE

<table>
<thead>
<tr>
<th>Order</th>
<th>Part name</th>
<th>Qty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hold the machine by placing the suitable stand under the engine.</td>
<td></td>
<td>Refer to &quot;HANDLING NOTE&quot;.</td>
</tr>
<tr>
<td></td>
<td>Rear wheel</td>
<td></td>
<td>Refer to &quot;FRONT WHEEL AND REAR WHEEL&quot; section.</td>
</tr>
<tr>
<td></td>
<td>Drain the brake fluid.</td>
<td></td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>1</td>
<td>Brake pedal</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Brake master cylinder</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Brake hose holder</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Union bolt</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Brake hose</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Pad pin plug</td>
<td>1</td>
<td>Remove when loosening the pad pin.</td>
</tr>
<tr>
<td>7</td>
<td>Pad pin</td>
<td>1</td>
<td>Loosen when disassembling the brake caliper.</td>
</tr>
<tr>
<td>8</td>
<td>Brake caliper</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
DISASSEMBLING THE BRAKE CALIPER

<table>
<thead>
<tr>
<th>Order</th>
<th>Part name</th>
<th>Qty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>A. Front</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>B. Rear</td>
</tr>
<tr>
<td>1</td>
<td>Pad pin</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Brake pad</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Pad support</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Brake caliper piston</td>
<td>2</td>
<td>1 Refer to removal section.</td>
</tr>
<tr>
<td>5</td>
<td>Brake caliper piston dust seal</td>
<td>2</td>
<td>1 Refer to removal section.</td>
</tr>
<tr>
<td>6</td>
<td>Brake caliper piston seal</td>
<td>2</td>
<td>1 Refer to removal section.</td>
</tr>
</tbody>
</table>

Torque Specifications:
- 3 Nm (0.3 m · kg, 2.2 ft · lb)
- 6 Nm (0.6 m · kg, 4.3 ft · lb)
- 18 Nm (1.8 m · kg, 13 ft · lb)
### FRONT BRAKE AND REAR BRAKE

#### DISASSEMBLING THE BRAKE MASTER CYLINDER

<table>
<thead>
<tr>
<th>Order</th>
<th>Part name</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brake master cylinder cap</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Diaphragm</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Reservoir float</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Push rod (Front)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Brake master cylinder boot</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Circlip</td>
<td>1</td>
<td>Use a long nose circlip pliers.</td>
</tr>
<tr>
<td>7</td>
<td>Washer</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Push rod (Rear)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Brake master cylinder kit</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
Support the machine securely so there is no danger of it falling over.

**WARNING**

Do not remove the diaphragm.

**TIP**

**DRAINING THE BRAKE FLUID**

1. Remove:
   - Brake master cylinder cap "1"
   - Protector (rear brake)

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

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

**WARNING**

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

**REMOVING THE BRAKE CALIPER PISTON**

1. Remove:
   - Brake caliper piston
   - Use compressed air and proceed carefully.

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

**REMOVING THE BRAKE CALIPER PISTON SEAL KIT**

1. Remove:
   - Brake caliper piston dust seal "1"
   - Brake caliper piston seal "2"

**TIP**

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

**NOTICE**

Never attempt to pry out brake caliper piston seals and brake caliper piston dust seals.

**WARNING**

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

**CHECKING THE BRAKE MASTER CYLINDER**

1. Inspect:
   - Brake master cylinder inner surface "a"
   - Wear/scratches → Replace master cylinder assembly.
   - Stains → Clean.

2. Inspect:
   - Diaphragm "1"
   - Crack/damage → Replace.

3. Inspect: (front brake only)
   - Reservoir float "1"
   - Damage → Replace.
4. Inspect:
• Brake master cylinder piston "1"
• Brake master cylinder cup "2"
  Wear/damage/score marks → Replace brake master cylinder kit.

CHECKING THE BRAKE CALIPER
1. Inspect:
• Brake caliper cylinder inner surface "a"
  Wear/score marks → Replace brake caliper assembly.

A. Front
B. Rear
2. Inspect:
• Brake caliper piston "1"
  Wear/score marks → Replace brake caliper piston assembly.

⚠️ WARNING
Replace the brake caliper piston seals and brake caliper piston dust seals "2" whenever a caliper is disassembled.

CHECKING THE BRAKE HOSE
1. Inspect:
• Brake hose "1"
  Crack/damage → Replace.

HANDLING NOTE

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

INSTALLING THE BRAKE CALIPER PISTON
1. Clean:
• Brake caliper
• Brake caliper piston seal
• Brake caliper piston dust seal
• Brake caliper piston
  Clean them with brake fluid.
2. Install:
• Brake caliper piston seal "1" New
• Brake caliper piston dust seal "2" New

⚠️ WARNING
Always use new brake caliper piston seals and brake caliper piston dust seals.

TIP
• Apply the brake fluid on the brake caliper piston seal.
• Apply the silicone grease on the brake caliper piston dust seal.
• Fit the brake caliper piston seals and brake caliper piston dust seals onto the slot on brake caliper correctly.

INSTALLING THE FRONT BRAKE CALIPER
1. Install:
• Pad support "1"
• Brake pad "2"
• Pad pin "3"
  Install the brake pads with their projections "a" into the brake caliper recesses "b".
  Temporarily tighten the pad pin at this point.

2. Install:
• Brake caliper "1"
• Bolt (brake caliper) "2"

Bolt (brake caliper):
  28 Nm (2.8 m•kg, 20 ft•lb)
FRONT BRAKE AND REAR BRAKE

INSTALLING THE REAR BRAKE CALIPER
1. Install:
   • Pad support "1"
   • Brake pad "2"
   • Pad pin "3"

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

2. Install:
   • Brake disc cover "1"
   • Bolt (brake disc cover) "2"

3. Install:
   • Brake caliper "1"
   • Rear wheel "2"
   Refer to "FRONT WHEEL AND REAR WHEEL" section.

INSTALLING THE BRAKE MASTER CYLINDER KIT
1. Clean:
   • Brake master cylinder
   • Brake master cylinder kit
   Clean them with brake fluid.

2. Install:
   • Brake master cylinder cup (primary) "1"
   • Brake master cylinder cup (secondary) "2"
   To brake master cylinder piston "3".

   TIP
   Apply the brake fluid on the brake master cylinder cup.

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

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

   TIP
   Install the spring at the smaller dia. side.

4. Install:
   • Brake master cylinder kit "1"
   • Washer (front brake) "2"
   • Push rod (rear brake) "2"
   • Circlip "3"
   • Brake master cylinder boot "4"
   • Push rod (front brake) "5"
   To brake master cylinder.

   TIP
   • Apply the brake fluid on the brake master cylinder kit.
   • Apply the silicone grease on the tip of the push rod.
   • When installing the circlip, use a long nose circlip pliers.

5. Install:
   • Brake master cylinder kit "1"
   • Washer (front brake) "2"
   • Push rod (rear brake) "2"
   • Circlip "3"
   • Brake master cylinder boot "4"
   • Push rod (front brake) "5"
   To brake master cylinder.

   TIP
   Apply the brake fluid on the brake master cylinder kit.

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

   Bolt (brake disc cover): 10 Nm (1.0 m•kg, 7.2 ft•lb)

   Bolt (brake master cylinder bracket): 9 Nm (0.9 m•kg, 6.5 ft•lb)
**TIP**
- Install the bracket so that the arrow mark "a" face upward.
- First tighten the bolts on the upper side of the brake master cylinder bracket, and then tighten the bolts on the lower side.

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

2. Install:
   - Brake master cylinder "1"
   - Bolt (brake master cylinder) "2"

**TIP**
Apply the silicone grease on the brake lever sliding surface, bolt and tip of the push rod.

**INSTALLING THE REAR BRAKE MASTER CYLINDER**

1. Install:
   - Copper washer "1" New
   - Brake hose "2"
   - Union bolt "3"

**WARNING**
Always use new copper washers.

2. Install:
   - Brake master cylinder "1"
   - Bolt (brake master cylinder) "2"

**INSTALLING THE FRONT BRAKE HOSE**

1. Install:
   - Copper washer "1" New
   - Brake hose "2"
   - Union bolt "3"

**TIP**
Apply the lithium soap base grease on the bolt, O-ring and brake pedal bracket.

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

**TIP**
Align the top "a" of the brake hose holder with the paint "b" of the brake hose.

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

**TIP**
After installing, check the brake pedal height. Refer to "ADJUSTING THE REAR BRAKE" section in the CHAPTER 3.
FRONT BRAKE AND REAR BRAKE

FILLING THE BRAKE FLUID

1. Fill:
   • Brake fluid
     Until the fluid level reaches
     "LOWER" level line "a".

   Recommended brake fluid:
   DOT #4

2. Air bleed:
   • Brake system
     Refer to "BLEEDING THE HY-
     DRaulic BRAKE SYSTEM" sec-
     tion in the CHAPTER 3.

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

INSTALLING THE REAR BRAKE HOSE

1. Install:
   • Copper washer "1" New
   • Brake hose "2"
   • Union bolt "3"

   Union bolt:
   30 Nm (3.0 m•kg, 22 ft•lb)

   WARNING
   Always use new copper washers.

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

   Screw (brake hose holder):
   3 Nm (0.3 m•kg, 2.2 ft•lb)

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

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

INSTALLING THE FRONT BRAKE HOSE

3. Pass the brake hose through the cable guide "1".

4. Install:
   • Copper washer "1" New
   • Brake hose "2"
   • Union bolt "3"

   Always use new copper washers.

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

   Union bolt:
   30 Nm (3.0 m•kg, 22 ft•lb)

   WARNING
   Always use new copper washers.
4. Install:
   • Reservoir float (front brake)
   • Diaphragm
   • Brake master cylinder cap "1"
   • Screw (brake master cylinder cap) "2"

   ![Screw (bolt) (brake master cylinder cap):
2 Nm (0.2 m•kg, 1.4 ft•lb)]

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

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

   ![Bolt (protector):
7 Nm (0.7 m•kg, 5.1 ft•lb)]
REMOVING THE FRONT FORK

Hold the machine by placing the suitable stand under the engine. Refer to "HANDLING NOTE".

Front wheel
Refer to "FRONT WHEEL AND REAR WHEEL" section.

Front brake caliper
Refer to "FRONT BRAKE AND REAR BRAKE" section.

Number plate
Refer to "SEAT, FUEL TANK AND SIDE COVERS" section in the CHAPTER 4.

<table>
<thead>
<tr>
<th>Order</th>
<th>Part name</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Protector</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Pinch bolt (upper bracket)</td>
<td>2</td>
<td>Only loosening.</td>
</tr>
<tr>
<td>3</td>
<td>Damper assembly</td>
<td>1</td>
<td>Loosen when disassembling the front fork.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>4</td>
<td>Pinch bolt (lower bracket)</td>
<td>2</td>
<td>Only loosening.</td>
</tr>
<tr>
<td>5</td>
<td>Front fork</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
DISASSEMBLING THE FRONT FORK

<table>
<thead>
<tr>
<th>Order</th>
<th>Part name</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Adjuster</td>
<td>1</td>
<td>Drain the fork oil. Refer to removal section.</td>
</tr>
<tr>
<td>2</td>
<td>Fork spring</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Dust seal</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>4</td>
<td>Stopper ring</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>5</td>
<td>Inner tube</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>6</td>
<td>Outer tube</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Piston metal</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Slide metal</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Oil seal washer</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Oil seal</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Base valve</td>
<td>1</td>
<td>Drain the fork oil. Refer to removal section.</td>
</tr>
<tr>
<td>12</td>
<td>Damper assembly</td>
<td>1</td>
<td>Drain the fork oil. Refer to removal section.</td>
</tr>
</tbody>
</table>

Torque values:
- 55 Nm (5.5 m·kg, 40 ft·lb)
- 30 Nm (3.0 m·kg, 22 ft·lb)
- 29 Nm (2.9 m·kg, 21 ft·lb)
- 29 Nm (2.9 m·kg, 21 ft·lb)
- 30 Nm (3.0 m·kg, 22 ft·lb)
- 1 Nm (0.1 m·kg, 0.7 ft·lb)
HANDLING NOTE

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

**TIP**
The front fork requires careful attention. So it is recommended that the front fork be maintained at the dealers.

**NOTICE**
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 base valve or front forks, be sure to extract the air from the air chamber completely.

**REMOVING THE DAMPER ASSEMBLY**
1. Loosen:
   - Damper assembly "1"

**TIP**
Before removing the front fork from the machine, loosen the damper assembly with the cap bolt ring wrench "2".

**REMOVING THE ADJUSTER**
1. Drain the outer tube of its front fork oil at its top.
2. Loosen:
   - Adjuster "1"

**REMOVING THE INNER TUBE**
1. Remove:
   - Dust seal "1"
   - Stopper ring "2"
   - Using slotted-head screwdriver.

**TIP**
While compressing the inner tube "2", set the cap bolt ring wrench "4" between the inner tube and locknut "3".
- Hold the locknut and remove the adjuster.

**NOTICE**
Do not remove the locknut as the damper rod may go into the damper assembly and not be taken out.

**REMOVING THE BASE VALVE**
1. Remove:
   - Base valve "1"
   - From damper assembly "2".

**TIP**
Hold the damper assembly with the cap bolt ring wrench "3" and use the cap bolt wrench "4" to remove the base valve.

**CHECKING THE DAMPER ASSEMBLY**
1. Inspect:
   - Damper assembly "1"<br>   - Bend/damage → Replace.<br>   - O-ring "2"<br>   - Wear/damage → Replace.

**NOTICE**
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.

**Oil seal removal steps:**
a. Push in slowly "a" the inner tube just before it bottoms out and then pull it back quickly "b".
b. Repeat this step until the inner tube can be pulled out from the outer tube.
CHECKING THE BASE VALVE
1. Inspect:
   - Base valve "1"
     Wear/damage → Replace.
   - Contamination → Clean.
   - O-ring "2"
     Wear/damage → Replace.
   - Piston metal "3"
     Wear/damage → Replace.
   - Spring "4"
     Damage/fatigue → Replace base valve.
   - Air bleed screw "5"
     Wear/damage → Replace.

CHECKING THE COLLAR
1. Inspect:
   - Piston metal "1"
     Wear/damage → Replace.

CHECKING THE FORK SPRING
1. Measure:
   - Fork spring free length "a"
     Out of specification → Replace.

CHECKING THE ADJUSTER
1. Inspect:
   - Adjuster "1"
   - O-ring "2"
     Wear/damage → Replace.

ASSEMBLING THE FRONT FORK
1. Wash the all parts in a clean solvent.
2. Stretch the damper assembly fully.
3. Fill:
   - Front fork oil "1"
     To damper assembly.

NOTE
- 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.

TIP
- 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.

CHECKING THE OUTER TUBE
1. Inspect:
   - Outer tube "1"
     Score marks/wear/damage → Replace.

CHECKING THE 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".

Fork spring free length:
454 mm (17.9 in)
<Limit>: 449 mm (17.7 in)

Recommended oil:
Suspension oil "S1"
Oil capacity:
199 cm³ (7.00 Imp oz, 6.73 US oz)

Standard oil level:
145-148 mm (5.71-5.83 in)
From top of fully stretched damper assembly.

4. After filling, pump the damper assembly "1" slowly up and down (about 200 mm (7.9 in) stroke) several times to bleed the damper assembly of air.

TIP
- Be careful not to excessive full stroke. A stroke of 200 mm (7.9 in) or more will cause air to enter. In this case, repeat the steps 2 to 4.

5. Measure:
   - Oil level (left and right) "a"
     Out of specification → Adjust.
6. Tighten:
   • Locknut "1"

   **TIP**
   Fully finger tighten the locknut onto the damper assembly.

7. Loosen:
   • Compression damping adjuster "1"

   **TIP**
   • Loosen the compression damping adjuster finger tight.
   • Record the set position of the adjuster (the amount of turning out the fully turned in position).

8. Install:
   • Base valve "1" To damper assembly "2".

   **TIP**
   First bring the damper rod pressure to a maximum. Then install the base valve while releasing the damper rod pressure.

9. Check:
   • Damper assembly Not fully stretched → Repeat the steps 2 to 8.

10. Tighten:
    • Base valve "1"

**Base valve:**
29 Nm (2.9 m•kg, 21 ft•lb)

11. After filling, pump the damper assembly "1" slowly up and down more than 10 times to distribute the fork oil.

12. While protecting the damper assembly "1" with a rag and compressing fully, allow excessive oil to overflow on the base valve side.

   **NOTICE**
   Take care not to damage the damper assembly.

13. Allow the overflowing oil to escape at the hole "a" in the damper assembly.

14. Check:
    • Damper assembly smooth movement
    Tightness/binding/rough spots → Repeat the steps 2 to 13.

15. Install:
    • Dust seal "1"
    • Stopper ring "2"
    • Oil seal "3" *New*
    • Oil seal washer "4"
    • Slide metal "5" *New*
    To inner tube "6".

   **TIP**
   • 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 manufacturer's marks or number facing the axle holder side.

16. Install:
    • Piston metal "1" *New*

   **TIP**
   Install the piston metal onto the slot on inner tube.
17. Install:
- Outer tube "1"
  To inner tube "2".

18. Install:
- Slide metal "1"
- Oil seal washer "2"
  To outer tube slot.

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

19. Install:
- Oil seal "1"

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

20. Install:
- Stopper ring "1"

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

21. Install:
- Dust seal "1"

**TIP**
Apply the lithium soap base grease on the inner tube.

22. Check:
- Inner tube smooth movement
  Tightness/binding/rough spots →
  Repeat the steps 15 to 21.

23. Measure:
- Distance "a"

Out of specification →
Turn into the locknut.

**Distance "a":**
16 mm (0.63 in) or more
Between the damper assembly "1" bottom
and locknut "2" bottom.

24. Install:
- Collar "1"
- Fork spring "2"
  To damper assembly "3".

**TIP**
Install the collar with its larger dia.
end "a" facing the fork spring.

25. Install:
- Damper assembly "1"
  To inner tube "2".

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

26. Loosen:
- Rebound damping adjuster "1"

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

27. Install:
- Push rod "1"
- Copper washer "2"
  New Adjuster "3"
  To damper assembly "4".
TIP
• While compressing the inner tube “5”, set the cap bolt ring wrench “7” between the inner tube and locknut “6”.
• Fully finger tighten the adjuster onto the damper assembly.

Cap bolt ring wrench: YM-01501/90890-01501

28. Inspect:
• Gap “a” between the adjuster “1” and locknut “2”.
  Out of specification → Retighten and readjust the locknut.

Gap “a” between the adjuster and locknut:
0.5–1.0 mm (0.02–0.04 in)

TIP
If the adjuster is installed out of specification, proper damping force cannot be obtained.

29. Tighten:
• Adjuster (locknut) “1”

Adjuster (locknut):
29 Nm (2.9 m•kg, 21 ft•lb)

TIP
Hold the locknut “2” and tighten the adjuster with specified torque.

30. Install:
• Adjuster “1”

Adjuster:
55 Nm (5.5 m•kg, 40 ft•lb)
To inner tube.

31. Fill:
• Front fork oil “1”
  From outer tube top.

Recommended oil:
Suspension oil “S1”
Standard oil amount:
330 cm³ (11.6 Imp oz, 11.2 US oz)
Extent of adjustment:
300–375 cm³ (10.6–13.2 Imp oz, 10.1–12.7 US oz)

WARNING
Never fail to make the oil amount adjustment between the maximum and minimum amount and always adjust each front fork to the same setting. Uneven adjustment can cause poor handling and loss of stability.

NOTICE
• 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.

32. Install:
• Damper assembly “1”
  To outer tube.

TIP
Temporarily tighten the damper assembly.

33. Install:
• Protector guide “1”

INSTALLING THE FRONT FORK

1. Install:
• Front fork “1”

TIP
• Temporarily tighten the pinch bolts (lower bracket).
• Do not tighten the pinch bolts (upper bracket) yet.

2. Tighten:
• Damper assembly “1”

Damper assembly:
30 Nm (3.0 m•kg, 22 ft•lb)

TIP
Use the cap bolt ring wrench “2” to tighten the damper assembly with specified torque.

Cap bolt ring wrench:
YM-01501/90890-01501
3. Adjust:
- Front fork top end "a"

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

4. Tighten:
- Pinch bolt (upper bracket) "1"

Pinch bolt (upper bracket):
21 Nm (2.1 m•kg, 15 ft•lb)

- Pinch bolt (lower bracket) "2"

Pinch bolt (lower bracket):
21 Nm (2.1 m•kg, 15 ft•lb)

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

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

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

6. Adjust:
- Rebound damping force

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

7. Adjust:
- Compression damping force

**TIP**
Turn in the damping adjuster "1" finger-tight and then turn out to the originally set position.
### Removing the Handlebar

**Order | Part Name | Q'ty | Remarks**
--- | --- | --- | ---
1 | Number plate | 1 | Remove the band only.
1 | Clutch cable | 1 | Disconnect at the lever side.
2 | Clutch lever holder | 1 | |
3 | Engine stop switch | 1 | |
4 | Brake master cylinder | 1 | Refer to removal section.
5 | Throttle cable cap | 1 | Turn over the cap cover.
6 | Throttle cable | 1 | Disconnect at the throttle side.
7 | Throttle | 1 | Loosen the bolts.
8 | Cap cover | 1 | |
9 | Collar | 1 | |
10 | Left grip | 1 | Refer to removal section.
11 | Handlebar upper holder | 1 | |
12 | Handlebar | 1 | |
13 | Handlebar lower holder | 2 | |

*Torque Specifications (Nm - m, kgf, ft - lb)*

- 1 Nm (0.1 m - kg, 0.7 ft - lb)
- 4 Nm (0.4 m - kg, 2.9 ft - lb)
- 28 Nm (2.8 m - kg, 20 ft - lb)
- 40 Nm (4.0 m - kg, 29 ft - lb)
- 9 Nm (0.9 m - kg, 6.5 ft - lb)
# Disassembling the Throttle

<table>
<thead>
<tr>
<th>Order</th>
<th>Part name</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Grip cap (lower)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Grip cap (upper)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Grip assembly</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Grip (right)</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>5</td>
<td>Tube guide</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

\[ 4 \text{Nm (0.4 m \cdot kg, 2.9 ft \cdot lb)} \]
REMOVING THE BRAKE MASTER CYLINDER
1. Remove:
   • Brake master cylinder bracket "1"
   • Brake master cylinder "2"

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

REMOVING THE GRIP
1. Remove:
   • Grip "1"

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

CHECKING THE HANDLEBAR
1. Inspect:
   • Handlebar "1"
   Bends/cracks/damage → Replace.

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

ASSEMBLING THE THROTTLE
1. Remove:
   • Grip (right) "1"
   Apply the adhesive on the tube guide "2".

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

REMOVING THE GRIP
1. Remove:
   • Grip "1"

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

INSTALLING THE HANDLEBAR
1. Install:
   • Handlebar lower holder "1"
   • Washer "2"
   • Nut (handlebar lower holder) "3"
   - Install the handlebar lower holder with its side having the greater distance "a" from the mounting bolt center facing forward.
   - Apply the lithium soap base grease on the thread of the handlebar lower holder.
   - Installing the handlebar lower holder in the reverse direction allows the front-to-rear offset amount of the handlebar position to be changed.
   - Do not tighten the nut yet.

2. Install:
   • Handlebar "1"
   • Handlebar upper holder "2"
   • Bolt (handlebar upper holder) "3"

**Bolt (handlebar upper holder):**
28 Nm (2.8 m•kg, 20 ft•lb)

**TIP**
- The handlebar upper holder should be installed with the punched mark "a" forward.
- Install the handlebar so that the marks "b" are in place on both sides.
- Install the handlebar so that the projection "c" of the handlebar upper holder is positioned at the mark on the handlebar as shown.
- First tighten the bolts on the front side of the handlebar upper holder, and then tighten the bolts on the rear side.
3. Tighten:
   • Nut (handlebar lower holder) "1"

Nut (handlebar lower holder):
40 Nm (4.0 m•kg, 29 ft•lb)

4. Install:
   • Left grip "1"
   Apply the adhesive to the handlebar "2".

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

5. Install:
   • Collar "1"
   • Grip cap cover "2"
   • Throttle grip "3"

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

6. Install:
   • Throttle cables "1"
   To tube guide "2".

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

7. Install:
   • Roller "1"
   • Collar "2"

TIP
   • Apply the lithium soap base grease on the roller sliding surface and cable guide.
   • Install the roller so that the "UP-PER" mark "a" faces upward.
   • Pass the throttle cable in the groove "b" in the roller.

8. Install:
   • Throttle cable cap "1"
   • Screw (throttle cable cap) "2"

   Screw (throttle cable cap):
   1 Nm (0.1 m•kg, 0.7 ft•lb)

9. Adjust:
   • Throttle grip free play
   Refer to "ADJUSTING THE THROTTLE CABLE FREE PLAY" section in the CHAPTER 3.

10. Install:
    • Cap cover "1"

11. Install:
    • Brake master cylinder "1"
    • Brake master cylinder bracket "2"
    • Bolt (brake master cylinder bracket) "3"

   Bolt (brake master cylinder bracket):
   9 Nm (0.9 m•kg, 6.5 ft•lb)

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

12. Install:
    • Bolt (grip cap) "1"

   Bolt (grip cap):
   4 Nm (0.4 m•kg, 2.9 ft•lb)

A WARNING
After tightening the bolts, check that the throttle grip "2" moves smoothly. If it does not, retighten the bolts for adjustment.
13. Install:
- Engine stop switch "1"
- Clutch lever holder "2"
- Bolt (clutch lever holder) "3"
- Clamp "4"

**Tip**
- The engine stop switch, clutch lever holder and clamp should be installed according to the dimensions shown.
- Pass the engine stop switch lead in the middle of the clutch lever holder.

**Bolt (clutch lever holder):**
4 Nm (0.4 m•kg, 2.9 ft•lb)

14. Install:
- Clutch cable "1"

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

15. Adjust:
- Clutch lever free play
Refer to "ADJUSTING THE CLUTCH CABLE FREE PLAY" section in the CHAPTER 3.
### TIGHTENING STEPS:

- Tighten ring nut. 38 Nm (3.8 m·kg, 27 ft·lb)
- Loosen it one turn.
- Retighten it. 7 Nm (0.7 m·kg, 5.1 ft·lb)

<table>
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<th>Part name</th>
<th>Q’ty</th>
<th>Remarks</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Hold the machine by placing the suitable stand under the engine.</strong></td>
</tr>
<tr>
<td></td>
<td>Number plate</td>
<td></td>
<td>Refer to &quot;HANDLING NOTE&quot;.</td>
</tr>
<tr>
<td></td>
<td>Handlebar</td>
<td></td>
<td>Refer to &quot;HANDLEBAR&quot; section.</td>
</tr>
<tr>
<td>1</td>
<td>Steering stem nut</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Front fork</td>
<td>2</td>
<td>Refer to &quot;FRONT FORK&quot; section.</td>
</tr>
<tr>
<td>3</td>
<td>Upper bracket</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Steering ring nut</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>5</td>
<td>Lower bracket</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Bearing race cover</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Upper bearing</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Lower bearing</td>
<td>1</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>9</td>
<td>Bearing race</td>
<td>2</td>
<td>Refer to removal section.</td>
</tr>
</tbody>
</table>
HANDLING NOTE

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

**REMOVING THE STEERING RING NUT**
1. Remove:
   • Steering ring nut “1”
   Use the steering nut wrench “2”.

   ![Steering nut wrench: YU-33975/90890-01403](image)

**WARNING**
Support the steering stem so that it may not fall down.

**REMOVING THE LOWER BEARING**
1. Remove:
   • Lower bearing “1”
   Use the floor chisel “2”.

**NOTICE**
Take care not to damage the steering shaft thread.

**REMOVING THE BEARING RACE**
1. Remove:
   • Bearing race “1”
   Remove the bearing race using long rod “2” and the hammer.

**CHECKING THE STEERING STEM**
1. Inspect:
   • Steering stem “1”
   Bend/damage → Replace.

**CHECKING THE BEARING AND BEARING RACE**
1. Wash the bearings and bearing races with a solvent.
2. Inspect:
   • Bearing “1”
   • Bearing race
   Pitting/damage → Replace bearings and bearing races as a set.
   Install the bearing in the bearing races. Spin the bearings by hand.
   If the bearings hang up or are not smooth in their operation in the bearing races, replace bearings and bearing races as a set.

**INSTALLING THE LOWER BRACKET**
1. Install:
   • Lower bearing “1”
   Apply the lithium soap base grease on the dust seal lip and bearing inner circumference.

2. Install:
   • Bearing race
   • Upper bearing “1”
   • Bearing race cover “2”
   Apply the lithium soap base grease on the bearing and bearing race cover lip.

3. Install:
   • Lower bracket “1”

**TIP**
Apply the lithium soap base grease on the bearing, the portion “a” and thread of the steering stem.

4. Install:
   • Steering ring nut “1”

**Tighten the steering ring nut using the steering nut wrench “2”**.
Refer to “CHECKING AND ADJUSTING THE STEERING HEAD” section in the CHAPTER 3.

5. Check the steering stem by turning it lock to lock. If there is any binding, remove the steering stem assembly and inspect the steering bearings.
6. Install:
- Washer "1"

7. Install:
- Front fork "1"
- Upper bracket "2"

TIP
- Temporarily tighten the pinch bolts (lower bracket).
- Do not tighten the pinch bolts (upper bracket) yet.

8. Install:
- Washer "1"
- Steering stem nut "2"

9. After tightening the nut, check the steering for smooth movement. If not, adjust the steering by loosening the steering ring nut little by little.

10. Adjust:
- Front fork top end "a"

11. Tighten:
- Pinch bolt (upper bracket) "1"

   Pinch bolt (upper bracket):
   21 Nm (2.1 m•kg, 15 ft•lb)

- Pinch bolt (lower bracket) "2"

   Pinch bolt (lower bracket):
   21 Nm (2.1 m•kg, 15 ft•lb)

NOTICE
Tighten the lower bracket to specified torque. If torqued too much, it may cause the front fork to malfunction.
REMOVING THE SWINGARM

Hold the machine by placing the suitable stand under the engine. Refer to "HANDLING NOTE".

Brake hose holder
Refer to "FRONT BRAKE AND REAR BRAKE" section.

Rear brake caliper
Refer to "FRONT BRAKE AND REAR BRAKE" section.

Bolt (brake pedal)
Shift the brake pedal backward.

Drive chain support 1
Lower chain tensioner 1
Bolt (rear shock absorber-relay arm) 1
Bolt (connecting rod) 1
Pivot shaft 1
Swingarm 1

<table>
<thead>
<tr>
<th>Order</th>
<th>Part name</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Drive chain support</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Lower chain tensioner</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Bolt (rear shock absorber-relay arm)</td>
<td>1</td>
<td>Hold the swingarm.</td>
</tr>
<tr>
<td>4</td>
<td>Bolt (connecting rod)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Pivot shaft</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Swingarm</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
## DISASSEMBLING THE SWINGARM

<table>
<thead>
<tr>
<th>Order</th>
<th>Part name</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cap</td>
<td>2</td>
<td>Refer to removal section.</td>
</tr>
<tr>
<td>2</td>
<td>Relay arm</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Connecting rod</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Collar</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Oil seal</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Thrust bearing</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Bushing</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Oil seal</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Bearing</td>
<td>10</td>
<td>Refer to removal section.</td>
</tr>
</tbody>
</table>
HANDLING NOTE

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

REMOVING THE CAP
1. Remove:
   • Left cap "1"

**TIP**
Remove with a slotted-head screwdriver inserted under the mark "a" on the left cap.

REMOVING THE BEARING
1. Remove:
   • Bearing "1"

**TIP**
Remove the bearing by pressing its outer race.

CHECKING THE SWINGARM
1. Inspect:
   • Bearing "1"
   • Bushing "2"
   Free play exists/unsmooth revolution/rust → Replace bearing and bushing as a set.

2. Inspect:
   • Oil seal "3"
   Damage → Replace.

CHECKING THE CONNECTING ROD
1. Inspect:
   • Bearing "1"
   • Collar "2"
   Free play exists/unsmooth revolution/rust → Replace bearing and collar as a set.

2. Inspect:
   • Oil seal "3"
   Damage → Replace.

INSTALLING THE BEARING AND OIL SEAL
1. Install:
   • Bearing "1"
   • Oil seal "2"
   To swingarm.

**TIP**
- Apply the molybdenum disulfide grease on the bearing when installing.
- Install the bearing by pressing it on the side having the manufacture's marks or numbers.
- Apply the molybdenum disulfide grease on the washer.

2. Install:
   • Bearing "1"
   • Washer "2"
   • Oil seal "3"
   To relay arm.

**TIP**
- Apply the molybdenum disulfide grease on the bearing when installing.
- Install the bearing by pressing it on the side having the manufacture's marks or numbers.

3. Install:
   • Bearing "1"
   • Oil seal "2"
   To connecting rod.

**TIP**
- Apply the molybdenum disulfide grease on the bearing when installing.
- Install the bearing by pressing it on the side having the manufacture's marks or numbers.

**Installed depth of bearings:**
- Outer "a": Zero mm (Zero in)
- Inner "b": 6.5 mm (0.26 in)
INSTALLING THE SWINGARM

1. Install:
   • Bushing "1"
   • Thrust bearing "2"
   • Oil seal "3"
   • Collar "4"
   To swingarm "5".

TIP
Apply the molybdenum disulfide grease on the bushings, thrust bearings, oil seal lips and contact surfaces of the collar and thrust bearing.

2. Install:
   • Collar "1"
   • Washer "2"
   To relay arm "3".

TIP
Apply the molybdenum disulfide grease on the collars and oil seal lips.

3. Install:
   • Collar "1"
   To connecting rod "2".

TIP
Apply the molybdenum disulfide grease on the collar and oil seal lips.

4. Install:
   • Connecting rod "1"
   • Bolt (connecting rod) "2"
   • Washer "3"
   • Nut (connecting rod) "4"
   To relay arm "5".

TIP
Apply the molybdenum disulfide grease on the bolt.

Nut (connecting rod):
80 Nm (8.0 m•kg, 58 ft•lb)

5. Install:
   • Relay arm "1"
   • Bolt (relay arm) "2"
   • Washer "3"
   • Nut (relay arm) "4"
   To swingarm.

TIP
Apply the molybdenum disulfide grease on the bolt circumference and threaded portion.
Do not tighten the nut yet.

6. Install:
   • Swingarm "1"
   • Pivot shaft "2"

TIP
Apply the molybdenum disulfide grease on the pivot shaft.
Insert the pivot shaft from right side.

Pivot shaft:
85 Nm (8.5 m•kg, 61 ft•lb)

7. Check:
   • Swingarm side play "a"
     Free play exists → Replace thrust bearing.
   • Swingarm up and down movement "b"
     Unsmooth movement/binding/rough spots → Grease or replace bearings, bushings and collars.

8. Install:
   • Bolt (connecting rod) "1"
   • Washer "2"
   • Nut (connecting rod) "3"

TIP
Apply the molybdenum disulfide grease on the bolt.
Do not tighten the nut yet.

9. Install:
   • Bolt (rear shock absorber-relay arm) "1"
   • Nut (rear shock absorber-relay arm) "2"

Nut (rear shock absorber-relay arm):
53 Nm (5.3 m•kg, 38 ft•lb)

TIP
Apply the molybdenum disulfide grease on the bolt.
10. Tighten:
• Nut (connecting rod) “1”

**Nut (connecting rod): 80 Nm (8.0 m•kg, 58 ft•lb)**

11. Tighten:
• Nut (relay arm) “1”

**Nut (relay arm): 70 Nm (7.0 m•kg, 50 ft•lb)**

12. Install:
• Cap “1”

**TIP**
Install the right cap with its mark “a” facing forward.

13. Install:
• Bolt (lower chain tensioner) “1”
• Washer “2”
• Collar “3”
• Lower chain tensioner “4”
• Nut (lower chain tensioner) “5”

**Nut (lower chain tensioner): 16 Nm (1.6 m•kg, 11 ft•lb)**

14. Install:
• Drive chain support “1”
• Drive chain support cover “2”
• Bolt {drive chain support [L = 50 mm (1.97 in)]} “3”
• Nut (drive chain support) “4”

**Nut (drive chain support): 7 Nm (0.7 m•kg, 5.1 ft•lb)**
• Bolt {drive chain support cover [L = 10 mm (0.39 in)]} “5”

**Bolt (drive chain support cover): 7 Nm (0.7 m•kg, 5.1 ft•lb)**
REAR SHOCK ABSORBER
REMOVING THE REAR SHOCK ABSORBER

Order | Part name | Q’ty | Remarks
--- | --- | --- | ---
1 | Clamp (air filter joint) | 1 | Only loosening.
2 | Rear frame | 1 |
3 | Bolt (rear shock absorber-relay arm) | 1 | Hold the swingarm.
4 | Bolt (rear shock absorber-frame) | 1 |
5 | Rear shock absorber | 1 |
6 | Locknut | 1 | Only loosening.
7 | Adjuster | 1 | Only loosening.
8 | Spring seat | 2 |
9 | Lower spring guide | 1 |
10 | Upper spring guide | 1 |
11 | Spring (rear shock absorber) | 1 |
12 | Bearing | 2 | Refer to removal section.

Hold the machine by placing the suitable stand under the engine. Refer to "HANDLING NOTE".

Seat
Refer to "SEAT, FUEL TANK AND SIDE COVERS" section in the CHAPTER 4.

Silencer
Refer to "EXHAUST PIPE AND SILENCER" section in the CHAPTER 4.

56 Nm (5.6 m·kg, 40 ft·lb)
32 Nm (3.2 m·kg, 23 ft·lb)
29 Nm (2.9 m·kg, 21 ft·lb)
53 Nm (5.3 m·kg, 38 ft·lb)
HANDLING NOTE

**WARNING**
- Support the machine securely so there is no danger of it falling over.
- This rear 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 cannot be held responsible for property damage or personal injury that may result from improper handling.
- Never tamper or attempt to disassemble the cylinder or the tank.
- Never throw the rear shock absorber into an open flame or other high heat. The rear shock absorber may explode as a result of nitrogen gas expansion and/or damage to the hose.
- Be careful not to damage any part of the gas tank. A damaged gas tank will impair the damping performance or cause a malfunction.
- Take care not to scratch the contact surface of the piston rod with the cylinder; or oil could leak out.
- Never attempt to remove the plug at the bottom of the nitrogen gas tank. It is very dangerous to remove the plug.
- When scrapping the rear shock absorber, follow the instructions on disposal.

**NOTES ON DISPOSAL (YAMAHA DEALERS ONLY)**
Before disposing the rear shock absorber, be sure to extract the nitrogen gas from valve “1”. Wear eye protection to prevent eye damage from escaping gas and/or metal chips.

**WARNING**
To dispose of a damaged or worn-out rear shock absorber, take the unit to your Yamaha dealer for this disposal procedure.

---

**REAR SHOCK ABSORBER**

**REMOVING THE BEARING**

1. Remove:
   - Stopper ring (upper bearing) “1”

   **TIP**
   Press in the bearing while pressing its outer race and remove the stopper ring.

2. Remove:
   - Upper bearing “1”

   **TIP**
   Remove the bearing by pressing its outer race.

3. Remove:
   - Lower bearing “1”

   **TIP**
   Remove the bearing by pressing its outer race.

**CHECKING THE REAR SHOCK ABSORBER**

1. Inspect:
   - Damper rod “1”
     Bends/damage → Replace rear shock absorber assembly.
   - Shock absorber “2”
     Oil leaks → Replace rear shock absorber assembly.
     Gas leaks → Replace rear shock absorber assembly.
   - Spring “3”
     Damage → Replace spring.
     Fatigue → Replace spring.
     Move spring up and down.
   - Spring guide “4”
     Wear/damage → Replace spring guide.
   - Spring seat “5”
     Cracks/damage → Replace.
   - Bearing “6”
     Free play exists/unsmooth revolution/rust → Replace.

**INSTALLING THE BEARING**

1. Install:
   - Upper bearing “1”

   **TIP**
   Install the bearing parallel until the stopper ring groove appears by pressing its outer race.

**NOTICE**
Do not apply the grease on the bearing outer race because it will wear the rear shock absorber surface on which the bearing is press fitted.
2. Install:
   • Stopper ring (upper bearing) "1"

   **TIP**
   After installing the stopper ring, push back the bearing until it contacts the stopper ring.

3. Install:
   • Lower bearing "1"

   **TIP**
   Install the bearing by pressing it on the side having the manufacturer’s marks or numbers.

4. Adjust:
   • Spring length (installed)
   Refer to "ADJUSTING THE REAR SHOCK ABSORBER SPRING PRELOAD" section in the CHAPTER 3.

5. Tighten:
   • Locknut "1"

---

**INSTALLING THE SPRING (REAR SHOCK ABSORBER)**

1. Install:
   • Spring "1"
   • Upper spring guide "2"
   • Lower spring guide "3"

2. Install:
   • Spring seat "1"

   **TIP**
   Install the spring seat with the projection "a" brought into contact with the spring end, as shown.

---

**INSTALLING THE REAR SHOCK ABSORBER**

1. Install:
   • Dust seal "1"
   • O-ring "2"  
   • Collar "3"

   **TIP**
   Apply the molybdenum disulfide grease on the dust seal lips and collars.
   • Apply the lithium soap base grease on the O-rings.

2. Install:
   • Bushing "1"
   • Collar "2"
   • Dust seal "3"

   **TIP**
   Apply the molybdenum disulfide grease on the bearing and dust seal lips.
   • Install the dust seals with their lips facing inward.

3. Install:
   • Rear shock absorber

4. Install:
   • Bolt (rear shock absorber-frame) "1"
   • Washer "2"
   • Nut (rear shock absorber-frame) "3"

   **TIP**
   Apply the molybdenum disulfide grease on the bolt.

5. Install:
   • Bolt (rear shock absorber-relay arm) "1"
   • Nut (rear shock absorber-relay arm) "2"

   **TIP**
   Apply the molybdenum disulfide grease on the bolt.

---

Installed depth of the bearing "a": 4 mm (0.16 in)

---

Nut (rear shock absorber-frame):
56 Nm (5.6 m•kg, 40 ft•lb)

---

Nut (rear shock absorber-relay arm):
53 Nm (5.3 m•kg, 38 ft•lb)
6. Install:
   • Rear frame "1"
   • Bolt [rear frame (upper)] "2"

   Bolt [rear frame (upper)]:
   32 Nm (3.2 m•kg, 23 ft•lb)

   • Bolt [rear frame (lower)] "3"

   Bolt [rear frame (lower)]:
   29 Nm (2.9 m•kg, 21 ft•lb)

7. Tighten:
   • Bolt (air filter joint) "1"
ELECTRICAL

TIP

This section is intended for those who have basic knowledge and skill concerning the servicing of Yamaha motorcycles (e.g., Yamaha dealers, service engineers, etc.) Those who have little knowledge and skill concerning servicing are requested not to undertake inspection, adjustment, disassembly, or reassembly only by reference to this manual. It may lead to servicing trouble and mechanical damage.
ELECTRICAL COMPONENTS AND WIRING DIAGRAM

ELECTRICAL COMPONENTS

1. CDI unit
2. Engine stop switch
3. Ignition coil
4. Throttle position sensor
5. Solenoid valve
6. Neutral switch
7. CDI magneto
8. Spark plug

WIRING DIAGRAM

COLOR CODE

- B: Black
- L: Blue
- O: Orange
- R: Red
- Sb: Sky blue
- Y: Yellow
- B/L: Black/Blue
- B/R: Black/Red
- B/W: Black/White
- G/L: Green/Blue
- G/W: Green/White
- W/L: White/Blue
- W/R: White/Red

6-2
IGNITION SYSTEM

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

<table>
<thead>
<tr>
<th>Step Description</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spark gap test</td>
<td>Clean or replace spark plug.</td>
</tr>
<tr>
<td>Check entire ignition system for connection.</td>
<td>Repair or replace.</td>
</tr>
<tr>
<td>Check engine stop switch.</td>
<td>Replace.</td>
</tr>
<tr>
<td>Check ignition coil. (primary coil and secondary coil)</td>
<td>Replace.</td>
</tr>
<tr>
<td>Check spark plug cap.</td>
<td>Replace.</td>
</tr>
<tr>
<td>Check CDI magneto. (pickup coil and charging coil)</td>
<td>Replace.</td>
</tr>
<tr>
<td>Check neutral switch.</td>
<td>Repair or replace.</td>
</tr>
<tr>
<td>Replace CDI unit.</td>
<td></td>
</tr>
</tbody>
</table>

*marked: Only when the ignition checker is used.

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

Dynamic spark tester:
YM-34487
Ignition checker:
90890-06754
Pocket tester:
YU-3112-C/90890-03112
IGNITION SYSTEM

SPARK GAP TEST
1. Disconnect the spark plug cap from spark plug.
2. Connect the dynamic spark tester "1" (ignition checker "2") as shown.
   • Ignition coil "3"
   • Spark plug "4"
3. Kick the kickstarter crank.
4. Check the ignition spark gap.
5. Start engine, and increase spark gap until misfire occurs. (For USA and CDN only)

CHECKING THE COUPLERS, LEADS AND IGNITION COIL CONNECTION
1. Check:
   • Couplers and leads connection
     Rust/dust/looseness/short-circuit → Repair or replace.

CHECKING THE ENGINE STOP SWITCH
1. Inspect:
   • Engine stop switch conduction
   Tester (+) lead → Black/White lead "1"
   Tester (-) lead → Black lead "2"
   Result
   Conductive (while the engine stop switch is pushed)

CHECKING THE SPARK PLUG CAP
1. Inspect:
   • Spark plug cap
     Loose connection → Tighten.
     Deteriorated/damaged → Replace.
   • Spark plug cap resistance
     Out of specification → Replace.

CHECKING THE CDI MAGNETO
1. Inspect:
   • Pickup coil resistance
     Out of specification → Replace.

Minimum spark gap: 6.0 mm (0.24 in)
IGNITION SYSTEM

2. Inspect:
   • Charging coil 1 resistance
     Out of specification → Replace.

   **Tester (+) lead → Black/Red lead “1”**
   **Tester (-) lead → Black lead “2”**

<table>
<thead>
<tr>
<th>Charging coil 1 resistance</th>
<th>Tester selector position</th>
</tr>
</thead>
<tbody>
<tr>
<td>720–1,080 Ω at 20 °C (68 °F)</td>
<td>Ω × 100</td>
</tr>
</tbody>
</table>

3. Inspect:
   • Charging coil 2 resistance
     Out of specification → Replace.

   **Tester (+) lead → Green/Blue lead “1”**
   **Tester (-) lead → Green/White lead “2”**

<table>
<thead>
<tr>
<th>Charging coil 2 resistance</th>
<th>Tester selector position</th>
</tr>
</thead>
<tbody>
<tr>
<td>44–66 Ω at 20 °C (68 °F)</td>
<td>Ω × 10</td>
</tr>
</tbody>
</table>

CHECKING THE NEUTRAL SWITCH

1. Inspect:
   • Neutral switch conduction

   **Tester (+) lead → Sky blue lead ”1”**
   **Tester (-) lead → Ground ”2”**

   **Result**
   Conductive (while gear is in neutral)

   Not conductive while it is in neutral → Replace.
   Conductive while it is engaged → Replace.

   **TIP**
   Set the tester selection position to “Ω × 1”.

CHECKING THE CDI UNIT

Check all electrical components. If no fault is found, replace the CDI unit.
Then check the electrical components again.
SOLENOID VALVE SYSTEM

INSPECTION STEPS
If the solenoid valve will not operate, use the following inspection steps.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Check each couplers and wire connection.</td>
<td>No good → Repair or replace.</td>
</tr>
<tr>
<td>2. Check solenoid valve. (Check solenoid valve operation. Solenoid valve coil)</td>
<td>No good → Replace.</td>
</tr>
<tr>
<td>3. * Check CDI magneto. (Source coil)</td>
<td>No good → Replace.</td>
</tr>
</tbody>
</table>

*marked: Refer to "IGNITION SYSTEM" section.

TIP
- Remove the following parts before inspection.
  1. Seat
  2. Fuel tank
- Use 12V battery in this inspection.
- Use the following special tools in this inspection.

Pocket tester:
YU-3112-C/90890-03112
CHECKING THE COUPLERS AND LEADS CONNECTION
1. Check:
   • Couplers and leads connection
     Rust/ Dust/ Looseness/Short-circuit → Repair or replace.

CHECKING THE SOLENOID VALVE OPERATION
1. Disconnect the solenoid valve coupler.
2. Connect 12V battery to the solenoid valve coupler.

3. Inspect:
   • Solenoid valve "1"
     No click when connecting the battery → Replace.

CHECKING THE SOLENOID VALVE COIL
1. Inspect:
   • Solenoid valve coil resistance
     Out of specification → Replace.

<table>
<thead>
<tr>
<th>Solenoid resistance</th>
<th>Tester selector position</th>
</tr>
</thead>
<tbody>
<tr>
<td>22.8–27.8 Ω at 20°C (68 °F)</td>
<td>Ω x 10</td>
</tr>
</tbody>
</table>
# THROTTLE POSITION SENSOR SYSTEM

## INSPECTION STEPS

If the throttle position sensor will not operate, use the following inspection steps.

<table>
<thead>
<tr>
<th>Step</th>
<th>Check</th>
<th>Condition</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Check entire ignition system for connection.</td>
<td>No good</td>
<td>Repair or replace.</td>
</tr>
<tr>
<td>2</td>
<td>Check throttle position sensor. (Throttle position sensor coil)</td>
<td>No good</td>
<td>Replace.</td>
</tr>
<tr>
<td>3</td>
<td>*Check CDI magneto. (Source coil)</td>
<td>No good</td>
<td>Replace.</td>
</tr>
<tr>
<td>4</td>
<td>Check CDI unit. (Throttle position sensor input voltage)</td>
<td>No good</td>
<td>Replace.</td>
</tr>
</tbody>
</table>

*marked: Refer to "IGNITION SYSTEM" section.

## TIP
- Remove the following parts before inspection.
  1. Seat
  2. Fuel tank
- Use the following special tools in this inspection.

Pocket tester:

YU-3112-C/90890-03112
### HANDLING NOTE

**NOTICE**

Do not loosen the screw (throttle position sensor) "1" except when changing the throttle position sensor due to failure because it will cause a drop in engine performance.

### CHECKING THE COUPLERS AND LEADS CONNECTION

1. **Check:**
   - Rust/dust/looseness/short-circuit → Repair or replace.

### CHECKING THE THROTTLE POSITION SENSOR COIL

1. **Remove:**
   - Carburetor
   - Mixing chamber top
   - Refer to "CARBURETOR AND REED VALVE" section in the CHAPTER 4.

2. **Inspect:**
   - Throttle position sensor coil resistance
   - Out of specification → Replace.

3. **Inspect:**
   - Throttle position sensor coil variable resistance
   - Check that the resistance is increased as the lever "1" is moved from the full close position to the full open position.
   - Out of specification → Replace.

### CHANGING AND ADJUSTING THE THROTTLE POSITION SENSOR

1. **Remove:**
   - Carburetor
   - Mixing chamber top
   - Refer to "CARBURETOR AND REED VALVE" section in the CHAPTER 4.

2. **Remove:**
   - Screw (throttle position sensor) "1"
   - Throttle position sensor "2"

3. **Replace:**
   - Throttle position sensor

4. **Install:**
   - Throttle position sensor "1"
   - Screw (throttle position sensor) "2"

   **TIP**
   - Align the slot "a" in the throttle position sensor with the projection "b" on the carburetor while the lever "3" is held down.
   - Temporarily tighten the screw (throttle position sensor).

5. **Install:**
   - Mixing chamber top
   - Carburetor
   - Refer to "CARBURETOR AND REED VALVE" section in the CHAPTER 4.

6. **Adjust:**
   - Idle speed for throttle position sensor adjustment

   **Adjustment steps:**
   a. Set the digital tachometer to the high tension cord.
   b. Turn the throttle stop screw "1" until the specified idle speed.
   - Refer to "ADJUSTING THE ENGINE IDLING SPEED" section in the CHAPTER 3.

7. Insert the thin electric conductors "2" (lead wire) into the throttle position sensor coupler "1", as shown, and connect the tester to them.

   **Tester (+) lead → Yellow lead "3"**
   **Tester (-) lead → Black lead "4"**

   **NOTICE**
   - Do not insert the electric conductors more than required because it may reduce the waterproof function of the coupler.
   - Make sure that a short-circuit does not develop between the terminals because it may cause damage to electrical components.
8. Start the engine.
9. Adjust:
   • Throttle position sensor output voltage

\textbf{Adjustment steps:}

\textit{a.} Adjust the installation angle of the throttle position sensor “1” to obtain the specified output voltage.

\begin{center}
\begin{tabular}{|c|c|}
\hline
Throttle position sensor output voltage & Tester selector position \\
\hline
0.5–0.7 V & DCV-20 \\
\hline
\end{tabular}
\end{center}

10. Put the aligning marks “a” on the throttle position sensor and carburetor.

11. Stop the engine.
12. Remove:
   • Carburetor
     Refer to “CARBURETOR AND REED VALVE” section in the CHAPTER 4.
13. Tighten:
   • Screw (throttle position sensor) “1”

\textbf{TIP}

Tighten the screws (throttle position sensor) using the T20 bit (tamper resistant fastener type) by aligning the marks “a” that were put before removal.

14. Install:
   • Carburetor
     Refer to “CARBURETOR AND REED VALVE” section in the CHAPTER 4.

\textbf{CHECKING THE THROTTLE POSITION SENSOR INPUT VOLTAGE}

1. Disconnect the throttle position sensor coupler.
2. Start the engine.
3. Inspect:
   • Throttle position sensor input voltage
     Out of specification → Replace the CDI unit.

\begin{center}
\begin{tabular}{|c|c|}
\hline
Tester (+) lead → Blue lead “1” \\
Tester (-) lead → Black/Blue lead “2” \\
\hline
\end{tabular}
\end{center}

\begin{center}
\begin{tabular}{|c|c|}
\hline
Throttle position sensor input voltage & Tester selector position \\
\hline
4–6 V & DCV-20 \\
\hline
\end{tabular}
\end{center}
TUNING
ENGINE
CARBURETOR SETTING
• The role of fuel is to cool the engine, and in the case of a 2-stroke engine, to lubricate the engine in addition to power generation. Accordingly, if a mixture of air and fuel is too lean, abnormal combustion will occur, and engine seizure may result. If the mixture is too rich, spark plugs will get wet with oil, thus making it impossible to bring the engine into full play or if the worst comes to the worst, the engine may stall.
• The richness of the air-fuel mixture required for the engine will vary with atmospheric conditions of the day and therefore, the settings of the carburetor must be properly suited to the atmospheric conditions (air pressure, humidity and temperature).
• Finally, the rider himself must make a test-run and check his machine for conditions (pick-up of engine speed, road surface conditions) and for the discoloration of the spark plug(s). After taking these into consideration, he must select the best possible carburetor settings.

TIP
It is advisable to make a note of settings, atmospheric conditions, road surface condition, lap-time, etc. so that the memorandum can be used as a reference useful for future.

ATMOSPHERIC CONDITIONS AND CARBURETOR SETTINGS

<table>
<thead>
<tr>
<th>Air temp.</th>
<th>Humidity</th>
<th>Air pressure (altitude)</th>
<th>Mixture</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>High</td>
<td>Low (high)</td>
<td>Richer</td>
<td>Leaner</td>
</tr>
<tr>
<td>Low</td>
<td>Low</td>
<td>High (low)</td>
<td>Leaner</td>
<td>Richer</td>
</tr>
</tbody>
</table>

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).
• 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.

TEST RUN
After warming up the engine equipped with the standard type carburetor(s) and spark plug(s), run two or three laps of the circuit and check the smooth operation of the engine and discoloration of spark plug(s).

<table>
<thead>
<tr>
<th>Discoloration</th>
<th>Condition of spark plug</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>Insulator is dry and burnt brown.</td>
</tr>
<tr>
<td>Over burned (too lean)</td>
<td>Insulator is whitish.</td>
</tr>
<tr>
<td>Oil fouled (too rich)</td>
<td>Insulator is sooty and wet.</td>
</tr>
</tbody>
</table>

A. Normal
B. Over burned (too lean)
C. Oil fouled (too rich)

EFFECT OF SETTING PARTS IN RELATION TO THROTTLE VALVE OPENING

TIP
The power jet closes at 8,500 rpm of the engine, after which only the main jet dominates.

A. Closed
B. Full-open
1. Pilot jet
2. Pilot air screw
3. Jet needle
4. Diameter of straight portion
5. Clip position
6. Throttle valve
7. Power jet
8. Main jet

ADJUSTING THE MAIN JET
The richness of air-fuel mixture with 3/4–4/4 throttle can be set by changing the main jet "1".

Standard main jet | #178
* Except for USA and CDN

1. Spark plug is too hot.
   • Select a main jet having higher calibrating No. than standard. (To be enriched)
2. Spark plug is wet.
   • Select a main jet having lower calibrating No. than standard. (To be leaned out)
ADJUSTING THE POWER JET
The richness of air-fuel mixture under 8,500 rpm to the extent of 1/2 to full opened throttle can be set by changing the power jet “1”. A larger size jet results in a richer mixture, and a smaller size in a leaner mixture.

| Standard power jet | #50 |

ADJUSTING THE PILOT AIR SCREW
The richness of the air-fuel mixture with full closed to 1/8 throttle can be set by turning the pilot air screw “1”. Turning in the pilot air screw will enrich the mixture at low speeds, and turning out it will lean out the mixture.

| Standard pilot air screw position | 1-1/4 turns out | * 2-1/4 turns out (for reference only) |

* Except for USA and CDN

ADJUSTING THE PILOT JET
The richness of air-fuel mixture with the throttle fully closed to 1/2 open can be set by changing the pilot jet “1”. It is changed when adjustment cannot be made by the pilot air screw alone.

| Standard pilot jet | #50 *#52 |

* Except for USA and CDN

ADJUSTING THE JET NEEDLE GROOVE POSITION
Should the engine be hard to run smoothly at intermediate speeds, the jet needle “1” must be adjusted. If the mixture is too rich or too lean at intermediate speed operation, irregular engine operation and poor acceleration will result. Whether or not the richness of the mixture is proper is hard to be determined by means of the spark plug and therefore, it should be judged from your feeling of actual engine operation.

1. Too rich at intermediate speeds
   - Rough engine operation is felt and the engine will not pick up speed smoothly.
   In this case, step up the jet needle clip by one groove and move down the needle to lean out the mixture.

2. Too lean at intermediate speeds
   - The engine breathes hard and will not pick up speed quickly.
   Step up the jet needle clip by one groove and move up the needle to enrich the mixture.

| Standard clip position | No.2 groove *No.3 groove |

*Except for USA and CDN

ADJUSTING THE JET NEEDLE NEEDLE
On the carburetors used in the YZ250, the main nozzle is press-fitted, so it can not be replaced. Therefore, carburetor setting requires the change of the jet needle.

1. The jet needle setting parts, having the same taper angle, are available in different straight portion diameters and in different taper starting positions.

| Standard jet needle | N3EW |

A. Difference in straight portion dia.
B. Difference in taper starting position
a. Diameter of the straight portion
b. Taper starting position
c. Rich
d. Lean

2. Effects of changing the jet needle (reference)
   - Diameter of straight portion
     Changing the diameter of the straight portion adjusts the air-fuel mixture when the throttle is 1/8 to 1/4 open.
   - Taper starting position
     Changing the taper starting position produces the same effect as changing the clip position by 0.5 groove.

<Example>
In case of being 0.5 groove leaner in relation to N3EW-3rd groove, choose N3CW-3rd groove.

A. In case of being 0.5 groove leaner in relation to N3EW-3rd groove.
   a. Difference of 0.5 groove

* Except for USA and CDN

7-2
RELATIONSHIP WITH THROTTLE OPENING

The flow of the fuel through the carburetor main system is controlled by the main jet and then, it is further regulated by the area between the main nozzle and the jet needle. On the relationship between the fuel flow and the throttle opening, the fuel flow relates to the jet needle straight portion diameter around 1/8 to 1/4 throttle opening, whereas around 1/4 to 1/1 throttle opening it relates to the taper starting position and to the clip position. Therefore, the fuel flow is balanced at each stage of throttle opening by the combination of the jet needle straight portion diameter, taper starting position and clip position.

Therefore, the fuel flow is balanced at each stage of throttle opening by the combination of the jet needle straight portion diameter, taper starting position and clip position.

### CARBURETOR SETTING PARTS

<table>
<thead>
<tr>
<th>Main jet “1”</th>
<th>Size</th>
<th>Part number (-14943-)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rich #190</td>
<td>4MX-45</td>
<td></td>
</tr>
<tr>
<td>#188</td>
<td>4MX-95</td>
<td></td>
</tr>
<tr>
<td>#185</td>
<td>4MX-44</td>
<td></td>
</tr>
<tr>
<td>#381</td>
<td>4MX-94</td>
<td></td>
</tr>
<tr>
<td>*(STD) #180</td>
<td>4MX-43</td>
<td></td>
</tr>
<tr>
<td>*(STD) #178</td>
<td>4MX-93</td>
<td></td>
</tr>
<tr>
<td>#175</td>
<td>4MX-42</td>
<td></td>
</tr>
<tr>
<td>#172</td>
<td>4MX-92</td>
<td></td>
</tr>
<tr>
<td>#170</td>
<td>4MX-41</td>
<td></td>
</tr>
<tr>
<td>#168</td>
<td>4MX-91</td>
<td></td>
</tr>
<tr>
<td>#165</td>
<td>4MX-40</td>
<td></td>
</tr>
<tr>
<td>Lean #162</td>
<td>4MX-90</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pilot jet “2”</th>
<th>Size</th>
<th>Part number (-14948-)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rich #62</td>
<td>4MX-12</td>
<td></td>
</tr>
<tr>
<td>#60</td>
<td>4MX-11</td>
<td></td>
</tr>
<tr>
<td>#58</td>
<td>4MX-10</td>
<td></td>
</tr>
<tr>
<td>#55</td>
<td>4MX-09</td>
<td></td>
</tr>
<tr>
<td>*(STD) #52</td>
<td>4MX-08</td>
<td></td>
</tr>
<tr>
<td>*(STD) #50</td>
<td>4MX-07</td>
<td></td>
</tr>
<tr>
<td>#48</td>
<td>4MX-06</td>
<td></td>
</tr>
<tr>
<td>#45</td>
<td>4MX-05</td>
<td></td>
</tr>
<tr>
<td>#42</td>
<td>4MX-04</td>
<td></td>
</tr>
<tr>
<td>#40</td>
<td>4MX-03</td>
<td></td>
</tr>
<tr>
<td>Lean #38</td>
<td>4MX-02</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Jet needle “3”</th>
<th>Size</th>
<th>Part number (-14916-)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rich N8RH</td>
<td>4SR-RH</td>
<td></td>
</tr>
<tr>
<td>N3EH</td>
<td>4SR-EH</td>
<td></td>
</tr>
<tr>
<td>N8RW</td>
<td>4SR-RW</td>
<td></td>
</tr>
<tr>
<td>*(STD) N3EW</td>
<td>4SR-EW</td>
<td></td>
</tr>
<tr>
<td>N3CW</td>
<td>4SR-CW</td>
<td></td>
</tr>
<tr>
<td>N3EJ</td>
<td>4SR-EJ</td>
<td></td>
</tr>
<tr>
<td>Lean N3CJ</td>
<td>4SR-CJ</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Power jet “4”</th>
<th>Size</th>
<th>Part number (-1494F-)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rich #65</td>
<td>4JT-13</td>
<td></td>
</tr>
<tr>
<td>#60</td>
<td>4JT-11</td>
<td></td>
</tr>
<tr>
<td>#55</td>
<td>4JT-09</td>
<td></td>
</tr>
<tr>
<td>*(STD) #50</td>
<td>4JT-07</td>
<td></td>
</tr>
<tr>
<td>Lean #40</td>
<td>4JT-03</td>
<td></td>
</tr>
</tbody>
</table>

* Except for USA and CDN

---

**Example**

- Lean (larger diameter)
- Rich (smaller diameter)
  1. 1/8 throttle
  2. 1/4 throttle
  3. 1/2 throttle
  4. 1/1 throttle
a. Main nozzle
ROAD CONDITION AND EXAMPLES OF CARBURETOR SETTING

<table>
<thead>
<tr>
<th></th>
<th>General condition</th>
<th>Sandy condition</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Under 10°C (50°F)</td>
<td>15–25°C (59–77°F)</td>
</tr>
<tr>
<td></td>
<td>(Winter)</td>
<td>(Spring, Autumn)</td>
</tr>
<tr>
<td>Main jet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>#178</td>
<td>#178</td>
</tr>
<tr>
<td>B</td>
<td>#180</td>
<td>#178</td>
</tr>
<tr>
<td>Jet needle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>N3CW-3</td>
<td>N3EW-2</td>
</tr>
<tr>
<td>B</td>
<td>N3EW-3</td>
<td>N3CW-3</td>
</tr>
<tr>
<td>Pilot jet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>#50</td>
<td>#50</td>
</tr>
<tr>
<td>B</td>
<td>-1/4</td>
<td>Zero</td>
</tr>
<tr>
<td>Pilot air screw</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>-1/4</td>
<td>Zero</td>
</tr>
<tr>
<td>B</td>
<td>-1/4</td>
<td>Zero</td>
</tr>
<tr>
<td>Power jet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>#50</td>
<td>#50</td>
</tr>
</tbody>
</table>

A. For USA and CDN
B. Except for USA and CDN

**TIP**
Optimum pilot air screw setting can be obtained by adding the ex-factory number of the same screw back-out turns to any required value provided in the chart. For example, if the ex-factory number is "1", add "1" to the value chosen in the chart.
### EXAMPLES OF CARBURETOR SETTING DEPENDING ON SYMPTOM

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Setting</th>
<th>Checking</th>
</tr>
</thead>
</table>
| **At full throttle**  
Hard breathing  
Shearing noise  
Whitish spark plug  
Lean mixture  
↓  
Lean mixture | Increase main jet calibration no. (Gradually) | Discoloration of spark plug → If tan color, it is in good condition.  
If cannot be corrected:  
Clogged float valve seat  
Clogged fuel hose  
Clogged fuel cock  
↓  
Lean mixture  
↓  
Lean mixture | **At full throttle**  
Stop of speed pick-up  
Slow speed pick-up  
Slow response  
Sooty spark plug  
Rich mixture | Decrease main jet calibration no. (Gradually)  
*In case of racing slight enrichment of mixture reduces engine trouble.  
↓  
Lean mixture  
↓  
Lean mixture | **At full throttle**  
Stop of speed pick-up  
Slow speed pick-up  
Slow response  
Sooty spark plug  
Rich mixture | Decrease main jet calibration no. (Gradually)  
*In case of racing slight enrichment of mixture reduces engine trouble.  
↓  
Lean mixture  
↓  
Lean mixture | **At full throttle**  
Stop of speed pick-up  
Slow speed pick-up  
Slow response  
Sooty spark plug  
Rich mixture | Decrease main jet calibration no. (Gradually)  
*In case of racing slight enrichment of mixture reduces engine trouble.  
↓  
Lean mixture  
↓  
Lean mixture | **Lean mixture** | Lower jet needle clip position. (1 groove down) | **Rich mixture** | Raise jet needle clip position. (1 groove up)  
1/4–3/4 throttle  
Hard breathing  
Lack of speed | Lower jet needle clip position. (1 groove down) | **1/4–1/2 throttle**  
Slow speed pick-up  
White smoke  
Poor acceleration | Raise jet needle clip position. (1 groove up)  
1/4–1/2 throttle  
Slow speed pick-up  
White smoke  
Poor acceleration | **0–1/4 throttle**  
Hard breathing  
Speed down | Use jet needle having a smaller diameter.  
Number of turns-back → Correct properly  
Overflow from carburetor | **0–1/4 throttle**  
Poor acceleration  
White smoke | Use jet needle with a larger diameter.  
1/4–1/2 throttle  
Slow speed pick-up  
White smoke  
Poor acceleration | **Unstable at low speeds**  
Pinking noise | Lower jet needle clip position. (1 groove down)  
Turn in pilot air screw. | **Poor response at extremely low speed** | Reduce pilot jet calibration No.  
Turn out pilot air screw.  
If not effect, reverse the above procedures. | Dragging brake  
Overflow from carburetor | **Poor response in the range of low to intermediate speeds** | Raise jet needle clip position.  
If no effect, reverse the above procedures. | **Poor response when throttle is opened quickly** | Check overall settings.  
Use main jet having lower calibration no.  
Raise jet needle clip position. (1 groove up)  
If no effect, reverse the above procedures. | Check air filter for fouling. | **Poor engine operation** | Turn in pilot air screw. | **Check throttle valve operation.** |

**TIP**  
This should be taken simply for an example. It is necessary to set the carburetor while checking the operating conditions of the engine and discoloration of spark plugs. Normally, carburetor setting is made by means of the main jet, needle clip position, pilot jet and pilot air screw. If the result of setting is still unsatisfactory, it is advisable to change the sizes of the jet needle.
CHANGE OF THE HEAT RANGE OF SPARK PLUGS
Judging from the discoloration of spark plugs, if they are found improper, it can be corrected by the following two methods; changing carburetor settings and changing the heat range of spark plug.

| Standard spark plug | BR8EG/NGK (resistance type) |

TIP
- In principle, it is advisable to first use spark plugs of standard heat range, and judging from the discoloration of spark plugs, adjust carburetor settings.
- If the calibration No. of the main jet must be changed by ±15, it is advisable to change the heat range of spark plugs and newly select the proper main jet.
- When checking the discoloration of spark plugs, be sure to stop the engine immediately after a run and check.
- Avoid racing.
- When changing the heat range of spark plugs, never attempt to change it more than ±1 rank.
- When using a spark plug other than standard, check its heat range against the standard and check that it is a resistance type.
- Note that even if the discoloration seems proper, it may slightly vary with the spark plug maker and oil in use.

<Requirement for selection of secondary gear reduction ratio>
- It is generally said that the secondary gear ratio should be reduced for a longer straight portion of a speed course and should be increased for a course with many corners. Actually, however, as the speed depends on the ground condition of the day of the race, be sure to run through the circuit to set the machine suitable for the entire course.
- In actuality, it is very difficult to achieve settings suitable for the entire course and some settings may be sacrificed. Thus, the settings should be matched to the portion of the course that has the greatest effect on the race result. In such a case, run through the entire course while making notes of lap times to find the best balance; then, determine the secondary reduction ratio.
- If a course has a long straight portion where a machine can run at maximum speed, the machine is generally set such that it can develop its maximum revolutions toward the end of the straight line, with care taken to avoid the engine over-revving.

TIP
Riding technique varies from rider to rider and the performance of a machine also vary from machine to machine. Therefore, do not imitate other rider’s settings from the beginning but choose your own setting according to the level of your riding technique.

**DRIVE AND REAR WHEEL SPROCKETS SETTING PARTS**

<table>
<thead>
<tr>
<th>Part name</th>
<th>Size</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive sprocket “1”</td>
<td>13T</td>
<td>9383E-13216</td>
</tr>
<tr>
<td></td>
<td>14T</td>
<td>9383E-14215</td>
</tr>
<tr>
<td>Rear wheel sprocket “2”</td>
<td>47T</td>
<td>1C3-25447-00</td>
</tr>
<tr>
<td></td>
<td>48T</td>
<td>1C3-25448-00</td>
</tr>
<tr>
<td></td>
<td>49T</td>
<td>1C3-25449-00</td>
</tr>
<tr>
<td></td>
<td>50T</td>
<td>1C3-25450-00</td>
</tr>
<tr>
<td></td>
<td>51T</td>
<td>1C3-25451-00</td>
</tr>
<tr>
<td></td>
<td>52T</td>
<td>1C3-25452-00</td>
</tr>
</tbody>
</table>

**TIRE PRESSURE**
Tire pressure should be adjust to suit the road surface condition of the circuit.

- Under a rainy, muddy, sandy, or slippery condition, the tire pressure should be lower for a larger area of contact with the road surface.

- Under a stony or hard road condition, the tire pressure should be higher to prevent a flat tire.

**FRONT FORK SETTING**
The front fork setting should be made depending on the rider's feeling of an actual run and the circuit conditions. The front fork setting includes the following three factors:
1. Setting of air spring characteristics
   - Change the fork oil amount.
2. Setting of spring preload
   - Change the spring.
3. Setting of damping force
   - Change the compression damping.
   - Change the rebound damping. The spring acts on the load and the damping force acts on the cushion travel speed.

**CHANGE IN AMOUNT AND CHARACTERISTICS OF FORK OIL**
Damping characteristic near the final stroke can be changed by changing the fork oil amount.
Adjust the oil amount in 5 cm$^3$ (0.2 Imp oz, 0.2 US oz) increments or decrements. Too small oil amount causes the front fork to produce a noise at full rebound or the rider to feel some pressure on his hands or body. Alternatively, too large oil amount will cause the air spring characteristics to have a tendency to be stiffer with the consequent deteriorated performance and characteristics. Therefore, adjust the front fork within the specified range.

### TIP
Generally a soft spring gives a soft riding feeling. Rebound damping tends to become stronger and the front fork may sink deeply over a series of gaps.

1. **Use of soft spring**
   - Change the rebound damping.
   - Change the compression damping.
   - Turn out one or two clicks.

### TIP
Generally a stiff spring gives a stiff riding feeling. Rebound damping tends to become weaker, resulting in lack of a sense of contact with the road surface or in a vibrating handlebar.

### FRONT FORK SETTING PARTS
- Front fork spring "1"
  - The I.D. mark (slits) "a" is proved on the end of the spring.

### REAR SUSPENSION SETTING
The rear suspension setting should be made depending on the rider’s feeling of an actual run and the circuit conditions. The rear suspension setting includes the following two factors:

1. Setting of spring preload
   - Change the set length of the spring.
   - Change the spring.
2. Setting of damping force
   - Change the rebound damping.
   - Change the compression damping.

### CHOOSING SET LENGTH
1. Place a stand or block under the engine to put the rear wheel above the floor, and measure the length "a" between the rear wheel axle center and the rear fender holding bolt.

2. Remove the stand or block from the engine and with a rider astride the seat, measure the sunken length "b" between the rear wheel axle center and the rear fender holding bolt.

3. Loosen the locknut "1" and make adjustment by turning the spring adjuster "2" to achieve the standard figure from the subtraction of the length "b" from the length "a".

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**A. Air spring characteristics in relation to oil amount change**

**B. Load**

**C. Stroke**

1. Max. oil amount
2. Standard oil amount
3. Min. oil amount

**SETTING OF SPRING AFTER REPLACEMENT**
As the front fork setting can be easily affected by rear suspension, take care so that the machine front and rear are balanced (in position, etc.) when setting the front fork.

1. Use of soft spring
   - Change the rebound damping.
   - Turn out one or two clicks.
   - Change the compression damping.
   - Turn in one or two clicks.

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**Standard oil amount:**
- 330 cm$^3$ (11.6 Imp oz, 11.2 US oz)
- Extent of adjustment:
  - 300–375 cm$^3$ (10.6–13.2 Imp oz, 10.1–12.7 US oz)

**TIP**
The I.D. mark (slits) "a" is proved on the end of the spring.
**TIP**
- If the machine is new and after it is broken in, the same set length of the spring may change because of the initial fatigue, etc. of the spring. Therefore, be sure to make reevaluation.
- If the standard figure cannot be achieved by adjusting the spring adjuster and changing the spring set length, replace the spring with an optional one and make readjustment.

**SETTING OF SPRING AFTER REPLACEMENT**
After replacement, be sure to adjust the spring to the set length [sunken length 90–100 mm (3.5–3.9 in)] and set it.

1. **Use of soft spring**
   - Set the soft spring for less rebound damping to compensate for its less spring load. Run with the rebound damping adjuster one or two clicks on the softer side and readjust it to suit your preference.
2. **Use of stiff spring**
   - Set the soft spring for more rebound damping to compensate for its greater spring load. Run with the rebound damping adjuster one or two clicks on the softer side and readjust it to suit your preference.

**TIP**
Adjusting the rebound damping will be followed more or less by a change in the compression damping. For correction, turn the low compression damping adjuster on the softer side.

**WARNING**
When using a rear shock absorber other than currently installed, use the one whose overall length "a" does not exceed the standard as it may result in faulty performance. Never use one whose overall length is greater than standard.
• Extent of adjustment (spring preload)

<table>
<thead>
<tr>
<th>SPRING PART NUMBER (-22212-)</th>
<th>Maximum</th>
<th>Minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td>1C3-00</td>
<td>Position in which the spring is turned in 18 mm (0.71 in) from its free length.</td>
<td>Position in which the spring is turned in 1.5 mm (0.06 in) from its free length.</td>
</tr>
<tr>
<td>1C3-10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1C3-20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1C3-30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5UN-00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5UN-A0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5UN-B0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5UN-C0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5UN-D0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5UN-E0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5UN-F0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5UN-G0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5UN-50</td>
<td>Position in which the spring is turned in 20 mm (0.79 in) from its free length.</td>
<td></td>
</tr>
<tr>
<td>5UN-60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5UN-70</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TIP**

- For the spring preload adjustment, refer to “ADJUSTING THE REAR SHOCK ABSORBER SPRING PRELOAD” in the CHAPTER 3.
- Preload adjusting extent is the same for the titanium and steel springs.
### SUSPENSION SETTING (FRONT FORK)

**TIP**
- If any of the following symptoms is experienced with the standard position as the base, make resetting by reference to the adjustment procedure given in the same chart.
- Before any change, set the rear shock absorber sunken length to the standard figure 90–100 mm (3.5–3.9 in).

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Jump</th>
<th>Large gap</th>
<th>Medium gap</th>
<th>Small gap</th>
<th>Check</th>
<th>Adjust</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stiff over entire range</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Compression damping</td>
<td>Turn adjuster counterclockwise (about 2 clicks) to decrease damping.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oil amount</td>
<td>Decrease oil amount by about 5–10 cm$^3$ (0.2–0.4 Imp oz, 0.2–0.3 US oz).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Spring</td>
<td>Replace with soft spring.</td>
</tr>
<tr>
<td>Unsmooth movement over entire range</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Outer tube</td>
<td>Check for any bends, dents, and other noticeable scars, etc. If any, replace affected parts.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Inner tube</td>
<td>Replace with a new one for extended use.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Slide metal</td>
<td>Replace with a new one for extended use.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Piston metal</td>
<td>Retighten to specified torque.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Under bracket tightening torque</td>
<td></td>
</tr>
<tr>
<td>Poor initial movement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Rebound damping</td>
<td>Turn adjuster counterclockwise (about 2 clicks) to decrease damping.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oil seal</td>
<td>Apply grease in oil seal wall.</td>
</tr>
<tr>
<td>Soft over entire range, bottoming out</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Compression damping</td>
<td>Turn adjuster clockwise (about 2 clicks) to increase damping.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oil amount</td>
<td>Increase oil amount by about 5–10 cm$^3$ (0.2–0.4 Imp oz, 0.2–0.3 US oz).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Spring</td>
<td>Replace with stiff spring.</td>
</tr>
<tr>
<td>Stiff toward stroke end</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oil amount</td>
<td>Decrease oil amount by about 5 cm$^3$ (0.2 Imp oz, 0.2 US oz).</td>
</tr>
<tr>
<td>Soft toward stroke end, bottoming out</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oil amount</td>
<td>Increase oil amount by about 5 cm$^3$ (0.2 Imp oz, 0.2 US oz).</td>
</tr>
<tr>
<td>Stiff initial movement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Compression damping</td>
<td>Turn adjuster counterclockwise (about 2 clicks) to decrease damping.</td>
</tr>
<tr>
<td>Low front, tending to lower front posture</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Compression damping</td>
<td>Turn adjuster clockwise (about 2 clicks) to increase damping.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Rebound damping</td>
<td>Turn adjuster counterclockwise (about 2 clicks) to decrease damping.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Balance with rear end</td>
<td>Set sunken length for 95–100 mm (3.7–3.9 in) when one passenger is astride seat (lower rear posture).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oil amount</td>
<td>Increase oil amount by about 5 cm$^3$ (0.2 Imp oz, 0.2 US oz).</td>
</tr>
<tr>
<td>&quot;Obtrusive&quot; front, tending to upper front posture</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Compression damping</td>
<td>Turn adjuster counterclockwise (about 2 clicks) to decrease damping.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Balance with rear end</td>
<td>Set sunken length for 90–95 mm (3.5–3.7 in) when one passenger is astride seat (upper rear posture).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Spring</td>
<td>Replace with soft spring.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oil amount</td>
<td>Decrease oil amount by about 5–10 cm$^3$ (0.2–0.4 Imp oz, 0.2–0.3 US oz).</td>
</tr>
</tbody>
</table>
### SUSPENSION SETTING (REAR SHOCK ABSORBER)

**TIP**
- If any of the following symptoms is experienced with the standard position as the base, make resetting by reference to the adjustment procedure given in the same chart.
- Adjust the rebound damping in 2-click increments or decrements.
- Adjust the low compression damping in 1-click increments or decrements.
- Adjust the high compression damping in 1/6 turn increments or decrements.

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Section</th>
<th>Check</th>
<th>Adjust</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Jump Large gap</td>
<td>Medium gap Small gap</td>
<td></td>
</tr>
<tr>
<td>Stiff, tending to sink</td>
<td>○</td>
<td>○</td>
<td>Rebound damping Turn adjuster counterclockwise (about 2 clicks) to decrease damping. Set sunken length for 90–100 mm (3.5–3.9 in) when one passenger is astride seat.</td>
</tr>
<tr>
<td>Spongy and unstable</td>
<td>○</td>
<td>○</td>
<td>Rebound damping Low compression damping Turn adjuster clockwise (about 2 clicks) to increase damping. Turn adjuster clockwise (about 1 click) to increase damping. Replace with stiff spring.</td>
</tr>
<tr>
<td>Heavy and dragging</td>
<td>○</td>
<td>○</td>
<td>Rebound damping Spring Turn adjuster counterclockwise (about 2 clicks) to decrease damping. Replace with soft spring.</td>
</tr>
<tr>
<td>Poor road gripping</td>
<td>○</td>
<td>○</td>
<td>Rebound damping Low compression damping High compression damping Turn adjuster clockwise (about 2 clicks) to increase damping. Turn adjuster clockwise (about 1 clicks) to increase damping. Turn adjuster clockwise (about 1/6 turn) to increase damping. Set sunken length for 90–100 mm (3.5–3.9 in) when one passenger is astride seat. Replace with soft spring.</td>
</tr>
<tr>
<td>Bottoming out</td>
<td>○</td>
<td>○</td>
<td>High compression damping Spring set length Spring Turn adjuster clockwise (about 1/6 turn) to increase damping. Set sunken length for 90–100 mm (3.5–3.9 in) when one passenger is astride seat. Replace with stiff spring.</td>
</tr>
<tr>
<td>Bouncing</td>
<td>○</td>
<td>○</td>
<td>Rebound damping Spring Turn adjuster clockwise (about 2 clicks) to increase damping. Replace with soft spring.</td>
</tr>
<tr>
<td>Stiff travel</td>
<td>○</td>
<td>○</td>
<td>High compression damping Spring set length Spring Turn adjuster counterclockwise (about 1/6 turn) to decrease damping. Set sunken length for 90–100 mm (3.5–3.9 in) when one passenger is astride seat. Replace with soft spring.</td>
</tr>
</tbody>
</table>